

REPORT NUMBER: SPNCAP-MGA-2012-013

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

**VOLKSWAGEN GROUP OF AMERICA
2012 Volkswagen Passat S 4-Dr Sedan
NHTSA No.: VC5802**

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



Test Date: October 10, 2011

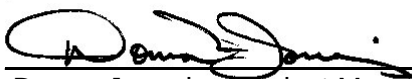
Final Report Date: November 22, 2011

FINAL REPORT

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

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Prepared by: 
Donna Janovicz, Project Manager

Approved by: 
Ben Fischer, Project Engineer

Approval Date: November 22, 2011

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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7. Author(s) Donna Janovicz, Project Manager Ben Fischer, Project Engineer		8. Performing Organization Report No. SPNCAP-MGA-2012-013																												
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16. Abstract A 32.2 km/h (20 mph), 75° oblique impact Side NCAP Test was conducted on the subject 2012 Volkswagen Passat S 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 10, 2011. The impact velocity was 32.1 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21.4°C. The test vehicle post-test maximum crush was 377 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">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>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>305</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>Gs</td> <td>82</td> <td>44</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>2985</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38*</td> <td>19</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td>mm</td> <td>45*</td> <td>17</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	305	Resultant Lower Spine Acceleration	Gs	82	44	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2985	Maximum Thoracic Rib Deflection	mm	38*	19	Maximum Abdomen Rib Deflection	mm	45*	17
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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, Room E12-100 Washington, DC 20590 Email: tis@nhtsa.dot.gov FAX: 202-493-2833																												
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SECTION 1

TEST PURPOSE AND PROCEDURE

This side impact test is part of the MY 2012 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-09-D-00124. The purpose of this test is to generate comparative side impact performance in a 2012 Volkswagen Passat S 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 August 2011.

SECTION 2 SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2012 Volkswagen Passat S 4-Dr Sedan. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.1 km/h. The test was conducted by MGA Research Corporation in Burlington, Wisconsin, on October 10, 2011. 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 August 2011. Camera locations and other pertinent camera information are included in this report.

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

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.

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	305
Resultant Lower Spine Acceleration	Gs	82	44
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2985
Maximum Thoracic Rib Deflection	mm	38*	19
Maximum Abdomen Rib Deflection	mm	45*	17

*Proposed IARV

Supplemental restraint information is given below:

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	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		No	

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

GENERAL COMMENTS

There was no valid data collected for:

- Vehicle CG X after 17 msec.

- Left Floor Sill Y after 17 msec.

- Left Mid A-Post Y after 11 msec.

- Left Lower B-Post Y after 8 msec.

- Driver Seat Track Y after 8 msec.

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: 2012 Volkswagen Passat S 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. VC5802
 Test Date: 10/10/2011

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	VC5802	Traction Control System (TCS)	Yes
Model Year	2012	Auto-Leveling System	No
Make	Volkswagen	Automatic Door Locks (ADL)	Yes
Model	Passat	Power Window Auto-Reverse	Yes
Body Style	Sedan	Other Optional Feature	N/A
VIN	1VWAP7A37CC006976	Driver Front Airbag	Yes
Body Color	Tungsten Silver Metallic	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	64 / 40	Driver Head/Torso Airbag	No
Engine Displacement (L)	2.5	Driver Torso Airbag	No
Type/No. Cylinders	5	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Lateral	Driver Pelvis Airbag	No
Transmission Type	Manual	Driver Knee Airbag	No
Transmission Speeds	5	Rear Pass. Curtain Airbag	Yes
Overdrive	No	Rear Pass. Head/Torso Airbag	No
Final Drive	Front	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	No	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	No
All Wheel Drive (AWD)	No	Other Safety Restraint	N/A
Does owner's manual provide instruction to turn off automatic door locks?			No

DATA FROM CERTIFICATION LABEL

Manufactured By	Volkswagen Group of America	GVWR (kg)	2010
Date of Manufacture	08/2011	GAWR Front (kg)	1030
Vehicle Type	Passenger Car	GAWR Rear (kg)	1030

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				506	(A)
DSC x 68.04 kg				340	(B)
Rated Cargo and Luggage Weight (RCLW)				166	(A-B)

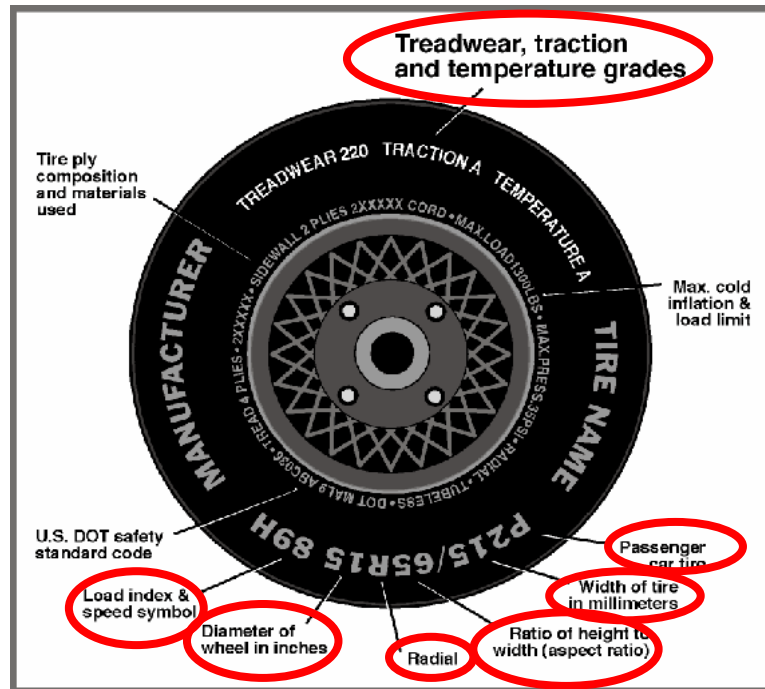
VEHICLE SEAT TYPE

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: 2012 Volkswagen Passat S 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. VC5802
 Test Date: 10/10/2011



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	200	200
Recommended Tire Size	215/60R16	215/60R16

TIRE SIDEWALL INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Tire Size on Vehicle	215/60R16	215/60R16
Tire Manufacturer	Continental	Continental
Tire Name	CONTIPROCONTACT	CONTIPROCONTACT
Tire Type	Passenger	Passenger
Tire Width	215	215
Aspect Ratio	60	60
Radial	Yes	Yes
Wheel Diameter	16	16
Load Index/Speed Symbol	95T	95T
Treadwear	500	500
Traction Grade	AA	AA
Temperature Grade	A	A
Tire Material	Rubber	Rubber

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

Test Vehicle: 2012 Volkswagen Passat S 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. VC5802
 Test Date: 10/10/2011

TEST PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kpa	200	200	200	200
Tire Placard	kpa	200	200	200	200
Owner's Manual	kpa				
As Tested	kpa	200	200	200	200

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	427.3	295.8		428.7	391.4		433.6	412.3	
Right	kg	433.2	299.8		440.9	406.9		425.1	403.7	
Ratio	%	59.1	40.9		52.1	47.9		51.3	48.7	
Totals	kg	860.5	595.6	1456.1	869.6	798.3	1667.9	858.7	816.0	1674.7

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1456.1	(A)
Actual Weight of 1 P572V ATD (SID-IIs) ATD Used	kg	52.2	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	166	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1674.3	(A+B+C)

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

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Weight of Ballast, if any	122.5
Right tail light, jack & tools, spare tire, trunk carpet, trunk mat, right rear floor mat.	24.9

TEST VEHICLE ATTITUDES AND CG

	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	deg	-0.7	-0.3	0.5	Yes
Front Pass. Sill Angle (front-to-rear)*	deg	-0.7	-0.1	0.3	Yes
Front Bumper Angle (left-to-right)**	deg	0.0	-0.1	-0.1	Yes
Rear Bumper Angle (left-to-right)**	deg	0.0	0.0	0.0	Yes
Vehicle CG (Aft of Front Axle)	mm	1147	1342	1367	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	5	13	8	

*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: 2012 Volkswagen Passat S 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. VC5802
 Test Date: 10/10/2011

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	20.6	15.9	18.3
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 SCR Height (mm)	SCR Height Position	SCR Height (mm)		
				Rear-most	Mid-Fore/Aft	Forward-Most
Driver Seat	18.3	Fixed	Max	Fixed	Fixed	Fixed
	18.3	Fixed	Mid	Fixed	Fixed	Fixed
	18.3	Fixed	Min	Fixed	Fixed	Fixed
Front Passenger Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
	Fixed	Fixed	Mid	Fixed	Fixed	Fixed
	Fixed	Fixed	Min	Fixed	Fixed	Fixed

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

Test Vehicle: 2012 Volkswagen Passat S 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

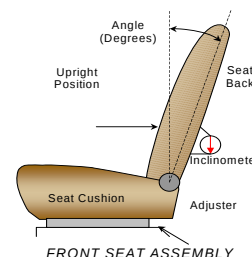
NHTSA No. VC5802
 Test Date: 10/10/2011

SEAT FORE/AFT POSITIONS

Seat	Total Fore/Aft Travel		Test Position from Forward-most Position	
	mm	Detents	mm	Detent
Driver Seat	252	38 (1 st as 1)	0	0 (1 st as 0)
Front Passenger Seat	170	26 (1 st as 1)	0	0 (1 st 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 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	Degrees	Detent
Driver Seat w/Seated Dummy	67.1		11.9	5 (1 st as 0)
Front Passenger Seat	68.5		14.7	5 (1 st as 0)
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 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	3 detents (1 st as 0)	3 (lowermost 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	5	Lowest

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

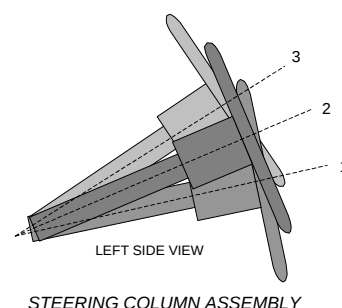
Test Vehicle: 2012 Volkswagen Passat S 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. VC5802
 Test Date: 10/10/2011

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.

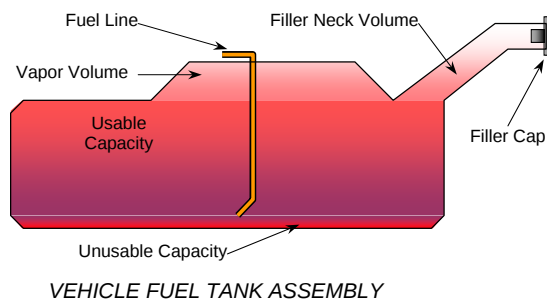
	Degrees	Fore/Aft Position (mm)
Lowermost, Position 1	69.0	170
Geometric Center, Position 2	66.6	143
Uppermost, Position 3	64.2	115
Telescoping Steering Wheel Travel		55
Test Position	66.6	143



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 runs for 2 seconds after ignition is switched on. If the engine doesn't run, the fuel pump stops running. If there is a crash signal, it will also stop running. The fuel pipe is on the right side.



FUEL TANK CAPACITY DATA

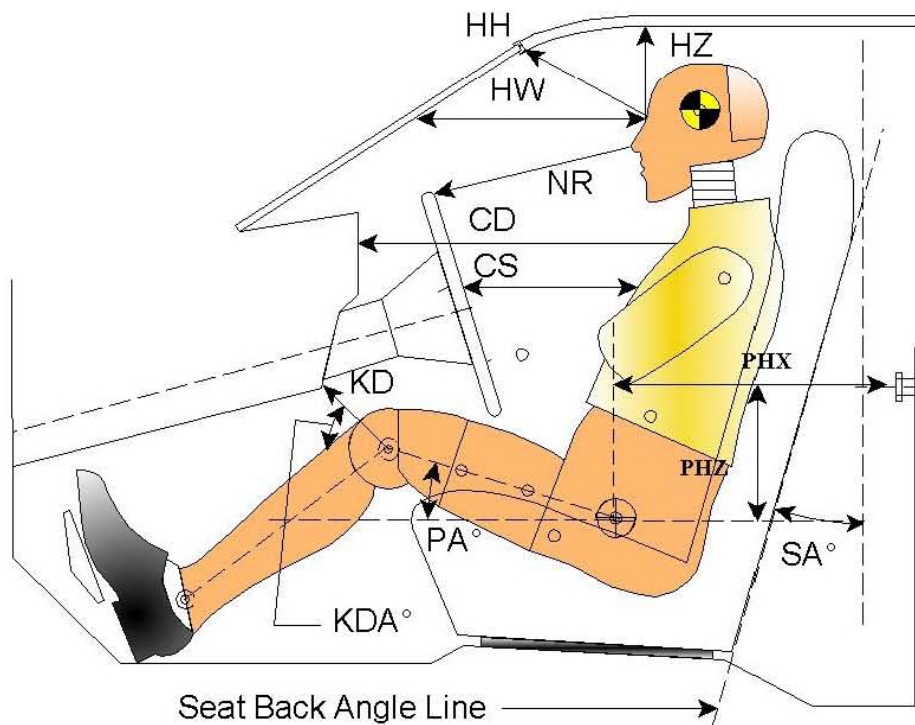
	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	70.0
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	70.0
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	65.1
Actual Amount of Solvent Used	65.1
1/3 of Usable Capacity	23.3

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

.DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Volkswagen Passat S 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. VC5802
 Test Date: 10/10/2011



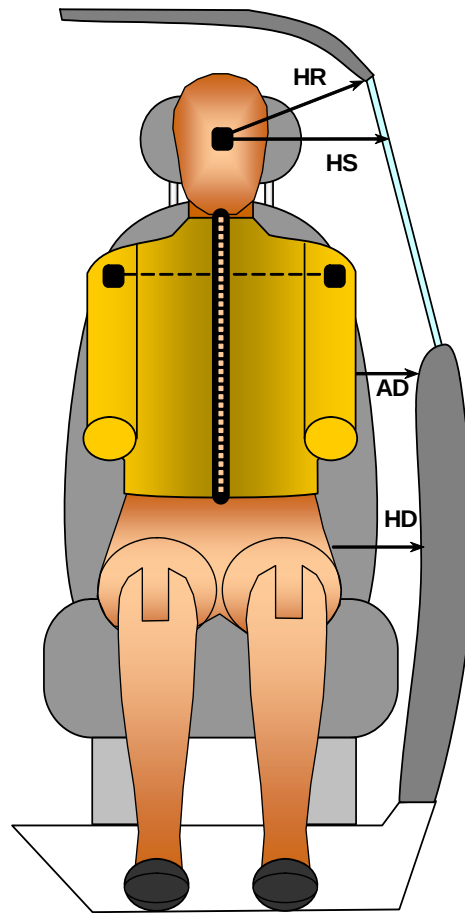
LEFT SIDE VIEW

Code	Measurement Description	Driver S/N 296	
		Length (mm)	Angle (°)
HH	Head to Header	272	
HW	Head to Windshield	642	
HZ	Head to Roof Liner	195	
NR	Nose to Rim	280	
CD	Chest to Dashboard	466	
CS	Chest to Steering Wheel	226	
KDL/KDAL°	Left Knee to Dash	159	29.6
KDR/KDAR°	Right Knee to Dash	143	33.2
PAX°	Pelvic Tilt Angle (X-Axis)		21.9
PAY°	Pelvic Tilt Angle (Y-Axis)		NA
PHX	Hip Point to Striker (X-Axis)	343	
PHZ	Hip Point to Striker (Z-Axis)	195	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Volkswagen Passat S 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. VC5802
 Test Date: 10/10/2011



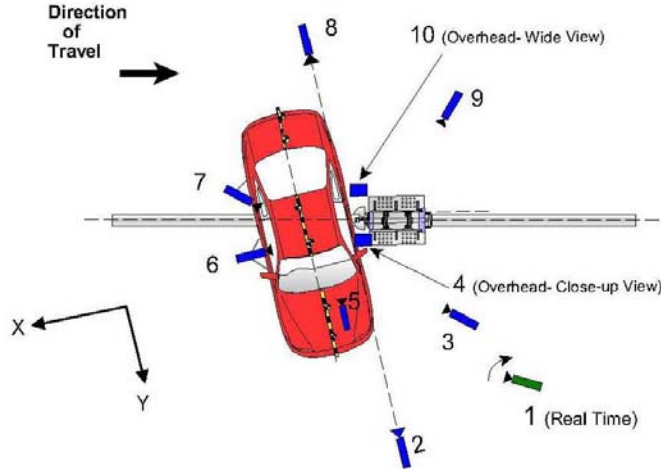
FRONT VIEW OF DUMMY

Code	Measurement Description	Driver S/N 296
		Length (mm)
HR	Head to Side Header	249
HS	Head to Side Window	383
AD	Arm to Door	196
HD	Hip Point to Door	174

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2012 Volkswagen Passat S 4-Dr Sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No. VC5802
Test Date: 10/10/2011



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	-50	-5410	-1730	24	1000
3	Impact Side 45° Forward	-2230	3820	-1820	20	1000
4	Overhead Closeup	110	0	-4420	50	1000
5	Onboard – Driver Front				16	1000
6	Onboard – Driver Side				8	1000
7	Onboard – Driver Rear				8	1000
8	Rear Ground Level	-60	-5310	-1710	24	1000
9	Impact Side 45° Rearward	-3670	-3310	-1840	20	1000
10	Overhead Wide View	340	0	-4610	14	1000
11	Real-Time Dummy Front View					30

* All measurements accurate to ± 6 mm

Note: Vehicle was at a 15° angle to the rigid pole.

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

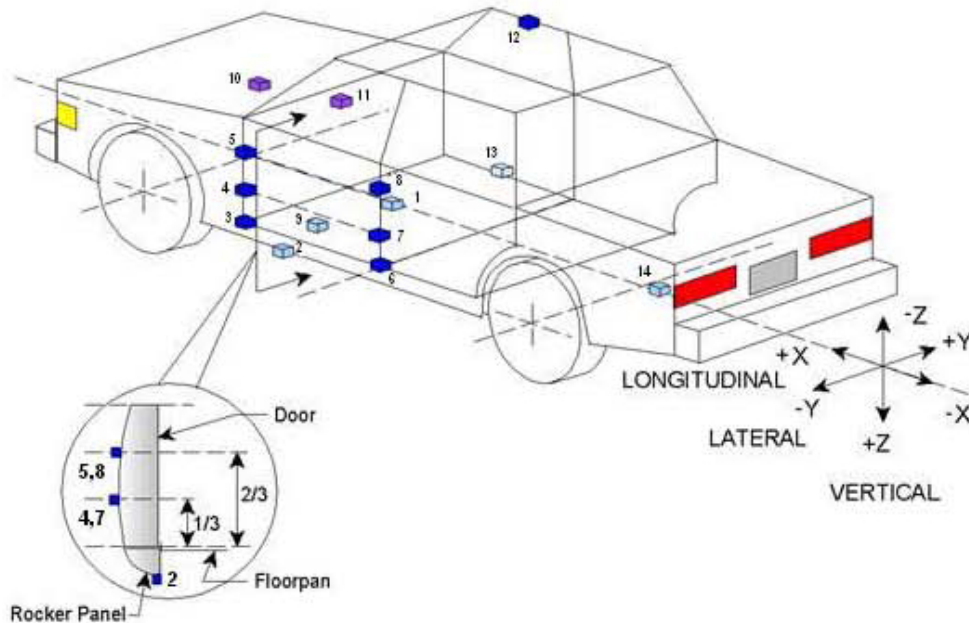
INSTRUMENTATION

INSTRUMENTATION	Number of Channels
Driver Dummy	16
Vehicle Structure	18
Pole Load Cells	8
TOTAL	42

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER DATA

Test Vehicle: 2012 Volkswagen Passat S 4-Dr Sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No. VC5802
Test Date: 10/10/2011



	Accelerometer Location			
	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2600	-178	-195
2	Left Floor Sill	3005	-710	-217
3	A Pillar Sill	3446	-715	-210
4	A Pillar Low	3400	-697	-590
5	A Pillar Mid	3432	-791	-745
6	B Pillar Sill	2366	-720	-225
7	B Pillar Low	2280	-690	-500
8	B Pillar Mid	2280	-697	-740
9	Driver Seat Track	2460	-600	-304
10	Engine Top	4074	190	-806
11	Firewall	3820	0	-858
12	Right Roof	2240	573	-1455
13	Right Floor Sill	3020	710	-217
14	Rear Floorpan	269	0	-315

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: 2012 Volkswagen Passat S 4-Dr Sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No. VC5802
Test Date: 10/10/2011



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: 2012 Volkswagen Passat S 4-Dr Sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No. VC5802
Test Date: 10/10/2011

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
Lower Torso	Side Airbag
Left Hip	Door Panel
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)					

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 and Separated from A-Pillar
Side Window Damage	Left Front Window Broke
Other Notable Effects	None

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

Test Vehicle: 2012 Volkswagen Passat S 4-Dr Sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No. VC5802
Test Date: 10/10/2011

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	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		No	

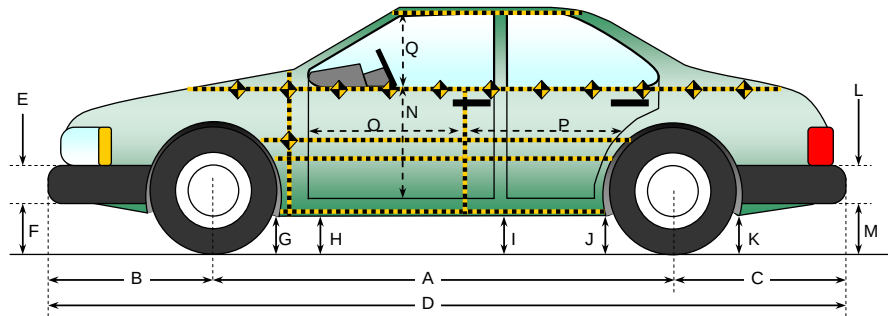
VEHICLE SPEED, VEHICLE ANGLE AT IMPACT, AND IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		1126
Actual Impact Point (Aft of Front Axle)	mm		1122
Horizontal Offset (+forward / -rearward)	mm	+/- 38 of Intended Impact Point	+4
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	32.1
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.0

DATA SHEET NO. 9
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Volkswagen Passat S 4-Dr Sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No. VC5802
Test Date: 10/10/2011



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

LEFT SIDE VIEW

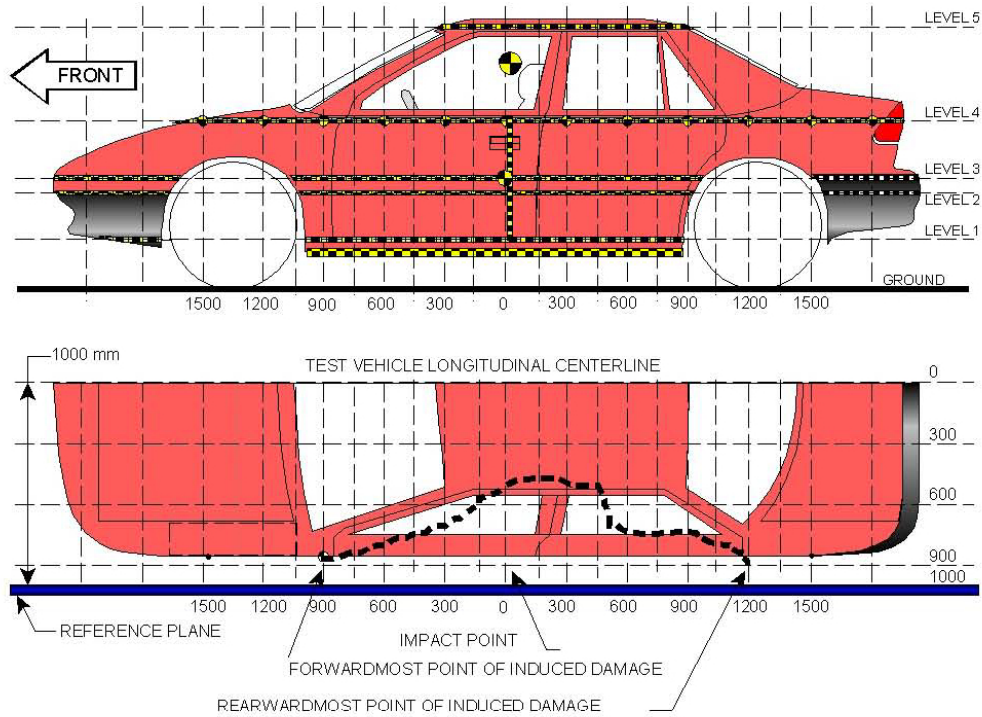
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2805	2690	115
B	Front Axle to FSOV	911	910	1
C	Rear Axle to RSOV	1150	1150	0
D	Total Vehicle Length at Centerline	4866	4750	116
E	Front Bumper Thickness	140	140	0
F	Front Bumper Bottom to Ground	247	280	-33
G	Sill Height at Front Wheel Well	195	162	33
H	Sill Height at Front Door Leading Edge	178	165	13
I	Sill Height at B Pillar	180	198	-18
J1	Sill Height at Rear Wheel Well	168	187	-19
J2	Pinch Weld Height at Rear Wheel Well	160	181	-21
K	Sill Height Aft of Rear Wheel Well	193	208	-15
L	Rear Bumper Thickness	126	126	0
M	Rear Bumper Bottom to Ground	260	248	12
N	Sill Height to Bottom of Front Window Sill	709	725	-16
O	Front Door Leading Edge to Impact CL	719	705	14
P	Rear Door Trailing Edge to Impact CL	1293	1310	-17
Q	Front Window Opening	400	365	35
R	Right Side Length	4097	4118	-21
S	Left Side Length	4097	3955	142
T	Vehicle Width at B-Pillars	1790	1643	147

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

Test Vehicle: 2012 Volkswagen Passat S 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. VC5802
 Test Date: 10/10/2011



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	243
2	Occupant Hip Point	495
3	Mid Door	612
4	Window Sill	918
5	Window Top	1366

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

Test Vehicle: 2012 Volkswagen Passat S 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. VC5802
 Test Date: 10/10/2011

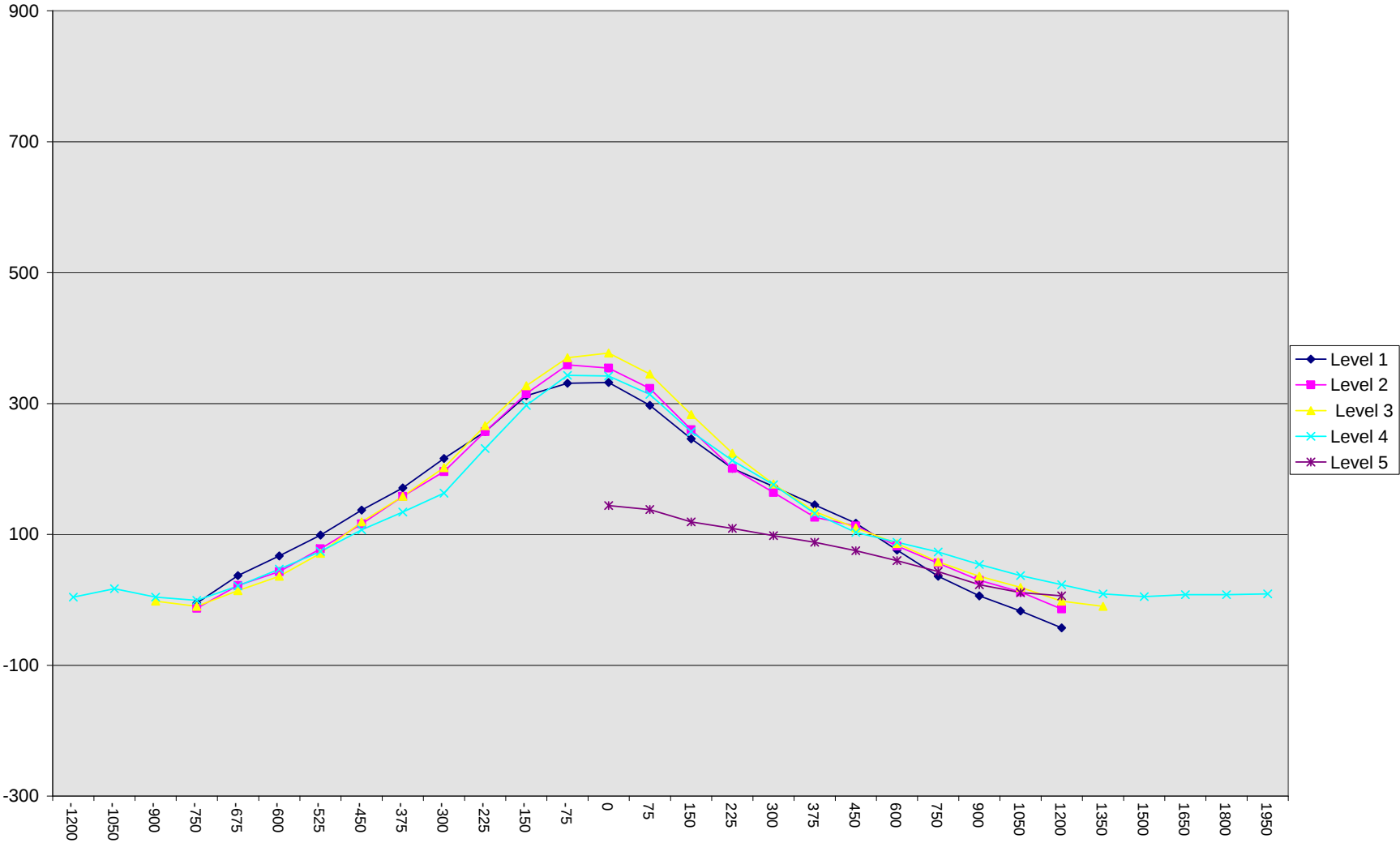
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1200				302					306					4	
-1050				278					295					17	
-900			193	280				191	284				-2	4	
-750	234	200	203	272		229	187	193	271		-5	-13	-10	-1	
-675	235	212	208	270		272	234	222	291		37	22	14	21	
-600	234	218	210	266		301	261	246	313		67	43	36	47	
-525	234	218	210	265		333	296	281	339		99	78	71	74	
-450	232	218	209	264		369	334	328	371		137	116	119	107	
-375	232	217	209	262		403	375	367	396		171	158	158	134	
-300	229	217	208	262		445	413	410	425		216	196	202	163	
-225	228	217	207	258		485	474	473	489		257	257	266	231	
-150	228	217	206	257		540	532	533	554		312	315	327	297	
-75	227	216	206	255		558	575	576	598		331	359	370	343	
0	227	216	206	256	491	559	570	583	598	635	332	354	377	342	144
75	227	216	206	257	488	524	539	551	571	626	297	323	345	314	138
150	227	216	206	256	487	473	476	489	513	606	246	260	283	257	119
225	227	217	207	255	486	428	418	431	468	595	201	201	224	213	109
300	227	218	207	254	486	400	382	384	430	584	173	164	177	176	98
375	226	219	207	255	486	371	345	342	387	574	145	126	135	132	88
450	226	220	209	256	487	343	333	319	359	562	117	113	110	103	75
600	224	221	210	257	491	300	303	296	345	551	76	82	86	88	60
750	226	222	214	259	493	262	278	272	332	536	36	56	58	73	43
900	230	224	217	259	499	236	254	253	313	522	6	30	36	54	23
1050	232	225	220	261	504	215	237	239	298	515	-17	12	19	37	11
1200	236	216	218	261	513	193	202	216	284	519	-43	-14	-2	23	6
1350			207	263				197	272				-10	9	
1500				266					271					5	
1650				270					278					8	
1800				277					285					8	
1950				288					297					9	

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: 2012 Volkswagen Passat S 4-Dr Sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No. VC5802
Test Date: 10/10/2011



DATA SHEET NO. 11
FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

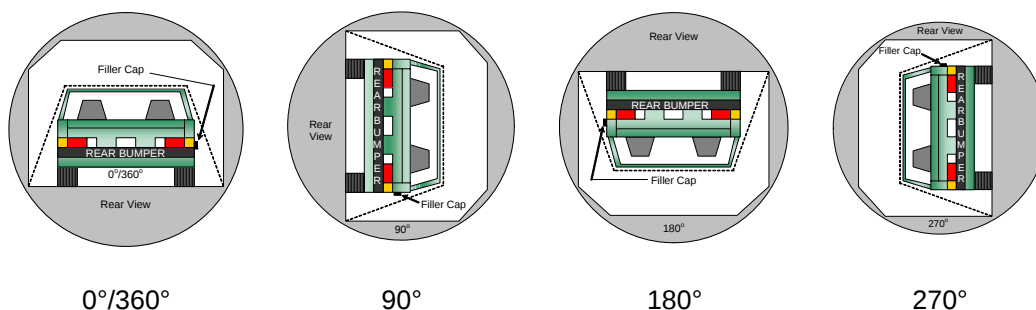
Test Vehicle: 2012 Volkswagen Passat S 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. VC5802
 Test Date: 10/10/2011

Test Time: 10:23 am Temperature: 21.4° 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°	119	300	419
90° to 180°	115	300	415
180° to 270°	109	300	409
270° to 360°	115	300	415

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

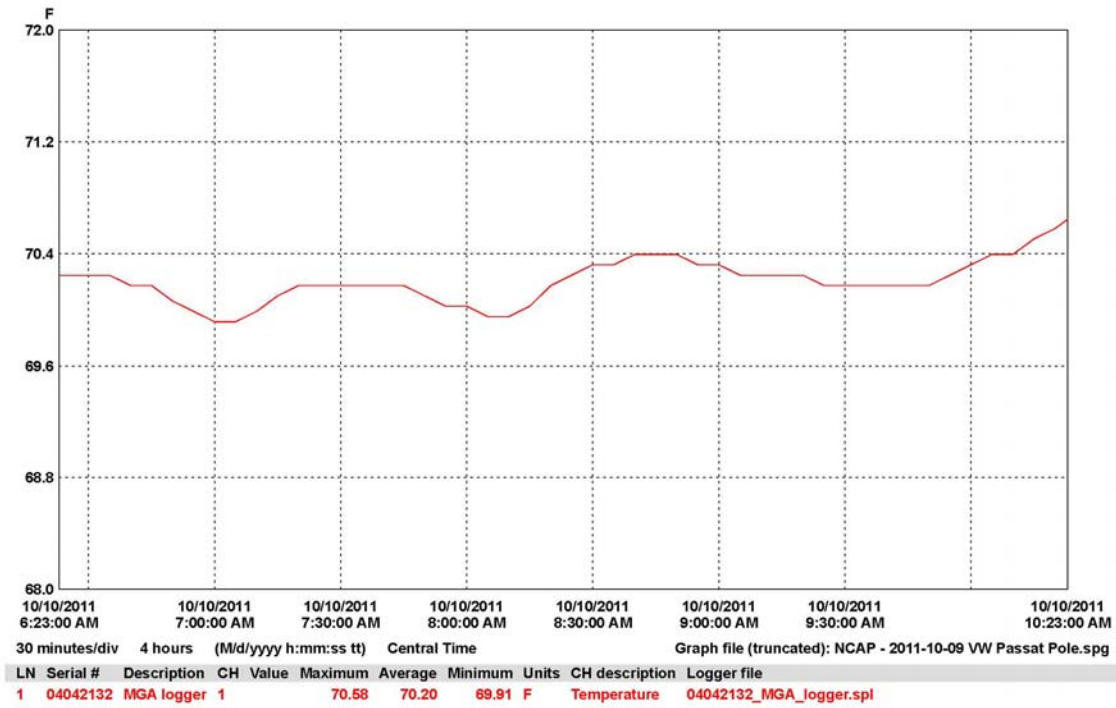
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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: 2012 Volkswagen Passat S 4-Dr Sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. VC5802
 Test Date: 10/10/2011



APPENDIX A
PHOTOGRAPHS

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As Delivered Right Front ¾ View of Test Vehicle



As Delivered Left Rear ¾ 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



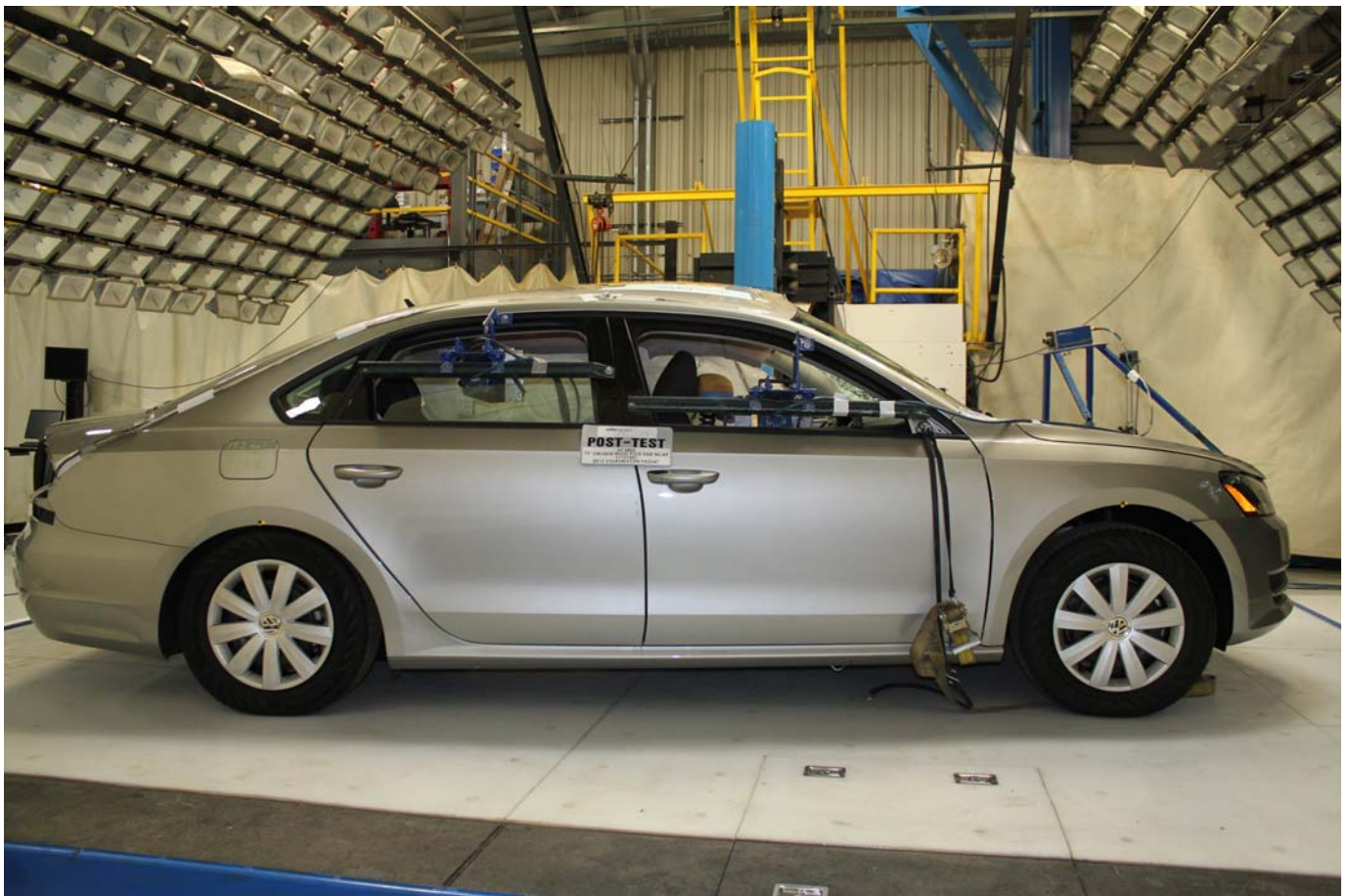
Pre-Test Rear View of Test Vehicle



Post-Test Rear View of Test Vehicle



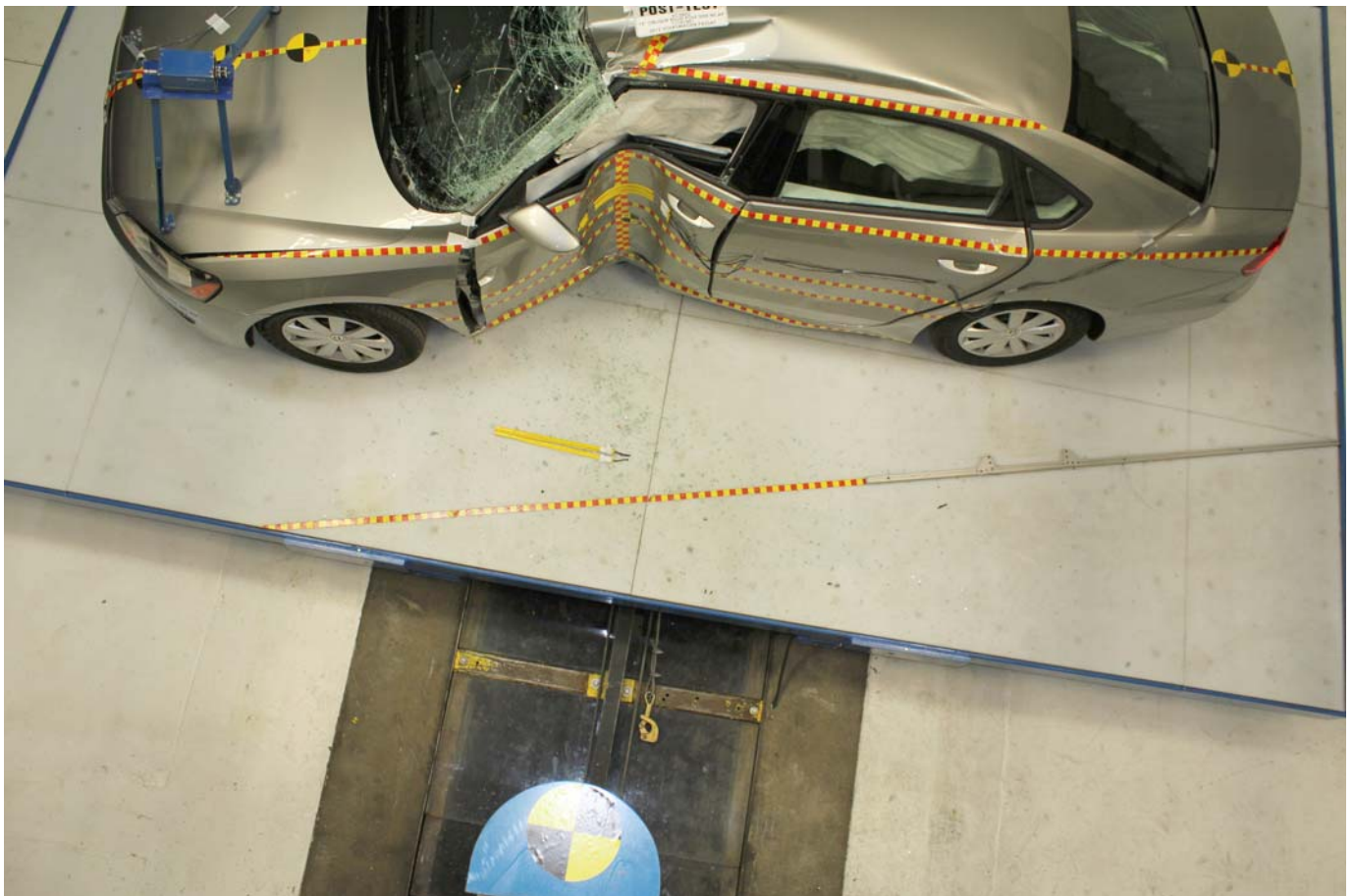
Pre-Test Right Side View of Test Vehicle



Post-Test Right Side View of Test Vehicle



Pre-Test Overhead View of Test Area



Post-Test Overhead View of Test Area



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 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



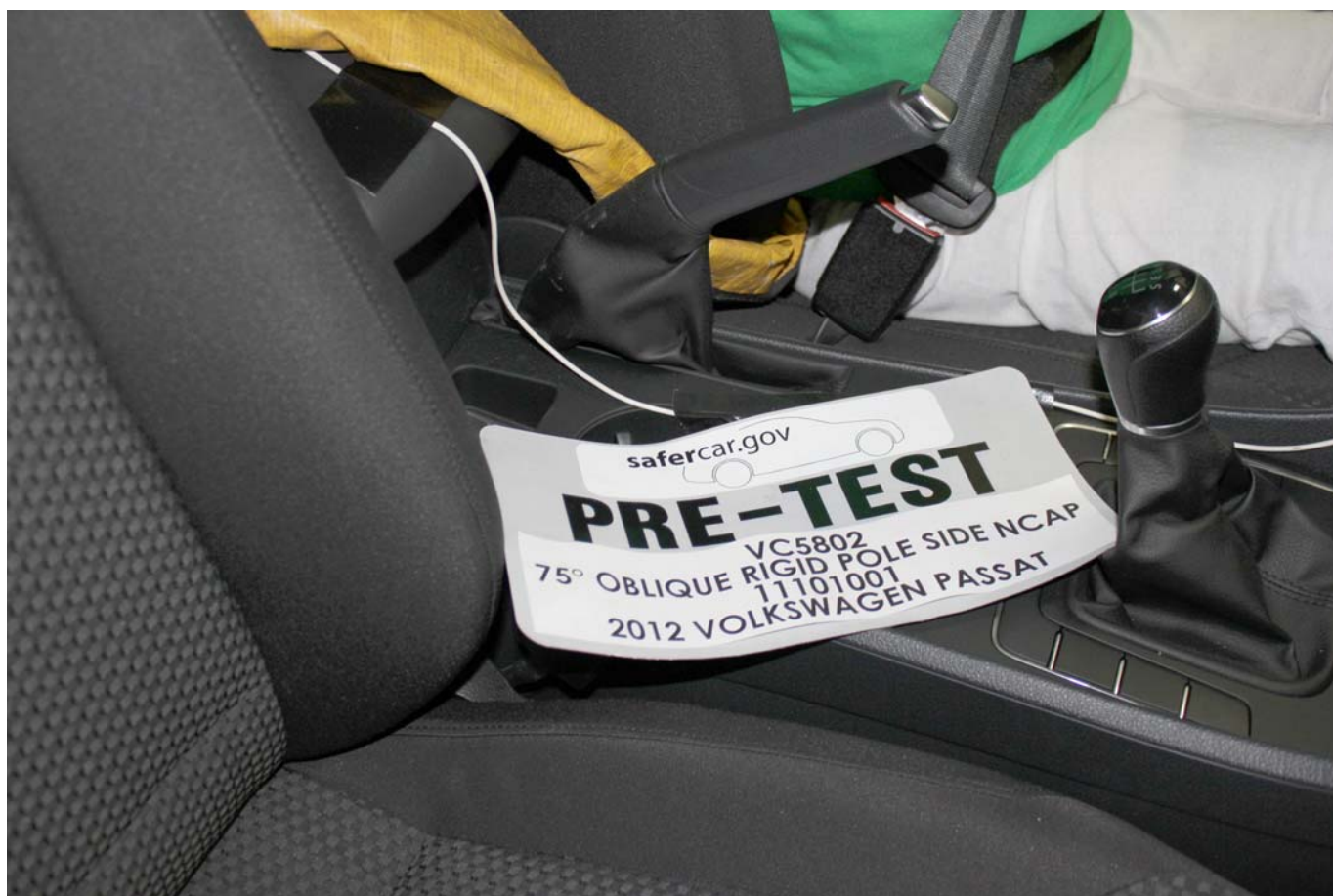
Pre-Test View of Belt Anchorage for Dummy



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



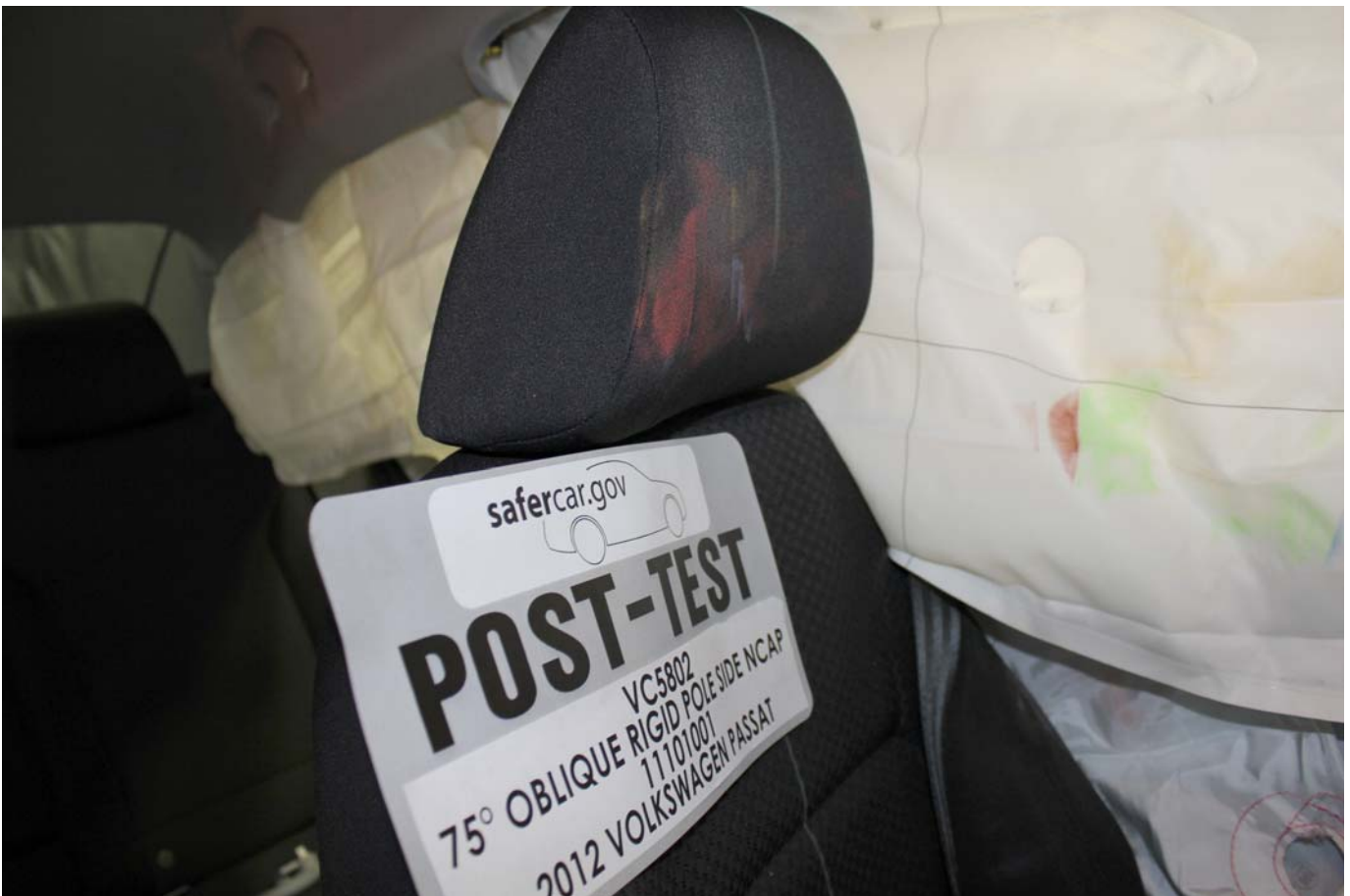
Post-Test Right Side View of Dummy and Front Seat of Occupant Compartment



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 Side Air Bag View



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



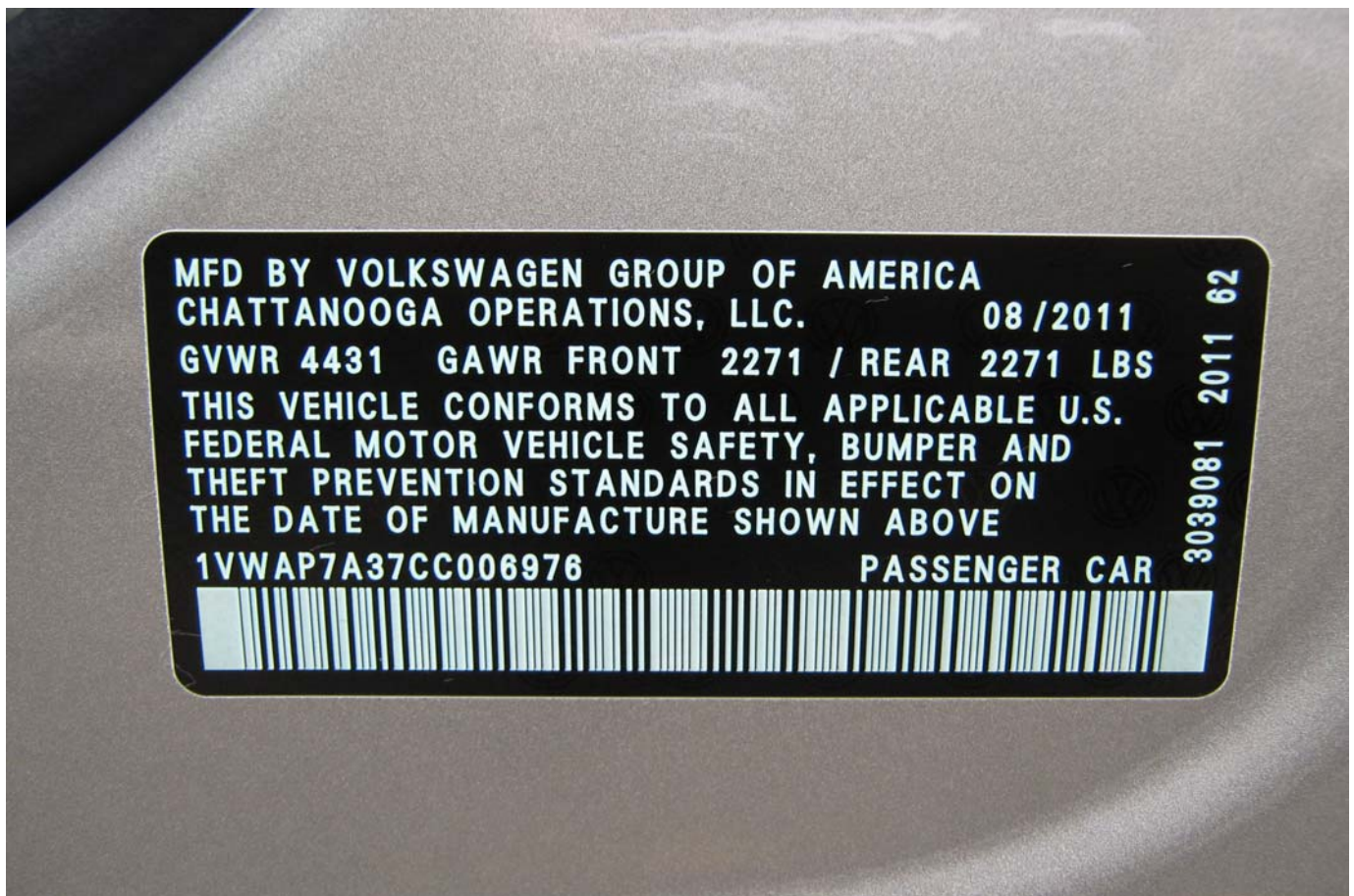
Post-Test Dummy Close-Up Pelvis Contact with Side Air Bag View



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



TIRE AND LOADING INFORMATION
RENSEIGNEMENTS SUR LES PNEUS ET LE CHARGEMENT

SEATING CAPACITY/NOMBRE DE PLACES | TOTAL 5 | FRONT/AVANT 2 | REAR/ARRIÈRE 3

THE COMBINED WEIGHT OF OCCUPANTS AND CARGO SHOULD NEVER EXCEED
LE POIDS TOTAL DES OCCUPANTS ET DU CHARGEMENT NE DOIT JAMAIS DÉPASSER

506 KG OR 1115 LBS
506 KG OU 1115 LB.

TIRE PNEU	SIZE DIMENSIONS	COLD TIRE PRESSURE PRESSION DES PNEUS À FROID
FRONT/AVANT	215/60 R16	200 KPA / 29 PSI
REAR/ARRIÈRE	215/60 R16	200 KPA / 29 PSI
SPARE/DE SECOURS	135/90 R16	420 KPA / 60 PSI

**SEE OWNER'S MANUAL
FOR ADDITIONAL
INFORMATION**
**VOIR LE MANUEL DE
L'USAGER POUR PLUS DE
RENSEIGNEMENTS**

561 010 740 K
XLB

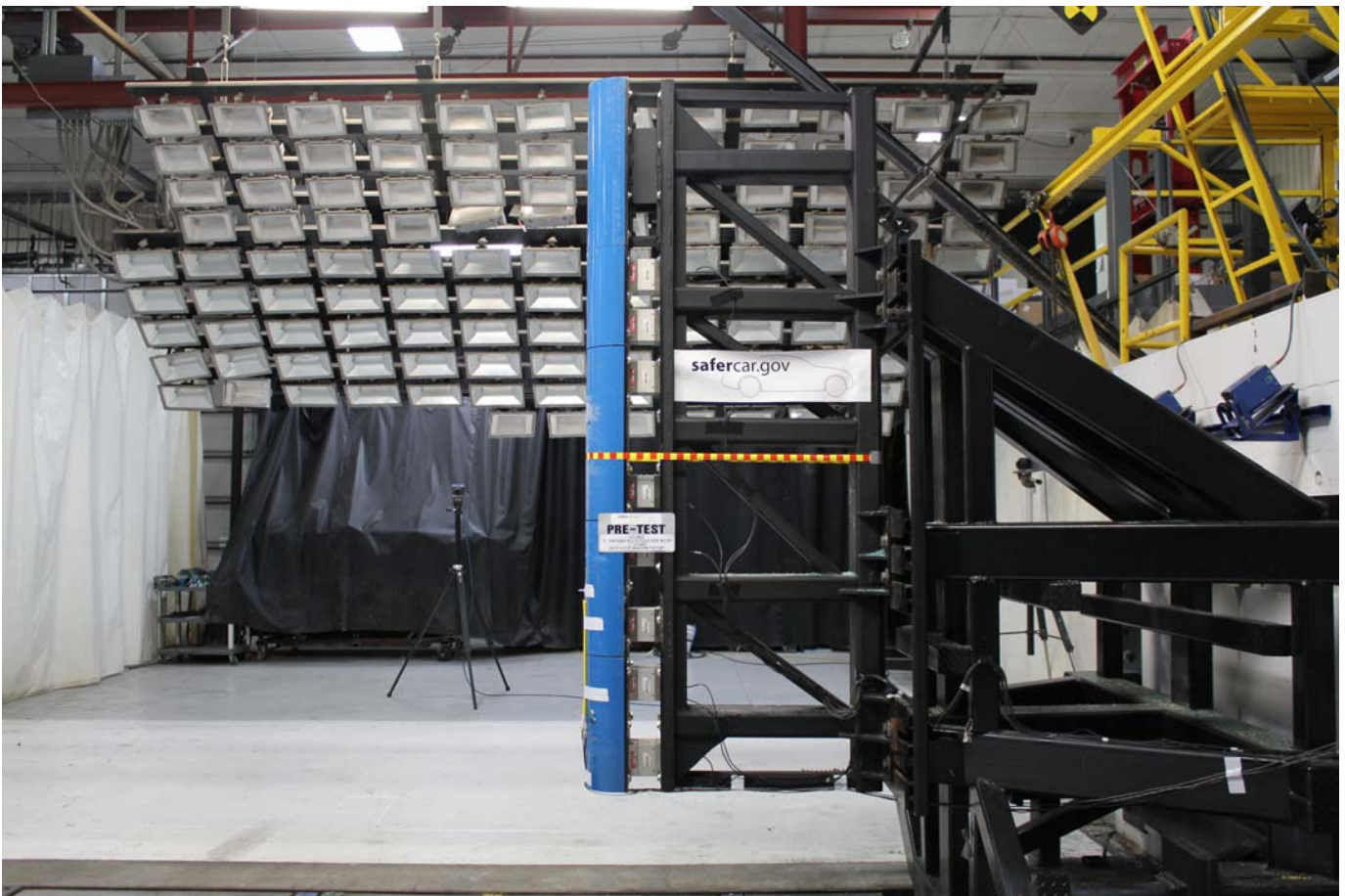
Close-Up View of Vehicle's Tire Information Placard or Label



Pre-Test Pole Barrier Front View



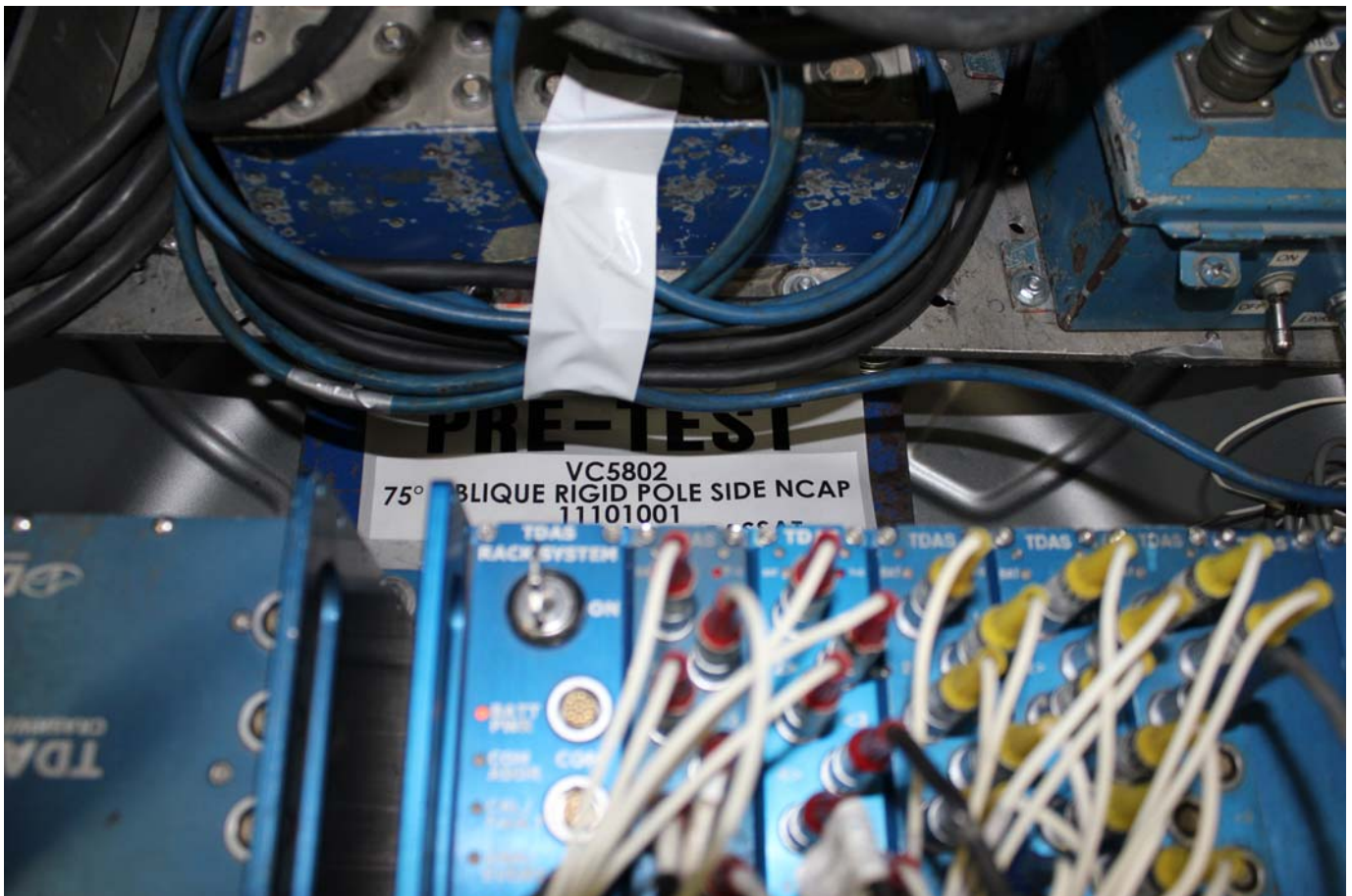
Post-Test Pole Barrier Front View



Pre-Test Pole Barrier Side View



Post-Test Pole Barrier Side View



Pre-Test Ballast View



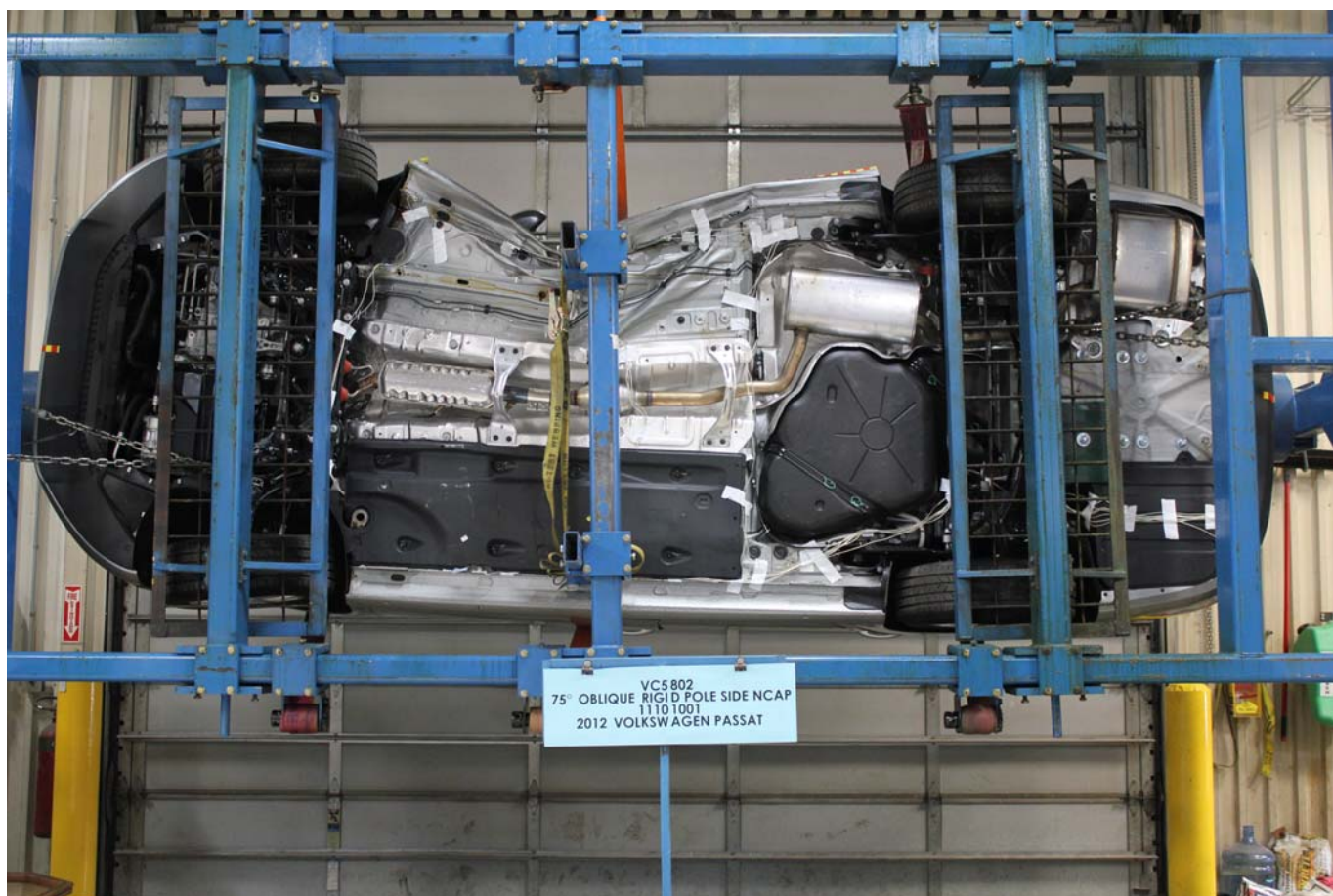
Pre-Test Ballast View



Post-Test Primary and Redundant Speed Trap Read-Out



FMVSS No. 301 Static Rollover 0 Degrees



FMVSS No. 301 Static Rollover 90 Degrees



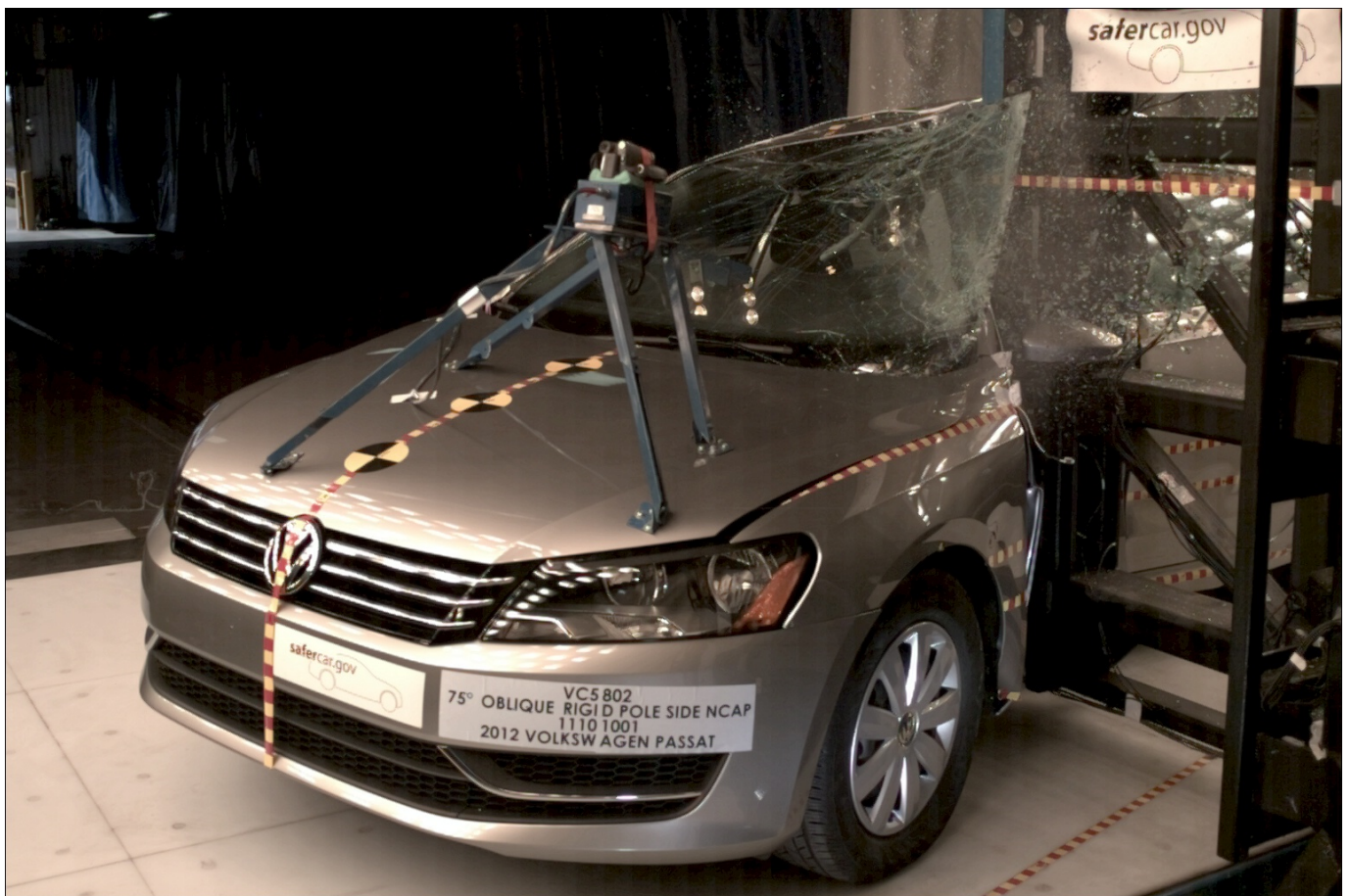
FMVSS No. 301 Static Rollover 180 Degrees



FMVSS No. 301 Static Rollover 270 Degrees



FMVSS No. 301 Static Rollover 360 Degrees



Impact Event

2012 Passat S

Exterior: Tungsten Silver Metallic Exterior

Interior: Titan Black Interior

The Power of German Engineering.



STANDARD FEATURES (unless replaced by options)

PERFORMANCE/HANDLING

- 2.5L, 170 horsepower, 177 lb-ft torque, in-line 5 cylinder engine
- Partial Zero Emission Vehicle
- Hydronic power steering
- Electronic Stability Control (ESC)
- Anti-Slip Regulation (ASR)
- Electronic differential lock (EDL)
- Anti-lock Braking System (ABS)
- 18" steel wheels w/ full wheel covers & all-season tires

SAFETY/DURABILITY

- Driver & front passenger airbag supplemental restraint system
- Driver & front passenger side airbag supplemental restraint system
- Side Curtain Protection/roof head impact substructure, front & rear
- 3-point safety belts, all seating positions
- Lower Anchors & Tethers for Children (LATCH)
- Child safety rear door locks
- Daytime Running Lights (DRL)
- Front & rear power assisted disc brakes
- Tire Pressure Monitoring System (TPMS)

COMFORT/CONVENIENCE

- Dual-zone, automatic climate control
- RCD 310 radio w/ single in-dash CD player & 6 speakers
- Bluetooth® mobile telephone connectivity
- Auxiliary input jack
- Multi-function steering wheel w/ audio & phone controls
- Height adjustable, telescoping steering column
- Cruise control
- Trip computer
- Hill hold control
- Automatic headlights w/ coming home function
- Power windows w/ pinch protection
- Power exterior mirrors
- Power central locking system w/ remote keyless locking
- Adjustable intermittent front wipers/washer system
- Front & rear sunvisors
- 60/40 split folding rear seat w/ valet lockout
- Remote release for trunk
- Front & rear cupholders

Manufacturer's Suggested Retail Price: \$19,995.00

DRIVER CARE PACKAGE

WARRANTY INFORMATION

- Volkswagen New Vehicle Limited Warranty
- 3 years/36,000 miles (whichever occurs first)
- Powertrain Limited Warranty
- 5 years/60,000 miles (whichever occurs first)
- Limited Warranty against Corrosion Perforation
- 12 years/unlimited mileage
- Please ask your dealer for a copy of the Volkswagen warranty booklet for details.
- 24-HOUR ROADSIDE ASSISTANCE
- 3 years/36,000 miles (whichever occurs first)
- (Towing, Jump Starts, Tire Changes, Out of Fuel, and Lock-Out)
- Provided by a third party supplier

VOLKSWAGEN CAREFREE MAINTENANCE

Scheduled maintenance services described in the Volkswagen Maintenance booklets are covered at no charge for 3 years/36,000 miles (whichever occurs first)

PACKAGES/OPTIONS

- Tungsten Silver Metallic Exterior No Charge
- Titan Black Interior No Charge
- Monster Mats® (set of 4) and Heavy Duty Trunk Liner \$215.00
- with CarGo Blocks \$15.00
- First Aid Kit No Charge
- 5-Speed Manual Transmission

Destination Charge

Total Price: \$21,035.00

Fuel, license, title fees, taxes and dealer-installed accessories are not included.

EPA Fuel Economy Estimates

CITY MPG

22

Expected range for most drivers
18 to 26 MPG

Estimated
Annual Fuel Cost
\$1,732

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

Combined Fuel Economy

This Vehicle

26

10 30
All Mid-Size Cars

HIGHWAY MPG

32

Expected range for most drivers
26 to 38 MPG

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



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



SOLD TO: 402648

FRANK BOUCHER VOLKSWAGEN
PO BOX 085560-9601 WASHINGTON AVE
RACINE, WI 53406

SHIP TO: 402648

FRANK BOUCHER VOLKSWAGEN
PO BOX 085560-9601 WASHINGTON AVE
RACINE, WI 53406

VIN: 1VWAP7A37CC006976
Port of Entry: CHATTANOOGA

GOVERNMENT SAFETY RATINGS

Frontal Crash	Driver Passenger	Not Rated
---------------	------------------	-----------

Star ratings based on the risk of injury in a frontal impact. Frontal ratings should ONLY be compared to other vehicles of similar size and weight.

Side Crash	Front Seat Rear Seat	Not Rated
------------	----------------------	-----------

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

Rollover	Not Rated
----------	-----------

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

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

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:

U.S./CANADIAN
PARTS CONTENT: 40%
MAJOR SOURCES OF FOREIGN
PARTS CONTENT:
GERMANY: 28%

FOR THIS VEHICLE:

FINAL ASSEMBLY POINT:
CHATTANOOGA, U.S.
COUNTRY OF ORIGIN:
ENGINE: MEXICO
TRANSMISSION:
ARGENTINA

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

Environmental Performance

Protect the environment, choose vehicles with higher scores:

Global Warming Score Smog Score

7 9

Average new vehicle Cleanest 10 1 Average new vehicle Cleanest 10

Using alternative fuels may improve scores. See www.DriveClean.ca.gov

Vehicles emissions are a primary contributor to global warming and smog. Scores are determined by the California Air Resources Board based on this vehicle's measured emissions. Please visit www.DriveClean.ca.gov for more information.

AIR RESOURCES BOARD

Who better to get you into a Volkswagen than us?

Volkswagen Credit



Monroney Label

Adjusting the head restraints

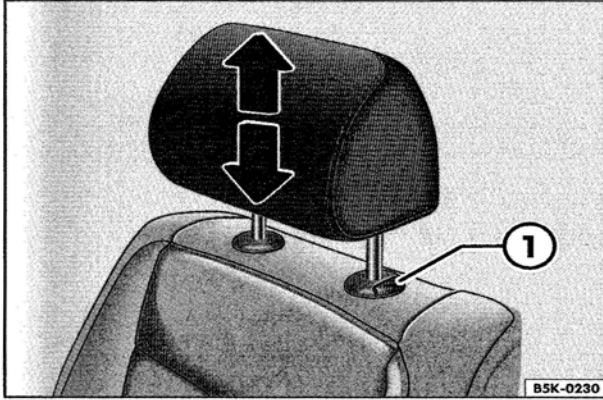


Fig. 44 Adjusting the front head restraints.



Please first read and note the introductory information and heed the WARNINGS ▲ on page 68.

All seats are equipped with head restraints. The rear center head restraint is designed only for the center seat on the rear bench. Therefore, only install the center head restraint in the center position.

Adjusting the height

- Push the head restraint up in the direction of the arrow or down when the button ⇒ fig. 44 ① or ⇒ fig. 45 ① is pressed ⇒ ▲.
- The head restraint must lock securely in the position selected.

Proper head restraint adjustment

Adjust head restraints so that the upper edge of the head restraint is at least at eye level or higher. Position the back of the head as close as possible to the head restraint.

Adjusting the head restraint for short people

Push the head restraint down as far as it will go, even if this means the person's head is still below the top edge of the head restraint. A small gap

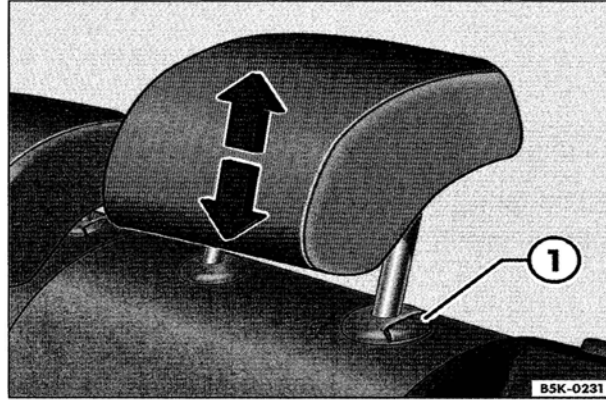


Fig. 45 Adjusting rear head restraints.

may remain between the head restraint and the backrest when the head restraint is all the way down.

Adjusting the head restraint for tall people

Pull the head restraint up as far as it will go.

Driving without head restraints or with improperly adjusted head restraints increases the risk of serious injuries in a collision.

- Always drive with the head restraints in place and properly adjusted to help minimize the risk of neck injury in crash.

- Every person in the vehicle must have a properly adjusted head restraint to minimize the risk of neck injury in a crash. Each head restraint must be adjusted according to the occupants' size so that the upper edge is even with the top of the person's head, but no lower than eye level. Always sit so that the back of your head is as close as possible to the head restraint.

- Never adjust head restraint while driving. ◀

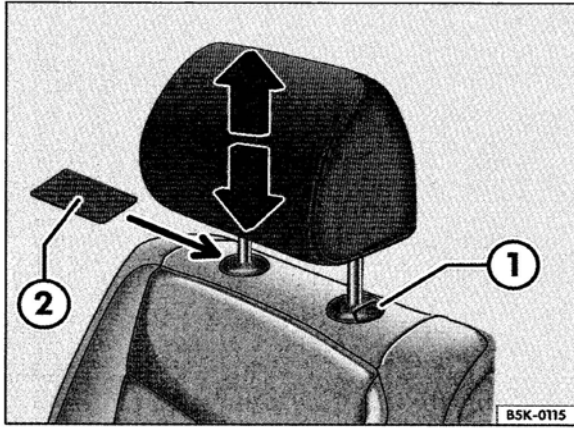


Fig. 46 Removing front head restraints.

Please first read and note the introductory information and heed the **WARNINGS** ▲ on page 68.

All seats are equipped with head restraints. The rear center head restraint is designed only for the center seat on the rear bench. Therefore, only install the center head restraint in the center position.

Removing the front head restraints

- Sit in the back seat behind the head restraint you want to remove. Pull the head restraint all the way up ⇒ ▲ in *Adjusting the head restraints* on page 73. Recline the backrest with the head restraint so that there is enough overhead clearance to remove it.
- Slide a flat object, such as a plastic credit card, underneath the right side of the cover cap on the right-hand seat guide rod ⇒ fig. 46 (2).
- Push the flat object (plastic card) in against the guide rod to depress a release button located under the cover cap (not visible).
- Use one hand to hold the release button in with the flat object. With your other hand, lift the same guide rod slightly to expose a notch in the rod at the bottom (can be seen and felt with fingers). The right-hand guide rod is now released.
- To release the left-hand guide rod, press button (1) in (towards guide rod) and hold.
- Pull the head restraint out completely while holding button (1).

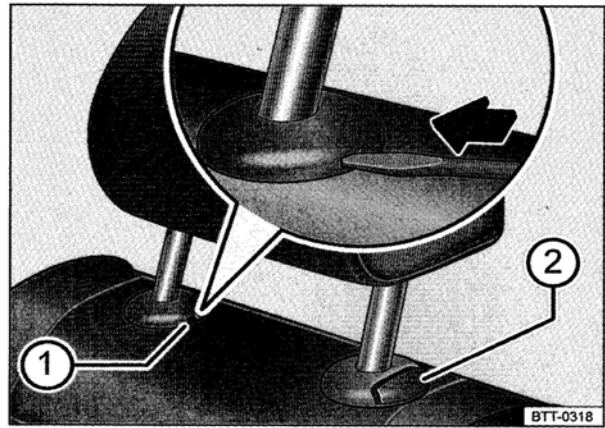


Fig. 47 Removing rear head restraints.

Installing the front head restraints

- Position head restraint properly over the head restraint guides of the respective seat back and insert the head restraint into the guides.
- Push the head restraint down while pressing button (1).
- Adjust the head restraint according to the occupant's size ⇒ page 73.

Removing the rear head restraint

- Unlock the rear bench and fold it forward ⇒ page 156.
- Pull the head restraint all the way up ⇒ ▲.
- If necessary, press the flat blade of the screwdriver from the vehicle tool kit into the slit of the trim cap ⇒ fig. 47 (1) in the direction of the arrow and hold it in this position.
- At the same time press button (2) while a second person pulls out the head restraint completely.
- Fold the backrest of the rear bench back so that it locks securely.

Reinstalling the rear head restraint

- Unlock the rear bench and fold it forward ⇒ page 156.
- Position head restraint properly over the head restraint guides of the respective seat back and insert the head restraint into the guides.
- Push the head restraint down while pressing button (2).
- Fold the backrest of the rear bench back so that it locks securely.
- Adjust the head restraint according to the occupant's size ⇒ page 73. ►

APPENDIX B

VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS
Driver Dummy Instrumentation Plots

		<u>Page No.</u>
Figure No. 1.	Driver Head Acceleration (X) Primary vs. Time	B-1
Figure No. 2.	Driver Head Acceleration (Y) Primary vs. Time	B-1
Figure No. 3.	Driver Head Acceleration (Z) Primary vs. Time	B-1
Figure No. 4.	Driver Head Resultant Primary Acceleration 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 Head Acceleration (X) Redundant
Driver Head Acceleration (Y) Redundant
Driver Head Acceleration (Z) Redundant
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)

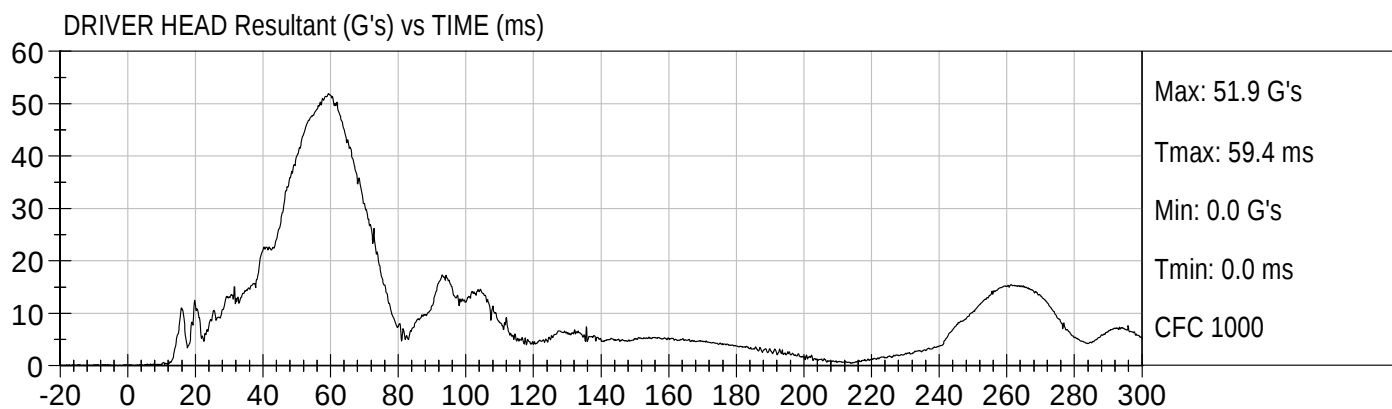
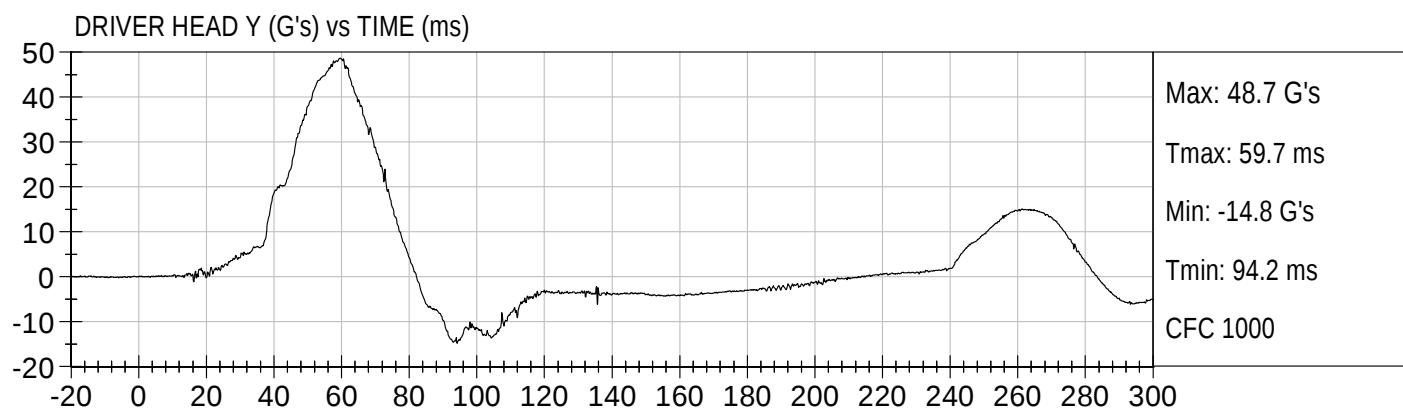
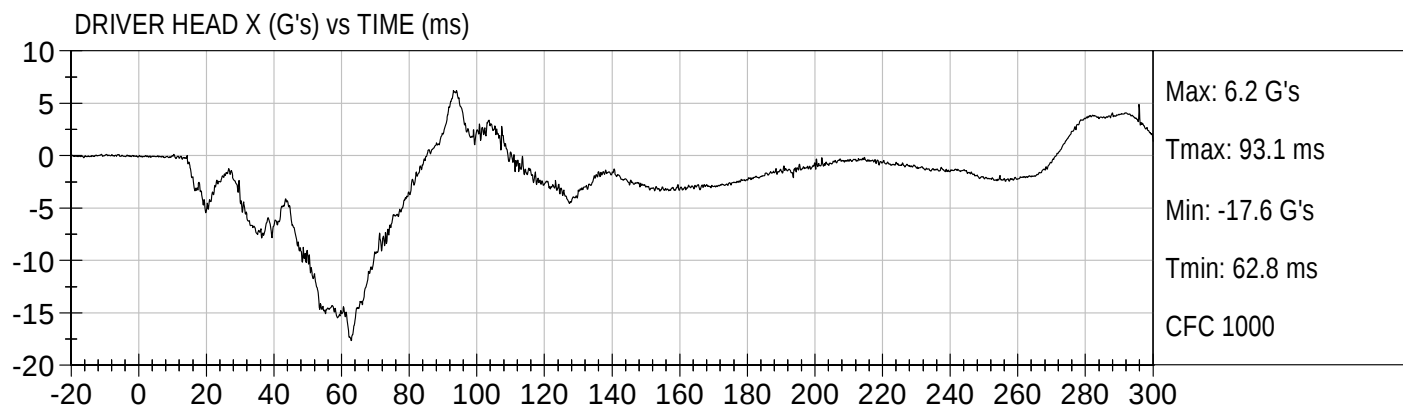
Load Cell Pole Barrier #4 Force (Y)

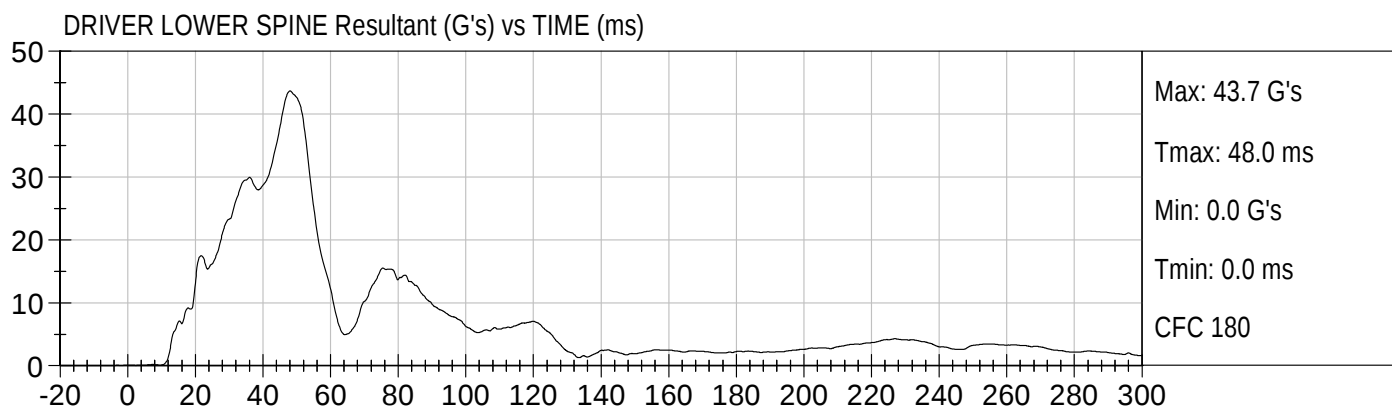
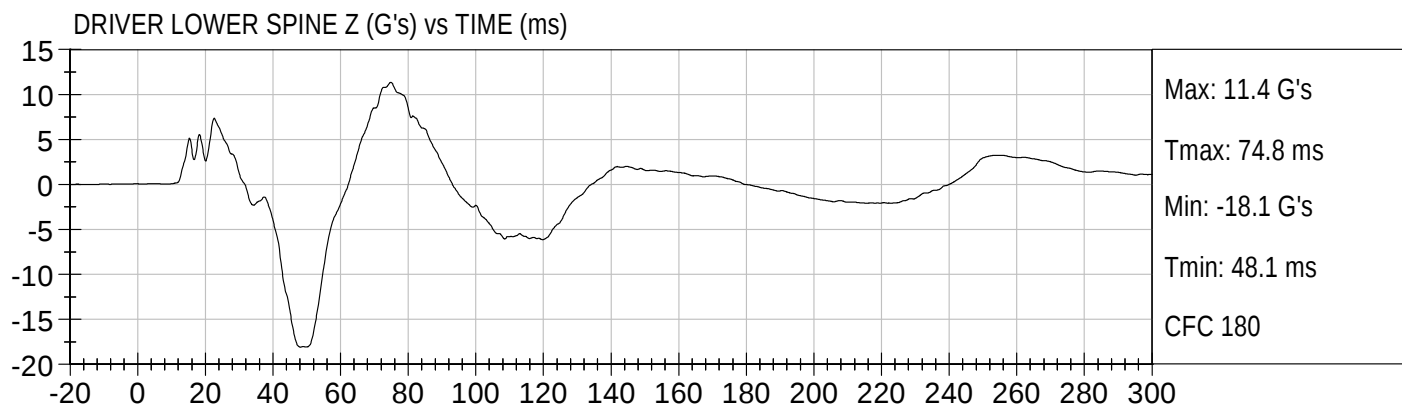
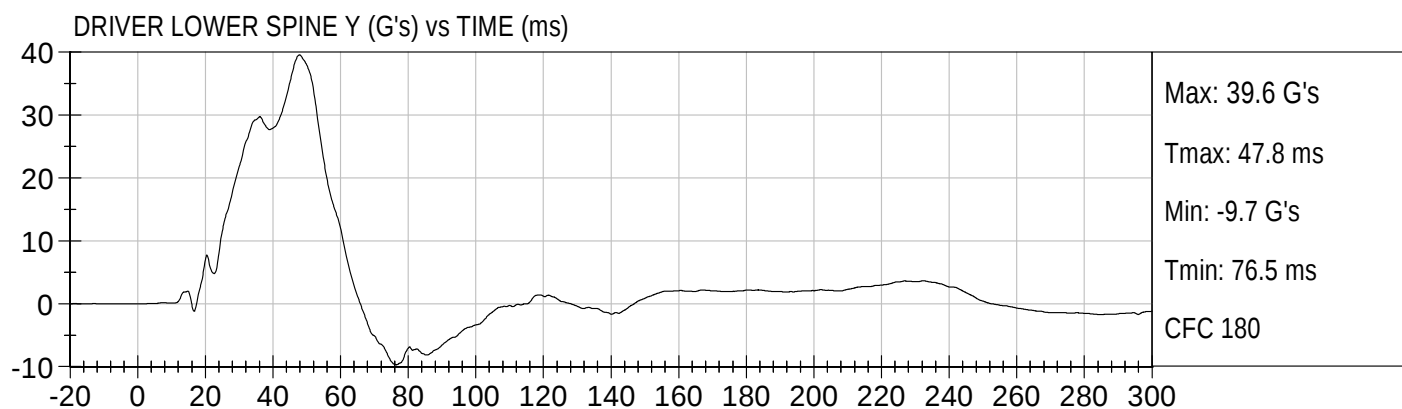
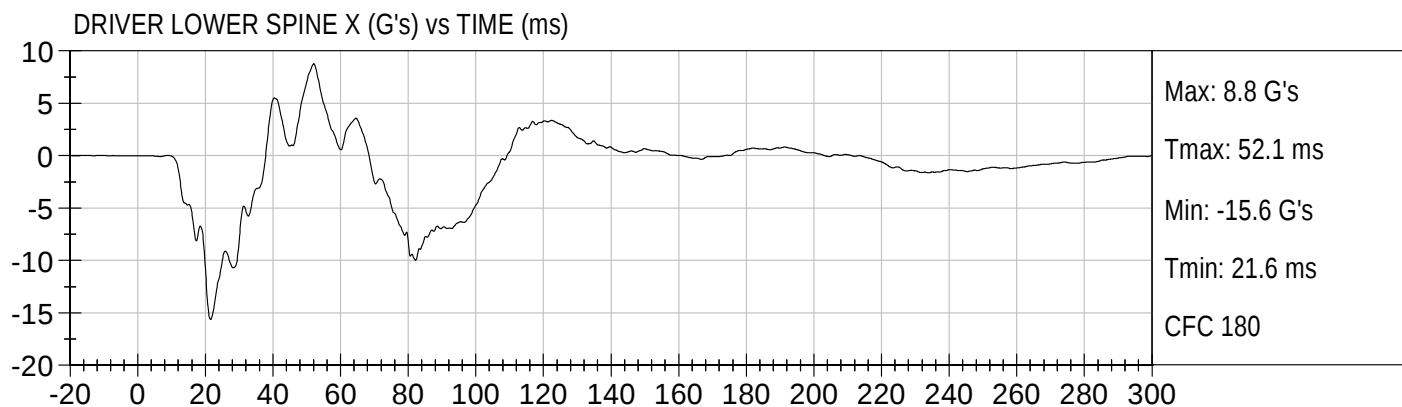
Load Cell Pole Barrier #5 Force (Y)

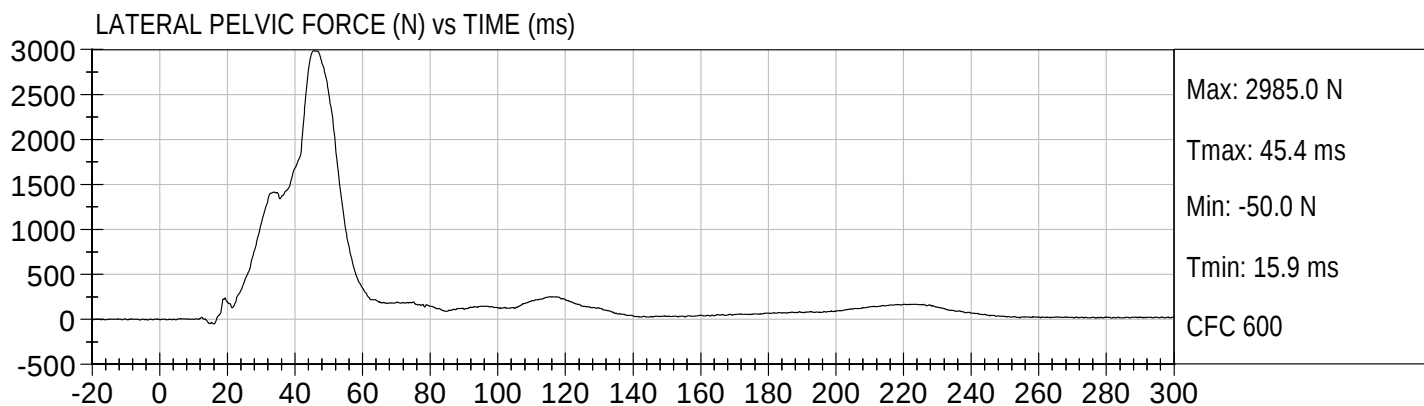
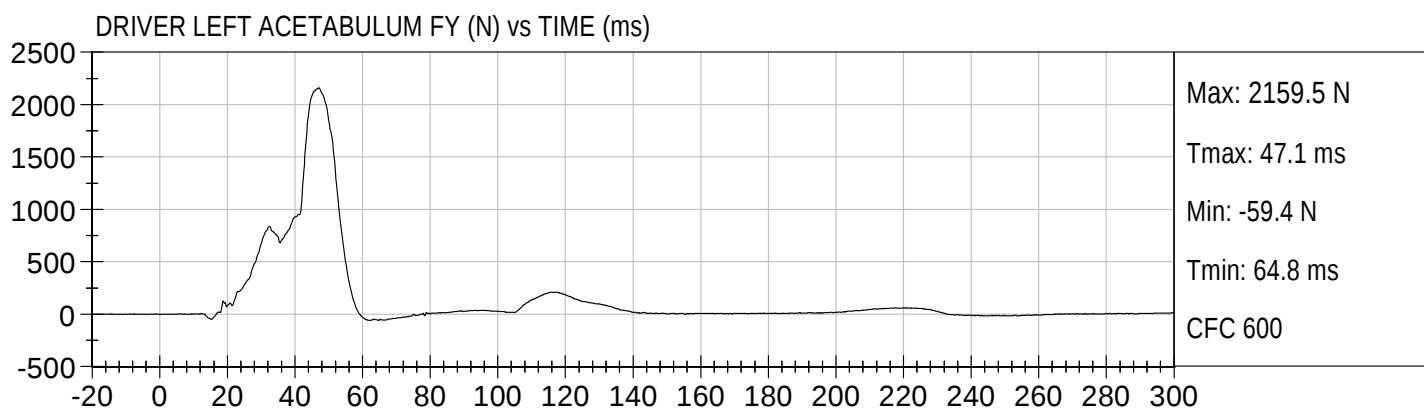
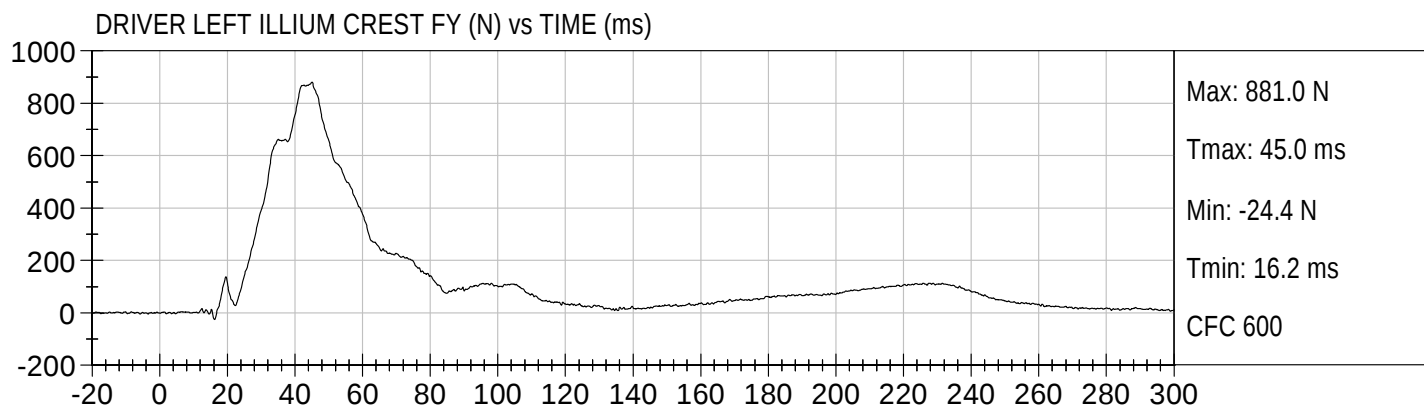
Load Cell Pole Barrier #6 Force (Y)

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: 296

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

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

ATD Serial No: 296

Test ID: D113361

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Peak Resultant Acceleration	G's	115 to 137	128	Pass
Peak Lateral Acceleration	G's	+/- 15	-3.3	Pass
Unimodal	N/A	<15%	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

10/6/11
Test Date

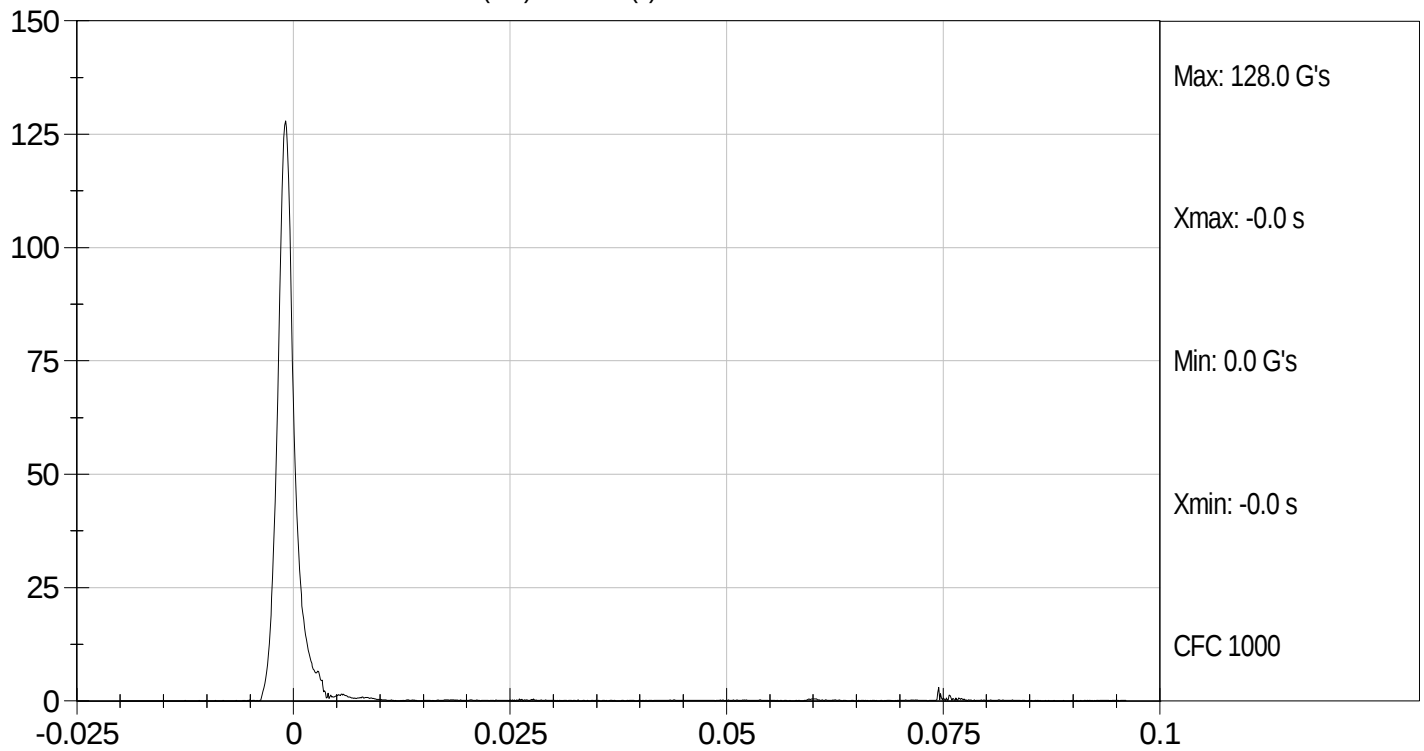

Approved By



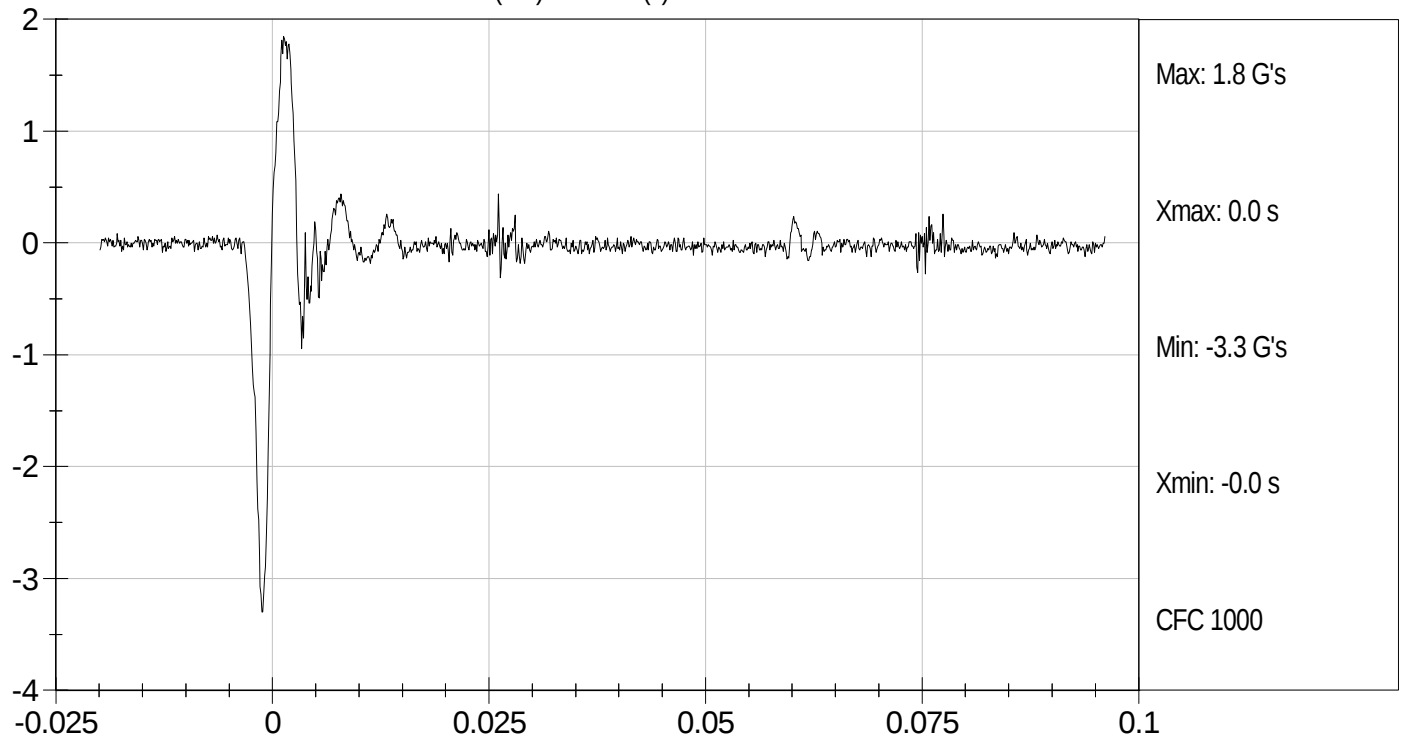
Test Desc: Head Drop
Component ID: D113361

Test Date: 10/6/11
Velocity: 0 ft/s, 0 m/s

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



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



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

ATD Serial No: 296

Test I.D: D113362

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.9	Pass
Humidity		%	10 to 70	44	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Delta Velocity	10 ms	m/s	2.20 to 2.80	2.57	Pass
	15 ms	m/s	3.30 to 4.10	3.72	Pass
	20 ms	m/s	4.40 to 5.40	4.91	Pass
	25 ms	m/s	5.40 to 6.10	5.44	Pass
	25-100 ms	m/s	5.50 to 6.20	5.51	Pass
Maximum D-Plane Rotation		deg	71 to 81	73	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	58	Pass
Maximum Occipital Condyle Moment during Rotation Interval Nm			-44 to -36	-43	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	115	Pass
Overall Test Results					Pass


 Laboratory Technician

10/6/11
 Test Date

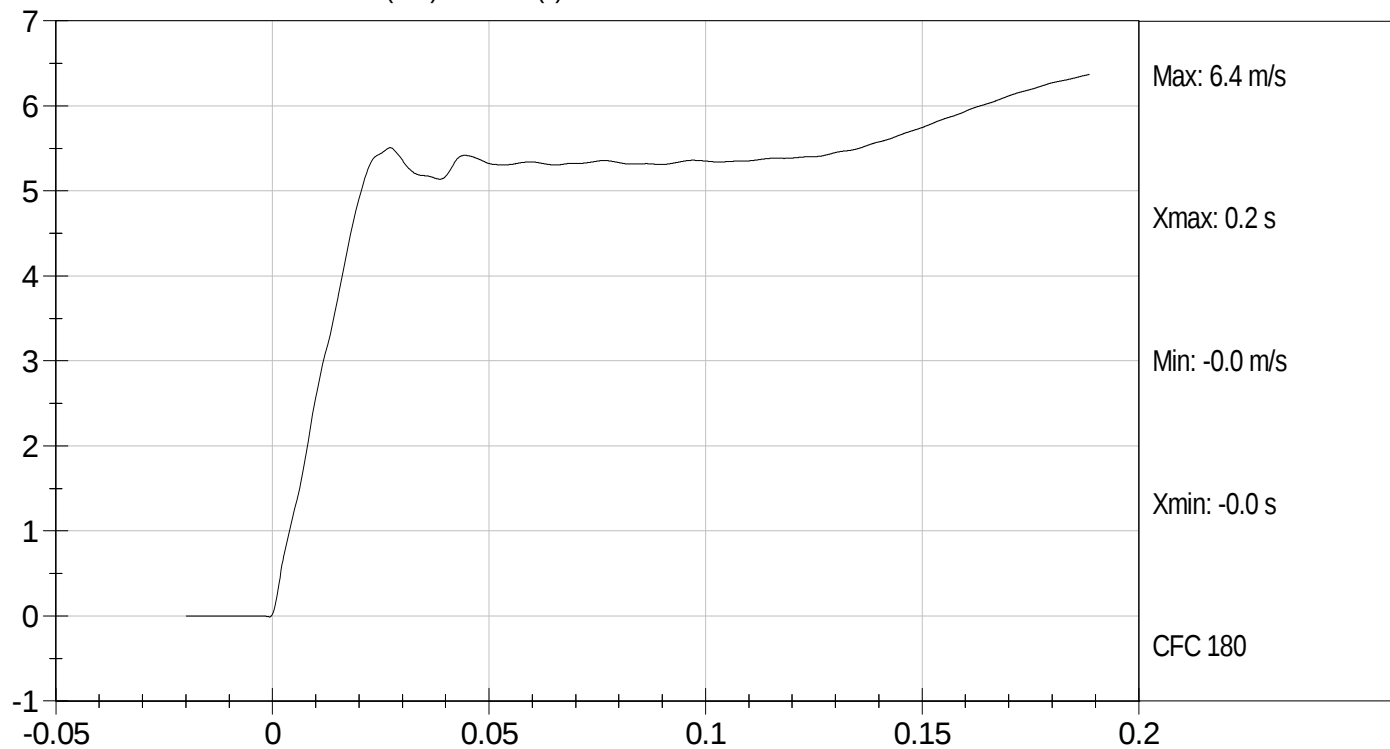

 Approved By



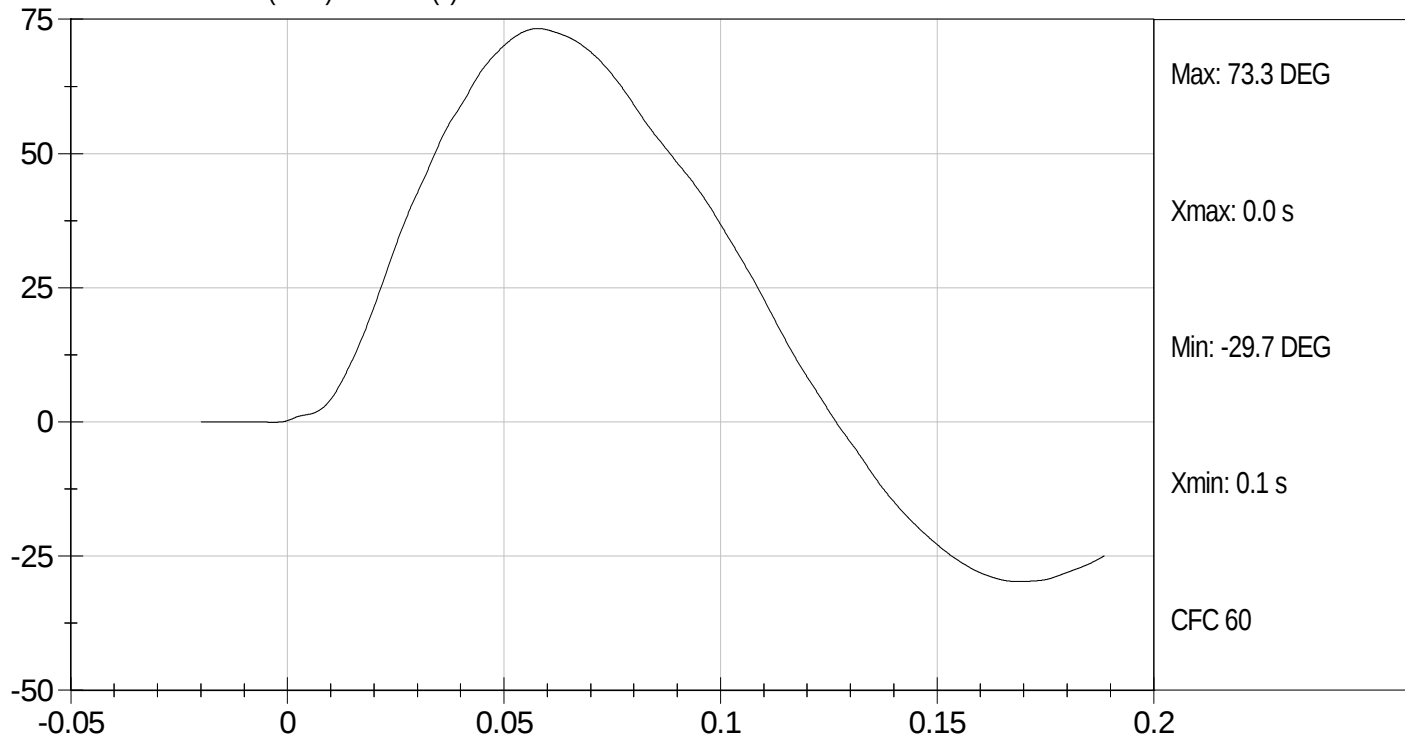
Test Desc: Neck Bending
Component ID: D113362

Test Date: 10/6/11
Velocity: 18.32 ft/s, 5.58 m/s

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



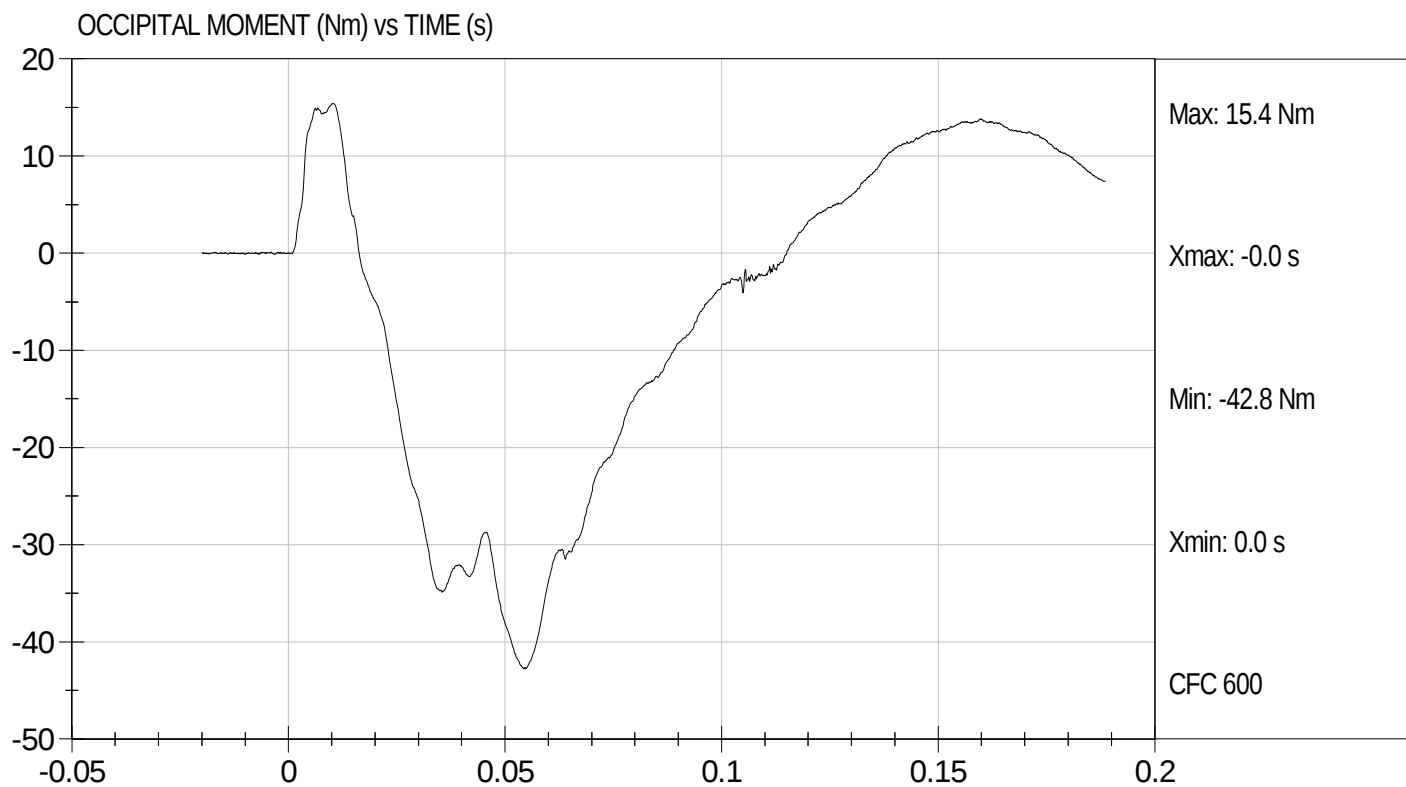
FLEXION ANGLE (DEG) vs TIME (s)





Test Desc: Neck Bending
Component ID: D113362

Test Date: 10/6/11
Velocity: 18.32 ft/s, 5.58 m/s

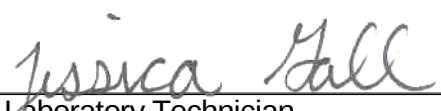


MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test ID: D113363

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


Laboratory Technician

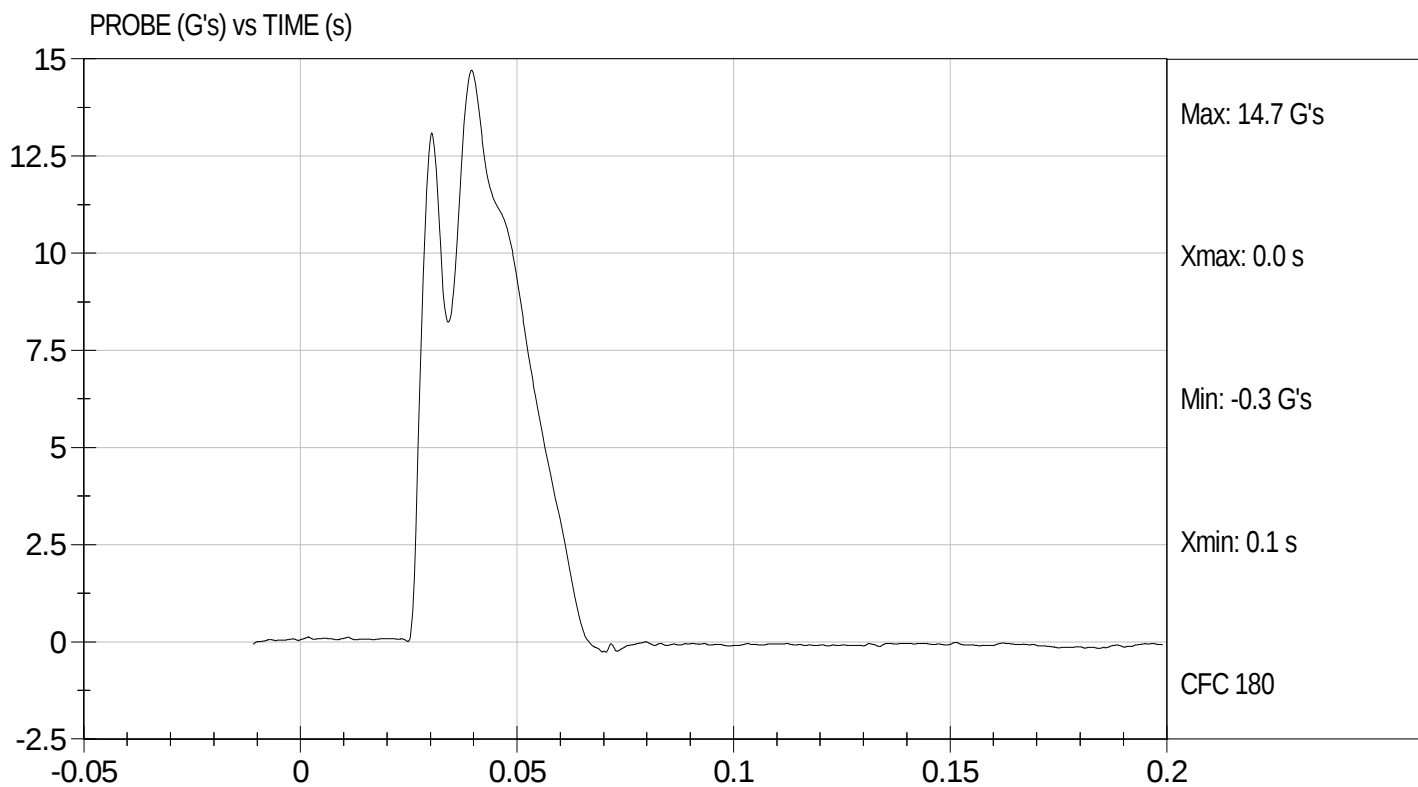
10/6/11
Test Date


Approved By



Test Desc: Shoulder Impact
Component ID: D113363

Test Date: 10/6/11
Velocity: 14.37 ft/s, 4.38 m/s

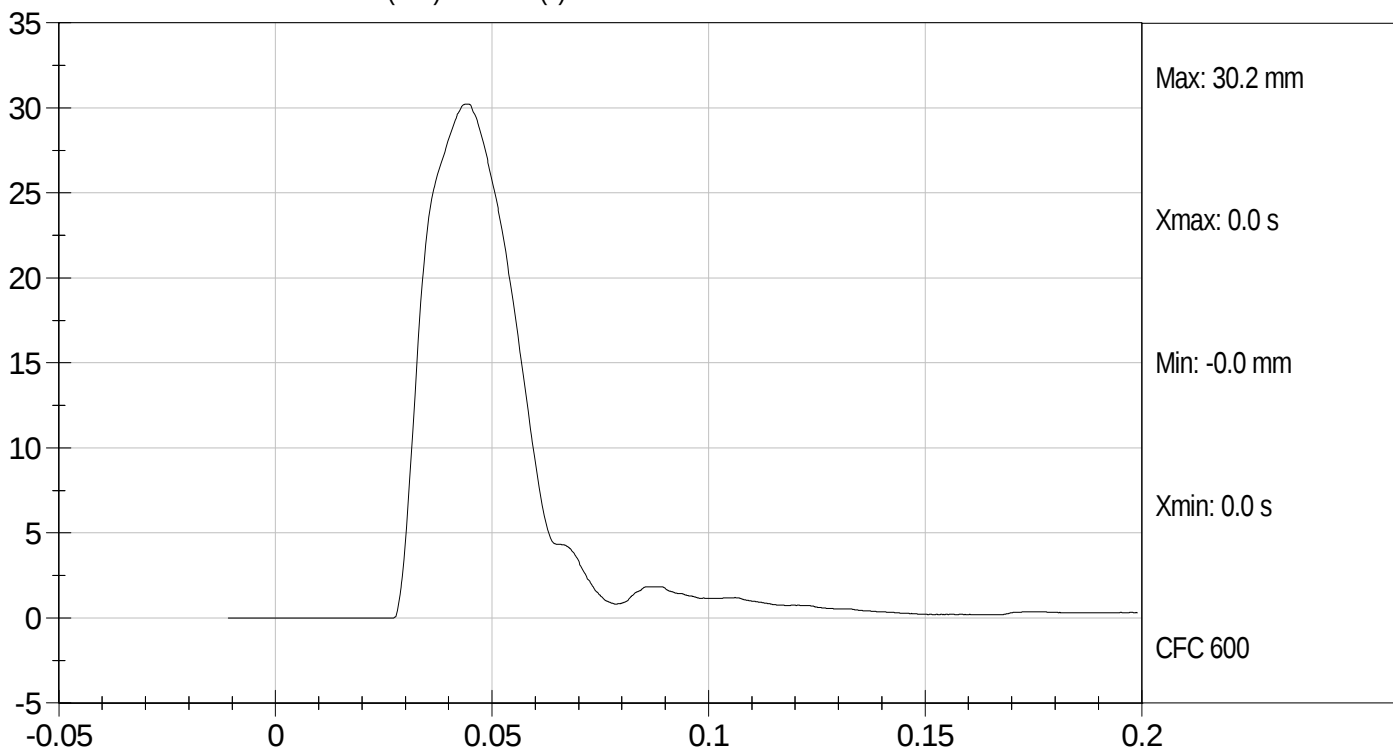




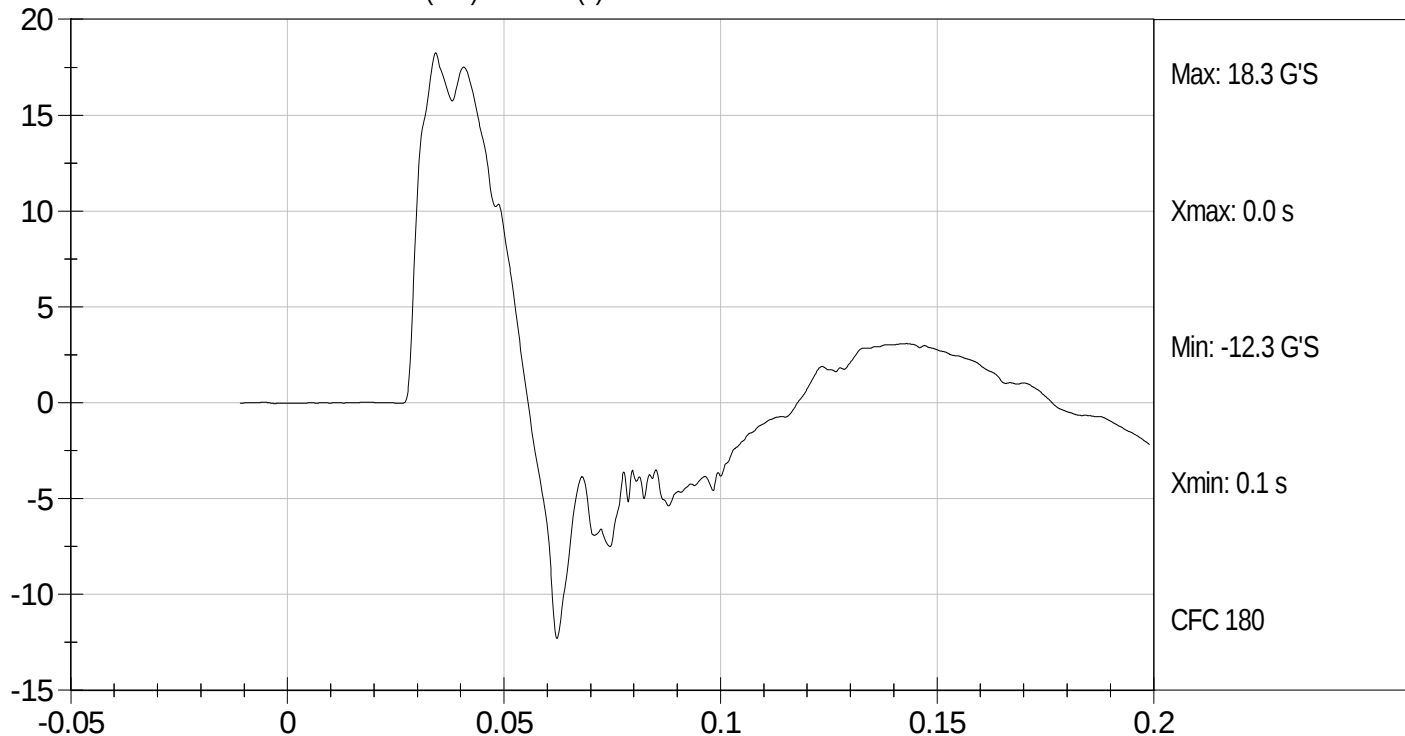
Test Desc: Shoulder Impact
Component ID: D113363

Test Date: 10/6/11
Velocity: 14.37 ft/s, 4.38 m/s

SHOULDER DISPLACEMENT (mm) vs TIME (s)



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

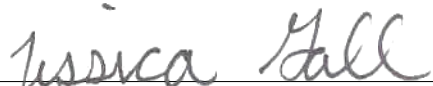


MGA RESEARCH CORPORATION
THORAX (WITH ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D113364

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	41	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Peak Impactor Acceleration	G's	30 to 36	32	Pass
Shoulder Displacement	mm	31 to 40	35	Pass
Upper Rib Displacement	mm	25 to 32	28	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	36	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	33	Pass
Overall Test Results				Pass


 Laboratory Technician

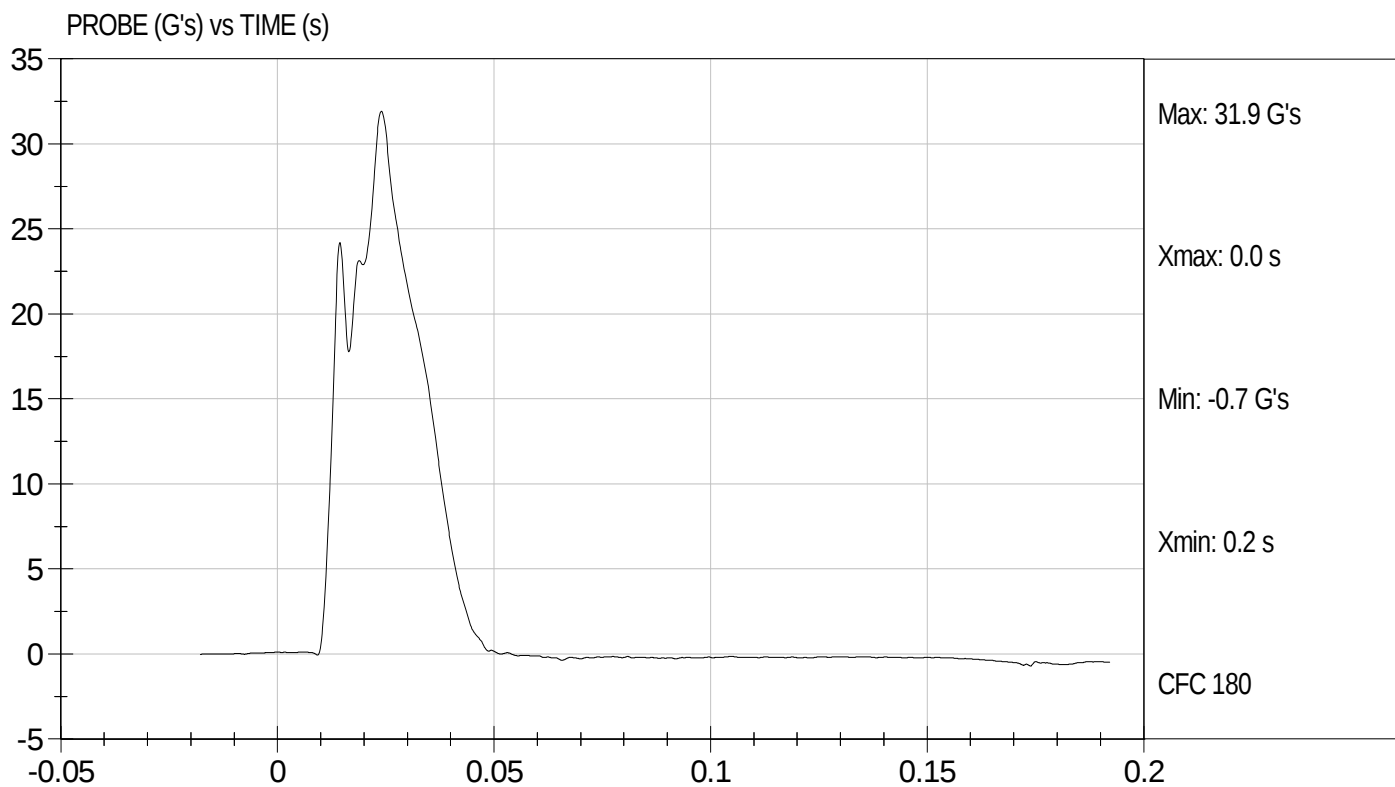
10/6/11
 Test Date


 Approved By



Test Desc: Thorax With Arm
Component ID: D113364

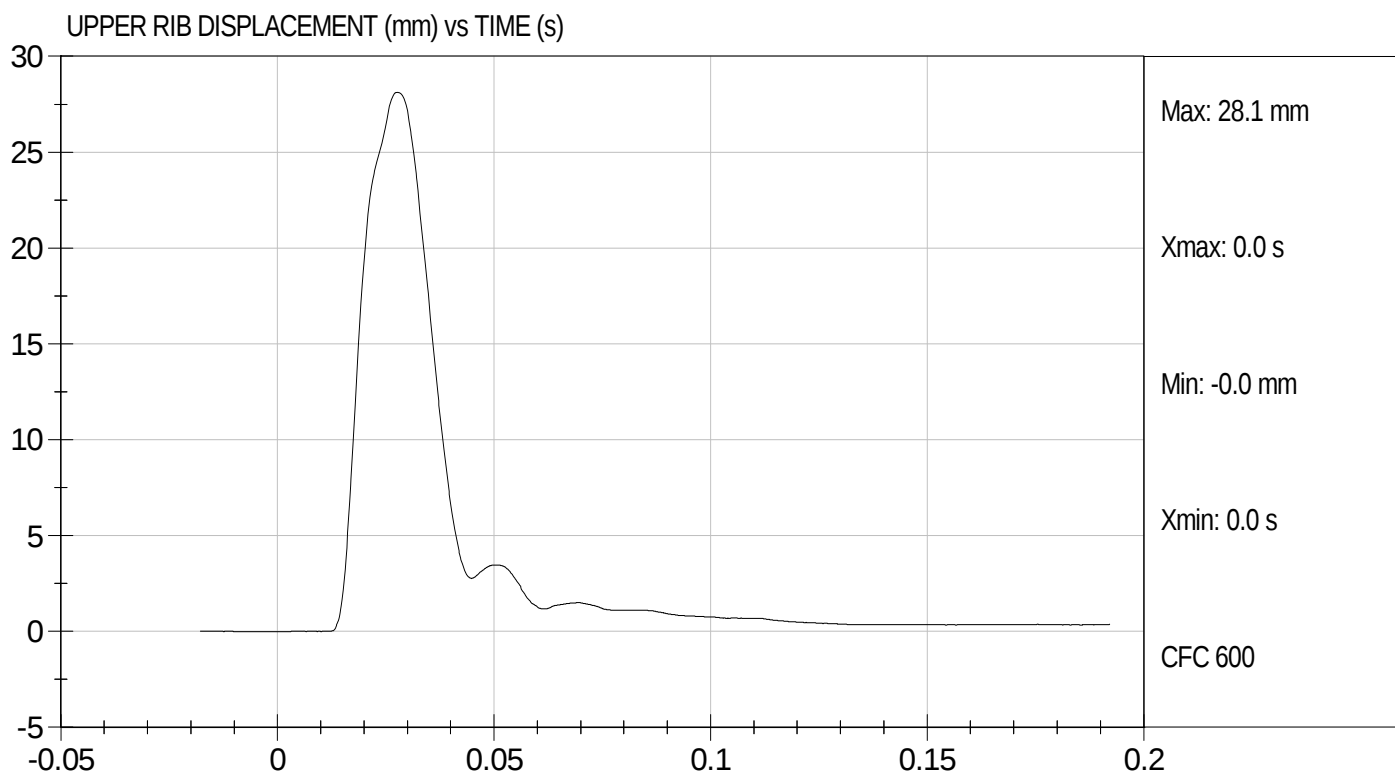
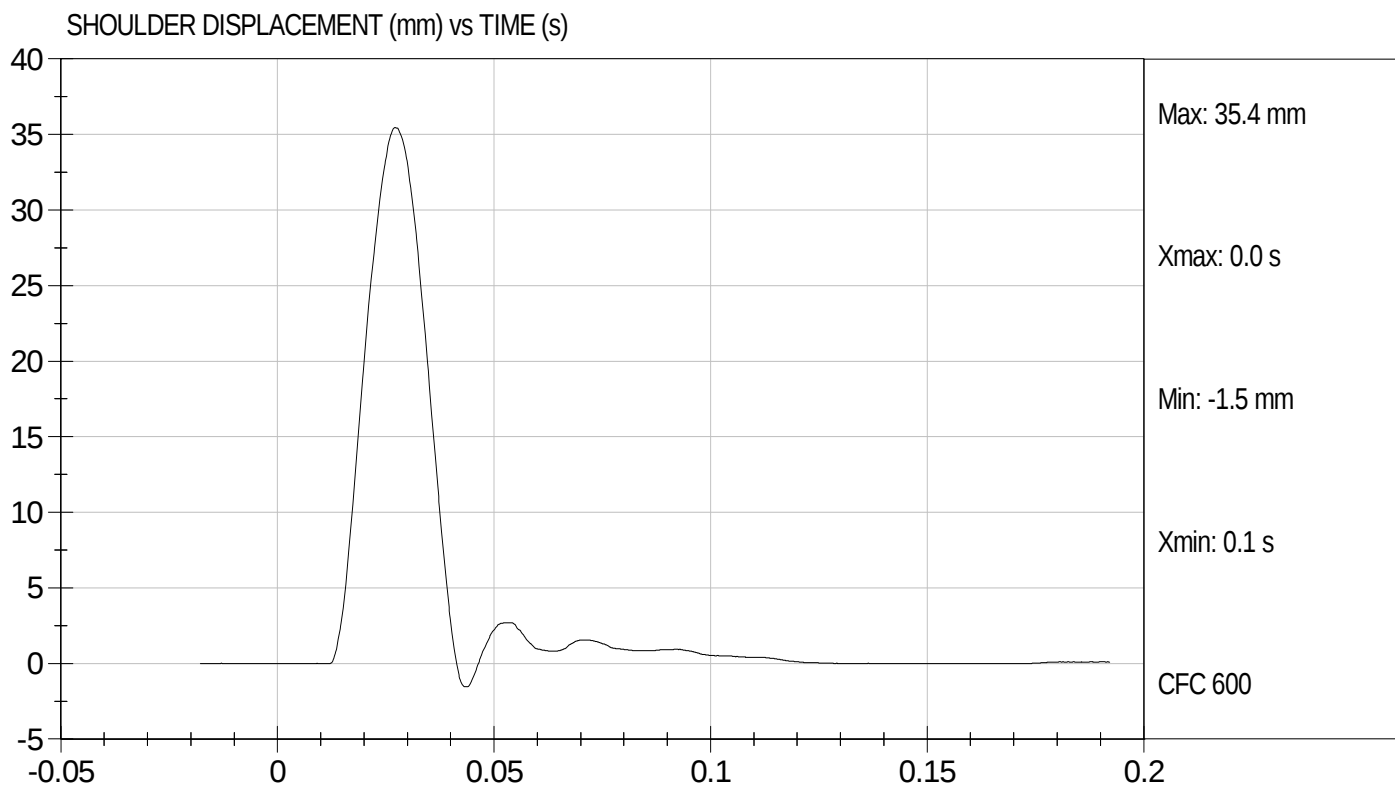
Test Date: 10/6/11
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D113364

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

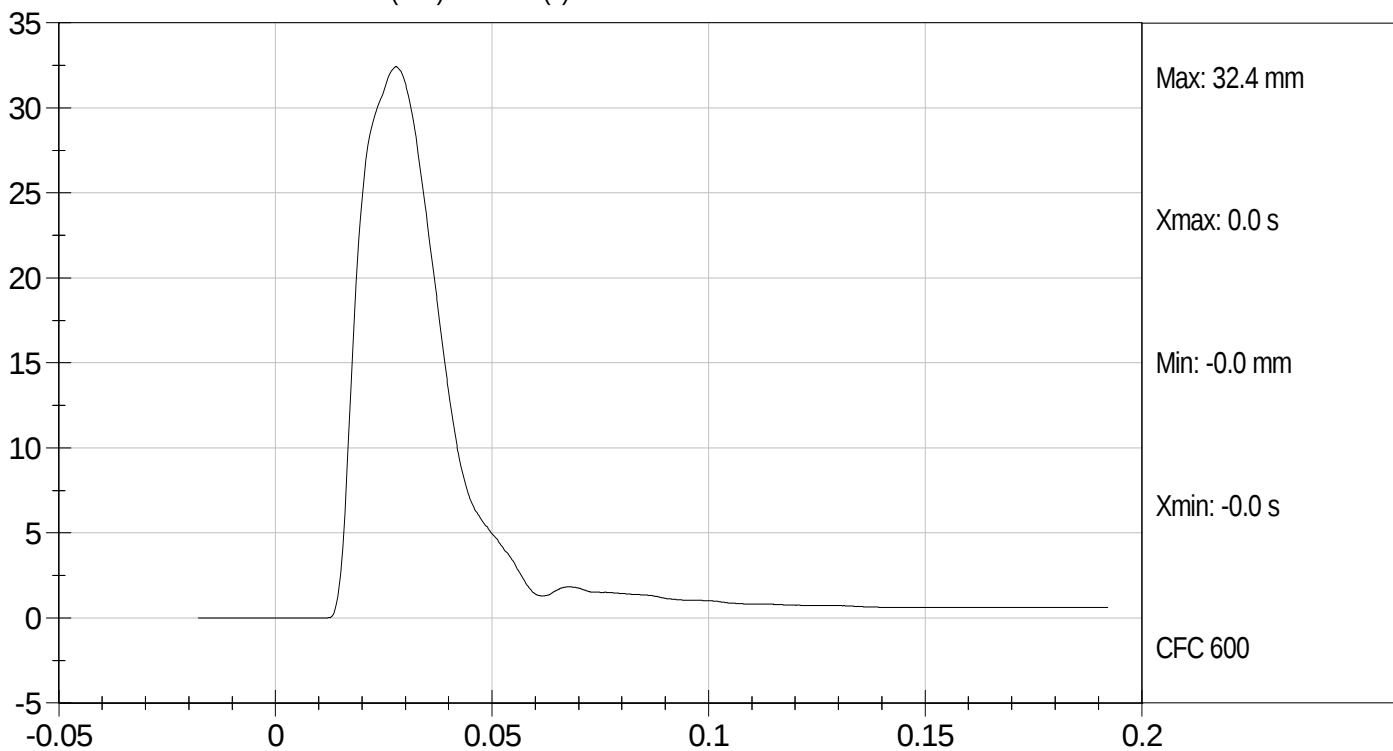




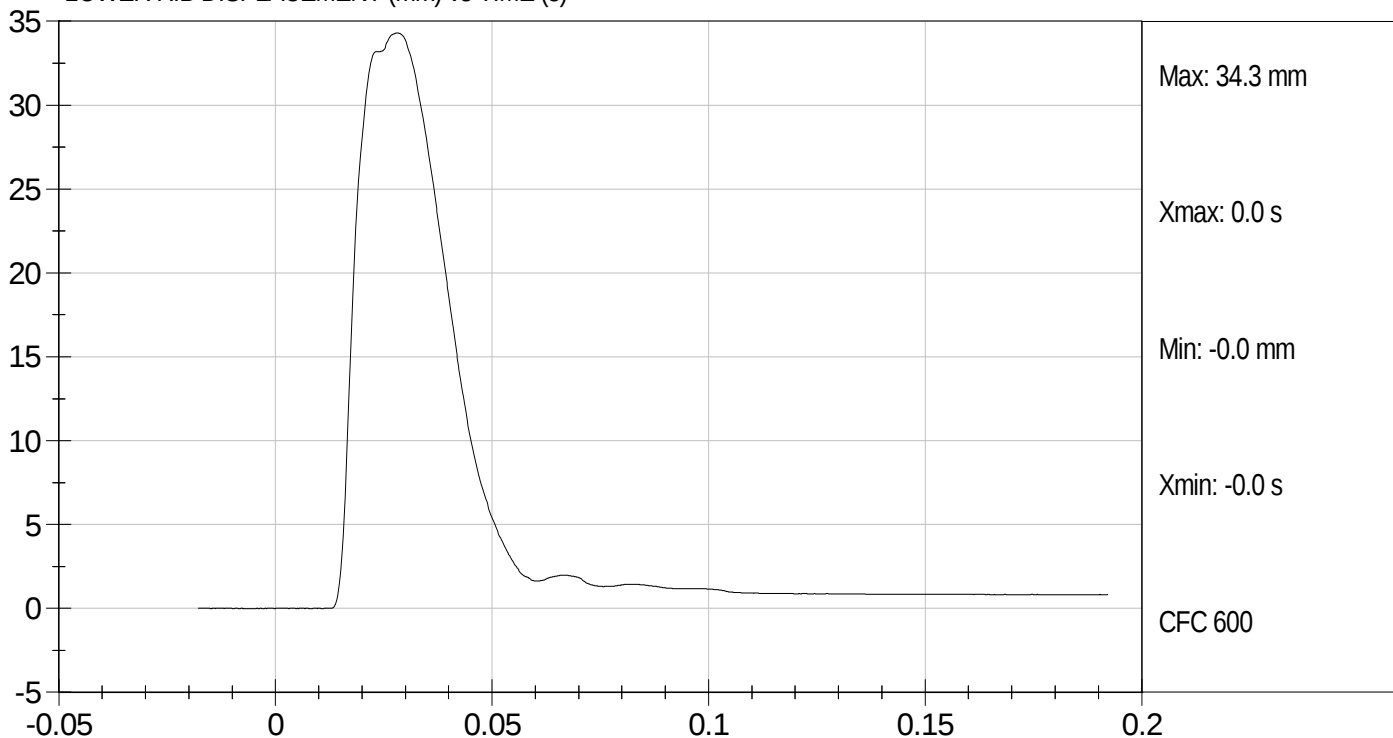
Test Desc: Thorax With Arm
Component ID: D113364

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

MIDDLE RIB DISPLACEMENT (mm) vs TIME (s)



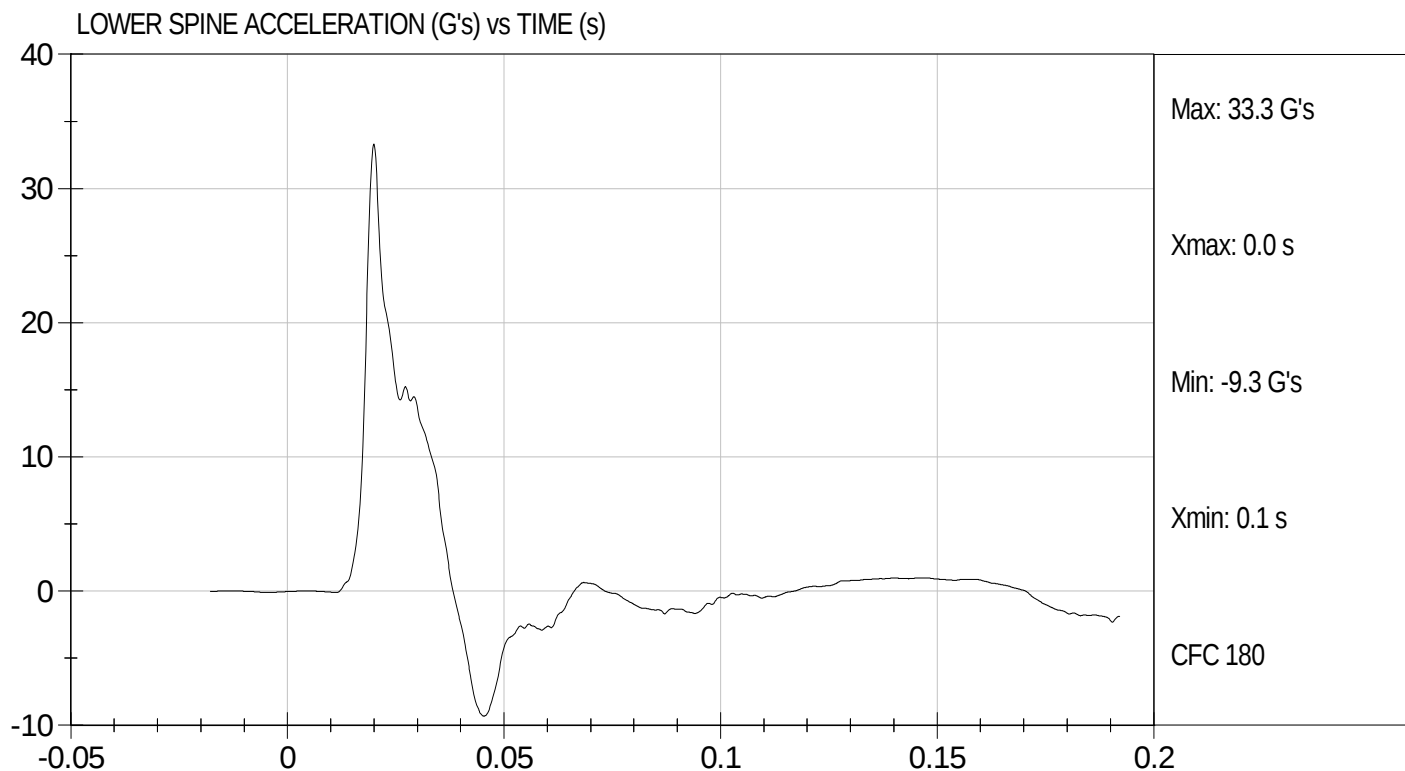
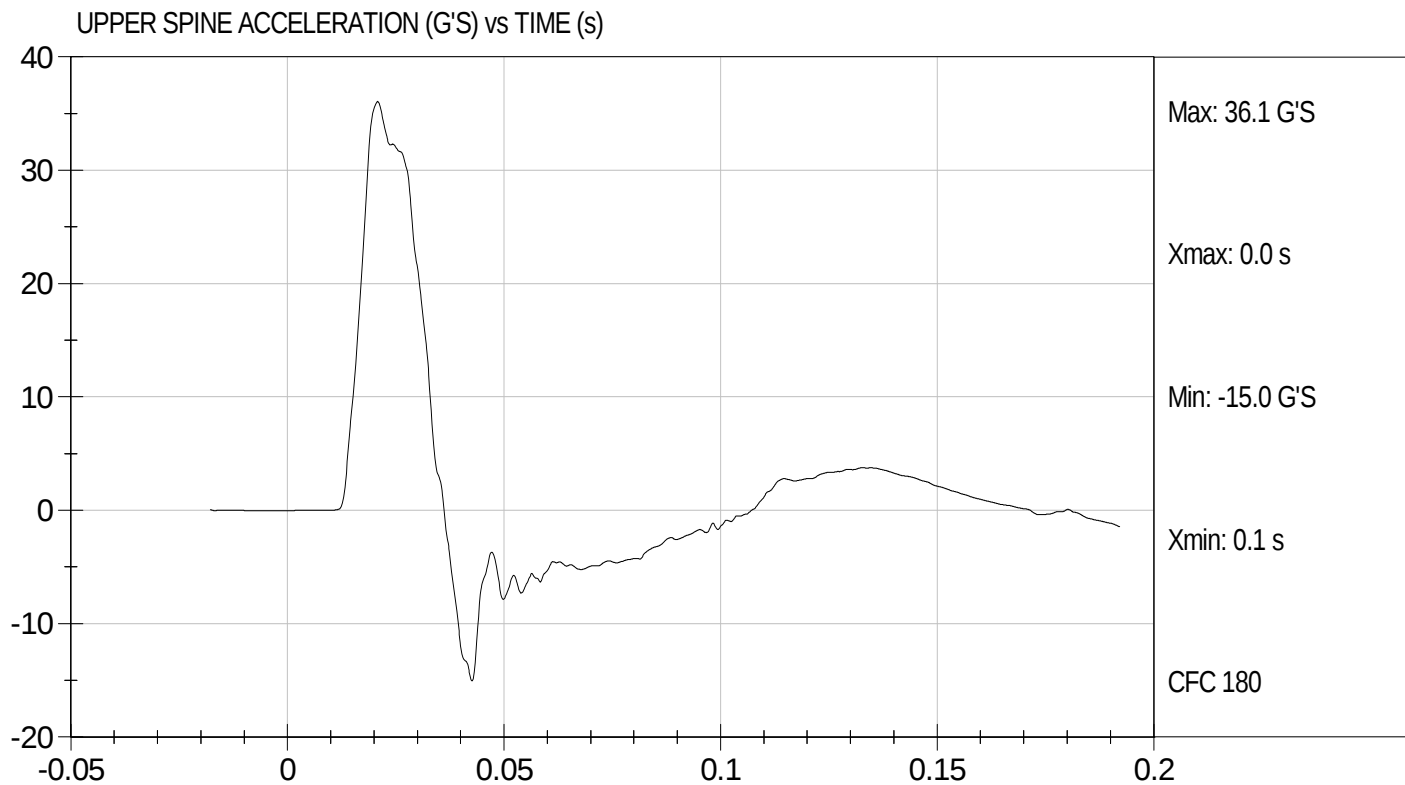
LOWER RIB DISPLACEMENT (mm) vs TIME (s)





Test Desc: Thorax With Arm
Component ID: D113364

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

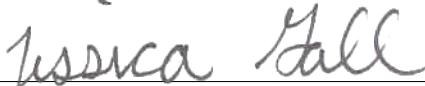


MGA RESEARCH CORPORATION
THORAX (WITHOUT ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D113365

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.6	Pass
Humidity	%	10 to 70	41	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Peak Impactor Force	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	38	Pass
Middle Rib Displacement	mm	39 to 45	43	Pass
Lower Rib Displacement	mm	35 to 43	41	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	13	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
Overall Test Results				Pass


 Laboratory Technician

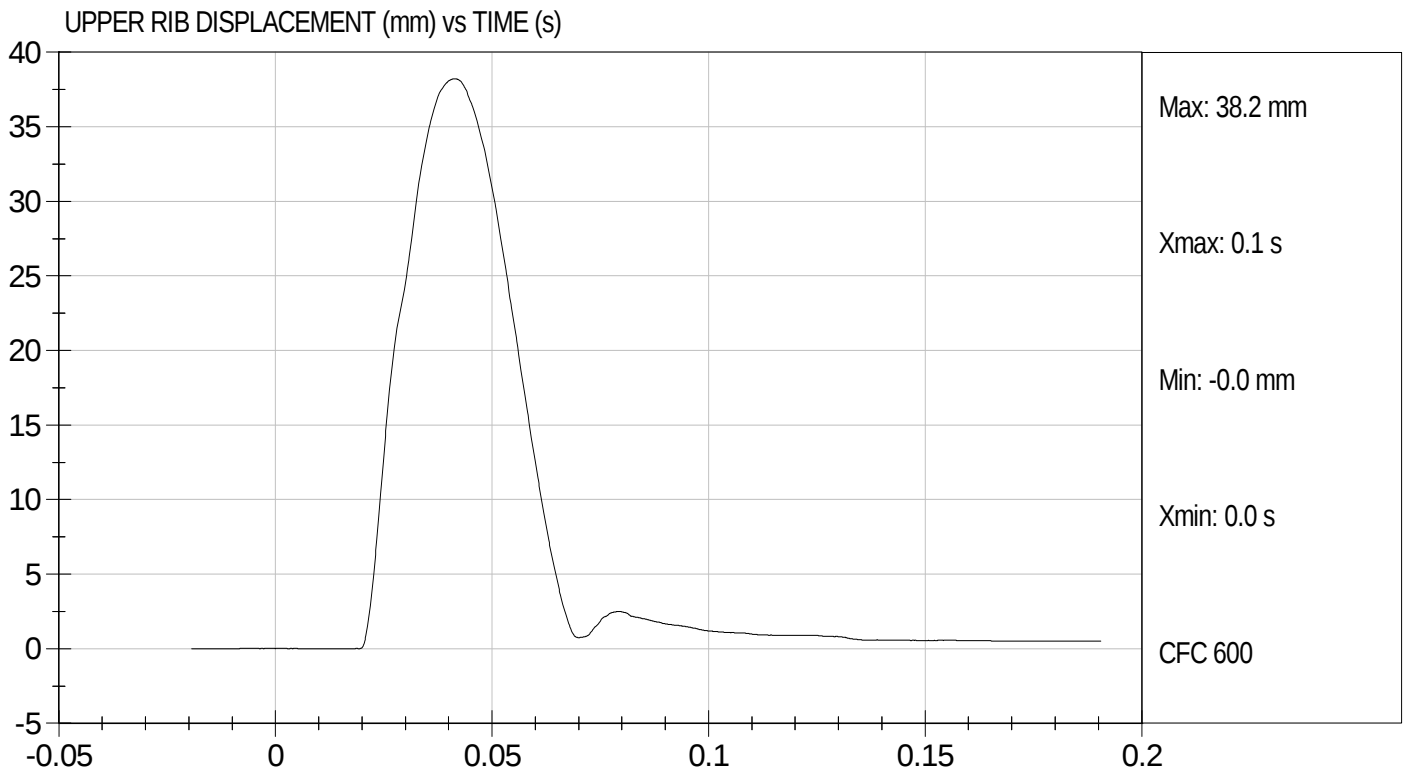
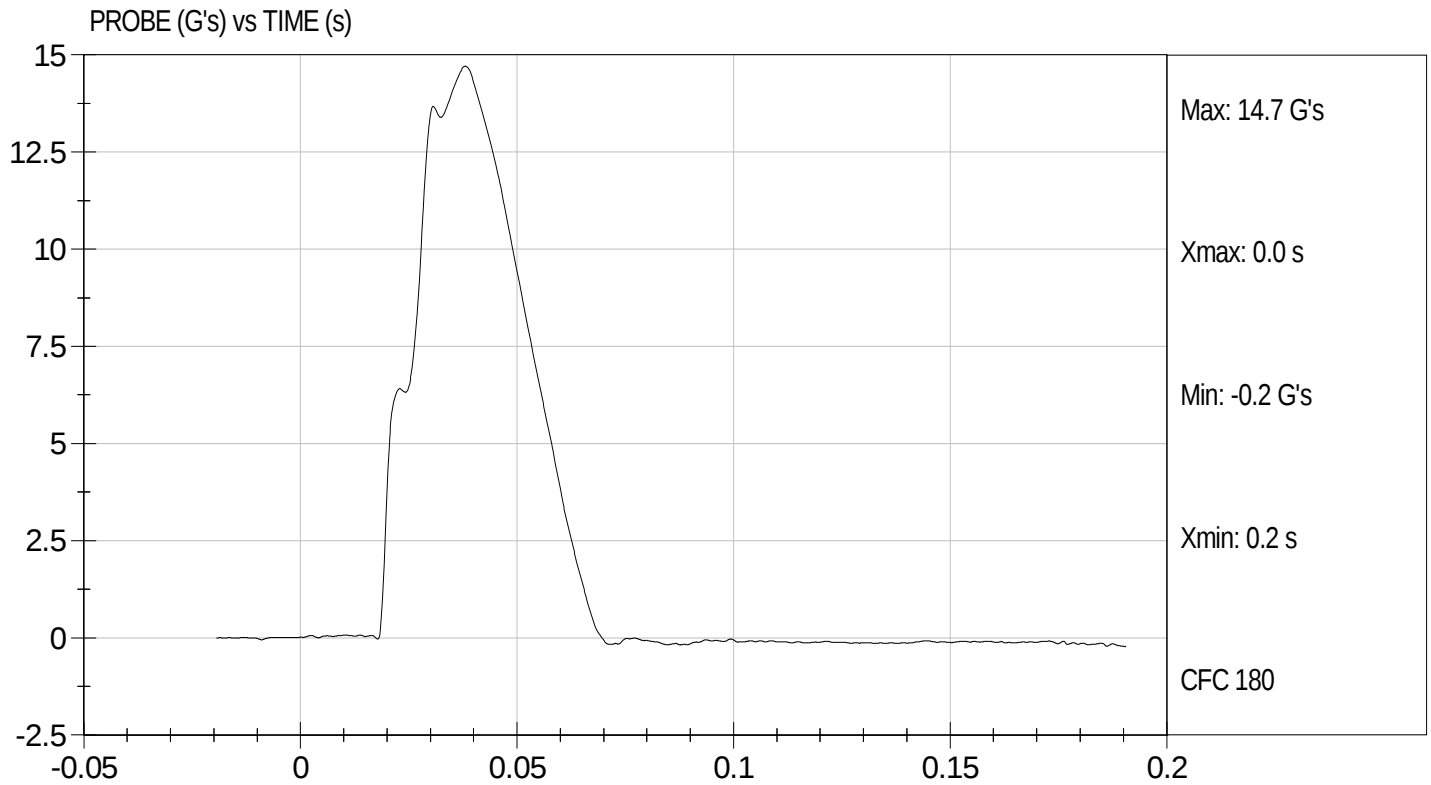
10/6/11
 Test Date


 Approved By



Test Desc: Thorax Without Arm
Component ID: D113365

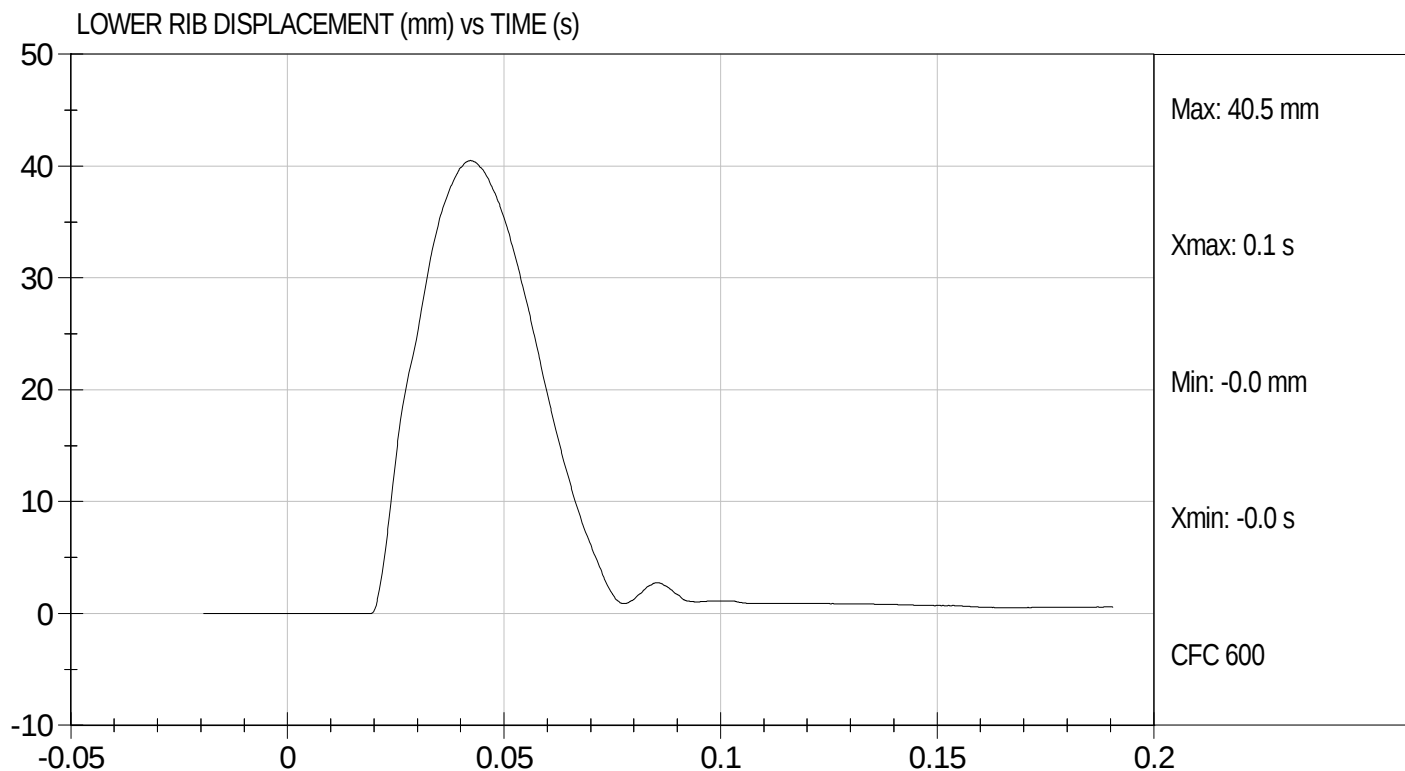
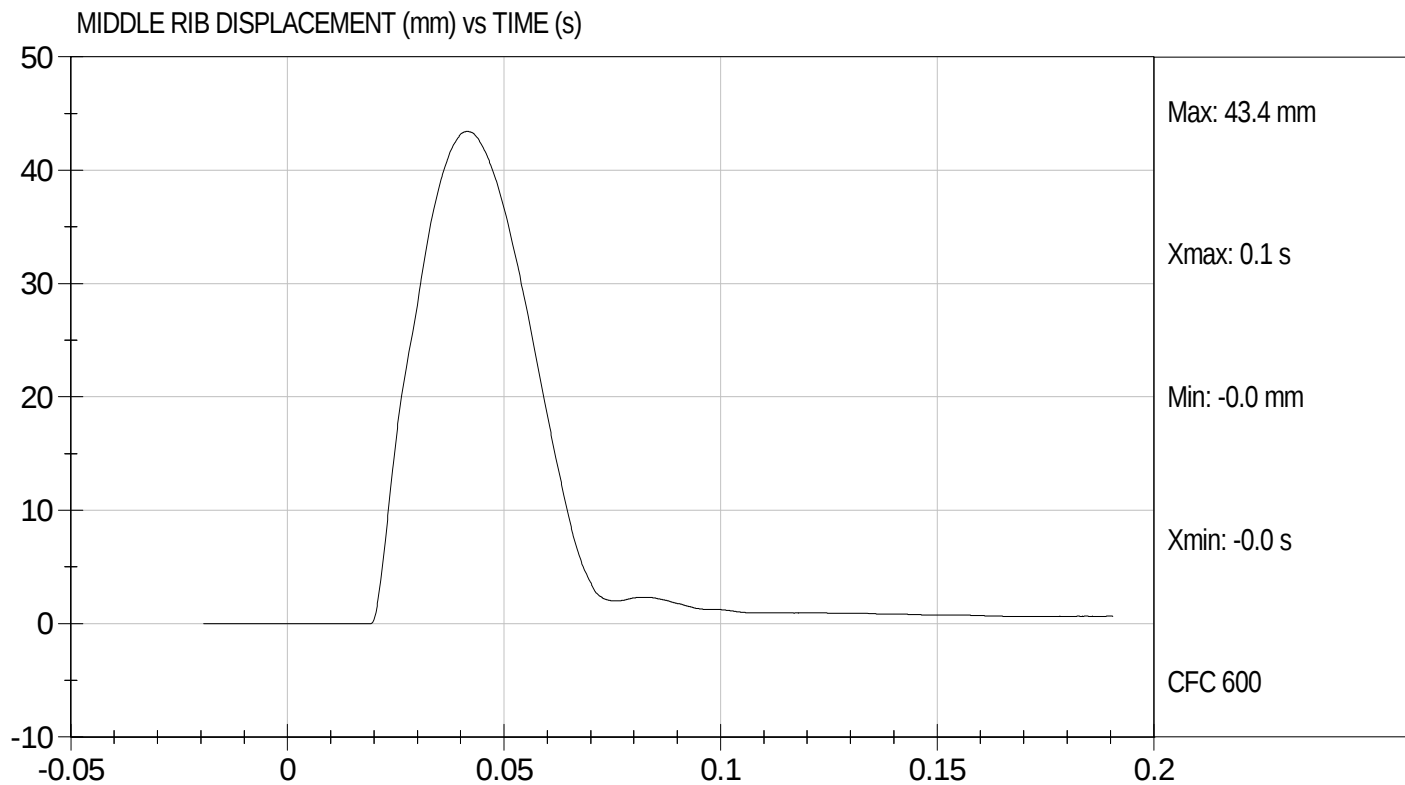
Test Date: 10/6/11
Velocity: 14.37 ft/s, 4.38 m/s





Test Desc: Thorax Without Arm
Component ID: D113365

Test Date: 10/6/11
Velocity: 14.37 ft/s, 4.38 m/s

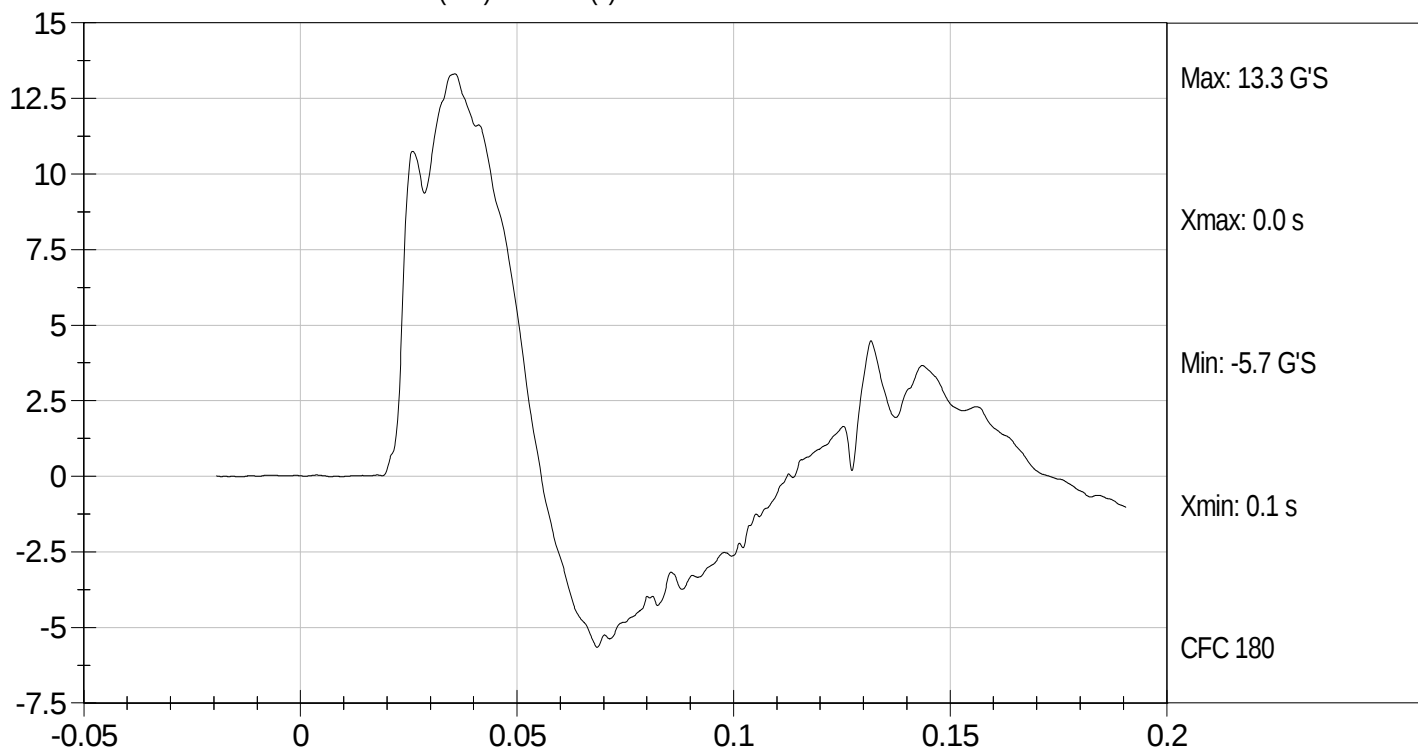




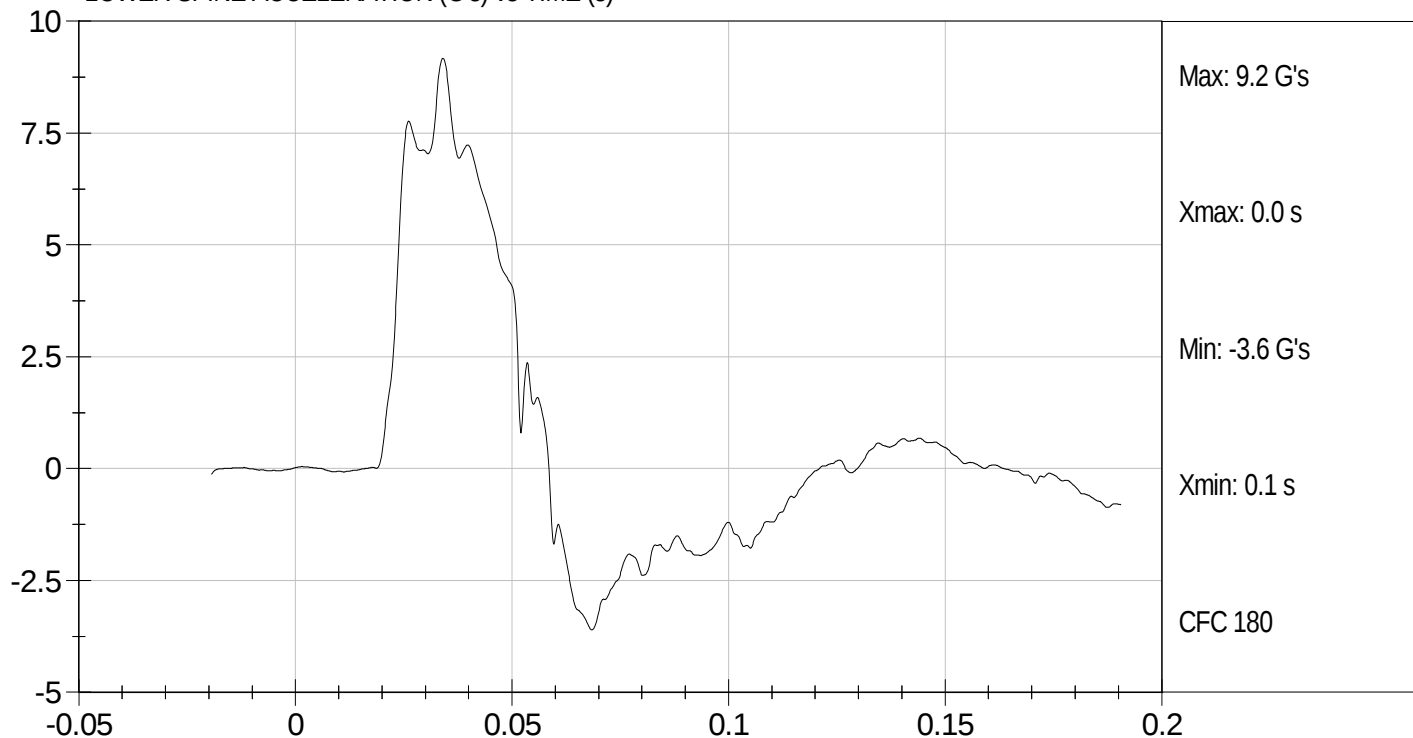
Test Desc: Thorax Without Arm
Component ID: D113365

Test Date: 10/6/11
Velocity: 14.37 ft/s, 4.38 m/s

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



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



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

ATD Serial No: 296

Test I.D: D113366

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	40	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Acceleration	G's	12 to 16	13	Pass
Upper Rib Displacement	mm	36 to 47	43	Pass
Lower Rib Displacement	mm	33 to 44	37	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results			Pass	


Laboratory Technician

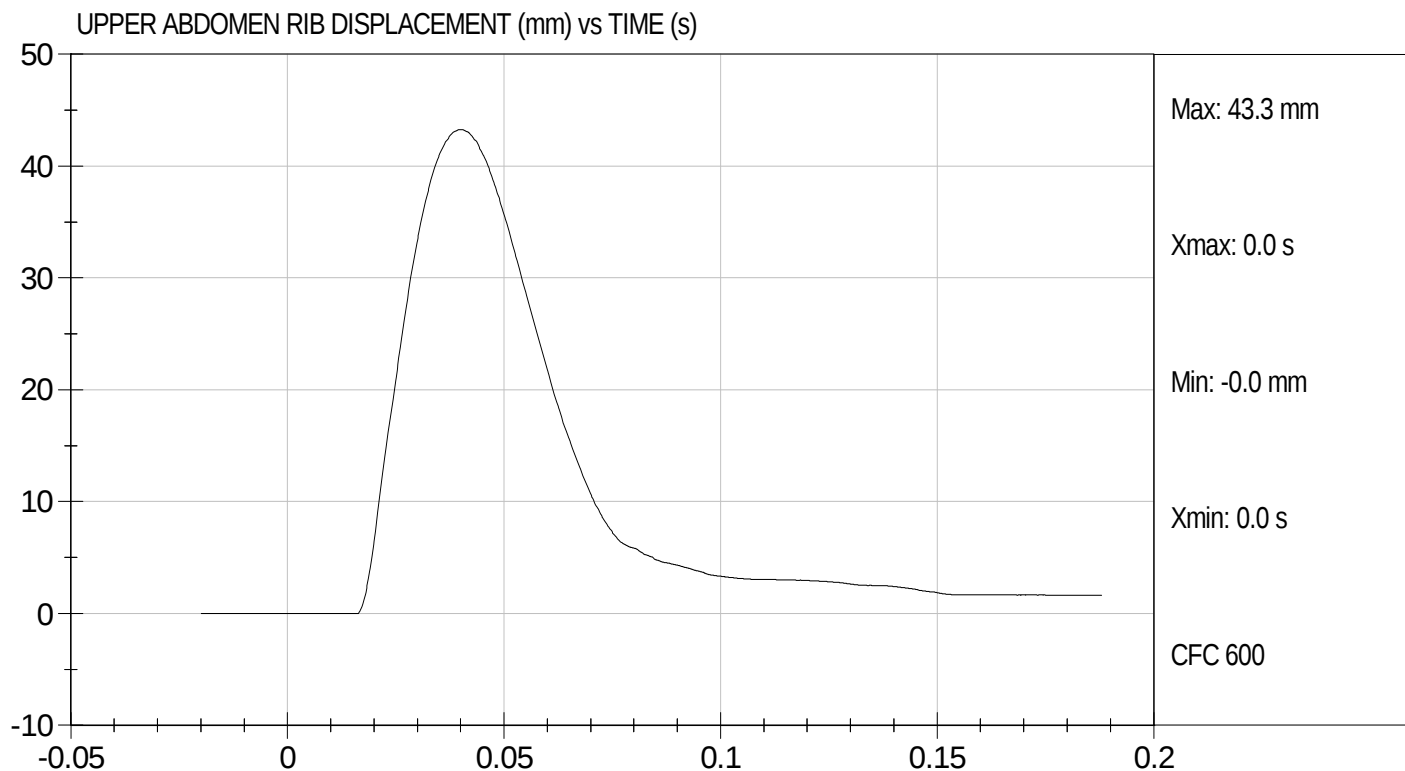
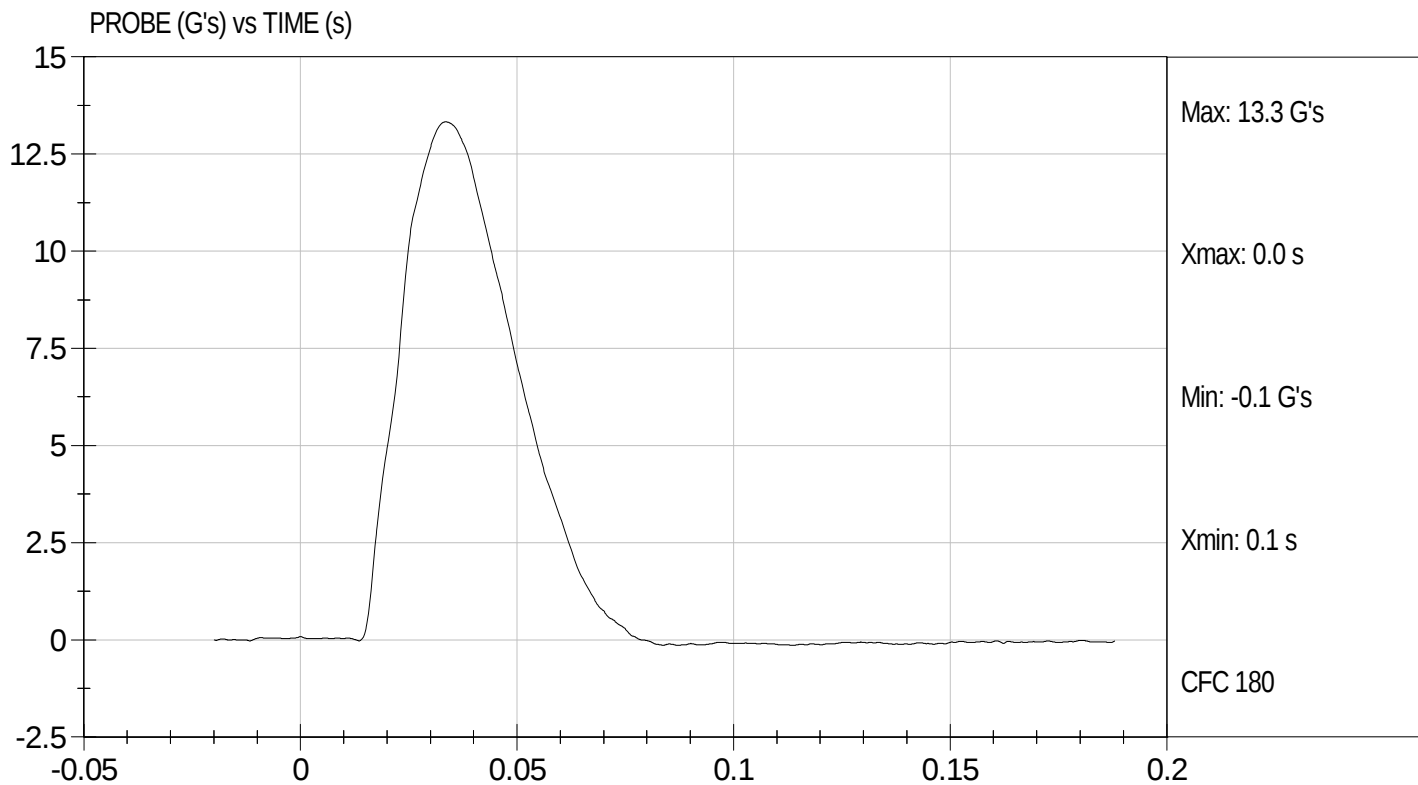
10/6/11
Test Date


Approved By



Test Desc: Abdomen Impact
Component ID: D113366

Test Date: 10/6/11
Velocity: 14.25 ft/s, 4.34 m/s

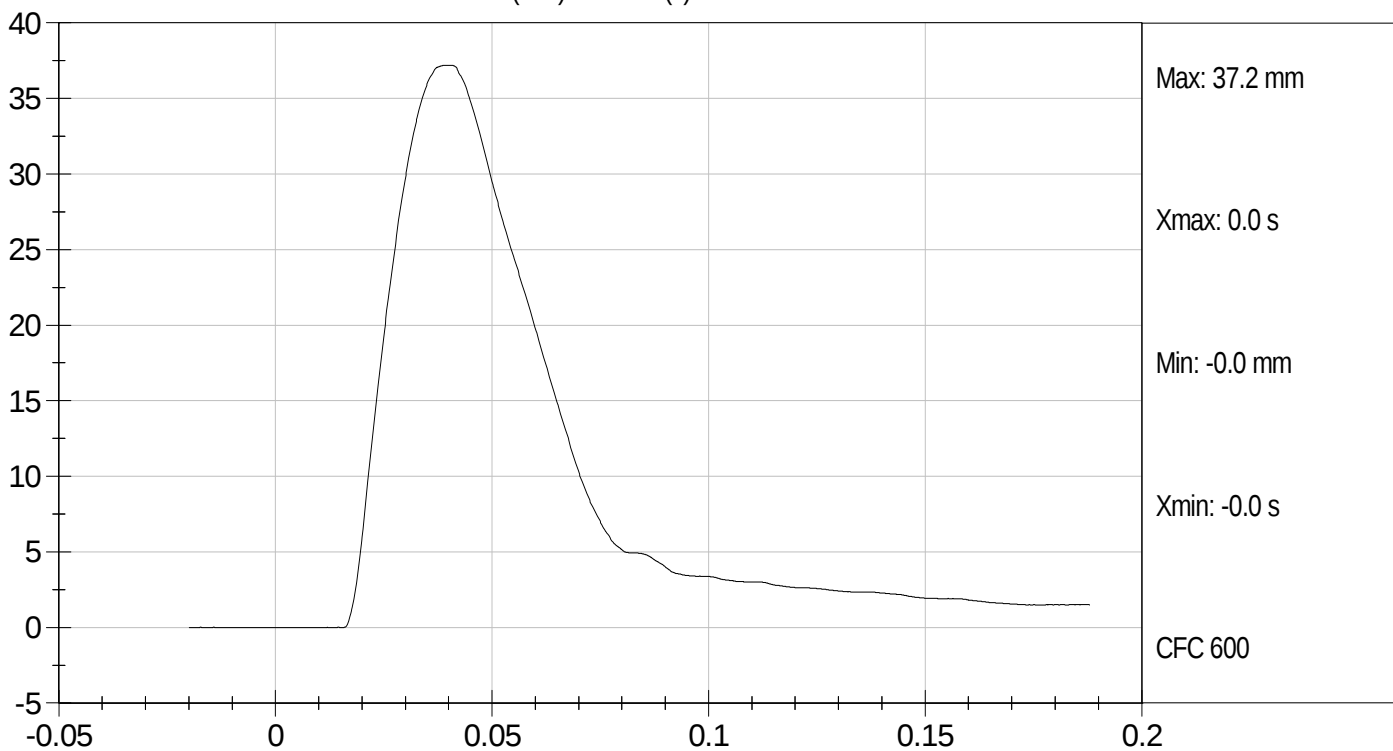




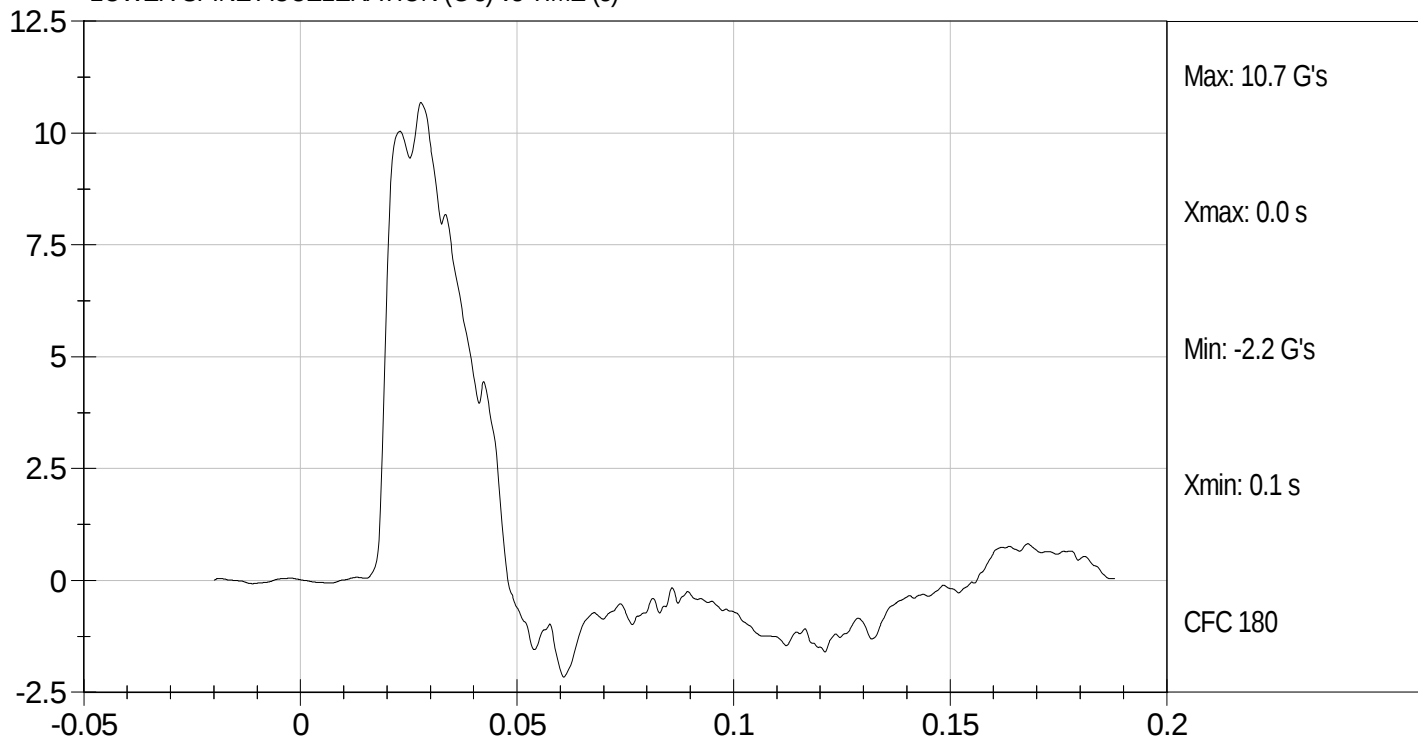
Test Desc: Abdomen Impact
Component ID: D113366

Test Date: 10/6/11
Velocity: 14.25 ft/s, 4.34 m/s

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



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

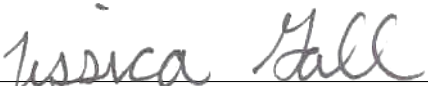


MGA RESEARCH CORPORATION
PELVIS IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D113367

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	40	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Peak Impactor Acceleration	G's	38 to 47	43	Pass
Pelvis Y Acceleration after 6 ms	G's	34 to 42	40	Pass
Peak Acetabulum Force	N	3600 to 4300	3888	Pass
Overall Test Results				Pass


Laboratory Technician

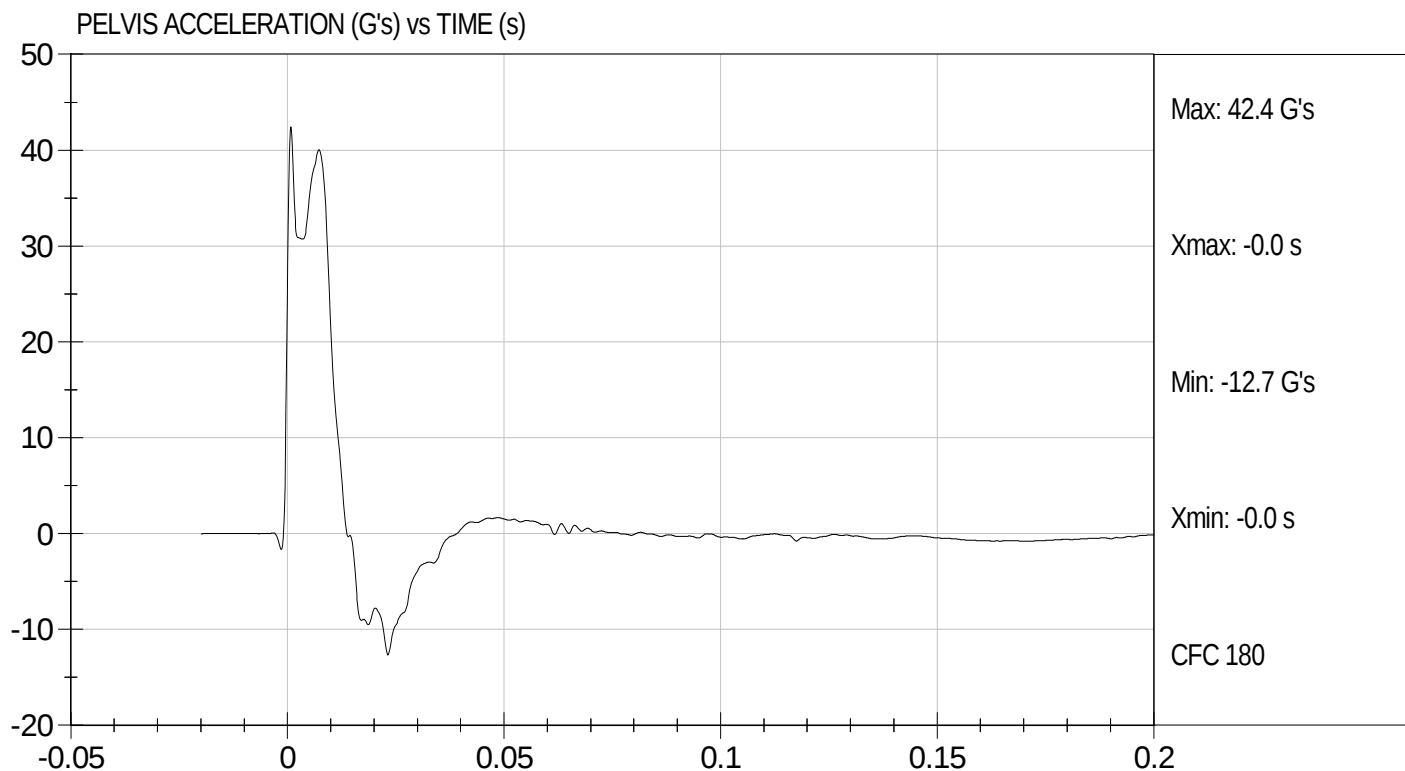
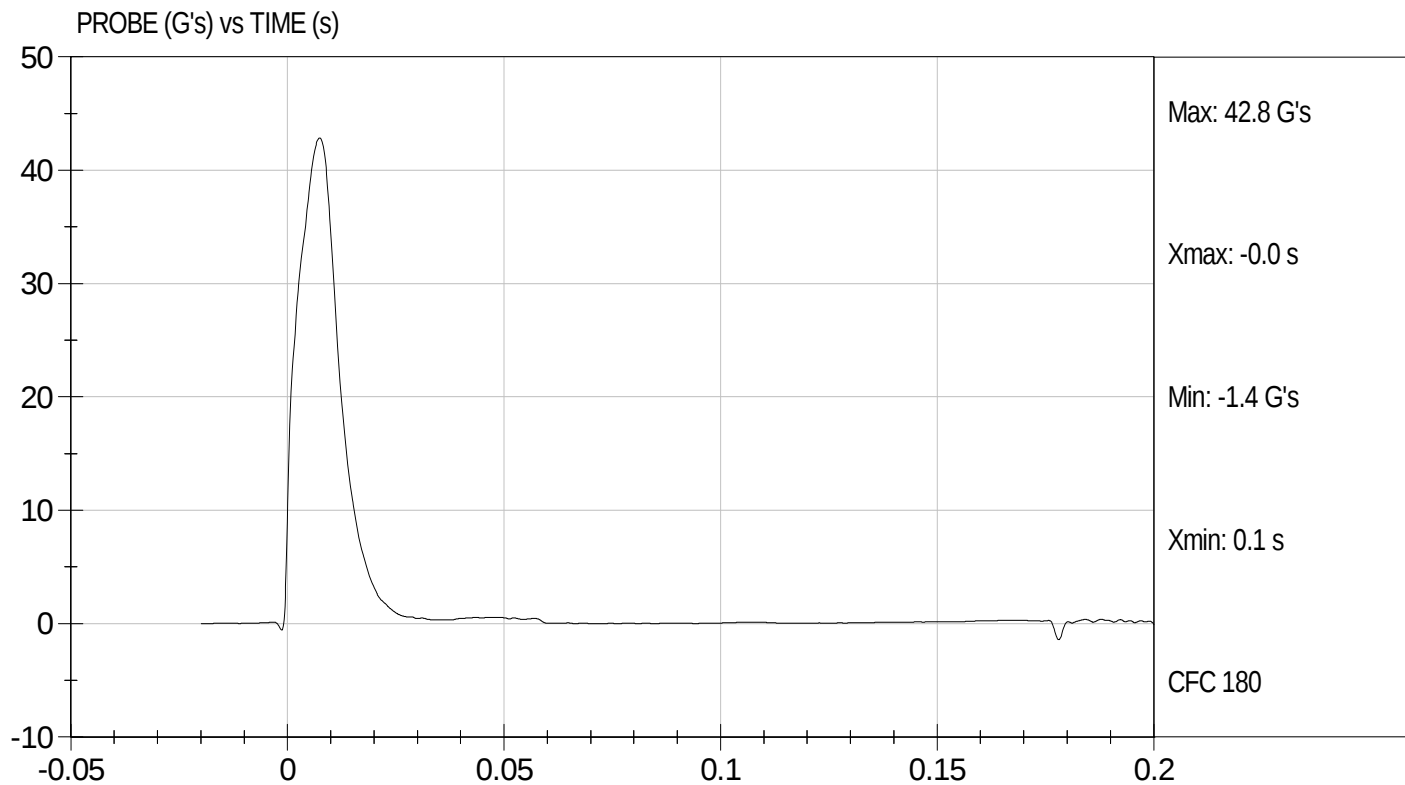
10/6/11
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D113367

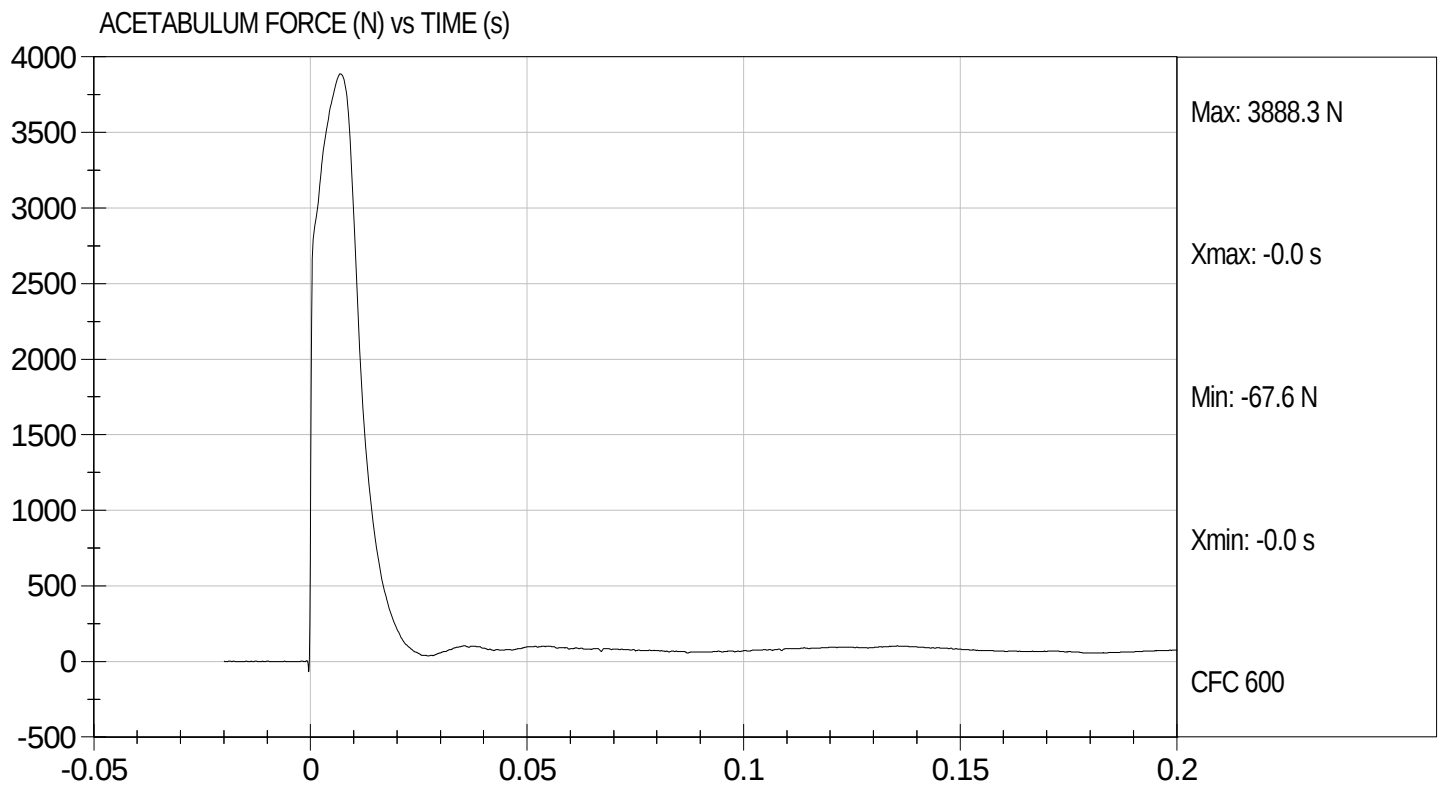
Test Date: 10/6/11
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Pelvis Impact
Component ID: D113367

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



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

ATD Serial No: 296

Test I.D: D113368

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	40	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Peak Impactor Acceleration	G's	36 to 45	37	Pass
Pelvis Y Acceleration	G's	28 to 39	30	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4610	Pass
Overall Test Results			Pass	


Laboratory Technician

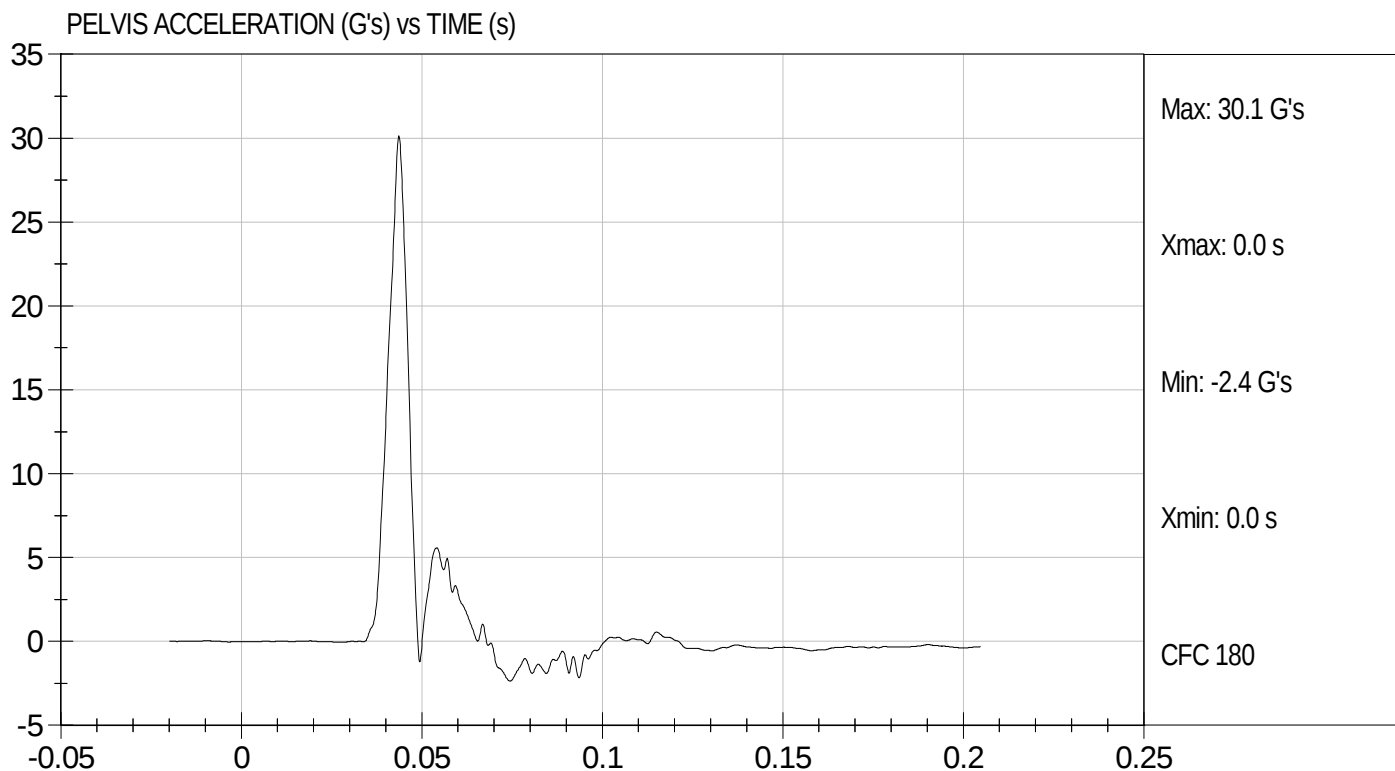
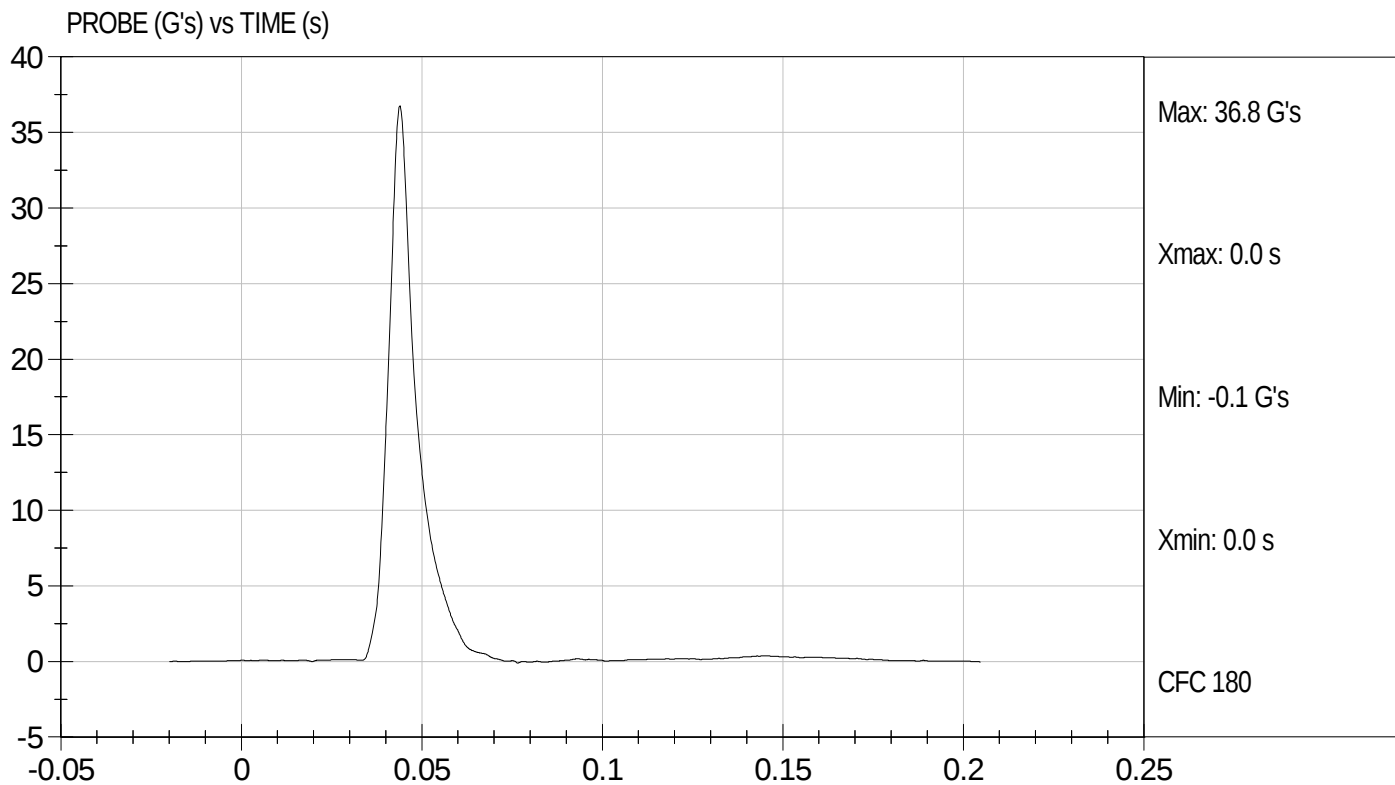
10/6/11
Test Date


Approved By



Test Desc: Iliac Impact
Component ID: D113368

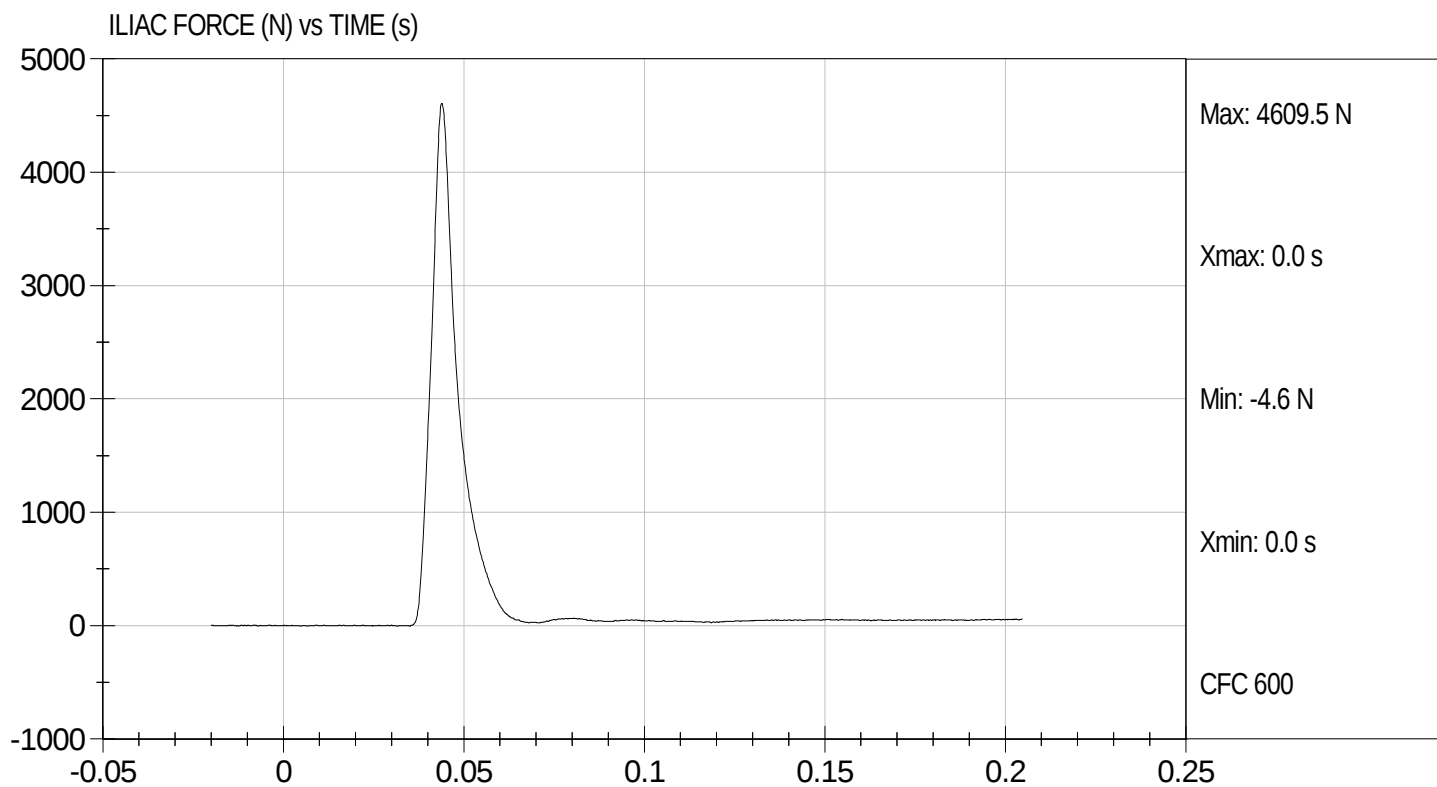
Test Date: 10/6/11
Velocity: 14.12 ft/s, 4.30 m/s





Test Desc: Iliac Impact
Component ID: D113368

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

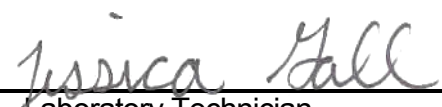


MGA RESEARCH CORPORATION
HEAD DROP TEST
SID-Its BUILD LEVEL D DUMMY

ATD Serial No: 296

Test ID: D113411

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	42	Pass
Peak Resultant Acceleration	G's	115 to 137	127	Pass
Peak Lateral Acceleration	G's	+/- 15	4.8	Pass
Unimodal	N/A	<15%	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

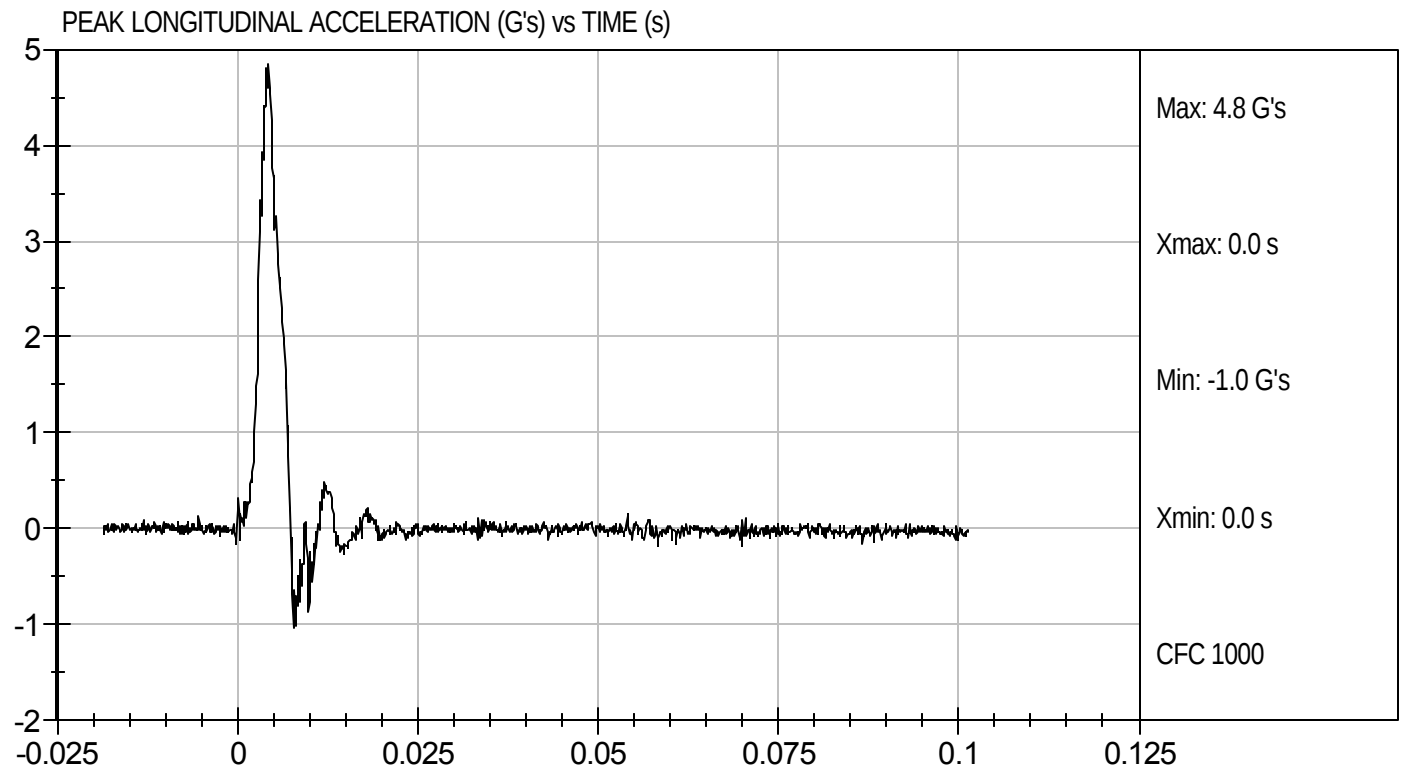
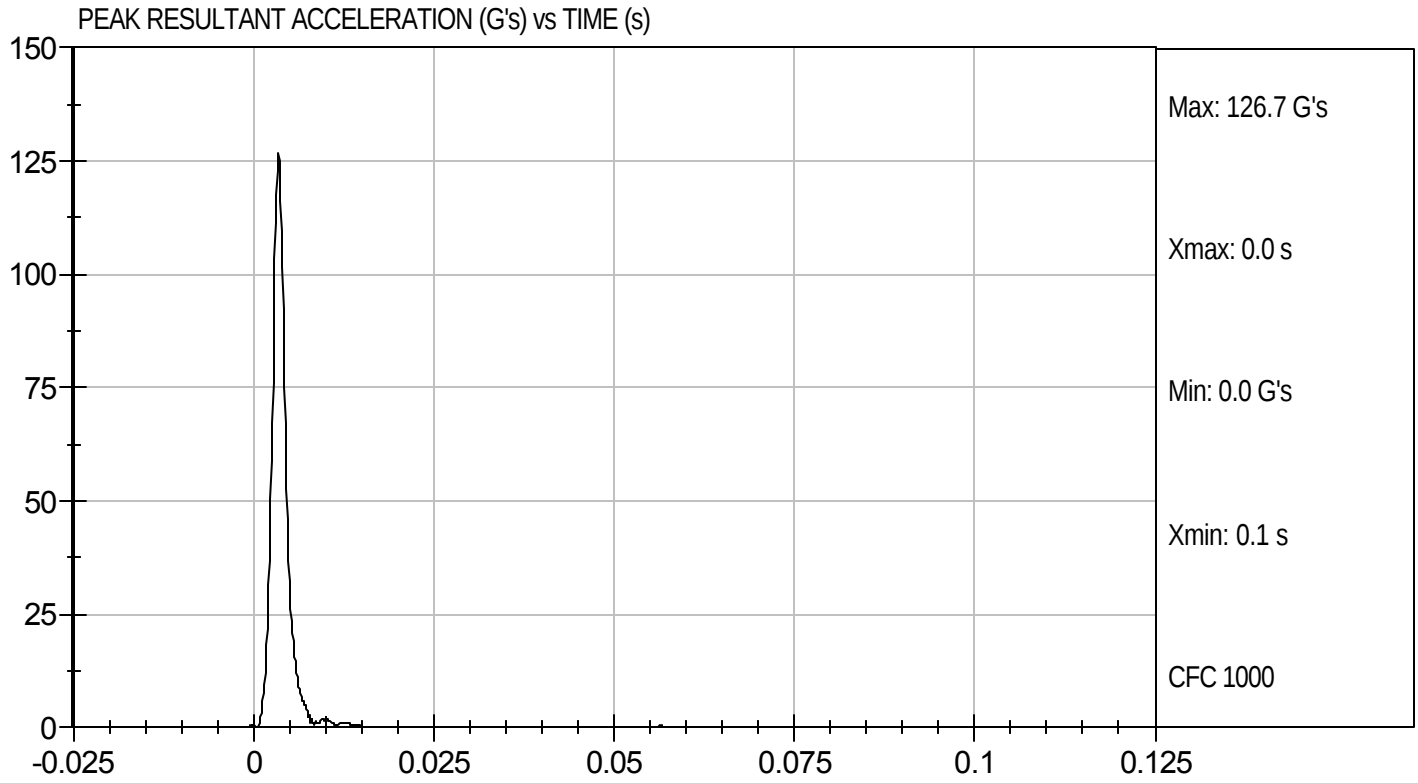
10/10/11
Test Date


Approved By



Test Desc: Head Drop
Component ID: D113411

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

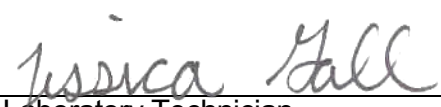


MGA RESEARCH CORPORATION
LATERAL NECK PENDULUM TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D113412

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.7	Pass
Humidity		%	10 to 70	42	Pass
Impact Velocity		m/s	5.51 to 5.63	5.52	Pass
Delta Velocity	10 ms	m/s	2.20 to 2.80	2.52	Pass
	15 ms	m/s	3.30 to 4.10	3.47	Pass
	20 ms	m/s	4.40 to 5.40	4.59	Pass
	25 ms	m/s	5.40 to 6.10	5.49	Pass
	25-100 ms	m/s	5.50 to 6.20	5.65	Pass
Maximum D-Plane Rotation		deg	71 to 81	71	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	60	Pass
Maximum Occipital Condyle Moment during Rotation Interval Nm			-44 to -36	-40	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	113	Pass
Overall Test Results				Pass	


 Laboratory Technician

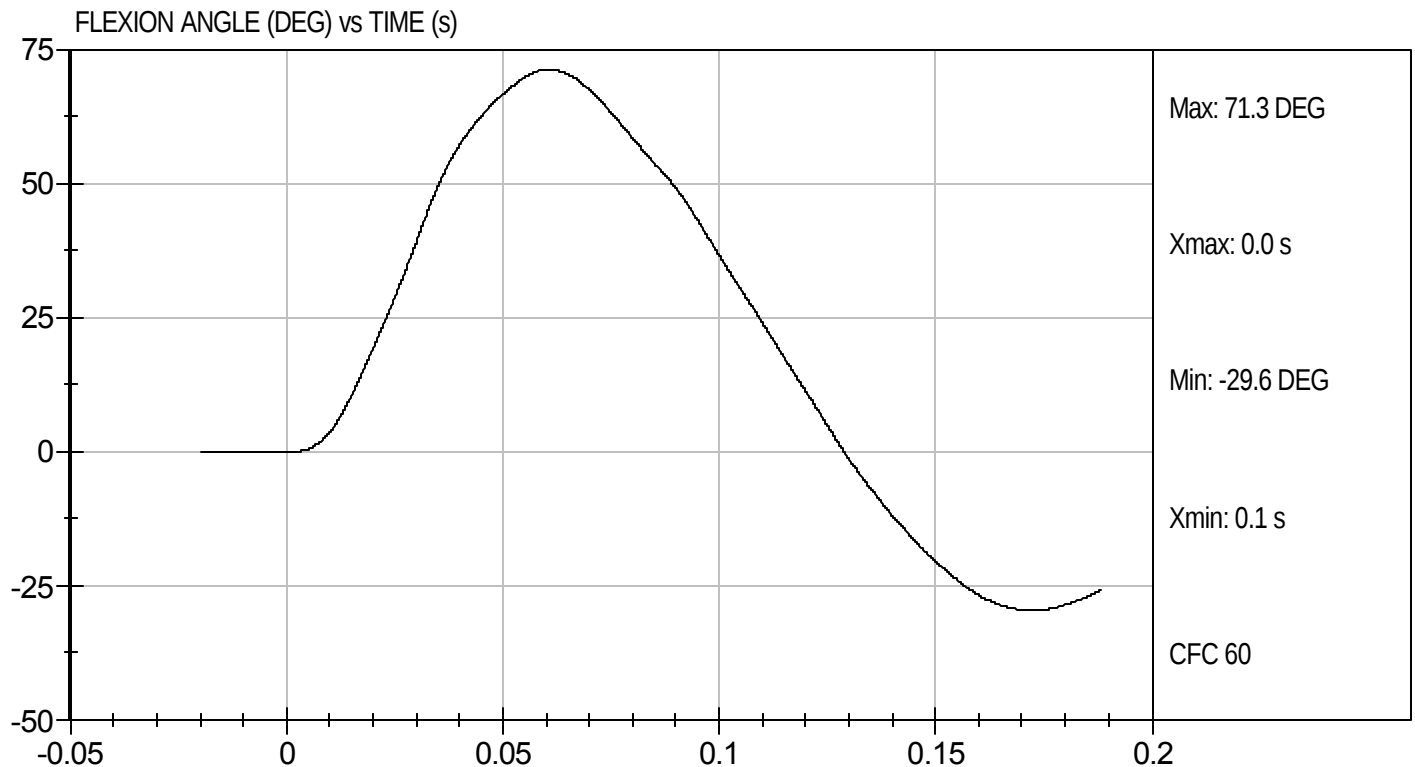
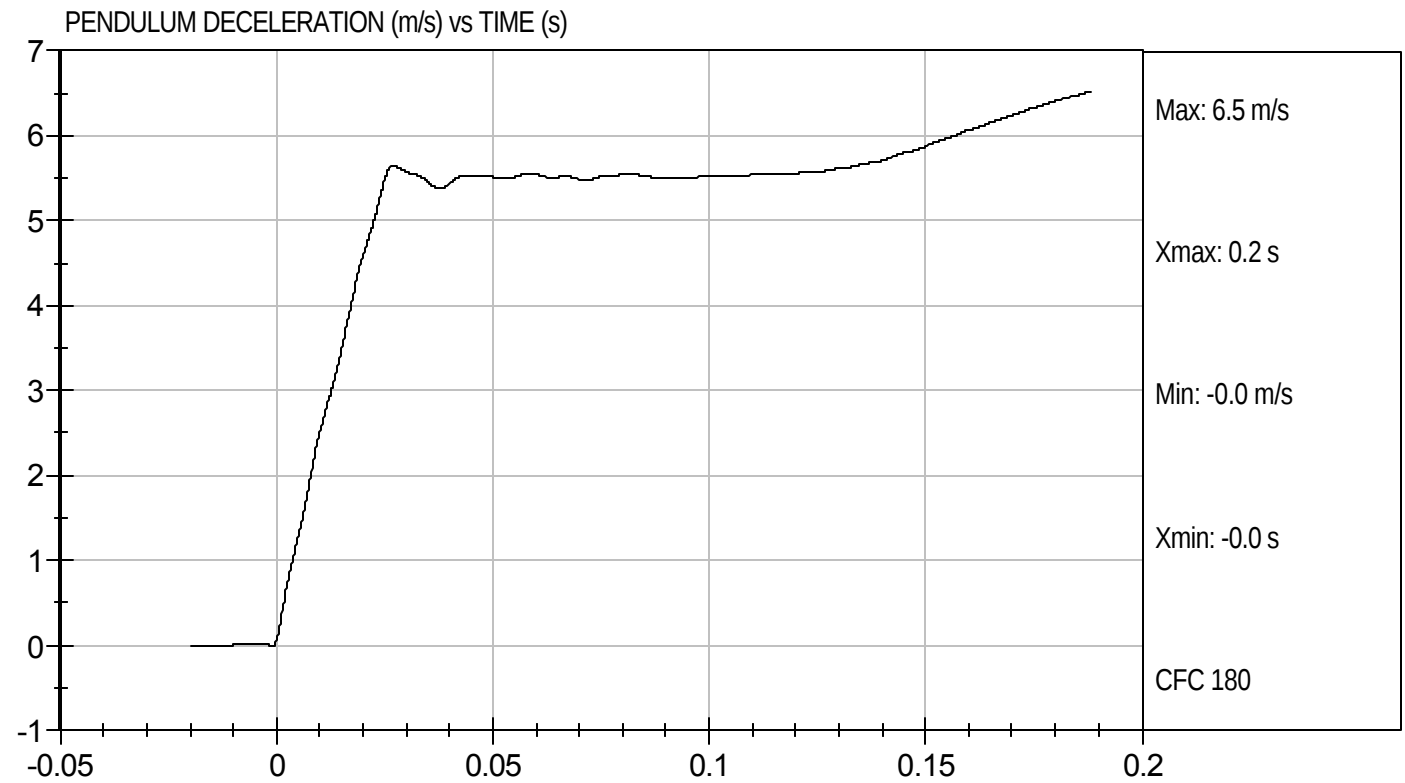
10/10/11
 Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D113412

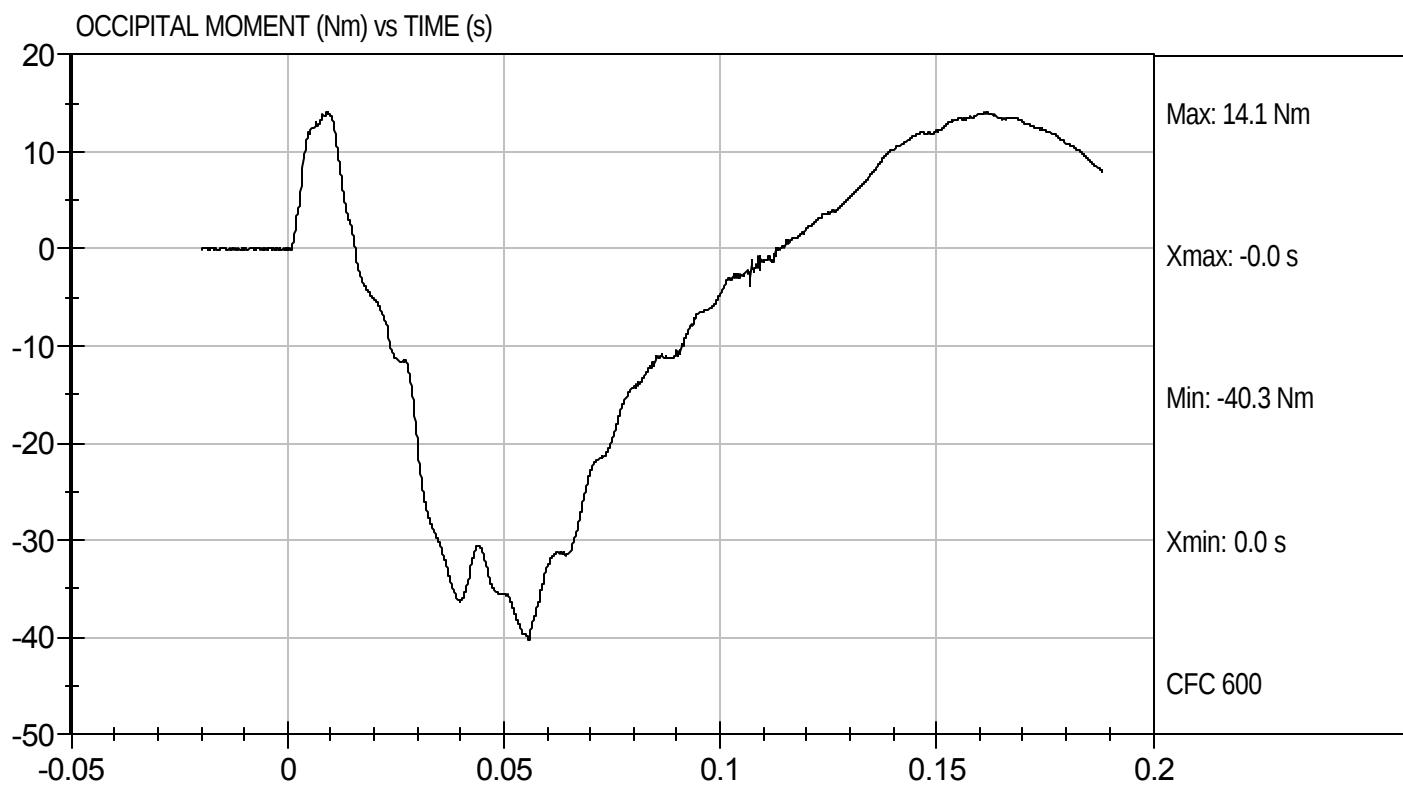
Test Date: 10/10/11
Velocity: 18.11 ft/s, 5.52 m/s





Test Desc: Neck Bending
Component ID: D113412

Test Date: 10/10/11
Velocity: 18.11 ft/s, 5.52 m/s



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

ATD Serial No: 296

Test ID: D113413

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	43	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	31	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	18	Pass
Overall Test Results				Pass


Laboratory Technician

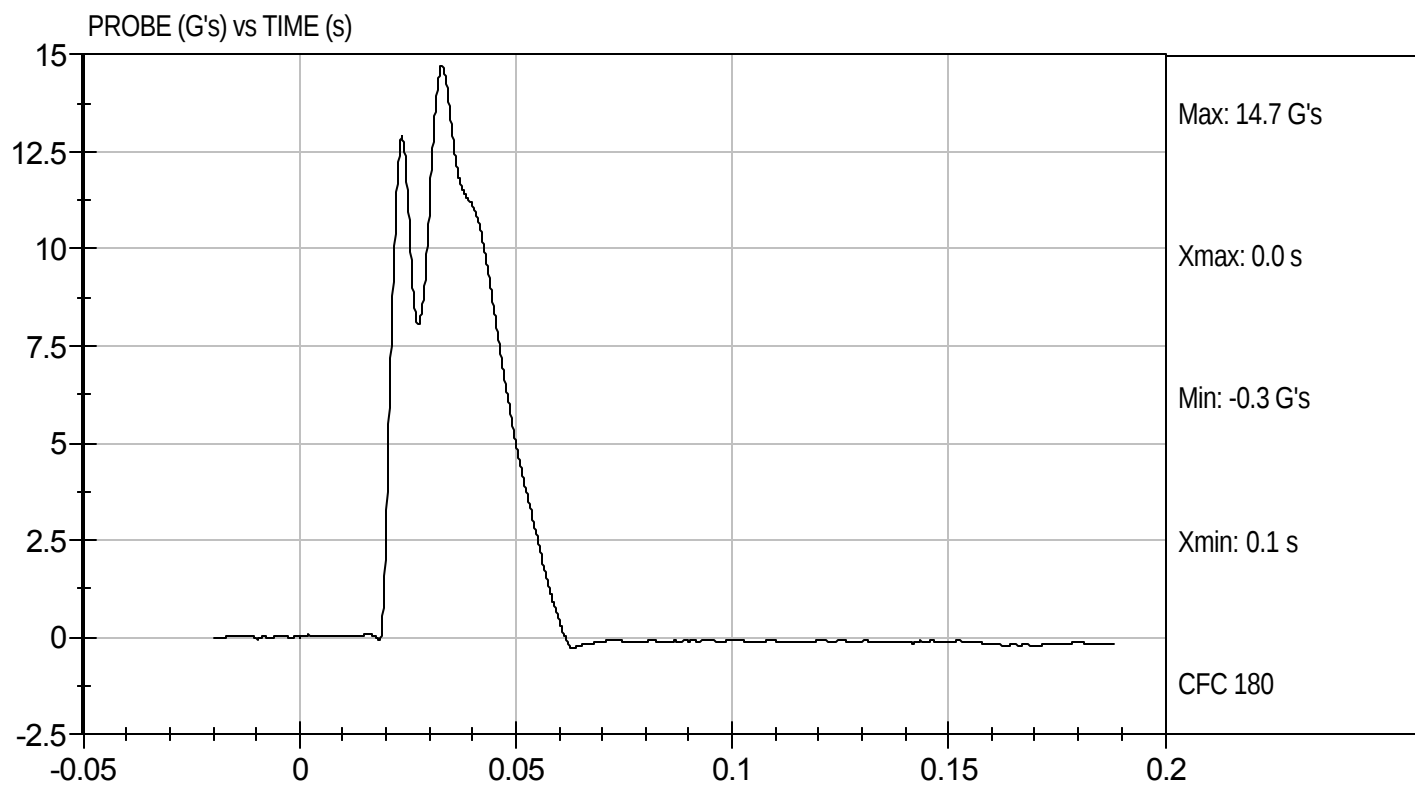
10/10/11
Test Date


Approved By



Test Desc: Shoulder Impact
Component ID: D113413

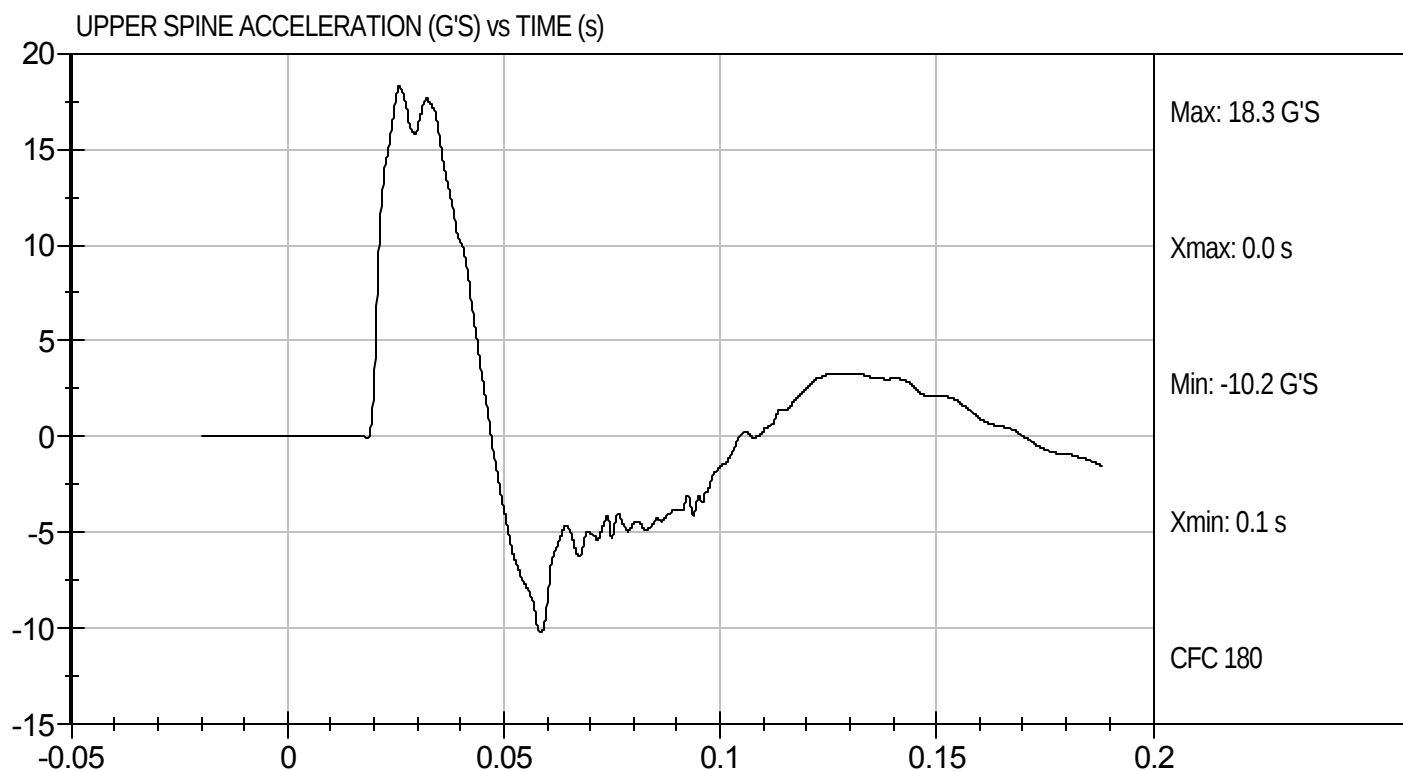
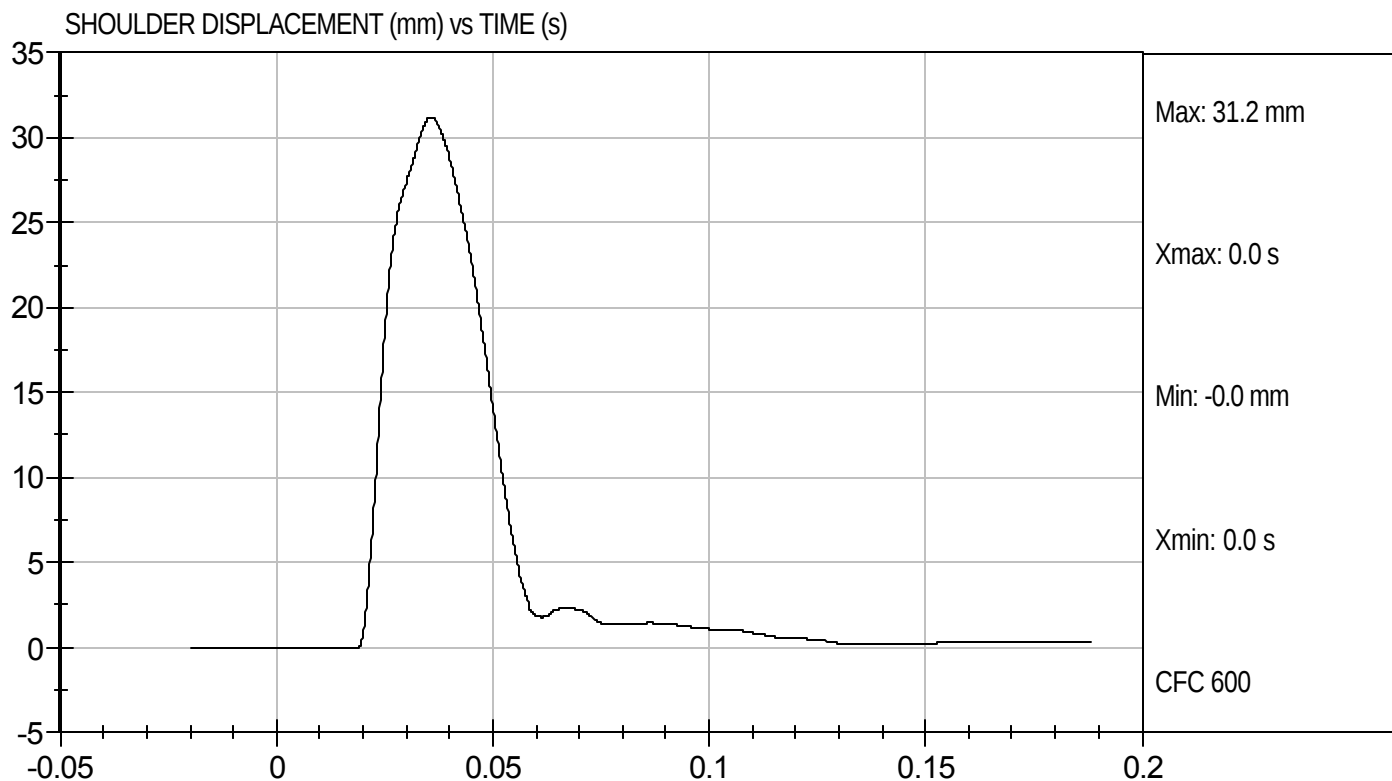
Test Date: 10/10/11
Velocity: 14.36 ft/s, 4.38 m/s





Test Desc: Shoulder Impact
Component ID: D113413

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



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

ATD Serial No: 296

Test I.D: D113414

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Peak Impactor Acceleration	G's	30 to 36	32	Pass
Shoulder Displacement	mm	31 to 40	35	Pass
Upper Rib Displacement	mm	25 to 32	28	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	32	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

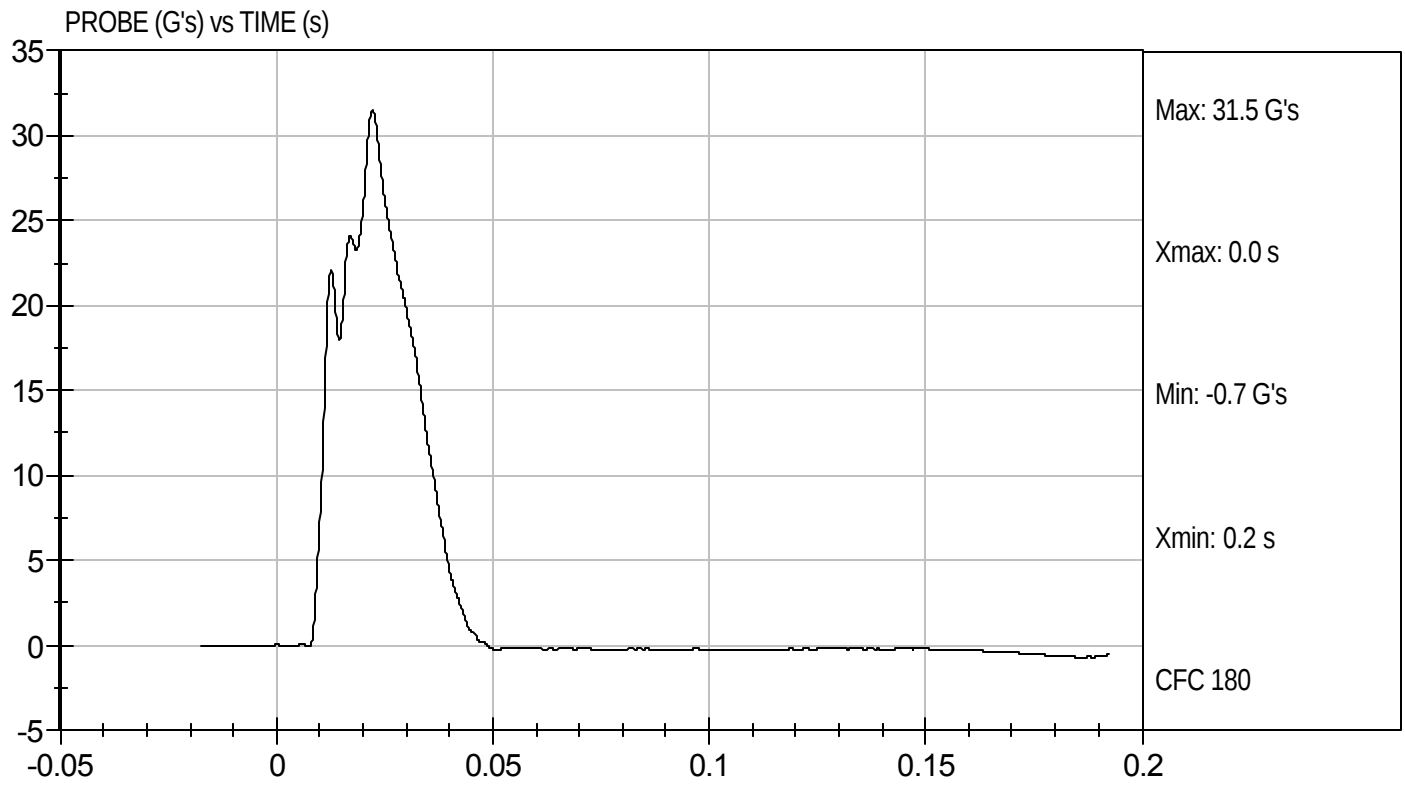
10/10/11
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax With Arm
Component ID: D113414

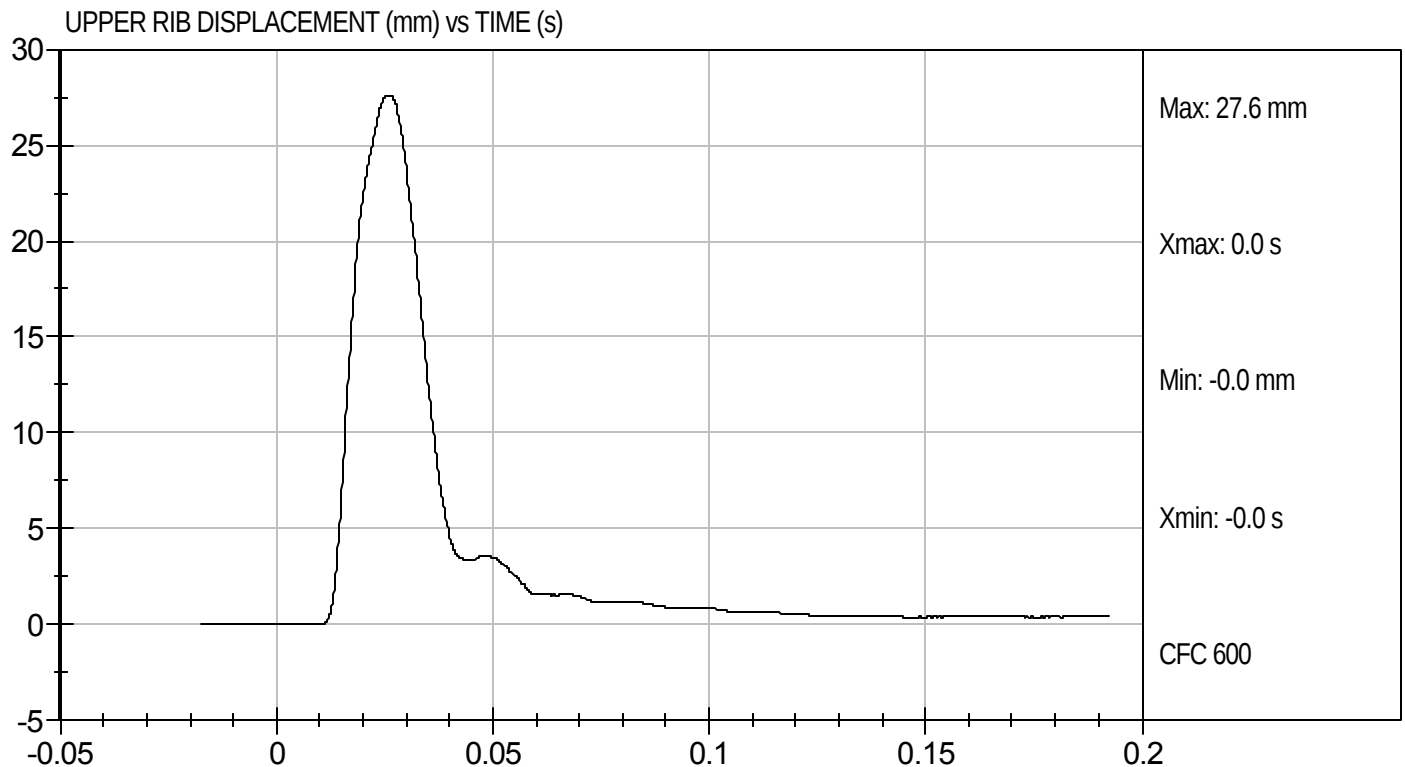
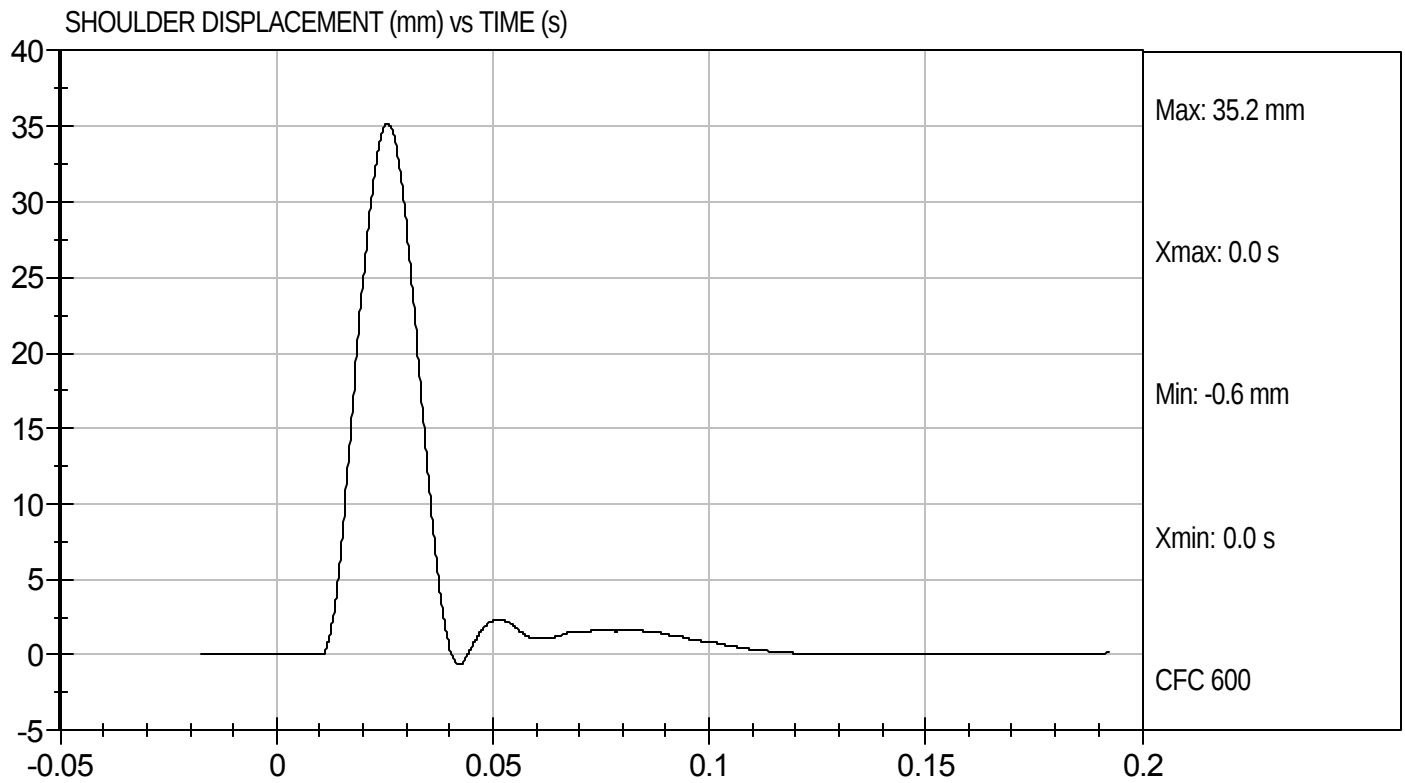
Test Date: 10/10/11
Velocity: 22.2 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D113414

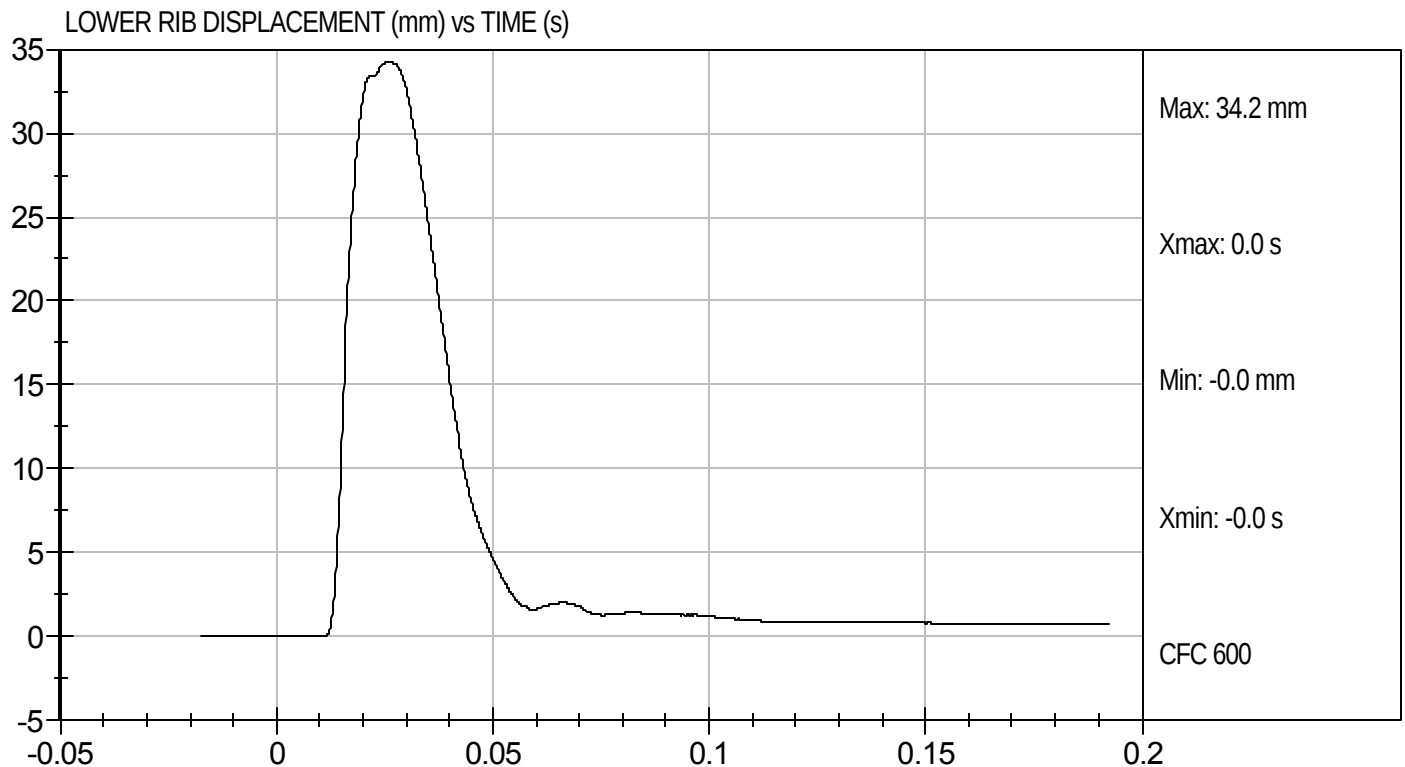
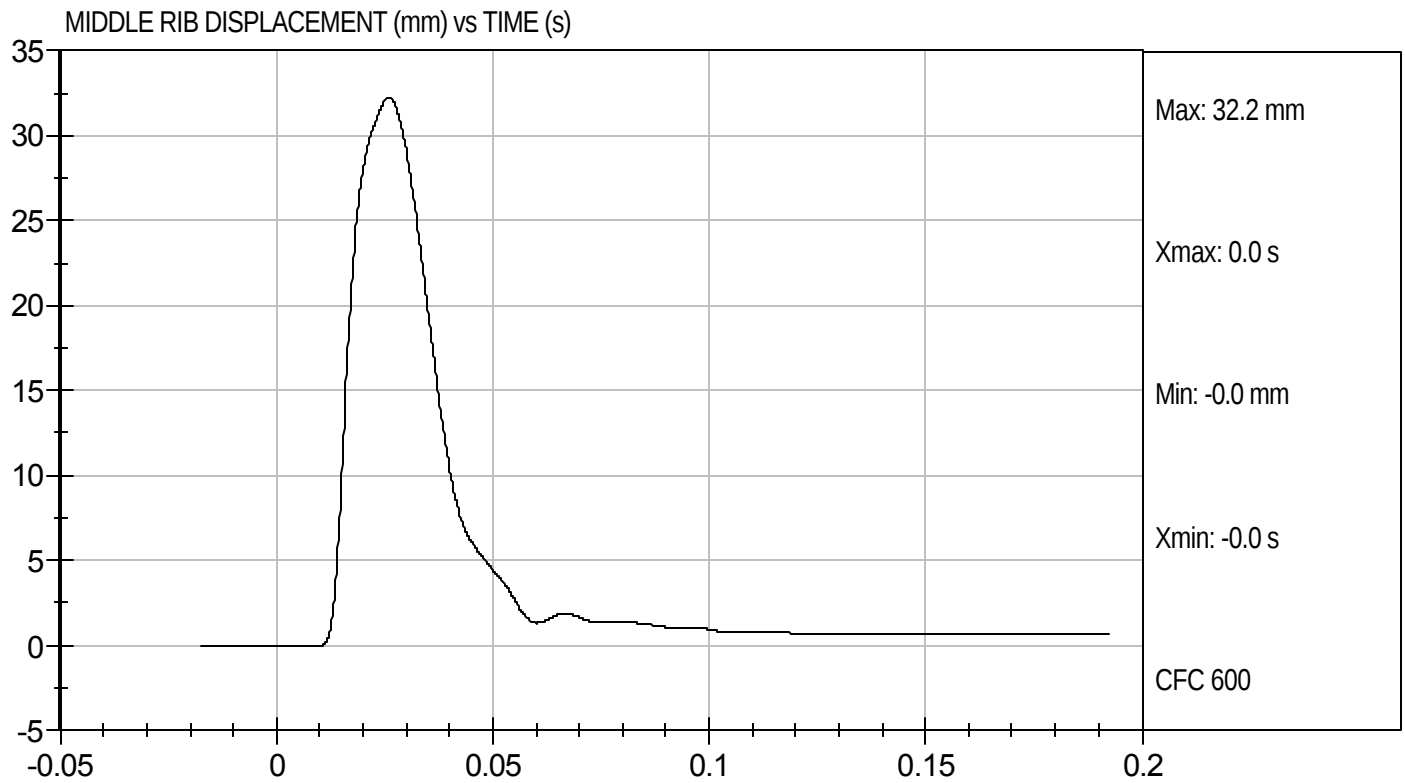
Test Date: 10/10/11
Velocity: 22.2 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D113414

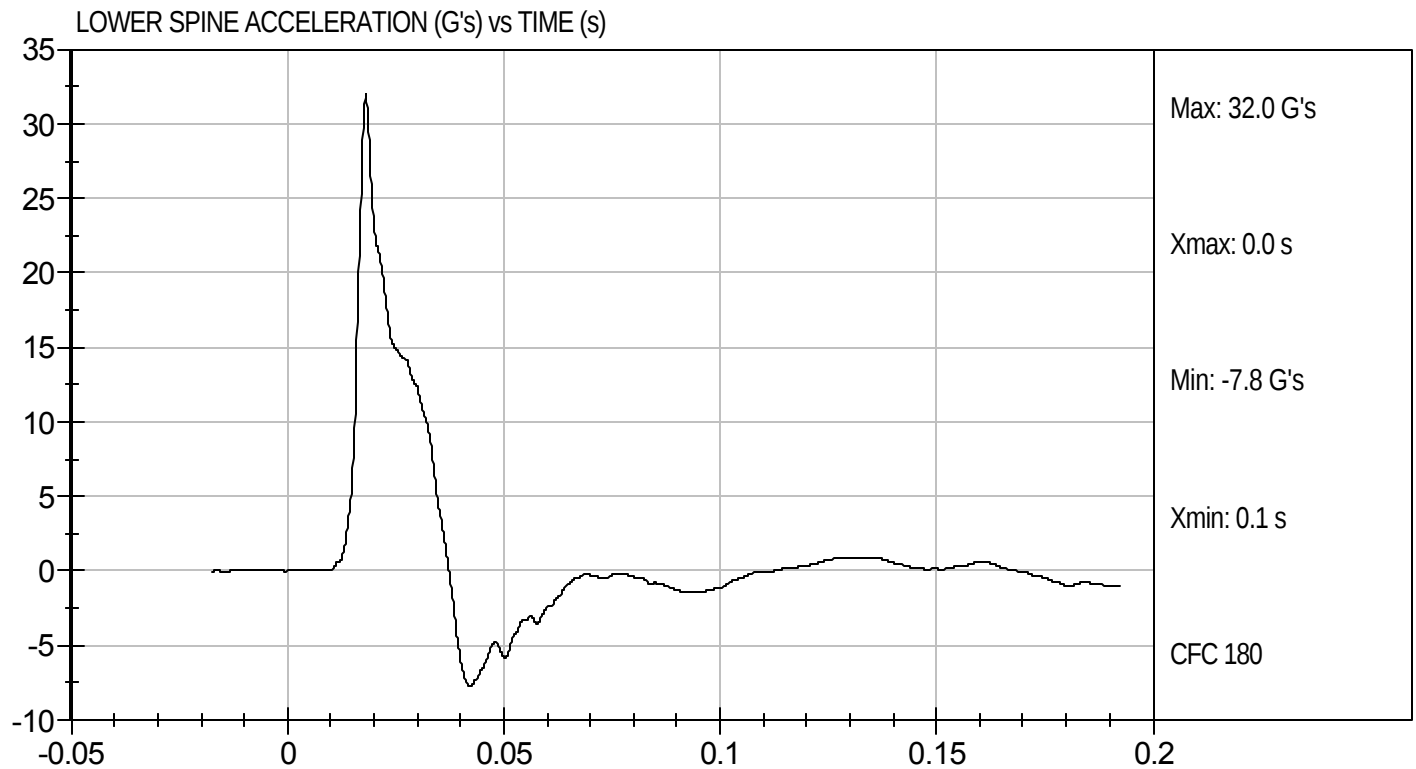
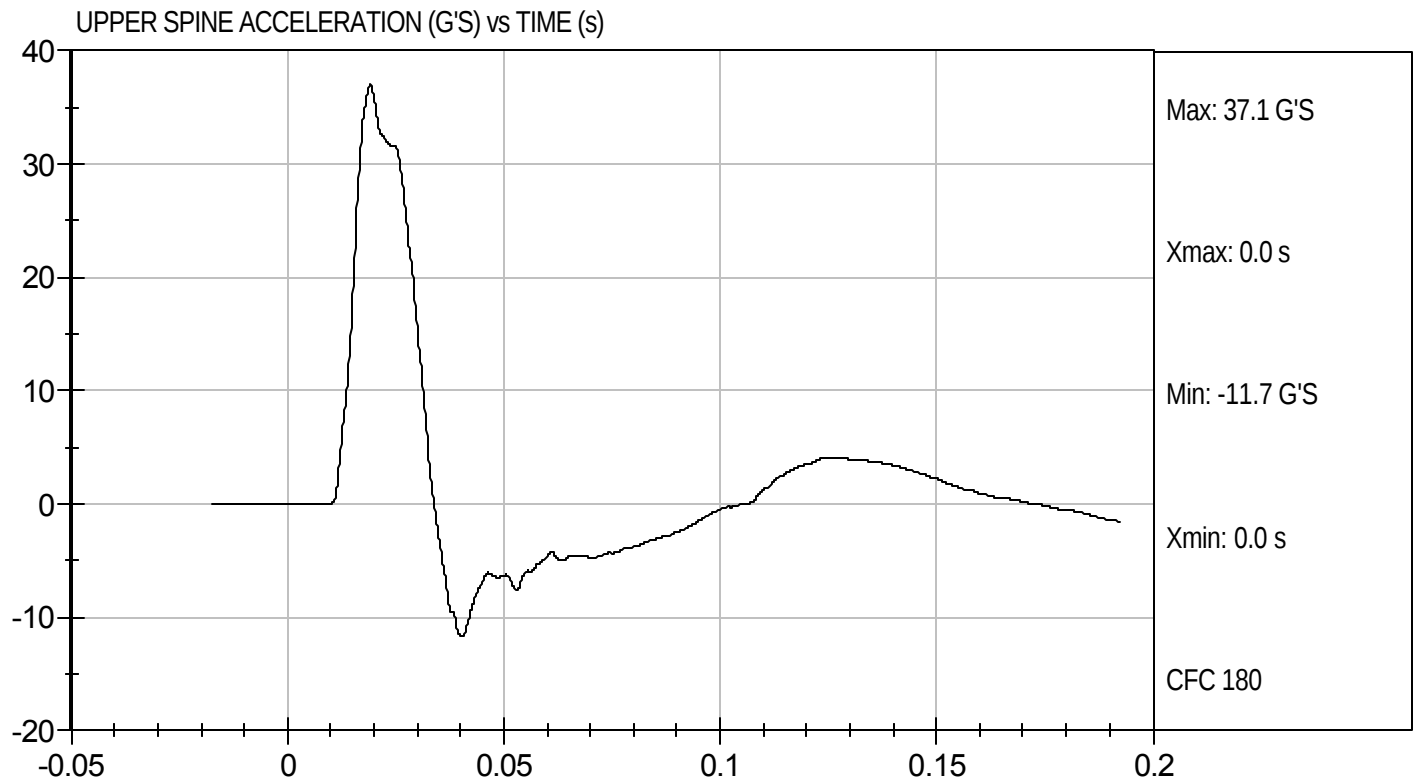
Test Date: 10/10/11
Velocity: 22.2 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D113414

Test Date: 10/10/11
Velocity: 22.2 ft/s, 6.77 m/s



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

ATD Serial No: 296

Test I.D: D113415

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Force	G's	14 to 18	14	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	39	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	13	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	8	Pass
Overall Test Results			Pass	


Laboratory Technician

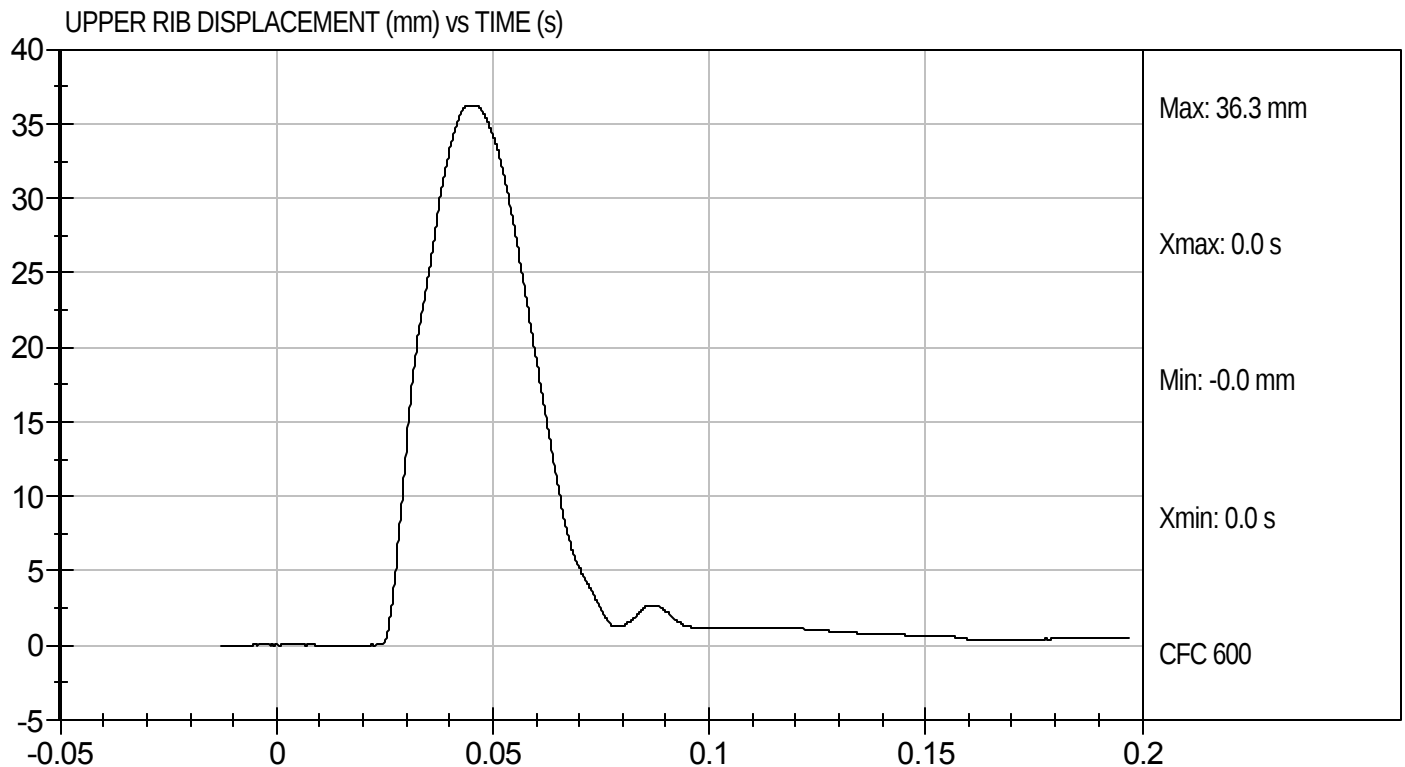
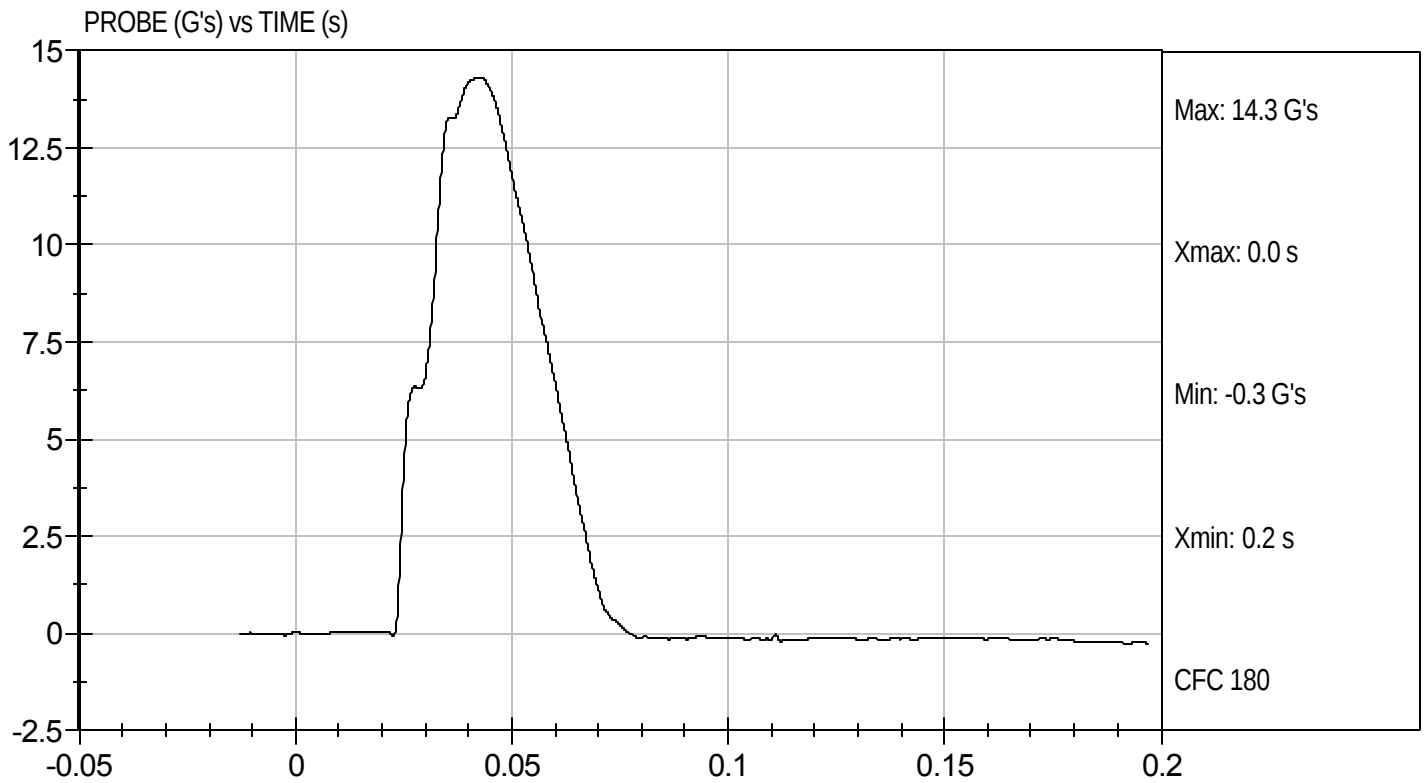
10/10/11
Test Date


Approved By



Test Desc: Thorax Without Arm
Component ID: D113415

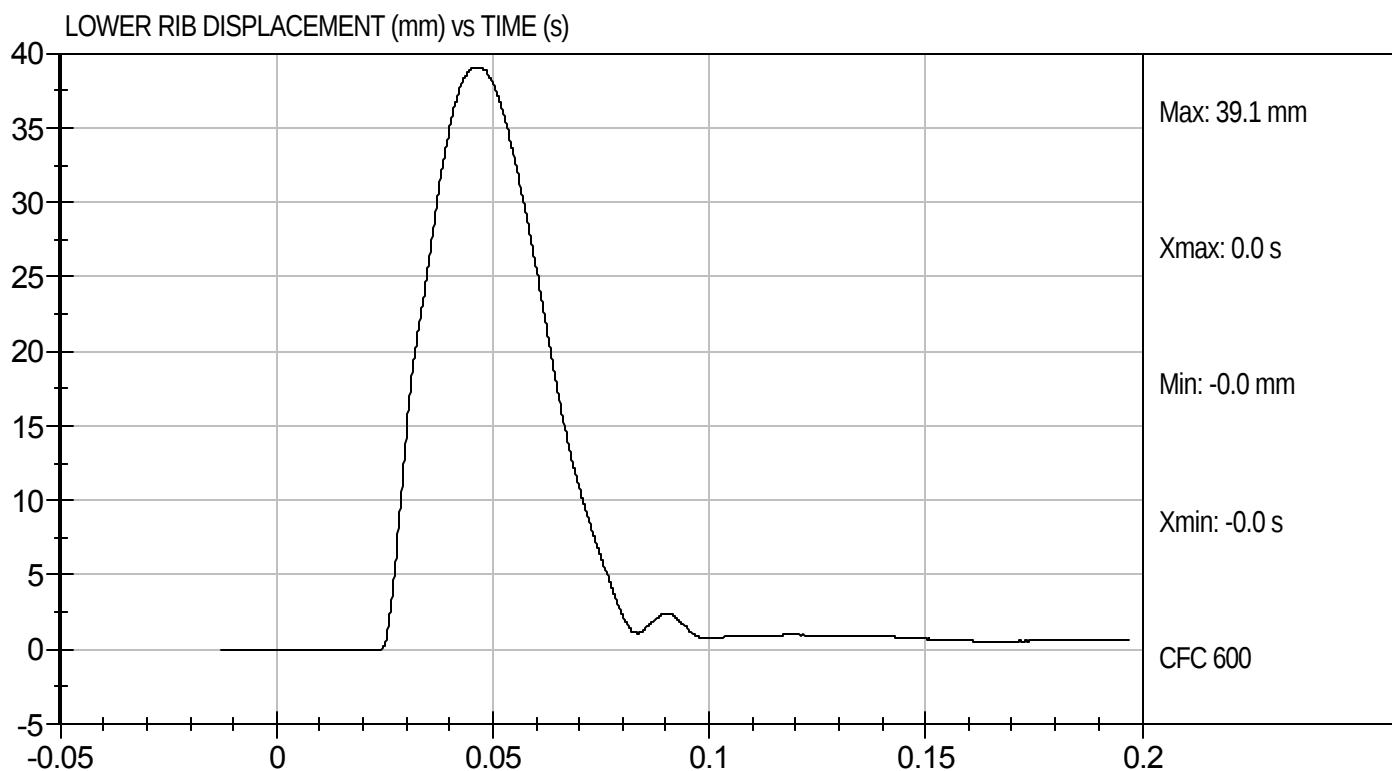
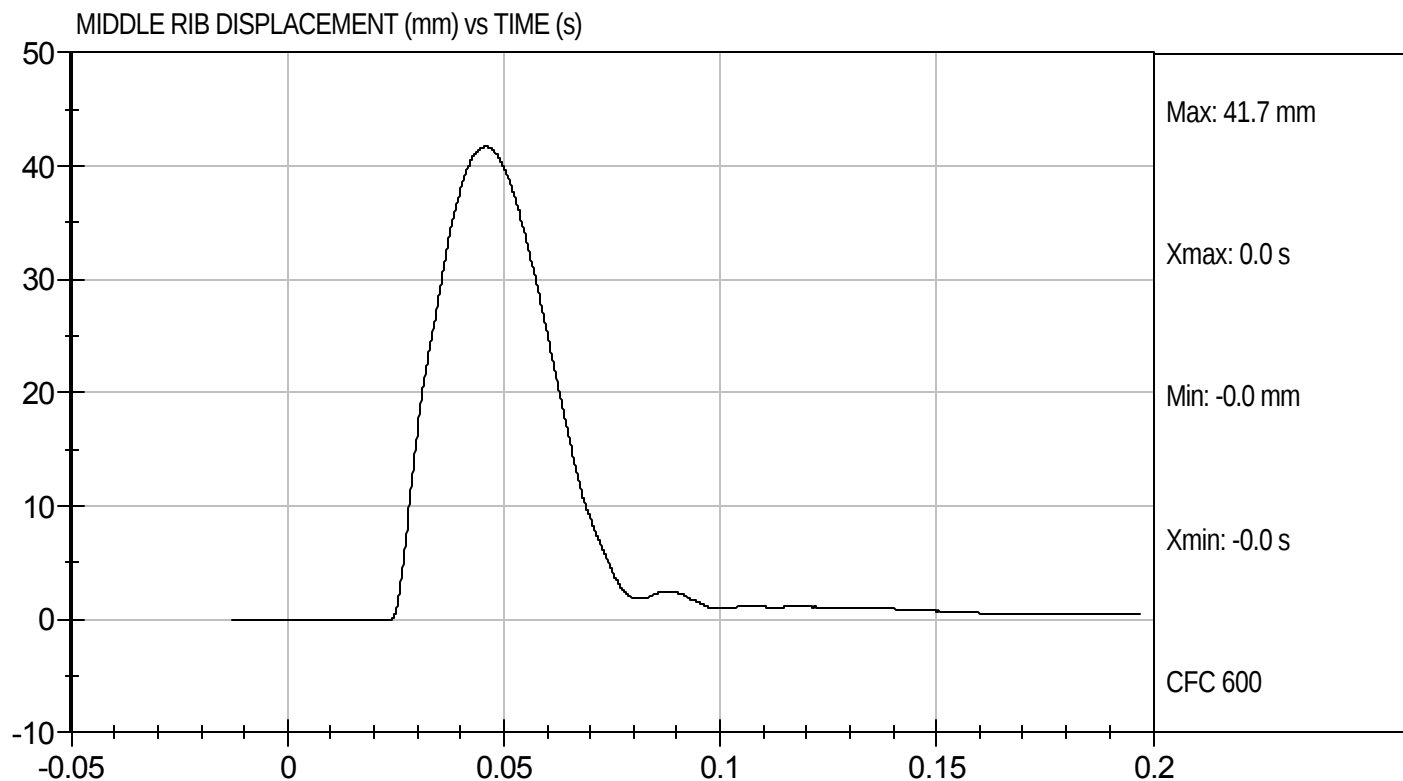
Test Date: 10/10/11
Velocity: 14.24 ft/s, 4.34 m/s





Test Desc: Thorax Without Arm
Component ID: D113415

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

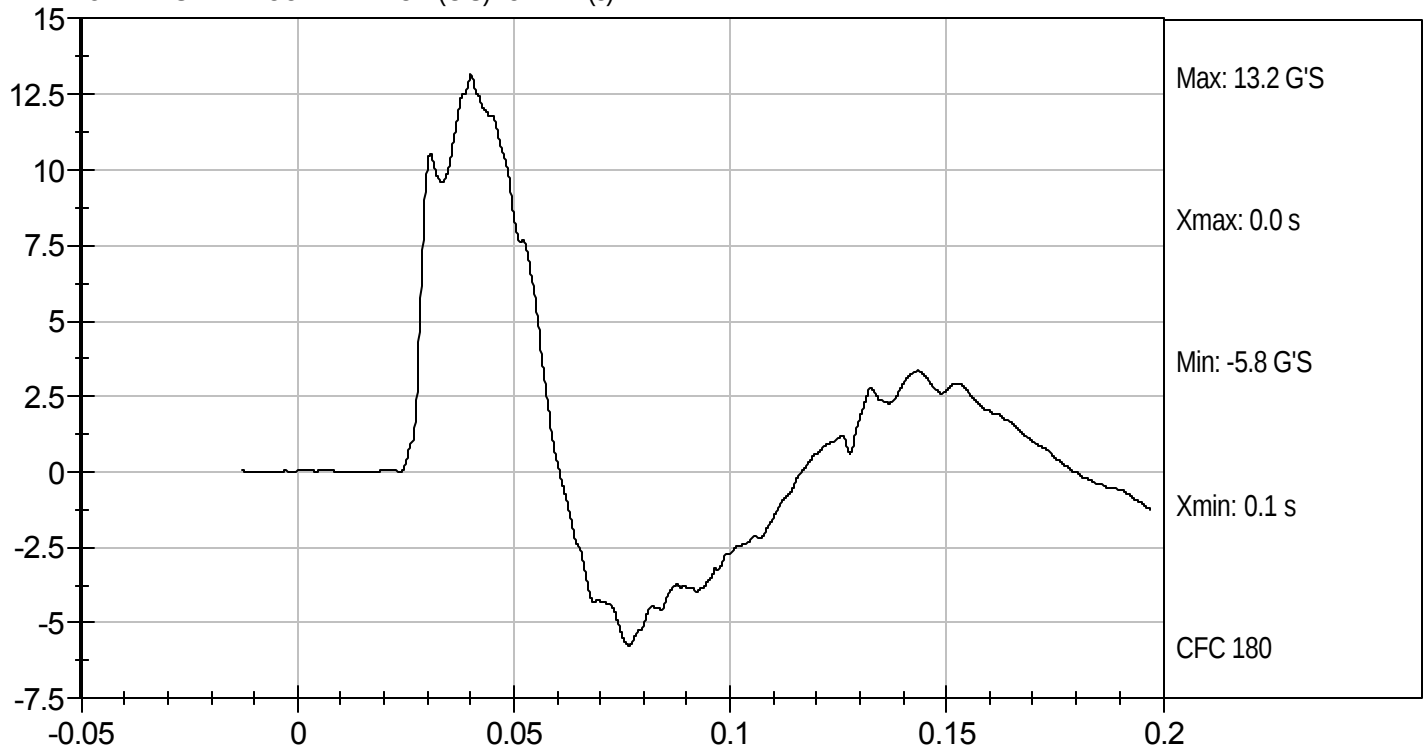




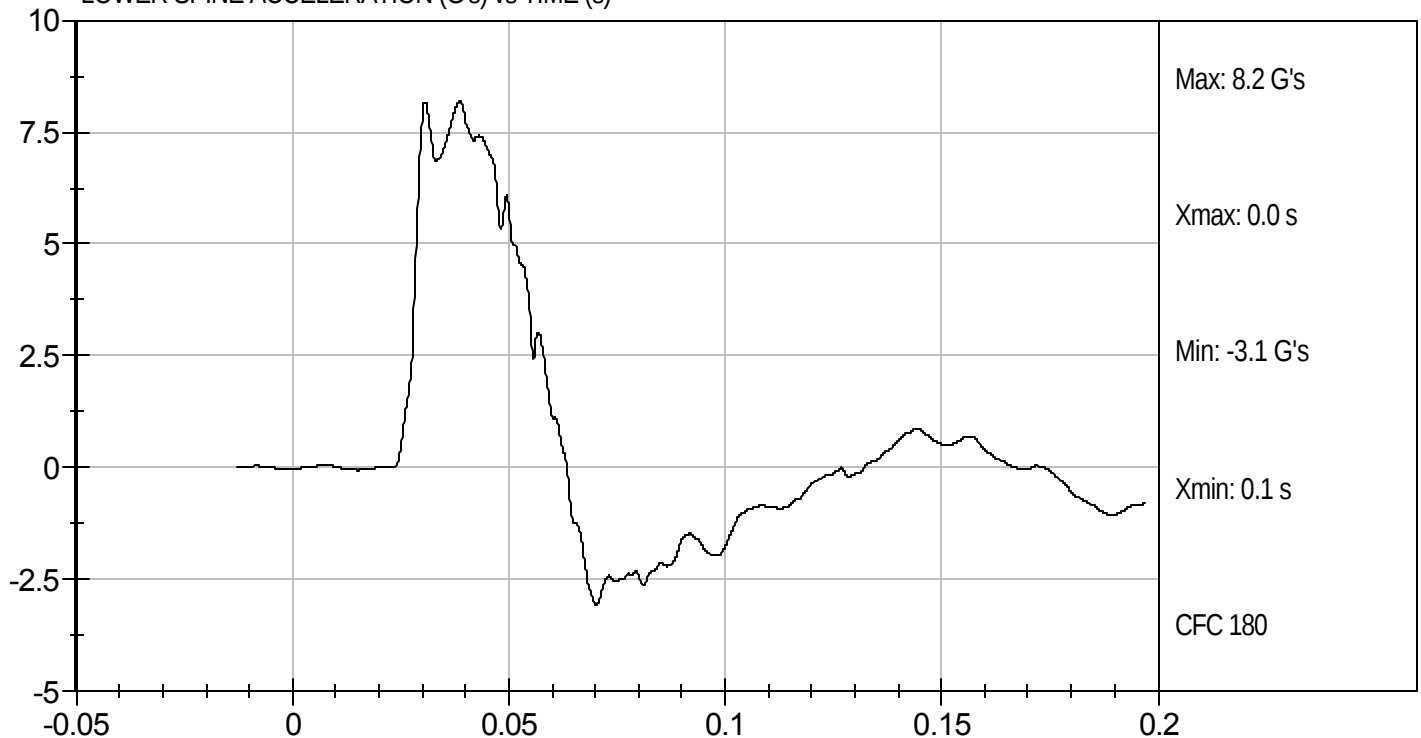
Test Desc: Thorax Without Arm
Component ID: D113415

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

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



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



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

ATD Serial No: 296

Test I.D: D113416

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Acceleration	G's	12 to 16	13	Pass
Upper Rib Displacement	mm	36 to 47	42	Pass
Lower Rib Displacement	mm	33 to 44	38	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

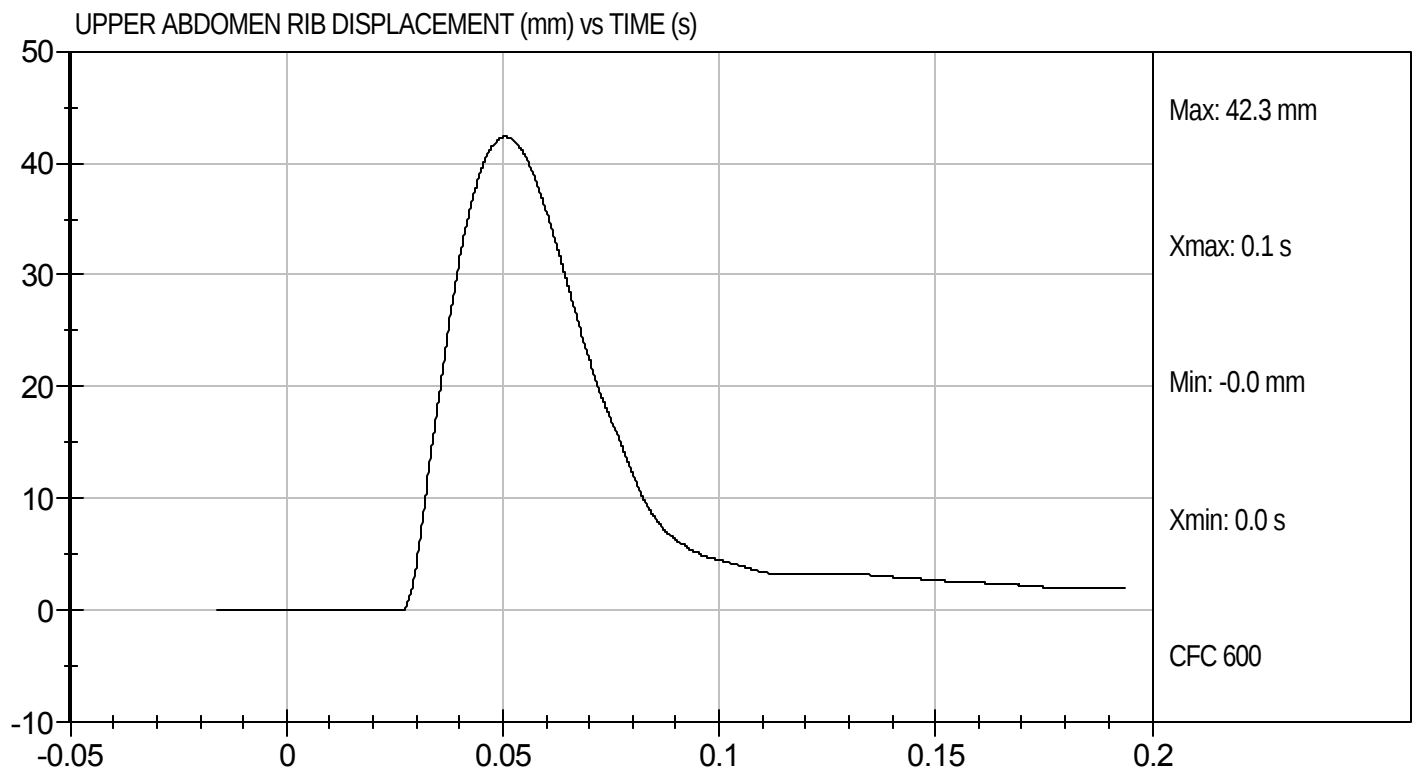
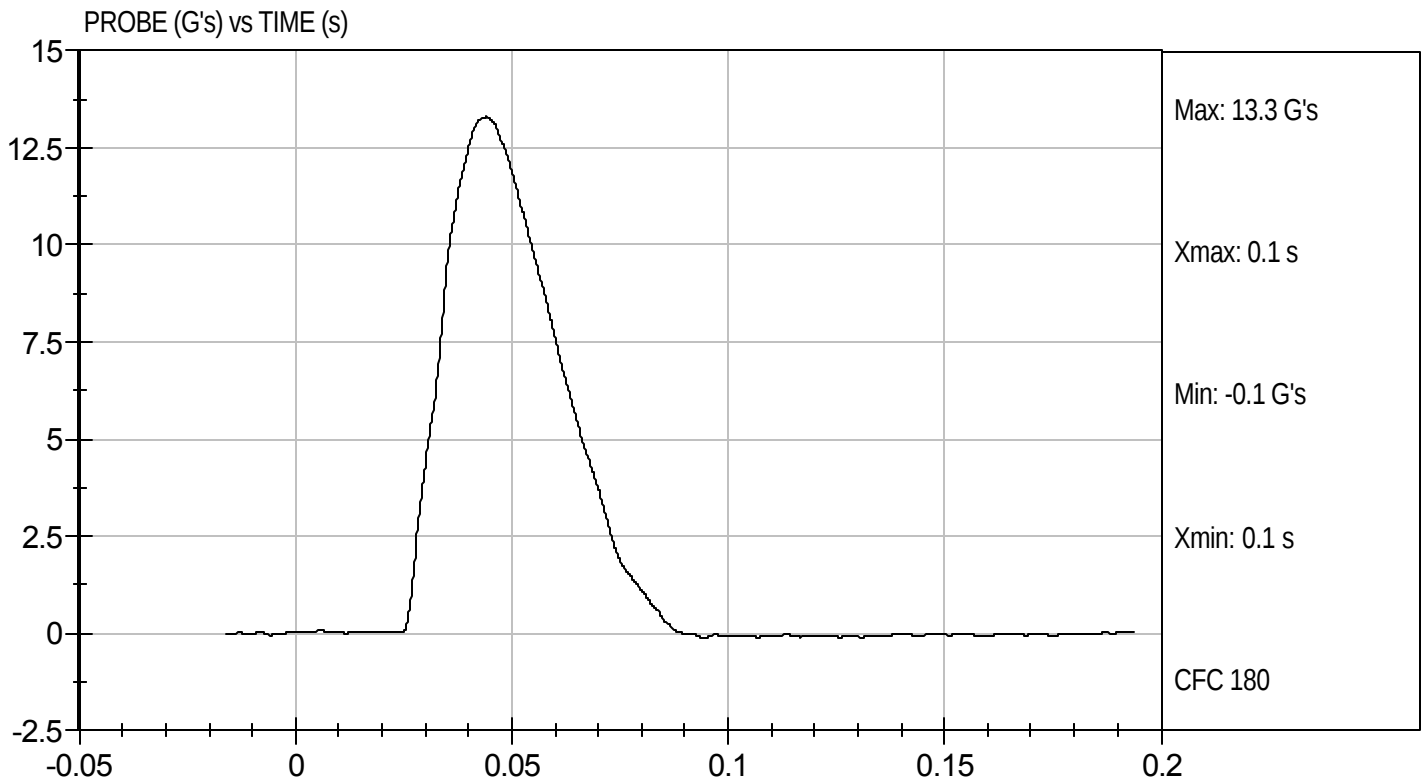
10/10/11
Test Date

David Winkelbauer
Approved By



Test Desc: Abdomen Impact
Component ID: D113416

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

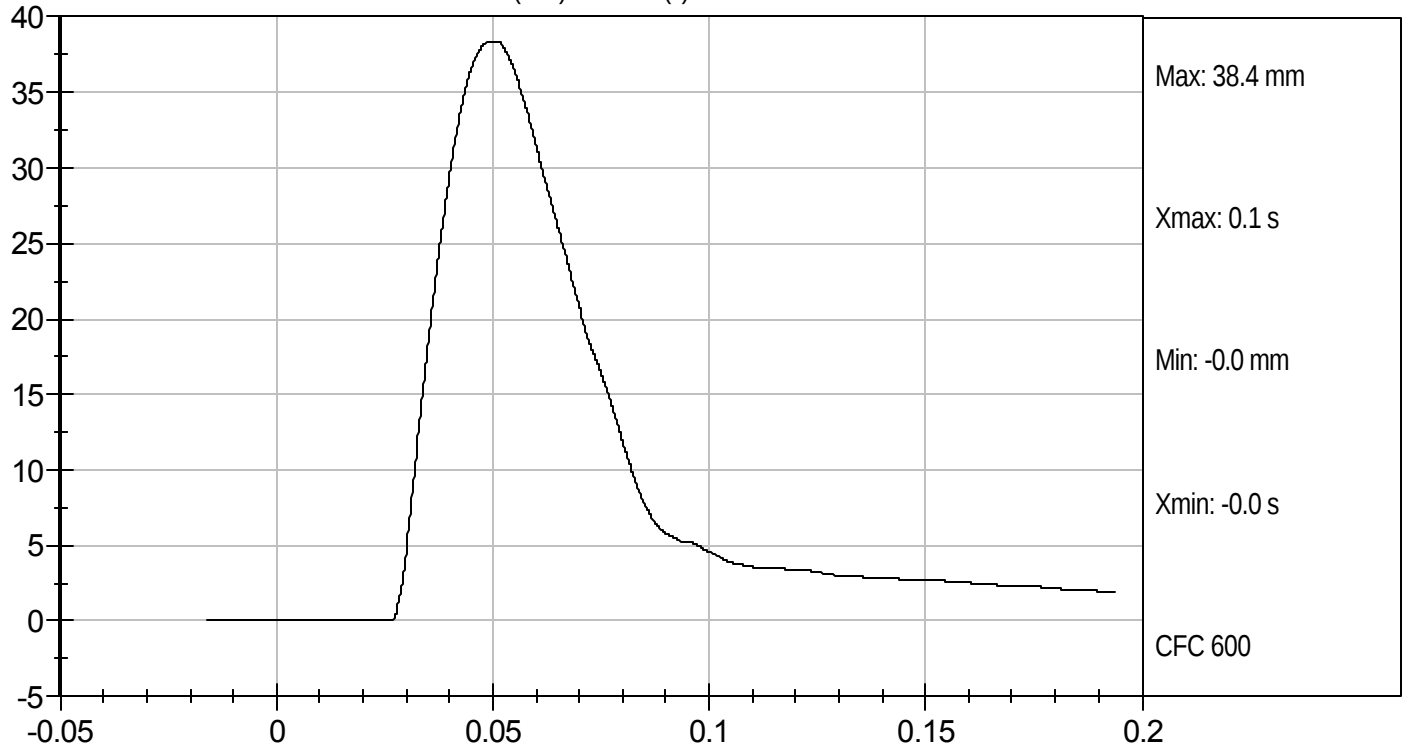




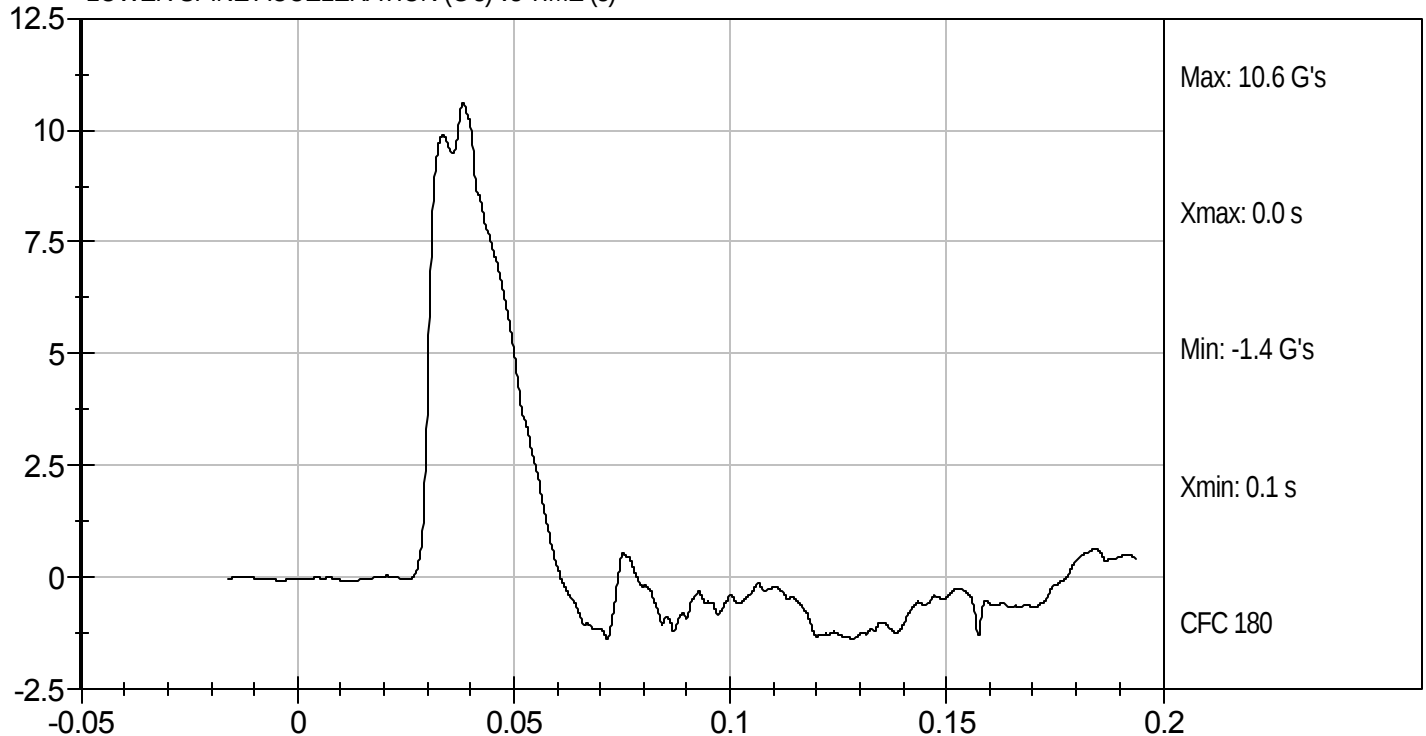
Test Desc: Abdomen Impact
Component ID: D113416

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

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



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



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

ATD Serial No: 296

Test I.D: D113417

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	6.60 to 6.80	6.77	Pass
Peak Impactor Acceleration	G's	38 to 47	43	Pass
Pelvis Y Acceleration after 6 ms	G's	34 to 42	40	Pass
Peak Acetabulum Force	N	3600 to 4300	3870	Pass
Overall Test Results				Pass


Laboratory Technician

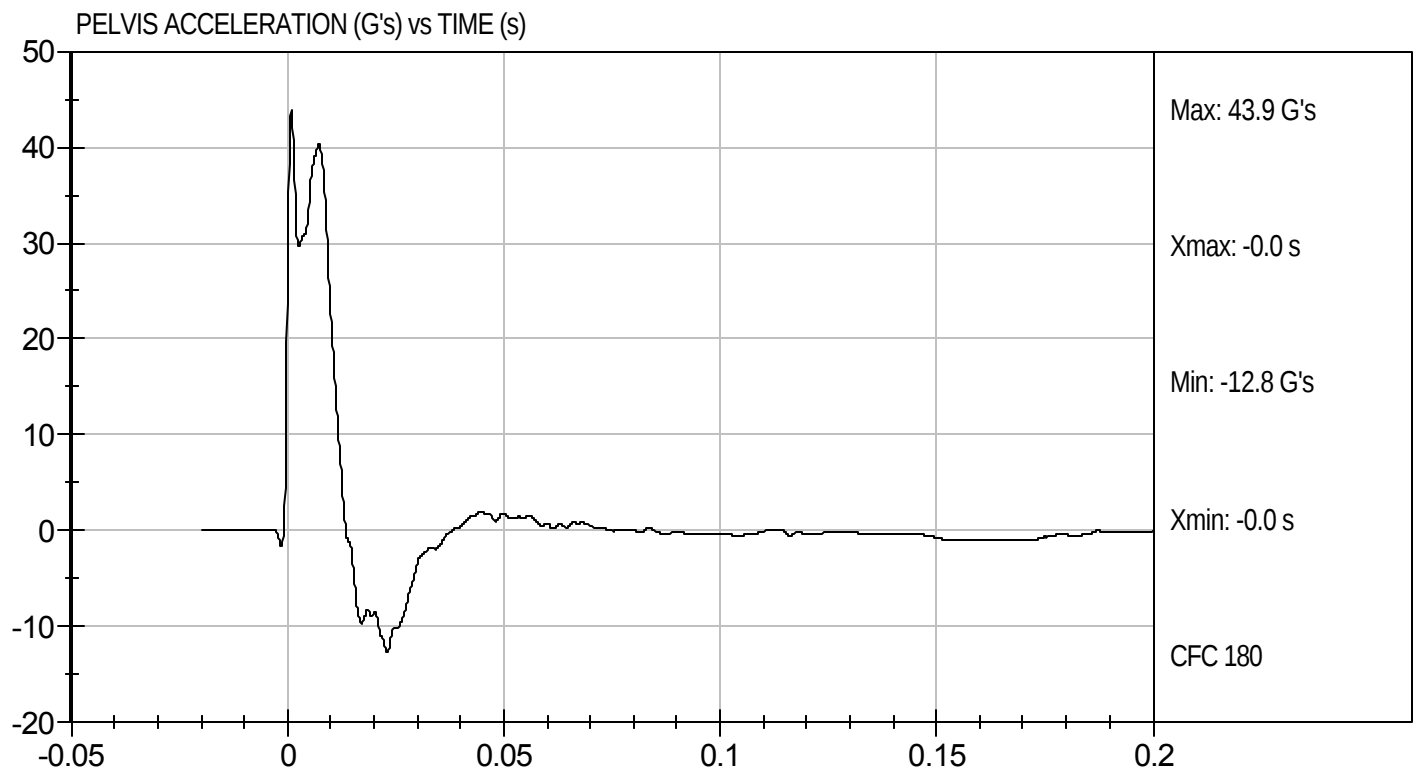
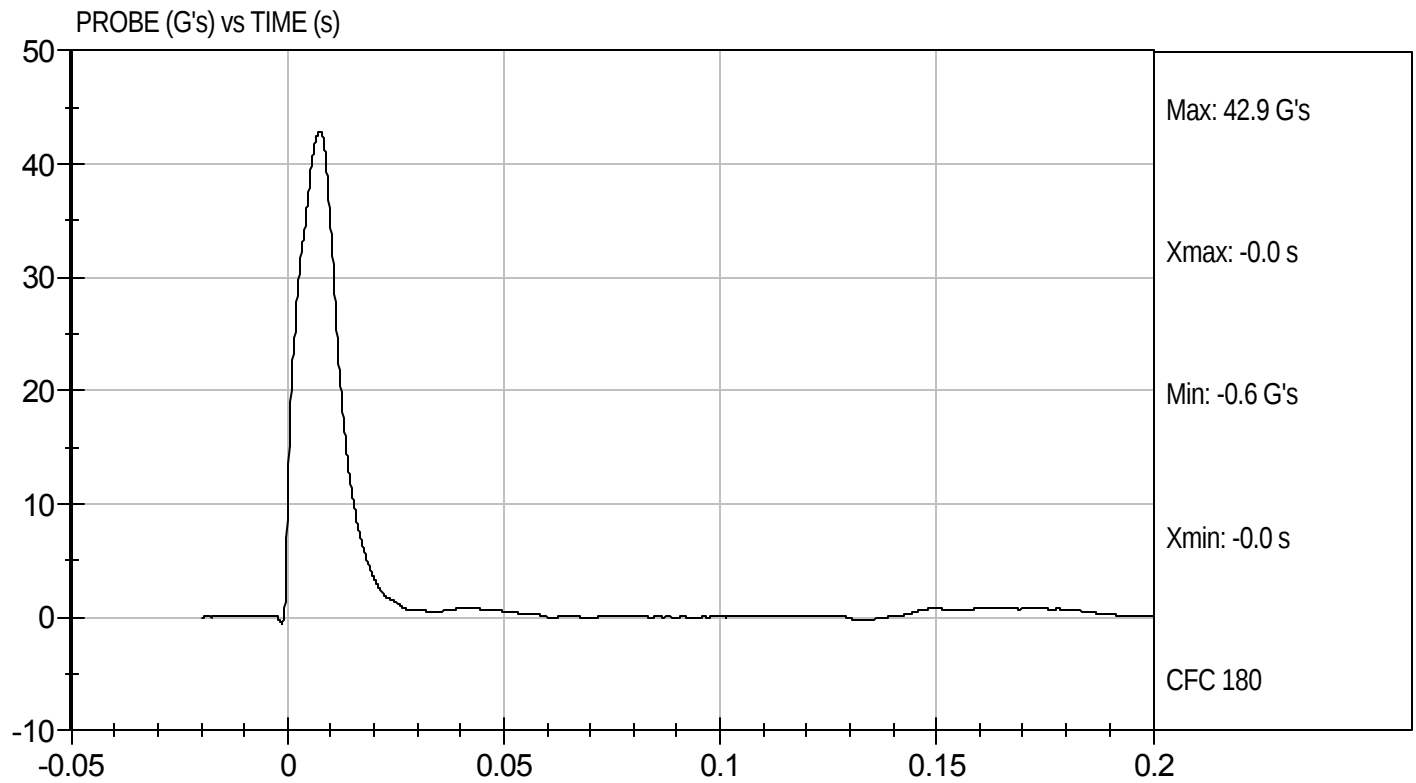
10/10/11
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D113417

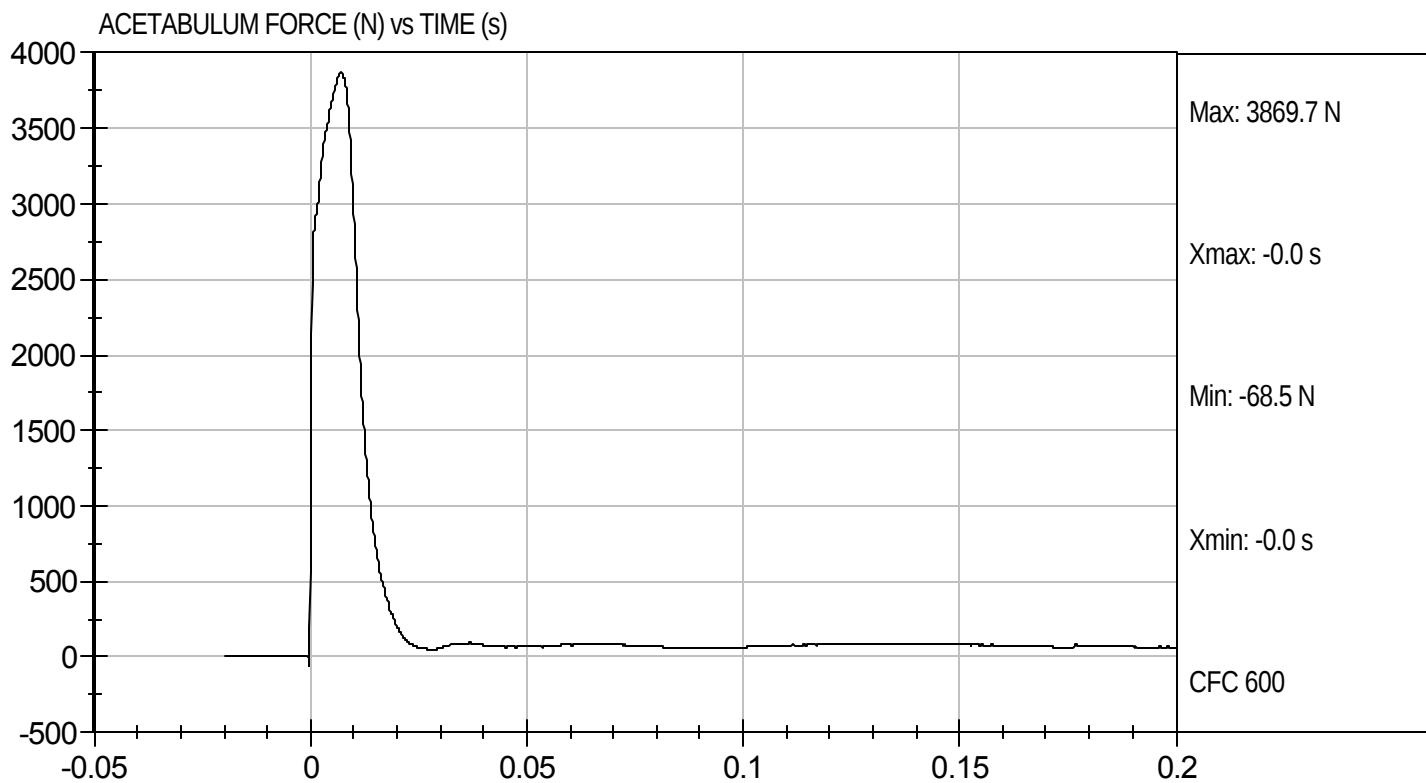
Test Date: 10/10/11
Velocity: 22.2 ft/s, 6.77 m/s





Test Desc: Pelvis Impact
Component ID: D113417

Test Date: 10/10/11
Velocity: 22.2 ft/s, 6.77 m/s



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

ATD Serial No: 296

Test I.D: D113418

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.5	Pass
Humidity	%	10 to 70	43	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Peak Impactor Acceleration	G's	36 to 45	36	Pass
Pelvis Y Acceleration	G's	28 to 39	29	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4431	Pass
Overall Test Results				Pass


Laboratory Technician

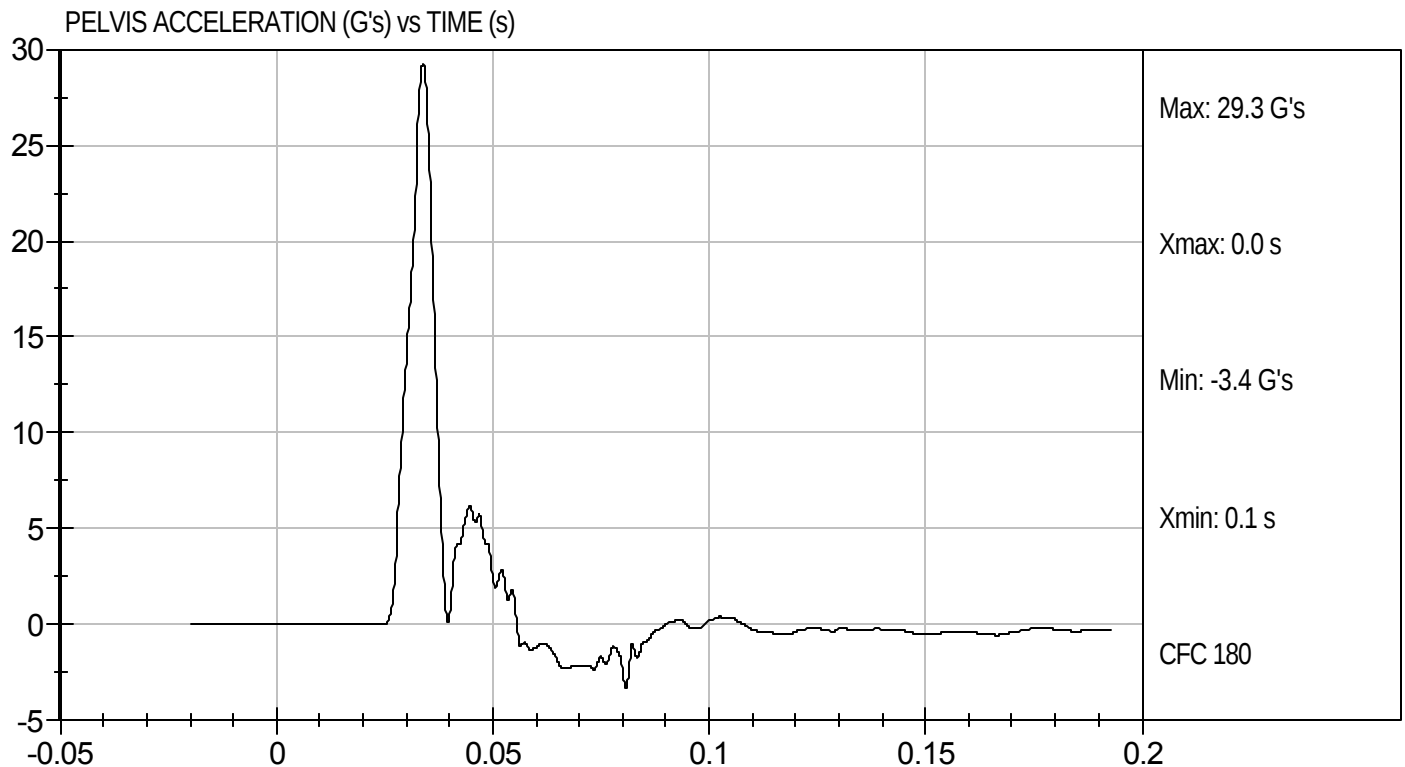
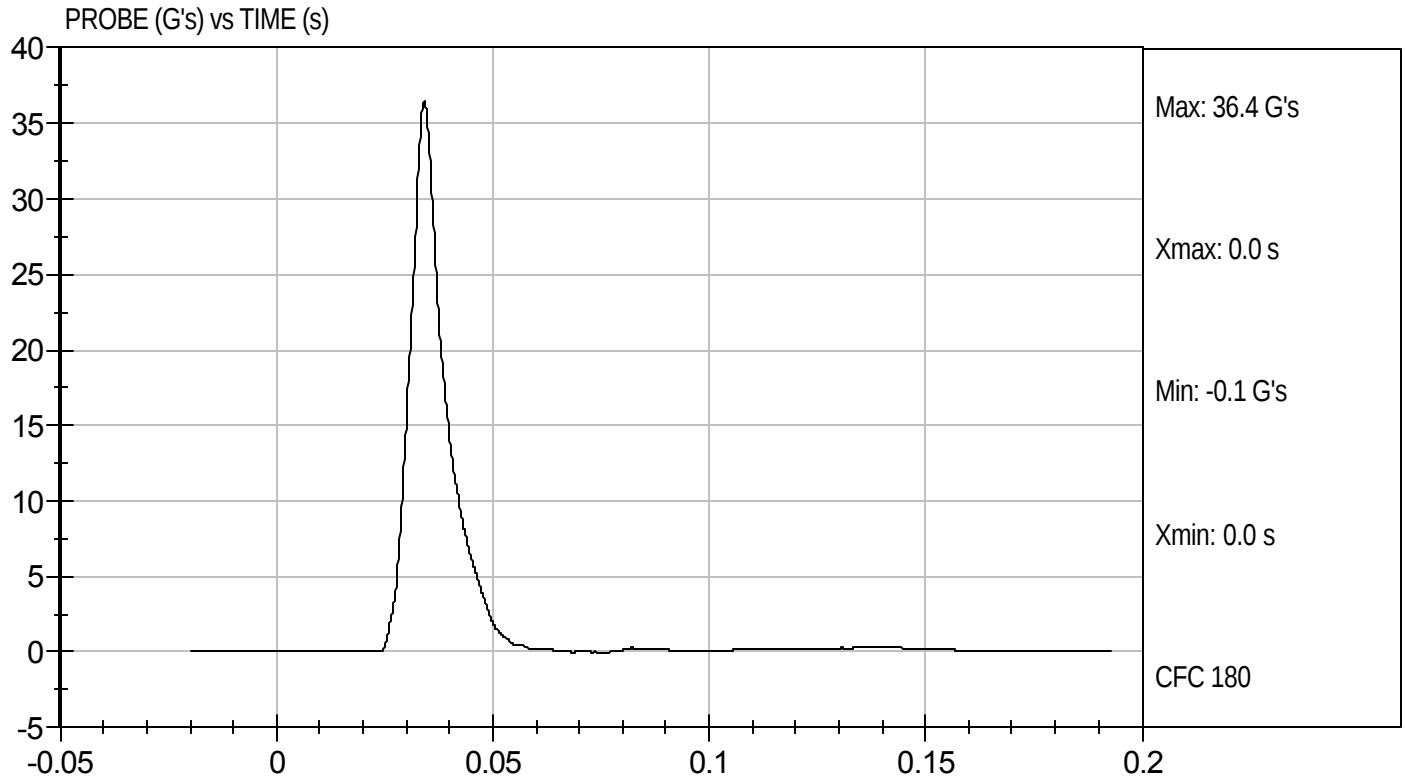
10/10/11
Test Date


Approved By



Test Desc: Iliac Impact
Component ID: D113418

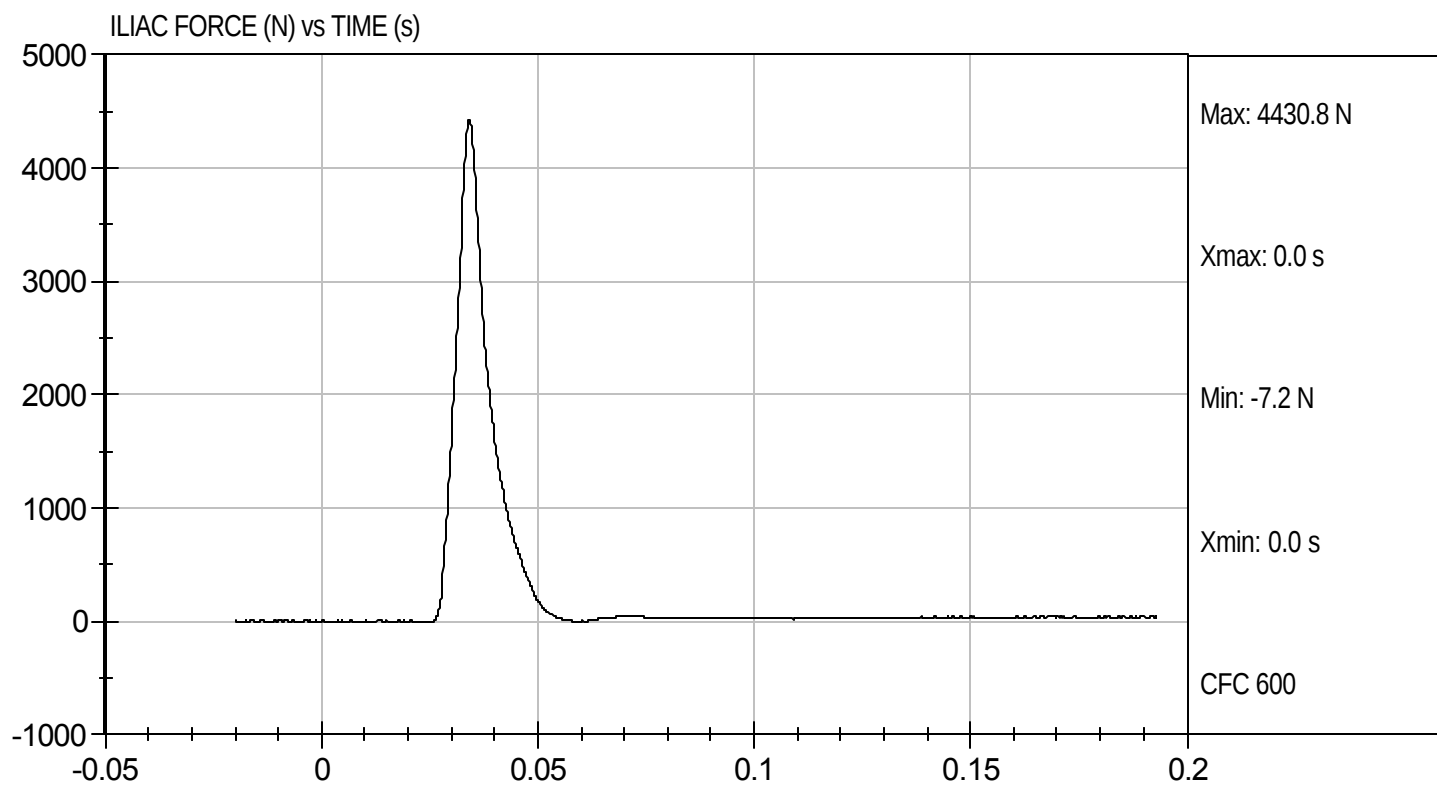
Test Date: 10/10/11
Velocity: 14.12 ft/s, 4.30 m/s





Test Desc: Iliac Impact
Component ID: D113418

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



APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 – Dummy Instrumentation

			SID-IIs S/N 296			
			Serial Number	Manufacturer	Calibration Date	
Head Accelerometers			X	P66632	Endevco	04/25/11
			Y	P66633	Endevco	04/25/11
			Z	P66634	Endevco	04/25/11
Head Accelerometers			Xr	P66678	Endevco	04/25/11
			Yr	P66679	Endevco	04/25/11
			Zr	P66680	Endevco	04/25/11
Displacement Potentiometers	Thoracic Rib	Upper	Y	G1214	FTSS	06/14/11
		Middle	Y	G1163	FTSS	06/14/11
		Lower	Y	G1158	FTSS	06/14/11
	Abdominal Rib	Upper	Y	G1146	FTSS	06/14/11
		Lower	Y	G1126	FTSS	06/14/11
Lower Spine Accelerometers (T12)			X	P66675	Endevco	04/25/11
			Y	P66676	Endevco	04/25/11
			Z	P66677	Endevco	04/25/11
Acetabulum Load Cell			Y	ACG269	Denton	01/06/11
Iliac Wing Load Cell			Y	IWG282	Denton	01/06/11
Pelvis Plug (struck side)				37153	FTSS	10/08/10
Pelvis Plug (non-struck side)				37173	FTSS	10/09/10

Table 2 – Vehicle Instrumentation

		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	P59658	Endevco	06/15/11
Vehicle Center of Gravity	Y	P59657	Endevco	06/15/11
Vehicle Center of Gravity	Z	P59659	Endevco	06/15/11
Left Floor Sill	Y	P59639	Endevco	05/20/11
A-Pillar Sill	Y	P59383	Endevco	09/12/11
A-Pillar Low	Y	P47894	Endevco	09/1/2/11
A-Pillar Mid	Y	P47837	Endevco	08/22/11
B-Pillar Sill	Y	P55687	Endevco	04/27/11
B-Pillar Low	Y	P55674	Endevco	07/07/11
B-Pillar Mid	V	P47087	Endevco	07/07/11
Driver Seat	Y	P47108	Endevco	07/08/11
Engine Top	X	P59310	Endevco	06/15/11
Engine Top	Y	P59383	Endevco	07/07/11
Firewall	Y	P59283	Endevco	07/07/11
Right Roof	Y	P55693	Endevco	06/10/11
Right Floor Sill	Y	P59311	Endevco	06/15/11
Rear Floorpan	X	P55688	Endevco	06/15/11
Rear Floorpan	Y	P55689	Endevco	06/15/11

Table 3 – Pole Instrumentation

	Serial Number	Manufacturer	Calibration Date
Load Cell 1	DG6277	FTSS	09/15/11
Load Cell 2	DG6278	FTSS	09/15/11
Load Cell 3	DG6279	FTSS	09/15/11
Load Cell 4	DG6280	FTSS	09/15/11
Load Cell 5	DG6281	FTSS	09/15/11
Load Cell 6	DG6283	FTSS	09/15/11
Load Cell 7	DG6284	FTSS	09/15/11
Load Cell 8	DG6582	FTSS	09/15/11