REPORT NUMBER: NCAPSIDE-MGA-2008-009

NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST

FORD MOTOR COMPANY
2008 FORD FOCUS 2-DOOR COUPE
NHTSA NUMBER: M80203

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

Test Date: November 2, 2007

Report Date: January 15, 2008

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
RULEMAKING
OFFICE OF CRASHWORTHINESS STANDARDS
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WASHINGTON, D.C. 20590

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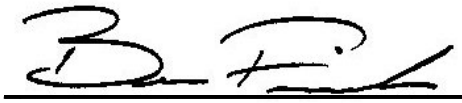
Prepared by:  Date: 1/15/08

Ben Fischer, Project Engineer

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Technical Report Documentation Page

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15. Supplementary Notes			

16. Abstract

A 55/28 km/h 90° Moving Deformable Barrier NCAP side impact was conducted on the subject 2008 Ford Focus 2-Door Coupe 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 2, 2007. 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 349 mm at level 2. The test vehicle's occupant performance is as follows:

	DRIVER	PASS.
Left Upper Rib (LUR) Accel., g	74.9	73.9
Left Lower Rib (LLR) Accel., g	101.2	89.1
Lower Spine (T_{12}) Accel., g	78.4	72.6
Thoracic Trauma Index (TTI)	90	81
Pelvis (PEV) Accel., g	72.1	70.4
HIC	174	558

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.

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 Ford Focus 2-Door Coupe manufactured by Ford Motor Company.

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 Ford Focus 2-Door Coupe 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 1406.1 kg and the test weight of the MDB was 1360.8 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on November 2, 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 349 mm at level 2, 1500 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	174	38.9	68.8	90	72.1
Passenger	558	44.5	62.7	81	70.4

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

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

TEST NOTES

There was no valid data collected for:
Driver Seat Track after 17 msec.

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2008 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007

TEST VEHICLE INFORMATION

Make	Ford
Model	Focus
Body Style	2-Door Coupe
NHTSA No.	M80203
VIN	1FAHP32N98W122606
Color	Ebony Clearcoat
Delivery Date	10/25/2007
Odometer Reading (mile)	112
Dealer	Boucher Fleet Group
Transmission	Automatic
Final Drive	Front
Number of Cylinders	4
Engine Displacement (L)	2.0
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	Ford Motor Company
Date of Manufacture	10/07

GVWR (kg)	1685
GAWR Front (kg)	896
GAWR Rear (kg)	796

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bucket		
Number Of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				375
Cargo Wt. (RCLW) (kg)				35

DATA SHEET NO. 1 (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2008 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	365.1	243.1		406.4	323.0	
Right	kg	367.4	239.1		370.1	306.6	
Ratio	%	60.3	39.7		55.2	44.8	
Totals	kg	732.5	482.2	1214.7	776.5	629.6	1406.1

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1214.7
Weight of 2 P572M ATDs	kg	161.5
Rated Cargo/Luggage Weight (RCLW)	kg	35
Calculated Vehicle Target Weight (TVTW)	kg	1411.2

* 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	670	672	672	681	1038
As Tested	mm	661	670	648	657	1170
Fully Loaded	mm	652	667	634	655	

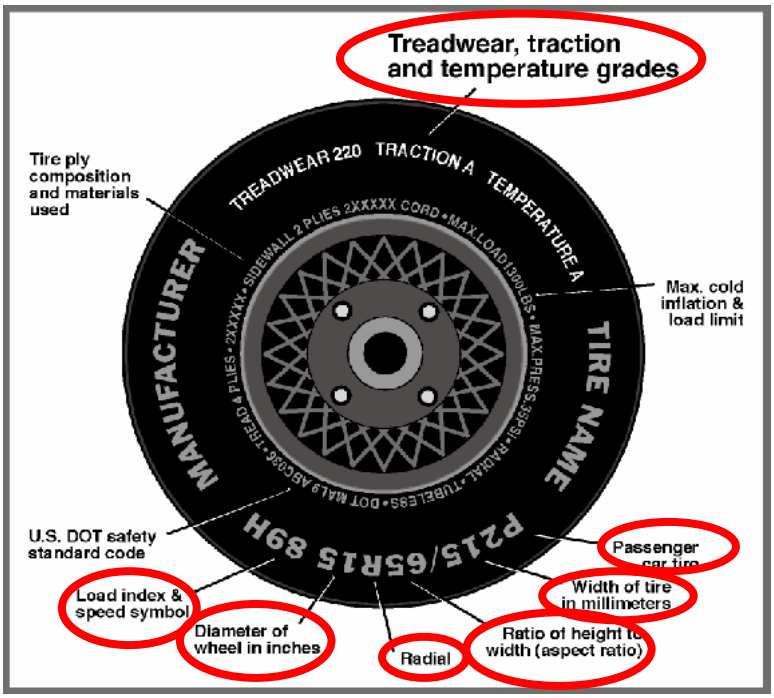
TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2614
Target Impact Point Aft of Front Axle	mm	367
Actual Impact Point Aft of Front Axle	mm	383

DATA SHEET NO. 2

TEST VEHICLE TIRE INFORMATION

Test Vehicle: 2008 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold / Test Pressure (kPa)	220	220
Recommended Tire Size	P195/60R15	P195/60R15
Tire Size on Vehicle	P195/60R15	P195/60R15
Tire Manufacturer	Hankook	Hankook
Tire Name	Optimo H725	Optimo H725
Tire Type	Passenger	Passenger
Tire Width (mm)	195	195
Ratio of Height to Width (aspect ratio)	60	60
Radial	R	R
Wheel Diameter	15	15
Load Index & Speed Symbol	87T	87T
Treadwear	620	620
Traction Grade	B	B
Temperature Grade	B	B

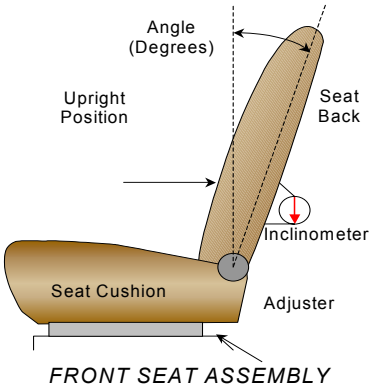
DATA SHEET NO. 3

TEST VEHICLE INFORMATION

Test Vehicle:	2008 Ford Focus 2-Door Coupe	NHTSA No.	M80203
Test Program:	NCAP Side Impact	Test Date:	11/02/2007

NORMAL DESIGN RIDING POSITION

The driver and passenger seat back is positioned to the manufacturer's designated angle. The procedure is as follows: Set seat back angle at 18.9 degrees measured at the headrest post.

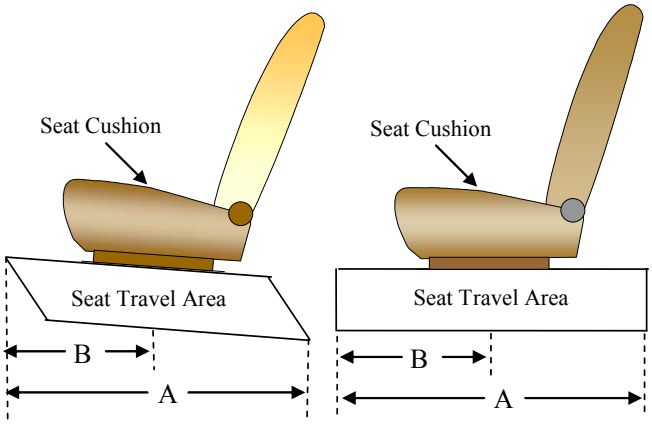


Driver seat back angle: 19.2 degrees at headrest post

Passenger seat back angle: Fixed

SEAT FORE/AFT POSITIONS

	Total Fore/Aft Travel	Placed in position #
Driver Seat	52 detents	26th detent (1st as 1)
Rear Seat	Fixed	Fixed



DATA SHEET NO. 3 (CONTINUED)

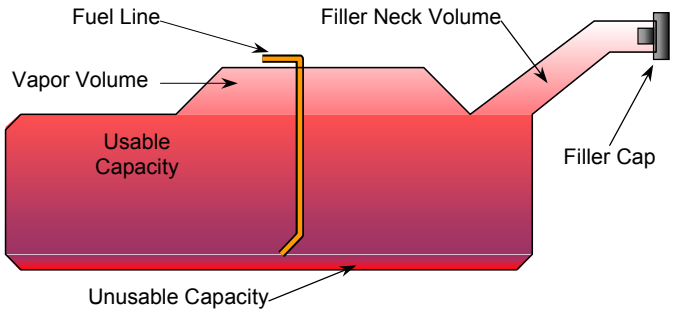
TEST VEHICLE INFORMATION

Test Vehicle: 2008 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	49.2
Usable Capacity of "Optional" Tank	
92-94% of Usable Capacity	45.3 – 46.2
Actual Amount of Solvent used	45.4
1/3 of Usable Capacity	16.4

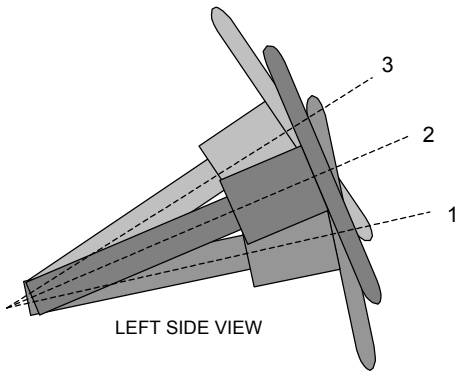
The test vehicle is equipped with an electric fuel pump. The electric fuel pump operates for 2 seconds to pressurize the fuel system following the actuation of the ignition. If no attempt has been made to start the engine within 2 seconds following ignition actuation the fuel pump will shut off. The fuel pump operates continuously while the engine is running. If the engine stalls, the fuel pump is deactivated. Also, a fuel pump shut-off switch is provided, designed to stop fuel flow to the engine if the vehicle sustains an impact above a certain magnitude.



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		65.0
Geometric center position No. 2		67.6
Uppermost position No. 3		70.3

DATA SHEET NO. 4

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Test Vehicle: 2008 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007

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	61.8
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.0
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.5

POST TEST OBSERVATIONS
MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	16 rearward
Vertical Offset	mm	+/-20	0

DATA SHEET NO. 5

POST TEST OBSERVATIONS

Test Vehicle: 2008 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007

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	Curtain Airbag, Headrest	Side Header, Curtain Airbag
Upper Torso Contact	Side Airbag	Door Panel
Lower Torso Contact	Door Panel	Door Panel
Left Knee Contact	Door Panel	Door Panel
Right Knee Contact	Left Knee	Left Knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

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

POST TEST STRUCTURAL OBSERVATIONS

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

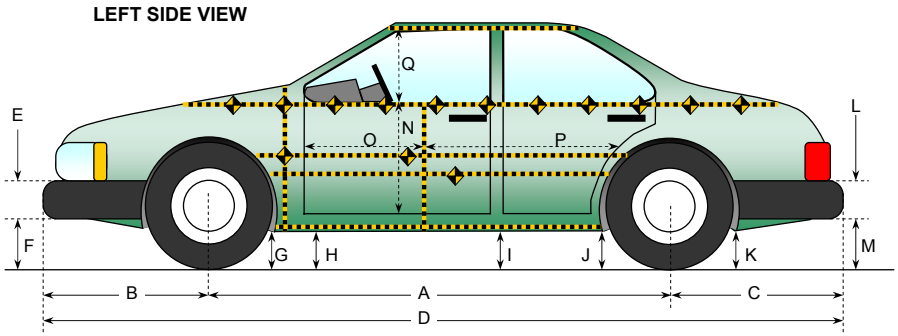
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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: 2008 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007



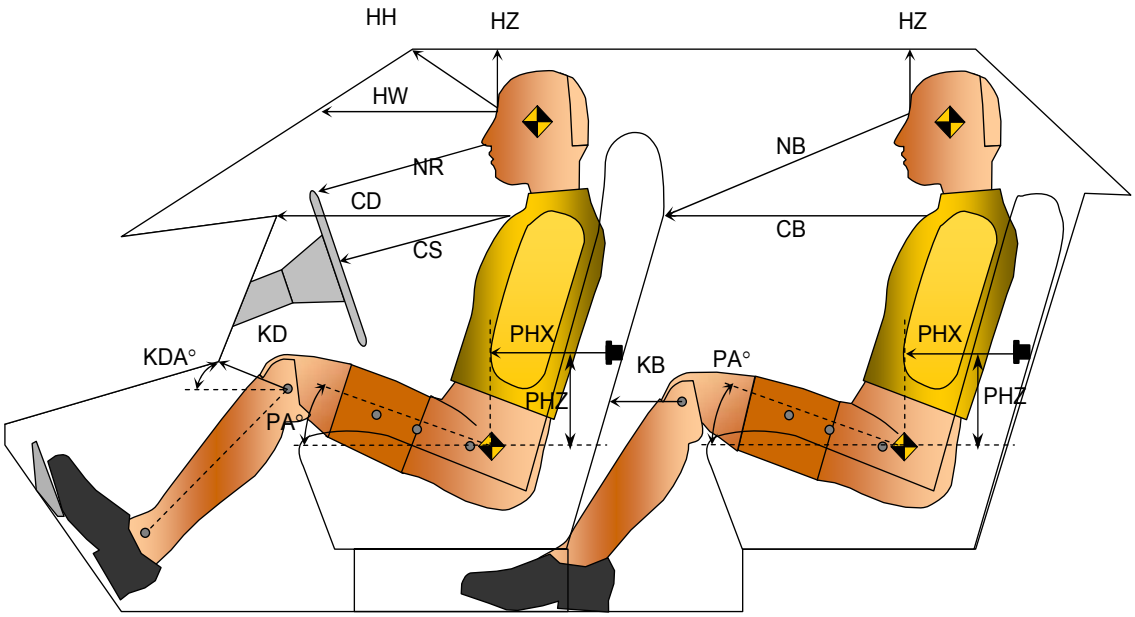
All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2614	2546	68
B	Front Axle to FSOV	880	885	-5
C	Rear Axle to RSOV	1019	1001	18
D	Total Length at Centerline	4513	4432	81
E	Front Bumper Thickness	135	135	0
F	Front Bumper Bottom to Ground	247	270	-23
G	Sill Height at Front Wheel Well	169	203	-34
H	Sill Height at Front Door Leading Edge	170	208	-38
I	Sill Height at "B" Pillar	168	194	-26
J1	Sill Height at Rear Wheel Well	165	184	-19
J2	Pinch Weld Height at Rear Wheel Well	163	177	-14
K	Sill Height Aft of Rear Wheel Well	235	214	21
L	Rear Bumper Thickness	190	190	0
M	Rear Bumper Bottom to Ground	287	272	15
N	Sill Height to Window Bottom Sill	686	559	127
O	Front Door Leading Edge to Impact CL	753	740	13
P	Rear Door Trailing Edge to Impact CL	579	582	-3
Q	Front Window Opening	411	397	14
R	Right Side Length	3712	3722	10
S	Left Side Length	3712	3629	83
T	Vehicle Width at "B" Post	1687	1395	292

DATA SHEET NO. 7

SID/HIII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2008 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007

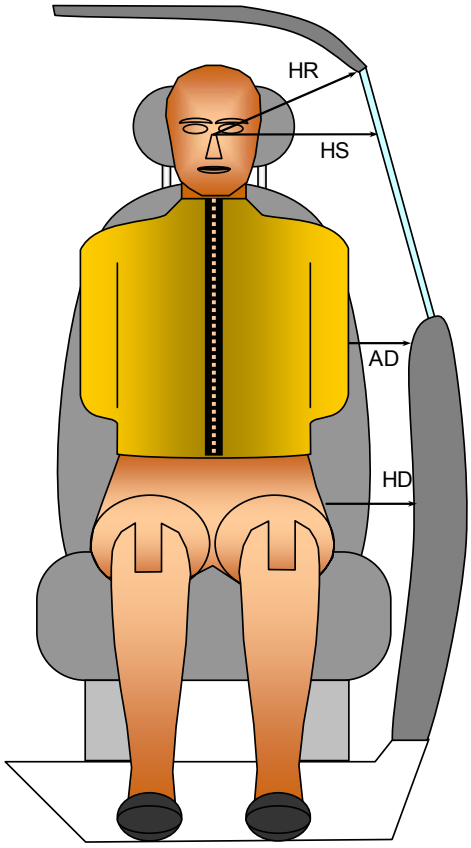


Driver Code	Pass. Code	Measurement Description	Driver S/N 904		Passenger S/N 271	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	386			
HW		Head to Windshield	603			
HZ	HZ	Head to Roof	162		153	
NR	NB	Nose to Rim/Nose to Seatback	466		511	
CD	CB	Chest to Dash or Seatback	544		458	
CS		Chest to Steering Wheel	370			
KDL	KBL	Left Knee to Dash or Seatback	136	42.3	160	26.1
KDR	KBR	Right Knee to Dash or Seatback	140	38.5	156	32.3
PA	PA	Pelvic Angle		23.9		24.1
PHX	PHX	H-Point to Striker (X-Axis)	421		423	
PHZ	PHZ	H-Point to Striker (Z-Axis)	126		-87	

DATA SHEET NO. 8

SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2008 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007



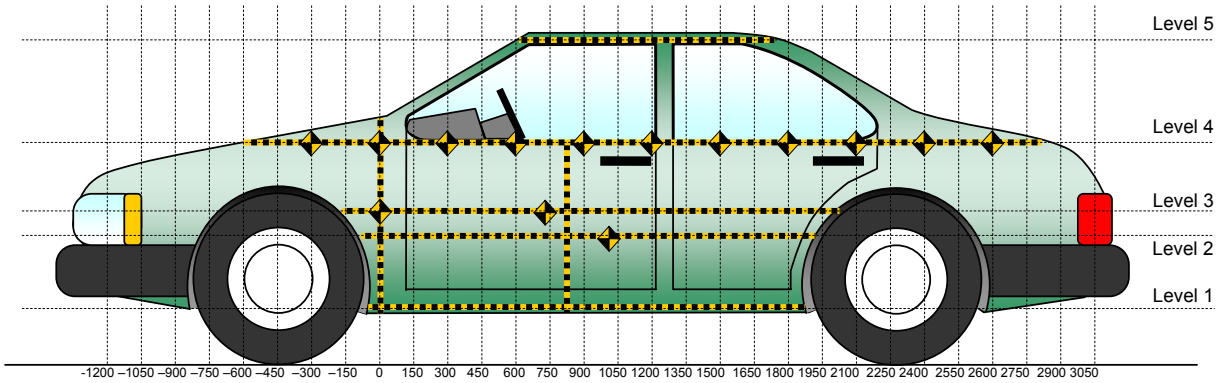
FRONT VIEW OF DUMMY

Code	Measurement Description	Units	Driver S/N 904	Passenger S/N 271
HR	Head to Side Header	mm	167	159
HS	Head to Side Window	mm	298	315
AD	Arm to Door	mm	96	51
HD	H-Point to Door	mm	141	113

DATA SHEET NO. 9

VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2008 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007



All Measurements Shown in mm

LEFT SIDE VIEW

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

Level	Measurement Description	Maximum Exterior Static Crush	Distance From Impact	Height Above Ground
5	Window	65	1350	1398
4	Window Sill	306	1500	929
3	Mid Door	323	1500	616
2	Occupant H-Point	349	1500	545
1	Sill Top	204	1200	247
	Maximum Penetration	349		

DATA SHEET NO. 10

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2008 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-600				339					351					12	
-450				329					344					15	
-300				318					350					32	
-150			248	311				300	353				52	42	
0	296	252	251	304		334	362	349	365		38	110	98	61	
150	294	264	264	302		430	528	506	416		136	264	242	114	
300	291	263	262	295		439	567	524	452		148	304	262	157	
450	292	261	261	291		444	577	533	491		152	316	272	200	
600	293	260	260	290		456	577	538	502		163	317	278	212	
750	292	260	258	291	549	466	570	538	520	599	174	310	280	229	50
900	292	259	258	291	549	477	581	539	517	599	185	322	281	226	50
1050	296	259	257	291	549	489	592	551	520	604	193	333	294	229	55
1200	298	260	258	294	551	502	601	552	526	606	204	341	294	232	55
1350	302	261	259	296	552	503	607	561	523	617	201	346	302	227	65
1500	305	261	259	300	552	501	610	582	606	609	196	349	323	306	57
1650	307	263	261	303	553	498	595	574	570	603	191	332	313	267	50
1800	281	258	259	307	555	469	575	573	514	598	188	317	314	207	43
1950		239	240	311	559		451	472	460	599		212	232	149	40
2100			235	316				367	408				132	92	
2250				324					385					61	
2400			240	331				306	376				66	45	
2550				342					376					34	
2700				354					375					21	
2850				375					380					5	

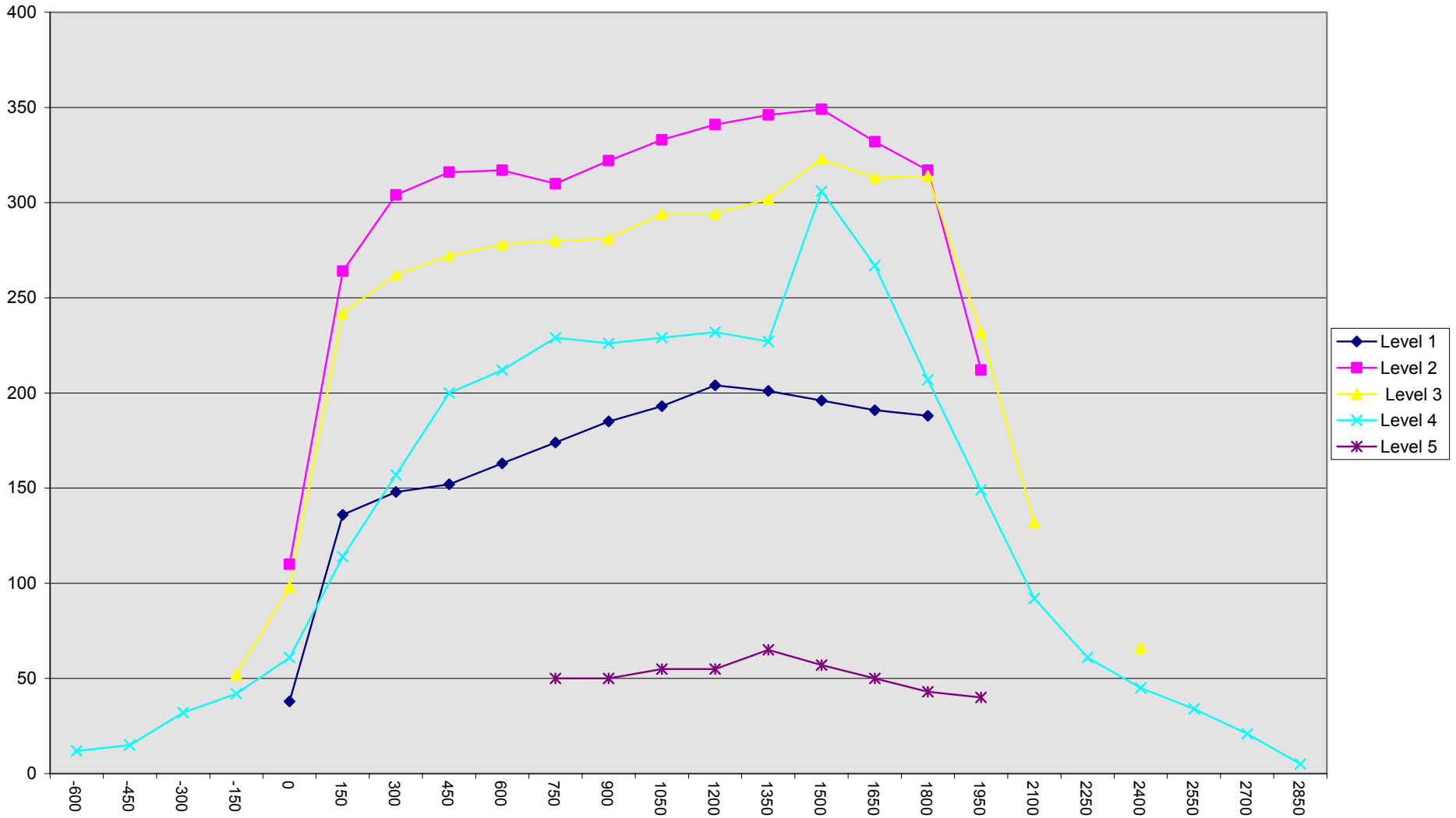
Reference plane is parallel to test vehicle longitudinal centerline.

Given dimensions = Reference plane to car body

DATA SHEET NO. 10... (continued)

VEHICLE EXTERIOR CRUSH PROFILES

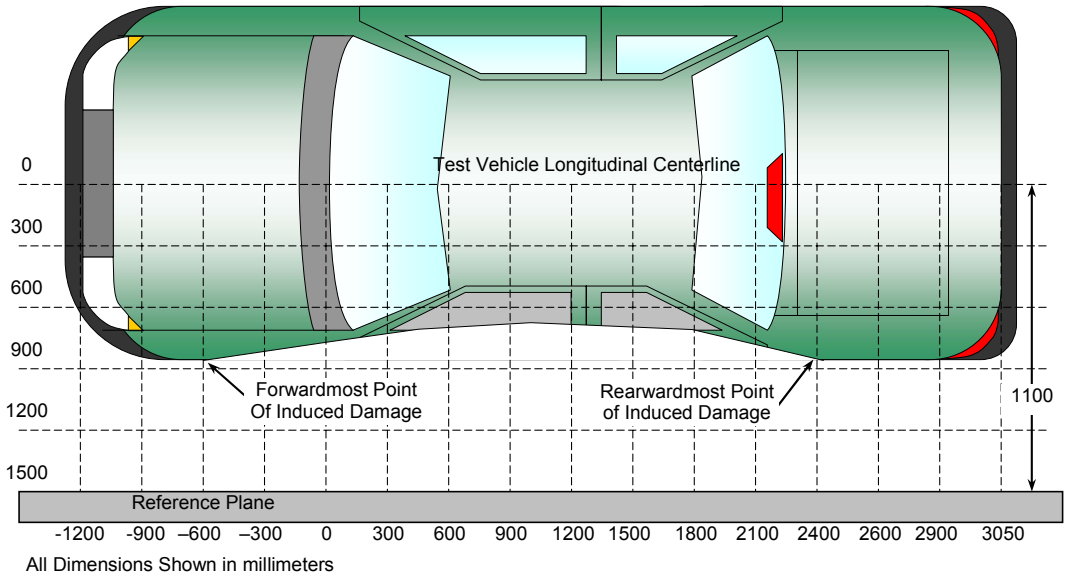
Test Vehicle: 2008 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007



DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2008 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007



TOP VIEW

DAMAGE PROFILE DISTANCES

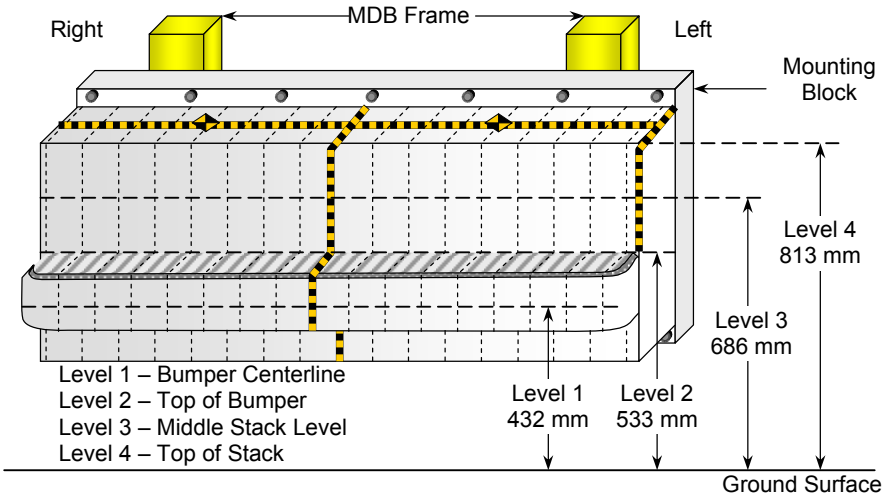
DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	2850	4	375	380	5
2	2181	4	318	394	76
3	1404	2	261	618	357
4	742	2	260	589	329
5	79	2	258	420	162
6	-600	4	339	351	12

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 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007



DEFORMABLE BARRIER STATIC CRUSH

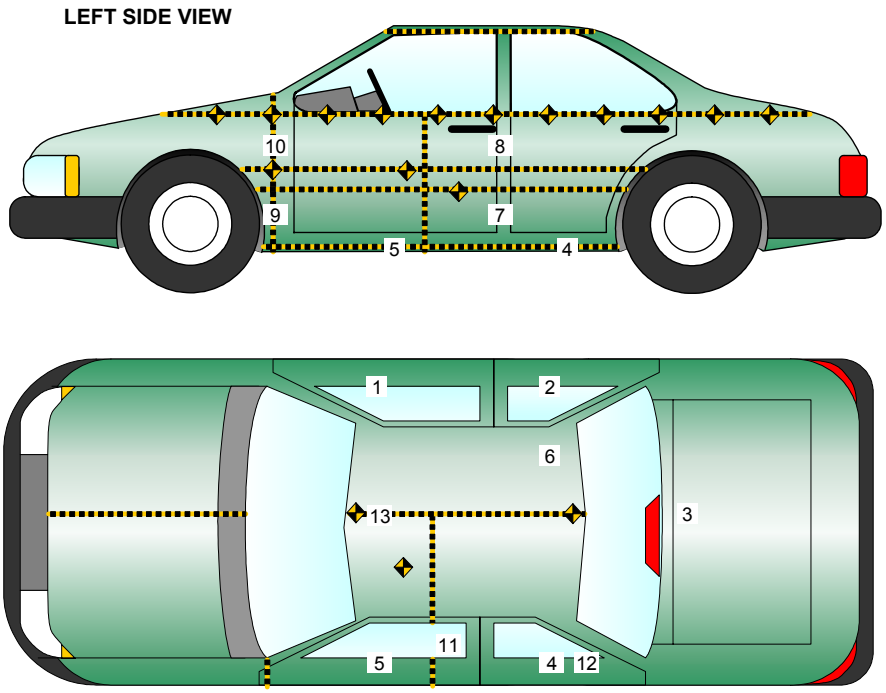
Stack Level	Distance Right of Center								C_L	Distance Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	44	48	53	48	42	40	39	40	41	43	45	47	49	52	68	87	107
2	45	41	31	25	24	23	22	24	25	26	29	30	31	34	41	56	71
3	17	-7	-5	1	6	-1	-1	-1	-1	1	3	5	8	13	30	59	106
4	48	11	-6	1	17	3	1	2	7	10	9	12	21	43	70	103	154

All Dimensions in mm

DATA SHEET NO. 13

VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2008 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007



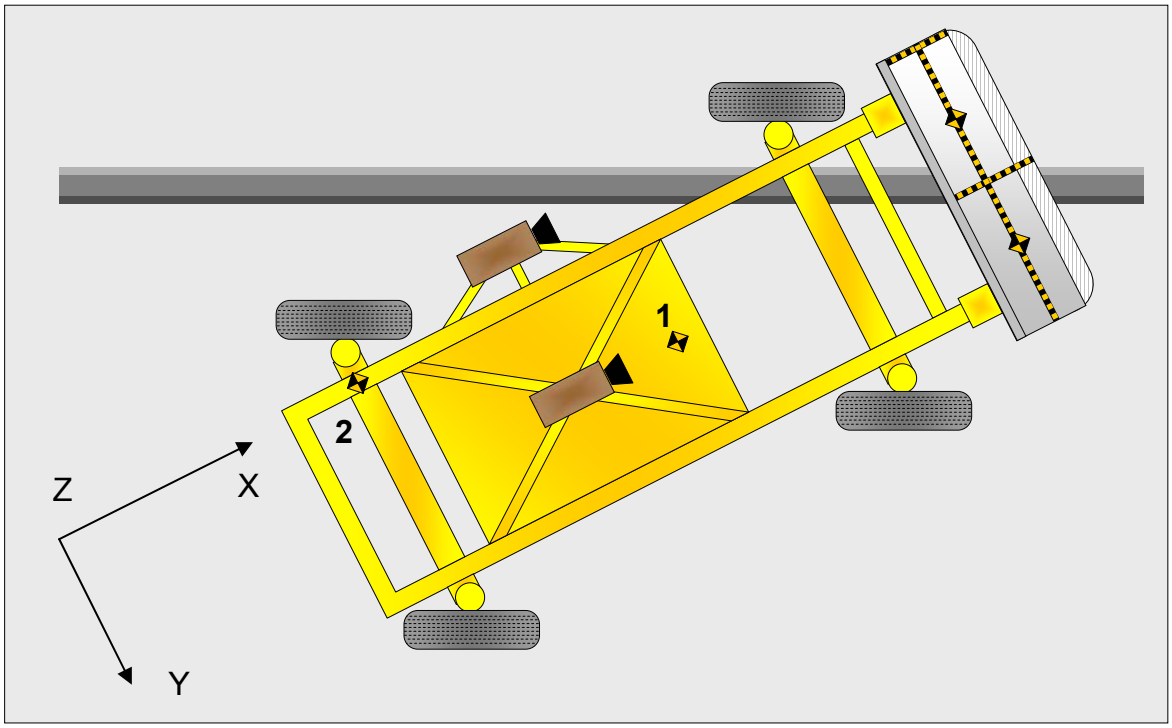
Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	2173	695	201
2	Right Sill at Rear Seat	1632	692	209
3	Rear Floorpan Above Axle	906	0	521
4	Left Sill at Rear Door	1524	-692	211
5	Left Sill at Front Door	2175	-695	209
6	Rear Occupant Compartment	1752	-349	277
7	Left Lower B-Post	1809	-701	436
8	Left Middle B-Post	1786	-698	702
9	Left Lower A-Post	2968	-702	484
10	Left Middle A-Post	3041	-788	752
11	Front Seat Track	2200	-562	347
12	Rear Seat Track or Structure			
13	Vehicle CG	2410	0	317

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 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007



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

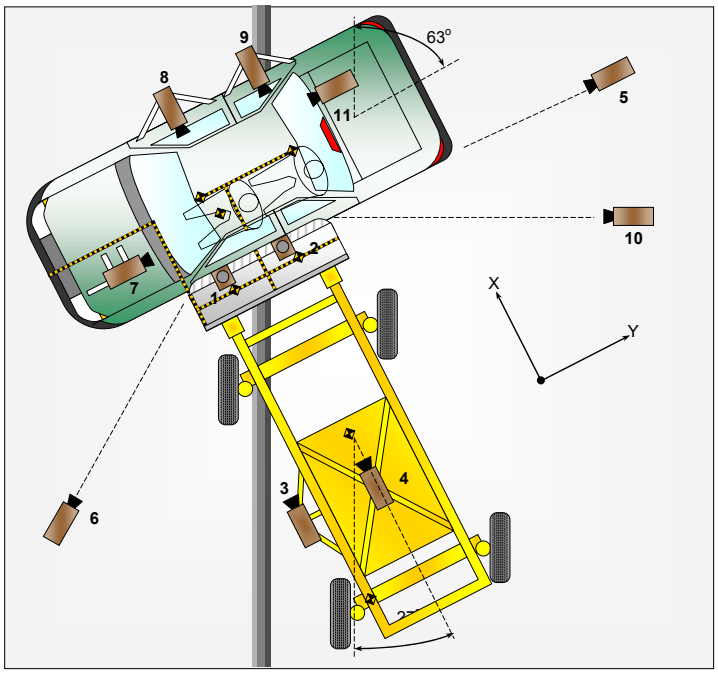
Test Vehicle: 2008 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007

	Elements	Pre-Test (mm)
1	Total Length	4513
2	Total Width	1687
3	Bumper Top Height	602
4	Bumper Bottom Height	432
5	Longitudinal Member Top Height	573
6	Distance between Longitudinal Members	1090
7	Longitudinal Member Width	90
8	Engine Top Height	843
9	Engine Bottom Height	215
10	Engine and gearbox width	833
11	Front bumper-engine distance	424
12	Front shock absorber fixing height	881
13	Bonnet leading edge height	764
14	Front shock absorber fixing width	1097
15	Front bumper – front axle distance	883
16	Front axle – a pillar distance	459
17	A-pillar – B-pillar distance	1341
18	B-Pillar – rear axle distance	804
19	B-pillar – C-pillar distance	949
20	Roof sill bottom height	1411
21	Roof sill top height	1463
22	Floor sill bottom height	225
23	Floor sill top height	363

DATA SHEET NO. 16

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2008 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007



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	1080	5100	1180	24	1000
6	Left Side, Ground Level, Overall	1100	-5050	1110	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				10	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 Ford Focus 2-Door Coupe NHTSA No. M80203
Test Program: NCAP Side Impact Test Date: 11/02/2007

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21° C Test Time: 10:43 am

Stoddard Solvent Spillage Measurements

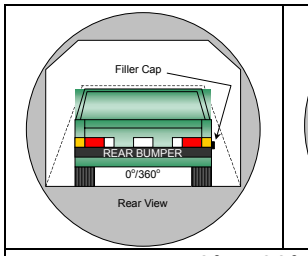
A. From impact until vehicle motion ceases: 0 oz.
(Maximum Allowable = 1 ounce)

B. For the 5 minute period after motion ceases: None
(Maximum allowable = 5 ounces)

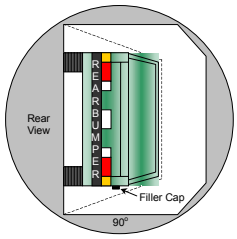
C. For the following 25 minutes: None
(Maximum allowable = 1 oz./minute)

D. Spillage Details: None

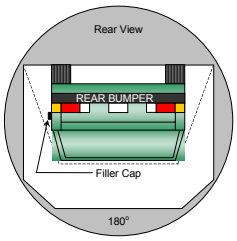
FMVSS 301 STATIC ROLLOVER DATA

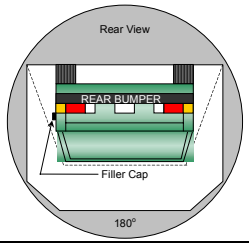


0° to 90°

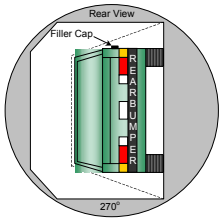


90° to 180°

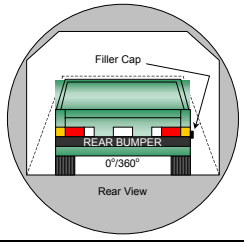




180° to 270°



270° to 360°



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**

Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage Collection Time (min)	Spillage (oz.)
0° to 90°	116	300	First 5	0
90° to 180°	117	300	First 5	0
180° to 270°	119	300	First 5	0
270° to 360°	118	300	First 5	0

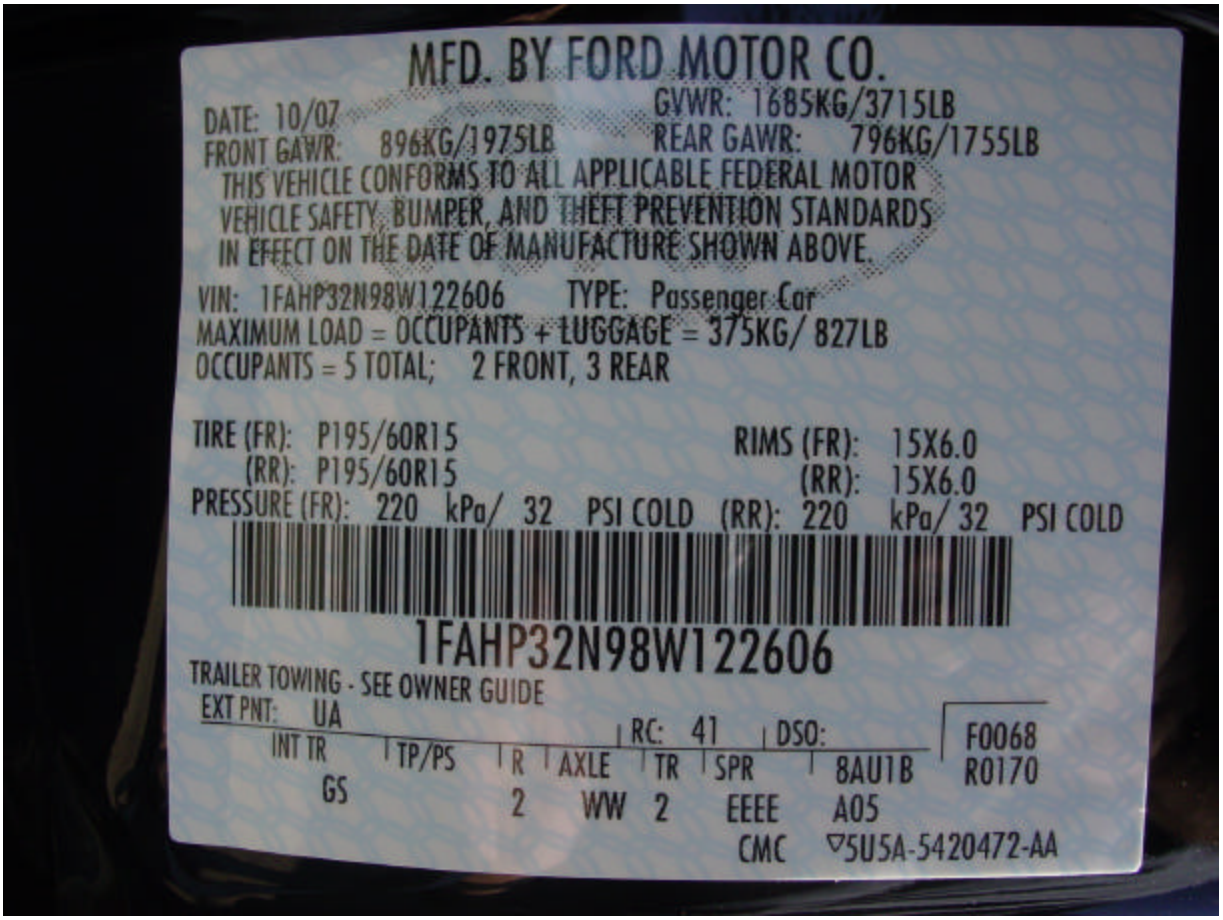
APPENDIX A

PHOTOGRAPHS

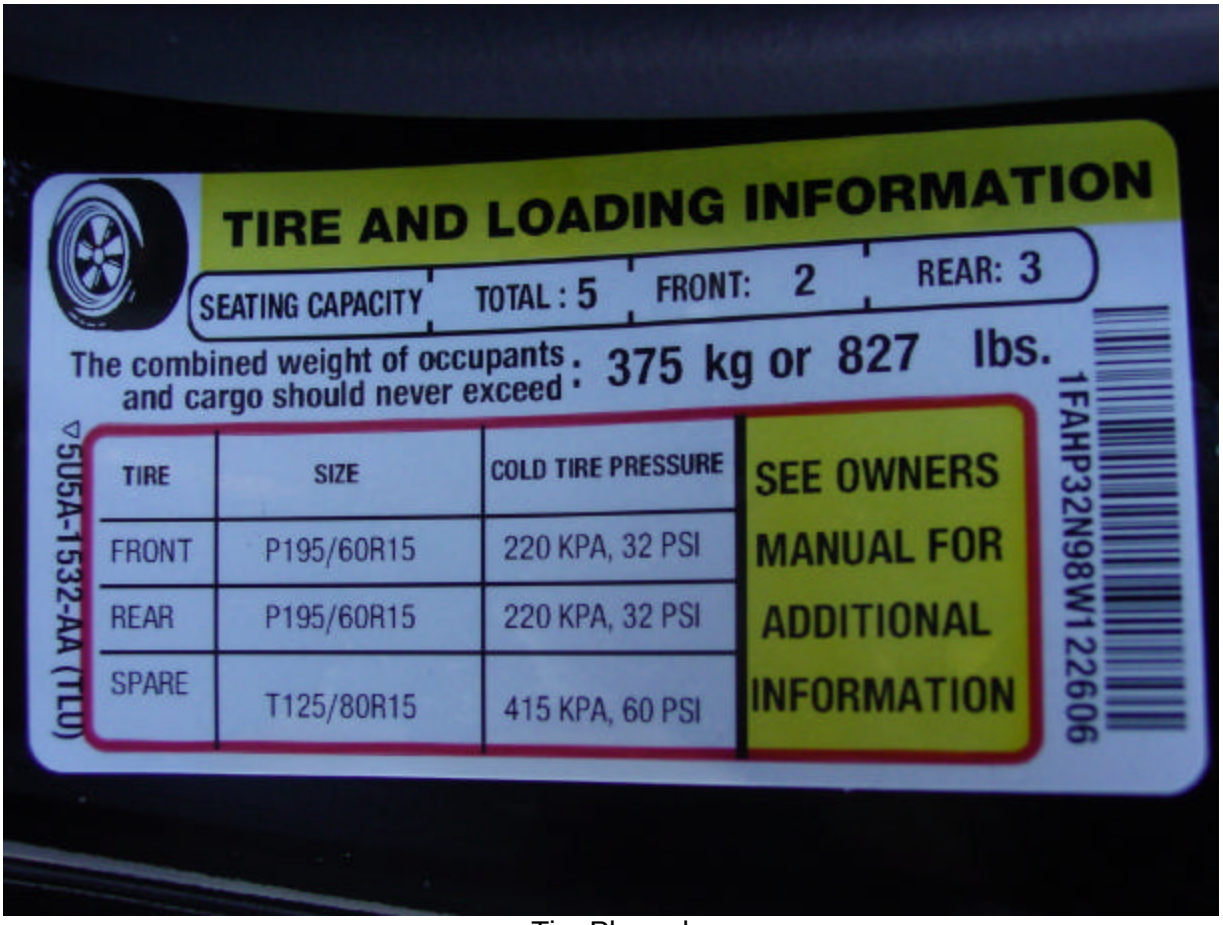
TABLE OF PHOTOGRAPHS

Left Front ¾ View, As Received

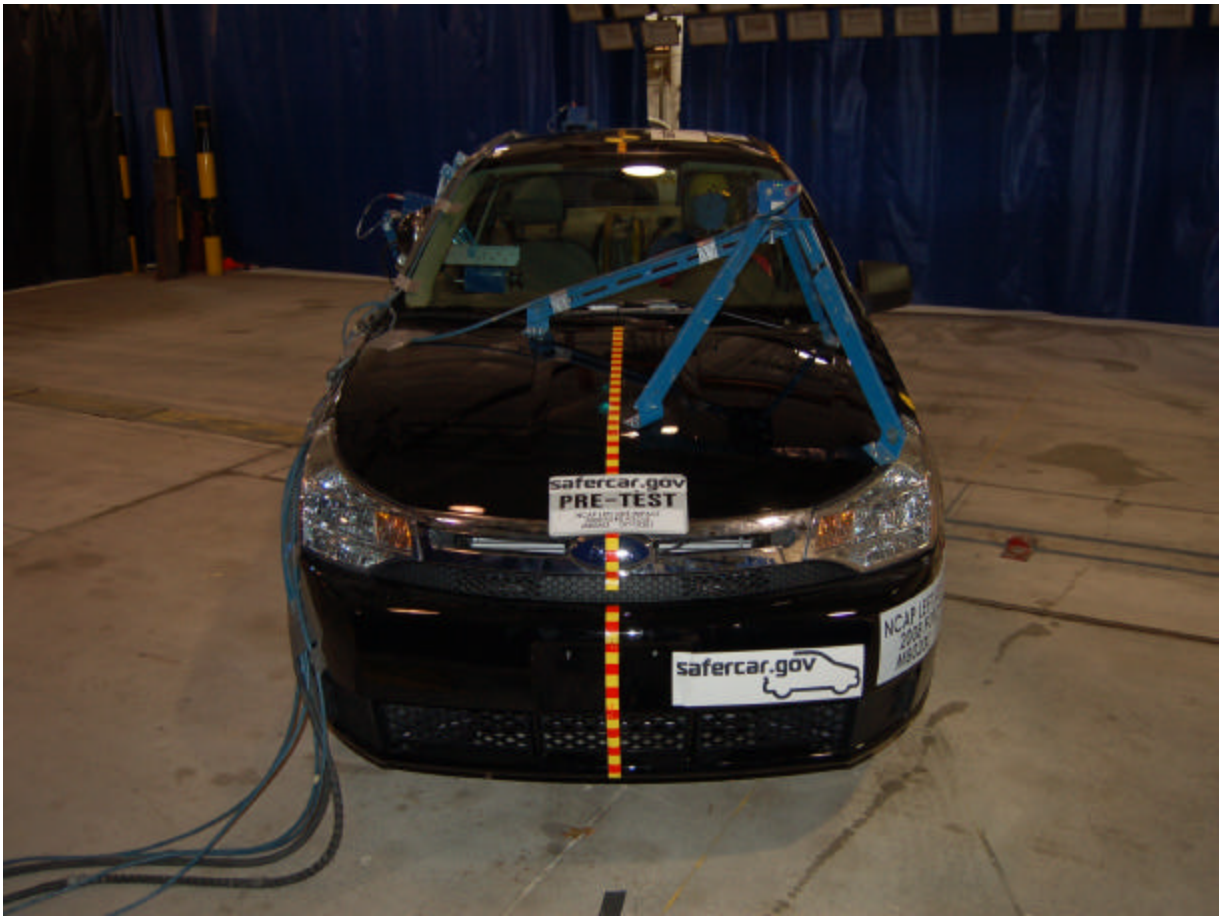
Right Rear ¾ View, As Received



Manufacturer's Label



Tire Placard



Pre-Test Front View

Post-Test Front View

Pre-Test Left Front ¾ View

Post-Test Left Front ¾ View

Pre-Test Left Side View

Post-Test Left Side View

Pre-Test Left Rear ¾ View

Pre-Test Rear View

Post-Test Rear View

Pre-Test Right Rear ¾ View

Post-Test Right Rear ¾ View

Pre-Test Right Side View

Post-Test Right Side View

Pre-Test Right Front ¾ View

Post-Test Right Front ¾ View

Pre-Test Left Impact Point

Post-Test Left Impact Point

Pre-Test Front ¾ View of Left Side Doors

Post-Test Front ¾ View of Left Side Doors

Pre-Test Rear ¾ View of Left Side Doors

Post-Test Rear ¾ 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 Clearance From Door

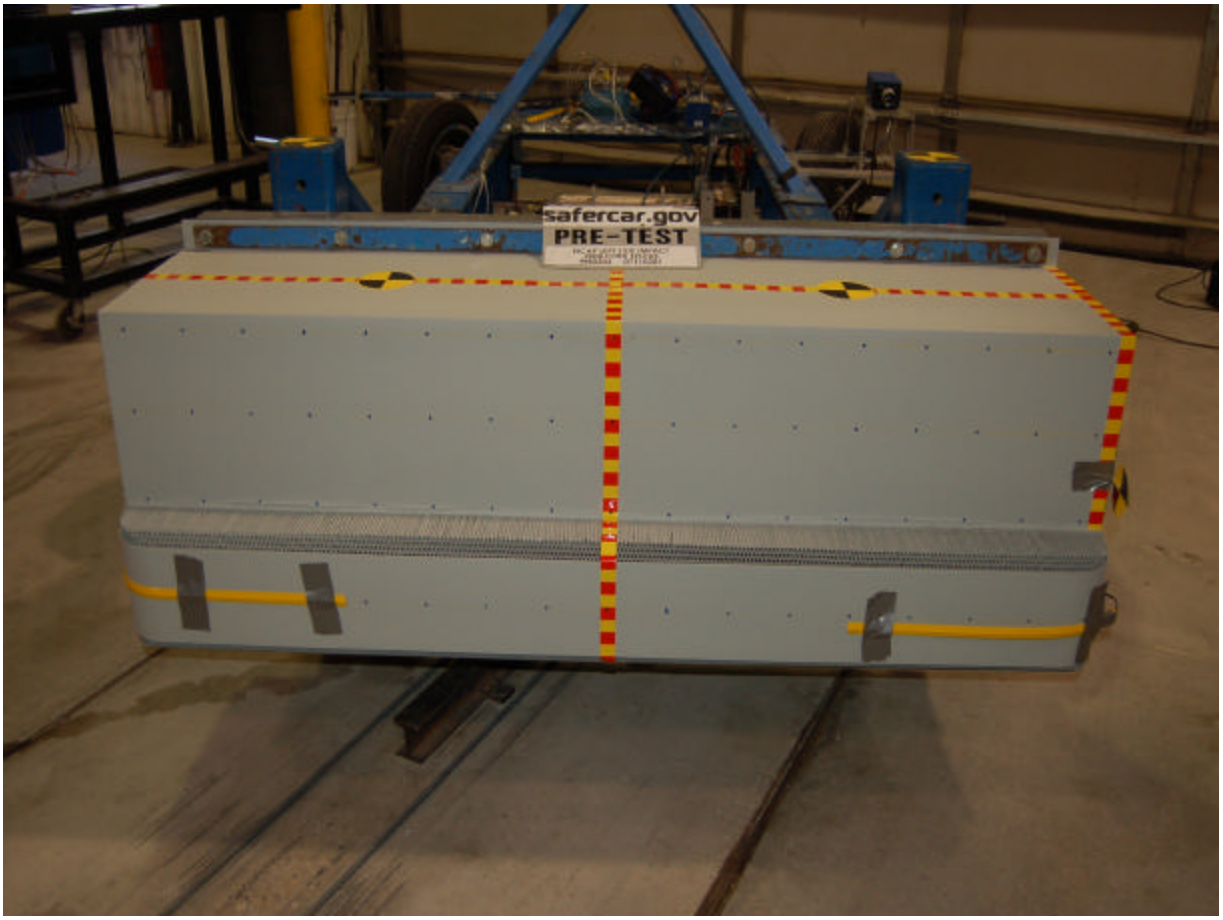
Post-Test Passenger Dummy Clearance From Door

Pre-Test Passenger Dummy (Through Window)

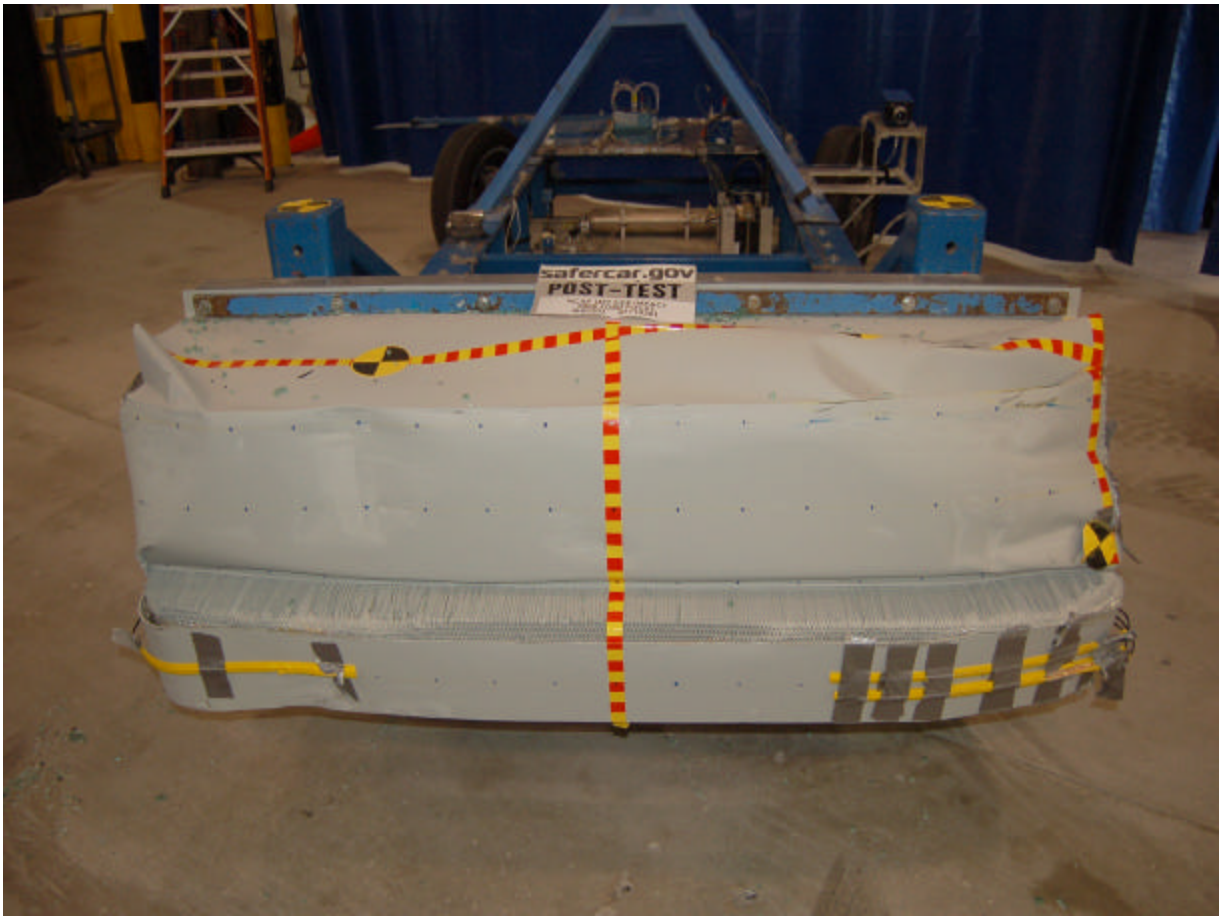
Post-Test Passenger Dummy (Through Window)

Pre-Test Passenger Dummy Right Side View

Post-Test Passenger Dummy Right Side View



Pre-Test Front View of Deformable Barrier

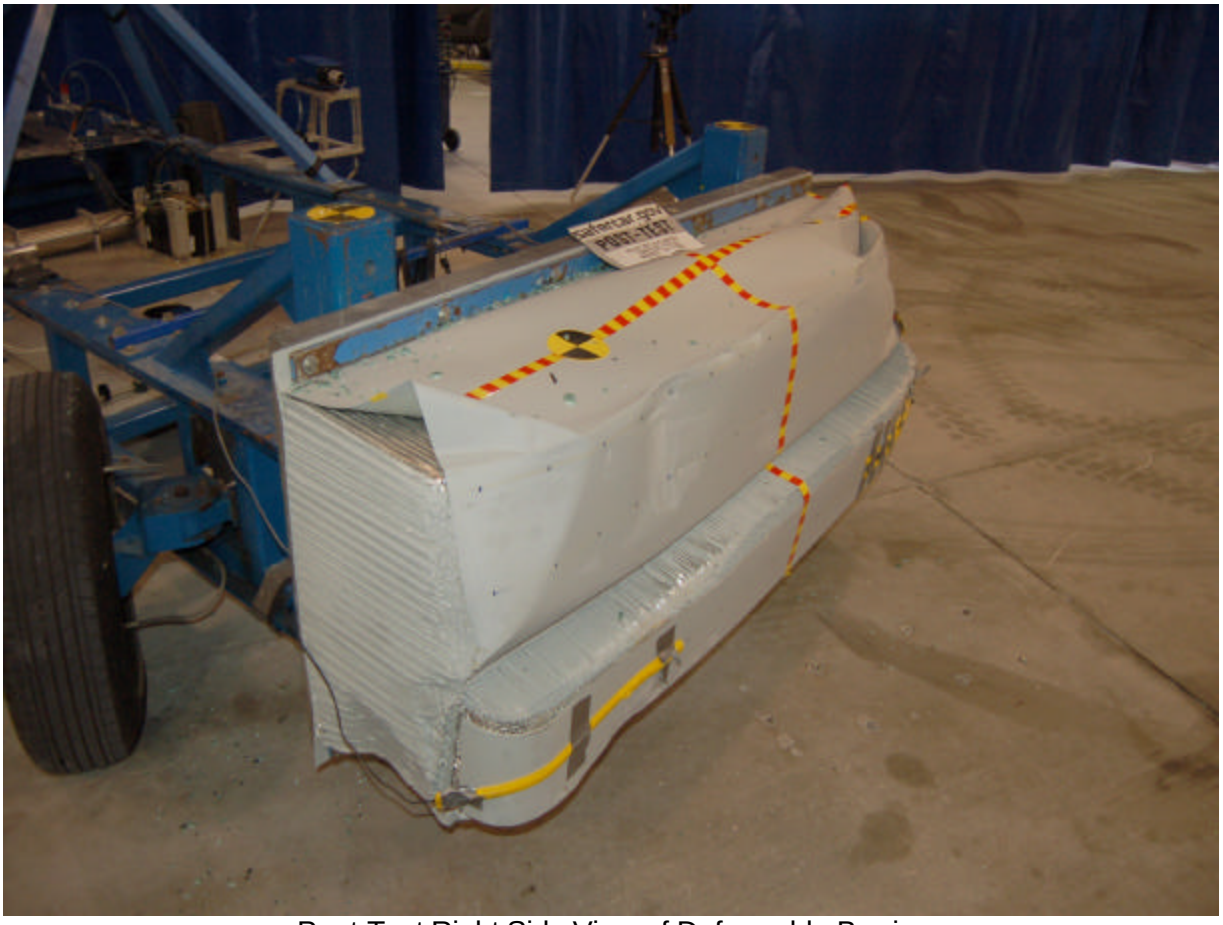


Post-Test Front View of Deformable Barrier

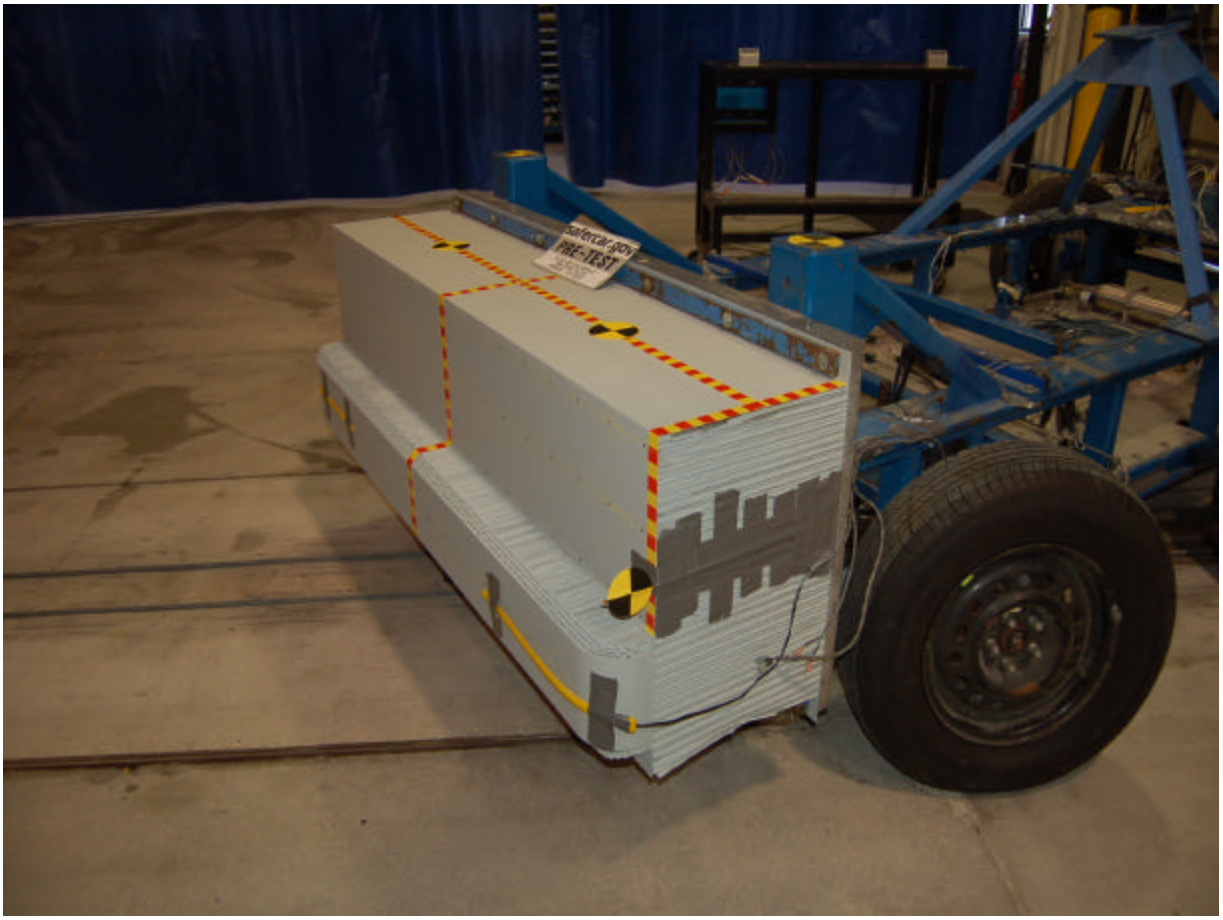
Pre-Test Top View of Deformable Barrier

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)

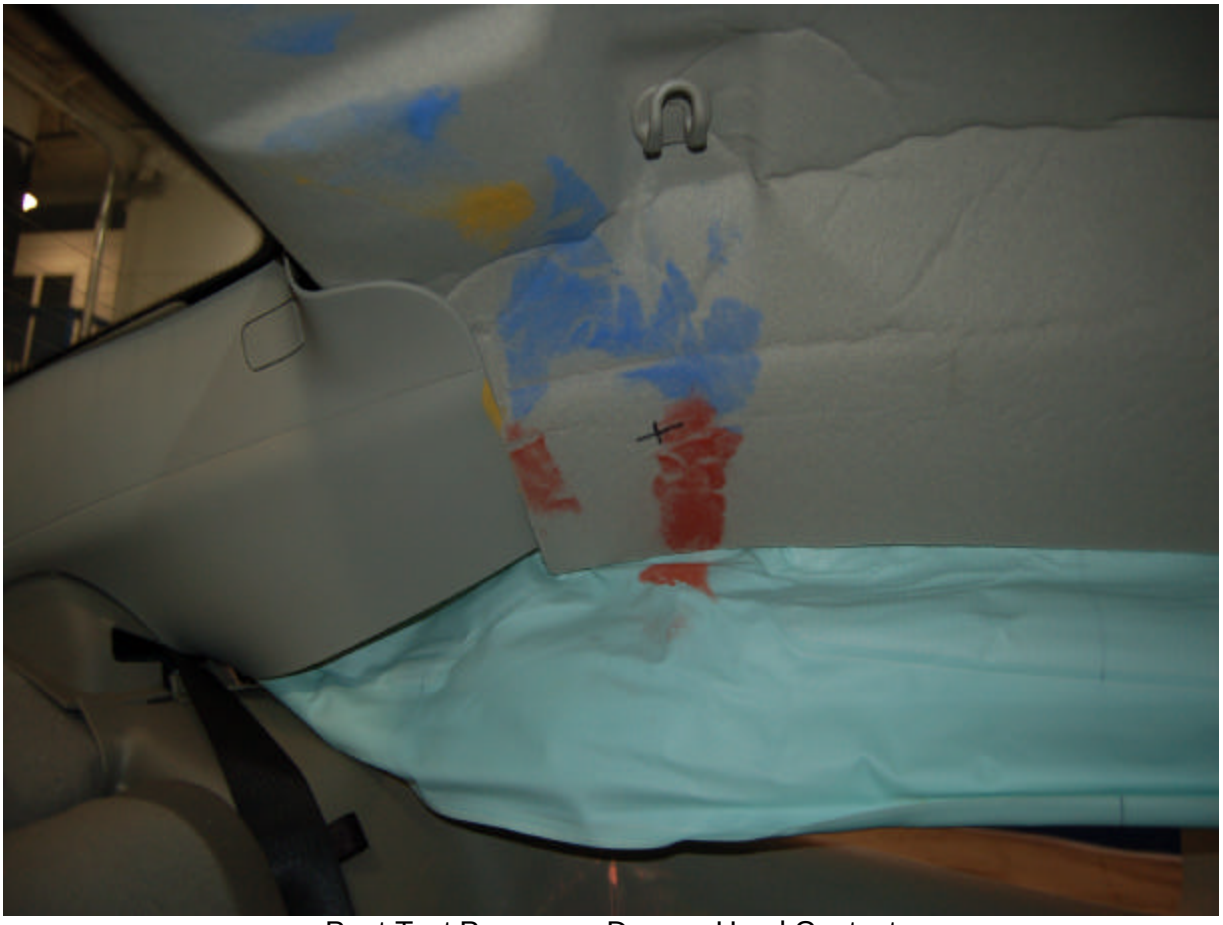
Vehicle Impact


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

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

TABLE OF DATA PLOTS

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

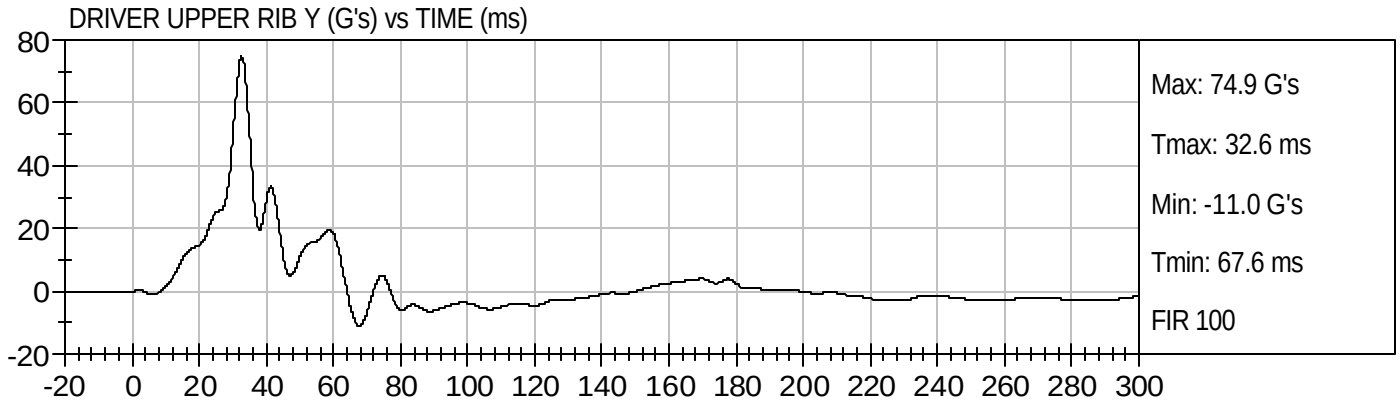
MDB Rear Y

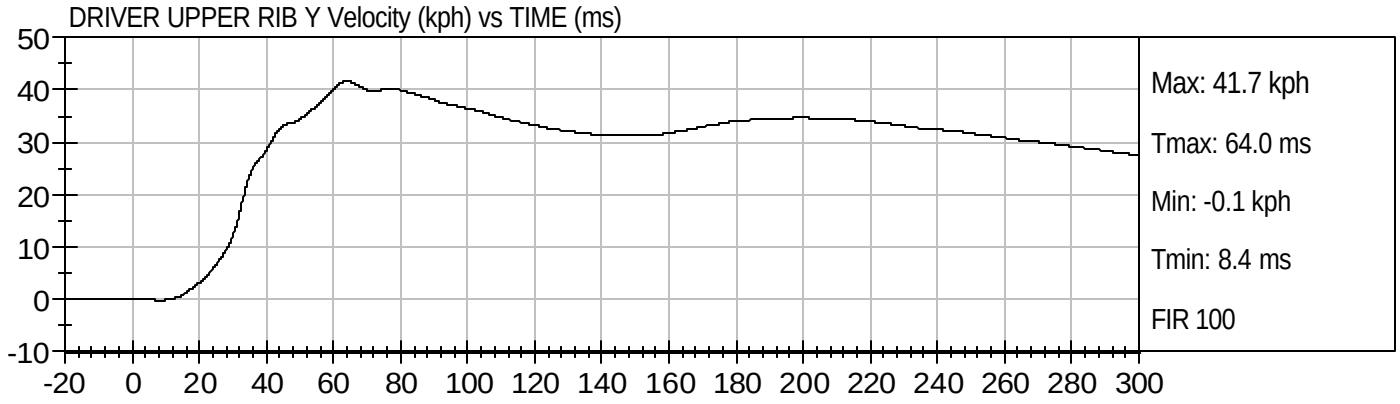
MDB Left Bumper Contact

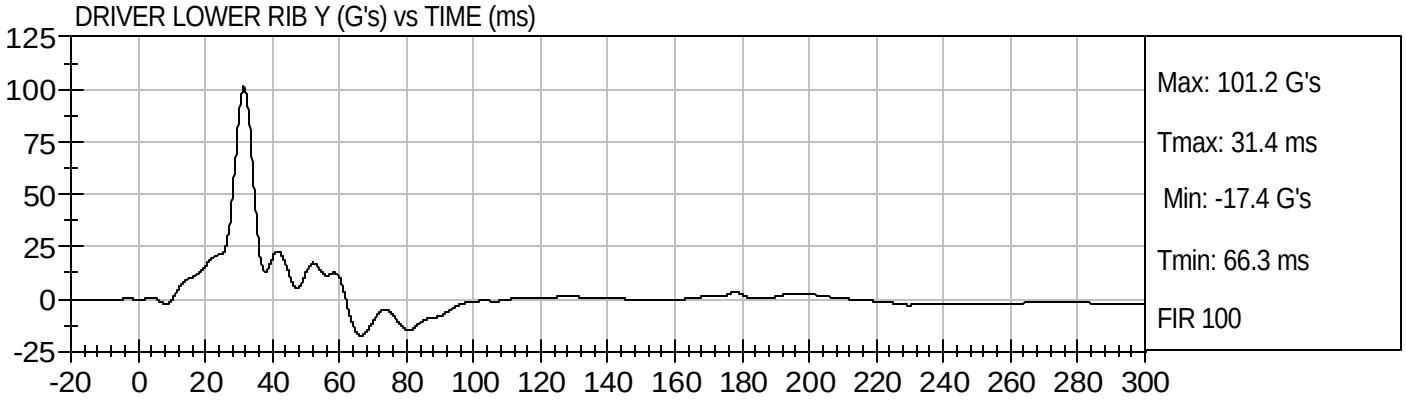
MDB Right Bumper Contact

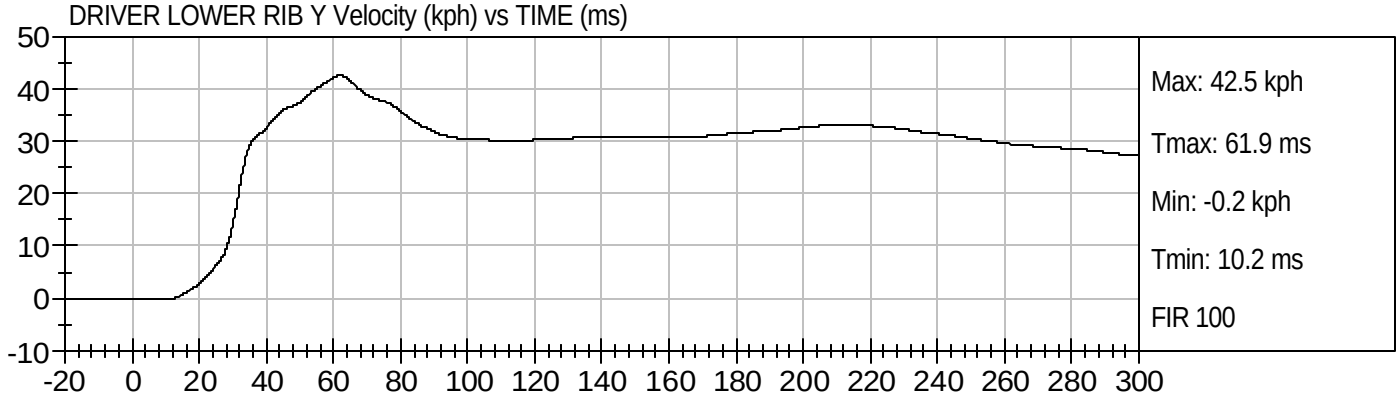
NCAP LEFT SIDE
2008 FORD FOCUS

Test Date: 11/02/2007
Speed: 38.4 mph (61.8 km/h)





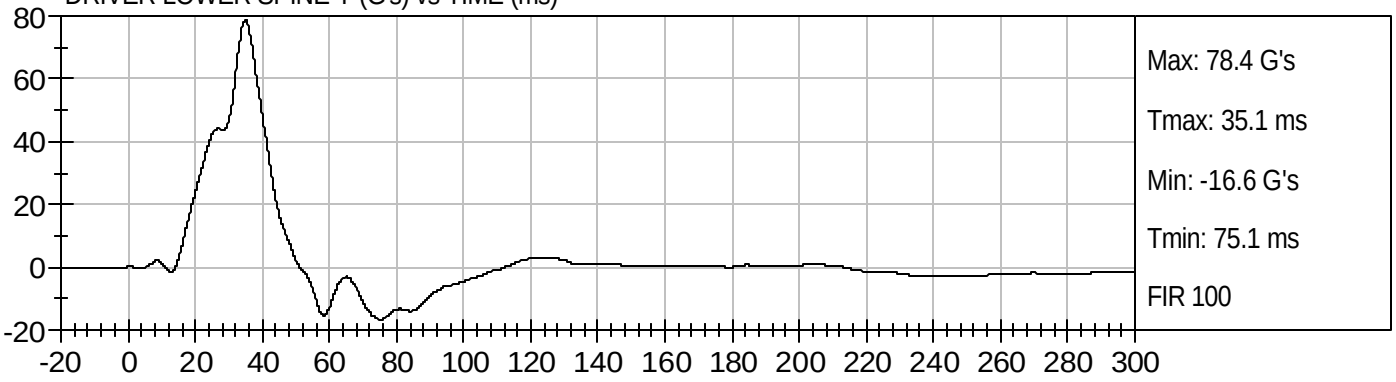




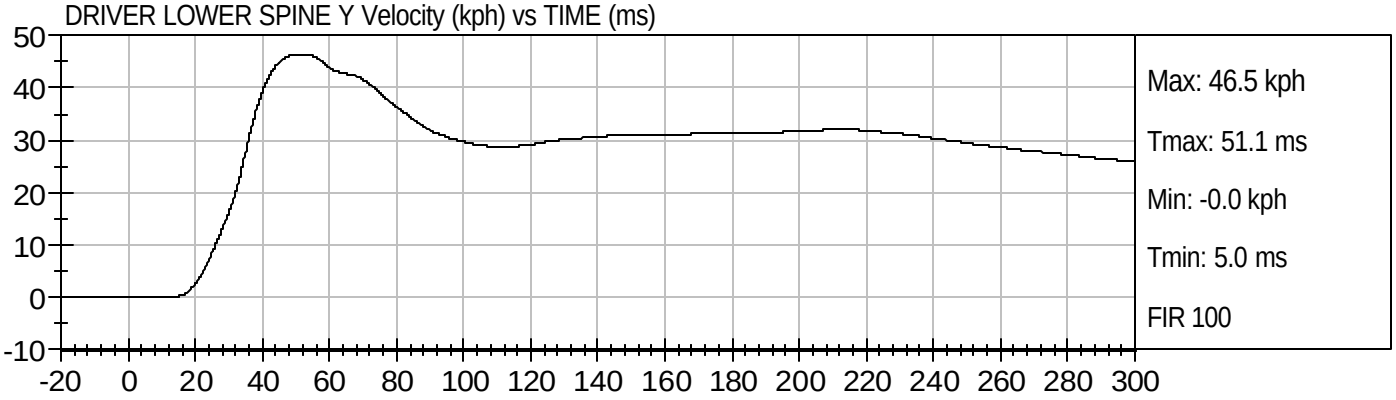
NCAP LEFT SIDE
2008 FORD FOCUS

Test Date: 11/02/2007
Speed: 38.4 mph (61.8 km/h)

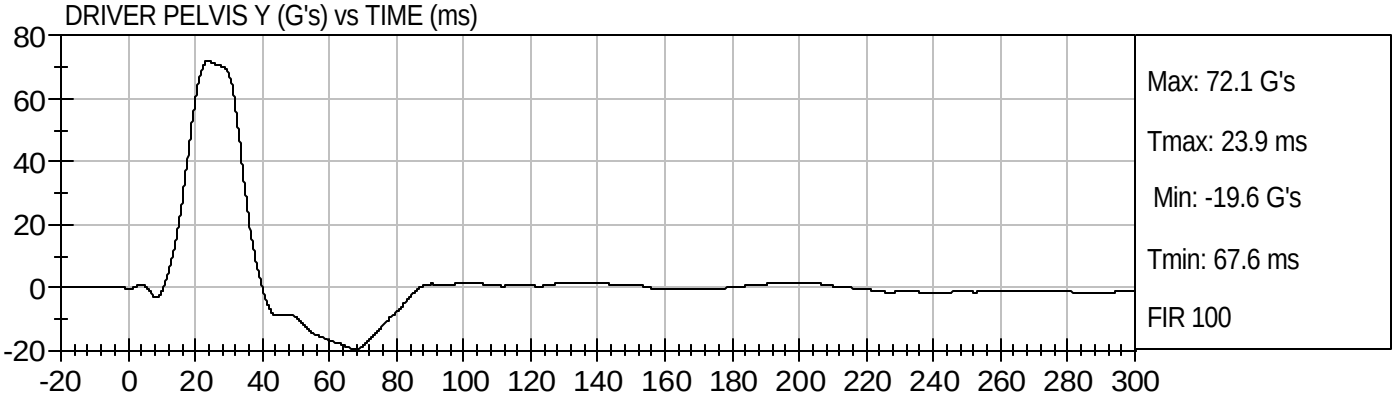
DRIVER LOWER SPINE Y (G's) vs TIME (ms)



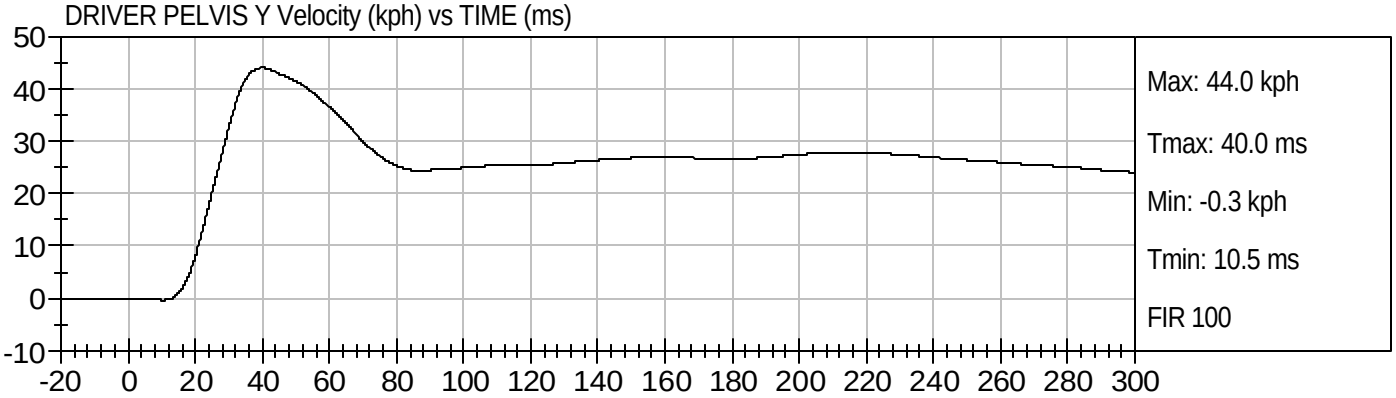
DRIVER LOWER SPINE Y Velocity (kph) vs TIME (ms)



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



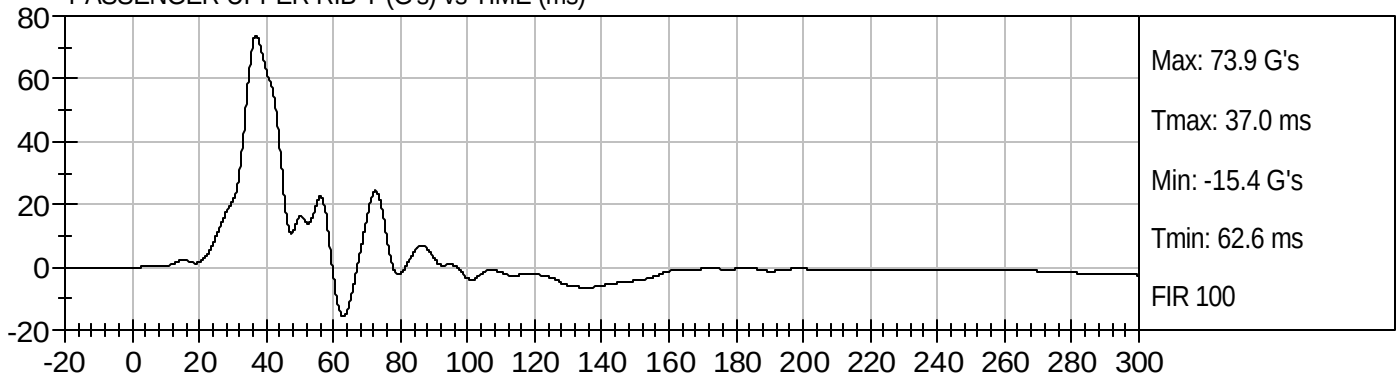
DRIVER PELVIS Y Velocity (kph) vs TIME (ms)



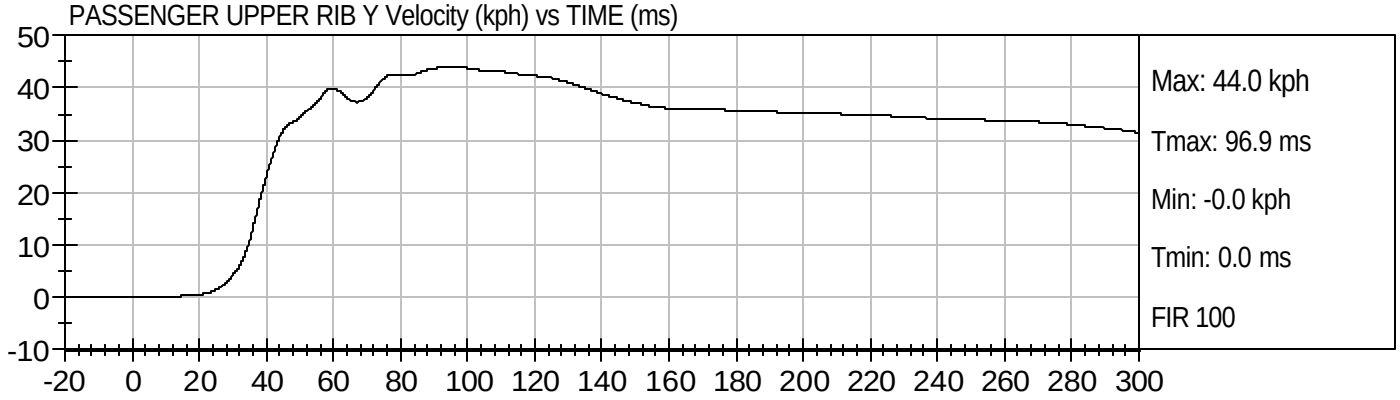
NCAP LEFT SIDE
2008 FORD FOCUS

Test Date: 11/02/2007
Speed: 38.4 mph (61.8 km/h)

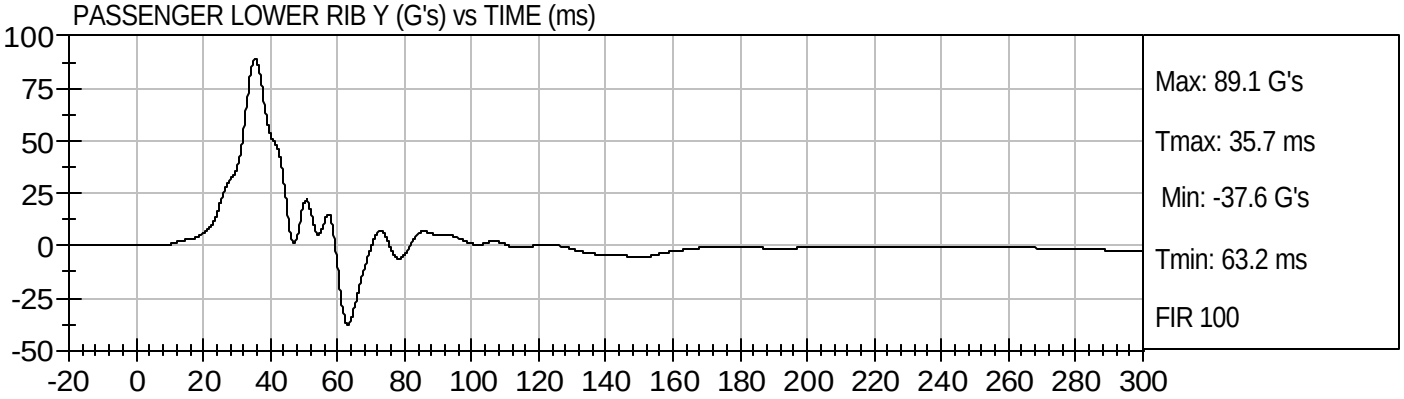
PASSENGER UPPER RIB Y (G's) vs TIME (ms)



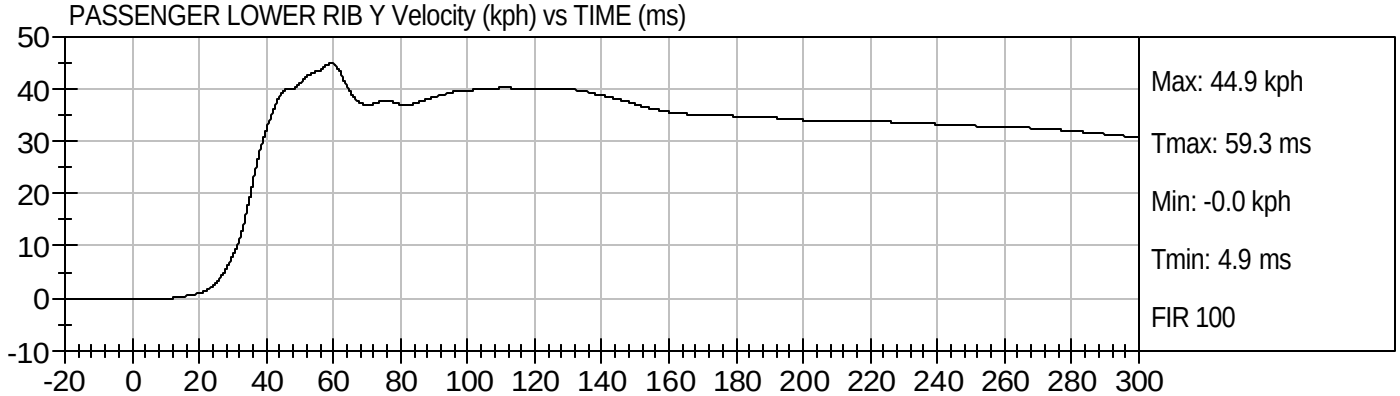
PASSENGER UPPER RIB Y Velocity (kph) vs TIME (ms)



PASSENGER LOWER RIB Y (G's) vs TIME (ms)



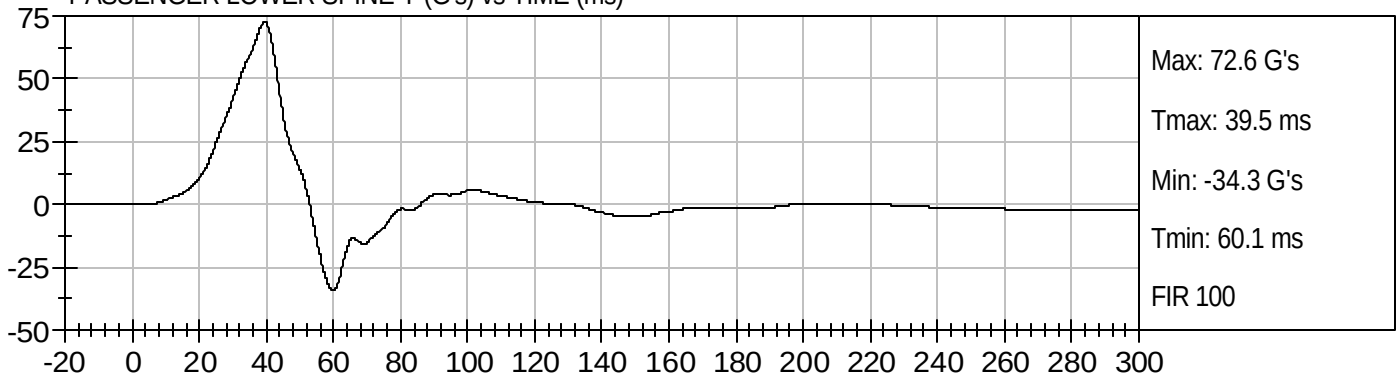
PASSENGER LOWER RIB Y Velocity (kph) vs TIME (ms)



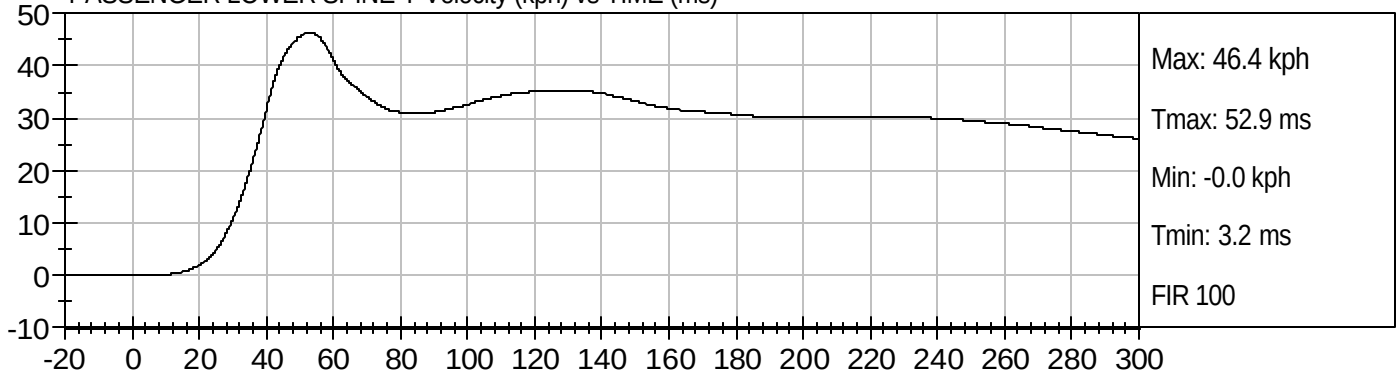
NCAP LEFT SIDE
2008 FORD FOCUS

Test Date: 11/02/2007
Speed: 38.4 mph (61.8 km/h)

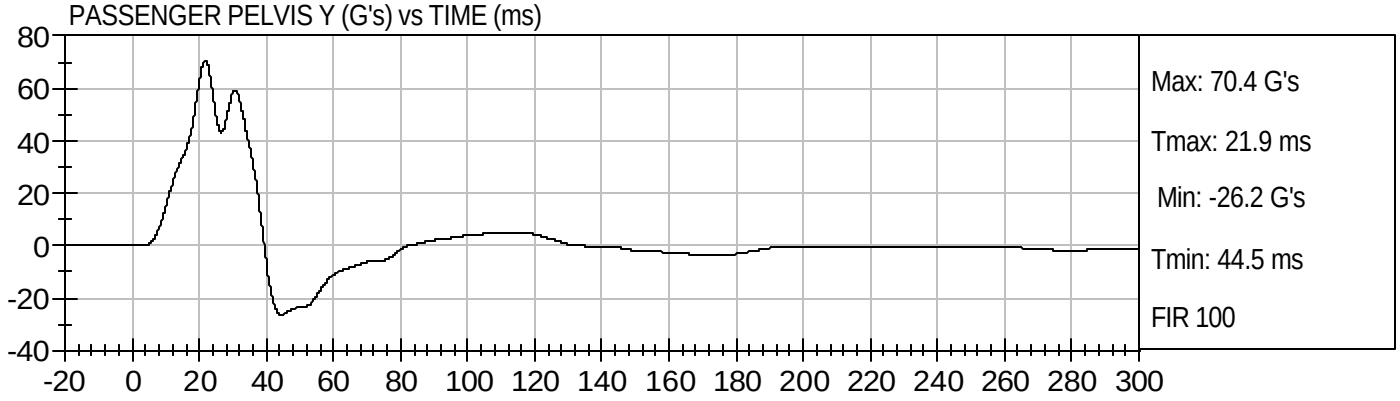
PASSENGER LOWER SPINE Y (G's) vs TIME (ms)



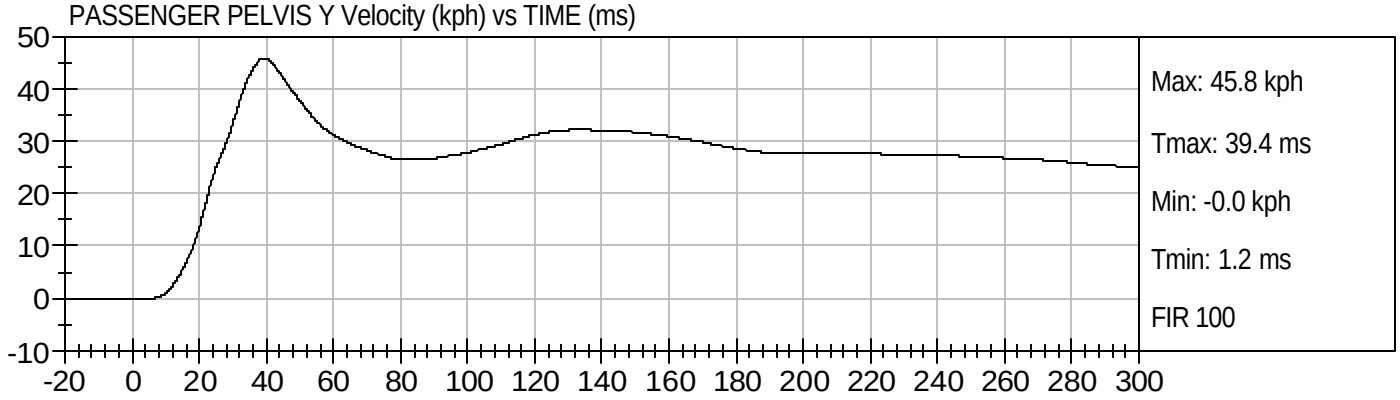
PASSENGER LOWER SPINE Y Velocity (kph) vs TIME (ms)



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



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



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:** D07319

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

10/12/2007
Test Date

David Winkelbauer
Approved By

SID/HIII Calibration Data Sheet

Side Impact Dummy

Head Drop Calibration (Lateral)

ATD Serial No: 904 **Test I.D:** D073191

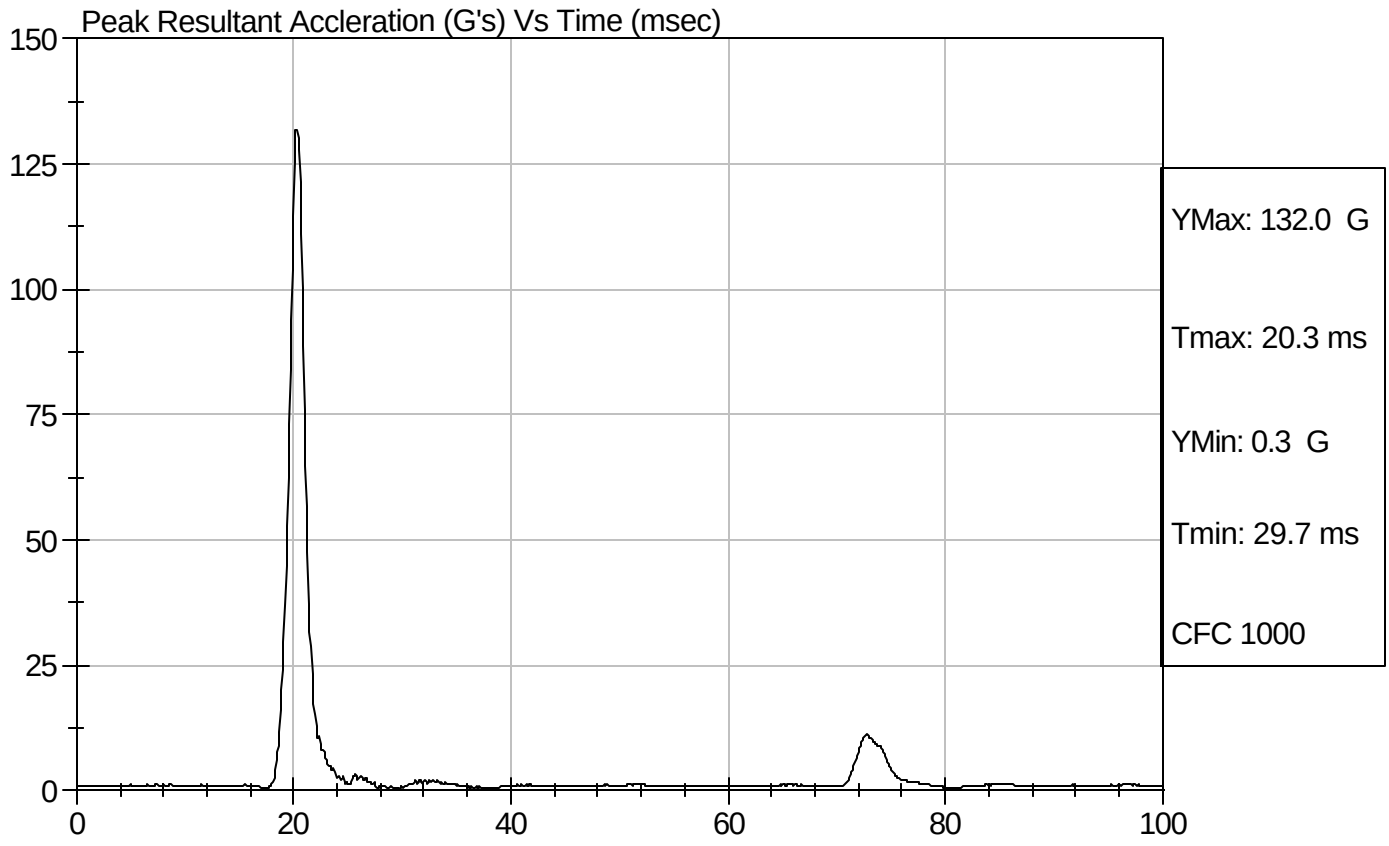
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	35	Pass
Peak Resultant Acceleration	G's	120 to 150	132	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-8.5	Pass
		Overall Test Results		Pass

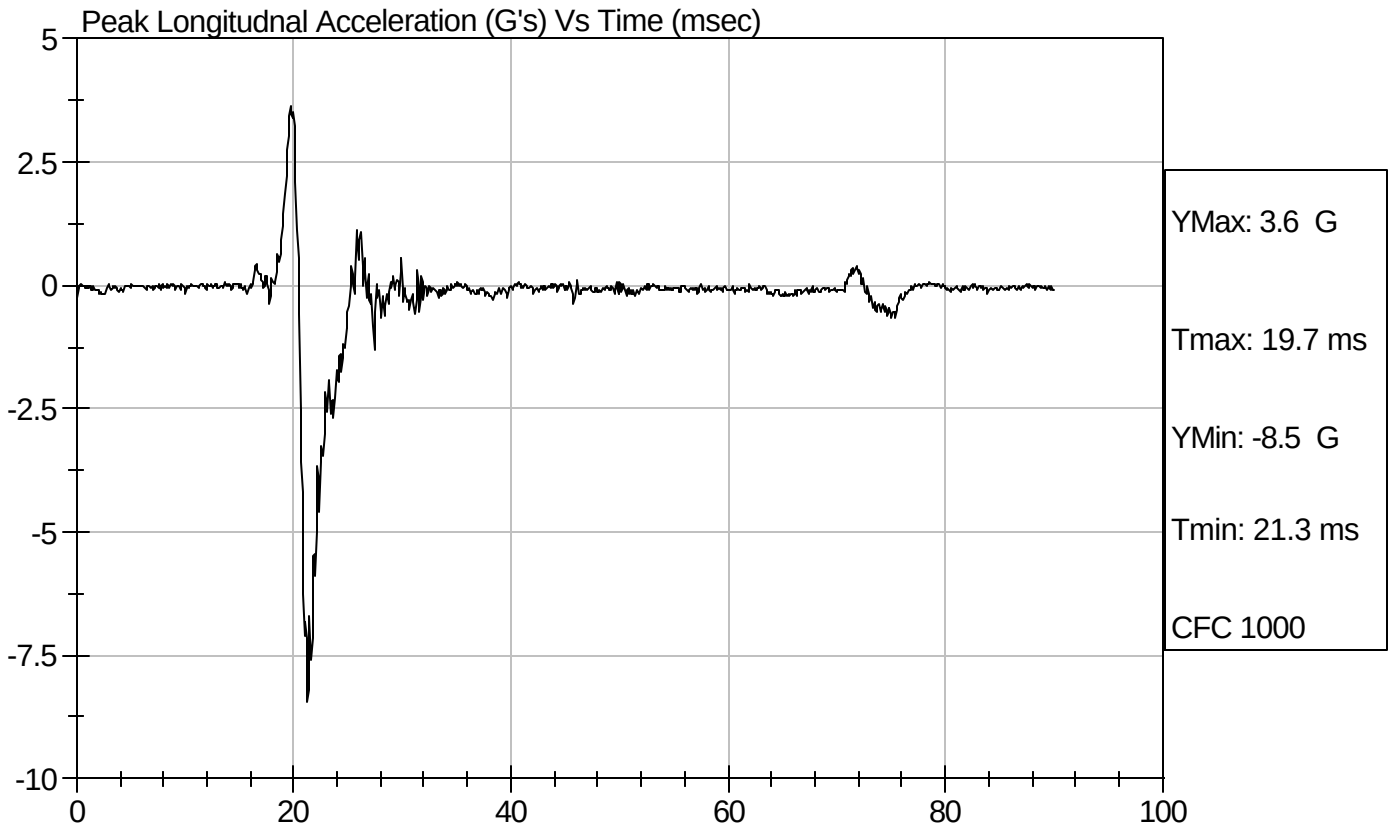
Jessica Hall
Laboratory Technician

10/11/07
Test Date

David Winkelbauer
Approved By

mga	Test Description: Head Drop	Test Date: 10/11/07
	Component: D073191	Speed: 0 ft/s, 0 m/s





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

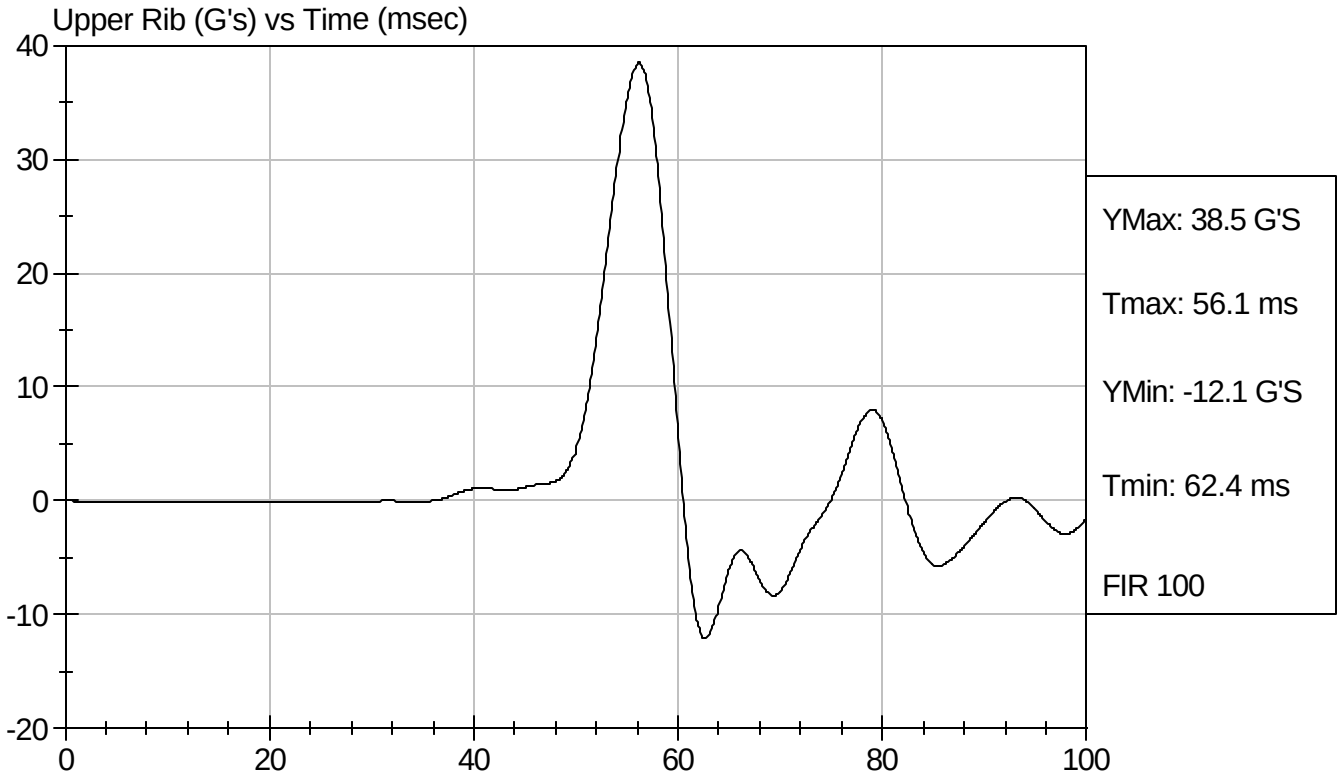
Jessica Hall
Laboratory Technician

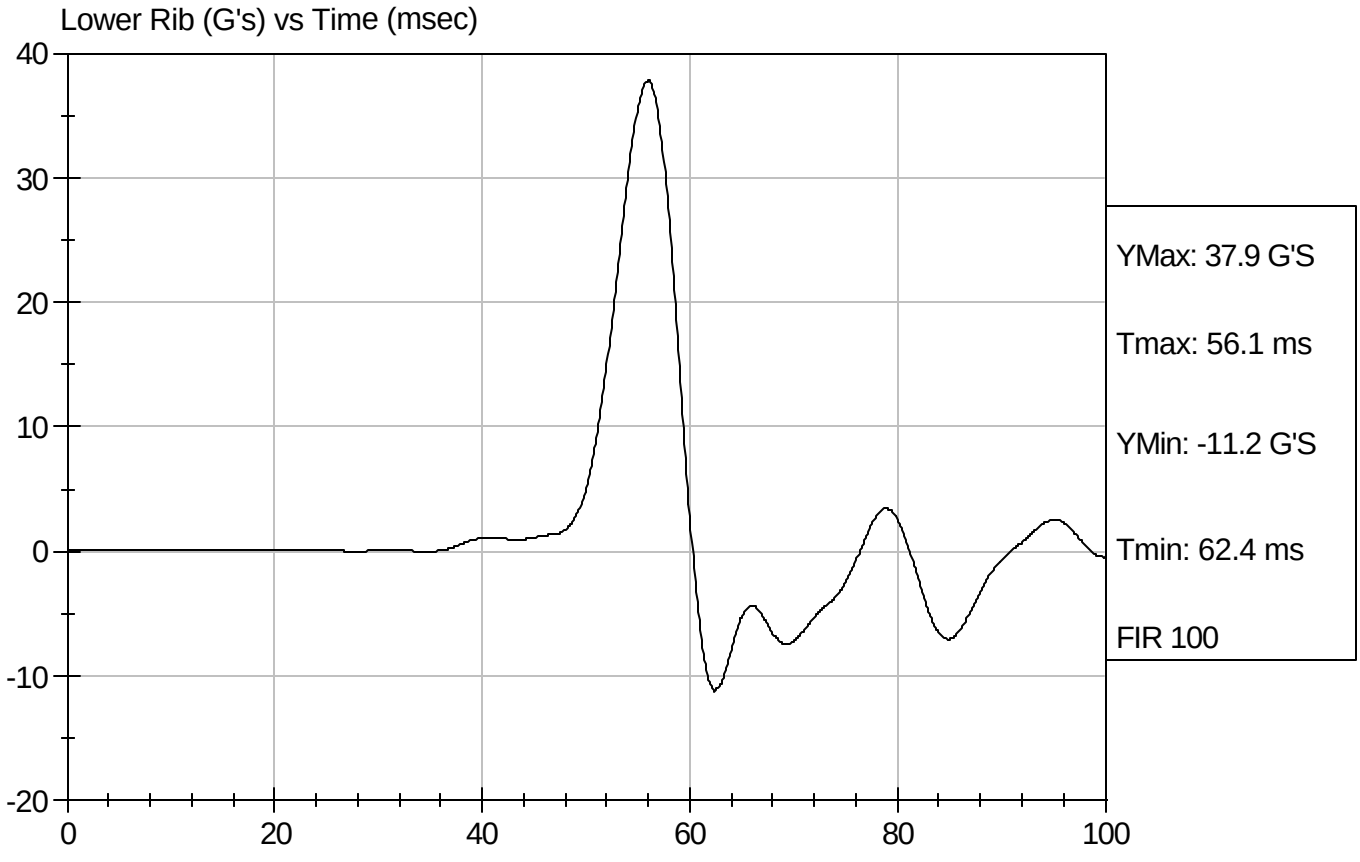
10/11/07
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D073192

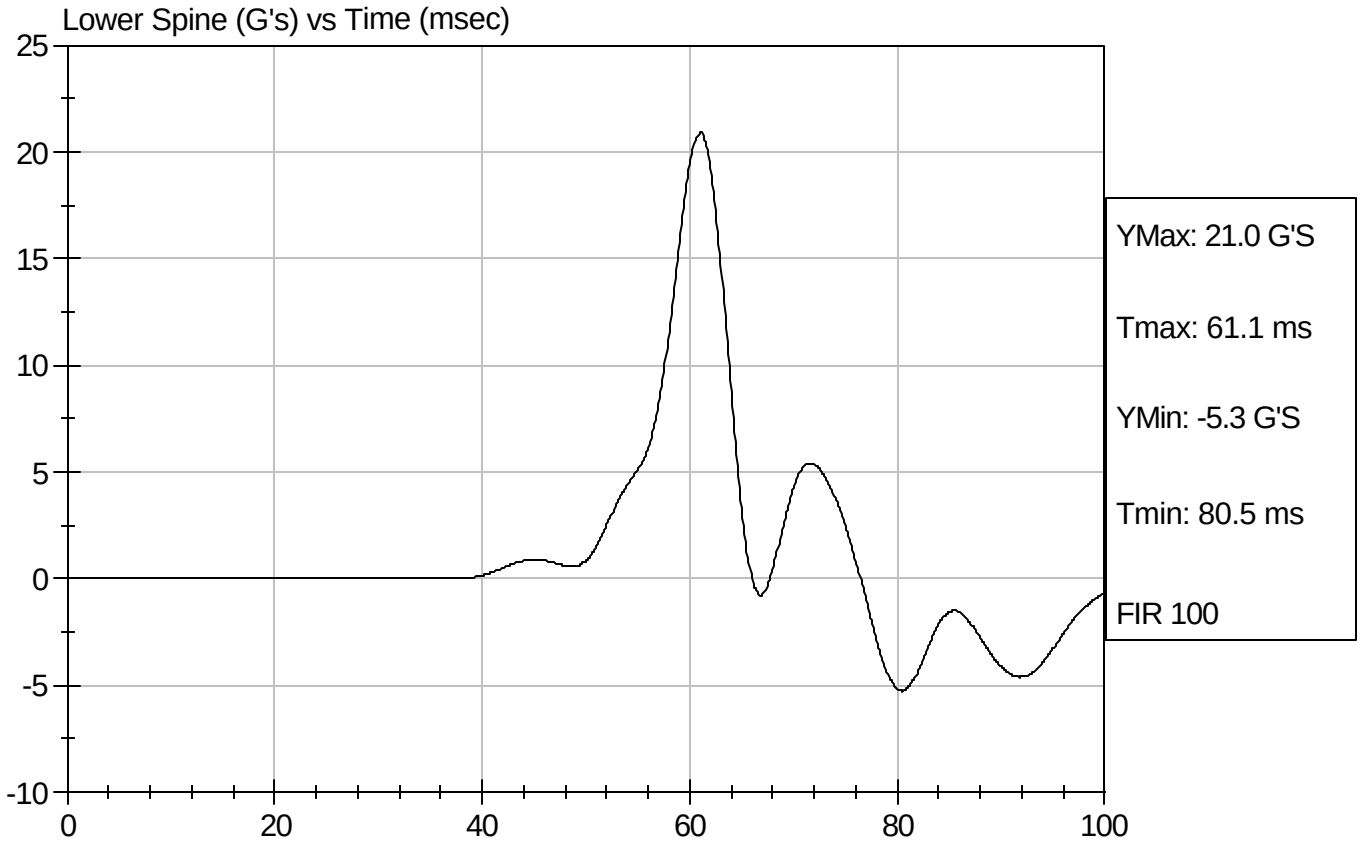
Test Date: 10/11/07
Speed: 14.12 ft/sec, 4.30 m/sec





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

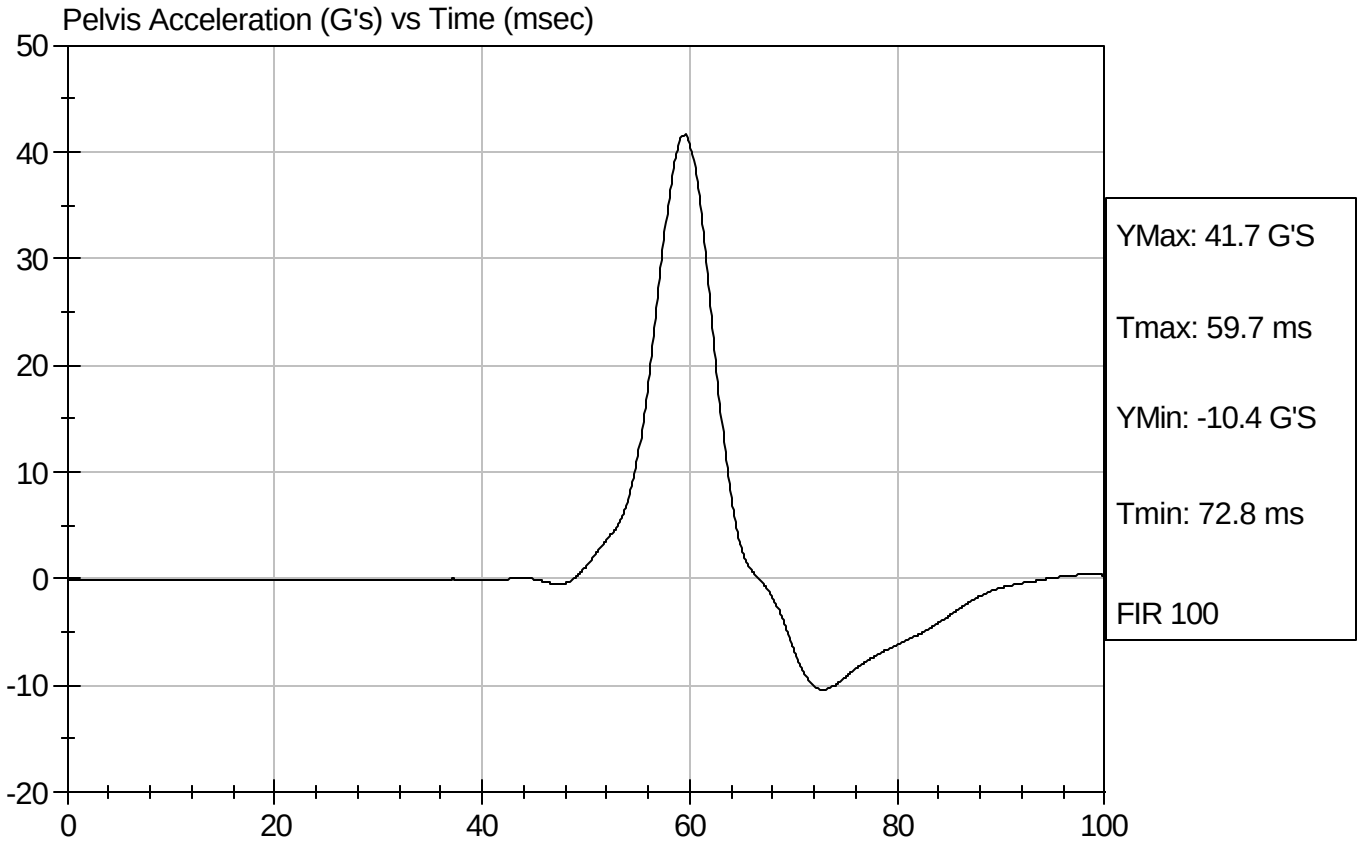
Jessica Hall
Laboratory Technician

10/11/07
Test Date

David Winkelbauer
Approved By

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

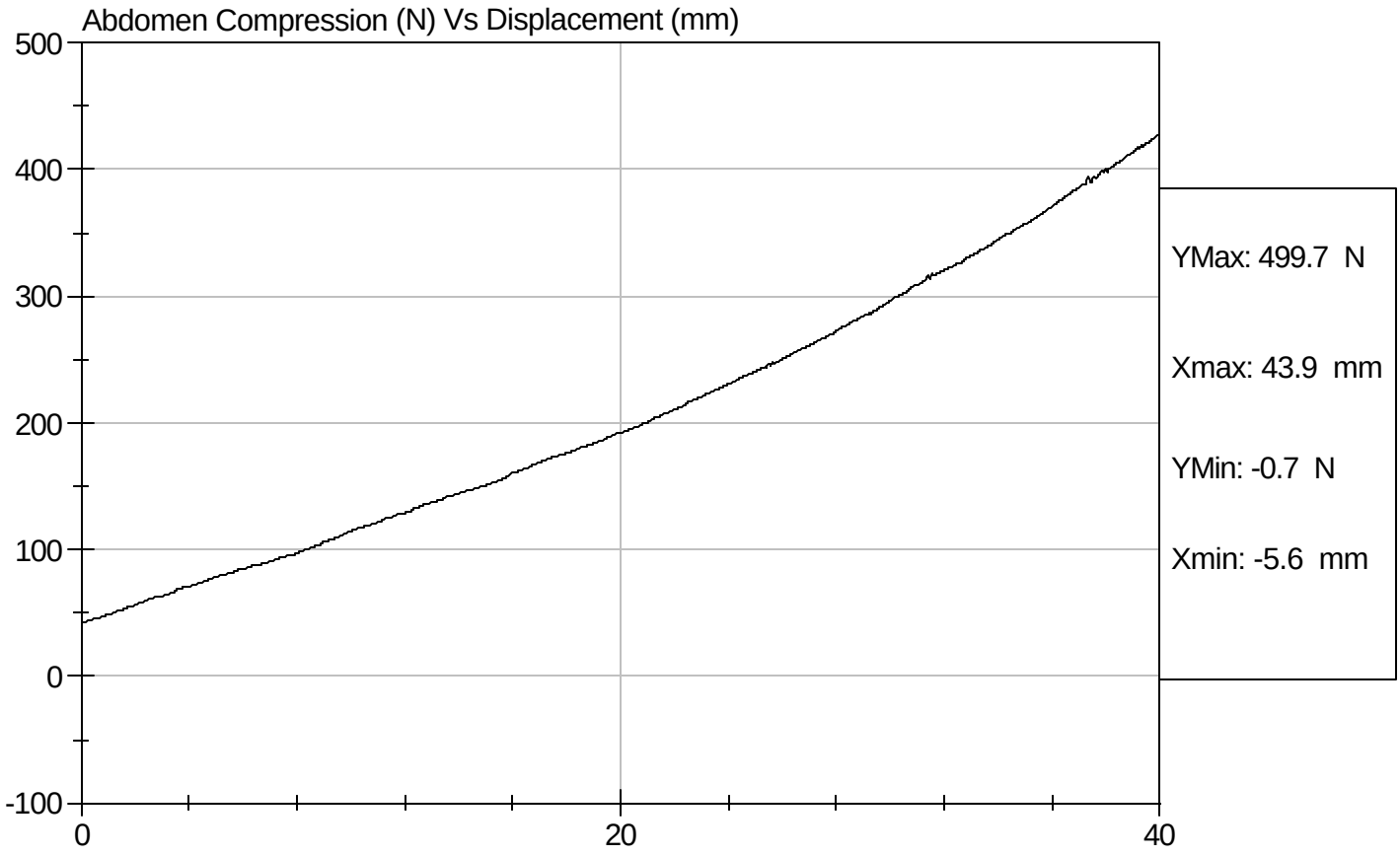
Jessica Hall
Laboratory Technician

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

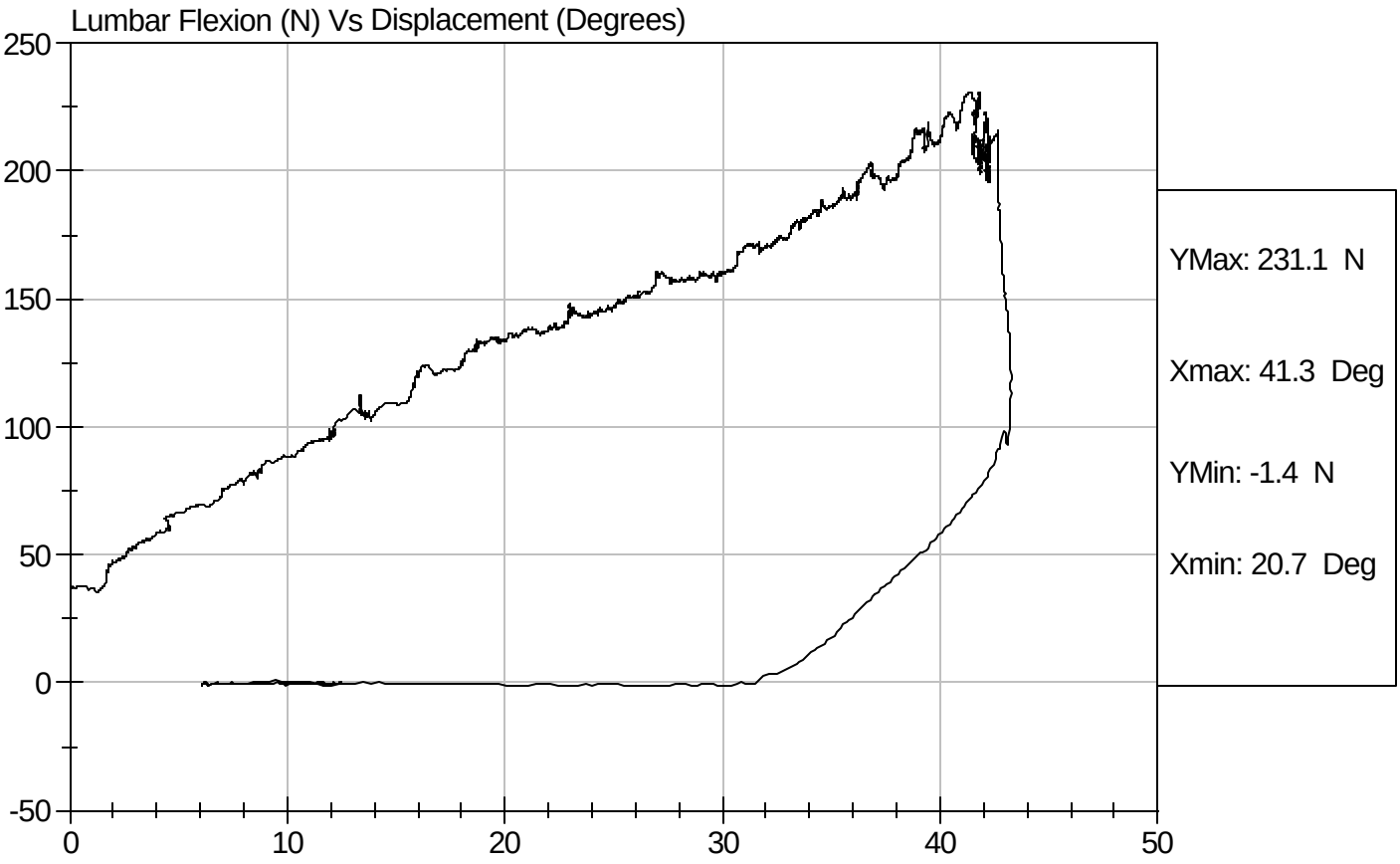
David Winkelbauer
Approved By

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
Midsaggital Plane Max Rotation		deg	66 to 82	72	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	58	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	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

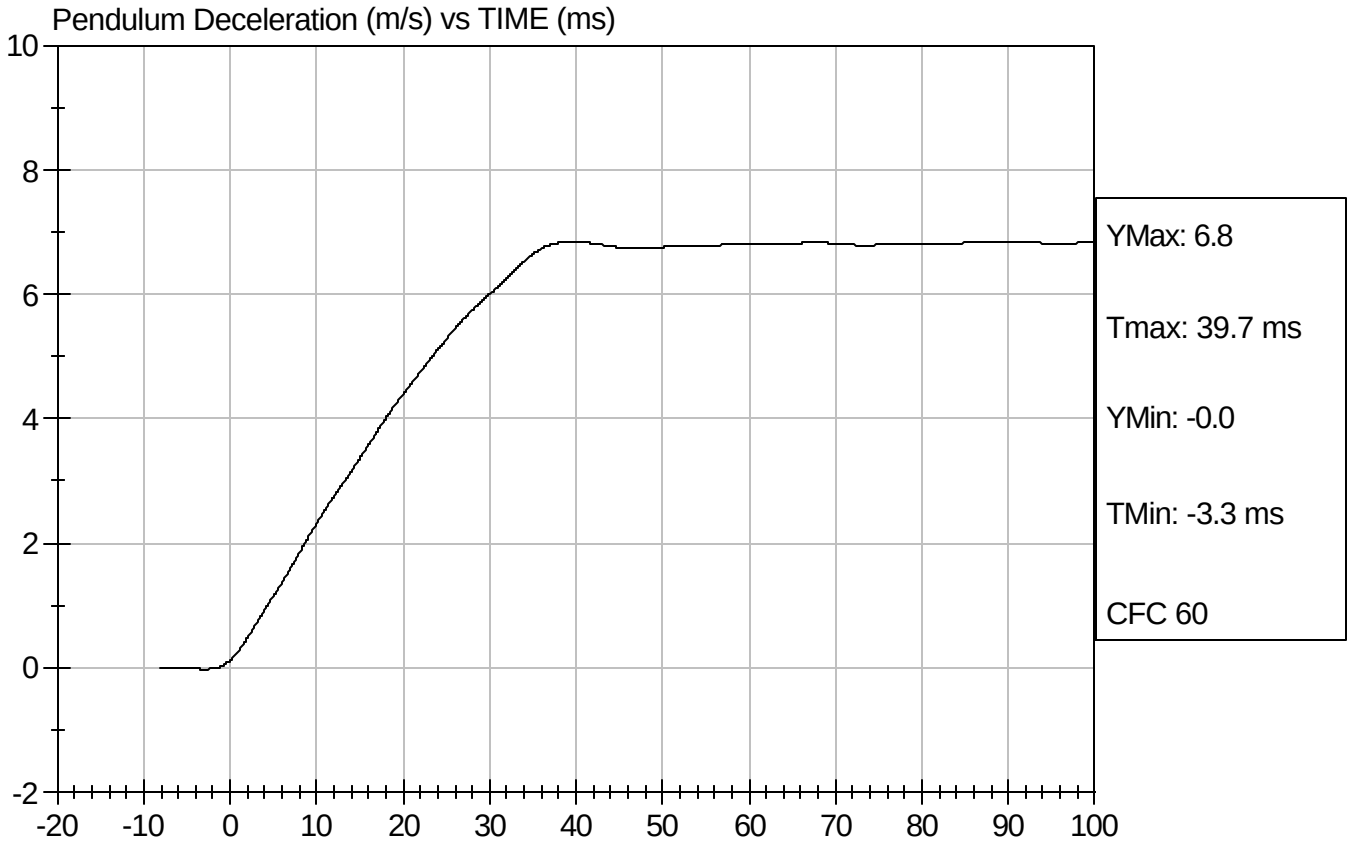
Jessica Hall
Laboratory Technician

10/12/07
Test Date

David Winkelbauer
Approved By

Test Desc: Neck Bending
Component ID: D073199

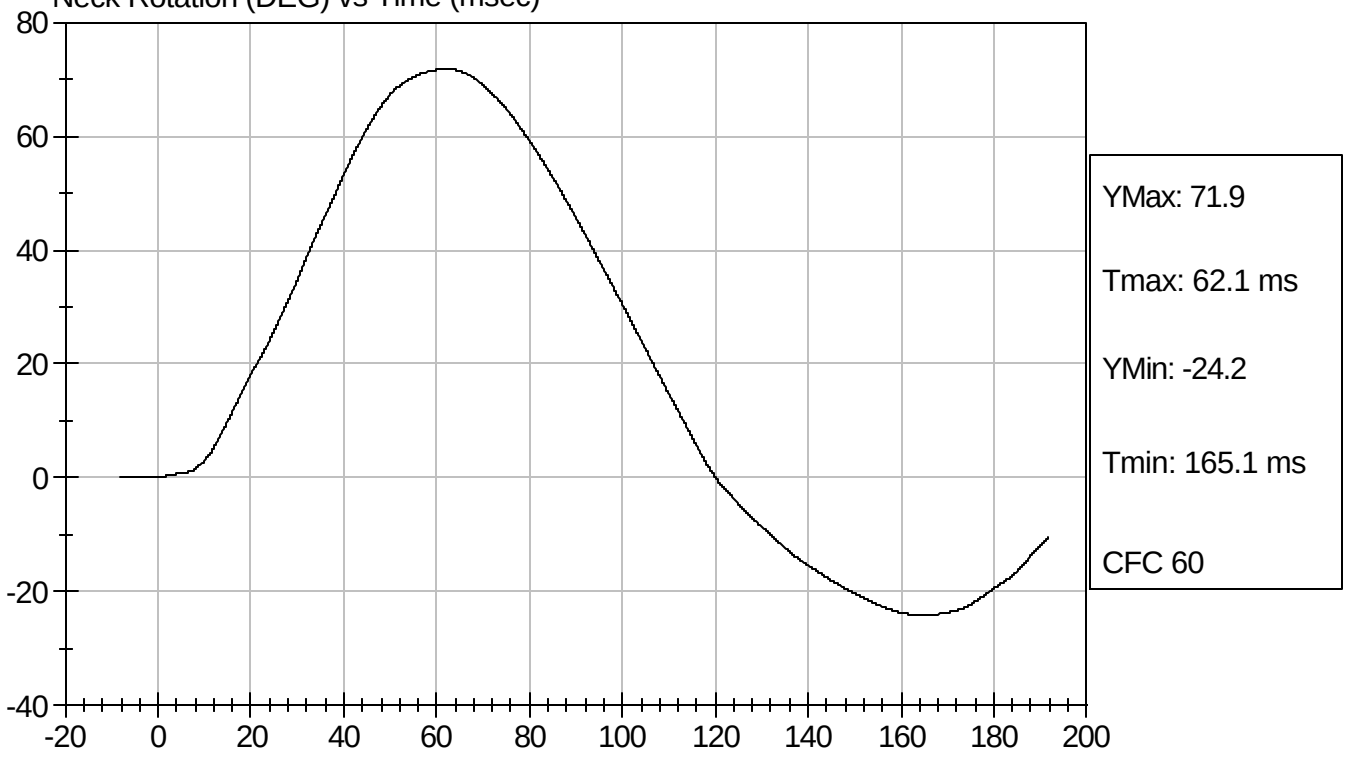
Test Date: 10/12/07
Speed: 23.14 ft/sec, 7.05 m/sec



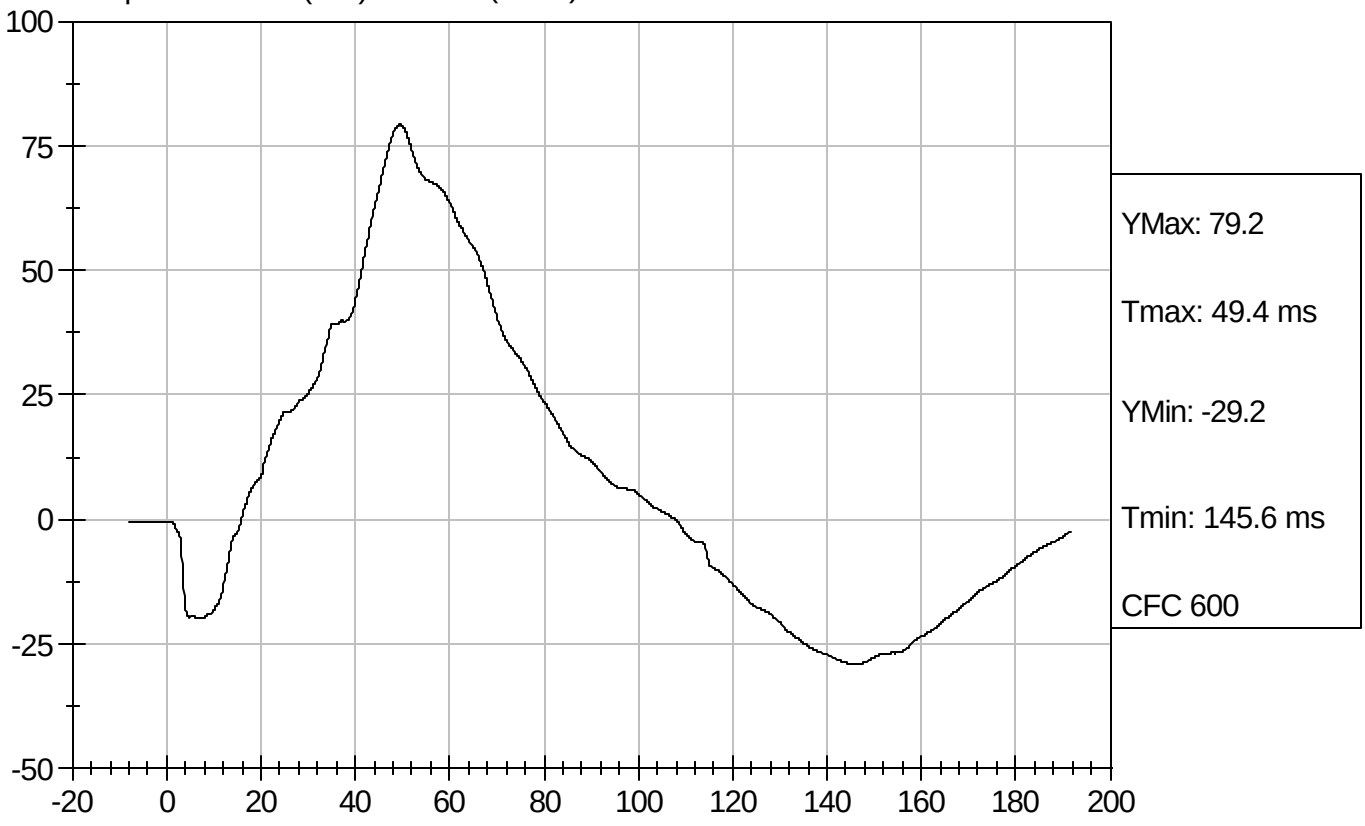
Test Desc: Neck Bending
Component ID: D073199

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

Neck Rotation (DEG) vs Time (msec)



Occipital Moment (Nm) vs Time (msec)



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:** D073331

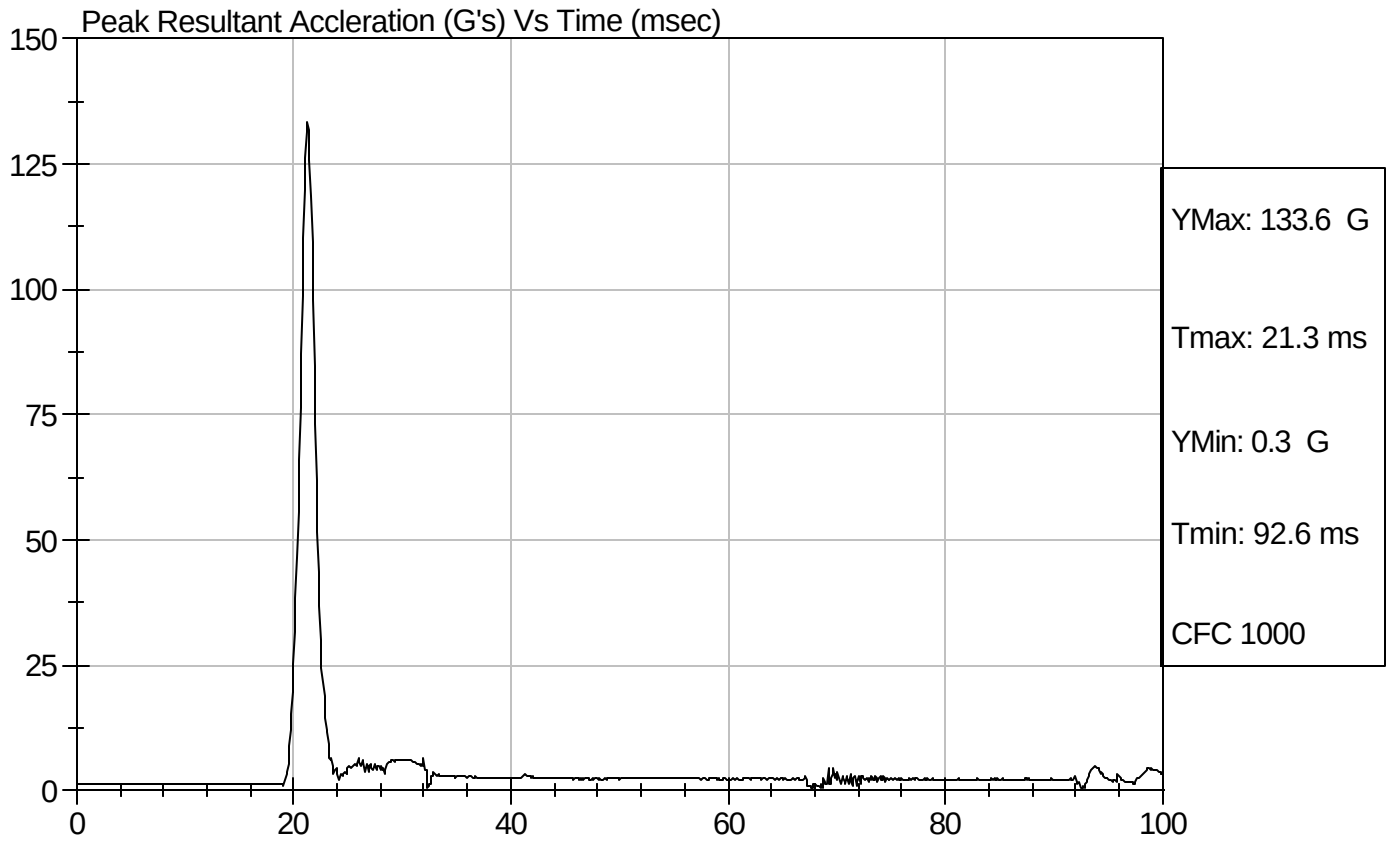
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	26	Pass
Peak Resultant Acceleration	G's	120 to 150	134	Pass
Is Resultant Curve Unimodal?	N/A	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-7.0	Pass
		Overall Test Results		Pass

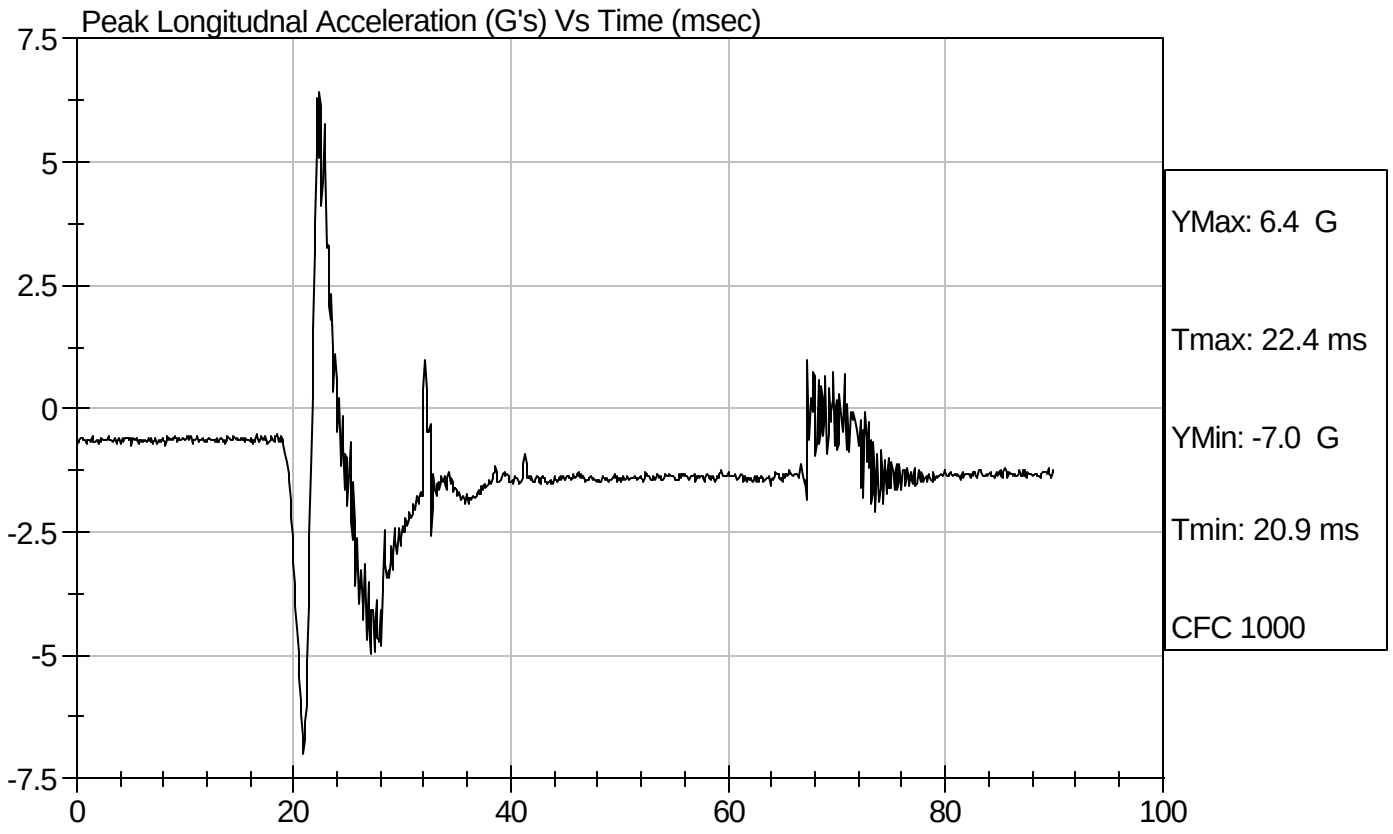
Jessica Hall
Laboratory Technician

11/5/07
Test Date

David Winkelbauer
Approved By

mga	Test Description: Head Drop	Test Date: 11/5/07
	Component: D073331	Speed: 0 ft/s, 0 m/s





SID/HIII Calibration Data Sheet

Side Impact Dummy

Thorax Impact Test

ATD Serial No: 904 **Test I.D:** D073332

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	30	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	18	Pass
		Overall Test Results		Pass

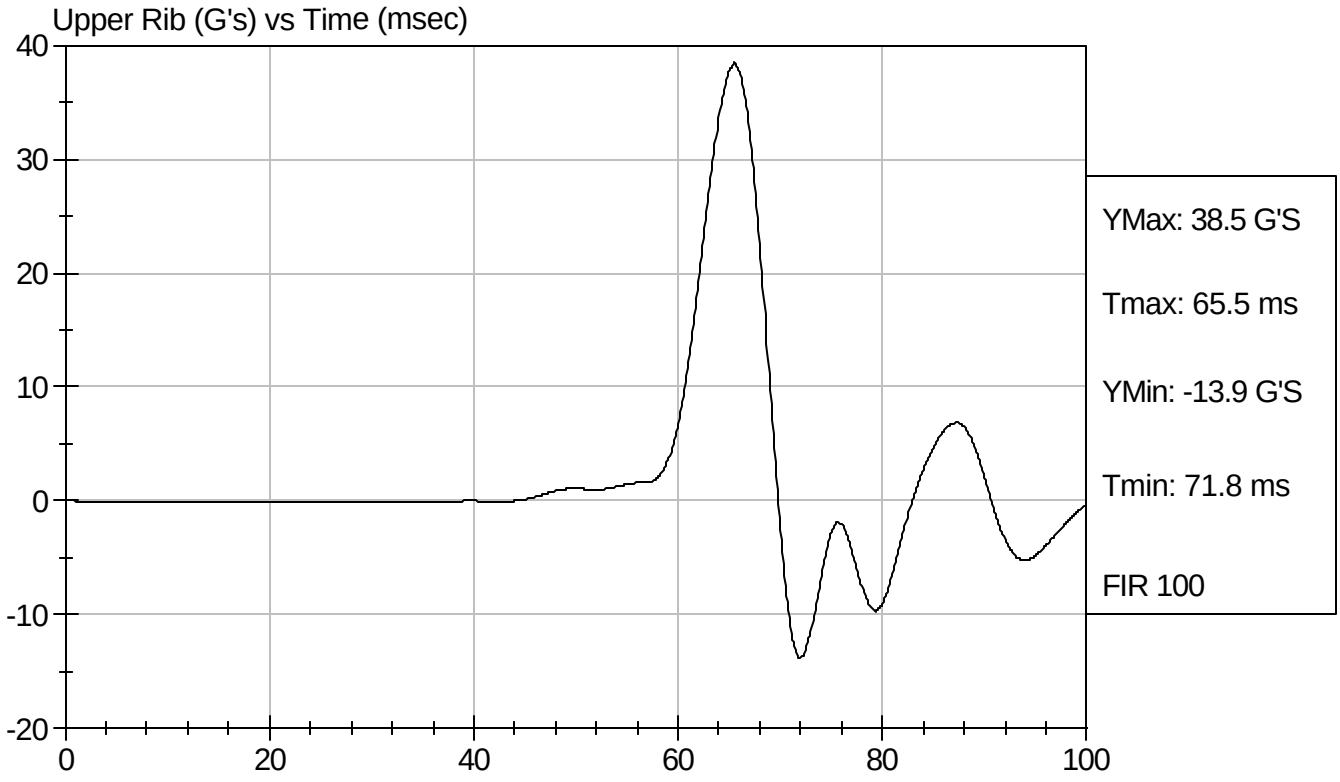
Jessica Hall
Laboratory Technician

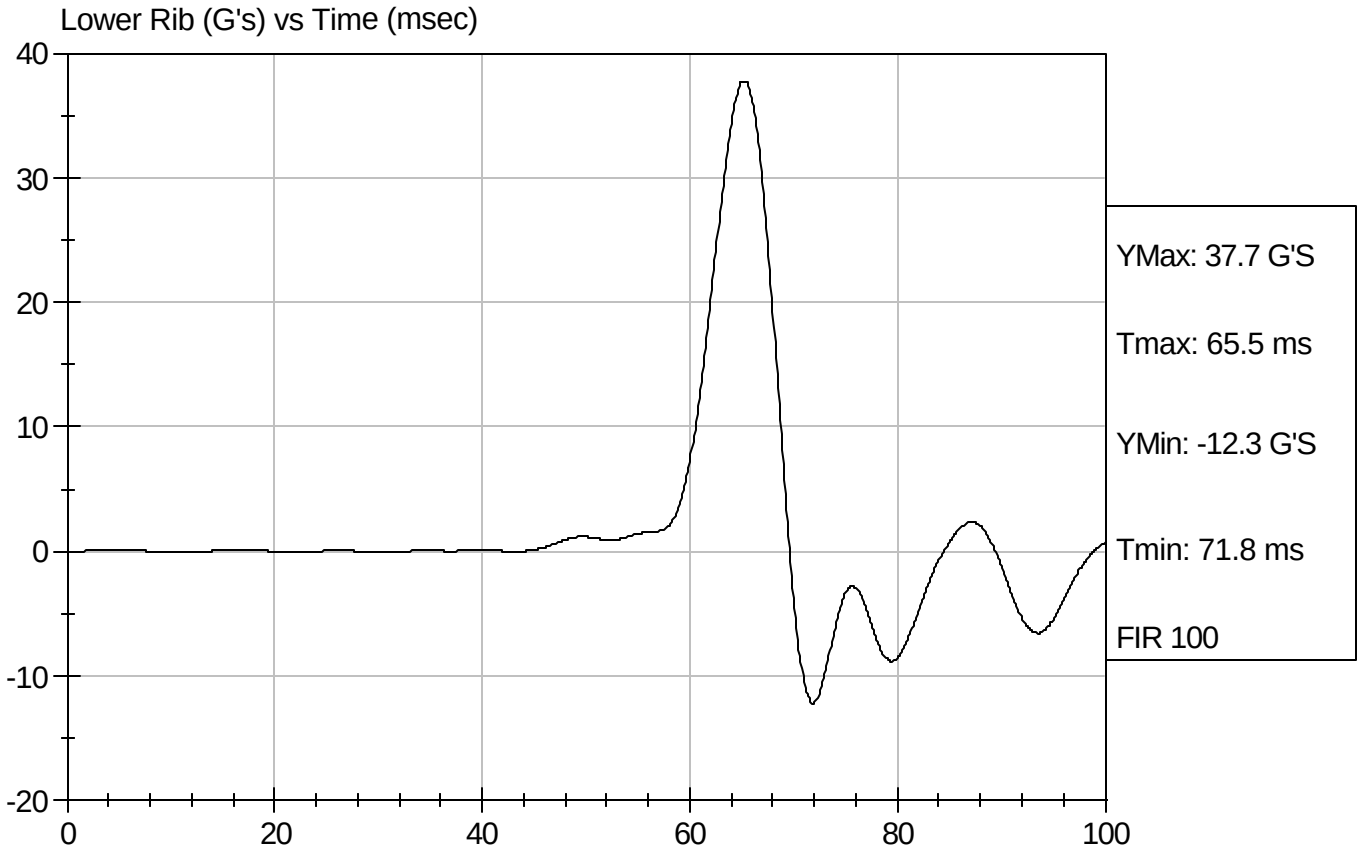
11/5/07
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D073332

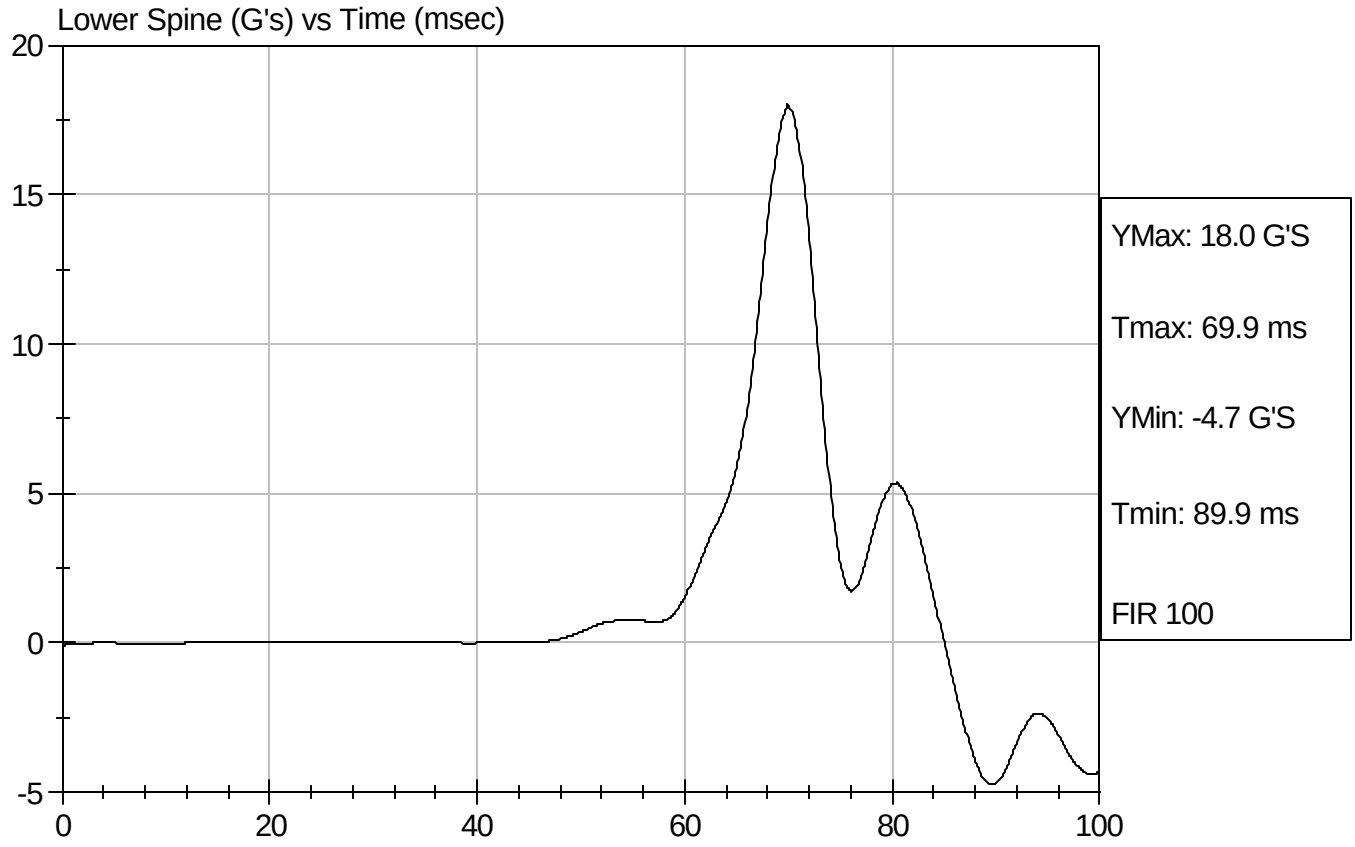
Test Date: 11/5/07
Speed: 14.00 ft/sec, 4.27 m/sec





Test Desc: Thorax Impact
Component ID: D073332

Test Date: 11/5/07
Speed: 14.00 ft/sec, 4.27 m/sec



SID/HIII Calibration Data Sheet

Side Impact Dummy

Pelvis Impact Test

ATD Serial No: 904 **Test I.D:** D073333

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	41	Pass
		Overall Test Results		Pass

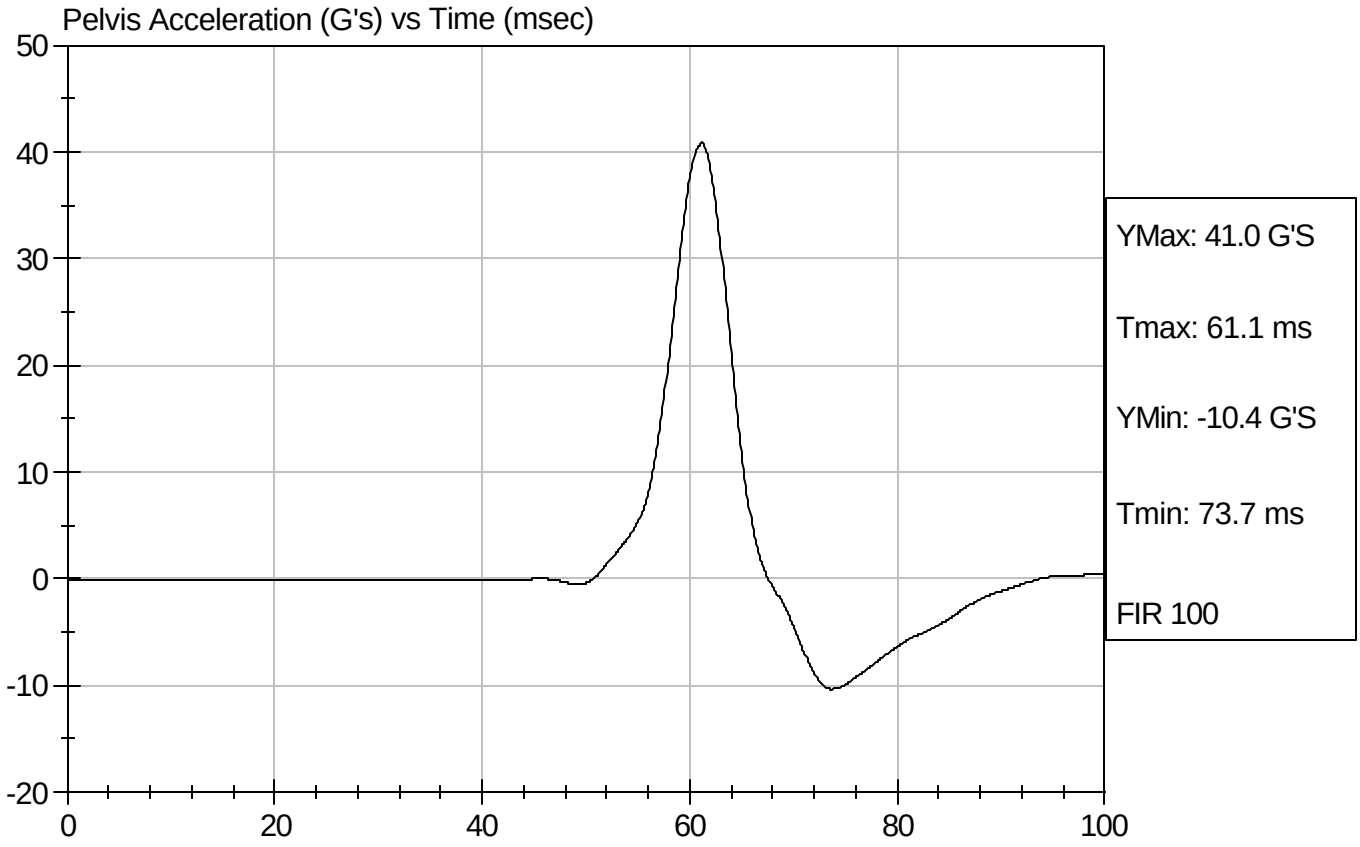
Jessica Hall
Laboratory Technician

11/5/07
Test Date

David Winkelbauer
Approved By

Test Desc: Pelvis Impact
Component ID: D073333

Test Date: 11/5/07
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:** D073334

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Force At 12.7 mm	N	104 -162	142	Pass
Force At 19 mm	N	163 - 222	194	Pass
Force At 25.4 mm	N	222 - 280	251	Pass
Force At 33 mm	N	325 - 391	330	Pass
		Overall Test Results		Pass

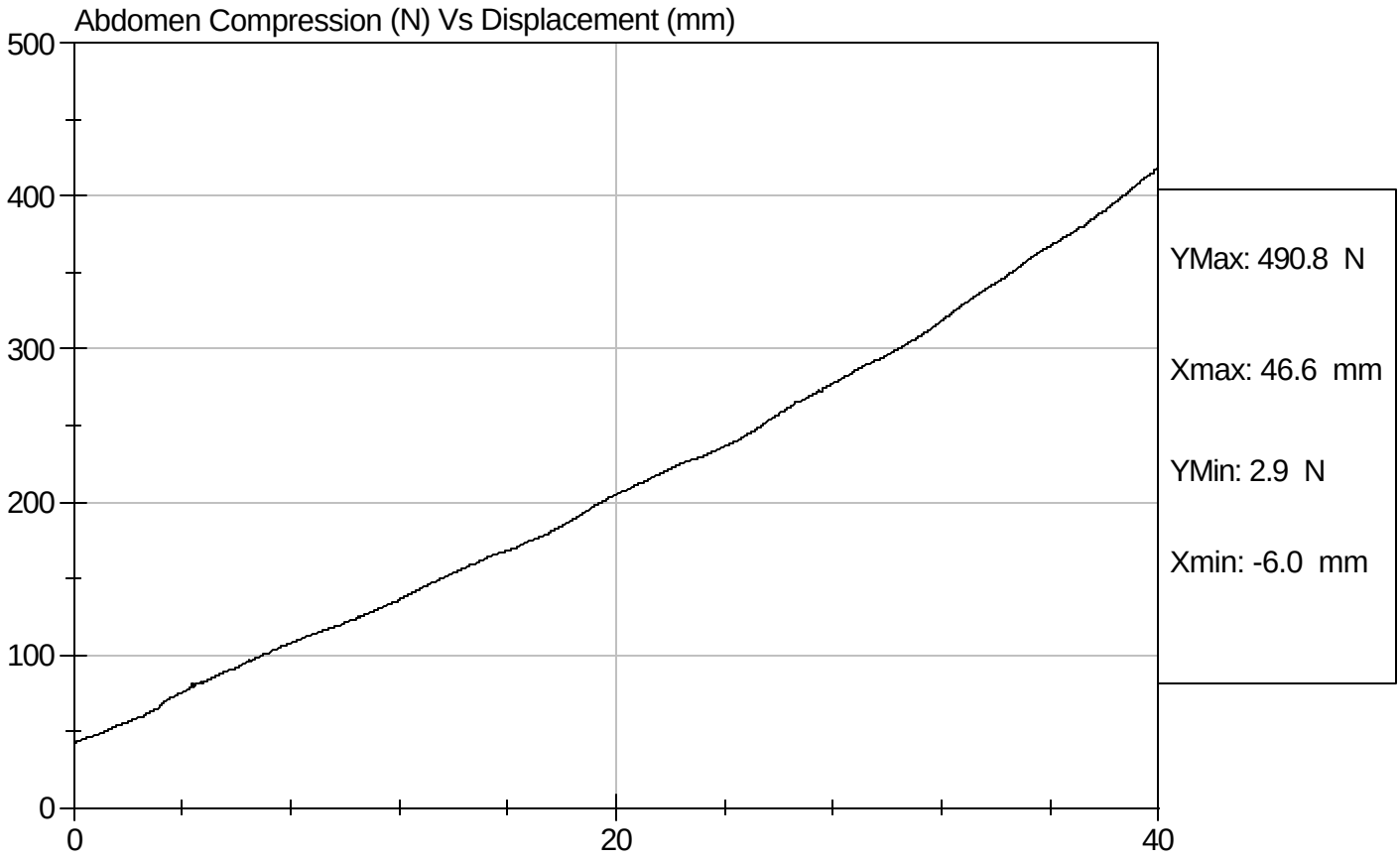
Jessica Hall
Laboratory Technician

11/5/07
Test Date

David Winkelbauer
Approved By

Test Description: Abdomen Compression Test Date: 11/5/07

Component: D073334 Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Lumbar Flexion Calibration

ATD Serial No: 904 **Test I.D:** D073335

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	129.8	Pass
Force At 30 deg	N	151.2 - 204.6	180.7	Pass
Force At 40 deg	N	204.6 - 258.0	230.9	Pass
Return Angle	Deg	12 Maximum	6	Pass
		Overall Test Results		Pass

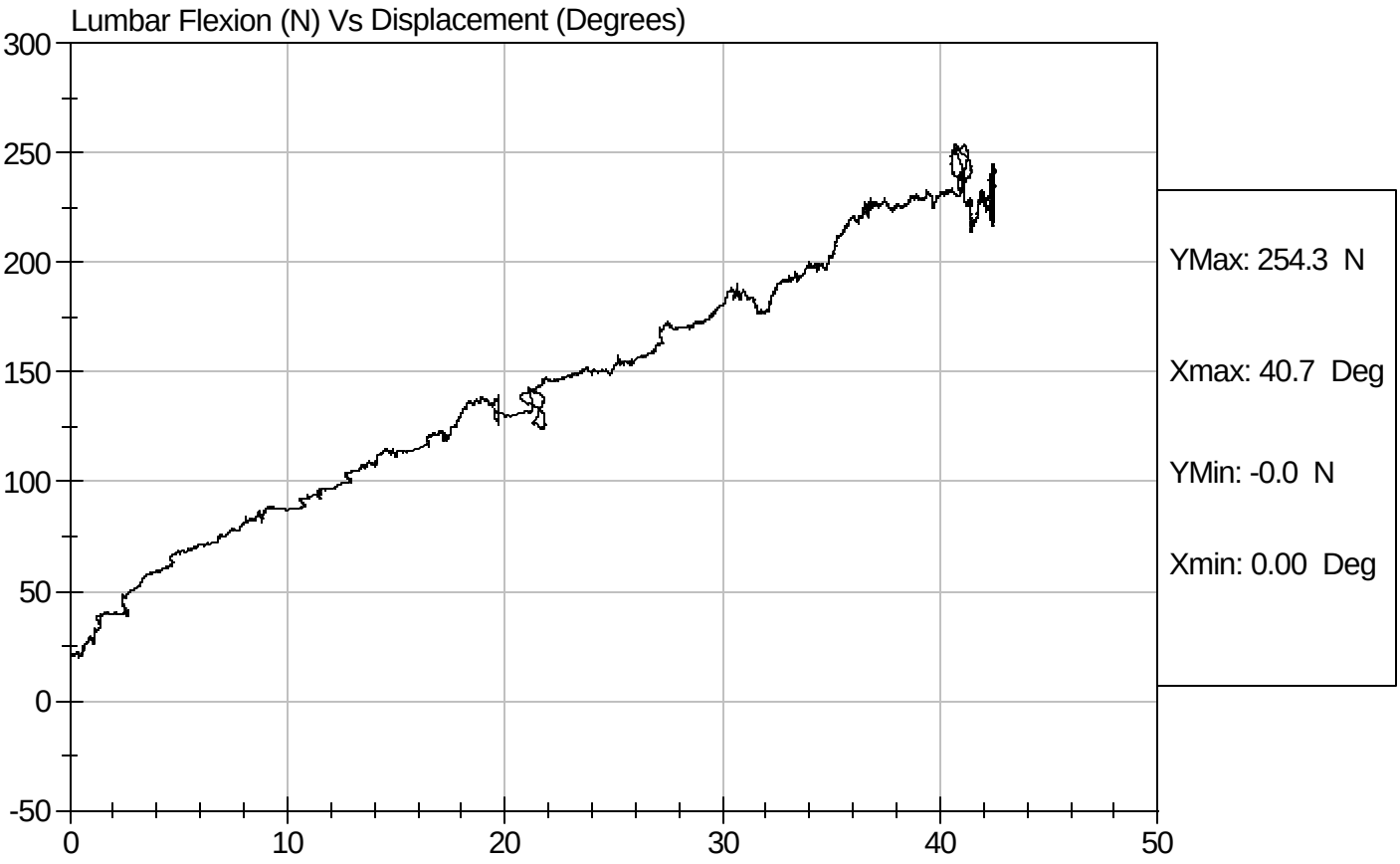
Jessica Hall
Laboratory Technician

11/5/07
Test Date

David Winkelbauer
Approved By

Test Description: Lumbar Flexion | Test Date: 11/5/07

Component: D073335 | Speed: 0 ft/sec, m/sec



SID/HIII Calibration Data Sheet

Side Impact Dummy

Neck Pendulum Test

ATD Serial No: 904 **Test I.D:** D073339

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	29	Pass
Impact Velocity		m/s	6.89 to 7.13	7.05	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.52	Pass
	20 msec	m/s	4.12 to 5.10	4.83	Pass
	30 msec	m/s	5.73 to 7.01	6.55	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.78	Pass
Midsaggital Plane Max Rotation		deg	66 to 82	75	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	60	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	15	Pass

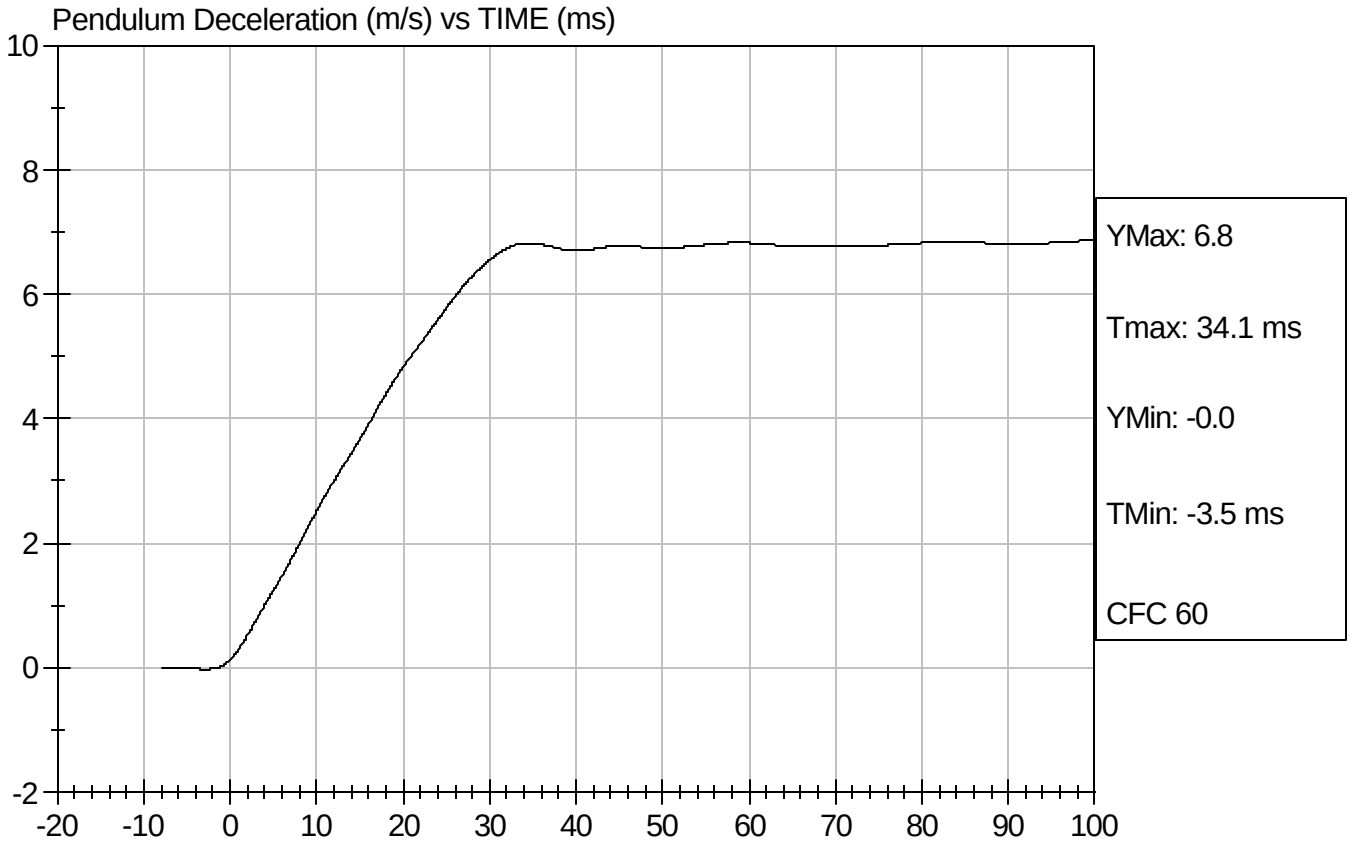
Jessica Hall
Laboratory Technician

11/5/07
Test Date

David Winkelbauer
Approved By

Test Desc: Neck Bending
Component ID: D073339

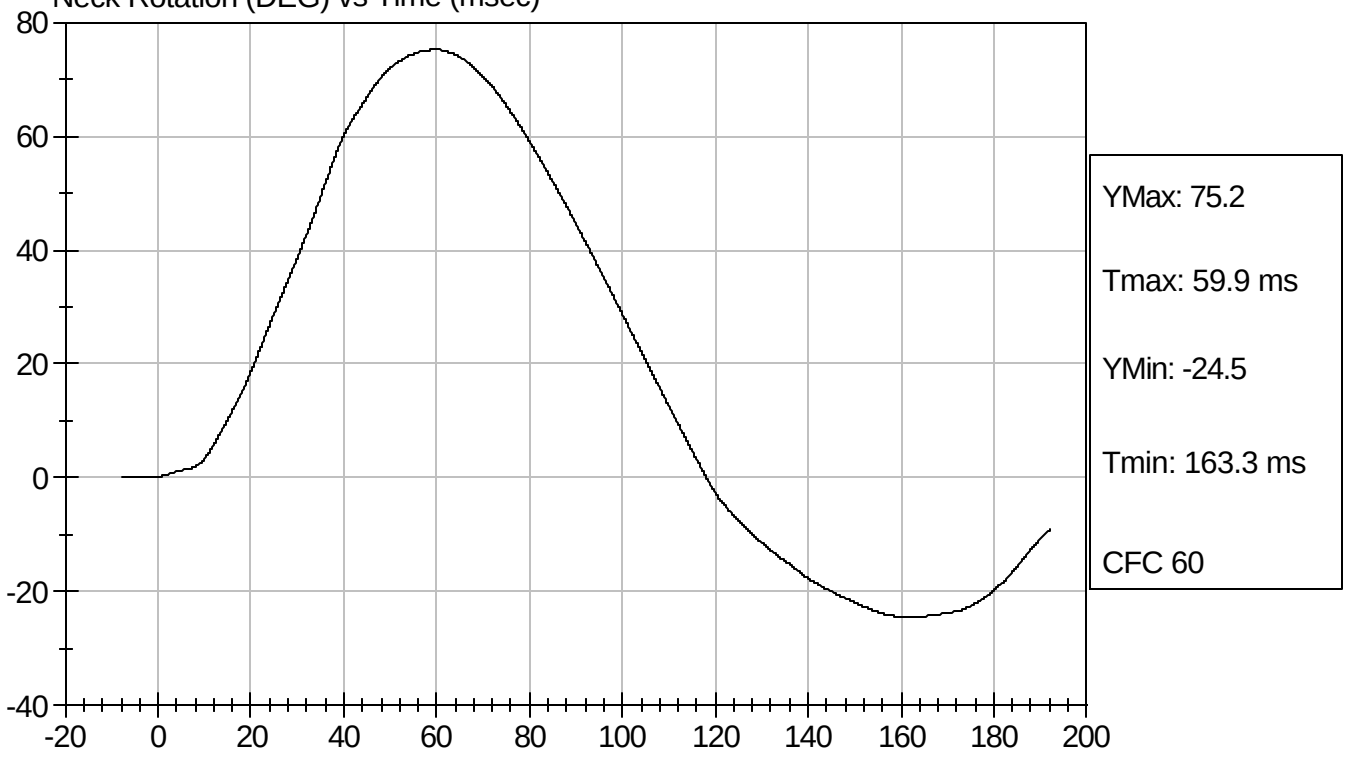
Test Date: 11/5/07
Speed: 23.14 ft/sec, 7.05 m/sec



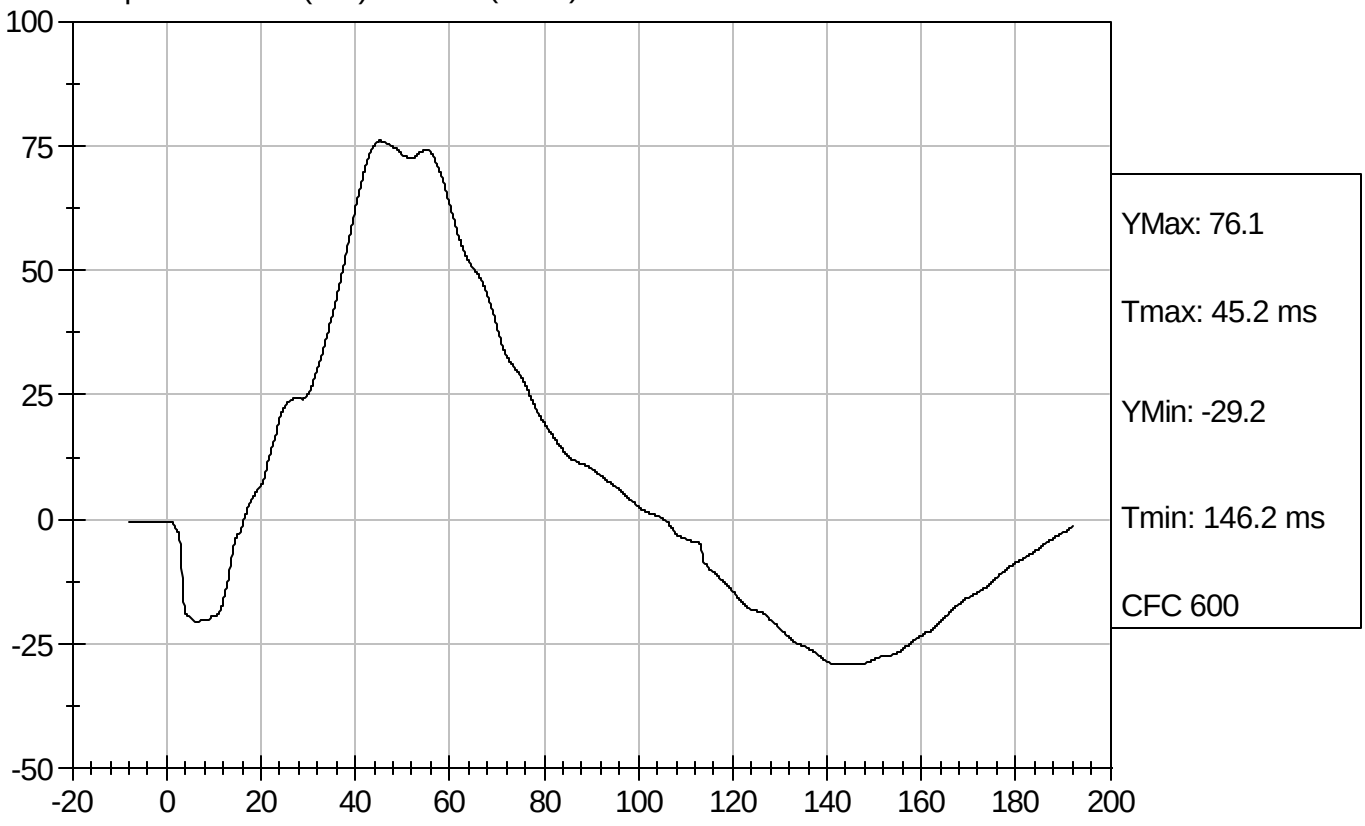
Test Desc: Neck Bending
Component ID: D073339

Test Date: 11/5/07
Speed: 23.14 ft/sec, 7.05 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: 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 Gall
Laboratory Technician

11/5/2007
Test Date

David Winkelbauer
Approved By

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:** D07318

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

Jessica Hall
Laboratory Technician

10/12/2007
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:** D073181

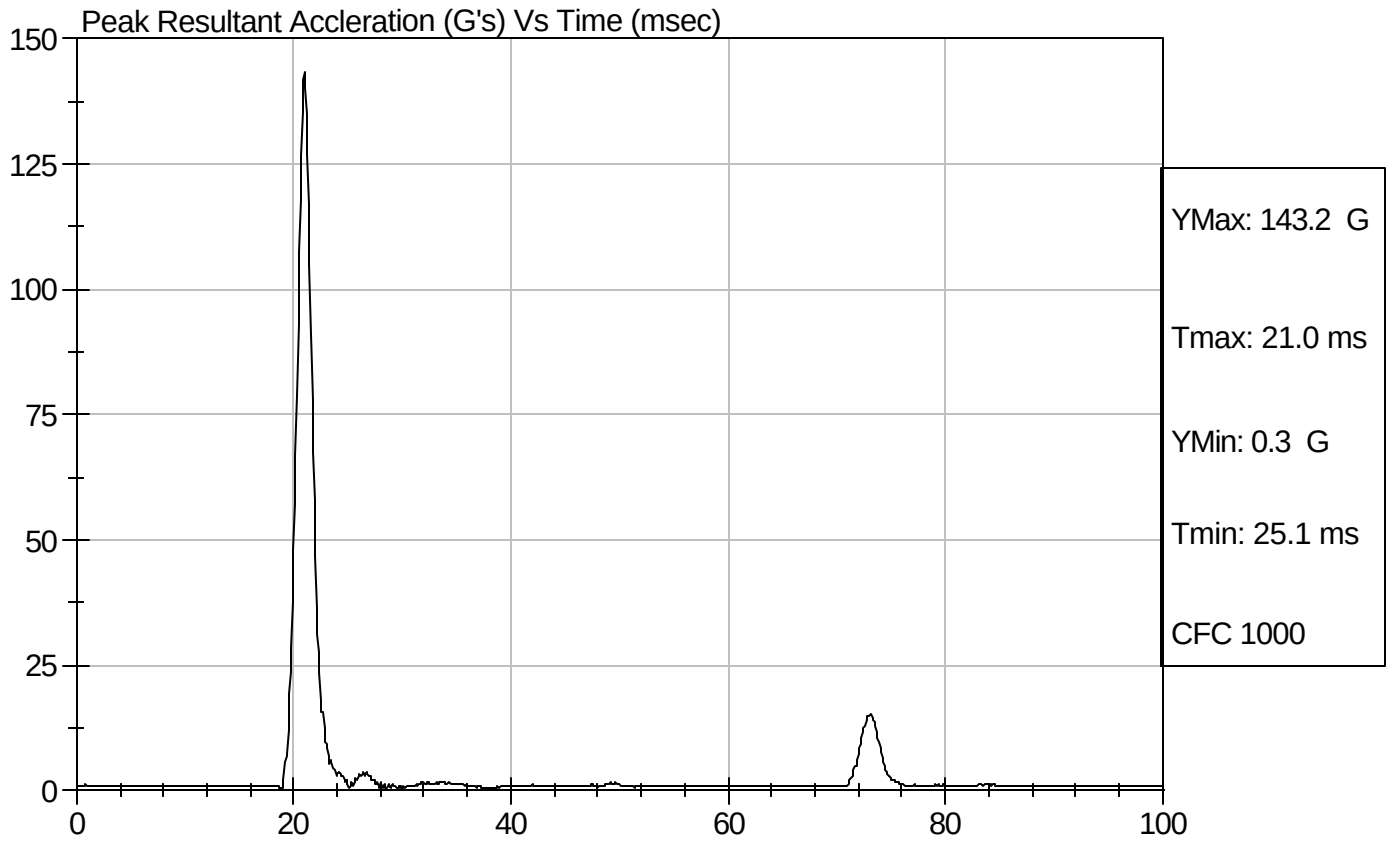
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	34	Pass
Peak Resultant Acceleration	G's	120 to 150	143	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/-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

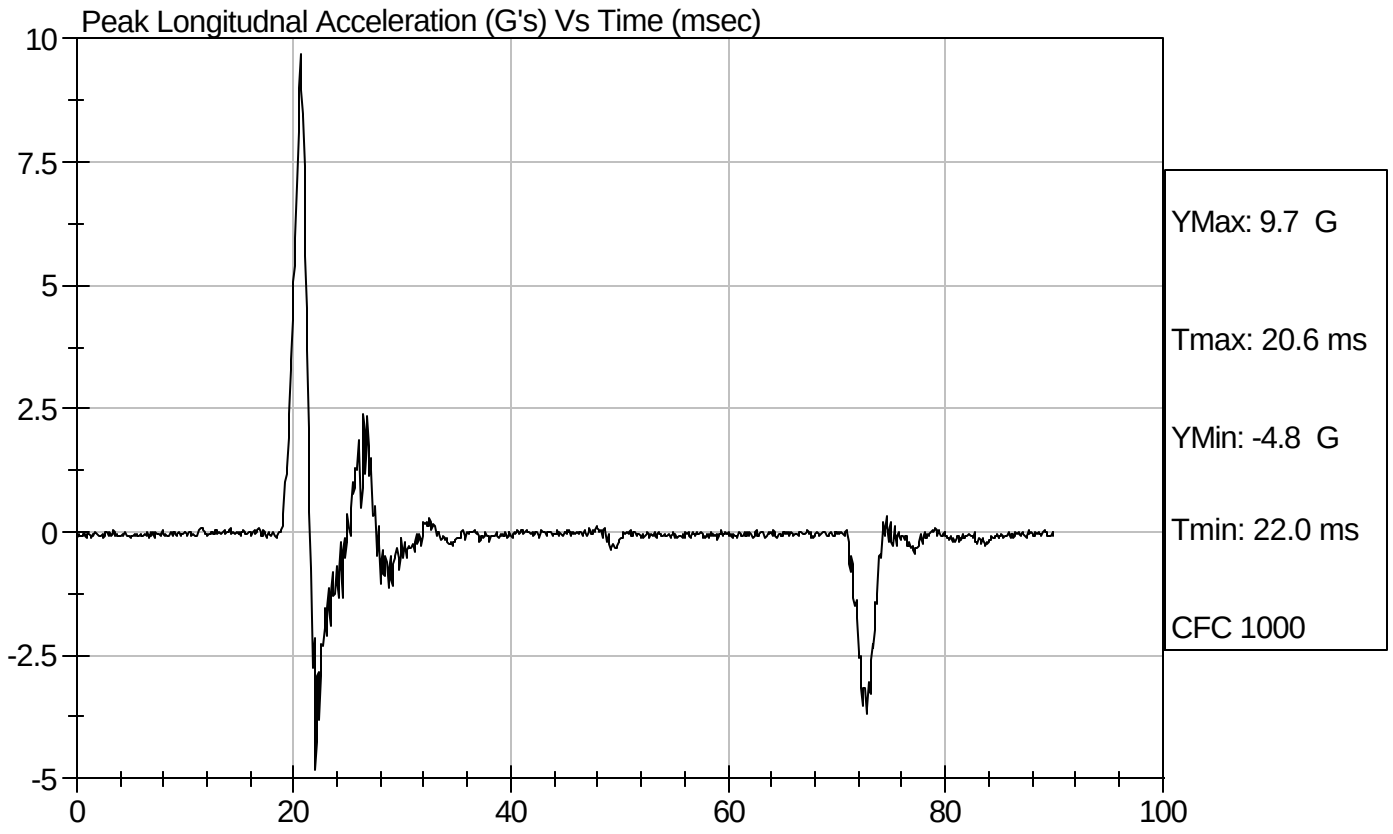
Jessica Hall
Laboratory Technician

10/11/07
Test Date

David Winkelbauer
Approved By

	Test Description: Head Drop	Test Date: 10/11/07
	Component: D073181	Speed: 0 ft/s, 0 m/s





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

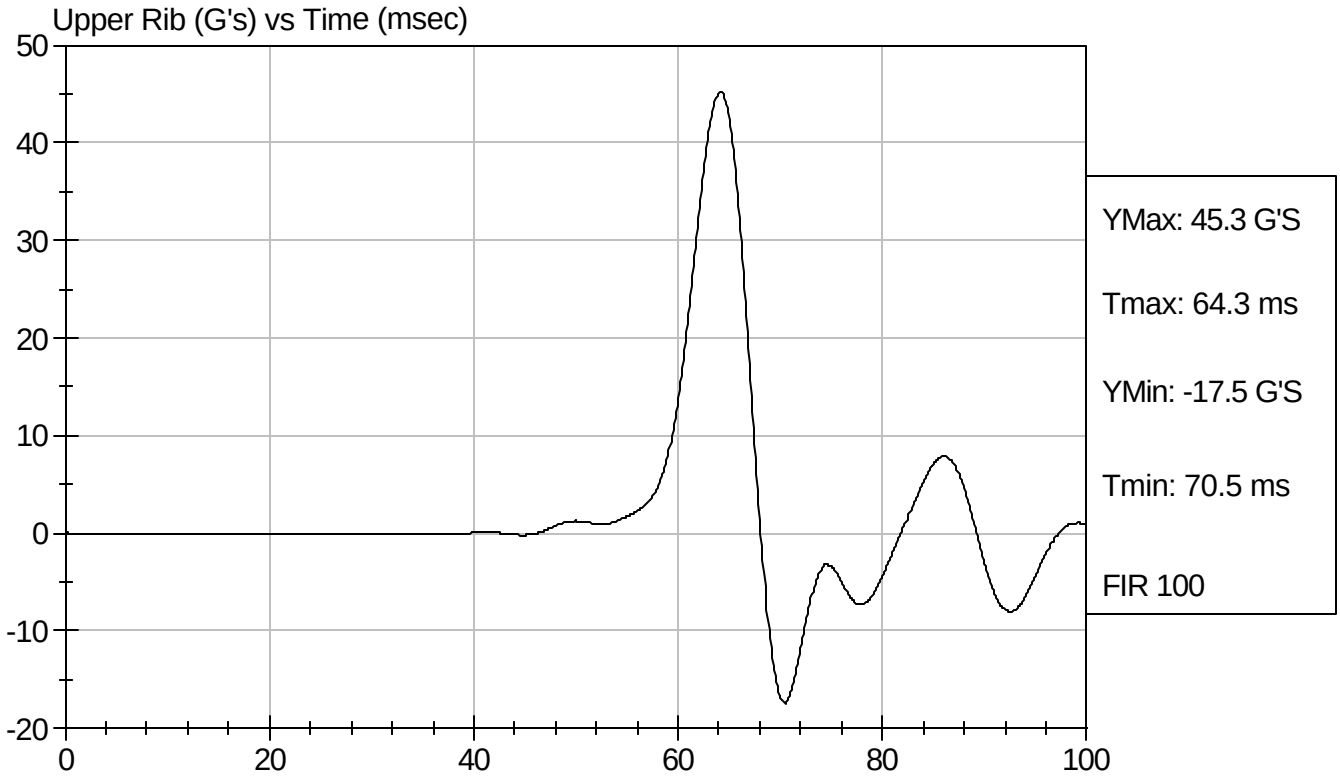
Jessica Hall
Laboratory Technician

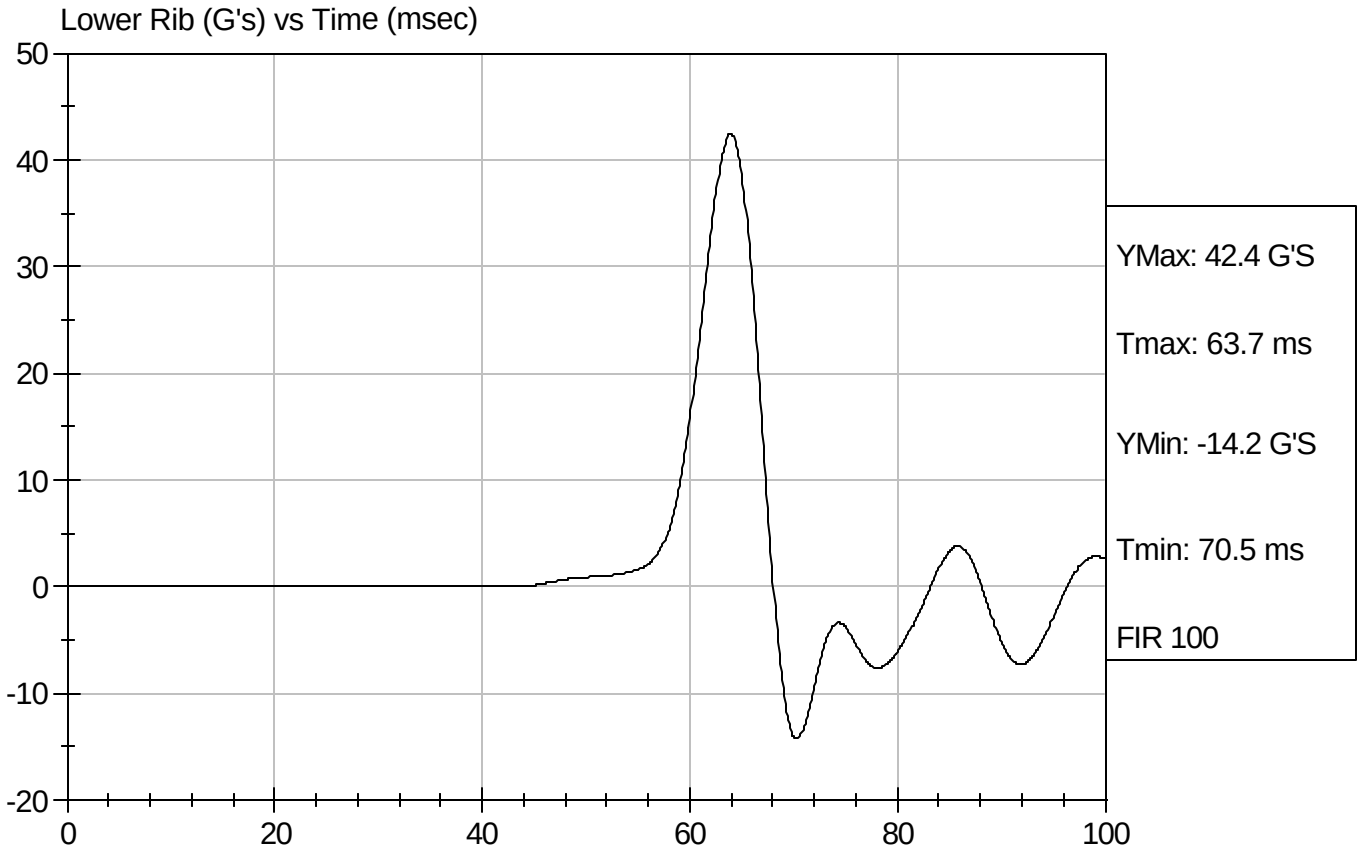
10/11/07
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D073182

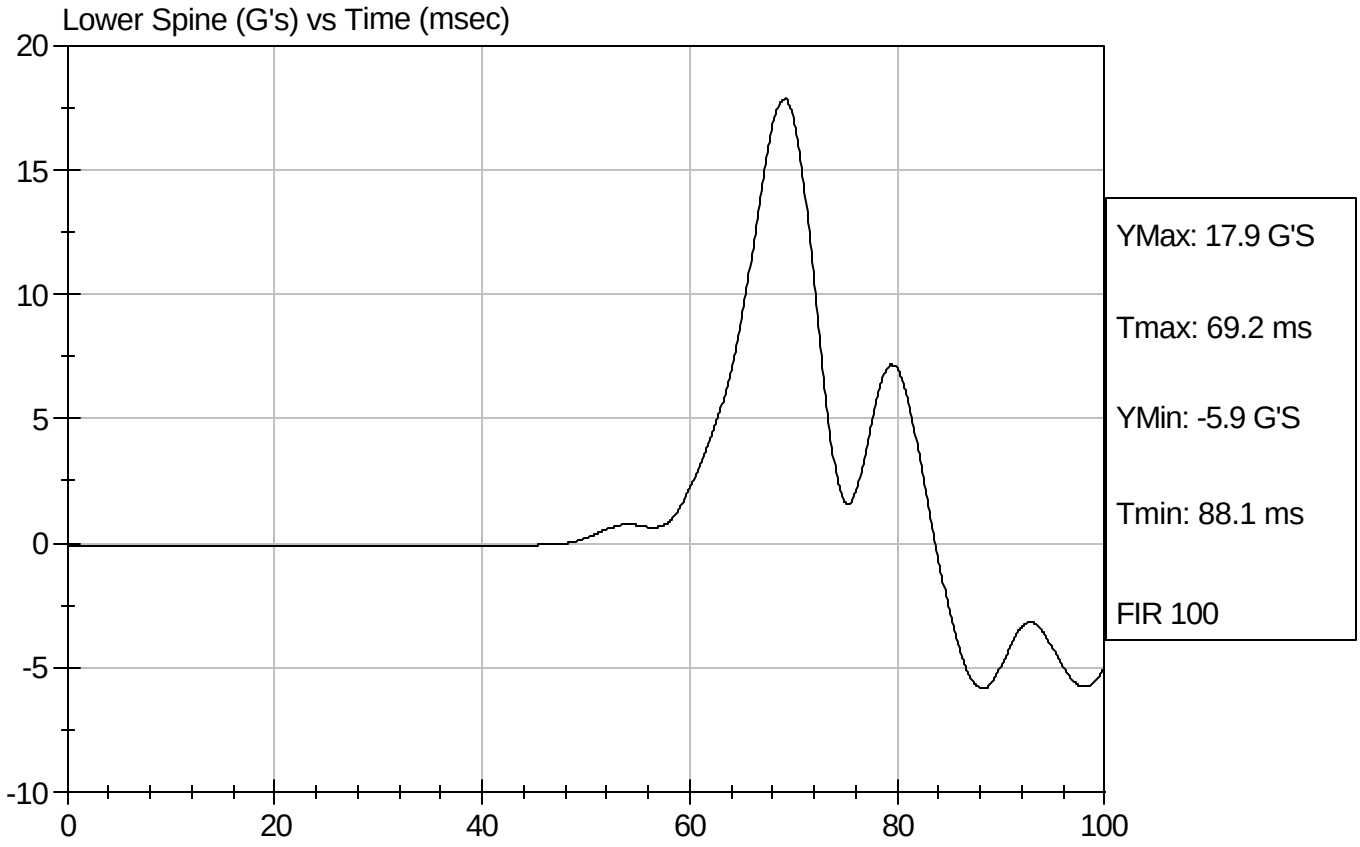
Test Date: 10/11/07
Speed: 14.00 ft/sec, 4.27 m/sec





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

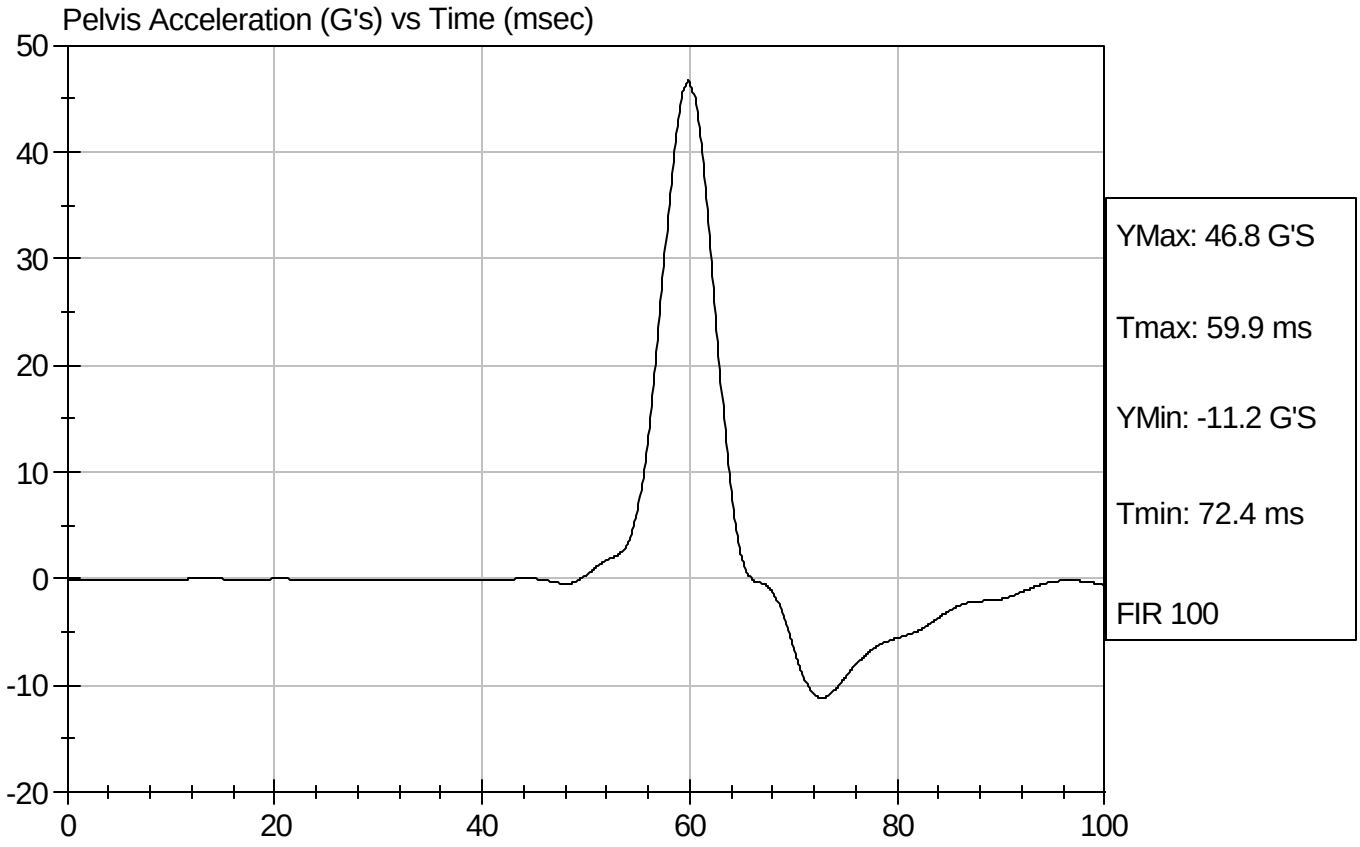
Jessica Hall
Laboratory Technician

10/11/07
Test Date

David Winkelbauer
Approved By

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

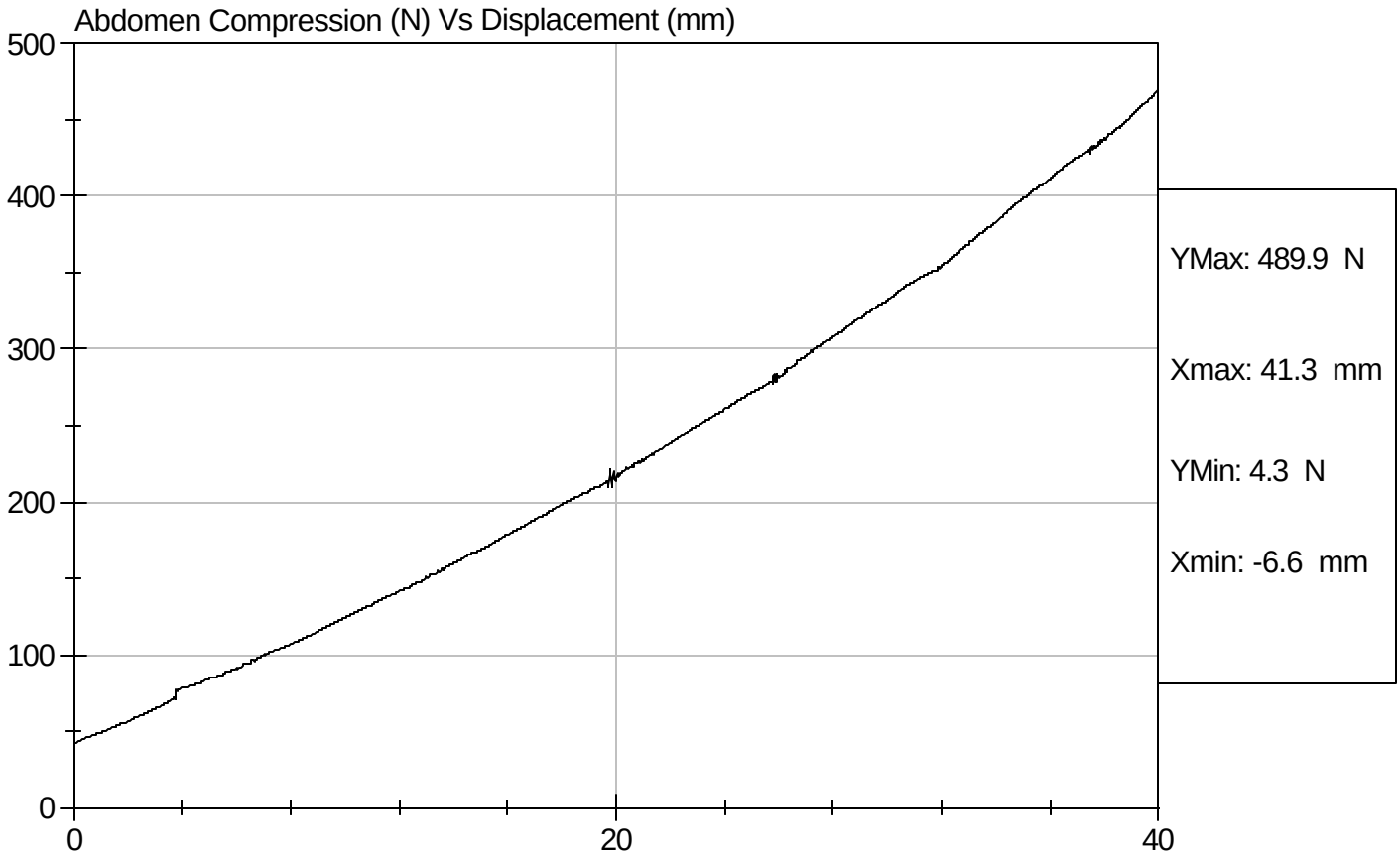
Jessica Hall
Laboratory Technician

10/11/07
Test Date

David Winkelbauer
Approved By

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

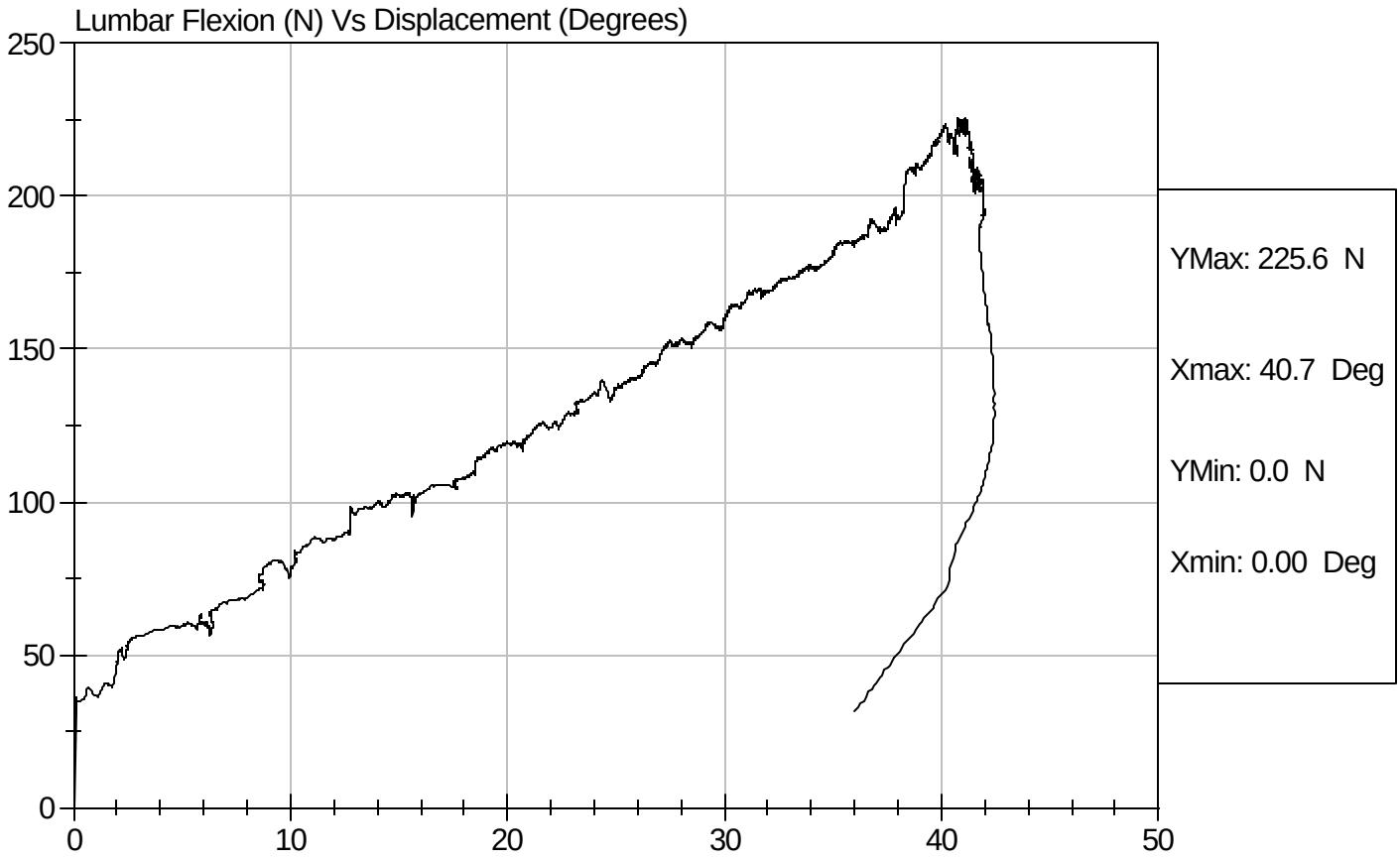
Jessica Hall
Laboratory Technician

10/11/07
Test Date

David Winkelbauer
Approved By

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
Midsaggital 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

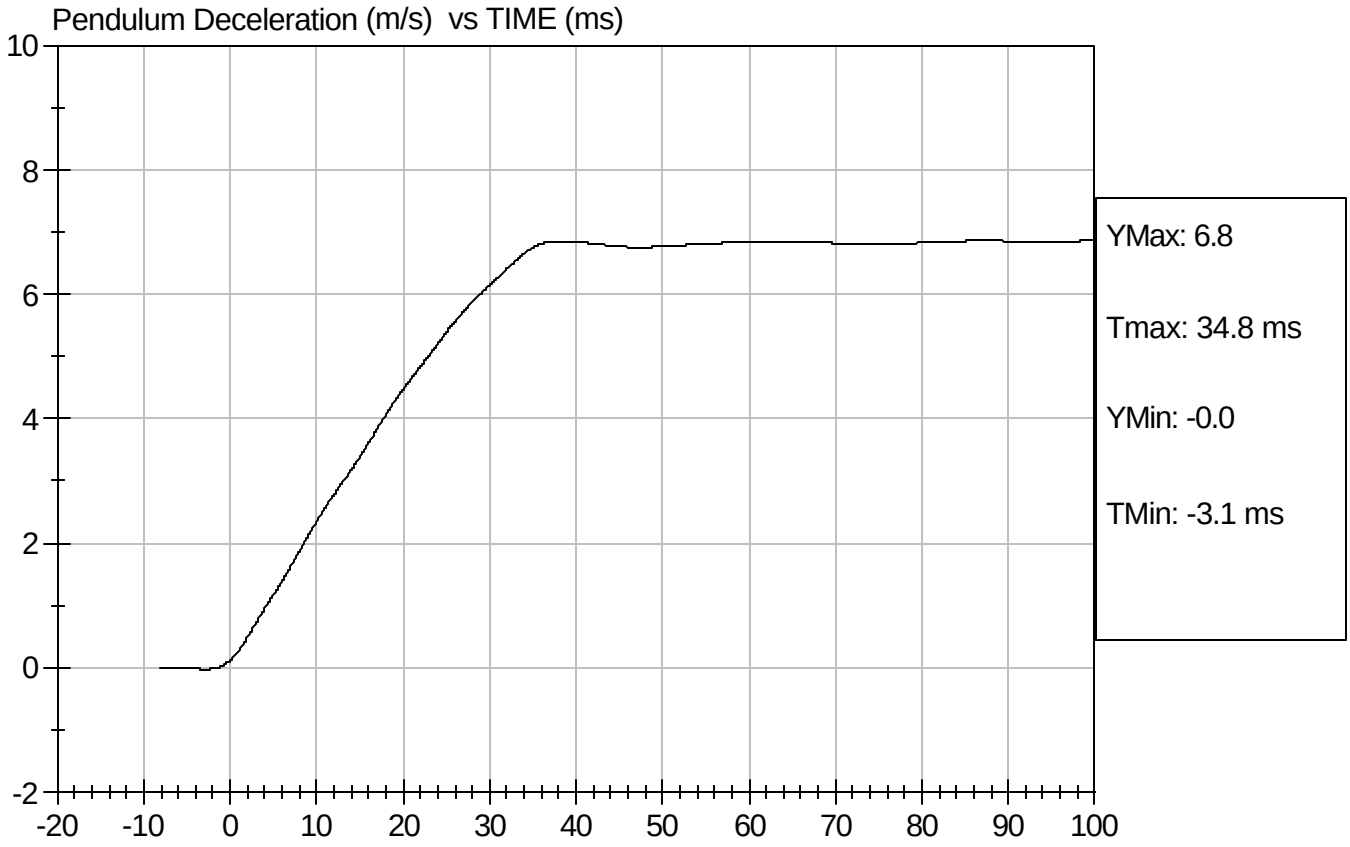
Jessica Hall
Laboratory Technician

10/12/07
Test Date

David Winkelbauer
Approved By

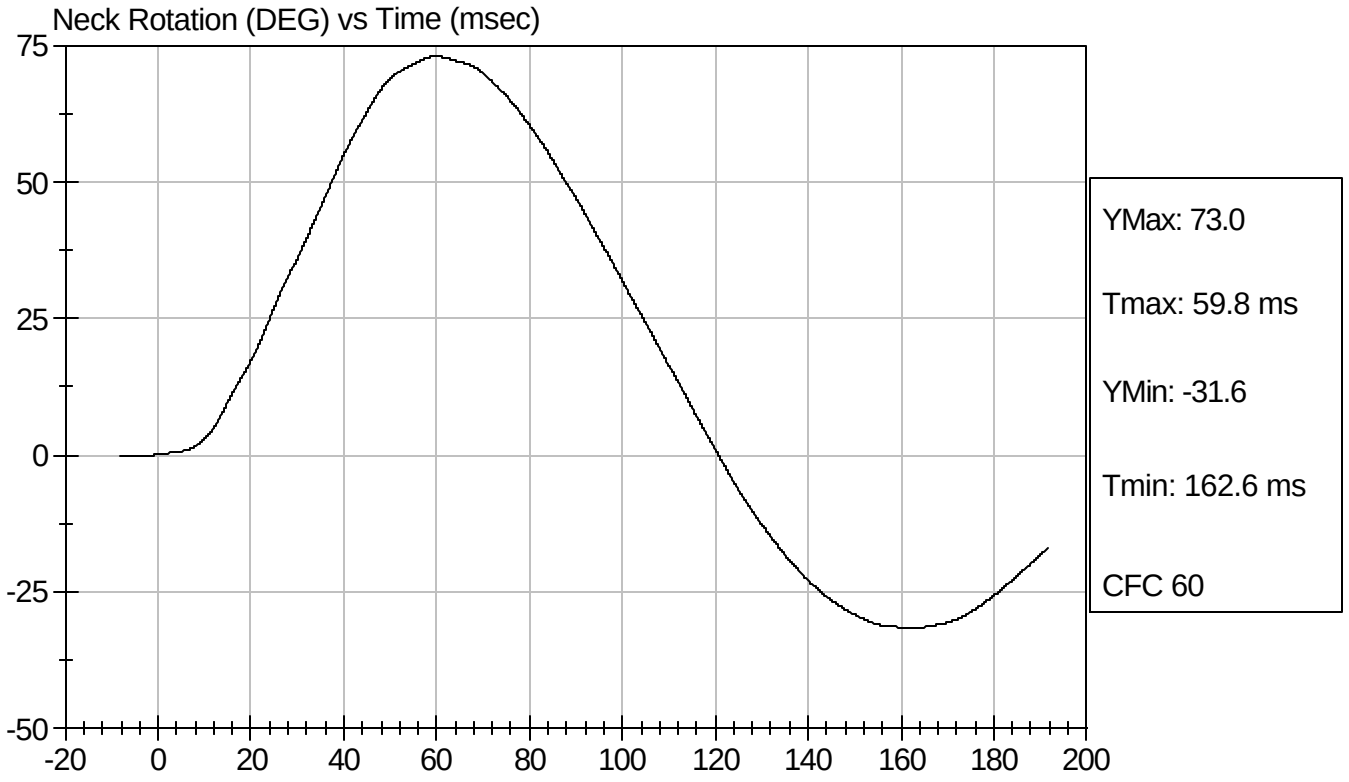
Test Desc: Neck Bending
Component ID: D073189

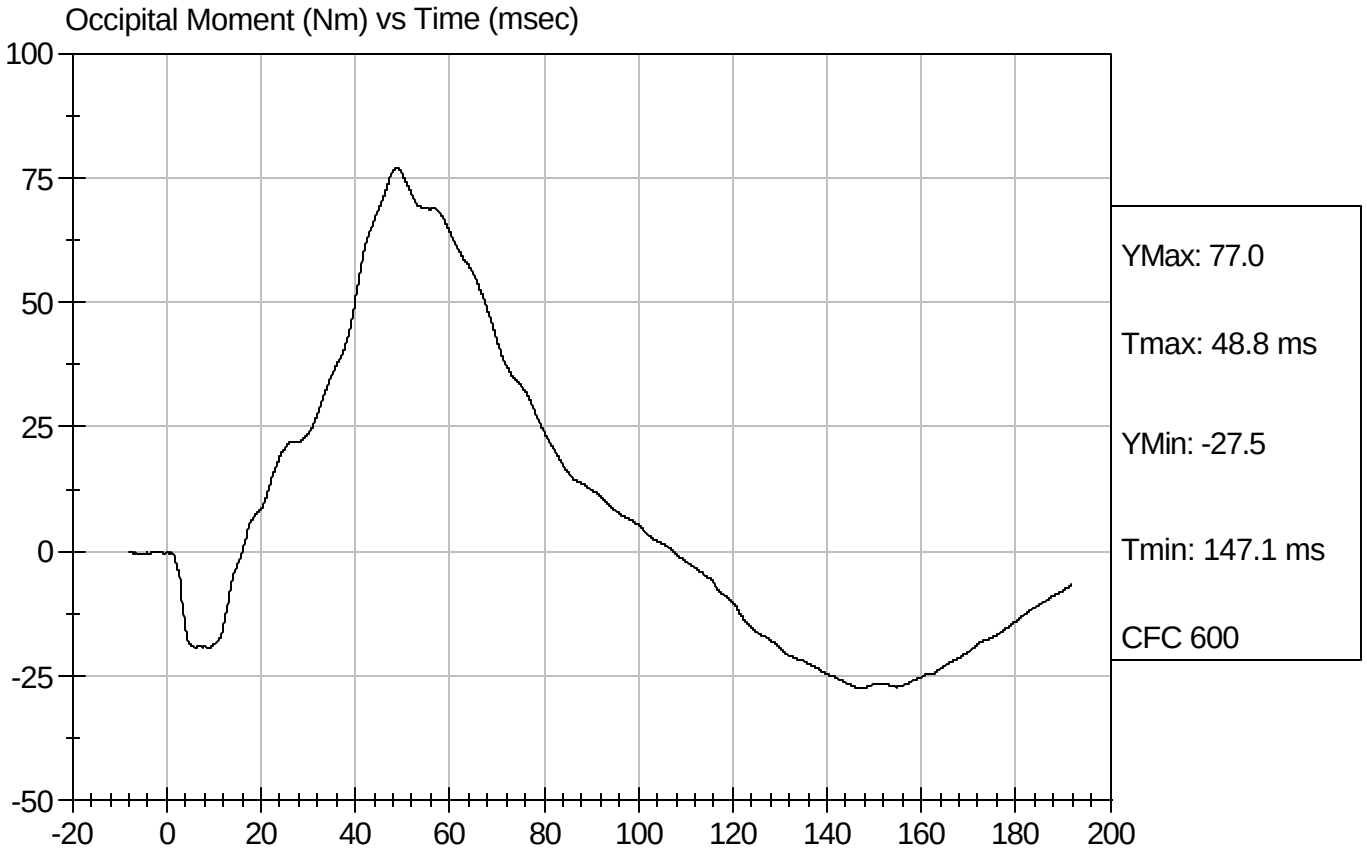
Test Date: 10/12/07
Speed: 23.14 ft/sec, 7.05 m/sec



Test Desc: Neck Bending
Component ID: D073189

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





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:** D073321

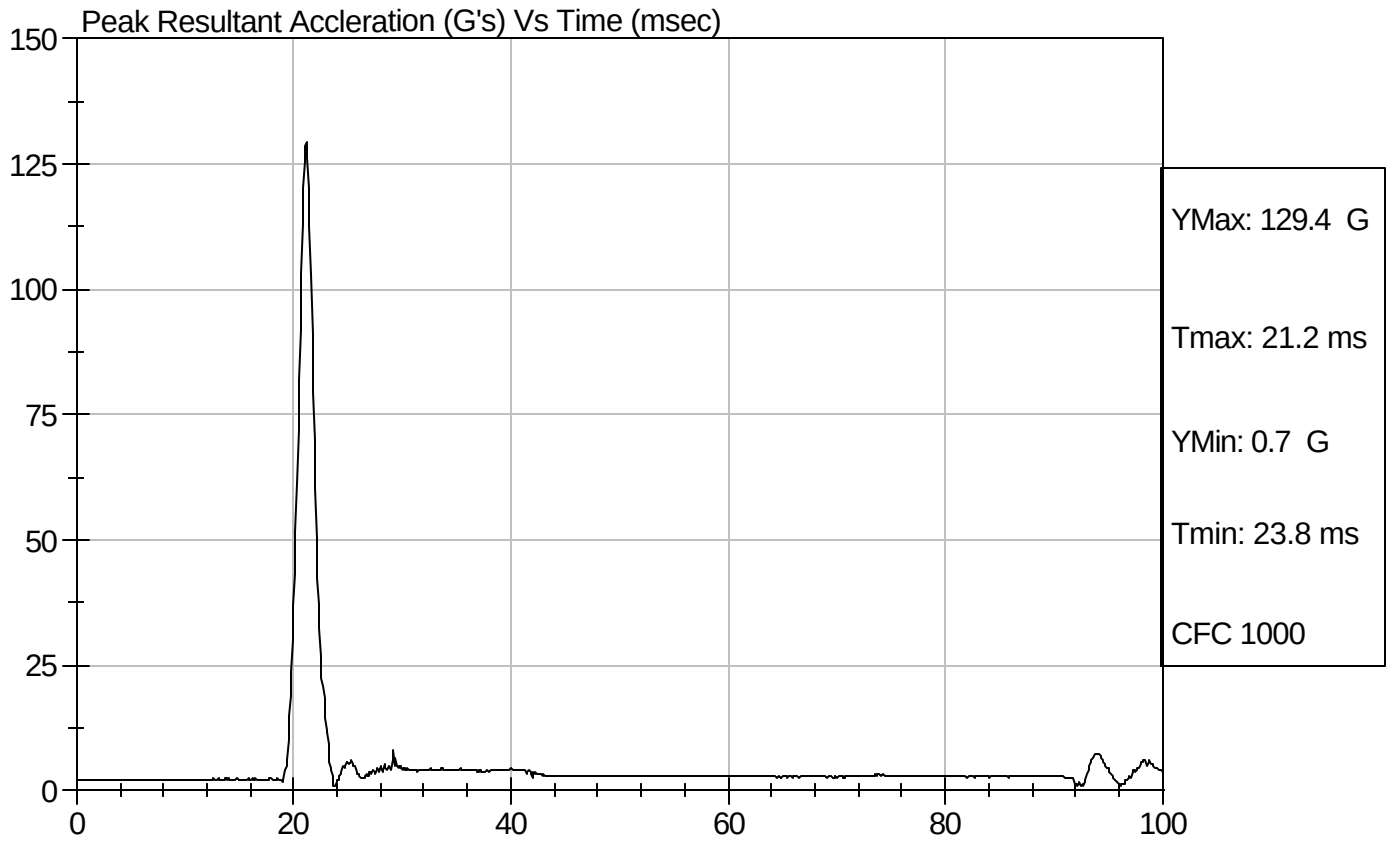
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Peak Resultant Acceleration	G's	120 to 150	129	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-6.3	Pass
		Overall Test Results		Pass

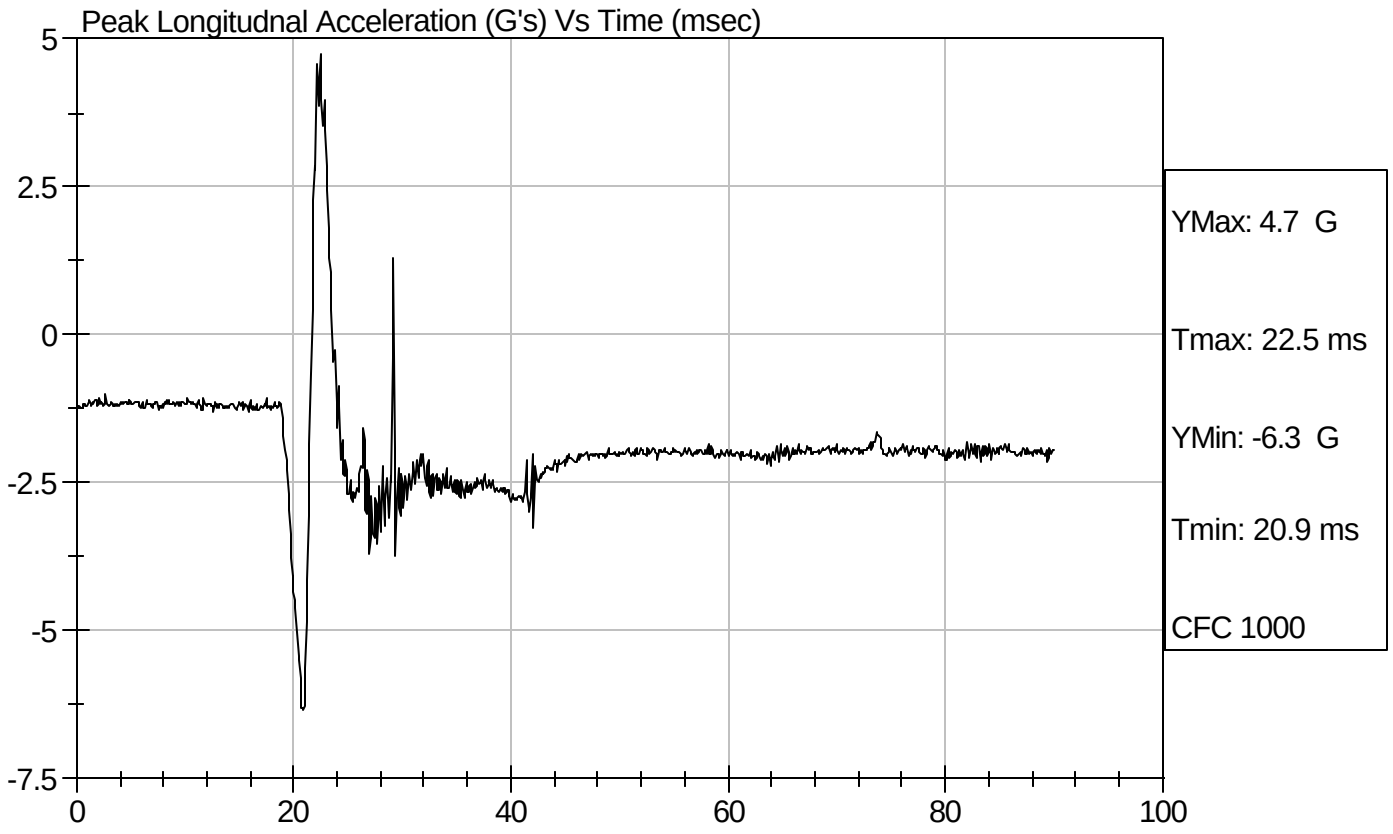
Jessica Gall
Laboratory Technician

11/5/07
Test Date

David Winkelbauer
Approved By

mga	Test Description: Head Drop	Test Date: 11/5/07
	Component: D073321	Speed: 0 ft/s, 0 m/s





SID/HIII Calibration Data Sheet

Side Impact Dummy

Thorax Impact Test

ATD Serial No: 271 **Test I.D:** D073322

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Probe Velocity	m/s	4.22 - 4.31	4.23	Pass
Upper Rib	G's	37 - 46	43	Pass
Lower Rib	G's	37 - 46	41	Pass
Lower Spine	G's	15 - 22	16	Pass
		Overall Test Results		Pass

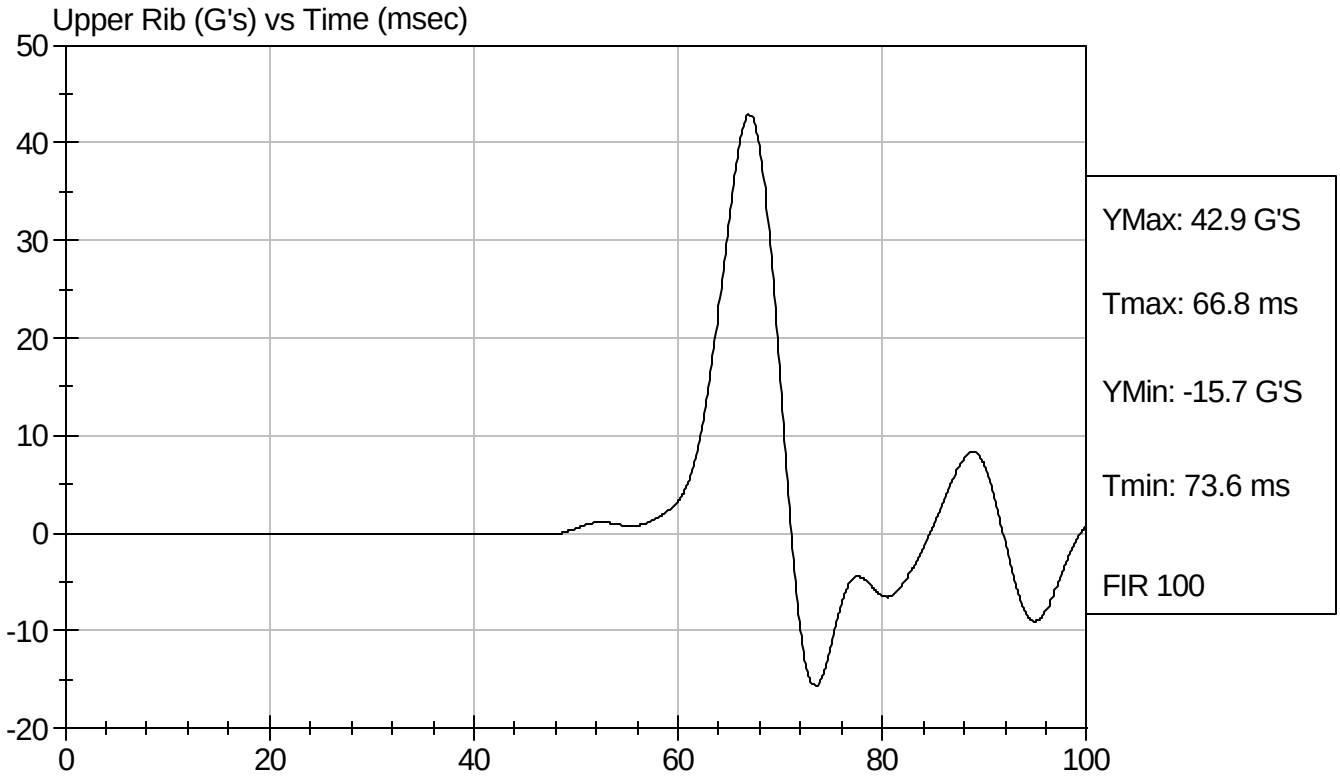
Jessica Hall
Laboratory Technician

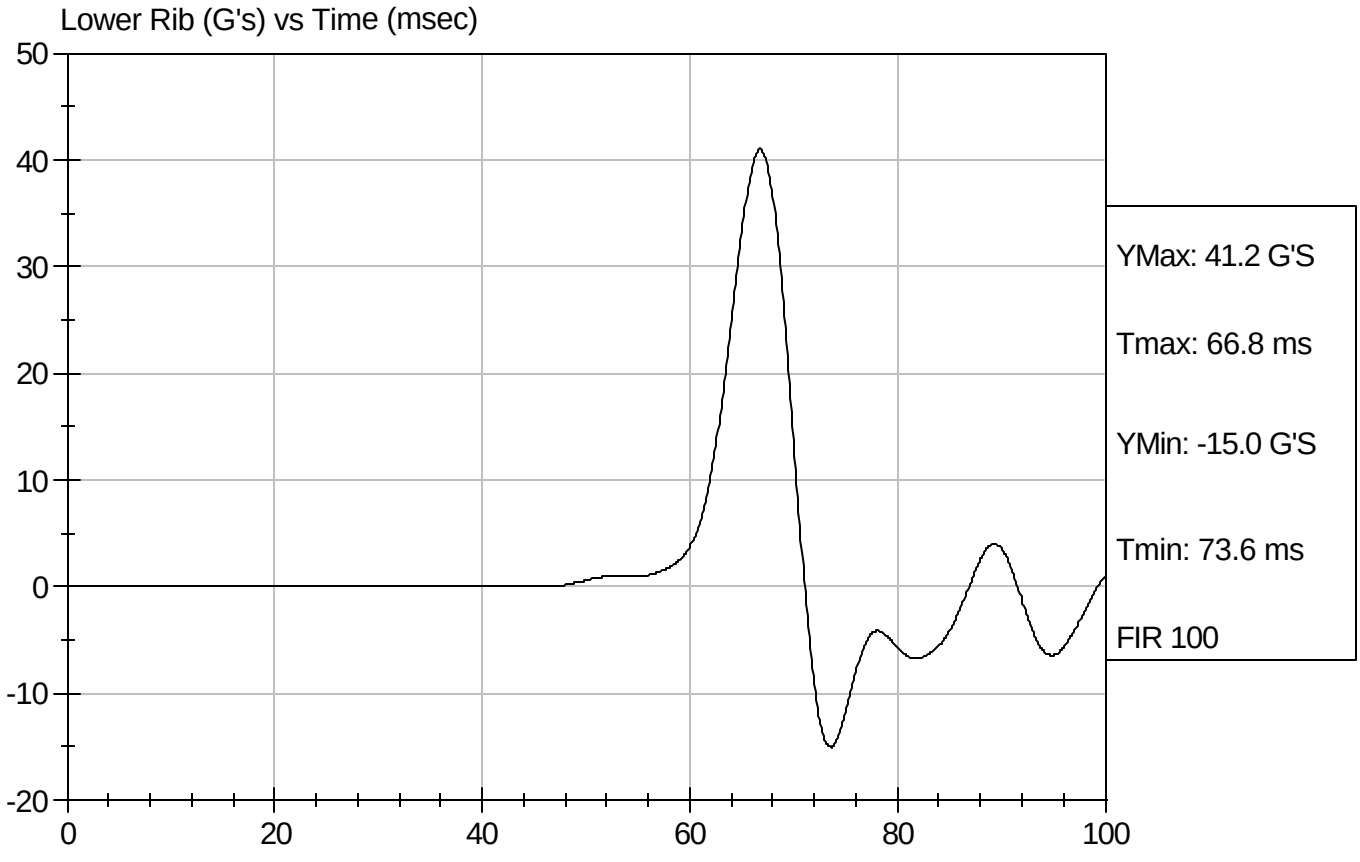
11/5/07
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D073322

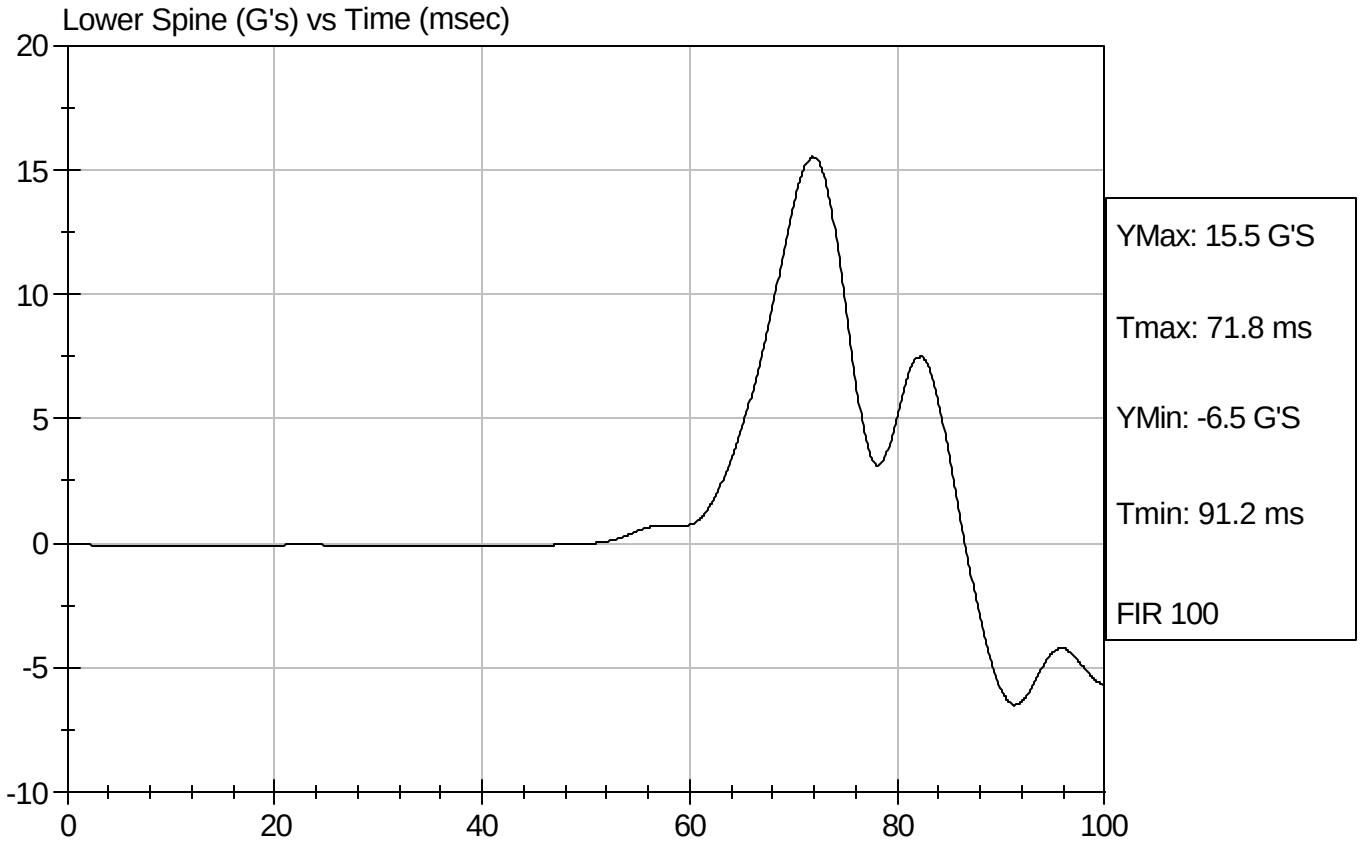
Test Date: 11/5/07
Speed: 13.89 ft/sec, 4.23 m/sec





Test Desc: Thorax Impact
Component ID: D073322

Test Date: 11/5/07
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:** D073323

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.3	Pass
Laboratory Relative Humidity	%	10 to 70	23	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	44	Pass
		Overall Test Results		Pass

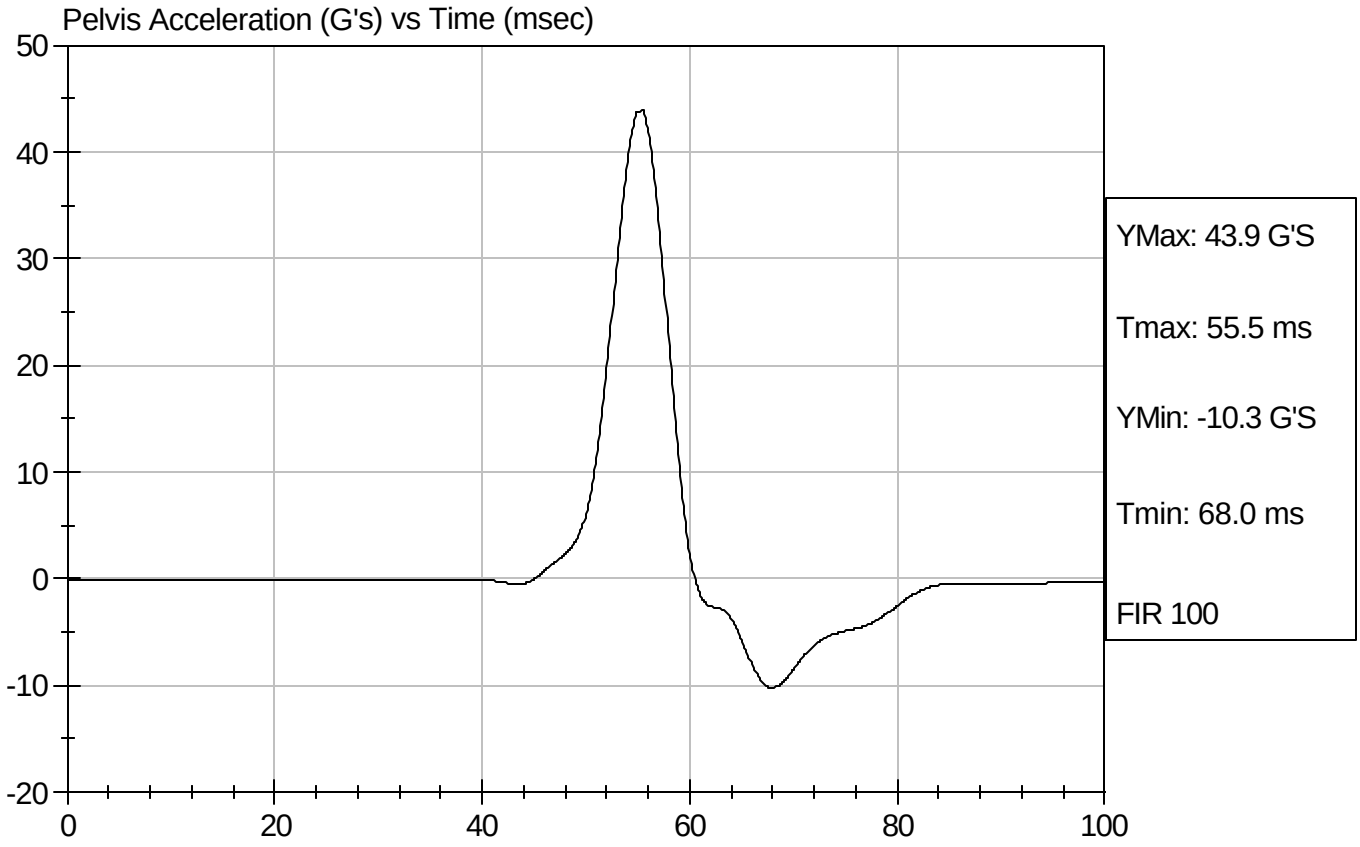
Jessica Gall
Laboratory Technician

11/2/07
Test Date

David Winkelbauer
Approved By

Test Desc: Pelvis Impact
Component ID: D073323

Test Date: 11/2/07
Speed: 14.1 ft/sec, 4.30 m/sec



SID/HIII Calibration Data Sheet

Side Impact Dummy

Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 271 **Test I.D:** D073324

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Force At 12.7 mm	N	104 -162	137	Pass
Force At 19 mm	N	163 - 222	193	Pass
Force At 25.4 mm	N	222 - 280	254	Pass
Force At 33 mm	N	325 - 391	336	Pass
		Overall Test Results		Pass

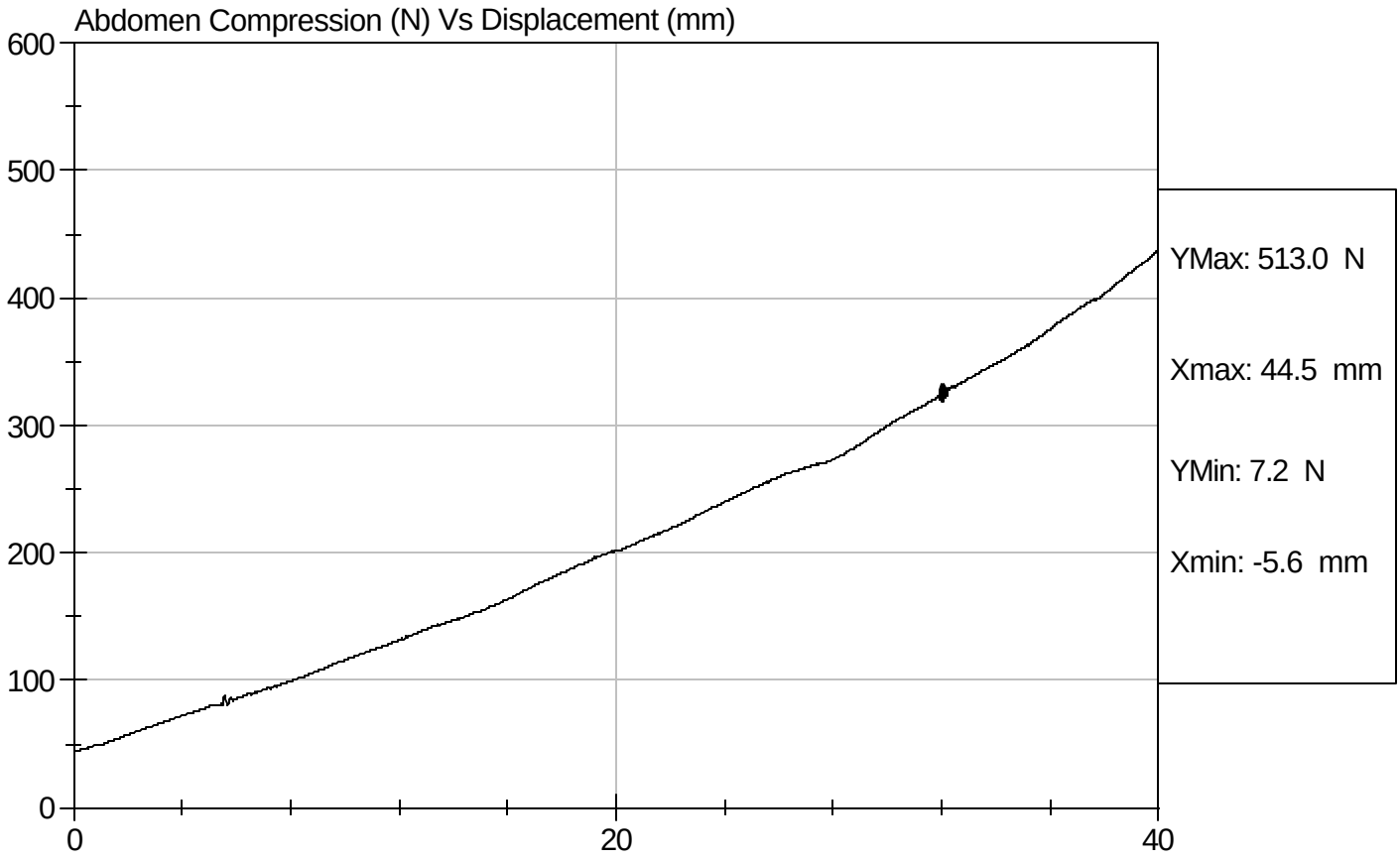
Jessica Hall
Laboratory Technician

11/5/07
Test Date

David Winkelbauer
Approved By

Test Description: Abdomen Compression Test Date: 11/5/07

Component: D073324 Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet

Side Impact Dummy

Lumbar Flexion Calibration

ATD Serial No: 271 **Test I.D:** D073325

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	136.0	Pass
Force At 30 deg	N	151.2 - 204.6	196.0	Pass
Force At 40 deg	N	204.6 - 258.0	248.3	Pass
Return Angle	Deg	12 Maximum	4	Pass
		Overall Test Results		Pass

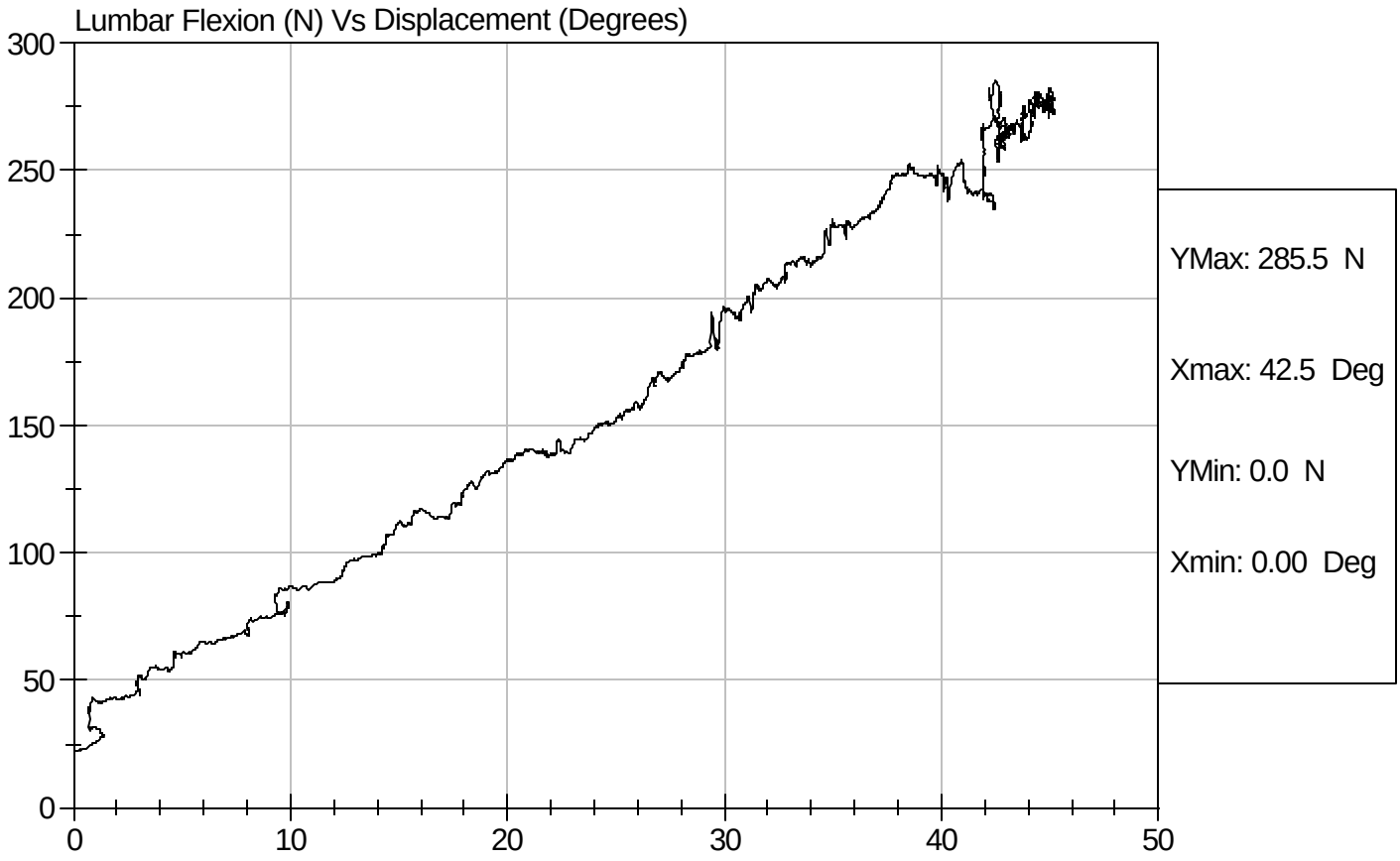
Jessica Hall
Laboratory Technician

11/5/07
Test Date

David Winkelbauer
Approved By

Test Description: Lumbar Flexion | Test Date: 11/5/07

Component: D073325 | 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:** D073329

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	28	Pass
Impact Velocity		m/s	6.89 to 7.13	7.05	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.53	Pass
	20 msec	m/s	4.12 to 5.10	4.86	Pass
	30 msec	m/s	5.73 to 7.01	6.57	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.75	Pass
Midsaggital Plane Max Rotation		deg	66 to 82	76	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	61	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	14	Pass

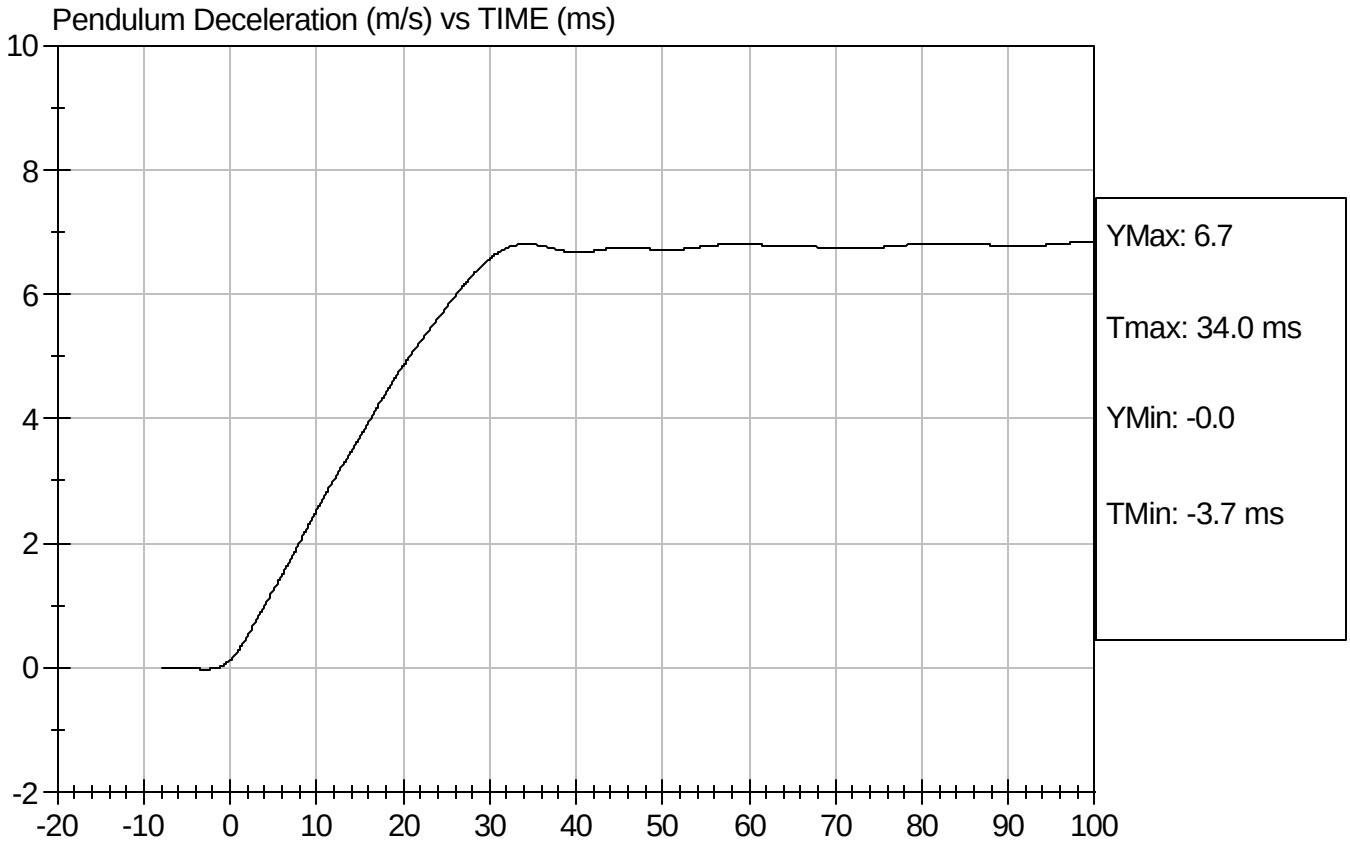
Jessica Hall
Laboratory Technician

11/5/07
Test Date

David Winkelbauer
Approved By

Test Desc: Neck Bending
Component ID: D073329

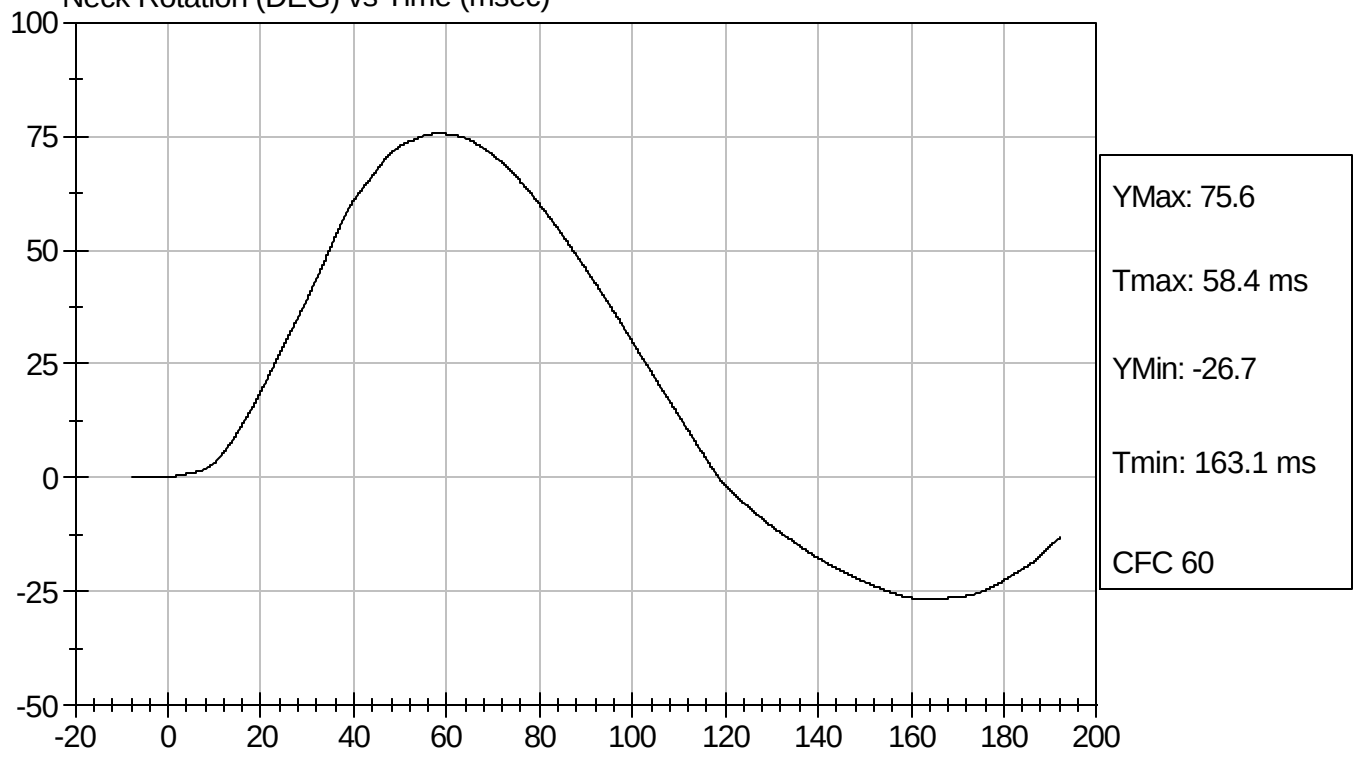
Test Date: 11/5/07
Speed: 23.14 ft/sec, 7.05 m/sec



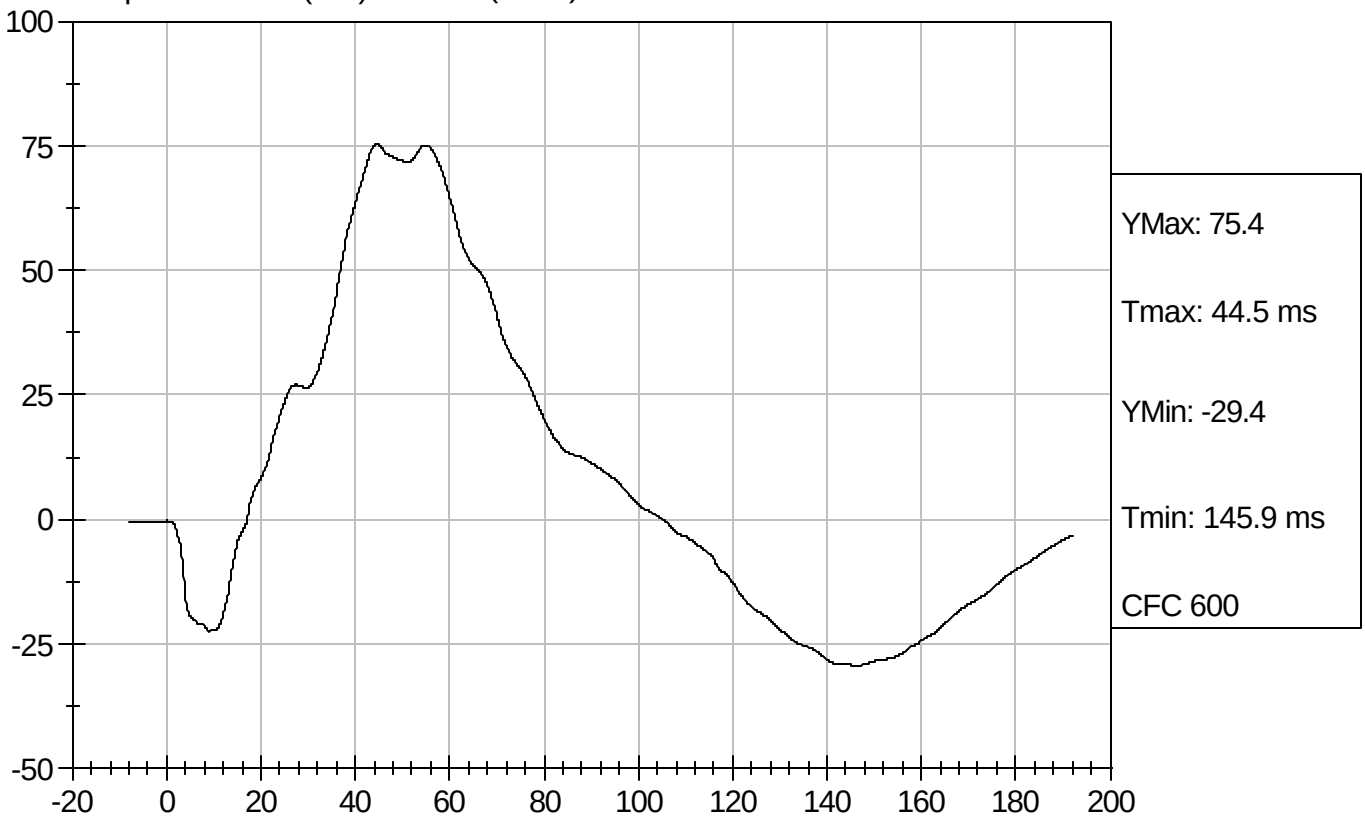
Test Desc: Neck Bending
Component ID: D073329

Test Date: 11/5/07
Speed: 23.14 ft/sec, 7.05 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

11/5/2007
Test Date

David Winkelbauer
Approved By

APPENDIX D

CHILD DUMMY DATA

SUMMARY OF TEST

Measurement Description	Units	Threshold	P3 ATD
Head Injury Criteria (HIC36)	N/A	N/A	237
Head Injury Criteria (HIC15)	N/A	390	158
Max. Thorax Accel. (3msec Clip)	G's	50	49

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	406.4	323.0	
Right	kg	370.1	306.6	
Ratio	%	55.2	44.8	
Totals	kg	776.5	629.6	1406.1

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

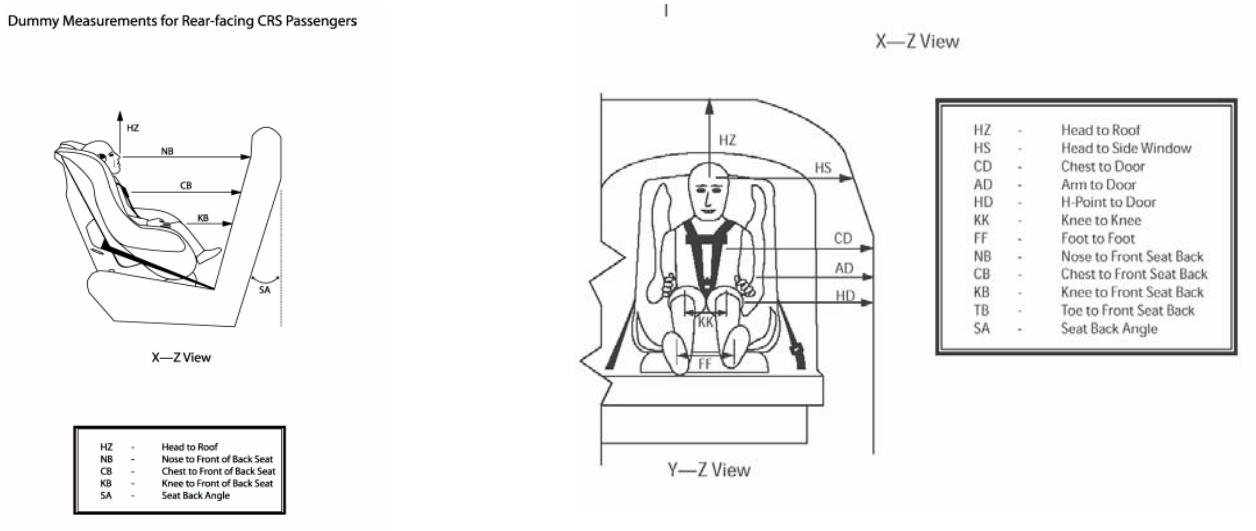
Location	Seat Movement (mm)	Seat Back Failure
P1 (Left Front)	0	None
P2 (Right Front)	0	None
P3 (Right Rear)	0	None
P4 (Left Rear)	0	None

VISIBLE DUMMY CONTACT POINTS

Description	Position 3 CRS
Head Contact	None
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 Snugride (Rear Facing)
NHTSA No.	M80203



Measurement	Pre-Test (mm)	Post-Test (mm)
	P3 CRS (093)	P3 CRS (093)
SA (deg)		
HS	284	264
CD	311	275
AD	195	179
HD	251	271
HZ	412	407
NB	576	597
CB	431	424
KK	108	119
FF	110	126
KB - LEFT	222	195
KB – RIGHT	220	198
TB - LEFT	54	81
TB - RIGHT	52	136

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

CRS PERFORMANCE DATA

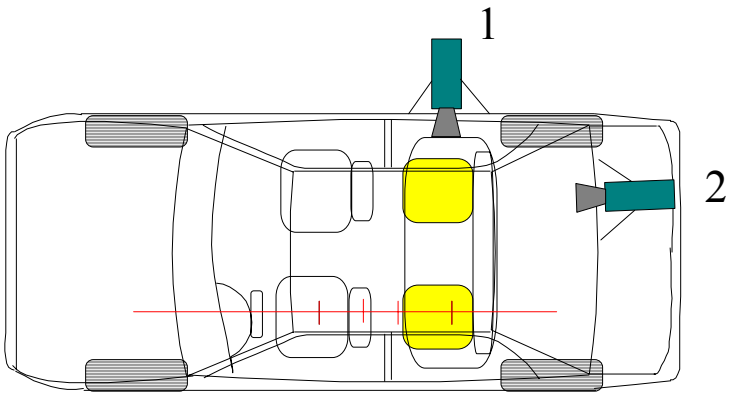
Child Restraint System (Position 3)	Graco Snugride (Rear Facing)
NHTSA No.	M80203

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.	M80203



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					10	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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Pre-Test Front View of Position 3 CRS

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Post-Test Left Side View of Position 3 CRS

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CHILD DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

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

RRP Child Seat X Acceleration vs. Time

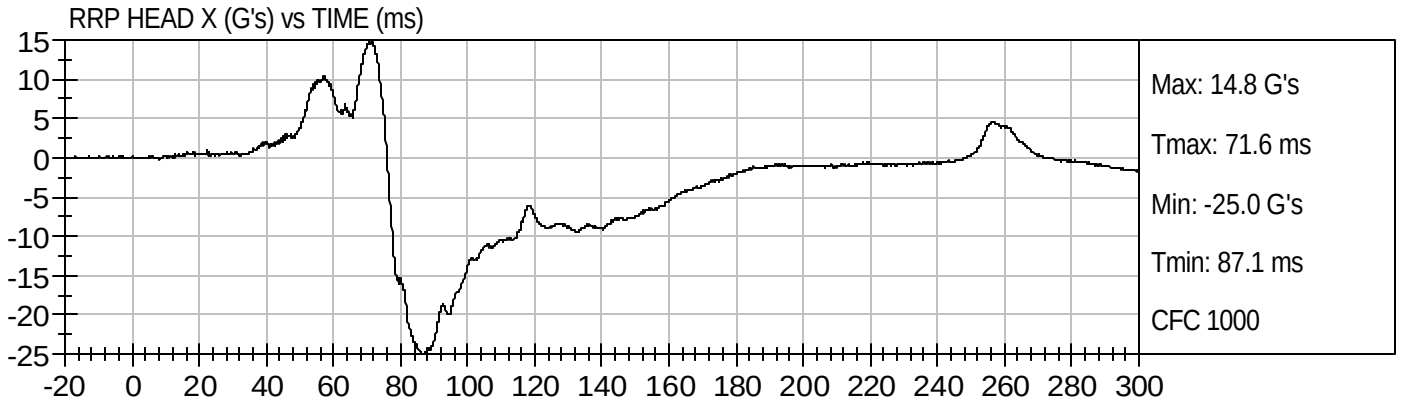
RRP Child Seat Y Acceleration vs. Time

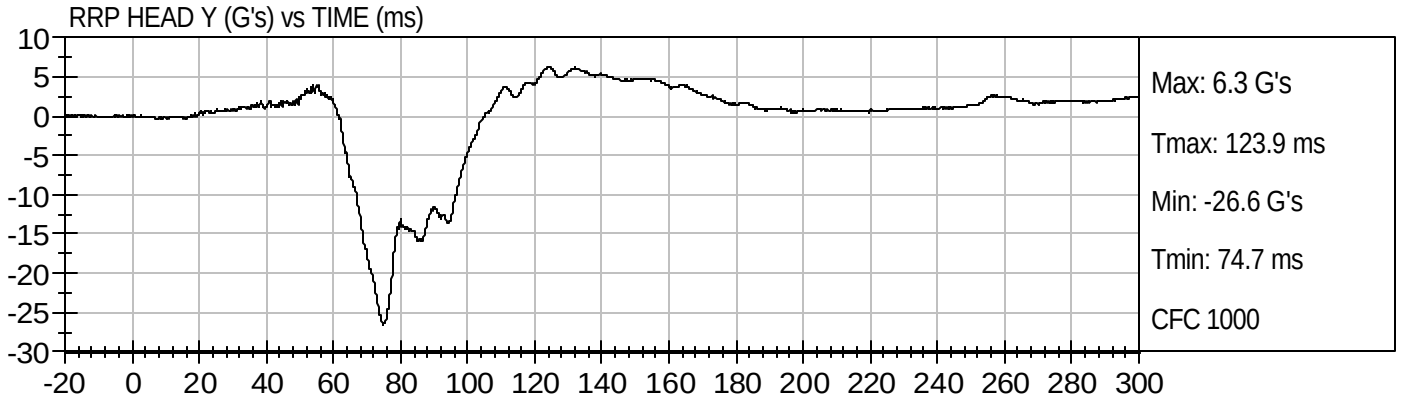
RRP Child Seat Z Acceleration vs. Time

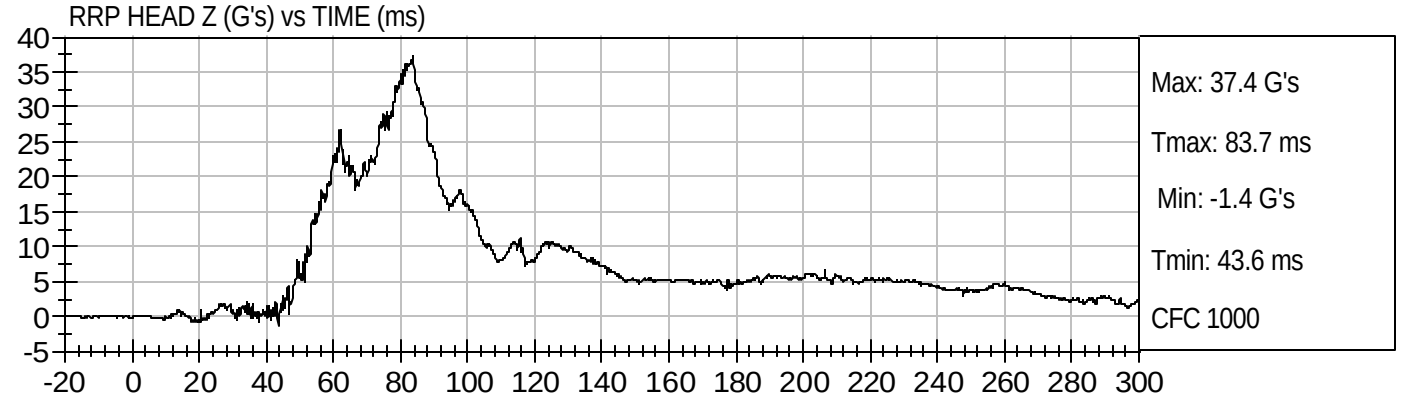
RRP Child Seat Resultant Acceleration vs. Time

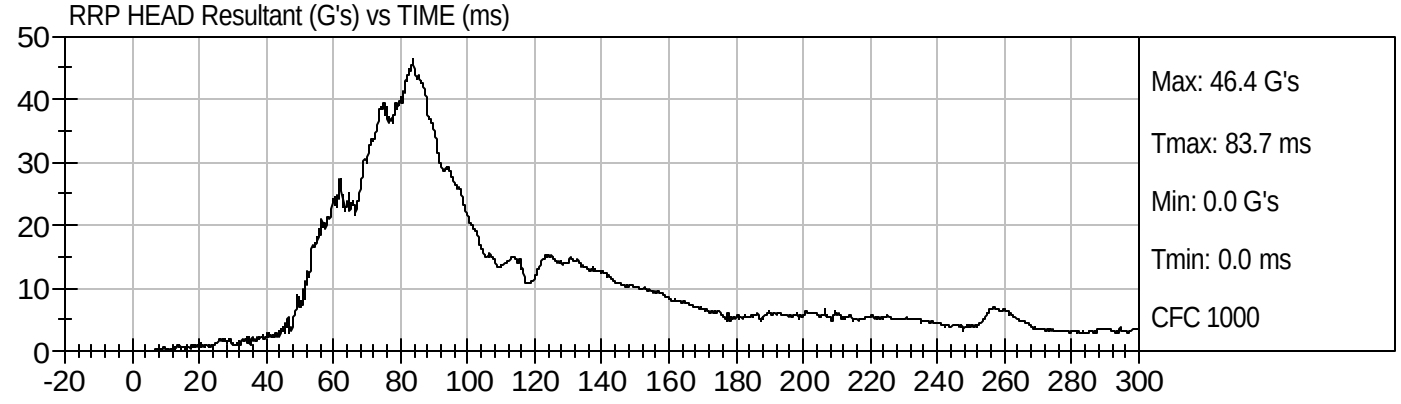
NCAP LEFT SIDE
2008 FORD FOCUS

Test Date: 11/02/2007
Speed: 38.4 mph (61.8 km/h)



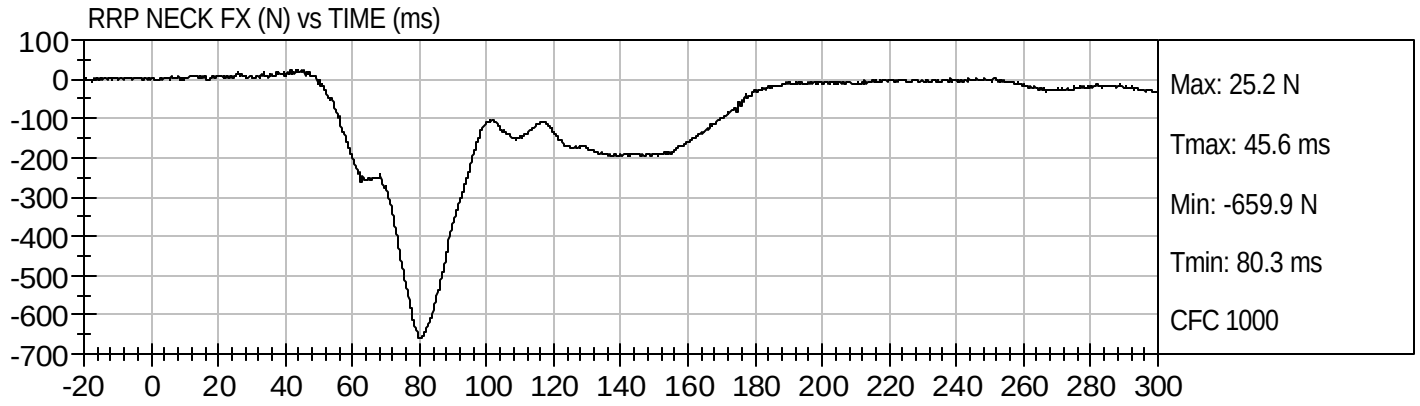


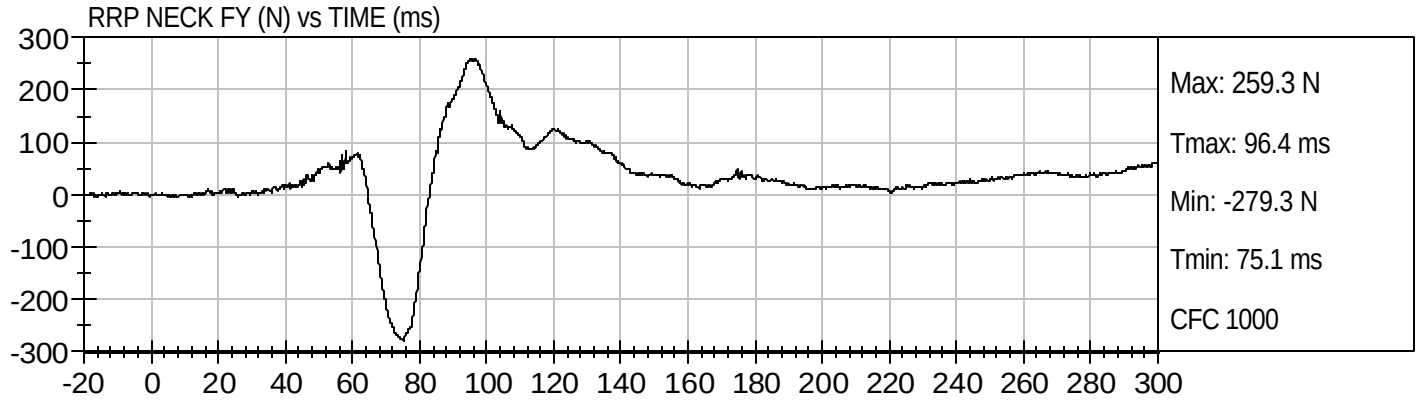


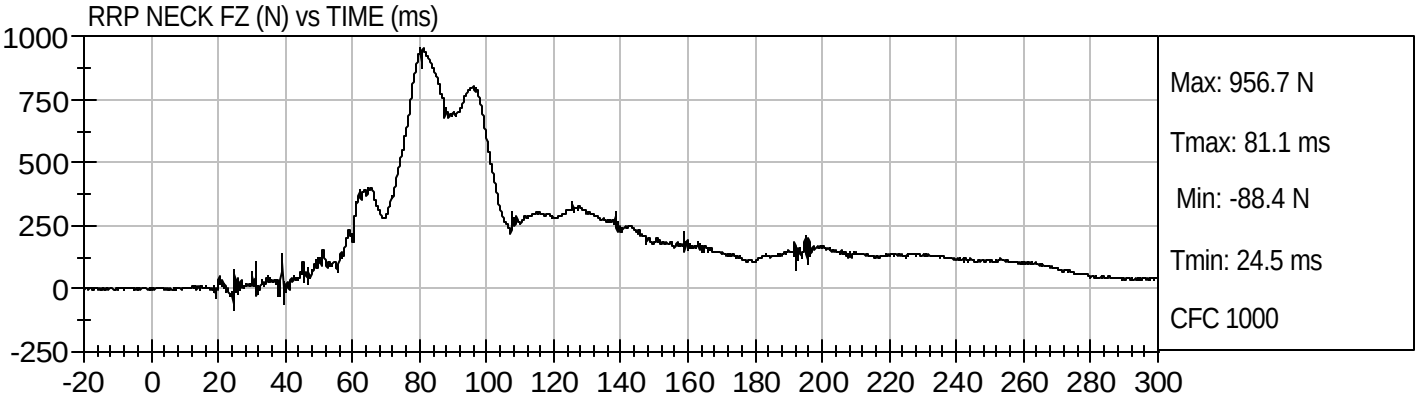


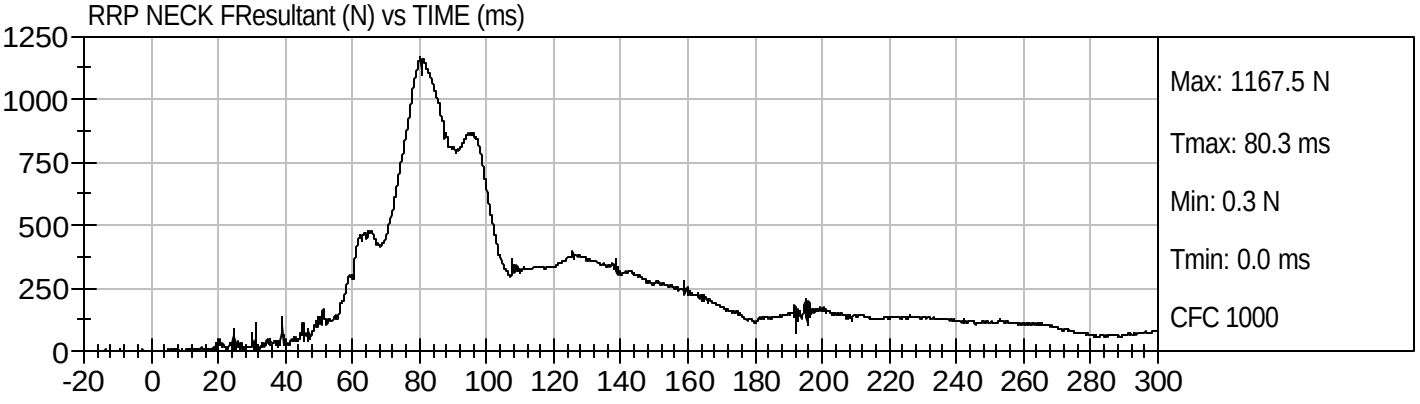
NCAP LEFT SIDE
2008 FORD FOCUS

Test Date: 11/02/2007
Speed: 38.4 mph (61.8 km/h)



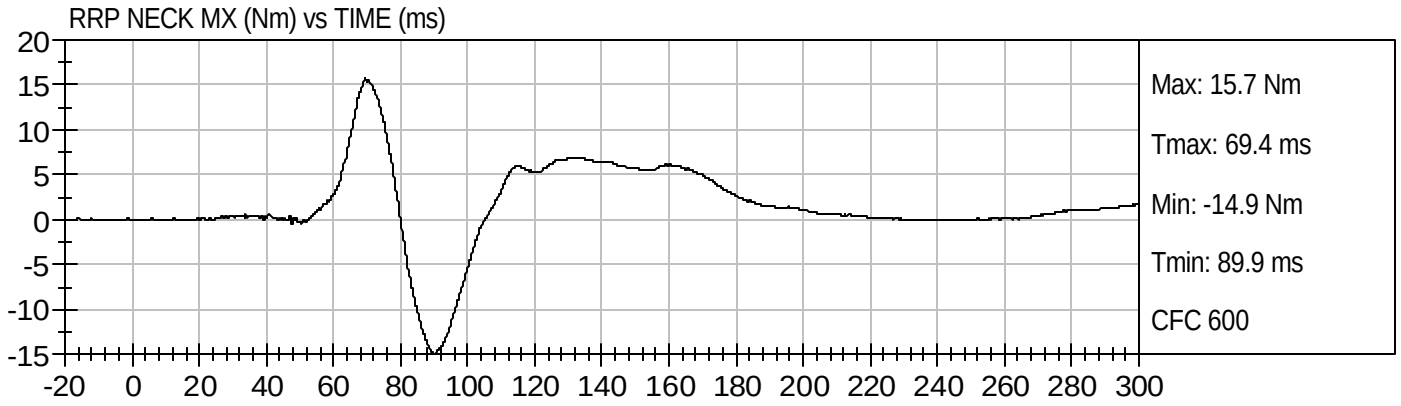


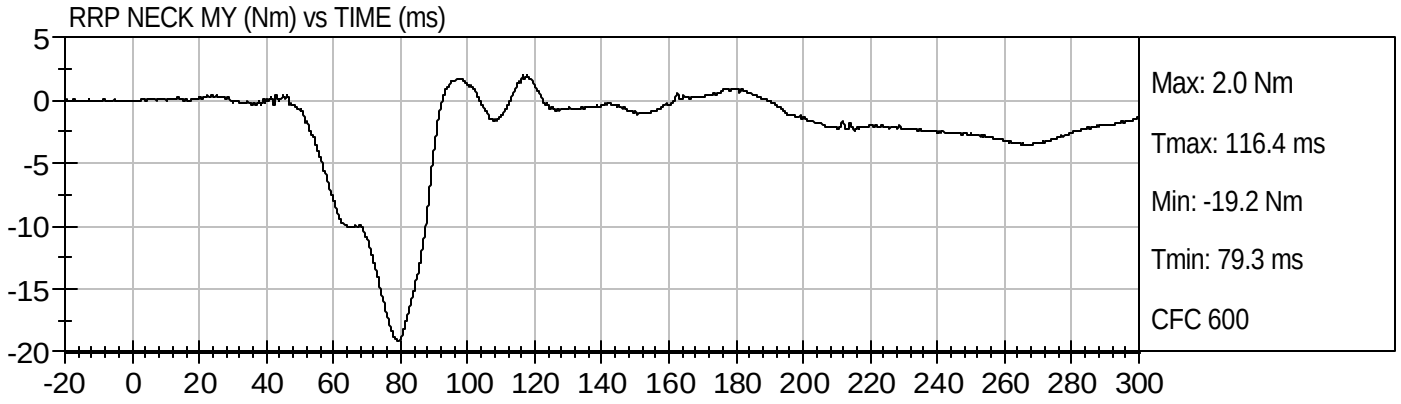


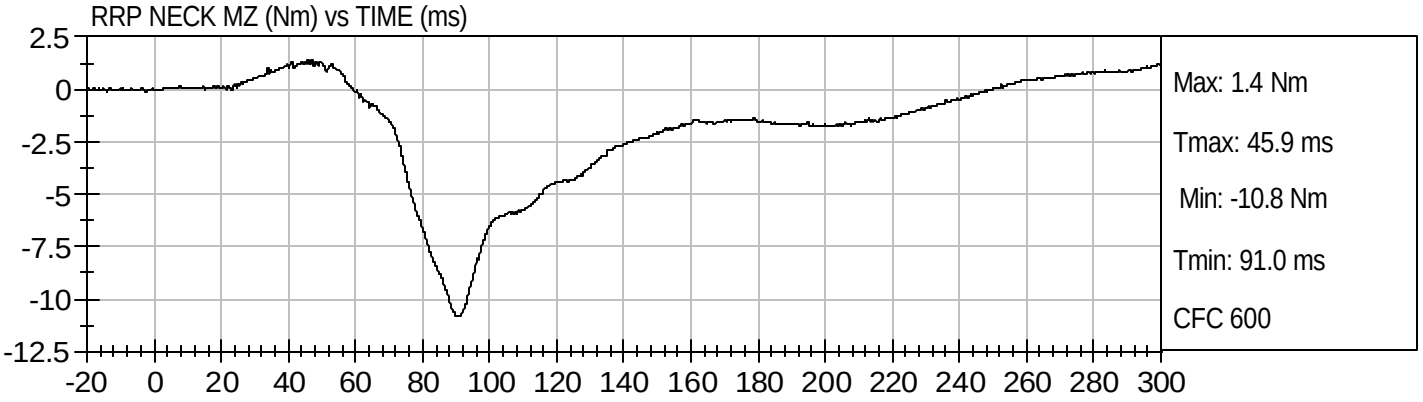


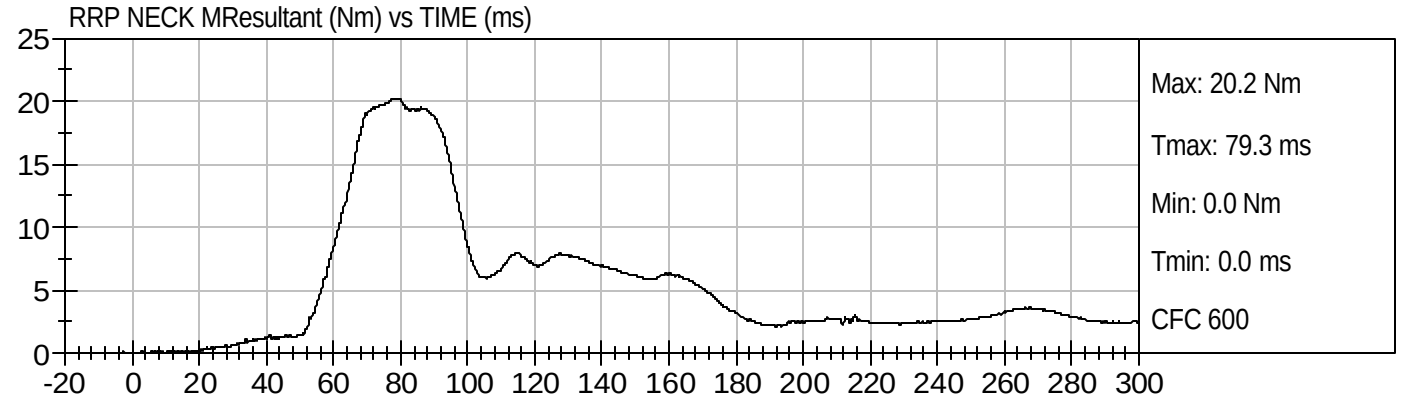
NCAP LEFT SIDE
2008 FORD FOCUS

Test Date: 11/02/2007
Speed: 38.4 mph (61.8 km/h)



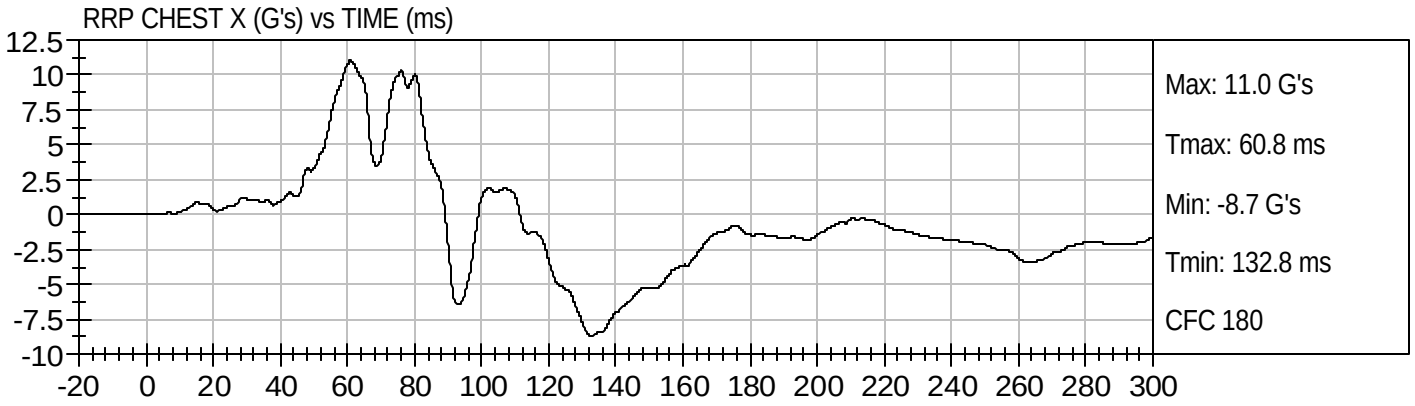


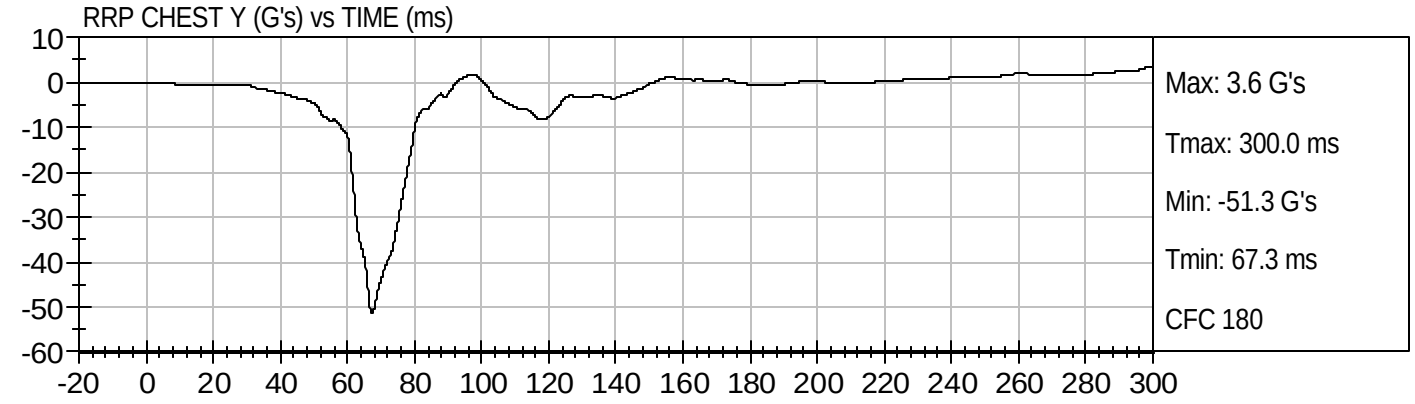


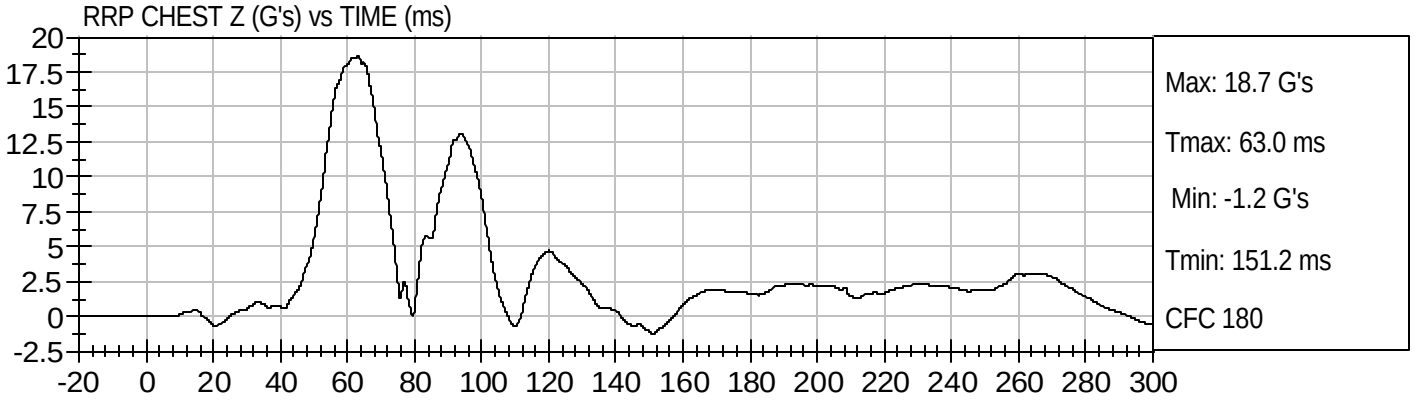


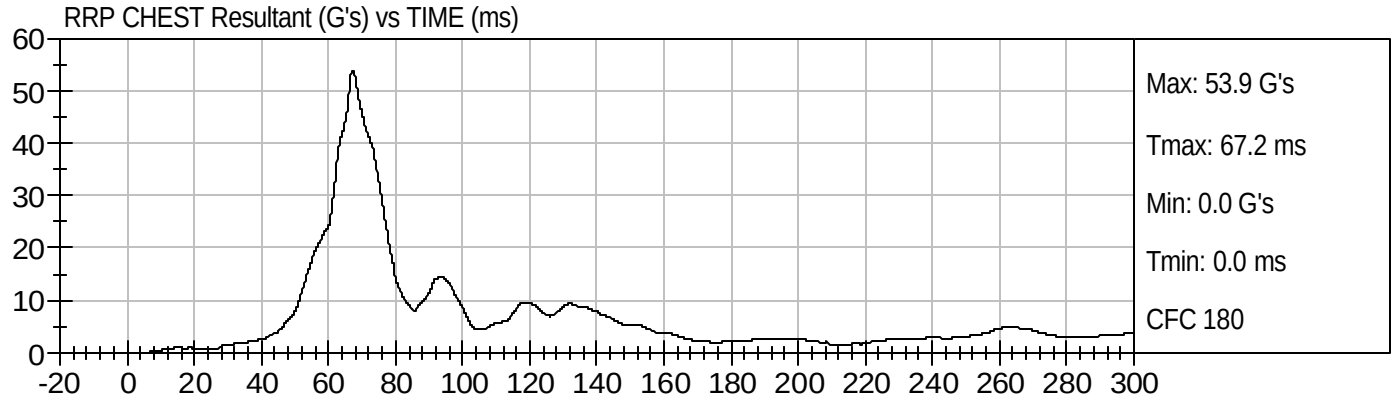
NCAP LEFT SIDE
2008 FORD FOCUS

Test Date: 11/02/2007
Speed: 38.4 mph (61.8 km/h)









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

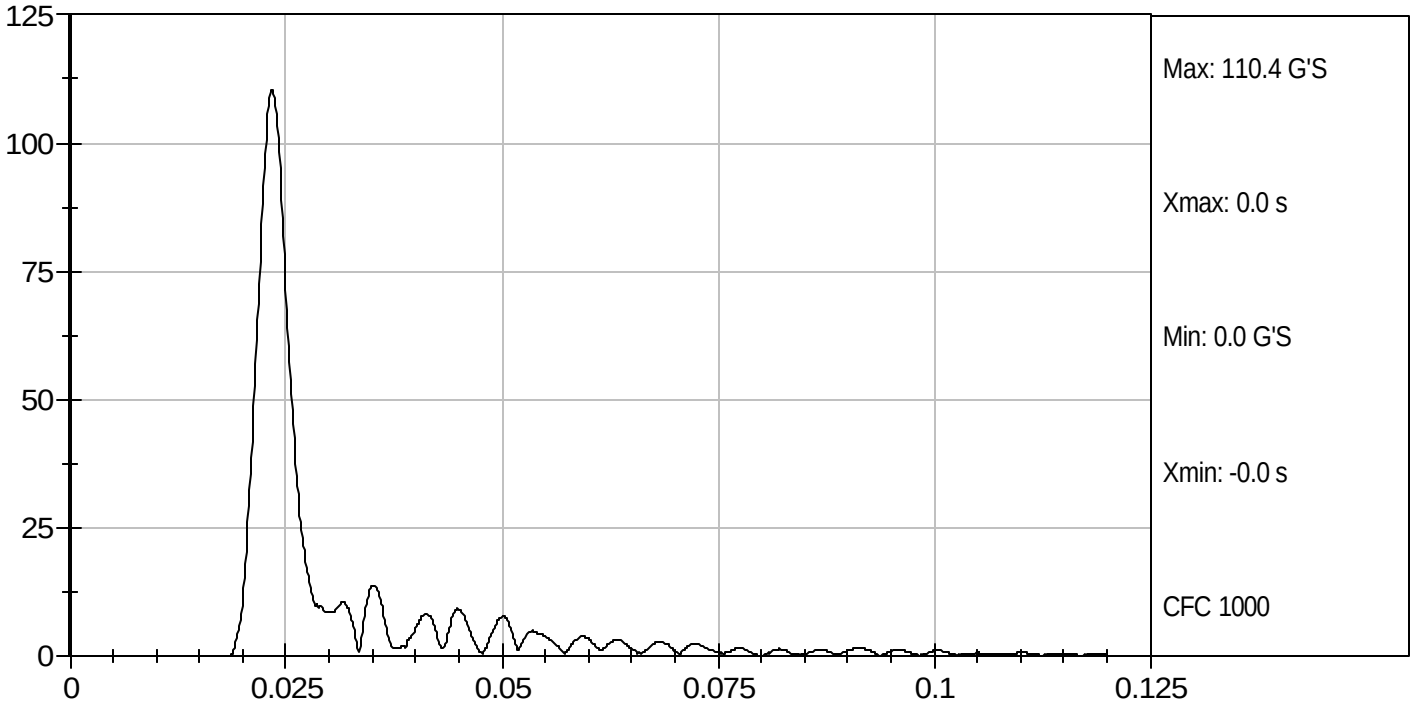
8/23/07
Test Date

Approved By

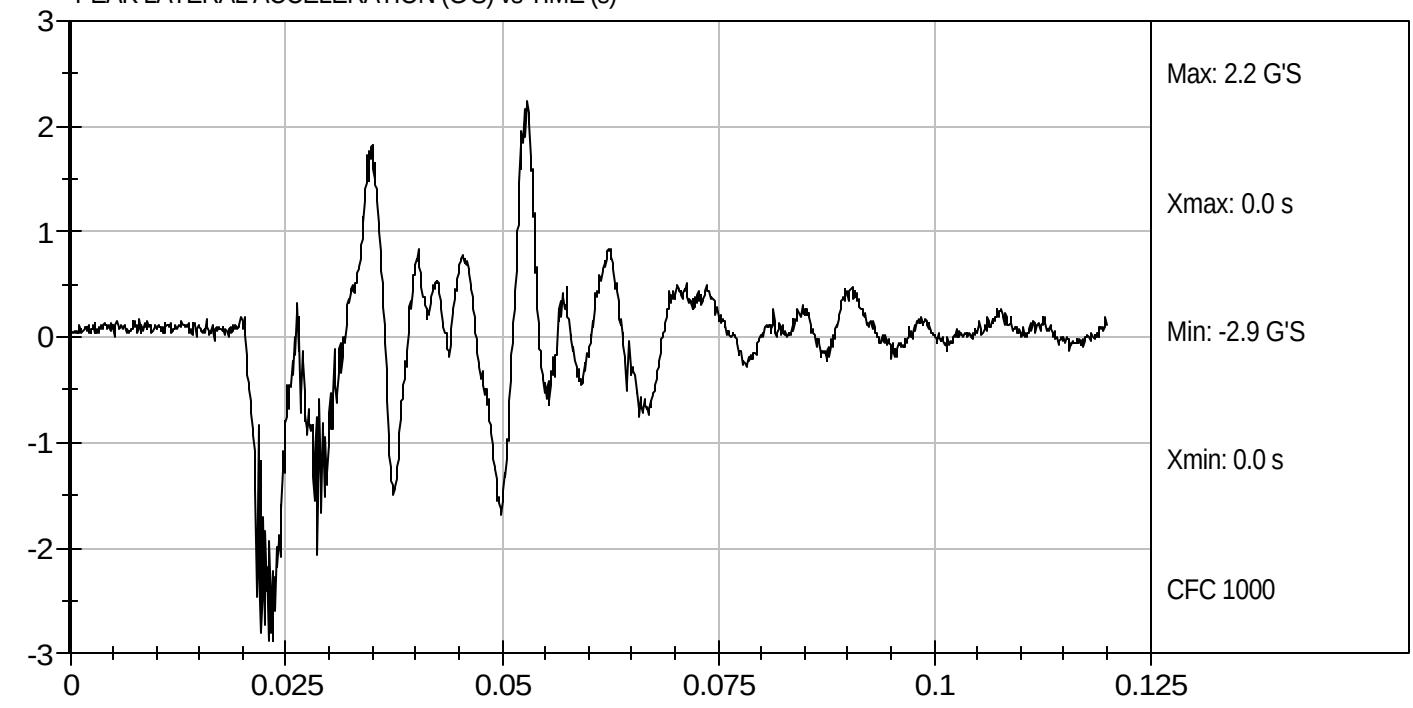
Test Desc: Head Drop
Component ID: D072541

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

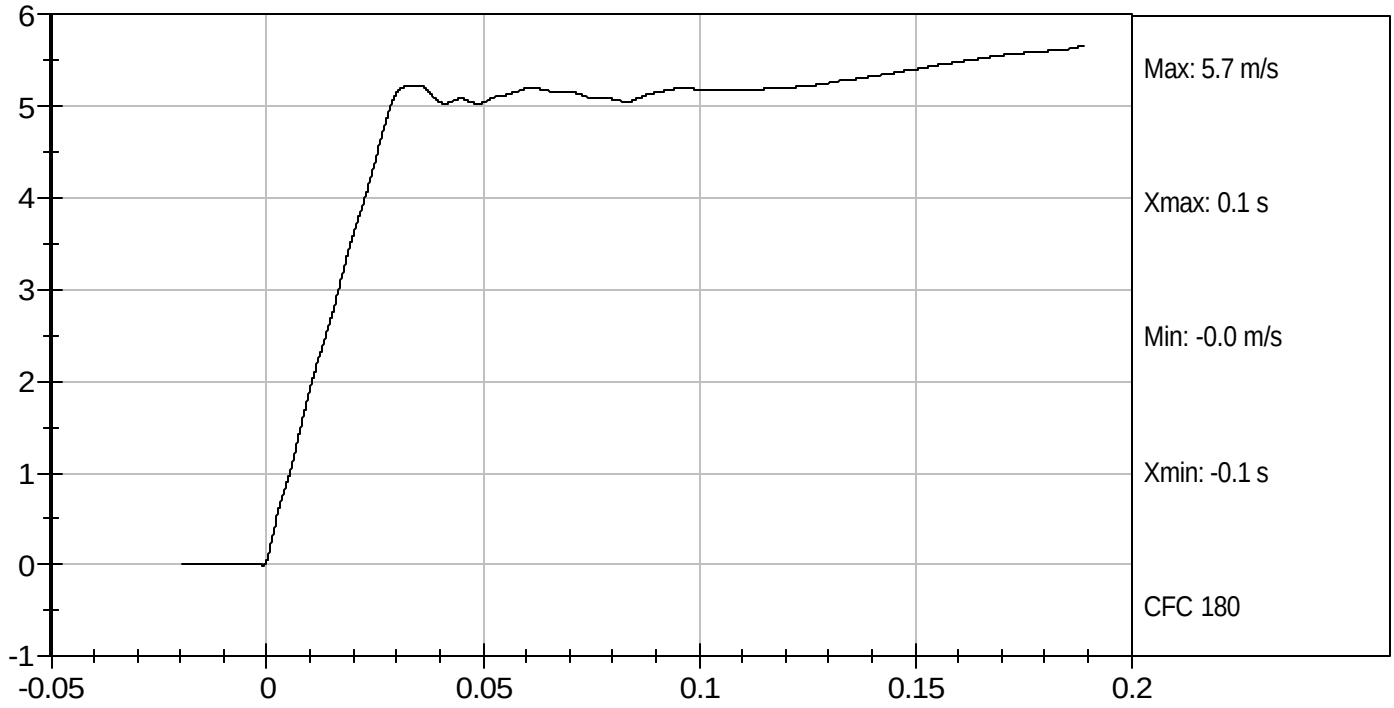
8/23/07
Test Date

David Winkelbauer
Approved By

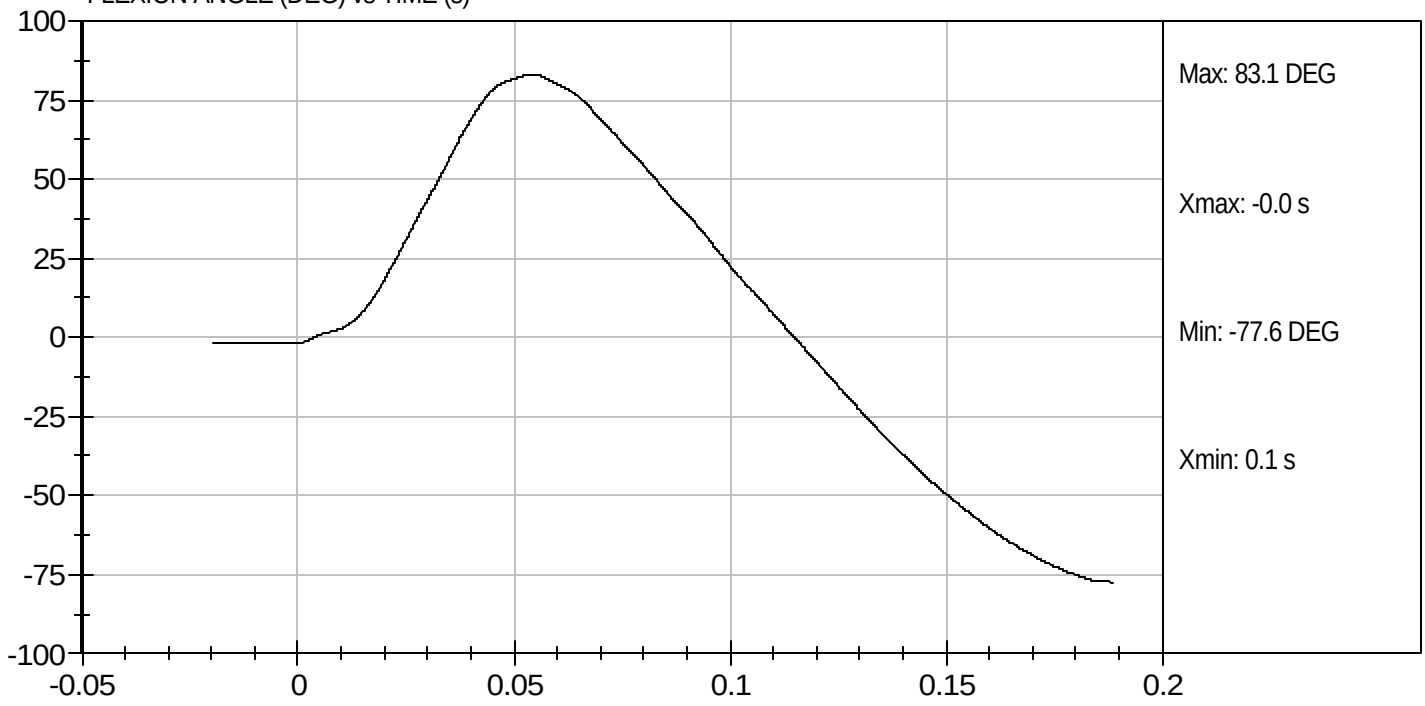
Test Desc: Neck Flexion
Component ID: D072542

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

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

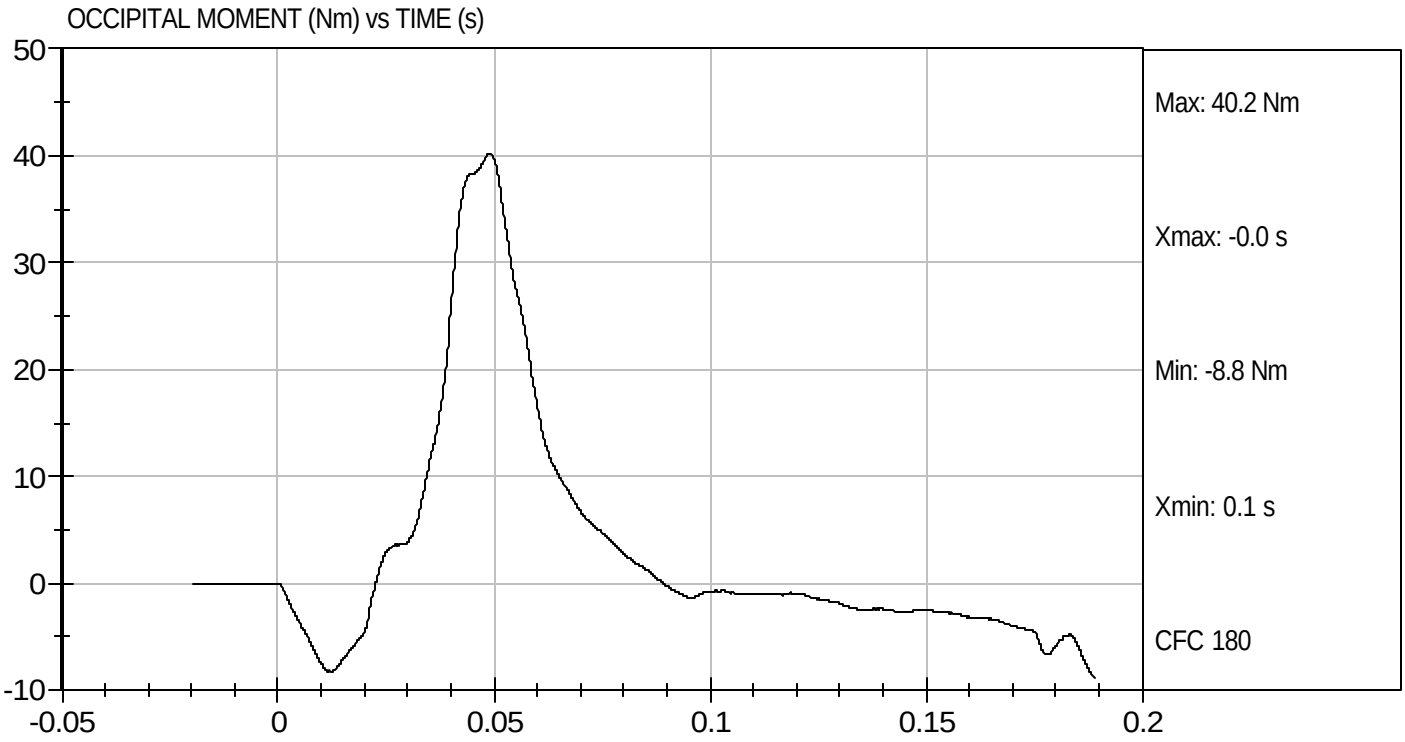


FLEXION ANGLE (DEG) vs TIME (s)



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

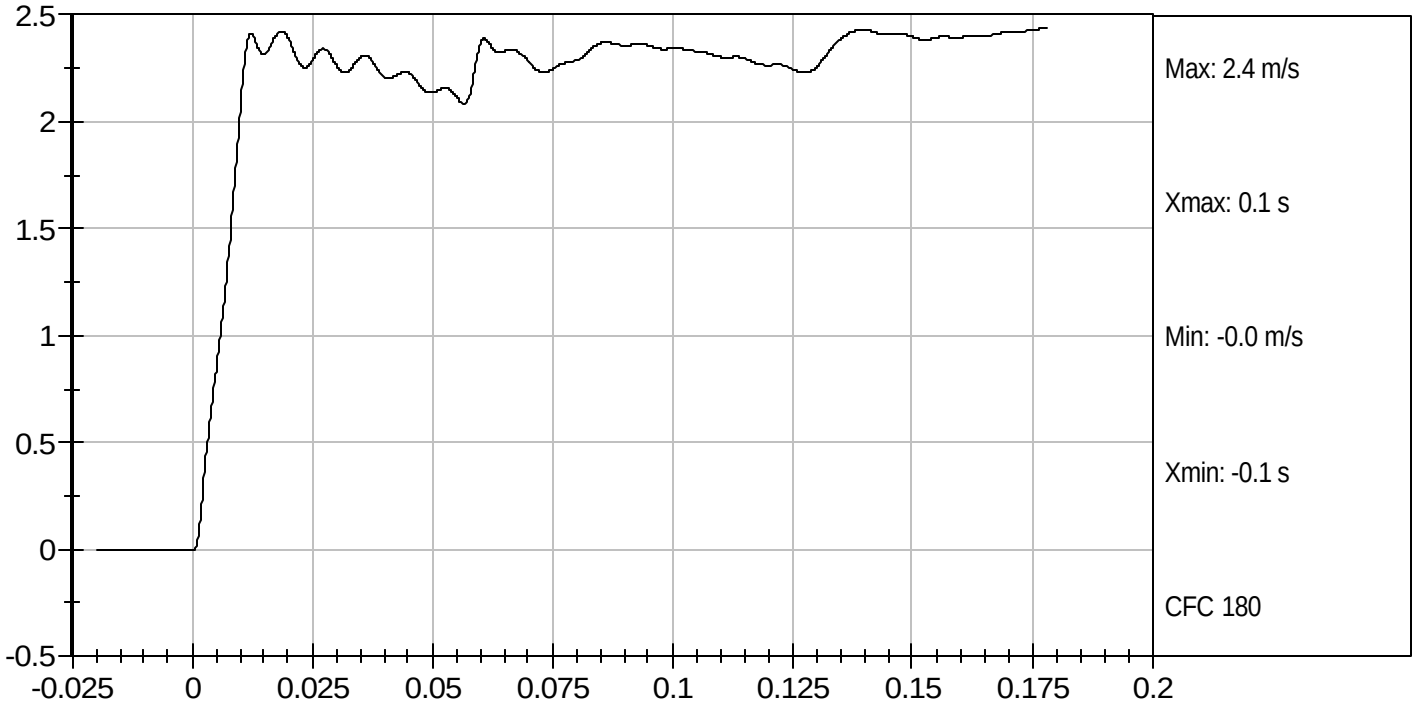
8/23/07
Test Date

David Winkelbauer
Approved By

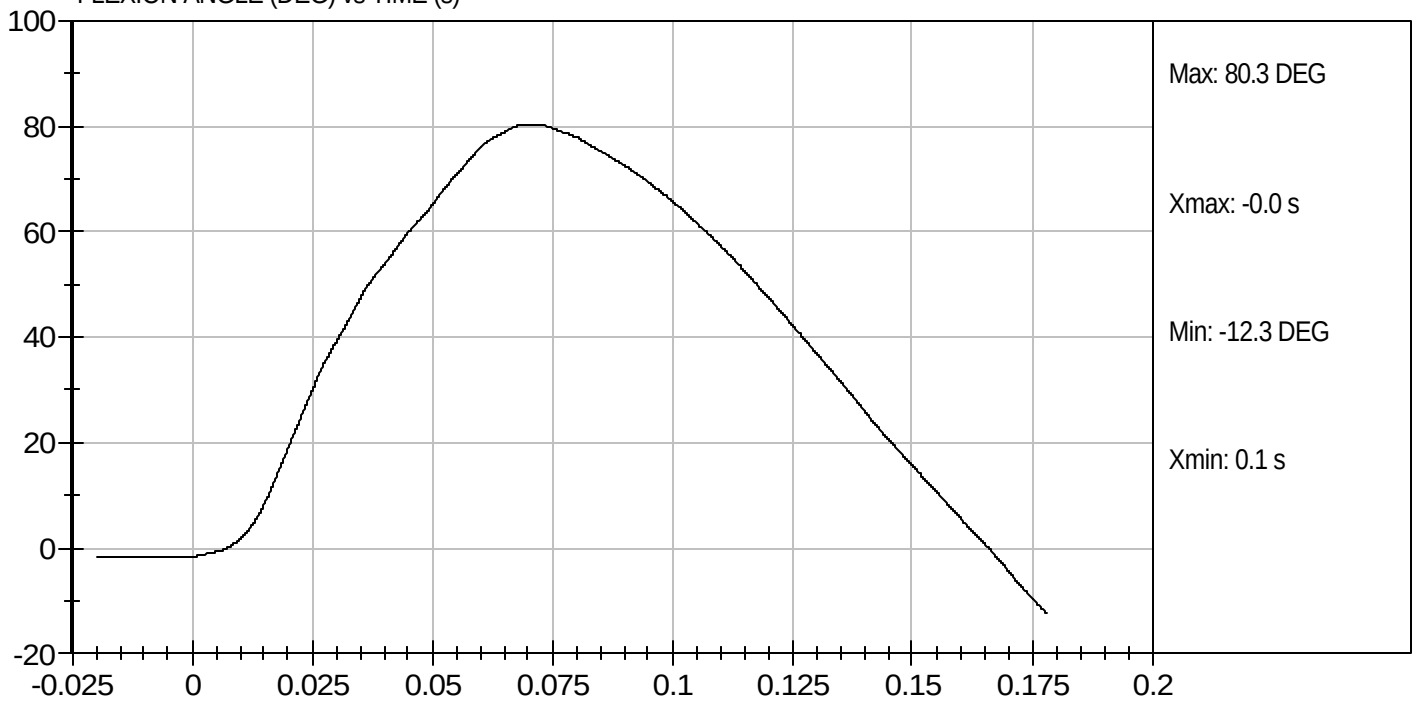
Test Desc: Neck Extension
Component ID: D072543

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

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

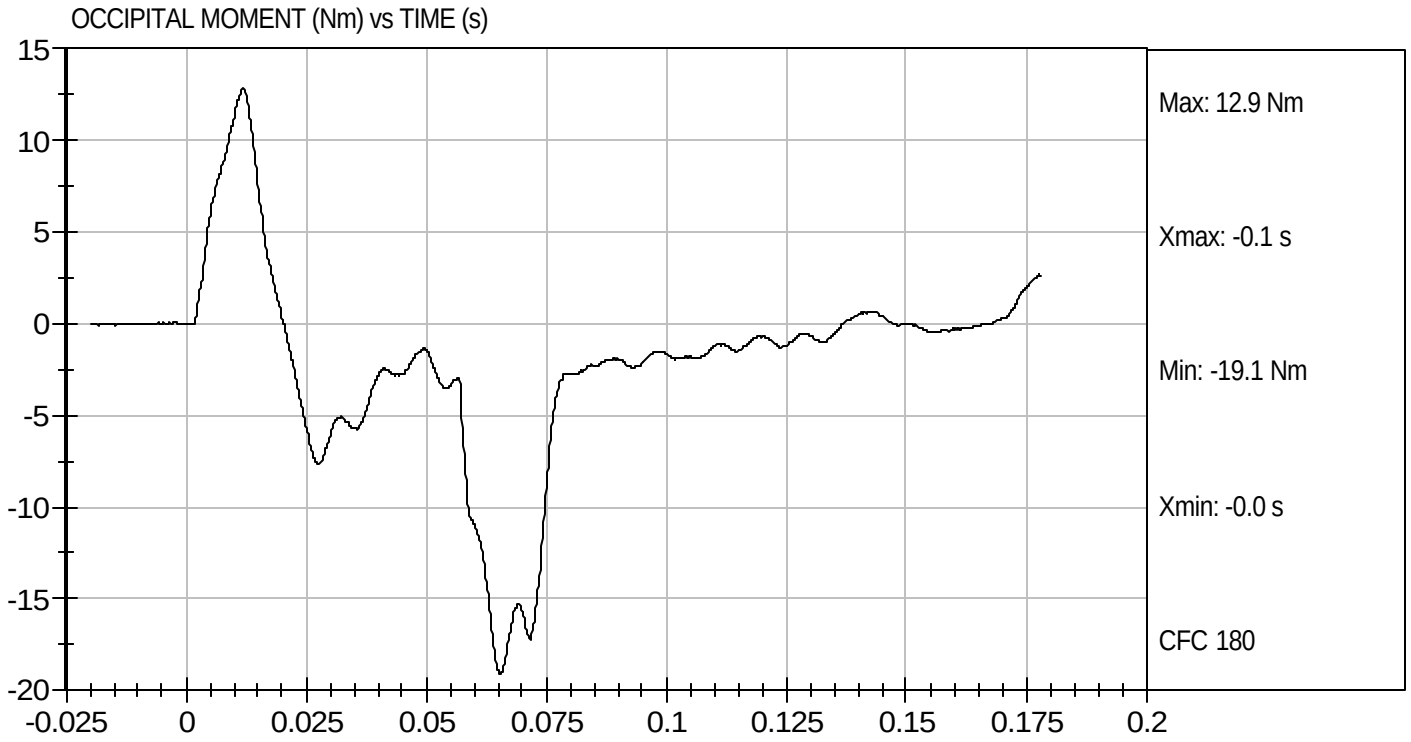


FLEXION ANGLE (DEG) vs TIME (s)



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

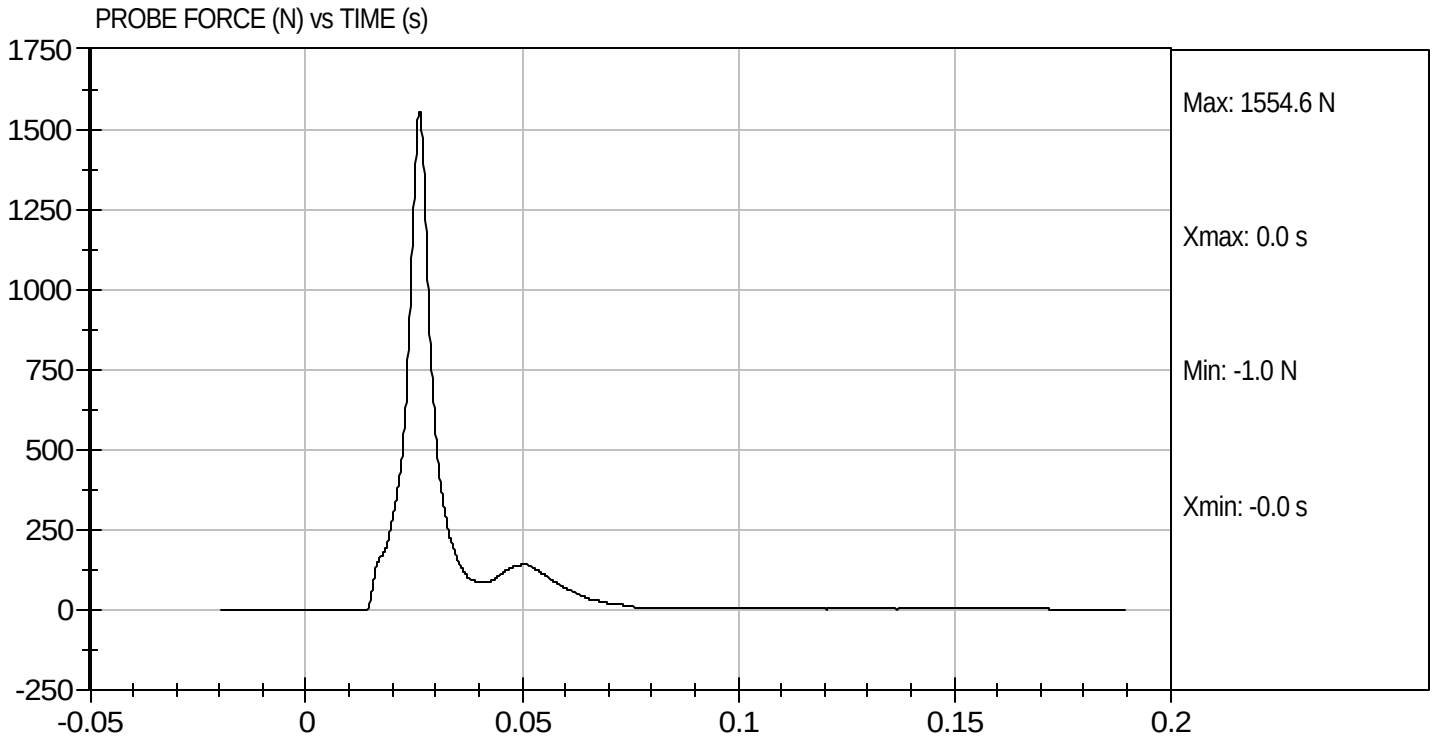
Laboratory Technician

8/23/07
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D072544

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



MGA RESEARCH CORPORATION

REAR HEAD DROP TEST

CRABI 12 MONTH

ATD Serial No: 093 **Test ID:** D072545

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

Laboratory Technician

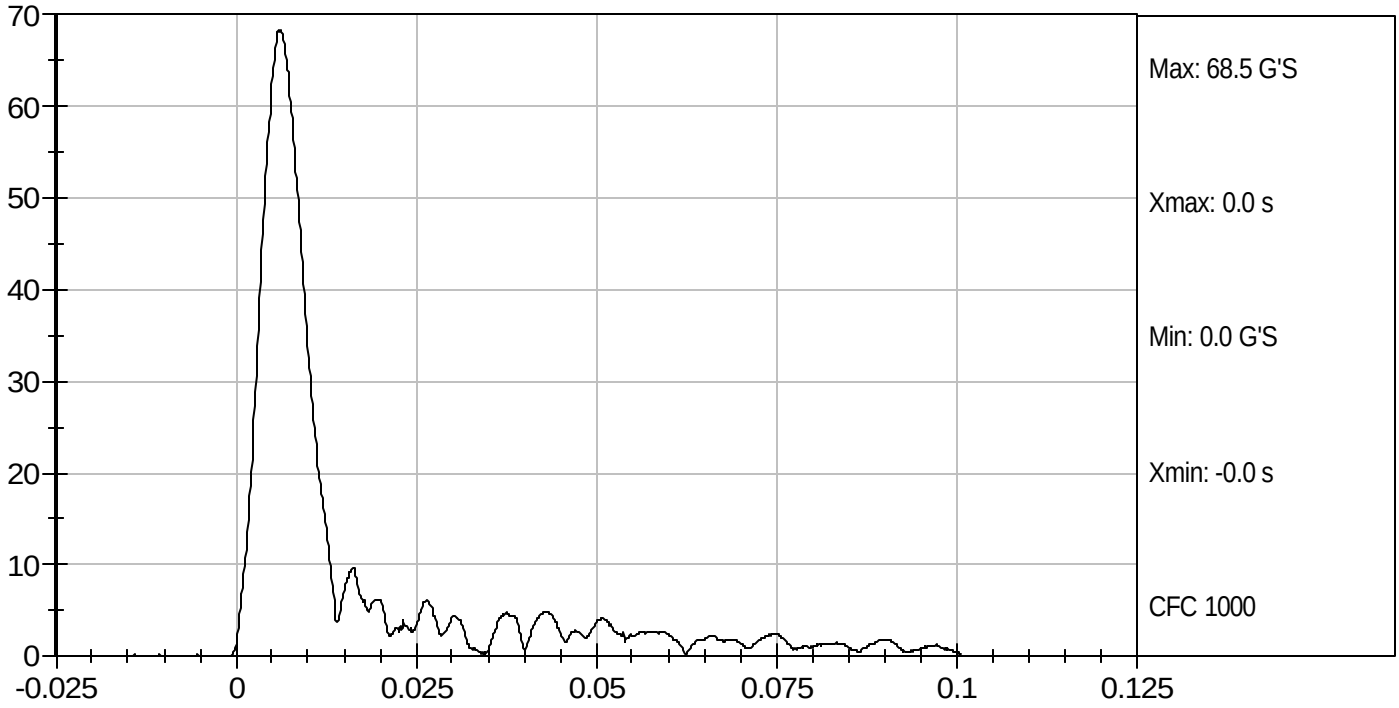
8/23/07
Test Date

Approved By

Test Desc: Head Drop
Component ID: D072545

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

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



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