

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

**HONDA MOTOR COMPANY, LTD
2010 HONDA INSIGHT 5-DR LX
NHTSA NUMBER: MA5302**

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



Test Date: May 13, 2009

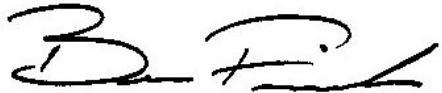
Report Date: June 8, 2009

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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16. Abstract A 55/28 km/h 90° Moving Deformable Barrier NCAP side impact was conducted on the subject 2010 Honda Insight 5-Dr LX 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 May 13, 2009. The impact velocity of the Moving Deformable Barrier (MDB) was 61.8 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 251 mm at level 3. The test vehicle's occupant performance is as follows: <table style="margin: auto; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"></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;">44.6</td> <td style="text-align: center;">56.3</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td style="text-align: center;">47.8</td> <td style="text-align: center;">67.4</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td style="text-align: center;">59.4</td> <td style="text-align: center;">73.4</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td style="text-align: center;">54</td> <td style="text-align: center;">70</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td style="text-align: center;">69.2</td> <td style="text-align: center;">59.7</td> </tr> <tr> <td>HIC</td> <td style="text-align: center;">282</td> <td style="text-align: center;">322</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	44.6	56.3	Left Lower Rib (LLR) Accel., g	47.8	67.4	Lower Spine (T ₁₂) Accel., g	59.4	73.4	Thoracic Trauma Index (TTI)	54	70	Pelvis (PEV) Accel., g	69.2	59.7	HIC	282	322
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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 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 2010 Honda Insight 5-Dr LX manufactured by Honda Motor Company, Ltd.

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 2010 Honda Insight 5-Dr LX 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 61.8 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 1431.1 kg and the test weight of the MDB was 1361.5 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on May 13, 2009.

One (1) real-time motion picture camera and nine (9) 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 251 mm at level 3, 900 mm rearward of the vertical impact point. The driver and passenger SID/HIIIs, Serial Nos. 272 and 271 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.

The occupant data is summarized below:

ATD position	HIC	T ¹	T ²	TTI (G's)	Peak Pelvis (G's)
Driver	282	36.8	68.3	54	69.2
Passenger	322	35.0	63.7	70	59.7

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:
Left Rear Sill Y

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Honda Insight 5-Dr LX
 Test Program: NCAP Side Impact

NHTSA No. MA5302
 Test Date: 5/13/2009

TEST VEHICLE INFORMATION

Make	Honda
Model	Insight
Body Style	Sedan
NHTSA No.	MA5302
VIN	JHMZE2H50AS003070
Color	Tango Red Pearl
Delivery Date	4/27/2009
Odometer Reading (mile)	51
Dealer	Schlossman's Honda City
Transmission	Automatic
Final Drive	Front
Number of Cylinders	4
Engine Displacement (L)	1.3
Engine Placement	Lateral
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
Traction Control	No
All Wheel Drive	No
Power Seats	No
Pretensioners	Yes
Load Limiters	Yes
Bucket Seats	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Honda Motor Company, Ltd.
Date of Manufacture	02/'09

GVWR (kg)	1650
GAWR Front (kg)	855
GAWR Rear (kg)	810

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bucket		
Number Of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				385
Cargo Wt. (RCLW) (kg)				45

DATA SHEET NO. 1 (continued)**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2010 Honda Insight 5-Dr LXNHTSA No. MA5302Test Program: NCAP Side ImpactTest Date: 5/13/2009**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	359.7	266.2		408.7	348.8	
Right	kg	352.5	254.5		370.6	303.0	
Ratio	%	57.8	42.2		54.5	45.5	
Totals	kg	712.2	520.7	1232.9	779.3	651.8	1431.1

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1232.9
Weight of 2 P572M ATDs	kg	161.5
Rated Cargo/Luggage Weight (RCLW)	kg	45
Calculated Vehicle Target Weight (TVTW)	kg	1439.4

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

Weight of Ballast in Trunk (kg): 0**TEST VEHICLE ATTITUDES AND CG**

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	653	657	657	663	1075
As Tested	mm	638	648	633	640	1160
Fully Loaded	mm	636	637	633	636	

TEST VEHICLE VERTICAL IMPACT LINE DATA

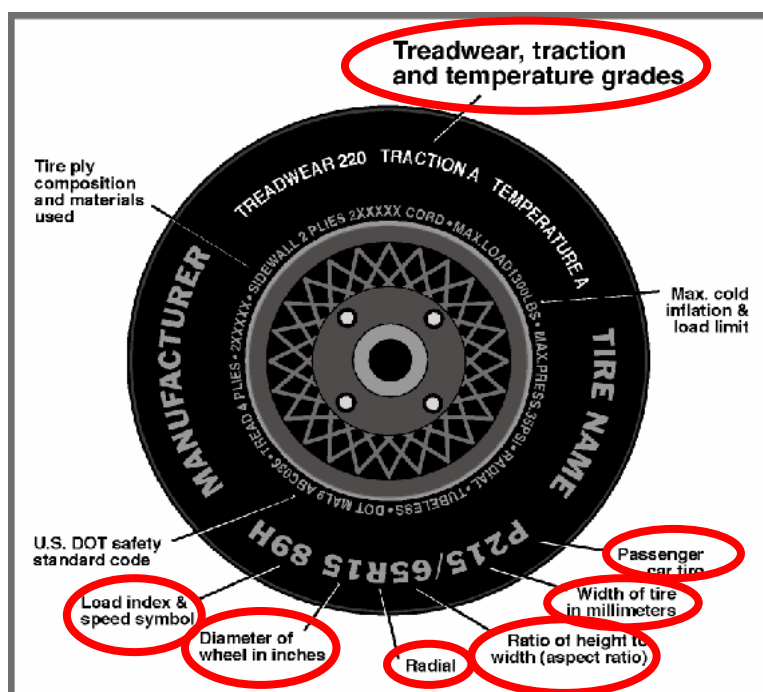
Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2546
Target Impact Point Aft of Front Axle	mm	333
Actual Impact Point Aft of Front Axle	mm	321

DATA SHEET NO. 2

TEST VEHICLE TIRE INFORMATION

Test Vehicle: 2010 Honda Insight 5-Dr LX
 Test Program: NCAP Side Impact

NHTSA No. MA5302
 Test Date: 5/13/2009



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Test Pressure (kPa)	230	230
Recommended Tire Size	175/65R15	175/65R15
Tire Size on Vehicle	175/65R15	175/65R15
Tire Manufacturer	Dunlop	Dunlop
Tire Name	SP31A	SP31A
Tire Type	Passenger	Passenger
Tire Width (mm)	175	175
Ratio of Height to Width (aspect ratio)	65	65
Radial	R	R
Wheel Diameter	15	15
Load Index & Speed Symbol	84S	84S
Treadwear	320	320
Traction Grade	A	A
Temperature Grade	B	B

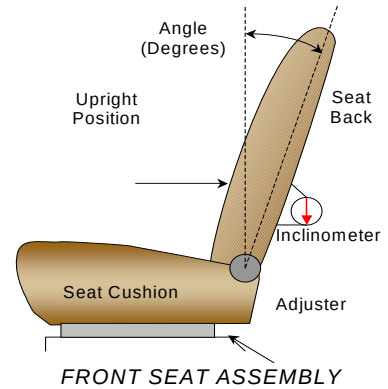
DATA SHEET NO. 3 **TEST VEHICLE INFORMATION**

Test Vehicle: 2010 Honda Insight 5-Dr LX
 Test Program: NCAP Side Impact

NHTSA No. MA5302
 Test Date: 5/13/2009

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, measure from Point A (rod center for sun visor bracket) to Point B (outer hole for head restraint). This measurement is 610 mm. Measure the angle of the seat back, use door sill as reference.

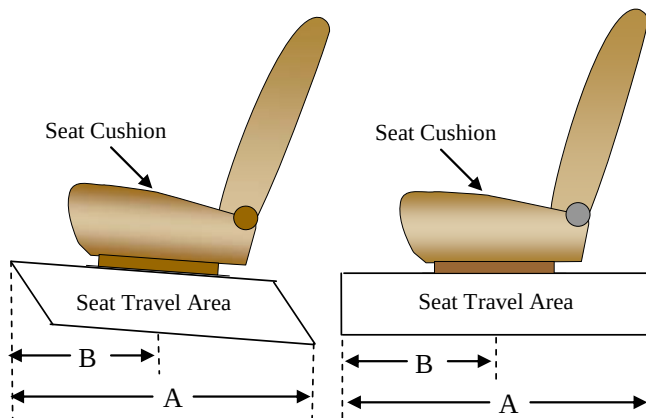


Driver seat back angle: 10.3 degrees at the headrest post

Passenger seat back angle: Fixed

SEAT FORE/AFT POSITIONS

	Total Fore/Aft Travel	Placed in position #
Driver Seat	25 detents	10 th detent (1 st forwardmost as 0)
Rear Seat	Fixed	Fixed



DATA SHEET NO. 3 (CONTINUED)

TEST VEHICLE INFORMATION

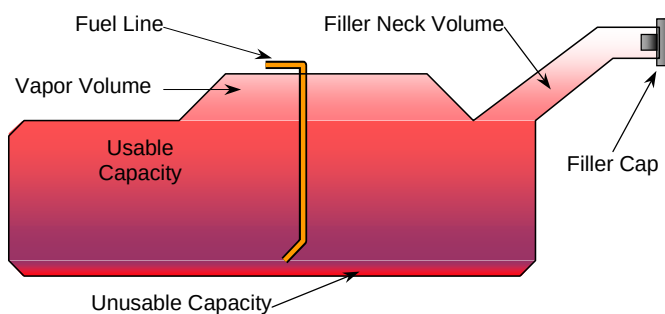
Test Vehicle: 2010 Honda Insight 5-Dr LX
 Test Program: NCAP Side Impact

NHTSA No. MA5302
 Test Date: 5/13/2009

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	40.0
Usable Capacity of "Optional" Tank	
92-94% of Usable Capacity	36.8 to 37.6
Actual Amount of Solvent used	37.4
1/3 of Usable Capacity	13.3

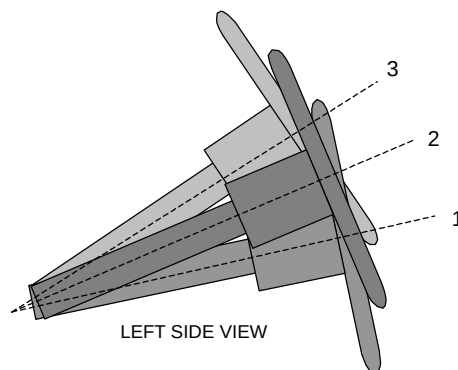
The test vehicle is equipped with an electric fuel pump. After the ignition key is turned from LOCK (0) to ON (II) position, the pump will be filled up for two seconds and then the pressure is maintained.



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	130	69.3
Geometric center position No. 2	145	72.1
Uppermost position No. 3	160	74.9

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

Test Vehicle: 2010 Honda Insight 5-Dr LX
 Test Program: NCAP Side Impact

NHTSA No. MA5302
 Test Date: 5/13/2009

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheel base of Framework Carriage	2592
C.G. Location aft of Front Axle	1129

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	411.8	281.6	
Right	kg	356.8	311.3	
Ratio	%	56.5	43.5	
Totals	kg	768.6	592.9	1361.5

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.8
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.8
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.8

POST TEST OBSERVATIONS
MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	12 forward
Vertical Offset	mm	+/-20	6 down

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

Test Vehicle: 2010 Honda Insight 5-Dr LX
 Test Program: NCAP Side Impact

NHTSA No. MA5302
 Test Date: 5/13/2009

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat SID/HIII	Rear Seat SID/HIII
Dummy Type / Serial No.	SID HIII / 272	SID HIII / 271
Head Contact	Curtain Airbag, Headrest, Headliner	Curtain Airbag, Headliner, Left & Mid Seat Headrests
Upper Torso Contact	Side Airbag, Door Panel, Curtain 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	Struck side doors were unlocked; Non-struck side doors were unlocked	Struck side doors were unlocked; Non-struck side 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	Left Front and Left Rear Windows were broken.
Other Notable Effects	None

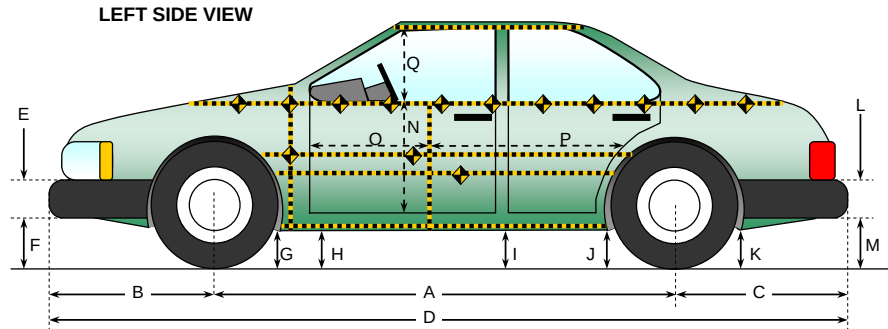
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

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

Test Vehicle: 2010 Honda Insight 5-Dr LX
 Test Program: NCAP Side Impact

NHTSA No. MA5302
 Test Date: 5/13/2009



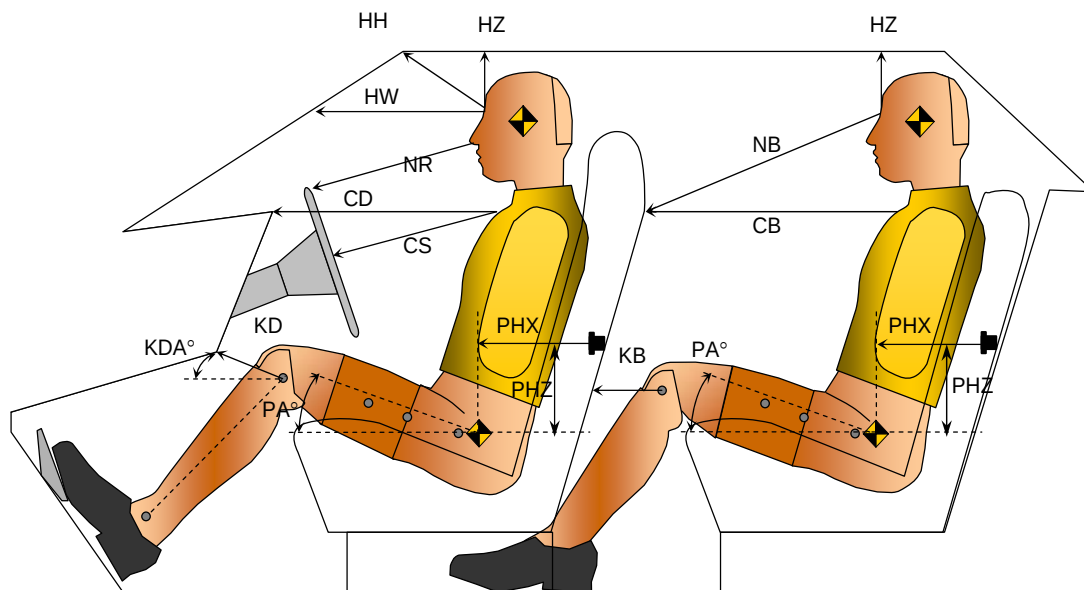
All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2546	2551	-5
B	Front Axle to FSOV	919	910	9
C	Rear Axle to RSOV	887	902	-15
D	Total Length at Centerline	4352	4363	-11
E	Front Bumper Thickness	139	139	0
F	Front Bumper Bottom to Ground	181	194	-13
G	Sill Height at Front Wheel Well	145	165	-20
H	Sill Height at Front Door Leading Edge	160	184	-24
I	Sill Height at "B" Pillar	162	193	-31
J1	Sill Height at Rear Wheel Well	154	174	-20
J2	Pinch Weld Height at Rear Wheel Well	161	176	-15
K	Sill Height Aft of Rear Wheel Well	238	226	12
L	Rear Bumper Thickness	283	283	0
M	Rear Bumper Bottom to Ground	316	301	15
N	Sill Height to Window Bottom Sill	657	545	112
O	Front Door Leading Edge to Impact CL	795	736	59
P	Rear Door Trailing Edge to Impact CL	1154	1113	41
Q	Front Window Opening	395	388	7
R	Right Side Length	3284	3289	-5
S	Left Side Length	3284	3271	13
T	Vehicle Width at "B" Post	1697	1484	213

DATA SHEET NO. 7
SID/HII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2010 Honda Insight 5-Dr LX
 Test Program: NCAP Side Impact

NHTSA No. MA5302
 Test Date: 5/13/2009

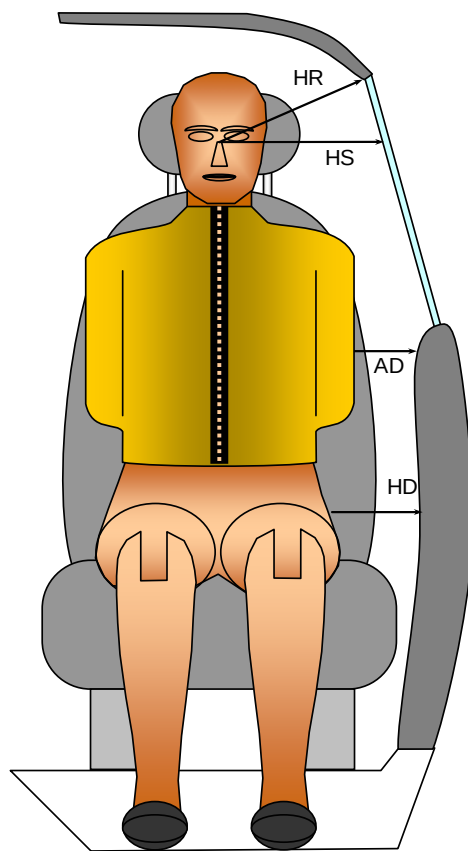


Driver Code	Pass. Code	Measurement Description	Driver S/N 272		Passenger S/N 271	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	386			
HW		Head to Windshield	688			
HZ	HZ	Head to Roof	164		109	
NR	NB	Nose to Rim/Nose to Seatback	392		634	
CD	CB	Chest to Dash or Seatback	525		524	
CS		Chest to Steering Wheel	305			
KDL	KBL	Left Knee to Dash or Seatback	140	28.5	197	21.2
KDR	KBR	Right Knee to Dash or Seatback	140	39.2	186	28.4
PA	PA	Pelvic Angle		24.0		23.8
PHX	PHX	H-Point to Striker (X-Axis)	241		209	
PHZ	PHZ	H-Point to Striker (Z-Axis)	160		240	

DATA SHEET NO. 8
SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2010 Honda Insight 5-Dr LX
 Test Program: NCAP Side Impact

NHTSA No. MA5302
 Test Date: 5/13/2009



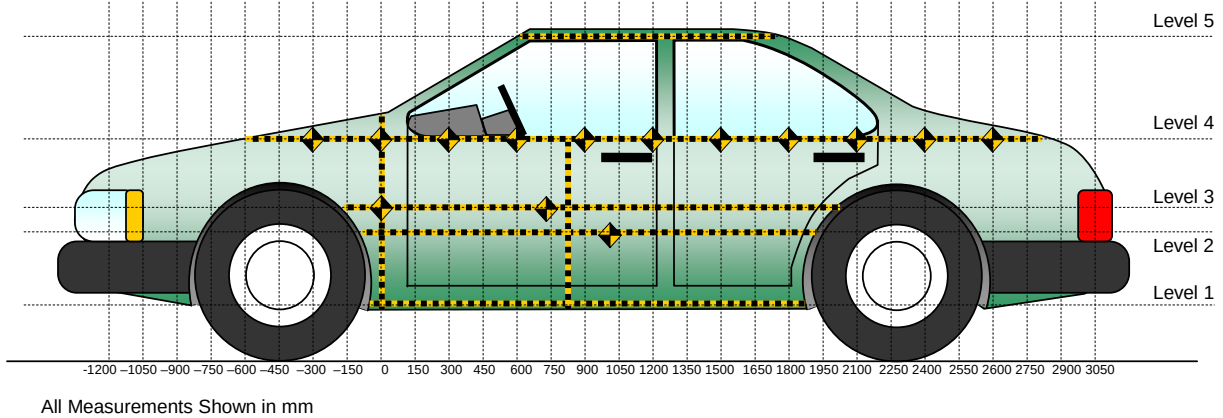
FRONT VIEW OF DUMMY

Code	Measurement Description	Units	Driver S/N 272	Passenger S/N 271
HR	Head to Side Header	mm	203	145
HS	Head to Side Window	mm	327	177
AD	Arm to Door	mm	72	88
HD	H-Point to Door	mm	153	130

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

Test Vehicle: 2010 Honda Insight 5-Dr LX
 Test Program: NCAP Side Impact

NHTSA No. MA5302
 Test Date: 5/13/2009



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	21	1350	1337
4	Window Sill	210	600	892
3	Mid Door	251	900	586
2	Occupant H-Point	231	1200	458
1	Sill Top	57	1050	228
	Maximum Penetration	251		

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2010 Honda Insight 5-Dr LX
 Test Program: NCAP Side Impact

NHTSA No. MA5302
 Test Date: 5/13/2009

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-600				323					327					4	
-450				306					316					10	
-300				295					315					20	
-150				299					321					22	
0		257	252	299			299	290	321			42	38	22	
150	270	258	255	299		270	430	442	402		0	172	187	103	
300	270	260	254	299		311	463	474	465		41	203	220	166	
450	269	260	254	300		314	475	484	508		45	215	230	208	
600	268	259	253	300	497	316	480	488	510	494	48	221	235	210	-3
750	268	257	252	303	498	319	468	502	502	497	51	211	250	199	-1
900	267	255	250	305	495	322	476	501	488	499	55	221	251	183	4
1050	268	254	248	308	495	325	481	470	474	505	57	227	222	166	10
1200	269	253	249	311	497	325	484	453	470	515	56	231	204	159	18
1350	268	254	250	315	497	321	483	464	460	518	53	229	214	145	21
1500	267	254	251	323	498	321	472	477	446	513	54	218	226	123	15
1650	266	254	252	330	502	319	474	484	414	511	53	220	232	84	9
1800	263	255	253	338	508	319	443	473	363	513	56	188	220	25	5
1950			253	347	514			380	322	515			127	-25	1
2100			250	358	522			303	314	520			53	-44	-2
2250			250	370	532			284	384	528			34	14	-4
2400			257	384	538			270	390	533			13	6	-5
2550				400					402					2	
2700				418					418					0	

Reference plane is parallel to test vehicle longitudinal centerline.

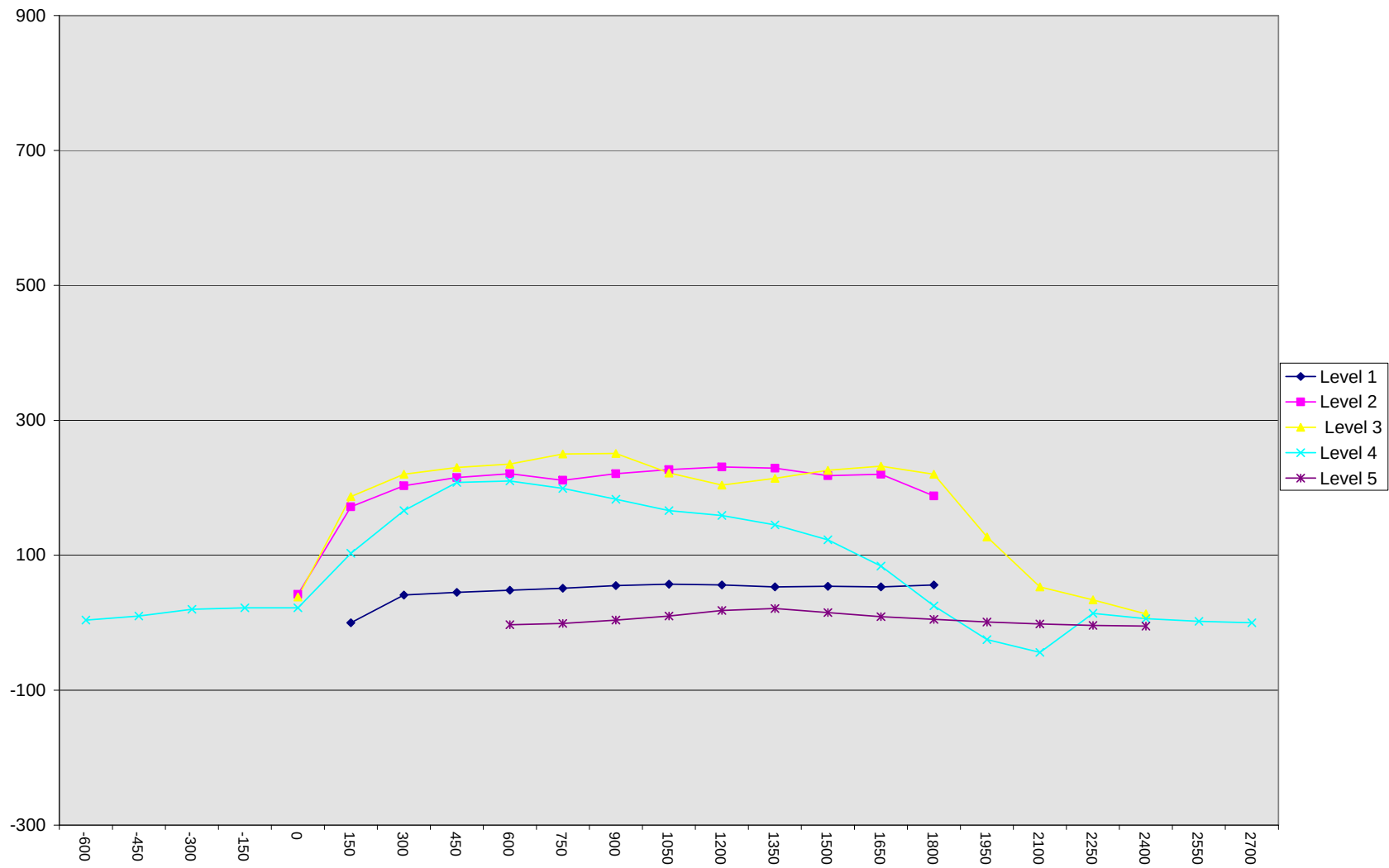
Given dimensions = Reference plane to car body

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

Test Vehicle: 2010 Honda Insight 5-Dr LX
Test Program: NCAP Side Impact

NHTSA No. MA5302
Test Date: 5/13/2009

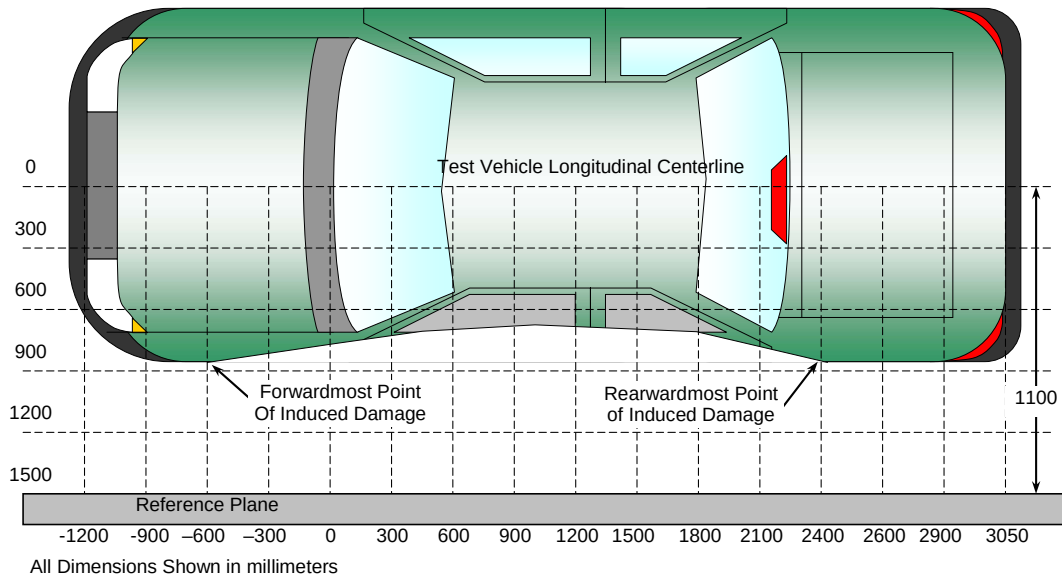
16



DATA SHEET NO. 11
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2010 Honda Insight 5-Dr LX
 Test Program: NCAP Side Impact

NHTSA No. MA5302
 Test Date: 5/13/2009



TOP VIEW

DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	2700	4	418	418	0
2	2054	3	252	312	60
3	1384	2	254	502	248
4	698	3	252	506	254
5	58	2	257	310	53
6	-600	4	323	327	4

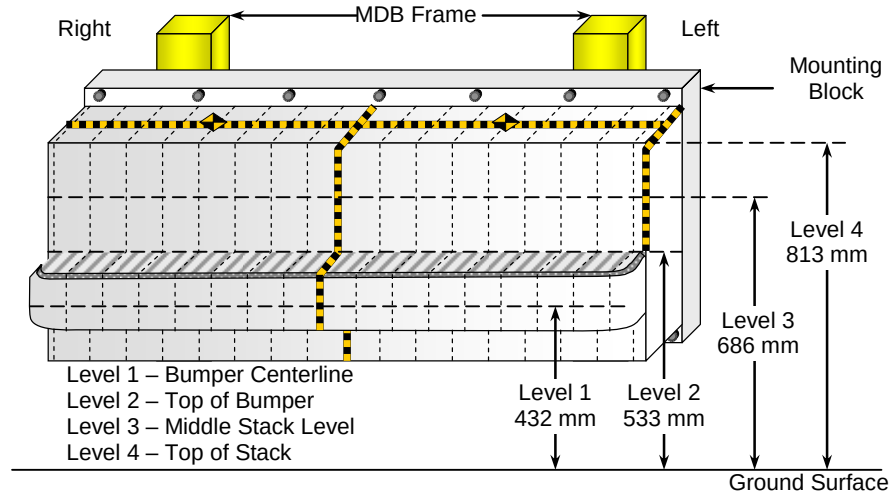
Reference plane is parallel to test vehicle longitudinal centerline.
 Given dimensions = Reference plane to car body.

DATA SHEET NO. 12

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2010 Honda Insight 5-Dr LX
 Test Program: NCAP Side Impact

NHTSA No. MA5302
 Test Date: 5/13/2009



DEFORMABLE BARRIER STATIC CRUSH

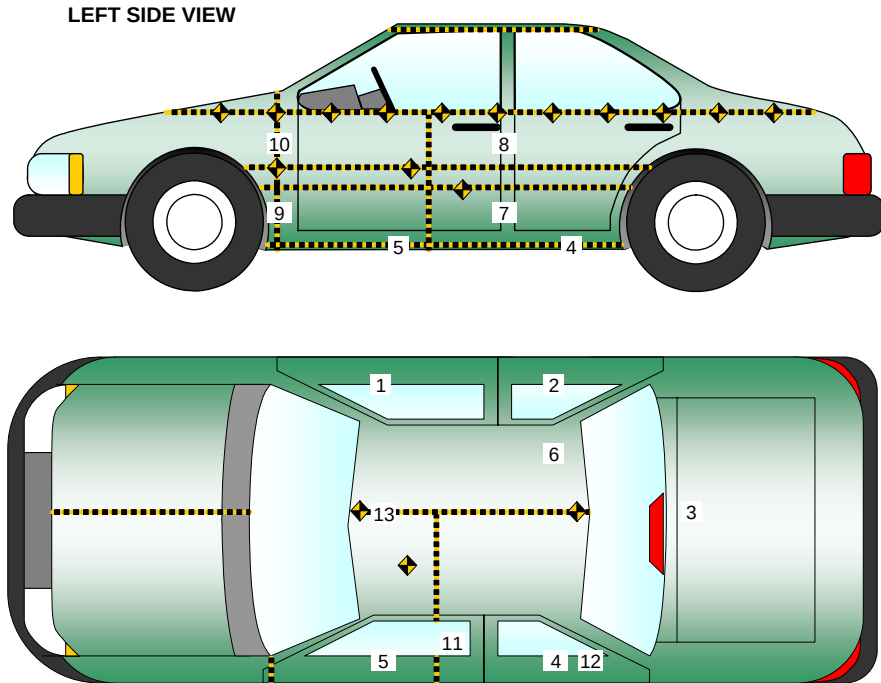
Stack Level	Distance Right of Center								C _L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	182	175	169	160	157	159	150	147	143	137	135	133	130	127	127	138	145
2	77	70	64	63	59	62	65	47	48	52	51	47	47	45	44	47	57
3	85	50	32	19	13	14	37	24	15	8	7	10	7	8	11	31	79
4	69	39	15	4	7	14	33	23	11	5	6	6	5	7	18	67	123

All Dimensions in mm

DATA SHEET NO. 13
VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2010 Honda Insight 5-Dr LX
 Test Program: NCAP Side Impact

NHTSA No. MA5302
 Test Date: 5/13/2009



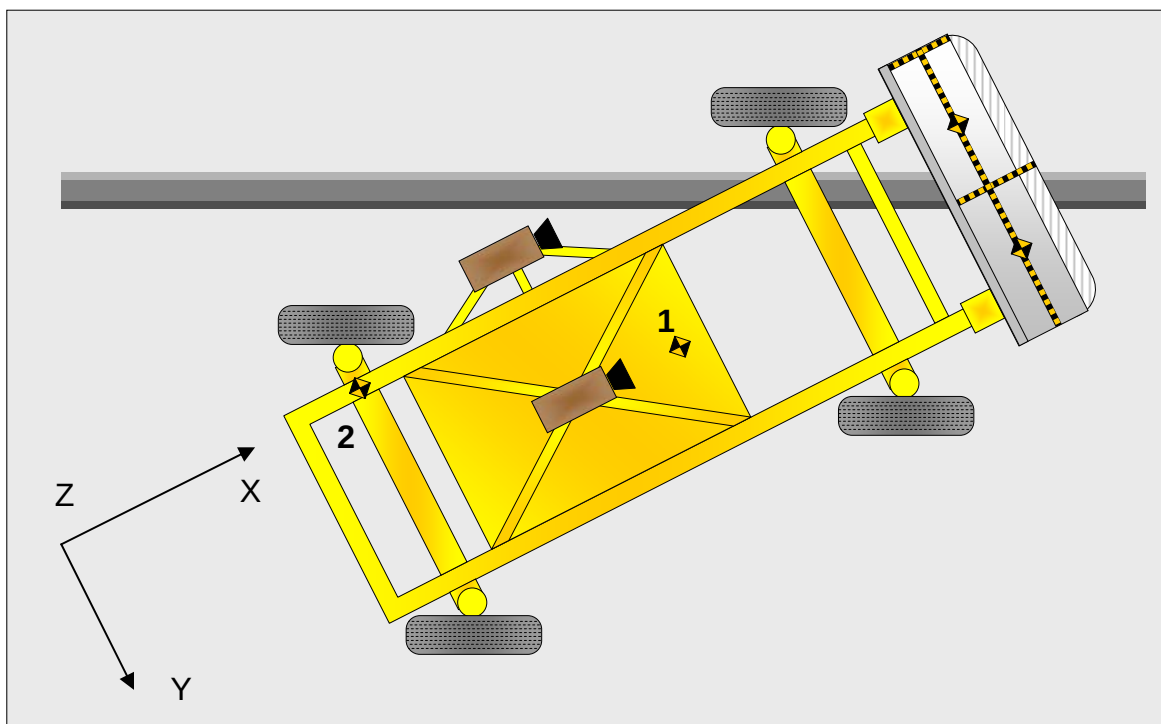
Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	2426	702	-198
2	Right Sill at Rear Seat	1034	700	-200
3	Rear Floorpan Above Axle	1033	0	-576
4	Left Sill at Rear Door	1529	-700	-198
5	Left Sill at Front Door	2492	-702	-195
6	Rear Occupant Compartment	1639	318	-358
7	Left Lower B-Post	2056	-690	-484
8	Left Middle B-Post	1971	-678	-778
9	Left Lower A-Post	2992	-710	-463
10	Left Middle A-Post	3043	-786	-705
11	Front Seat Track	2044	-549	-336
12	Rear Seat Track or Structure			
13	Vehicle CG	2304	0	-363

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: 2010 Honda Insight 5-Dr LX
 Test Program: NCAP Side Impact

NHTSA No. MA5302
 Test Date: 5/13/2009



Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	MDB CG	-1105	0	-330
2	MDB Rear	-2580	-650	-625

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: 2010 Honda Insight 5-Dr LX
Test Program: NCAP Side Impact

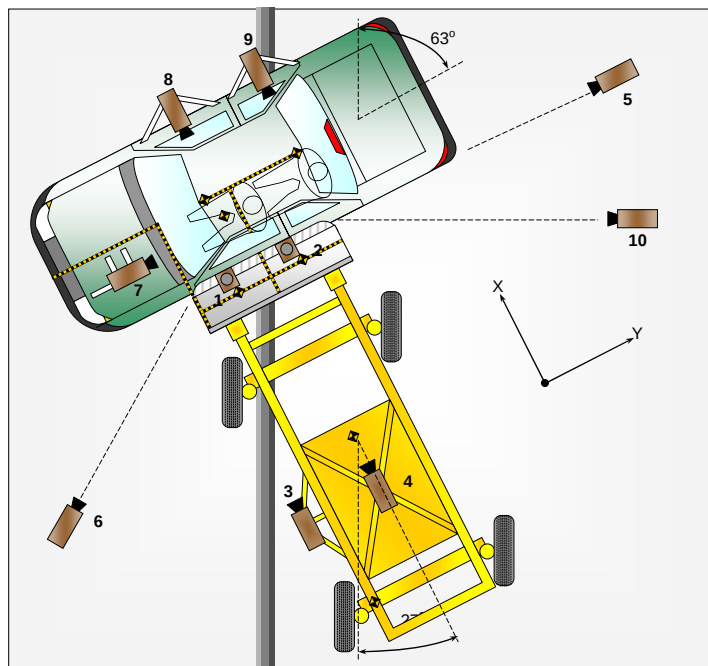
NHTSA No. MA5302
Test Date: 5/13/2009

	Elements	Pre-Test (mm)
1	Total Length	4352
2	Total Width	1697
3	Bumper Top Height	543
4	Bumper Bottom Height	414
5	Longitudinal Member Top Height	519
6	Distance between Longitudinal Members	1028
7	Longitudinal Member Width	62
8	Engine Top Height	865
9	Engine Bottom Height	200
10	Engine and gearbox width	846
11	Front bumper-engine distance	526
12	Front shock absorber fixing height	868
13	Bonnet leading edge height	682
14	Front shock absorber fixing width	1088
15	Front bumper – front axle distance	919
16	Front axle – a pillar distance	375
17	A-pillar – B-pillar distance	1130
18	B-Pillar – rear axle distance	1047
19	B-pillar – C-pillar distance	820
20	Roof sill bottom height	1343
21	Roof sill top height	1380
22	Floor sill bottom height	205
23	Floor sill top height	343

DATA SHEET NO. 16
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2010 Honda Insight 5-Dr LX
 Test Program: NCAP Side Impact

NHTSA No. MA5302
 Test Date: 5/13/2009



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Close-up	-545	-255	-5080	50	1000
2	Overhead Overall	140	1220	-5090	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	90	6610	-1015	24	1000
6	Left Side, Ground Level, Overall	-3250	-4810	-1020	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

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: 2010 Honda Insight 5-Dr LX
 Test Program: NCAP Side Impact

NHTSA No. MA5302
 Test Date: 5/13/2009

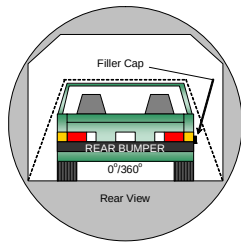
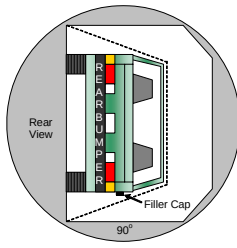
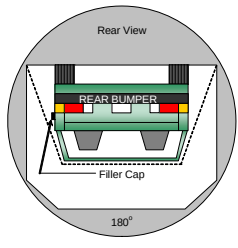
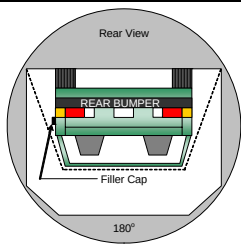
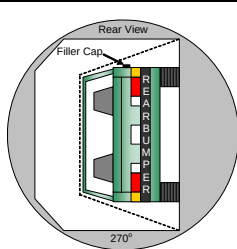
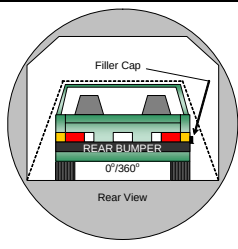
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21° C Test Time: 10:55 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°	121	300	First 5	0
90° to 180°	117	300	First 5	0
180° to 270°	109	300	First 5	0
270° to 360°	120	300	First 5	0

APPENDIX A
PHOTOGRAPHS

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Right Front $\frac{3}{4}$ View, As Received



Left Rear $\frac{3}{4}$ View, As Received



Manufacturer's Label



Tire Placard



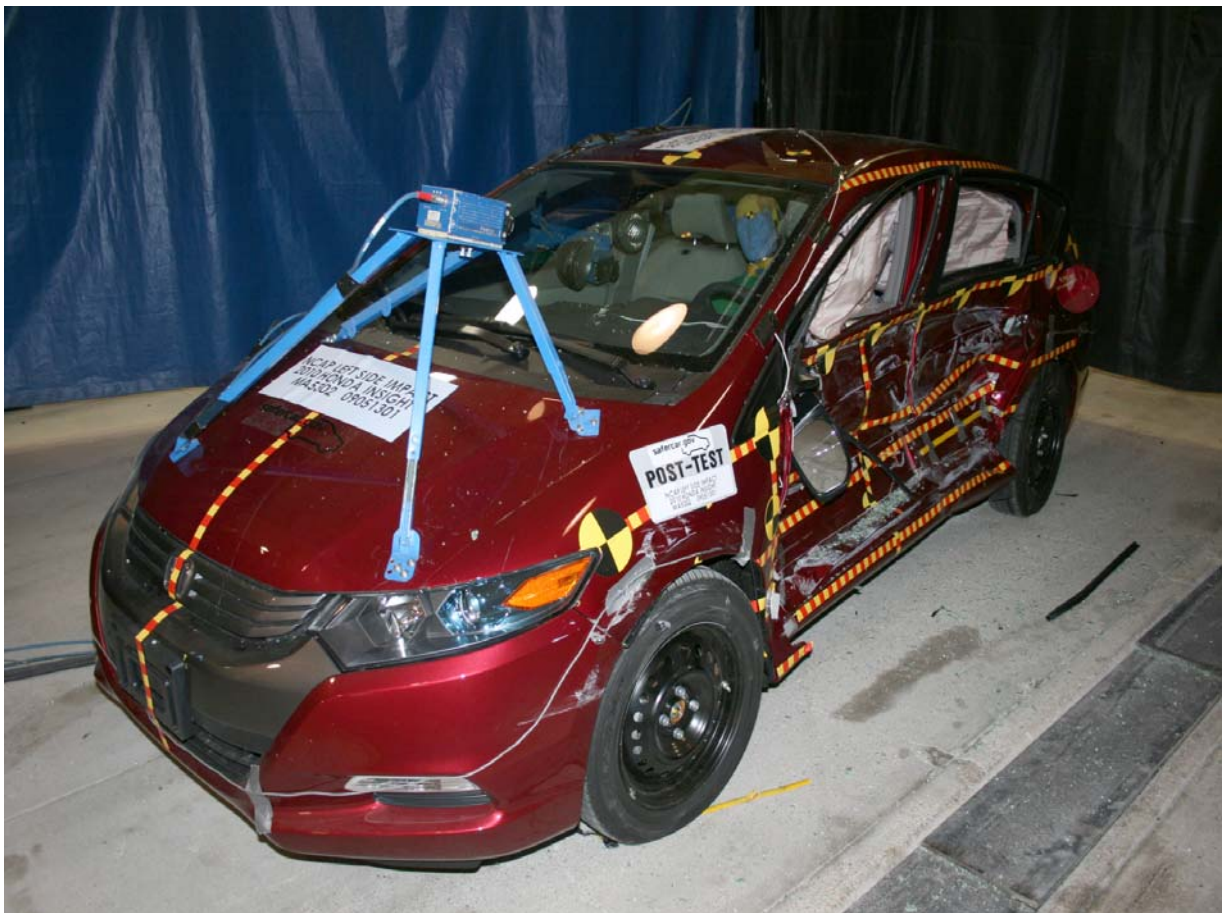
Pre-Test Front View



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



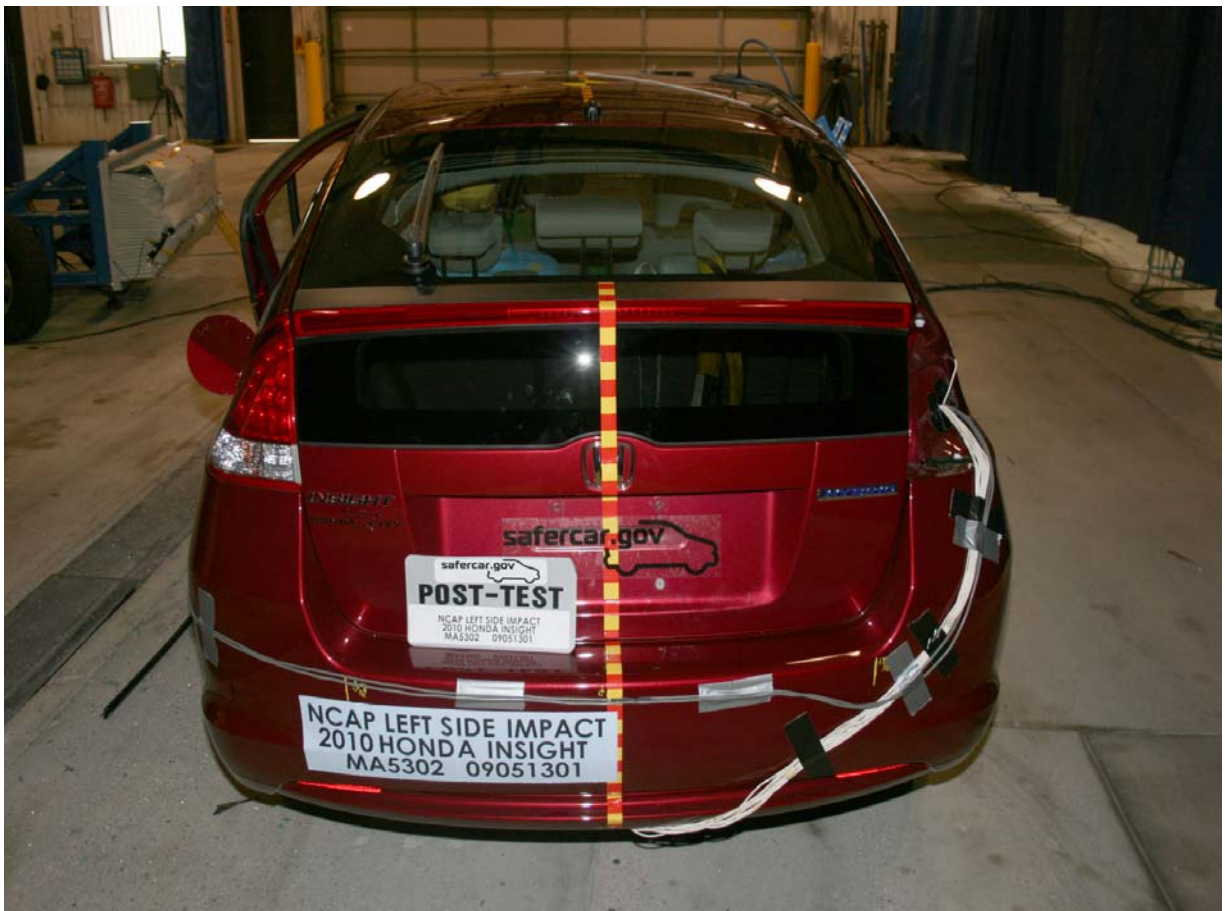
Pre-Test Left Rear $\frac{3}{4}$ View



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



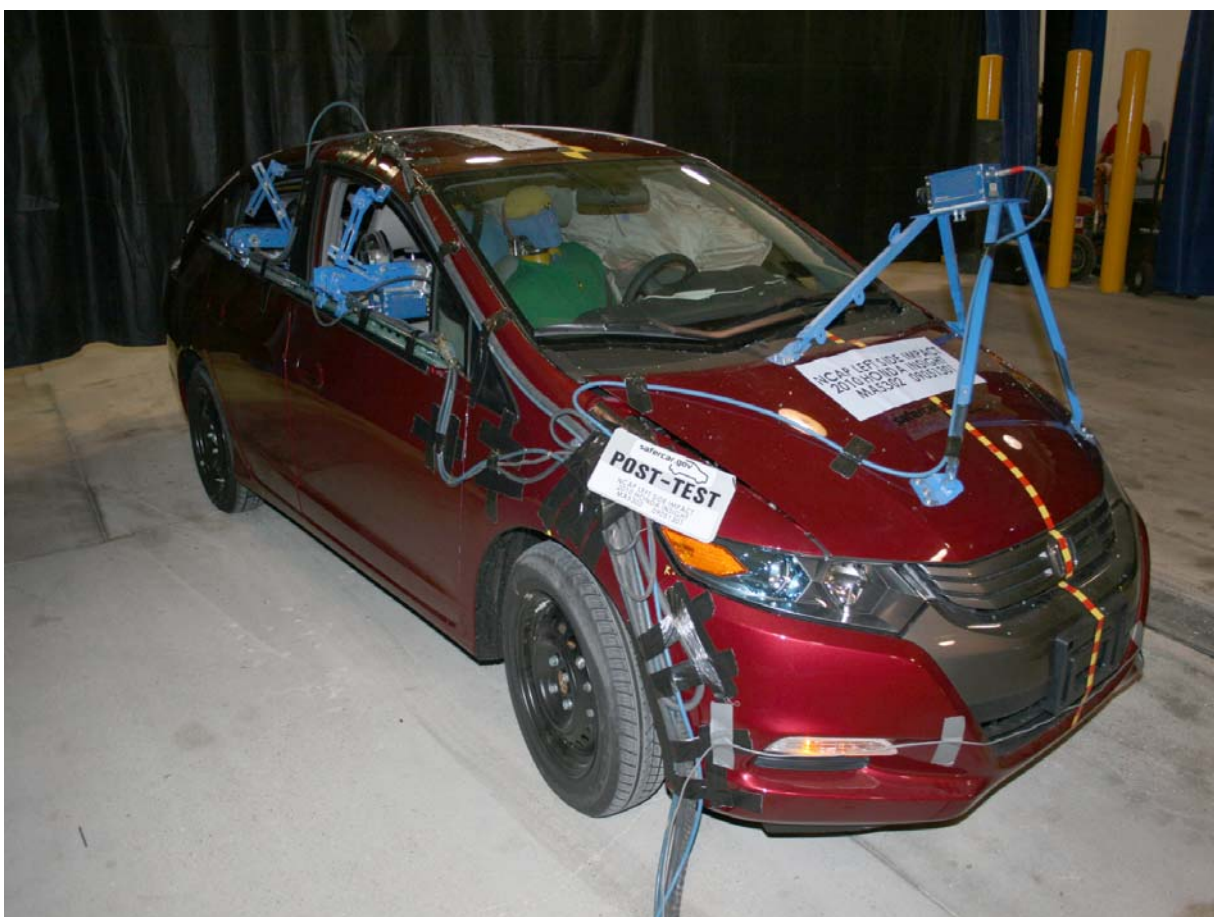
Pre-Test Right Side View



Post-Test Right Side View



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



Post-Test Right Front ¾ View



Pre-Test Left Impact Point



Post-Test Left Impact Point



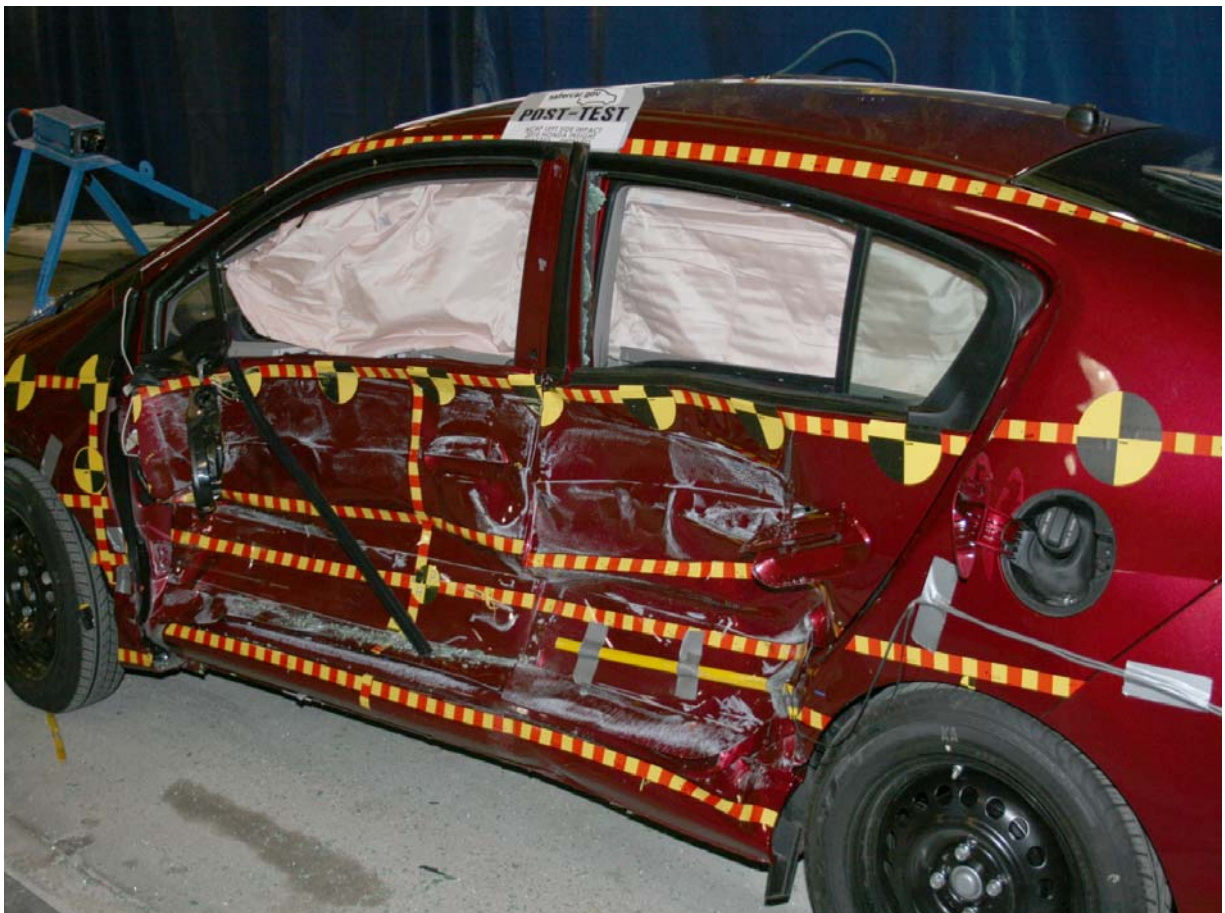
Pre-Test Front $\frac{3}{4}$ View of Left Side Doors



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 Overhead Close-up View



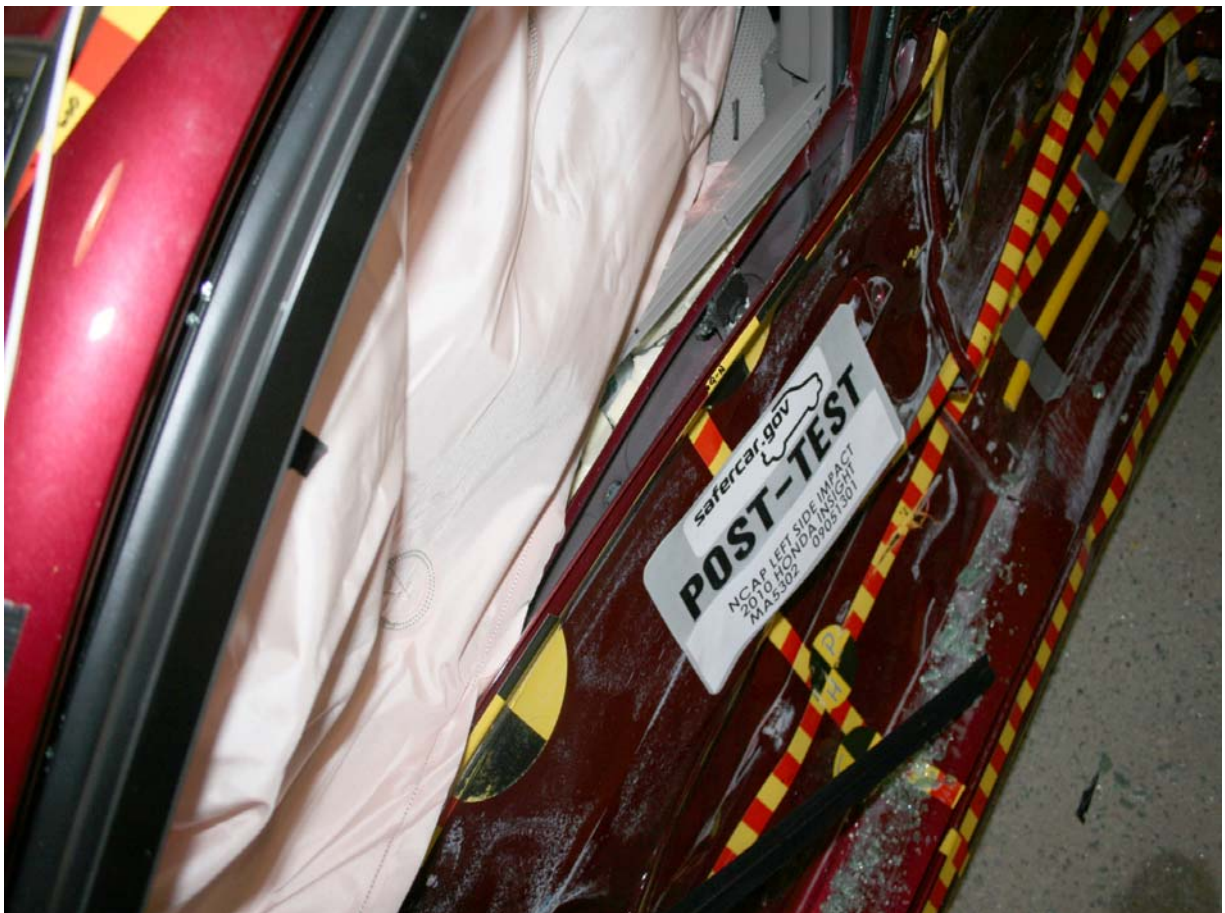
Post-Test Overhead Close-up View



Pre-Test Driver Dummy (Door Open)



Pre-Test Driver Dummy Clearance From Door



Post-Test Driver Dummy Clearance From Door



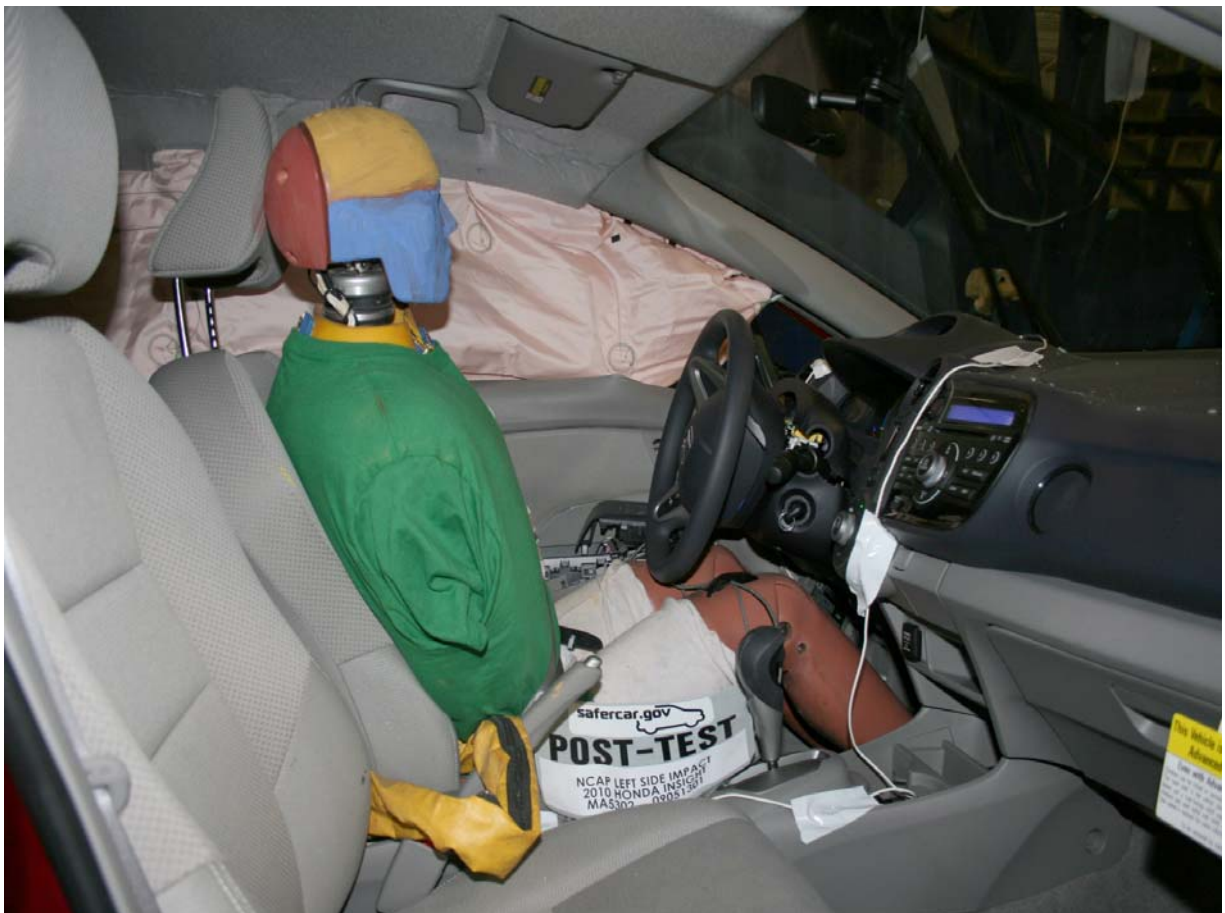
Pre-Test Driver Dummy (Through Window)



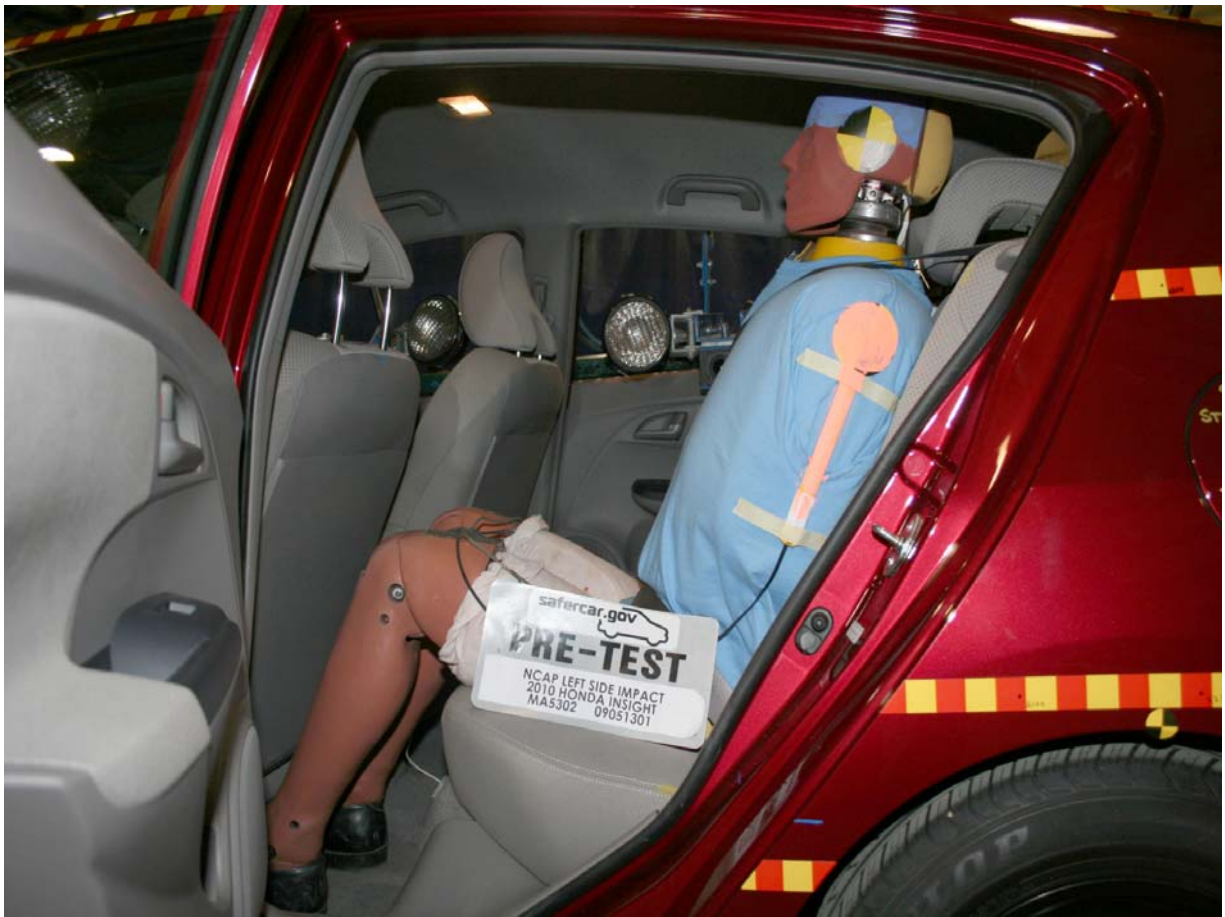
Post-Test Driver Dummy (Through Window)



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)



Post-Test Passenger Dummy (Through Window)



Pre-Test Passenger Dummy Right Side View



Post-Test Passenger Dummy Right Side View



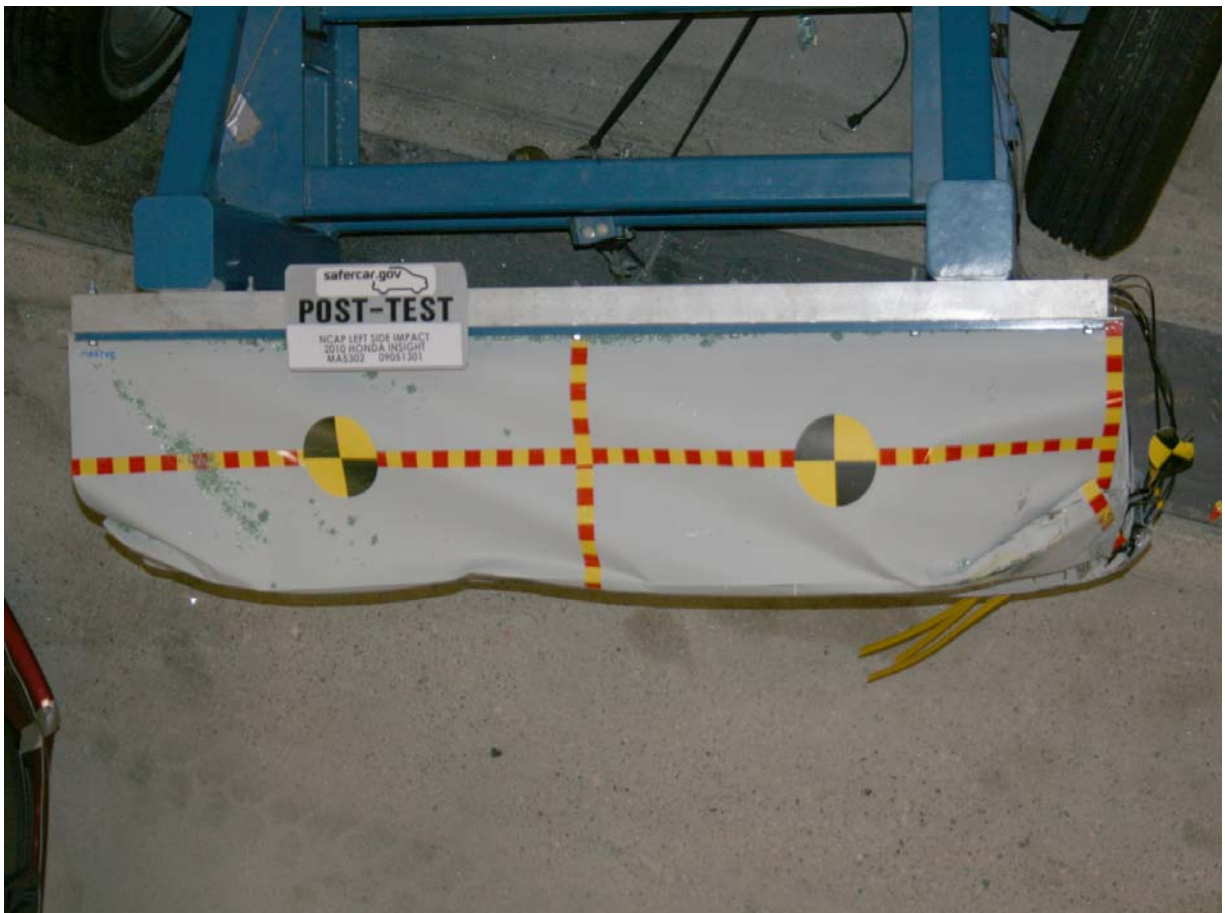
Pre-Test Front View of Deformable Barrier



Post-Test Front View of Deformable Barrier



Pre-Test Top View of Deformable Barrier



Post-Test Top View of Deformable Barrier



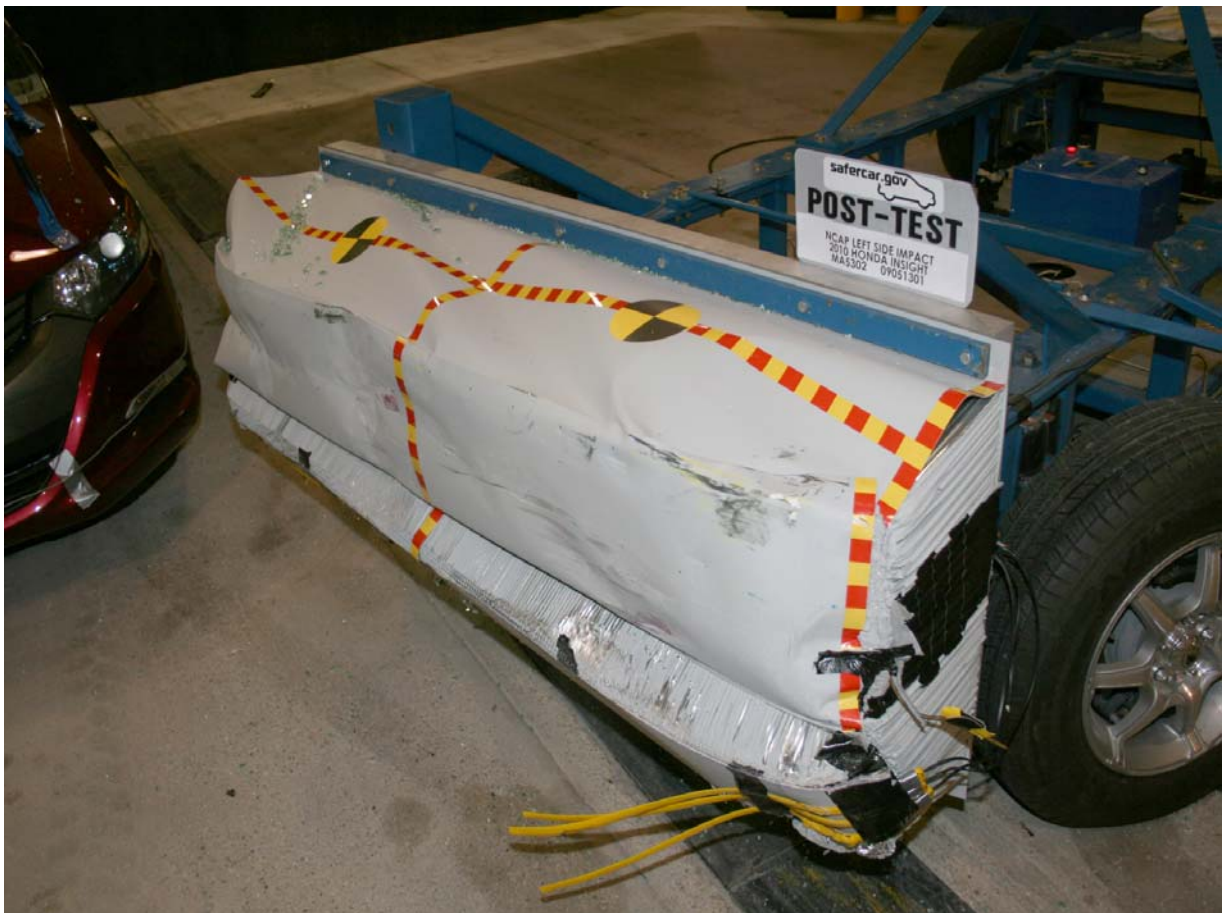
Pre-Test Right Side View of Deformable Barrier



Post-Test Right Side View of Deformable Barrier



Pre-Test Left Side View of Deformable Barrier



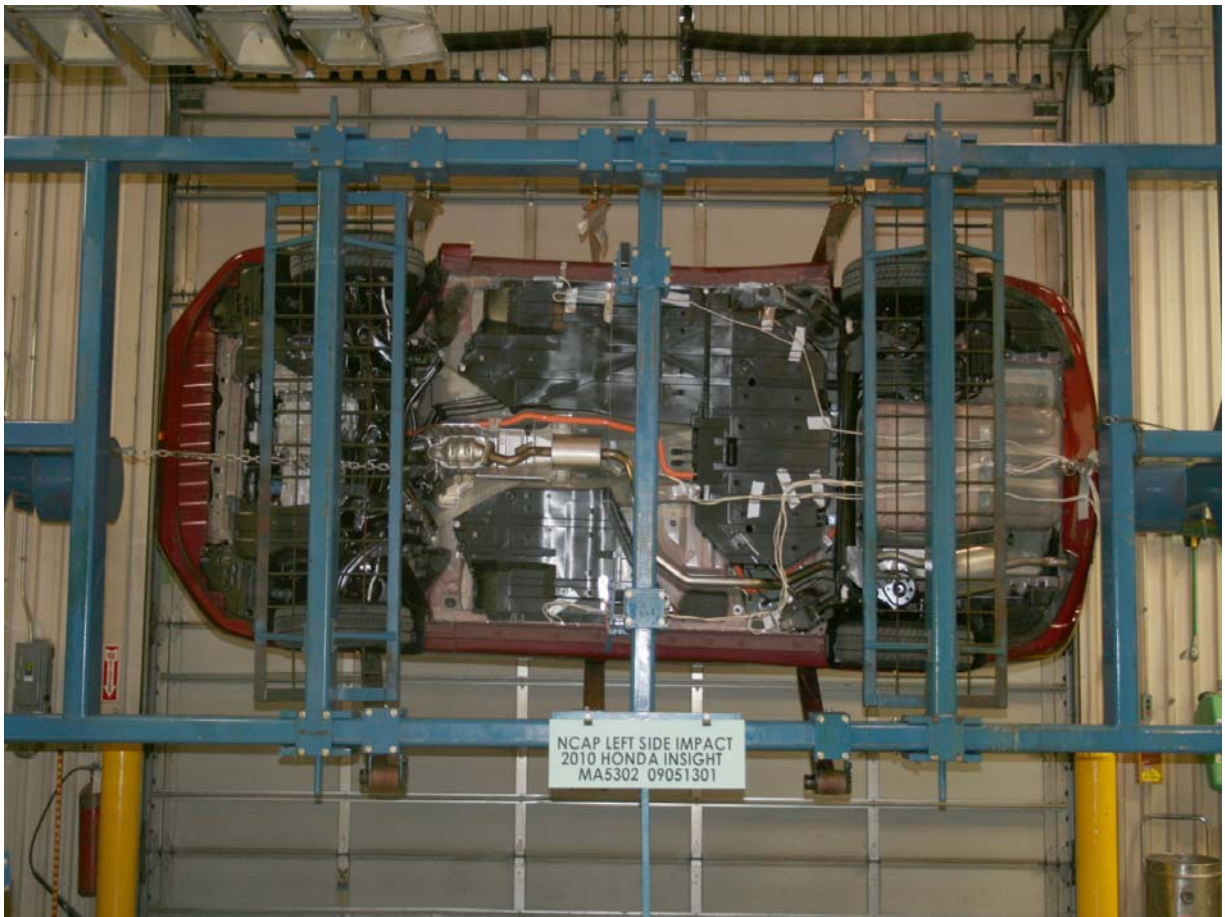
Post-Test Left Side View of Deformable Barrier



Vehicle on Rollover Device (90 Degrees)



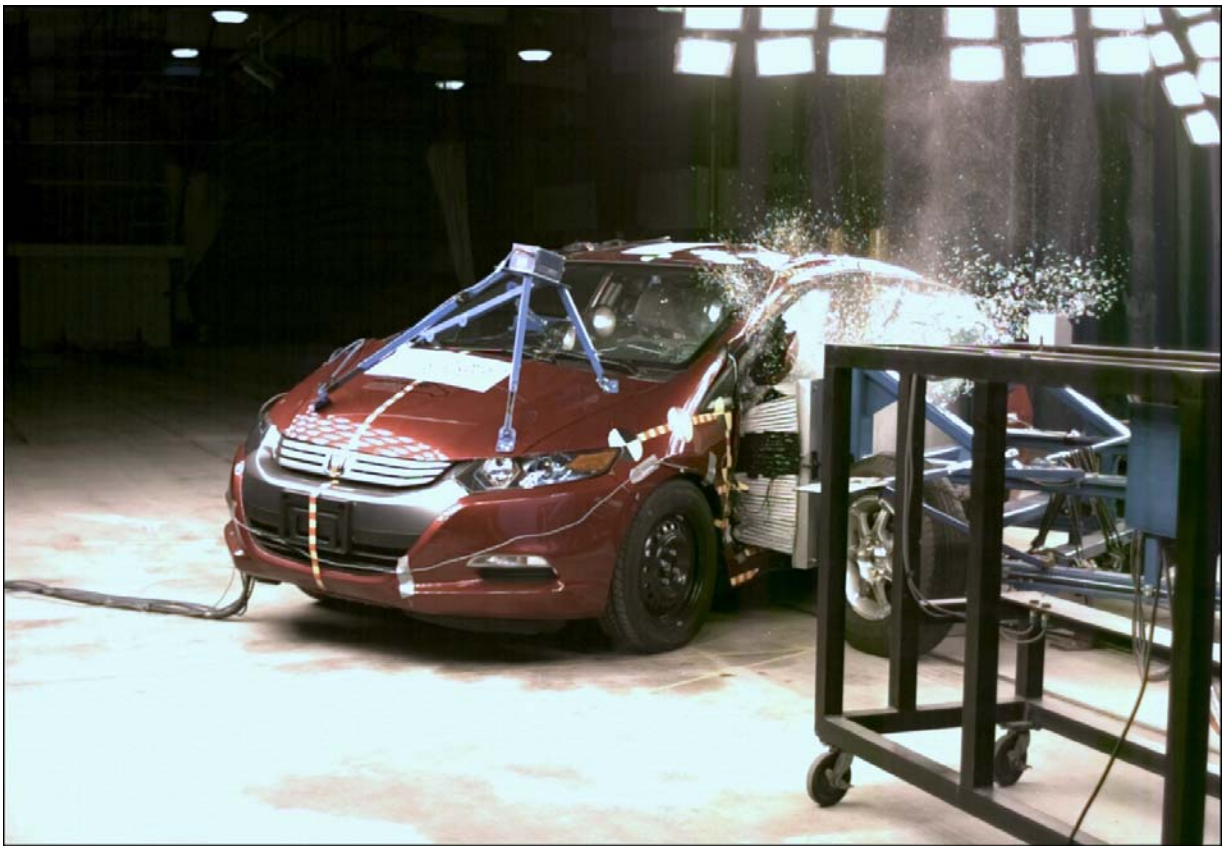
Vehicle on Rollover Device (180 Degrees)



Vehicle on Rollover Device (270 Degrees)



Vehicle on Rollover Device (360 Degrees)



Vehicle Impact



Post-Test Driver Dummy Head Contact View



Post-Test Driver Dummy Upper Torso Contact



Post-Test Driver Dummy Lower Torso Contact



Post-Test Driver Dummy Contact



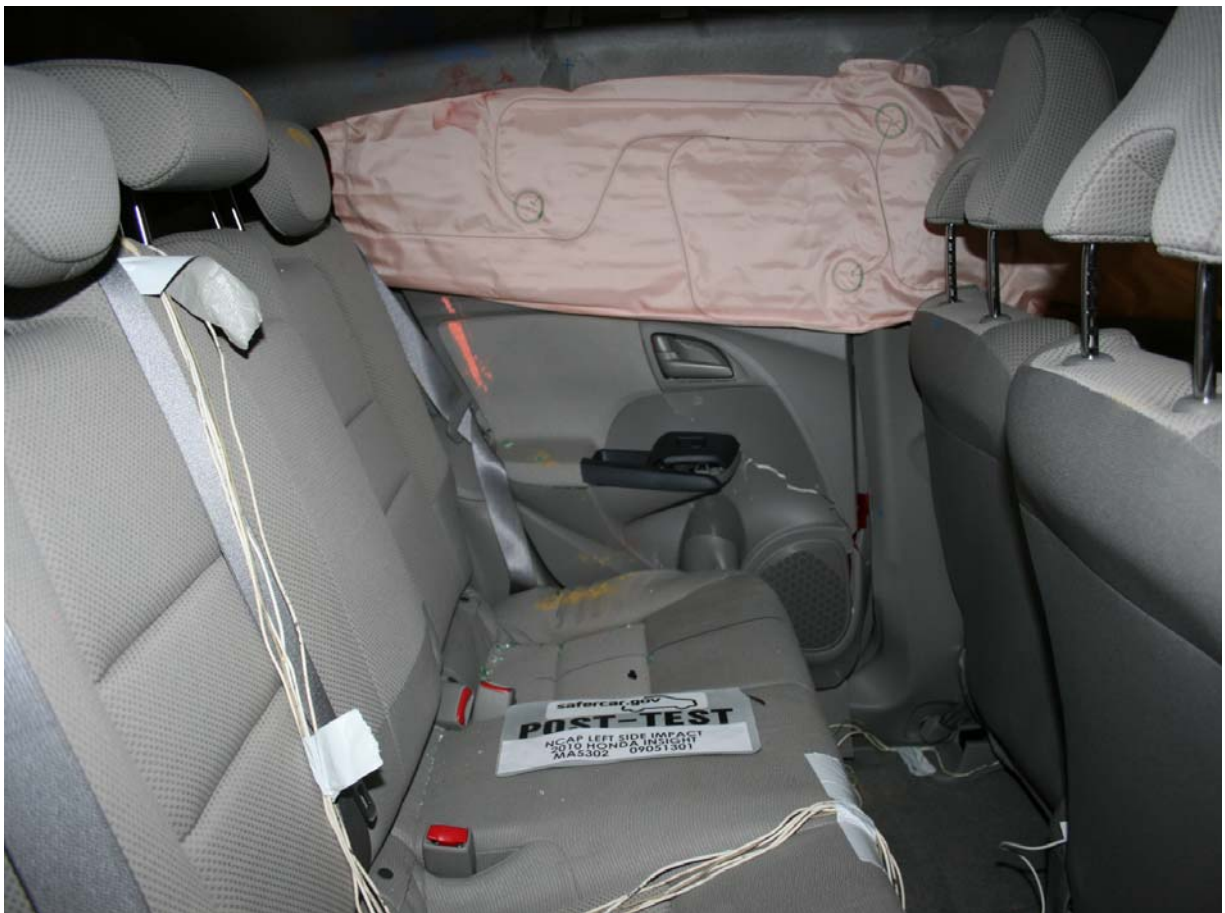
Post-Test Passenger Dummy Head Contact View



Post-Test Passenger Dummy Upper Torso Contact



Post-Test Passenger Dummy Lower 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

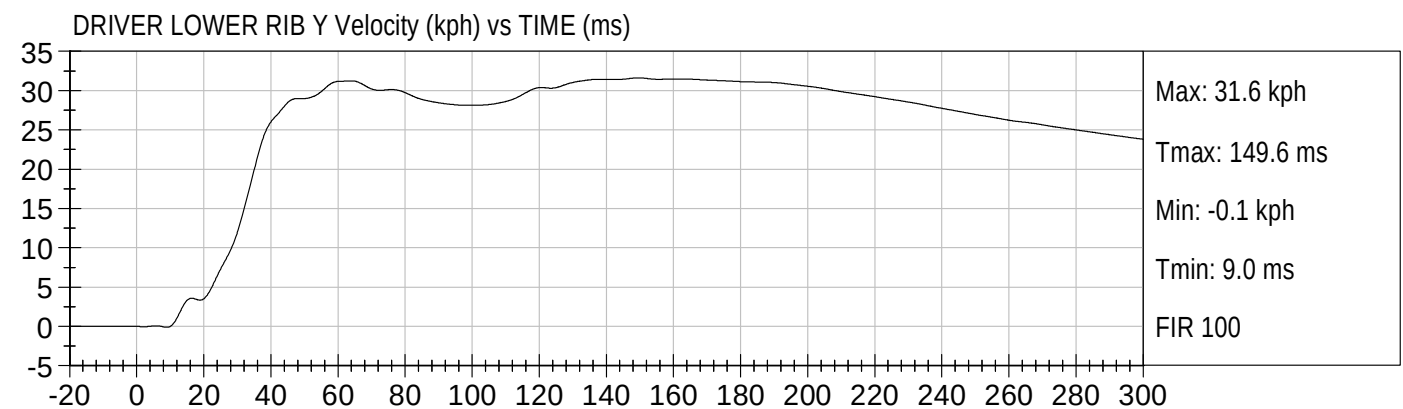
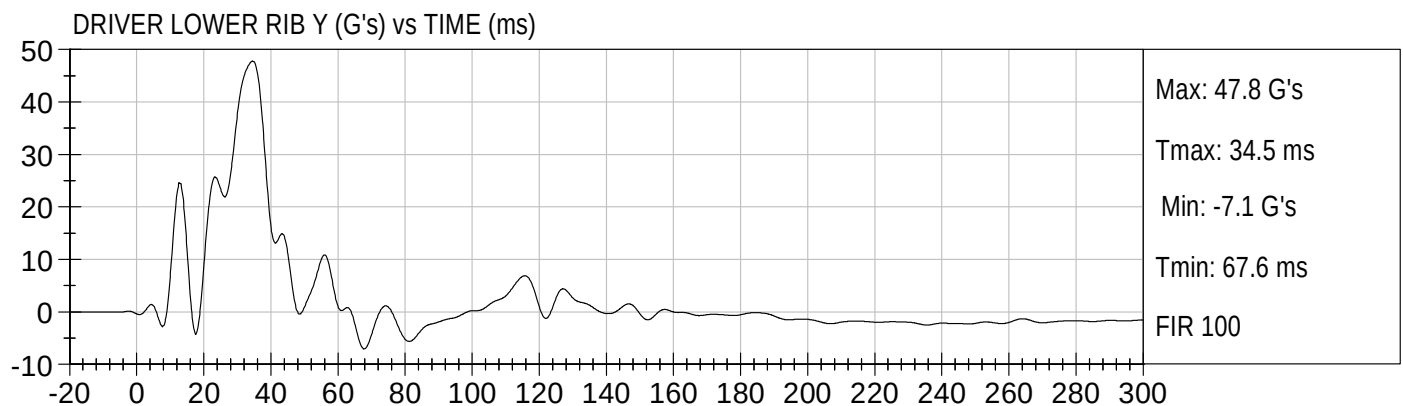
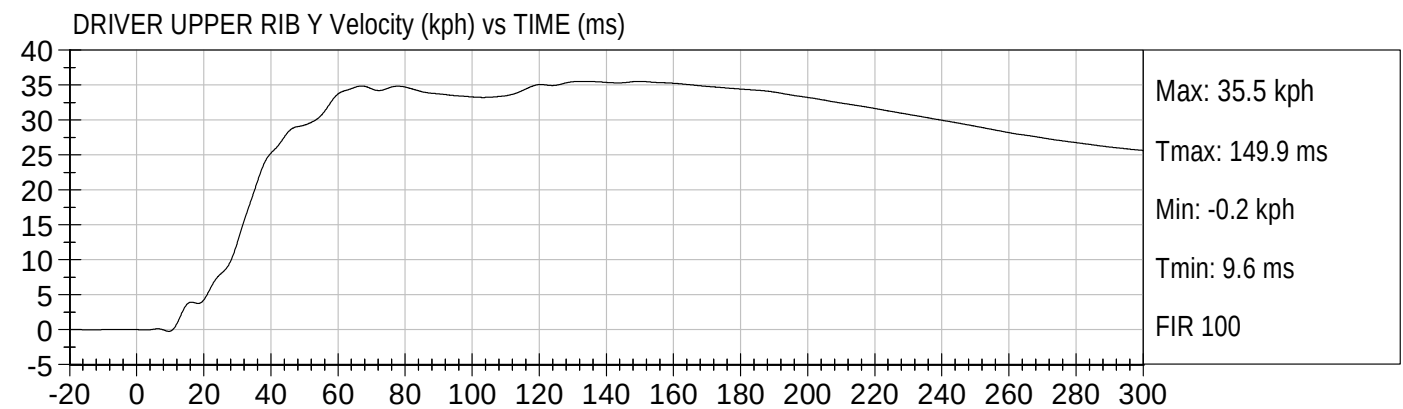
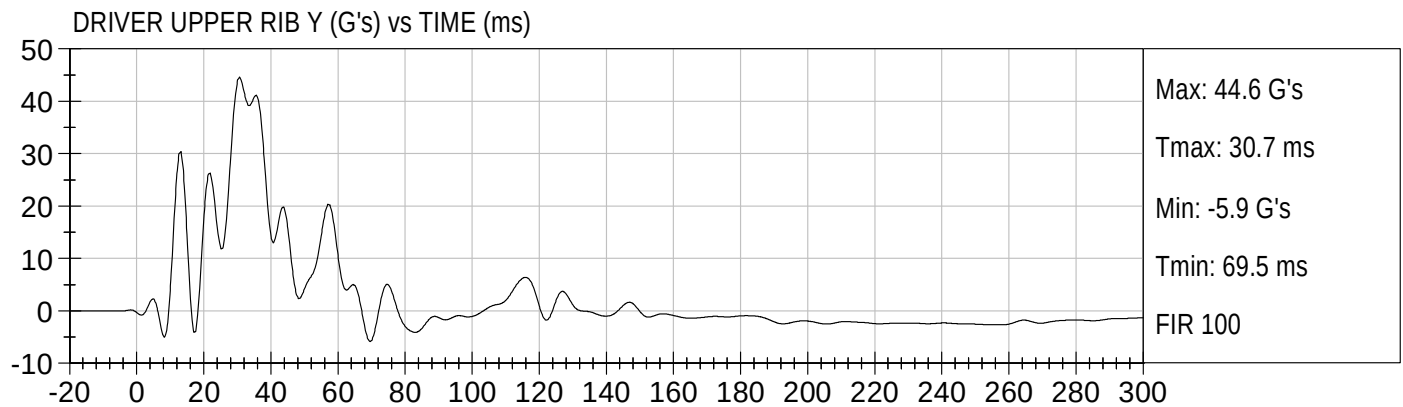
Driver Upper Neck Force Y

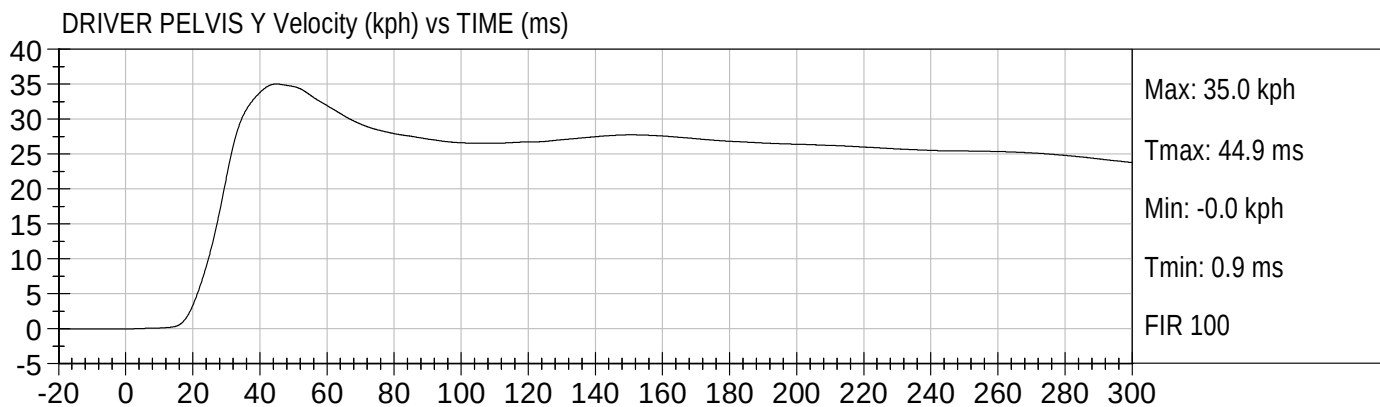
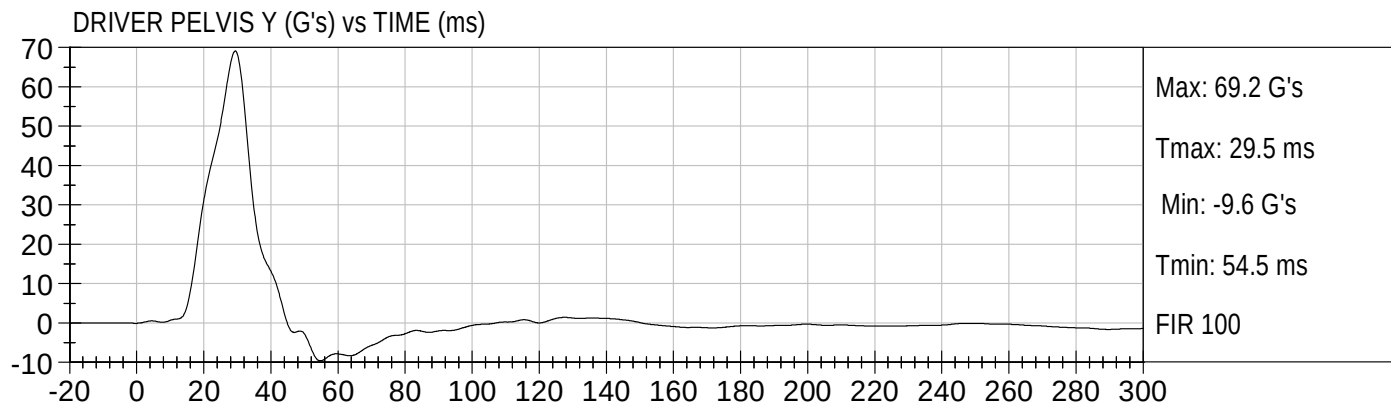
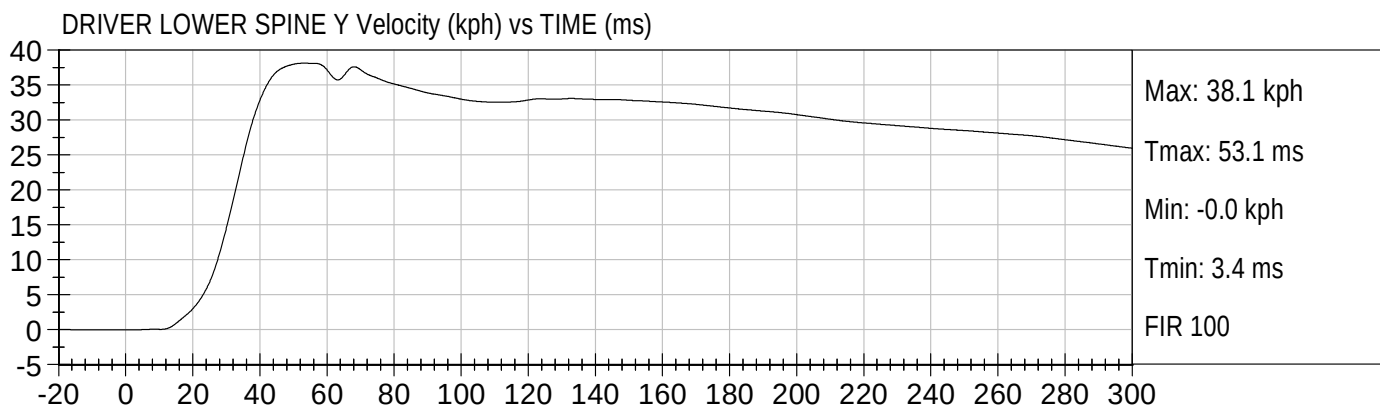
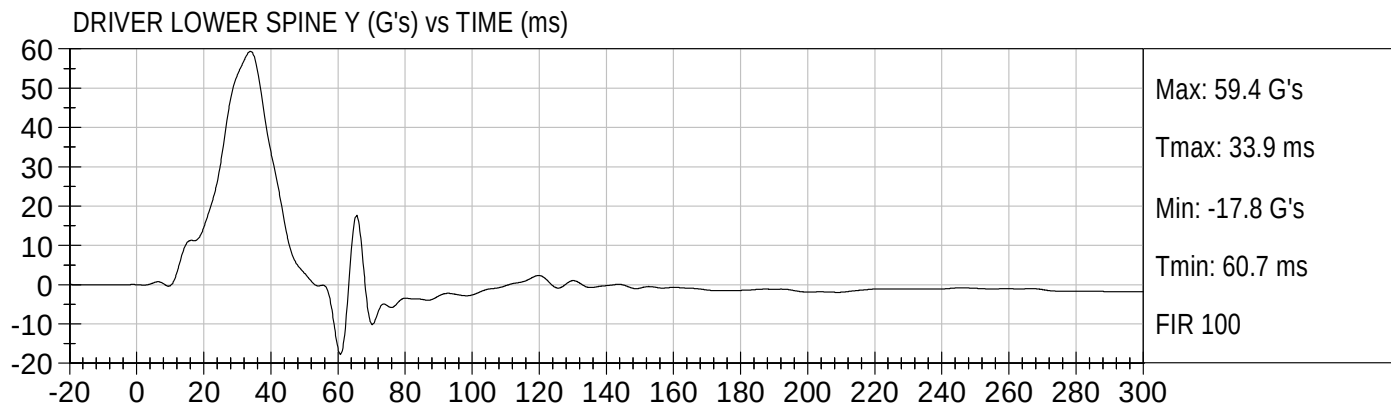
Driver Upper Neck Force Z

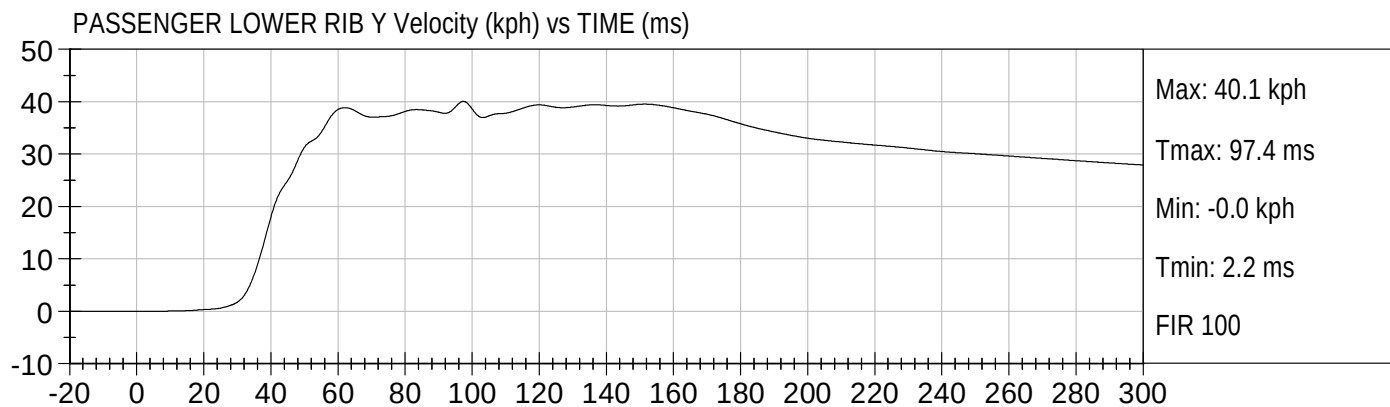
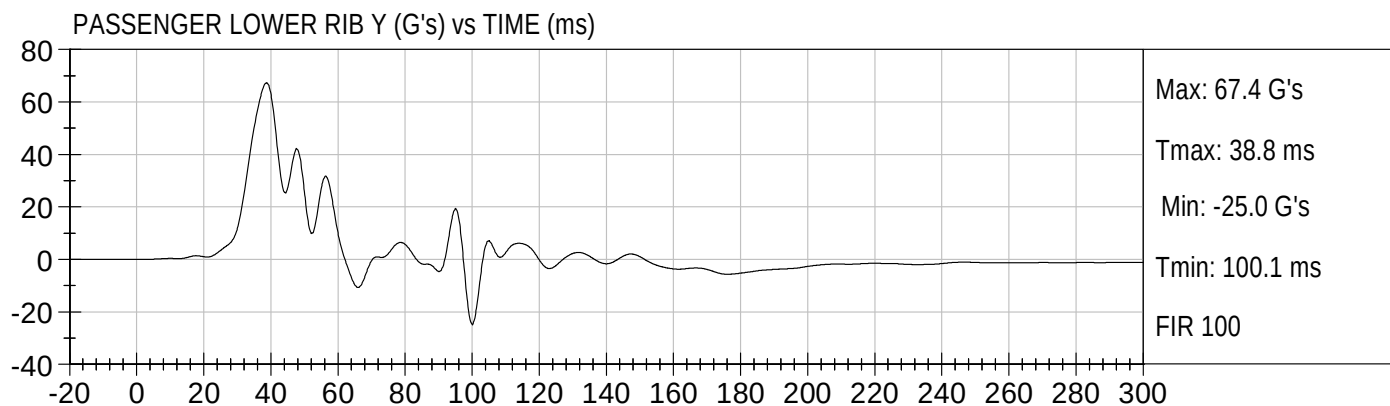
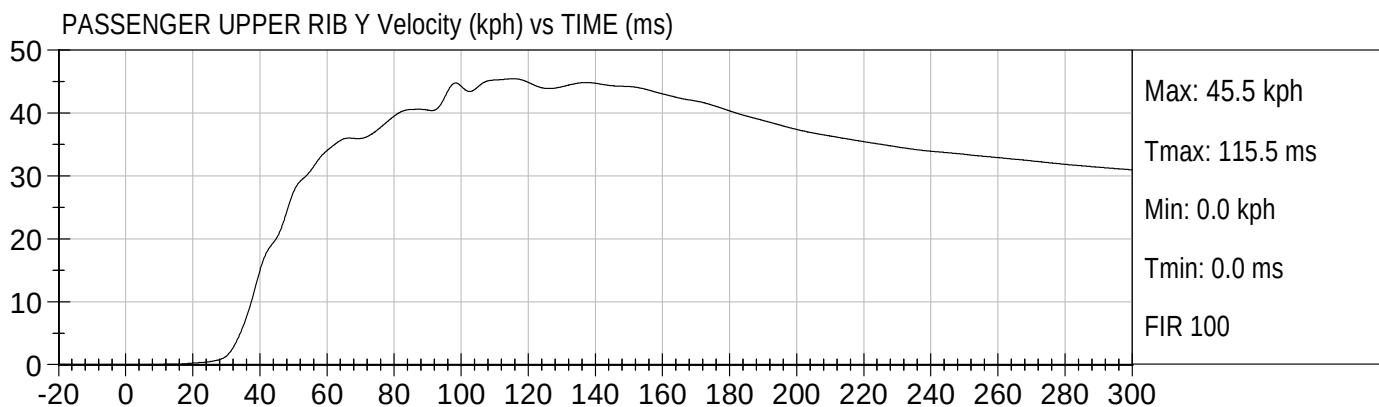
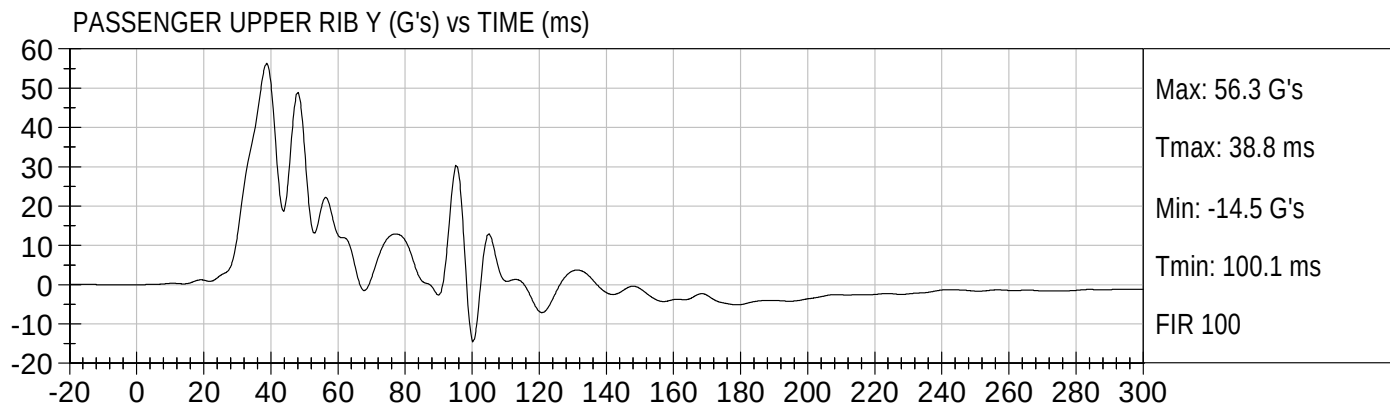
Driver Upper Neck Moment X

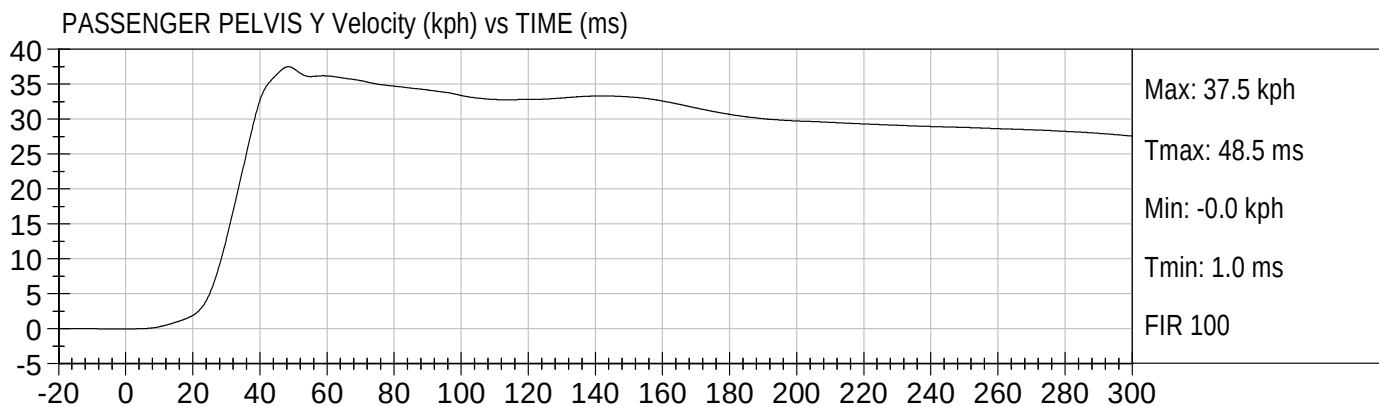
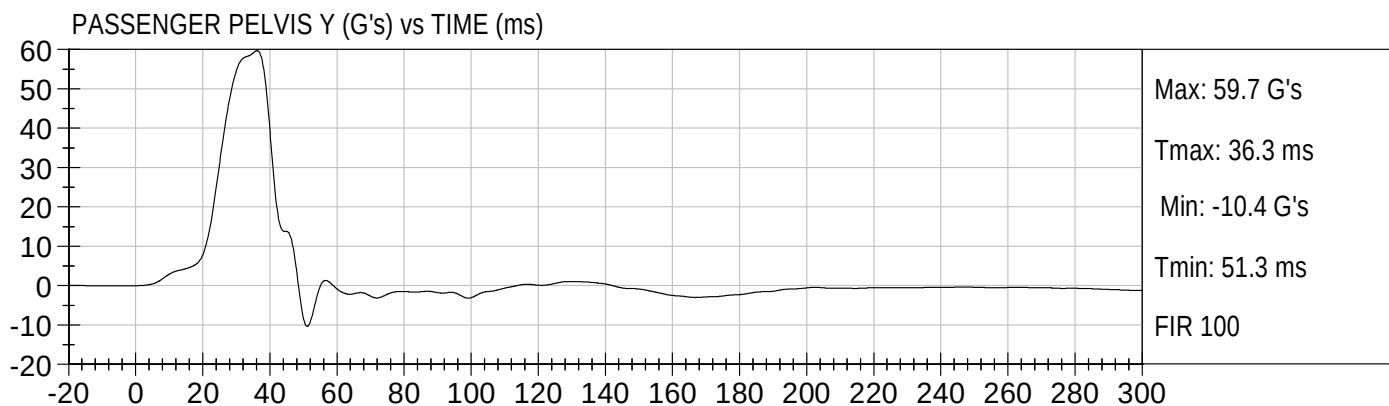
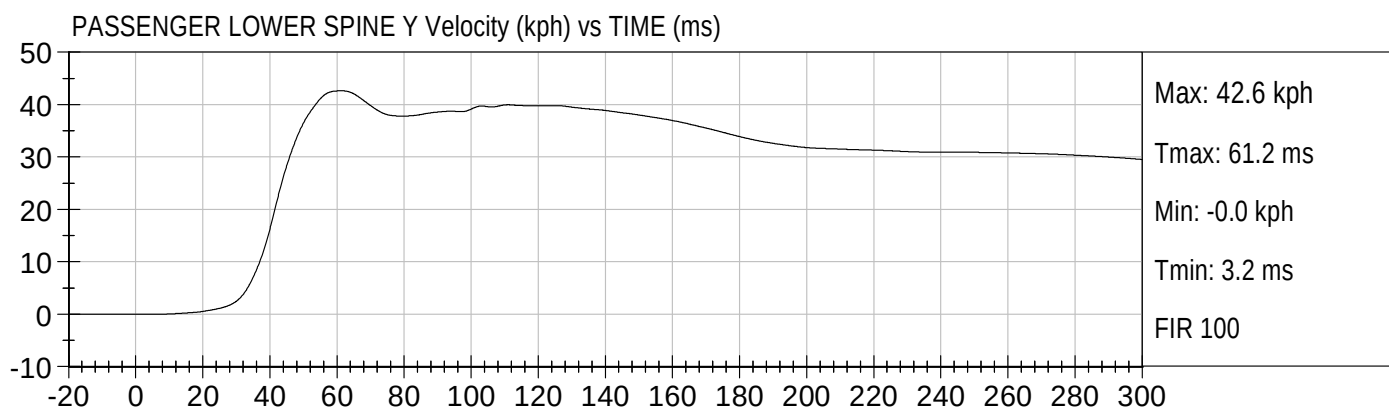
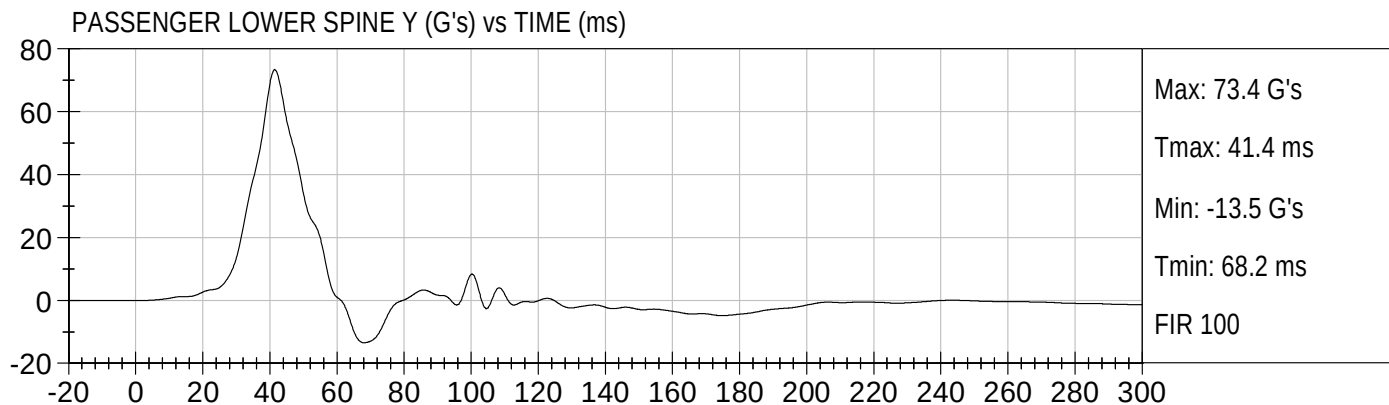
Driver Upper Neck Moment Y
Driver Upper Neck Moment Z
Driver Upper Rib Redundant Y
Driver Lower Rib Redundant Y
Driver Lower Spine Redundant Y
Driver Pelvis Redundant Y
Driver Thorax Contact
Driver Pelvis Contact
Passenger Head X Primary
Passenger Head Y Primary
Passenger Head Z Primary
Passenger Head 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: 272

Calibration Test Results Summary

Dummy Serial Number: 272

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: 272

Test I.D: D08252

Tested Parameter	Units	Specification	Result	Pass/Fail
SH - Seated Height	mm	889 - 909	907	Pass
RH - Rib Height	mm	501 - 521	520	Pass
HP - Hip Pivot Height	mm	99 ref.	99	Pass
RD - Rib from Back Line	mm	229 - 241	230	Pass
KV - Knee Pivot to Back Line	mm	511 - 526	525	Pass
SW - Knee Pivot to Floor	mm	490 - 505	495	Pass
HW - Hip Width	mm	356 - 391	358	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

5/4/09
Test Date

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

ATD Serial No: 272

Test I.D: D091021

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Peak Resultant Acceleration	G's	120 to 150	140	Pass
Is Resultant Curve Unimodal?	N/A	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-9.4	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

5/4/09
Test Date

David Winkelbauer
Approved By

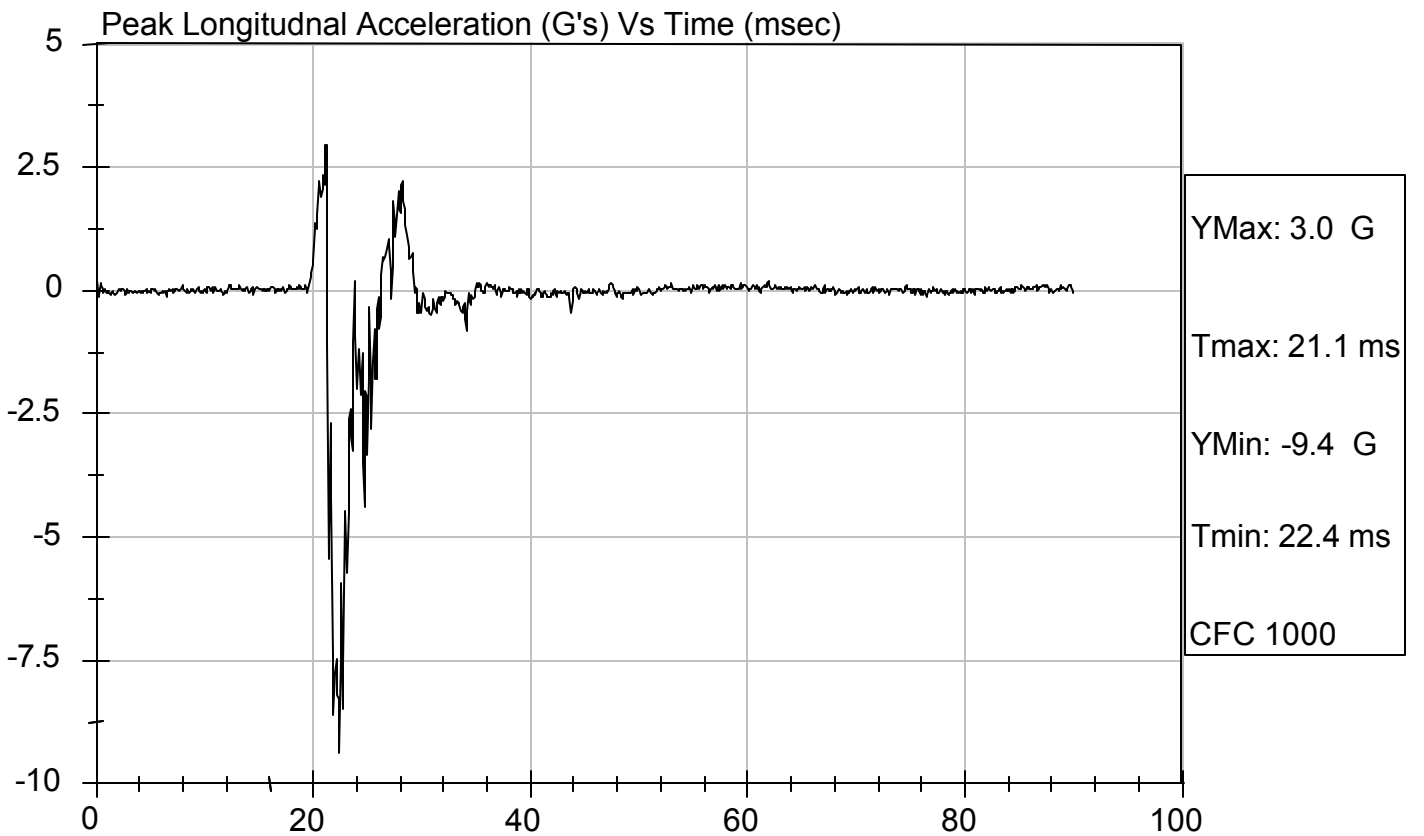
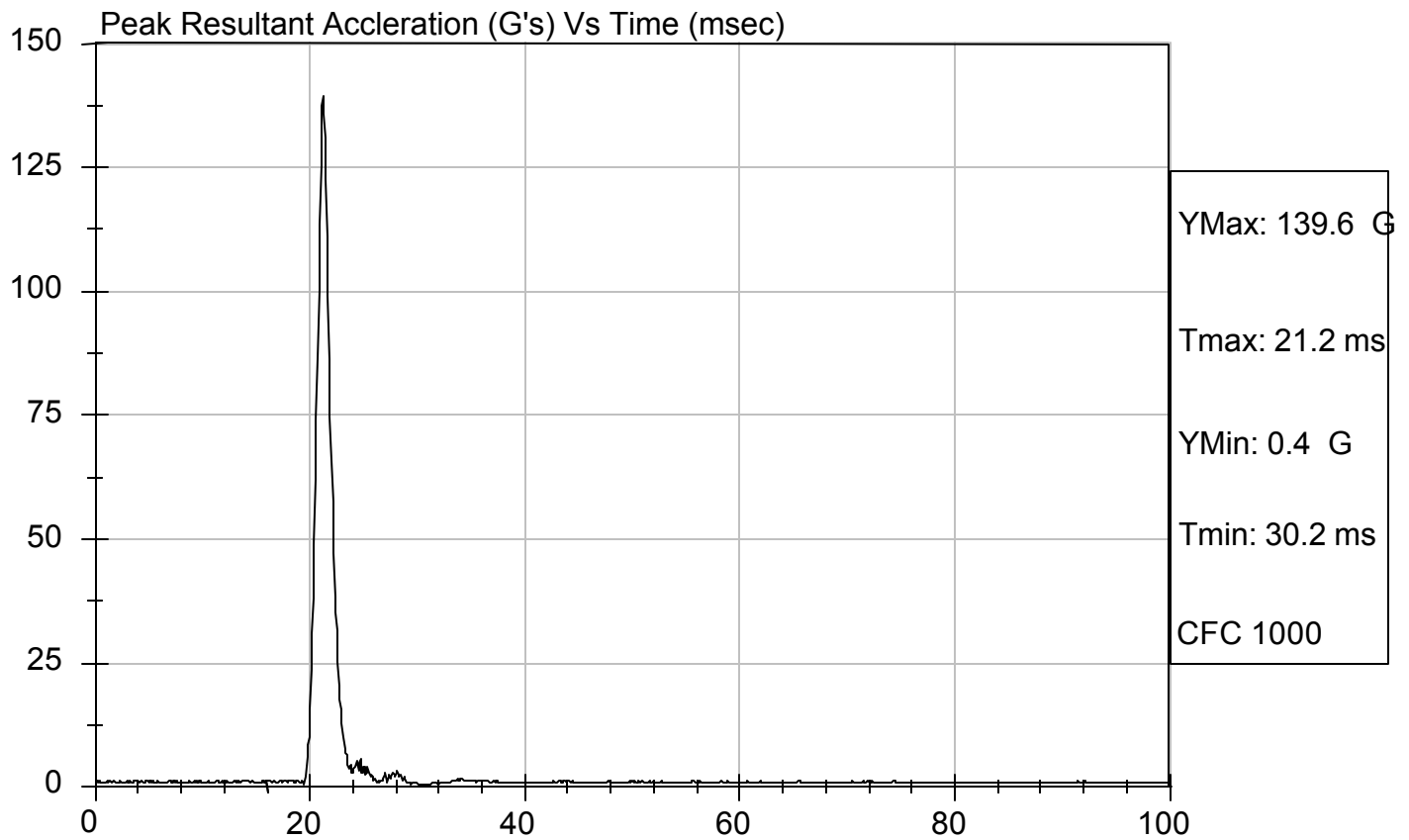


Test Description: Head Drop

Test Date: 5/4/09

Component: D091021

Speed: 0 ft/s, 0 m/s



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

ATD Serial No: 272

Test I.D: D091022

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Probe Velocity	m/s	4.22 - 4.31	4.30	Pass
Upper Rib	G's	37 - 46	39	Pass
Lower Rib	G's	37 - 46	37	Pass
Lower Spine	G's	15 - 22	19	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

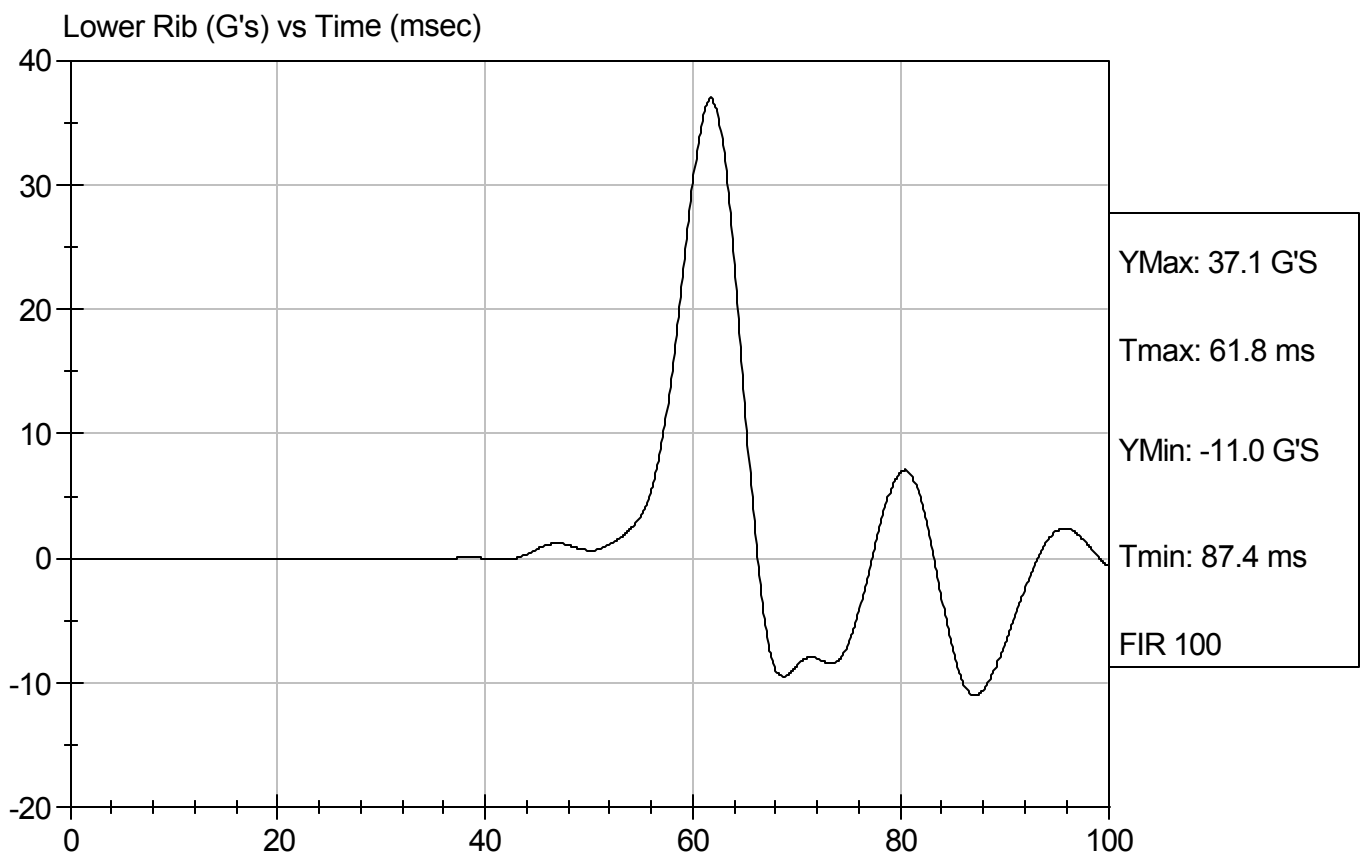
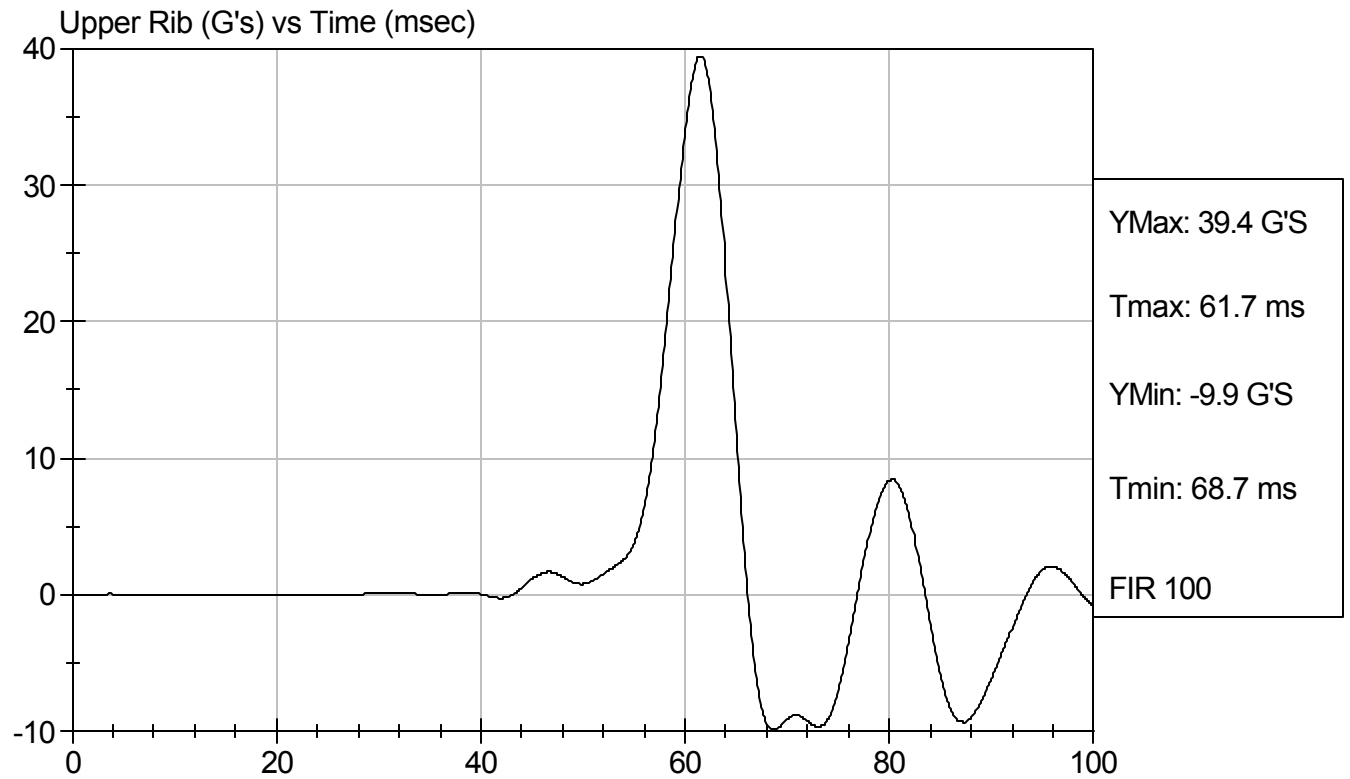
David Winkelbauer
Approved By

5/4/09
Test Date



Test Desc: Thorax Impact
Component ID: D091022

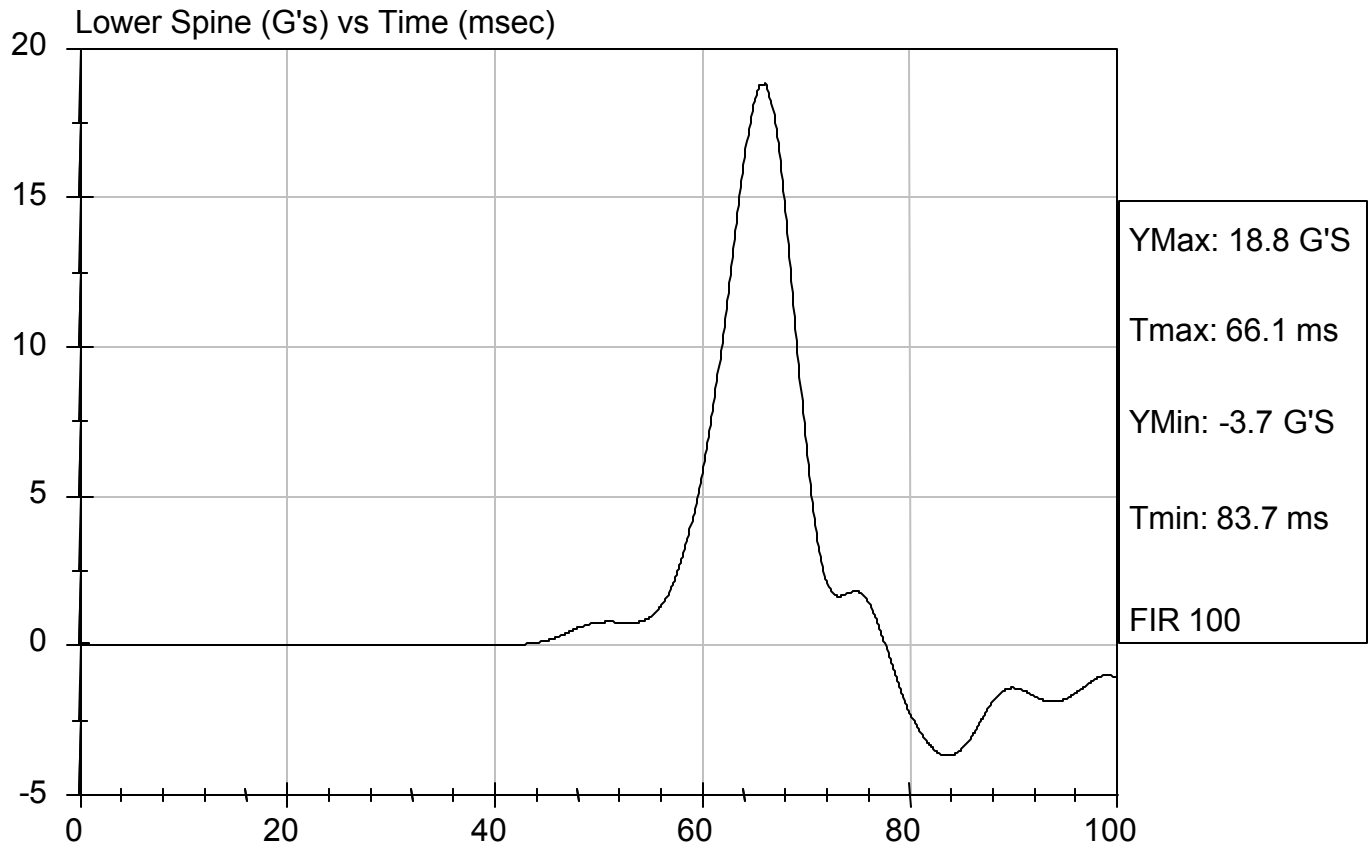
Test Date: 5/4/09
Speed: 14.12 ft/sec, 4.30 m/sec





Test Desc: Thorax Impact
Component ID: D091022

Test Date: 5/4/09
Speed: 14.12 ft/sec, 4.30 m/sec



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

ATD Serial No: 272

Test I.D: D091023

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	44	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

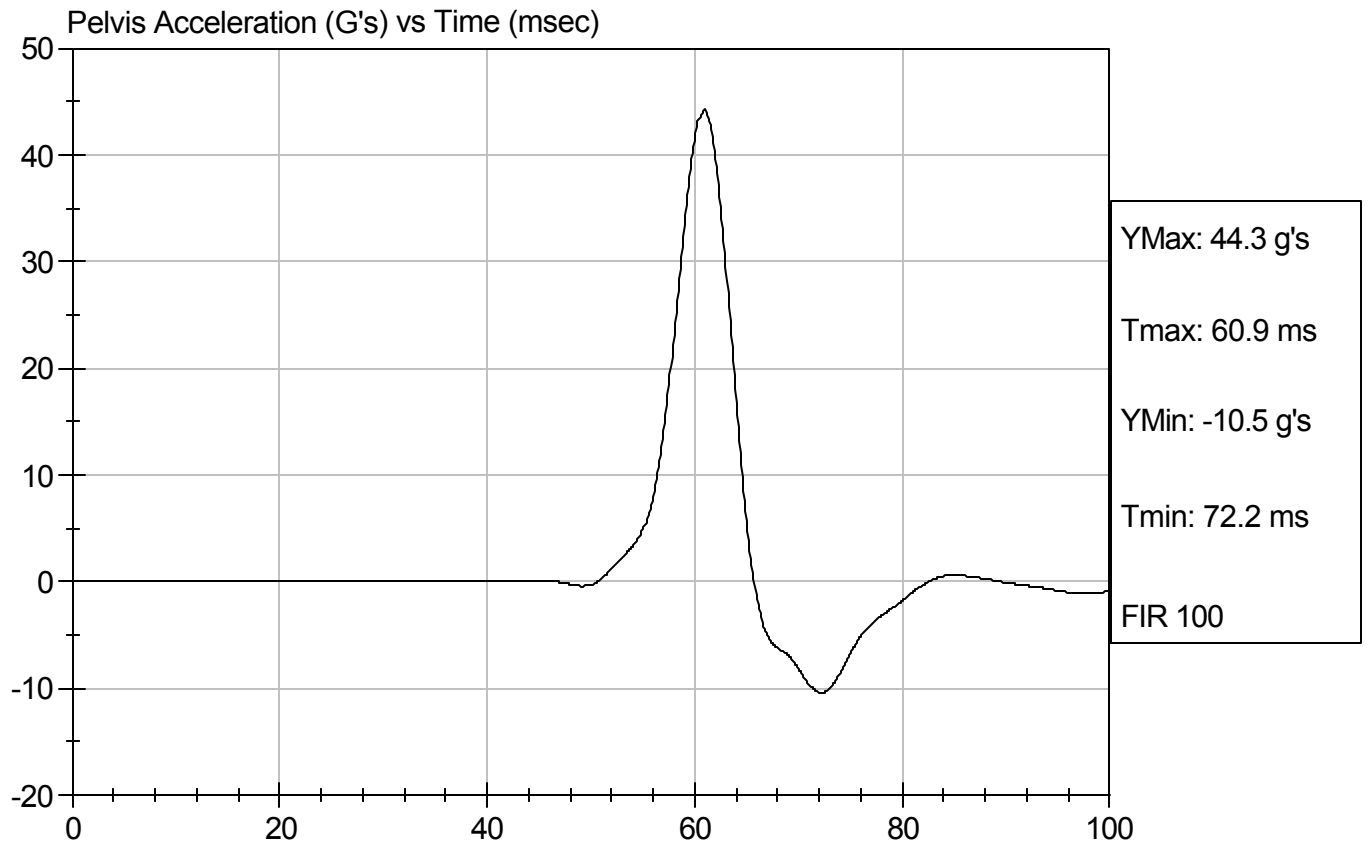
David Winkelbauer
Approved By

5/4/09
Test Date



Test Desc: Pelvis Impact
Component ID: D091023

Test Date: 5/4/09
Speed: 14.12 ft/sec, 4.30 m/sec



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

ATD Serial No: 272

Test I.D: D091024

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Force At 12.7 mm	N	104 -162	130	Pass
Force At 19 mm	N	163 - 222	178	Pass
Force At 25.4 mm	N	222 - 280	242	Pass
Force At 33 mm	N	325 - 391	336	Pass
			Overall Test Results	Pass

Jessica Gall
Laboratory Technician

David Winkelbauer
Approved By

5/4/09
Test Date

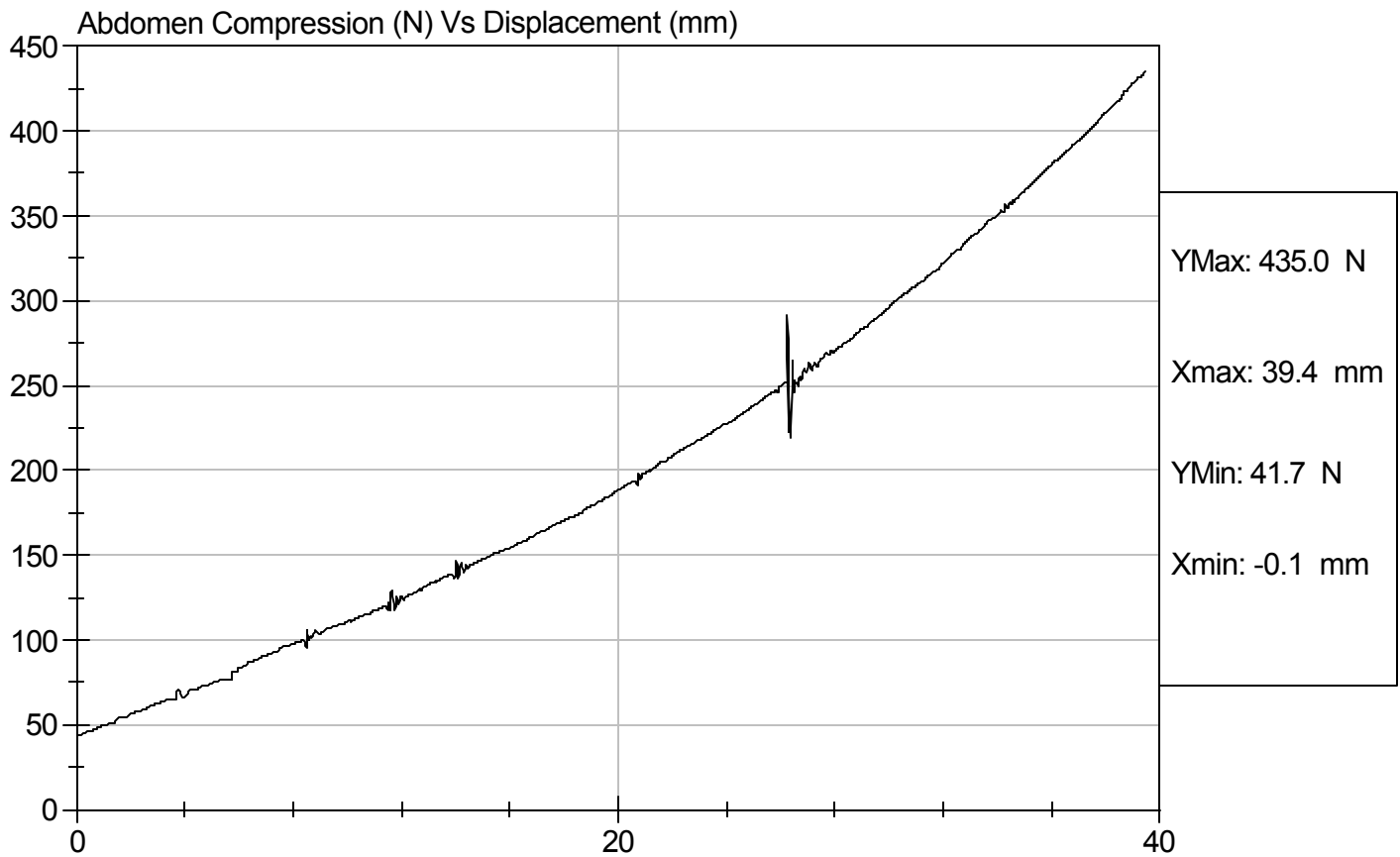


Test Description: Abdomen Compression

Test Date: 5/4/09

Component: D091024

Speed: 0 ft/sec, 0 m/sec



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

ATD Serial No: 272

Test I.D: D091025

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	133.3	Pass
Force At 30 deg	N	151.2 - 204.6	187.8	Pass
Force At 40 deg	N	204.6 - 258.0	225.4	Pass
Return Angle	Deg	12 Maximum	7	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

5/4/09
Test Date

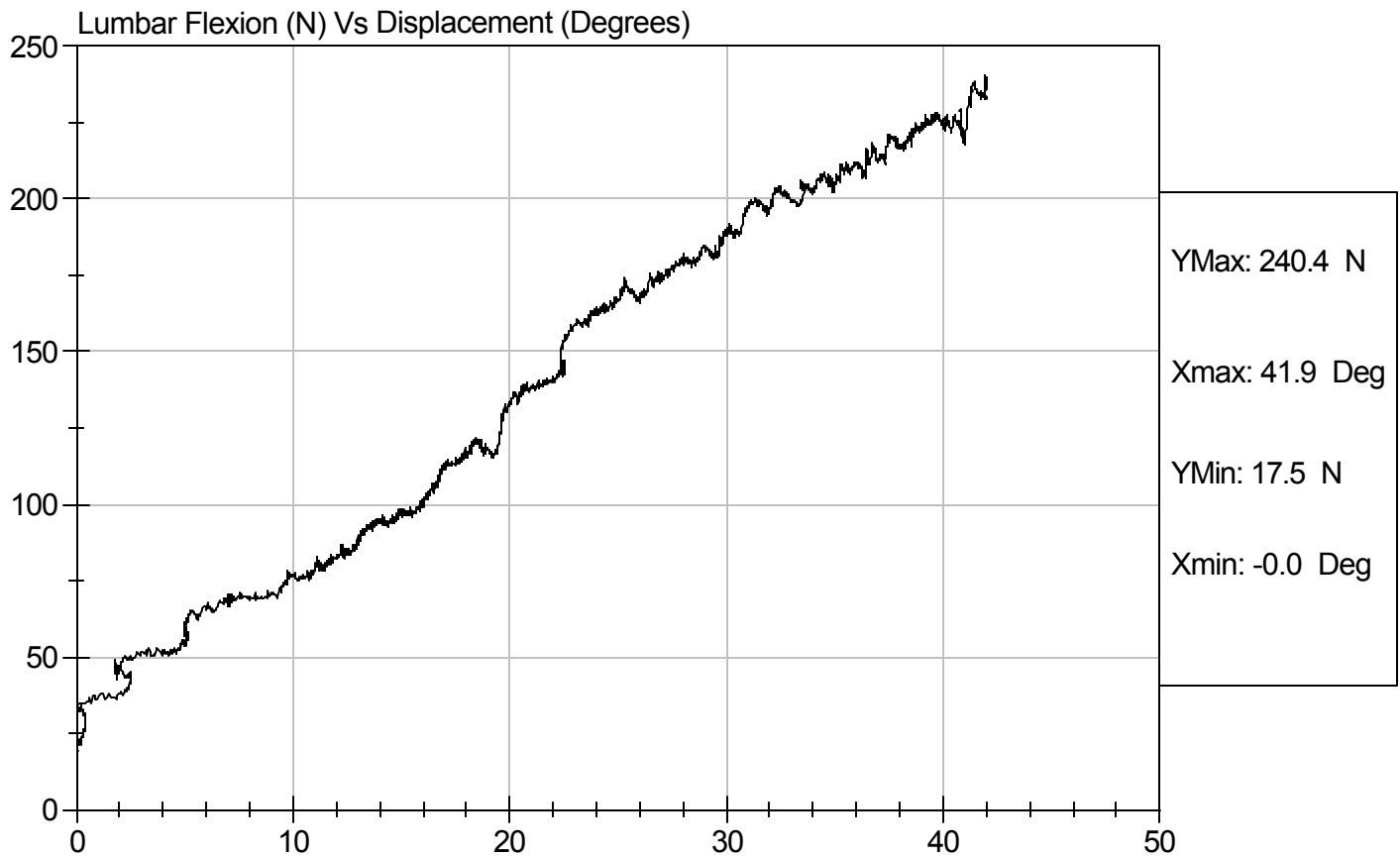


Test Description: Lumbar Flexion

Test Date: 5/4/09

Component: D091025

Speed: 0 ft/sec, 0 m/sec



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

ATD Serial No: 272

Test I.D: D091029

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	29	Pass
Impact Velocity		m/s	6.89 to 7.13	7.04	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.14	Pass
	20 msec	m/s	4.12 to 5.10	4.16	Pass
	30 msec	m/s	5.73 to 7.01	5.88	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.81	Pass
Midsaggital Plane Max Rotation		deg	66 to 82	67	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	55	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	8	Pass

Jessica Hall
Laboratory Technician

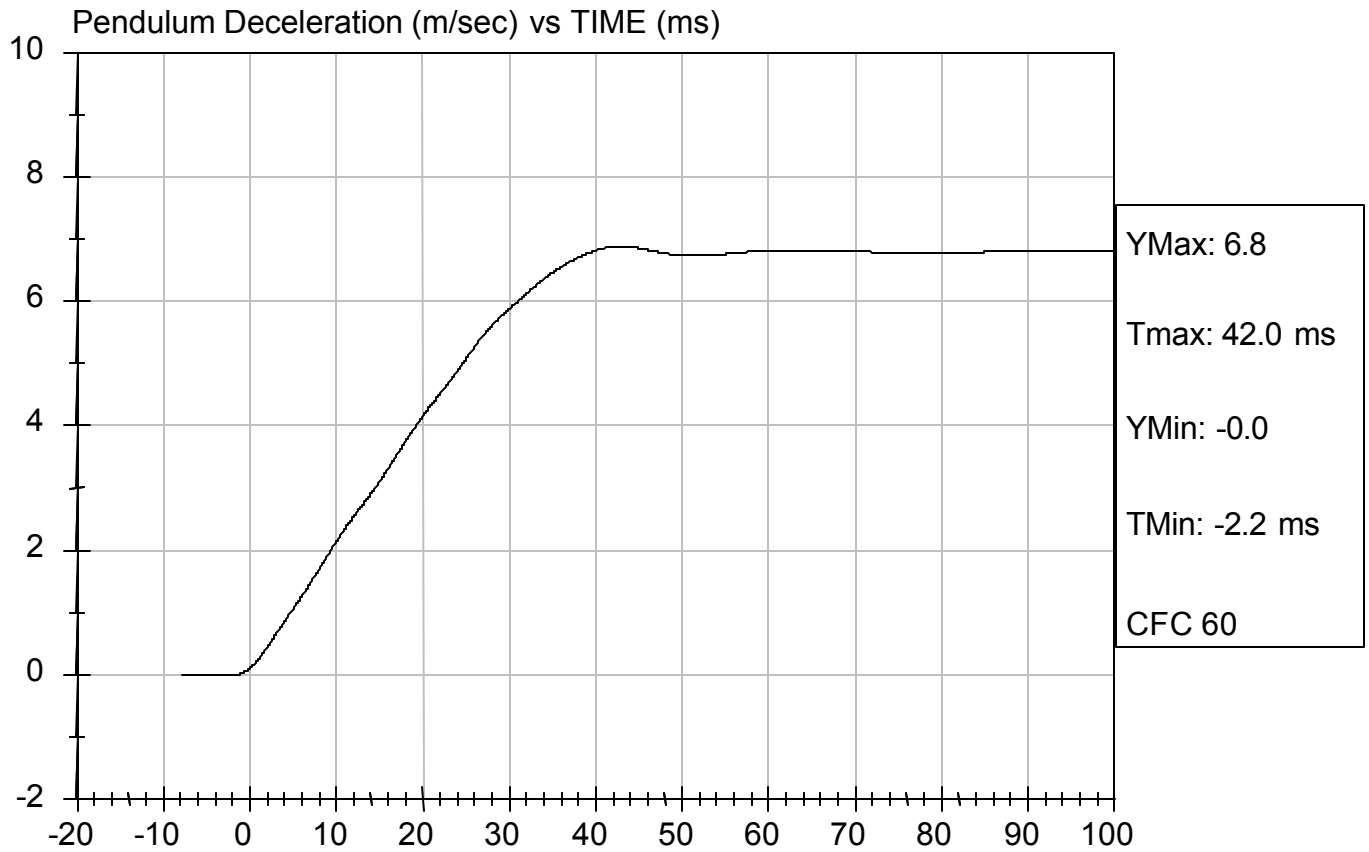
David Winkelbauer
Approved By

5/4/09
Test Date



Test Desc: Neck Bending
Component ID: D091029

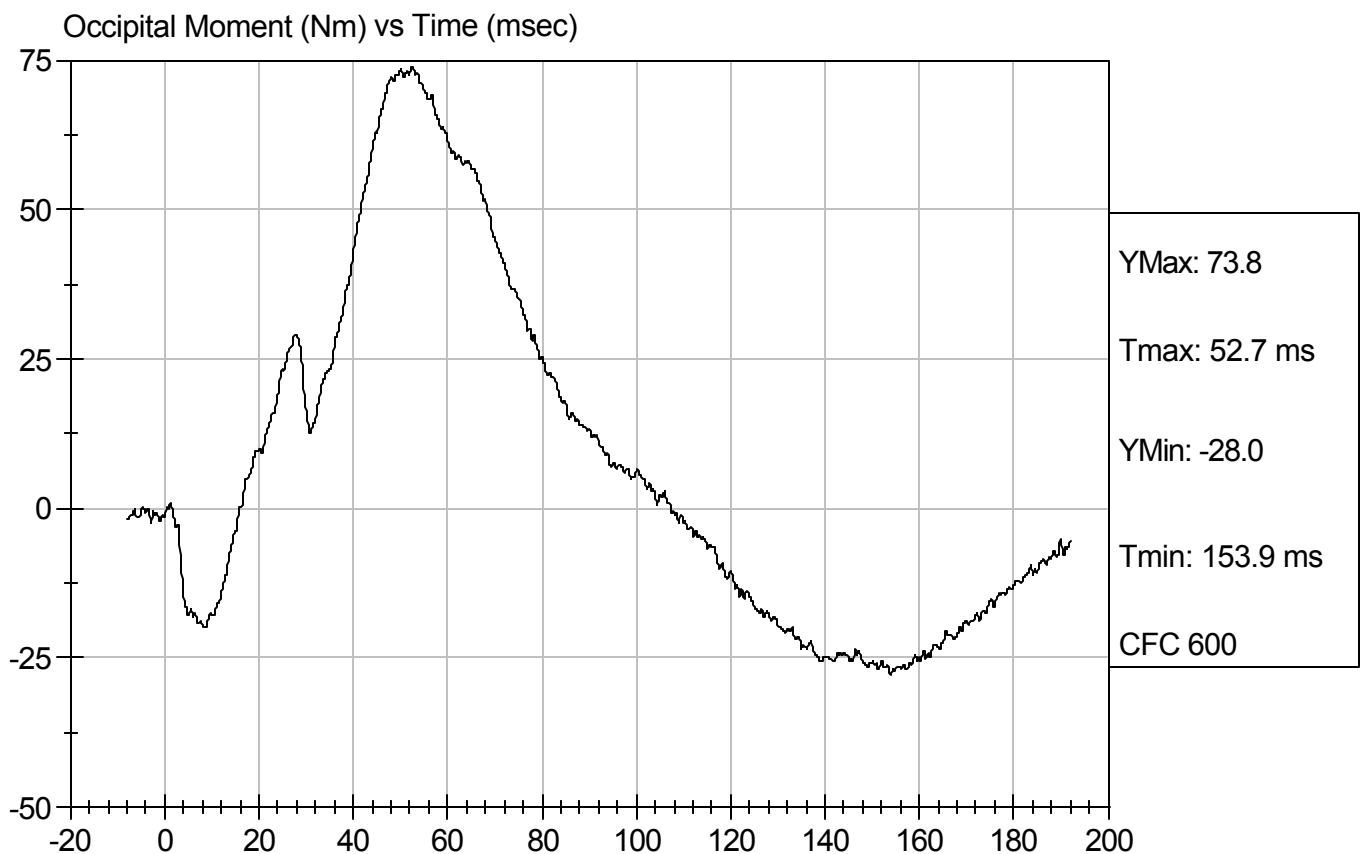
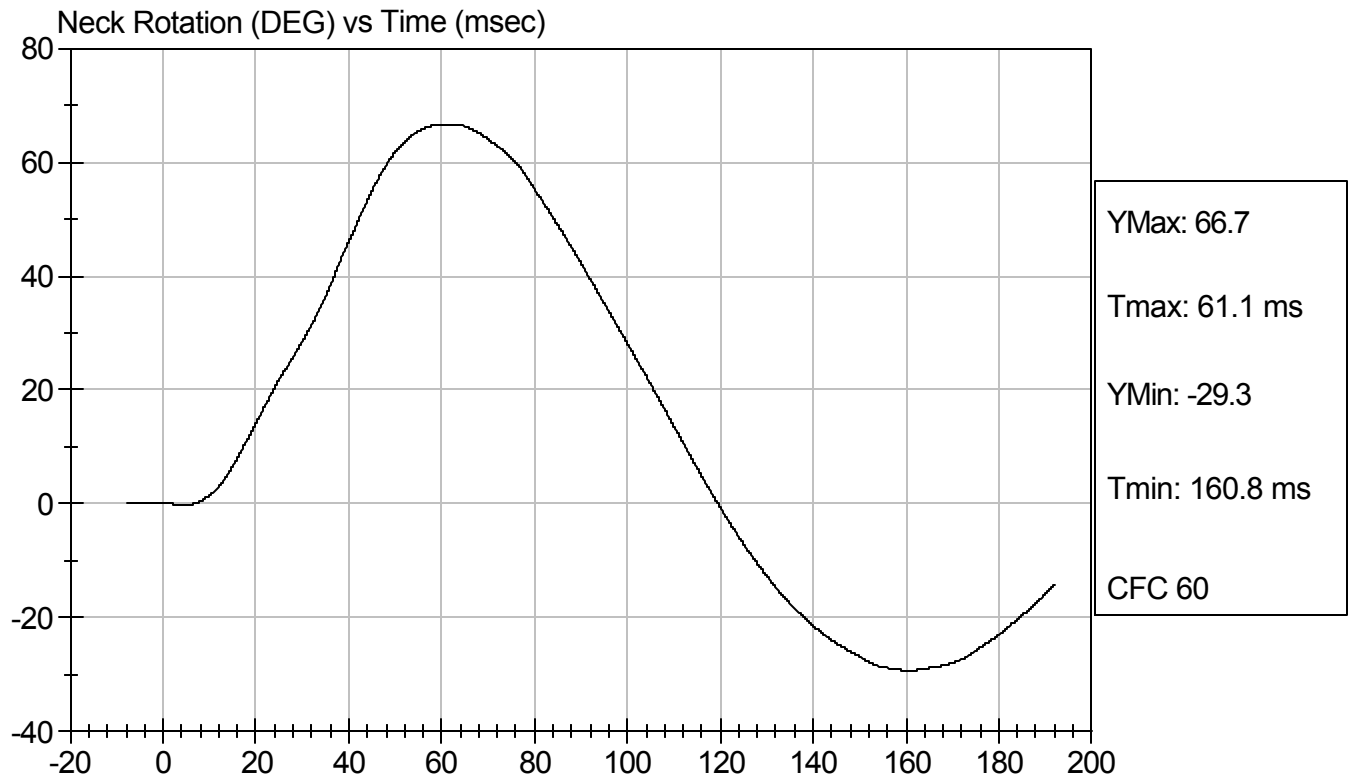
Test Date: 5/4/09
Speed: 23.1 ft/sec, 7.04 m/sec





Test Desc: Neck Bending
Component ID: D091029

Test Date: 5/4/09
Speed: 23.1 ft/sec, 7.04 m/sec



Calibration Test Results Summary

Dummy Serial Number: 272

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: 272

Test I.D: D091171

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Peak Resultant Acceleration	G's	120 to 150	146	Pass
Is Resultant Curve Unimodal?	N/A	15% of peak	Yes	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-6.9	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

5/14/09
Test Date

David Winkelbauer
Approved By



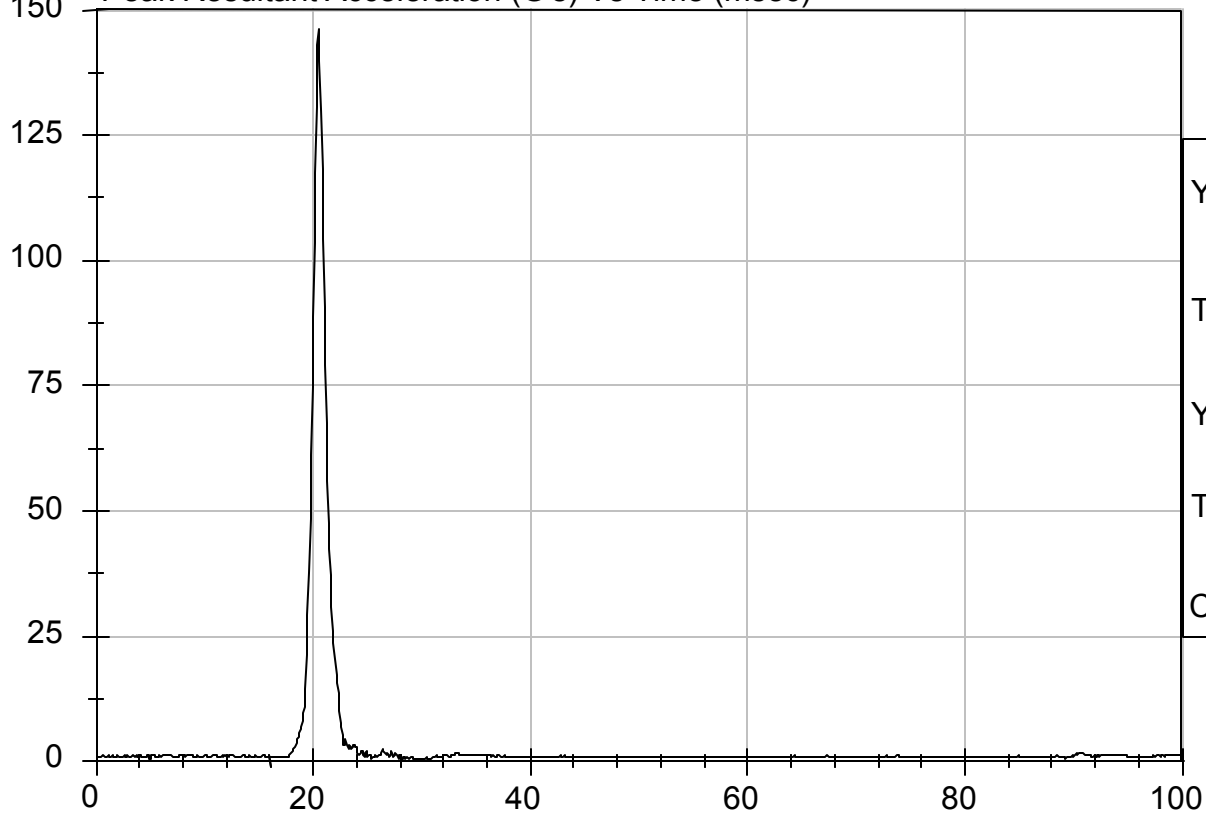
Test Description: Head Drop

Test Date: 5/14/09

Component: D091171

Speed: 0 ft/s, 0 m/s

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



YMax: 146.2 G

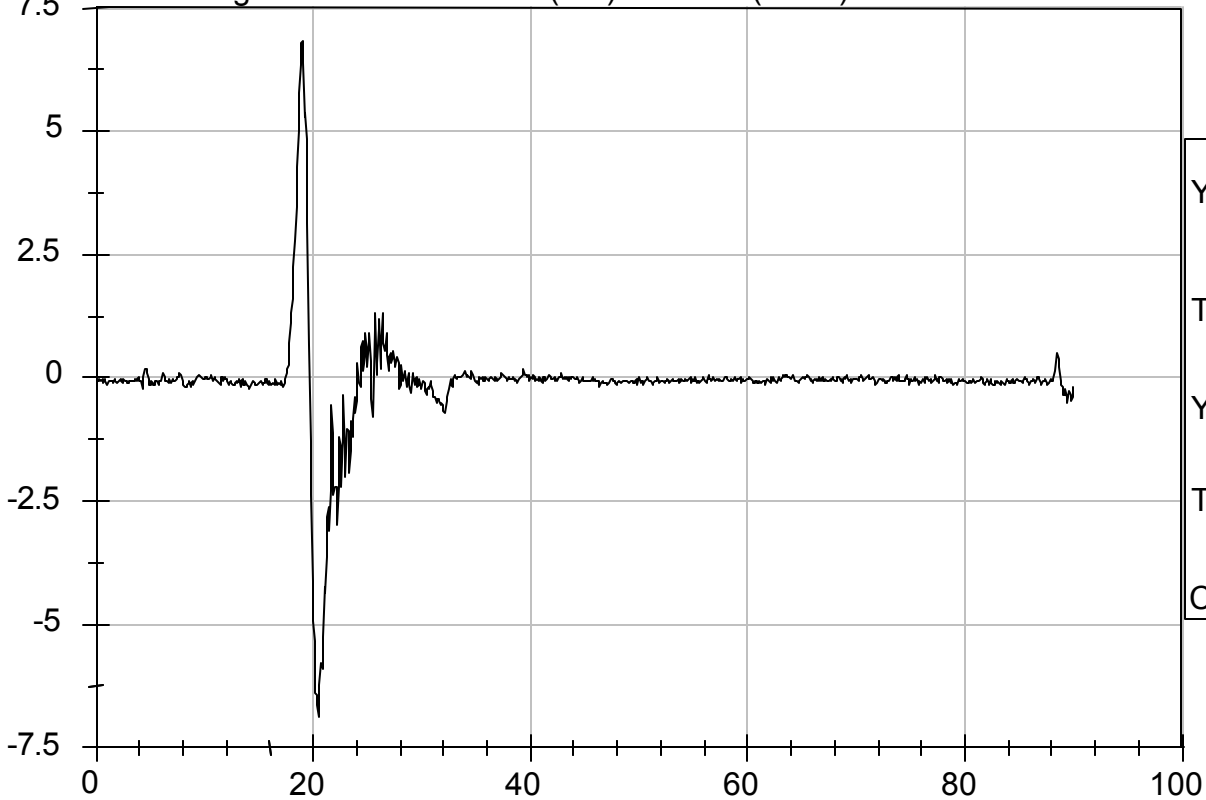
Tmax: 20.5 ms

YMin: 0.4 G

Tmin: 29.9 ms

CFC 1000

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



YMax: 6.8 G

Tmax: 19.0 ms

YMin: -6.9 G

Tmin: 20.5 ms

CFC 1000

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

ATD Serial No: 272

Test I.D: D091172

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Probe Velocity	m/s	4.22 - 4.31	4.30	Pass
Upper Rib	G's	37 - 46	39	Pass
Lower Rib	G's	37 - 46	38	Pass
Lower Spine	G's	15 - 22	19	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

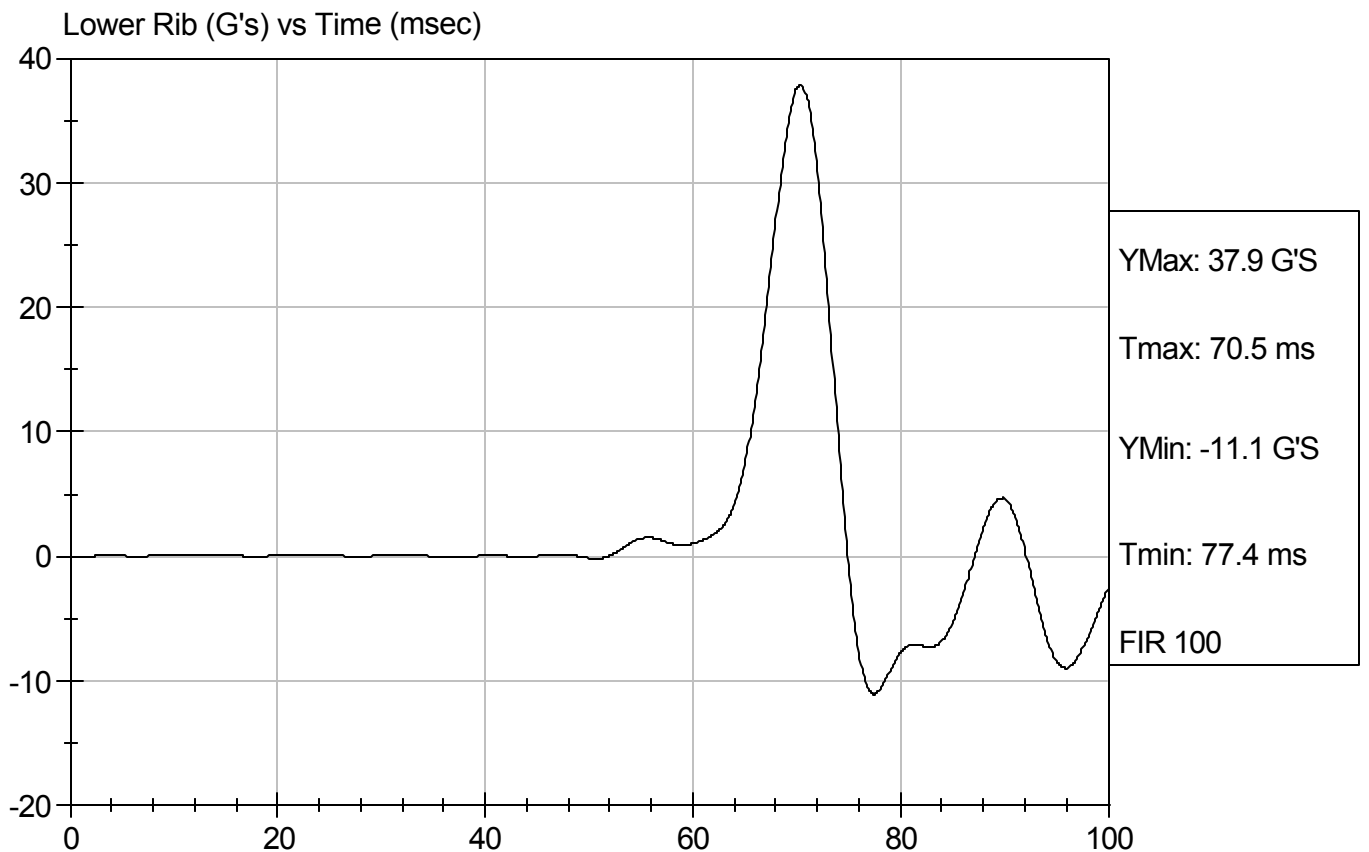
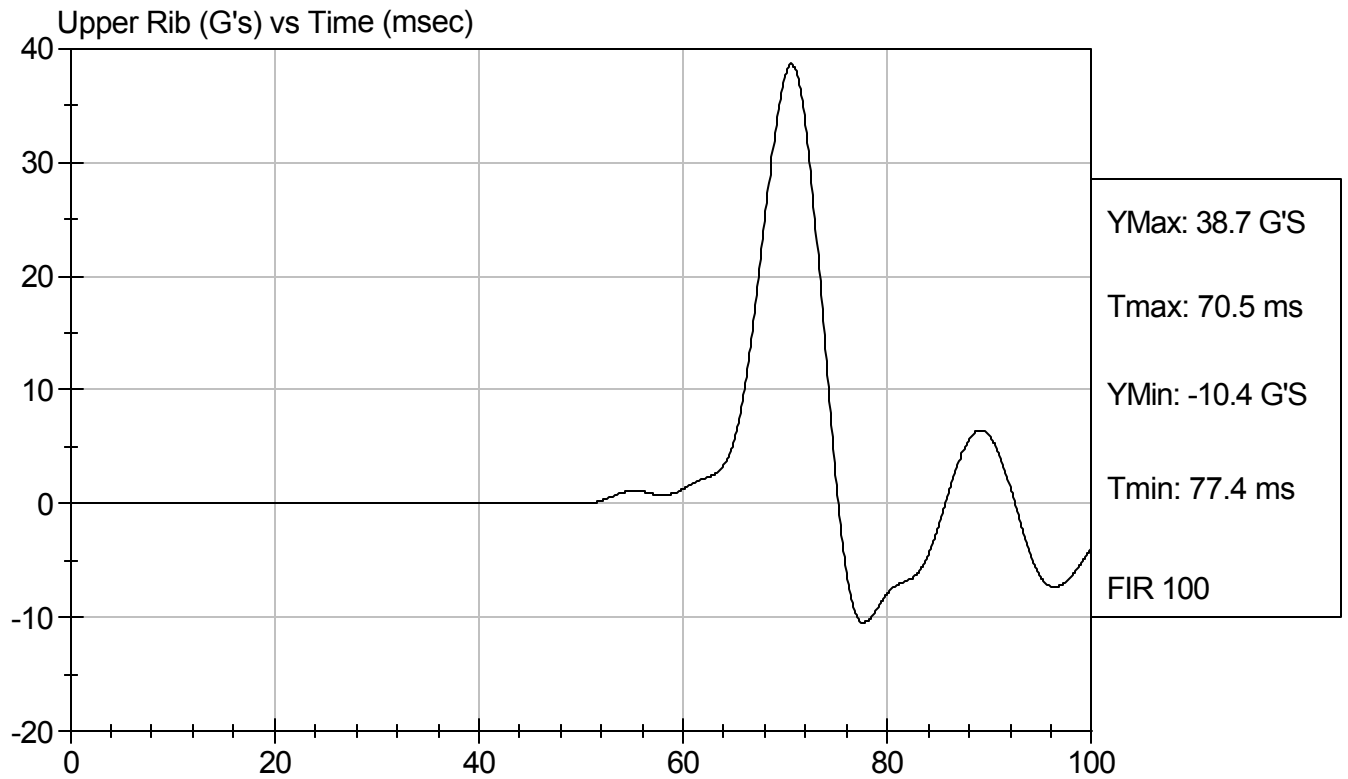
David Winkelbauer
Approved By

5/14/09
Test Date



Test Desc: Thorax Impact
Component ID: D091172

Test Date: 5/14/09
Speed: 14.12 ft/sec, 4.30 m/sec

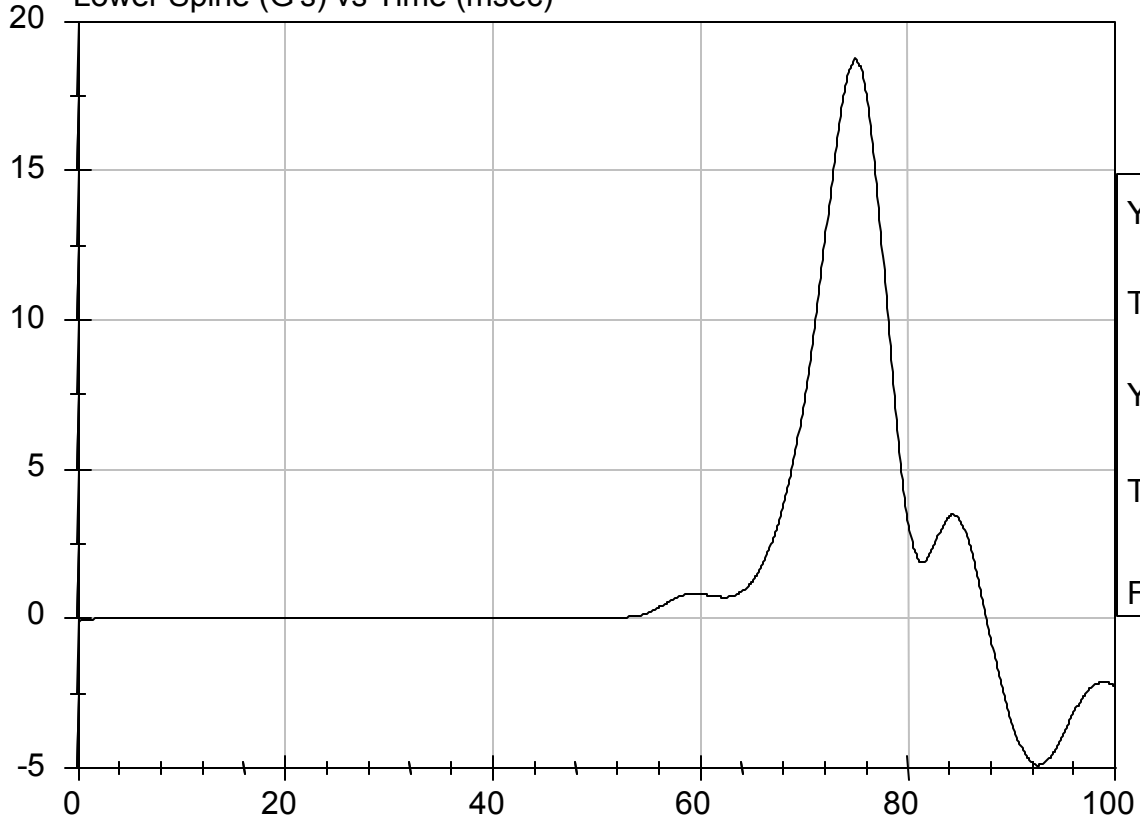




Test Desc: Thorax Impact
Component ID: D091172

Test Date: 5/14/09
Speed: 14.12 ft/sec, 4.30 m/sec

Lower Spine (G's) vs Time (msec)



YMax: 18.7 G'S

Tmax: 74.9 ms

YMin: -4.9 G'S

Tmin: 92.4 ms

FIR 100

SID/HIII Calibration Data Sheet

Side Impact Dummy

Pelvis Impact Test

ATD Serial No: 272

Test I.D: D091173

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	40	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

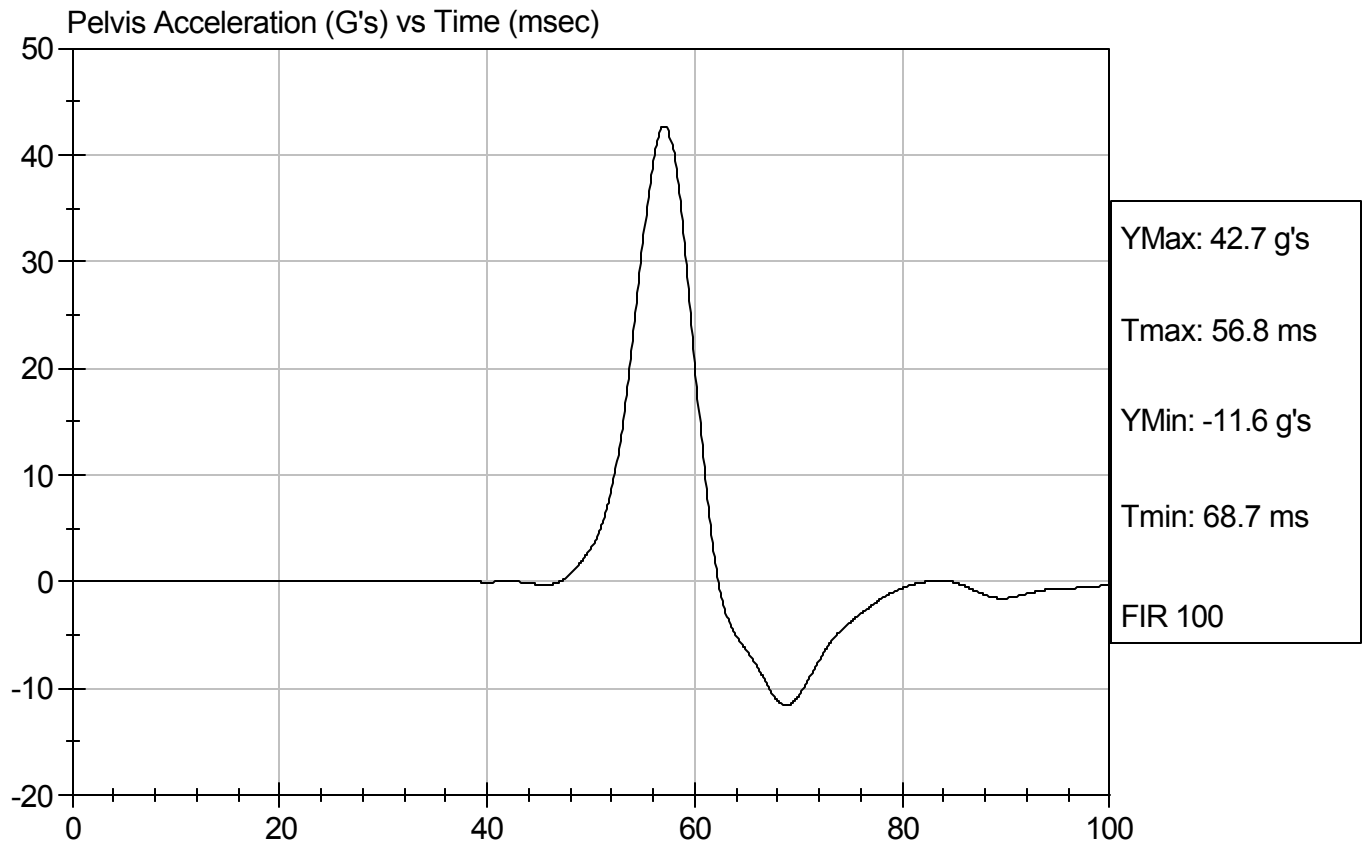
5/14/09
Test Date

David Winkelbauer
Approved By



Test Desc: Pelvis Impact
Component ID: D091173

Test Date: 5/14/09
Speed: 14.12 ft/sec, 4.30 m/sec



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

ATD Serial No: 272

Test I.D: D091174

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Force At 12.7 mm	N	104 -162	130	Pass
Force At 19 mm	N	163 - 222	181	Pass
Force At 25.4 mm	N	222 - 280	242	Pass
Force At 33 mm	N	325 - 391	329	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

5/14/09
Test Date

David Winkelbauer
Approved By

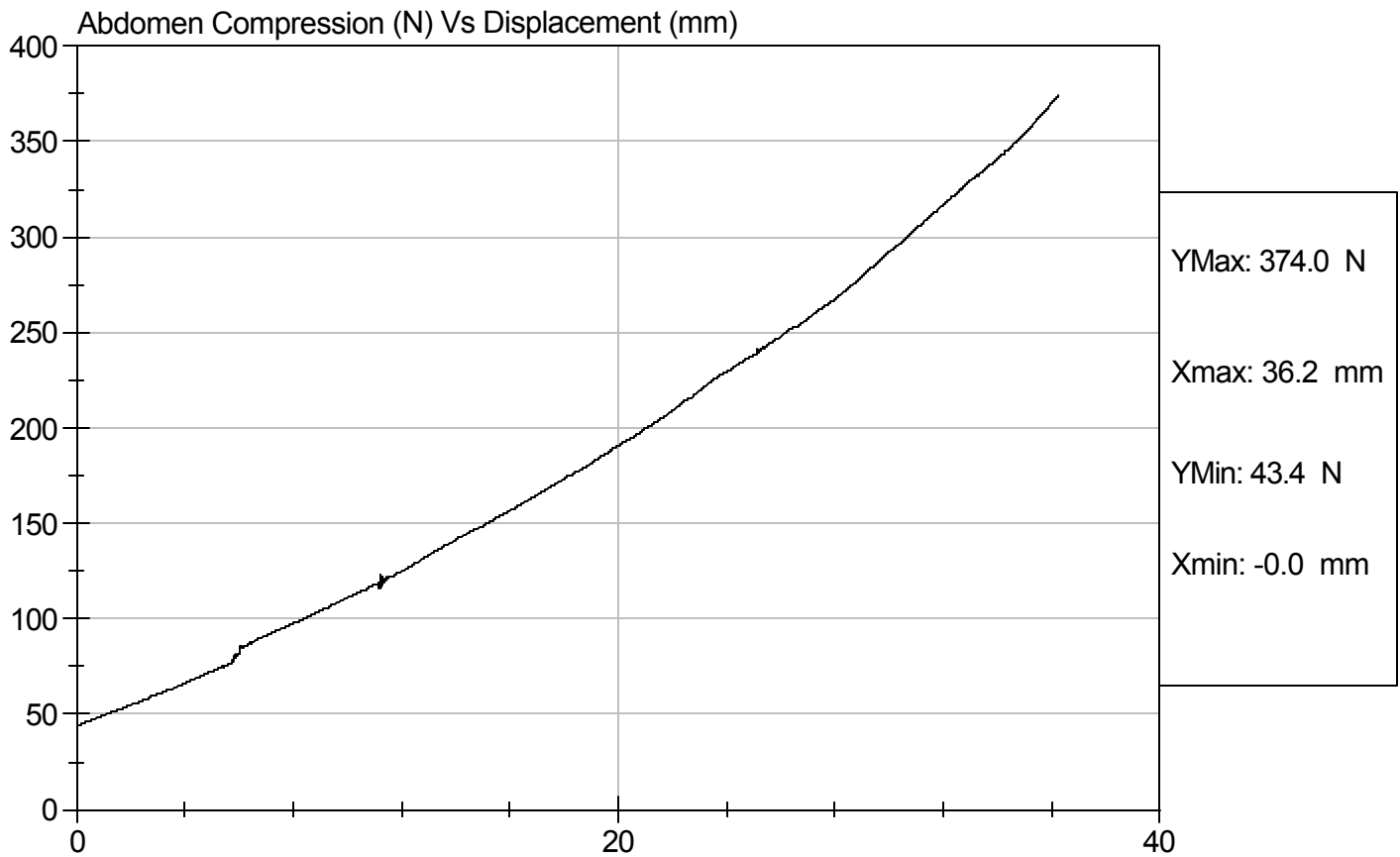


Test Description: Abdomen Compression

Test Date: 5/14/09

Component: D091174

Speed: 0 ft/sec, 0 m/sec



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

ATD Serial No: 272

Test I.D: D091175

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	119.7	Pass
Force At 30 deg	N	151.2 - 204.6	161.9	Pass
Force At 40 deg	N	204.6 - 258.0	214.8	Pass
Return Angle	Deg	12 Maximum	6	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

5/14/09
Test Date

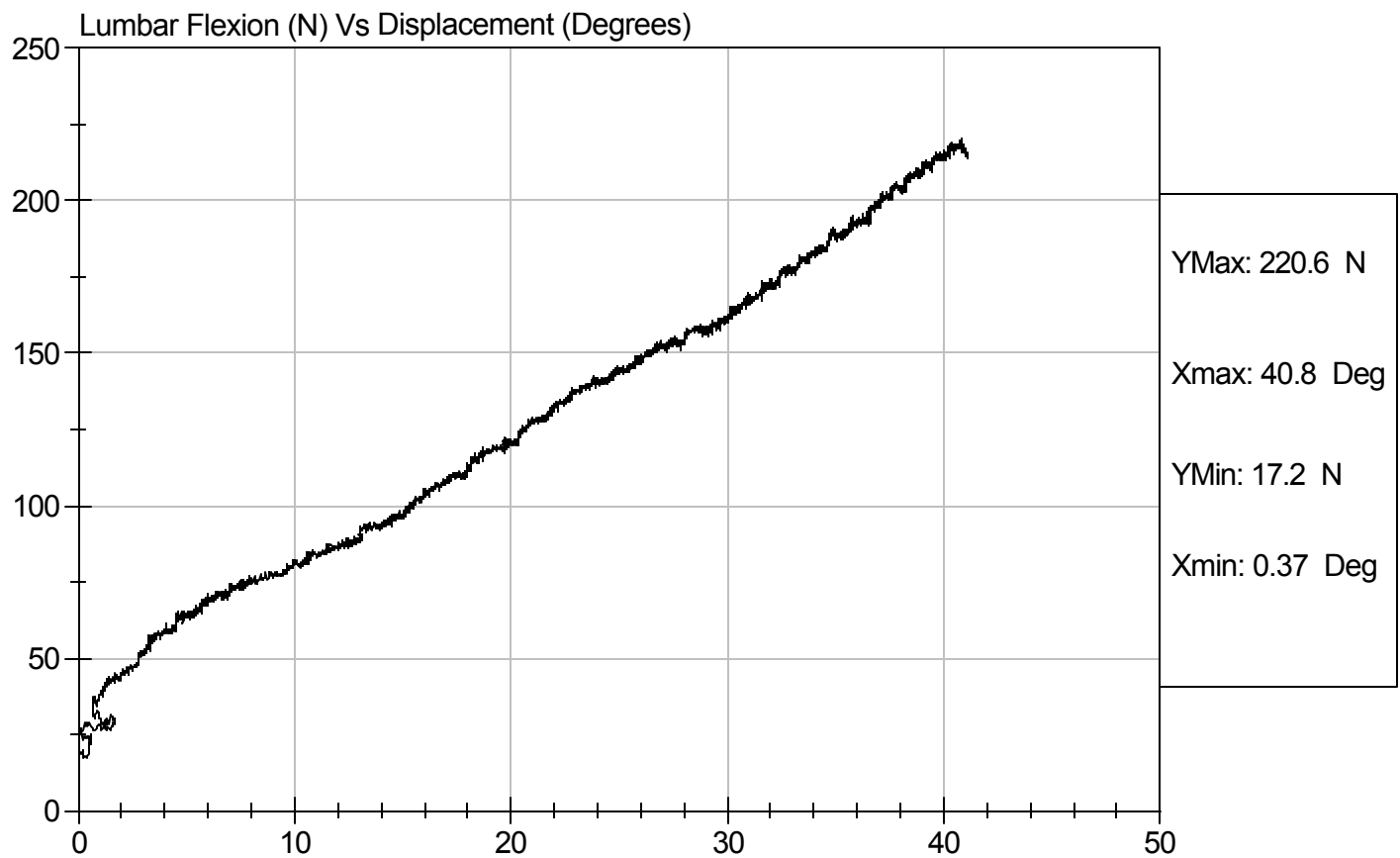


Test Description: Lumbar Flexion

Test Date: 5/14/09

Component: D091175

Speed: 0 ft/sec, 0 m/sec



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

ATD Serial No: 272

Test I.D: D091179

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	39	Pass
Impact Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.35	Pass
	20 msec	m/s	4.12 to 5.10	4.59	Pass
	30 msec	m/s	5.73 to 7.01	6.48	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.71	Pass
Midsaggital Plane Max Rotation		deg	66 to 82	70	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	58	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	77	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	59	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	13	Pass

Jessica Hall
Laboratory Technician

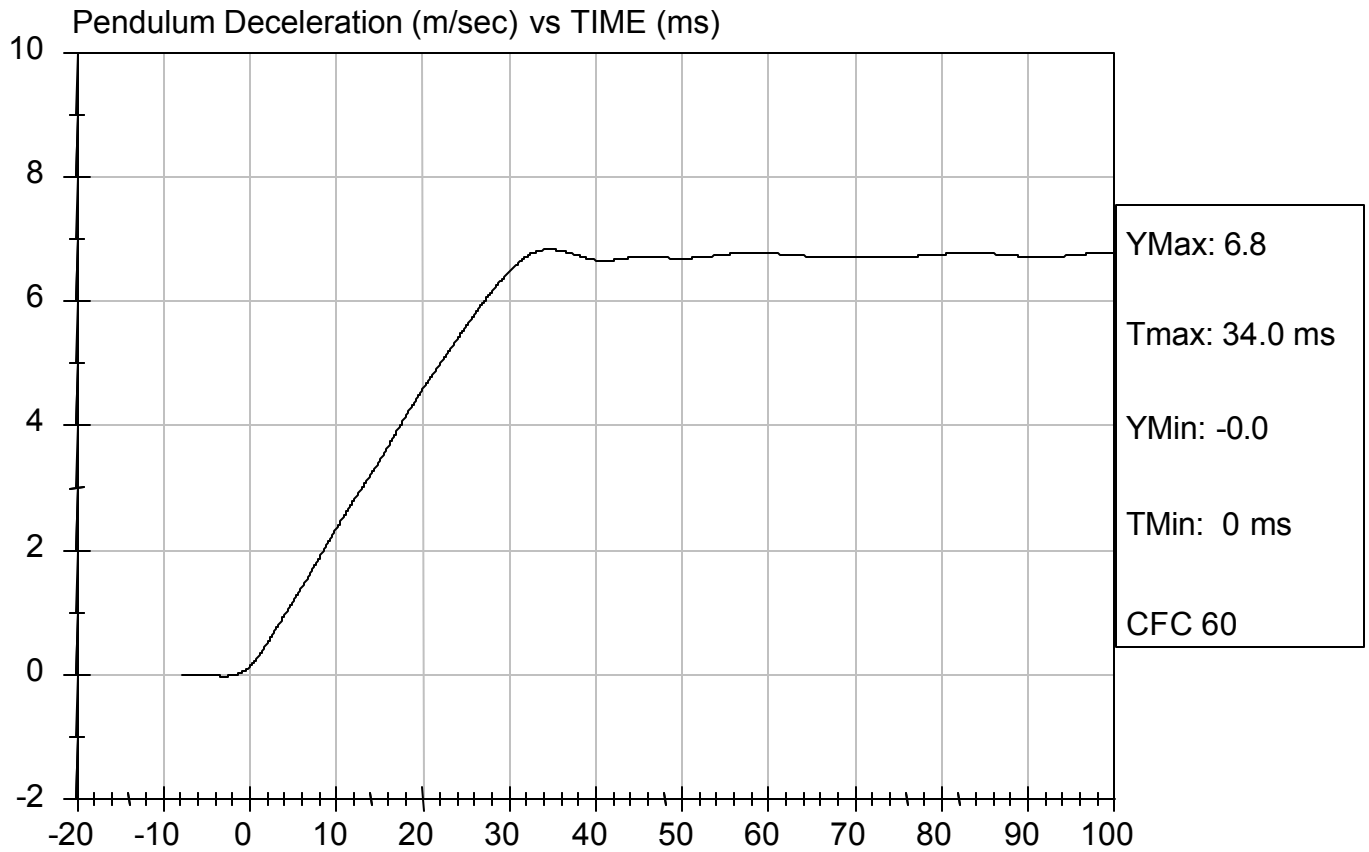
David Winkelbauer
Approved By

5/14/09
Test Date



Test Desc: Neck Bending
Component ID: D091179

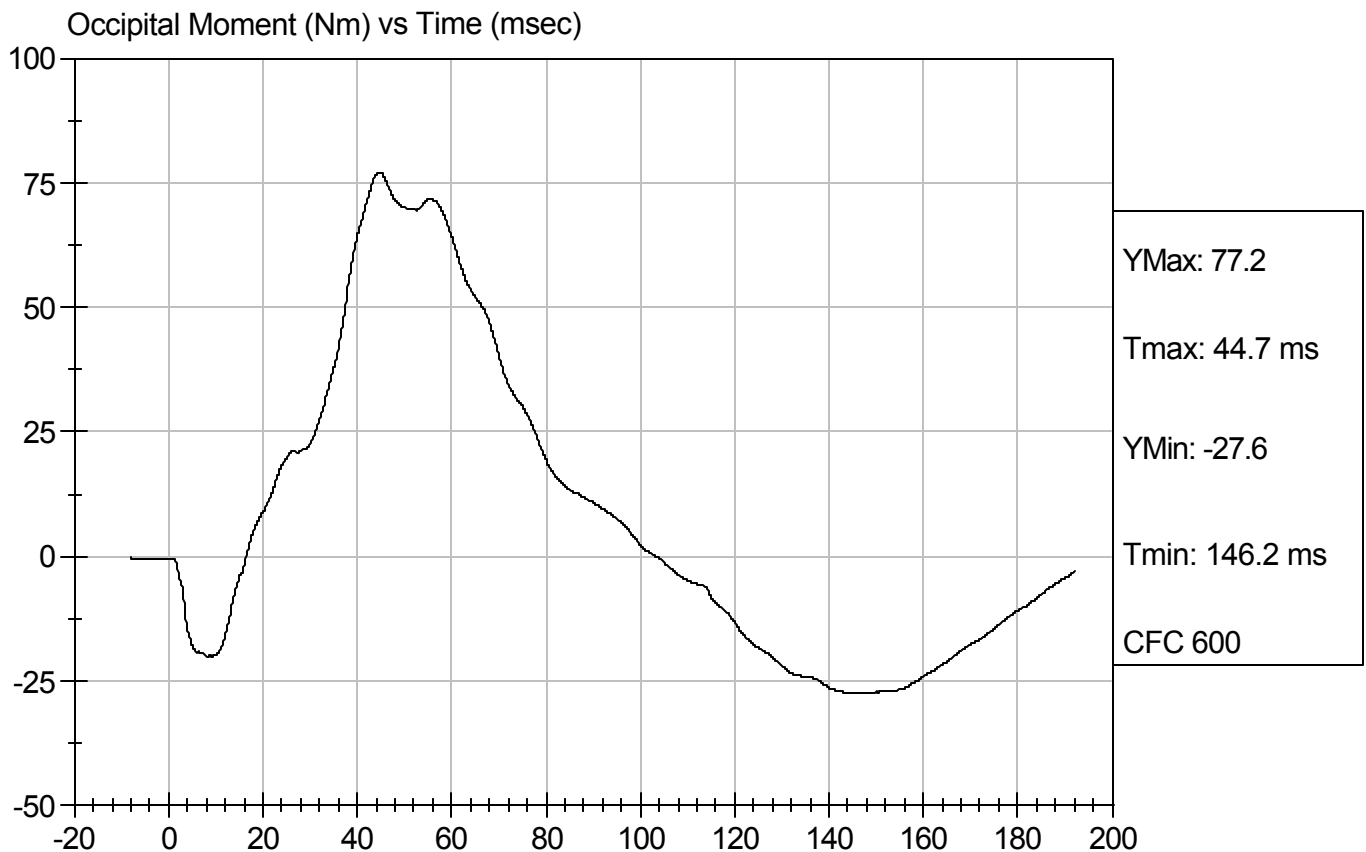
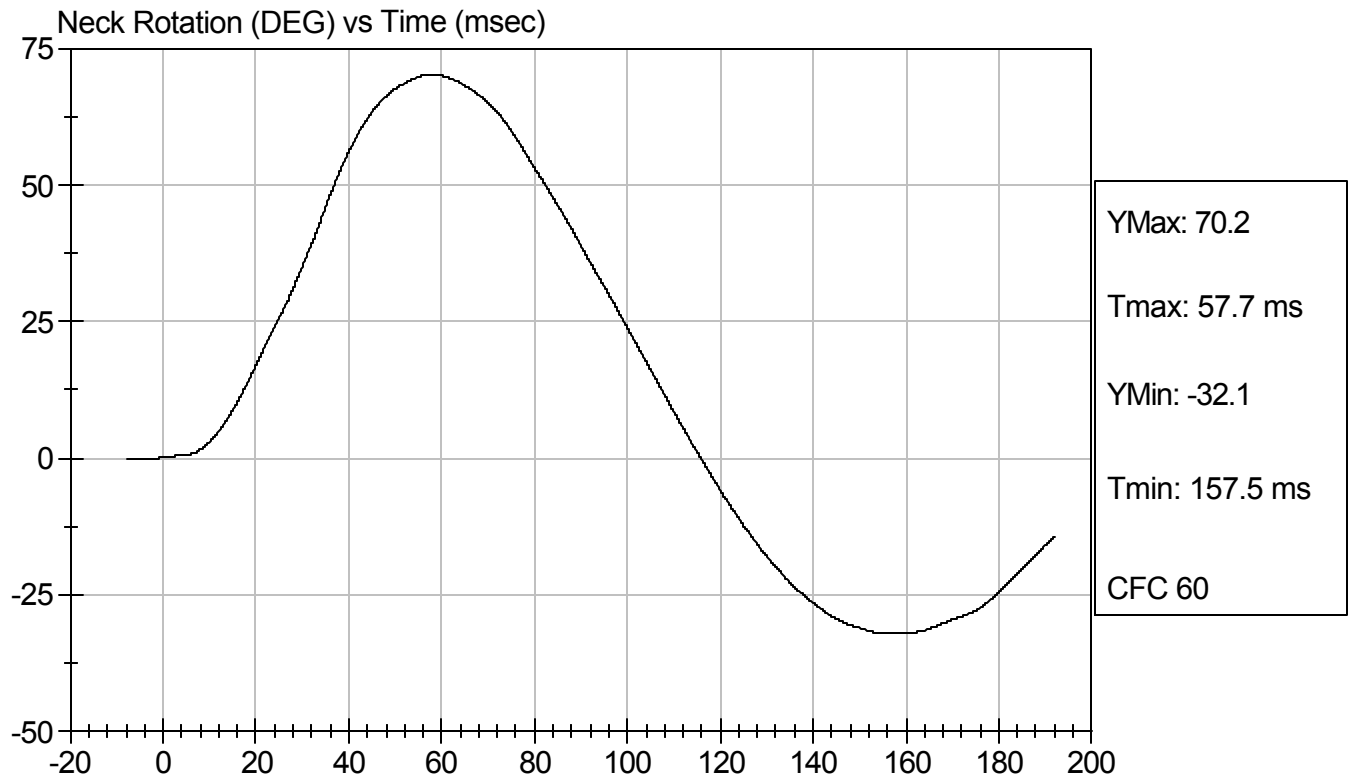
Test Date: 5/14/09
Speed: 23.148 ft/sec, 7.06 m/sec





Test Desc: Neck Bending
Component ID: D091179

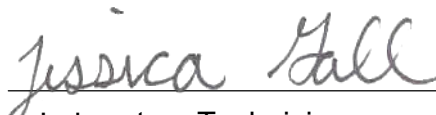
Test Date: 5/14/09
Speed: 23.148 ft/sec, 7.06 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Inspection Checklist

ATD Serial No: 272

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

5/14/09

Test Date

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: D08251

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	

Jessica Gall
Laboratory Technician

David Winkelbauer
Approved By

5/4/09
Test Date

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

ATD Serial No: 271

Test I.D: D091011

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Peak Resultant Acceleration	G's	120 to 150	147	Pass
Is Resultant Curve Unimodal?	N/A	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-7.0	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

David Winkelbauer
Approved By

5/4/09
Test Date



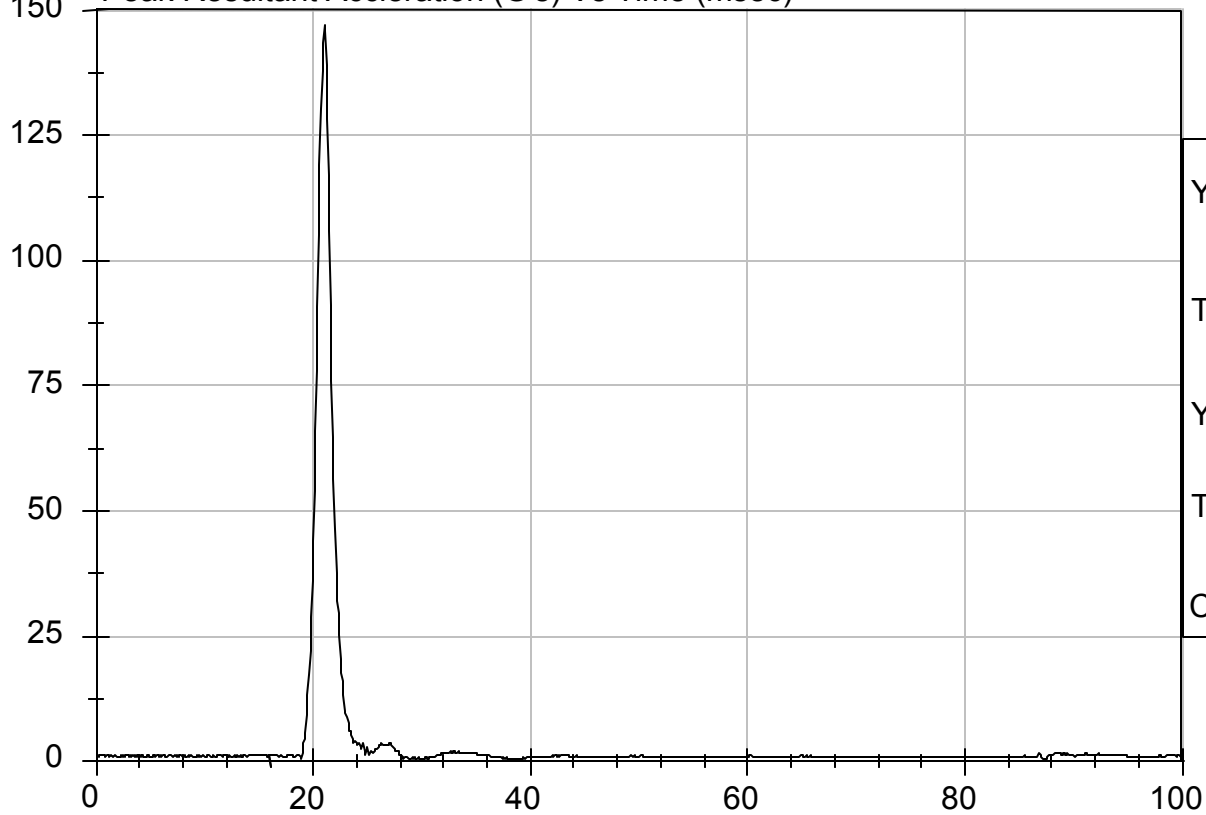
Test Description: Head Drop

Test Date: 5/4/09

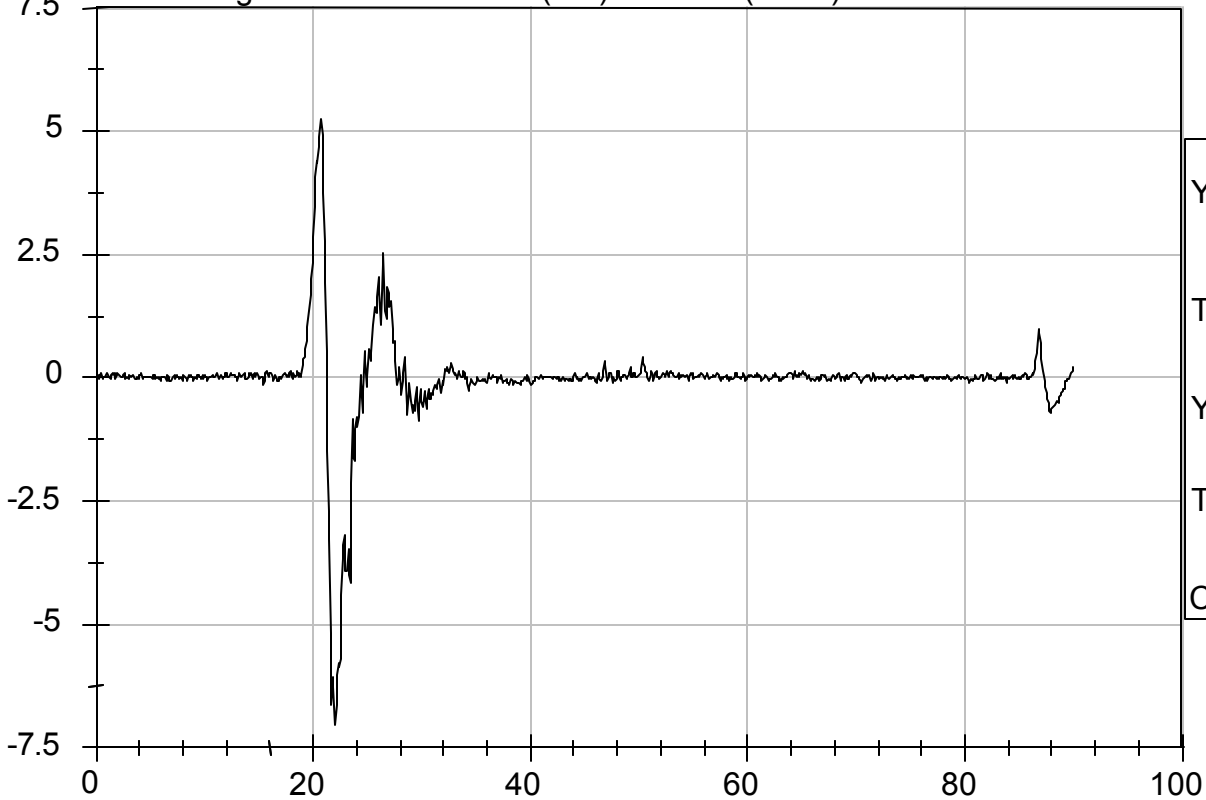
Component: D091011

Speed: 0 ft/s, 0 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: D091012

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Probe Velocity	m/s	4.22 - 4.31	4.30	Pass
Upper Rib	G's	37 - 46	40	Pass
Lower Rib	G's	37 - 46	38	Pass
Lower Spine	G's	15 - 22	18	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

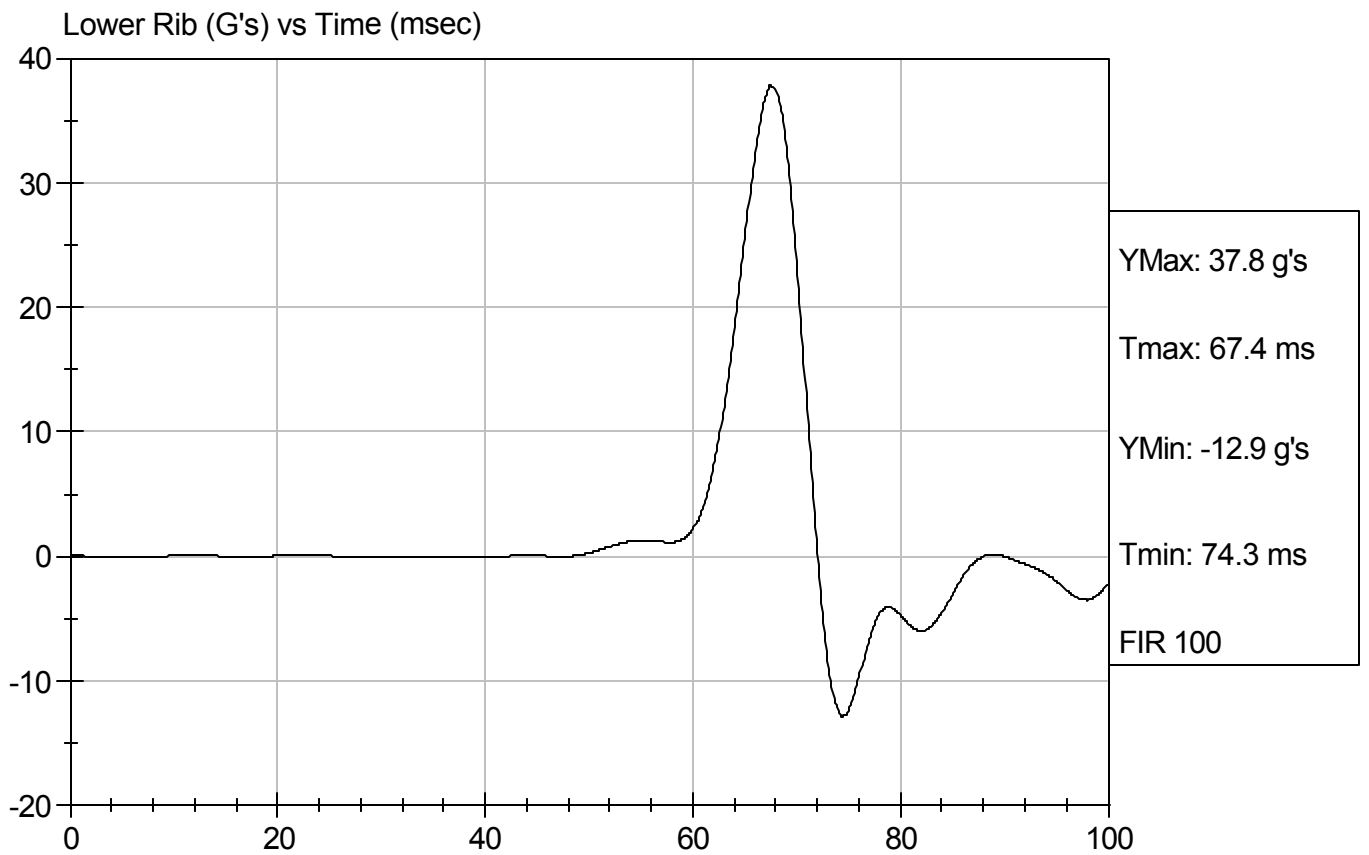
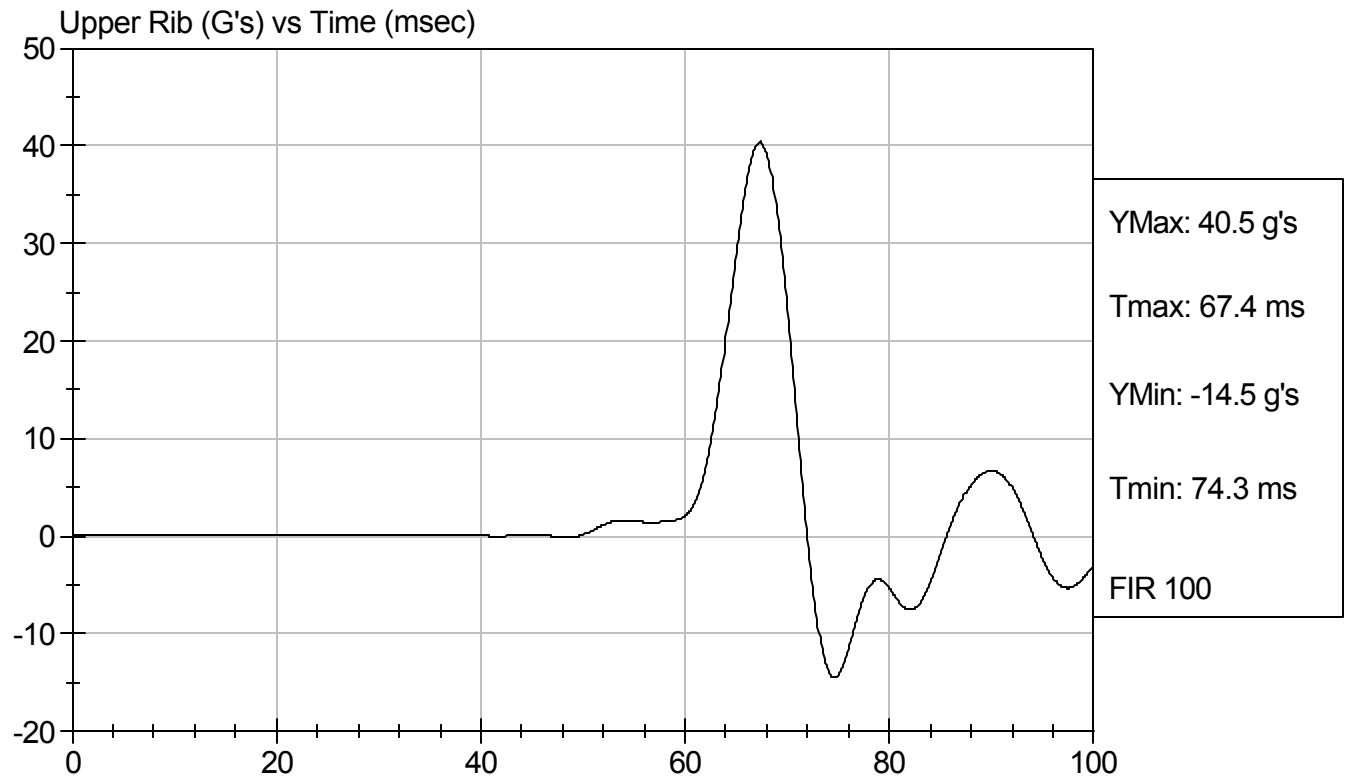
David Winkelbauer
Approved By

5/4/09
Test Date



Test Desc: Thorax Impact
Component ID: D091012

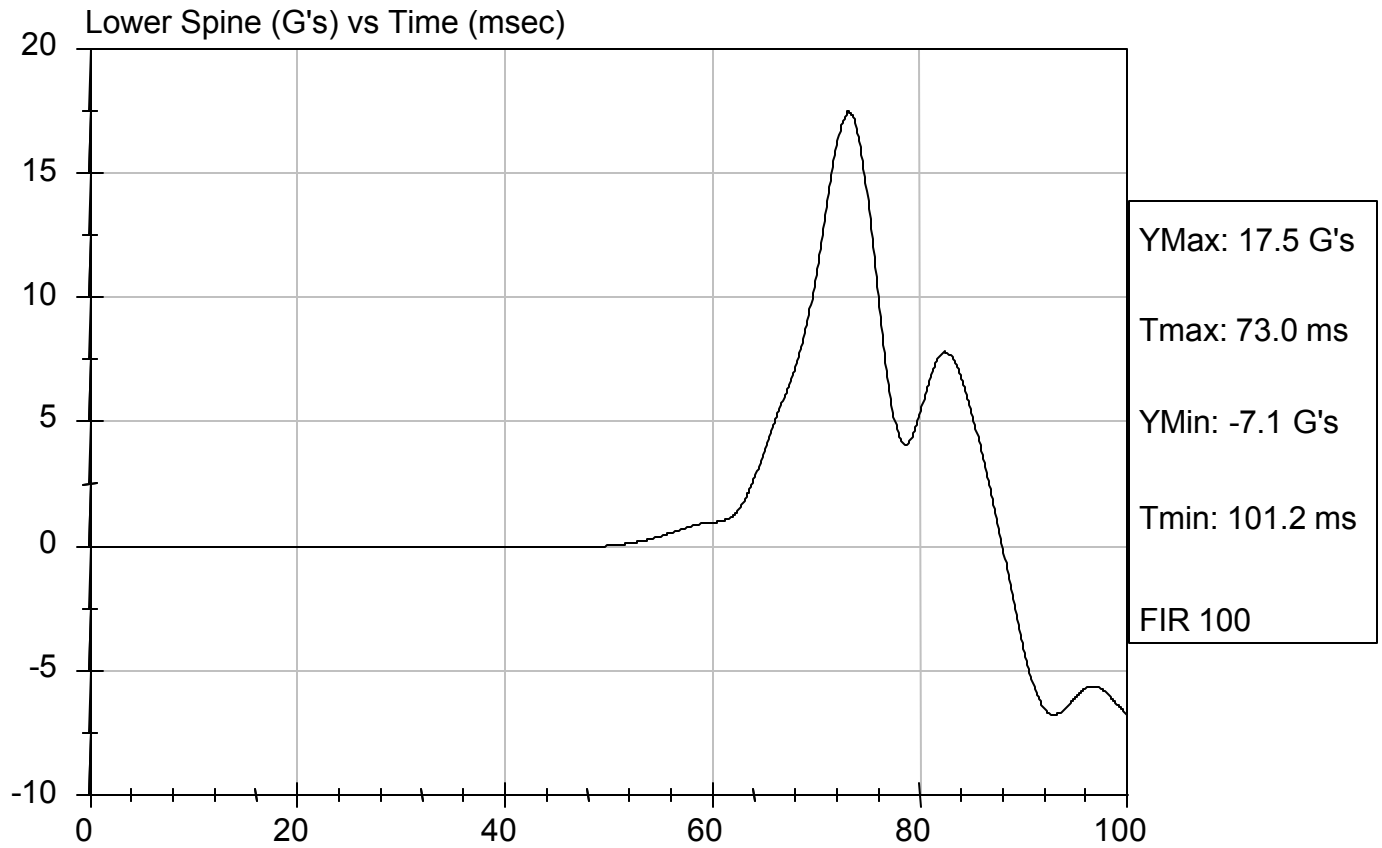
Test Date: 5/4/09
Speed: 14.12 ft/sec, 4.30 m/sec





Test Desc: Thorax Impact
Component ID: D091012

Test Date: 5/4/09
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: D091013

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Probe Velocity	m/s	4.27 - 4.33	4.29	Pass
Pelvis Acceleration	G's	40 - 60	43	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

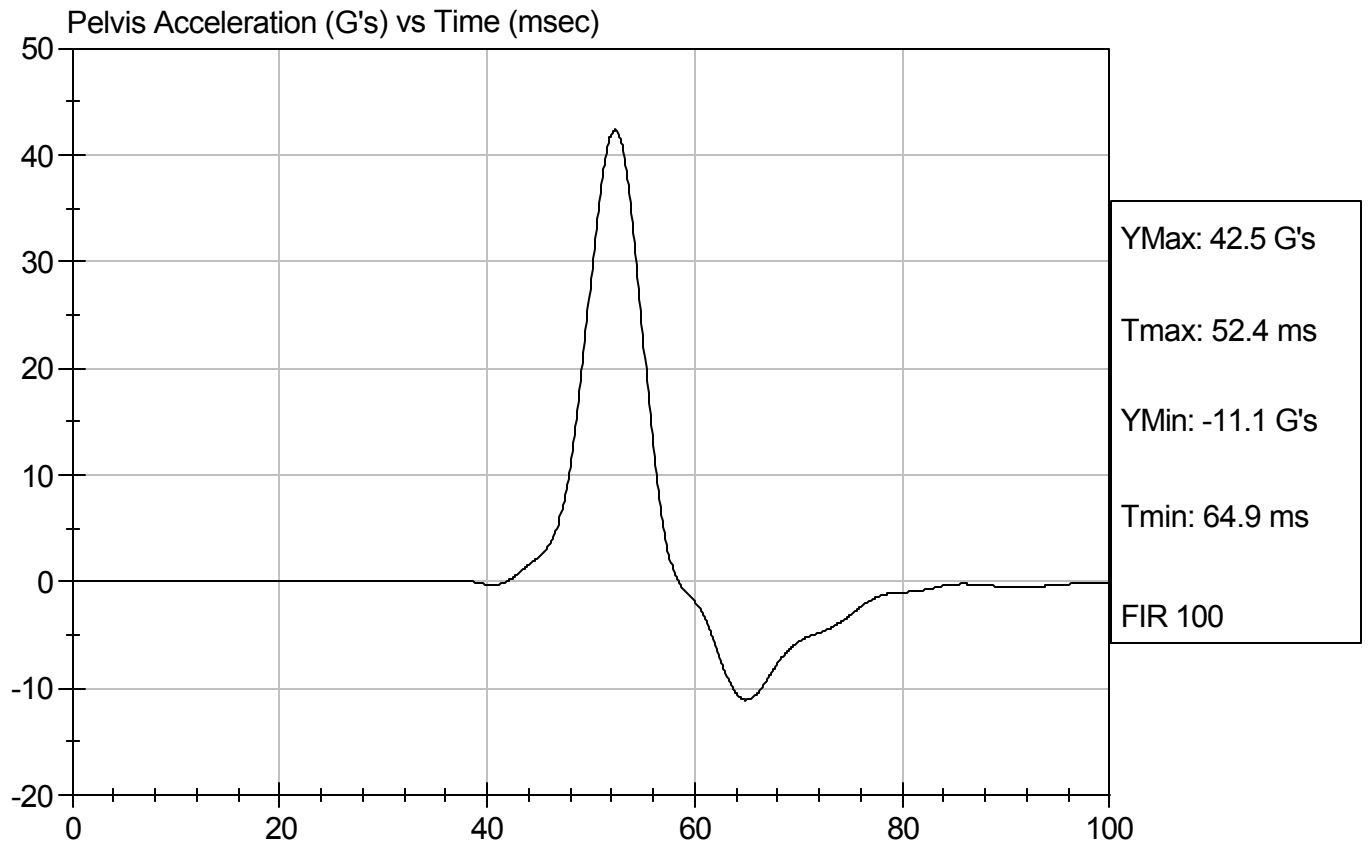
David Winkelbauer
Approved By

5/4/09
Test Date



Test Desc: Pelvis Impact
Component ID: D091013

Test Date: 5/4/09
Speed: 14.08 ft/sec, 4.29 m/sec



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

ATD Serial No: 271

Test I.D: D091014

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Force At 12.7 mm	N	104 -162	150	Pass
Force At 19 mm	N	163 - 222	204	Pass
Force At 25.4 mm	N	222 - 280	280	Pass
Force At 33 mm	N	325 - 391	384	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

5/4/09
Test Date

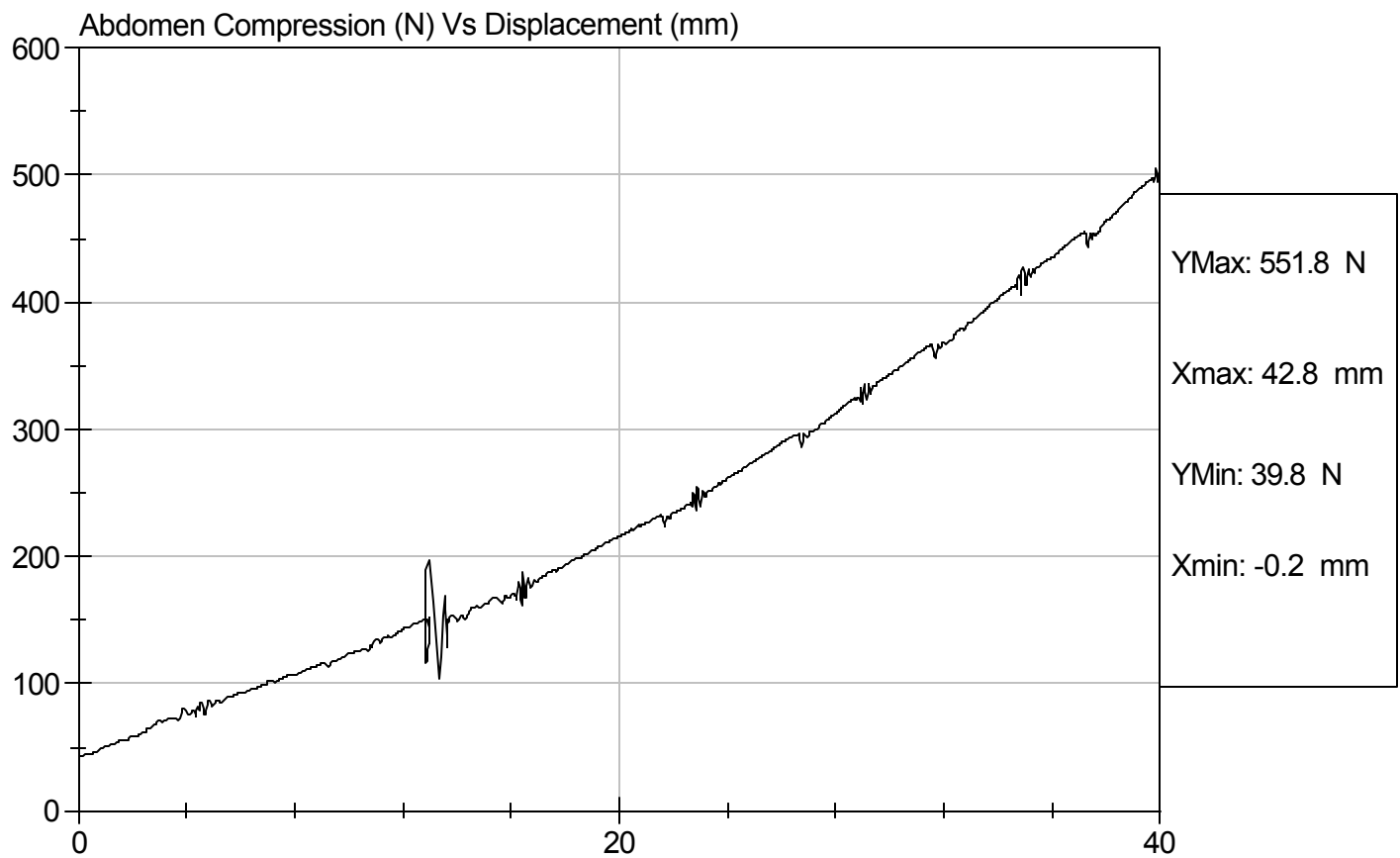


Test Description: Abdomen Compression

Test Date: 5/4/09

Component: D091014

Speed: 0 ft/sec, 0 m/sec

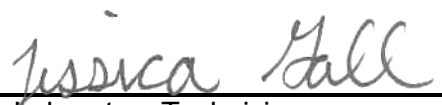


SID/HIII Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 271

Test I.D: D091015

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	104.5	Pass
Force At 30 deg	N	151.2 - 204.6	158.0	Pass
Force At 40 deg	N	204.6 - 258.0	243.3	Pass
Return Angle	Deg	12 Maximum	5	Pass
Overall Test Results			Pass	


Laboratory Technician


Approved By

5/4/09
Test Date

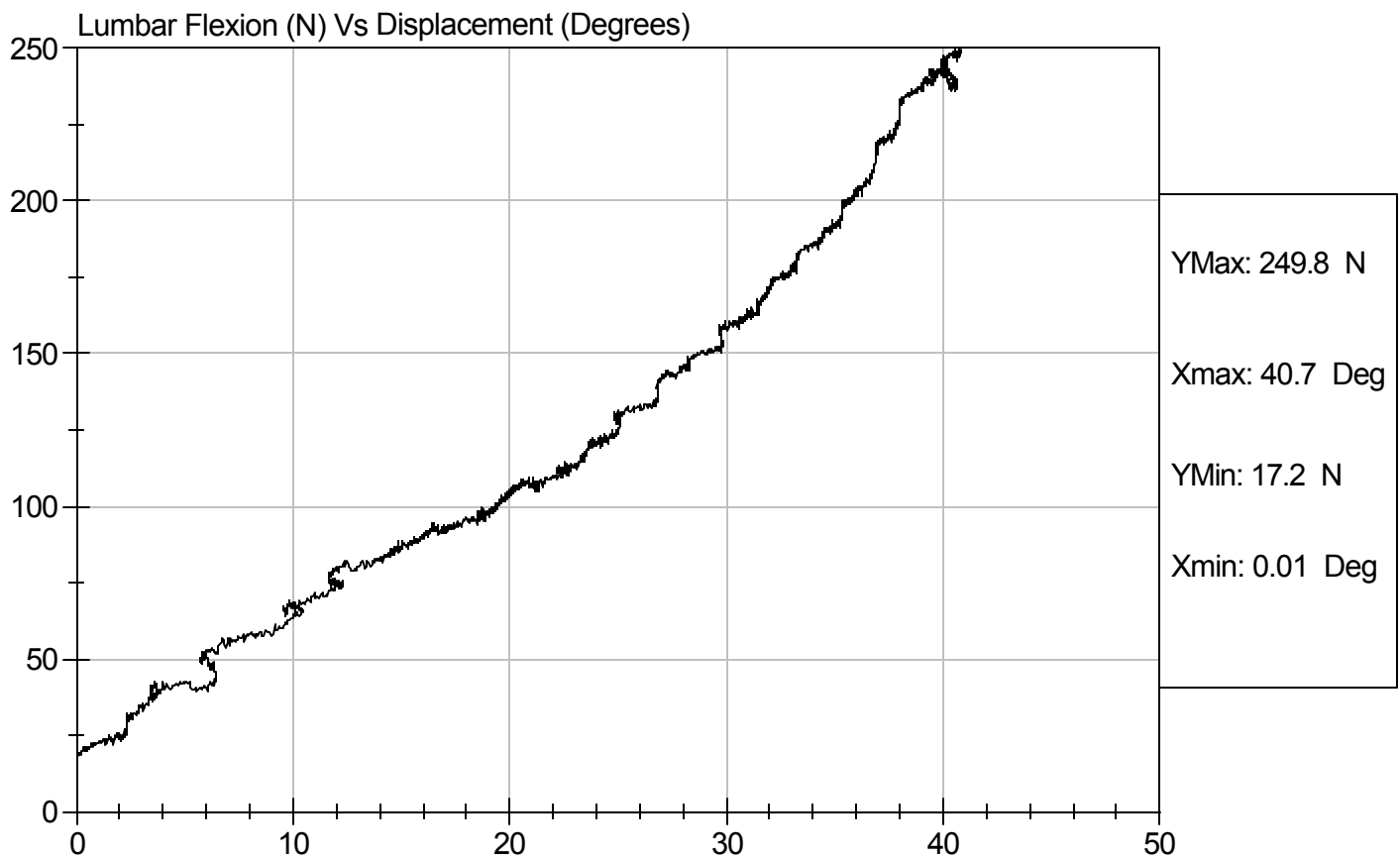


Test Description: Lumbar Flexion

Test Date: 5/4/09

Component: D091015

Speed: 0 ft/sec, 0 m/sec

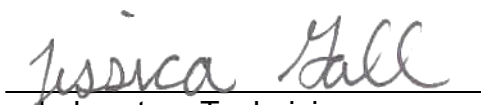


SID/HIII Calibration Data Sheet
Side Impact Dummy
Neck Pendulum Test

ATD Serial No: 271

Test I.D: D091019

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	29	Pass
Impact Velocity		m/s	6.89 to 7.13	7.13	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.22	Pass
	20 msec	m/s	4.12 to 5.10	4.25	Pass
	30 msec	m/s	5.73 to 7.01	5.87	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.82	Pass
Midsaggital Plane Max Rotation		deg	66 to 82	67	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	62	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	80	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	56	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	5	Pass


 Laboratory Technician

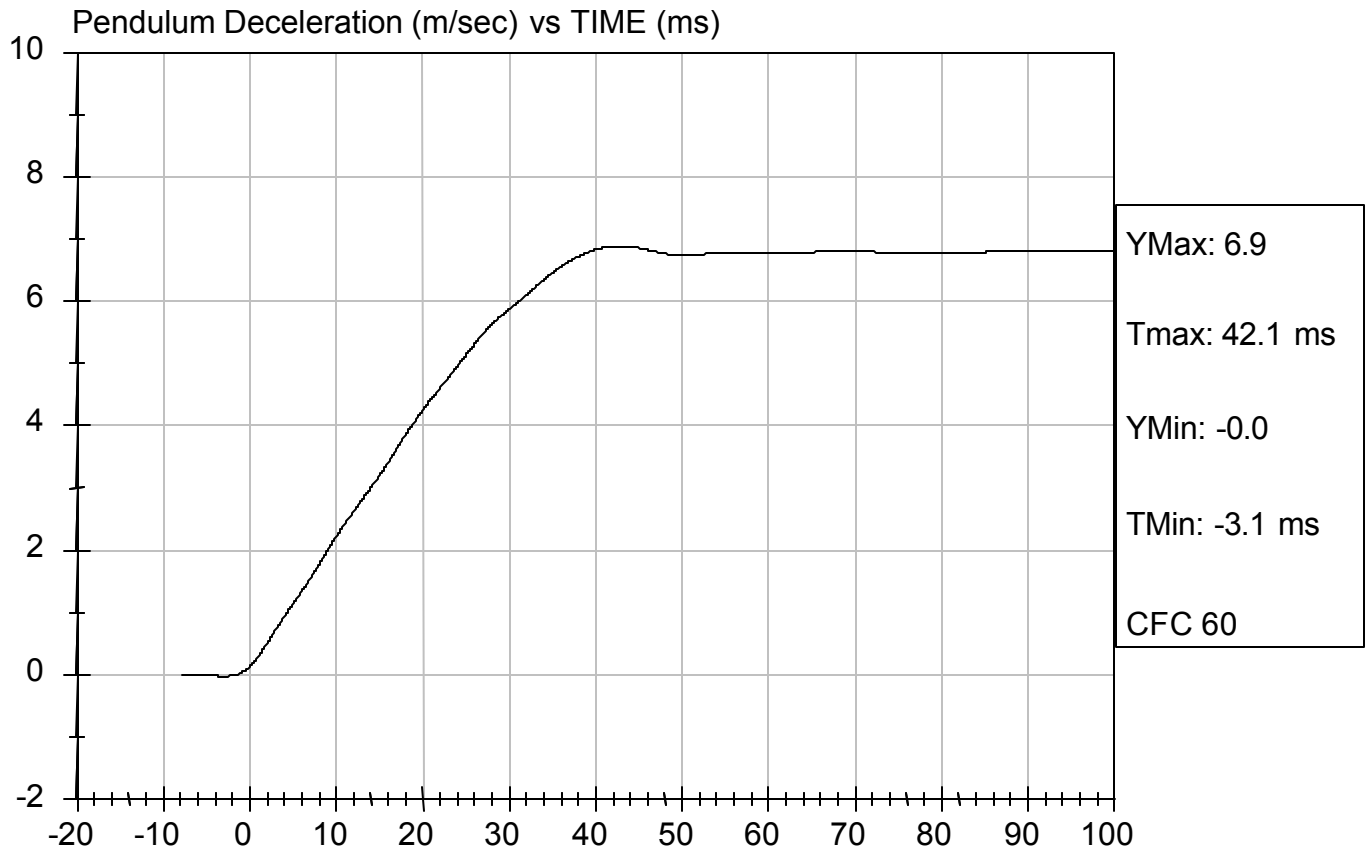

 Approved By

5/4/09
 Test Date



Test Desc: Neck Bending
Component ID: D091019

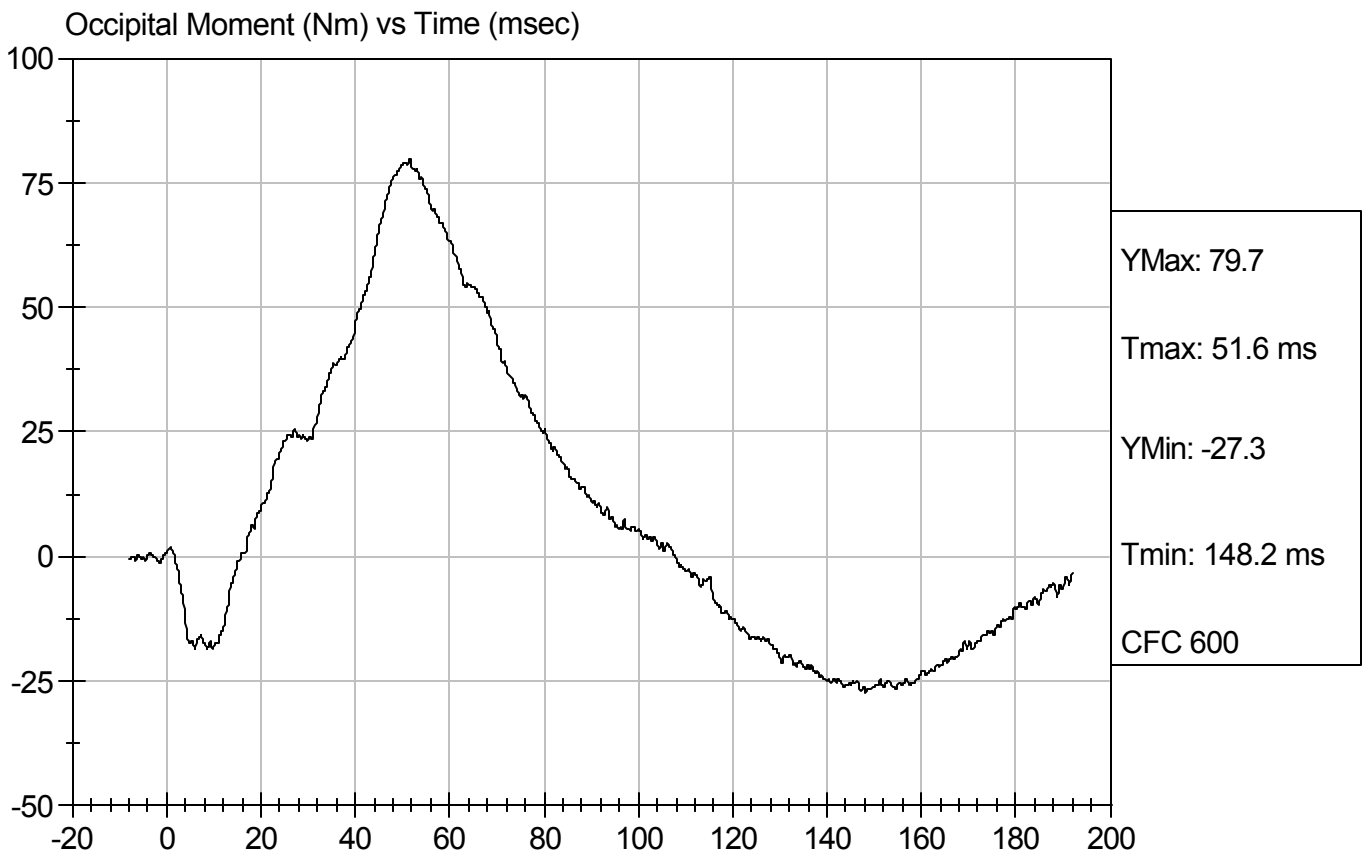
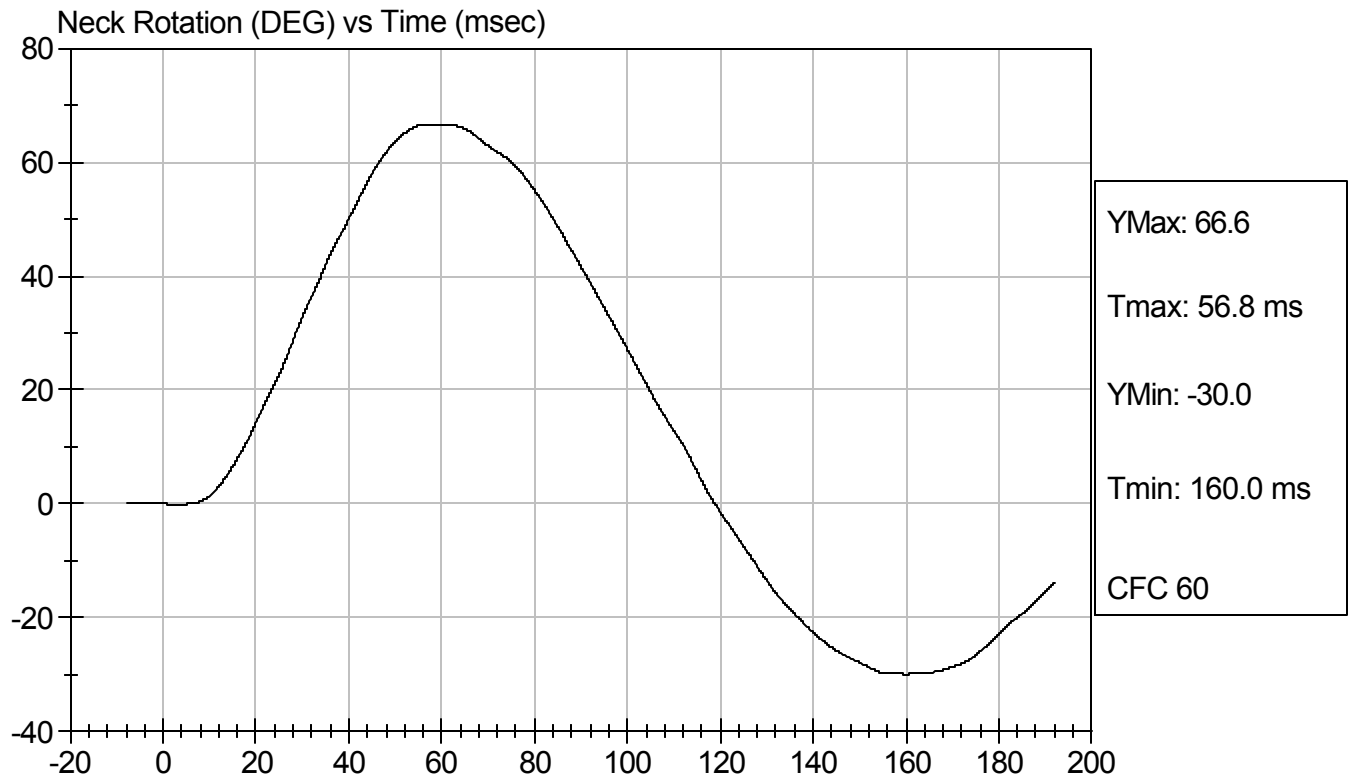
Test Date: 5/4/09
Speed: 23.4 ft/sec, 7.13 m/sec





Test Desc: Neck Bending
Component ID: D091019

Test Date: 5/4/09
Speed: 23.4 ft/sec, 7.13 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: D091161

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Peak Resultant Acceleration	G's	120 to 150	143	Pass
Is Resultant Curve Unimodal?	N/A	15% of peak	Yes	Pass
Peak Longitudinal Acceleration	G's	+/- 15	-9.5	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

5/14/09
Test Date

David Winkelbauer
Approved By



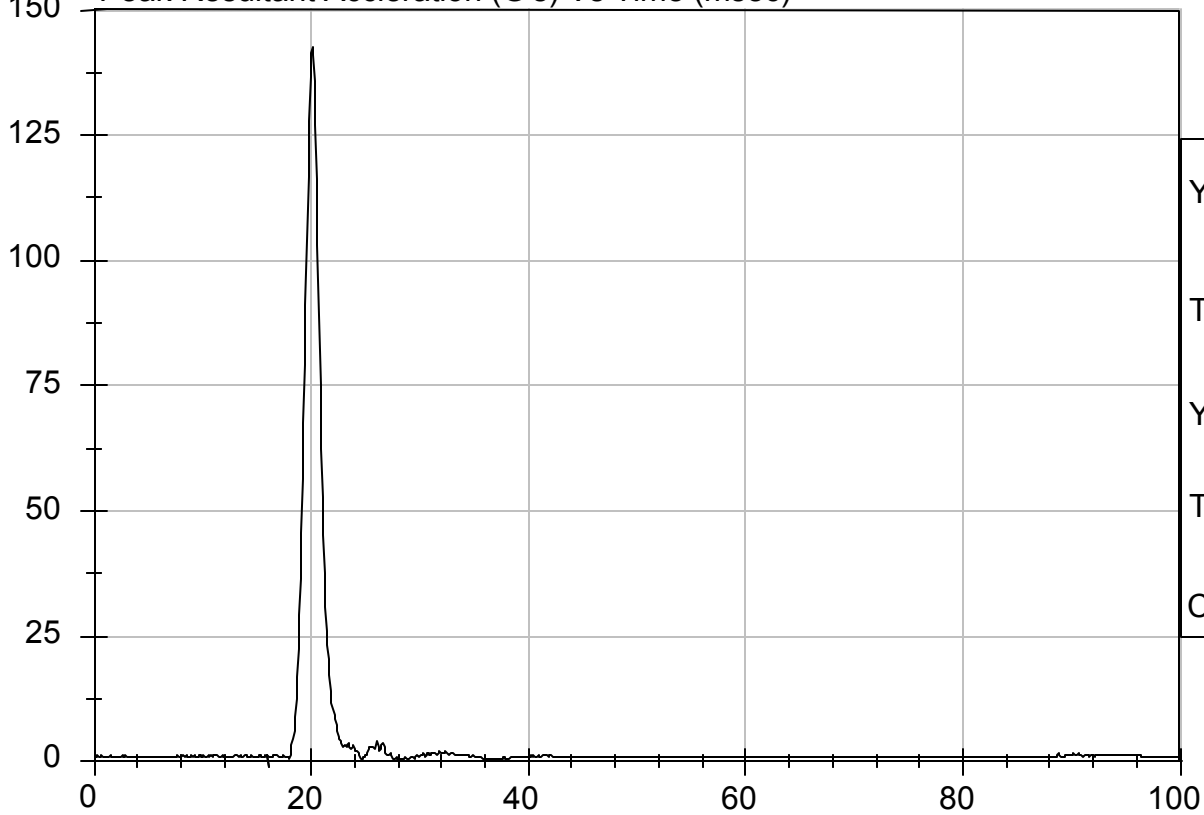
Test Description: Head Drop

Test Date: 5/14/09

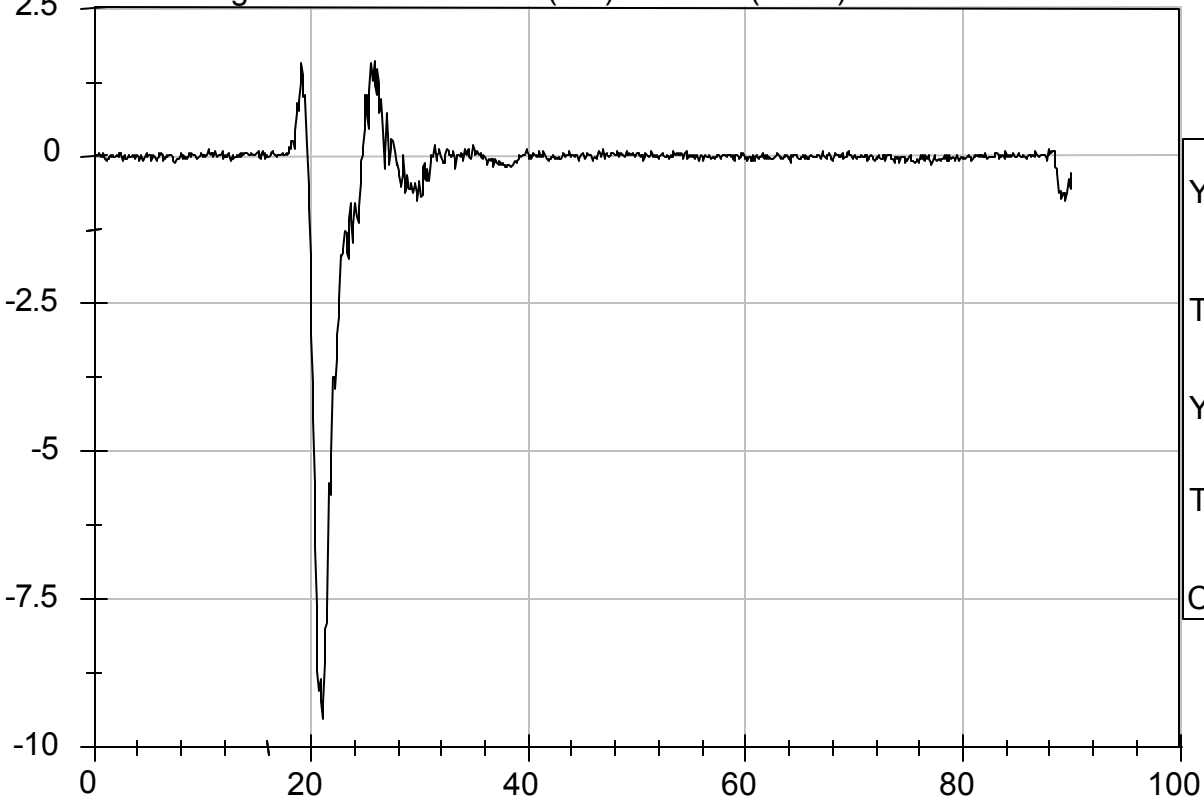
Component: D091161

Speed: 0 ft/s, 0 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: D091162

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	49	Pass
Probe Velocity	m/s	4.22 - 4.31	4.30	Pass
Upper Rib	G's	37 - 46	39	Pass
Lower Rib	G's	37 - 46	39	Pass
Lower Spine	G's	15 - 22	17	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

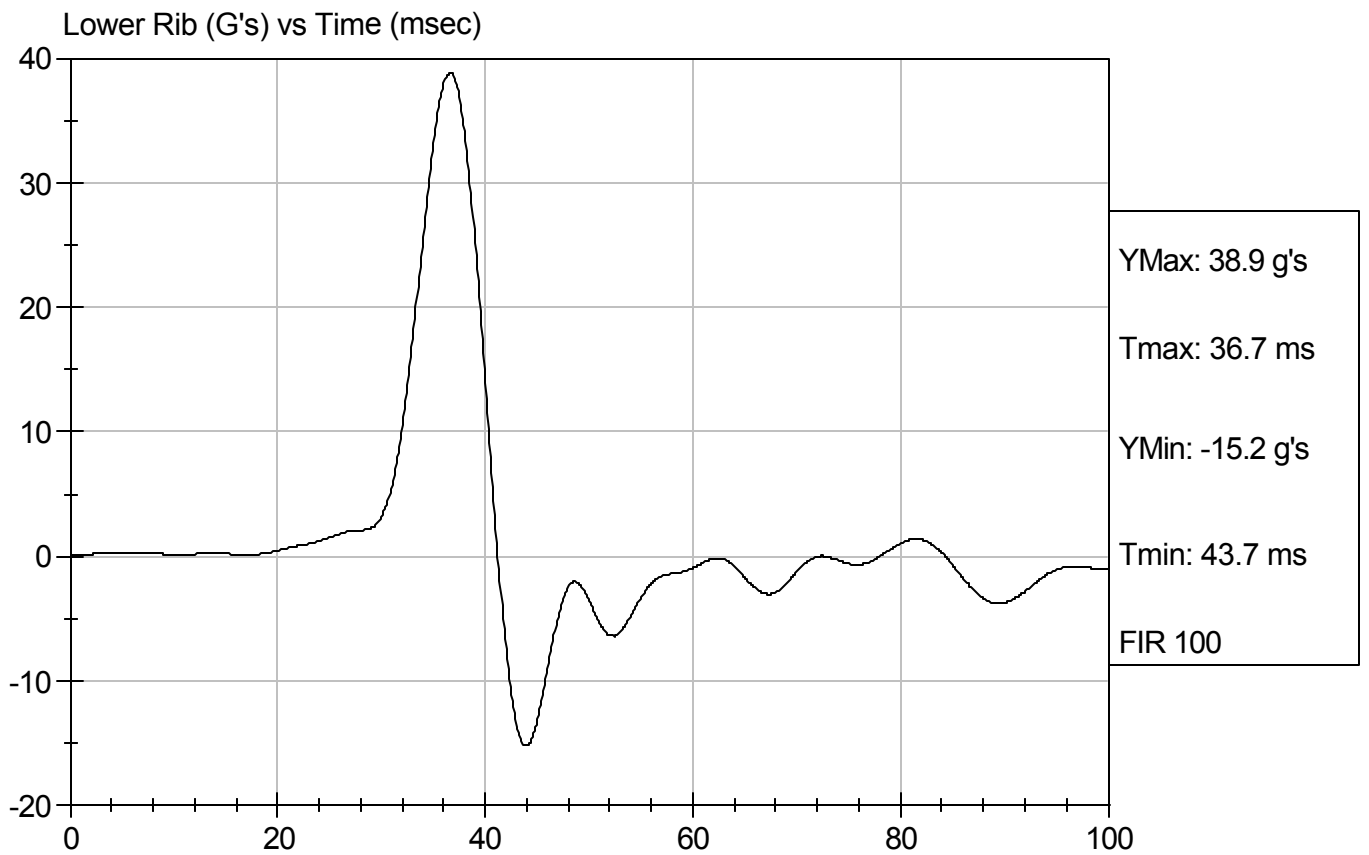
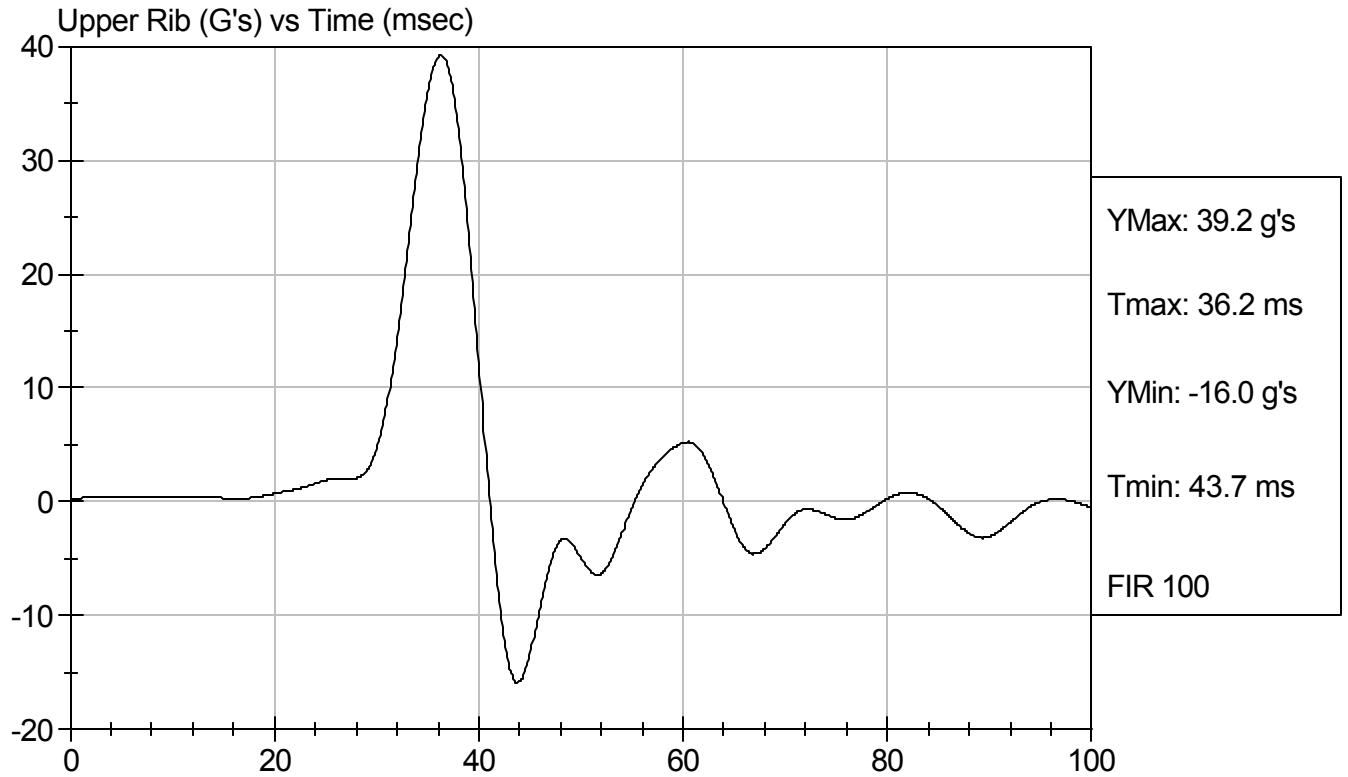
David Winkelbauer
Approved By

5/13/09
Test Date



Test Desc: Thorax Impact
Component ID: D091162

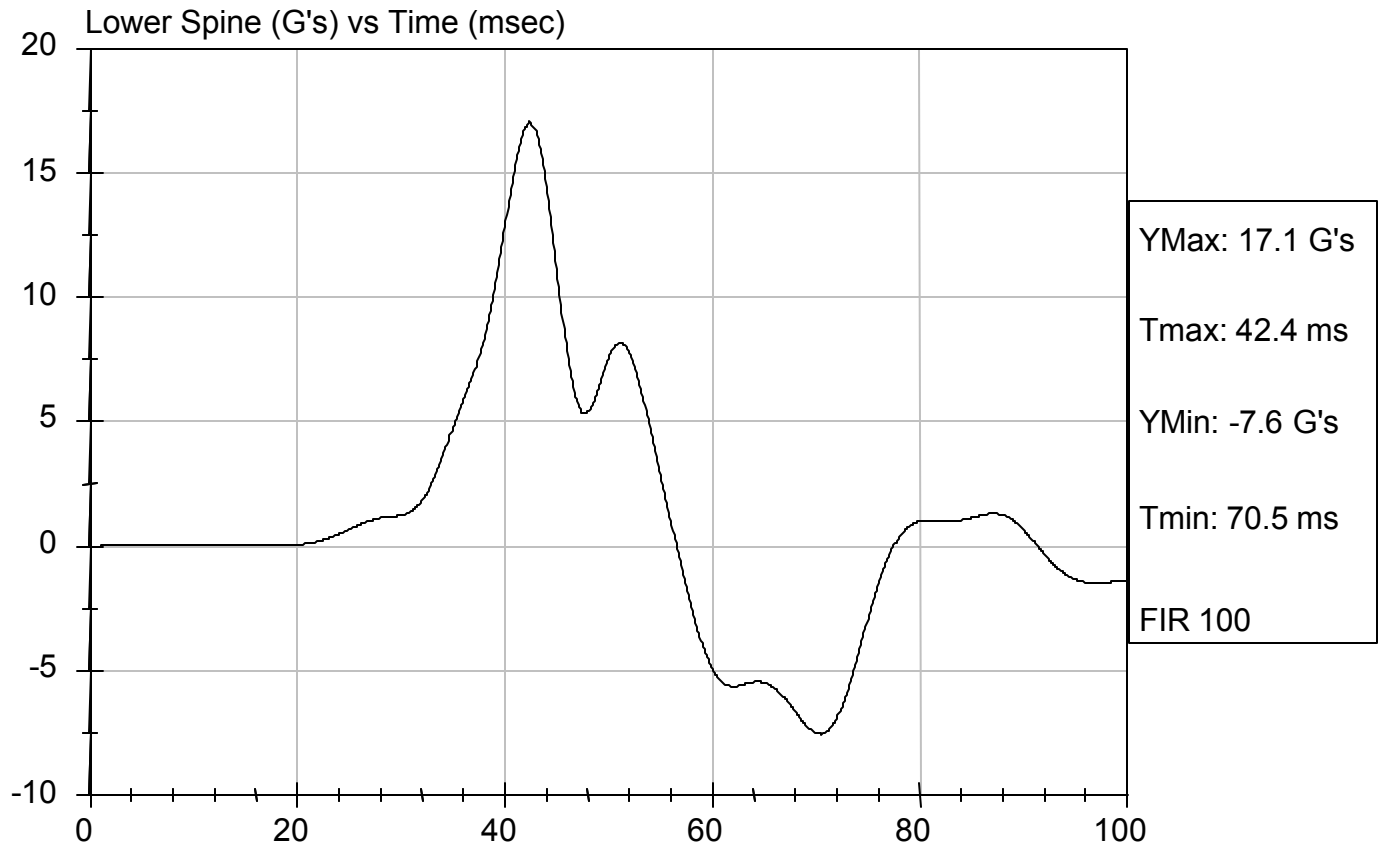
Test Date: 5/13/09
Speed: 14.1 ft/sec, 4.30 m/sec





Test Desc: Thorax Impact
Component ID: D091162

Test Date: 5/13/09
Speed: 14.1 ft/sec, 4.30 m/sec



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

ATD Serial No: 271

Test I.D: D091163

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	49	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	45	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

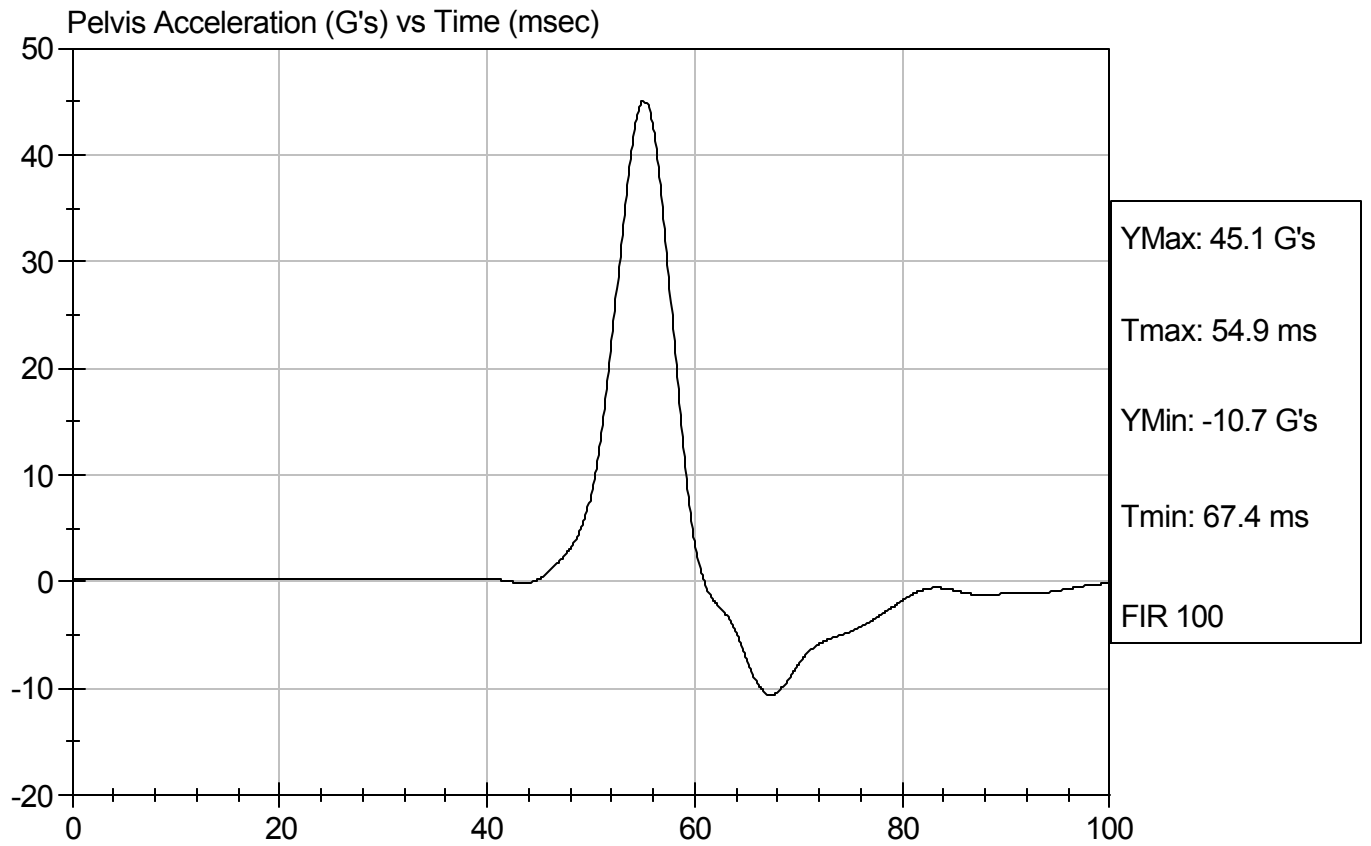
David Winkelbauer
Approved By

5/13/09
Test Date



Test Desc: Pelvis Impact
Component ID: D091163

Test Date: 5/13/09
Speed: 14.1 ft/sec, 4.30 m/sec



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

ATD Serial No: 271

Test I.D: D091164

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Force At 12.7 mm	N	104 -162	143	Pass
Force At 19 mm	N	163 - 222	195	Pass
Force At 25.4 mm	N	222 - 280	267	Pass
Force At 33 mm	N	325 - 391	361	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

5/14/09
Test Date

David Winkelbauer
Approved By

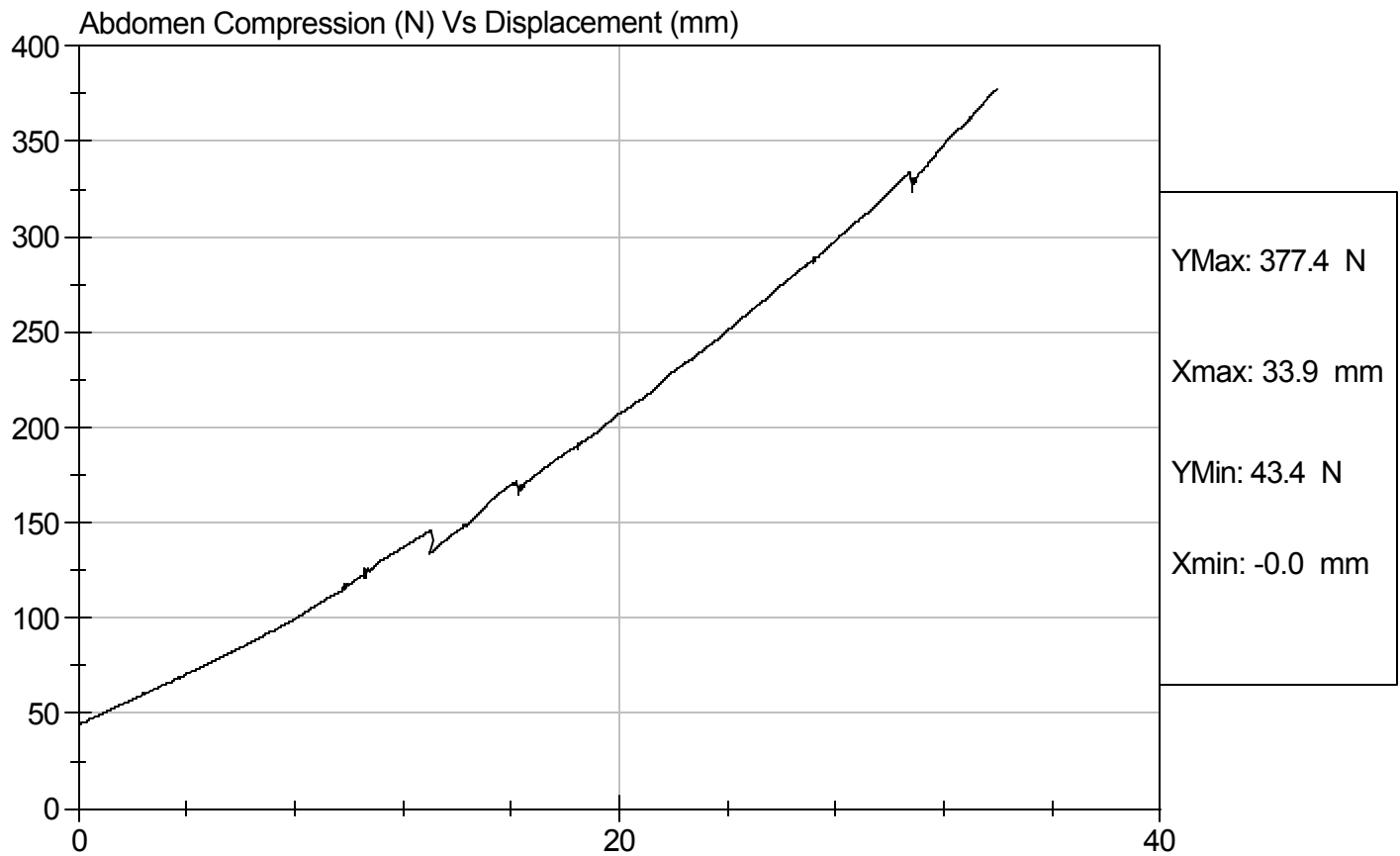


Test Description: Abdomen Compression

Test Date: 5/14/09

Component: D091164

Speed: 0 ft/sec, 0 m/sec

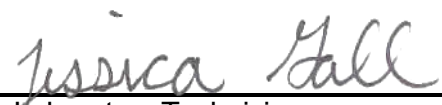


SID/HIII Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 271

Test I.D: D091165

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	129.4	Pass
Force At 30 deg	N	151.2 - 204.6	182.3	Pass
Force At 40 deg	N	204.6 - 258.0	249.8	Pass
Return Angle	Deg	12 Maximum	7	Pass
Overall Test Results			Pass	


Laboratory Technician


Approved By

5/14/09
Test Date

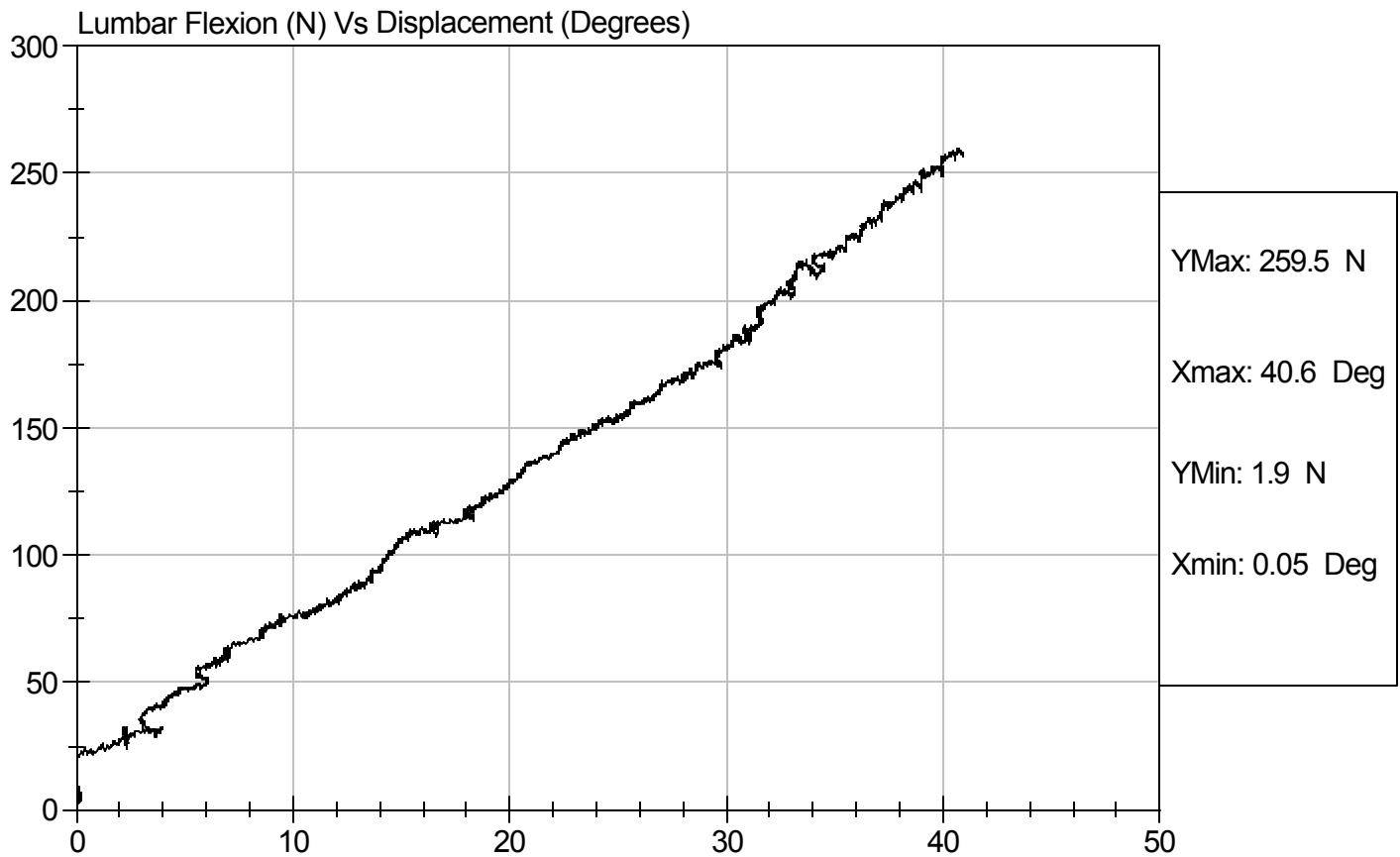


Test Description: Lumbar Flexion

Test Date: 5/14/09

Component: D091165

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: D091169

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	40	Pass
Impact Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.39	Pass
	20 msec	m/s	4.12 to 5.10	4.64	Pass
	30 msec	m/s	5.73 to 7.01	6.45	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.73	Pass
Midsaggital Plane Max Rotation		deg	66 to 82	72	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	58	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	75	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	58	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	12	Pass

Jessica Hall
Laboratory Technician

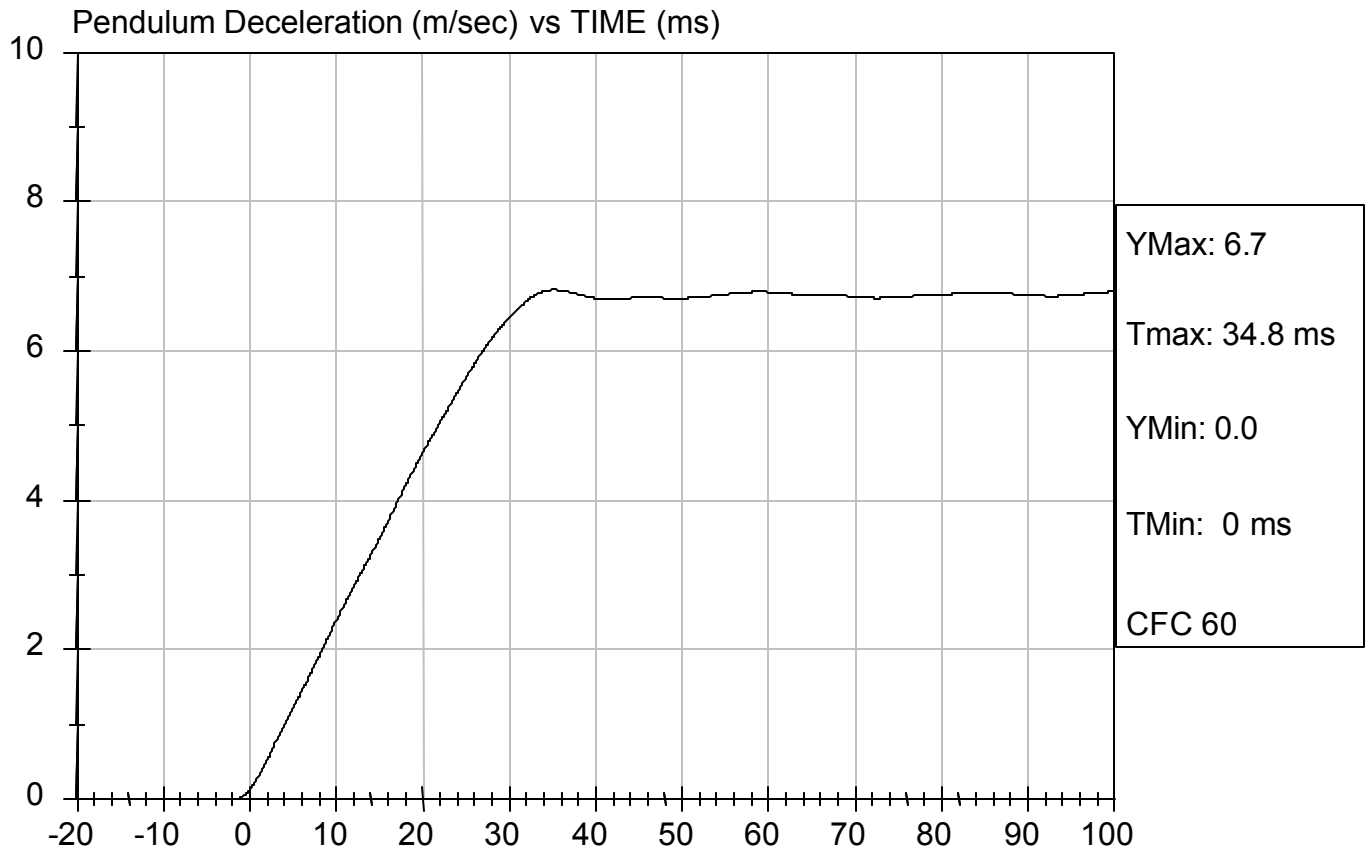
David Winkelbauer
Approved By

5/14/09
Test Date



Test Desc: Neck Bending
Component ID: D091169

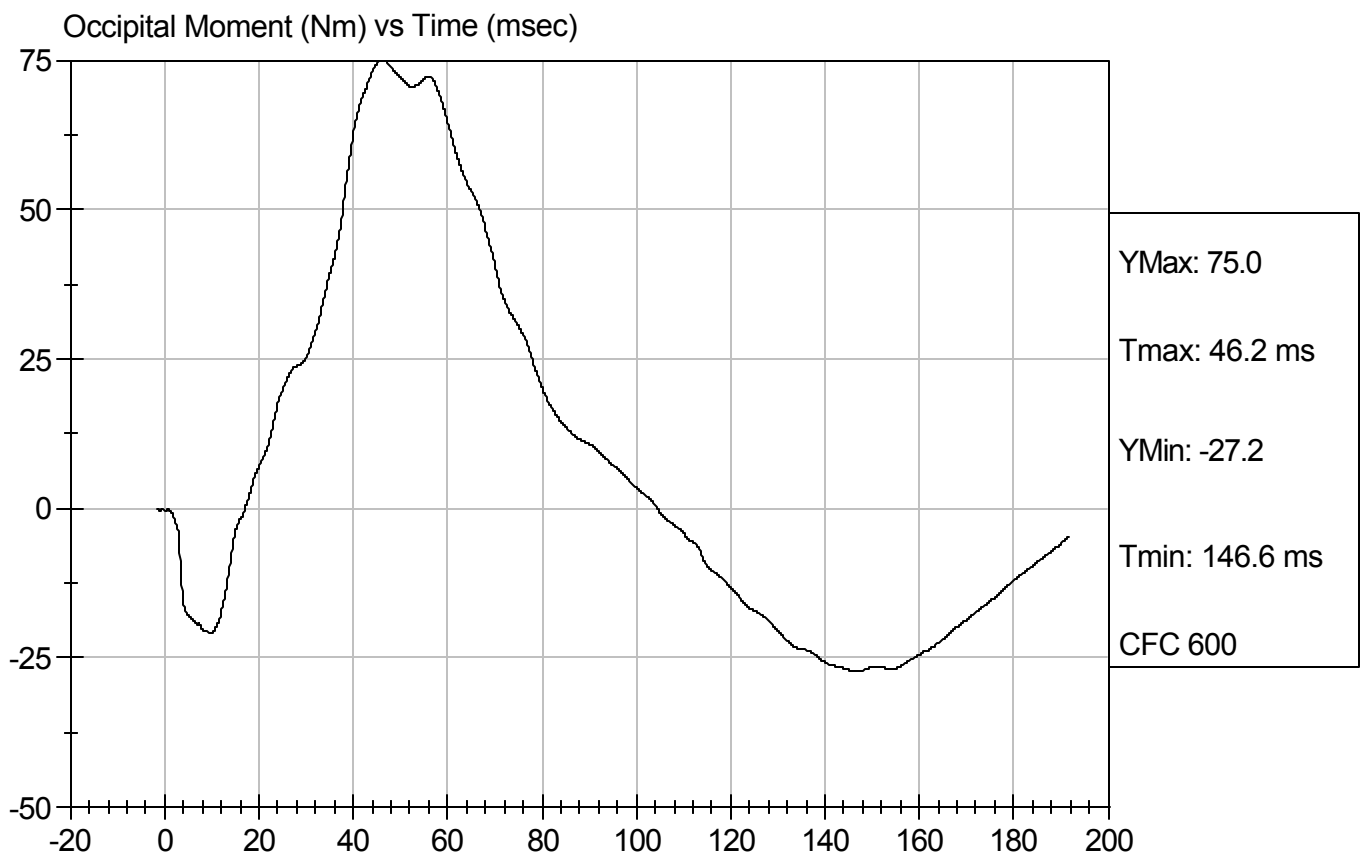
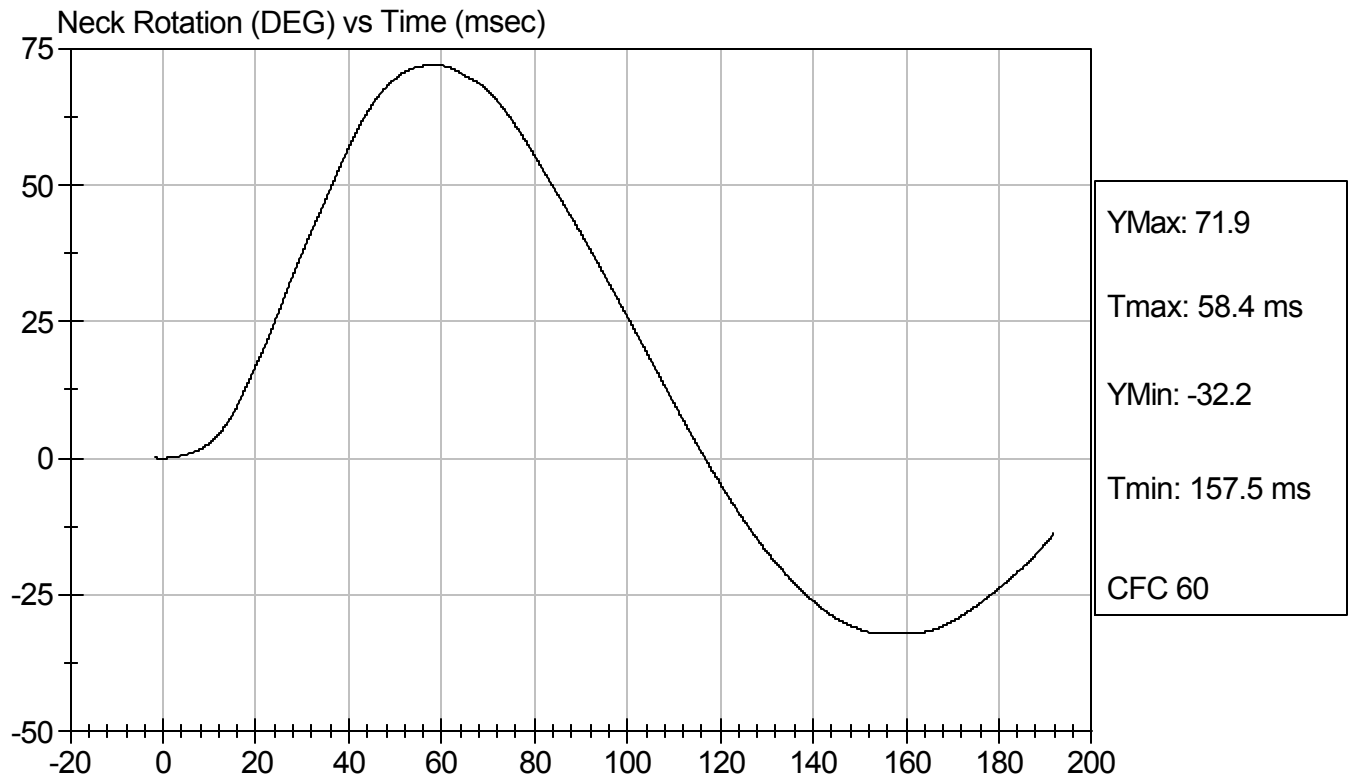
Test Date: 5/14/09
Speed: 22.83 ft/sec, 6.96 m/sec





Test Desc: Neck Bending
Component ID: D091169

Test Date: 5/14/09
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

Jessica Hall
 Laboratory Technician
David Winkelbauer
 Approved By

5/14/09
 Test Date