

REPORT NUMBER: SPNCAP-MGA-2011-048

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

**HONDA MFG. OF ALABAMA, LLC
2011 Honda Odyssey LX Minivan
NHTSA No.: MB5312**

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



Test Date: December 2, 2010

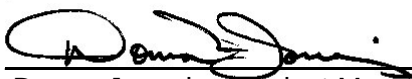
Final Report Date: January 6, 2011

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: January 6, 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 Honda Odyssey LX Minivan NHTSA No.: MB5312		5. Report Date January 6, 2011																				
		6. Performing Organization Code MGA																				
7. Author(s) Donna Janovicz, Project Manager Ben Fischer, Project Engineer		8. Performing Organization Report No. SPNCAP-MGA-2011-048																				
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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 Honda Odyssey LX Minivan 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 December 2, 2010. The impact velocity was 32.3 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 394 mm at level 2. The test vehicle's performance was as follows: <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD (SID-IIs)</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>423</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>Gs</td> <td>82</td> <td>49</td> </tr> <tr> <td>Combined Acetabular and Iliac Pelvic Force</td> <td>N</td> <td>5525</td> <td>3556</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	423	Resultant Lower Spine Acceleration	Gs	82	49	Combined Acetabular and Iliac Pelvic Force	N	5525	3556
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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 Honda Odyssey LX Minivan. 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 Honda Odyssey LX Minivan. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.3 km/h. The test was conducted by MGA Research Corporation in Burlington, Wisconsin, on December 2, 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	423	49	Iliac Wing	1263
			Acetabular	2297
			Sum	3556

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 10 msec.

- Left A-Post @ Sill Y after 80 msec.

- Left Lower B-Post Y after 15 msec.

- Driver Seat Track Y after 30 msec.

- Right Roof at Impact Line Y – noise spike between 109-113 msec.

Camera No. 7 – Dummy Rear Oblique View did not run.

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 Honda Odyssey LX Minivan
Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5312
Test Date: 12/02/2010

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MB5312	Anti-Lock Brakes	Yes
Model Year	2011	All Wheel Drive	No
Make	Honda	Power Steering	Yes
Model	Odyssey	Driver Front Airbag	Yes
Body Style	Minivan	Driver Curtain Airbag	Yes
VIN	5FNRL5H26BB007234	Driver Head/Torso Airbag	No
Body Color	Alabaster Silver M	Driver Torso Airbag	No
Delivery Date	11/01/2010	Driver Torso/Pelvis Airbag	Yes
Odometer (mi)	92	Driver Pelvis Airbag	No
Odometer (km)	148	Driver Knee Airbag	No
Dealer	Rosen Honda	Rear Pass. Front Airbag	No
Transmission	Automatic	Rear Pass. Curtain Airbag	Yes
Final Drive	Front	Rear Pass. Head/Torso Airbag	No
Type/No. Cylinders	6	Rear Pass. Torso Airbag	No
Engine Displacement (L)	3.5	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	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	Yes
Does owner's manual provide instruction to turn off automatic door locks?			Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Honda Mfg. of Alabama, LLC	GVWR (kg)	2730
Date of Manufacture	09/10	GAWR Front (kg)	1320
		GAWR Rear (kg)	1450

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3	2	7	
Capacity Weight (VCW) (kg)				608	(A)
DSC x 68.04 kg				476	(B)
Cargo Weight (RCLW) (kg)				132	(A-B)

VEHICLE SEAT TYPE

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

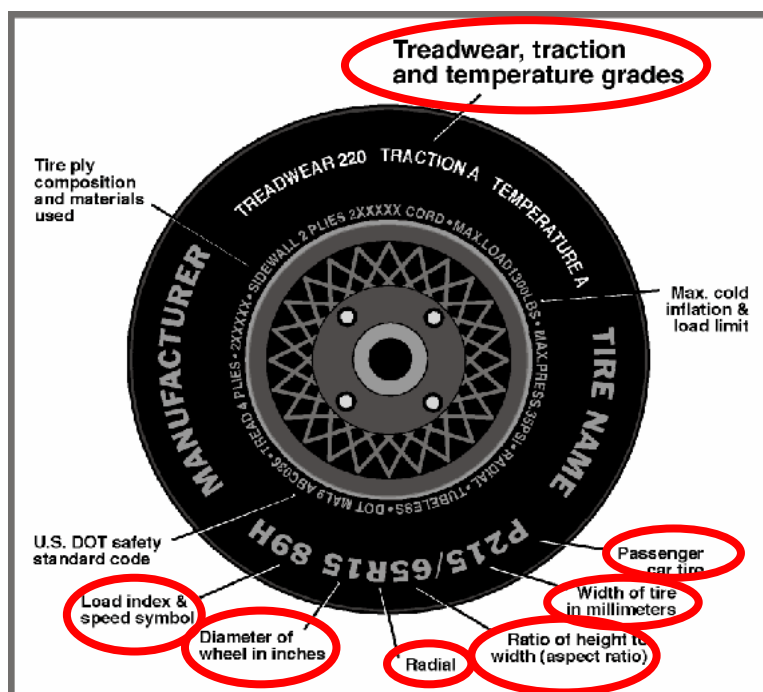
DATA SHEET NO. 1 (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Honda Odyssey LX Minivan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5312
 Test Date: 12/02/2010

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	230	230
Recommended Tire Size	P235/65R17	P235/65R17
Tire Size on Vehicle	P235/65R17	P235/65R17
Tire Manufacturer	Continental	Continental
Tire Model	Conti Pro Contact	Conti Pro Contact
Treadwear	500	500
Traction	AA	AA
Temperature Grades	A	A
Tire Plies Sidewall	1	1
Tire Plies Body	4	4
Load Index & Speed Symbol	103T	103T
Tire Material	Rubber	Rubber
DOT Safety Code Right	A387 3VM 3310	A387 3VM 3310
DOT Safety Code Left	A387 3VM 3310	A387 3VM 3310

DATA SHEET NO. 1 (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Honda Odyssey LX Minivan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5312
 Test Date: 12/02/2010

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	563.8	427.3		588.8	499.9		577.0	521.7	
Right	kg	561.6	419.6		568.8	491.7		552.0	505.3	
Ratio	%	57.1	42.9		53.9	46.1		52.4	47.6	
Totals	kg	1125.4	846.9	1972.3	1157.6	991.6	2149.2	1129.0	1027.0	2156.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1972.3	(A)
Actual Weight of 1 P572V ATD (SID-IIs) ATD Used	kg	52.2	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	132	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	2156.5	(A+B+C)

TEST VEHICLE ATTITUDES AND CG

	Units	As Delivered	As Tested	Fully Loaded
Driver Door Sill Angle (front-to-rear)*	deg	0.3	0.2	0.2
Front Passenger Sill Angle (front-to-rear)*	deg	0.4	0.2	0.2
Front Bumper Angle (left-to-right)**	deg	0.0	0.0	-0.2
Rear Bumper Angle (left-to-right)**	deg	0.0	-0.1	-0.2
Vehicle CG (Aft of Front Axle)	mm	1290	1386	1431
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	4	11	16

*Front up is positive ** Left up is positive

GENERAL VEHICLE TEST DATA

Measurement Description	Units	Value
Weight of Ballast in Cargo Area	kg	45.4
Weight of Vehicle Components Removed	kg	5.0

Vehicle components removed to meet target vehicle test weight: Right tail light, right side mirror, splash guards.

TEST VEHICLE IMPACT POINT DATA

Measurement Parameter	Units	Value
Vertical Impact Reference Line (Aft of Front Axle)	mm	1035
Actual Impact Point (Aft of Front Axle)	mm	1033
Impact Point Difference (- forward / + rearward)	mm	-2

DATA SHEET NO. 2

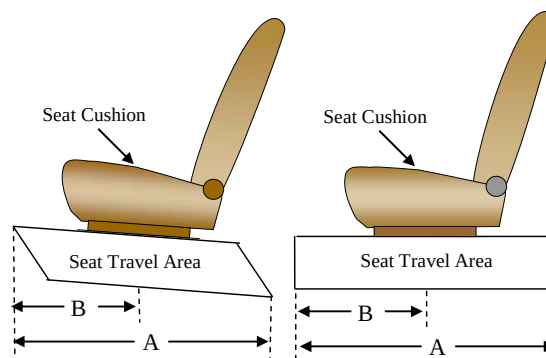
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2011 Honda Odyssey LX Minivan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5312
 Test Date: 12/02/2010

SEAT FORE/AFT POSITIONS

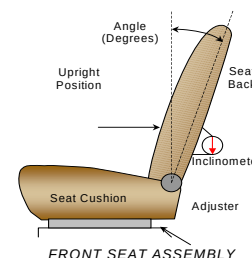
The driver seat was a power fore/aft adjustable seat with power height and angle adjustments. The seat travel was set as specified in Appendix B of the TP dated January 2010. The right front passenger seat was set to match the driver seat. The rear passenger seats were set as specified in Appendix B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



SEAT FORE/AFT POSITIONING	Total Fore/Aft Travel	Placed in Detent # or Position
Driver Seat	220 mm	0 mm (full forward)
Front Passenger Seat	20 detents (1 st as 1)	0 (forward-most as 0)
Rear Seat – Struck Side		Rearmost
Rear Seat – Non-Struck Side		Rearmost

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 on the headrest post guide.



SEAT BACK ANGLE	Degrees	Detents
Driver Seat Back Angle with Seated Dummy	2.6	
Front Passenger Seat Back Angle	3.8	
Struck Side Rear Seat Back Angle		Fixed
Non-Struck Side Rear Passenger Seat Back Angle		Fixed

SEAT BELT UPPER ANCHORAGE

The driver seat belt upper anchorage was 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)

DATA SHEET NO. 2 (CONTINUED)

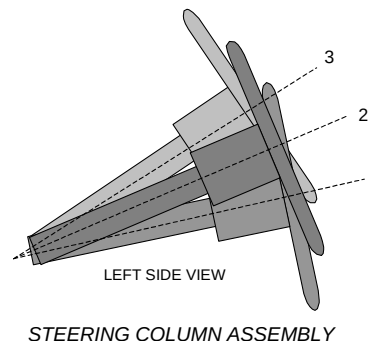
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2011 Honda Odyssey LX Minivan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5312
 Test Date: 12/02/2010

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.

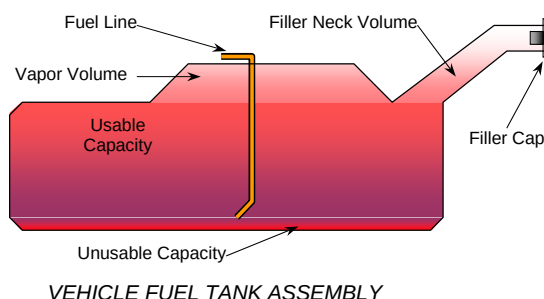


STEERING COLUMN POSITIONING

	Degrees	Fore/Aft Position (mm)
Lowermost - Position 1	68.1	247
Geometric Center – Position 2	64.9	227
Uppermost – Position 3	61.7	207
Telescoping Steering Wheel Travel		40
Test Position	64.9	227

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. After the ignition key is turned from LOCK (0) to ON (II) position, the pump will be filled up for two seconds, and then the pressure is maintained. The fuel pipe is on the left side.



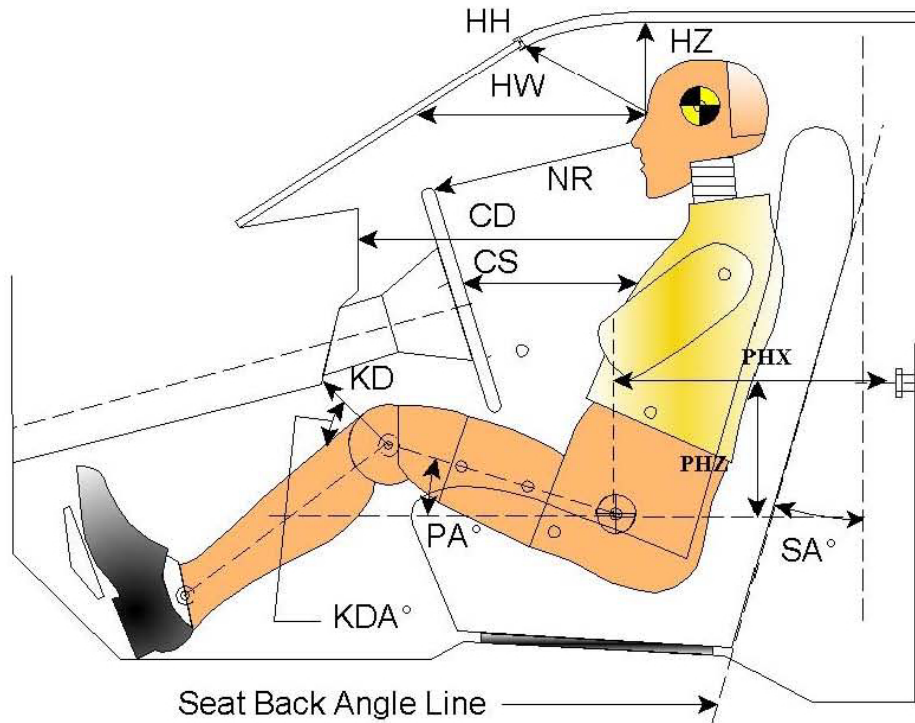
FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard" Tank	79.5
Usable Capacity of "Optional" Tank	
Usable Capacity of Standard Tank as Specified in Owner's Manual	79.5
Usable Capacity of Optional Tank as Specified in Owner's Manual	
92-94% of Usable Capacity	73.1 to 74.7
Actual Amount of Solvent Used	73.9
1/3 of Usable Capacity	26.5

.DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Honda Odyssey LX Minivan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5312
 Test Date: 12/02/2010

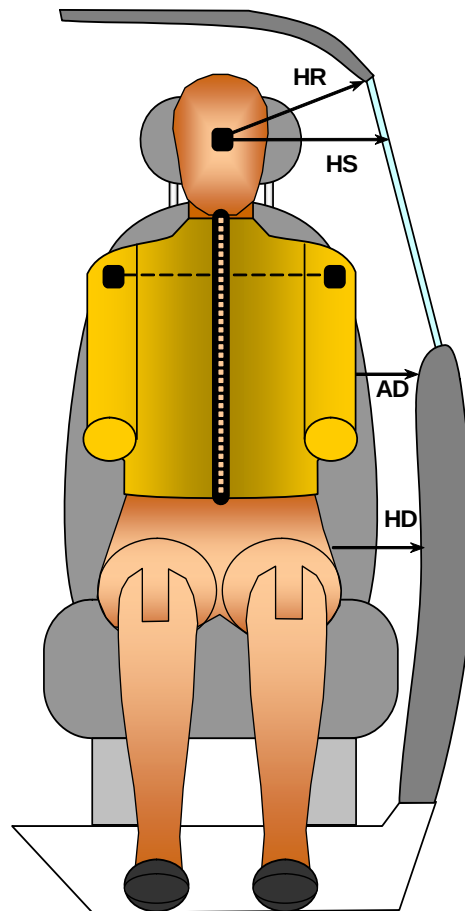


Code	Measurement Description	Driver S/N 296	
		Length (mm)	Angle (°)
HH	Head to Header	261	
HW	Head to Windshield	657	
HZ	Head to Roof	194	
NR	Nose to Rim	240	
CD	Chest to Dash	430	
CS	Chest to Steering Wheel	186	
KDL/KDAL	Left Knee to Dash	88	37.5
KDR/KDAR	Right Knee to Dash	67	34.0
PA	Pelvic Angle		19.7
PHX	H-Point to Striker (X-Axis)	355	
PHZ	H-Point to Striker (Z-Axis)	5	
SA	Seat Back Angle		2.6

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Honda Odyssey LX Minivan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5312
 Test Date: 12/02/2010



FRONT VIEW OF DUMMY

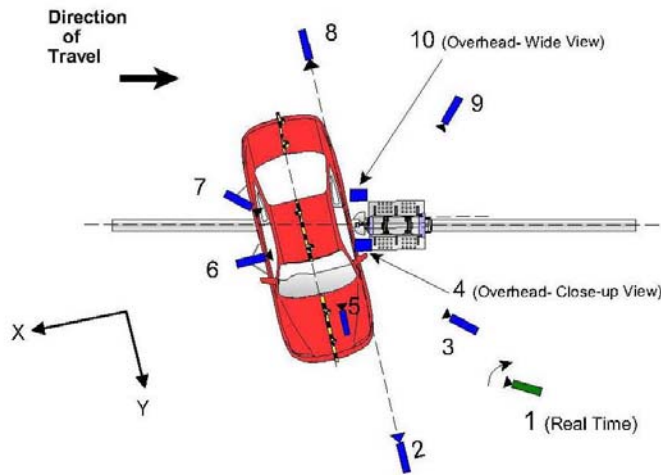
Code	Measurement Description	Driver S/N 296
		Length (mm)
HR	Head to Side Header	277
HS	Head to Side Window	405
AD	Arm to Door	187
HD	H-Point to Door	145

DATA SHEET NO. 5

CAMERA LOCATIONS AND DATA

Test Vehicle: 2011 Honda Odyssey LX Minivan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5312
 Test Date: 12/02/2010



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	10	5540	-1560	24	1000
3	Impact Side 45° Forward	-1930	4180	-1650	20	1000
4	Overhead Closeup	30	0	-4520	50	1000
5	Onboard – Driver Front				16	1000
6	Onboard – Driver Side				8	1000
7	Onboard – Driver Rear				8	1000
8	Rear Ground Level	-10	-6430	-1580	24	1000
9	Impact Side 45° Rearward	-3510	-2910	-1640	20	1000
10	Overhead Wide View	170	0	-4960	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

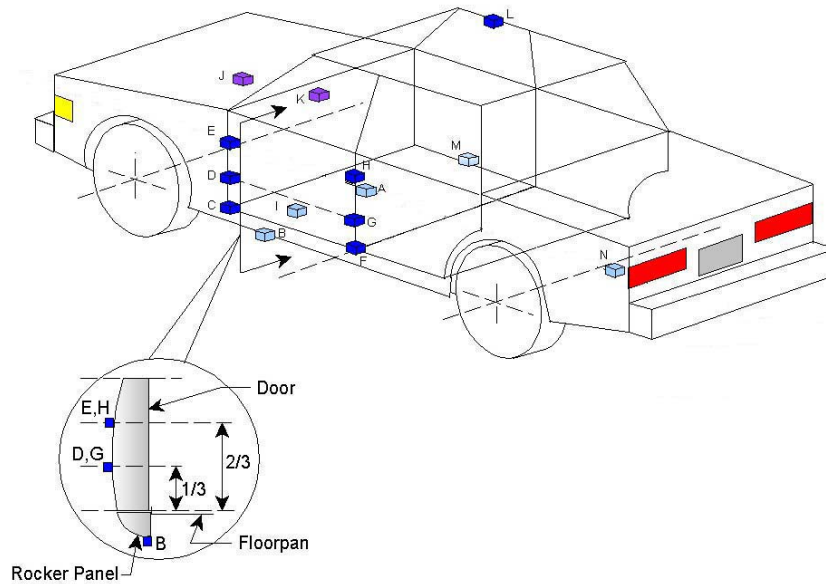
	Number of Channels
Driver Dummy	16
Vehicle Structure	21
Pole Load Cells – Not used	8
Contact Switches	3
Airbag Timing	2
Total No. of Data Channels	50

DATA SHEET NO. 6

VEHICLE ACCELEROMETER DATA

Test Vehicle: 2011 Honda Odyssey LX Minivan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5312
 Test Date: 12/02/2010



	Accelerometer Location			
	ID	Coordinates (mm)		
		X	Y	Z
A	Vehicle CG	2762	-70	-190
	Vehicle CG Sensor	2732	-70	-190
B	Left Floor Sill	3229	-841	-205
C	A Pillar Sill	3640	-841	-205
D	A Pillar Low	3593	-820	-588
E	A Pillar Mid	3690	-895	-960
F	B Pillar Sill	2614	-843	-220
G	B Pillar Low	2629	-803	-667
H	B Pillar Mid	2629	-792	-912
I	Driver Seat	2800	-634	-675
L	Engine Top	4463	0	-894
J	Firewall	4323	50	-1020
K	Right Roof	2574	688	-1695
M	Right Floor Sill	2872	832	-210
N	Rear Floorpan	952	-110	-555

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 Honda Odyssey LX Minivan
Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5312
Test Date: 12/02/2010



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 Honda Odyssey LX MinivanNHTSA No. MB5312Test Program: NCAP Side Pole Impact TestTest Date: 12/02/2010**TEST DUMMY INFORMATION AND CONTACT**

Description	Driver
Dummy Type / Serial No.	SID-IIs / 296
Head Contact	Curtain Airbag, Headrest, Visor, Seat back
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	2
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.3
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.5

DATA SHEET NO. 9

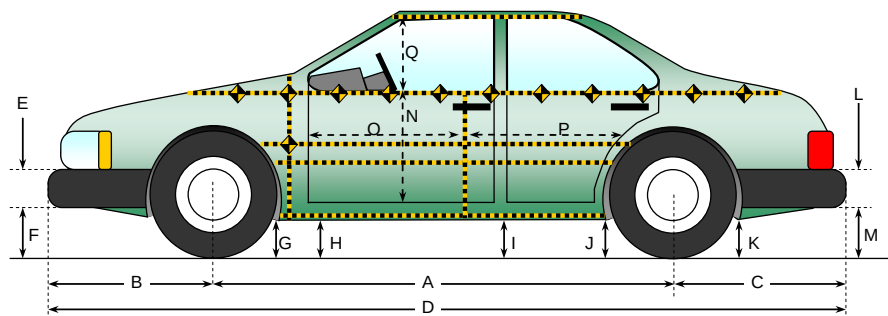
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Honda Odyssey LX Minivan

NHTSA No. MB5312

Test Program: NCAP Side Pole Impact Test

Test Date: 12/02/2010



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

LEFT SIDE VIEW

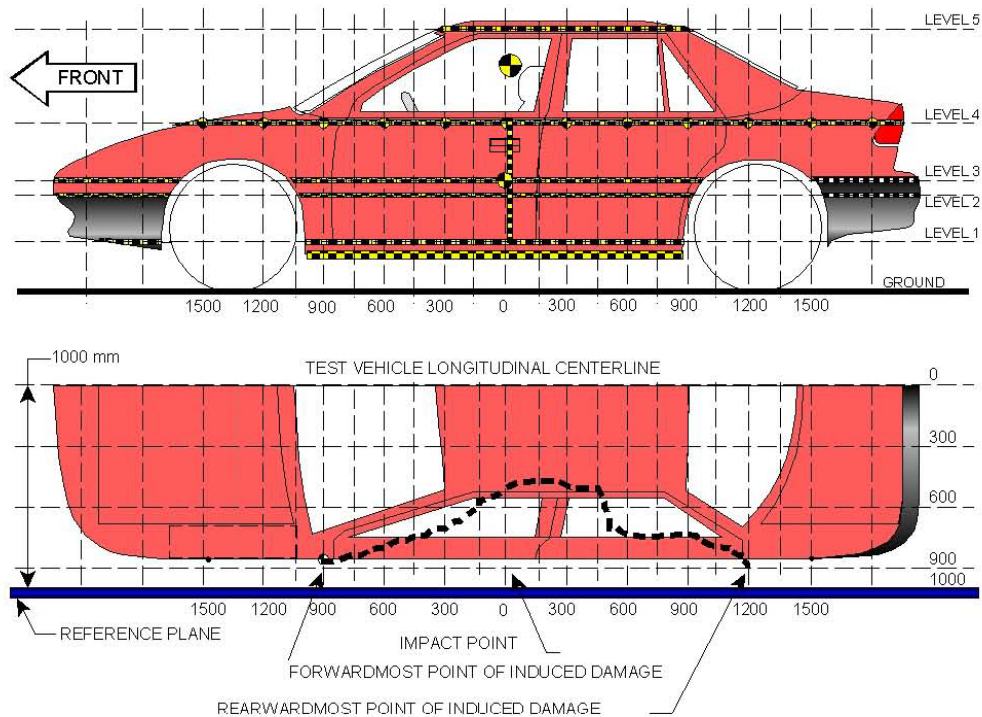
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3005	2897	108
B	Front Axle to FSOV	947	947	0
C	Rear Axle to RSOV	1214	1253	-39
D1	Total Vehicle Length at Left Side	4147	4018	129
D2	Total Vehicle Length at Centerline	5166	5097	69
D3	Total Vehicle Length at Right Side	4147	4165	-18
E	Front Bumper Thickness	130	130	0
F	Front Bumper Bottom to Ground	248	268	-20
G	Sill Height at Front Wheel Well	180	178	2
H	Sill Height at Front Door Leading Edge	186	186	0
I	Sill Height at B Pillar	190	155	35
J1	Sill Height at Rear Wheel Well	200	215	-15
J2	Pinch Weld Height at Rear Wheel Well	199	145	54
K	Sill Height Aft of Rear Wheel Well	283	306	-23
L	Rear Bumper Thickness	126	126	0
M	Rear Bumper Bottom to Ground	340	335	5
N	Sill Height to Window Bottom Sill	816	818	-2
O	Front Door Leading Edge to Impact CL	588	572	16
P	Rear Door Trailing Edge to Impact CL	1517	1572	-55
Q	Front Window Opening	495	450	45
R	Right Side Length	4147	4165	-18
S	Left Side Length	4147	4018	129
T	Vehicle Width at B Post	1984	1893	91

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

Test Vehicle: 2011 Honda Odyssey LX Minivan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5312
 Test Date: 12/02/2010



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	270
2	Mid Door	725
3	Occupant H-Point	750
4	Window Sill	1065
5	Window Top	1820

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

Test Vehicle: 2011 Honda Odyssey LX Minivan
 Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5312
 Test Date: 12/02/2010

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1200				214					220					6	
-1050				199					214					15	
-900				184					200					16	
-750		101	102	175			132	134	196			31	32	21	
-600	146	114	116	170		174	132	136	201		28	18	20	31	
-525	146	118	120	168		192	197	200	238		46	79	80	70	
-450	146	119	120	165		245	246	248	272		99	127	128	107	
-375	145	118	119	163		266	291	292	313		121	173	173	150	
-300	144	117	118	162		324	341	342	359		180	224	224	197	
-225	143	116	116	160		366	391	392	410		223	275	276	250	
-150	143	115	116	159		415	440	440	461		272	325	324	302	
-75	142	113	115	158	370	466	485	486	504	568	324	372	371	346	198
0	142	113	115	157	360	501	507	508	517	550	359	394	393	360	190
75	142	113	113	156	356	480	488	488	494	522	338	375	375	338	166
150	142	112	112	156	353	424	435	436	439	488	282	323	324	283	135
225	142	111	112	156	352	371	369	368	381	465	229	258	256	225	113
300	141	111	112	155	352	342	298	301	325	441	201	187	189	170	89
375	142	110	110	154	352	313	245	248	268	418	171	135	138	114	66
450	141	110	111	154	352	283	193	197	225	390	142	83	86	71	38
525	143	109	110	153	352	266	177	177	215	373	123	68	67	62	21
600	142	109	110	153	352	244	170	170	204	365	102	61	60	51	13
750	142	109	110	154	353	217	153	153	189	351	75	44	43	35	-2
900	144	110	110	155		191	141	141	179		47	31	31	24	
1050	145	110	110	156		167	125	126	169		22	15	16	13	
1200	146	111	112	157		138	112	112	148		-8	1	0	-9	

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 Honda Odyssey LX Minivan
Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5312
Test Date: 12/02/2010

MAXIMUM CRUSH DATA

	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush (mm)	359	394	393	360	198
Distance From Impact (mm)	0	0	0	0	-75

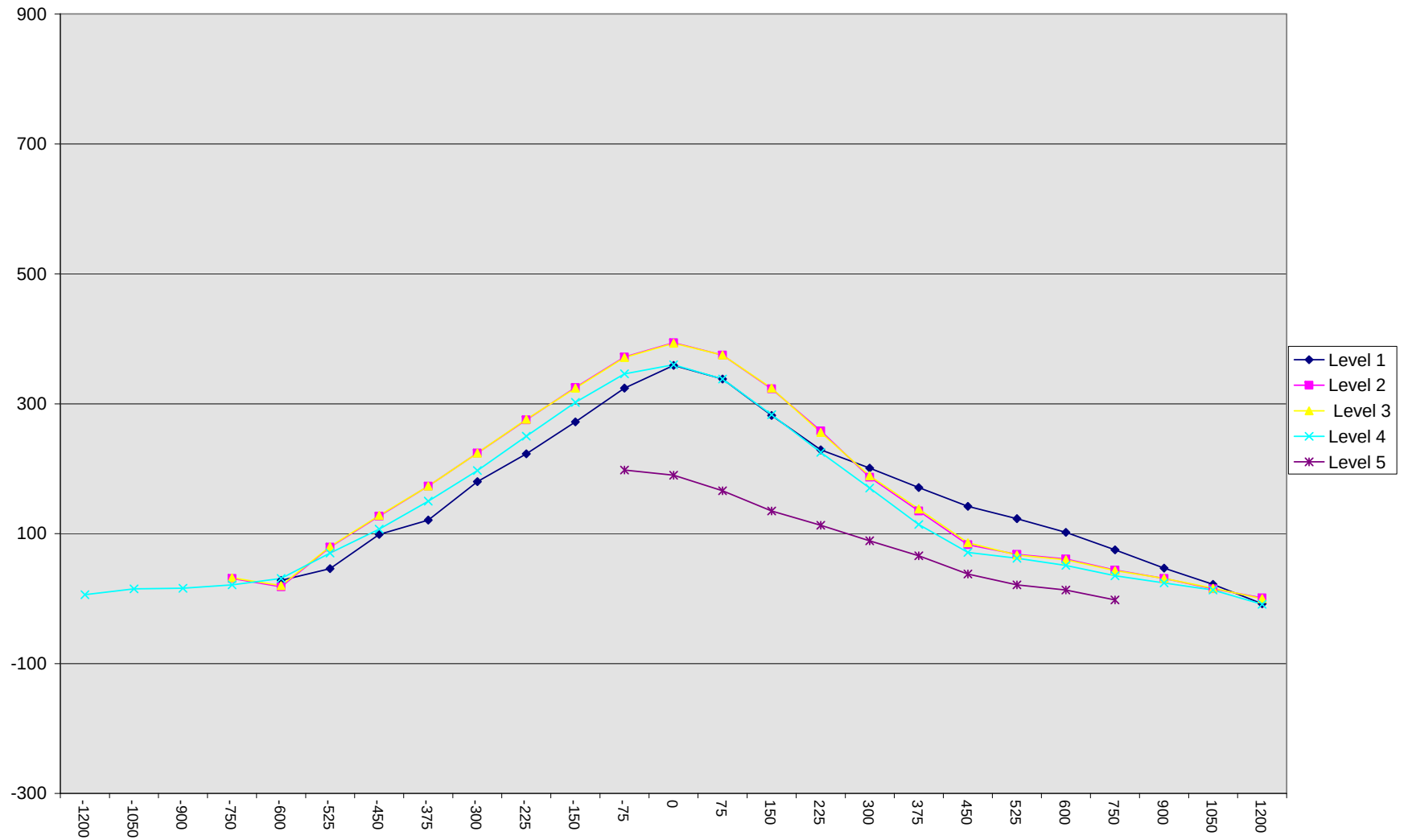
Note: Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to test based on an estimated impact point. The final distance to impact is determined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

NHTSA No. MB5312
Test Date: 12/02/2010

20



DATA SHEET NO. 11

FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2011 Honda Odyssey LX Minivan

NHTSA No. MB5312

Test Program: NCAP Side Pole Impact Test

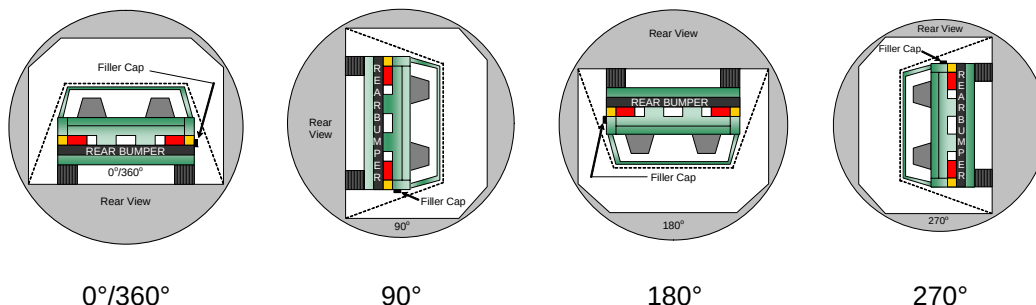
Test Date: 12/02/2010

Test Time: 10:28 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°	113	300	413
90° to 180°	110	300	410
180° to 270°	104	300	404
270° to 360°	111	300	411

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

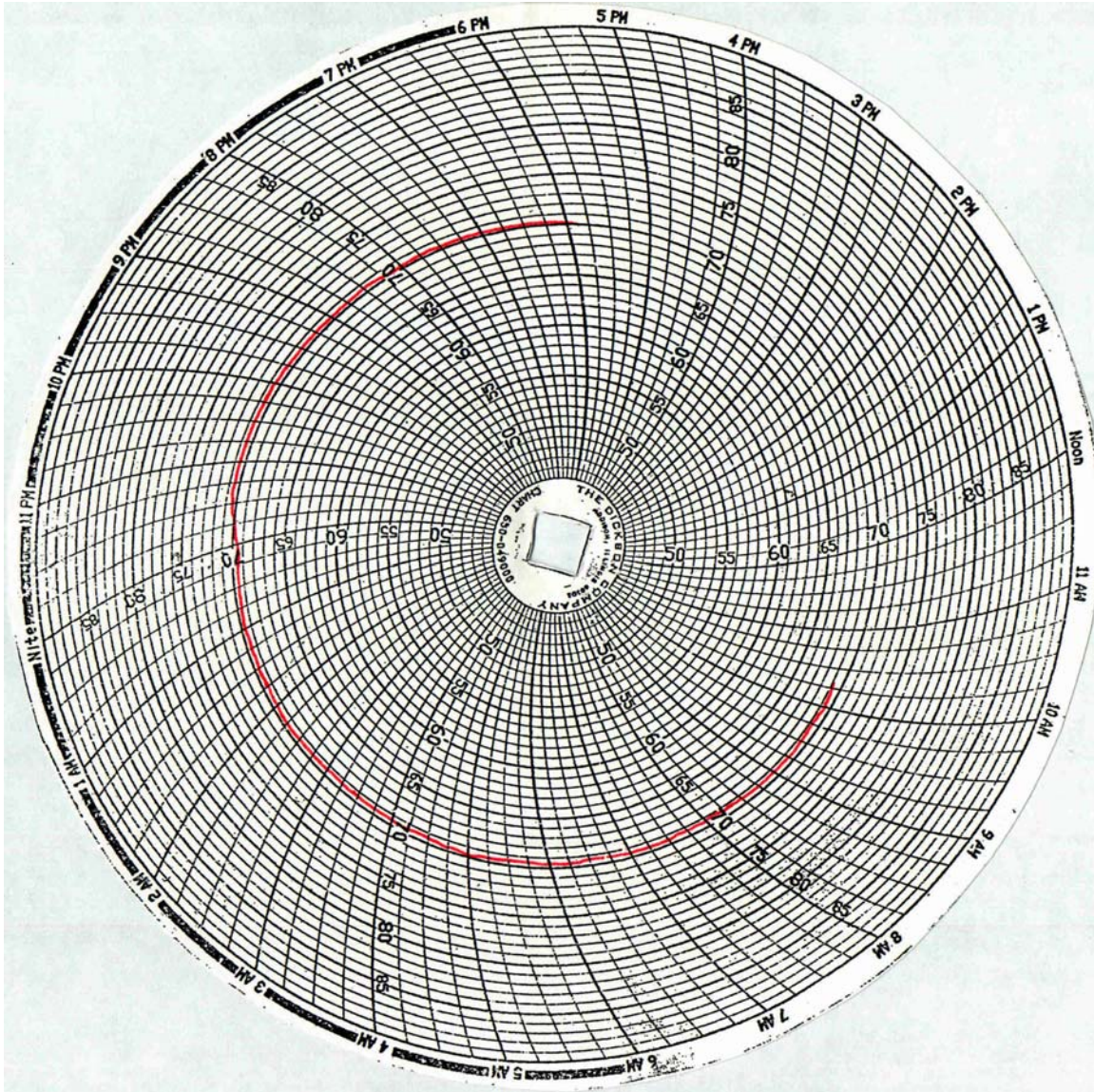
Test Phase	Spillage Location
0° to 90°	
90° to 180°	
180° to 270°	
270° to 360°	

DATA SHEET NO. 12

DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle: 2011 Honda Odyssey LX Minivan
Test Program: NCAP Side Pole Impact Test

NHTSA No. MB5312
Test Date: 12/02/2010



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



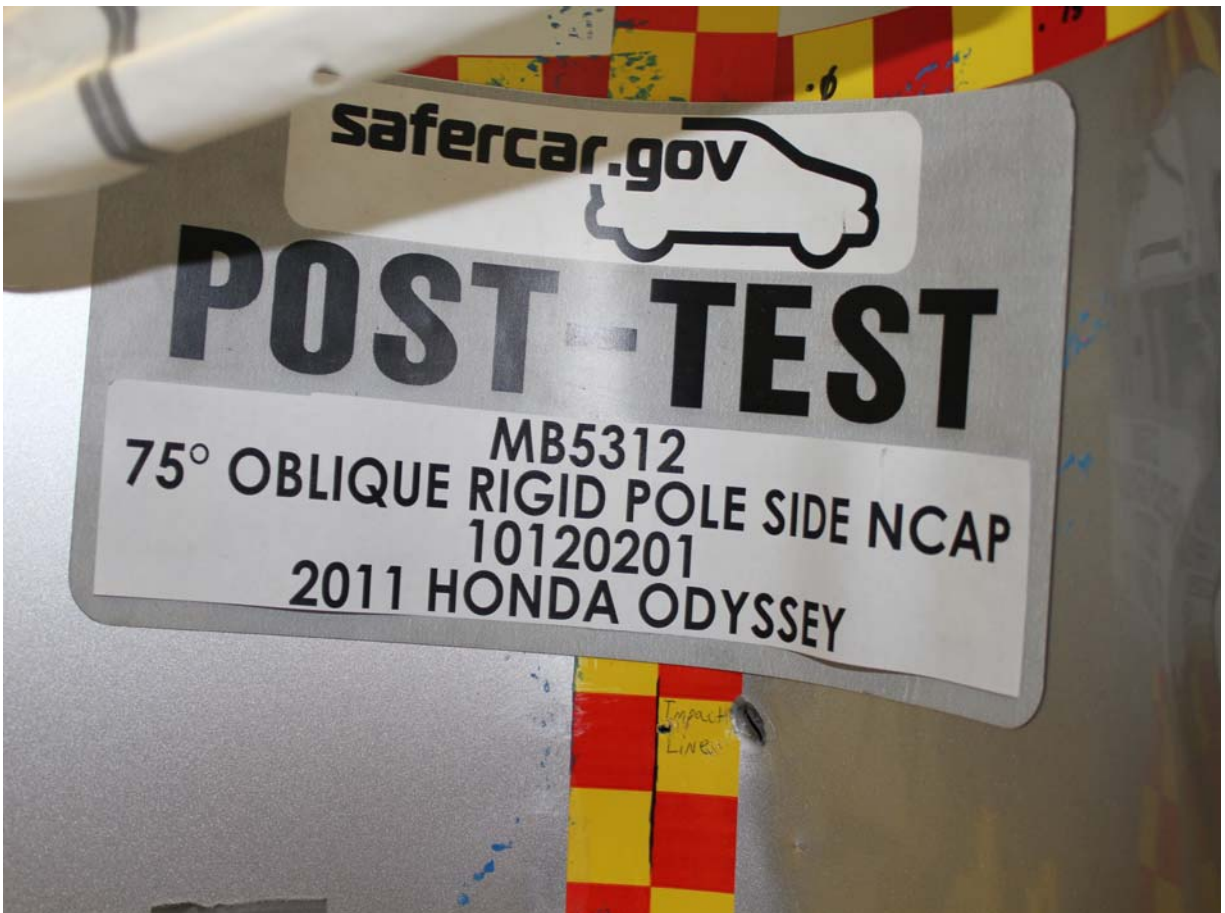
Pre-Test Left Side View of Pole Positioned Against Side of Vehicle



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



Pre-Test Close-Up View of Impact Point Target



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



Pre-Test Front Close-Up View of Dummy (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



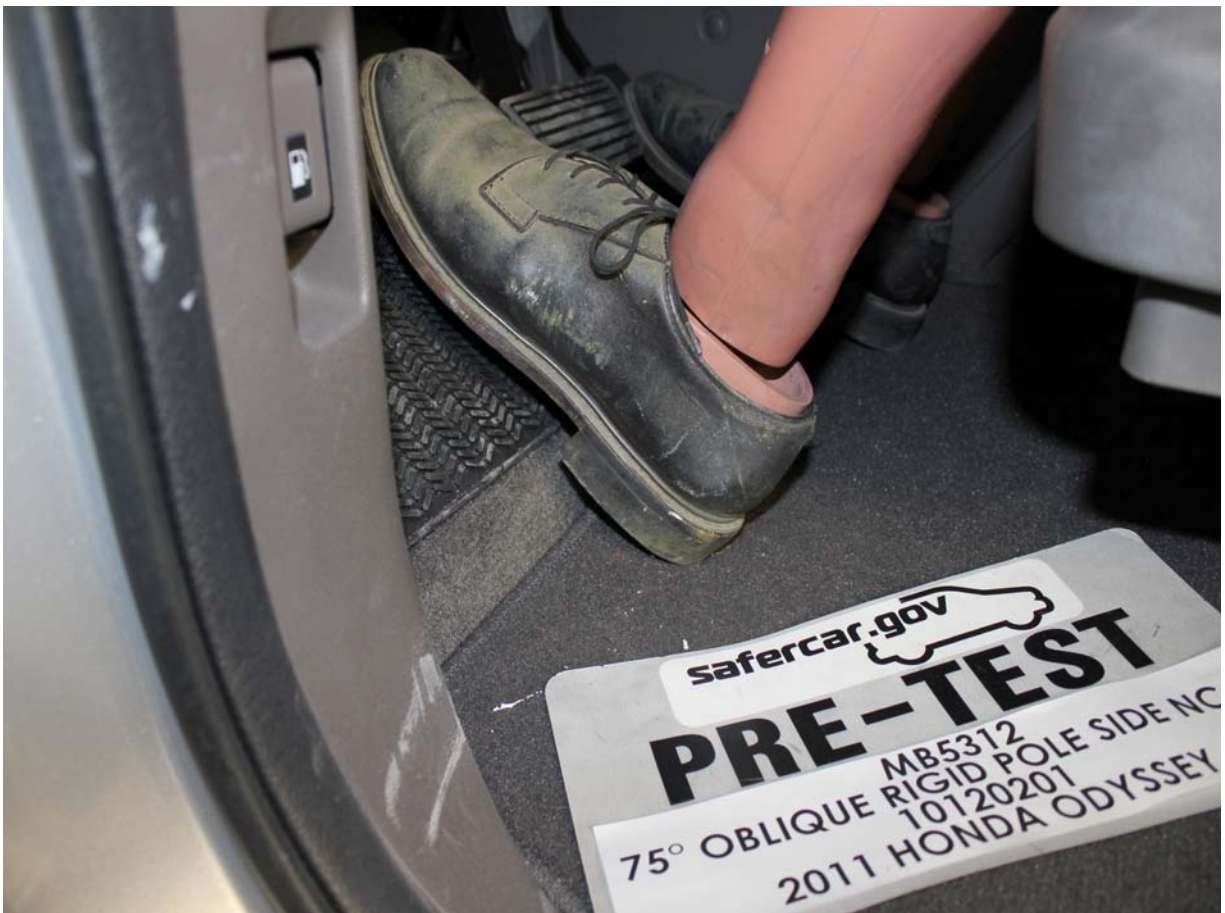
Pre-Test Overhead View of Dummy Thighs on Seat Pan



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 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



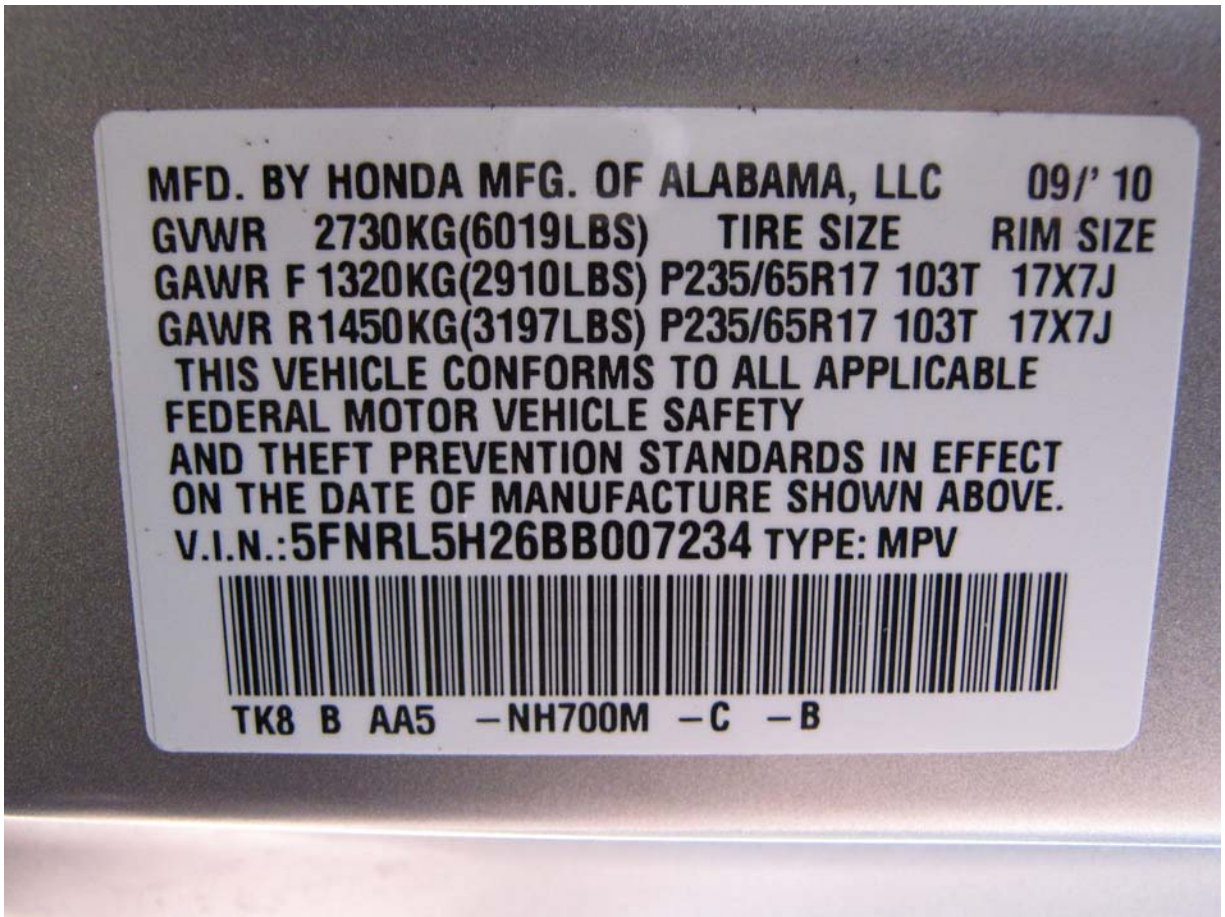
Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View



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



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



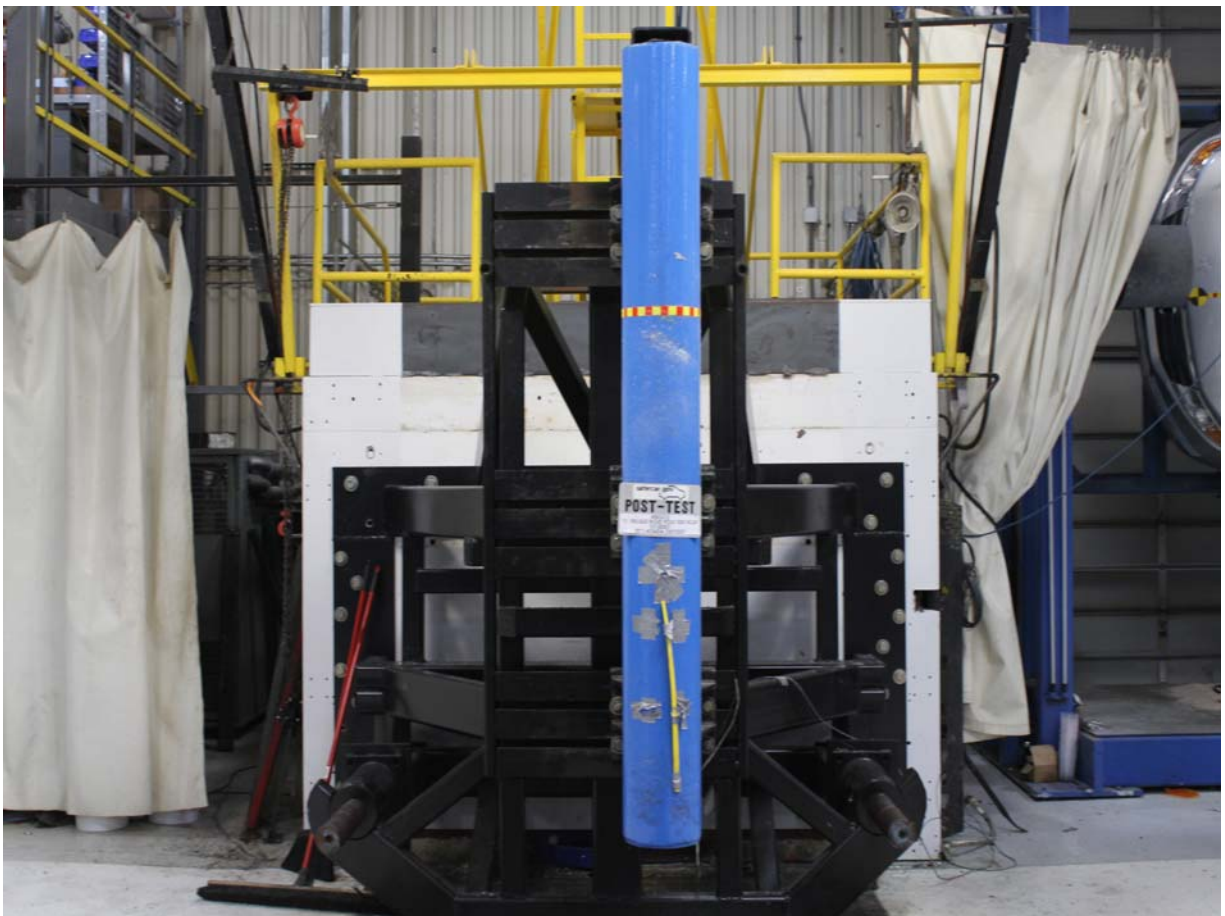
Close-Up View of Vehicle's Certification Label



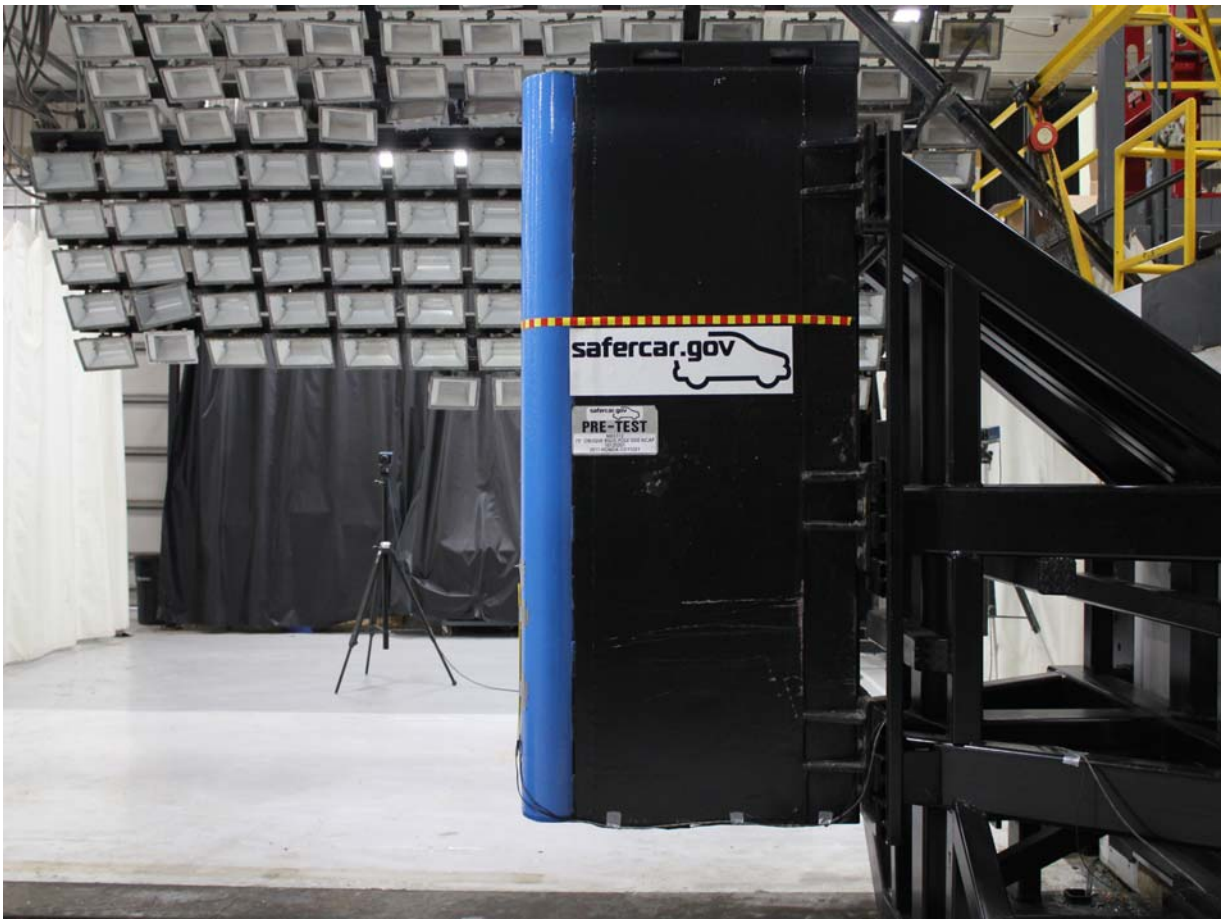
Close-Up View of Vehicle's Tire Information Placard or Label



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 ODYSSEY 5DR LX

VEHICLE NUMBER: 5FNRL5H26B8007234
ENGINE NUMBER: J3522-1007610 EXT: ALABAMA SILVER M
CONTROL NUMBER: 013960 INT: TRUFFLE

STANDARD EQUIPMENT AT NO EXTRA COST

- **TECHNICAL FEATURES ***
 - 249ci 3.5-liter SOHC 24-Valve i-VTEC V6 Engine with Variable Cylinder Management (VCM)
 - 5-Speed Automatic Transmission with Grade Logic Control
 - 4-Wheel Disc Brakes
 - Front MacPherson Strut Suspension
 - Rear Double-Wishbone Suspension
 - Variable-Assist Rack-and-Pinion Power Steering
 - Immobilizer Thiel-Deterrent System

- **SAFETY FEATURES ***
 - Driver's and Front Passenger's Dual-Stage Airbags (SRS)
 - Driver's and Front Passenger's Side Airbags
 - Side Curtain Airbags with Rollover Sensor
 - Active Front Head Restraints
 - Active Stability Assist (VSA)
 - Anti-Lock Braking System (ABS) Brake Assist
 - Electronic Brake Distribution (EBD)
 - Tire Pressure Monitoring System
 - 3-Point Seat Belts
 - Front Seat Belts with Automatic Tensioning System
 - ACE Body Structure
 - Daytime Running Lights (DRL)
 - LATCH System for Child Seats

- **INTERIOR FEATURES ***
 - AM/FM/CD Audio System w/ 5 Speakers Incl. MP3/WMA Playback
 - MP3/Auxiliary Input Jack
 - Tilt & Telescopic Steering Column
 - Front and Rear Air Conditioning
 - One-Motion 60/40 Split Folding 3rd-Row Magic Seat
 - Two-Row Power Windows
 - Driver's Auto Up/Down Window
 - Power Door Locks w/ Tailgate Locks
 - Split-Fold Second Row
 - 12-Volt Power Outlets
 - Floor Mats
 - Maintenance Minder System
- **EXTERIOR FEATURES ***
 - 17" x 7.0" Steel Wheels with Full Wheel Covers
 - 235/65 R17 All-Season Tires
 - Dual Sliding Doors
 - Power Door Mirrors
 - Remote Entry System

Manufacturer's Suggested Retail Price
Full Tank of Fuel

\$27,800.00

No Charge

A35872

Destination and Handling

780.00

TOTAL VEHICLE PRICE
(includes Pre-Delivery Service)

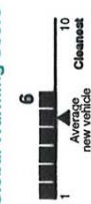
\$28,580.00

Licenses and title fees, state and local taxes and dealer options and accessories are not included in the manufacturer's suggested retail price.

Environmental Performance

Protect the environment, choose vehicles with **higher scores**:

Global Warming Score



Smog Score



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

SCHLOSSMANN'S HONDA CITY
3450 SO. 108TH STREET
MILWAUKEE, WI 53227

PORT OF ENTRY: ALABAMA
DELIVERY POINT: SCHALMBURG
SHIP#: 857423
TRANS METHOD: N50 ELWOOD
VIN: 5FNRL5H26B8007234

ORIG. DLR: 206917
REF. NO.: 40545
HN CODE: HN-6087
EMISSION: 50 STATE
DEALER: 206917



EPA Fuel Economy Estimates

CITY MPG

18

Expected range for most drivers
14 to 22 MPG

Estimated Annual Fuel Cost

\$2,142

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

Combined Fuel Economy

21

This Vehicle

13 24

All Special Purpose Vehicles - Minivans

HIGHWAY MPG

27

Expected range for most drivers
22 to 32 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



PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE
U.S./Canadian Parts Content: **75 %**
Major Sources of Foreign Parts Content:
JAPAN 15 %

NOTE: Parts content does not include final assembly, distribution or other non-parts costs.

GOVERNMENT SAFETY RATINGS

Frontal Crash Driver Passenger
Not Rated Not Rated

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

Side Crash Front seat Rear seat
Not Rated Not Rated

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

Rollover
Not Rated

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

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

FOR THIS VEHICLE
Final Assembly Point:
USA
LINCOLN, ALABAMA

Country of Origin: Engine:

U.S.A.

Transmission:

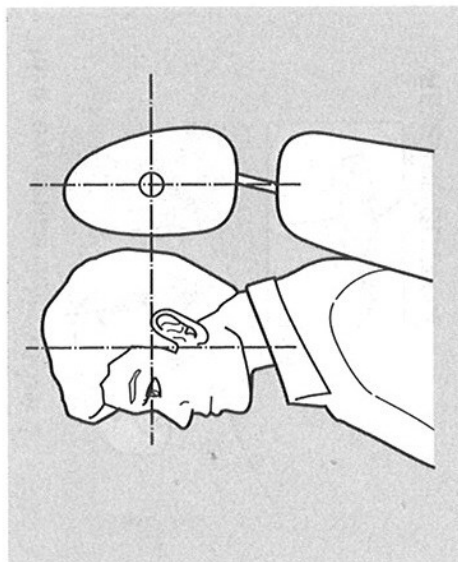
U.S.A.

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

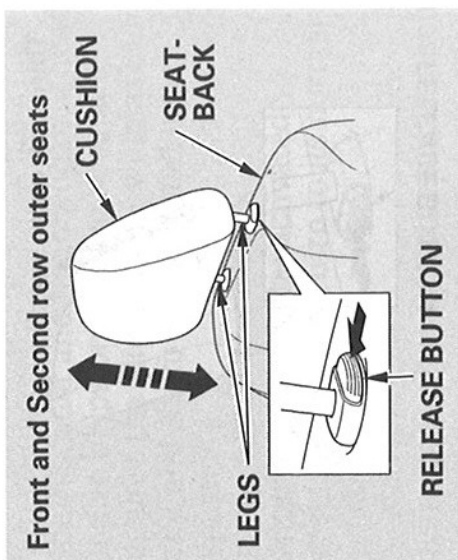
Head Restraints

See page 14 for important safety information and a warning about improperly positioning head restraints.

Your vehicle is equipped with head restraints in all seating positions to help protect you and your passengers from the likelihood of whiplash and other injuries.



They are most effective when you adjust them so the center of the back of the occupant's head rests against the center of the restraint.

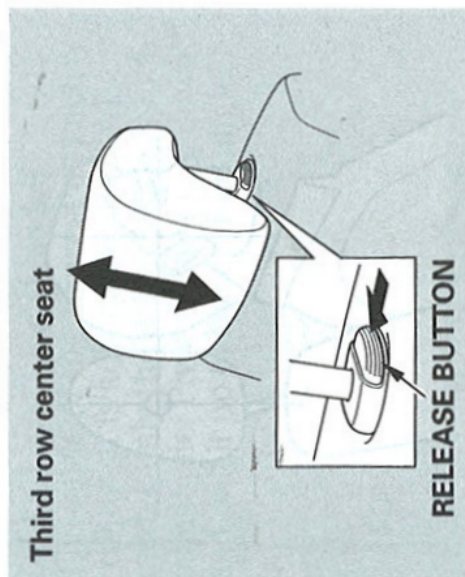
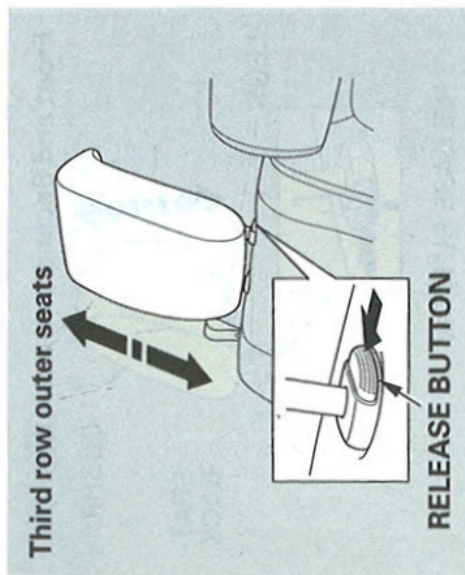


Adjusting the Head Restraint

The head restraints adjust for height. You need both hands to adjust a restraint. Do not attempt to adjust it while driving. To raise it, pull upward. To lower the restraint, push the release button sideways, and push the restraint down.

CONTINUED

Seats



Make sure the removed head restraints are securely stored.

When reinstalling a head restraint, put the legs back in place. Then adjust it to the appropriate height while pressing the release button.

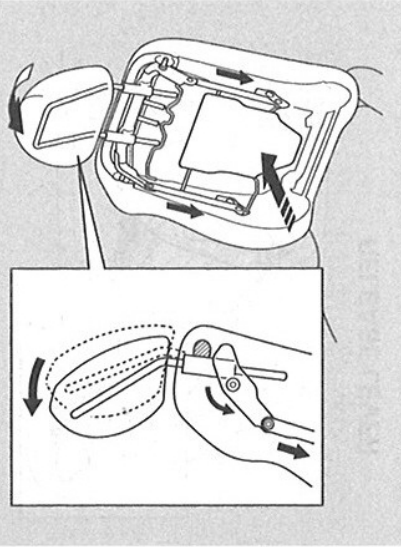
Removing the Head Restraint

To remove a head restraint for cleaning or repair, pull it up as far as it will go. Push the release button, then pull the restraint out of the seat-back.

For Third Row Seat Outer Head Restraints

The seat-back must be folded forward (see page 177) to get ceiling clearance for removal of the head restraints.

Active Head Restraints



The driver's and front passenger's seats have active head restraints. If the vehicle is struck severely from the rear, the occupant properly secured with the seat belt will be pushed against the seat-back and the head restraint will automatically move forward.

⚠ WARNING

Failure to reinstall the head restraints can result in severe injury during a crash.

Always replace the head restraints before driving.

Make sure the head restraint locks in position when you reinstall it.

This reduces the distance between the restraint and the occupant's head. It also helps protect the occupants against the likelihood of whiplash and injuries to the neck and upper spine.

After a collision, the activated restraint should return to its normal position.

If the restraints do not return to their normal position, or in the event of a severe collision, have the vehicle inspected by a Honda dealer.

CONTINUED

APPENDIX B
DUMMY RESPONSE DATA

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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

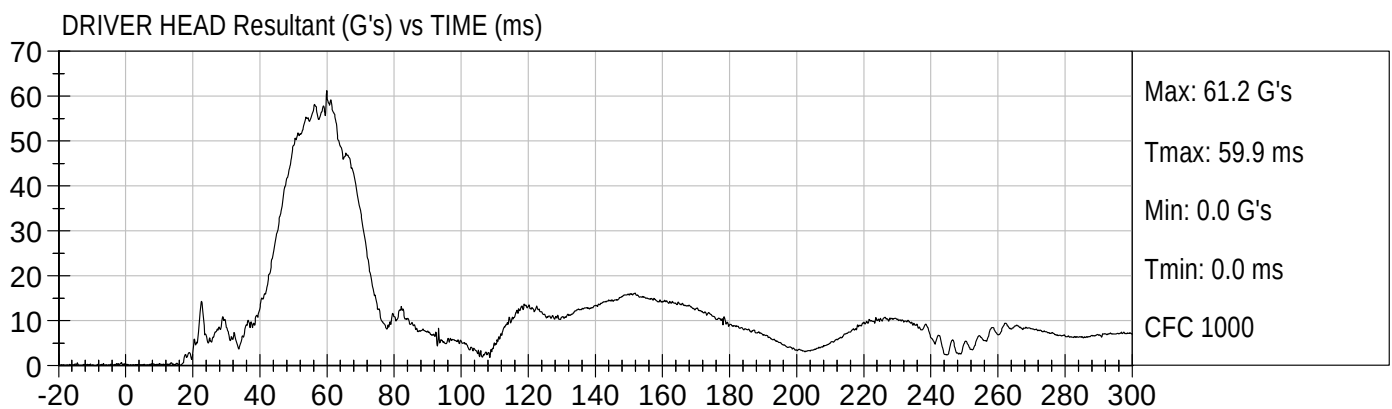
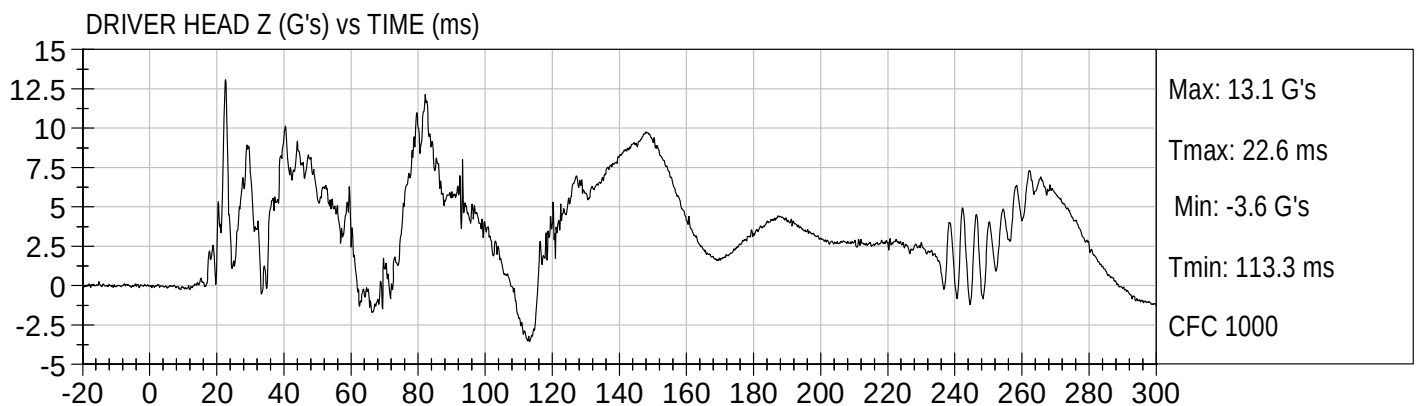
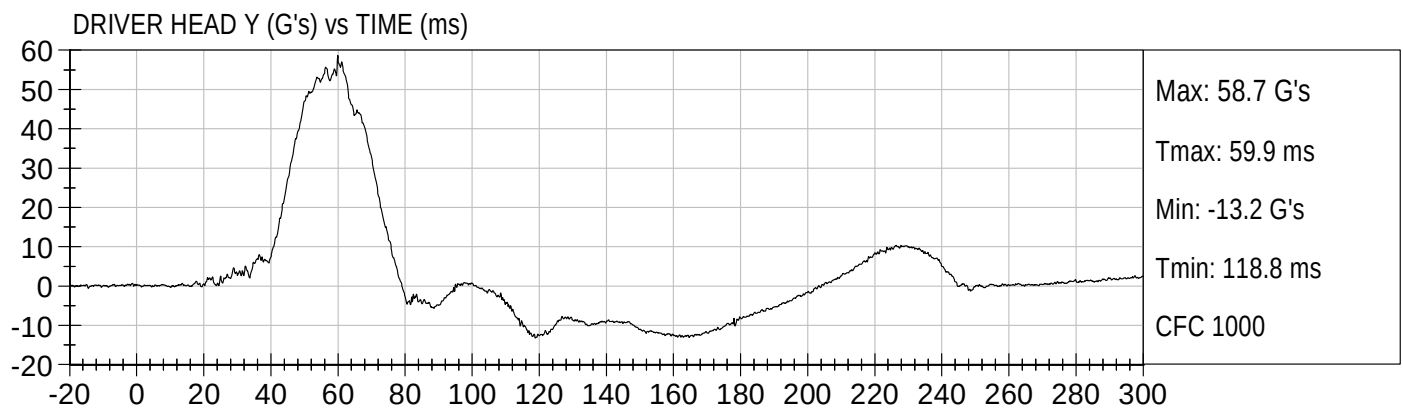
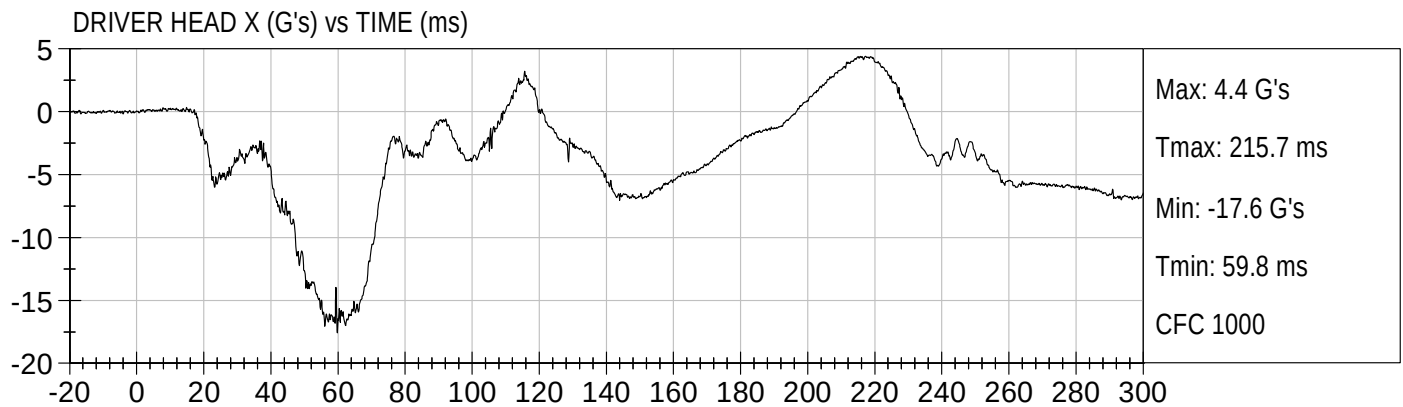
Vehicle CG Acceleration (X)

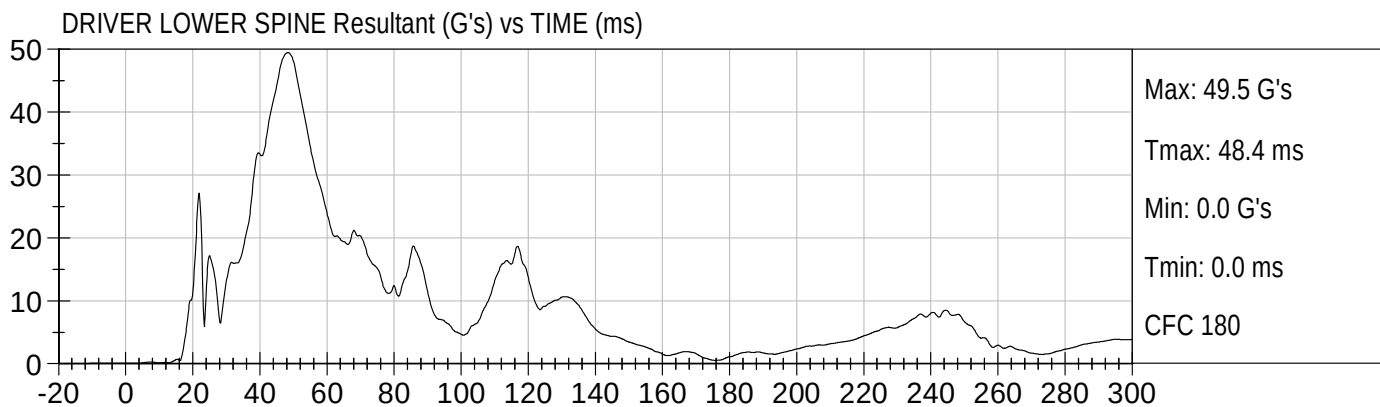
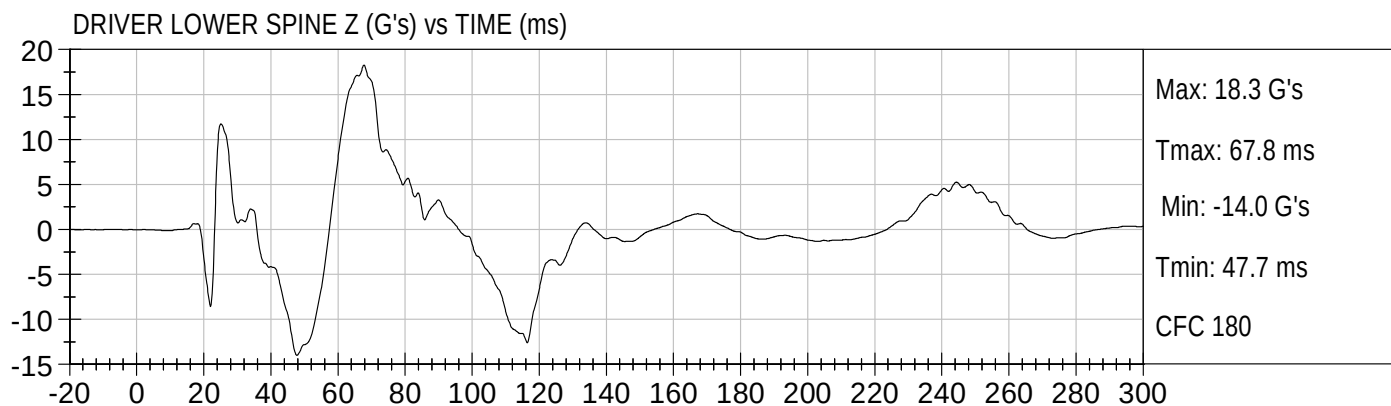
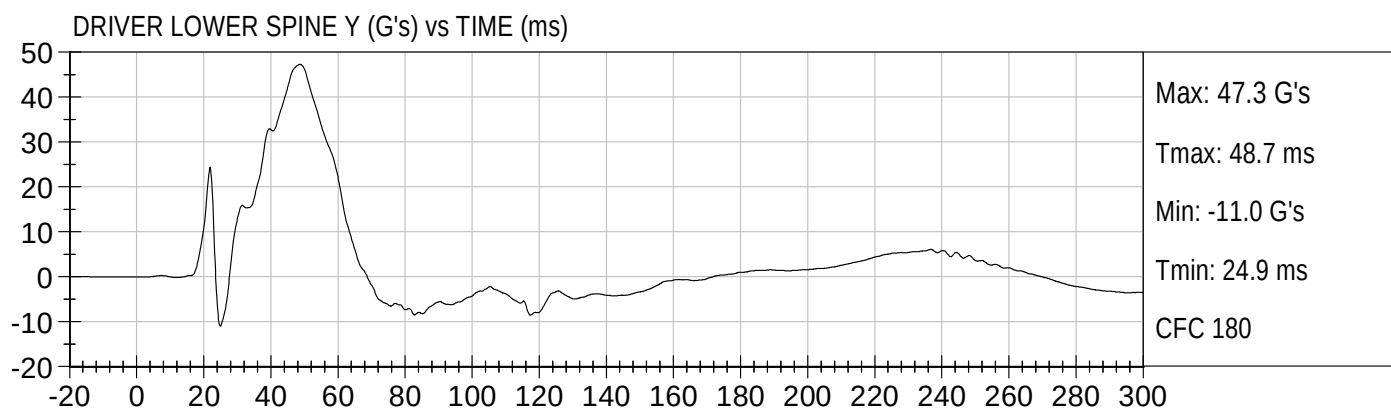
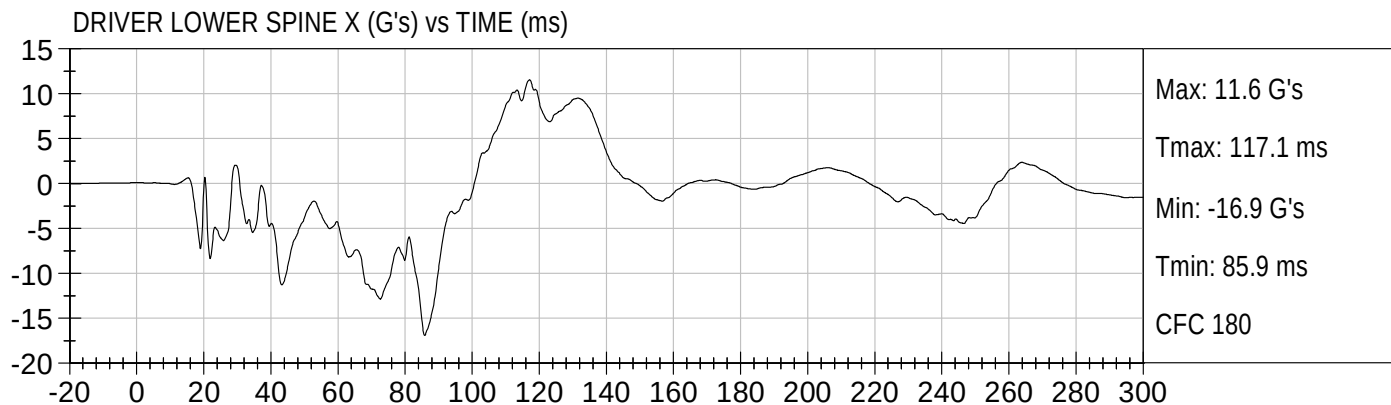
Vehicle CG Acceleration (Y)

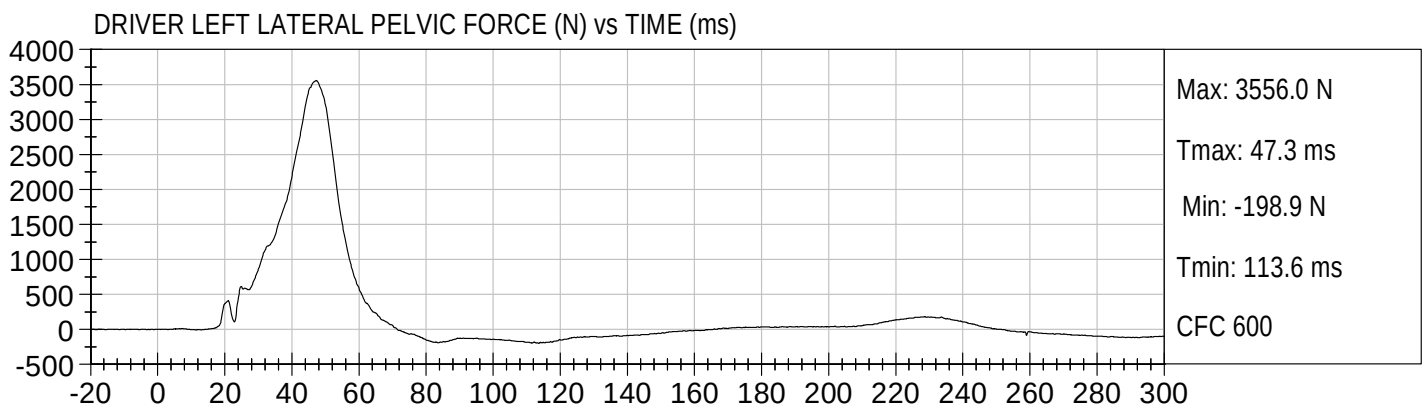
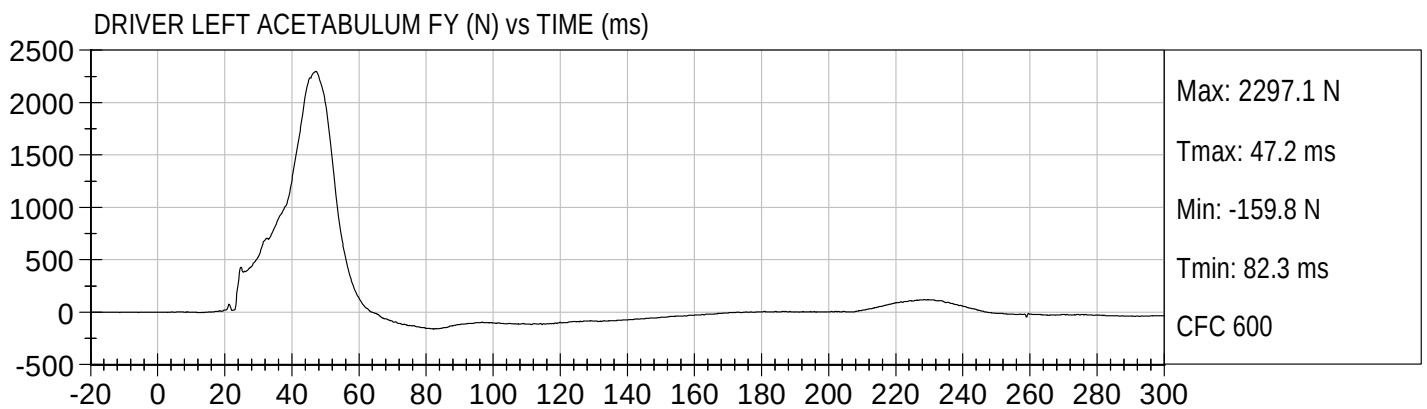
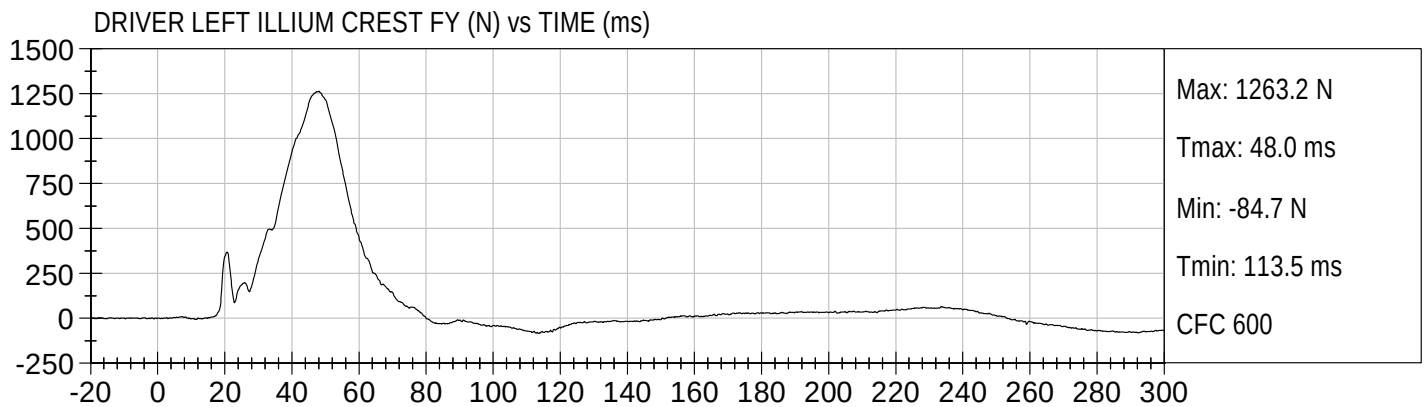
Vehicle CG Acceleration (Z)

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: D104141

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	26	Pass
Peak Resultant Acceleration	G's	115 to 137	118	Pass
Peak Lateral Acceleration	G's	+/- 15	-6.8	Pass
Unimodal	N/A	<15%	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

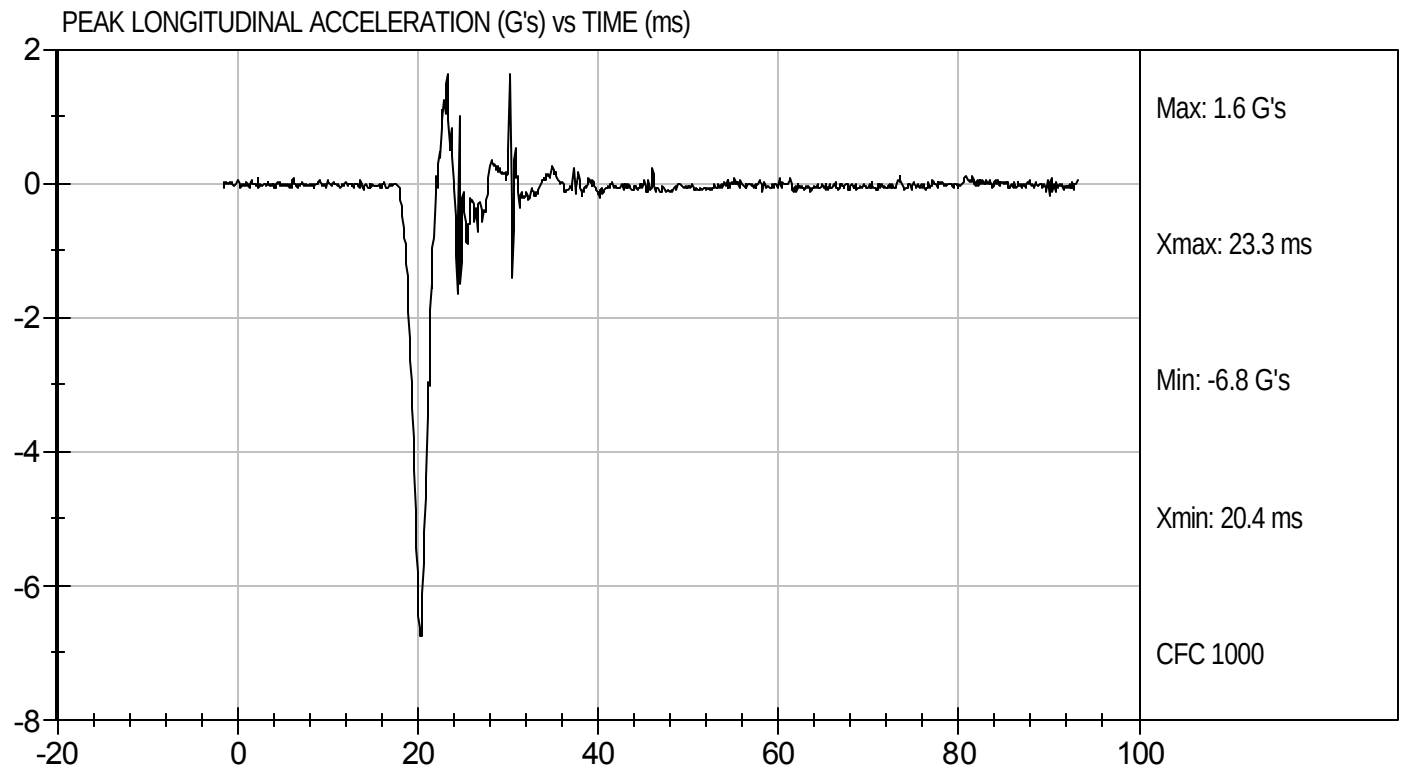
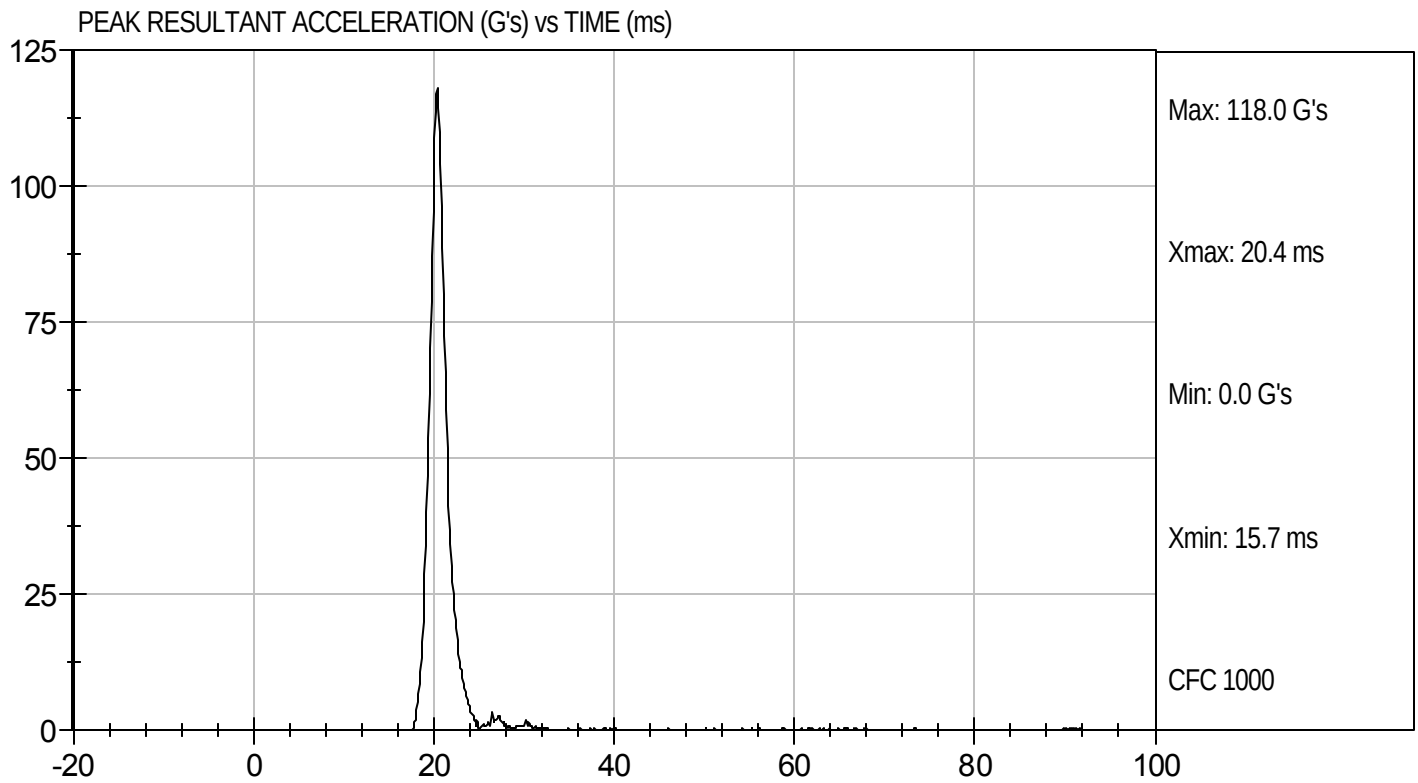
11/24/10
Test Date


Approved By



Test Desc: Head Drop
Component ID: D104141

Test Date: 11/24/10
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: D104142

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	20.7	Pass
Humidity		%	10 to 70	25	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	3.57	Pass
	20 ms	m/s	4.40 to 5.40	4.76	Pass
	25 ms	m/s	5.40 to 6.10	5.50	Pass
	25-100 ms	m/s	5.50 to 6.20	5.55	Pass
Maximum D-Plane Rotation		deg	71 to 81	75	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	61	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	120	Pass
Overall Test Results				Pass	


 Laboratory Technician

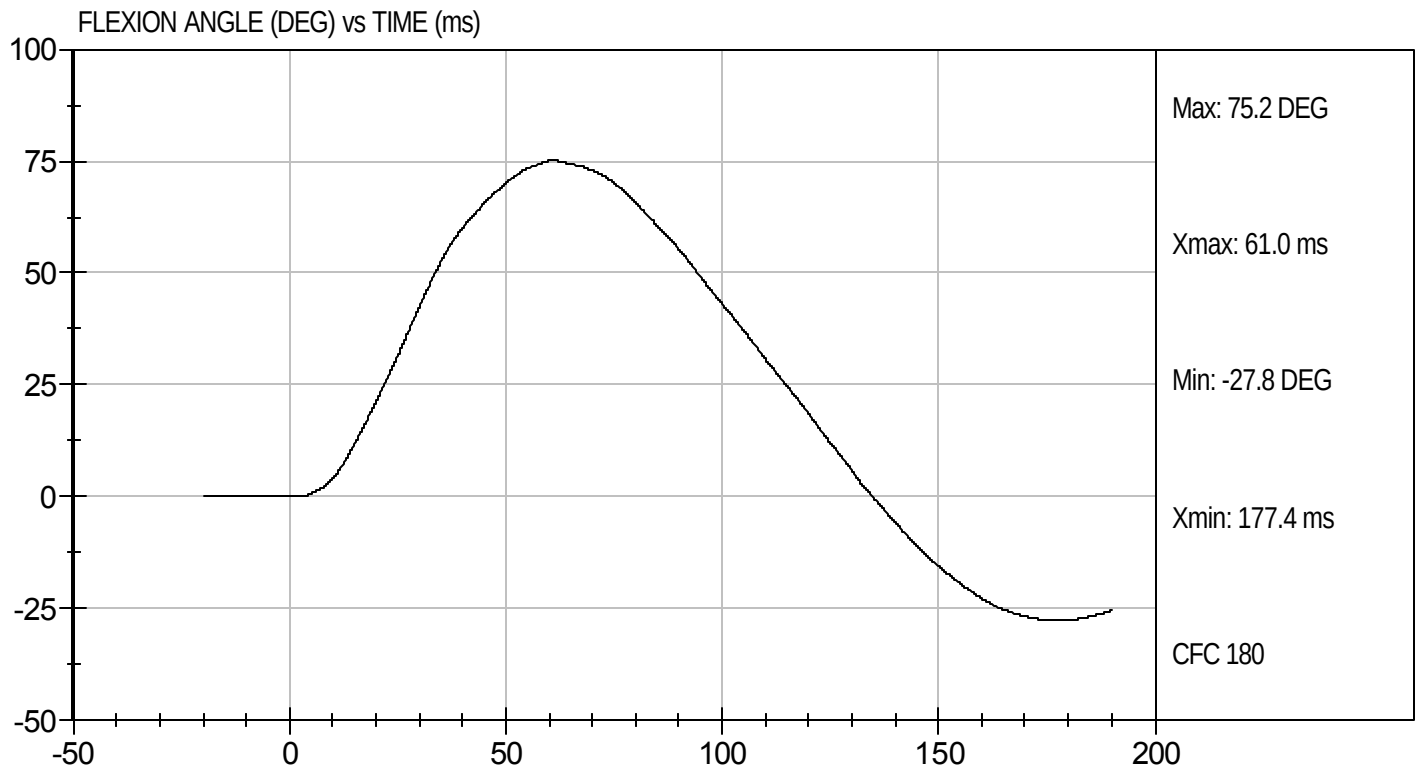
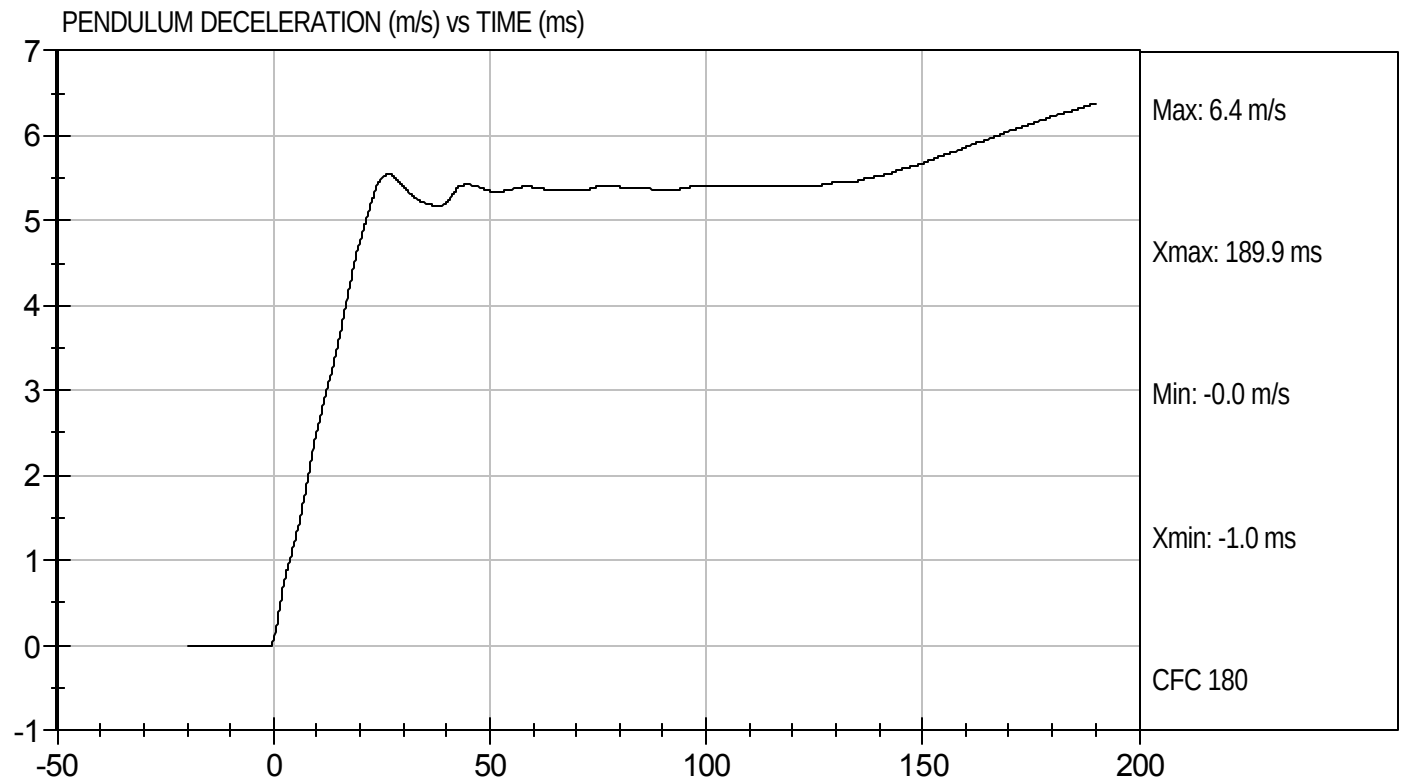
11/24/10
 Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D104142

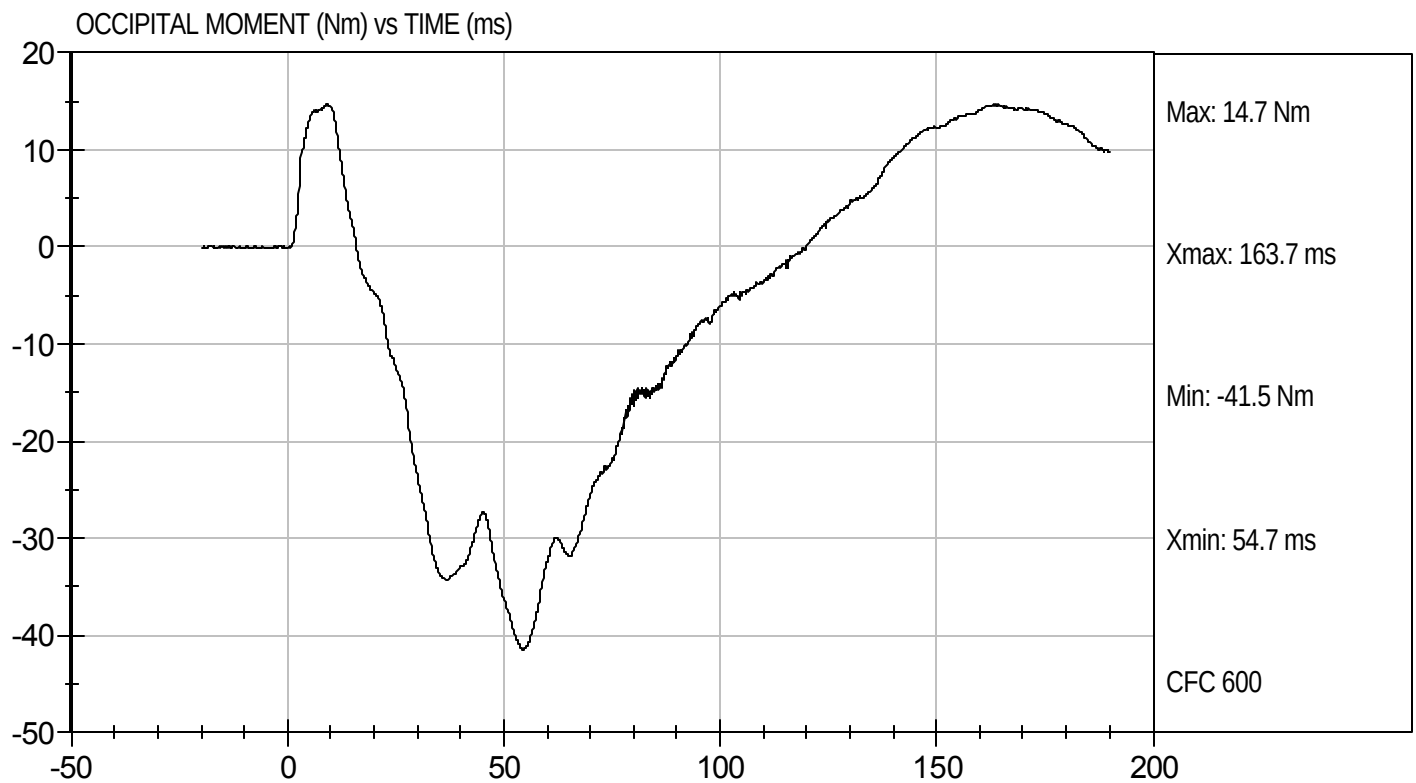
Test Date: 11/24/10
Velocity: 18.32 ft/s, 5.58 m/s





Test Desc: Neck Bending
Component ID: D104142

Test Date: 11/24/10
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: D104143

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Maximum Probe Acceleration	G's	13 to 18	16	Pass
Shoulder Displacement	mm	28 to 37	32	Pass
Upper Spine (T1) Y Acceleration	G's	17 to 22	19	Pass
Overall Test Results				Pass


Laboratory Technician

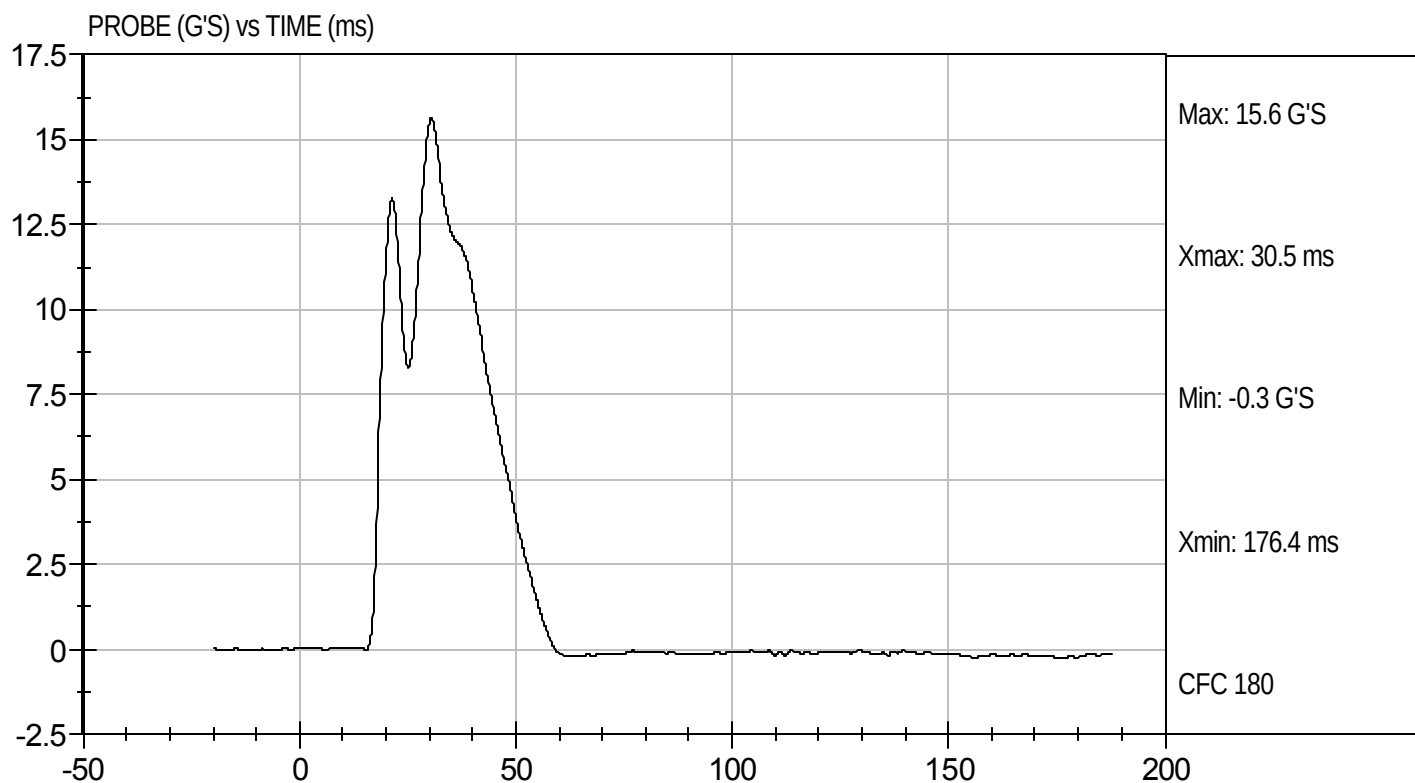
11/24/10
Test Date


Approved By



Test Desc: Shoulder Impact
Component ID: D104143

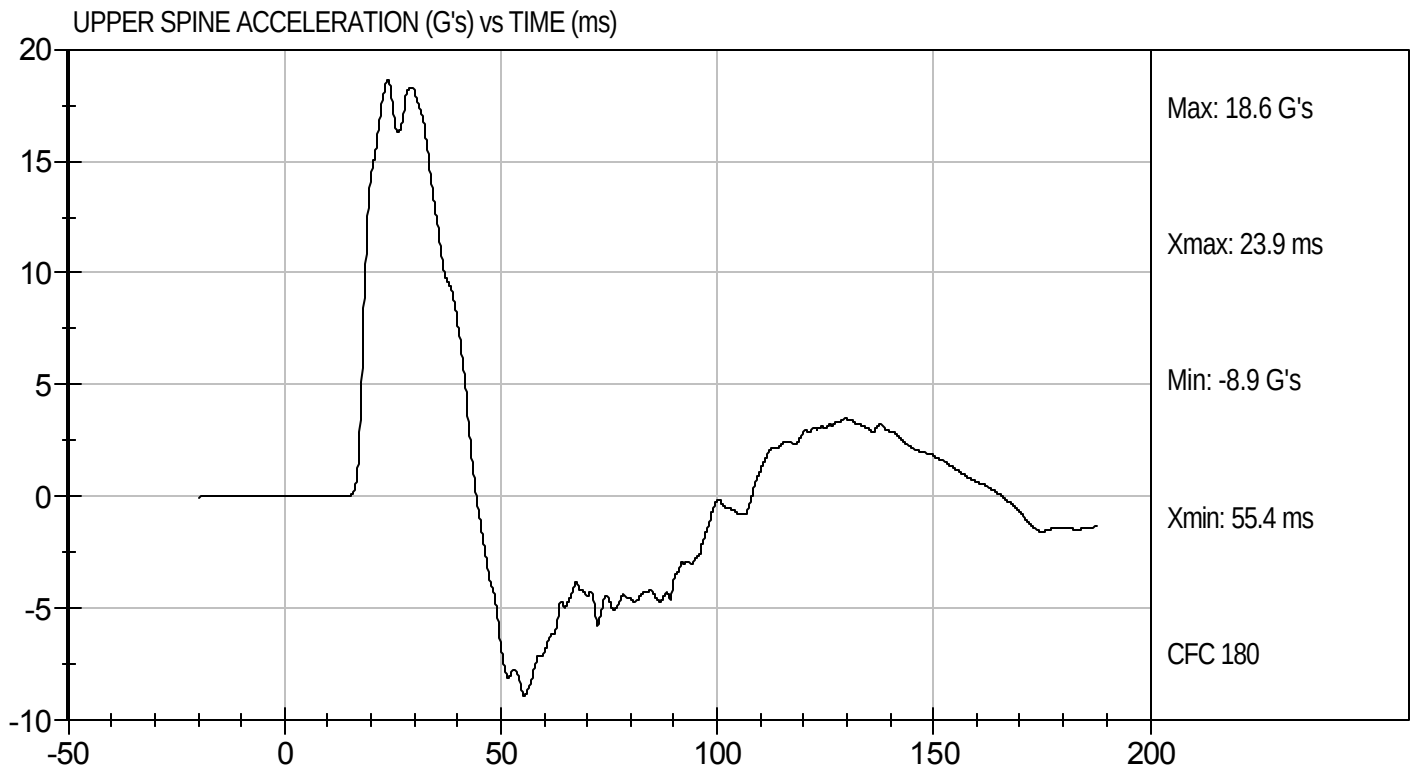
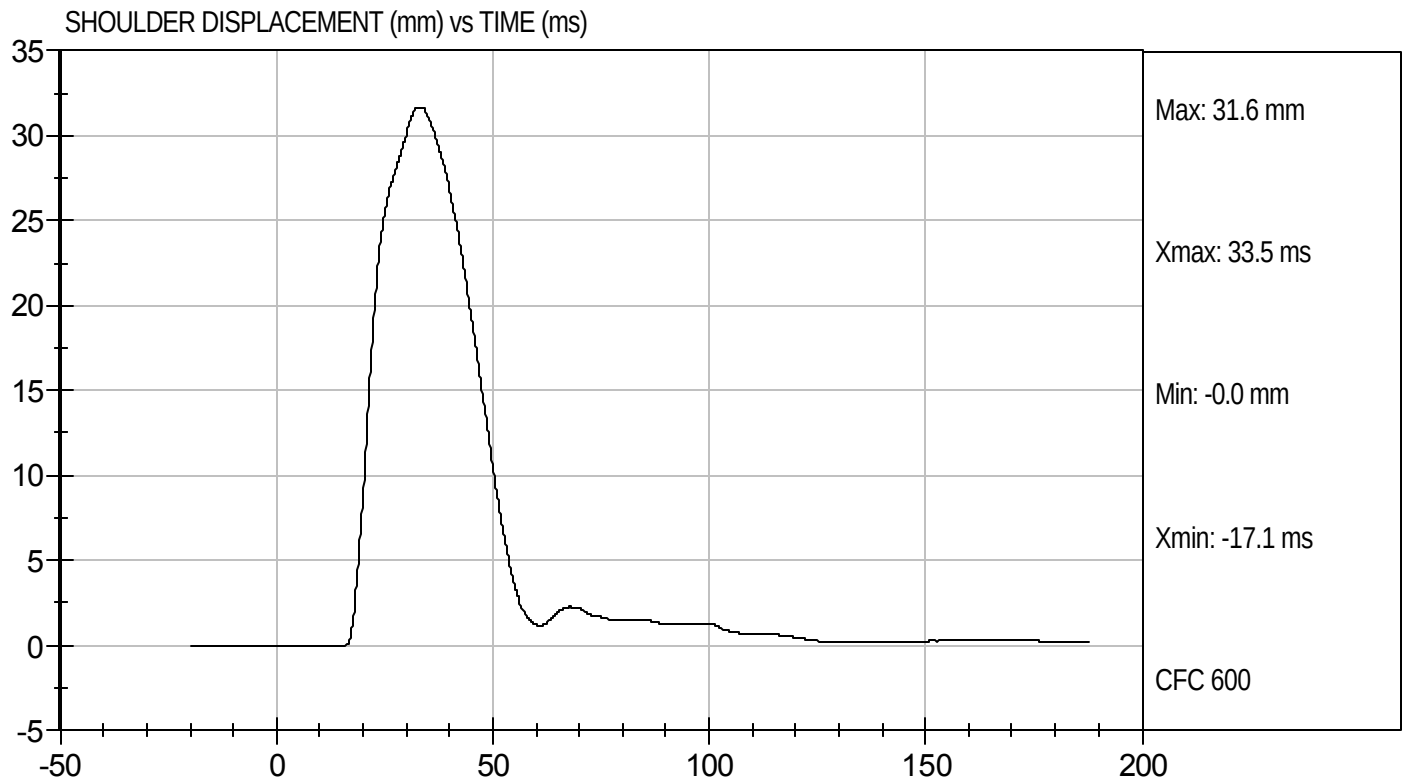
Test Date: 11/24/10
Velocity: 14.25 ft/s, 4.34 m/s





Test Desc: Shoulder Impact
Component ID: D104143

Test Date: 11/24/10
Velocity: 14.25 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: D104144

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


Laboratory Technician

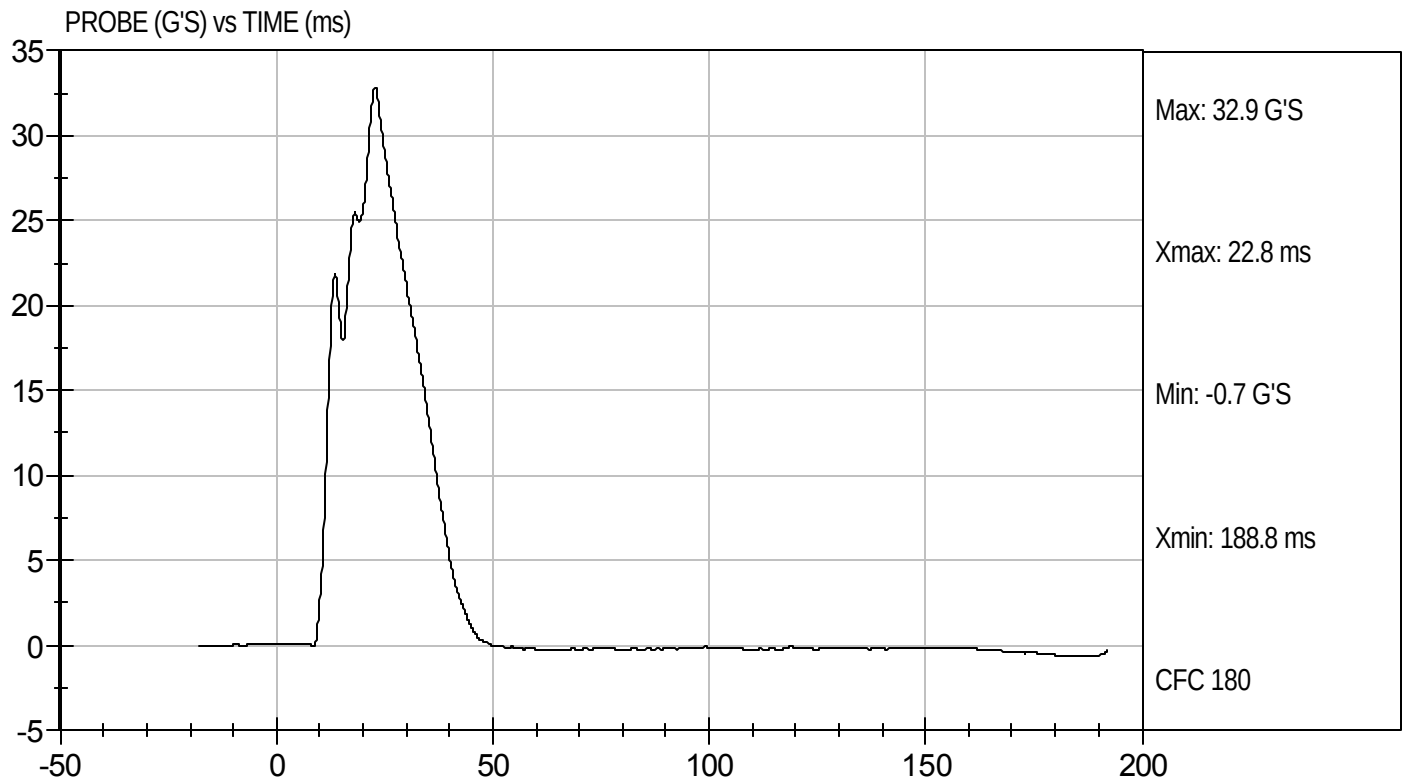
11/24/10
Test Date


Approved By



Test Desc: Thorax With Arm
Component ID: D104144

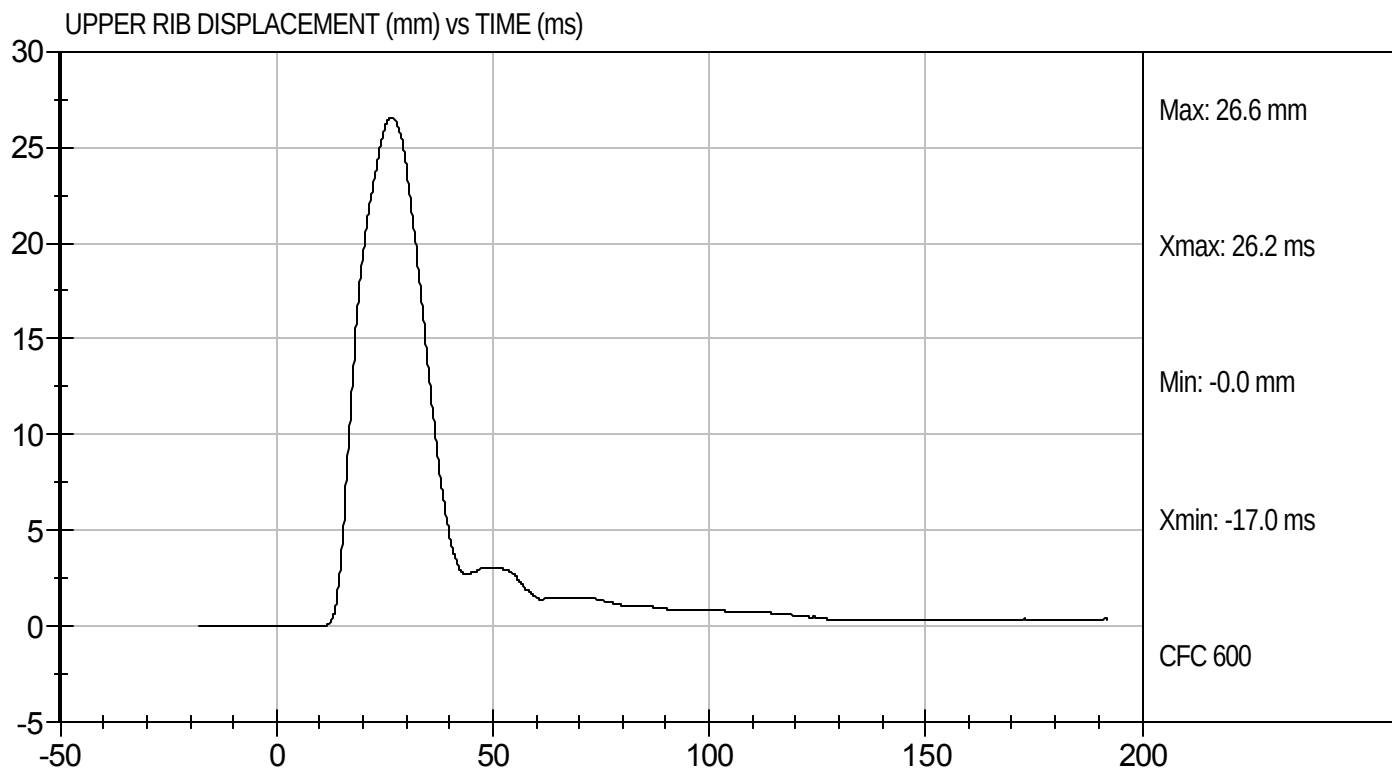
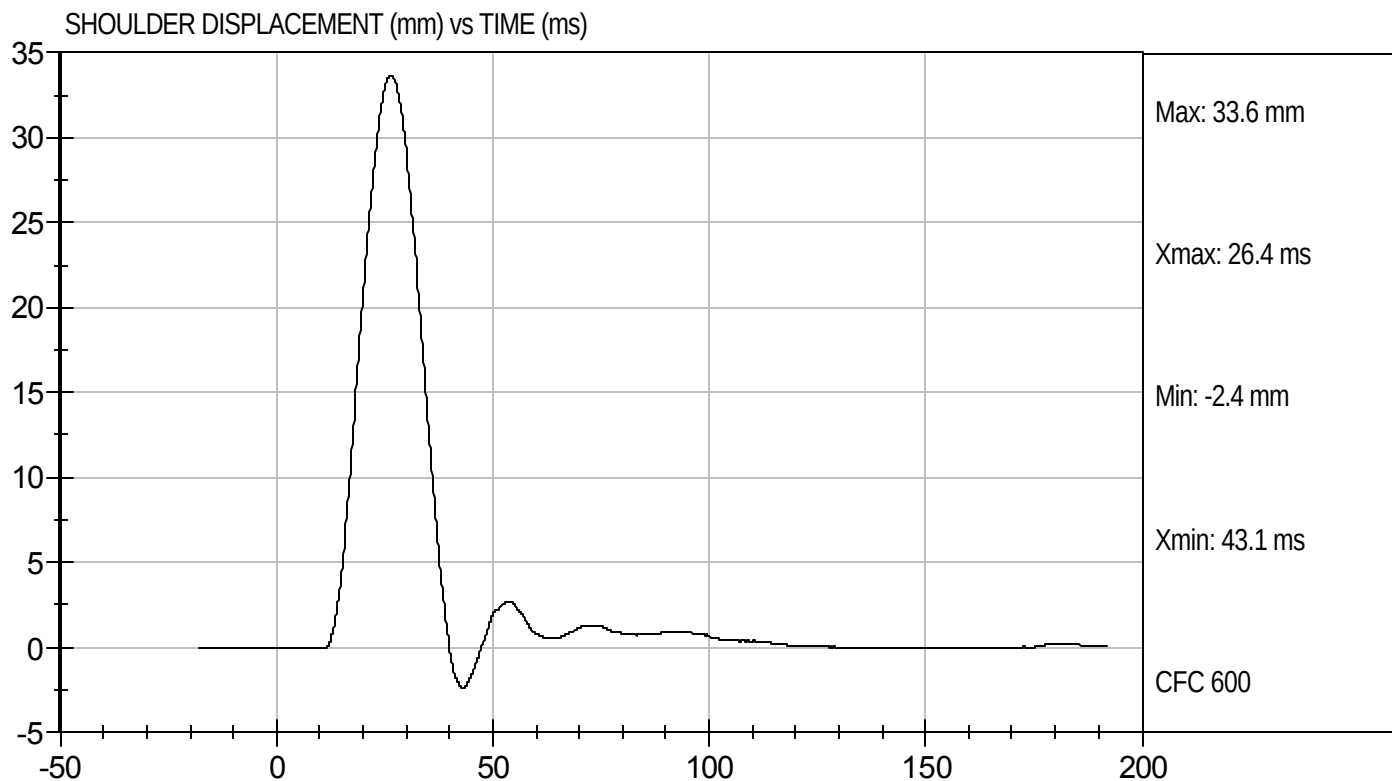
Test Date: 11/24/10
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D104144

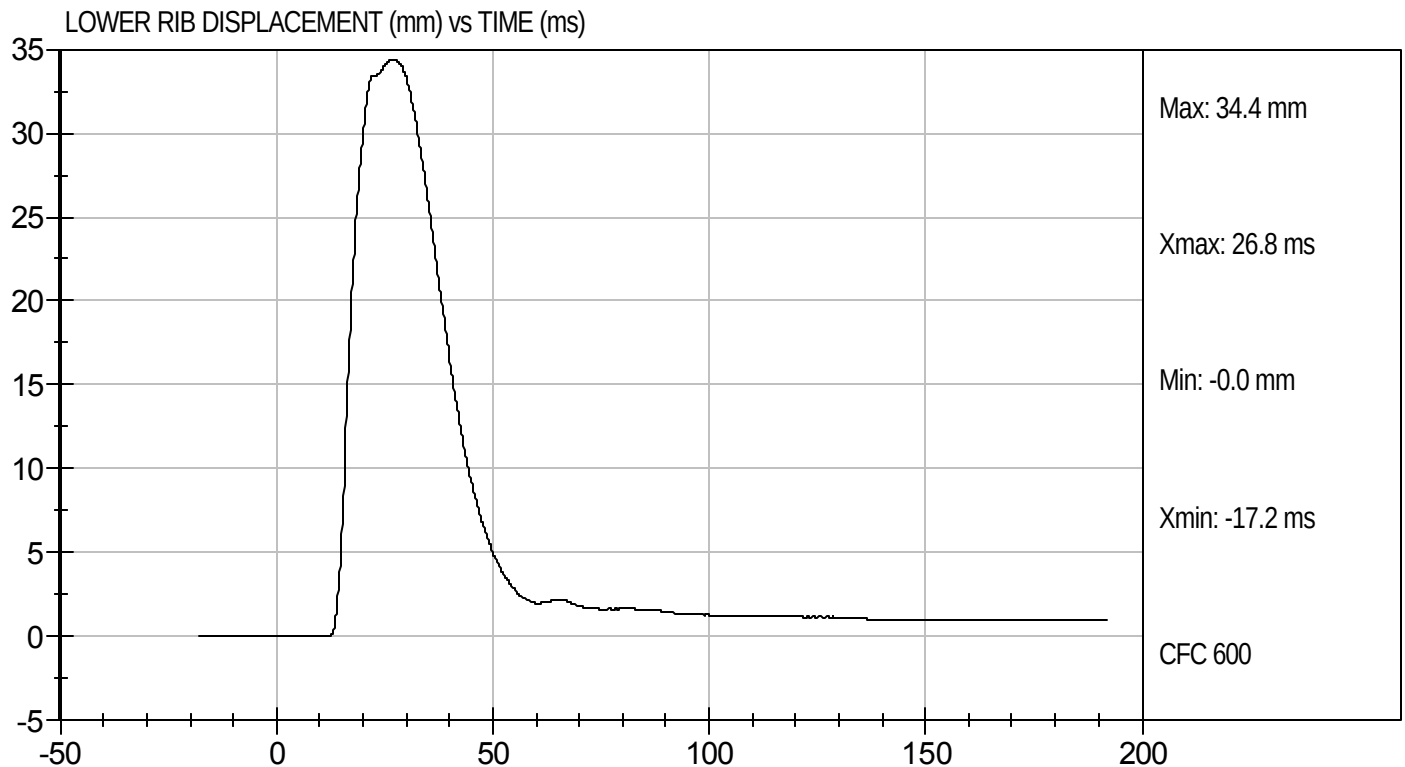
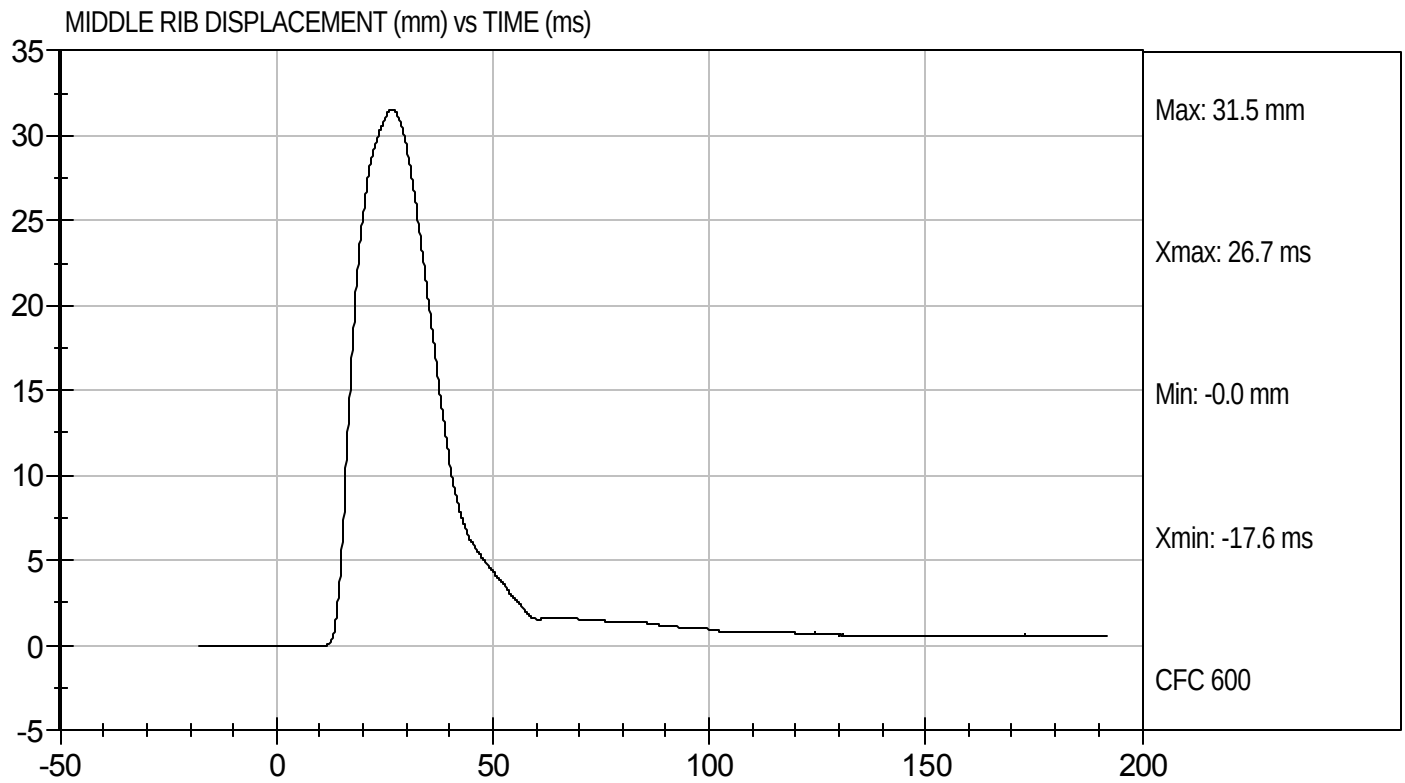
Test Date: 11/24/10
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D104144

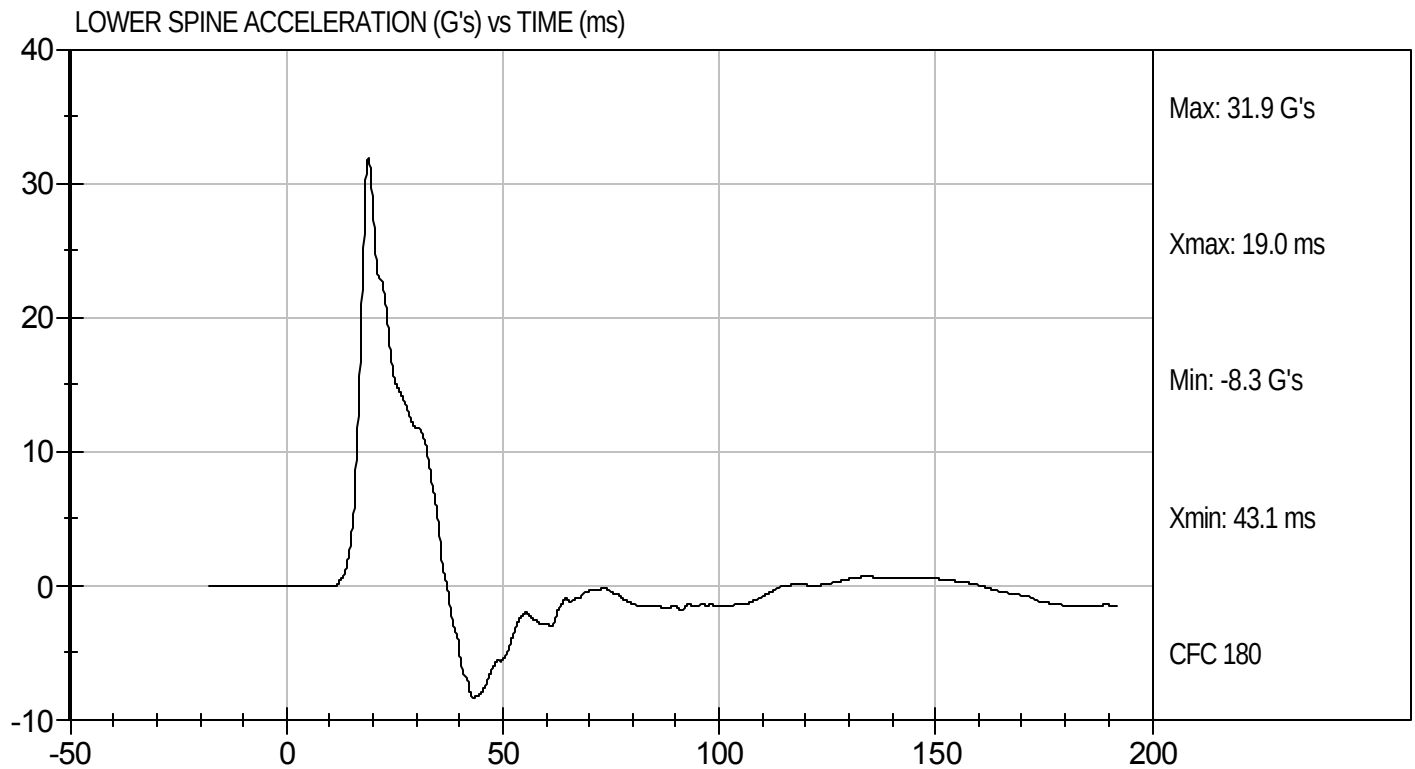
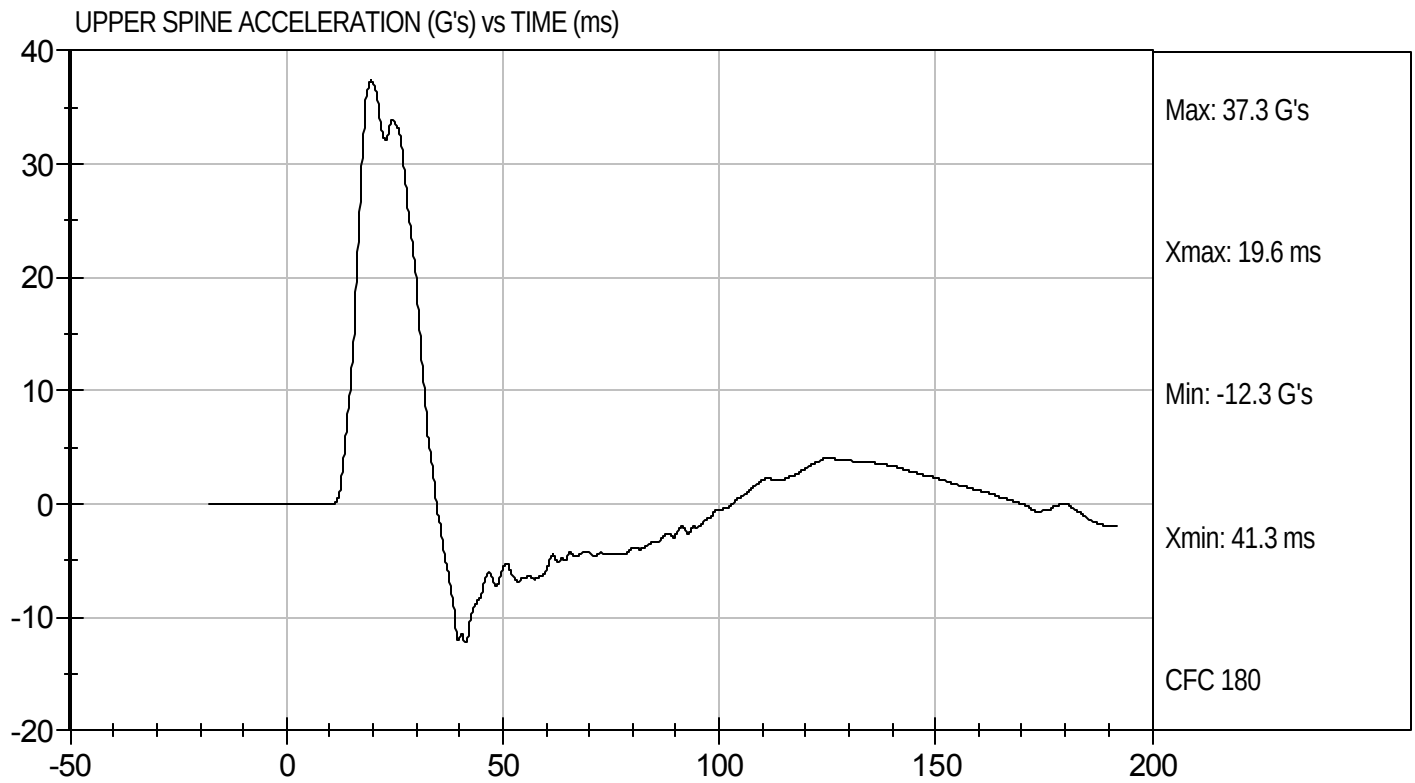
Test Date: 11/24/10
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm
Component ID: D104144

Test Date: 11/24/10
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: D104145

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.8	Pass
Humidity	%	10 to 70	25	Pass
Impact Velocity	m/s	4.20 to 4.40	4.30	Pass
Peak Impactor Force	G's	14 to 18	16	Pass
Upper Rib Displacement	mm	32 to 40	36	Pass
Middle Rib Displacement	mm	39 to 45	43	Pass
Lower Rib Displacement	mm	35 to 43	41	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	14	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	9	Pass
Overall Test Results			Pass	


Laboratory Technician

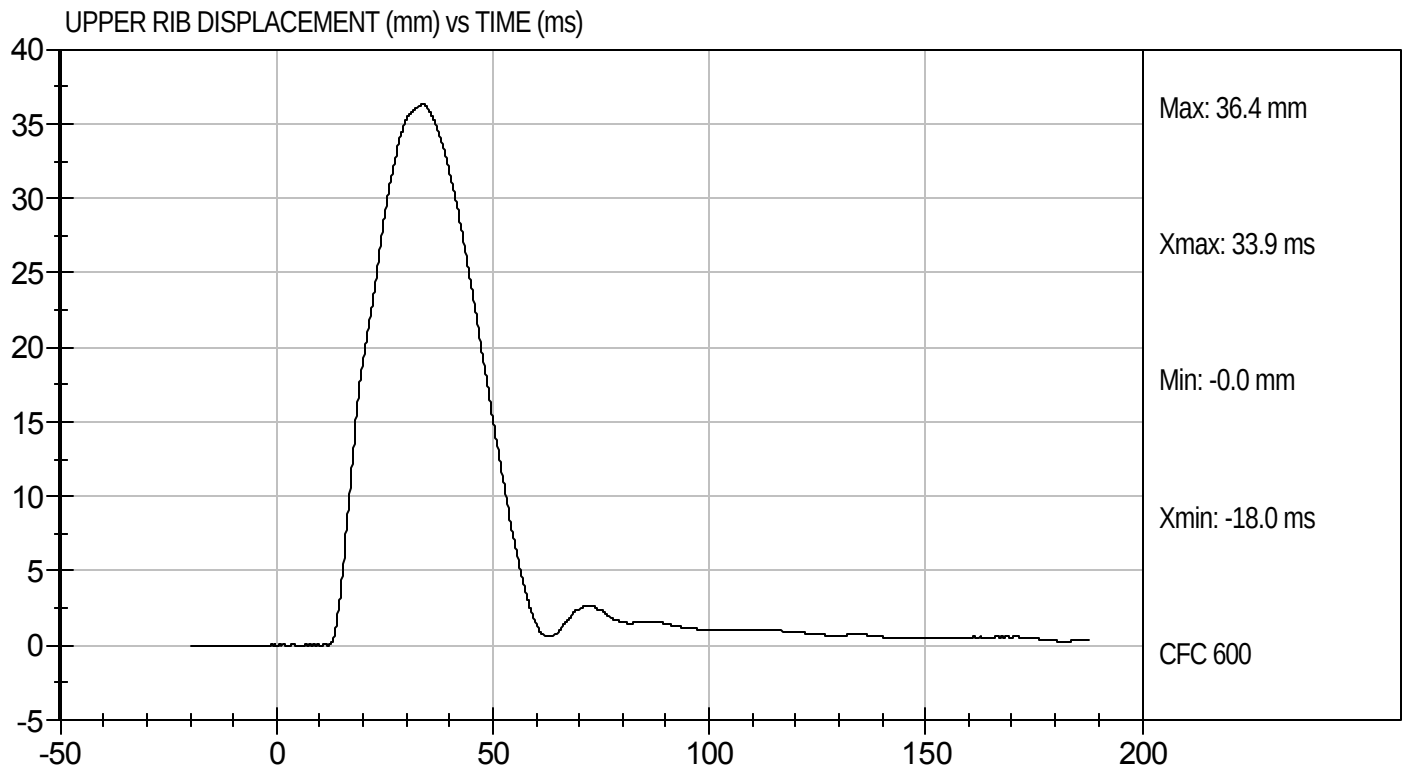
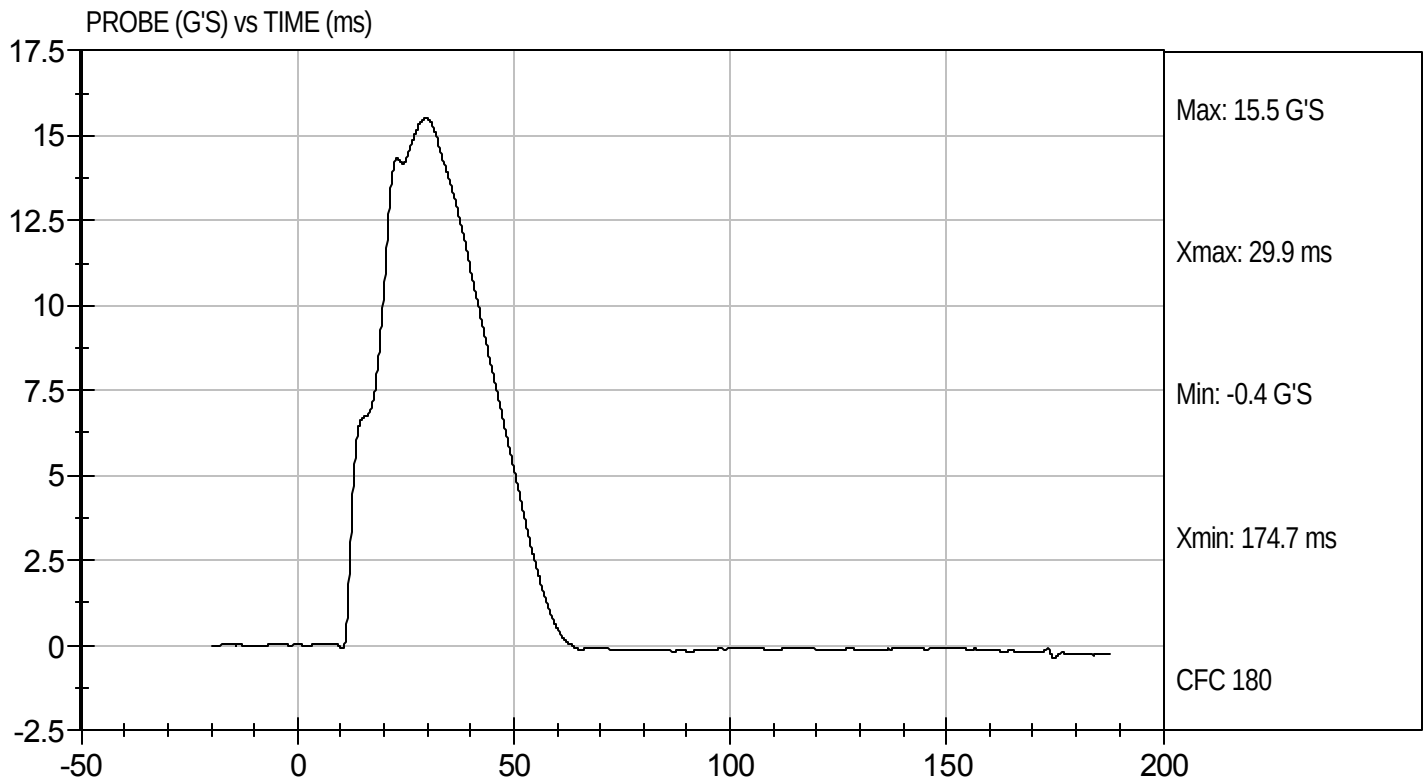
11/24/10
Test Date


Approved By



Test Desc: Thorax Without Arm
Component ID: D104145

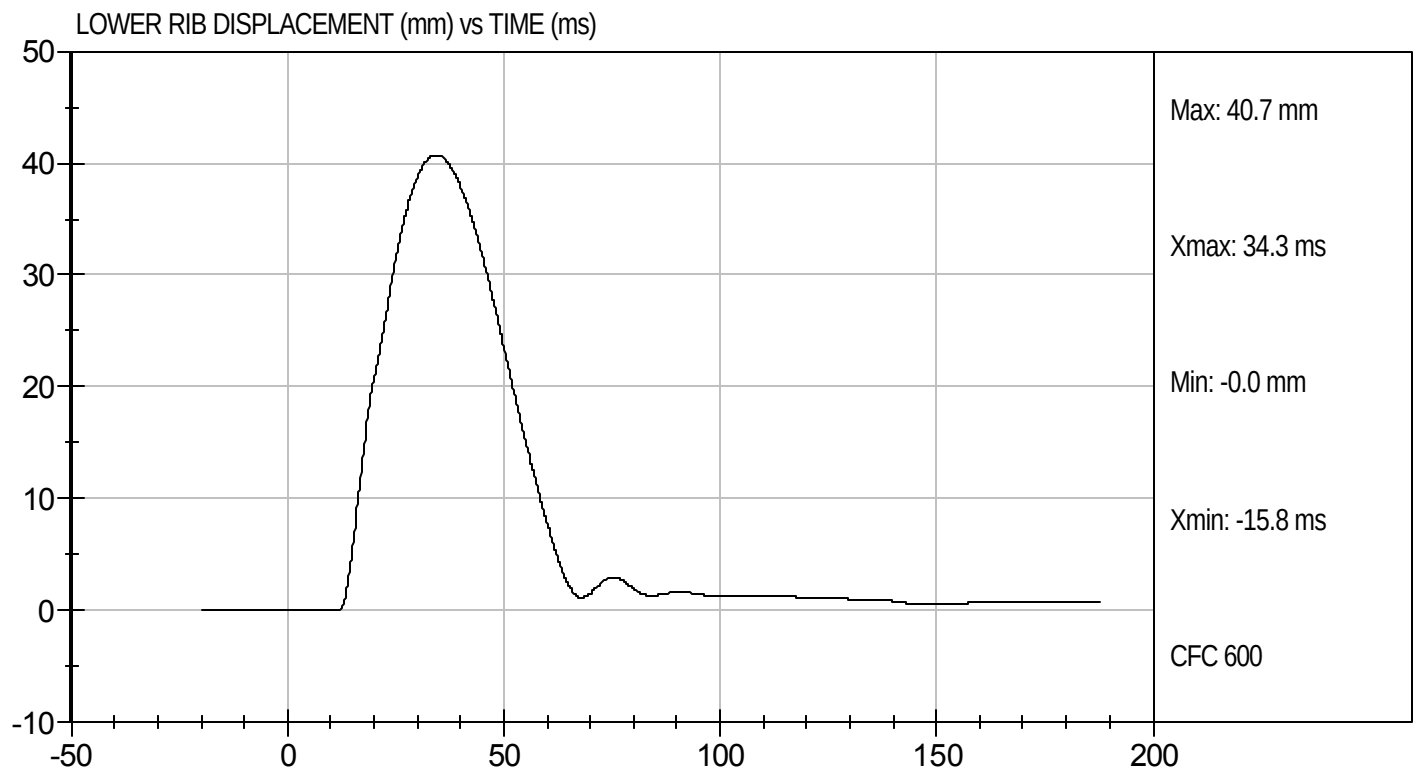
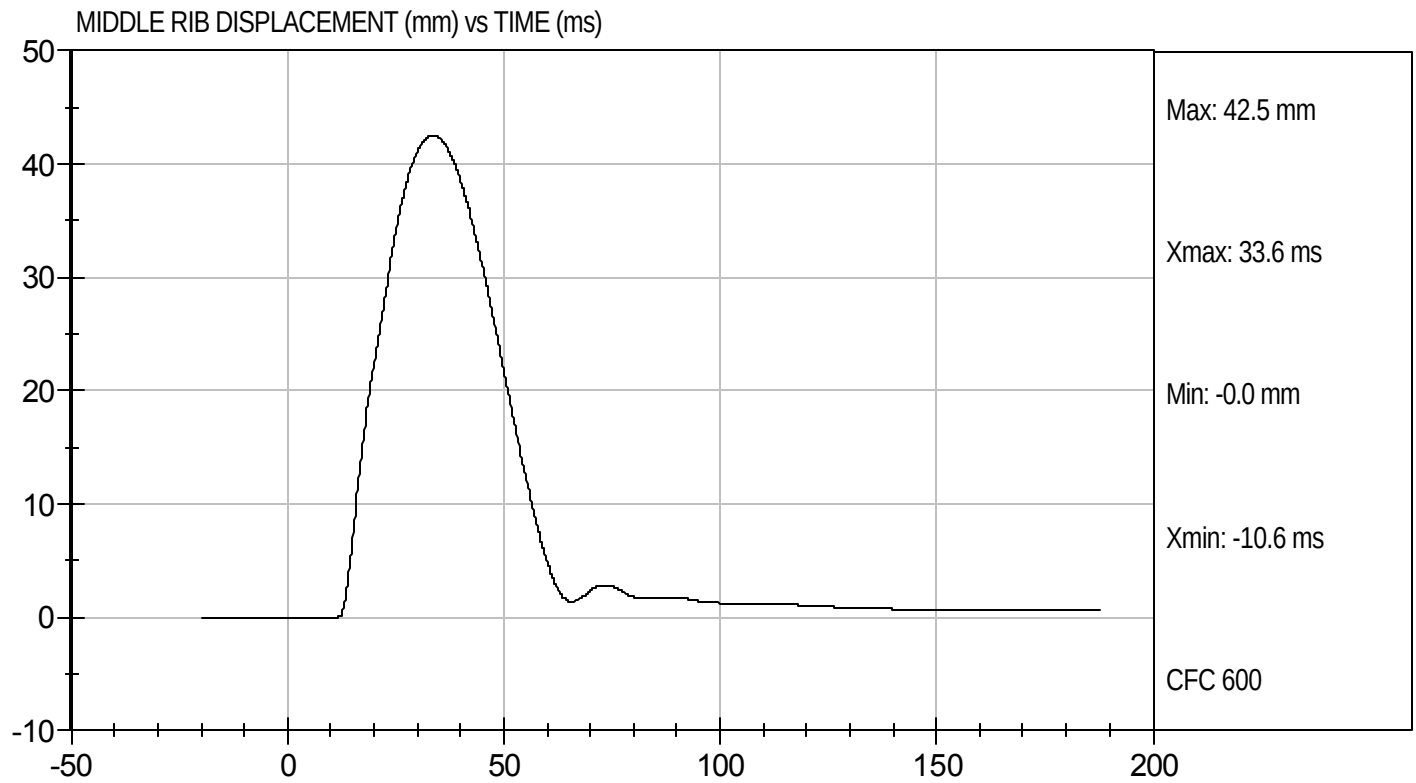
Test Date: 11/24/10
Velocity: 14.12 ft/s, 4.30 m/s





Test Desc: Thorax Without Arm
Component ID: D104145

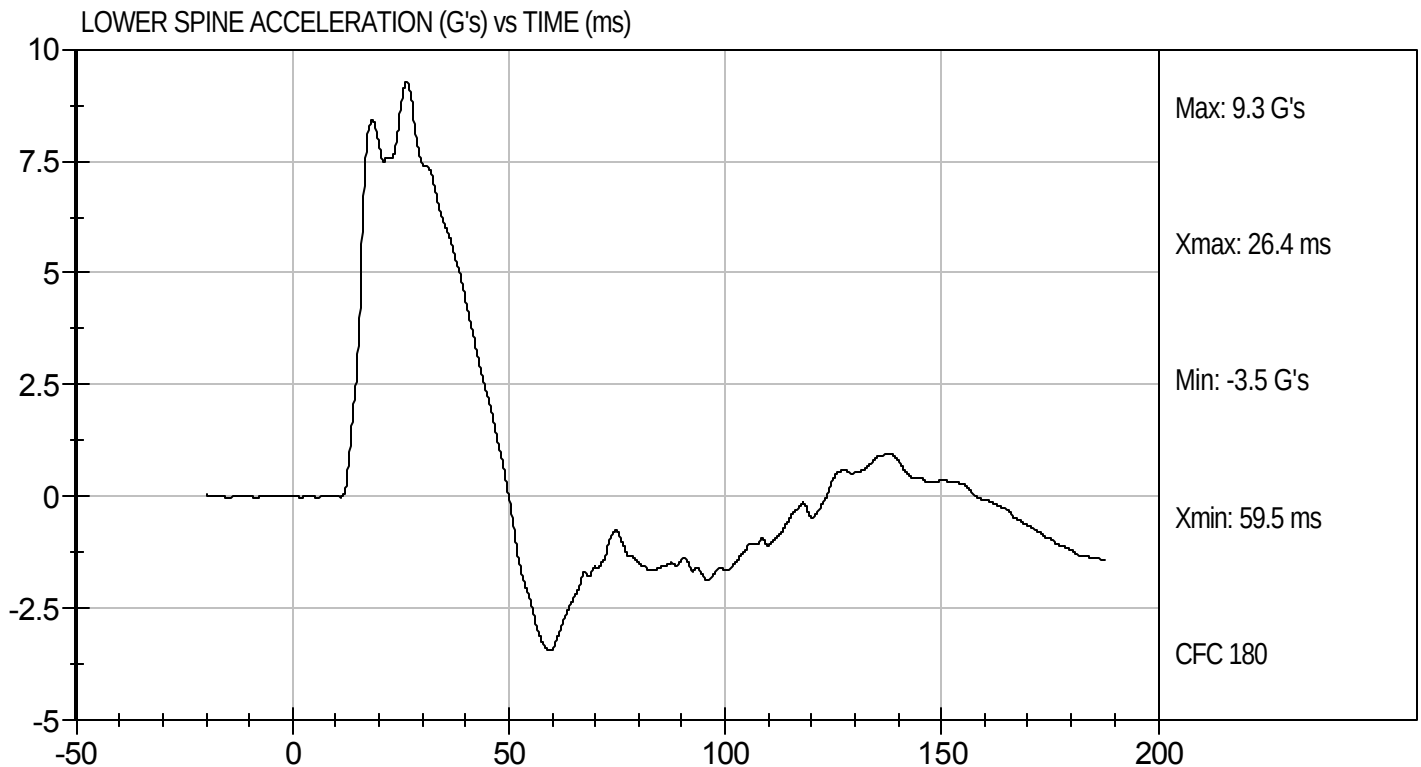
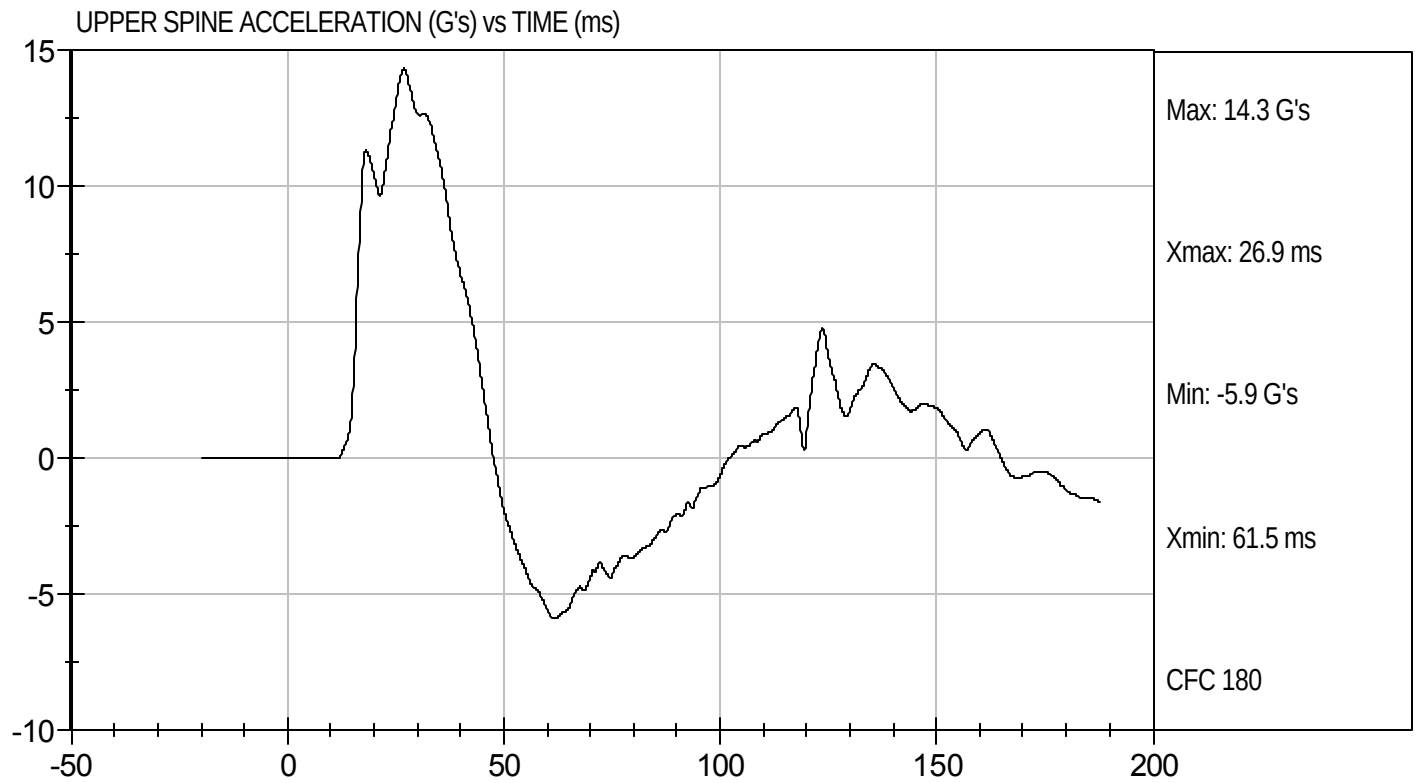
Test Date: 11/24/10
Velocity: 14.12 ft/s, 4.30 m/s





Test Desc: Thorax Without Arm
Component ID: D104145

Test Date: 11/24/10
Velocity: 14.12 ft/s, 4.30 m/s



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

ATD Serial No: 296

Test I.D: D104146

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.7	Pass
Humidity	%	10 to 70	25	Pass
Impact Velocity	m/s	4.20 to 4.40	4.39	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	42	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
			Overall Test Results	Pass


Laboratory Technician

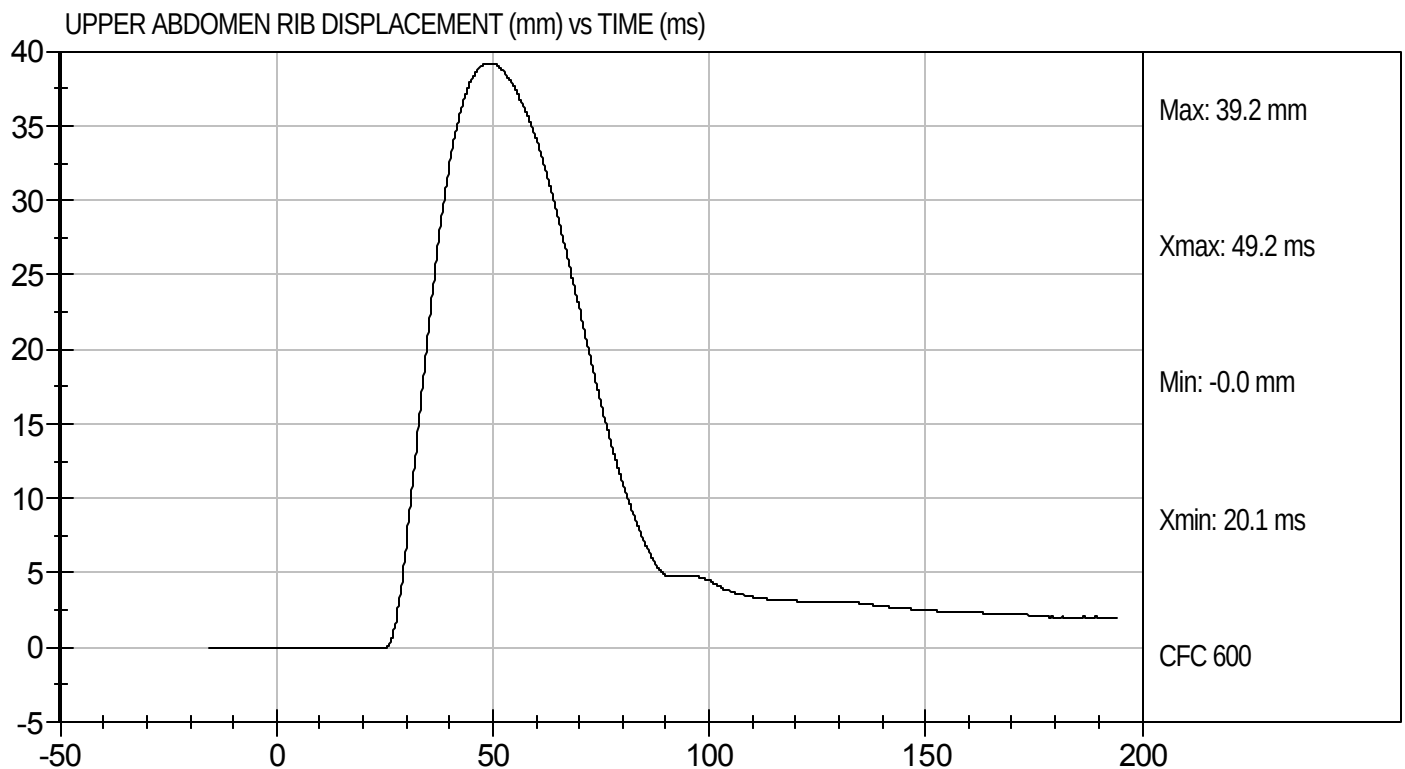
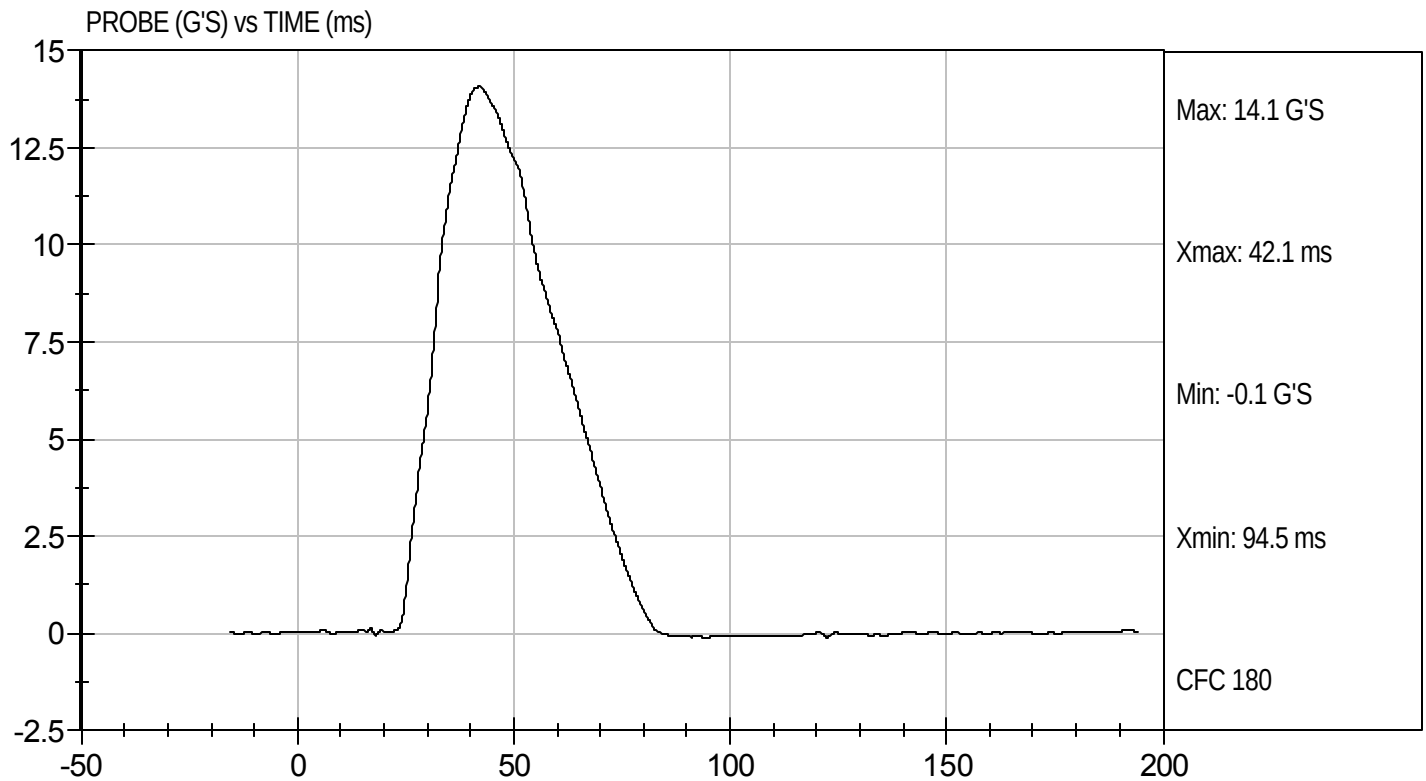
11/24/10
Test Date


Approved By



Test Desc: Abdomen Impact
Component ID: D104146

Test Date: 11/24/10
Velocity: 14.40 ft/s, 4.39 m/s

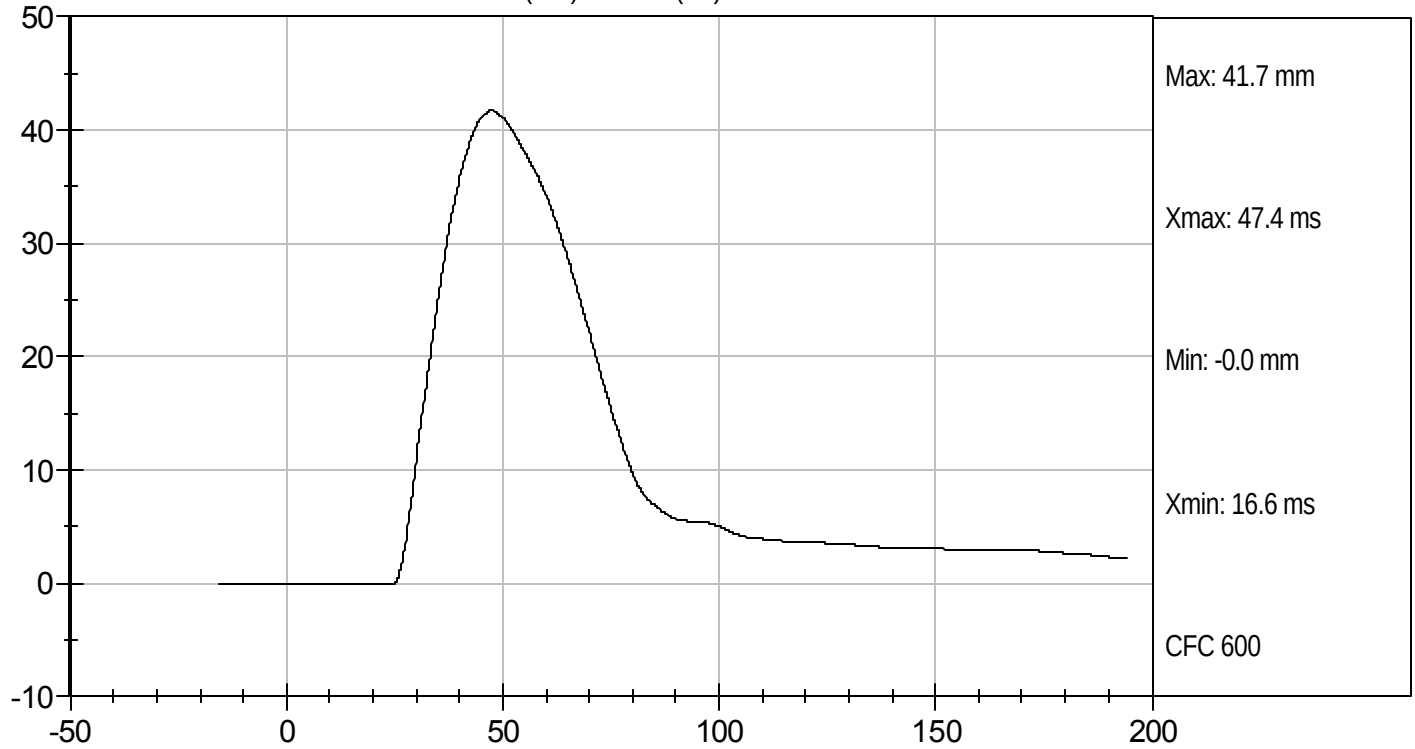




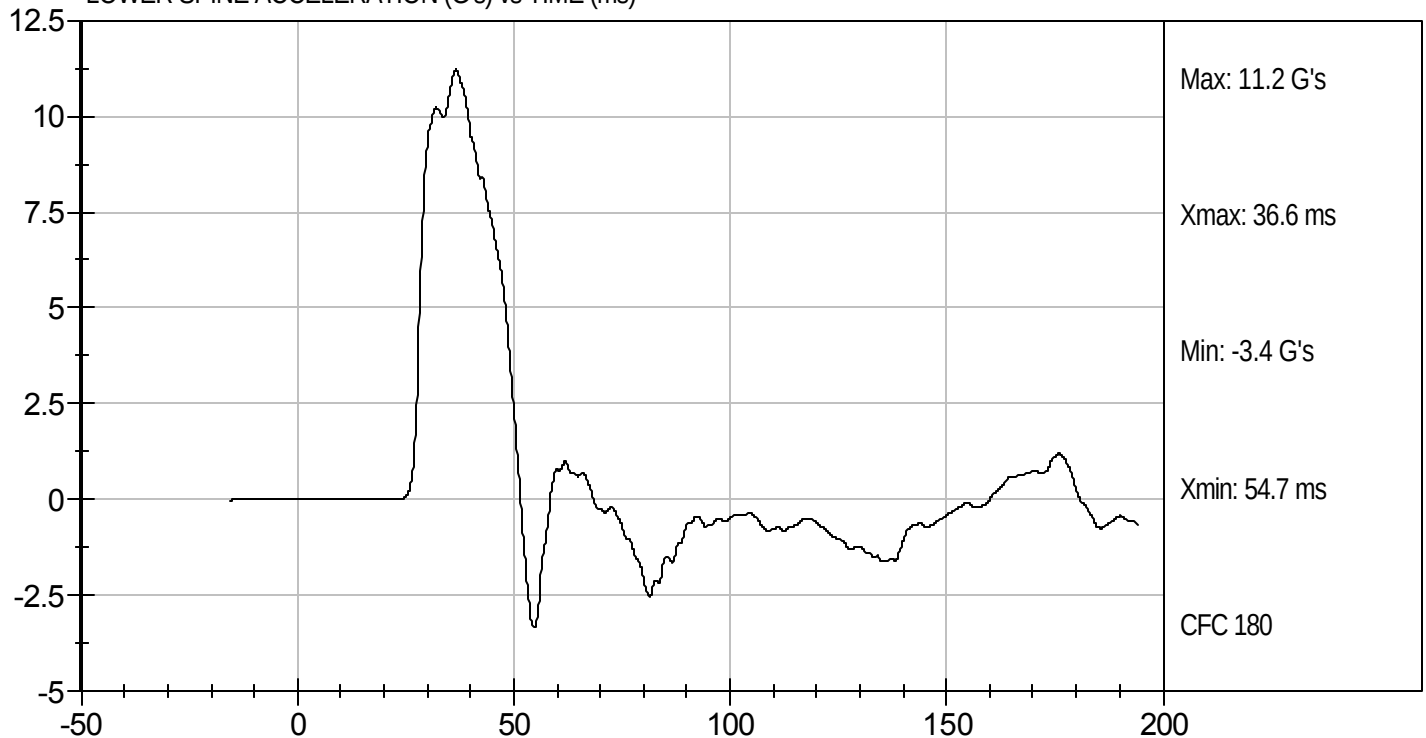
Test Desc: Abdomen Impact
Component ID: D104146

Test Date: 11/24/10
Velocity: 14.40 ft/s, 4.39 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: D104147

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.8	Pass
Humidity	%	10 to 70	26	Pass
Impact Velocity	m/s	6.60 to 6.80	6.68	Pass
Peak Impactor Acceleration	G's	38 to 47	44	Pass
Pelvis Y Acceleration after 6 ms	G's	34 to 42	41	Pass
Peak Acetabulum Force	N	3600 to 4300	4252	Pass
Overall Test Results				Pass


Laboratory Technician

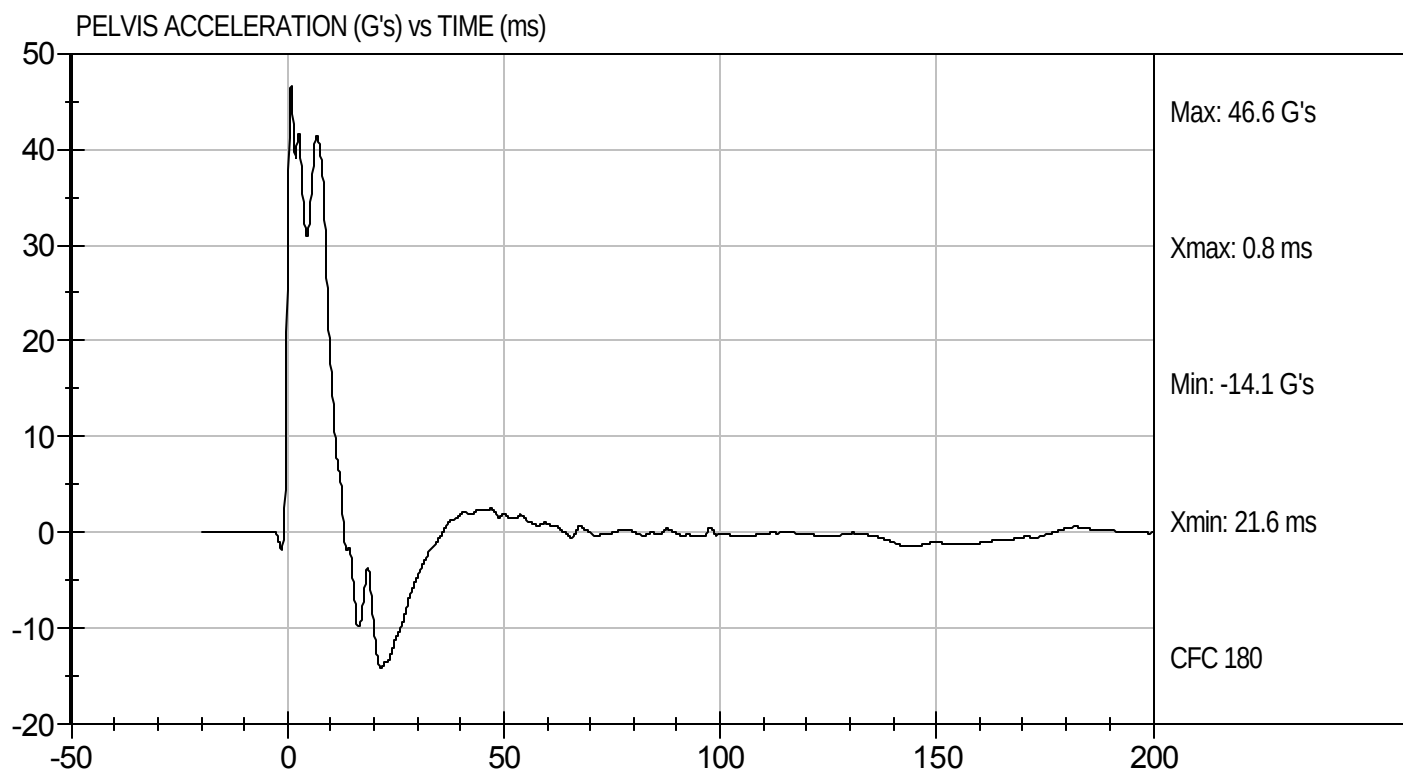
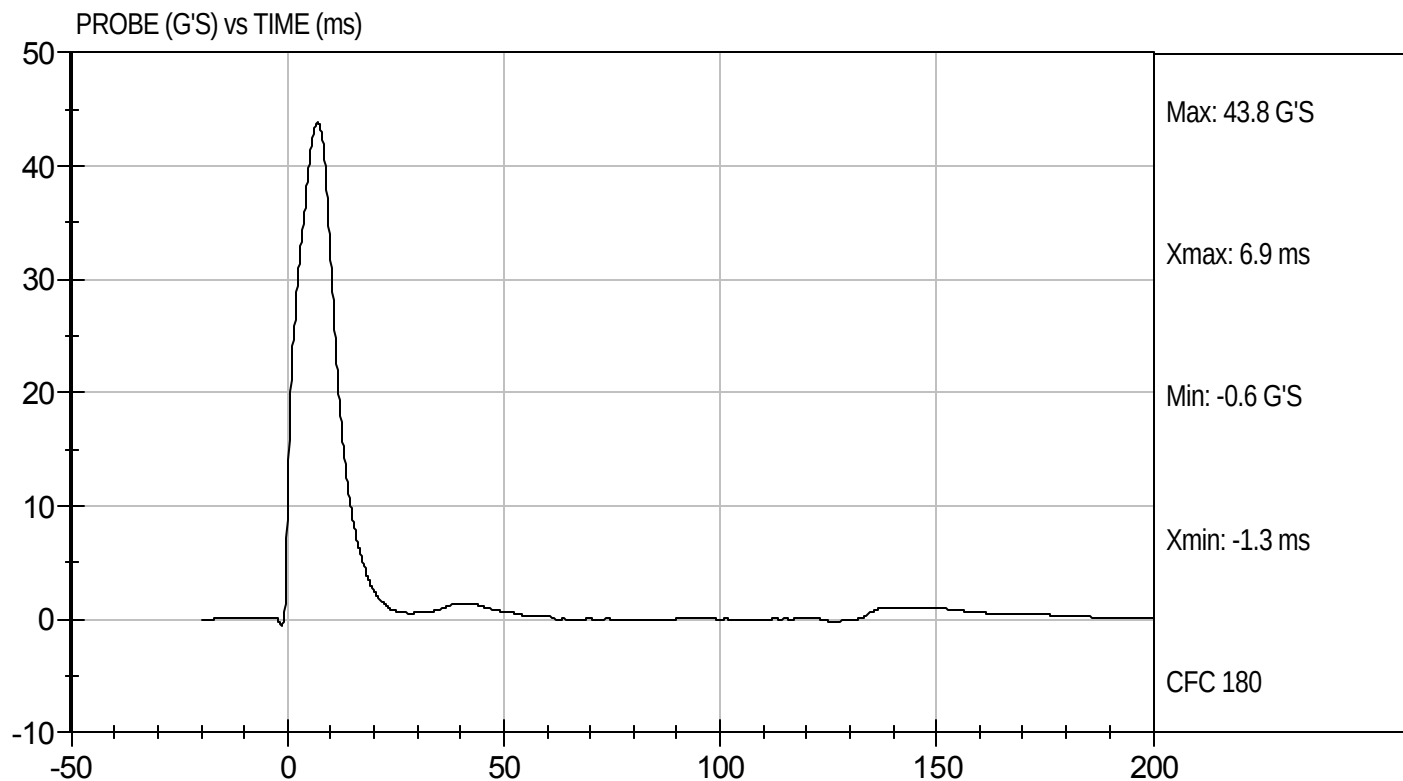
11/24/10
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D104147

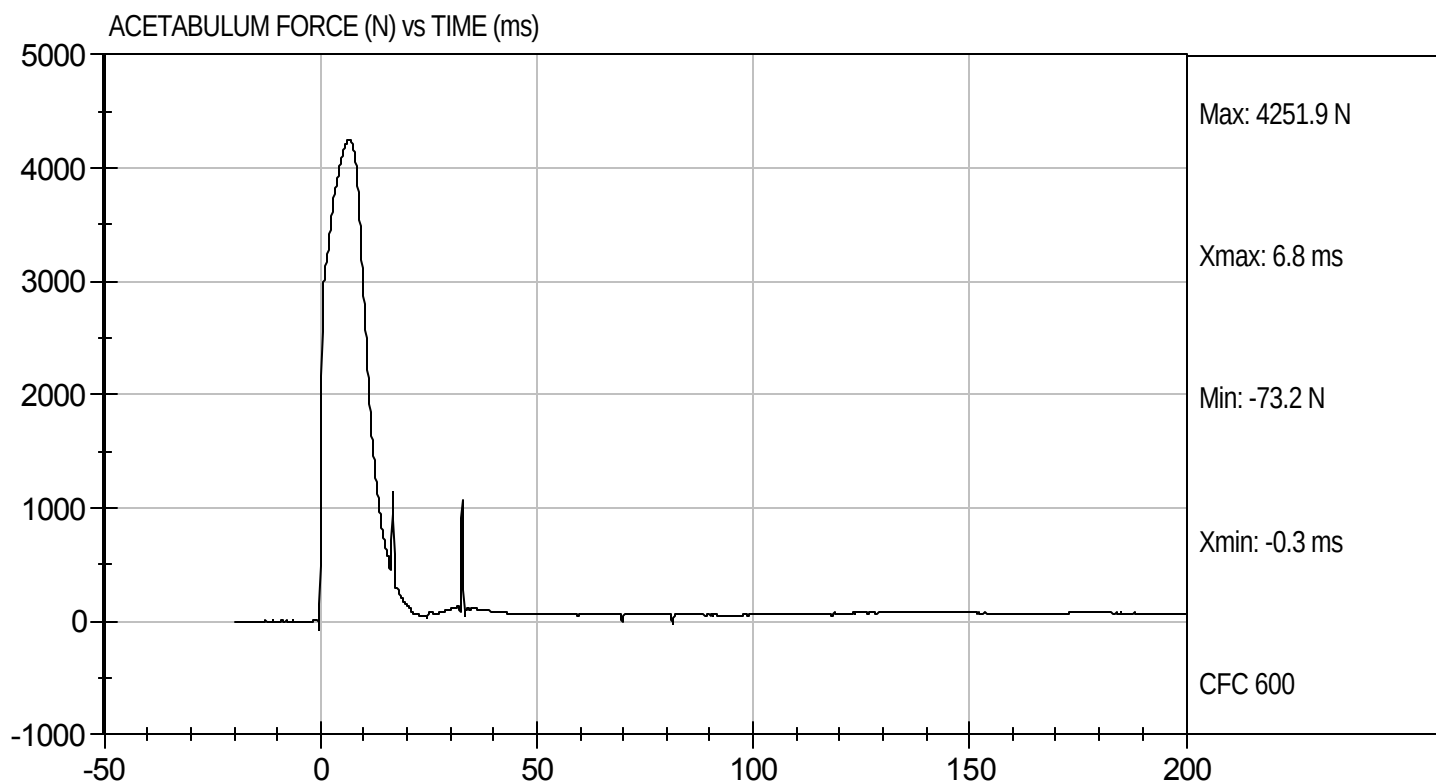
Test Date: 11/24/10
Velocity: 21.90 ft/s, 6.68 m/s





Test Desc: Pelvis Impact
Component ID: D104147

Test Date: 11/24/10
Velocity: 21.90 ft/s, 6.68 m/s



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

ATD Serial No: 296

Test I.D: D104148

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	20.8	Pass
Humidity	%	10 to 70	26	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	30	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4274	Pass
Overall Test Results				Pass


Laboratory Technician

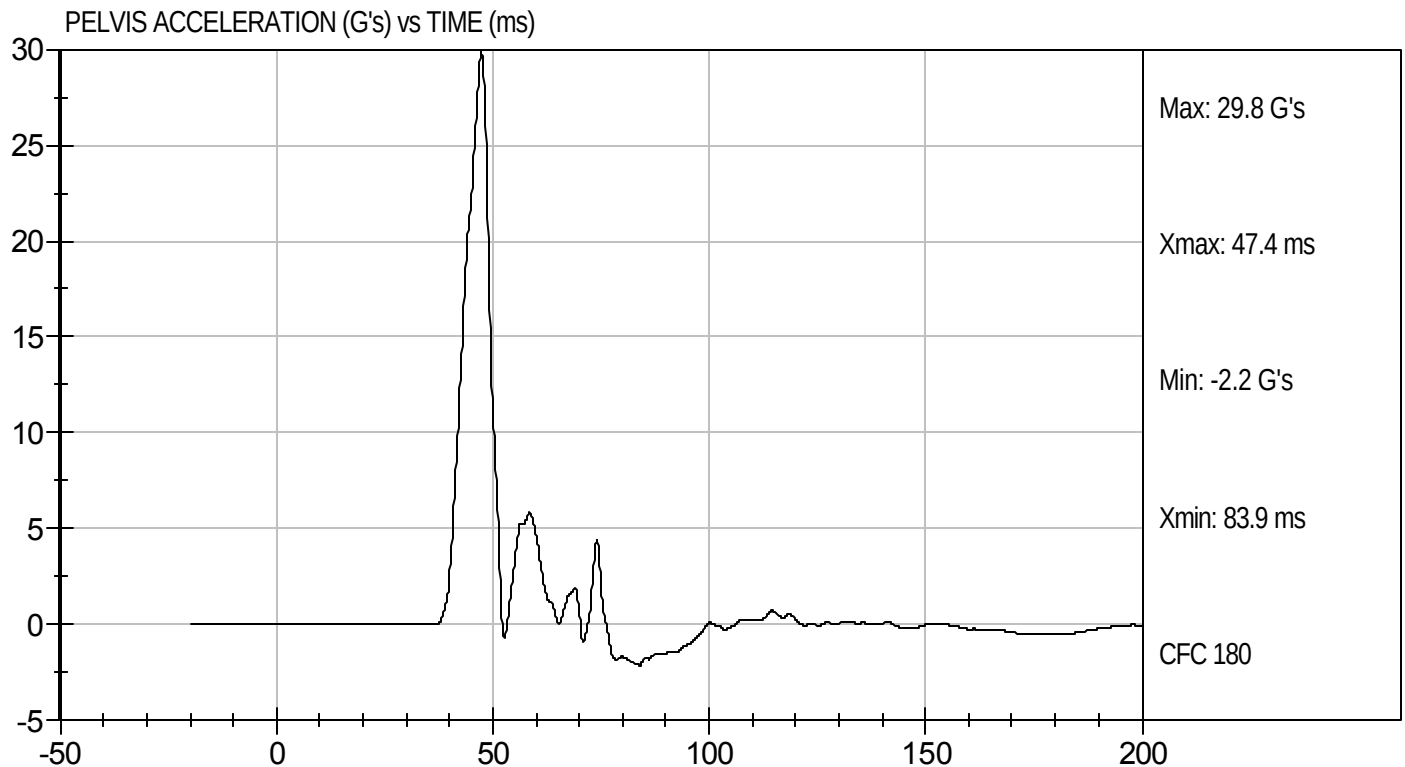
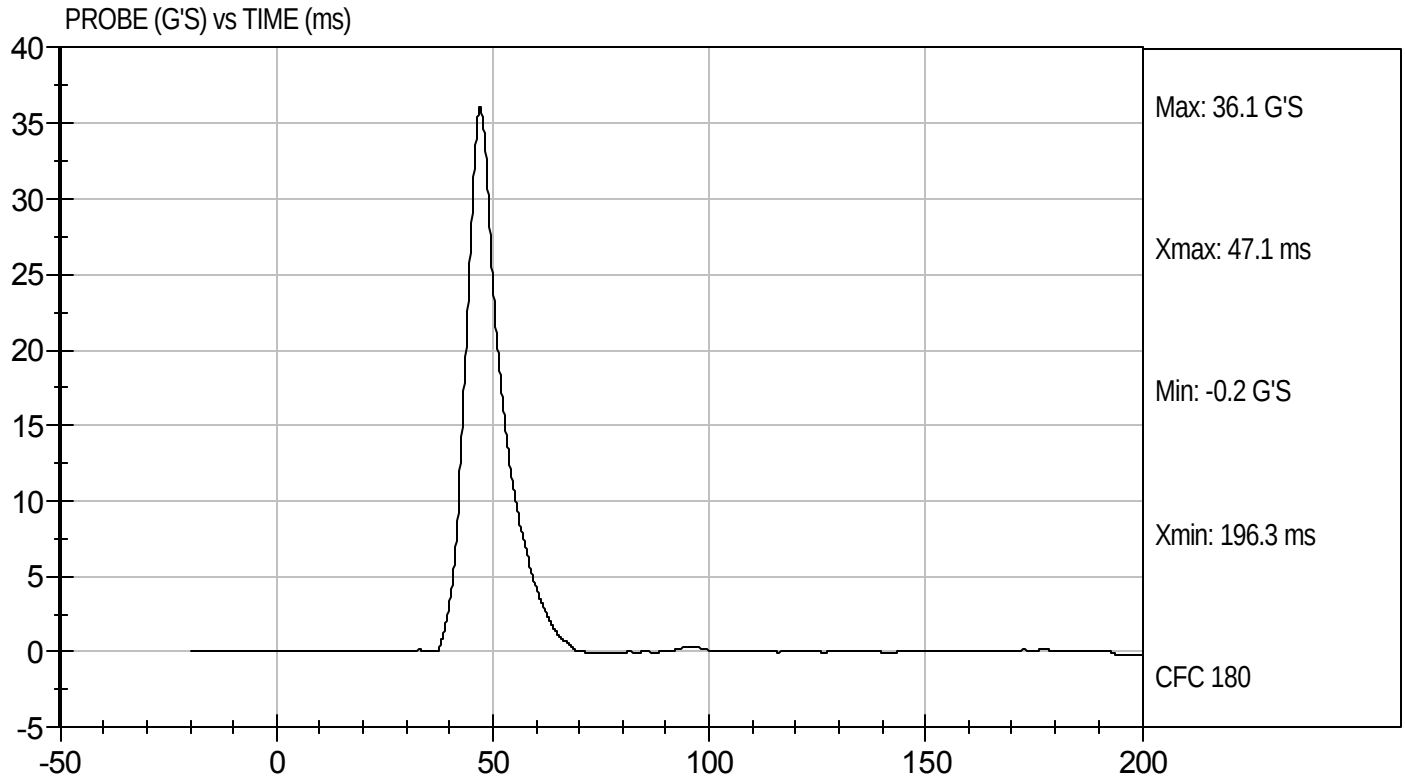
11/24/10
Test Date


Approved By



Test Desc: Iliac Impact
Component ID: D104148

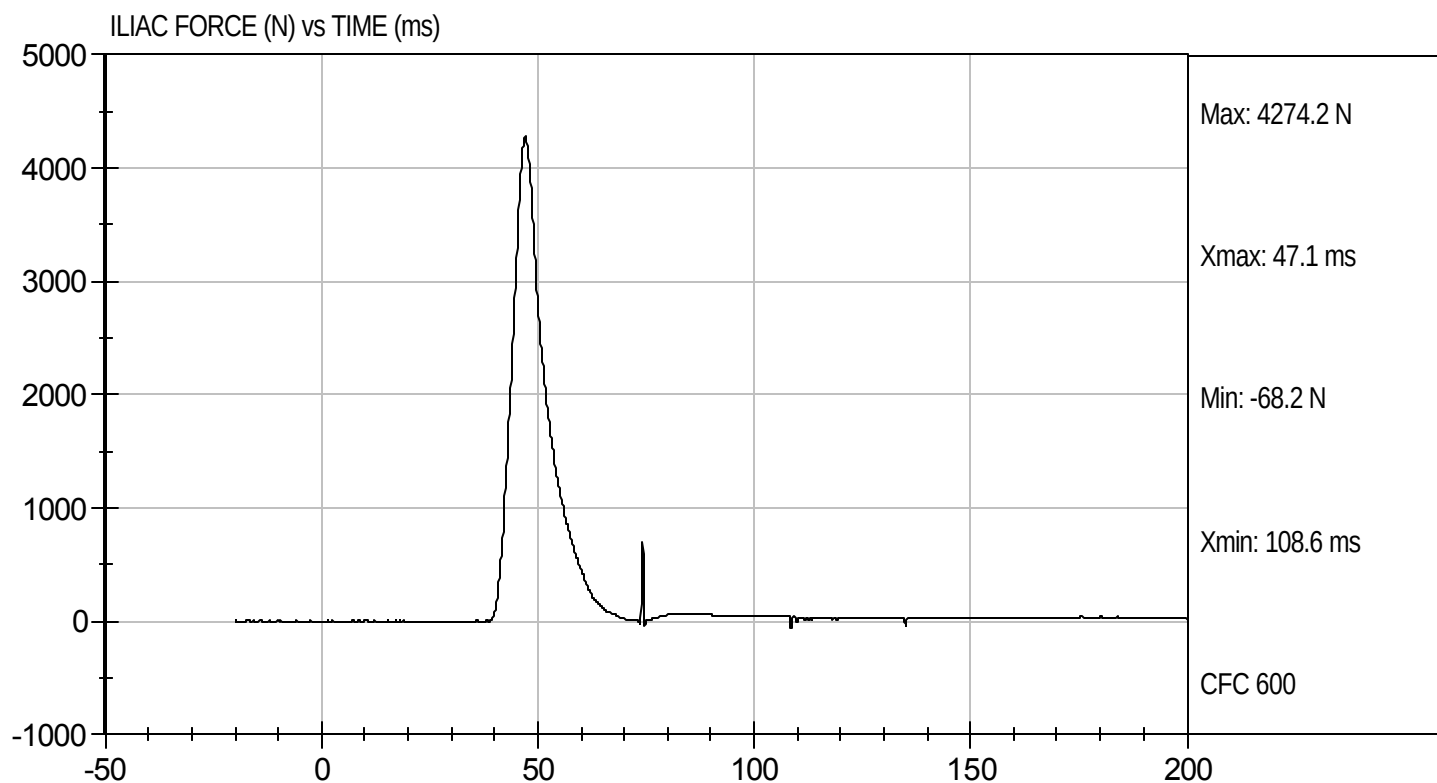
Test Date: 11/24/10
Velocity: 14.37 ft/s, 4.38 m/s





Test Desc: Iliac Impact
Component ID: D104148

Test Date: 11/24/10
Velocity: 14.37 ft/s, 4.38 m/s



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

ATD Serial No: 296

Test ID: D104221

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	19	Pass
Peak Resultant Acceleration	G's	115 to 137	124	Pass
Peak Lateral Acceleration	G's	+/- 15	-12.2	Pass
Unimodal	N/A	<15%	Yes	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

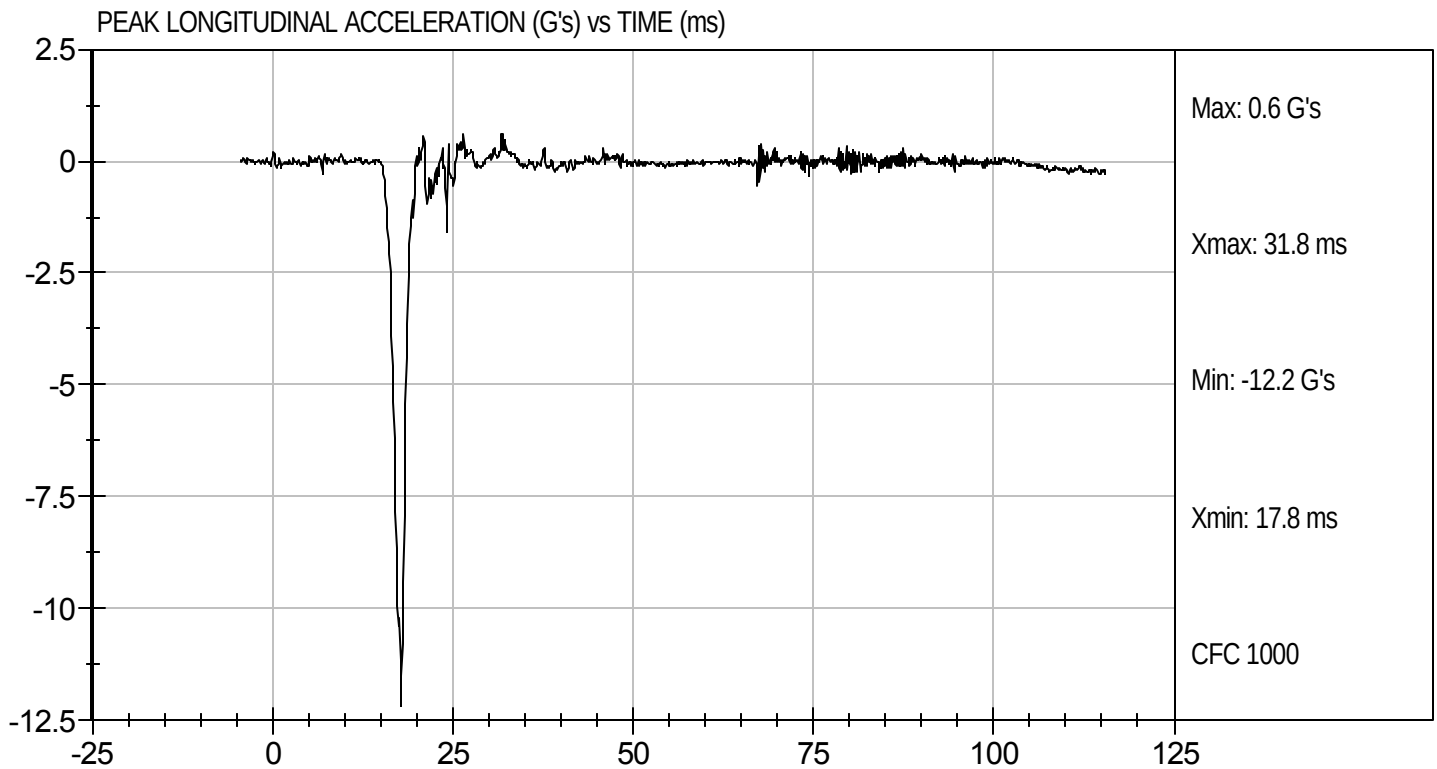
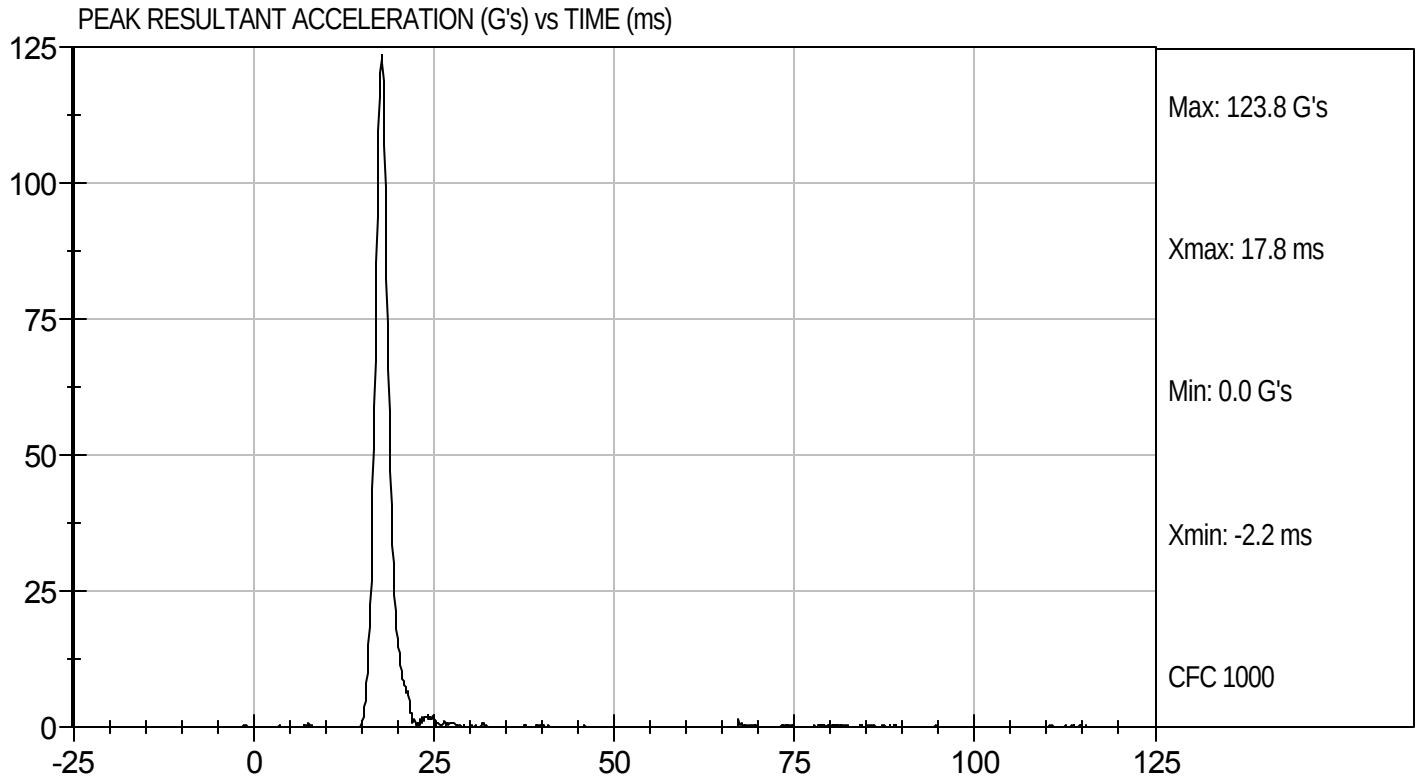
12/2/10
Test Date

David Winkelbauer
Approved By



Test Desc: Head Drop
Component ID: D104221

Test Date: 12/2/10
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: D104222

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	22.0	Pass
Humidity		%	10 to 70	18	Pass
Impact Velocity		m/s	5.51 to 5.63	5.58	Pass
Delta Velocity	10 ms	m/s	2.20 to 2.80	2.44	Pass
	15 ms	m/s	3.30 to 4.10	3.40	Pass
	20 ms	m/s	4.40 to 5.40	4.53	Pass
	25 ms	m/s	5.40 to 6.10	5.54	Pass
	25-100 ms	m/s	5.50 to 6.20	5.57	Pass
Maximum D-Plane Rotation		deg	71 to 81	72	Pass
Time of Maximum D-Plane Rotation		ms	50 to 70	63	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	118	Pass
Overall Test Results				Pass	


 Laboratory Technician

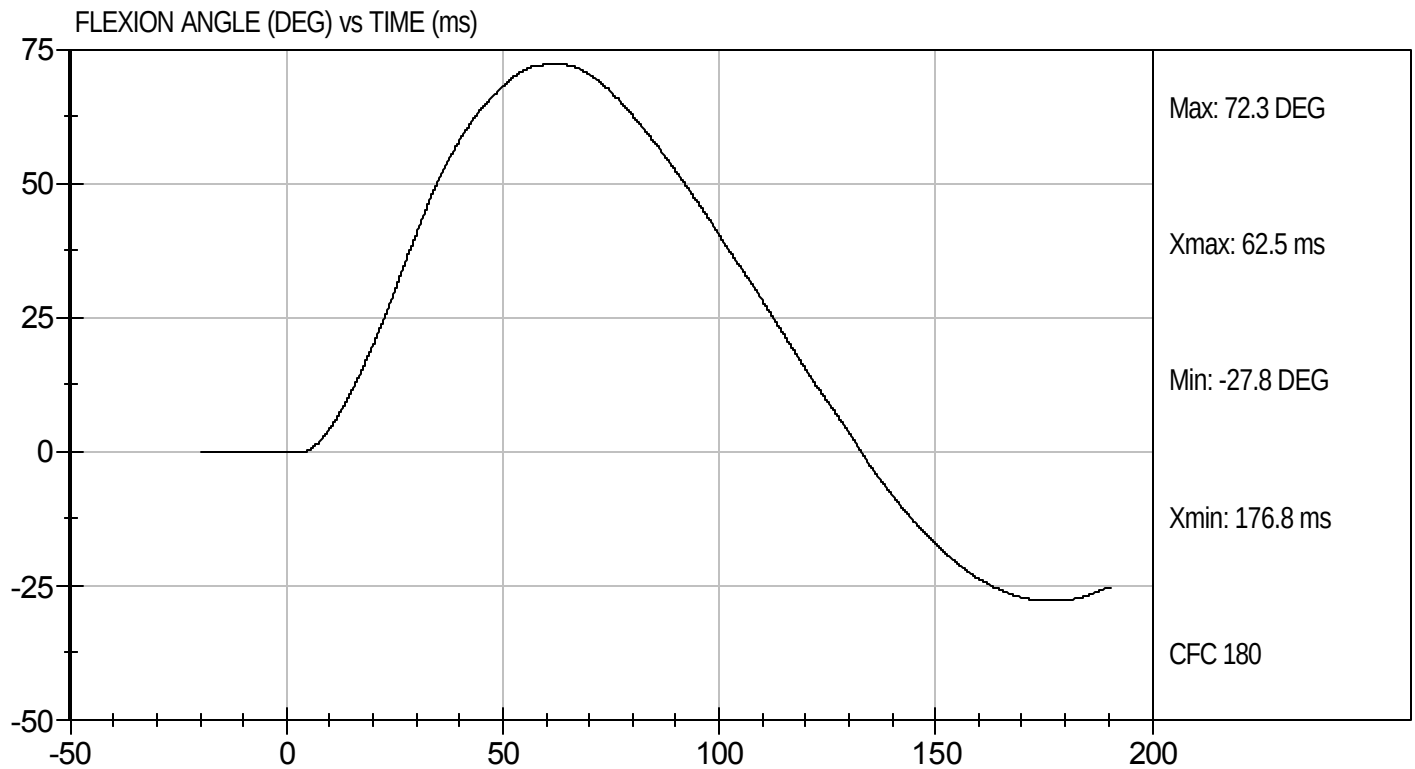
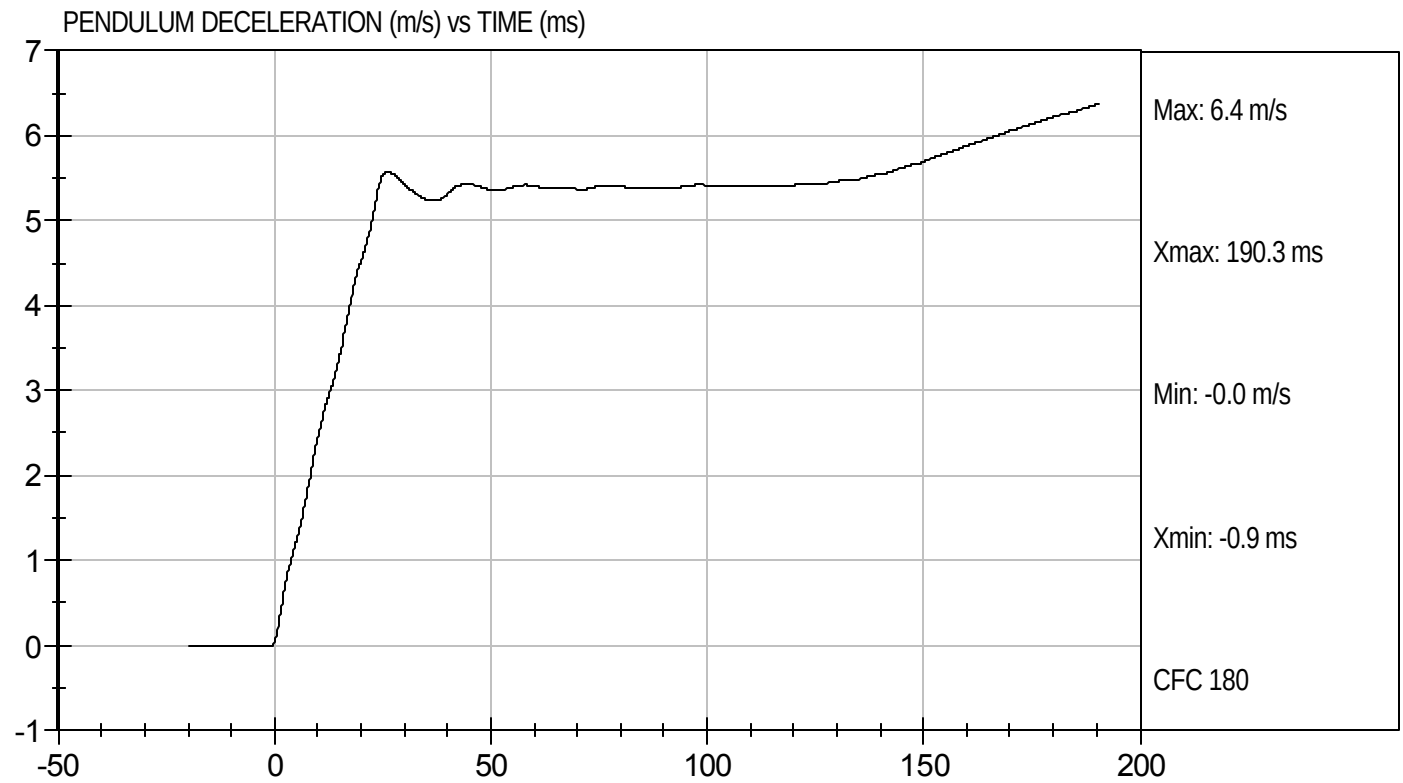
12/2/10
 Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D104222

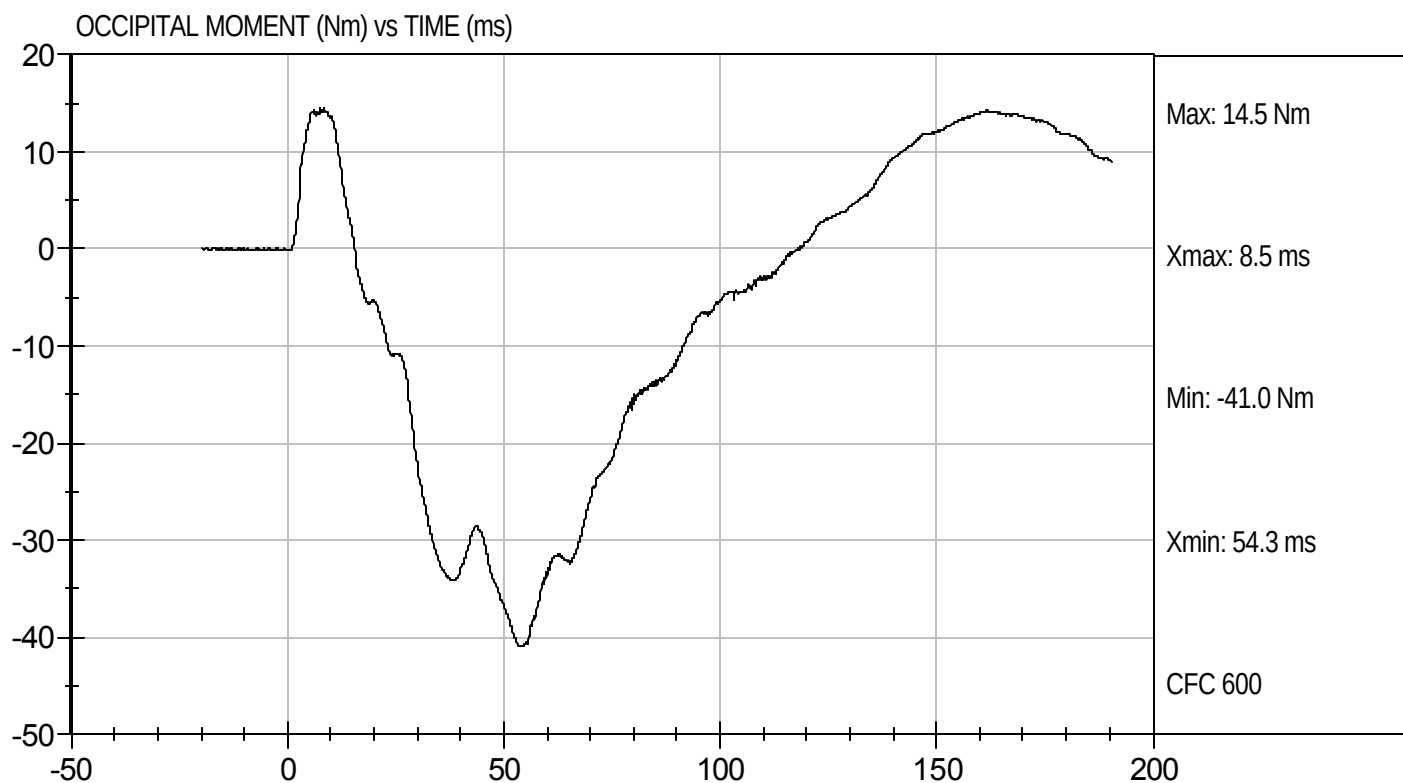
Test Date: 12/2/10
Velocity: 18.32 ft/s, 5.58 m/s





Test Desc: Neck Bending
Component ID: D104222

Test Date: 12/2/10
Velocity: 18.32 ft/s, 5.58 m/s



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

ATD Serial No: 296

Test ID: D104223

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	18	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Maximum Probe Acceleration	G's	13 to 18	16	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

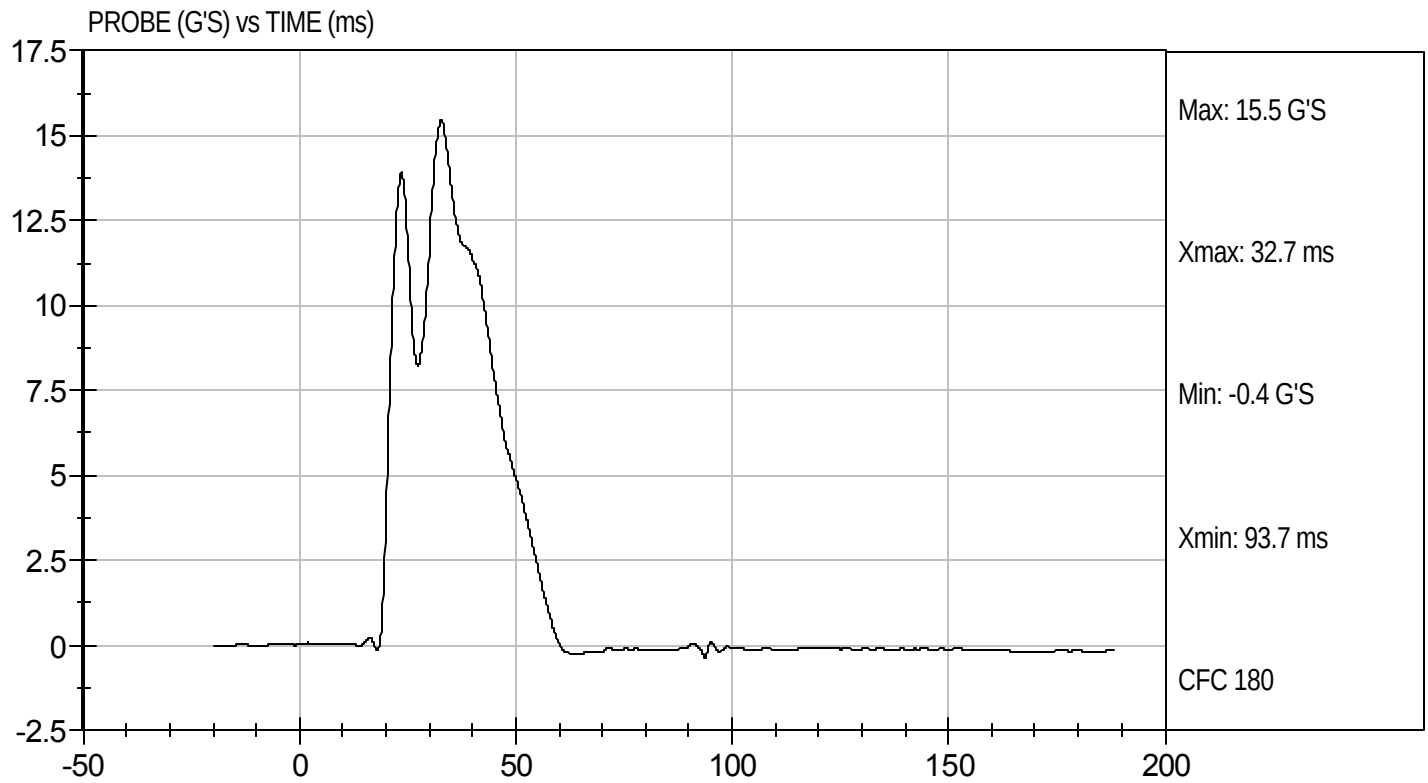
12/2/10
Test Date


Approved By



Test Desc: Shoulder Impact
Component ID: D104223

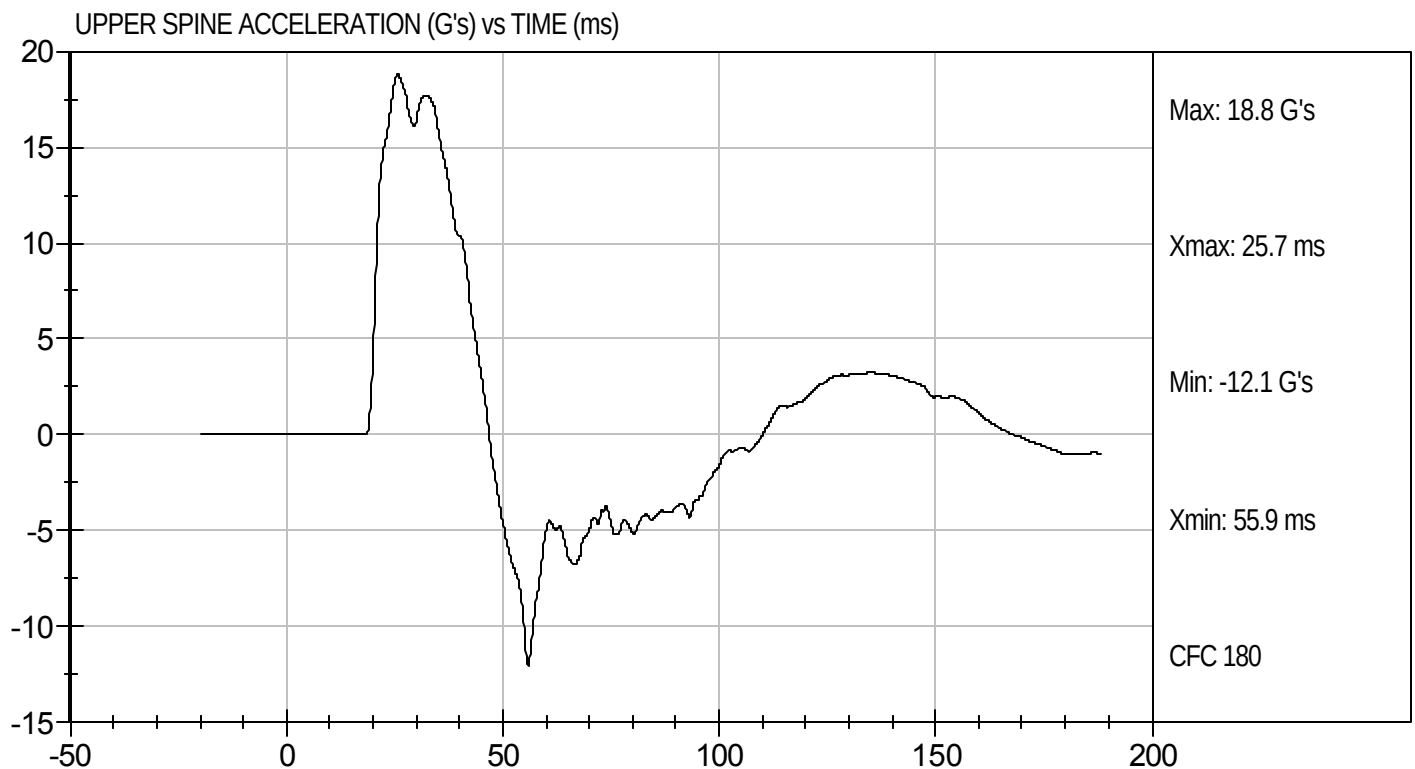
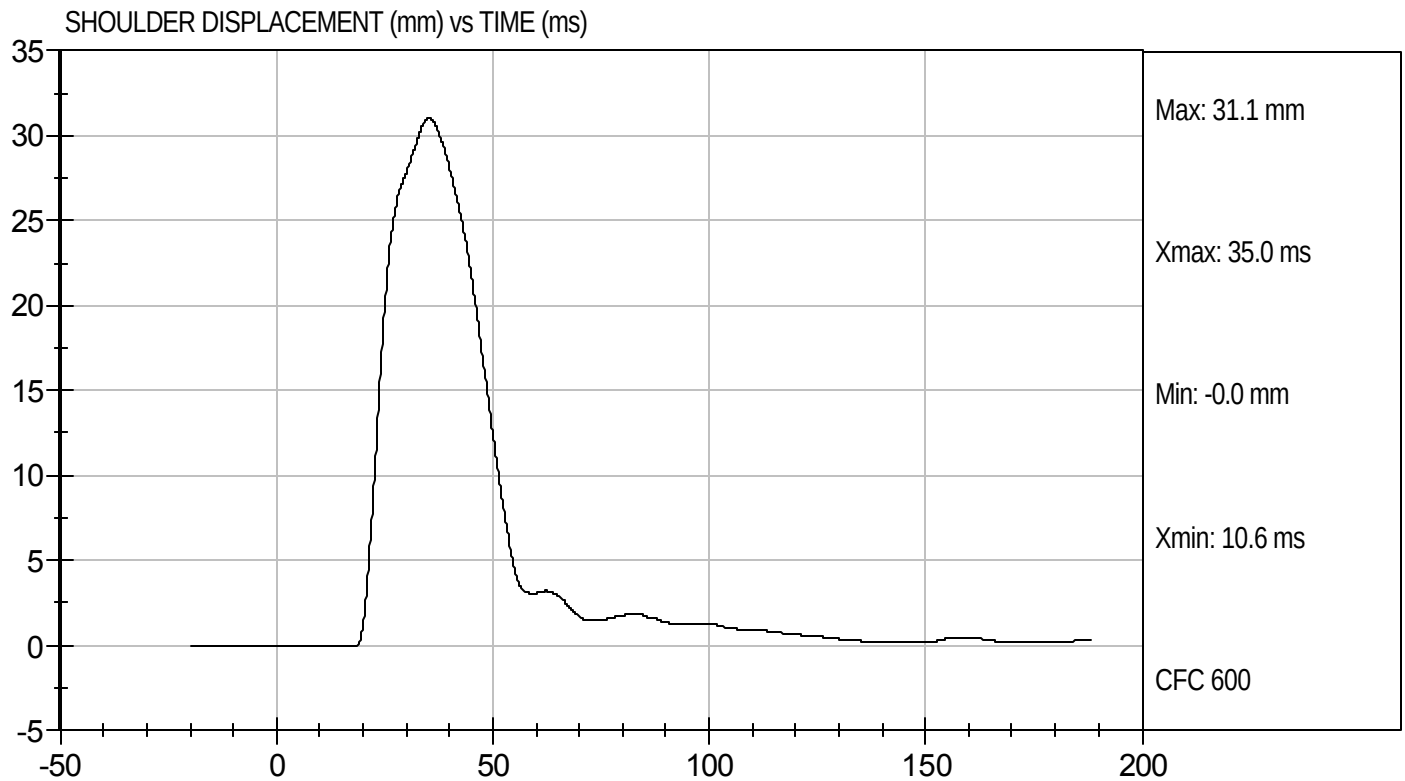
Test Date: 12/2/10
Velocity: 14.37 ft/s, 4.38 m/s





Test Desc: Shoulder Impact
Component ID: D104223

Test Date: 12/2/10
Velocity: 14.37 ft/s, 4.38 m/s



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

ATD Serial No: 296

Test I.D: D104224

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	22.0	Pass
Humidity	%	10 to 70	18	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	33	Pass
Upper Rib Displacement	mm	25 to 32	29	Pass
Middle Rib Displacement	mm	30 to 36	31	Pass
Lower Rib Displacement	mm	32 to 38	34	Pass
Upper Spine (T1) Y Acceleration	G's	34 to 43	38	Pass
Lower Spine (T12) Y Acceleration	G's	29 to 37	32	Pass
Overall Test Results			Pass	

Jessica Gall
Laboratory Technician

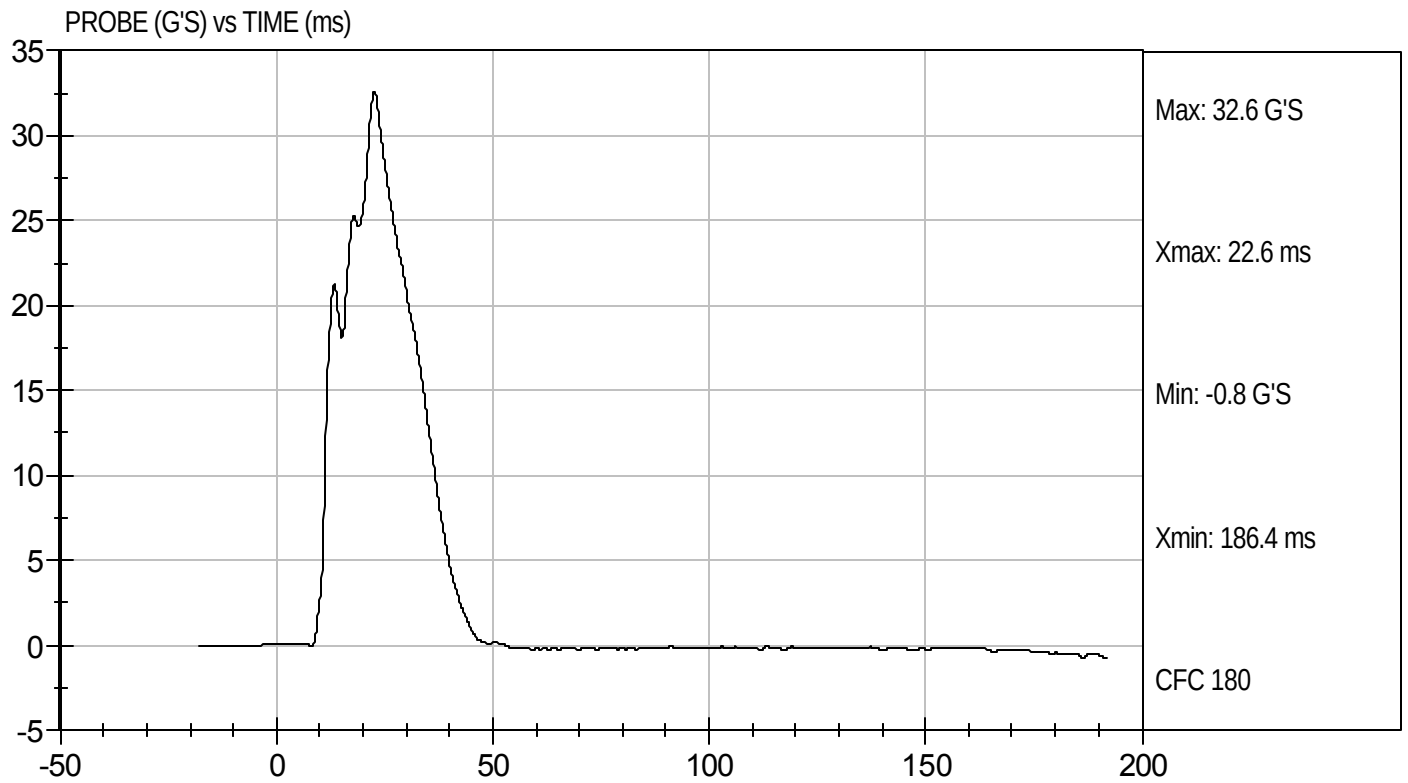
12/2/10
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax With Arm
Component ID: D104224

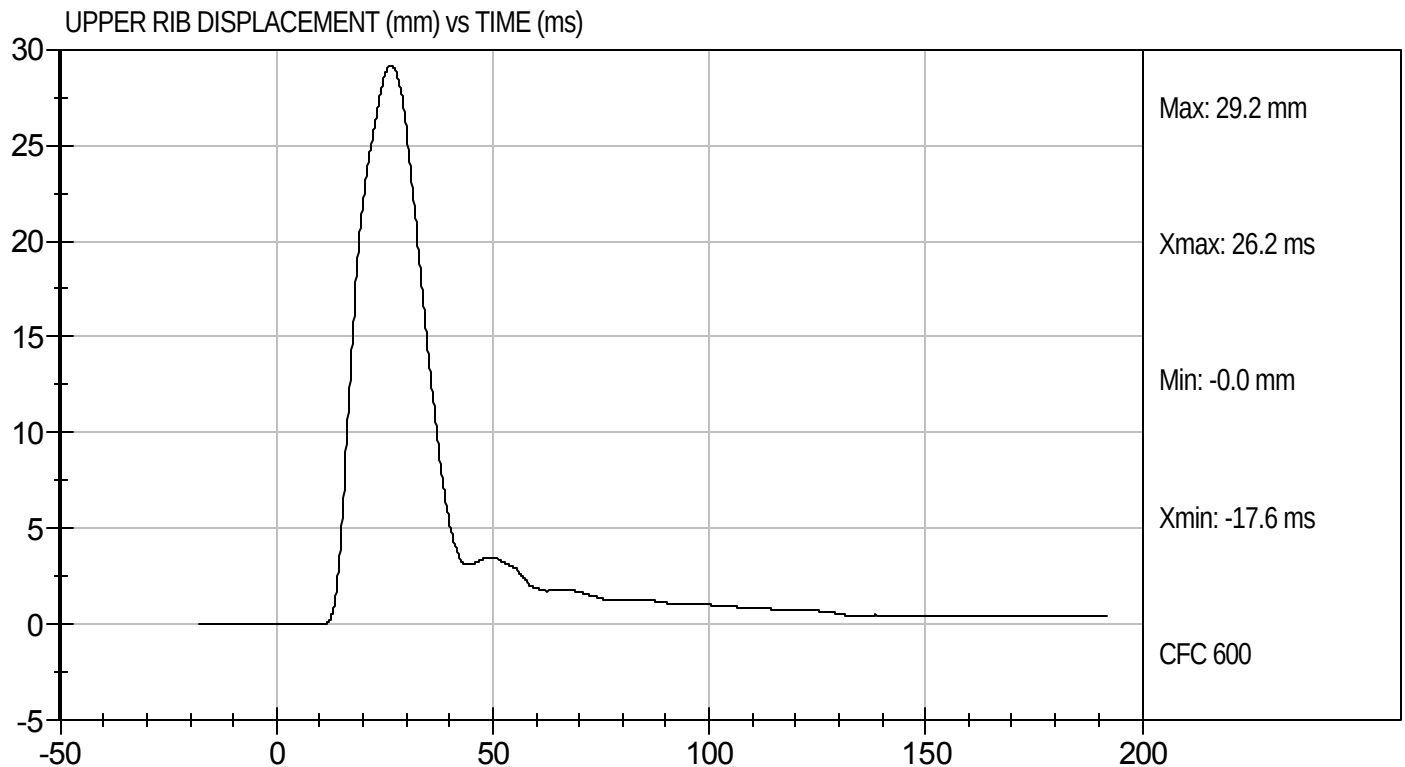
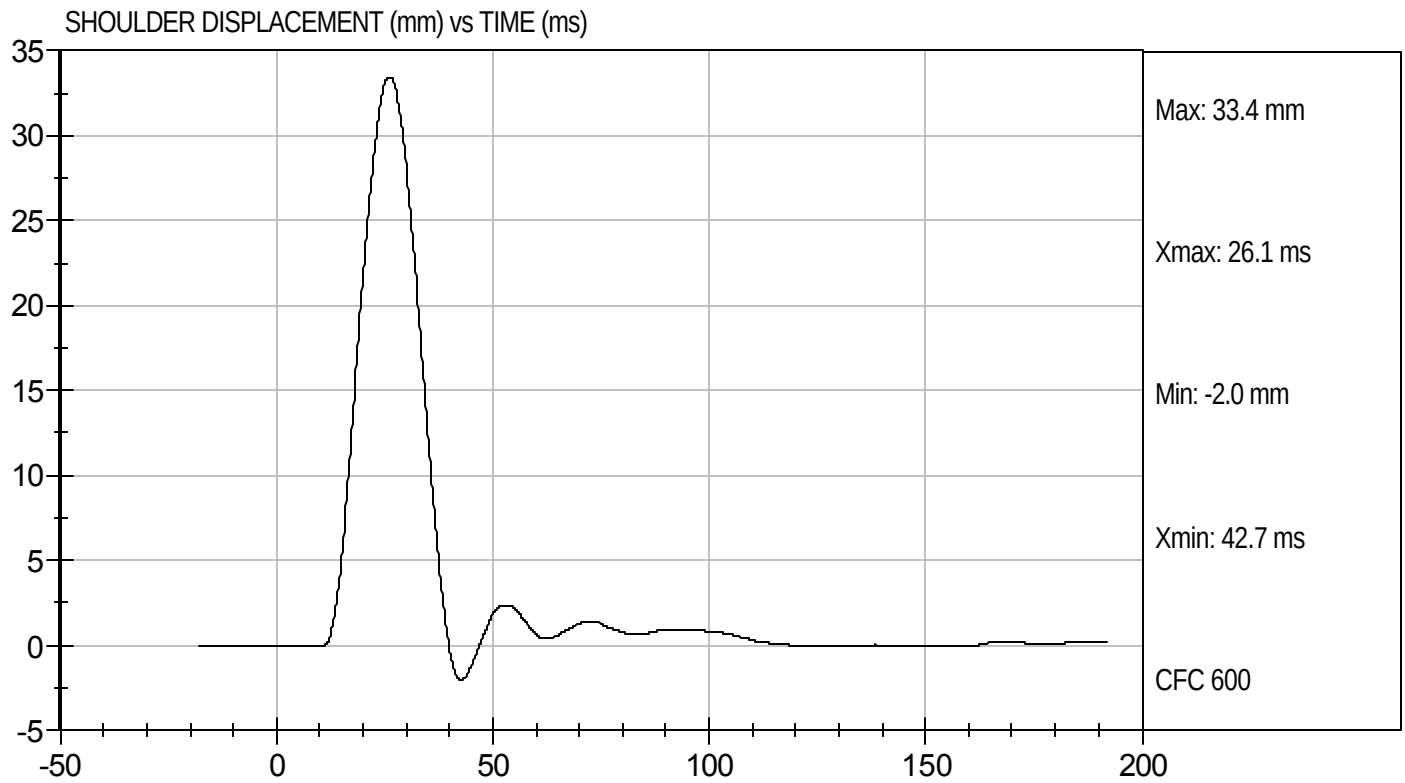
Test Date: 12/2/10
Velocity: 21.93 ft/s, 6.68 m/s





Test Desc: Thorax With Arm
Component ID: D104224

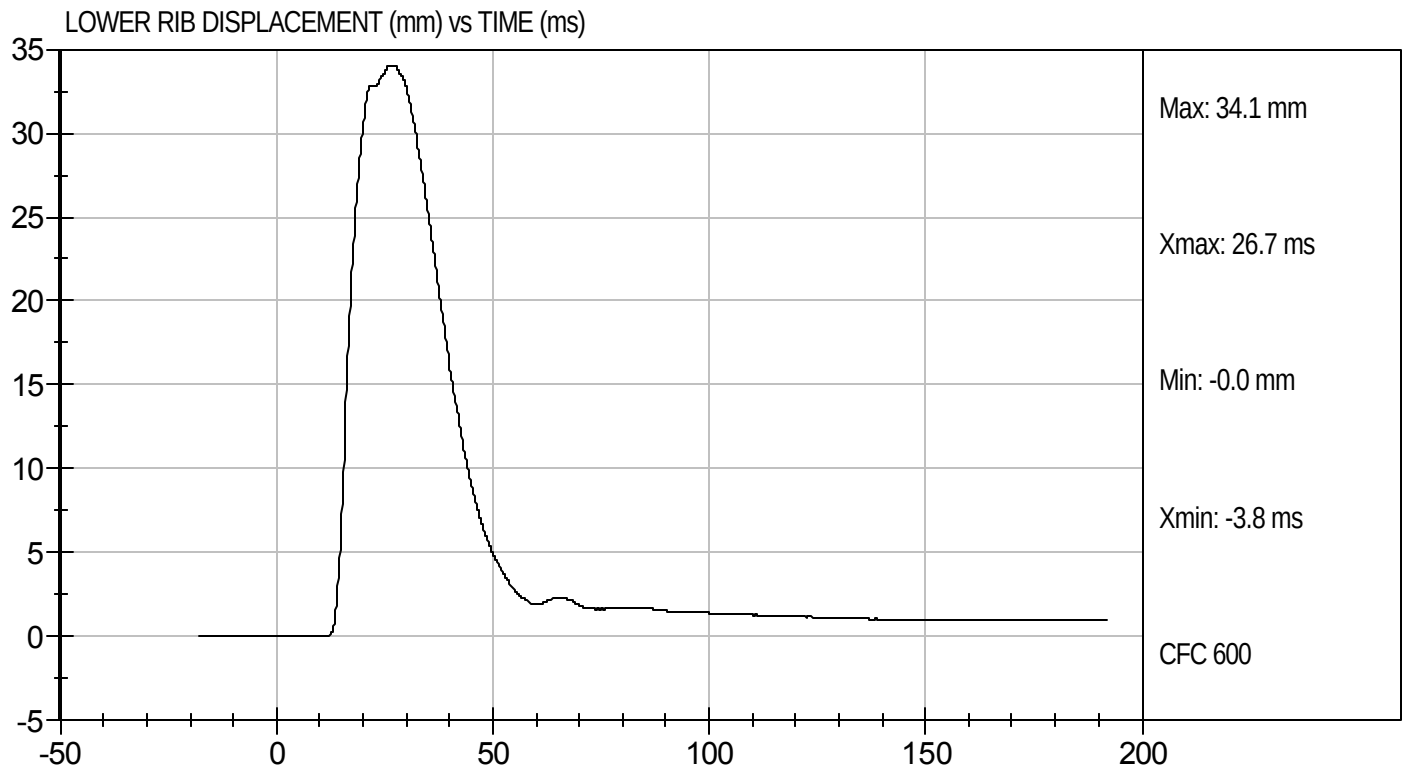
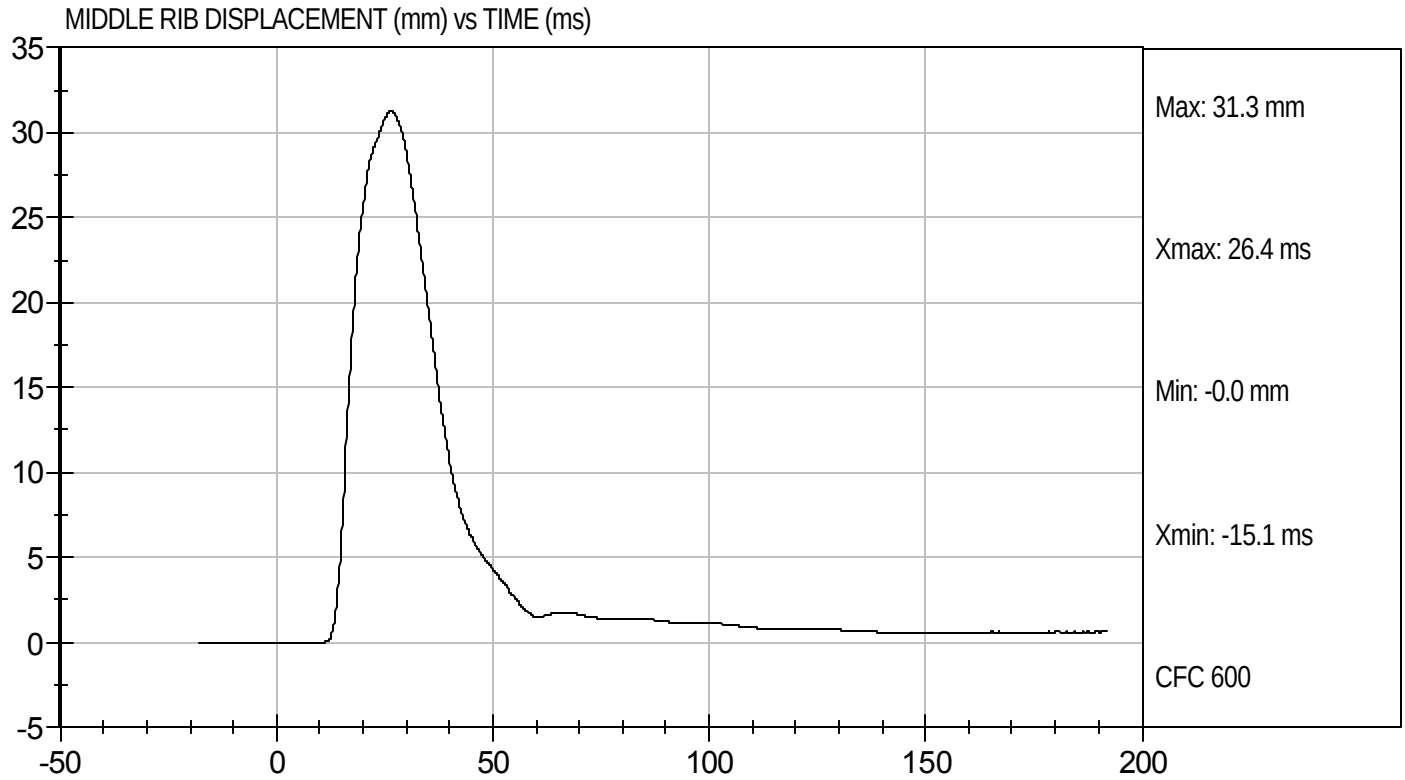
Test Date: 12/2/10
Velocity: 21.93 ft/s, 6.68 m/s





Test Desc: Thorax With Arm
Component ID: D104224

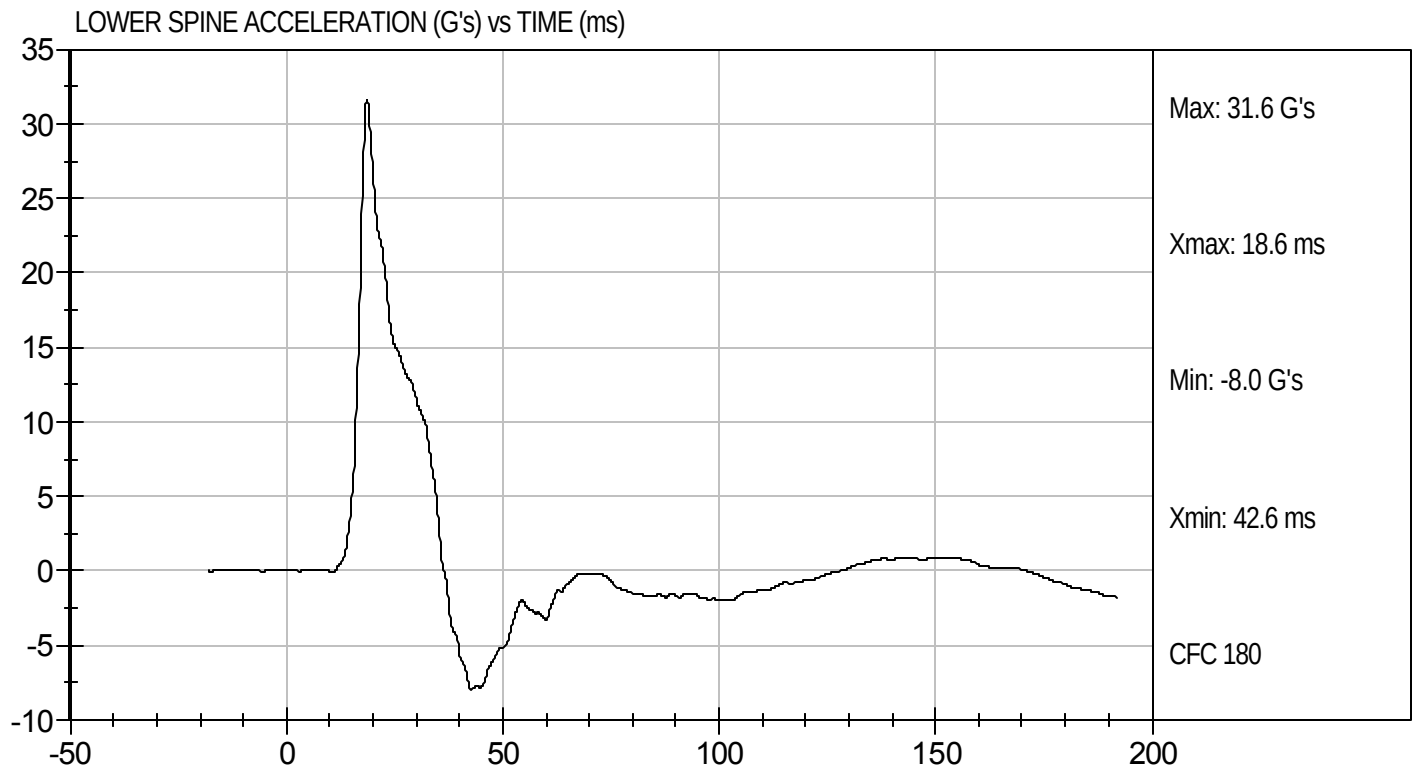
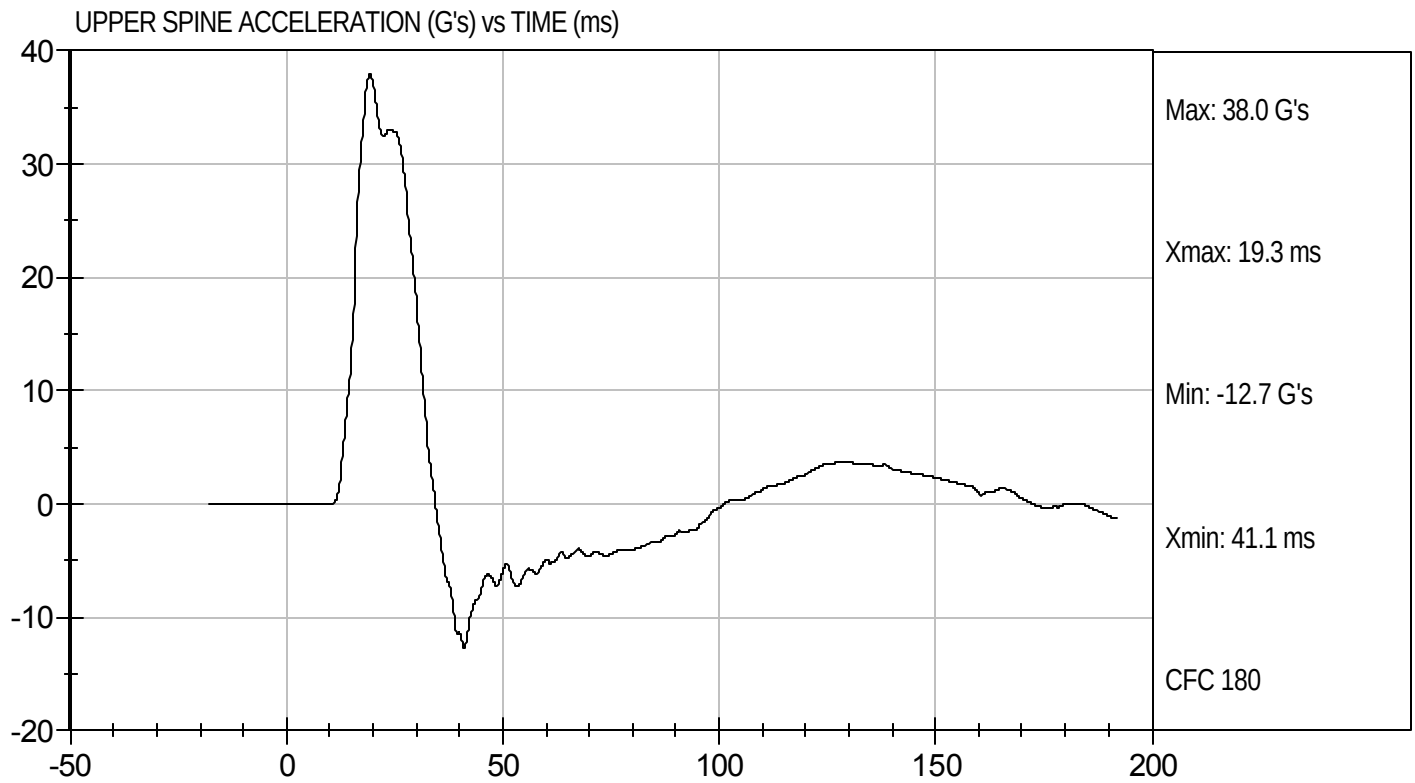
Test Date: 12/2/10
Velocity: 21.93 ft/s, 6.68 m/s





Test Desc: Thorax With Arm
Component ID: D104224

Test Date: 12/2/10
Velocity: 21.93 ft/s, 6.68 m/s

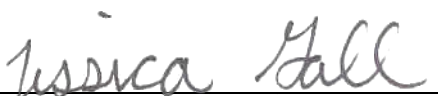


MGA RESEARCH CORPORATION
THORAX (WITHOUT ARM) IMPACT TEST
SID-IIs BUILD LEVEL D DUMMY

ATD Serial No: 296

Test I.D: D104225

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	17	Pass
Impact Velocity	m/s	4.20 to 4.40	4.34	Pass
Peak Impactor Force	G's	14 to 18	16	Pass
Upper Rib Displacement	mm	32 to 40	39	Pass
Middle Rib Displacement	mm	39 to 45	43	Pass
Lower Rib Displacement	mm	35 to 43	42	Pass
Upper Spine (T1) Y Acceleration	G's	13 to 17	14	Pass
Lower Spine (T12) Y Acceleration	G's	7 to 11	10	Pass
Overall Test Results			Pass	


Laboratory Technician

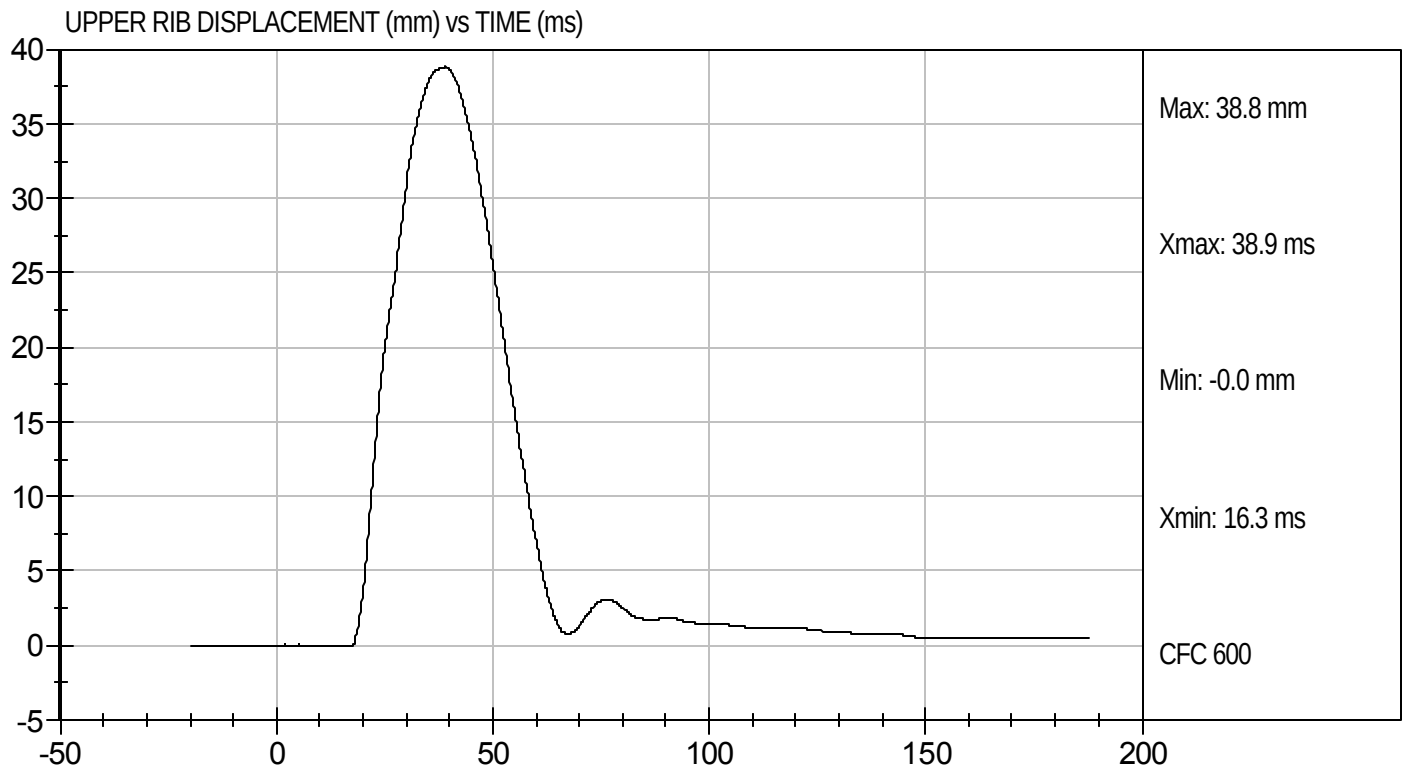
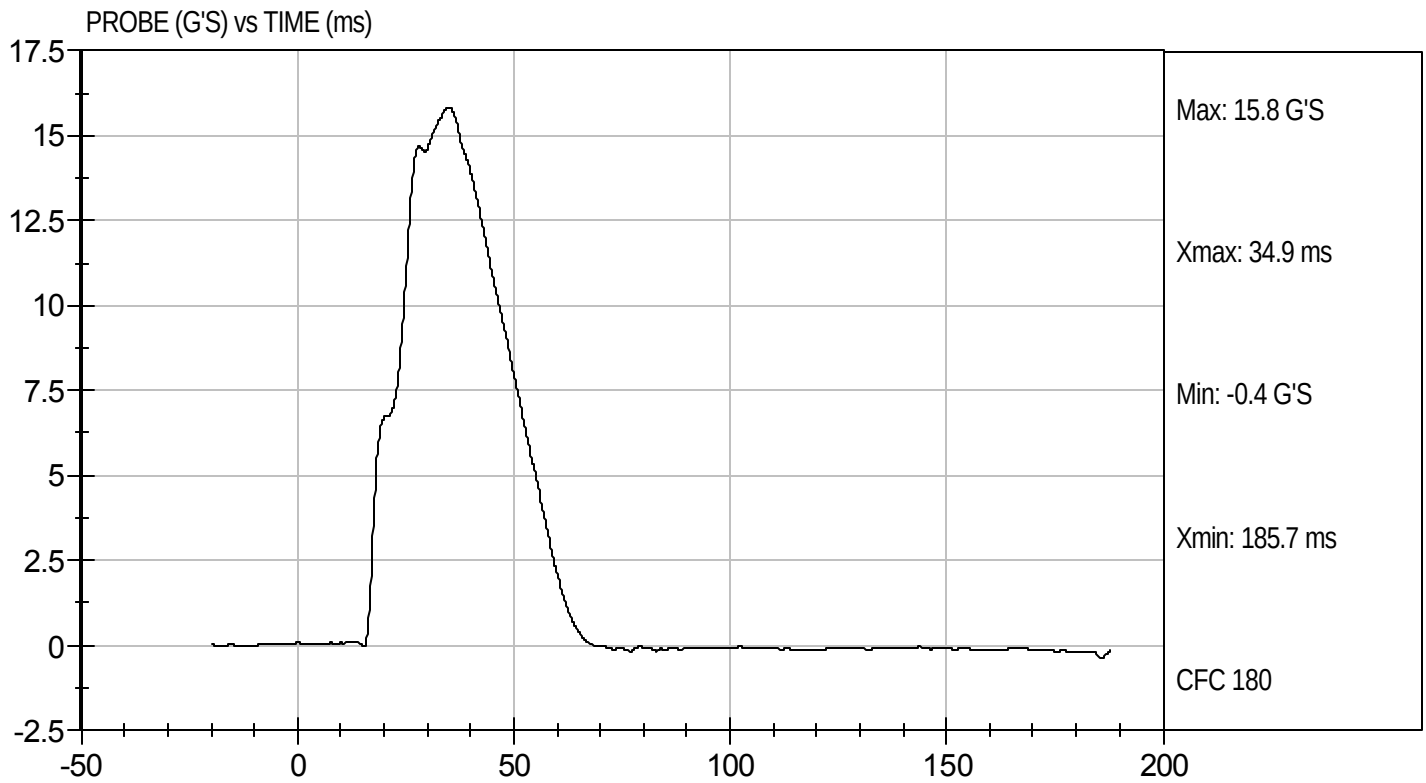
12/2/10
Test Date


Approved By



Test Desc: Thorax Without Arm
Component ID: D104225

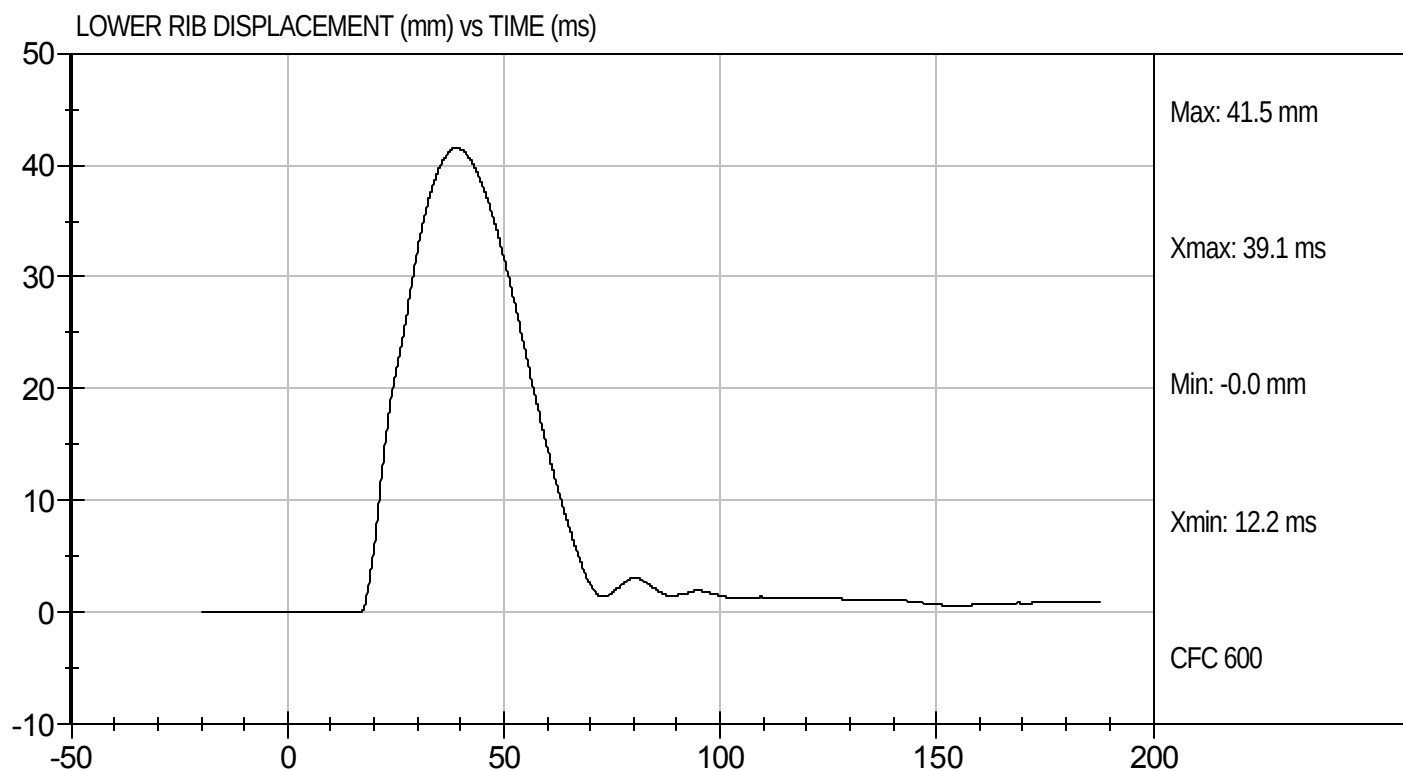
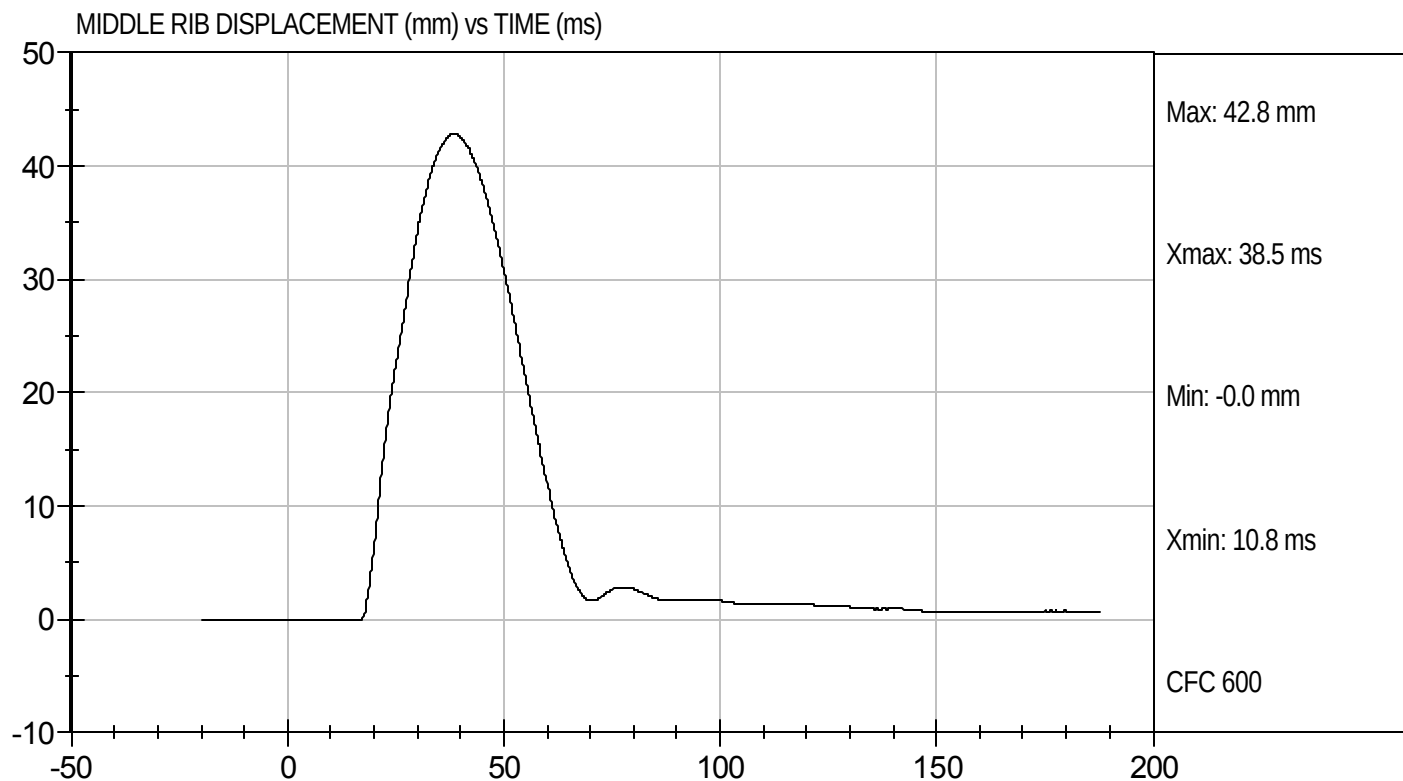
Test Date: 12/2/10
Velocity: 14.25 ft/s, 4.34 m/s





Test Desc: Thorax Without Arm
Component ID: D104225

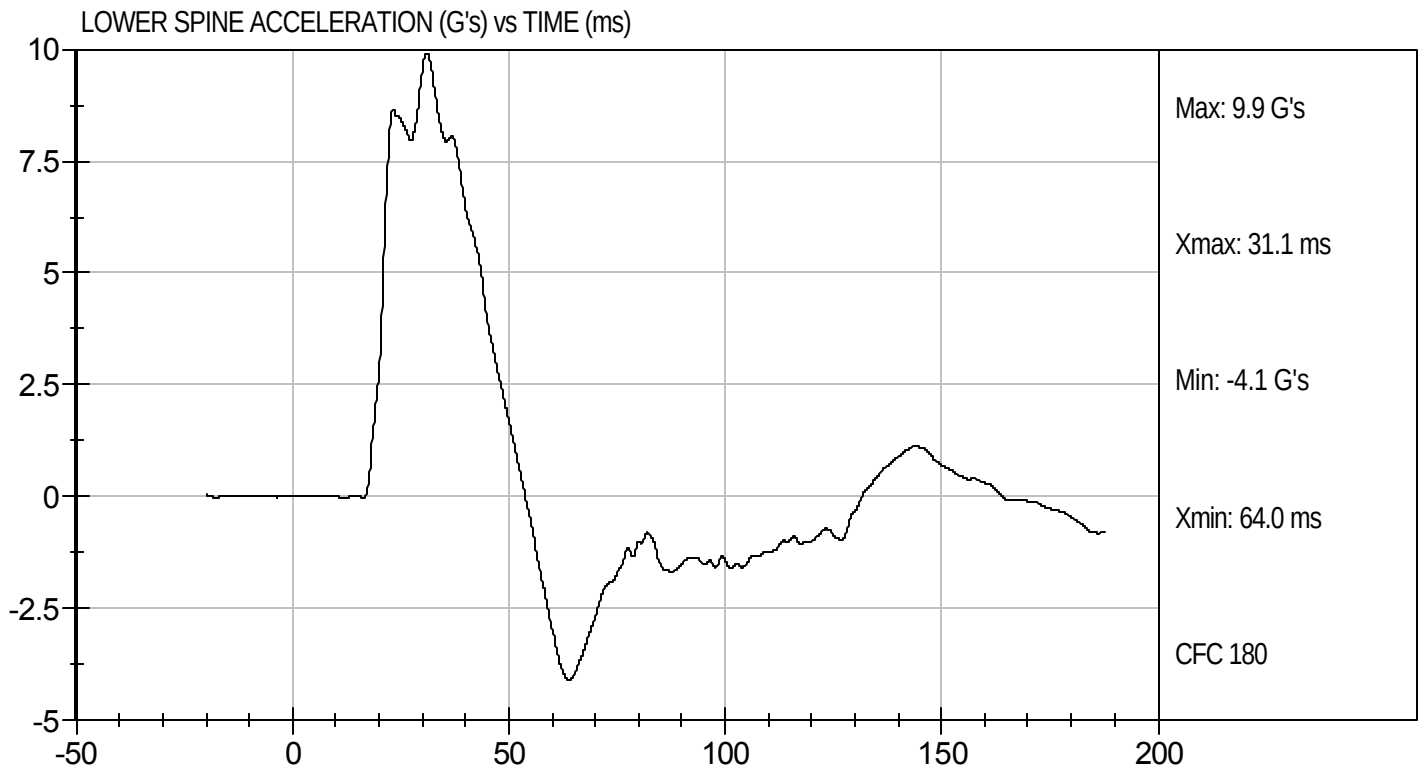
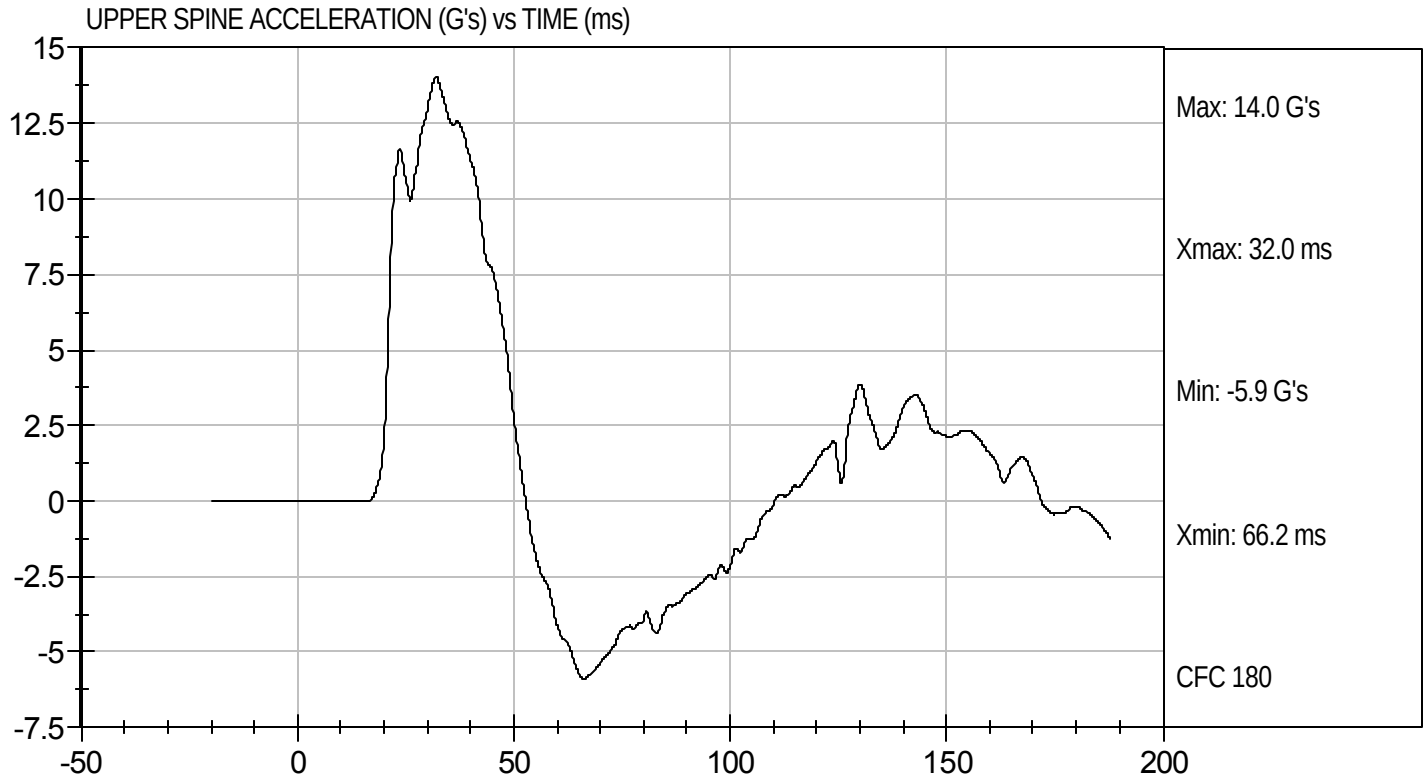
Test Date: 12/2/10
Velocity: 14.25 ft/s, 4.34 m/s





Test Desc: Thorax Without Arm
Component ID: D104225

Test Date: 12/2/10
Velocity: 14.25 ft/s, 4.34 m/s



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

ATD Serial No: 296

Test I.D: D104226

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	17	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	42	Pass
Lower Rib Displacement	mm	33 to 44	40	Pass
Lower Spine (T12) Y Acceleration	G's	9 to 14	11	Pass
			Overall Test Results	Pass


Laboratory Technician

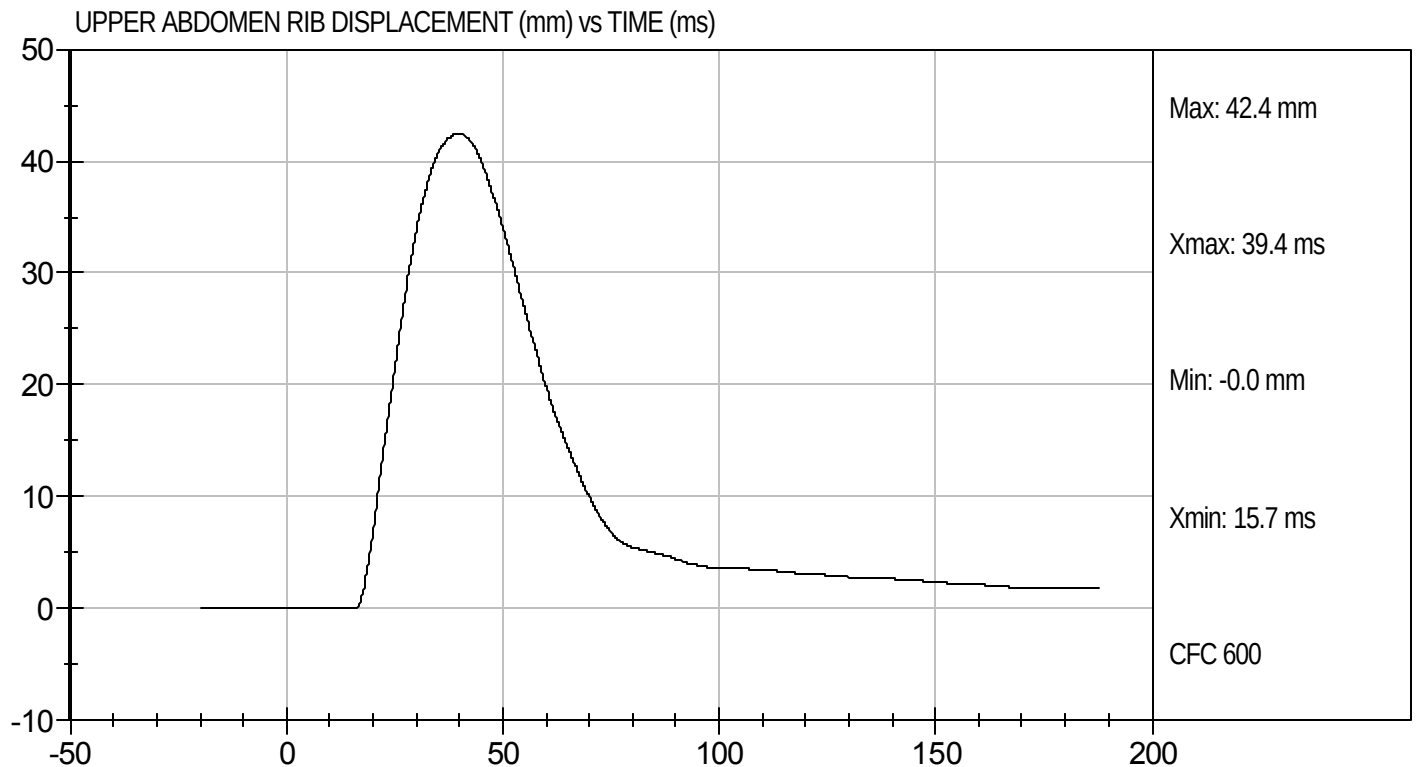
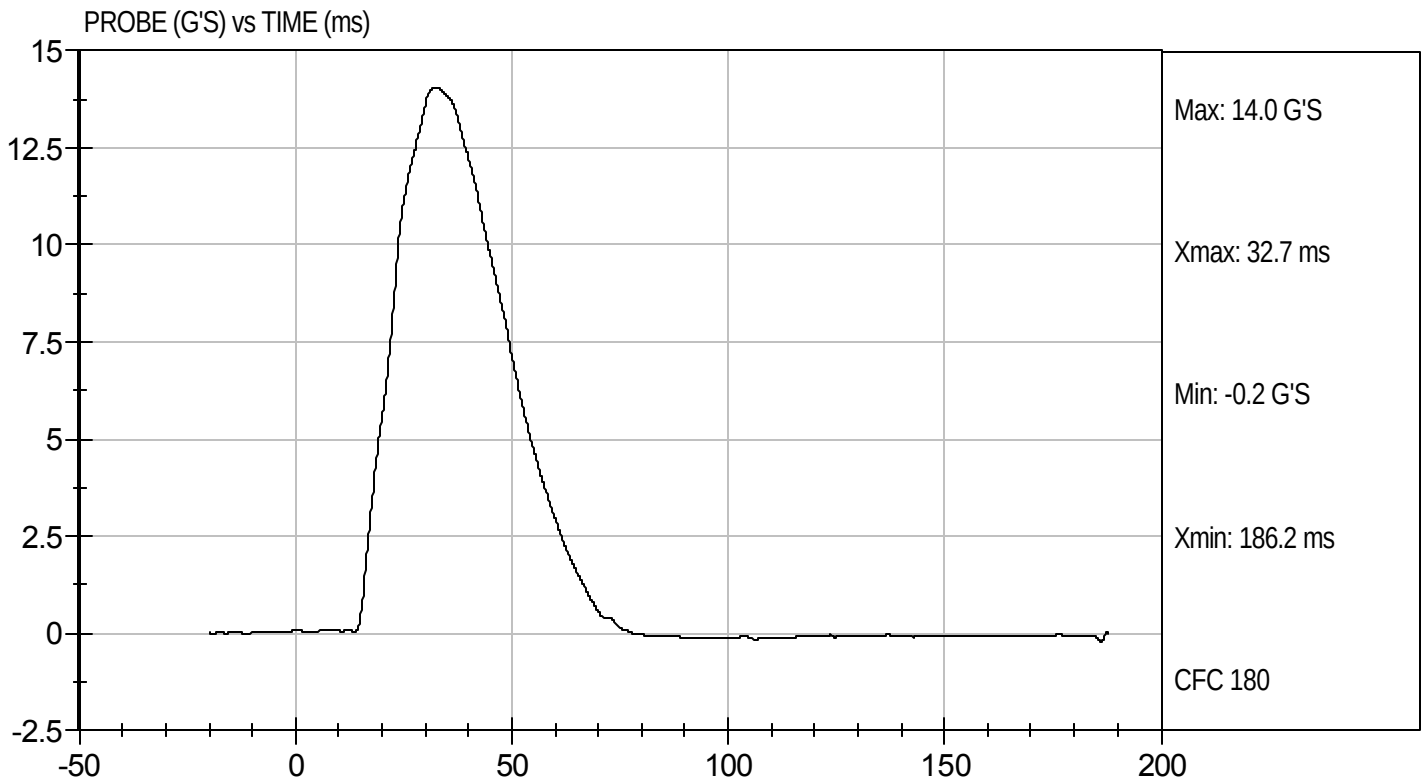
12/2/10
Test Date


Approved By



Test Desc: Abdomen Impact
Component ID: D104226

Test Date: 12/2/10
Velocity: 14.37 ft/s, 4.38 m/s

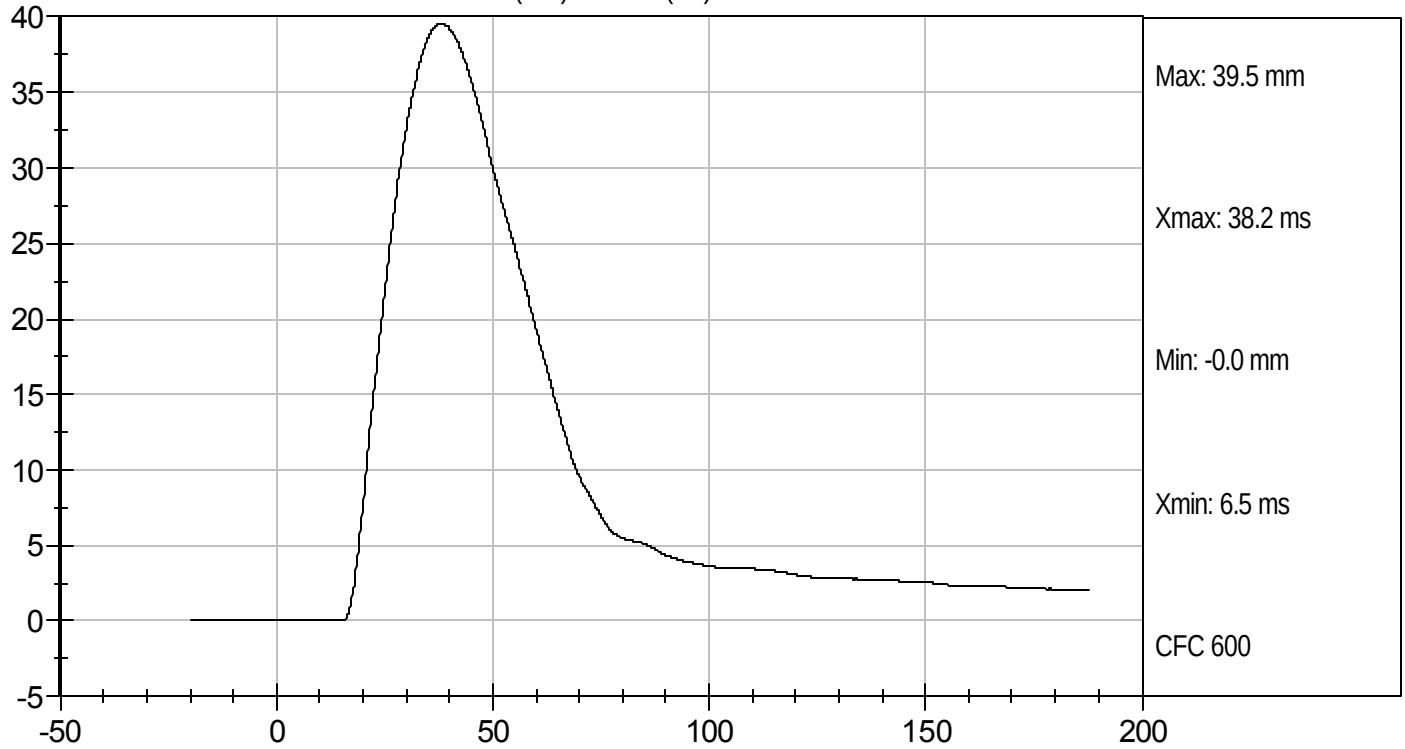




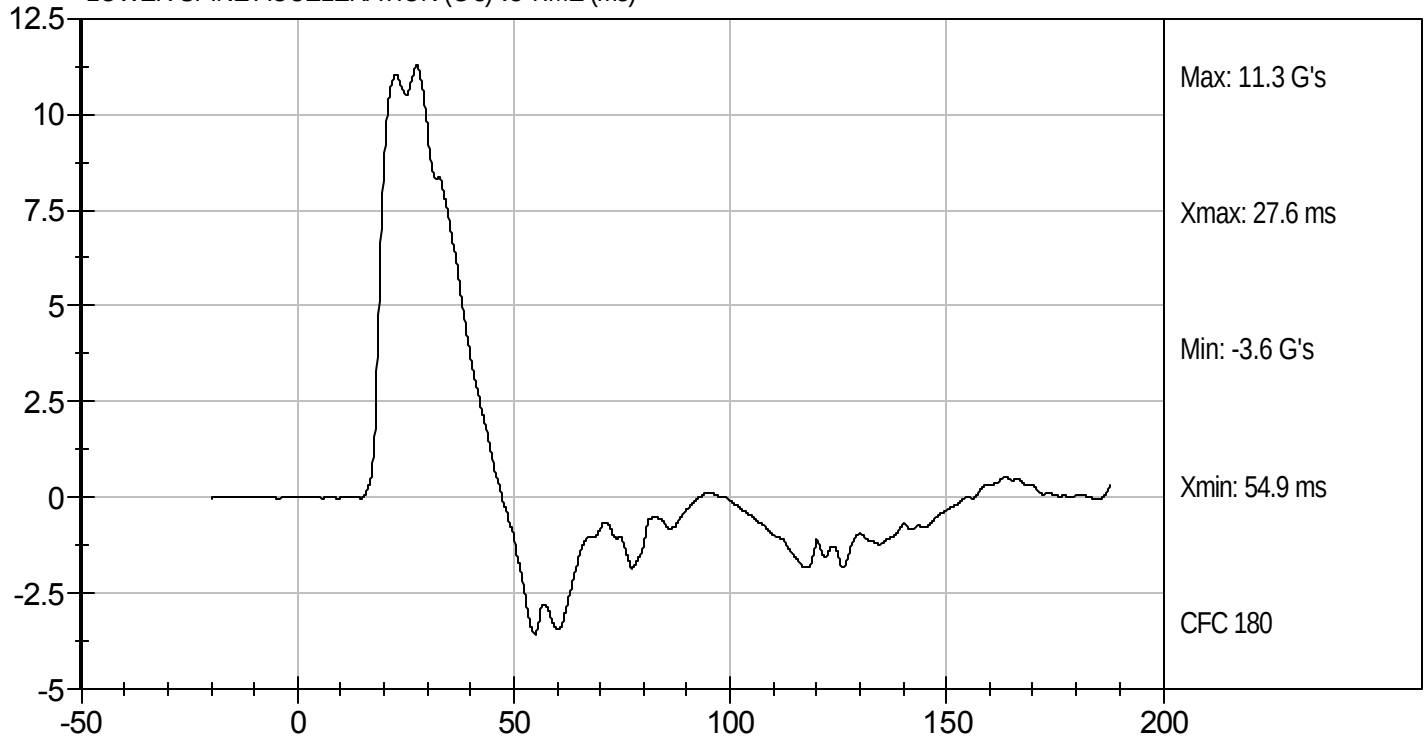
Test Desc: Abdomen Impact
Component ID: D104226

Test Date: 12/2/10
Velocity: 14.37 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: D104227

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.8	Pass
Humidity	%	10 to 70	17	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	39	Pass
Peak Acetabulum Force	N	3600 to 4300	4243	Pass
Overall Test Results				Pass


Laboratory Technician

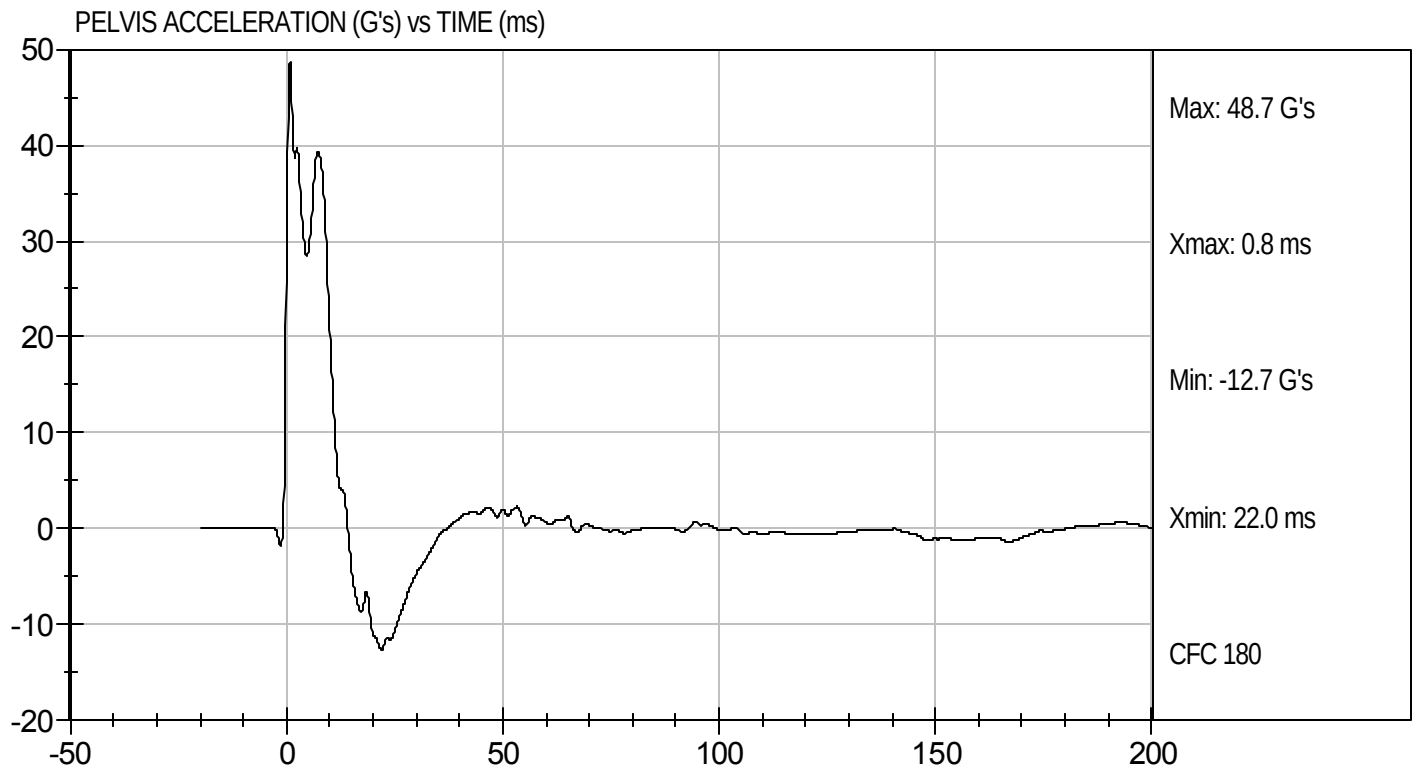
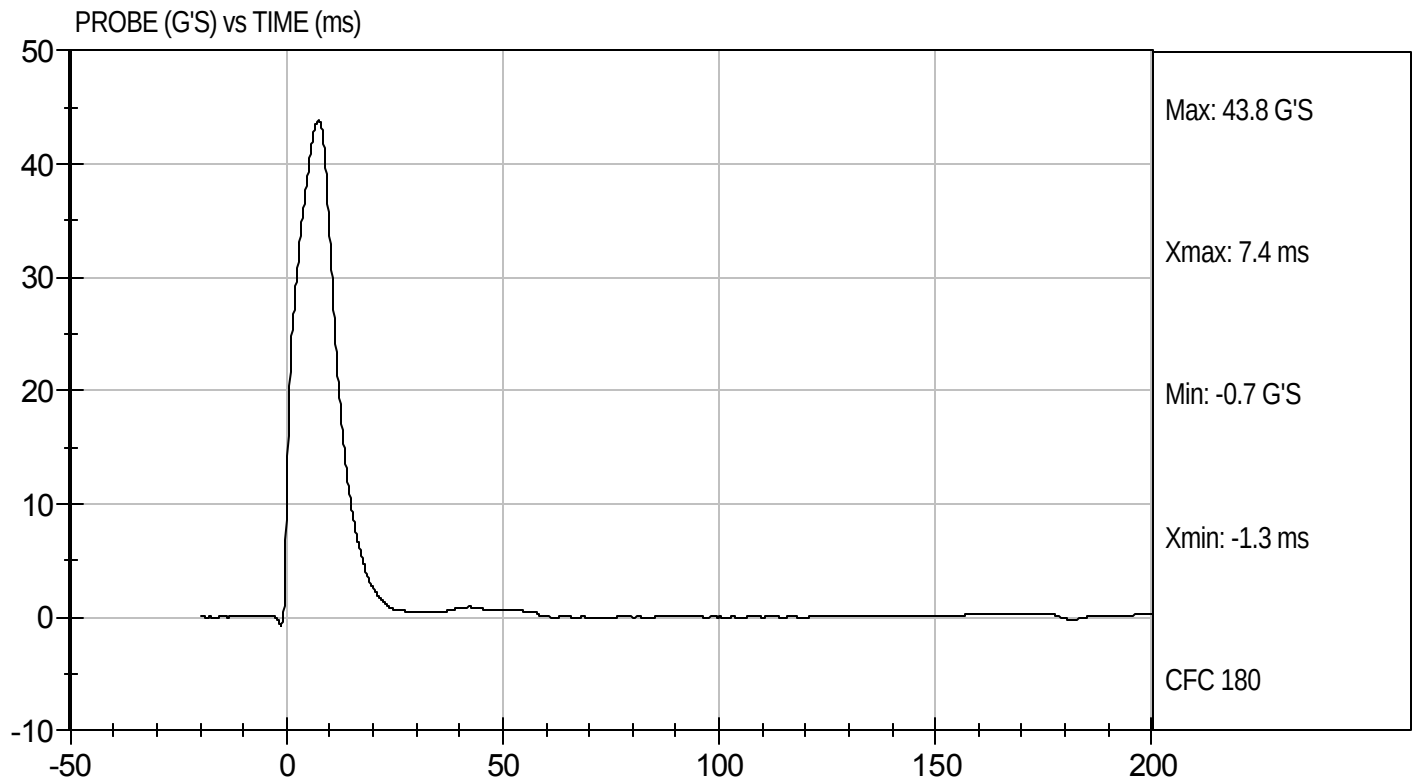
12/2/10
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D104227

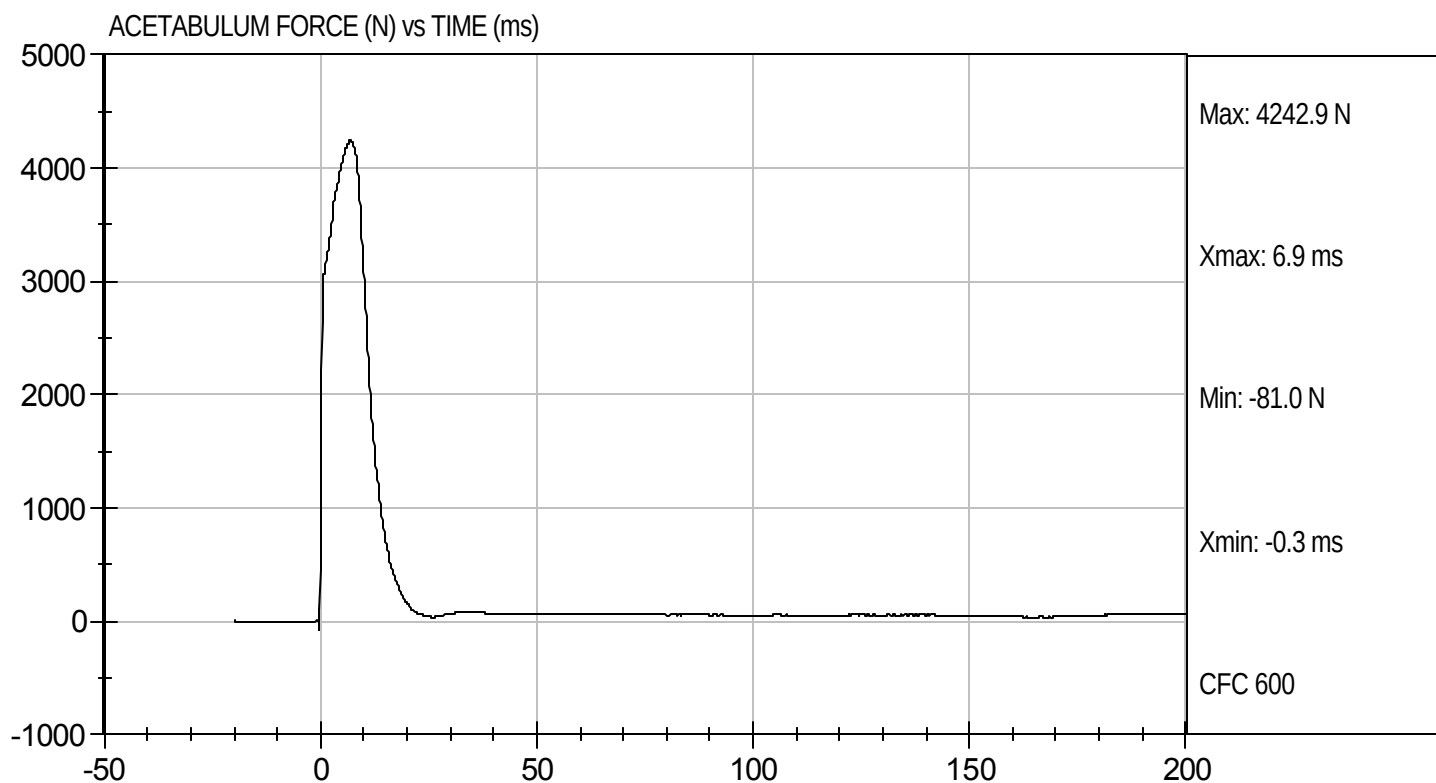
Test Date: 12/2/10
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Pelvis Impact
Component ID: D104227

Test Date: 12/2/10
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: D104228

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.9	Pass
Humidity	%	10 to 70	18	Pass
Impact Velocity	m/s	4.20 to 4.40	4.38	Pass
Peak Impactor Acceleration	G's	36 to 45	38	Pass
Pelvis Y Acceleration	G's	28 to 39	32	Pass
Peak Pelvis Iliac Force	N	4100 to 5100	4614	Pass
Overall Test Results			Pass	


Laboratory Technician

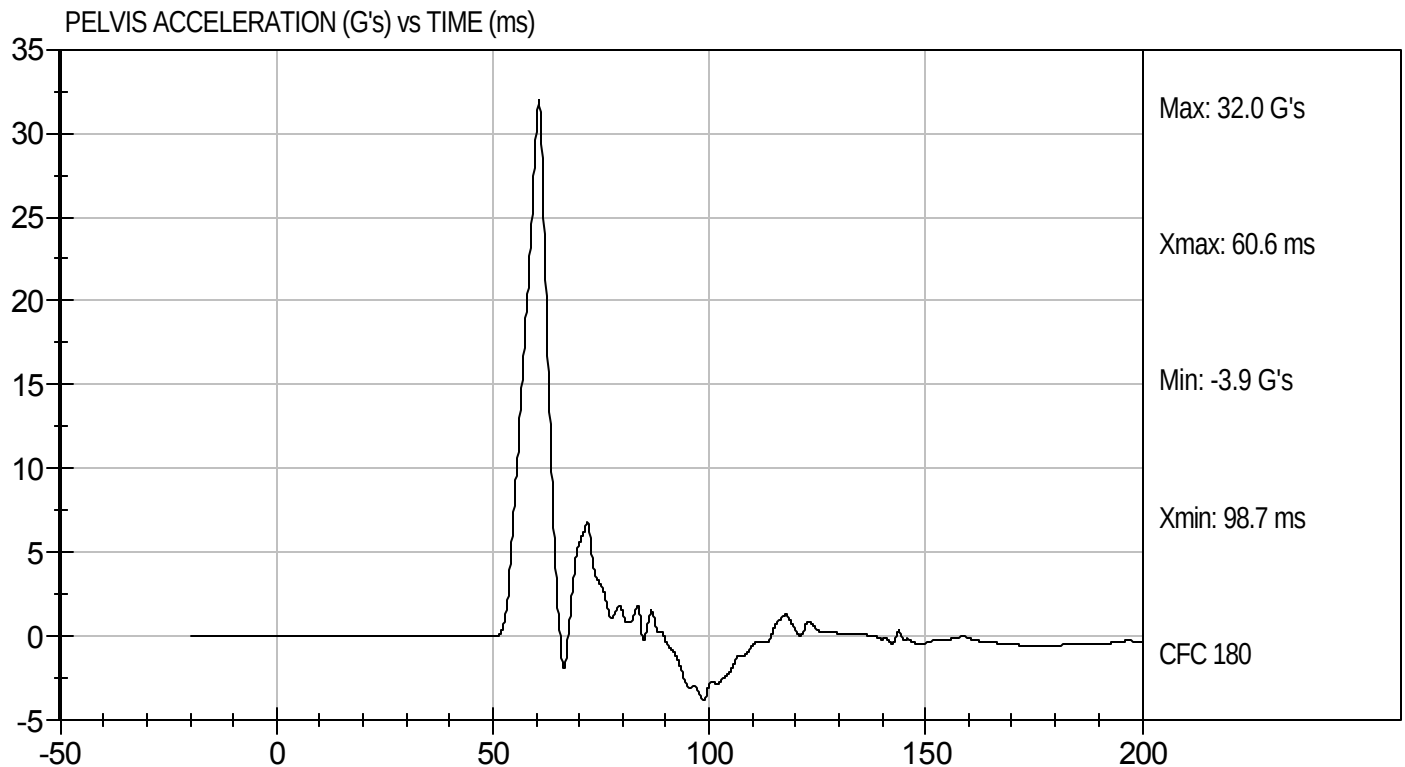
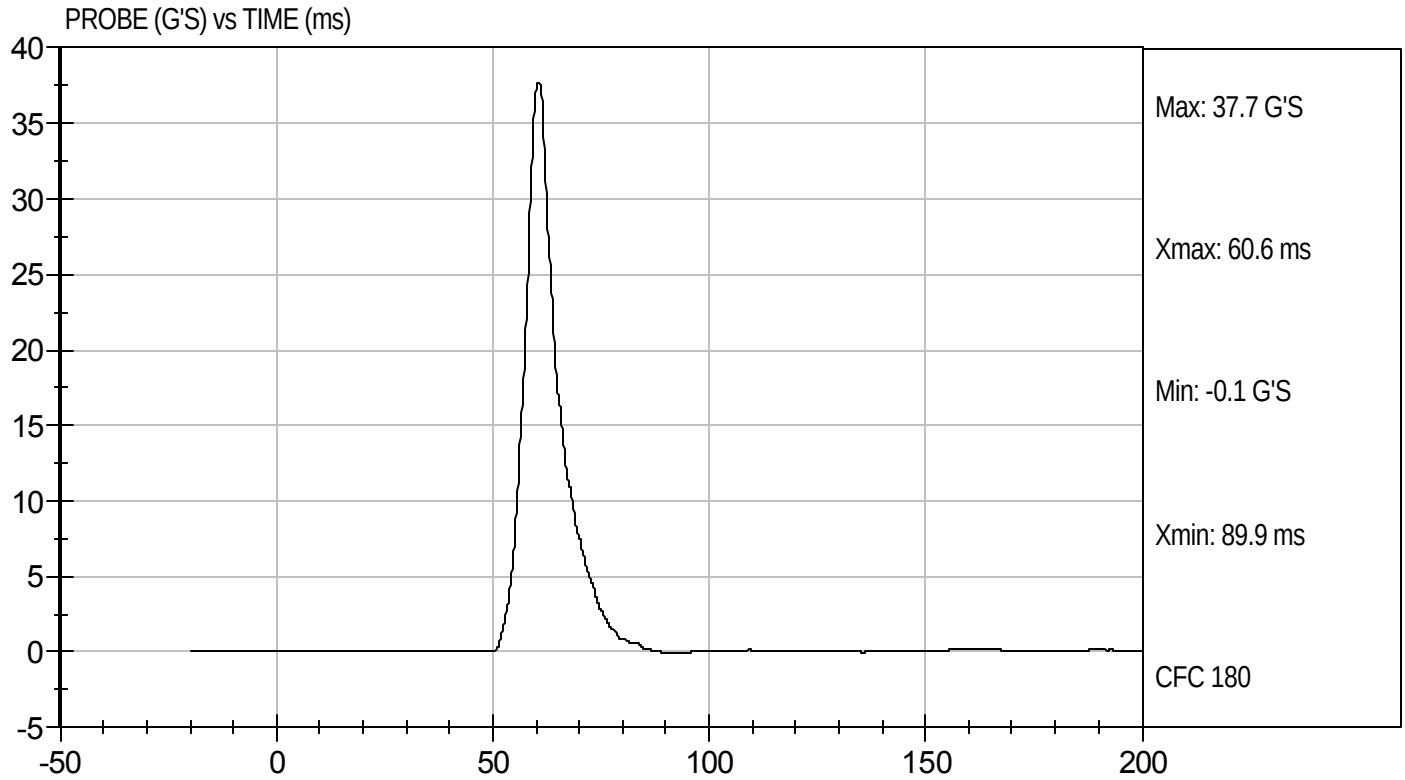
12/2/10
Test Date


Approved By



Test Desc: Iliac Impact
Component ID: D104228

Test Date: 12/2/10
Velocity: 14.37 ft/s, 4.38 m/s





Test Desc: Iliac Impact
Component ID: D104228

Test Date: 12/2/10
Velocity: 14.37 ft/s, 4.38 m/s

