

REPORT NUMBER: SPNCAP-MGA-2011-029

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

**NISSAN MOTOR CO., LTD.
2011 Nissan Rogue S 5-Dr SUV
NHTSA No.: MB5209**

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



Test Date: October 13, 2010

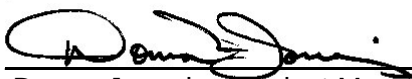
Final Report Date: March 7, 2011

FINAL REPORT

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

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

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Approval Date: March 7, 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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4. Title and Subtitle Final Report of New Car Assessment Program Side Impact Pole Testing of 2011 Nissan Rogue S 5-Dr SUV NHTSA No.: MB5209		5. Report Date March 7, 2011																				
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		14. Sponsoring Agency Code NVS-111																				
15. Supplementary Notes																						
16. Abstract A 32.2 km/h (20 mph), 75° oblique impact NCAP Side Pole Test was conducted on the subject 2011 Nissan Rogue S 5-Dr SUV in accordance with the specifications of the Office of Crashworthiness Standards NCAP Side 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 13, 2010. The impact velocity was 32.5 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21°C. The test vehicle post-test maximum crush was 444 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>188</td> </tr> <tr> <td style="text-align: left;">Resultant Lower Spine Acceleration</td> <td>Gs</td> <td>82</td> <td>38</td> </tr> <tr> <td style="text-align: left;">Combined Acetabular and Iliac Pelvic Force</td> <td>N</td> <td>5525</td> <td>2906</td> </tr> </tbody> </table> 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	188	Resultant Lower Spine Acceleration	Gs	82	38	Combined Acetabular and Iliac Pelvic Force	N	5525	2906
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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 Adm. Technical Reference Division 1200 New Jersey Ave, SE Washington, D.C. 20590																				
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SECTION 1
TEST PURPOSE AND PROCEDURE

This side impact test is part of the MY 2011 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-09-D-00124. The purpose of this test is to generate comparative side impact performance in a 2011 Nissan Rogue S 5-Dr SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated January 2010.

SECTION 2

SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2011 Nissan Rogue S 5-Dr SUV. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.5 km/h. The test was conducted by MGA Research Corporation in Burlington, Wisconsin, on October 13, 2010. 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 NCAP Side Pole Laboratory Test Procedure dated January 2010. 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
 Thorax Upper, Middle, and Lower Rib Displacement Potentiometers
 Abdomen Upper and Lower Rib Displacement Potentiometers
 Lower Spine Triaxial Accelerometers
 Iliac Load Cell
 Acetabulum Load Cell

Appendix B contains the vehicle and dummy response data. Dummy configuration and performance verification data can be found in Appendix C of this report.

The following table summarizes the results of the test:

DUMMY INJURY VALUES

Dummy	HIC (36ms)	Resultant Lower Spine Acceleration	Pelvic Force (N)	
SID-IIs 5 th Percentile Female	188	38	Iliac Wing	672
			Acetabular	2286
			Sum	2906

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

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

GENERAL COMMENTS

The following cameras did not run.

Camera No. 5 – Dummy Front View

Camera No. 7 – Dummy Rear Oblique View

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: 2011 Nissan Rogue S 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5209
 Test Date: 10/13/2010

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MB5209	Anti-Lock Brakes	Yes
Model Year	2011	All Wheel Drive	No
Make	Nissan	Power Steering	Yes
Model	Rogue	Driver Front Airbag	Yes
Body Style	SUV	Driver Curtain Airbag	Yes
VIN	JN8AS5MT4BW560804	Driver Head/Torso Airbag	No
Body Color	Brilliant Silver	Driver Torso Airbag	No
Delivery Date	9/21/2010	Driver Torso/Pelvis Airbag	Yes
Odometer (mi)	43	Driver Pelvis Airbag	No
Odometer (km)	69	Driver Knee Airbag	No
Dealer	Rosen Nissan of Gurnee	Rear Pass. Front Airbag	No
Transmission	Automatic	Rear Pass. Curtain Airbag	Yes
Final Drive	Front	Rear Pass. Head/Torso Airbag	No
Type/No. Cylinders	4	Rear Pass. Torso Airbag	No
Engine Displacement (L)	2.5	Rear Pass. Torso/Pelvis Airbag	No
Engine Placement	Lateral	Rear Pass. Pelvis Airbag	No
Roof Rack	No	Rear Pass. Knee Airbag	No
Sunroof/T-Top	No	Pretensioners	Yes
Tinted Glass	No	Load Limiters	Yes
Traction Control	Yes	Automatic Door Locks	Yes
Power Brakes	Yes	Bucket Seats	Yes
Front Disc	Yes	Tilt Steering	Yes
Rear Disc	Yes	Power Seats	No
Does owner's manual provide instruction to turn off automatic door locks?			No

DATA FROM CERTIFICATION LABEL

Manufactured By	Nissan Motor Co., Ltd.	GVWR (kg)	1968
Date of Manufacture	7/10	GAWR Front (kg)	1039
		GAWR Rear (kg)	936

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3		5	
Capacity Weight (VCW) (kg)				408	(A)
DSC x 68.04 kg				340	(B)
Cargo Weight (RCLW) (kg)				68	(A-B)

VEHICLE SEAT TYPE

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

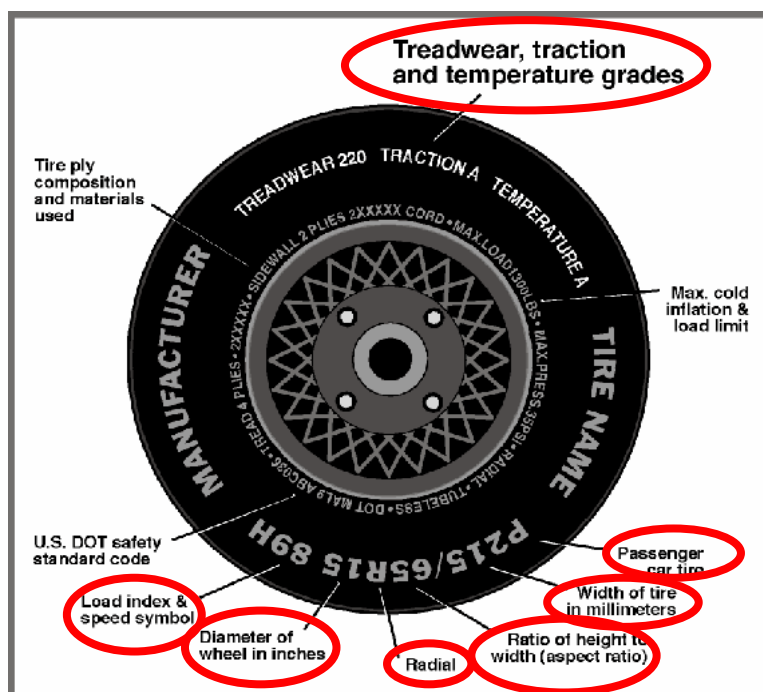
DATA SHEET NO. 1 (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Nissan Rogue S 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5209
 Test Date: 10/13/2010

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	230	230
Recommended Tire Size	P215/70R16	P215/70R16
Tire Size on Vehicle	P215/70R16	P215/70R16
Tire Manufacturer	Continental	Continental
Tire Model	4x4 Contact	4x4 Contact
Treadwear	360	360
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	1	1
Tire Plies Body	3	3
Load Index & Speed Symbol	99H	99H
Tire Material	Rubber	Rubber
DOT Safety Code Right	FDYV 3AJ3010	FDYV 3AJ3010
DOT Safety Code Left	FDYV 3AJ3010	FDYV 3AJ3010

DATA SHEET NO. 1 (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Nissan Rogue S 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5209
 Test Date: 10/13/2010

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	435.4	308.9		460.4	347.0		458.6	363.3	
Right	kg	459.5	286.7		471.7	324.8		464.0	324.8	
Ratio	%	60.0	40.0		58.1	41.9		57.3	42.7	
Totals	kg	894.9	595.6	1490.5	932.1	671.8	1603.9	922.6	688.1	1610.7

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1490.5	(A)
Actual Weight of 1 P572V ATD (SID-IIs) ATD Used	kg	52.2	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	68	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	1610.7	(A+B+C)

TEST VEHICLE ATTITUDES AND CG

	Units	As Delivered	As Tested	Fully Loaded
Driver Door Sill Angle (front-to-rear)*	deg	-0.9	-0.9	-0.6
Front Passenger Sill Angle (front-to-rear)*	deg	-1.2	-1.1	-1.0
Front Bumper Angle (left-to-right)**	deg	0.2	-0.1	-0.6
Rear Bumper Angle (left-to-right)**	deg	-0.1	-0.1	0.2
Vehicle CG (Aft of Front Axle)	mm	1075	1127	1149
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	1	5	16

*Front up is positive ** Left up is positive

GENERAL VEHICLE TEST DATA

Measurement Description	Units	Value
Weight of Ballast in Cargo Area	kg	11.3
Weight of Vehicle Components Removed	kg	24.0

Vehicle components removed to meet target vehicle test weight: Spare tire, passenger side mirror, trunk carpet, and right tail light.

TEST VEHICLE IMPACT POINT DATA

Measurement Parameter	Units	Value
Vertical Impact Reference Line (Aft of Front Axle)	mm	1053
Actual Impact Point (Aft of Front Axle)	mm	1043
Impact Point Difference (- forward / + rearward)	mm	-10

DATA SHEET NO. 2

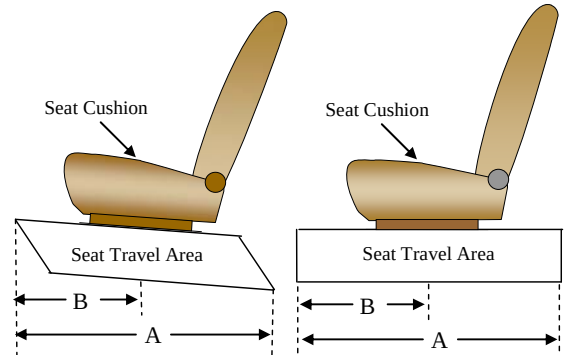
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2011 Nissan Rogue S 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5209
 Test Date: 10/13/2010

SEAT FORE/AFT POSITIONS

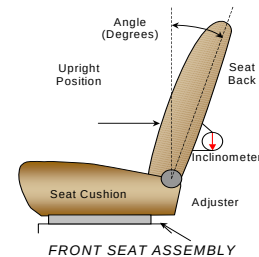
The driver seat was a manual fore/aft adjustable seat with a manual height adjustment. The seat travel was set as specified in Appendix B of the TP dated January 2010. The right front passenger manual seat was set to match the driver seat. The rear passenger seats were non-adjustable.



SEAT FORE/AFT POSITIONING	Total Fore/Aft Travel (mm)	Placed in Detent # or Position (mm)
Driver Seat	25 detents	0 mm (full forward)
Front Passenger Seat	25 detents	0 mm (full forward)
Rear Seat – Struck Side	Fixed	
Rear Seat – Non-Struck Side	Fixed	

SEAT BACK ANGLE POSITION

The seat back was set as specified in Appendix B of the TP dated January 2010. The seat back angle measurement was made relative to the rocker sill at the headrest post.



SEAT BACK ANGLE	Degrees	Detents
Driver Seat Back Angle with Seated Dummy	-6.5	Forward-most locking position
Front Passenger Seat Back Angle	-7.4	Forward-most locking position
Struck Side Rear Seat Back Angle	Fixed	
Non-Struck Side Rear Passenger Seat Back Angle	Fixed	

SEAT BELT UPPER ANCHORAGE

The driver and passenger seat belt upper anchorages were set at the manufacturer's specified placement in Form 1.

SEAT BELT UPPER ANCHORAGES	Total # of Positions	Placed in Position #
Driver Seat	4 detents	0 (uppermost as 0)
Front Passenger Seat	4 detents	0 (uppermost as 0)

DATA SHEET NO. 2 (CONTINUED)

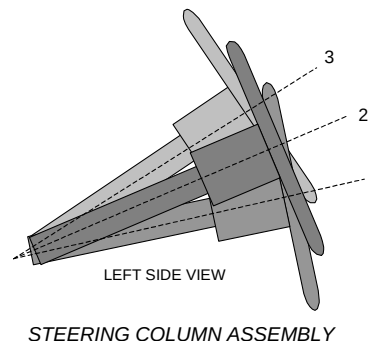
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2011 Nissan Rogue S 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5209
 Test Date: 10/13/2010

STEERING COLUMN ADJUSTMENT

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

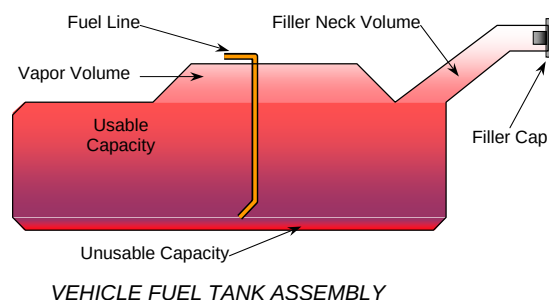


STEERING COLUMN POSITIONING

	Degrees	Fore/Aft Position (mm)
Lowermost - Position 1	64.8	
Geometric Center – Position 2	62.6	
Uppermost – Position 3	60.4	
Telescoping Steering Wheel Travel		
Test Position	62.6	

FUEL PUMP

Describe the fuel pump type, its behavior, and the location of the fuel filler pipe. The vehicle is equipped with an electric fuel pump. The fuel pump will pump fuel when the ignition key is in the “ON” position. The fuel pipe is on the right side.



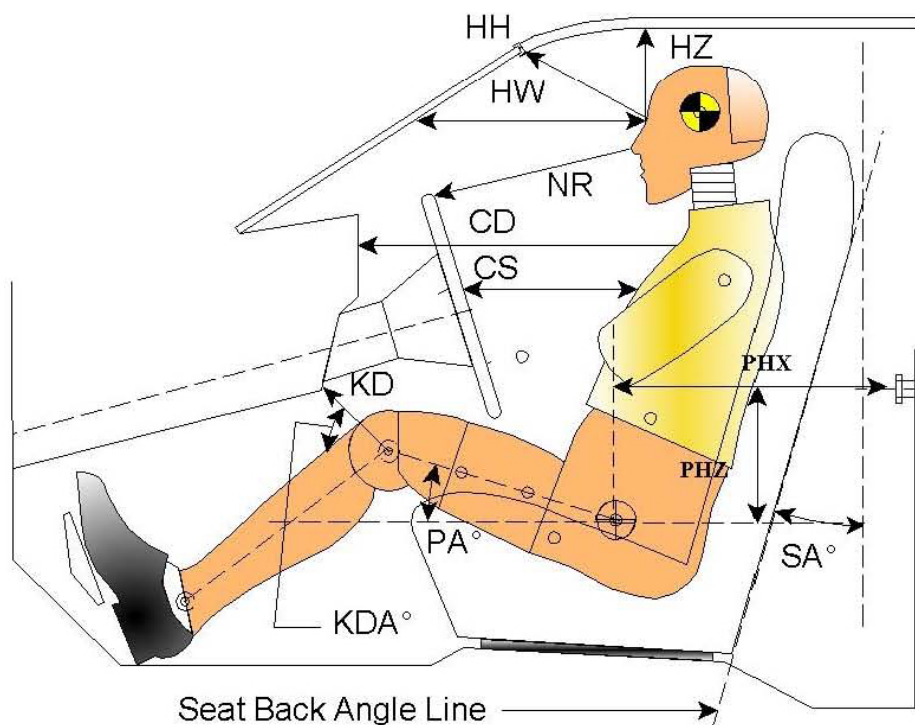
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of “Standard” Tank	60.0
Usable Capacity of “Optional” Tank	
Usable Capacity of Standard Tank as Specified in Owner’s Manual	60.0
Usable Capacity of Optional Tank as Specified in Owner’s Manual	
92-94% of Usable Capacity	55.2 to 56.4
Actual Amount of Solvent Used	56.0
1/3 of Usable Capacity	20.0

.DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Nissan Rogue S 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5209
 Test Date: 10/13/2010

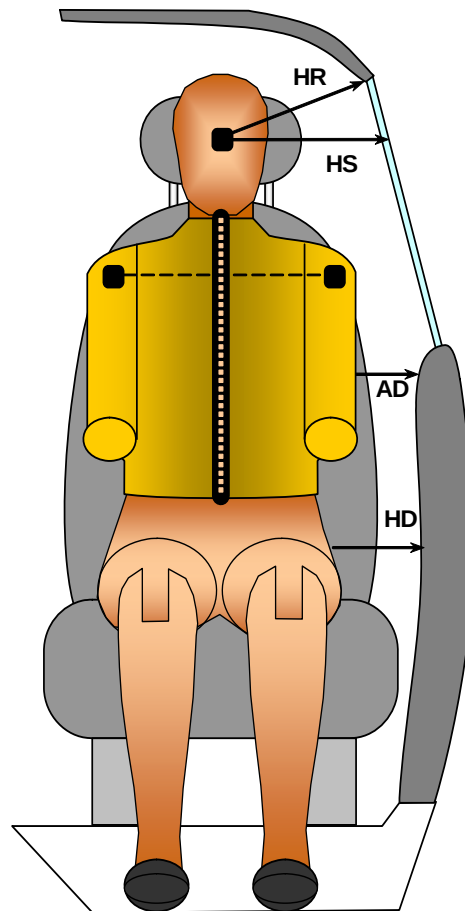


Code	Measurement Description	Driver S/N 296	
		Length (mm)	Angle (°)
HH	Head to Header	225	
HW	Head to Windshield	496	
HZ	Head to Roof	164	
NR	Nose to Rim	230	
CD	Chest to Dash	383	
CS	Chest to Steering Wheel	150	
KDL/KDAL	Left Knee to Dash	97	26.4
KDR/KDAR	Right Knee to Dash	98	17.9
PA	Pelvic Angle		19.9
PHX	H-Point to Striker (X-Axis)	383	
PHZ	H-Point to Striker (Z-Axis)	104	
SA	Seat Back Angle		-6.5

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Nissan Rogue S 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5209
 Test Date: 10/13/2010



FRONT VIEW OF DUMMY

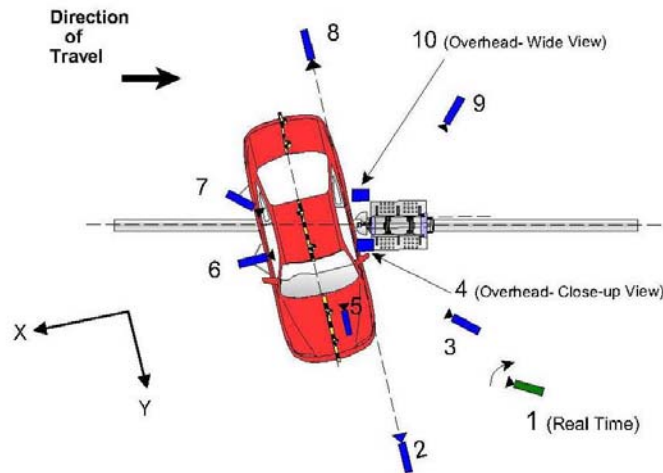
Code	Measurement Description	Driver S/N 296
		Length (mm)
HR	Head to Side Header	248
HS	Head to Side Window	367
AD	Arm to Door	144
HD	H-Point to Door	159

DATA SHEET NO. 5

CAMERA LOCATIONS AND DATA

Test Vehicle: 2011 Nissan Rogue S 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5209
 Test Date: 10/13/2010



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	30	5580	-1660	24	1000
3	Impact Side 45° Forward	-1790	4230	-1680	20	1000
4	Overhead Closeup	30	0	-4520	50	1000
5	Onboard – Driver Front				12.5	See test notes
6	Onboard – Driver Side				8	1000
7	Onboard – Driver Rear				8	See test notes
8	Rear Ground Level	0	-6570	-1570	24	1000
9	Impact Side 45° Rearward	-3550	-2860	-1620	20	1000
10	Overhead Wide View	90	0	-4580	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.

INSTRUMENTATION

	Number of Channels
Driver Dummy	16
Vehicle Structure	21
Pole Load Cells – Not used	8
Contact Switches	3
Airbag Timing	2
Total No. of Data Channels	50

DATA SHEET NO. 6

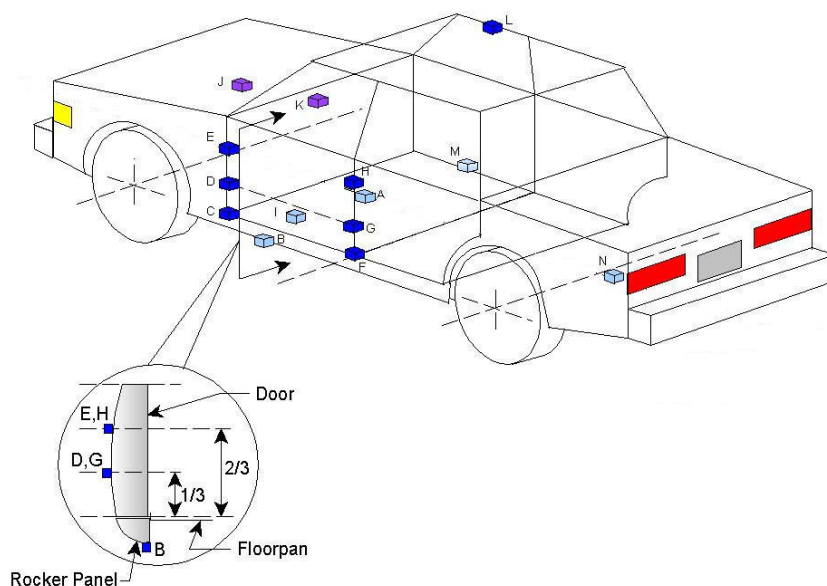
VEHICLE ACCELEROMETER DATA

Test Vehicle: 2011 Nissan Rogue S 5-Dr SUV

NHTSA No. MB5209

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	Accelerometer Location			
	ID	Coordinates (mm)		
		X	Y	Z
A	Vehicle CG	2486	0	-415
	Vehicle CG Sensor	2506	0	-415
B	Left Floor Sill	2994	-731	-282
C	A Pillar Sill	3120	-731	-280
D	A Pillar Low	3110	-716	-630
E	A Pillar Mid	3155	-792	-865
F	B Pillar Sill	2037	-731	-295
G	B Pillar Low	2030	-712	-616
H	B Pillar Mid	2055	-695	-878
I	Driver Seat	2319	-480	-450
L	Engine Top	3921	0	-850
J	Firewall	3696	0	-1000
K	Right Roof	2354	605	-1578
M	Right Floor Sill	2571	731	-285
N	Rear Floorpan	835	0	-472

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

DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA

Test Vehicle: 2011 Nissan Rogue S 5-Dr SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5209
Test Date: 10/13/2010



254 mm Diameter Rigid Pole

The pole was not instrumented.

Load Cell Locations	
ID	Height From Ground (m)
1	
2	
3	
4	
5	
6	
7	
8	

DATA SHEET NO. 8**POST-TEST OBSERVATIONS**Test Vehicle: 2011 Nissan Rogue S 5-Dr SUVNHTSA No. MB5209Test Program: NCAP Side Pole Impact TestTest Date: 10/13/2010**TEST DUMMY INFORMATION AND CONTACT**

Description	Driver
Dummy Type / Serial No.	SID-IIs / 296
Head Contact	Curtain Airbag, Headrest
Upper Torso Contact	Side Airbag
Lower Torso Contact	Side Airbag
Left Knee Contact	Door Panel
Right Knee Contact	Left Knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

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

POST-TEST STRUCTURAL OBSERVATIONS

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

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

VEHICLE SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset from Vertical Impact Reference Line	mm	+/- 38	10
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.5
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.5

DATA SHEET NO. 9

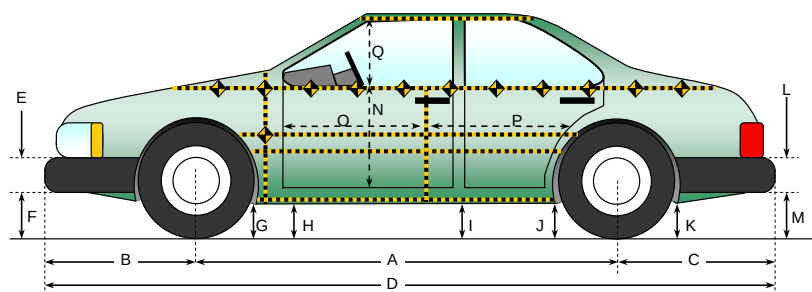
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Nissan Rogue S 5-Dr SUV

NHTSA No. MB5209

Test Program: NCAP Side Pole Impact Test

Test Date: 10/13/2010



LEFT SIDE VIEW

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

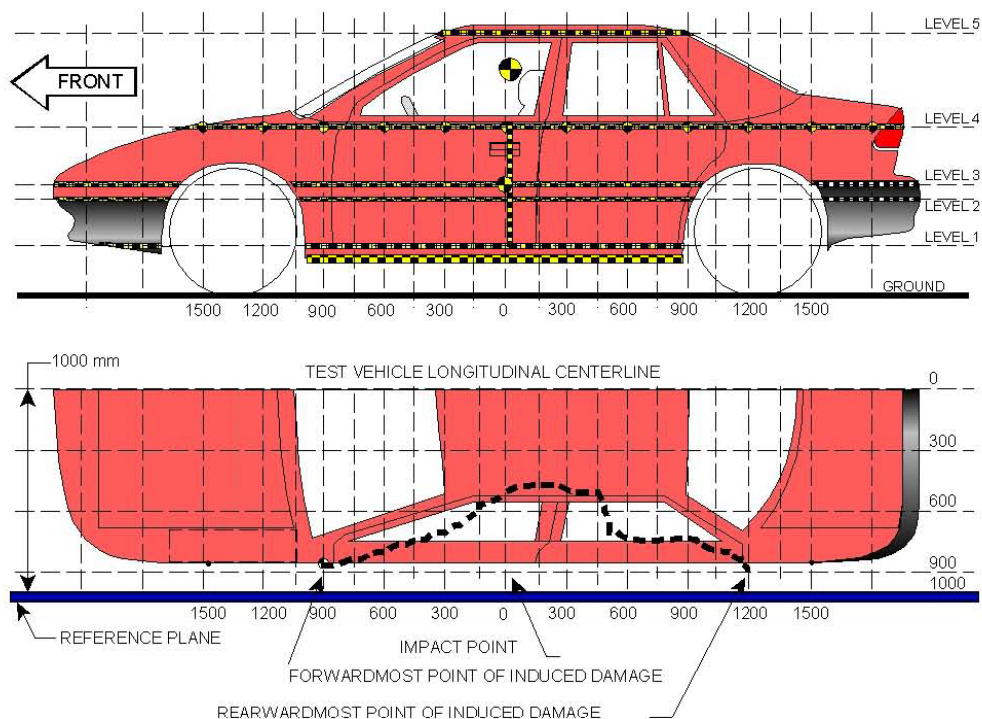
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2690	2578	112
B	Front Axle to FSOV	1000	1031	-31
C	Rear Axle to RSOV	984	996	-12
D1	Total Vehicle Length at Left Side	3432	3270	162
D2	Total Vehicle Length at Centerline	4674	4605	69
D3	Total Vehicle Length at Right Side	3432	3442	-10
E	Front Bumper Thickness	80	80	0
F	Front Bumper Bottom to Ground	230	265	-35
G	Sill Height at Front Wheel Well	258	252	6
H	Sill Height at Front Door Leading Edge	260	255	5
I	Sill Height at B Pillar	280	290	-10
J1	Sill Height at Rear Wheel Well	298	304	-6
J2	Pinch Weld Height at Rear Wheel Well	292	300	-8
K	Sill Height Aft of Rear Wheel Well	325	330	-5
L	Rear Bumper Thickness	119	119	0
M	Rear Bumper Bottom to Ground	392	375	17
N	Sill Height to Window Bottom Sill	786	785	1
O	Front Door Leading Edge to Impact CL	616	600	16
P	Rear Door Trailing Edge to Impact CL	1501	1540	-39
Q	Front Window Opening	407	362	45
R	Right Side Length	3432	3442	-10
S	Left Side Length	3432	3270	162
T	Vehicle Width at B Post	1793	1645	148

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Nissan Rogue S 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5209
 Test Date: 10/13/2010



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

Level	Measurement Description	Height Above Ground (mm)
1	Sill Top	350
2	Occupant H-Point	715
3	Mid-Door	740
4	Window Sill	1060
5	Window Top	1555

DATA SHEET NO. 10 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Nissan Rogue S 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5209
 Test Date: 10/13/2010

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1350				296					291					-5	
-1200				286					296					10	
-1050				281					306					25	
-900		202	201	280			222	222	301			20	21	21	
-750		203	202	280			228	228	305			25	26	25	
-675	281	209	208	279		314	268	268	312		33	59	60	33	
-600	284	213	213	276		365	332	332	319		81	119	119	43	
-525	281	213	212	275		403	352	354	364		122	139	142	89	
-450	280	213	212	272		441	397	395	412		161	184	183	140	
-375	278	212	211	271		480	447	447	462		202	235	236	191	
-300	275	211	210	270		521	459	459	516		246	248	249	246	
-225	275	210	209	268		556	546	547	558		281	336	338	290	
-150	274	209	208	268		598	601	600	607		324	392	392	339	
-75	275	208	207	267	492	640	634	635	639	661	365	426	428	372	169
0	274	206	205	266	480	632	649	649	649	663	358	443	444	383	183
75	275	205	204	265	479	593	607	607	608	648	318	402	403	343	169
150	275	205	204	263	477	534	550	548	549	629	259	345	344	286	152
225	273	205	204	263	478	495	486	489	498	611	222	281	285	235	133
300	273	205	204	262	478	444	424	424	444	591	171	219	220	182	113
375	274	204	203	262	480	403	365	366	393	573	129	161	163	131	93
450	274	204	203	265	481	392	334	334	382	557	118	130	131	117	76
525	270	204	203	264	482	371	319	319	359	540	101	115	116	95	58
600	270	203	202	264	484	364	308	308	353	528	94	105	106	89	44
675	270	203	202	264	485	331	291	291	342	519	61	88	89	78	34
750	275	203	202	264	486	316	274	274	329	510	41	71	72	65	24
825	275	203	202	265	488	293	262	262	322	515	18	59	60	57	27
900	275	204	203	265	493	261	234	233	302	510	-14	30	30	37	17
1050	272	203	202	265	498	220	202	202	281	515	-52	-1	0	16	17
1200		198	197	266	506		168	166	265	522		-30	-31	-1	16
1350			196	269	519			196	250	534			0	-19	15
1500				272	536				280	545				8	9
1650				280	556				281	563				1	7

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

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

Test Vehicle: 2011 Nissan Rogue S 5-Dr SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5209
Test Date: 10/13/2010

MAXIMUM CRUSH DATA

	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush (mm)	365	443	444	383	183
Distance From Impact (mm)	-75	0	0	0	0

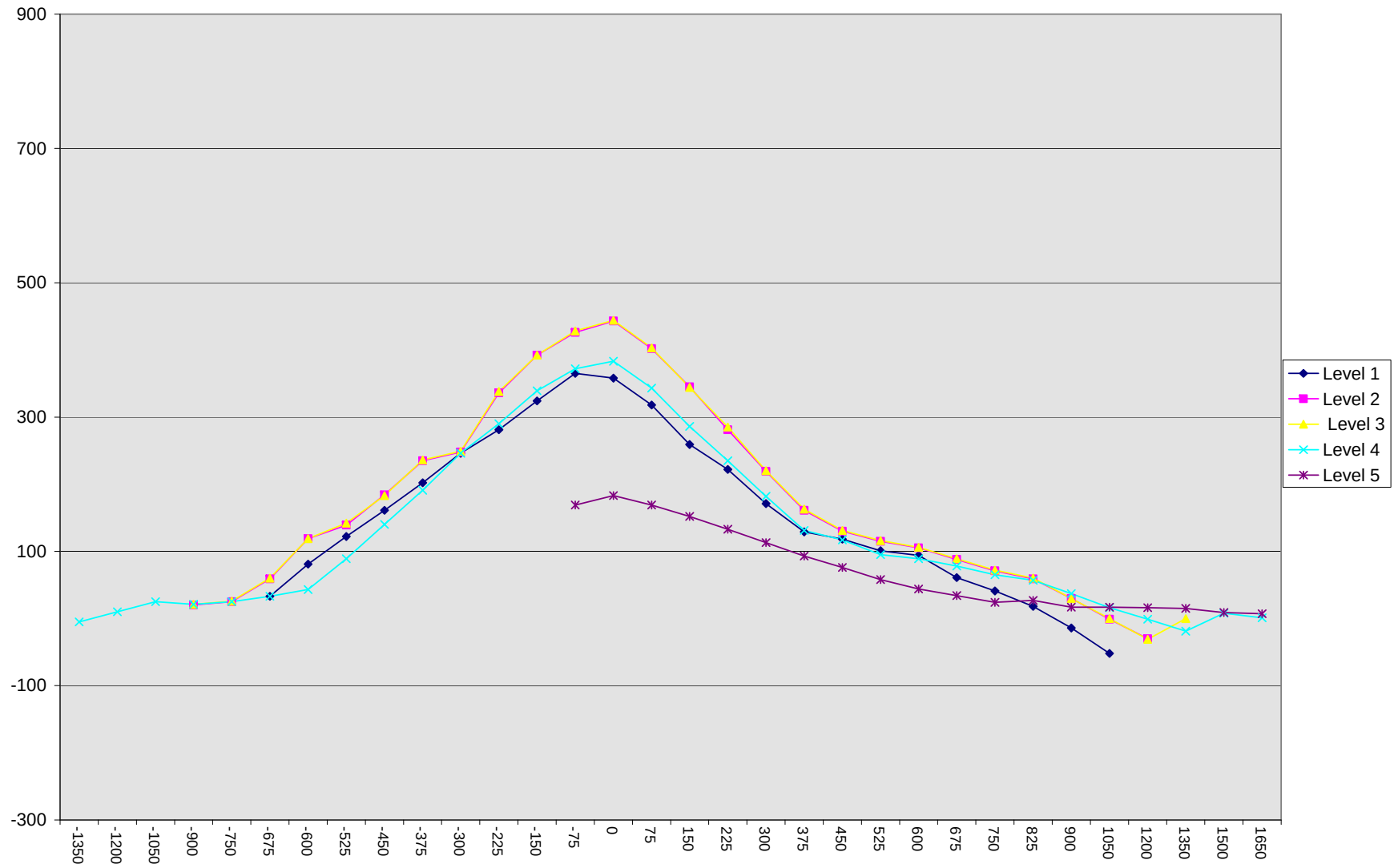
Note: Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to test based on an estimated impact point. The final distance to impact is determined 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: 2011 Nissan Rogue S 5-Dr SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5209
Test Date: 10/13/2010

20



DATA SHEET NO. 11

FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

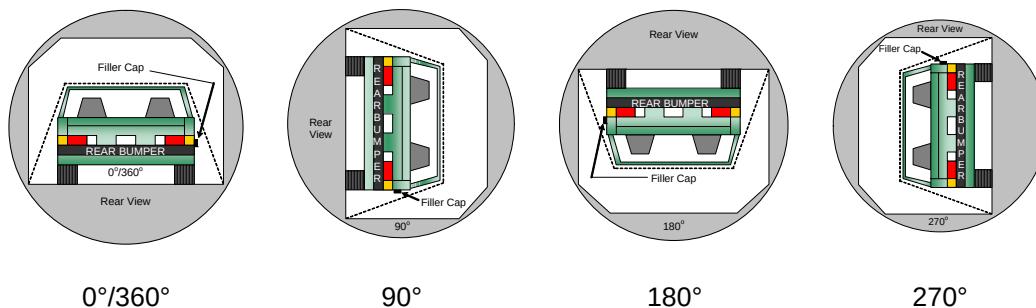
Test Vehicle: 2011 Nissan Rogue S 5-Dr SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5209
 Test Date: 10/13/2010

Test Time: 10:37 am Temperature: 21° C

- A. From impact until vehicle motion ceases: 0 oz.
 (Maximum Allowable = 1 ounce)
 B. For the 5 minute period after motion ceases: None
 (Maximum allowable = 5 ounces)
 C. For the following 25 minutes: None
 (Maximum allowable = 1 oz./minute)
 D. Spillage Details: None

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	108	300	408
90° to 180°	111	300	411
180° to 270°	107	300	407
270° to 360°	112	300	412

FMVSS 301 ROLLOVER SPILLAGE TABLE (units in ounces)

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

ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

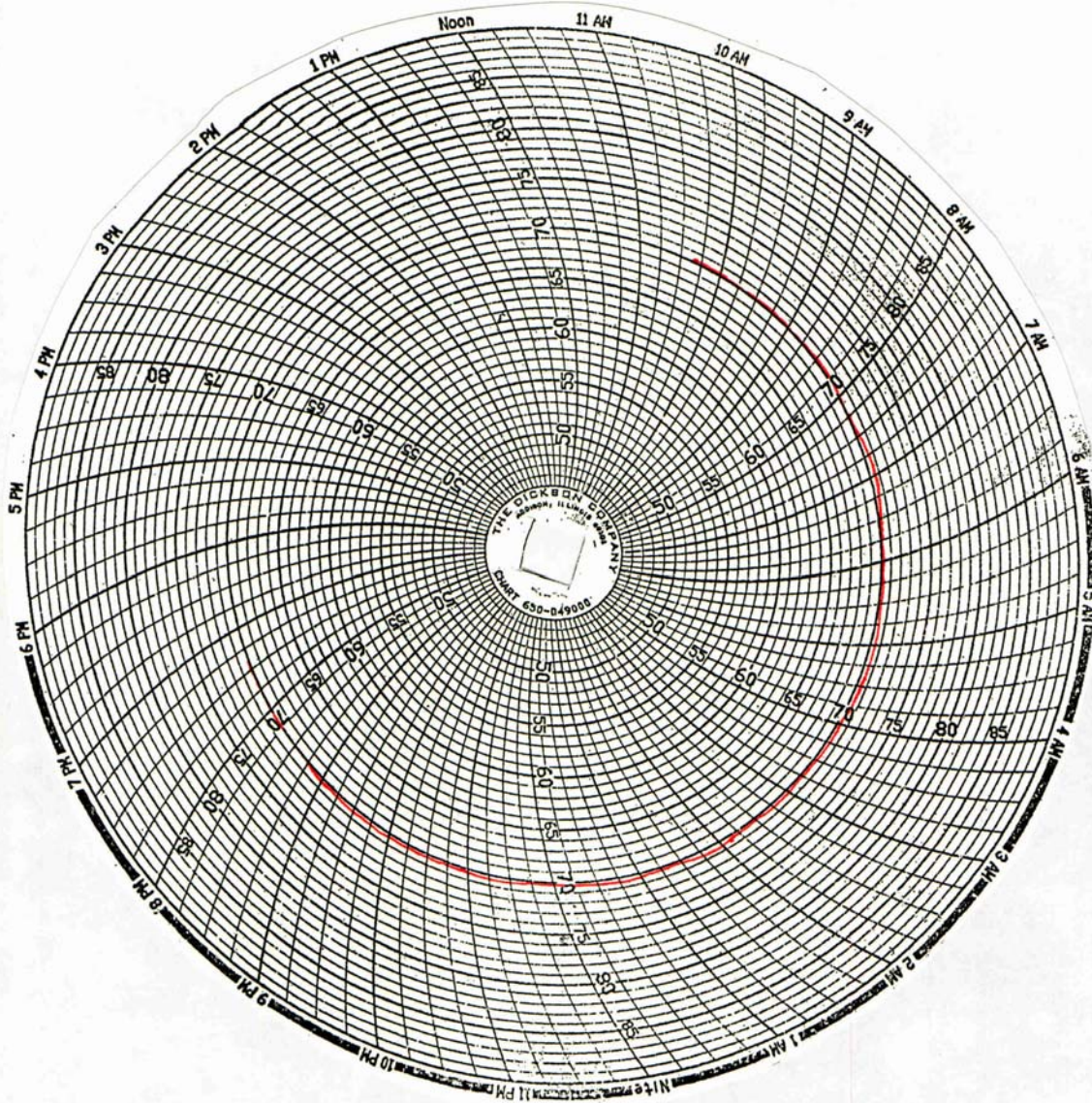
Test Phase	Spillage Location
0° to 90°	
90° to 180°	
180° to 270°	
270° to 360°	

DATA SHEET NO. 12

DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle: 2011 Nissan Rogue S 5-Dr SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5209
Test Date: 10/13/2010



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 Vehicle and Pole



Post-Test Overhead View of Test Vehicle and Pole



Pre-Test Left Side View of Pole Positioned Against Side of Vehicle at Ideal Impact Point



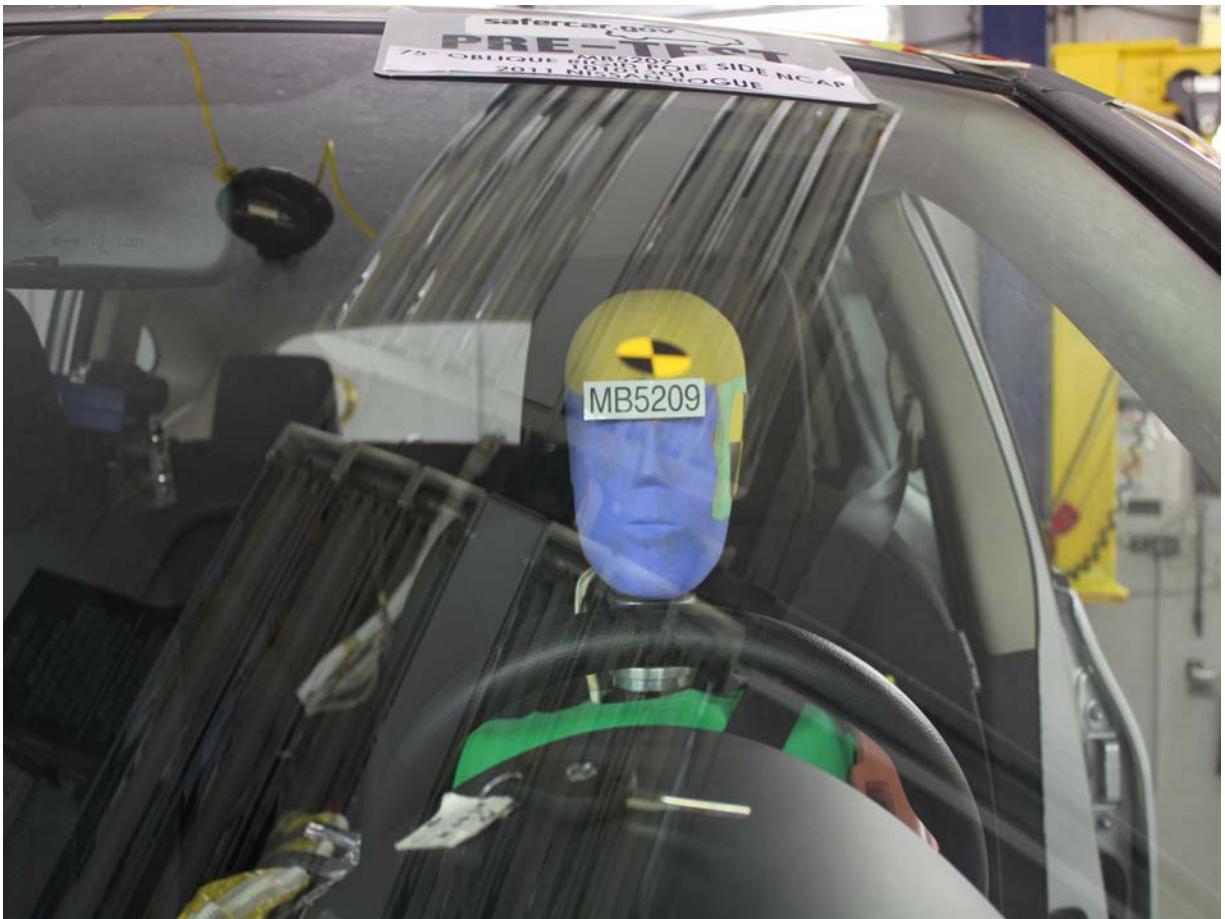
Pre-Test Right Side View of Pole Positioned Against Side of Vehicle at Ideal Impact Point



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 (through front window)



Post-Test Front Close-Up View of Dummy (through front window)



Pre-Test Left Side View of Dummy Showing Belts, Chalking, and Contact Switches (Door Open)



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 Frontal View of Seat Back Prior to Dummy Positioning



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



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



Pre-Test Overhead View of Dummy Thighs on Seat Pan



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



Pre-Test 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 to Show Position



Pre-Test Left Side View of Steering Wheel to Show Position



Pre-Test View of Parking Brake



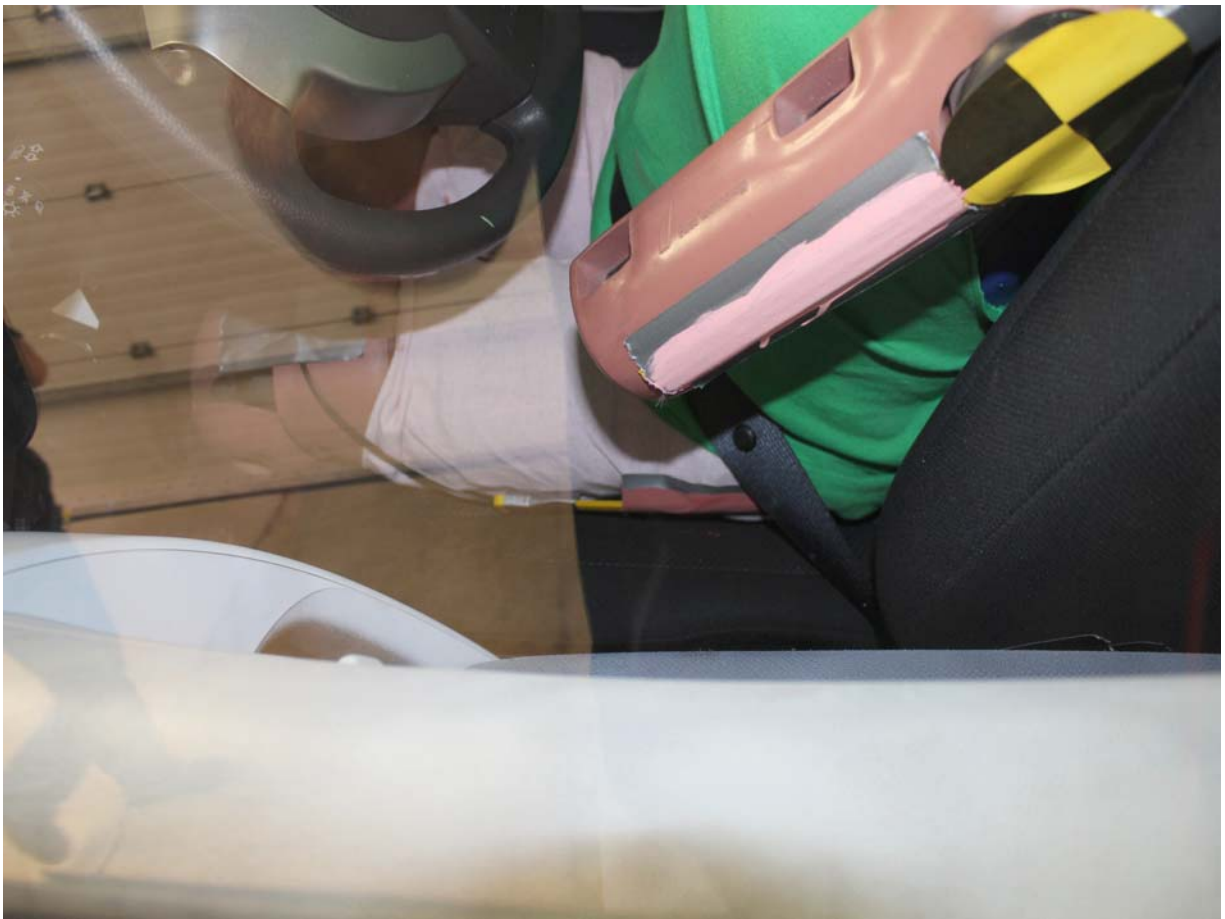
Pre-Test Close-Up Left Side View of Driver Seat Track Showing Test Position



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



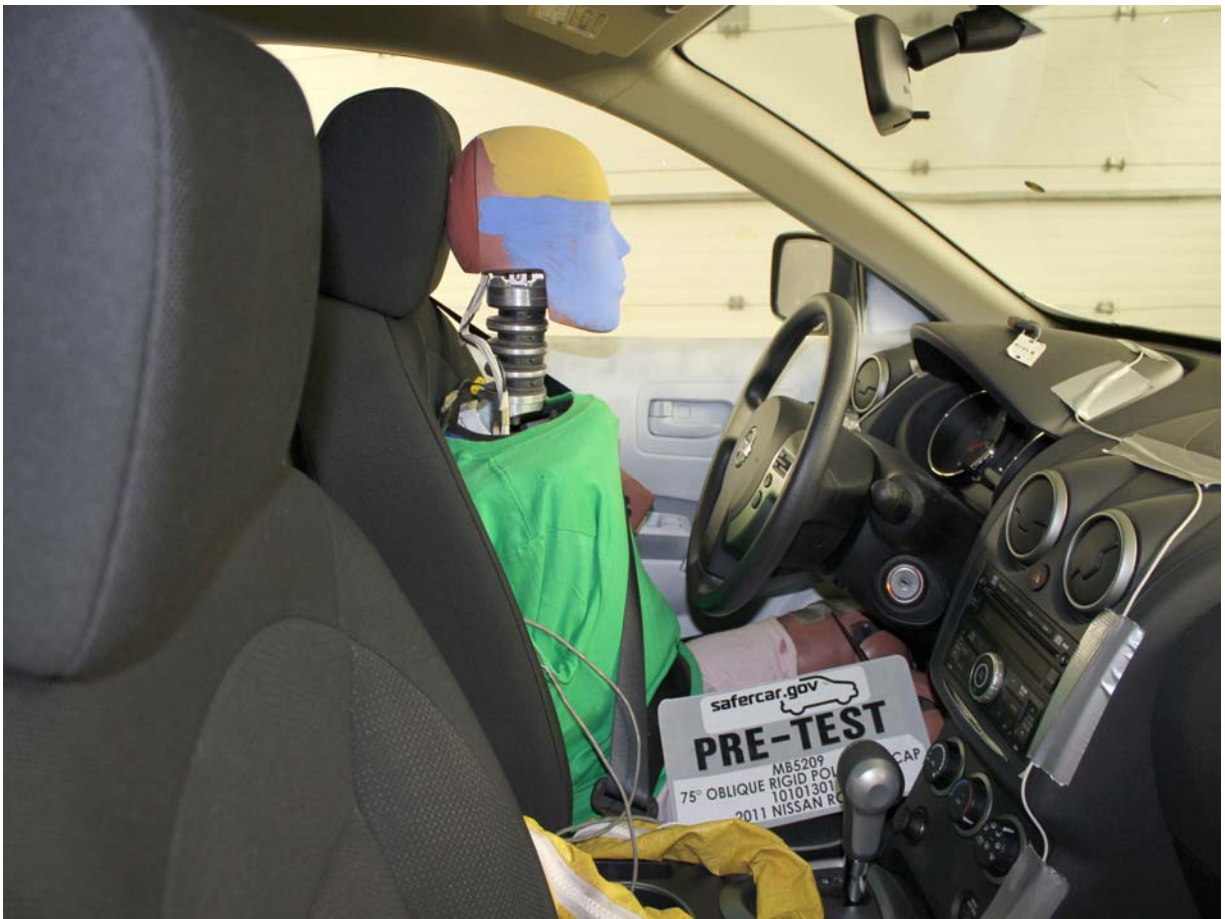
Pre-Test Close-Up View of Driver Seat Back or Head Restraint Showing Seat Back Test Position



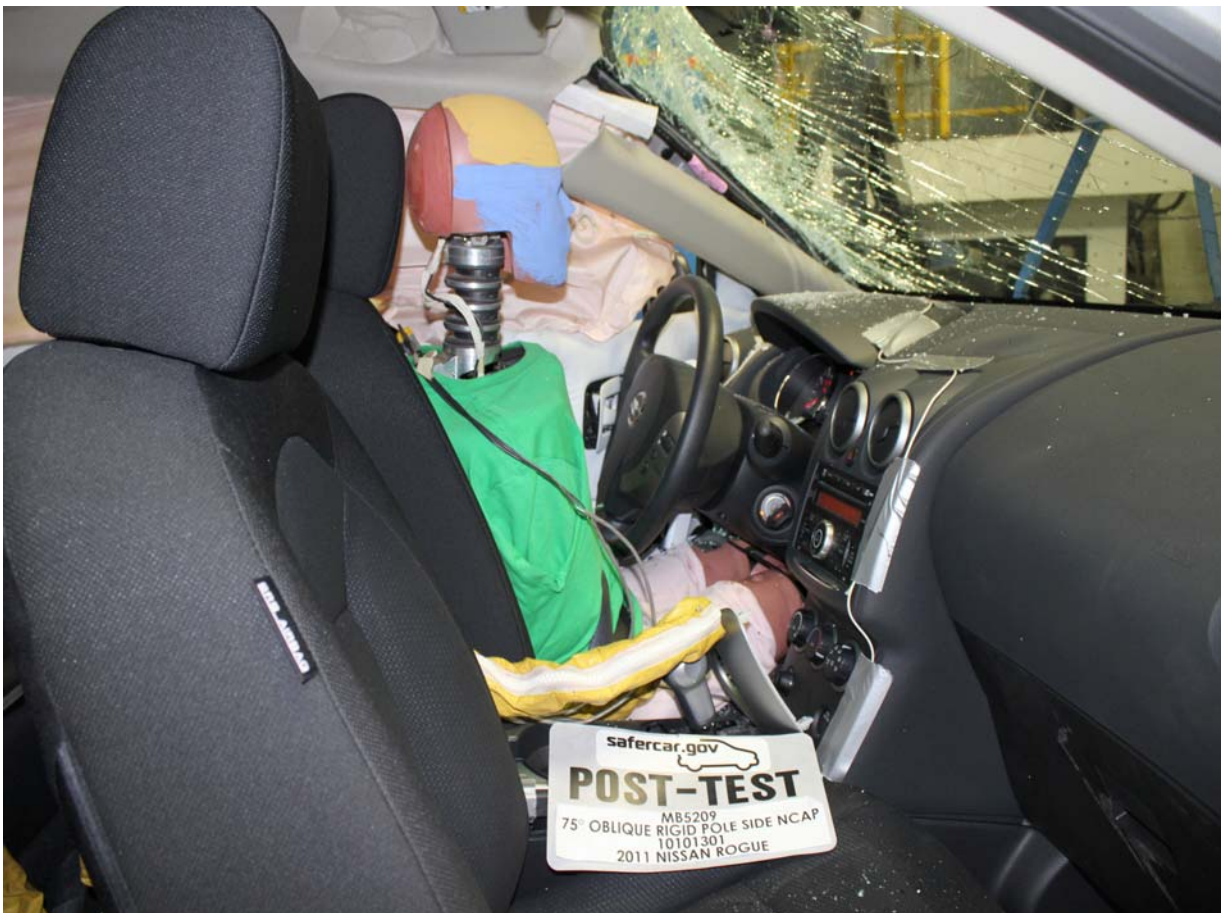
Pre-Test Dummy and Door Clearance View



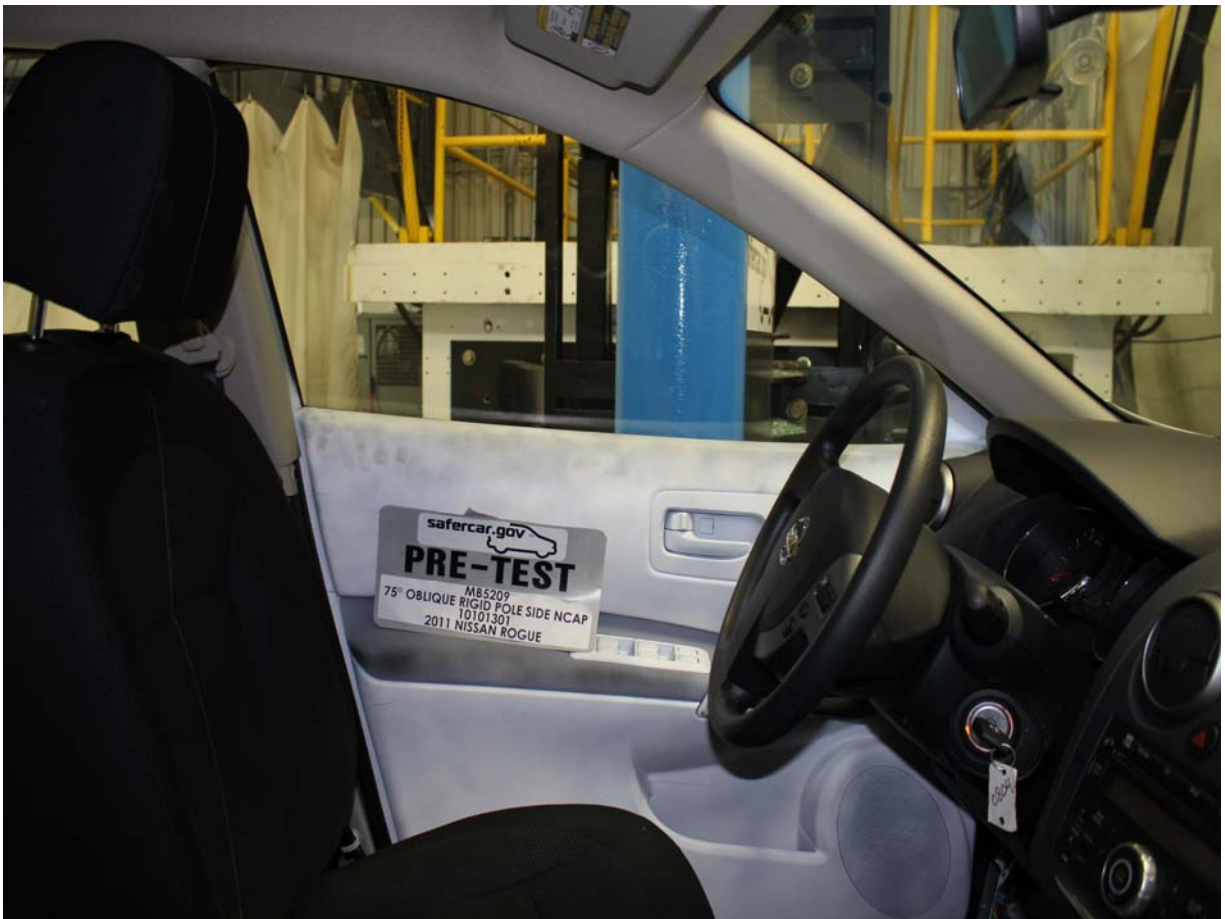
Post-Test Dummy and Door Clearance View



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



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



Pre-Test Inner Driver Door Panel View



Post-Test Inner Driver 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 Airbag View



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



Post-Test Dummy Close-Up Torso Contact with Side Airbag View



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



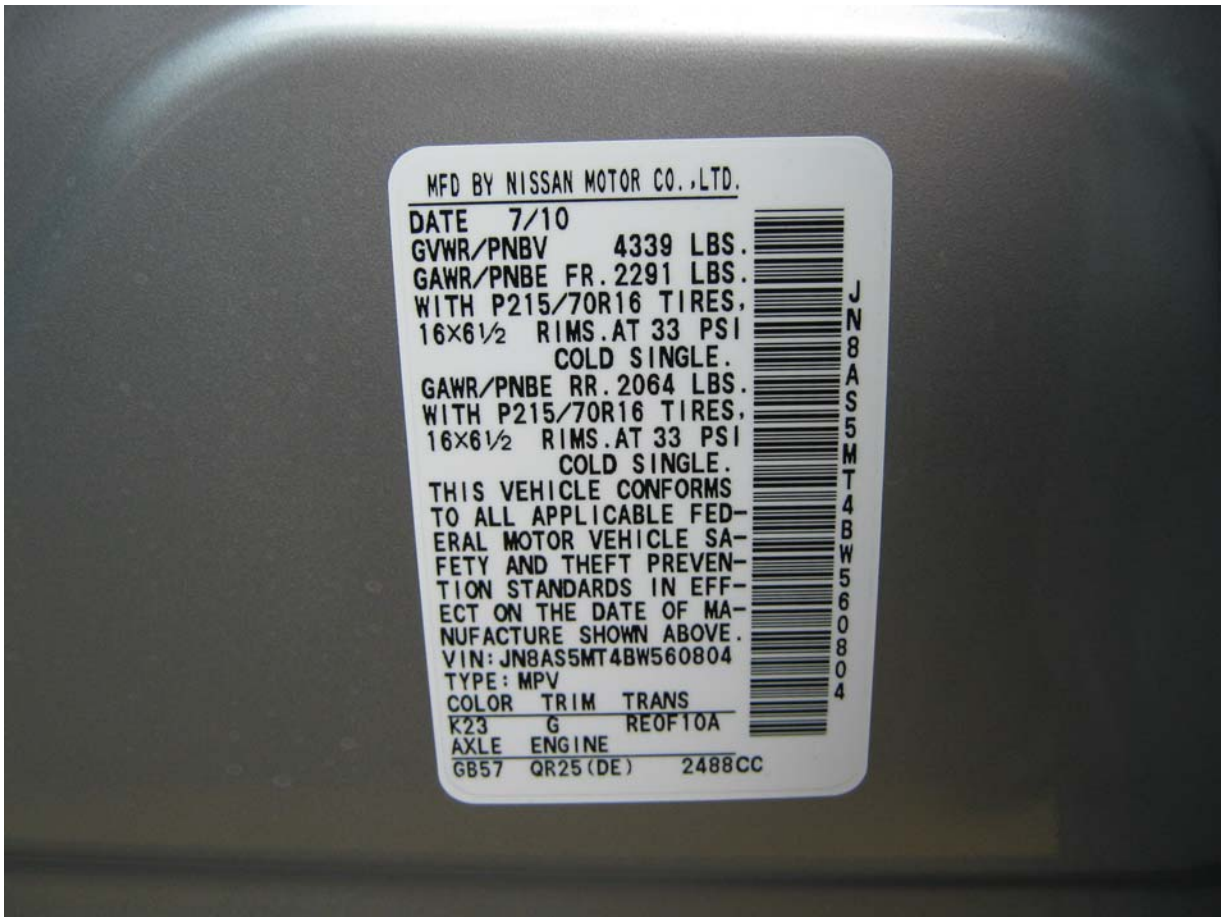
Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View



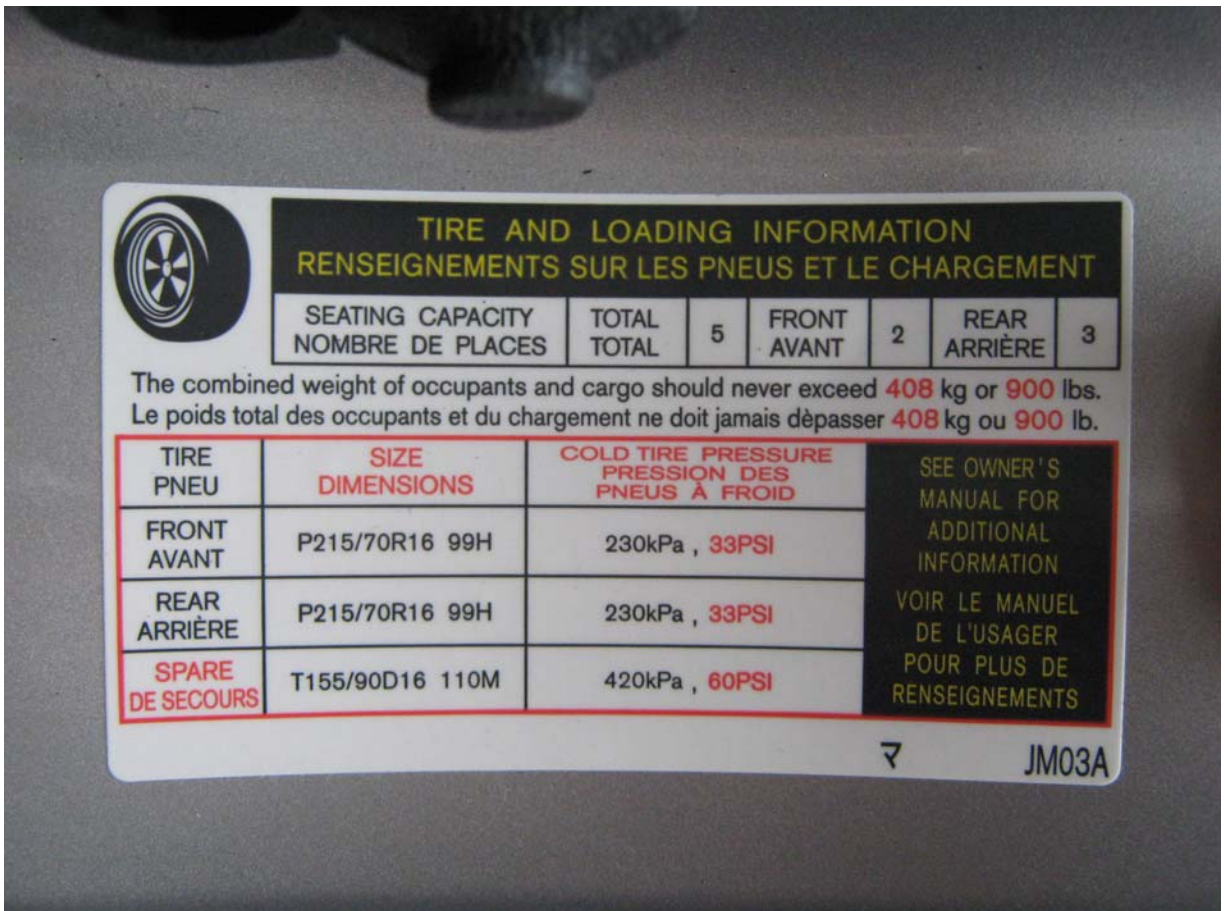
Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



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



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. 301/305 Rollover 0 Degrees



FMVSS No. 301/305 Rollover 90 Degrees



FMVSS No. 301/305 Rollover 180 Degrees



FMVSS No. 301/305 Rollover 270 Degrees



FMVSS No. 301/305 Rollover 360 Degrees



Impact Event



2011 ROGUE S FWD

As versatile as you are.

Standard Equipment Included at No Extra Charge

MECHANICAL & PERFORMANCE
2.5-liter DOHC 4-Cylinder Engine
170 Horsepower and 175 lb-ft of Torque
Xtronic CVT[®] Continuously Variable Transmission
Front-Wheel Drive
Power-Assisted Rack-and-Pinion Steering
Independent Strut Front Suspension with Coil Springs and Stabilizer Bar
Independent Multi-Link Rear Suspension with Stabilizer Bar
4-Speed Over-Drive Brakes
16" Steel Wheels with Full Wheel Covers
P215/70R16 Tires
Temporary Use Spare Tire
15.9-Gallon Fuel Tank

SAFETY & SECURITY
Nissan Advanced Air Bag System (AABS)
Front Seat-Mounted Side-Impact Supplemental Air Bags
Roof-Mounted Curtain Side-Impact/Rollover Supplemental Air Bags
For Outboard Occupant Head Protection
Front Seatbelts with Pretensioners & Adjustable Upper Anchors
Front-Seat Active Head Restraints
3-Point Seat Belts with ALR/ELR (Driver ELR Only)
Lower Anchors and Tethers for Children (LATCH)
Child Safety Rear Door Locks
Energy-Absorbing Steering Column
Zone Body Construction with Front and Rear Crumple Zones and Reinforced Passenger Compartment
4-Wheel Anti-Lock Braking System (ABS)
Vehicle Dynamic Control (VDC) with Traction Control System (TCS)
Electronic Brake Force Distribution (EBD) & Brake Assist (BA)
Tire Pressure Monitoring System (TPMS)
Vehicle Security System (VSS)
Nissan Vehicle Immobilizer System

COMFORT & CONVENIENCE
6-Way Manual Driver Seat
4-Way Manual Front Passenger Seat
60/40 Split Fold-Down Rear Seat
Manual Tilt Steering Column
Cruise Control with Steering-Wheel-Mounted Controls

4-Speaker AM/FM/CD Audio System
Auxiliary Audio Input Jack[®]
Interface System for iPod[®]
Tachometer, Odometer, Dual Trip Odometers, Fuel Level Gauge
Multi-Function Trip Computer with Outside Temperature Display
Air Conditioning with In-Cabin Microfilter
Rear-Seat Heating/Cooling Ducts
Power Windows with Driver's Window with Selective Unlocking Feature
Power Windows with Driver's Window One-Touch Auto-Up/Down
Power Door Locks with Auto-Locking Feature
Dual Overhead Map Lights
Illuminated Visor Vanity Mirrors
Sunglasses Holder
Dual Front and Rear Cup Holders
Front Seatback Map Pockets
Front Door Map Pockets
Front Console with Integrated Armrest and Storage Compartments
Cargo Area Storage Tray (Under Floor)
Cup Holder
(2) 12-Volt DC Power Outlets

EXTERIOR
Halogen Headlights
Dual Power Outside Mirrors
Body-Color Bumpers
Body-Color Rear Spoiler
Chrome Grille, Door Handles, Body Side Moldings, and License Plate Finisher
Variable Intermittent Front Windshield Wipers
Intermittent Rear Window Wiper

Manufacturer's Suggested Retail Base Price:	\$20,810.00
Options Included by Manufacturer FLOOR MATS & CARGO AREA PROTECTOR	185.00
Destination Charges:	800.00
Total *	\$21,795.00

EPA Fuel Economy Estimates

CITY MPG

22

Expected range for most drivers
18 to 26 MPG

Estimated Annual Fuel Cost

\$1,800

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

Combined Fuel Economy

This Vehicle

25

10 32
All SUVs

HIGHWAY MPG

28

Expected range for most drivers
23 to 33 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



GOVERNMENT SAFETY RATINGS

Frontal Crash Driver Passenger

To Be Rated To Be 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

To Be Rated To Be Rated

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

Rollover ★ ★ ★ ★

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

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

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

This Vehicle qualifies for Nissan's

Security+Plus Vehicle Protection Plan

The only service agreement backed by Nissan!
Ask your dealer for details, or call 1-800-NISSAN-1 for more information



DELIVERY

VEHICLE COLORS:
EXT: BRILLIANT SILVE
INT: BLACK

FINAL ASSEMBLY POINT:
LOS ANGELES

TRANSPORT METHOD:
TRUCK

DEALER:
ROSEN NISSAN OF GURNEE
7000 GRAND AVENUE
GURNEE IL
60031

VIN: JN8AS5MT4BW560804
EMS: 50 STATE EMISSIONS
MDL: 22111-560804 K23-G
OPT: A-C03L92

201008172304264S5033

*Does not include dealer installed options and accessories, local taxes or license fees. This label has been applied pursuant to federal law. Do not remove prior to delivery to the ultimate purchaser.

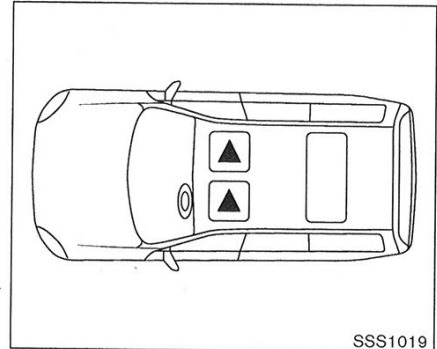
cured cargo could cause personal injury.

- When returning the seatbacks to the upright position, be certain they are completely secured in the latched position. If they are not completely secured, passengers may be injured in an accident or sudden stop.

HEAD RESTRAINTS

WARNING

Head restraints supplement the other vehicle safety systems. They may provide additional protection against injury in certain rear end collisions. Adjust the head restraints properly, as specified in this section. Check the adjustment after someone else uses the seat. Do not attach anything to the head restraint stalks or remove the head restraint. Do not use the seat if the head restraint has been removed. If the head restraint was removed, install and properly adjust the head restraint before an occupant uses the seating position. Failure to follow these instructions can reduce the effectiveness of the head restraints. This may increase the risk of serious injury or death in a collision.

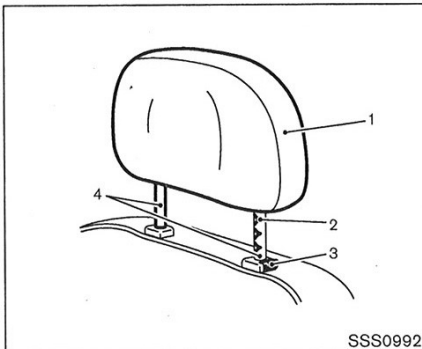


SSS1019

The illustration shows the seating positions equipped with head restraints. The head restraints are adjustable.

▲ Indicates the seating position is equipped with a head restraint.

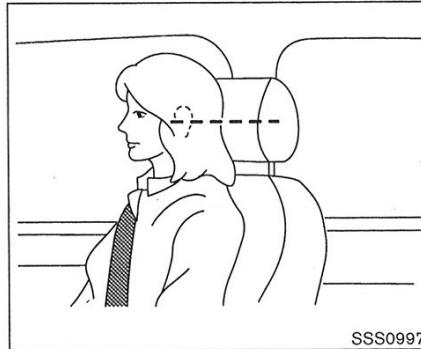
Safety — Seats, seat belts and supplemental restraint system 1-7



SSS0992

Components

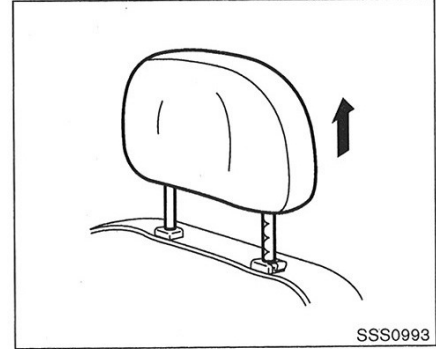
1. Head restraint
2. Adjustment notches
3. Lock knob
4. Stalks



SSS0997

Adjustment

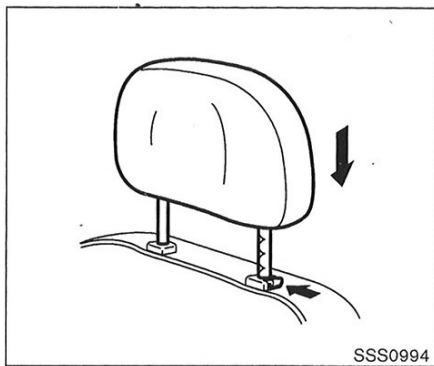
Adjust the head restraint so the center is level with the center of your ears.



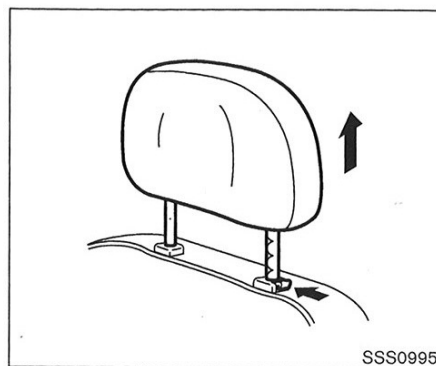
SSS0993

To raise the head restraint, pull it up.

1-8 Safety — Seats, seat belts and supplemental restraint system



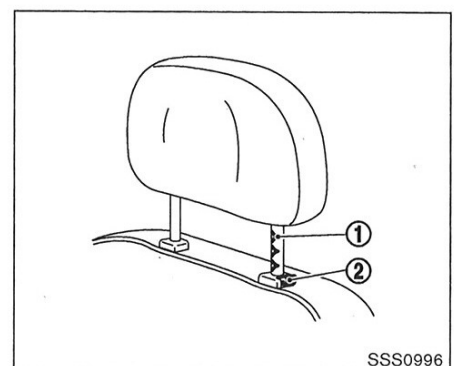
To lower, push and hold the lock knob and push the head restraint down.



Removal

Use the following procedure to remove the adjustable head restraints.

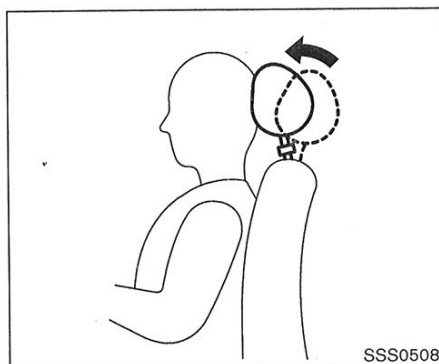
1. Pull the head restraint up to the highest position.
2. Push and hold the lock knob.
3. Remove the head restraint from the seat.
4. Store the head restraint properly in a secure place so it is not loose in the vehicle.
5. Install and properly adjust the head restraint before an occupant uses the seating position.



Install

1. Align the head restraint stalks with the holes in the seat. Make sure that the head restraint is facing the correct direction. The stalk with the adjustment notches (1) must be installed in the hole with the lock knob (2).
2. Push and hold the lock knob and push the head restraint down.
3. Properly adjust the head restraint before an occupant uses the seating position.

Safety — Seats, seat belts and supplemental restraint system 1-9



Adjust the Active Head Restraints properly as described earlier in this section.

Front-seat Active Head Restraints

The Active Head Restraint moves forward utilizing the force that the seatback receives from the occupant in a rear-end collision. The movement of the head restraint helps support the occupant's head by reducing its backward movement and helping absorb some of the forces that may lead to whiplash-type injuries.

Active Head Restraints are effective for collisions at low to medium speeds in which it is said that whiplash injury occurs most.

Active Head Restraints operate only in certain rear-end collisions. After the collision, the head restraints return to their original position.

1-10 Safety — Seats, seat belts and supplemental restraint system

APPENDIX B
DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

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List of Data Plots Provided in the Test Report		
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
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The following dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

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)

Driver Shoulder Contact Switch

Driver Torso Contact Switch

Driver Pelvis Contact Switch

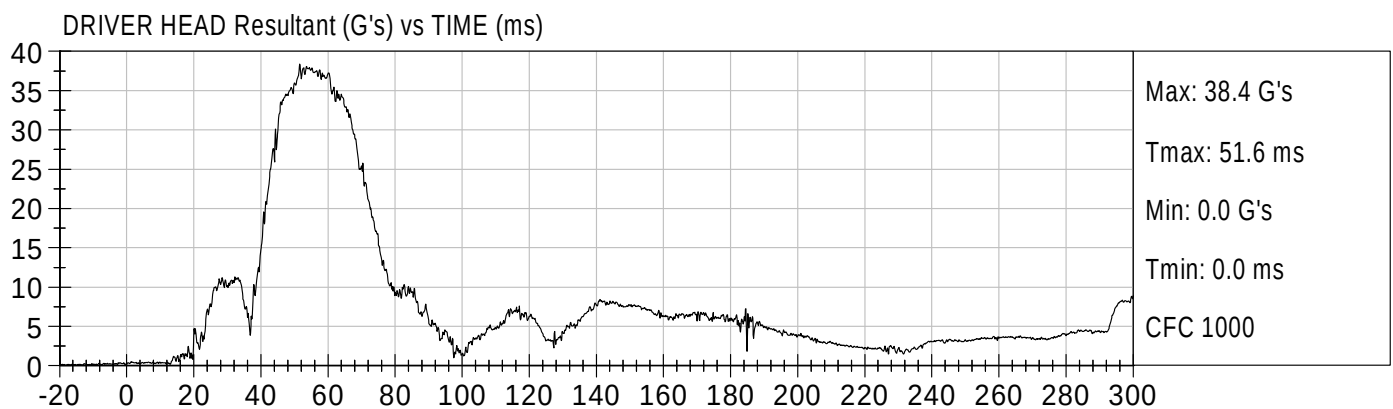
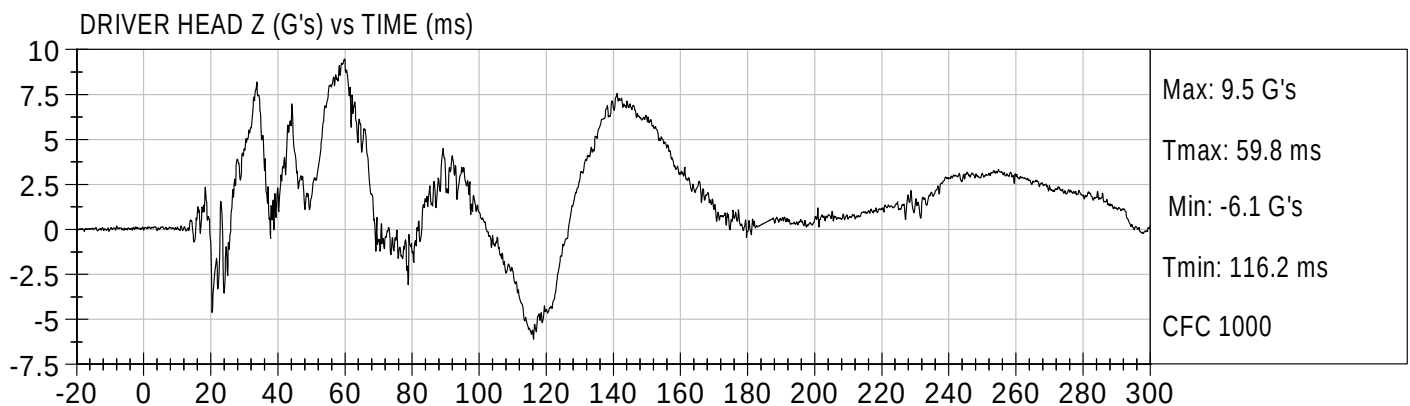
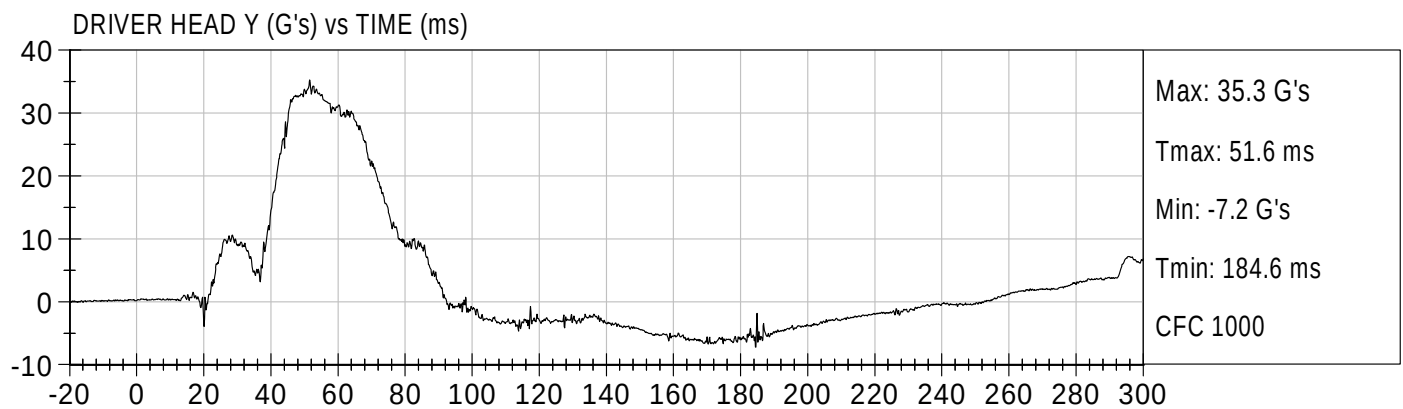
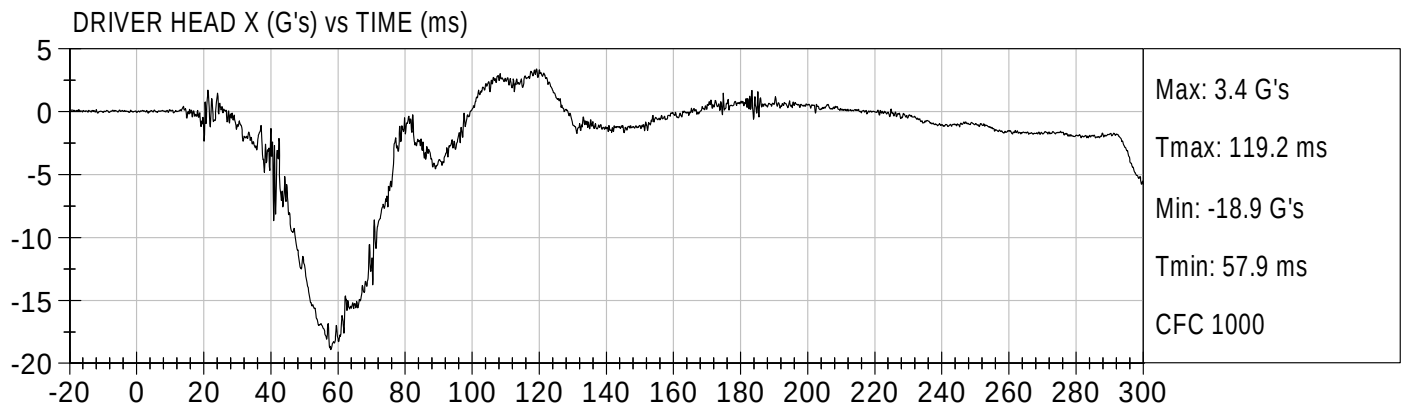
Vehicle CG Acceleration (X)

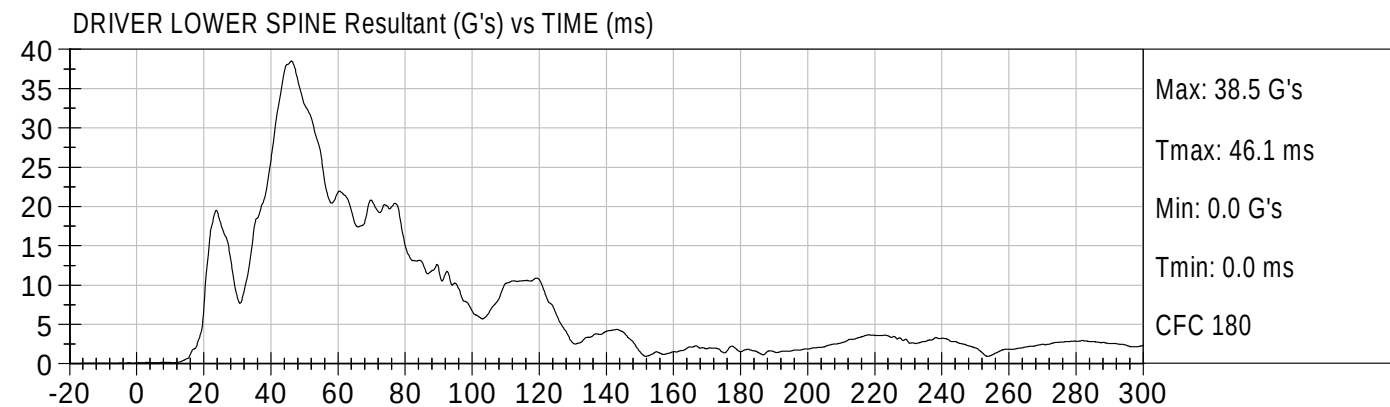
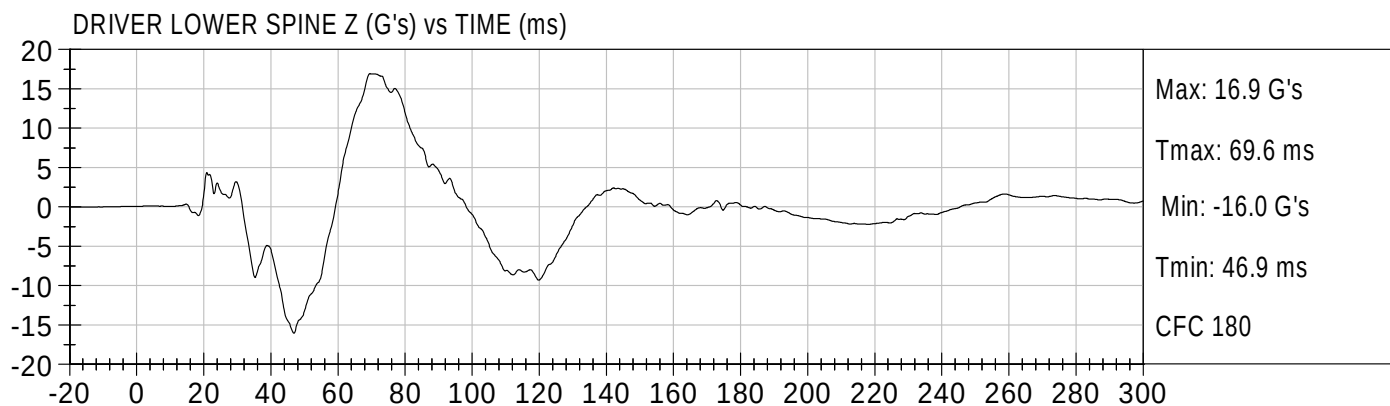
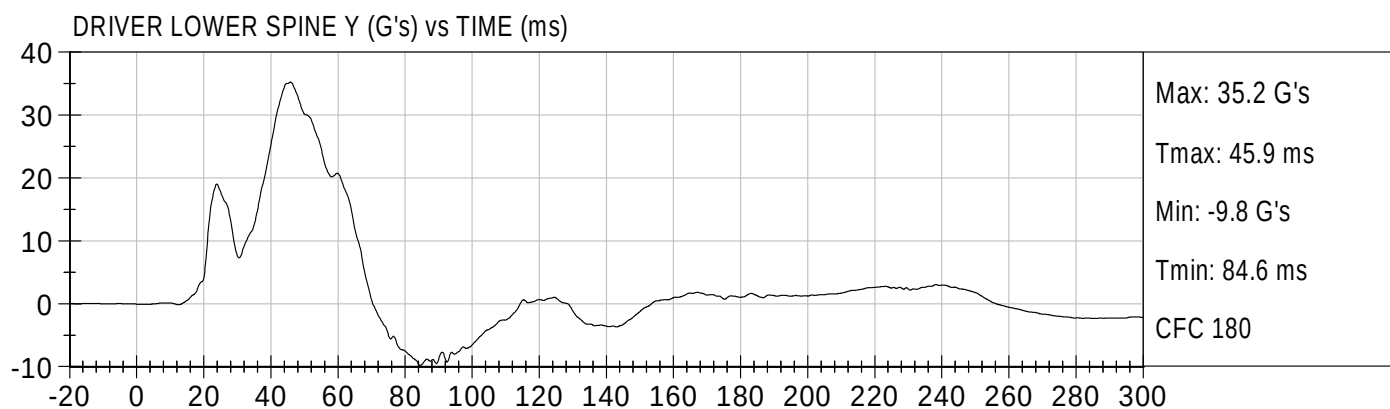
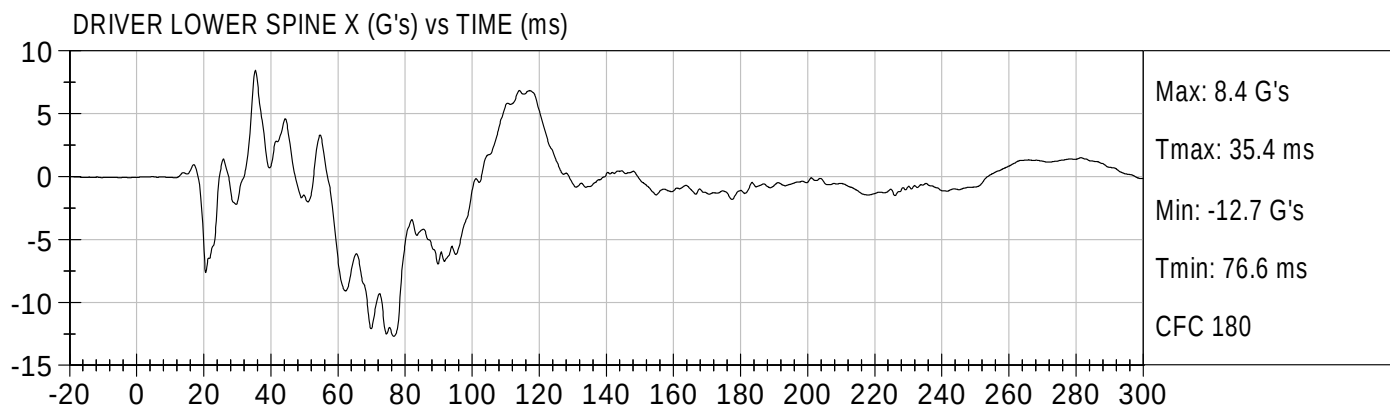
Vehicle CG Acceleration (Y)

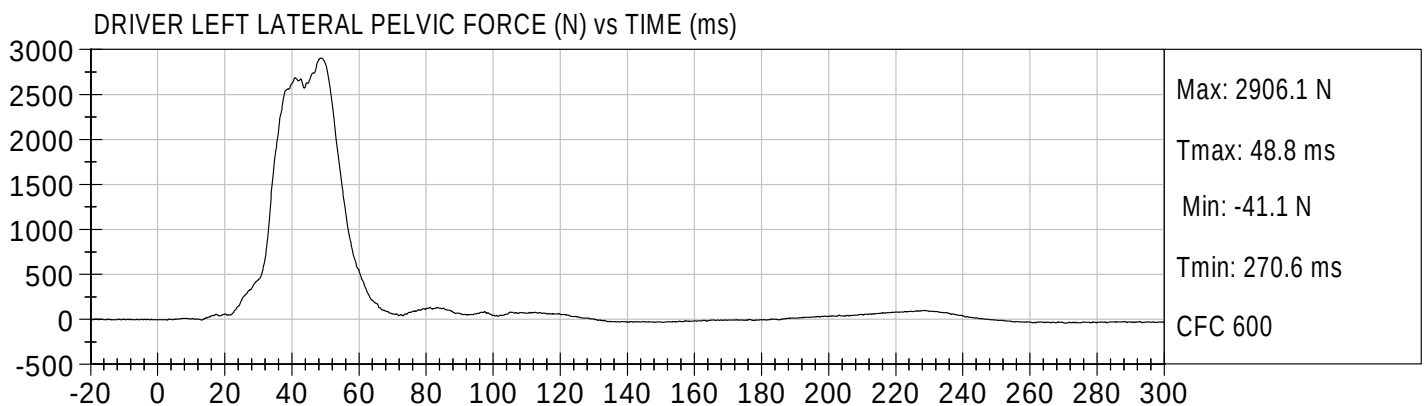
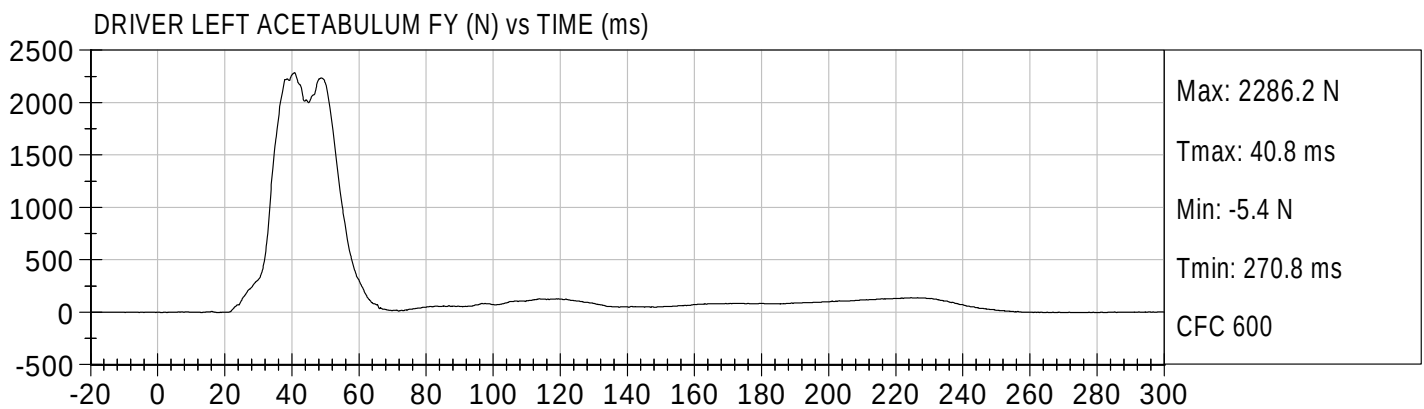
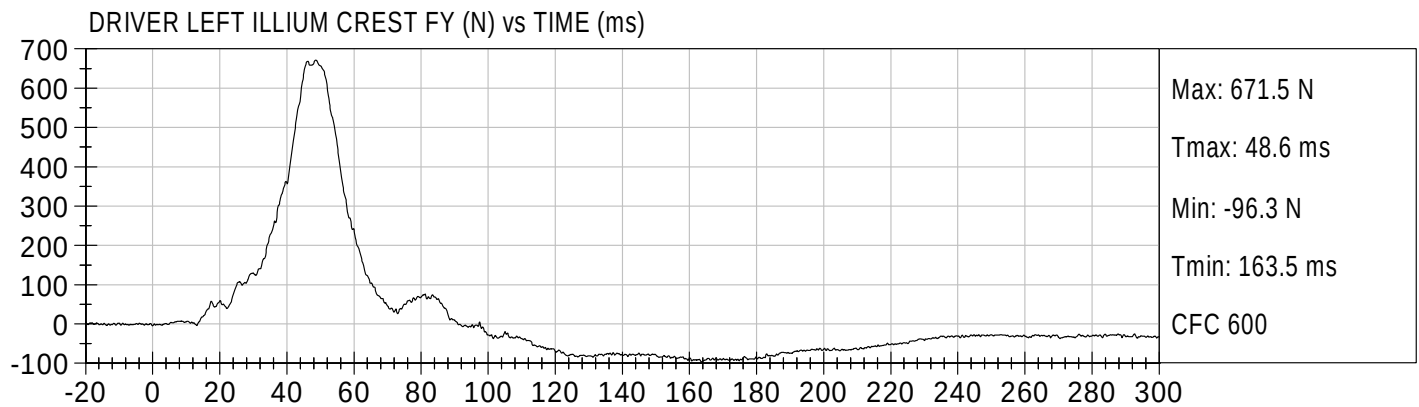
Vehicle CG Acceleration (Z)

Vehicle CG Angular Rate About X (Roll)

Vehicle CG Angular Rate About Y (Pitch)
Vehicle CG Angular Rate About Z (Yaw)
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 H-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)
Driver Side Airbag Timing
Driver Side Curtain Airbag Timing – Not Installed
Load Cell Pole Barrier #1 Force (Y) – Not used
Load Cell Pole Barrier #2 Force (Y) – Not used
Load Cell Pole Barrier #3 Force (Y) – Not used
Load Cell Pole Barrier #4 Force (Y) – Not used
Load Cell Pole Barrier #5 Force (Y) – Not used
Load Cell Pole Barrier #6 Force (Y) – Not used
Load Cell Pole Barrier #7 Force (Y) – Not used
Load Cell Pole Barrier #8 Force (Y) – Not used







APPENDIX C

DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

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

ATD Serial No: 296

Test ID: D103301

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Peak Resultant Acceleration	G's	115 to 137	119	Pass
Peak Lateral Acceleration	G's	+/- 15	-6.3	Pass
Unimodal	N/A	<15%	Yes	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

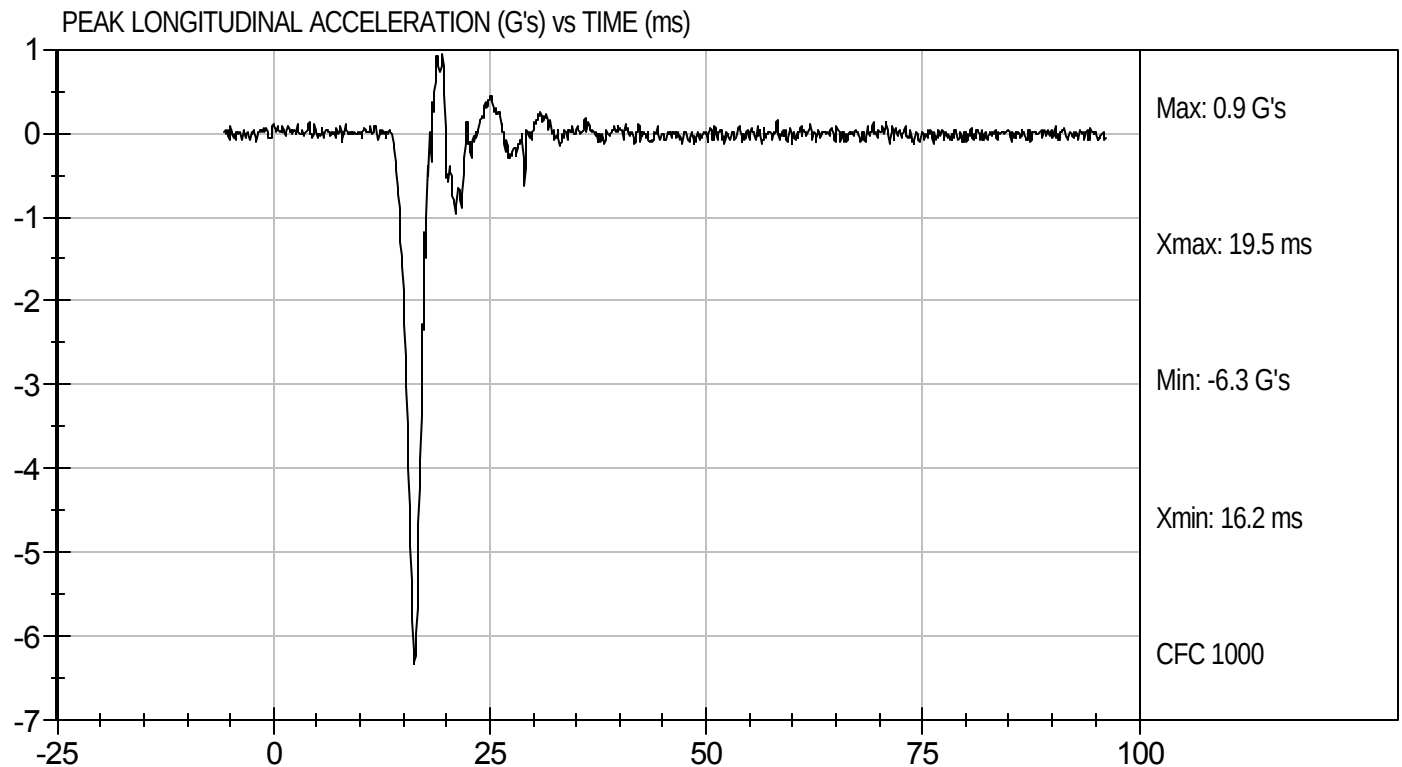
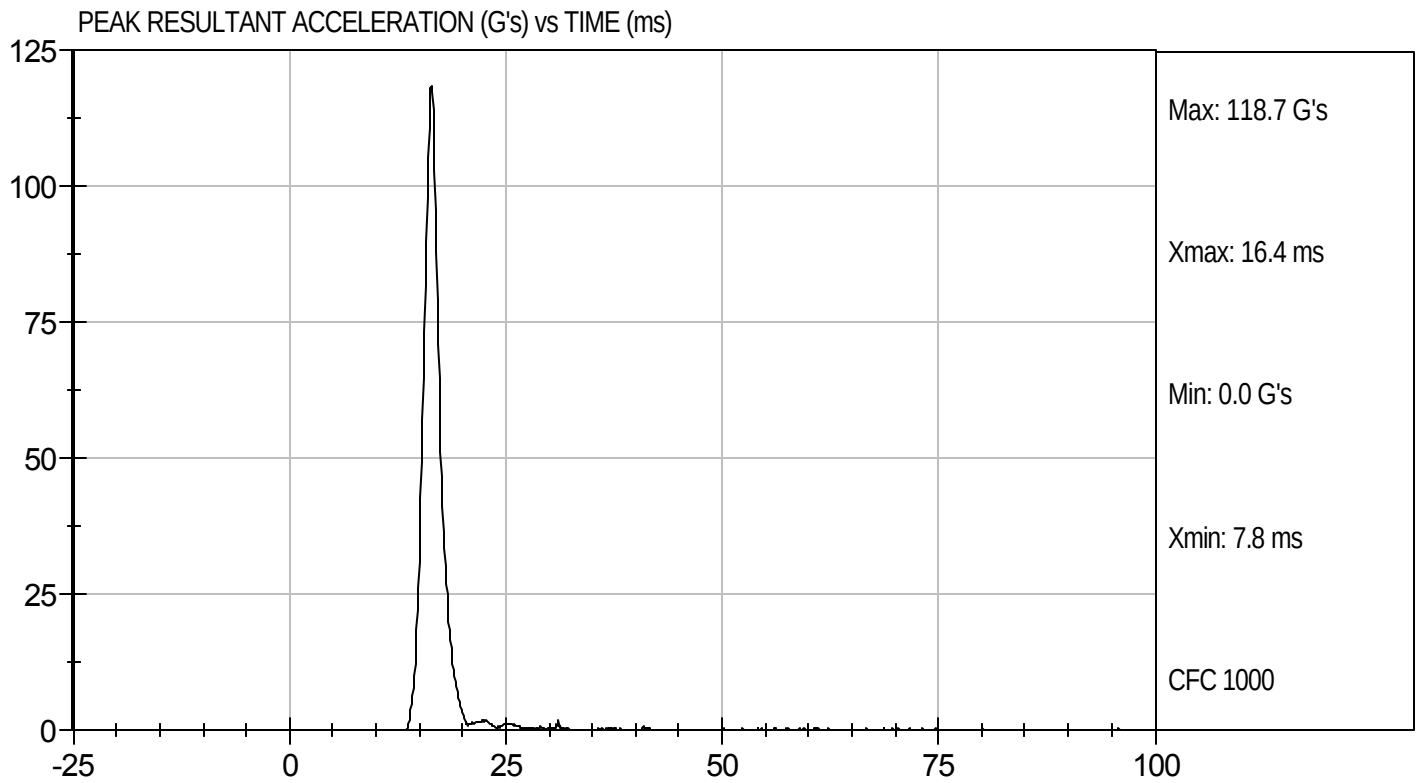
9/30/10
Test Date

David Winkelbauer
Approved By



Test Desc: Head Drop
Component ID: D103301

Test Date: 9/30/10
Velocity: 0 ft/s, 0 m/s

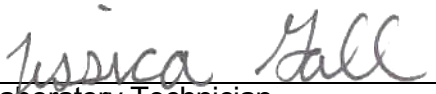


MGA RESEARCH CORPORATION
LATERAL NECK PENDULUM TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D103302

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	22.0	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	2.65	Pass
	15 ms	m/s	3.30 to 4.10	3.80	Pass
	20 ms	m/s	4.40 to 5.40	5.02	Pass
	25 ms	m/s	5.40 to 6.10	5.52	Pass
	25-100 ms	m/s	5.50 to 6.20	5.52	Pass
Maximum D-Plane Rotation		deg	71 to 81	73	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	61	Pass
Maximum Occipital Condyle Moment during Rotation Interval Nm			-44 to -36	-44	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	116	Pass
Overall Test Results				Pass	


 Laboratory Technician

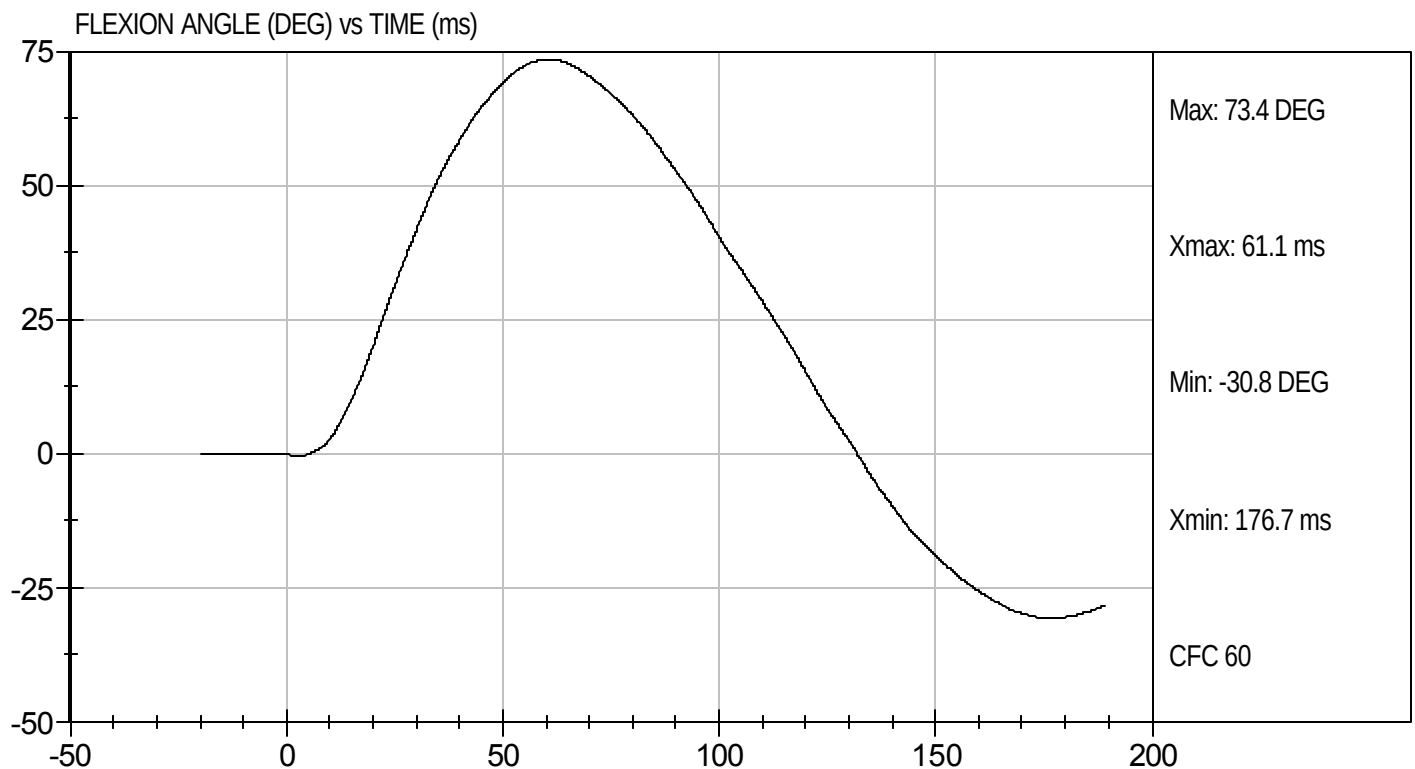
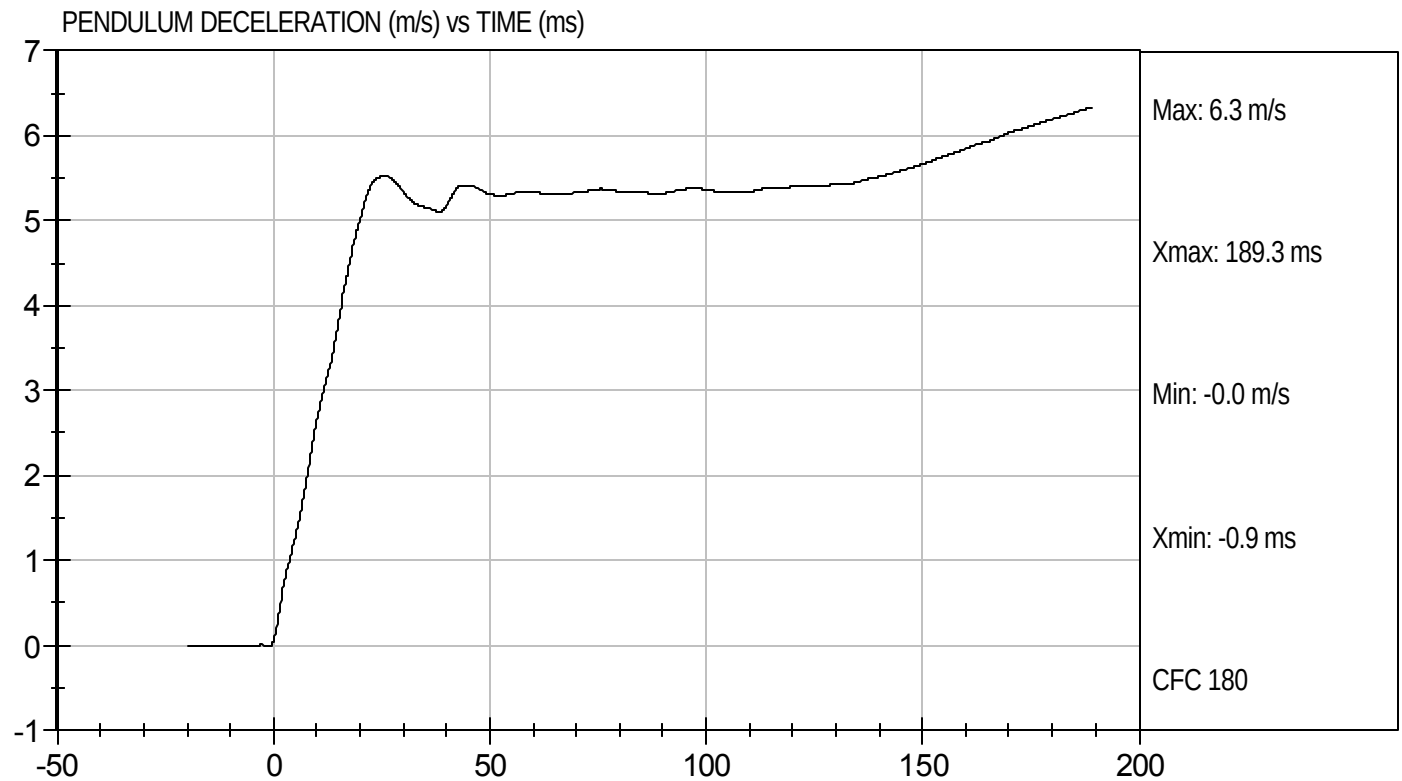
9/30/10
 Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D103302

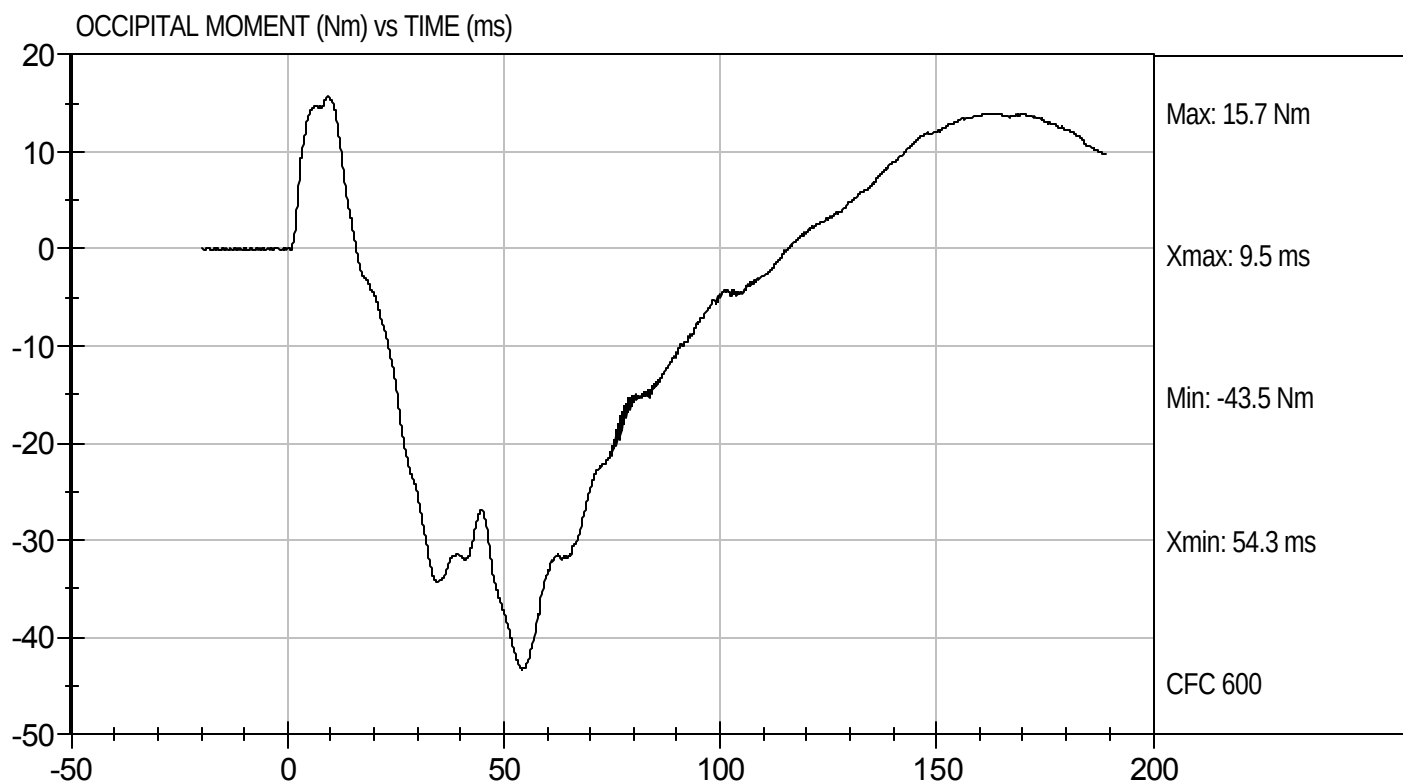
Test Date: 9/30/10
Velocity: 18.32 ft/s, 5.58 m/s





Test Desc: Neck Bending
Component ID: D103302

Test Date: 9/30/10
Velocity: 18.32 ft/s, 5.58 m/s



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

ATD Serial No: 296

Test ID: D103303

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	46	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	13 to 18	15	Pass
Shoulder Displacement	mm	28 to 37	29	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	17	Pass
Overall Test Results				Pass


Laboratory Technician

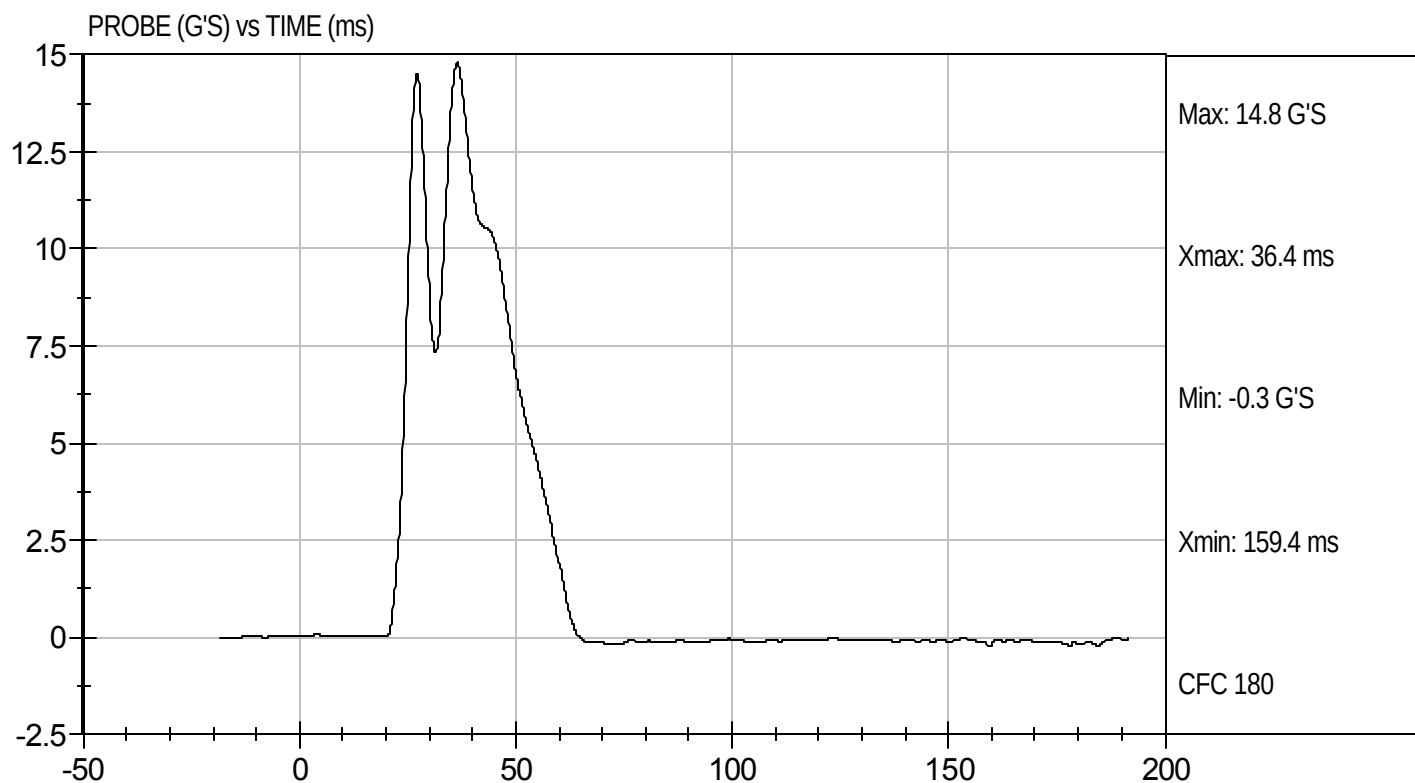
9/30/10
Test Date


Approved By



Test Desc: Shoulder Impact
Component ID: D103303

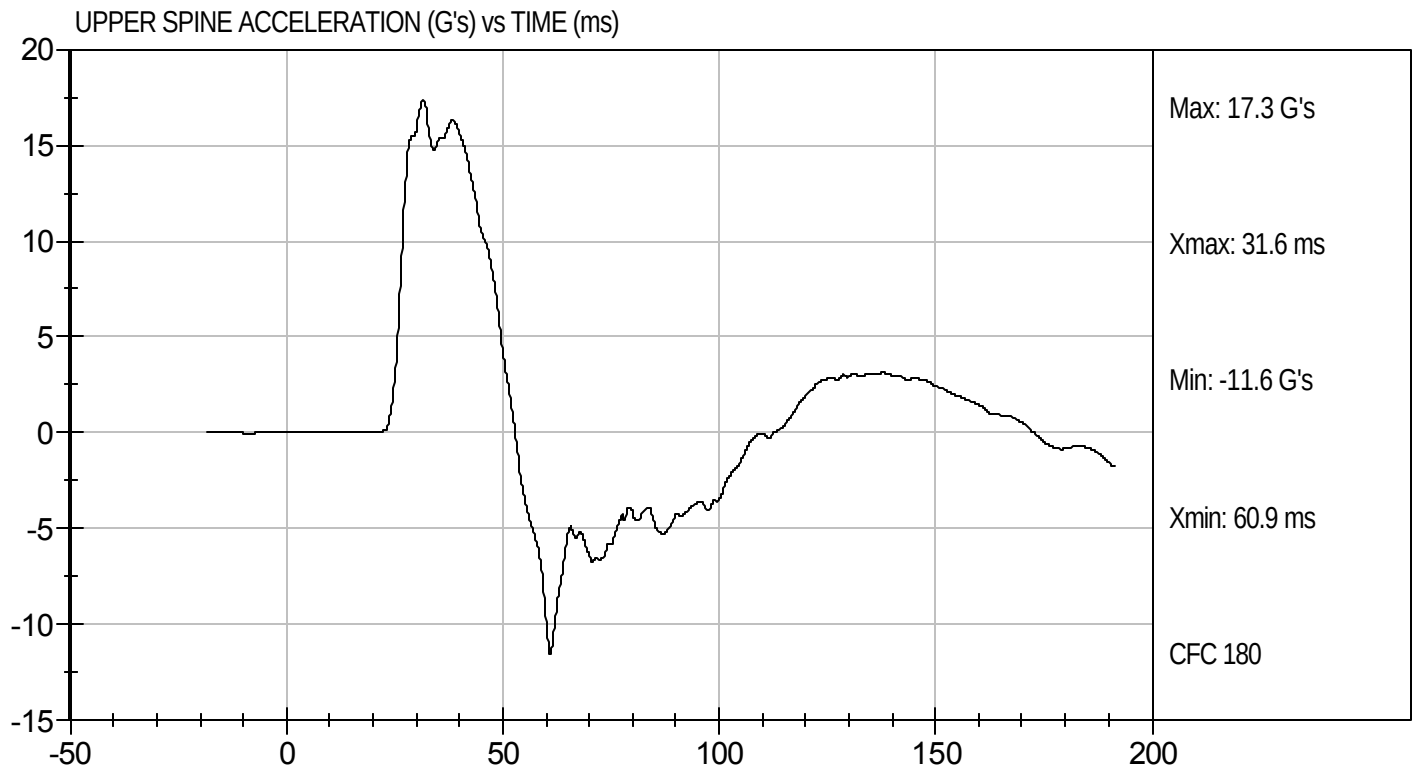
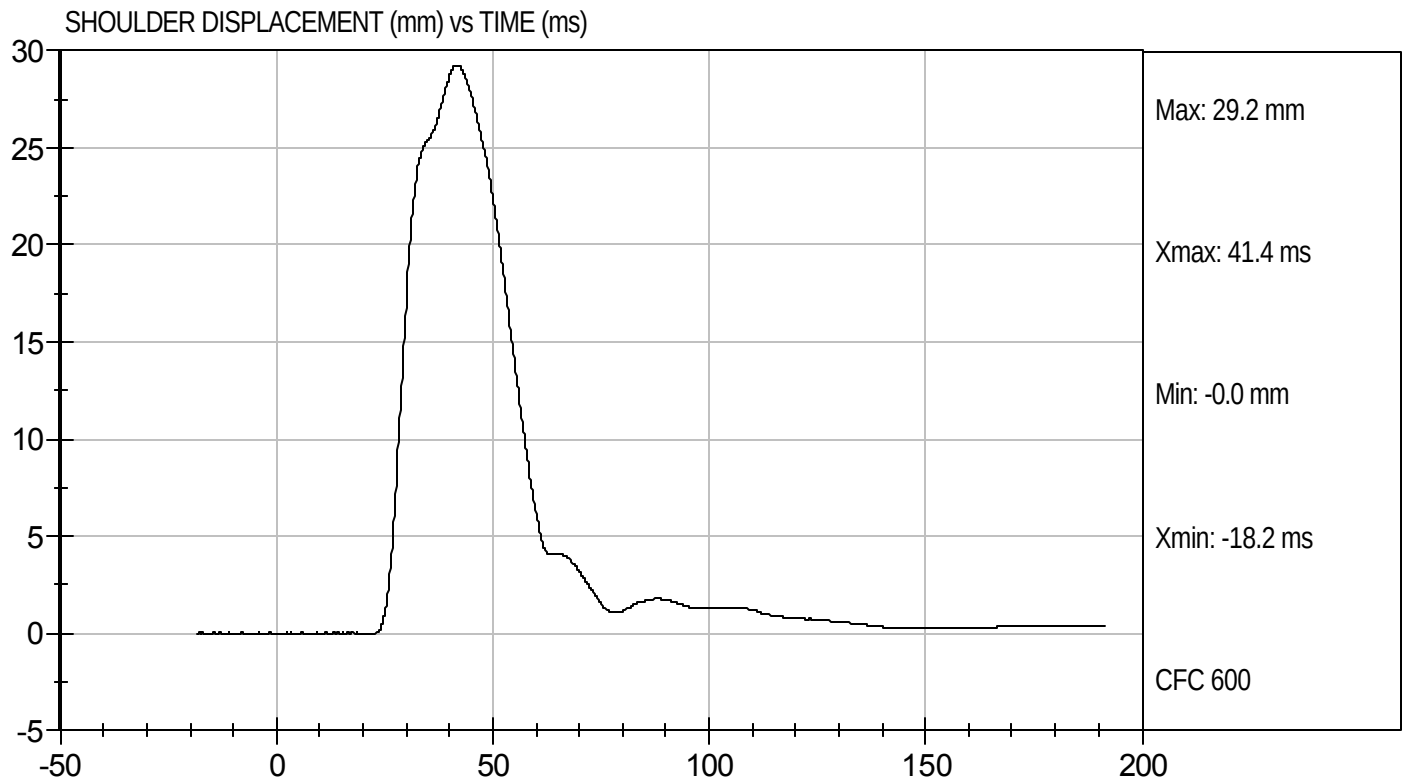
Test Date: 9/30/10
Velocity: 14.24 ft/s, 4.34 m/s





Test Desc: Shoulder Impact
Component ID: D103303

Test Date: 9/30/10
Velocity: 14.24 ft/s, 4.34 m/s



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

ATD Serial No: 296

Test I.D: D103304

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	46	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	36	Pass
Upper Rib Displacement	mm	25 to 32	27	Pass
Middle Rib Displacement	mm	30 to 36	31	Pass
Lower Rib Displacement	mm	32 to 38	33	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	37	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	31	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

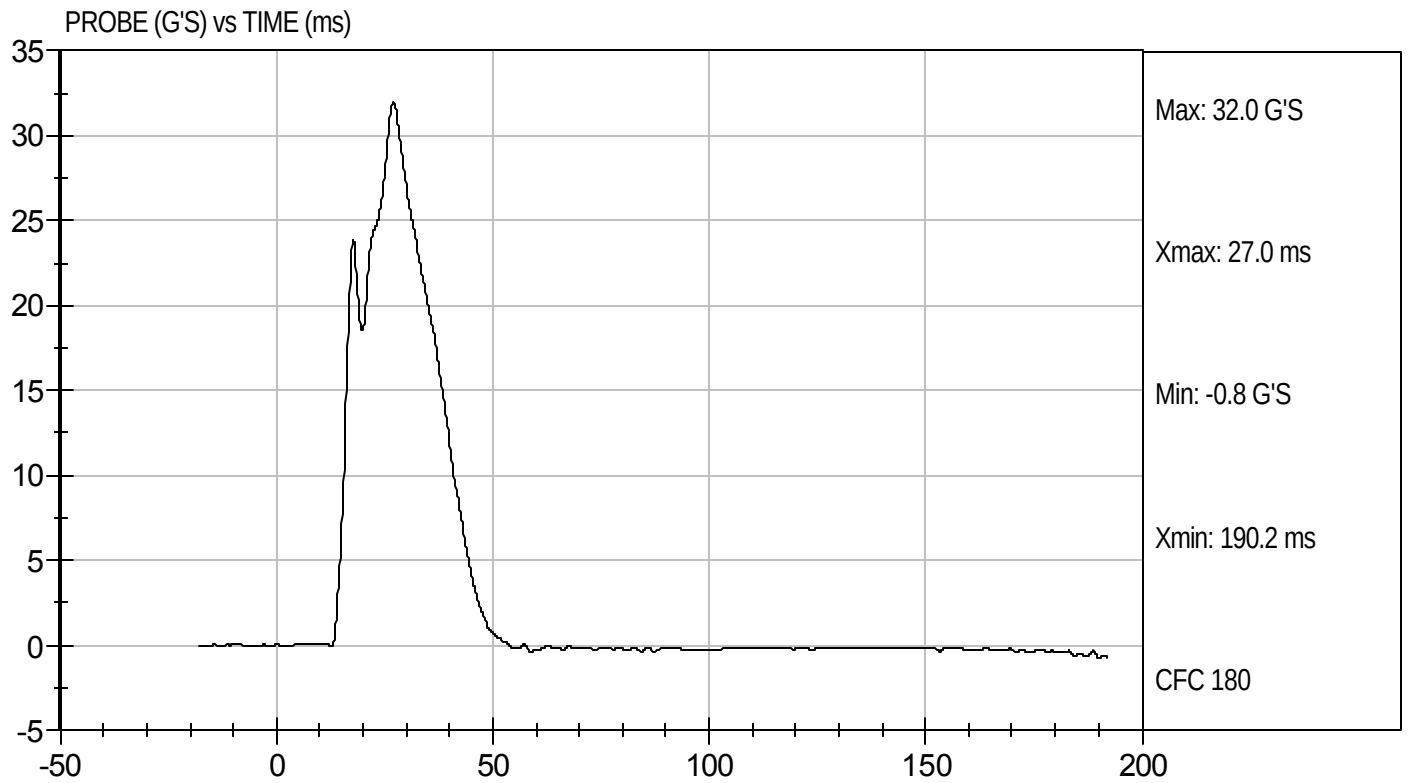
9/30/10
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax With Arm
Component ID: D103304

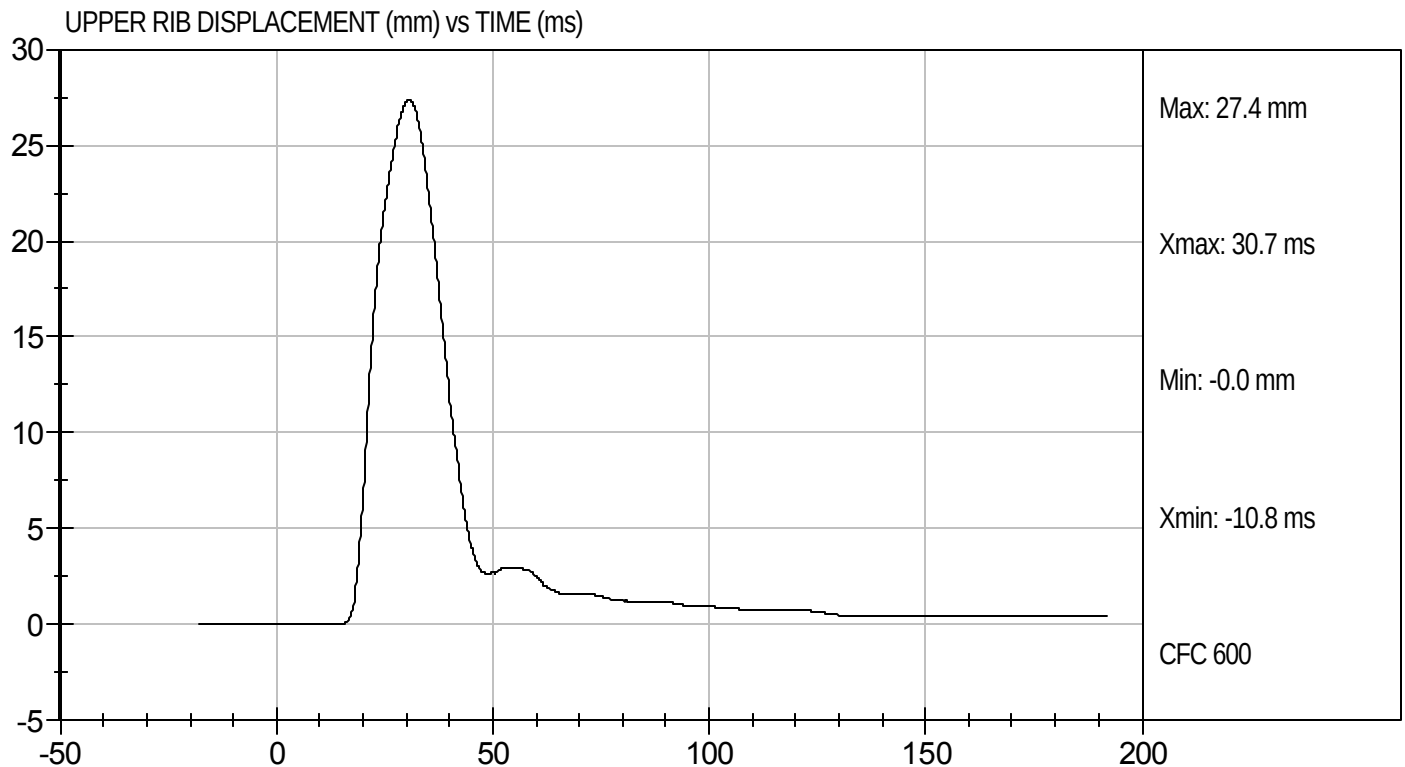
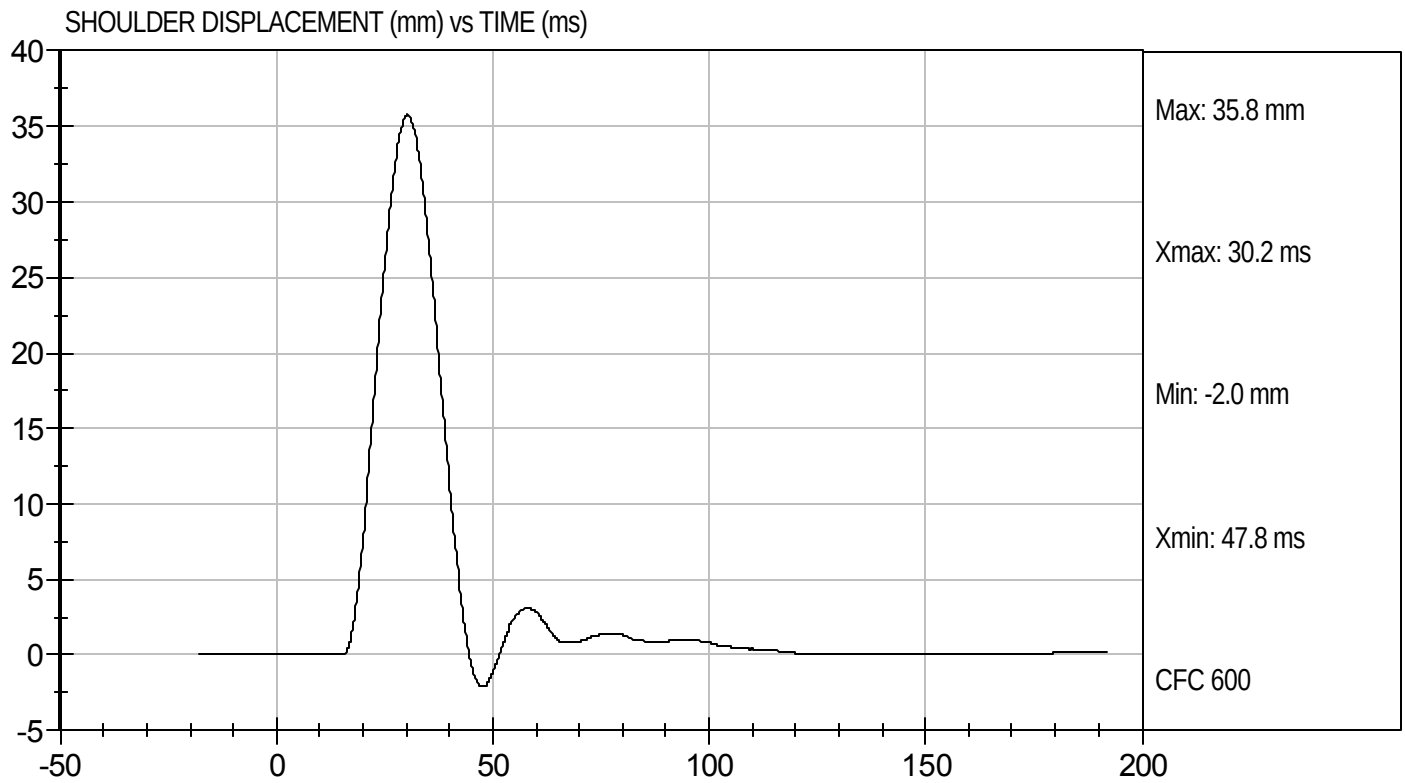
Test Date: 9/30/10
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D103304

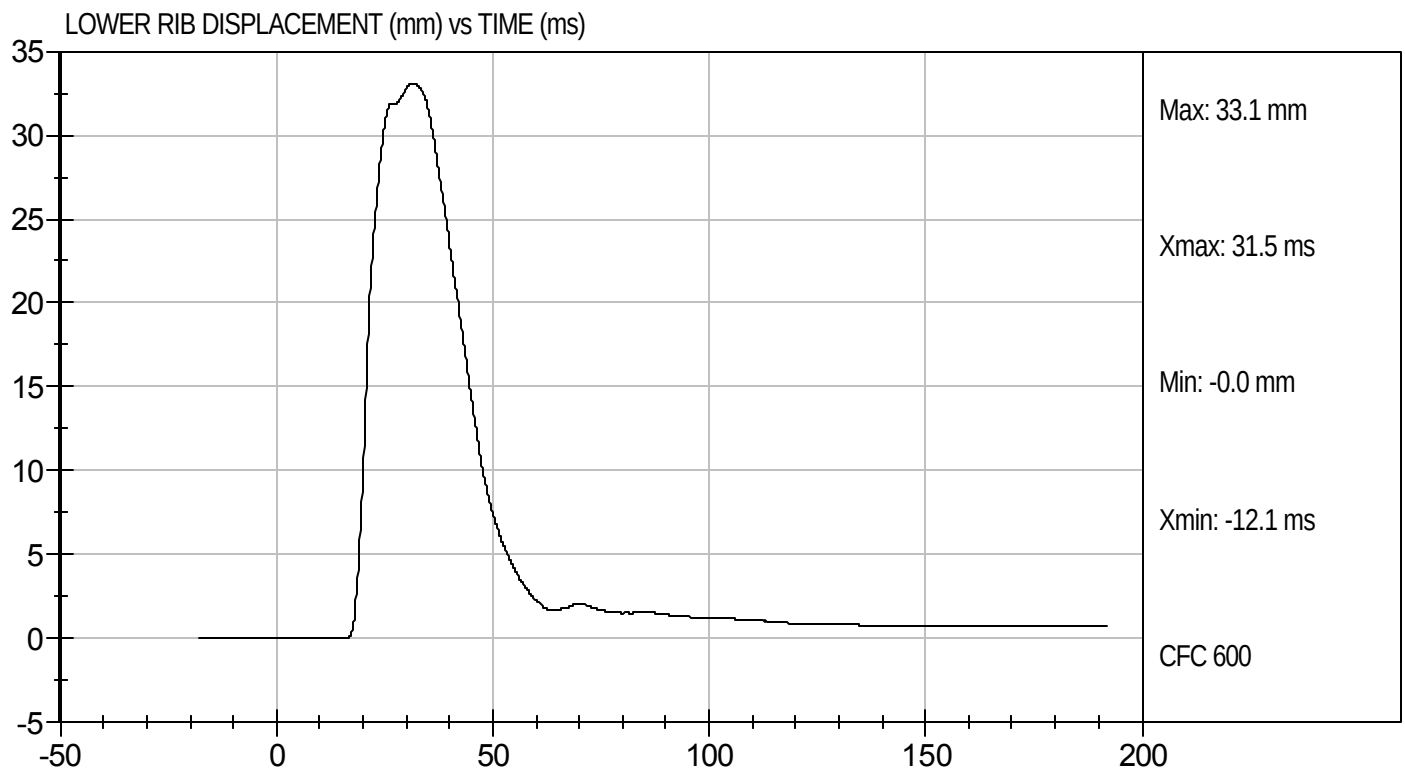
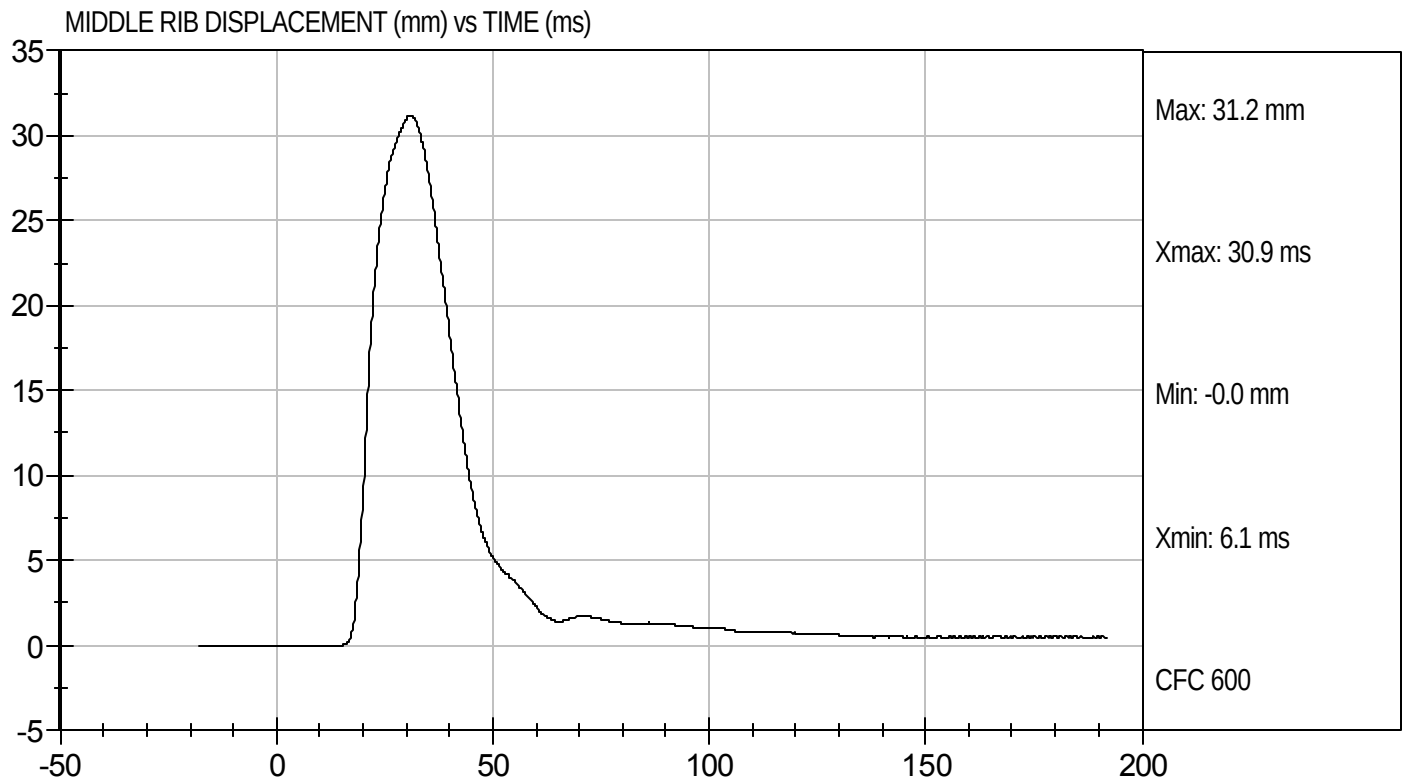
Test Date: 9/30/10
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D103304

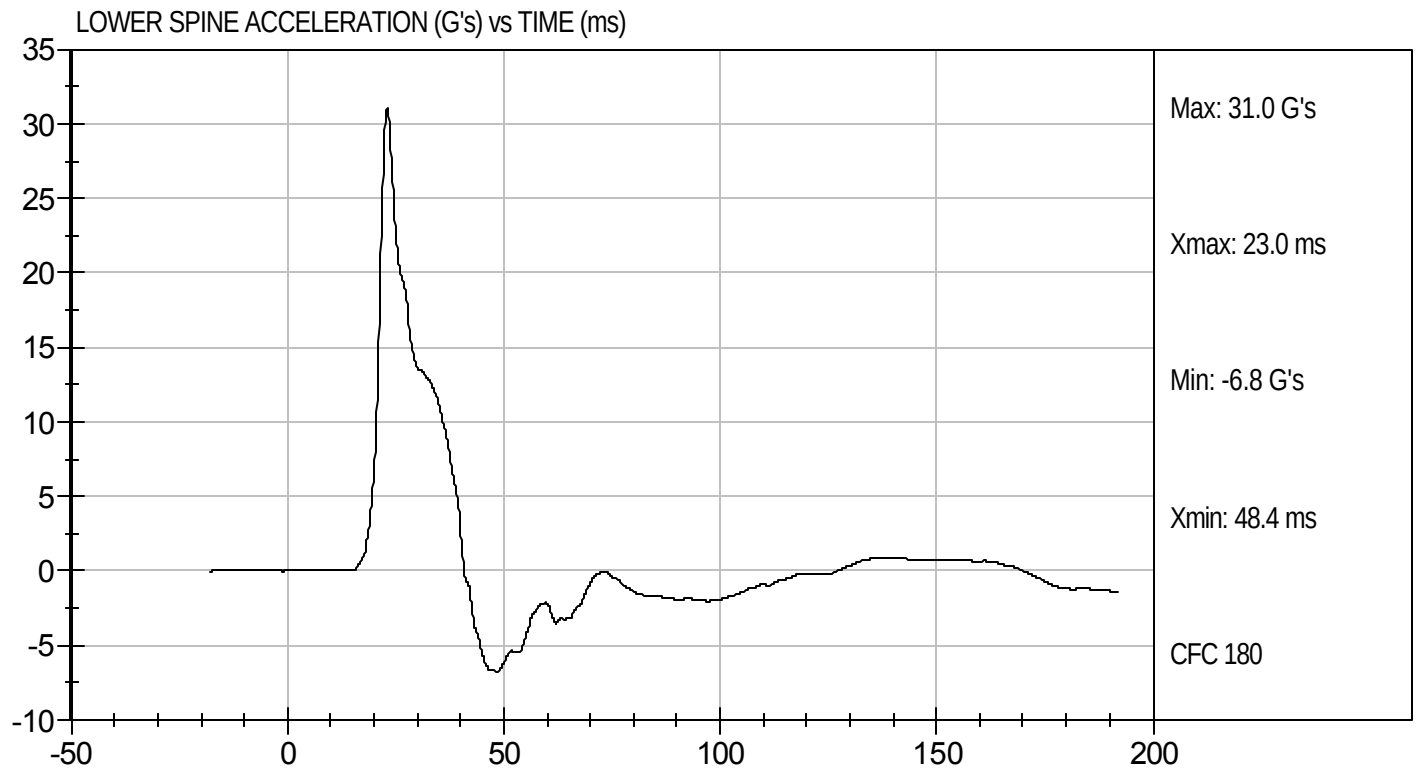
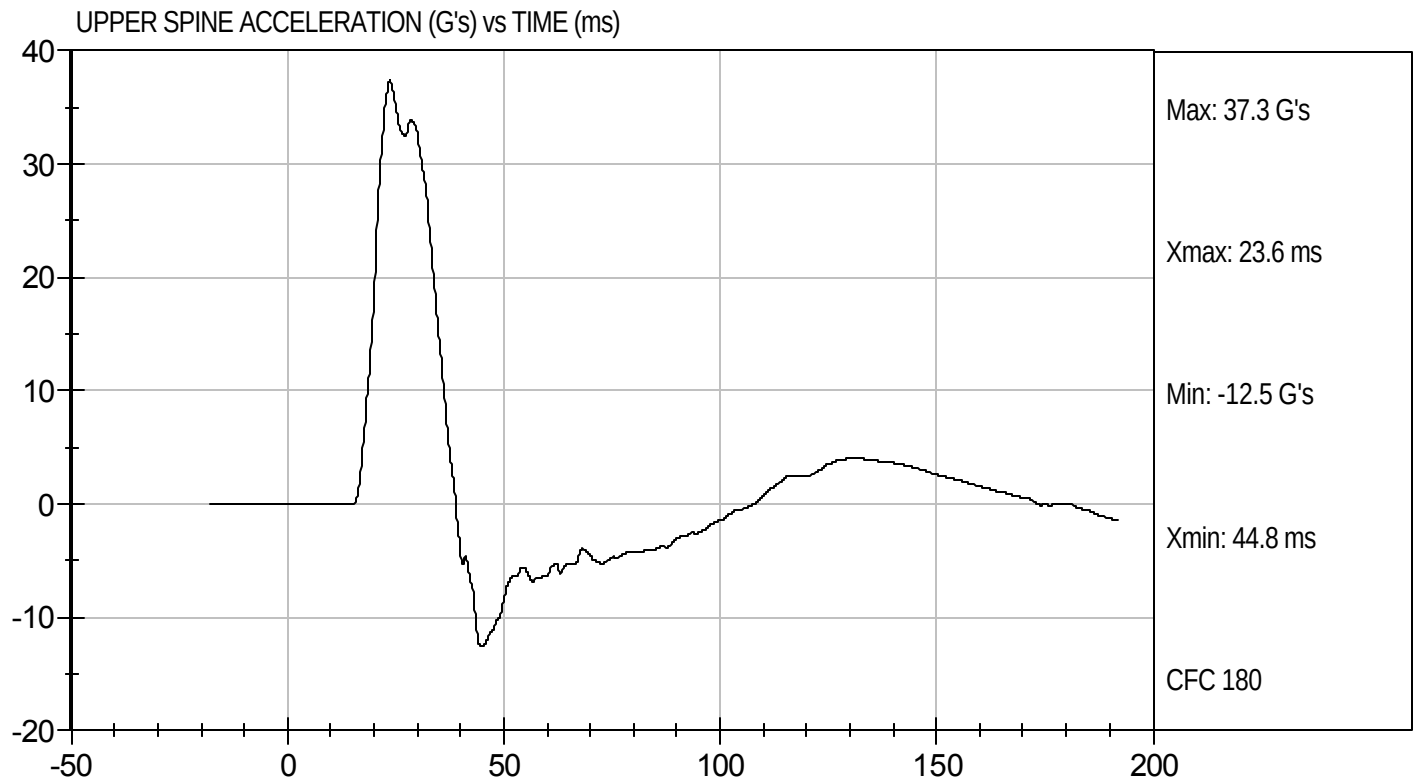
Test Date: 9/30/10
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D103304

Test Date: 9/30/10
Velocity: 22.22 ft/s, 6.77 m/s

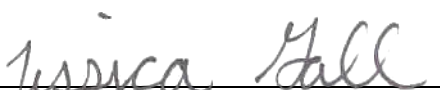


MGA RESEARCH CORPORATION
THORAX (WITHOUT ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D103305

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	46	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	37	Pass
Middle Rib Displacement	mm	39 to 45	41	Pass
Lower Rib Displacement	mm	35 to 43	38	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	14	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	8	Pass
Overall Test Results				Pass


Laboratory Technician

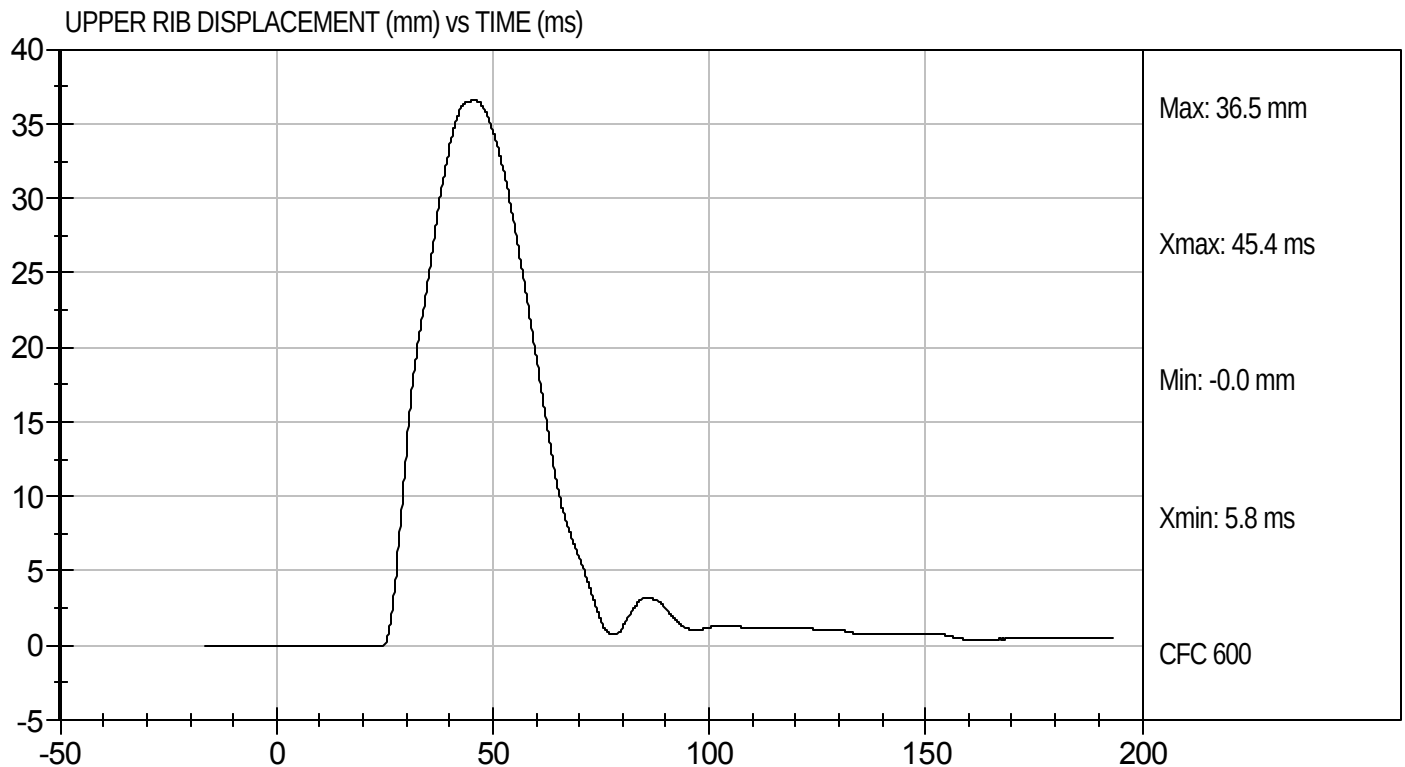
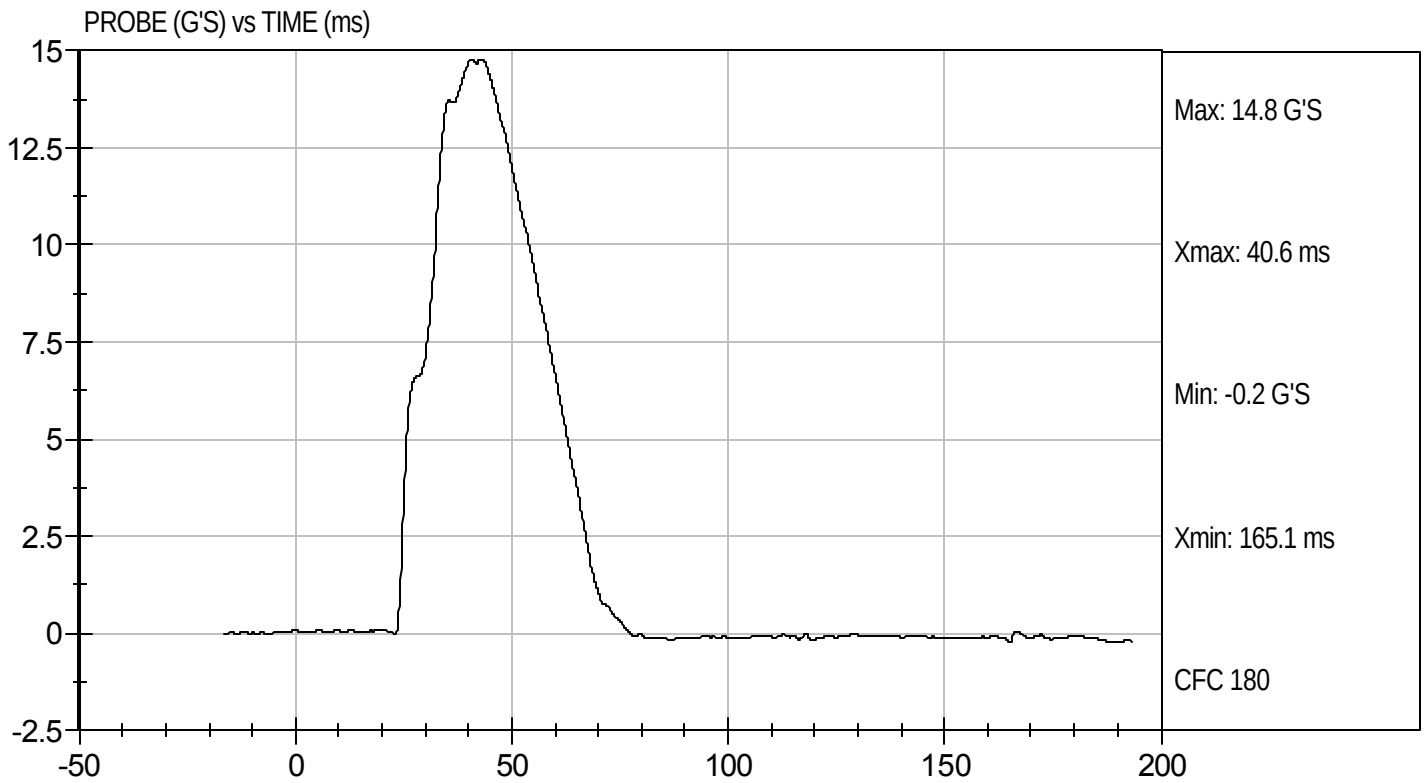
9/30/10
Test Date


Approved By



Test Desc: Thorax Without Arm
Component ID: D103305

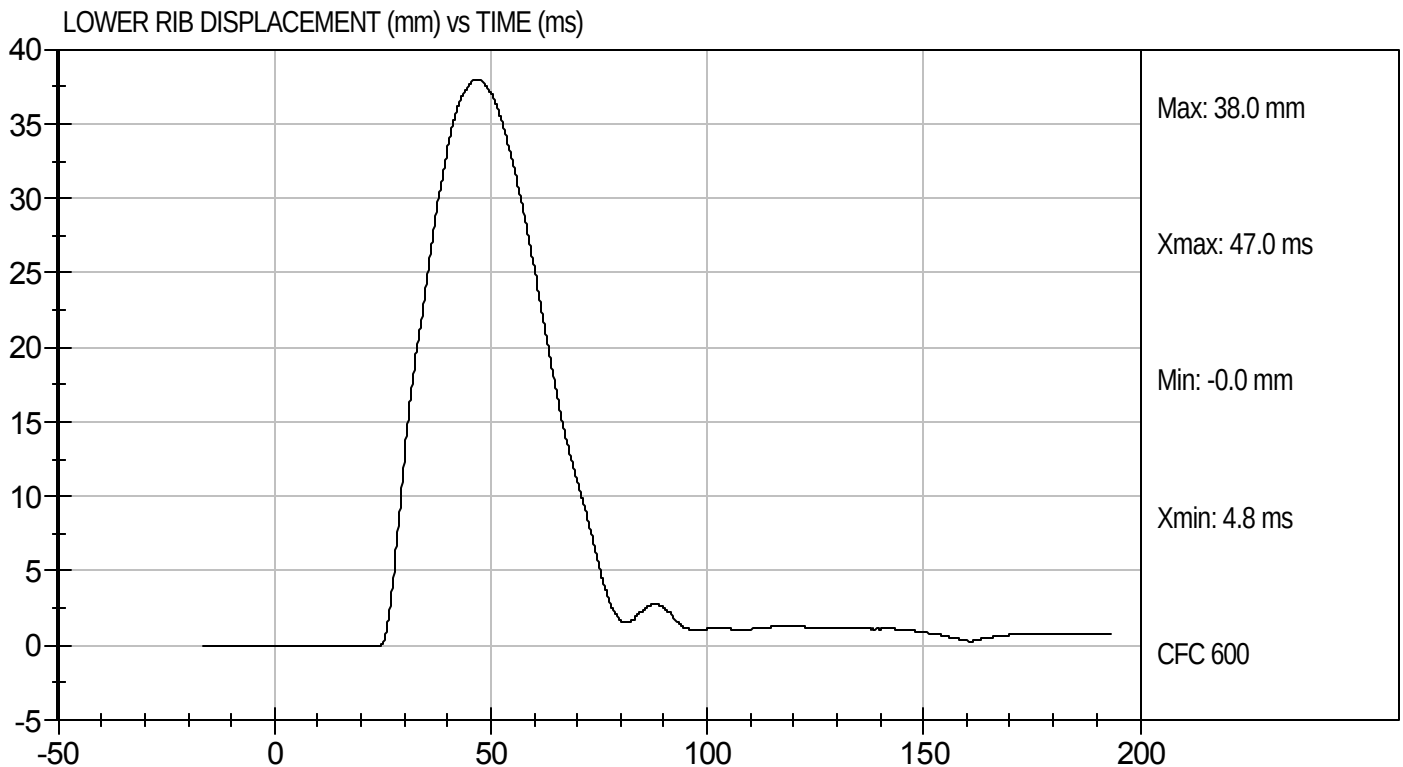
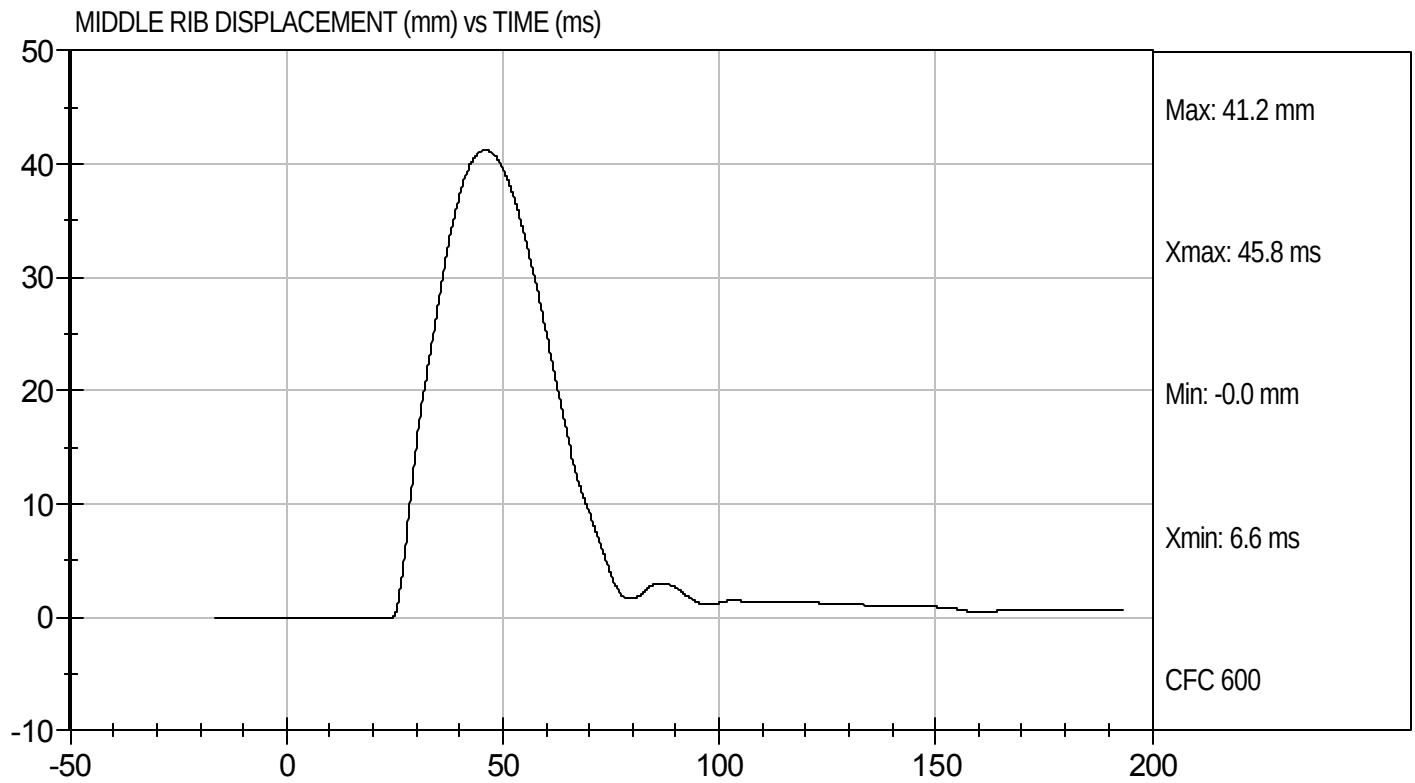
Test Date: 9/30/10
Velocity: 14.36 ft/s, 4.38 m/s





Test Desc: Thorax Without Arm
Component ID: D103305

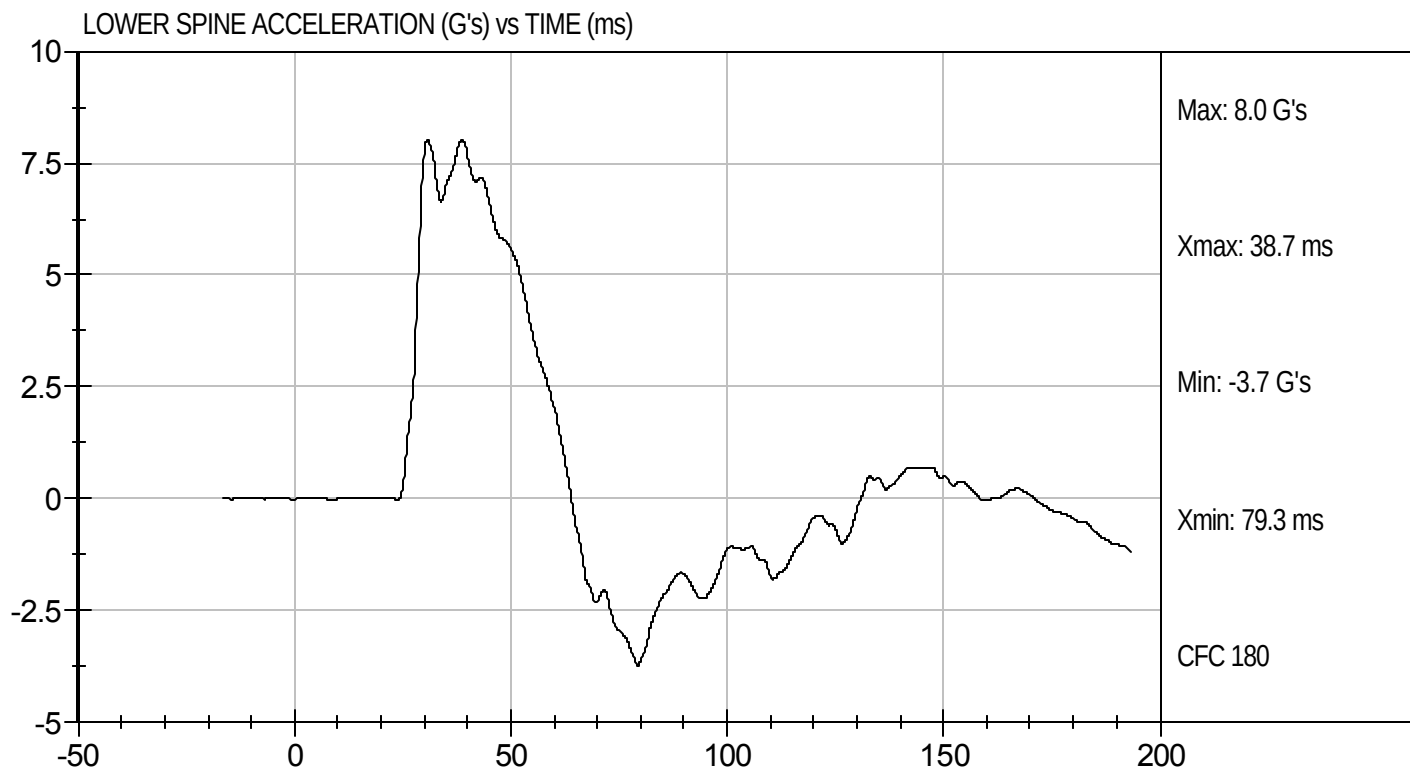
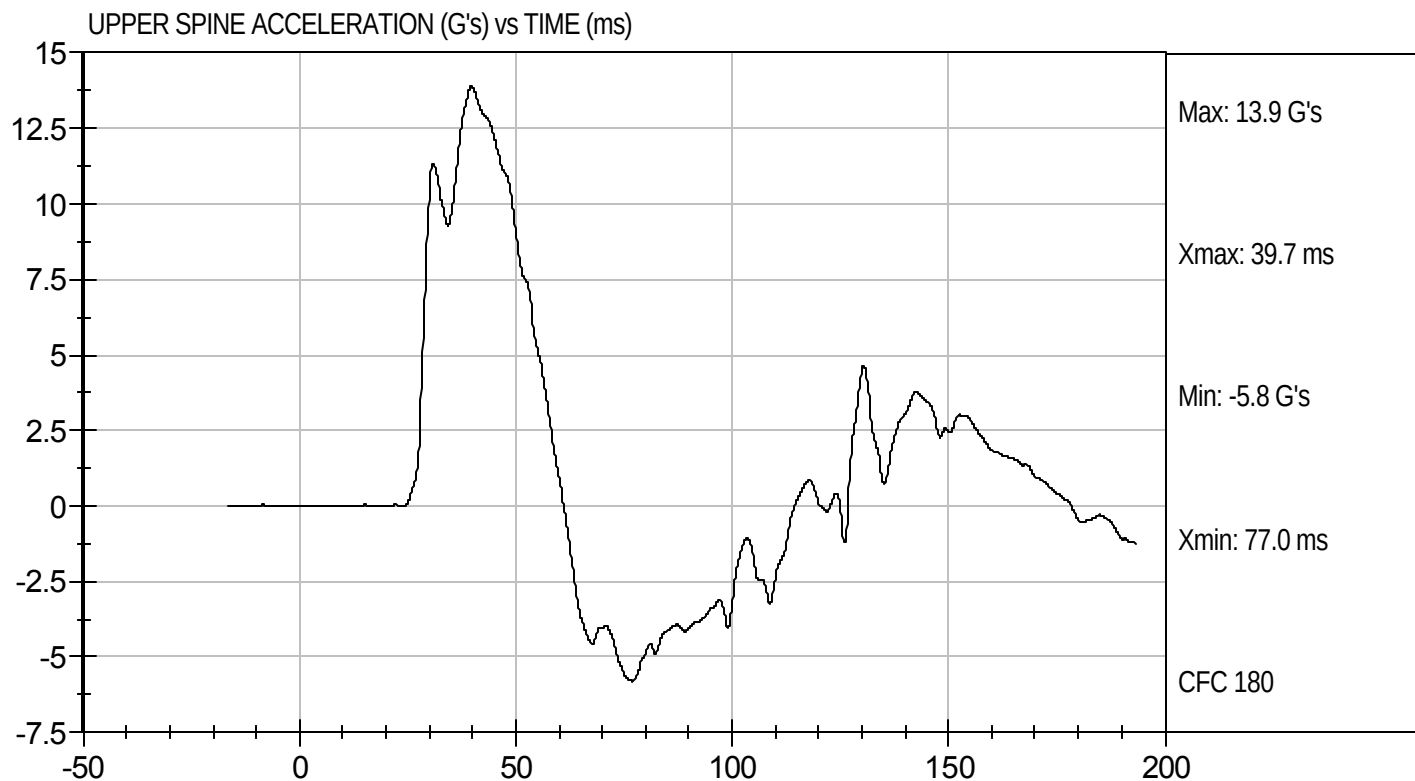
Test Date: 9/30/10
Velocity: 14.36 ft/s, 4.38 m/s





Test Desc: Thorax Without Arm
Component ID: D103305

Test Date: 9/30/10
Velocity: 14.36 ft/s, 4.38 m/s



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

ATD Serial No: 296

Test I.D: D103306

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	46	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Peak Impactor Acceleration	G's	12 to 16	14	Pass
Upper Rib Displacement	mm	36 to 47	39	Pass
Lower Rib Displacement	mm	33 to 44	38	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	10	Pass
Overall Test Results			Pass	


Laboratory Technician

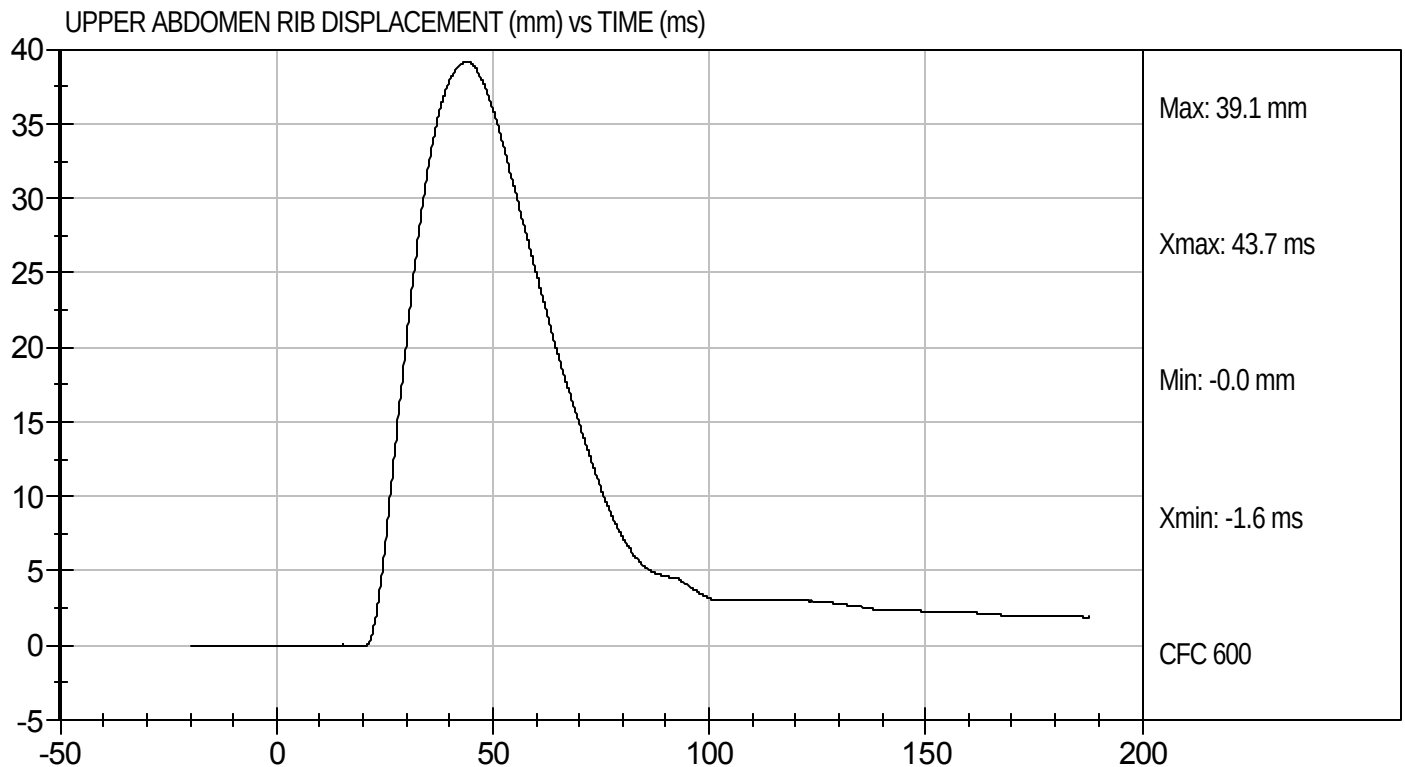
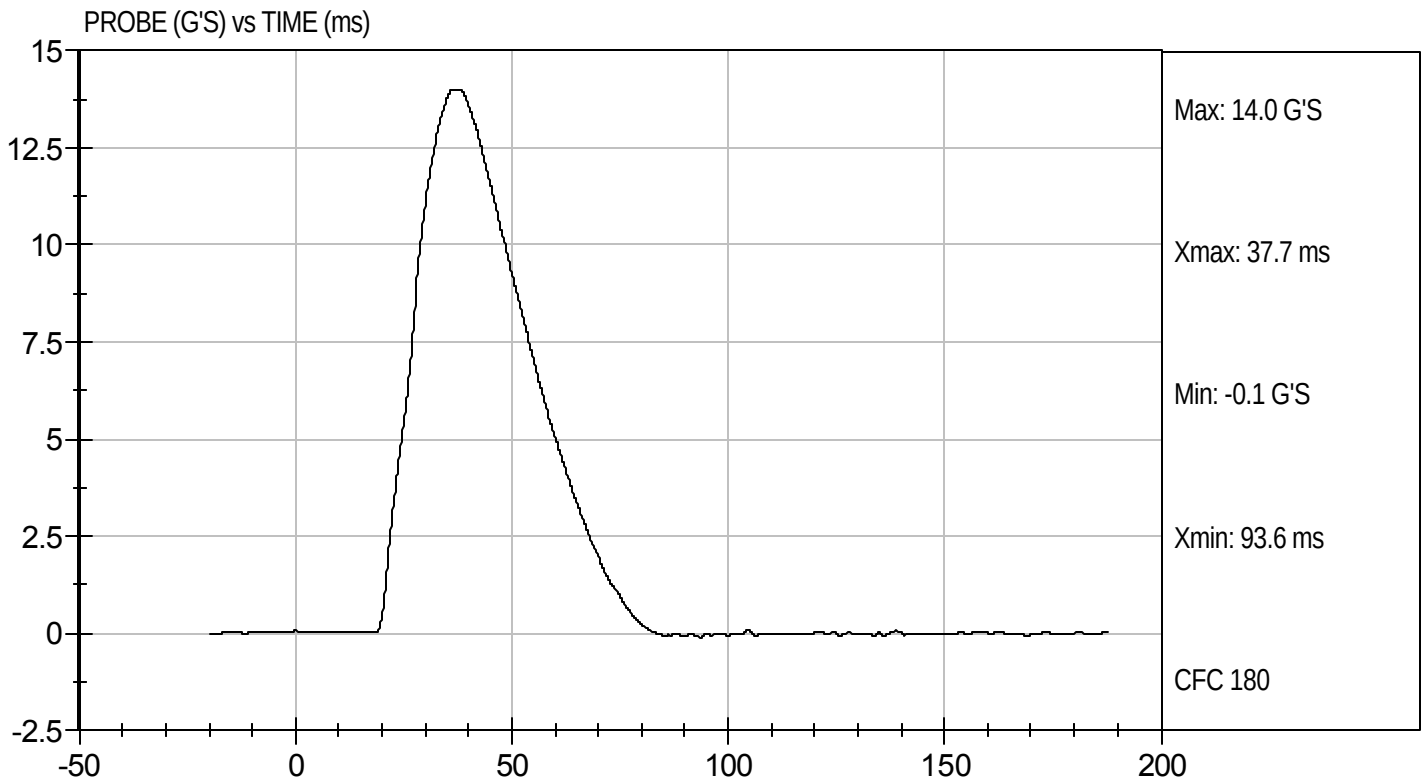
9/30/10
Test Date


Approved By



Test Desc: Abdomen Impact
Component ID: D103306

Test Date: 9/30/10
Velocity: 14.12 ft/s, 4.30 m/s

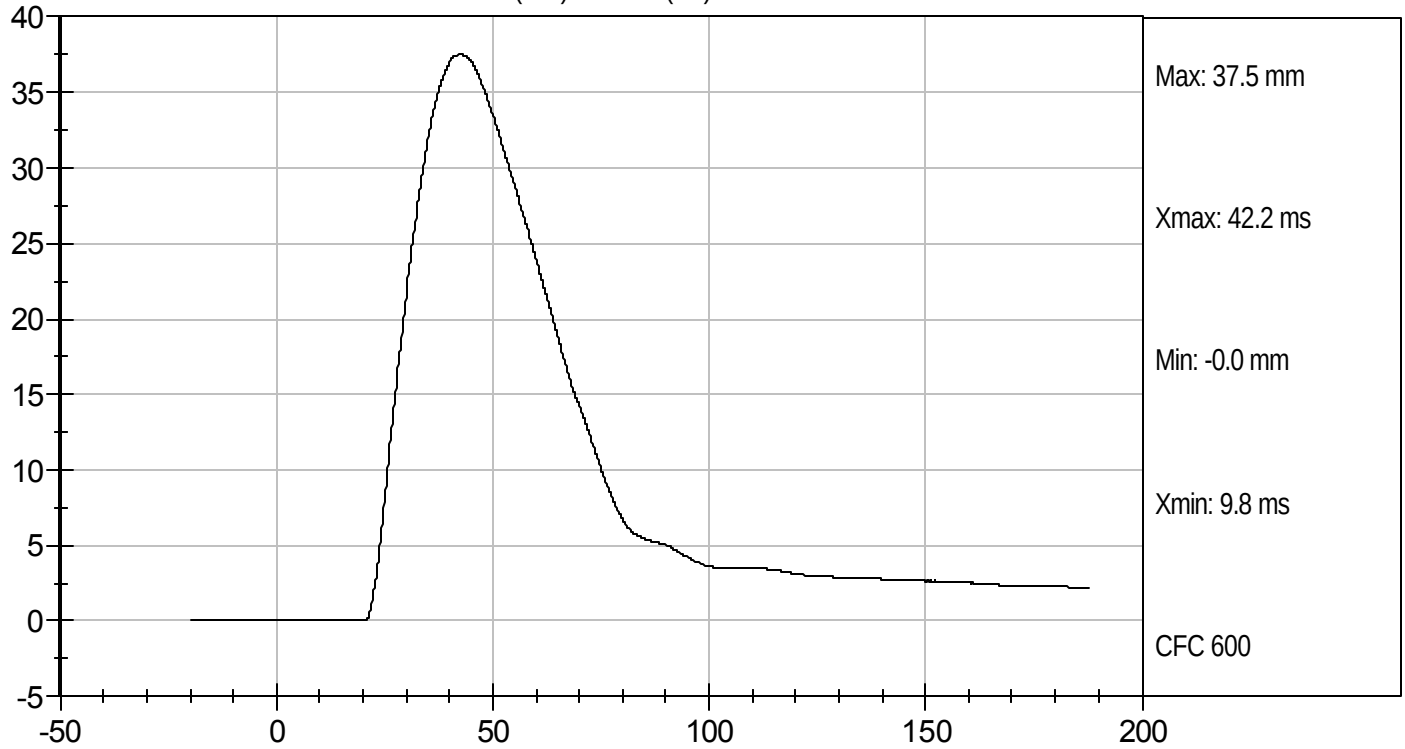




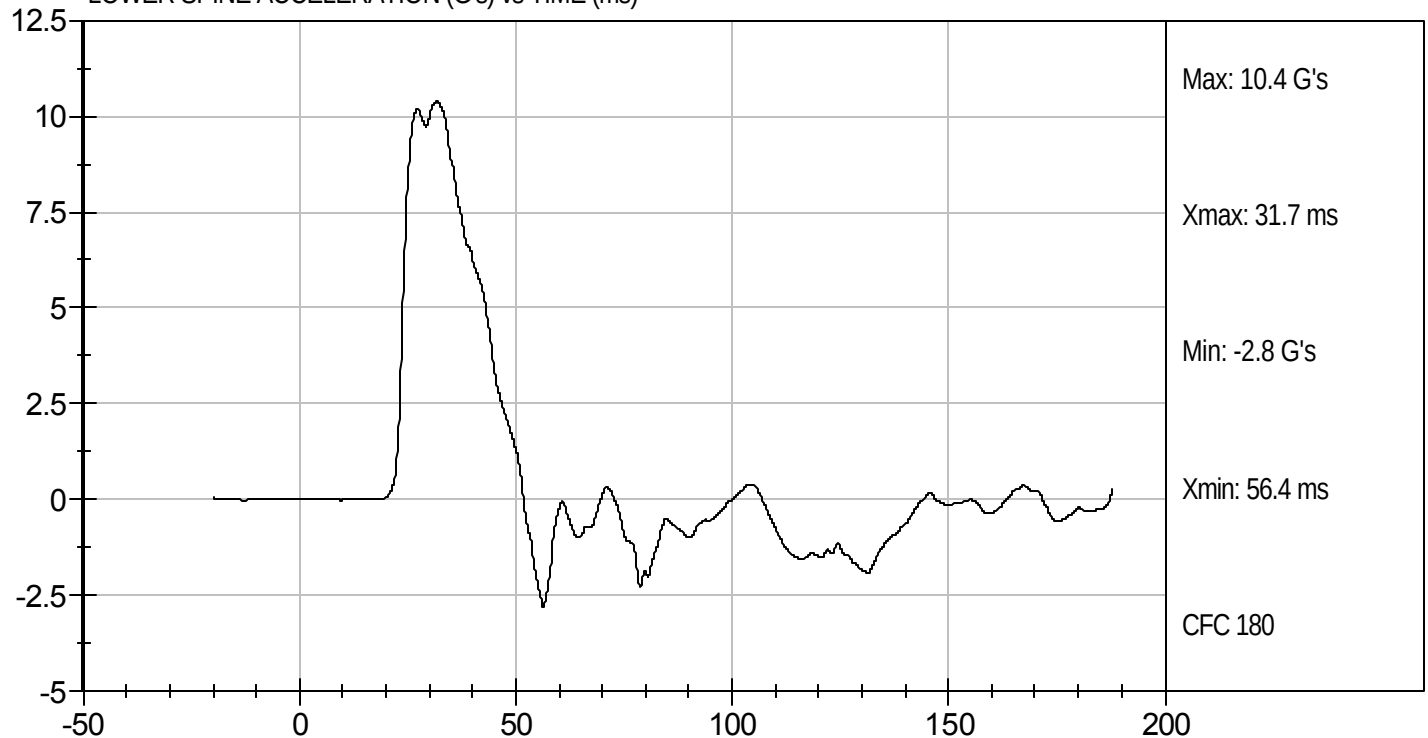
Test Desc: Abdomen Impact
Component ID: D103306

Test Date: 9/30/10
Velocity: 14.12 ft/s, 4.30 m/s

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



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



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

ATD Serial No: 296

Test I.D: D103307

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	46	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	4009	Pass
Overall Test Results				Pass


Laboratory Technician

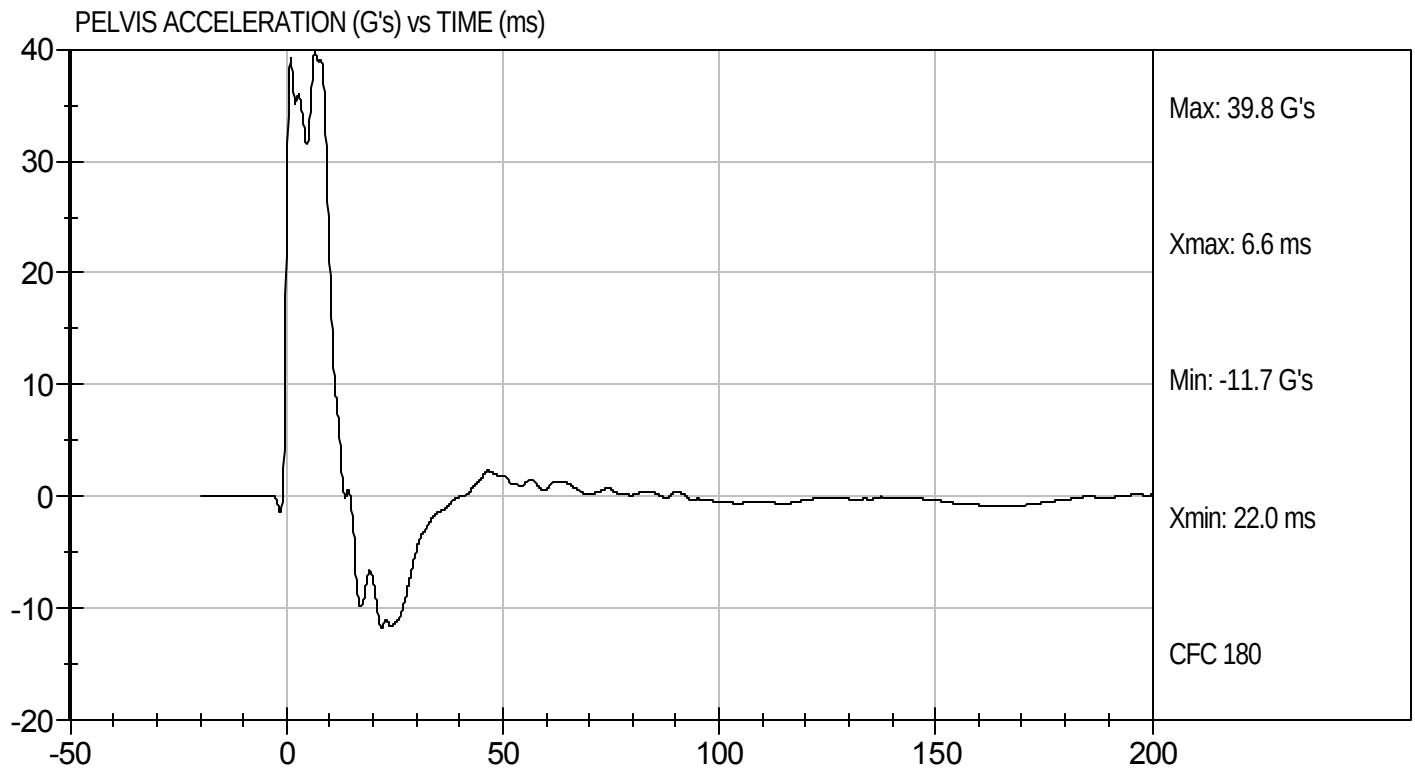
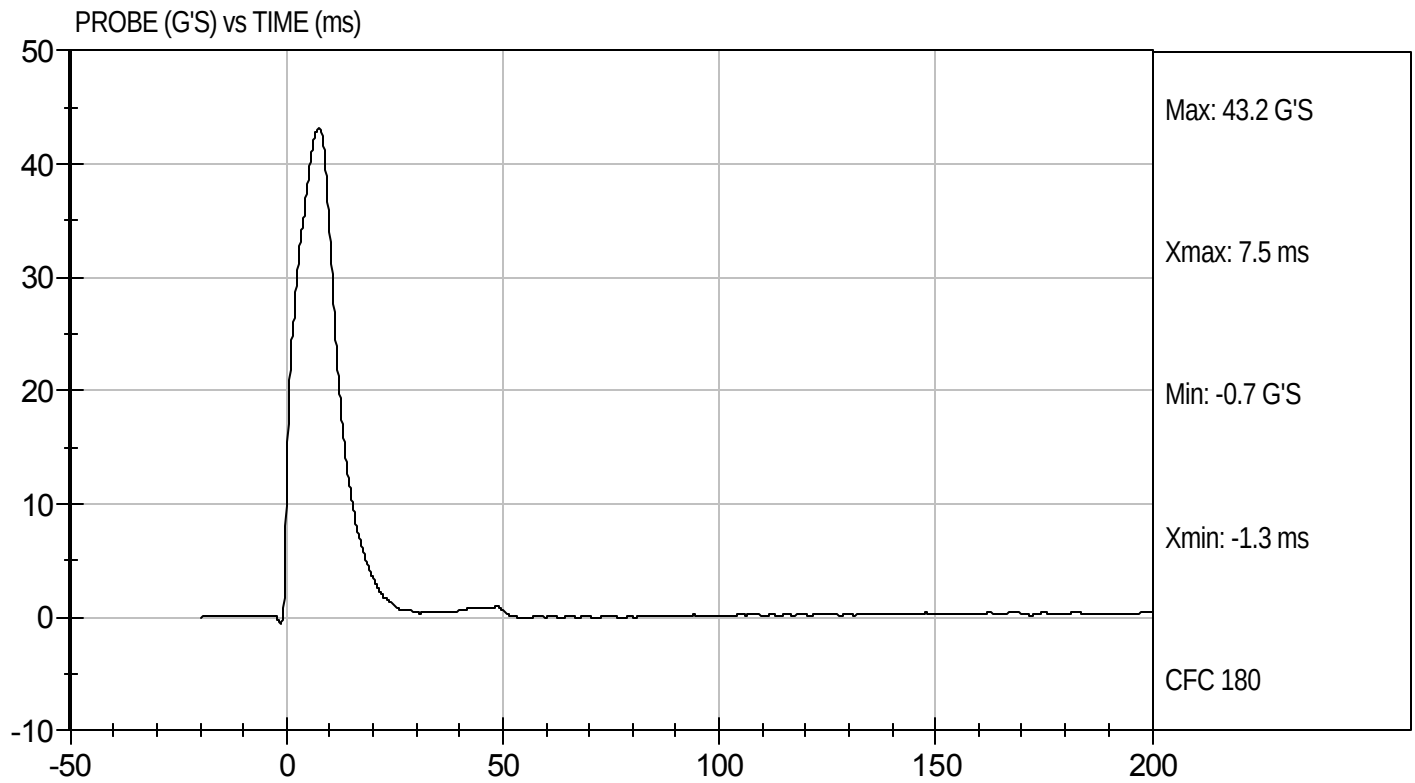
9/30/10
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D103307

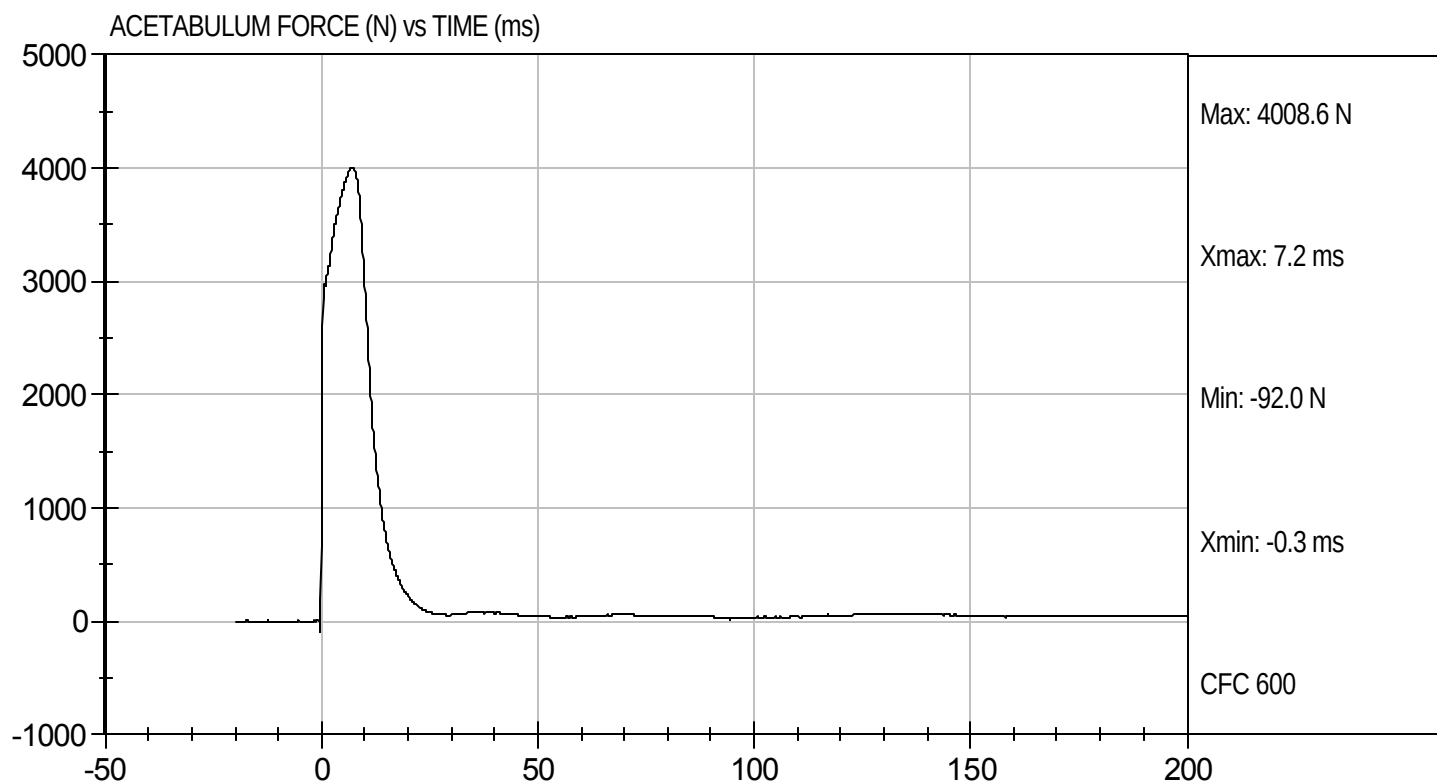
Test Date: 9/30/10
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Pelvis Impact
Component ID: D103307

Test Date: 9/30/10
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: D103308

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	46	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	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	4239	Pass
Overall Test Results			Pass	

Jessica Gall
Laboratory Technician

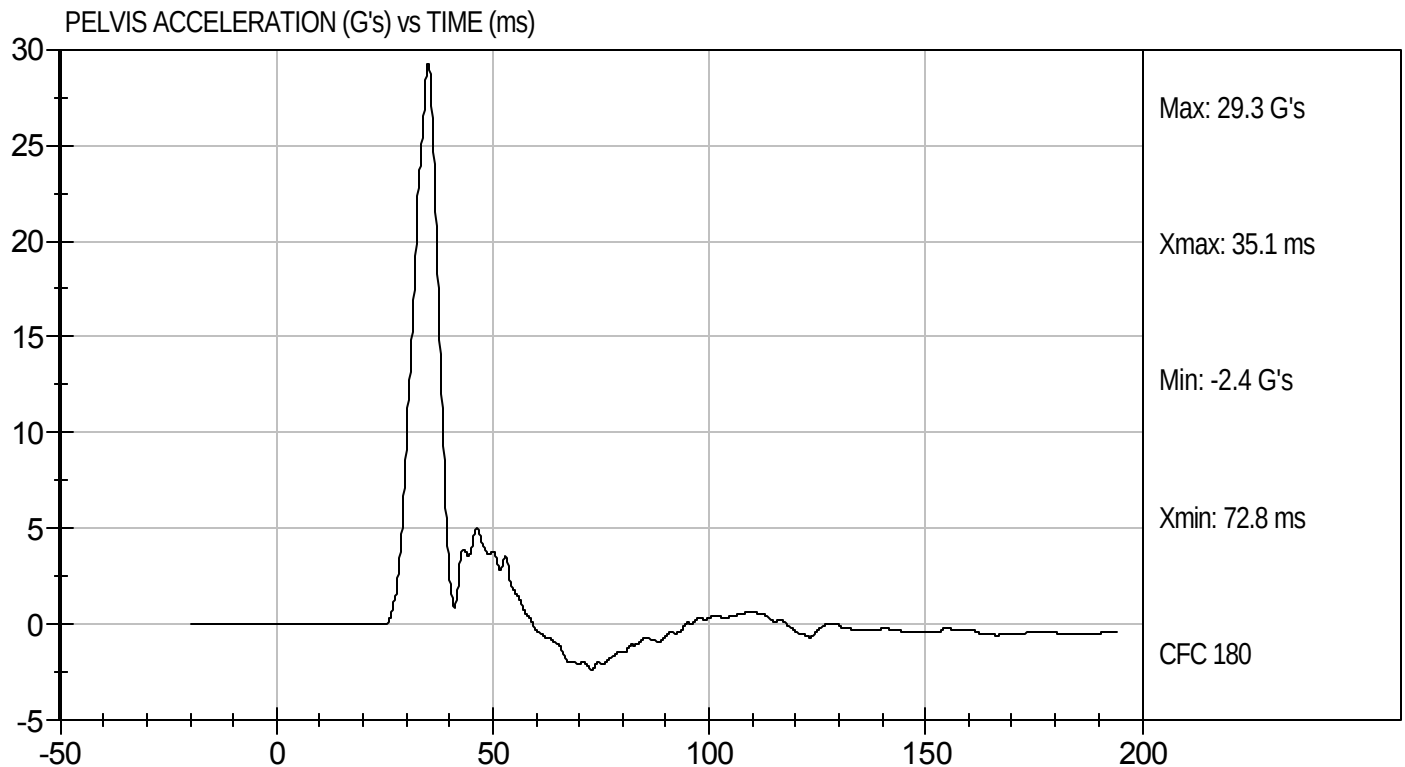
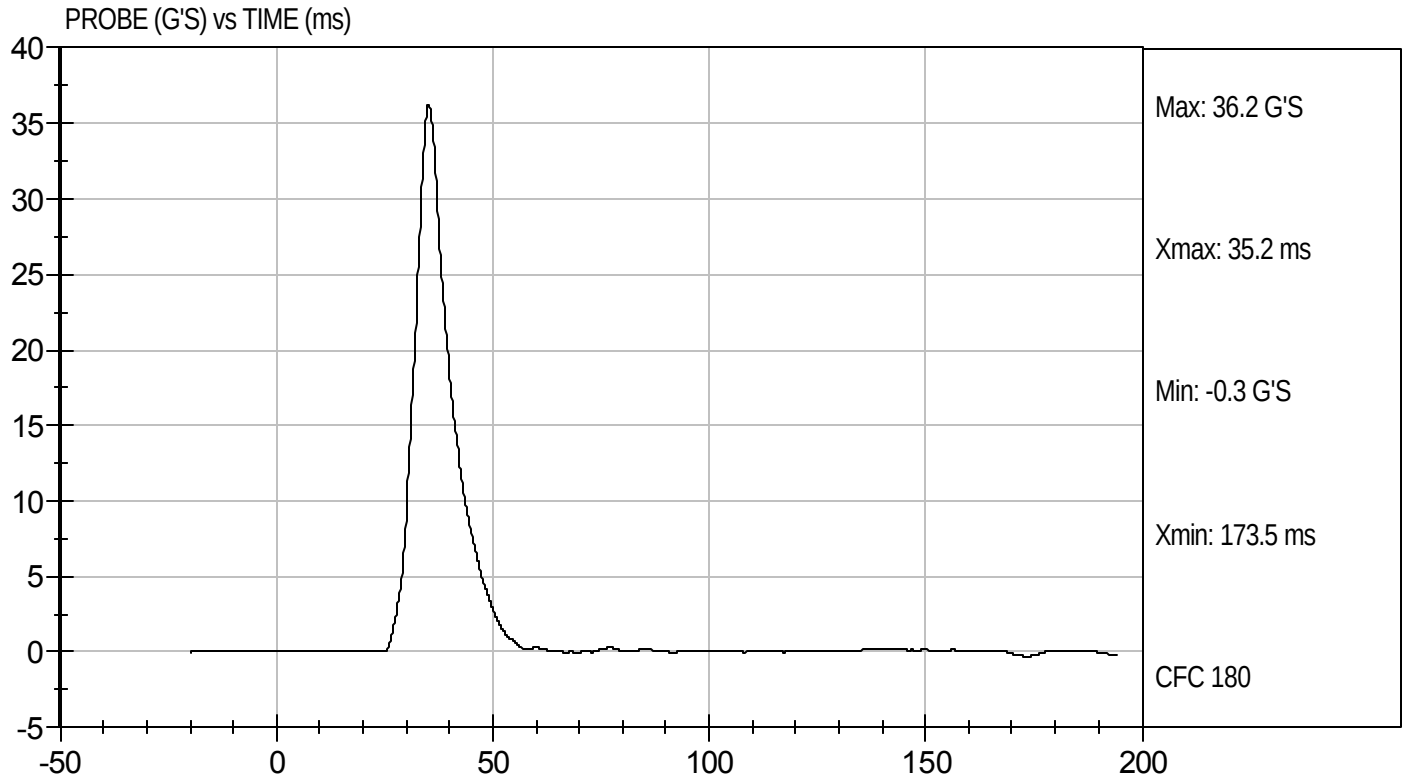
9/30/10
Test Date

David Winkelbauer
Approved By



Test Desc: Iliac Impact
Component ID: D103308

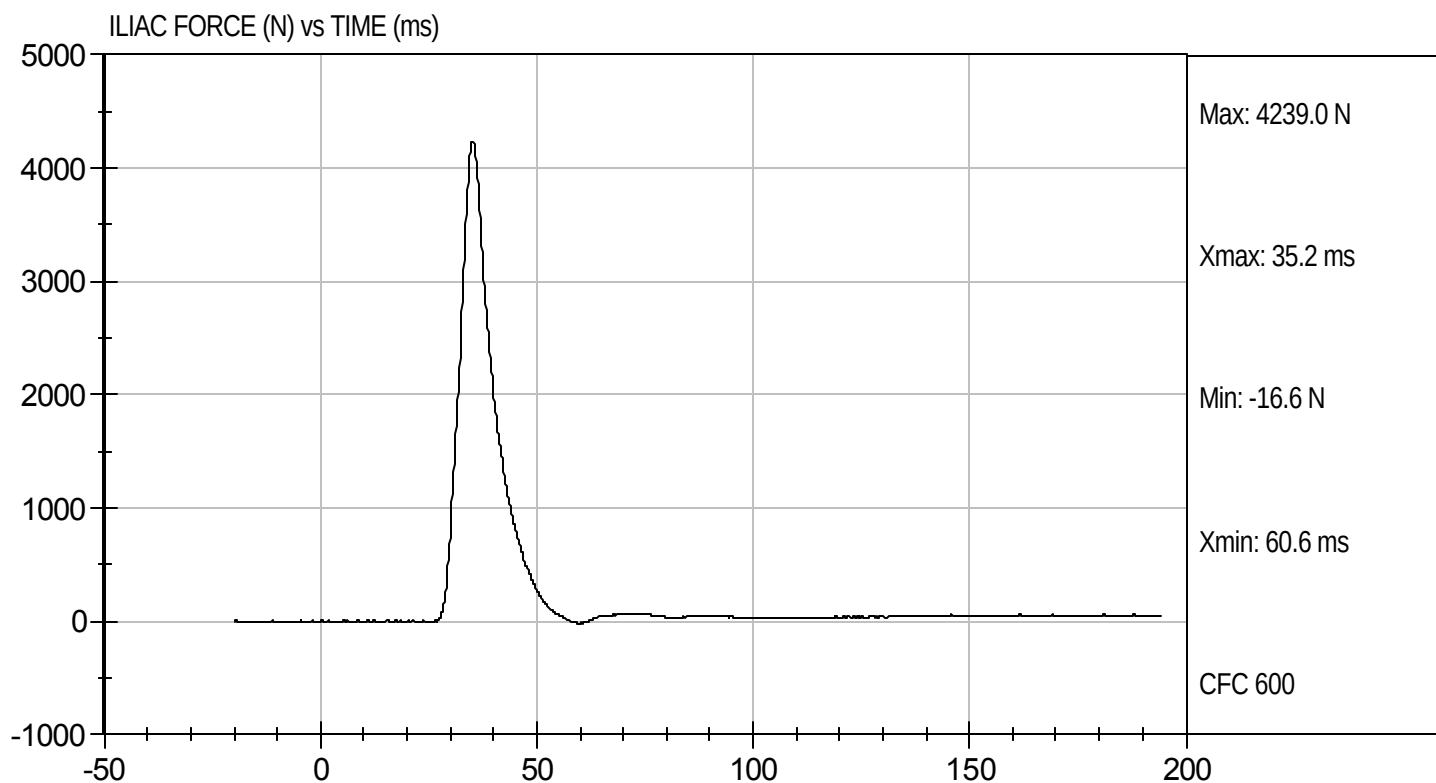
Test Date: 9/30/10
Velocity: 14.36 ft/s, 4.38 m/s





Test Desc: Iliac Impact
Component ID: D103308

Test Date: 9/30/10
Velocity: 14.36 ft/s, 4.38 m/s



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

ATD Serial No: 296

Test ID: D103471

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Peak Resultant Acceleration	G's	115 to 137	123	Pass
Peak Lateral Acceleration	G's	+/- 15	3	Pass
Unimodal	N/A	<15%	Yes	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

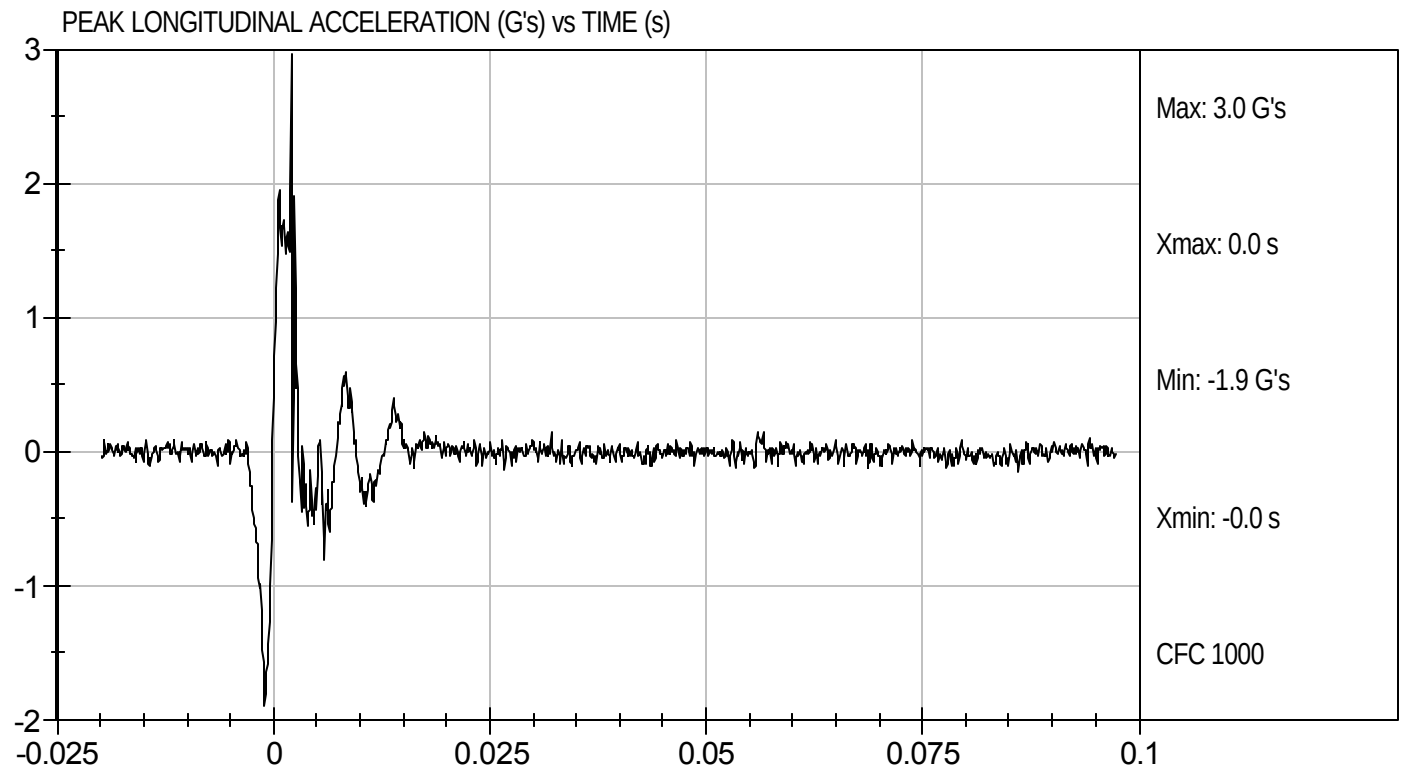
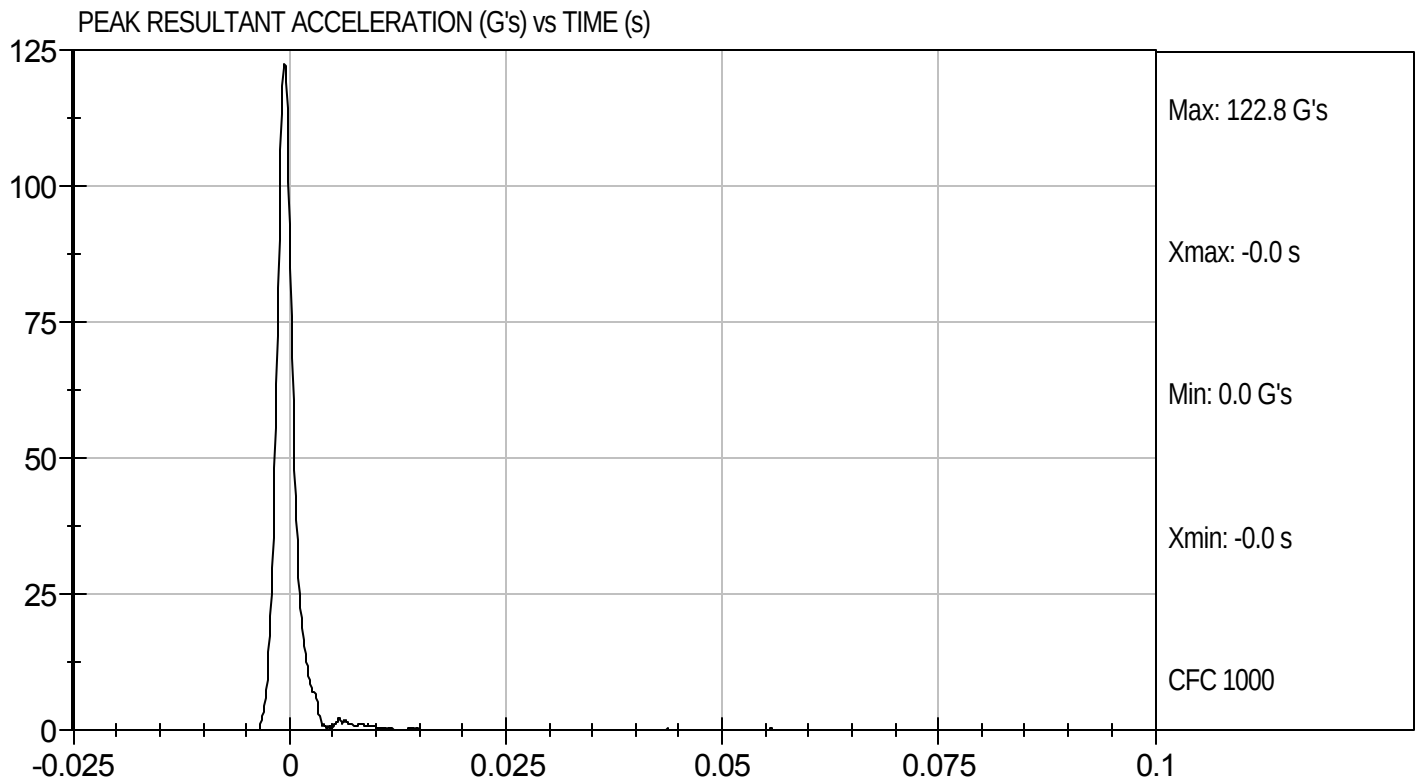
10/13/10
Test Date

David Winkelbauer
Approved By



Test Desc: Head Drop
Component ID: D103471

Test Date: 10/13/10
Velocity: 0 ft/s, 0 m/s

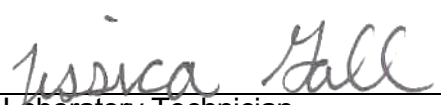


MGA RESEARCH CORPORATION
LATERAL NECK PENDULUM TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D103472

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.9	Pass
Humidity		%	10 to 70	36	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Delta Velocity	10 ms	m/s	2.20 to 2.80	2.51	Pass
	15 ms	m/s	3.30 to 4.10	3.53	Pass
	20 ms	m/s	4.40 to 5.40	4.69	Pass
	25 ms	m/s	5.40 to 6.10	5.51	Pass
	25-100 ms	m/s	5.50 to 6.20	5.55	Pass
Maximum D-Plane Rotation		deg	71 to 81	71	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	59	Pass
Maximum Occipital Condyle Moment during Rotation Interval Nm			-44 to -36	-41	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	116	Pass
Overall Test Results				Pass	


 Laboratory Technician

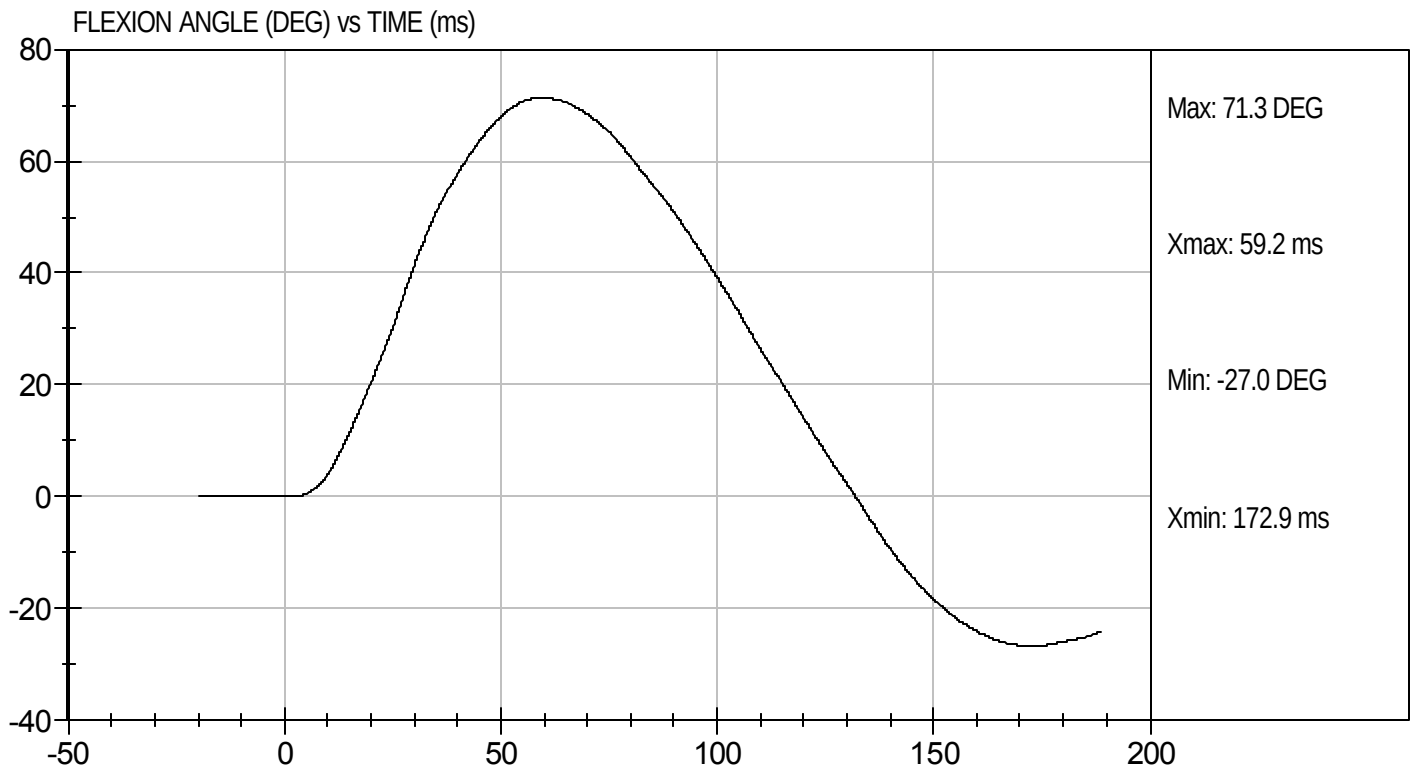
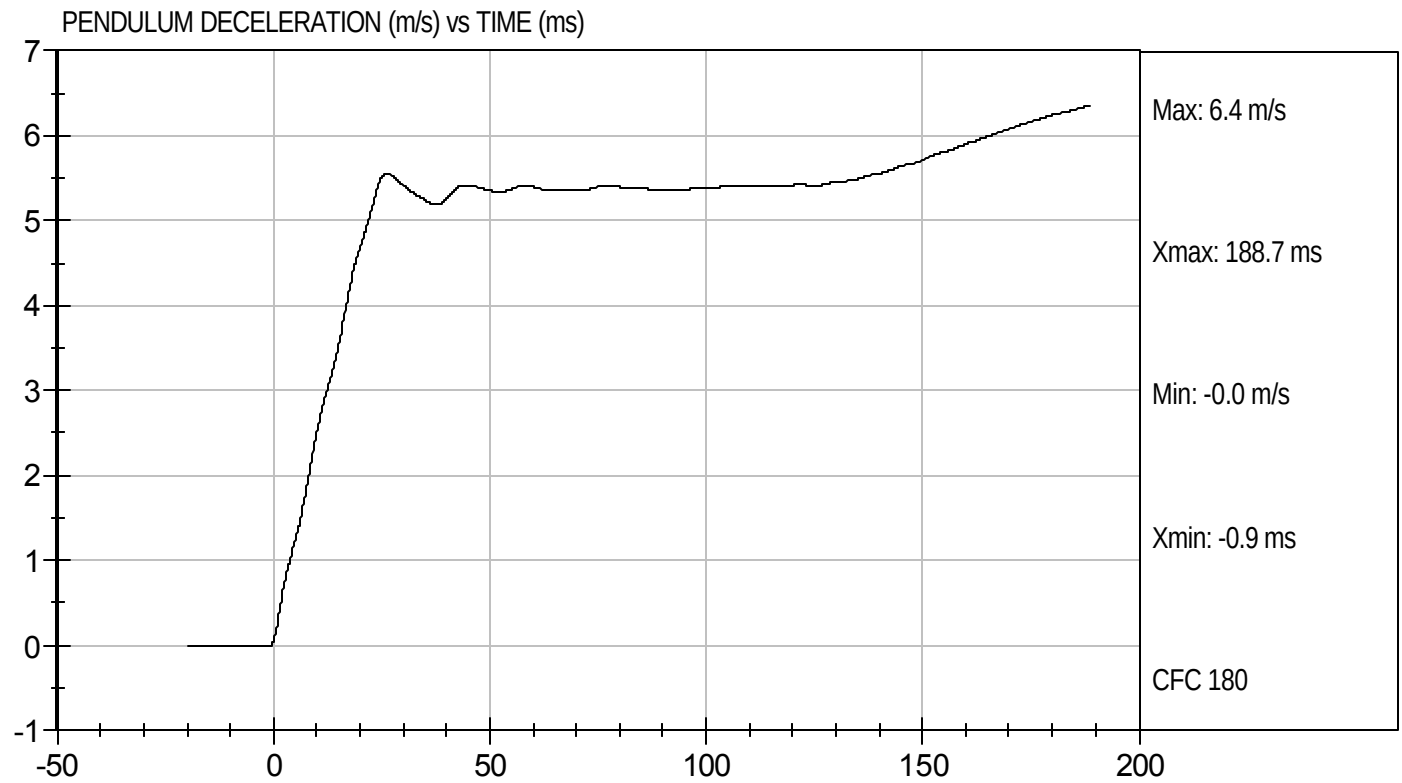
10/13/10
 Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D103472

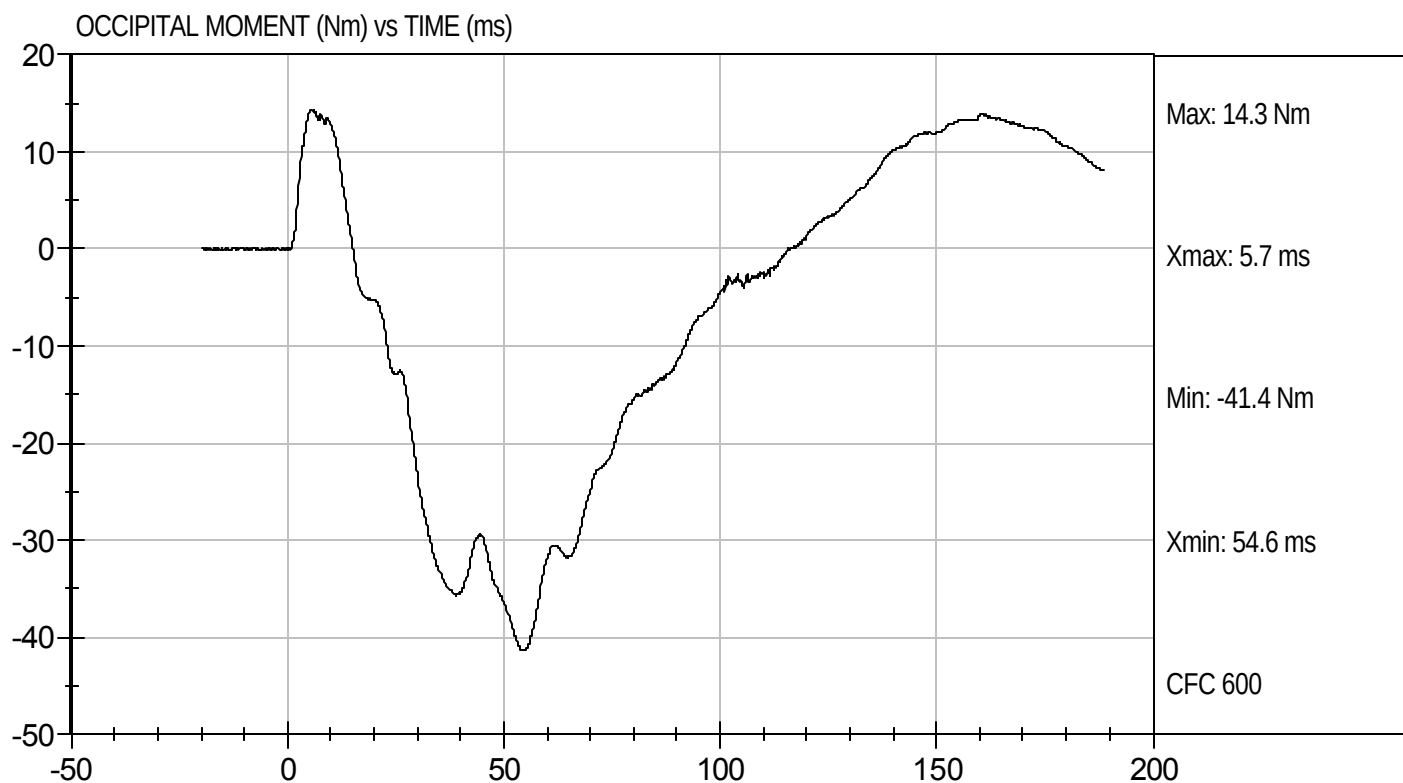
Test Date: 10/13/10
Velocity: 18.32 ft/s, 5.58 m/s





Test Desc: Neck Bending
Component ID: D103472

Test Date: 10/13/10
Velocity: 18.32 ft/s, 5.58 m/s



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

ATD Serial No: 296

Test ID: D103473

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	40	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	31	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	18	Pass
Overall Test Results				Pass


Laboratory Technician

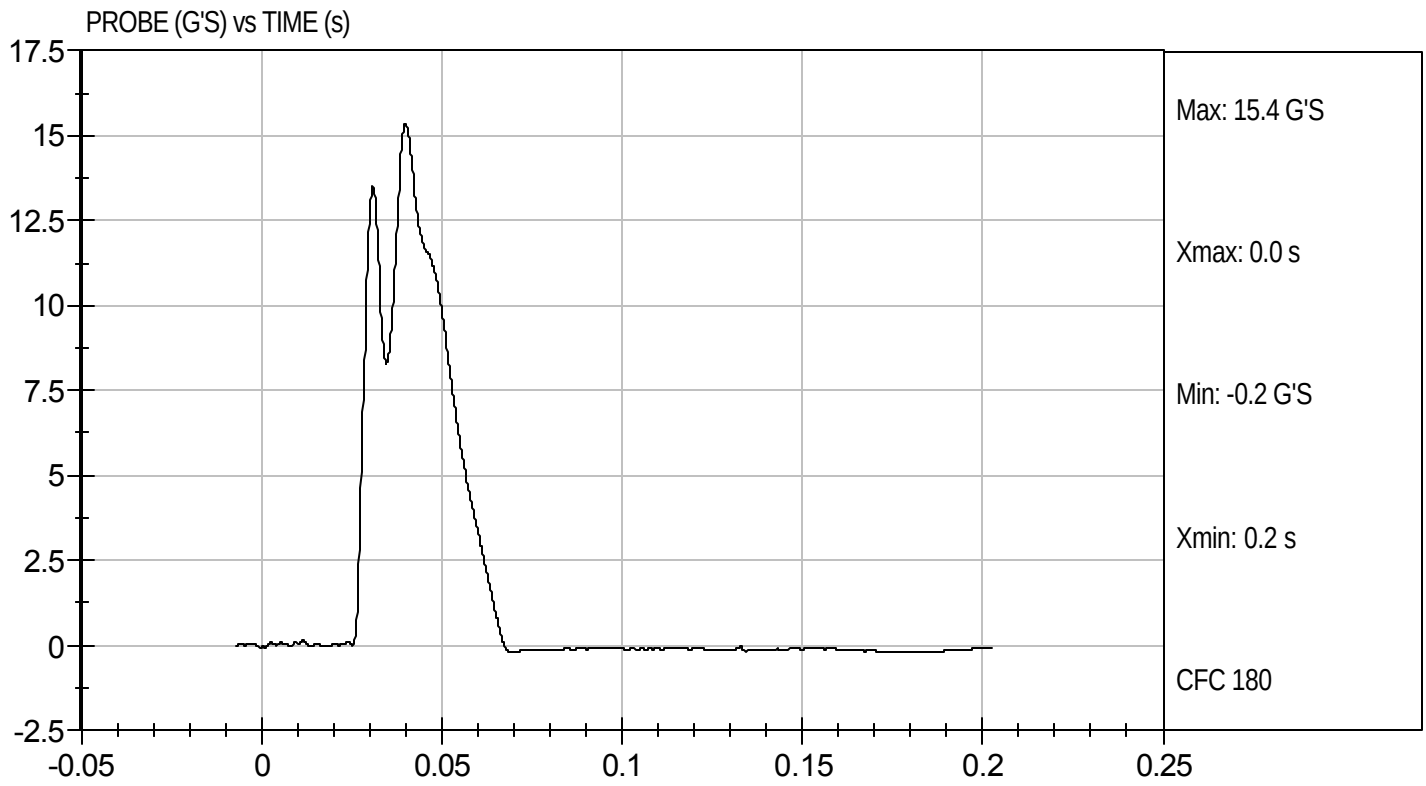
10/13/10
Test Date


Approved By



Test Desc: Shoulder Impact
Component ID: D103473

Test Date: 10/13/10
Velocity: 14.12 ft/s, 4.30 m/s

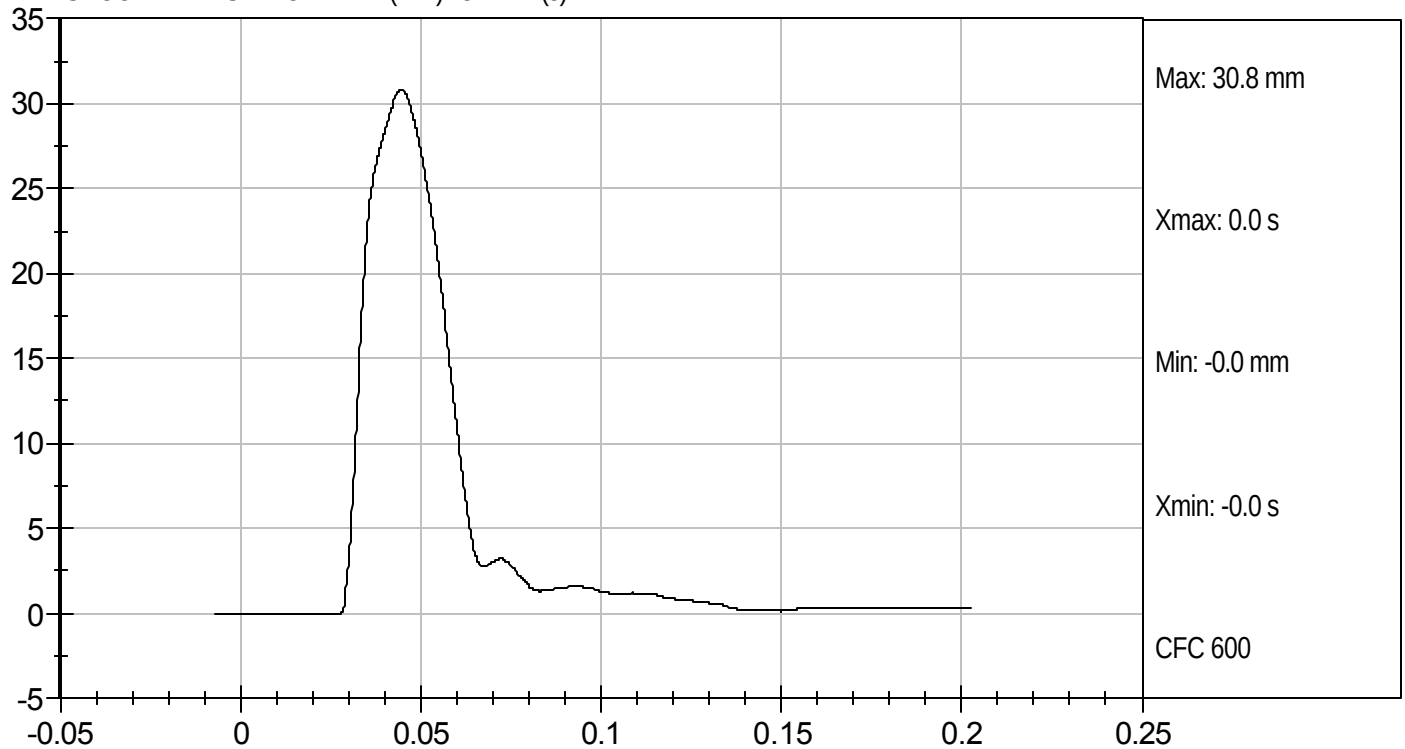




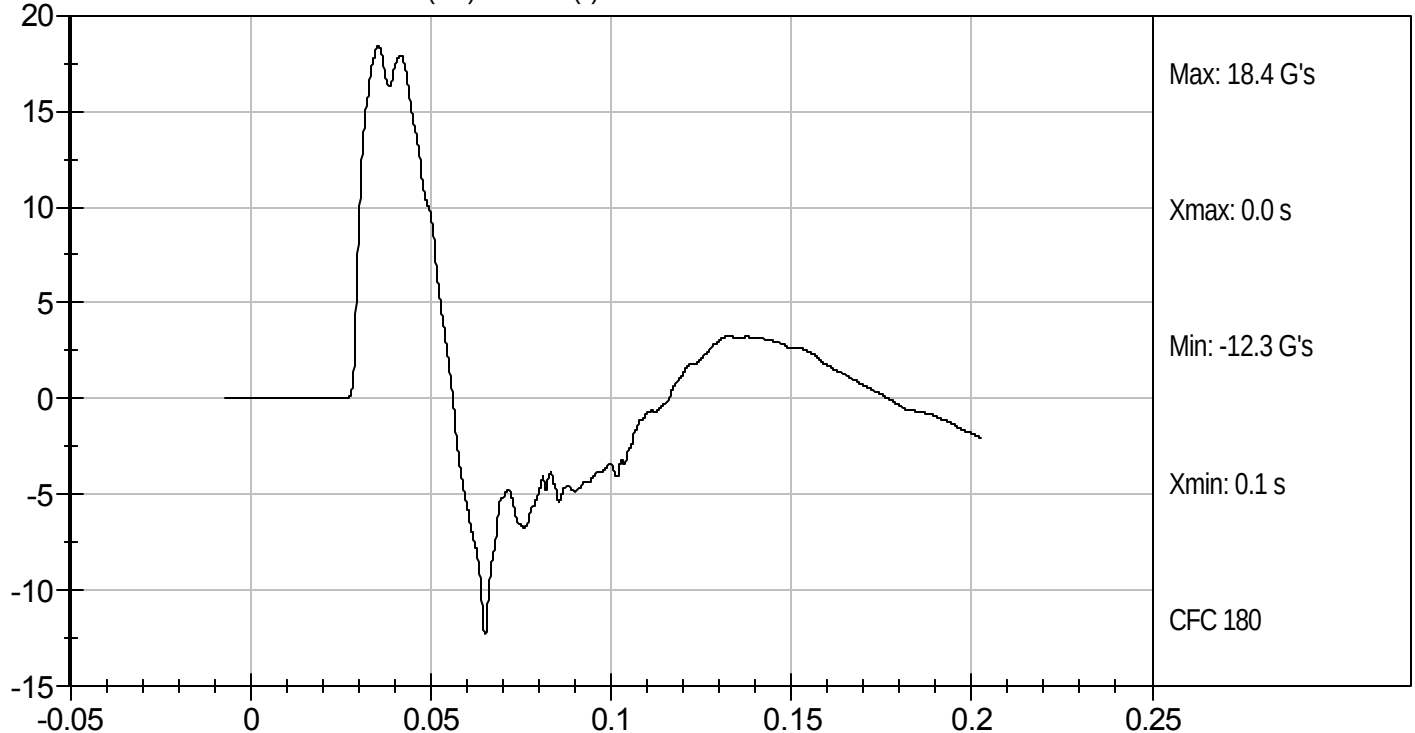
Test Desc: Shoulder Impact
Component ID: D103473

Test Date: 10/13/10
Velocity: 14.12 ft/s, 4.30 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: D103474

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	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	37	Pass
Upper Rib Displacement	mm	25 to 32	28	Pass
Middle Rib Displacement	mm	30 to 36	31	Pass
Lower Rib Displacement	mm	32 to 38	32	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	37	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	33	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

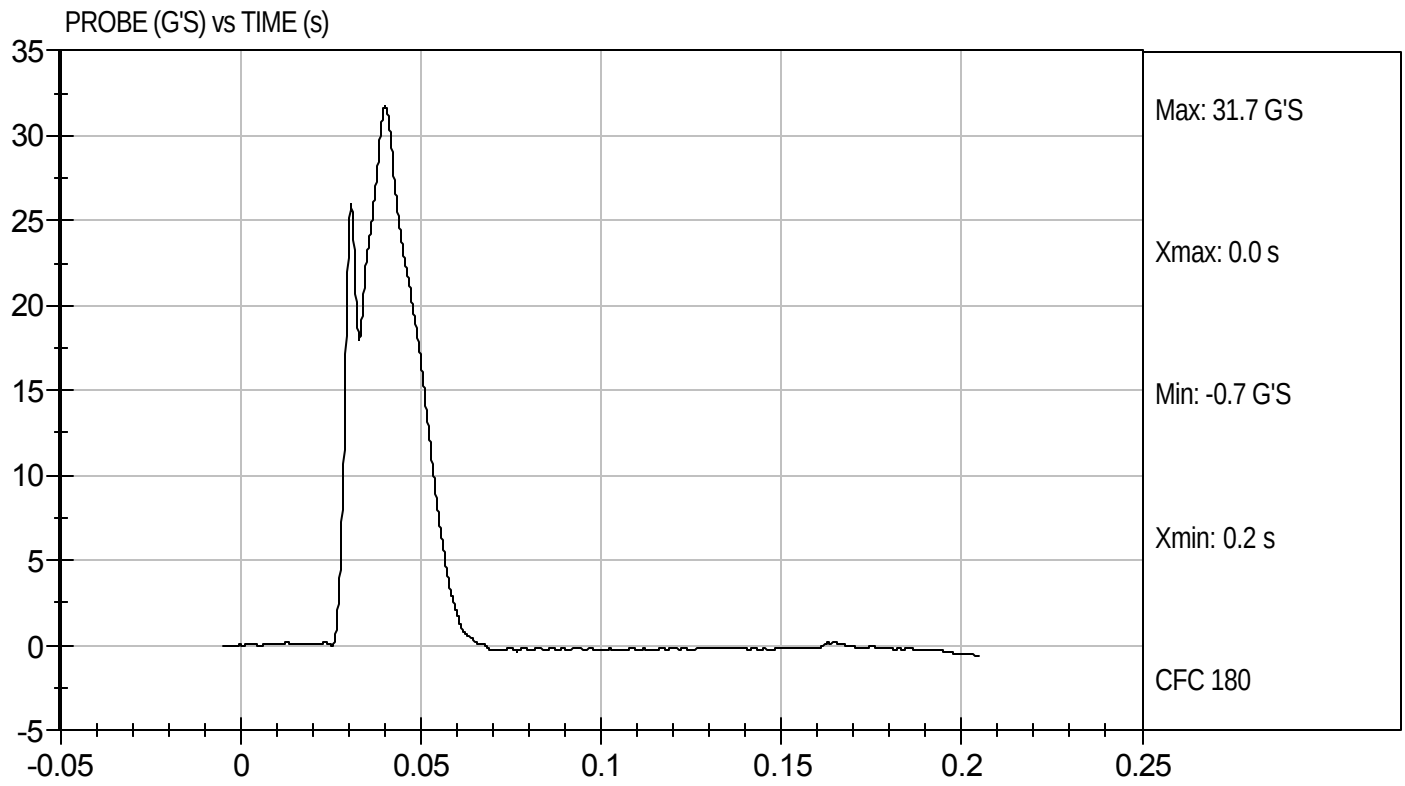
10/13/10
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax With Arm
Component ID: D103474

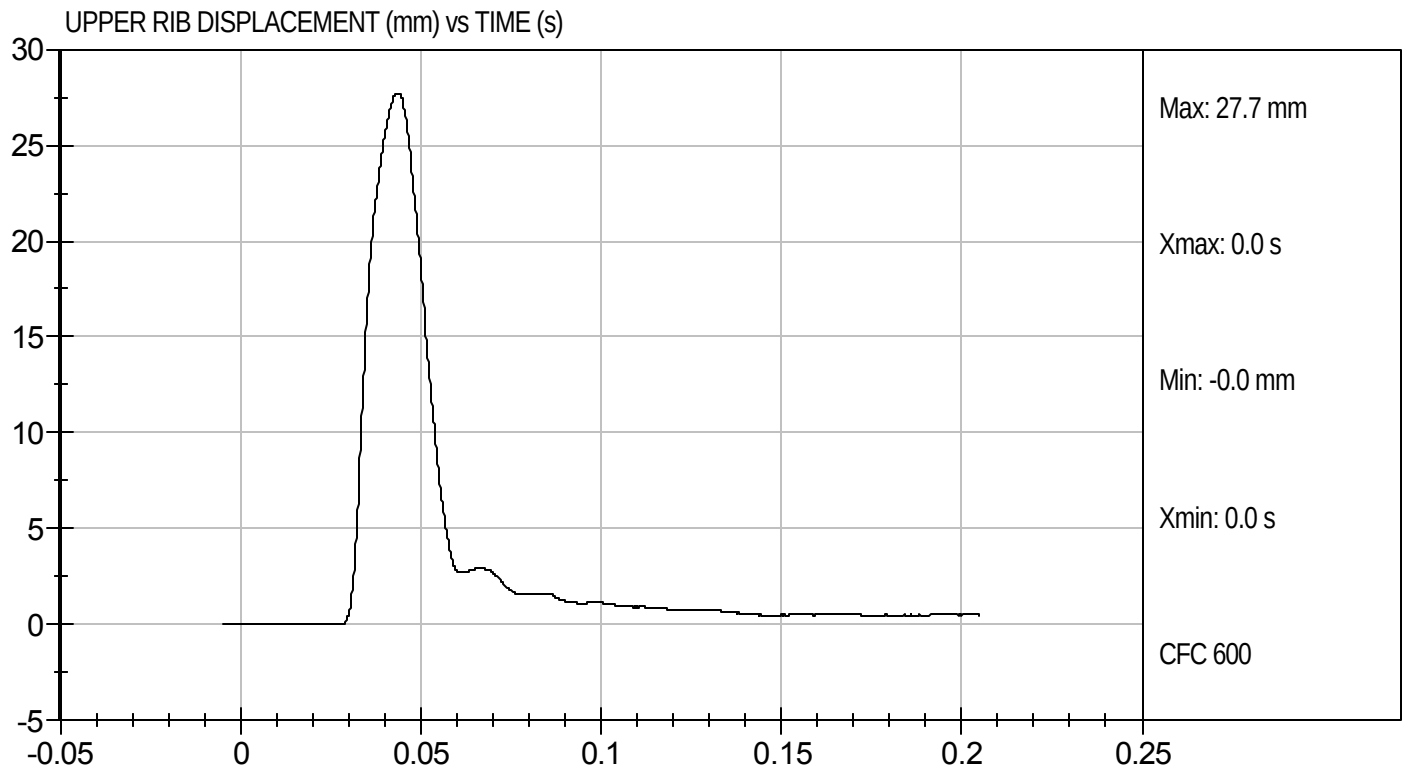
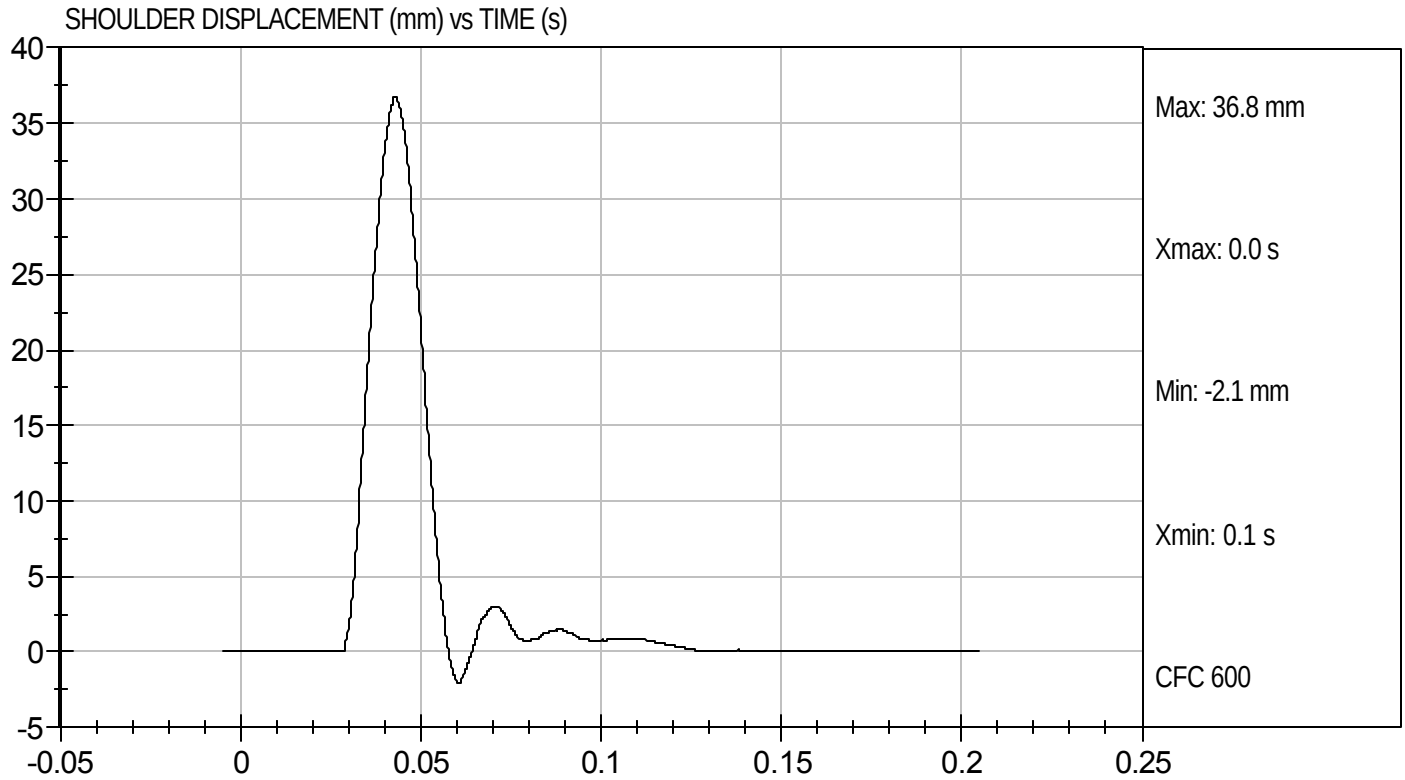
Test Date: 10/13/10
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D103474

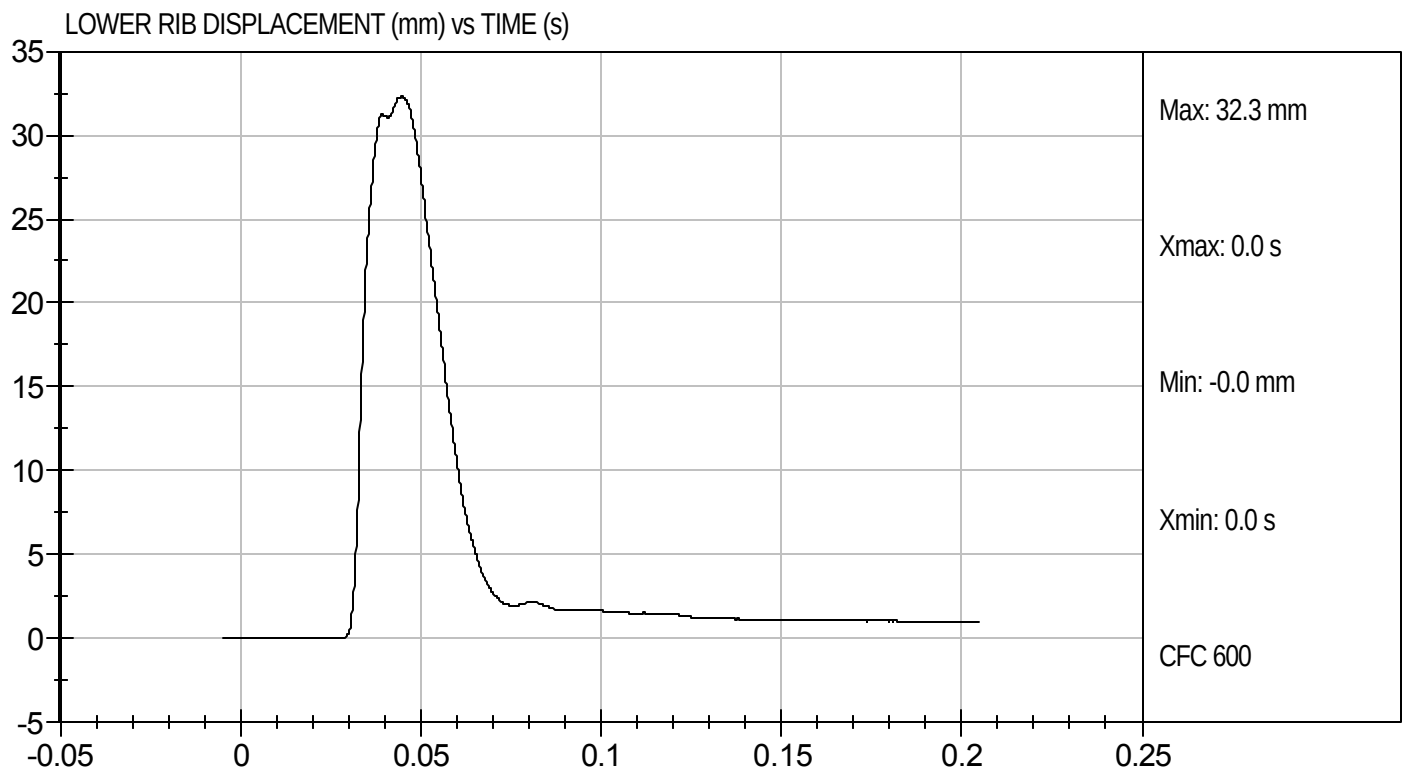
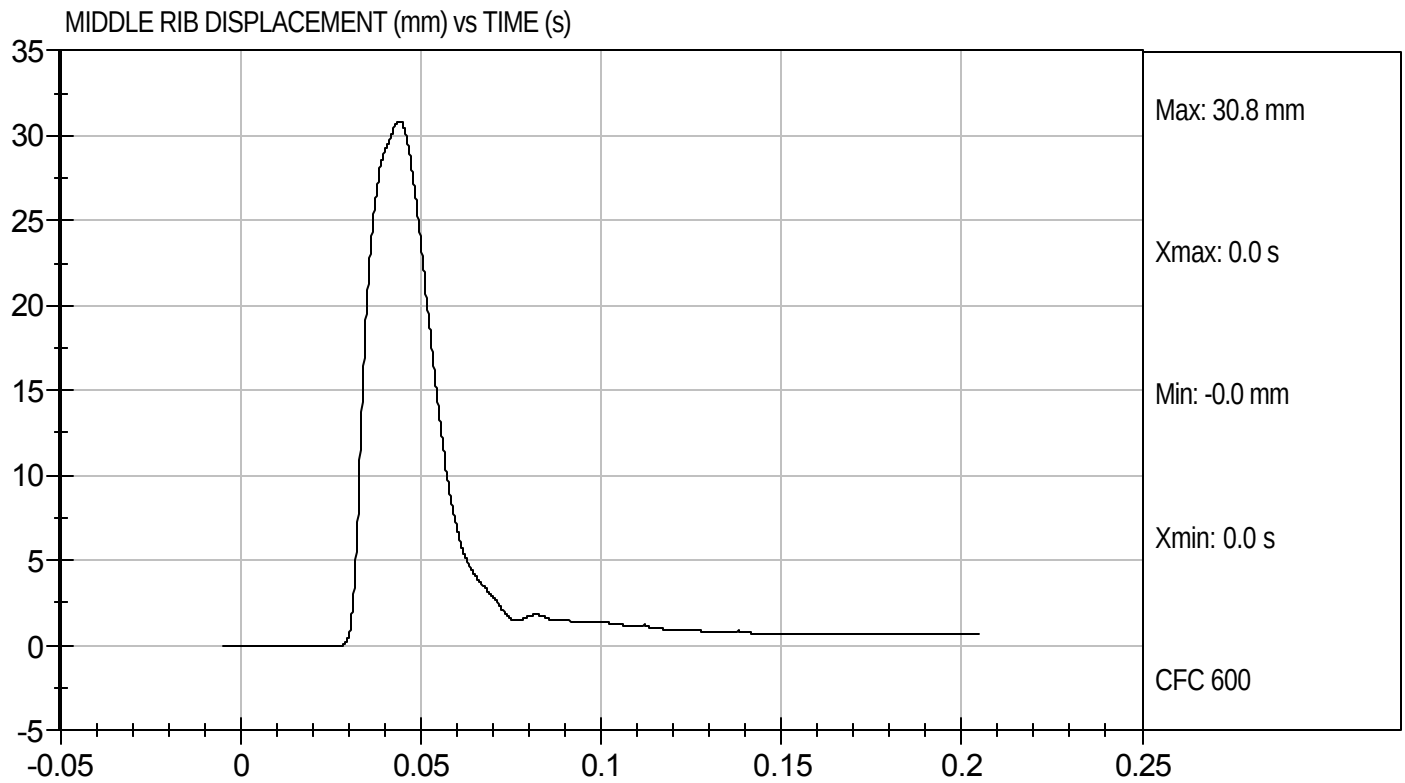
Test Date: 10/13/10
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D103474

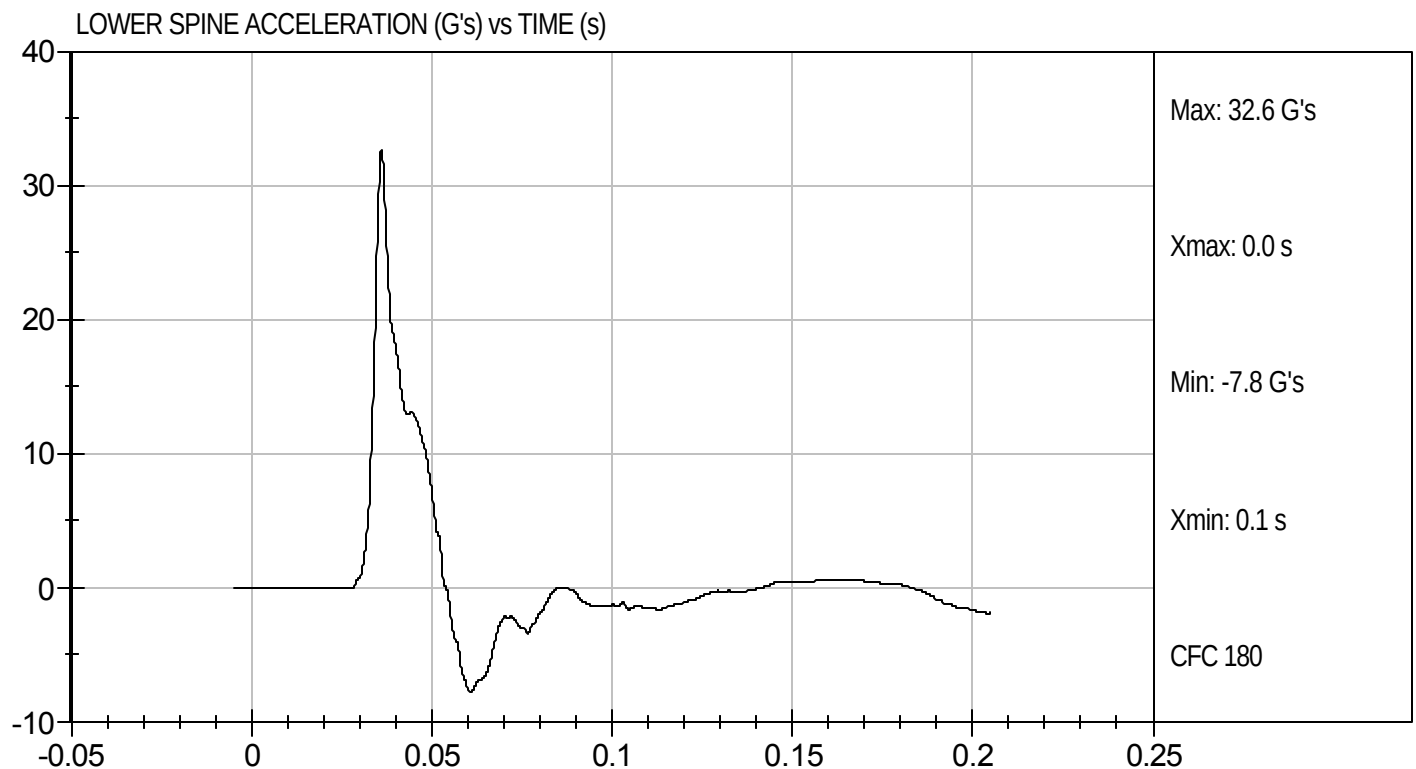
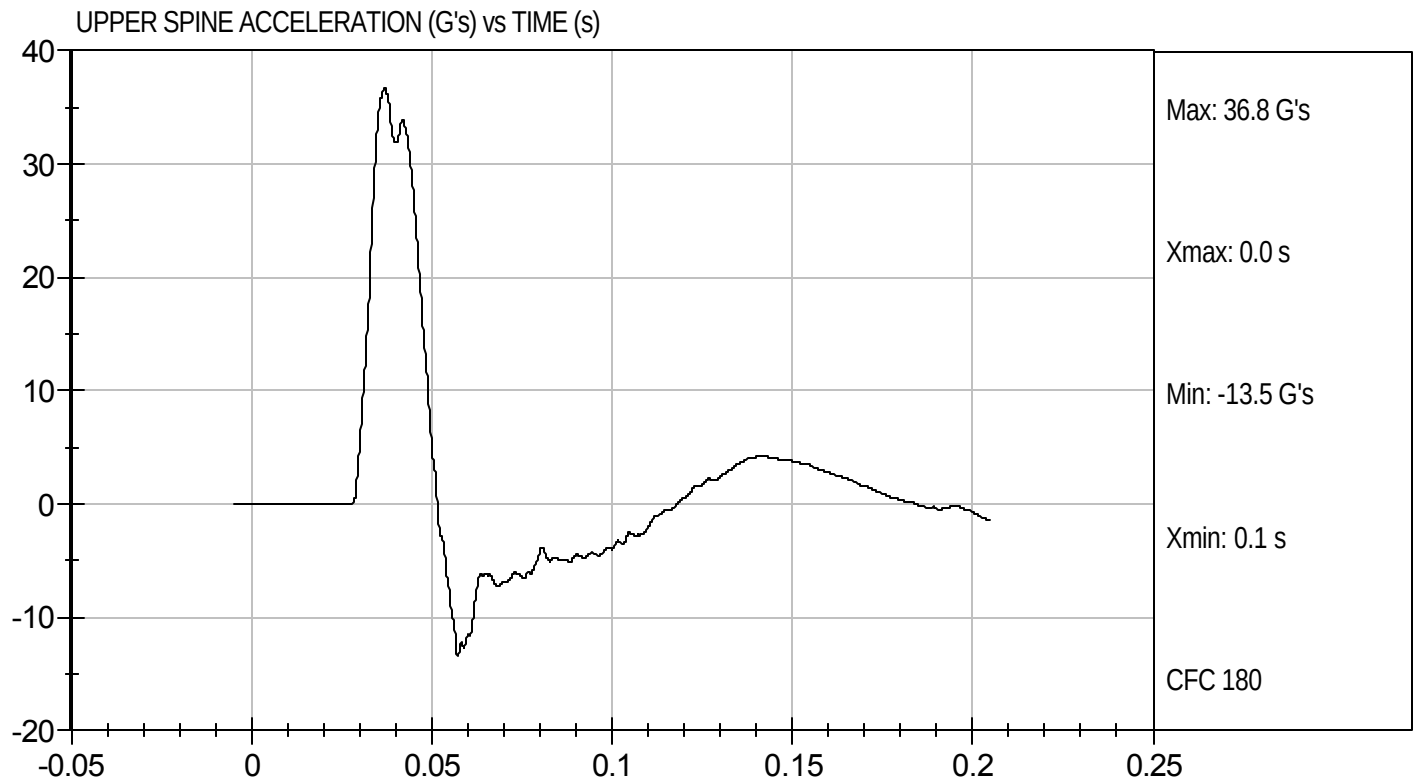
Test Date: 10/13/10
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D103474

Test Date: 10/13/10
Velocity: 22.22 ft/s, 6.77 m/s

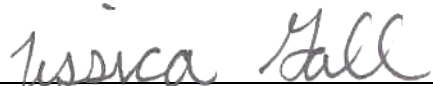


MGA RESEARCH CORPORATION
THORAX (WITHOUT ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D103475

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	40	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	42	Pass
Lower Rib Displacement	mm	35 to 43	38	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	14	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	8	Pass
Overall Test Results				Pass


Laboratory Technician

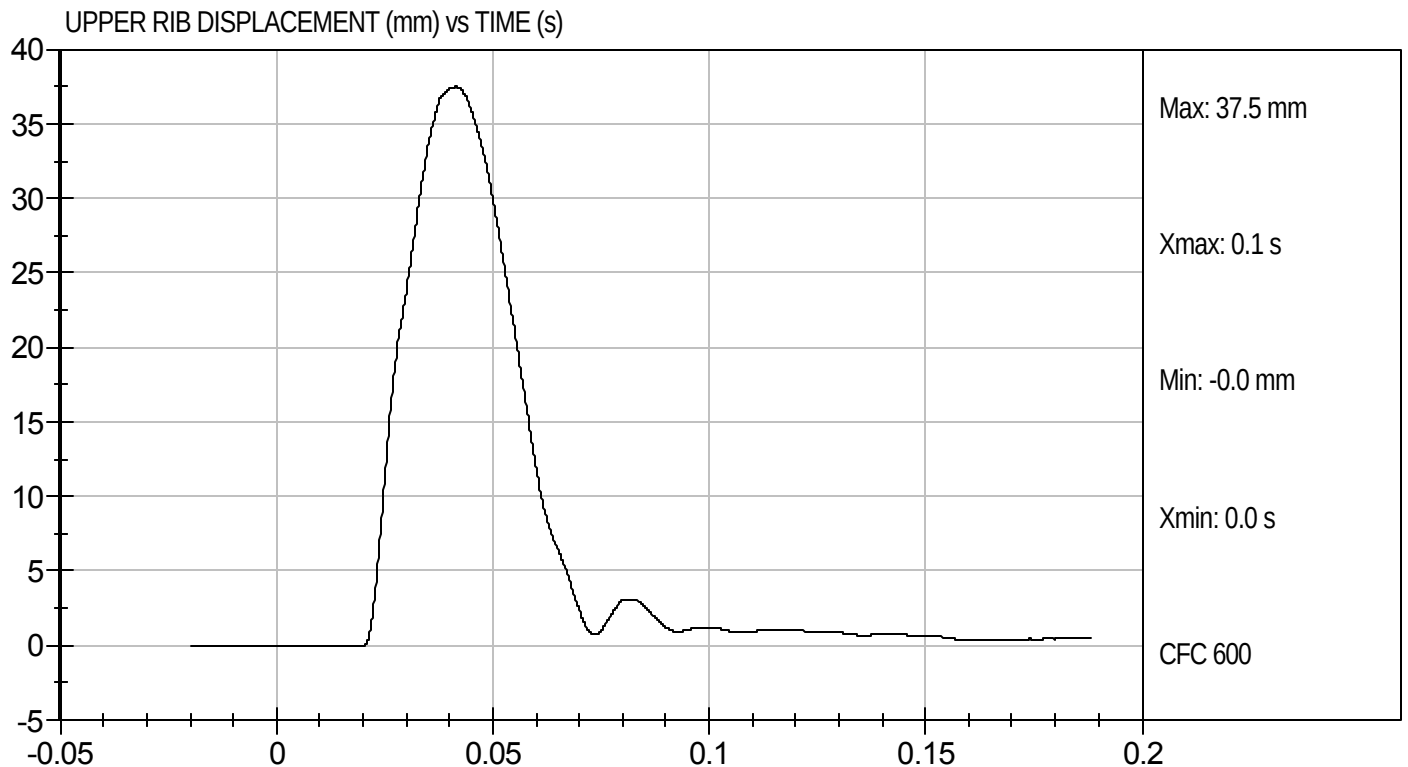
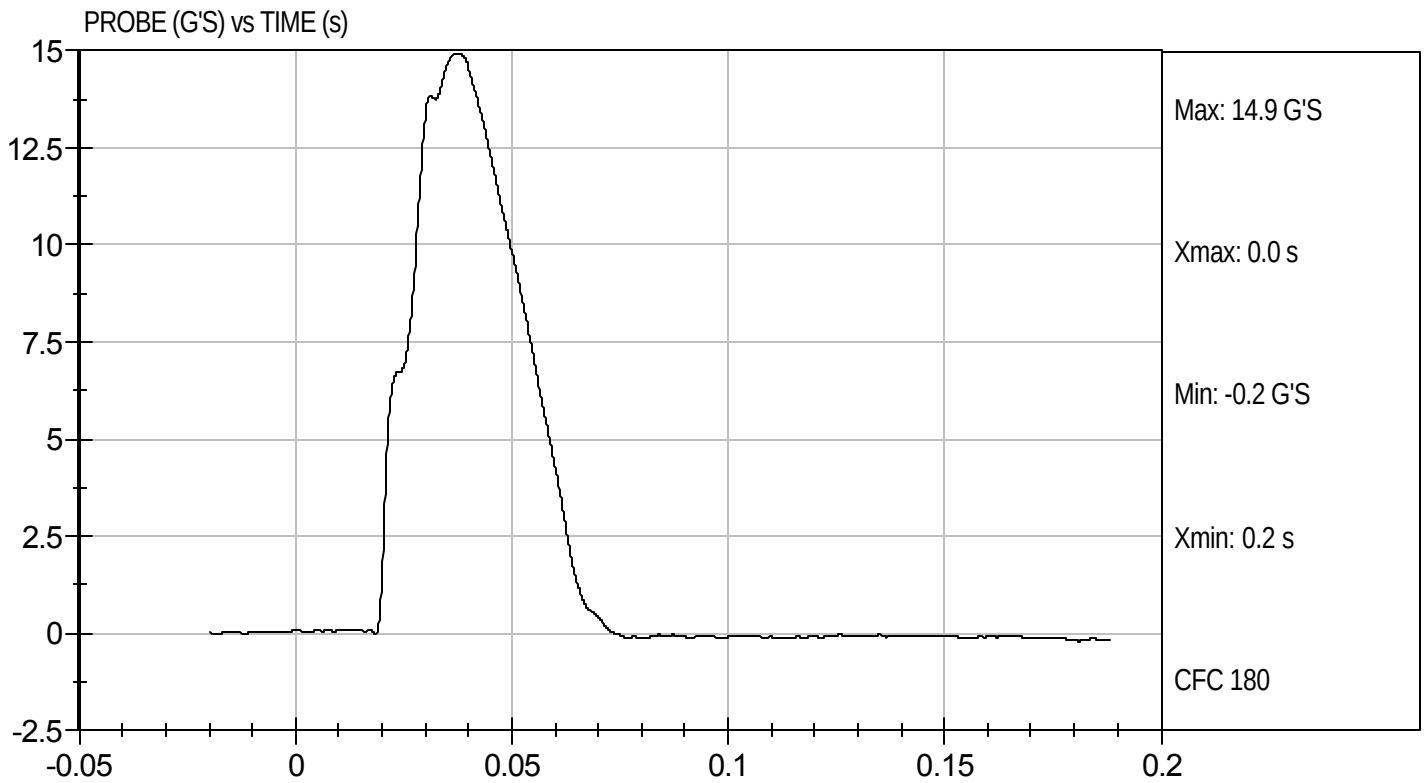
10/13/10
Test Date


Approved By



Test Desc: Thorax Without Arm
Component ID: D103475

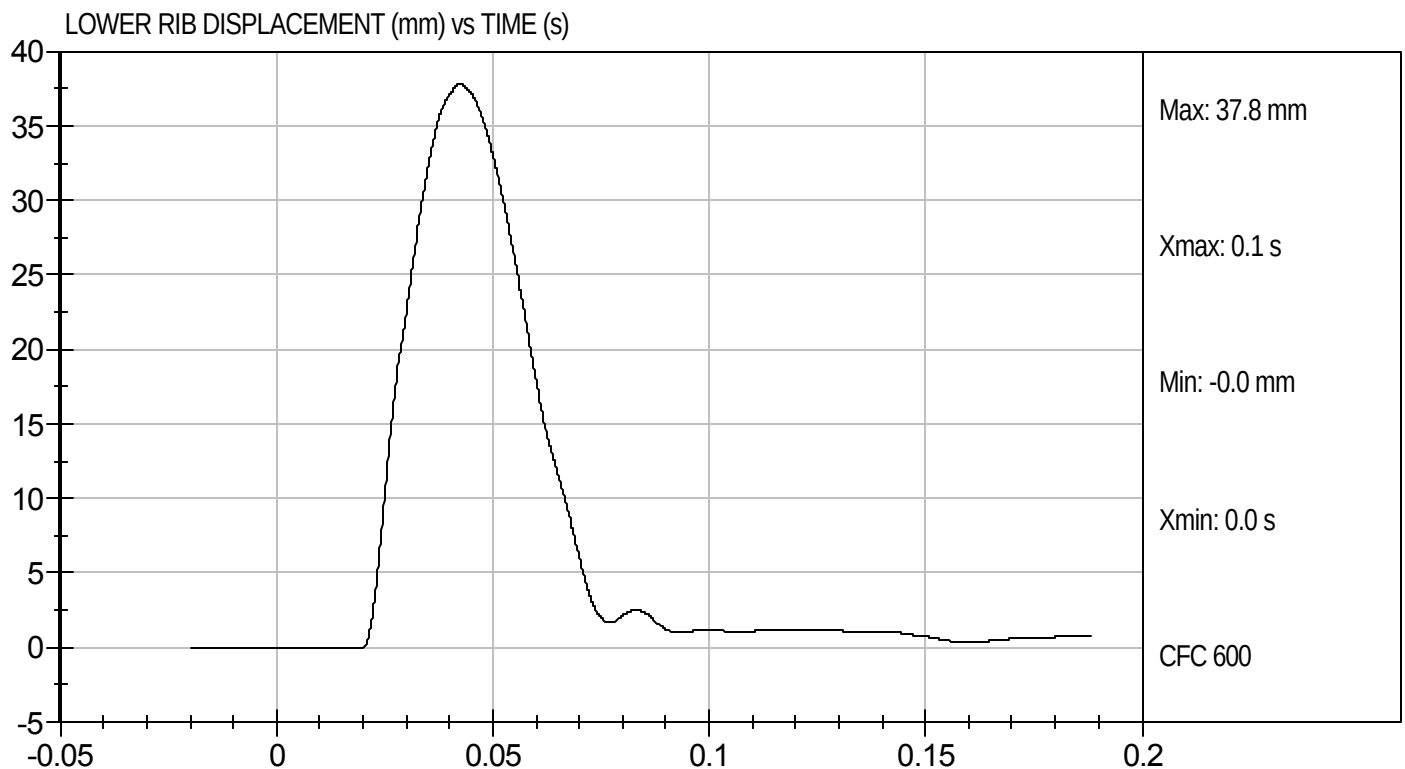
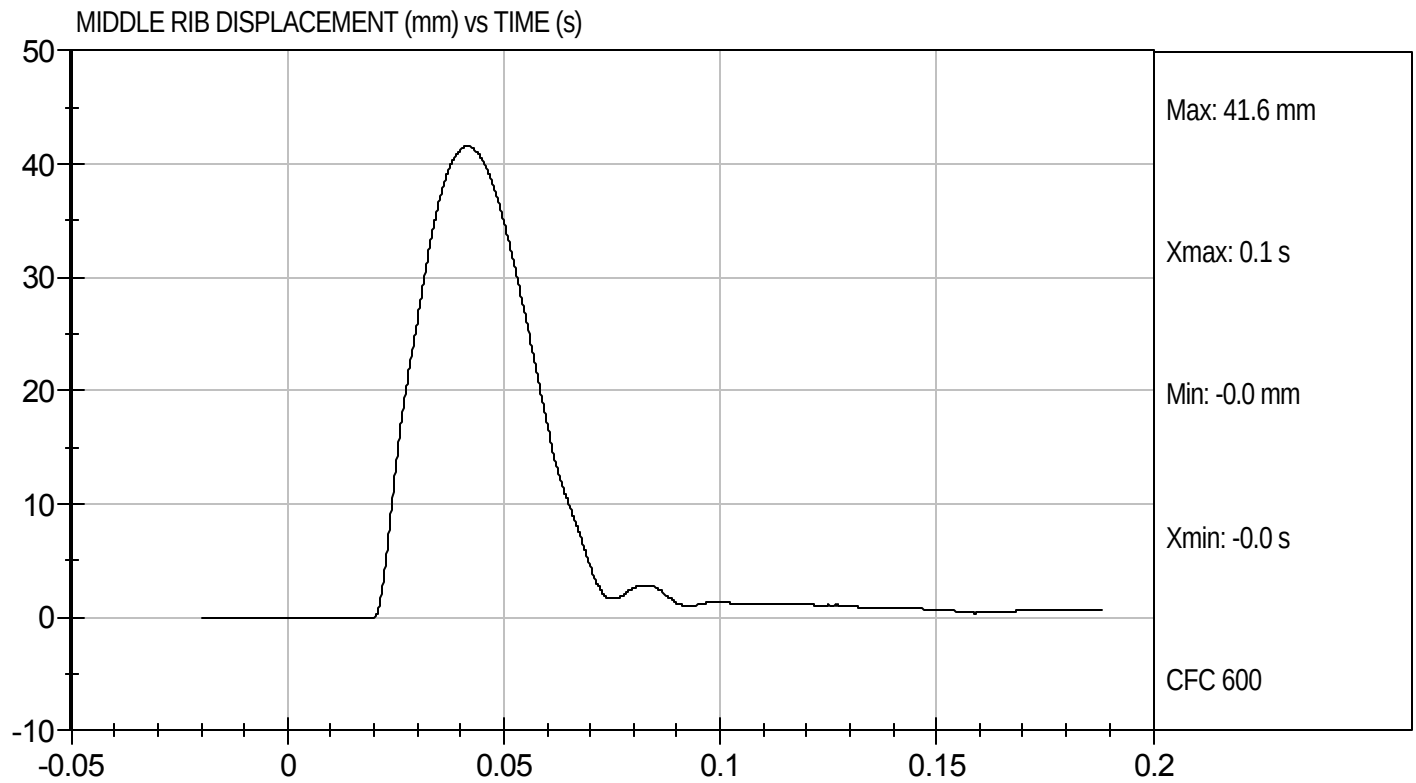
Test Date: 10/13/10
Velocity: 14.36 ft/s, 4.38 m/s





Test Desc: Thorax Without Arm
Component ID: D103475

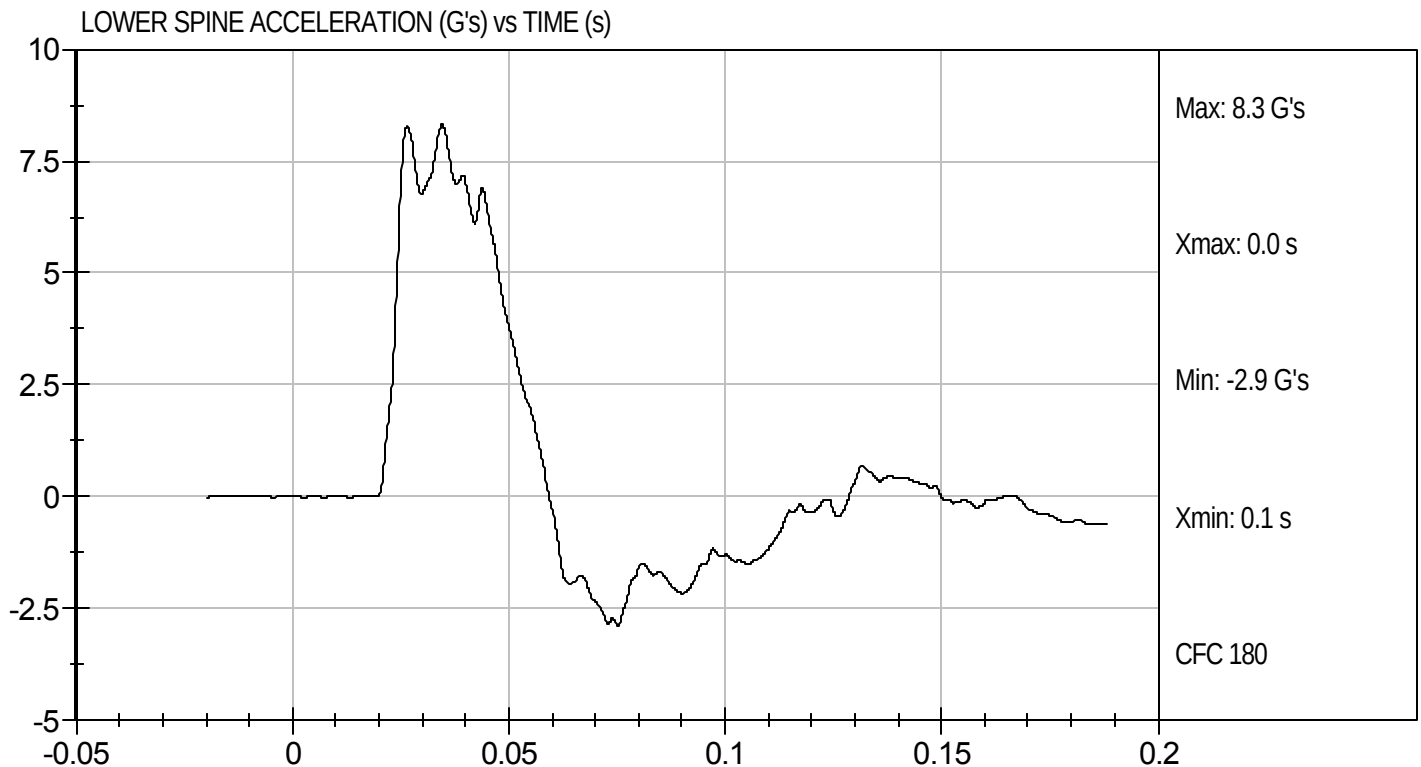
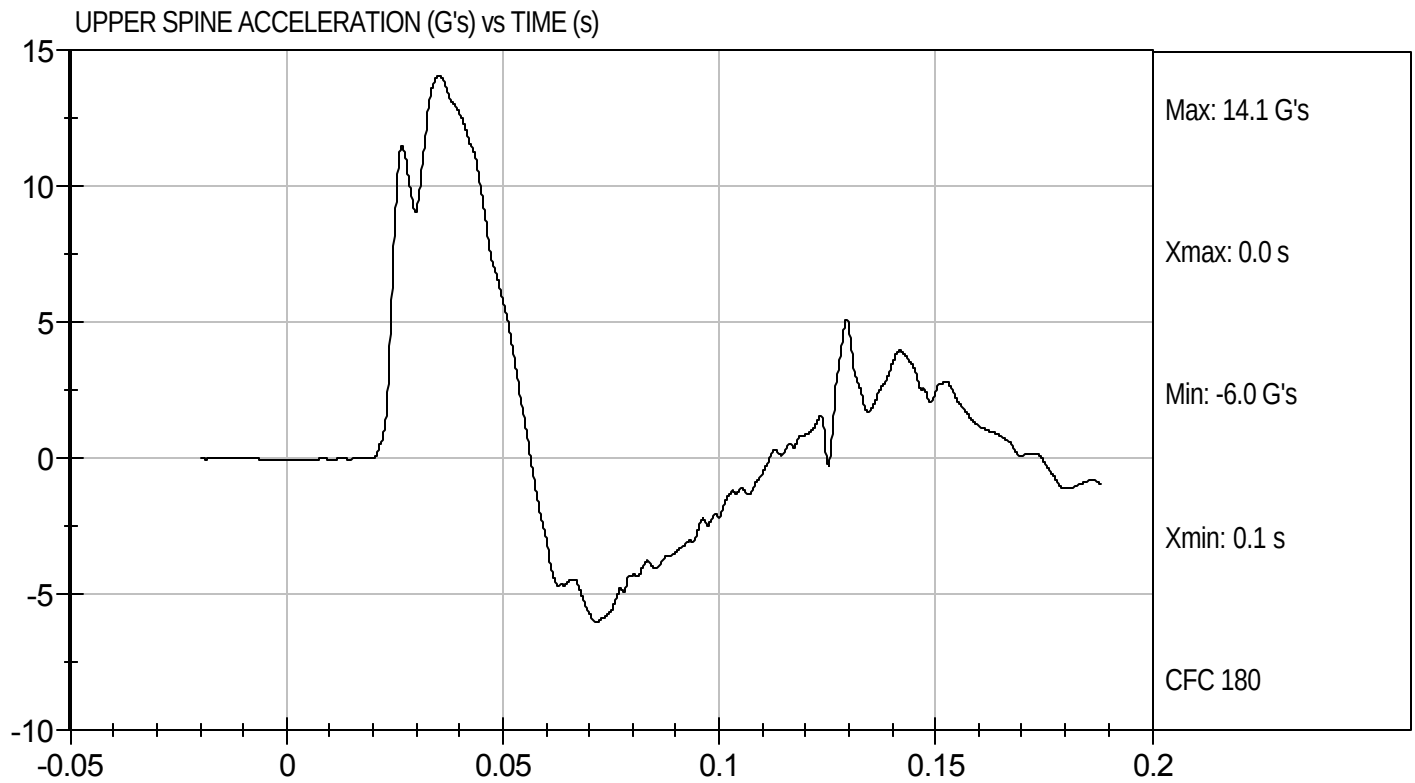
Test Date: 10/13/10
Velocity: 14.36 ft/s, 4.38 m/s





Test Desc: Thorax Without Arm
Component ID: D103475

Test Date: 10/13/10
Velocity: 14.36 ft/s, 4.38 m/s



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

ATD Serial No: 296

Test I.D: D103476

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.0	Pass
Humidity	%	10 to 70	41	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Peak Impactor Acceleration	G's	12 to 16	14	Pass
Upper Rib Displacement	mm	36 to 47	43	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

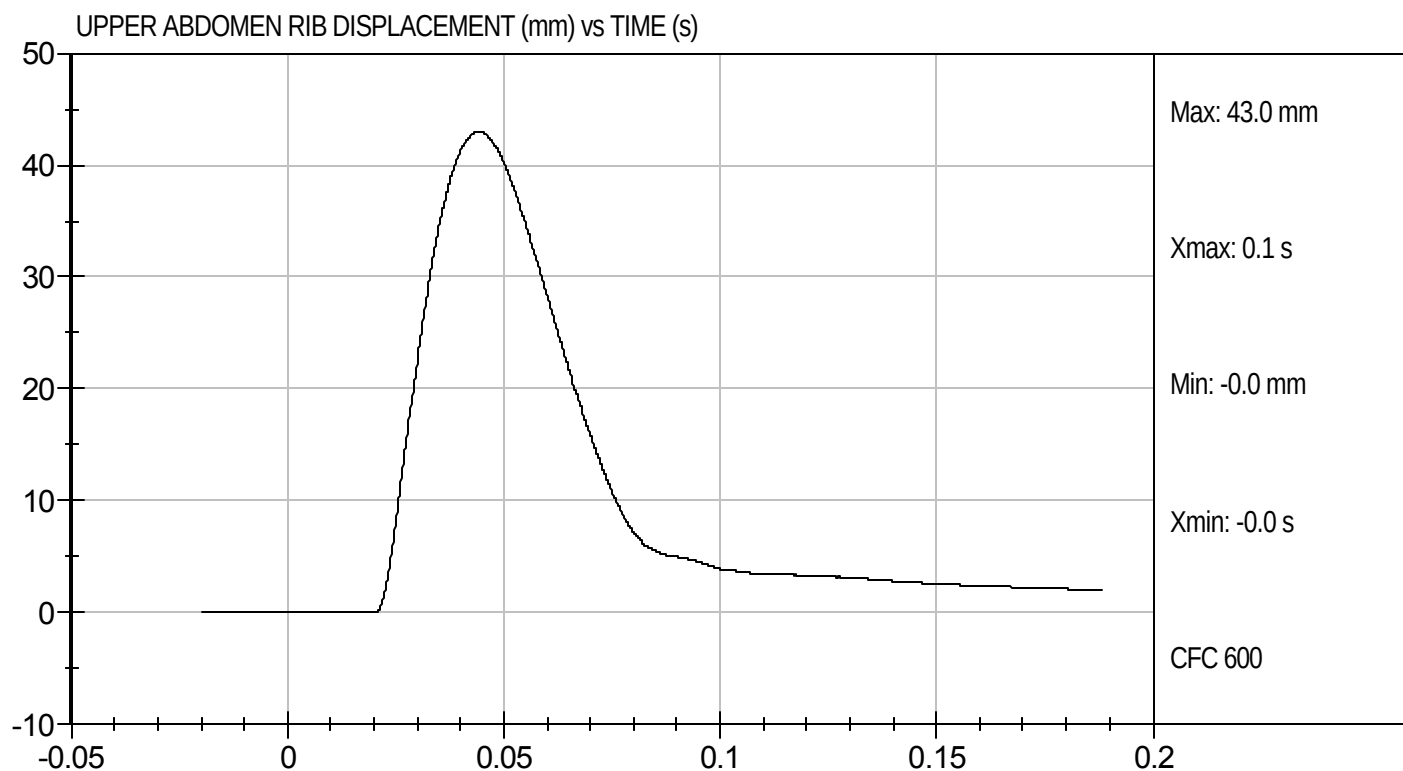
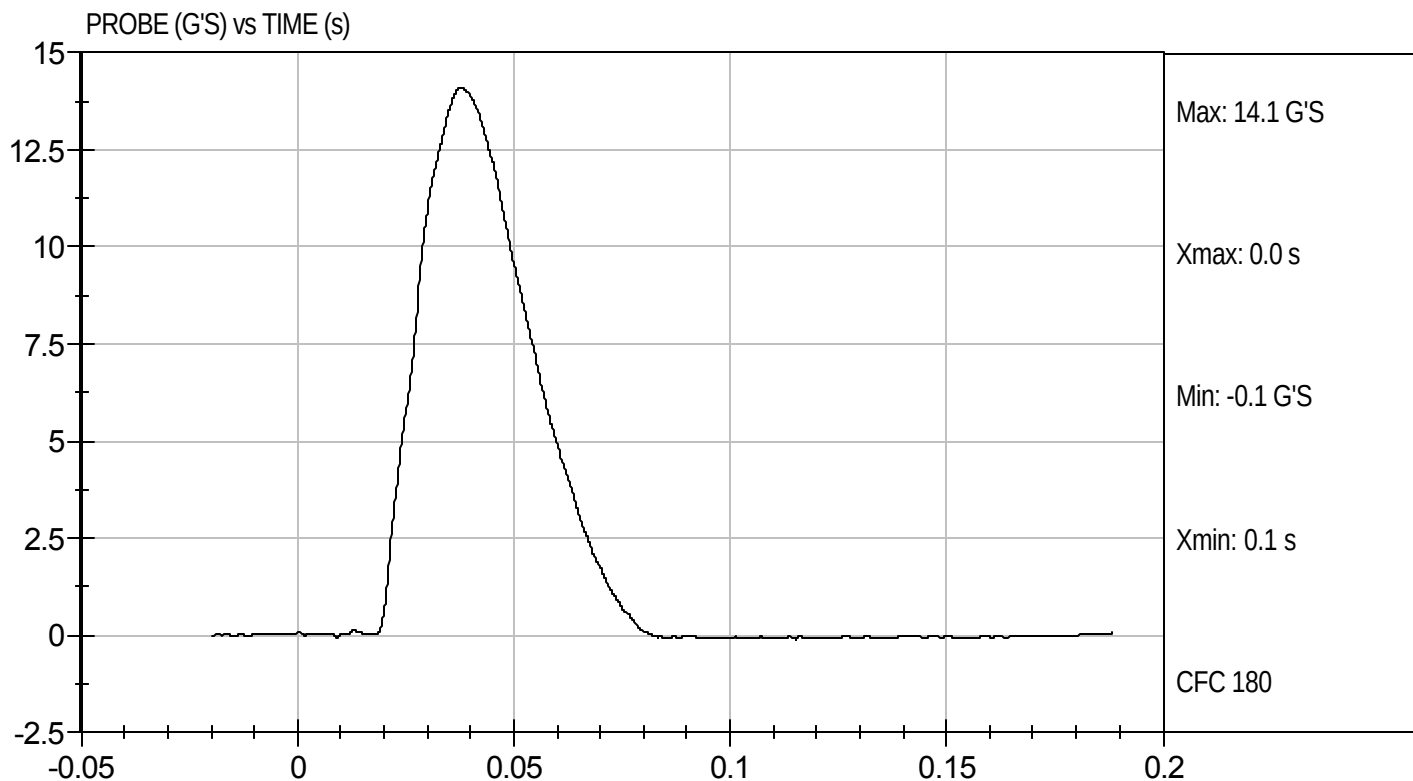
10/13/10
Test Date

David Winkelbauer
Approved By



Test Desc: Abdomen Impact
Component ID: D103476

Test Date: 10/13/10
Velocity: 14.36 ft/s, 4.38 m/s

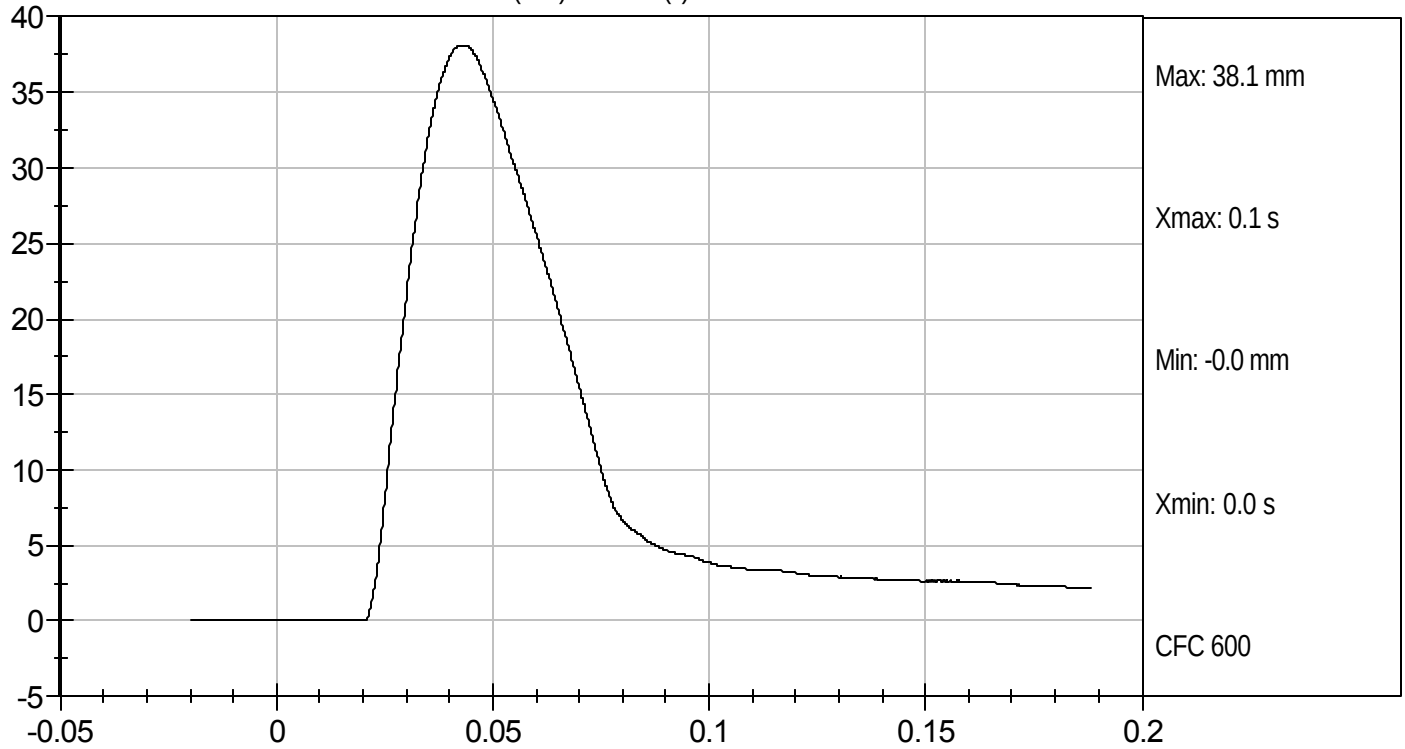




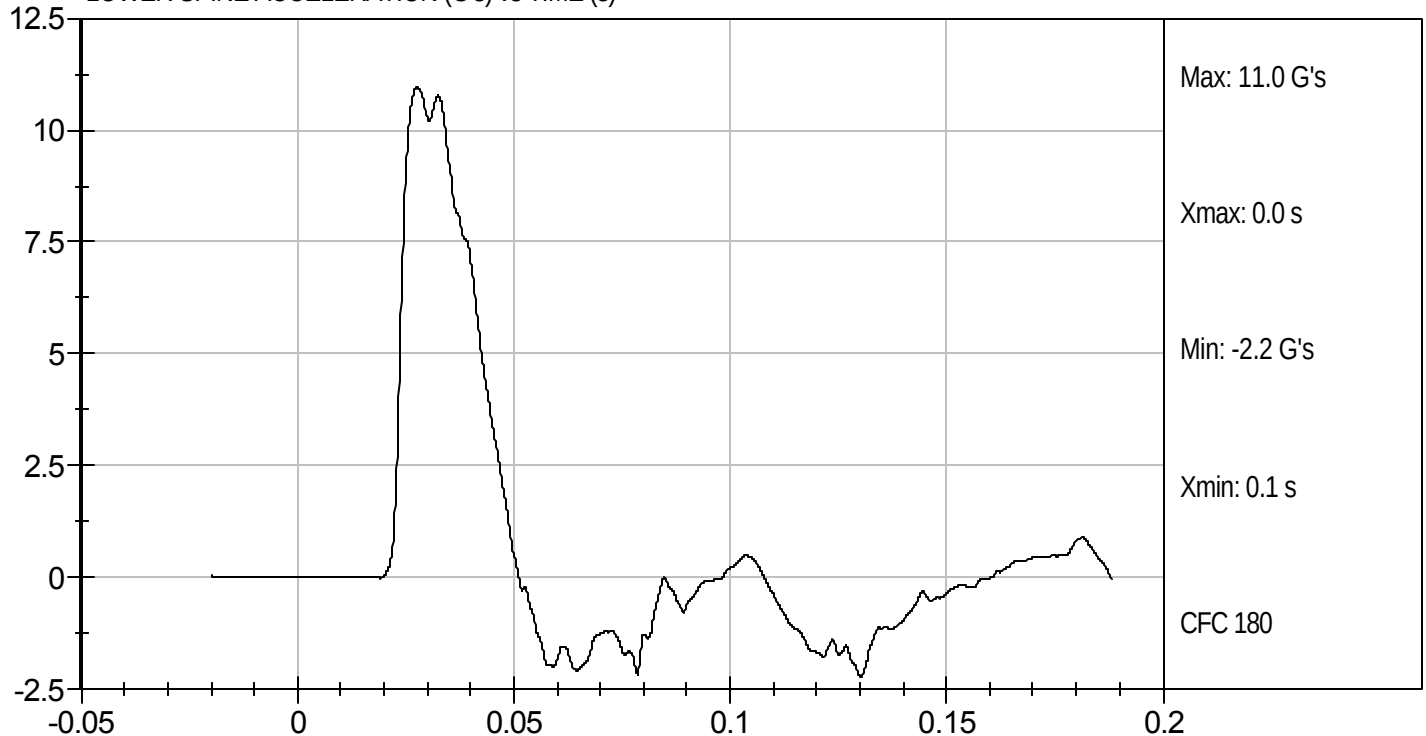
Test Desc: Abdomen Impact
Component ID: D103476

Test Date: 10/13/10
Velocity: 14.36 ft/s, 4.38 m/s

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



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



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

ATD Serial No: 296

Test I.D: D103477

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	44	Pass
Pelvis Y Acceleration after 6 ms	G's	34 to 42	42	Pass
Peak Acetabulum Force	N	3600 to 4300	4139	Pass
Overall Test Results			Pass	


Laboratory Technician

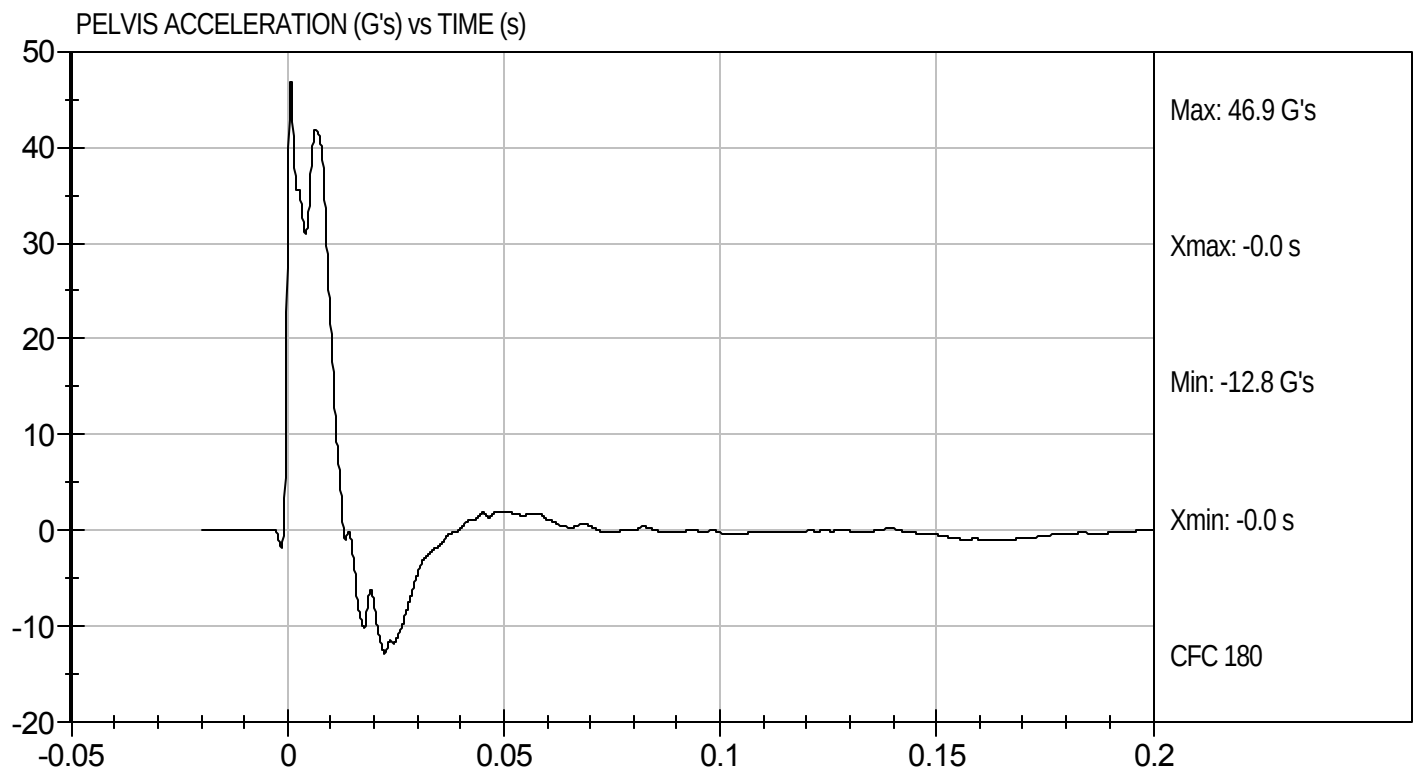
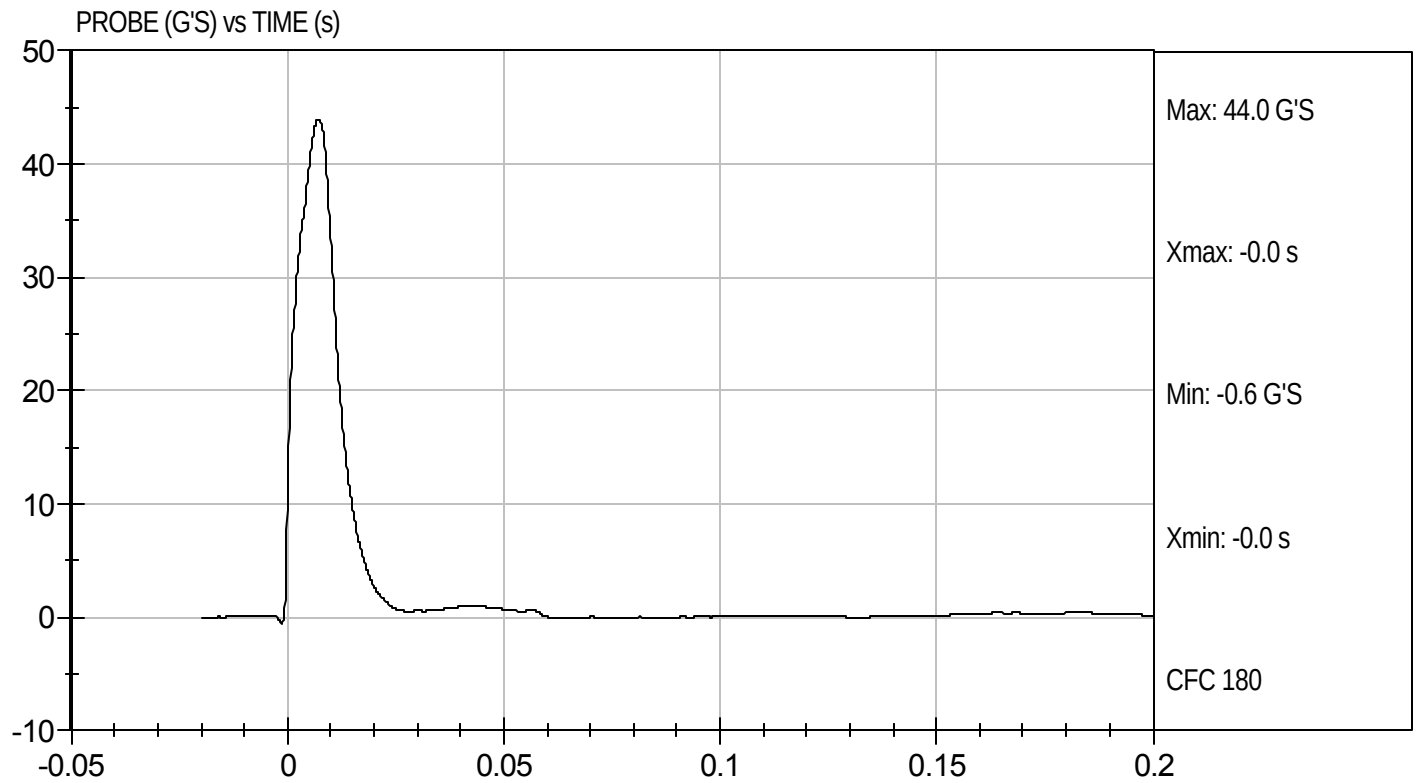
10/13/10
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D103477

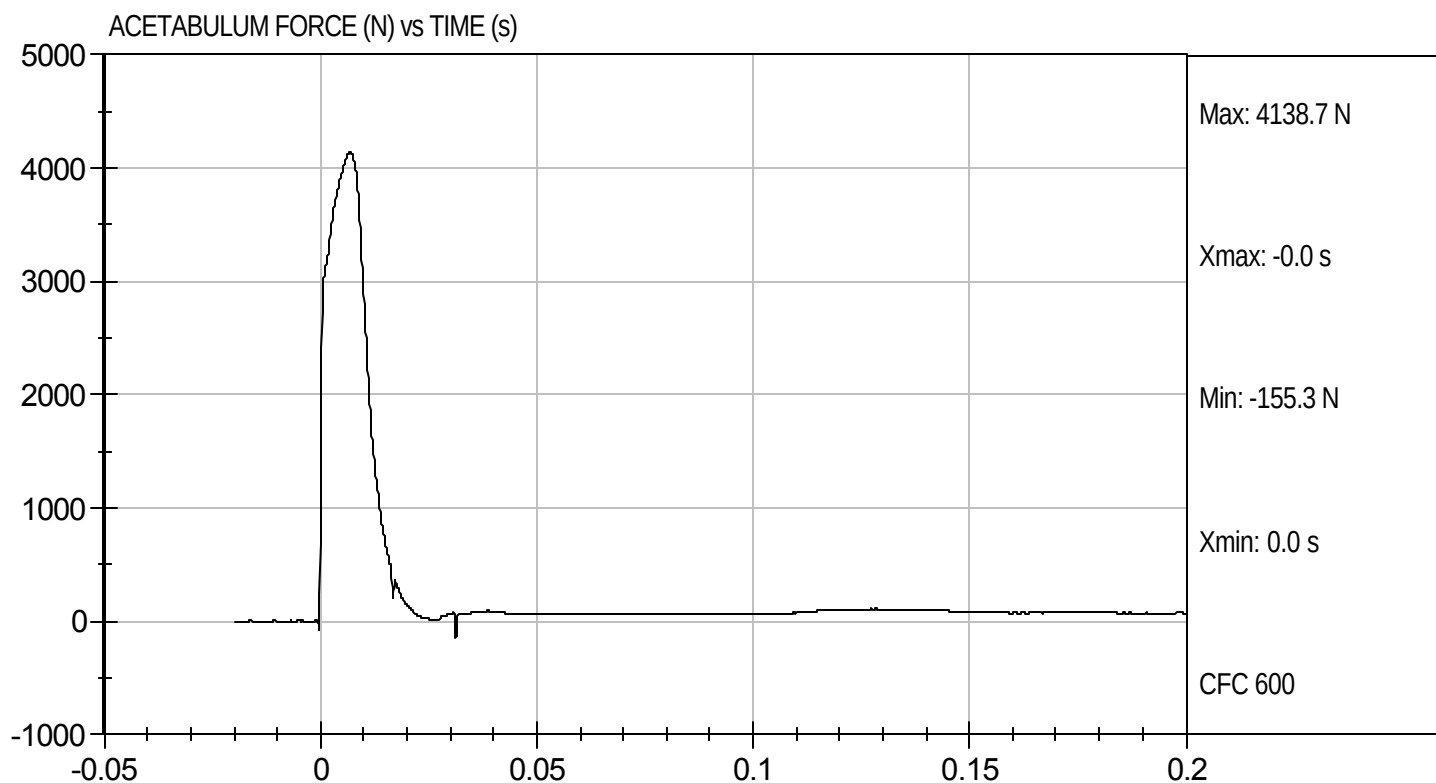
Test Date: 10/13/10
Velocity: 22.20 ft/s, 6.77 m/s





Test Desc: Pelvis Impact
Component ID: D103477

Test Date: 10/13/10
Velocity: 22.20 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: D103478

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.0	Pass
Humidity	%	10 to 70	40	Pass
Impact Velocity	m/s	4.20 to 4.40	4.39	Pass
Peak Impactor 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	4512	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

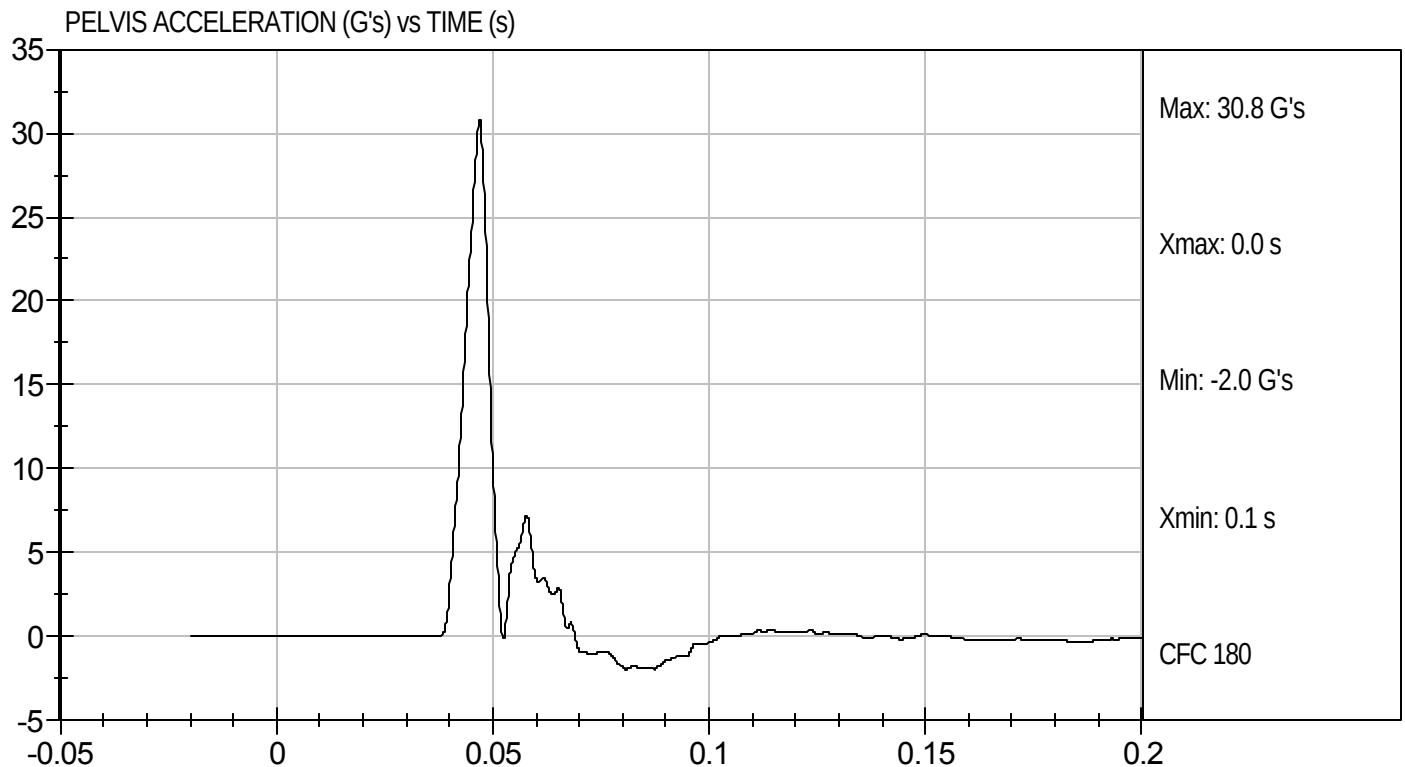
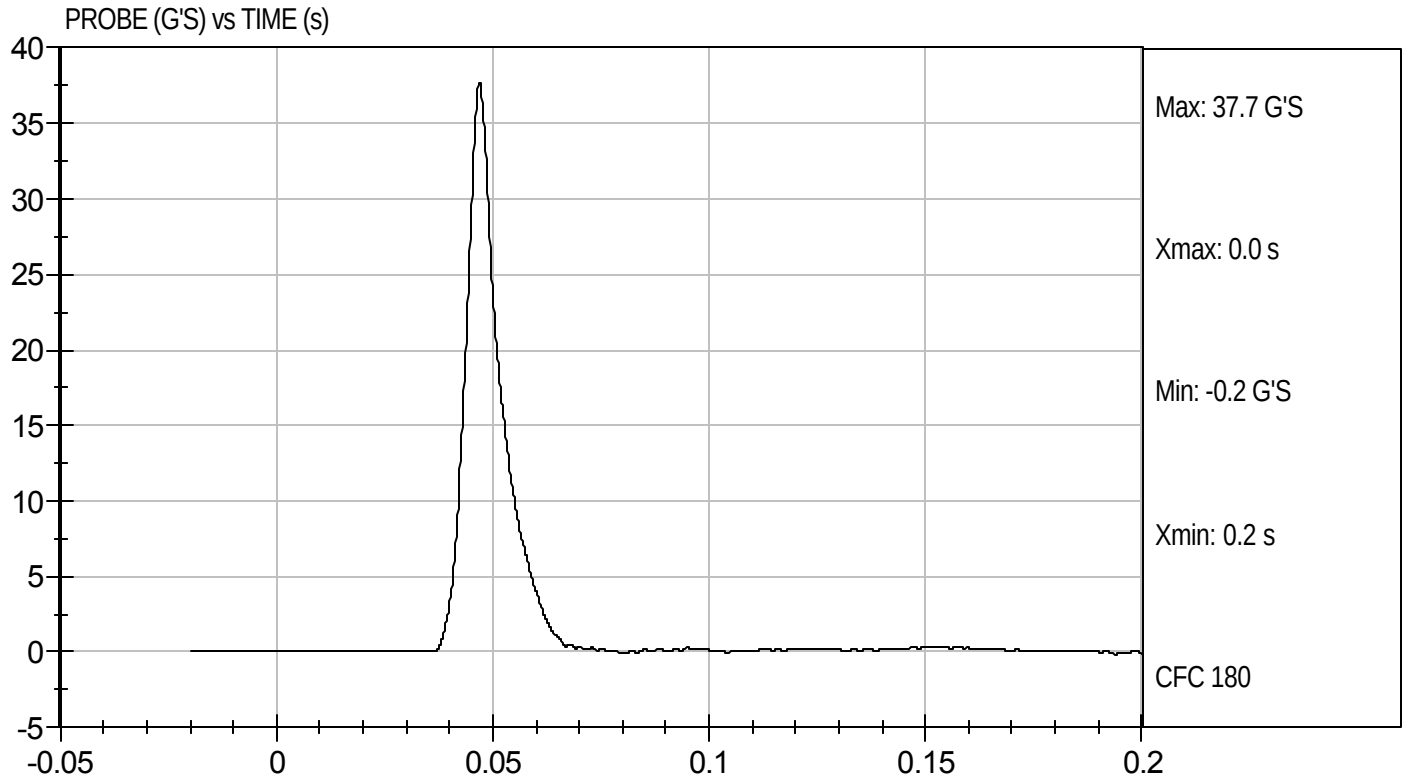
10/13/10
Test Date

David Winkelbauer
Approved By



Test Desc: Iliac Impact
Component ID: D103478

Test Date: 10/13/10
Velocity: 14.40 ft/s, 4.39 m/s





Test Desc: Iliac Impact
Component ID: D103478

Test Date: 10/13/10
Velocity: 14.40 ft/s, 4.39 m/s

