

REPORT NUMBER: NCAPSIDE-MGA-2009-002

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

**TOYOTA MOTOR CORPORATION
2009 TOYOTA YARIS 4-DOOR SEDAN
NHTSA NUMBER: M95108**

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



Test Date: November 14, 2008

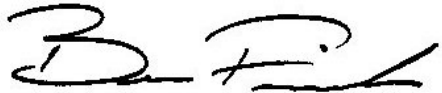
Report Date: December 16, 2008

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**

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-03-D-12005.

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Date: 12/16/08

Technical Report Documentation Page

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		6. Performing Organization Code MGA																						
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16. Abstract A 55/28 km/h 90° Moving Deformable Barrier NCAP side impact was conducted on the subject 2009 Toyota Yaris 4-Door Sedan 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 14, 2008. 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 242 mm at level 3. The test vehicle's occupant performance is as follows: <table style="margin-left: auto; margin-right: auto; border: none;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>DRIVER</u></th> <th style="text-align: center;"><u>PASS.</u></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) Accel., g</td> <td style="text-align: center;">58.5</td> <td style="text-align: center;">58.9</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td style="text-align: center;">64.4</td> <td style="text-align: center;">63.3</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td style="text-align: center;">68.6</td> <td style="text-align: center;">76.9</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td style="text-align: center;">66</td> <td style="text-align: center;">70</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td style="text-align: center;">78.3</td> <td style="text-align: center;">85.6</td> </tr> <tr> <td>HIC</td> <td style="text-align: center;">185</td> <td style="text-align: center;">189</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	58.5	58.9	Left Lower Rib (LLR) Accel., g	64.4	63.3	Lower Spine (T ₁₂) Accel., g	68.6	76.9	Thoracic Trauma Index (TTI)	66	70	Pelvis (PEV) Accel., g	78.3	85.6	HIC	185	189
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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 2009 Toyota Yaris 4-Door Sedan manufactured by Toyota Motor Corporation.

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 2009 Toyota Yaris 4-Door Sedan 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 1270.1 kg and the test weight of the MDB was 1361.5 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on November 14, 2008.

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 242 mm at level 3, 300 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	185	27.5	53.0	66	78.3
Passenger	189	28.5	64.5	70	85.6

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

None

DATA SHEET NO. 1**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2009 Toyota Yaris 4-Door SedanNHTSA No. M95108Test Program: NCAP Side ImpactTest Date: 11/14/2008**TEST VEHICLE INFORMATION**

Make	Toyota
Model	Yaris
Body Style	Sedan
NHTSA No.	M95108
VIN	JTDBT903491297523
Color	Silver Streak
Delivery Date	11/04/2008
Odometer Reading (mile)	28
Dealer	Basil Toyota
Transmission	Manual Overdrive
Final Drive	Front
Number of Cylinders	4
Engine Displacement (L)	1.5
Engine Placement	Lateral
Automatic Door Locks (ADL)	No
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	No
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	Toyota Motor Corporation
Date of Manufacture	08/08

GVWR (kg)	1497
GAWR Front (kg)	835
GAWR Rear (kg)	826

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number Of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				383
Cargo Wt. (RCLW) (kg)				43

DATA SHEET NO. 1 (continued)**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2009 Toyota Yaris 4-Door SedanNHTSA No. M95108Test Program: NCAP Side ImpactTest Date: 11/14/2008**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	323.4	218.2		372.4	305.7	
Right	kg	313.0	215.9		317.1	274.9	
Ratio	%	59.4	40.6		54.3	45.7	
Totals	kg	636.4	434.1	1070.5	689.5	580.6	1270.1

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1070.5
Weight of 2 P572M ATDs	kg	161.5
Rated Cargo/Luggage Weight (RCLW)	kg	43
Calculated Vehicle Target Weight (TVTW)	kg	1275.0

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

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

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	661	668	664	668	1035
As Tested	mm	643	664	615	626	1167
Fully Loaded	mm	640	661	607	625	

TEST VEHICLE VERTICAL IMPACT LINE DATA

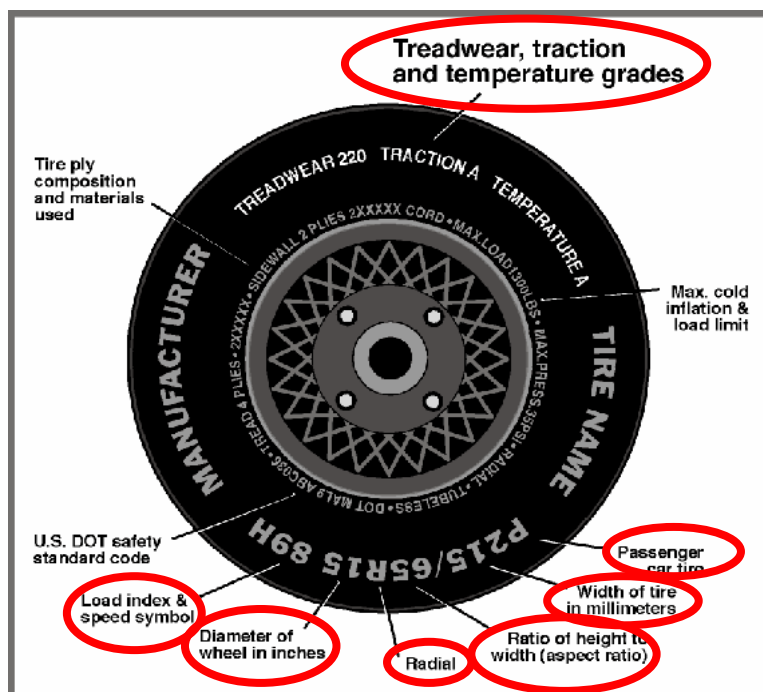
Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2552
Target Impact Point Aft of Front Axle	mm	336
Actual Impact Point Aft of Front Axle	mm	333

DATA SHEET NO. 2

TEST VEHICLE TIRE INFORMATION

Test Vehicle: 2009 Toyota Yaris 4-Door Sedan
 Test Program: NCAP Side Impact

NHTSA No. M95108
 Test Date: 11/14/2008



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Test Pressure (kPa)	220	220
Recommended Tire Size	P185/60R15	P185/60R15
Tire Size on Vehicle	P185/60R15	P185/60R15
Tire Manufacturer	Goodyear	Goodyear
Tire Name	Eagle LS	Eagle LS
Tire Type	Passenger	Passenger
Tire Width (mm)	185	185
Ratio of Height to Width (aspect ratio)	60	60
Radial	R	R
Wheel Diameter	15	15
Load Index & Speed Symbol	84T	84T
Treadwear	360	360
Traction Grade	A	A
Temperature Grade	B	B

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

Test Vehicle: 2009 Toyota Yaris 4-Door Sedan
 Test Program: NCAP Side Impact

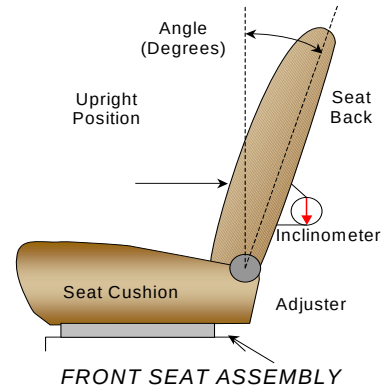
NHTSA No. M95108
 Test Date: 11/14/2008

NORMAL DESIGN RIDING POSITION

The driver and passenger seat back is positioned to the manufacturer's designated angle. The procedure is as follows:
 Set in the 5th detent out of 41 detents total (forward-most detent defined as 1)

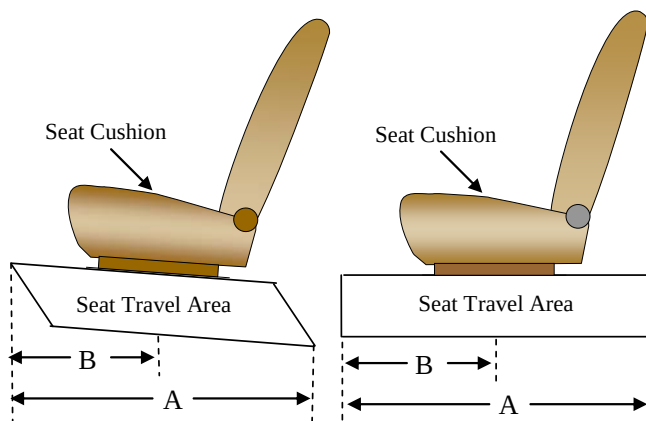
Driver seat back angle: 5th detent (forward-most as 1)

Passenger seat back angle: Fixed



SEAT FORE/AFT POSITIONS

	Total Fore/Aft Travel	Placed in position #
Driver Seat	17 detents	9 th detent (forward-most as 1)
Rear Seat	Fixed	Fixed



DATA SHEET NO. 3 (CONTINUED)

TEST VEHICLE INFORMATION

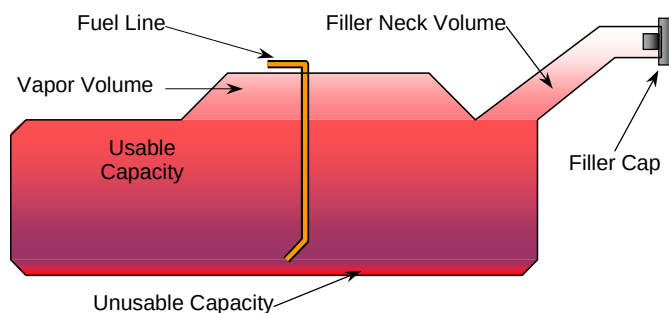
Test Vehicle: 2009 Toyota Yaris 4-Door Sedan
Test Program: NCAP Side Impact

NHTSA No. M95108
Test Date: 11/14/2008

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	42.0
Usable Capacity of "Optional" Tank	
92-94% of Usable Capacity	38.6 to 39.5
Actual Amount of Solvent used	39.0
1/3 of Usable Capacity	14.0

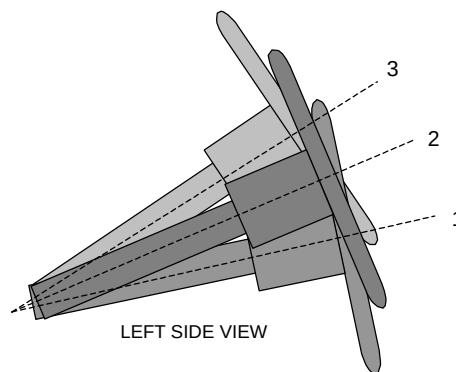
The test vehicle is equipped with an electric fuel pump. The condition under which the fuel pump will pump fuel is that ignition is on.



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		64.0
Geometric center position No. 2		65.5
Uppermost position No. 3		67.0

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

Test Vehicle: 2009 Toyota Yaris 4-Door Sedan
Test Program: NCAP Side Impact

NHTSA No. M95108
Test Date: 11/14/2008

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	89.7

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

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	3 forward
Vertical Offset	mm	+/-20	1 up

DATA SHEET NO. 5**POST TEST OBSERVATIONS**Test Vehicle: 2009 Toyota Yaris 4-Door SedanNHTSA No. M95108Test Program: NCAP Side ImpactTest Date: 11/14/2008**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, Headliner	Curtain Airbag, Headliner, Headrest, Mid 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 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	Cracked
Window Damage	Left Front and Left Rear Windows Broke
Other Notable Effects	None

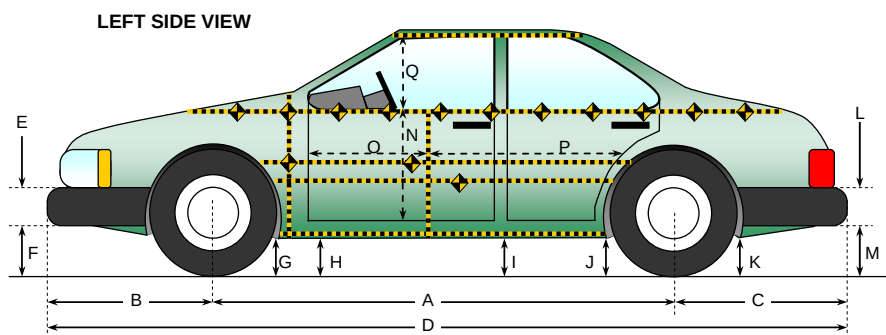
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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: 2009 Toyota Yaris 4-Door Sedan
 Test Program: NCAP Side Impact

NHTSA No. M95108
 Test Date: 11/14/2008



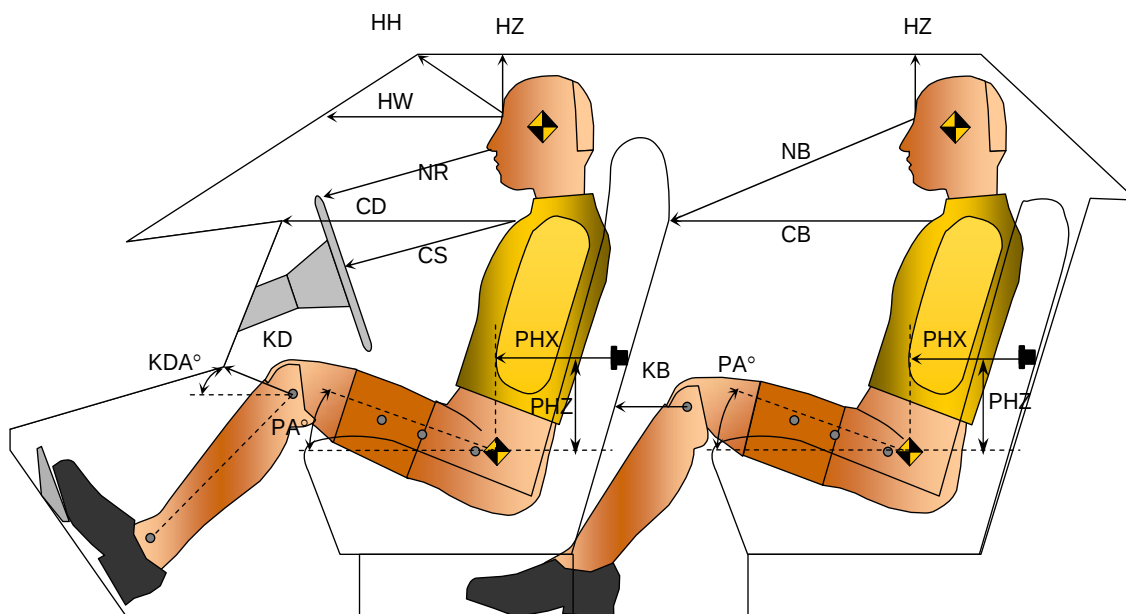
All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2552	2548	4
B	Front Axle to FSOV	782	790	-8
C	Rear Axle to RSOV	970	959	11
D	Total Length at Centerline	4304	4297	7
E	Front Bumper Thickness	143	143	0
F	Front Bumper Bottom to Ground	205	225	-20
G	Sill Height at Front Wheel Well	154	189	-35
H	Sill Height at Front Door Leading Edge	173	193	-20
I	Sill Height at "B" Pillar	166	195	-29
J1	Sill Height at Rear Wheel Well	128	189	-61
J2	Pinch Weld Height at Rear Wheel Well	160	148	12
K	Sill Height Aft of Rear Wheel Well	207	218	-11
L	Rear Bumper Thickness	275	275	0
M	Rear Bumper Bottom to Ground	283	320	-37
N	Sill Height to Window Bottom Sill	685	559	126
O	Front Door Leading Edge to Impact CL	785	720	65
P	Rear Door Trailing Edge to Impact CL	1191	1154	37
Q	Front Window Opening	417	397	20
R	Right Side Length	3265	3274	-9
S	Left Side Length	3265	3244	21
T	Vehicle Width at "B" Post	1698	1610	88

DATA SHEET NO. 7
SID/HIII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2009 Toyota Yaris 4-Door Sedan
 Test Program: NCAP Side Impact

NHTSA No. M95108
 Test Date: 11/14/2008

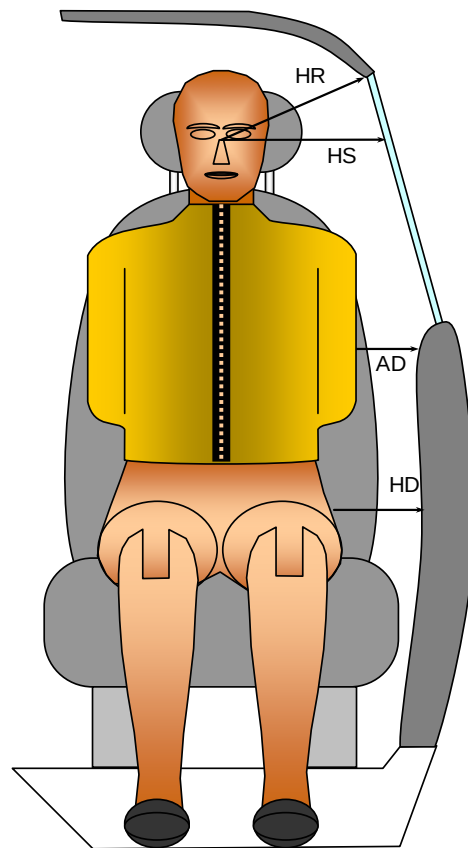


Driver Code	Pass. Code	Measurement Description	Driver S/N 272		Passenger S/N 271	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	349			
HW		Head to Windshield	585			
HZ	HZ	Head to Roof	146		116	
NR	NB	Nose to Rim/Nose to Seatback	442		595	
CD	CB	Chest to Dash or Seatback	646		514	
CS		Chest to Steering Wheel	331			
KDL	KBL	Left Knee to Dash or Seatback	149	30.5	230	20.7
KDR	KBR	Right Knee to Dash or Seatback	135	24.1	225	20.9
PA	PA	Pelvic Angle		23.5		24.5
PHX	PHX	H-Point to Striker (X-Axis)	219		258	
PHZ	PHZ	H-Point to Striker (Z-Axis)	169		255	

DATA SHEET NO. 8
SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2009 Toyota Yaris 4-Door Sedan
 Test Program: NCAP Side Impact

NHTSA No. M95108
 Test Date: 11/14/2008



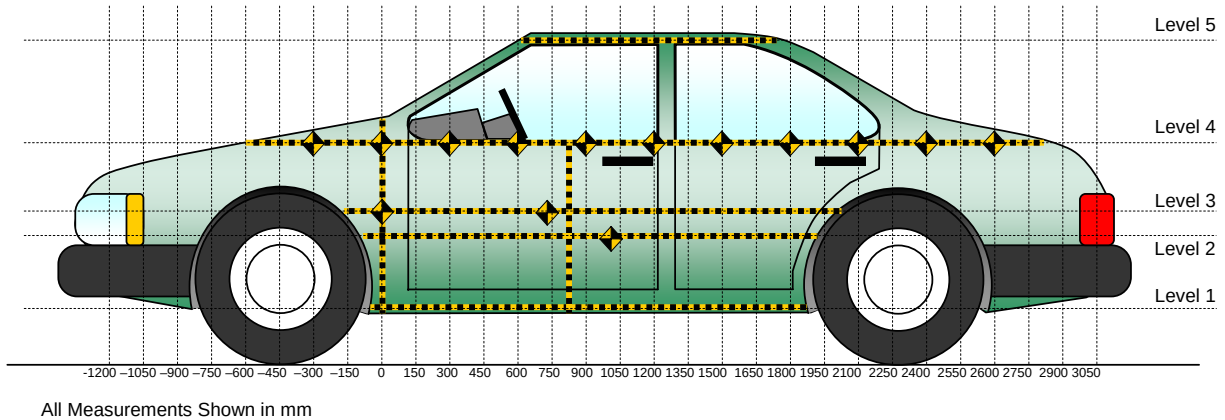
FRONT VIEW OF DUMMY

Code	Measurement Description	Units	Driver S/N 272	Passenger S/N 271
HR	Head to Side Header	mm	181	145
HS	Head to Side Window	mm	308	173
AD	Arm to Door	mm	103	58
HD	H-Point to Door	mm	145	134

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

Test Vehicle: 2009 Toyota Yaris 4-Door Sedan
 Test Program: NCAP Side Impact

NHTSA No. M95108
 Test Date: 11/14/2008



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	34	1500	1361
4	Window Sill	170	450	925
3	Mid Door	242	300	615
2	Occupant H-Point	223	300	451
1	Sill Top	86	900	255
	Maximum Penetration	242		

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2009 Toyota Yaris 4-Door Sedan
 Test Program: NCAP Side Impact

NHTSA No. M95108
 Test Date: 11/14/2008

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-450				322					322					0	
-300				312					318					6	
-150				311					325					14	
0		265	261	314			410	363	331			145	102	17	
150	302	277	269	316		337	472	471	405		35	195	202	89	
300	302	282	269	321		369	505	511	475		67	223	242	154	
450	299	284	267	322		374	504	500	492		75	220	233	170	
600	295	280	263	325		376	500	479	480		81	220	216	155	
750	293	278	259	326	560	376	489	462	465	562	83	211	203	139	2
900	292	276	256	327	555	378	480	439	456	565	86	204	183	129	10
1050	292	276	254	329	555	375	465	421	438	572	83	189	167	109	17
1200	293	276	254	332	557	371	325	341	348	583	78	49	87	16	26
1350	294	276	255	335	559	365	345	355	370	592	71	69	100	35	33
1500	297	275	256	339	562	347	335	367	376	596	50	60	111	37	34
1650	299	273	257	345	565	346	335	380	375	588	47	62	123	30	23
1800	294	262	259	350	572	300	311	378	400	584	6	49	119	50	12
1950			260	358	583			350	375	592			90	17	9
2100			259	366				300	362				41	-4	
2250			263	376				291	401				28	25	
2400			275	391				292	398				17	7	
2550			292	409				301	410				9	1	
2700			316	427				318	429				2	2	
2850				454					452					-2	

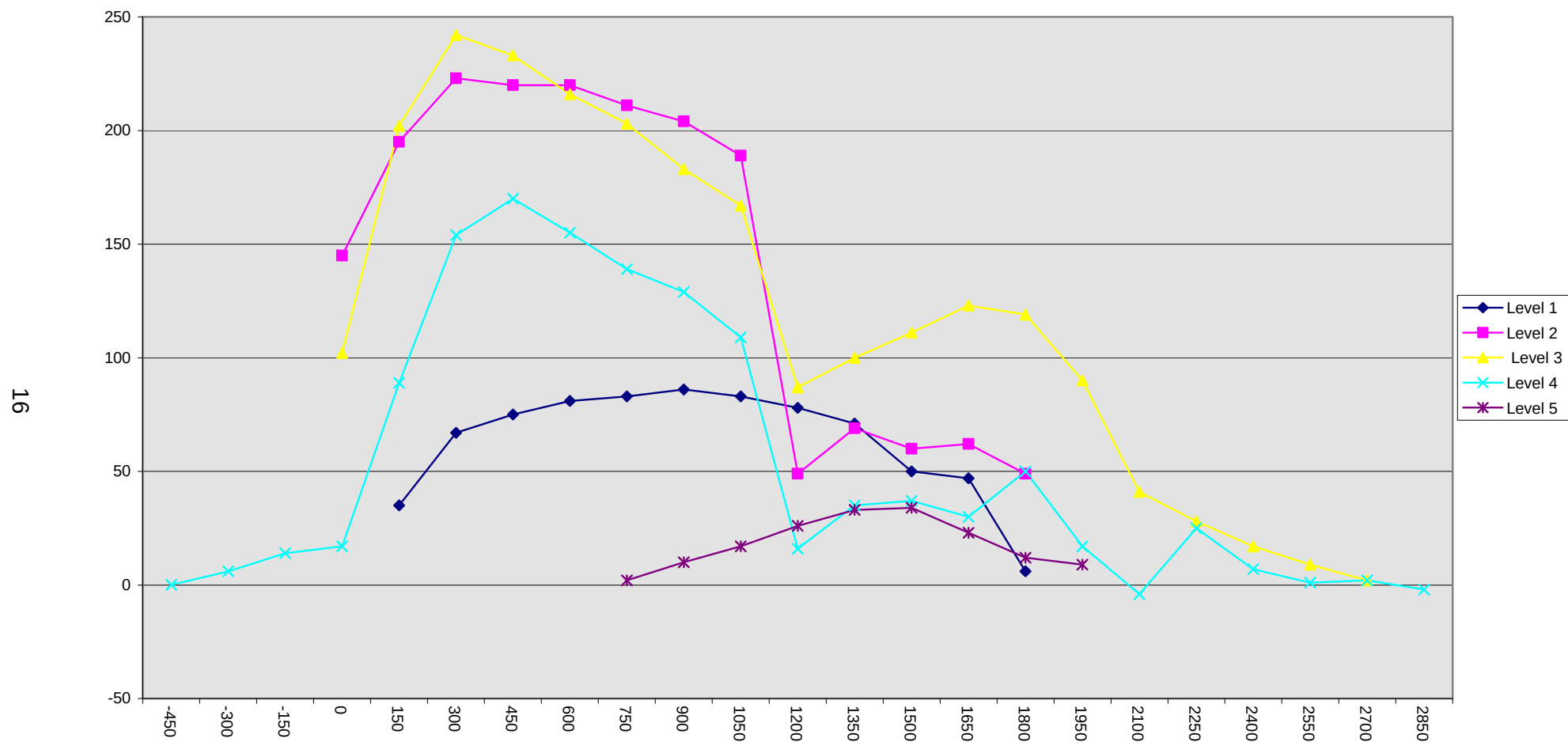
Reference plane is parallel to test vehicle longitudinal centerline.

Given dimensions = Reference plane to car body

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

Test Vehicle: 2009 Toyota Yaris 4-Door Sedan
Test Program: NCAP Side Impact

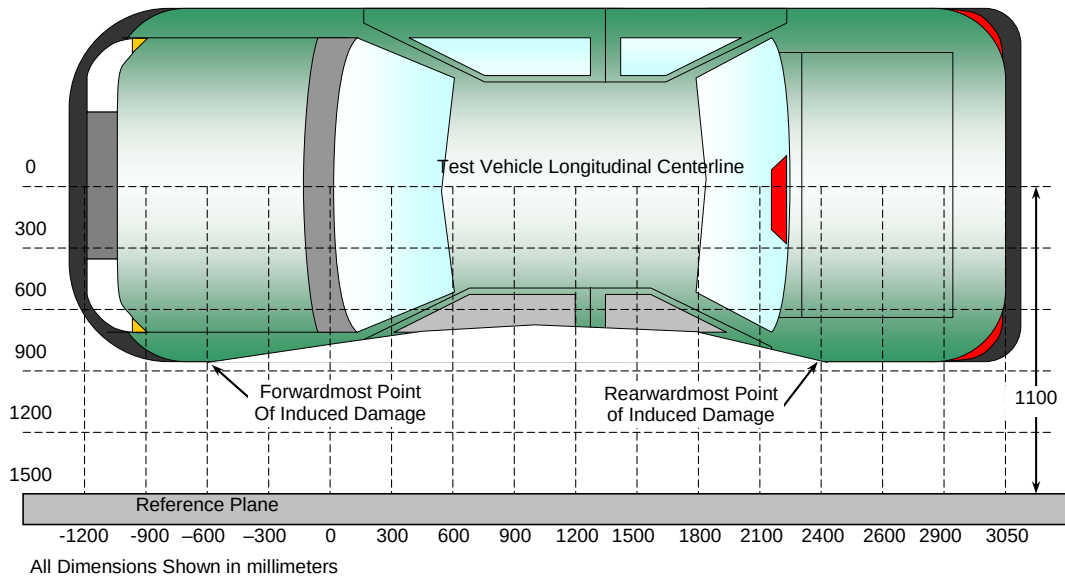
NHTSA No. M95108
Test Date: 11/14/2008



DATA SHEET NO. 11
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2009 Toyota Yaris 4-Door Sedan
 Test Program: NCAP Side Impact

NHTSA No. M95108
 Test Date: 11/14/2008



TOP VIEW

DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	2850	4	452	454	2
2	2200	4	373	400	27
3	1527	4	280	405	125
4	850	3	267	500	233
5	170	3	274	501	227
6	-450	4	322	322	0

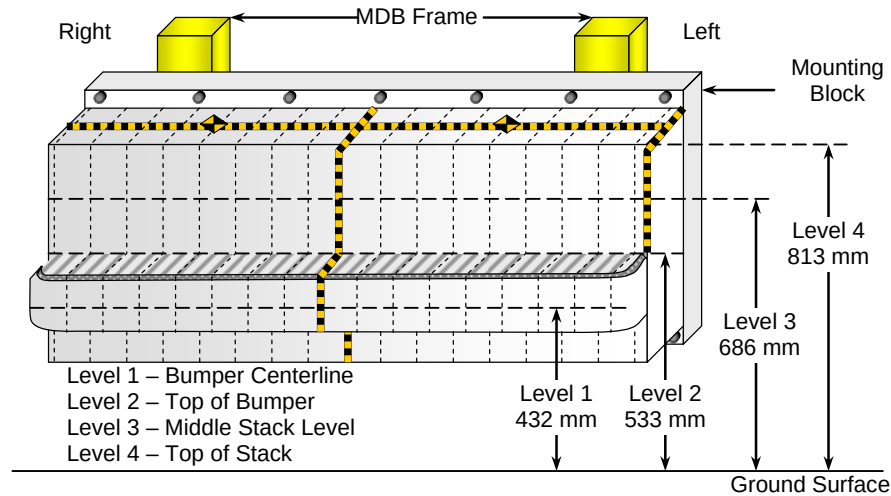
Reference plane is parallel to test vehicle longitudinal centerline.
 Given dimensions = Reference plane to car body.

DATA SHEET NO. 12

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2009 Toyota Yaris 4-Door Sedan
 Test Program: NCAP Side Impact

NHTSA No. M95108
 Test Date: 11/14/2008



DEFORMABLE BARRIER STATIC CRUSH

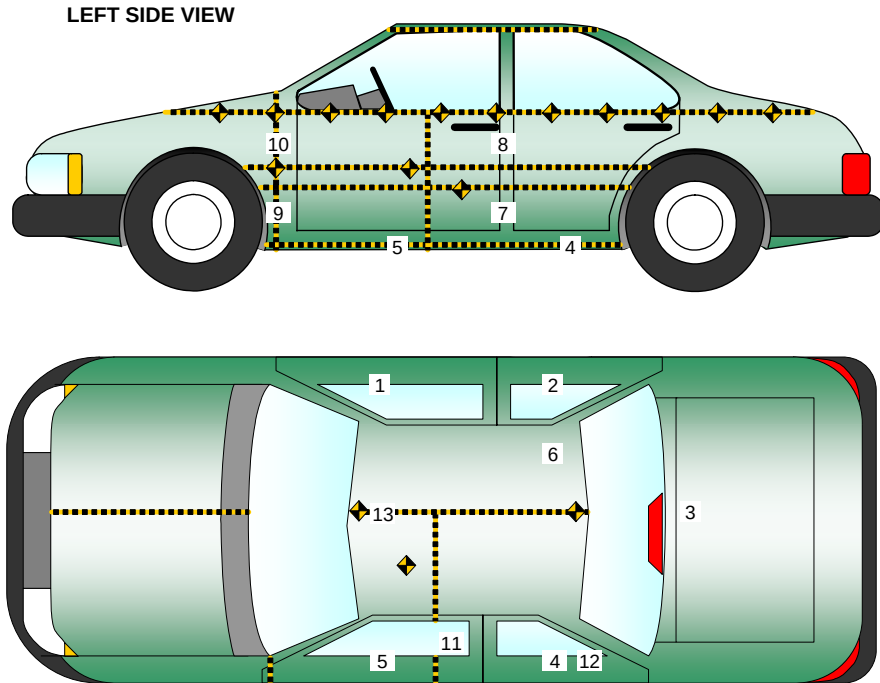
Stack Level	Distance Right of Center								C _L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	169	158	145	127	112	109	103	101	97	94	93	91	90	87	87	97	108
2	66	55	41	34	31	30	29	28	31	30	29	28	27	27	29	31	41
3	26	12	6	3	3	8	38	31	15	0	1	4	5	7	10	15	63
4	59	11	0	-5	-5	6	23	24	11	9	7	11	11	14	15	43	100

All Dimensions in mm

DATA SHEET NO. 13
VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2009 Toyota Yaris 4-Door Sedan
 Test Program: NCAP Side Impact

NHTSA No. M95108
 Test Date: 11/14/2008



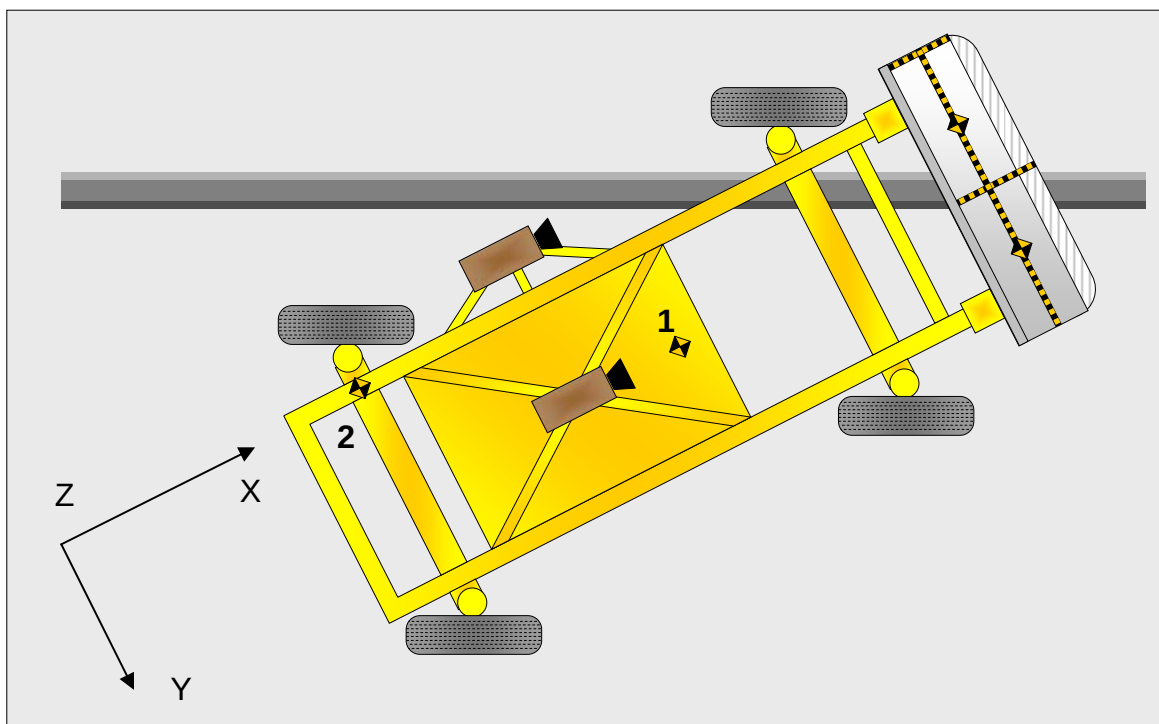
Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	2360	670	-220
2	Right Sill at Rear Seat	1404	675	-215
3	Rear Floorpan Above Axle	905	0	-415
4	Left Sill at Rear Door	1400	-680	-215
5	Left Sill at Front Door	2360	-680	-220
6	Rear Occupant Compartment	1605	-400	-450
7	Left Lower B-Post	2040	-735	-480
8	Left Middle B-Post	2015	-725	-770
9	Left Lower A-Post	3038	-720	-450
10	Left Middle A-Post	3050	-800	-780
11	Front Seat Track	2360	-540	-425
12	Rear Seat Track or Structure			
13	Vehicle CG	2255	0	-336

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: 2009 Toyota Yaris 4-Door Sedan
 Test Program: NCAP Side Impact

NHTSA No. M95108
 Test Date: 11/14/2008



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: 2009 Toyota Yaris 4-Door Sedan
Test Program: NCAP Side Impact

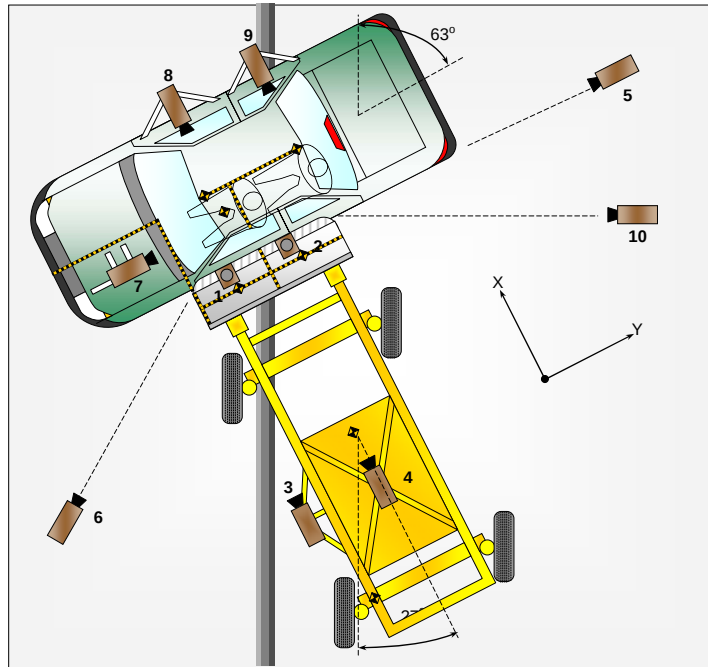
NHTSA No. M95108
Test Date: 11/14/2008

	Elements	Pre-Test (mm)
1	Total Length	4304
2	Total Width	1698
3	Bumper Top Height	525
4	Bumper Bottom Height	420
5	Longitudinal Member Top Height	525
6	Distance between Longitudinal Members	1115
7	Longitudinal Member Width	60
8	Engine Top Height	820
9	Engine Bottom Height	195
10	Engine and gearbox width	825
11	Front bumper-engine distance	370
12	Front shock absorber fixing height	898
13	Bonnet leading edge height	855
14	Front shock absorber fixing width	1130
15	Front bumper – front axle distance	782
16	Front axle – a pillar distance	420
17	A-pillar – B-pillar distance	1035
18	B-Pillar – rear axle distance	1097
19	B-pillar – C-pillar distance	1055
20	Roof sill bottom height	1350
21	Roof sill top height	1445
22	Floor sill bottom height	230
23	Floor sill top height	355

DATA SHEET NO. 16
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2009 Toyota Yaris 4-Door Sedan
 Test Program: NCAP Side Impact

NHTSA No. M95108
 Test Date: 11/14/2008



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Close-up	595	1225	5050	50	1000
2	Overhead Overall	-495	0	5050	14	1000
3	MDB Onboard, Impact Point Close-up				50	1000
4	MDB Onboard, Centerline of Impact				16	1000
5	Right Side, Ground Level, Overall	-2985	5185	1300	24	1000
6	Left Side, Ground Level, Overall	2660	-3940	1185	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: 2009 Toyota Yaris 4-Door Sedan
 Test Program: NCAP Side Impact

NHTSA No. M95108
 Test Date: 11/14/2008

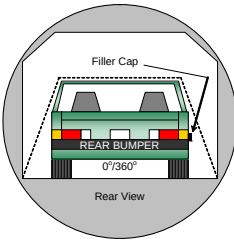
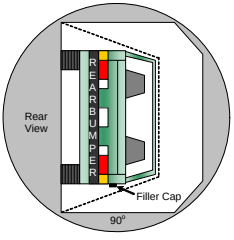
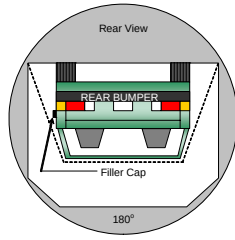
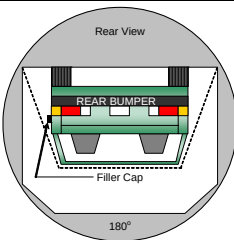
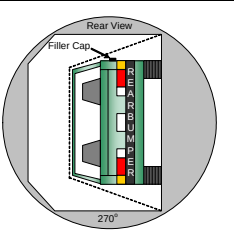
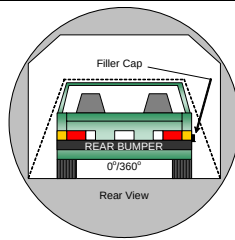
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21° C Test Time: 10:35 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°	119	300	First 5	0
90° to 180°	116	300	First 5	0
180° to 270°	108	300	First 5	0
270° to 360°	123	300	First 5	0

APPENDIX A
PHOTOGRAPHS

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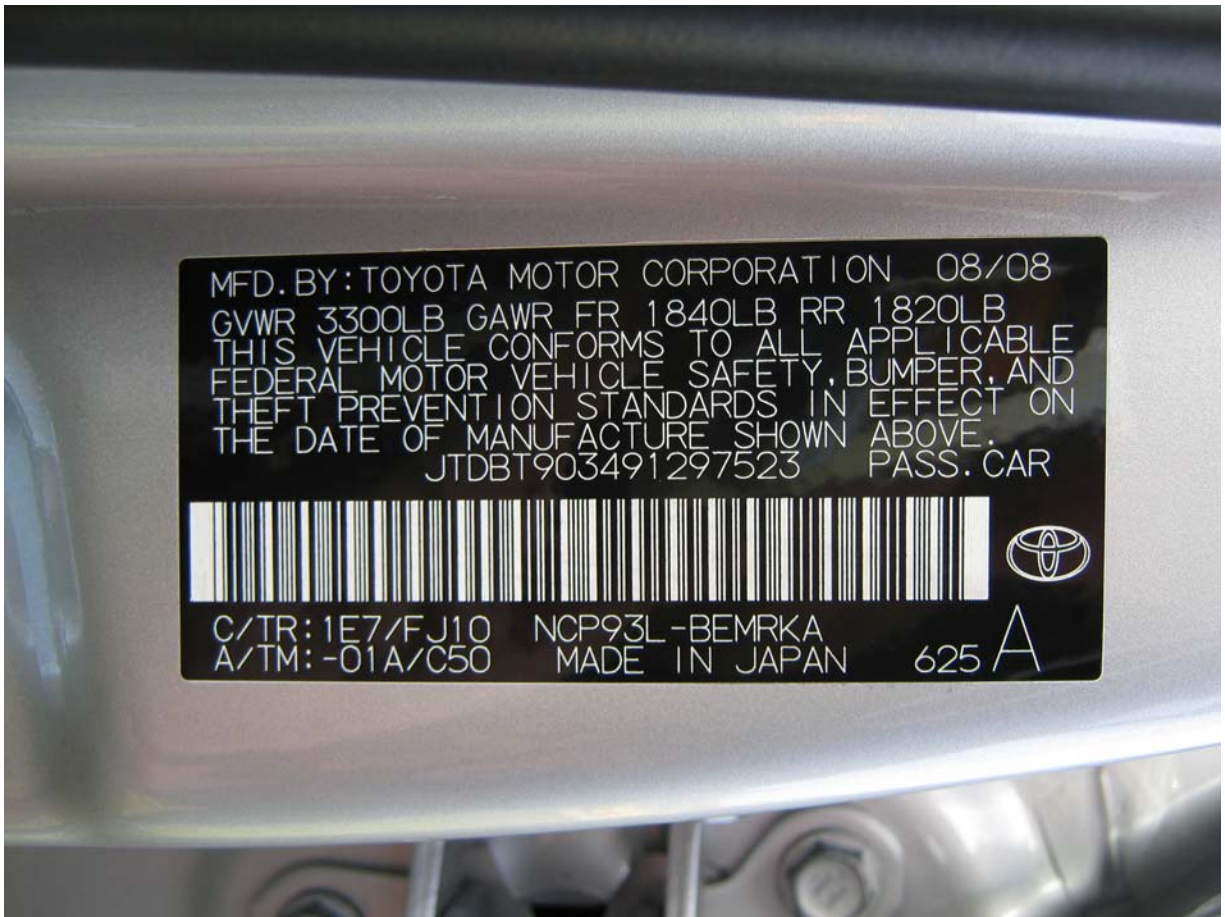
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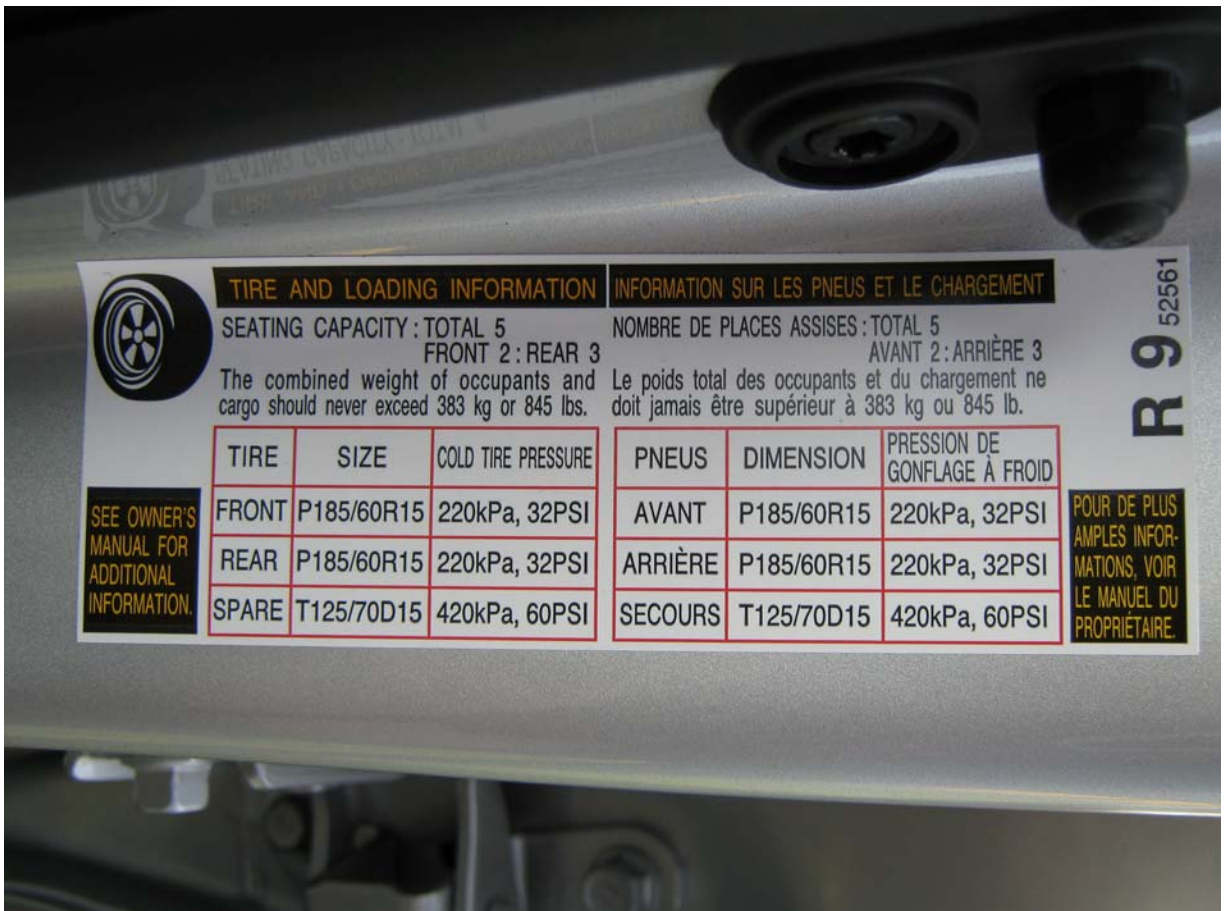
Left Front $\frac{3}{4}$ View, As Received



Right 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



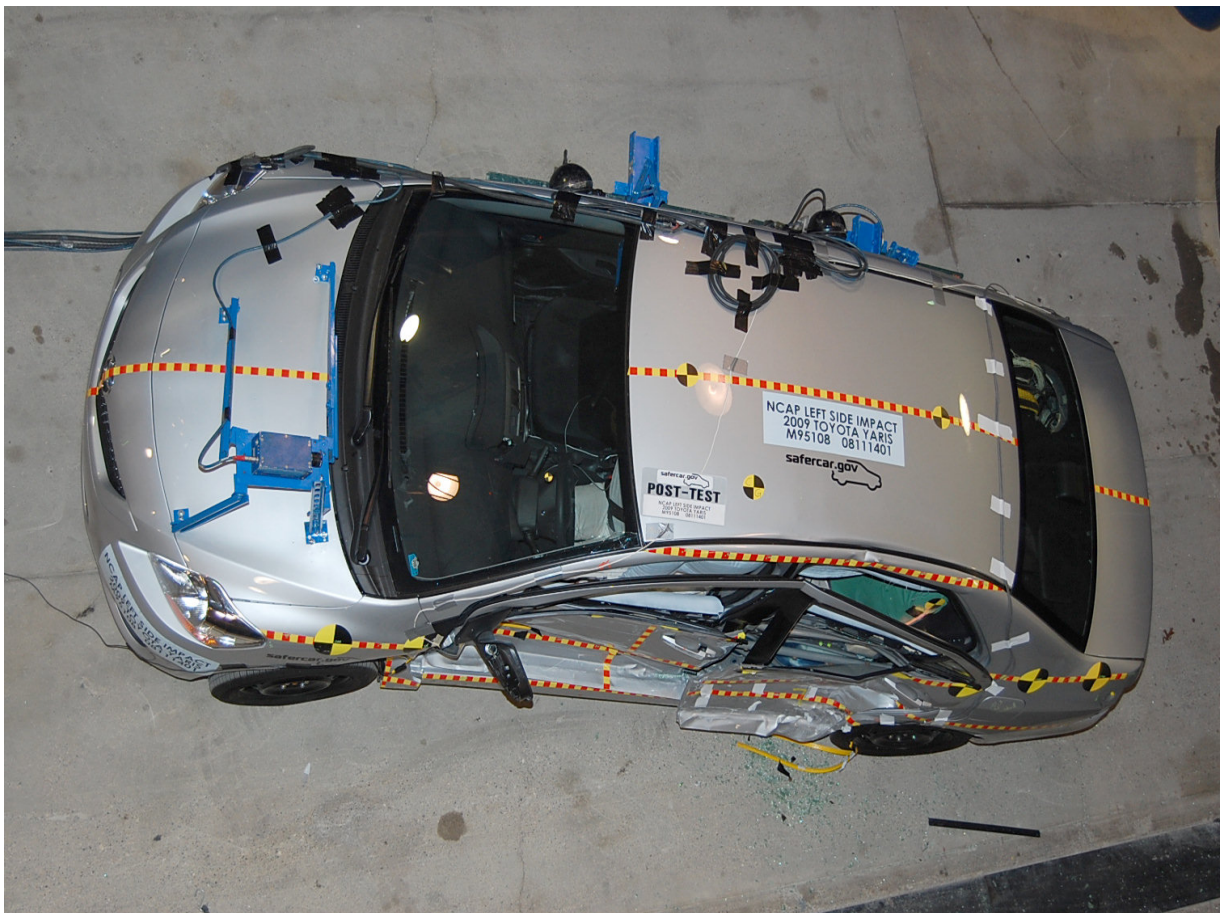
Pre-Test Left Side Impact Close-up



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)



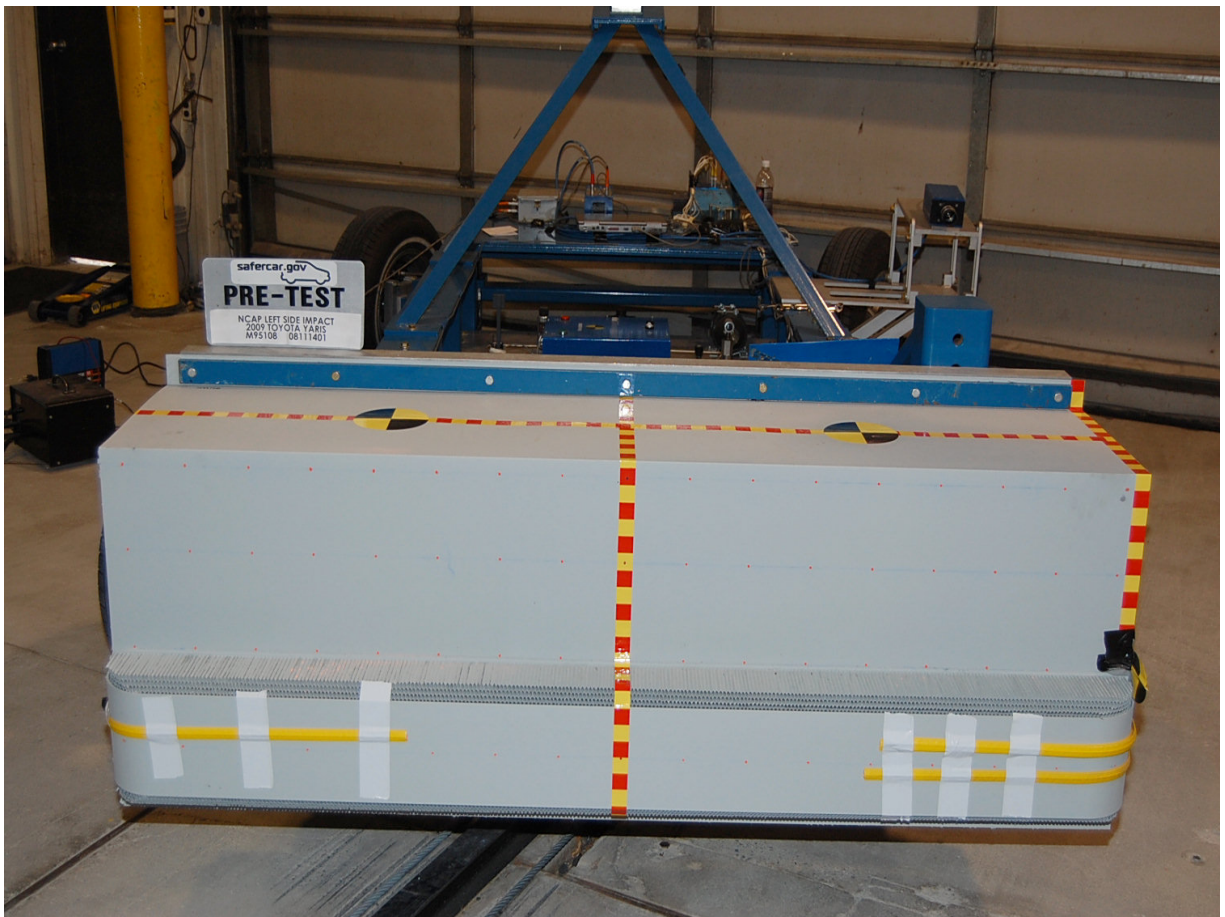
Post-Test Passenger Dummy (Through Window)



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



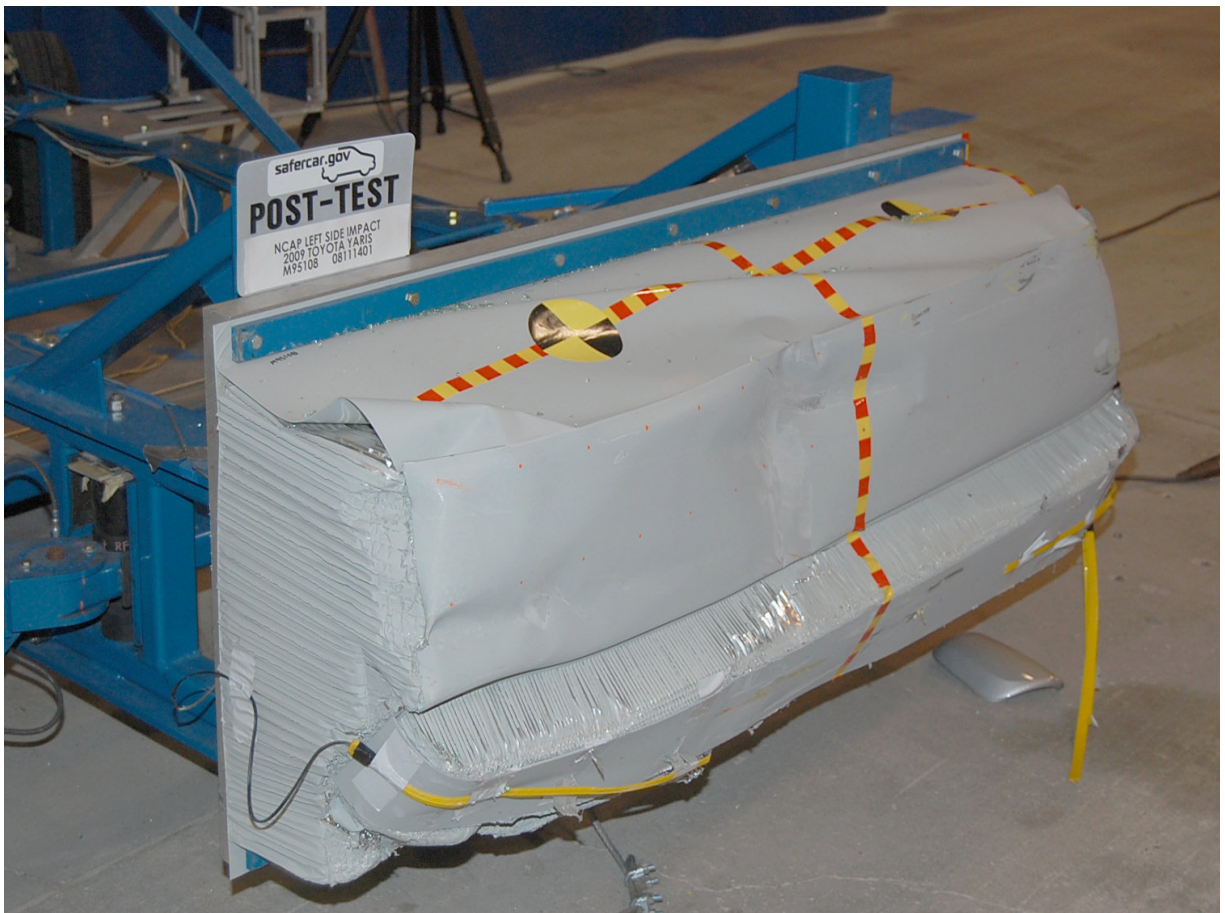
Pre-Test Top View of Deformable Barrier



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



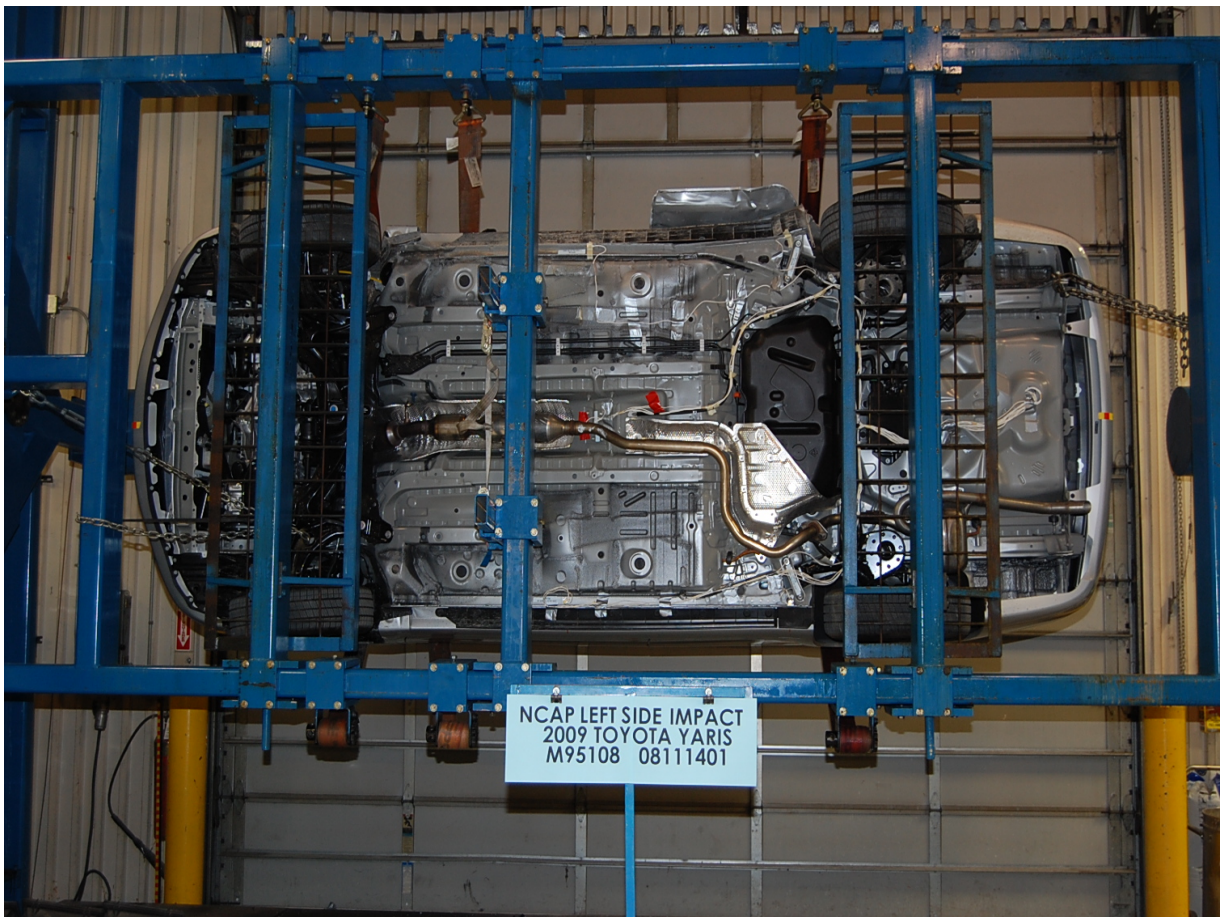
Post-Test Left Side View of Deformable Barrier



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



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 1



Post-Test Passenger Dummy Head Contact View 2



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

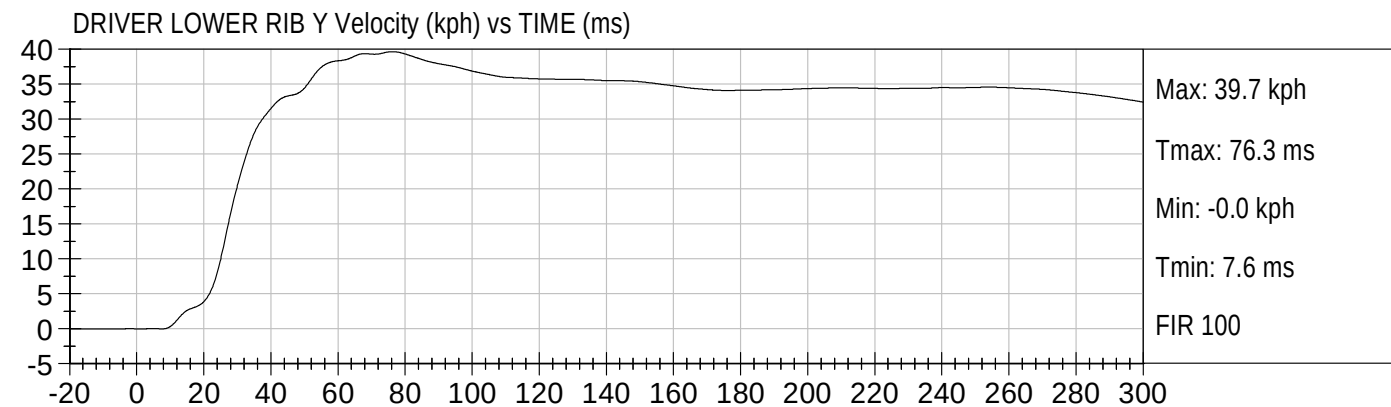
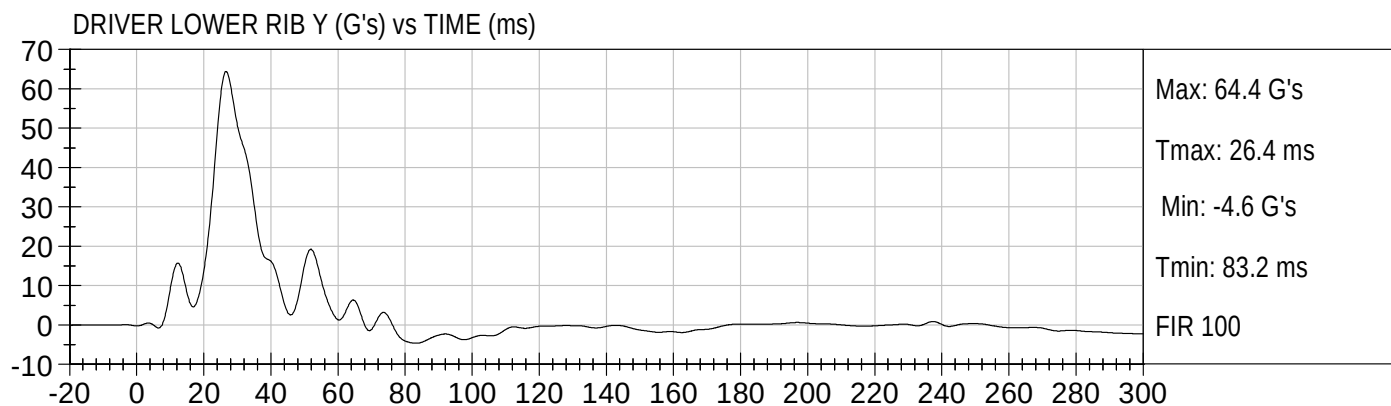
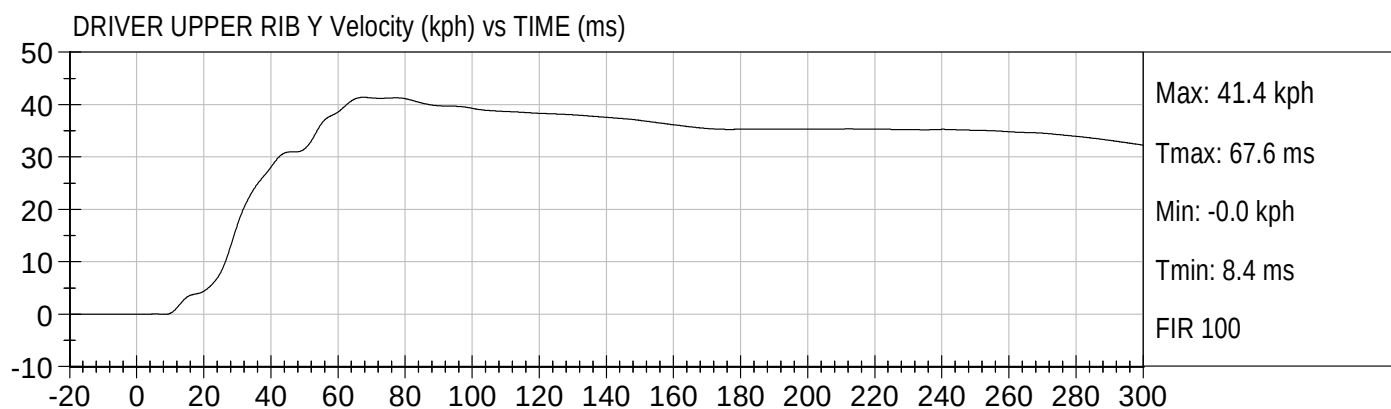
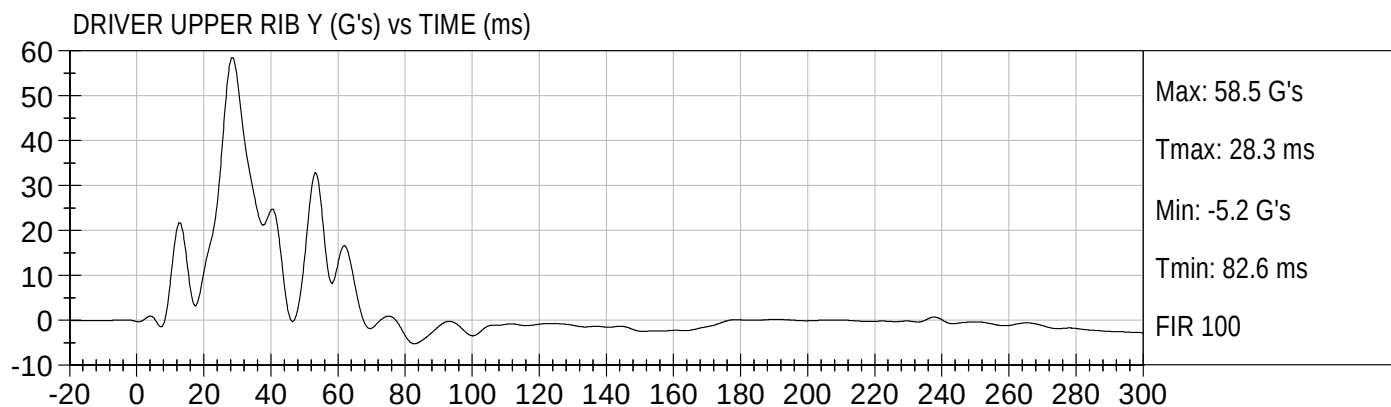
Driver Upper Neck Force Y

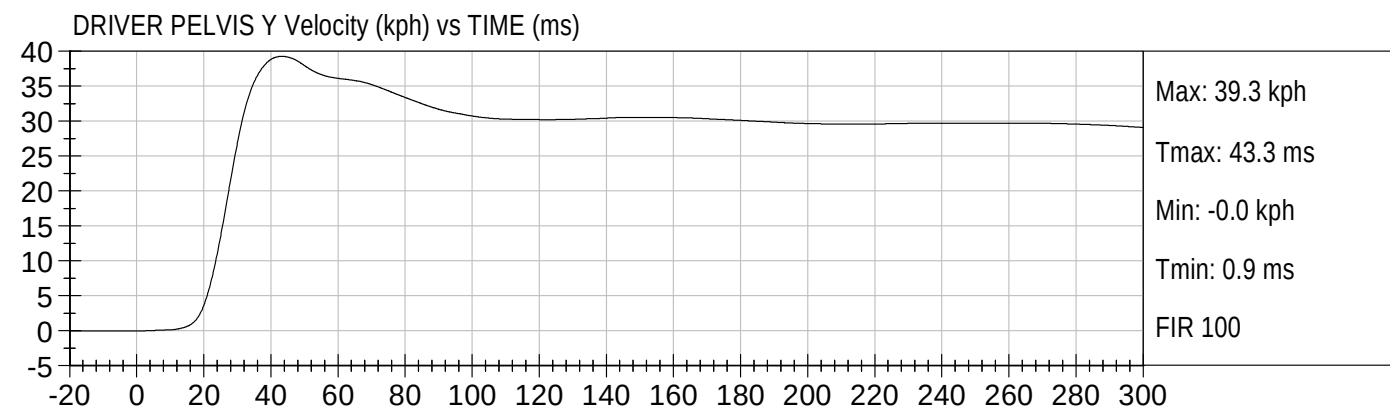
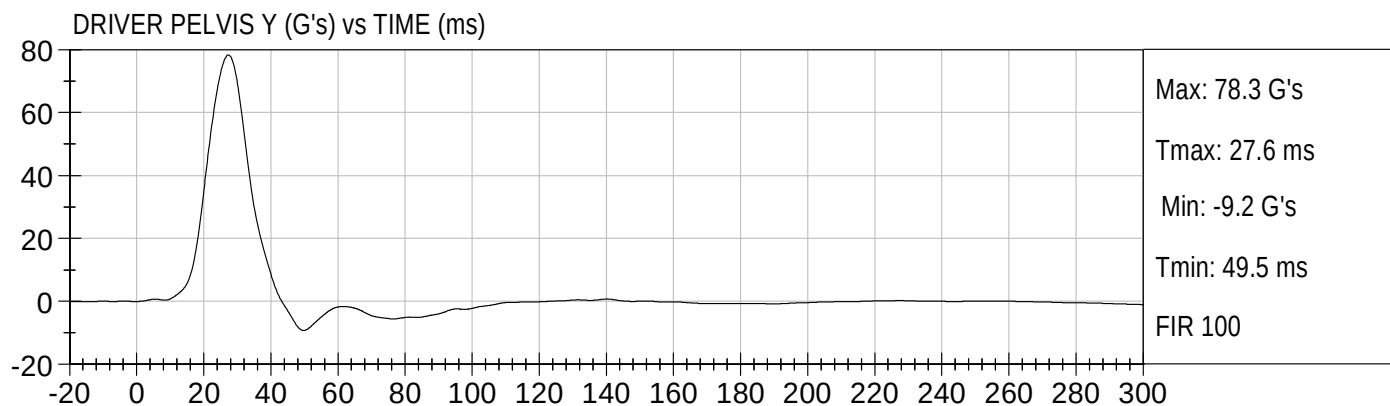
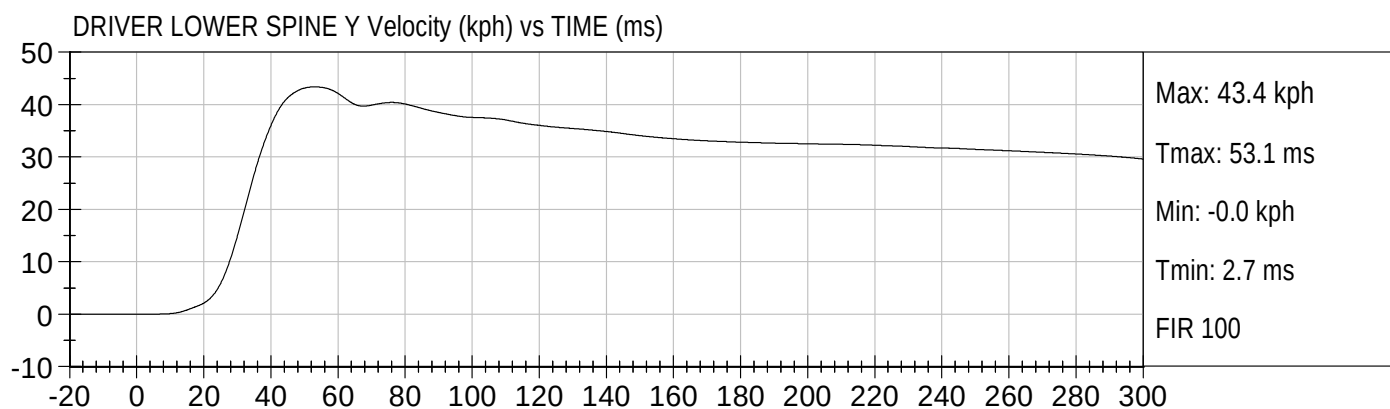
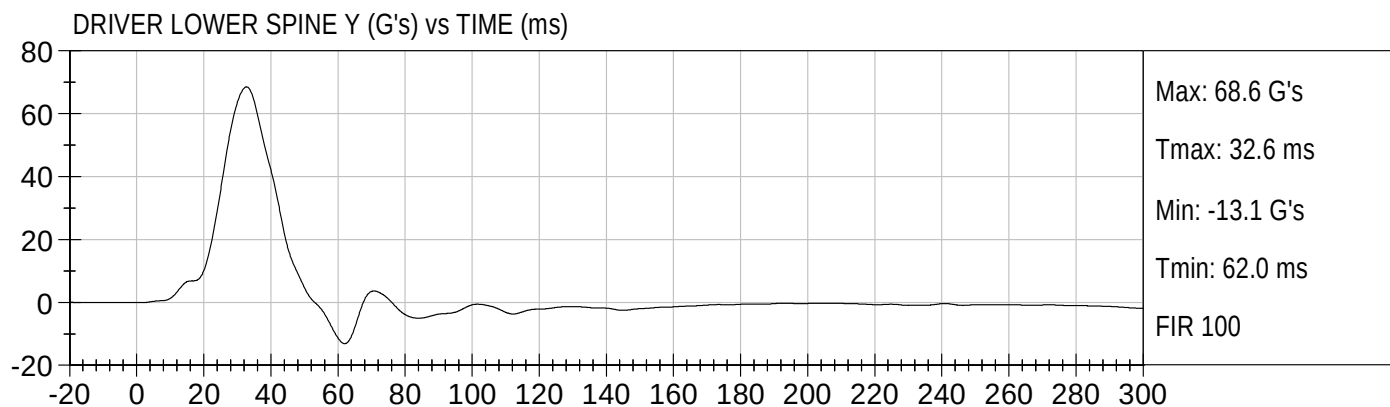
Driver Upper Neck Force Z

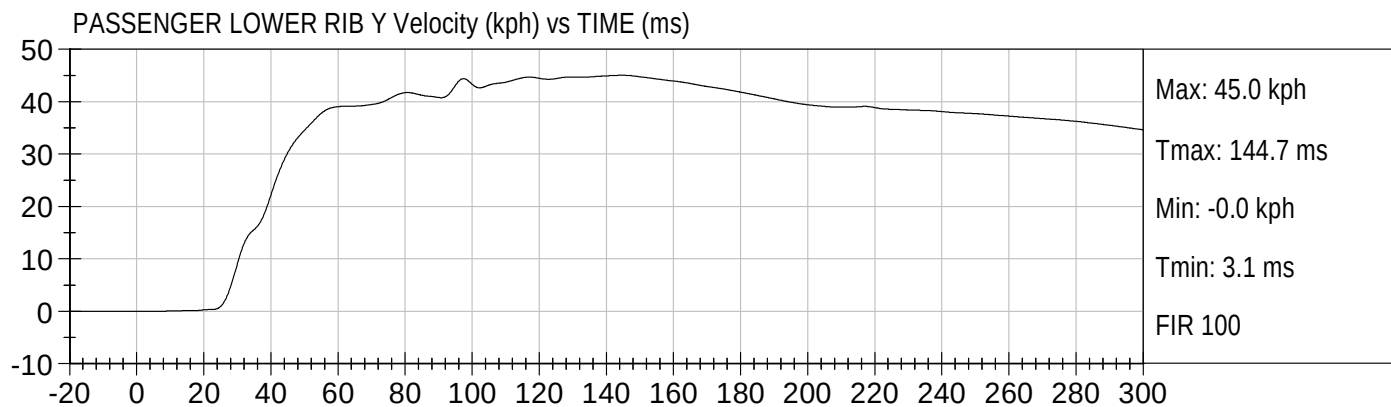
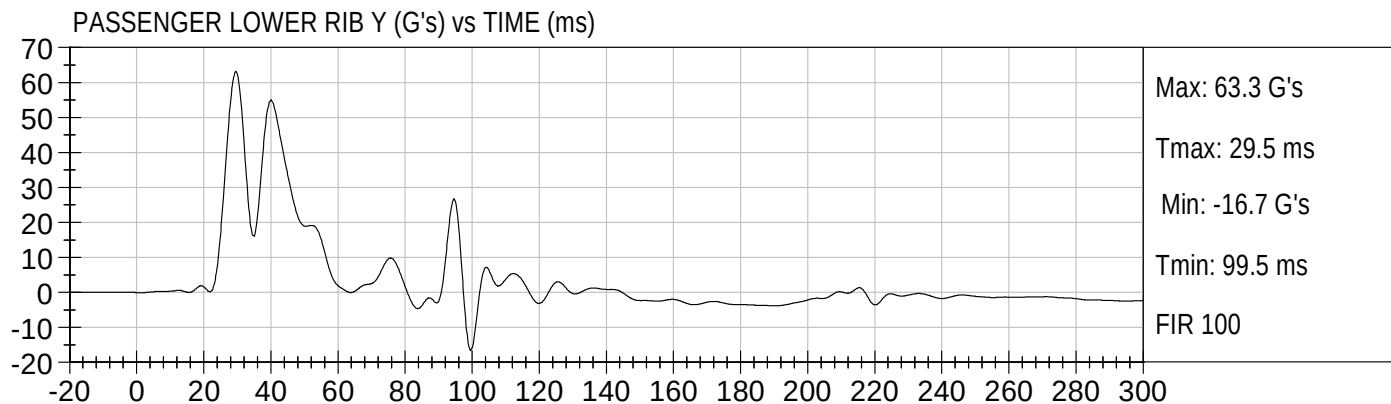
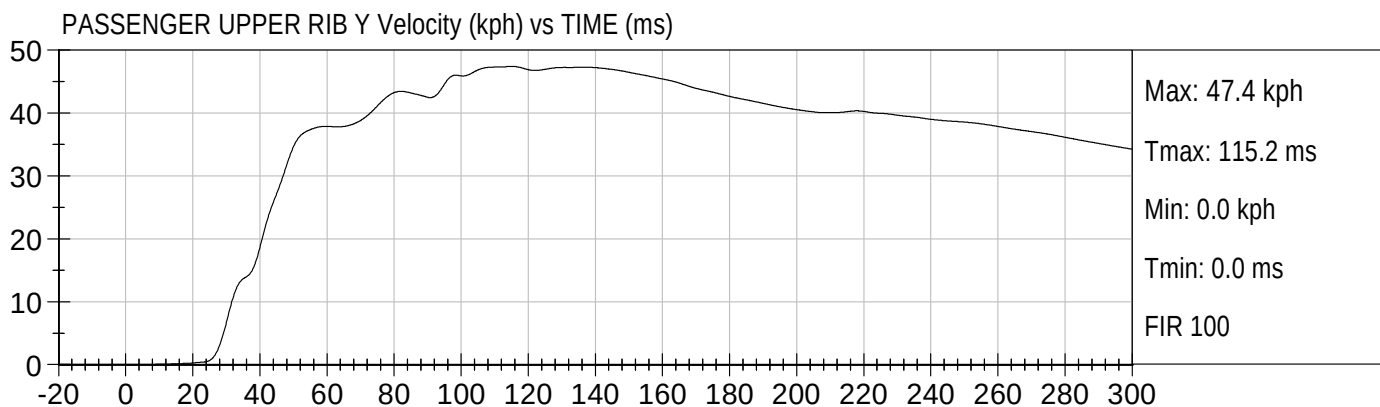
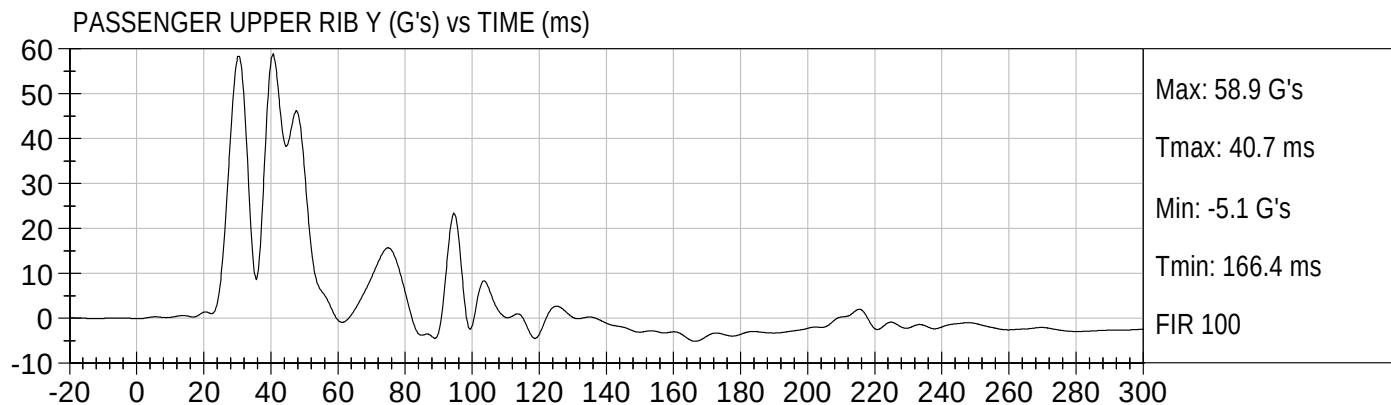
Driver Upper Neck Moment X

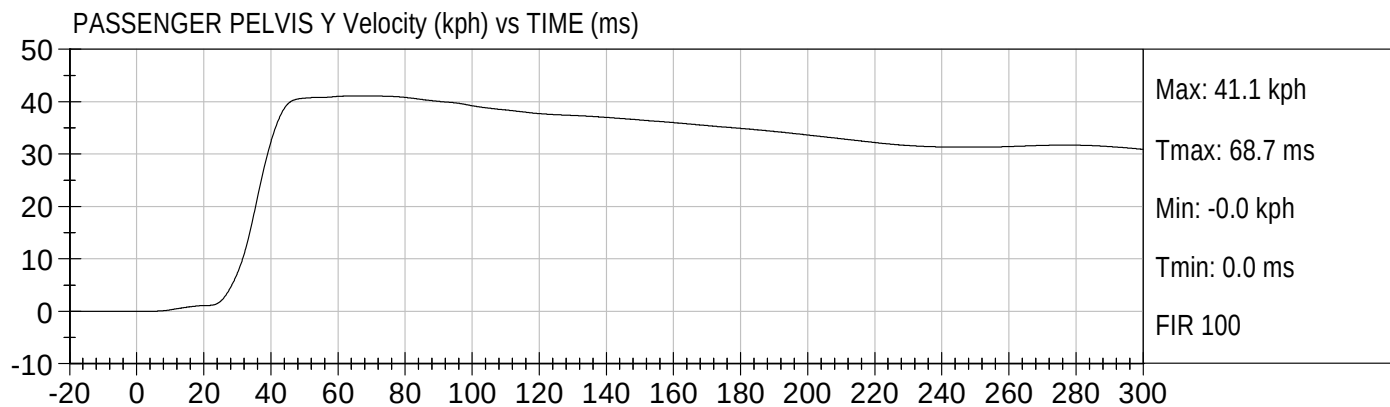
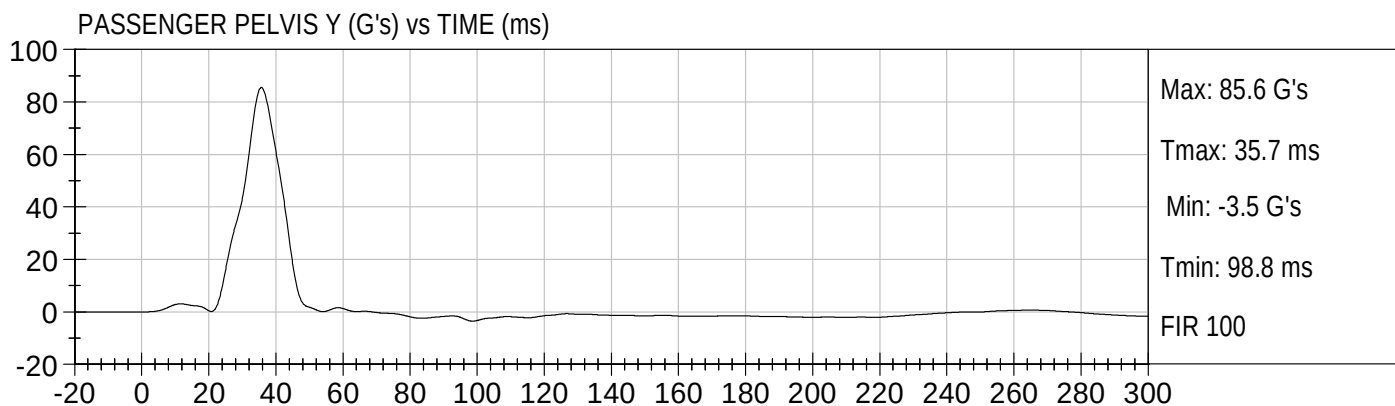
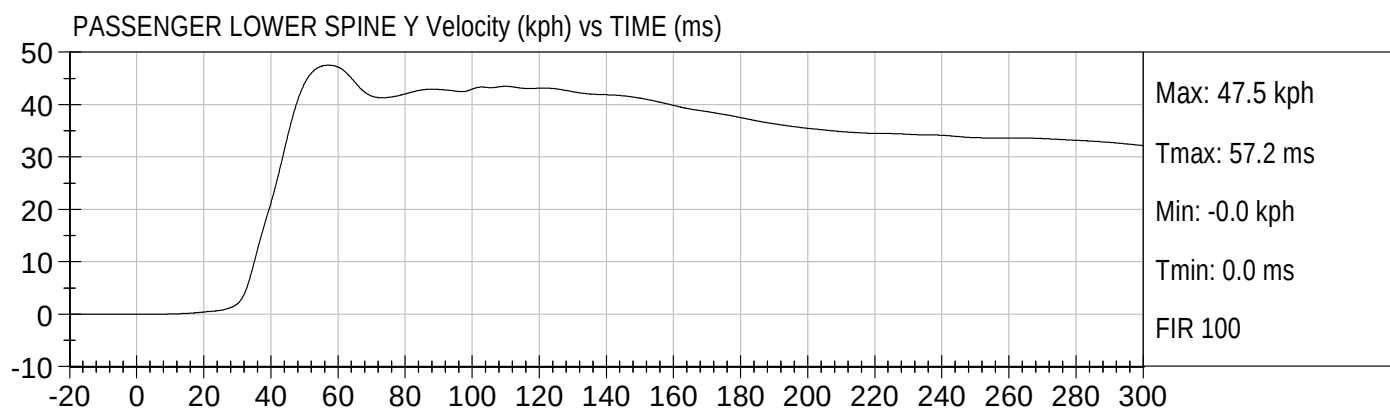
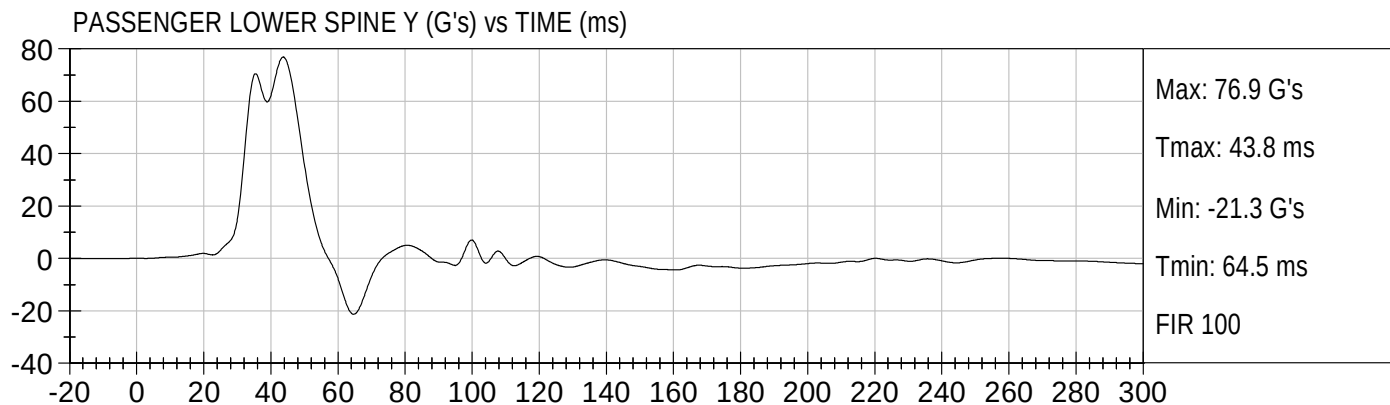
Driver Upper Neck Moment Y
Driver Upper Neck Moment Z
Driver Upper Rib Redundant Y
Driver Lower Rib Redundant Y
Driver Lower Spine Redundant Y
Driver Pelvis Redundant Y
Driver Thorax Contact
Driver Pelvis Contact
Passenger Head X Primary
Passenger Head Y Primary
Passenger Head Z Primary
Passenger Head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


Laboratory Technician


Approved By

8/29/08

Test Date

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

ATD Serial No: 272

Test I.D: D082721

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	40	Pass
Peak Resultant Acceleration	G's	120 to 150	133	Pass
Is Resultant Curve Unimodal?	N/A	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-14.4	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

9/24/08
Test Date



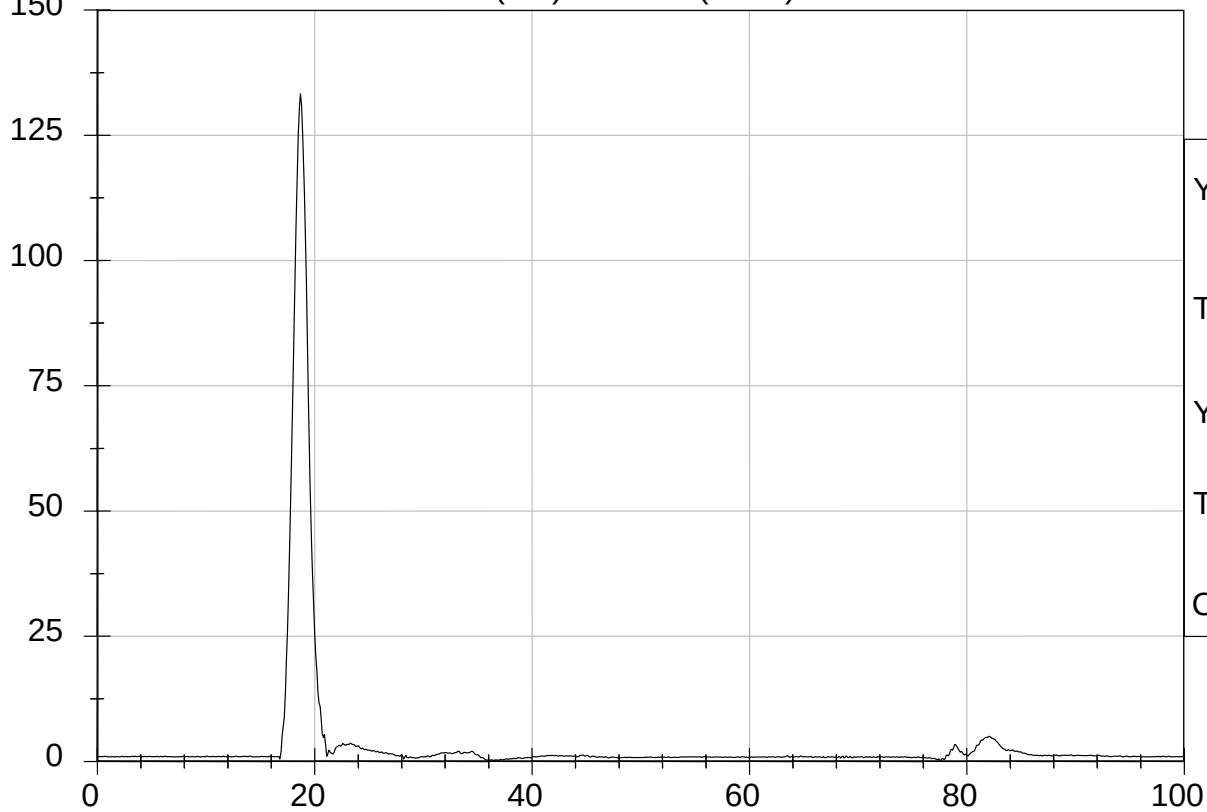
Test Description: Head Drop

Test Date: 9/24/08

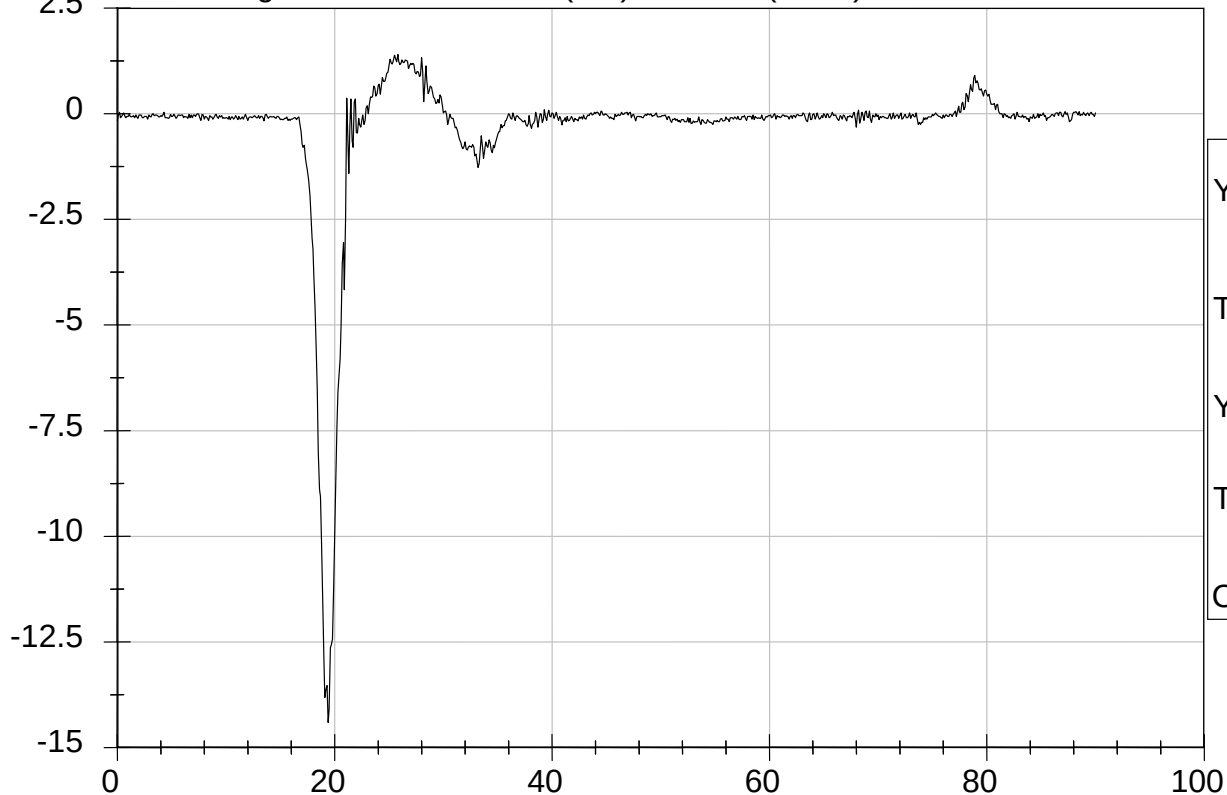
Component: D082721

Speed: 0 ft/s, 0 m/s

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



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



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

ATD Serial No: 272

Test I.D: D082722

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	44	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	37	Pass
Lower Spine	G's	15 - 22	18	Pass
Overall Test Results				Pass


Laboratory Technician

9/24/08

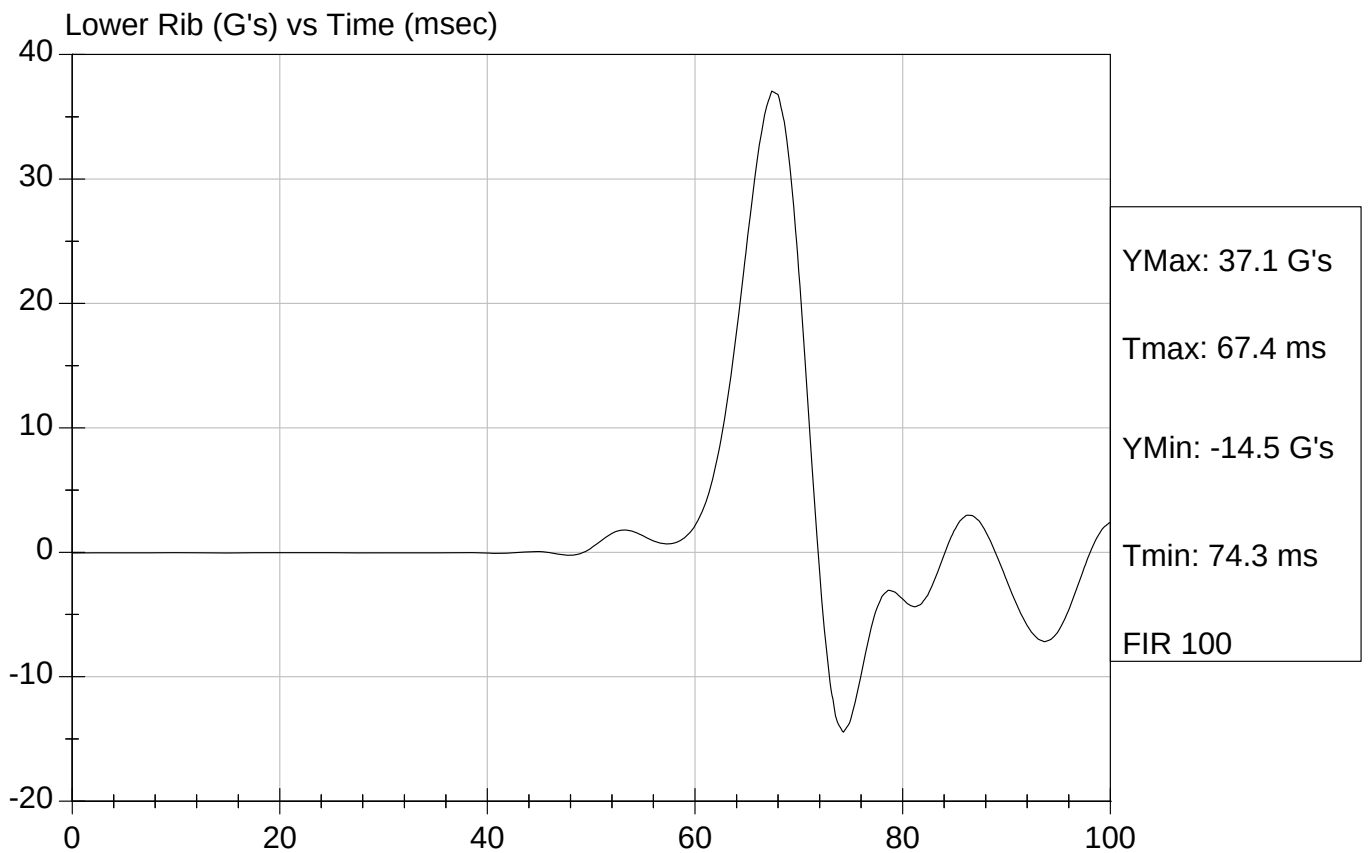
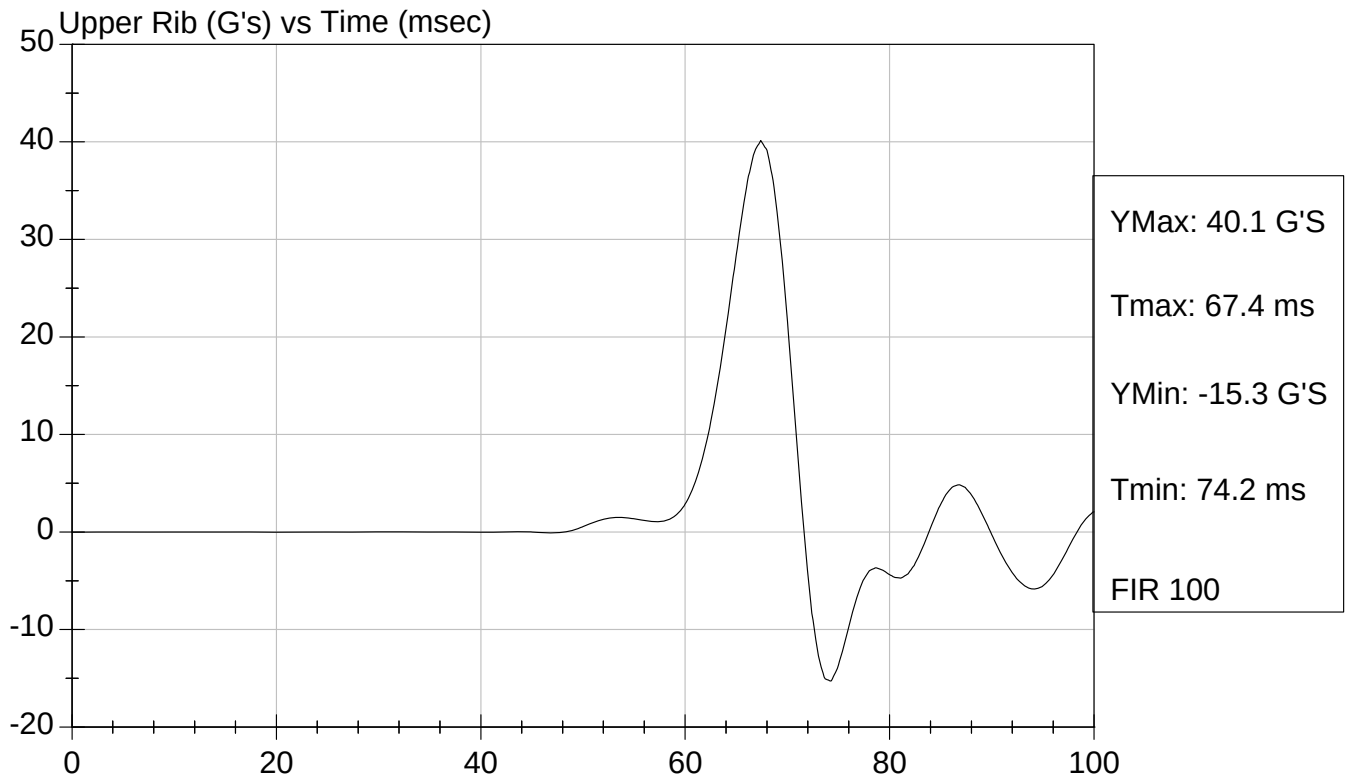
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D082722

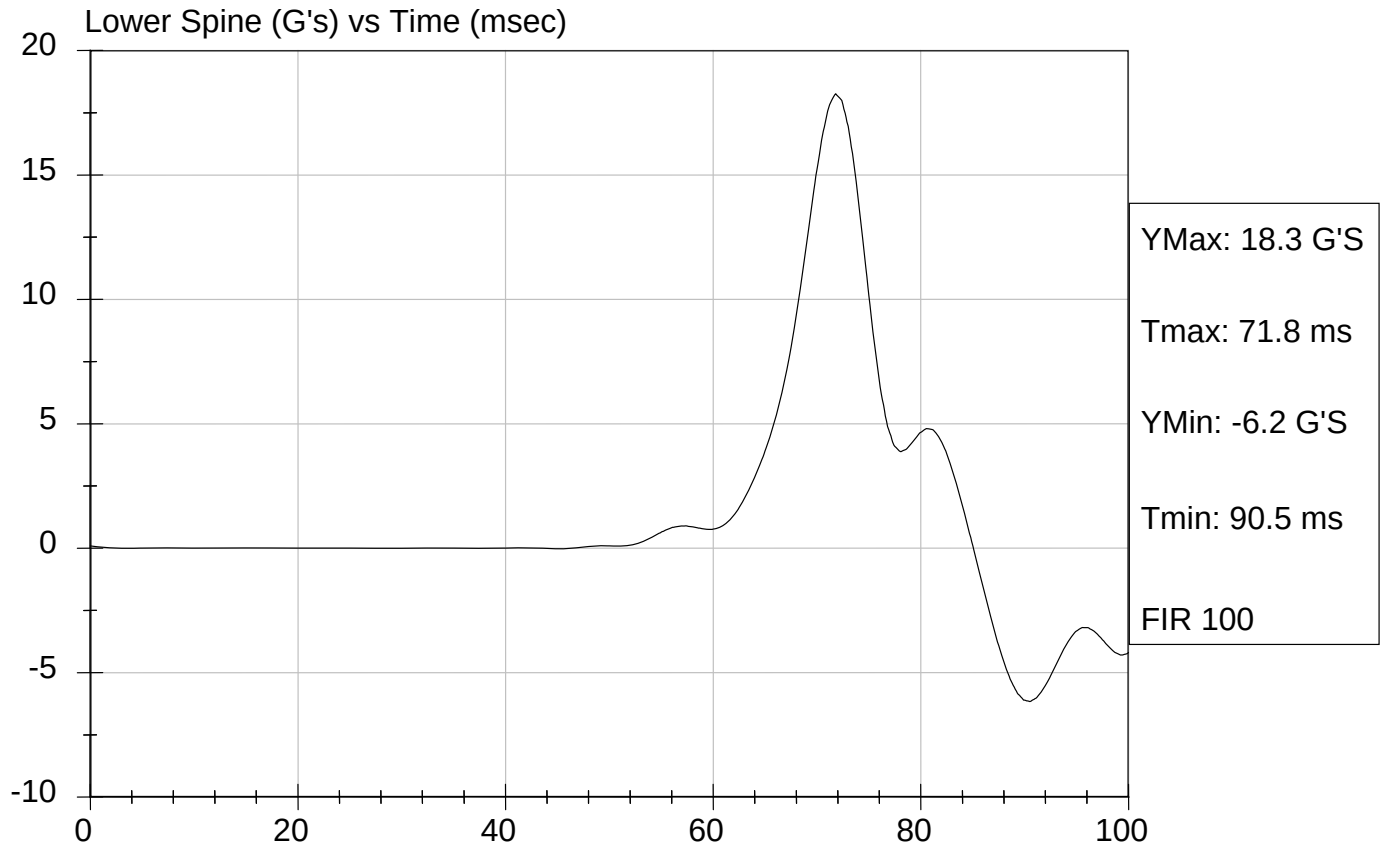
Test Date: 9/24/08
Speed: 14.12 ft/sec, 4.30 m/sec





Test Desc: Thorax Impact
Component ID: D082722

Test Date: 9/24/08
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: D082723

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	44	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

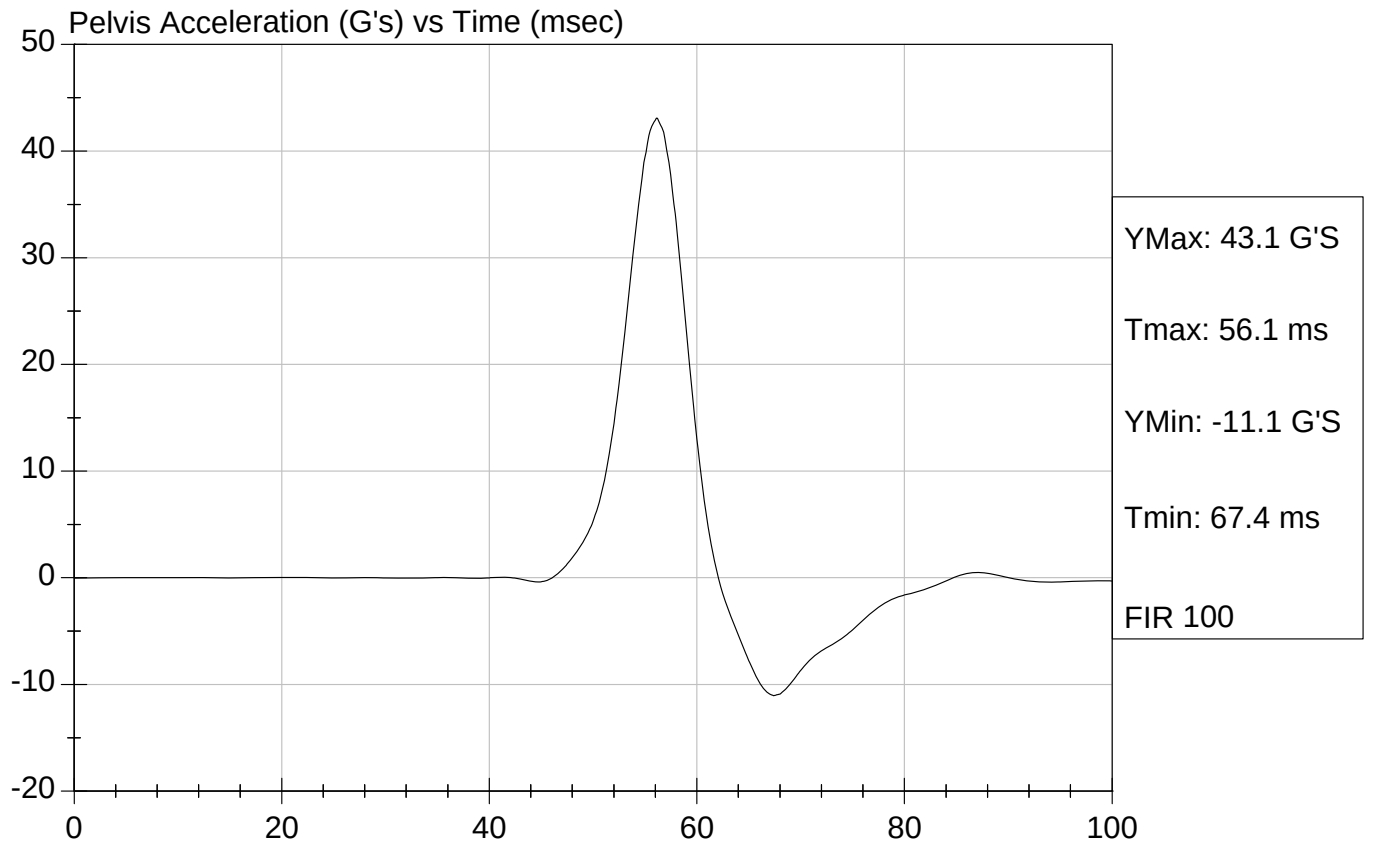
David Winkelbauer
Approved By

9/24/08
Test Date



Test Desc: Pelvis Impact
Component ID: D082723

Test Date: 9/24/08
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: D082724

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Force At 12.7 mm	N	104 -162	138	Pass
Force At 19 mm	N	163 - 222	194	Pass
Force At 25.4 mm	N	222 - 280	268	Pass
Force At 33 mm	N	325 - 391	381	Pass
			Overall Test Results	Pass


Laboratory Technician

9/23/08

Test Date

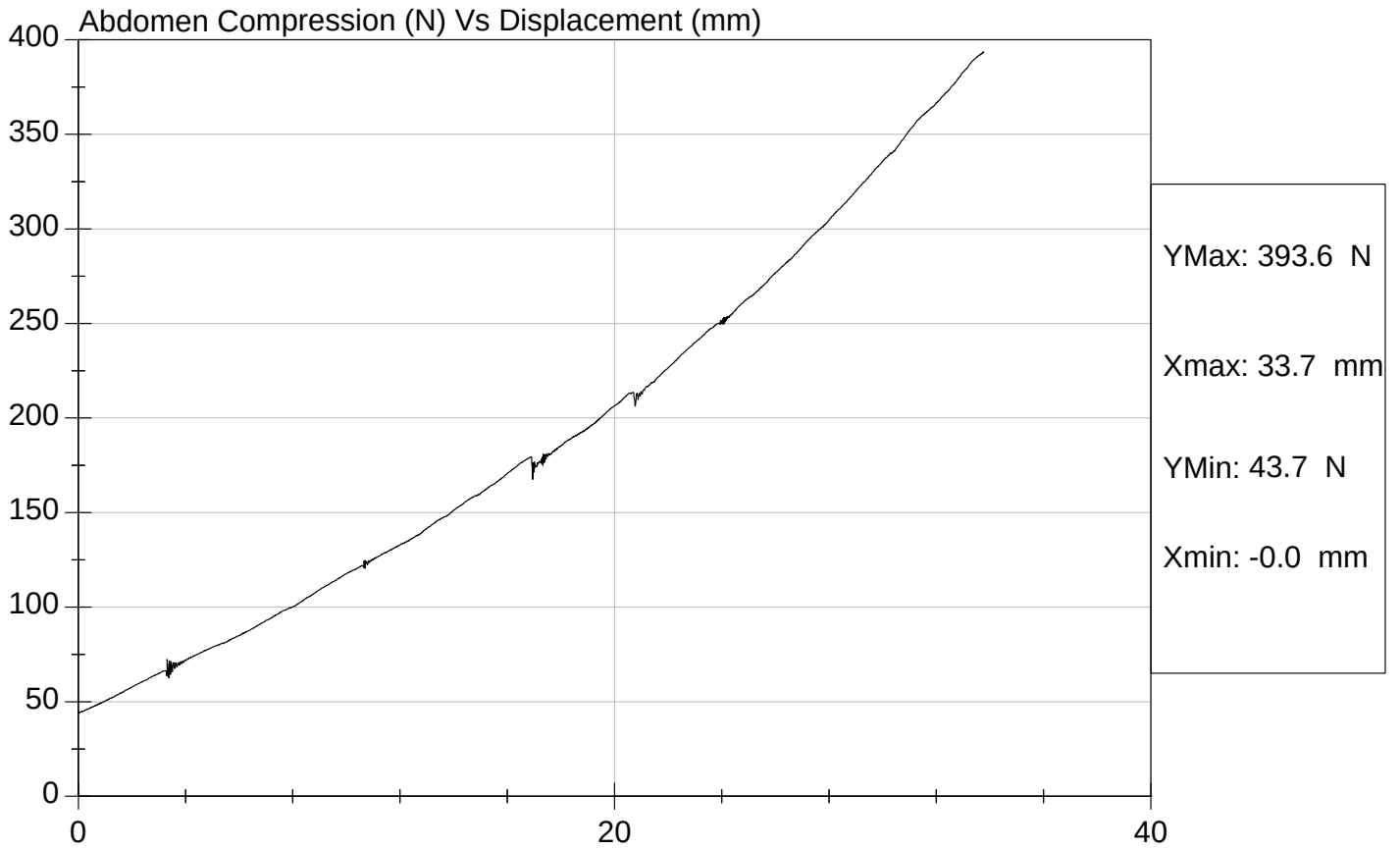

Approved By



Test Description: Abdomen Compression Test Date: 9/23/08

Component: D082724

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: D082725

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	125.6	Pass
Force At 30 deg	N	151.2 - 204.6	177.0	Pass
Force At 40 deg	N	204.6 - 258.0	249.9	Pass
Return Angle	Deg	12 Maximum	6	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

9/23/08
Test Date

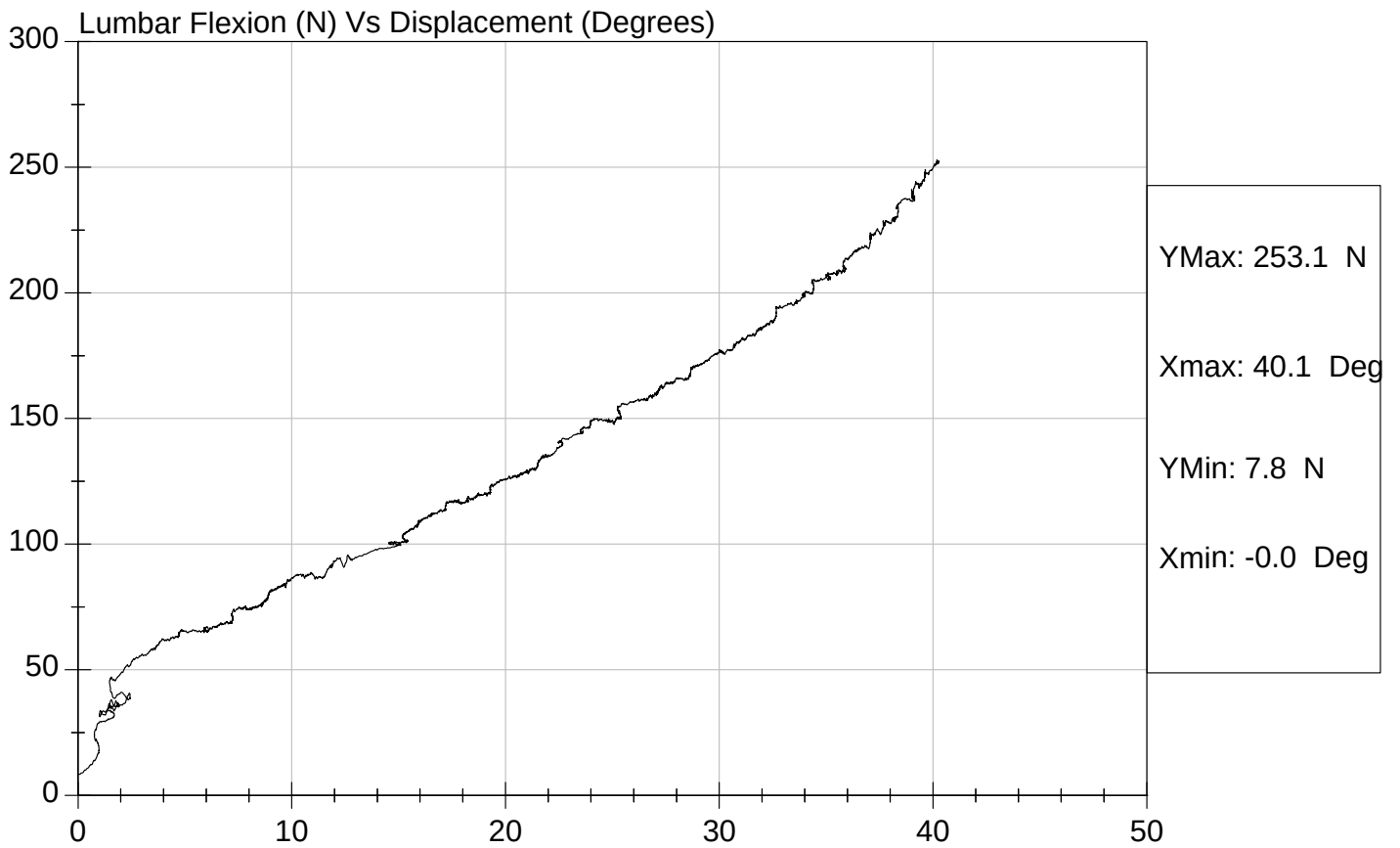


Test Description: Lumbar Flexion

Test Date: 9/23/08

Component: D082725

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: D082729

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity		%	10 to 70	42	Pass
Impact Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.51	Pass
	20 msec	m/s	4.12 to 5.10	5.00	Pass
	30 msec	m/s	5.73 to 7.01	6.61	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.59	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	76	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	51	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	9	Pass


 Laboratory Technician


 Approved By

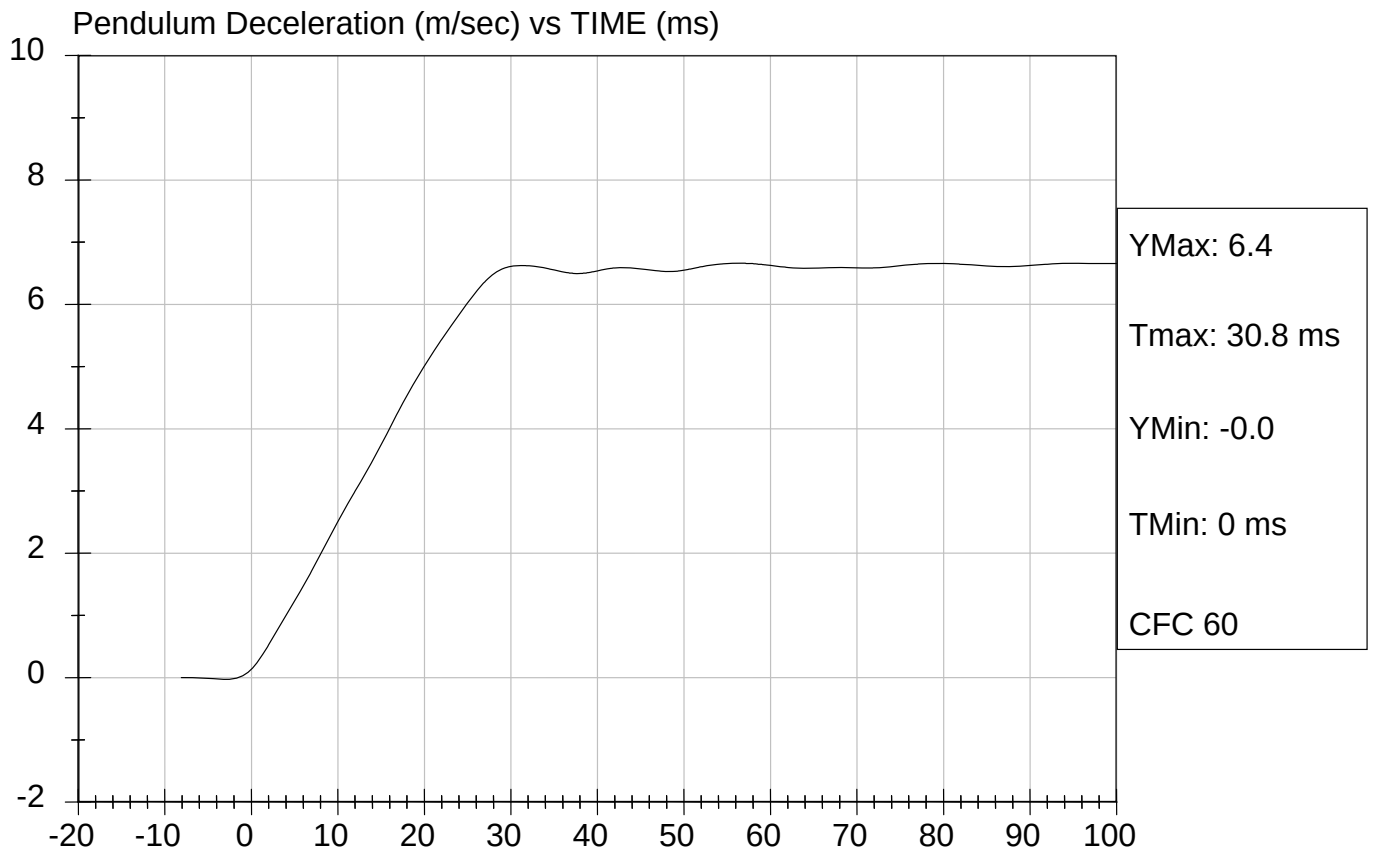
9/24/08

Test Date



Test Desc: Neck Bending
Component ID: D082729

Test Date: 9/24/08
Speed: 23.15 ft/sec, 7.06 m/sec

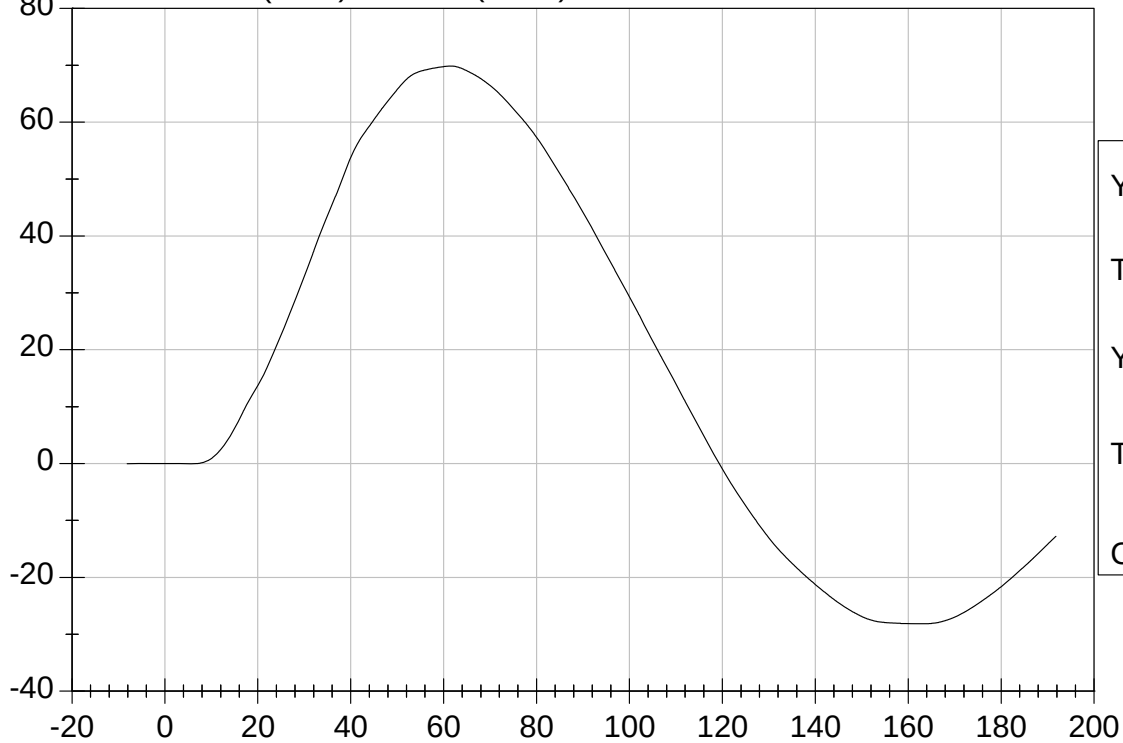




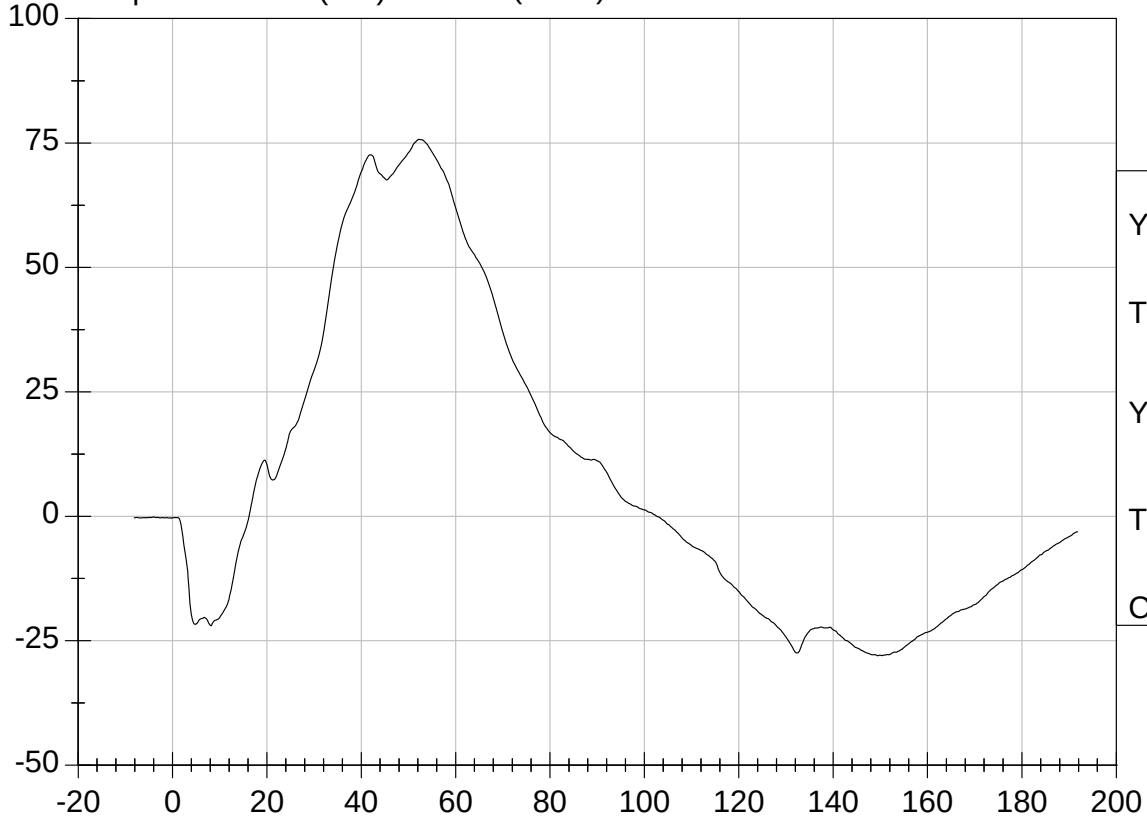
Test Desc: Neck Bending
Component ID: D082729

Test Date: 9/24/08
Speed: 23.15 ft/sec, 7.06 m/sec

Neck Rotation (DEG) vs Time (msec)



Occipital Moment (Nm) vs Time (msec)



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: D083021

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Peak Resultant Acceleration	G's	120 to 150	139	Pass
Is Resultant Curve Unimodal?	N/A	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-12.8	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

11/17/08
Test Date

David Winkelbauer
Approved By



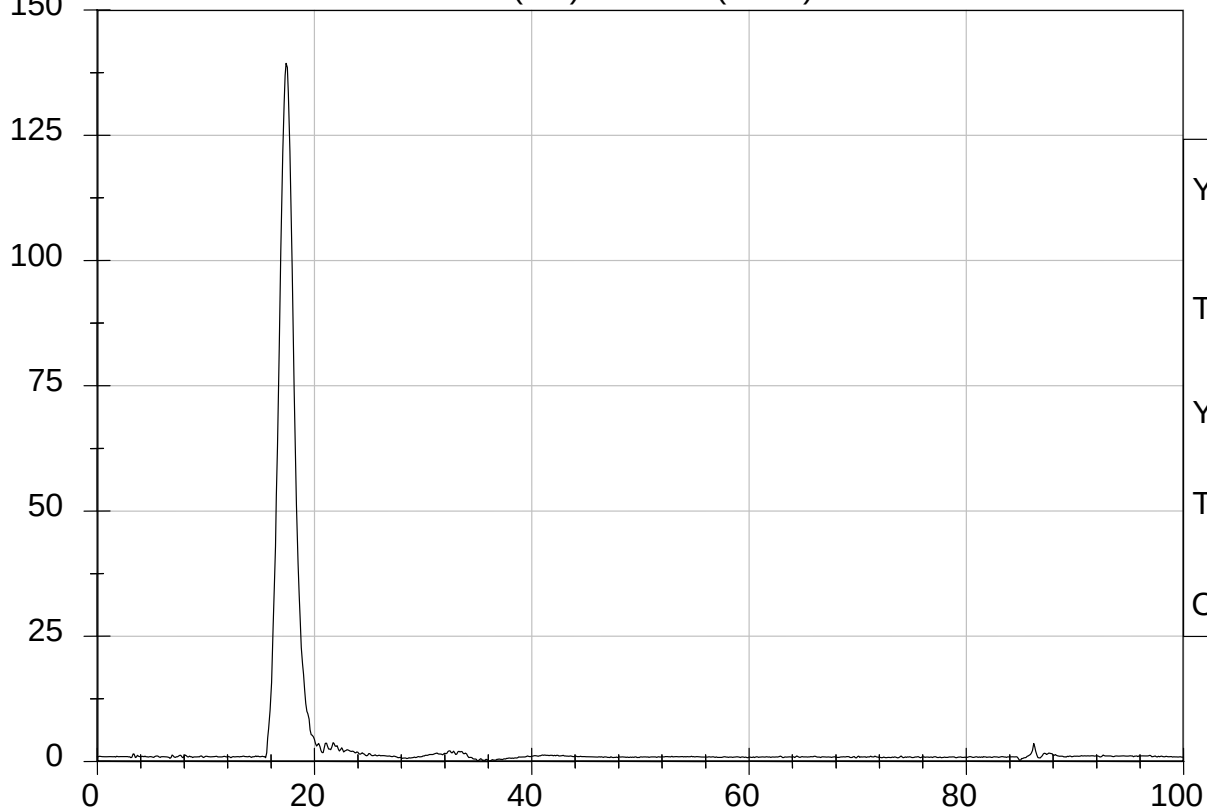
Test Description: Head Drop

Test Date: 11/17/08

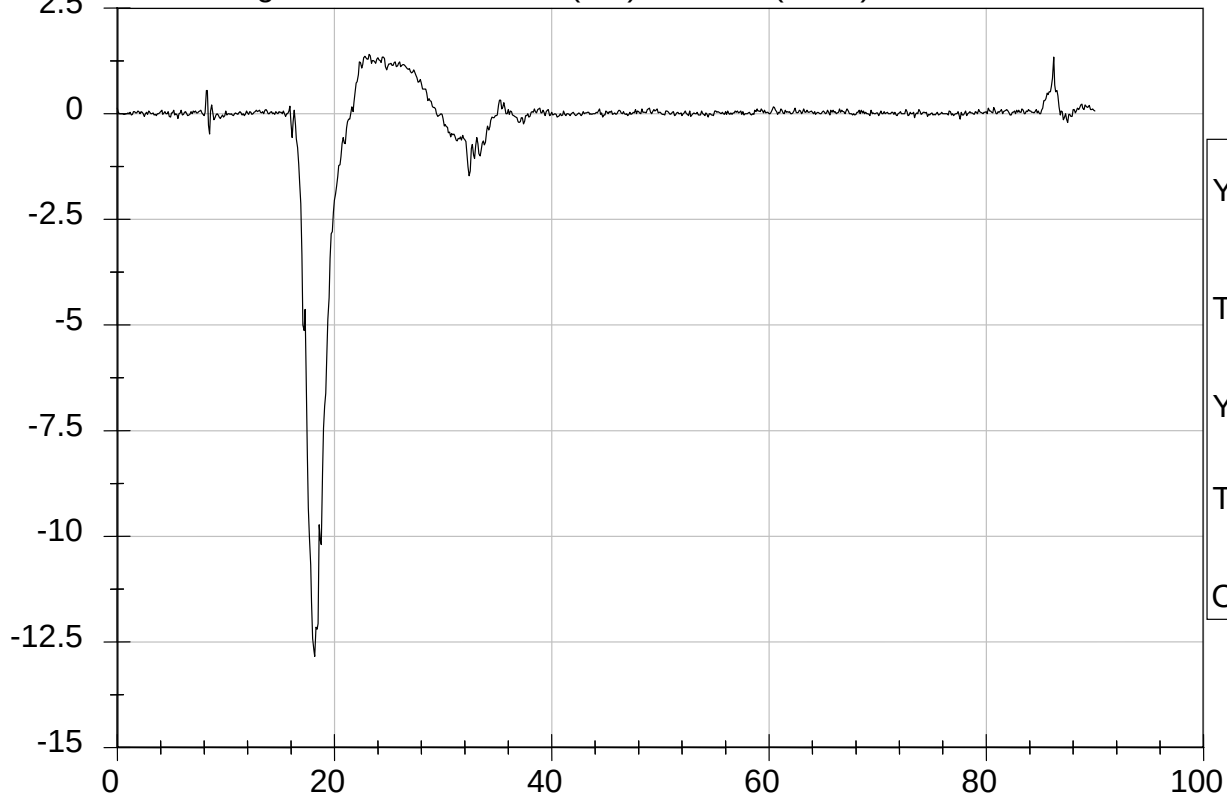
Component: D083021

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: 272

Test I.D: D083022

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	20	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	37	Pass
Lower Spine	G's	15 - 22	20	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

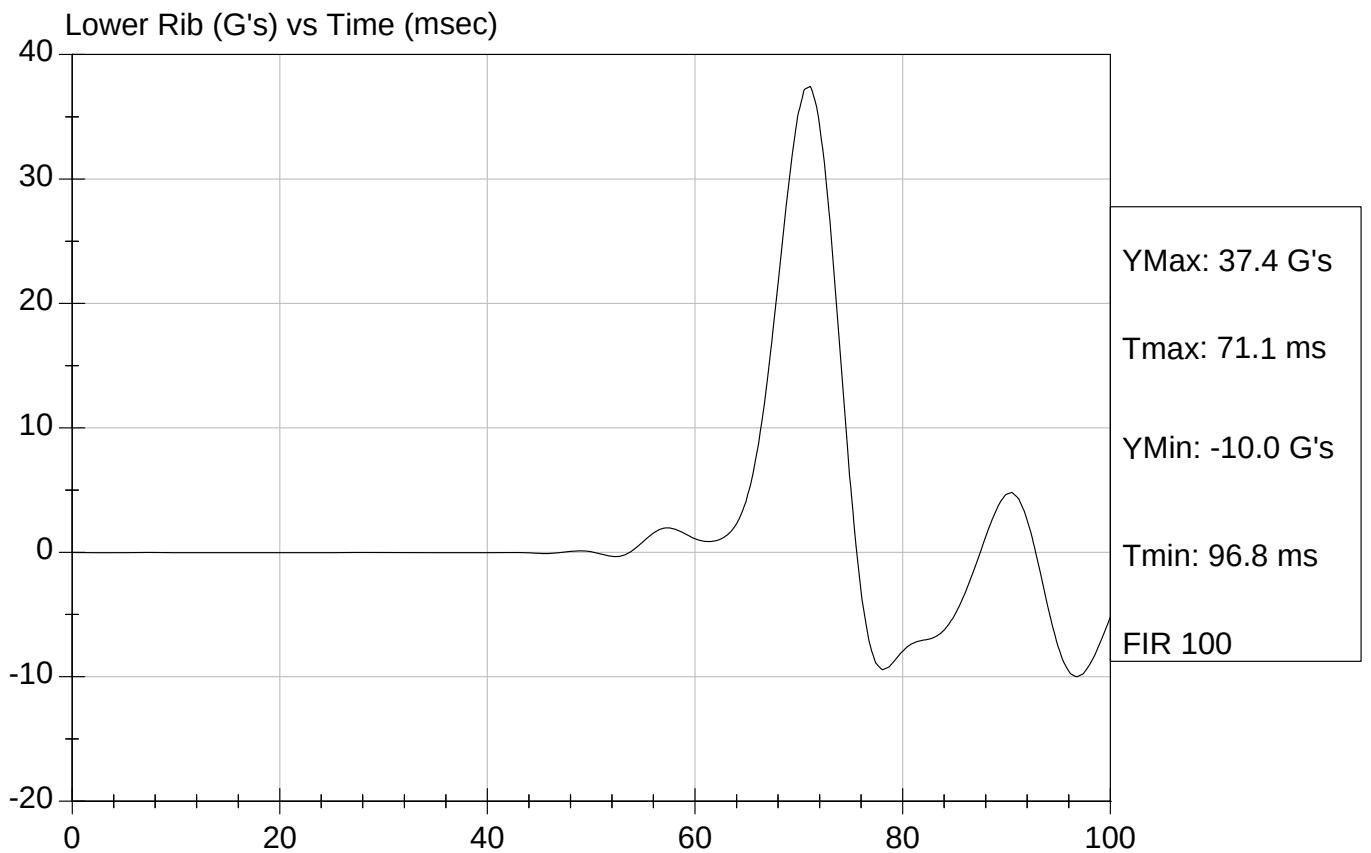
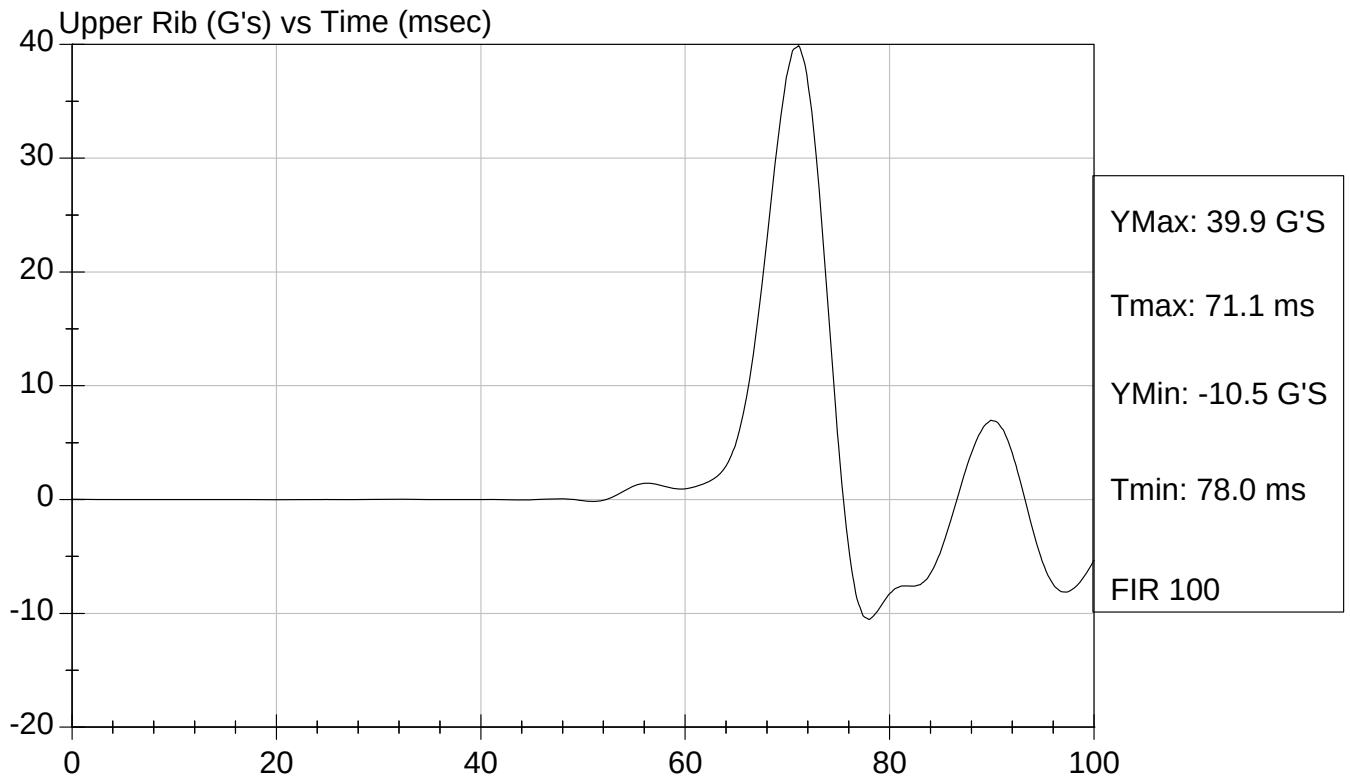
11/17/08
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax Impact
Component ID: D083022

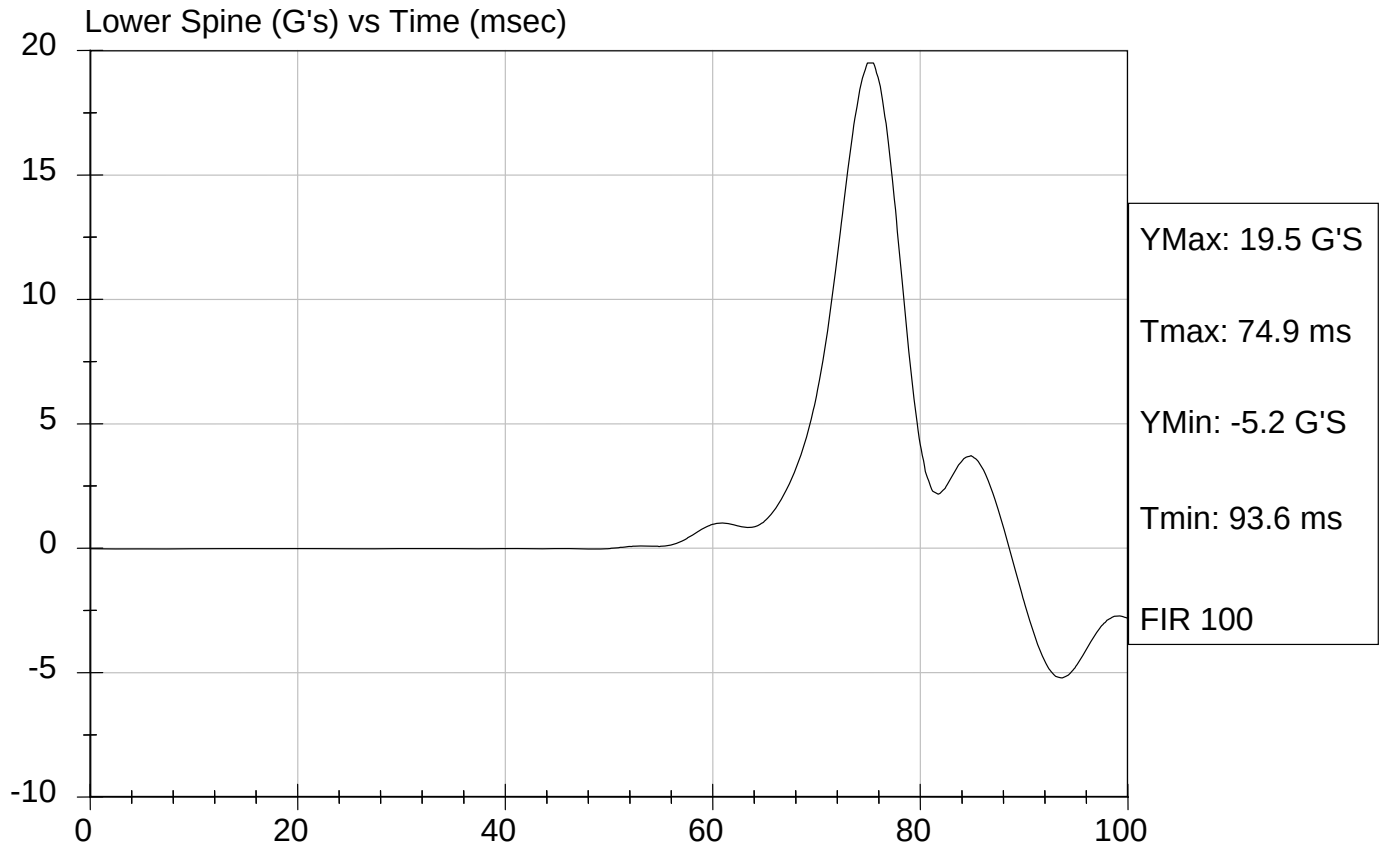
Test Date: 11/17/08
Speed: 14.12 ft/sec, 4.30 m/sec





Test Desc: Thorax Impact
Component ID: D083022

Test Date: 11/17/08
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: D083023

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	20	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

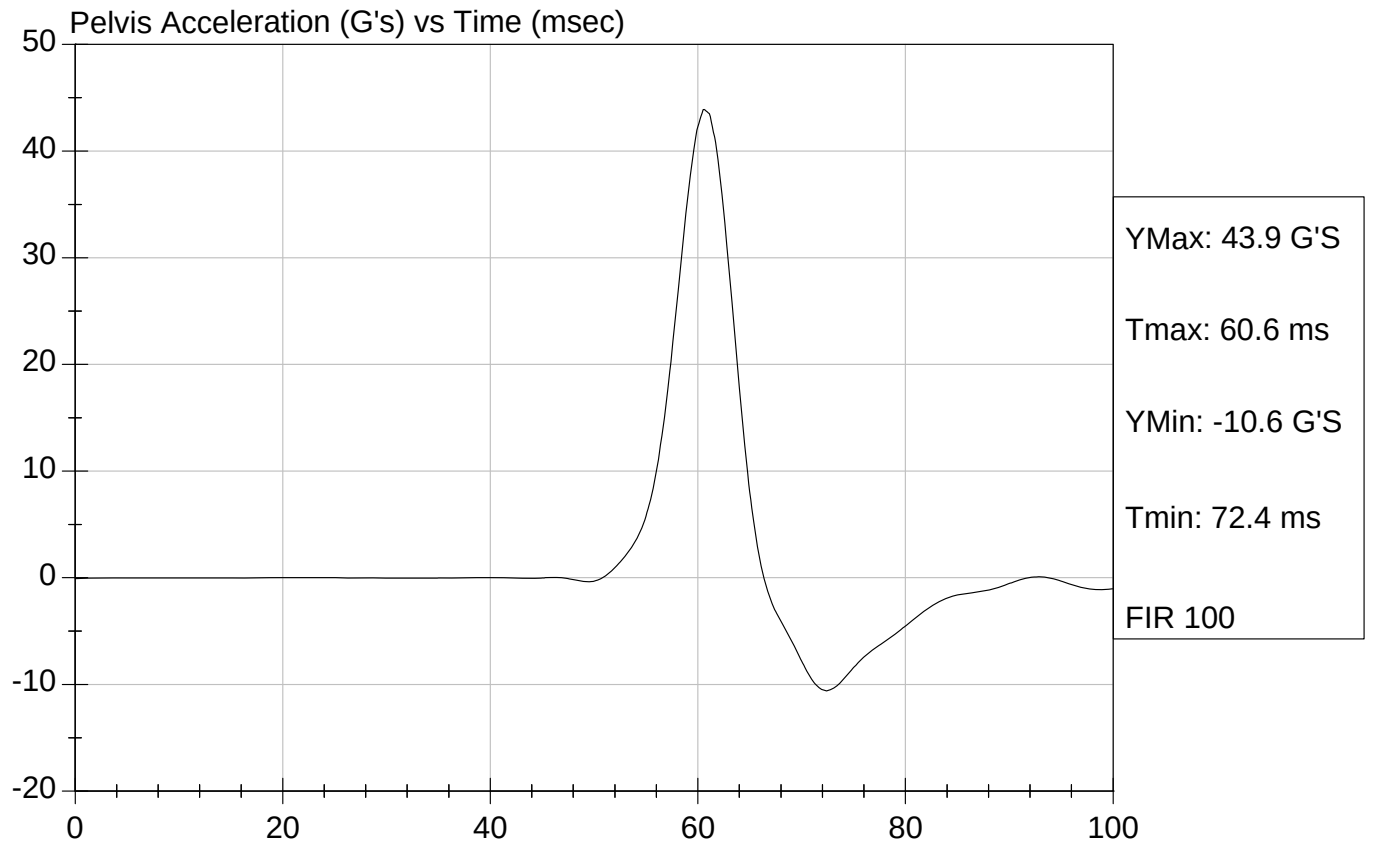
11/17/08
Test Date

David Winkelbauer
Approved By



Test Desc: Pelvis Impact
Component ID: D083023

Test Date: 11/17/08
Speed: 14.12 ft/sec, 4.30 m/sec

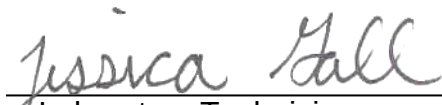


SID/HIII Calibration Data Sheet
Side Impact Dummy
Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 272

Test I.D: D083024

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Force At 12.7 mm	N	104 -162	131	Pass
Force At 19 mm	N	163 - 222	179	Pass
Force At 25.4 mm	N	222 - 280	245	Pass
Force At 33 mm	N	325 - 391	336	Pass
Overall Test Results				Pass


Laboratory Technician

11/17/08

Test Date

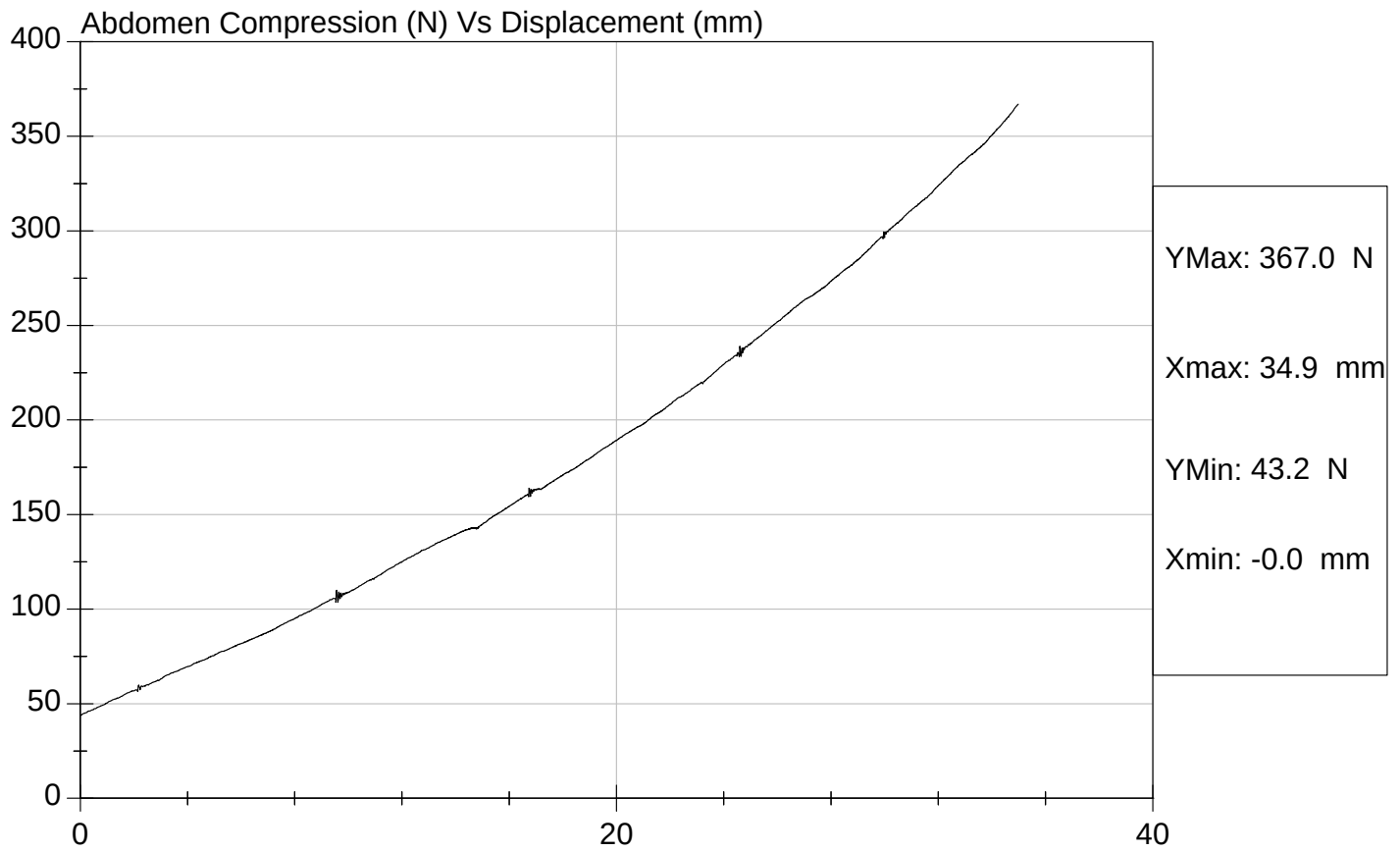

Approved By



Test Description: Abdomen Compression Test Date: 11/17/08

Component: D083024

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: D083025

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	131.6	Pass
Force At 30 deg	N	151.2 - 204.6	176.7	Pass
Force At 40 deg	N	204.6 - 258.0	244.4	Pass
Return Angle	Deg	12 Maximum	5	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

11/17/08
Test Date

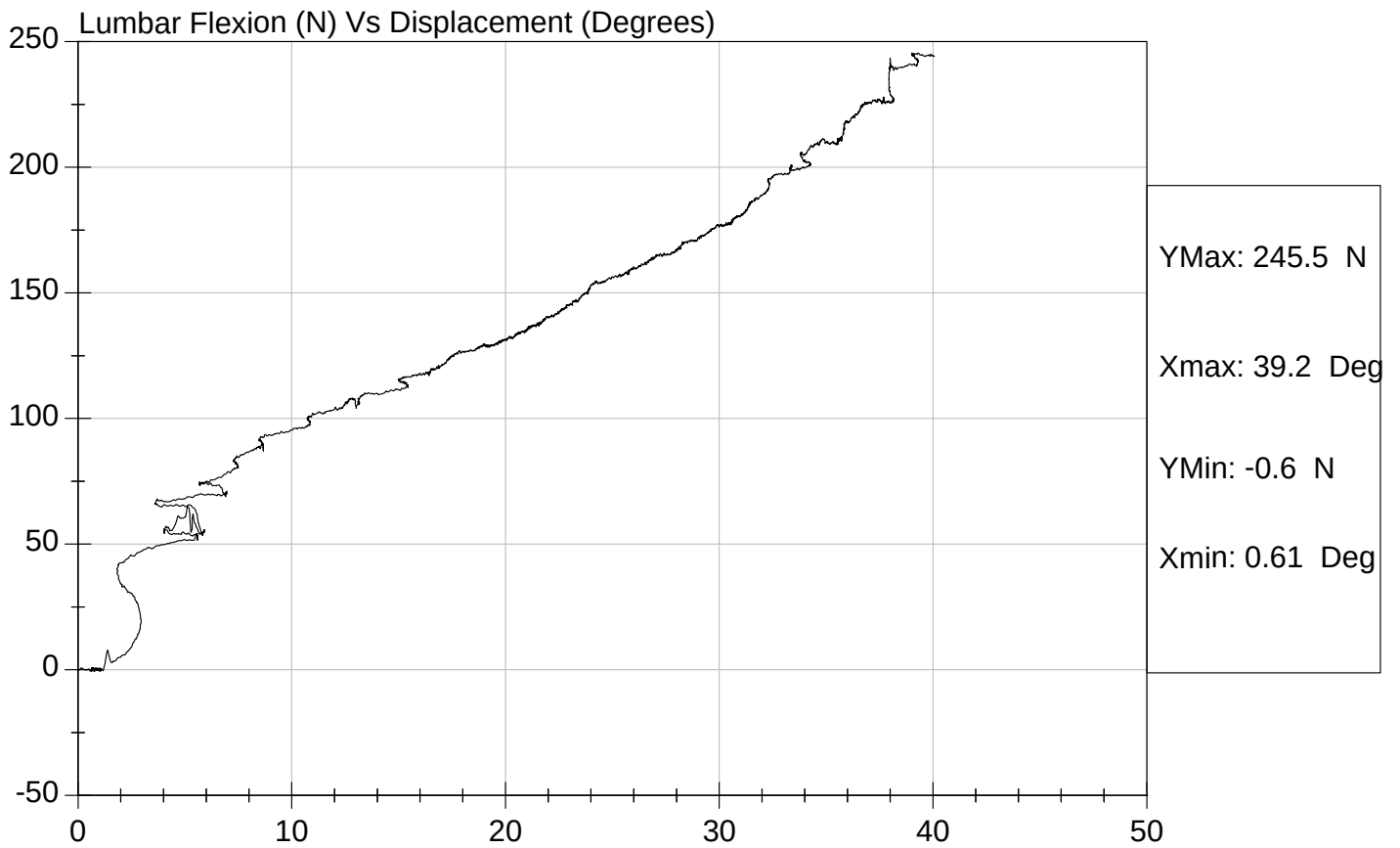


Test Description: Lumbar Flexion

Test Date: 11/17/08

Component: D083025

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: D083029

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	20	Pass
Impact Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.44	Pass
	20 msec	m/s	4.12 to 5.10	4.71	Pass
	30 msec	m/s	5.73 to 7.01	6.45	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.82	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	72	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	59	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	76	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	58	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	13	Pass


 Laboratory Technician

11/17/08

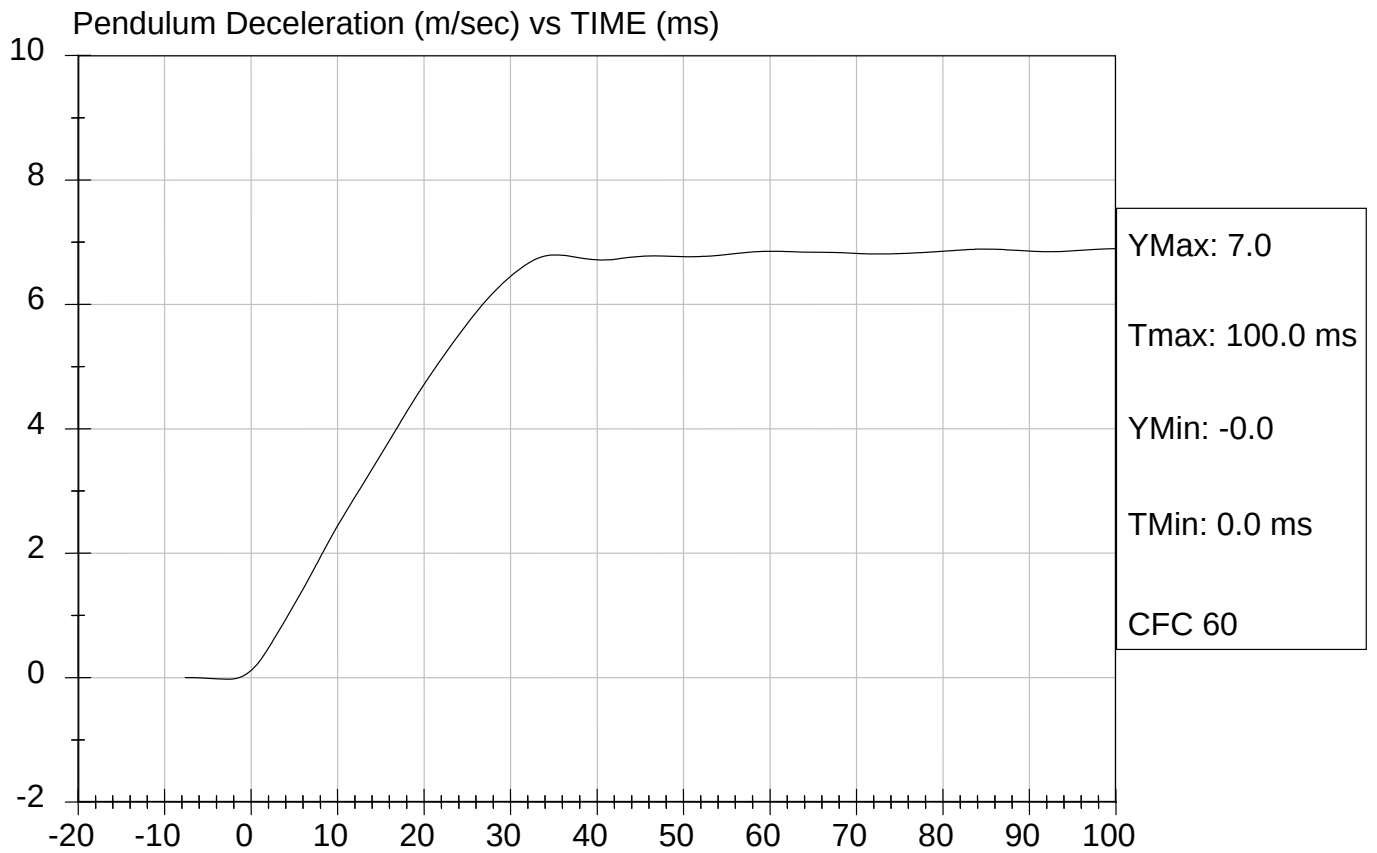
Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D083029

Test Date: 11/17/08
Speed: 23.15 ft/sec, 7.06 m/sec

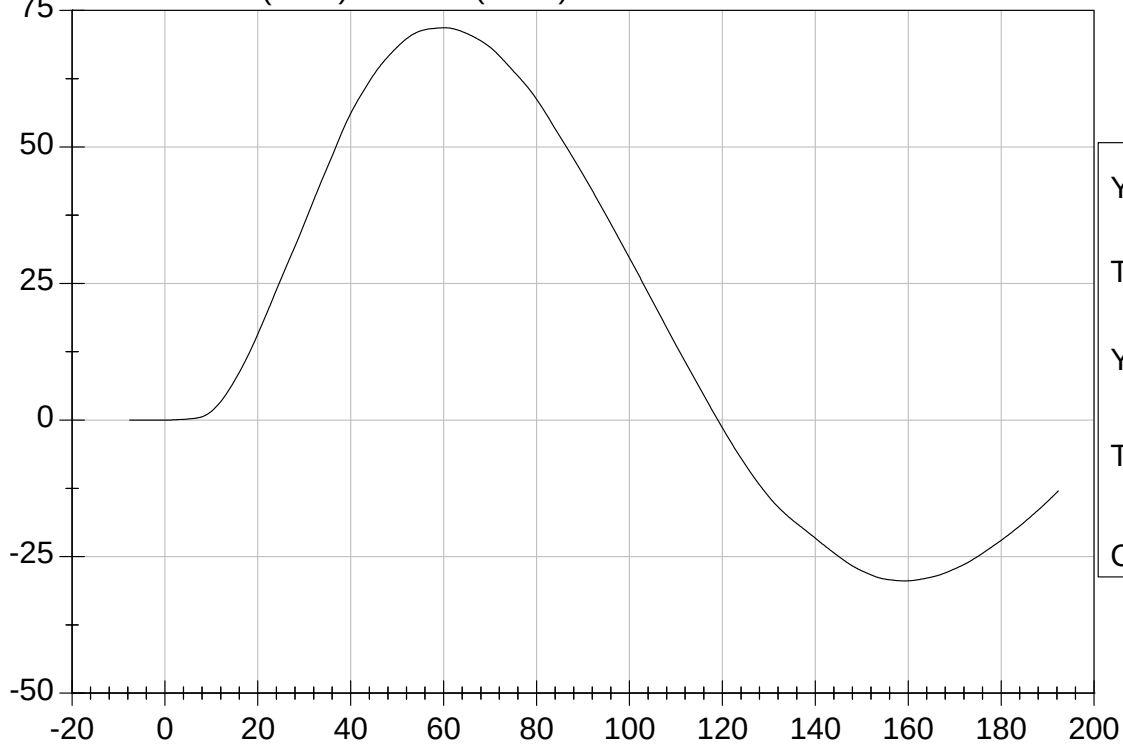




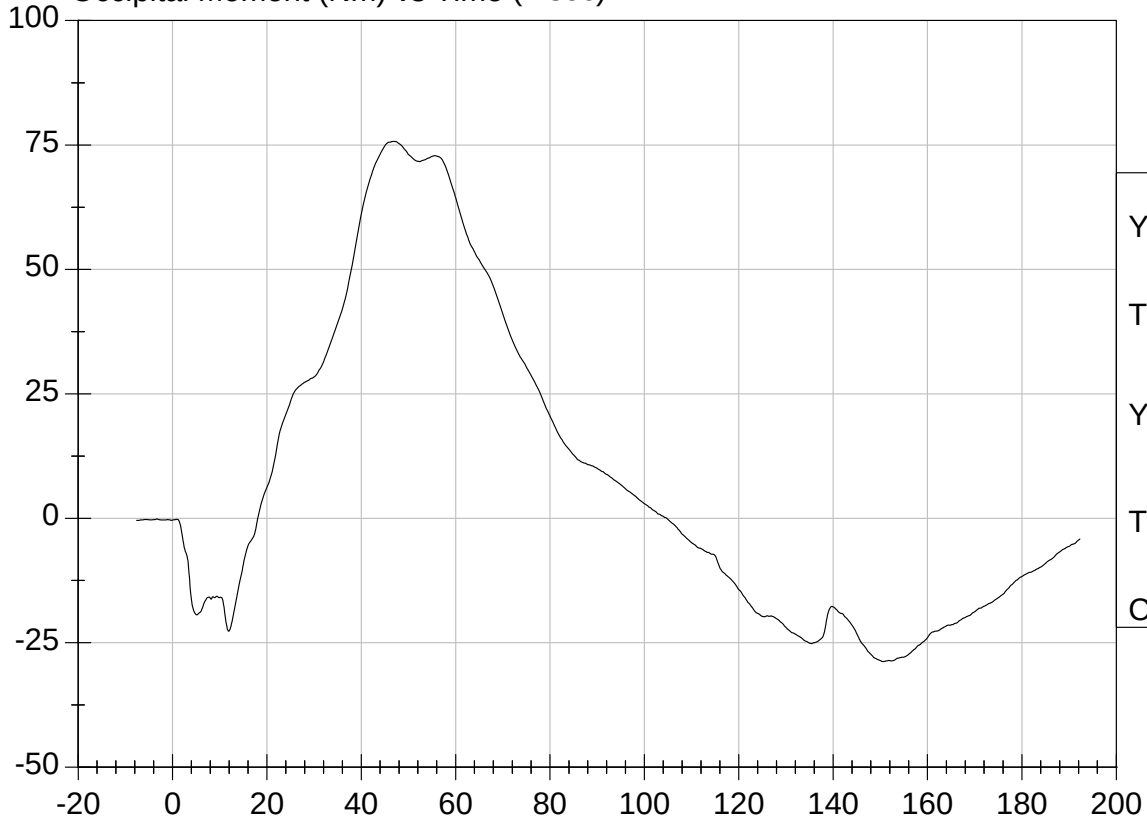
Test Desc: Neck Bending
Component ID: D083029

Test Date: 11/17/08
Speed: 23.15 ft/sec, 7.06 m/sec

Neck Rotation (DEG) vs Time (msec)



Occipital Moment (Nm) vs Time (msec)



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

Jessica Hall
 Laboratory Technician
David Winkelbauer
 Approved By

9/24/08

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	


 Laboratory Technician


 Approved By

8/29/08

Test Date

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

ATD Serial No: 271

Test I.D: D082711

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	40	Pass
Peak Resultant Acceleration	G's	120 to 150	137	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


Laboratory Technician


Approved By

9/24/08
Test Date



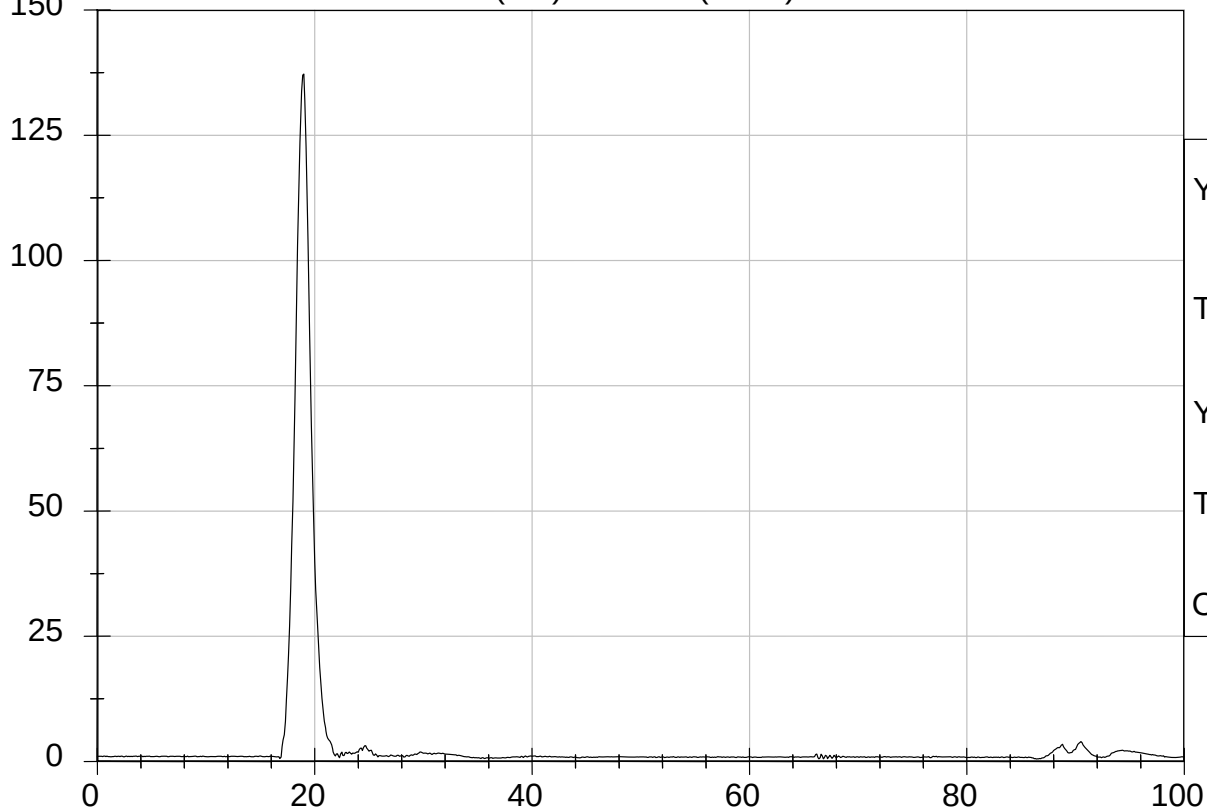
Test Description: Head Drop

Test Date: 9/24/08

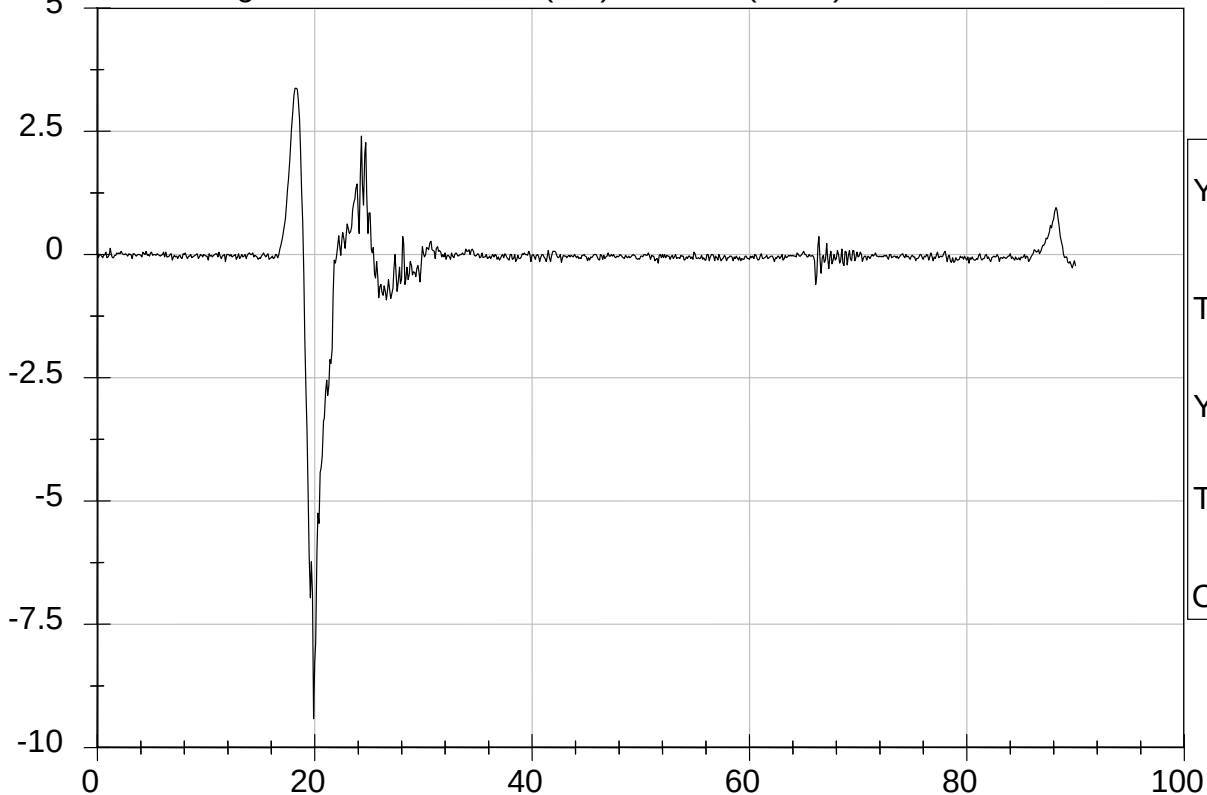
Component: D082711

Speed: 0 ft/s, 0 m/s

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



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

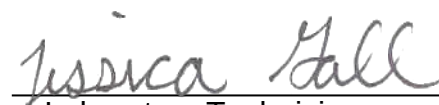


SID/HIII Calibration Data Sheet
Side Impact Dummy
Thorax Impact Test

ATD Serial No: 271

Test I.D: D082712

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Probe Velocity	m/s	4.22 - 4.31	4.30	Pass
Upper Rib	G's	37 - 46	38	Pass
Lower Rib	G's	37 - 46	38	Pass
Lower Spine	G's	15 - 22	17	Pass
Overall Test Results				Pass


 Laboratory Technician

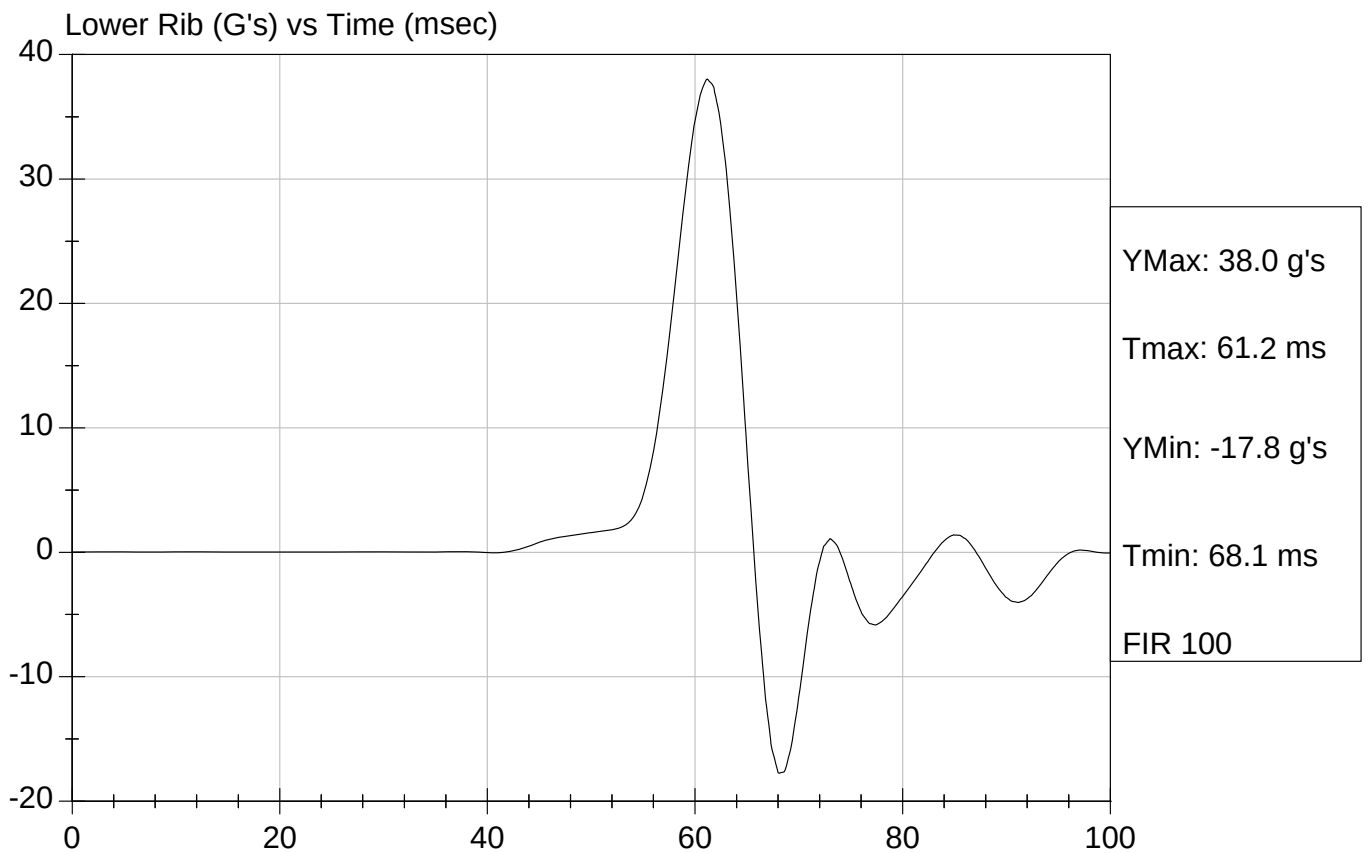
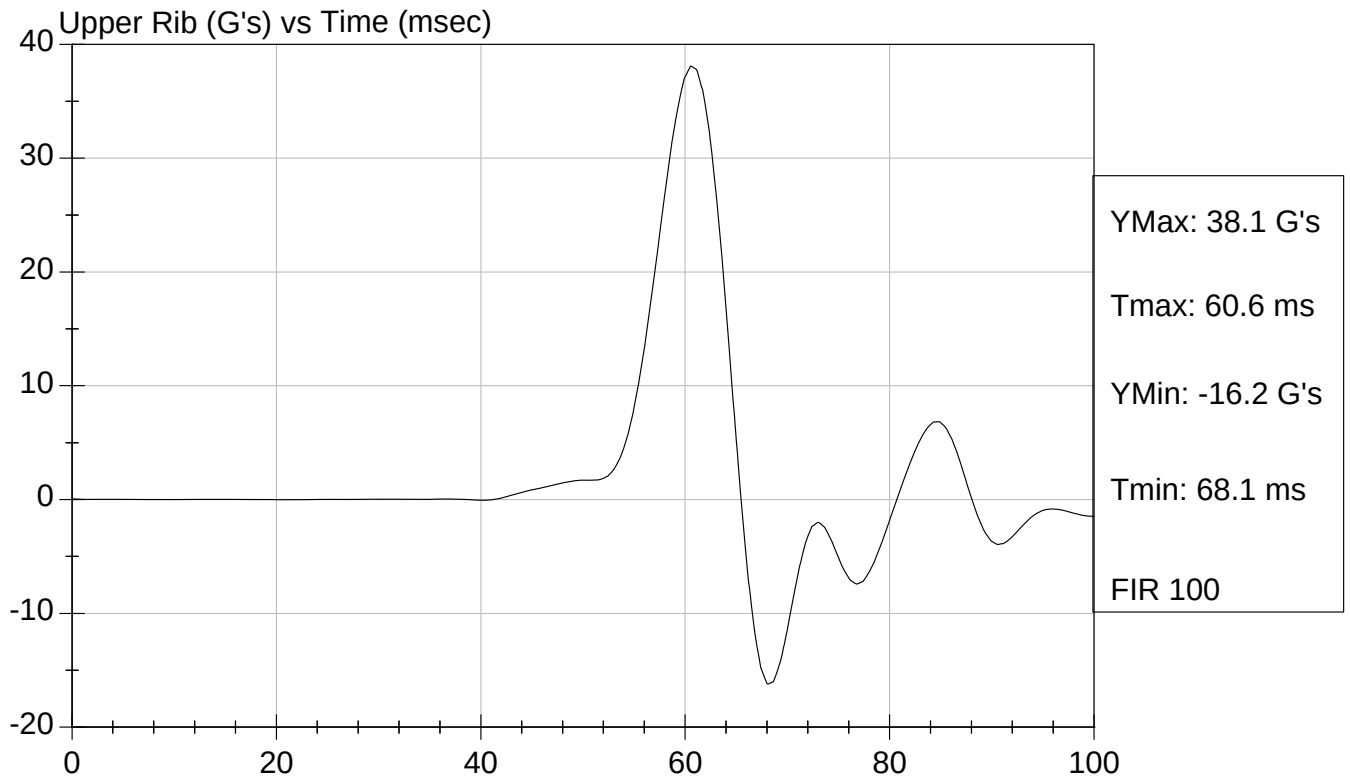
9/24/08
 Test Date


 Approved By



Test Desc: Thorax Impact
Component ID: D082712

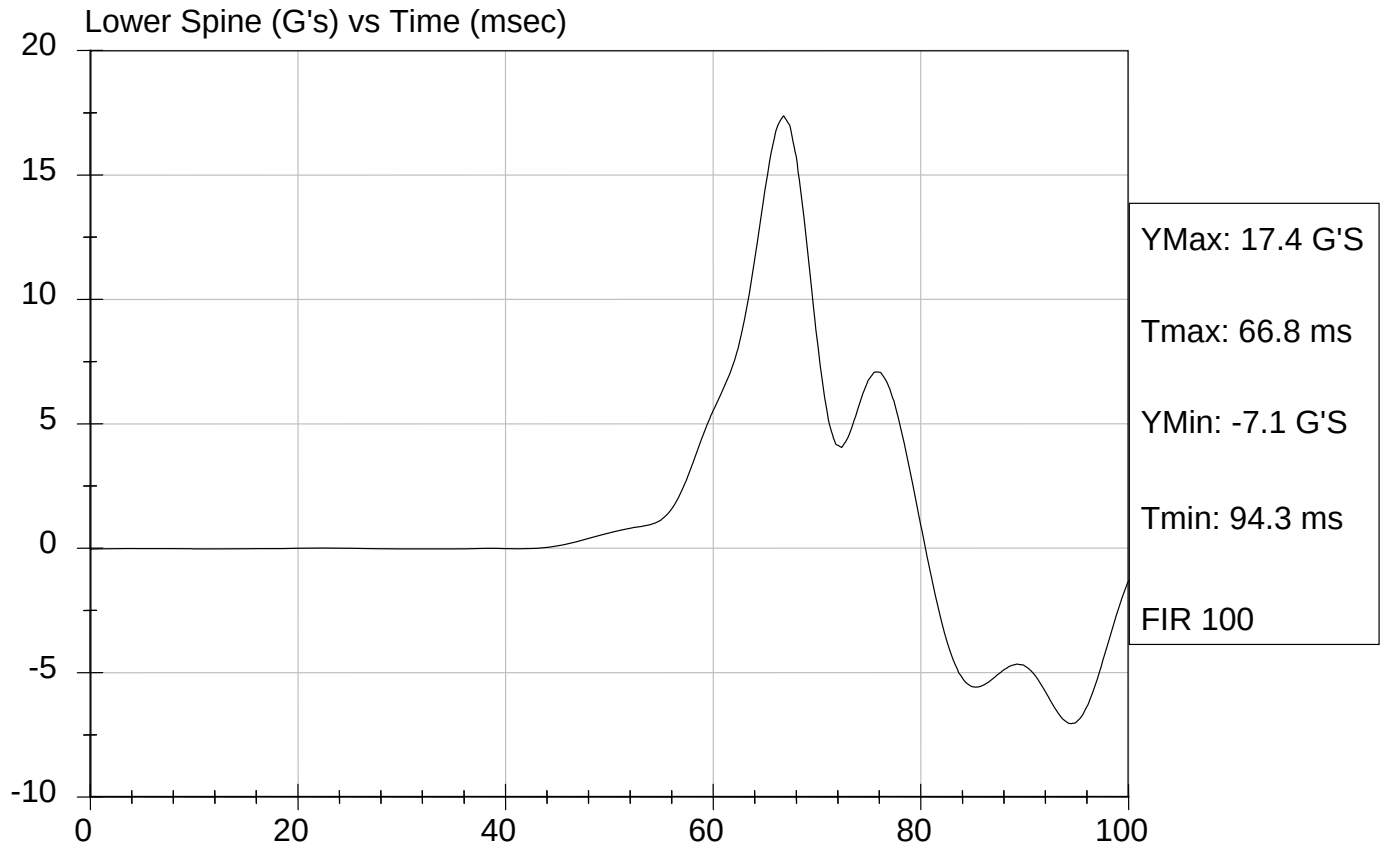
Test Date: 9/24/08
Speed: 14.12 ft/sec, 4.30 m/sec





Test Desc: Thorax Impact
Component ID: D082712

Test Date: 9/24/08
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: D082713

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	44	Pass
Probe Velocity	m/s	4.27 - 4.33	4.29	Pass
Pelvis Acceleration	G's	40 - 60	46	Pass
Overall Test Results				Pass


Laboratory Technician

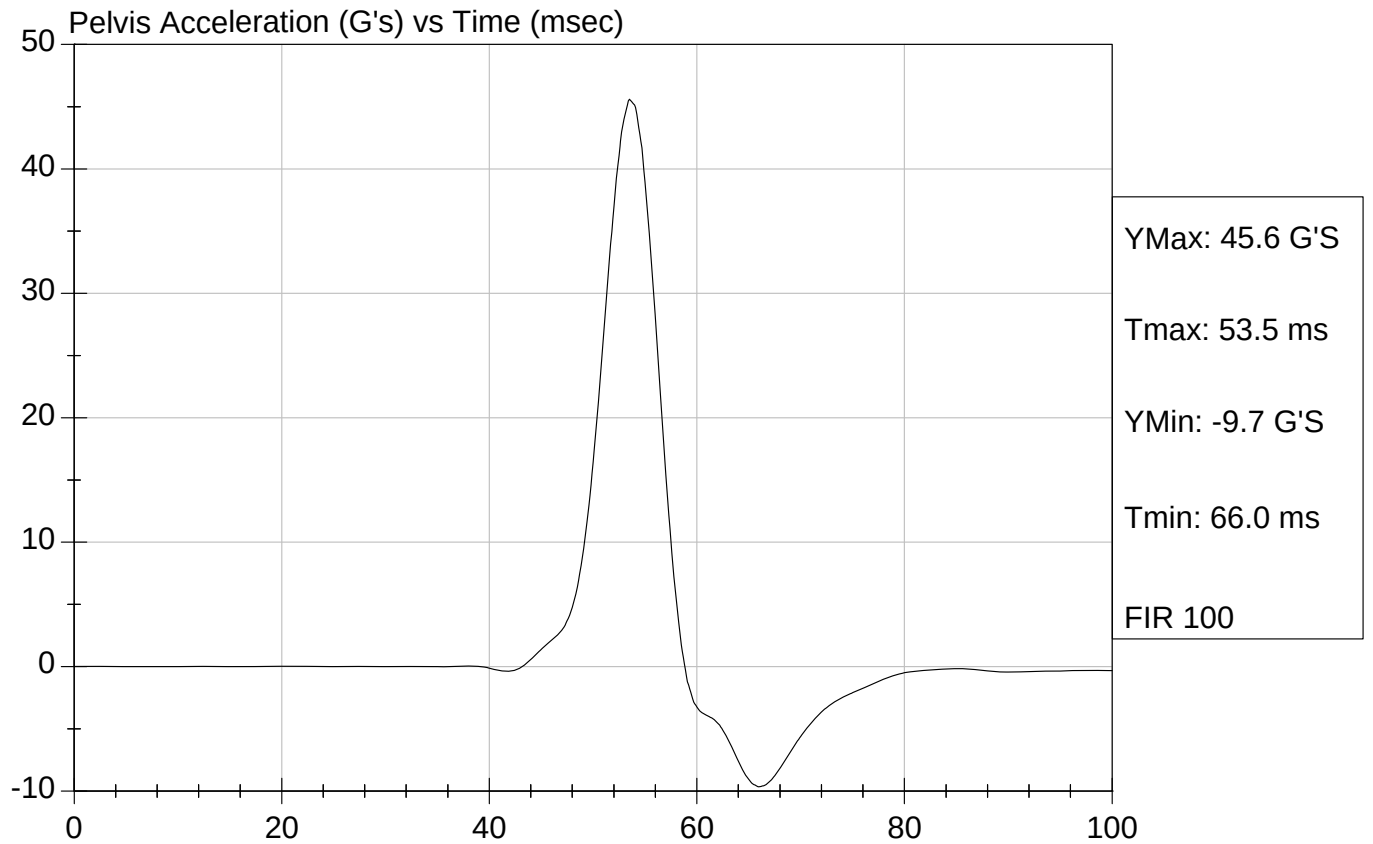

Approved By

9/24/08
Test Date



Test Desc: Pelvis Impact
Component ID: D082713

Test Date: 9/24/08
Speed: 14.06 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: D082714

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Force At 12.7 mm	N	104 -162	134	Pass
Force At 19 mm	N	163 - 222	193	Pass
Force At 25.4 mm	N	222 - 280	269	Pass
Force At 33 mm	N	325 - 391	376	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

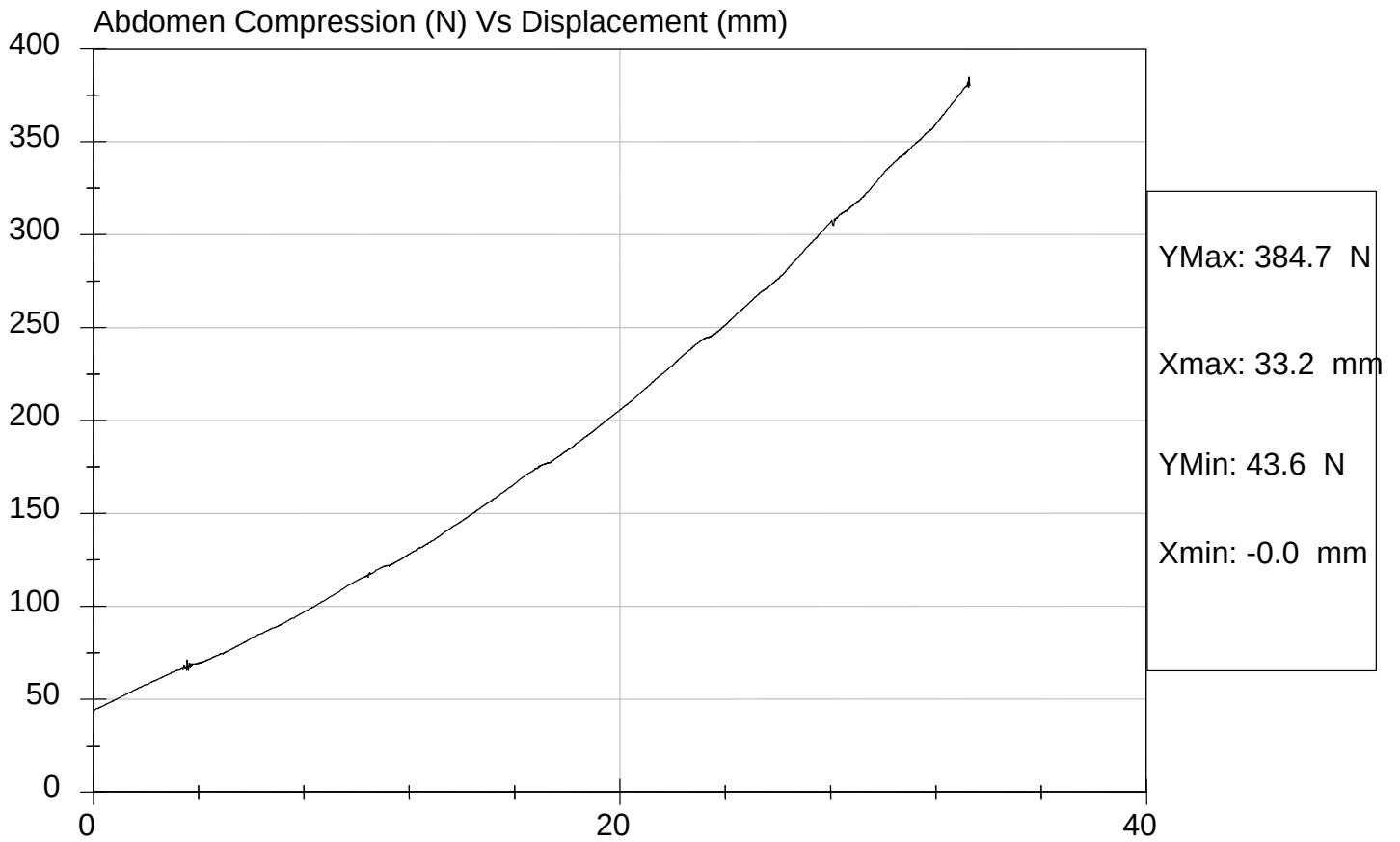
9/24/08
Test Date



Test Description: Abdomen Compression Test Date: 9/24/08

Component: D082714

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: D082715

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	120.0	Pass
Force At 30 deg	N	151.2 - 204.6	177.4	Pass
Force At 40 deg	N	204.6 - 258.0	239.8	Pass
Return Angle	Deg	12 Maximum	10	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

9/23/08
Test Date

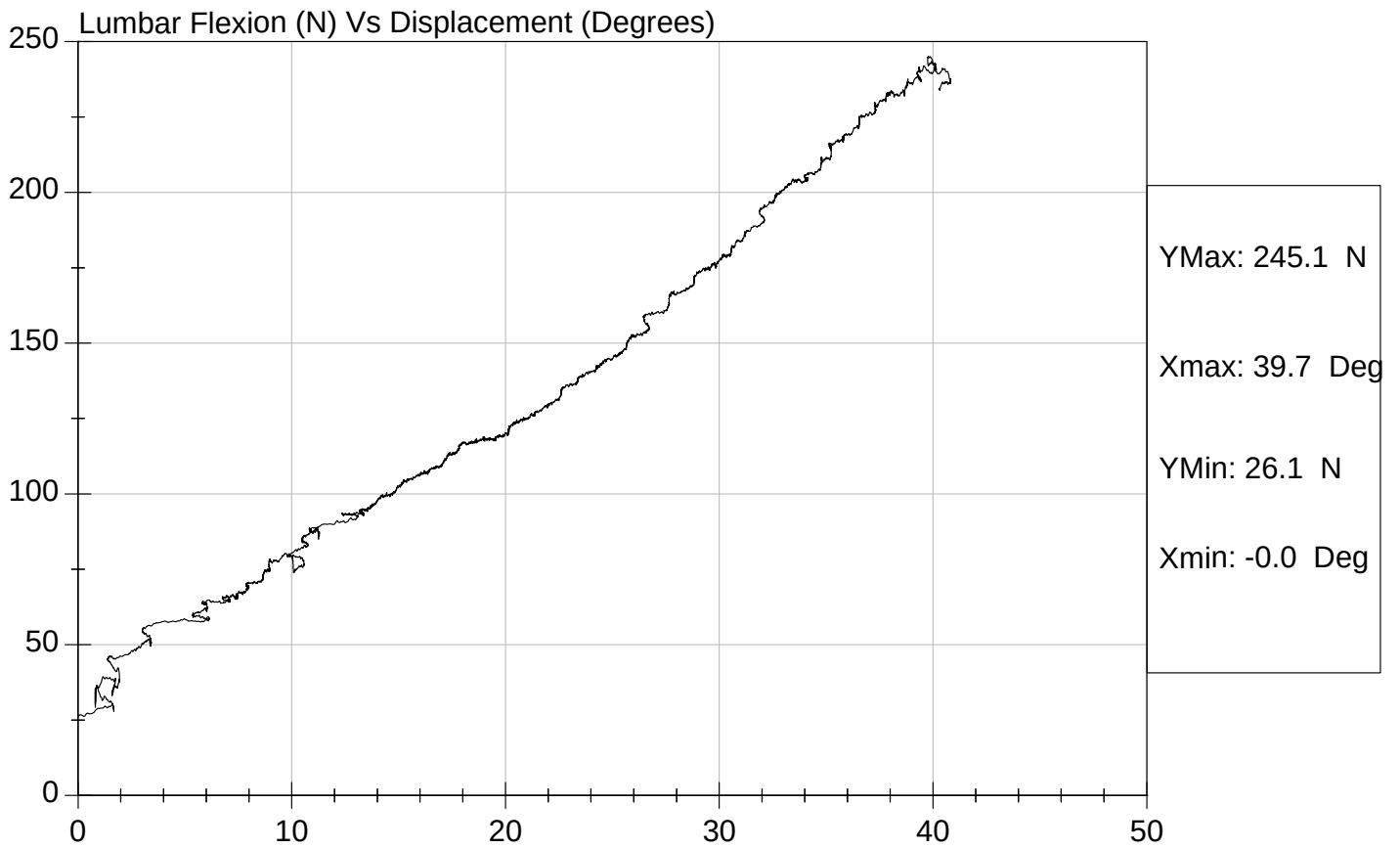


Test Description: Lumbar Flexion

Test Date: 9/23/08

Component: D082715

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: D082719

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity		%	10 to 70	42	Pass
Impact Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.33	Pass
	20 msec	m/s	4.12 to 5.10	4.62	Pass
	30 msec	m/s	5.73 to 7.01	6.38	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.59	Pass
Midsaggital Plane Max Rotation		deg	66 to 82	72	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	61	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	77	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	50	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	4	Pass


Laboratory Technician


Approved By

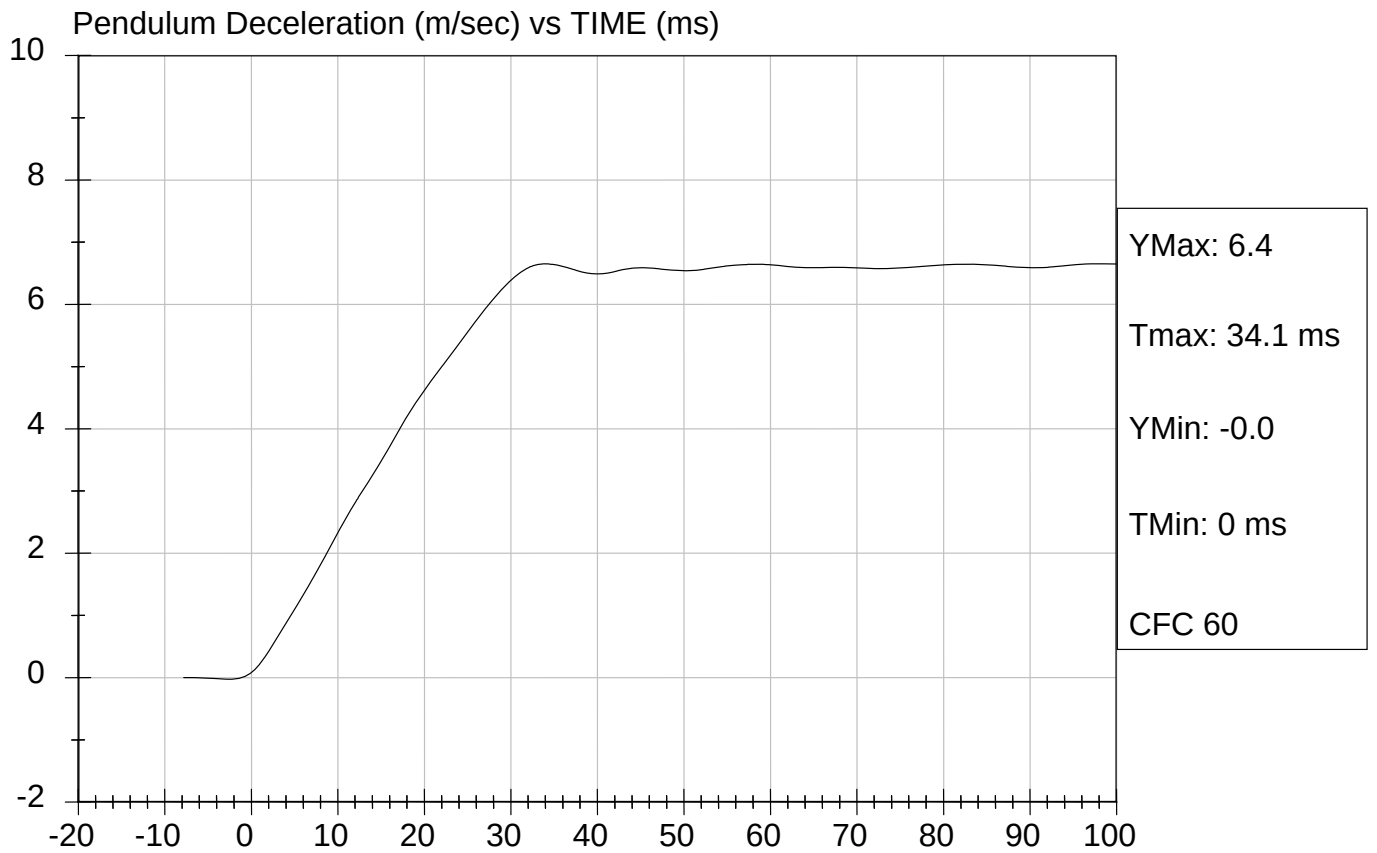
9/24/08

Test Date



Test Desc: Neck Bending
Component ID: D082719

Test Date: 9/24/08
Speed: 23.15 ft/sec, 7.06 m/sec

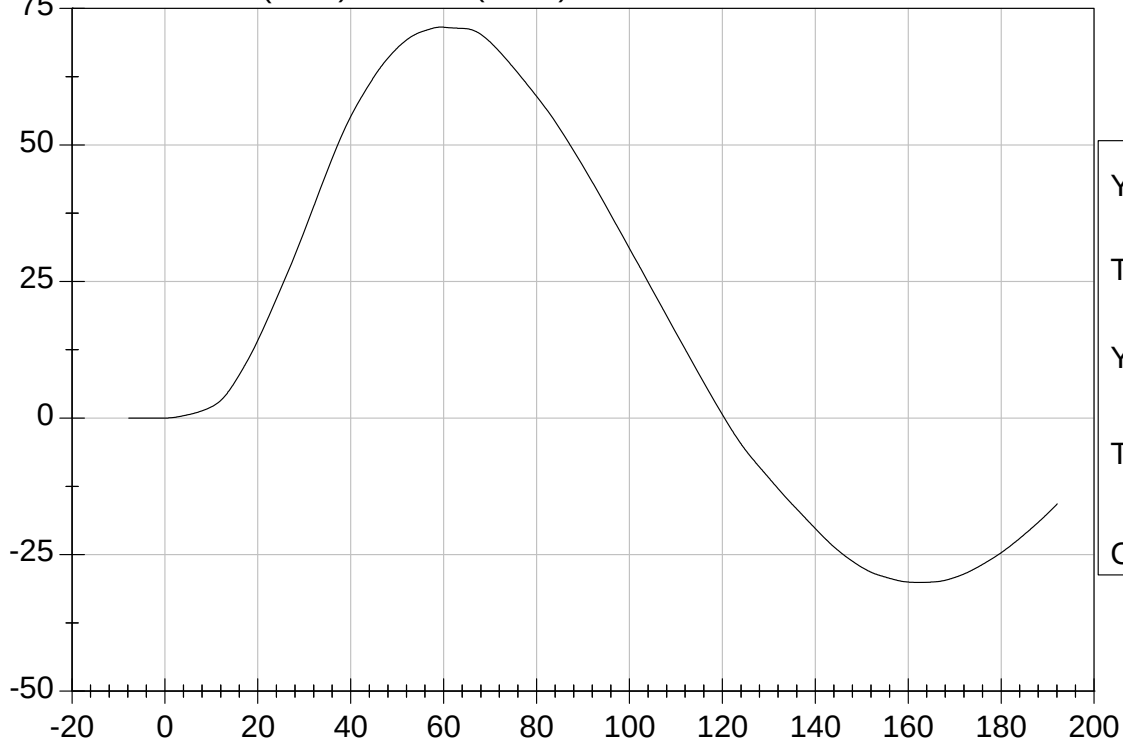




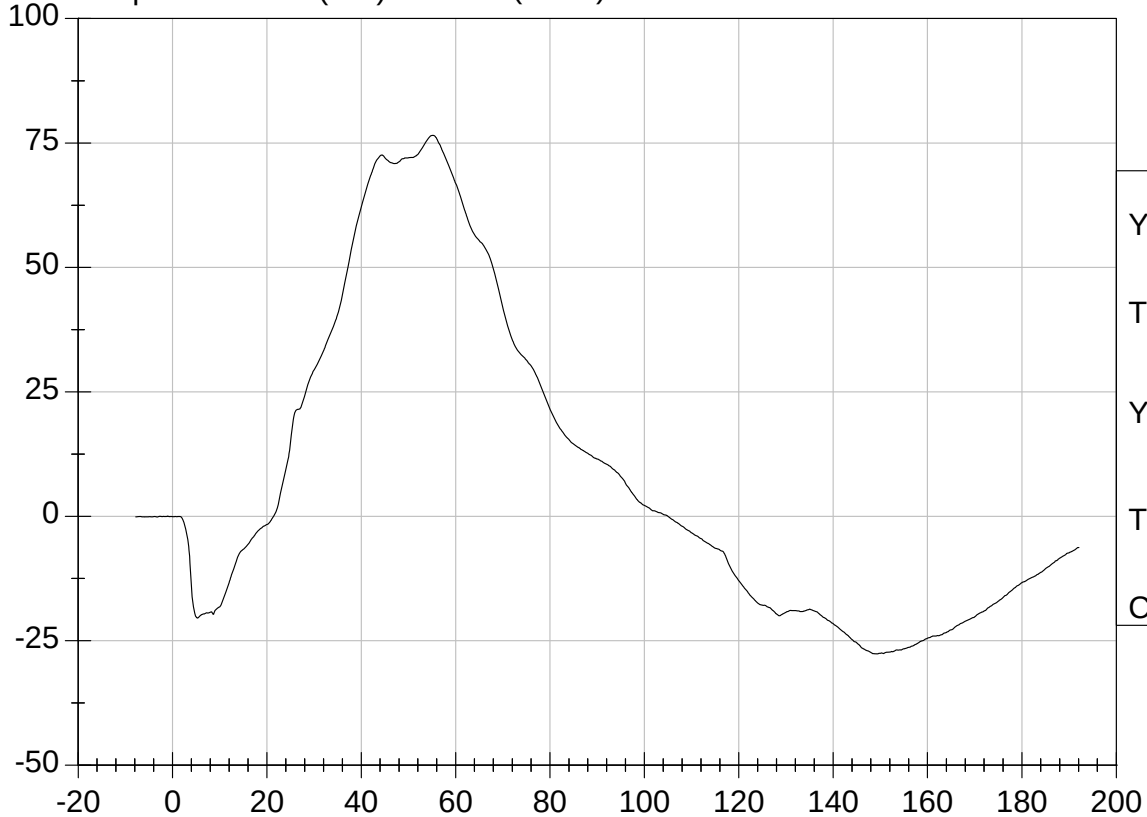
Test Desc: Neck Bending
Component ID: D082719

Test Date: 9/24/08
Speed: 23.15 ft/sec, 7.06 m/sec

Neck Rotation (DEG) vs Time (msec)



Occipital Moment (Nm) vs Time (msec)



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: D083011

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	20	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	-8.1	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

11/17/08
Test Date

David Winkelbauer
Approved By



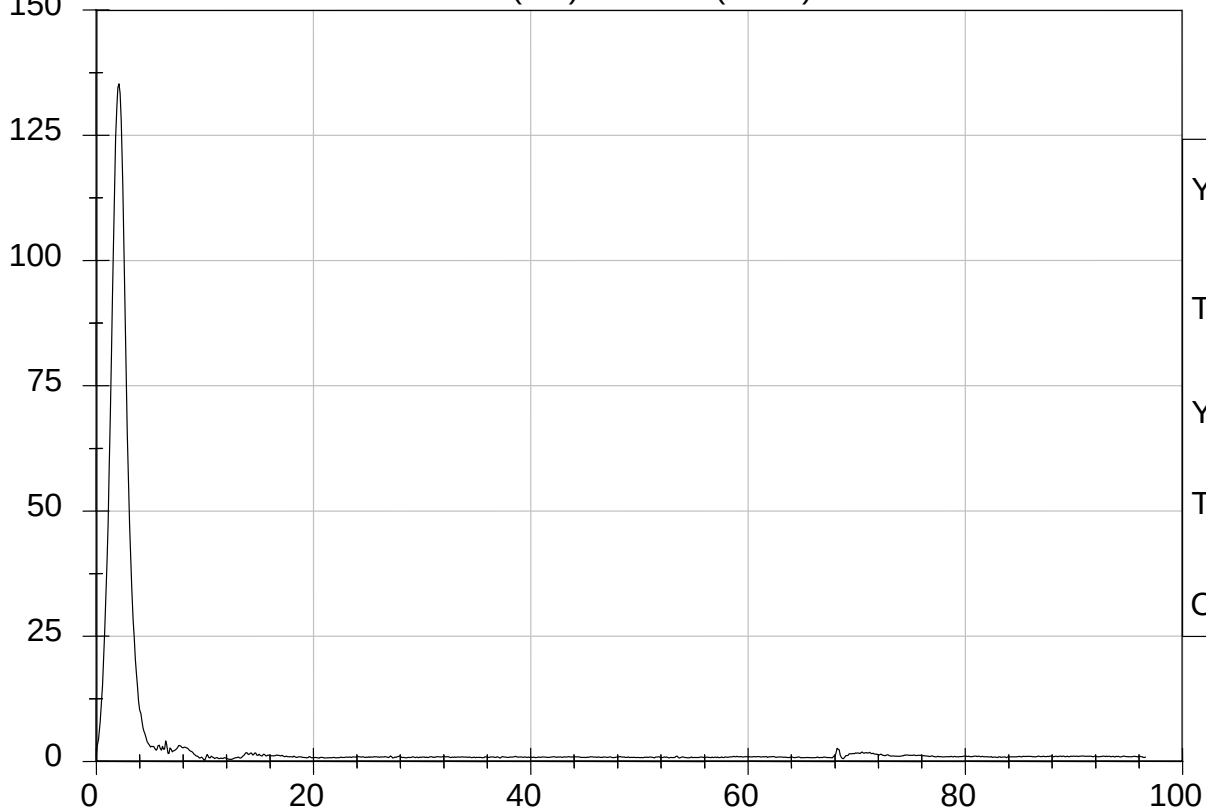
Test Description: Head Drop

Test Date: 11/17/08

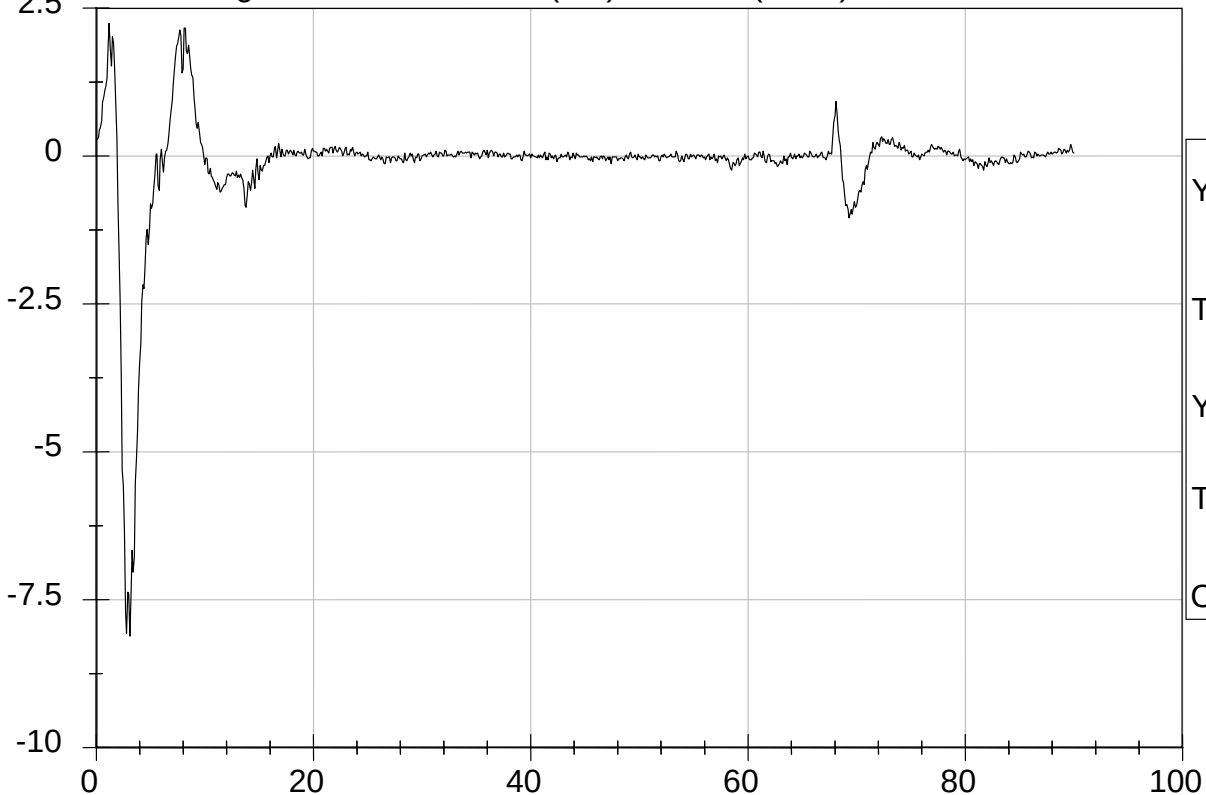
Component: D083011

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: D083012

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Probe Velocity	m/s	4.22 - 4.31	4.27	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

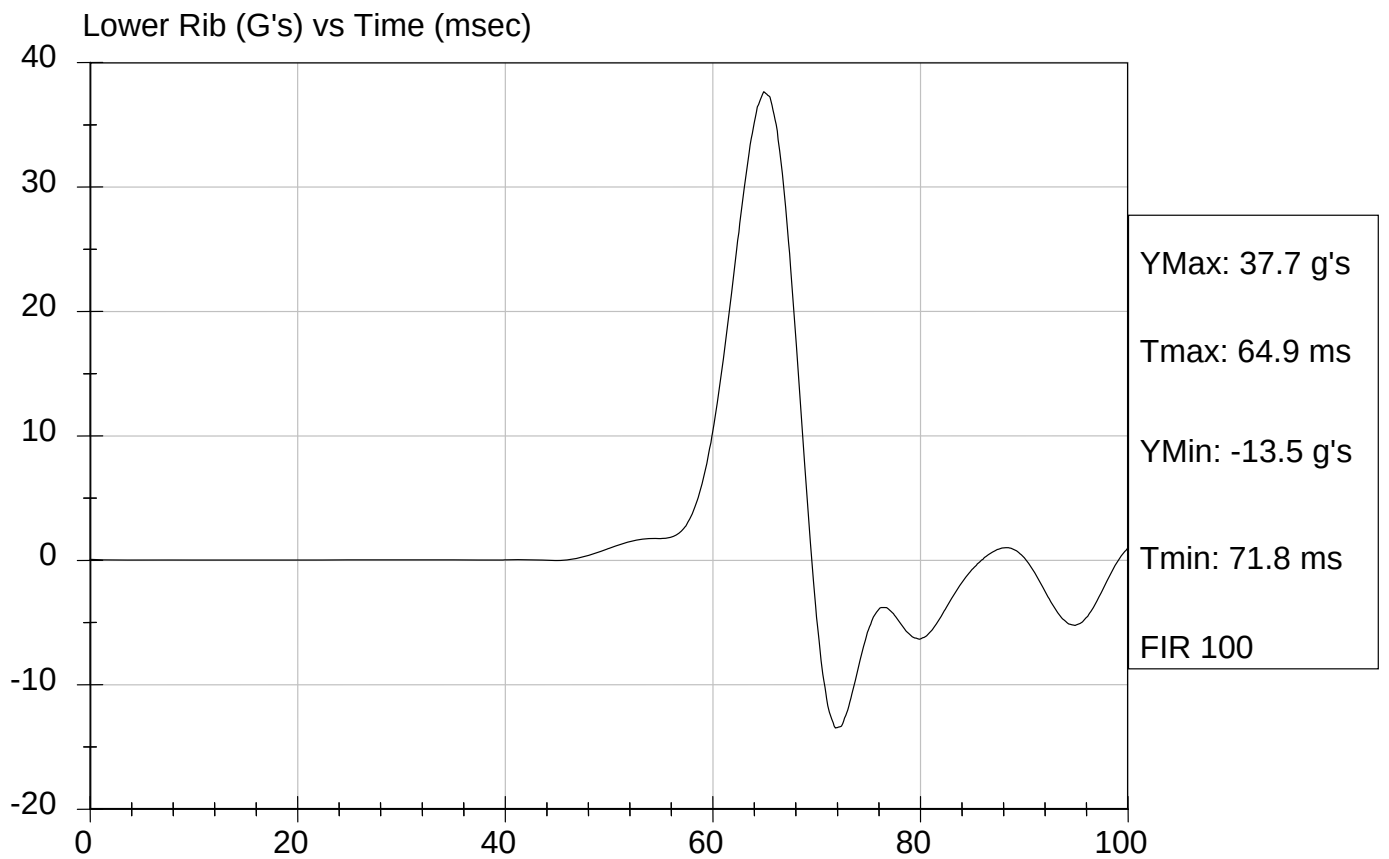
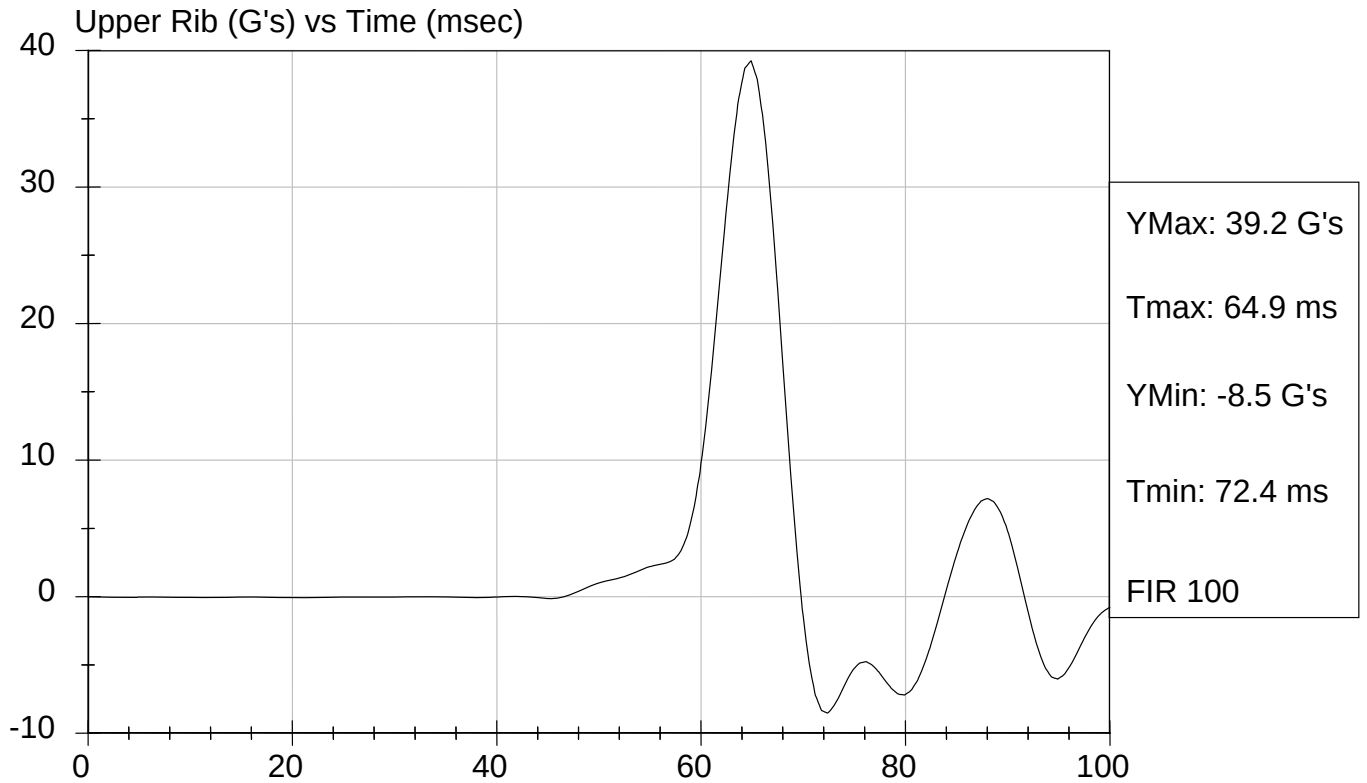
11/17/08
Test Date

David Winkelbauer
Approved By



Test Desc: Thorax Impact
Component ID: D083012

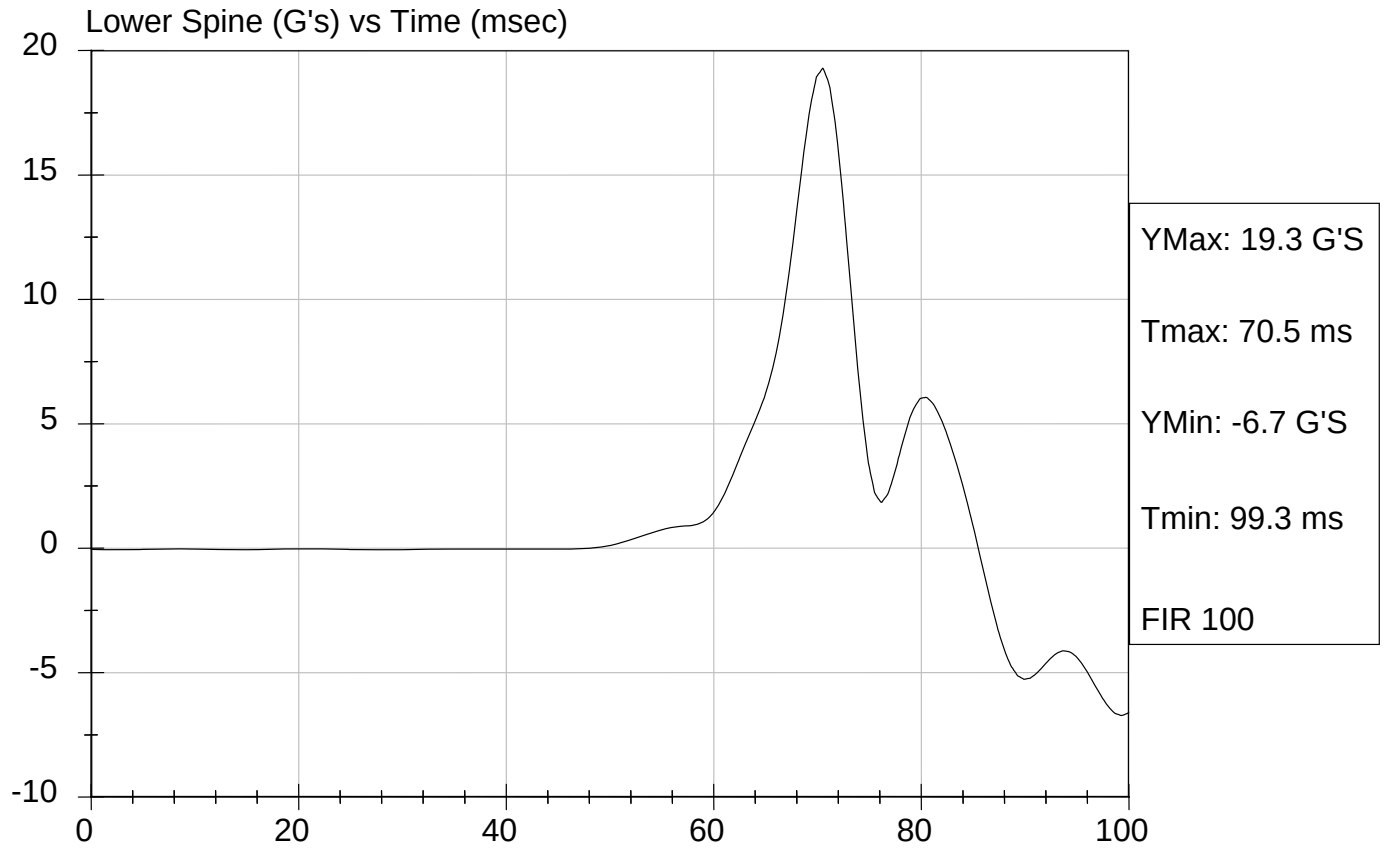
Test Date: 11/17/08
Speed: 14.01 ft/sec, 4.27 m/sec





Test Desc: Thorax Impact
Component ID: D083012

Test Date: 11/17/08
Speed: 14.01 ft/sec, 4.27 m/sec



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

ATD Serial No: 271

Test I.D: D083013

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	43	Pass
Overall Test Results				Pass


Laboratory Technician

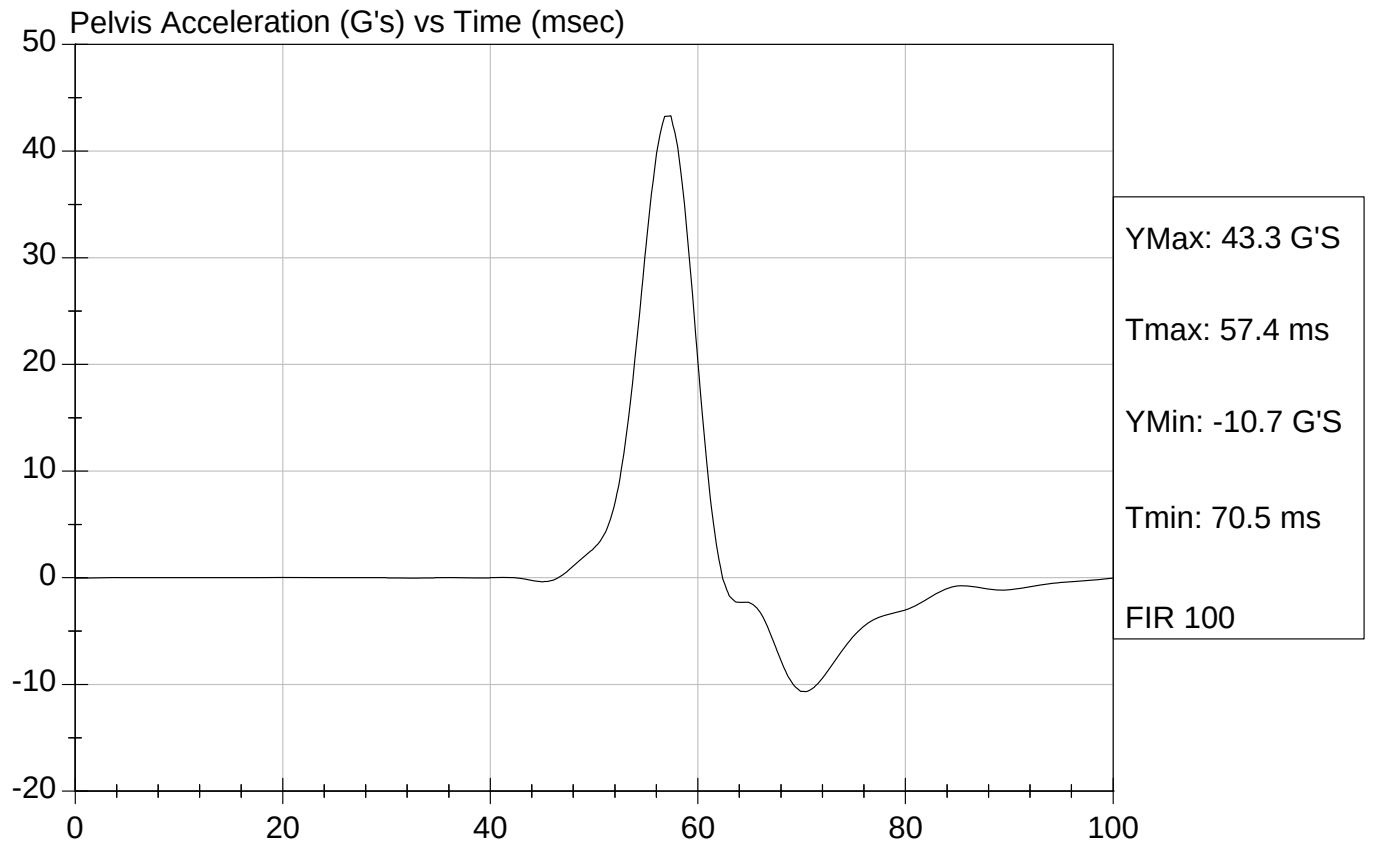
11/17/08
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D083013

Test Date: 11/17/08
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: 271

Test I.D: D083014

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Force At 12.7 mm	N	104 -162	143	Pass
Force At 19 mm	N	163 - 222	201	Pass
Force At 25.4 mm	N	222 - 280	268	Pass
Force At 33 mm	N	325 - 391	368	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

11/17/08
Test Date

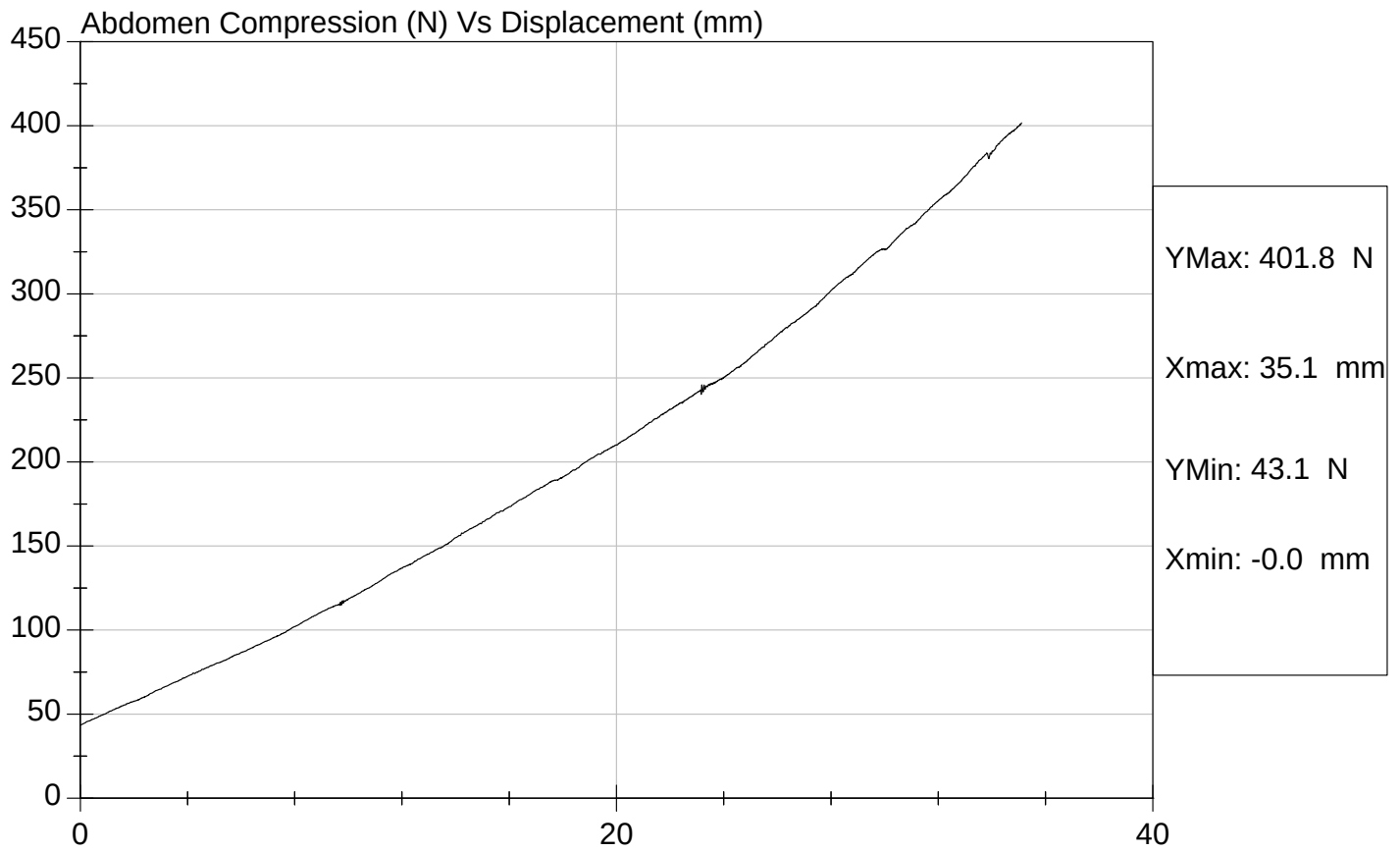
David Winkelbauer
Approved By



Test Description: Abdomen Compression Test Date: 11/17/08

Component: D083014

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: D083015

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	16.96	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	115.0	Pass
Force At 30 deg	N	151.2 - 204.6	154.8	Pass
Force At 40 deg	N	204.6 - 258.0	232.4	Pass
Return Angle	Deg	12 Maximum	6	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

11/17/08
Test Date

David Winkelbauer
Approved By

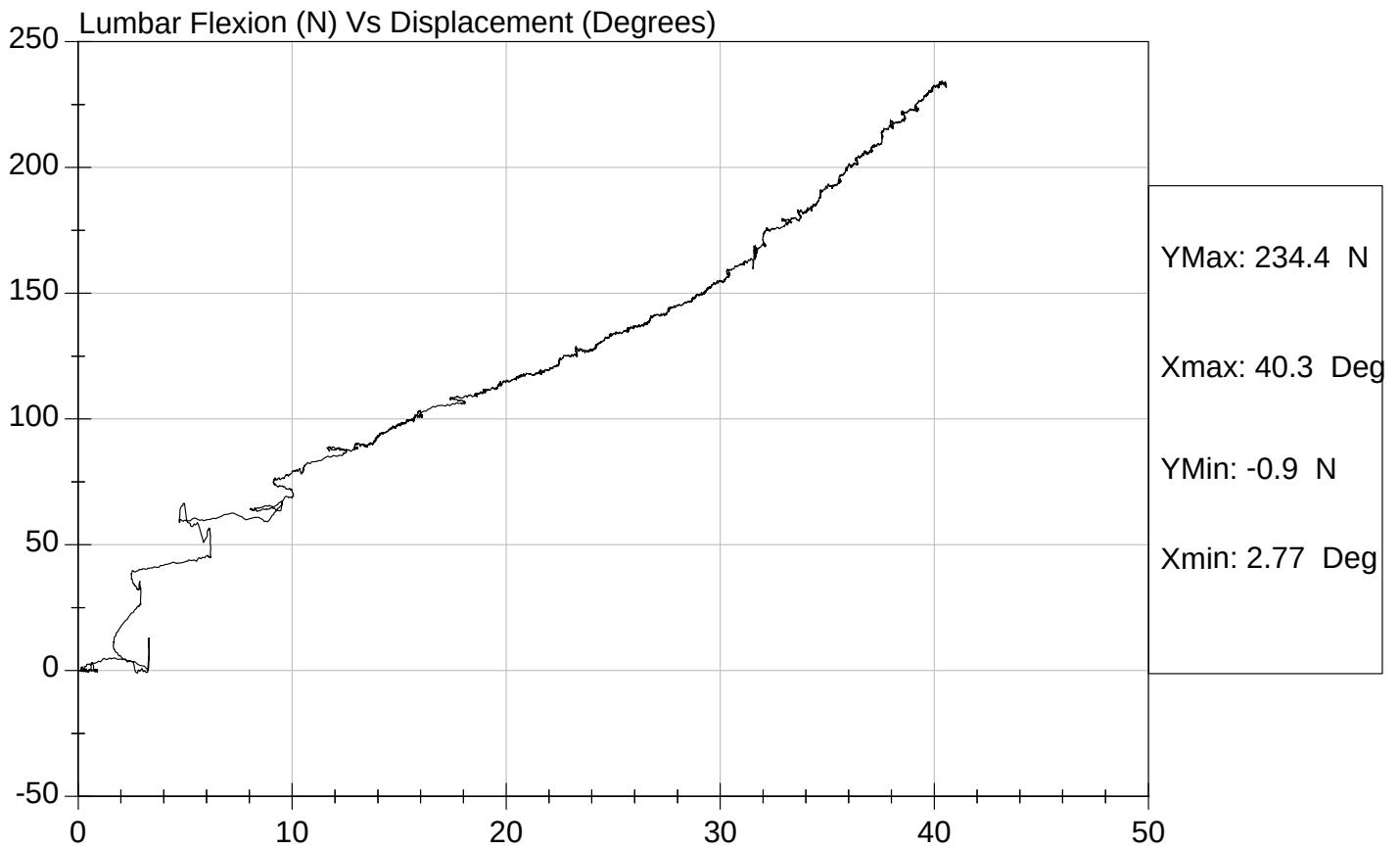


Test Description: Lumbar Flexion

Test Date: 11/17/08

Component: D083015

Speed: 0 ft/sec, 0 m/sec

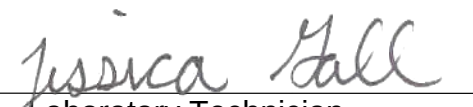


SID/HIII Calibration Data Sheet
Side Impact Dummy
Neck Pendulum Test

ATD Serial No: 271

Test I.D: D083019

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity		%	10 to 70	22	Pass
Impact Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.45	Pass
	20 msec	m/s	4.12 to 5.10	4.85	Pass
	30 msec	m/s	5.73 to 7.01	6.61	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.81	Pass
Midsaggital Plane Max Rotation		deg	66 to 82	74	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	59	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	78	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	50	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	5	Pass


Laboratory Technician

11/17/08

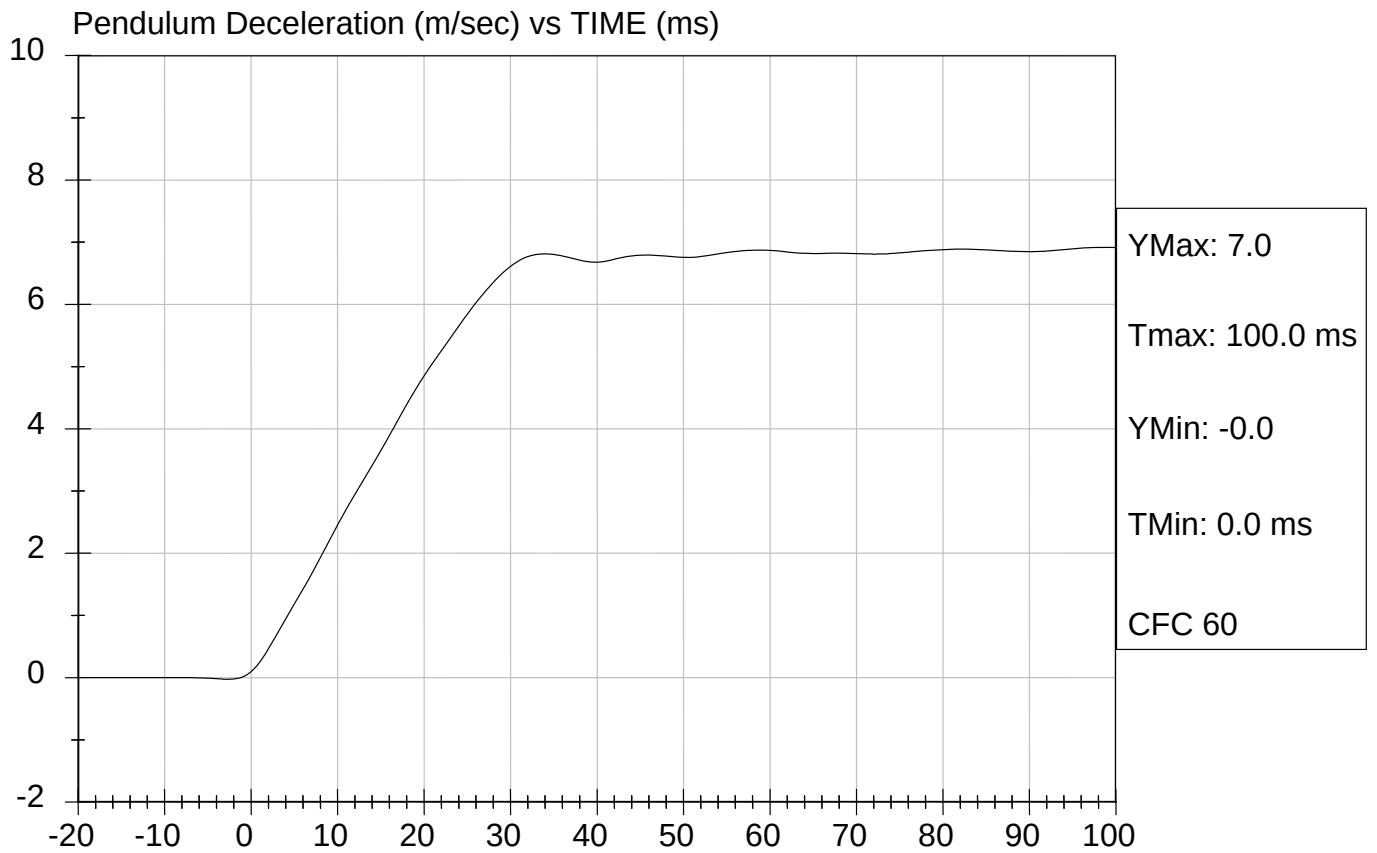
Test Date


Approved By



Test Desc: Neck Bending
Component ID: D083019

Test Date: 11/17/08
Speed: 23.15 ft/sec, 7.06 m/sec

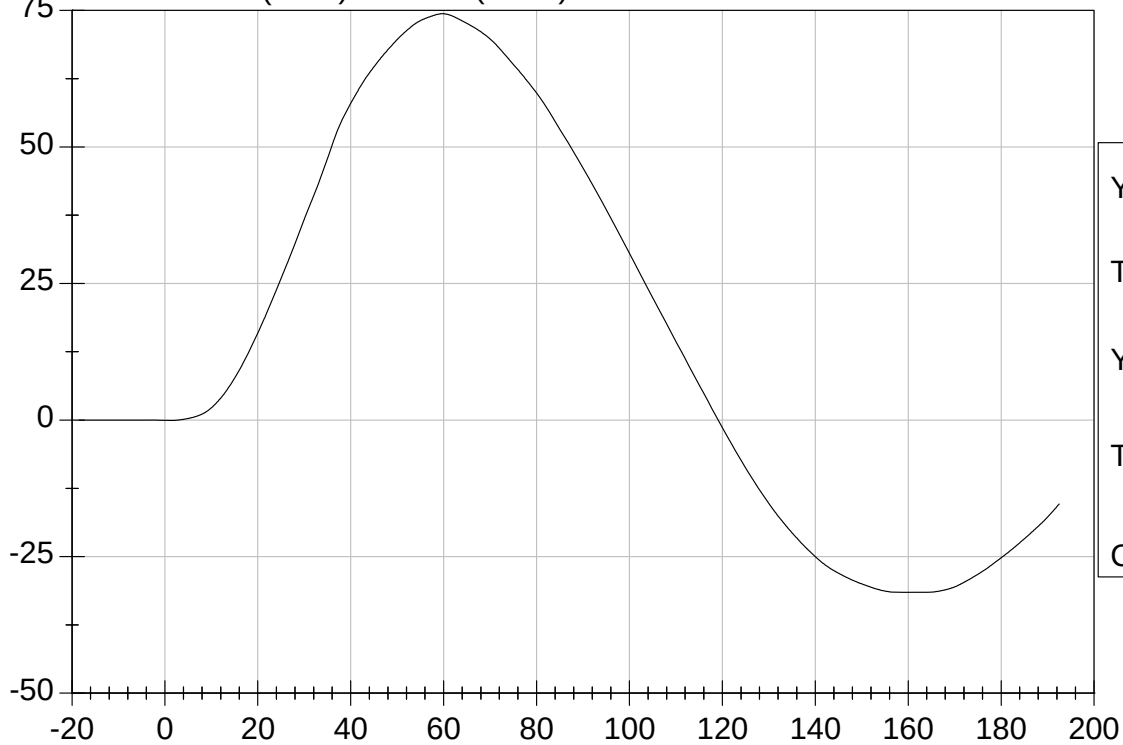




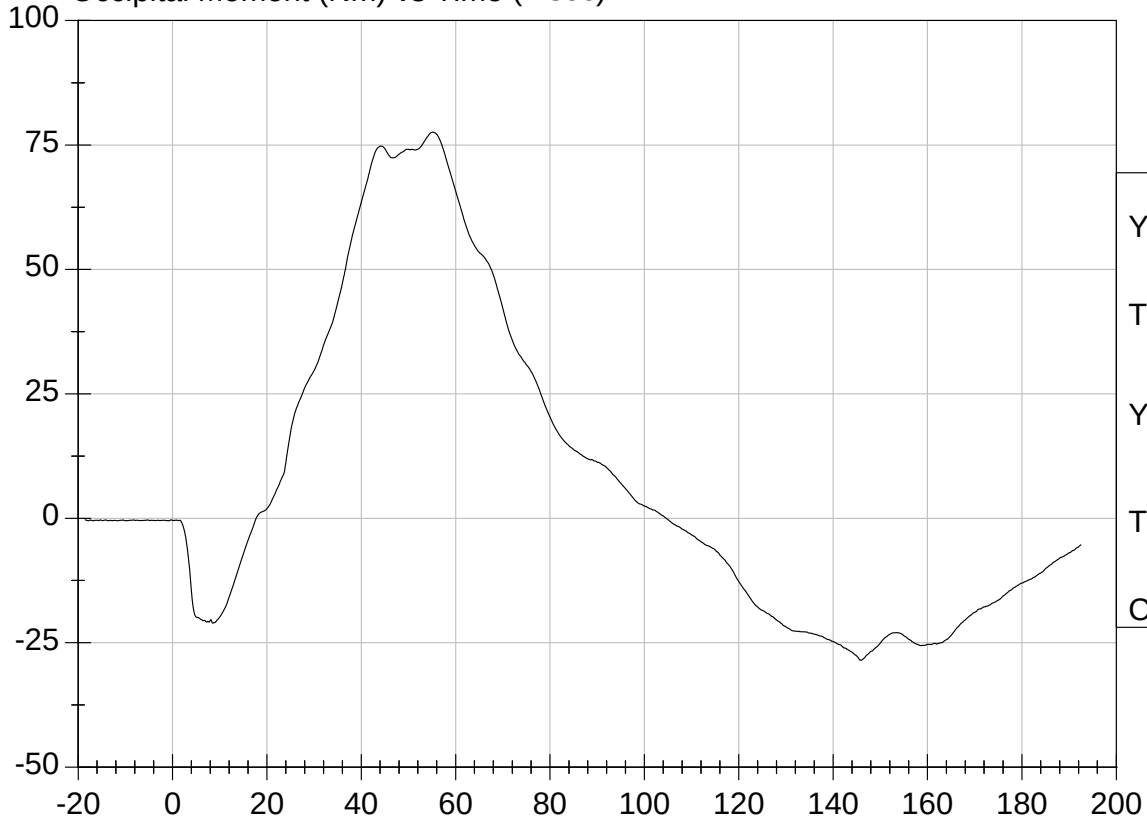
Test Desc: Neck Bending
Component ID: D083019

Test Date: 11/17/08
Speed: 23.15 ft/sec, 7.06 m/sec

Neck Rotation (DEG) vs Time (msec)



Occipital Moment (Nm) vs Time (msec)



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

9/24/08

Test Date