REPORT NUMBER: 214I-MGA-2009-001

SAFETY COMPLIANCE TESTING FOR FMVSS 214 INDICANT SIDE IMPACT PROTECTION

CHRYSLER LLC
2009 DODGE CHALLENGER SE 2-DOOR SEDAN
NHTSA NUMBER: C90300

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

Test Date: October 2, 2008

Report Date: October 24, 2008

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
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WASHINGTON, D.C. 20590

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-07-D-00062.

Prepared by:  Date: 10/24/08

Ben Fischer, Project Engineer

Reviewed by:  Date: 10/24/08

David Winkelbauer, Facility Director

FINAL REPORT ACCEPTED BY:

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COTR, Side Impact

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Date of Acceptance

Technical Report Documentation Page

1. Report No. 214I-MGA-2009-001	*2. Government Accession No.*	*3. Recipient's Catalog No.*	
4. Title and Subtitle Final Report of FMVSS 214I Side Impact Testing Side Impact Testing of 2009 Dodge Challenger SE 2-Door NHTSA No.: C90300		*5. Report Date* October 24, 2008 *6. Performing Organization Code* MGA	
7. Author(s) Ben Fischer, Project Engineer		*8. Performing Organization Report No.* 214I-MGA-2009-001	
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		*10. Work Unit No.* *11. Contract or Grant No.* DTNH22-07-D-00062	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Enforcement, Office of Vehicle Safety Compliance 1200 New Jersey Ave, SE, Room W43-503, NVS-220 Washington, D.C. 20590		*13. Type of Report and Period Covered: Final Report* 10/02/2008 to 10/24/2008 *14. Sponsoring Agency Code* NVS-220	
15. Supplementary Notes			

16. Abstract

A 55/28 km/h 90° Moving Deformable Barrier side impact was conducted on the subject 2009 Dodge Challenger SE 2-Door Sedan to obtain new car assessment and research data indicant of FMVSS No. 214D performance. The test was conducted at MGA Research Corporation, in Burlington, Wisconsin, on October 2, 2008. The impact velocity of the Moving Deformable Barrier (MDB) was 62.4 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 189 mm at level 3. The test vehicle's occupant performance is as follows:

	DRIVER	PASS.
Left Upper Rib (LUR) Accel., g	42.3	46.2
Left Lower Rib (LLR) Accel., g	50.2	53.2
Lower Spine (T_{12}) Accel., g	50.3	55.3
Thoracic Trauma Index (TTI)	50	54
Pelvis (PEV) Accel., g	58.4	33.7
HIC	156	172

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 FMVSS 214 Indicant 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	
19. Security Classif. (of this report) Unclassified	*20. Security Classif. (of this page)* Unclassified	*21. No. of Pages* 140	22. Price

Form DOT F1700.7 (8-72)

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SECTION 1

PURPOSE AND TEST PROCEDURE

PURPOSE

This side impact test was conducted as part of the FY' 2009 test program sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-07-D-00062. The purpose of this test was to evaluate side impact protection in a 2009 Dodge Challenger SE 2-Door Sedan manufactured by Chrysler LLC.

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 FMVSS 214 INDICANT TEST

A model year 2009 Dodge Challenger SE 2-Door Sedan was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.4 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 1897.4 kg and the test weight of the MDB was 1361.5 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on October 2, 2008.

One (1) real-time motion picture camera and nine (9) high-speed motion picture cameras were used to document the impact event. The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera. Camera locations and pertinent camera information are documented in the data sheets. Pre- and post-test photographs of the vehicle and Side Impact Dummies (SID/HIIIs) can be found in Appendix A. Two 50th percentile adult male SID/HIIIs were placed in the driver and left rear passenger designated seating positions according to instructions specified in the Laboratory Test Procedure for New Car Assessment Program Side Impact Testing dated November 2002. Each SID/HIII was instrumented in the following locations:

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

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

2.2 GENERAL COMMENTS

The test vehicle sustained a maximum static crush of 189 mm at level 3, 1200 mm rearward of the vertical impact point. The driver and passenger SID/HIIIs, Serial Nos. 271 and 272 respectively, were calibrated just prior to this test.

Appendix A contains the still photograph prints. Appendix B contains the SID/HIII response data traces. Appendix C contains the dummy calibration data.

The occupant data is summarized below:

ATD position	HIC	T^1	T^2	TTI (G's)	Peak Pelvis (G's)
Driver	156	40.2	71.9	50	58.4
Passenger	172	30.5	59.6	54	33.7

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

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

TEST NOTES

There was no valid data collected for:
Left Lower B-Post Y
Left Mid A-Post Y

The NHTSA No. was incorrect on the photographs. The correct NHTSA No. is C90300.

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008

TEST VEHICLE INFORMATION

Make	Dodge
Model	Challenger
Body Style	Sedan
NHTSA No.	C90300
VIN	2B3LJ44V89H522859
Color	TorRed
Delivery Date	9/11/2008
Odometer Reading (mile)	34
Dealer	Martin's Garage
Transmission	Automatic
Final Drive	Rear
Number of Cylinders	6
Engine Displacement (L)	3.5
Engine Placement	Longitudinal
Automatic Door Locks (ADL)	Yes
Owner's Manual Details Instructions on Disabling ADLs	No

TEST VEHICLE OPTIONS

Driver Front Airbag	Yes
Driver Side Curtain Airbag	Yes
Driver Side Torso Airbag	No
Rear Passenger Side Curtain Airbag	Yes
Rear Passenger Side Torso Airbag	No
Power Steering	Yes
Power Door Locks	Yes
Tilt Wheel	Yes
Anti-lock Brakes	Yes
Traction Control	Yes
All Wheel Drive	No
Power Seats	Yes
Pretensioners	Yes
Load Limiters	Yes
Bucket Seats	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Chrysler LLC
Date of Manufacture	8-08

GVWR (kg)	2225
GAWR Front (kg)	1275
GAWR Rear (kg)	1275

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number Of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				392
Cargo Wt. (RCLW) (kg)				52

DATA SHEET NO. 1 (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	441.4	389.6		488.1	481.2	
Right	kg	460.4	399.2		460.4	467.7	
Ratio	%	53.3	46.7		50.0	50.0	
Totals	kg	901.8	788.8	1690.6	948.5	948.9	1897.4

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1690.6
Weight of 2 P572M ATDs	kg	161.5
Rated Cargo/Luggage Weight (RCLW)	kg	68
Calculated Vehicle Target Weight (TVTW)	kg	1920.1

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

Weight of Ballast in Spare Tire Well: 9 kg

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	788	781	797	791	1376
As Tested	mm	772	773	767	765	1295
Fully Loaded	mm	772	773	764	764	

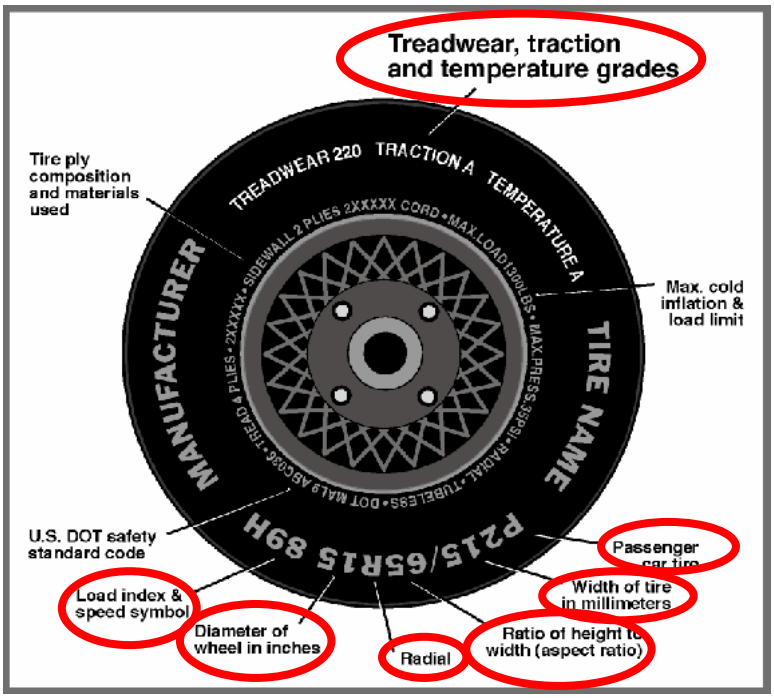
TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2950
Target Impact Point Aft of Front Axle	mm	508
Actual Impact Point Aft of Front Axle	mm	499

DATA SHEET NO. 2

TEST VEHICLE TIRE INFORMATION

Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold / Test Pressure (kPa)	207	207
Recommended Tire Size	P225/60R18	P225/60R18
Tire Size on Vehicle	P225/60R18	P225/60R18
Tire Manufacturer	Continental	Continental
Tire Name	Contipro Contact	Conti Pro Contact
Tire Type	Passenger	Passenger
Tire Width (mm)	225	225
Ratio of Height to Width (aspect ratio)	60	60
Radial	R	R
Wheel Diameter	18	18
Load Index & Speed Symbol	99H	99H
Treadwear	500	500
Traction Grade	A	A
Temperature Grade	A	A

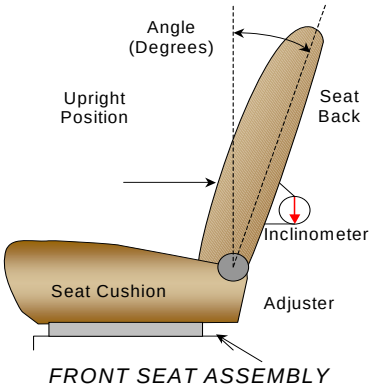
DATA SHEET NO. 3

TEST VEHICLE INFORMATION

Test Vehicle:	2009 Dodge Challenger SE 2-Door	NHTSA No.	C90300
Test Program:	FMVSS 214 Indicant	Test Date:	10/02/2008

NORMAL DESIGN RIDING POSITION

The driver and passenger seat back is positioned to the manufacturer's designated angle. The procedure is as follows: Set the seat back angles at 14 degrees (measured from upright position).

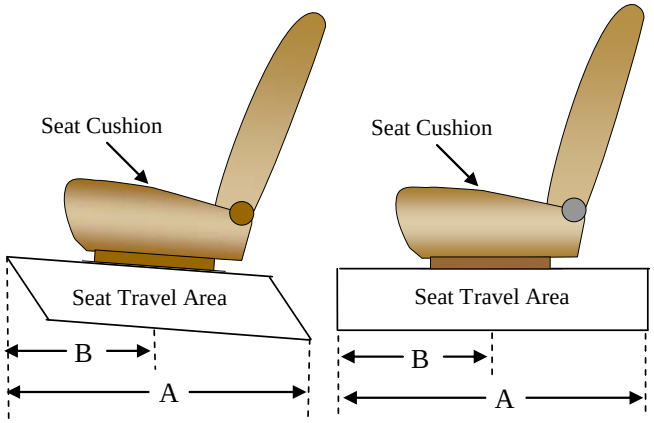


Driver seat back angle: 8.6 degrees (on headrest post)

Passenger seat back angle: Fixed

SEAT FORE/AFT POSITIONS

	Total Fore/Aft Travel	Placed in position #
Driver Seat	300 mm	150 mm
Rear Seat	Fixed	Fixed



DATA SHEET NO. 3 (CONTINUED)

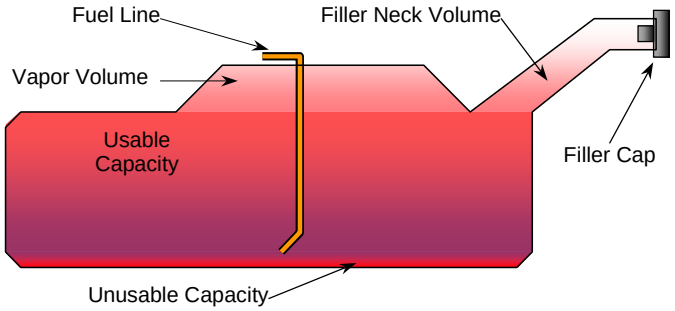
TEST VEHICLE INFORMATION

Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	64.3
Usable Capacity of "Optional" Tank	
92-94% of Usable Capacity	59.2 to 60.4
Actual Amount of Solvent used	59.6
1/3 of Usable Capacity	21.4

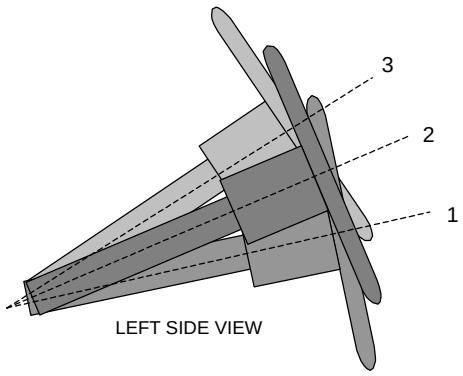
The test vehicle is equipped with an electric fuel pump. The fuel pump will pump fuel when 1) with ignition in on position, pump operates for 2 seconds, 2) with engine started pump operates continuously, 3) with engine speed below 500 rpm, i.e. (below idle), pump stops operating as failsafe.



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	0	67.7
Geometric center position No. 2	30	70.4
Uppermost position No. 3	60	73.1

DATA SHEET NO. 4

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008

MDB SPECIFICATIONS

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

MDB WEIGHTS

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

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.4
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.6
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.7

POST TEST OBSERVATIONS
MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	9 forward
Vertical Offset	mm	+/-20	1 down

DATA SHEET NO. 5

POST TEST OBSERVATIONS

Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat SID/HIII	Rear Seat SID/HIII
Dummy Type / Serial No.	SID HIII / 271	SID HIII / 272
Head Contact	Curtain Airbag, Side Header, Headrest	Curtain Airbag, Side Header, Headrest
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	Struck side doors were locked	Struck side doors were locked
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 Window Broke
Other Notable Effects	Windshield Cracked

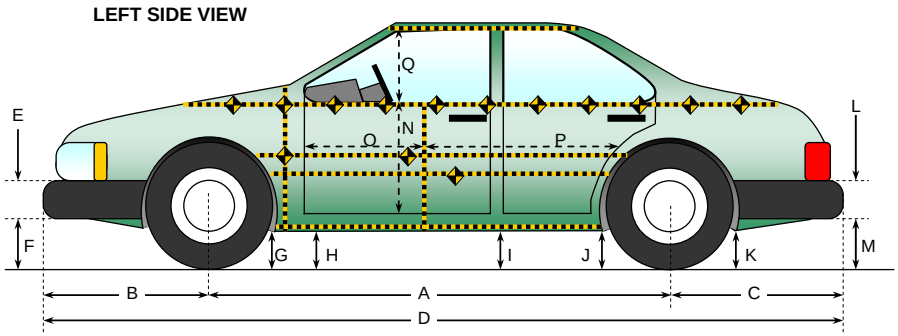
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

DATA SHEET NO. 6

VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008



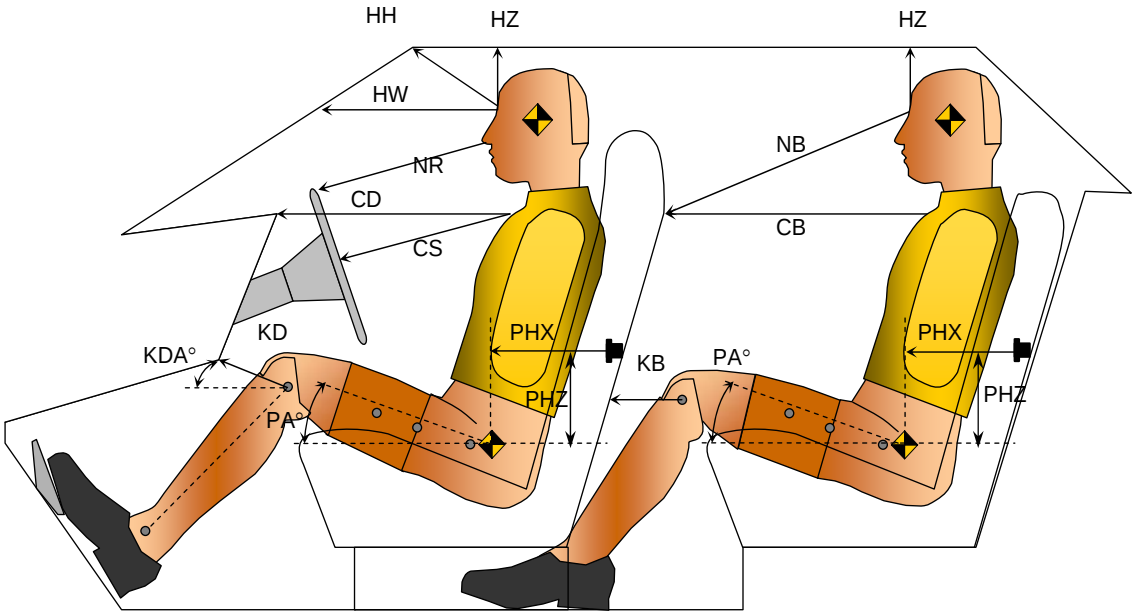
All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2950	2934	16
B	Front Axle to FSOV	949	971	-22
C	Rear Axle to RSOV	1111	1113	-2
D	Total Length at Centerline	5010	5018	-8
E	Front Bumper Thickness	140	140	0
F	Front Bumper Bottom to Ground	215	225	-10
G	Sill Height at Front Wheel Well	175	154	21
H	Sill Height at Front Door Leading Edge	167	152	15
I	Sill Height at "B" Pillar	165	155	10
J1	Sill Height at Rear Wheel Well	170	170	0
J2	Pinch Weld Height at Rear Wheel Well	165	172	-7
K	Sill Height Aft of Rear Wheel Well	212	221	-9
L	Rear Bumper Thickness	116	116	0
M	Rear Bumper Bottom to Ground	360	256	104
N	Sill Height to Window Bottom Sill	780	660	120
O	Front Door Leading Edge to Impact CL	659	655	4
P	Rear Door Trailing Edge to Impact CL	740	716	24
Q	Front Window Opening	346	341	5
R	Right Side Length	4604	4605	-1
S	Left Side Length	4604	4580	24
T	Vehicle Width at "B" Post	1917	1810	107

DATA SHEET NO. 7

SID/HIII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008

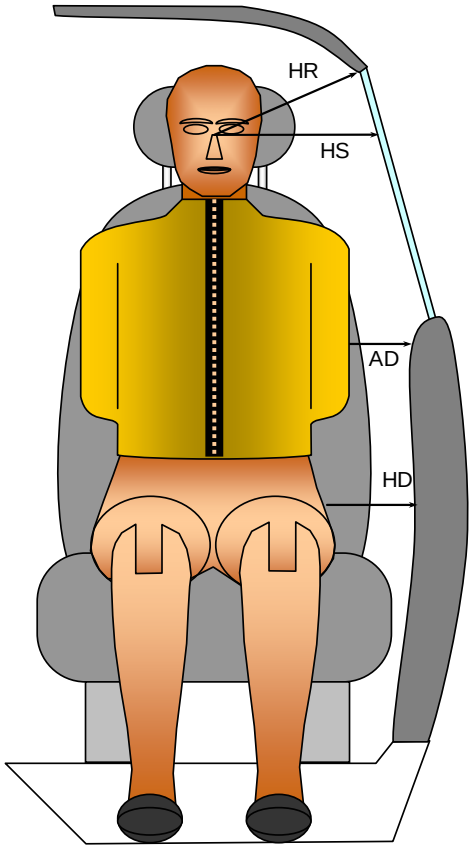


Driver Code	Pass. Code	Measurement Description	Driver S/N 271		Passenger S/N 272	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	517			
HW		Head to Windshield	728			
HZ	HZ	Head to Roof	199		141	
NR	NB	Nose to Rim/Nose to Seatback	445		608	
CD	CB	Chest to Dash or Seatback	564		482	
CS		Chest to Steering Wheel	348			
KDL	KBL	Left Knee to Dash or Seatback	182	14.9	133	23.6
KDR	KBR	Right Knee to Dash or Seatback	180	15.3	140	21.7
PA	PA	Pelvic Angle		23.3		24.3
PHX	PHX	H-Point to Striker (X-Axis)	464		394	
PHZ	PHZ	H-Point to Striker (Z-Axis)	155		129	

DATA SHEET NO. 8

SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008



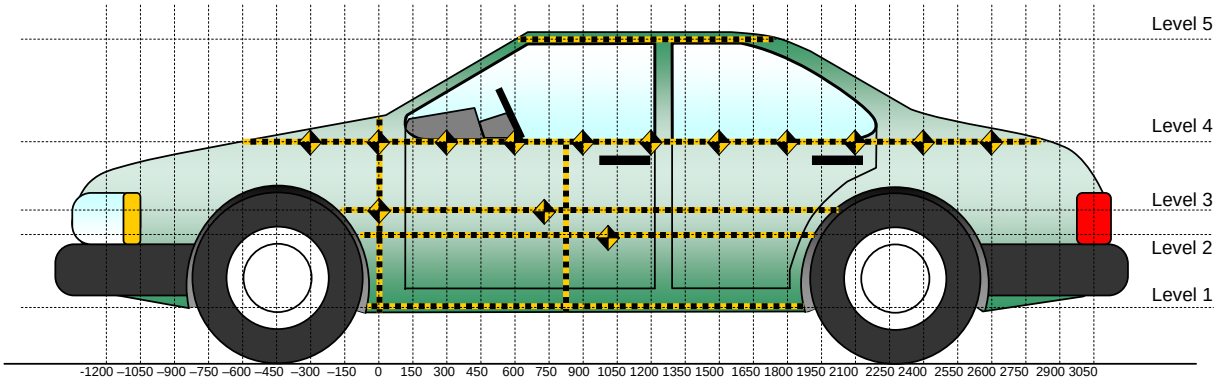
FRONT VIEW OF DUMMY

Code	Measurement Description	Units	Driver S/N 271	Passenger S/N 272
HR	Head to Side Header	mm	240	151
HS	Head to Side Window	mm	343	209
AD	Arm to Door	mm	150	57
HD	H-Point to Door	mm	161	120

DATA SHEET NO. 9

VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008



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	20	1800	1335
4	Window Sill	75	1650	995
3	Mid Door	189	1200	640
2	Occupant H-Point	158	750	452
1	Sill Top	48	300	275
	Maximum Penetration	258		

DATA SHEET NO. 10

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1200				318					316					-2	
-1050				307					310					3	
-900				294					301					7	
-750				287					294					7	
-600				282					291					9	
-450				274					286					12	
-300				269					281					12	
-150			153	263				170	277				17	14	
0	223	170	153	258		249	243	196	279		26	73	43	21	
150	223	171	152	254		261	287	222	275		38	116	70	21	
300	221	171	152	250		269	290	251	280		48	119	99	30	
450	219	170	148	246		252	321	279	268		33	151	131	22	
600	218	169	147	244		248	325	295	259		30	156	148	15	
750	220	168	145	243	438	251	326	295	255	455	31	158	150	12	17
900	218	168	145	241	426	258	326	301	249	439	40	158	156	8	13
1050	221	169	145	242	426	251	323	315	252	442	30	154	170	10	16
1200	221	170	146	241	428	247	303	335	260	445	26	133	189	19	17
1350	221	171	148	241	431	242	305	329	278	448	21	134	181	37	17
1500	225	173	150	243	432	244	273	281	303	449	19	100	131	60	17
1650	227	175	151	235	436	245	221	249	310	451	18	46	98	75	15
1800	227	177	153	219	438	256	222	240	290	458	29	45	87	71	20
1950	229	179	155	210	446	238	191	192	270	463	9	12	37	60	17
2100			157	205	460			169	258	474			12	53	14
2250				205	482				246	492				41	10
2400				207					226					19	
2550				215					226					11	
2700				224					234					10	
2850				236					344					8	
3000				248					256					8	
3150				265					269					4	

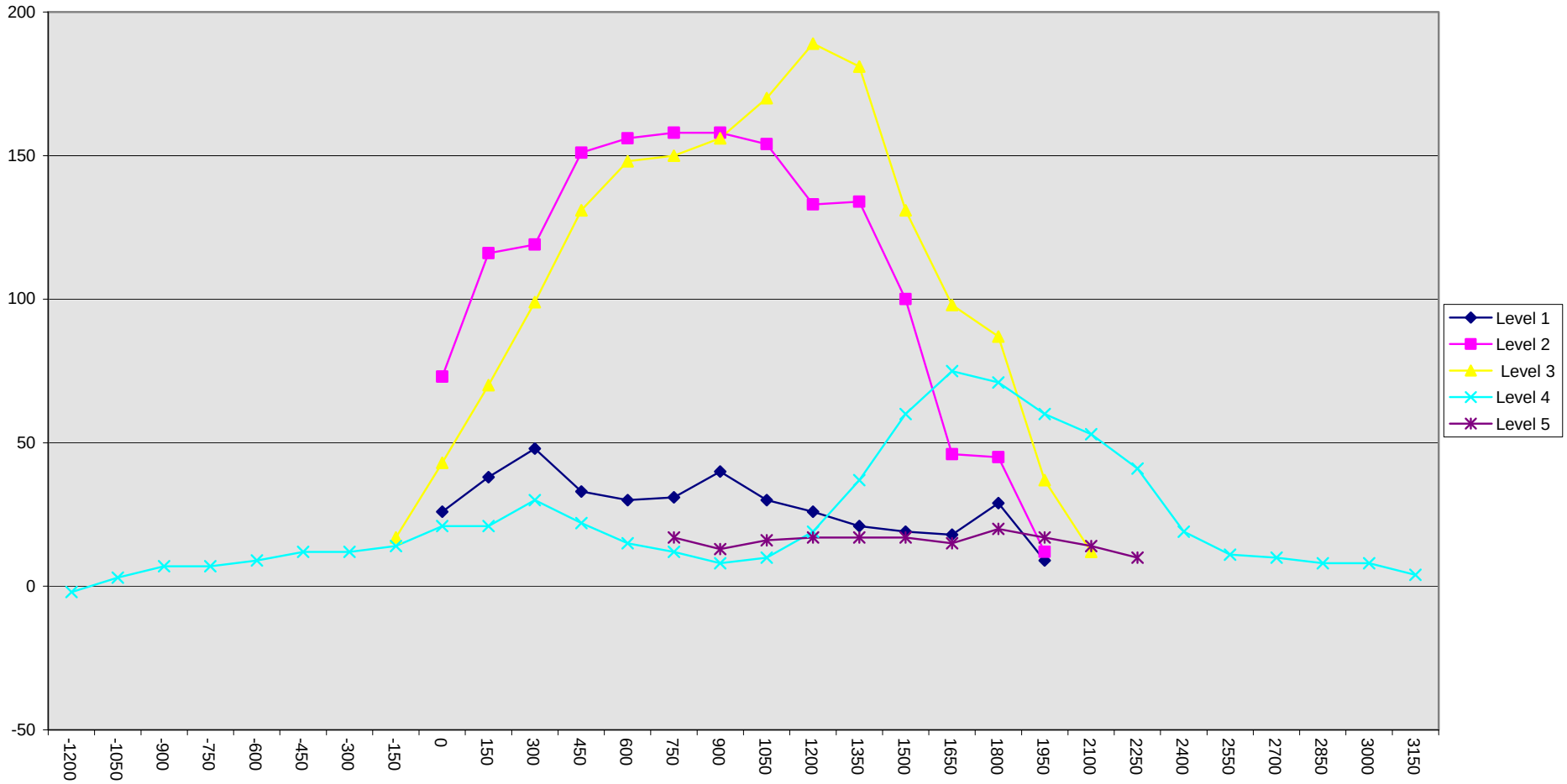
Reference plane is parallel to test vehicle longitudinal centerline.

Given dimensions = Reference plane to car body

DATA SHEET NO. 10... (continued)

VEHICLE EXTERIOR CRUSH PROFILES

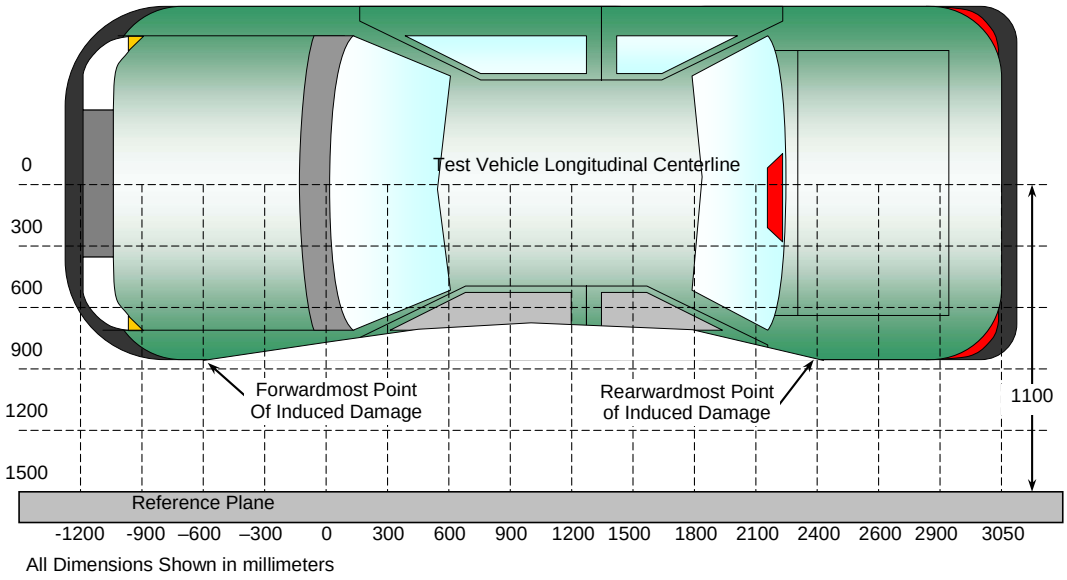
Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008



DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008



TOP VIEW

DAMAGE PROFILE DISTANCES

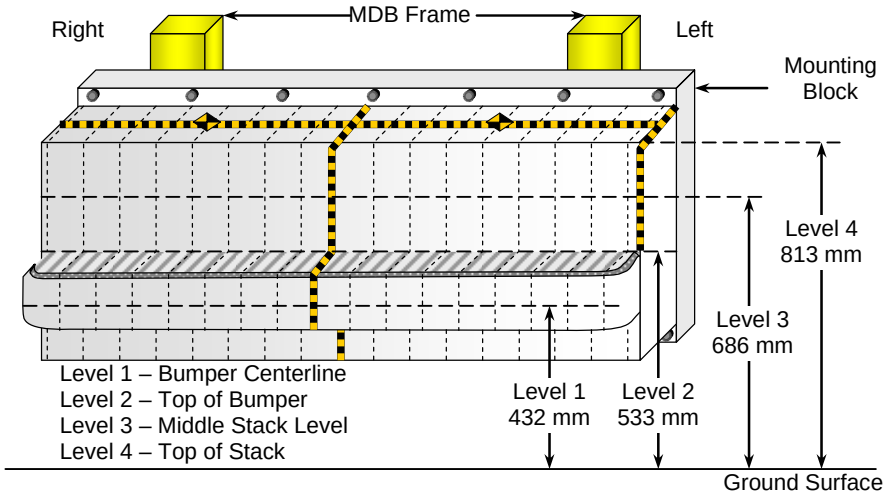
DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	3150	4	265	269	4
2	2295	4	205	250	45
3	1400	3	172	331	159
4	538	2	169	319	150
5	-319	4	269	282	13
6	-1200	4	318	316	-2

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

DATA SHEET NO. 12

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008



DEFORMABLE BARRIER STATIC CRUSH

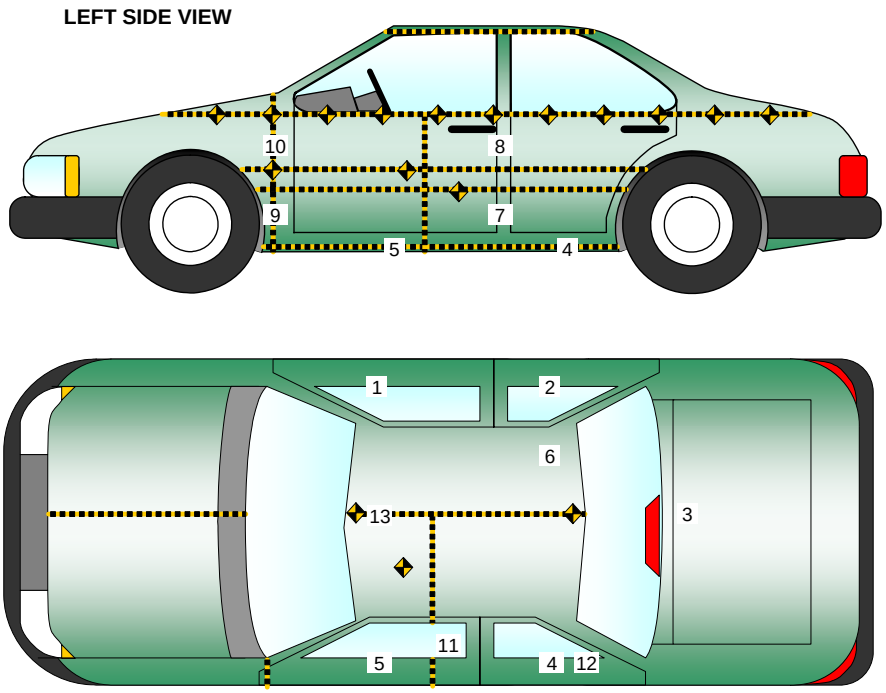
Stack Level	Distance Right of Center								C_L	Distance Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	286	304	251	206	173	157	138	136	137	140	143	148	156	169	205	208	193
2	240	238	185	139	115	96	88	88	93	105	117	119	126	137	155	163	173
3	161	171	114	82	51	40	35	30	33	39	45	57	75	101	154	162	133
4	150	165	106	65	45	30	38	50	59	70	80	92	107	130	175	193	157

All Dimensions in mm

DATA SHEET NO. 13

VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008



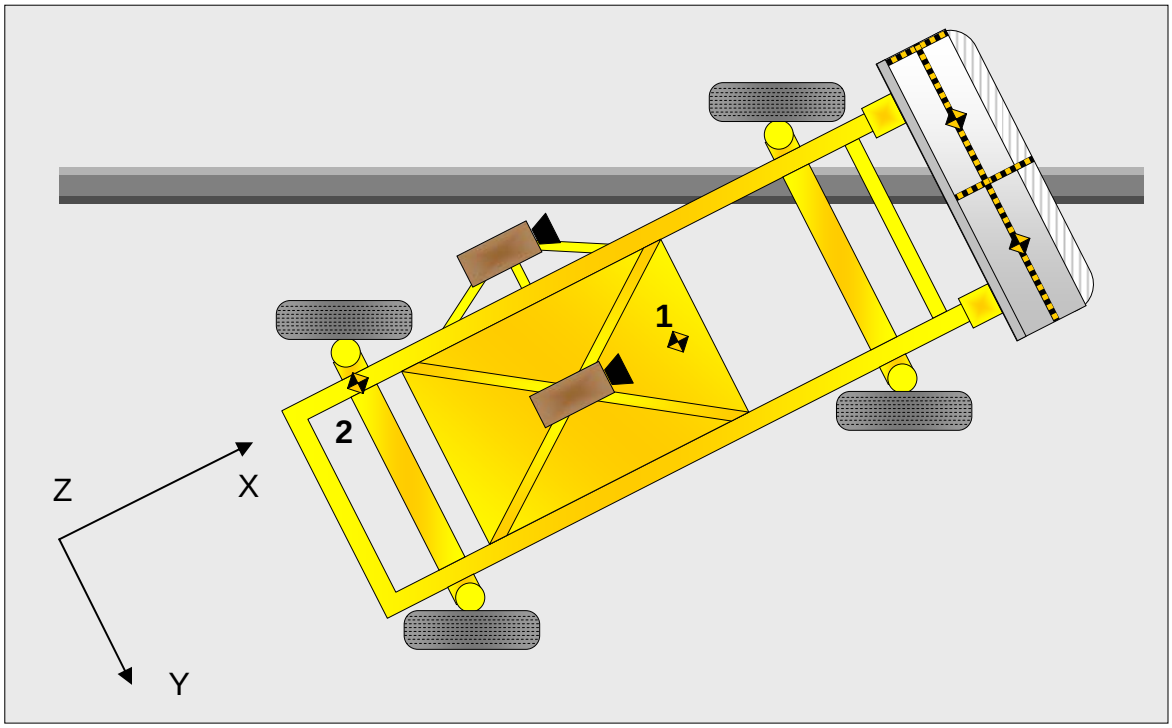
Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	2698	778	-197
2	Right Sill at Rear Seat	1624	780	-211
3	Rear Floorpan Above Axle	812	0	-554
4	Left Sill at Rear Door	1617	-780	-212
5	Left Sill at Front Door	2708	-778	-202
6	Rear Occupant Compartment	1945	-415	-554
7	Left Lower B-Post	2068	-754	-543
8	Left Middle B-Post	1989	-758	-792
9	Left Lower A-Post	3213	-737	-565
10	Left Middle A-Post	3256	-832	-800
11	Front Seat Track	2395	-578	-324
12	Rear Seat Track or Structure			
13	Vehicle CG	2583	0	-452

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

DATA SHEET NO. 14

MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008



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

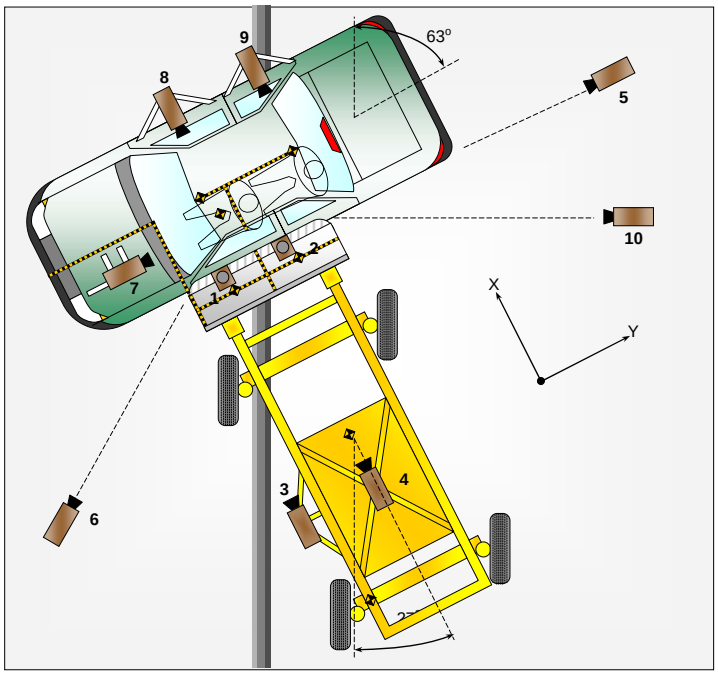
Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008

	Elements	Pre-Test (mm)
1	Total Length	5010
2	Total Width	1917
3	Bumper Top Height	592
4	Bumper Bottom Height	395
5	Longitudinal Member Top Height	427
6	Distance between Longitudinal Members	788
7	Longitudinal Member Width	79
8	Engine Top Height	911
9	Engine Bottom Height	185
10	Engine and gearbox width	1051
11	Front bumper-engine distance	658
12	Front shock absorber fixing height	893
13	Bonnet leading edge height	899
14	Front shock absorber fixing width	983
15	Front bumper – front axle distance	949
16	Front axle – a pillar distance	494
17	A-pillar – B-pillar distance	1529
18	B-Pillar – rear axle distance	938
19	B-pillar – C-pillar distance	684
20	Roof sill bottom height	1295
21	Roof sill top height	1430
22	Floor sill bottom height	176
23	Floor sill top height	401

DATA SHEET NO. 16

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Close-up	590	-1225	5050	50	1000
2	Overhead Overall	-510	0	5050	14	1000
3	MDB Onboard, Impact Point Close-up				50	1000
4	MDB Onboard, Centerline of Impact				10	1000
5	Right Side, Ground Level, Overall	-2890	5195	1290	24	1000
6	Left Side, Ground Level, Overall	2655	-3950	1170	24	1000
7	Vehicle Onboard Front SID/HIII, Front				12.5	1000
8	Vehicle Onboard Front SID/HIII, Side				8	1000
9	Vehicle Onboard Rear SID/HIII, Side				8	1000
10	Real Time Coverage				13	24

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

DATA SHEET NO. 17

SUMMARY OF FMVSS 301 DATA

Test Vehicle: 2009 Dodge Challenger SE 2-Door NHTSA No. C90300
Test Program: FMVSS 214 Indicant Test Date: 10/02/2008

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21° C Test Time: 10:45 am

Stoddard Solvent Spillage Measurements

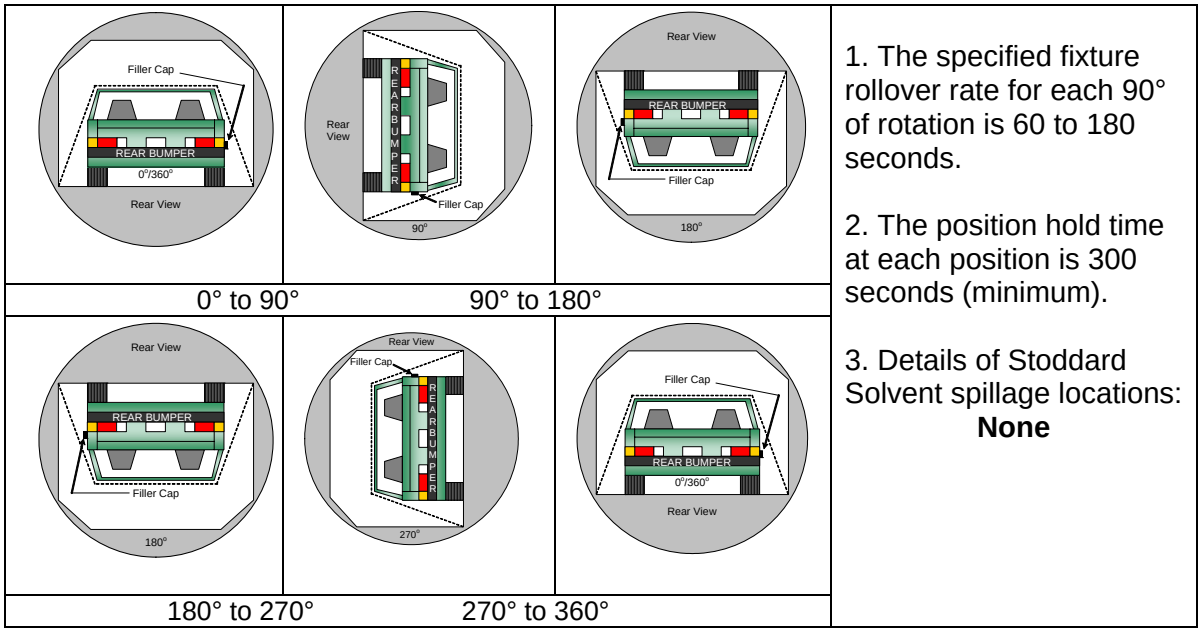
A. From impact until vehicle motion ceases: 0 oz.
(Maximum Allowable = 1 ounce)

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**

Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage Collection Time (min)	Spillage (oz.)
0° to 90°	122	300	First 5	0
90° to 180°	117	300	First 5	0
180° to 270°	110	300	First 5	0
270° to 360°	122	300	First 5	0

APPENDIX A

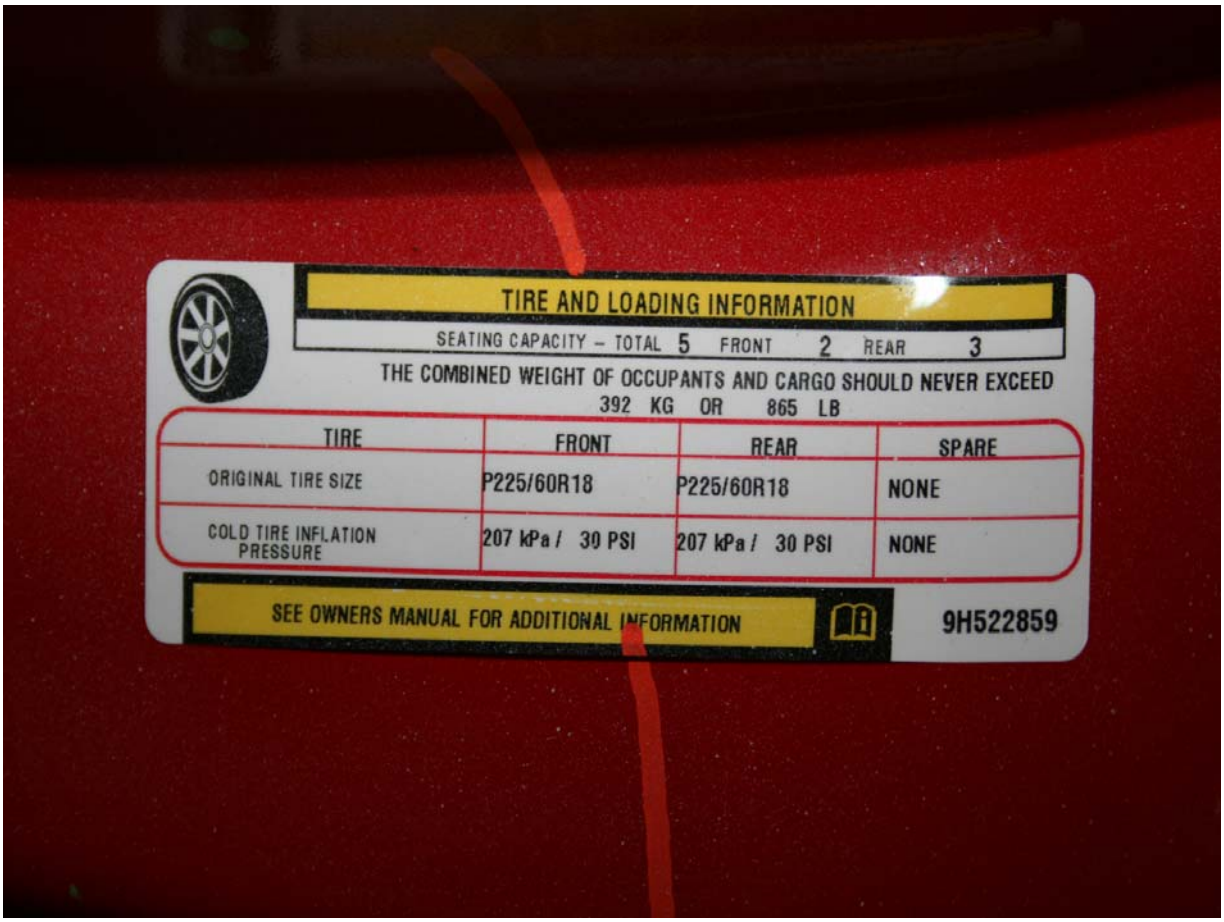
PHOTOGRAPHS

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

Pre-Test Left Rear ¾ View

Post-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

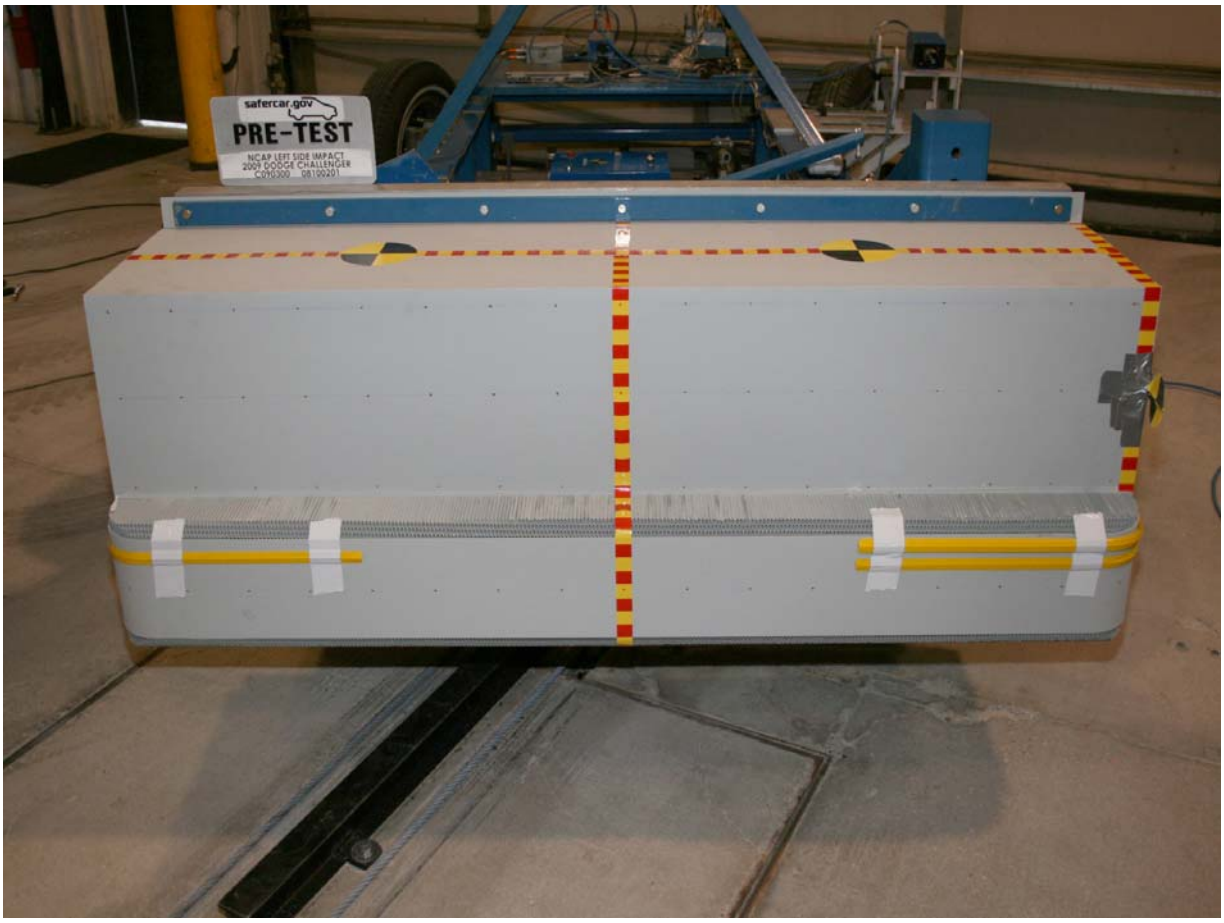
Post-Test Passenger Dummy Clearance From Door

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

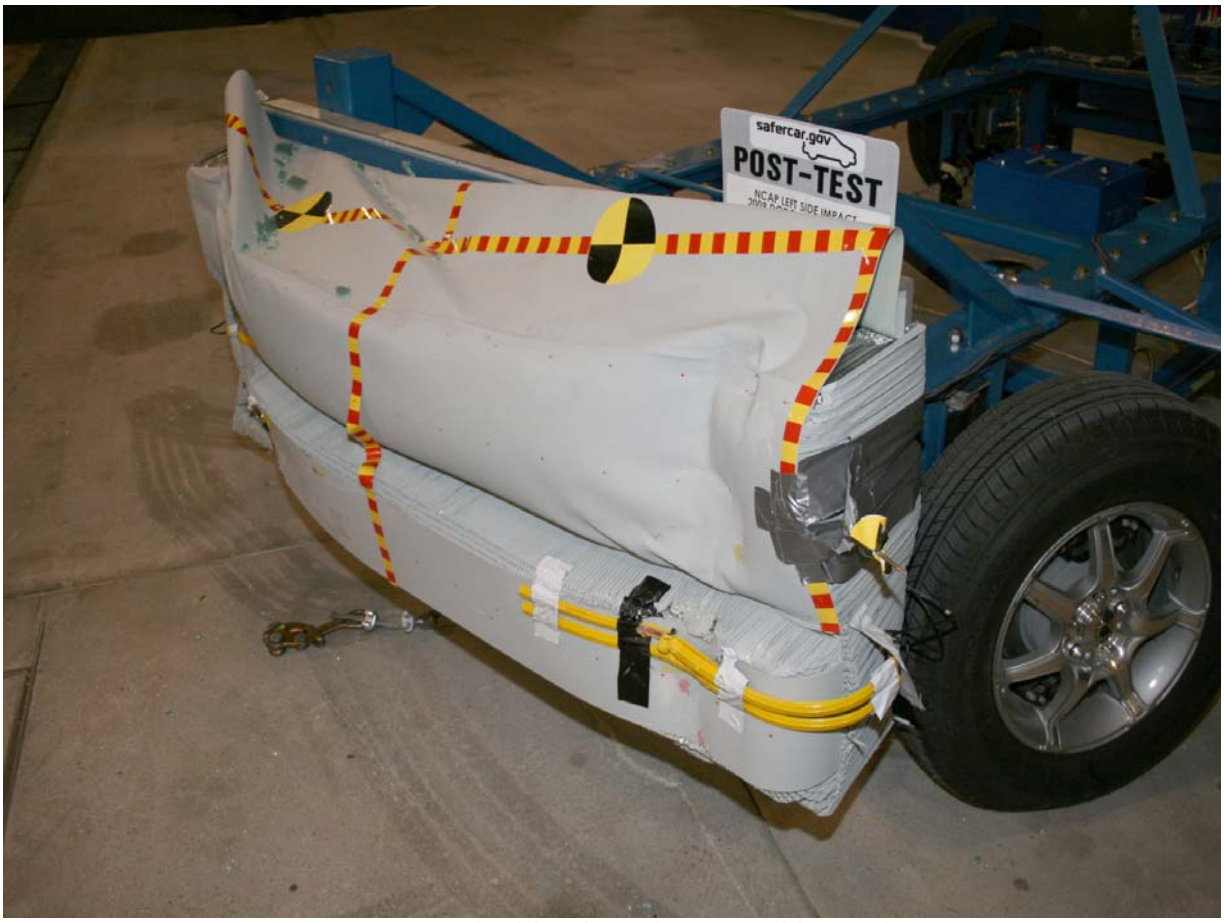
Pre-Test Top View of Deformable Barrier

Post-Test Top View of Deformable Barrier

Pre-Test Right Side View of Deformable Barrier

Post-Test Right Side View of Deformable Barrier

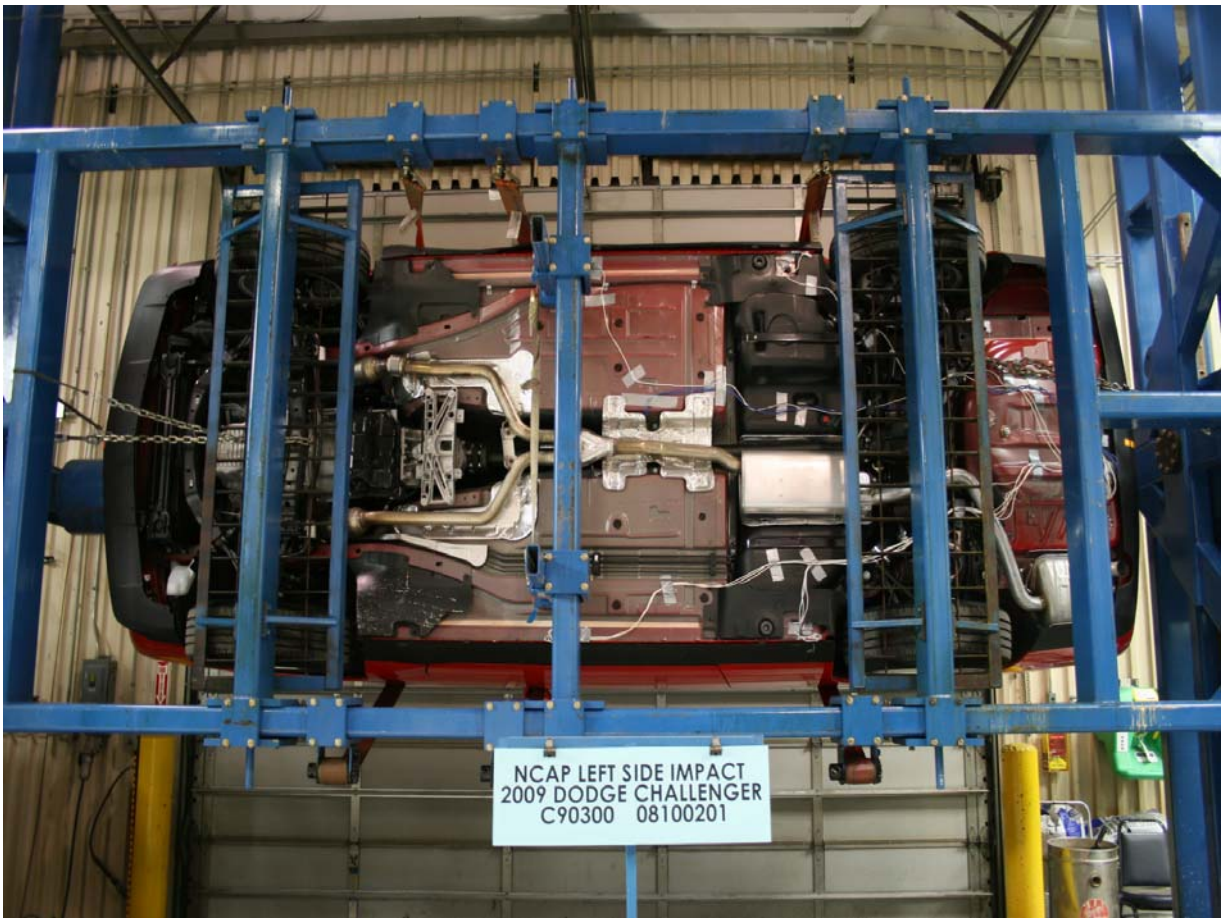
Pre-Test Left Side View of Deformable Barrier



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

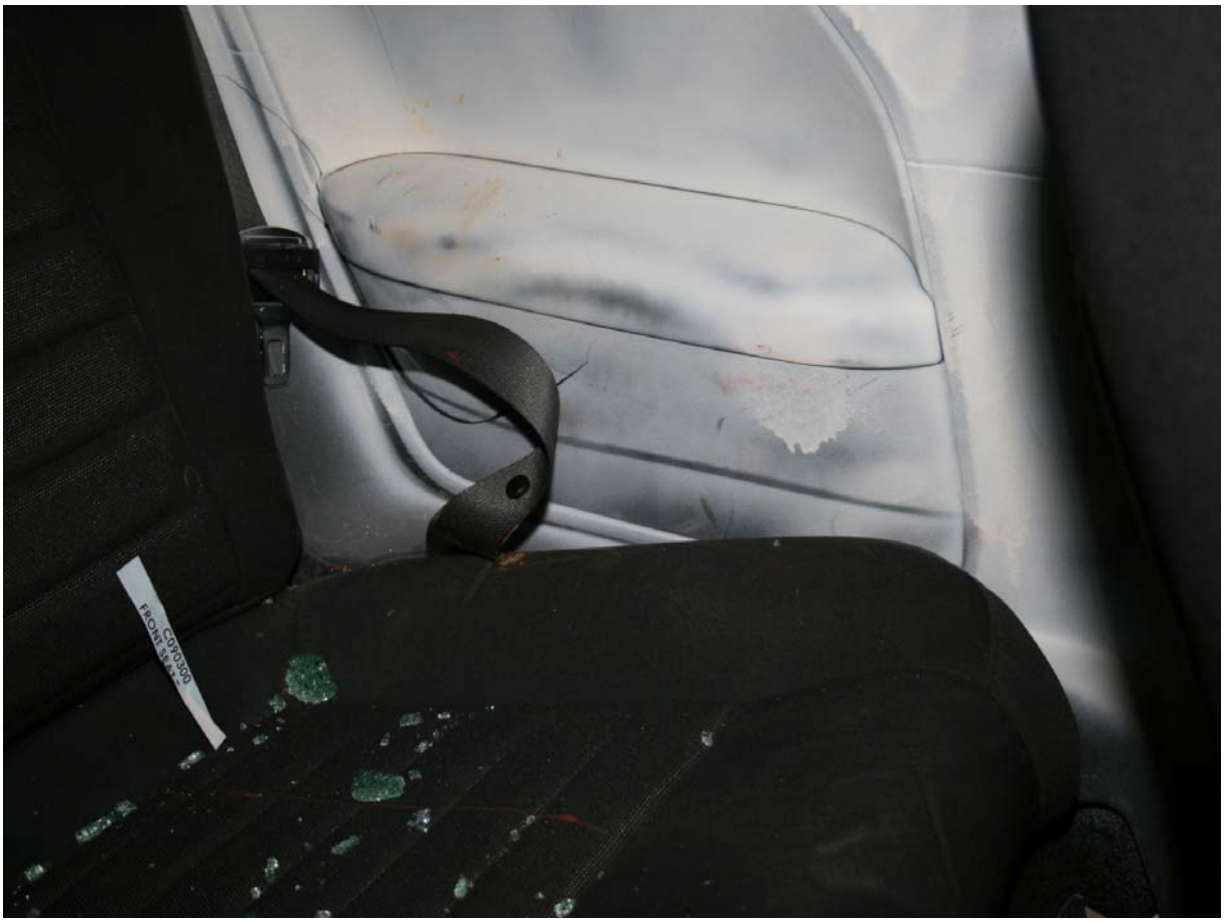
Post-Test Driver Dummy Upper Torso Contact

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

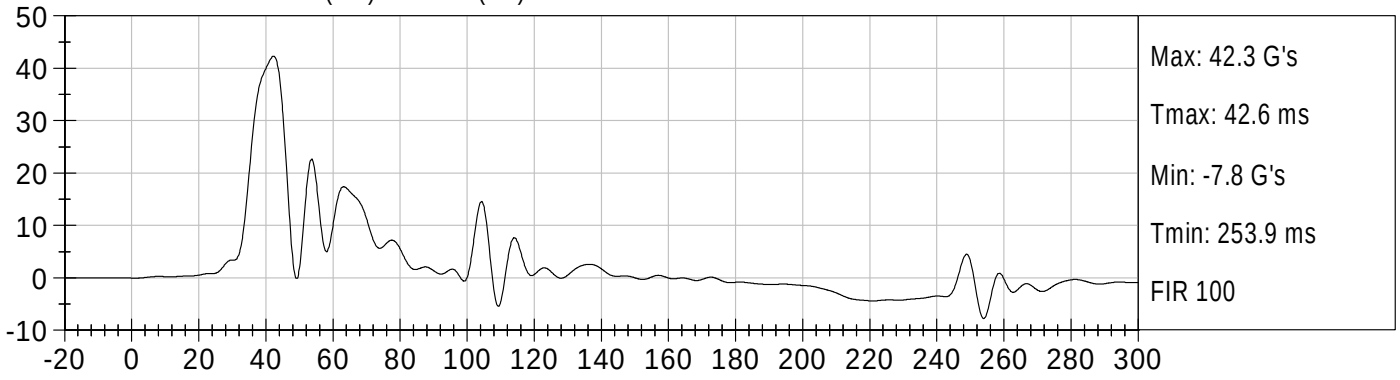
MDB Left Bumper Contact

MDB Right Bumper Contact

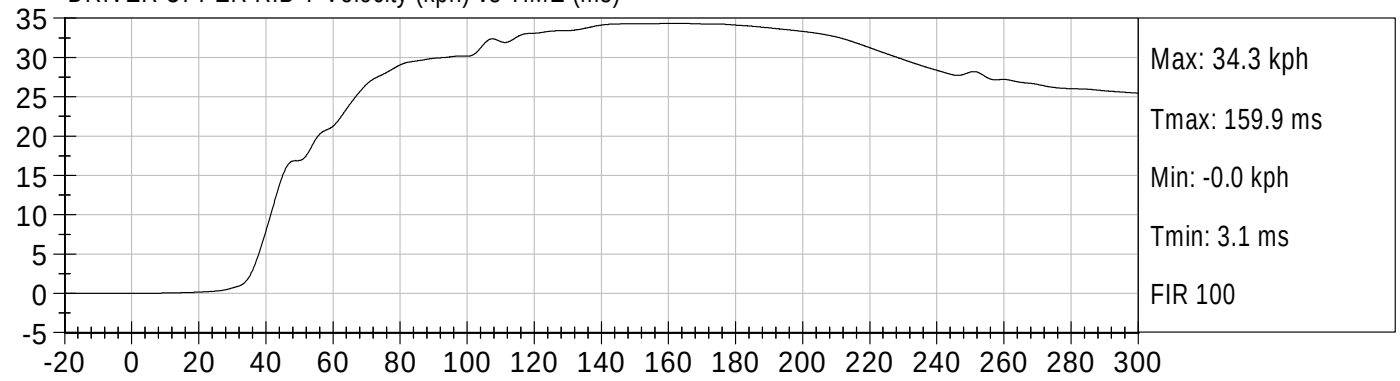
NCAP LEFT SIDE
2009 DODGE CHALLENGER C90300

Test Date: 10/02/2008
Speed: 38.8 mph (62.4 km/h)

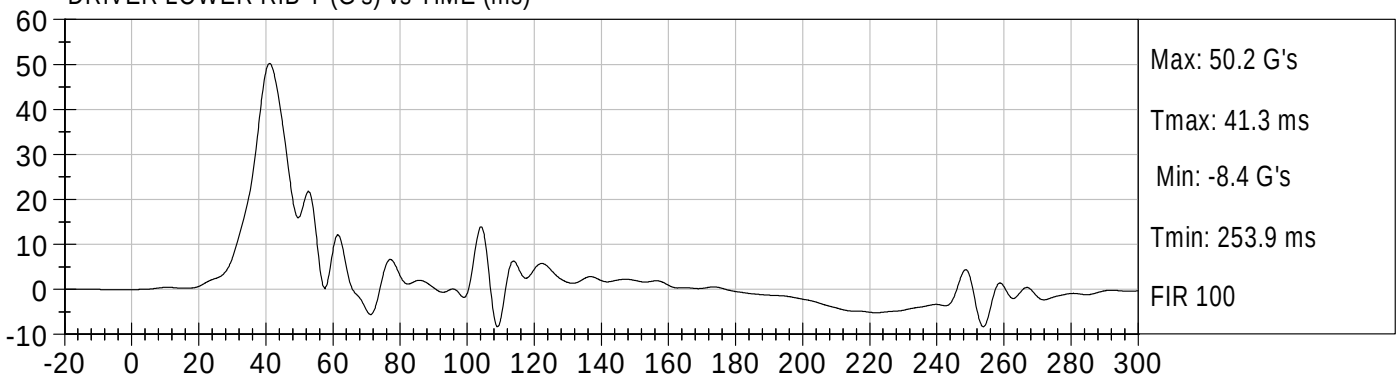
DRIVER UPPER RIB Y (G's) vs TIME (ms)



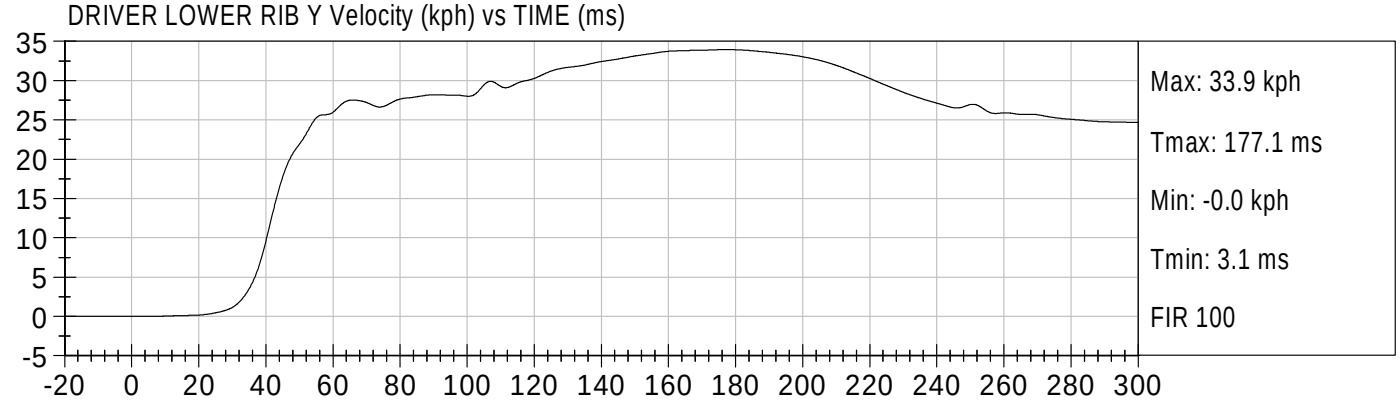
DRIVER UPPER RIB Y Velocity (kph) vs TIME (ms)



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

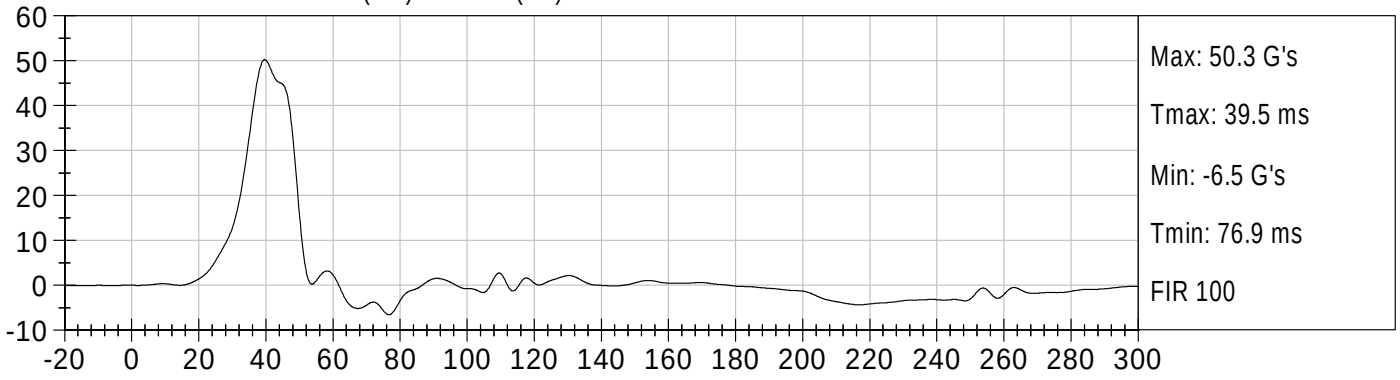


DRIVER LOWER RIB Y Velocity (kph) vs TIME (ms)

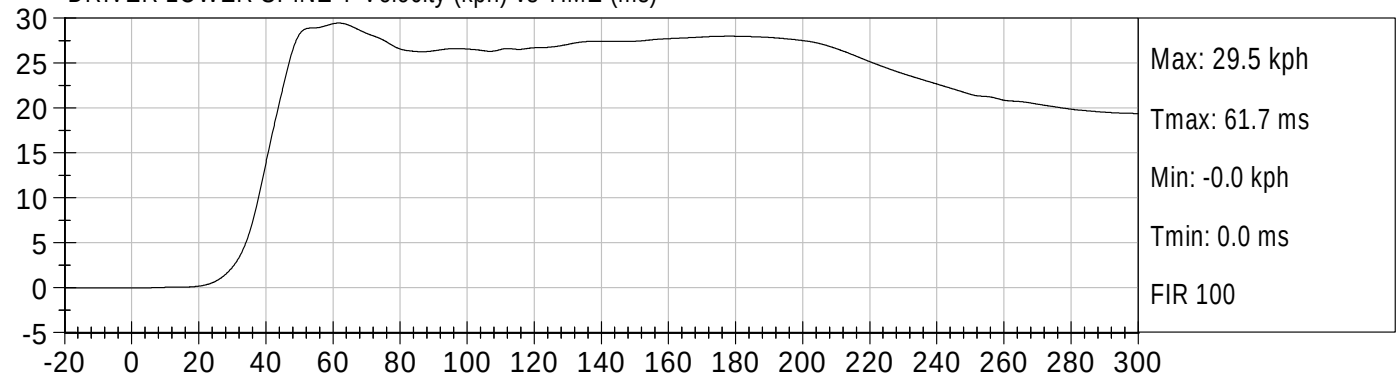


NCAP LEFT SIDE
2009 DODGE CHALLENGER C90300
Test Date: 10/02/2008
Speed: 38.8 mph (62.4 km/h)

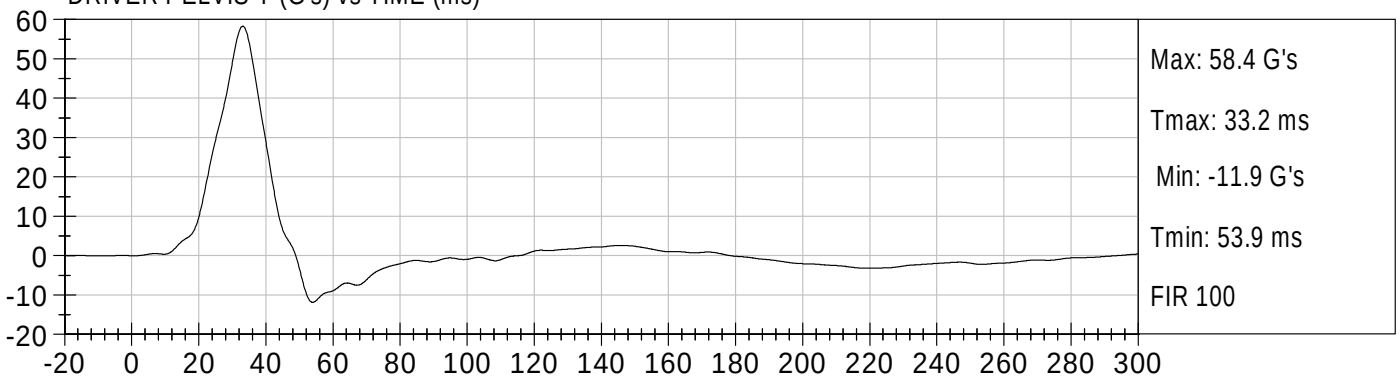
DRIVER LOWER SPINE Y (G's) vs TIME (ms)



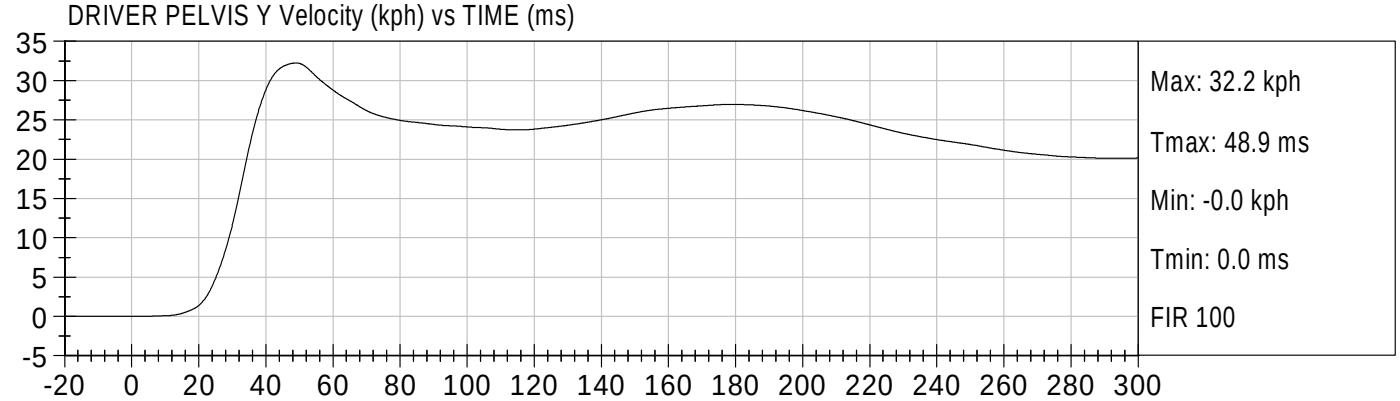
DRIVER LOWER SPINE Y Velocity (kph) vs TIME (ms)



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

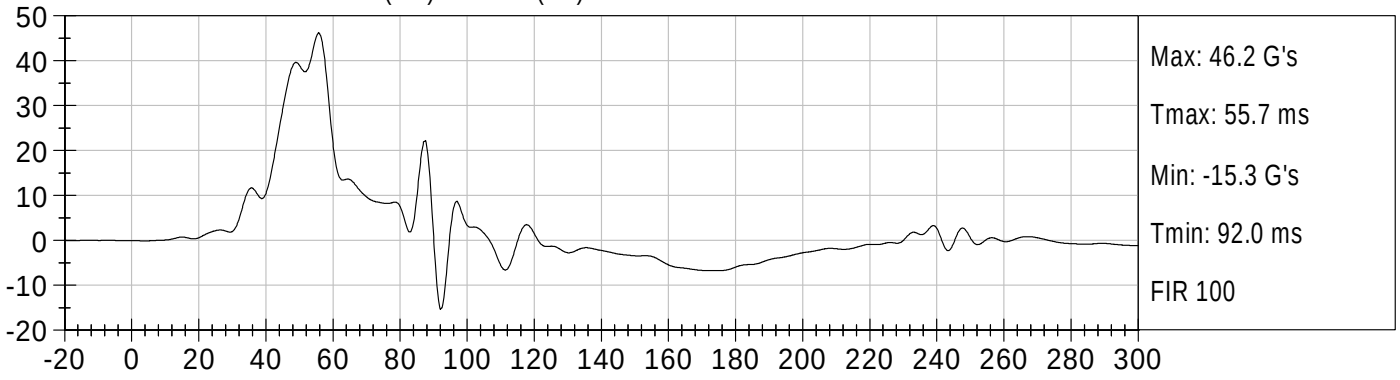


DRIVER PELVIS Y Velocity (kph) vs TIME (ms)

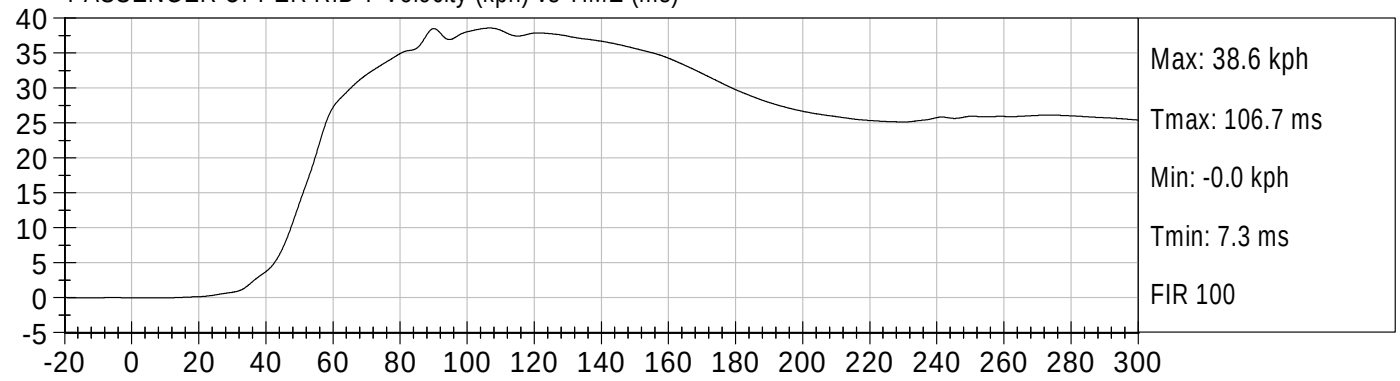


NCAP LEFT SIDE
2009 DODGE CHALLENGER C90300
Test Date: 10/02/2008
Speed: 38.8 mph (62.4 km/h)

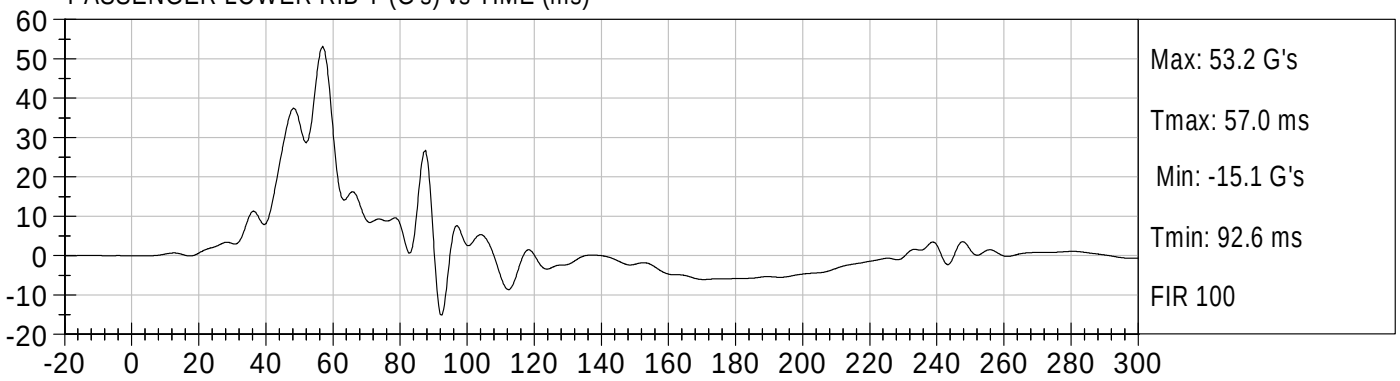
PASSENGER UPPER RIB Y (G's) vs TIME (ms)



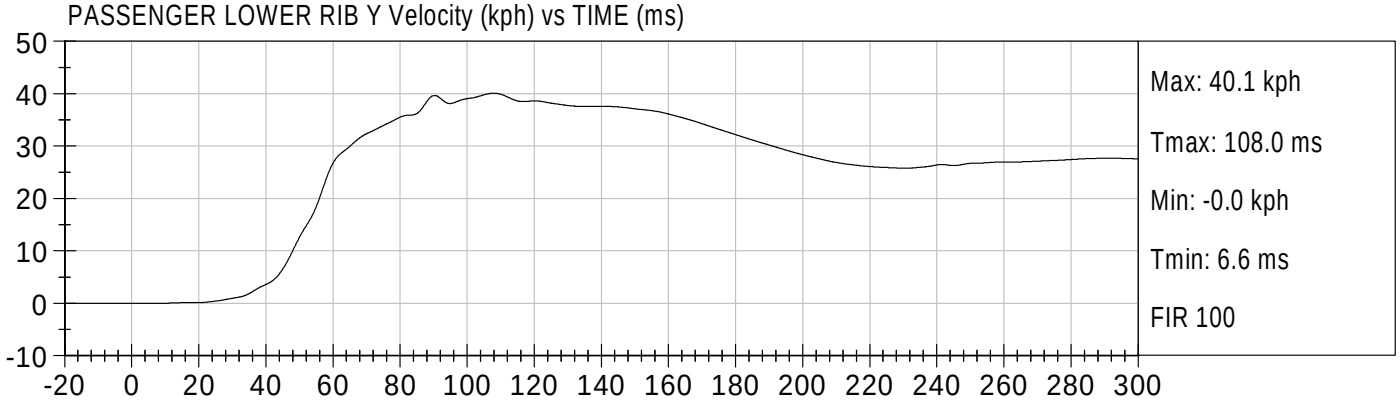
PASSENGER UPPER RIB Y Velocity (kph) vs TIME (ms)



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

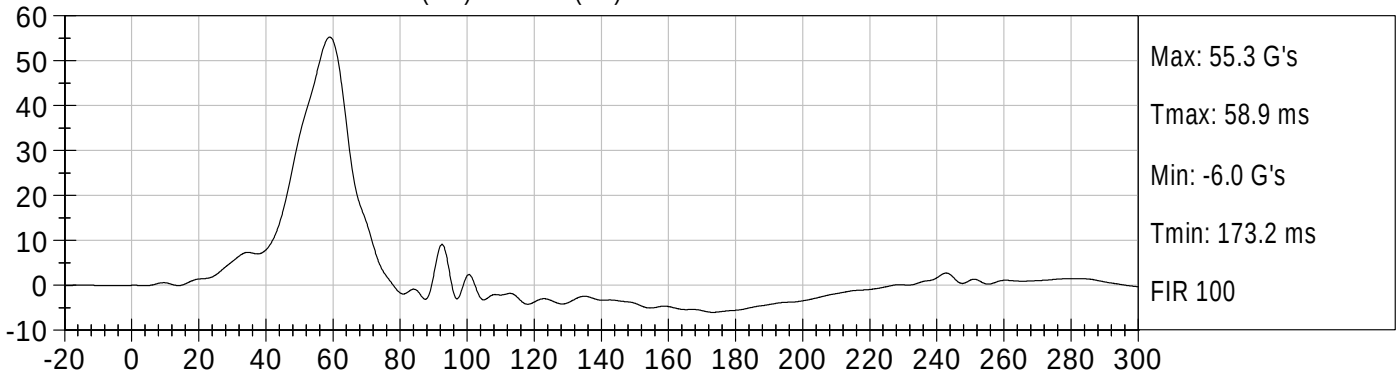


PASSENGER LOWER RIB Y Velocity (kph) vs TIME (ms)

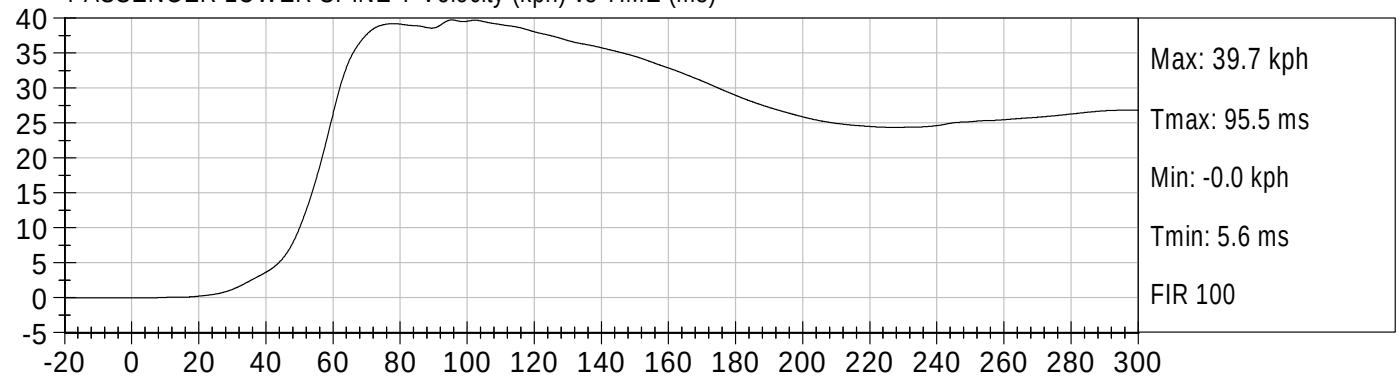


NCAP LEFT SIDE
2009 DODGE CHALLENGER C90300
Test Date: 10/02/2008
Speed: 38.8 mph (62.4 km/h)

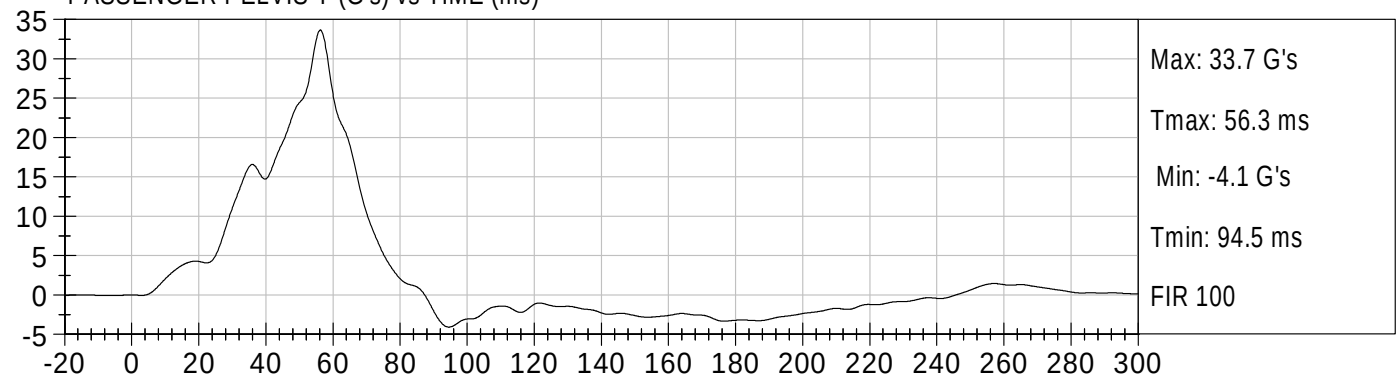
PASSENGER LOWER SPINE Y (G's) vs TIME (ms)



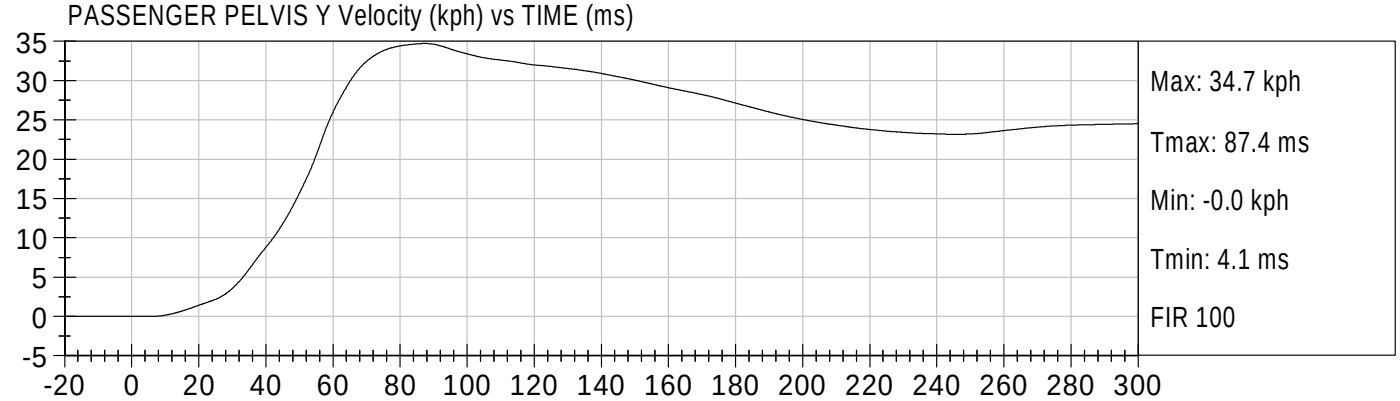
PASSENGER LOWER SPINE Y Velocity (kph) vs TIME (ms)



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: 271

Calibration Test Results Summary

Dummy Serial Number: 271

Pre-Test Calibration

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

SID/HIII Calibration Data Sheet

Side Impact Dummy

External Measurements

ATD Serial No: 271 **Test I.D:** D08251

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

Jessica Hall
Laboratory Technician

8/29/08
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:** D082711

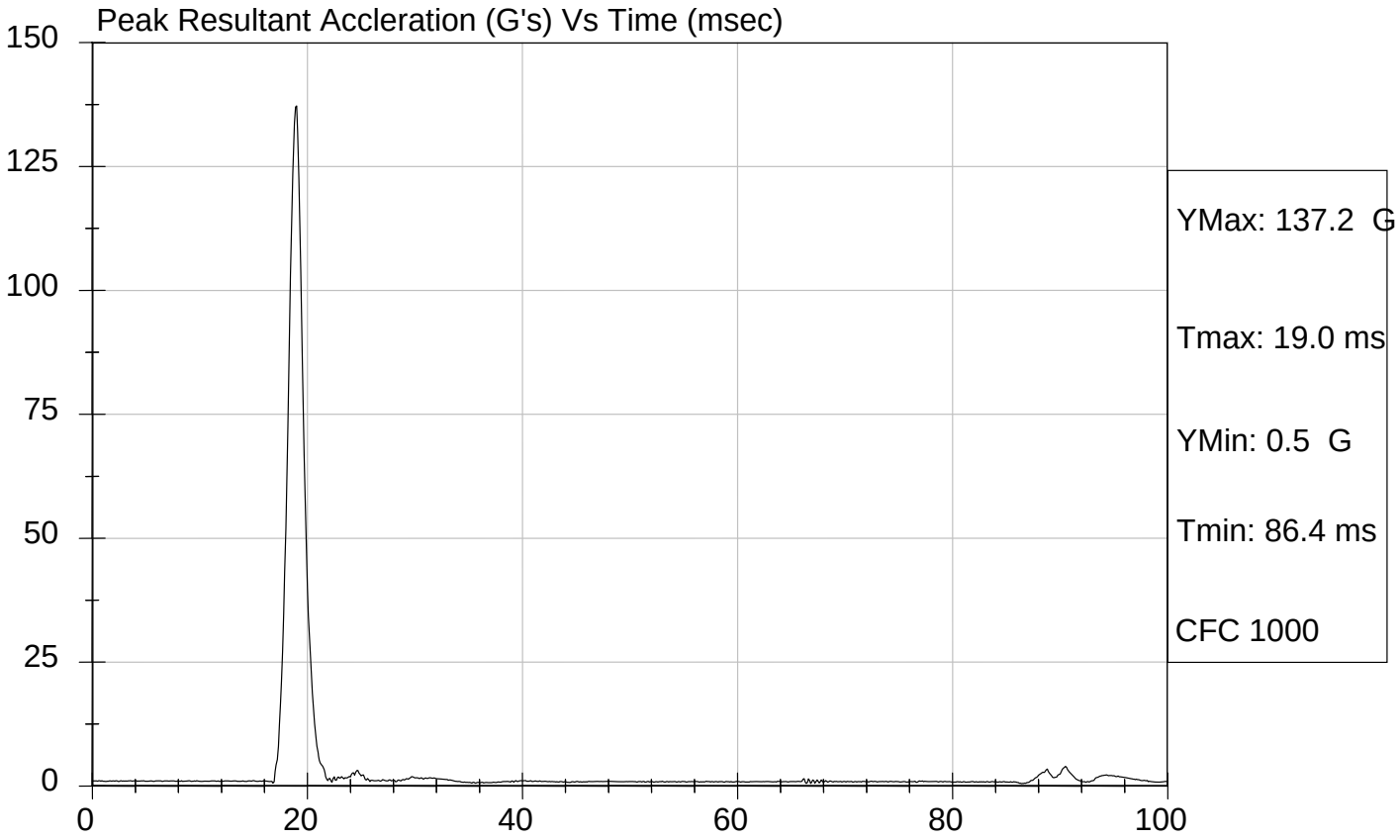
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Peak Resultant Acceleration	G's	120 to 150	137	Pass
Is Resultant Curve Unimodal?	N/A	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-9.4	Pass
		Overall Test Results		Pass

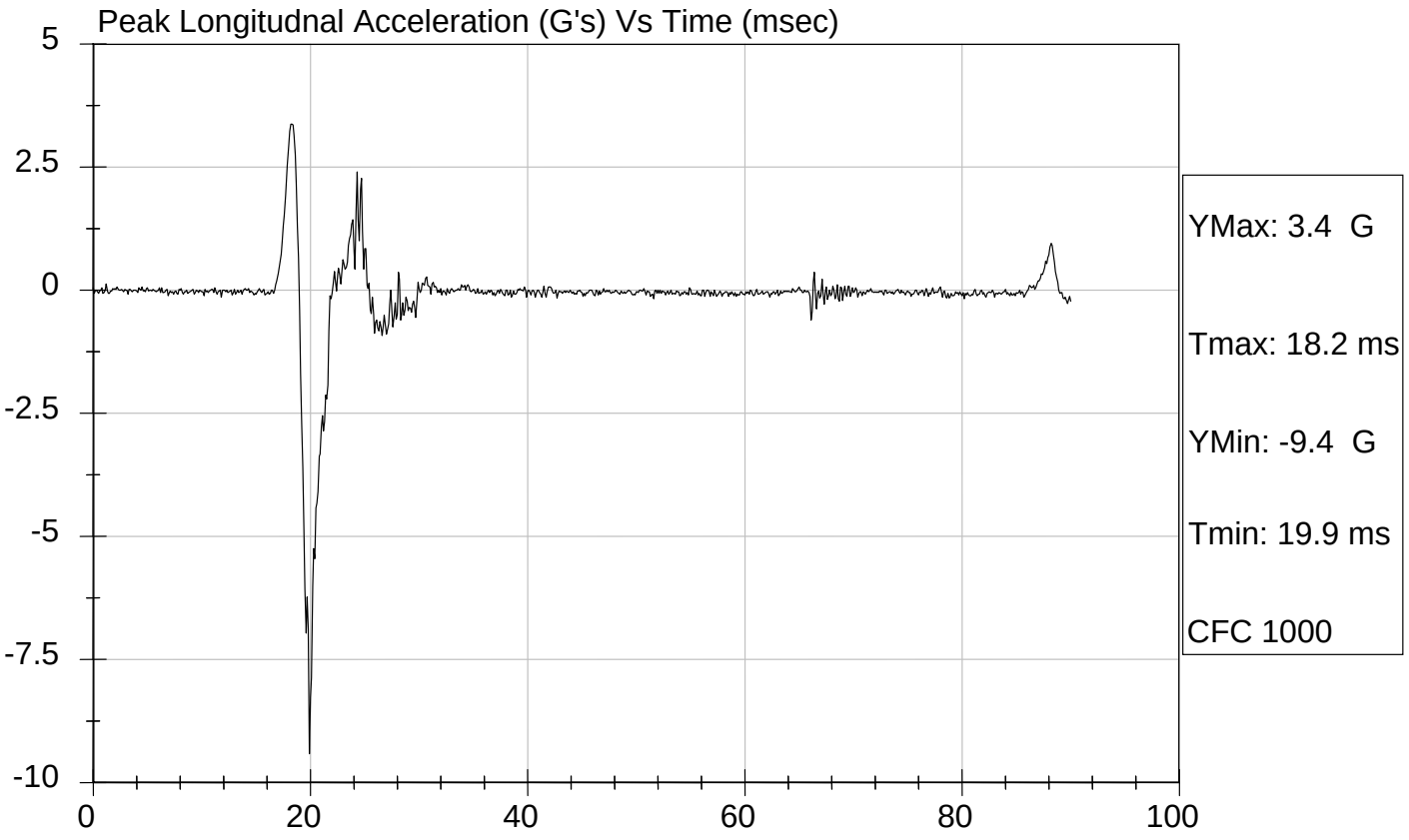
Jessica Hall
Laboratory Technician

9/24/08
Test Date

David Winkelbauer
Approved By

	Test Description: Head Drop	Test Date: 9/24/08
	Component: D082711	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:** D082712

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

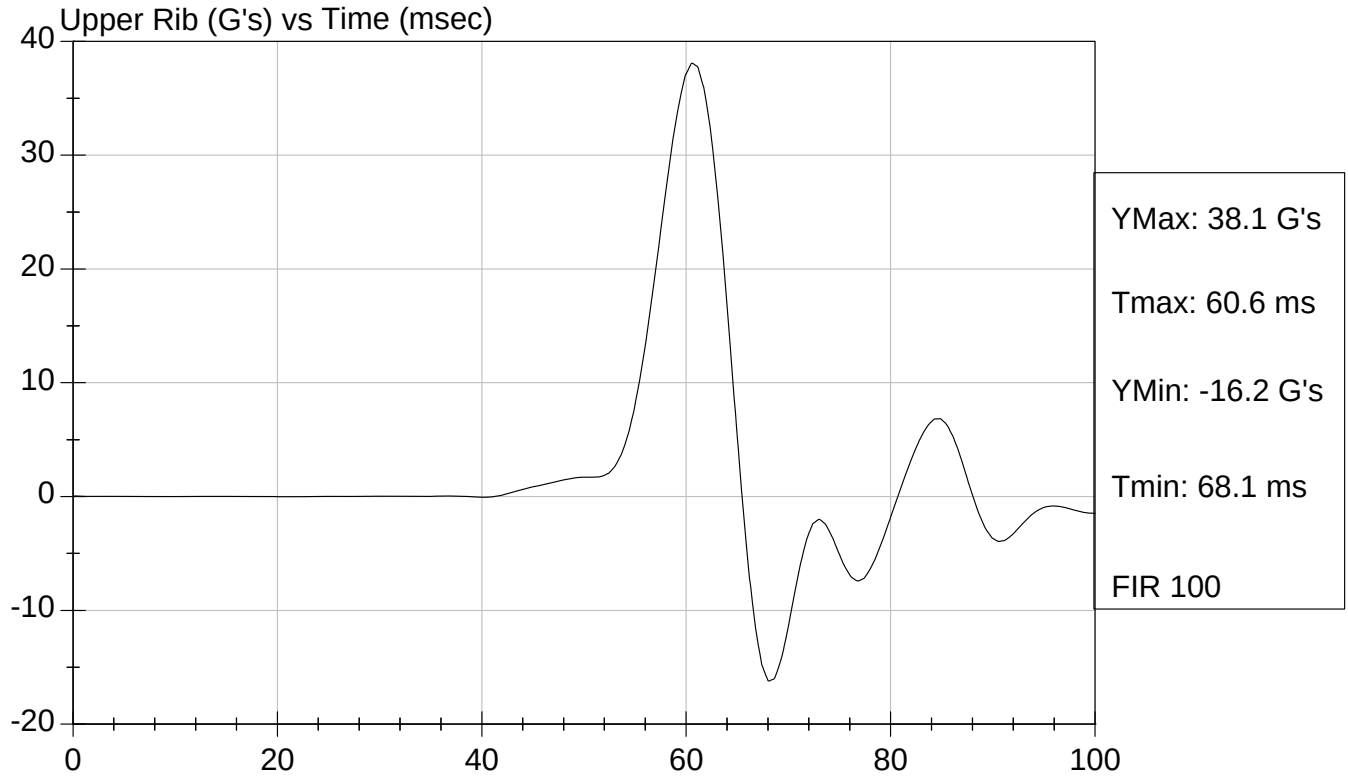
Jessica Hall
Laboratory Technician

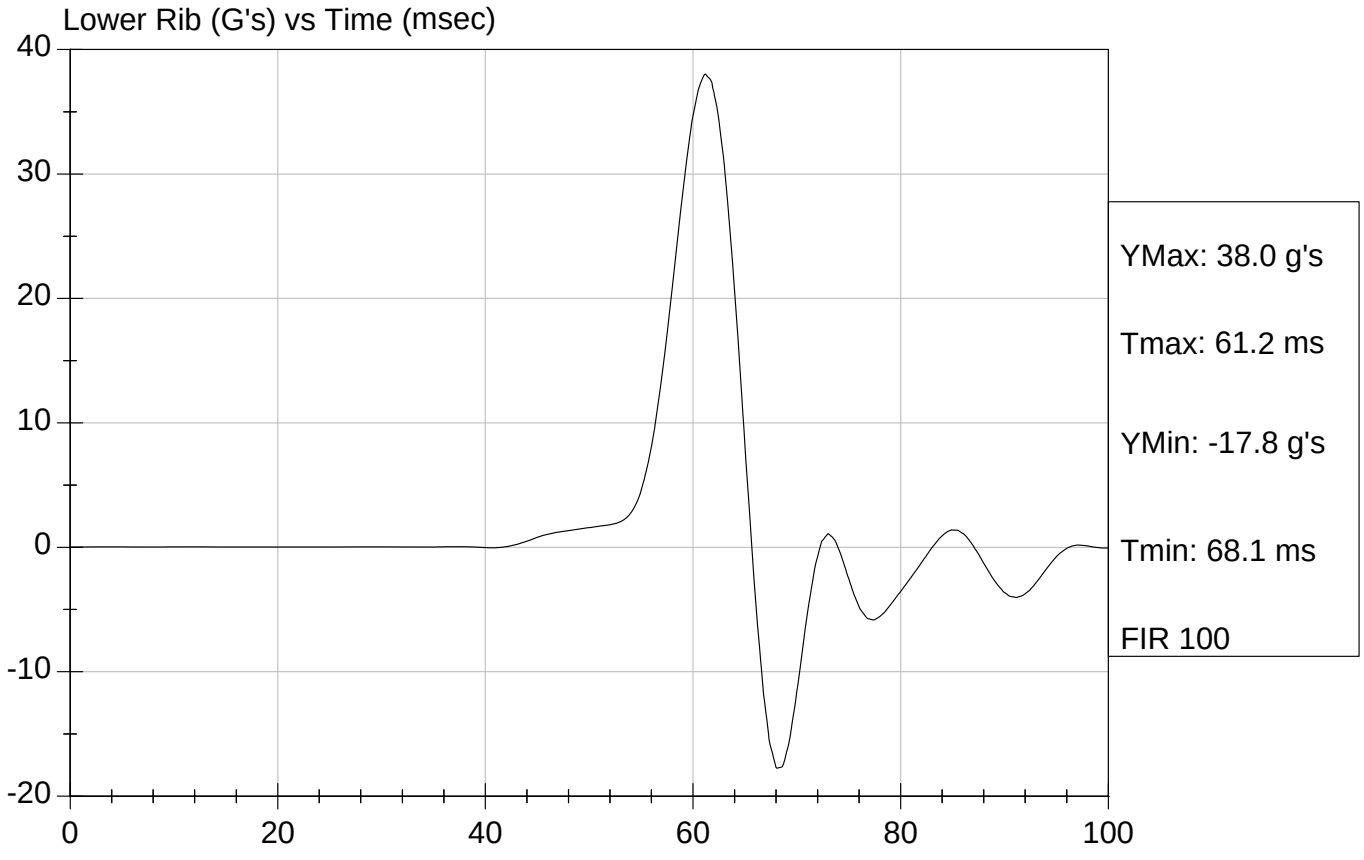
9/24/08
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D082712

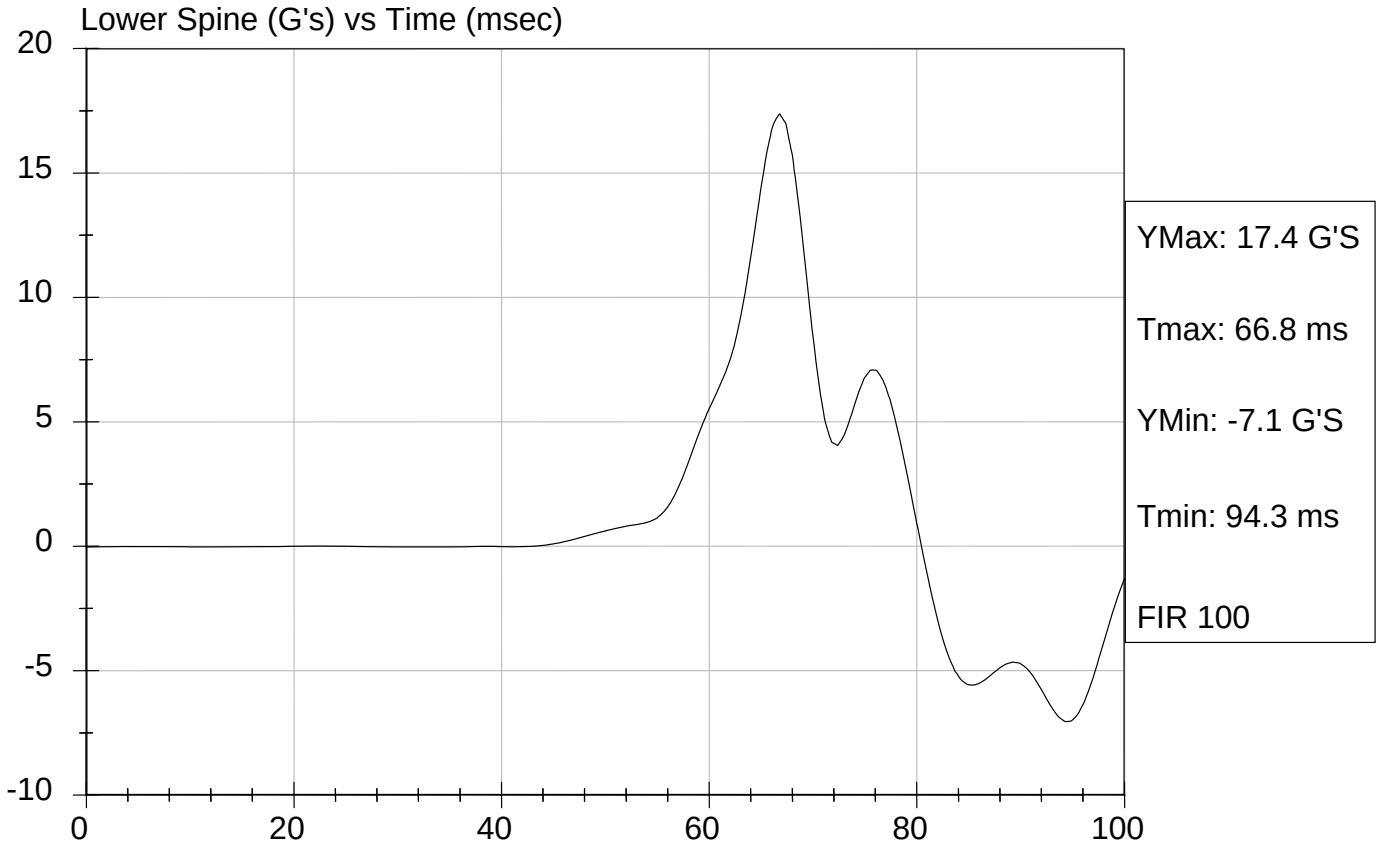
Test Date: 9/24/08
Speed: 14.12 ft/sec, 4.30 m/sec





Test Desc: Thorax Impact
Component ID: D082712

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



SID/HIII Calibration Data Sheet

Side Impact Dummy

Pelvis Impact Test

ATD Serial No: 271 **Test I.D:** D082713

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Probe Velocity	m/s	4.27 - 4.33	4.29	Pass
Pelvis Acceleration	G's	40 - 60	46	Pass
		Overall Test Results		Pass

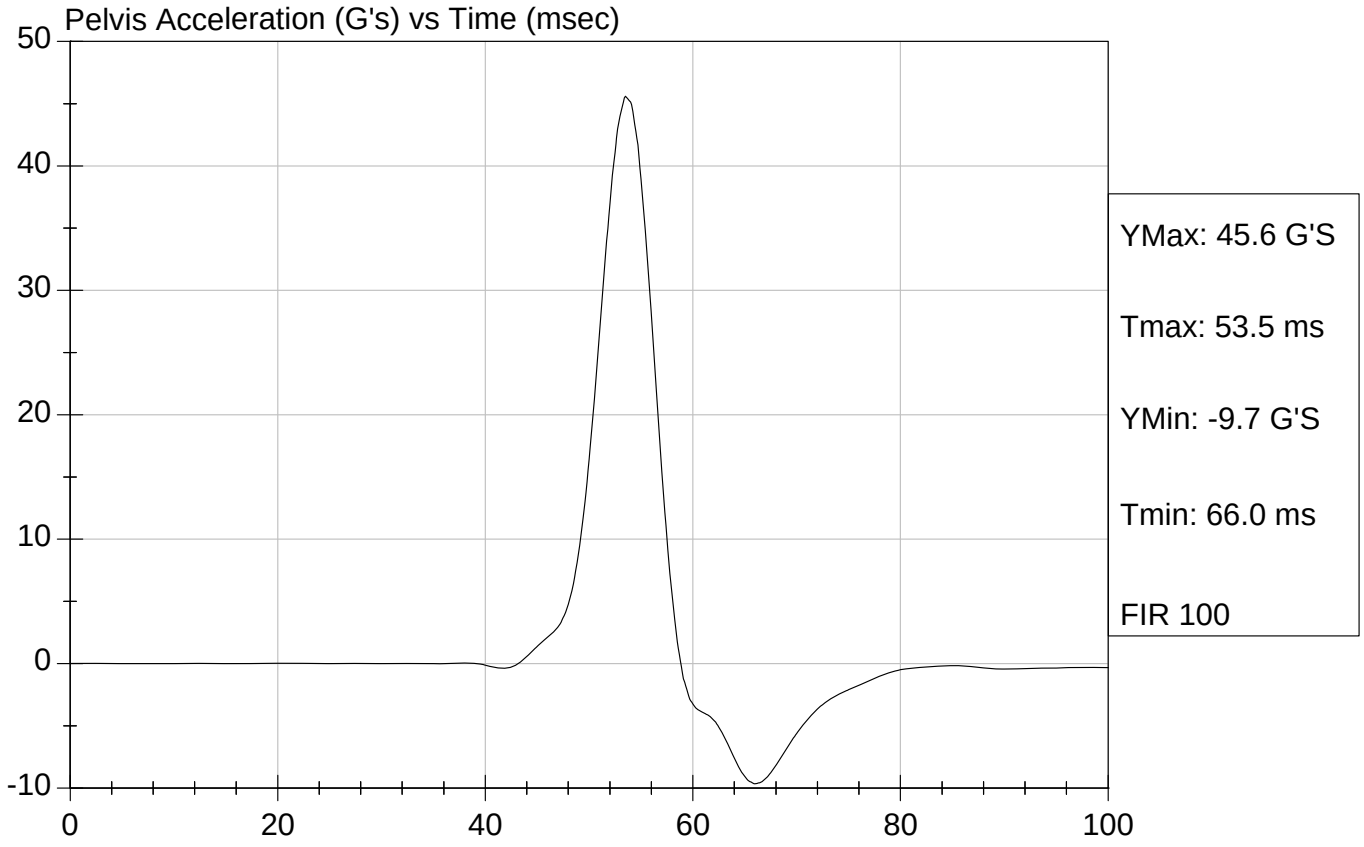
Jessica Hall
Laboratory Technician

9/24/08
Test Date

David Winkelbauer
Approved By

Test Desc: Pelvis Impact
Component ID: D082713

Test Date: 9/24/08
Speed: 14.06 ft/sec, 4.29 m/sec



SID/HIII Calibration Data Sheet

Side Impact Dummy

Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 271 **Test I.D:** D082714

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

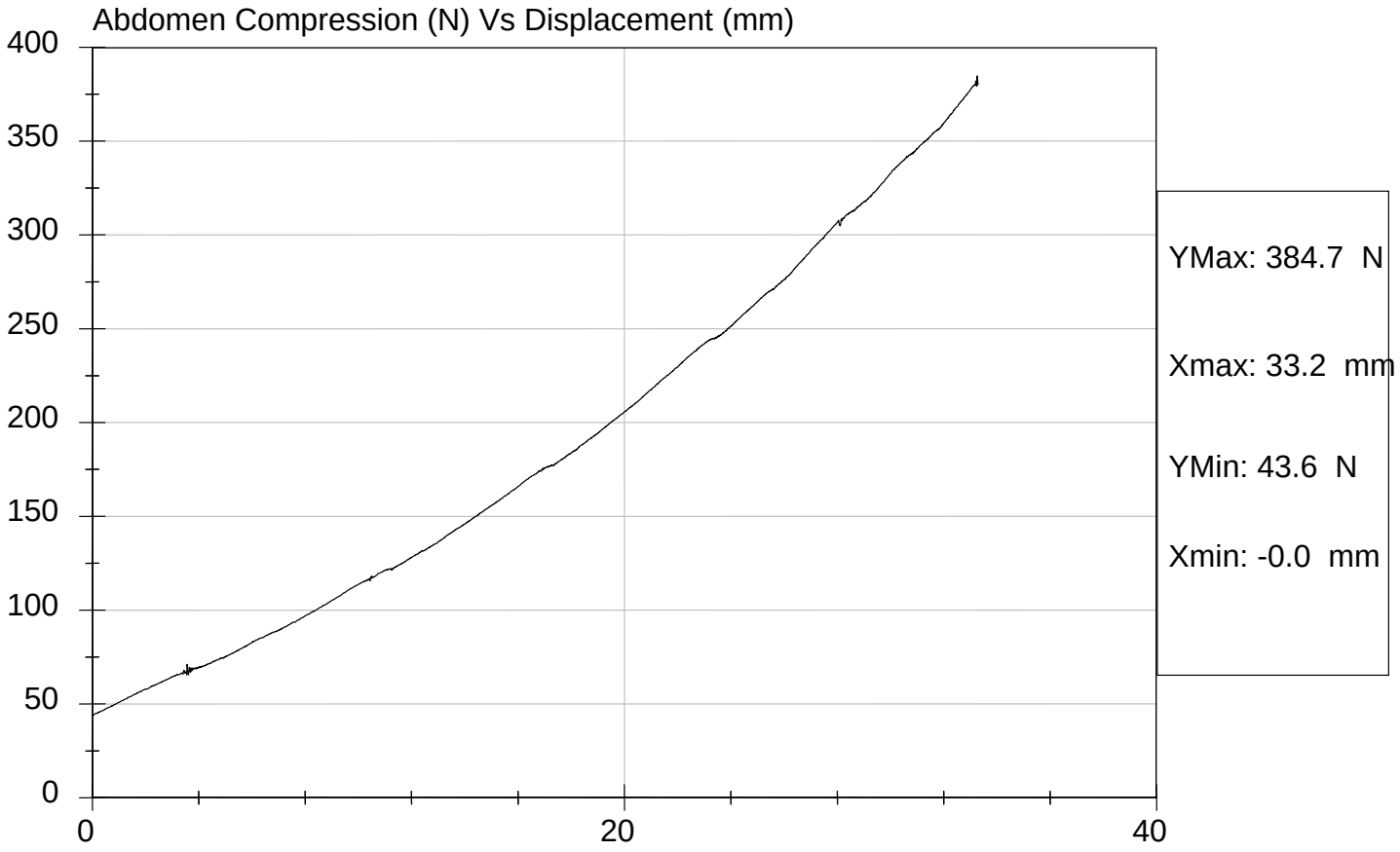
Jessica Gall
Laboratory Technician

9/24/08
Test Date

David Winkelbauer
Approved By

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

Component: D082714 Speed: 0 ft/sec, 0 m/sec



SID/HIII Calibration Data Sheet

Side Impact Dummy

Lumbar Flexion Calibration

ATD Serial No: 271 **Test I.D:** D082715

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

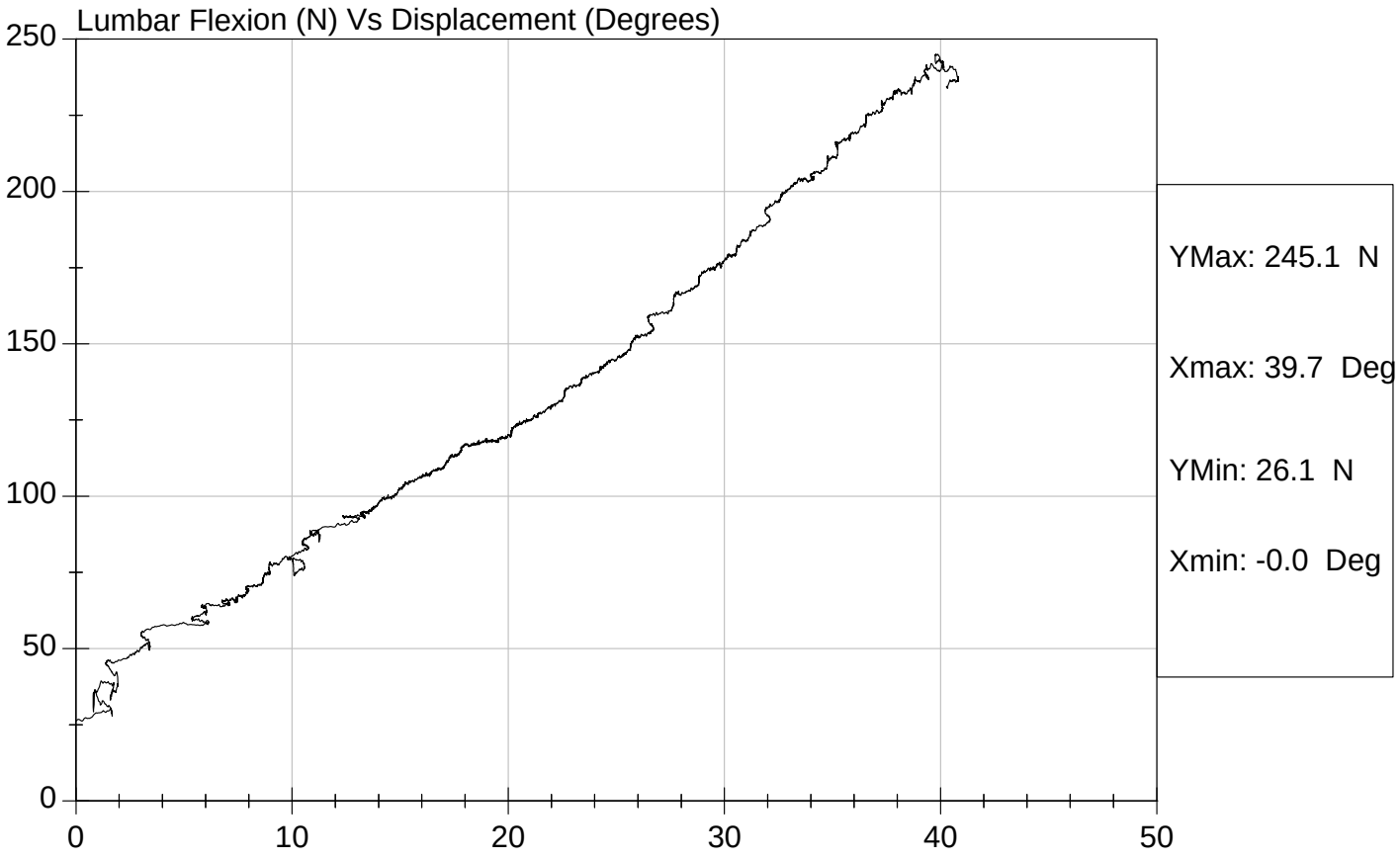
Jessica Gall
Laboratory Technician

9/23/08
Test Date

David Winkelbauer
Approved By

Test Description: Lumbar Flexion | Test Date: 9/23/08

Component: D082715 | Speed: 0 ft/sec, 0 m/sec



SID/HIII Calibration Data Sheet

Side Impact Dummy

Neck Pendulum Test

ATD Serial No: 271 **Test I.D:** D082719

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

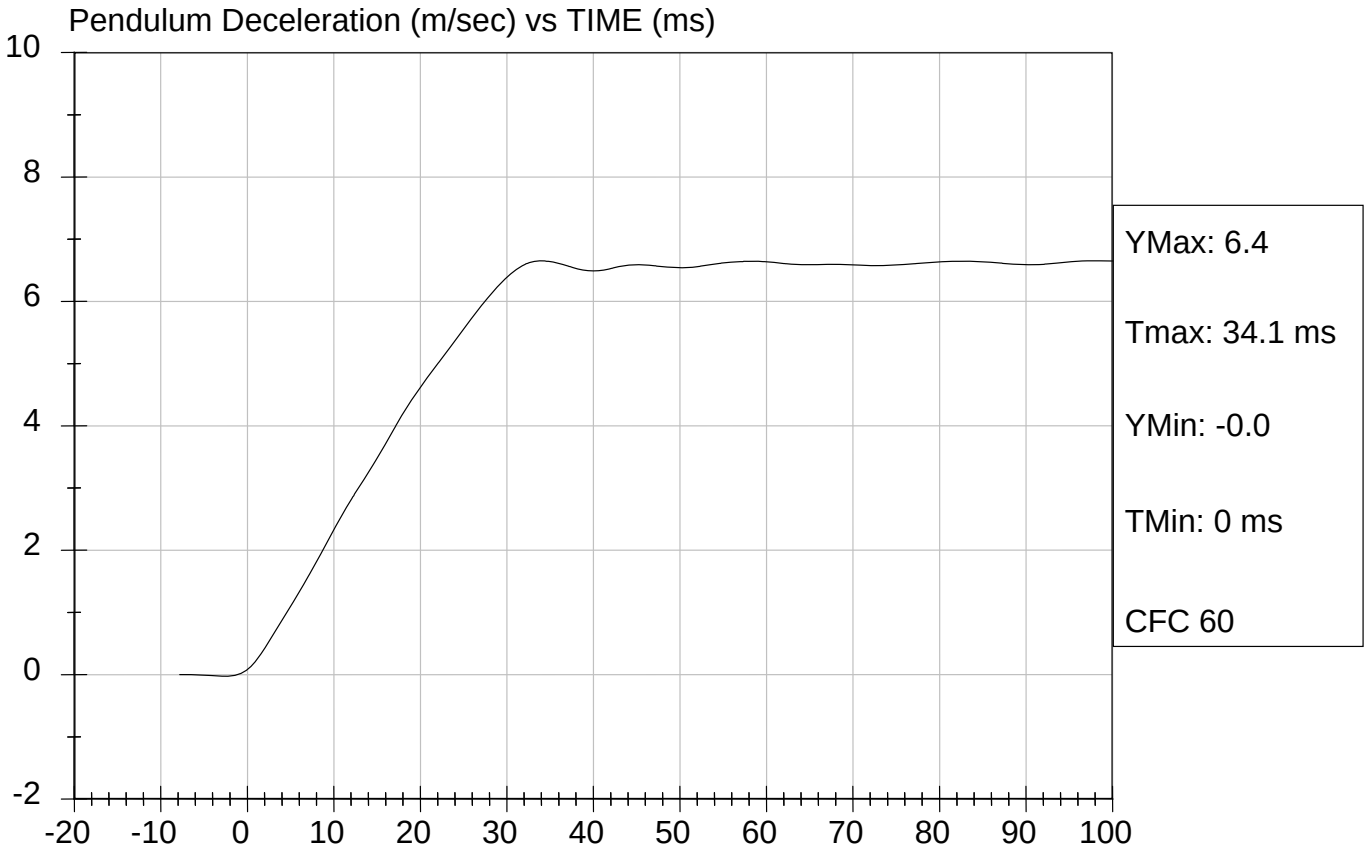
Jessica Gall
Laboratory Technician

9/24/08
Test Date

David Winkelbauer
Approved By

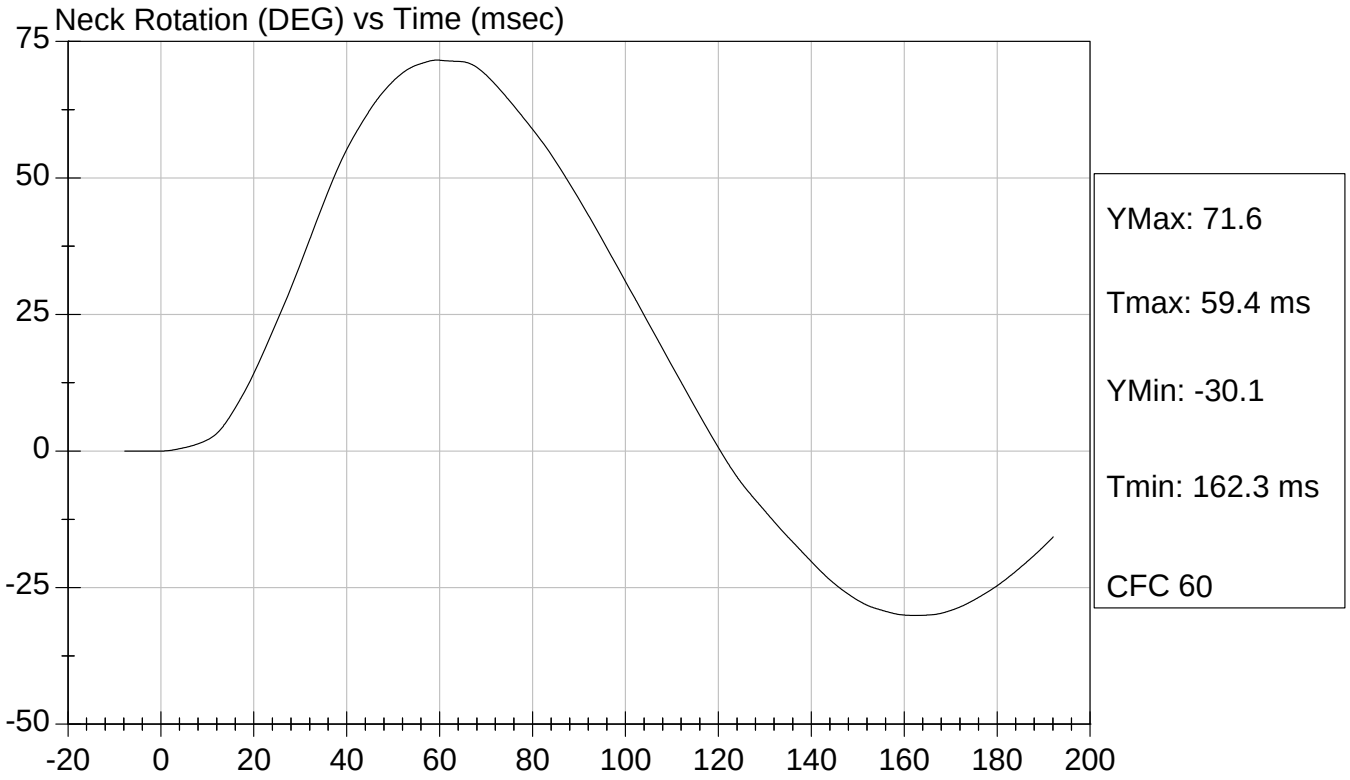
Test Desc: Neck Bending
Component ID: D082719

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



Test Desc: Neck Bending
Component ID: D082719

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



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:** D082781

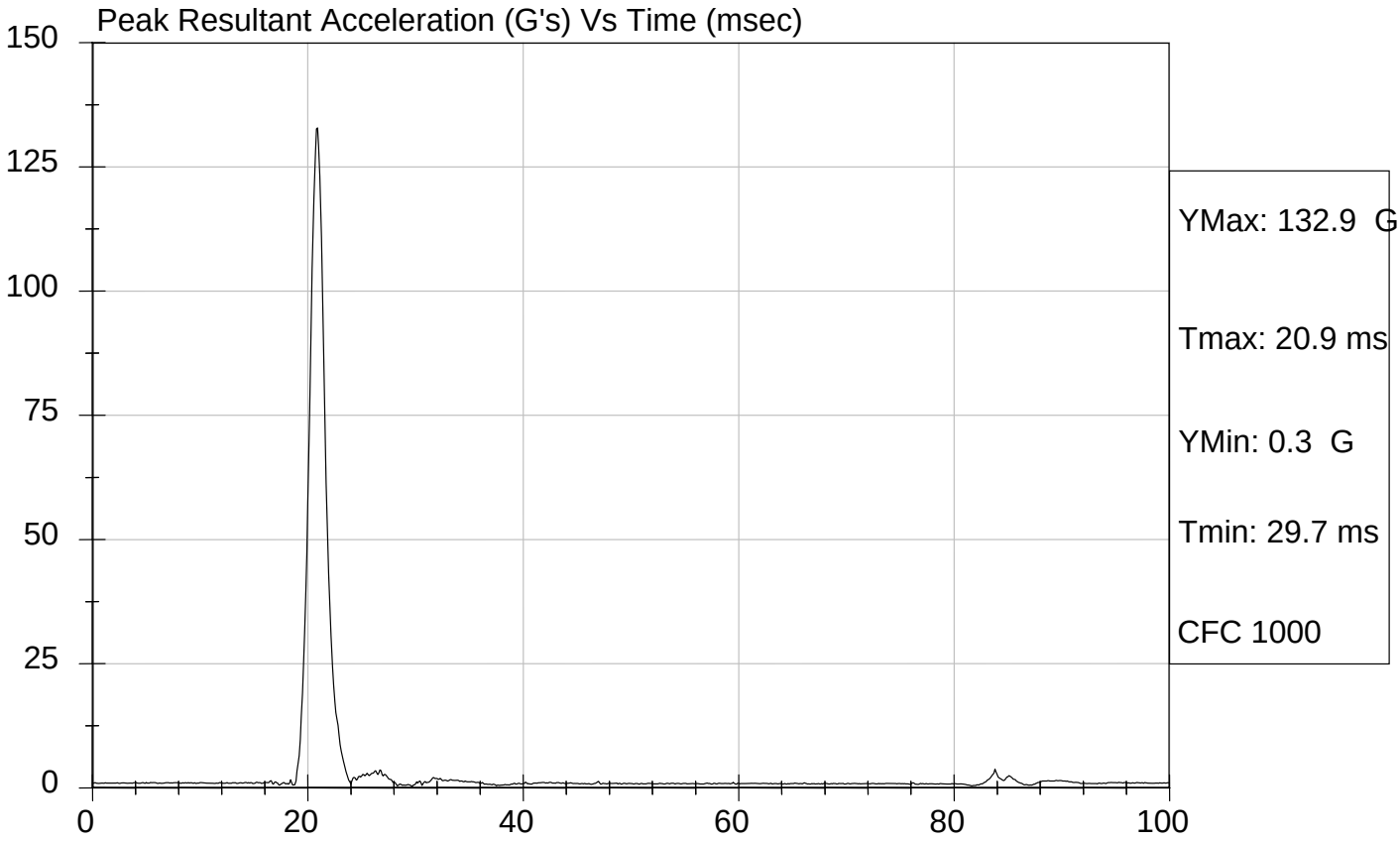
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Peak Resultant Acceleration	G's	120 to 150	133	Pass
Is Resultant Curve Unimodal?	N/A	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-9.1	Pass
		Overall Test Results		Pass

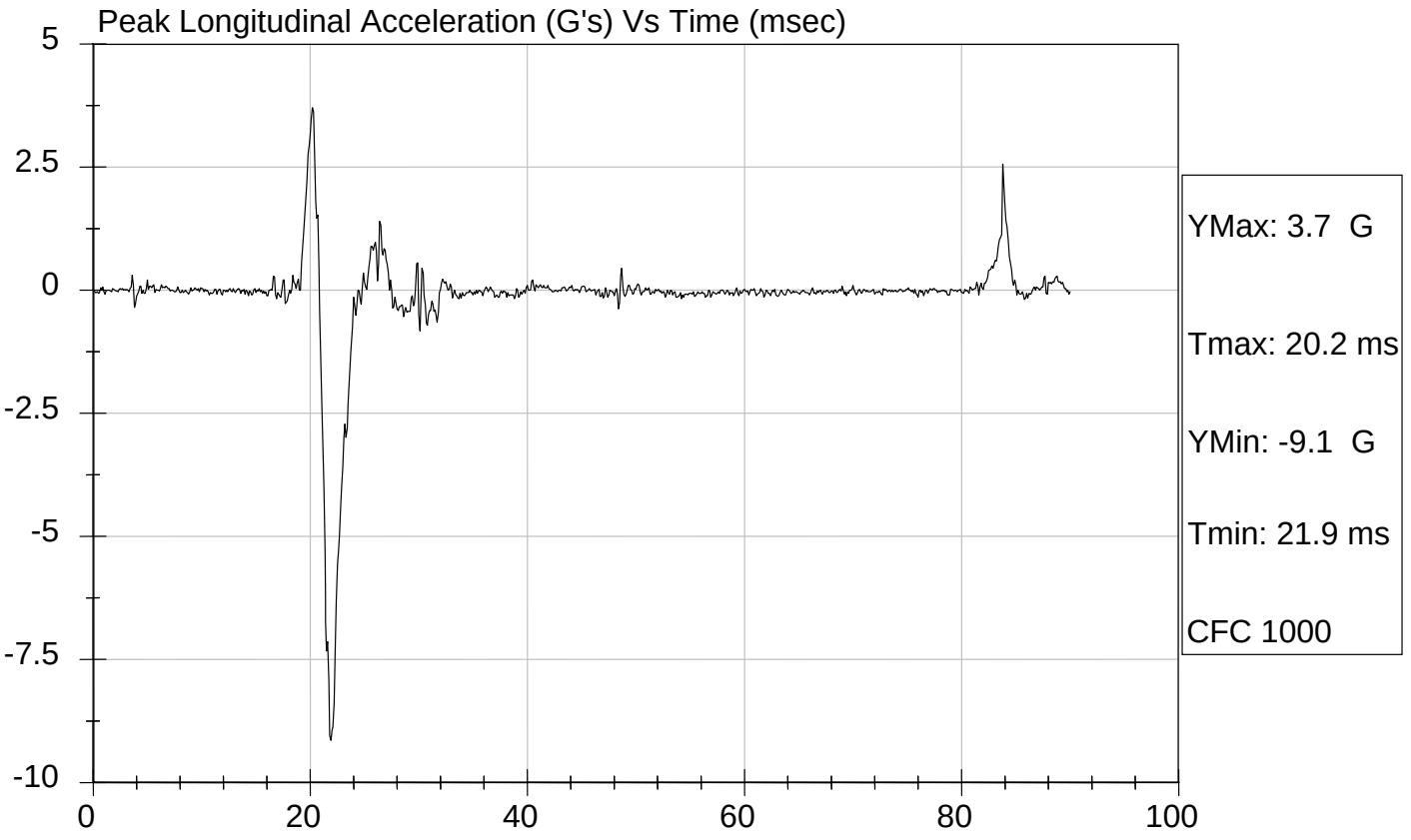
Jessica Hall
Laboratory Technician

10/2/08
Test Date

David Winkelbauer
Approved By

	Test Description: Head Drop	Test Date: 10/2/08
	Component: D082781	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:** D082782

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Probe Velocity	m/s	4.22 - 4.31	4.30	Pass
Upper Rib	G's	37 - 46	37	Pass
Lower Rib	G's	37 - 46	38	Pass
Lower Spine	G's	15 - 22	16	Pass
		Overall Test Results		Pass

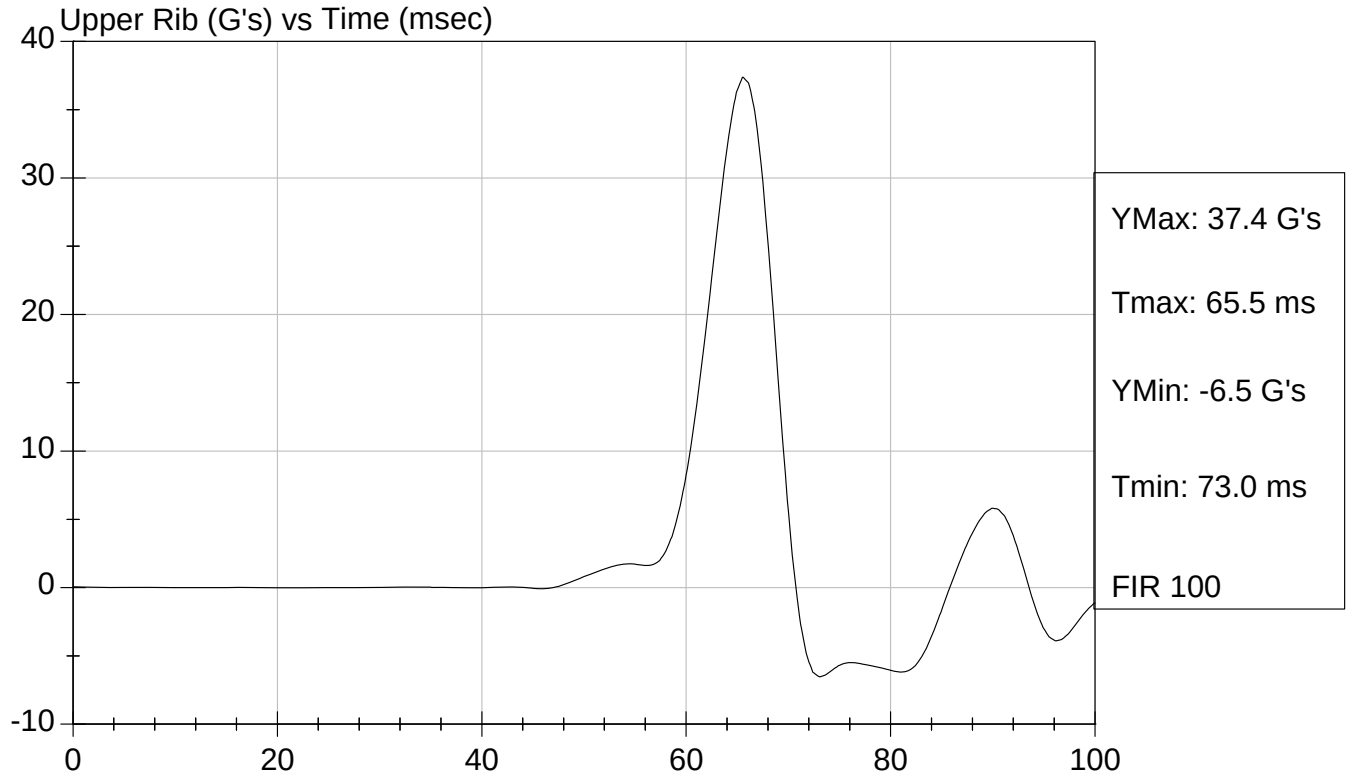
Jessica Hall
Laboratory Technician

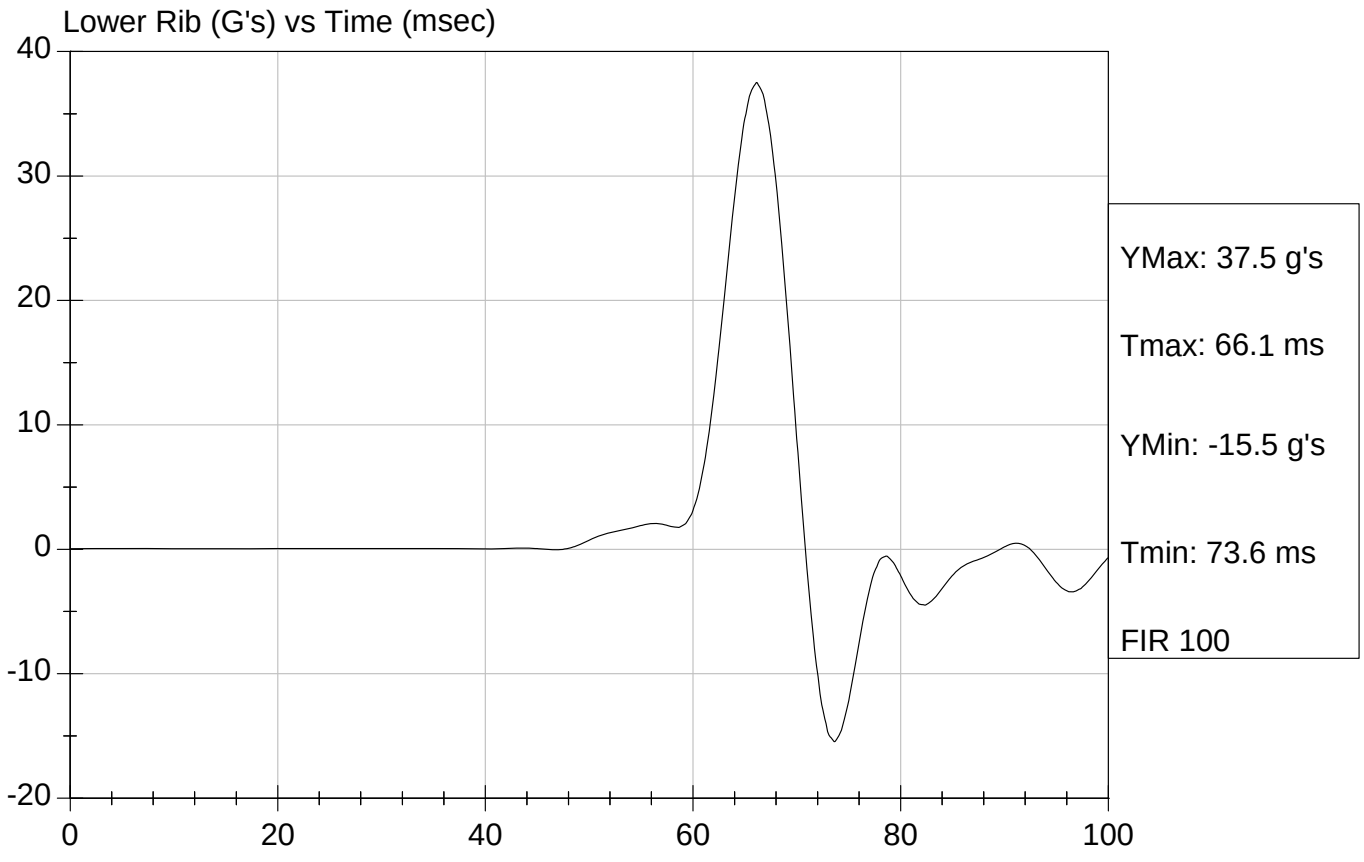
10/2/08
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D082782

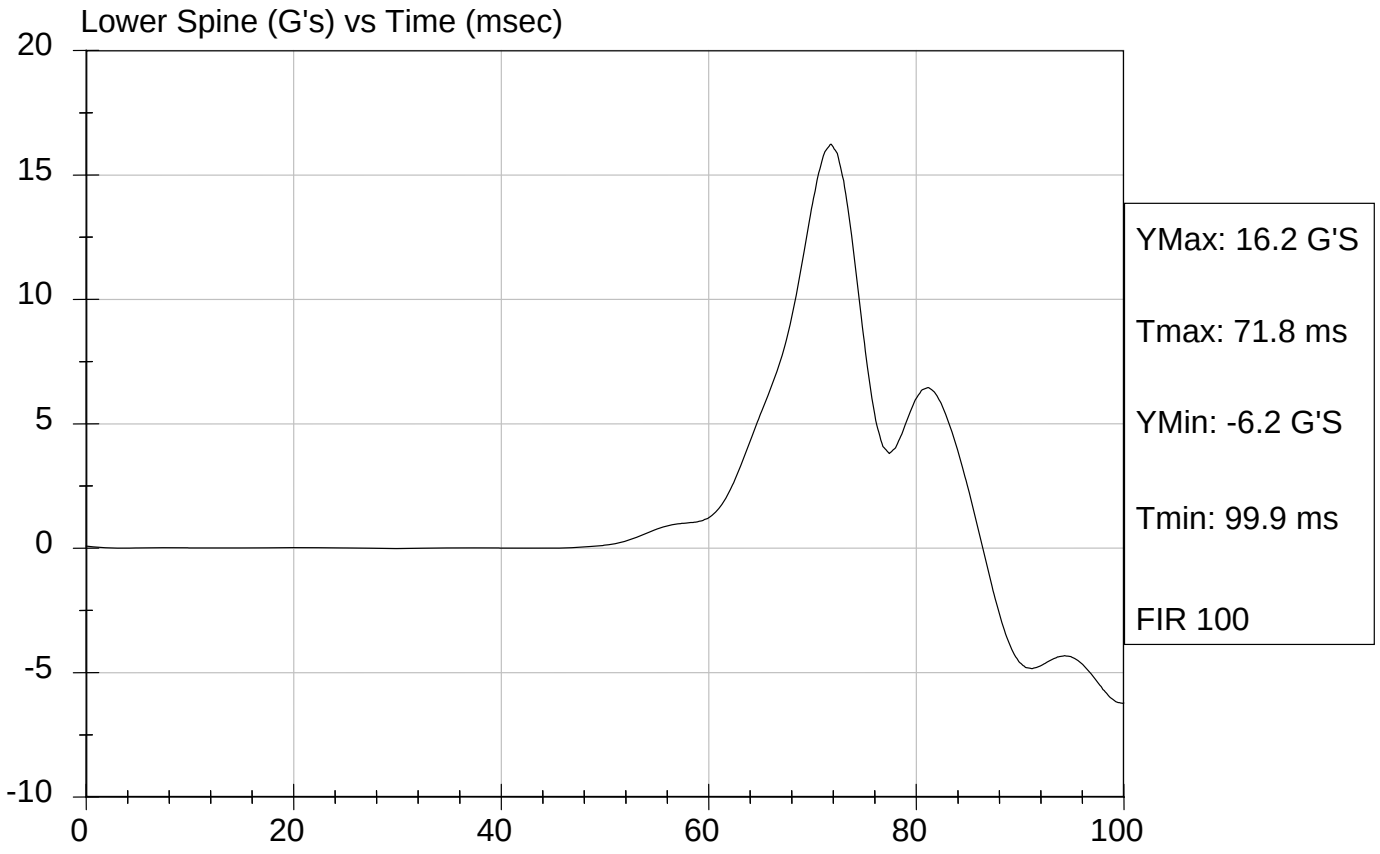
Test Date: 10/2/08
Speed: 14.12 ft/sec, 4.30 m/sec





Test Desc: Thorax Impact
Component ID: D082782

Test Date: 10/2/08
Speed: 14.12 ft/sec, 4.30 m/sec



SID/HIII Calibration Data Sheet

Side Impact Dummy

Pelvis Impact Test

ATD Serial No: 271 **Test I.D:** D082783

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	37	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	43	Pass
		Overall Test Results		Pass

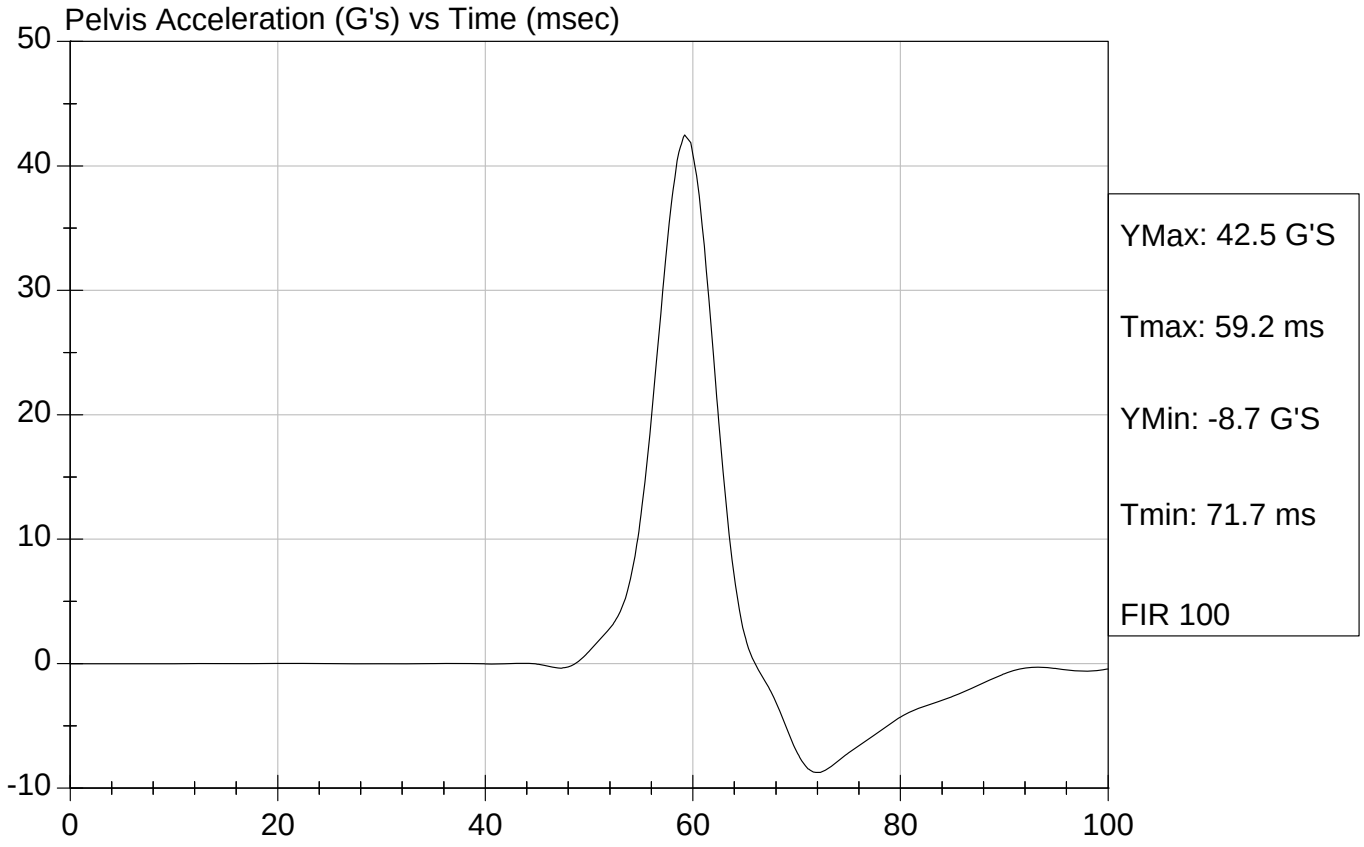
Jessica Hall
Laboratory Technician

10/2/08
Test Date

David Winkelbauer
Approved By

Test Desc: Pelvis Impact
Component ID: D082783

Test Date: 10/2/08
Speed: 14.12 ft/sec, 4.30 m/sec



SID/HIII Calibration Data Sheet

Side Impact Dummy

Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 271 **Test I.D:** D082784

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
Force At 12.7 mm	N	104 -162	138	Pass
Force At 19 mm	N	163 - 222	198	Pass
Force At 25.4 mm	N	222 - 280	272	Pass
Force At 33 mm	N	325 - 391	375	Pass
		Overall Test Results		Pass

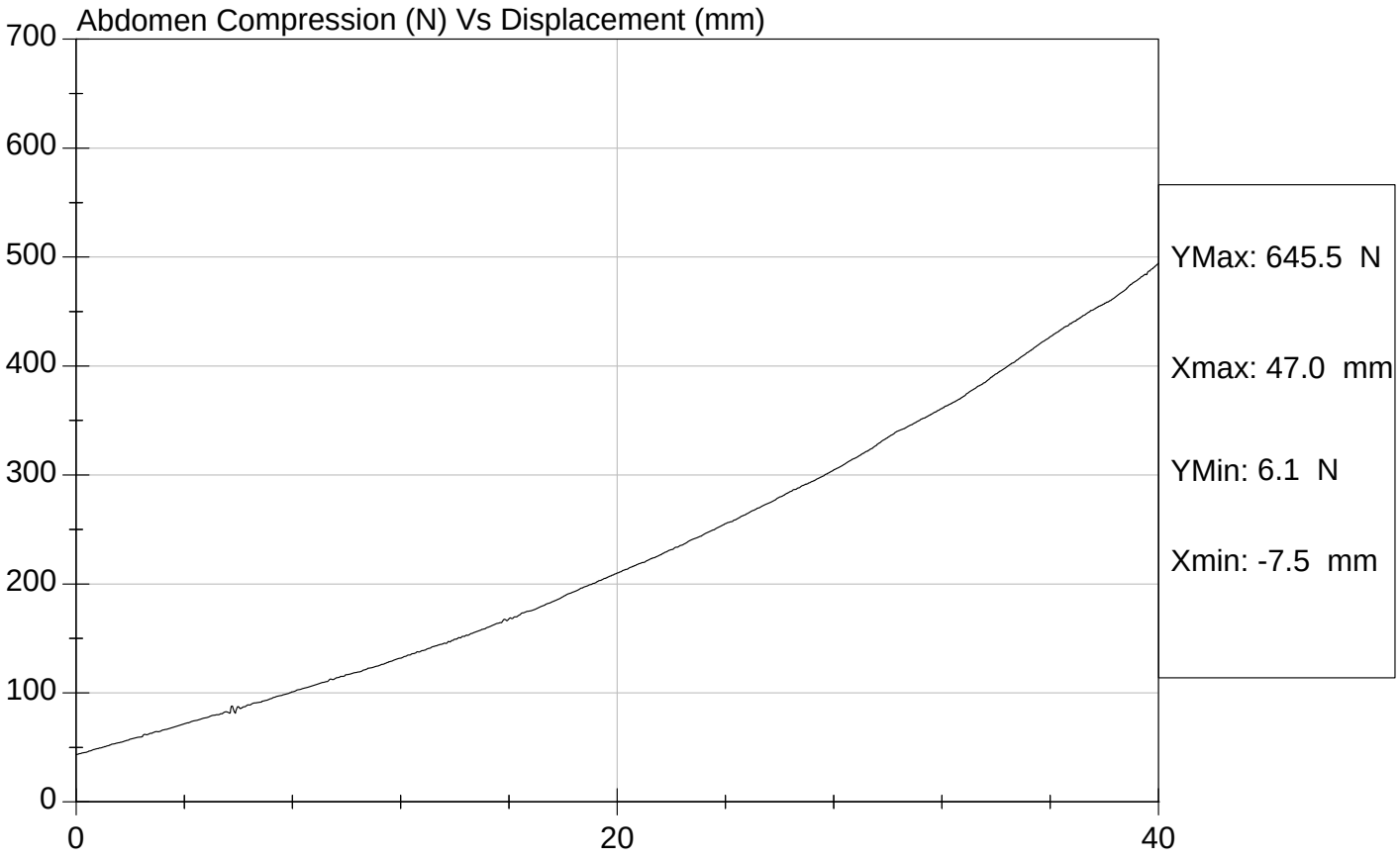
Jessica Hall
Laboratory Technician

10/3/08
Test Date

David Winkelbauer
Approved By

Test Description: Abdomen Compression Test Date: 10/3/08

Component: D082784 Speed: 0 ft/sec, 0 m/sec



SID/HIII Calibration Data Sheet

Side Impact Dummy

Lumbar Flexion Calibration

ATD Serial No: 271 **Test I.D:** D082785

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	141.8	Pass
Force At 30 deg	N	151.2 - 204.6	190.9	Pass
Force At 40 deg	N	204.6 - 258.0	235.3	Pass
Return Angle	Deg	12 Maximum	4	Pass
		Overall Test Results		Pass

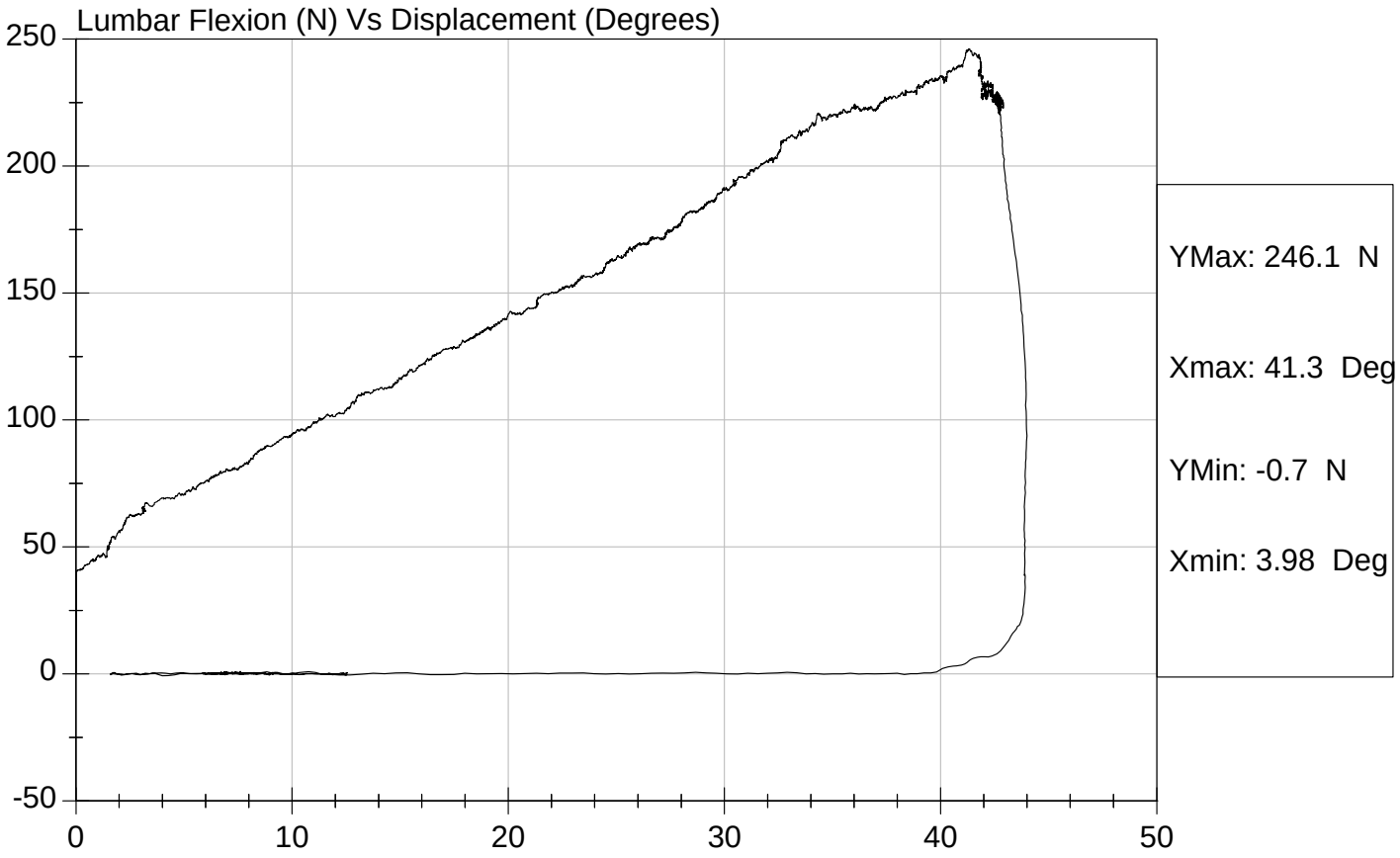
Jessica Hall
Laboratory Technician

10/3/08
Test Date

David Winkelbauer
Approved By

Test Description: Lumbar Flexion | Test Date: 10/3/08

Component: D082785 | Speed: 0 ft/sec, m/sec



SID/HIII Calibration Data Sheet

Side Impact Dummy

Neck Pendulum Test

ATD Serial No: 271 **Test I.D:** D082789

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	35	Pass
Impact Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.52	Pass
	20 msec	m/s	4.12 to 5.10	4.80	Pass
	30 msec	m/s	5.73 to 7.01	6.49	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.60	Pass
Midsaggital Plane Max Rotation		deg	66 to 82	73	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	59	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	76	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	49	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	6	Pass

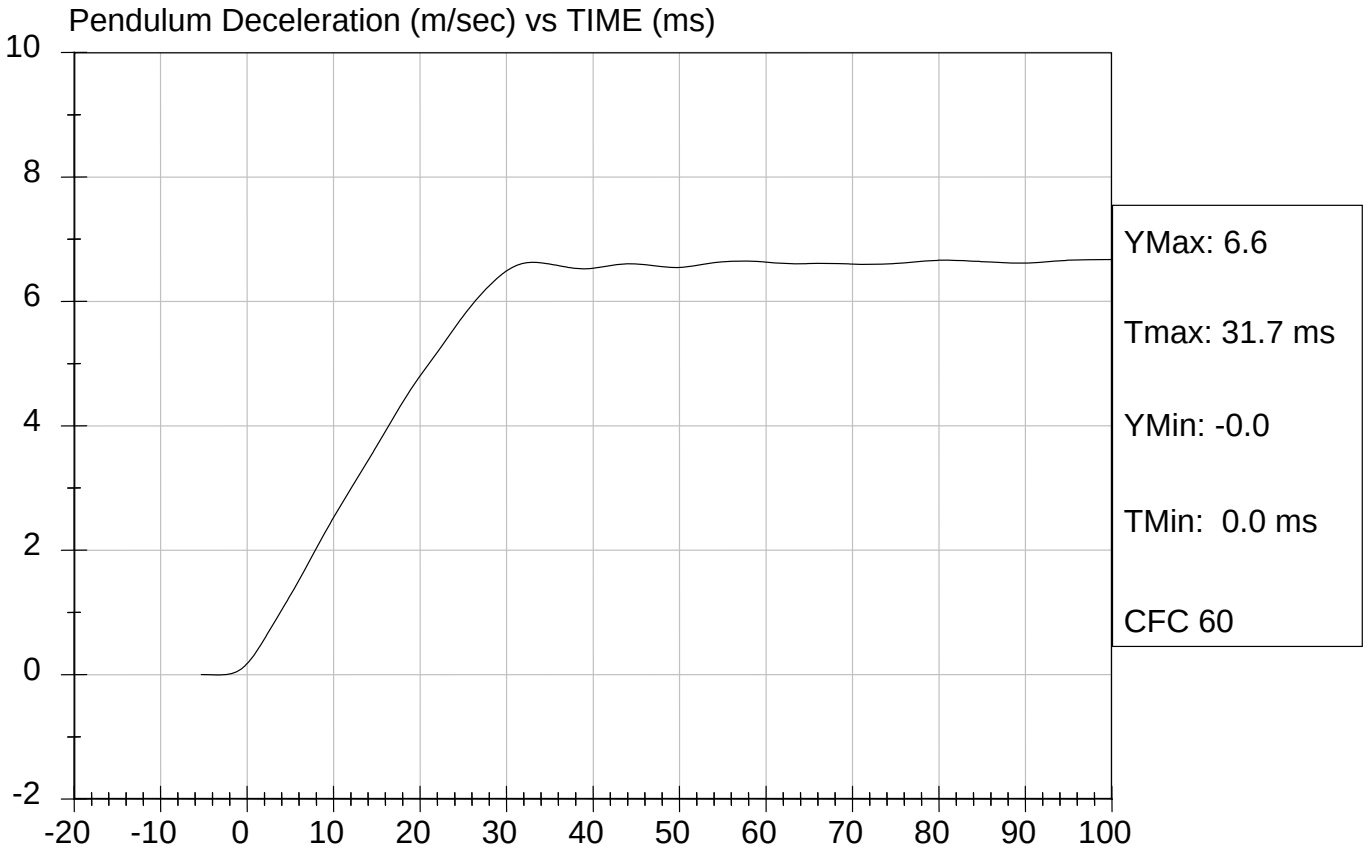
Jessica Hall
Laboratory Technician

10/3/08
Test Date

David Winkelbauer
Approved By

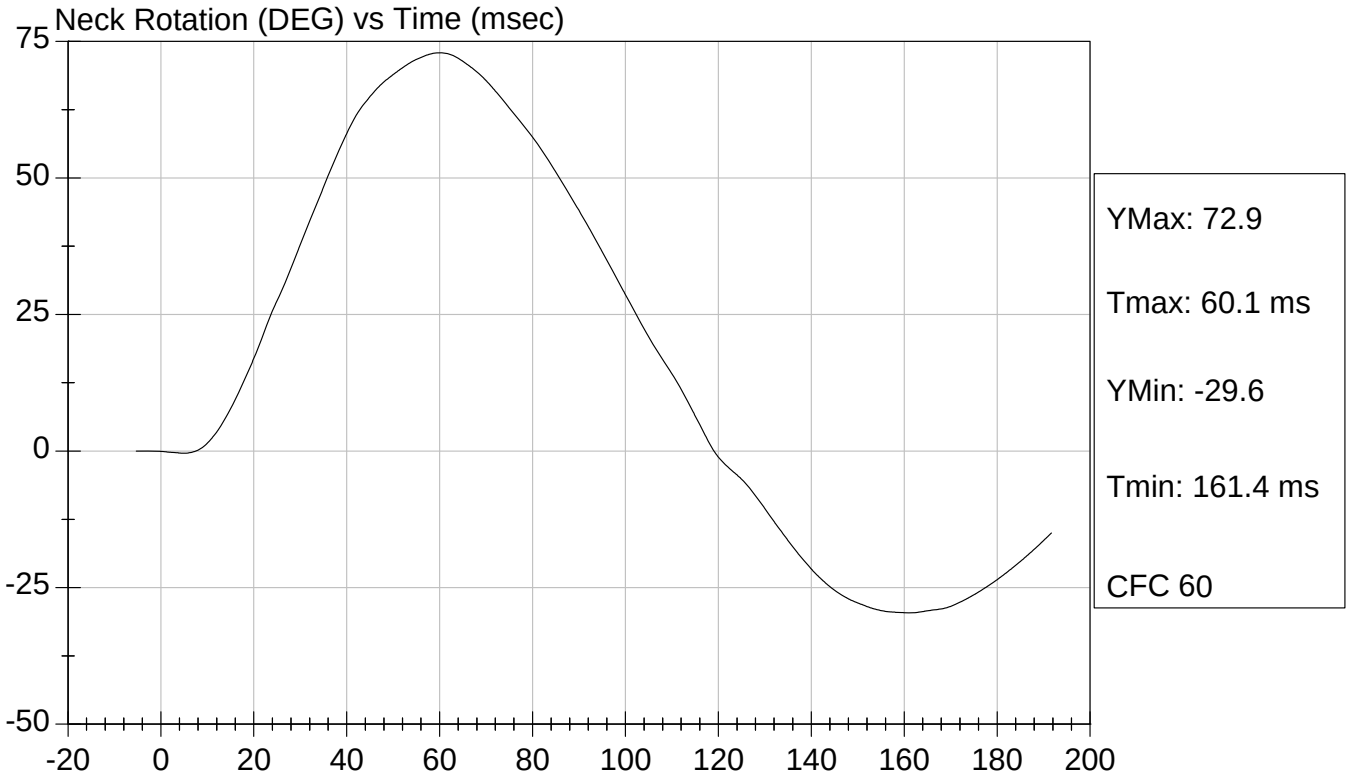
Test Desc: Neck Bending
Component ID: D082789

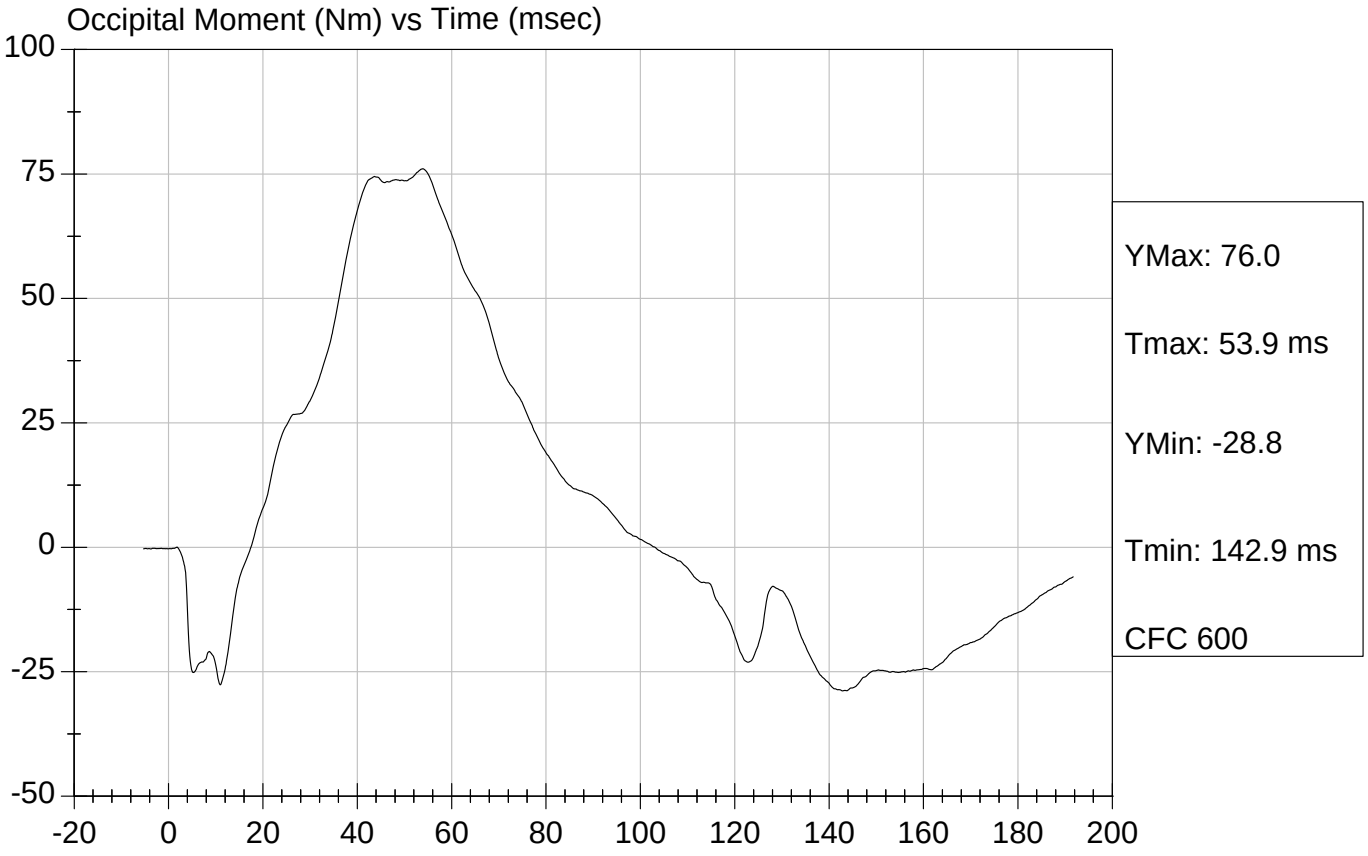
Test Date: 10/3/08
Speed: 23.15 ft/sec, 7.06 m/sec



Test Desc: Neck Bending
Component ID: D082789

Test Date: 10/3/08
Speed: 23.15 ft/sec, 7.06 m/sec





SID/HIII Calibration Data Sheet

Side Impact Dummy

Inspection Checklist

ATD Serial No: 271

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

Jessica Hall
Laboratory Technician

9/24/08
Test Date

David Winkelbauer
Approved By

CERTIFICATION DATA

Dummy Serial Number: 272

Calibration Test Results Summary

Dummy Serial Number: 272

Pre-Test Calibration

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

SID/HIII Calibration Data Sheet

Side Impact Dummy

External Measurements

ATD Serial No: 272 **Test I.D:** D08252

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

Jessica Gall
Laboratory Technician

8/29/08
Test Date

David Winkelbauer
Approved By

SID/HIII Calibration Data Sheet

Side Impact Dummy

Head Drop Calibration (Lateral)

ATD Serial No: 272 **Test I.D:** D082721

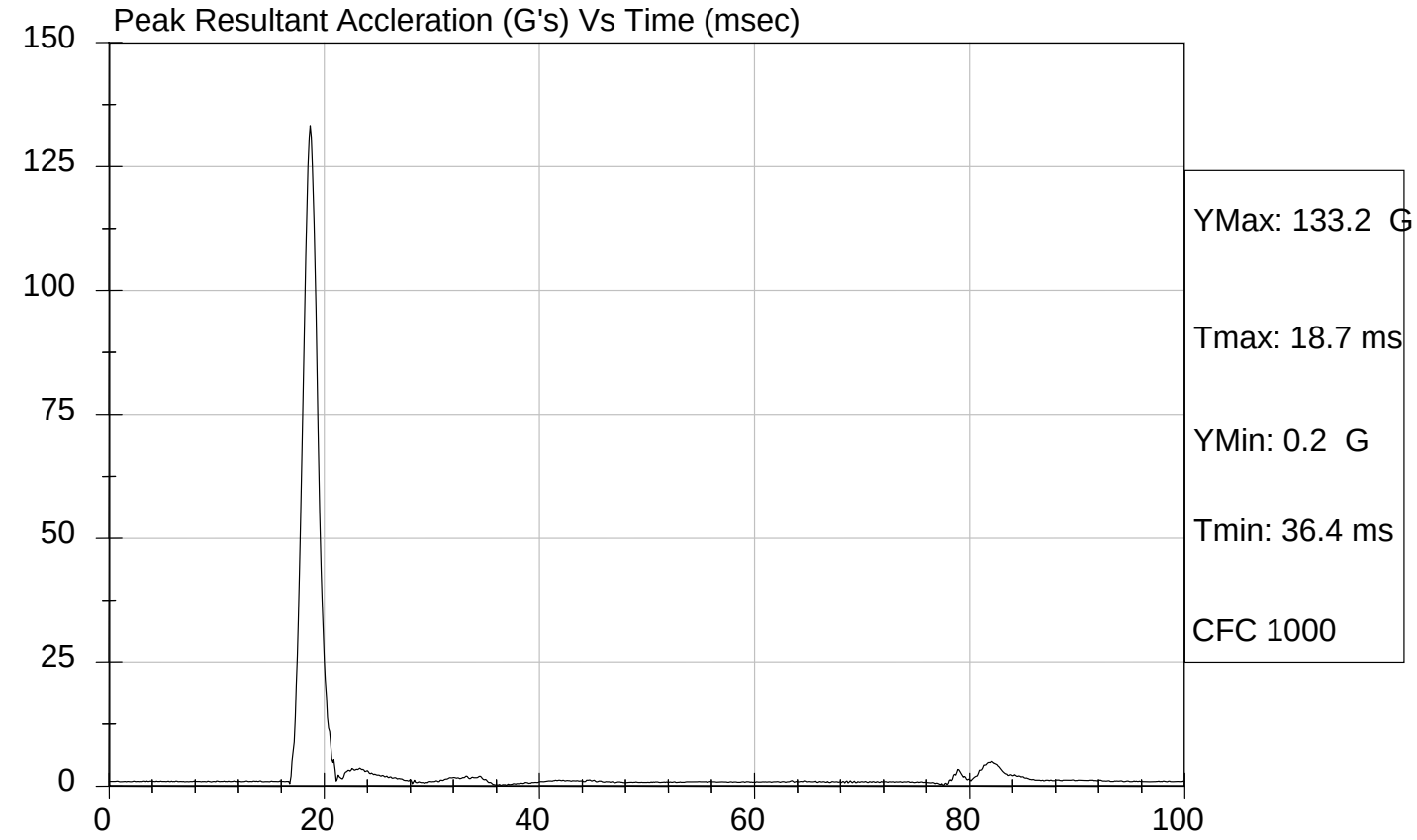
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Peak Resultant Acceleration	G's	120 to 150	133	Pass
Is Resultant Curve Unimodal?	N/A	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-14.4	Pass
		Overall Test Results		Pass

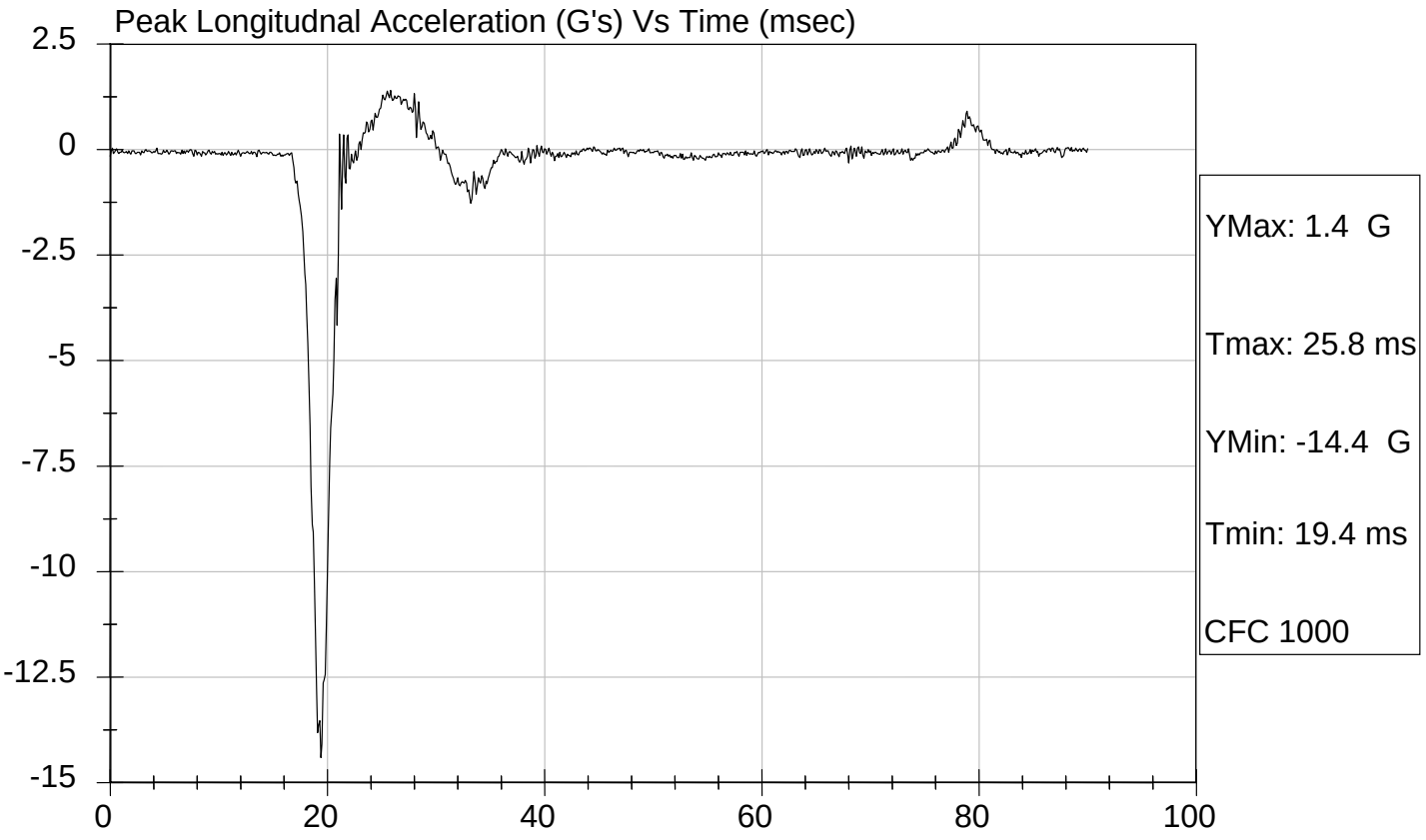
Jessica Gall
Laboratory Technician

9/24/08
Test Date

David Winkelbauer
Approved By

	Test Description: Head Drop	Test Date: 9/24/08
	Component: D082721	Speed: 0 ft/s, 0 m/s





SID/HIII Calibration Data Sheet

Side Impact Dummy

Thorax Impact Test

ATD Serial No: 272 **Test I.D:** D082722

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Probe Velocity	m/s	4.22 - 4.31	4.30	Pass
Upper Rib	G's	37 - 46	40	Pass
Lower Rib	G's	37 - 46	37	Pass
Lower Spine	G's	15 - 22	18	Pass
		Overall Test Results		Pass

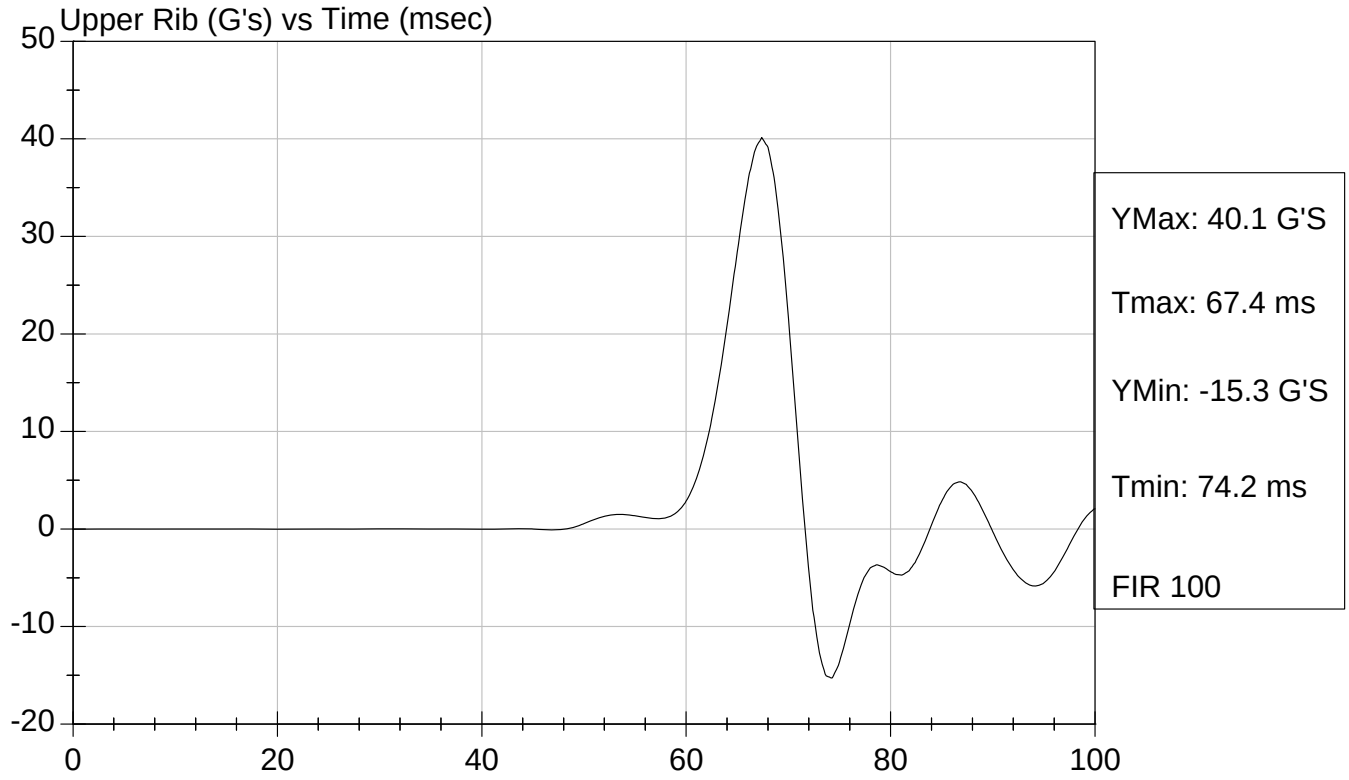
Jessica Gall
Laboratory Technician

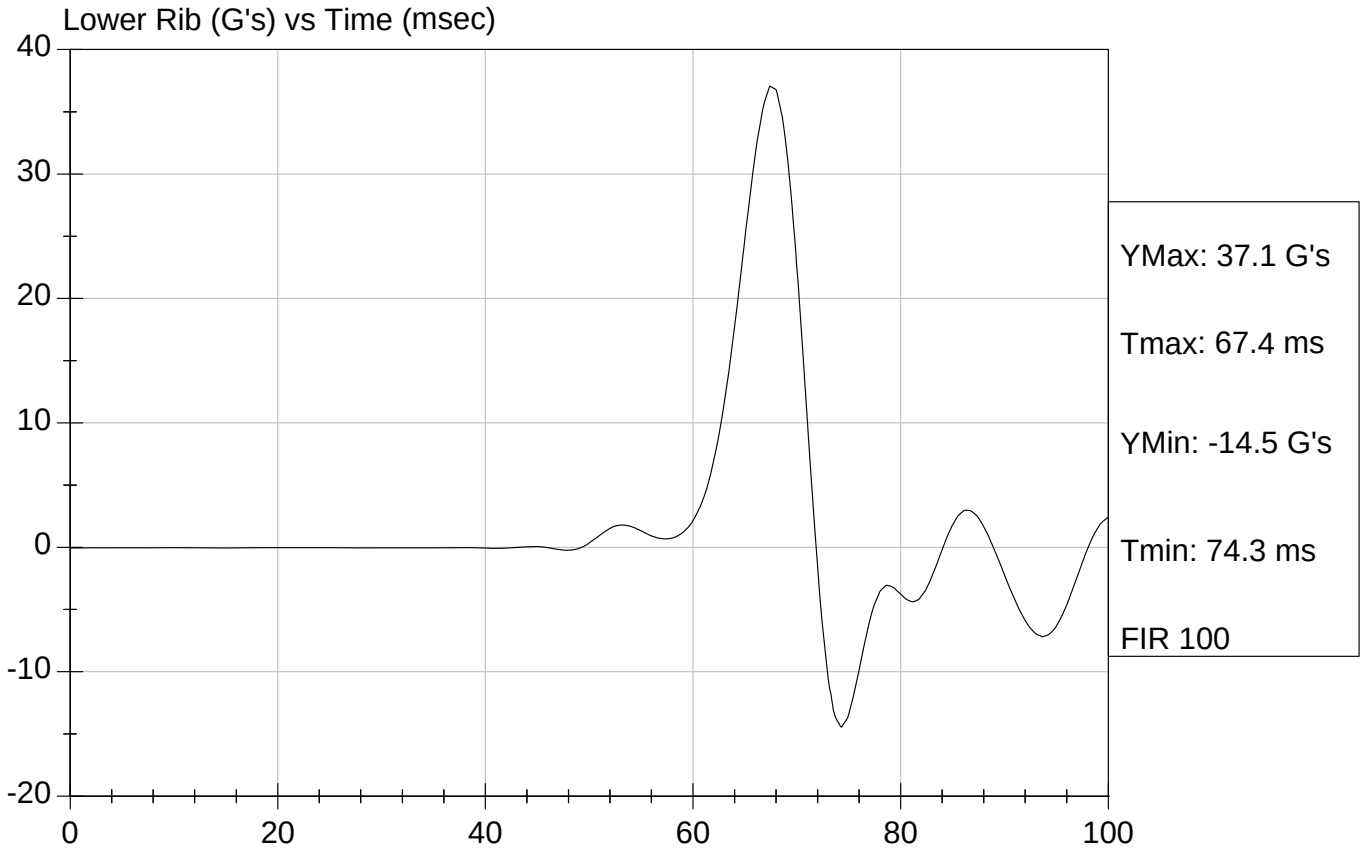
9/24/08
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D082722

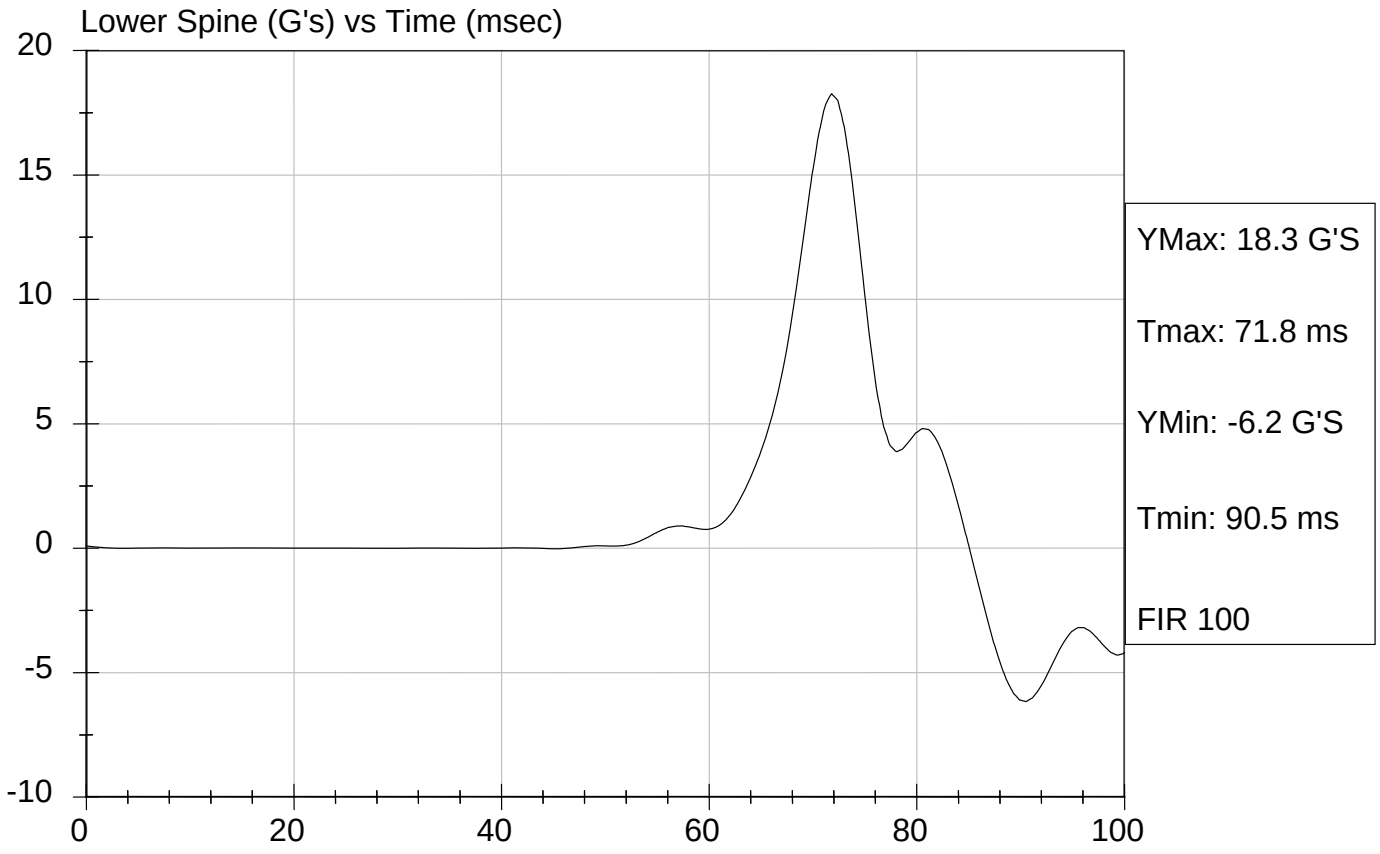
Test Date: 9/24/08
Speed: 14.12 ft/sec, 4.30 m/sec





Test Desc: Thorax Impact
Component ID: D082722

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



SID/HIII Calibration Data Sheet

Side Impact Dummy

Pelvis Impact Test

ATD Serial No: 272 **Test I.D:** D082723

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	43	Pass
		Overall Test Results		Pass

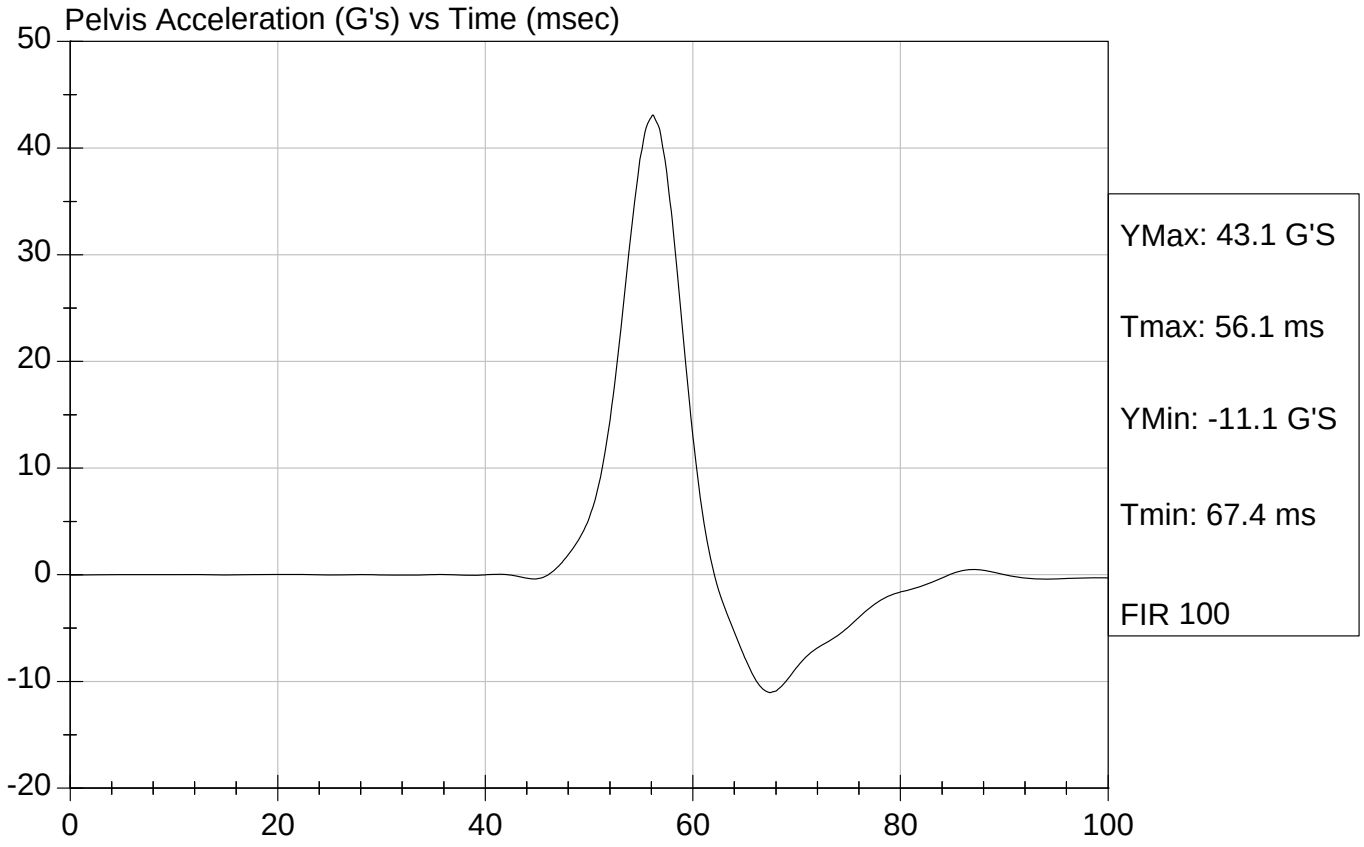
Jessica Hall
Laboratory Technician

9/24/08
Test Date

David Winkelbauer
Approved By

Test Desc: Pelvis Impact
Component ID: D082723

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



SID/HIII Calibration Data Sheet

Side Impact Dummy

Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 272 **Test I.D:** D082724

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

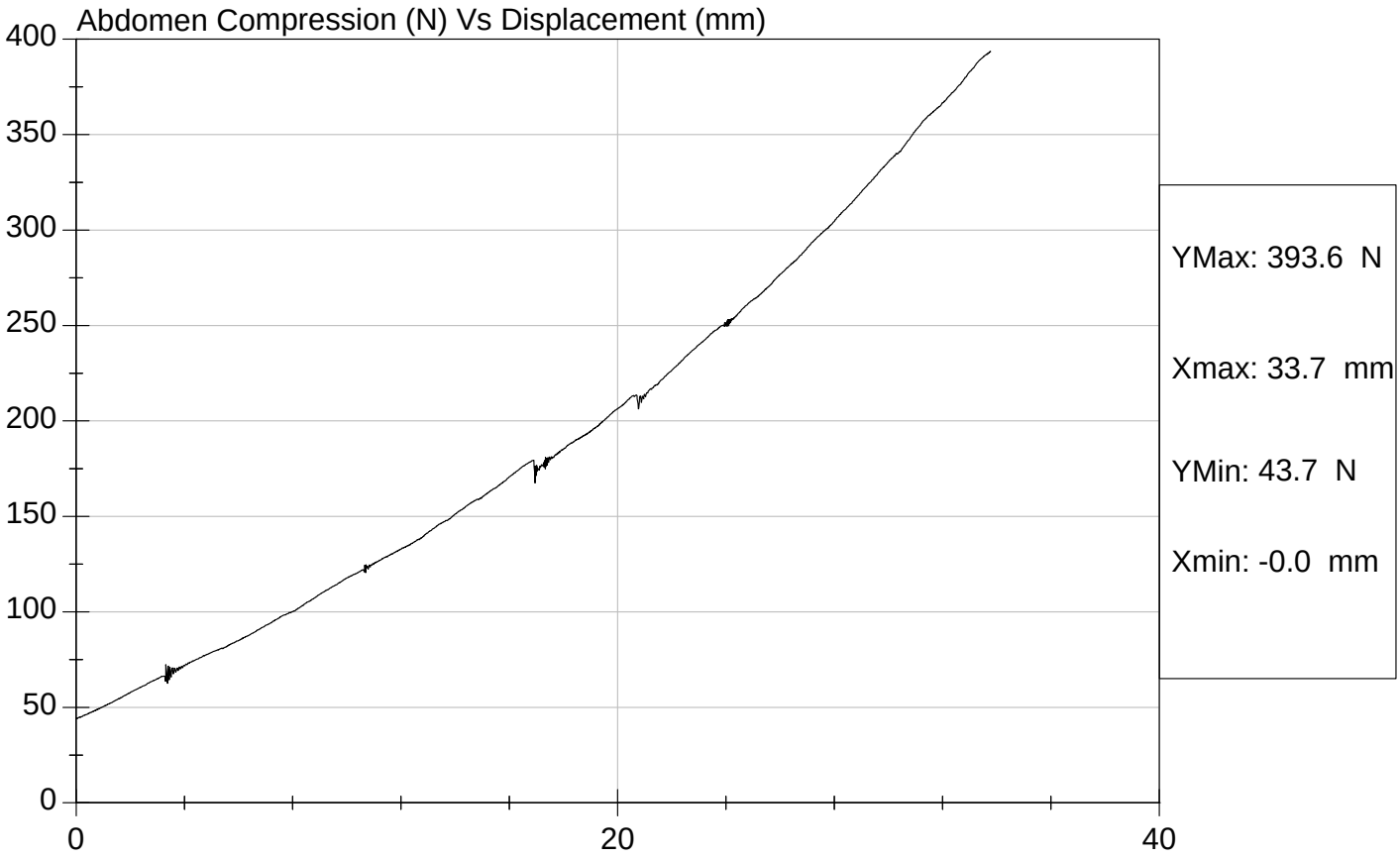
Jessica Hall
Laboratory Technician

9/23/08
Test Date

David Winkelbauer
Approved By

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

Component: D082724 Speed: 0 ft/sec, 0 m/sec



SID/HIII Calibration Data Sheet

Side Impact Dummy

Lumbar Flexion Calibration

ATD Serial No: 272 **Test I.D:** D082725

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

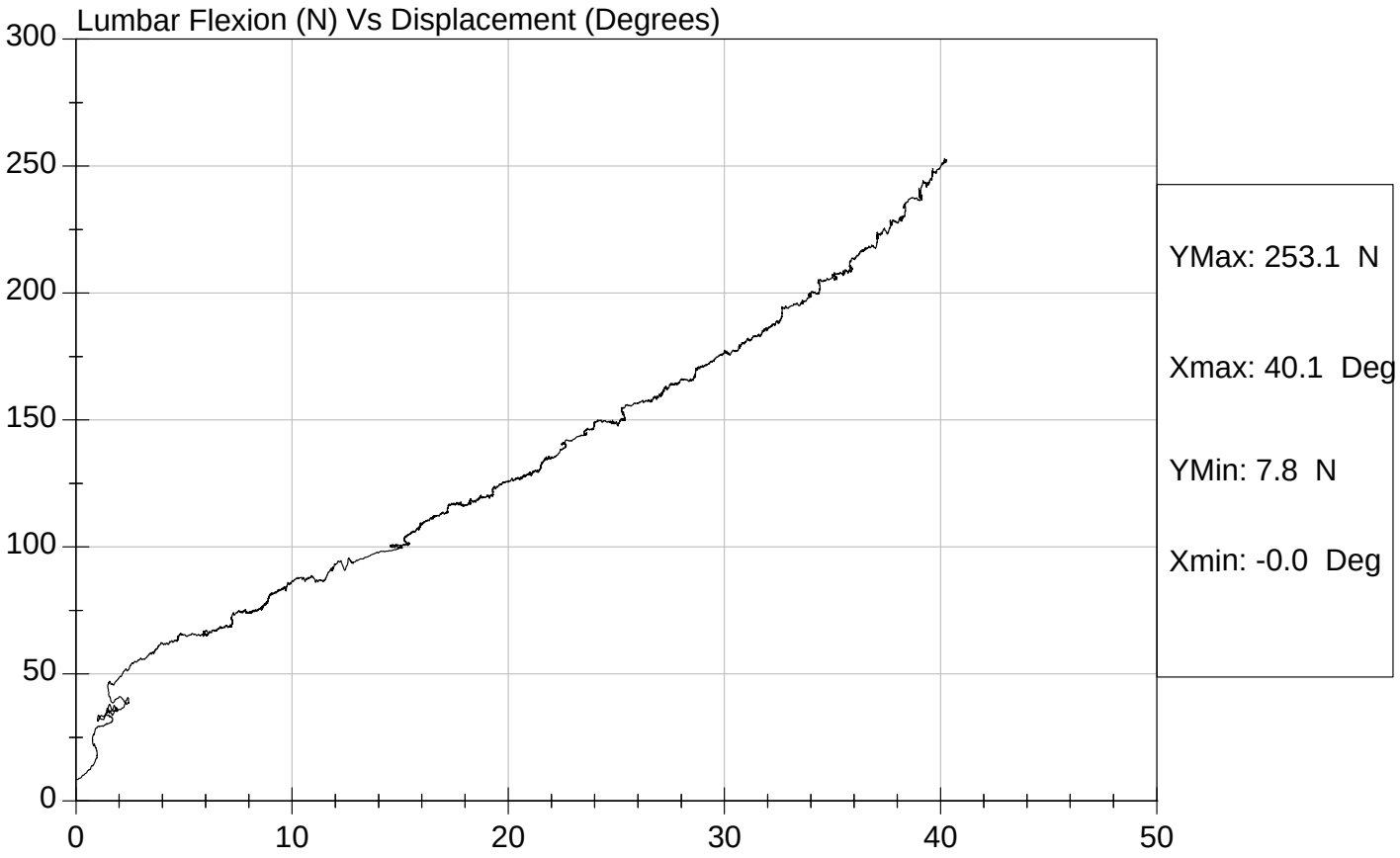
Jessica Hall
Laboratory Technician

9/23/08
Test Date

David Winkelbauer
Approved By

Test Description: Lumbar Flexion | Test Date: 9/23/08

Component: D082725 | Speed: 0 ft/sec, 0 m/sec



SID/HIII Calibration Data Sheet

Side Impact Dummy

Neck Pendulum Test

ATD Serial No: 272 **Test I.D:** D082729

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity		%	10 to 70	42	Pass
Impact Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.51	Pass
	20 msec	m/s	4.12 to 5.10	5.00	Pass
	30 msec	m/s	5.73 to 7.01	6.61	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.59	Pass
Midsaggital Plane Max Rotation		deg	66 to 82	70	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	58	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	76	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	51	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	9	Pass

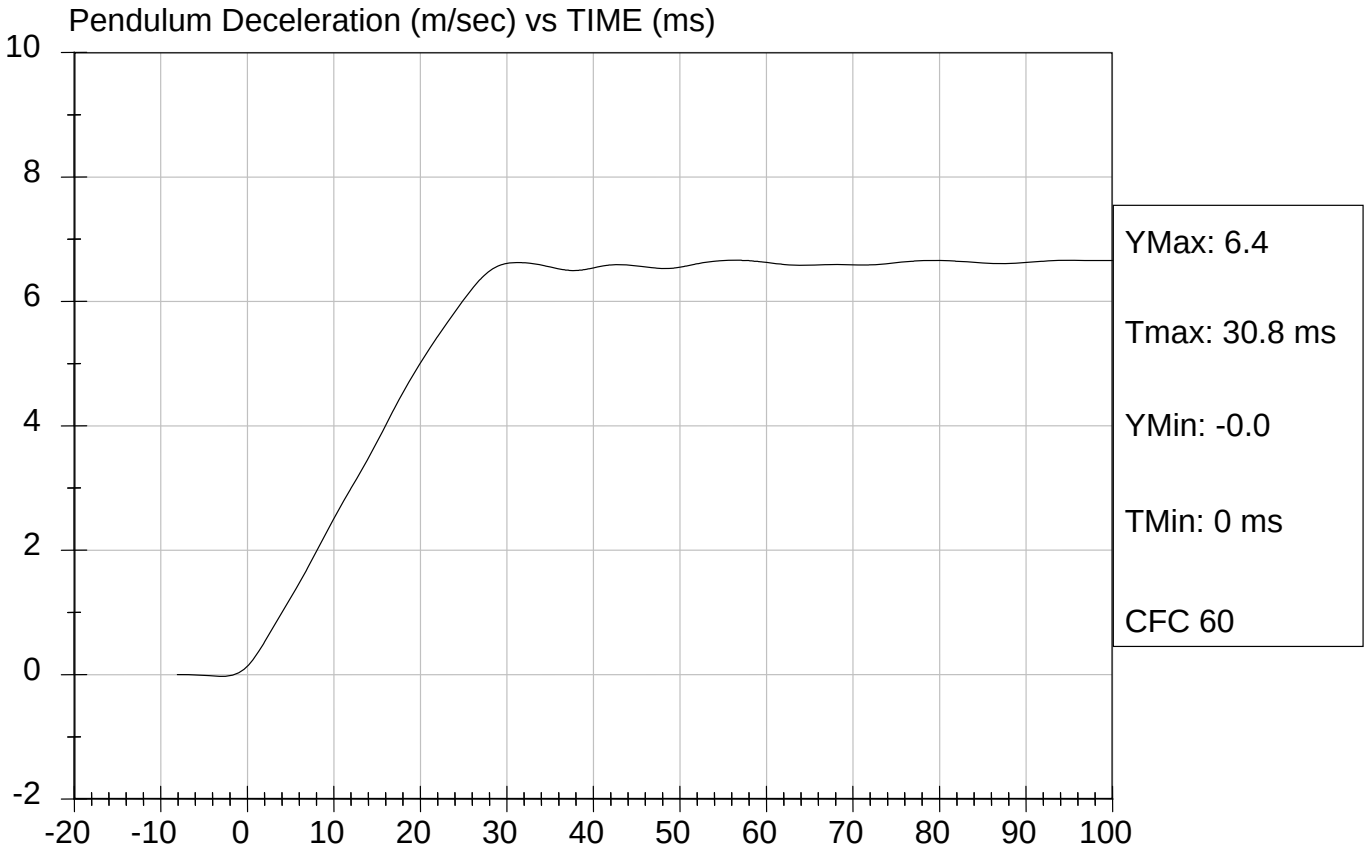
Jessica Hall
Laboratory Technician

9/24/08
Test Date

David Winkelbauer
Approved By

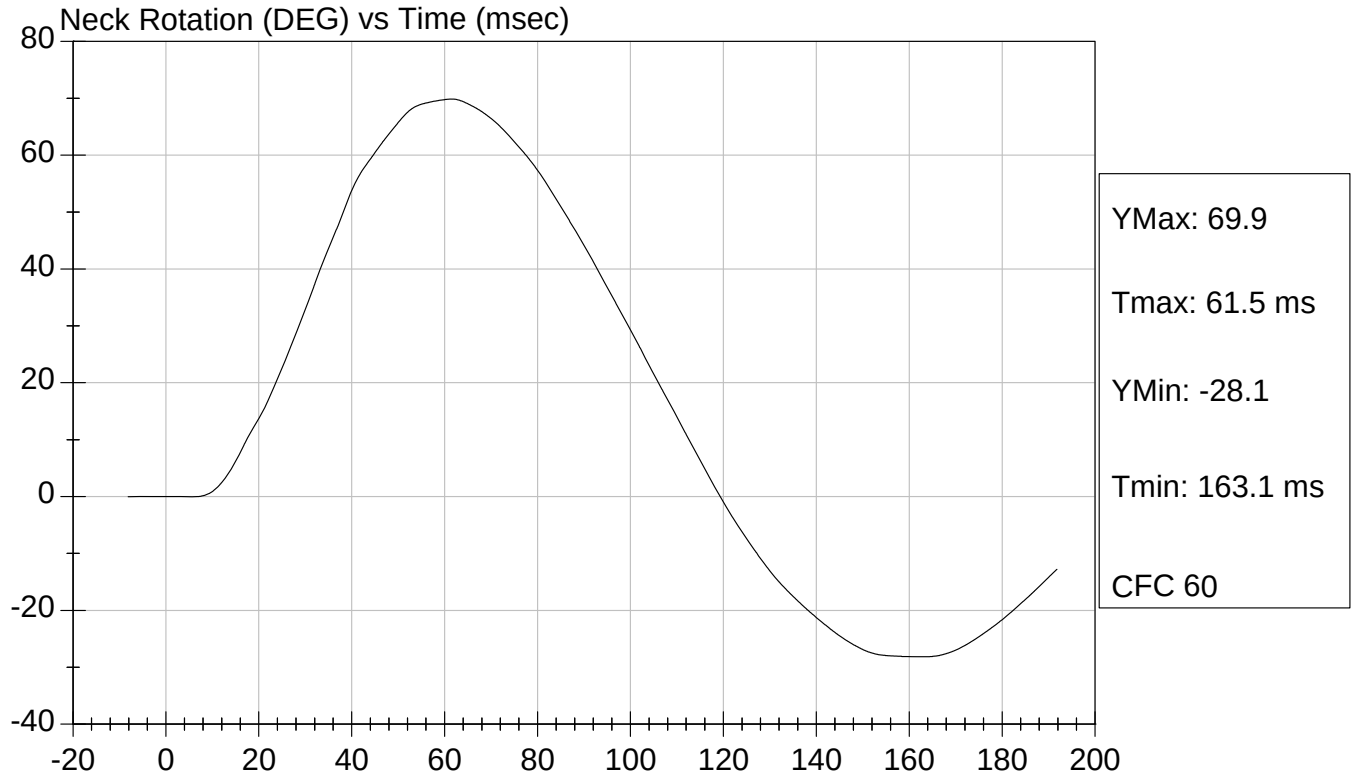
Test Desc: Neck Bending
Component ID: D082729

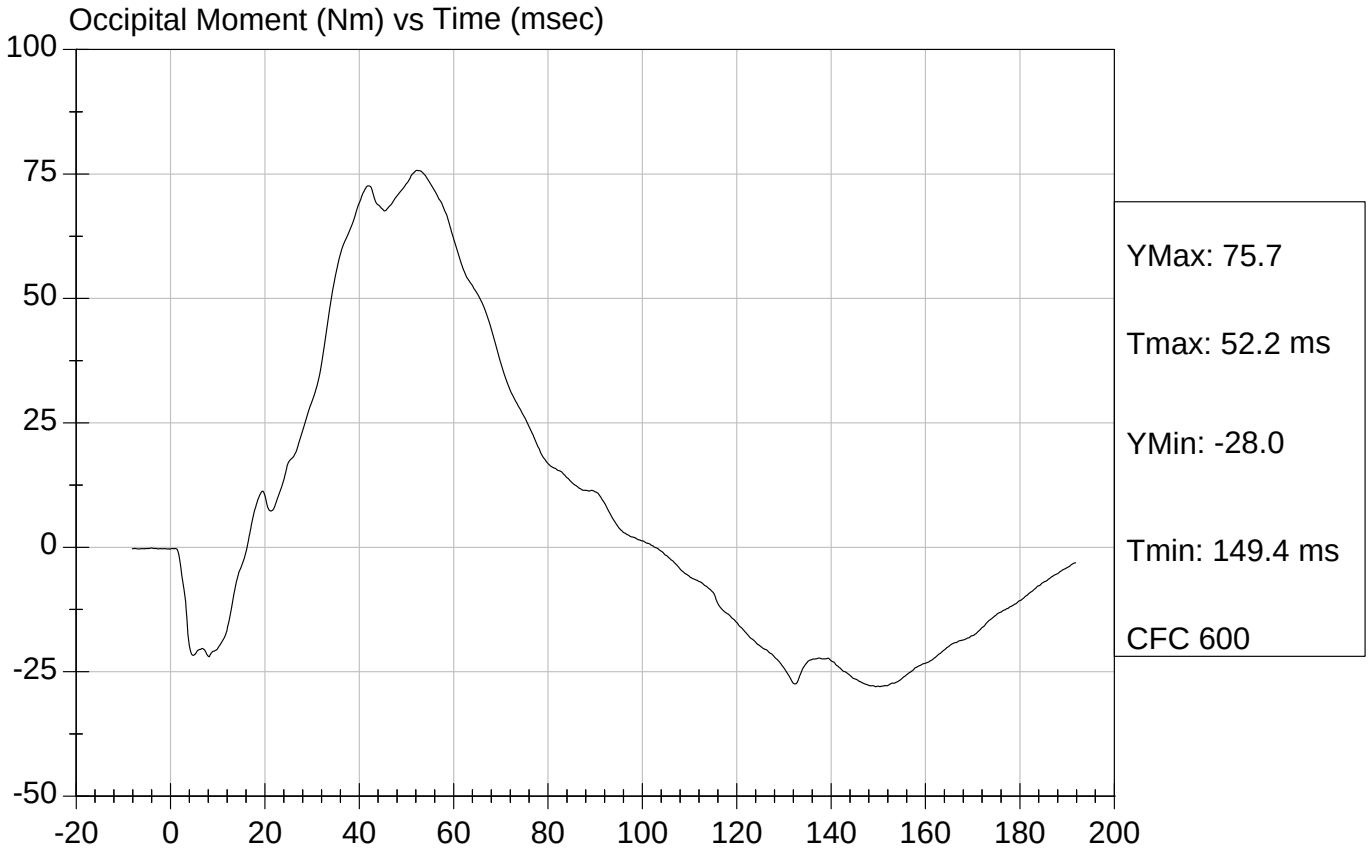
Test Date: 9/24/08
Speed: 23.15 ft/sec, 7.06 m/sec



Test Desc: Neck Bending
Component ID: D082729

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





Calibration Test Results Summary

Dummy Serial Number: 272

Post-Test Calibration

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

SID/HIII Calibration Data Sheet

Side Impact Dummy

Head Drop Calibration (Lateral)

ATD Serial No: 272 **Test I.D:** D082791

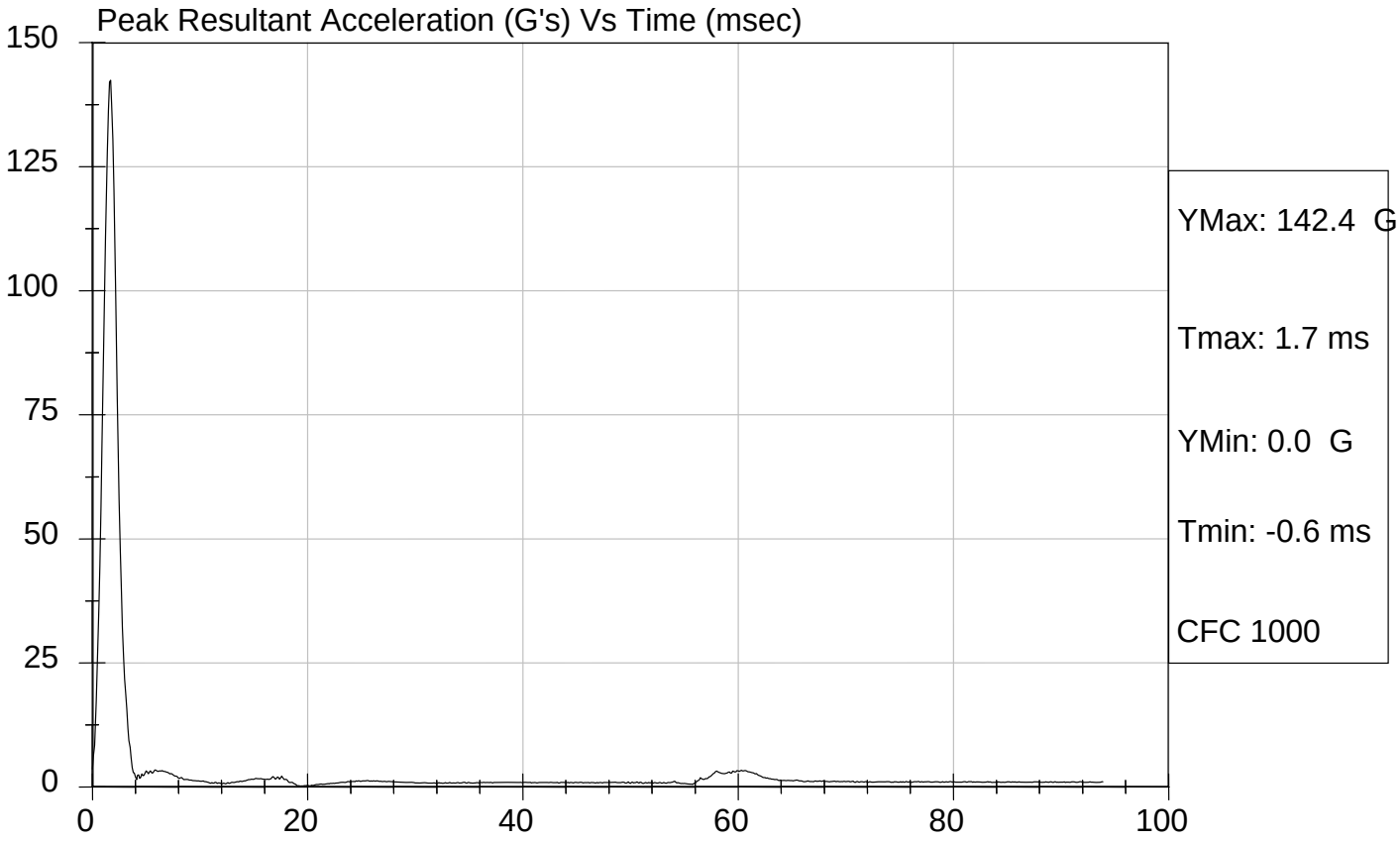
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Peak Resultant Acceleration	G's	120 to 150	142	Pass
Is Resultant Curve Unimodal?	N/A	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-8.1	Pass
		Overall Test Results		Pass

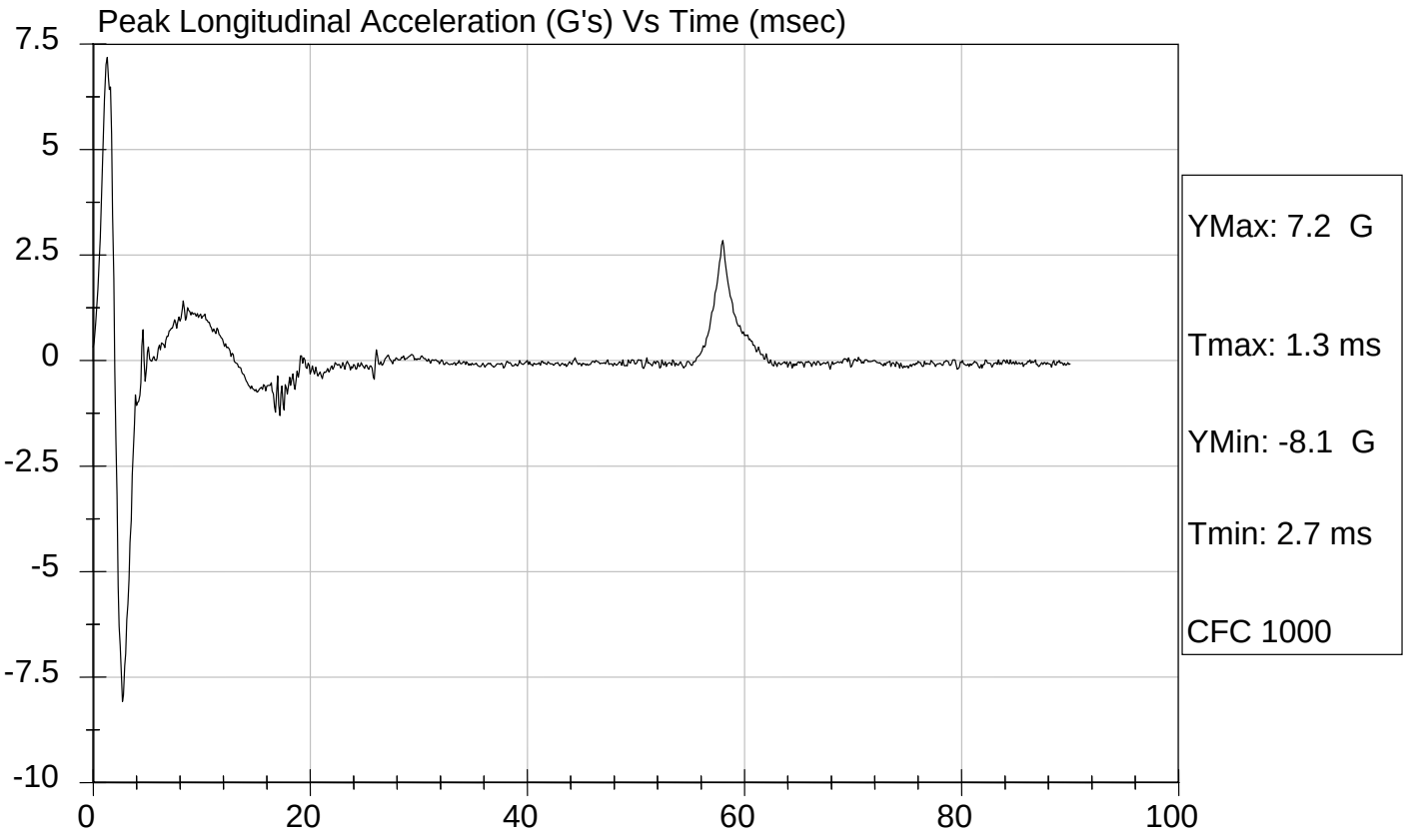
Jessica Hall
Laboratory Technician

10/2/08
Test Date

David Winkelbauer
Approved By

	Test Description: Head Drop	Test Date: 10/2/08
	Component: D082791	Speed: 0 ft/s, 0 m/s





SID/HIII Calibration Data Sheet

Side Impact Dummy

Thorax Impact Test

ATD Serial No: 272 **Test I.D:** D082792

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	38	Pass
Probe Velocity	m/s	4.22 - 4.31	4.30	Pass
Upper Rib	G's	37 - 46	40	Pass
Lower Rib	G's	37 - 46	38	Pass
Lower Spine	G's	15 - 22	19	Pass
		Overall Test Results		Pass

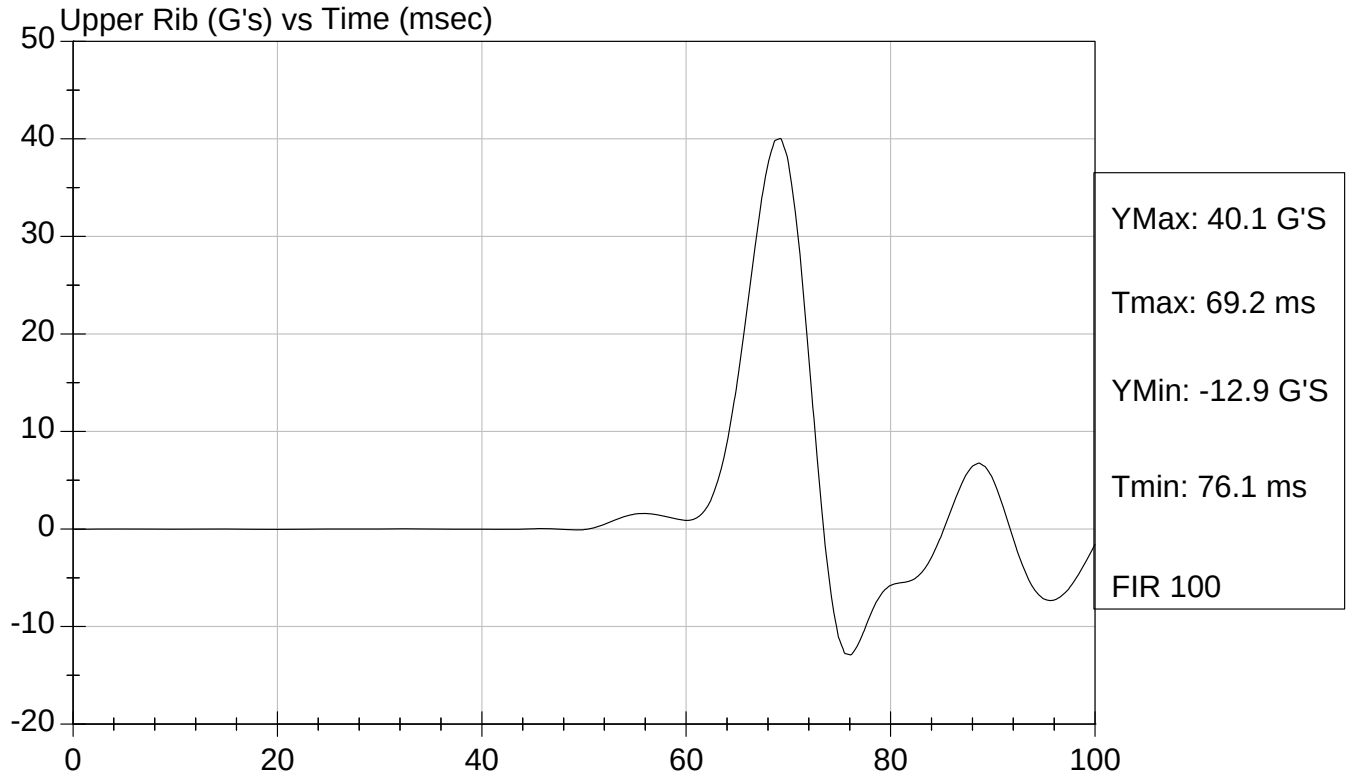
Jessica Gall
Laboratory Technician

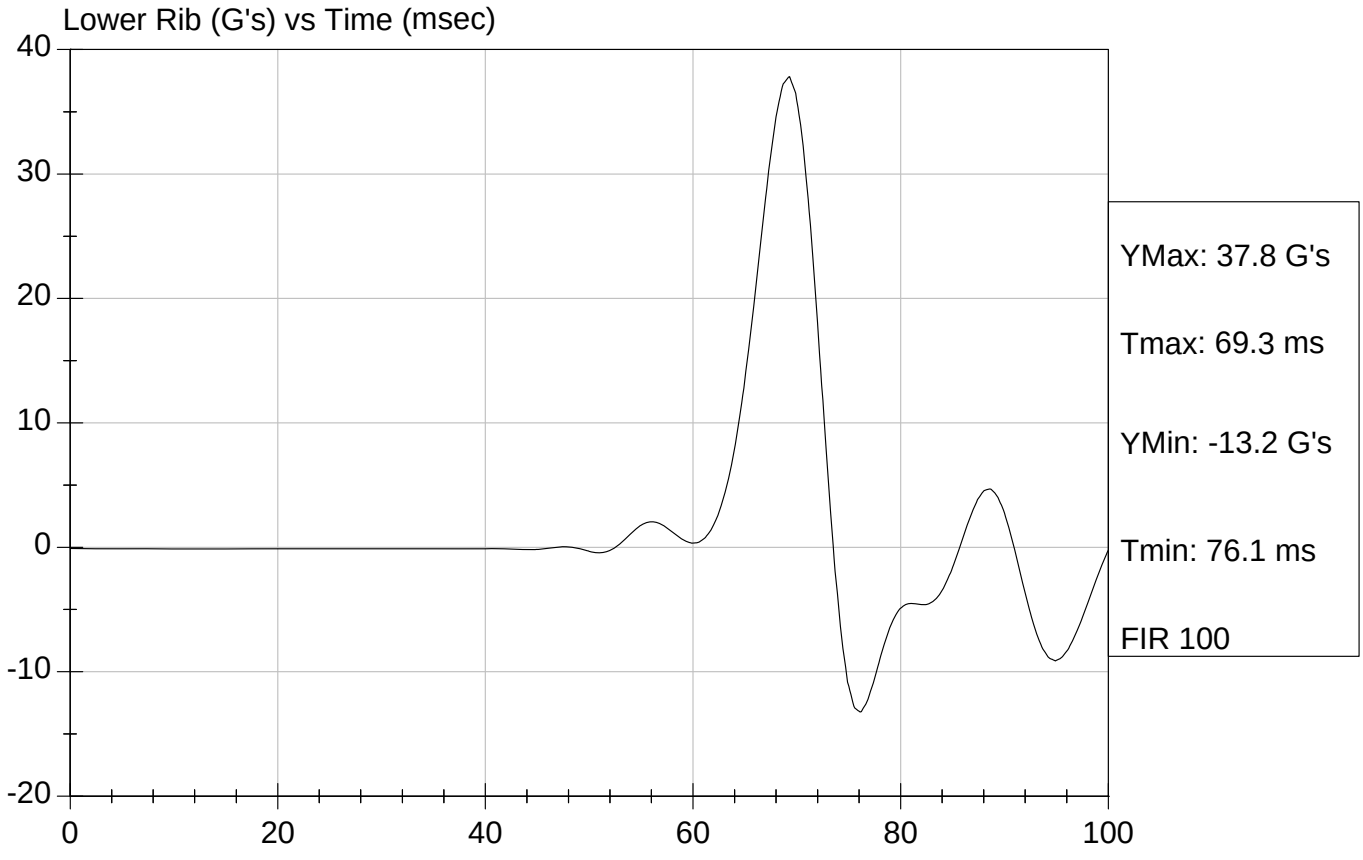
10/2/08
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Component ID: D082792

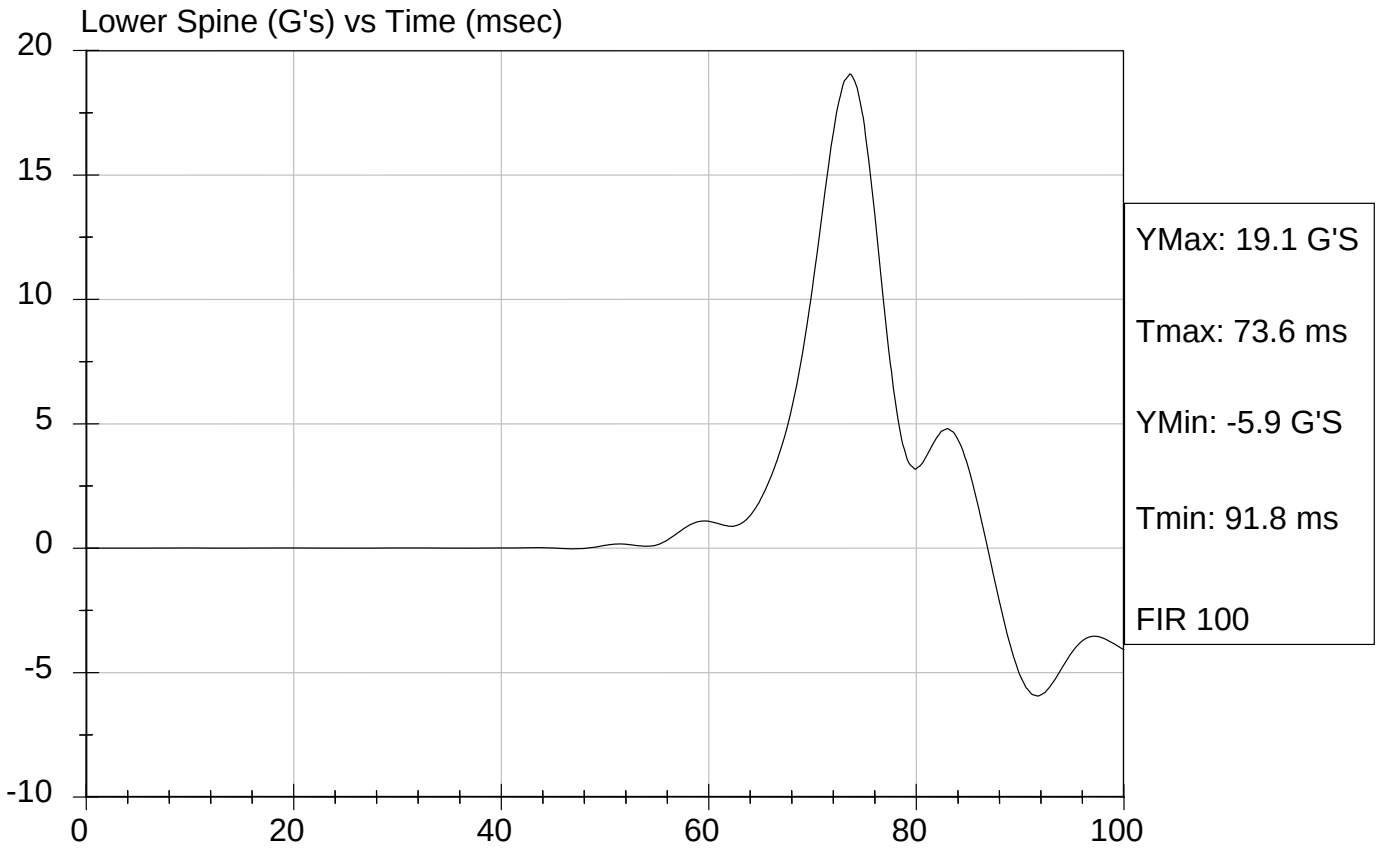
Test Date: 10/2/08
Speed: 14.12 ft/sec, 4.30 m/sec





Test Desc: Thorax Impact
Component ID: D082792

Test Date: 10/2/08
Speed: 14.12 ft/sec, 4.30 m/sec



SID/HIII Calibration Data Sheet

Side Impact Dummy

Pelvis Impact Test

ATD Serial No: 272 **Test I.D:** D082793

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	38	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	44	Pass
		Overall Test Results		Pass

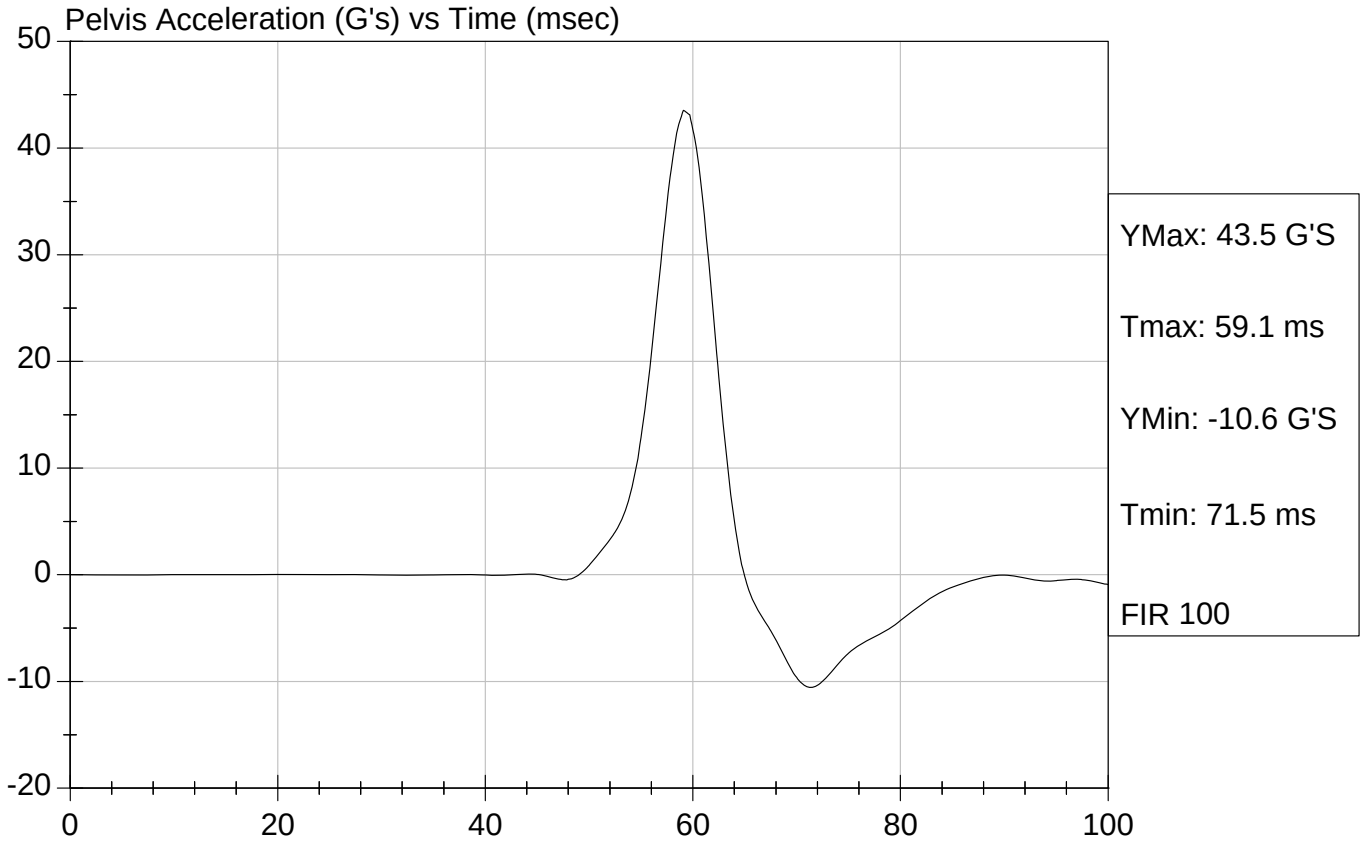
Jessica Gall
Laboratory Technician

10/2/08
Test Date

David Winkelbauer
Approved By

Test Desc: Pelvis Impact
Component ID: D082793

Test Date: 10/2/08
Speed: 14.12 ft/sec, 4.30 m/sec



SID/HIII Calibration Data Sheet

Side Impact Dummy

Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 272 **Test I.D:** D082794

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
Force At 12.7 mm	N	104 -162	131	Pass
Force At 19 mm	N	163 - 222	177	Pass
Force At 25.4 mm	N	222 - 280	237	Pass
Force At 33 mm	N	325 - 391	327	Pass
		Overall Test Results		Pass

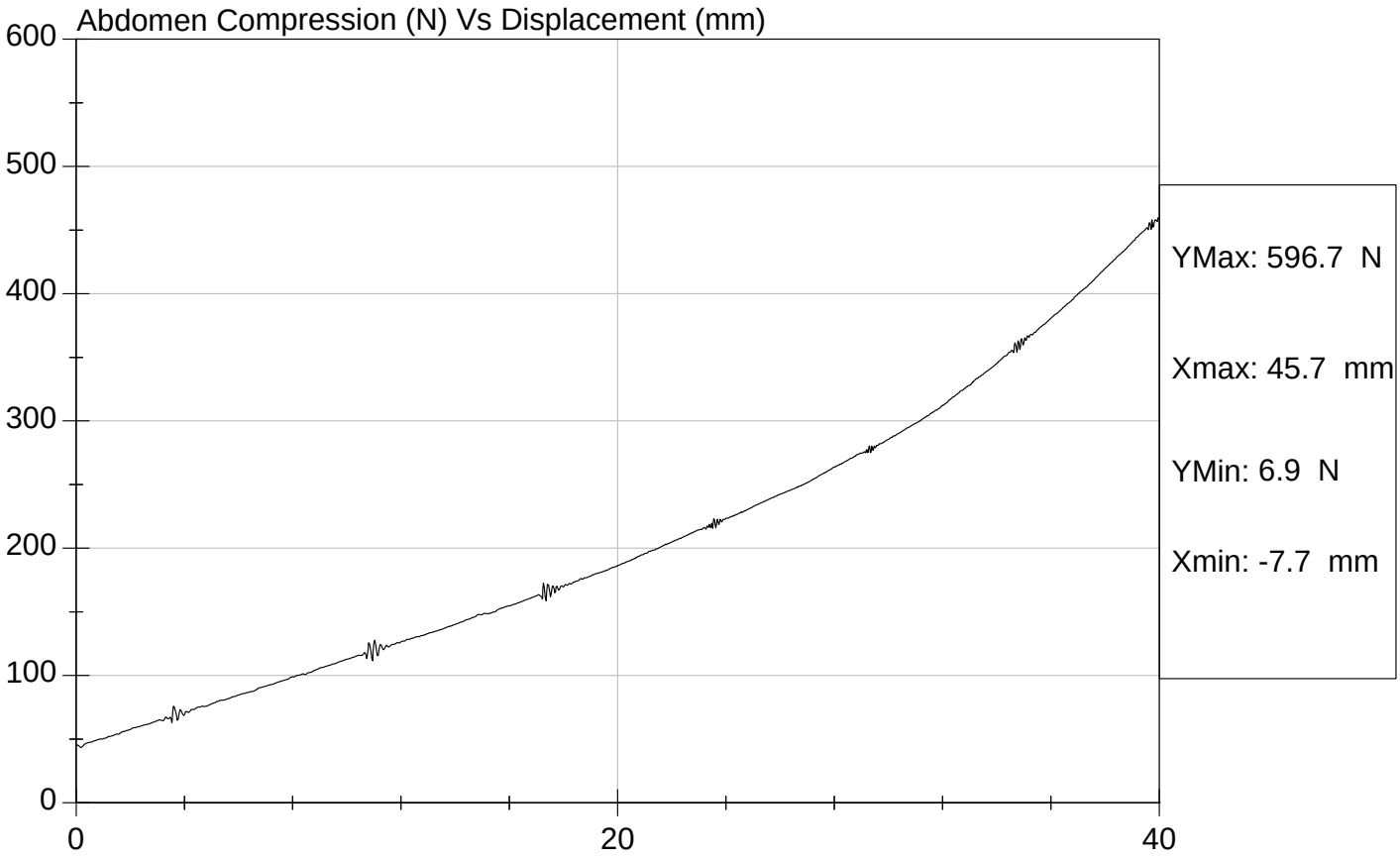
Jessica Gall
Laboratory Technician

10/3/08
Test Date

David Winkelbauer
Approved By

Test Description: Abdomen Compression Test Date: 10/3/08

Component: D082794 Speed: 0 ft/sec, 0 m/sec



SID/HIII Calibration Data Sheet

Side Impact Dummy

Lumbar Flexion Calibration

ATD Serial No: 272 **Test I.D:** D082795

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	32	Pass
Force At 0 deg	N	0 - 26.7	0	Pass
Force At 20 deg	N	97.9 - 151.2	114.7	Pass
Force At 30 deg	N	151.2 - 204.6	160.0	Pass
Force At 40 deg	N	204.6 - 258.0	238.4	Pass
Return Angle	Deg	12 Maximum	4	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

10/3/08
Test Date

David Winkelbauer
Approved By

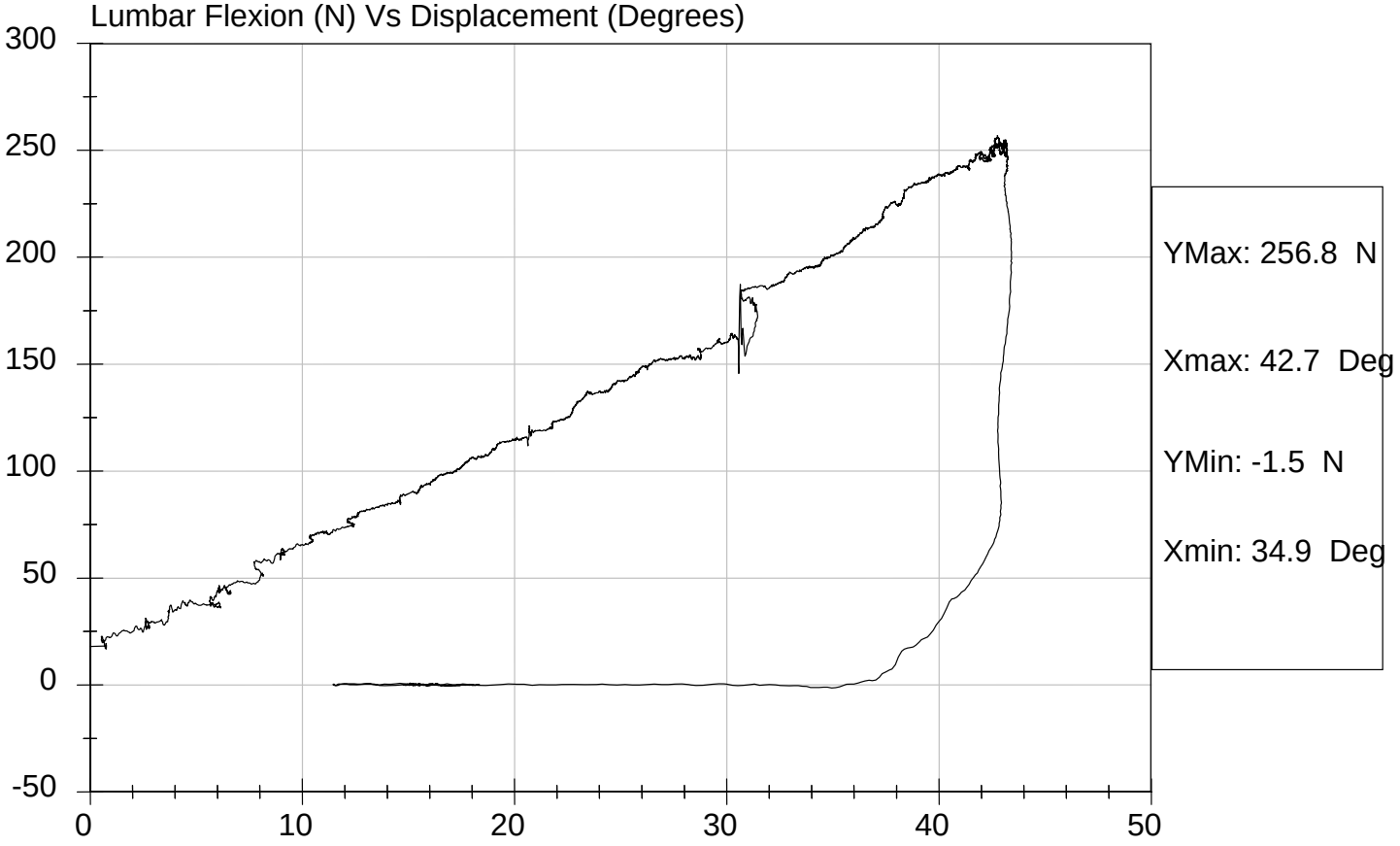
Test Description: Lumbar Flexion

Test Date: 10/3/08

Component: D082795

Speed: 0 ft/sec, 0 m/sec

Lumbar Flexion (N) Vs Displacement (Degrees)



SID/HIII Calibration Data Sheet

Side Impact Dummy

Neck Pendulum Test

ATD Serial No: 272 **Test I.D:** D082799

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	35	Pass
Impact Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.43	Pass
	20 msec	m/s	4.12 to 5.10	4.55	Pass
	30 msec	m/s	5.73 to 7.01	6.27	Pass
	40 to 70 msec	m/s	6.27 to 7.64	6.61	Pass
Midsaggital Plane Max Rotation		deg	66 to 82	69	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	60	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	74	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	55	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	12	Pass

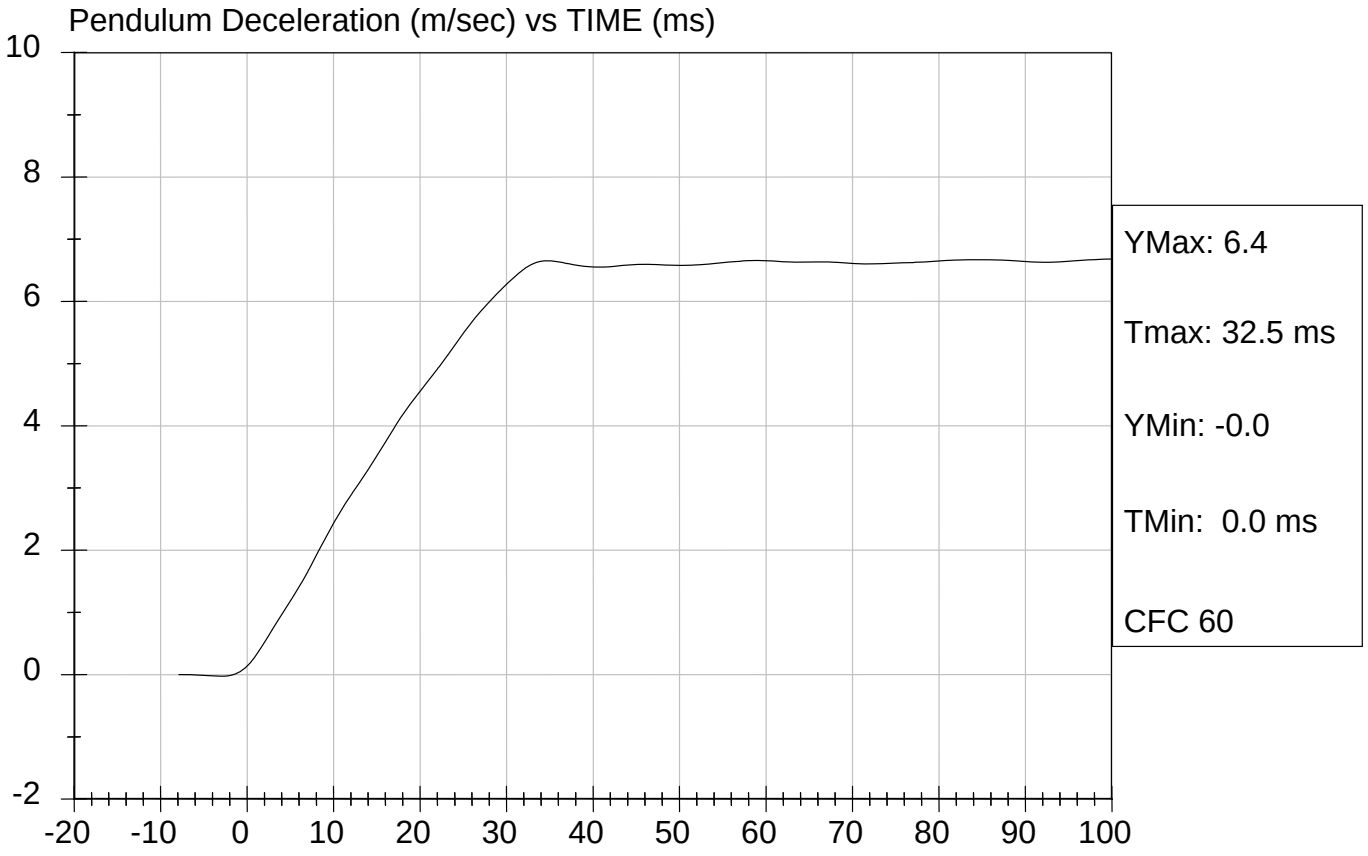
Jessica Gall
Laboratory Technician

10/3/08
Test Date

David Winkelbauer
Approved By

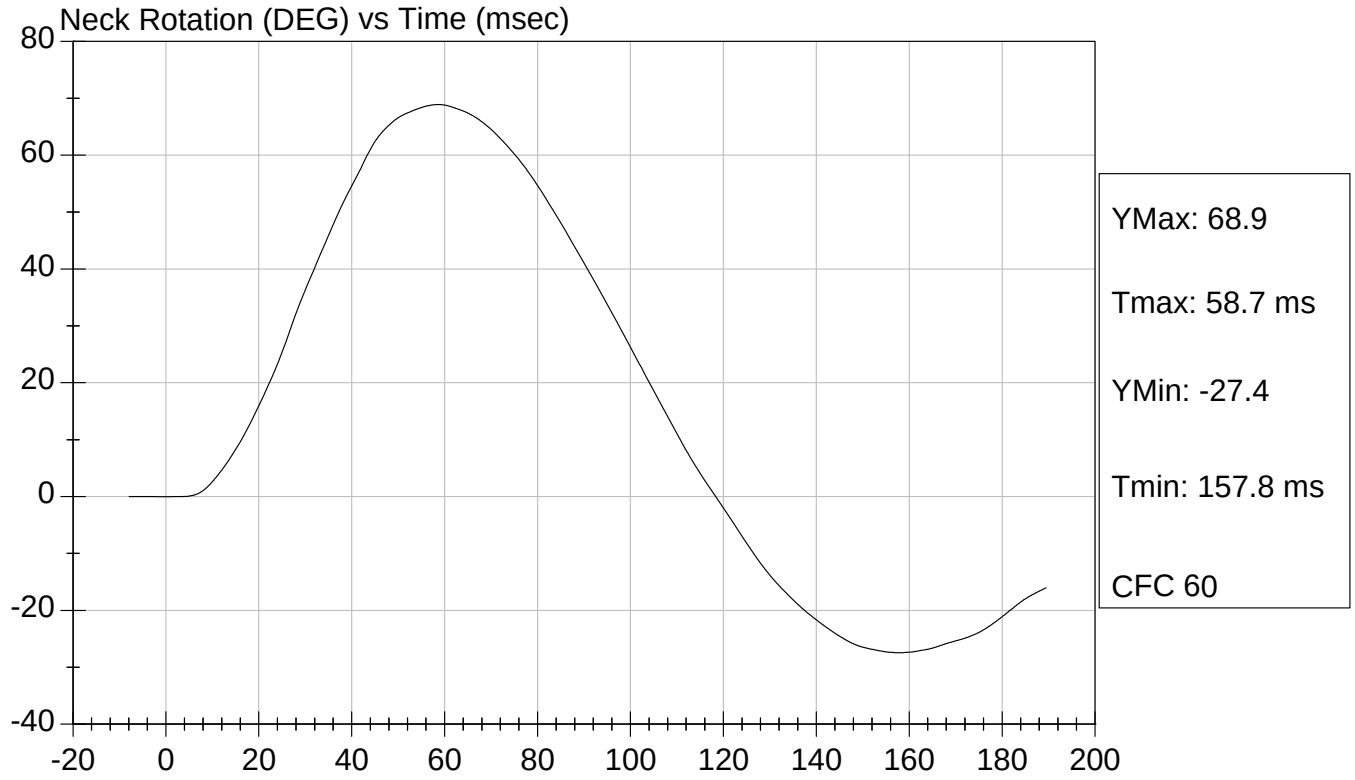
Test Desc: Neck Bending
Component ID: D082799

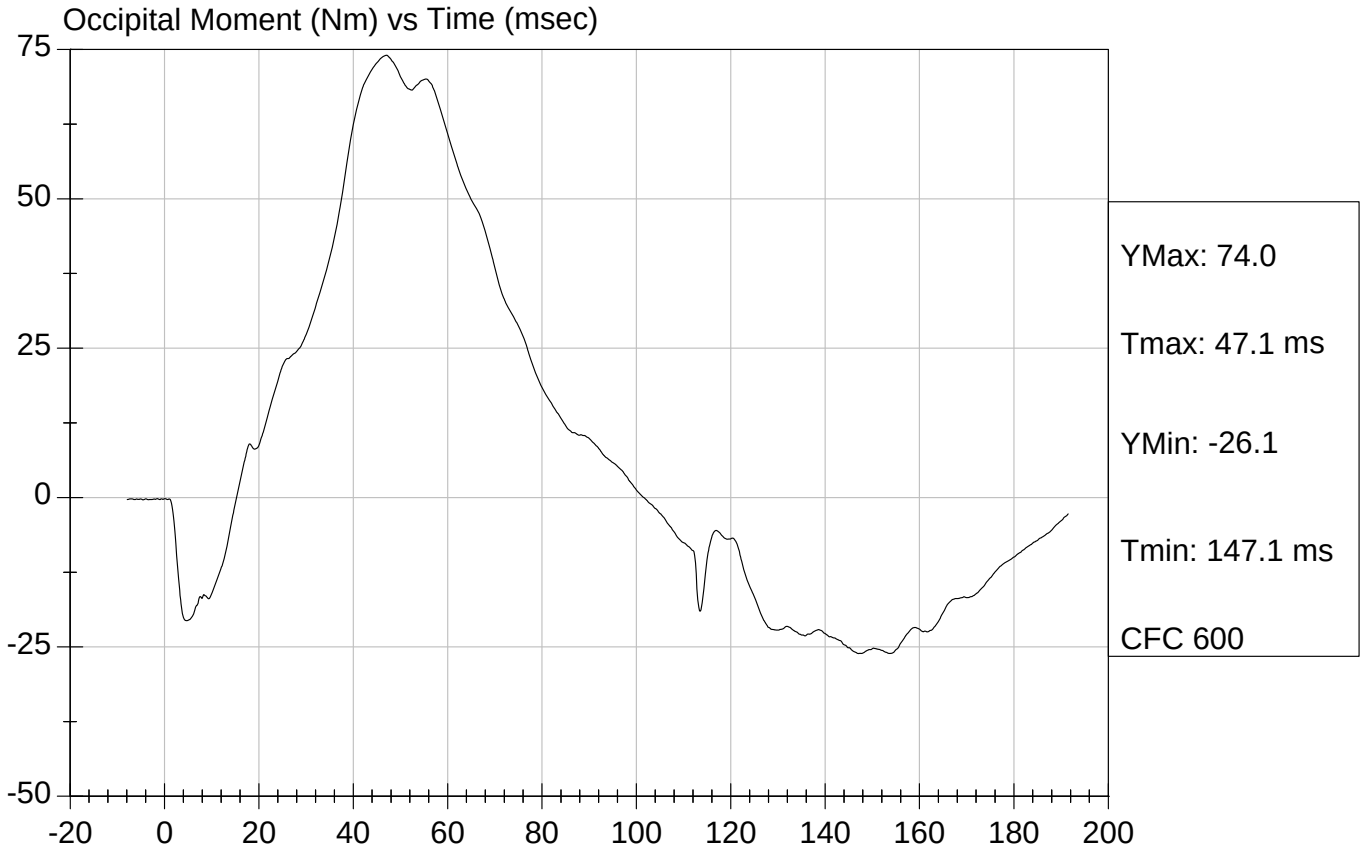
Test Date: 10/3/08
Speed: 23.15 ft/sec, 7.06 m/sec



Test Desc: Neck Bending
Component ID: D082799

Test Date: 10/3/08
Speed: 23.15 ft/sec, 7.06 m/sec





SID/HIII Calibration Data Sheet

Side Impact Dummy

Inspection Checklist

ATD Serial No: 272

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

Jessica Hall

Laboratory Technician

9/24/08

Test Date

David Winkelbauer

Approved By