

REPORT NUMBER: NCAPSIDE-MGA-2008-008

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

**TOYOTA MOTOR CORPORATION
2008 TOYOTA YARIS 3-DOOR LIFTBACK
NHTSA NUMBER: M85117**

**PREPARED BY:
MGA RESEARCH CORPORATION
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BURLINGTON, WI 53105**



Test Date: October 11, 2007

Report Date: December 3, 2007

FINAL REPORT

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

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Date: 12/03/07

Technical Report Documentation Page

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16. Abstract A 55/28 km/h 90° Moving Deformable Barrier NCAP side impact was conducted on the subject 2008 Toyota Yaris 3-Door Liftback to obtain new car assessment and research data indicant of FMVSS No. 214D performance. The test was conducted at MGA Research Corporation, in Burlington, Wisconsin, on October 11, 2007. The impact velocity of the Moving Deformable Barrier (MDB) was 62.3 km/h, and the ambient temperature at the struck side (drivers) of the vehicle was 21°C. The target vehicle's maximum post test static crush was 248 mm at level 2. The test vehicle's occupant performance is as follows: <table style="margin: auto; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"></th> <th style="text-align: center;"><u>DRIVER</u></th> <th style="text-align: center;"><u>PASS.</u></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) Accel., g</td> <td style="text-align: center;">66.1</td> <td style="text-align: center;">55.6</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td style="text-align: center;">68.5</td> <td style="text-align: center;">77.0</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td style="text-align: center;">80.5</td> <td style="text-align: center;">74.8</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td style="text-align: center;">74</td> <td style="text-align: center;">76</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td style="text-align: center;">63.8</td> <td style="text-align: center;">79.8</td> </tr> <tr> <td>HIC</td> <td style="text-align: center;">305</td> <td style="text-align: center;">389</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	66.1	55.6	Left Lower Rib (LLR) Accel., g	68.5	77.0	Lower Spine (T ₁₂) Accel., g	80.5	74.8	Thoracic Trauma Index (TTI)	74	76	Pelvis (PEV) Accel., g	63.8	79.8	HIC	305	389
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17. Key Words New Car Assessment Program (NCAP) Side Impact Side Impact Hybrid III Dummy (SID/HIII) Occupant Side Impact Protection		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Adm. Technical Ref. Division, 1200 New Jersey Ave, SE Washington, D.C. 20590																						
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SECTION 1

PURPOSE AND TEST PROCEDURE

PURPOSE

This side impact test was conducted as part of the FY' 2008 test program sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-03-D-12005. The purpose of this test was to evaluate side impact protection in a 2008 Toyota Yaris 3-Door Liftback 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 2008 Toyota Yaris 3-Door Liftback was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.3 km/h. The specified impact velocity range is from 61.1 to 62.7 km/h. The test (target) vehicle was stationary and positioned 63° to the line of forward motion. The weight of the vehicle as tested was 1265.5 kg and the test weight of the MDB was 1360.8 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on October 11, 2007.

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

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

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

2.2 GENERAL COMMENTS

The test vehicle sustained a maximum static crush of 248 mm at level 2, 1200 mm rearward of the vertical impact point. The driver and passenger SID/HIIIs, Serial Nos. 904 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. Appendix D contains the child dummy data.

The occupant data is summarized below:

ATD position	HIC	T ¹	T ²	TTI (G's)	Peak Pelvis (G's)
Driver	305	54.3	90.3	74	63.8
Passenger	389	36.7	59.9	76	79.8

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

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 Mid A-Post Y

Driver Seat Track Y

Vehicle CG X, Y, and Z after 12 msec.

DATA SHEET NO. 1**GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2008 Toyota Yaris 3-Door Liftback
 Test Program: NCAP Side Impact

NHTSA No. M85117
 Test Date: 10/11/2007

TEST VEHICLE INFORMATION

Make	Toyota
Model	Yaris
Body Style	3-Door Liftback
NHTSA No.	M85117
VIN	JTDJT923985139436
Color	Blazing Blue
Delivery Date	9/20/2007
Odometer Reading (mile)	66
Dealer	Wilde Toyota
Transmission	Automatic
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	No
Driver Side Torso Airbag	No
Rear Passenger Side Curtain Airbag	No
Rear Passenger Side Torso Airbag	No
Power Steering	Yes
Power Door Locks	No
Tilt Wheel	Yes
Anti-lock Brakes	No
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	08/07

GVWR (kg)	1465
GAWR Front (kg)	830
GAWR Rear (kg)	830

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bucket		
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: 2008 Toyota Yaris 3-Door LiftbackNHTSA No. M85117Test Program: NCAP Side ImpactTest Date: 10/11/2007**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	335.2	202.7		386.5	288.9	
Right	kg	322.1	208.7		325.7	264.4	
Ratio	%	61.5	38.5		56.3	43.7	
Totals	kg	657.3	411.4	1068.7	712.2	553.3	1265.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1068.7
Weight of 2 P572M ATDs	kg	161.5
Rated Cargo/Luggage Weight (RCLW)	kg	43
Calculated Vehicle Target Weight (TVTW)	kg	1273.2

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

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

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	667	667	672	674	947
As Tested	mm	647	655	635	642	1076
Fully Loaded	mm	643	654	626	640	

TEST VEHICLE VERTICAL IMPACT LINE DATA

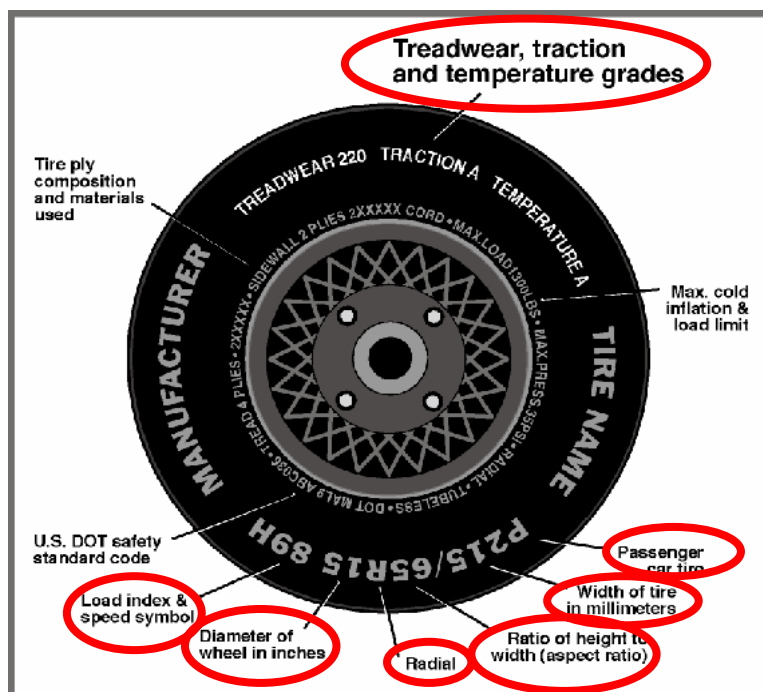
Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2461
Target Impact Point Aft of Front Axle	mm	291
Actual Impact Point Aft of Front Axle	mm	294

DATA SHEET NO. 2

TEST VEHICLE TIRE INFORMATION

Test Vehicle: 2008 Toyota Yaris 3-Door Liftback
 Test Program: NCAP Side Impact

NHTSA No. M85117
 Test Date: 10/11/2007



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	Eagle
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: 2008 Toyota Yaris 3-Door Liftback
 Test Program: NCAP Side Impact

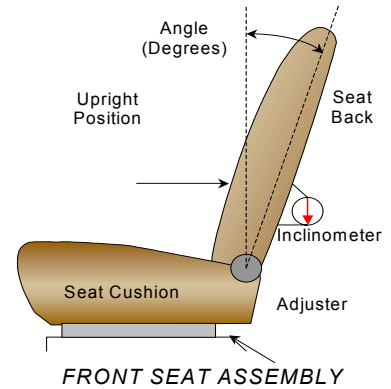
NHTSA No. M85117
 Test Date: 10/11/2007

NORMAL DESIGN RIDING POSITION

The driver and passenger seat back is positioned to the manufacturer's designated angle. The procedure is as follows:
 For the driver seat, set in the 6th detent with the forward-most detent defined as 0 (26 total detents).

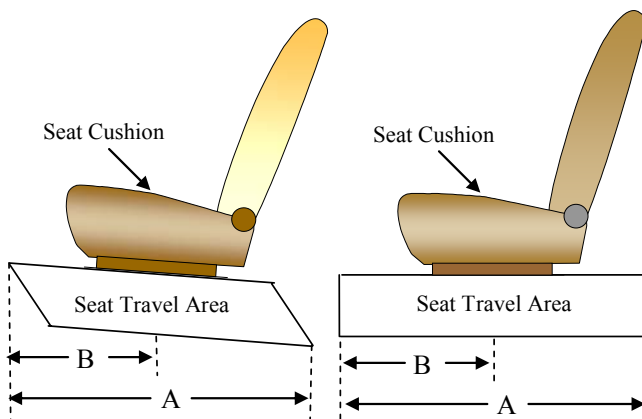
Driver seat back angle: 6th detent (1st as 0)

Passenger seat back angle: Fixed



SEAT FORE/AFT POSITIONS

	Total Fore/Aft Travel	Placed in position #
Driver Seat	17 detents	8 th detent (1 st as 0)
Rear Seat	Fixed	Fixed



DATA SHEET NO. 3 (CONTINUED)

TEST VEHICLE INFORMATION

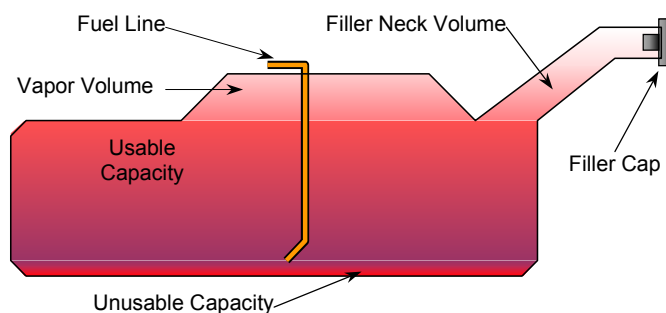
Test Vehicle: 2008 Toyota Yaris 3-Door Liftback
Test Program: NCAP Side Impact

NHTSA No. M85117
Test Date: 10/11/2007

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	42.0
Usable Capacity of "Optional" Tank	
92-94% of Usable Capacity	38.6 – 39.5
Actual Amount of Solvent used	39.4
1/3 of Usable Capacity	14.0

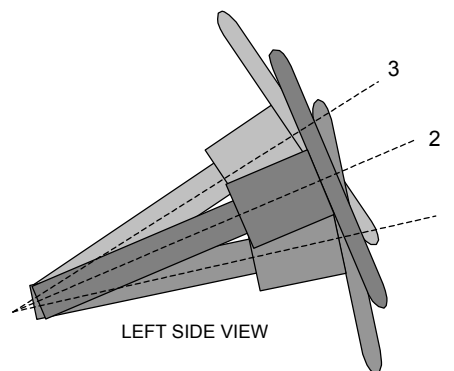
The test vehicle is equipped with an electric fuel pump. The fuel pump will pump fuel when the ignition is on.



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		60.5
Geometric center position No. 2		62.0
Uppermost position No. 3		63.5

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

Test Vehicle: 2008 Toyota Yaris 3-Door Liftback
 Test Program: NCAP Side Impact

NHTSA No. M85117
 Test Date: 10/11/2007

MDB SPECIFICATIONS

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

MDB WEIGHTS

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

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.3
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.5
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.0

POST TEST OBSERVATIONS
MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	3 rearward
Vertical Offset	mm	+/-20	0

DATA SHEET NO. 5**POST TEST OBSERVATIONS**Test Vehicle: 2008 Toyota Yaris 3-Door LiftbackNHTSA No. M85117Test Program: NCAP Side ImpactTest Date: 10/11/2007**TEST DUMMY INFORMATION AND CONTACT POINTS**

Description	Front Seat SID/HIII	Rear Seat SID/HIII
Dummy Type / Serial No.	SID HIII / 904	SID HIII / 271
Head Contact	Headrest, Door Panel	Headrest, Headliner, C-Pillar
Upper Torso Contact	Door Panel	Door Panel
Lower Torso Contact	Door Panel	Door Panel
Left Knee Contact	Door Panel	Door Panel
Right Knee Contact	Left Knee	Left Knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Locked/Unlocked Doors	Doors were unlocked	Doors were unlocked
Left Side Door Opening	Door remained closed and latched	Door remained closed and latched
Right Side Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
Seat Movement	0	0
Seat Back Failure	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No Separation
Sill Separation	None
Windshield Damage	None
Window Damage	Left Front and Left Rear Windows Broke
Other Notable Effects	None

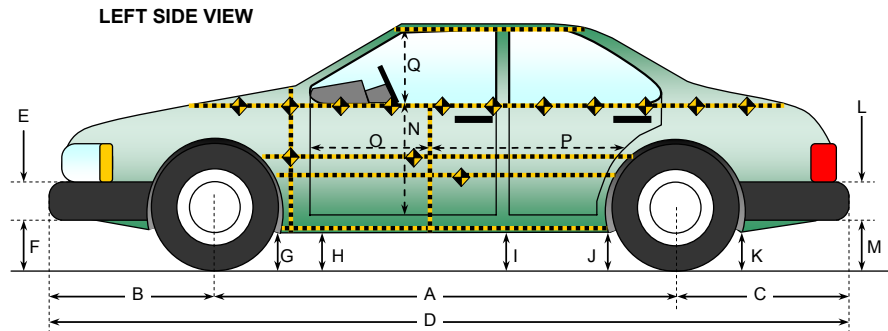
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

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

Test Vehicle: 2008 Toyota Yaris 3-Door Liftback
 Test Program: NCAP Side Impact

NHTSA No. M85117
 Test Date: 10/11/2007



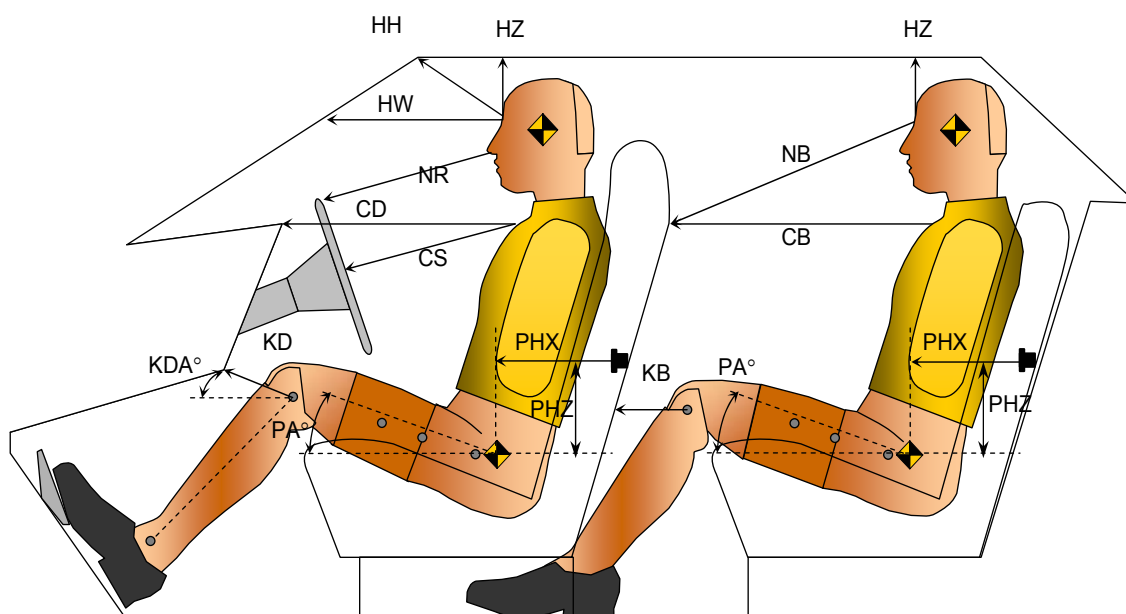
All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2461	2464	3
B	Front Axle to FSOV	652	656	4
C	Rear Axle to RSOV	528	532	4
D	Total Length at Centerline	3641	3652	11
E	Front Bumper Thickness	155	155	0
F	Front Bumper Bottom to Ground	195	204	9
G	Sill Height at Front Wheel Well	154	151	-3
H	Sill Height at Front Door Leading Edge	152	175	23
I	Sill Height at "B" Pillar	174	195	21
J1	Sill Height at Rear Wheel Well	148	158	10
J2	Pinch Weld Height at Rear Wheel Well	151	159	8
K	Sill Height Aft of Rear Wheel Well	233	257	24
L	Rear Bumper Thickness	225	225	0
M	Rear Bumper Bottom to Ground	282	291	9
N	Sill Height to Window Bottom Sill	730	596	-134
O	Front Door Leading Edge to Impact CL	740	722	-18
P	Rear Door Trailing Edge to Impact CL	536	532	-4
Q	Front Window Opening	419	424	5
R	Right Side Length	2760	2767	7
S	Left Side Length	2760	2730	-30
T	Vehicle Width at "B" Post	1690	1598	-92

DATA SHEET NO. 7
SID/HII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2008 Toyota Yaris 3-Door Liftback
 Test Program: NCAP Side Impact

NHTSA No. M85117
 Test Date: 10/11/2007

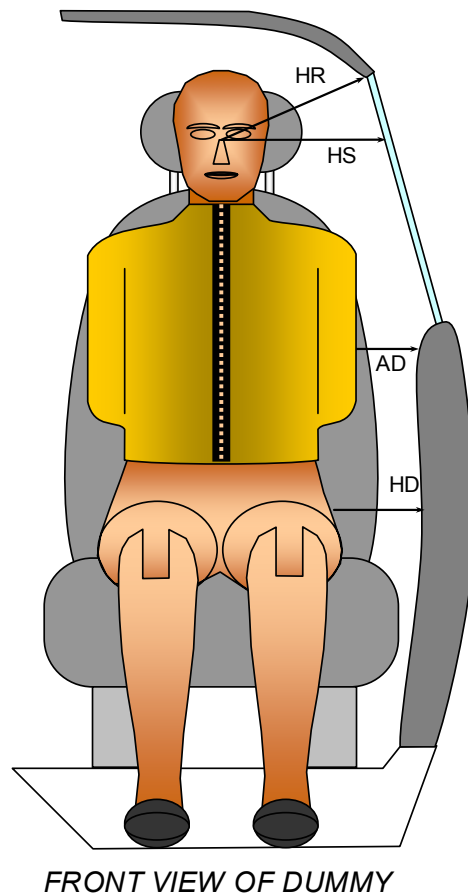


Driver Code	Pass. Code	Measurement Description	Driver S/N 904		Passenger S/N 271	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	366			
HW		Head to Windshield	594			
HZ	HZ	Head to Roof	153		152	
NR	NB	Nose to Rim/Nose to Seatback	432		547	
CD	CB	Chest to Dash or Seatback	588		486	
CS		Chest to Steering Wheel	327			
KDL	KBL	Left Knee to Dash or Seatback	152	23.8	224	13.4
KDR	KBR	Right Knee to Dash or Seatback	159	30.6	214	13.2
PA	PA	Pelvic Angle		24.1		23.2
PHX	PHX	H-Point to Striker (X-Axis)	400		518	
PHZ	PHZ	H-Point to Striker (Z-Axis)	207		133	

DATA SHEET NO. 8
SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2008 Toyota Yaris 3-Door Liftback
 Test Program: NCAP Side Impact

NHTSA No. M85117
 Test Date: 10/11/2007

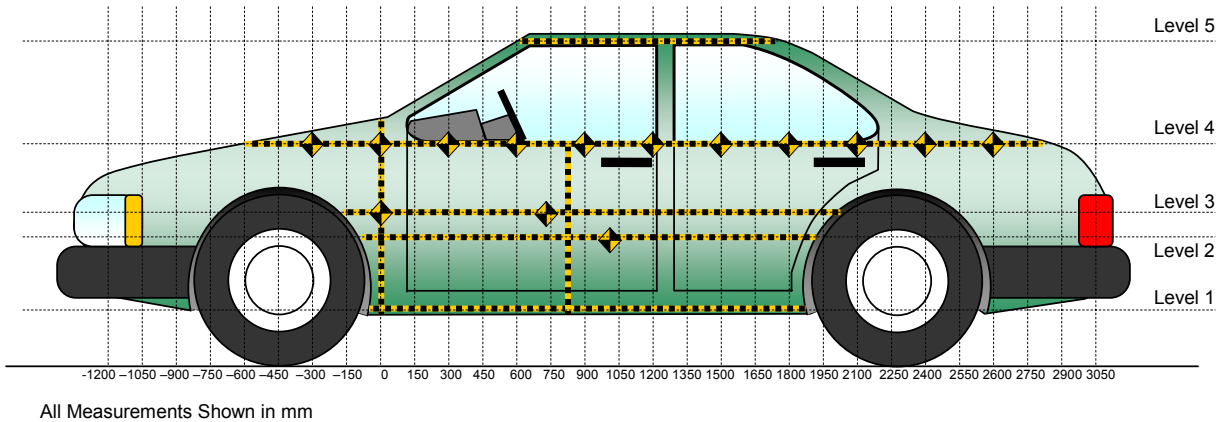


Code	Measurement Description	Units	Driver S/N 904	Passenger S/N 271
HR	Head to Side Header	mm	192	170
HS	Head to Side Window	mm	306	289
AD	Arm to Door	mm	81	56
HD	H-Point to Door	mm	143	147

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

Test Vehicle: 2008 Toyota Yaris 3-Door Liftback
 Test Program: NCAP Side Impact

NHTSA No. M85117
 Test Date: 10/11/2007



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	2	1350	1412
4	Window Sill	102	1500	967
3	Mid Door	242	1050	636
2	Occupant H-Point	248	1200	502
1	Sill Top	86	1200	259
	Maximum Penetration	248		

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2008 Toyota Yaris 3-Door Liftback
 Test Program: NCAP Side Impact

NHTSA No. M85117
 Test Date: 10/11/2007

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-300				319					318					-1	
-150				317					323					6	
0			259	319				355	342				96	23	
150	296	277	275	324		332	485	458	372		36	208	183	48	
300	301	283	274	322		375	520	478	414		74	237	204	92	
450	299	280	270	323		373	521	479	393		74	241	209	70	
600	297	277	266	326	544	371	515	477	389	544	74	238	211	63	0
750	294	274	263	326	537	371	495	478	397	537	77	221	215	71	0
900	293	273	261	326	533	372	496	480	408	440	79	223	219	82	-93
1050	292	271	260	329	534	372	510	502	393	467	80	239	242	64	-67
1200	294	271	260	332	536	380	519	482	386	498	86	248	222	54	-38
1350	296	271	259	336	540	375	509	456	432	542	79	238	197	96	2
1500	298	271	259	340	542	363	506	477	442	542	65	235	218	102	0
1650	301	269	261	347	542	344	492	480	422	542	43	223	219	75	0
1800	297	258	263	353	547	330	452	473	410	545	33	194	210	57	-2
1950			259	365	555			379	386	554			120	21	-1
2100			258	377	571			318	370	568			60	-7	-3
2250			265	401				307	407				42	6	
2400				435					435					0	

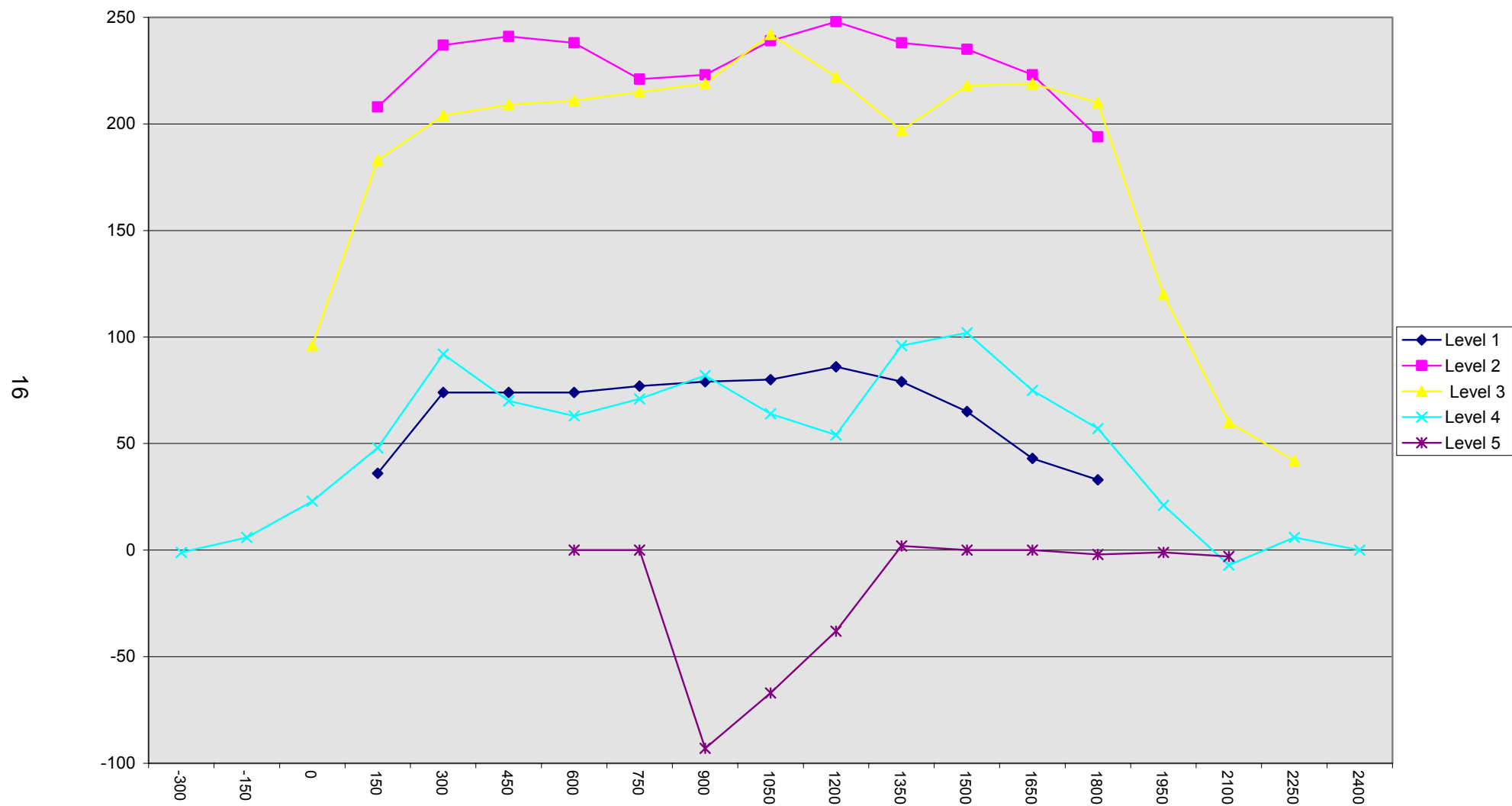
Reference plane is parallel to test vehicle longitudinal centerline.

Given dimensions = Reference plane to car body

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

Test Vehicle: 2008 Toyota Yaris 3-Door Liftback
Test Program: NCAP Side Impact

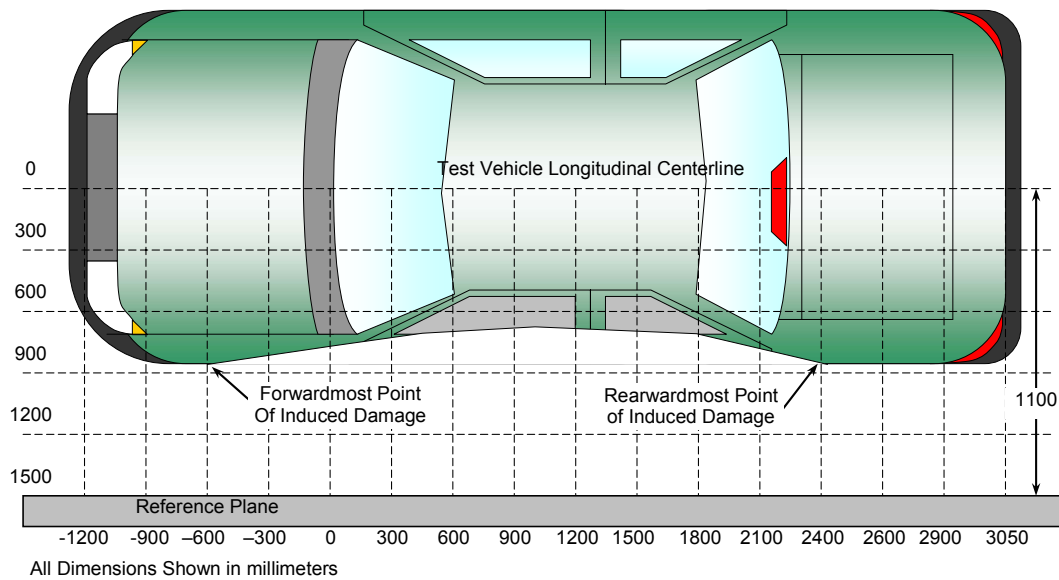
NHTSA No. M85117
Test Date: 10/11/2007



DATA SHEET NO. 11 **VEHICLE DAMAGE PROFILE DISTANCES**

Test Vehicle: 2008 Toyota Yaris 3-Door Liftback
 Test Program: NCAP Side Impact

NHTSA No. M85117
 Test Date: 10/11/2007



TOP VIEW

DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	2400	4	435	435	0
2	1880	3	263	468	205
3	1290	2	271	512	241
4	770	2	275	511	236
5	225	3	275	509	234
6	-300	4	319	318	-1

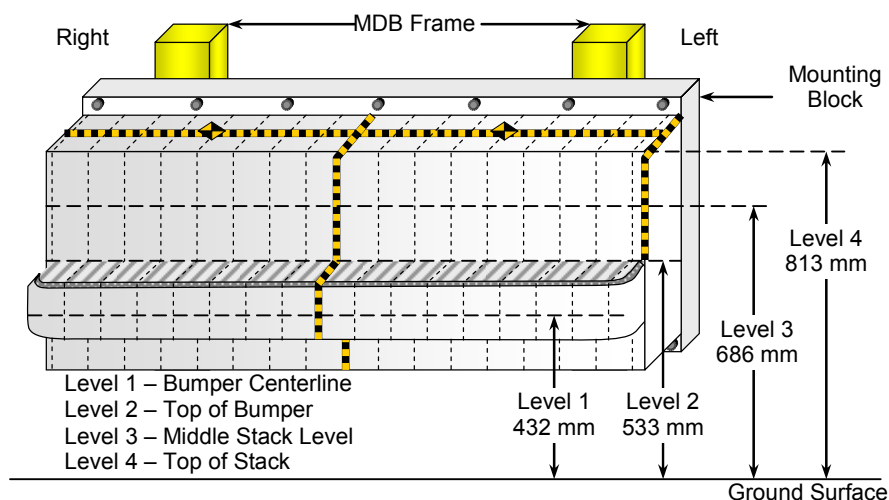
Reference plane is parallel to test vehicle longitudinal centerline.
 Given dimensions = Reference plane to car body.

DATA SHEET NO. 12

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2008 Toyota Yaris 3-Door Liftback
 Test Program: NCAP Side Impact

NHTSA No. M85117
 Test Date: 10/11/2007



DEFORMABLE BARRIER STATIC CRUSH

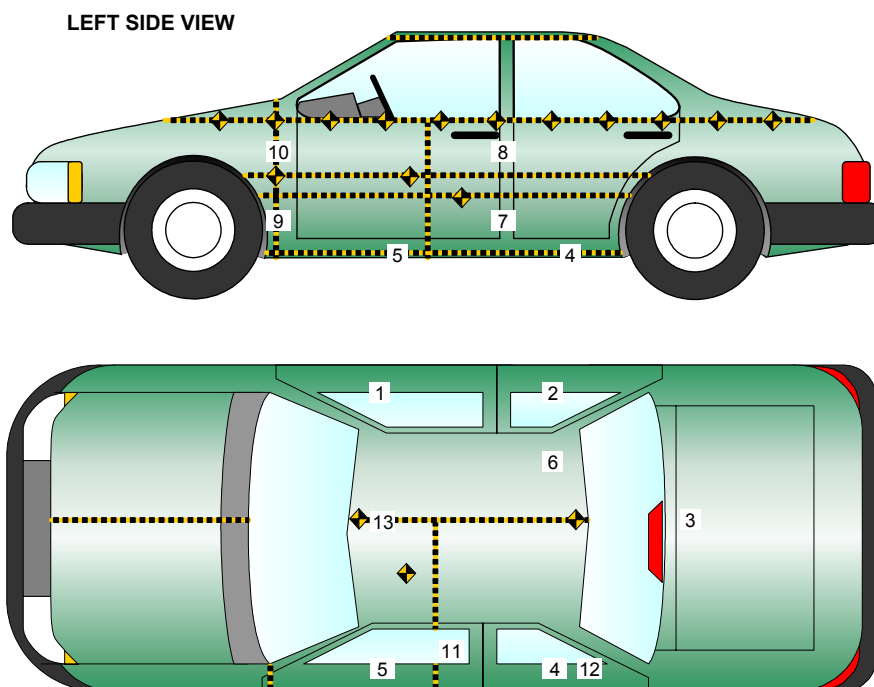
Stack Level	Distance Right of Center								C _L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	157	151	133	127	127	124	111	108	109	108	108	109	107	109	117	136	138
2	100	87	69	61	53	54	45	49	46	46	47	49	49	50	55	67	77
3	33	17	23	19	45	43	22	10	7	7	7	10	14	20	31	51	112
4	61	34	13	20	60	66	39	29	28	28	26	34	45	63	77	105	152

All Dimensions in mm

DATA SHEET NO. 13
VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2008 Toyota Yaris 3-Door Liftback
 Test Program: NCAP Side Impact

NHTSA No. M85117
 Test Date: 10/11/2007



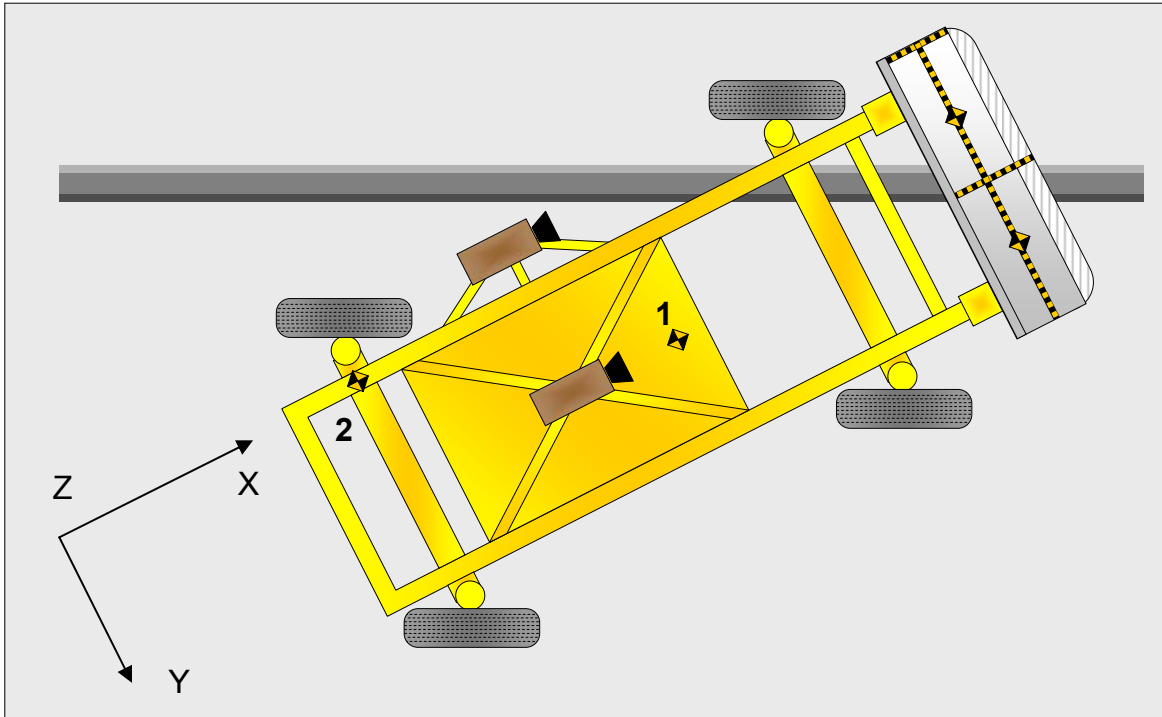
Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	1800	682	225
2	Right Sill at Rear Seat	1038	685	229
3	Rear Floorpan Above Axle	723	0	446
4	Left Sill at Rear Door	1059	-685	217
5	Left Sill at Front Door	1817	-683	215
6	Rear Occupant Compartment	1278	-516	262
7	Left Lower B-Post	1442	-694	561
8	Left Middle B-Post	1439	-694	792
9	Left Lower A-Post	2625	-698	503
10	Left Middle A-Post	2634	-756	772
11	Front Seat Track	1752	-551	378
12	Rear Seat Track or Structure			
13	Vehicle CG	1962	0	360

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

DATA SHEET NO. 14
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2008 Toyota Yaris 3-Door Liftback
 Test Program: NCAP Side Impact

NHTSA No. M85117
 Test Date: 10/11/2007



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

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

DATA SHEET NO. 15
VEHICLE STRUCTURAL MEASUREMENTS

Test Vehicle: 2008 Toyota Yaris 3-Door Liftback
Test Program: NCAP Side Impact

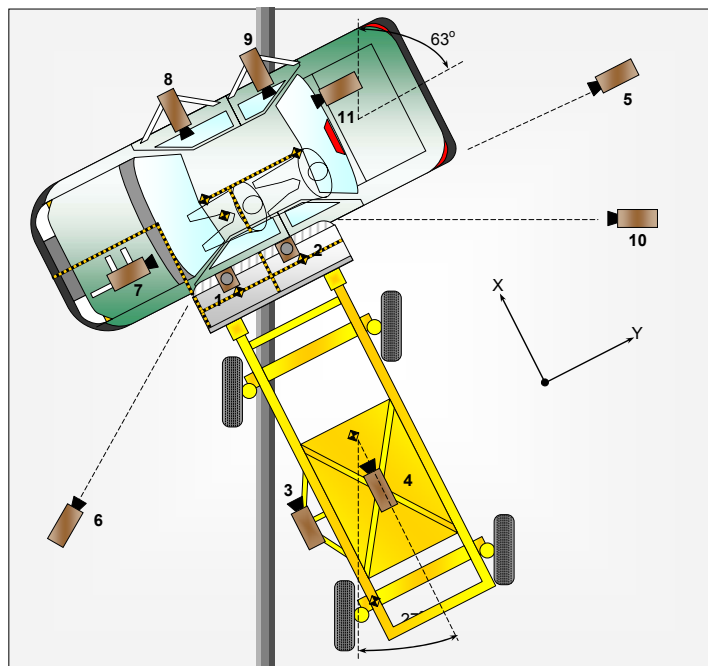
NHTSA No. M85117
Test Date: 10/11/2007

	Elements	Pre-Test (mm)
1	Total Length	3641
2	Total Width	1690
3	Bumper Top Height	566
4	Bumper Bottom Height	411
5	Longitudinal Member Top Height	516
6	Distance between Longitudinal Members	851
7	Longitudinal Member Width	66
8	Engine Top Height	779
9	Engine Bottom Height	195
10	Engine and gearbox width	820
11	Front bumper-engine distance	318
12	Front shock absorber fixing height	894
13	Bonnet leading edge height	849
14	Front shock absorber fixing width	1134
15	Front bumper – front axle distance	727
16	Front axle – a pillar distance	387
17	A-pillar – B-pillar distance	1285
18	B-Pillar – rear axle distance	787
19	B-pillar – C-pillar distance	854
20	Roof sill bottom height	1360
21	Roof sill top height	1450
22	Floor sill bottom height	225
23	Floor sill top height	347

DATA SHEET NO. 16
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2008 Toyota Yaris 3-Door Liftback
 Test Program: NCAP Side Impact

NHTSA No. M85117
 Test Date: 10/11/2007



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Close-up	100	0	5050	50	1000
2	Overhead Overall	-340	0	5050	14	1000
3	MDB Onboard, Impact Point Close-up				50	1000
4	MDB Onboard, Centerline of Impact				16	1000
5	Right Side, Ground Level, Overall	1100	5180	1150	24	1000
6	Left Side, Ground Level, Overall	1080	-5140	1150	24	1000
7	Vehicle Onboard Front SID/HIII, Front				12.5	1000
8	Vehicle Onboard Front SID/HIII, Side				8	1000
9	Vehicle Onboard Rear SID/HIII, Side				8	1000
10	Real Time Coverage				13	24
11	On Board Child Seat				8.5	1000

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

DATA SHEET NO. 17
SUMMARY OF FMVSS 301 DATA

Test Vehicle: 2008 Toyota Yaris 3-Door Liftback
 Test Program: NCAP Side Impact

NHTSA No. M85117
 Test Date: 10/11/2007

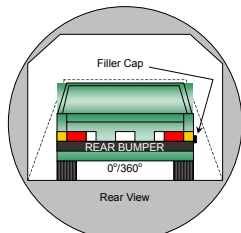
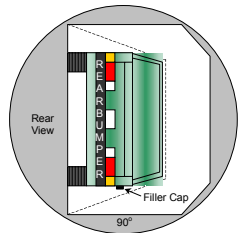
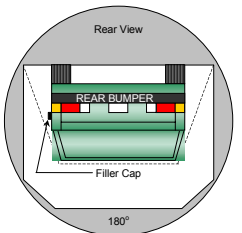
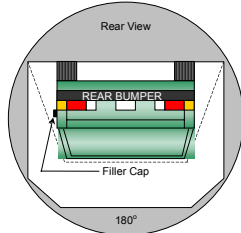
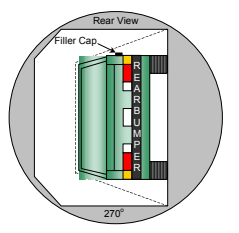
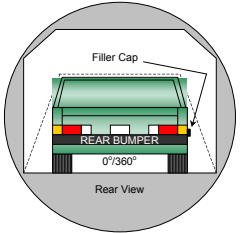
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21° C Test Time: 11:37 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°	123	300	First 5	0
90° to 180°	118	300	First 5	0
180° to 270°	113	300	First 5	0
270° to 360°	116	300	First 5	0

APPENDIX A
PHOTOGRAPHS

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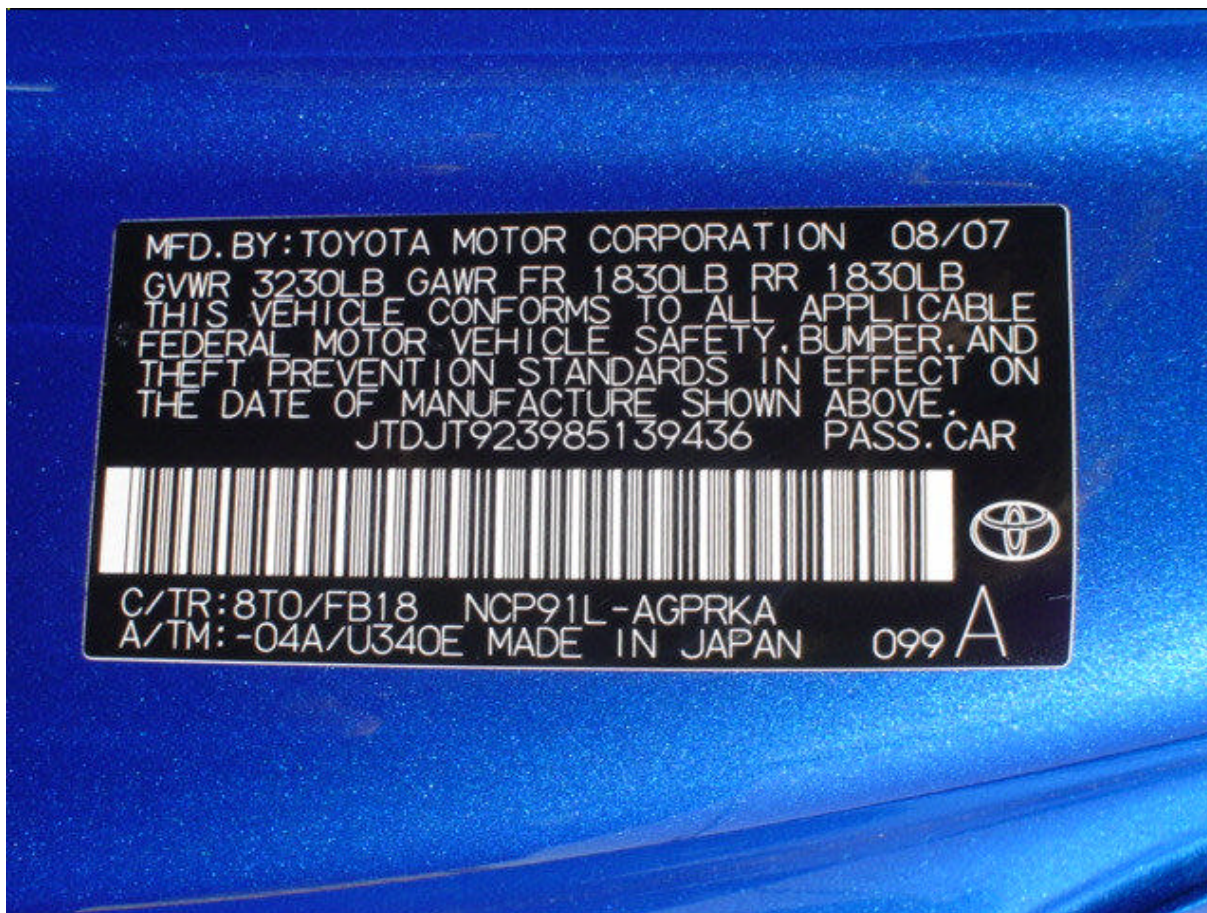
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Left Front $\frac{3}{4}$ View, As Received



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



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



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



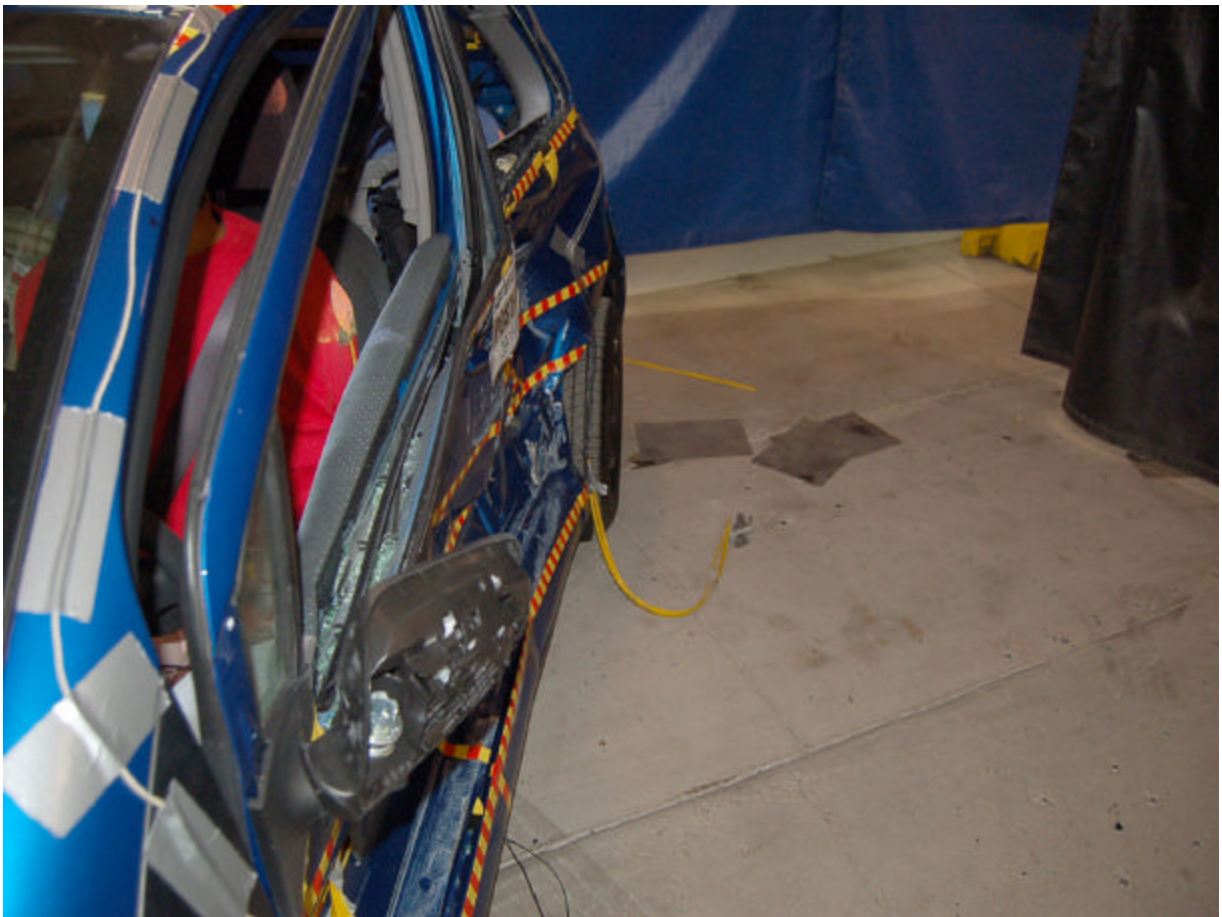
Pre-Test Left Impact Point



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



Post-Test Left Side Impact Close-up



Pre-Test Overhead View



Post-Test Overhead View



Pre-Test Driver Dummy (Door Open)



Pre-Test Driver Dummy Clearance From Door



Post-Test Driver Dummy Clearance From Door



Pre-Test Driver Dummy (Through Window)



Post-Test Driver Dummy (Through Window)



Pre-Test Driver Dummy Right Side View



Post-Test Driver Dummy Right Side View



Pre-Test Passenger Dummy 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)



82.00 ms 011 Oct 2007 10:54 0T0: 21 01,000 fpe 0Frame: 113

Vehicle Impact



Post-Test Driver Dummy Head Contact



Post-Test Driver Dummy Torso Contact



Post-Test Driver Dummy Contact



Post-Test Passenger Dummy Head Contact



Post-Test Passenger Dummy Torso Contact



Post-Test Passenger Dummy Contact

APPENDIX B

SID/HIII RESPONSE DATA TRACES

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

Driver Head X Primary

Driver Head Y Primary

Driver Head Z Primary

Driver Head X Redundant

Driver Head Y Redundant

Driver Head Z Redundant

Driver Upper Neck Force X

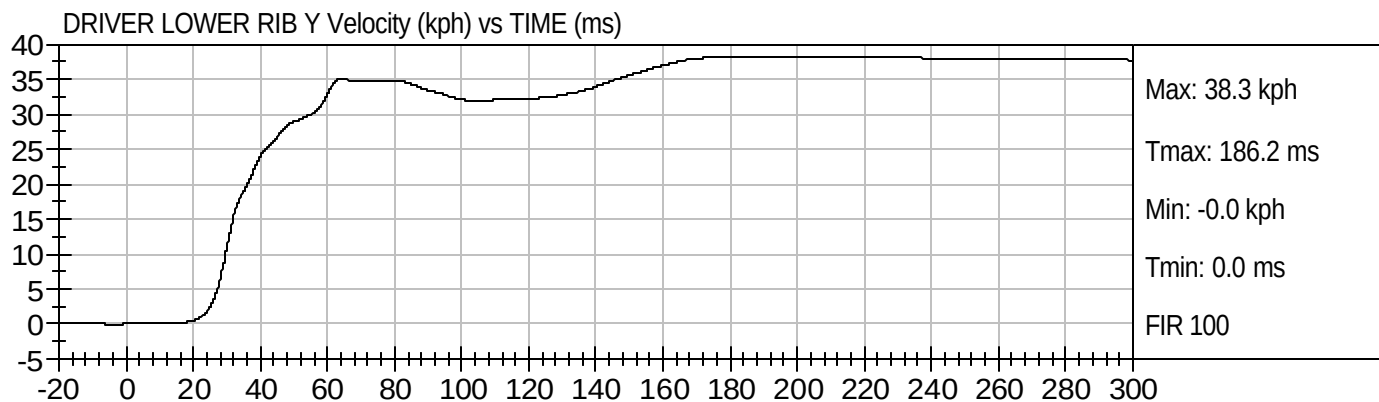
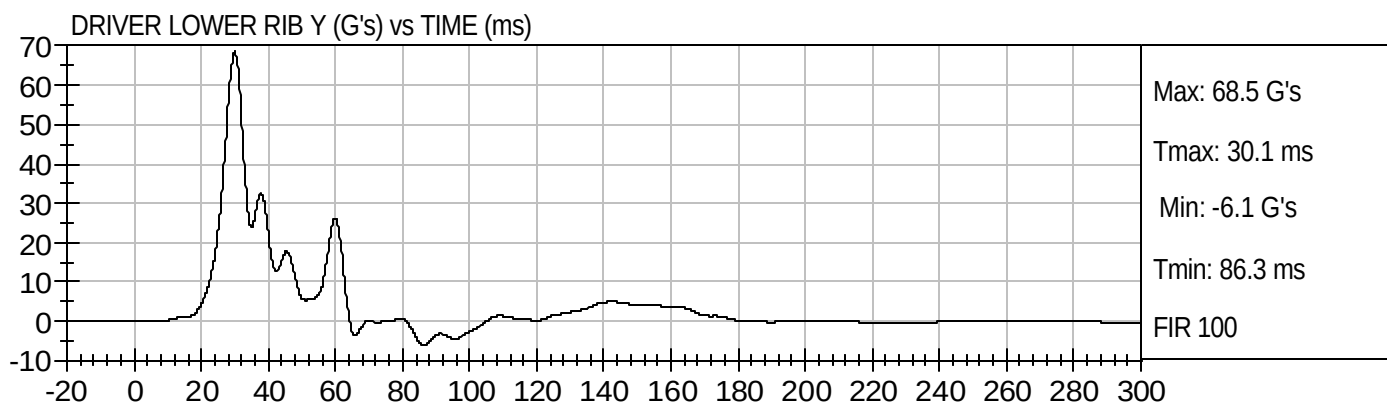
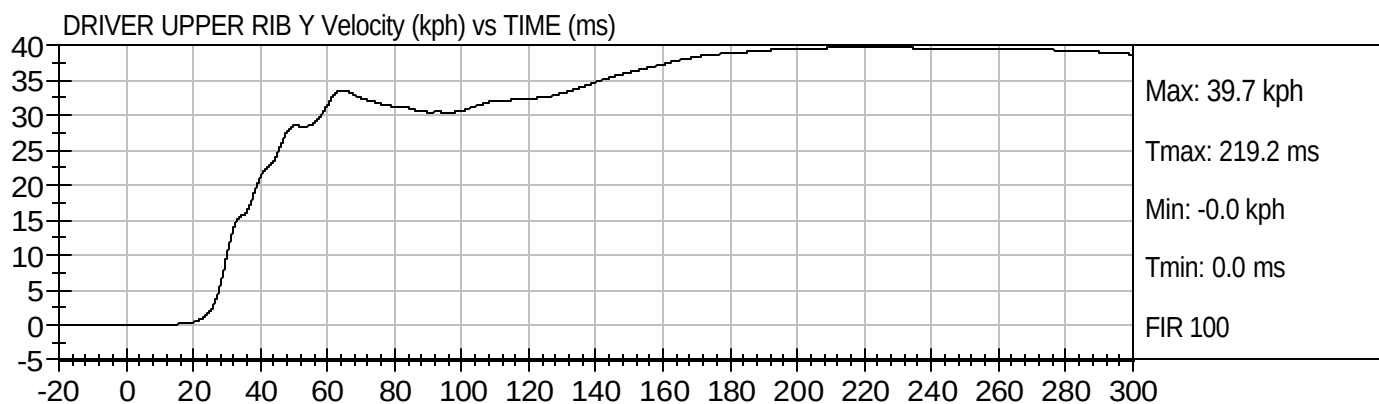
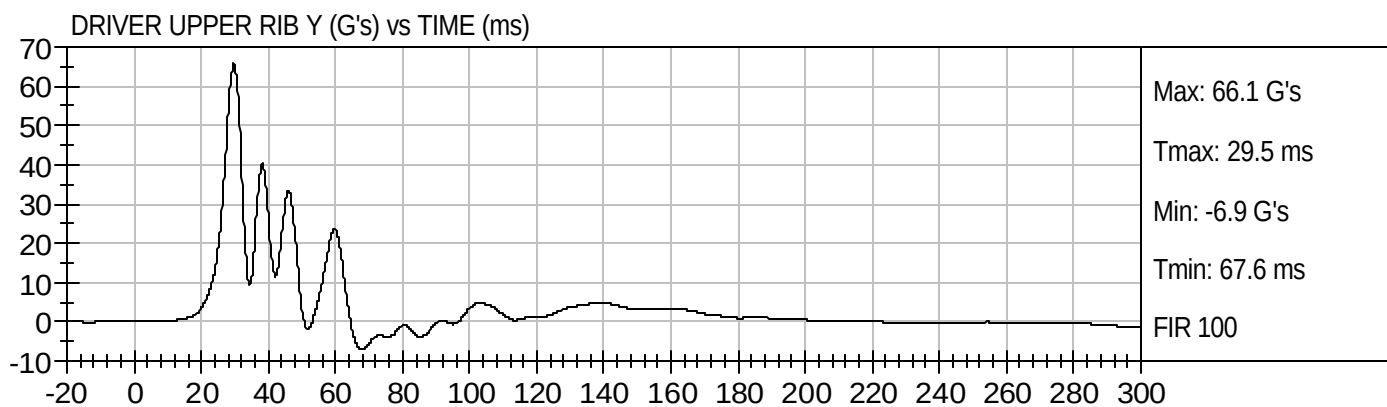
Driver Upper Neck Force Y

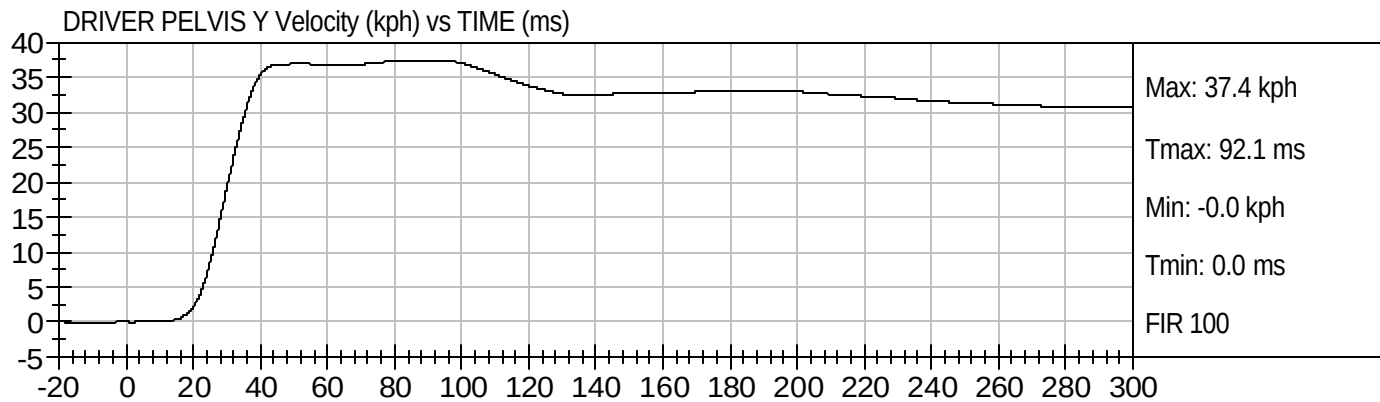
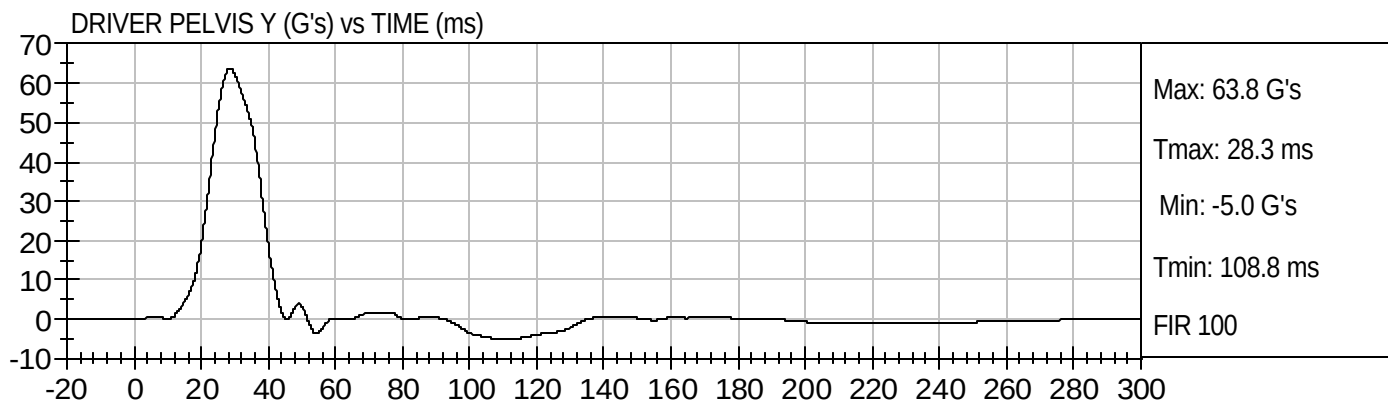
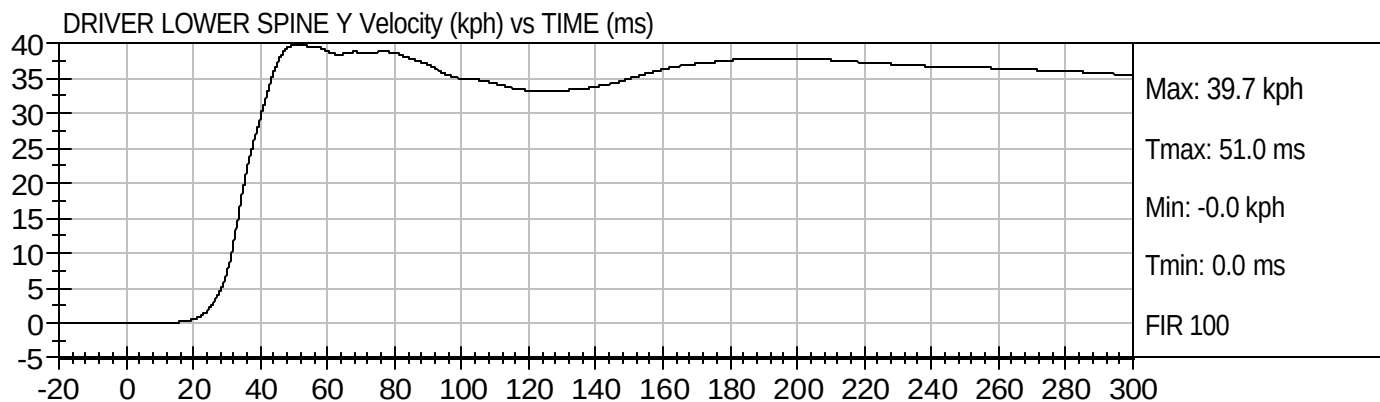
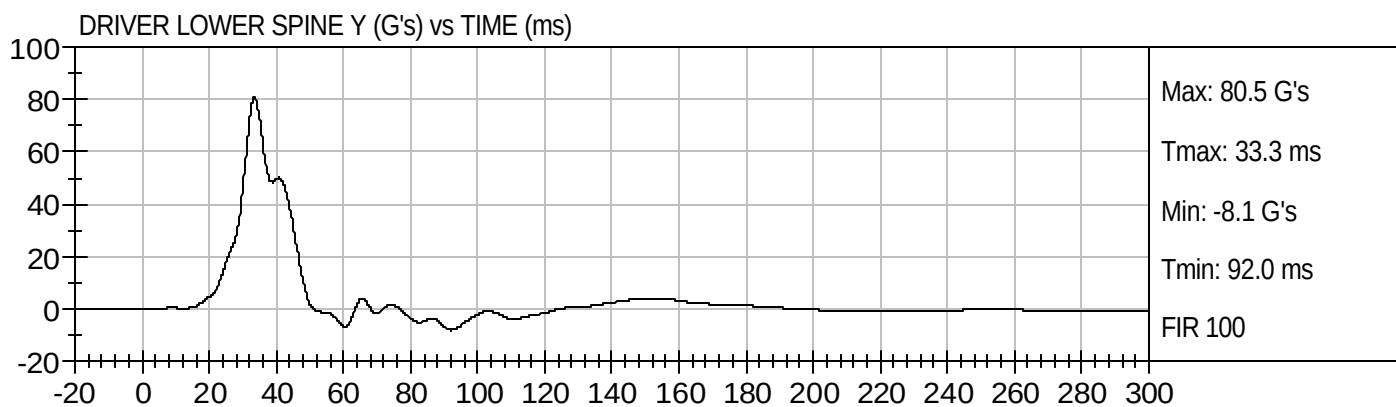
Driver Upper Neck Force Z

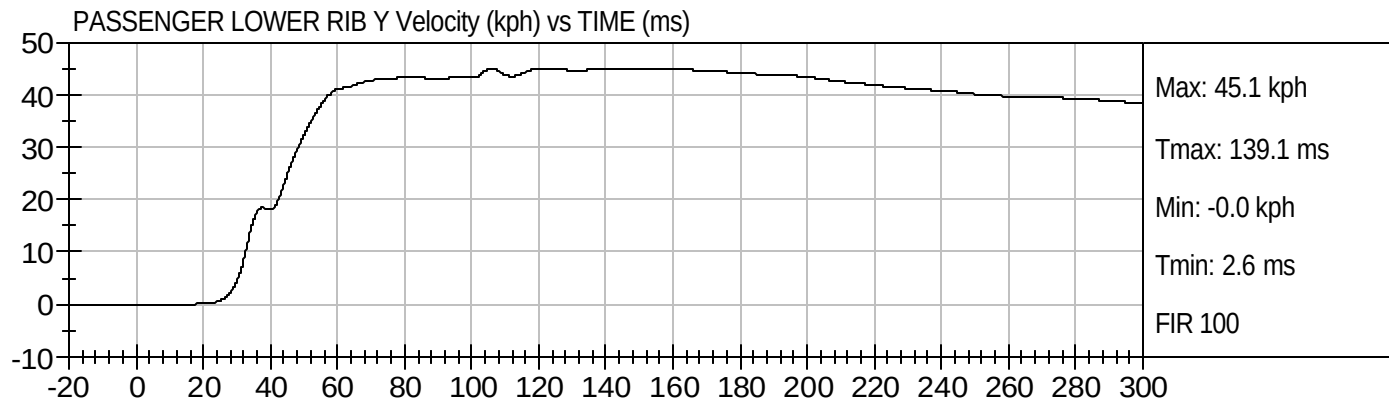
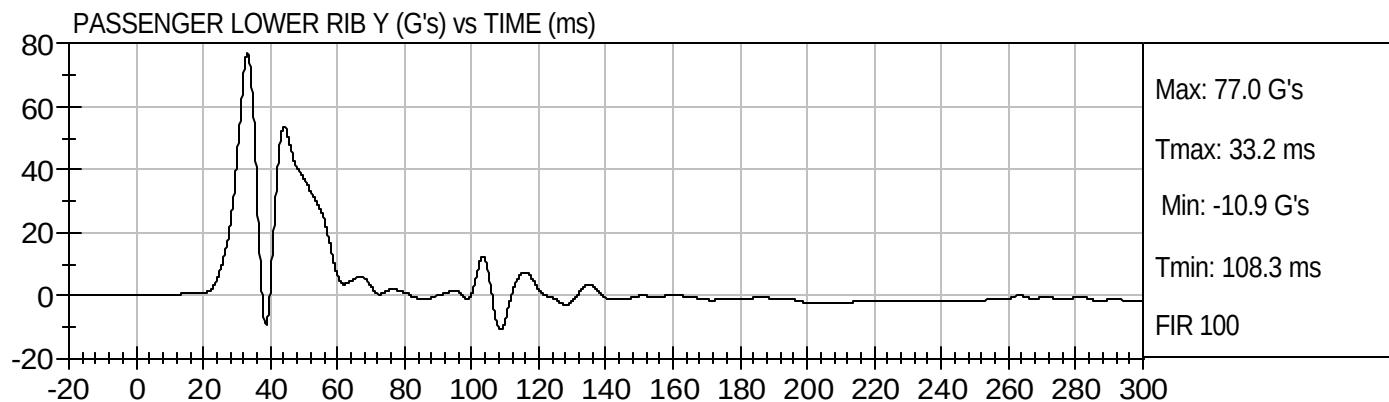
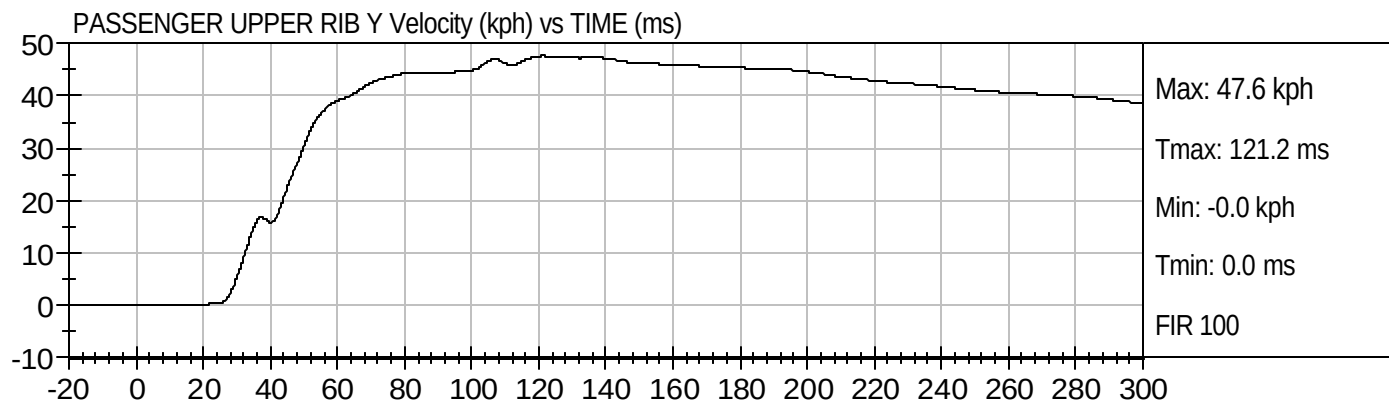
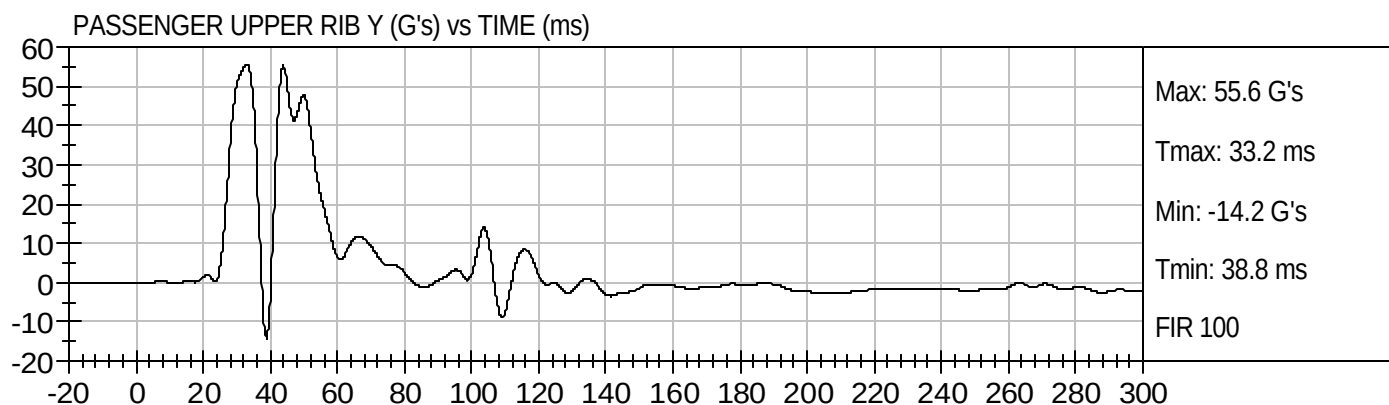
Driver Upper Neck Moment X

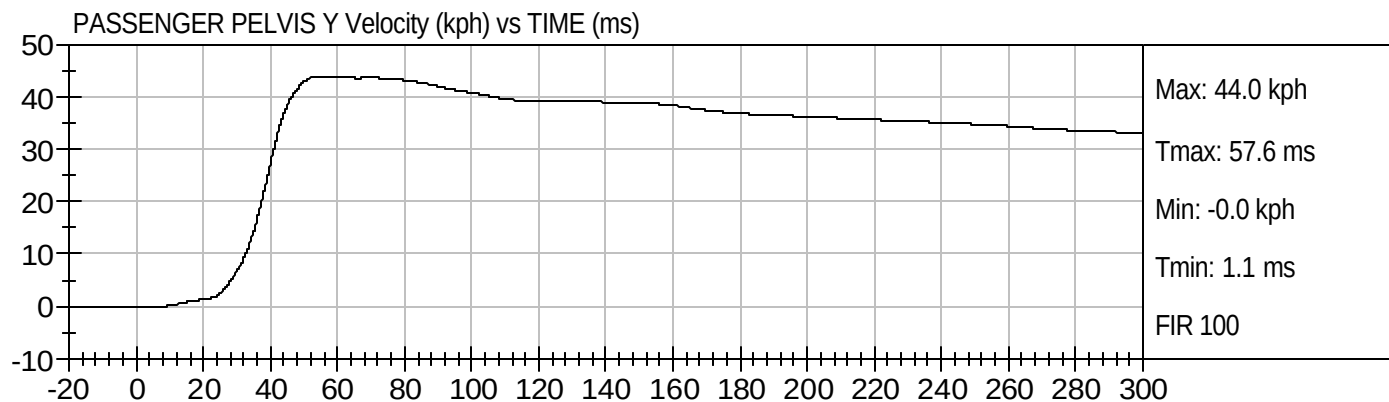
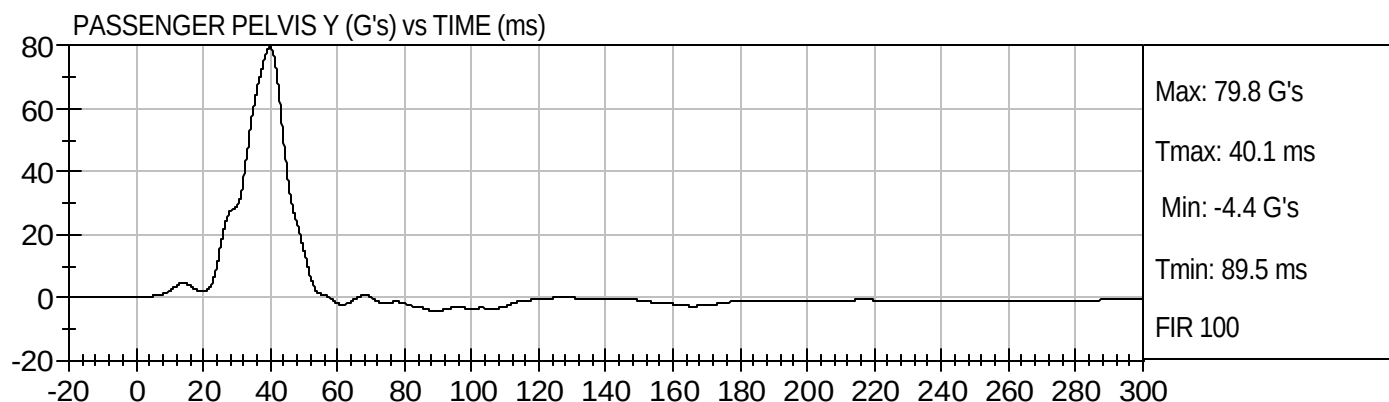
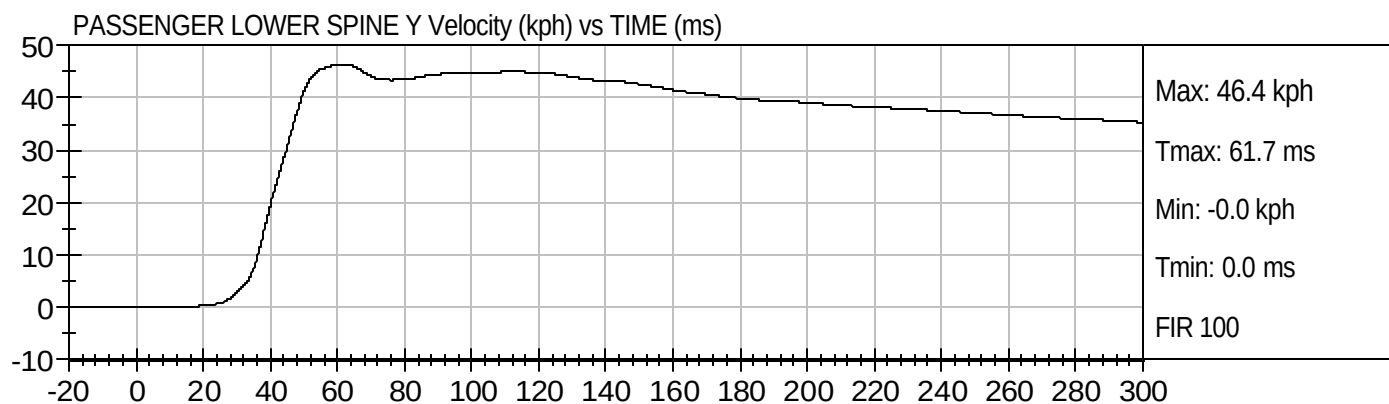
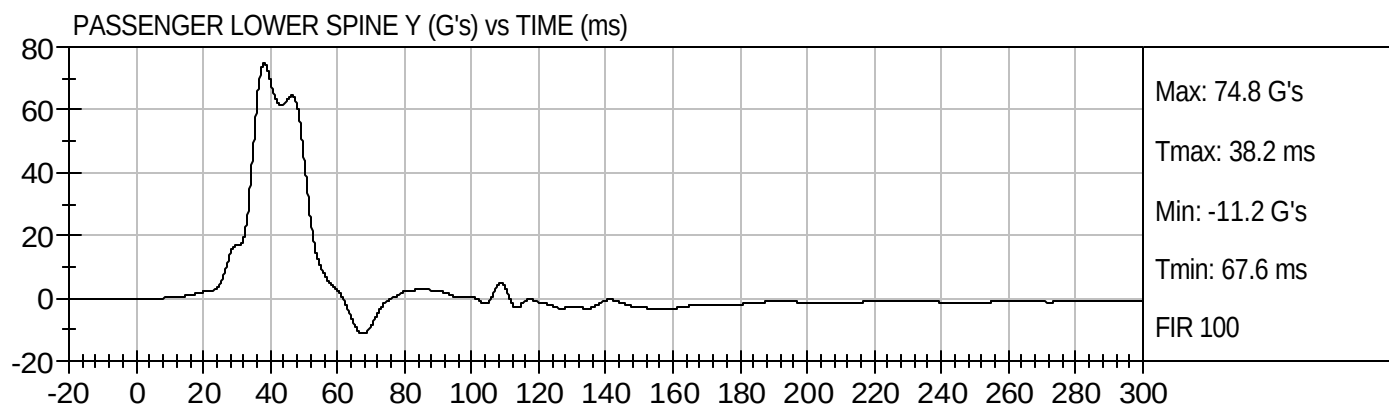
Driver Upper Neck Moment Y
Driver Upper Neck Moment Z
Driver Upper Rib Redundant Y
Driver Lower Rib Redundant Y
Driver Lower Spine Redundant Y
Driver Pelvis Redundant Y
Driver Thorax Contact
Driver Pelvis Contact
Passenger Head X Primary
Passenger Head Y Primary
Passenger Head Z Primary
Passenger Head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

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









APPENDIX C
DUMMY CALIBRATION DATA

CERTIFICATION DATA

Dummy Serial Number: 904

Calibration Test Results Summary

Dummy Serial Number: 904

Pre-Test Calibration

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

SID Calibration Data Sheet
Side Impact Dummy
External Measurements

ATD Serial No: 904

Test I.D: D07315

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

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

10/9/2007
Test Date

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

ATD Serial No: 904

Test I.D: D073151

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

Jessica Gall
Laboratory Technician

David Winkelbauer
Approved By

10/8/07
Test Date



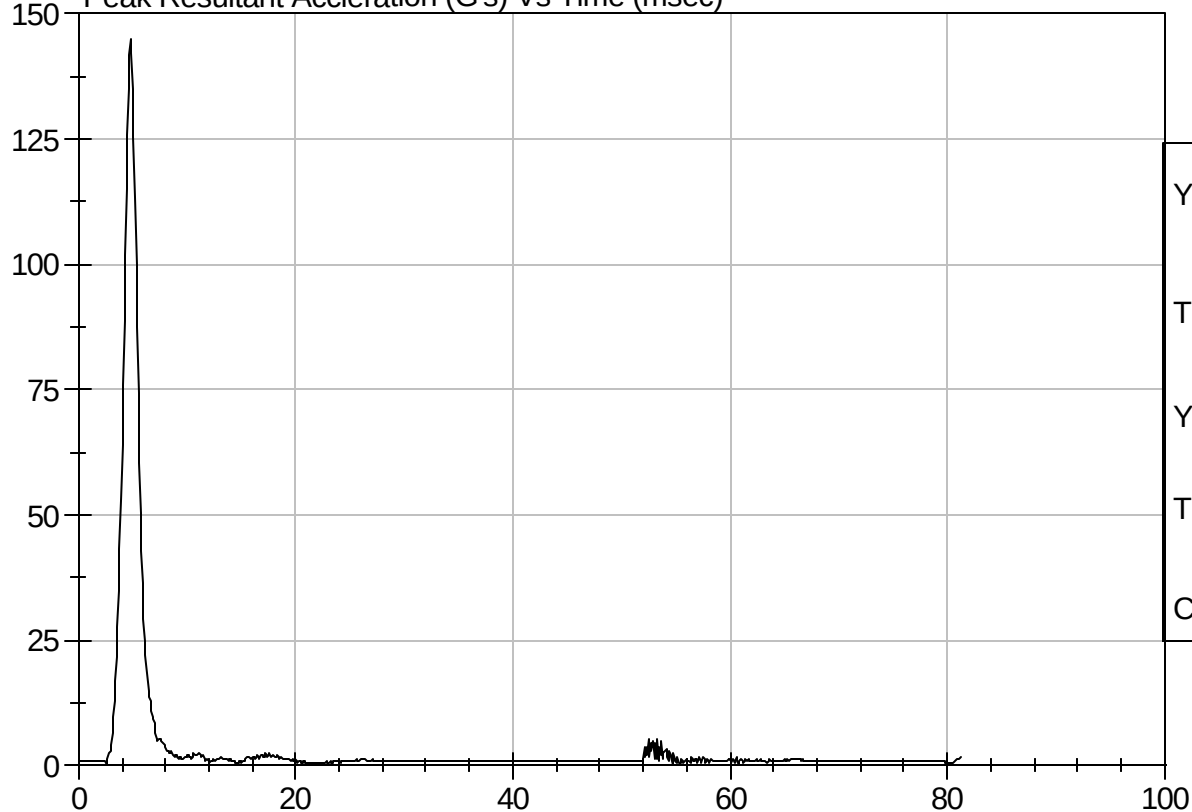
Test Description: Head Drop

Test Date: 10/8/07

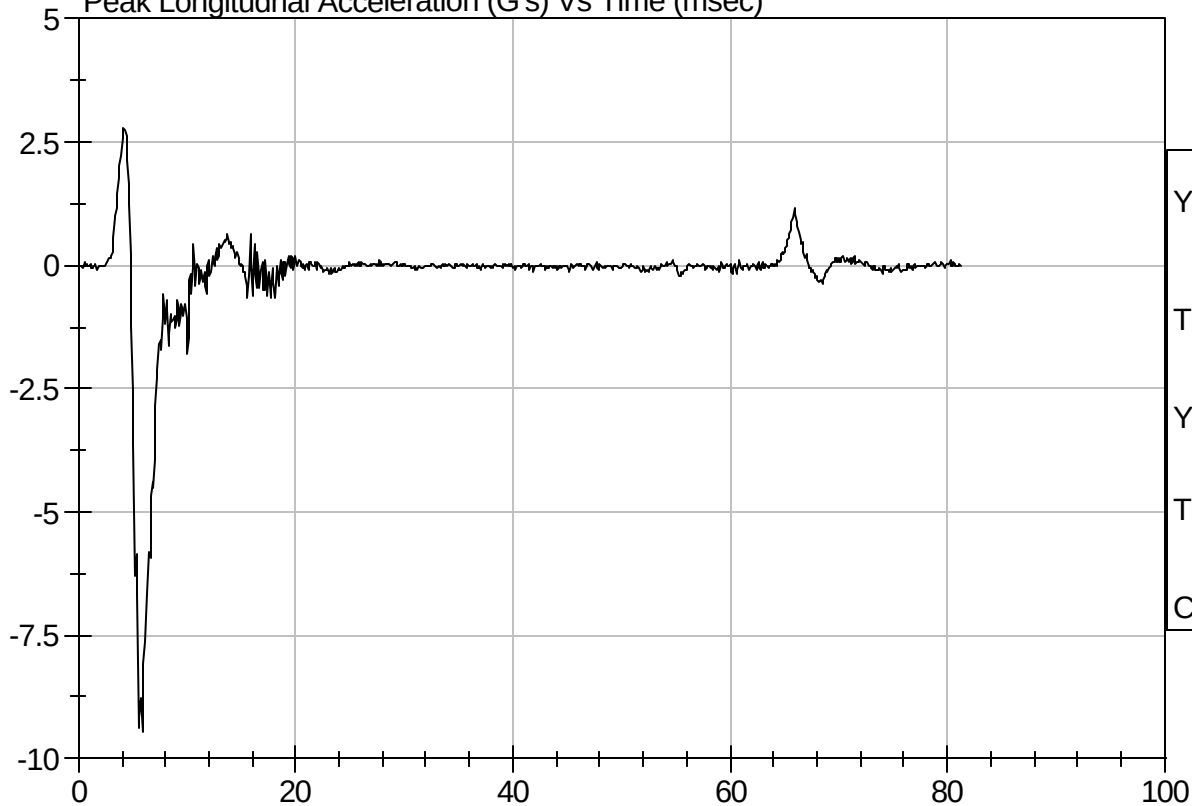
Component: D073151

Speed: 0 ft/s, 0.00 m/s

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



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



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

ATD Serial No: 904

Test I.D: D073152

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


Laboratory Technician

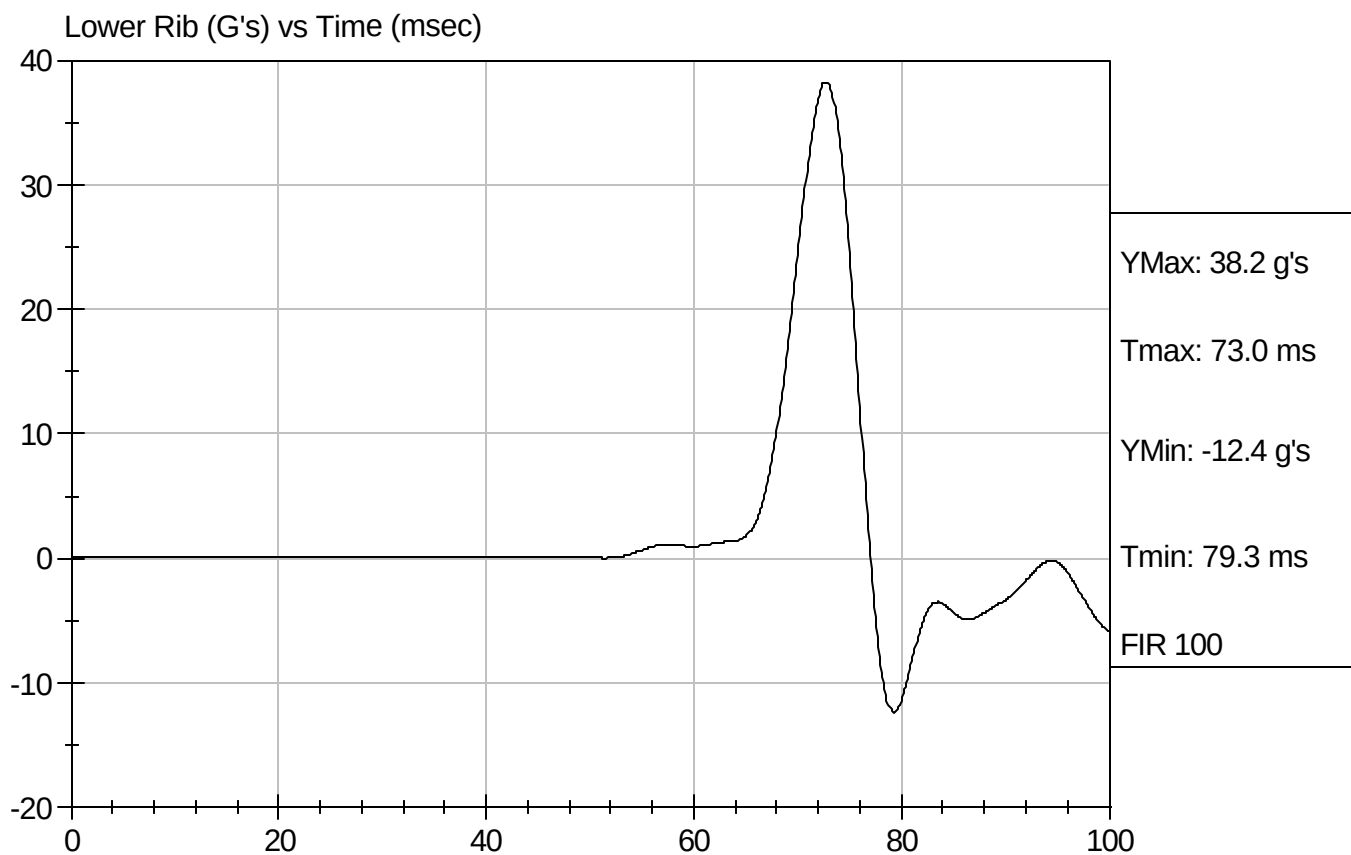
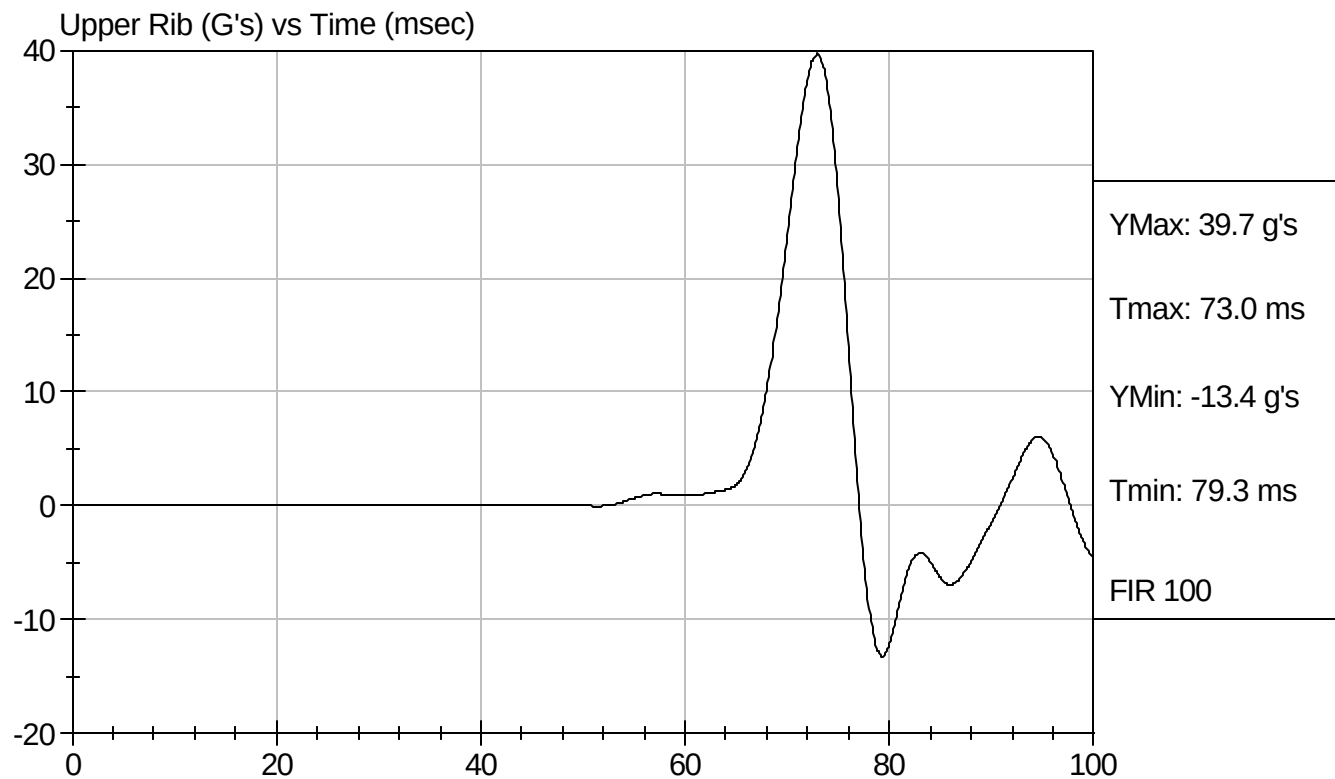

Approved By

10/8/07
Test Date



Test Desc: Thorax Impact
Component ID: D073152

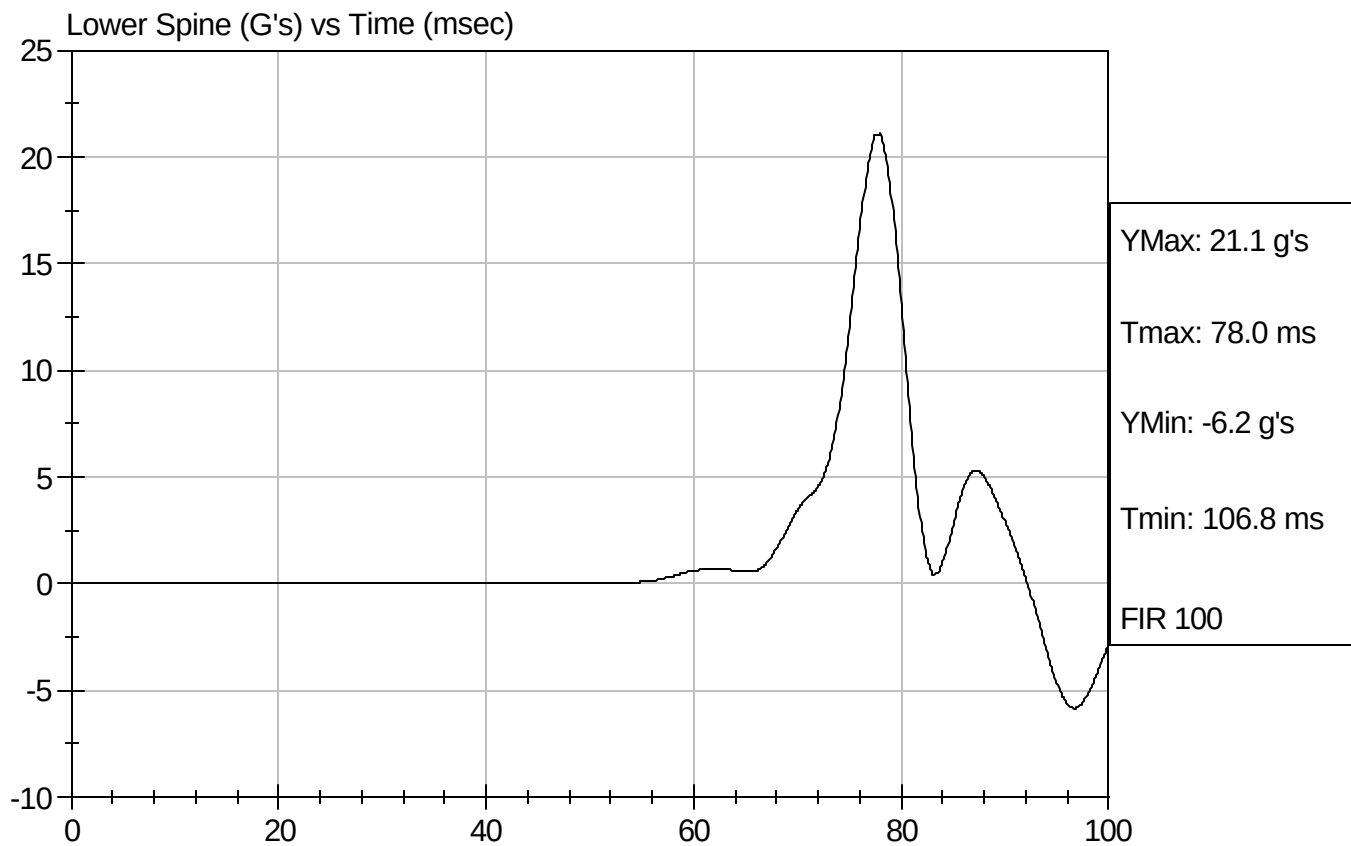
Test Date: 10/8/07
Speed: 13.89 ft/sec, 4.23 m/sec





Test Desc: Thorax Impact
Component ID: D073152

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



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

ATD Serial No: 904

Test I.D: D073153

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

Jessica Gall
Laboratory Technician

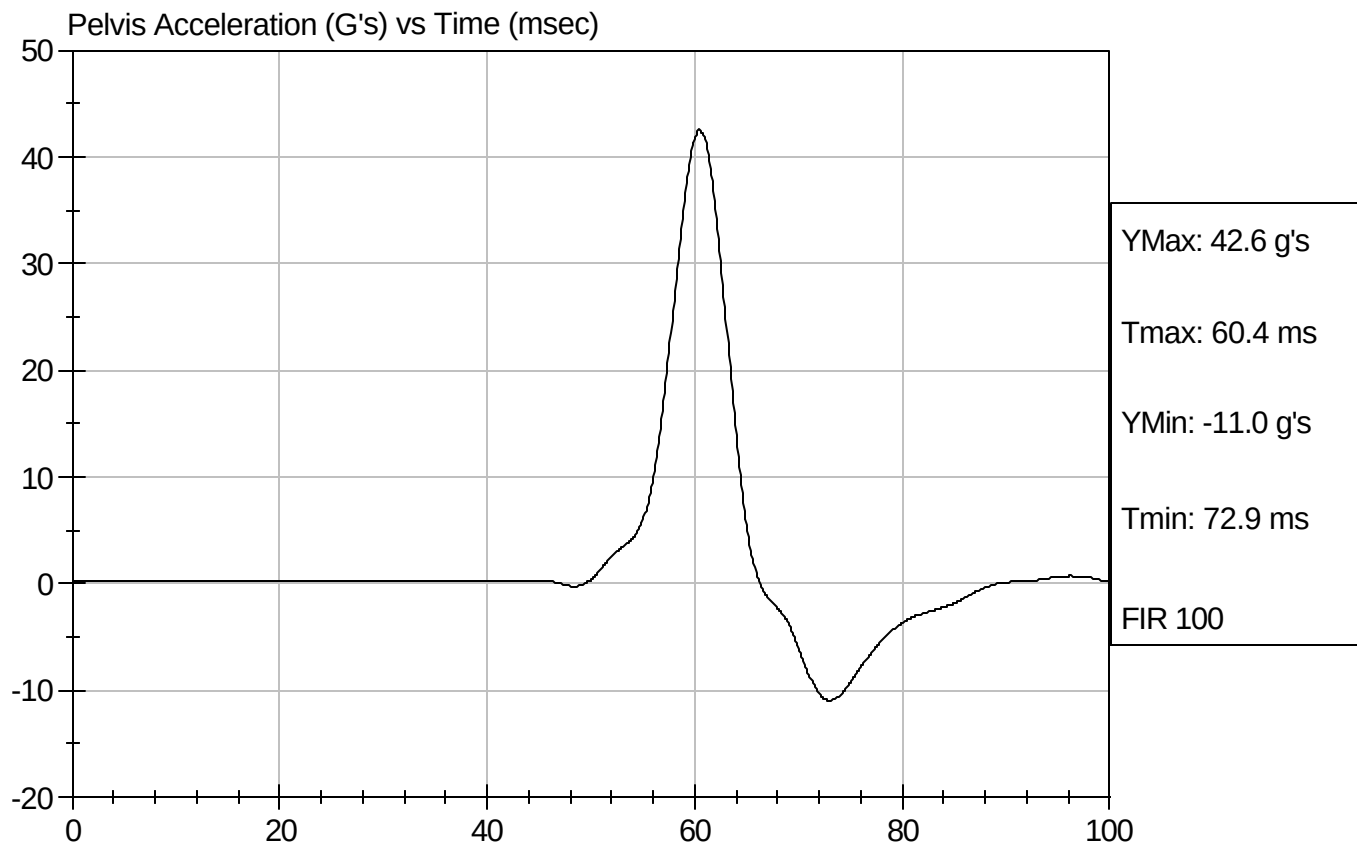
David Winkelbauer
Approved By

10/8/07
Test Date



Test Desc: Pelvis Impact
Component ID: D073153

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



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

ATD Serial No: 904

Test I.D: D073154

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

Jessica Gall
Laboratory Technician

10/8/07
Test Date

David Winkelbauer
Approved By

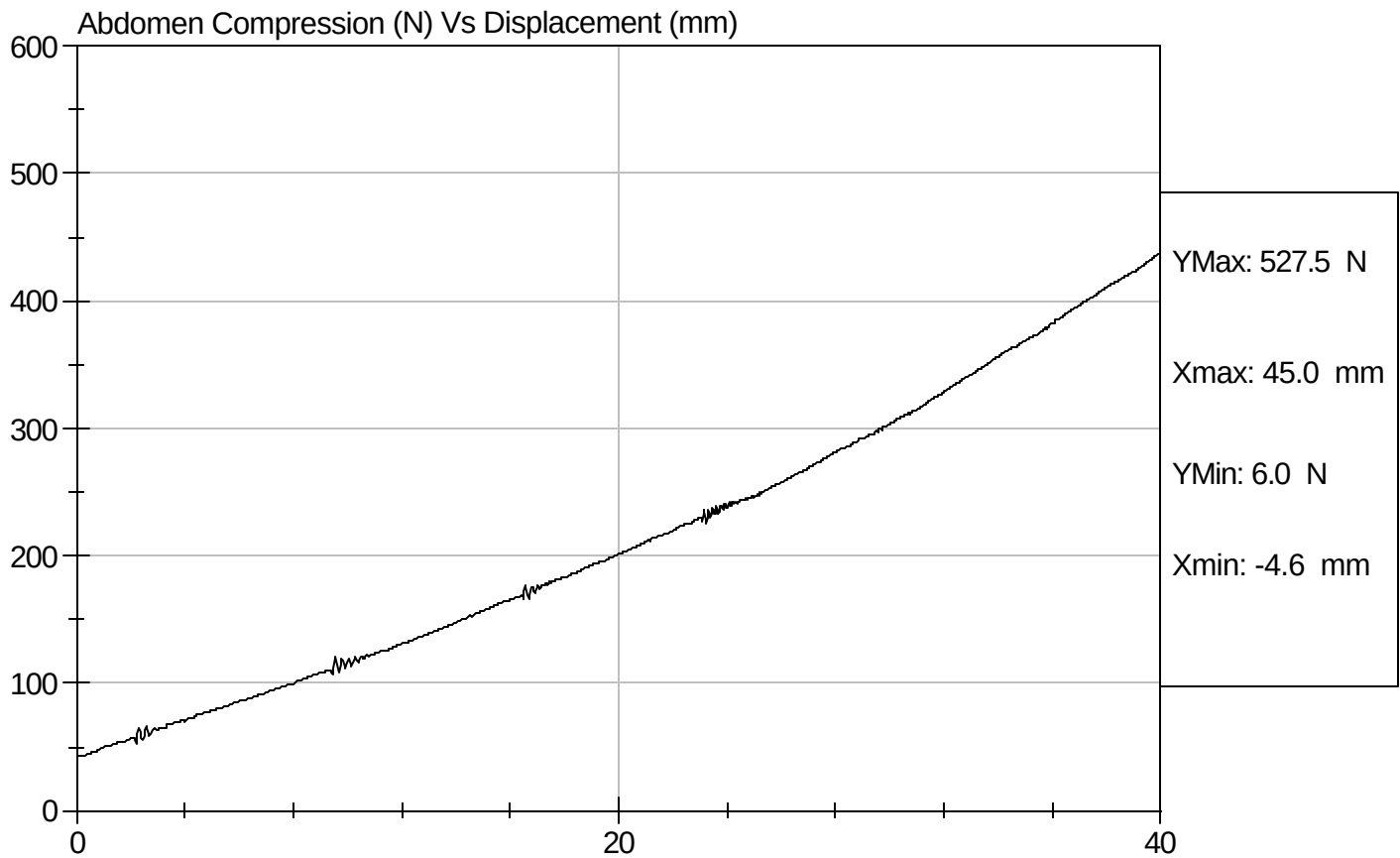


Test Description: Abdomen Compression

Test Date: 10/8/07

Component: D073154

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 904

Test I.D: D073155

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


Laboratory Technician


Approved By

10/8/07
Test Date

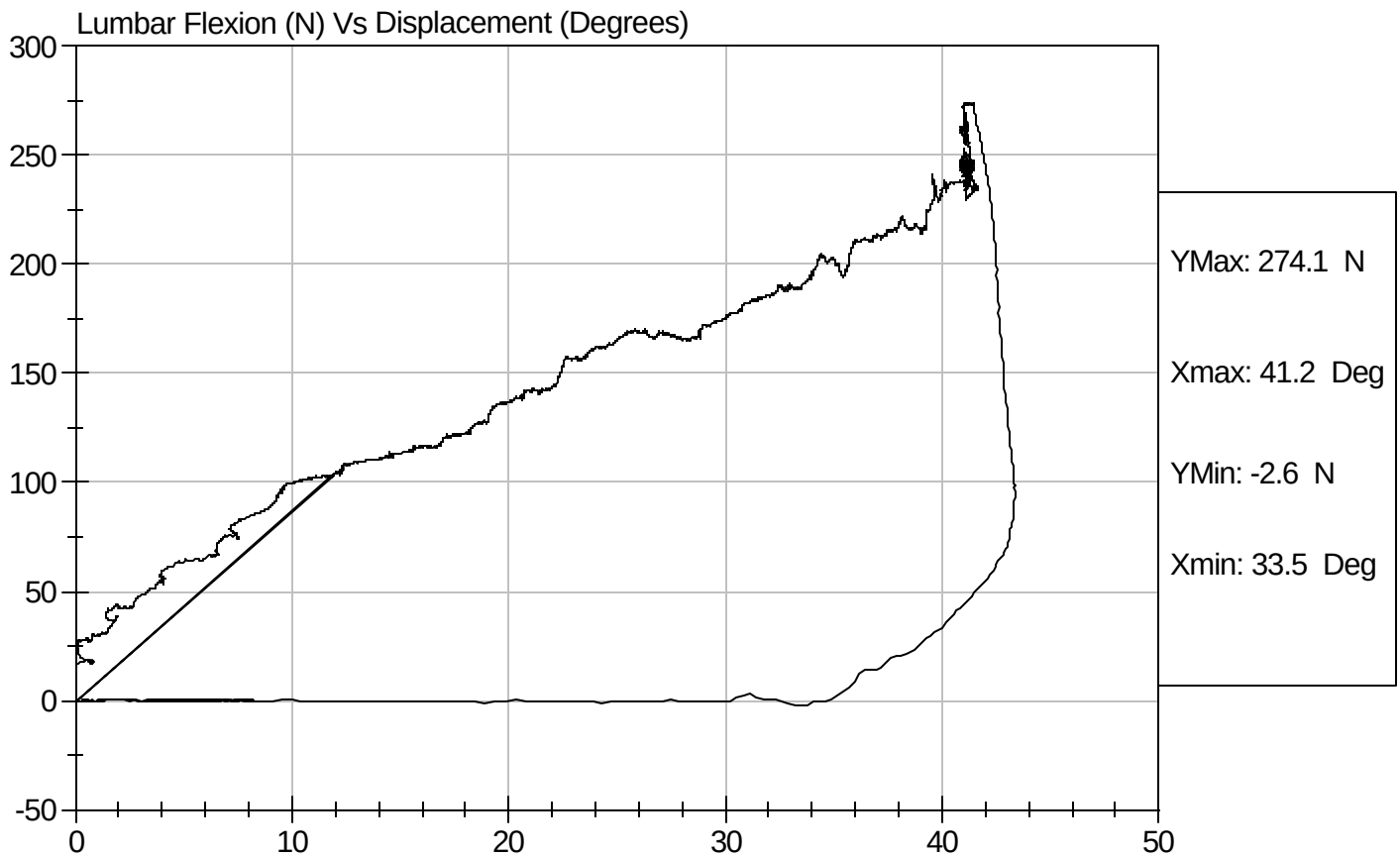


Test Description: Lumbar Flexion

Test Date: 10/8/07

Component: D073155

Speed: 0 ft/sec, 0.00 m/sec



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

ATD Serial No: 904

Test I.D: D073159

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


 Laboratory Technician

10/9/07

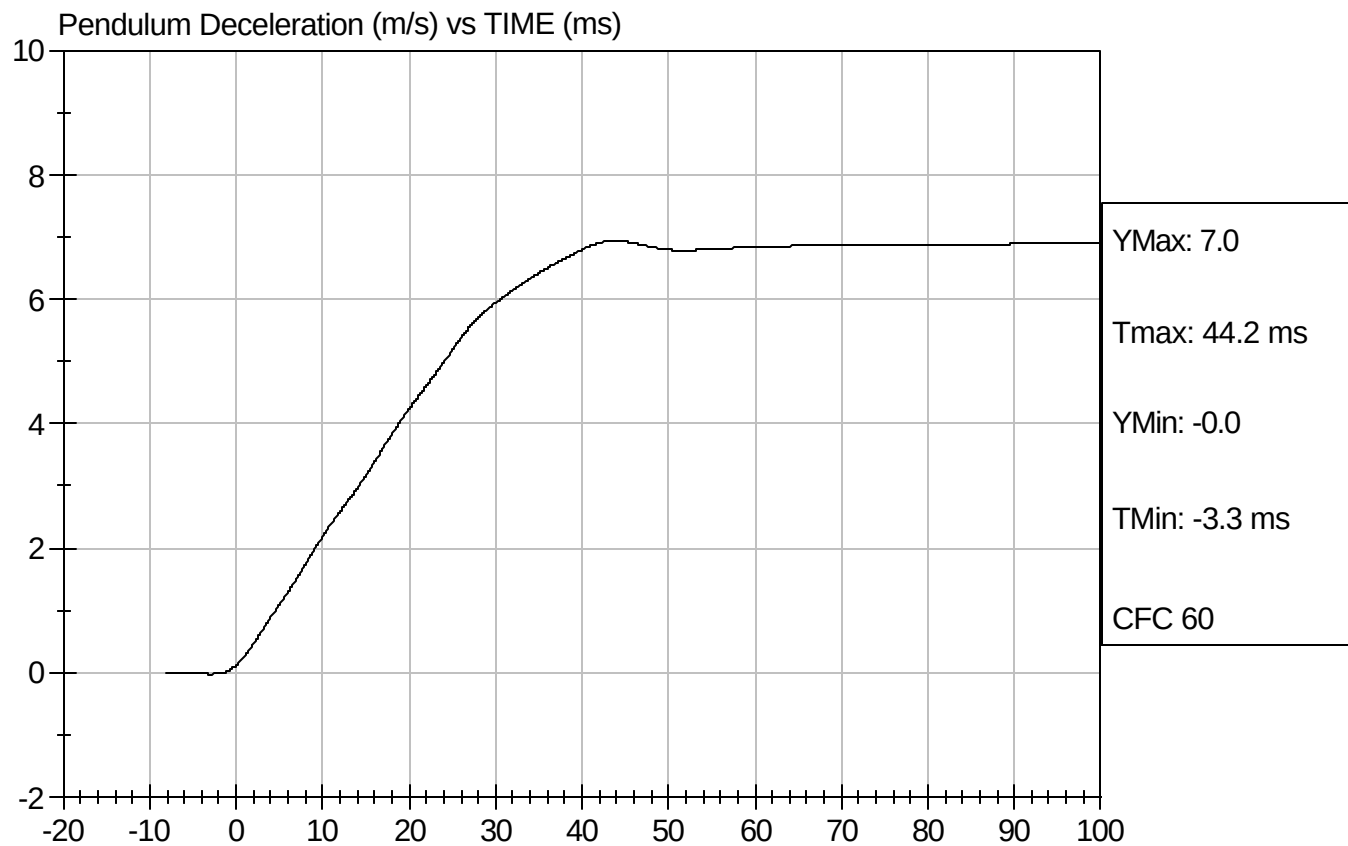
Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D073159

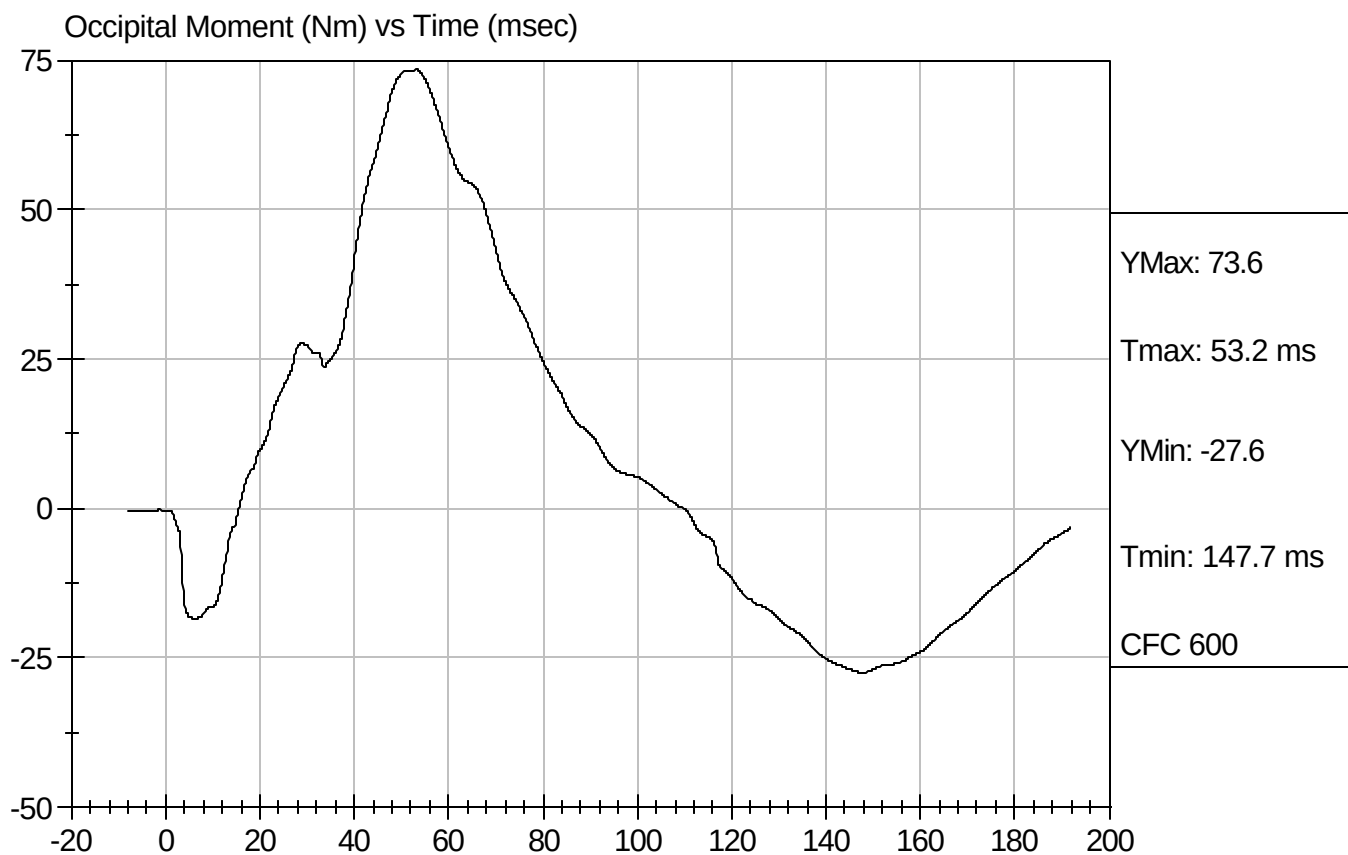
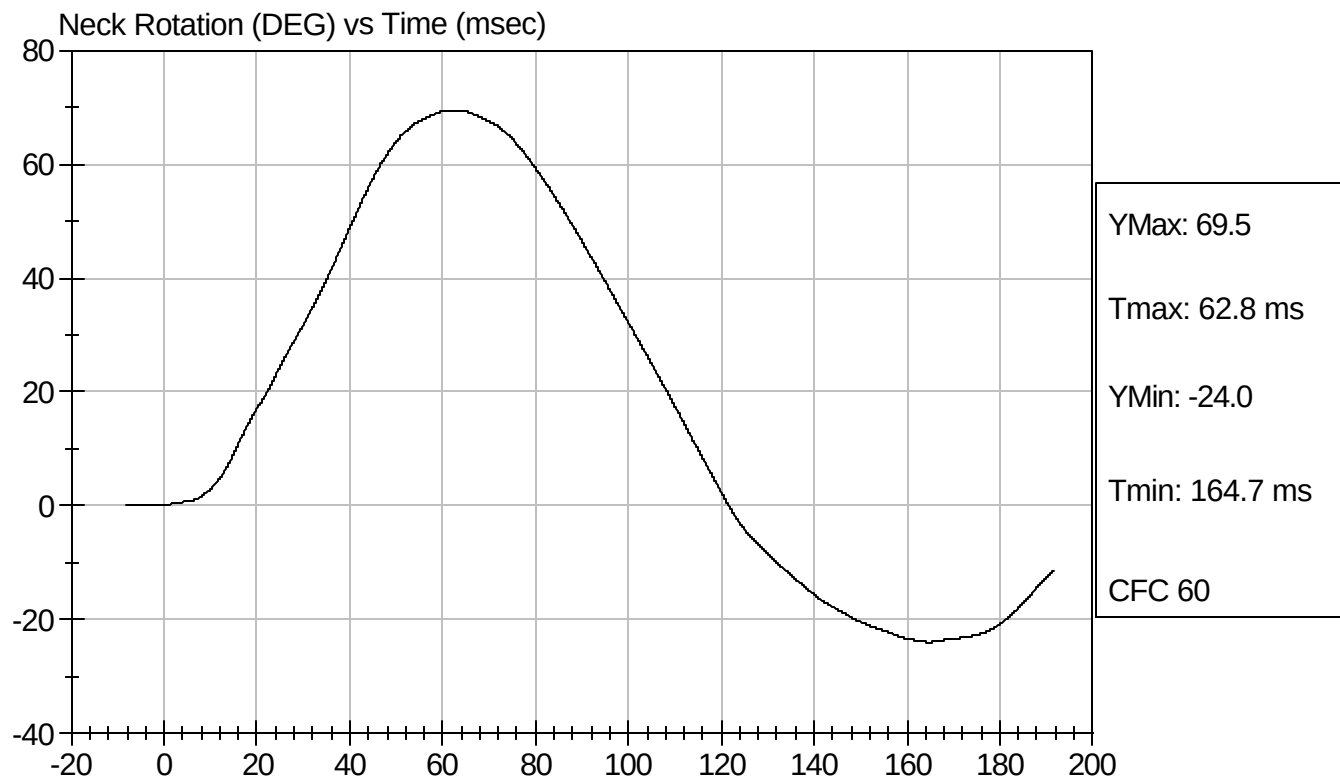
Test Date: 10/9/07
Speed: 23.15 ft/sec, 7.06 m/sec





Test Desc: Neck Bending
Component ID: D073159

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



Calibration Test Results Summary

Dummy Serial Number: 904

Post-Test Calibration

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

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

ATD Serial No: 904

Test I.D: D073191

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	35	Pass
Peak Resultant Acceleration	G's	120 to 150	132	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-8.5	Pass
			Overall Test Results	Pass


Laboratory Technician


Approved By

10/11/07
Test Date



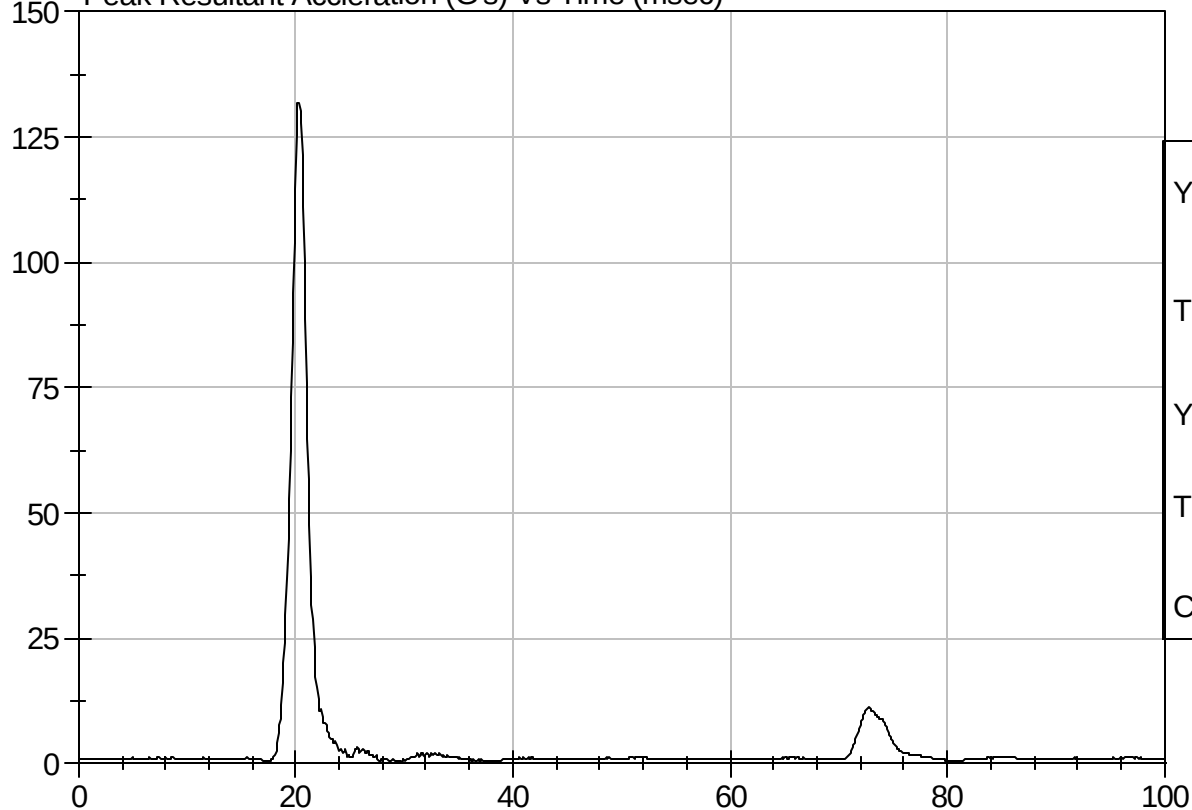
Test Description: Head Drop

Test Date: 10/11/07

Component: D073191

Speed: 0 ft/s, 0 m/s

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



YMax: 132.0 G

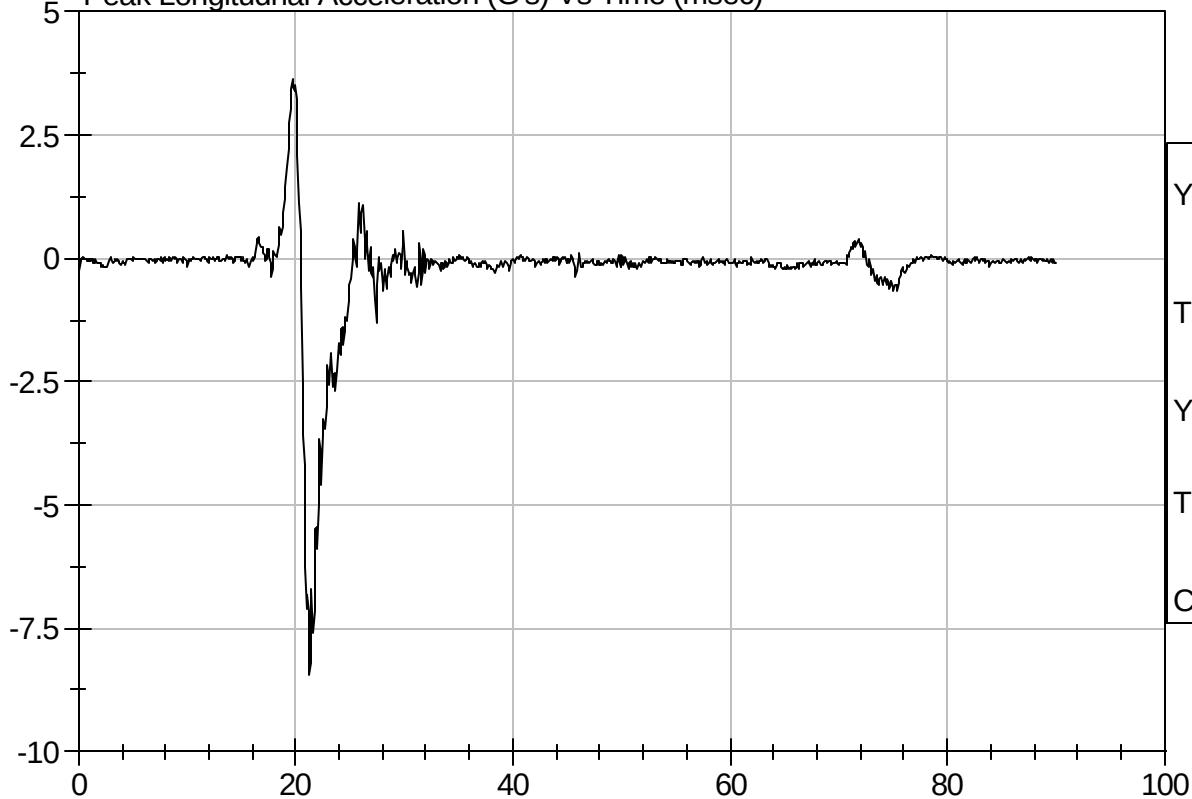
Tmax: 20.3 ms

YMin: 0.3 G

Tmin: 29.7 ms

CFC 1000

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



YMax: 3.6 G

Tmax: 19.7 ms

YMin: -8.5 G

Tmin: 21.3 ms

CFC 1000

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

ATD Serial No: 904

Test I.D: D073192

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	34	Pass
Probe Velocity	m/s	4.22 - 4.31	4.30	Pass
Upper Rib	G's	37 - 46	39	Pass
Lower Rib	G's	37 - 46	38	Pass
Lower Spine	G's	15 - 22	21	Pass
Overall Test Results				Pass


Laboratory Technician

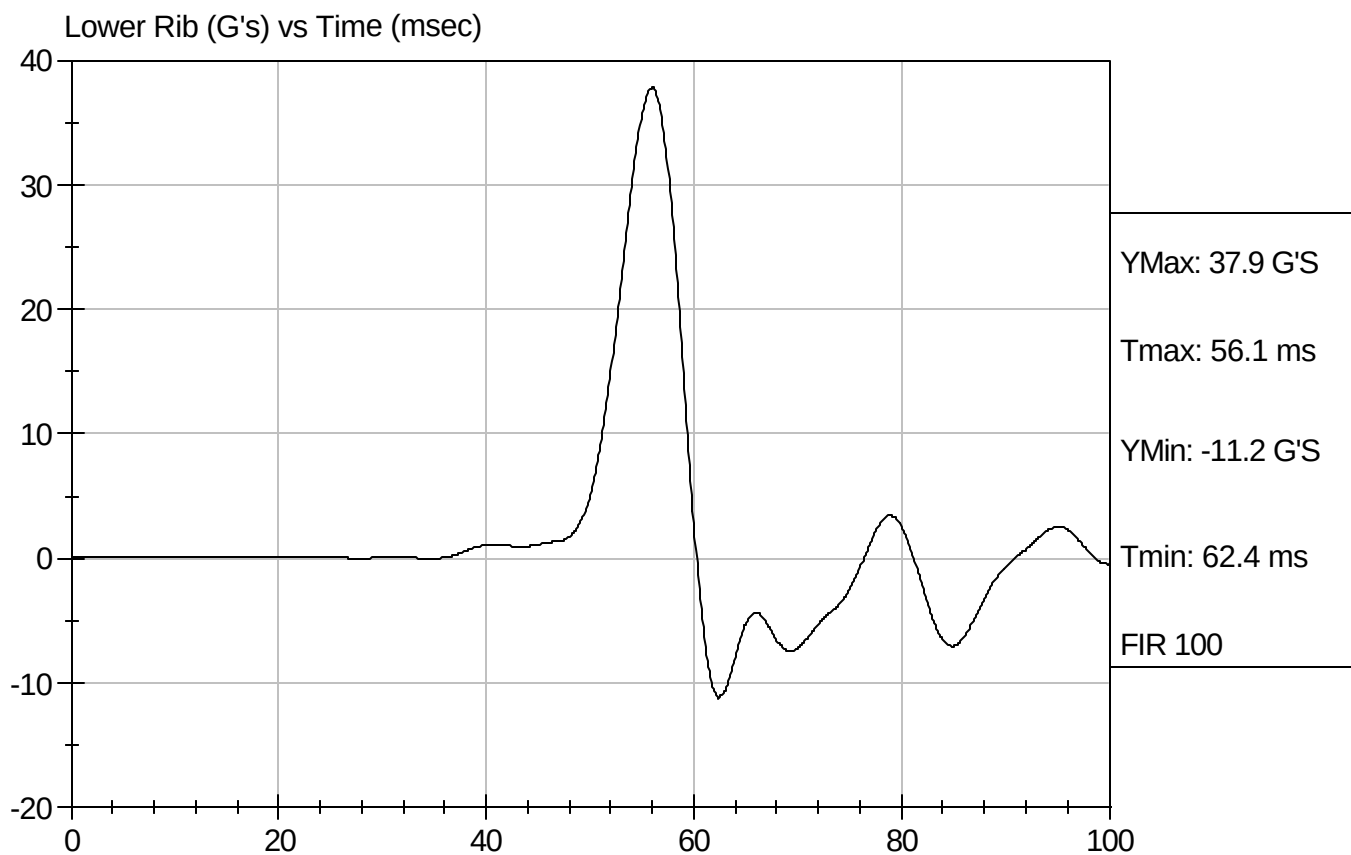
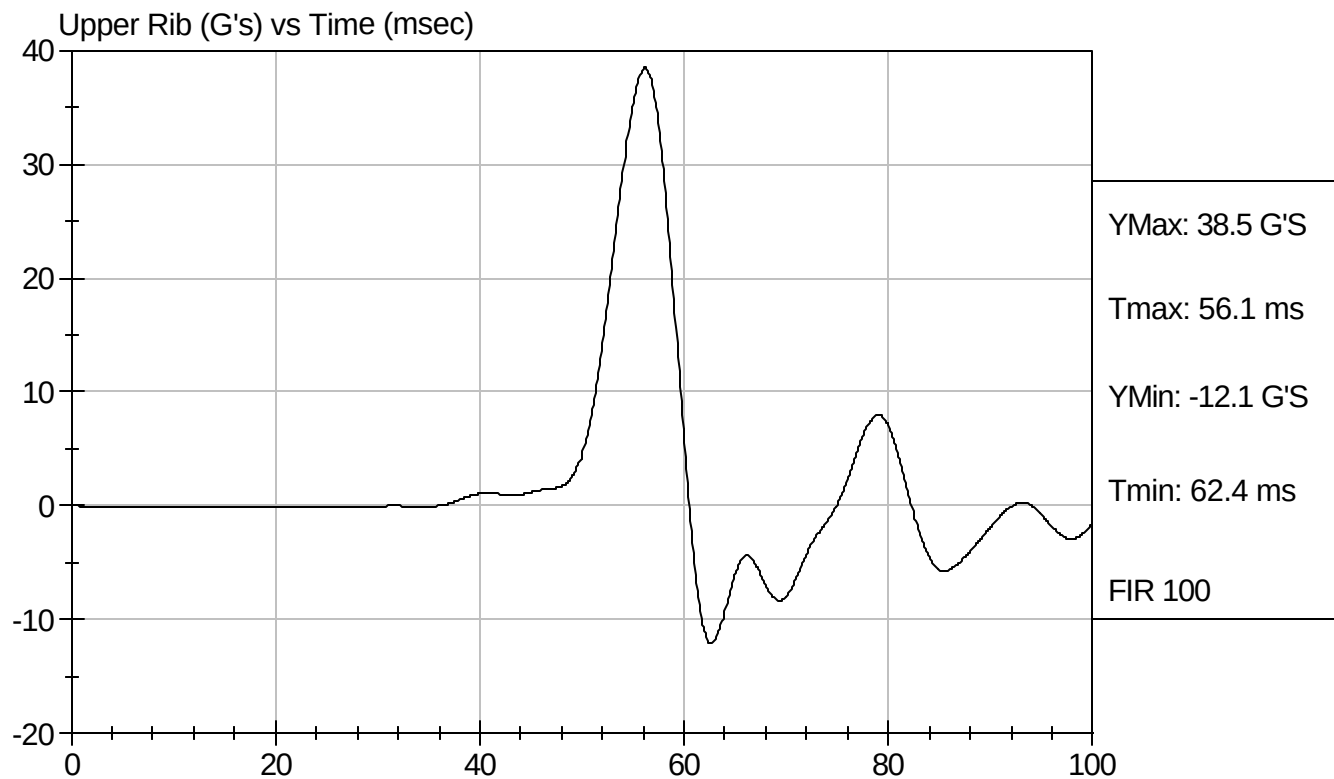

Approved By

10/11/07
Test Date



Test Desc: Thorax Impact
Component ID: D073192

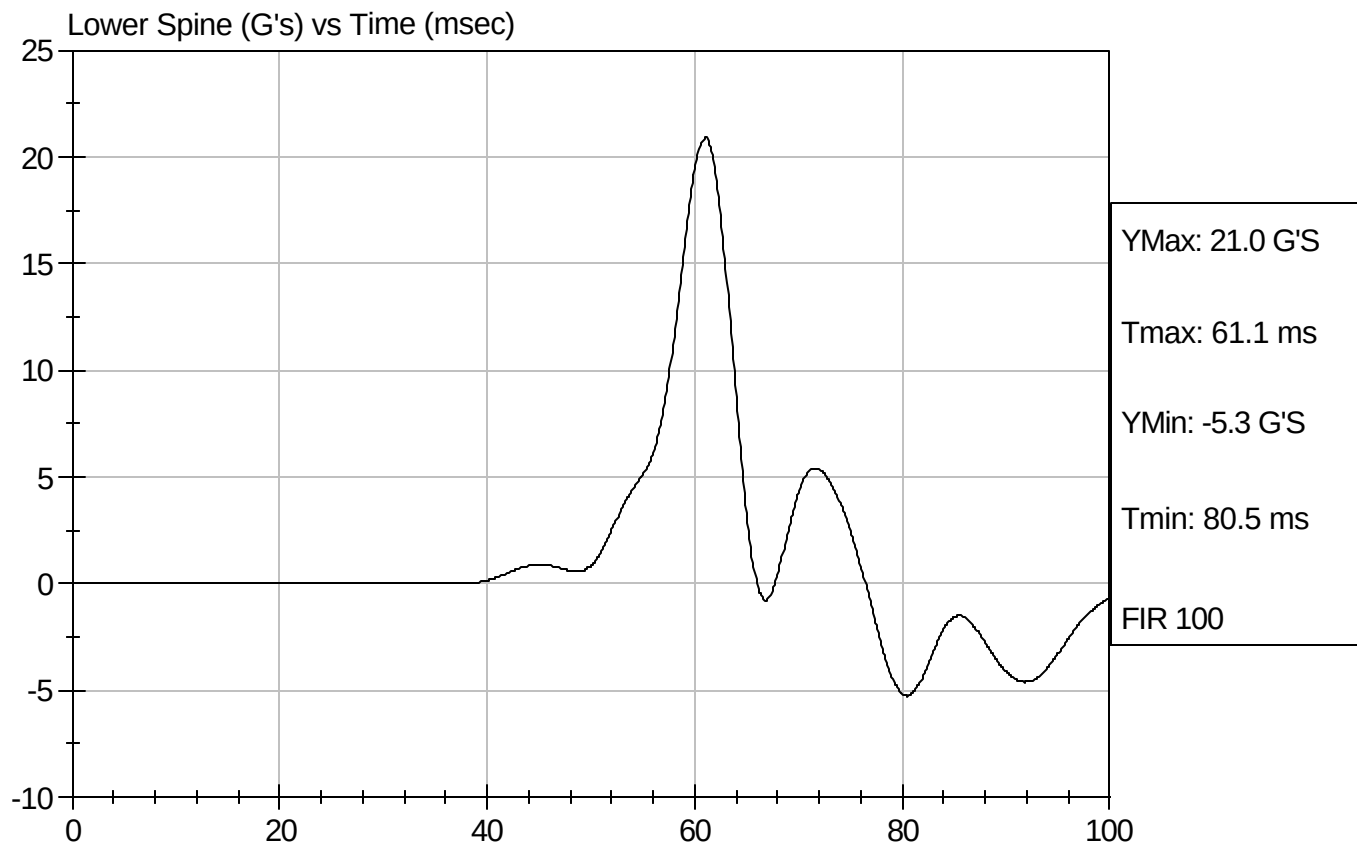
Test Date: 10/11/07
Speed: 14.12 ft/sec, 4.30 m/sec





Test Desc: Thorax Impact
Component ID: D073192

Test Date: 10/11/07
Speed: 14.12 ft/sec, m/sec



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

ATD Serial No: 904

Test I.D: D073193

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	35	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	42	Pass
Overall Test Results			Pass	

Jessica Gall
Laboratory Technician

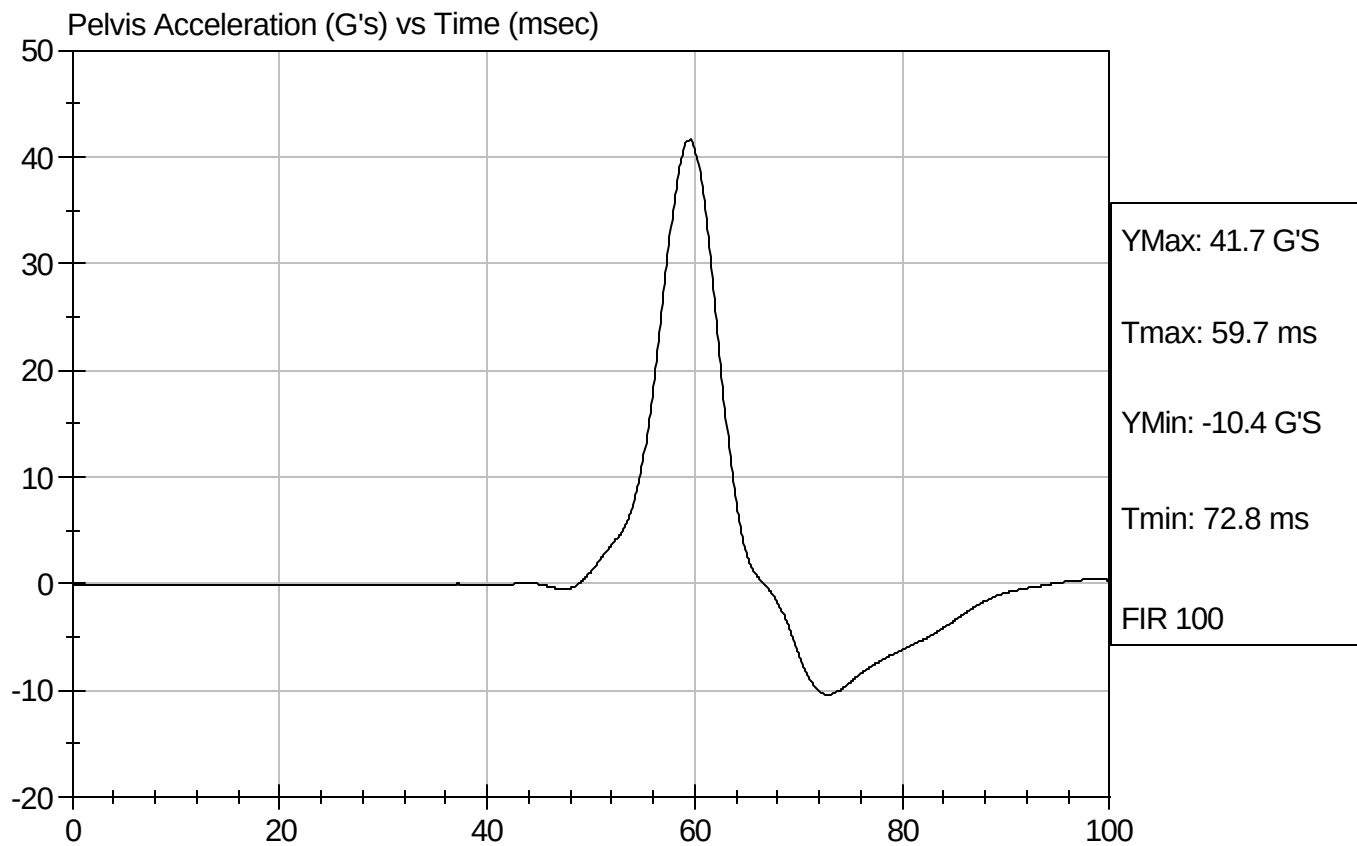
David Winkelbauer
Approved By

10/11/07
Test Date



Test Desc: Pelvis Impact
Component ID: D073193

Test Date: 10/11/07
Speed: 14.1 ft/sec, 4.30 m/sec



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

ATD Serial No: 904

Test I.D: D073194

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	34	Pass
Force At 12.7 mm	N	104 -162	136	Pass
Force At 19 mm	N	163 - 222	183	Pass
Force At 25.4 mm	N	222 - 280	244	Pass
Force At 33 mm	N	325 - 391	330	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

10/11/07
Test Date

David Winkelbauer
Approved By

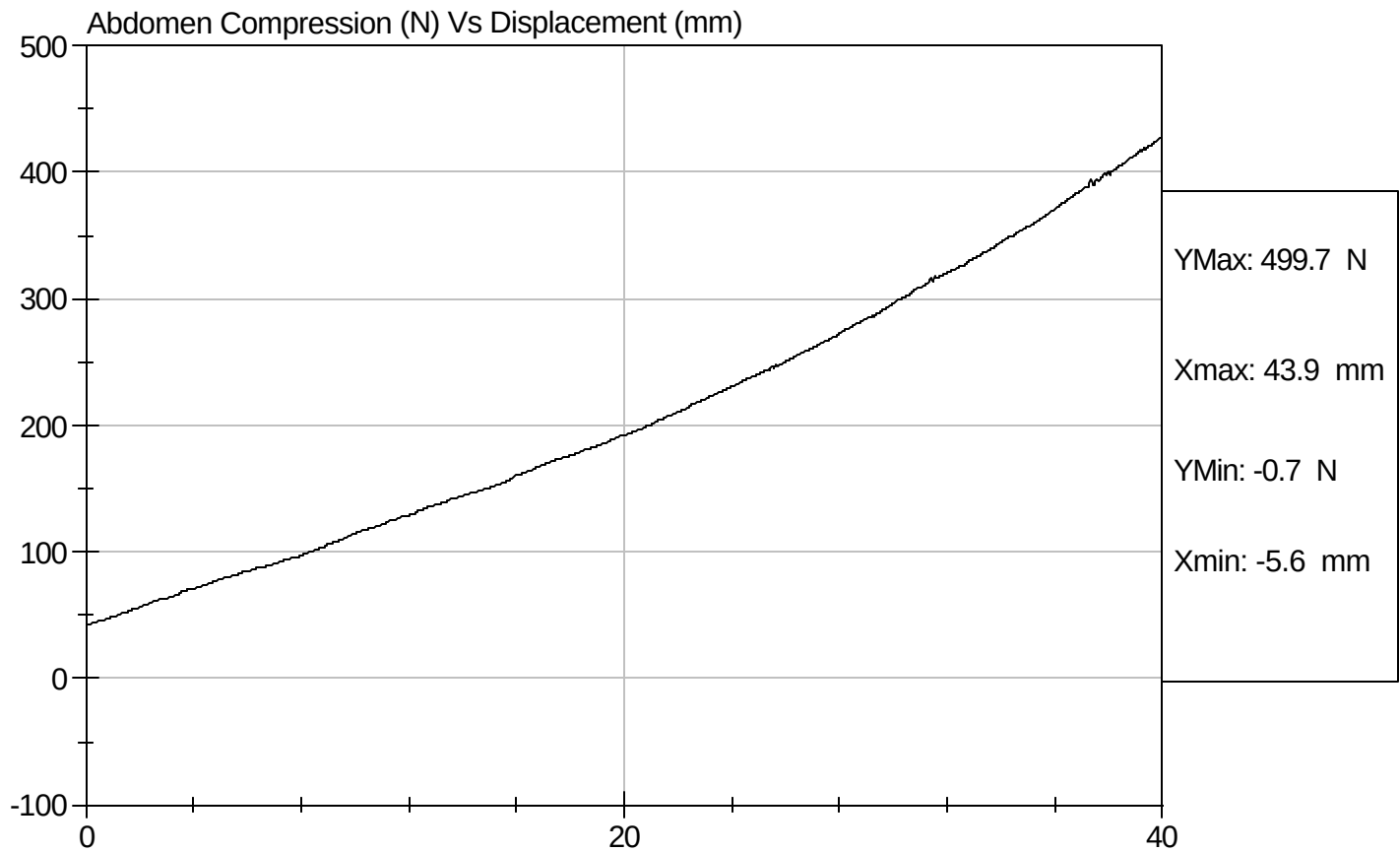


Test Description: Abdomen Compression

Test Date: 10/11/07

Component: D073194

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 904

Test I.D: D073195

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	34	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	133.9	Pass
Force At 30 deg	N	151.2 - 204.6	160.2	Pass
Force At 40 deg	N	204.6 - 258.0	211.6	Pass
Return Angle	Deg	12 Maximum	6	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

10/11/07
Test Date

David Winkelbauer
Approved By

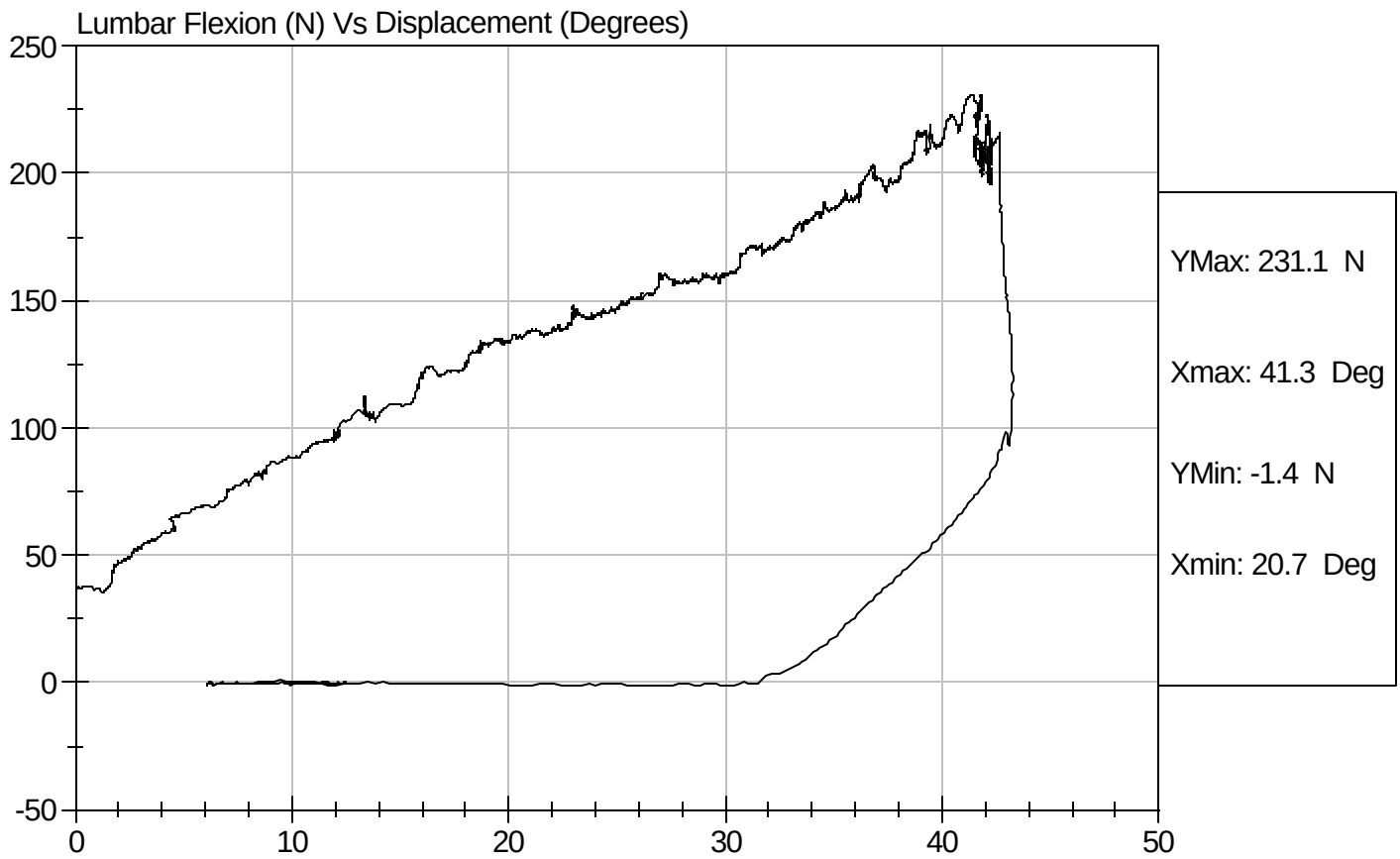


Test Description: Lumbar Flexion

Test Date: 10/11/07

Component: D073195

Speed: 0 ft/sec, 0 m/sec



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

ATD Serial No: 904

Test I.D: D073199

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	36	Pass
Impact Velocity		m/s	6.89 to 7.13	7.05	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.33	Pass
	20 msec	m/s	4.12 to 5.10	4.40	Pass
	30 msec	m/s	5.73 to 7.01	6.00	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	58	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	79	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	59	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	13	Pass


 Laboratory Technician

10/12/07

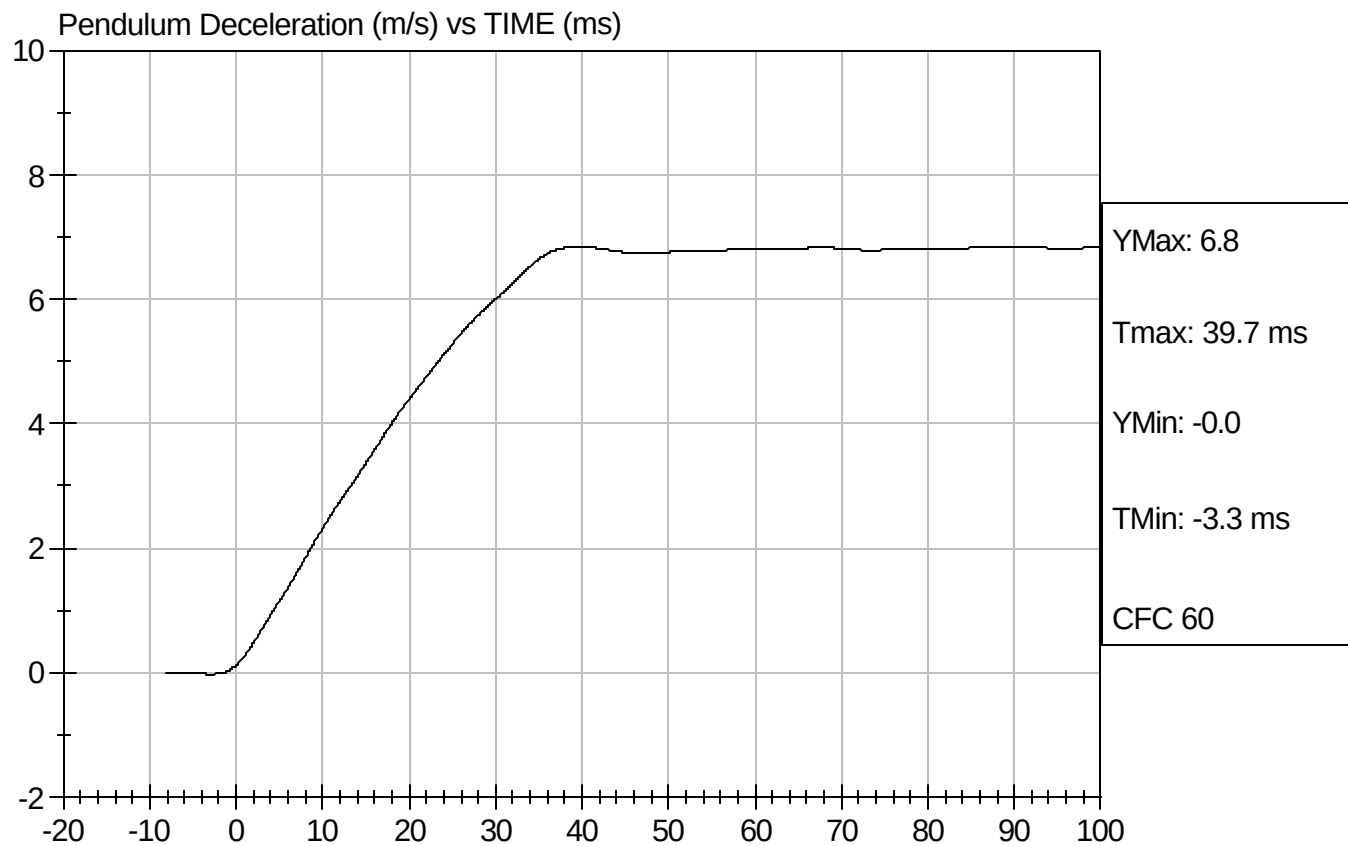
Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D073199

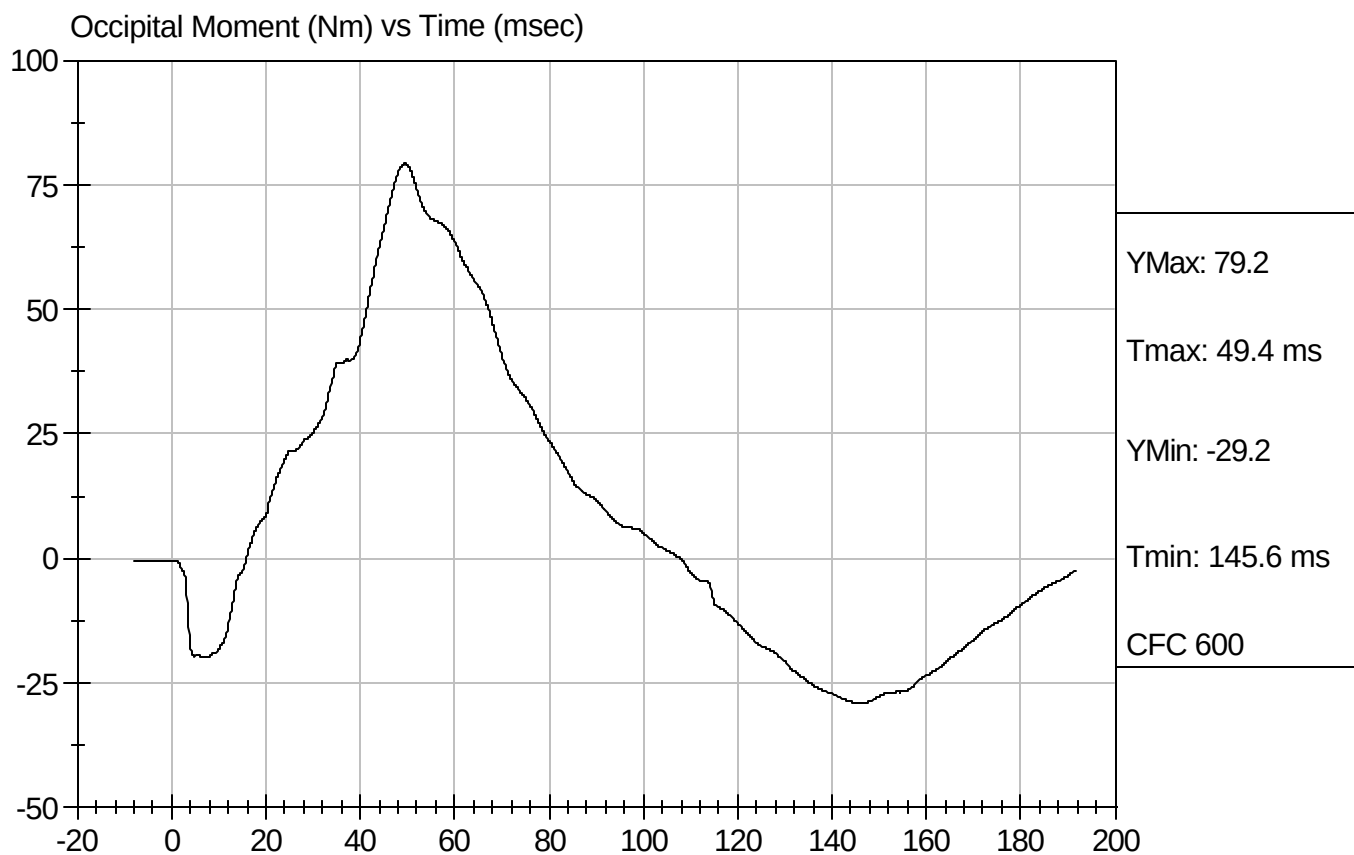
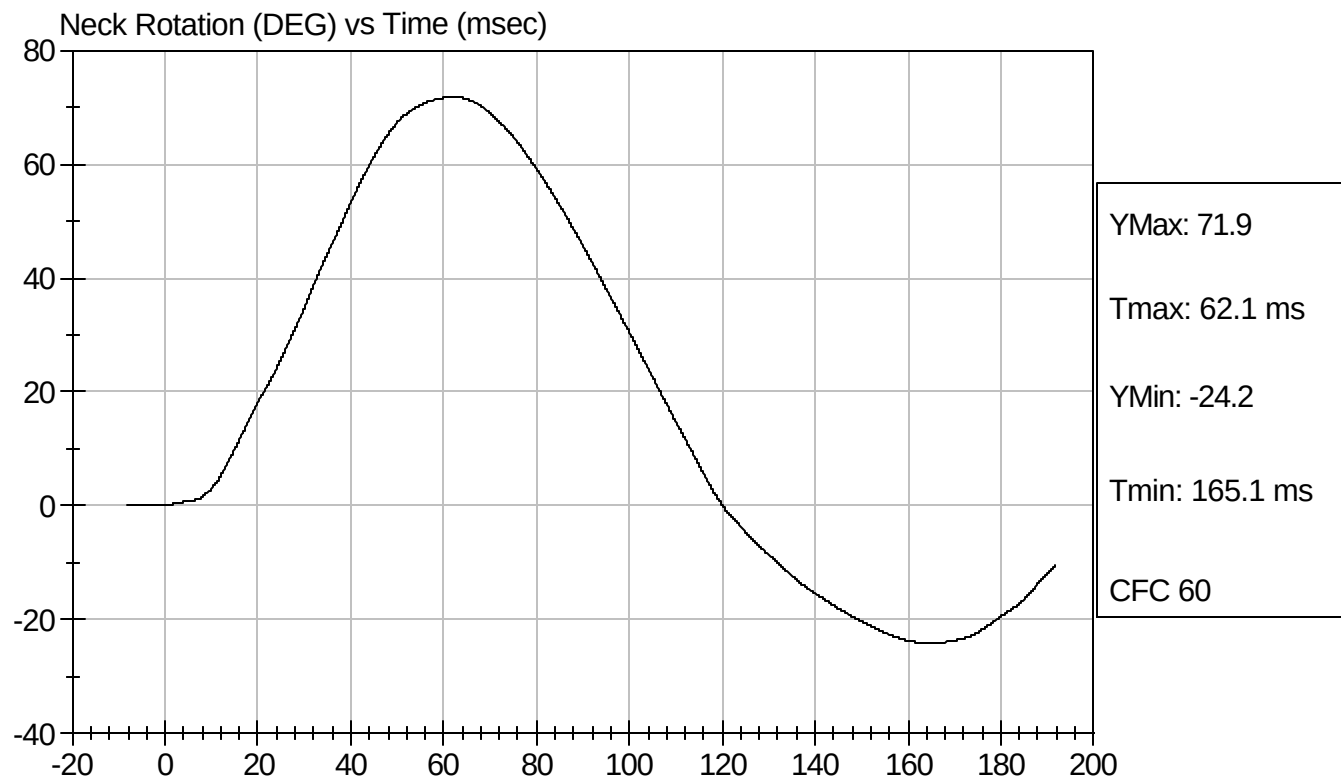
Test Date: 10/12/07
Speed: 23.14 ft/sec, 7.05 m/sec





Test Desc: Neck Bending
Component ID: D073199

Test Date: 10/12/07
Speed: 23.14 ft/sec, 7.05 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Inspection Checklist

ATD Serial No: 904

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

Jessica Hall
Laboratory Technician
David Winkelbauer
Approved By

10/12/2007
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: D07314

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

Jessica Gall
Laboratory Technician

10/9/2007
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: D073141

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

Jessica Gall
Laboratory Technician

10/8/07
Test Date

David Winkelbauer
Approved By



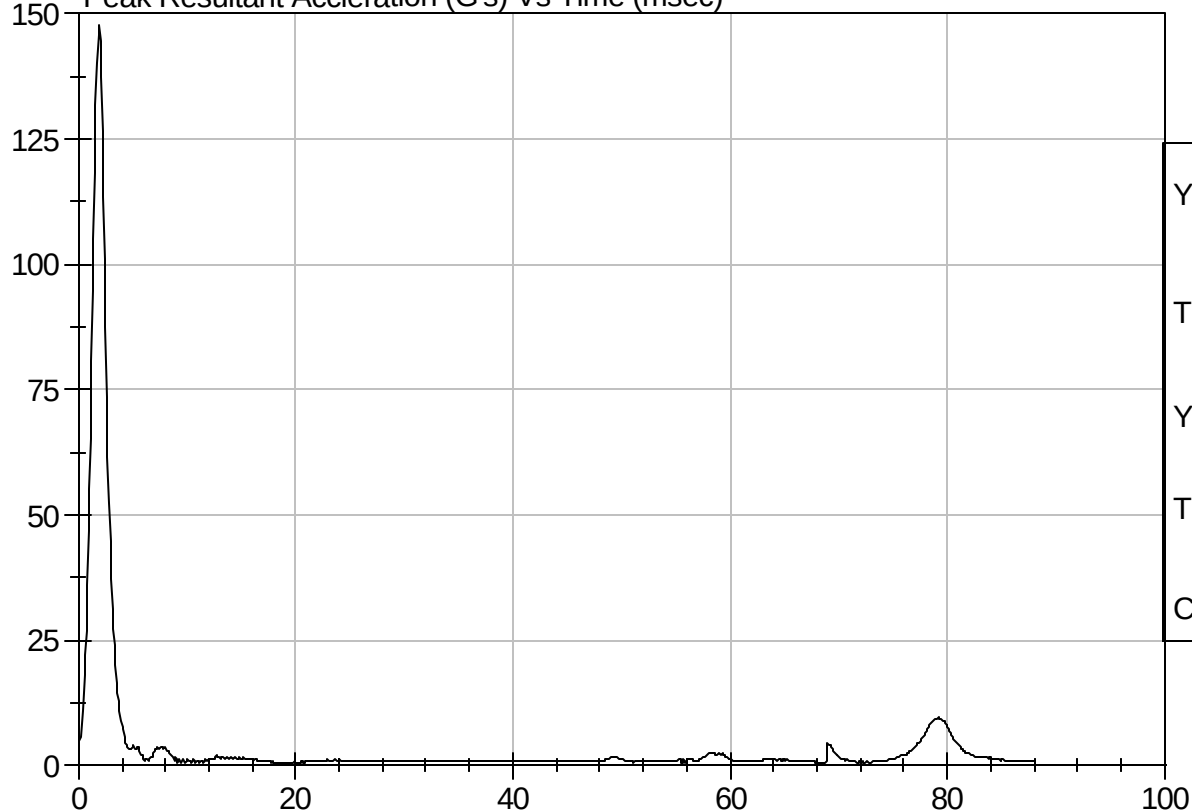
Test Description: Head Drop

Test Date: 10/8/07

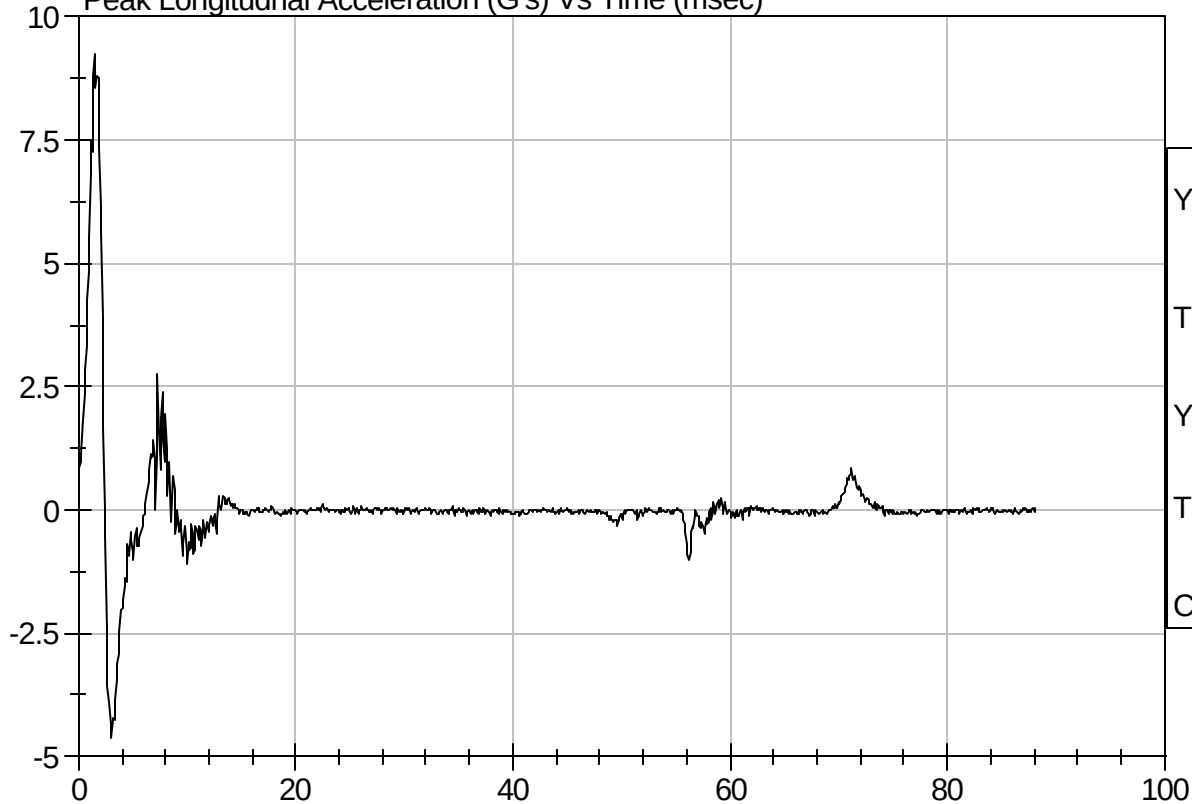
Component: D073141

Speed: 0 ft/s, 0.00 m/s

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



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



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

ATD Serial No: 271

Test I.D: D073142

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

Jessica Gall
Laboratory Technician

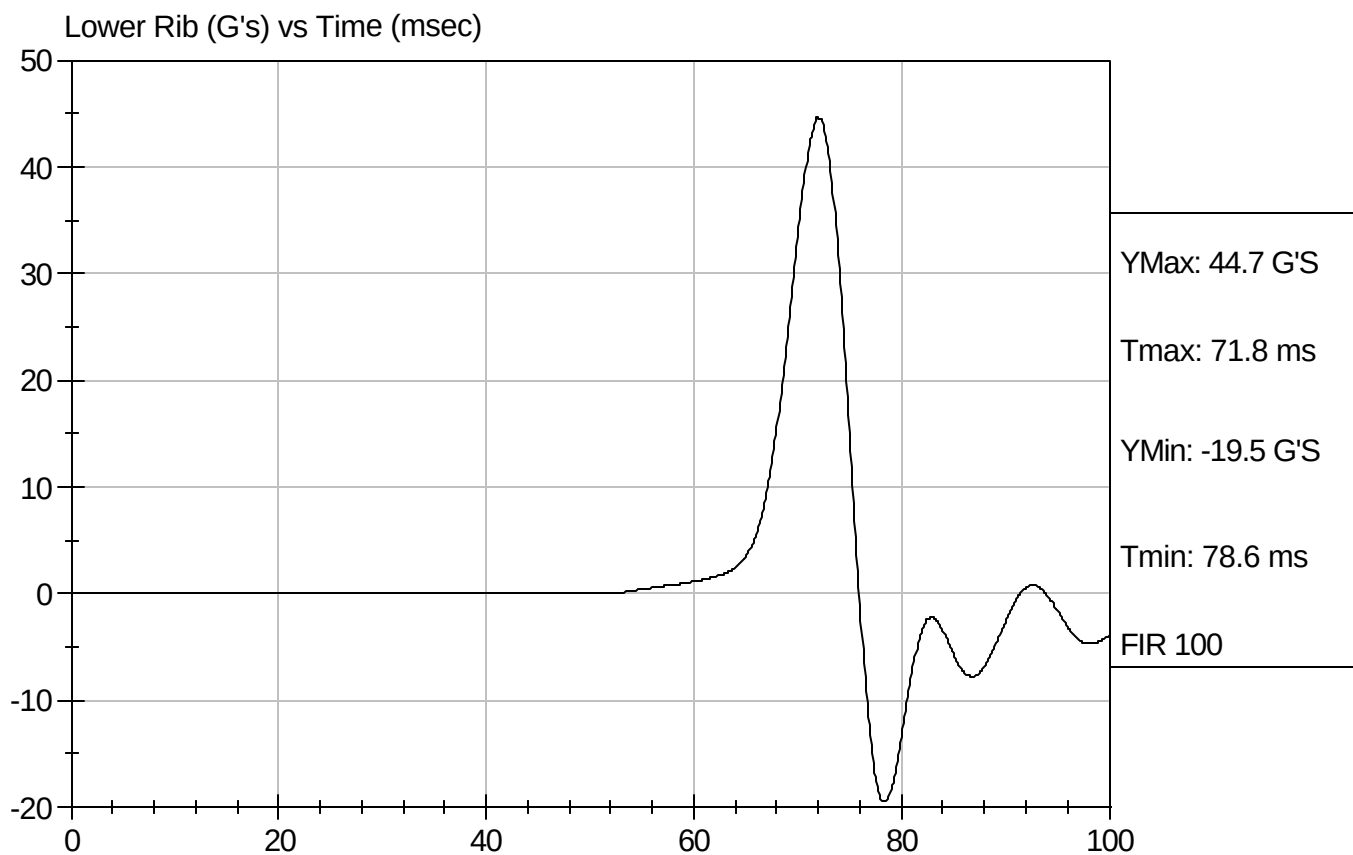
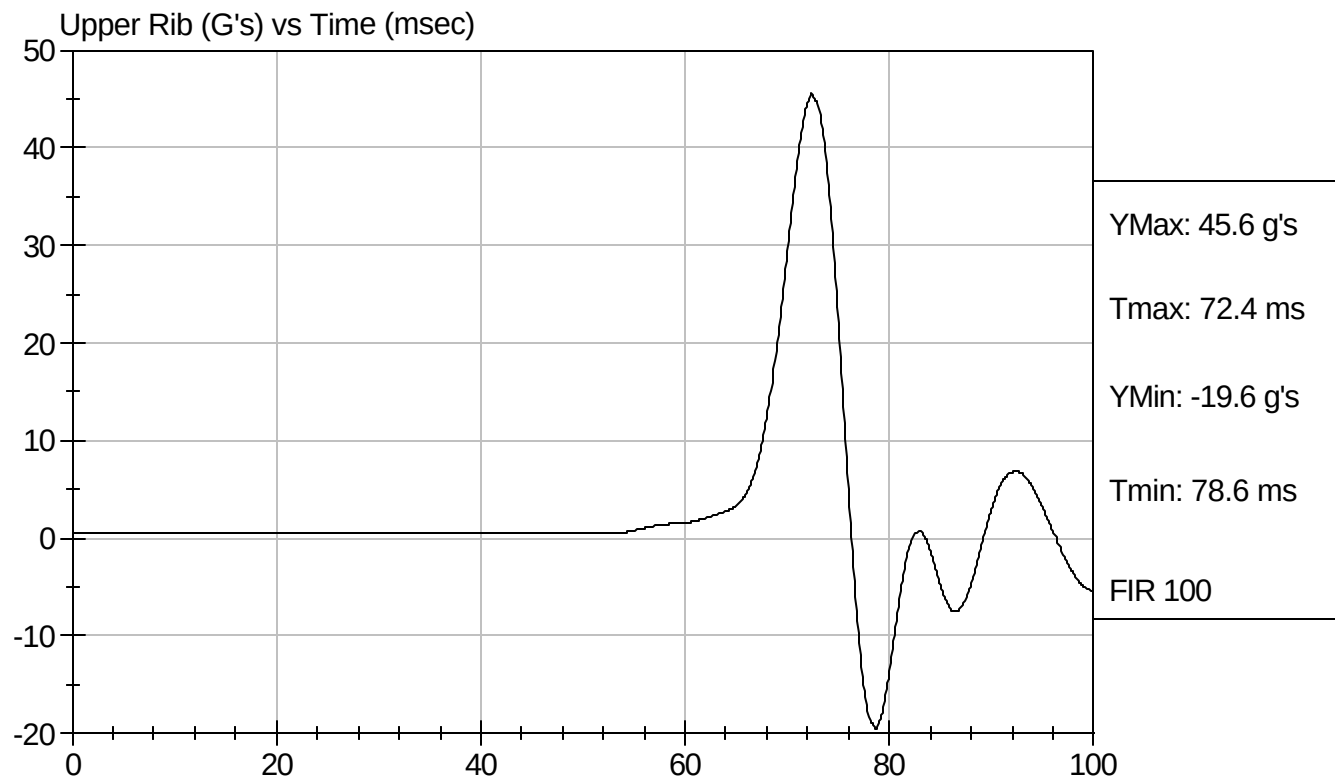
David Winkelbauer
Approved By

10/8/07
Test Date



Test Desc: Thorax Impact
Component ID: D073142

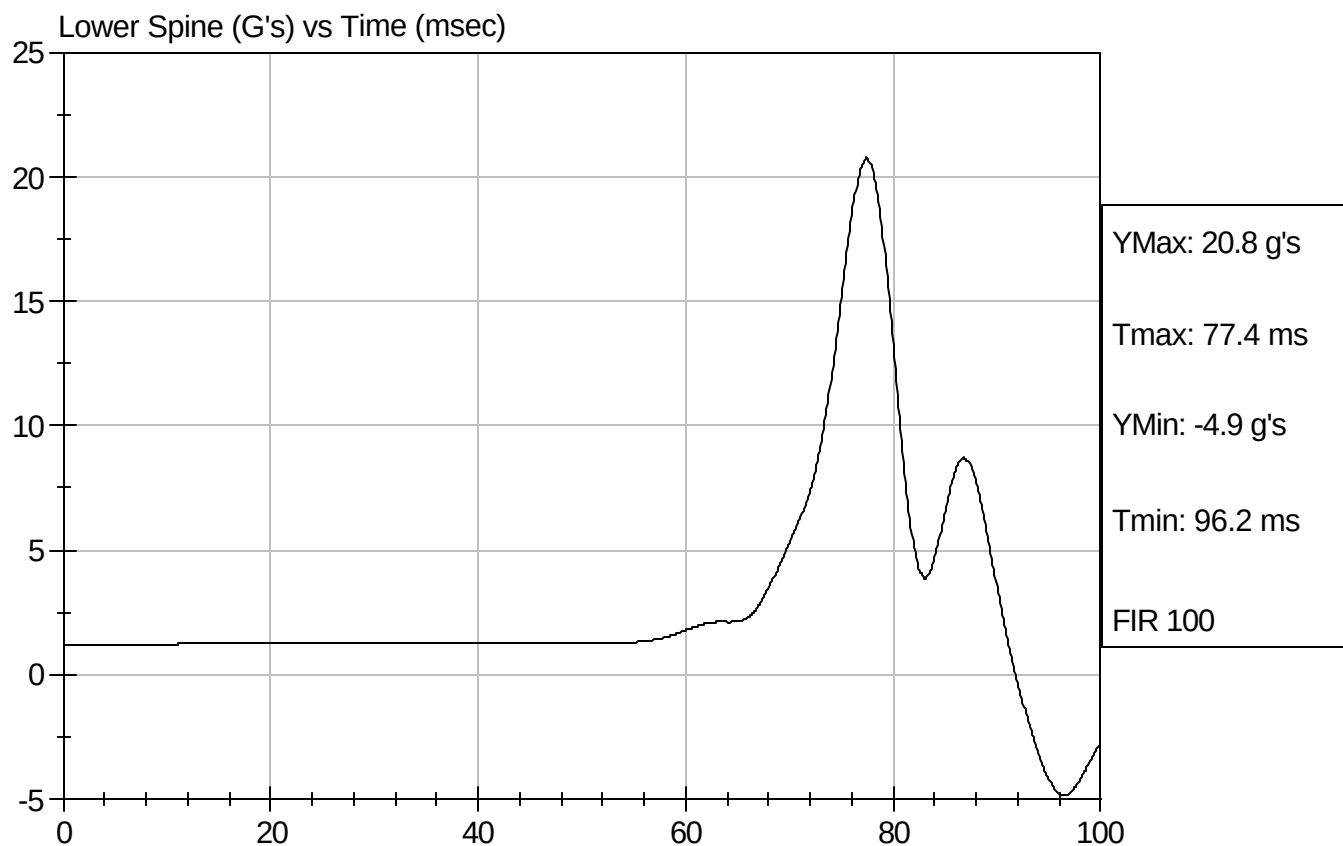
Test Date: 10/8/07
Speed: 13.89 ft/sec, 4.23 m/sec





Test Desc: Thorax Impact
Component ID: D073142

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



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

ATD Serial No: 271

Test I.D: D073143

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

Jessica Gall
Laboratory Technician

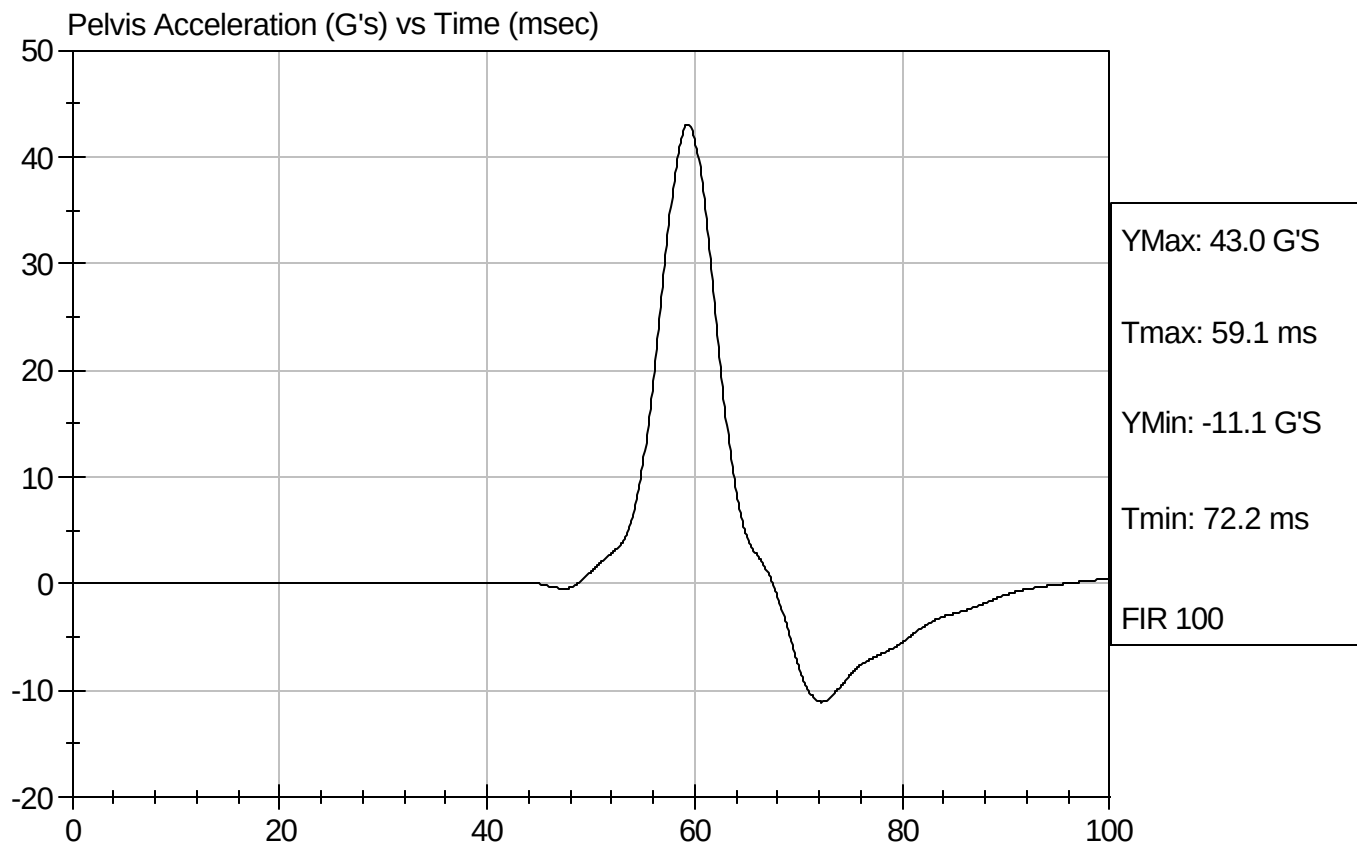
David Winkelbauer
Approved By

10/8/07
Test Date



Test Desc: Pelvis Impact
Component ID: D073143

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



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

ATD Serial No: 271

Test I.D: D073144

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

Jessica Gall
Laboratory Technician

10/8/07
Test Date

David Winkelbauer
Approved By

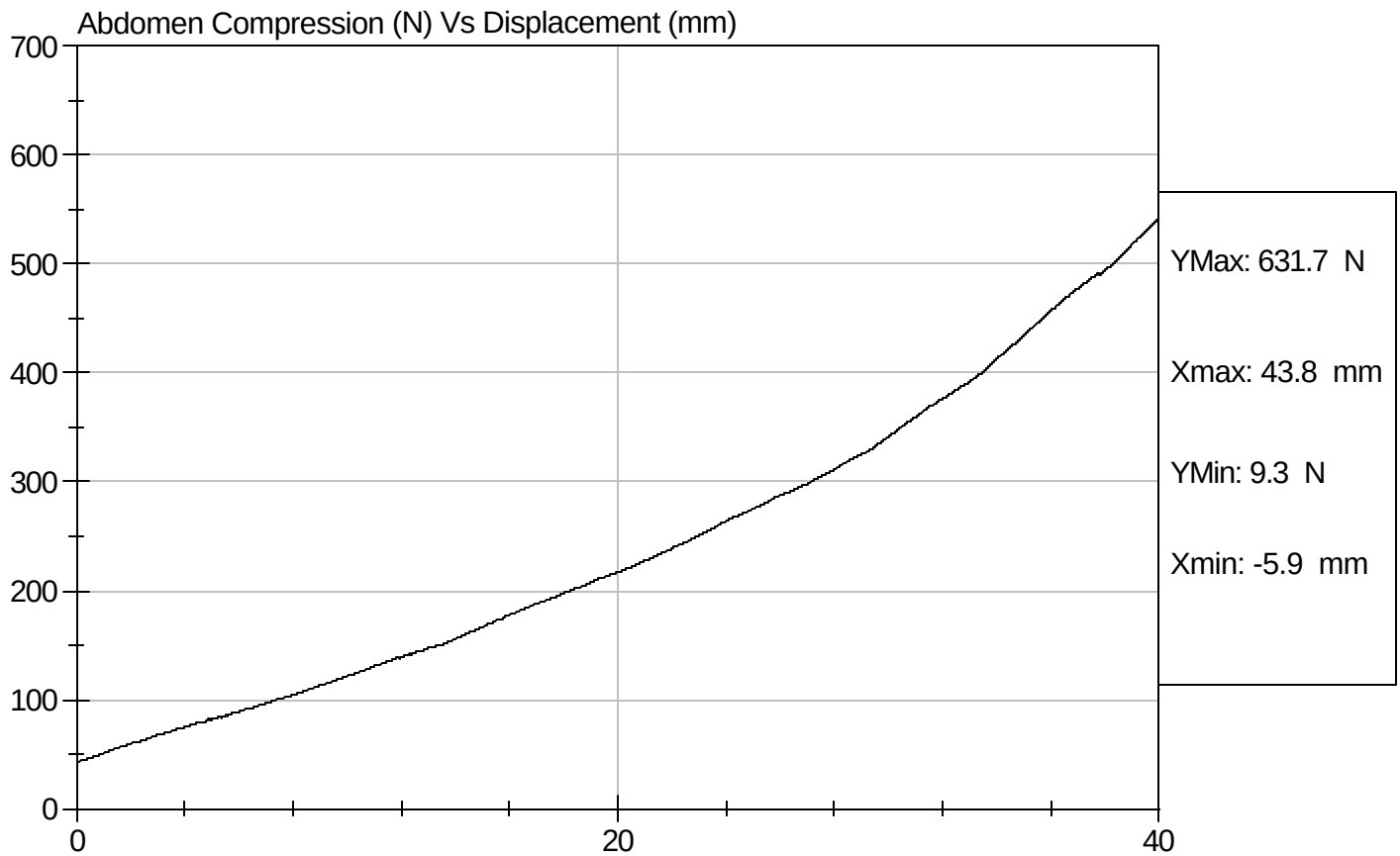


Test Description: Abdomen Compression

Test Date: 10/8/07

Component: D073144

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 271

Test I.D: D073145

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


Laboratory Technician


Approved By

10/8/07
Test Date

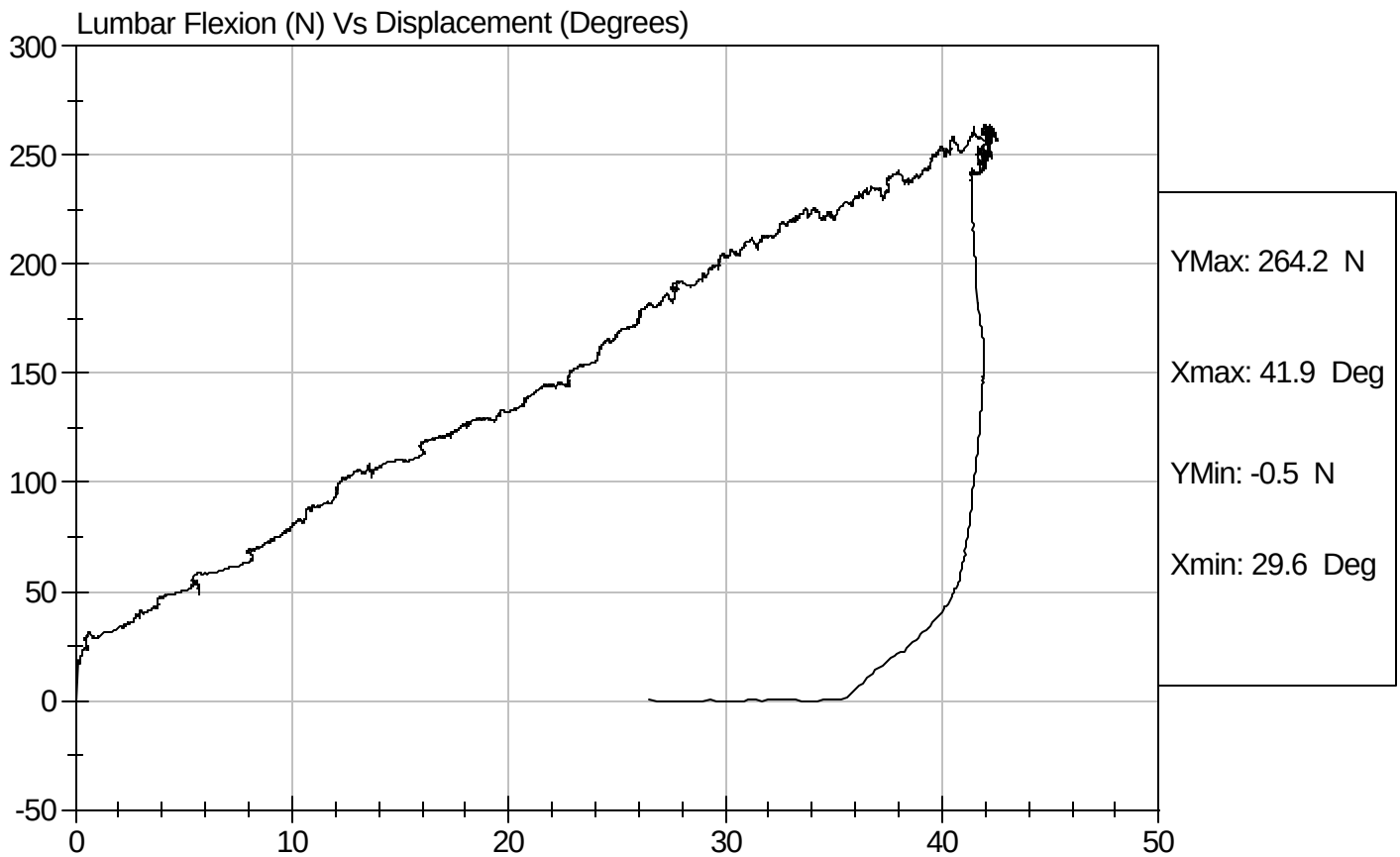


Test Description: Lumbar Flexion

Test Date: 10/8/07

Component: D073145

Speed: 0 ft/sec, 0.00 m/sec



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

ATD Serial No: 271

Test I.D: D073149

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


 Laboratory Technician

10/9/07

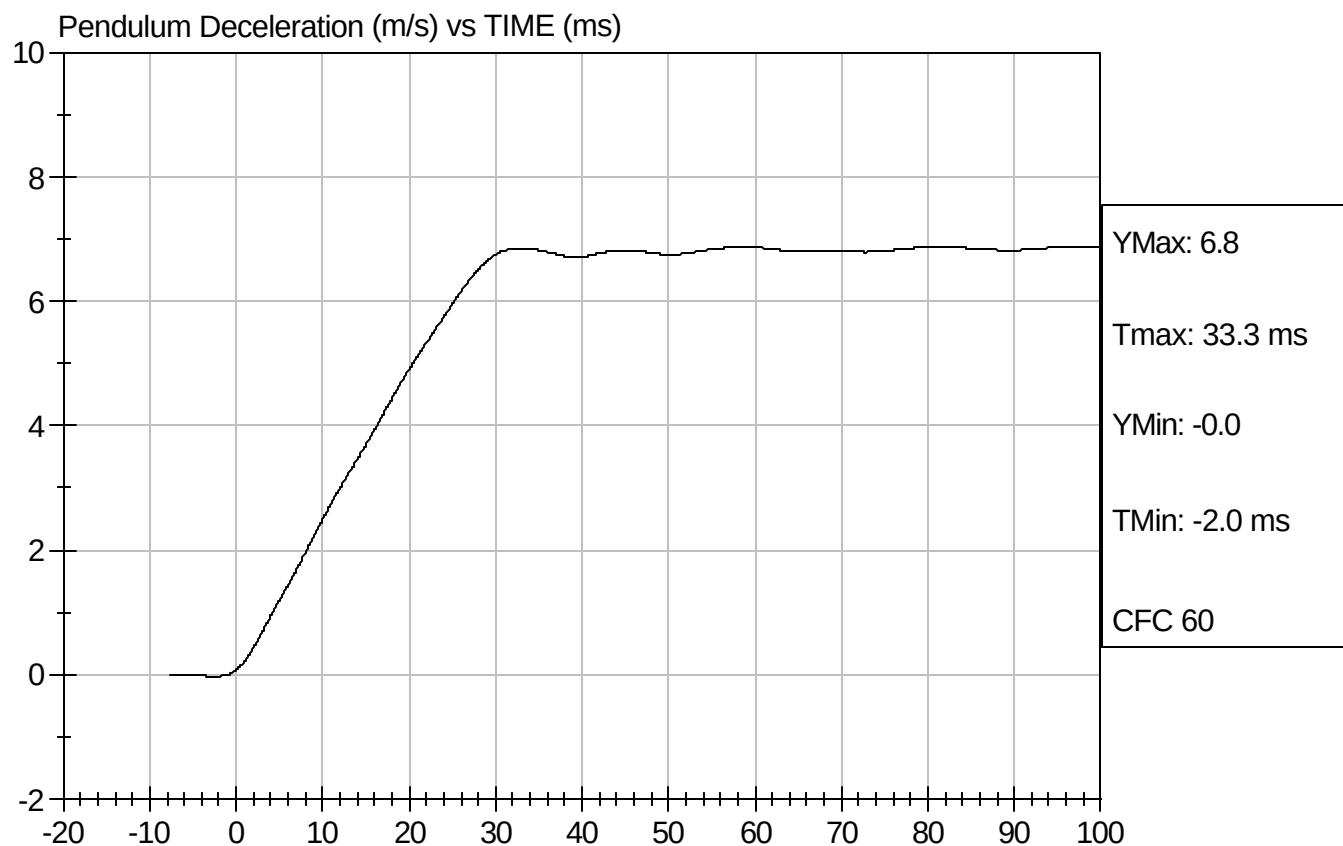
Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D073149

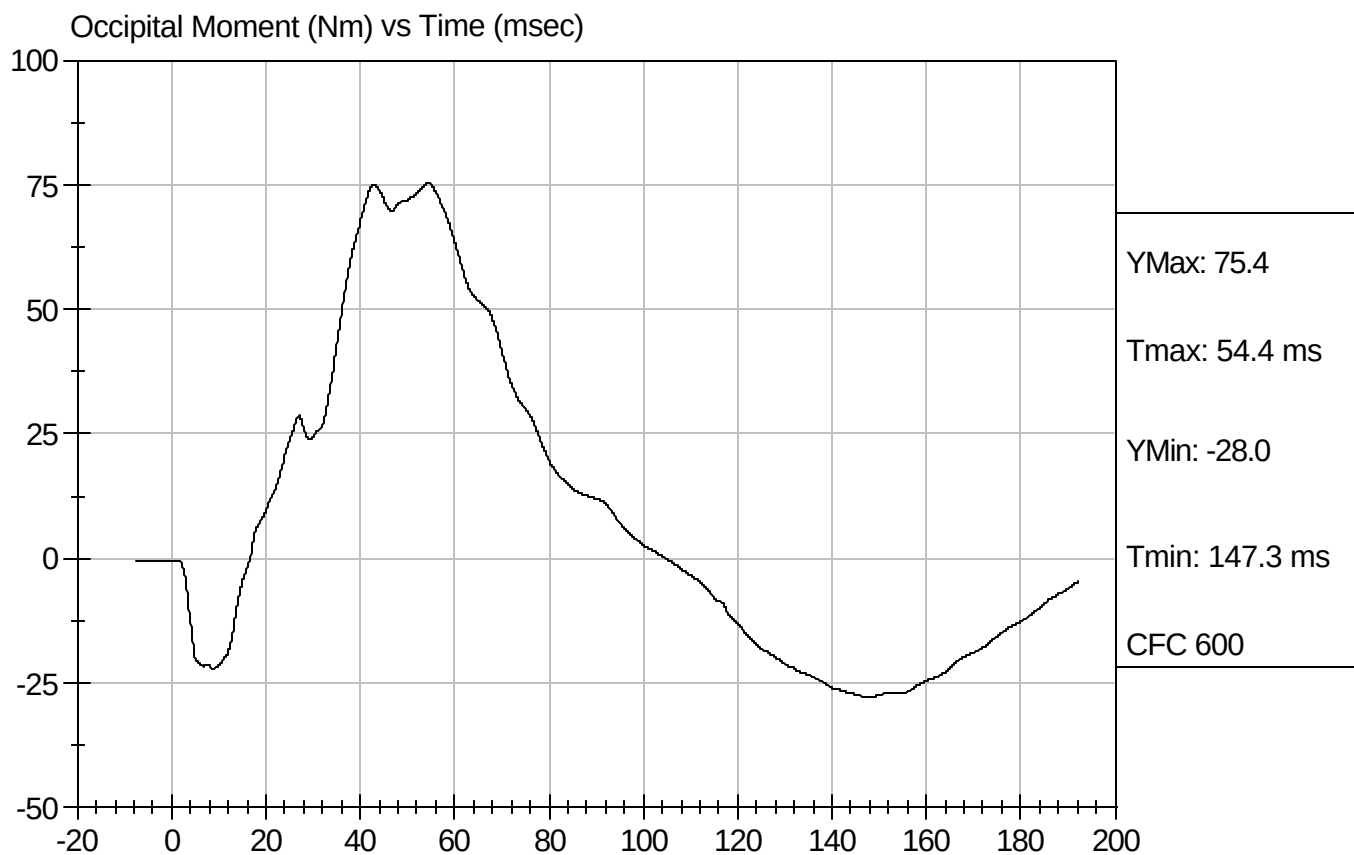
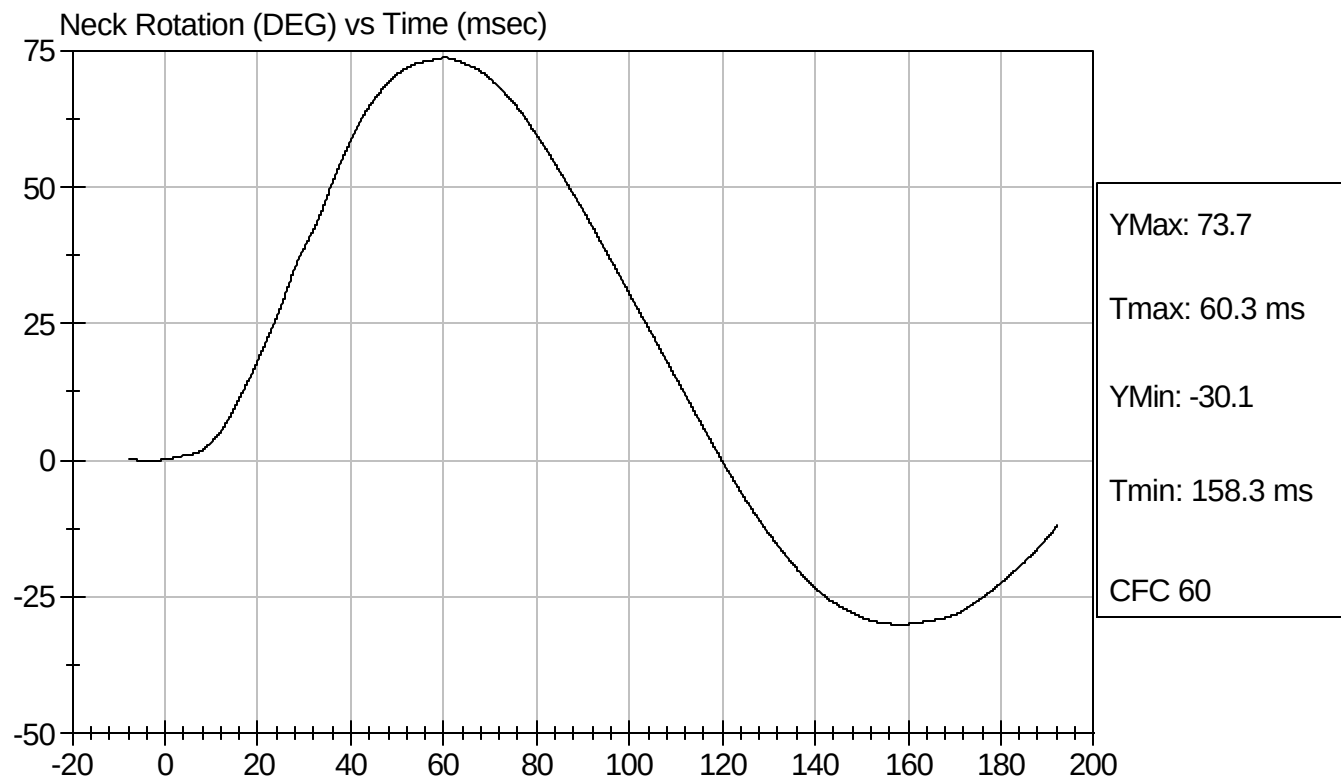
Test Date: 10/9/07
Speed: 22.83 ft/sec, 6.96 m/sec





Test Desc: Neck Bending
Component ID: D073149

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



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: D073181

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	34	Pass
Peak Resultant Acceleration	G's	120 to 150	143	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	9.7	Pass
			Overall Test Results	Pass

Jessica Gall
Laboratory Technician

David Winkelbauer
Approved By

10/11/07
Test Date



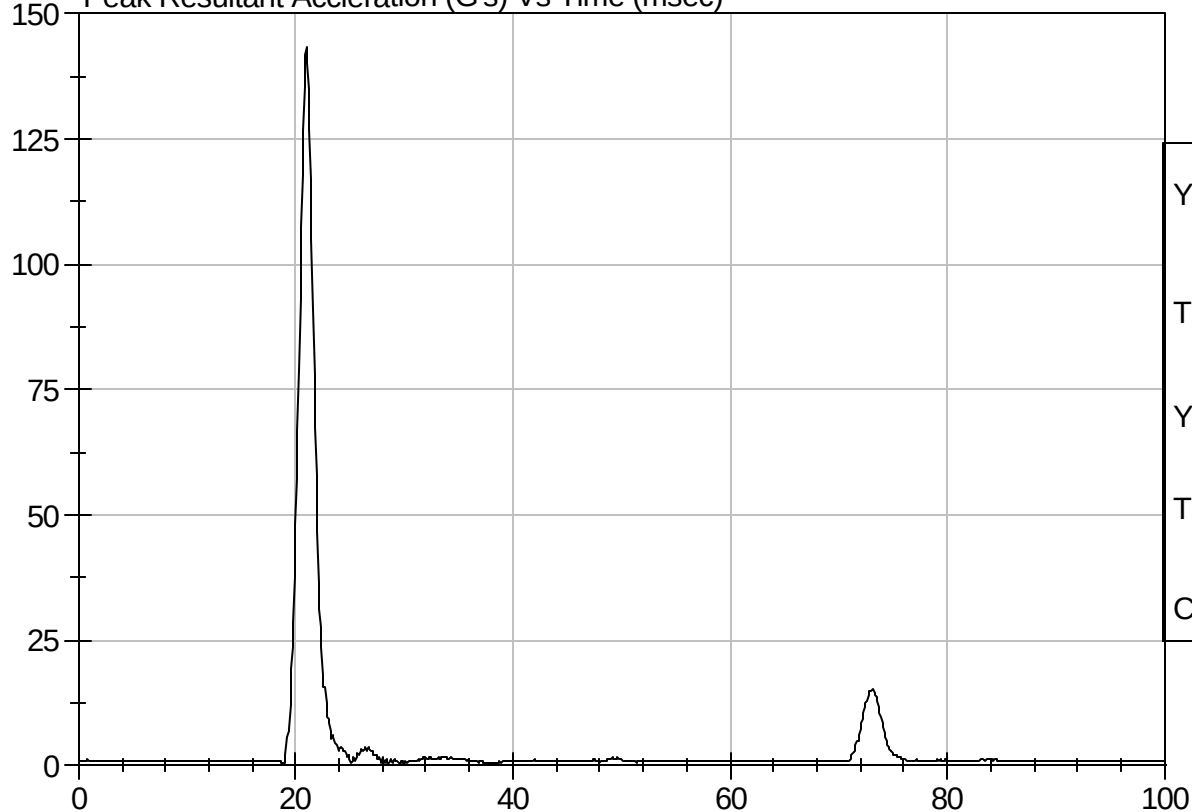
Test Description: Head Drop

Test Date: 10/11/07

Component: D073181

Speed: 0 ft/s, 0 m/s

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



YMax: 143.2 G

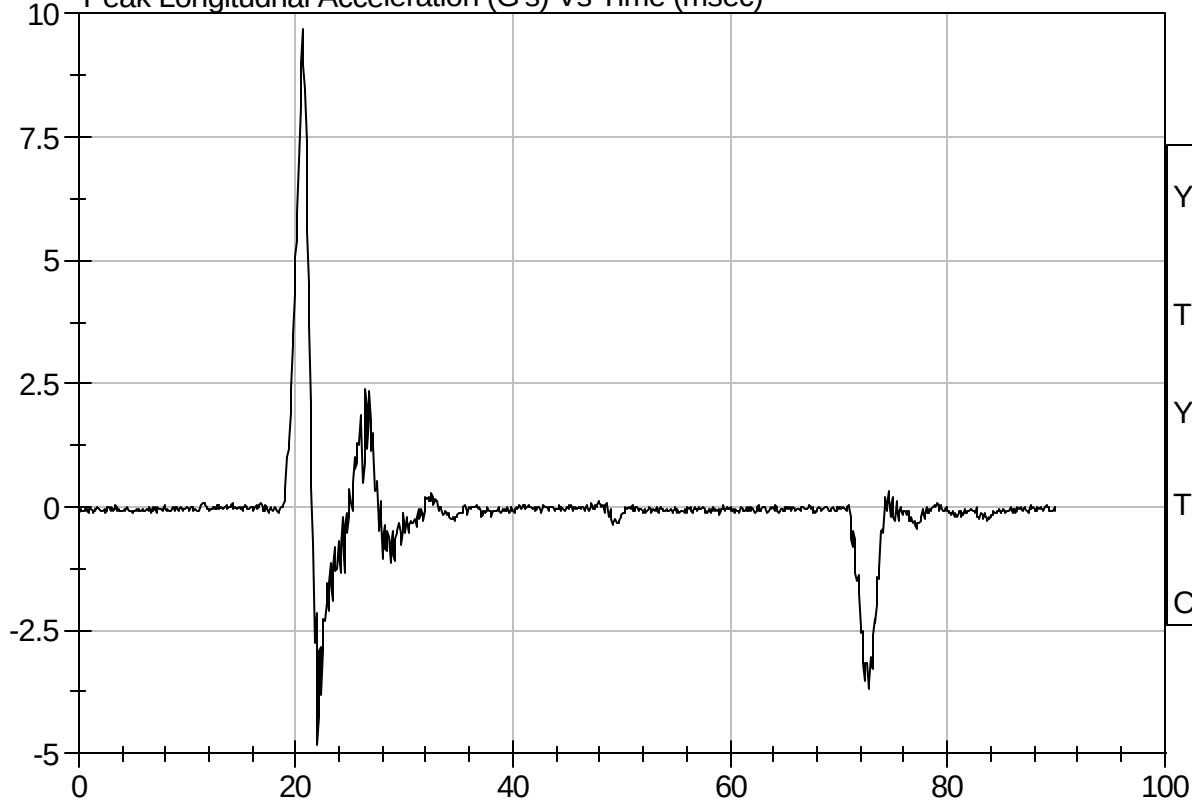
Tmax: 21.0 ms

YMin: 0.3 G

Tmin: 25.1 ms

CFC 1000

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



YMax: 9.7 G

Tmax: 20.6 ms

YMin: -4.8 G

Tmin: 22.0 ms

CFC 1000

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

ATD Serial No: 271

Test I.D: D073182

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	35	Pass
Probe Velocity	m/s	4.22 - 4.31	4.27	Pass
Upper Rib	G's	37 - 46	45	Pass
Lower Rib	G's	37 - 46	42	Pass
Lower Spine	G's	15 - 22	18	Pass
Overall Test Results				Pass


Laboratory Technician

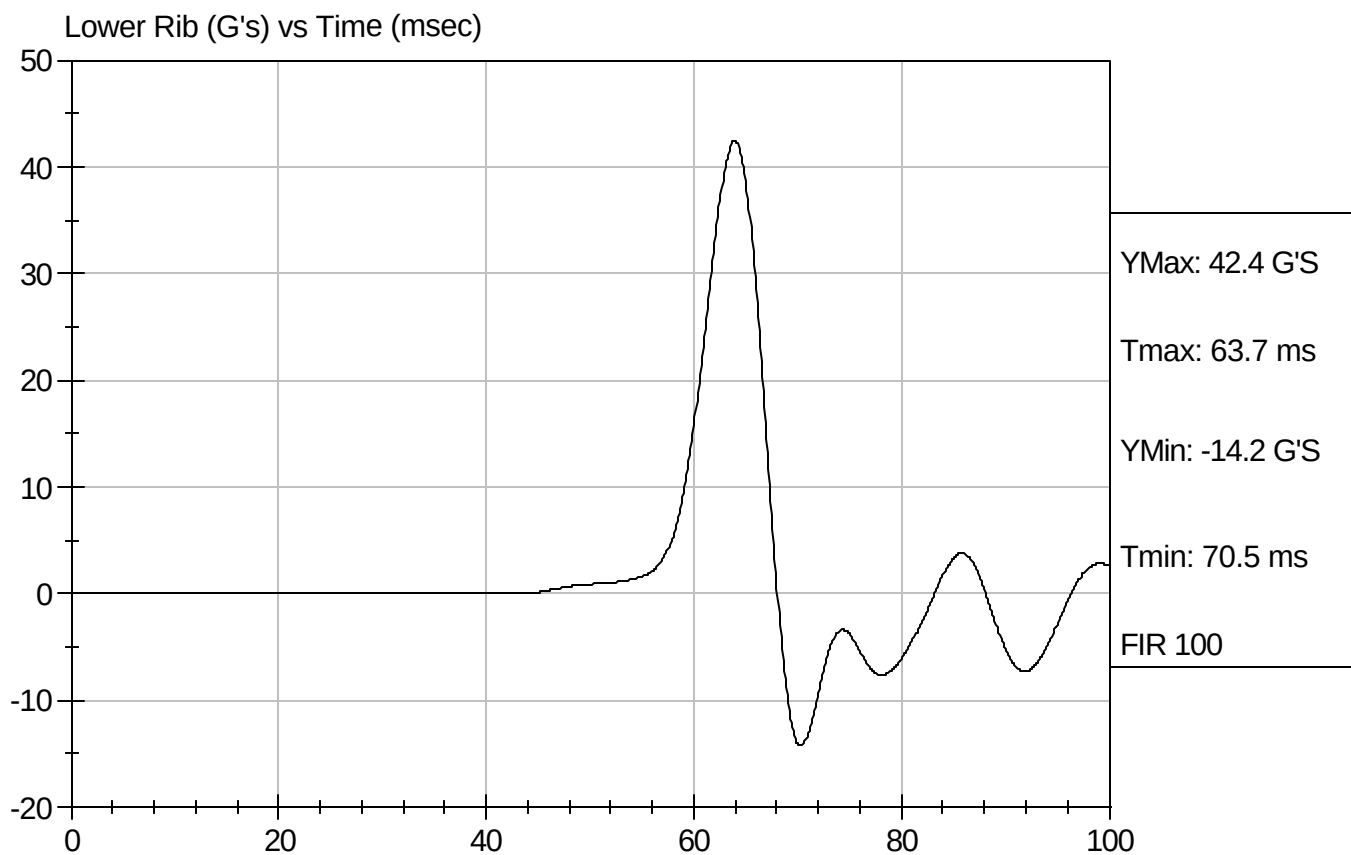
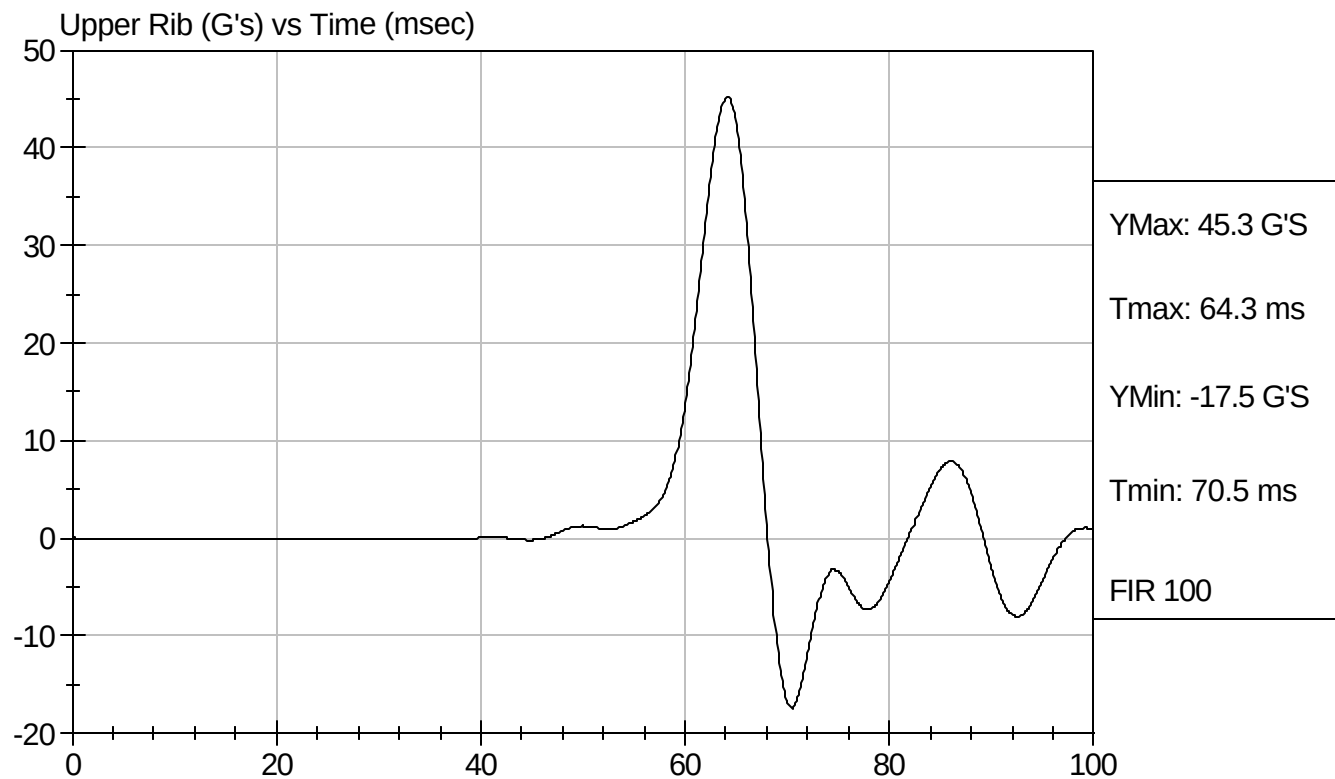

Approved By

10/11/07
Test Date



Test Desc: Thorax Impact
Component ID: D073182

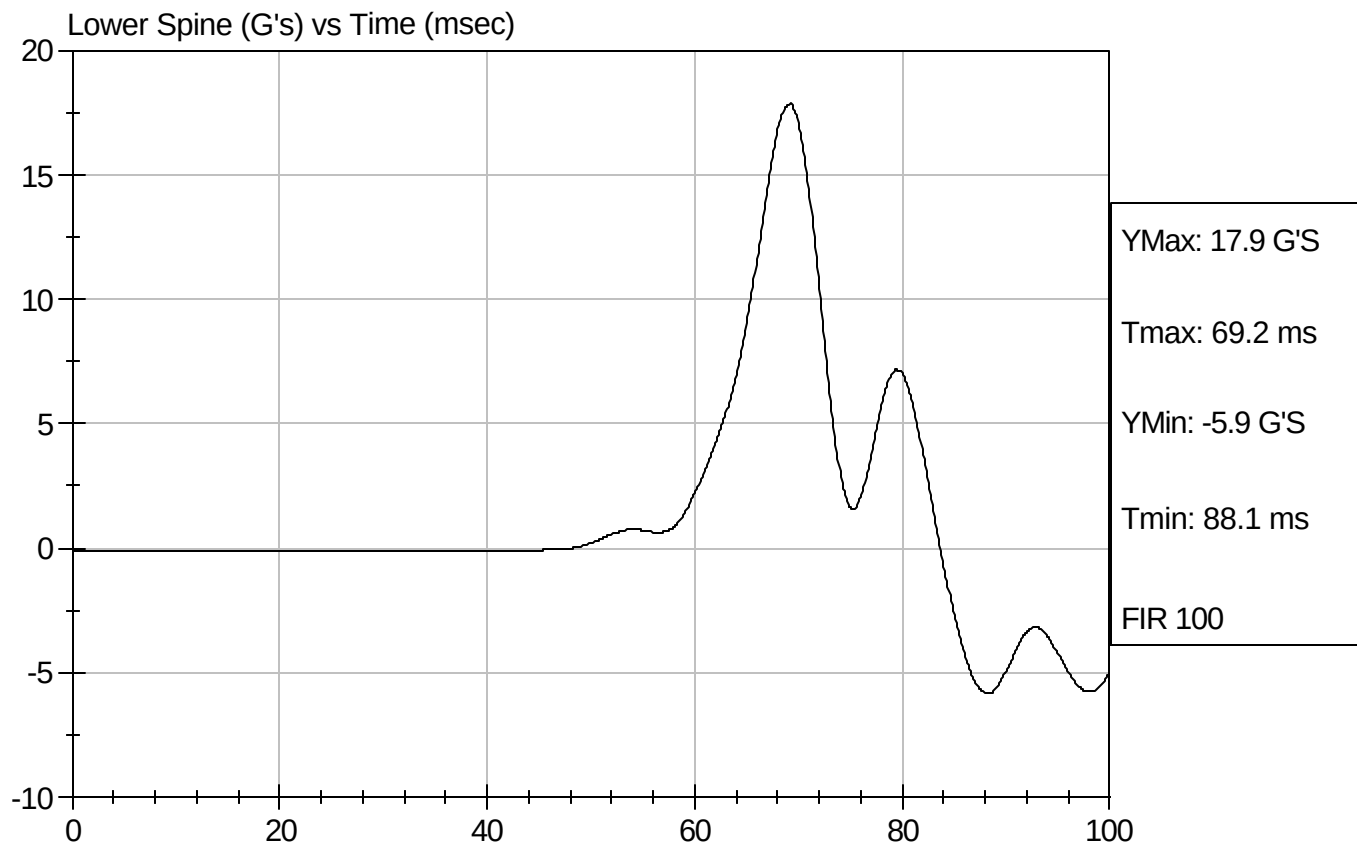
Test Date: 10/11/07
Speed: 14.00 ft/sec, 4.27 m/sec





Test Desc: Thorax Impact
Component ID: D073182

Test Date: 10/11/07
Speed: 14.00 ft/sec, 4.27 m/sec



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

ATD Serial No: 271

Test I.D: D073183

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	34	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	47	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

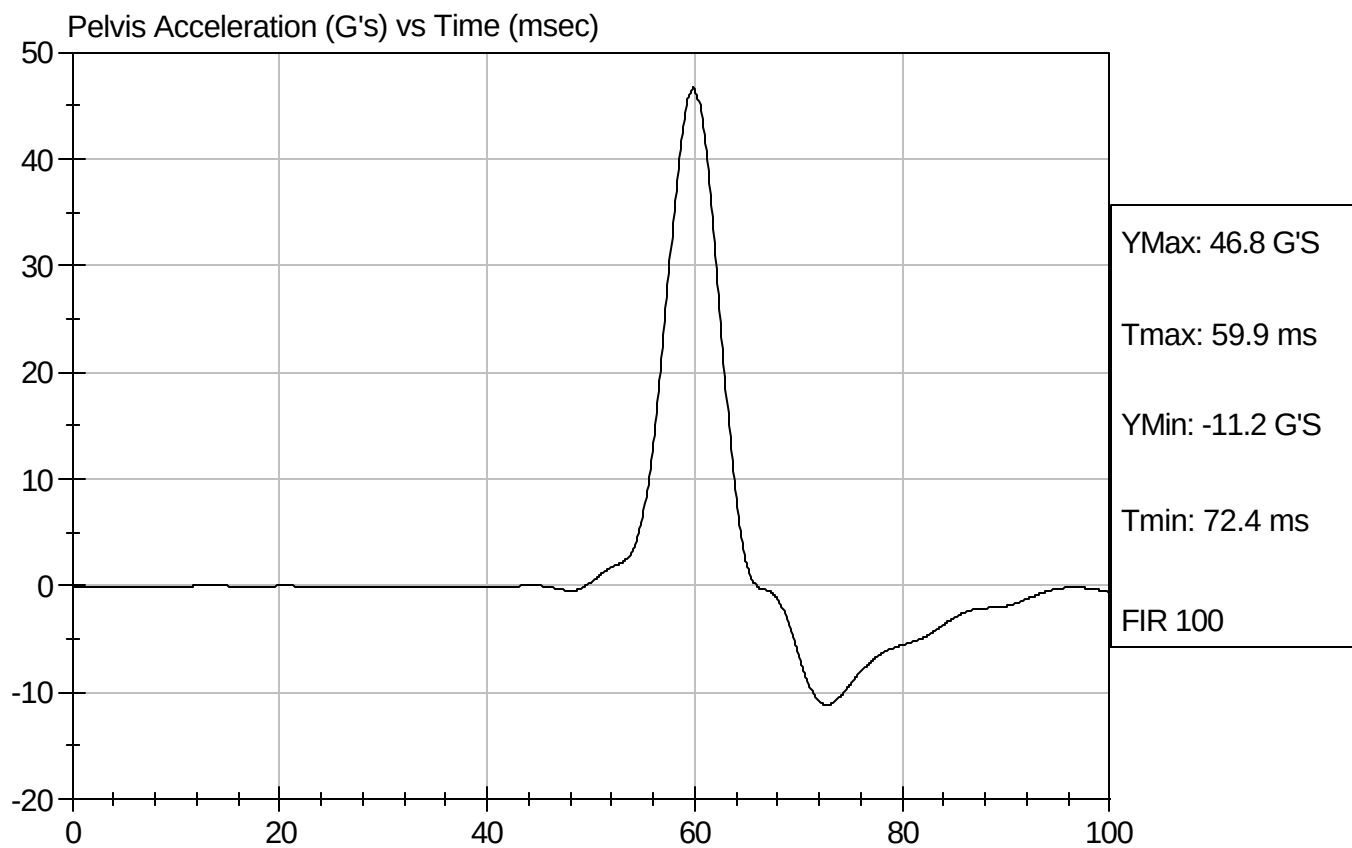
David Winkelbauer
Approved By

10/11/07
Test Date



Test Desc: Pelvis Impact
Component ID: D073183

Test Date: 10/11/07
Speed: 14.12 ft/sec, 4.30 m/sec



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

ATD Serial No: 271

Test I.D: D073184

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	35	Pass
Force At 12.7 mm	N	104 -162	147	Pass
Force At 19 mm	N	163 - 222	206	Pass
Force At 25.4 mm	N	222 - 280	275	Pass
Force At 33 mm	N	325 - 391	368	Pass
			Overall Test Results	Pass

Jessica Gall
Laboratory Technician

David Winkelbauer
Approved By

10/11/07

Test Date

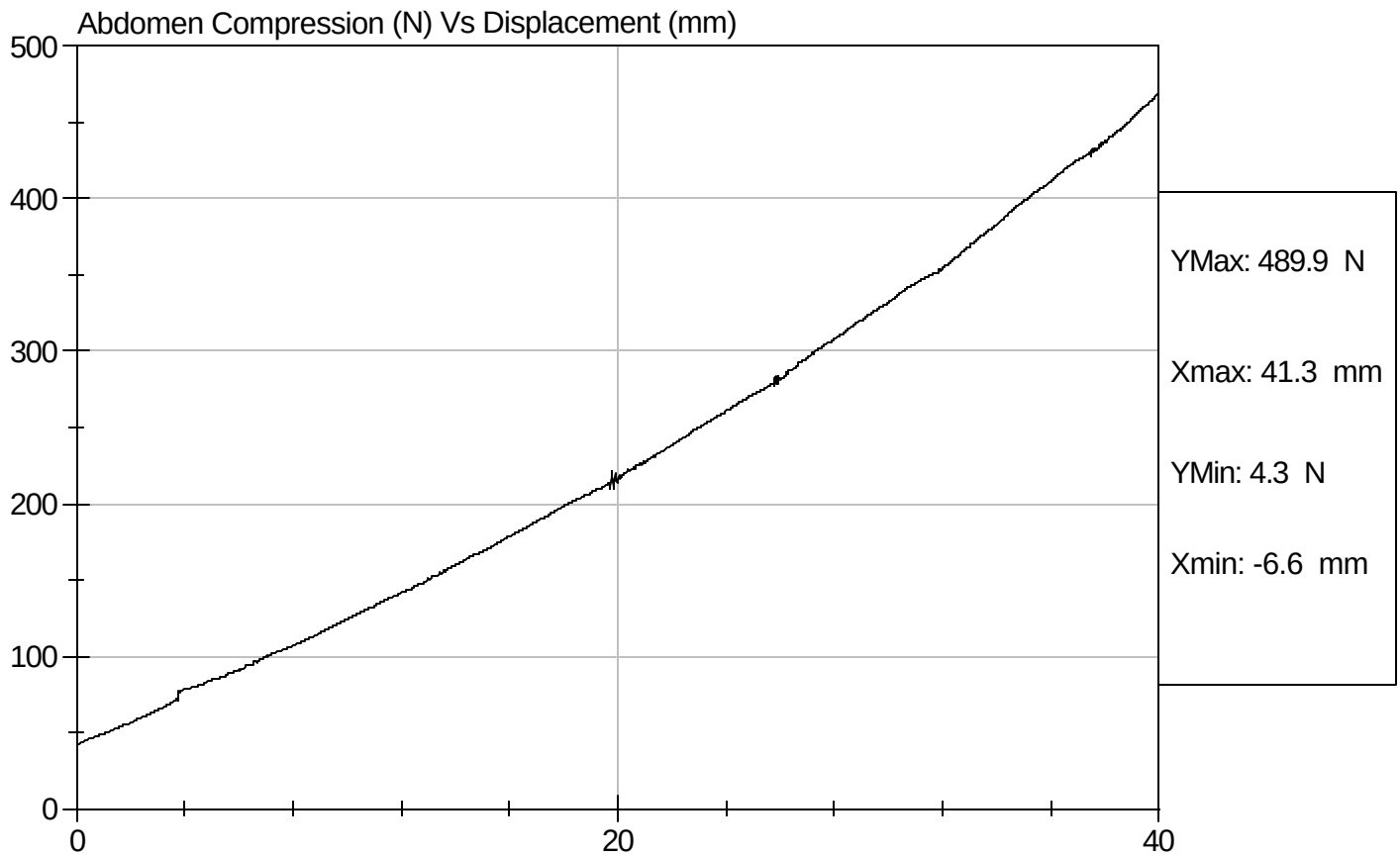


Test Description: Abdomen Compression

Test Date: 10/11/07

Component: D073184

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 271

Test I.D: D073185

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	35	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	119.3	Pass
Force At 30 deg	N	151.2 - 204.6	159.6	Pass
Force At 40 deg	N	204.6 - 258.0	221.2	Pass
Return Angle	Deg	12 Maximum	5	Pass
Overall Test Results			Pass	


Laboratory Technician


Approved By

10/11/07
Test Date

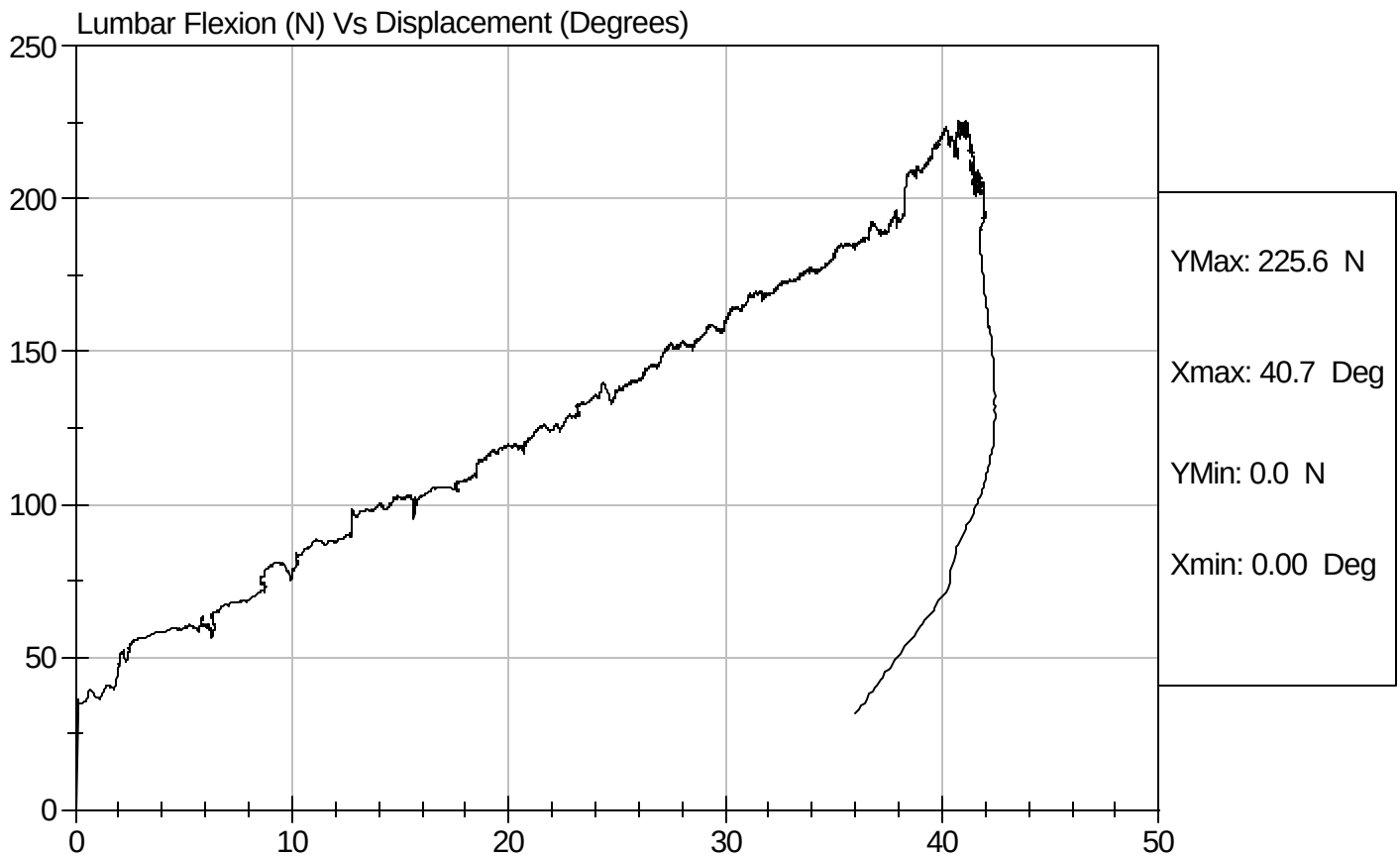


Test Description: Lumbar Flexion

Test Date: 10/11/07

Component: D073185

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: D073189

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity		%	10 to 70	37	Pass
Impact Velocity		m/s	6.89 to 7.13	7.05	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.36	Pass
	20 msec	m/s	4.12 to 5.10	4.47	Pass
	30 msec	m/s	5.73 to 7.01	6.15	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.82	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	73	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	61	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	77	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	59	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	11	Pass


 Laboratory Technician

10/12/07

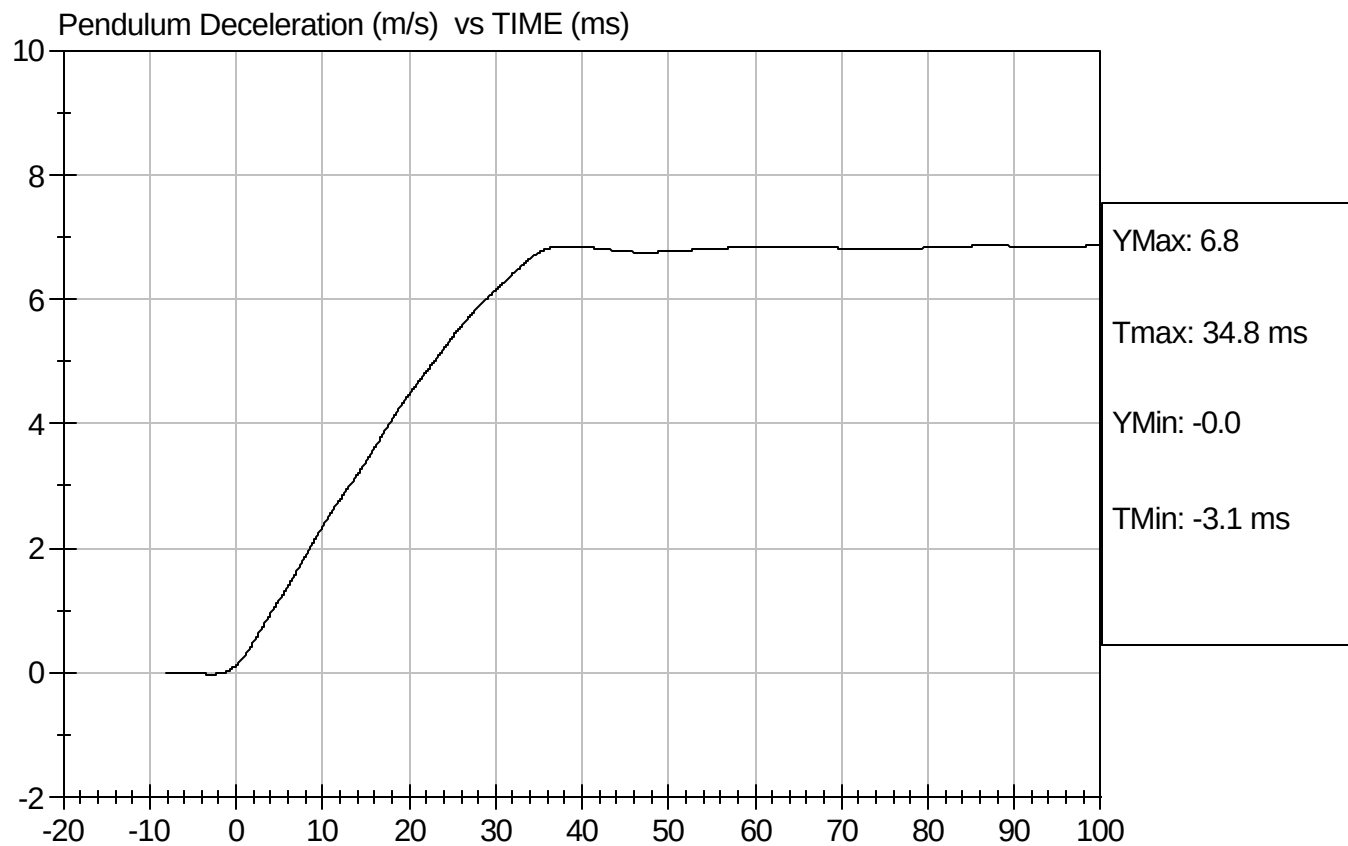
Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D073189

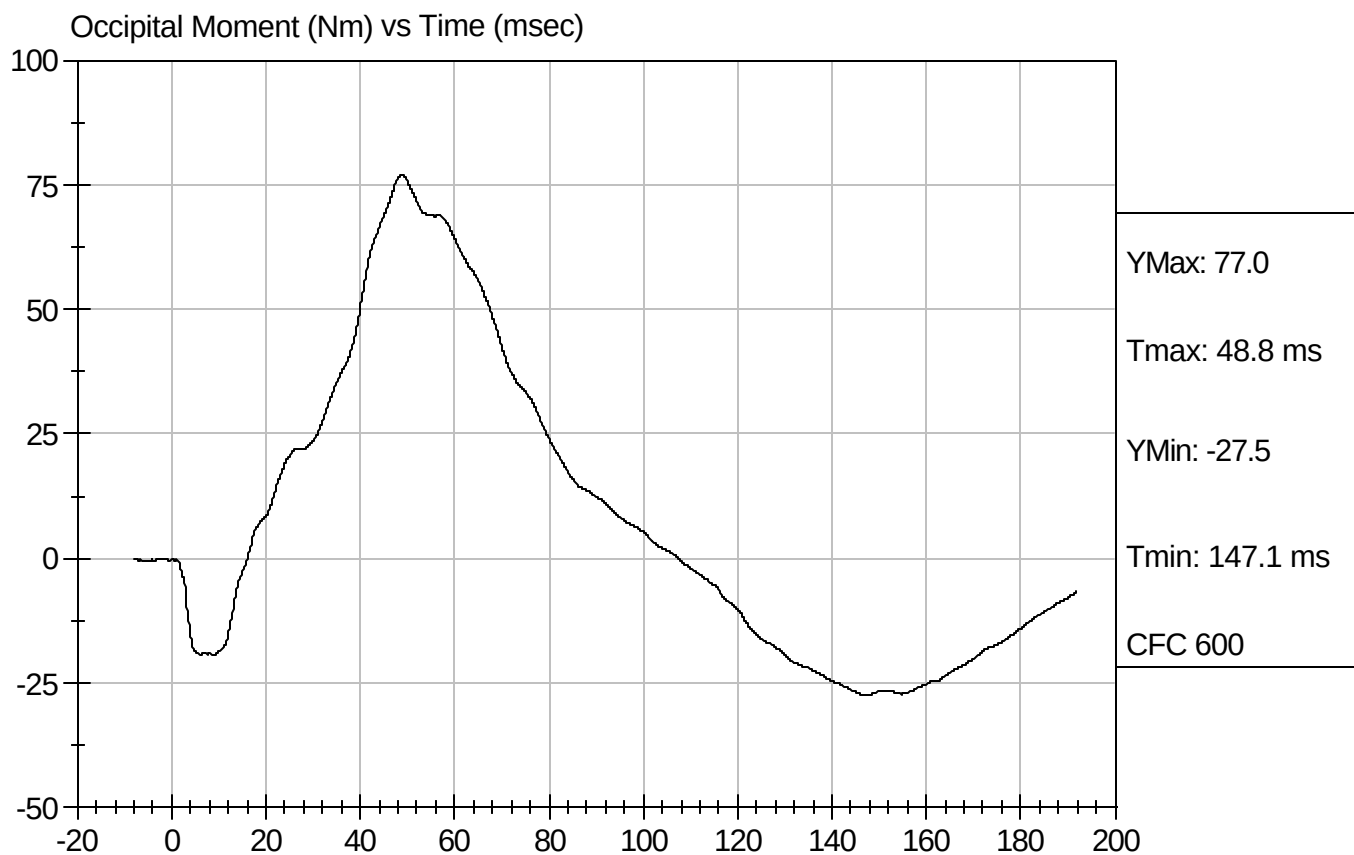
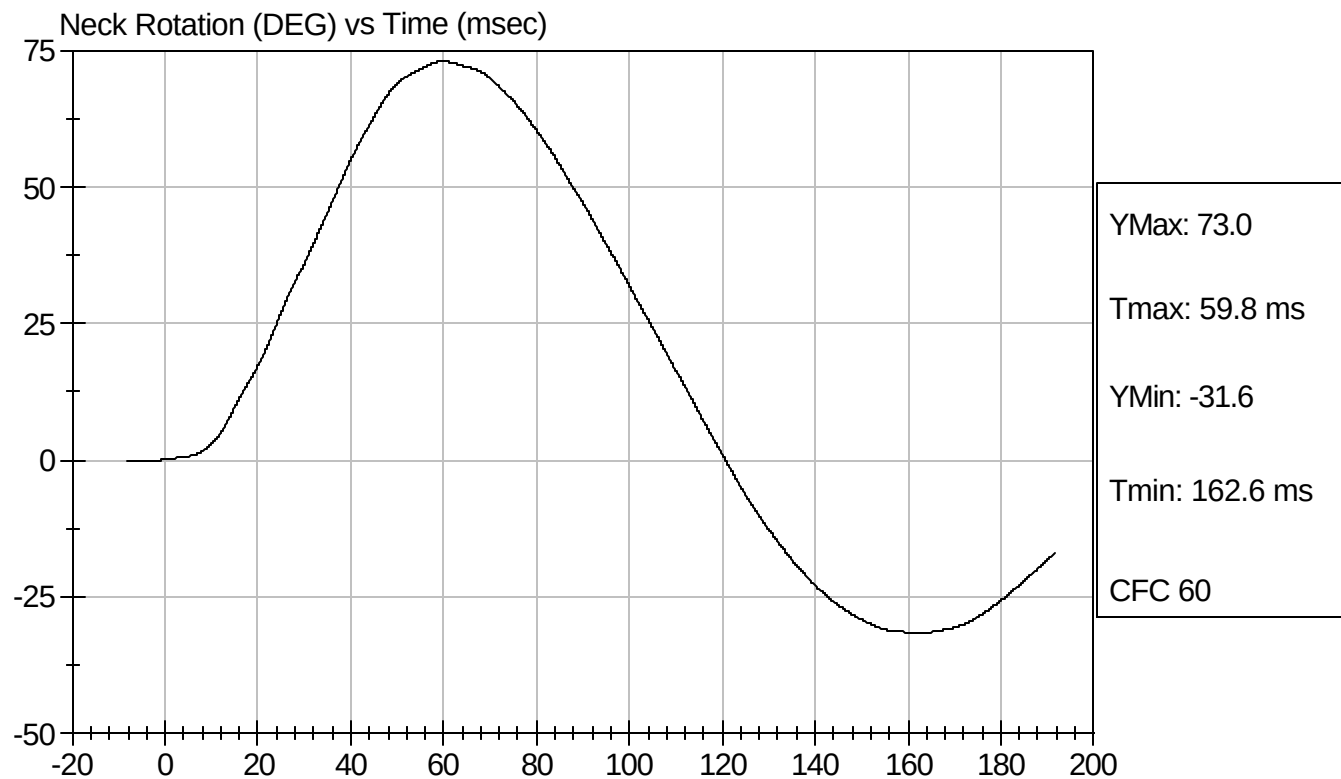
Test Date: 10/12/07
Speed: 23.14 ft/sec, 7.05 m/sec





Test Desc: Neck Bending
Component ID: D073189

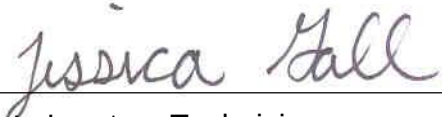
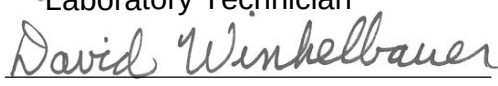
Test Date: 10/12/07
Speed: 23.14 ft/sec, 7.05 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Inspection Checklist

ATD Serial No: 271

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


Laboratory Technician

Approved By

10/12/2007
Test Date

APPENDIX D
CHILD DUMMY DATA

SUMMARY OF TEST

Measurement Description	Units	Threshold	P3 ATD
Head Injury Criteria (HIC36)	N/A	N/A	324
Head Injury Criteria (HIC15)	N/A	390	186
Max. Thorax Accel. (3msec Clip)	G's	50	38

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

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

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

TEST VEHICLE WEIGHTS

	Units	As Tested (ATW) (Axle)		
		Front	Rear	Total
Left	kg	386.5	288.9	
Right	kg	325.7	264.4	
Ratio	%	56.3	43.7	
Totals	kg	712.2	553.3	1265.5

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

TEST NOTES

None

TEST DUMMY INFORMATION

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

POST TEST SEAT DATA

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

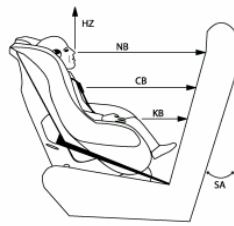
VISIBLE DUMMY CONTACT POINTS

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

CHILD DUMMY POSITIONING IN VEHICLE

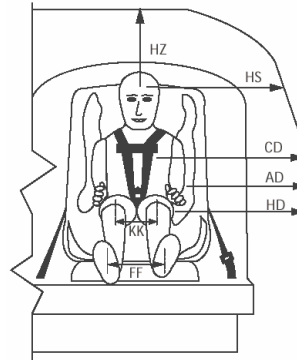
Child Restraint System (Position 3)	Graco Snuggly (Rear Facing)
NHTSA No.	M85117

Dummy Measurements for Rear-facing CRS Passengers



X—Z View

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



Y—Z View

X—Z View

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

Measurement	Pre-Test (mm)	Post-Test (mm)
	P3 CRS (093)	P3 CRS (093)
SA (deg)	15.8	15.7
HS	325	442
CD	358	401
AD	240	266
HD	307	297
HZ	442	469
NB	538	483
CB	403	396
KK	105	106
FF	103	108
KB - LEFT	187	171
KB - RIGHT	165	173
TB - LEFT	19	42
TB - RIGHT	25	82

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

CRS PERFORMANCE DATA

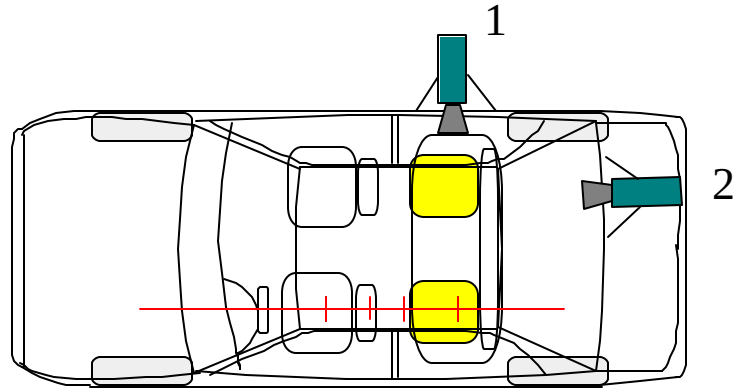
Child Restraint System (Position 3)	Graco Snugride (Rear Facing)
NHTSA No.	M85117

POSITION 3 CRS POST-TEST INSPECTION

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

CRS CAMERA DATA

Child Restraint System (Position 3)	Graco Snugride (Rear Facing)
NHTSA No.	M85117



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

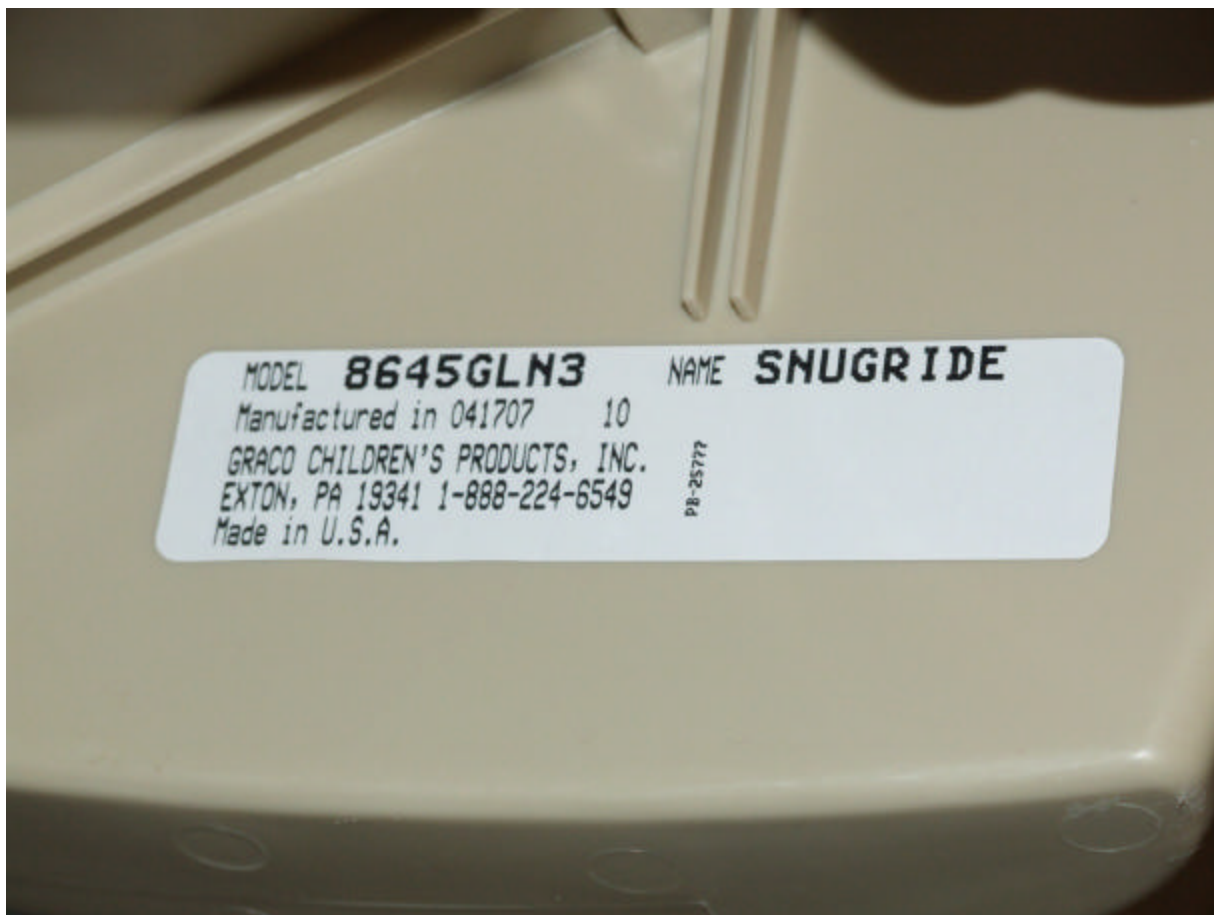
***COORDINATES:**

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

PHOTOGRAPHS

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Figure No. 14.	Post-Test Position 3 Foot Contact View	D-14



Close-up View of Position 3 CRS Label



Pre-Test Front View of Position 3 CRS



Post-Test Front View of Position 3 CRS



Pre-Test Rear View of Position 3 CRS



Post-Test Rear View of Position 3 CRS



Pre-Test Left Side View of Position 3 CRS



Post-Test Left Side View of Position 3 CRS



Pre-Test Right Side View of Position 3 CRS



Post-Test Right Side View of Position 3 CRS



Pre-Test Position 3 Left Side View



Post-Test Position 3 Left Side View



Pre-Test Position 3 Right Side View



Post-Test Position 3 Right ¾ View



Post-Test Position 3 Foot Contact View

CHILD DUMMY RESPONSE DATA TRACES

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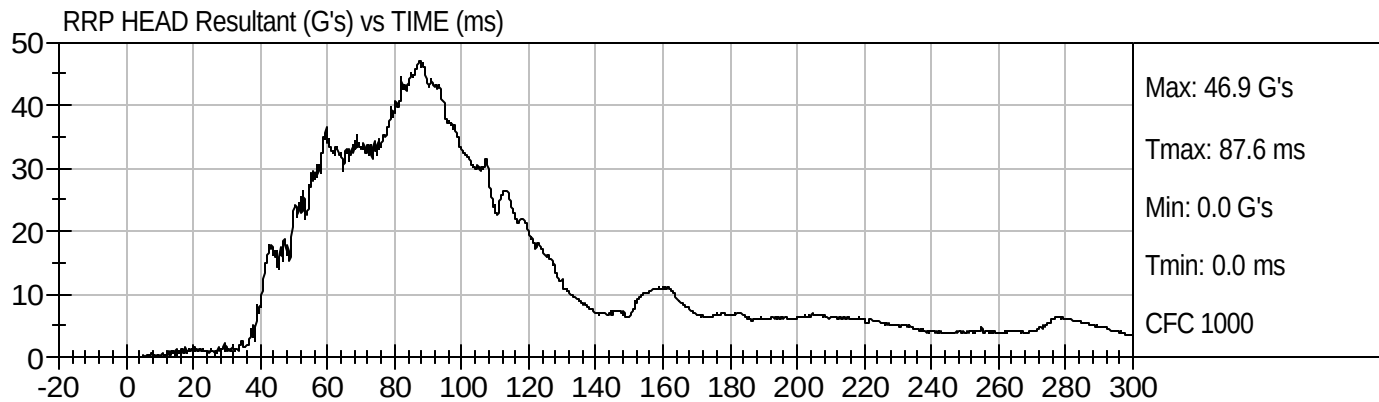
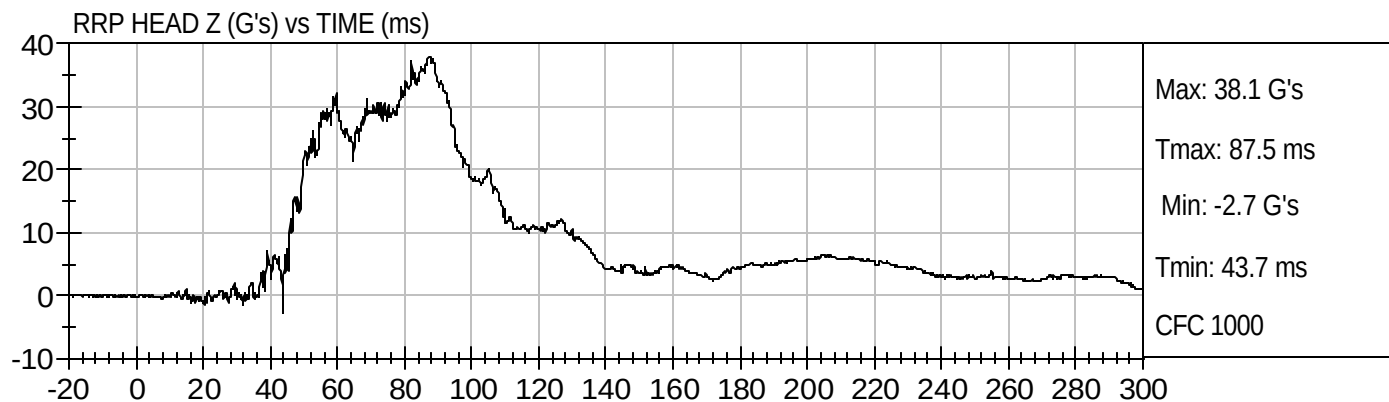
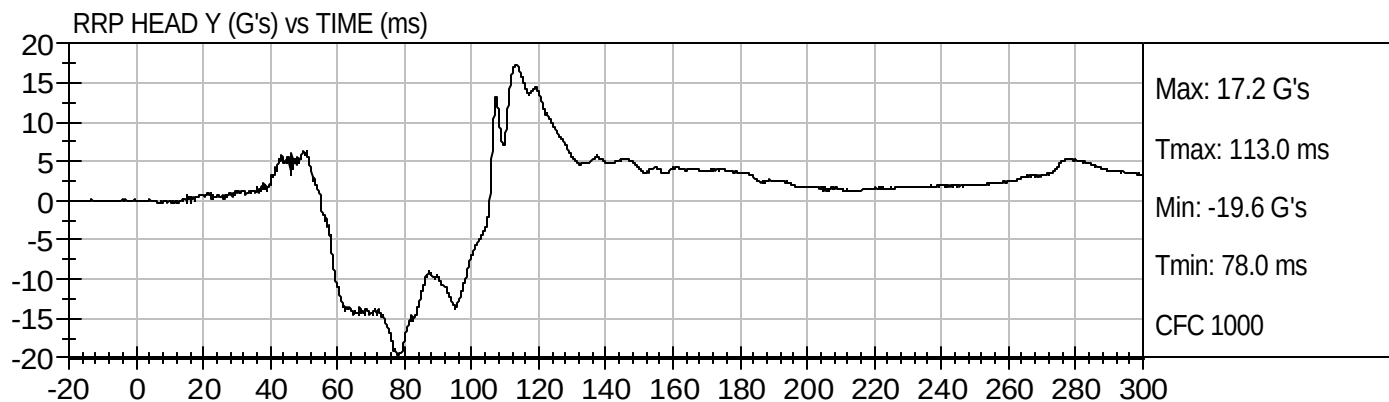
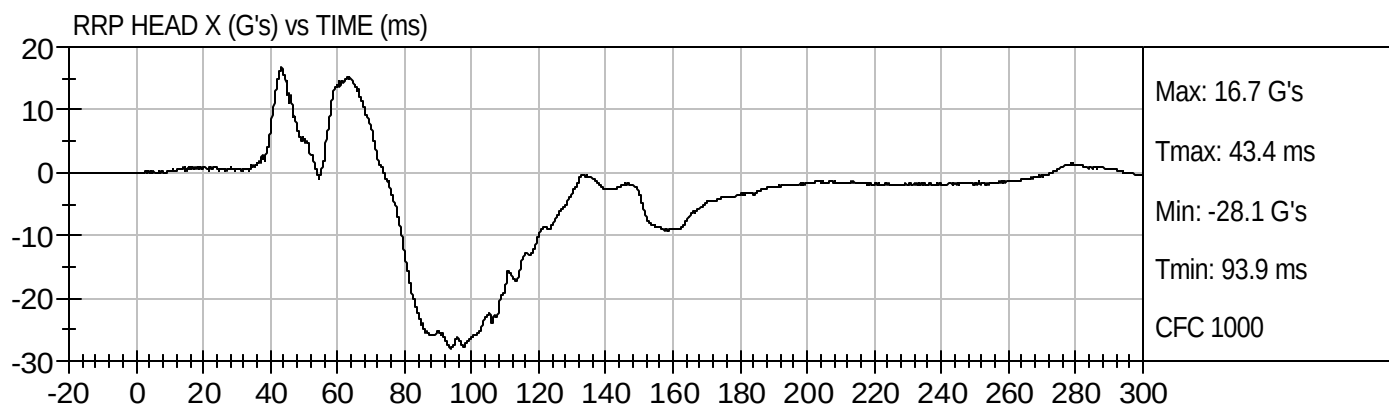
The following response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

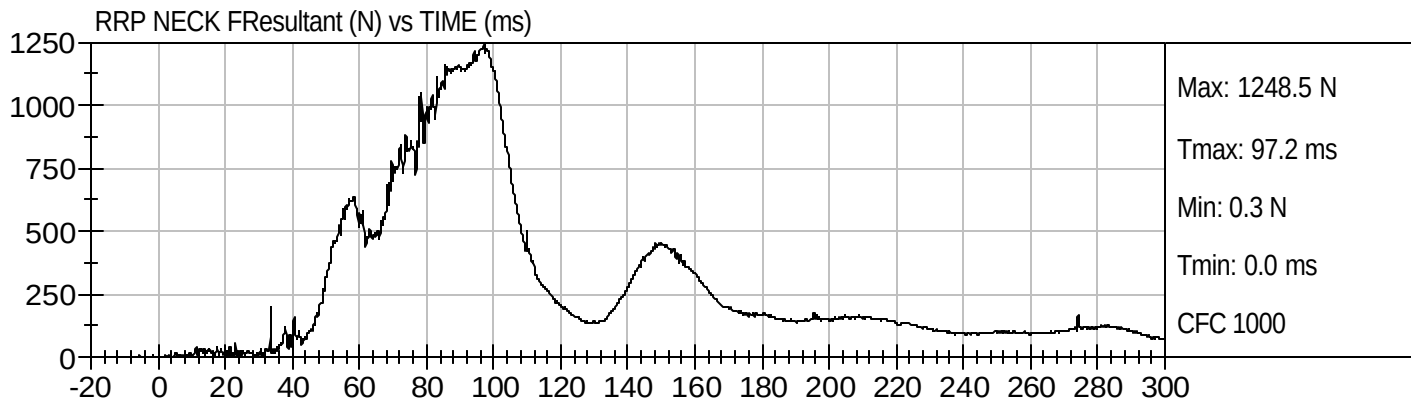
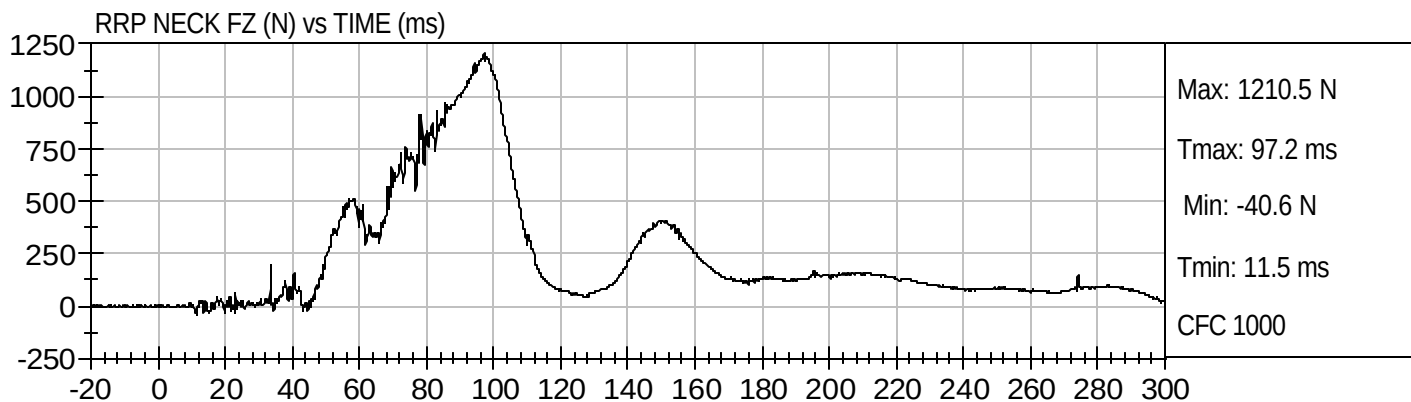
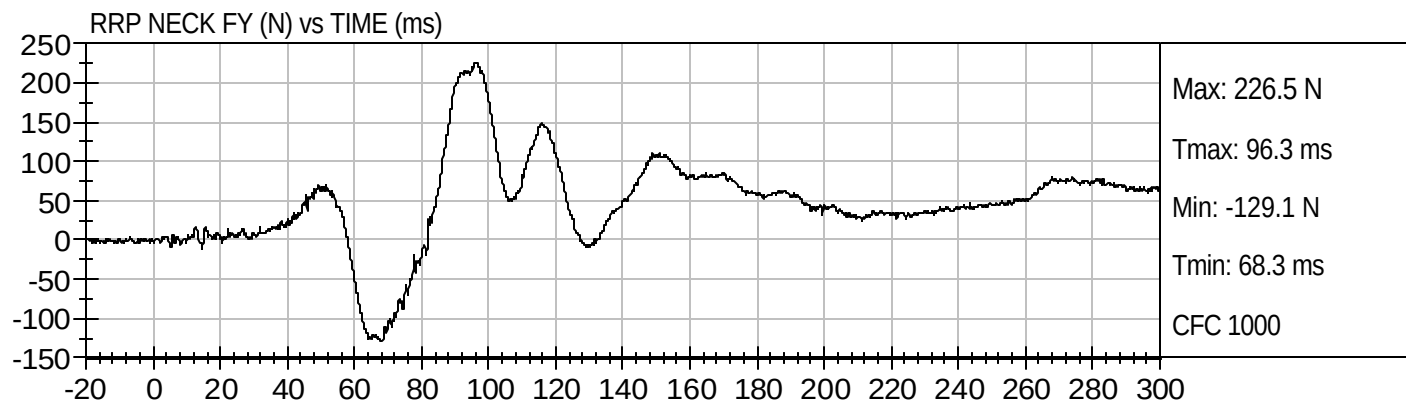
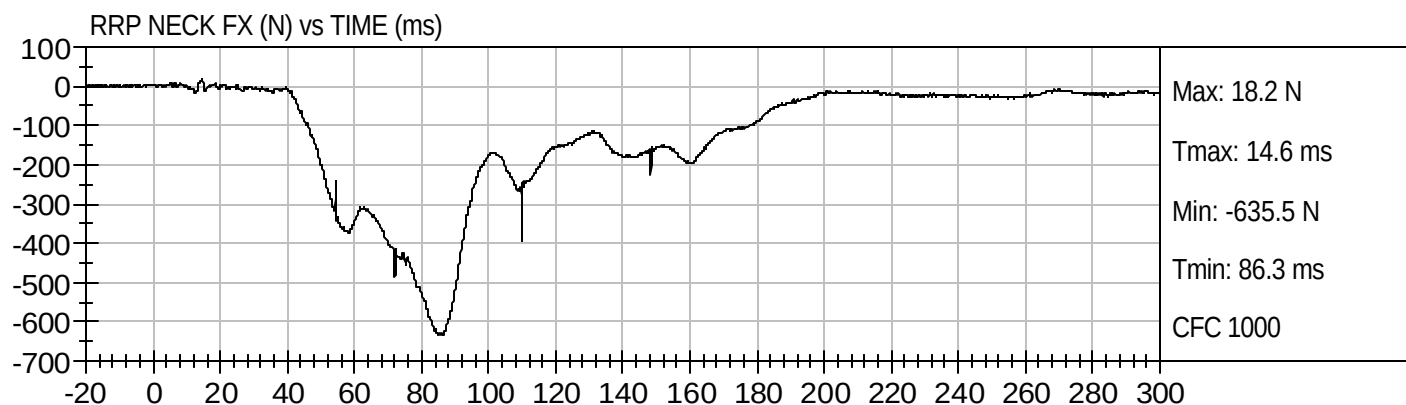
RRP Child Seat X Acceleration vs. Time

RRP Child Seat Y Acceleration vs. Time

RRP Child Seat Z Acceleration vs. Time

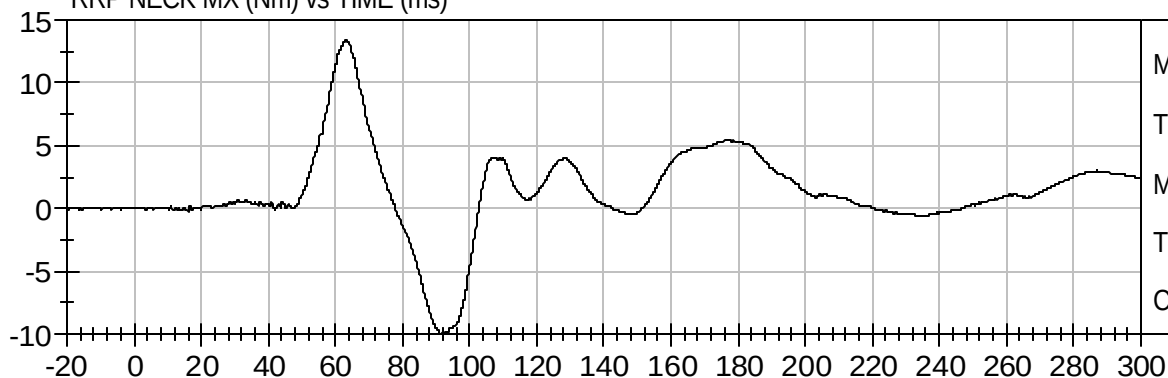
RRP Child Seat Resultant Acceleration vs. Time





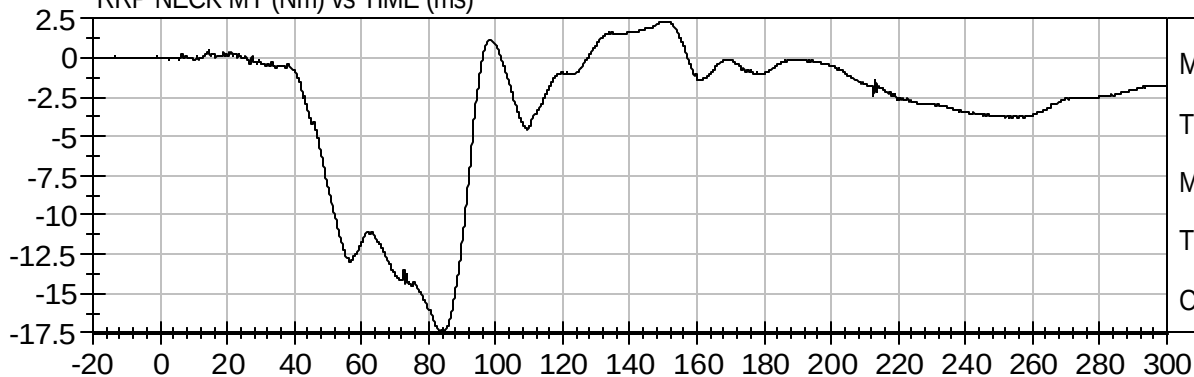


RRP NECK MX (Nm) vs TIME (ms)



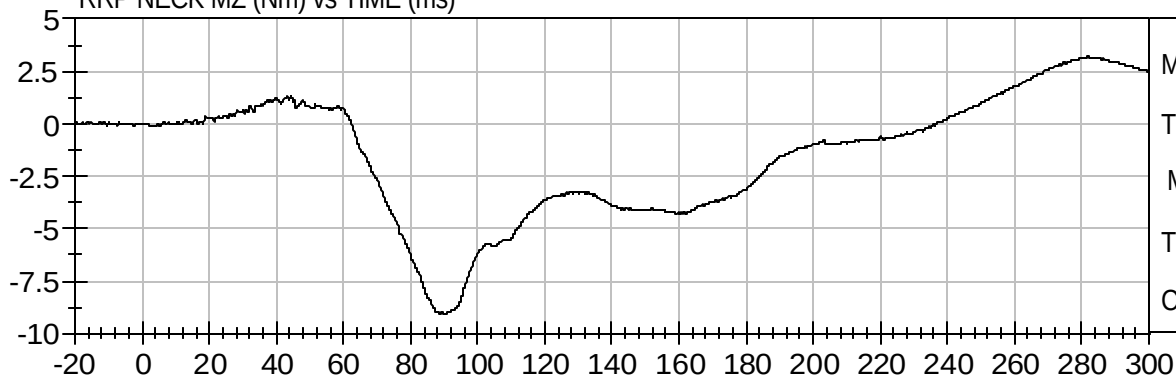
Max: 13.4 Nm
Tmax: 63.2 ms
Min: -10.0 Nm
Tmin: 92.2 ms
CFC 600

RRP NECK MY (Nm) vs TIME (ms)



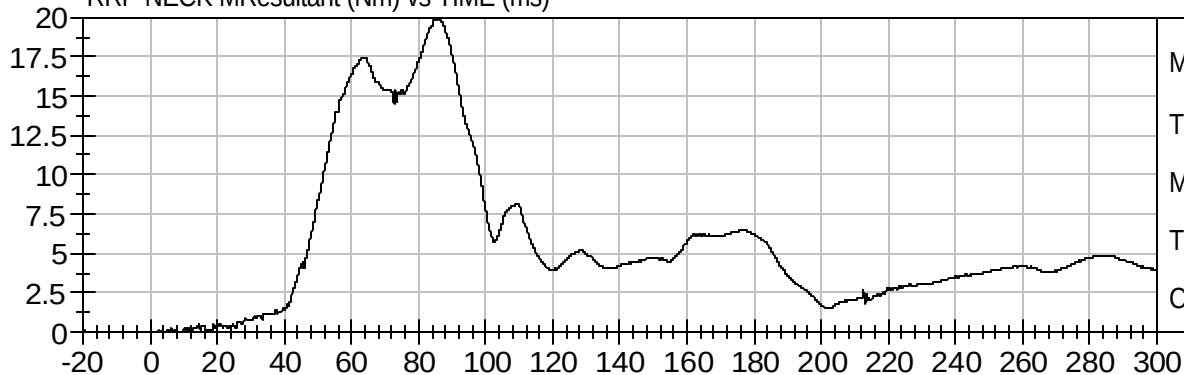
Max: 2.3 Nm
Tmax: 150.4 ms
Min: -17.4 Nm
Tmin: 83.5 ms
CFC 600

RRP NECK MZ (Nm) vs TIME (ms)

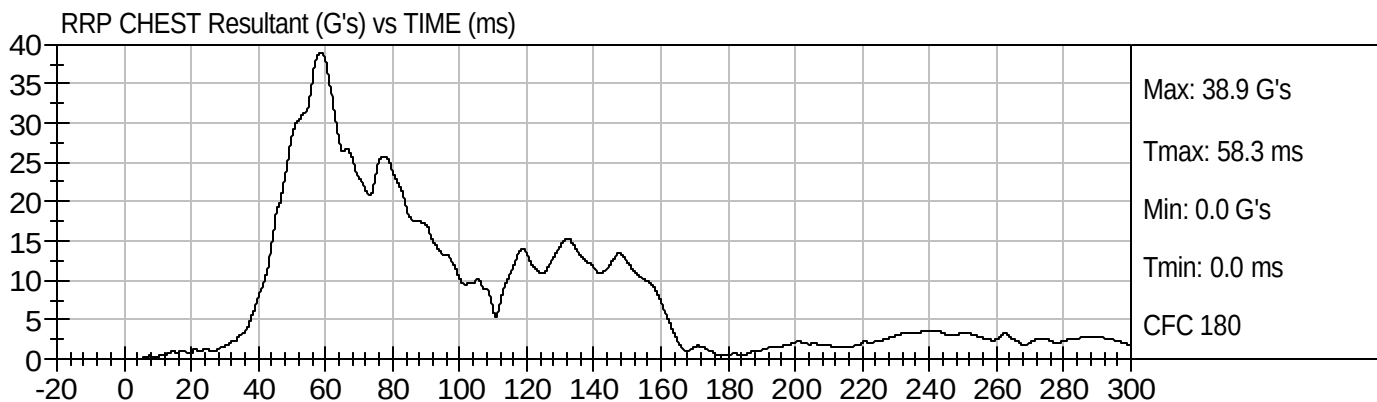
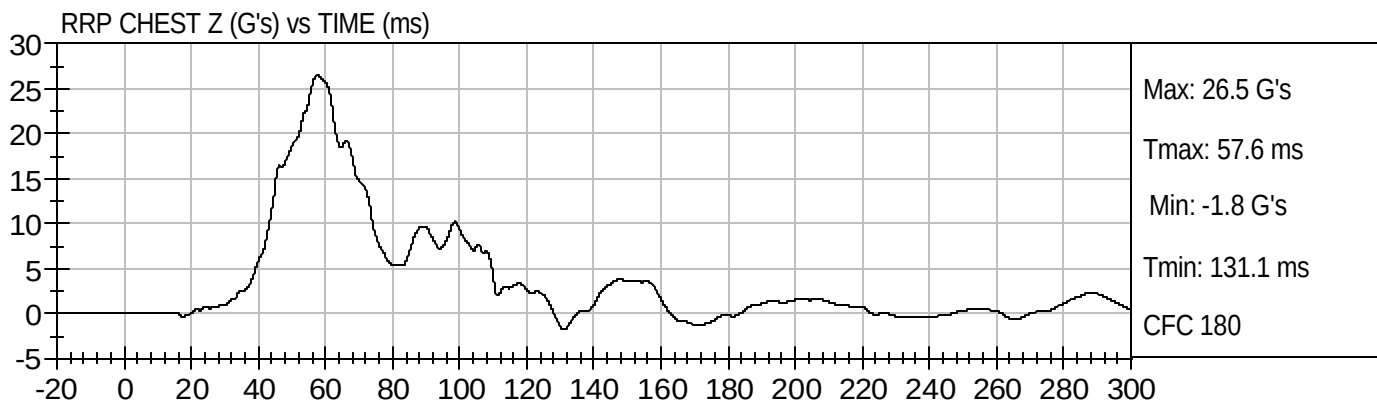
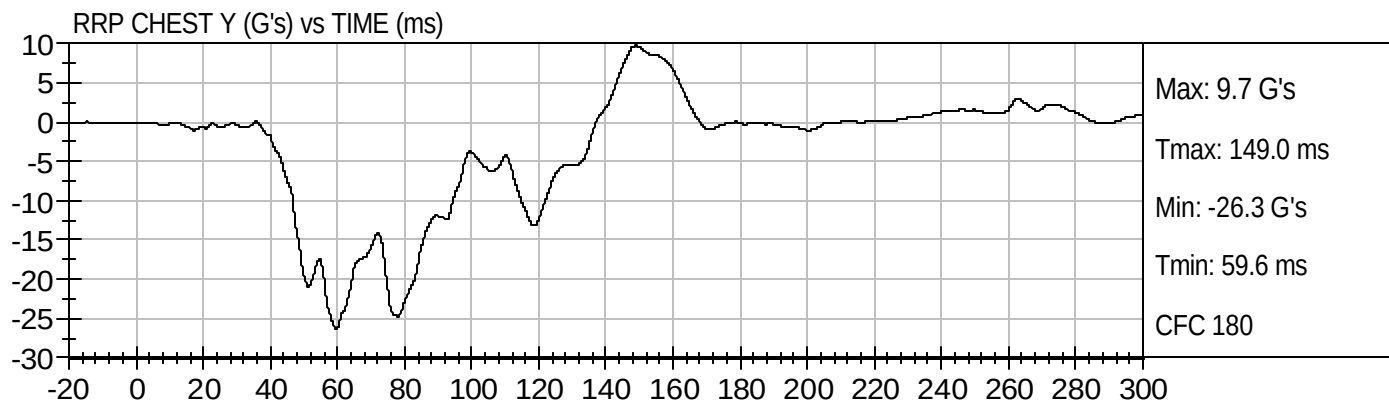
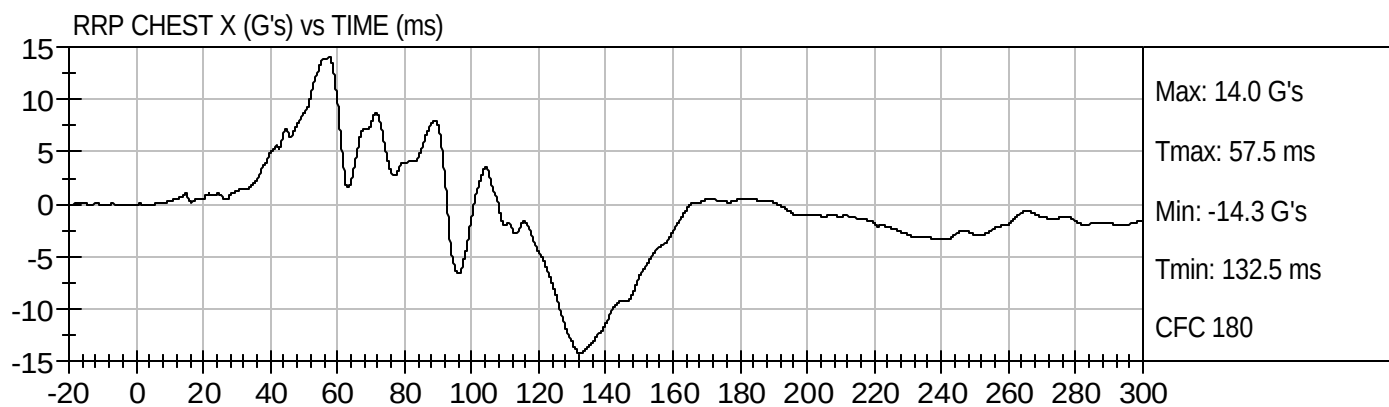


Max: 3.2 Nm
Tmax: 282.1 ms
Min: -9.1 Nm
Tmin: 90.3 ms
CFC 600

RRP NECK MResultant (Nm) vs TIME (ms)



Max: 19.9 Nm
Tmax: 85.8 ms
Min: 0.0 Nm
Tmin: 0.0 ms
CFC 600



CHILD DUMMY CALIBRATION INFORMATION

MGA RESEARCH CORPORATION
FRONT HEAD DROP TEST
CRABI 12 MONTH

ATD Serial No: 093

Test ID: D072541

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


Laboratory Technician

8/23/07

Test Date

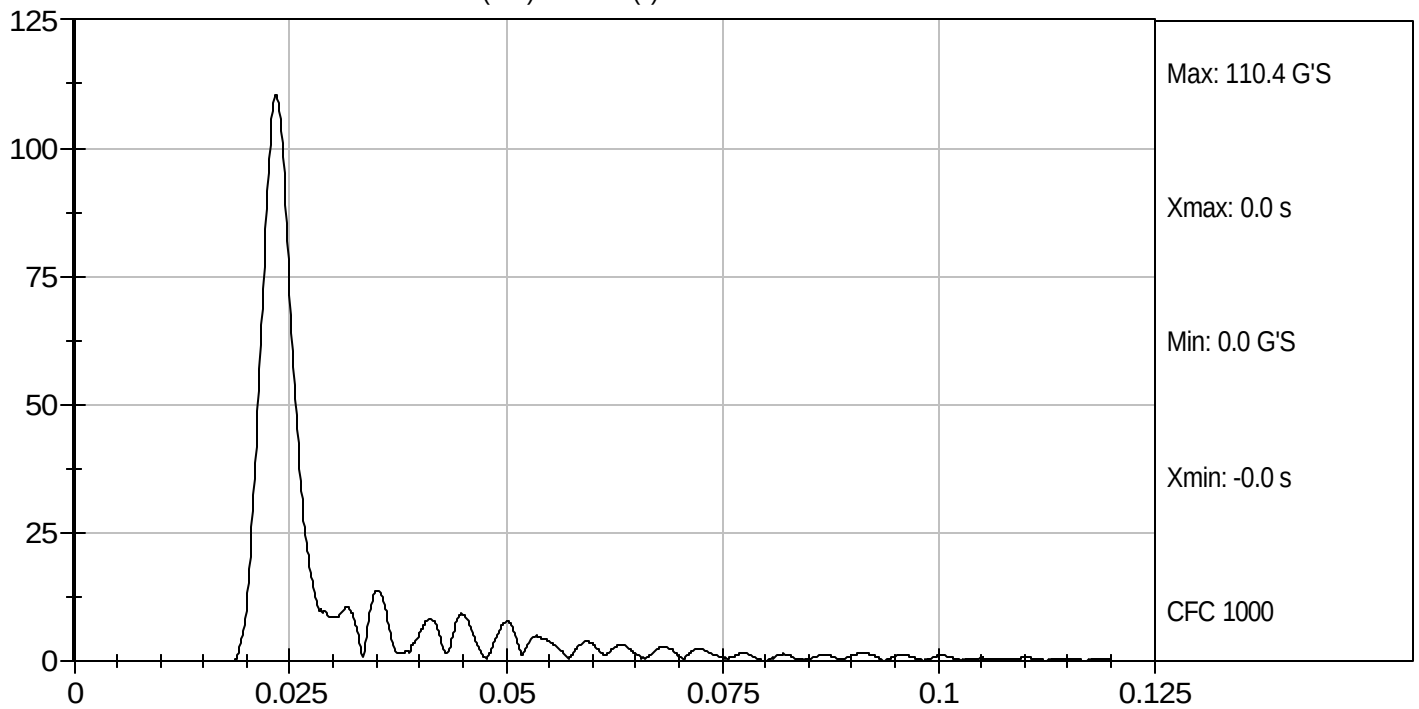

Approved By



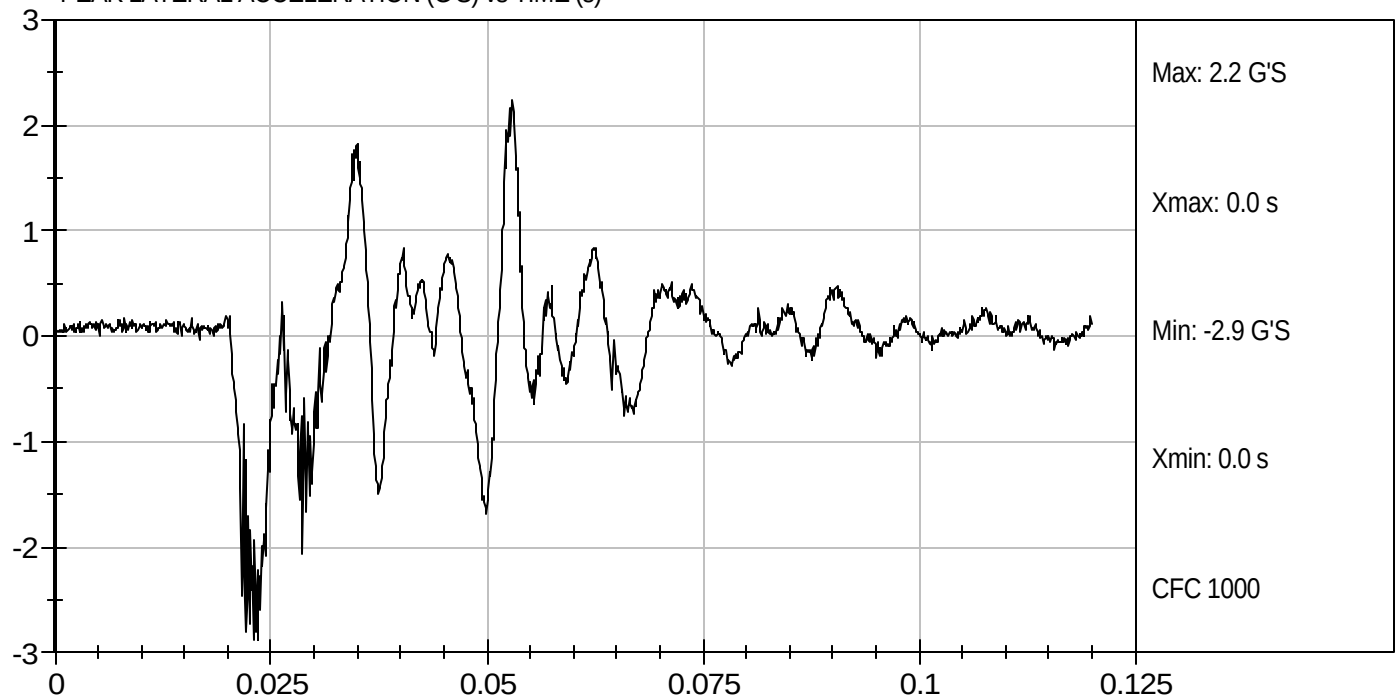
Test Desc: Head Drop
Component ID: D072541

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

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



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



MGA RESEARCH CORPORATION
NECK FLEXION TEST
CRABI 12 MONTH

ATD Serial No: 093

Test I.D: D072542

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



Laboratory Technician

8/23/07

Test Date



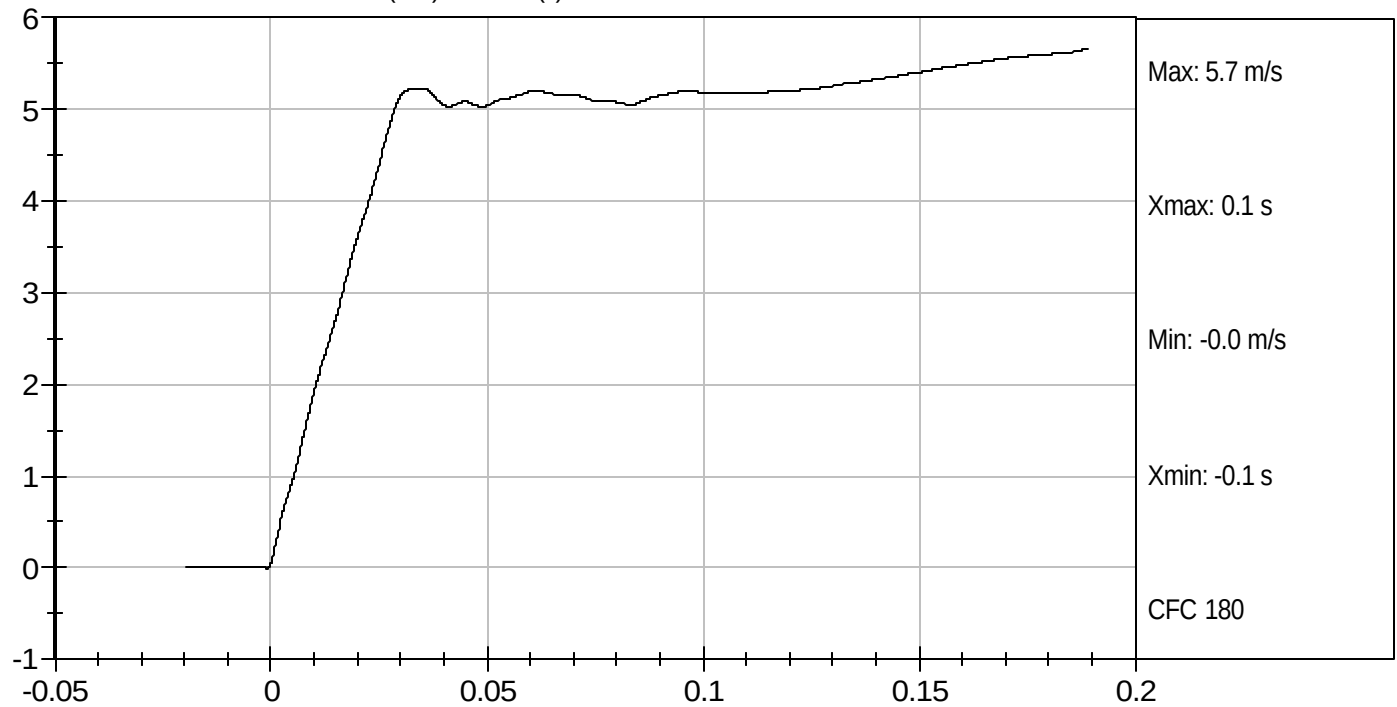
Approved By



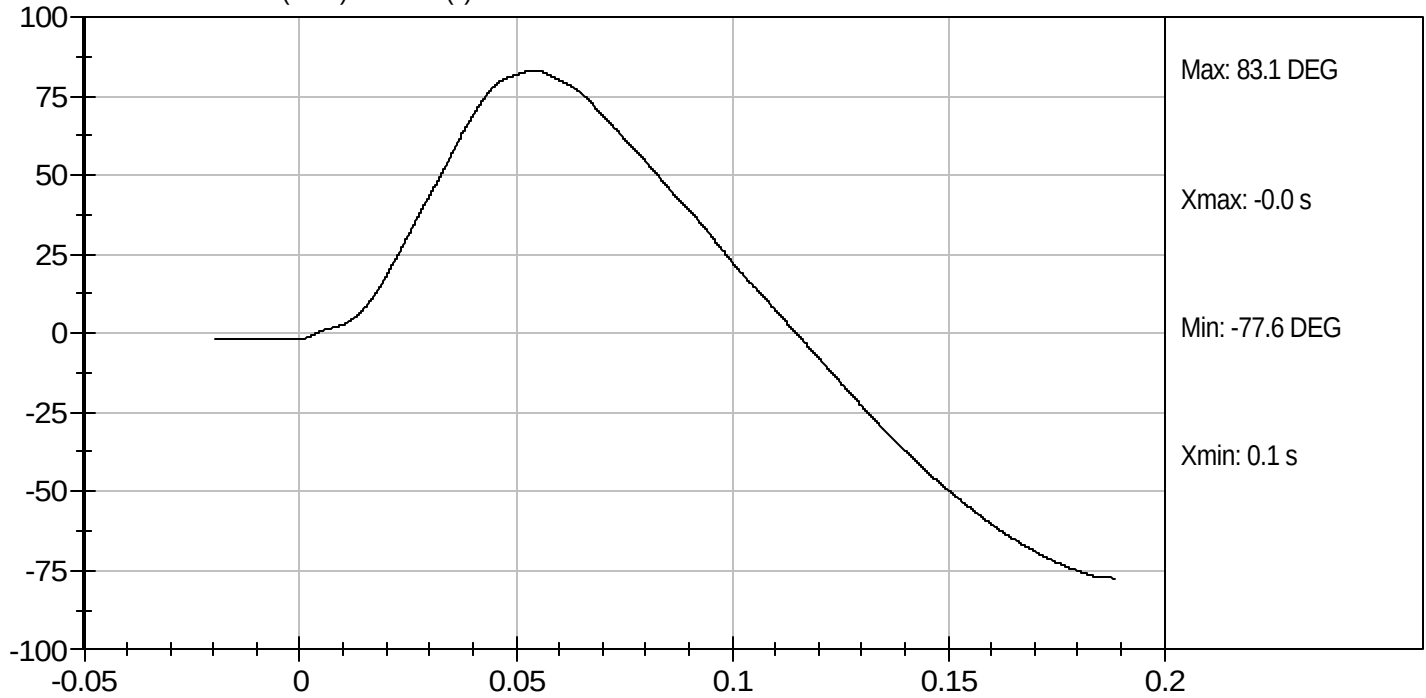
Test Desc: Neck Flexion
Component ID: D072542

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

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



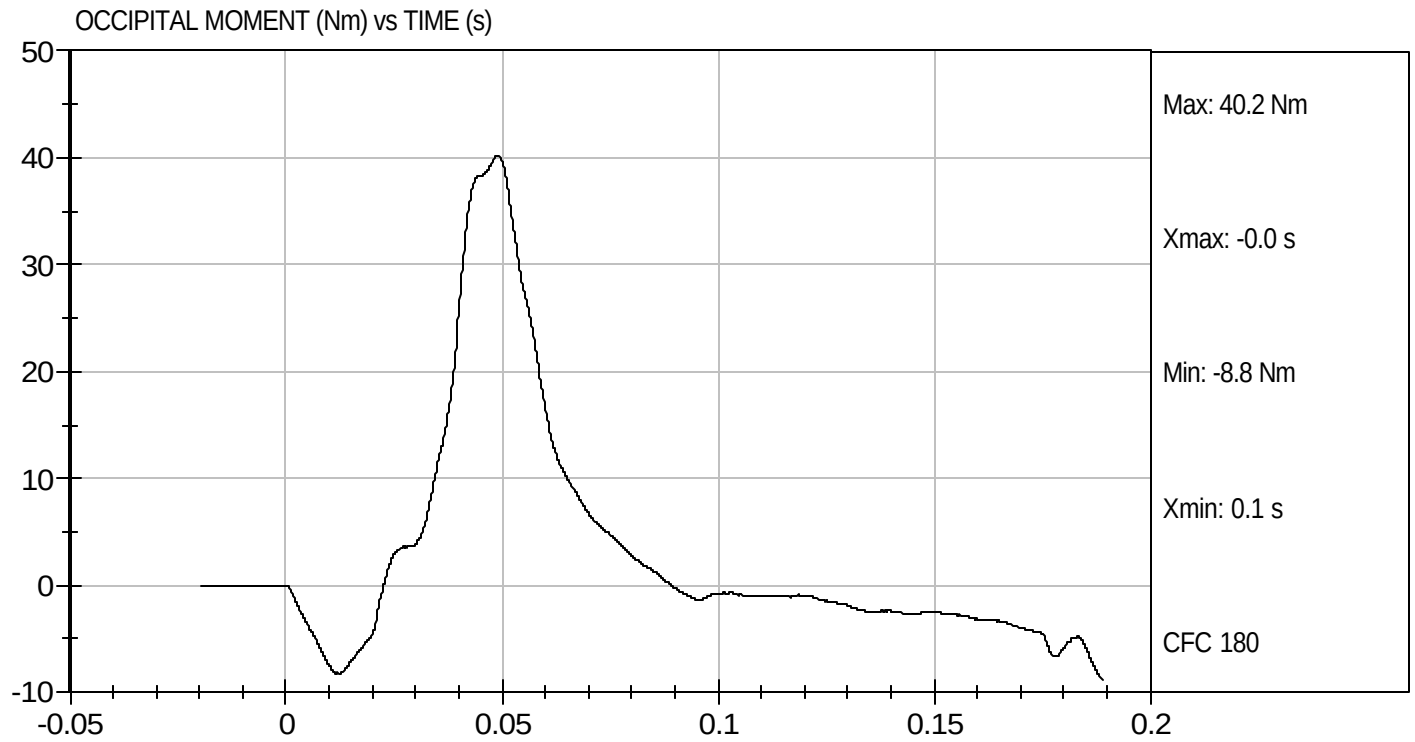
FLEXION ANGLE (DEG) vs TIME (s)





Test Desc: Neck Flexion
Component ID: D072542

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



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
CRABI 12 MONTH

ATD Serial No: 093

Test I.D: D072543

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


 Laboratory Technician

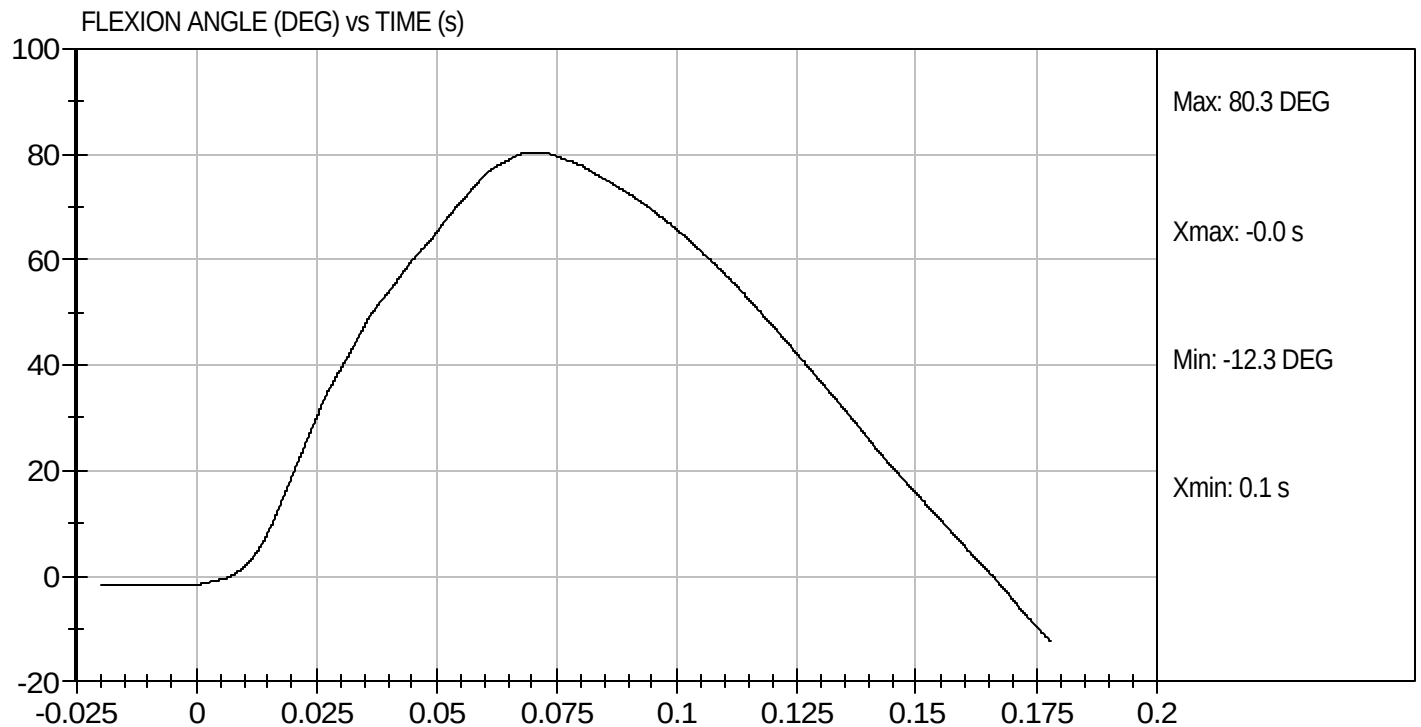
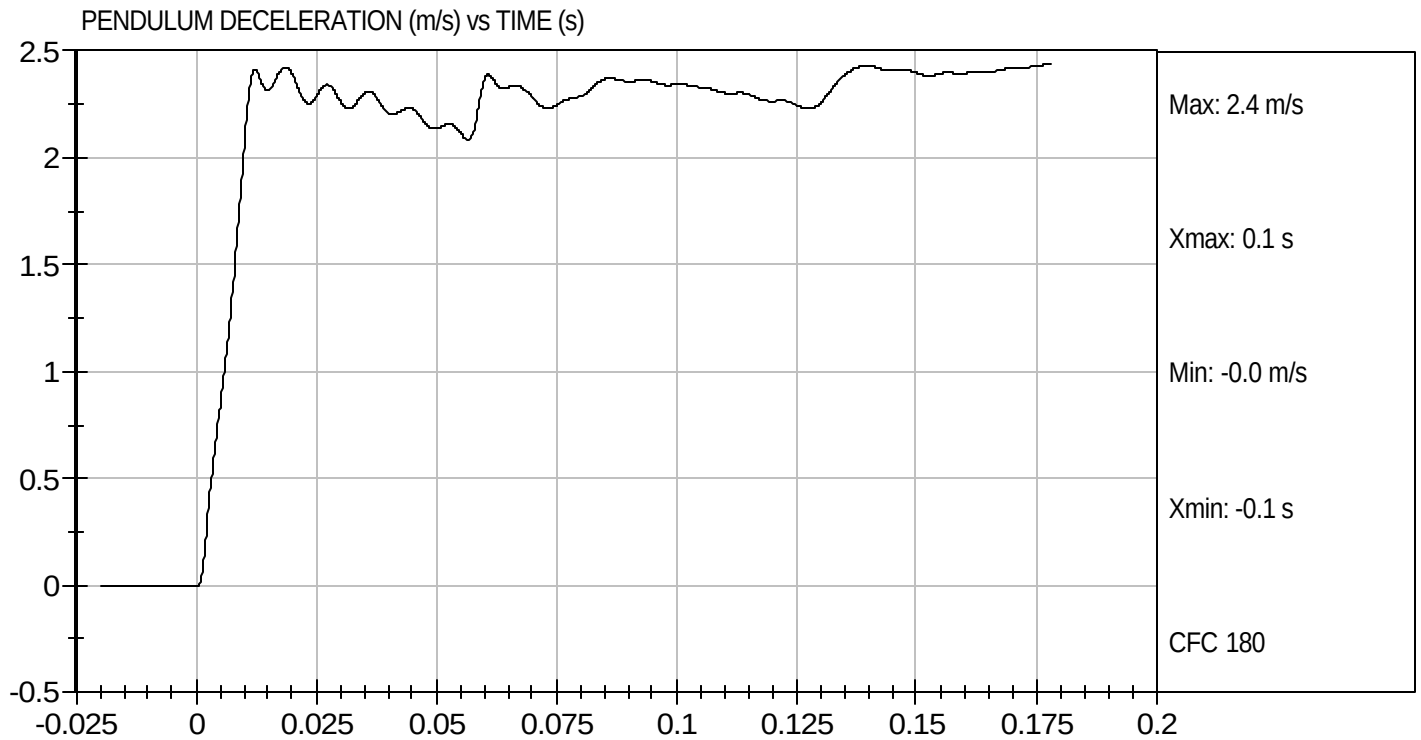
8/23/07
 Test Date


 Approved By



Test Desc: Neck Extension
Component ID: D072543

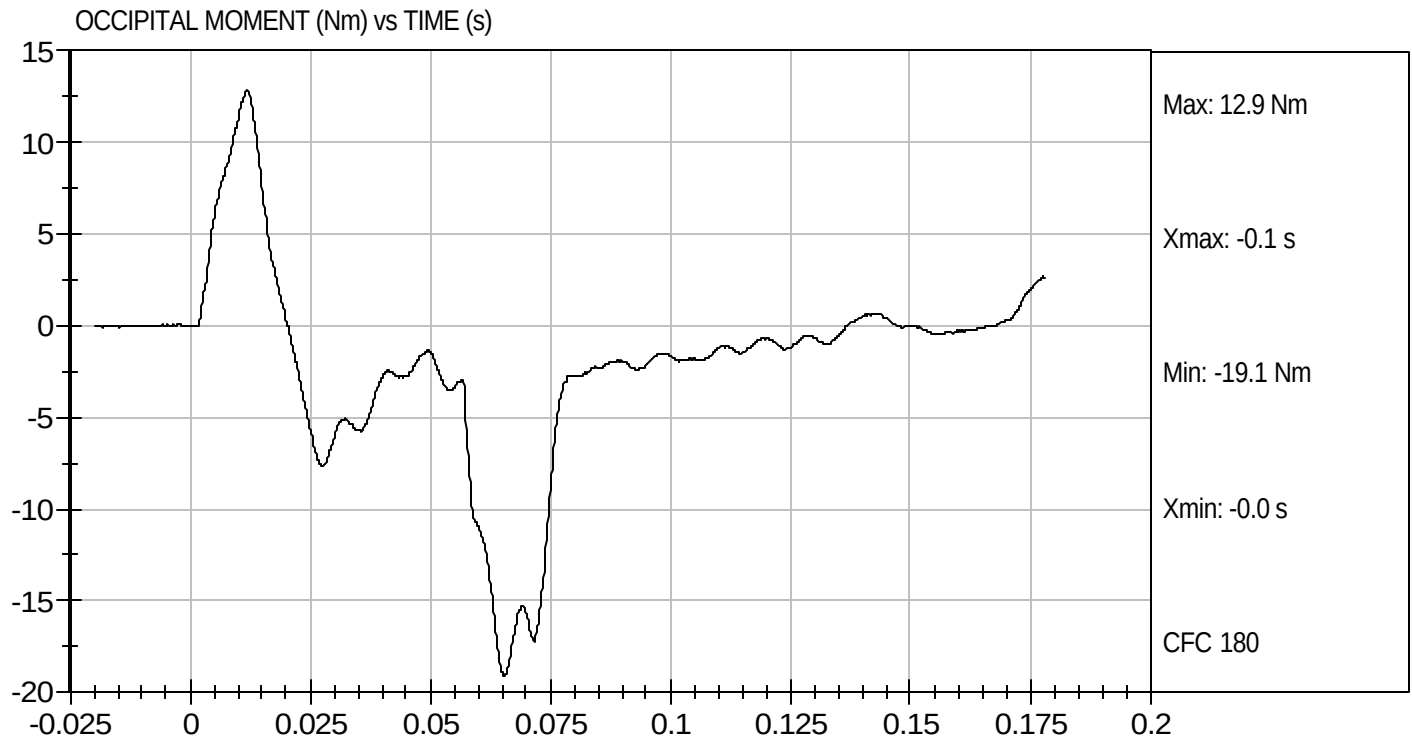
Test Date: 8/23/07
Velocity: 8.33 ft/s, 2.5 m/s





Test Desc: Neck Extension
Component ID: D072543

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



MGA RESEARCH CORPORATION
THORAX IMPACT TEST
CRABI 12 MONTH

ATD Serial No: 093

Test I.D: D072544

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Speed	m/sec	4.9 to 5.1	5.03	Pass
Probe Force	kN	1.51 to 1.80	1.55	Pass
Overall Test Results				Pass


Laboratory Technician

8/23/07

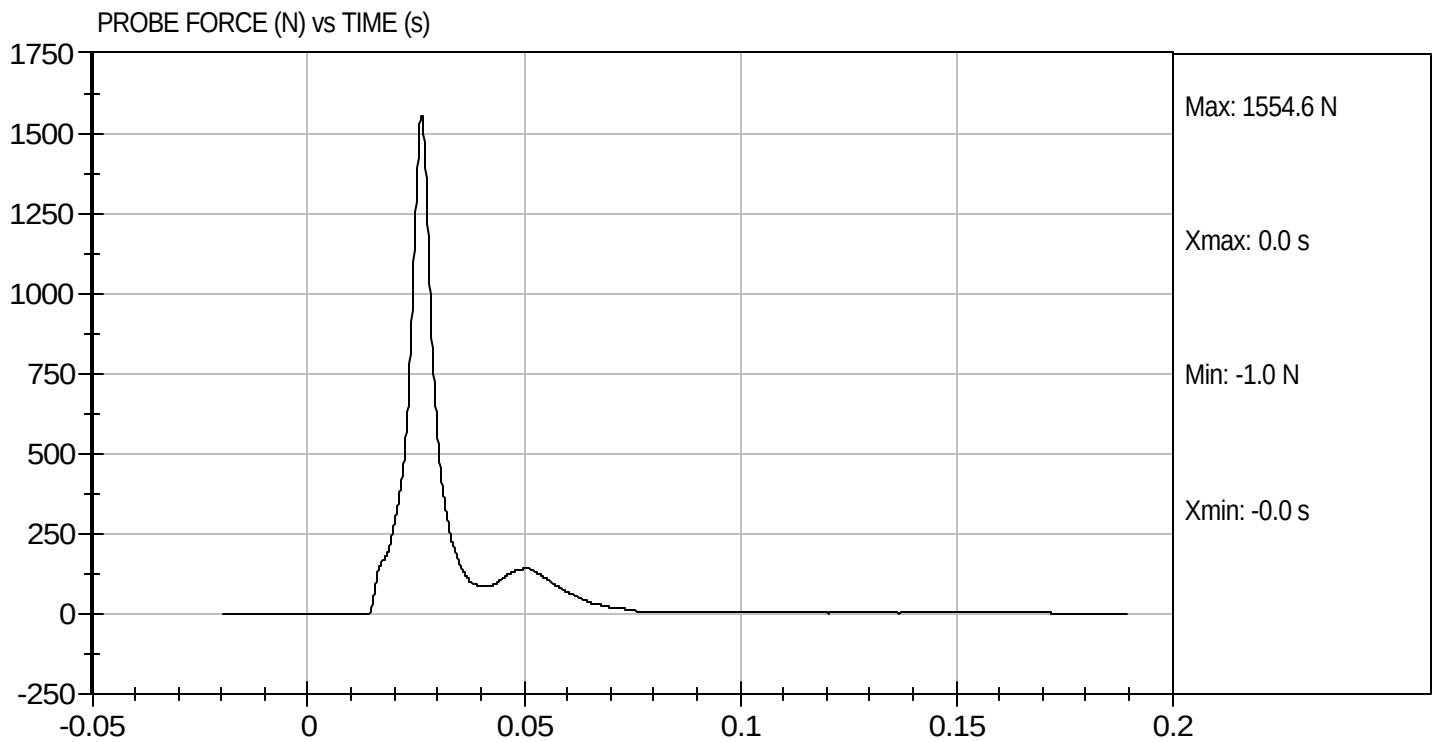
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D072544

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

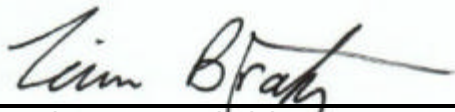


MGA RESEARCH CORPORATION
REAR HEAD DROP TEST
CRABI 12 MONTH

ATD Serial No: 093

Test ID: D072545

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


Laboratory Technician


Approved By

8/23/07
Test Date



Test Desc: Head Drop
Component ID: D072545

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

