

REPORT NUMBER: SPNCAP-MGA-2011-016

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

**GENERAL MOTORS LLC
2011 Chevrolet Tahoe LS 2WD
NHTSA No.: MB0118**

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



Test Date: September 1, 2010

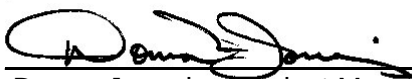
Final Report Date: October 1, 2010

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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Approved by: 
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Approval Date: October 1, 2010

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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						9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105																			
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						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 Chevrolet Tahoe LS 2WD 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 September 1, 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 452 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></th> <th colspan="3">Driver ATD (SID-IIs)</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>319</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>Gs</td> <td>82</td> <td>52</td> </tr> <tr> <td>Combined Acetabular and Iliac Pelvic Force</td> <td>N</td> <td>5525</td> <td>3675</td> </tr> </tbody> </table> The 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.							Driver ATD (SID-IIs)			Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	319	Resultant Lower Spine Acceleration	Gs	82	52	Combined Acetabular and Iliac Pelvic Force	N	5525	3675
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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 Chevrolet Tahoe LS 2WD. 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 Chevrolet Tahoe LS 2WD. 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 September 1, 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 Accelerometers
- Thorax Upper, Middle, and Lower Rib Potentiometers
- Abdomen Upper and Lower Rib Potentiometers
- Lower Spine 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	319	52	Iliac Wing	1003
			Acetabular	2911
			Sum	3675

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

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

GENERAL COMMENTS

There was no valid data collected for:

Left Floor Sill Y after 40 msec.

Left Lower B-Post Y after 10 msec.

The contacts were removed from the dummy per the manufacturer's request.

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 Chevrolet Tahoe LS 2WD
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB0118
 Test Date: 9/01/2010

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MB0118	Anti-Lock Brakes	Yes
Model Year	2011	All Wheel Drive	No
Make	Chevrolet	Power Steering	Yes
Model	Tahoe	Driver Front Airbag	Yes
Body Style	MPV	Driver Curtain Airbag	Yes
VIN	1GNSCAE00BR101432	Driver Head/Torso Airbag	No
Body Color	Sheer Silver Metallic	Driver Torso Airbag	No
Delivery Date	8/02/2010	Driver Torso/Pelvis Airbag	Yes
Odometer (mi)	43	Driver Pelvis Airbag	No
Odometer (km)	69	Driver Knee Airbag	No
Dealer	Ray Auto Group	Rear Pass. Front Airbag	No
Transmission	Automatic	Rear Pass. Curtain Airbag	Yes
Final Drive	Rear	Rear Pass. Head/Torso Airbag	No
Type/No. Cylinders	8	Rear Pass. Torso Airbag	No
Engine Displacement (L)	5.3	Rear Pass. Torso/Pelvis Airbag	No
Engine Placement	Longitudinal	Rear Pass. Pelvis Airbag	No
Roof Rack	Yes	Rear Pass. Knee Airbag	No
Sunroof/T-Top	No	Pretensioners	Yes
Tinted Glass	Yes	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	General Motors LLC	GVWR (kg)	3221
Date of Manufacture	07/10	GAWR Front (kg)	1452
		GAWR Rear (kg)	1860

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3	3	8	
Capacity Weight (VCW) (kg)				728	(A)
DSC x 68.04 kg				544	(B)
Cargo Weight (RCLW) (kg)				136	(A-B)

VEHICLE SEAT TYPE

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

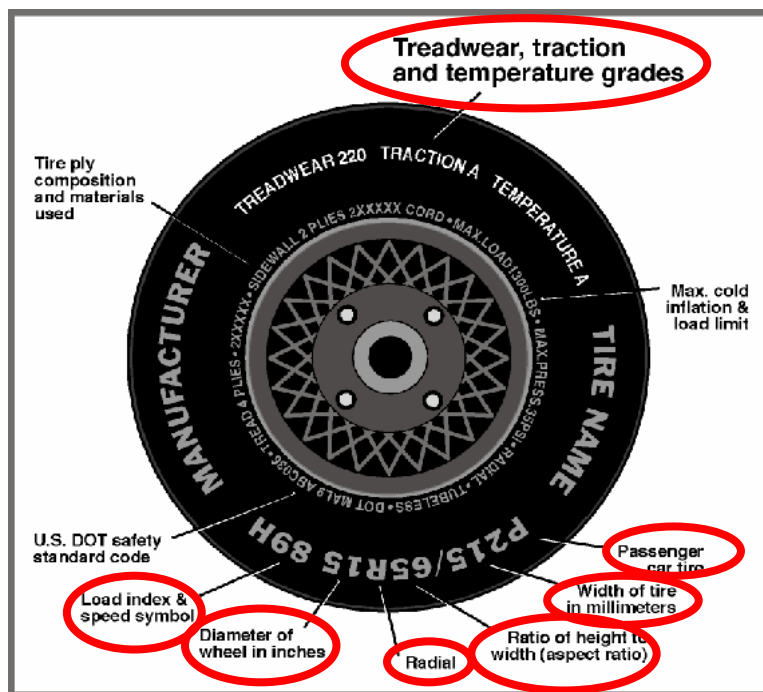
DATA SHEET NO. 1 (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Chevrolet Tahoe LS 2WD
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB0118
 Test Date: 9/01/2010

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	220	220
Recommended Tire Size	P265/70R17	P265/70R17
Tire Size on Vehicle	P265/70R17	P265/70R17
Tire Model	Goodyear	Goodyear
Tire Manufacturer	Wrangler HP	Wrangler HP
Treadwear	340	340
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index & Speed Symbol	113S	113S
Tire Material	Rubber	Rubber
DOT Safety Code Right	ABT6 FOCR	ABT6 FOCR
DOT Safety Code Left	ABT6 FOCR	ABT6 FOCR

DATA SHEET NO. 1 (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Chevrolet Tahoe LS 2WD
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB0118
 Test Date: 9/01/2010

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	619.2	626.9		621.0	704.4		630.0	727.6	
Right	kg	630.9	591.9		639.1	686.8		620.1	679.5	
Ratio	%	50.6	49.4		47.5	52.5		47.0	53.0	
Totals	kg	1250.1	1218.8	2468.9	1260.1	1391.2	2651.3	1250.1	1407.1	2657.2

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2468.9	(A)
Actual Weight of 1 P572V ATD (SID-IIs) ATD Used	kg	52.2	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	136	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	2657.1	(A+B+C)

TEST VEHICLE ATTITUDES AND CG

	Units	As Delivered	As Tested	Fully Loaded
Driver Door Sill Angle (front-to-rear)*	deg	-0.8	-0.5	-0.2
Front Passenger Sill Angle (front-to-rear)*	deg	-0.7	-0.4	-0.2
Front Bumper Angle (left-to-right)**	deg	0.0	0.0	0.0
Rear Bumper Angle (left-to-right)**	deg	-0.4	-0.4	-0.5
Vehicle CG (Aft of Front Axle)	mm	1456	1548	1562
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	8	0	19

*Front up is positive ** Left up is positive

GENERAL VEHICLE TEST DATA

Measurement Description	Units	Value
Weight of Ballast in Cargo Area	kg	140.2
Weight of Vehicle Components Removed	kg	59.9

Vehicle components removed to meet target vehicle test weight: Third row seat, right side cargo area trim, cargo area carpet, right front side mirror, right rear tail light.

TEST VEHICLE IMPACT POINT DATA

Measurement Parameter	Units	Value
Vertical Impact Reference Line (Aft of Front Axle)	mm	1206
Actual Impact Point (Aft of Front Axle)	mm	1211
Impact Point Difference (- forward / + rearward)	mm	5

DATA SHEET NO. 2

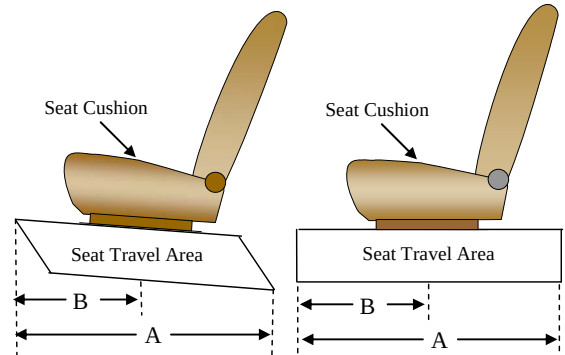
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2011 Chevrolet Tahoe LS 2WD
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB0118
 Test Date: 9/01/2010

SEAT FORE/AFT POSITIONS

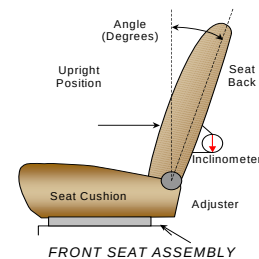
The driver seat was a power fore/aft adjustable seat with a manual angle adjustment. The seat travel was set as specified in Appendix B of the TP dated January 2010. The right front passenger manual seat was set to match the driver seat. The rear passenger seats were not adjustable.



SEAT FORE/AFT POSITIONING	Total Fore/Aft Travel (mm)	Placed in Detent # or Position (mm)
Driver Seat	240 mm	0 mm (full forward)
Front Passenger Seat	240 mm	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 for the front seats and at the seat back frame for the rear seats.



SEAT BACK ANGLE	Degrees	Detents
Driver Seat Back Angle with Seated Dummy	1.8 (headrest post)	
Front Passenger Seat Back Angle	1.5 (headrest post)	
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	5 detents	0 (uppermost as 0)
Front Passenger Seat	5 detents	0 (uppermost as 0)

DATA SHEET NO. 2 (CONTINUED)

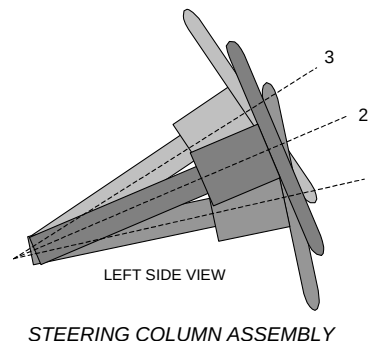
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2011 Chevrolet Tahoe LS 2WD
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB0118
 Test Date: 9/01/2010

STEERING COLUMN ADJUSTMENT

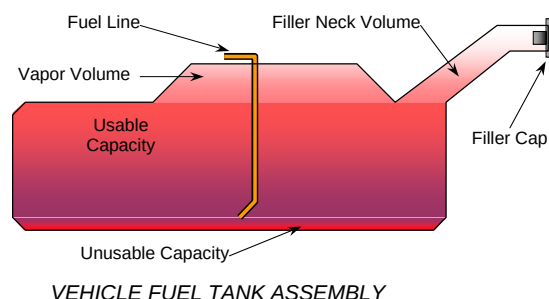
Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, an inclinometer is placed on the plate and the angle is measured.



STEERING COLUMN POSITIONING

	Degrees	Fore/Aft Position (mm)
Lowermost - Position 1	79.4	
Geometric Center – Position 2	69.4	
Uppermost – Position 3	59.4	
Telescoping Steering Wheel Travel		
Test Position	69.4	

Describe the fuel pump type, its behavior, and the location of the fuel filler pipe. The test vehicle is equipped with an electric fuel pump. Pump will run when engine is running. Also, it will run briefly when ignition key is turned to the “on” position without starting the engine. The fuel pipe is on the left side.



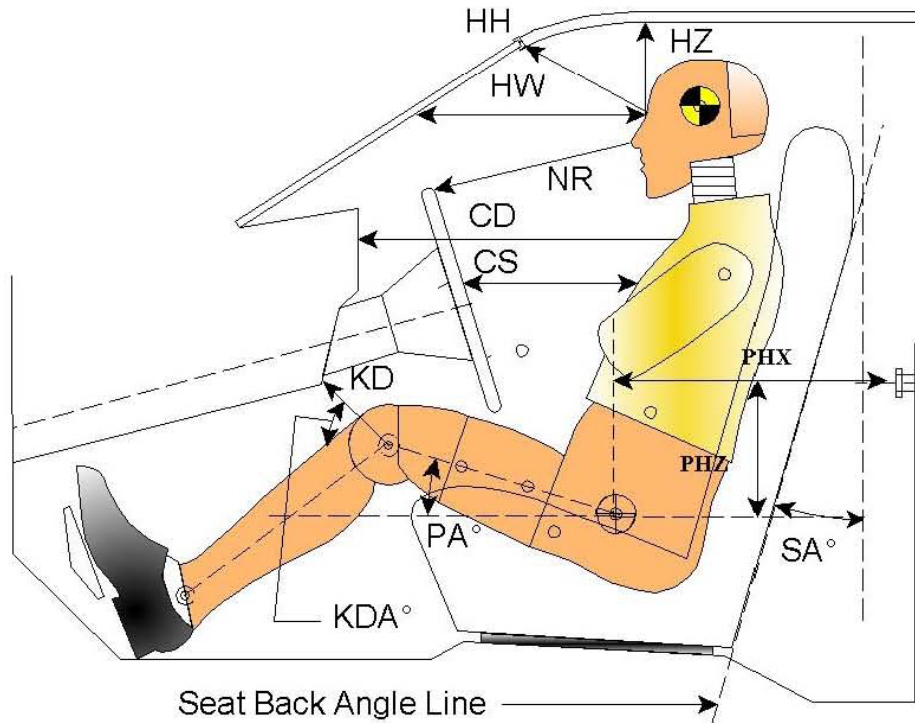
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of “Standard” Tank	98.4
Usable Capacity of “Optional” Tank	
Usable Capacity of Standard Tank as Specified in Owner’s Manual	98.4
Usable Capacity of Optional Tank as Specified in Owner’s Manual	
92-94% of Usable Capacity	90.5 to 92.5
Actual Amount of Solvent Used	91.0
1/3 of Usable Capacity	32.8

.DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Chevrolet Tahoe LS 2WD
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB0118
 Test Date: 9/01/2010

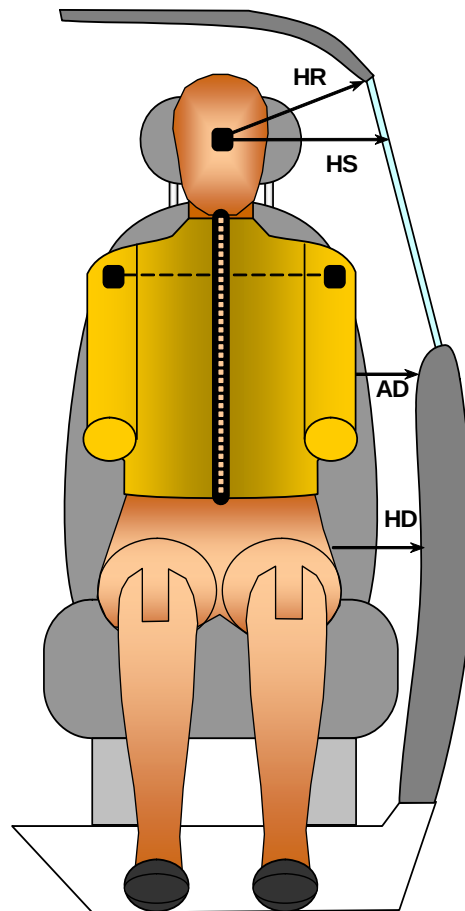


Code	Measurement Description	Driver S/N 296	
		Length (mm)	Angle (°)
HH	Head to Header	137	
HW	Head to Windshield	646	
HZ	Head to Roof	256	
NR	Nose to Rim	226	
CD	Chest to Dash	401	
CS	Chest to Steering Wheel	181	
KDL/KDAL	Left Knee to Dash	107	44.5
KDR/KDAR	Right Knee to Dash	99	48.8
PA	Pelvic Angle		18.2
PHX	H-Point to Striker (X-Axis)	450	
PHZ	H-Point to Striker (Z-Axis)	5	
SA	Seat Back Angle		1.8

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Chevrolet Tahoe LS 2WD
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB0118
 Test Date: 9/01/2010



FRONT VIEW OF DUMMY

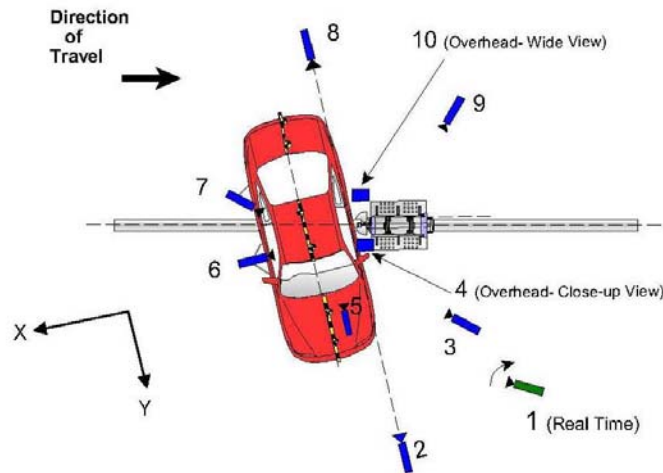
Code	Measurement Description	Driver S/N 296
		Length (mm)
HR	Head to Side Header	253
HS	Head to Side Window	377
AD	Arm to Door	168
HD	H-Point to Door	151

DATA SHEET NO. 5

CAMERA LOCATIONS AND DATA

Test Vehicle: 2011 Chevrolet Tahoe LS 2WD
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB0118
 Test Date: 9/01/2010



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	20	5520	-1640	24	1000
3	Impact Side 45° Forward	-1860	4230	-1690	20	1000
4	Overhead Closeup	40	0	-4520	50	1000
5	Onboard – Driver Front				12.5	1000
6	Onboard – Driver Side				8	1000
7	Onboard – Driver Rear				8	1000
8	Rear Ground Level	0	-6590	-1610	24	1000
9	Impact Side 45° Rearward	-3620	-2820	-1660	20	1000
10	Overhead Wide View	100	0	-4520	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

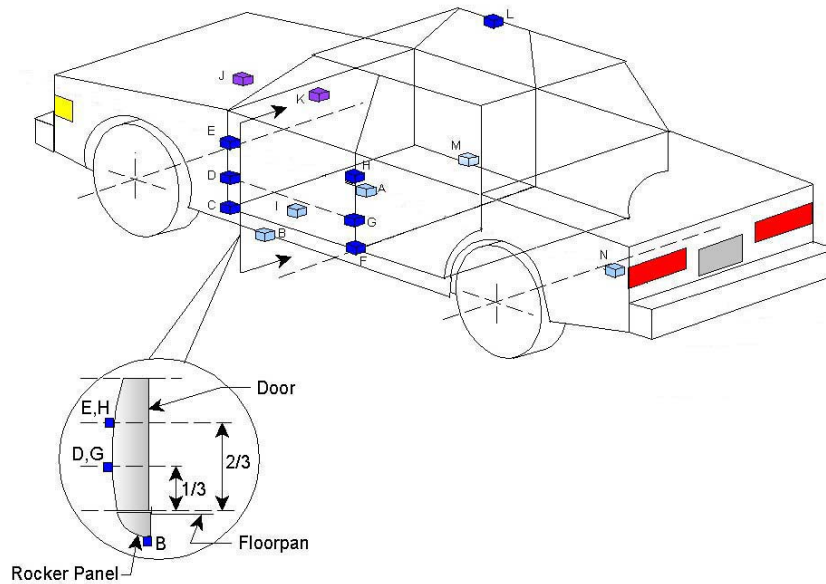
	Number of Channels
Driver Dummy	16
Vehicle Structure	21
Pole Load Cells – Not used	8
Contact Switches	3 (see Test Notes)
Airbag Timing	2
Total No. of Data Channels	50

DATA SHEET NO. 6

VEHICLE ACCELEROMETER DATA

Test Vehicle: 2011 Chevrolet Tahoe LS 2WD
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB0118
 Test Date: 9/01/2010



	Accelerometer Location			
	ID	Coordinates (mm)		
		X	Y	Z
A	Vehicle CG	2338	0	-585
	Vehicle CG Sensor	2358	0	-585
B	Left Floor Sill	3208	-874	-440
C	A Pillar Sill	3483	-874	-420
D	A Pillar Low	3453	-790	-690
E	A Pillar Mid	3588	-888	-950
F	B Pillar Sill	2318	-805	-408
G	B Pillar Low	2320	-815	-780
H	B Pillar Mid	2320	-810	-1020
I	Driver Seat	2130	-630	-635
L	Engine Top	4110	-5	-1110
J	Firewall	3920	-25	-1220
K	Right Roof	3019	790	-1770
M	Right Floor Sill	2635	810	-481
N	Rear Floorpan	1420	0	-750

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 Chevrolet Tahoe LS 2WD
Test Program: NCAP Side Pole Impact Test

NHTSA No. MB0118
Test Date: 9/01/2010



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 Chevrolet Tahoe LS 2WDNHTSA No. MB0118Test Program: NCAP Side Pole Impact TestTest Date: 9/01/2010**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	Yes	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	+5
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	32.3

DATA SHEET NO. 9

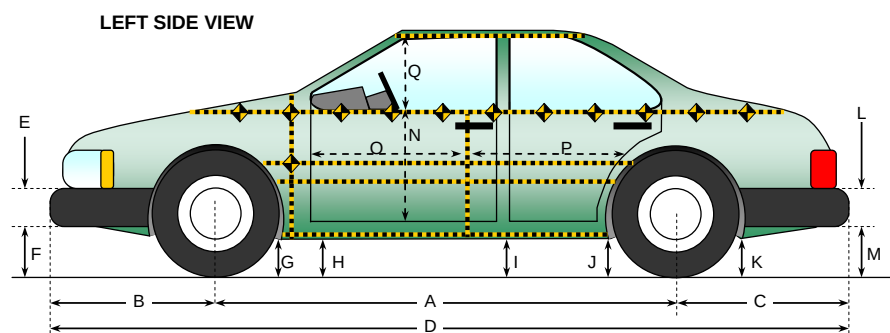
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Chevrolet Tahoe LS 2WD

NHTSA No. MB0118

Test Program: NCAP Side Pole Impact Test

Test Date: 9/01/2010



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

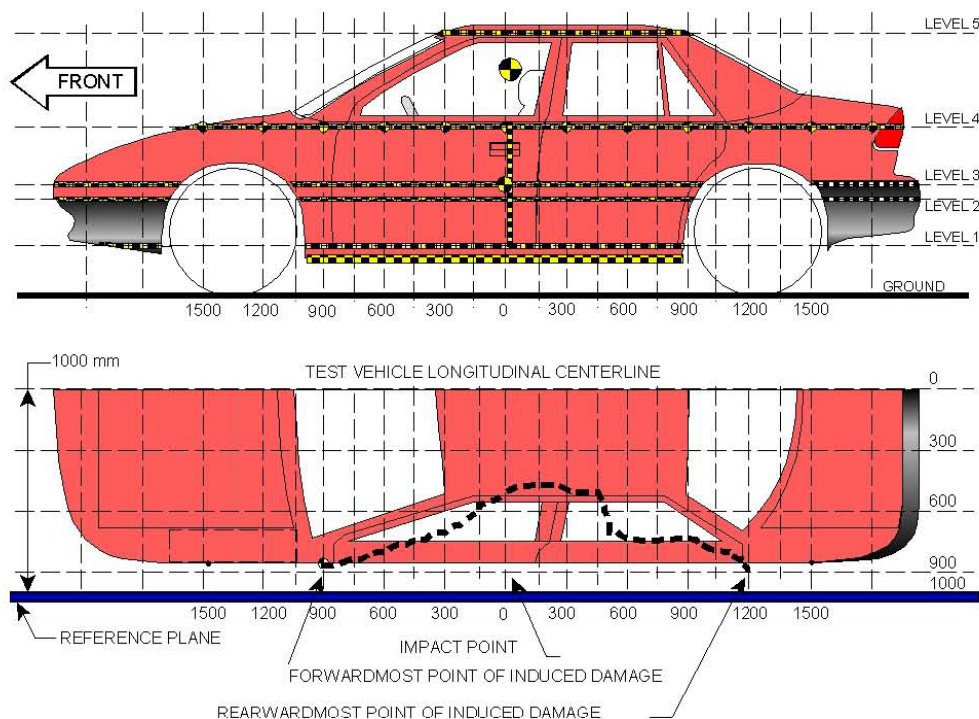
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2950	2850	100
B	Front Axle to FSOV	964	1015	-51
C	Rear Axle to RSOV	1185	1165	20
D1	Total Vehicle Length at Left Side	4284	4056	228
D2	Total Vehicle Length at Centerline	5099	5030	69
D3	Total Vehicle Length at Right Side	4284	4305	-21
E	Front Bumper Thickness	157	157	0
F	Front Bumper Bottom to Ground	211	217	-6
G	Sill Height at Front Wheel Well	288	293	-5
H	Sill Height at Front Door Leading Edge	272	277	-5
I	Sill Height at B Pillar	299	302	-3
J1	Sill Height at Rear Wheel Well	288	291	-3
J2	Pinch Weld Height at Rear Wheel Well	305	310	-5
K	Sill Height Aft of Rear Wheel Well	357	361	-4
L	Rear Bumper Thickness	235	235	0
M	Rear Bumper Bottom to Ground	407	406	1
N	Sill Height to Window Bottom Sill	872	881	-9
O	Front Door Leading Edge to Impact CL	675	795	-120
P	Rear Door Trailing Edge to Impact CL	1507	1570	-63
Q	Front Window Opening	455	410	45
R	Right Side Length	4284	4305	-21
S	Left Side Length	4284	4056	228
T	Vehicle Width at B Post	2000	1890	110

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Chevrolet Tahoe LS 2WD
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB0118
 Test Date: 9/01/2010



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	425
2	Occupant H-Point	800
3	Mid-Door	850
4	Window Sill	1180
5	Window Top	1740

DATA SHEET NO. 10 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Chevrolet Tahoe LS 2WD
Test Program: NCAP Side Pole Impact Test

NHTSA No. MB0118
Test Date: 9/01/2010

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-750	180			162		181			158		1			-4	
-600	195	115	116	160		230	137	132	178		35	22	16	18	
-525	195	110	116	159		262	183	181	213		67	73	65	54	
-450	195	109	115	160		301	240	237	254		106	131	122	94	
-375	195	109	115	158		342	293	295	307		147	184	180	149	
-300	193	111	114	155		380	351	349	358		187	240	235	203	
-225	194	111	114	155		419	407	401	413		225	296	287	258	
-150	192	111	114	155	376	461	462	456	474	551	269	351	342	319	175
-75	190	111	112	155	372	519	515	518	536	602	329	404	406	381	230
0	189	111	112	155	368	550	558	564	575	606	361	447	452	420	238
75	188	110	110	155	368	534	551	561	568	562	346	441	451	413	194
150	188	110	110	155	368	497	530	528	534	528	309	420	418	379	160
225	186	109	110	154	370	434	483	474	475	494	248	373	364	321	124
300	186	109	110	154	368	378	412	414	414	453	192	303	304	260	85
375	186	109	110	151	370	337	347	353	359	423	151	238	243	208	53
450	187	110	110	152	370	285	273	280	295	461	98	163	170	143	91
525	186	109	110	152	370	231	205	208	257	449	45	96	98	105	79
600	185	110	110	152	371	263	200	207	248	441	78	90	97	96	70
675	185	110	110	152	370	239	184	188	230	420	54	74	78	78	50
750	186	110	110	152	370	237	184	186	231	419	51	74	76	79	49
900	183	110	110	152	370	209	162	166	207	396	26	52	56	55	26
1050	178	110	110	153	371	186	146	150	192	378	8	36	40	39	7
1200		111	111	154	373		128	133	176	358		17	22	22	-15
1350		111	100	156	375		105	107	168	402		-6	7	12	27
1500				160	380				171	399				11	19
1650				162	380				169	395				7	15
1800				165	382				174	398				9	16
1950				170	390				172	400				2	10

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 Chevrolet Tahoe LS 2WD
Test Program: NCAP Side Pole Impact Test

NHTSA No. MB0118
Test Date: 9/01/2010

MAXIMUM CRUSH DATA

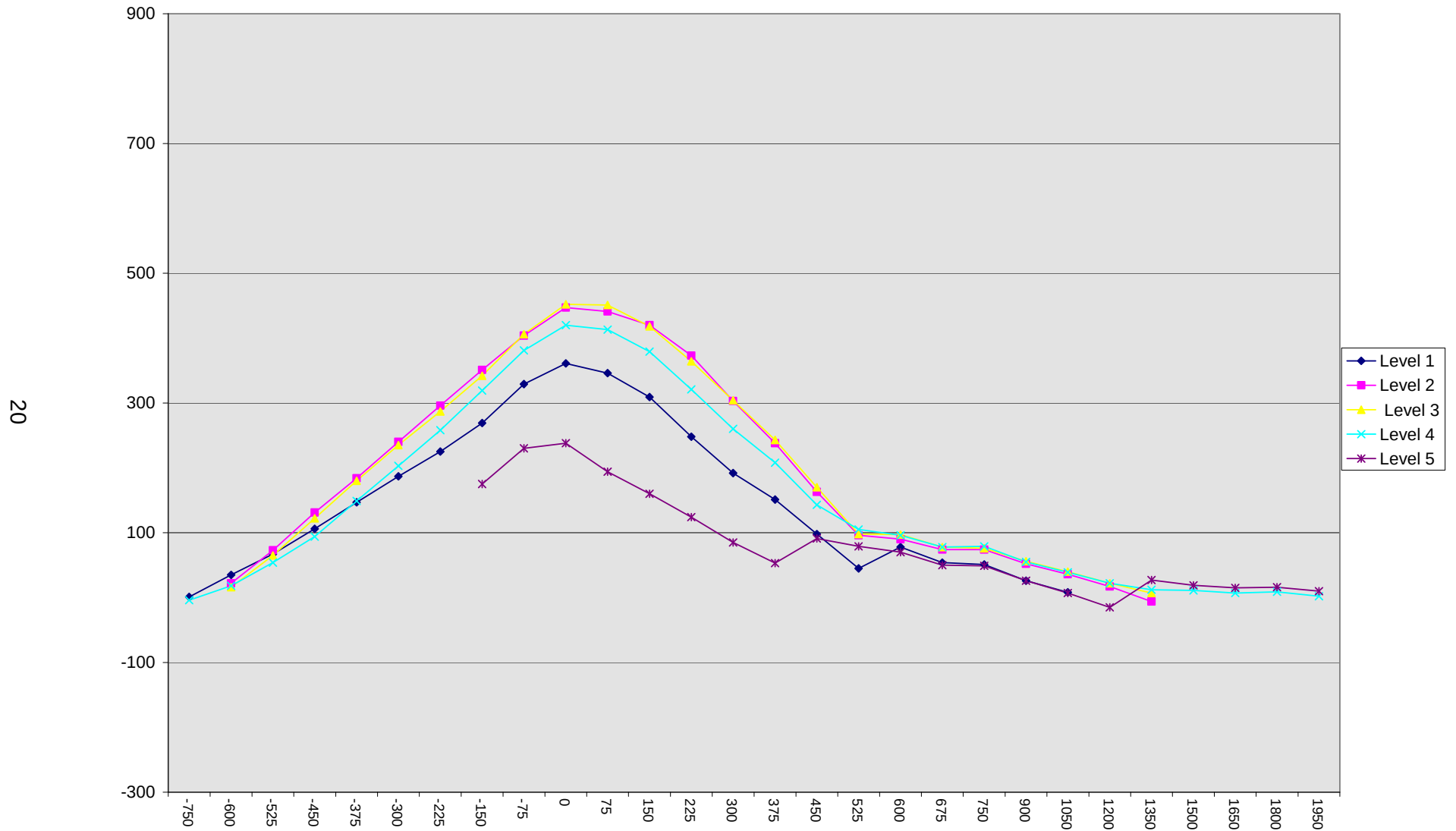
	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush (mm)	361	447	452	420	238
Distance From Impact (mm)	0	0	0	0	0

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 Chevrolet Tahoe LS 2WD
Test Program: NCAP Side Pole Impact Test

NHTSA No. MB0118
Test Date: 9/01/2010



DATA SHEET NO. 11

FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

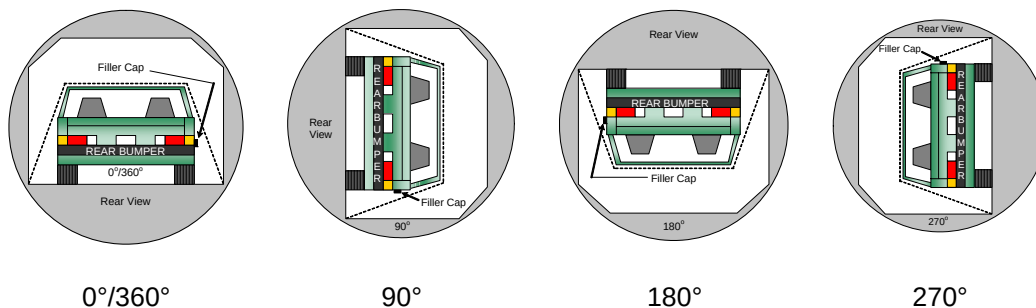
Test Vehicle: 2011 Chevrolet Tahoe LS 2WD
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB0118
 Test Date: 9/01/2010

Test Time: 10:53 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°	106	300	406
90° to 180°	112	300	412
180° to 270°	112	300	412
270° to 360°	109	300	409

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

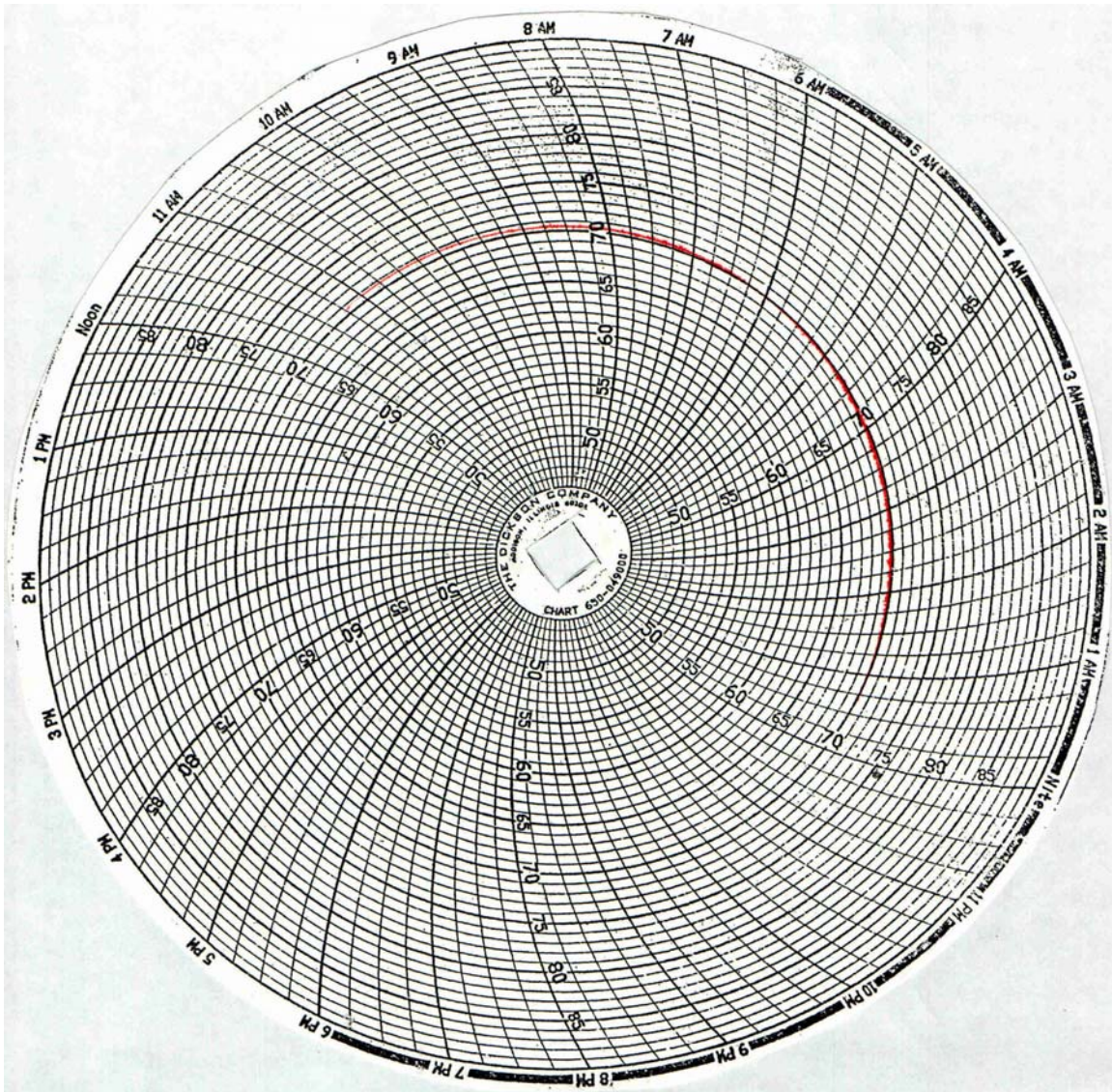
Test Phase	Spillage Location
0° to 90°	
90° to 180°	
180° to 270°	
270° to 360°	

DATA SHEET NO. 12

DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle: 2011 Chevrolet Tahoe LS 2WD
Test Program: NCAP Side Pole Impact Test

NHTSA No. MB0118
Test Date: 9/01/2010



APPENDIX A
PHOTOGRAPHS

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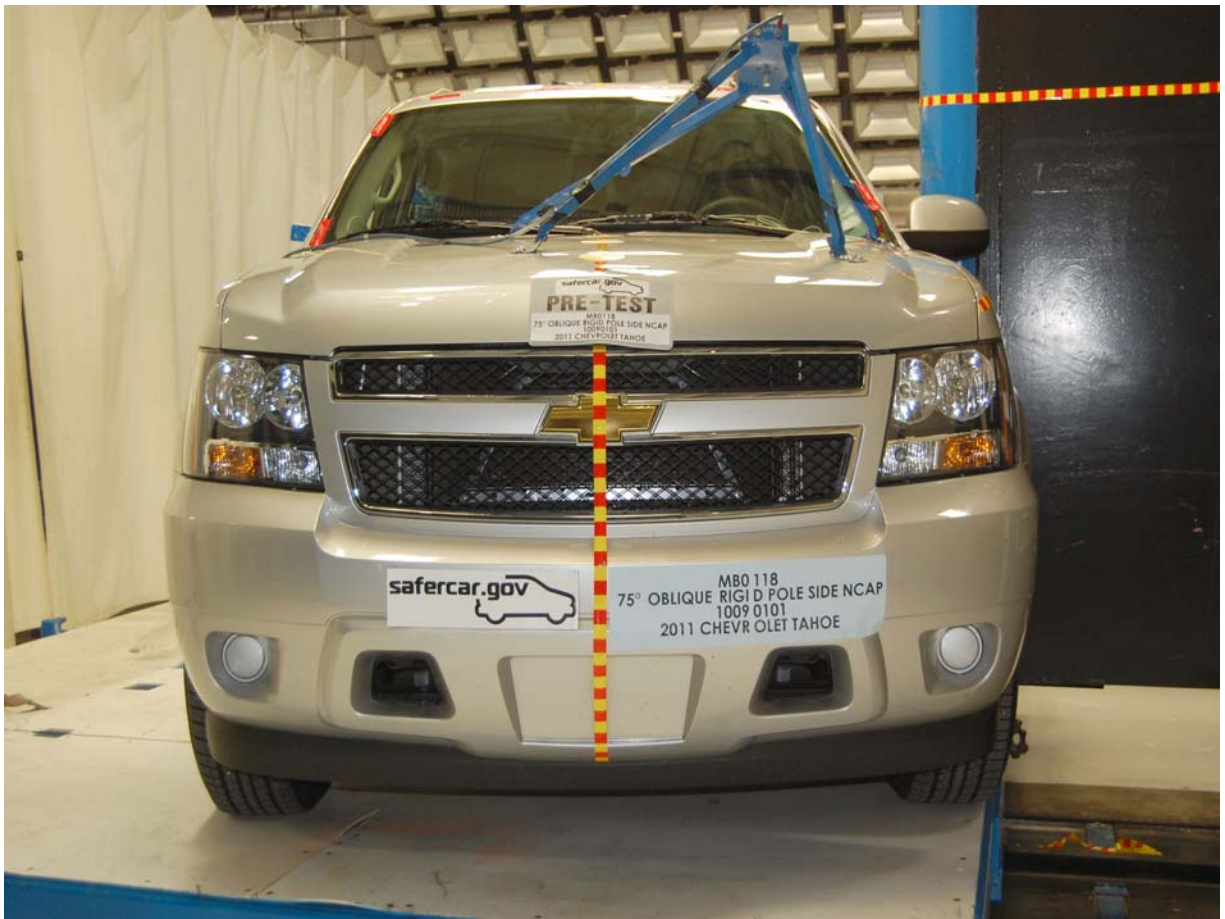
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As Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



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



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



Pre-Test Front Close-Up View of Dummy



Post-Test Front Close-Up View of Dummy



Pre-Test Left Side View of Dummy Showing Belts and Chalking (no contact switches)



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



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



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



Pre-Test Dummy and Door Clearance View



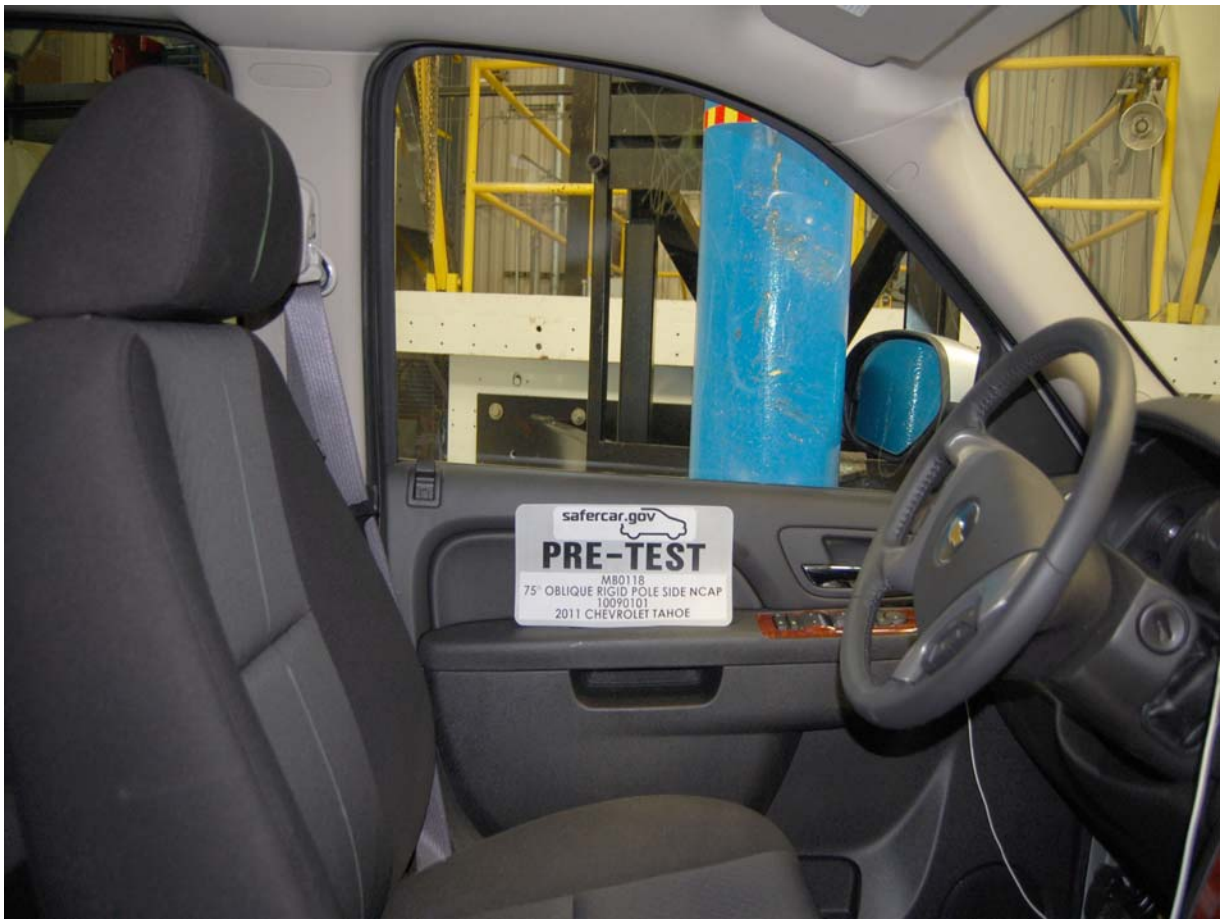
Post-Test Dummy and Door Clearance View



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



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



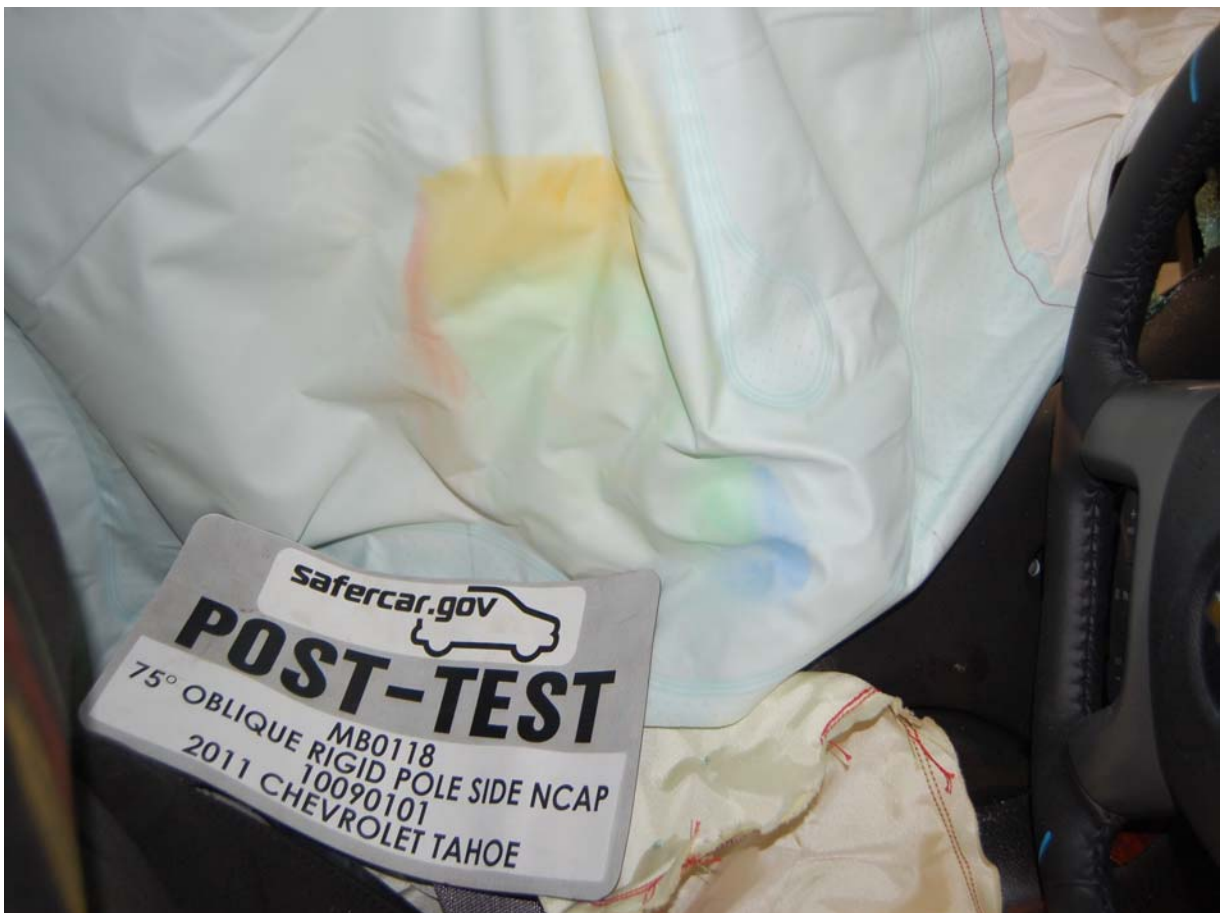
Pre-Test Inner Door Panel View



Post-Test Inner Door Panel View Showing Dummy Contact Location



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



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



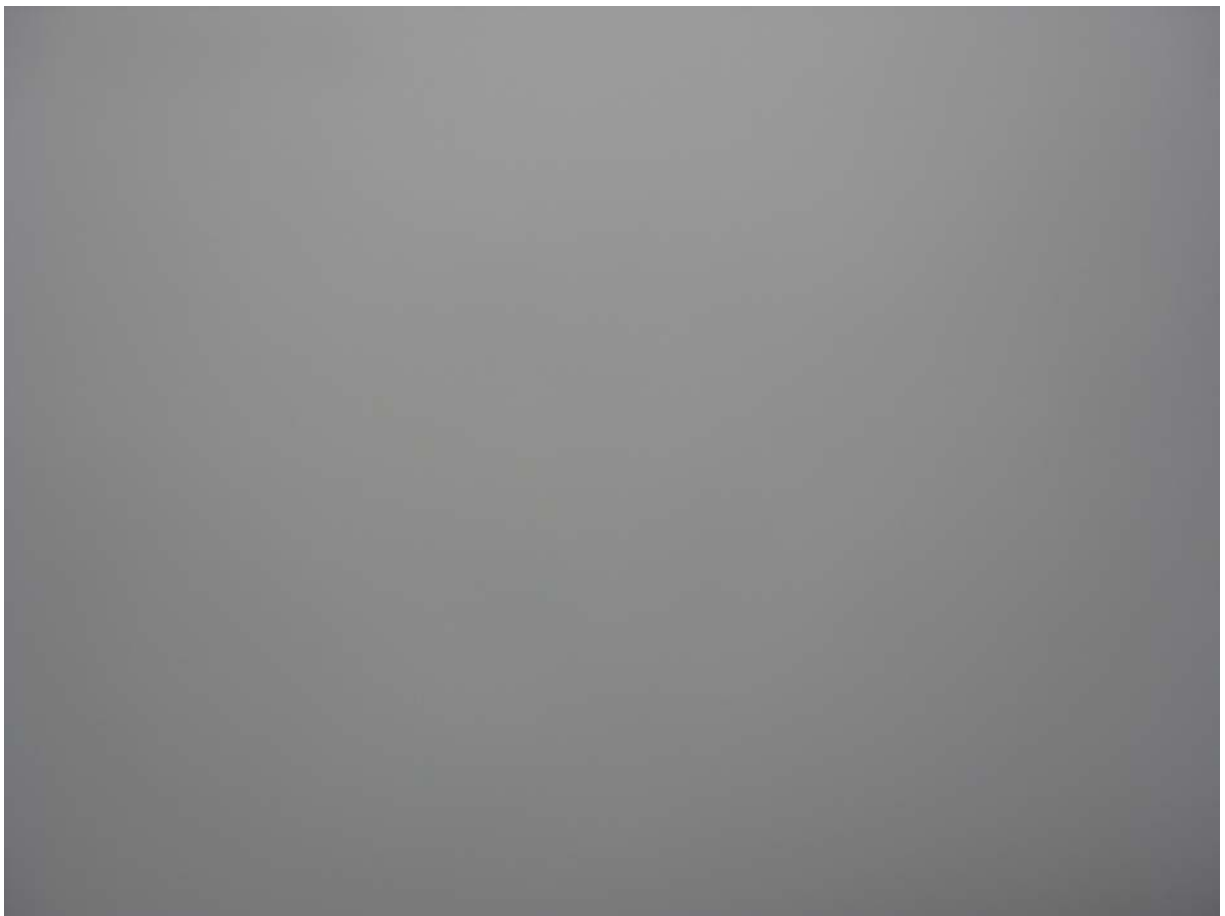
Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View (Not Applicable)



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



Post-Test Dummy Close-Up Pelvis Contact View (Not Applicable)



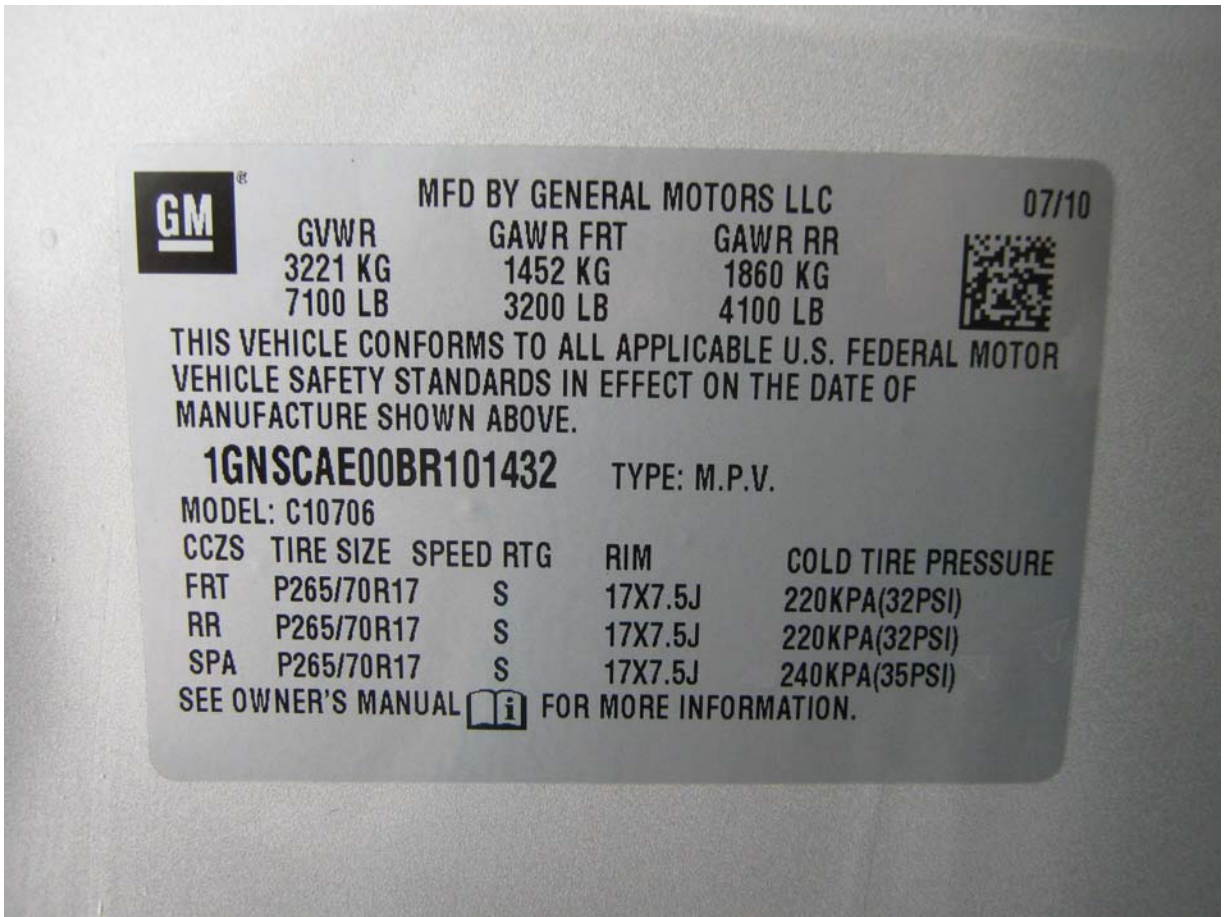
Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View (Not Applicable)



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



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



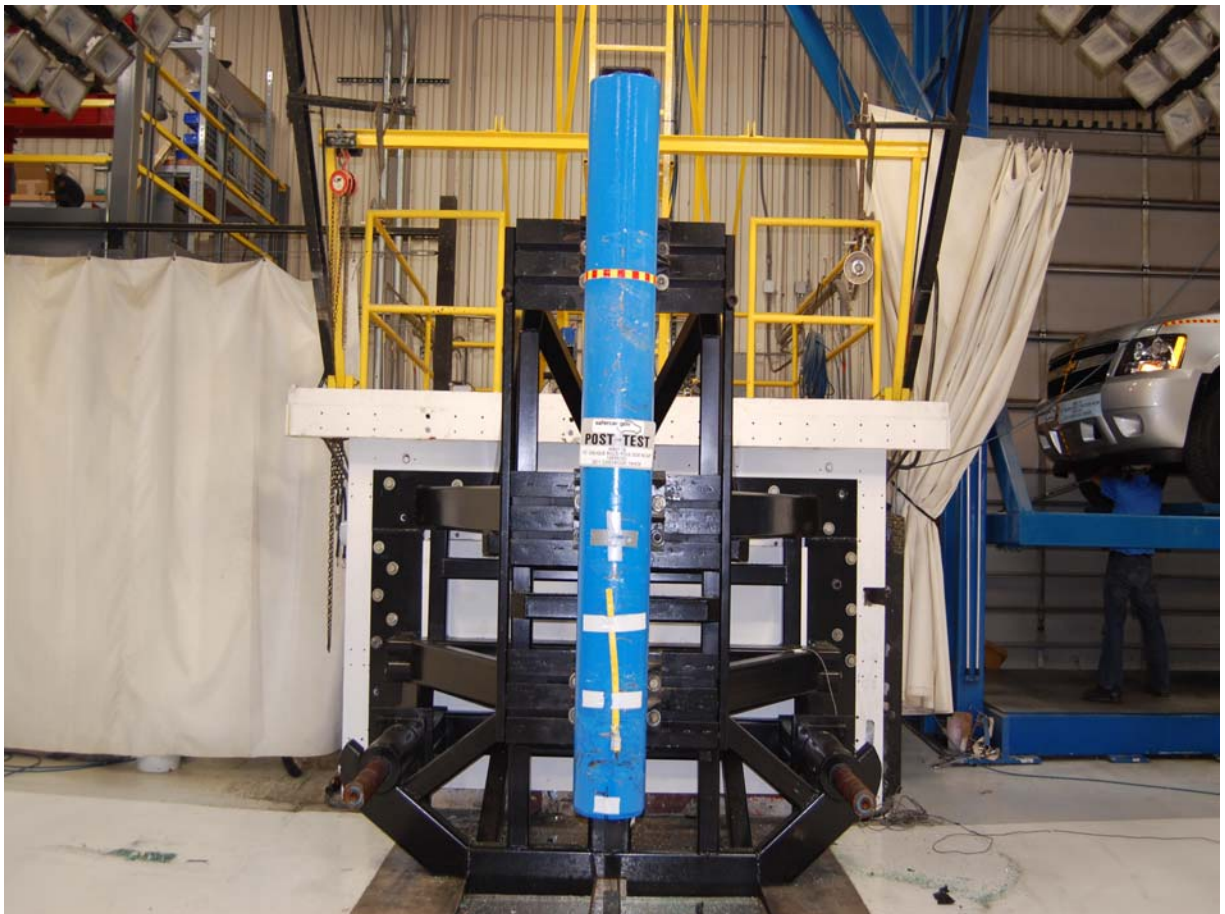
Close-Up View of Vehicle's Certification Label



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



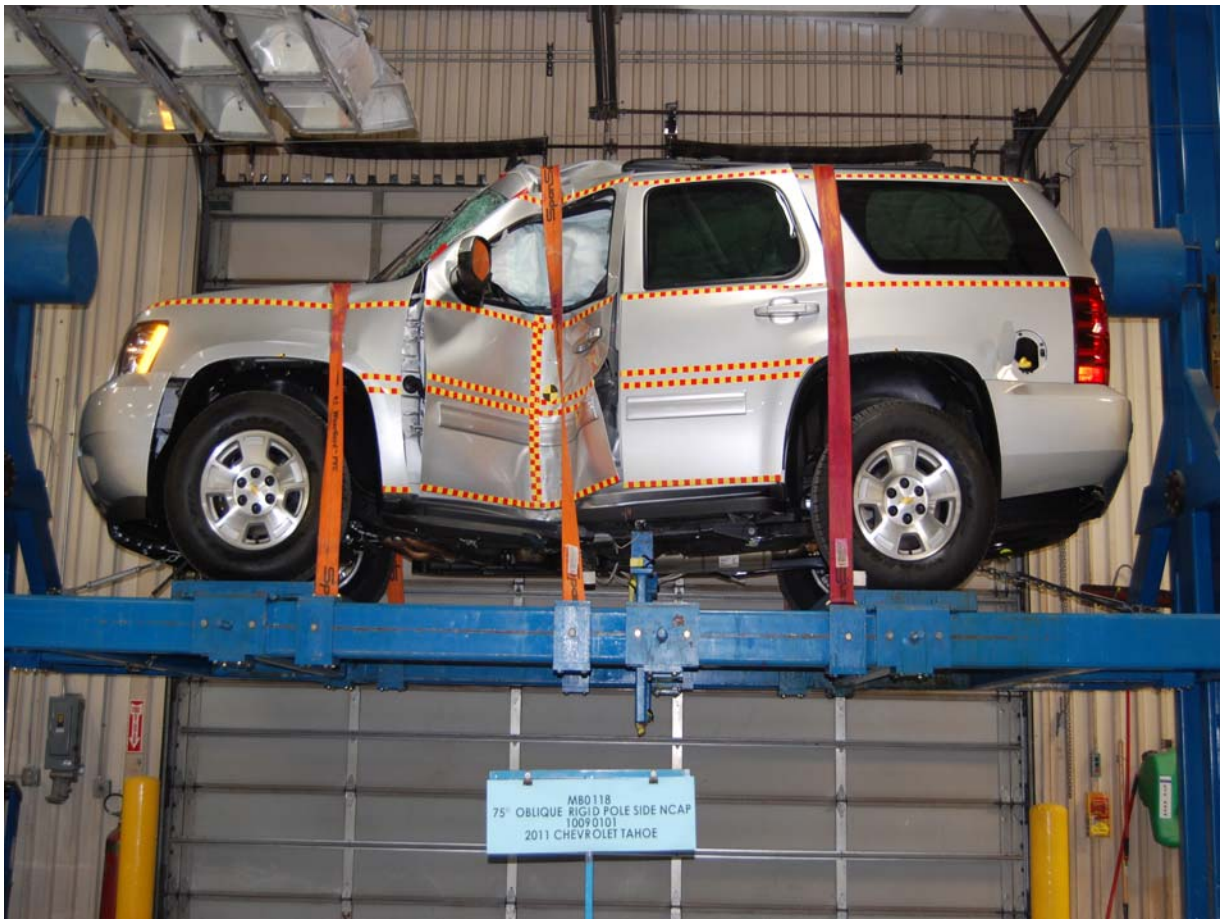
FMVSS No. 301/305 Rollover 90 Degrees



FMVSS No. 301/305 Rollover 180 Degrees



FMVSS No. 301/305 Rollover 270 Degrees



FMVSS No. 301/305 Rollover 360 Degrees



Impact Event



CHEVROLET

2011 TAHOE 2WD LS

EXTERIOR: SHEER SILVER METALLIC
INTERIOR: EBONY

VORTEC 5.3L V8 SFI ENGINE
6-SPEED AUTOMATIC TRANSMISSION

STANDARD EQUIPMENT

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

• 5 YEAR / 100,000 MILE POWERTRAIN LIMITED WARRANTY¹

SEE DEALER FOR DETAILS

MECHANICAL

- ENGINE 5.3L VORTEC V8 WITH ACTIVE FUEL MANAGEMENT & FLEX-FUEL CAPABILITY
- TRANSMISSION, 6 SPEED AUTO
- PREM. SMOOTH RIDE SUSPENSION

SAFETY & SECURITY

- AIR BAGS, DUAL FRONTAL
- HEAD CURTAIN SIDE AIR BAGS, ALL SEATING ROWS
- SEAT MOUNTED SIDE IMPACT AIR BAGS, DRIVER & FRONT PASS
- PASSENGER SENSING SYSTEM
- 6 MTHS ONSTAR DIRECTIONS & CONNECTIONS WITH AUTOMATIC CRASH RESPONSE AND TURN-BY-

TURN NAVIGATION (ASK DEALER ABOUT GEOGRAPHIC COVERAGE)

- ANTILOCK BRAKE SYSTEM, 4 WHEEL DISC
- STABILITRAK-STABILITY CONTROL WITH TRACTION CONTROL SYSTEM
- THEFT DETERRENT SYSTEM
- RR DOOR CHILD SECURITY LOCKS
- PWR DOOR LOCKS, PROGRAMMABLE
- PWR WINDOWS-DRIVER EXPRESS ON
- REMOTE KEYLESS ENTRY
- TIRE PRESSURE MONITOR SYSTEM

INTERIOR

- SEATS, FRONT BUCKET, CLOTH
- 6-WAY PWR DRIVER/FRONT PASS SEAT
- 2ND ROW 60/40 BENCH, CLOTH
- REAR WINDOW DEFROGGER & WIPER
- LIFTGATE/LIFTGLASS
- SOLAR-RAY DEEP TINTED GLASS
- AUTOMATIC HEADLAMPS
- POWER HEATED OUTSIDE MIRRORS
- AM/FM STEREO WITH CD PLAYER
- USB PORT
- BLUETOOTH FOR PHONE

Visit us at www.chevy.com

MANUFACTURER'S SUGGESTED RETAIL PRICE

STANDARD VEHICLE PRICE \$37,570.00

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

INC. INC.
GWM RATING-7100 LBS
REAR AXLE 3.08 RATIO

TOTAL OPTIONS \$0.00
TOTAL VEHICLE & OPTIONS \$37,570.00
DESTINATION CHARGE \$50.00

TOTAL VEHICLE PRICE* \$38,520.00

- XM RADIO - SERVICE SUBSCRIPTION SOLD SEPARATELY BY SIRIUS/XM AFTER 3 MONTHS
- CRUISE CONTROL
- FLOOR MATS, 1ST & 2ND ROW
- VISOR MIRRORS, LIGHTED
- DRIVER INFORMATION CENTER

EXTERIOR

- ASSIST STEPS
- TRAILERING RECEIVER/CONNECTOR
- 17" ALUMINUM WHEELS
- UNDERBODY MOUNTED SPARE TIRE
- LUGGAGE RACK - SIDE RAILS
- W/CROSS BARS
- REAR WINDOW DEFROGGER & WIPER
- LIFTGATE/LIFTGLASS
- SOLAR-RAY DEEP TINTED GLASS
- AUTOMATIC HEADLAMPS
- POWER HEATED OUTSIDE MIRRORS

OPTIONS & PRICING

EPA Fuel Economy Estimates

GASOLINE
CITY MPG

15

Expected range for most drivers
12 to 18 MPG

*Fuel economy when operating on E85 will yield different values than gasoline. See Fuel Economy Guide for more information.

FLEXIBLE FUEL VEHICLE*
GASOLINE - ETHANOL(E85)

Estimated
Annual Fuel Cost
\$2,293

based on 15,000 miles at
\$2.60 per gallon of GASOLINE

Combined GASOLINE
Fuel Economy

This Vehicle

17

10 32
All SUVs

GASOLINE
HIGHWAY MPG

21

Expected range for most drivers
17 to 25 MPG

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

AC2



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



GOVERNMENT SAFETY RATINGS

Frontal Crash Driver Not Rated
Passenger Not Rated

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

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

Side Crash Front seat Not Rated
Rear seat Not Rated

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

Rollover ★ ★ ★

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

Star rating 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

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 65%
MAJOR SOURCES OF FOREIGN PARTS CONTENT: MEXICO 31%

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

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT:
ARLINGTON, TX U.S.A.
COUNTRY OF ORIGIN:
ENGINE: UNITED STATES
TRANSMISSION: UNITED STATES

This label has been applied pursuant to Federal law. Do not remove prior to delivery to the consumer. Manufacturer's recommended retail price includes dealer installed options and accessories not listed above. Actual dealer price may vary.

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GM_LBL_PROD_0018 - 06/27/2009

ORDER NO. 10703 SALES CODE E
SALES MODEL CODE 007008
DEALER NO. 00011
SALES OFFICE: ARLINGTON, TX, U.S.A.

VIN 1GNSCAE00BR101432

DEALER TO WHOM DELIVERED
WEBER GRANITE CITY CHEVROLET COMPANY
3499 PROGRESS PKWY
GRANITE CITY, IL 62040-8817

3A

1AZ9399025

3-2 Seats and Restraints

Head Restraints

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

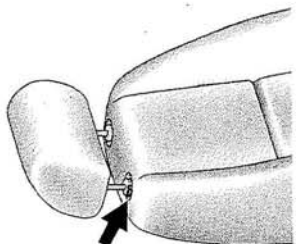


WARNING

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



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



Pull the head restraint up to raise it. To lower the head restraint, press the button, located on the top of the seatback, and push the restraint down.

Push down on the head restraint after the button is released to make sure that it is locked in place.

The head restraints are not designed to be removed.

The vehicle's 2nd-row seats have head restraints in the outboard seating positions that cannot be adjusted.

The vehicle's 3rd-row seat, if equipped, has headrests that can be adjusted up and down.

APPENDIX B
DUMMY RESPONSE DATA

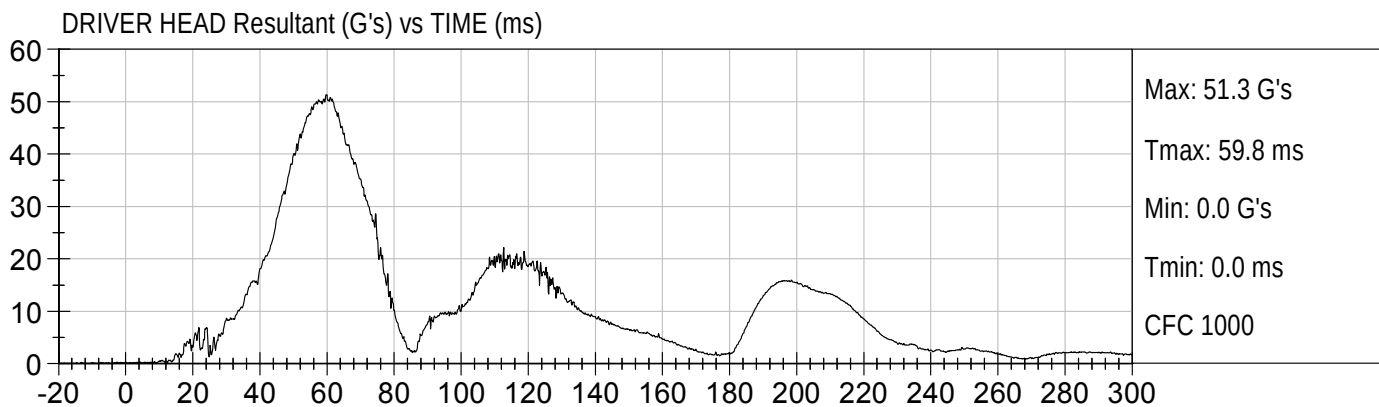
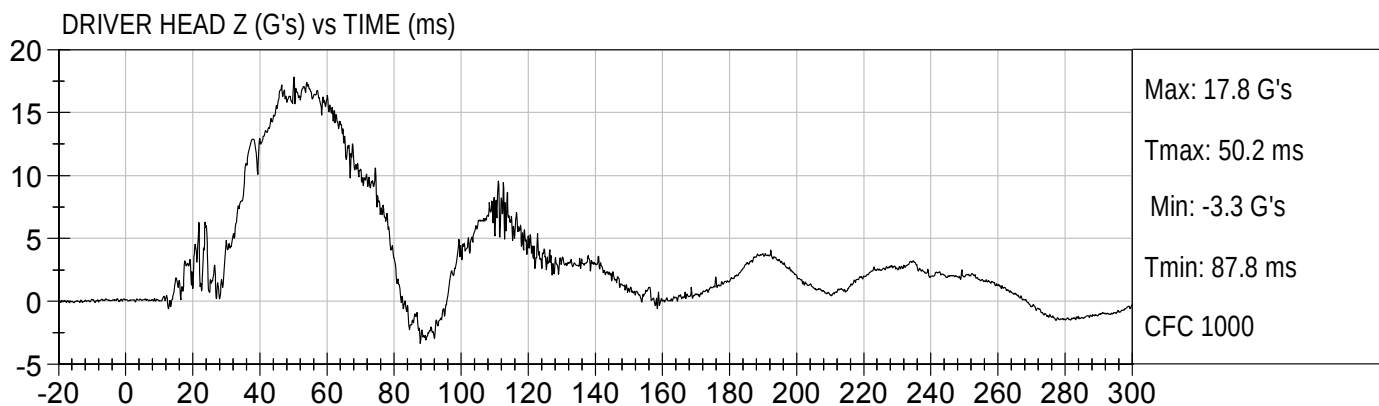
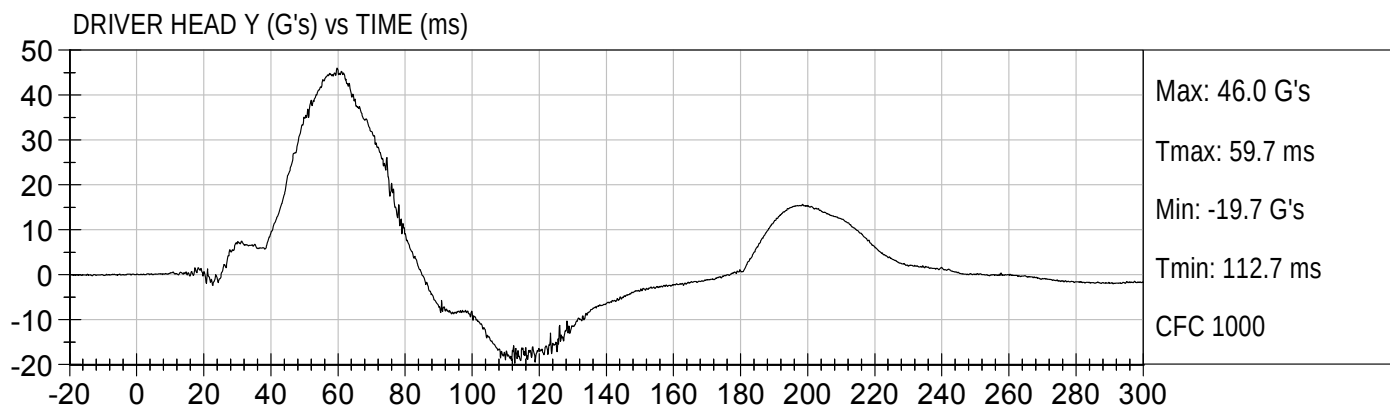
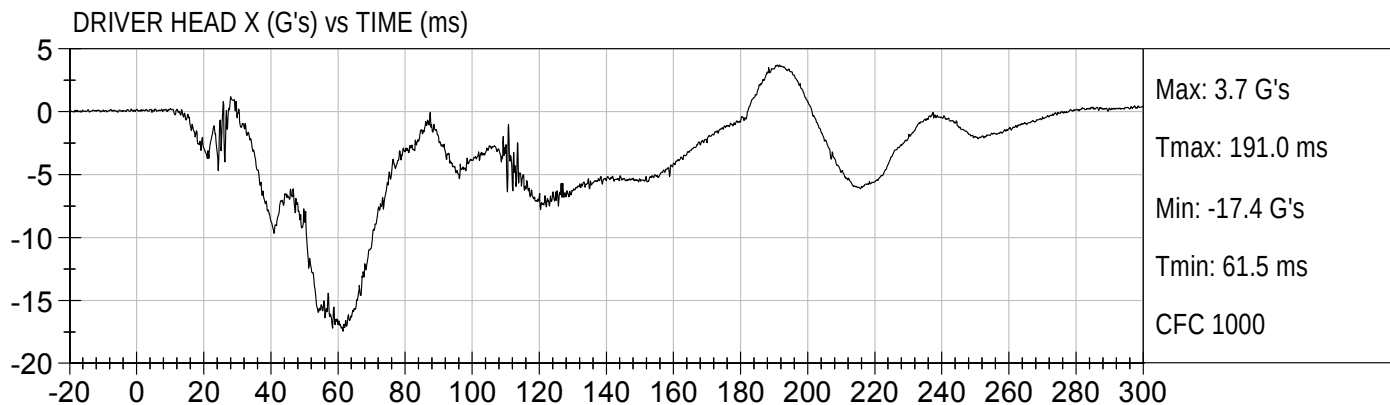
TABLE OF DATA PLOTS

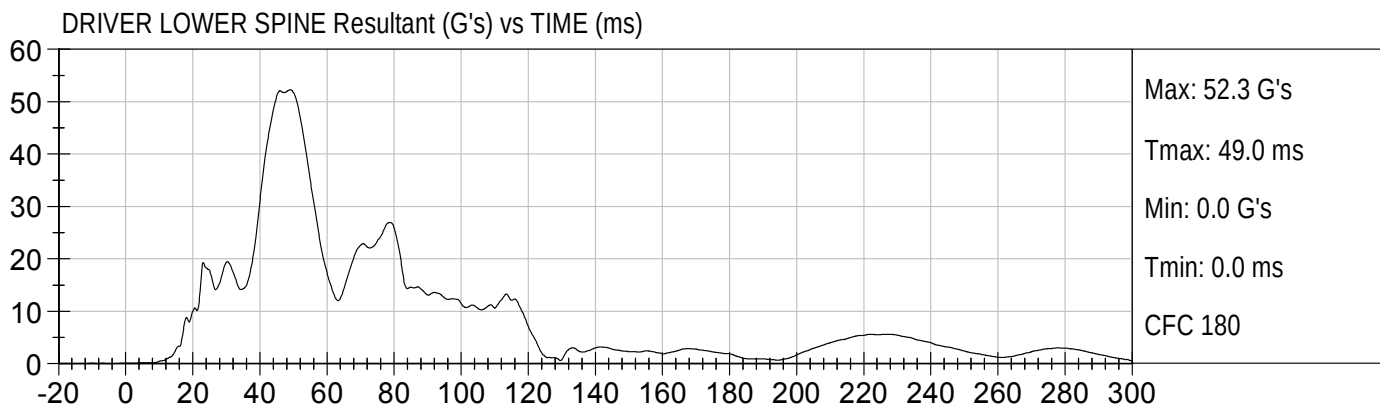
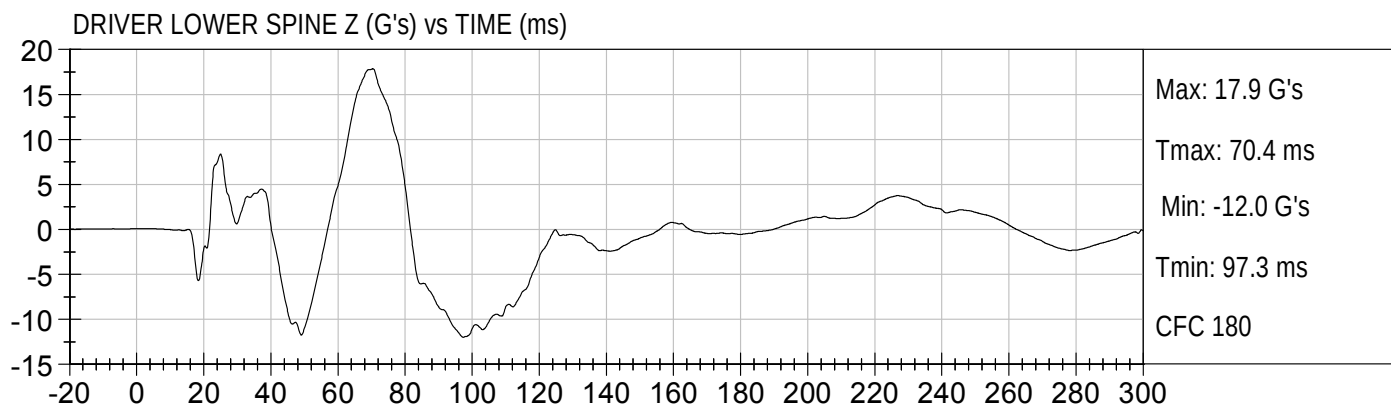
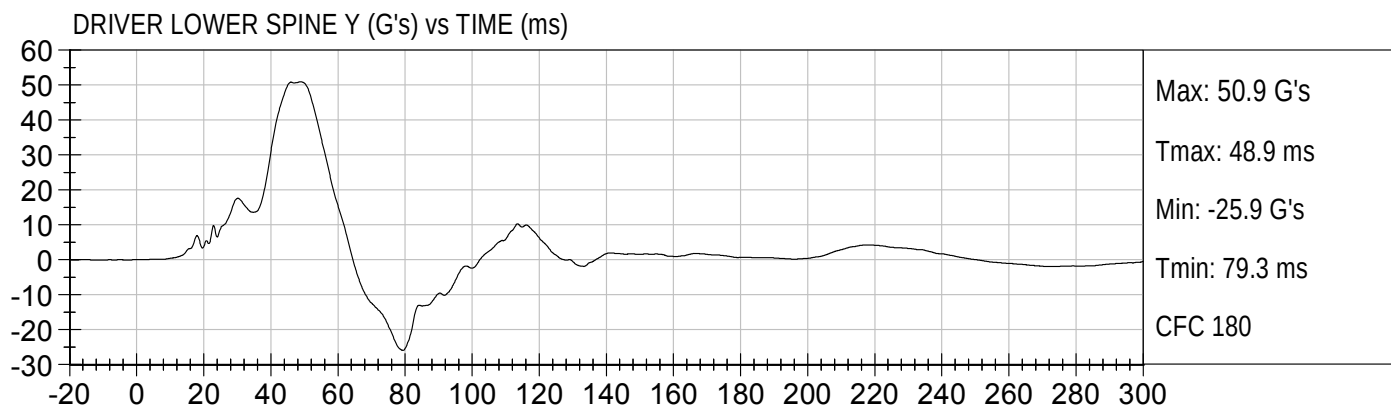
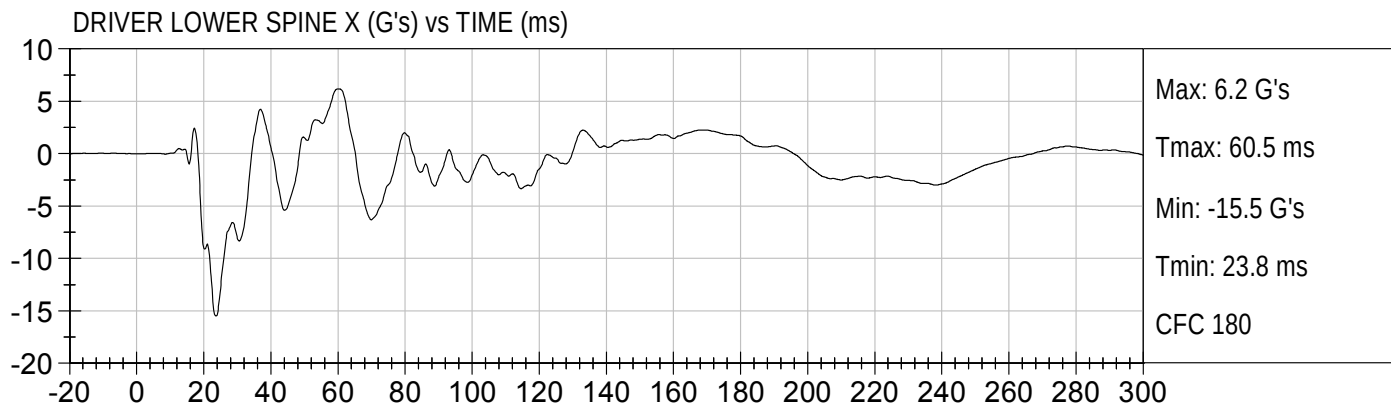
		<u>Page No.</u>
List of Data Plots Provided in the Test Report		
Figure No. 1.	Driver Head Acceleration (X) Primary vs. Time	B-1
Figure No. 2.	Driver Head Acceleration (Y) Primary vs. Time	B-1
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Figure No. 10.	Driver Acetabulum Force on Impact Side (Y) vs. Time	B-3
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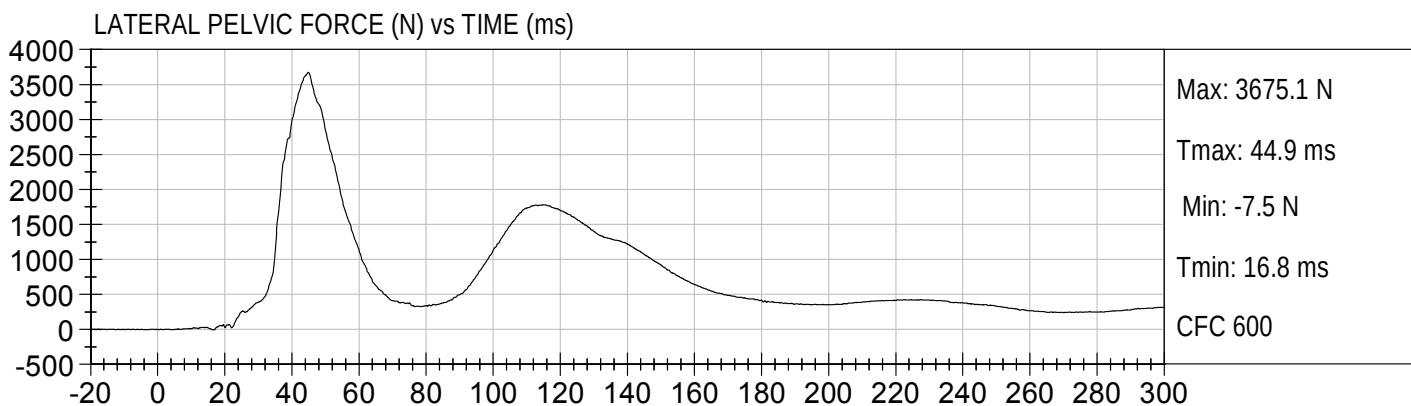
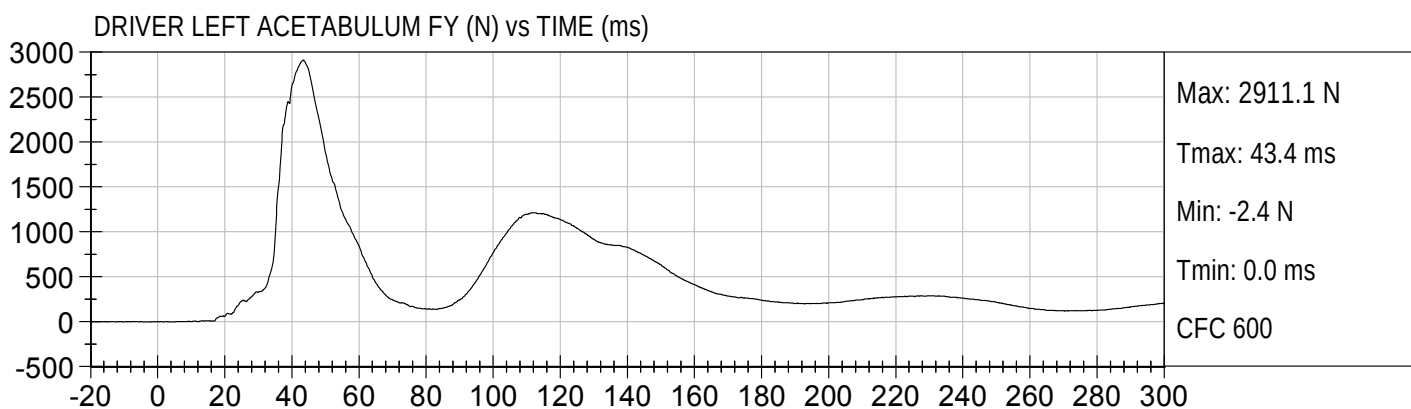
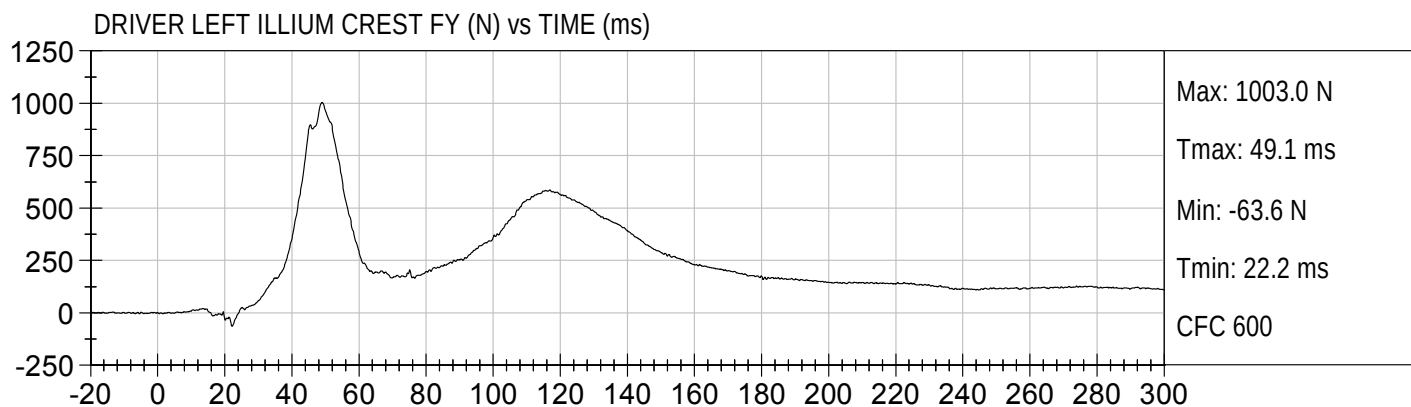
The following dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

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 – Not installed
Driver Torso Contact Switch – Not installed
Driver Pelvis Contact Switch – Not installed
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

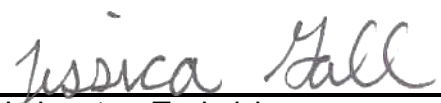
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

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

ATD Serial No: 296

Test ID: D102561

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	49	Pass
Peak Resultant Acceleration	G's	115 to 137	127	Pass
Peak Lateral Acceleration	G's	+/- 15	-3.1	Pass
Unimodal	N/A	<15%	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

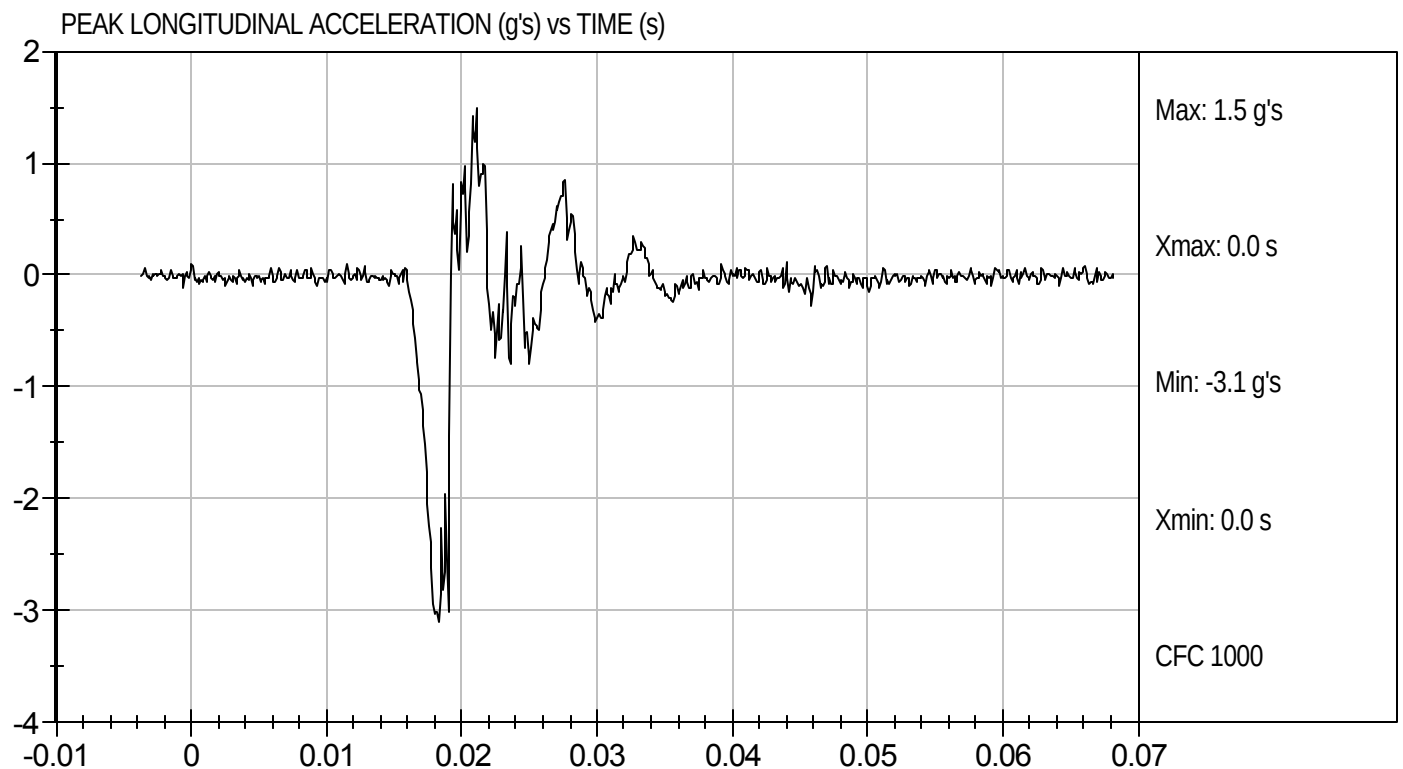
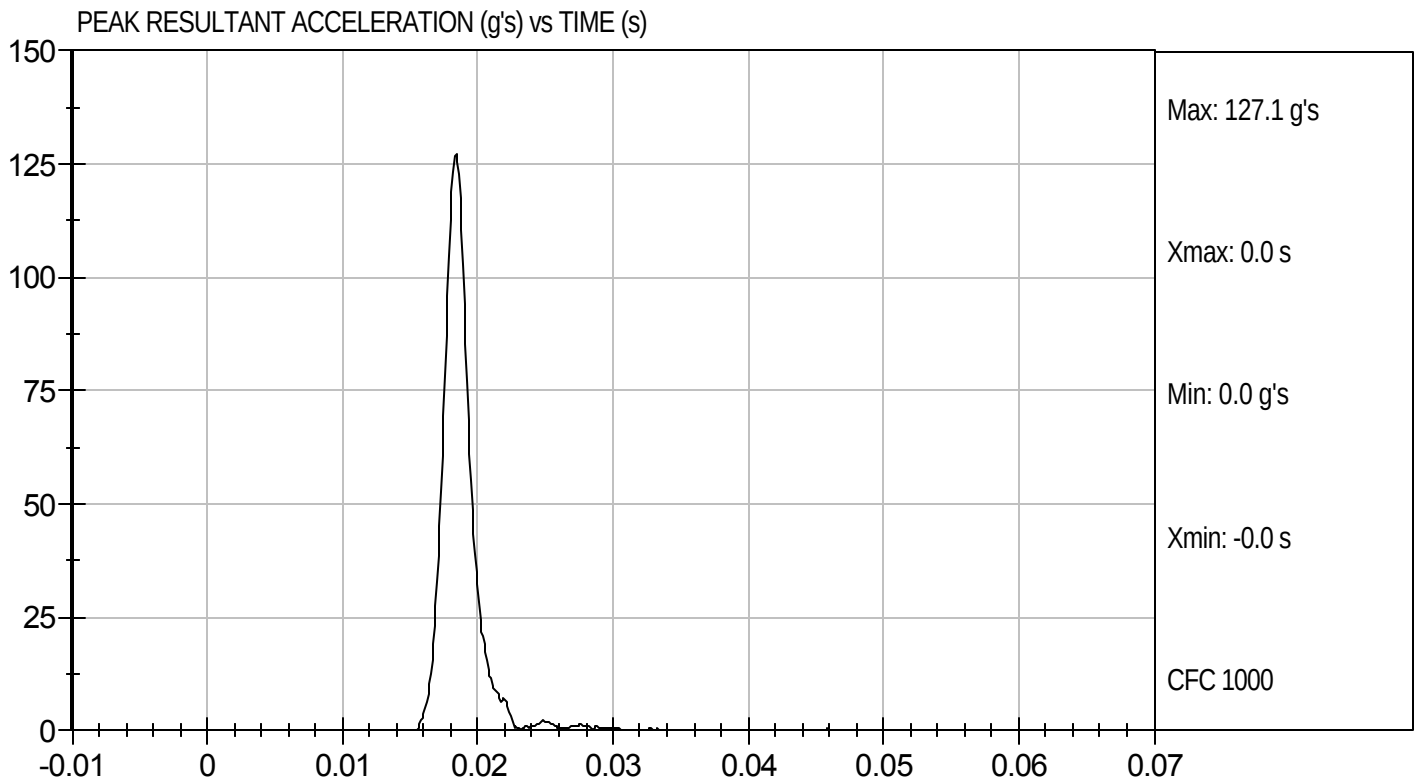
8/13/10
Test Date


Approved By



Test Desc: Head Drop
Component ID: D102561

Test Date: 8/13/10
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: D102562

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.9	Pass
Humidity		%	10 to 70	49	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Delta Velocity	10 ms	m/s	2.20 to 2.80	2.77	Pass
	15 ms	m/s	3.30 to 4.10	3.93	Pass
	20 ms	m/s	4.40 to 5.40	5.28	Pass
	25 ms	m/s	5.40 to 6.10	5.52	Pass
	25-100 ms	m/s	5.50 to 6.20	5.54	Pass
Maximum D-Plane Rotation		deg	71 to 81	72	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	59	Pass
Maximum Occipital Condyle Moment during Rotation Interval Nm			-44 to -36	-43	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	112	Pass
Overall Test Results				Pass	


 Laboratory Technician

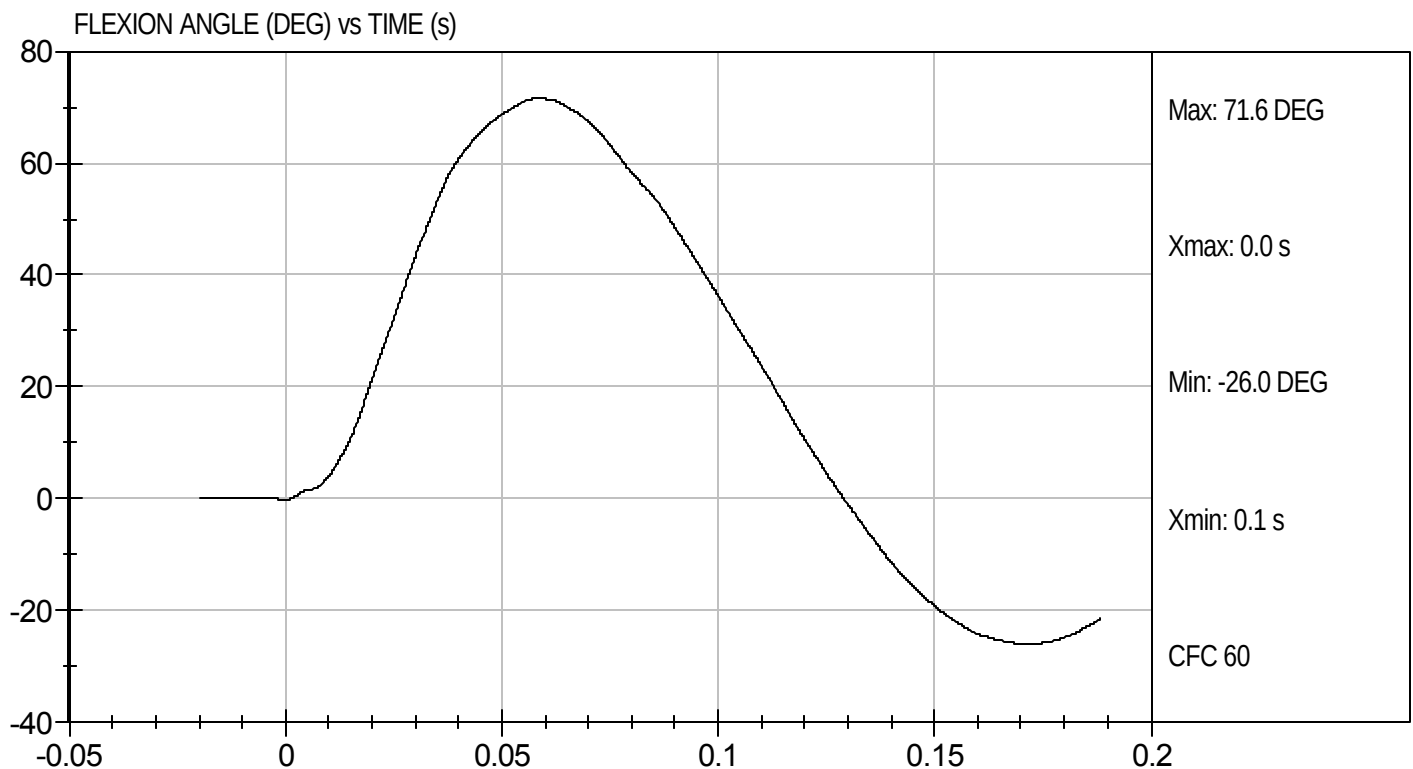
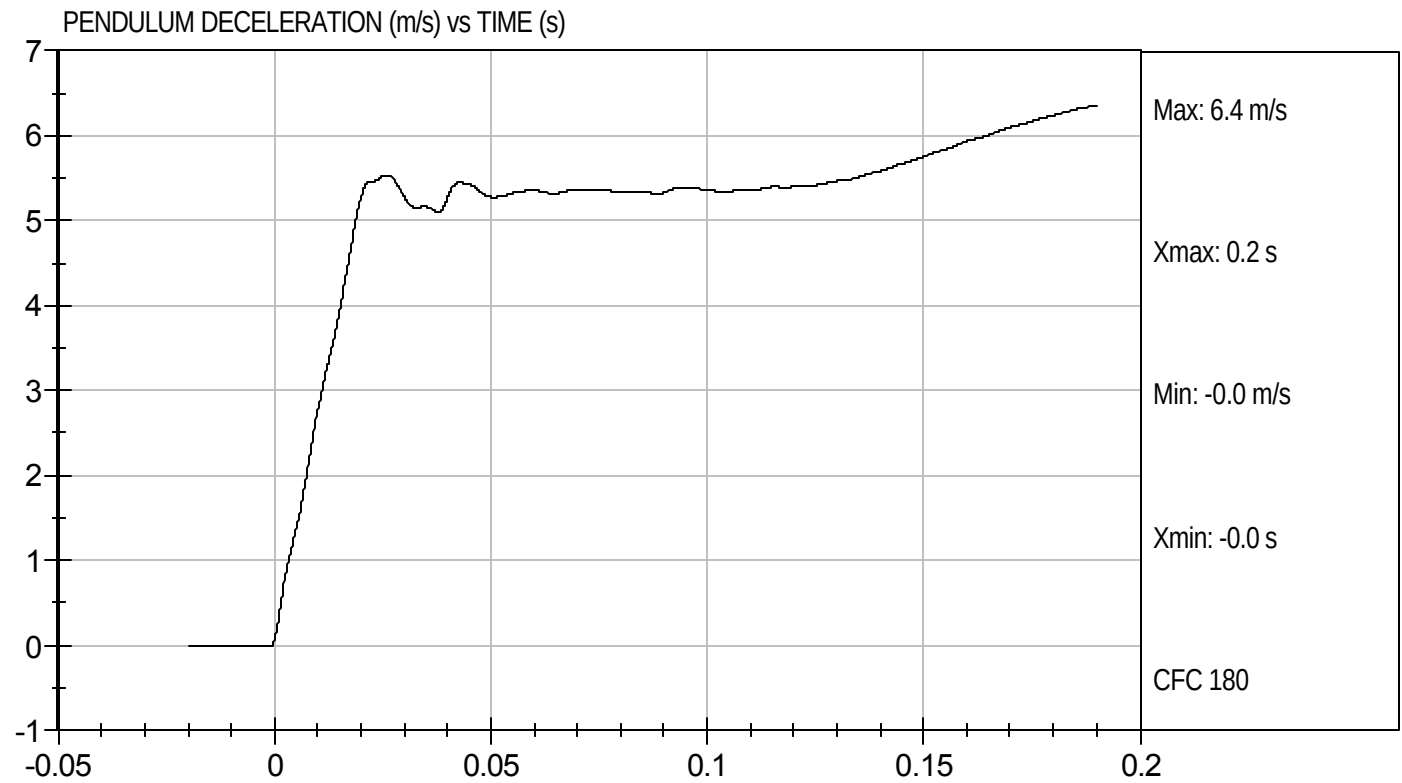
8/13/10
 Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D102562

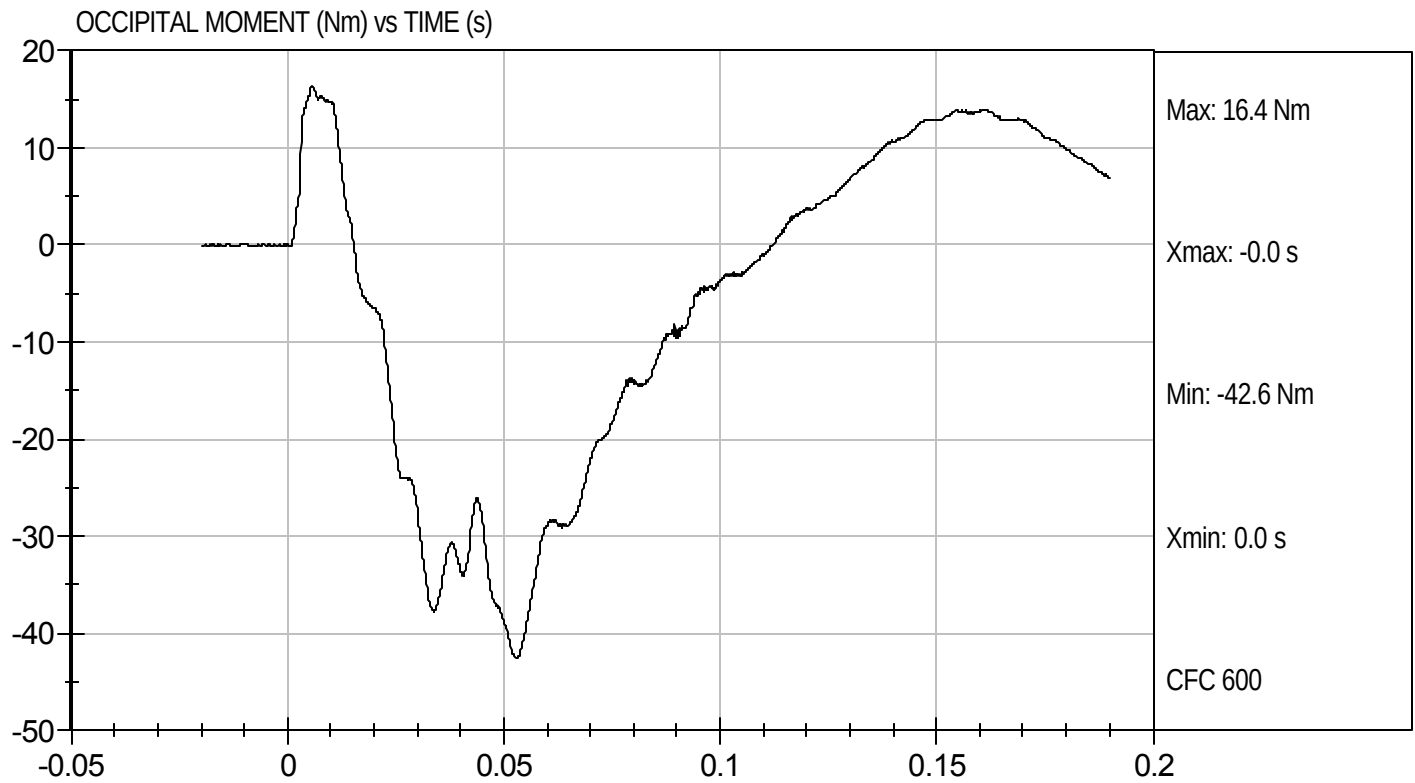
Test Date: 8/13/10
Velocity: 18.32 ft/s, 5.58 m/s





Test Desc: Neck Bending
Component ID: D102562

Test Date: 8/13/10
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: D102563

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	58	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	33	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	18	Pass
Overall Test Results				Pass


Laboratory Technician

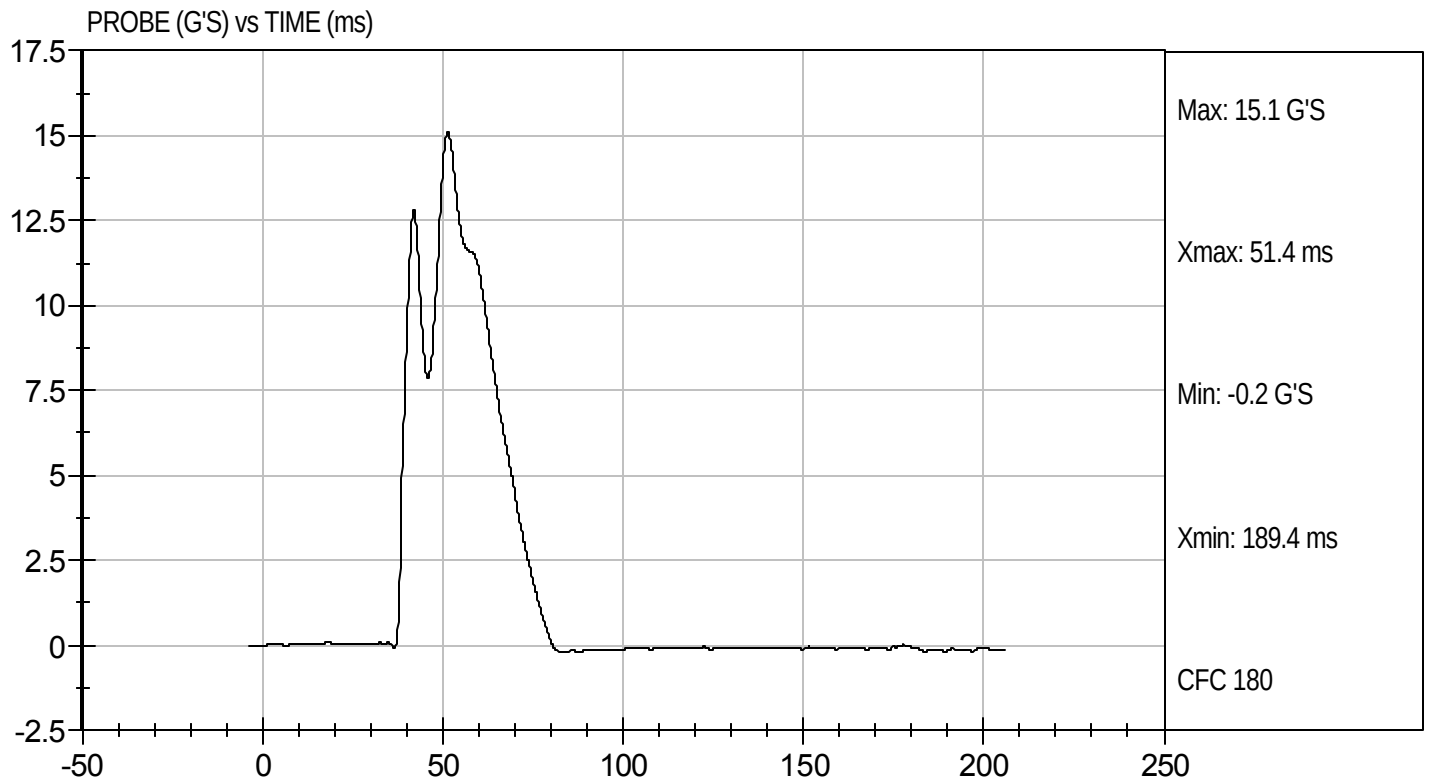
8/12/10
Test Date


Approved By



Test Desc: Shoulder Impact
Component ID: D102563

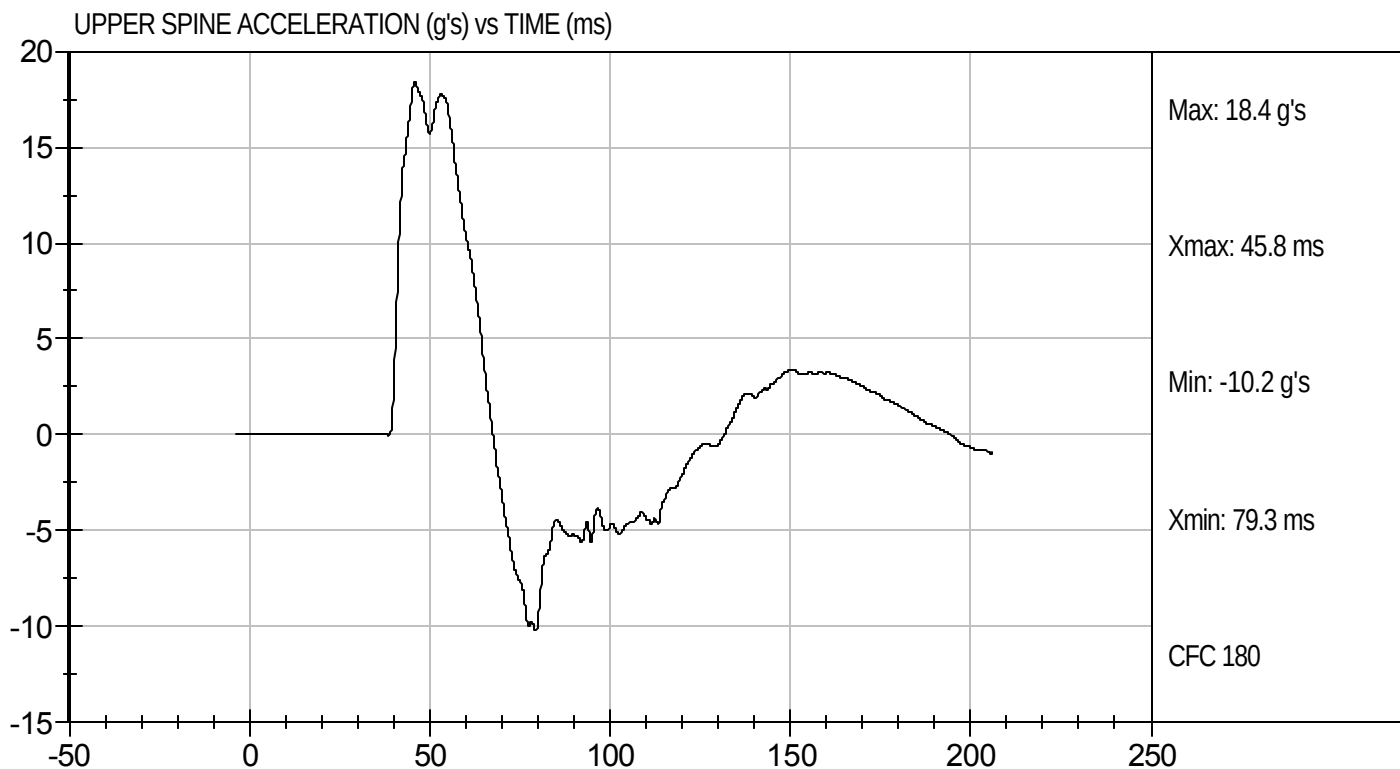
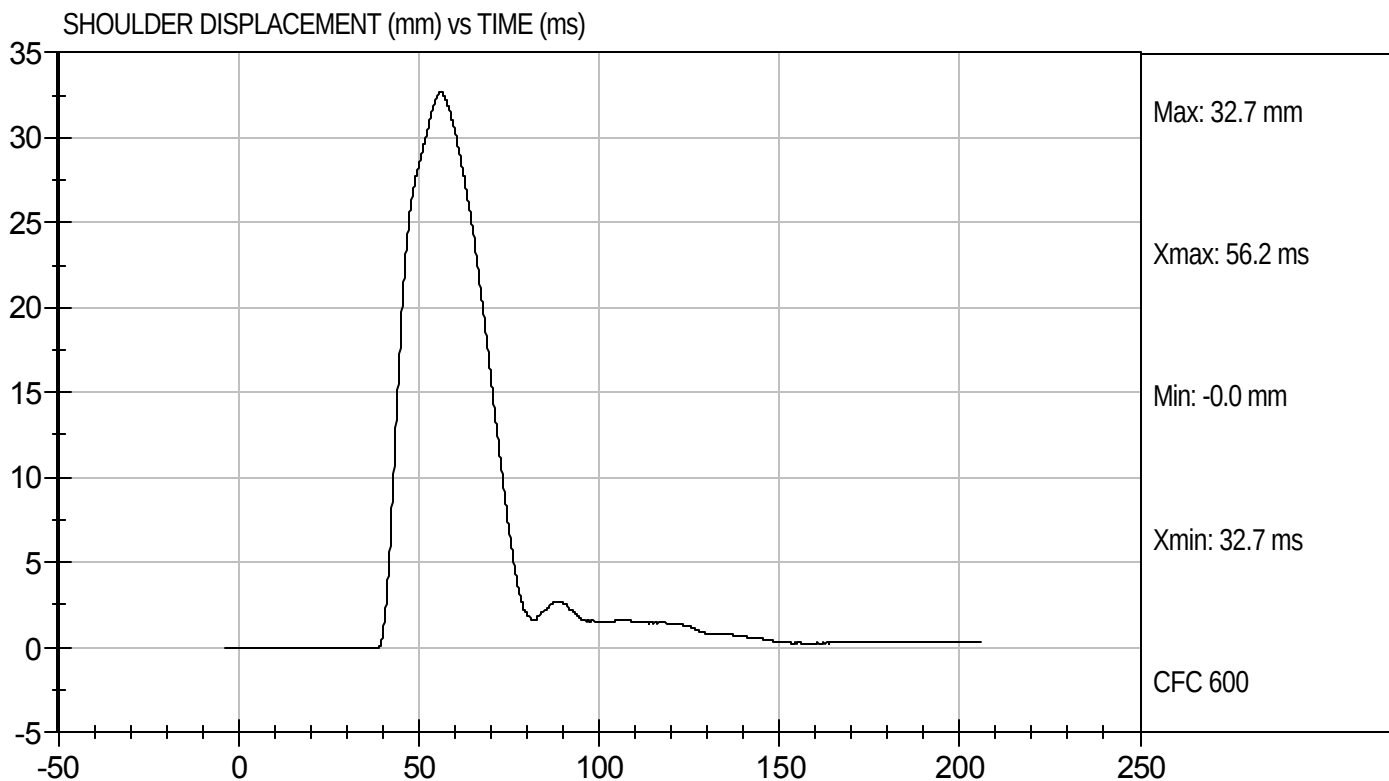
Test Date: 8/12/10
Velocity: 14.1 ft/s, 4.30 m/s





Test Desc: Shoulder Impact
Component ID: D102563

Test Date: 8/12/10
Velocity: 14.1 ft/s, m/s



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

ATD Serial No: 296

Test I.D: D102564

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	58	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Peak Impactor Acceleration	G's	30 to 36	31	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	32	Pass
Lower Rib Displacement	mm	32 to 38	33	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

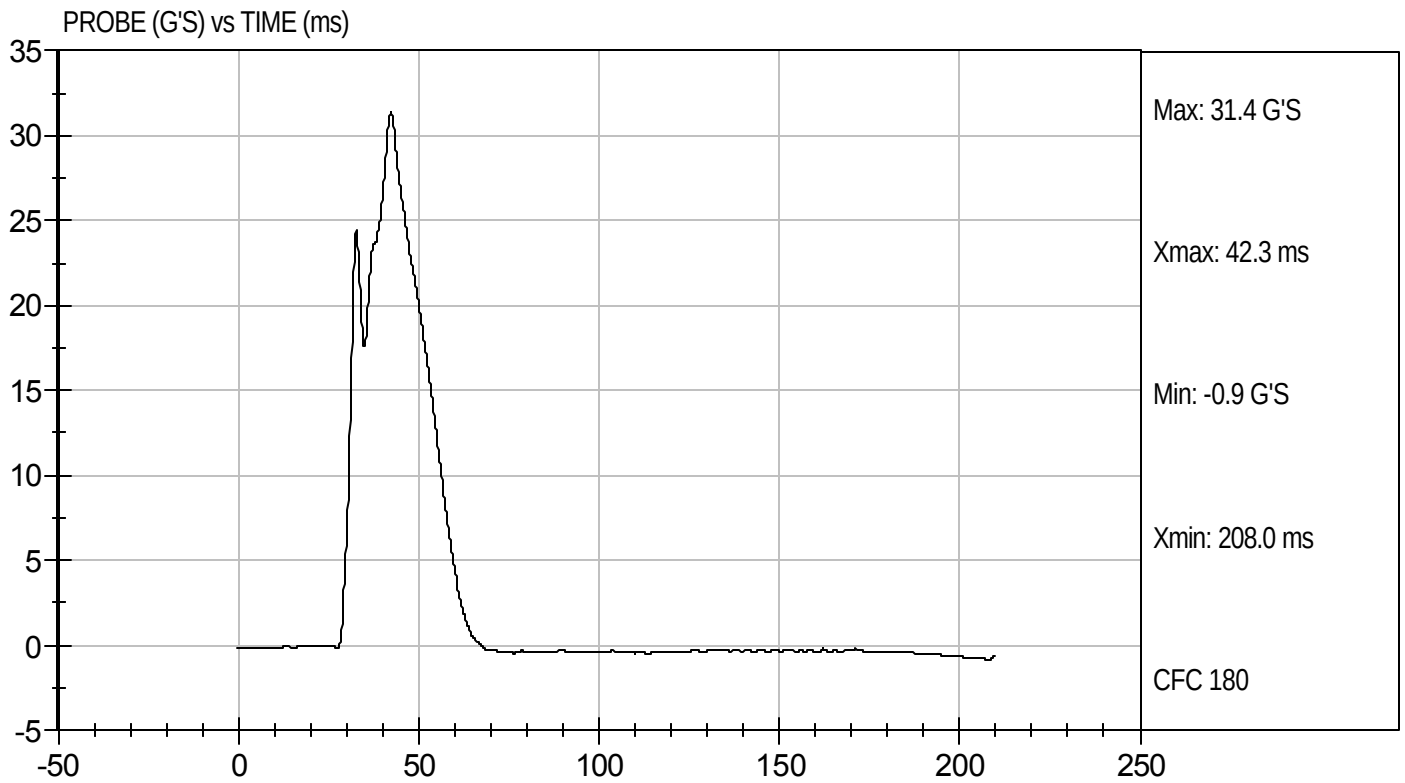
8/12/10
 Test Date


 Approved By



Test Desc: Thorax With Arm
Component ID: D102564

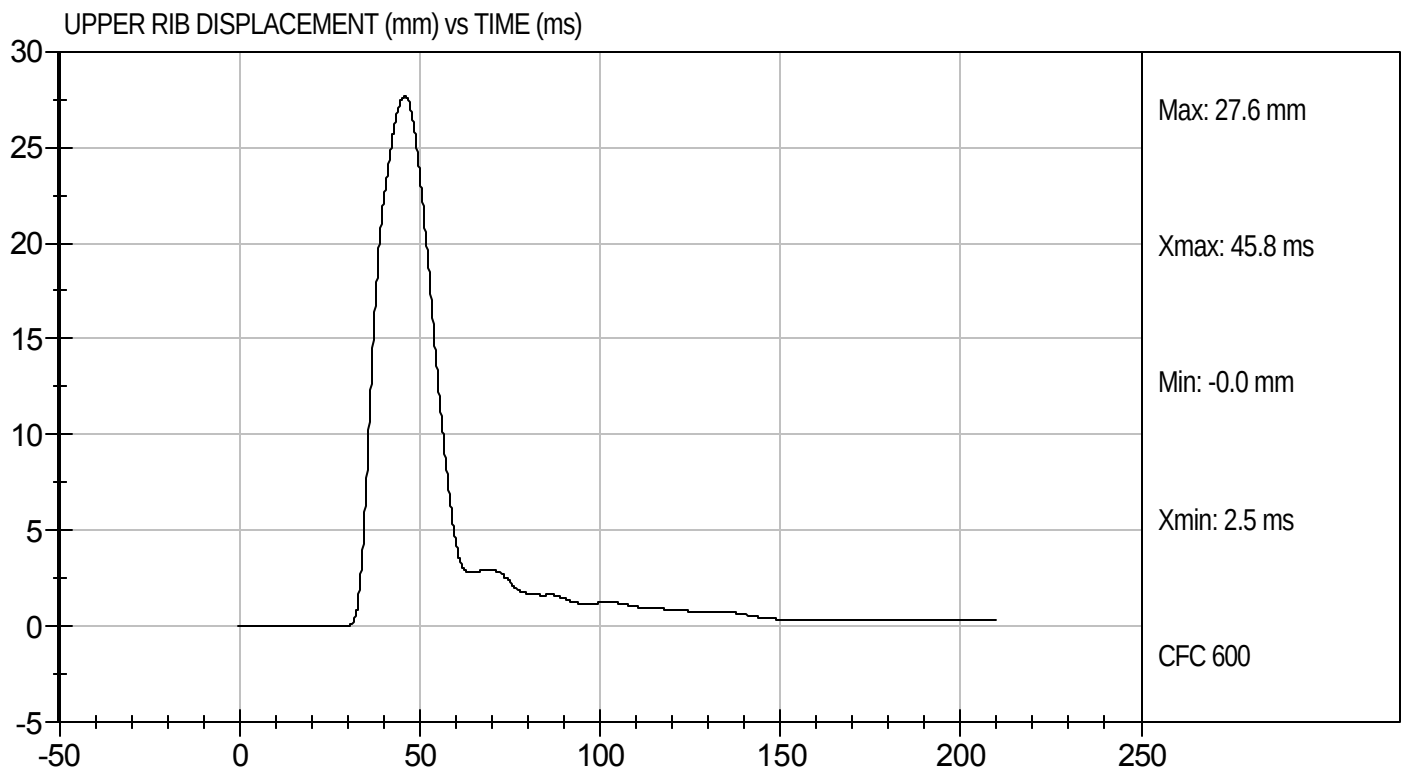
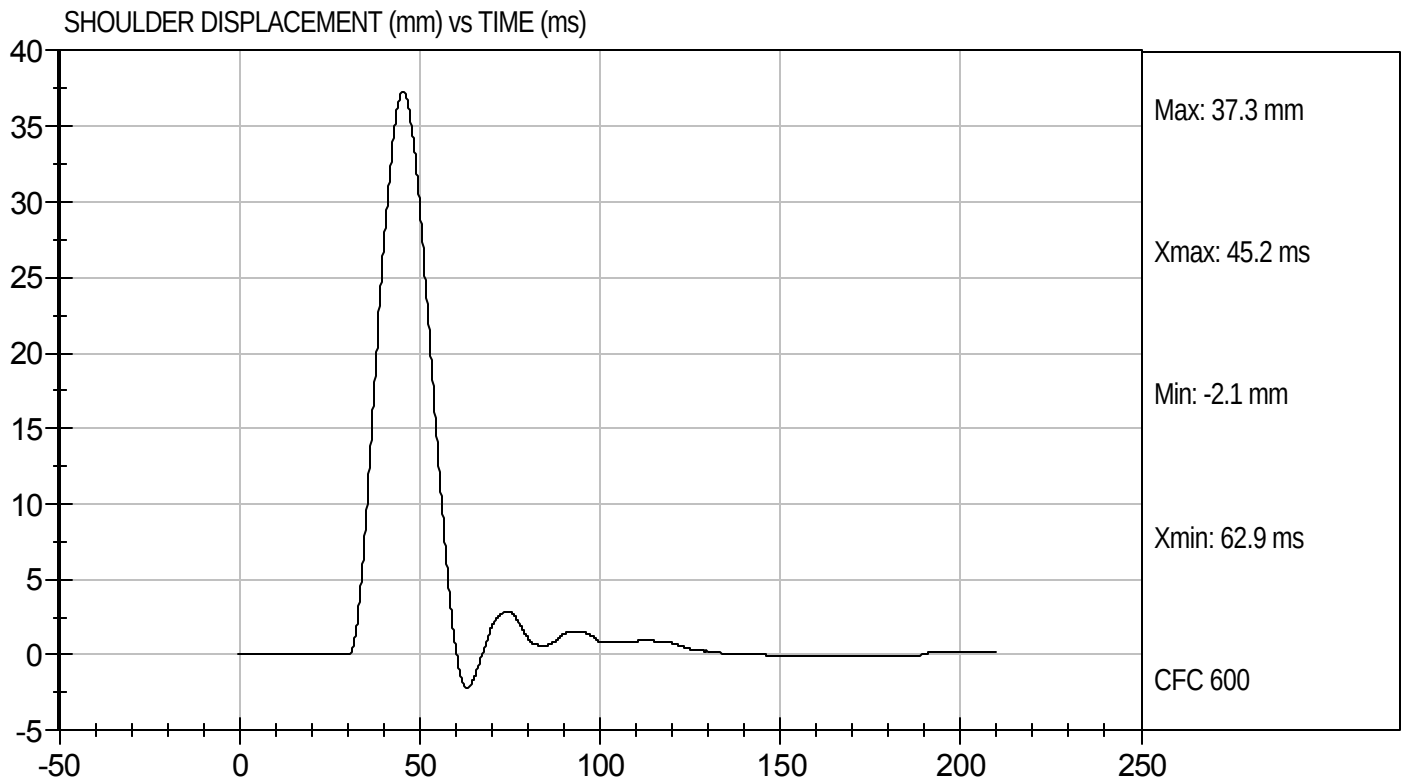
Test Date: 8/12/10
Velocity: 21.9 ft/s, 6.68 m/s





Test Desc: Thorax With Arm
Component ID: D102564

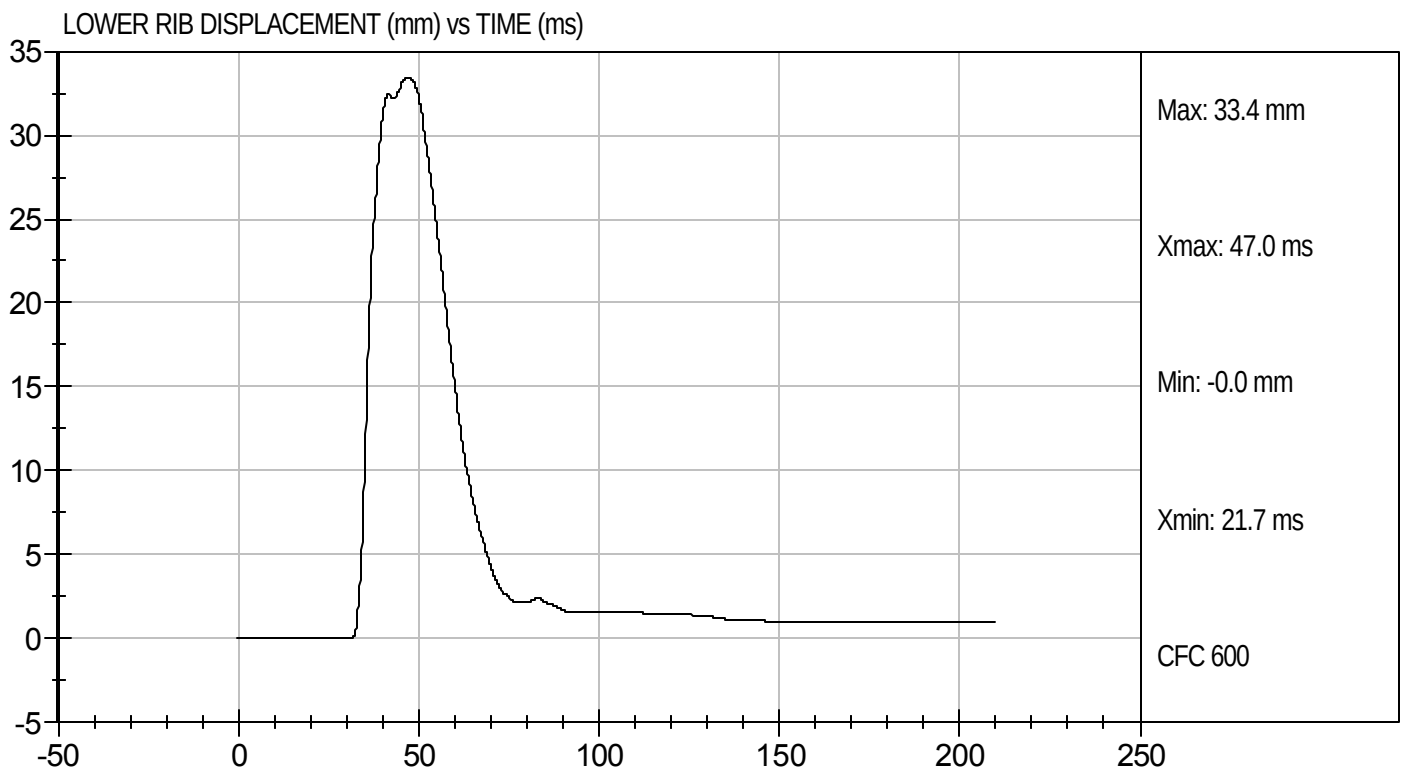
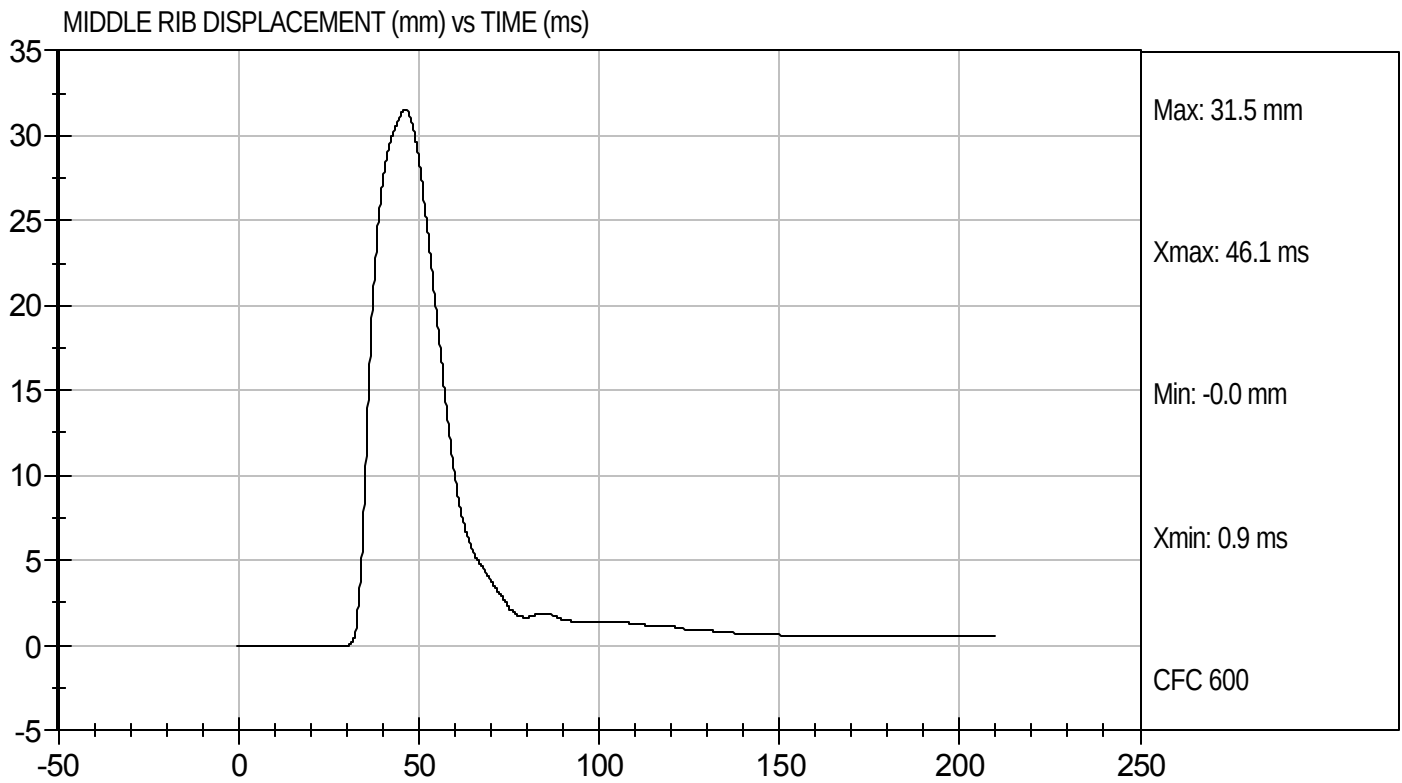
Test Date: 8/12/10
Velocity: 21.9 ft/s, 6.68 m/s





Test Desc: Thorax With Arm
Component ID: D102564

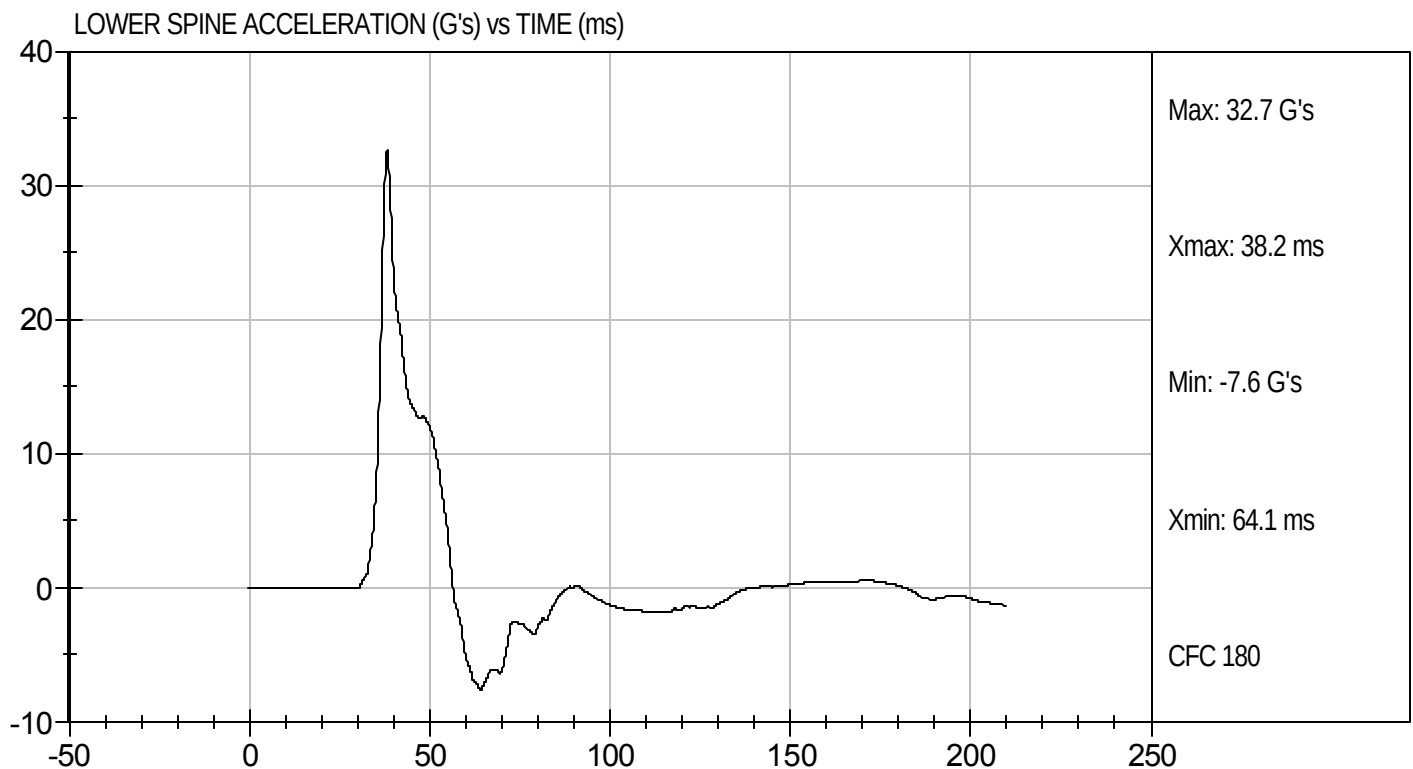
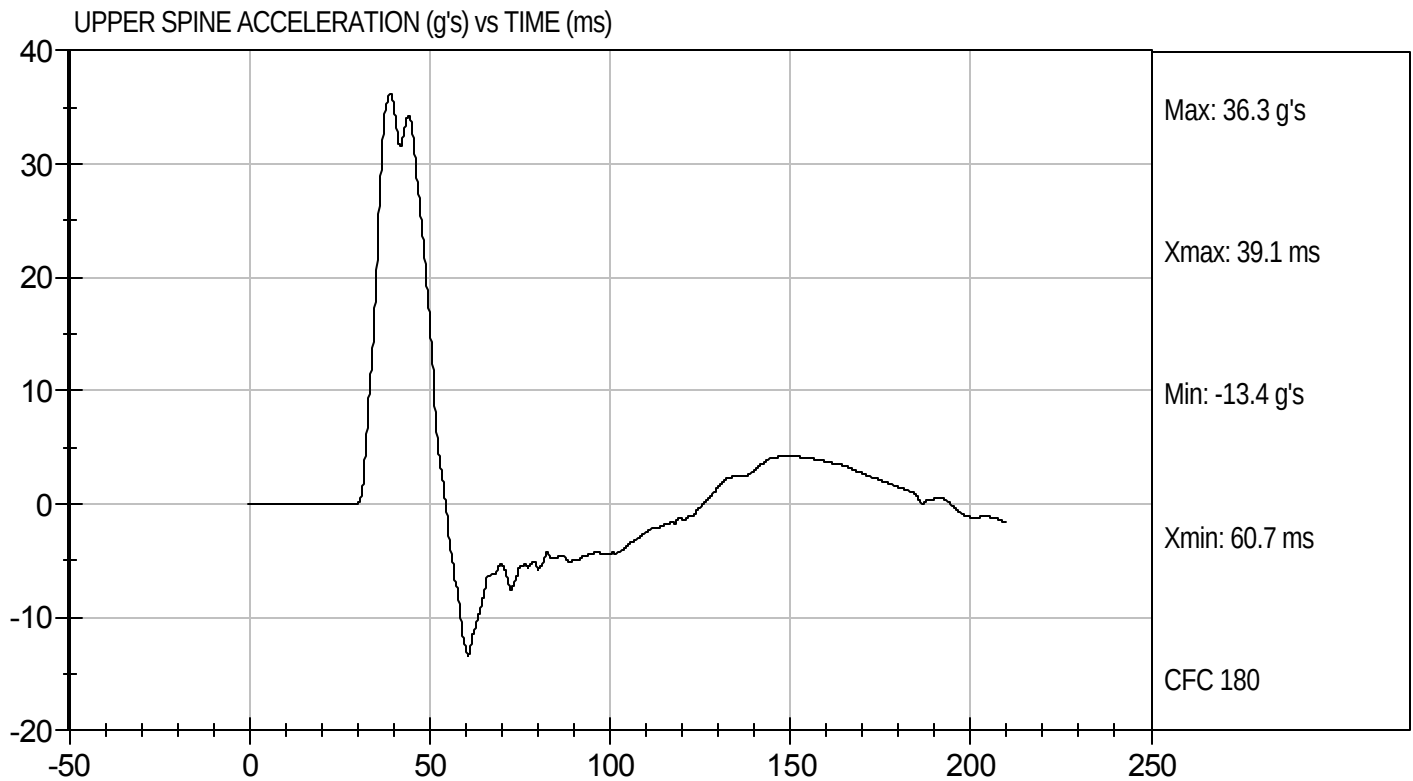
Test Date: 8/12/10
Velocity: 21.9 ft/s, 6.68 m/s





Test Desc: Thorax With Arm
Component ID: D102564

Test Date: 8/12/10
Velocity: 21.9 ft/s, 6.68 m/s



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

ATD Serial No: 296

Test I.D: D102565

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	58	Pass
Impact Velocity	m/s	4.20 to 4.40	4.27	Pass
Peak Impactor Force	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	35	Pass
Middle Rib Displacement	mm	39 to 45	41	Pass
Lower Rib Displacement	mm	35 to 43	39	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	13	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	8	Pass
			Overall Test Results	Pass


Laboratory Technician

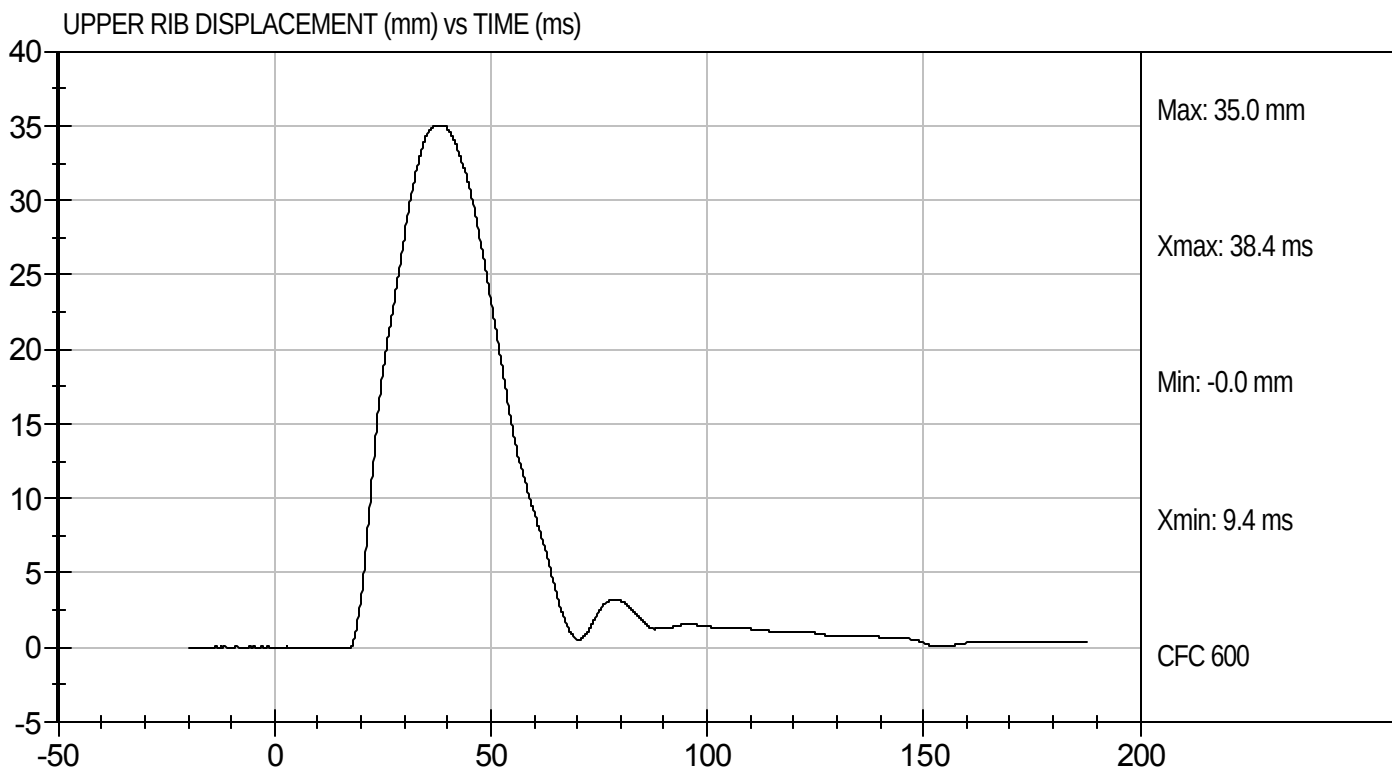
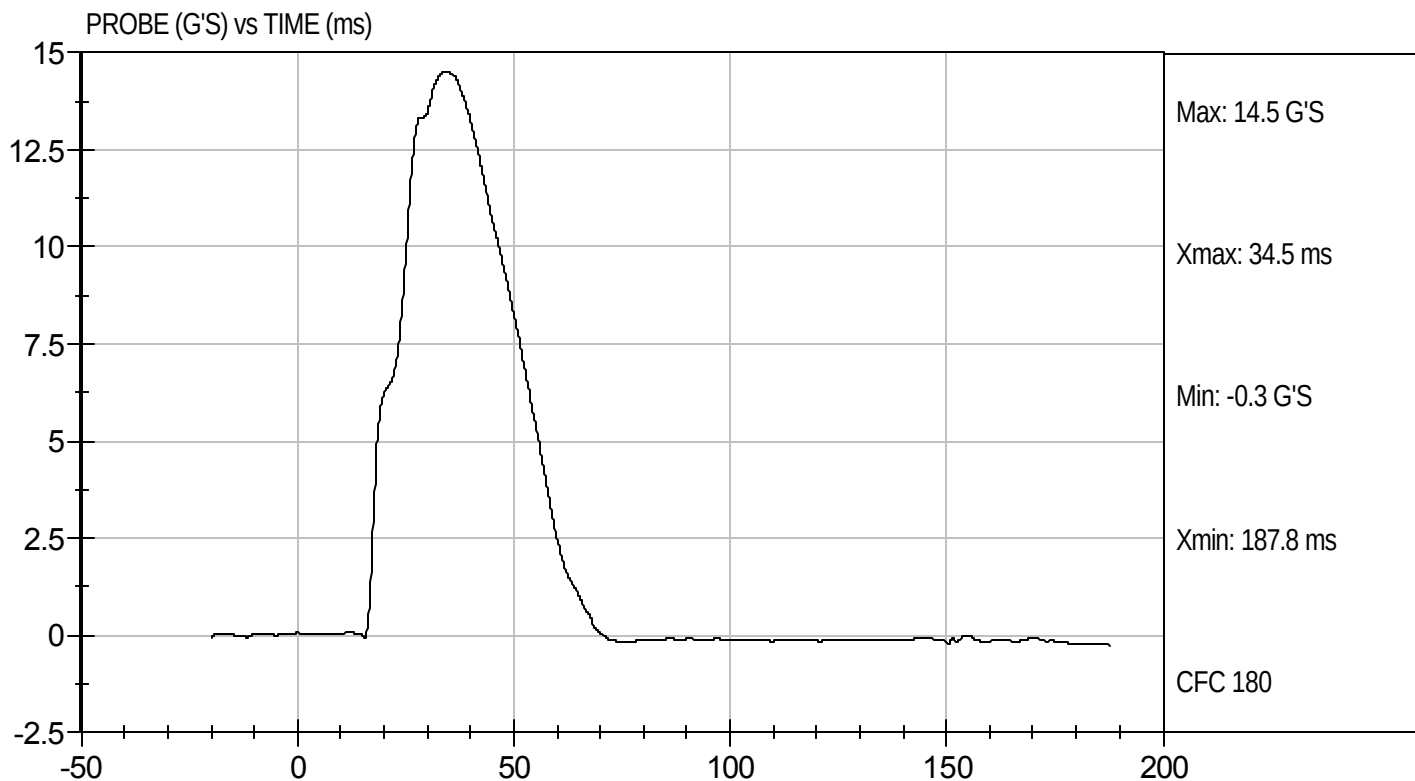
8/12/10
Test Date


Approved By



Test Desc: Thorax Without Arm
Component ID: D102565

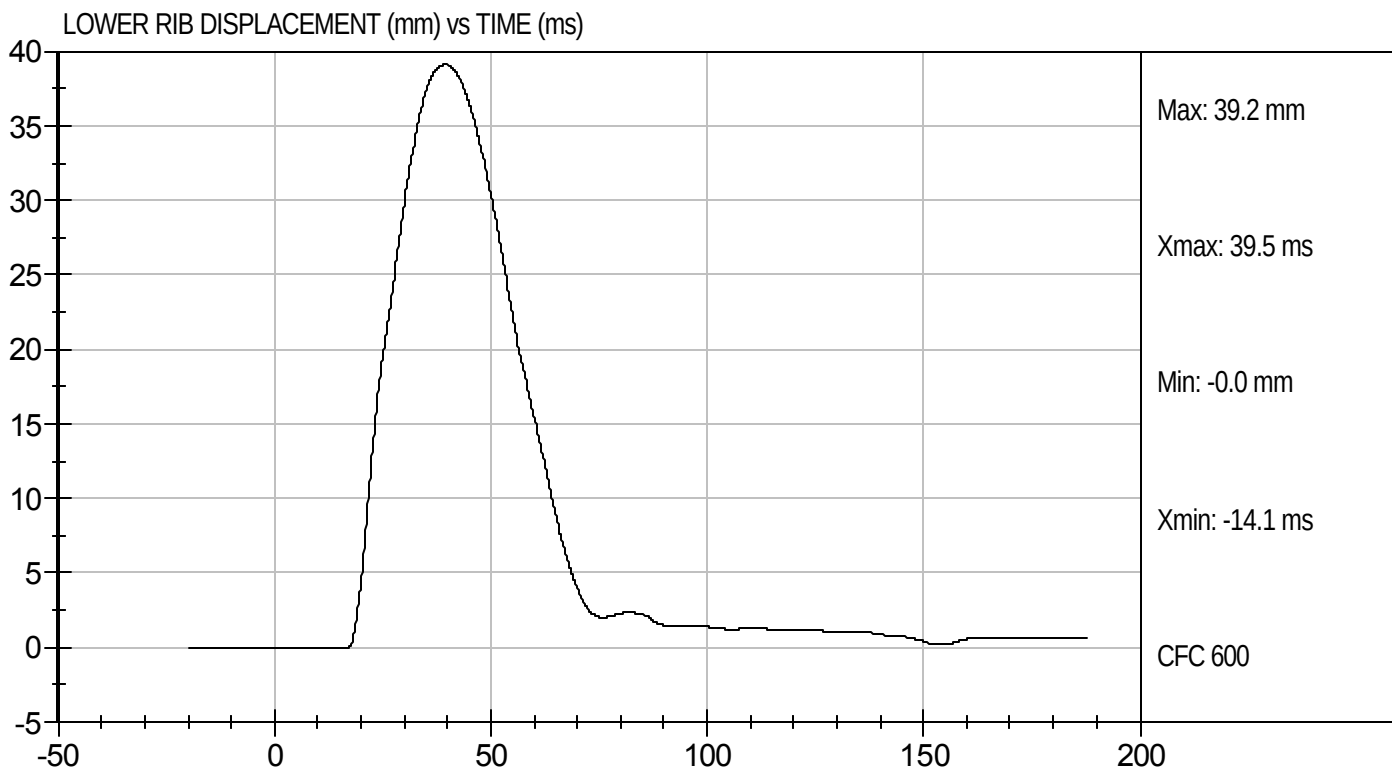
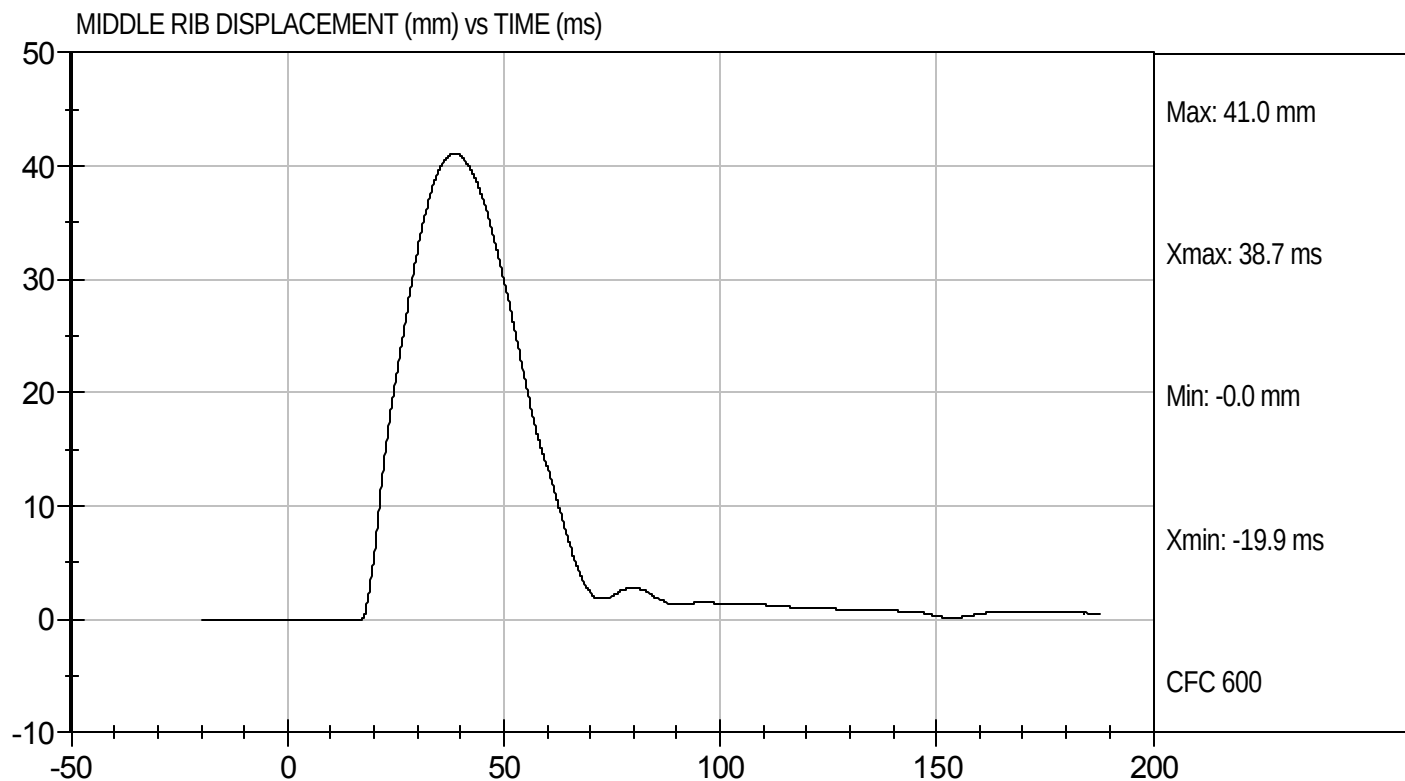
Test Date: 8/12/10
Velocity: 14.0 ft/s, 4.27 m/s





Test Desc: Thorax Without Arm
Component ID: D102565

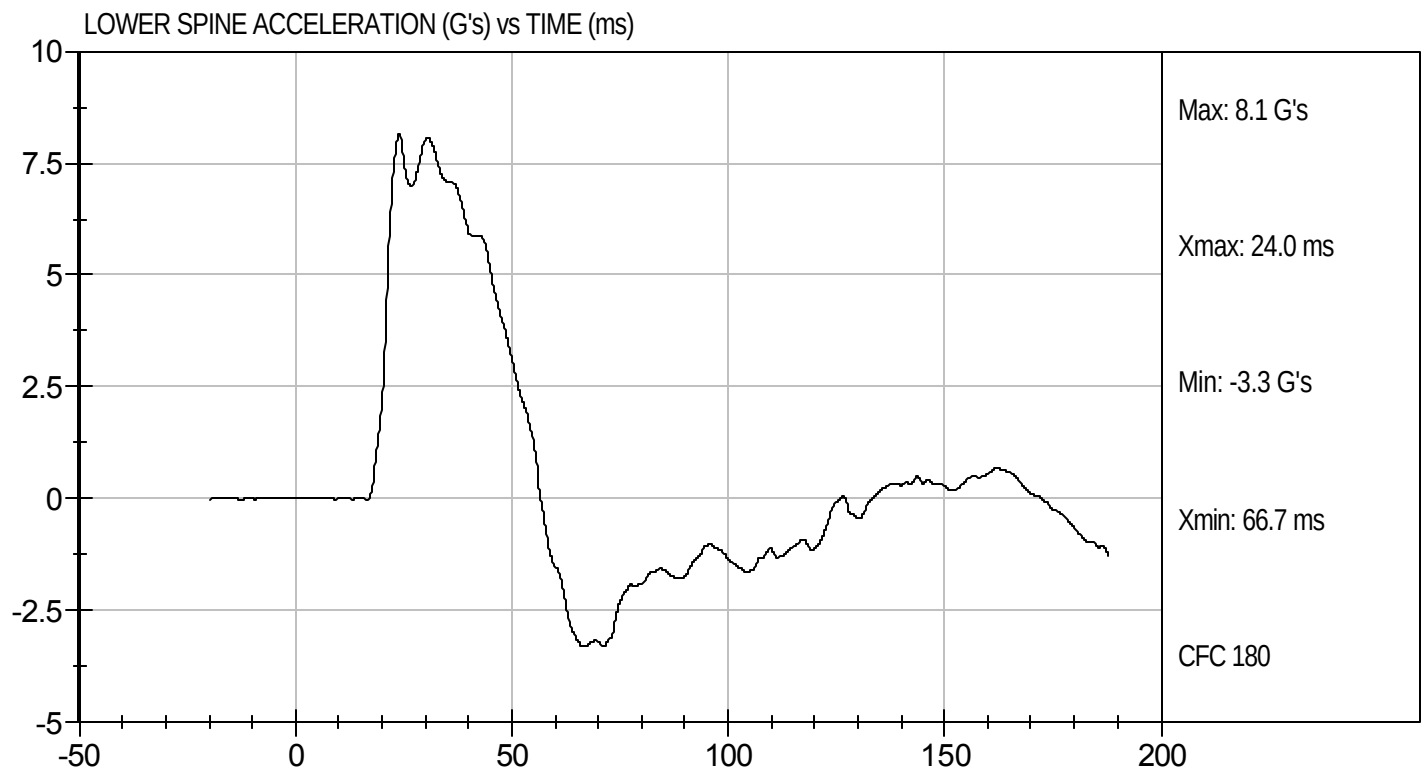
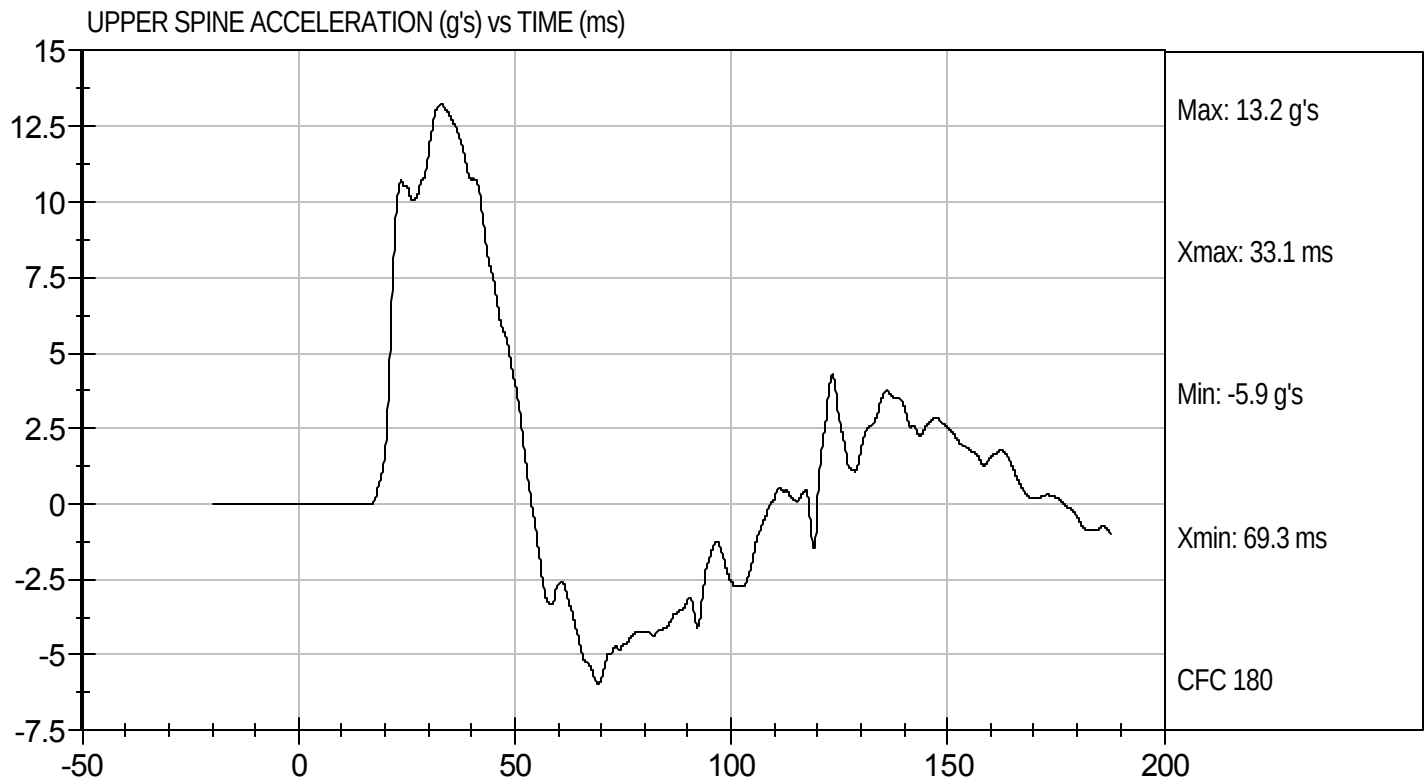
Test Date: 8/12/10
Velocity: 14.0 ft/s, 4.27 m/s





Test Desc: Thorax Without Arm
Component ID: D102565

Test Date: 8/12/10
Velocity: 14.0 ft/s, 4.27 m/s



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

ATD Serial No: 296

Test I.D: D102566

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	58	Pass
Impact Velocity	m/s	4.20 to 4.40	4.21	Pass
Peak Impactor Acceleration	G's	12 to 16	14	Pass
Upper Rib Displacement	mm	36 to 47	38	Pass
Lower Rib Displacement	mm	33 to 44	38	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass


Laboratory Technician

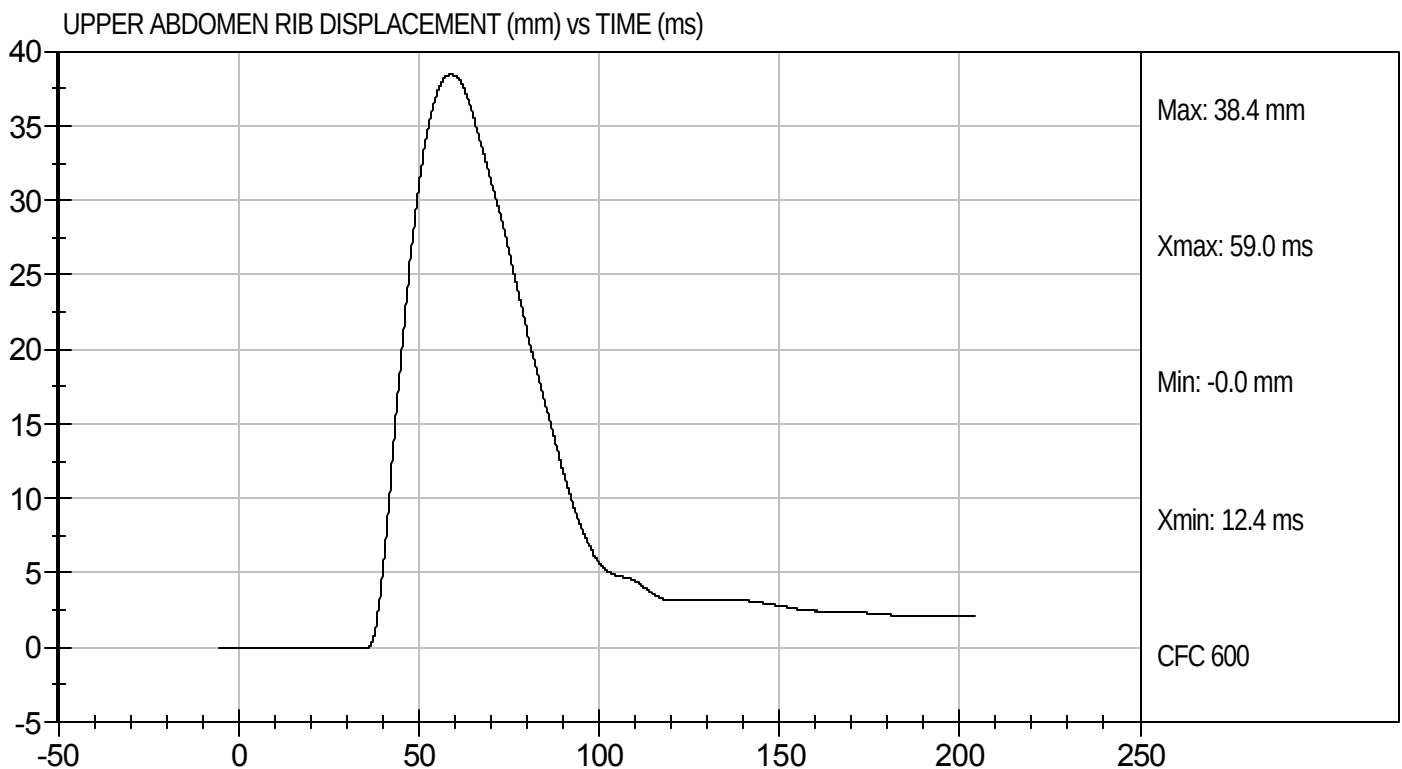
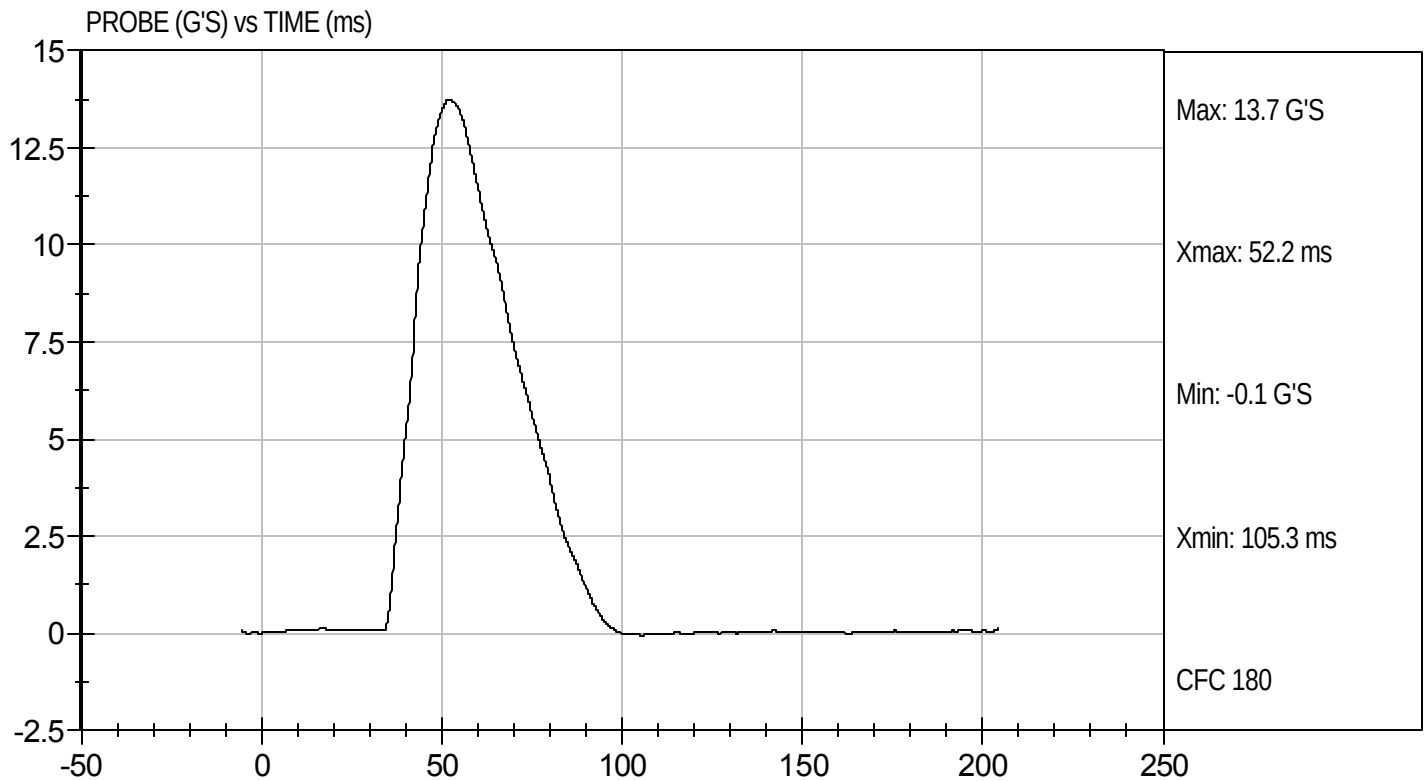
8/12/10
Test Date


Approved By



Test Desc: Abdomen Impact
Component ID: D102566

Test Date: 8/12/10
Velocity: 13.8 ft/s, 4.21 m/s

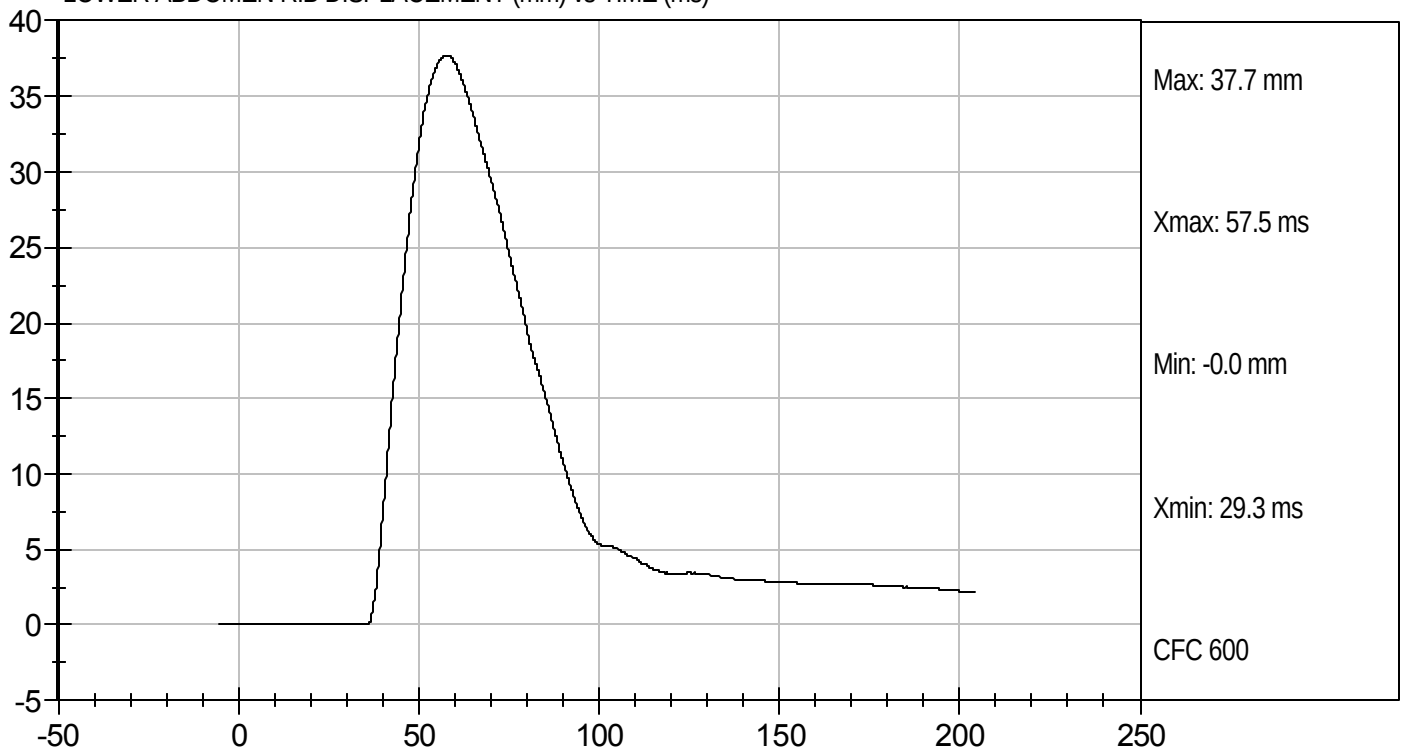




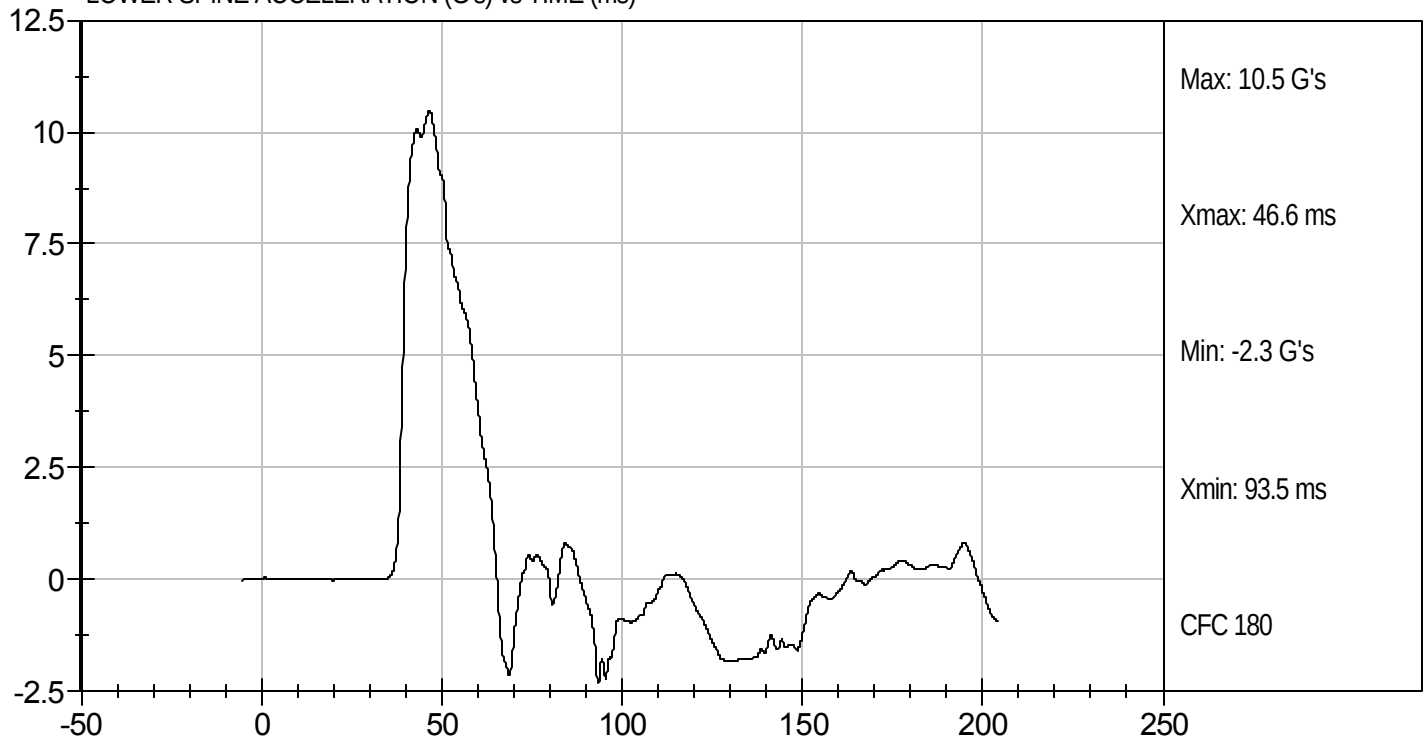
Test Desc: Abdomen Impact
Component ID: D102566

Test Date: 8/12/10
Velocity: 13.8 ft/s, 4.21 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: D102567

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	58	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	4095	Pass
Overall Test Results				Pass


Laboratory Technician

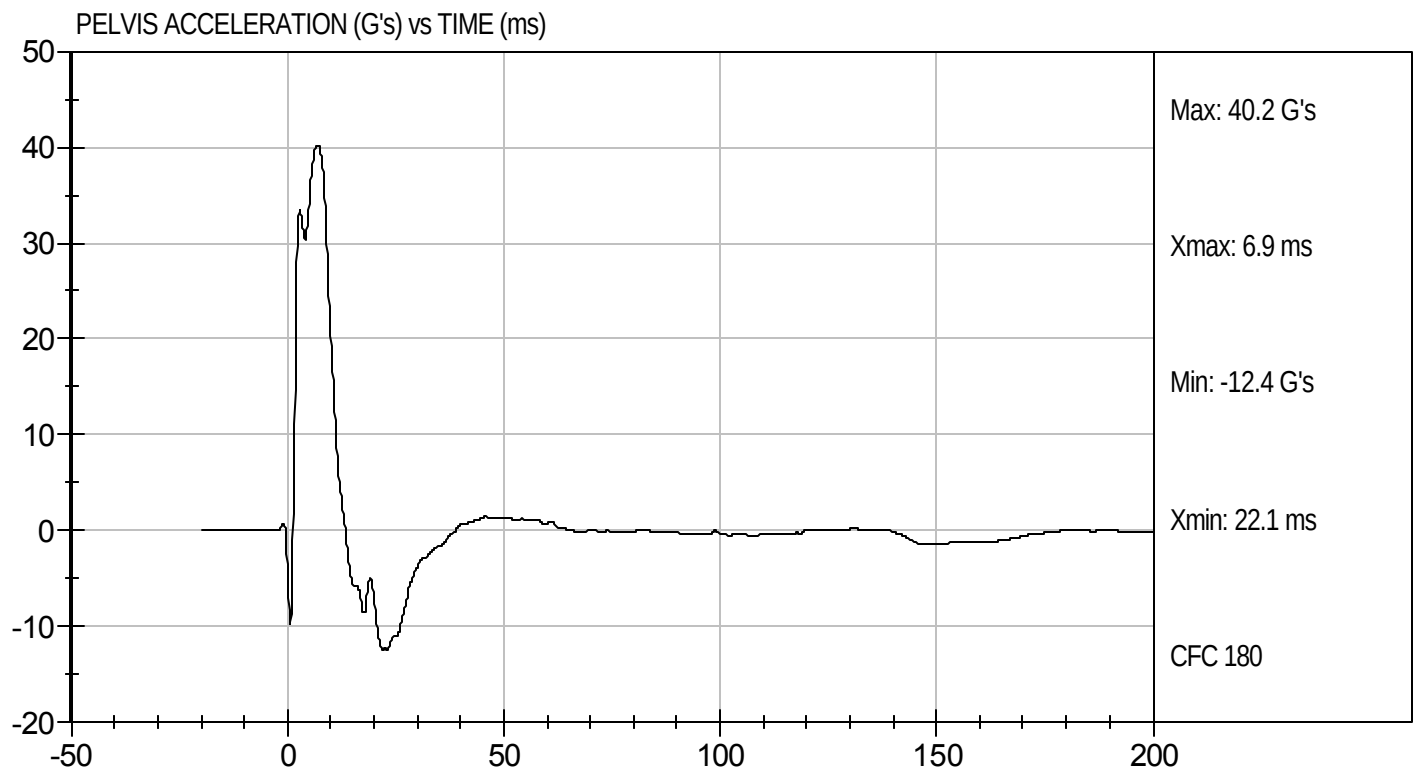
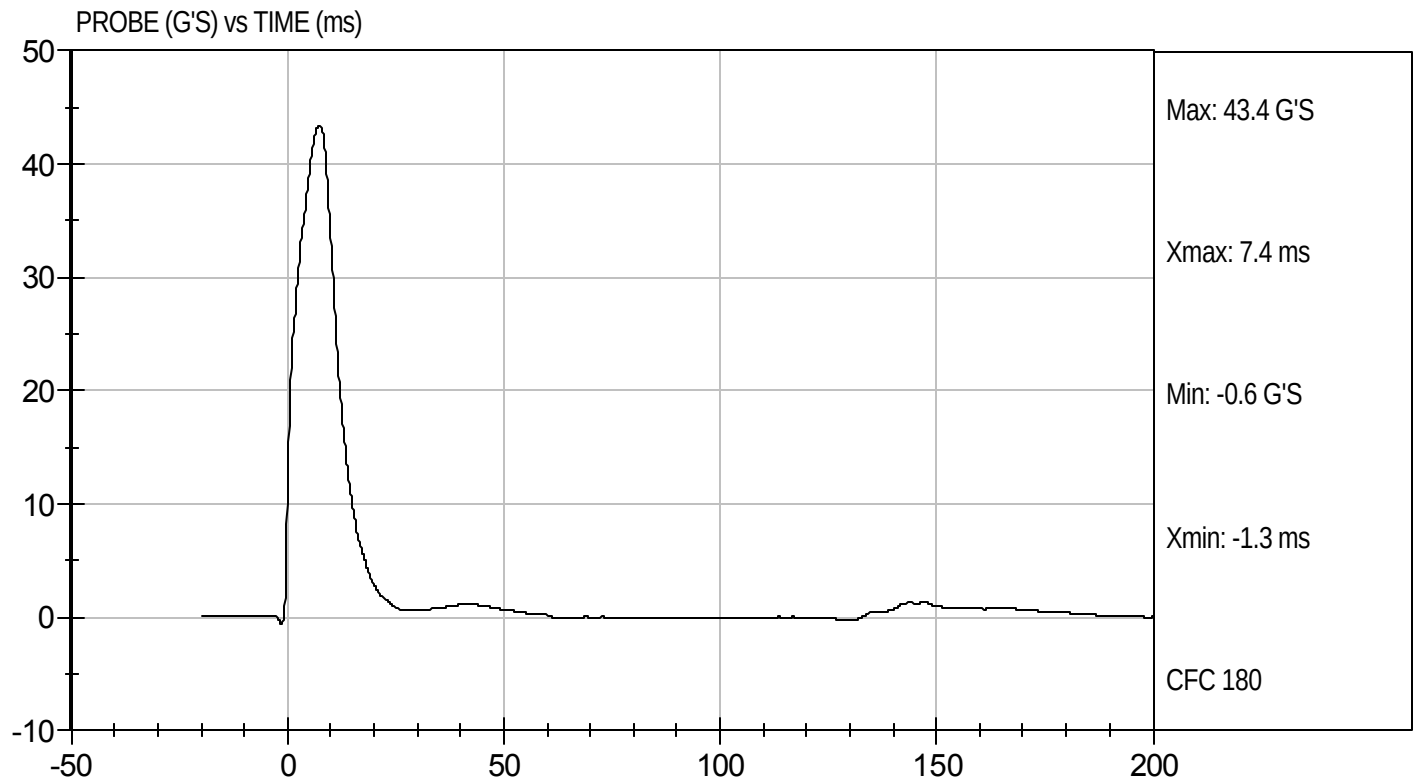
8/12/10
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D102567

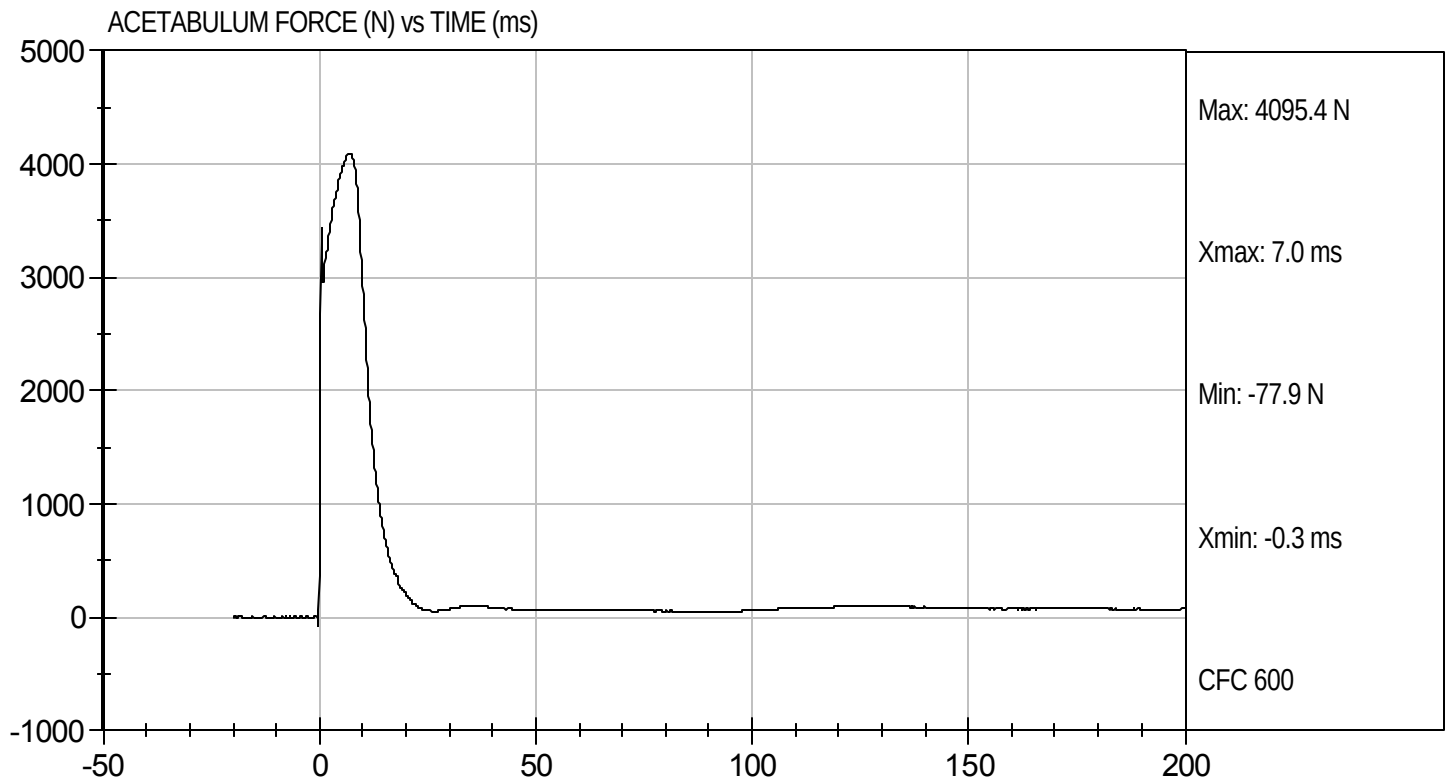
Test Date: 8/12/10
Velocity: 22.2 ft/s, 6.77 m/s





Test Desc: Pelvis Impact
Component ID: D102567

Test Date: 8/12/10
Velocity: 22.2 ft/s, 6.77 m/s

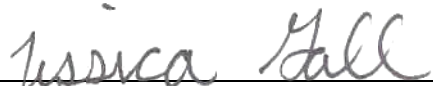


MGA RESEARCH CORPORATION
ILIAC IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D102568

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.7	Pass
Humidity	%	10 to 70	58	Pass
Impact Velocity	m/s	4.20 to 4.40	4.36	Pass
Peak Impactor Acceleration	G's	36 to 45	38	Pass
Pelvis Y Acceleration	G's	28 to 39	35	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4614	Pass
Overall Test Results			Pass	


Laboratory Technician

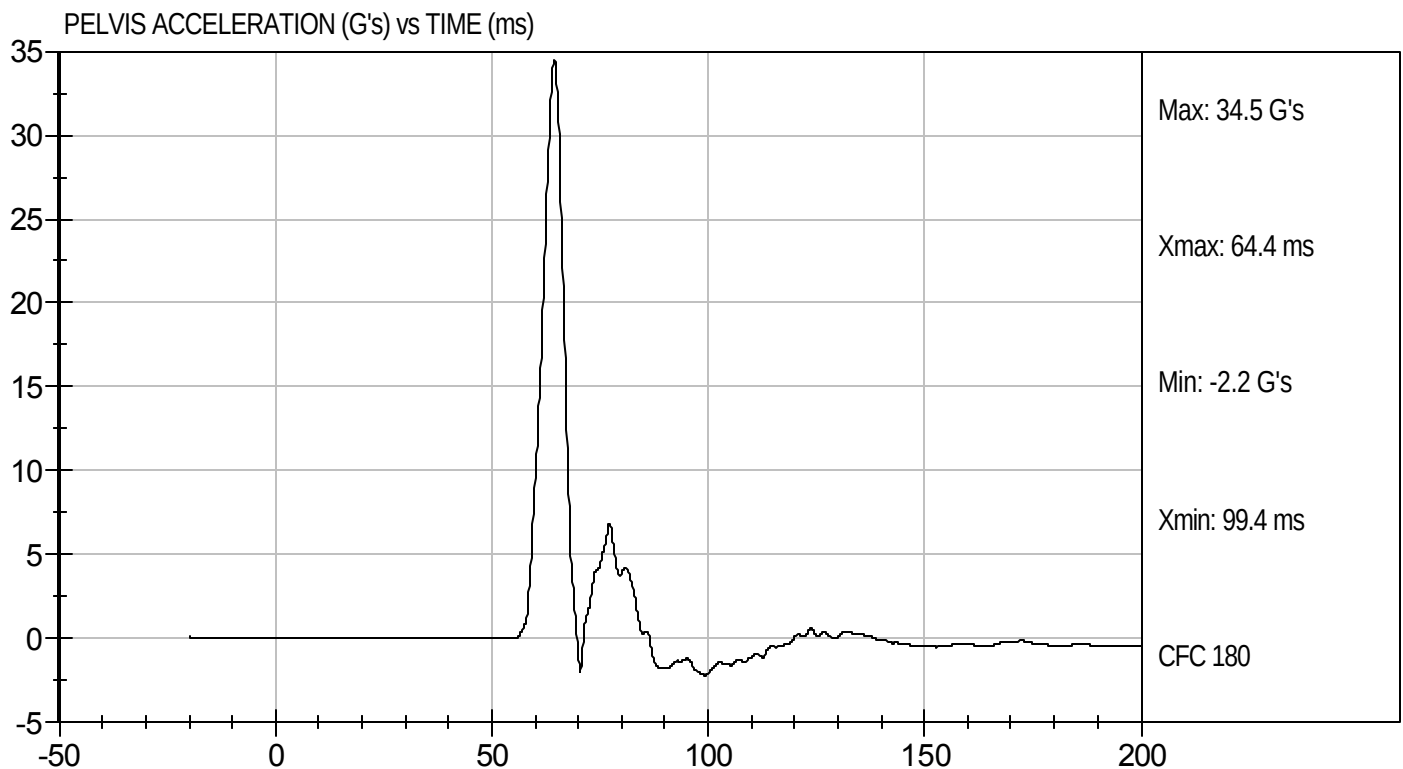
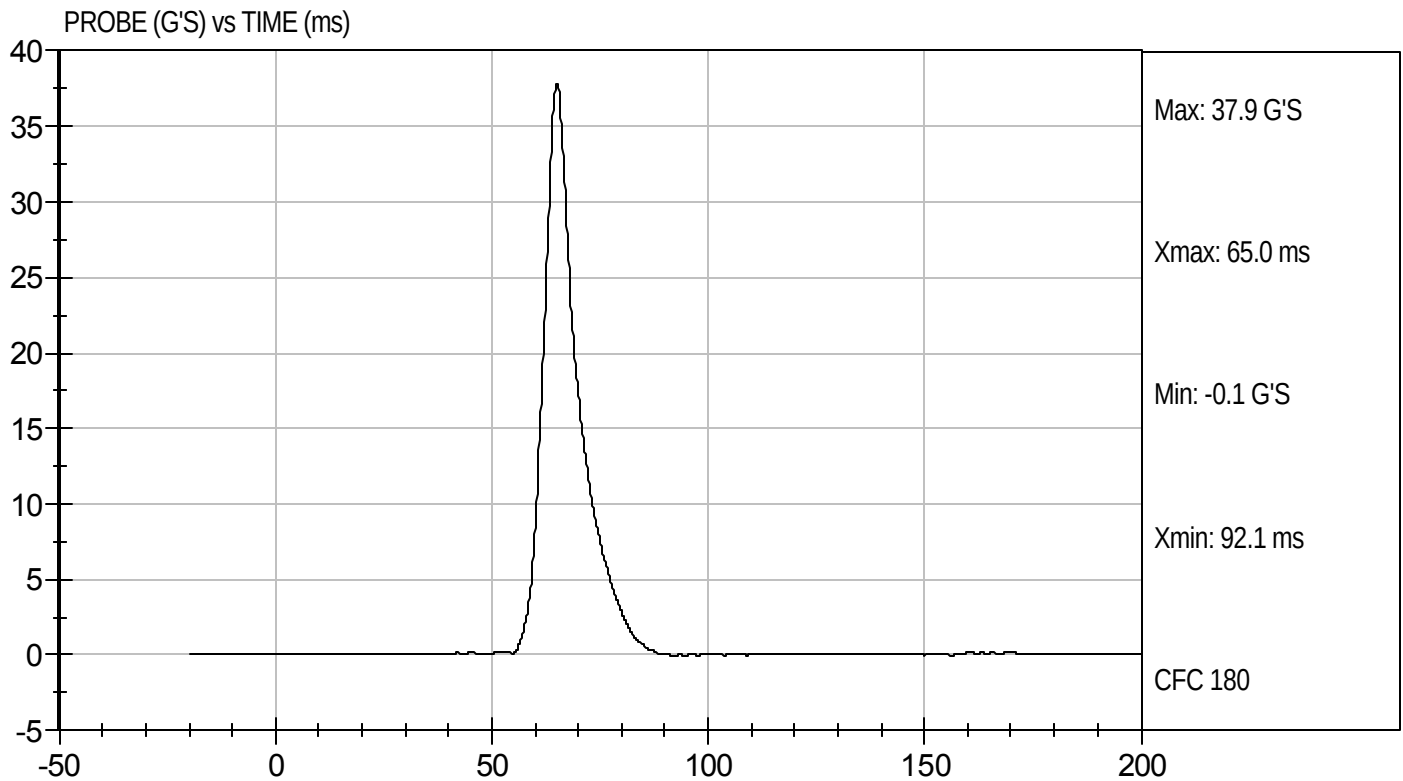
8/12/10
Test Date


Approved By



Test Desc: Iliac Impact
Component ID: D102568

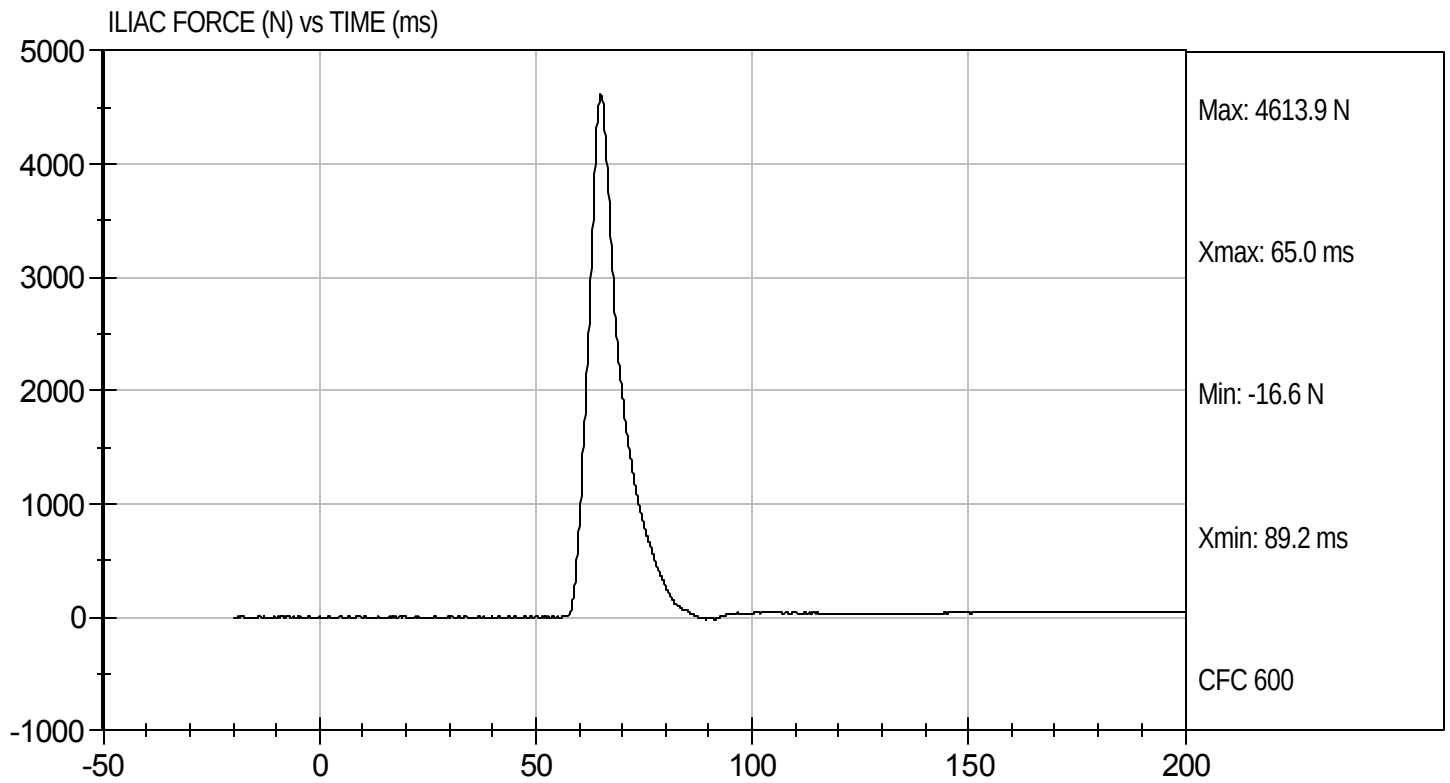
Test Date: 8/12/10
Velocity: 14.3 ft/s, 4.36 m/s





Test Desc: Iliac Impact
Component ID: D102568

Test Date: 8/12/10
Velocity: 14.3 ft/s, 4.36 m/s

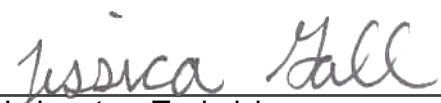


MGA RESEARCH CORPORATION
HEAD DROP TEST
SID-ILs BUILD LEVEL D DUMMY

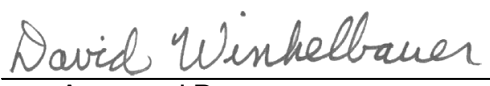
ATD Serial No: 296

Test ID: D102851

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	55	Pass
Peak Resultant Acceleration	G's	115 to 137	123	Pass
Peak Lateral Acceleration	G's	+/- 15	5	Pass
Unimodal	N/A	<15%	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

9/2/10
Test Date

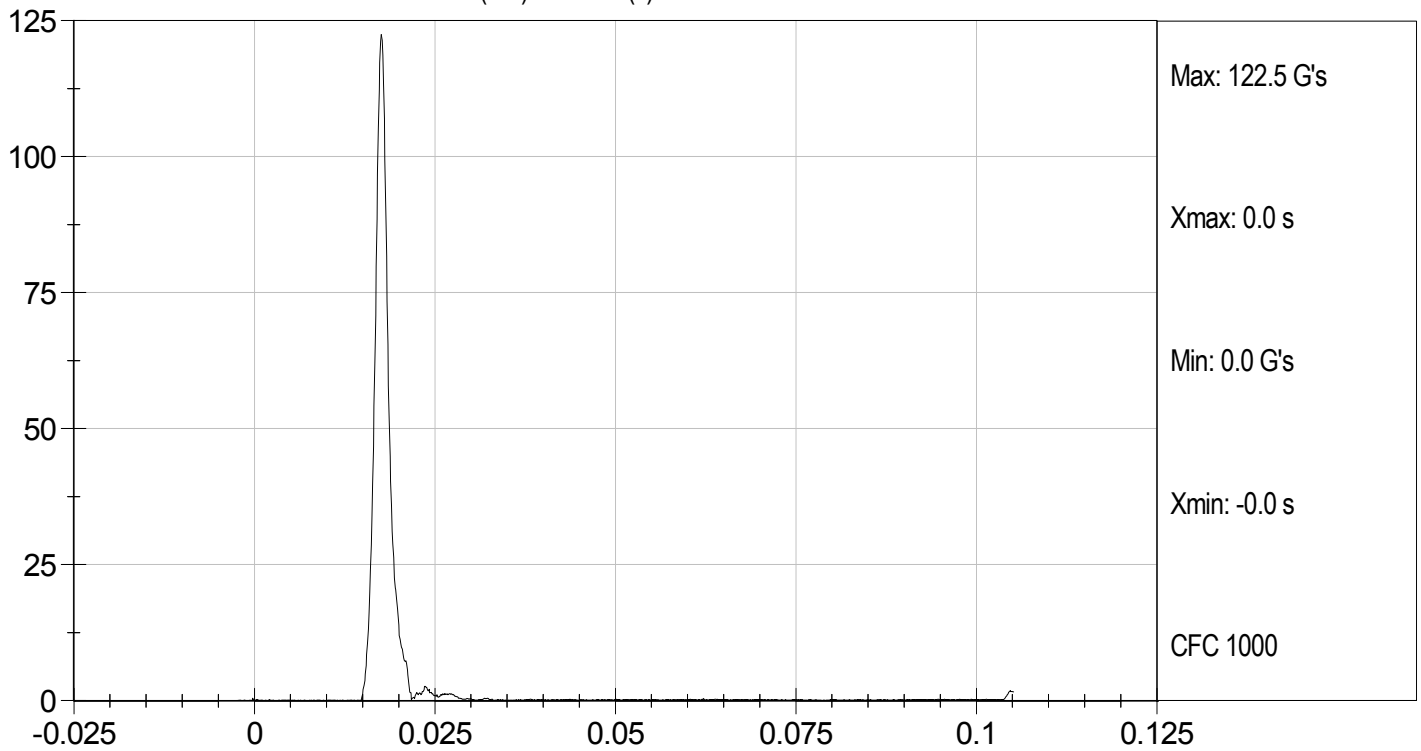

Approved By



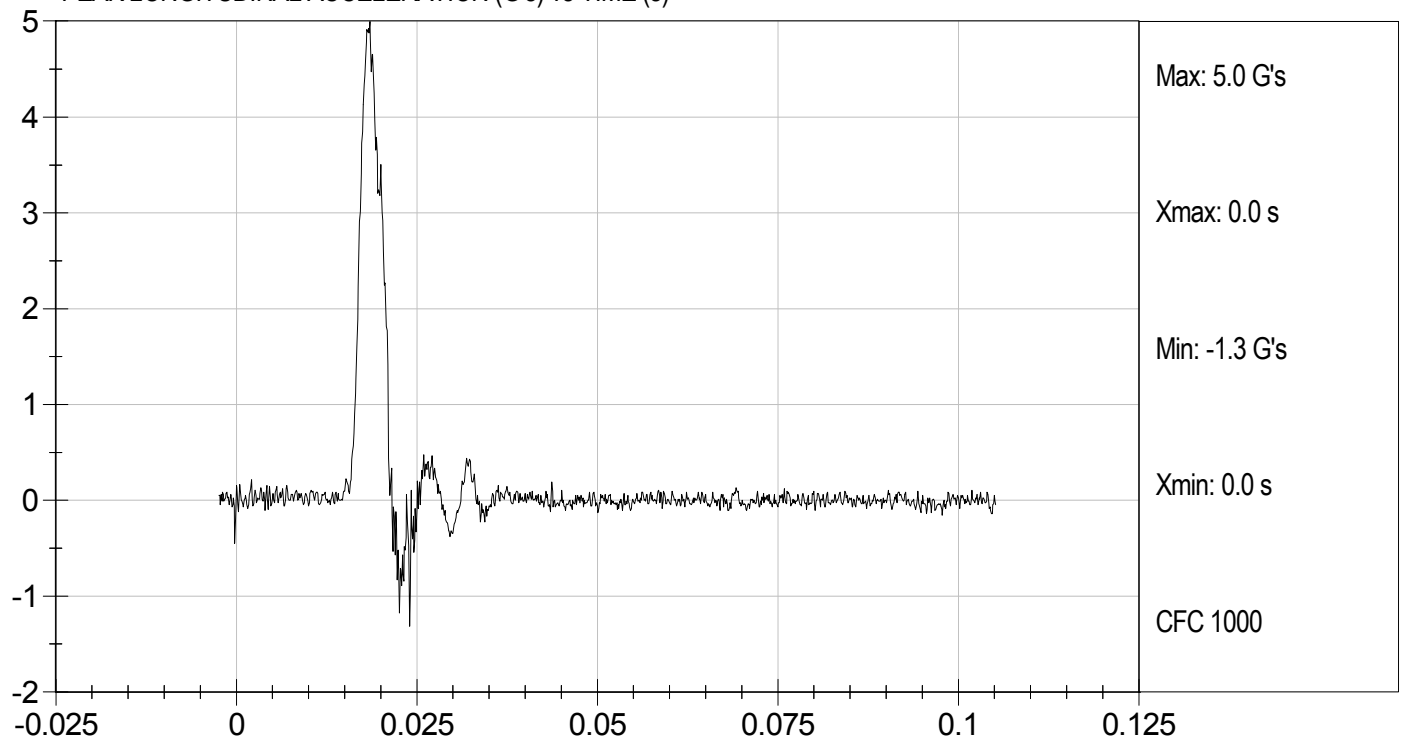
Test Desc: Head Drop
Component ID: D102851

Test Date: 9/2/10
Velocity: 0 ft/s, 0.00 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: D102852

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	21.3	Pass
Humidity		%	10 to 70	56	Pass
Impact Velocity		m/s	5.51 to 5.63	5.52	Pass
Delta Velocity	10 ms	m/s	2.20 to 2.80	2.48	Pass
	15 ms	m/s	3.30 to 4.10	3.47	Pass
	20 ms	m/s	4.40 to 5.40	4.65	Pass
	25 ms	m/s	5.40 to 6.10	5.52	Pass
	25-100 ms	m/s	5.50 to 6.20	5.56	Pass
Maximum D-Plane Rotation		deg	71 to 81	71	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	58	Pass
Maximum Occipital Condyle Moment during Rotation Interval Nm			-44 to -36	-42	Pass
Time of Moment Decay to 0 Nm		ms	102 to 126	113	Pass
Overall Test Results				Pass	


 Laboratory Technician

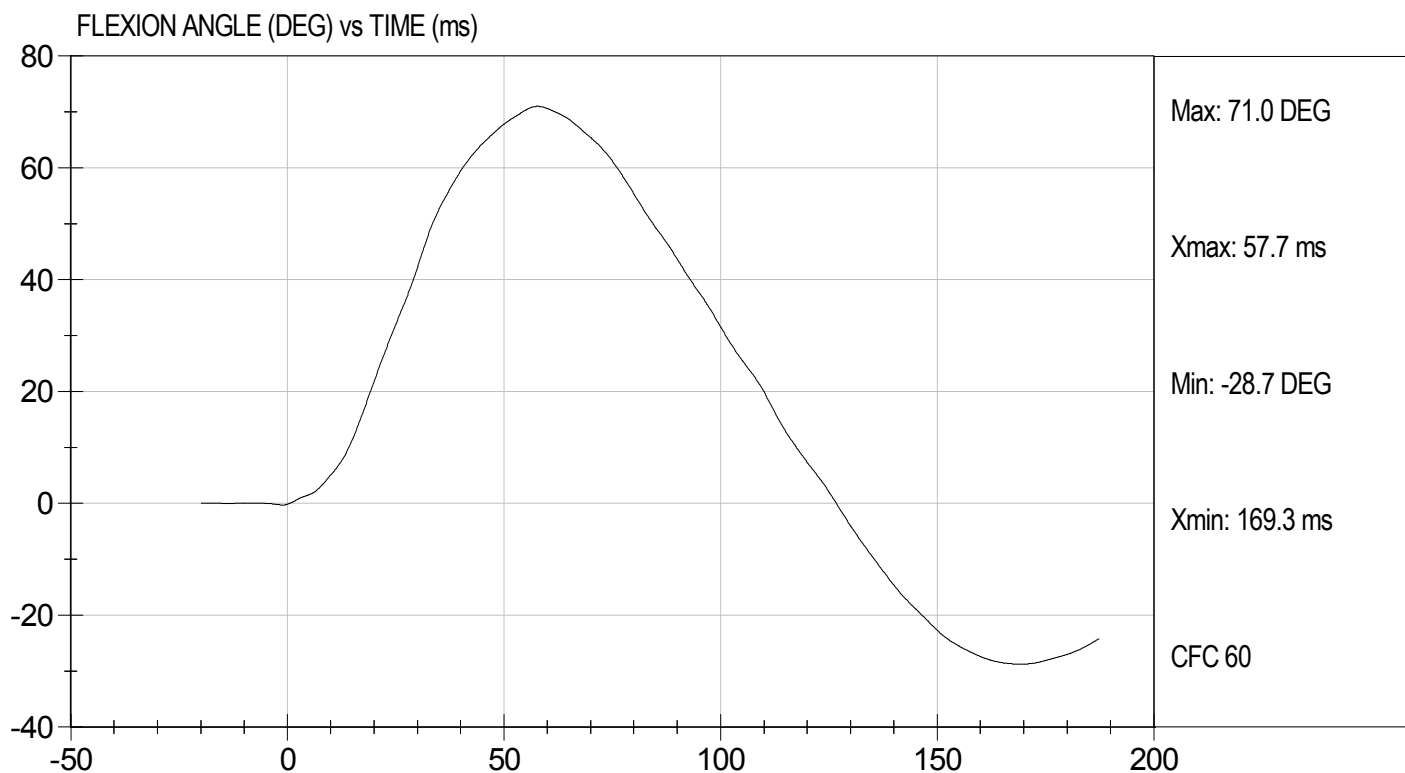
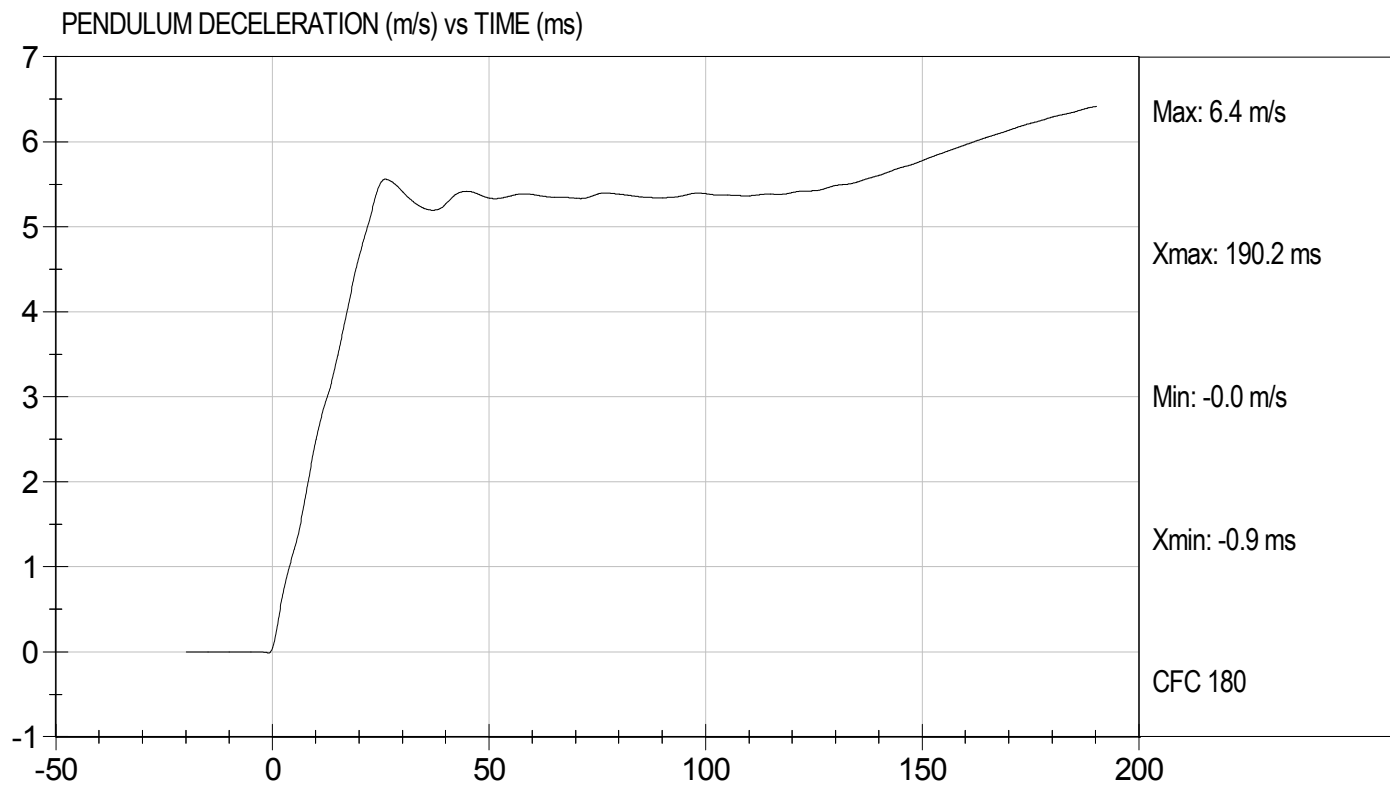
9/2/10
 Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D102852

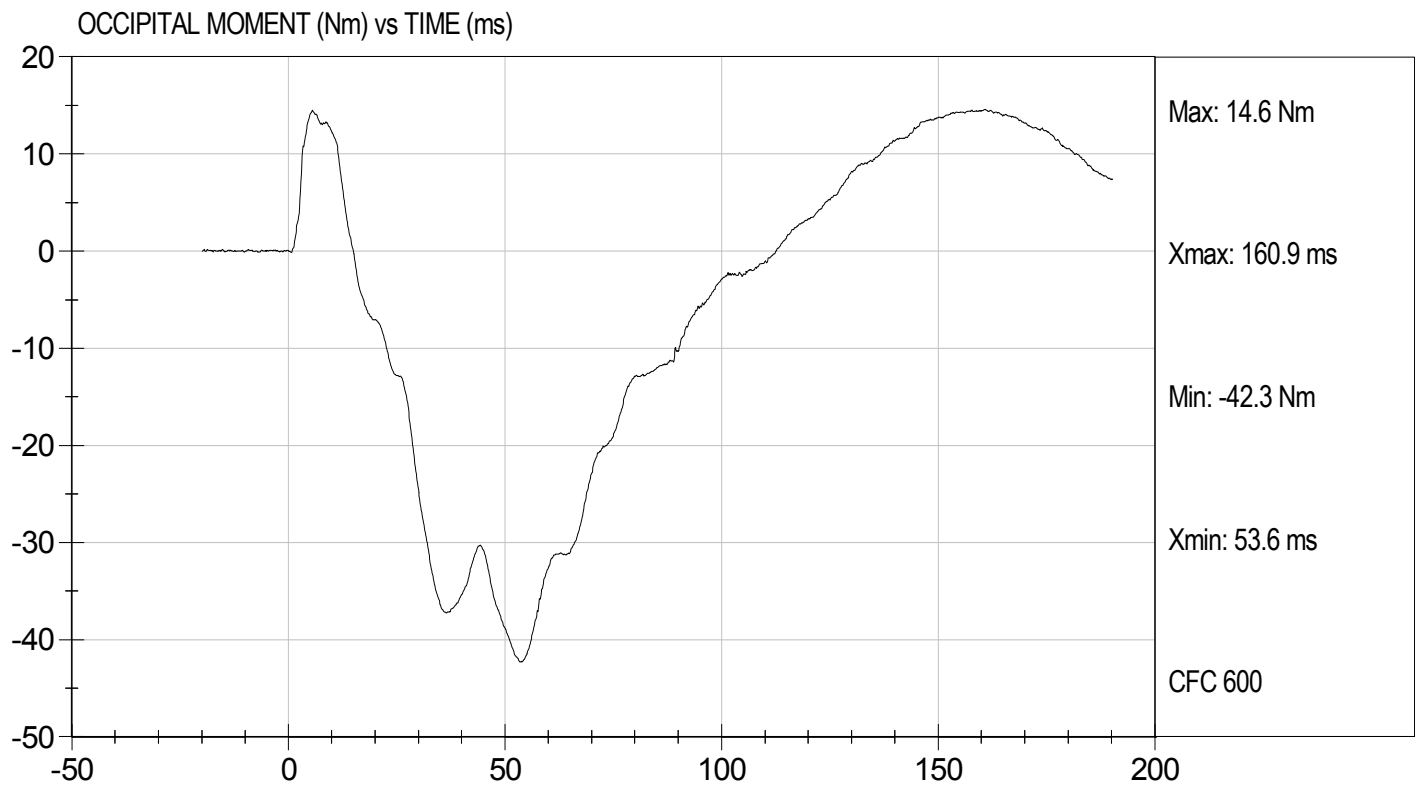
Test Date: 9/2/10
Velocity: 18.1 ft/s, 5.52 m/s





Test Desc: Neck Bending
Component ID: D102852

Test Date: 9/2/10
Velocity: 18.1 ft/s, 5.52 m/s

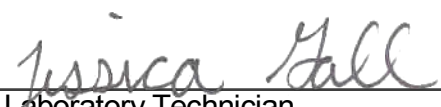


MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
SID-ILs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test ID: D102853

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	55	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	19	Pass
Overall Test Results				Pass


Laboratory Technician

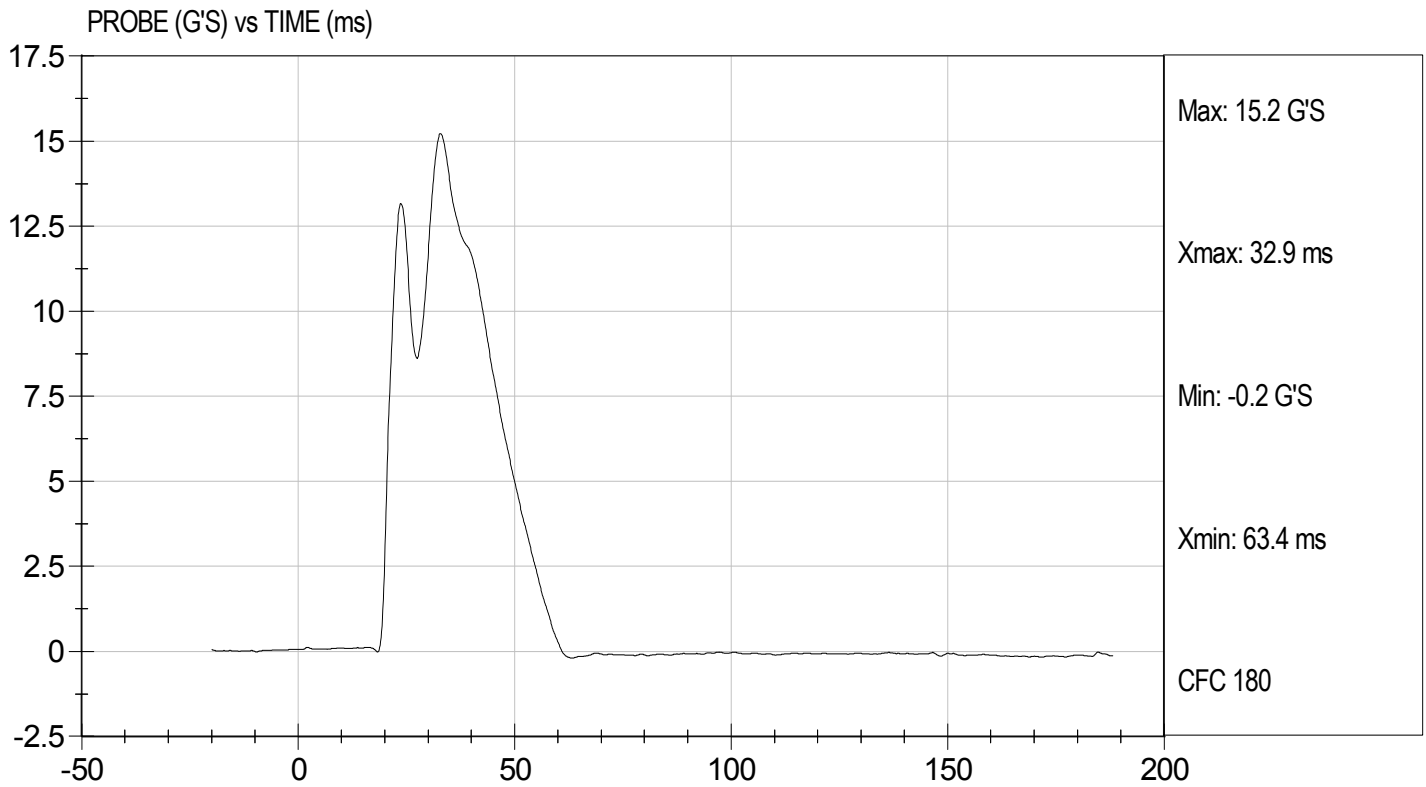
9/2/10
Test Date


Approved By



Test Desc: Shoulder Impact
Component ID: D102853

Test Date: 9/2/10
Velocity: 14.1 ft/s, 4.30 m/s

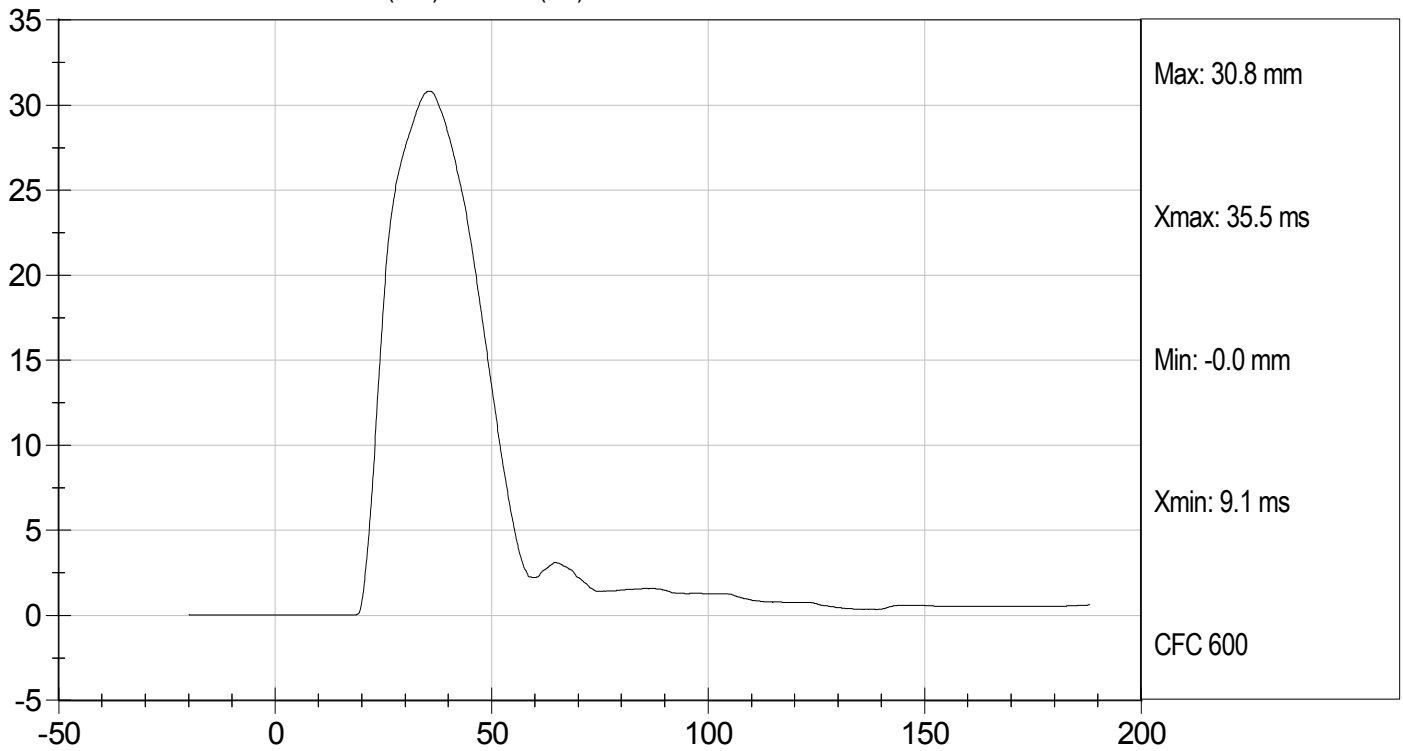




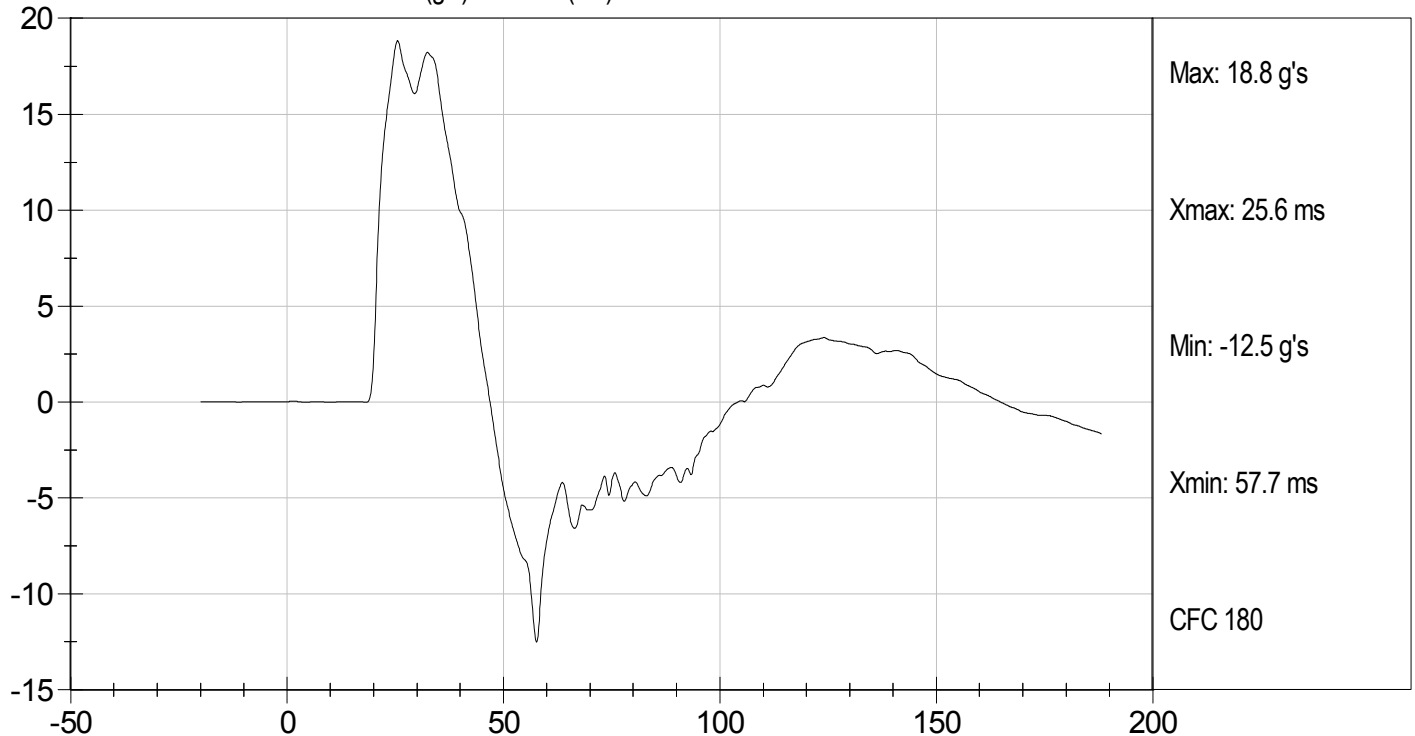
Test Desc: Shoulder Impact
Component ID: D102853

Test Date: 9/2/10
Velocity: 14.1 ft/s, 4.30 m/s

SHOULDER DISPLACEMENT (mm) vs TIME (ms)



UPPER SPINE ACCELERATION (g's) vs TIME (ms)

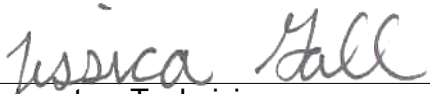


MGA RESEARCH CORPORATION
THORAX (WITH ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D102854

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.1	Pass
Humidity	%	10 to 70	55	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Peak Impactor Acceleration	G's	30 to 36	33	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	38	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	33	Pass
Overall Test Results				Pass


 Laboratory Technician

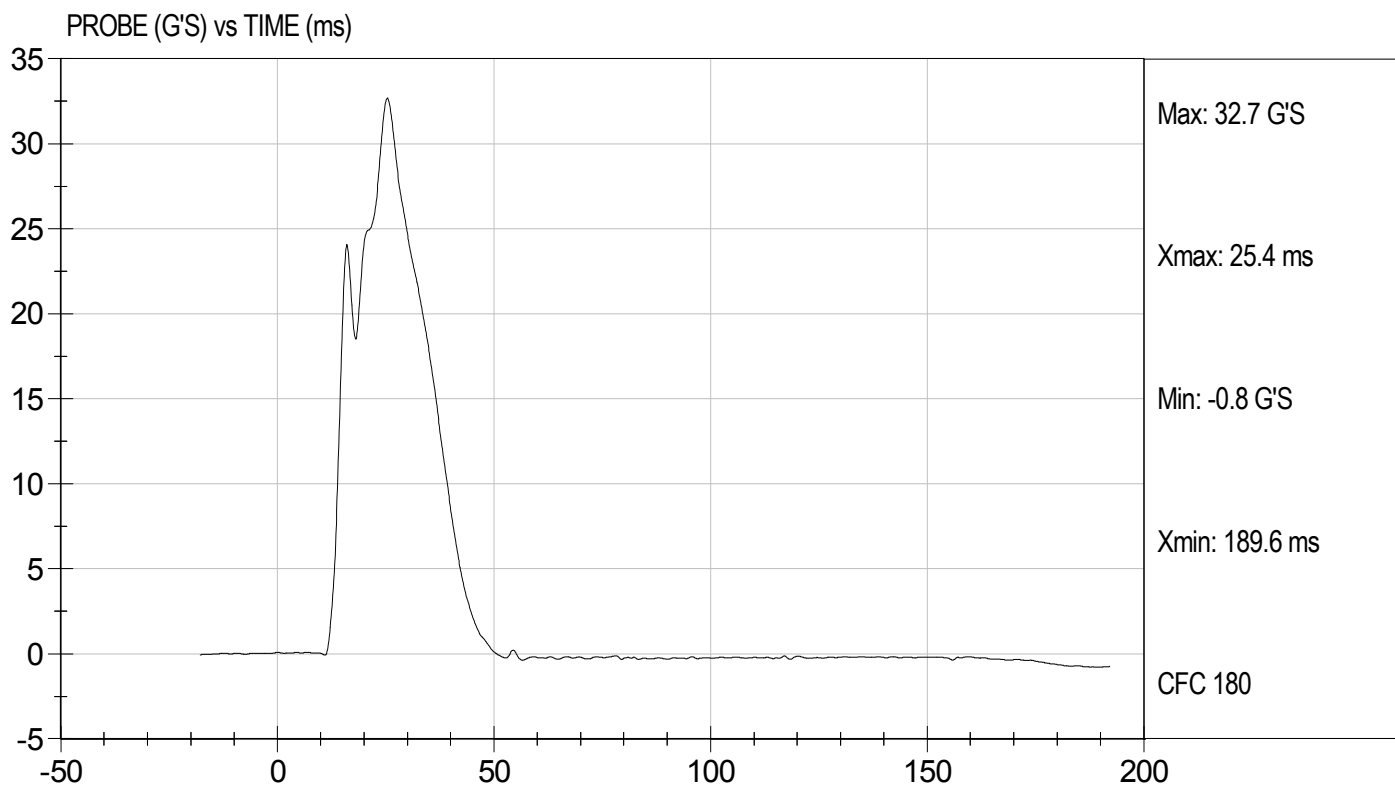
9/2/10
 Test Date


 Approved By



Test Desc: Thorax With Arm
Component ID: D102854

Test Date: 9/2/10
Velocity: 21.9 ft/s, 6.68 m/s

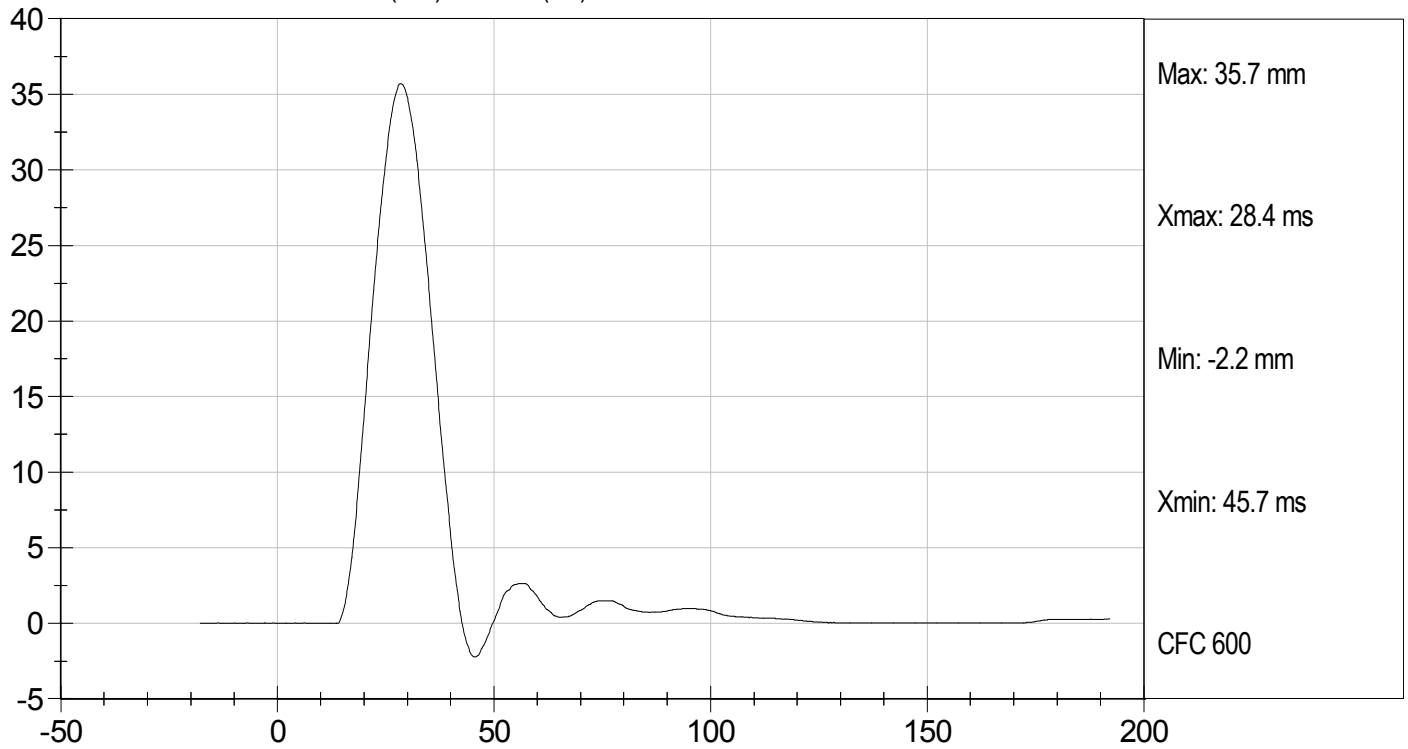




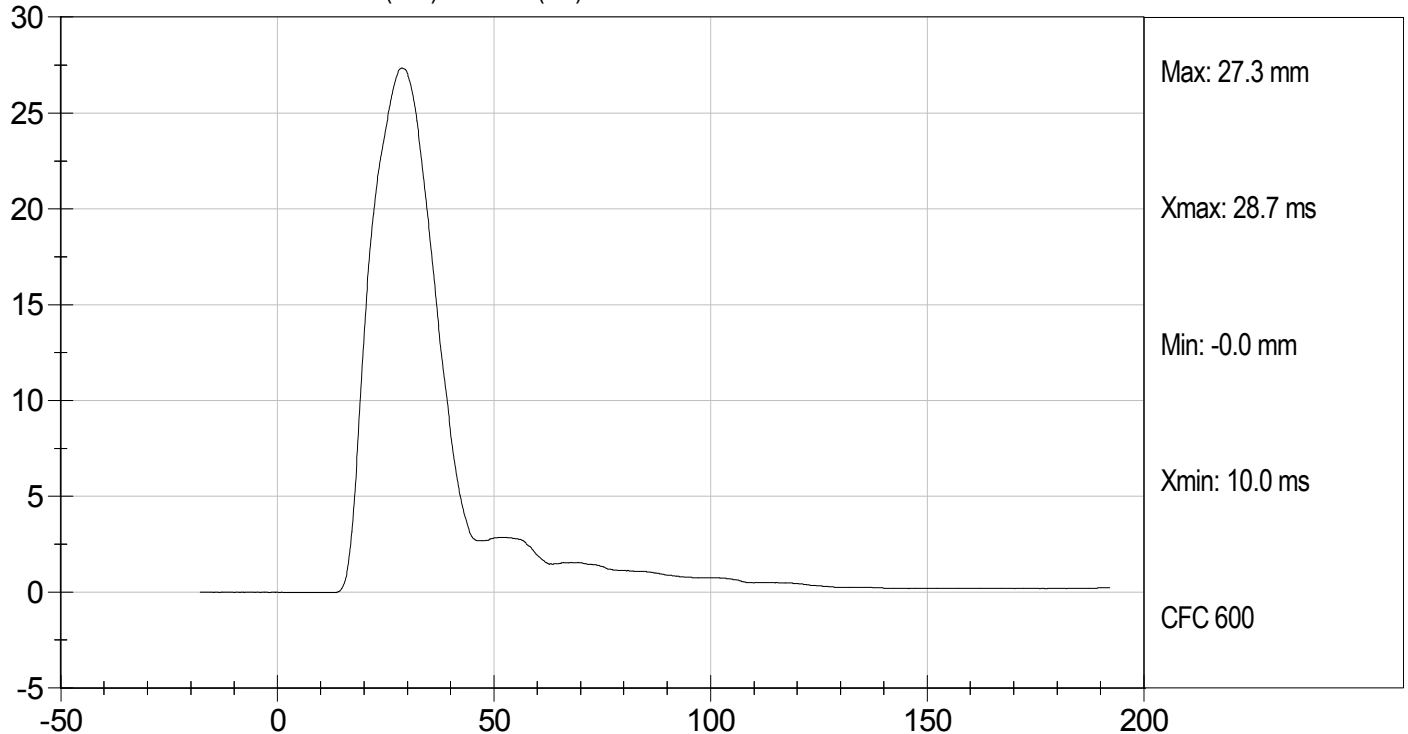
Test Desc: Thorax With Arm
Component ID: D102854

Test Date: 9/2/10
Velocity: 21.9 ft/s, 6.68 m/s

SHOULDER DISPLACEMENT (mm) vs TIME (ms)



UPPER RIB DISPLACEMENT (mm) vs TIME (ms)

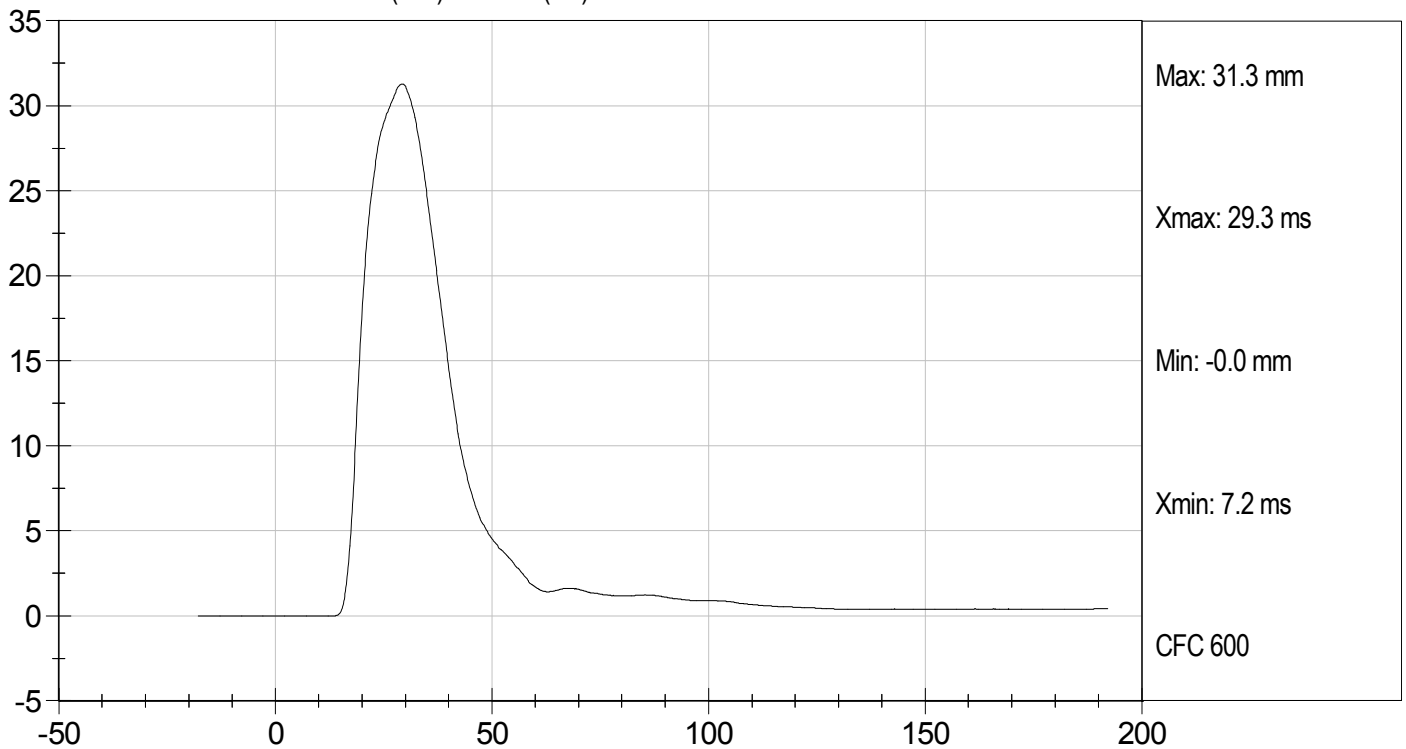




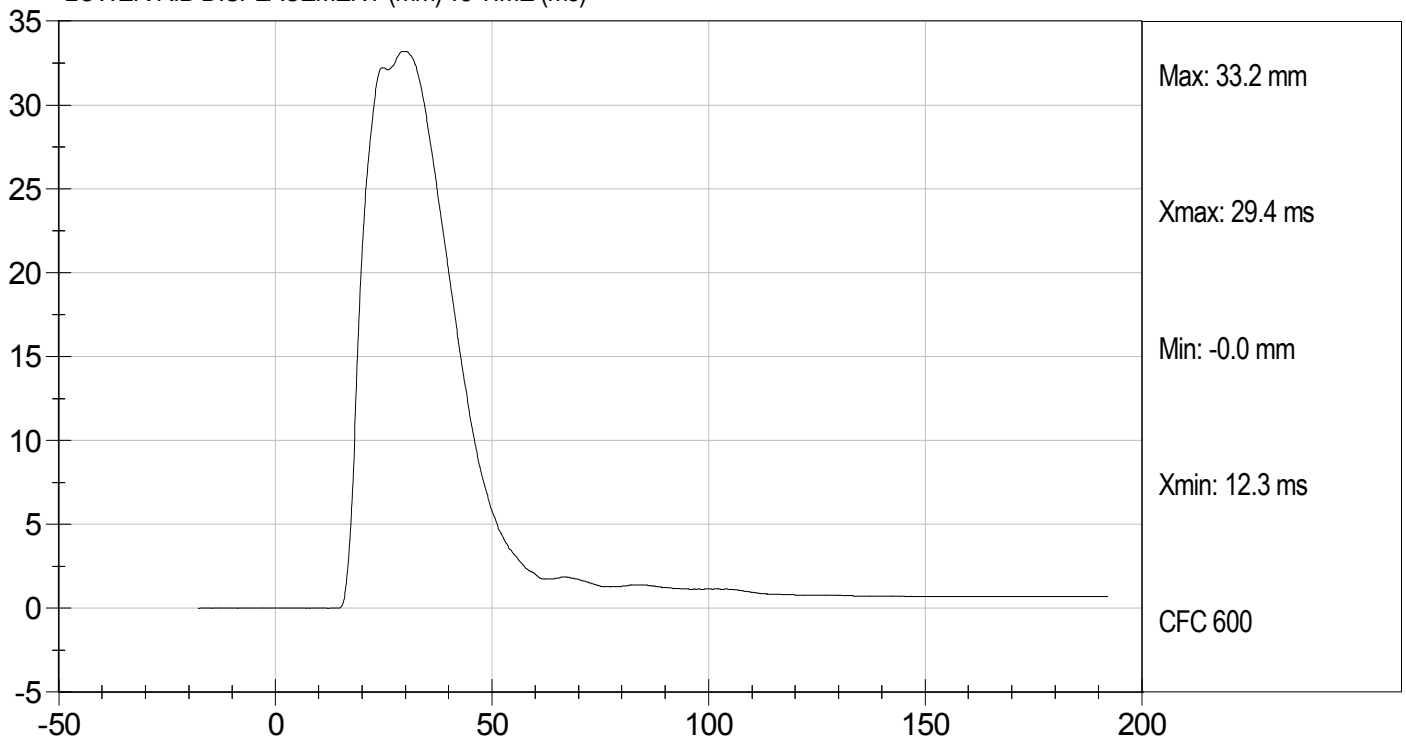
Test Desc: Thorax With Arm
Component ID: D102854

Test Date: 9/2/10
Velocity: 21.9 ft/s, 6.68 m/s

MIDDLE RIB DISPLACEMENT (mm) vs TIME (ms)



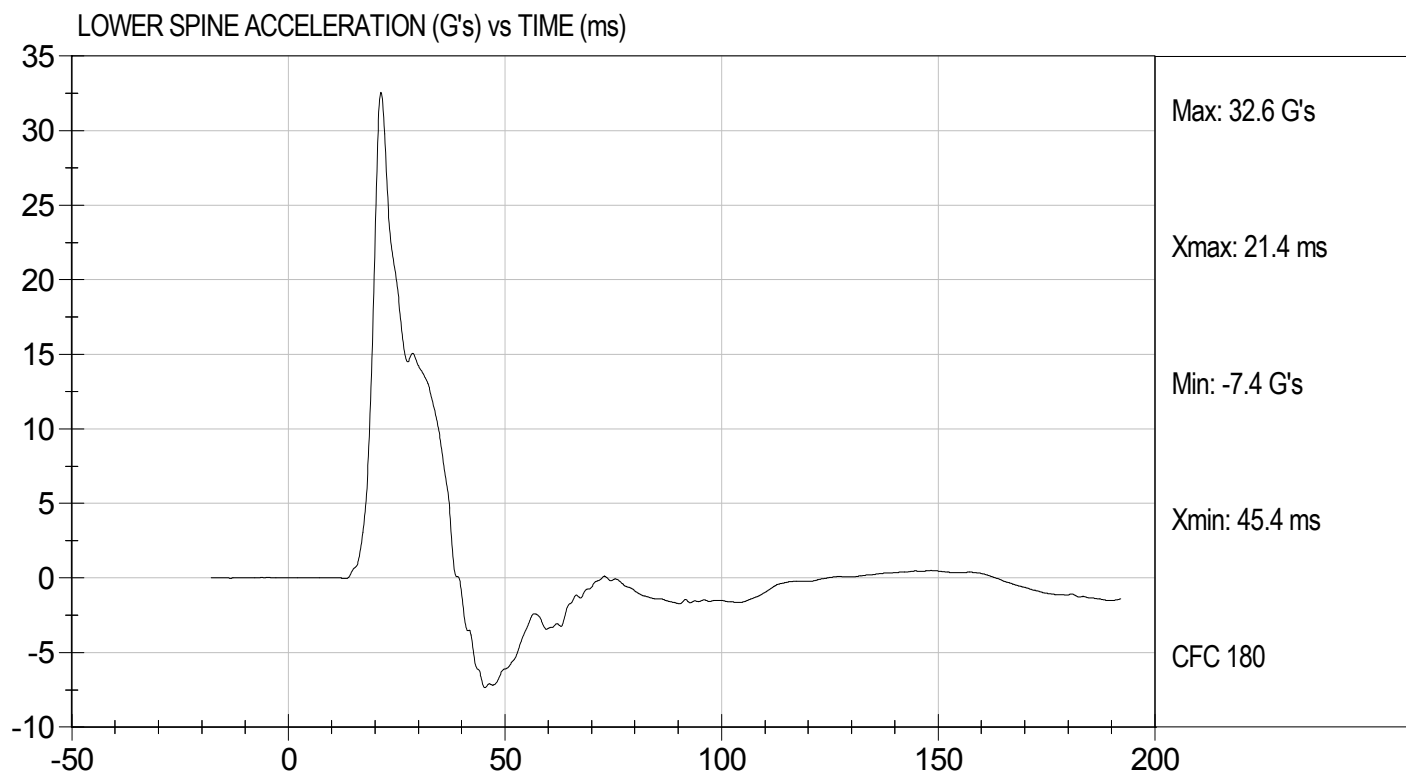
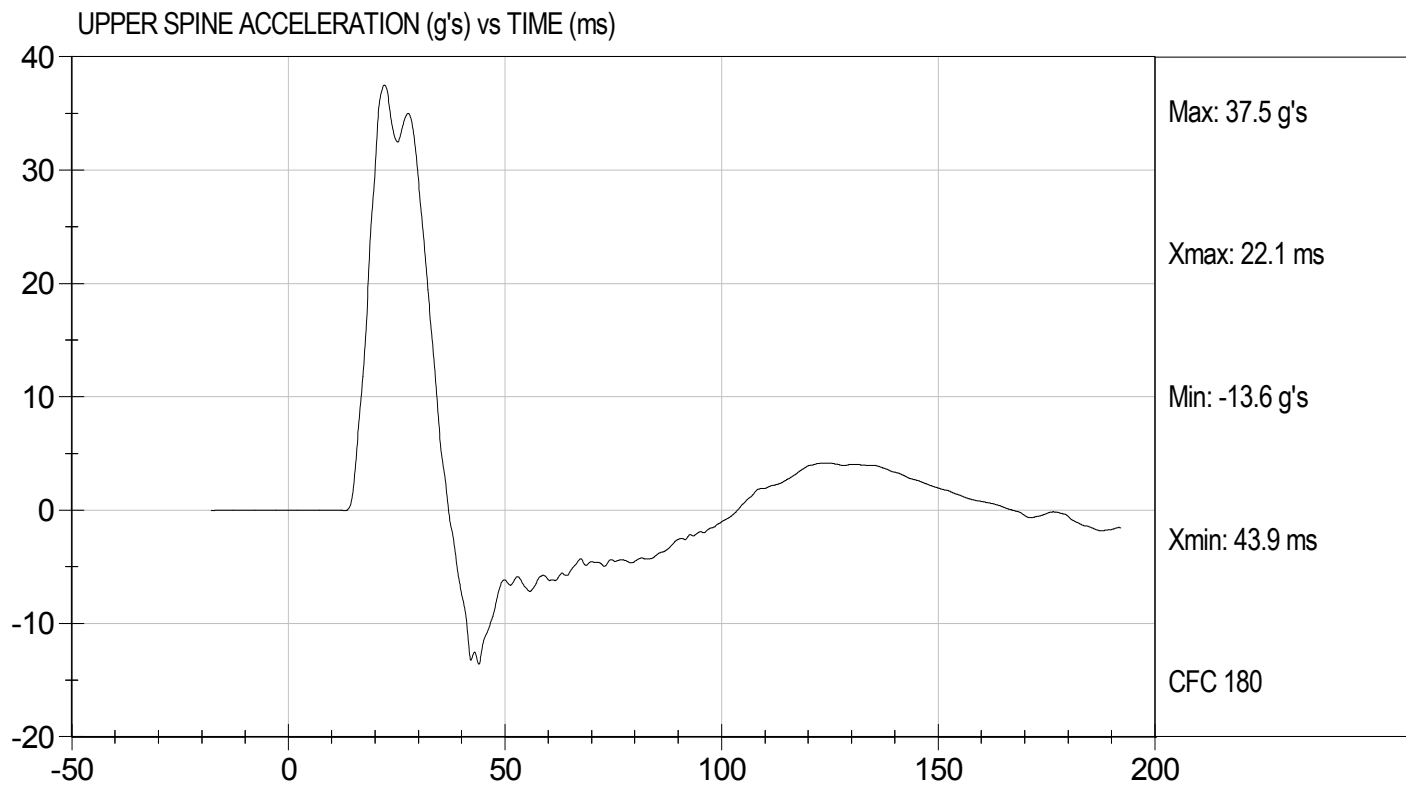
LOWER RIB DISPLACEMENT (mm) vs TIME (ms)





Test Desc: Thorax With Arm
Component ID: D102854

Test Date: 9/2/10
Velocity: 21.9 ft/s, 6.68 m/s

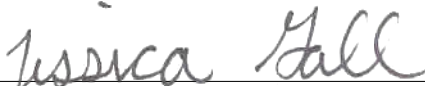


MGA RESEARCH CORPORATION
THORAX (WITHOUT ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D102855

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.1	Pass
Humidity	%	10 to 70	55	Pass
Impact Velocity	m/s	4.20 to 4.40	4.23	Pass
Peak Impactor Force	G's	14 to 18	15	Pass
Upper Rib Displacement	mm	32 to 40	34	Pass
Middle Rib Displacement	mm	39 to 45	40	Pass
Lower Rib Displacement	mm	35 to 43	39	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	14	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
Overall Test Results				Pass


 Laboratory Technician

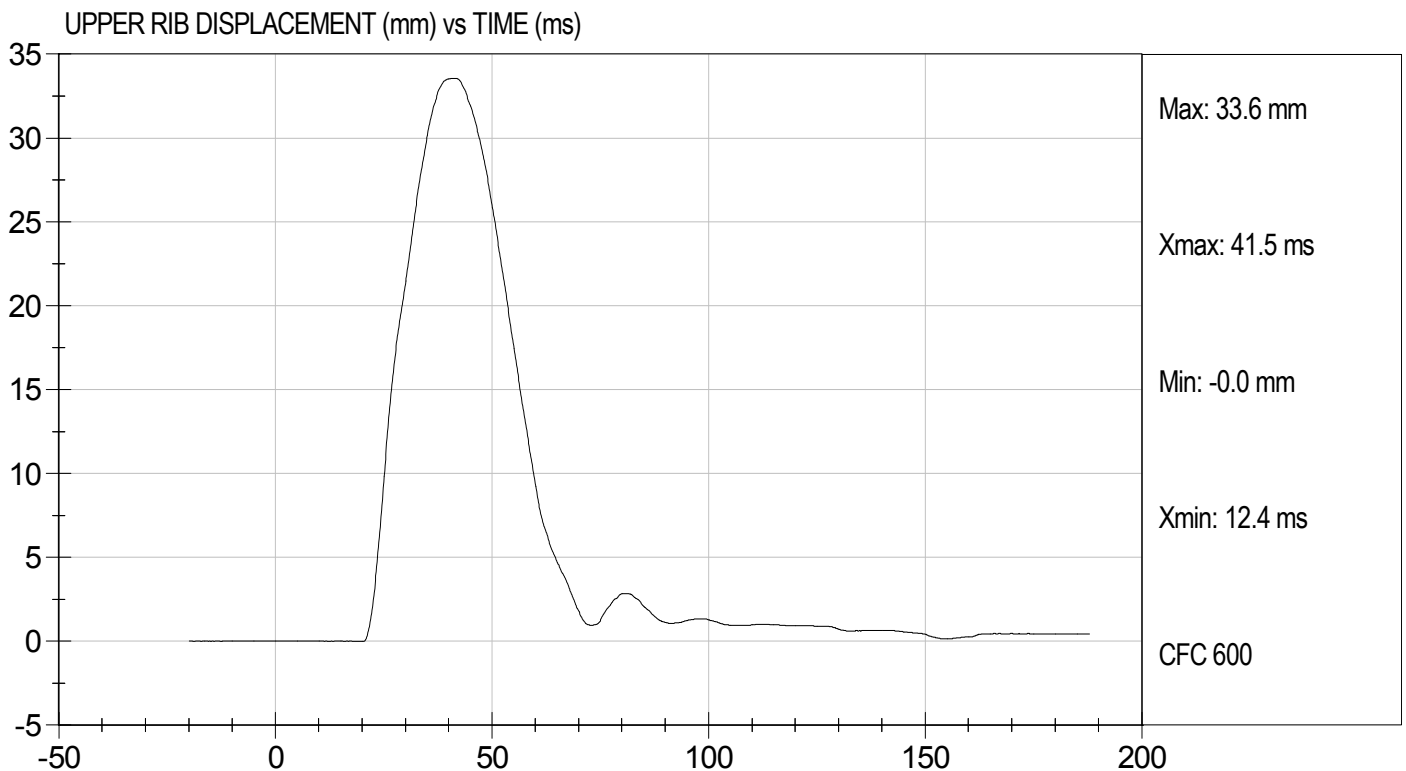
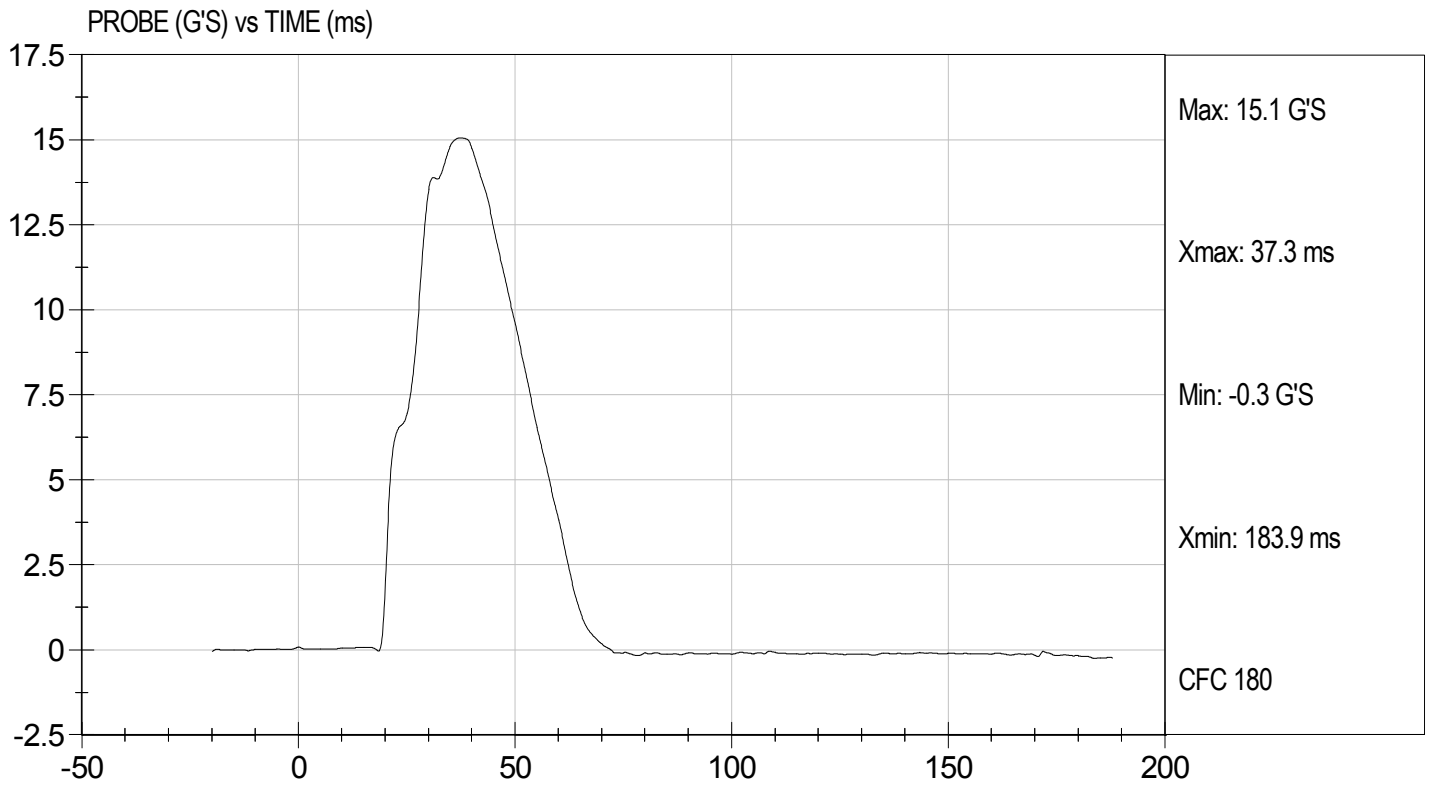
9/2/10
 Test Date


 Approved By



Test Desc: Thorax Without Arm
Component ID: D102855

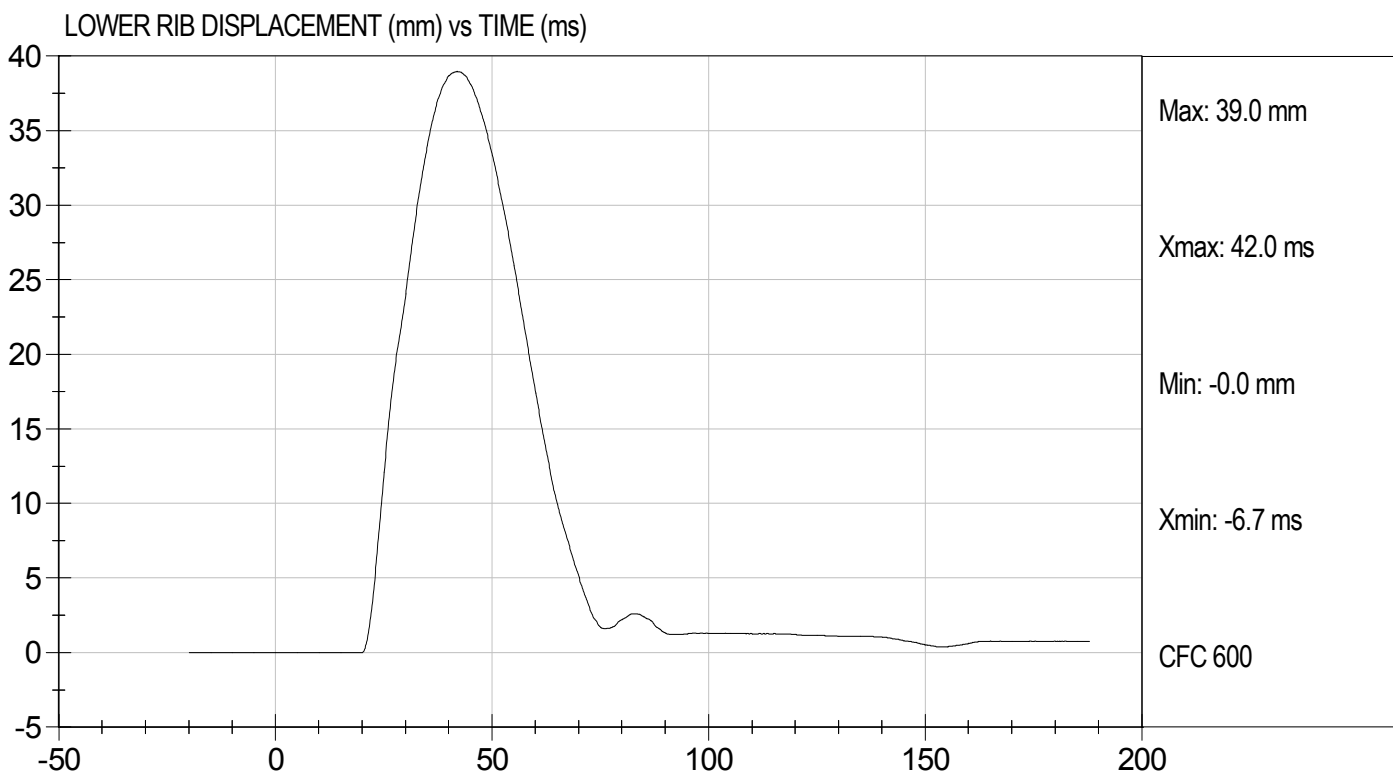
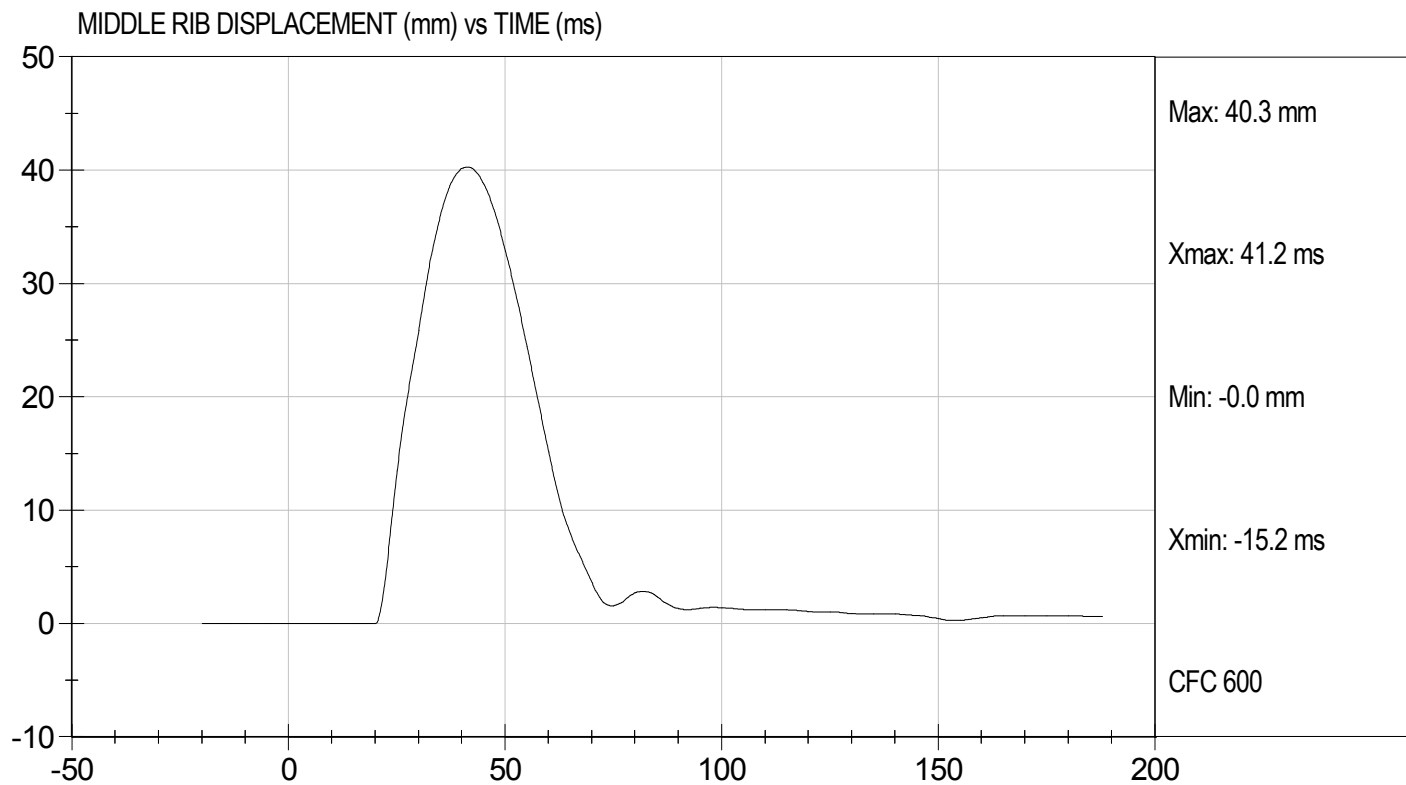
Test Date: 9/2/10
Velocity: 13.88 ft/s, 4.23 m/s





Test Desc: Thorax Without Arm
Component ID: D102855

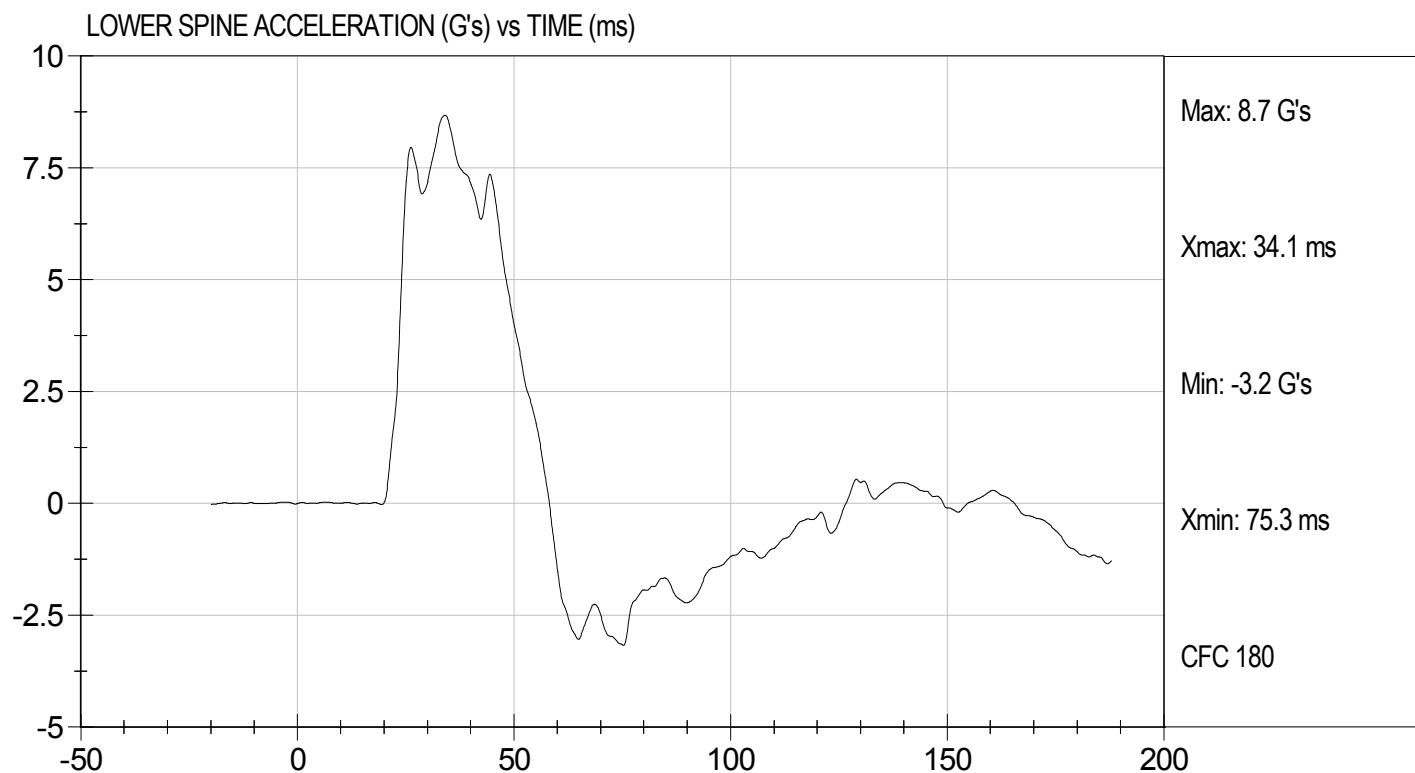
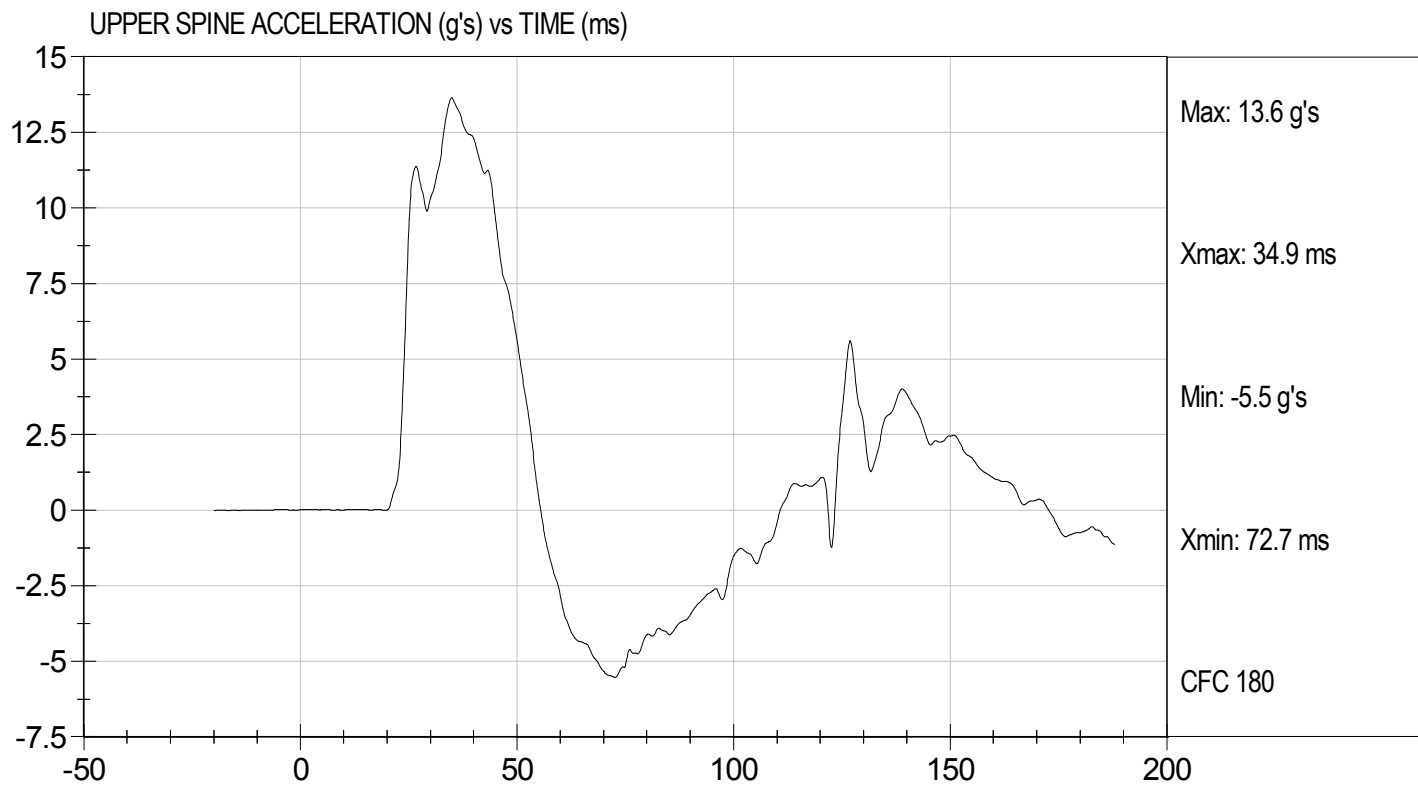
Test Date: 9/2/10
Velocity: 13.88 ft/s, 4.23 m/s





Test Desc: Thorax Without Arm
Component ID: D102855

Test Date: 9/2/10
Velocity: 13.88 ft/s, 4.23 m/s



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

ATD Serial No: 296

Test I.D: D102856

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.1	Pass
Humidity	%	10 to 70	55	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	39	Pass
Lower Rib Displacement	mm	33 to 44	39	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
Overall Test Results				Pass


Laboratory Technician

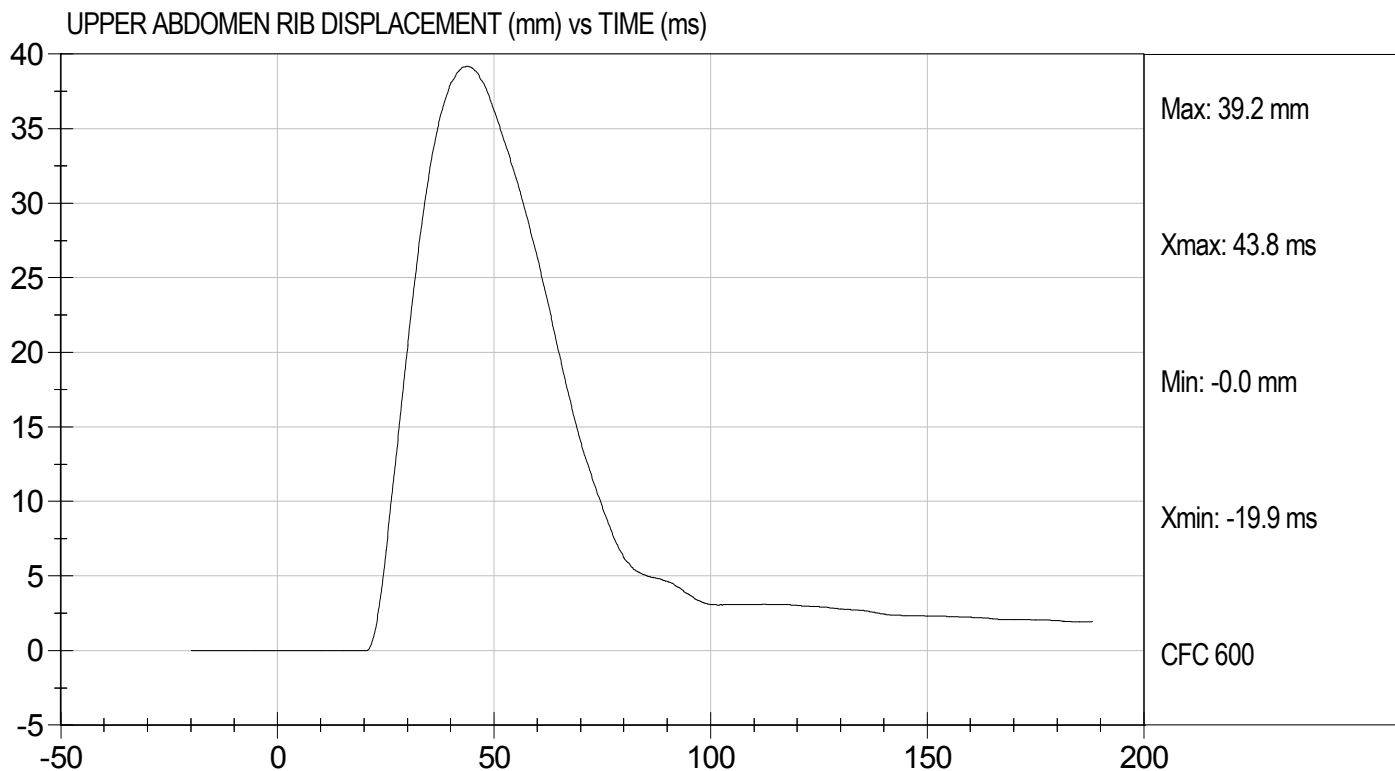
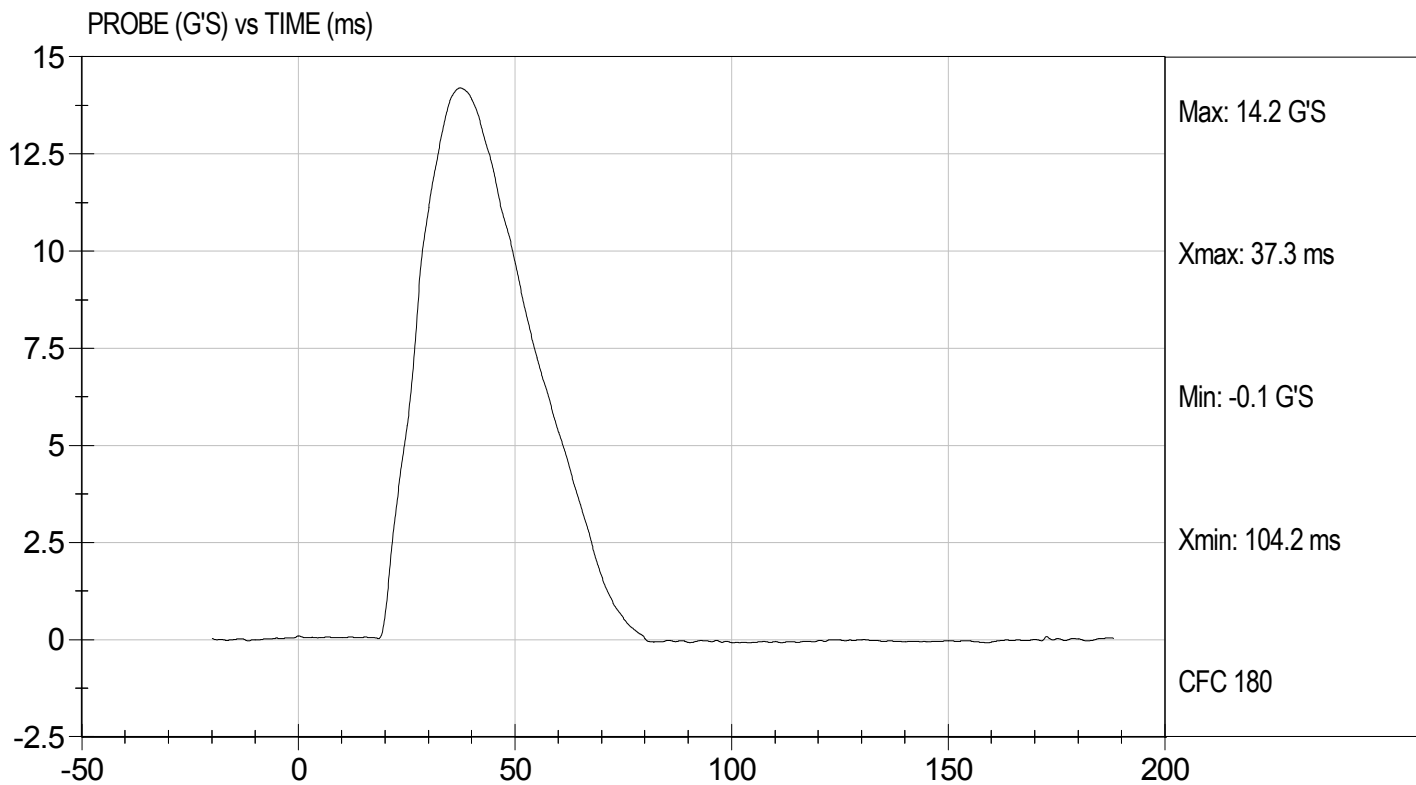
9/2/10
Test Date


Approved By



Test Desc: Abdomen Impact
Component ID: D102856

Test Date: 9/2/10
Velocity: 14.36 ft/s, 4.38 m/s

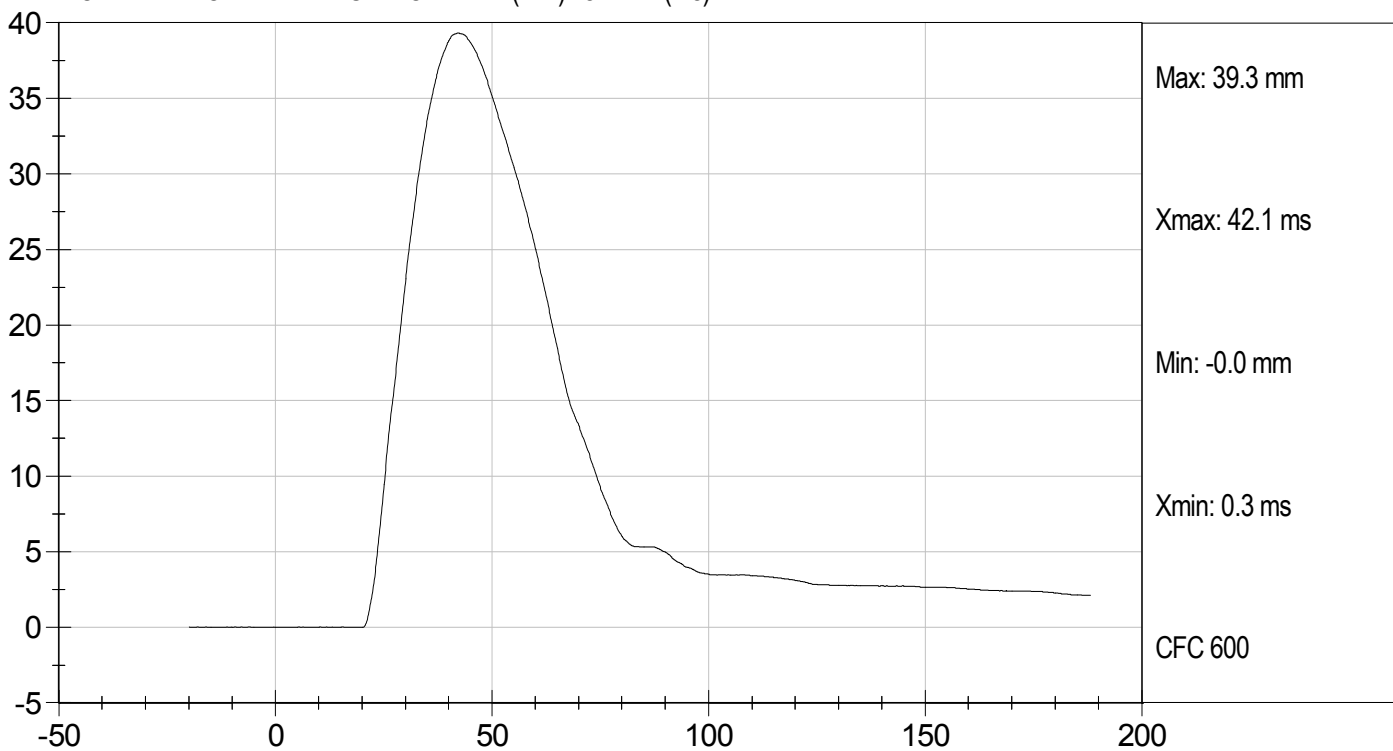




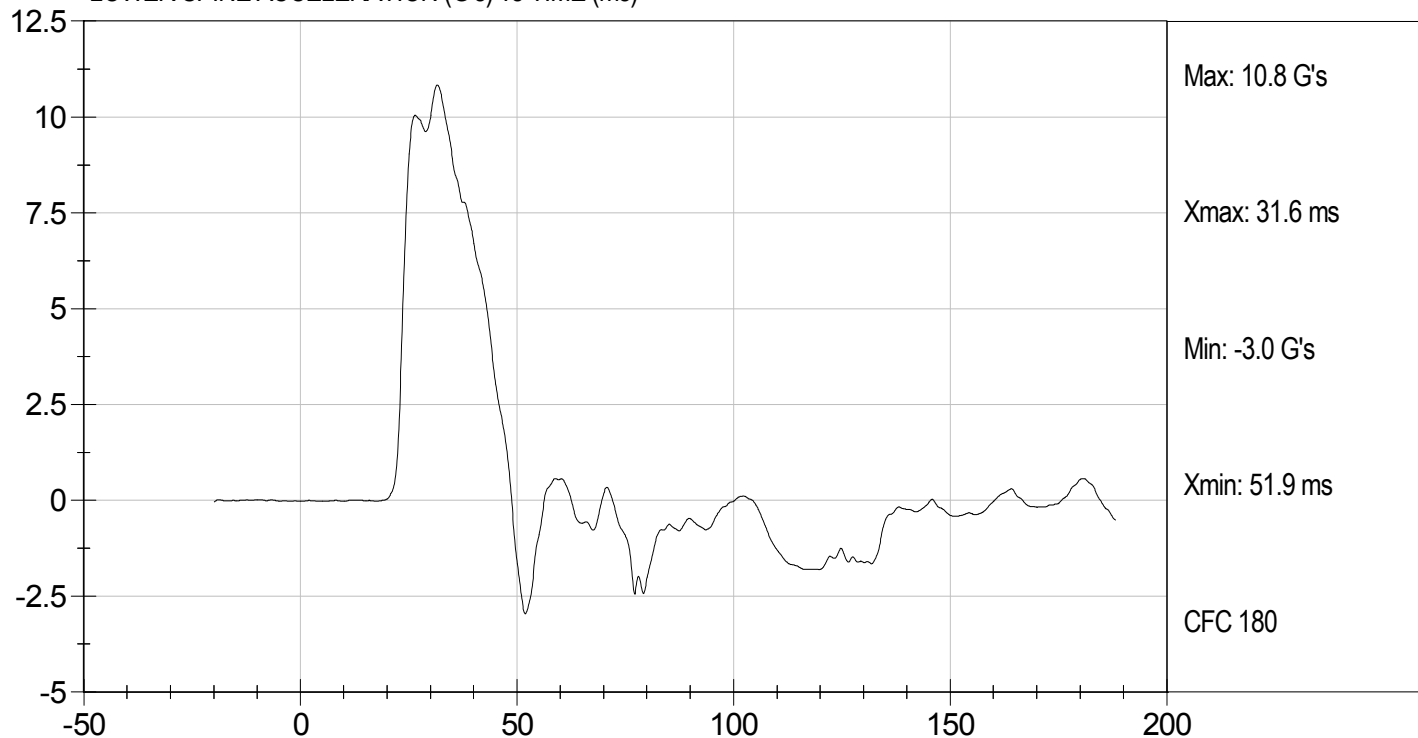
Test Desc: Abdomen Impact
Component ID: D102856

Test Date: 9/2/10
Velocity: 14.36 ft/s, 4.38 m/s

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



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

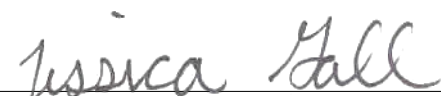


MGA RESEARCH CORPORATION
PELVIS IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D102857

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.1	Pass
Humidity	%	10 to 70	55	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	40	Pass
Peak Acetabulum Force	N	3600 to 4300	4146	Pass
Overall Test Results				Pass


Laboratory Technician

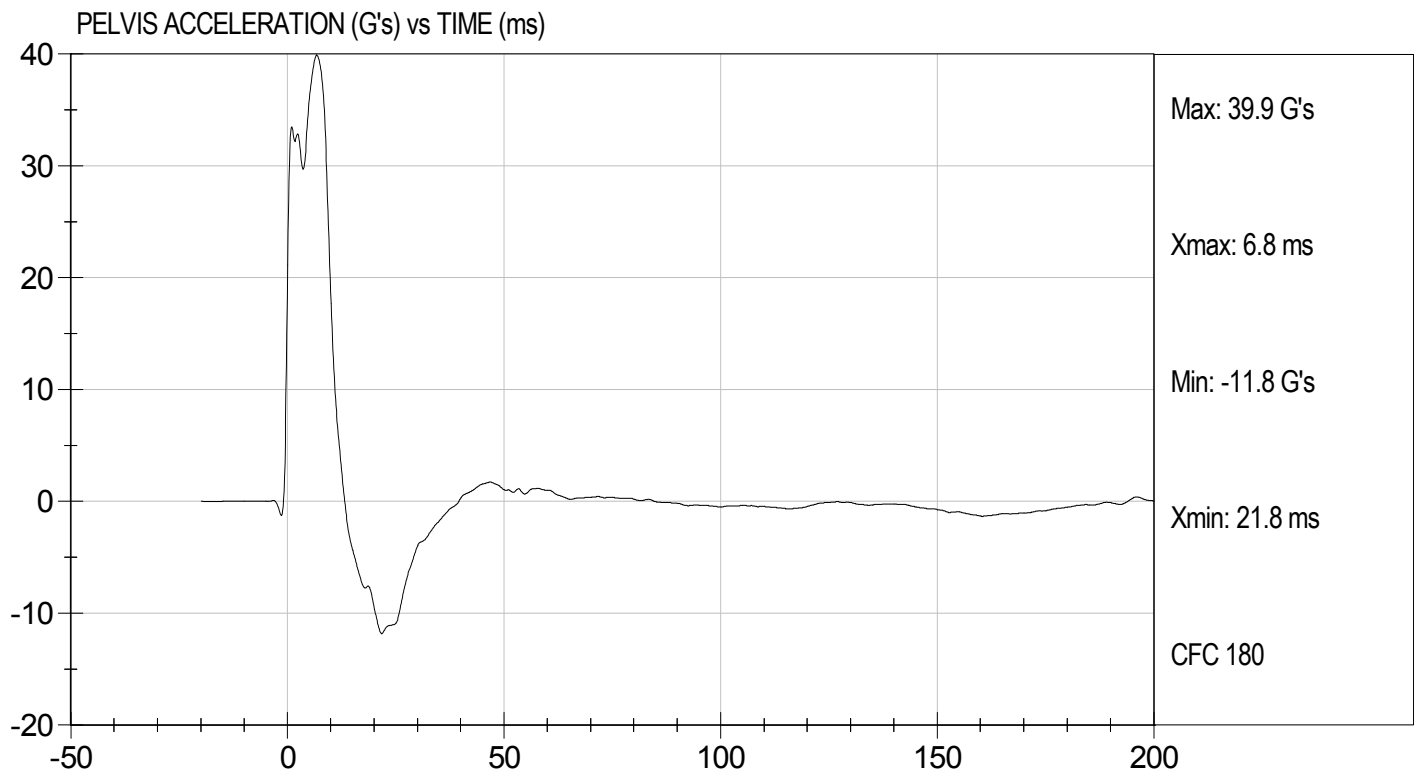
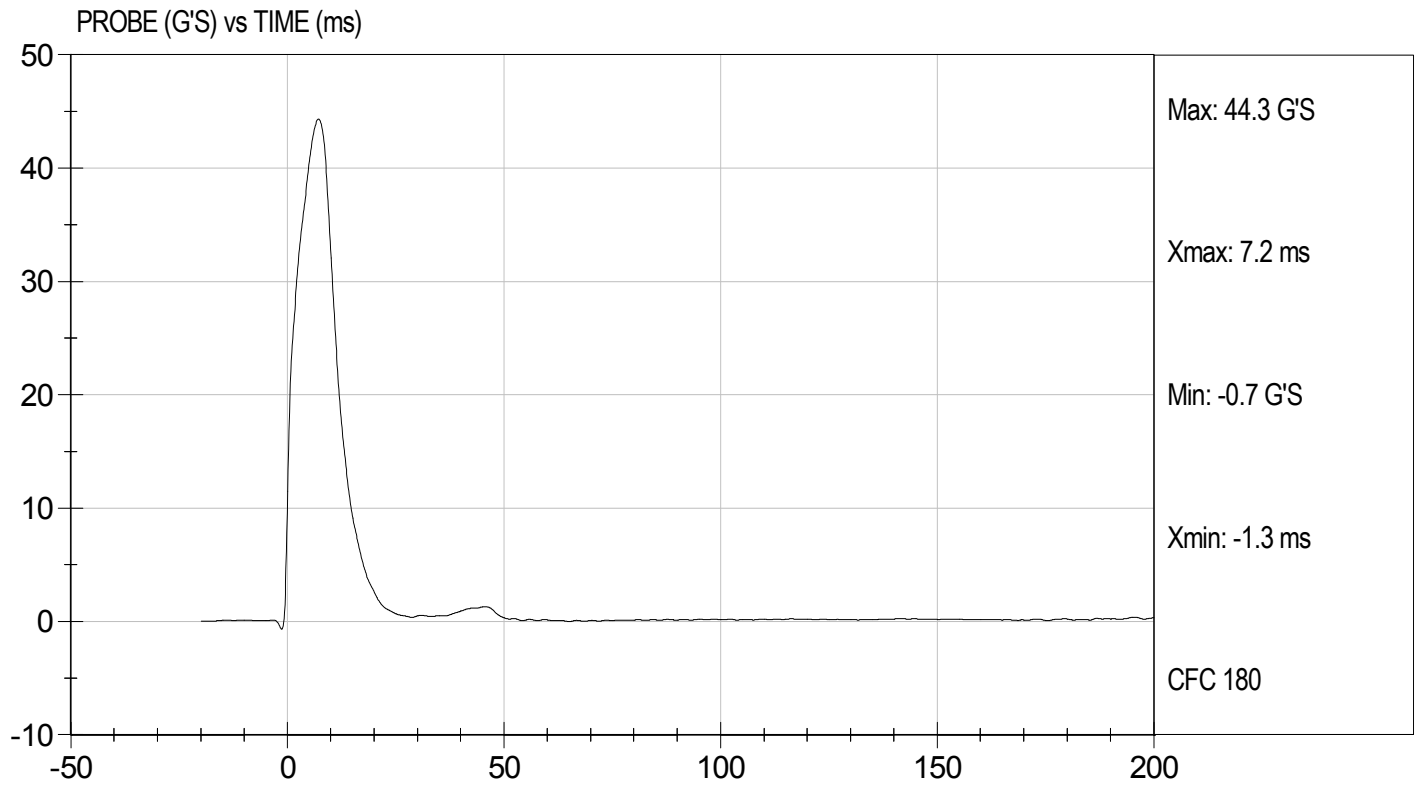
9/2/10
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D102857

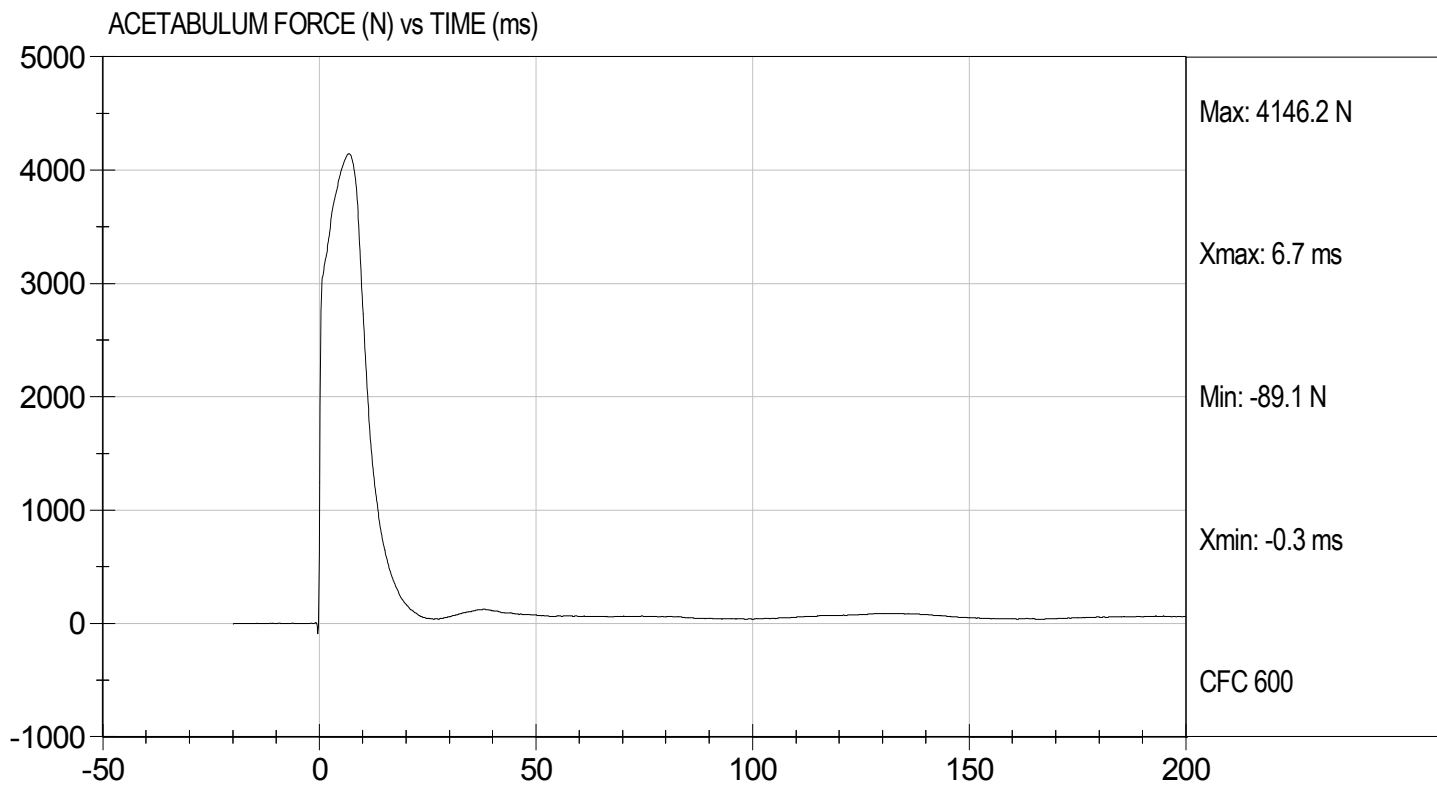
Test Date: 9/2/10
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Pelvis Impact
Component ID: D102857

Test Date: 9/2/10
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: D102858

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.2	Pass
Humidity	%	10 to 70	50	Pass
Impact Velocity	m/s	4.20 to 4.40	4.33	Pass
Peak Impactor Acceleration	G's	36 to 45	37	Pass
Pelvis Y Acceleration	G's	28 to 39	33	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4503	Pass
			Overall Test Results	Pass


Laboratory Technician

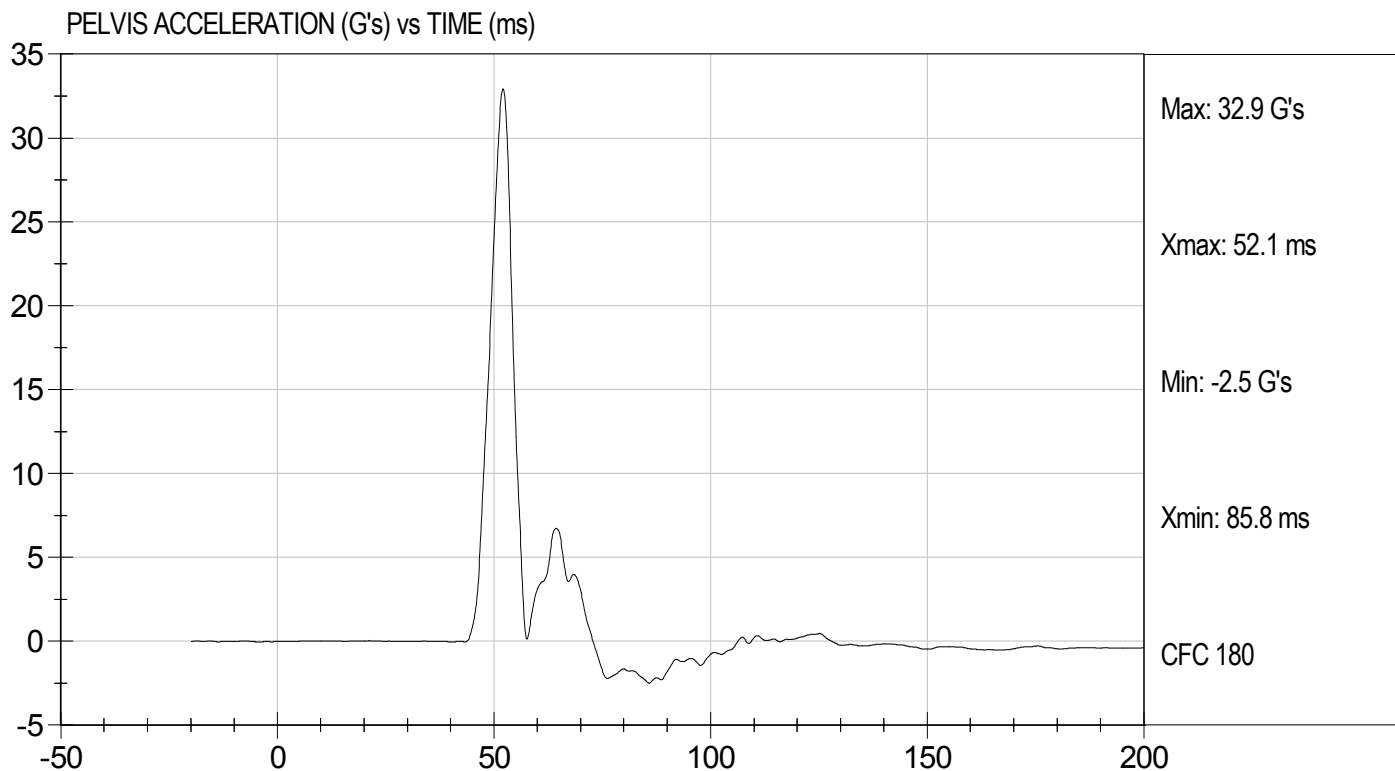
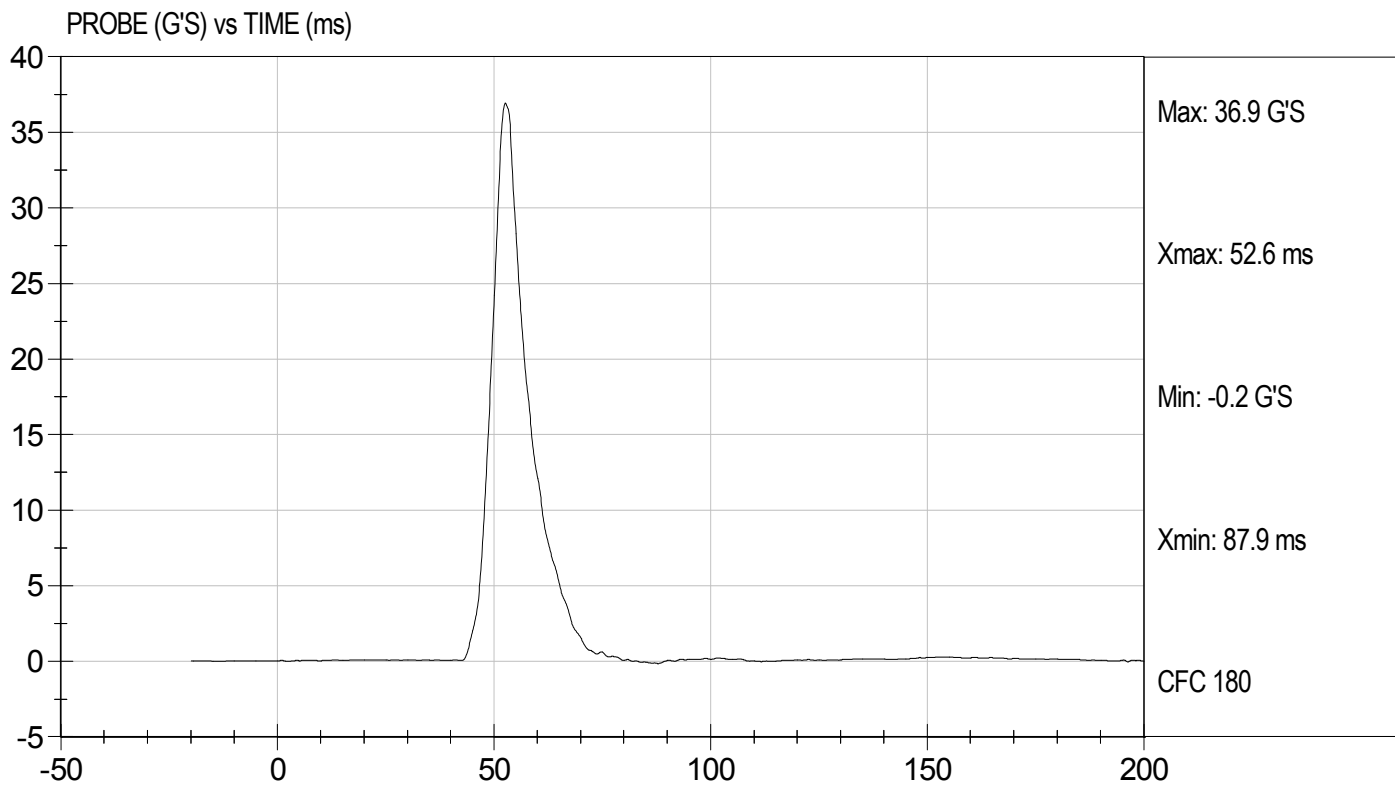
9/2/10
Test Date


Approved By



Test Desc: Iliac Impact
Component ID: D102858

Test Date: 9/2/10
Velocity: 14.2 ft/s, 4.33 m/s





Test Desc: Iliac Impact
Component ID: D102858

Test Date: 9/2/10
Velocity: 14.2 ft/s, 4.33 m/s

