

REPORT NUMBER: NCAPSIDE-MGA-2010-008

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

**GENERAL MOTORS DE MEXICO, S. DE R.L. DE C.V.
2010 CADILLAC SRX FWD
NHTSA NUMBER: MA0121**

**PREPARED BY:
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Test Date: November 30, 2009

Report Date: December 21, 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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Date: 12/21/2009

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 2010 Cadillac SRX FWD 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 November 30, 2009. The impact velocity of the Moving Deformable Barrier (MDB) was 62.1 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 238 mm at level 3. The test vehicle's occupant performance is as follows: <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>DRIVER</u></th> <th style="text-align: center;"><u>PASSENGER</u></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) Accel., g</td> <td style="text-align: center;">19.6</td> <td style="text-align: center;">36.1</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td style="text-align: center;">22.3</td> <td style="text-align: center;">35.2</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td style="text-align: center;">26.8</td> <td style="text-align: center;">42.7</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td style="text-align: center;">25</td> <td style="text-align: center;">39</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td style="text-align: center;">30.4</td> <td style="text-align: center;">42.5</td> </tr> <tr> <td>HIC</td> <td style="text-align: center;">79</td> <td style="text-align: center;">90</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>PASSENGER</u>	Left Upper Rib (LUR) Accel., g	19.6	36.1	Left Lower Rib (LLR) Accel., g	22.3	35.2	Lower Spine (T ₁₂) Accel., g	26.8	42.7	Thoracic Trauma Index (TTI)	25	39	Pelvis (PEV) Accel., g	30.4	42.5	HIC	79	90
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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. DTNH22-09-D-00124. The purpose of this test was to evaluate side impact protection in a 2010 Cadillac SRX FWD manufactured by General Motors de Mexico, S. de R.L. de C.V.

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 Cadillac SRX FWD 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 62.1 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 2205.4 kg and the test weight of the MDB was 1361.5 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on November 30, 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 238 mm at level 3, 1650 mm rearward of the vertical impact point. The driver and passenger SID/HIIIs, Serial Nos. 271 and 272 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	79	37.5	71.8	25	30.4
Passenger	90	43.5	79.5	39	42.5

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

Left Front Sill Y

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DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Cadillac SRX FWD
 Test Program: NCAP Side Impact

NHTSA No. MA0121
 Test Date: 11/30/2009

TEST VEHICLE INFORMATION

Make	Cadillac
Model	SRX
Body Style	MPV
NHTSA No.	MA0121
VIN	3GYFNGEY7AS535639
Color	Black
Delivery Date	11/09/2009
Odometer Reading (mile)	58 miles
Dealer	Crest Cadillac Inc.
Transmission	Automatic
Final Drive	Front
Number of Cylinders	6
Engine Displacement (L)	3.0
Engine Placement	Lateral
Automatic Door Locks (ADL)	Yes
Owner's Manual Details Instructions on Disabling ADLs	N/A

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	Yes
All Wheel Drive	No
Power Seats	Yes
Pretensioners	Yes
Load Limiters	Yes
Bucket Seats	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors de Mexico, S. de R.L. de C.V.
Date of Manufacture	10/09

GVWR (kg)	2480
GAWR Front (kg)	1410
GAWR Rear (kg)	1300

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bucket		
Number Of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				550
Cargo Wt. (RCLW) (kg)				210

DATA SHEET NO. 1 (continued)**GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2010 Cadillac SRX FWD
 Test Program: NCAP Side Impact

NHTSA No. MA0121
 Test Date: 11/30/2009

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	554.3	415.9		594.7	547.9	
Right	kg	576.1	367.9		579.7	483.1	
Ratio	%	59.0	41.0		53.3	46.7	
Totals	kg	1130.4	783.8	1914.2	1174.4	1031.0	2205.4

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1914.2
Weight of 2 P572M ATDs	kg	161.5
Rated Cargo/Luggage Weight (RCLW)	kg	136
Calculated Vehicle Target Weight (TVTW)	kg	2211.7

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

Weight of Ballast in Truck Bed (kg): 106.6

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	821	821	849	853	1150
As Tested	mm	817	817	820	821	1313
Fully Loaded	mm	805	807	819	819	

TEST VEHICLE VERTICAL IMPACT LINE DATA

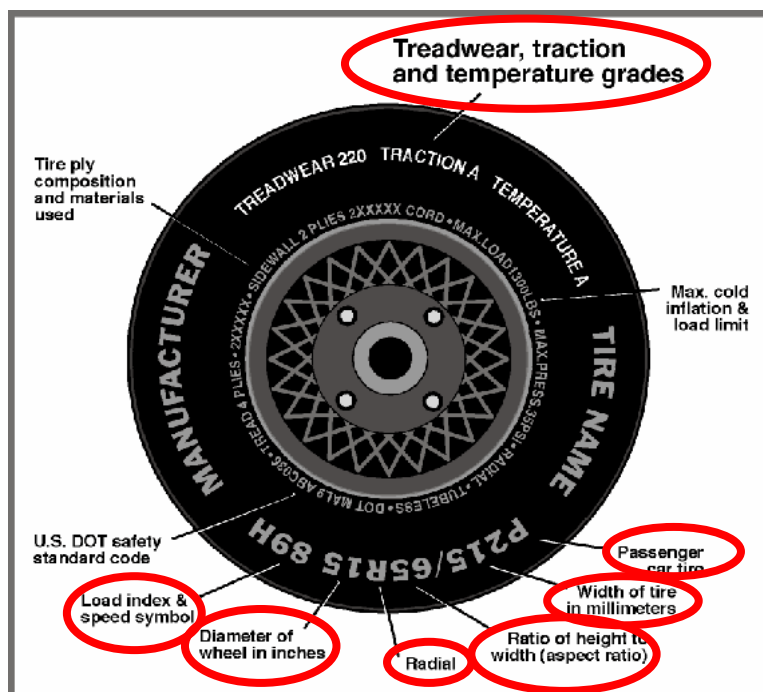
Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2808
Target Impact Point Aft of Front Axle	mm	464
Actual Impact Point Aft of Front Axle	mm	461

DATA SHEET NO. 2

TEST VEHICLE TIRE INFORMATION

Test Vehicle: 2010 Cadillac SRX FWD
 Test Program: NCAP Side Impact

NHTSA No. MA0121
 Test Date: 11/30/2009



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Test Pressure (kPa)	240	240
Recommended Tire Size	P235/65R18	P235/65R18
Tire Size on Vehicle	P235/65R18	P235/65R18
Tire Manufacturer	Michelin	Michelin
Tire Name	Latitude Tour	Latitude Tour
Tire Type	Passenger	Passenger
Tire Width (mm)	235	235
Ratio of Height to Width (aspect ratio)	65	65
Radial	R	R
Wheel Diameter	18	18
Load Index & Speed Symbol	104H	104H
Treadwear	440	440
Traction Grade	A	A
Temperature Grade	A	A

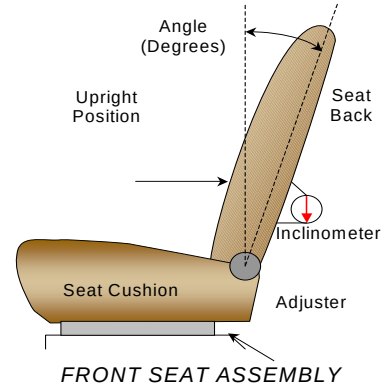
DATA SHEET NO. 3 **TEST VEHICLE INFORMATION**

Test Vehicle: 2010 Cadillac SRX FWD
 Test Program: NCAP Side Impact

NHTSA No. MA0121
 Test Date: 11/30/2009

NOMINAL 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's seat, set seat back at -13.9 degrees measured from upright position at the headrest post. Place the left rear passenger's seat in the 3rd detent out of 6 total.

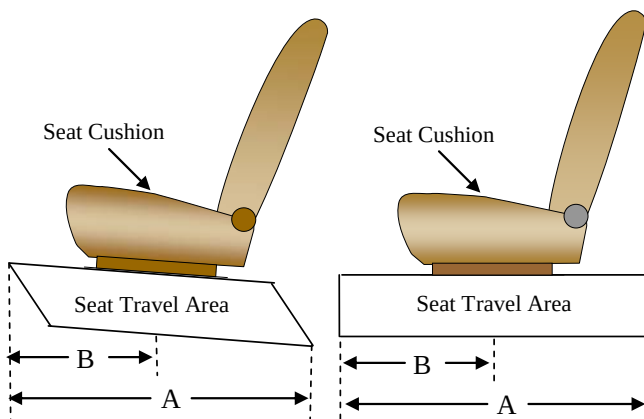


Driver seat back angle: -13.9 degrees at headrest post

Passenger seat back angle: 3rd detent (forward-most defined as 0)

SEAT FORE/AFT POSITIONS

	Total Fore/Aft Travel	Placed in position #
Driver Seat	340 mm	170 mm
Rear Seat	Fixed	Fixed



DATA SHEET NO. 3 (CONTINUED)

TEST VEHICLE INFORMATION

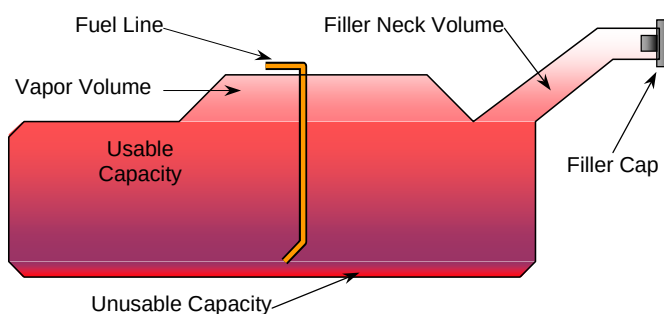
Test Vehicle: 2010 Cadillac SRX FWD
Test Program: NCAP Side Impact

NHTSA No. MA0121
Test Date: 11/30/2009

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	79.5
Usable Capacity of "Optional" Tank	
92-94% of Usable Capacity	73.1 to 74.7
Actual Amount of Solvent used	73.8
1/3 of Usable Capacity	26.5

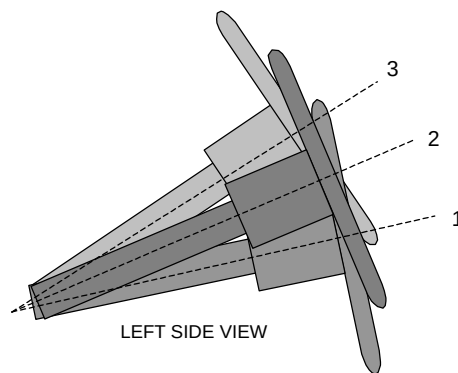
The test vehicle is equipped with an electric fuel pump. If ignition button is at "On" position and engine is not running, the fuel pump only operates for a short duration to prime the fuel system. If the engine is running, then the fuel pump will operate continuously. To pressurize the fuel system during the test, crank the engine for 30 seconds right before the test.



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	181	68.8
Geometric center position No. 2	156	67.2
Uppermost position No. 3	131	65.6

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

Test Vehicle: 2010 Cadillac SRX FWD
Test Program: NCAP Side Impact

NHTSA No. MA0121
Test Date: 11/30/2009

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	62.1
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.0
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.7

**POST TEST OBSERVATIONS
MDB LEFT EDGE IMPACT POINT DATA**

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	3 forward
Vertical Offset	mm	+/-20	7 down

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

Test Vehicle: 2010 Cadillac SRX FWD
 Test Program: NCAP Side Impact

NHTSA No. MA0121
 Test Date: 11/30/2009

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat SID/HIII	Rear Seat SID/HIII
Dummy Type / Serial No.	SID HIII / 271	SID HIII / 272
Head Contact	Curtain Airbag, Headrest	Curtain Airbag, Headliner, Headrest
Upper Torso Contact	Side Airbag	Door Panel
Lower Torso Contact	Side Airbag	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 door was locked; Non-struck side door was unlocked	Struck side door was locked; Non-struck side door was 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

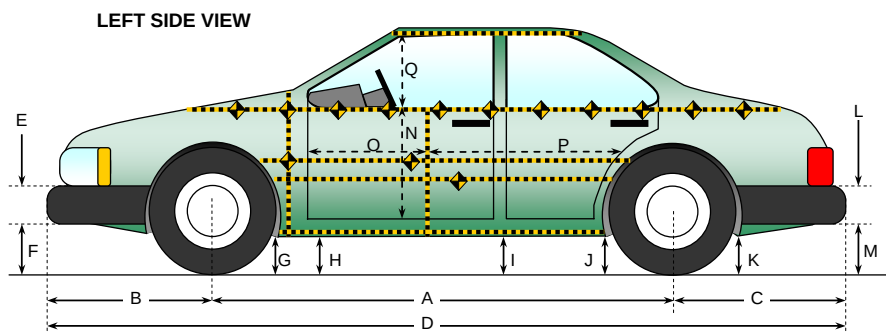
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint 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 Cadillac SRX FWD
 Test Program: NCAP Side Impact

NHTSA No. MA0121
 Test Date: 11/30/2009



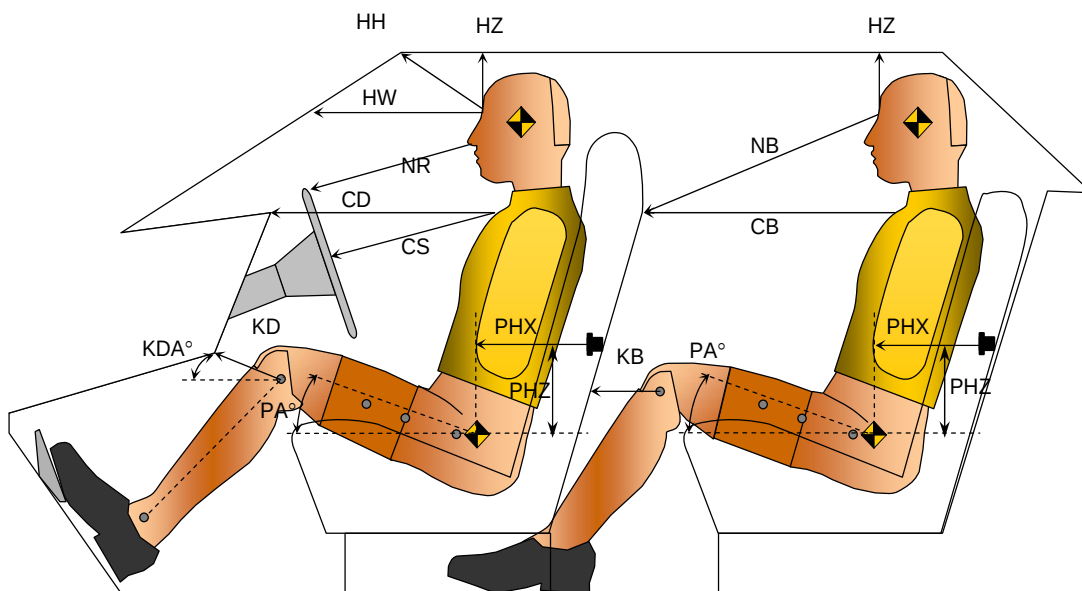
All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2808	2813	-5
B	Front Axle to FSOV	1029	1029	0
C	Rear Axle to RSOV	1010	1003	7
D	Total Length at Centerline	4847	4845	2
E	Front Bumper Thickness	163	163	0
F	Front Bumper Bottom to Ground	178	178	0
G	Sill Height at Front Wheel Well	258	272	-14
H	Sill Height at Front Door Leading Edge	263	263	0
I	Sill Height at "B" Pillar	280	281	-1
J1	Sill Height at Rear Wheel Well	265	273	-8
J2	Pinch Weld Height at Rear Wheel Well	263	270	-7
K	Sill Height Aft of Rear Wheel Well	310	325	-15
L	Rear Bumper Thickness	160	160	0
M	Rear Bumper Bottom to Ground	425	438	-13
N	Sill Height to Window Bottom Sill	836	850	-14
O	Front Door Leading Edge to Impact CL	774	770	4
P	Rear Door Trailing Edge to Impact CL	1177	1193	-16
Q	Front Window Opening	433	433	0
R	Right Side Length	3713	3713	0
S	Left Side Length	3713	3703	10
T	Vehicle Width at "B" Post	1865	1692	173

DATA SHEET NO. 7
SID/HII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2010 Cadillac SRX FWD
 Test Program: NCAP Side Impact

NHTSA No. MA0121
 Test Date: 11/30/2009

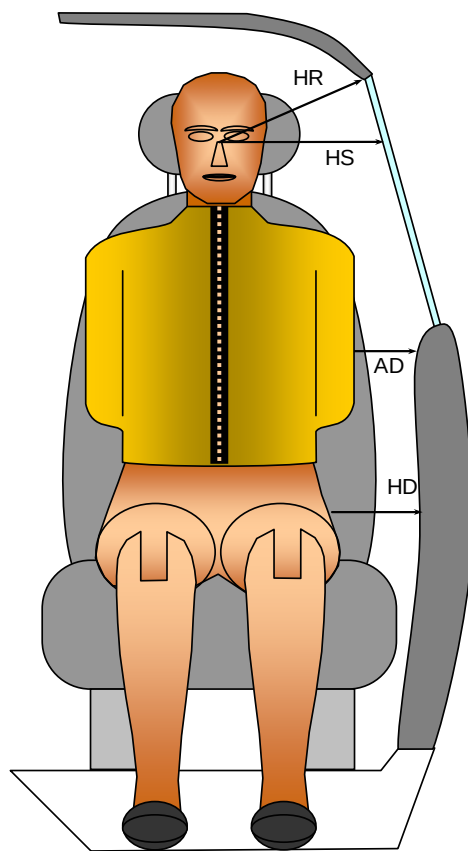


Driver Code	Pass. Code	Measurement Description	Driver S/N 271		Passenger S/N 272	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	443			
HW		Head to Windshield	753			
HZ	HZ	Head to Roof	205		159	
NR	NB	Nose to Rim/Nose to Seatback	445		620	
CD	CB	Chest to Dash or Seatback	561		522	
CS		Chest to Steering Wheel	351			
KDL	KBL	Left Knee to Dash or Seatback	174	29.9	215	24.3
KDR	KBR	Right Knee to Dash or Seatback	144	31.2	194	30.4
PA	PA	Pelvic Angle		23.7		23.8
PHX	PHX	H-Point to Striker (X-Axis)	195		254	
PHZ	PHZ	H-Point to Striker (Z-Axis)	120		250	

DATA SHEET NO. 8
SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2010 Cadillac SRX FWD
 Test Program: NCAP Side Impact

NHTSA No. MA0121
 Test Date: 11/30/2009



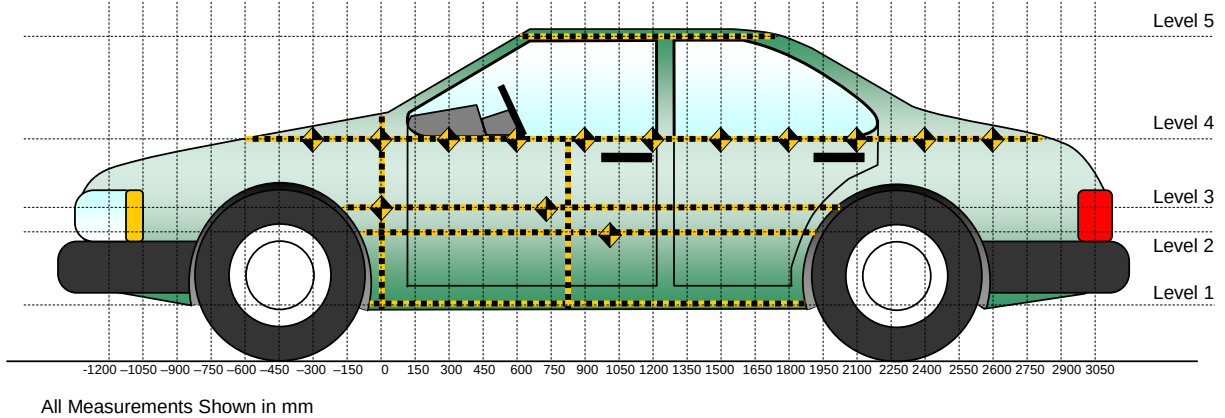
FRONT VIEW OF DUMMY

Code	Measurement Description	Units	Driver S/N 271	Passenger S/N 272
HR	Head to Side Header	mm	202	160
HS	Head to Side Window / C-Post Trim	mm	338	195
AD	Arm to Door	mm	109	87
HD	H-Point to Door	mm	166	153

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

Test Vehicle: 2010 Cadillac SRX FWD
 Test Program: NCAP Side Impact

NHTSA No. MA0121
 Test Date: 11/30/2009



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	-15	2250	1600
4	Window Sill	37	1200	1125
3	Mid Door	238	1650	740
2	Occupant H-Point	227	1650	640
1	Sill Top	46	1650	320
	Maximum Penetration	238		

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2010 Cadillac SRX FWD
 Test Program: NCAP Side Impact

NHTSA No. MA0121
 Test Date: 11/30/2009

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-300				265					265					0	
-150			151	263				169	269				18	6	
0	232	165	159	262		242	213	185	261		10	48	26	-1	
150	234	173	170	260		241	274	296	237		7	101	126	-23	
300	234	172	169	261		247	317	329	251		13	145	160	-10	
450	233	171	169	260		253	318	352	255		20	147	183	-5	
600	233	170	169	262		255	335	366	258		22	165	197	-4	
750	233	171	169	262	508	259	350	375	261	498	26	179	206	-1	-10
900	233	171	169	265	502	260	367	381	270	491	27	196	212	5	-11
1050	233	172	169	265	500	265	352	350	279	493	32	180	181	14	-7
1200	233	174	171	268	499	270	340	377	305	490	37	166	206	37	-9
1350	234	175	173	270	496	274	360	402	289	489	40	185	229	19	-7
1500	236	176	176	272	494	279	381	411	281	485	43	205	235	9	-9
1650	237	178	178	276	493	283	405	416	275	484	46	227	238	-1	-9
1800	243	176	177	283	495	277	377	392	272	482	34	201	215	-11	-13
1950		161	165	288	500		255	255	273	488		94	90	-15	-12
2100			154	297	505			188	283	490			34	-14	-15
2250				307	515				302	500				-5	-15

Reference plane is parallel to test vehicle longitudinal centerline.

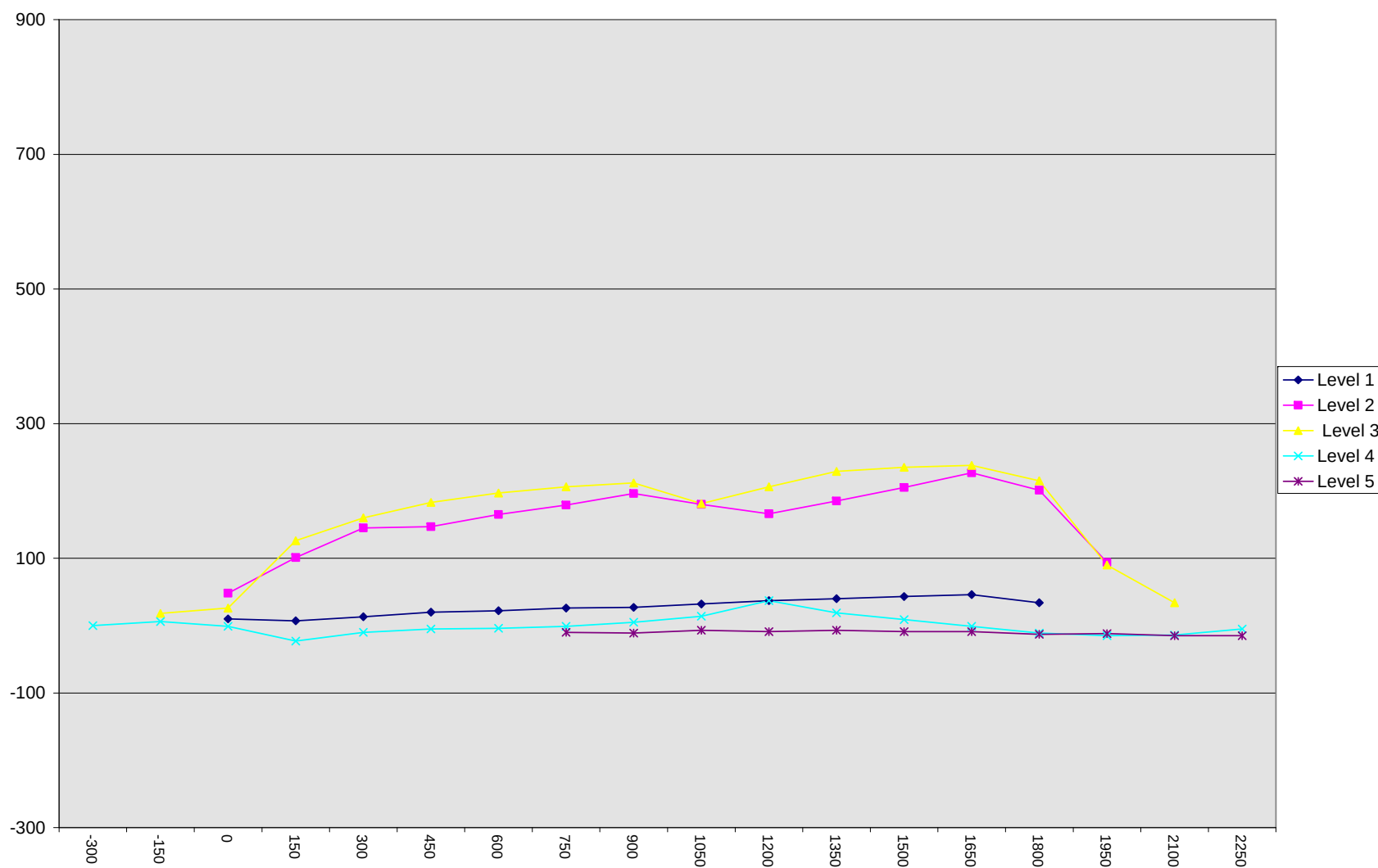
Given dimensions = Reference plane to car body

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

Test Vehicle: 2010 Cadillac SRX FWD
Test Program: NCAP Side Impact

NHTSA No. MA0121
Test Date: 11/30/2009

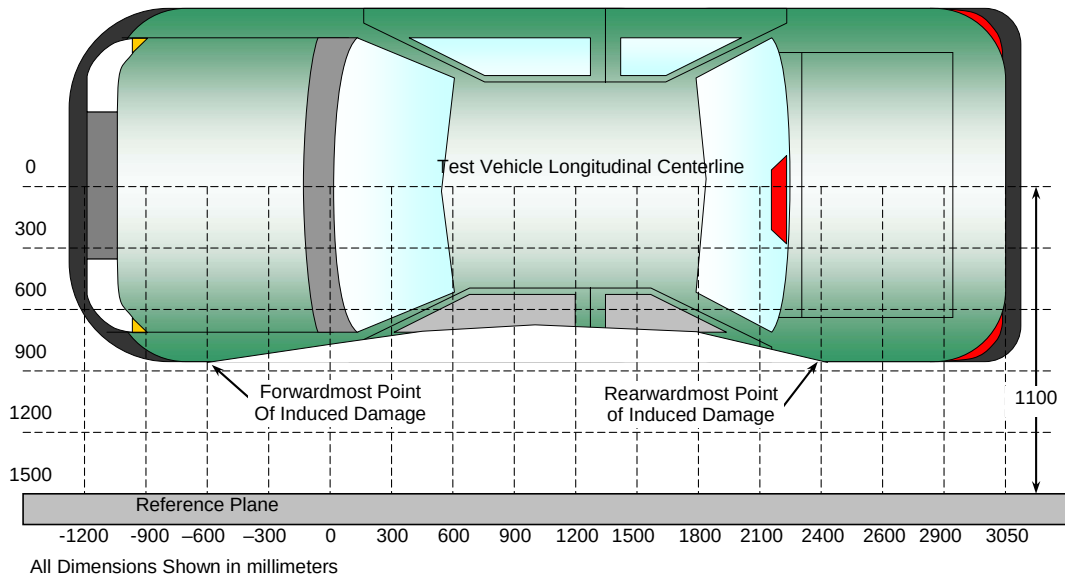
16



DATA SHEET NO. 11
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2010 Cadillac SRX FWD
 Test Program: NCAP Side Impact

NHTSA No. MA0121
 Test Date: 11/30/2009



TOP VIEW

DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	2250	4	307	302	-5
2	1720	3	178	421	243
3	1210	3	171	379	208
4	695	3	169	374	205
5	190	3	170	314	144
6	-300	4	265	265	0

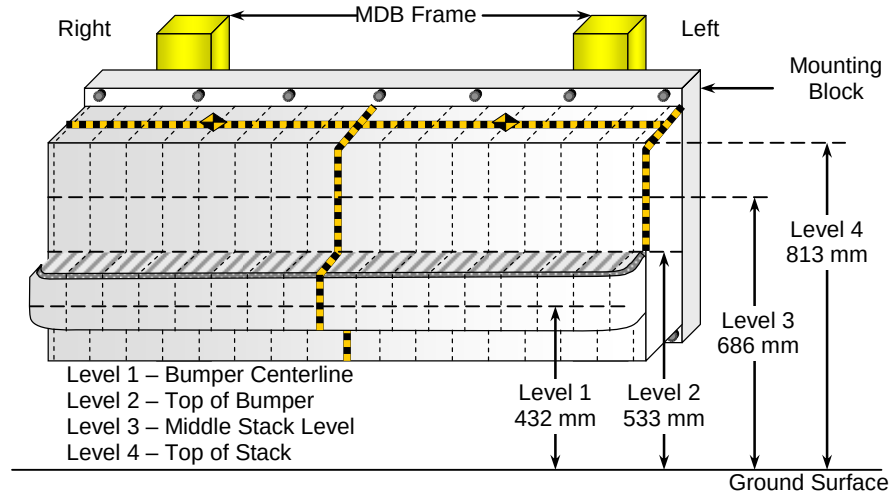
Reference plane is parallel to test vehicle longitudinal centerline.
 Given dimensions = Reference plane to car body.

DATA SHEET NO. 12

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2010 Cadillac SRX FWD
 Test Program: NCAP Side Impact

NHTSA No. MA0121
 Test Date: 11/30/2009



DEFORMABLE BARRIER STATIC CRUSH

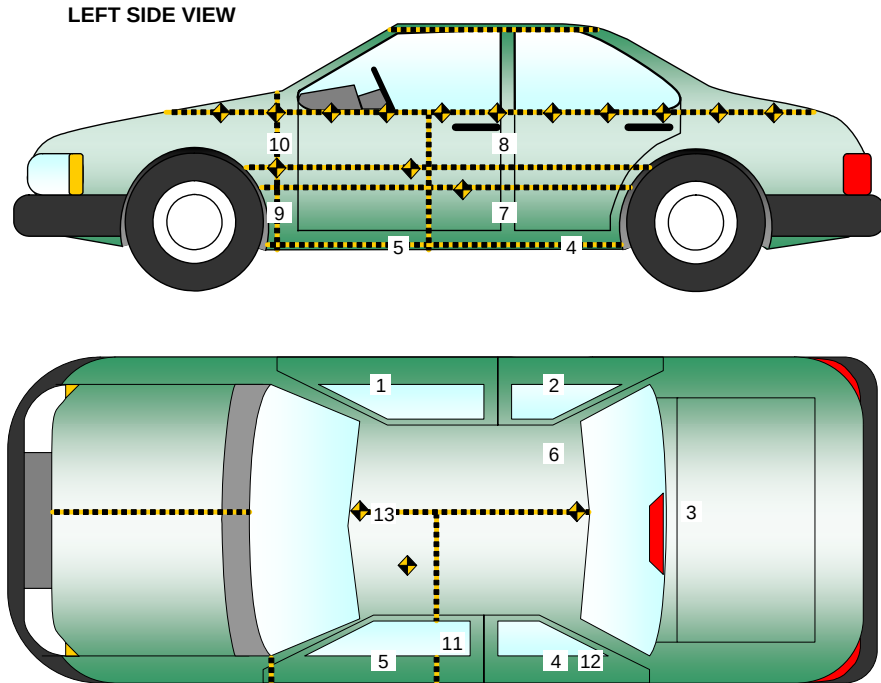
Stack Level	Distance Right of Center								C _L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	258	251	255	254	260	257	256	257	260	257	256	257	254	256	256	257	257
2	148	146	139	145	132	129	135	135	148	146	148	152	155	155	153	153	166
3	95	65	65	75	79	100	119	113	94	72	75	78	85	95	107	129	158
4	103	90	73	59	65	88	116	125	102	84	83	88	99	108	130	158	195

All Dimensions in mm

DATA SHEET NO. 13
VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2010 Cadillac SRX FWD
 Test Program: NCAP Side Impact

NHTSA No. MA0121
 Test Date: 11/30/2009



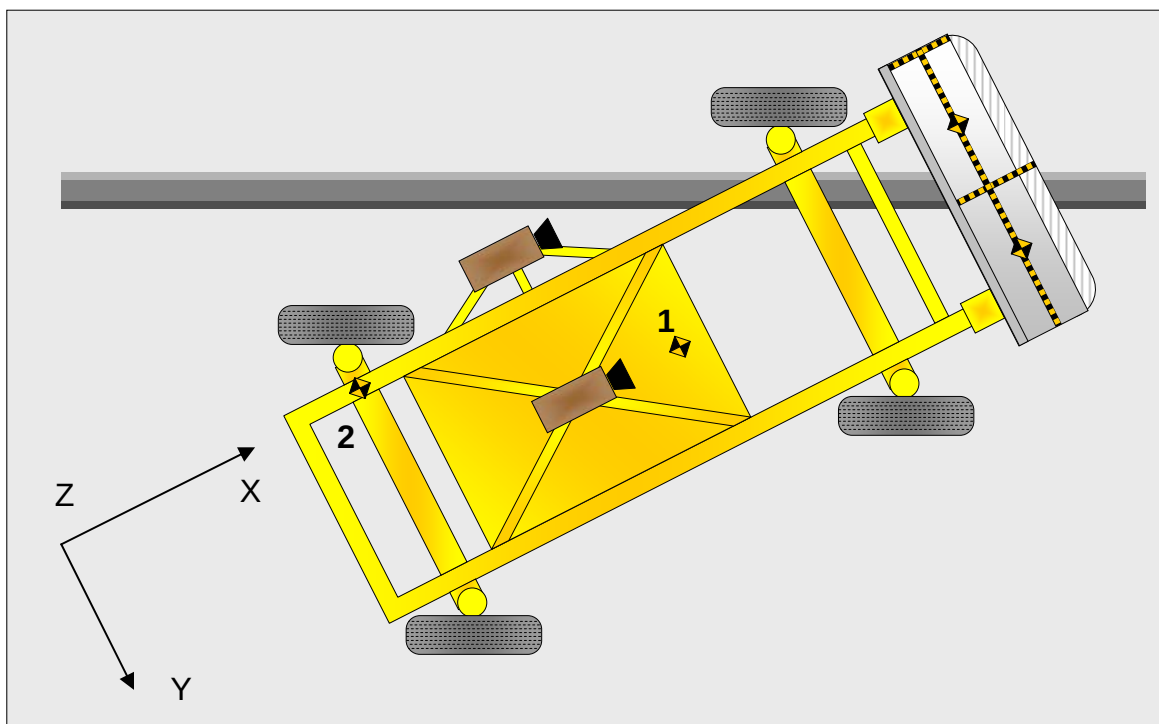
Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	2690	757	-283
2	Right Sill at Rear Seat	1650	766	-293
3	Rear Floorpan Above Axle	910	0	-550
4	Left Sill at Rear Door	1650	-766	-293
5	Left Sill at Front Door	2691	-757	-274
6	Rear Occupant Compartment	1836	340	-453
7	Left Lower B-Post	2160	-743	-649
8	Left Middle B-Post	2160	-743	-908
9	Left Lower A-Post	3272	-682	-660
10	Left Middle A-Post	3203	-836	-890
11	Front Seat Track	2403	-600	-510
12	Rear Seat Track or Structure			
13	Vehicle CG	2443	0	-353

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 Cadillac SRX FWD
 Test Program: NCAP Side Impact

NHTSA No. MA0121
 Test Date: 11/30/2009



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 Cadillac SRX FWD
Test Program: NCAP Side Impact

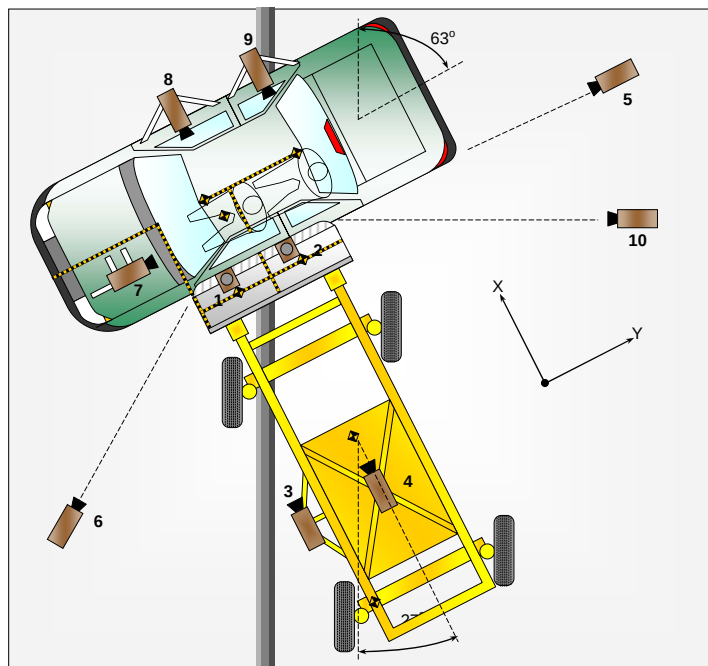
NHTSA No. MA0121
Test Date: 11/30/2009

	Elements	Pre-Test (mm)
1	Total Length	4847
2	Total Width	1865
3	Bumper Top Height	692
4	Bumper Bottom Height	535
5	Longitudinal Member Top Height	664
6	Distance between Longitudinal Members	1037
7	Longitudinal Member Width	70
8	Engine Top Height	1068
9	Engine Bottom Height	270
10	Engine and gearbox width	852
11	Front bumper-engine distance	545
12	Front shock absorber fixing height	1079
13	Bonnet leading edge height	945
14	Front shock absorber fixing width	1320
15	Front bumper – front axle distance	1029
16	Front axle – a pillar distance	530
17	A-pillar – B-pillar distance	1060
18	B-Pillar – rear axle distance	1223
19	B-pillar – C-pillar distance	1001
20	Roof sill bottom height	1506
21	Roof sill top height	1641
22	Floor sill bottom height	287
23	Floor sill top height	472

DATA SHEET NO. 16
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2010 Cadillac SRX FWD
 Test Program: NCAP Side Impact

NHTSA No. MA0121
 Test Date: 11/30/2009



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Close-up	-550	-270	-5055	50	1000
2	Overhead Overall	680	1240	-5050	14	1000
3	MDB Onboard, Impact Point Close-up				50	
4	MDB Onboard, Centerline of Impact				16	
5	Right Side, Ground Level, Overall	50	7190	-1230	24	1000
6	Left Side, Ground Level, Overall	-1490	-5245	-1210	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

Cameras 3 and 4 did not run.

DATA SHEET NO. 17
SUMMARY OF FMVSS 301 DATA

Test Vehicle: 2010 Cadillac SRX FWD
 Test Program: NCAP Side Impact

NHTSA No. MA0121
 Test Date: 11/30/2009

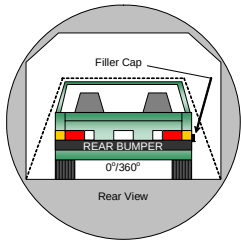
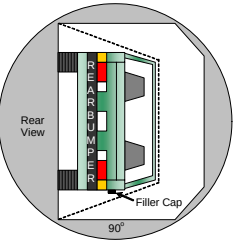
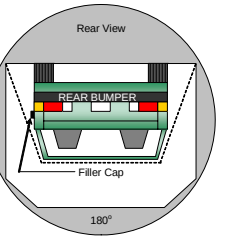
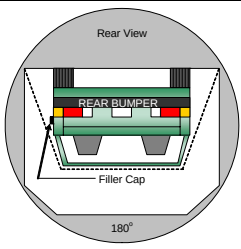
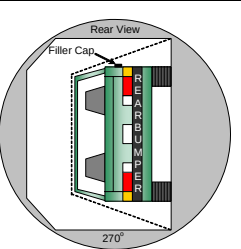
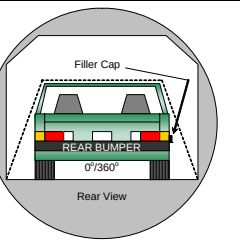
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21° C Test Time: 11:11 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°	108	300	First 5	0
90° to 180°	109	300	First 5	0
180° to 270°	107	300	First 5	0
270° to 360°	110	300	First 5	0

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PHOTOGRAPHS

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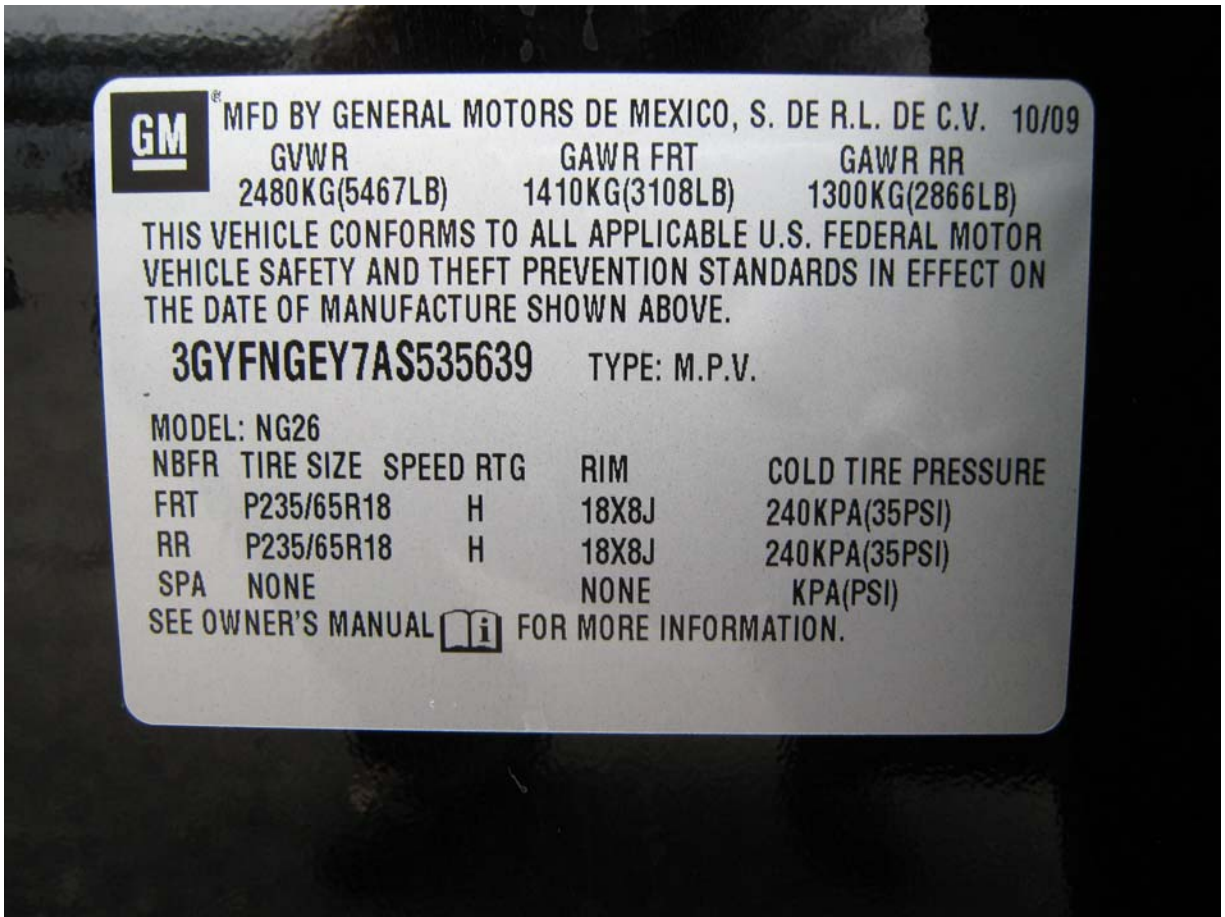
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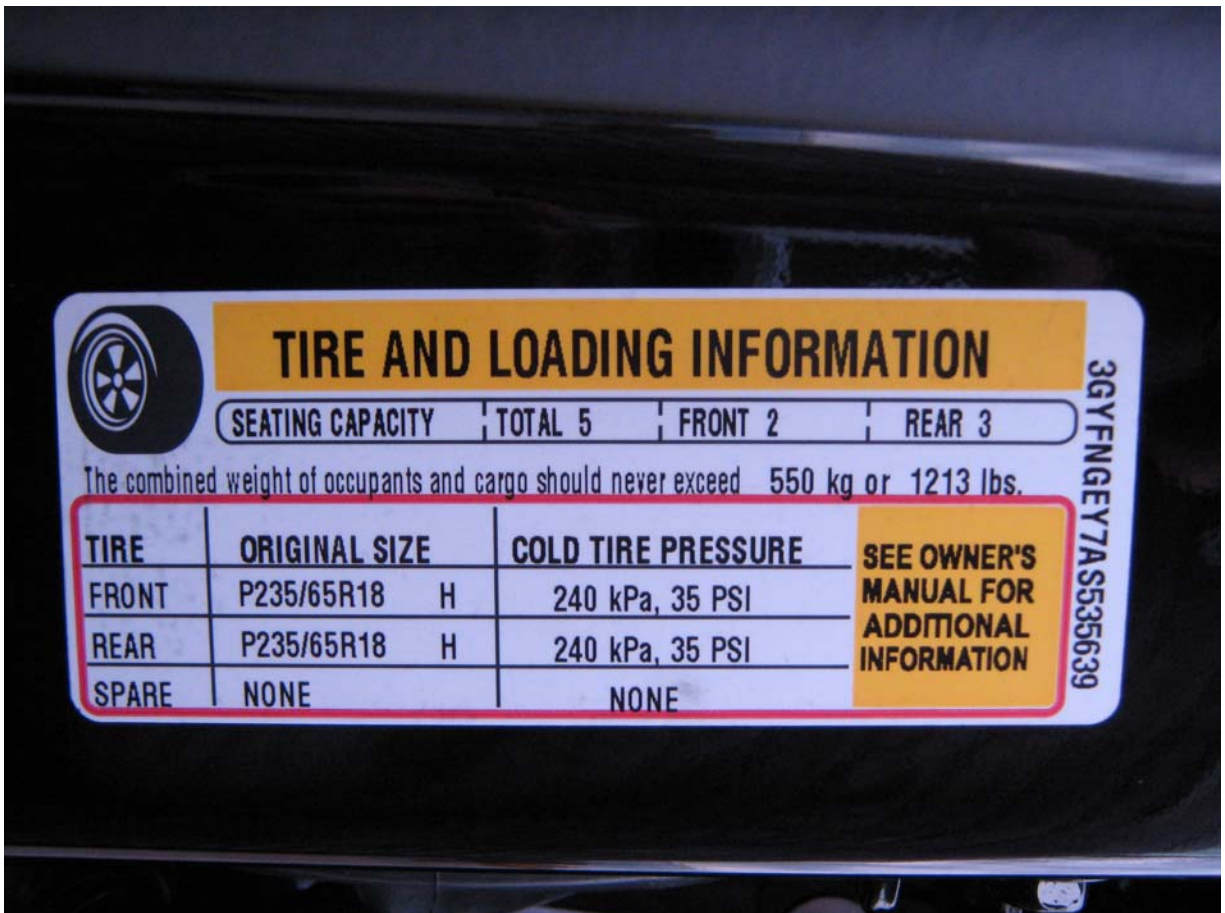
Right Front $\frac{3}{4}$ View, As Received



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 $\frac{3}{4}$ View



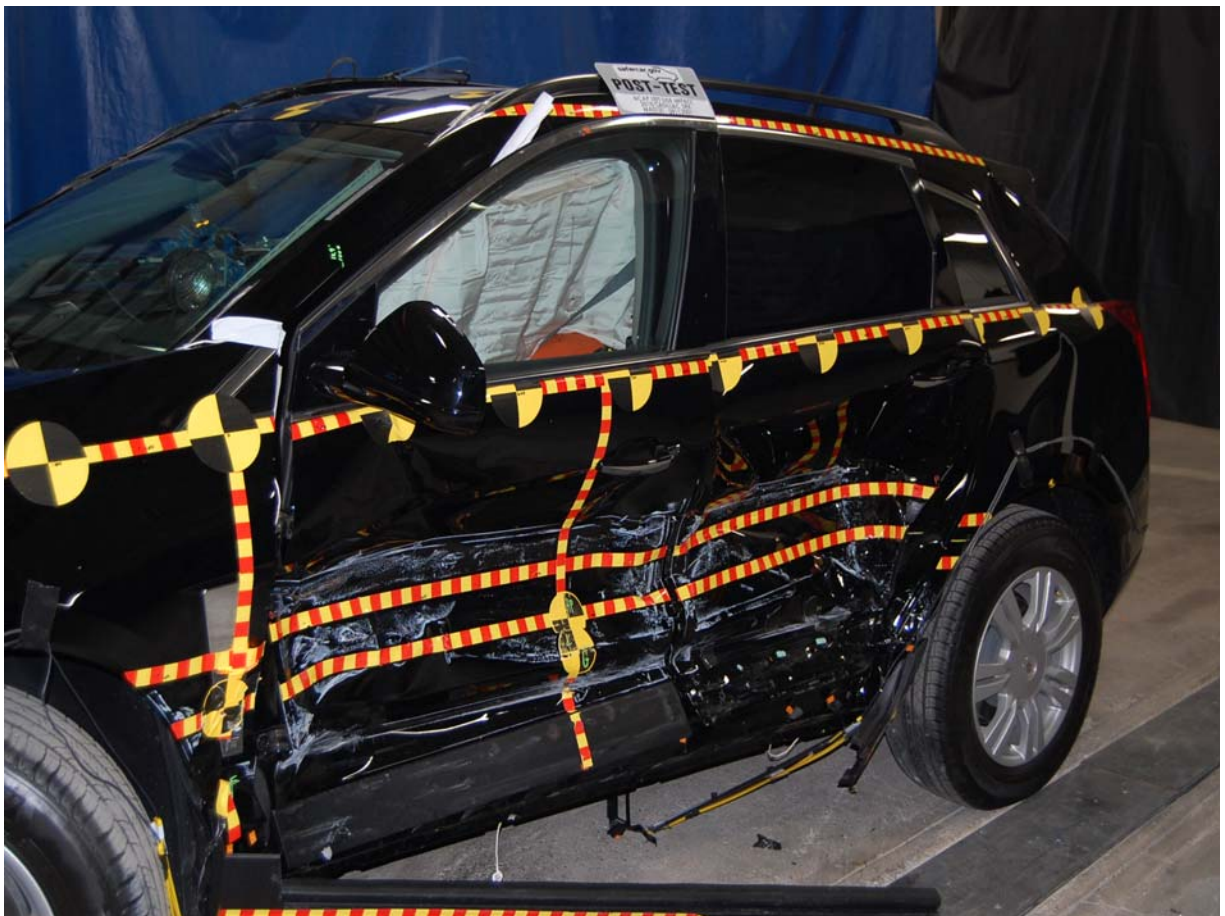
Pre-Test Left Impact Point



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



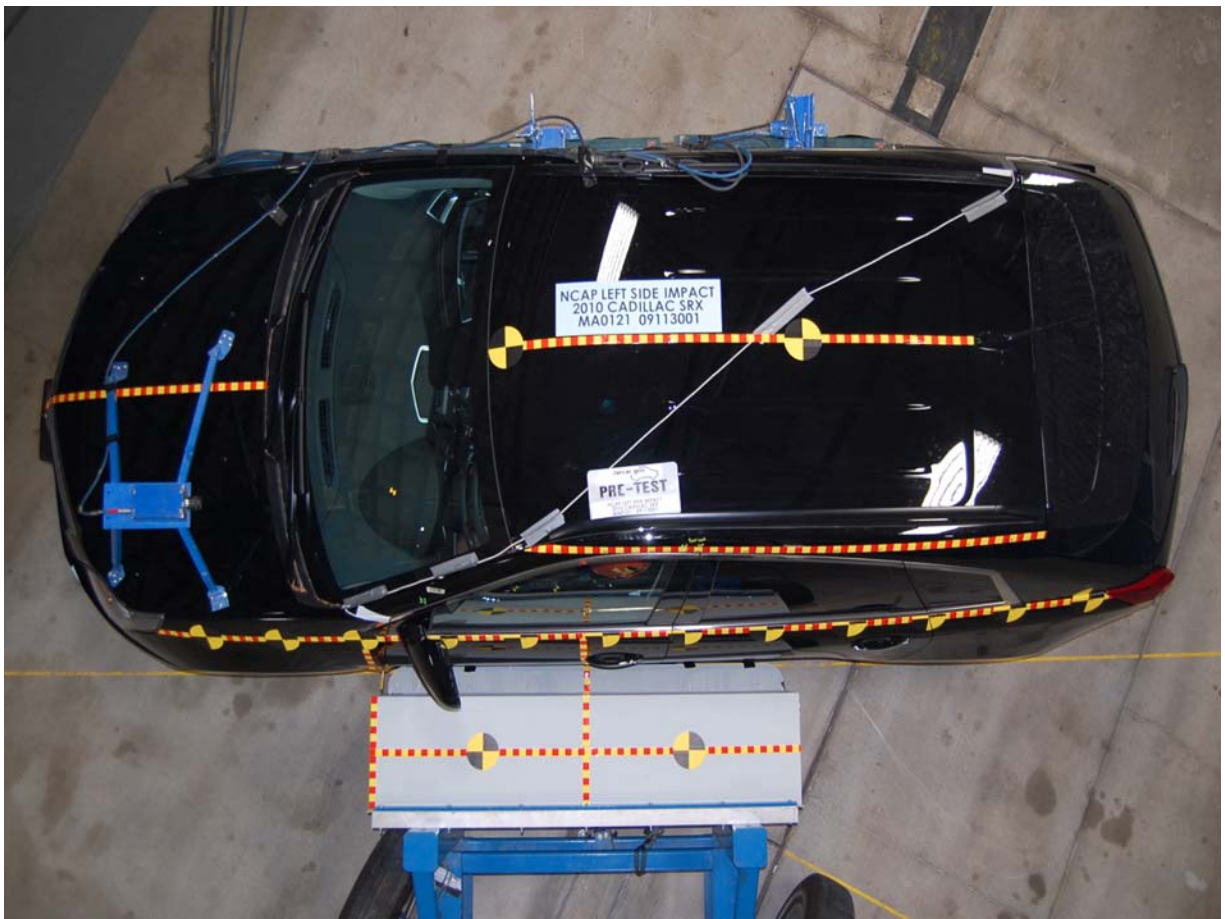
Post-Test Rear $\frac{3}{4}$ View of Left Side Doors



Pre-Test Left Side Impact Close-up



Post-Test Left Side Impact Close-up



Pre-Test Overhead View



Post-Test Overhead View



Pre-Test 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



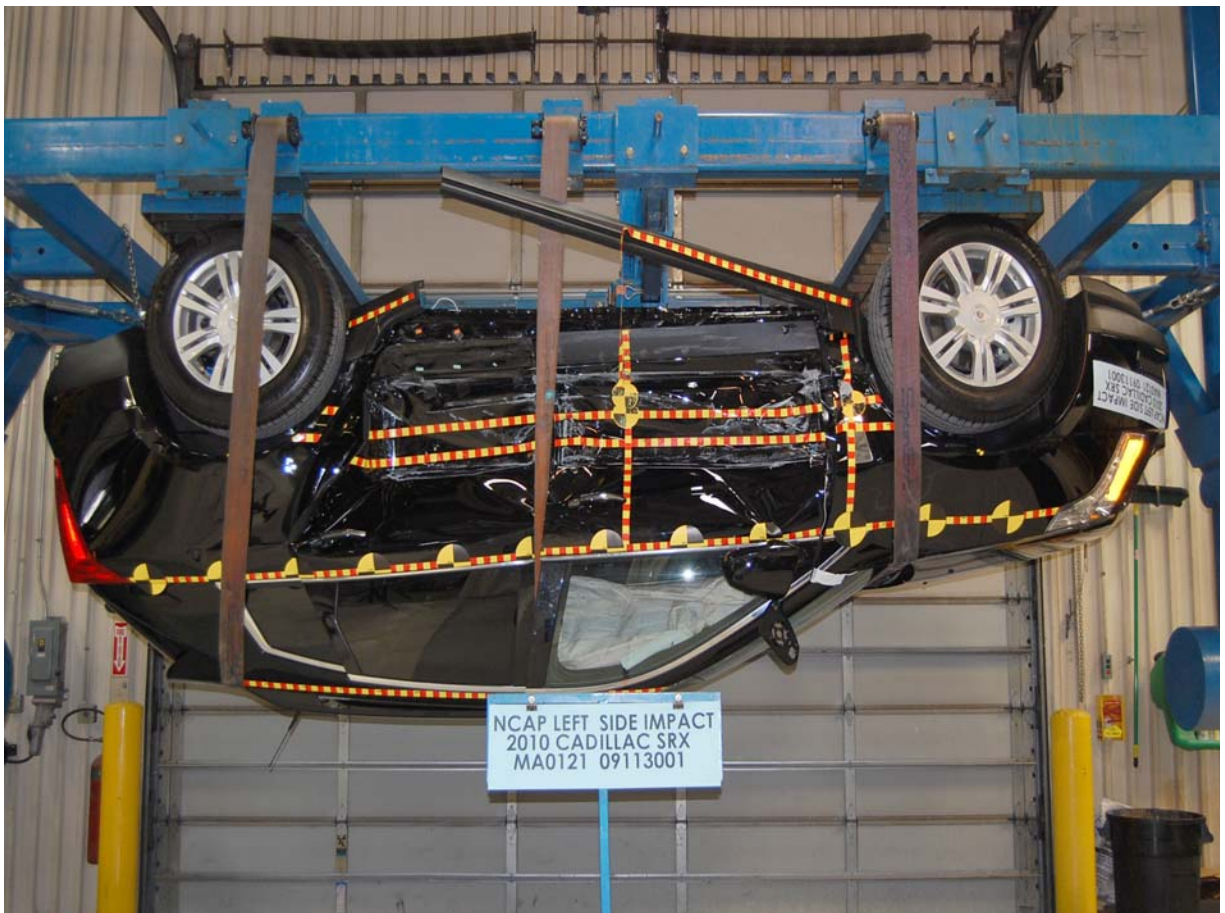
Pre-Test Left Side View of Deformable Barrier



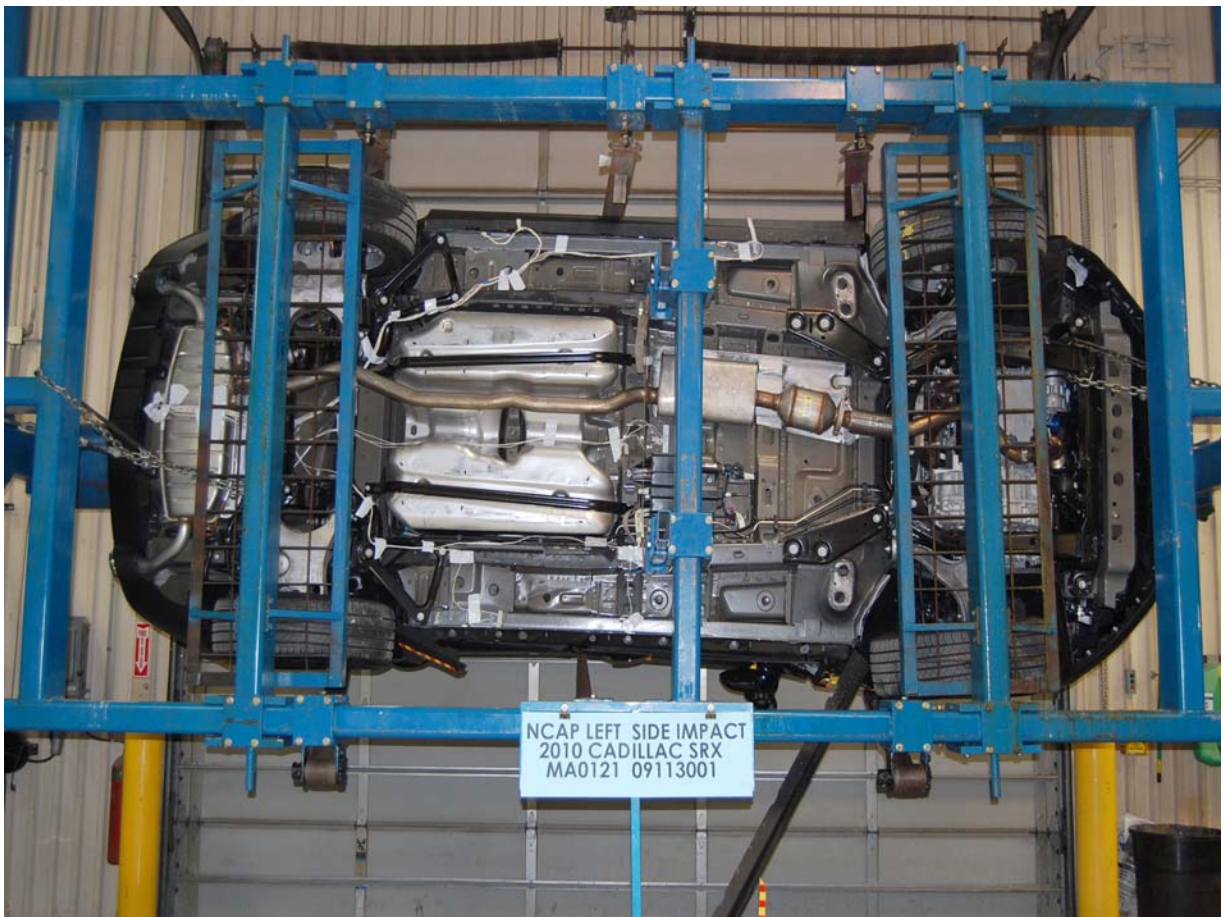
Post-Test Left Side View of Deformable Barrier



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 Torso Contact



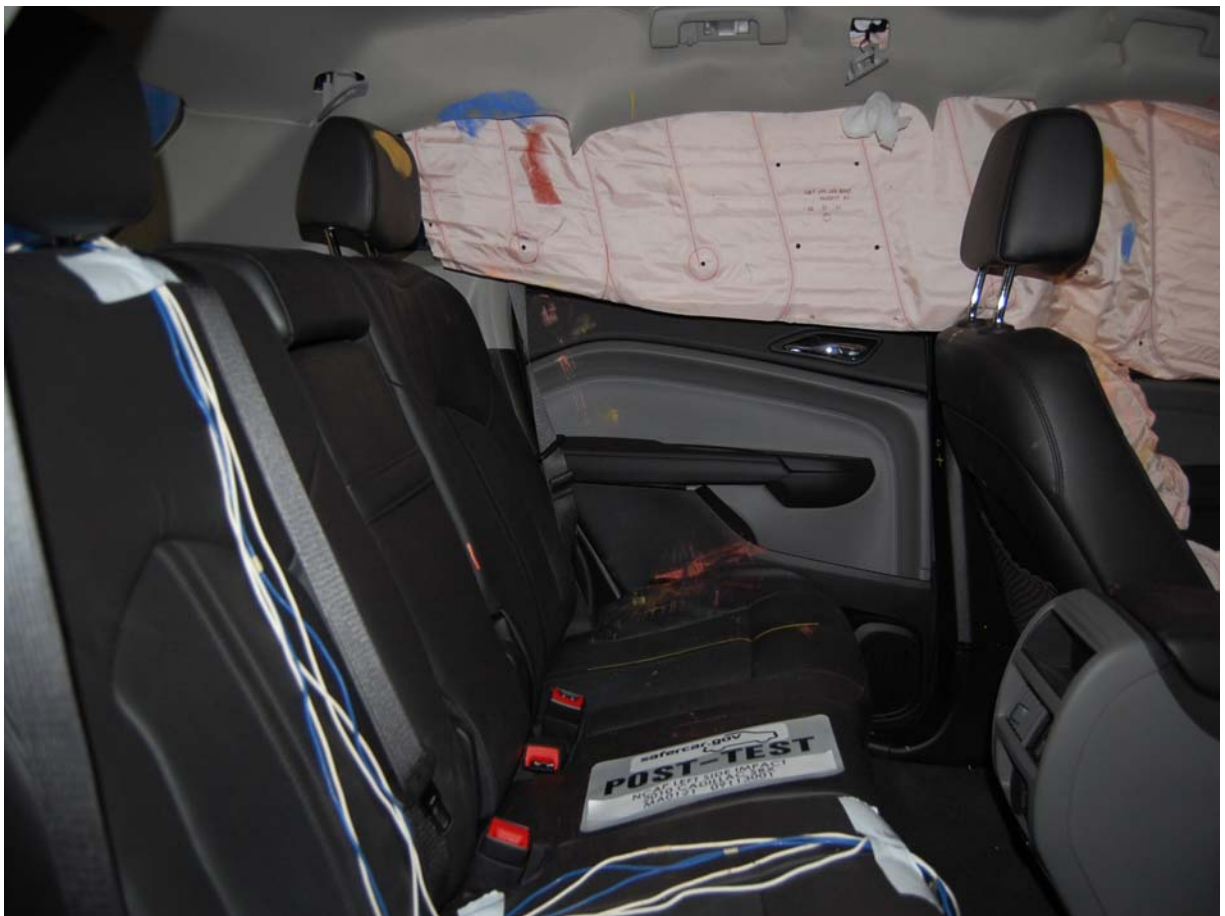
Post-Test Driver Dummy Contact



Post-Test Passenger Dummy Head Contact View



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

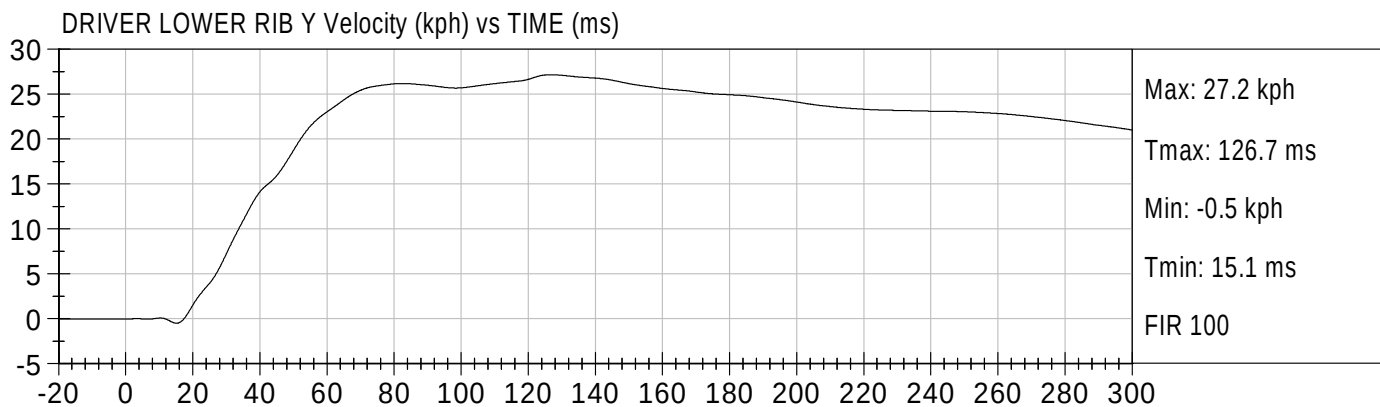
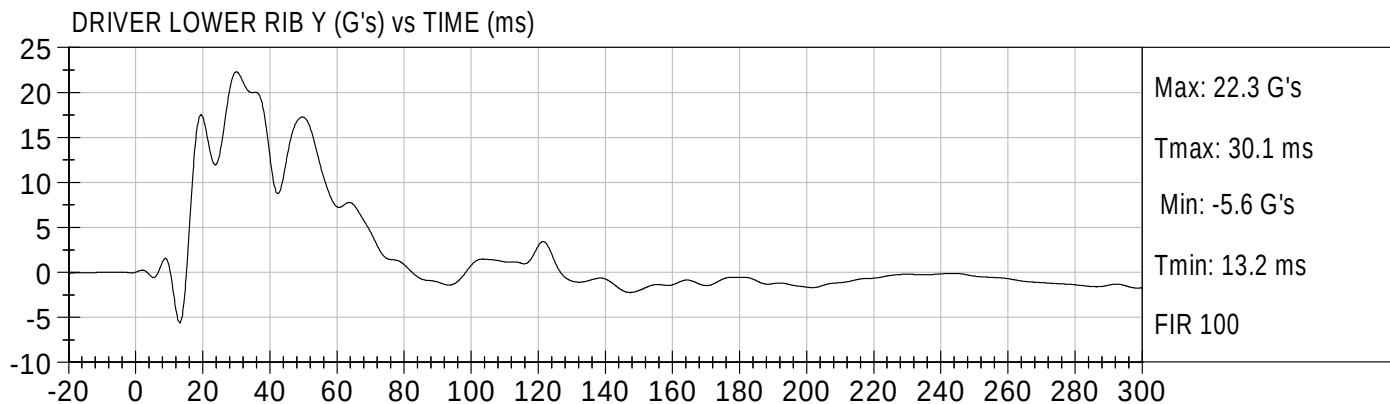
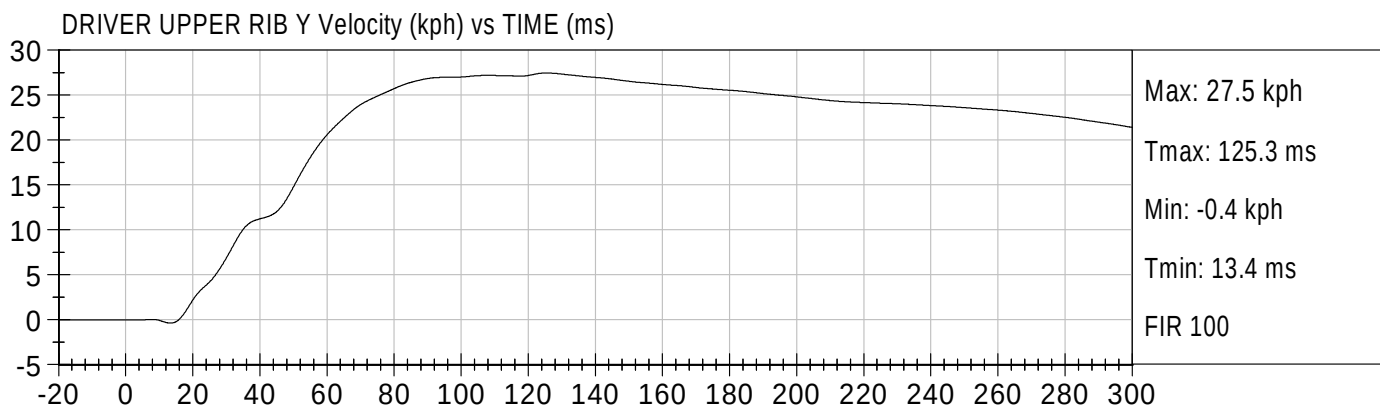
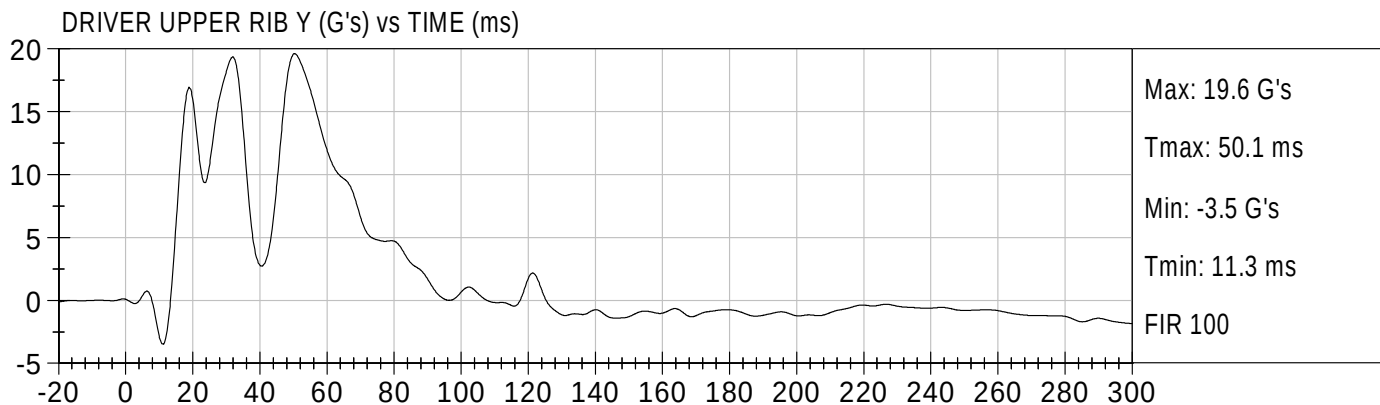
Driver Upper Neck Force Y

Driver Upper Neck Force Z

Driver Upper Neck Moment X

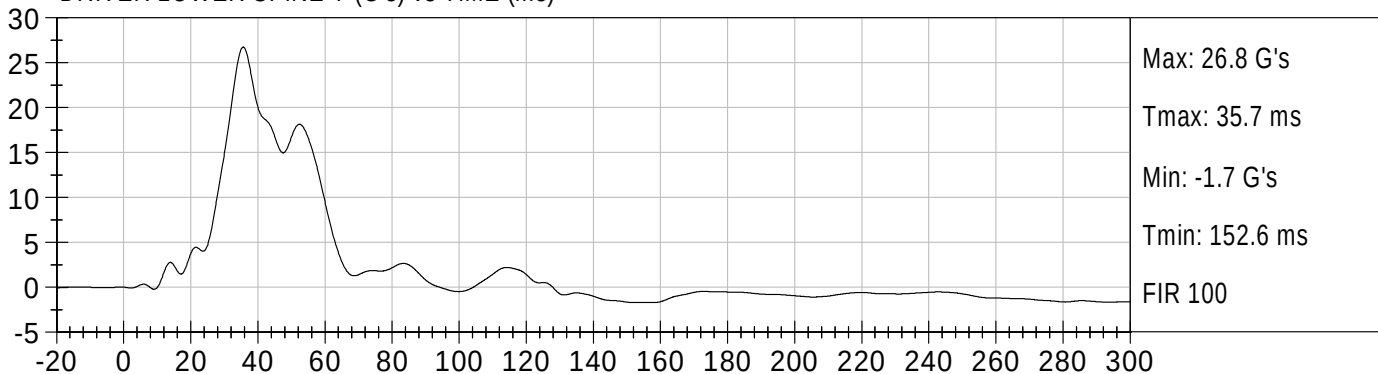
Driver Upper Neck Moment Y
Driver Upper Neck Moment Z
Driver Upper Rib Redundant Y
Driver Lower Rib Redundant Y
Driver Lower Spine Redundant Y
Driver Pelvis Redundant Y
Driver Thorax Contact
Driver Pelvis Contact
Passenger Head X Primary
Passenger Head Y Primary
Passenger Head Z Primary
Passenger Head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

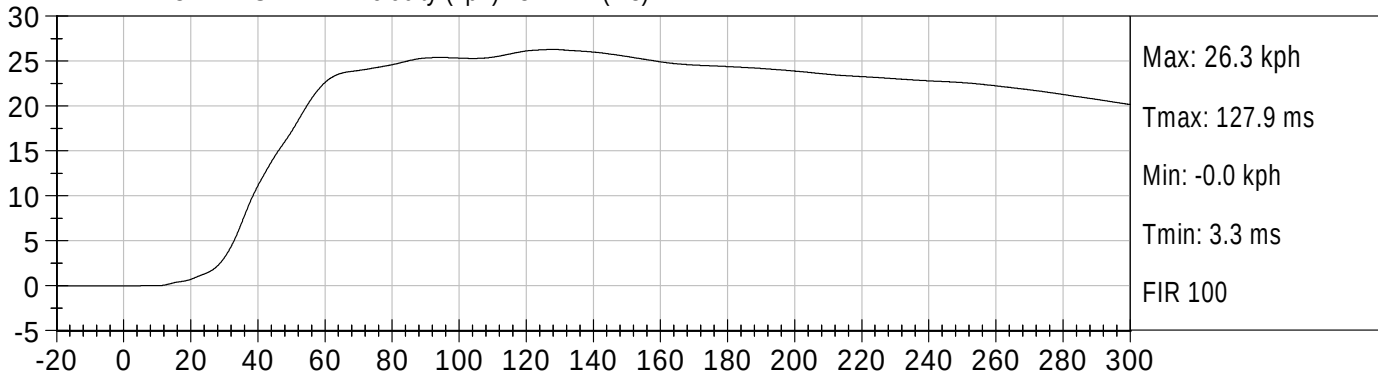




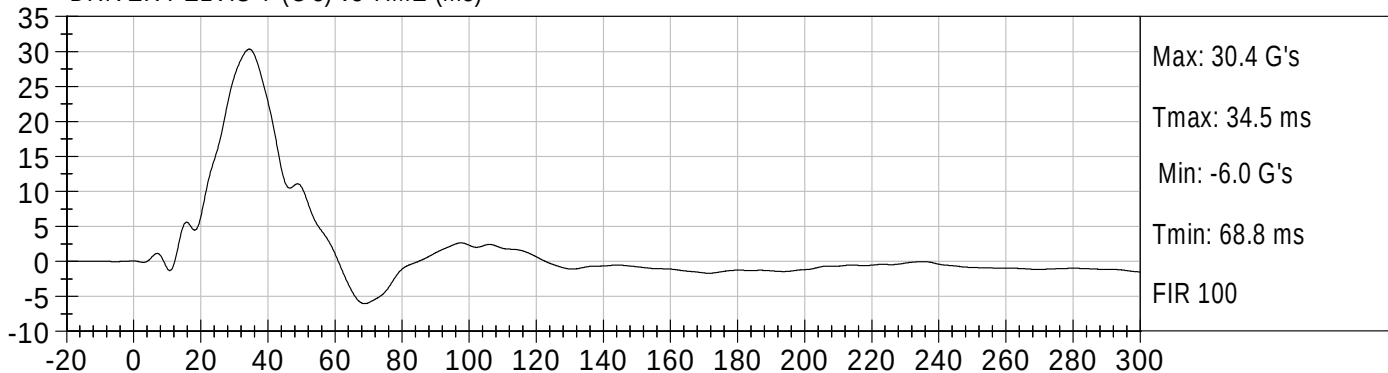
DRIVER LOWER SPINE Y (G's) vs TIME (ms)



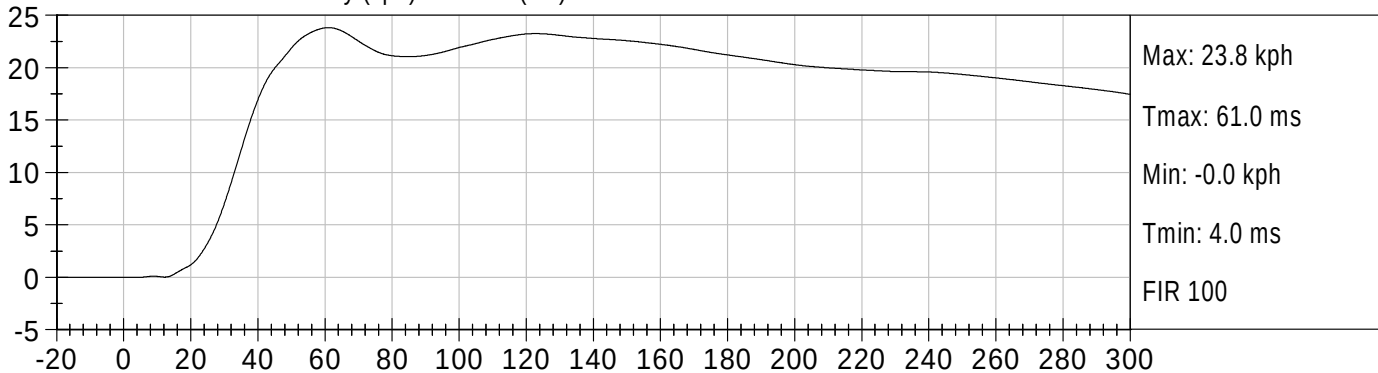
DRIVER LOWER SPINE Y Velocity (kph) vs TIME (ms)

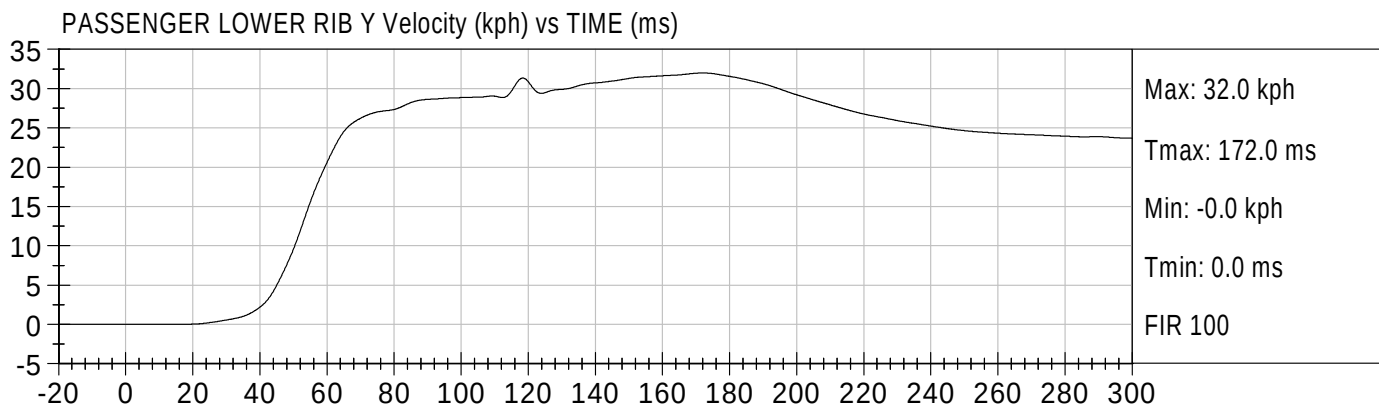
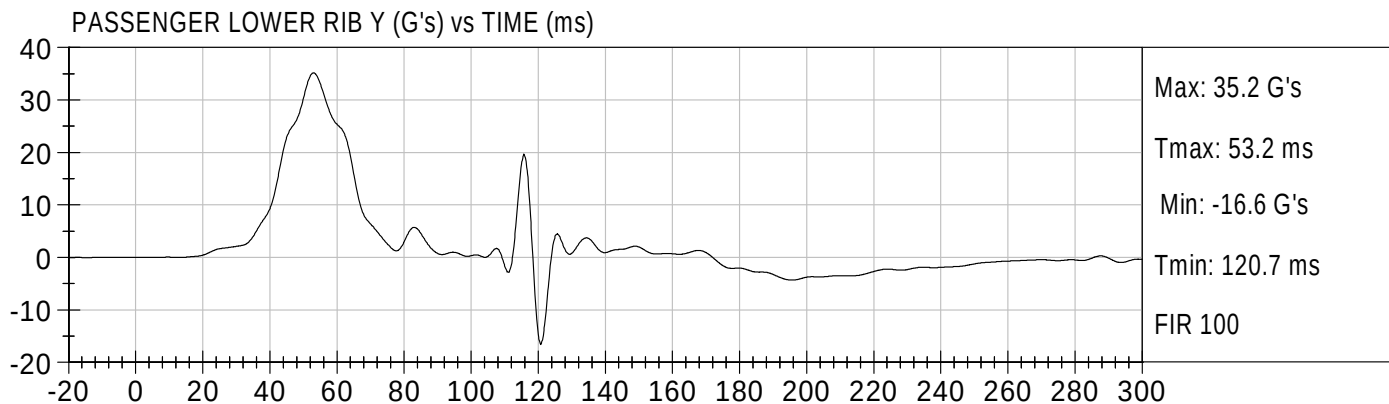
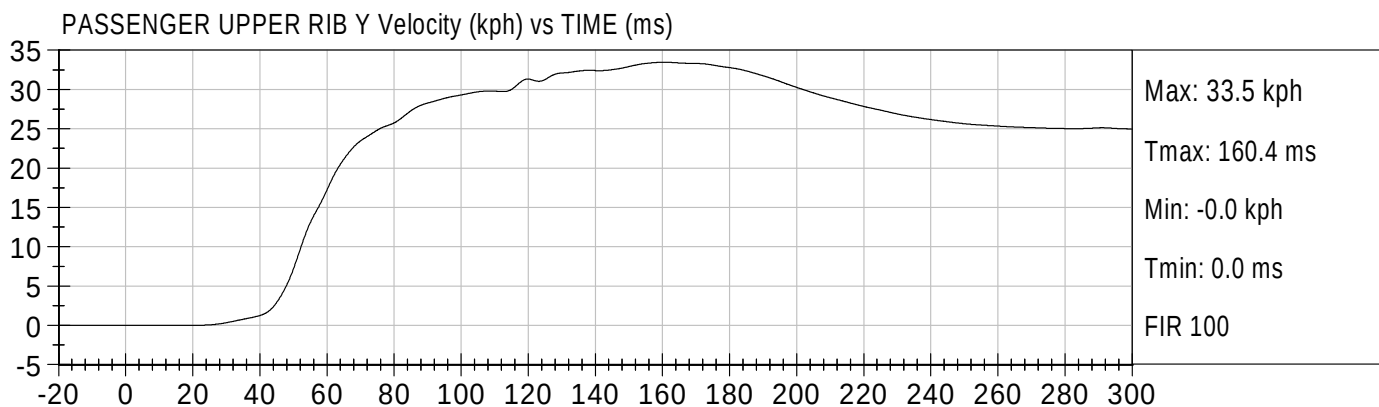
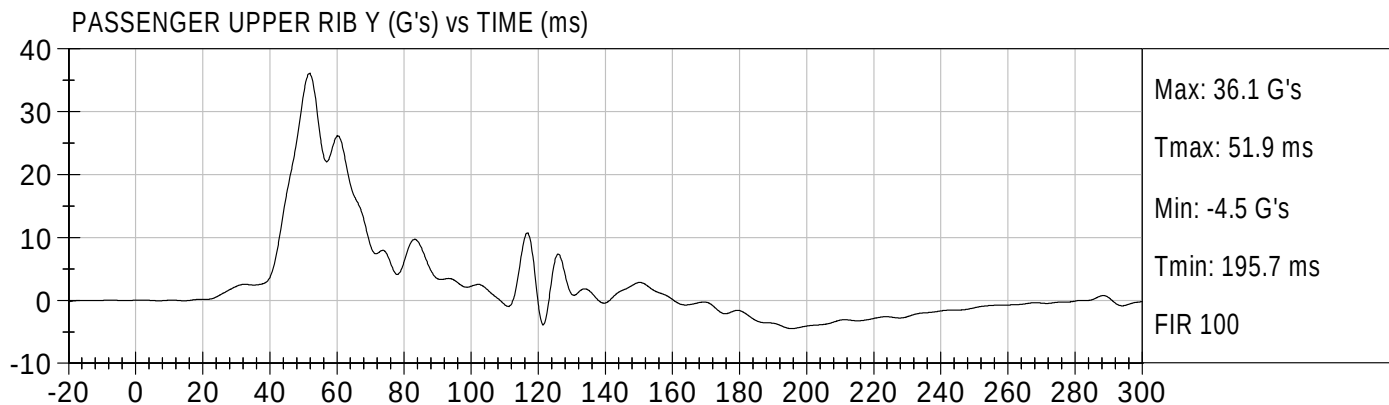


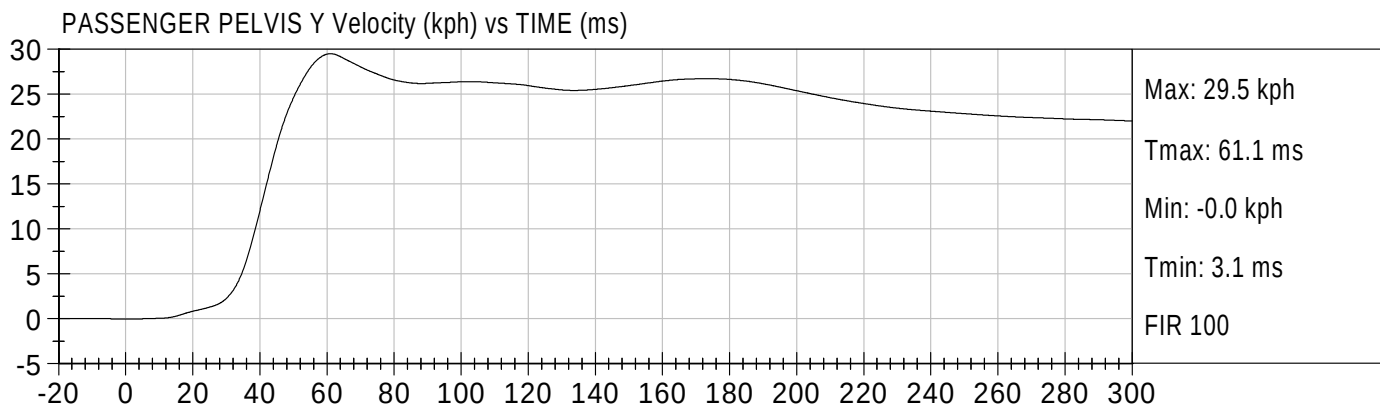
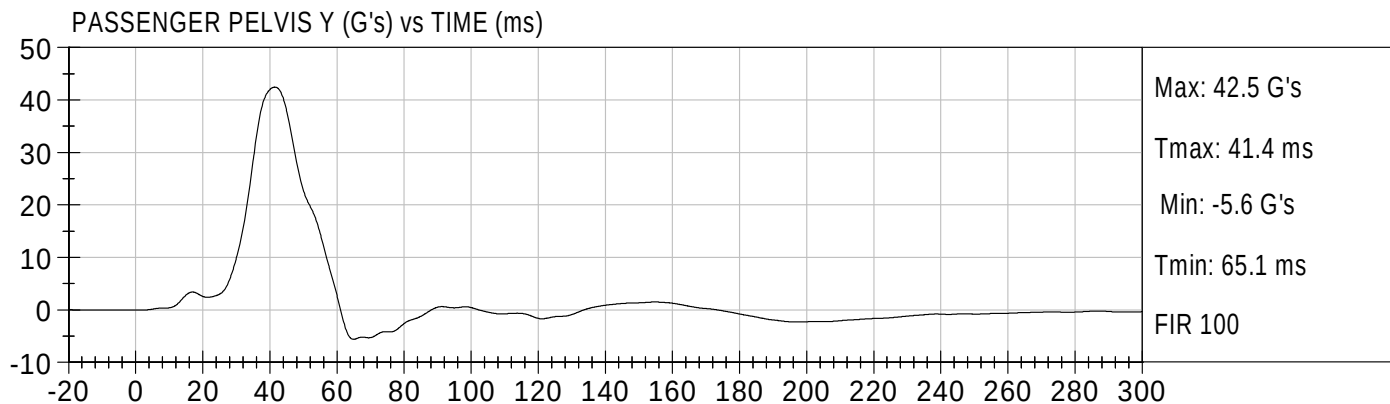
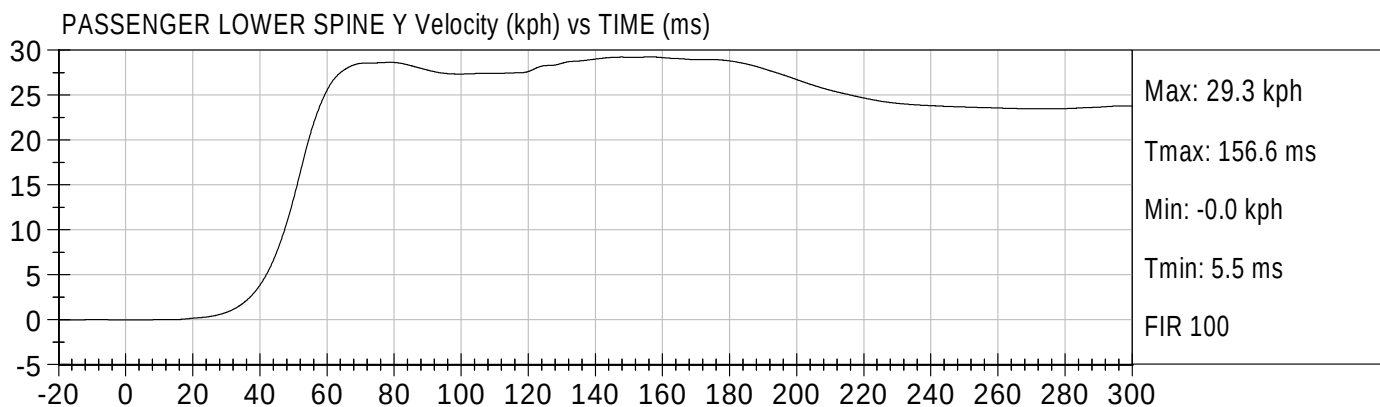
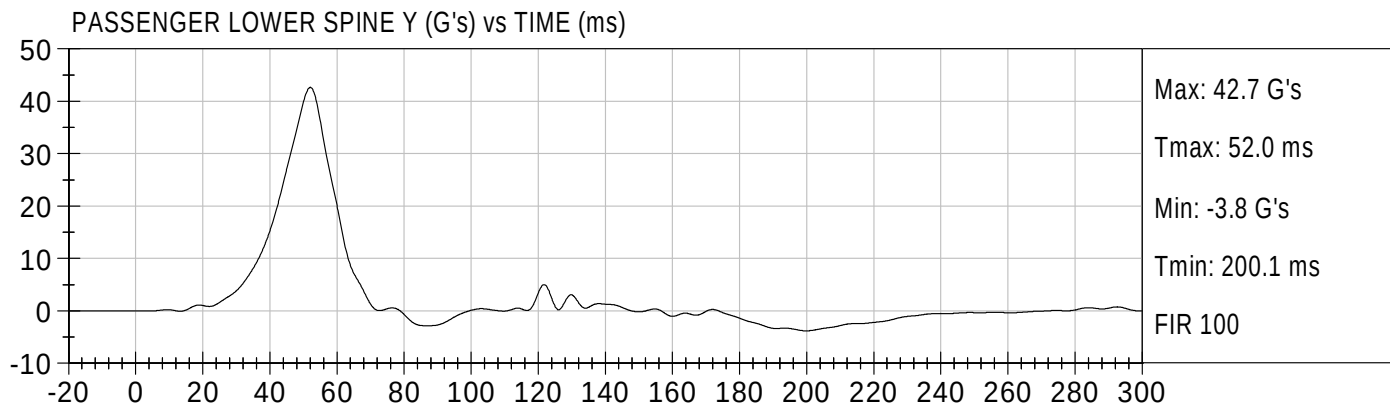
DRIVER PELVIS Y (G's) vs TIME (ms)



DRIVER PELVIS Y Velocity (kph) vs TIME (ms)







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/HIII Calibration Data Sheet
Side Impact Dummy
External Measurements

ATD Serial No: 271

Test I.D: D09290

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 Hall
Laboratory Technician

11/19/2009
Test Date

David Winkelbauer
Approved By

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

ATD Serial No: 271

Test I.D: D092901

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	37	Pass
Peak Resultant Acceleration	G's	120 to 150	135	Pass
Is Resultant Curve Unimodal?	N/A	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-6.6	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

11/19/09
Test Date

David Winkelbauer
Approved By



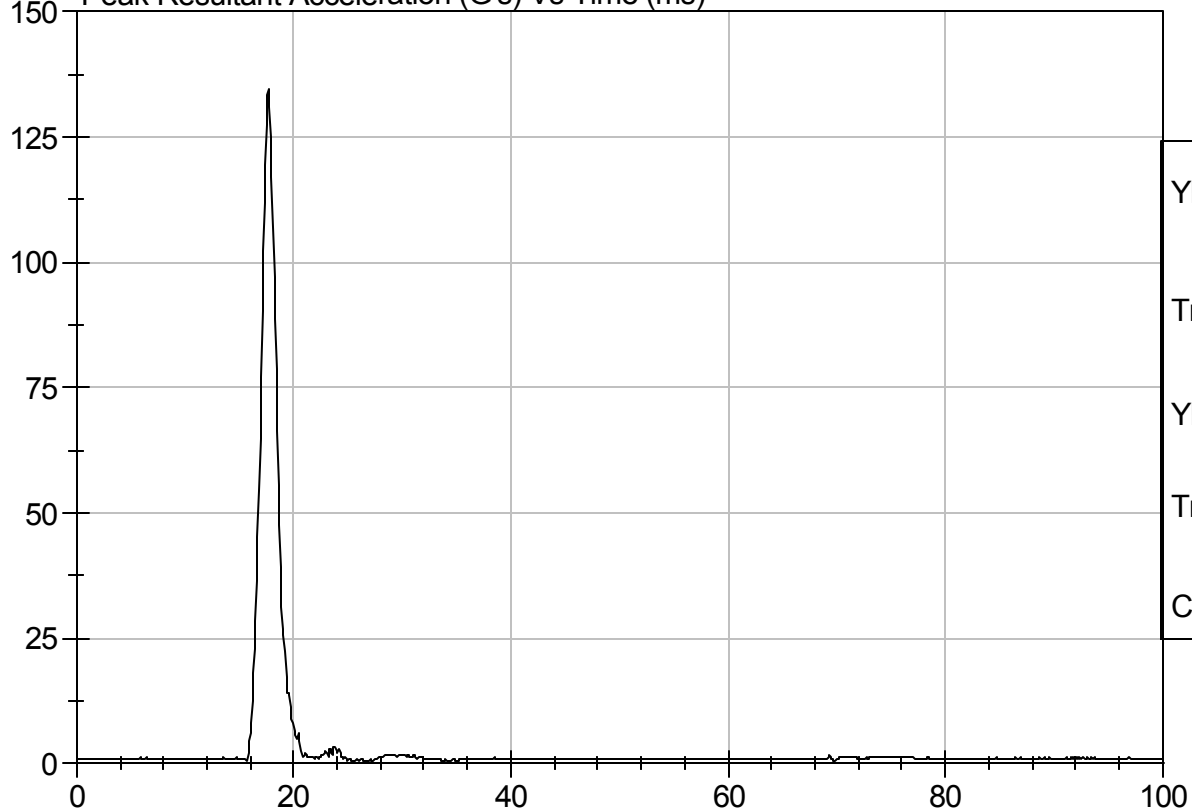
Test Description: Head Drop

Test Date: 11/19/09

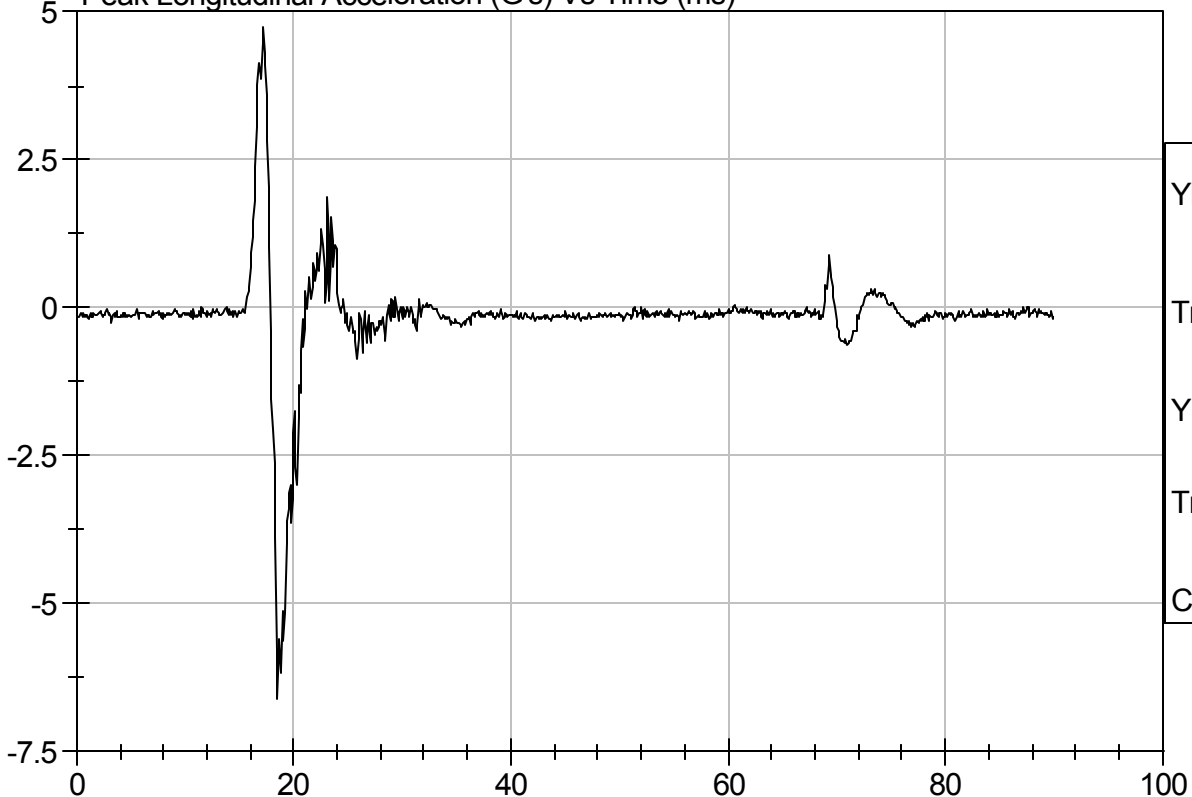
Component: D092901

Speed: 0 ft/s, 0 m/s

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



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



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

ATD Serial No: 271

Test I.D: D092902

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Probe Velocity	m/s	4.22 - 4.31	4.23	Pass
Upper Rib	G's	37 - 46	37	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

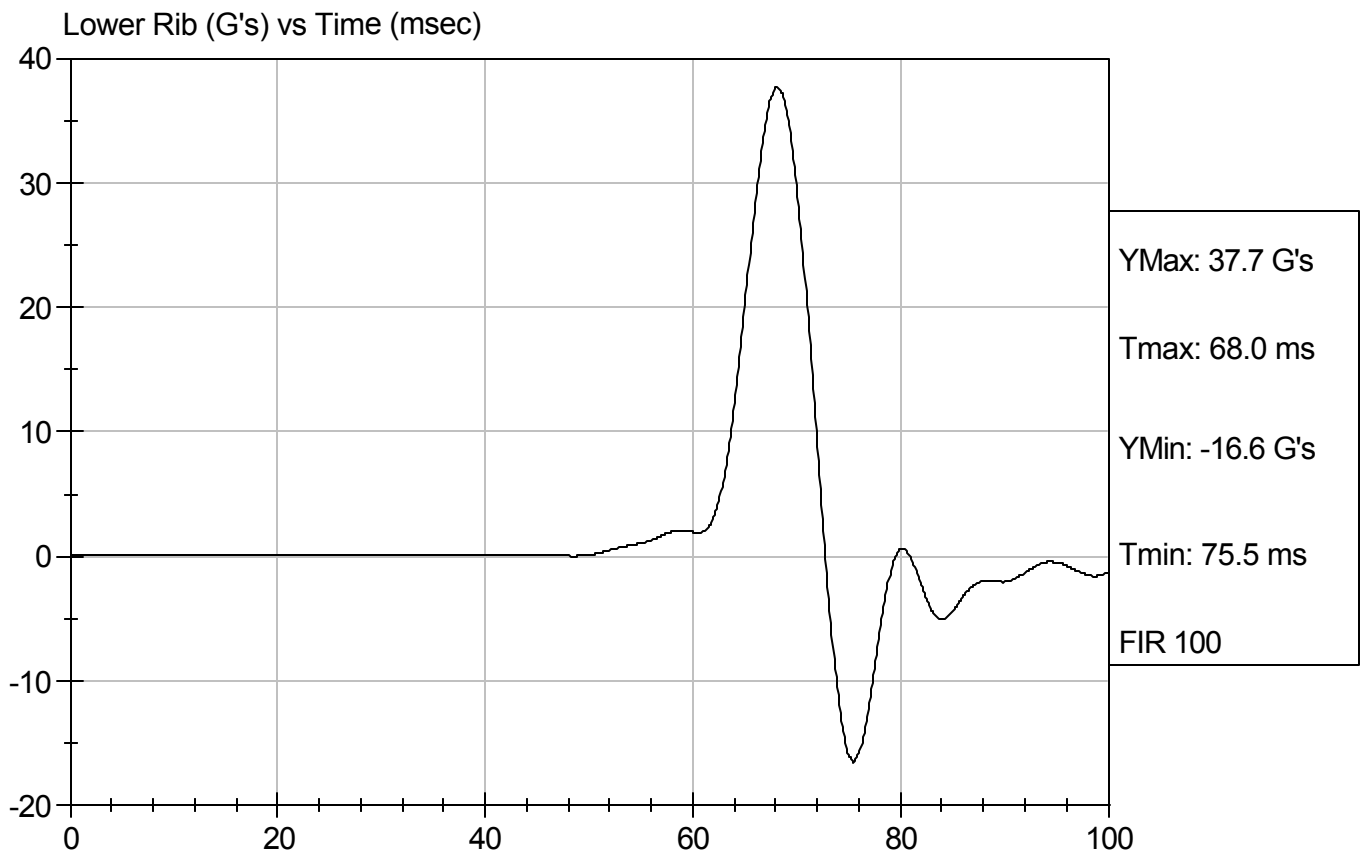
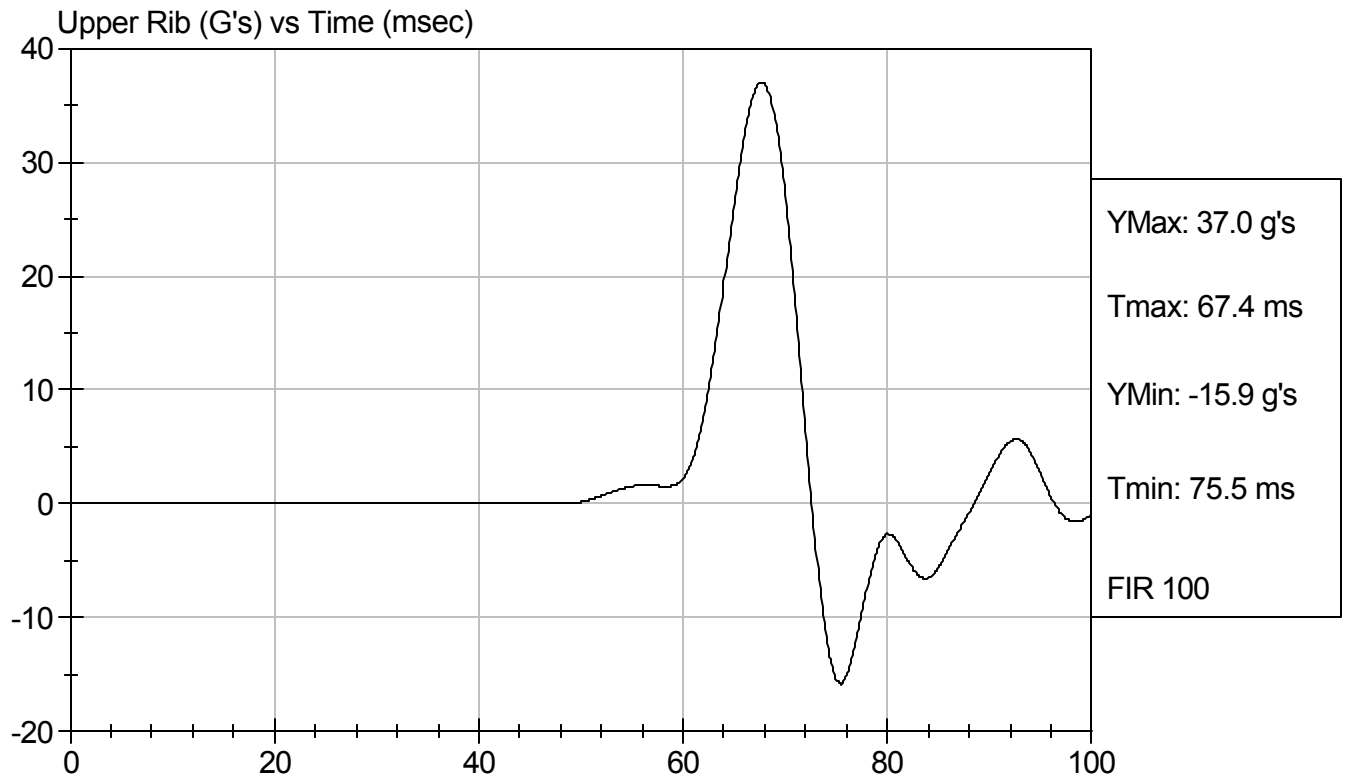
David Winkelbauer
Approved By

11/19/09
Test Date



Test Desc: Thorax Impact
Component ID: D092902

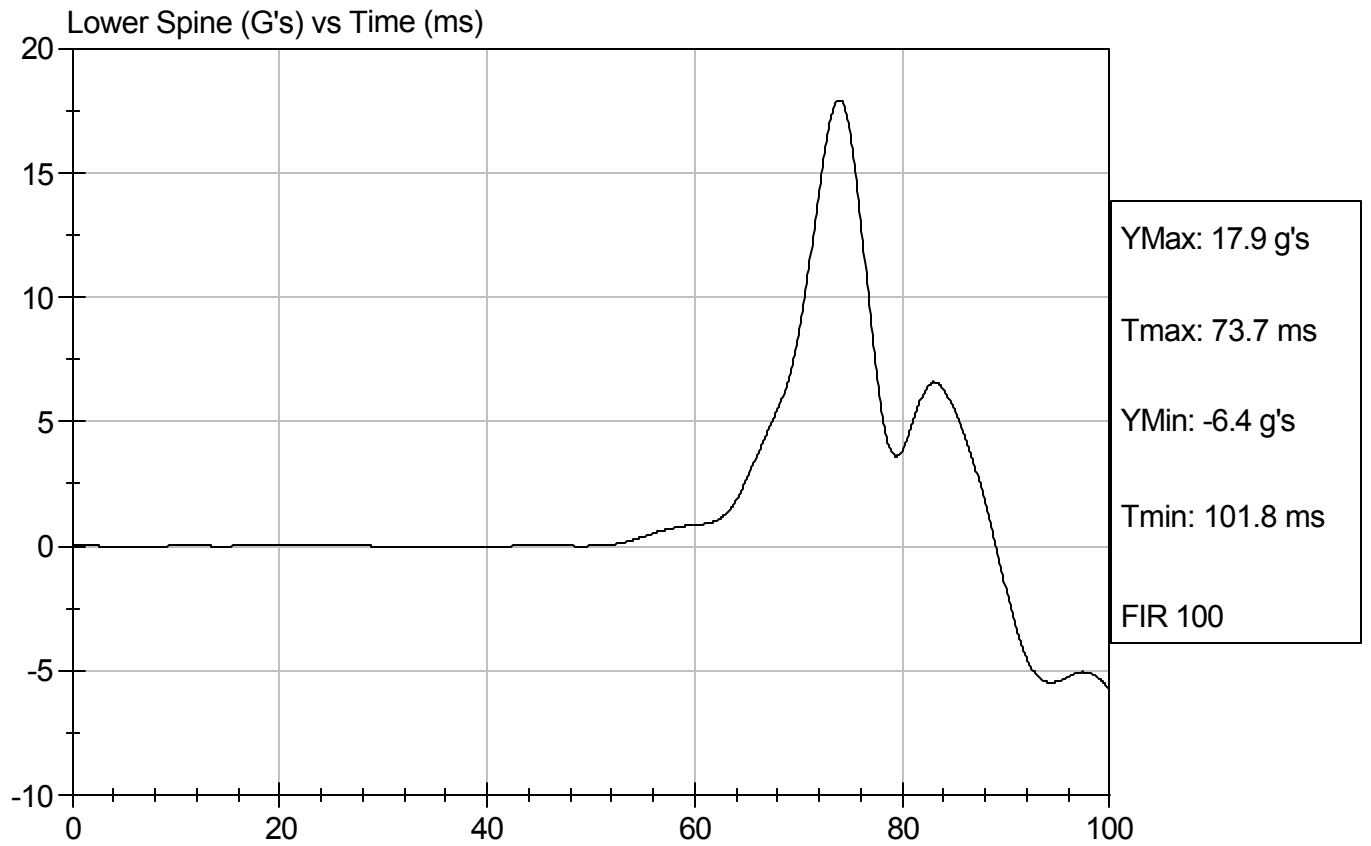
Test Date: 11/19/09
Speed: 13.89 ft/s, 4.23 m/s





Test Desc: Thorax Impact
Component ID: D092902

Test Date: 11/19/09
Speed: 13.89 ft/s, 4.23 m/s



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

ATD Serial No: 271

Test I.D: D092903

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	46	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

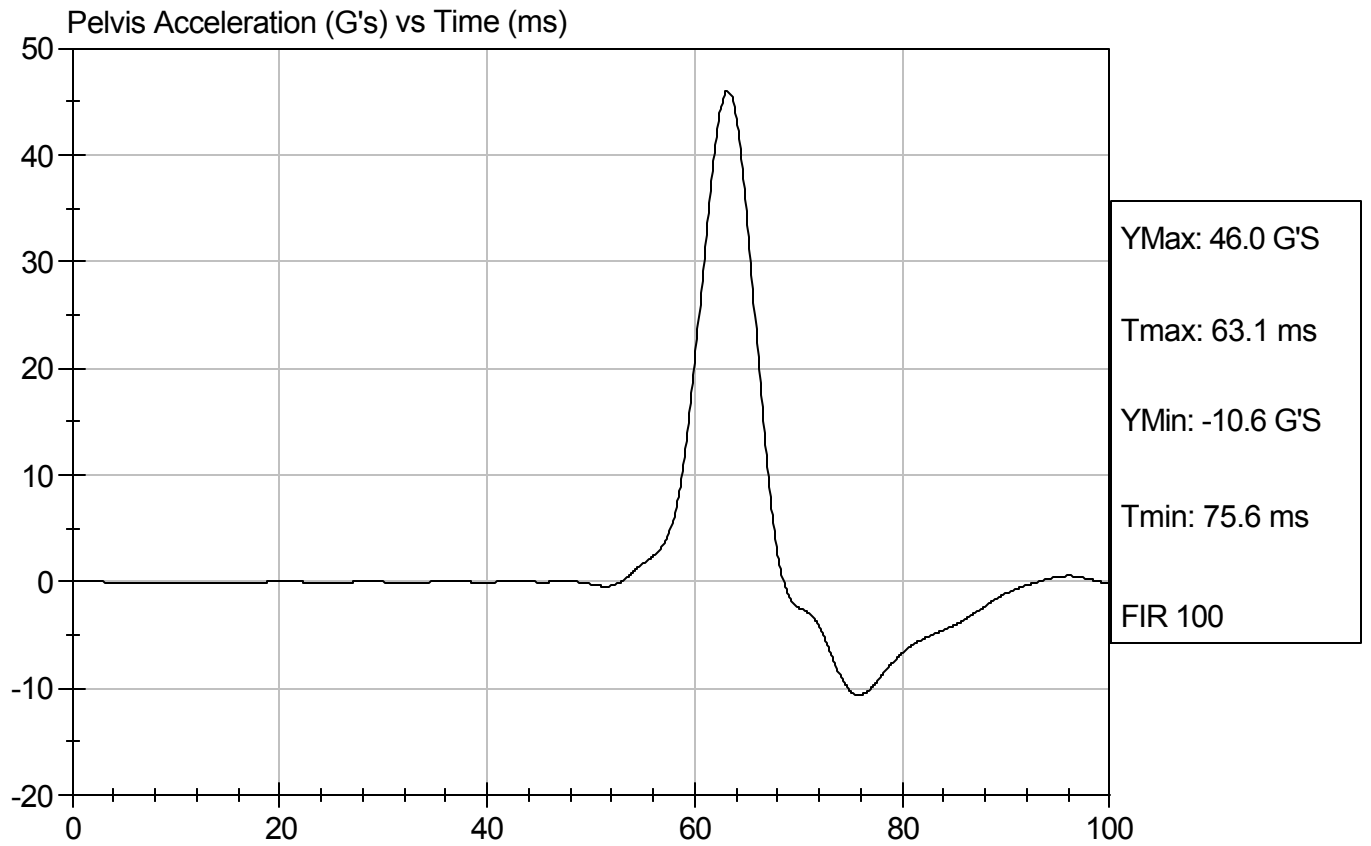
David Winkelbauer
Approved By

11/19/09
Test Date



Test Desc: Pelvis Impact
Component ID: D092903

Test Date: 11/19/09
Speed: 14.12 ft/s, 4.30 m/s



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

ATD Serial No: 271

Test I.D: D092904

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Force At 12.7 mm	N	104 -162	141	Pass
Force At 19 mm	N	163 - 222	193	Pass
Force At 25.4 mm	N	222 - 280	260	Pass
Force At 33 mm	N	325 - 391	352	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

11/18/09
Test Date

David Winkelbauer
Approved By

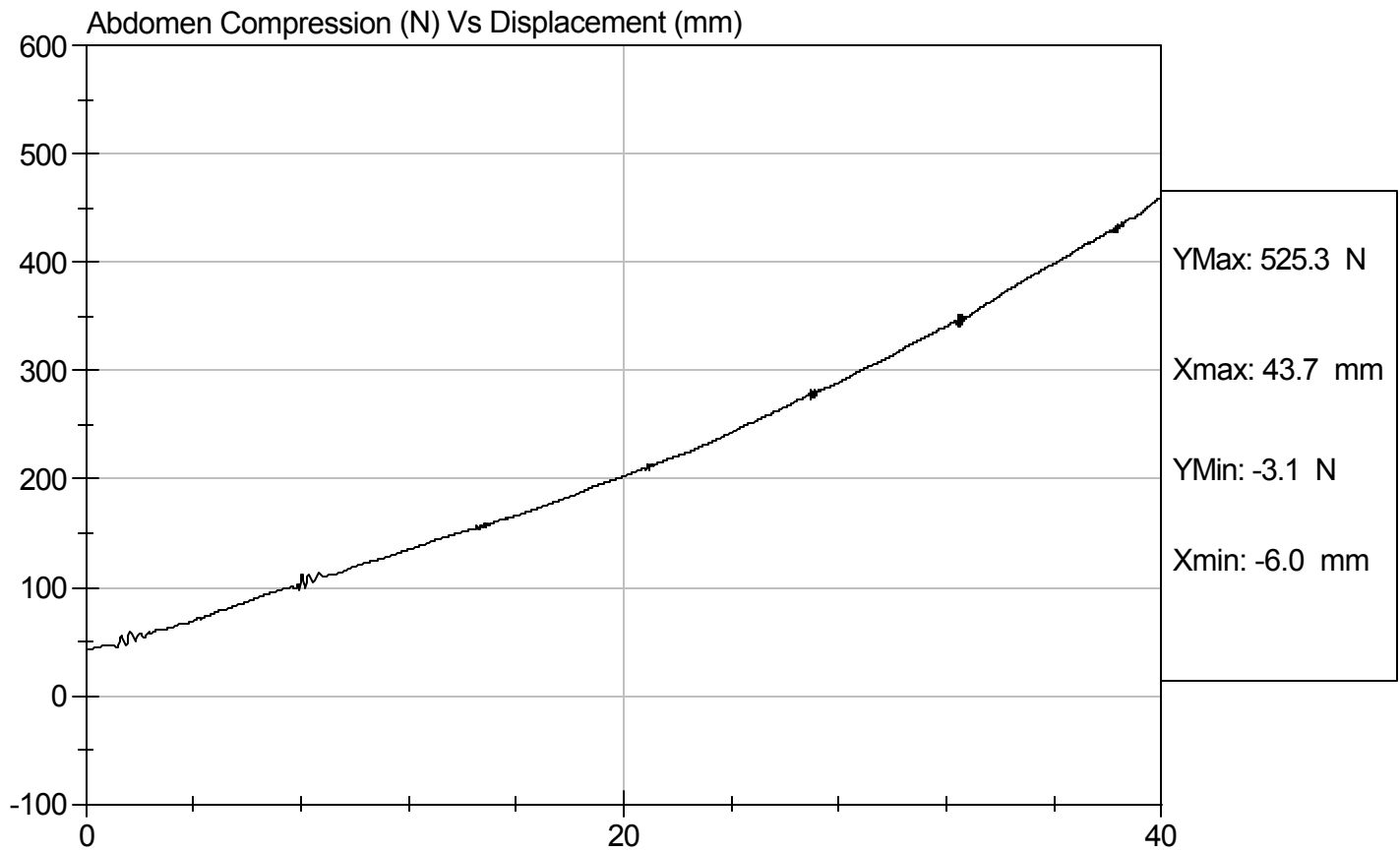


Test Description: Abdomen Compression

Test Date: 11/18/09

Component: D092904

Speed: 0 ft/s, 0 m/s



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

ATD Serial No: 271

Test I.D: D092905

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	110.1	Pass
Force At 30 deg	N	151.2 - 204.6	161.2	Pass
Force At 40 deg	N	204.6 - 258.0	211.0	Pass
Return Angle	Deg	12 Maximum	5	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

11/19/09
Test Date

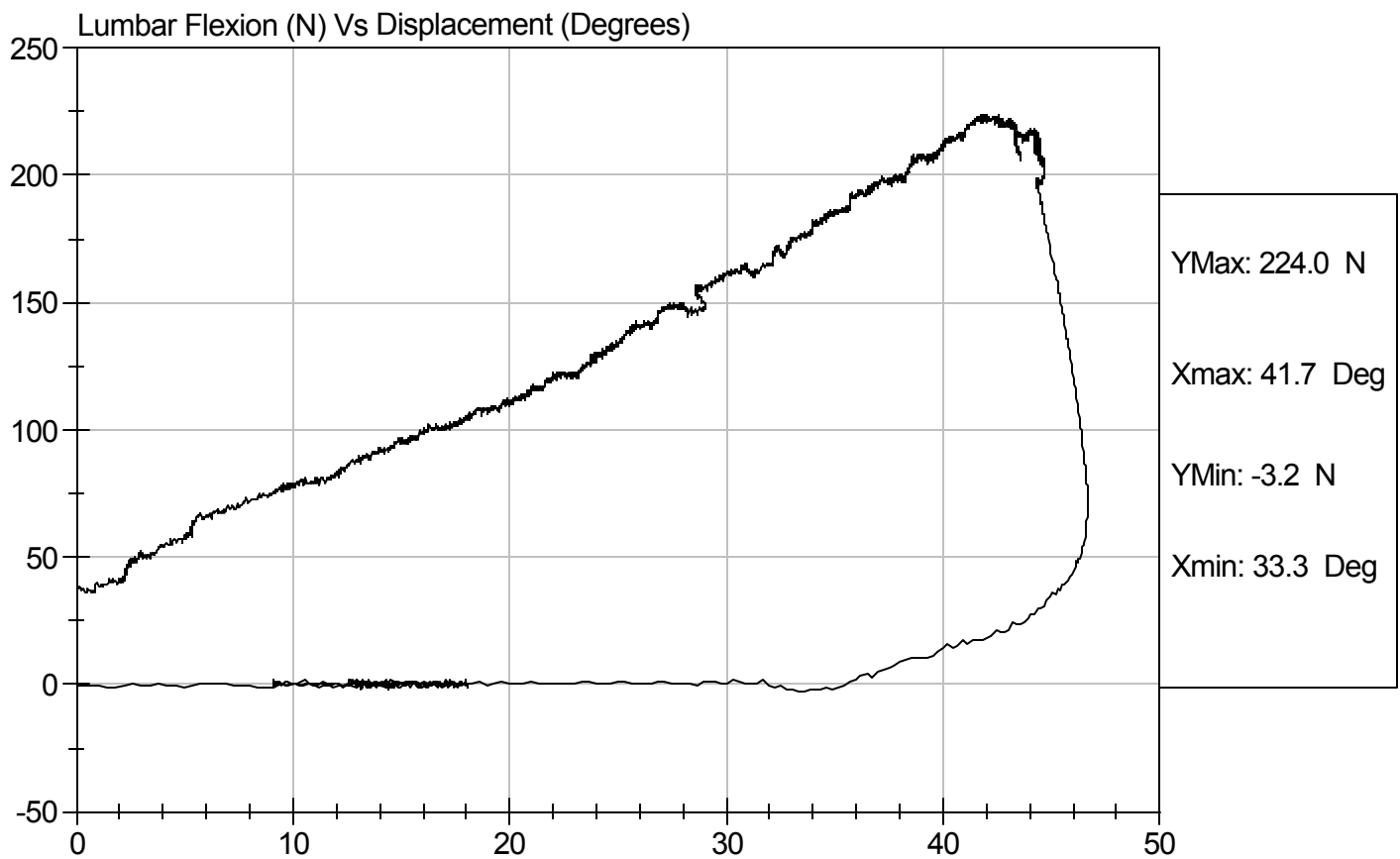


Test Description: Lumbar Flexion

Test Date: 11/19/09

Component: D092905

Speed: 0 ft/s, 0 m/s



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

ATD Serial No: 271

Test I.D: D092909

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	37	Pass
Impact Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	m/s	1.96 to 2.55	2.32	Pass
	20 ms	m/s	4.12 to 5.10	4.62	Pass
	30 ms	m/s	5.73 to 7.01	6.41	Pass
	40 to 70 ms	m/s	6.27 to 7.64	6.86	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	76	Pass
Head Rotation Peak to Zero - Decay Time		ms	58 to 67	63	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	79	Pass
Mx Peak To Zero - Decay Time		ms	49 to 64	59	Pass
Mx Peak to Max. Head Rotation		ms	2 to 16	13	Pass


 Laboratory Technician

11/19/09

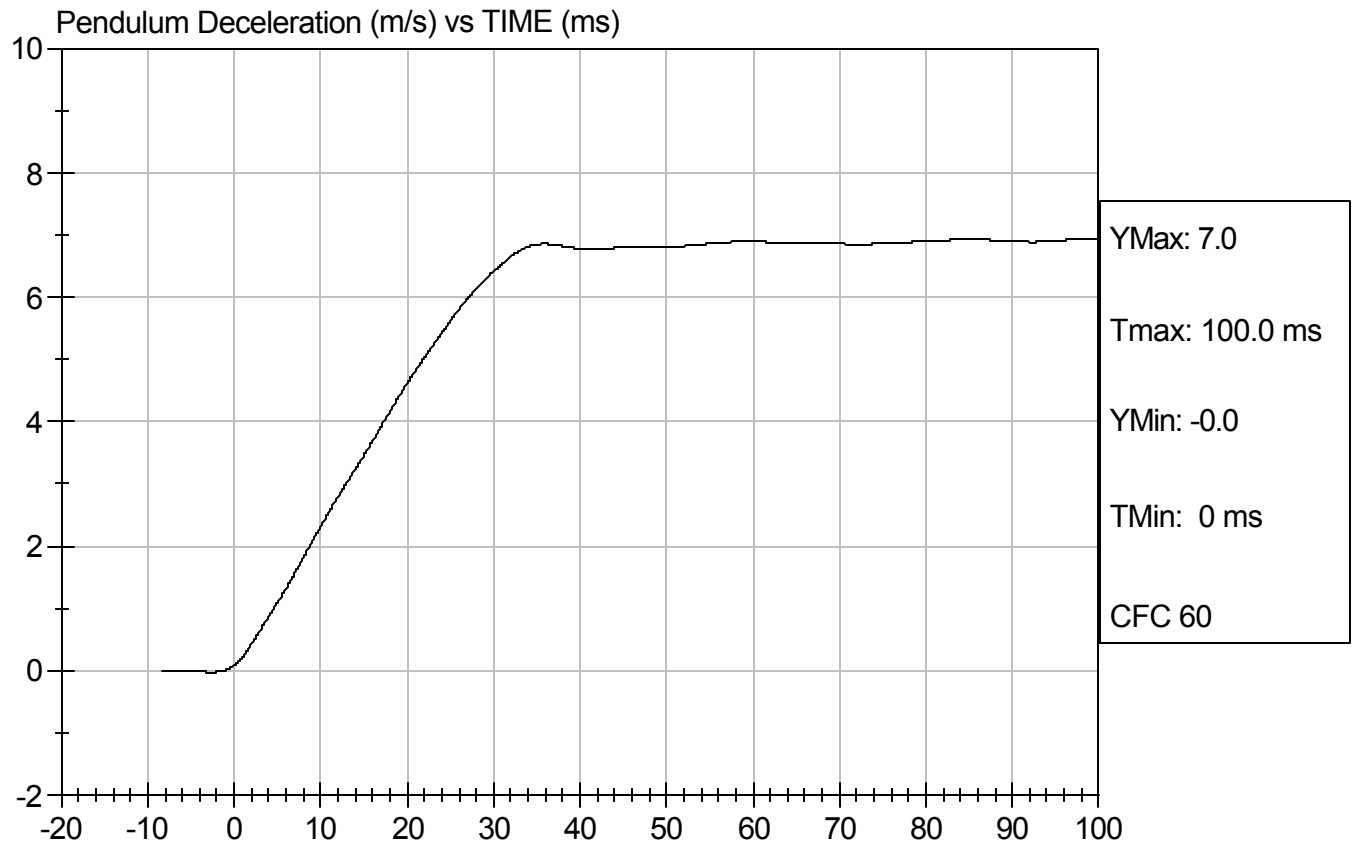
Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D092909

Test Date: 11/19/09
Speed: 23.15 ft/s, 7.06 m/s

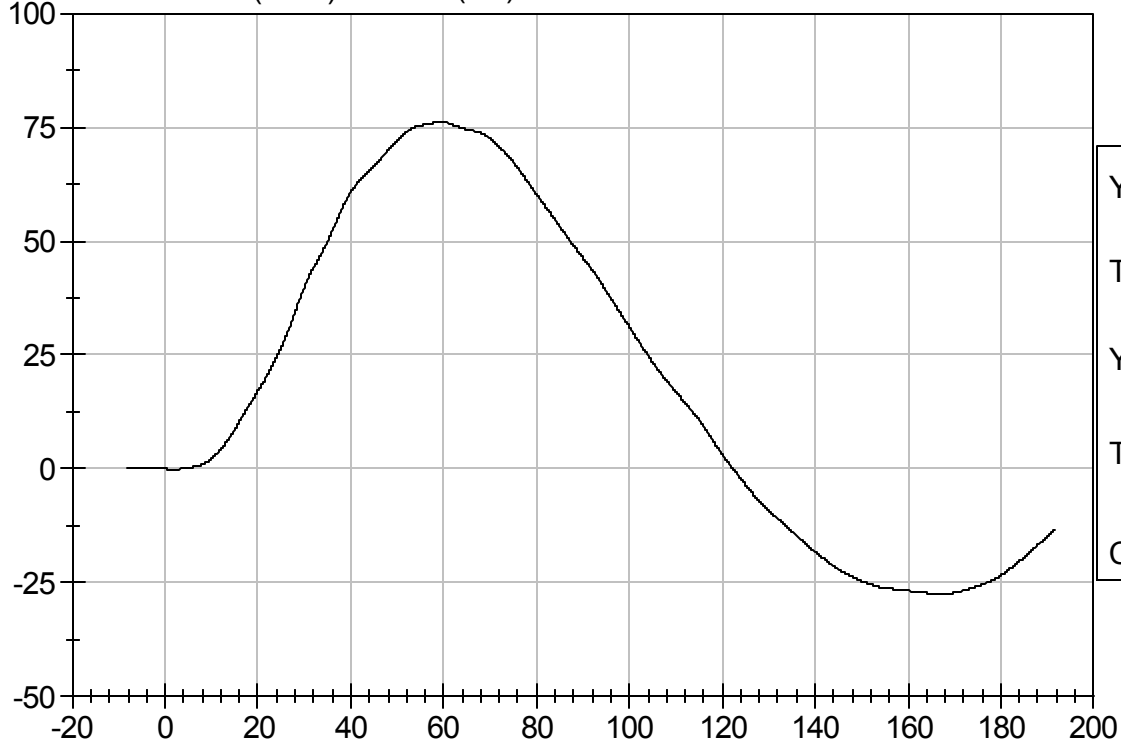




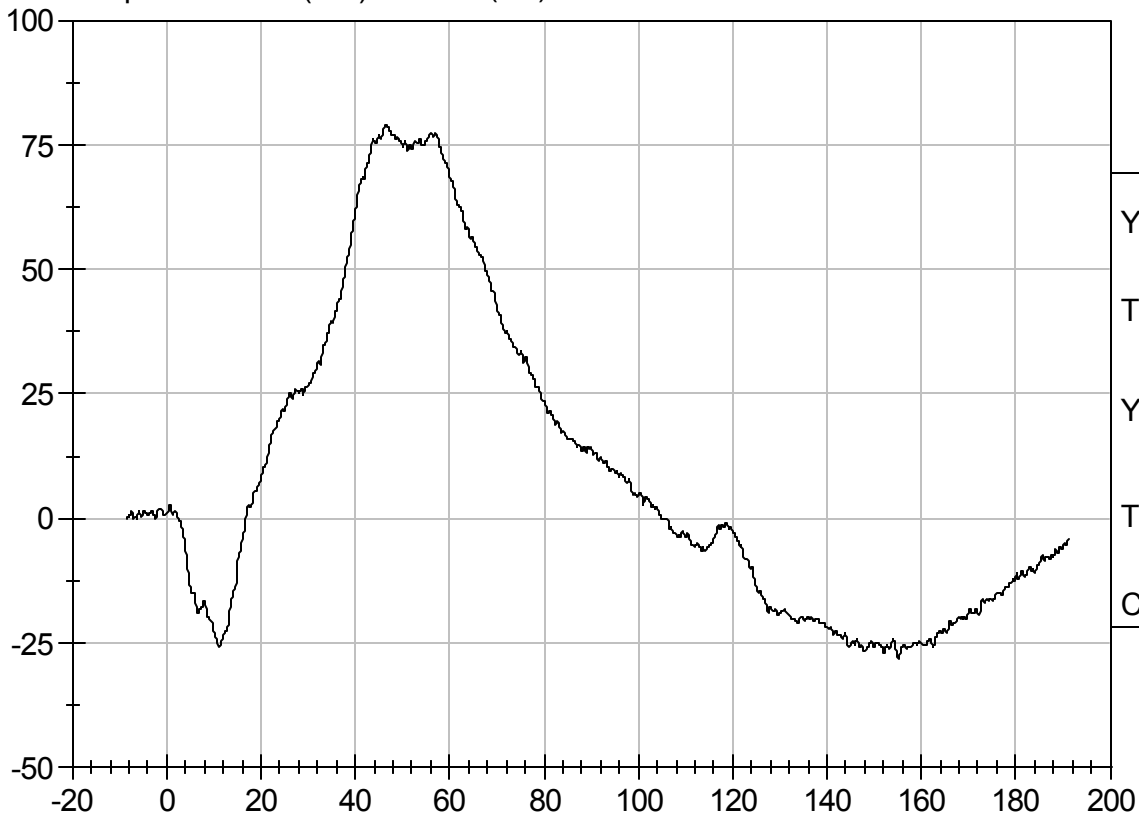
Test Desc: Neck Bending
Component ID: D092909

Test Date: 11/19/09
Speed: 23.15 ft/s, 7.06 m/s

Neck Rotation (DEG) vs Time (ms)



Occipital Moment (Nm) vs Time (ms)



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: D092901

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	37	Pass
Peak Resultant Acceleration	G's	120 to 150	135	Pass
Is Resultant Curve Unimodal?	N/A	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-6.6	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

11/19/09
Test Date

David Winkelbauer
Approved By



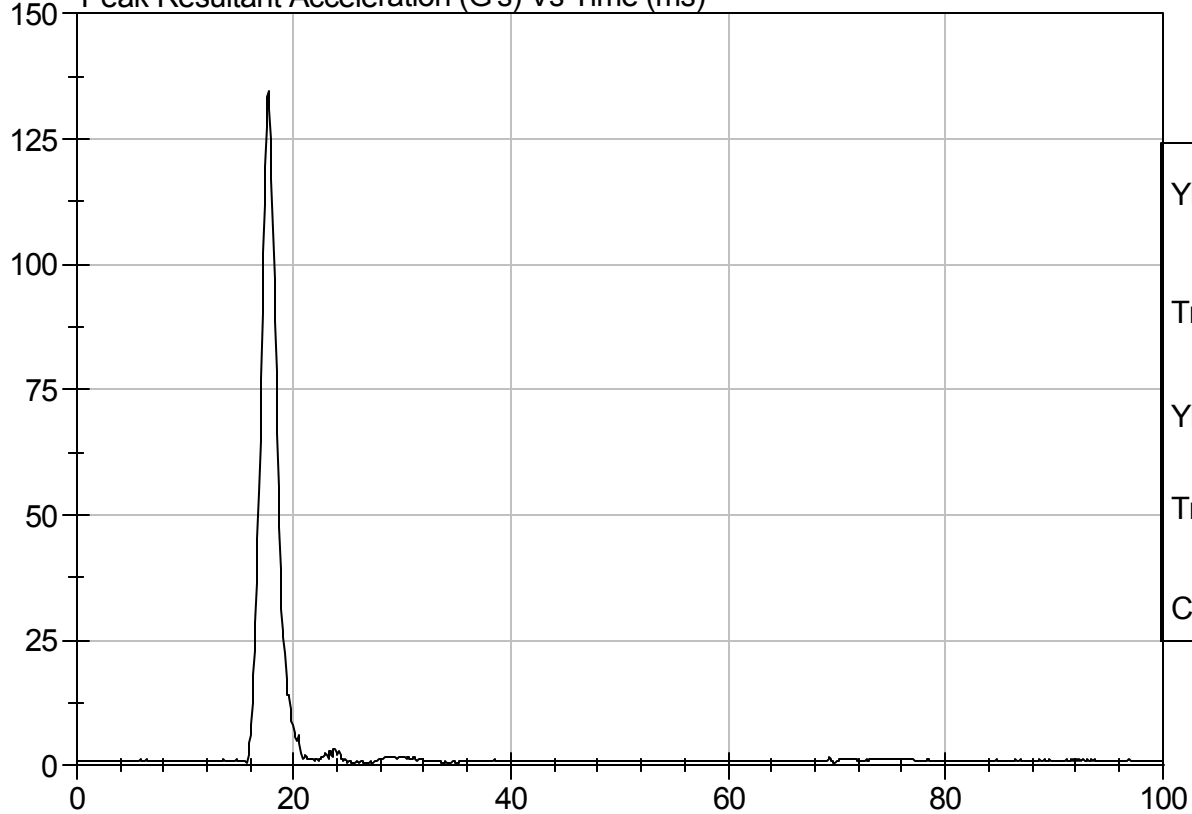
Test Description: Head Drop

Test Date: 11/19/09

Component: D092901

Speed: 0 ft/s, 0 m/s

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



YMax: 134.5 G

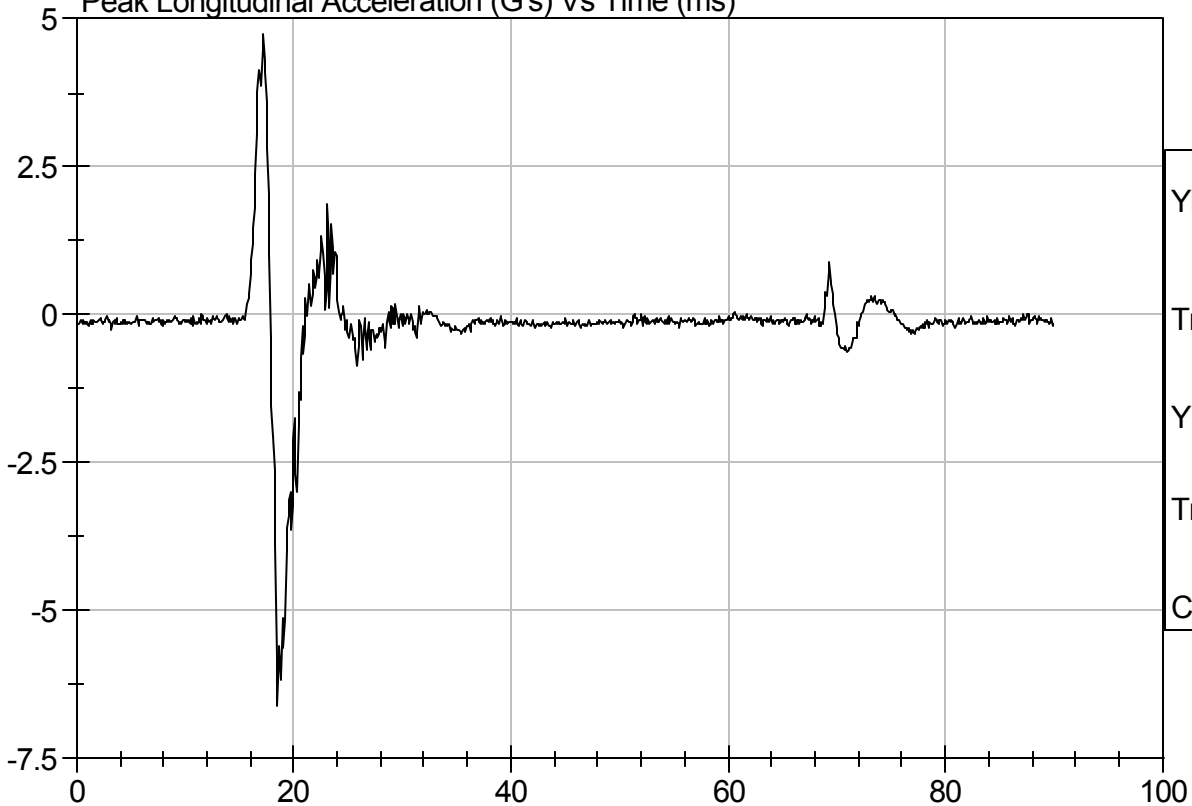
Tmax: 17.7 ms

YMin: 0.3 G

Tmin: 26.5 ms

CFC 1000

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



YMax: 4.8 G

Tmax: 17.2 ms

YMin: -6.6 G

Tmin: 18.5 ms

CFC 1000

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

ATD Serial No: 271

Test I.D: D092902

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Probe Velocity	m/s	4.22 - 4.31	4.23	Pass
Upper Rib	G's	37 - 46	37	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

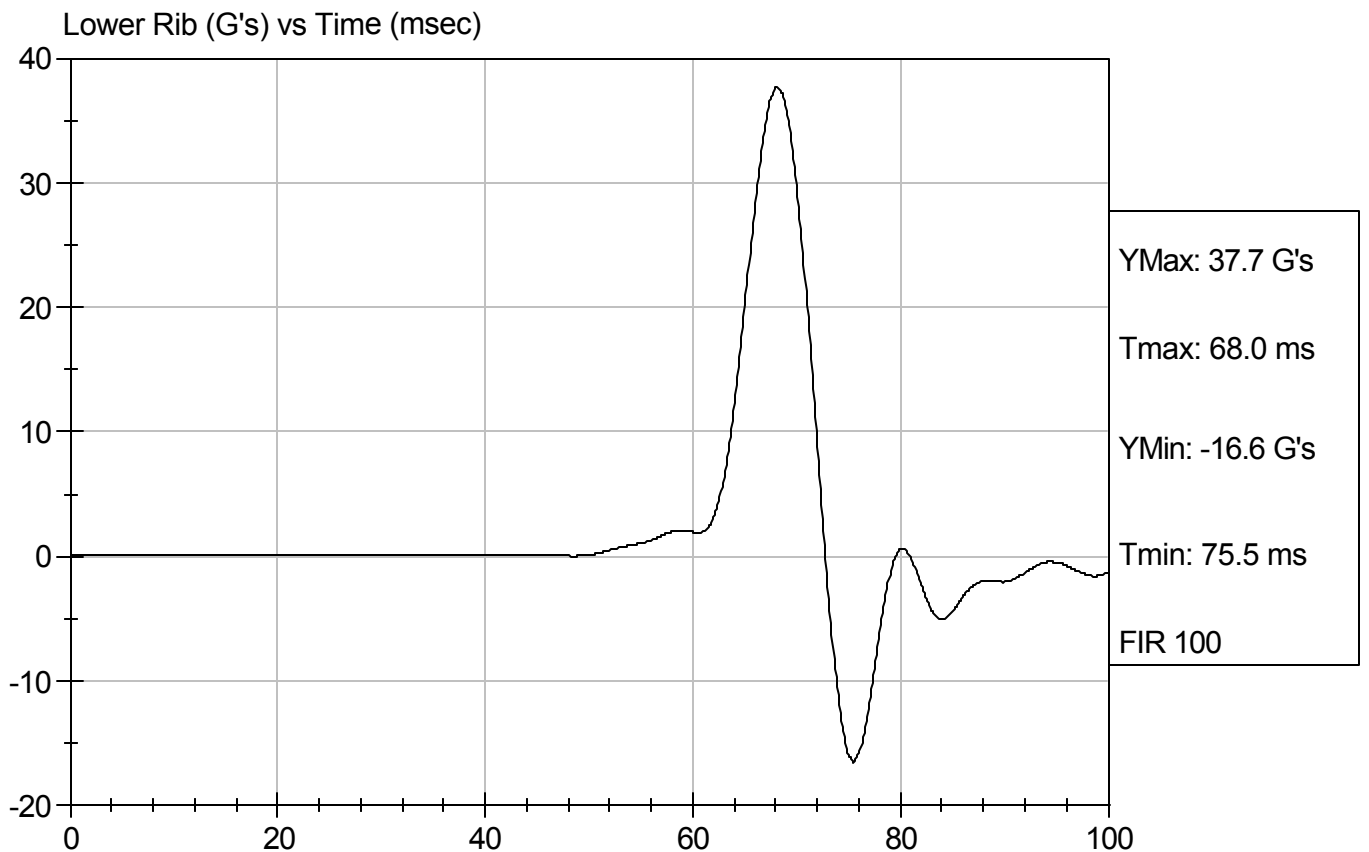
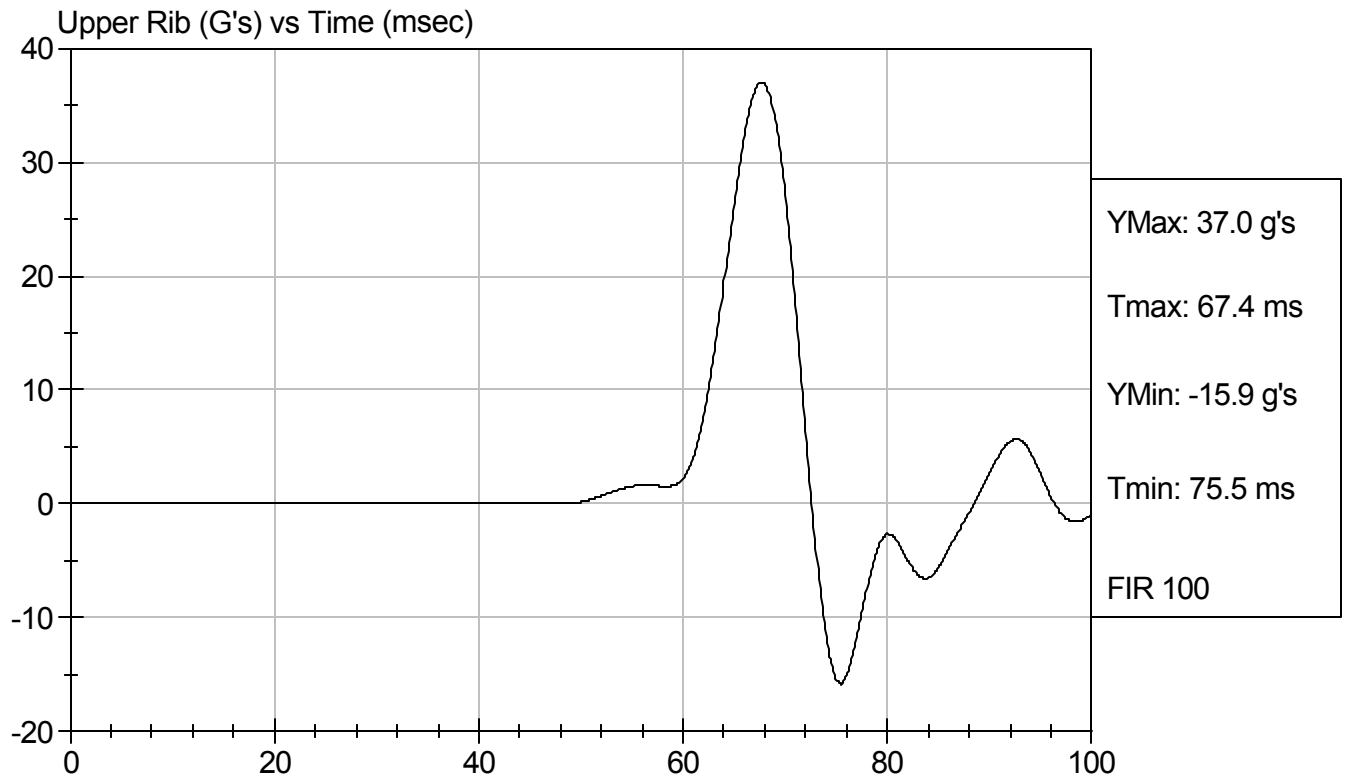
11/19/09
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax Impact
Component ID: D092902

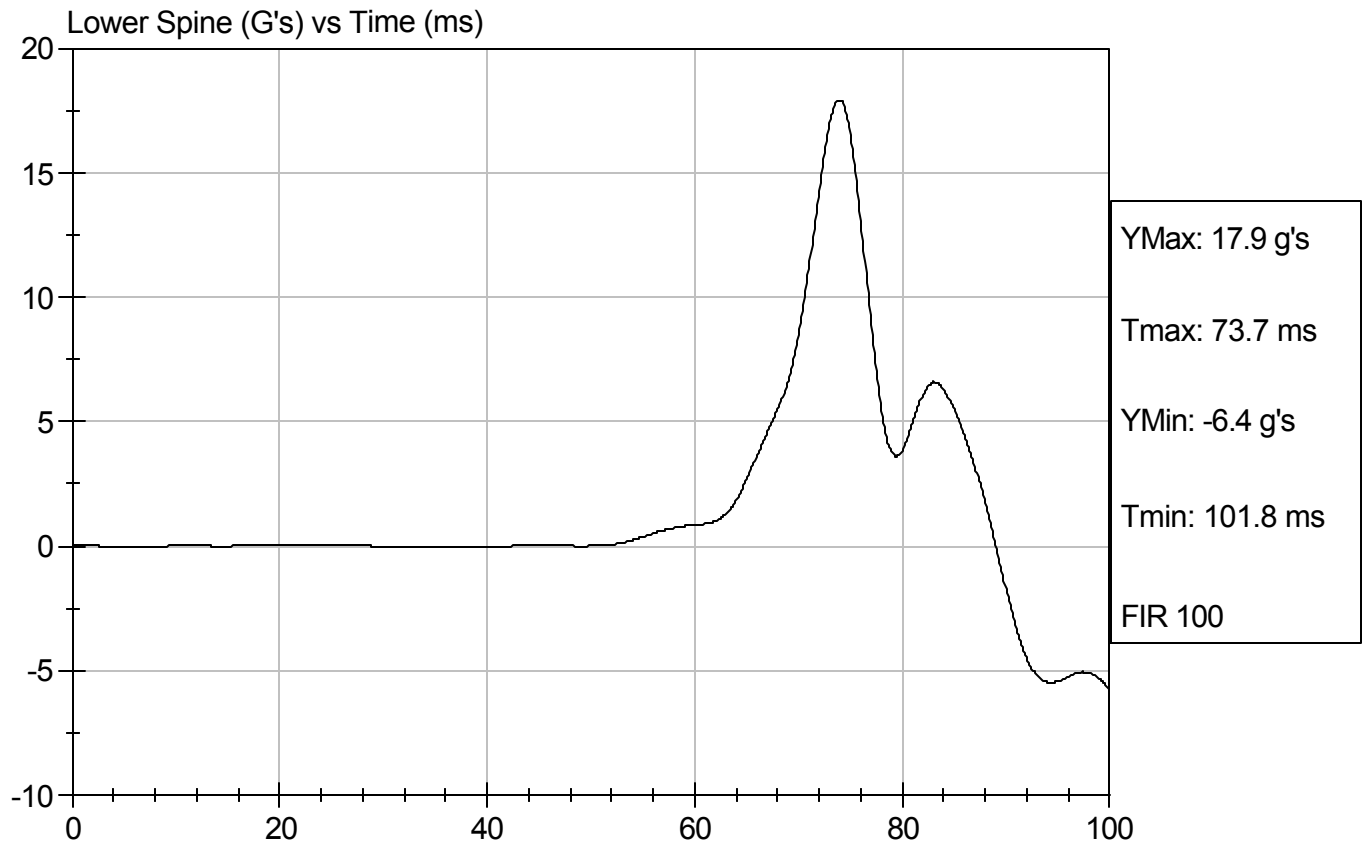
Test Date: 11/19/09
Speed: 13.89 ft/s, 4.23 m/s





Test Desc: Thorax Impact
Component ID: D092902

Test Date: 11/19/09
Speed: 13.89 ft/s, 4.23 m/s



SID/HIII Calibration Data Sheet

Side Impact Dummy

Pelvis Impact Test

ATD Serial No: 271

Test I.D: D092903

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	46	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

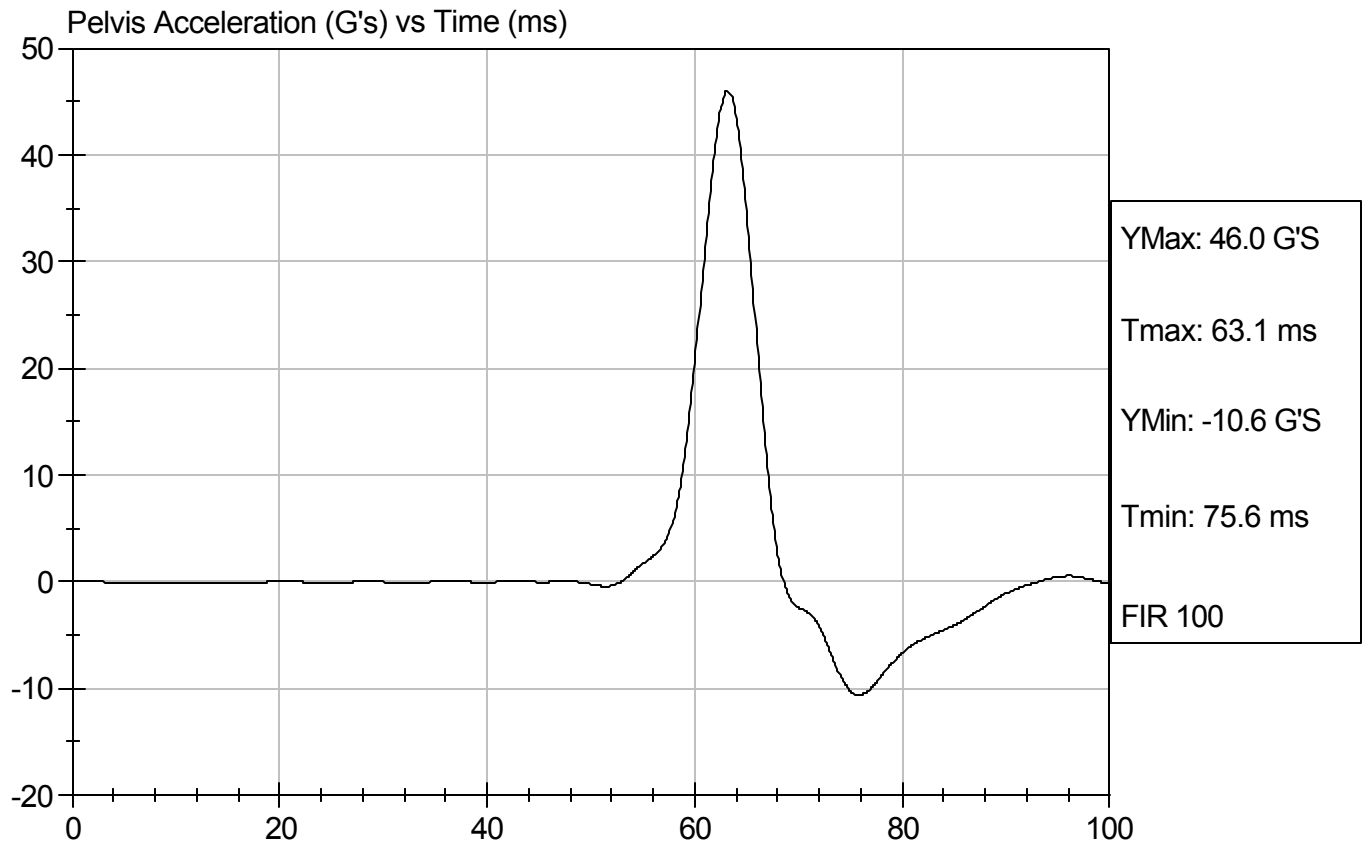
11/19/09
Test Date

David Winkelbauer
Approved By



Test Desc: Pelvis Impact
Component ID: D092903

Test Date: 11/19/09
Speed: 14.12 ft/s, 4.30 m/s



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

ATD Serial No: 271

Test I.D: D092904

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Force At 12.7 mm	N	104 -162	141	Pass
Force At 19 mm	N	163 - 222	193	Pass
Force At 25.4 mm	N	222 - 280	260	Pass
Force At 33 mm	N	325 - 391	352	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

11/18/09
Test Date

David Winkelbauer
Approved By

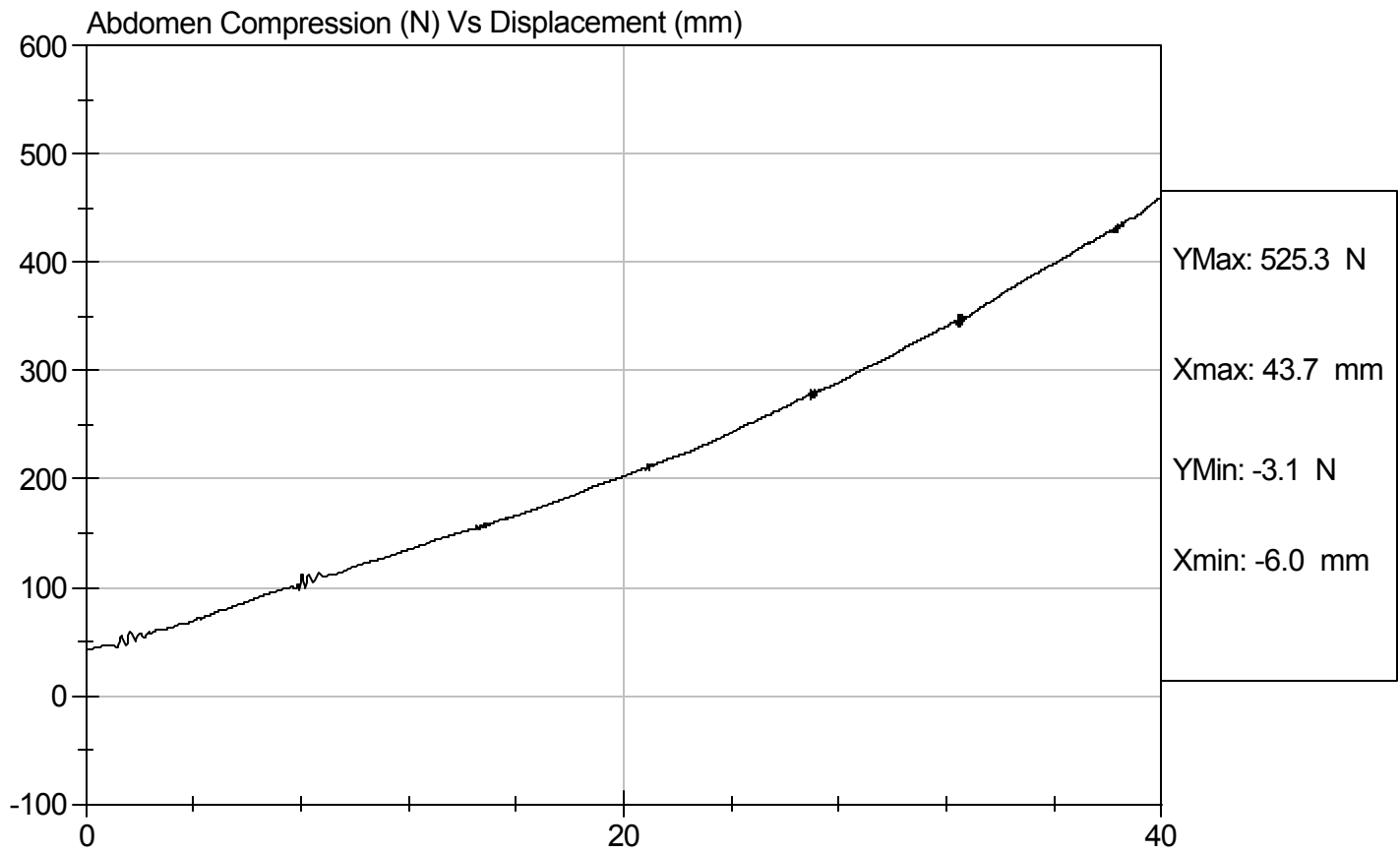


Test Description: Abdomen Compression

Test Date: 11/18/09

Component: D092904

Speed: 0 ft/s, 0 m/s



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

ATD Serial No: 271

Test I.D: D092905

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	110.1	Pass
Force At 30 deg	N	151.2 - 204.6	161.2	Pass
Force At 40 deg	N	204.6 - 258.0	211.0	Pass
Return Angle	Deg	12 Maximum	5	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

11/19/09
Test Date

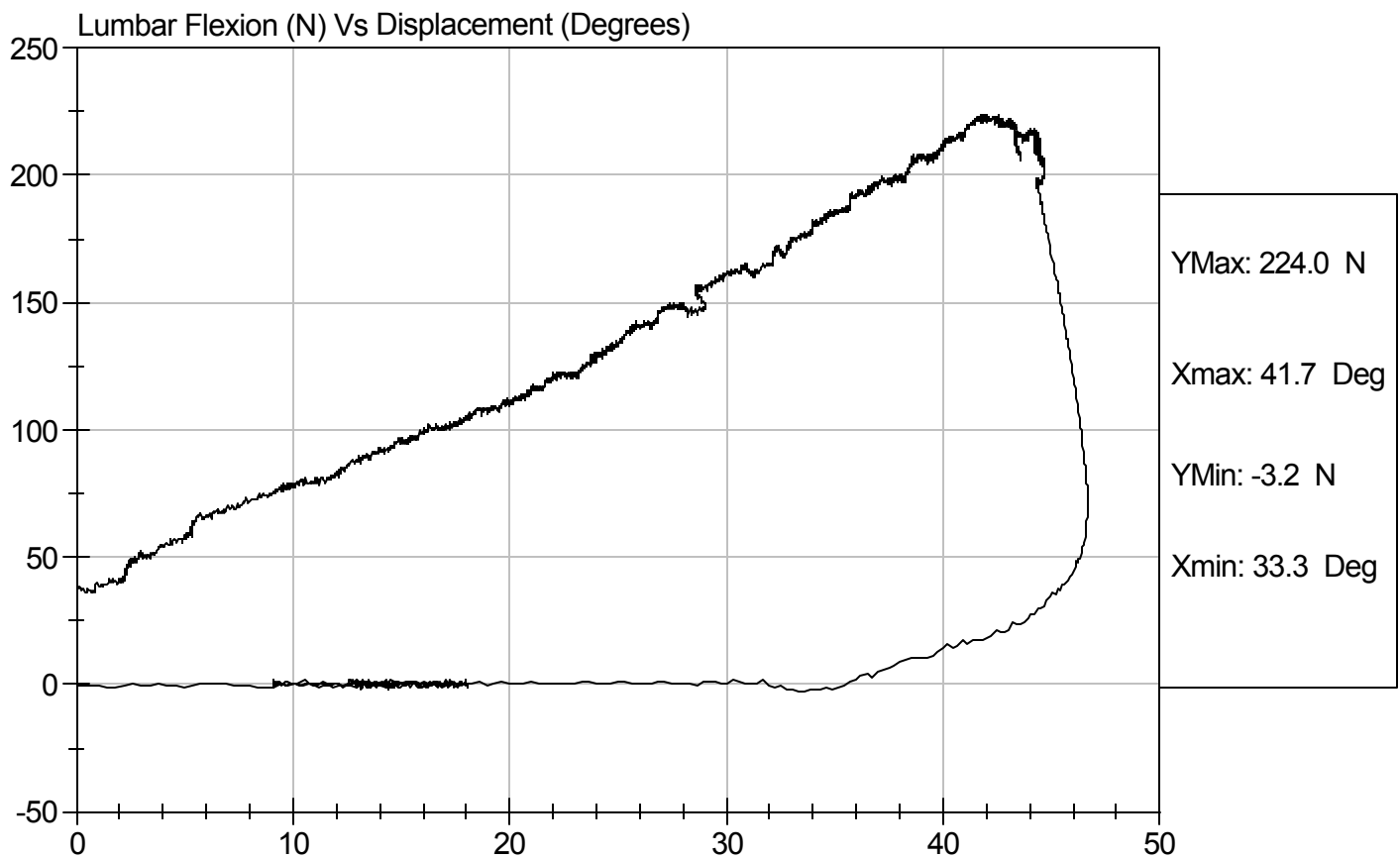


Test Description: Lumbar Flexion

Test Date: 11/19/09

Component: D092905

Speed: 0 ft/s, 0 m/s

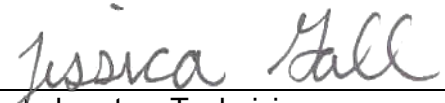


SID/HIII Calibration Data Sheet
Side Impact Dummy
Neck Pendulum Test

ATD Serial No: 271

Test I.D: D092909

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	37	Pass
Impact Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	m/s	1.96 to 2.55	2.32	Pass
	20 ms	m/s	4.12 to 5.10	4.62	Pass
	30 ms	m/s	5.73 to 7.01	6.41	Pass
	40 to 70 ms	m/s	6.27 to 7.64	6.86	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	76	Pass
Head Rotation Peak to Zero - Decay Time		ms	58 to 67	63	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	79	Pass
Mx Peak To Zero - Decay Time		ms	49 to 64	59	Pass
Mx Peak to Max. Head Rotation		ms	2 to 16	13	Pass


 Laboratory Technician

11/19/09

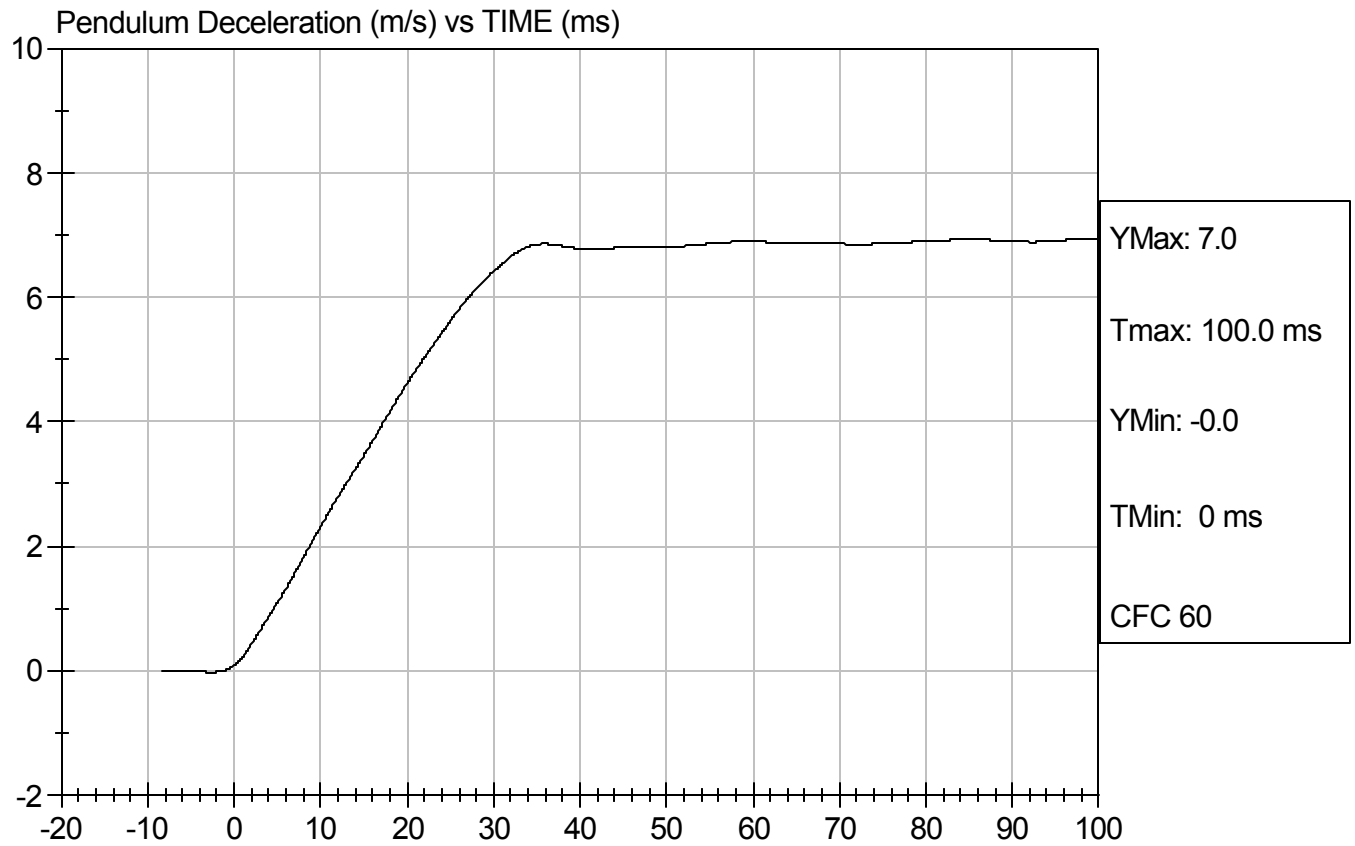
Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D092909

Test Date: 11/19/09
Speed: 23.15 ft/sec, 7.06 m/sec

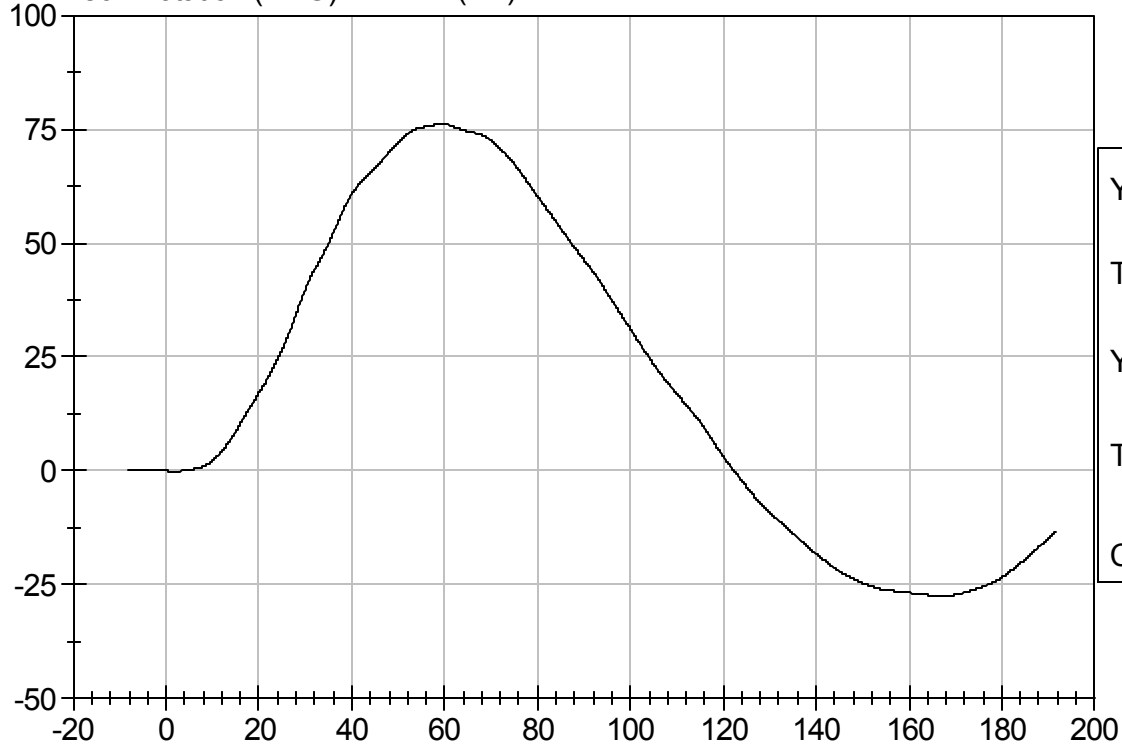




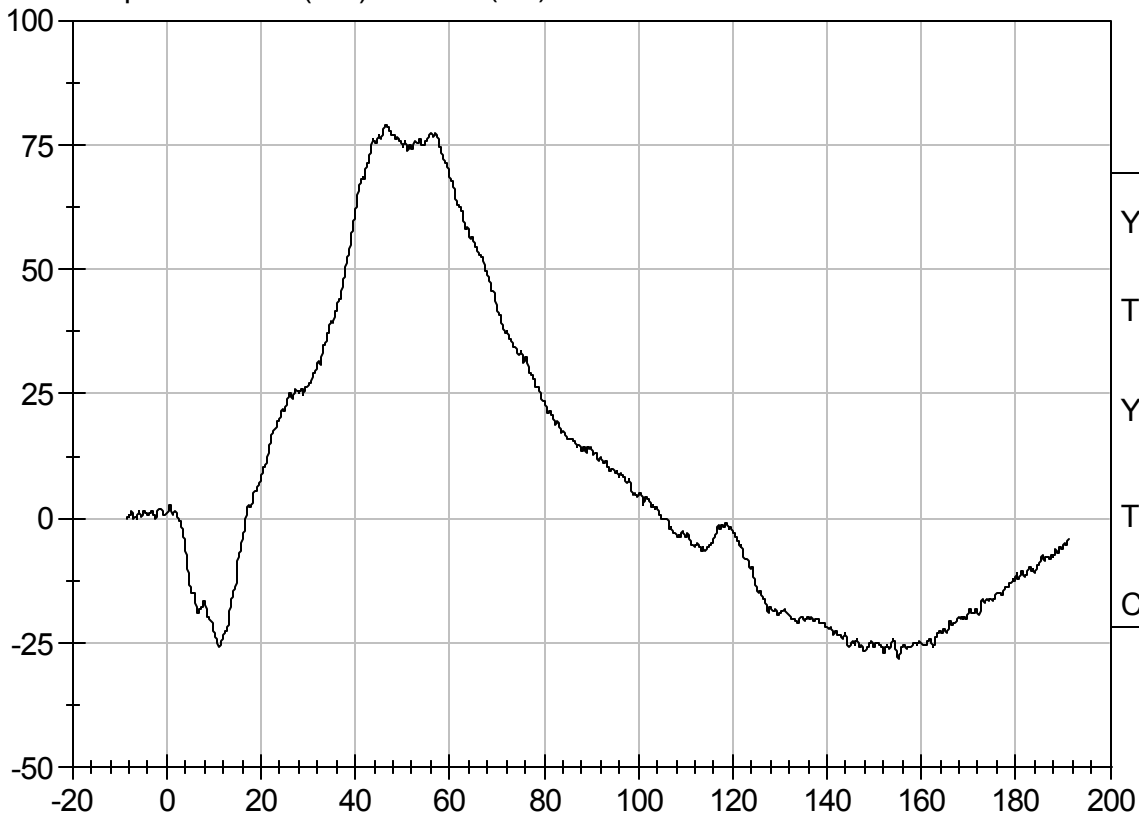
Test Desc: Neck Bending
Component ID: D092909

Test Date: 11/19/09
Speed: 23.15 ft/sec, 7.06 m/sec

Neck Rotation (DEG) vs Time (ms)



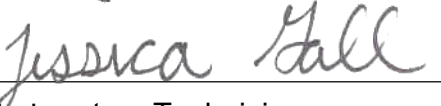
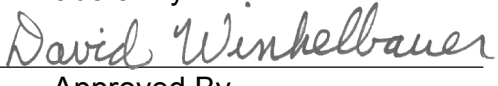
Occipital Moment (Nm) vs Time (ms)



SID/HIII 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

12/1/2009
Test Date

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/HIII Calibration Data Sheet
Side Impact Dummy
External Measurements

ATD Serial No: 272

Test I.D: D09291

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

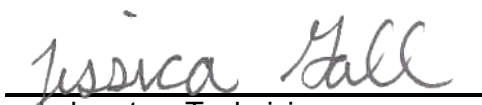
11/19/2009
Test Date

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

ATD Serial No: 272

Test I.D: D092911

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	37	Pass
Peak Resultant Acceleration	G's	120 to 150	128	Pass
Is Resultant Curve Unimodal?	N/A	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-9.5	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

11/19/09
Test Date



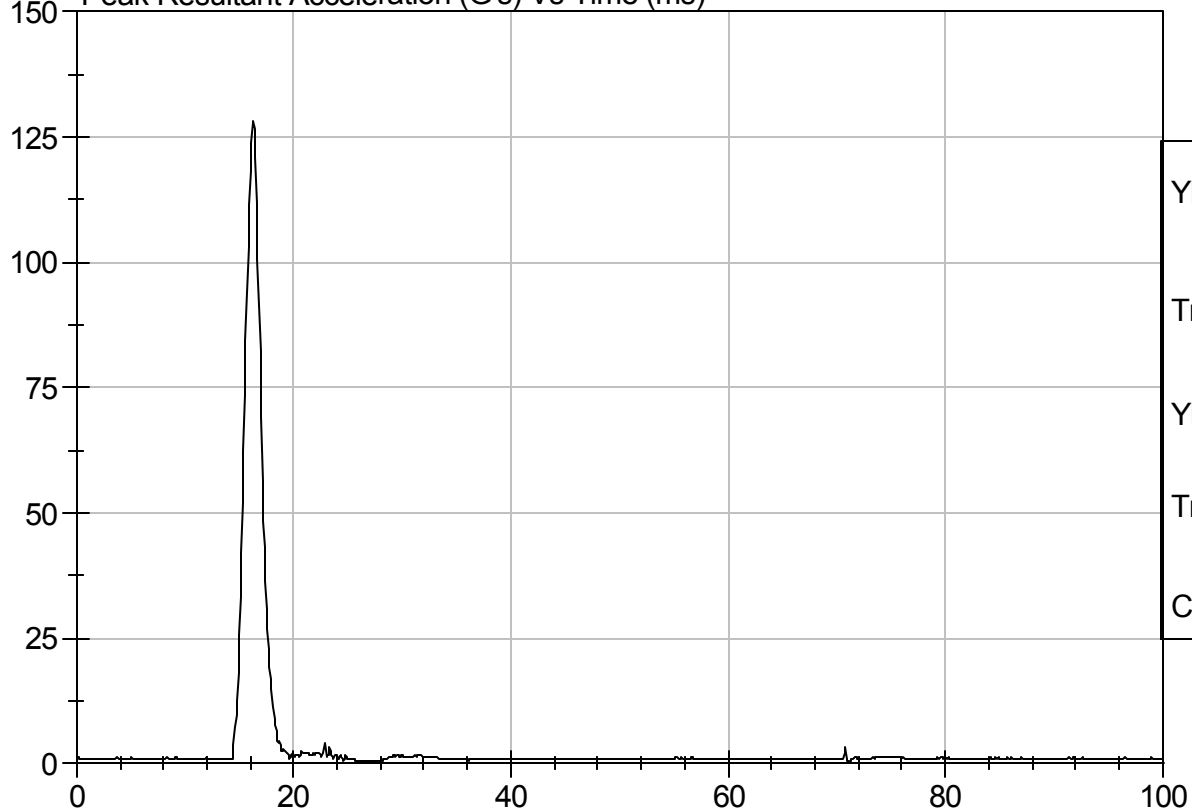
Test Description: Head Drop

Test Date: 11/19/09

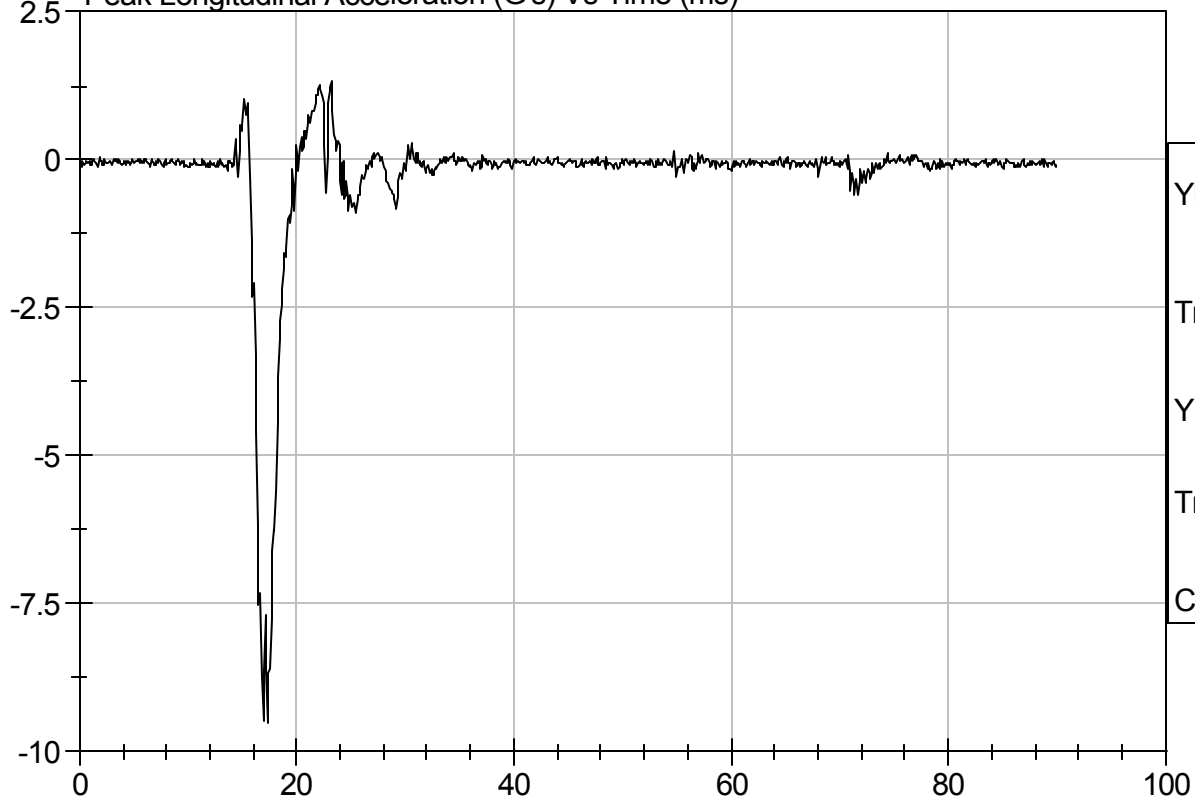
Component: D092911

Speed: 0 ft/s, 0 m/s

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



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



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

ATD Serial No: 272

Test I.D: D092912

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	33	Pass
Probe Velocity	m/s	4.22 - 4.31	4.23	Pass
Upper Rib	G's	37 - 46	41	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

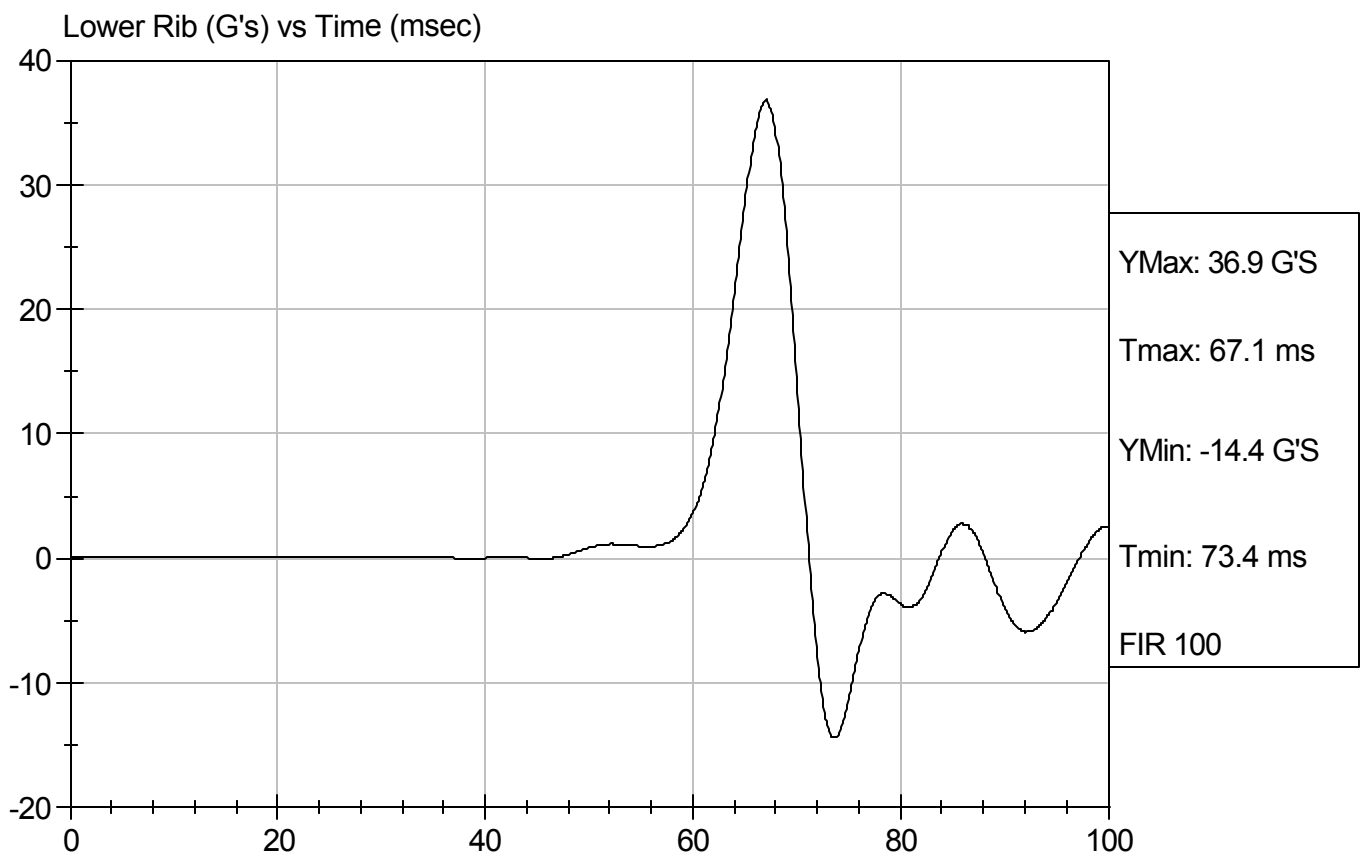
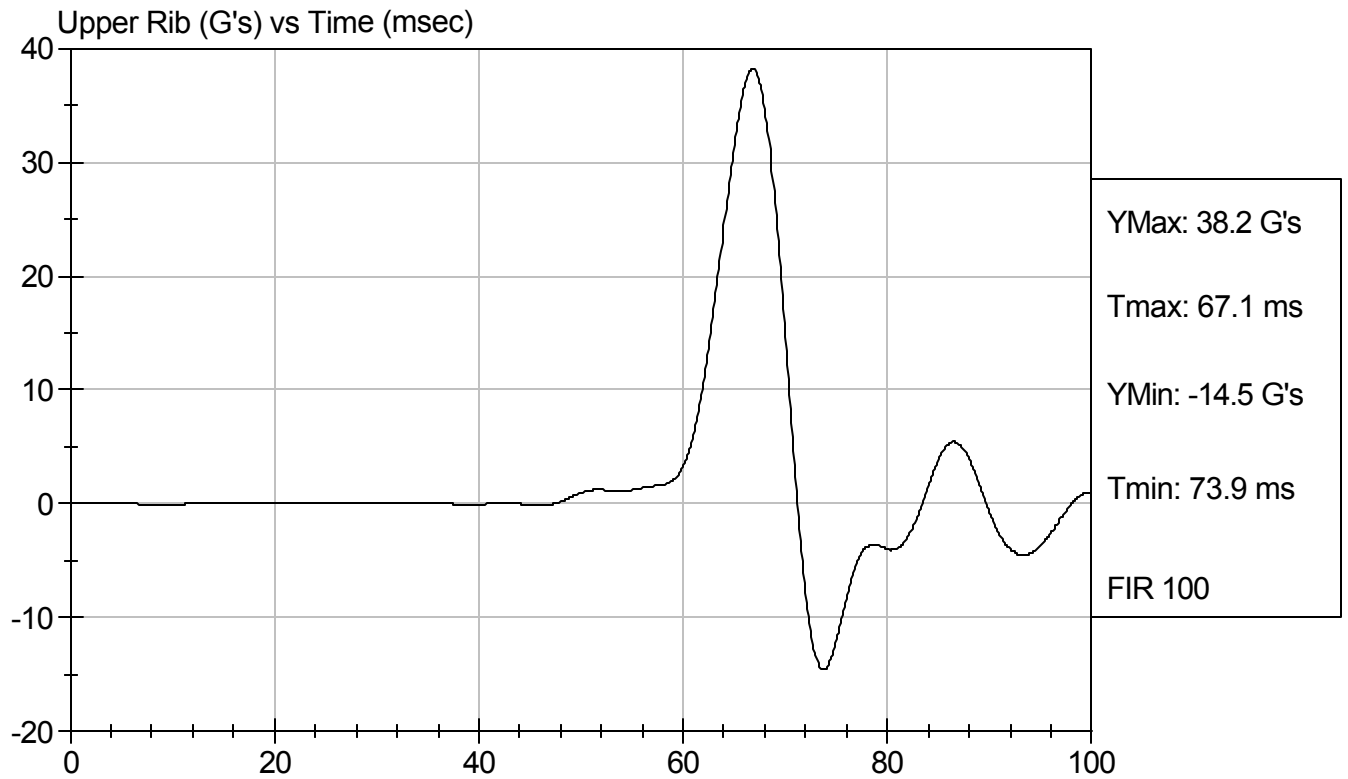
David Winkelbauer
Approved By

11/19/09
Test Date



Test Desc: Thorax Impact
Component ID: D092912

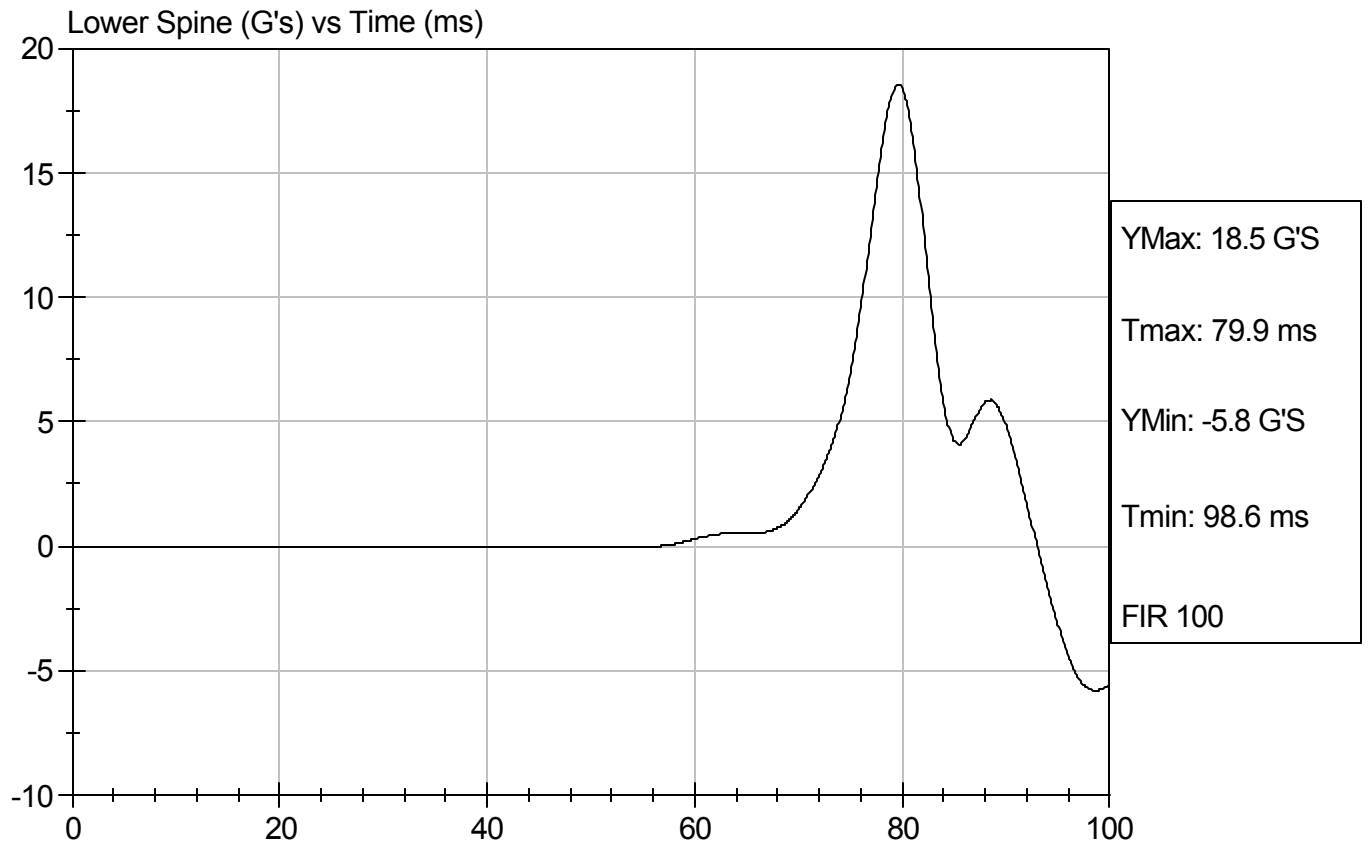
Test Date: 11/19/09
Speed: 13.89 ft/s, 4.23 m/s





Test Desc: Thorax Impact
Component ID: D092912

Test Date: 11/19/09
Speed: 13.89 ft/s, 4.23 m/s



SID/HIII Calibration Data Sheet

Side Impact Dummy

Pelvis Impact Test

ATD Serial No: 272

Test I.D: D092913

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	33	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	41	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

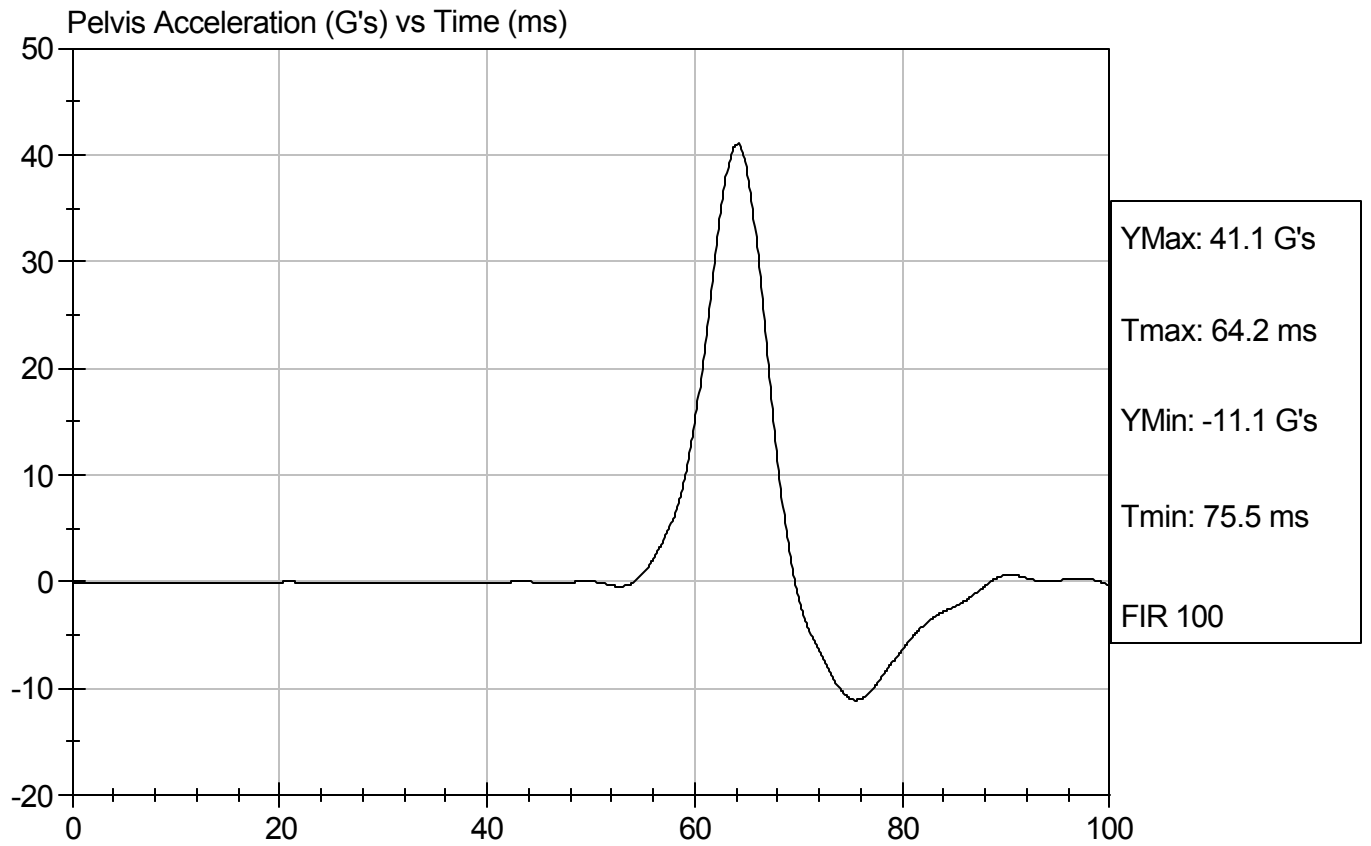
11/19/09

Test Date



Test Desc: Pelvis Impact
Component ID: D092913

Test Date: 11/19/09
Speed: 14.12 ft/s, 4.30 m/s



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

ATD Serial No: 272

Test I.D: D092914

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Force At 12.7 mm	N	104 -162	137	Pass
Force At 19 mm	N	163 - 222	187	Pass
Force At 25.4 mm	N	222 - 280	253	Pass
Force At 33 mm	N	325 - 391	347	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

11/19/09
Test Date

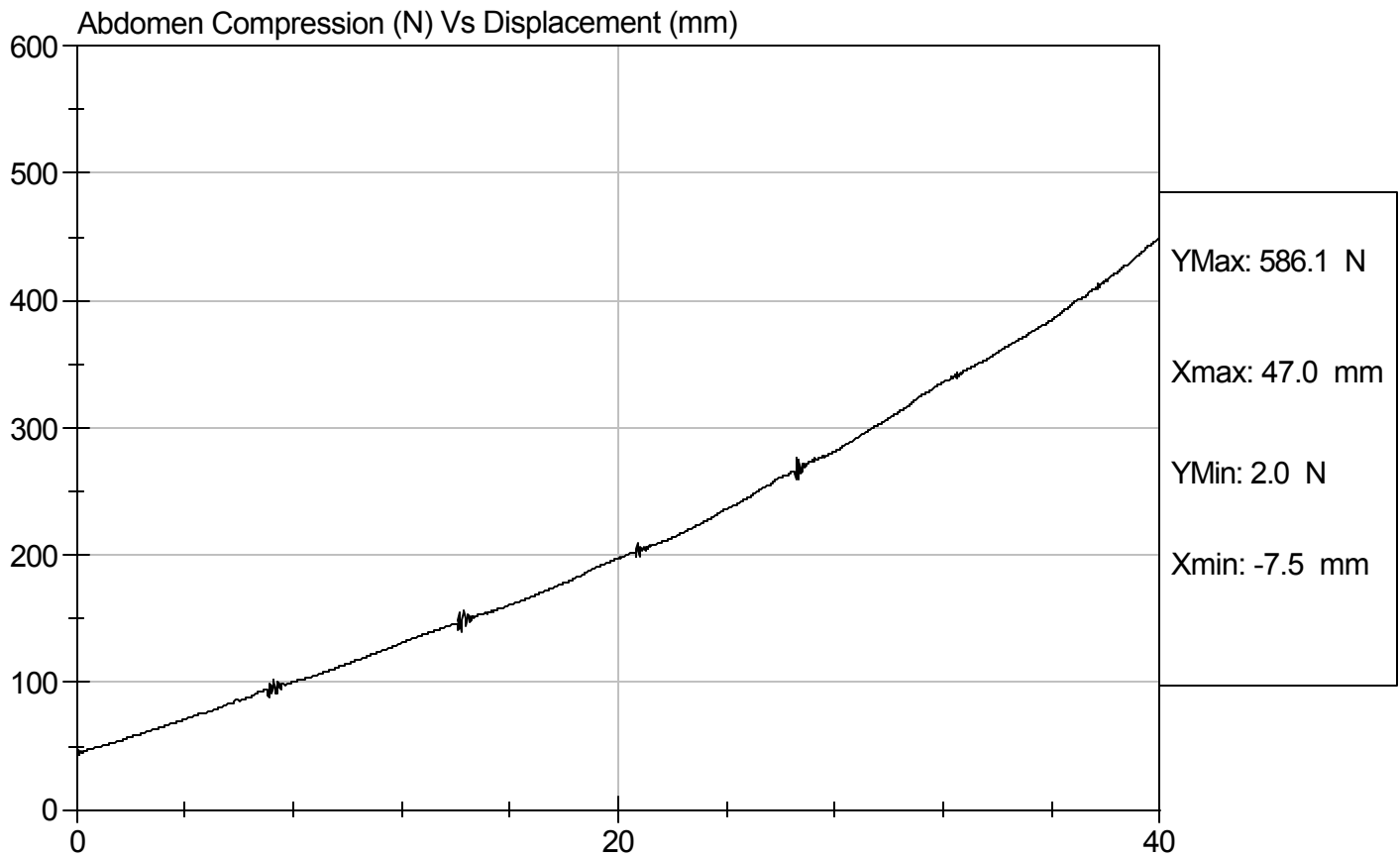


Test Description: Abdomen Compression

Test Date: 11/19/09

Component: D092914

Speed: 0 ft/s, 0 m/s



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

ATD Serial No: 272

Test I.D: D092915

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	142.2	Pass
Force At 30 deg	N	151.2 - 204.6	179.3	Pass
Force At 40 deg	N	204.6 - 258.0	224.4	Pass
Return Angle	Deg	12 Maximum	3	Pass
Overall Test Results			Pass	


Laboratory Technician


Approved By

11/19/09
Test Date

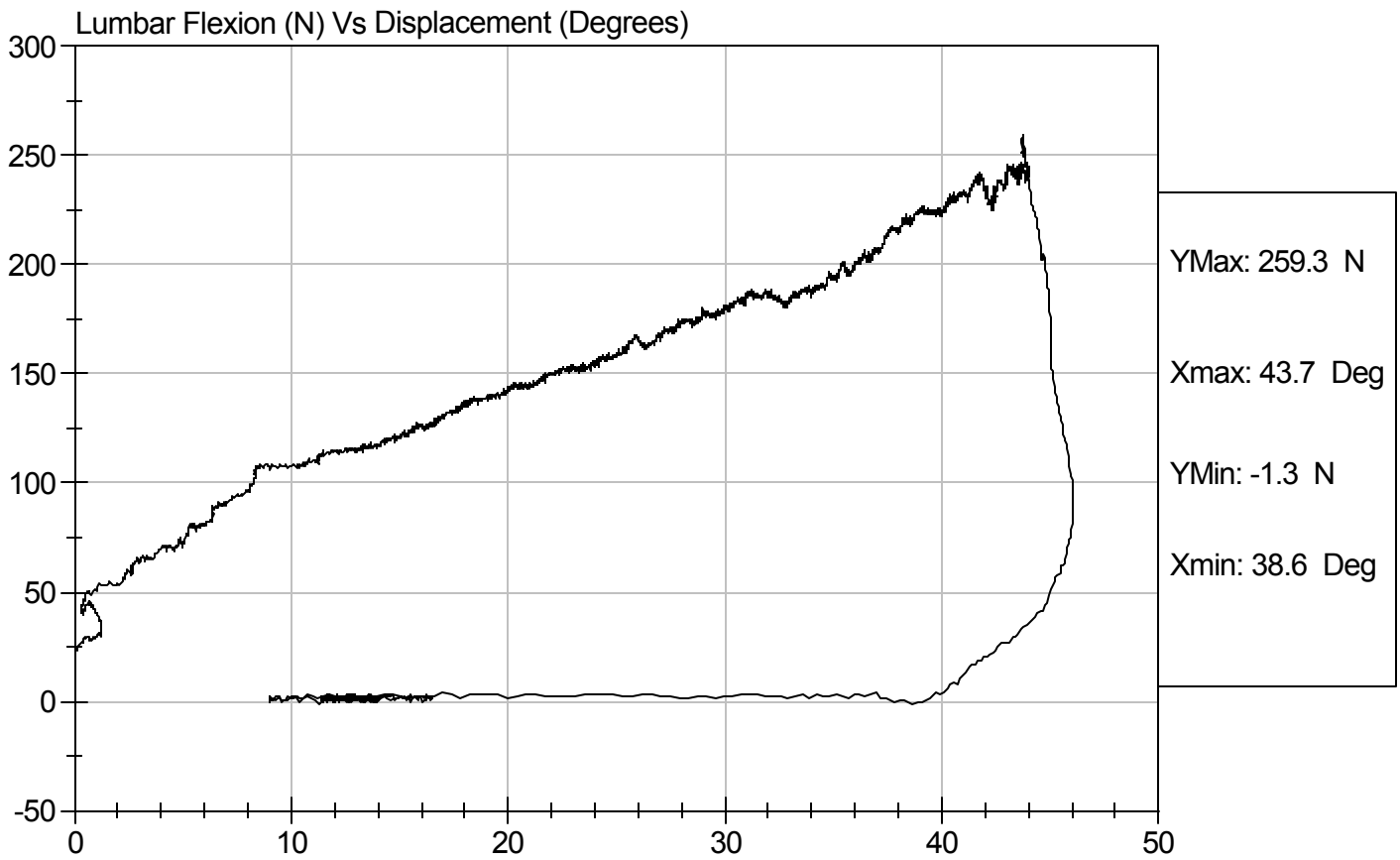


Test Description: Lumbar Flexion

Test Date: 11/19/09

Component: D092915

Speed: 0 ft/s, 0 m/s

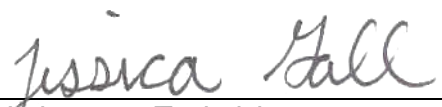


SID/HIII Calibration Data Sheet
Side Impact Dummy
Neck Pendulum Test

ATD Serial No: 272

Test I.D: D092919

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	37	Pass
Impact Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	m/s	1.96 to 2.55	2.32	Pass
	20 ms	m/s	4.12 to 5.10	4.53	Pass
	30 ms	m/s	5.73 to 7.01	6.18	Pass
	40 to 70 ms	m/s	6.27 to 7.64	6.91	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	73	Pass
Head Rotation Peak to Zero - Decay Time		ms	58 to 67	59	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	79	Pass
Mx Peak To Zero - Decay Time		ms	49 to 64	55	Pass
Mx Peak to Max. Head Rotation		ms	2 to 16	12	Pass


 Laboratory Technician

11/19/09

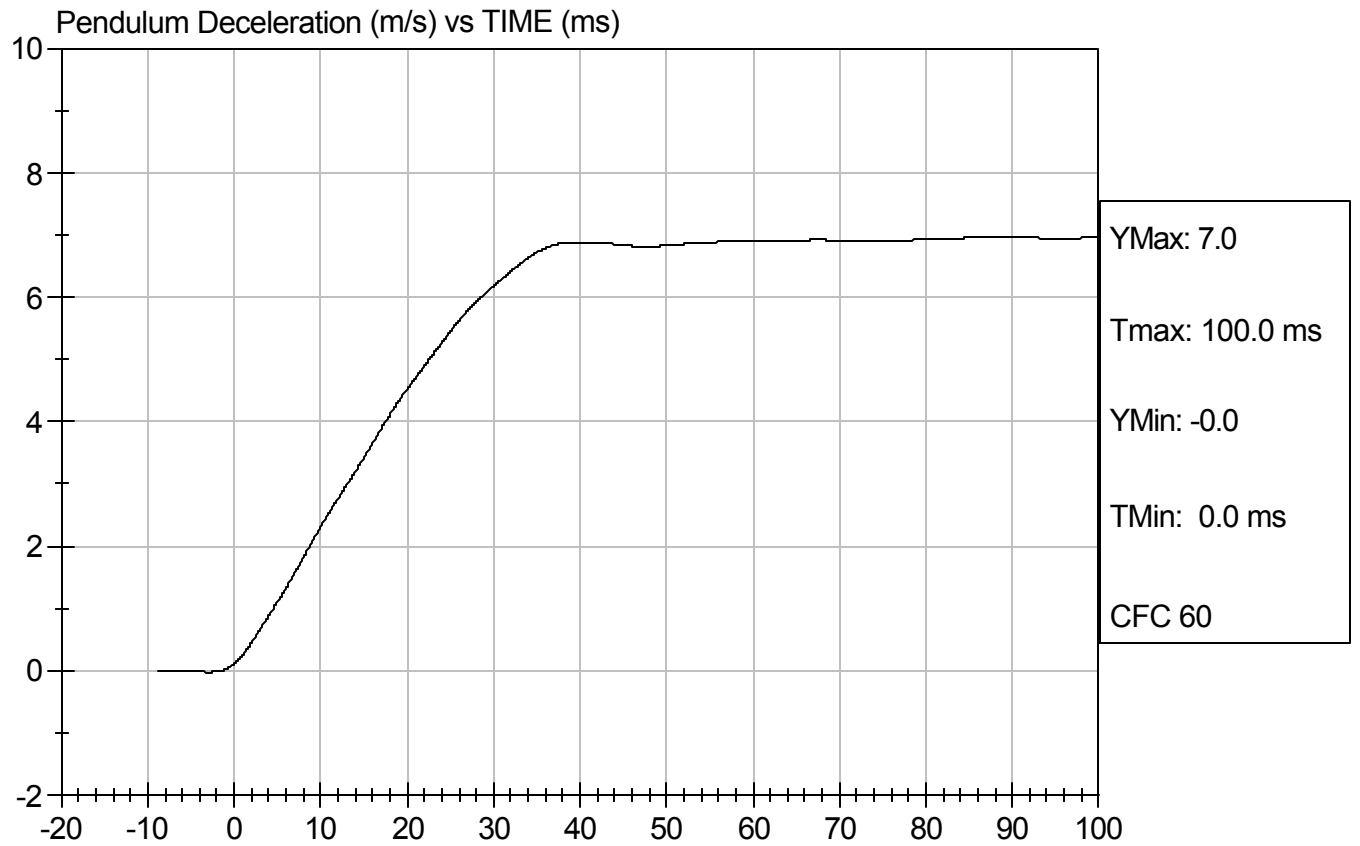
Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D092919

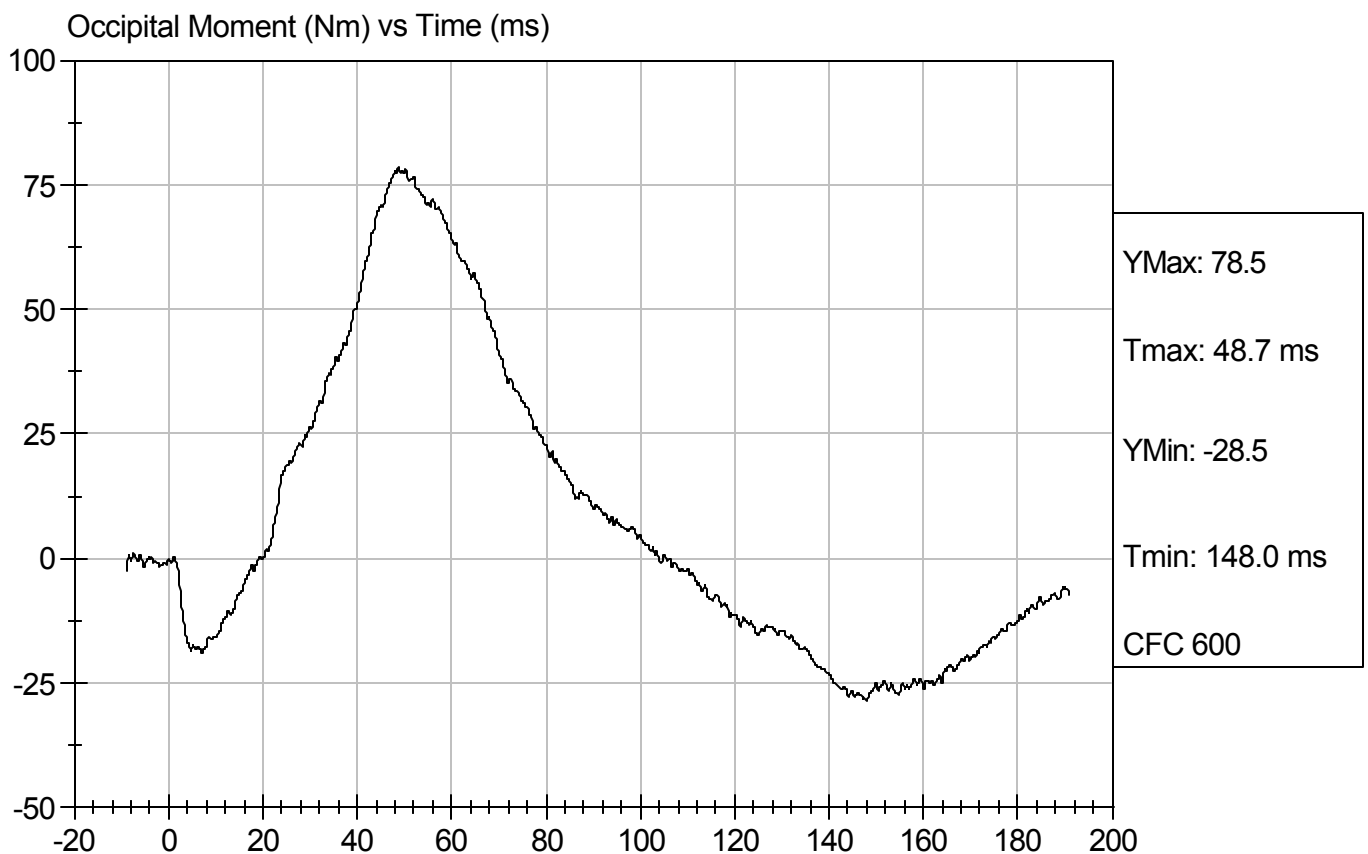
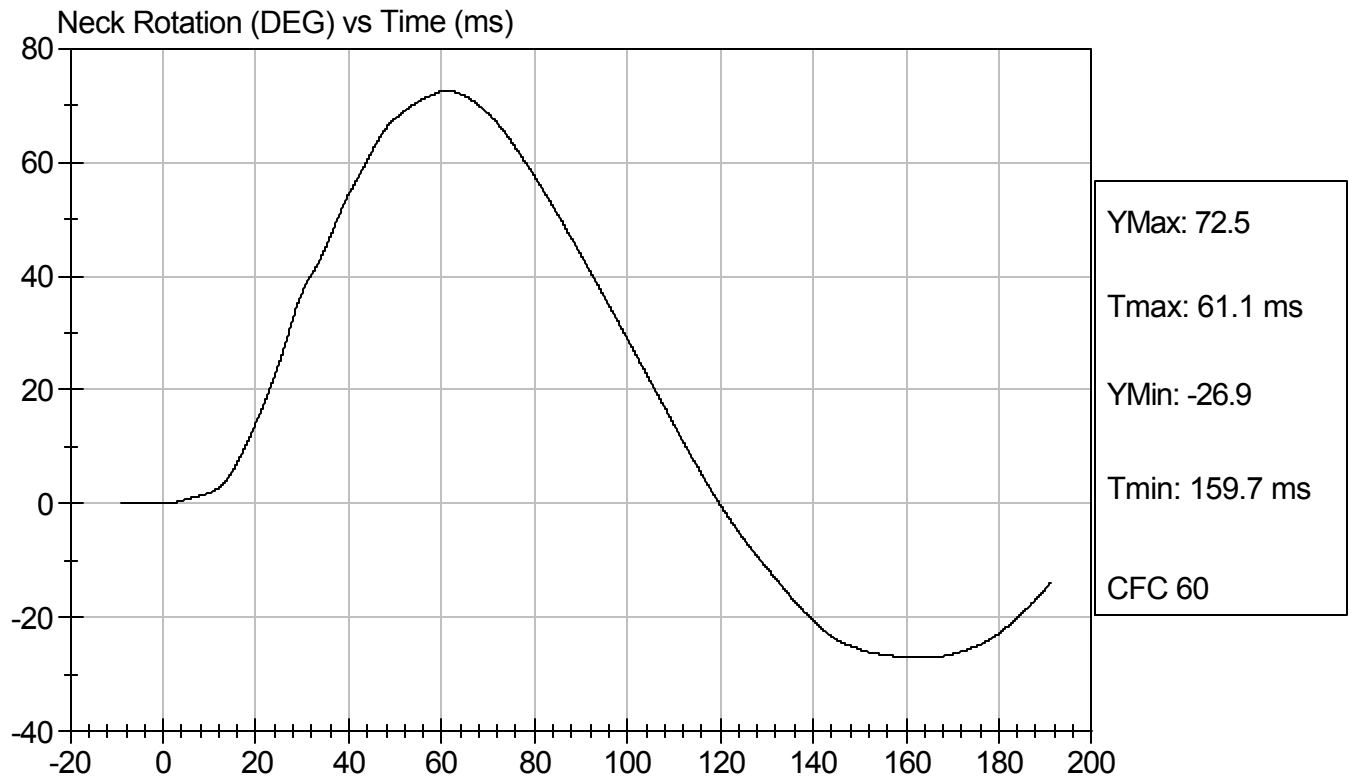
Test Date: 11/19/09
Speed: 23.15 ft/s, 7.06 m/s





Test Desc: Neck Bending
Component ID: D092919

Test Date: 11/19/09
Speed: 23.15 ft/s, 7.06 m/s



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: D092961

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	25	Pass
Peak Resultant Acceleration	G's	120 to 150	134	Pass
Is Resultant Curve Unimodal?	N/A	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	7.6	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

11/30/09
Test Date

David Winkelbauer
Approved By



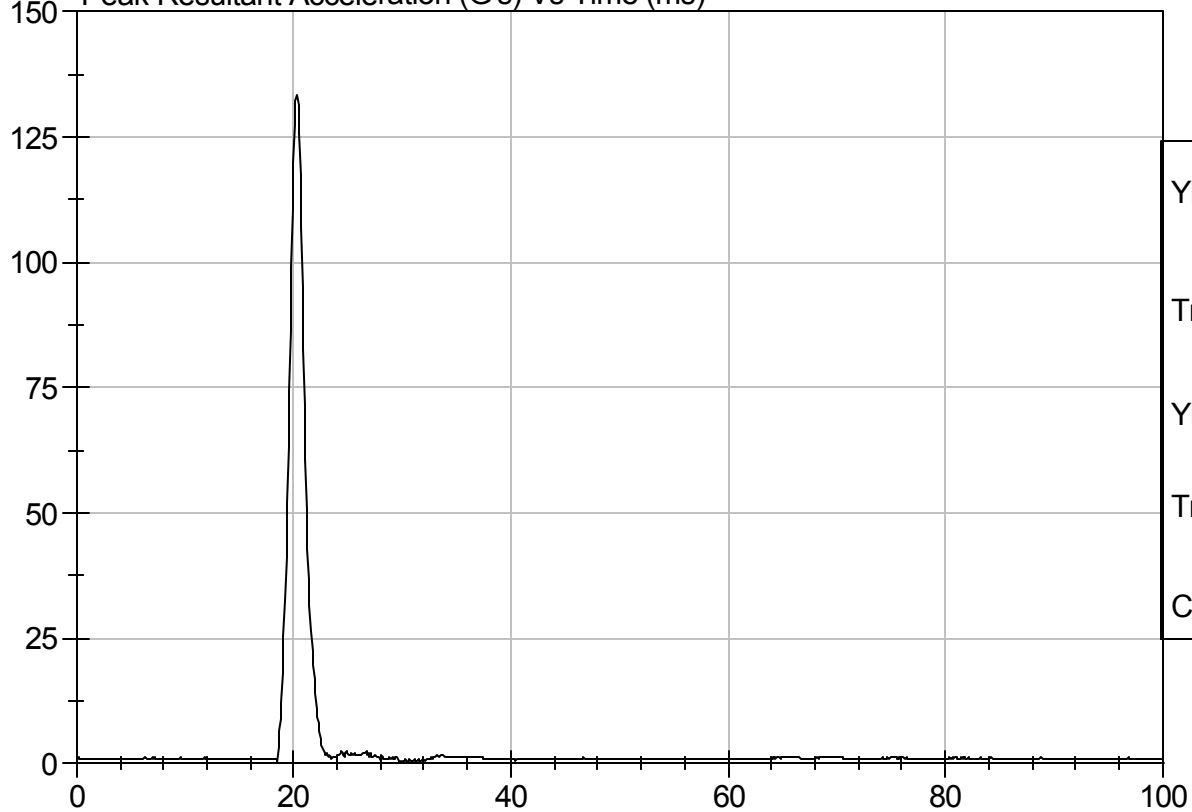
Test Description: Head Drop

Test Date: 11/30/09

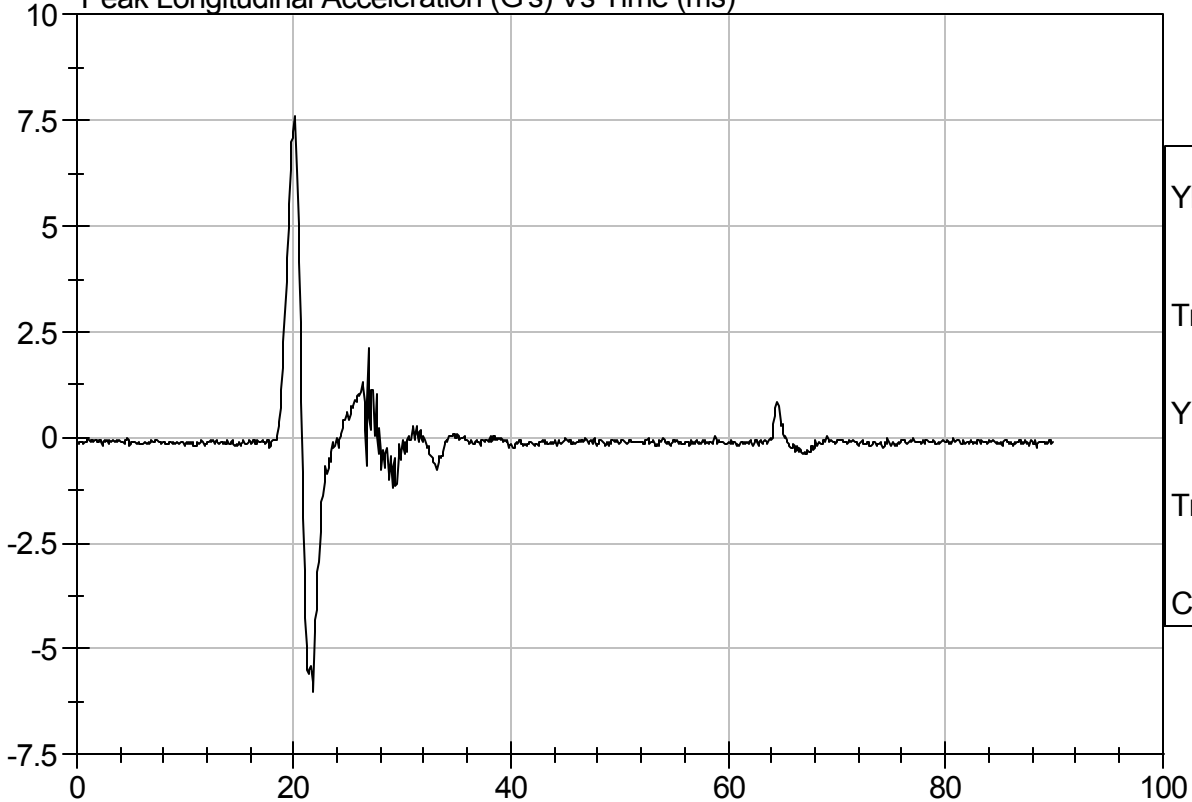
Component: D092961

Speed: 0 ft/s, 0.00 m/s

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



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



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

ATD Serial No: 272

Test I.D: D092962

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	24	Pass
Probe Velocity	m/s	4.22 - 4.31	4.27	Pass
Upper Rib	G's	37 - 46	40	Pass
Lower Rib	G's	37 - 46	42	Pass
Lower Spine	G's	15 - 22	21	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

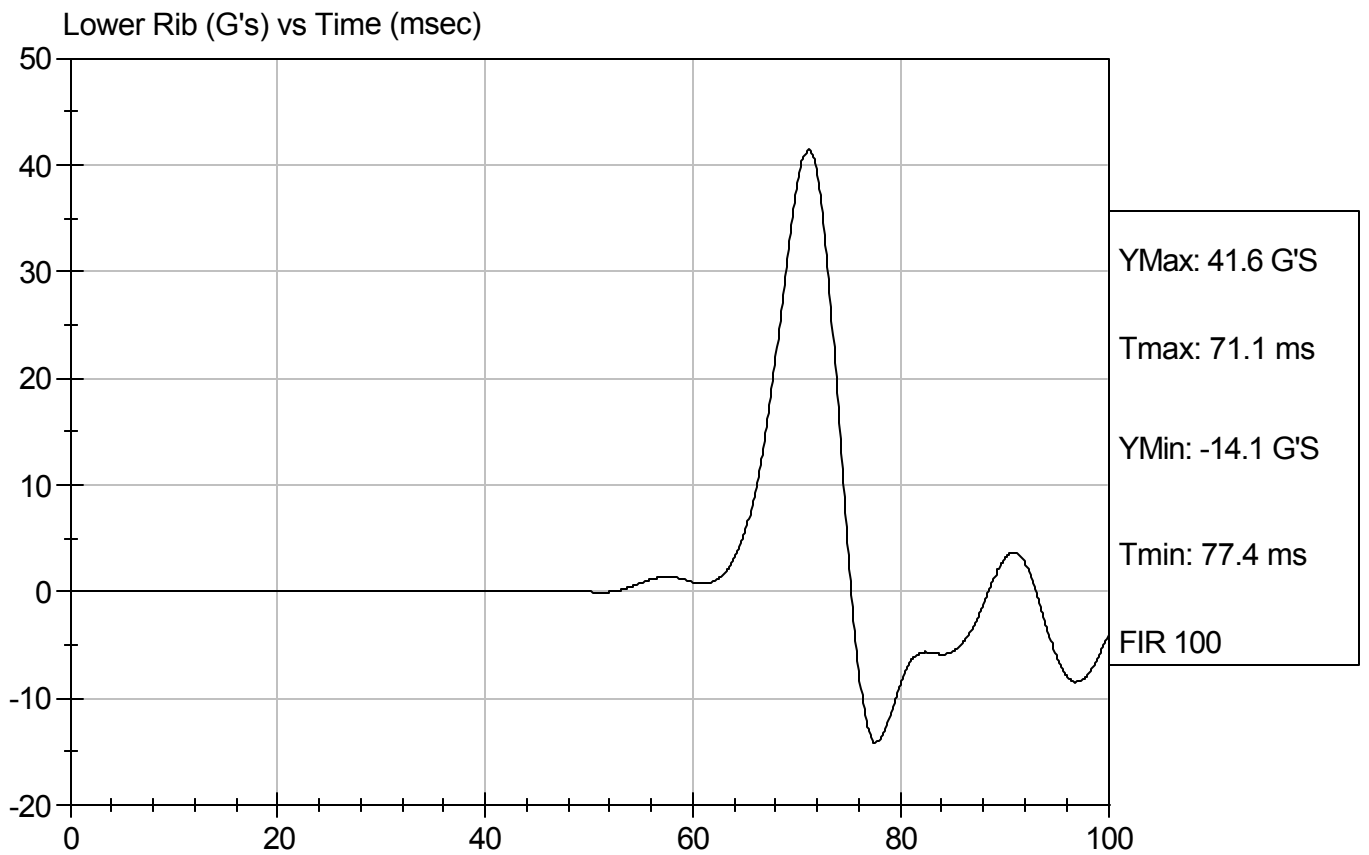
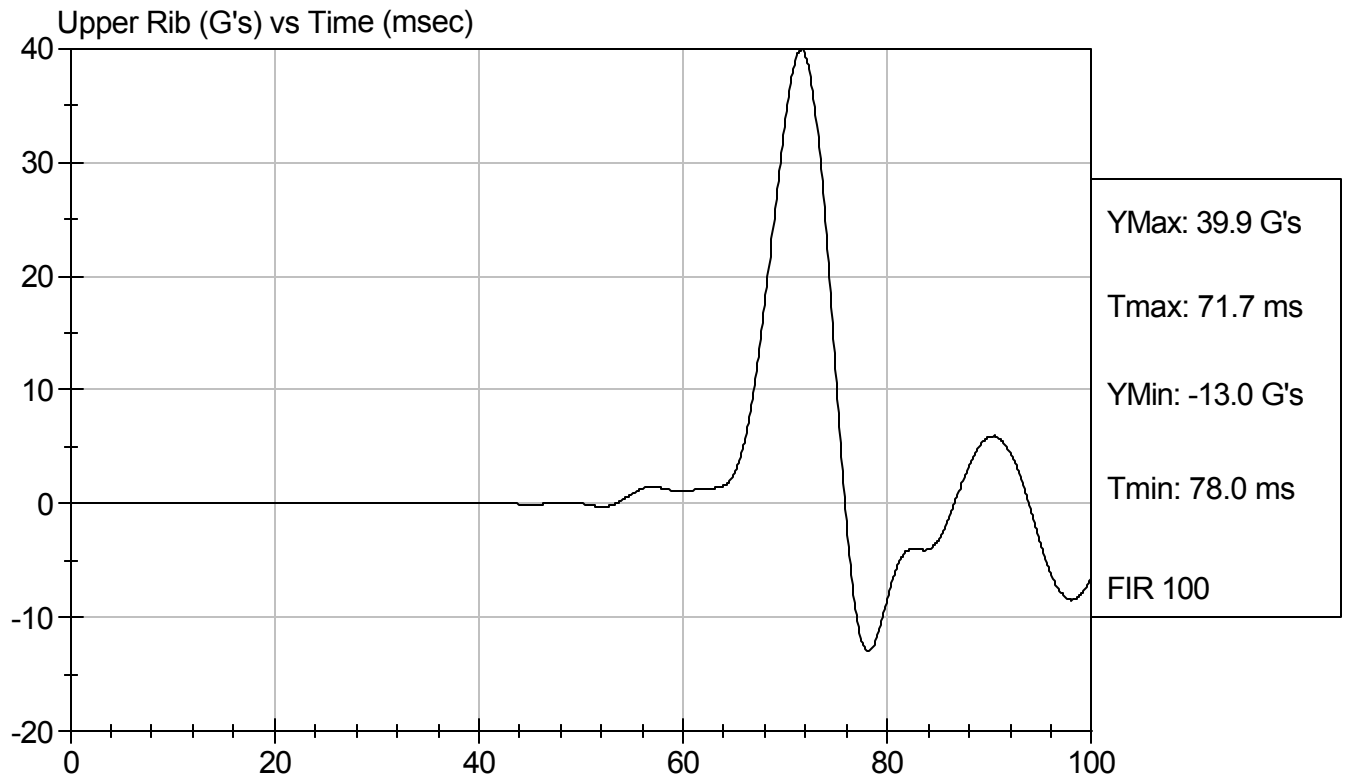
11/30/09
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax Impact
Component ID: D092962

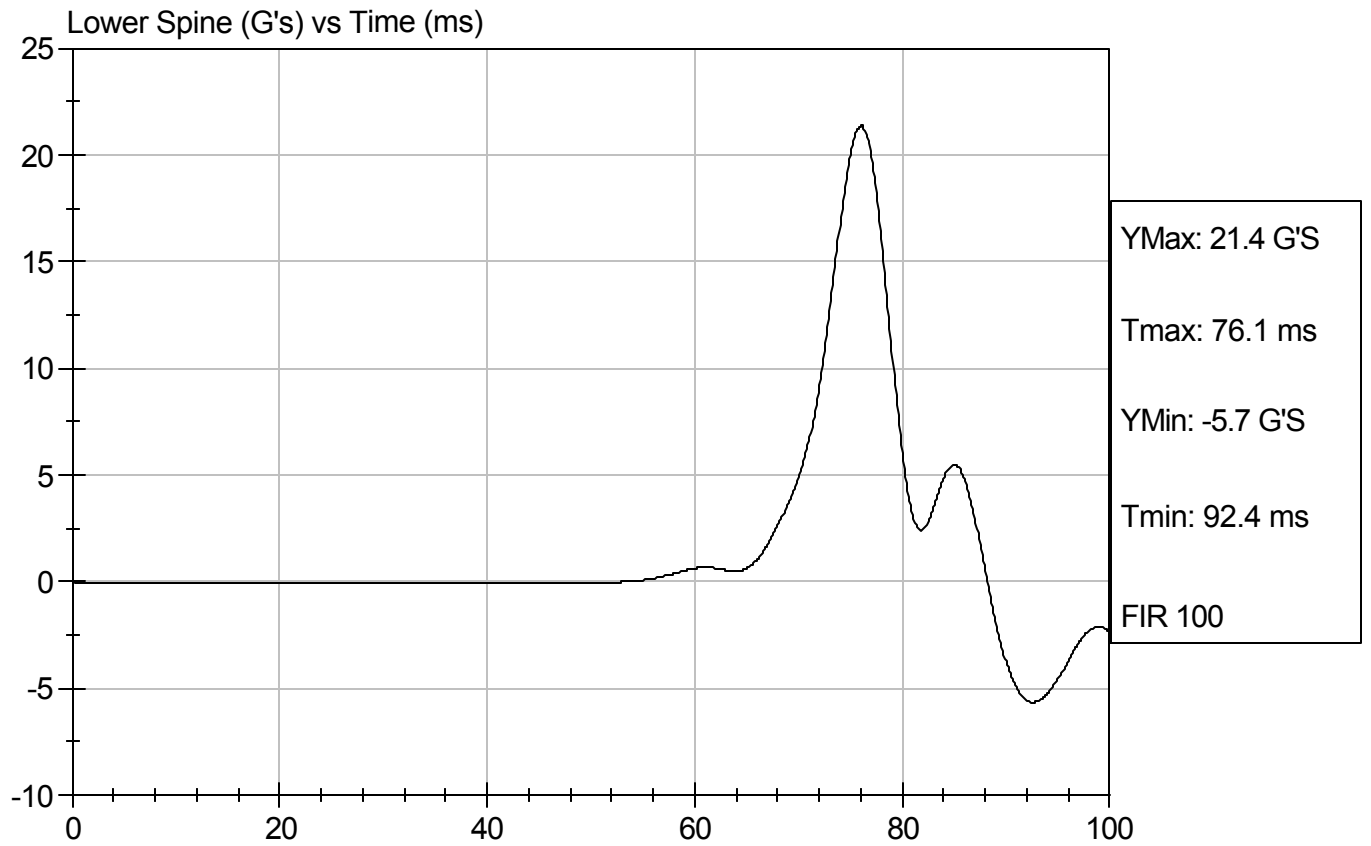
Test Date: 11/30/09
Speed: 14.01 ft/s, 4.27 m/s





Test Desc: Thorax Impact
Component ID: D092962

Test Date: 11/30/09
Speed: 14.01 ft/s, 4.27 m/s



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

ATD Serial No: 272

Test I.D: D092963

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	24	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

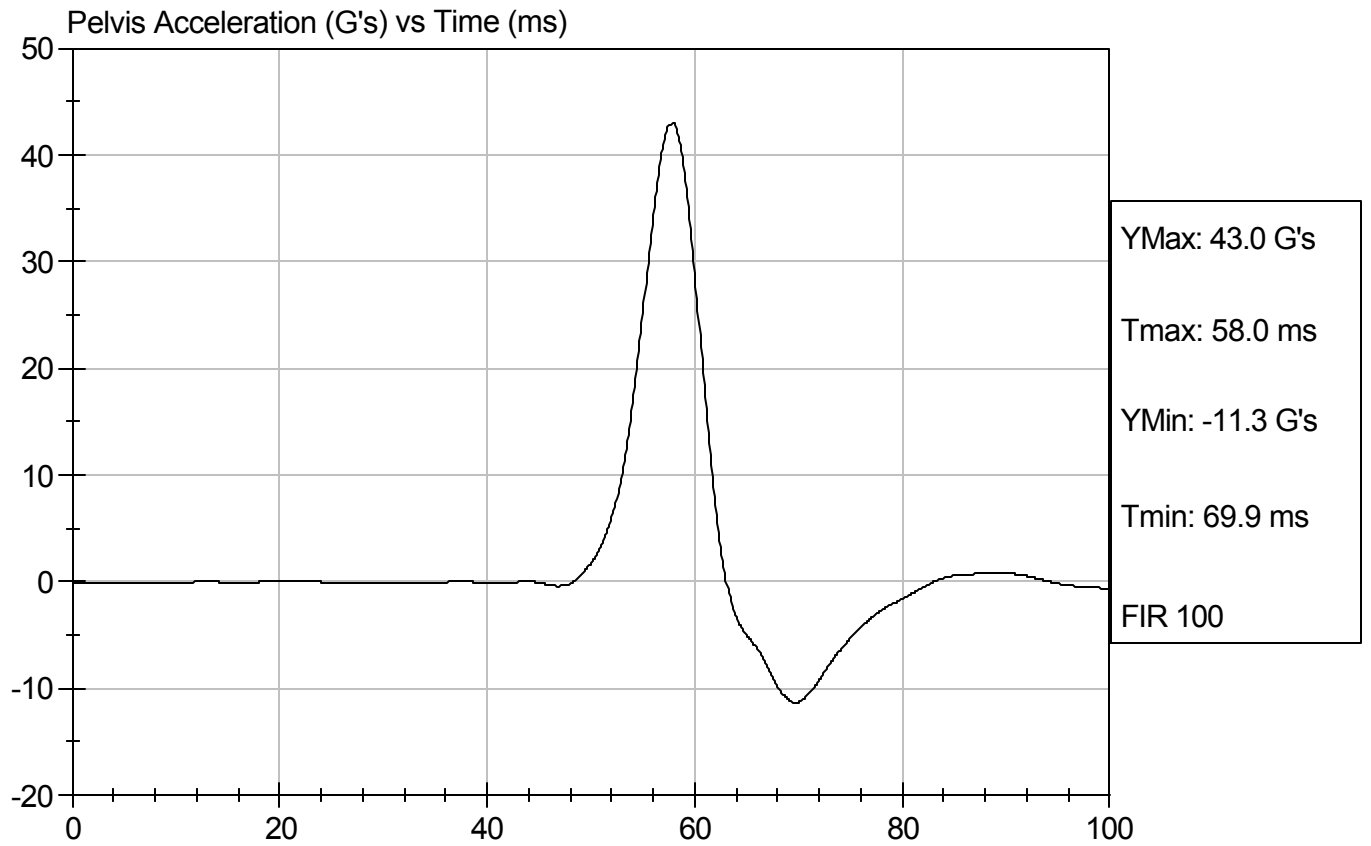
11/30/09
Test Date

David Winkelbauer
Approved By



Test Desc: Pelvis Impact
Component ID: D092963

Test Date: 11/30/09
Speed: 14.12 ft/s, 4.30 m/s



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

ATD Serial No: 272

Test I.D: D092964

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Force At 12.7 mm	N	104 -162	137	Pass
Force At 19 mm	N	163 - 222	193	Pass
Force At 25.4 mm	N	222 - 280	262	Pass
Force At 33 mm	N	325 - 391	361	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

12/1/09
Test Date

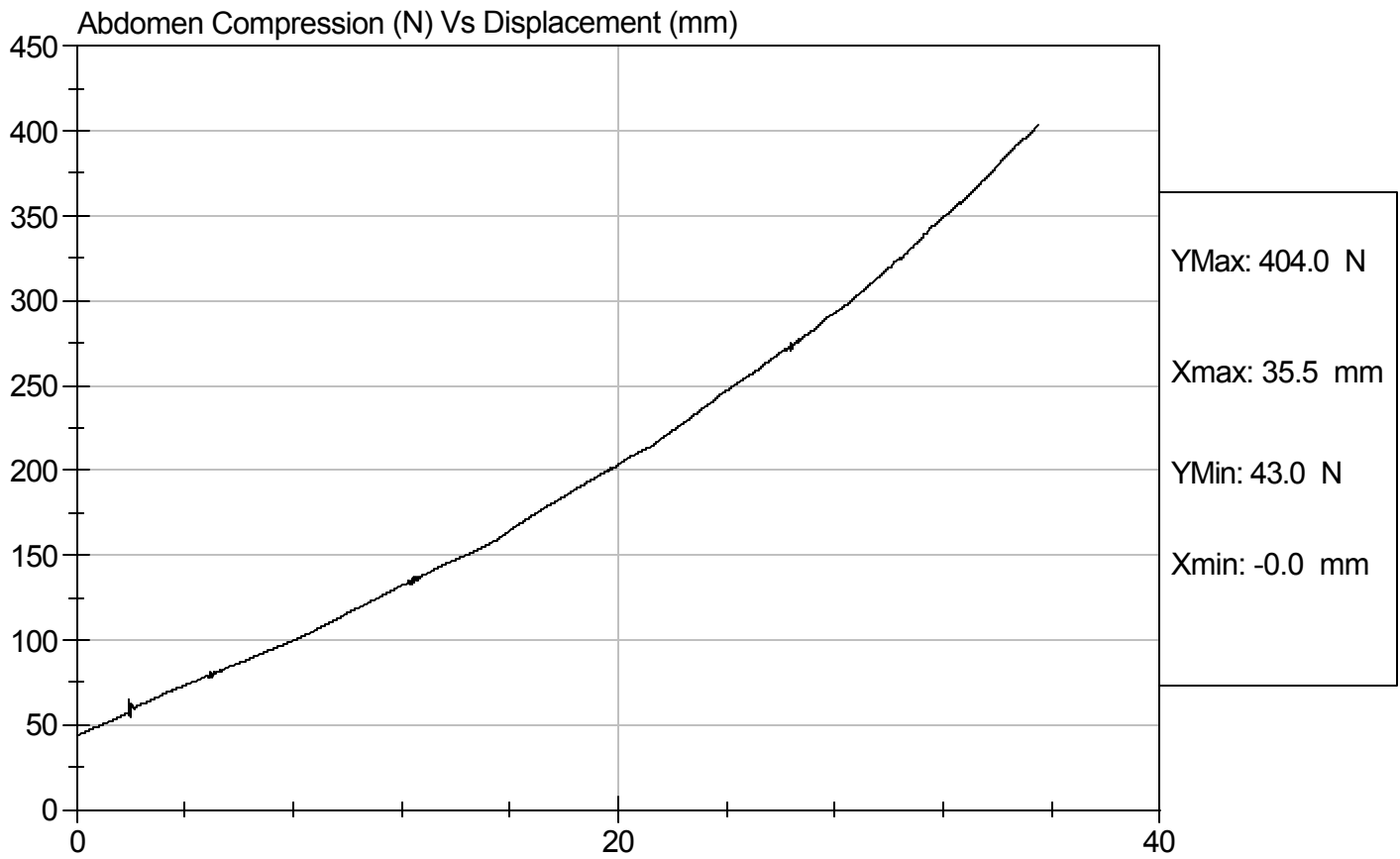


Test Description: Abdomen Compression

Test Date: 12/1/09

Component: D092964

Speed: 0 ft/s, 0 m/s



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

ATD Serial No: 272

Test I.D: D092965

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	145.1	Pass
Force At 30 deg	N	151.2 - 204.6	200.6	Pass
Force At 40 deg	N	204.6 - 258.0	253.3	Pass
Return Angle	Deg	12 Maximum	4	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

12/1/09
Test Date

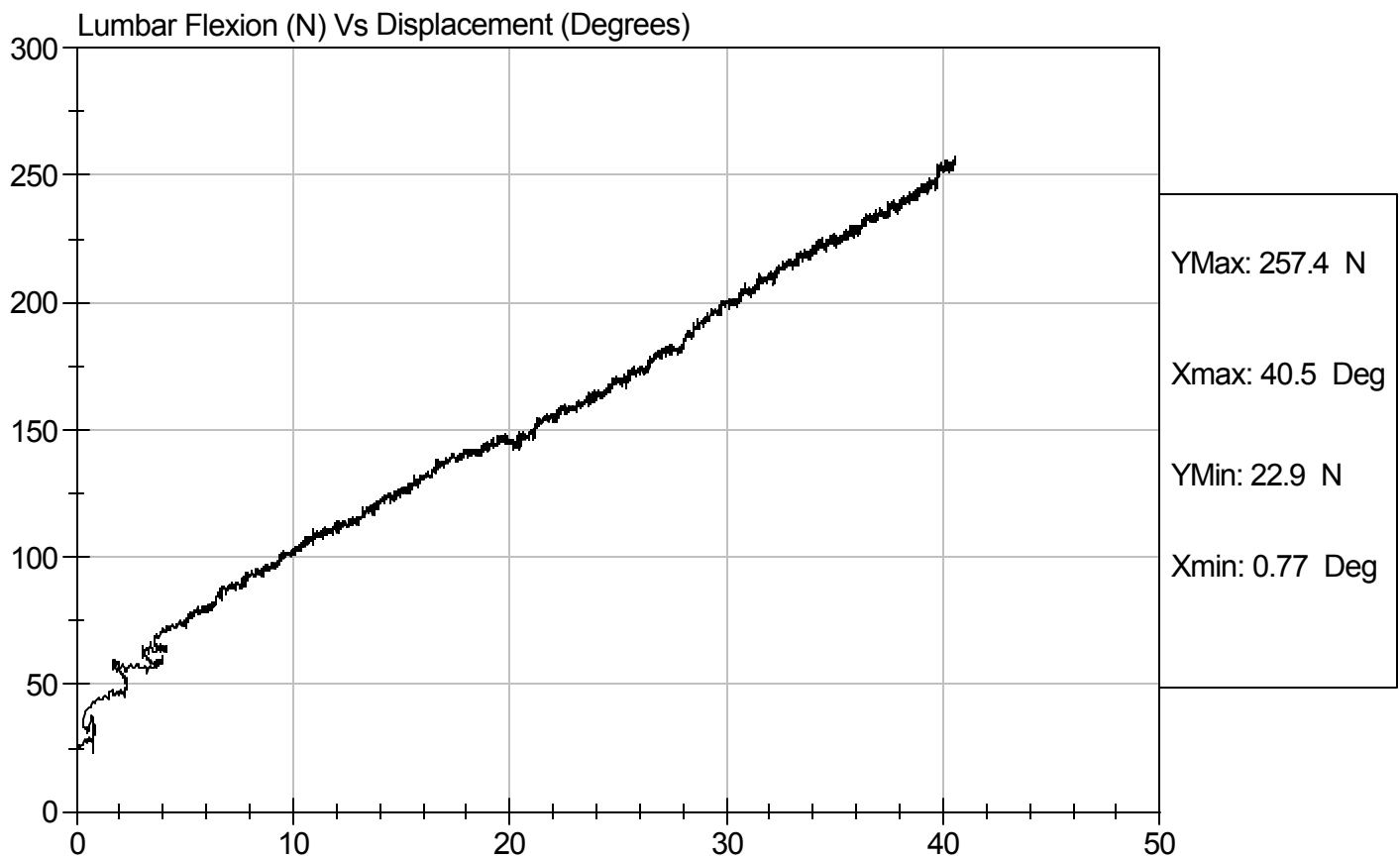


Test Description: Lumbar Flexion

Test Date: 12/1/09

Component: D092965

Speed: 0 ft/s, 0 m/s



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

ATD Serial No: 272

Test I.D: D092969

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	25	Pass
Impact Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 ms	m/s	1.96 to 2.55	2.42	Pass
	20 ms	m/s	4.12 to 5.10	4.71	Pass
	30 ms	m/s	5.73 to 7.01	6.52	Pass
	40 to 70 ms	m/s	6.27 to 7.64	6.85	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	69	Pass
Head Rotation Peak to Zero - Decay Time		ms	58 to 67	58	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	79	Pass
Mx Peak To Zero - Decay Time		ms	49 to 64	57	Pass
Mx Peak to Max. Head Rotation		ms	2 to 16	14	Pass


 Laboratory Technician

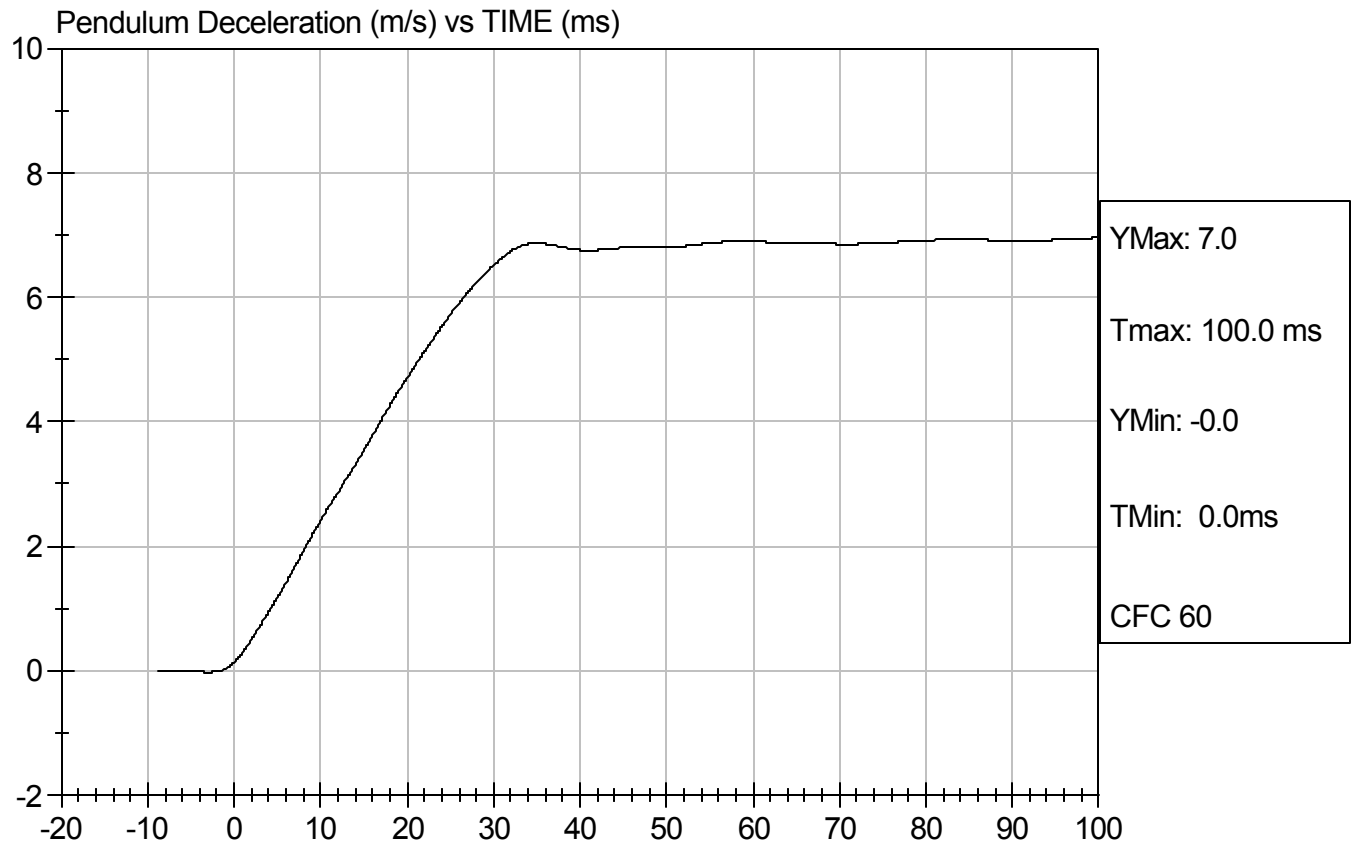

 Approved By

12/1/09
 Test Date



Test Desc: Neck Bending
Component ID: D092969

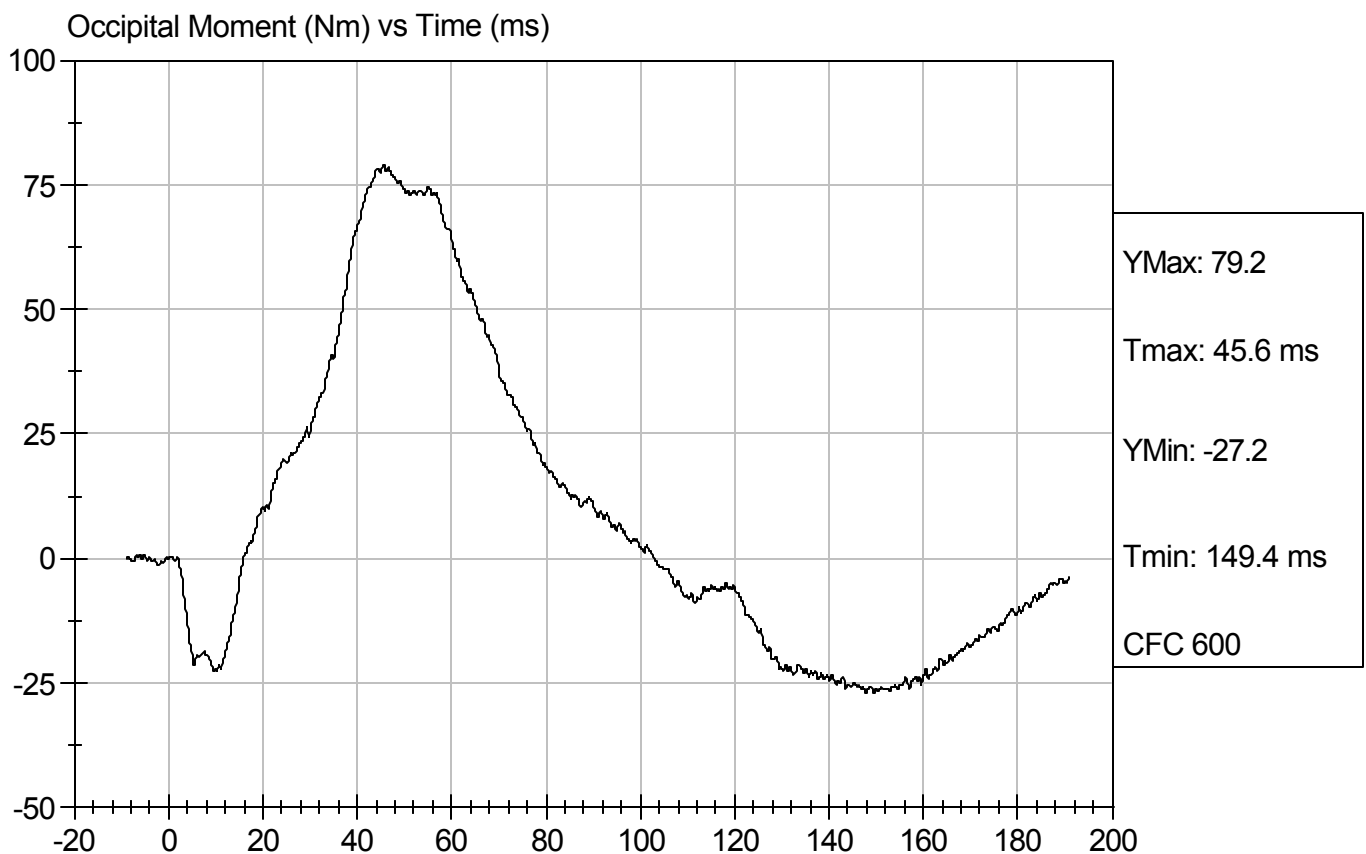
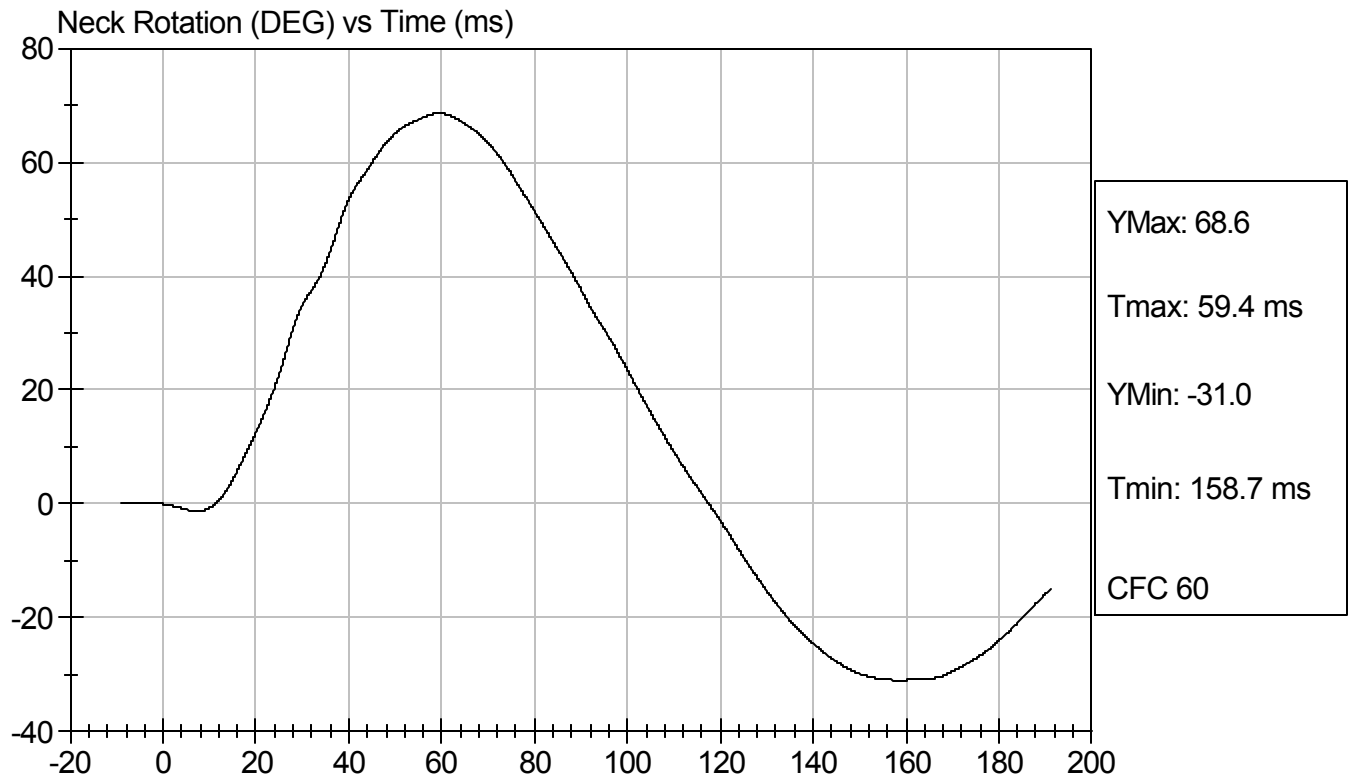
Test Date: 12/1/09
Speed: 23.15 ft/sec, 7.06 m/sec





Test Desc: Neck Bending
Component ID: D092969

Test Date: 12/1/09
Speed: 23.15 ft/s, 7.06 m/s



SID/HIII 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

Jessica Hall
Laboratory Technician
David Winkelbauer
Approved By

12/1/2009
Test Date