

REPORT NUMBER: NCAPSIDE-MGA-2008-007

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

**DAIMLERCHRYSLER AG STUTTGART
2008 MERCEDES-BENZ C300
NHTSA NUMBER: M80509**

**PREPARED BY:
MGA RESEARCH CORPORATION
5000 WARREN ROAD
BURLINGTON, WI 53105**



Test Date: October 8, 2007

Report Date: November 8, 2007

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
RULEMAKING
OFFICE OF CRASHWORTHINESS STANDARDS
1200 NEW JERSEY AVENUE, SE, ROOM W43-410
WASHINGTON, D.C. 20590**

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Prepared by: 
Joe Fleck, Project Engineer

Date: 11/08/07

Reviewed by: 
David Winkelbauer, Facility Director

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Technical Report Documentation Page

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16. Abstract A 55/28 km/h 90° Moving Deformable Barrier NCAP side impact was conducted on the subject 2008 Mercedes-Benz C300 to obtain new car assessment and research data indicant of FMVSS No. 214D performance. The test was conducted at MGA Research Corporation, in Burlington, Wisconsin, on October 8, 2007. The impact velocity of the Moving Deformable Barrier (MDB) was 62.3 km/h, and the ambient temperature at the struck side (drivers) of the vehicle was 21°C. The target vehicle's maximum post test static crush was 191 mm at level 3. The test vehicle's occupant performance is as follows: <table style="width: 100%; margin-top: 10px;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>DRIVER</u></th> <th style="text-align: center;"><u>PASS.</u></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) Accel., g</td> <td style="text-align: center;">50.9</td> <td style="text-align: center;">62.7</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td style="text-align: center;">46.9</td> <td style="text-align: center;">61.6</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td style="text-align: center;">44.9</td> <td style="text-align: center;">42.4</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td style="text-align: center;">48</td> <td style="text-align: center;">53</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td style="text-align: center;">38.9</td> <td style="text-align: center;">37.9</td> </tr> <tr> <td>HIC</td> <td style="text-align: center;">120</td> <td style="text-align: center;">294</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.					<u>DRIVER</u>	<u>PASS.</u>	Left Upper Rib (LUR) Accel., g	50.9	62.7	Left Lower Rib (LLR) Accel., g	46.9	61.6	Lower Spine (T ₁₂) Accel., g	44.9	42.4	Thoracic Trauma Index (TTI)	48	53	Pelvis (PEV) Accel., g	38.9	37.9	HIC	120	294
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17. Key Words New Car Assessment Program (NCAP) Side Impact Side Impact Hybrid III Dummy (SID/HIII) Occupant Side Impact Protection		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Adm. Technical Ref. Division, 1200 New Jersey Ave, SE Washington, D.C. 20590																						
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SECTION 1

PURPOSE AND TEST PROCEDURE

PURPOSE

This side impact test was conducted as part of the FY' 2008 test program sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-03-D-12005. The purpose of this test was to evaluate side impact protection in a 2008 Mercedes-Benz C300 manufactured by DaimlerChrysler AG Stuttgart.

TEST PROCEDURE

The side impact test was conducted in accordance with the Laboratory Test Procedure for New Car Assessment Program Side Impact Testing dated November 2002 and the corresponding MGA Research Corporation Test Procedure MGA-NHTSA5. The procedures for receiving, inspection, testing, and reporting of test results are described in the test procedures and are not repeated in this report.

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

SECTION 2

SUMMARY OF NCAP SIDE IMPACT TEST

A model year 2008 Mercedes-Benz C300 was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.3 km/h. The specified impact velocity range is from 61.1 to 62.7 km/h. The test (target) vehicle was stationary and positioned 63° to the line of forward motion. The weight of the vehicle as tested was 1808.5 kg and the test weight of the MDB was 1360.8 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on October 8, 2007.

One (1) real-time motion picture camera and ten (10) high-speed motion picture cameras were used to document the impact event. The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera. Camera locations and pertinent camera information are documented in the data sheets. Pre- and post-test photographs of the vehicle and Side Impact Dummies (SID/HIIIs) can be found in Appendix A. Two 50th percentile adult male SID/HIIIs were placed in the driver and left rear passenger designated seating positions according to instructions specified in the Laboratory Test Procedure for New Car Assessment Program Side Impact Testing dated November 2002. Each SID/HIII was instrumented in the following locations:

- Left Upper Rib (LUR) uni-axial accelerometer (Y-axis primary and redundant)
- Left Lower Rib (LLR) uni-axial accelerometer (Y-axis primary and redundant)
- Lower Thoracic Spine (T12) uni-axial accelerometer (Y-axis primary and redundant)
- Pelvic (PEV) section uni-axial accelerometer (Y-axis primary and redundant)
- Head Center of Gravity (CG) tri-axial accelerometers (X, Y and Z axes primary and redundant)
- Upper Neck load cell (Fx, Fy, Fz, Mx, My, Mz)

The test vehicle was instrumented with twenty (20) structural accelerometers and the MDB was instrumented with five (5) accelerometers and two (2) contact switches on the bumper to compare left side to right side bumper impact timing. All data channels were recorded with a fully self contained on-board DTS TDAS Pro Data Acquisition System. The data was digitally sampled at 10,000 samples per second and processed per Appendix V of the Test Procedure.

2.2 GENERAL COMMENTS

The test vehicle sustained a maximum static crush of 191 mm at level 3, 1650 mm rearward of the vertical impact point. The driver and passenger SID/HIIIs, Serial Nos. 271 and 904 respectively, were calibrated just prior to this test.

Appendix A contains the still photograph prints. Appendix B contains the SID/HIII response data traces. Appendix C contains the dummy calibration data. Appendix D contains the child dummy data.

The occupant data is summarized below:

ATD position	HIC	T ¹	T ²	TTI (G's)	Peak Pelvis (G's)
Driver	120	33.6	60.9	48	38.9
Passenger	294	46.2	55.1	53	37.9

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Information	Left Front (Driver)		Left Rear (Passenger)	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	No	No	
Side Torso Airbag	Yes	Yes	No	
Curtain Airbag	Yes	Yes	Yes	Yes

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

TEST NOTES

There was no valid data collected for:

Floorpan @ Rear Axle Y

Left Lower B-Post Y

Left Mid A-Post after 20 msec.

Driver Seat Track after 20 msec.

DATA SHEET NO. 1**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2008 Mercedes-Benz C300NHTSA No. M80509Test Program: NCAP Side ImpactTest Date: 10/08/2007**TEST VEHICLE INFORMATION**

Make	Mercedes-Benz
Model	C300
Body Style	Sedan
NHTSA No.	M80509
VIN	WDDGF54X68F043788
Color	Black
9/24/2007	9/14/2007
Odometer Reading (mile)	55
Dealer	Waukesha Imports LLC
Transmission	Automatic
Final Drive	Rear
Number of Cylinders	6
Engine Displacement (L)	3.0
Engine Placement	Longitudinal
Automatic Door Locks (ADL)	Yes
Owner's Manual Details Instructions on Disabling ADLs	Yes

TEST VEHICLE OPTIONS

Driver Front Airbag	Yes
Driver Side Curtain Airbag	Yes
Driver Side Torso Airbag	Yes
Rear Passenger Side Curtain Airbag	Yes
Rear Passenger Side Torso Airbag	No
Power Steering	Yes
Power Door Locks	Yes
Tilt Wheel	Yes
Anti-lock Brakes	Yes
Anti-Slip	Yes
All Wheel Drive	No
Power Seats	Yes
Pretensioners	Yes
Load Limiters	Yes
Bucket Seats	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	DaimlerChrysler AG Stuttgart
Date of Manufacture	08/07

GVWR (kg)	2060
GAWR Front (kg)	1010
GAWR Rear (kg)	1090

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bucket		
Number Of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				380
Cargo Wt. (RCLW) (kg)				40

DATA SHEET NO. 1 (continued)**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2008 Mercedes-Benz C300NHTSA No. M80509Test Program: NCAP Side ImpactTest Date: 10/08/2007**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	417.3	386.5		460.4	466.3	
Right	kg	434.5	377.4		440.0	441.8	
Ratio	%	52.7	47.3		49.8	50.2	
Totals	kg	851.8	763.9	1615.7	900.4	908.1	1808.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1615.7
Weight of 2 P572M ATDs	kg	161.5
Rated Cargo/Luggage Weight (RCLW)	kg	40
Calculated Vehicle Target Weight (TVTW)	kg	1817.2

* Actual As Tested Weight (ATW) will be TVTW -5/-10 kg

Weight of Ballast in Cargo Area: None**TEST VEHICLE ATTITUDES AND CG**

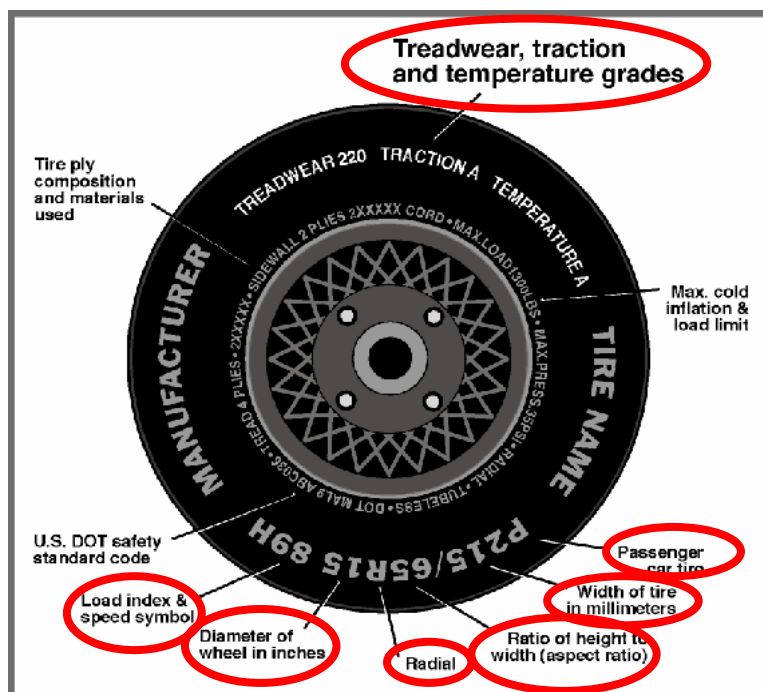
	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	667	665	664	670	1305
As Tested	mm	649	664	641	661	1386
Fully Loaded	mm	647	663	639	651	

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2760
Target Impact Point Aft of Front Axle	mm	440
Actual Impact Point Aft of Front Axle	mm	442

TEST VEHICLE TIRE INFORMATION

NHTSA No. M80509
Test Date: 10/08/2007



Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold / Test Pressure (kPa)	190	230
Recommended Tire Size	P225/45R17	P245/40R17
Tire Size on Vehicle	P225/45R17	P245/40R17
Tire Manufacturer	Continental	Continental
Tire Name	Conti Pro Contact	Conti Pro Contact
Tire Type	Passenger M+S	Passenger M+S
Tire Width (mm)	225	245
Ratio of Height to Width (aspect ratio)	45	40
Radial	R	R
Wheel Diameter	17	17
Load Index & Speed Symbol	91H	91H
Treadwear	400	400
Traction Grade	AA	AA
Temperature Grade	A	A

DATA SHEET NO. 3 **TEST VEHICLE INFORMATION**

Test Vehicle: 2008 Mercedes-Benz C300
 Test Program: NCAP Side Impact

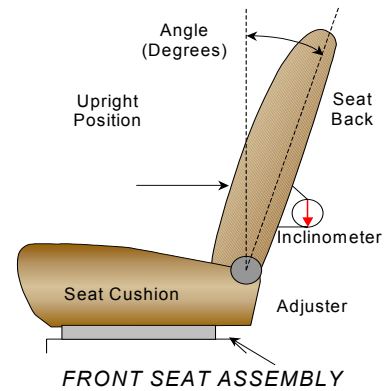
NHTSA No. M80509
 Test Date: 10/08/2007

NORMAL DESIGN RIDING POSITION

The driver and passenger seat back is positioned to the manufacturer's designated angle. The procedure is as follows:
 For the driver seat, measured at seat back, set at 21 degrees.

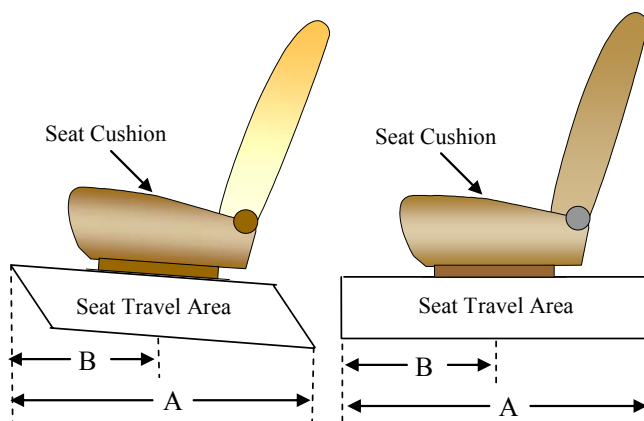
Driver seat back angle: 20.8 degrees

Passenger seat back angle: Fixed



SEAT FORE/AFT POSITIONS

	Total Fore/Aft Travel	Placed in position #
Driver Seat	285 mm	142 mm
Rear Seat	Fixed	Fixed



DATA SHEET NO. 3 (CONTINUED)

TEST VEHICLE INFORMATION

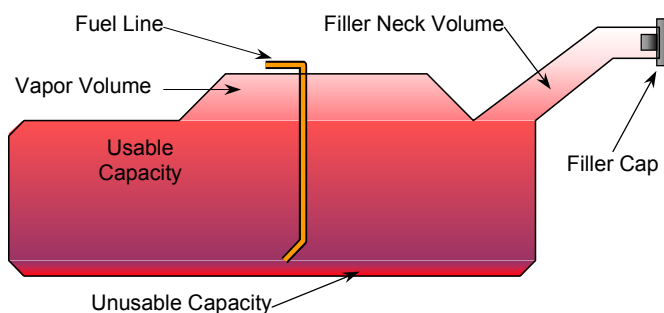
Test Vehicle: 2008 Mercedes-Benz C300
 Test Program: NCAP Side Impact

NHTSA No. M80509
 Test Date: 10/08/2007

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	66.0
Usable Capacity of "Optional" Tank	
92-94% of Usable Capacity	60.7 – 62.0
Actual Amount of Solvent used	61.7
1/3 of Usable Capacity	22.0

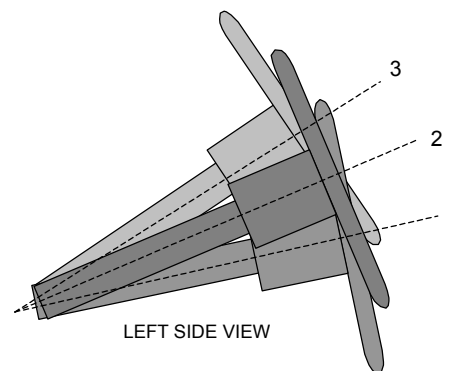
The test vehicle is equipped with an electric fuel pump. The fuel pump is in operation if the ignition is switched to the "ON" position. After about 15 seconds, the pump switches back to standby mode if the engine is not started.



VEHICLE FUEL TANK ASSEMBLY

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 ASSEMBLY

STEERING COLUMN POSITION

	Fore/Aft (mm)	Degrees
Lowermost position No. 1	0	66.0
Geometric center position No. 2	30	68.5
Uppermost position No. 3	60	71.0

DATA SHEET NO. 4
MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Test Vehicle: 2008 Mercedes-Benz C300
 Test Program: NCAP Side Impact

NHTSA No. M80509
 Test Date: 10/08/2007

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheel base of Framework Carriage	2588
C.G. Location aft of Front Axle	1101

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	473.5	219.5	
Right	kg	308.3	359.5	
Ratio	%	57.5	42.5	
Totals	kg	781.8	579.0	1360.8

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.3
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.3
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.0

POST TEST OBSERVATIONS
MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	2 rearward
Vertical Offset	mm	+/-20	0

DATA SHEET NO. 5**POST TEST OBSERVATIONS**

Test Vehicle: 2008 Mercedes-Benz C300
 Test Program: NCAP Side Impact

NHTSA No. M80509
 Test Date: 10/08/2007

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat SID/HIII	Rear Seat SID/HIII
Dummy Type / Serial No.	SID HIII / 271	SID HIII / 904
Head Contact	Curtain Airbag	Curtain Airbag, Headrest
Upper Torso Contact	Side Airbag	Door Panel
Lower Torso Contact	Door Panel	Door Panel
Left Knee Contact	Door Panel	Door Panel
Right Knee Contact	Left Knee	Left Knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Locked/Unlocked Doors	Doors were unlocked	Doors were unlocked
Left Side Door Opening	Door remained closed and latched	Door remained closed and latched
Right Side Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
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	None
Window Damage	None
Other Notable Effects	None

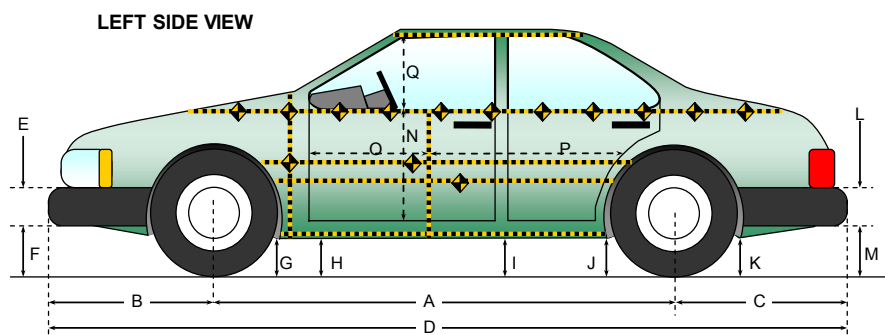
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Occupant Location 01		Occupant Location 04	
	Installed	Operation	Installed	Operation
Front Airbag	Yes	No	No	
Side Torso Airbag	Yes	Yes	No	
Curtain Airbag	Yes	Yes	Yes	Yes

DATA SHEET NO. 6
VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2008 Mercedes-Benz C300
 Test Program: NCAP Side Impact

NHTSA No. M80509
 Test Date: 10/08/2007



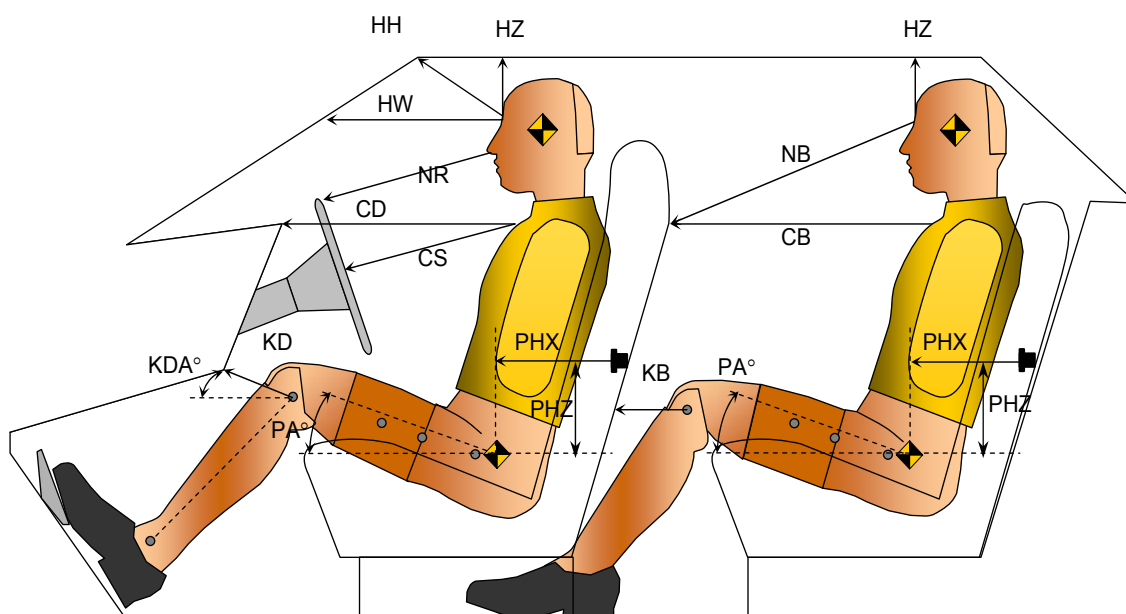
All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2760	2750	10
B	Front Axle to FSOV	703	705	-2
C	Rear Axle to RSOV	1168	1166	2
D	Total Length at Centerline	4631	4621	10
E	Front Bumper Thickness	78	78	0
F	Front Bumper Bottom to Ground	186	202	-16
G	Sill Height at Front Wheel Well	146	158	-12
H	Sill Height at Front Door Leading Edge	159	160	-1
I	Sill Height at "B" Pillar	158	135	23
J1	Sill Height at Rear Wheel Well	140	137	3
J2	Pinch Weld Height at Rear Wheel Well	150	141	9
K	Sill Height Aft of Rear Wheel Well	174	175	-1
L	Rear Bumper Thickness	170	170	0
M	Rear Bumper Bottom to Ground	258	261	-3
N	Sill Height to Window Bottom Sill	652	596	56
O	Front Door Leading Edge to Impact CL	676	670	6
P	Rear Door Trailing Edge to Impact CL	1244	1200	44
Q	Front Window Opening	377	378	-1
R	Right Side Length	3674	3672	2
S	Left Side Length	3674	3650	24
T	Vehicle Width at "B" Post	1774	1709	65

DATA SHEET NO. 7
SID/HII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2008 Mercedes-Benz C300
 Test Program: NCAP Side Impact

NHTSA No. M80509
 Test Date: 10/08/2007

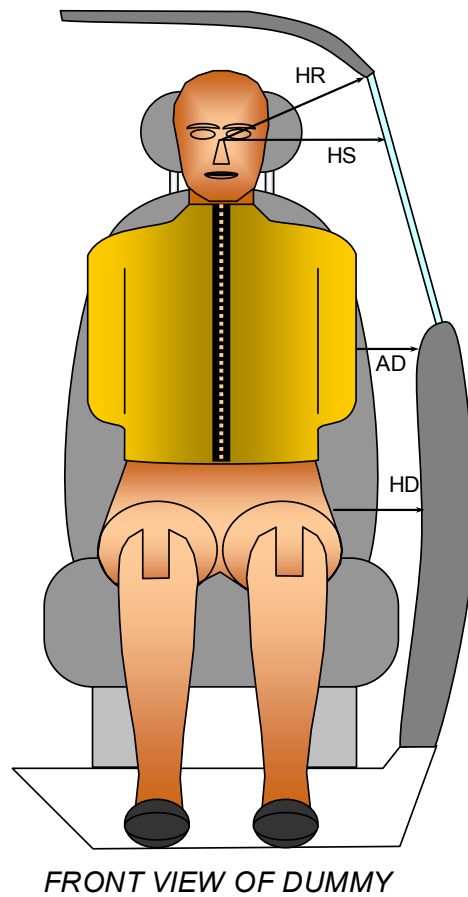


Driver Code	Pass. Code	Measurement Description	Driver S/N 271		Passenger S/N 904	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	296			
HW		Head to Windshield	538			
HZ	HZ	Head to Roof	167		123	
NR	NB	Nose to Rim/Nose to Seatback	396		600	
CD	CB	Chest to Dash or Seatback	491		524	
CS		Chest to Steering Wheel	302			
KDL	KBL	Left Knee to Dash or Seatback	156	23.1	213	17.7
KDR	KBR	Right Knee to Dash or Seatback	147	32.0	210	18.5
PA	PA	Pelvic Angle		23.9		23.9
PHX	PHX	H-Point to Striker (X-Axis)	177		122	
PHZ	PHZ	H-Point to Striker (Z-Axis)	235		310	

DATA SHEET NO. 8
SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2008 Mercedes-Benz C300
 Test Program: NCAP Side Impact

NHTSA No. M80509
 Test Date: 10/08/2007

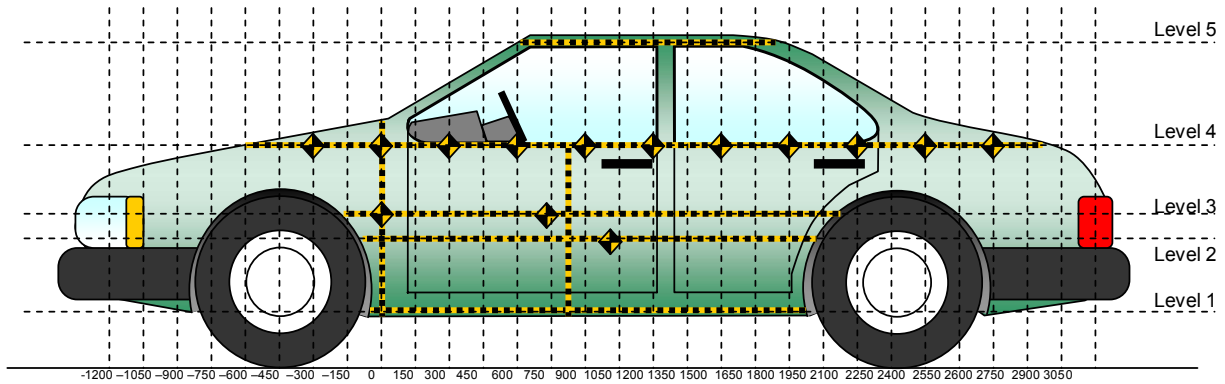


Code	Measurement Description	Units	Driver S/N 271	Passenger S/N 904
HR	Head to Side Header	mm	172	178
HS	Head to Side Window	mm	294	297
AD	Arm to Door	mm	84	127
HD	H-Point to Door	mm	128	191

DATA SHEET NO. 9 **VEHICLE SIDE MEASUREMENTS**

Test Vehicle: 2008 Mercedes-Benz C300
 Test Program: NCAP Side Impact

NHTSA No. M80509
 Test Date: 10/08/2007



All Measurements Shown in mm

LEFT SIDE VIEW

Measurements are taken with vehicle in the as tested condition.
 Measurements along the vertical 800 mm.
 All measurements below in mm.

Level	Measurement Description	Maximum Exterior Static Crush	Distance From Impact	Height Above Ground
5	Window	22	1350	1344
4	Window Sill	149	1650	905
3	Mid Door	191	1650	594
2	Occupant H-Point	161	1650	483
1	Sill Top	93	1350	275
	Maximum Penetration	191		

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2008 Mercedes-Benz C300
Test Program: NCAP Side Impact

NHTSA No. M80509
Test Date: 10/08/2007

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-600				296					297					1	
-450				291					294					3	
-300				287					292					5	
-150			213	284				204	291				-9	7	
0	254	234	227	281		269	279	271	291		15	45	44	10	
150	253	236	225	279		284	339	300	306		31	103	75	27	
300	252	235	222	280		297	359	333	321		45	124	111	41	
450	250	234	220	280		301	378	363	321		51	144	143	41	
600	248	233	219	280		307	380	387	331		59	147	168	51	
750	248	232	218	280		309	372	396	350		61	140	178	70	
900	246	232	216	282	497	314	386	401	358	518	68	154	185	76	21
1050	245	231	215	285	570	321	391	384	358	531	76	160	169	73	21
1200	245	231	215	286	518	324	374	354	367	540	79	143	139	81	22
1350	246	232	216	291	522	339	353	325	398	544	93	121	119	107	22
1500	245	233	216	293	527	321	374	365	416	542	76	141	149	123	15
1650	246	235	218	297	528	304	396	409	446	543	58	161	191	149	15
1800	246	237	220	305	529	270	360	397	420	543	24	123	177	115	14
1950		228	223	310	531		257	314	380	540		29	91	70	9
2100			226	316				335	350				109	34	
2250				323					320					-3	
2400				332					346					14	
2550				341					350					9	
2700				354					361					7	
2850				368					372					4	

Reference plane is parallel to test vehicle longitudinal centerline.

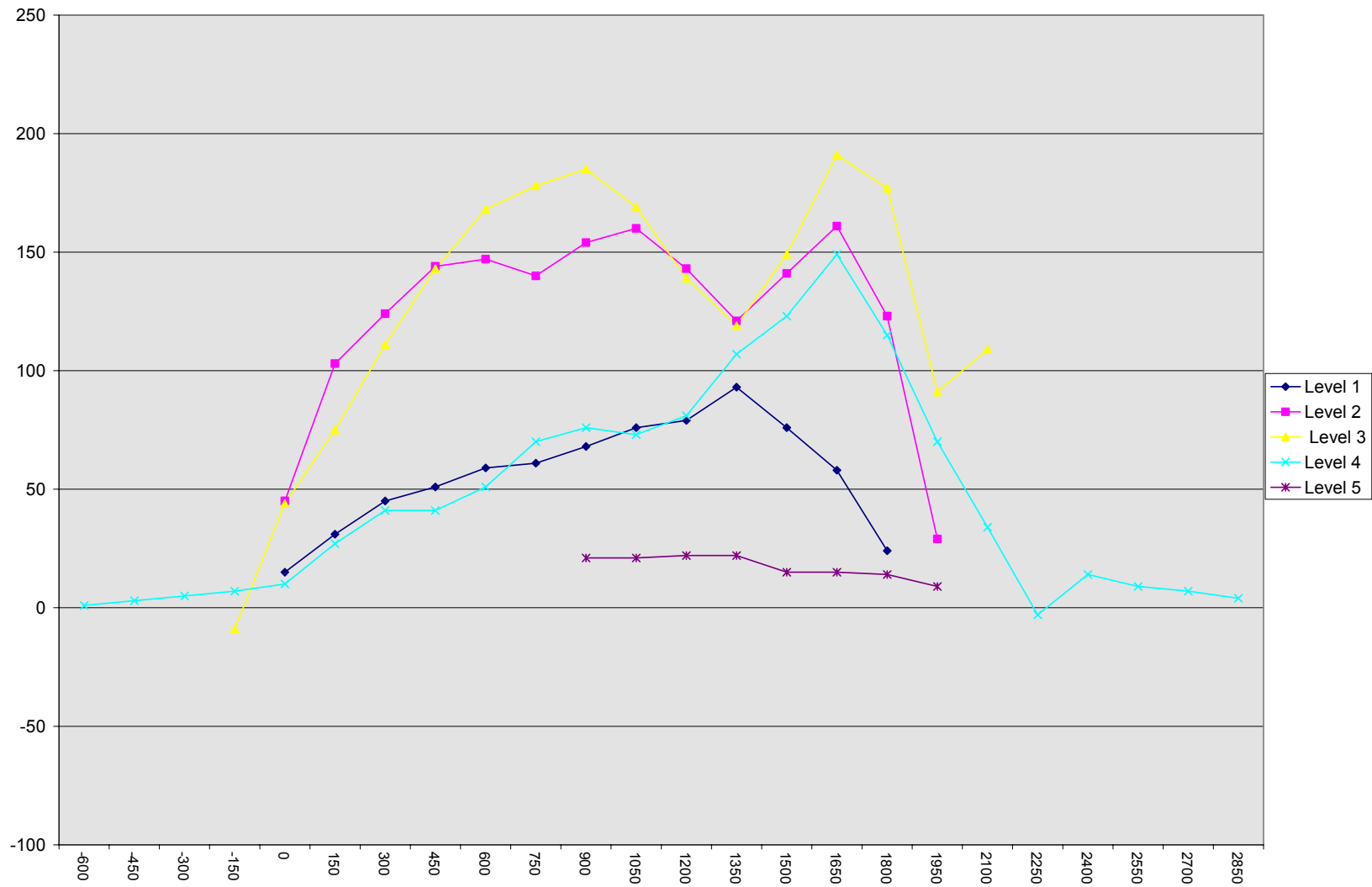
Given dimensions = Reference plane to car body

DATA SHEET NO. 10... (continued)
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2008 Mercedes-Benz C300
Test Program: NCAP Side Impact

NHTSA No. M80509
Test Date: 10/08/2007

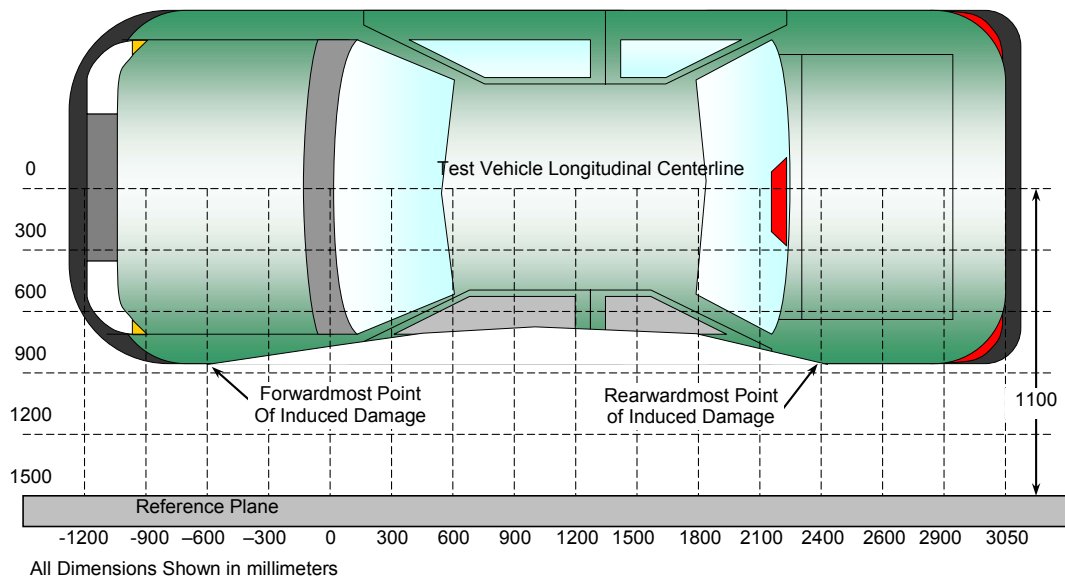
16



DATA SHEET NO. 11
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2008 Mercedes-Benz C300
 Test Program: NCAP Side Impact

NHTSA No. M80509
 Test Date: 10/08/2007



TOP VIEW

DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	2850	4	368	372	4
2	2170	4	317	332	15
3	1460	2	233	356	123
4	765	2	232	396	164
5	165	2	236	324	88
6	-600	4	296	297	1

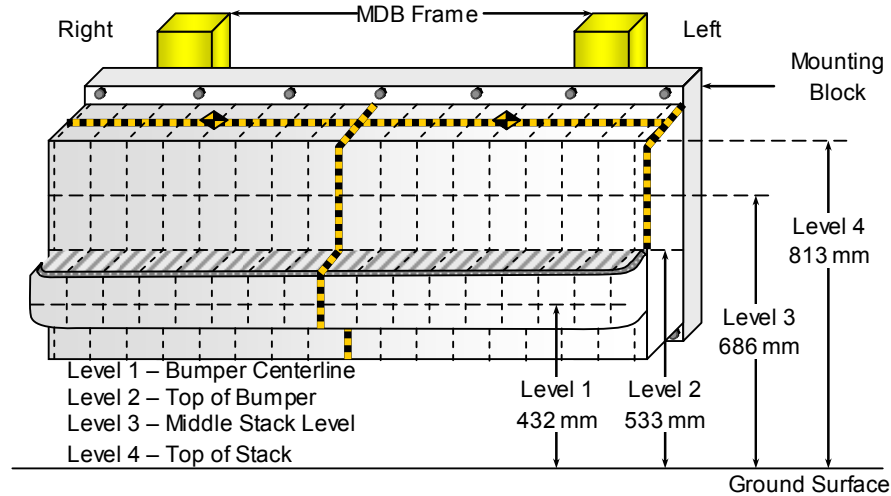
Reference plane is parallel to test vehicle longitudinal centerline.
 Given dimensions = Reference plane to car body.

DATA SHEET NO. 12

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2008 Mercedes-Benz C300
 Test Program: NCAP Side Impact

NHTSA No. M80509
 Test Date: 10/08/2007



DEFORMABLE BARRIER STATIC CRUSH

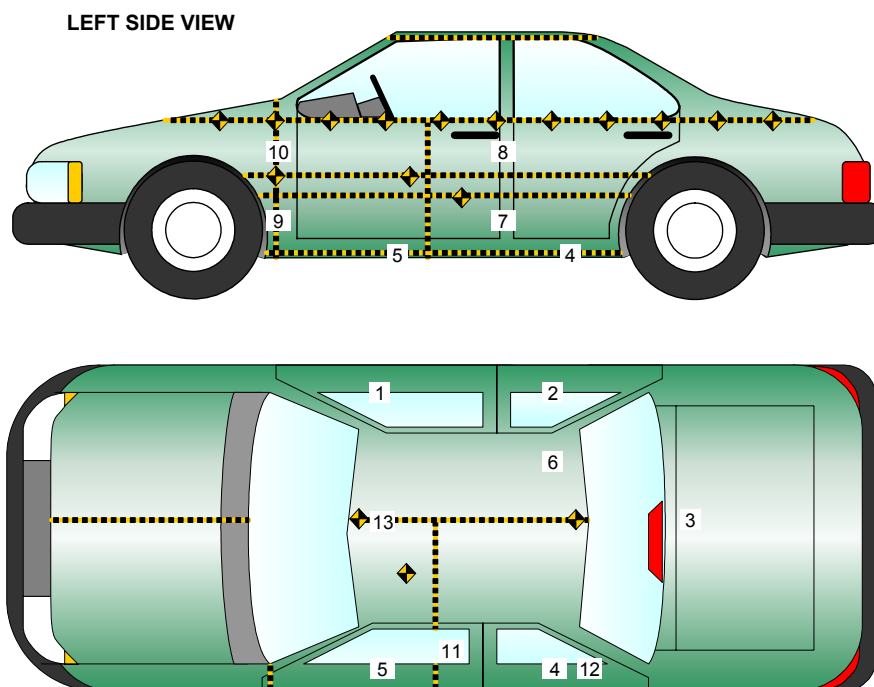
Stack Level	Distance Right of Center								C _L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	210	205	209	217	242	231	220	205	192	186	188	197	202	215	230	252	252
2	164	173	180	190	200	186	166	152	139	139	143	150	156	164	169	181	196
3	69	71	85	101	138	136	112	83	67	65	67	71	80	96	126	178	215
4	50	53	68	87	128	121	114	110	85	99	102	100	107	130	138	177	196

All Dimensions in mm

DATA SHEET NO. 13
VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2008 Mercedes-Benz C300
 Test Program: NCAP Side Impact

NHTSA No. M80509
 Test Date: 10/08/2007



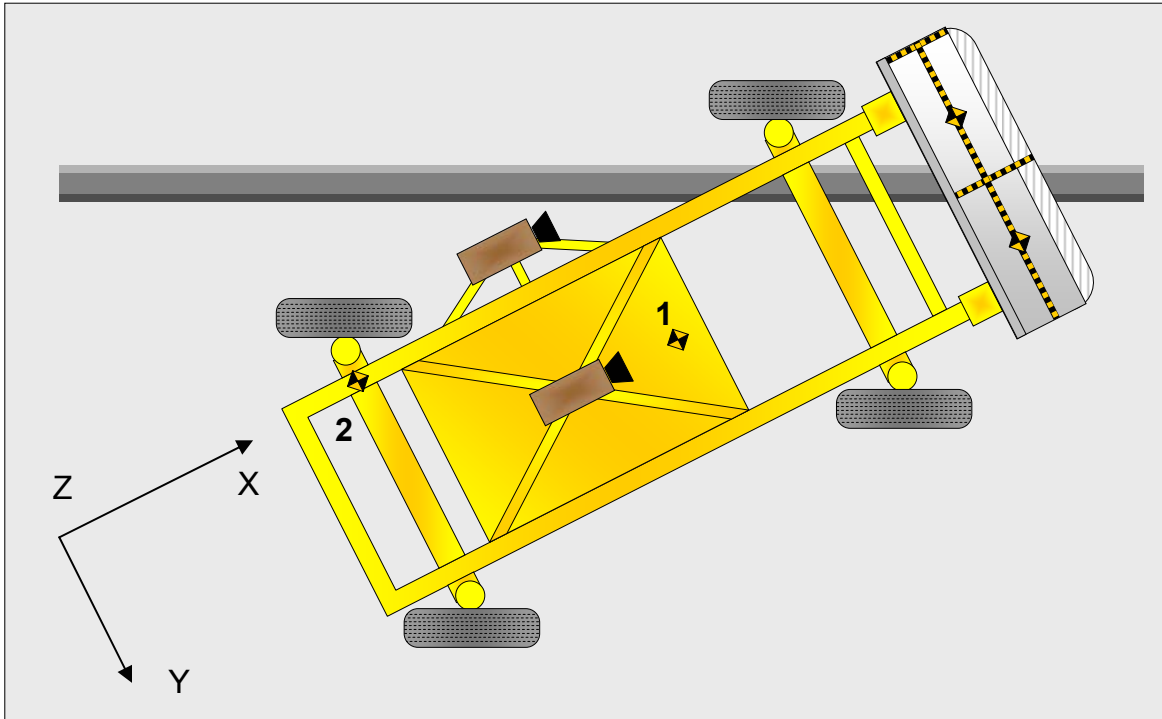
Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	2670	695	177
2	Right Sill at Rear Seat	1777	695	174
3	Rear Floorpan Above Axle	942	0	501
4	Left Sill at Rear Door	1805	-695	181
5	Left Sill at Front Door	2691	-695	181
6	Rear Occupant Compartment	1860	-332	284
7	Left Lower B-Post	2093	-687	439
8	Left Middle B-Post	2106	-714	767
9	Left Lower A-Post	3075	-682	462
10	Left Middle A-Post	3132	-766	806
11	Front Seat Track	2328	-572	264
12	Rear Seat Track or Structure			
13	Vehicle CG	2444	0	272

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

DATA SHEET NO. 14
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2008 Mercedes-Benz C300
 Test Program: NCAP Side Impact

NHTSA No. M80509
 Test Date: 10/08/2007



Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	MDB CG	-1092	0	-483
2	MDB Rear	-2591	-625	-622

Reference Points X - MDB Front Axle (+ forward)
 Y - MDB Centerline (+ to right)
 Z - Ground Plane (+ down)

DATA SHEET NO. 15
VEHICLE STRUCTURAL MEASUREMENTS

Test Vehicle: 2008 Mercedes-Benz C300
Test Program: NCAP Side Impact

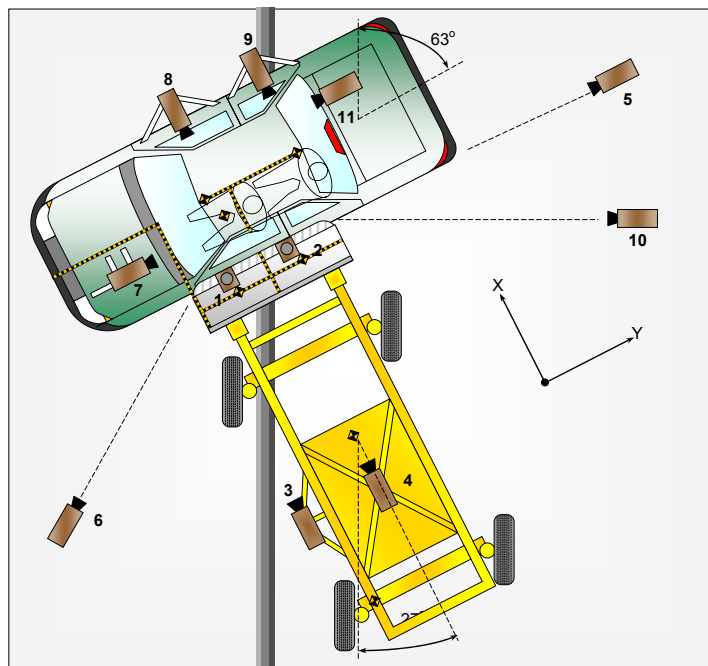
NHTSA No. M80509
Test Date: 10/08/2007

	Elements	Pre-Test (mm)
1	Total Length	4631
2	Total Width	1774
3	Bumper Top Height	499
4	Bumper Bottom Height	413
5	Longitudinal Member Top Height	502
6	Distance between Longitudinal Members	790
7	Longitudinal Member Width	60
8	Engine Top Height	845
9	Engine Bottom Height	284
10	Engine and gearbox width	707
11	Front bumper-engine distance	484
12	Front shock absorber fixing height	839
13	Bonnet leading edge height	748
14	Front shock absorber fixing width	1179
15	Front bumper – front axle distance	735
16	Front axle – a pillar distance	620
17	A-pillar – B-pillar distance	1080
18	B-Pillar – rear axle distance	1050
19	B-pillar – C-pillar distance	625
20	Roof sill bottom height	1264
21	Roof sill top height	1387
22	Floor sill bottom height	174
23	Floor sill top height	365

DATA SHEET NO. 16
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2008 Mercedes-Benz C300
 Test Program: NCAP Side Impact

NHTSA No. M80509
 Test Date: 10/08/2007



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Close-up	130	0	5050	50	1000
2	Overhead Overall	-340	0	5050	14	1000
3	MDB Onboard, Impact Point Close-up				50	1000
4	MDB Onboard, Centerline of Impact				16	1000
5	Right Side, Ground Level, Overall	600	5310	1210	24	1000
6	Left Side, Ground Level, Overall	1220	-5410	1190	24	1000
7	Vehicle Onboard Front SID/HIII, Front				12.5	1000
8	Vehicle Onboard Front SID/HIII, Side				8	1000
9	Vehicle Onboard Rear SID/HIII, Side				8	1000
10	Real Time Coverage				13	24
11	Onboard Child Seat				8.5	1000

Reference Points X - Impact Line
 Y - MDB Left Edge Impact Point
 Z - Ground Plane

DATA SHEET NO. 17
SUMMARY OF FMVSS 301 DATA

Test Vehicle: 2008 Mercedes-Benz C300
 Test Program: NCAP Side Impact

NHTSA No. M80509
 Test Date: 10/08/2007

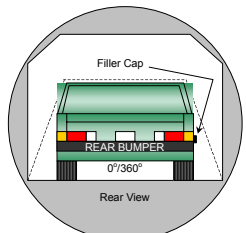
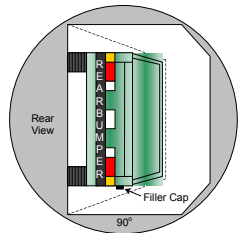
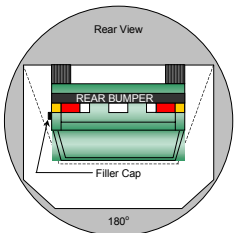
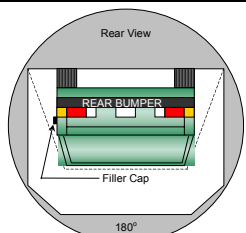
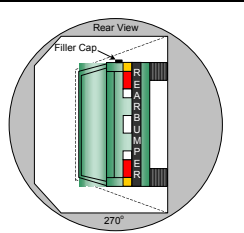
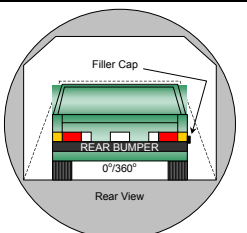
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21° C Test Time: 10:32 am

Stoddard Solvent Spillage Measurements

- 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

			1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds. 2. The position hold time at each position is 300 seconds (minimum). 3. Details of Stoddard Solvent spillage locations: None
0° to 90° 90° to 180°			
			
180° to 270° 270° to 360°			

Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage Collection Time (min)	Spillage (oz.)
0° to 90°	120	300	First 5	0
90° to 180°	117	300	First 5	0
180° to 270°	115	300	First 5	0
270° to 360°	115	300	First 5	0

APPENDIX A
PHOTOGRAPHS

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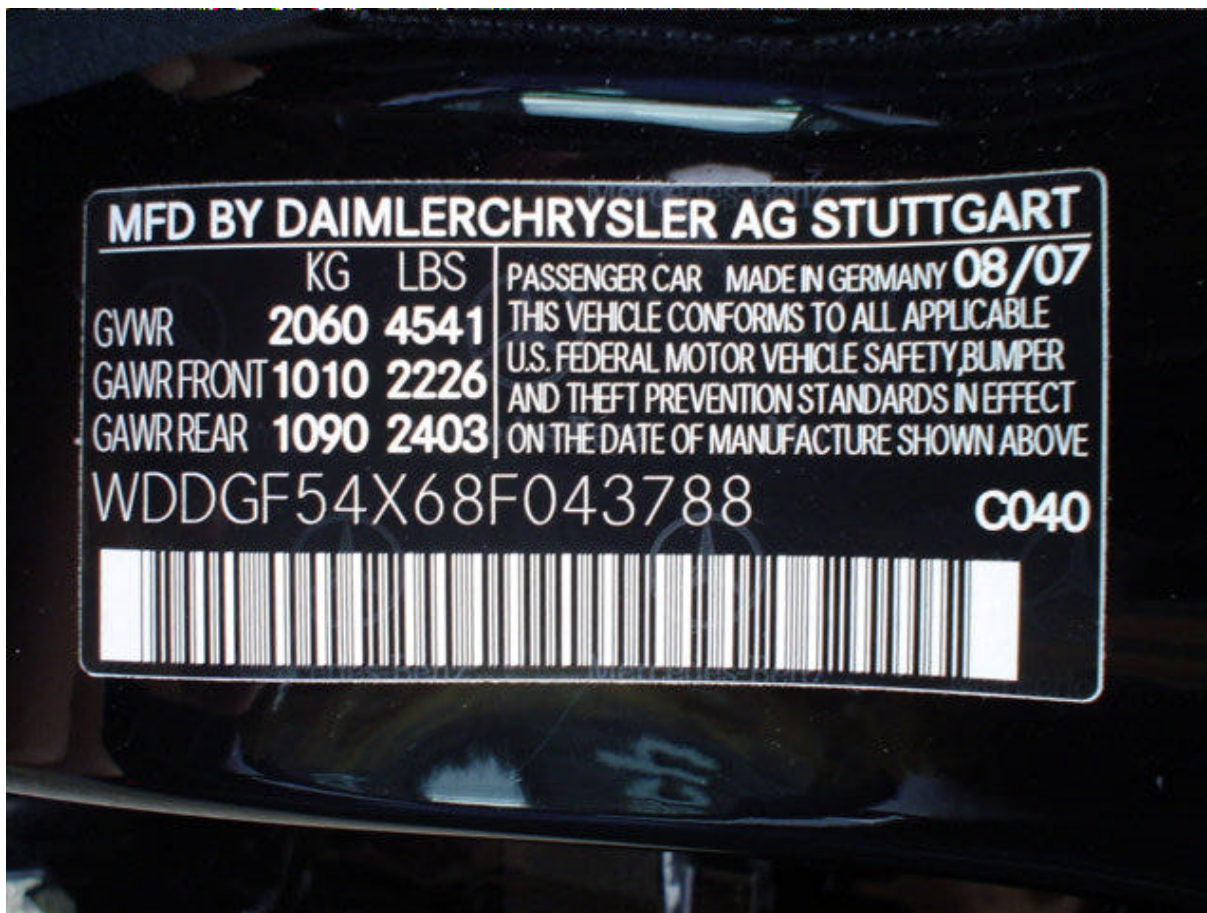
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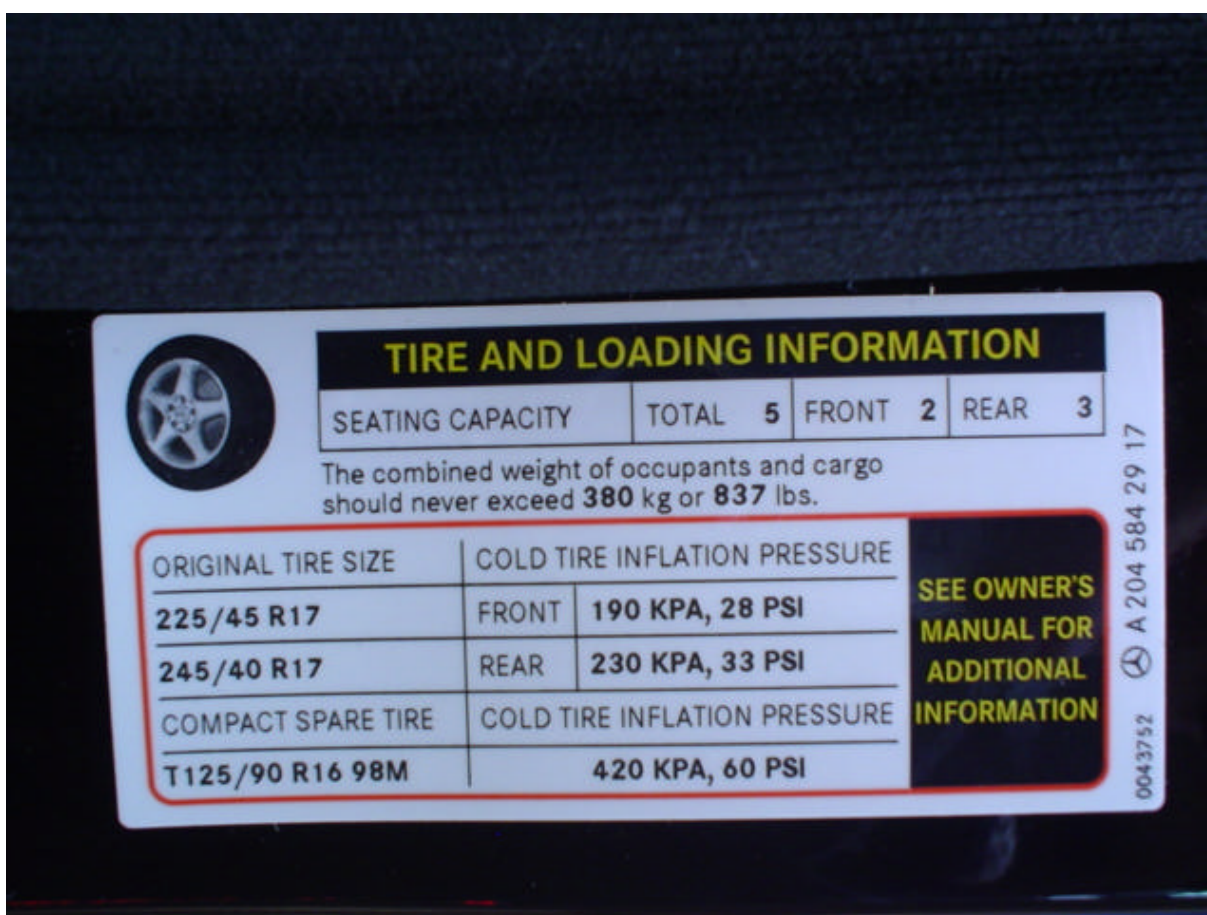
Left Front ¾ View, As Received



Right Rear ¾ View, As Received



Manufacturer's Label



Tire Placard



Pre-Test Front View



Post-Test Front View



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



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



Pre-Test Left Side View



Post-Test Left Side View



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



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



Pre-Test Rear View



Post-Test Rear View



Pre-Test Right Rear $\frac{3}{4}$ View



Post-Test Right Rear $\frac{3}{4}$ View



Pre-Test Right Side View



Post-Test Right Side View



Pre-Test Right Front ¾ View



Post-Test Right Front $\frac{3}{4}$ View



Pre-Test Left Impact Point



Post-Test Left Impact Point



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



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



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



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



Pre-Test Left Side Impact Close-up



Post-Test Left Side Impact Close-up



Pre-Test Overhead View



Post-Test Overhead View



Pre-Test Driver Dummy (Door Open)



Pre-Test Driver Dummy Clearance From Door



Post-Test Driver Dummy Clearance From Door



Pre-Test Driver Dummy (Through Window)



Post-Test Driver Dummy (Through Window)



Pre-Test Driver Dummy Right Side View



Post-Test Driver Dummy Right Side View



Pre-Test Passenger Dummy (Door Open)



Pre-Test Passenger Dummy Clearance From Door



Post-Test Passenger Dummy Clearance From Door



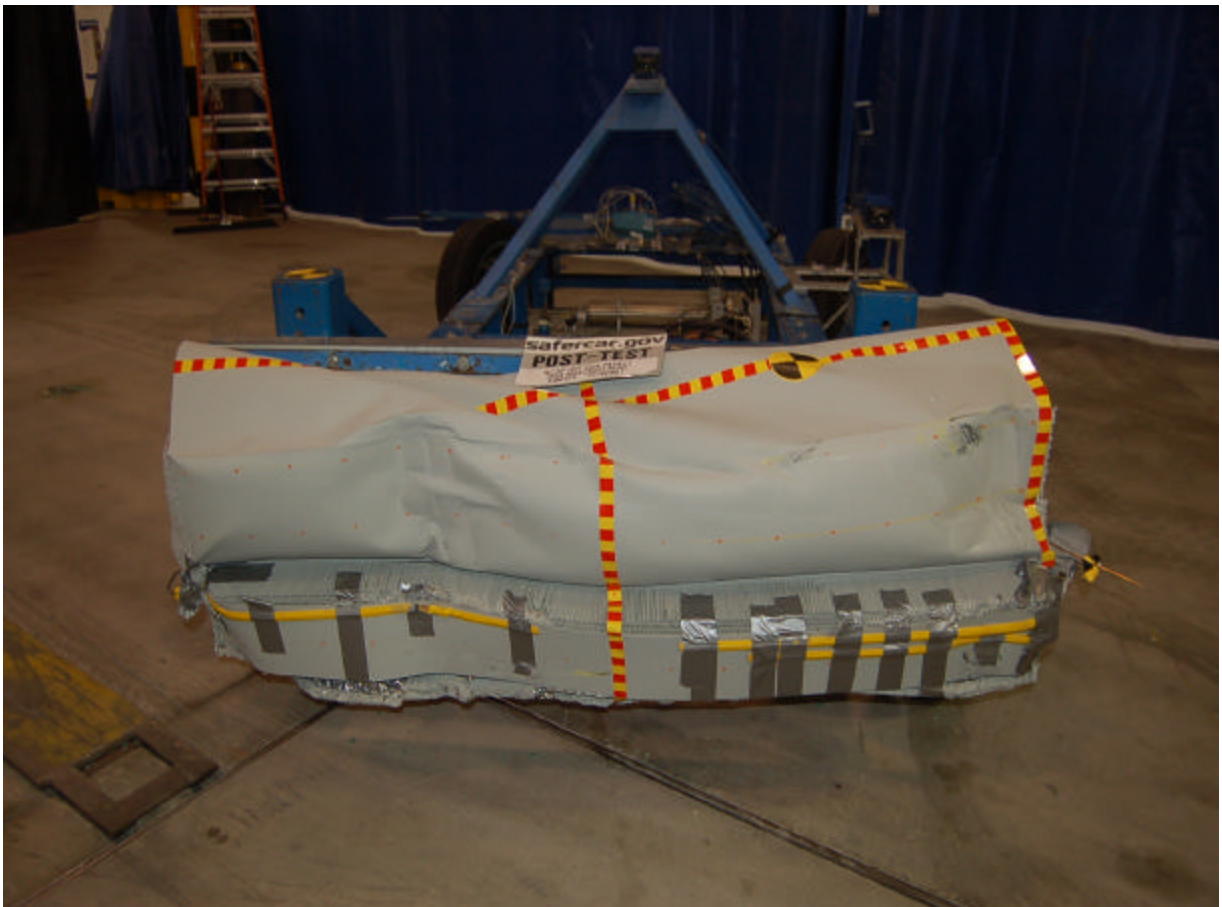
Pre-Test Passenger Dummy (Through Window)



Pre-Test Passenger Dummy Right Side View



Pre-Test Front View of Deformable Barrier



Post-Test Front View of Deformable Barrier



Pre-Test Top View of Deformable Barrier



Post-Test Top View of Deformable Barrier



Pre-Test Right Side View of Deformable Barrier



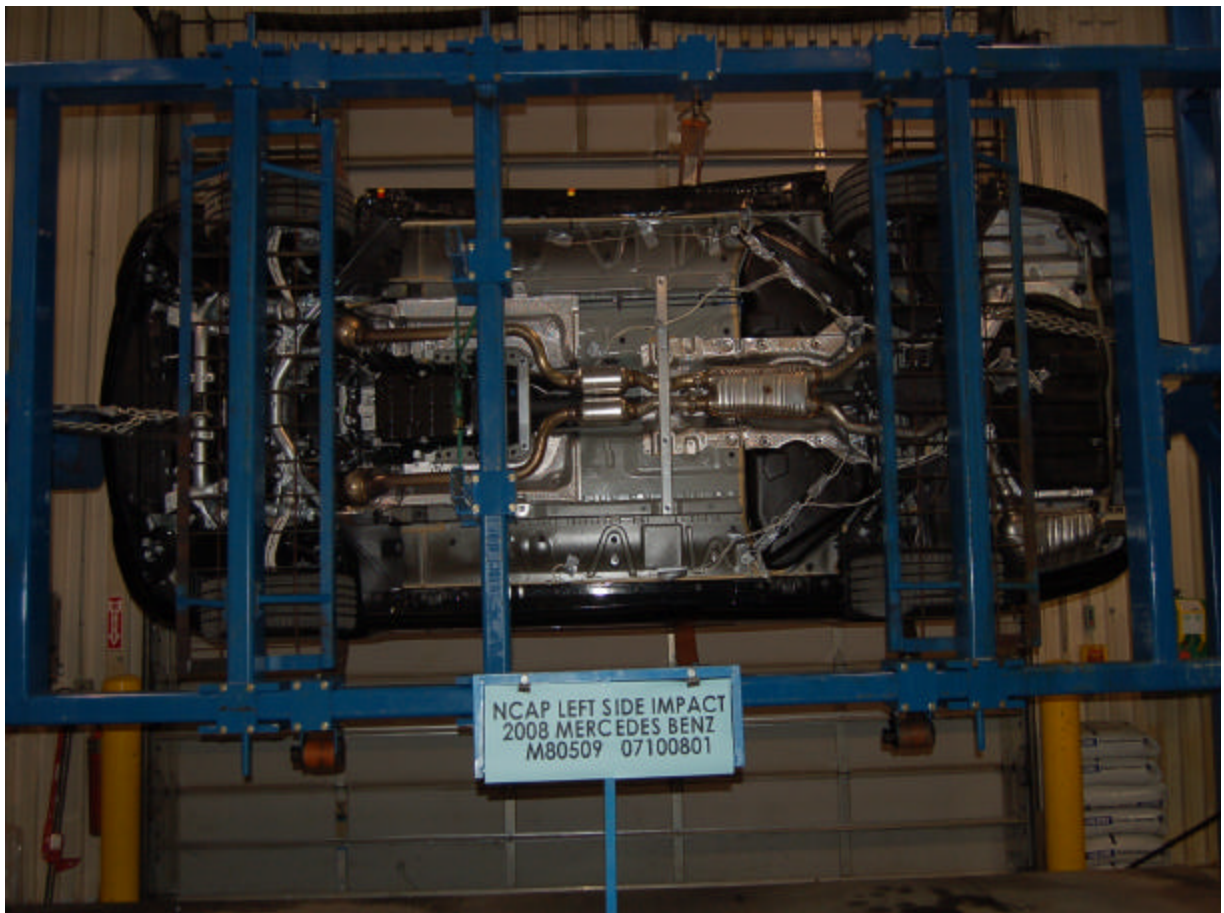
Post-Test Right Side View of Deformable Barrier



Pre-Test Left Side View of Deformable Barrier



Post-Test Left Side View of Deformable Barrier



Vehicle on Rollover Device (90 Degrees)



Vehicle on Rollover Device (180 Degrees)



Vehicle on Rollover Device (270 Degrees)



Vehicle on Rollover Device (360 Degrees)



95,00 ms • 8 Oct 2007 10:43 • T0: 21 • 1,000 fps • Frame: 116

Vehicle Impact



Post-Test Driver Dummy Head Contact



Post-Test Driver Dummy Torso Contact



Post-Test Driver Dummy Contact



Post-Test Passenger Dummy Head Contact



Post-Test Passenger Dummy Torso Contact



Post-Test Passenger Dummy Contact

APPENDIX B

SID/HIII RESPONSE DATA TRACES

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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 X Primary

Driver Head Y Primary

Driver Head Z Primary

Driver Head X Redundant

Driver Head Y Redundant

Driver Head Z Redundant

Driver Upper Neck Force X

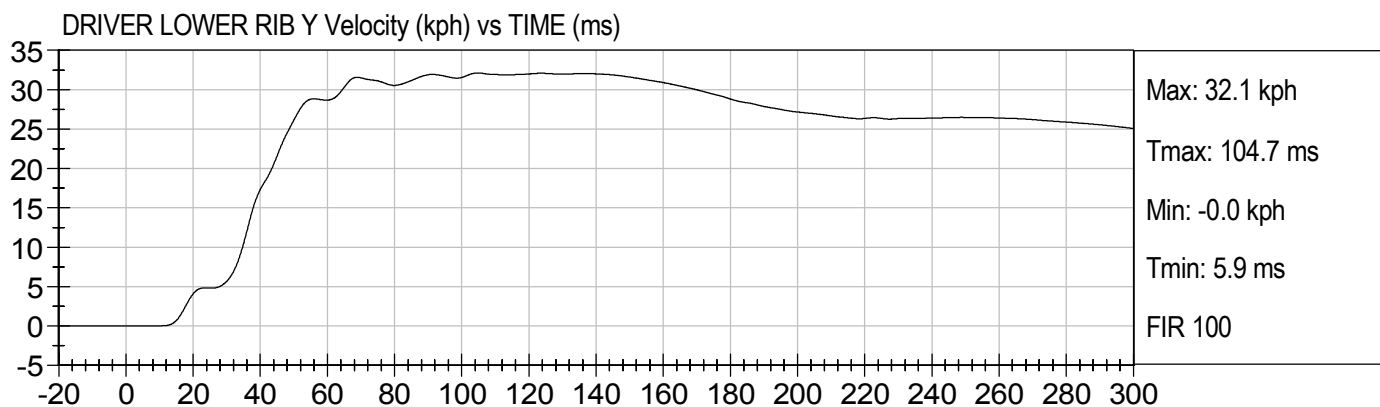
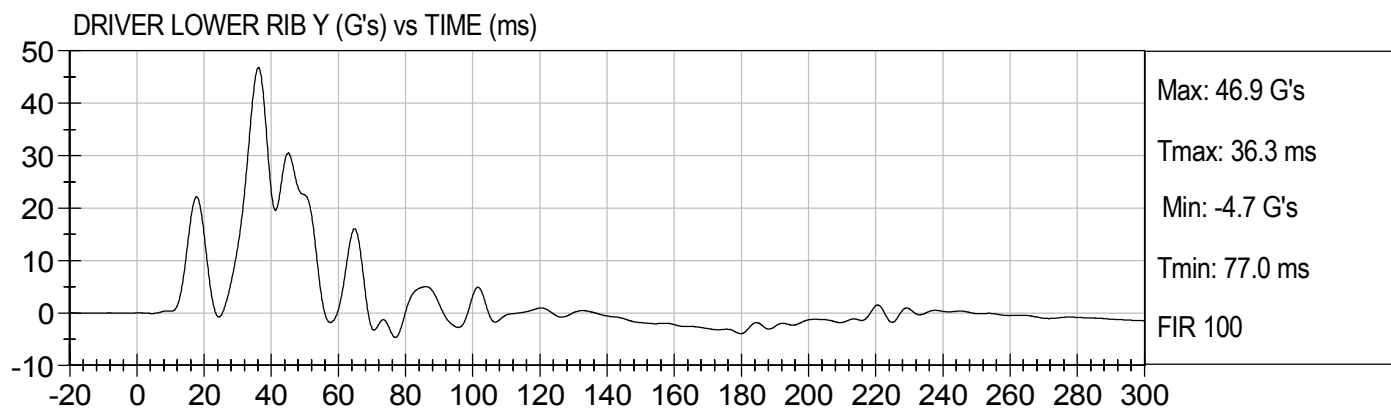
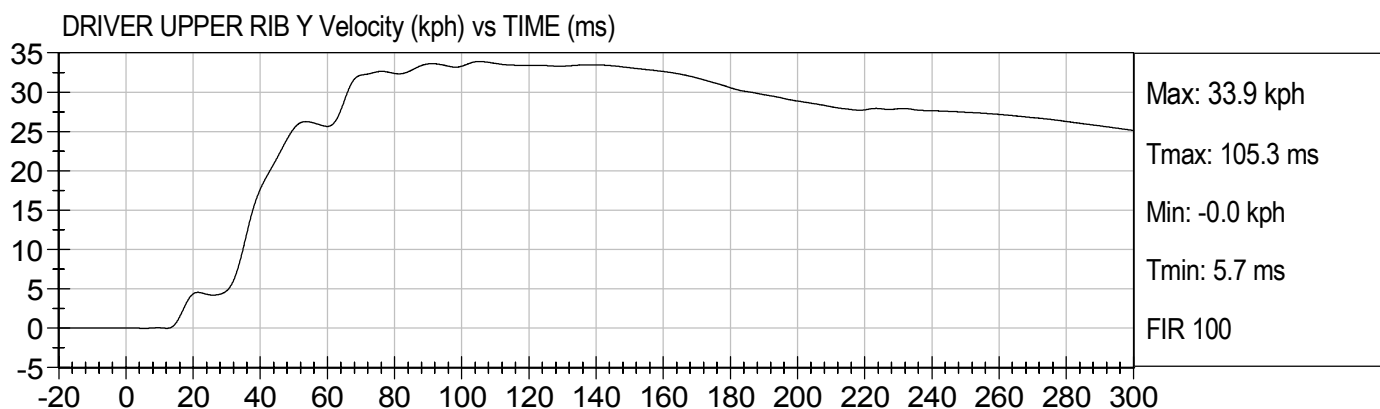
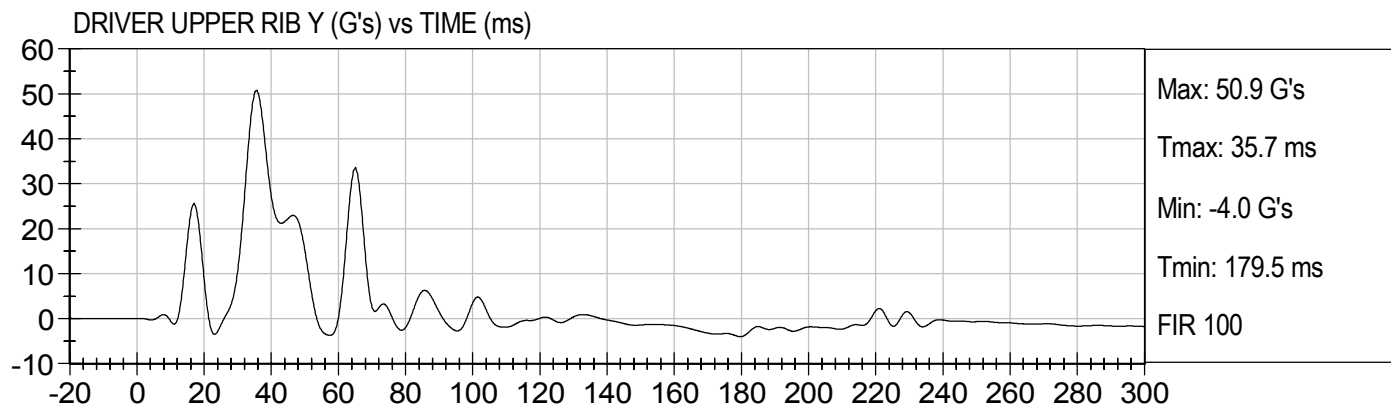
Driver Upper Neck Force Y

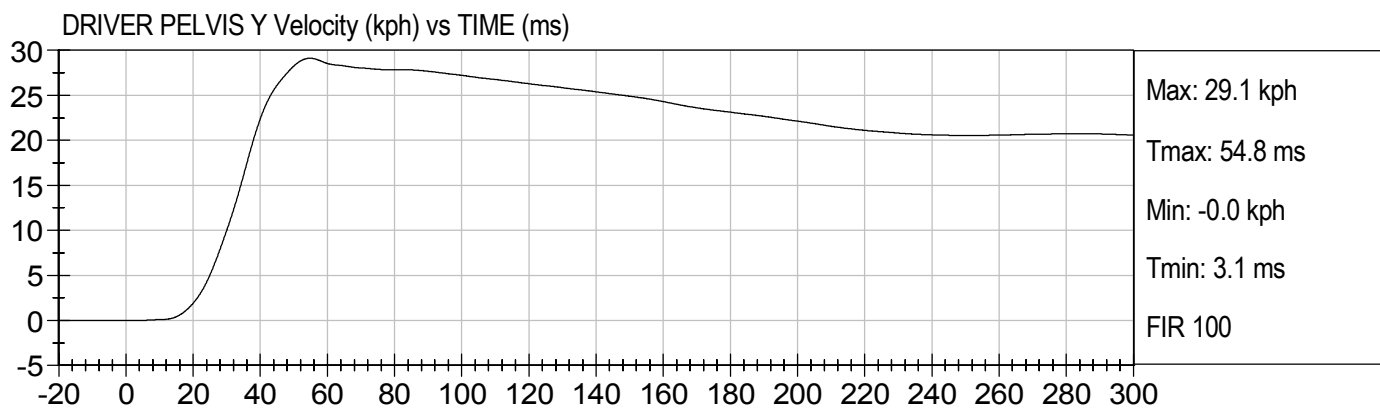
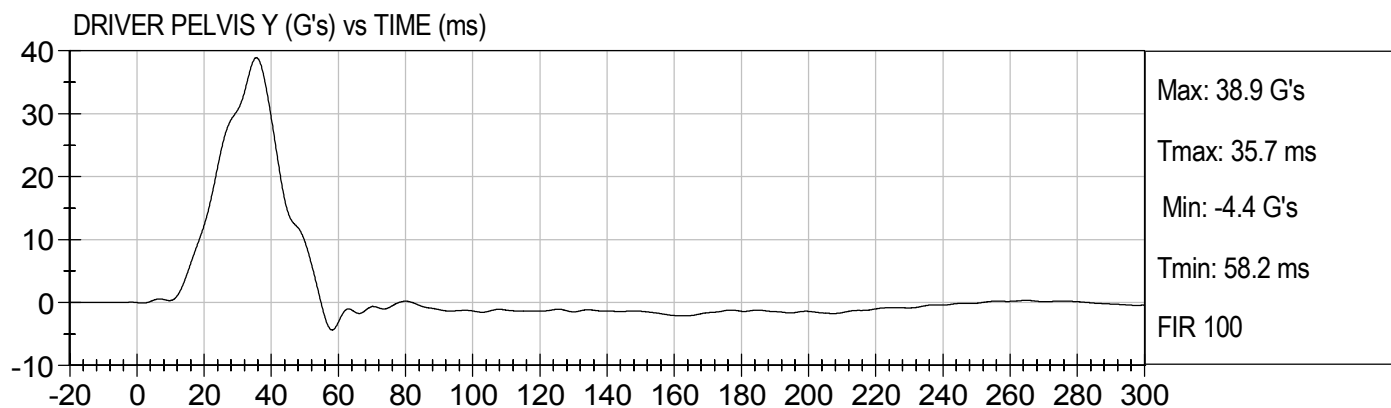
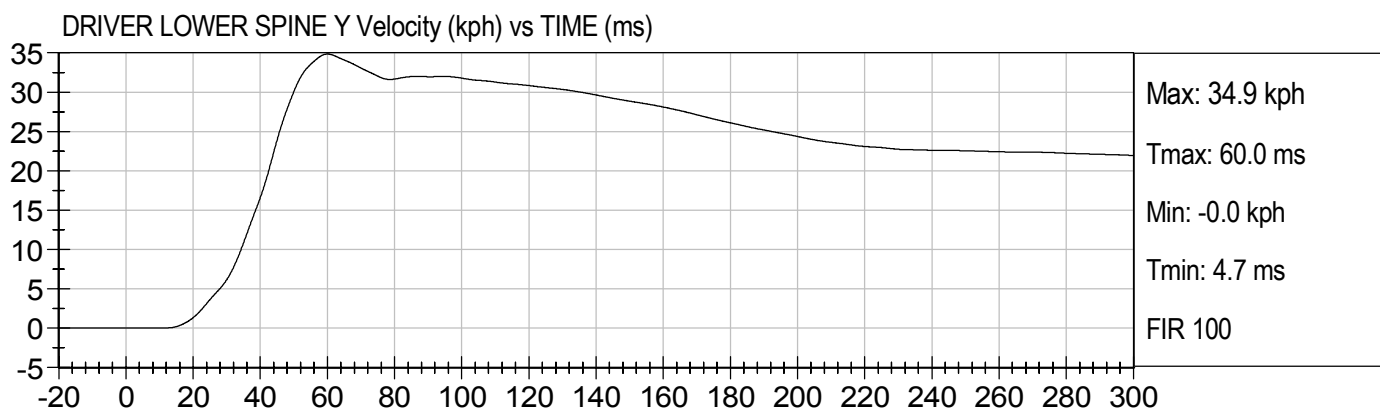
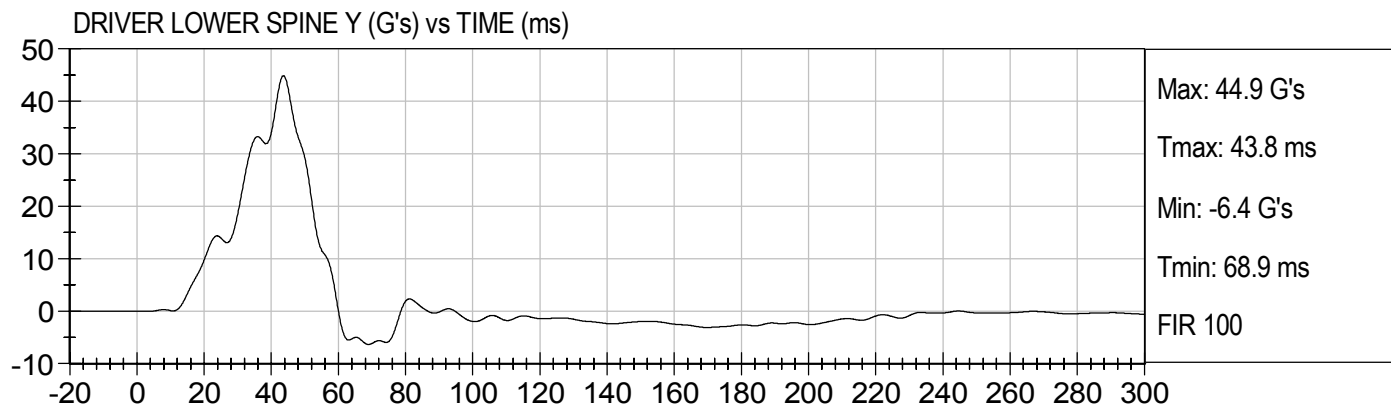
Driver Upper Neck Force Z

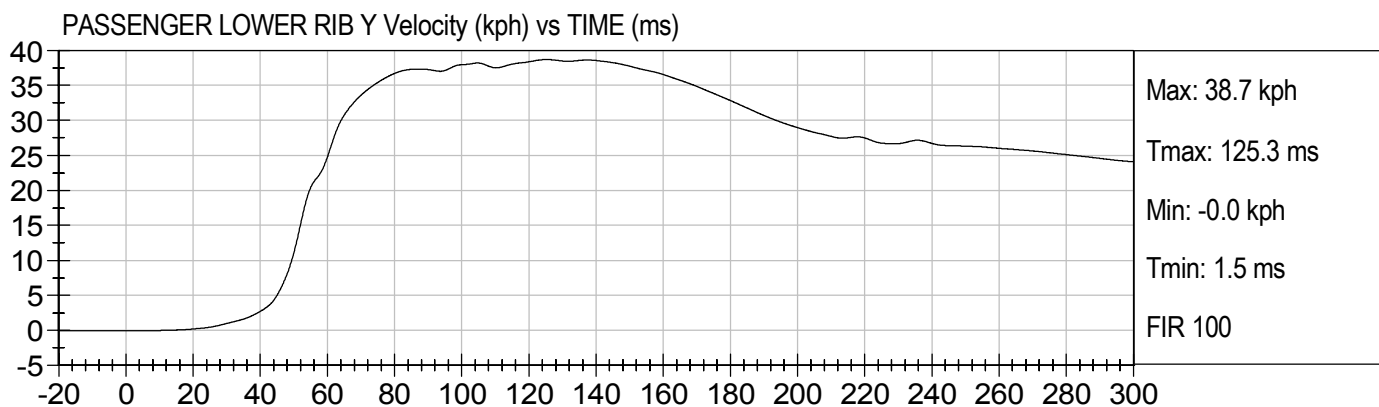
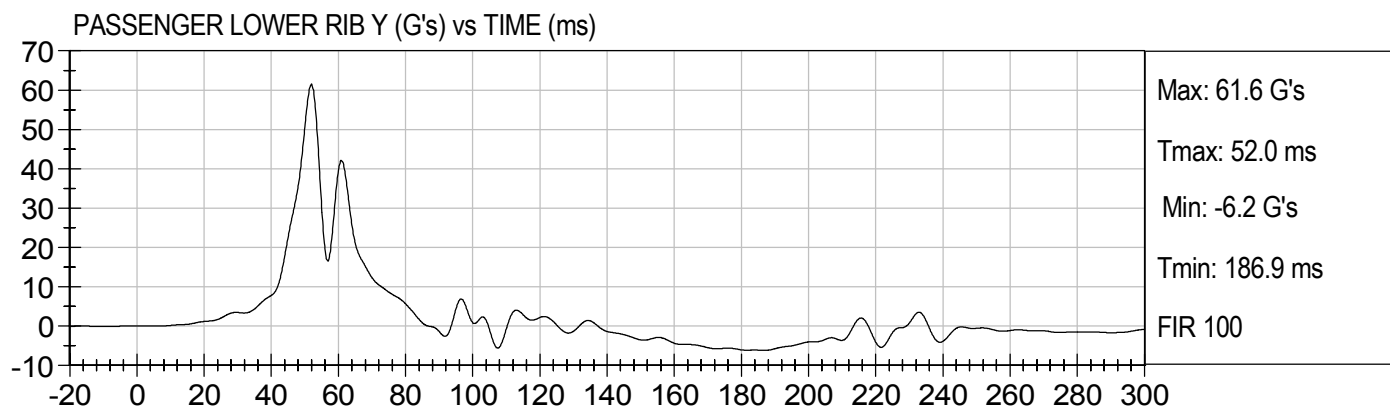
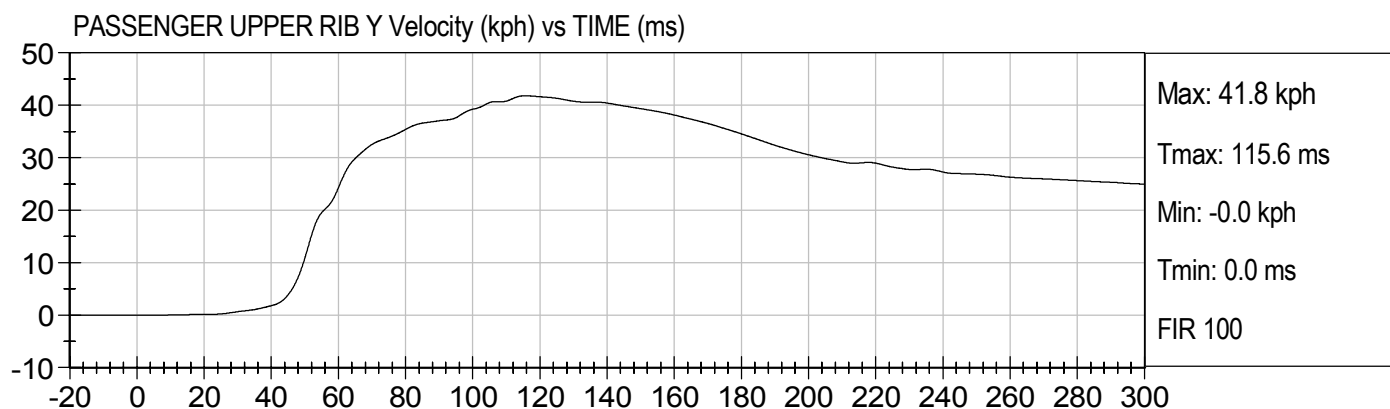
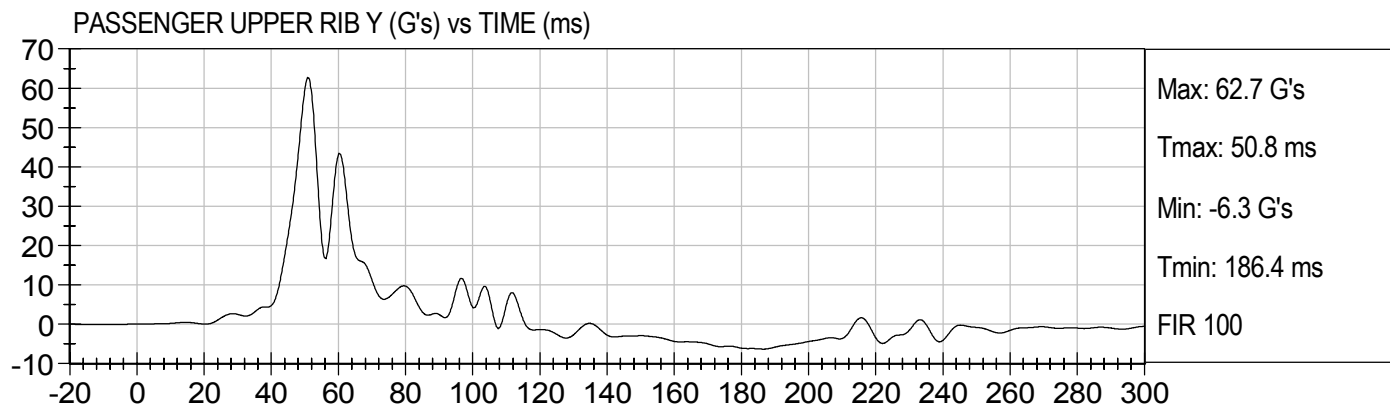
Driver Upper Neck Moment X

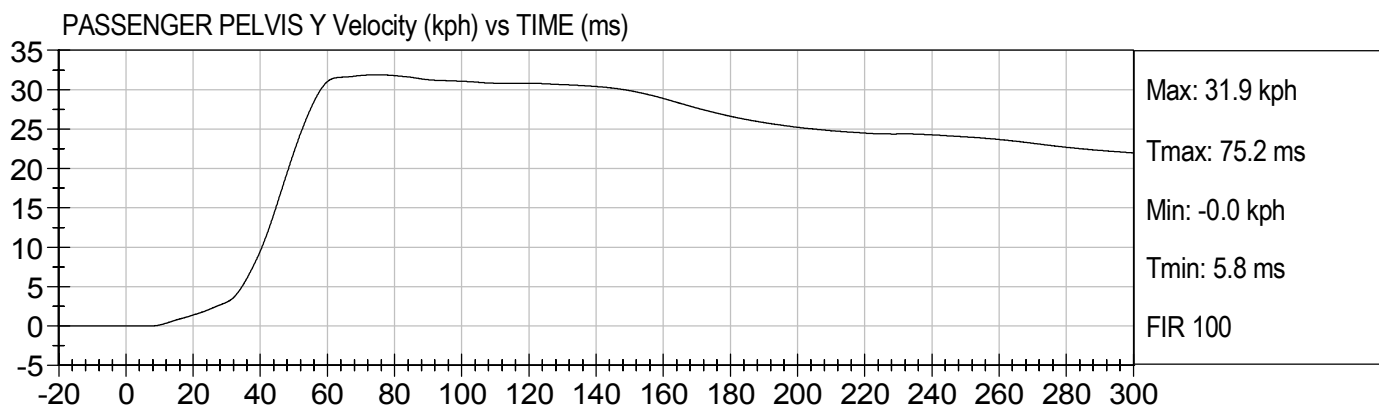
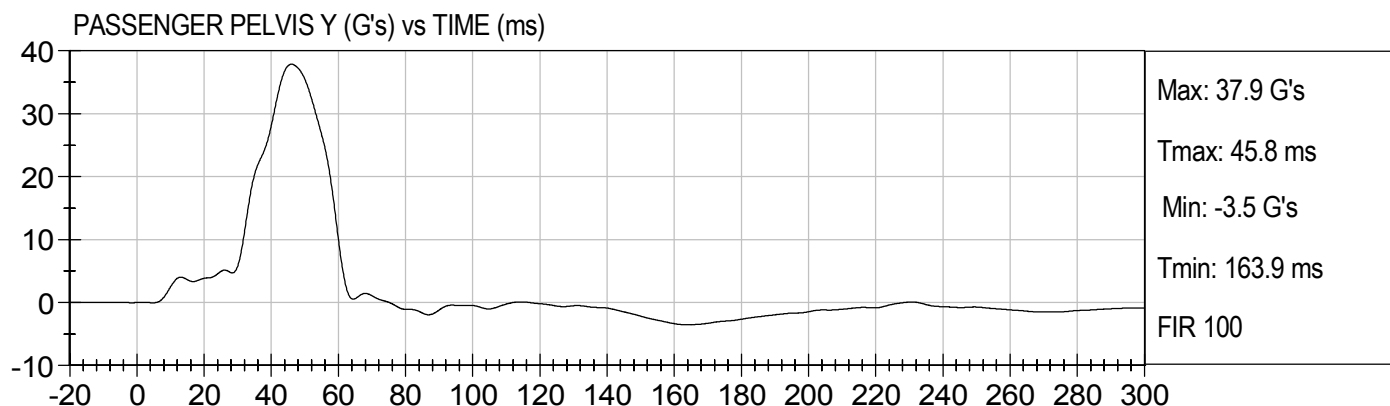
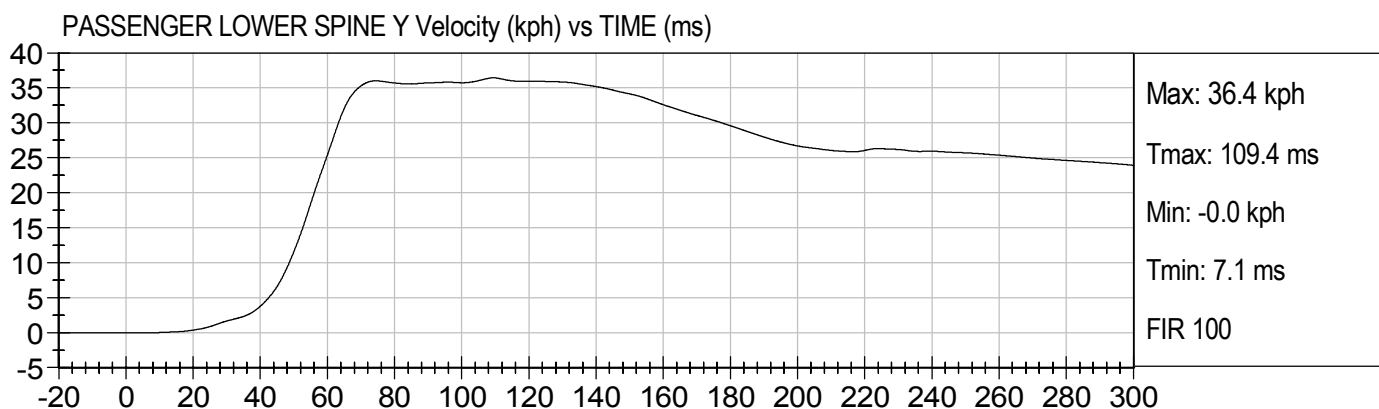
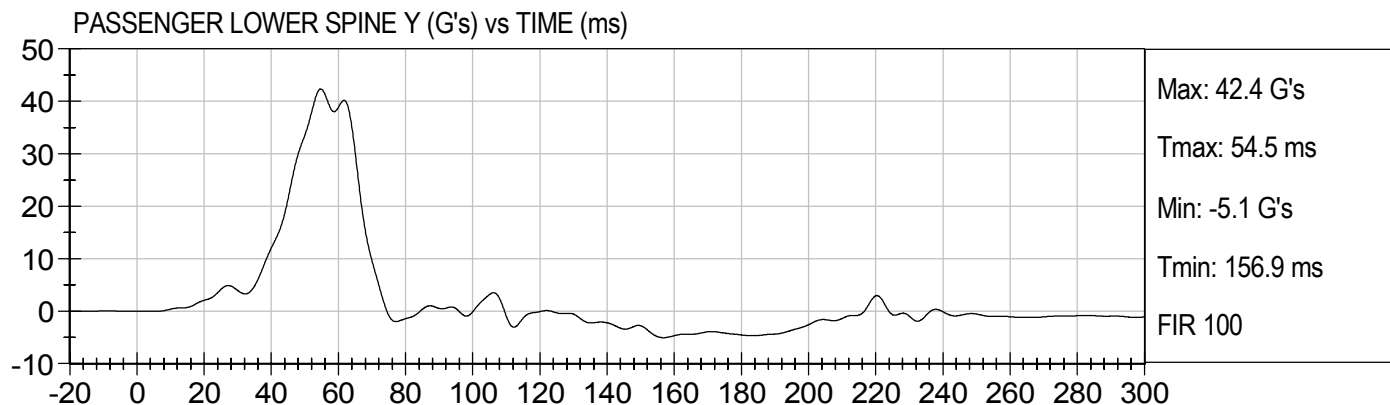
Driver Upper Neck Moment Y
Driver Upper Neck Moment Z
Driver Upper Rib Redundant Y
Driver Lower Rib Redundant Y
Driver Lower Spine Redundant Y
Driver Pelvis Redundant Y
Driver Thorax Contact
Driver Pelvis Contact
Passenger Head X Primary
Passenger Head Y Primary
Passenger Head Z Primary
Passenger Head X Redundant
Passenger Head Y Redundant
Passenger Head Z Redundant
Passenger Upper Neck Force X
Passenger Upper Neck Force Y
Passenger Upper Neck Force Z
Passenger Upper Neck Moment X
Passenger Upper Neck Moment Y
Passenger Upper Neck Moment Z
Passenger Upper Rib Redundant Y
Passenger Lower Rib Redundant Y
Passenger Lower Spine Redundant Y
Passenger Pelvis Redundant Y
Passenger Thorax Contact
Passenger Pelvis Contact
Vehicle Right Sill at Front Seat X
Vehicle Right Sill at Front Seat Y
Vehicle Right Sill at Front Seat Z
Vehicle Right Sill at Rear Seat X
Vehicle Right Sill at Rear Seat Y
Vehicle Right Sill at Rear Seat Z

Vehicle Rear Floor Above Axle X
Vehicle Rear Floor Above Axle Y
Vehicle Rear Floor Above Axle Z
Vehicle Left Sill at Rear Door Y
Vehicle Left Sill at Front Door Y
Vehicle Right Rear Occupant Compartment
Vehicle B-Post Lower Y
Vehicle B-Post Middle Y
Vehicle A-Post Lower Y
Vehicle A-Post Middle Y
Vehicle Left Front Seat Track
Vehicle CG X
Vehicle CG Y
Vehicle CG Z
MDB CG X
MDB CG Y
MDB CG Z
MDB Rear X
MDB Rear Y
MDB Left Bumper Contact
MDB Right Bumper Contact









APPENDIX C
DUMMY CALIBRATION DATA

CERTIFICATION DATA

Dummy Serial Number: 271

Calibration Test Results Summary

Dummy Serial Number: 271

Pre-Test Calibration

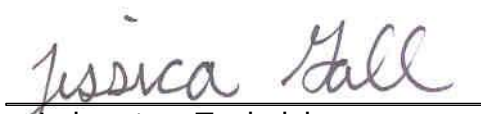
External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all pendulum test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SID Calibration Data Sheet
Side Impact Dummy
External Measurements

ATD Serial No: 271

Test I.D: D07296

Tested Parameter	Units	Specification	Result	Pass/Fail
SH - Seated Height	mm	889 - 909	905	Pass
RH - Rib Height	mm	501 - 521	502	Pass
HP - Hip Pivot Height	mm	99 ref.	99	Pass
RD - Rib from Back Line	mm	229 - 241	239	Pass
KV - Knee Pivot to Back Line	mm	511 - 526	526	Pass
SW - Knee Pivot to Floor	mm	490 - 505	497	Pass
HW - Hip Width	mm	356 - 391	371	Pass
Overall Test Results			Pass	


Laboratory Technician


Approved By

9/21/2007
Test Date

SID/HIII Calibration Data Sheet
Side Impact Dummy
Head Drop Calibration (Lateral)

ATD Serial No: 271

Test I.D: D072961

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Peak Resultant Acceleration	G's	120 to 150	130	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-10.6	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

9/21/07
Test Date

David Winkelbauer
Approved By



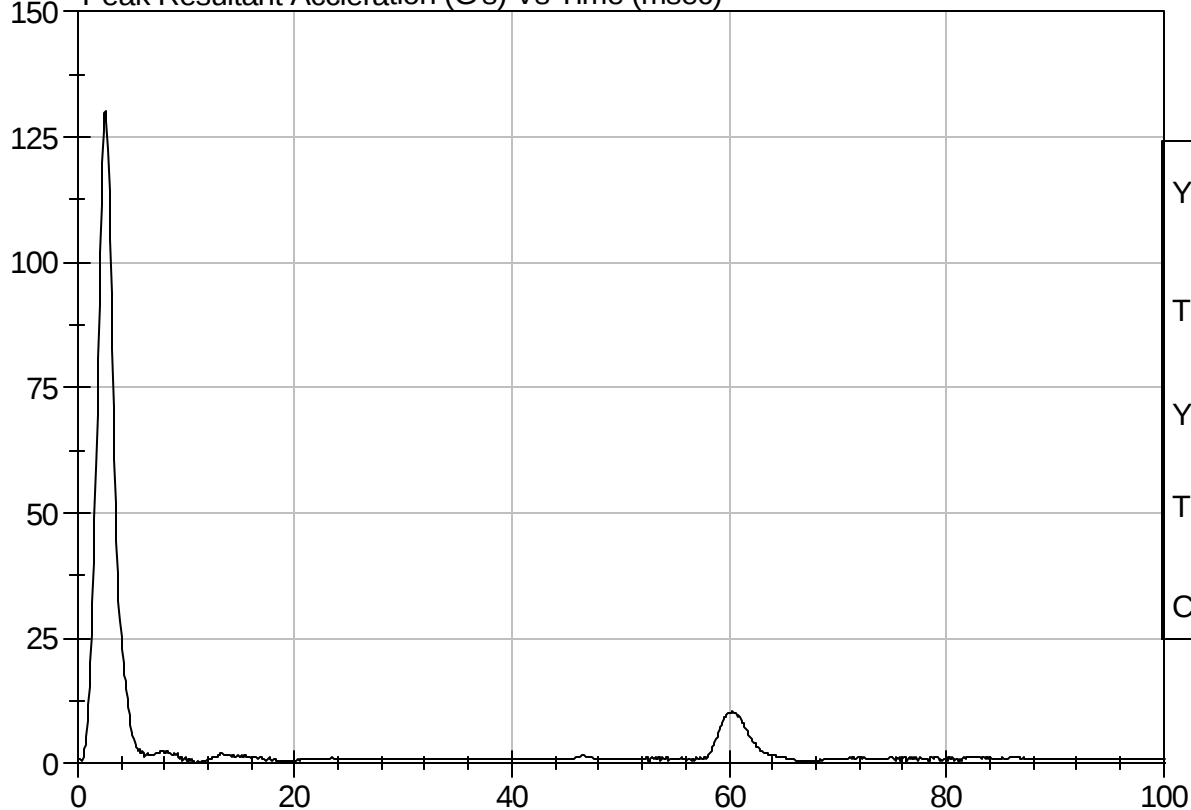
Test Description: Head Drop

Test Date: 9/21/07

Component: D072961

Speed: 0 ft/s, 0.00 m/s

Peak Resultant Acceleration (G's) Vs Time (msec)



YMax: 130.4 G

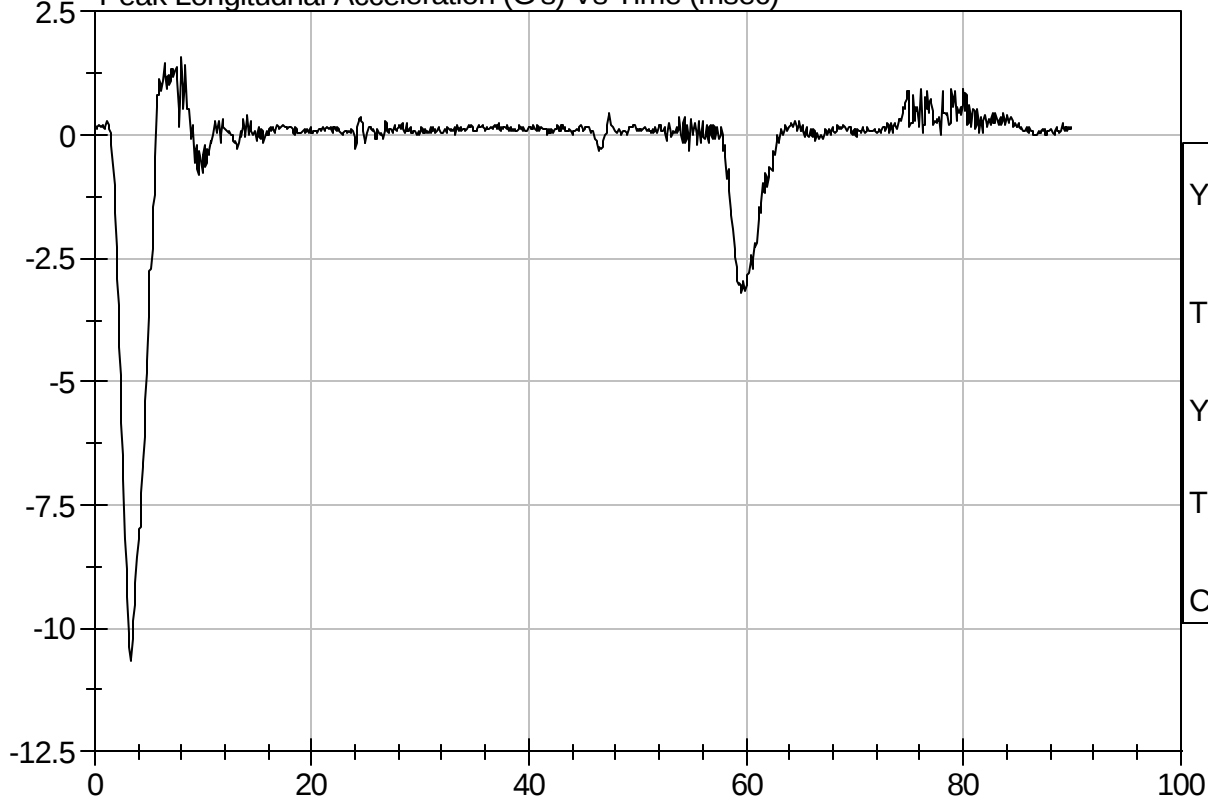
Tmax: 2.6 ms

YMin: 0.2 G

Tmin: 10.8 ms

CFC 1000

Peak Longitudinal Acceleration (G's) Vs Time (msec)



YMax: 1.6 G

Tmax: 8.0 ms

YMin: -10.6 G

Tmin: 3.3 ms

CFC 1000

SID/HIII Calibration Data Sheet
Side Impact Dummy
Thorax Impact Test

ATD Serial No: 271

Test I.D: D072962

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Probe Velocity	m/s	4.22 - 4.31	4.30	Pass
Upper Rib	G's	37 - 46	42	Pass
Lower Rib	G's	37 - 46	41	Pass
Lower Spine	G's	15 - 22	17	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

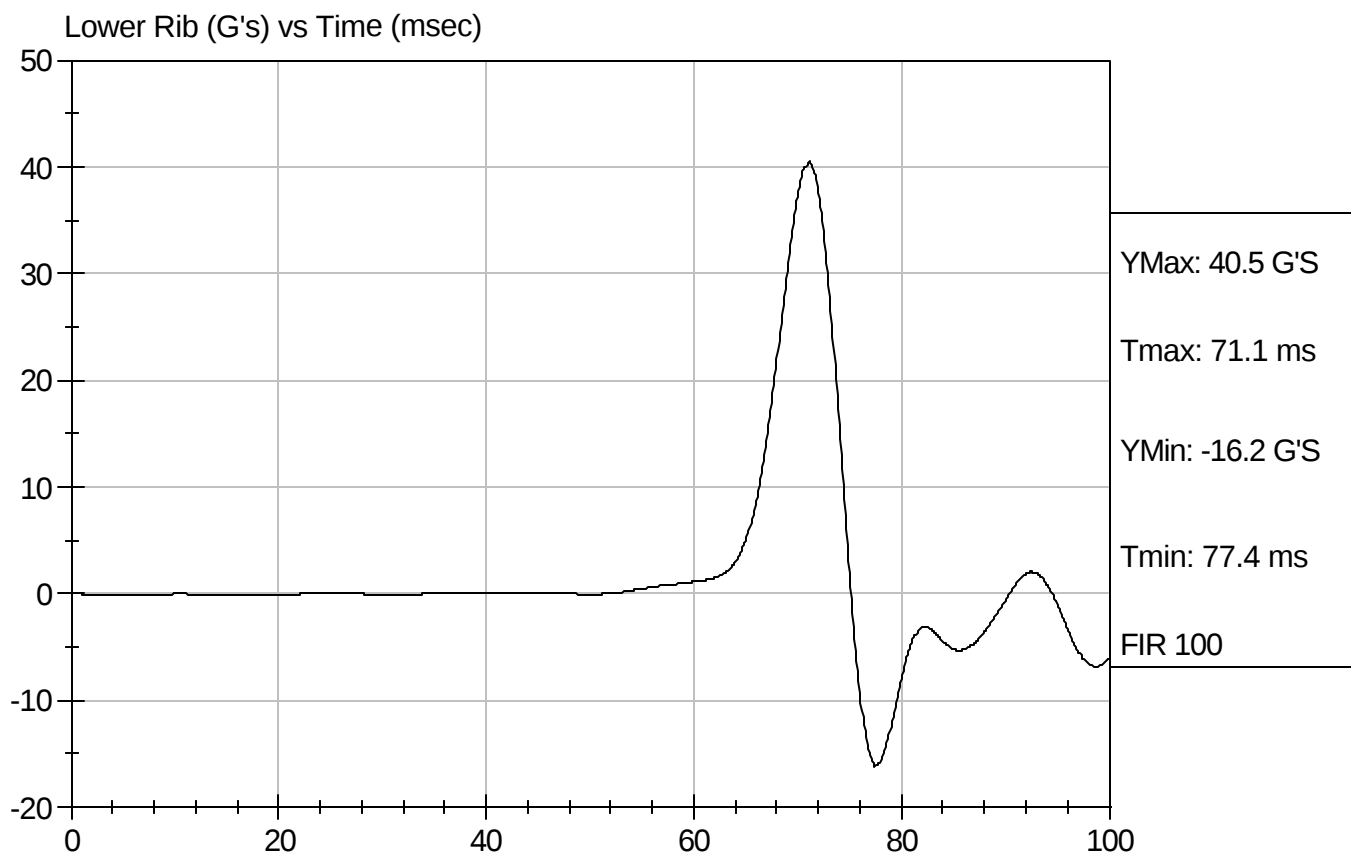
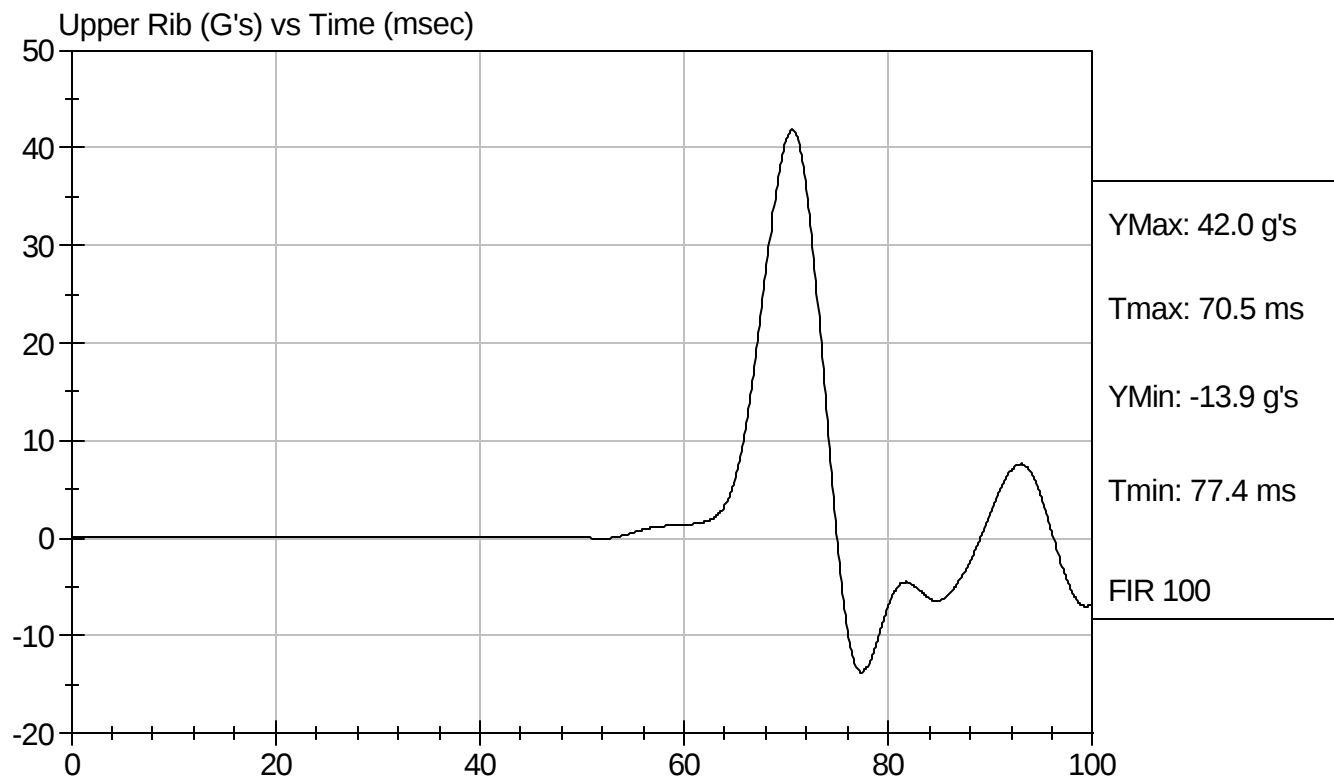
9/21/07
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax Impact
Component ID: D072962

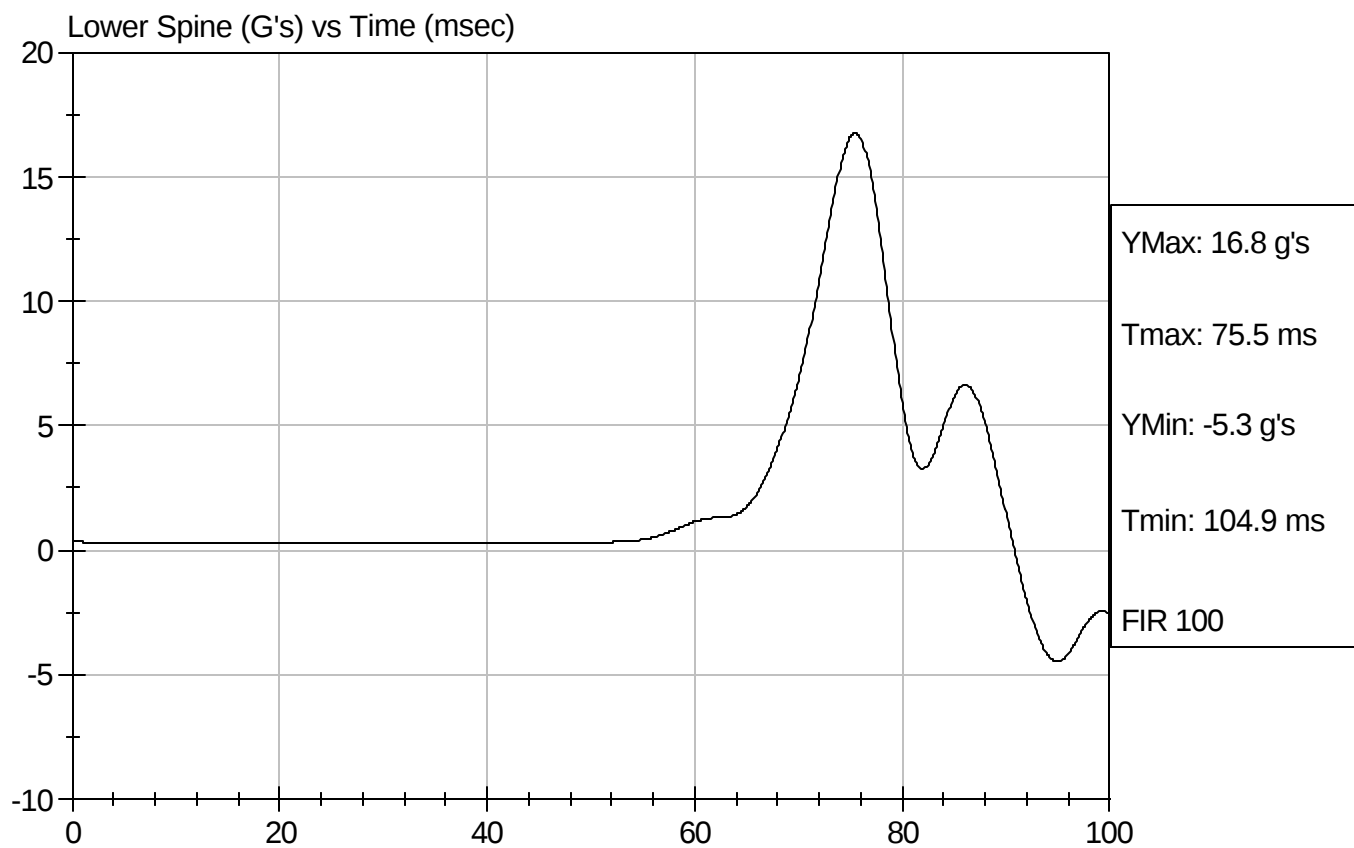
Test Date: 9/21/07
Speed: 14.12 ft/sec, 4.30 m/sec





Test Desc: Thorax Impact
Component ID: D072962

Test Date: 9/21/07
Speed: 14.12 ft/sec, 4.30 m/sec

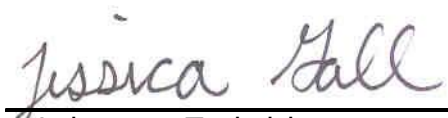


SID/HIII Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Test

ATD Serial No: 271

Test I.D: D072963

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Probe Velocity	m/s	4.27 - 4.33	4.32	Pass
Pelvis Acceleration	G's	40 - 60	44	Pass
Overall Test Results				Pass


Laboratory Technician

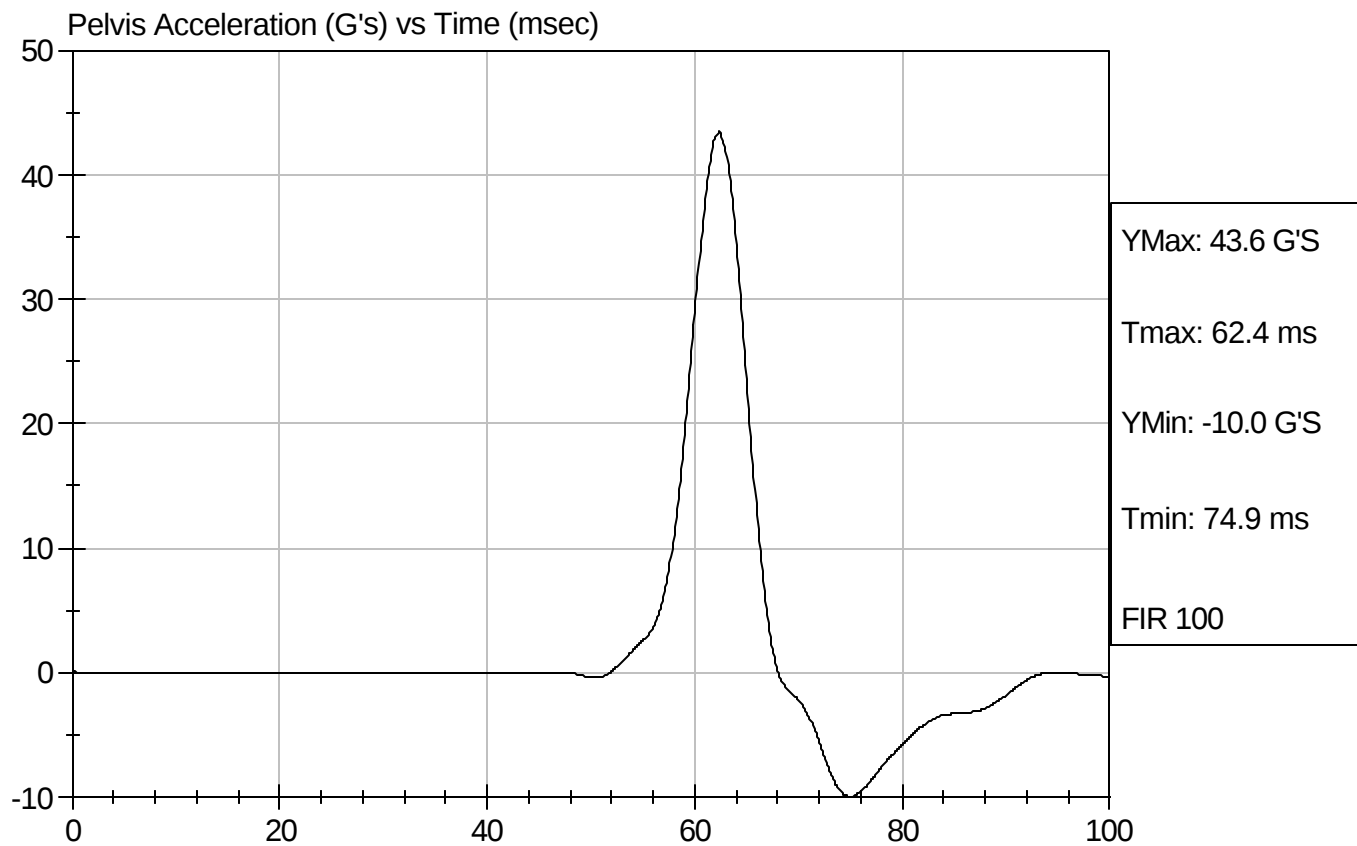
9/21/07
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D072963

Test Date: 9/21/07
Speed: 14.18 ft/sec, 4.32 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 271

Test I.D: D072964

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Force At 12.7 mm	N	104 -162	147	Pass
Force At 19 mm	N	163 - 222	207	Pass
Force At 25.4 mm	N	222 - 280	274	Pass
Force At 33 mm	N	325 - 391	371	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

9/21/07
Test Date

David Winkelbauer
Approved By

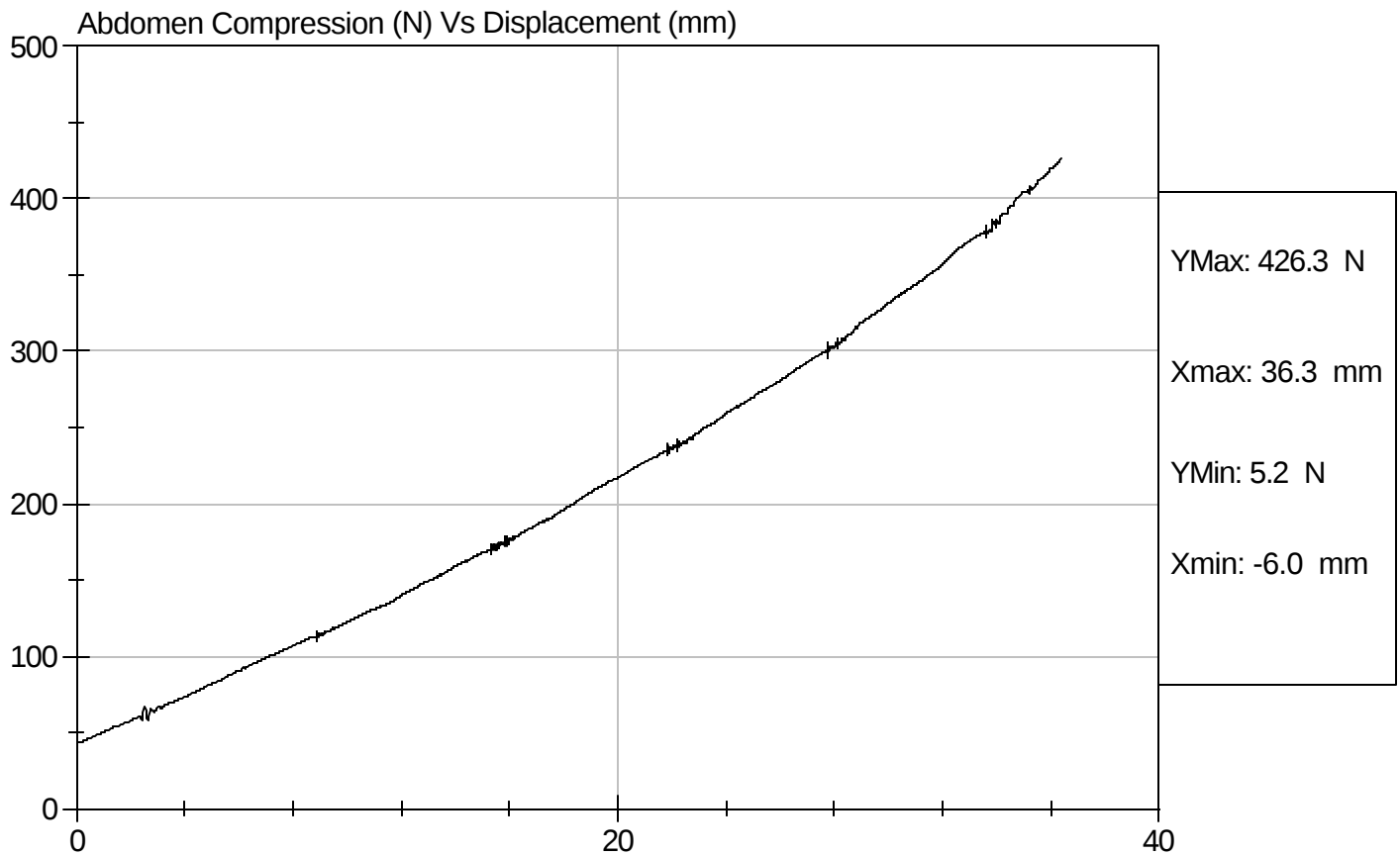


Test Description: Abdomen Compression

Test Date: 9/21/07

Component: D072964

Speed: 0 ft/sec, 0 m/sec



SID/HIII Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 271

Test I.D: D072965

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	38	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	120.3	Pass
Force At 30 deg	N	151.2 - 204.6	189.8	Pass
Force At 40 deg	N	204.6 - 258.0	243.2	Pass
Return Angle	Deg	12 Maximum	7	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

9/21/07
Test Date

David Winkelbauer
Approved By

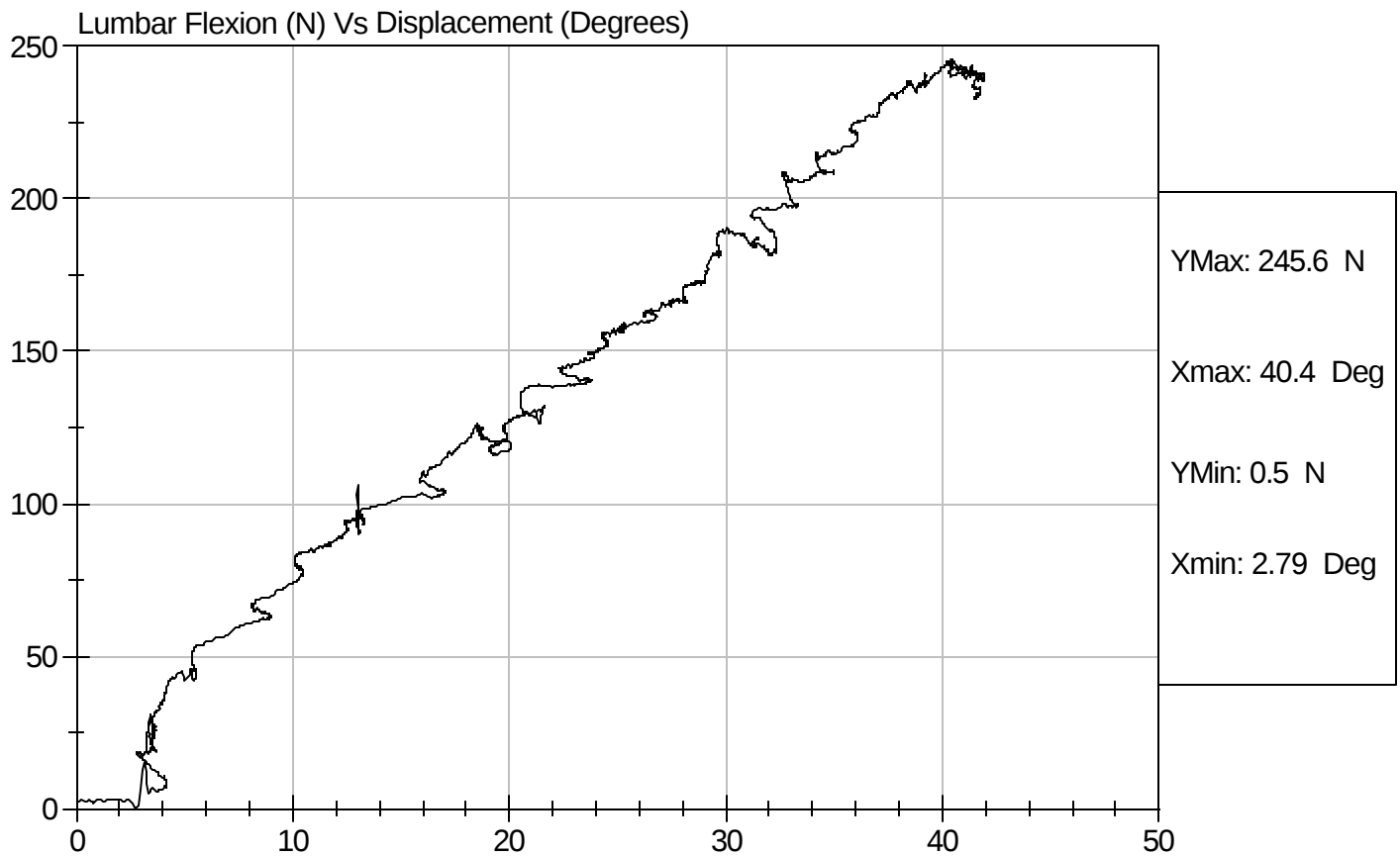


Test Description: Lumbar Flexion

Test Date: 9/21/07

Component: D072965

Speed: 0 ft/sec, 0 m/sec

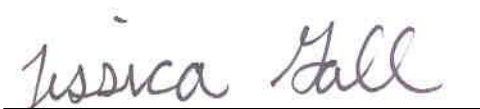


SID/HIII Calibration Data Sheet
Side Impact Dummy
Neck Pendulum Test

ATD Serial No: 271

Test I.D: D072969

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	38	Pass
Impact Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.21	Pass
	20 msec	m/s	4.12 to 5.10	4.41	Pass
	30 msec	m/s	5.73 to 7.01	6.09	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.84	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	73	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	61	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	75	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	60	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	12	Pass


 Laboratory Technician

9/21/07

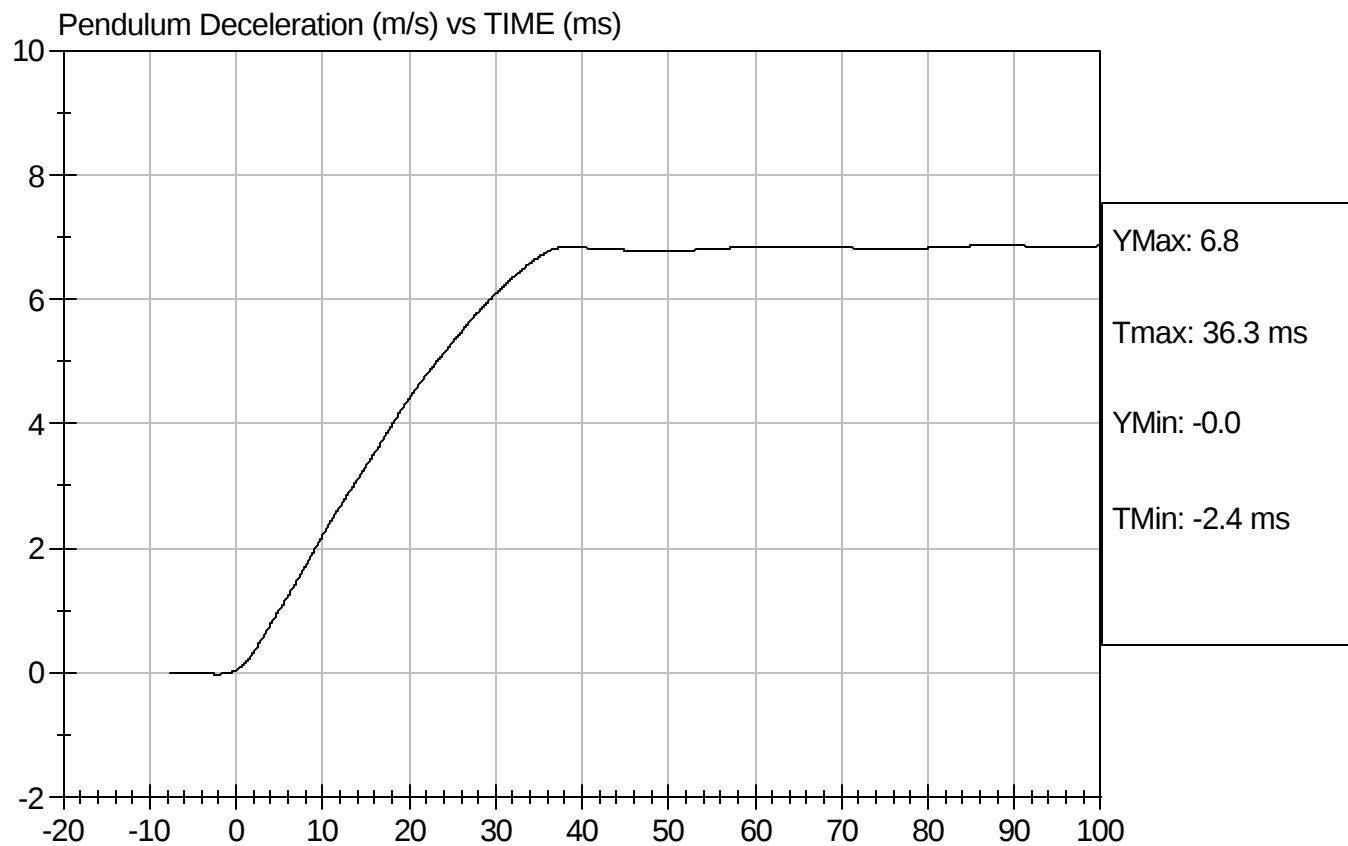
Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D072969

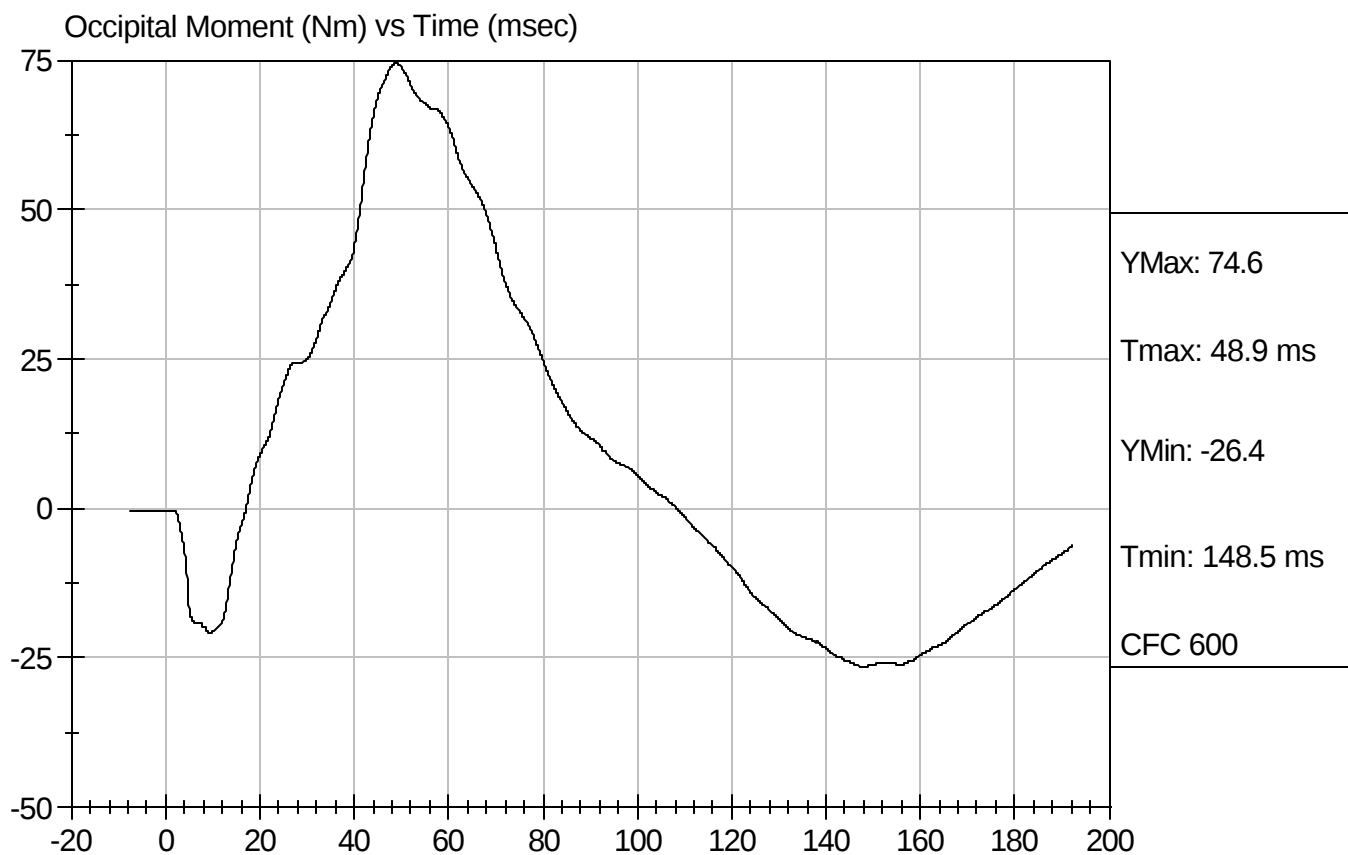
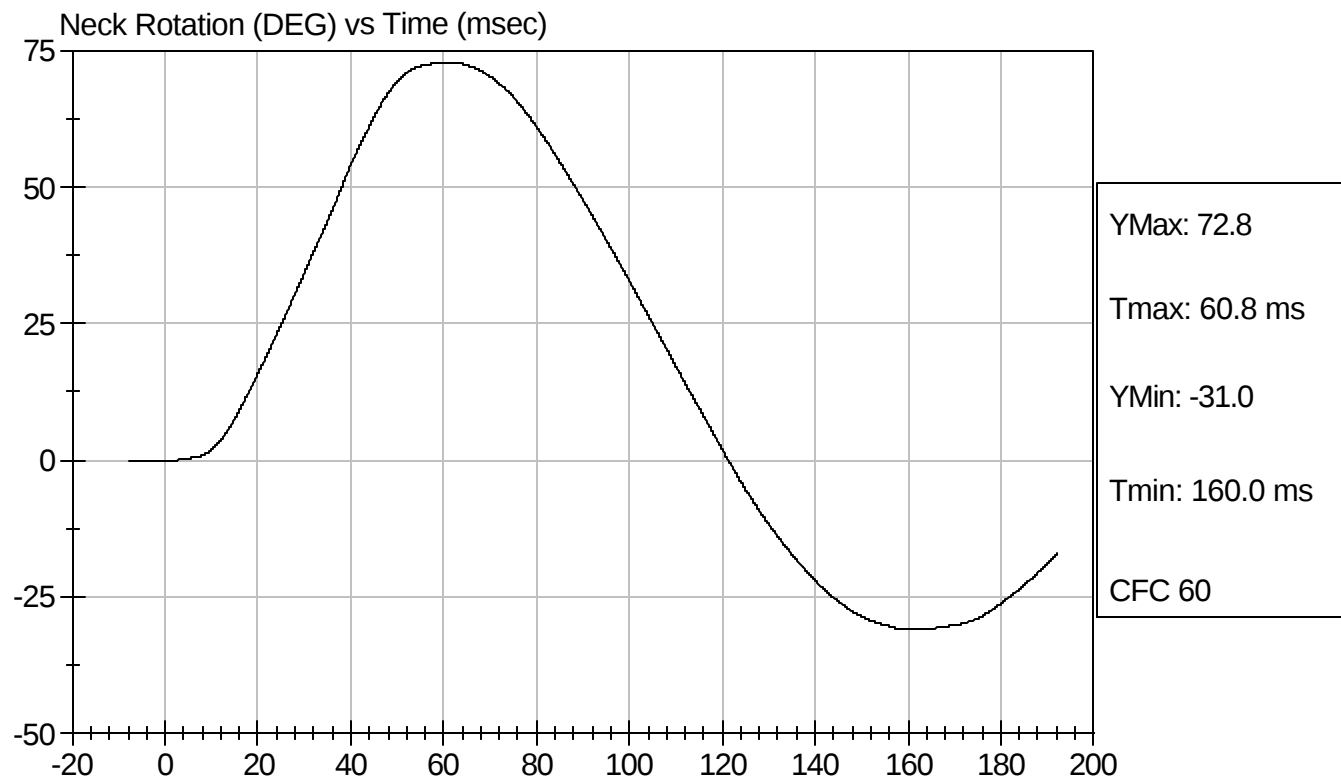
Test Date: 9/21/07
Speed: 22.831 ft/sec, 6.96 m/sec





Test Desc: Neck Bending
Component ID: D072969

Test Date: 9/21/07
Speed: 22.831 ft/sec, 6.96 m/sec



Calibration Test Results Summary

Dummy Serial Number: 271

Post-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all pendulum test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SID/HIII Calibration Data Sheet
Side Impact Dummy
Head Drop Calibration (Lateral)

ATD Serial No: 271

Test I.D: D073141

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Peak Resultant Acceleration	G's	120 to 150	148	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	9.3	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

10/8/07
Test Date

David Winkelbauer
Approved By



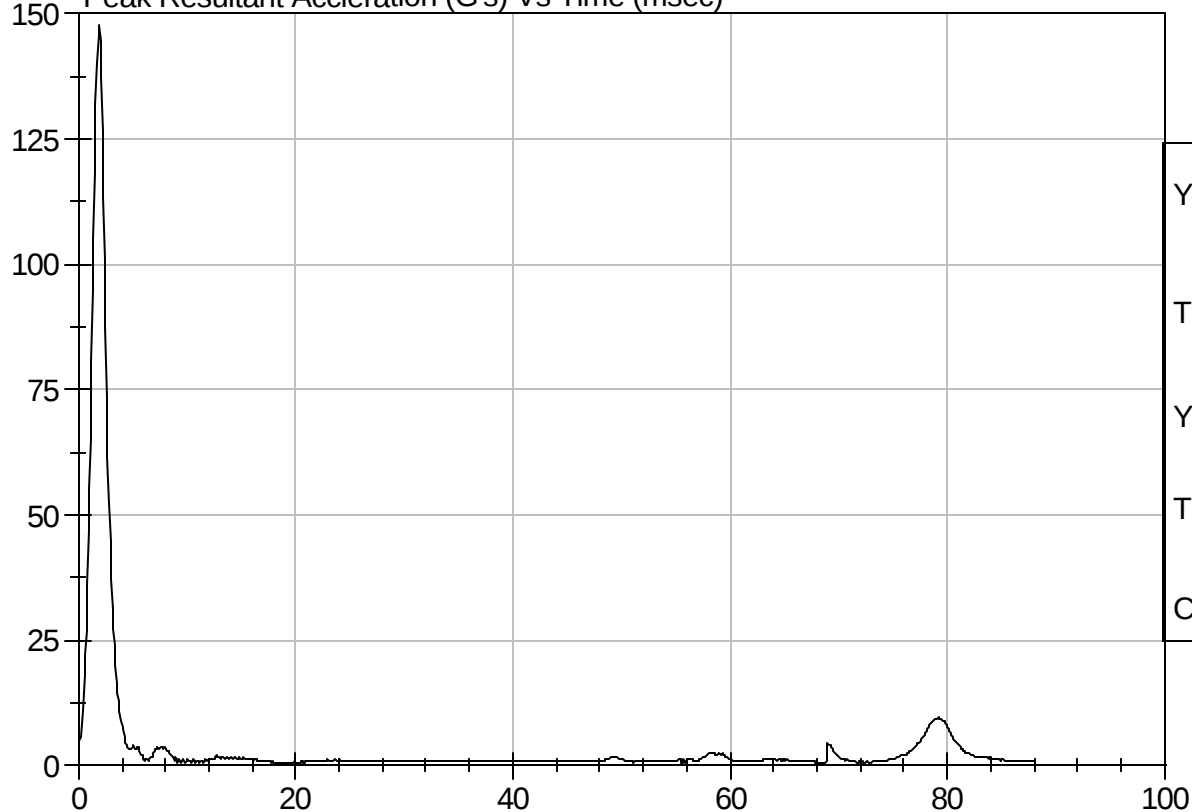
Test Description: Head Drop

Test Date: 10/8/07

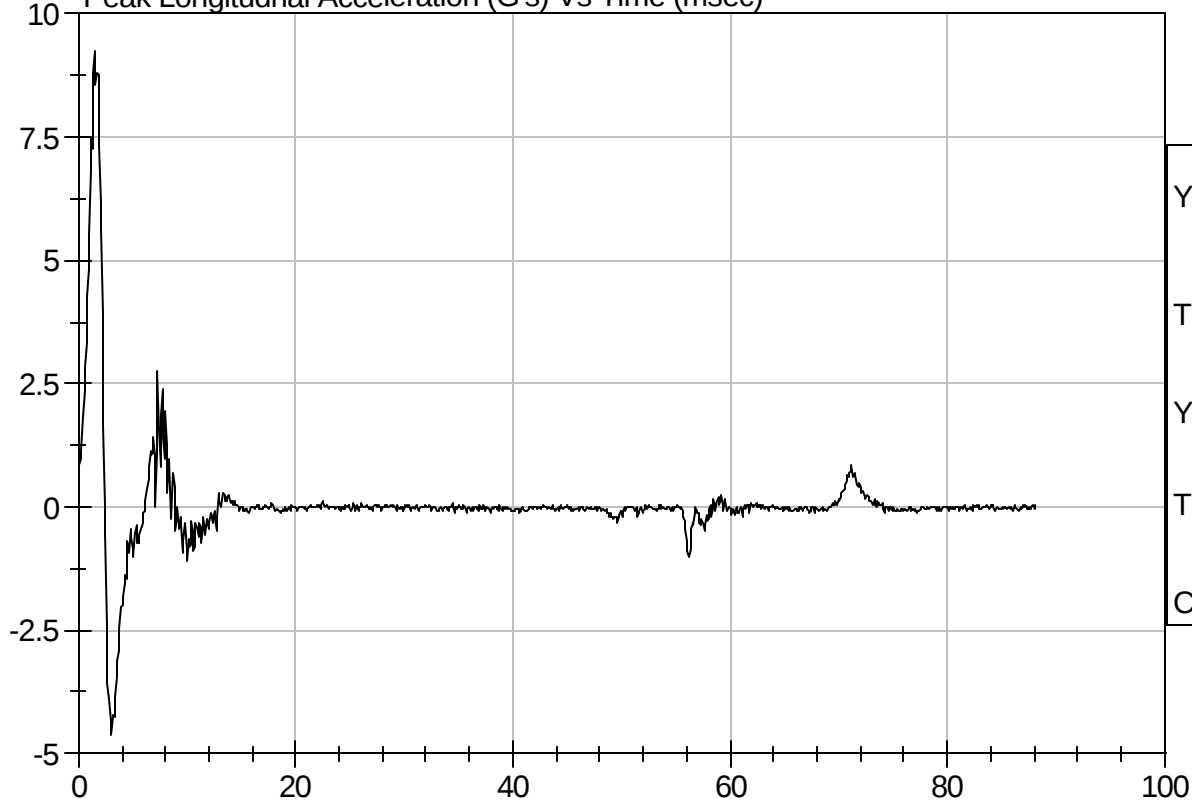
Component: D073141

Speed: 0 ft/s, 0.00 m/s

Peak Resultant Acceleration (G's) Vs Time (msec)



Peak Longitudinal Acceleration (G's) Vs Time (msec)



SID/HIII Calibration Data Sheet
Side Impact Dummy
Thorax Impact Test

ATD Serial No: 271

Test I.D: D073142

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Probe Velocity	m/s	4.22 - 4.31	4.23	Pass
Upper Rib	G's	37 - 46	46	Pass
Lower Rib	G's	37 - 46	45	Pass
Lower Spine	G's	15 - 22	21	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

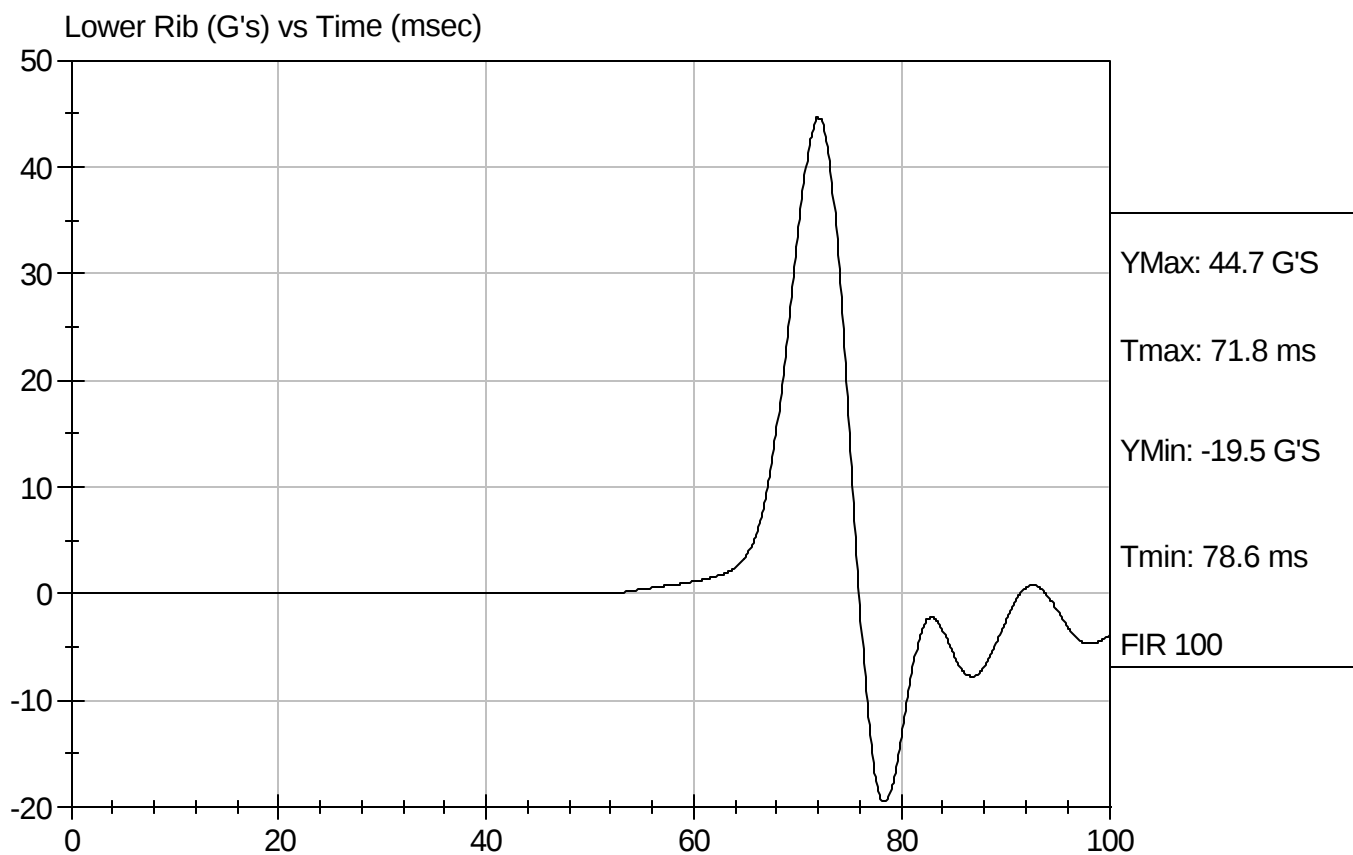
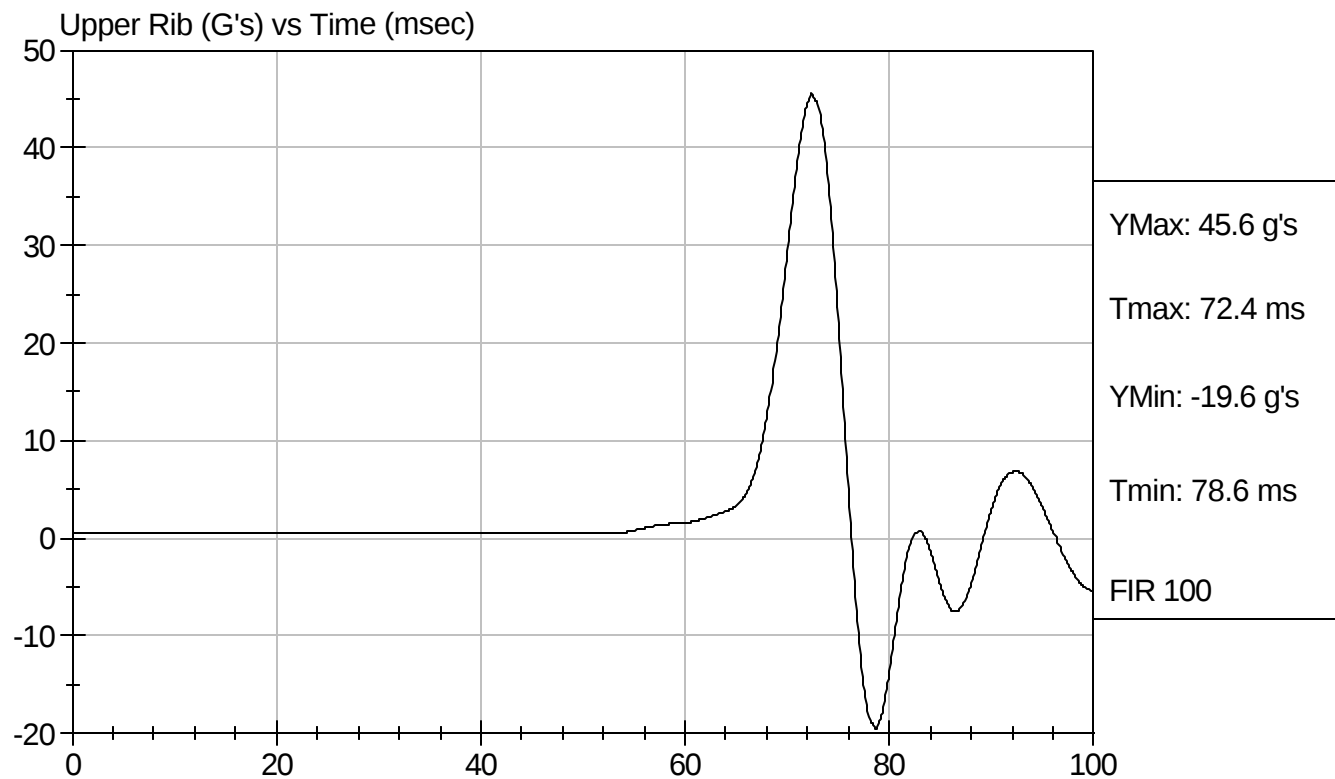
10/8/07
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax Impact
Component ID: D073142

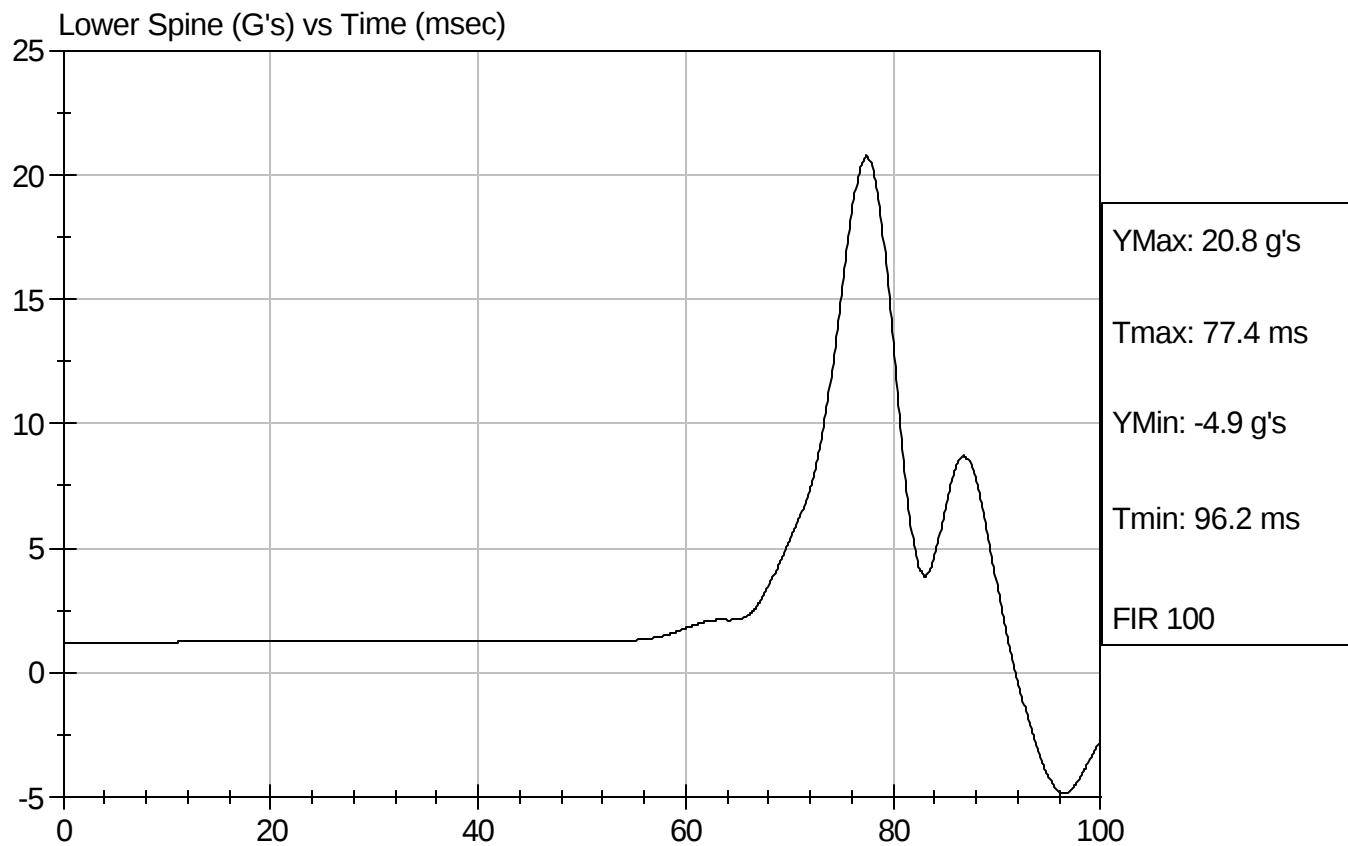
Test Date: 10/8/07
Speed: 13.89 ft/sec, 4.23 m/sec





Test Desc: Thorax Impact
Component ID: D073142

Test Date: 10/8/07
Speed: 13.89 ft/sec, 4.23 m/sec



SID/HIII Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Test

ATD Serial No: 271

Test I.D: D073143

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	43	Pass
Overall Test Results			Pass	

Jessica Gall
Laboratory Technician

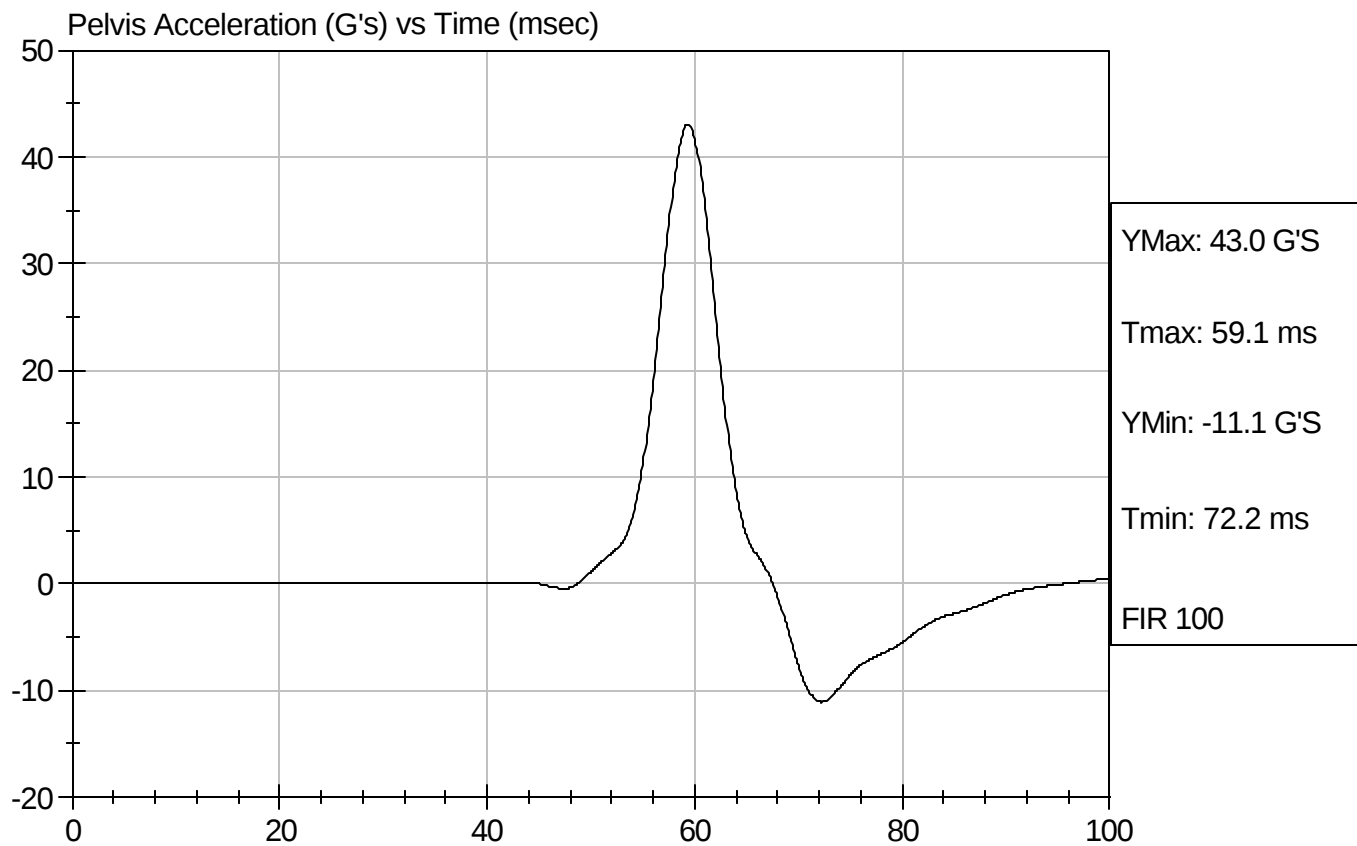
David Winkelbauer
Approved By

10/8/07
Test Date



Test Desc: Pelvis Impact
Component ID: D073143

Test Date: 10/8/07
Speed: 14.12 ft/sec, 4.30 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 271

Test I.D.: D073144

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Force At 12.7 mm	N	104 -162	145	Pass
Force At 19 mm	N	163 - 222	207	Pass
Force At 25.4 mm	N	222 - 280	280	Pass
Force At 33 mm	N	325 - 391	390	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

10/8/07
Test Date

David Winkelbauer
Approved By

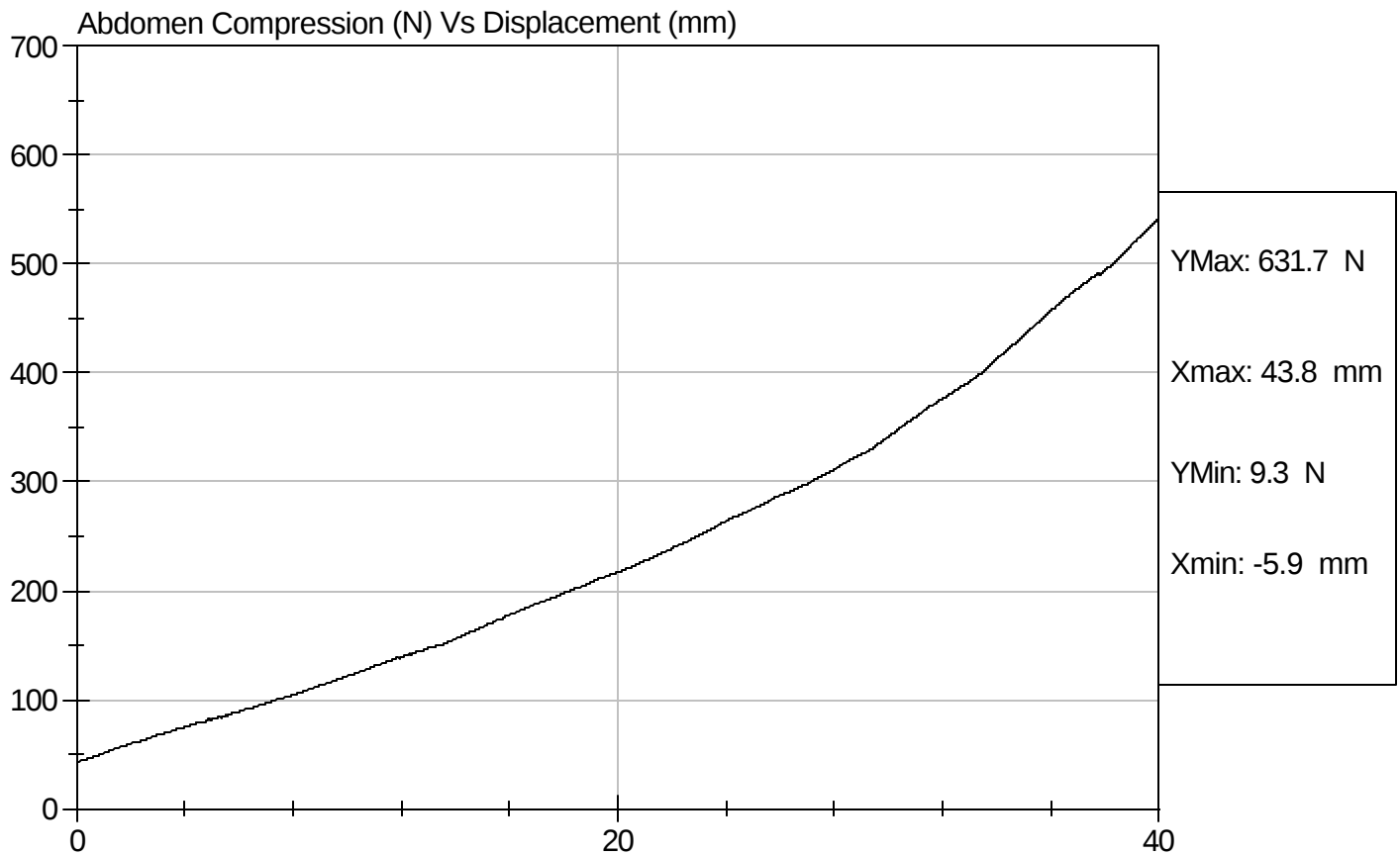


Test Description: Abdomen Compression

Test Date: 10/8/07

Component: D073144

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 271

Test I.D: D073145

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	132.4	Pass
Force At 30 deg	N	151.2 - 204.6	203.5	Pass
Force At 40 deg	N	204.6 - 258.0	253.3	Pass
Return Angle	Deg	12 Maximum	6	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

10/8/07
Test Date

David Winkelbauer
Approved By

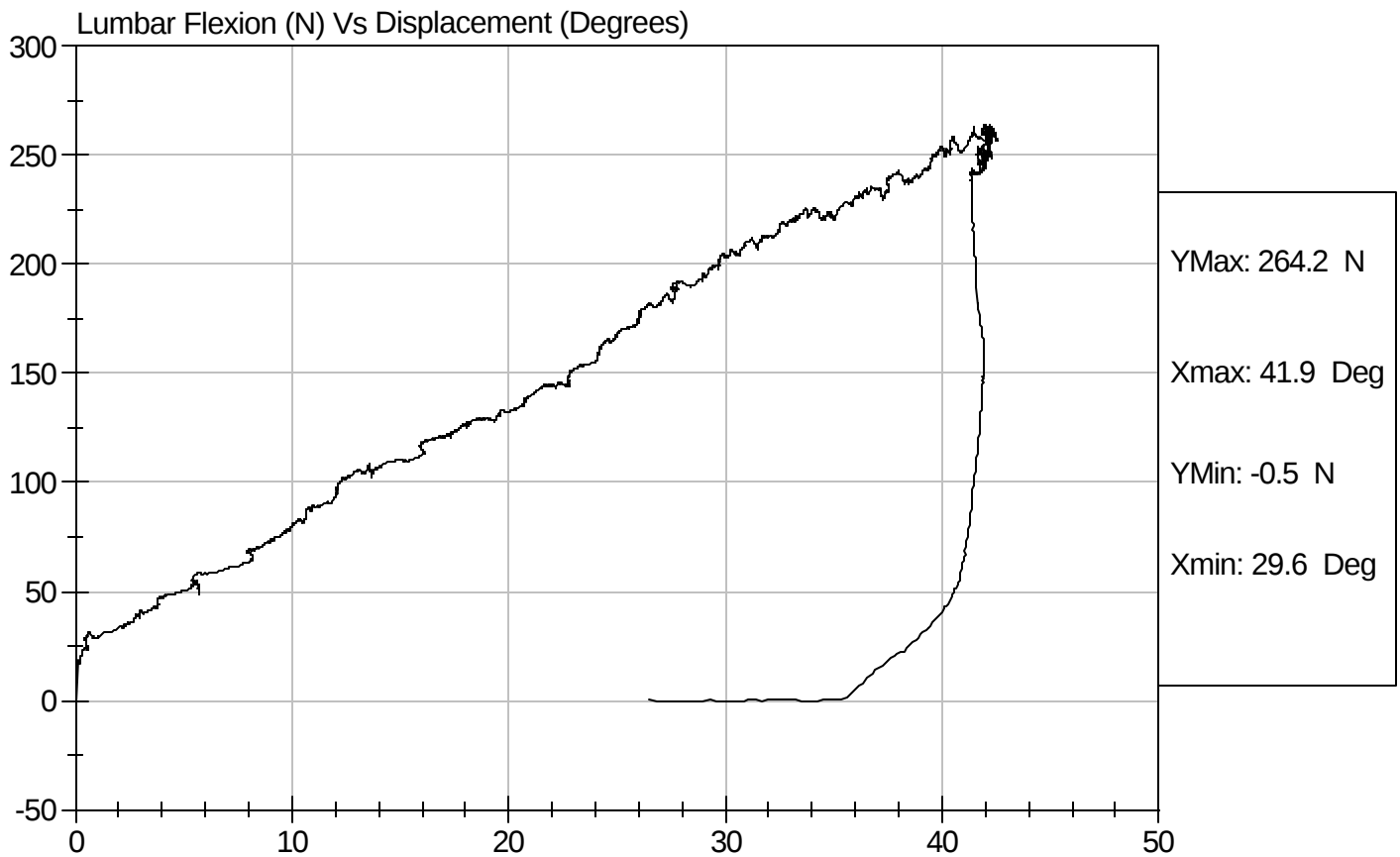


Test Description: Lumbar Flexion

Test Date: 10/8/07

Component: D073145

Speed: 0 ft/sec, 0.00 m/sec



SID/HIII Calibration Data Sheet
Side Impact Dummy
Neck Pendulum Test

ATD Serial No: 271

Test I.D: D073149

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	20.8	Pass
Laboratory Relative Humidity		%	10 to 70	43	Pass
Impact Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.50	Pass
	20 msec	m/s	4.12 to 5.10	4.91	Pass
	30 msec	m/s	5.73 to 7.01	6.75	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.81	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	74	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	60	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	75	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	50	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	6	Pass


 Laboratory Technician

10/9/07

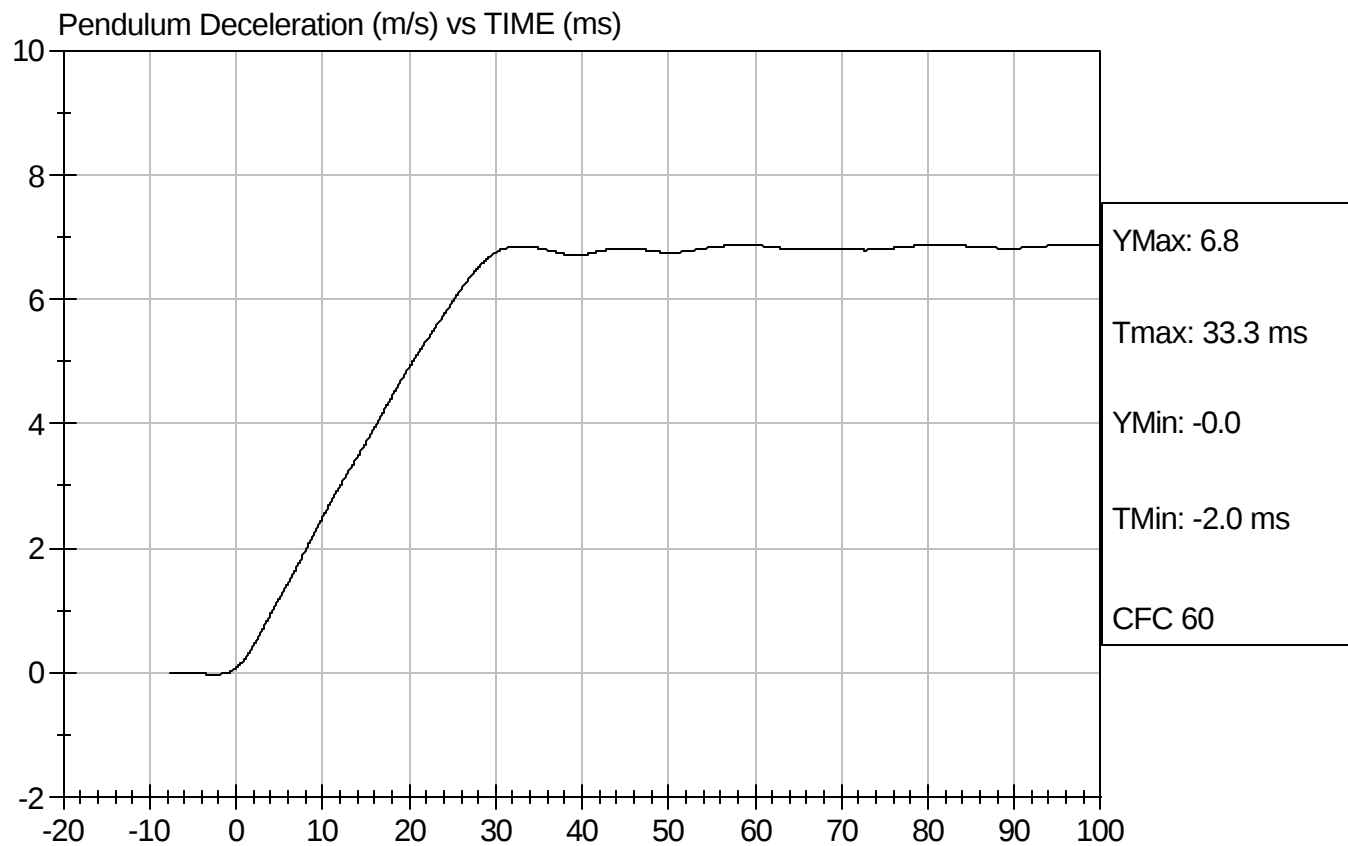
Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D073149

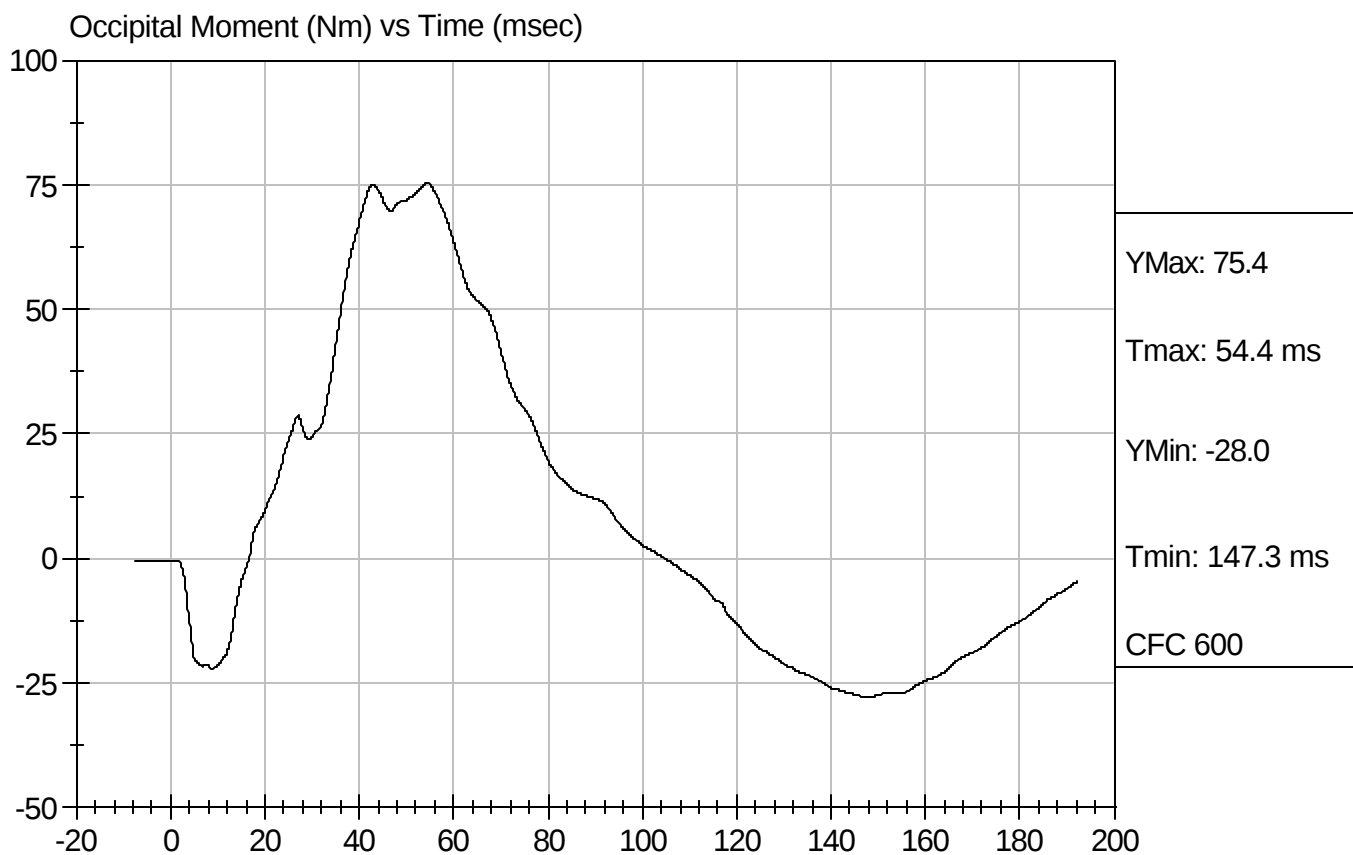
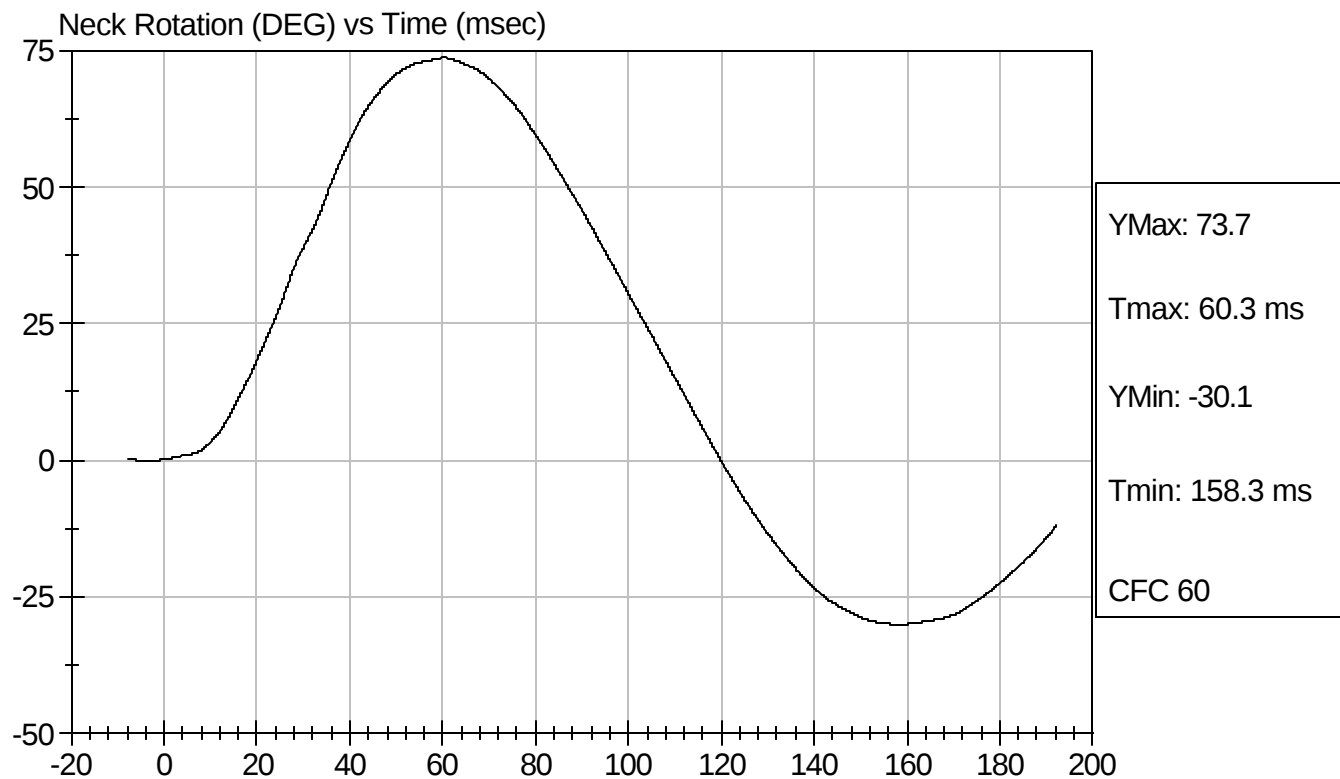
Test Date: 10/9/07
Speed: 22.83 ft/sec, 6.96 m/sec





Test Desc: Neck Bending
Component ID: D073149

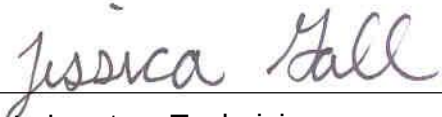
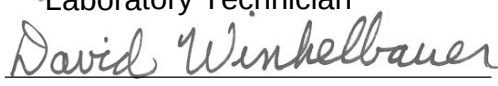
Test Date: 10/9/07
Speed: 22.83 ft/sec, 6.96 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Inspection Checklist

ATD Serial No: 271

Test Part	Items Checked	Result
Skin	Visual inspection	Pass
Head	Visual, ballast, accelerometer mount	Pass
Neck	Visual	Pass
Spine Box	Visual, ballast, accelerometer mount	Pass
Rib Cage	Visual, measure	Pass
Sternum	Visual	Pass
Lumbar Spine	Visual	Pass
Abdomen	Visual	Pass
Pelvis	Visual, palpate, accelerometer mount	Pass
Upper Legs	Visual	Pass
Knees	Visual	Pass
Lower Legs	Visual, range of motion	Pass
Ankles	Visual, range of motion	Pass
Feet	Visual, range of motion	Pass
Joints	1 to 2 g range	Pass
Other		Pass


Laboratory Technician

Approved By

10/9/2007
Test Date

CERTIFICATION DATA

Dummy Serial Number: 904

Calibration Test Results Summary

Dummy Serial Number: 904

Pre-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all pendulum test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SID Calibration Data Sheet
Side Impact Dummy
External Measurements

ATD Serial No: 904

Test I.D: D07297

Tested Parameter	Units	Specification	Result	Pass/Fail
SH - Seated Height	mm	889 - 909	906	Pass
RH - Rib Height	mm	501 - 521	508	Pass
HP - Hip Pivot Height	mm	99 ref.	99	Pass
RD - Rib from Back Line	mm	229 - 241	240	Pass
KV - Knee Pivot to Back Line	mm	511 - 526	523	Pass
SW - Knee Pivot to Floor	mm	490 - 505	496	Pass
HW - Hip Width	mm	356 - 391	360	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

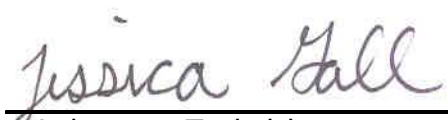
9/21/2007
Test Date

SID/HIII Calibration Data Sheet
Side Impact Dummy
Head Drop Calibration (Lateral)

ATD Serial No: 904

Test I.D: D072971

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	38	Pass
Peak Resultant Acceleration	G's	120 to 150	148	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-8.0	Pass
Overall Test Results				Pass


Laboratory Technician

9/21/07
Test Date


Approved By



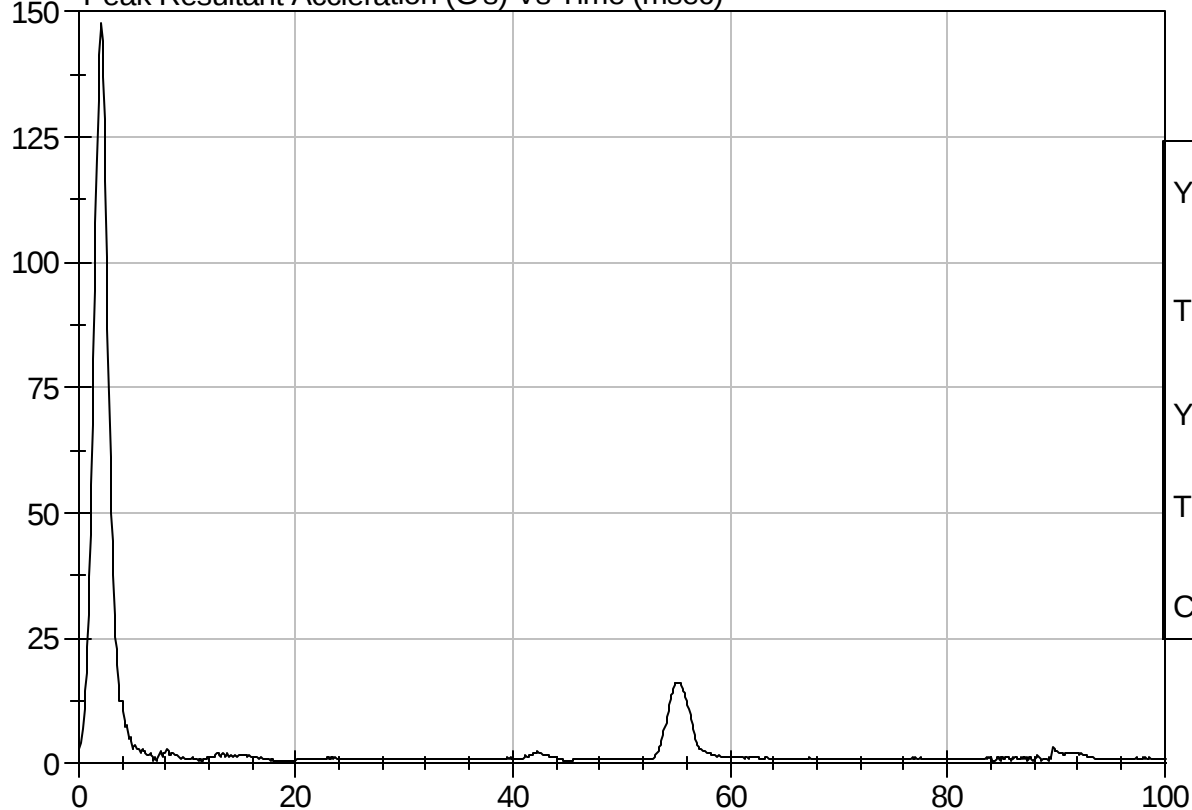
Test Description: Head Drop

Test Date: 9/21/07

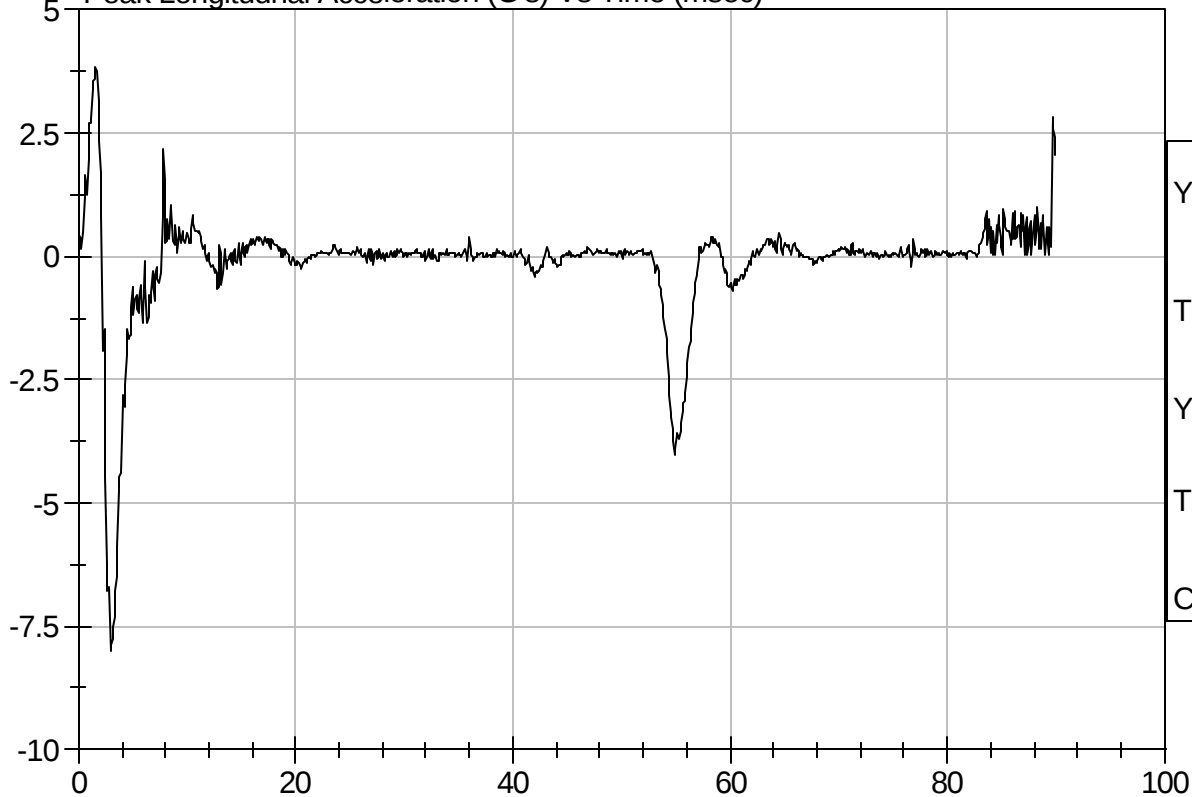
Component: D072971

Speed: 0 ft/s, 0.00 m/s

Peak Resultant Acceleration (G's) Vs Time (msec)



Peak Longitudinal Acceleration (G's) Vs Time (msec)

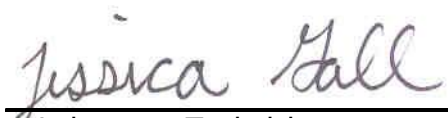


SID/HIII Calibration Data Sheet
Side Impact Dummy
Thorax Impact Test

ATD Serial No: 904

Test I.D: D072972

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Probe Velocity	m/s	4.22 - 4.31	4.27	Pass
Upper Rib	G's	37 - 46	41	Pass
Lower Rib	G's	37 - 46	40	Pass
Lower Spine	G's	15 - 22	21	Pass
Overall Test Results				Pass


Laboratory Technician

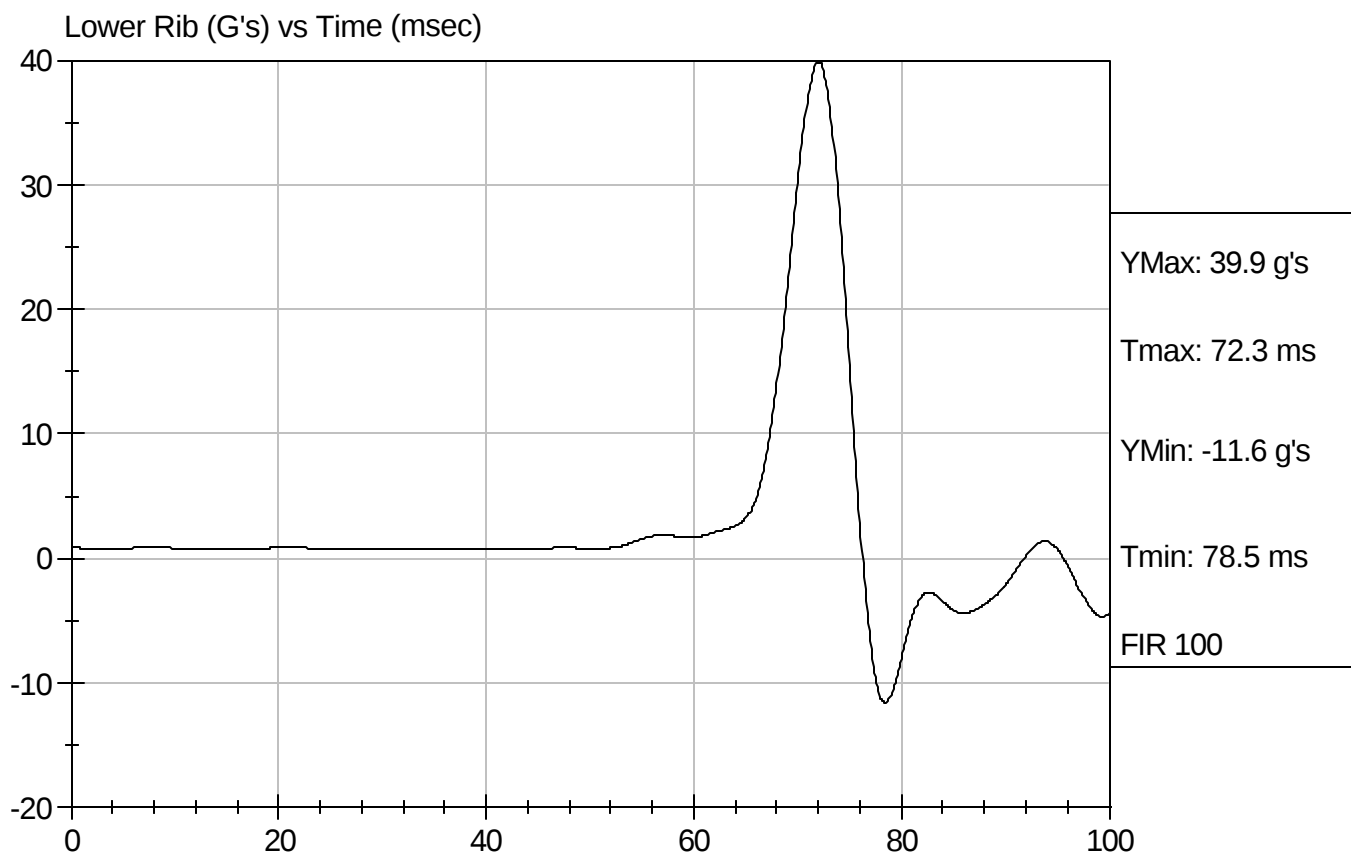
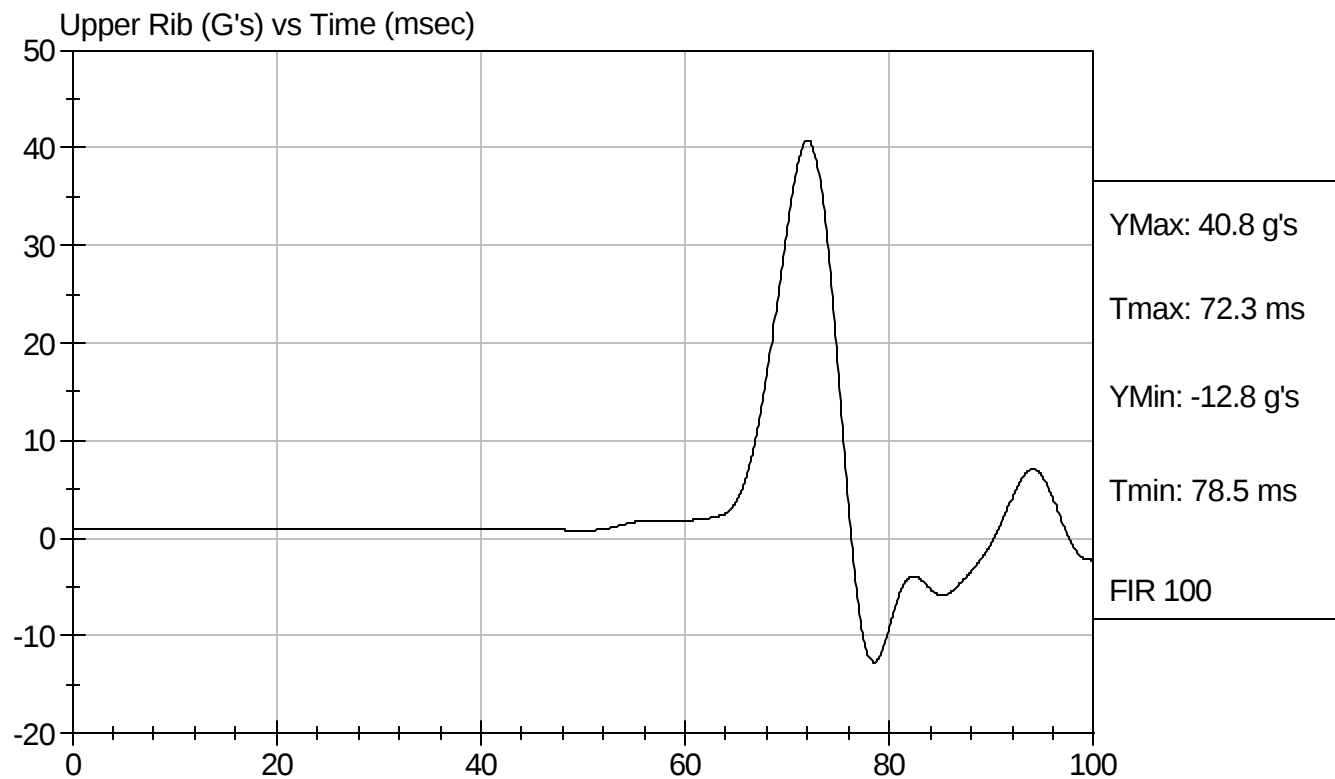
9/21/07
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D072972

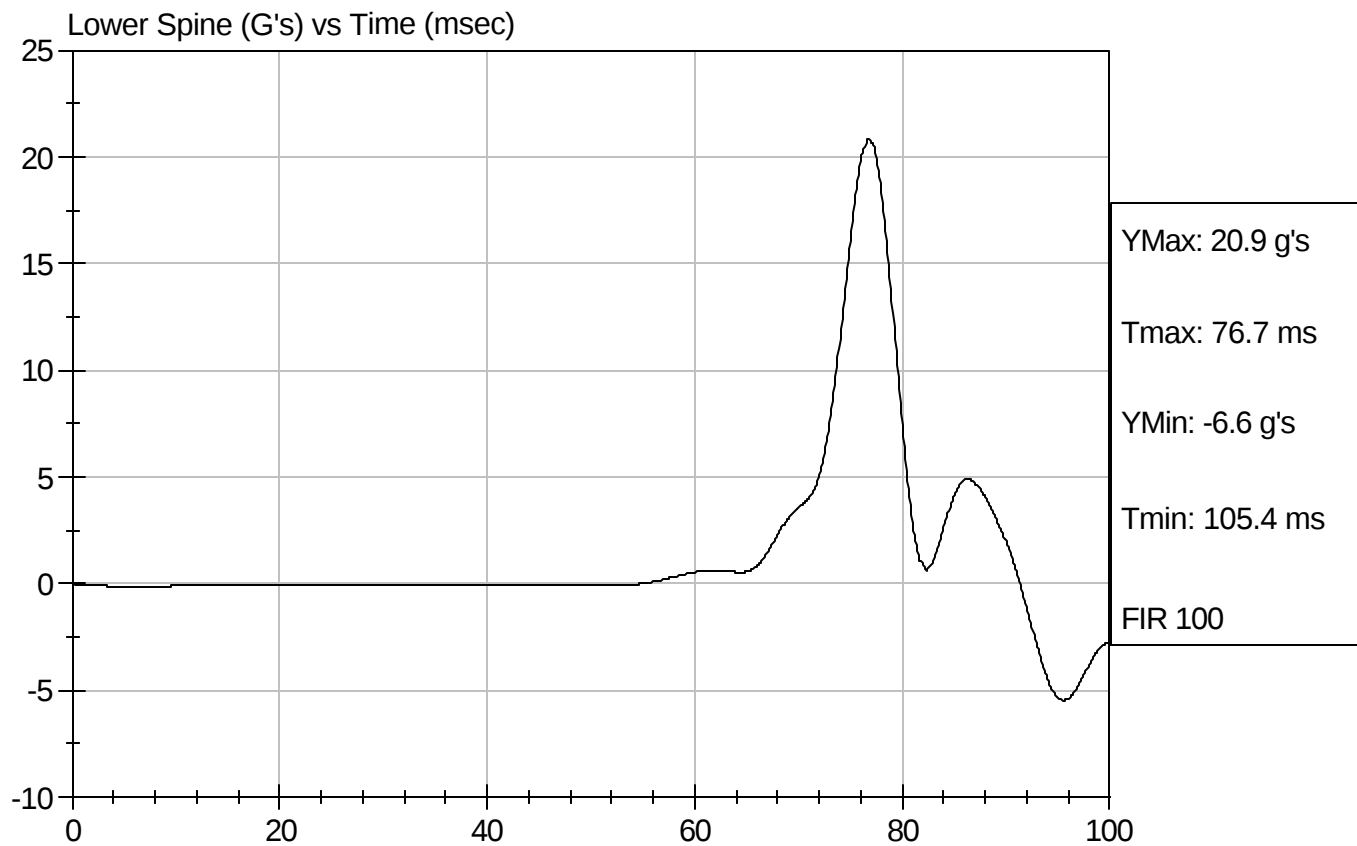
Test Date: 9/21/07
Speed: 14.00 ft/sec, 4.27 m/sec





Test Desc: Thorax Impact
Component ID: D072972

Test Date: 9/21/07
Speed: 14.00 ft/sec, 4.27 m/sec



SID/HIII Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Test

ATD Serial No: 904

Test I.D: D072973

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	43	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

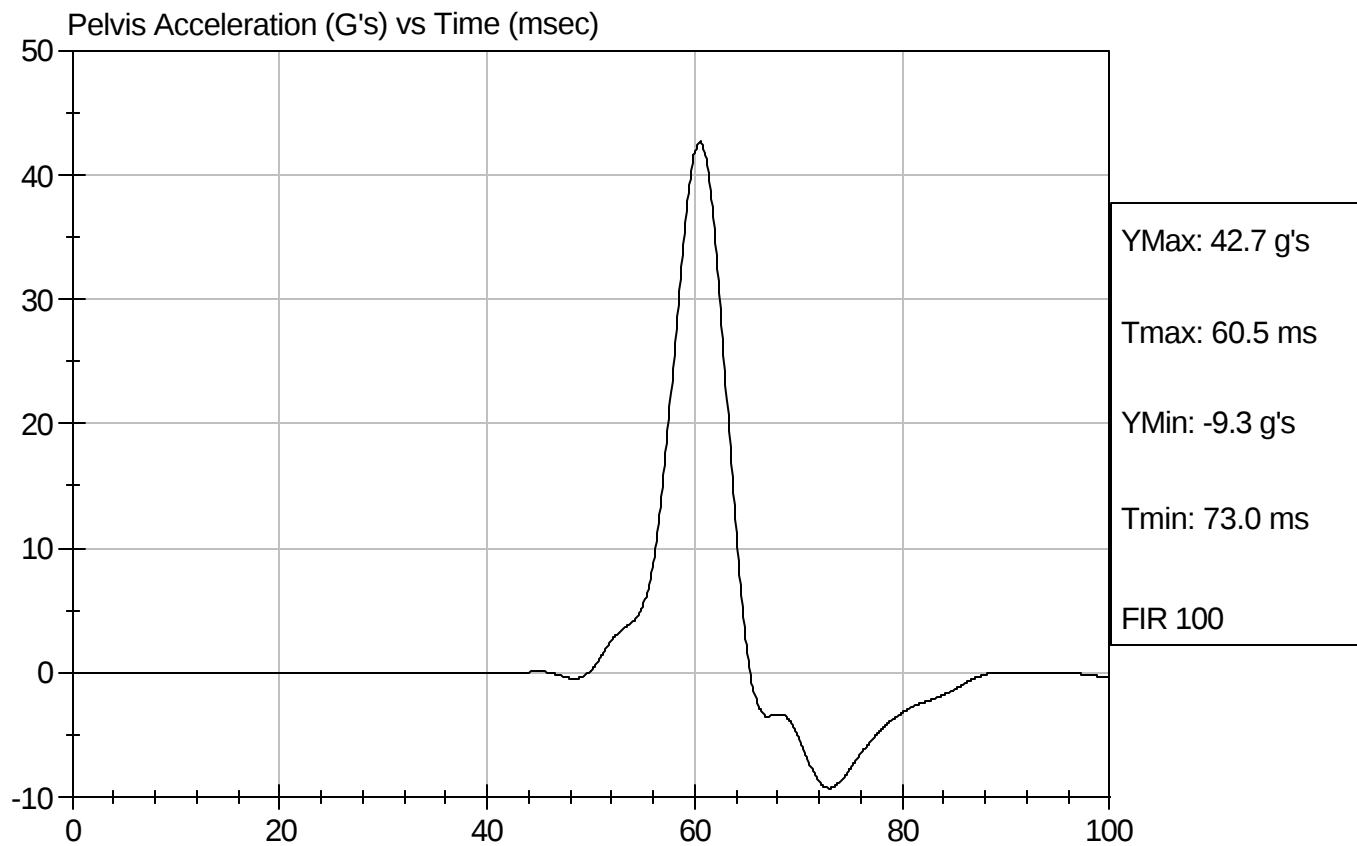
9/21/07
Test Date

David Winkelbauer
Approved By



Test Desc: Pelvis Impact
Component ID: D072973

Test Date: 9/21/07
Speed: 14.12 ft/sec, 4.30 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 904

Test I.D: D072974

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Force At 12.7 mm	N	104 -162	129	Pass
Force At 19 mm	N	163 - 222	177	Pass
Force At 25.4 mm	N	222 - 280	232	Pass
Force At 33 mm	N	325 - 391	308	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

9/21/07
Test Date

David Winkelbauer
Approved By

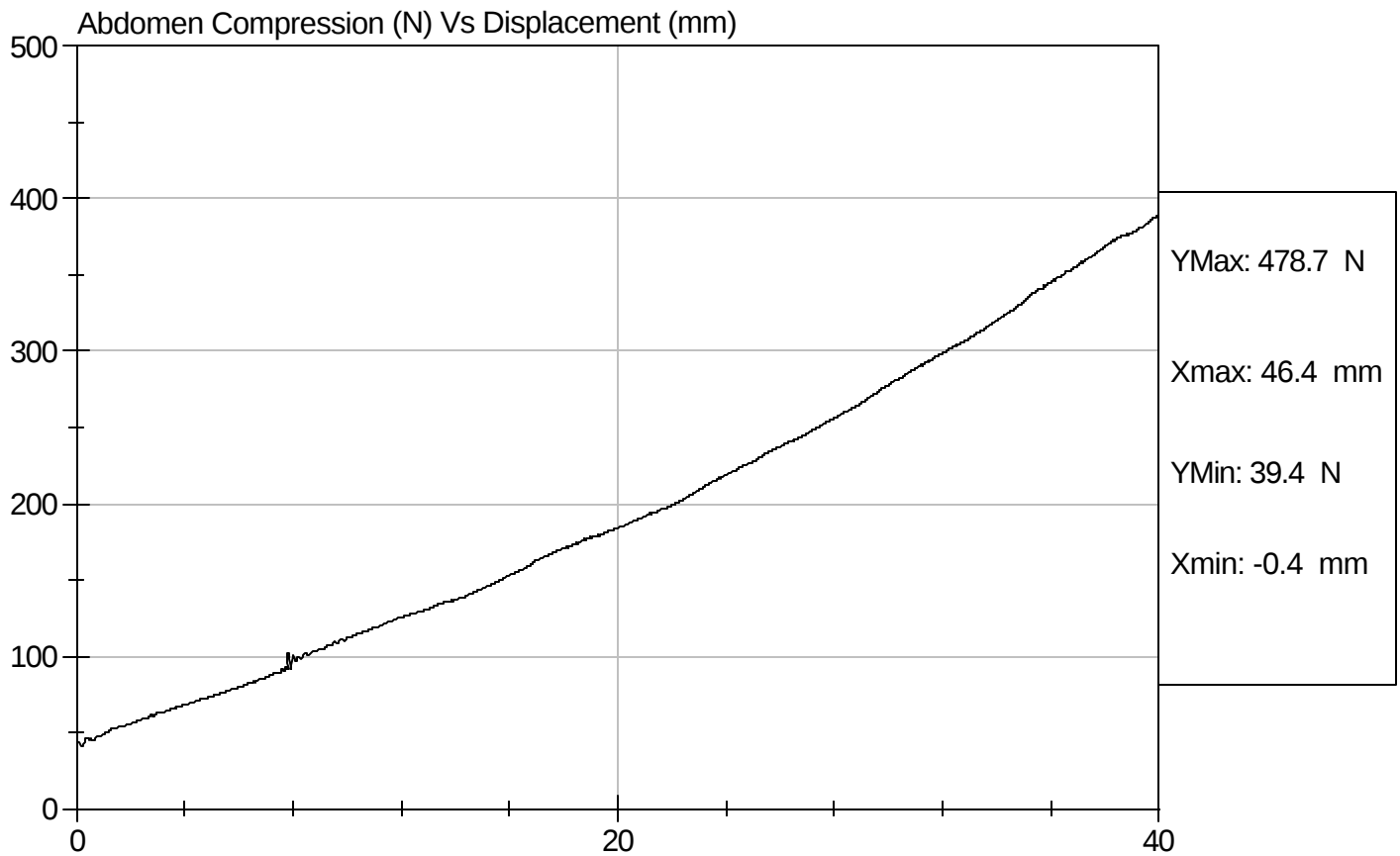


Test Description: Abdomen Compression

Test Date: 9/21/07

Component: D072974

Speed: 0 ft/sec, 0 m/sec

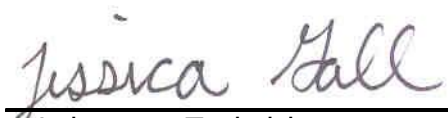


SID/HIII Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 904

Test I.D: D072975

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	38	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	129.5	Pass
Force At 30 deg	N	151.2 - 204.6	180.4	Pass
Force At 40 deg	N	204.6 - 258.0	224.1	Pass
Return Angle	Deg	12 Maximum	6	Pass
Overall Test Results			Pass	


Laboratory Technician

9/21/07
Test Date


Approved By

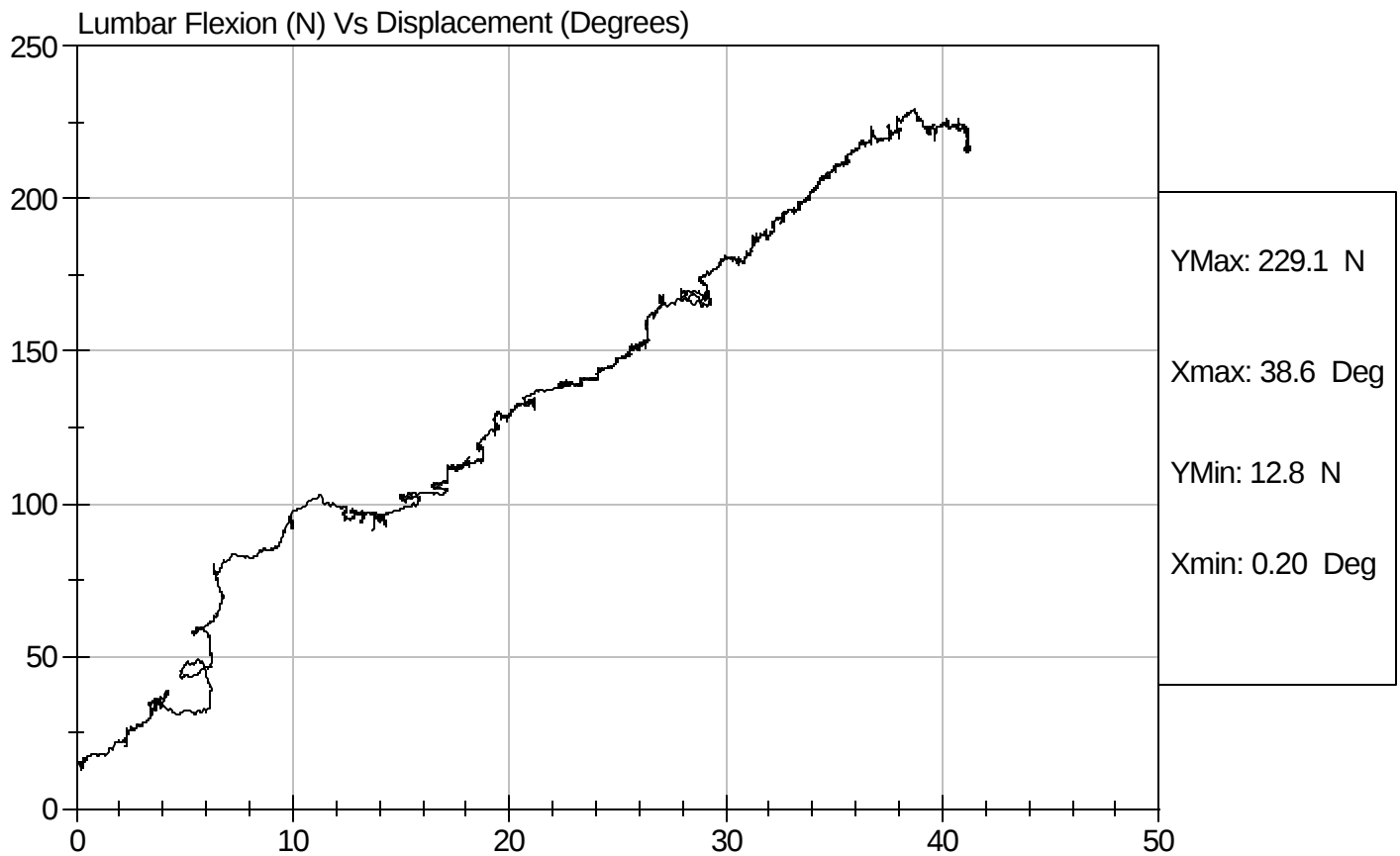


Test Description: Lumbar Flexion

Test Date: 9/21/07

Component: D072975

Speed: 0 ft/sec, 0 m/sec

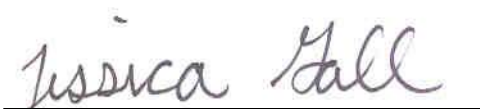


SID/HIII Calibration Data Sheet
Side Impact Dummy (SID)
Neck Pendulum Test

ATD Serial No: 904

Test I.D: D072979

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	38	Pass
Impact Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.24	Pass
	20 msec	m/s	4.12 to 5.10	4.54	Pass
	30 msec	m/s	5.73 to 7.01	6.46	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.77	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	71	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	58	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	73	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	63	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	14	Pass


 Laboratory Technician

9/21/07

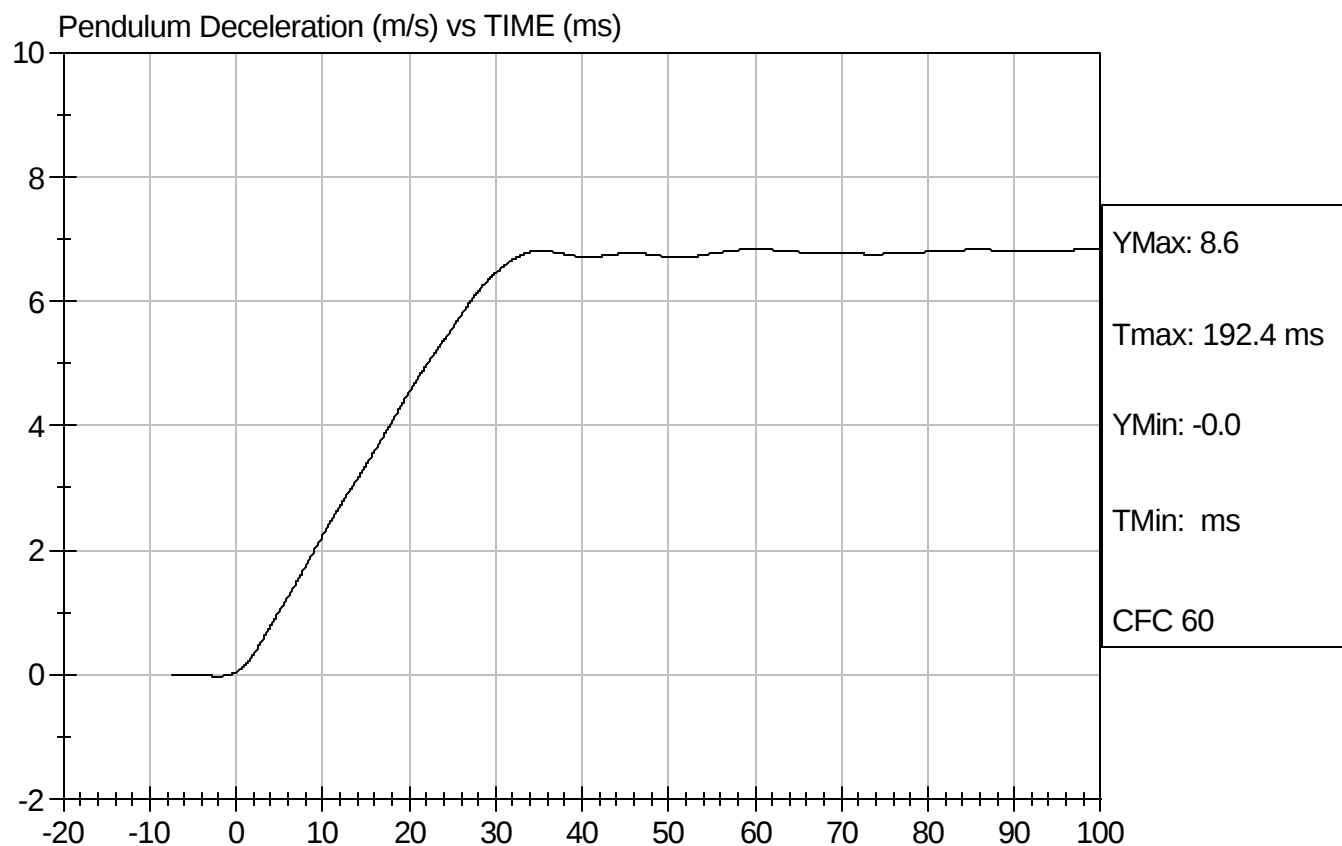
Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D072979

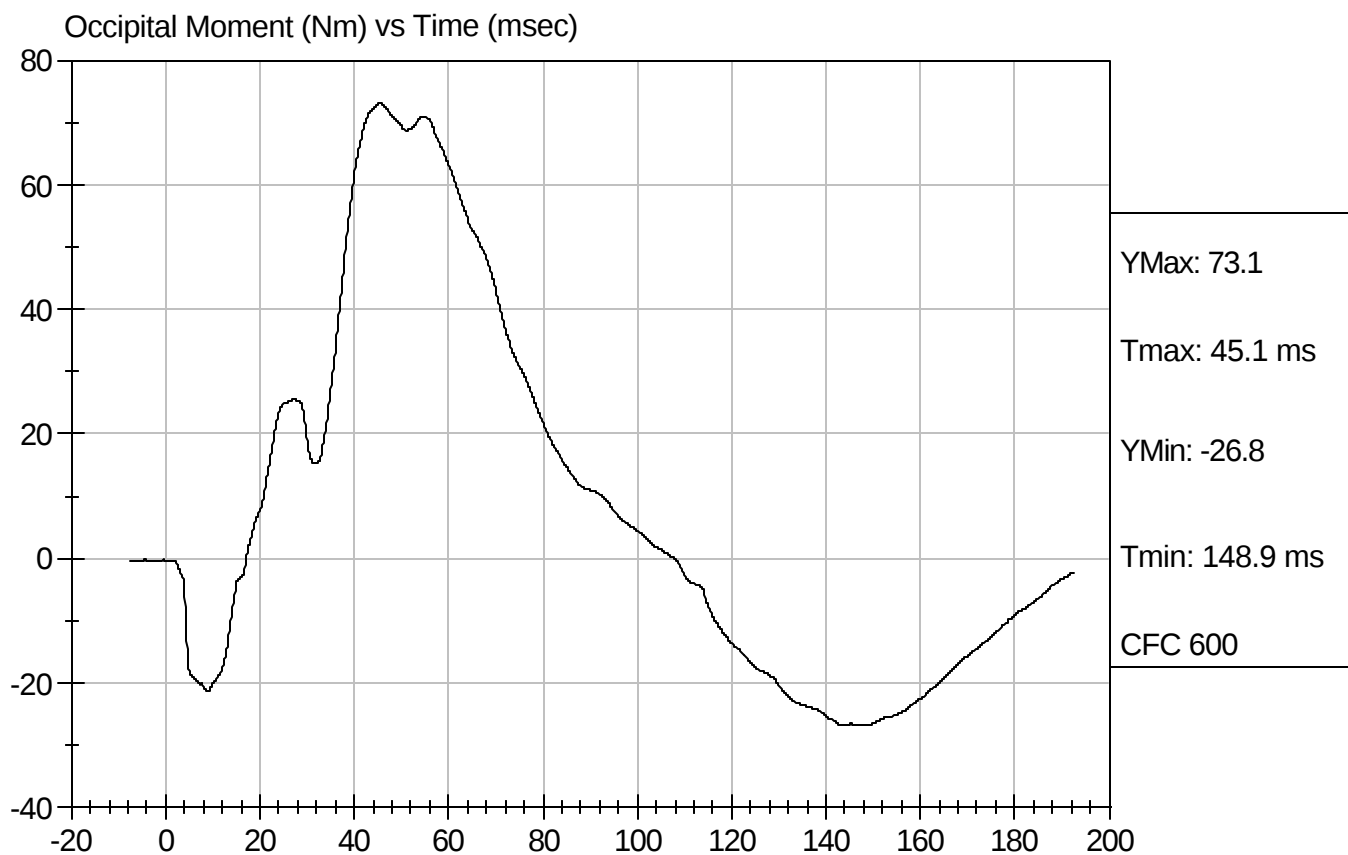
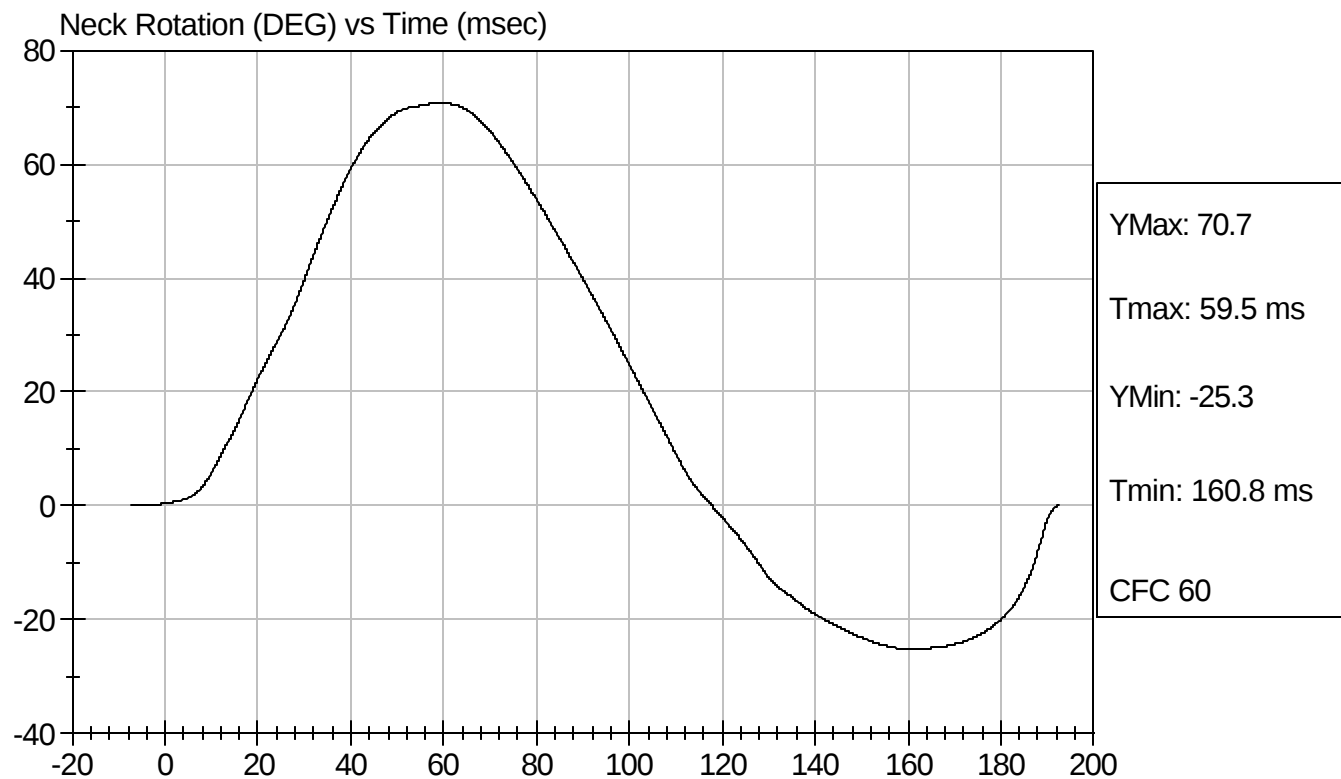
Test Date: 9/21/07
Speed: 23.148 ft/sec, 7.06 m/sec





Test Desc: Neck Bending
Component ID: D072979

Test Date: 9/21/07
Speed: 23.148 ft/sec, 7.06 m/sec



Calibration Test Results Summary

Dummy Serial Number: 904

Post-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all pendulum test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SID/HIII Calibration Data Sheet
Side Impact Dummy
Head Drop Calibration (Lateral)

ATD Serial No: 904

Test I.D: D073151

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Peak Resultant Acceleration	G's	120 to 150	145	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-9.5	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

10/8/07
Test Date

David Winkelbauer
Approved By



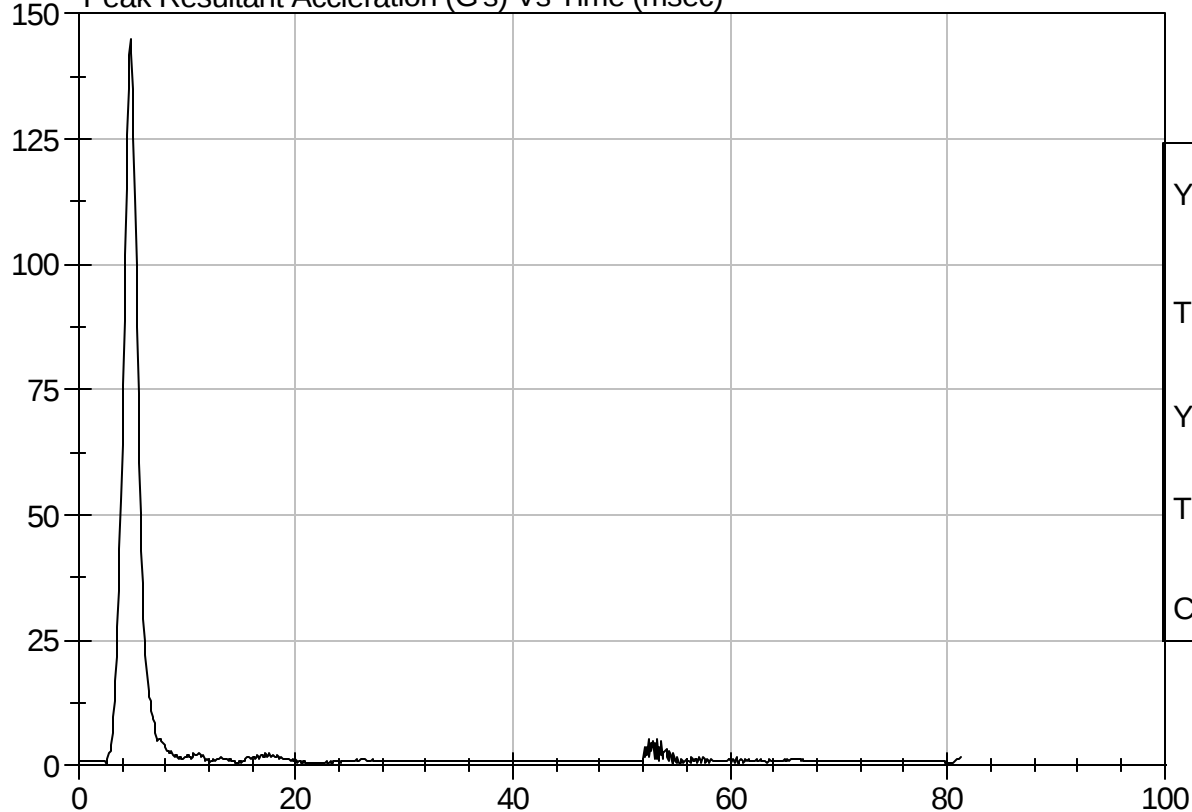
Test Description: Head Drop

Test Date: 10/8/07

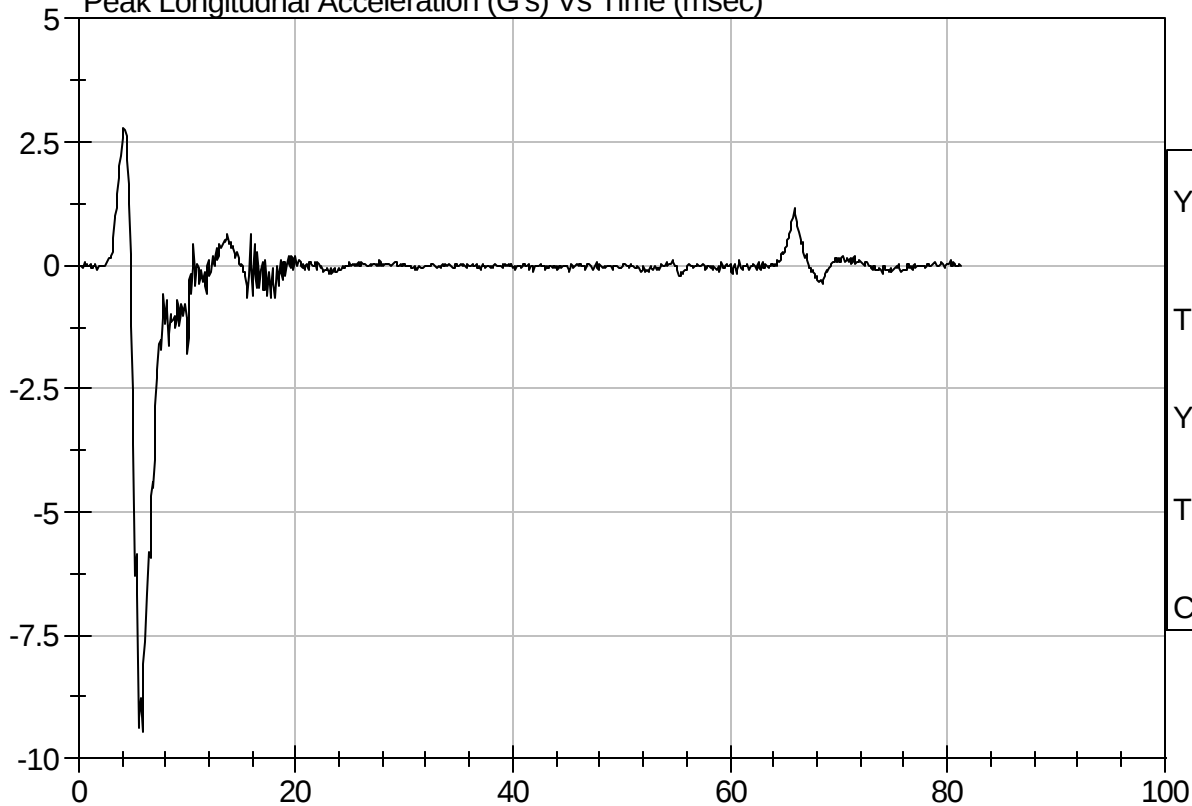
Component: D073151

Speed: 0 ft/s, 0.00 m/s

Peak Resultant Acceleration (G's) Vs Time (msec)



Peak Longitudinal Acceleration (G's) Vs Time (msec)

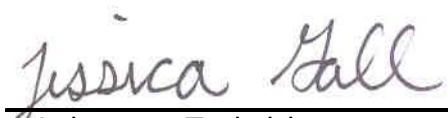


SID/HIII Calibration Data Sheet
Side Impact Dummy
Thorax Impact Test

ATD Serial No: 904

Test I.D: D073152

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Velocity	m/s	4.22 - 4.31	4.23	Pass
Upper Rib	G's	37 - 46	40	Pass
Lower Rib	G's	37 - 46	38	Pass
Lower Spine	G's	15 - 22	21	Pass
Overall Test Results				Pass


Laboratory Technician

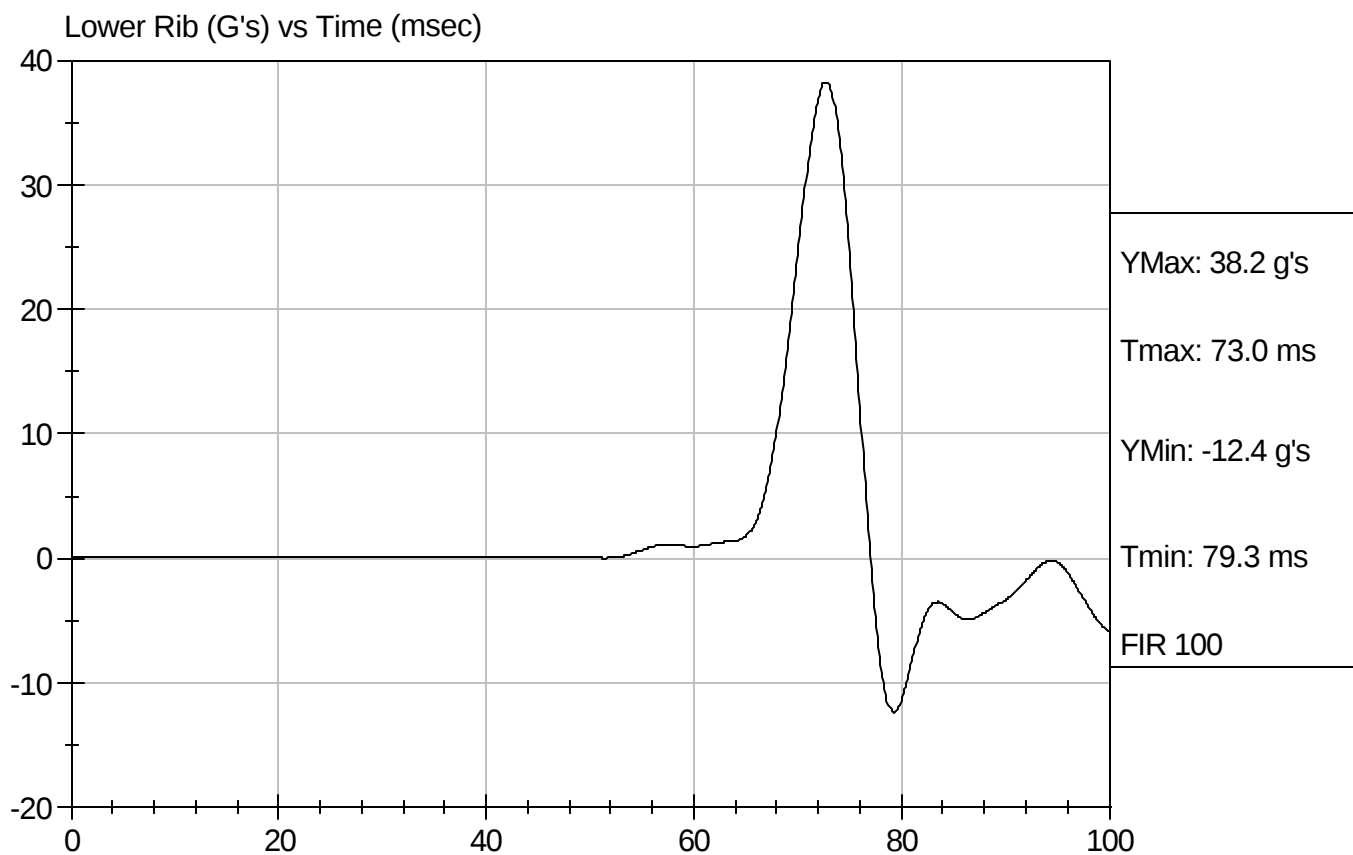
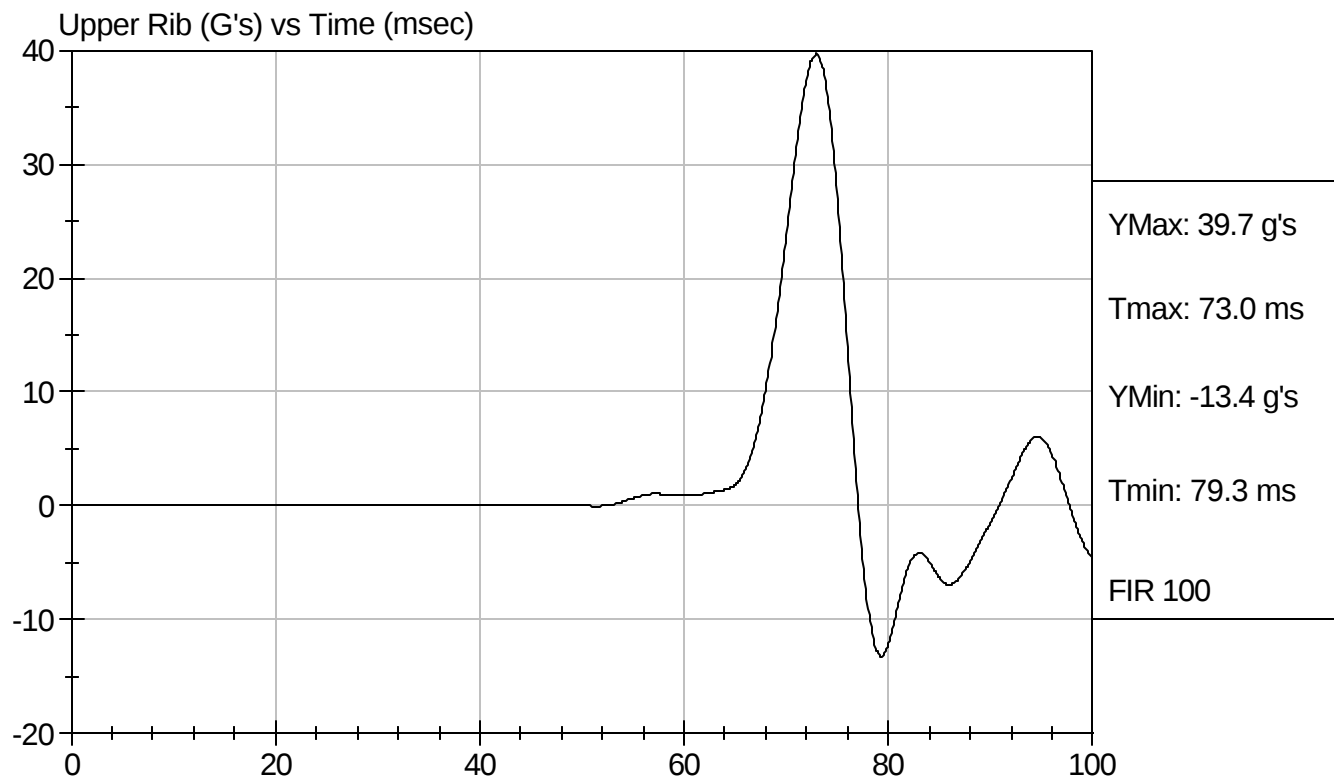
10/8/07
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D073152

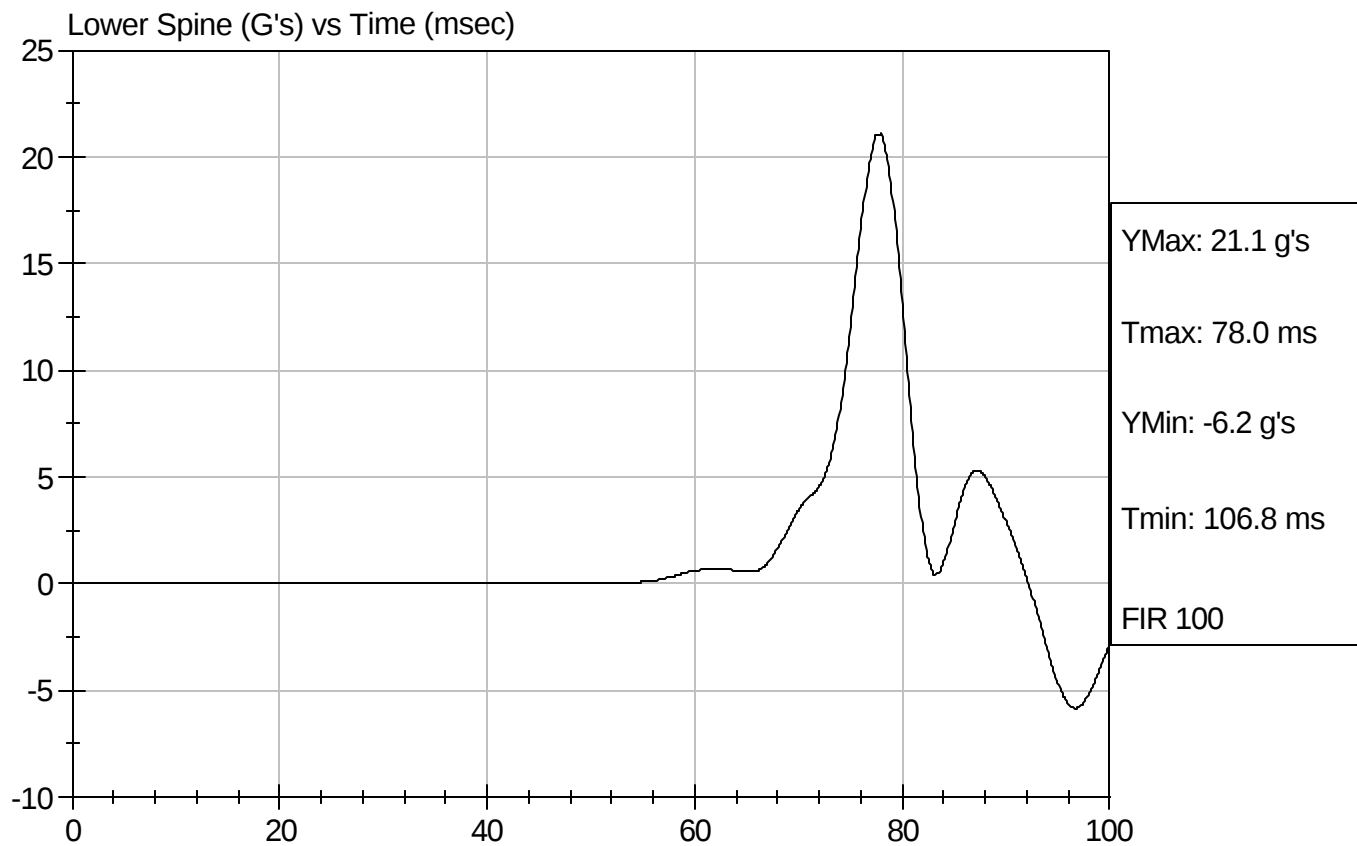
Test Date: 10/8/07
Speed: 13.89 ft/sec, 4.23 m/sec





Test Desc: Thorax Impact
Component ID: D073152

Test Date: 10/8/07
Speed: 13.89 ft/sec, 4.23 m/sec



SID/HIII Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Test

ATD Serial No: 904

Test I.D: D073153

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	43	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

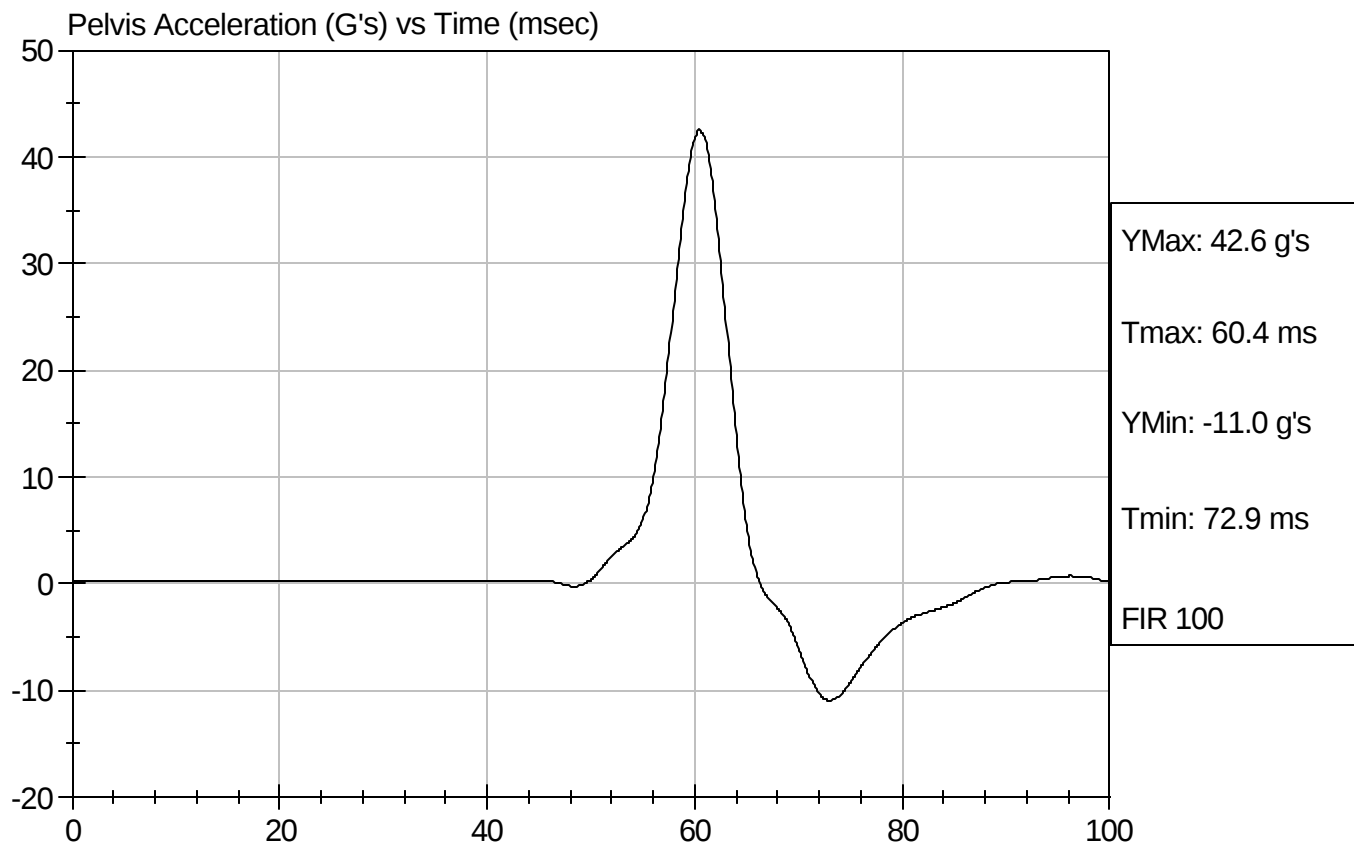
10/8/07
Test Date

David Winkelbauer
Approved By



Test Desc: Pelvis Impact
Component ID: D073153

Test Date: 10/8/07
Speed: 14.12 ft/sec, 4.30 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 904

Test I.D: D073154

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Force At 12.7 mm	N	104 -162	137	Pass
Force At 19 mm	N	163 - 222	192	Pass
Force At 25.4 mm	N	222 - 280	251	Pass
Force At 33 mm	N	325 - 391	341	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

10/8/07
Test Date

David Winkelbauer
Approved By

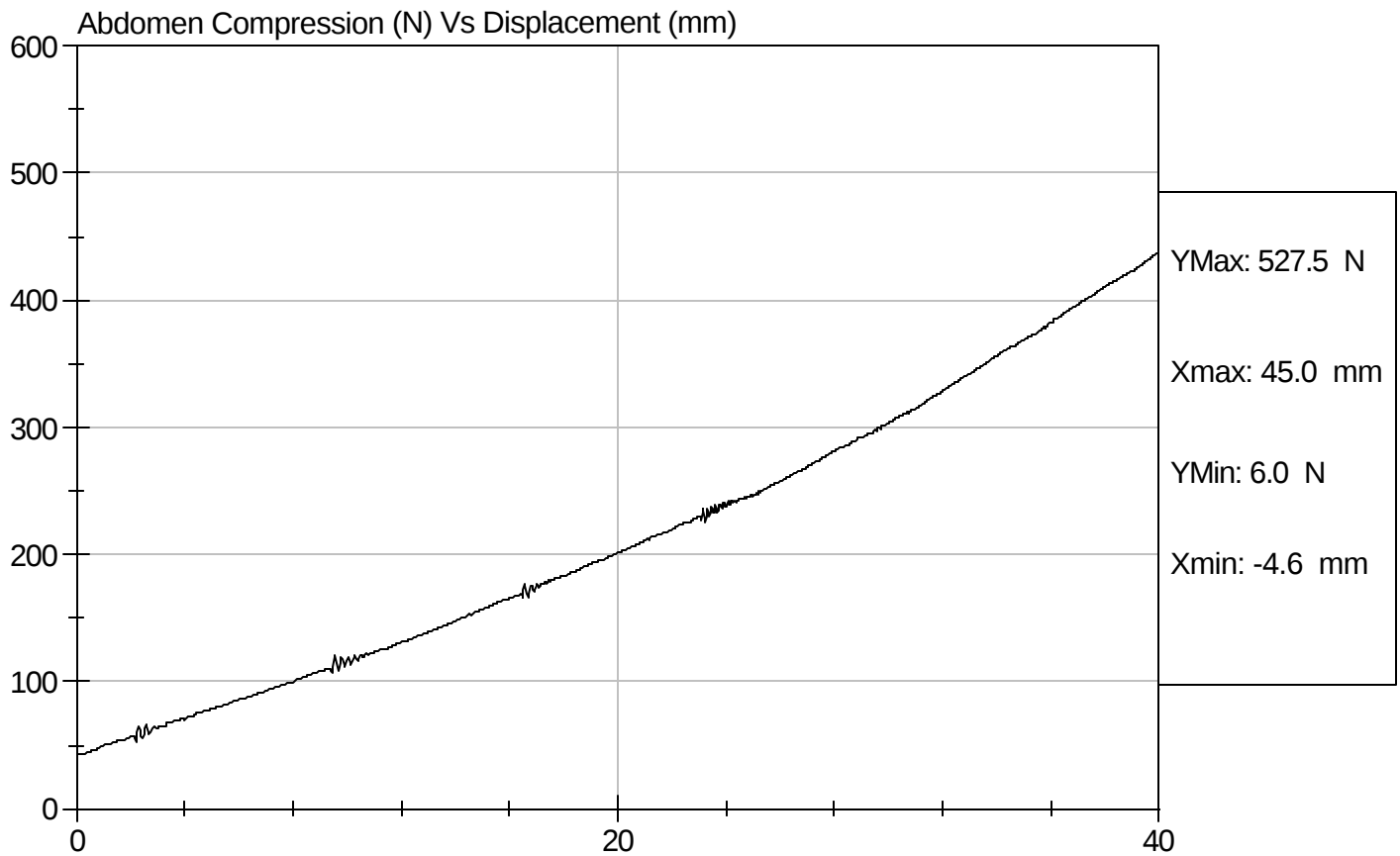


Test Description: Abdomen Compression

Test Date: 10/8/07

Component: D073154

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 904

Test I.D.: D073155

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	136.7	Pass
Force At 30 deg	N	151.2 - 204.6	174.6	Pass
Force At 40 deg	N	204.6 - 258.0	233.6	Pass
Return Angle	Deg	12 Maximum	4	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

10/8/07
Test Date

David Winkelbauer
Approved By

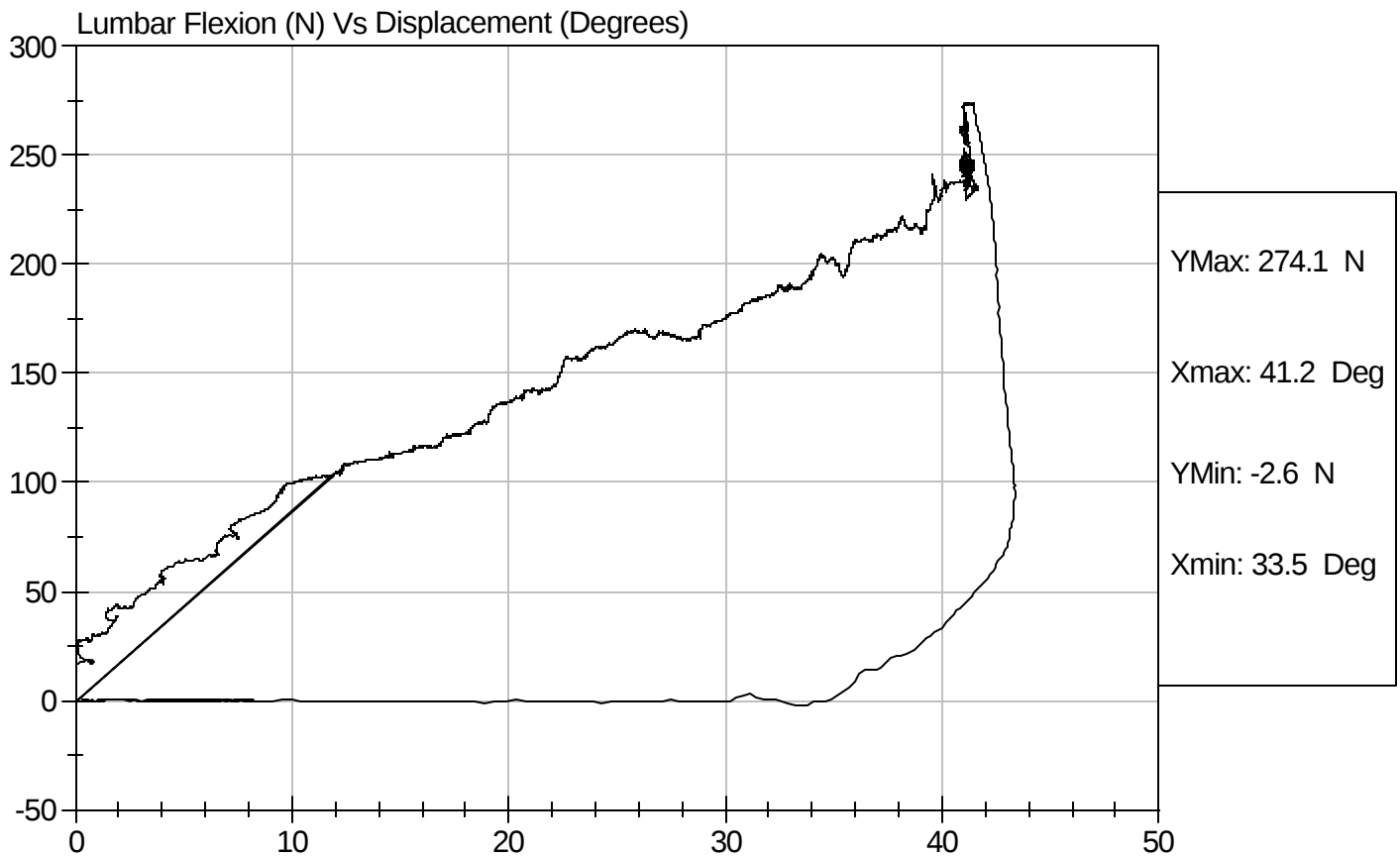


Test Description: Lumbar Flexion

Test Date: 10/8/07

Component: D073155

Speed: 0 ft/sec, 0.00 m/sec

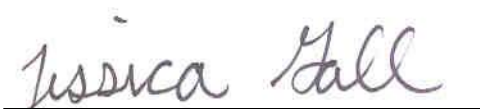


SID/HIII Calibration Data Sheet
Side Impact Dummy
Neck Pendulum Test

ATD Serial No: 904

Test I.D: D073159

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	20.8	Pass
Laboratory Relative Humidity		%	10 to 70	43	Pass
Impact Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.19	Pass
	20 msec	m/s	4.12 to 5.10	4.24	Pass
	30 msec	m/s	5.73 to 7.01	5.95	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.88	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	70	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	59	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	74	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	57	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	10	Pass


 Laboratory Technician

10/9/07

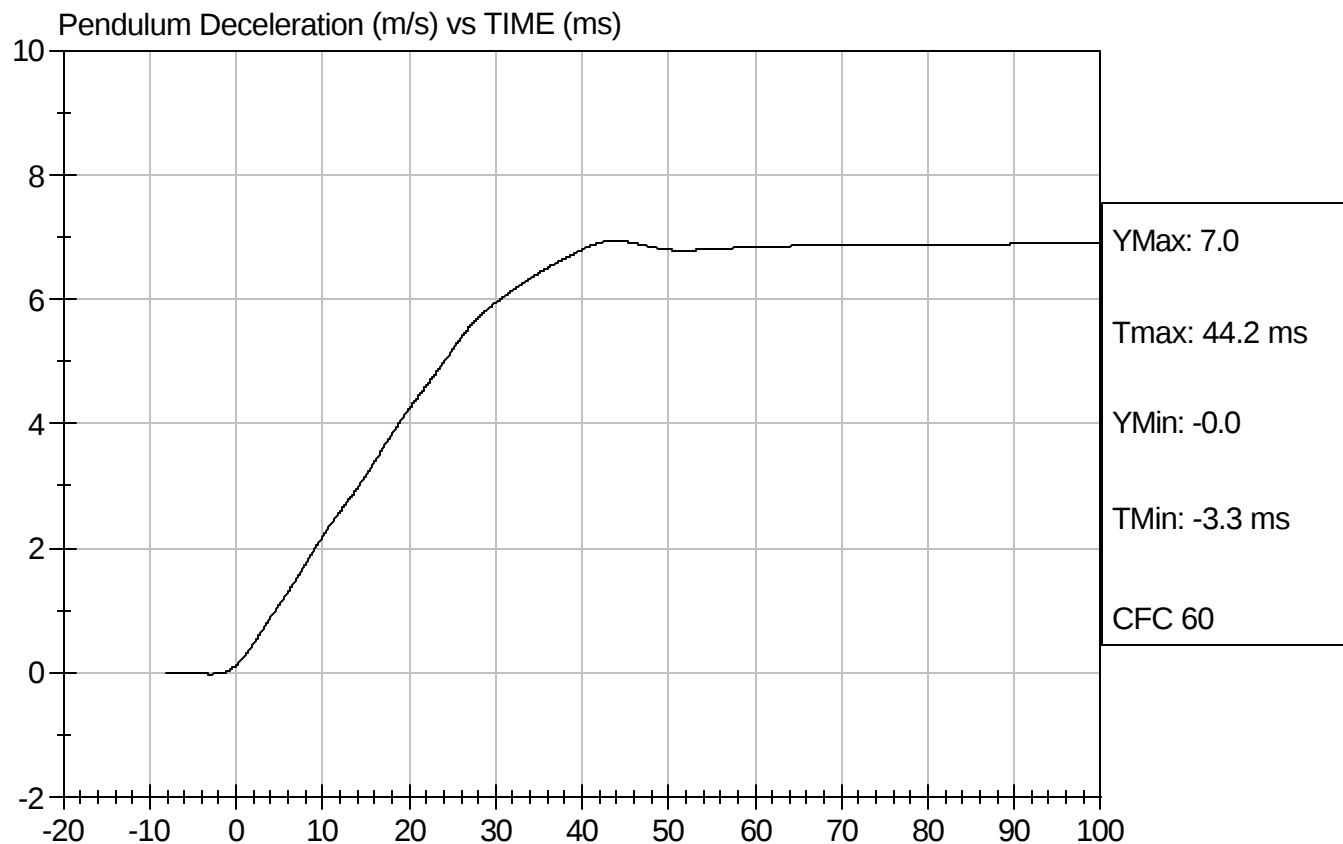
Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D073159

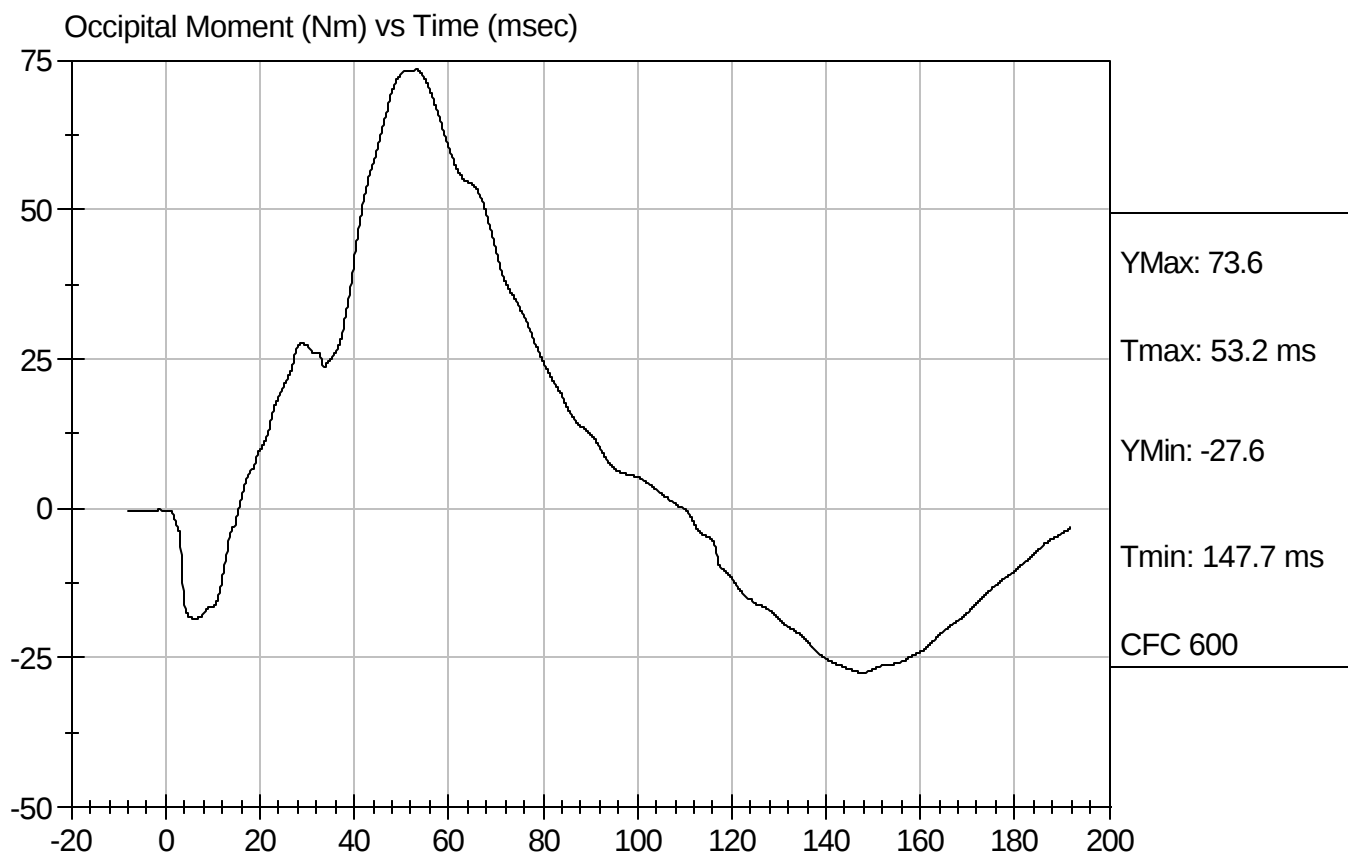
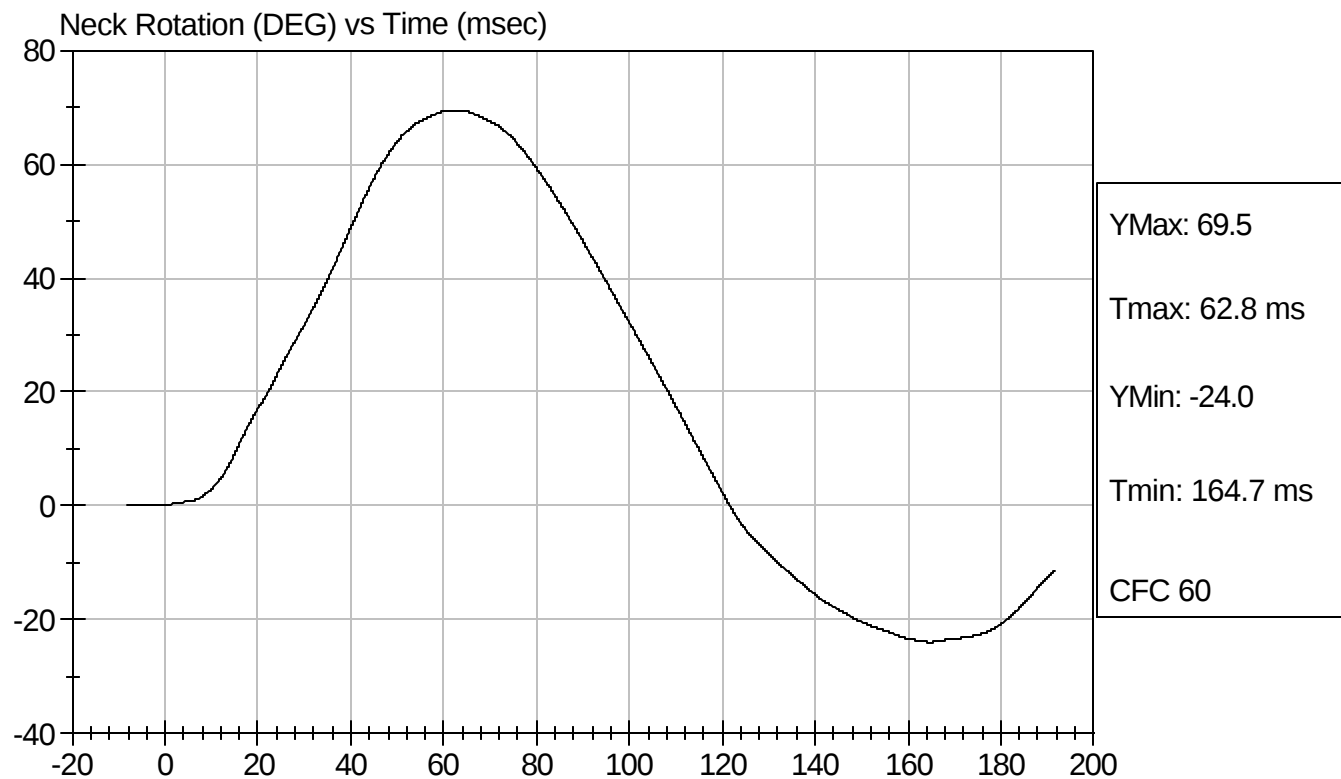
Test Date: 10/9/07
Speed: 23.15 ft/sec, 7.06 m/sec





Test Desc: Neck Bending
Component ID: D073159

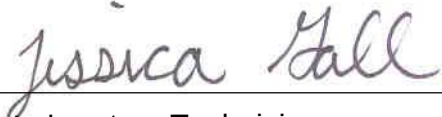
Test Date: 10/9/07
Speed: 23.15 ft/sec, 7.06 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Inspection Checklist

ATD Serial No: 904

Test Part	Items Checked	Result
Skin	Visual inspection	Pass
Head	Visual, ballast, accelerometer mount	Pass
Neck	Visual	Pass
Spine Box	Visual, ballast, accelerometer mount	Pass
Rib Cage	Visual, measure	Pass
Sternum	Visual	Pass
Lumbar Spine	Visual	Pass
Abdomen	Visual	Pass
Pelvis	Visual, palpate, accelerometer mount	Pass
Upper Legs	Visual	Pass
Knees	Visual	Pass
Lower Legs	Visual, range of motion	Pass
Ankles	Visual, range of motion	Pass
Feet	Visual, range of motion	Pass
Joints	1 to 2 g range	Pass
Other		Pass


Laboratory Technician

Approved By

10/9/2007
Test Date

APPENDIX D
CHILD DUMMY DATA

SUMMARY OF TEST

Measurement Description	Units	Threshold	P3 ATD
Head Injury Criteria (HIC36)	N/A	N/A	112
Head Injury Criteria (HIC15)	N/A	390	58
Max. Thorax Accel. (3msec Clip)	G's	50	21

The child dummy was instrumented with head, chest, and upper six axial neck force and moment sensors.

The right rear (Position 3) child dummy (S/N 093) was calibrated previous to this test. Child dummy certification information can be found in this Appendix.

Position 3 was rear facing and used the vehicle LATCH attachment.

TEST VEHICLE WEIGHTS

	Units	As Tested (ATW) (Axle)		
		Front	Rear	Total
Left	kg	460.4	466.3	
Right	kg	440.0	441.8	
Ratio	%	49.8	50.2	
Totals	kg	900.4	908.1	1808.5

As tested weight of vehicle includes two ATDs, one CRABI with CRS, cargo, equipment and instrumentation.

TEST NOTES

None

TEST DUMMY INFORMATION

Description	Position 3 CRS
Dummy Type / Serial No.	12 month old CRABI / 093
Number of Data Channels	12
Restraint System	Graco Snugride (Rear Facing)

POST TEST SEAT DATA

Location	Seat Movement (mm)	Seat Back Failure
P1 (Left Front)	0	None
P2 (Right Front)	0	None
P3 (Right Rear)	0	None
P4 (Left Rear)	0	None

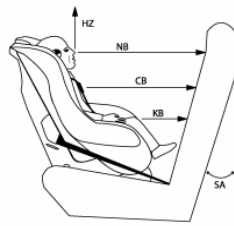
VISIBLE DUMMY CONTACT POINTS

Description	Position 3 CRS
Head Contact	Back of Head to CRS
Upper Torso Contact	None
Lower Torso Contact	None
Left Foot Contact	Foot to RR Seat Back
Right Foot Contact	Foot to RR Seat Back

CHILD DUMMY POSITIONING IN VEHICLE

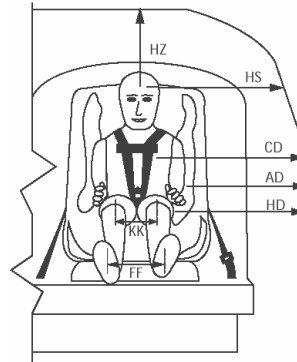
Child Restraint System (Position 3)	Graco Snuggly (Rear Facing)
NHTSA No.	M80509

Dummy Measurements for Rear-facing CRS Passengers



X—Z View

HZ	-	Head to Roof
NB	-	Nose to Front of Back Seat
CB	-	Chest to Front of Back Seat
KB	-	Knee to Front of Back Seat
SA	-	Seat Back Angle



Y—Z View

X—Z View

HZ	-	Head to Roof
HS	-	Head to Side Window
CD	-	Chest to Door
AD	-	Arm to Door
HD	-	H-Point to Door
KK	-	Knee to Knee
FF	-	Foot to Foot
NB	-	Nose to Front Seat Back
CB	-	Chest to Front Seat Back
KB	-	Knee to Front Seat Back
TB	-	Toe to Front Seat Back
SA	-	Seat Back Angle

Measurement	Pre-Test (mm)	Post-Test (mm)
	P3 CRS (093)	P3 CRS (093)
SA (deg)	31.0	
HS	376	442
CD	374	391
AD	271	263
HD	311	299
HZ	371	417
NB	568	563
CB	459	451
KK	98	102
FF	95	118
KB - LEFT	186	163
KB - RIGHT	206	210
TB - LEFT	74	53
TB - RIGHT	79	55

All dimensions in mm (unless noted)
P3 – Right Rear Passenger (Rear Facing)

CRS PERFORMANCE DATA

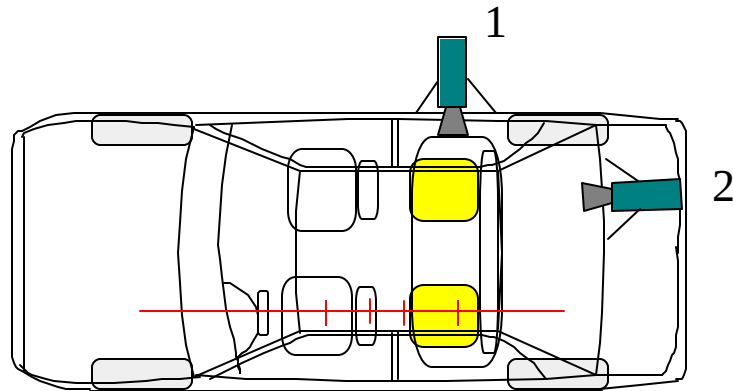
Child Restraint System (Position 3)	Graco Snugride (Rear Facing)
NHTSA No.	M80509

POSITION 3 CRS POST-TEST INSPECTION

Location	Damage	Remarks
Upper Tether Strap		
Upper Tether Buckle		
Upper Tether Hook		
Vehicle Upper Tether Anchor		
Lower Anchor Strap	None	
Lower Anchor Buckle		
Lower Anchor Hooks	None	
Vehicle Lower CRS Anchors	None	
Harness Connections	None	
Cracks on CRS	None	
Fabric Tears on CRS	None	
Vehicle Seat Structure	None	
Vehicle Seat Fabric Tears	None	
Child Dummy	None	CRABI 12 Month Old

CRS CAMERA DATA

Child Restraint System (Position 3)	Graco Snugride (Rear Facing)
NHTSA No.	M80509



No.	Camera View	Location (mm) *			Angle (deg)	Lens (mm)	Speed (fps)
		X	Y	Z			
1	Vehicle Onboard Rear SID/HIII, Side					8	1000
2	Onboard Child Seat					8.5	1000

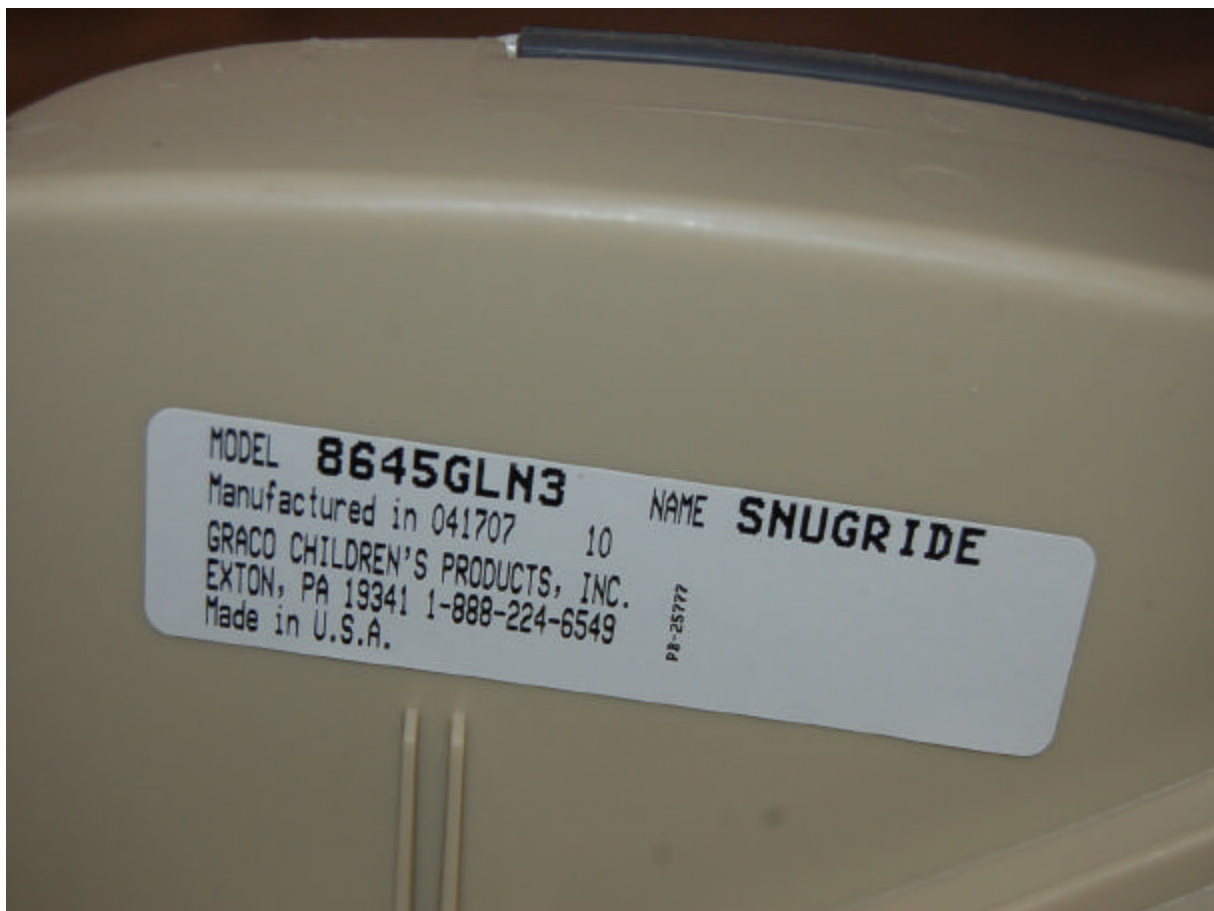
***COORDINATES:**

- +X = film plane rearward of barrier
- +Y = film plane to right of monorail centerline
- +Z = film plane above ground level

PHOTOGRAPHS

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Figure No. 3.	Post-Test Front View of Position 3 CRS	D-8
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Figure No. 5.	Post-Test Rear View of Position 3 CRS	D-9
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Figure No. 7.	Post-Test Left Side View of Position 3 CRS	D-10
Figure No. 8.	Pre-Test Right Side View of Position 3 CRS	D-11
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Figure No. 10.	Pre-Test Position 3 Right Side View	D-13
Figure No. 11.	Post-Test Position 3 Right Side View	D-13



Close-up View of Position 3 CRS Label



Pre-Test Front View of Position 3 CRS



Post-Test Front View of Position 3 CRS



Pre-Test Rear View of Position 3 CRS



Post-Test Rear View of Position 3 CRS



Pre-Test Left Side View of Position 3 CRS



Post-Test Left Side View of Position 3 CRS



Pre-Test Right Side View of Position 3 CRS



Pre-Test Position 3 Left Side View



Pre-Test Position 3 Right Side View



Post-Test Position 3 Right Side View

CHILD DUMMY RESPONSE DATA TRACES

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Figure No. 15.	RRP Child Head Resultant Acceleration vs. Time	D-15
Figure No. 16.	RRP Child Neck X Force vs. Time	D-16
Figure No. 17.	RRP Child Neck Y Force vs. Time	D-16
Figure No. 18.	RRP Child Neck Z Force vs. Time	D-16
Figure No. 19.	RRP Child Neck Resultant Force vs. Time	D-16
Figure No. 20.	RRP Child Neck X Moment vs. Time	D-17
Figure No. 21.	RRP Child Neck Y Moment vs. Time	D-17
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Figure No. 26.	RRP Child Chest Z Acceleration vs. Time	D-18
Figure No. 27.	RRP Child Chest Resultant Acceleration vs. Time	D-18

The following response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

RRP Child Seat X Acceleration vs. Time

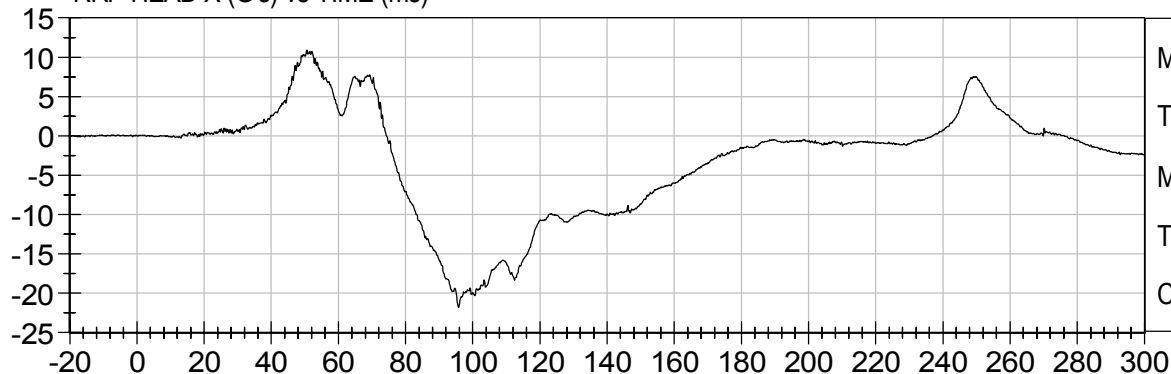
RRP Child Seat Y Acceleration vs. Time

RRP Child Seat Z Acceleration vs. Time

RRP Child Seat Resultant Acceleration vs. Time

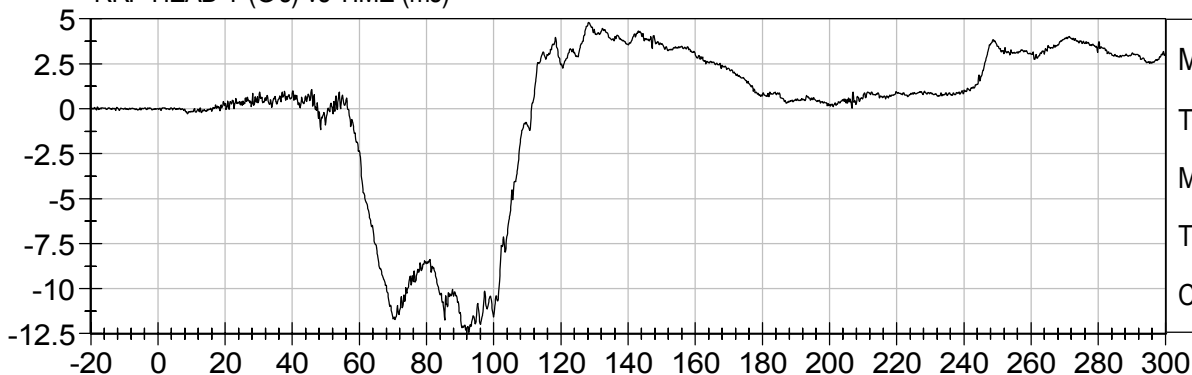


RRP HEAD X (G's) vs TIME (ms)



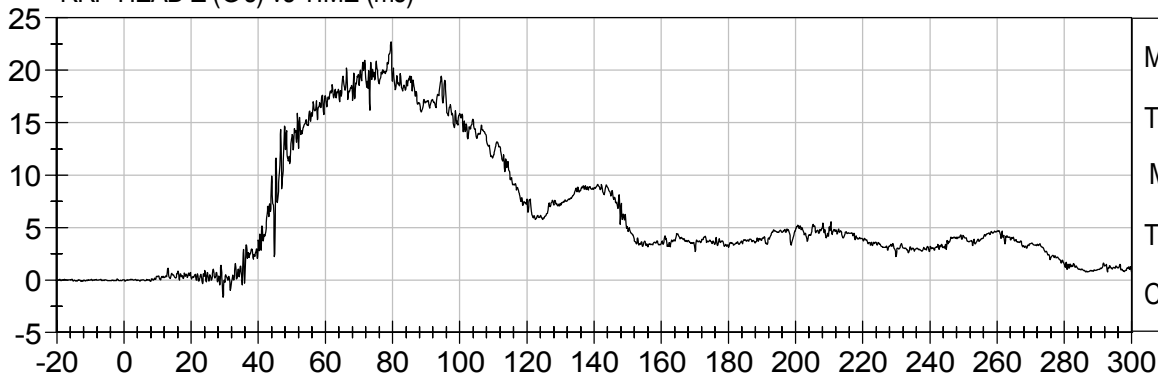
Max: 10.9 G's
Tmax: 50.6 ms
Min: -21.8 G's
Tmin: 95.8 ms
CFC 1000

RRP HEAD Y (G's) vs TIME (ms)



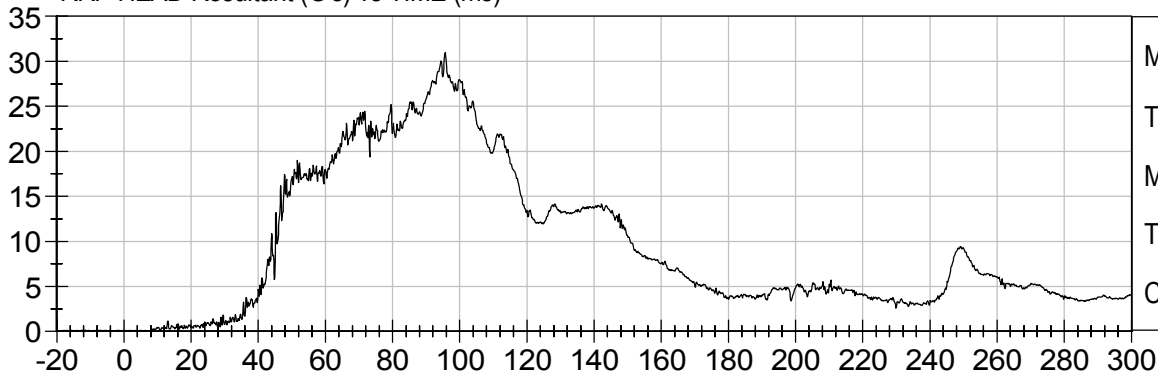
Max: 4.8 G's
Tmax: 128.3 ms
Min: -12.4 G's
Tmin: 92.6 ms
CFC 1000

RRP HEAD Z (G's) vs TIME (ms)



Max: 22.7 G's
Tmax: 79.5 ms
Min: -1.6 G's
Tmin: 29.5 ms
CFC 1000

RRP HEAD Resultant (G's) vs TIME (ms)

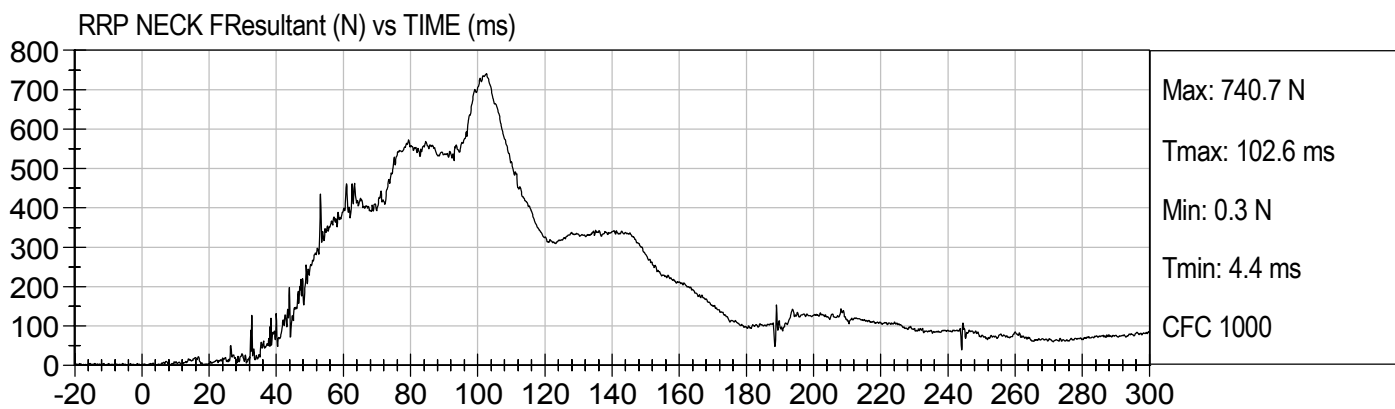
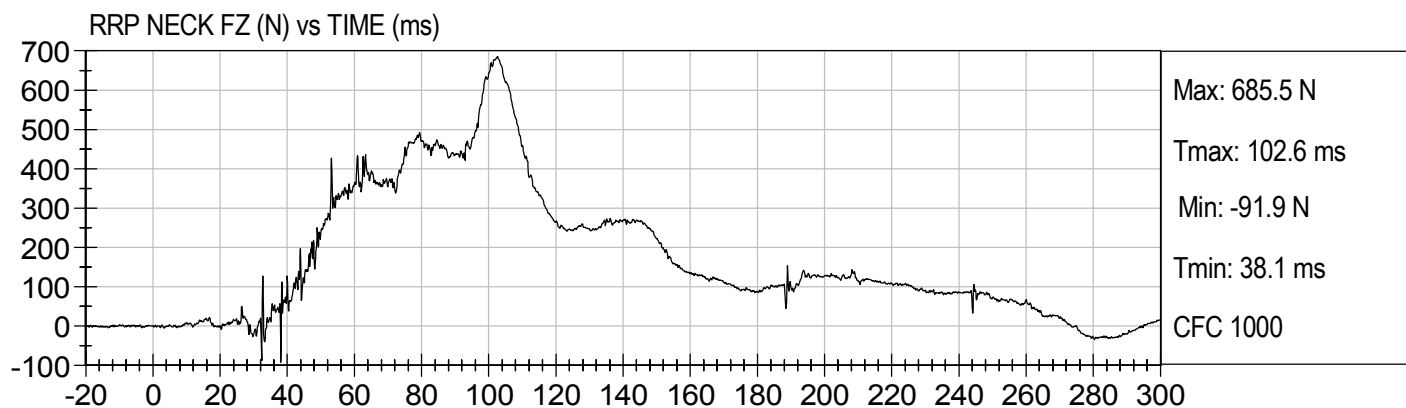
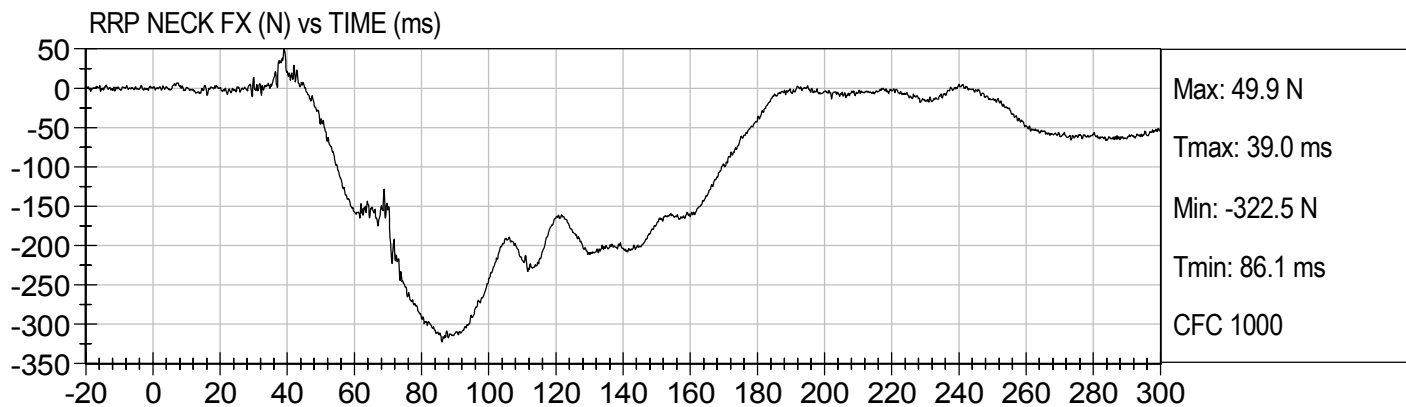


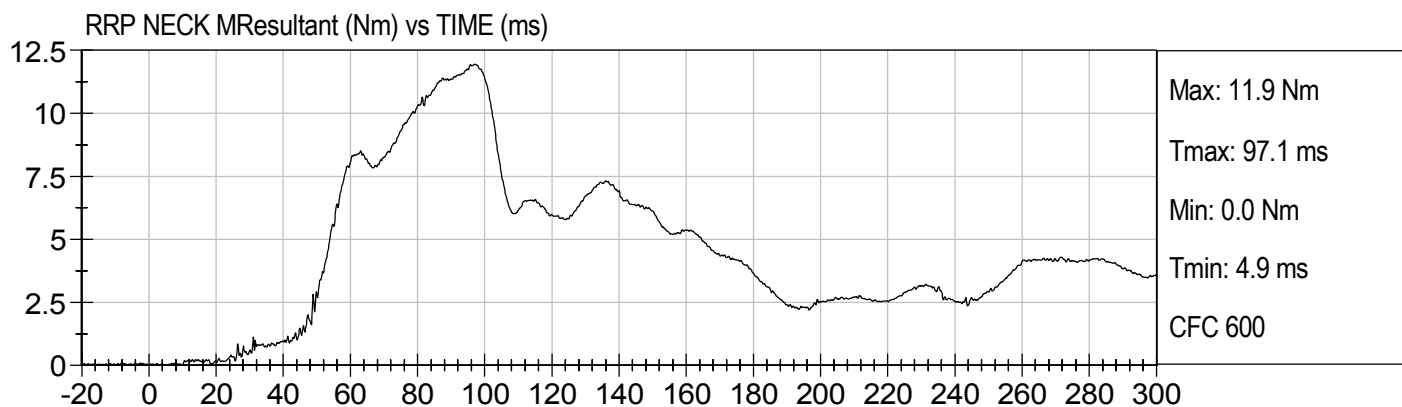
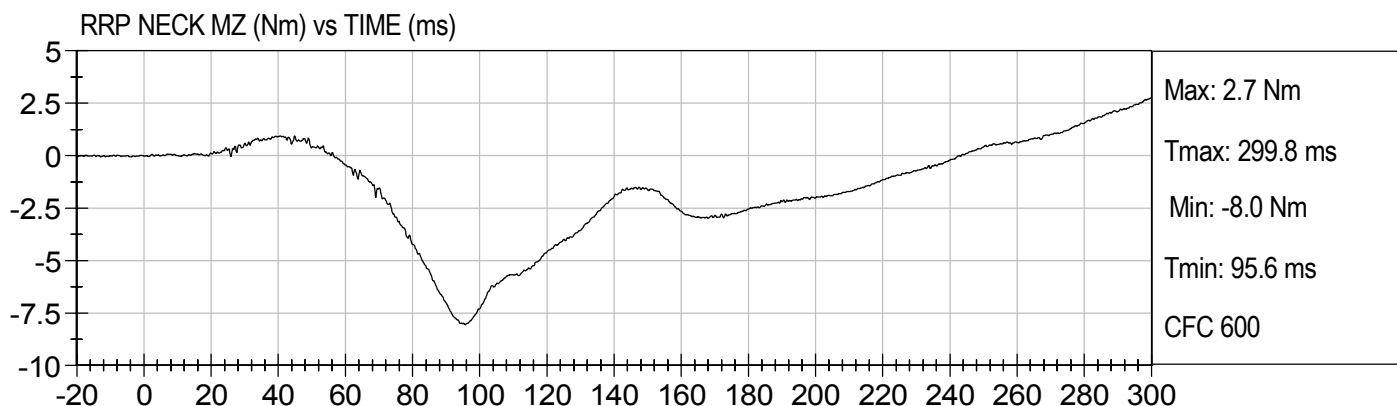
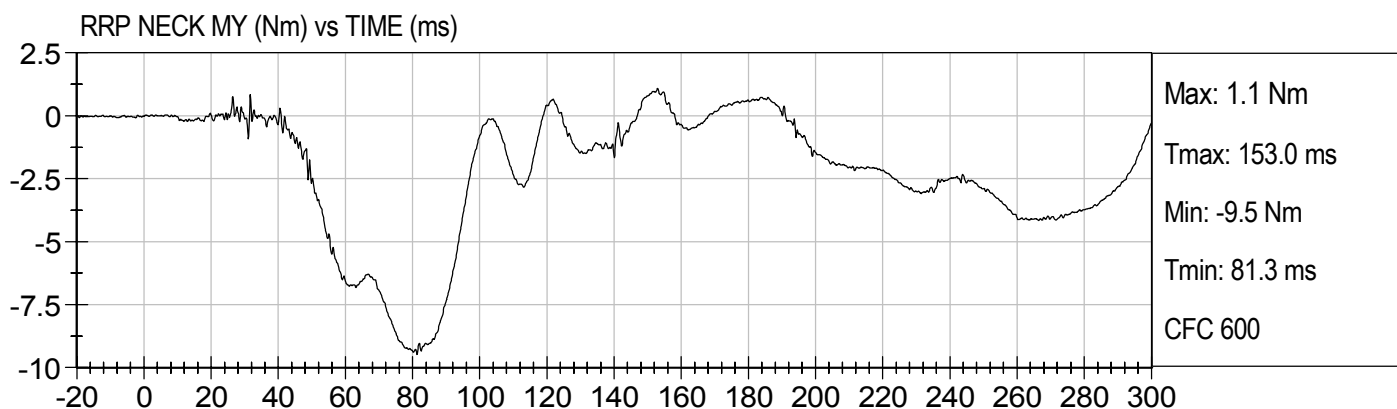
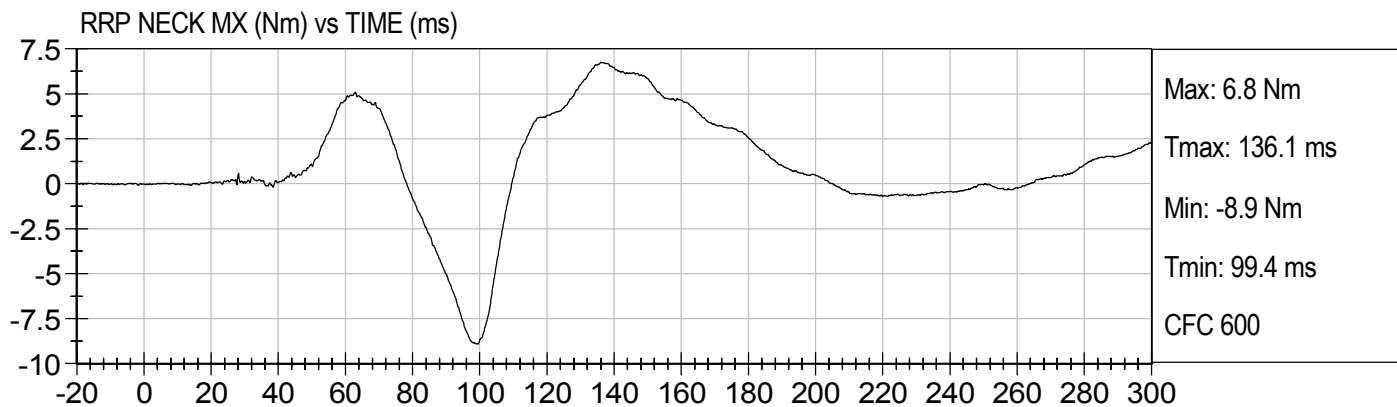
Max: 31.0 G's
Tmax: 95.7 ms
Min: 0.0 G's
Tmin: 7.1 ms
CFC 1000



NCAP LEFT SIDE
2008 MERCEDES BENZ C300 M80509

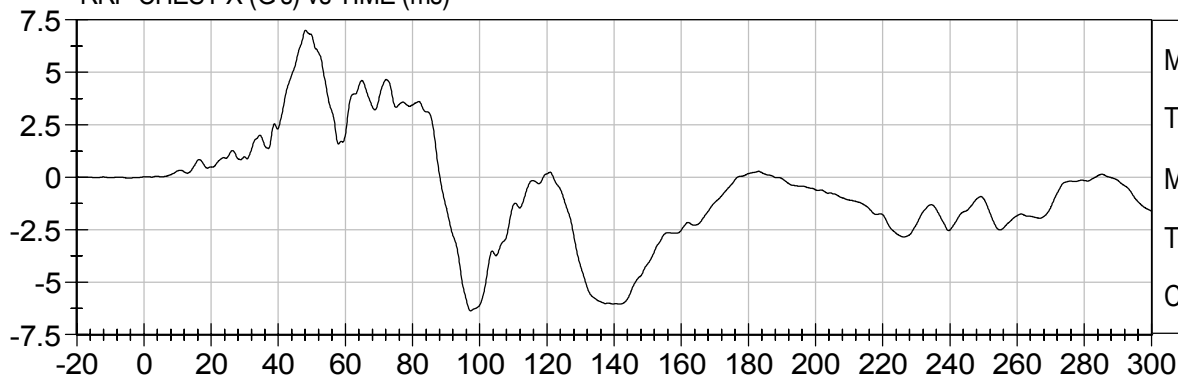
Test Date: 10/08/2007
Speed: 38.7 mph (62.3 km/h)





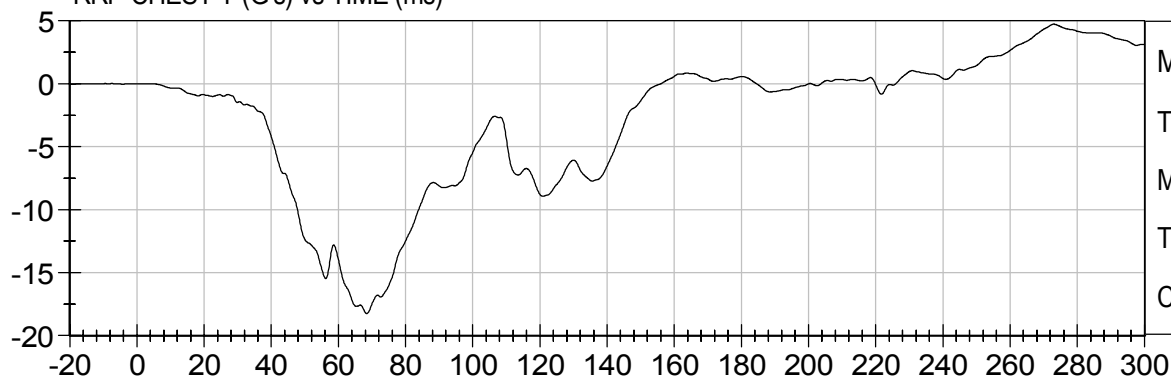


RRP CHEST X (G's) vs TIME (ms)



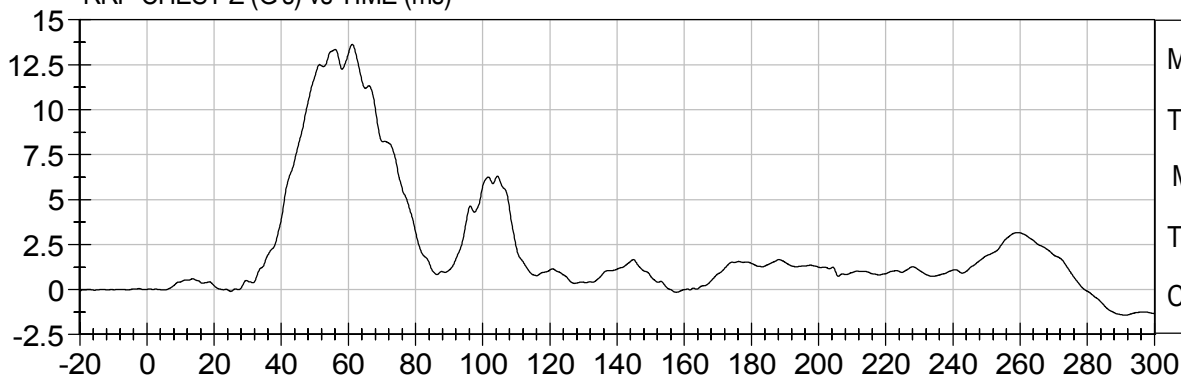
Max: 7.0 G's
Tmax: 48.1 ms
Min: -6.4 G's
Tmin: 97.3 ms
CFC 180

RRP CHEST Y (G's) vs TIME (ms)



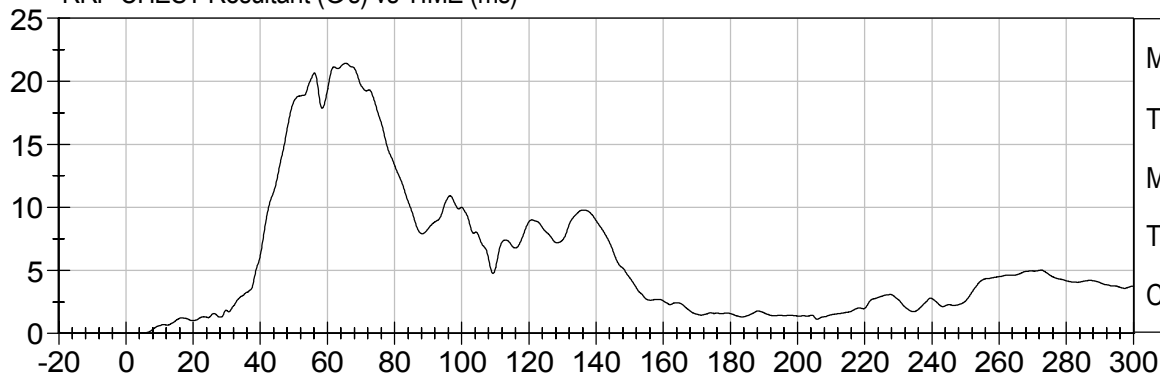
Max: 4.7 G's
Tmax: 273.0 ms
Min: -18.3 G's
Tmin: 68.4 ms
CFC 180

RRP CHEST Z (G's) vs TIME (ms)



Max: 13.6 G's
Tmax: 61.1 ms
Min: -1.4 G's
Tmin: 291.3 ms
CFC 180

RRP CHEST Resultant (G's) vs TIME (ms)



Max: 21.4 G's
Tmax: 65.4 ms
Min: 0.0 G's
Tmin: 0.0 ms
CFC 180

CHILD DUMMY CALIBRATION INFORMATION

MGA RESEARCH CORPORATION
FRONT HEAD DROP TEST
CRABI 12 MONTH

ATD Serial No: 093

Test ID: D072541

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	47	Pass
Peak Resultant Acceleration	G's	100 to 120	110	Pass
Peak Lateral Acceleration	G's	+/- 15	-3	Pass
Unimodal	N/A	within 17% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

8/23/07

Test Date

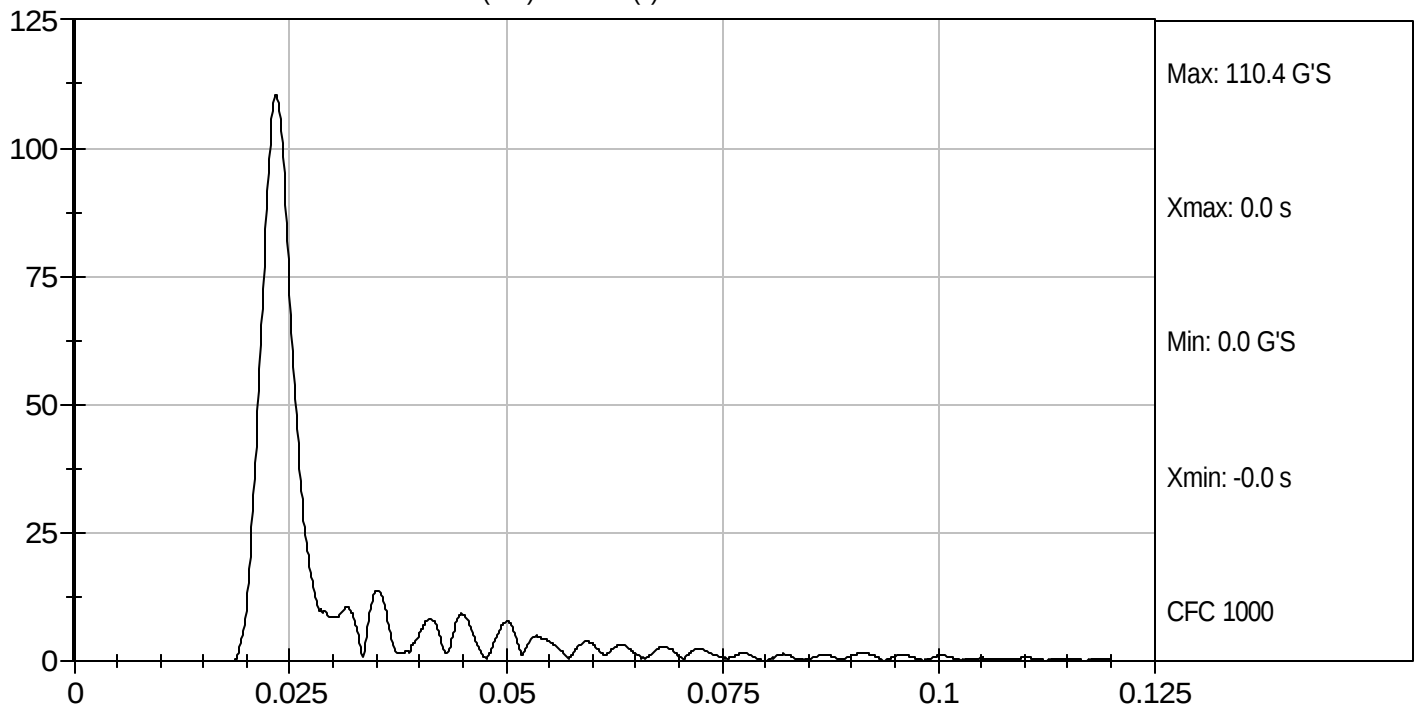

Approved By



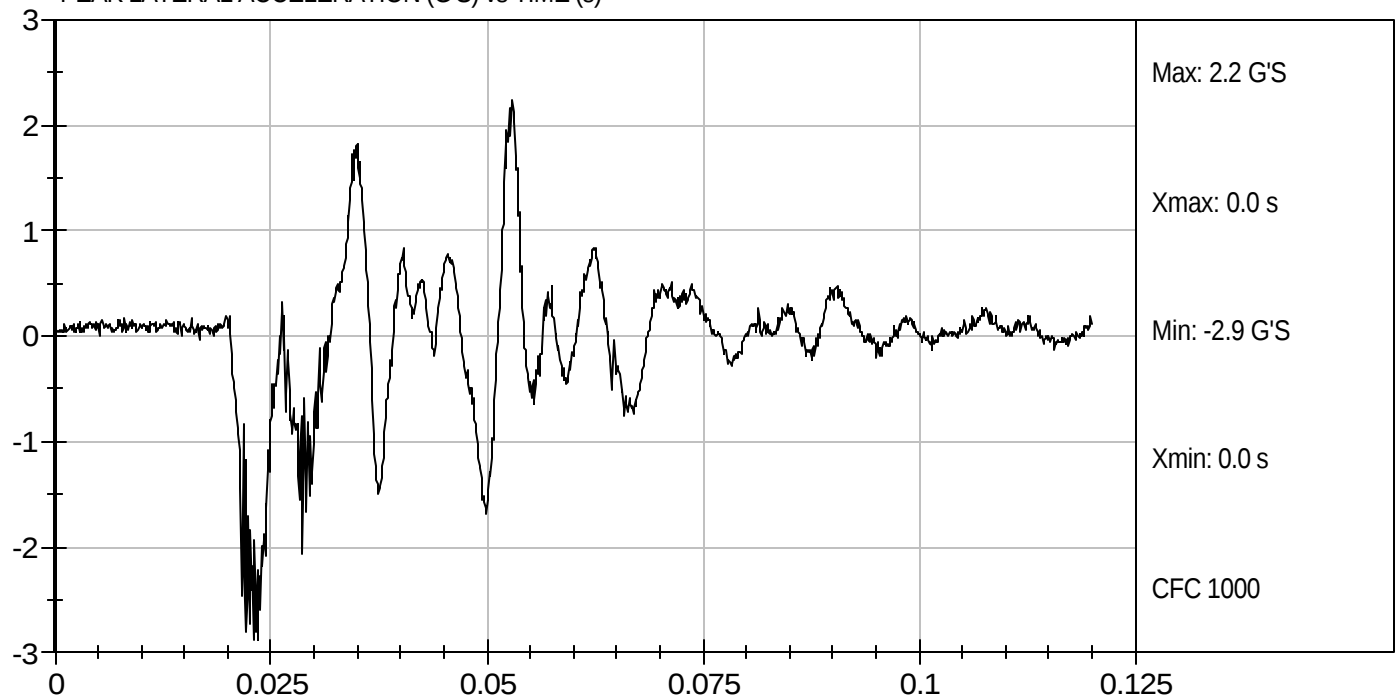
Test Desc: Head Drop
Component ID: D072541

Test Date: 8/23/07
Velocity: 0 ft/s, 0 m/s

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



PEAK LATERAL ACCELERATION (G'S) vs TIME (s)



MGA RESEARCH CORPORATION
NECK FLEXION TEST
CRABI 12 MONTH

ATD Serial No: 093

Test I.D: D072542

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	20.8	Pass
Humidity		%	10 to 70	46	Pass
Impact Velocity		m/s	5.1 to 5.3	5.2	Pass
Pendulum Deceleration	10 msec	m/s	1.6 to 2.3	1.9	Pass
	20 msec	m/s	3.4 to 4.2	3.6	Pass
	25 msec	m/s	4.3 to 5.2	4.4	Pass
D Plane Rotation		deg	75.0 to 86.0	83.1	Pass
Moment About Occipital Condyle		Nm	36.0 to 45.0	40.2	Pass
Positive Moment - Time Curve Decay to 5 Nm		msec	60 to 80	74	Pass
Overall Test Results				Pass	



Laboratory Technician

8/23/07

Test Date



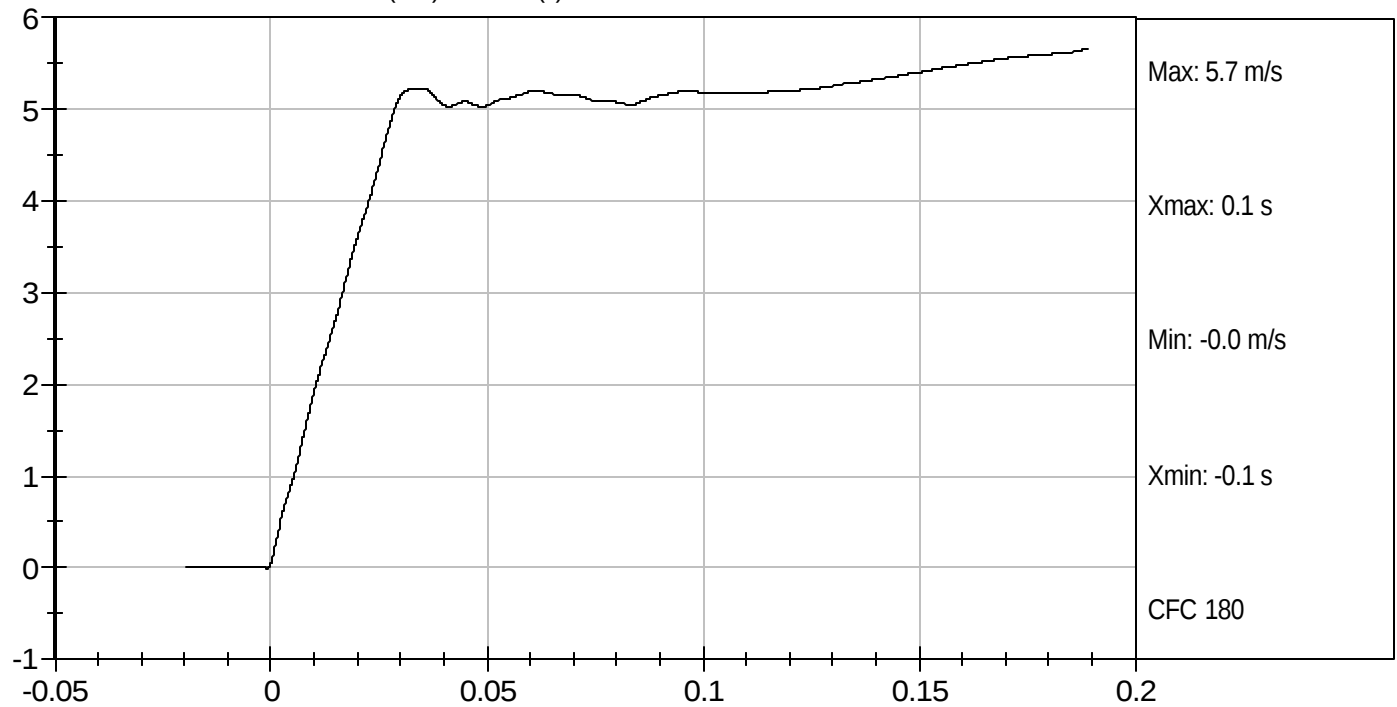
Approved By



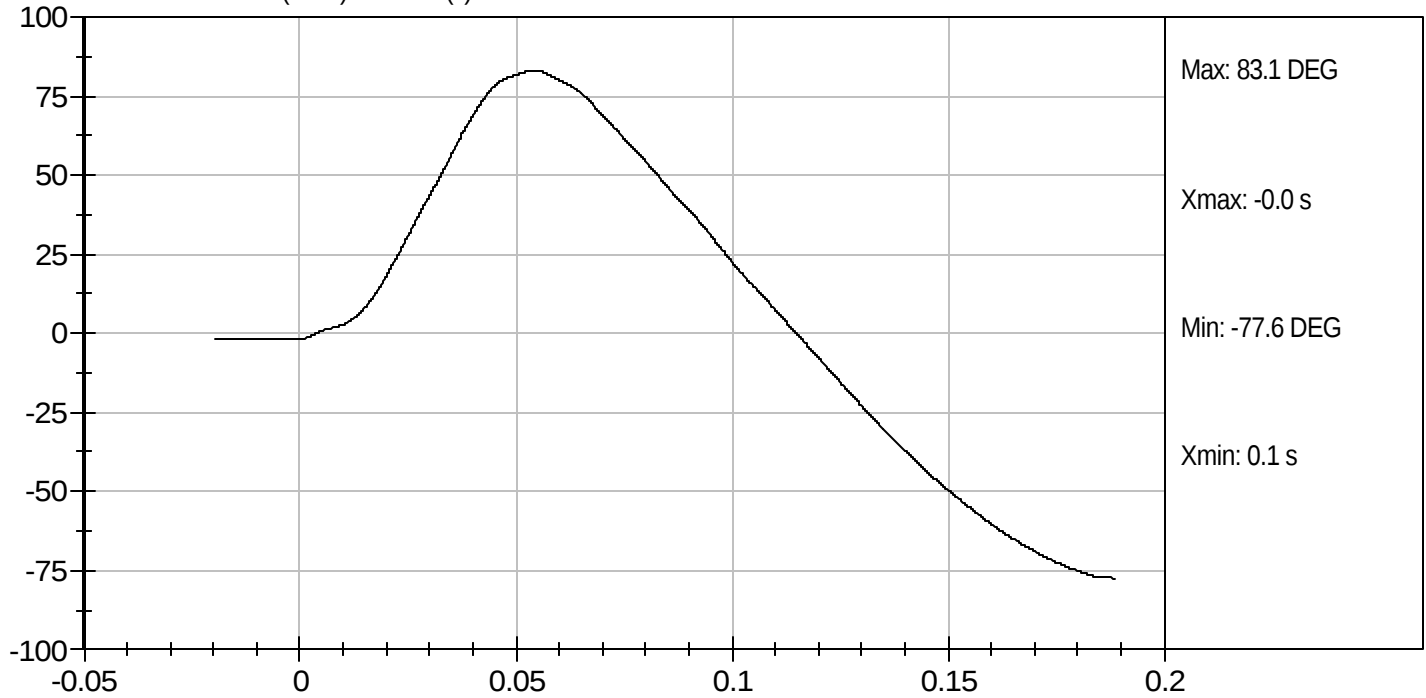
Test Desc: Neck Flexion
Component ID: D072542

Test Date: 8/23/07
Velocity: 17.006 ft/s, 5.2 m/s

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



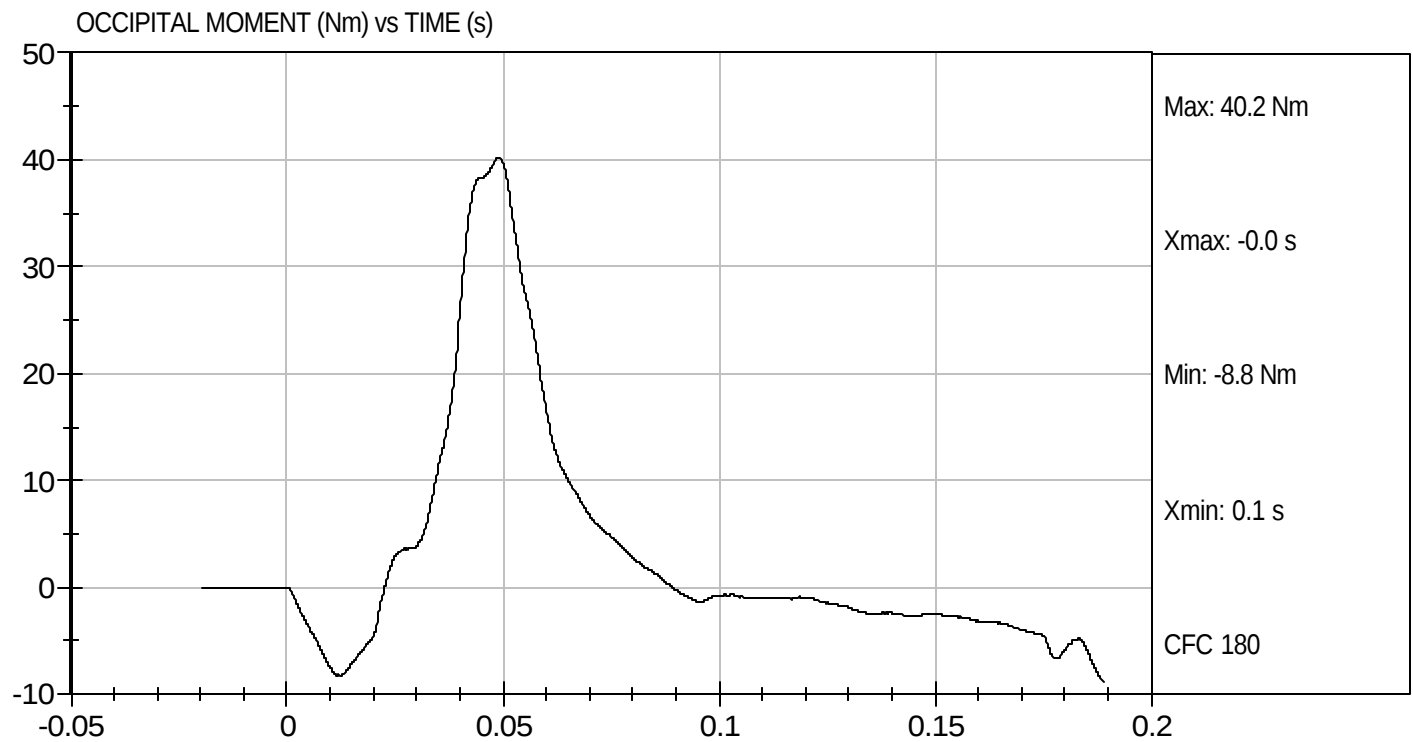
FLEXION ANGLE (DEG) vs TIME (s)





Test Desc: Neck Flexion
Component ID: D072542

Test Date: 8/23/07
Velocity: 17.006 ft/s, 5.2 m/s



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
CRABI 12 MONTH

ATD Serial No: 093

Test I.D: D072543

Tested Parameter		Units	Specification	Result	Pass/Fail
Temperature		deg C	20.6 to 22.2	20.8	Pass
Humidity		%	10 to 70	46	Pass
Pendulum Speed		m/s	2.4 to 2.6	2.5	Pass
Pendulum Deceleration	6 msec	m/s	0.8 to 1.2	1.0	Pass
	10 msec	m/s	1.5 to 2.1	2.0	Pass
	14 msec	m/s	2.2 to 2.9	2.3	Pass
D Plane Rotation		deg	80.0 to 92.0	80.3	Pass
Moment About Occipital Condyle		Nm	-23.0 to -12.0	-19.1	Pass
Negative Moment - Time Curve Decay to -5 Nm		msec	76 to 90	77	Pass
Overall Test Results				Pass	


 Laboratory Technician

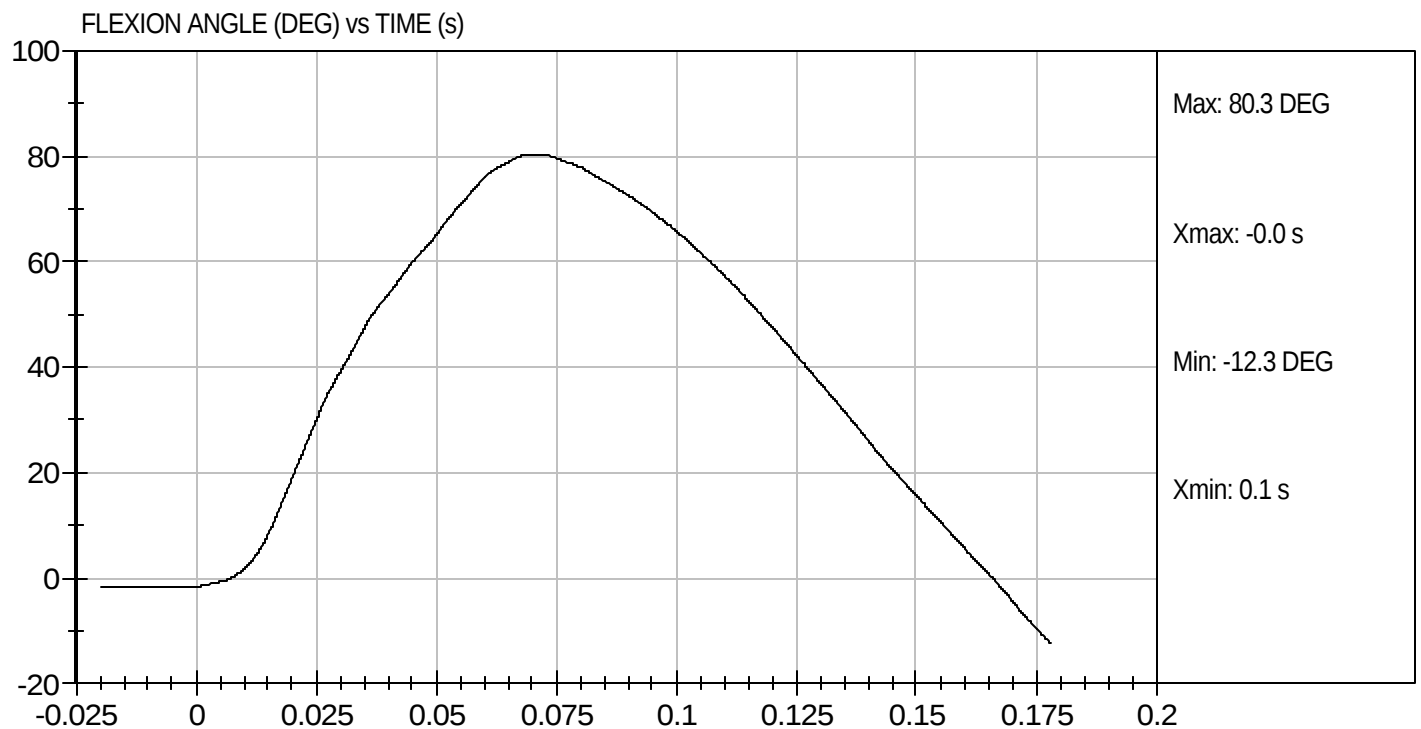
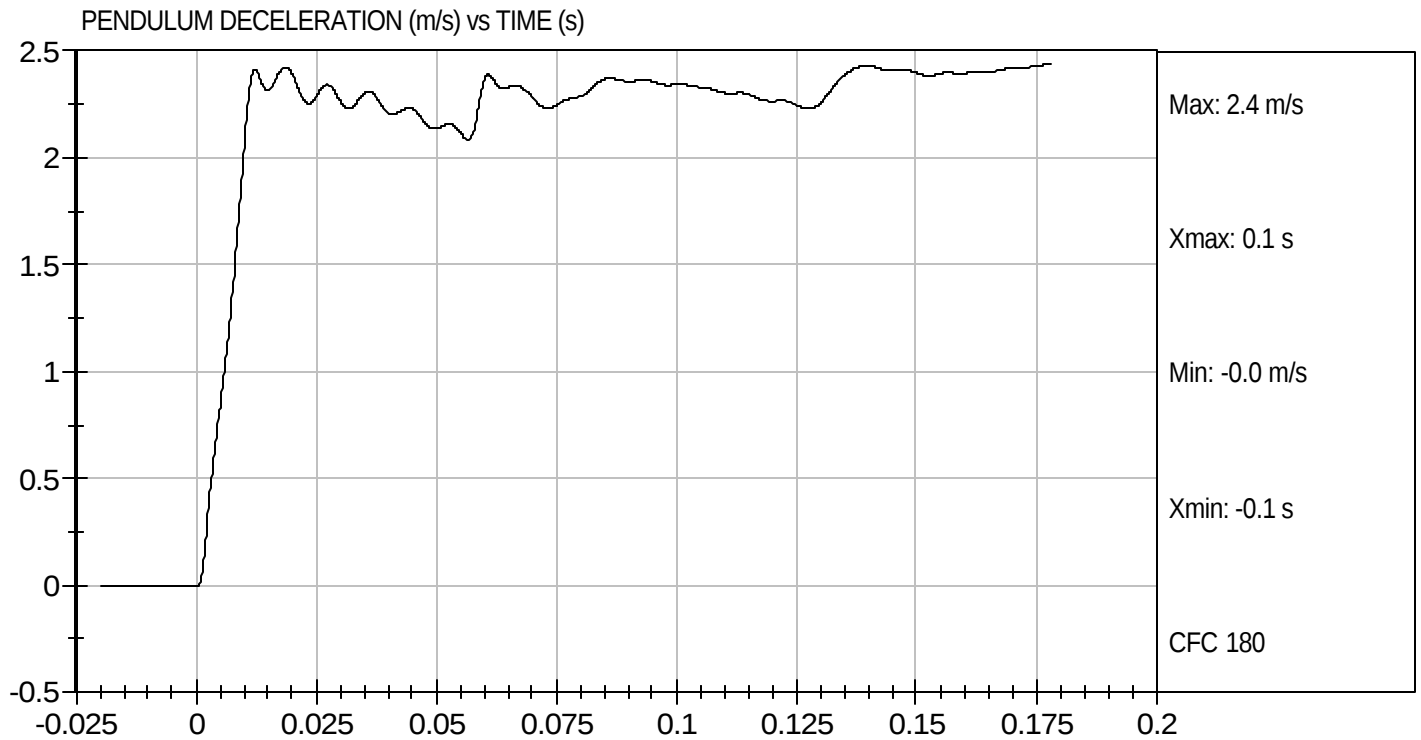
8/23/07
 Test Date


 Approved By



Test Desc: Neck Extension
Component ID: D072543

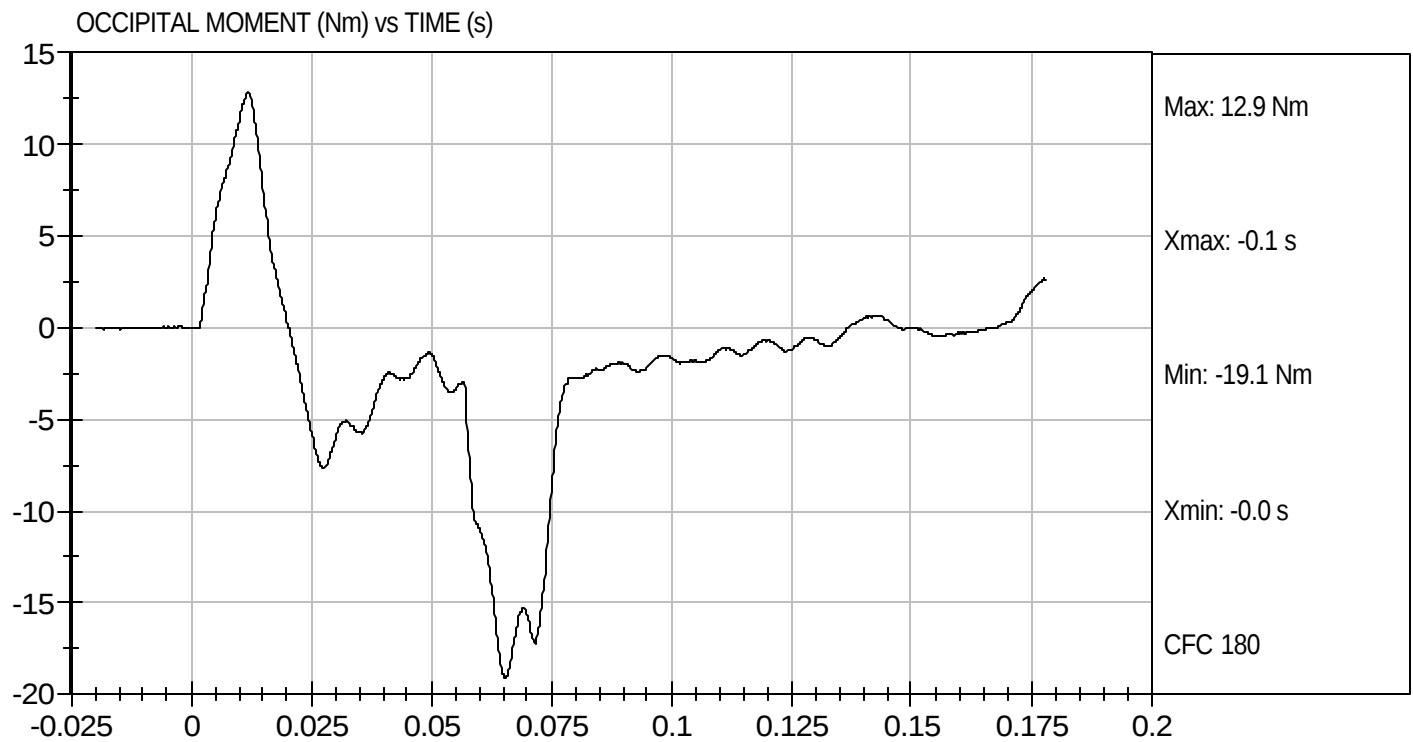
Test Date: 8/23/07
Velocity: 8.33 ft/s, 2.5 m/s





Test Desc: Neck Extension
Component ID: D072543

Test Date: 8/23/07
Velocity: 8.33 ft/s, 2.5 m/s



MGA RESEARCH CORPORATION
THORAX IMPACT TEST
CRABI 12 MONTH

ATD Serial No: 093

Test I.D: D072544

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	43	Pass
Probe Speed	m/sec	4.9 to 5.1	5.03	Pass
Probe Force	kN	1.51 to 1.80	1.55	Pass
Overall Test Results				Pass


Laboratory Technician

8/23/07

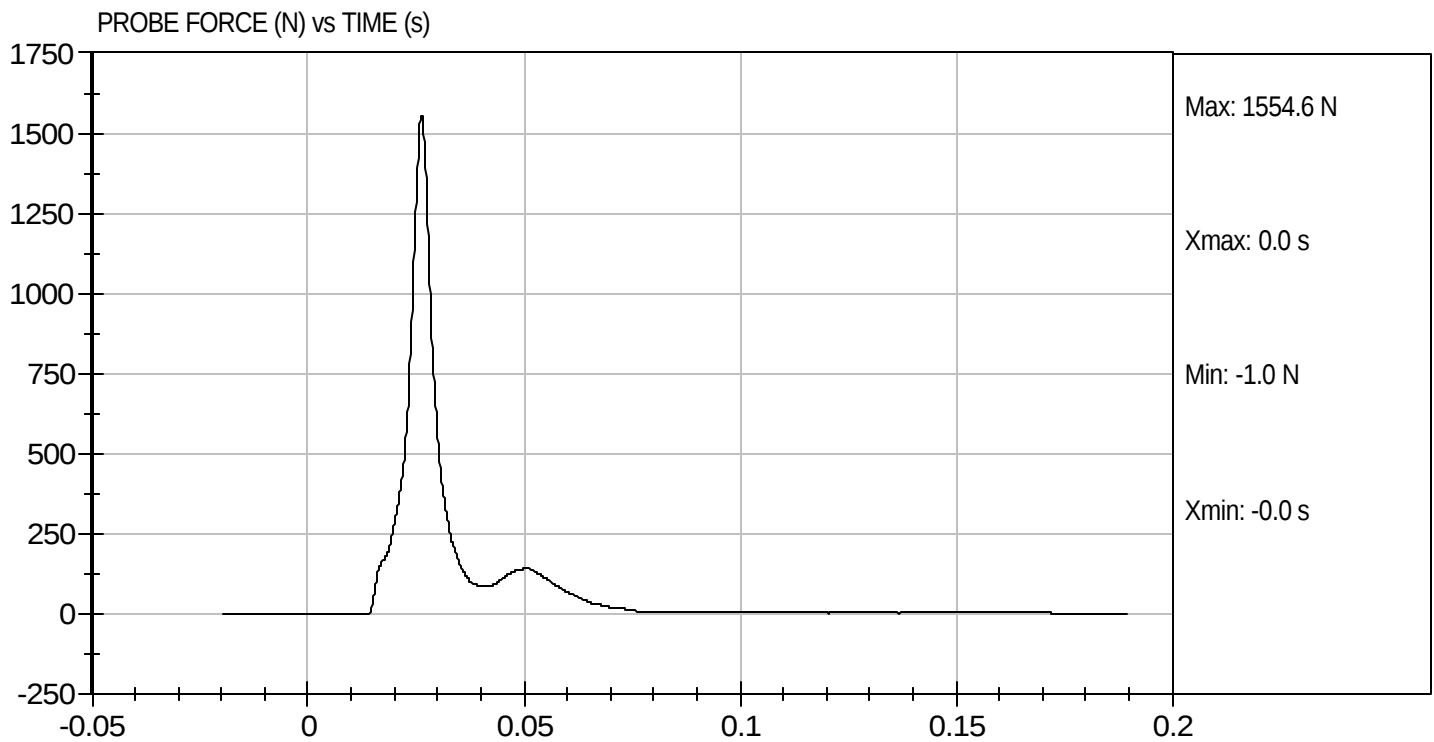
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D072544

Test Date: 8/23/07
Velocity: 16.5 ft/s, 5.03 m/s



MGA RESEARCH CORPORATION
REAR HEAD DROP TEST
CRABI 12 MONTH

ATD Serial No: 093

Test ID: D072545

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.6	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	47	Pass
Peak Resultant Acceleration	G's	55 to 71	69	Pass
Peak Lateral Acceleration	G's	+/- 15	3	Pass
Unimodal	N/A	within 17% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

8/23/07
Test Date


Approved By



Test Desc: Head Drop
Component ID: D072545

Test Date: 8/23/07
Velocity: 0 ft/s, 0 m/s

