

REPORT NUMBER: NCAPSIDE-MGA-2006-002

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

**TOYOTA MOTOR CORPORATION
2006 TOYOTA SCION XB
NHTSA NUMBER: M65103**

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



Test Date: September 14, 2005

Report Date: October 19, 2005

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
RULEMAKING
OFFICE OF CRASHWORTHINESS STANDARDS
400 SEVENTH STREET, SW, ROOM 5311
WASHINGTON, D.C. 20590**

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

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Date: 10/19/05

Technical Report Documentation Page

1. Report No. NCAPSIDE-MGA-2006-002	2. Government Accession No.	3. Recipient's Catalog No.																						
4. Title and Subtitle Final Report of New Car Assessment Program Side Impact Testing of 2006 Toyota Scion XB NHTSA No.: M65103		5. Report Date October 19, 2005																						
		6. Performing Organization Code MGA																						
7. Author(s) Shefalika Naik, Project Engineer		8. Performing Organization Report No. NCAPSIDE-MGA-2006-002																						
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		10. Work Unit No.																						
		11. Contract or Grant No. DTNH22-03-D-12005																						
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Rulemaking, Office of Crashworthiness Standards 400 Seventh Street, SW, Room 5311 Washington, D.C. 20590		13. Type of Report and Period Covered: <i>Final Report</i> 09/14/05 to 10/19/05																						
		14. Sponsoring Agency Code NVS-111																						
15. Supplementary Notes																								
16. Abstract A 55/28 km/h 90° Moving Deformable Barrier NCAP side impact was conducted on the subject 2006 Toyota Scion XB 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 September 14, 2005. The impact velocity of the Moving Deformable Barrier (MDB) was 62.1 km/h, and the ambient temperature at the struck side (drivers) of the vehicle was 21°C. The target vehicle's maximum post test static crush was 272 mm at level 2. The test vehicle's occupant performance is as follows: <table style="margin-left: auto; margin-right: auto; border: none;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>DRIVER</u></th> <th style="text-align: center;"><u>PASS.</u></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) Accel., g</td> <td style="text-align: center;">57.8</td> <td style="text-align: center;">49.7</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td style="text-align: center;">69.6</td> <td style="text-align: center;">55.9</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td style="text-align: center;">79.1</td> <td style="text-align: center;">78.0</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td style="text-align: center;">74.4</td> <td style="text-align: center;">67.0</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td style="text-align: center;">81.2</td> <td style="text-align: center;">82.0</td> </tr> <tr> <td>HIC</td> <td style="text-align: center;">383.7</td> <td style="text-align: center;">798.1</td> </tr> </tbody> </table>					<u>DRIVER</u>	<u>PASS.</u>	Left Upper Rib (LUR) Accel., g	57.8	49.7	Left Lower Rib (LLR) Accel., g	69.6	55.9	Lower Spine (T ₁₂) Accel., g	79.1	78.0	Thoracic Trauma Index (TTI)	74.4	67.0	Pelvis (PEV) Accel., g	81.2	82.0	HIC	383.7	798.1
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17. Key Words New Car Assessment Program (NCAP) Side Impact Side Impact Hybrid III Dummy (SID/HIII) Occupant Side Impact Protection		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Adm. Technical Ref. Division, Room 5108 (NPO-230) 400 Seventh Street, S.W. Washington, D.C. 20590																						
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 142	22. Price																					

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SECTION 1

PURPOSE AND TEST PROCEDURE

PURPOSE

This side impact test was conducted as part of the FY' 2006 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 2006 Scion XB manufactured by Toyota Motor Corporation.

TEST PROCEDURE

The side impact test was conducted in accordance with the Laboratory Test Procedure for New Car Assessment Program Side Impact Testing dated November 2002 and the corresponding MGA Research Corporation Test Procedure MGA-NHTSA5. The procedures for receiving, inspection, testing, and reporting of test results are described in the test procedures and are not repeated in this report.

MGA does not endorse or certify products. The manufacturer's name appears solely for identification purposes.

SECTION 2

SUMMARY OF NCAP SIDE IMPACT TEST

A model year 2006 Toyota Scion XB was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.1 km/h. The specified impact velocity range is from 61.1 to 62.7 km/h. The test (target) vehicle was stationary and positioned 63° to the line of forward motion. The weight of the vehicle as tested was 1301.5 kg and the test weight of the MDB was 1360.8 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on September 14, 2005.

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-five (25) structural accelerometers and the MDB was instrumented with six (6) 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 272 mm at level 2, 450 mm rearward of the left 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.

The occupant data is summarized below:

ATD position	HIC	T ¹	T ²	TTI (G's)	Peak Pelvis (G's)
Driver	383.7	51.3	87.3	74.4	81.2
Passenger	798.1	61.4	97.4	67.0	82.0

SUPPLEMENTAL RESTRAINT INFORMATION

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

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

TEST NOTES

The following channels did not collect valid data:

Driver Neck FX after 30ms

Floorpan @ Rear Axle Z after 20ms

LR Door Upper Centerline Y after 90ms

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

Test Vehicle: 2006 Toyota Scion XB
 Test Program: NCAP Side Impact

NHTSA No. M65103
 Test Date: 09/14/05

TEST VEHICLE INFORMATION

Make	Toyota
Model	Scion XB
Body Style	MPV
NHTSA No.	M65103
VIN	JTLKT324064033507
Color	Silver
Delivery Date	9/2/05
Odometer Reading (mile)	36
Dealer	Wilde Toyota
Transmission	Automatic
Final Drive	FWD
Number of Cylinders	4
Engine Displacement (L)	1.5
Engine Placement	Lateral
Automatic Door Locks (ADL)	No
Owner's Manual Details Instructions on Disabling ADLs	NA

TEST VEHICLE OPTIONS

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Toyota Motor Corporation
Date of Manufacture	07/05

GVWR (kg)	1530
GAWR Front (kg)	780
GAWR Rear (kg)	760

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench		
Number Of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				375
Cargo Wt. (RCLW) (kg)				34.0

DATA SHEET NO. 1 (continued)**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2006 Toyota Scion XBNHTSA No. M65103Test Program: NCAP Side ImpactTest Date: 09/14/05**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	337.5	225.0		375.0	319.5	
Right	kg	324.5	225.5		318.0	289.0	
Ratio	%	59.5	40.5		53.2	46.8	
Totals	kg	662.0	450.5	1112.5	693.0	608.5	1301.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1112.5
Weight of 2 P572E ATDs	kg	161.5
Rated Cargo/Luggage Weight (RCLW)	kg	34.0
Calculated Vehicle Target Weight (TVTW)	kg	1308.0

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

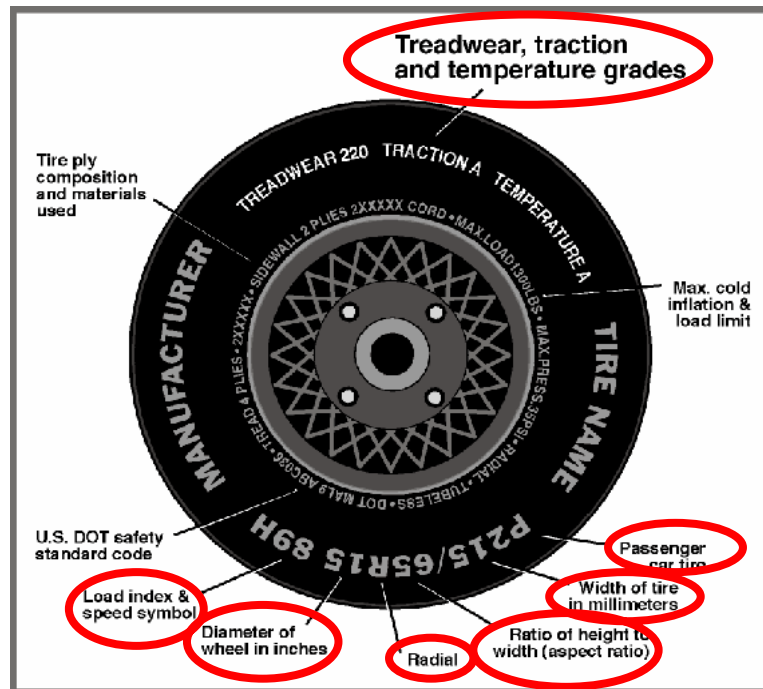
Weight of Ballast in Cargo Area: 0.0 kg**TEST VEHICLE ATTITUDES AND CG**

	Units	LF	RF	LR	RR	CG(aft of front axle)
As Delivered	mm	673	675	674	676	1014
As Tested	mm	659	673	639	657	1171
Fully Loaded	mm	657	672	638	654	

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2504
Target Impact Point Aft of Front Axle	mm	312
Actual Impact Point Aft of Front Axle	mm	342

DATA SHEET NO. 2
TEST VEHICLE TIRE INFORMATION



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	200	200
Cold / Test Pressure (kPa)	200	200
Recommended Tire Size	P185/60R15	P185/60R15
Tire Size on Vehicle	P185/60R15	P185/60R15
Tire Manufacturer	Good Year	Good Year
Tire Name	Eagle LS	Eagle LS
Tire Type	All Season	All Season
Tire Width (mm)	185	185
Ratio of Height to Width (aspect ratio)	60	60
Radial	R	R
Wheel Diameter	15	15
Load Index & Speed Symbol	84T	84T
Treadwear	360	360
Traction Grade	A	A
Temperature Grade	B	B

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

Test Vehicle: 2006 Toyota Scion XB
 Test Program: NCAP Side Impact

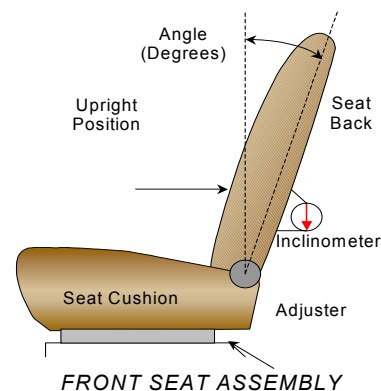
NHTSA No. M65103
 Test Date: 09/14/05

NORMAL DESIGN RIDING POSITION

The driver and passenger seat back is positioned to the manufacturer's designated angle. The seat back angle at forward-most locking position or forward stop (measured from upright position) = -12 degrees. Seat back angle at test position = 2 degrees.

Driver seat back angle: 2.0° on head rest post

Passenger seat back angle: non adjustable

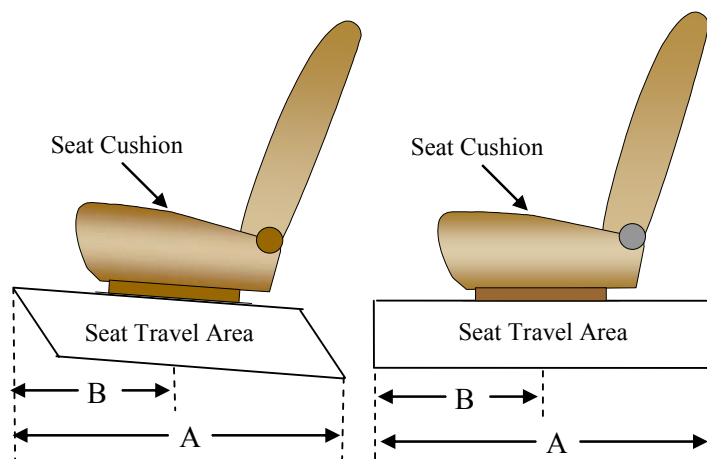


SEAT FORE/AFT POSITIONS

Forward-most measurements and rearward-most measurements should be taken from the bottom of the seat cushion (including the plastic base if applicable).

SEAT FORE/AFT POSITIONS		
	Total Fore/Aft Travel	Placed in position #
Driver Seat	15 detents	8 th detent *
Rear Seat	Non adjustable	Non adjustable

* forward-most detent defined as 0.



DATA SHEET NO. 3 (CONTINUED)

TEST VEHICLE INFORMATION

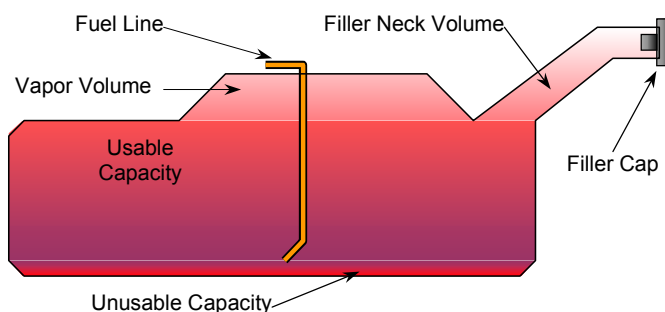
Test Vehicle: 2006 Toyota Scion XB
 Test Program: NCAP Side Impact

NHTSA No. M65103
 Test Date: 09/14/05

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	45.0
Usable Capacity of "Optional" Tank	
92-94% of Usable Capacity	41.4 to 42.3
Actual Amount of Solvent used	41.6
1/3 of Usable Capacity	15.0

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



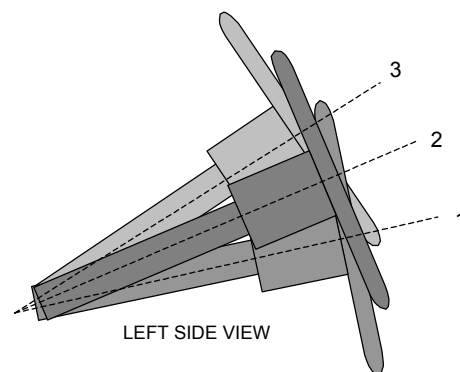
VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, an inclinometer is placed on the plate and the angle is measured.

Manufacturer's angle at upper-most locking position = 33.8°

Manufacturer's angle at test position = 32.0°



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

	Fore/Aft Position (mm)	Degrees
Lowermost position No. 1		30.0
Geometric center position No. 2		32.0*
Uppermost position No. 3		33.9

* Placed in the manufacturer's nominal design position.

DATA SHEET NO. 4**MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS**Test Vehicle: 2006 Toyota Scion XBNHTSA No. M65103Test Program: NCAP Side ImpactTest Date: 09/14/05**MDB SPECIFICATIONS**

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

MDB WEIGHTS

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

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.1
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.1
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.8

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

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	30 mm right
Vertical Offset	mm	+/-20	8 mm up

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

Test Vehicle: 2006 Toyota Scion XB
 Test Program: NCAP Side Impact

NHTSA No. M65103
 Test Date: 09/14/05

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	Door panel, Headrest	Headrest, C-Pillar
Upper Torso Contact	Door panel	Door Panel
Lower Torso Contact	Door panel	Door Panel
Left Knee Contact	Door Panel	Door Panel
Right Knee Contact	Left Knee	Left Knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

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

POST TEST STRUCTURAL OBSERVATIONS

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

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Occupant Location 01		Occupant Location 04	
	Installed	Operation	Installed	Operation
Front Airbag	Yes	No	No	
Side Airbag	No		No	
Head Airbag	No		No	
Curtain Airbag	No		No	
Seat Belt Pretensioner	Yes		Yes	
Seat Belt Load Limiter	Yes		Yes	

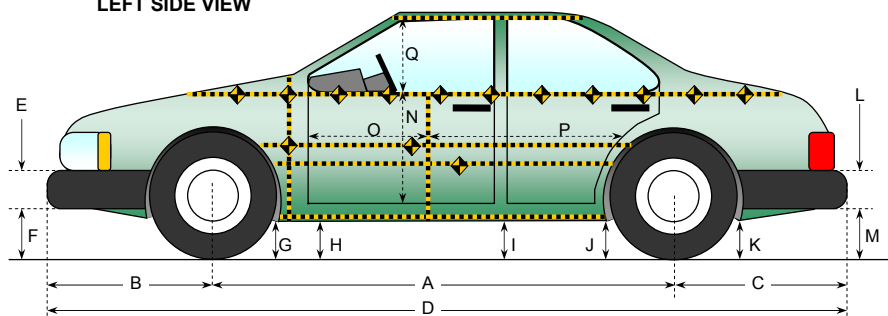
DATA SHEET NO. 6

VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2006 Toyota Scion XB
 Test Program: NCAP Side Impact

NHTSA No. M65103
 Test Date: 09/14/05

LEFT SIDE VIEW



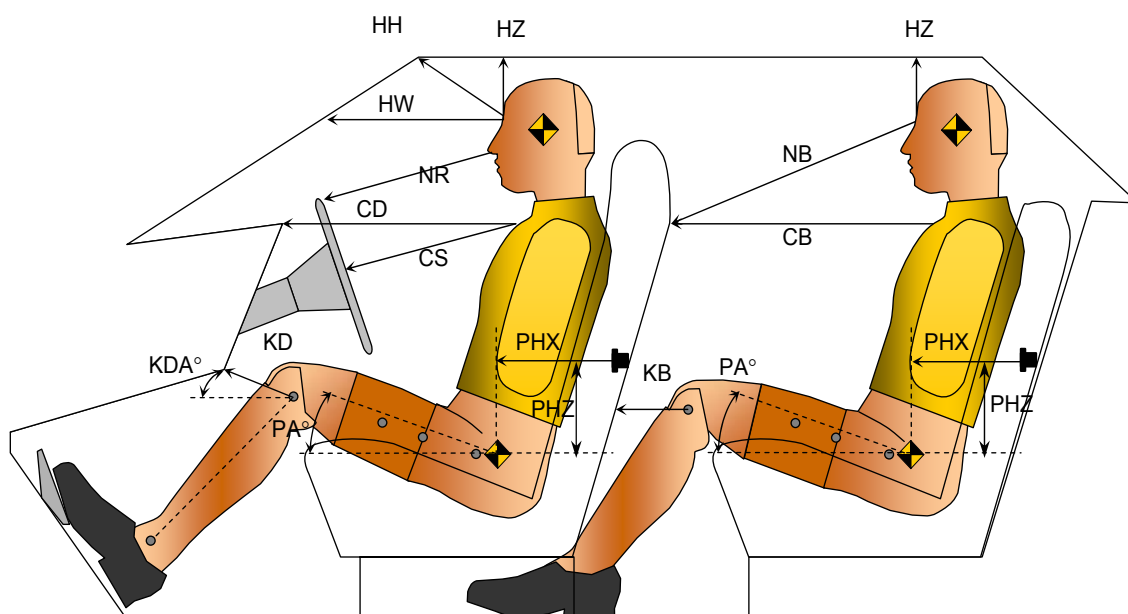
All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2504	2500	4
B	Front Axle to FSOV	756	752	4
C	Rear Axle to RSOV	663	679	-16
D	Total Length at Centerline	3923	3931	-8
E	Front Bumper Thickness	140	140	0
F	Front Bumper Bottom to Ground	202	196	6
G	Sill Height at Front Wheel Well	170	163	7
H	Sill Height at Front Door Leading Edge	185	206	-21
I	Sill Height at "B" Pillar	187	223	-36
J1	Sill Height at Rear Wheel Well	167	223	-56
J2	Pinch Weld Height at Rear Wheel Well	184	193	-9
K	Sill Height Aft of Rear Wheel Well	175	166	9
L	Rear Bumper Thickness	123	123	0
M	Rear Bumper Bottom to Ground	200	202	-2
N	Sill Height to Window Bottom Sill	754	618	136
O	Front Door Leading Edge to Impact CL	722	665	57
P	Rear Door Trailing Edge to Impact CL	1258	1105	153
Q	Front Window Opening	495	485	10
R	Right Side Length	3268	3265	3
S	Left Side Length	3268	3230	38
T	Vehicle Width at "B" Post	1672	1438	234

DATA SHEET NO. 7
SID/HII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2006 Toyota Scion XB
 Test Program: NCAP Side Impact

NHTSA No. M65103
 Test Date: 09/14/05

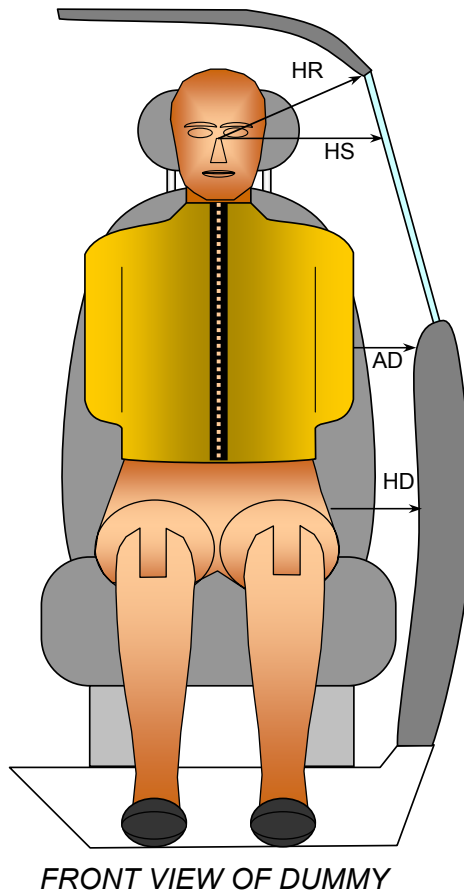


Driver Code	Pass. Code	Measurement Description	Driver S/N 904		Passenger S/N 271	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	644			
HW		Head to Windshield	772			
HZ	HZ	Head to Roof	218		241	
NR	NB	Nose to Rim/Nose to Seatback	496		712	
CD	CB	Chest to Dash or Seatback	607		610	
CS		Chest to Steering Wheel	374			
KDL	KBL	Left Knee to Dash or Seatback	139	22.0	293	18.7
KDR	KBR	Right Knee to Dash or Seatback	145	29.9	302	27.7
PA	PA	Pelvic Angle		23.8		23.5
PHX	PHX	H-Point to Striker (X-Axis)	248		187	
PHZ	PHZ	H-Point to Striker (Z-Axis)	118		295	

DATA SHEET NO. 8
SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2006 Toyota Scion XB
 Test Program: NCAP Side Impact

NHTSA No. M65103
 Test Date: 09/14/05

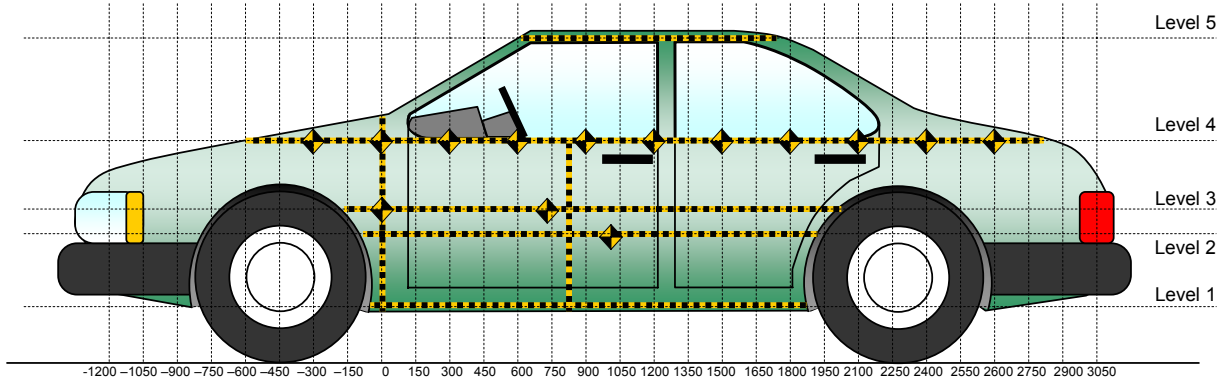


Code	Measurement Description	Units	Driver S/N 904	Passenger S/N 271
HR	Head to Side Header	mm	297	305
HS	Head to Side Window	mm	374	362
AD	Arm to Door	mm	124	60
HD	H-Point to Door	mm	120	122

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

Test Vehicle: 2006 Toyota Scion XB
 Test Program: NCAP Side Impact

NHTSA No. M65103
 Test Date: 09/14/05



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	32	1200	1519
4	Window Sill	231	1200	989
3	Mid Door	270	450	685
2	Occupant H-Point	272	450	640
1	Sill Top	112	450	303
	Maximum Penetration	272		

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2006 Toyota Scion XB
 Test Program: NCAP Side Impact

NHTSA No. M65103
 Test Date: 09/14/05

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-600				361					366					5	
-450			283	354				287	360				4	6	
-300			268	342				278	354				10	12	
-150		262	278	336			280	294	350			18	16	14	
0		279	280	330			315	328	348			36	48	18	
150		275	277	330			450	439	373			175	162	43	
300	319	273	274	326		403	526	527	432		84	253	253	106	
450	317	270	271	327	463	429	542	541	502	475	112	272	270	175	12
600	317	270	269	320	448	409	521	526	494	469	92	251	257	174	21
750	317	268	268	321	445	402	510	516	482	471	85	242	248	161	26
900	315	267	268	318	443	394	500	510	473	472	79	233	242	155	29
1050	316	267	267	318	441	385	492	506	467	472	69	225	239	149	31
1200	317	267	267	319	441	395	520	533	550	473	78	253	266	231	32
1350	318	268	267	318	442	393	521	534	543	471	75	253	267	225	29
1500	316	268	268	318	442	390	522	536	532	469	74	254	268	214	27
1650	318	270	269	318	444	388	523	535	498	466	70	253	266	180	22
1800		271	271	320	444		517	523	440	464		246	252	120	20
1950		265	273	322	447		406	402	374	462		141	129	52	15
2100			264	324	450			325	368	458			61	44	8
2250			264	328	454			301	355	453			37	27	-1
2400			279	330	459			296	346	453			17	16	-6
2550			288	334	466			297	340	455			9	6	-11

Reference plane is parallel to test vehicle longitudinal centerline.

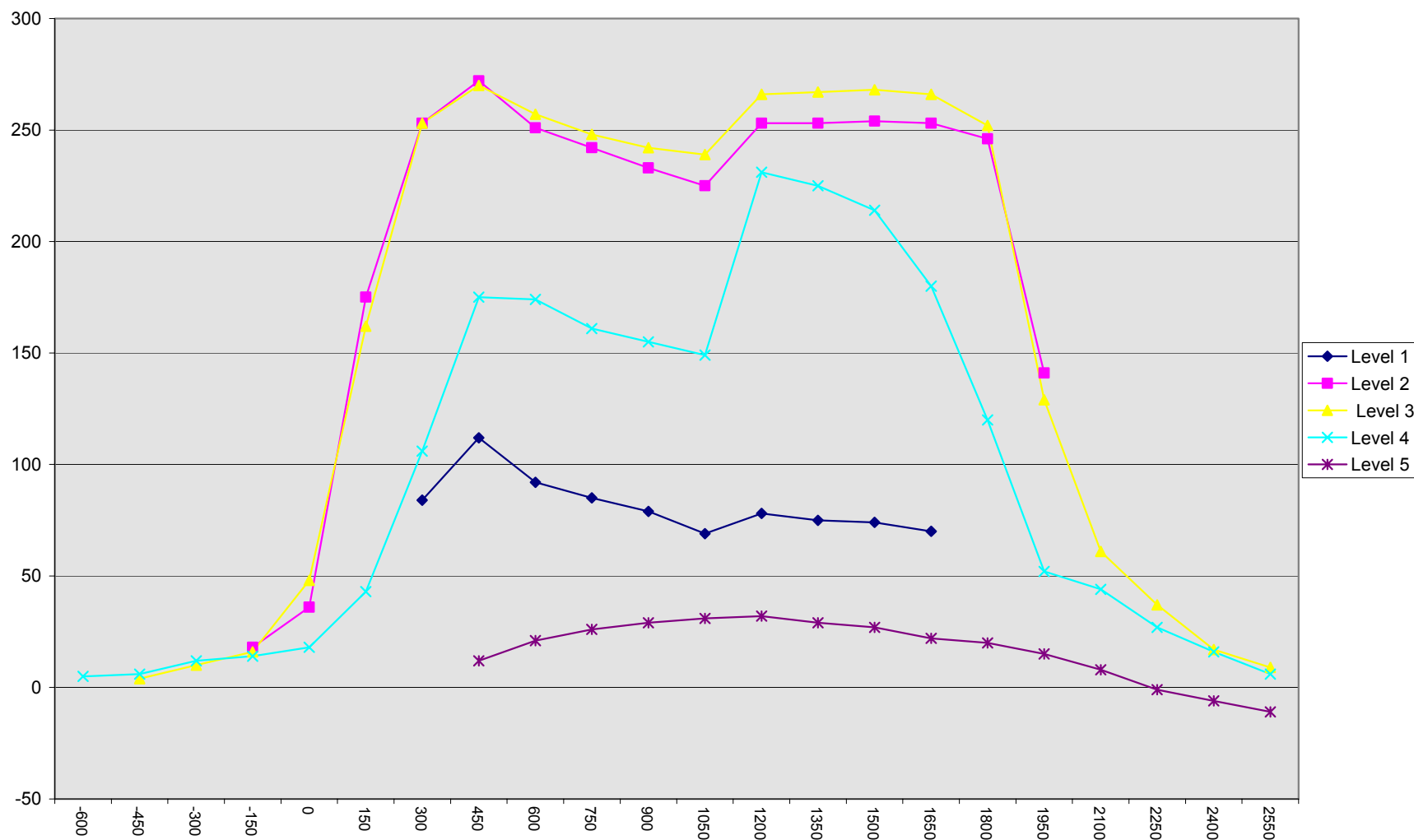
Given dimensions = Reference plane to car body

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

Test Vehicle: 2006 Toyota Scion XB
Test Program: NCAP Side Impact

NHTSA No. M65103
Test Date: 09/14/05

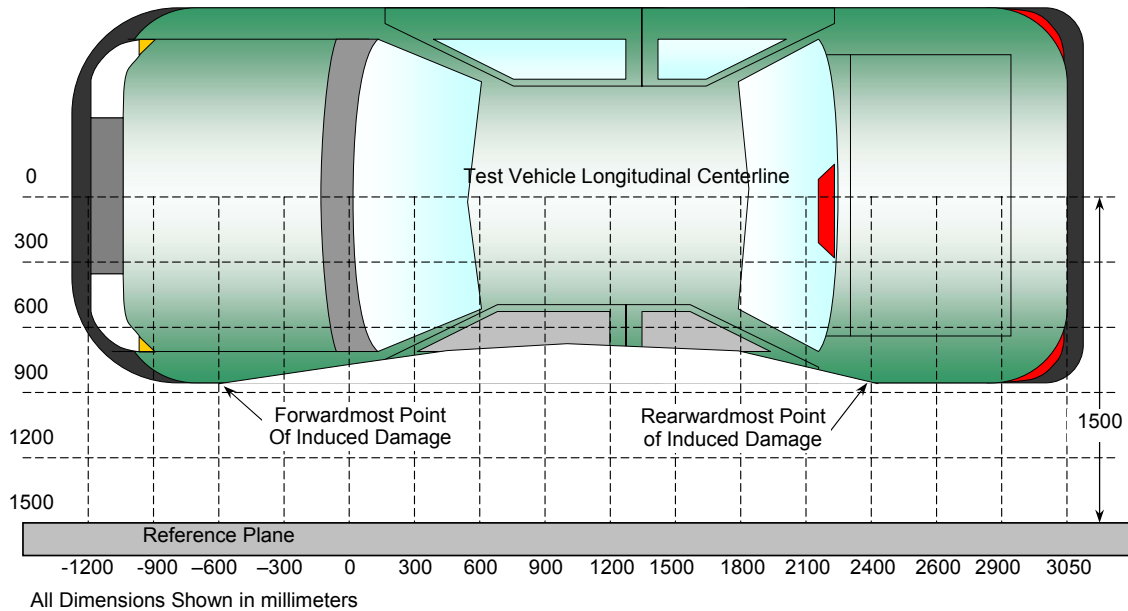
16



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

Test Vehicle: 2006 Toyota Scion XB
 Test Program: NCAP Side Impact

NHTSA No. M65103
 Test Date: 09/14/05



TOP VIEW

DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	2500 mm	4	334	340	6
2	1880 mm	3	272	462	190
3	1270 mm	3	267	533	266
4	634 mm	3	269	521	252
5	14 mm	3	280	317	37
6	-600 mm	4	361	366	5

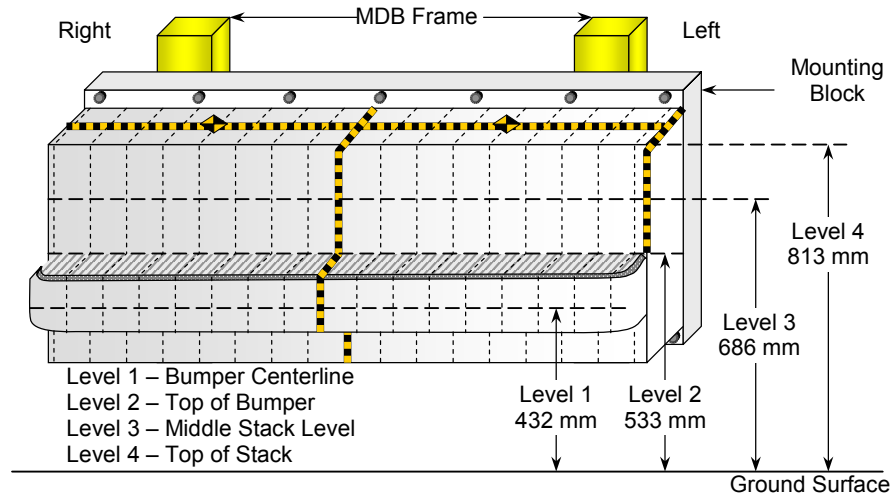
Reference plane is parallel to test vehicle longitudinal centerline.
 Given dimensions = Reference plane to car body.

DATA SHEET NO. 12

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2006 Toyota Scion XB
 Test Program: NCAP Side Impact

NHTSA No. M65103
 Test Date: 09/14/05



DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C _L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	124	128	117	104	94	92	83	71	67	69	65	65	62	59	65	86	96
2	64	56	48	44	41	37	35	33	32	30	30	30	25	25	25	35	54
3	27	9	4	4	5	8	10	11	5	5	6	7	9	12	18	31	82
4	86	31	2	0	0	8	26	31	14	11	11	15	17	25	36	78	143

All Dimensions in mm

DATA SHEET NO. 13

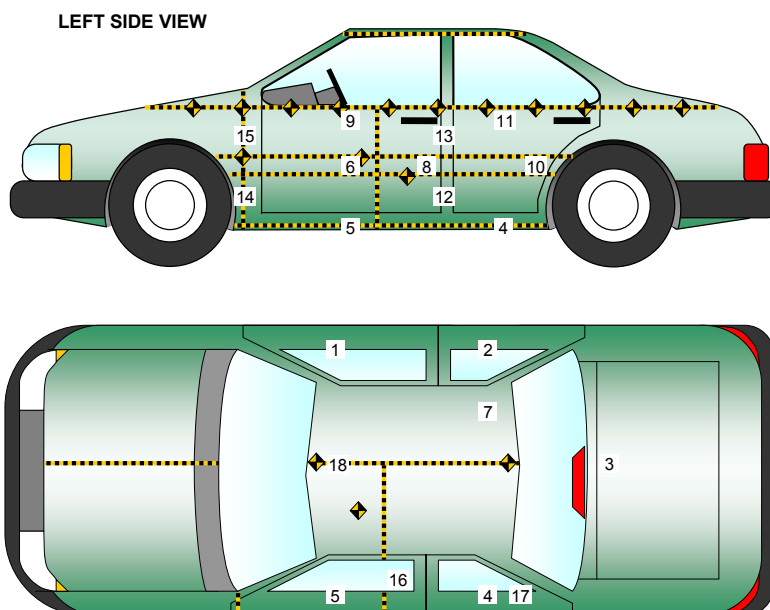
VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2006 Toyota Scion XB

NHTSA No. M65103

Test Program: NCAP Side Impact

Test Date: 09/14/05



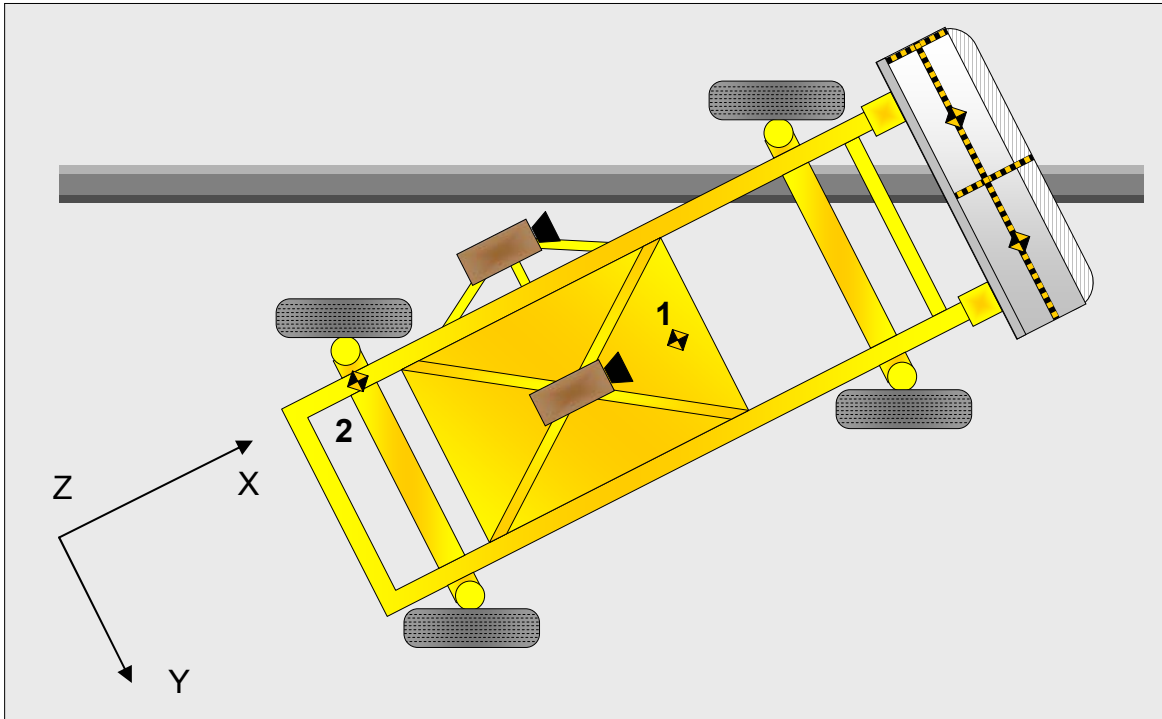
Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	2176	657	219
2	Right Sill at Rear Seat	1384	658	223
3	Rear Floorpan Above Axle	617	0	429
4	Left Sill at Rear Door	1275	-653	228
5	Left Sill at Front Door	2035	-654	220
6	Left Front Door C/L	2192	-705	430
7	Rear Occupant Compartment	1364	294	369
8	Left Front Door Mid-Rear	1934	-708	450
9	Left Front Door Upper C/L	2474	-730	676
10	Left Rear Door Mid-Rear	1549	-780	710
11	Left Rear Door Upper C/L	1031	-694	674
12	Left Lower B-Post	1723	-672	385
13	Left Middle B-Post	1717	-656	794
14	Left Lower A-Post	2696	-794	556
15	Left Middle A-Post	2717	-792	858
16	Front Seat Track	2907	-530	865
17	Rear Seat Track or Structure			
18	Vehicle CG	2112	215	435

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: 2006 Toyota Scion XB
 Test Program: NCAP Side Impact

NHTSA No. M65103
 Test Date: 09/14/05



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: 2006 Toyota Scion XB
 Test Program: NCAP Side Impact

NHTSA No. M65103
 Test Date: 09/14/05

	Elements	Pre-Test (mm)
1	Total Length	3923
2	Total Width	1672
3	Bumper Top Height	693
4	Bumper Bottom Height	202
5	Longitudinal Member Top Height	561
6	Distance between Longitudinal Members	1466
7	Longitudinal Member Width	55
8	Engine Top Height	816
9	Engine Bottom Height	206
10	Engine and gearbox width	780
11	Front bumper-engine distance	323
12	Front shock absorber fixing height	870
13	Bonnet leading edge height	864
14	Front shock absorber fixing width	1131
15	Front bumper – front axle distance	756
16	Front axle – a pillar distance	406
17	A-pillar – B-pillar distance	1083
18	B-Pillar – rear axle distance	1016
19	B-pillar – C-pillar distance	906
20	Roof sill bottom height	1532
21	Roof sill top height	1593
22	Floor sill bottom height	207
23	Floor sill top height	342

DATA SHEET NO. 16

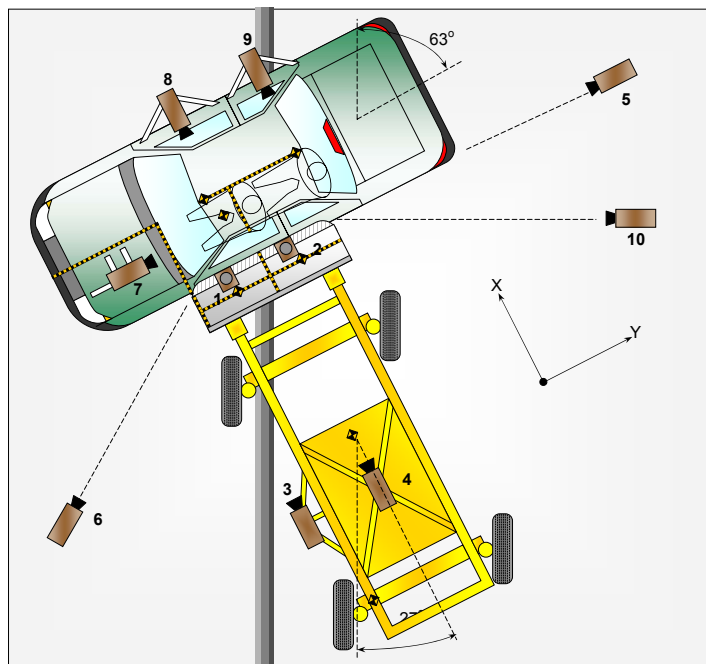
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2006 Toyota Scion XB

NHTSA No. M65103

Test Program: NCAP Side Impact

Test Date: 09/14/05



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Close-up	110	-320	5450	50	1000
2	Overhead Overall	155	-615	5460	14	1000
3	MDB Onboard, Impact Point Close-up				50	1000
4	MDB Onboard, Centerline of Impact				25	1000
5	Right Side, Ground Level, Overall	-3095	7590	1500	35	1000
6	Left Side, Ground Level, Overall	2755	-3630	1455	24	1000
7	Vehicle Onboard Front SID/HIII, Front				10	500
8	Vehicle Onboard Front SID/HIII, Side				8	500
9	Vehicle Onboard Rear SID/HIII, Side				8	500
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: 2006 Toyota Scion XB
 Test Program: NCAP Side Impact

NHTSA No. M65103
 Test Date: 09/14/05

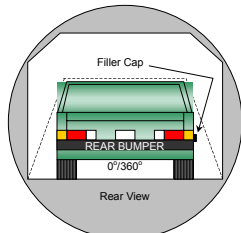
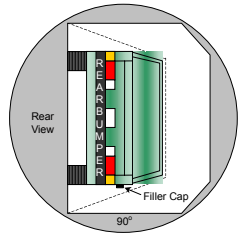
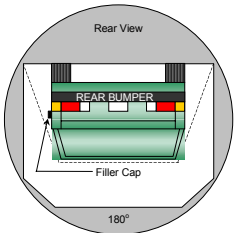
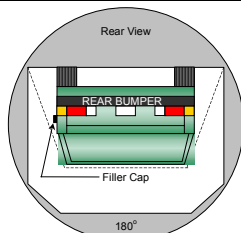
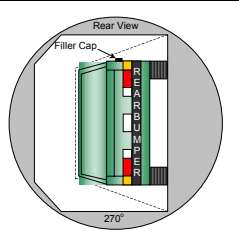
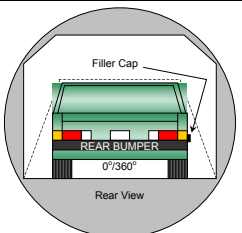
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21° C Test Time: 11:38 am

Stoddard Solvent Spillage Measurements

- A. From impact until vehicle motion ceases: 0 oz.
 (Maximum Allowable = 1 ounce)
- B. For the 5 minute period after motion ceases: None
 (Maximum allowable = 5 ounces)
- C. For the following 25 minutes: None
 (Maximum allowable = 1 oz./minute)
- D. Spillage Details: None

FMVSS 301 STATIC ROLLOVER DATA

			1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds. 2. The position hold time at each position is 300 seconds (minimum). 3. Details of Stoddard Solvent spillage locations: None
0° to 90° 90° to 180°			
			
180° to 270° 270° to 360°			

Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage Collection Time (min)	Spillage (oz.)
0° to 90°	173	300	First 5	0
90° to 180°	151	300	First 5	0
180° to 270°	135	300	First 5	0
270° to 360°	158	300	First 5	0

APPENDIX A
PHOTOGRAPHS

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



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



Manufacturer's Label



Tire Placard



Pre-Test Front View



Post-Test Front View



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



Post-Test Left Front $\frac{3}{4}$ View



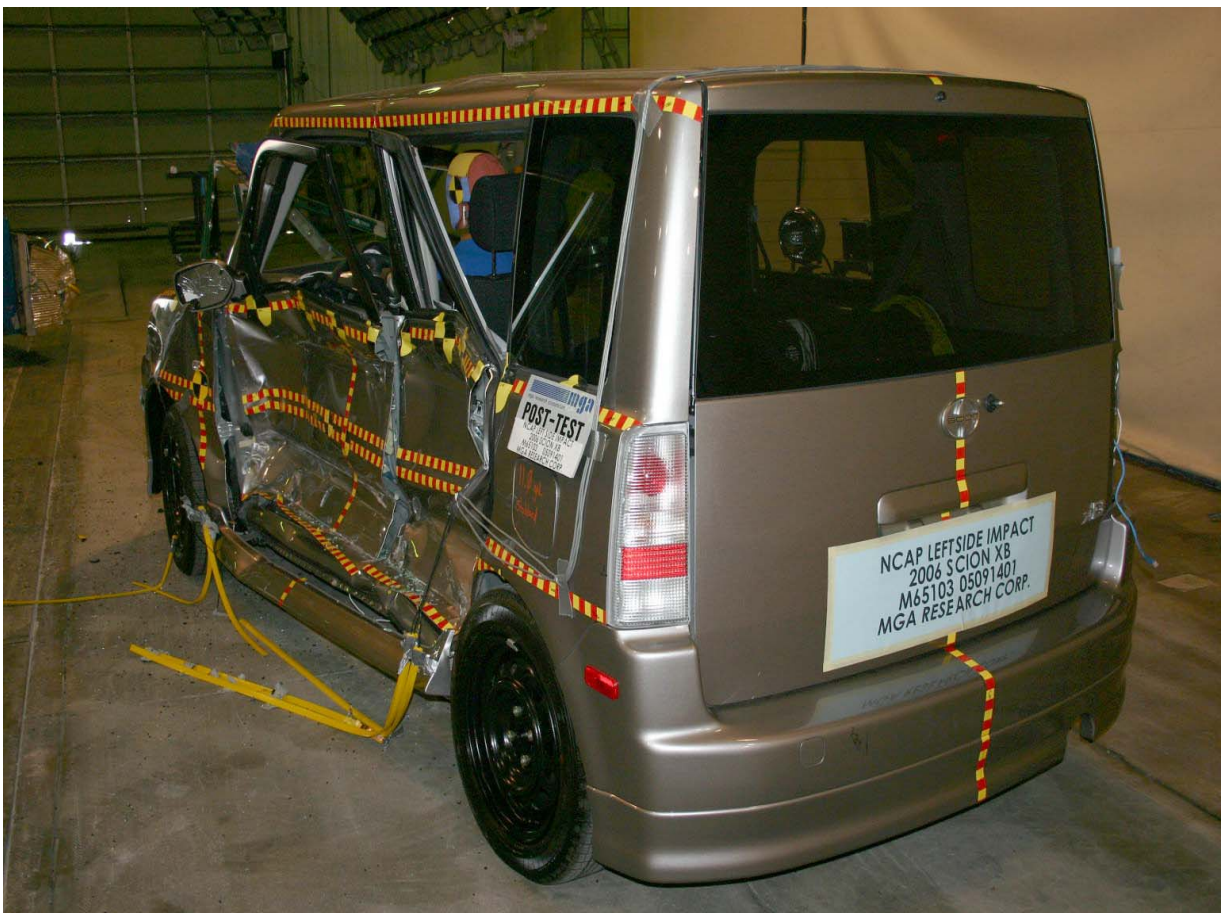
Pre-Test Left Side View



Post-Test Left Side View



Pre-Test Left Rear 3/4 View



Post-Test Left Rear 3/4 View



Pre-Test Rear View



Post-Test Rear View



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



Post-Test Right Rear $\frac{3}{4}$ View



Pre-Test Right Side View



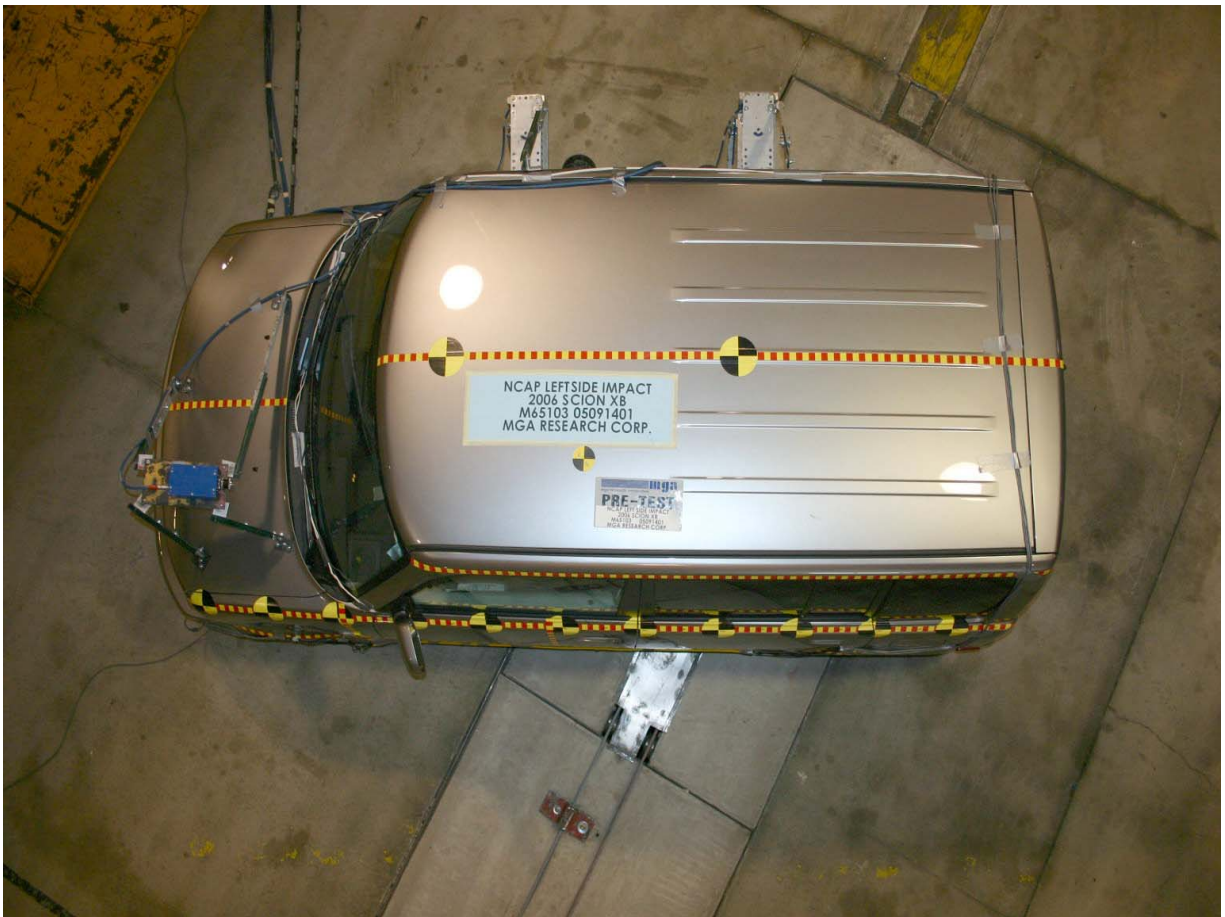
Post-Test Right Side View



Pre-Test Right Front $\frac{3}{4}$ View



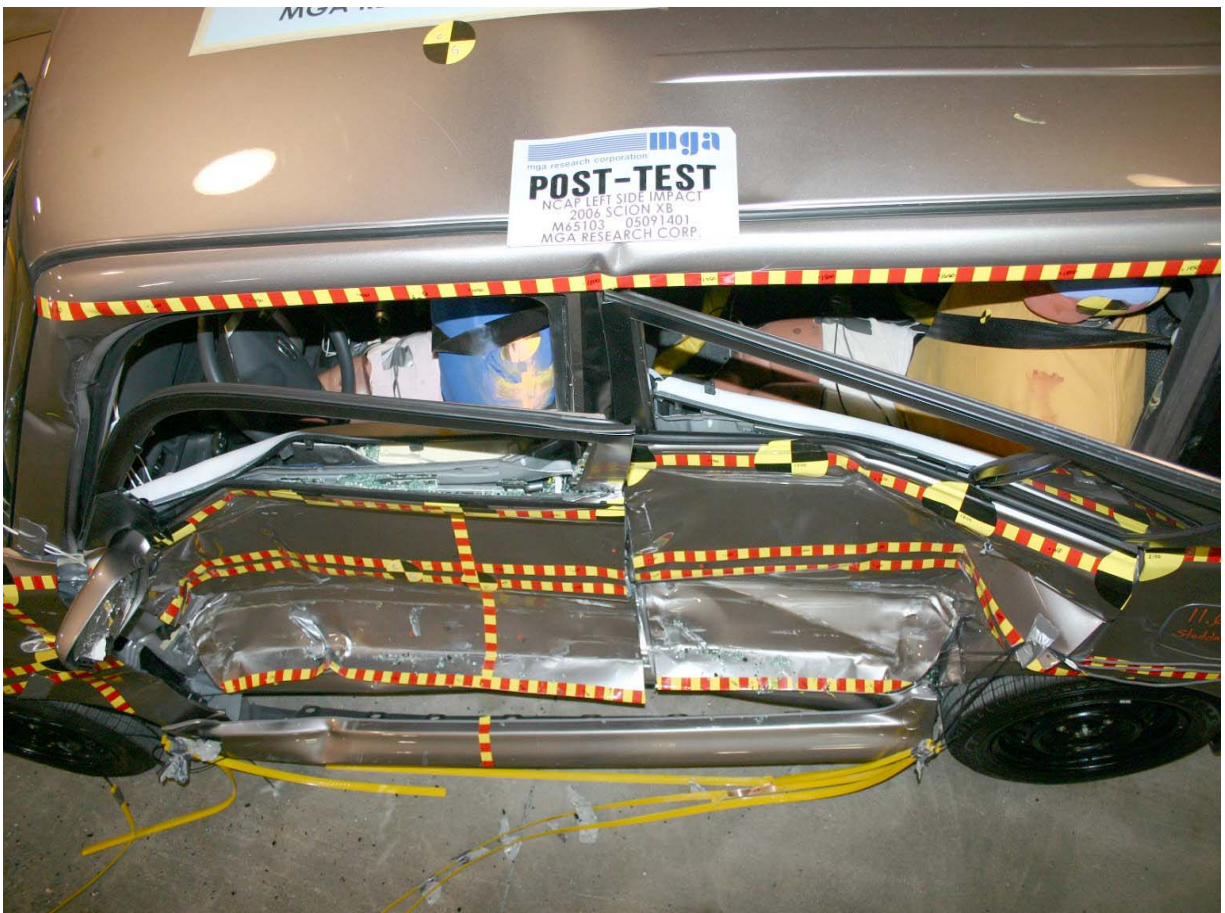
Post-Test Right Front $\frac{3}{4}$ View



Pre-Test Overhead View



Pre-Test Overhead Close-up View



Post-Test Overhead Close-up View



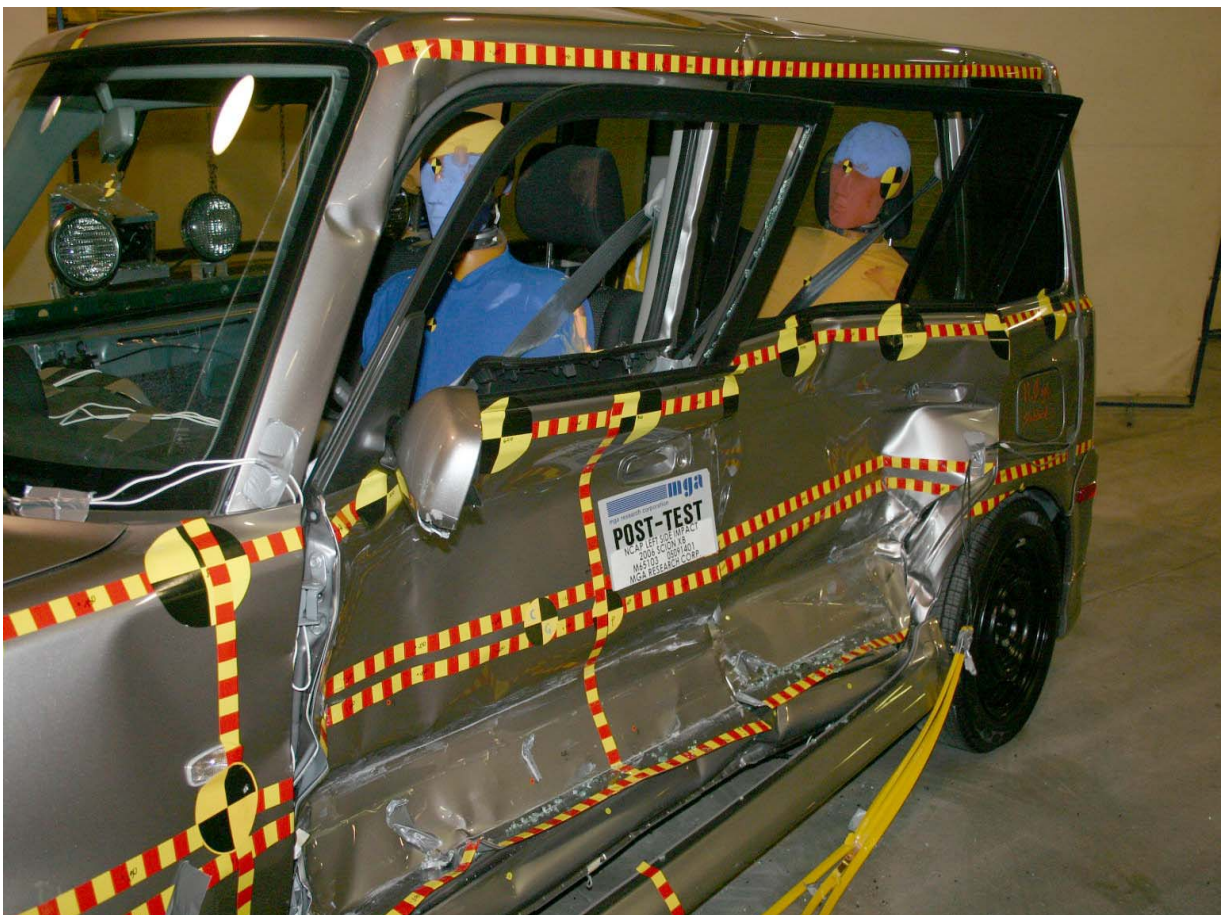
Pre-Test Left Impact Point



Post-Test Left Impact Point



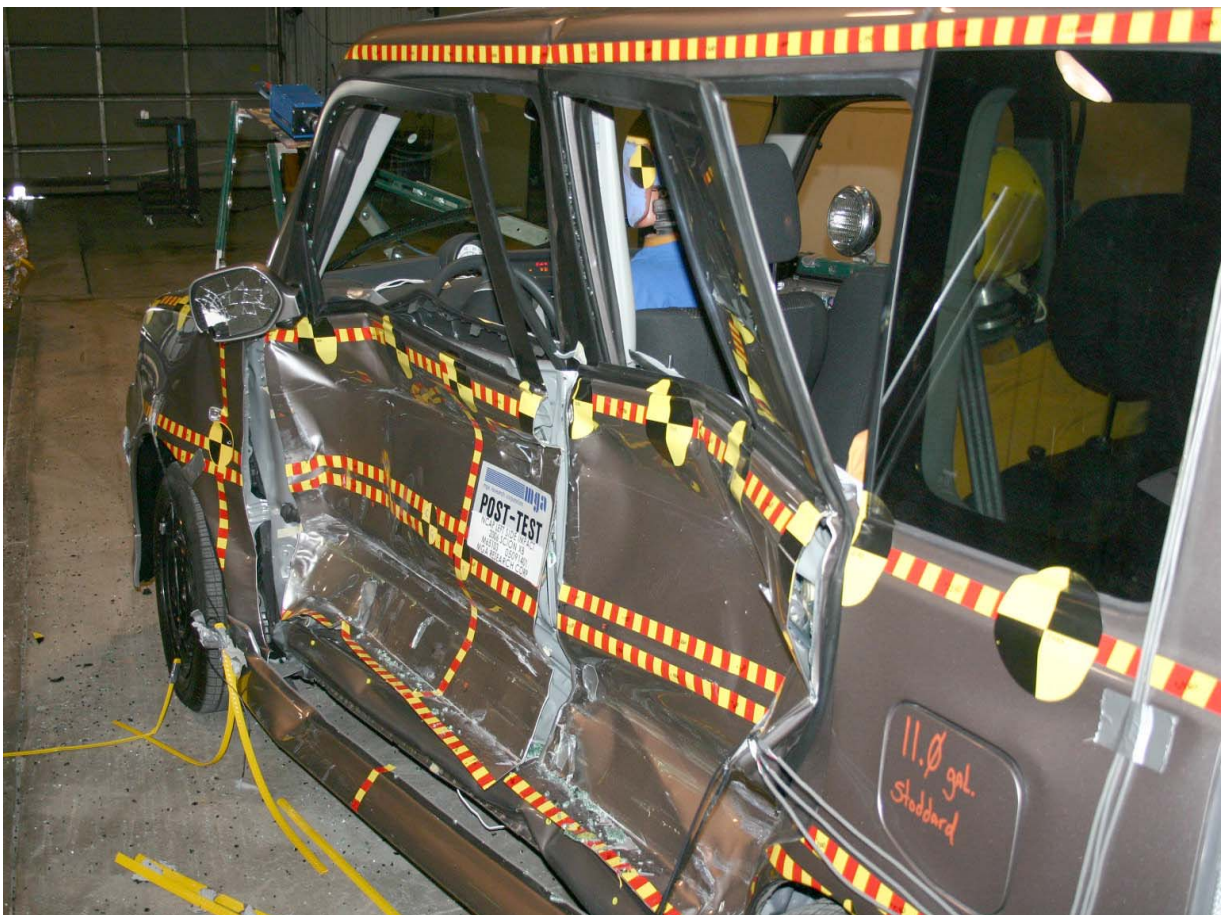
Pre-Test Front $\frac{3}{4}$ View of Left Side Doors



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



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



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



Pre-Test Left Front Door



Post-Test Left Front Door



Pre-Test Left Rear Door



Post-Test Left Rear Door



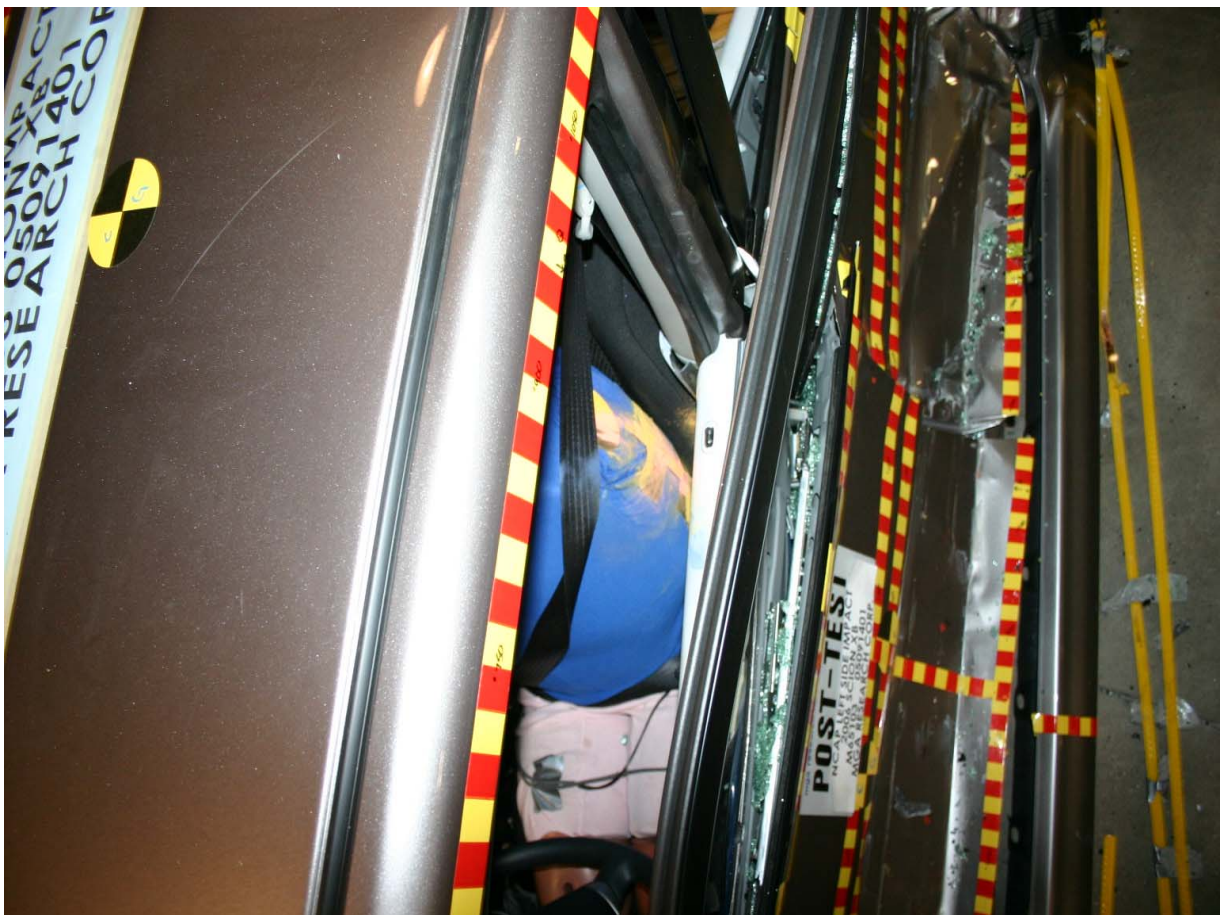
Pre-Test Driver Dummy (Door Open)



Pre-Test Driver Dummy (Through Window)



Pre-Test Driver Dummy Clearance From Door



Post-Test Driver Dummy Clearance From Door



Pre-Test Driver Dummy Right Side View



Post-Test Driver Dummy Right Side View



Post-Test Front Door Panel (Interior)



Pre-Test Passenger Dummy (Door Open)



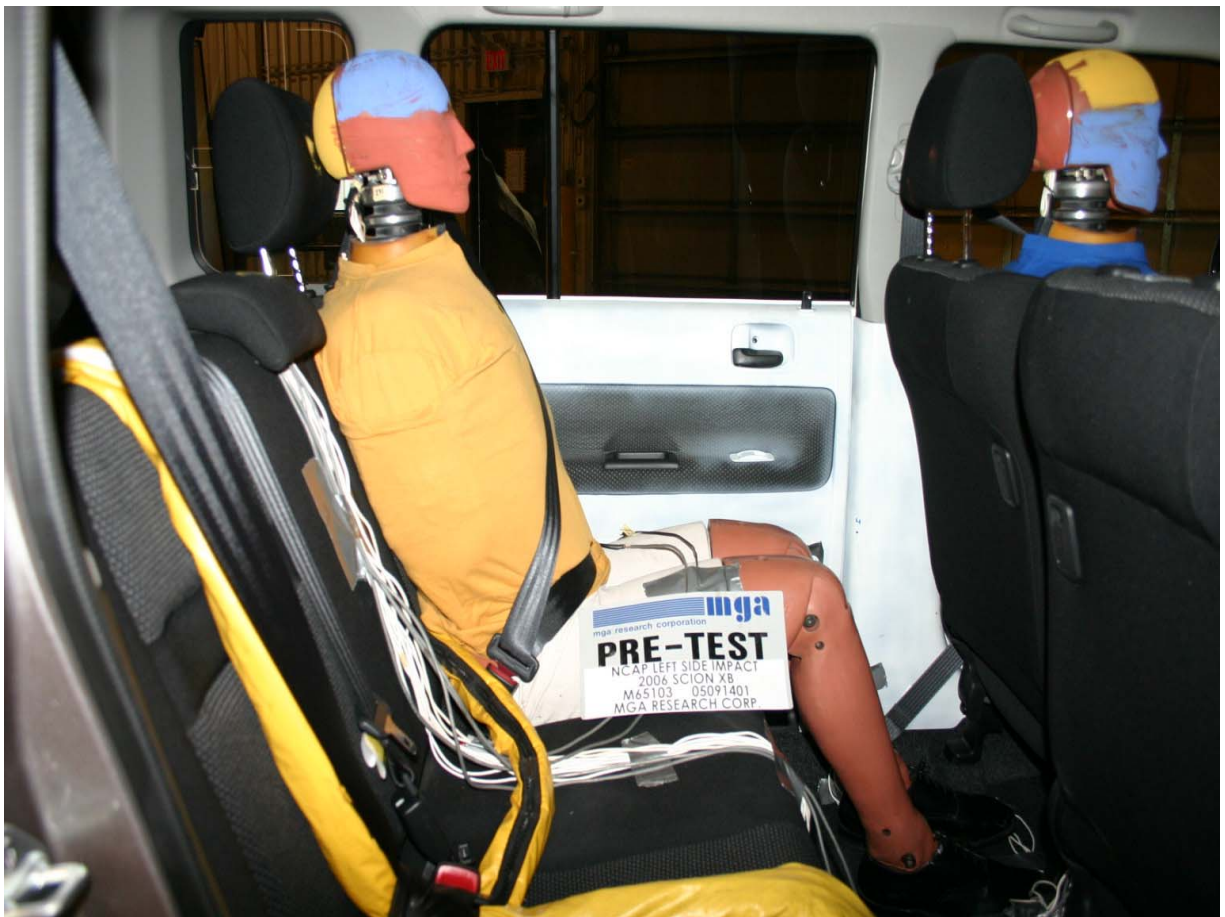
Pre-Test Passenger Dummy (Through Window)



Pre-Test Passenger Dummy Clearance From Door



Post-Test Passenger Dummy Clearance From Door



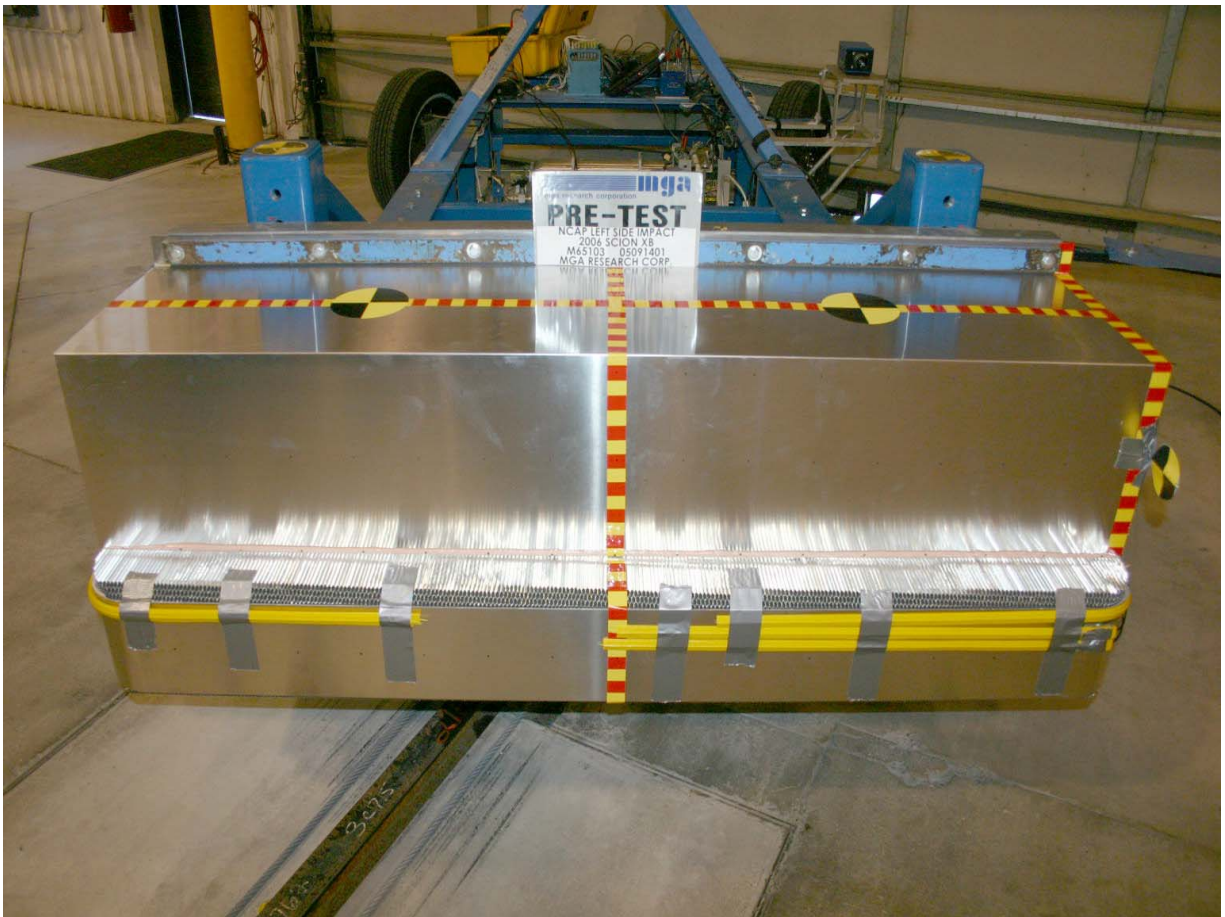
Pre-Test Passenger Dummy Right Side View



Post-Test Passenger Dummy Right Side View



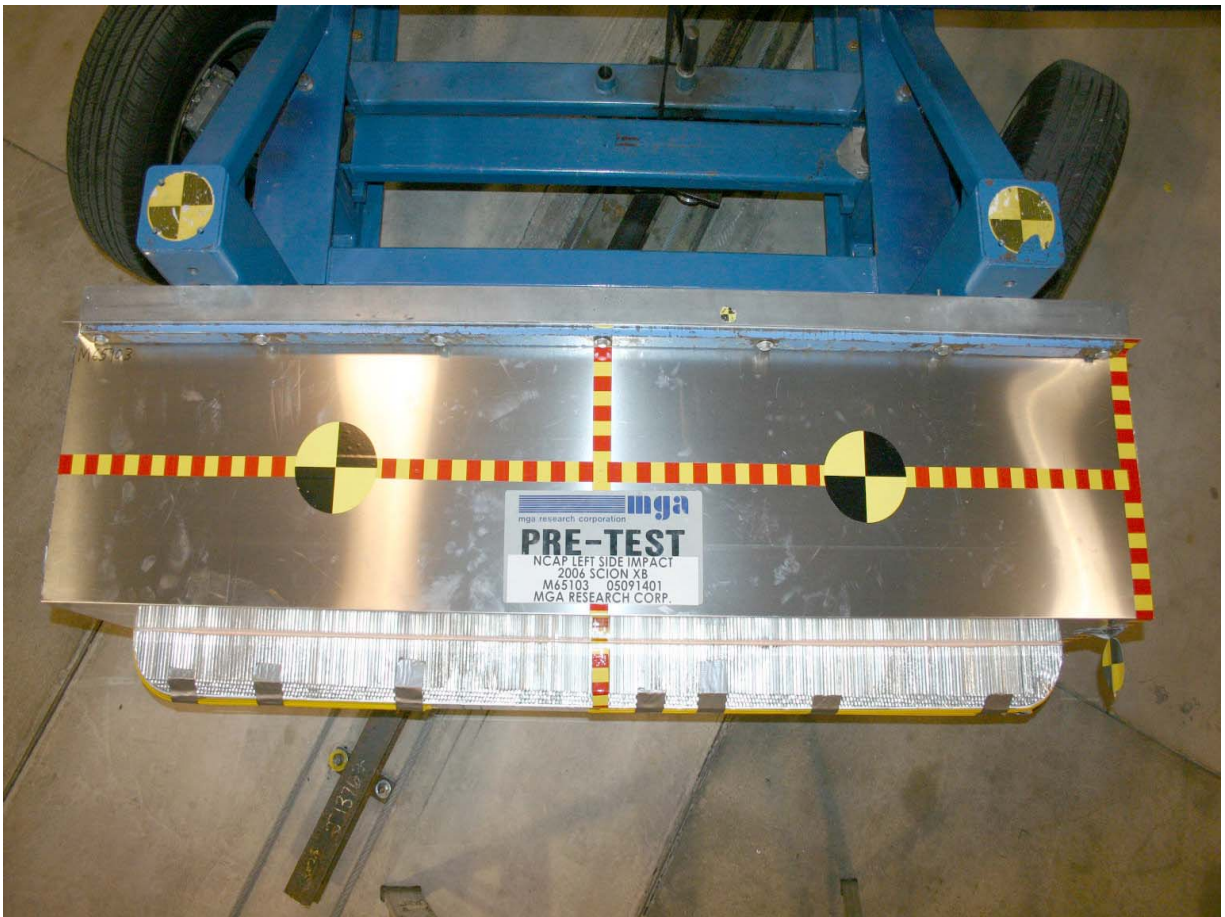
Post-Test Rear Door Panel (Interior)



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 Passenger Door Clearance View



Post-Test Driver Dummy Head Contact



Post-Test Driver Dummy Upper Torso Contact



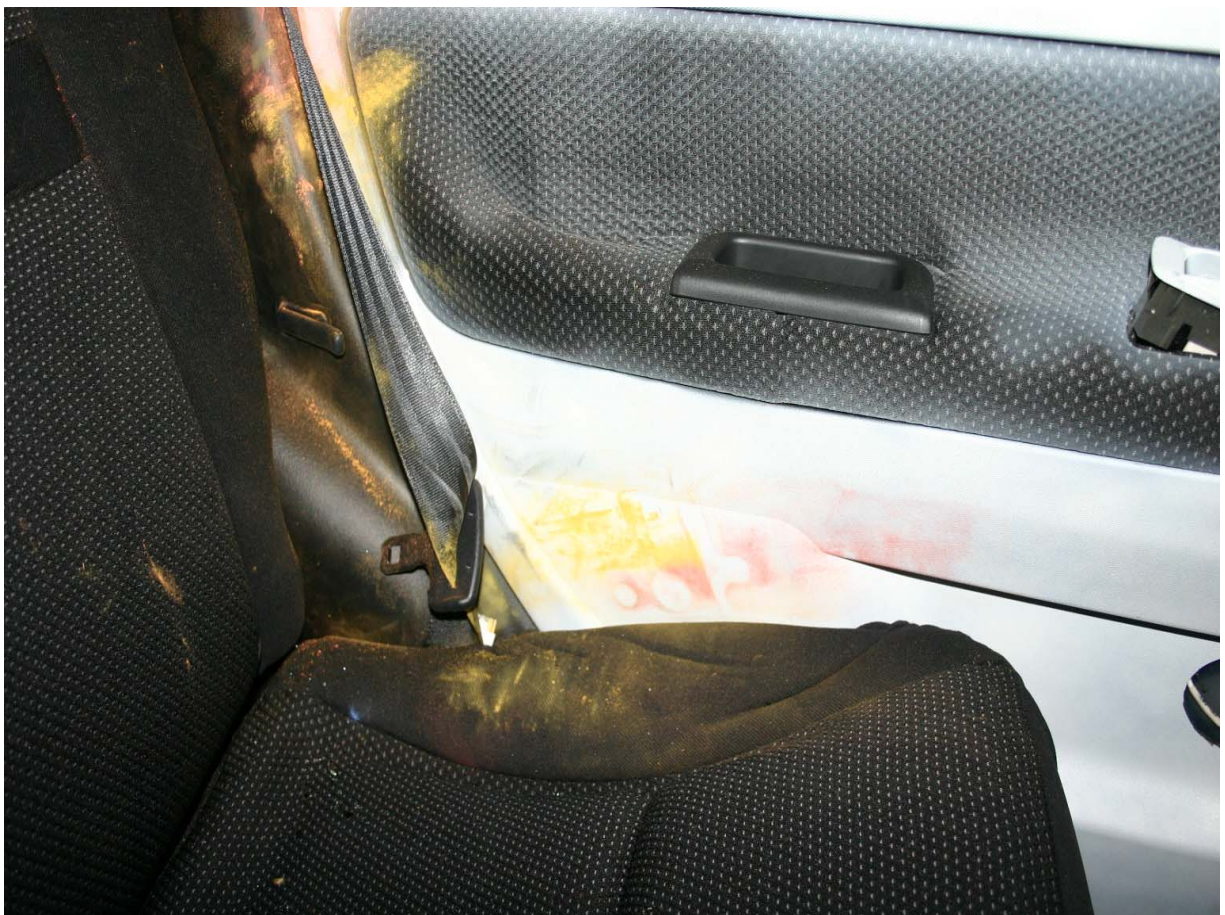
Post-Test Driver Dummy Lower Torso Contact



Post-Test Passenger Dummy Head Contact



Post-Test Passenger Dummy Upper Torso Contact



Post-Test Passenger Dummy Lower Torso Contact

APPENDIX B
SID/HIII RESPONSE DATA TRACES

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

Driver Head X Primary

Driver Head Y Primary

Driver Head Z Primary

Driver Head X Redundant

Driver Head Y Redundant

Driver Head Z Redundant

Driver Upper Neck Force X

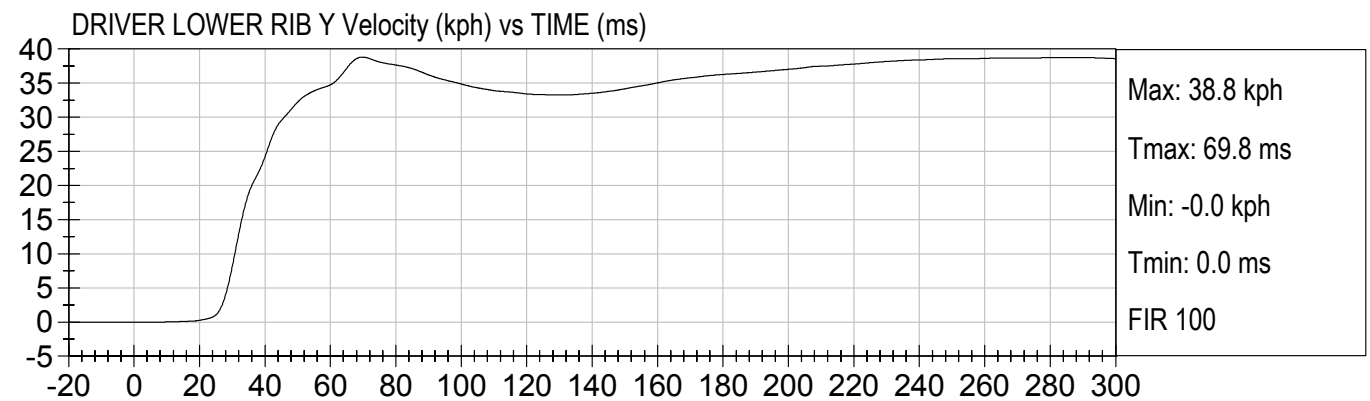
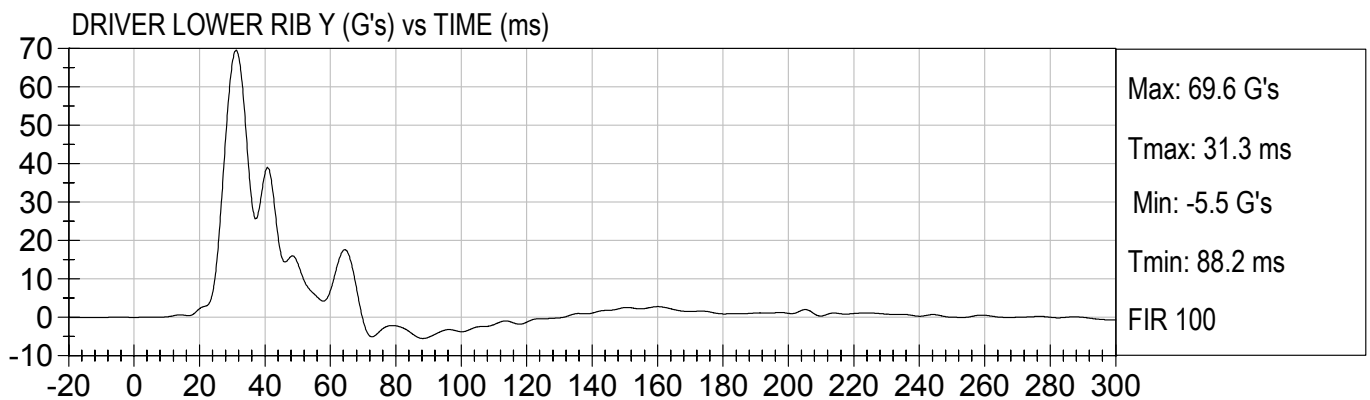
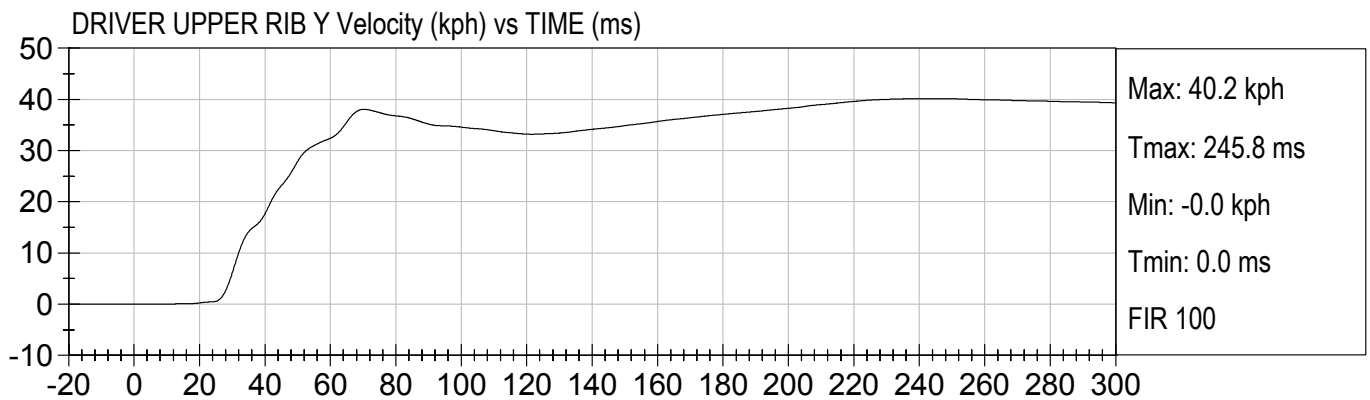
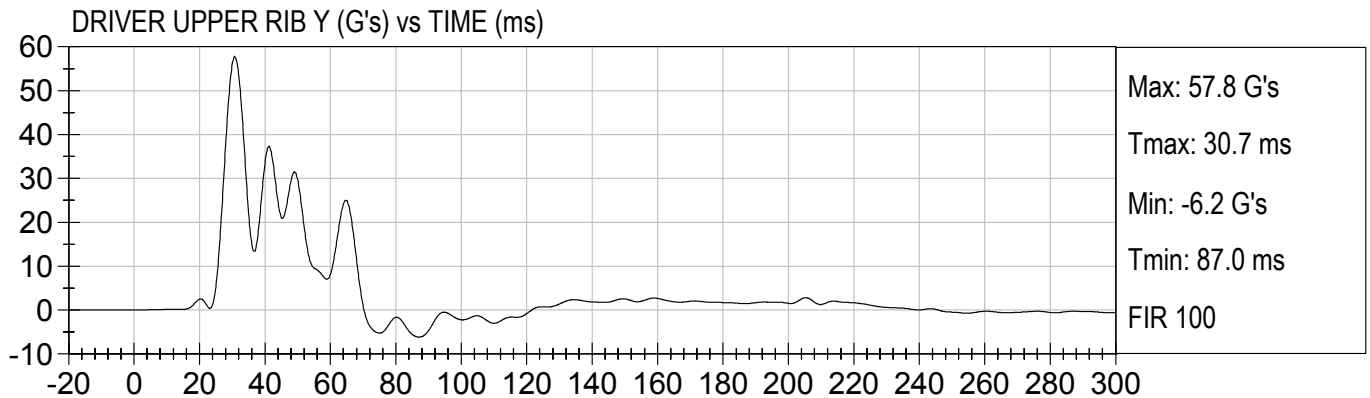
Driver Upper Neck Force Y

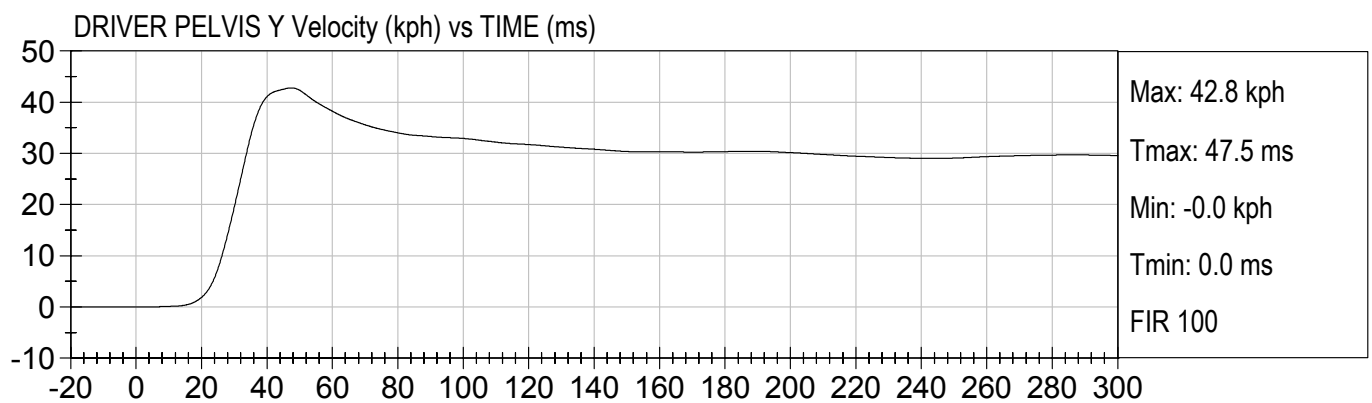
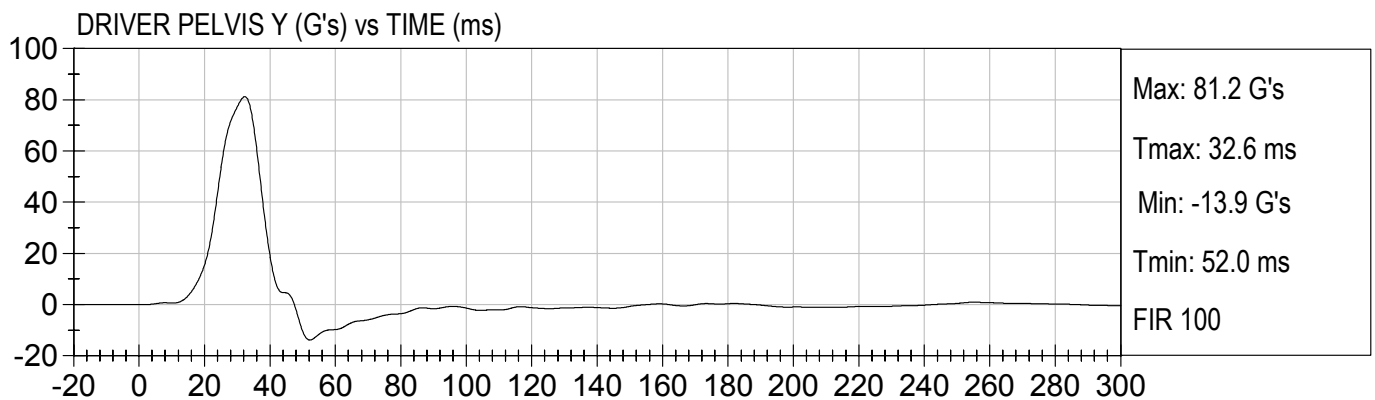
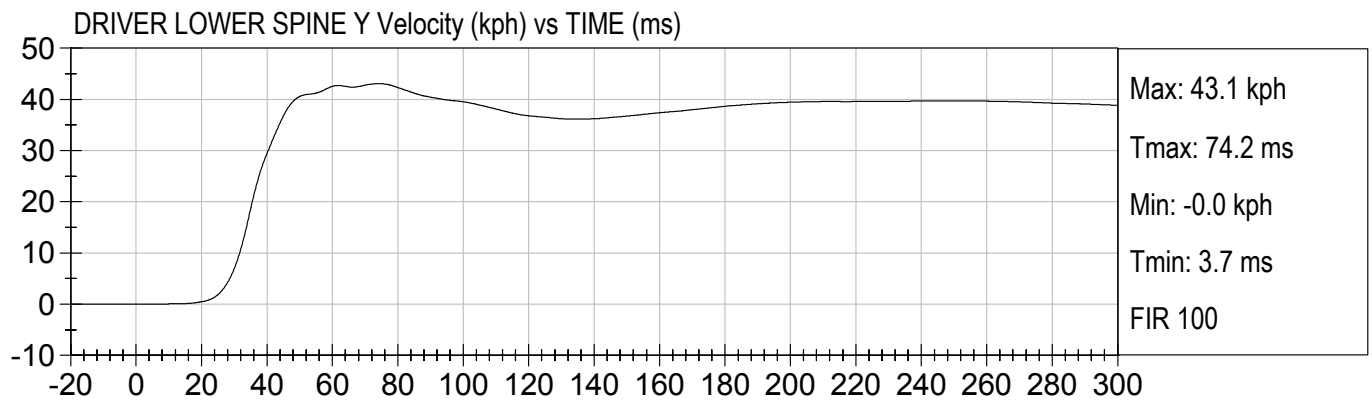
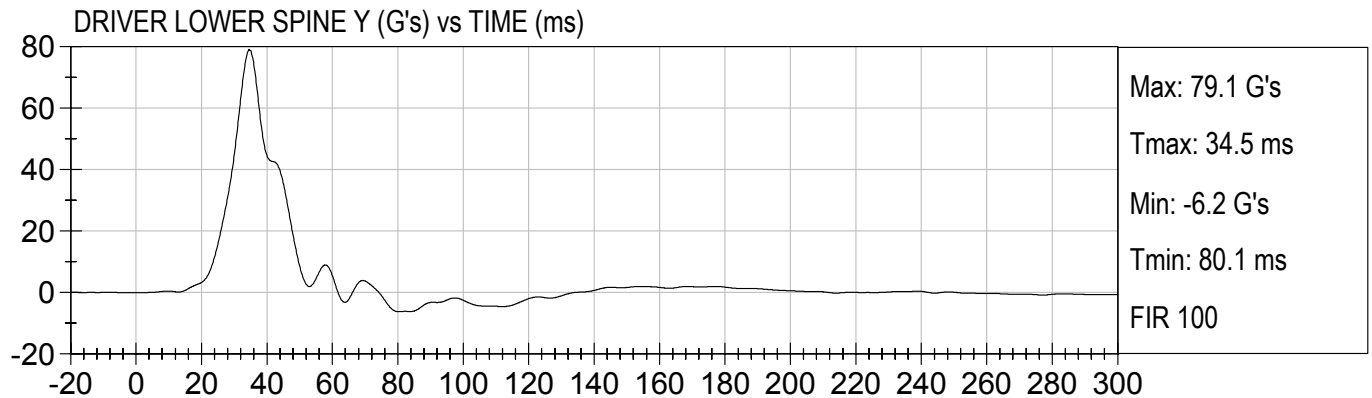
Driver Upper Neck Force Z

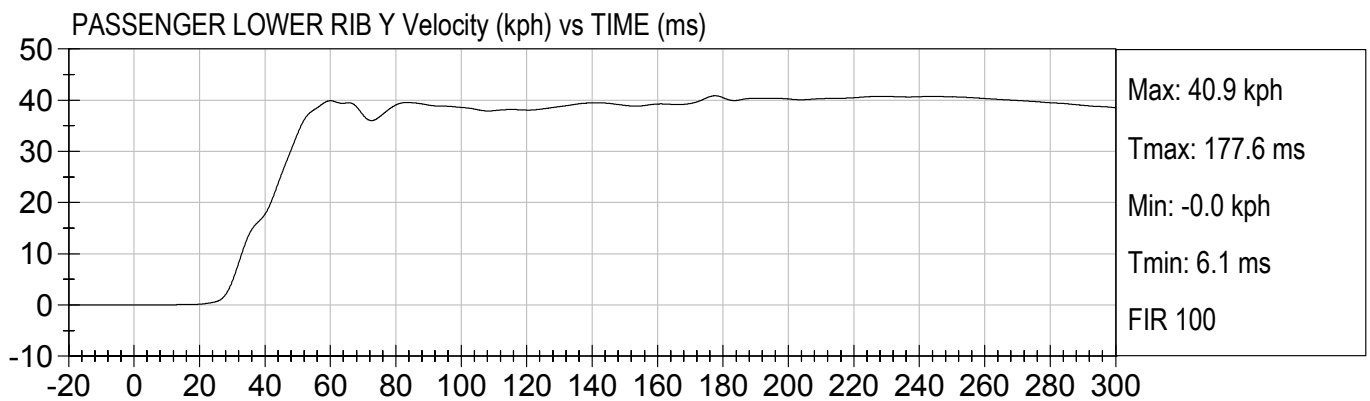
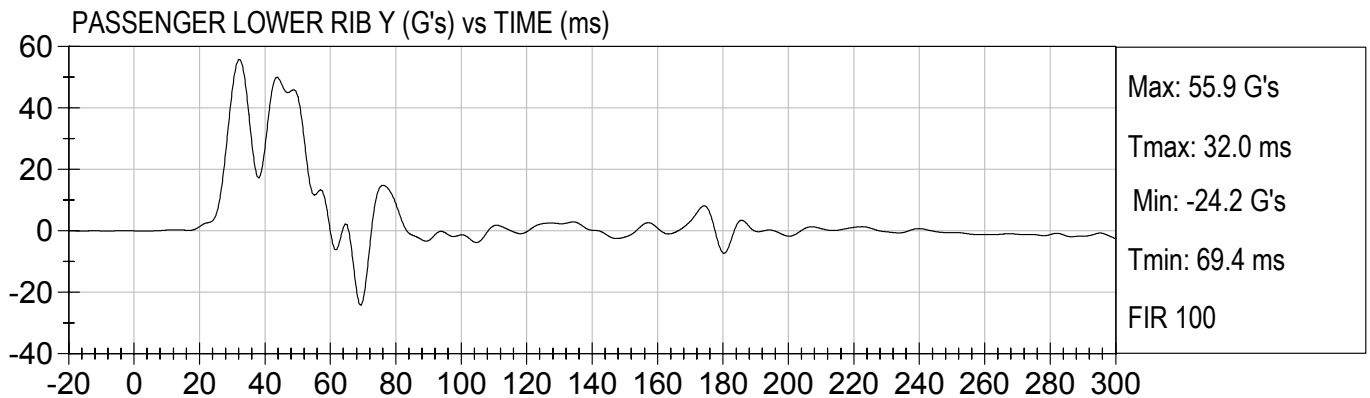
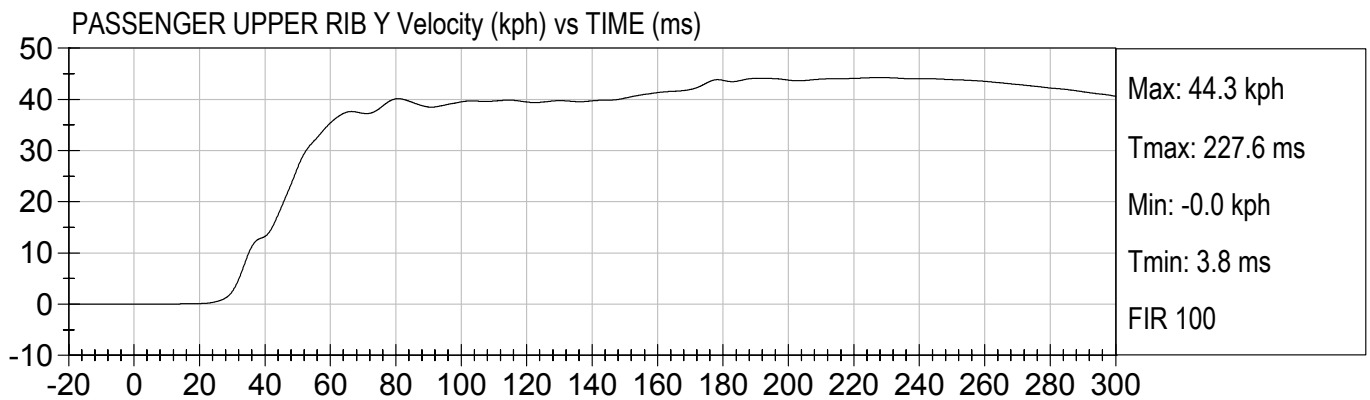
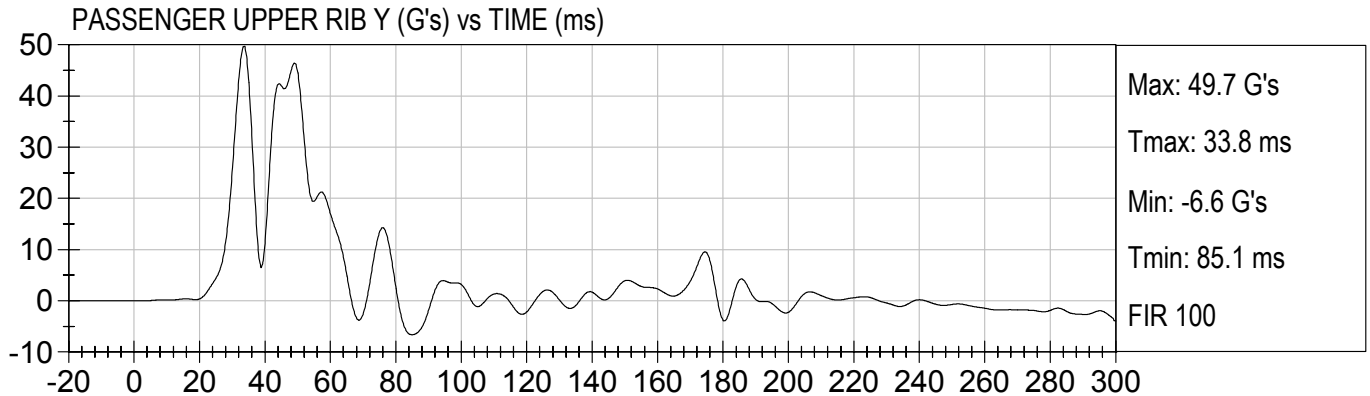
Driver Upper Neck Moment X

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

Vehicle Rear Floor Above Axle X
Vehicle Rear Floor Above Axle Y
Vehicle Rear Floor Above Axle Z
Vehicle Left Sill at Rear Door Y
Vehicle Left Sill at Front Door Y
Vehicle Left Front Door CL Y
Vehicle Right Rear Occupant Compartment
Vehicle Left Front Door Mid Rear Y
Vehicle Left Front Door Upper CL Y
Vehicle Left Rear Door Mid Rear Y
Vehicle Left Rear Door Upper CL Y
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 Rear Z
MDB Left Bumper Contact
MDB Right Bumper Contact

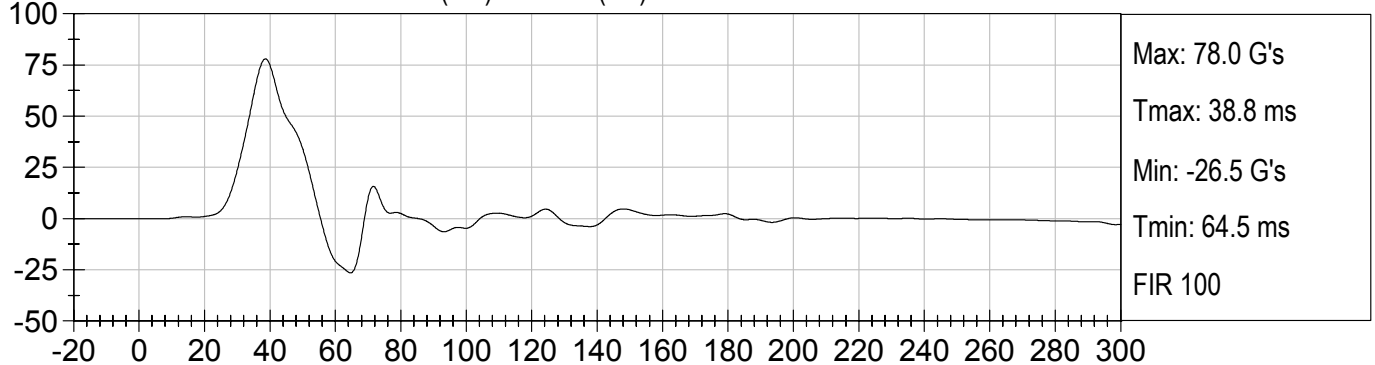




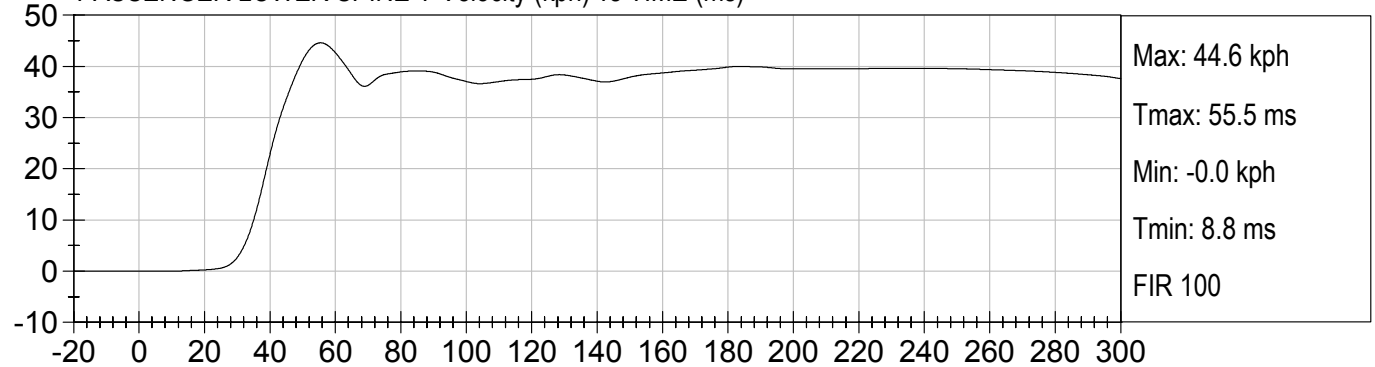




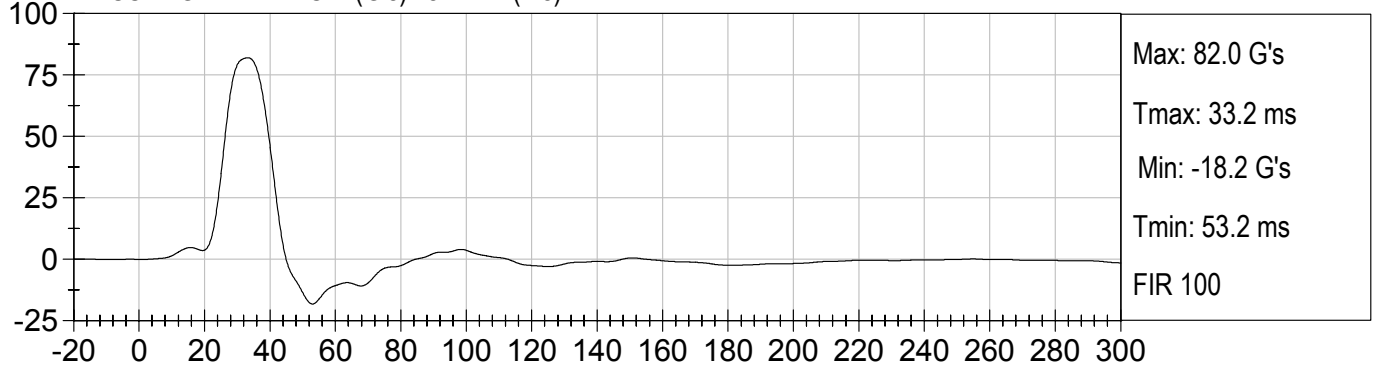
PASSENGER LOWER SPINE Y (G's) vs TIME (ms)



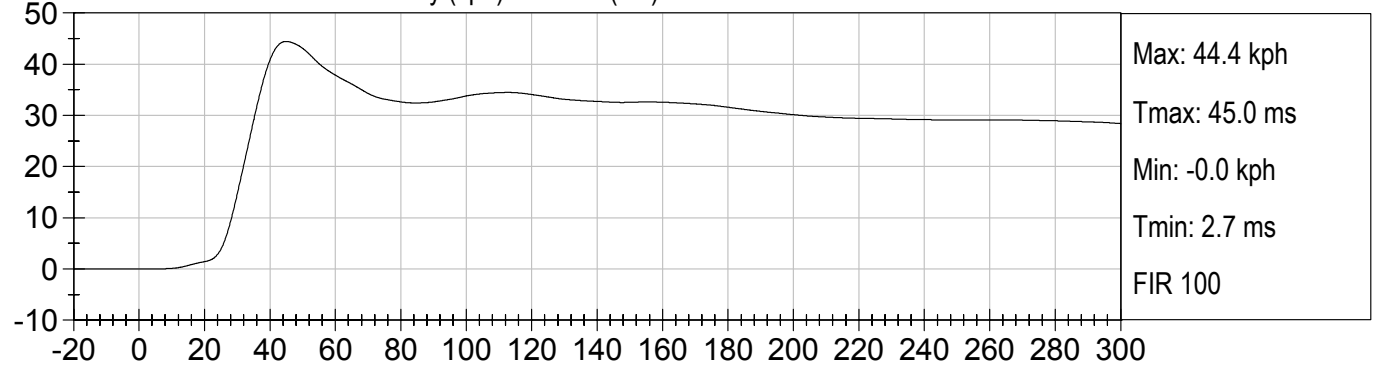
PASSENGER LOWER SPINE Y Velocity (kph) vs TIME (ms)



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: D05235

Tested Parameter	Units	Specification	Result	Pass/Fail
SH - Seated Height	mm	889 - 909	903	Pass
RH - Rib Height	mm	501 - 521	509	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	525	Pass
SW - Knee Pivot to Floor	mm	490 - 505	500	Pass
HW - Hip Width	mm	356 - 391	368	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

08/23/2005
Test Date

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

ATD Serial No: 904

Test I.D: D052431

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	22.1	Pass
Laboratory Relative Humidity	%	10 to 70	47	Pass
Peak Resultant Acceleration	G's	120 to 150	138	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-9	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

David Winkelbauer
Approved By

09/01/2005
Test Date



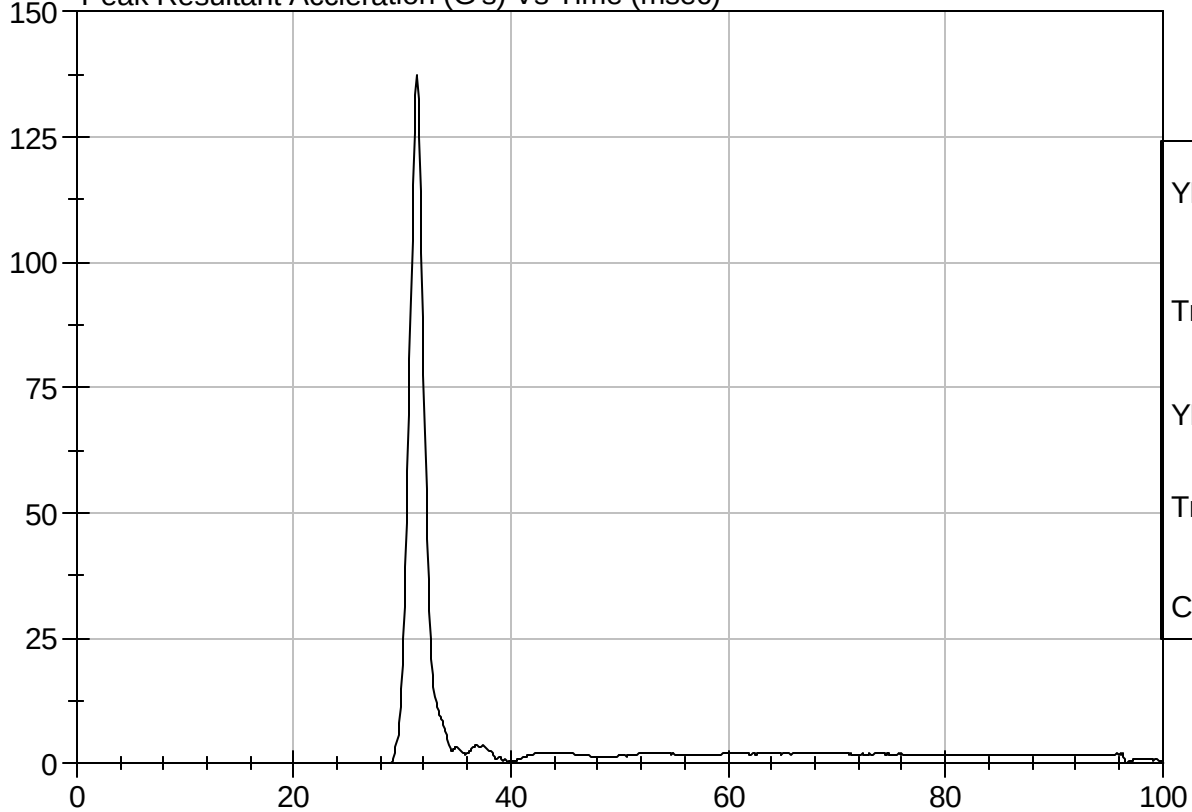
Test Description: Head Drop

Test Date: 09/01/2005

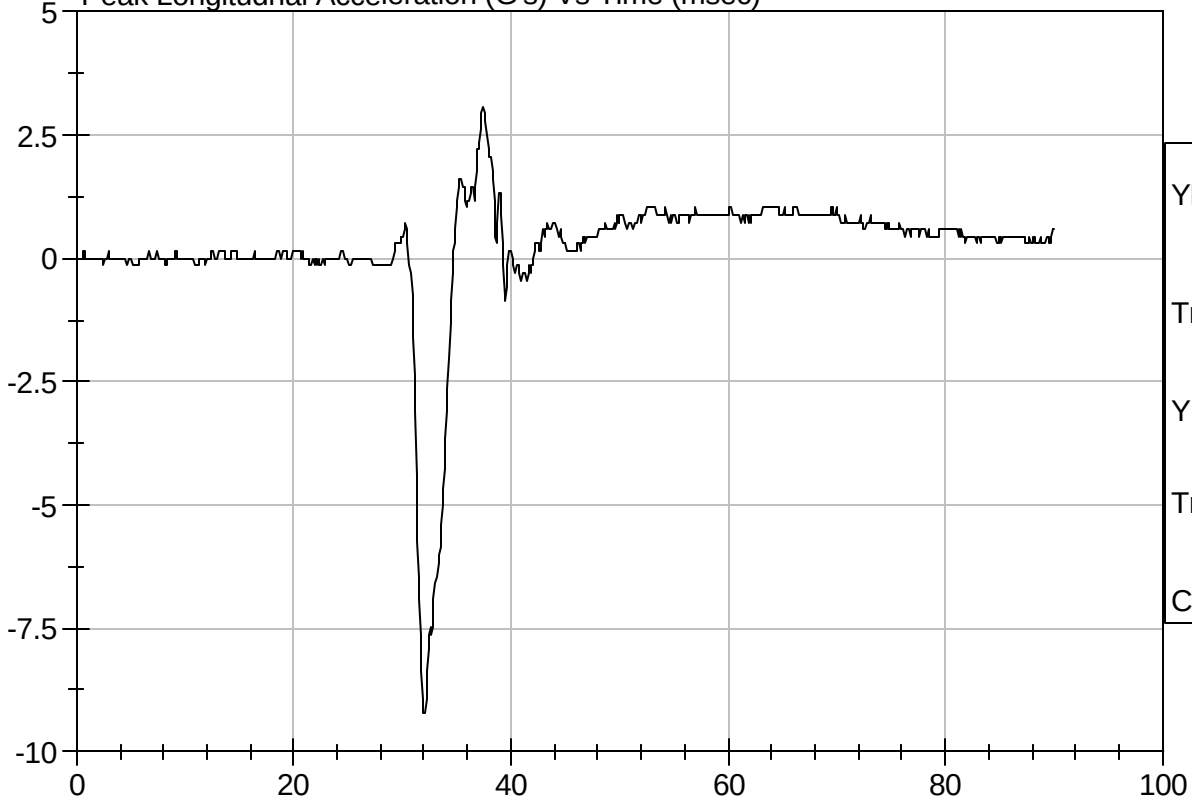
Component: D052431

Speed: 0 ft/s, 0.00 m/s

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



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



SID Calibration Data Sheet
Side Impact Dummy
Thorax Impact Test

ATD Serial No: 904

Test I.D: D052432

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
Probe Velocity	m/s	4.22 - 4.31	4.29	Pass
Upper Rib	G's	37 - 46	42	Pass
Lower Rib	G's	37 - 46	39	Pass
Lower Spine	G's	15 - 22	22	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

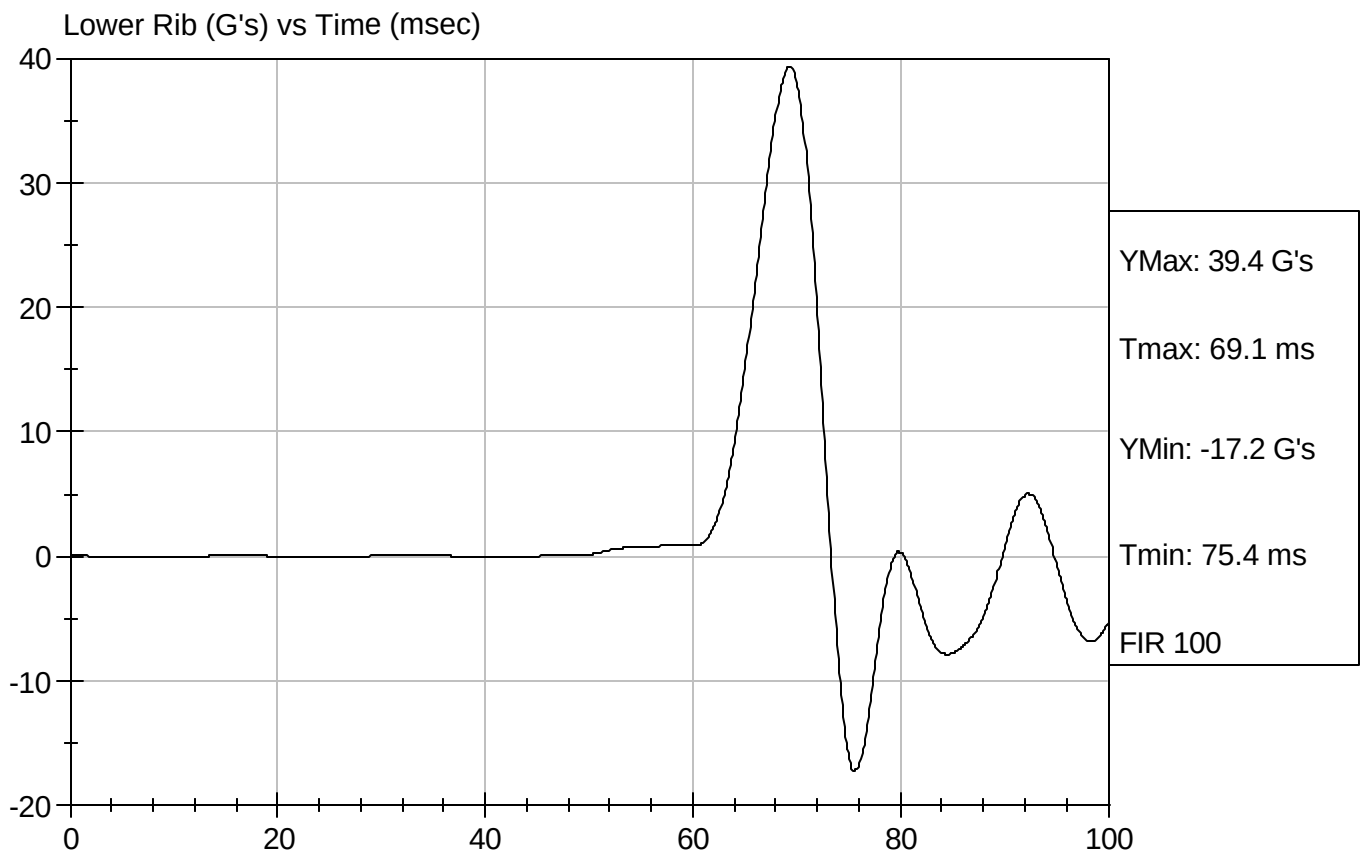
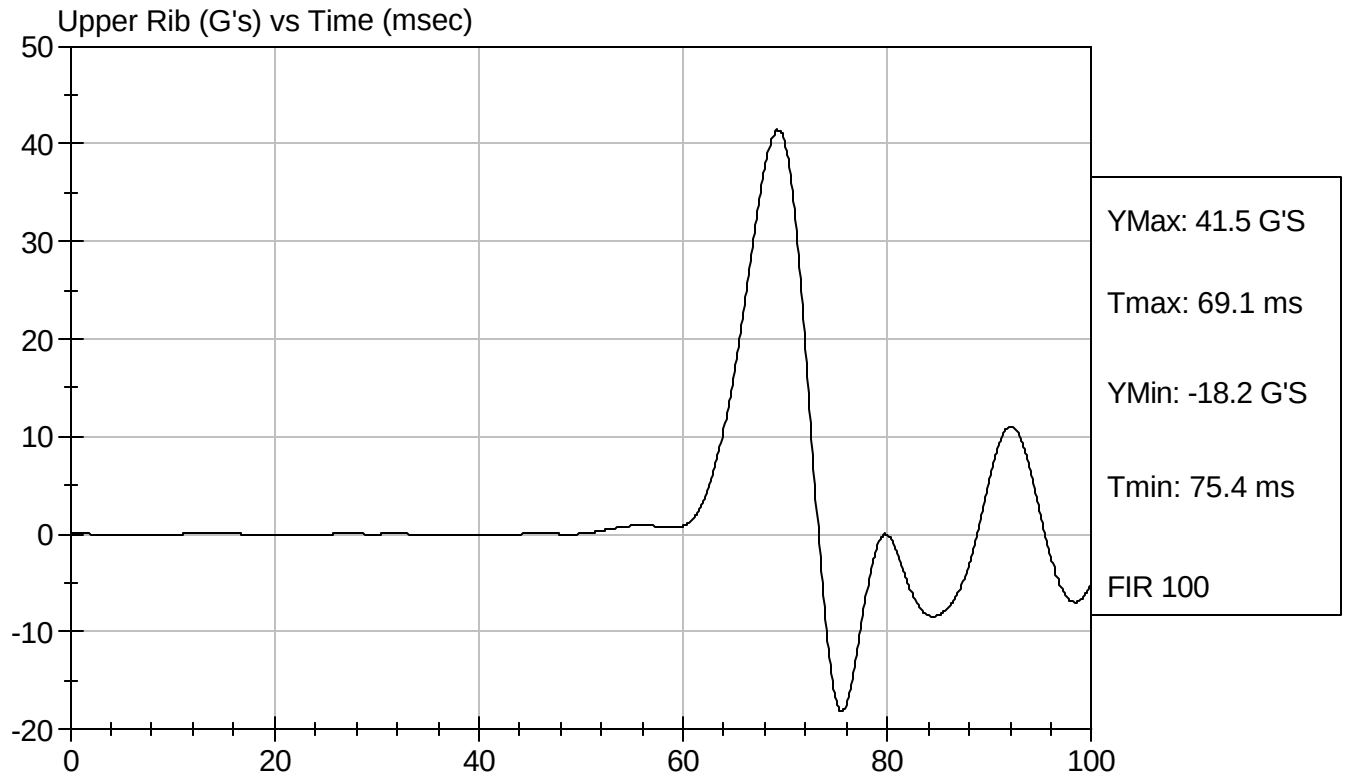
David Winkelbauer
Approved By

09/02/2005
Test Date



Test Desc: Thorax Impact
Component ID: D052432

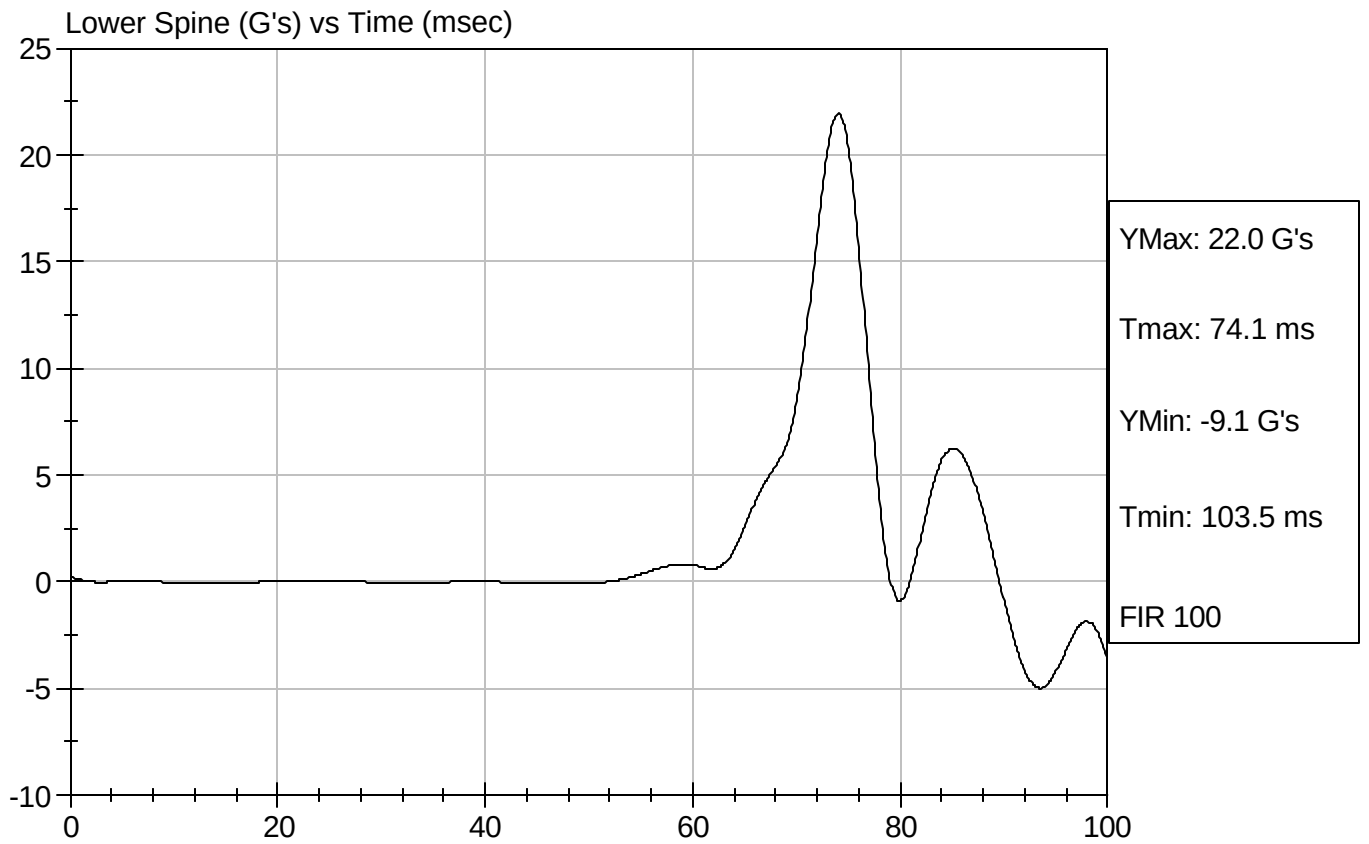
Test Date: 09/02/2005
Speed: 14.07 ft/sec, 4.29 m/sec





Test Desc: Thorax Impact
Component ID: D052432

Test Date: 09/02/2005
Speed: 14.07 ft/sec, 4.29 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Test

ATD Serial No: 042

Test I.D: D052433

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	40	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	47	Pass
Overall Test Results			Pass	

Jessica Gall
Laboratory Technician

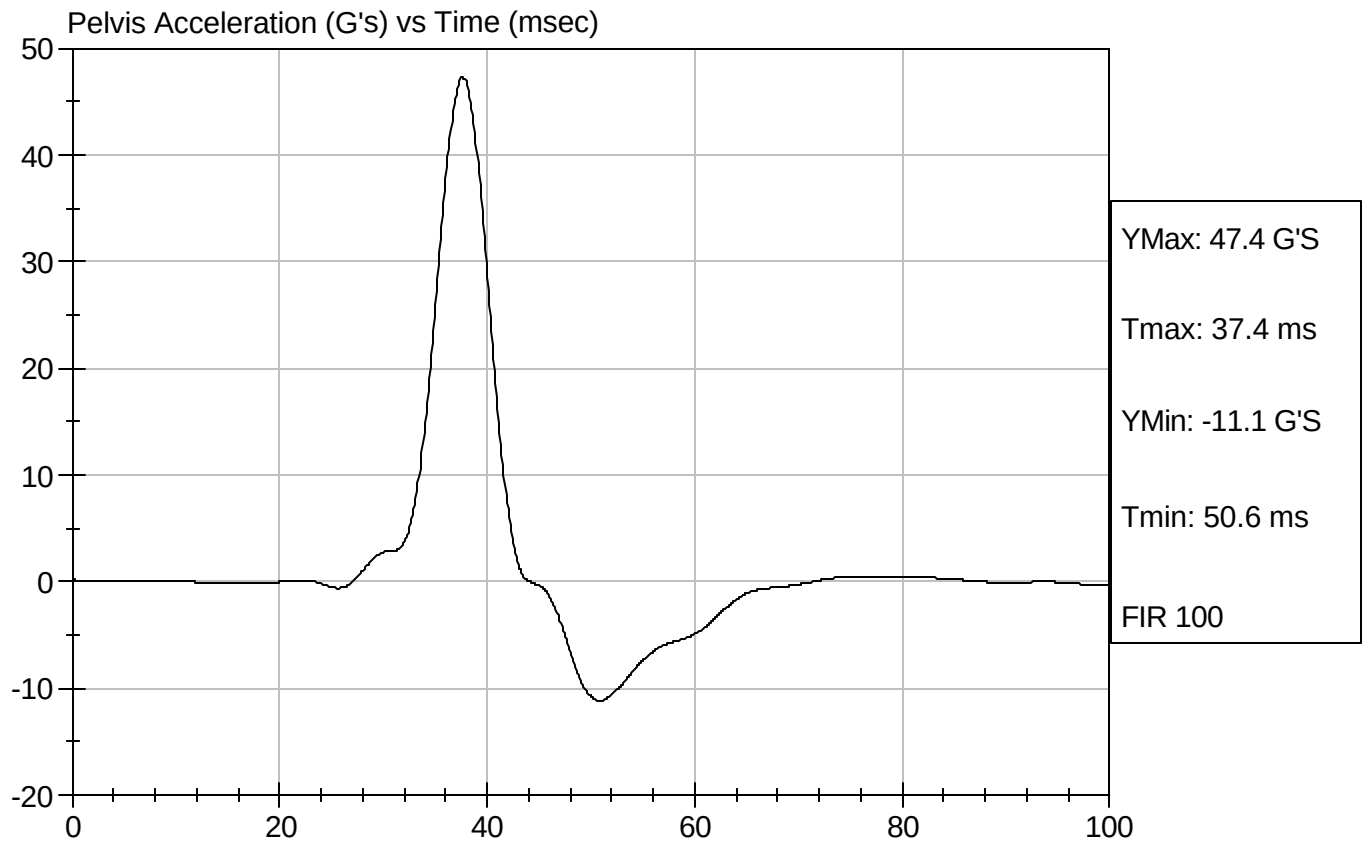
David Winkelbauer
Approved By

09/02/2005
Test Date



Test Desc: Thorax Impact
Component ID: D052433

Test Date: 09/02/2005
Speed: 14.10 ft/sec, 4.30 m/sec



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

ATD Serial No: 901

Test I.D: D052434

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Force At 12.7 mm	N	104 -162	137	Pass
Force At 19 mm	N	163 - 222	189	Pass
Force At 25.4 mm	N	222 - 280	256	Pass
Force At 33 mm	N	325 - 391	353	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

David Winkelbauer
Approved By

09/01/2005
Test Date

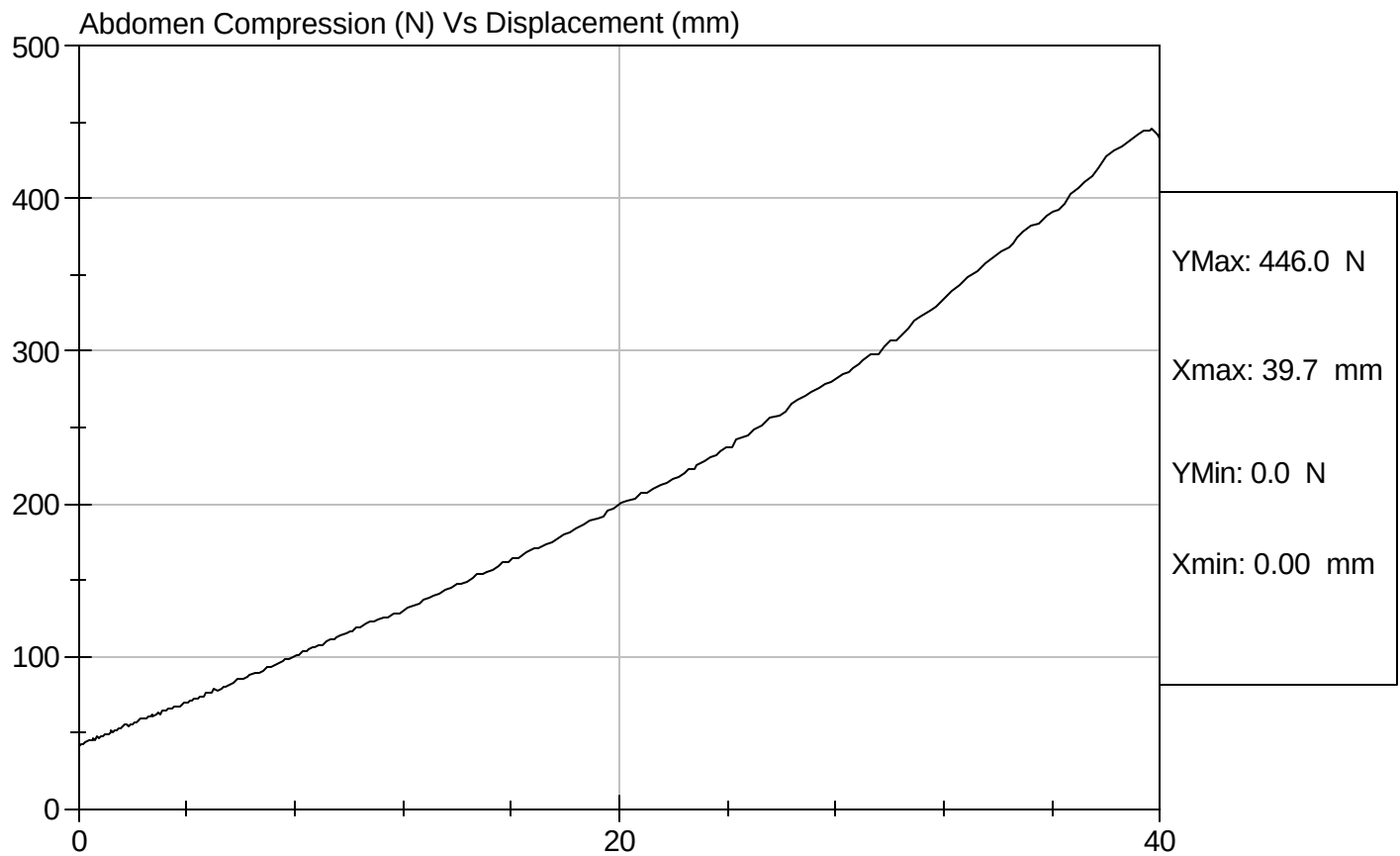


Test Description: Abdomen Compression

Test Date: 09/01/2005

Component: D052434

Speed: 0 ft/sec, 0 m/sec



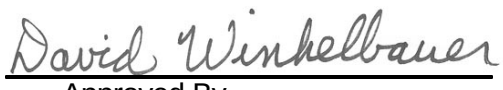
SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 904

Test I.D: D052435

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Force At 0 deg	N	0 - 26.7	0.0	Pass
Force At 20 deg	N	97.9 - 151.2	126.9	Pass
Force At 30 deg	N	151.2 - 204.6	177.0	Pass
Force At 40 deg	N	204.6 - 258.0	249.3	Pass
Return Angle	Deg	12 Maximum	2	Pass
			Overall Test Results	Pass


Laboratory Technician


Approved By

09/01/2005

Test Date

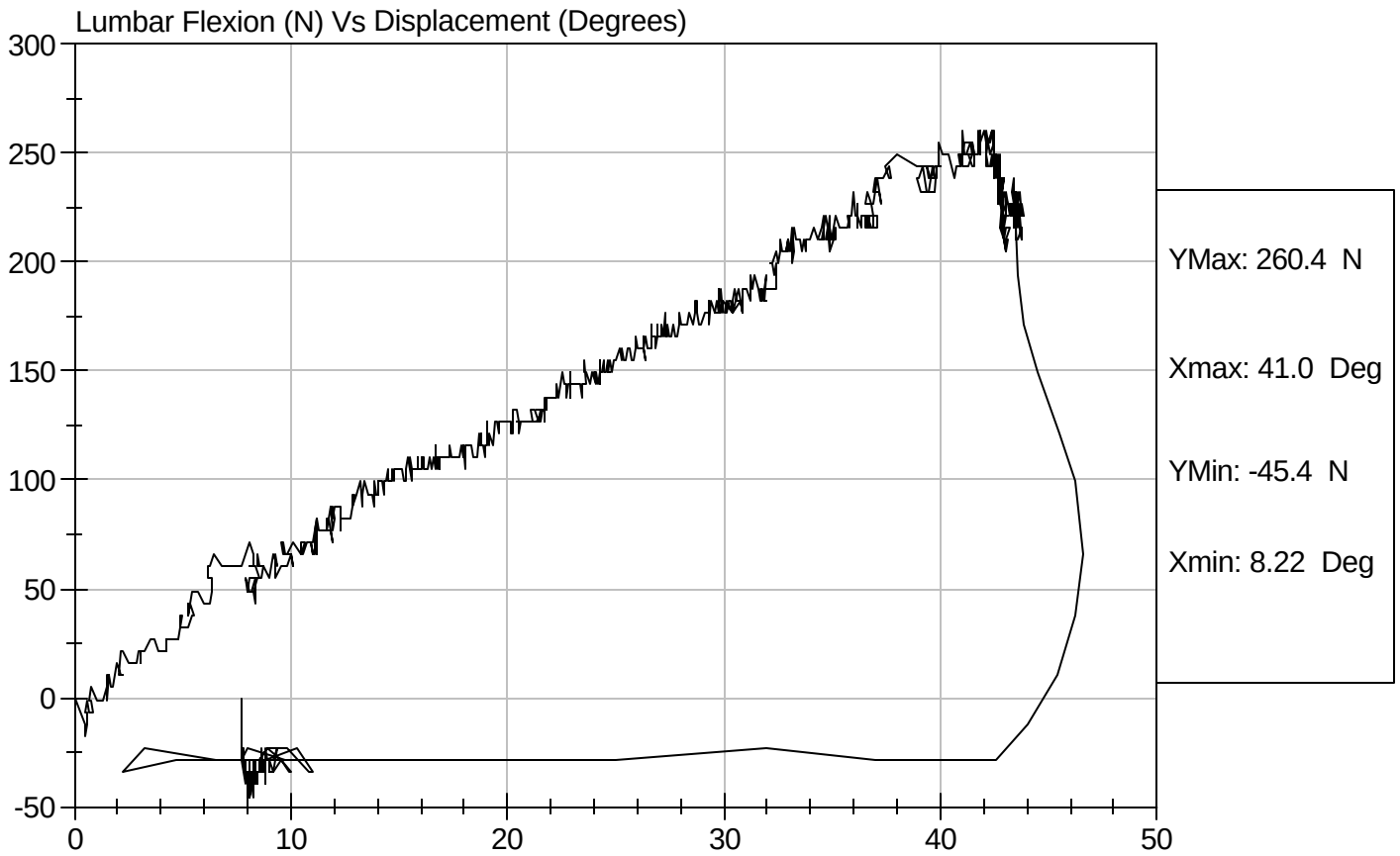


Test Description: Lumbar Flexion

Test Date: 09/01/2005

Component: D052435

Speed: 0 ft/sec, 0 m/sec

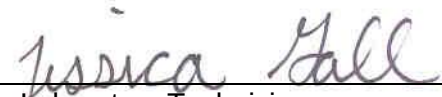


SID Calibration Data Sheet
Side Impact Dummy (SID)
Neck Pendulum Test

ATD Serial No: 904

Test I.D: D052439

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	22.1	Pass
Laboratory Relative Humidity		%	10 to 70	46	Pass
Impact Velocity		m/s	6.89 to 7.13	7.08	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.38	Pass
	20 msec	m/s	4.12 to 5.10	4.67	Pass
	30 msec	m/s	5.73 to 7.01	6.55	Pass
	40 to 70 msec	m/s	6.27 to 7.64	7.16	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	75	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	59	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	77	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	61	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	13	Pass


 Laboratory Technician


 Approved By

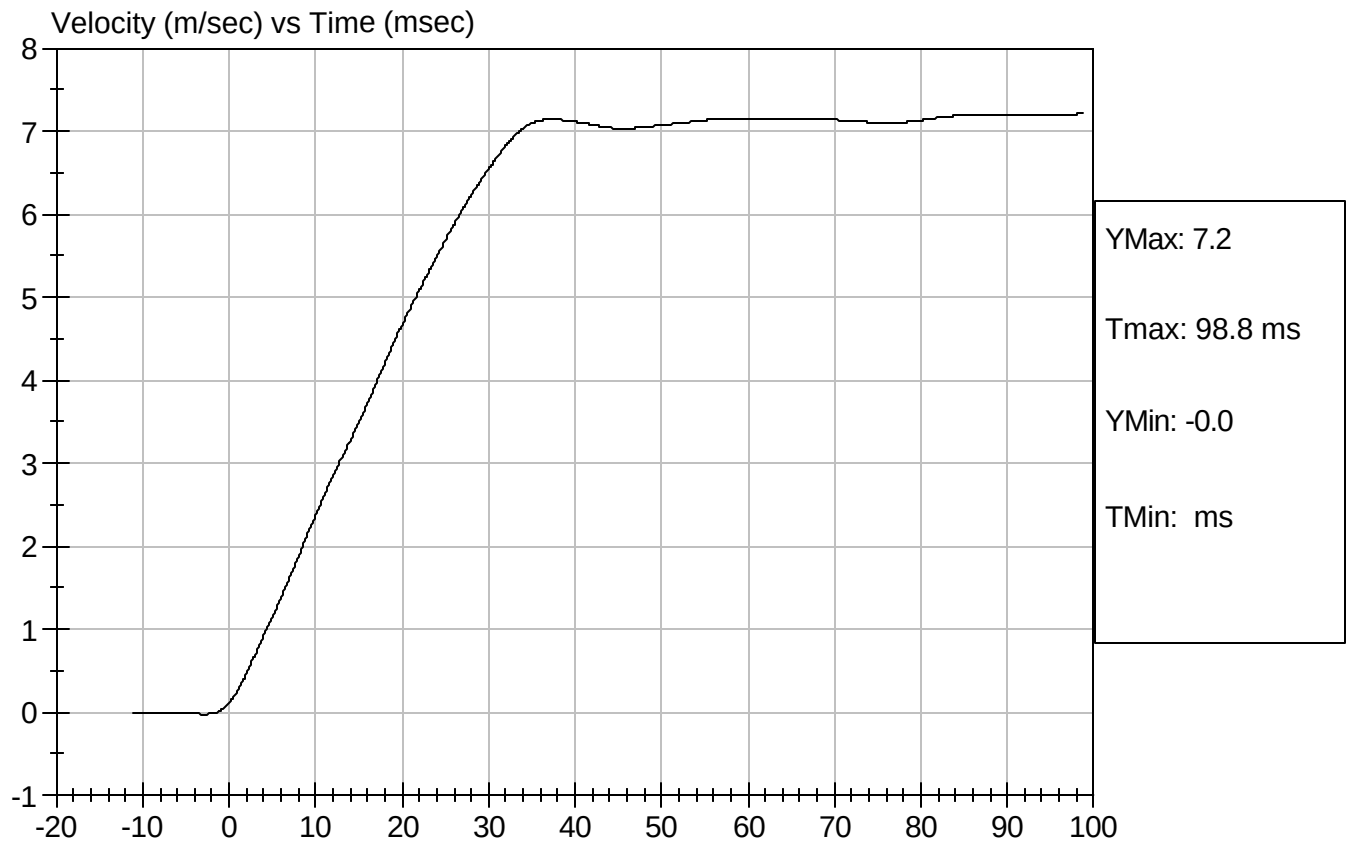
09/01/2005

Test Date



Test Desc: Neck Bending
Component ID: D052439

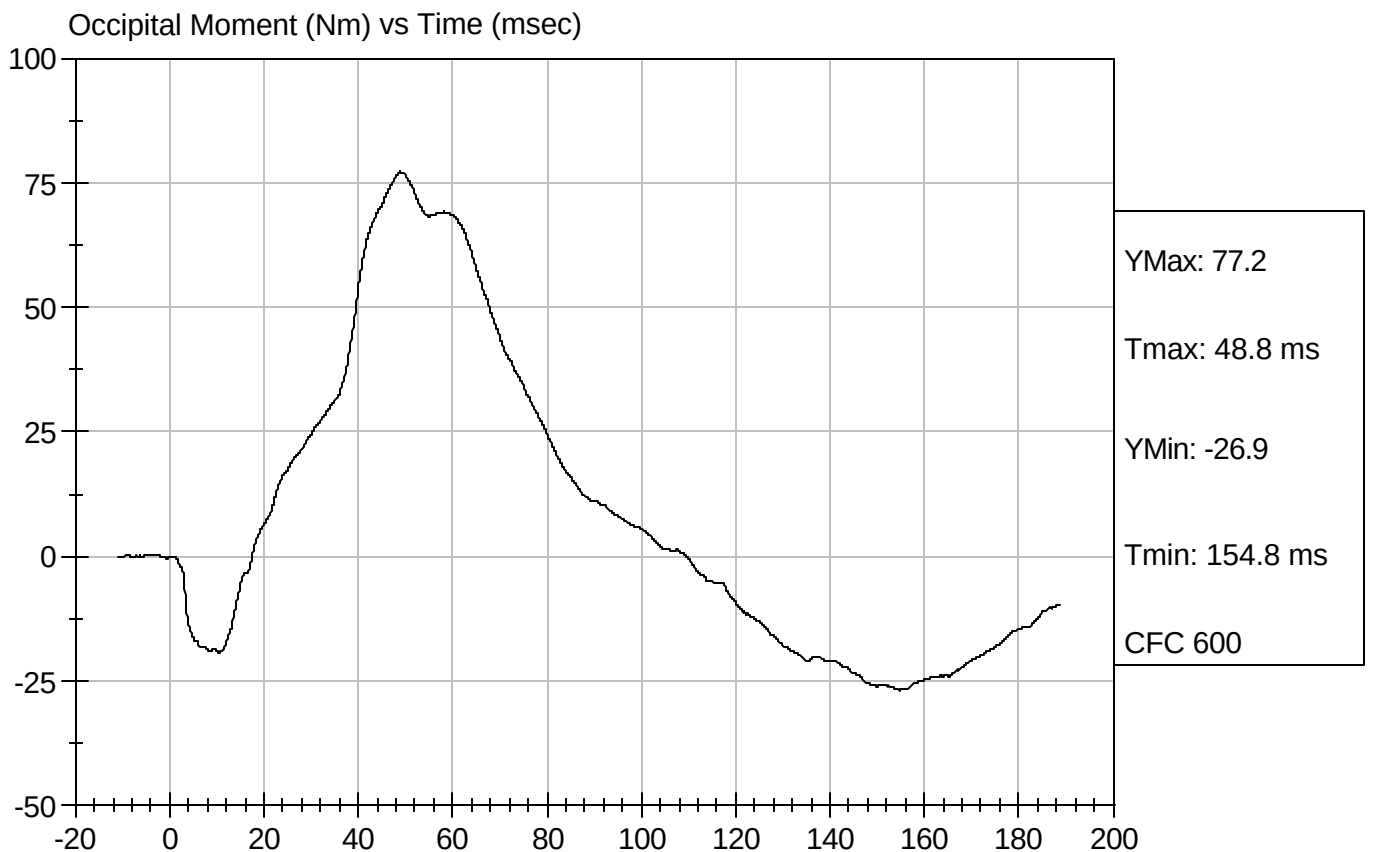
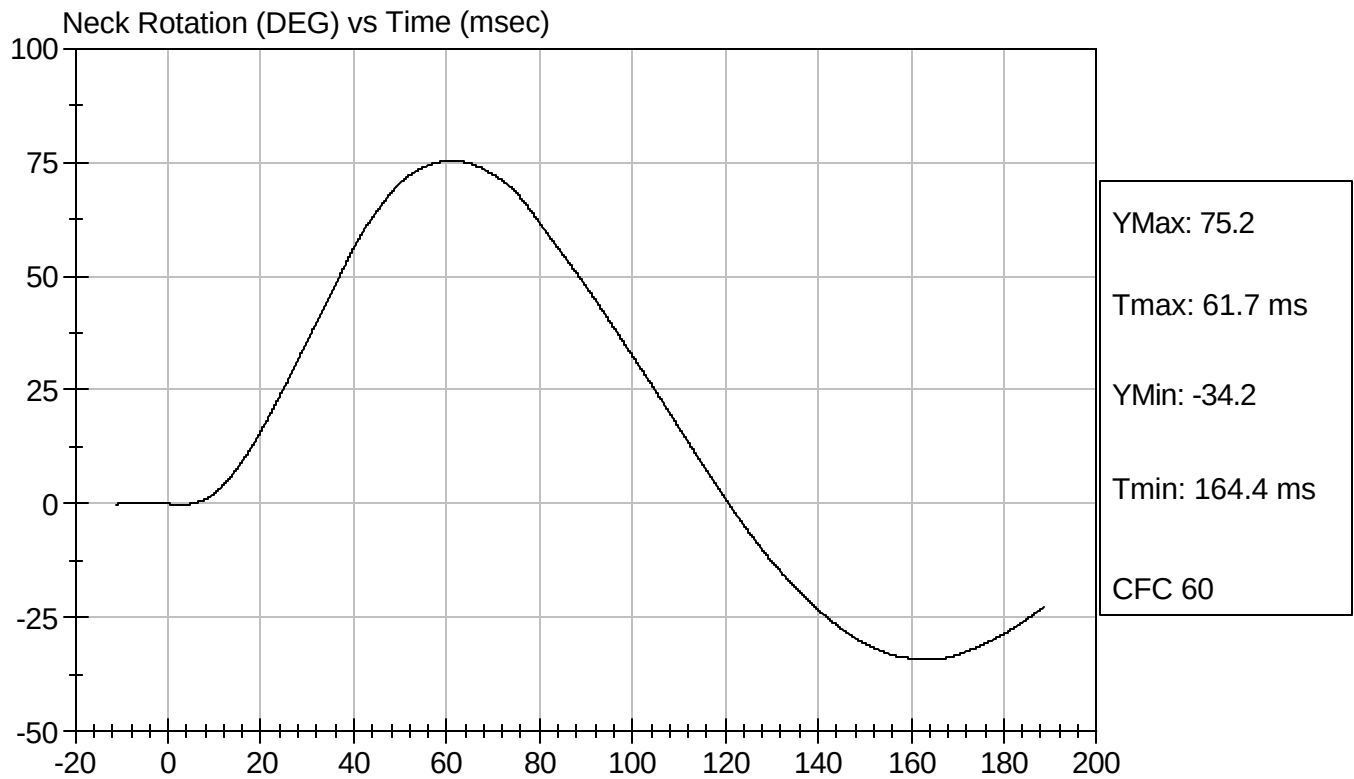
Test Date: 09/01/2005
Speed: 23.23 ft/sec, 7.08 m/sec





Test Desc: Neck Bending
Component ID: D052439

Test Date: 09/01/2005
Speed: 23.23 ft/sec, 7.08 m/sec



Calibration Test Results Summary

Dummy Serial Number: 904

Post-Test Calibration

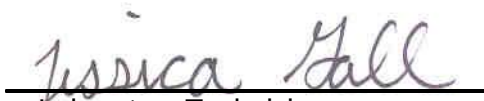
External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all pendulum test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis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

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

ATD Serial No: 904

Test I.D: D052551

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	39	Pass
Peak Resultant Acceleration	G's	120 to 150	144	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-8	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

09/14/2005
Test Date



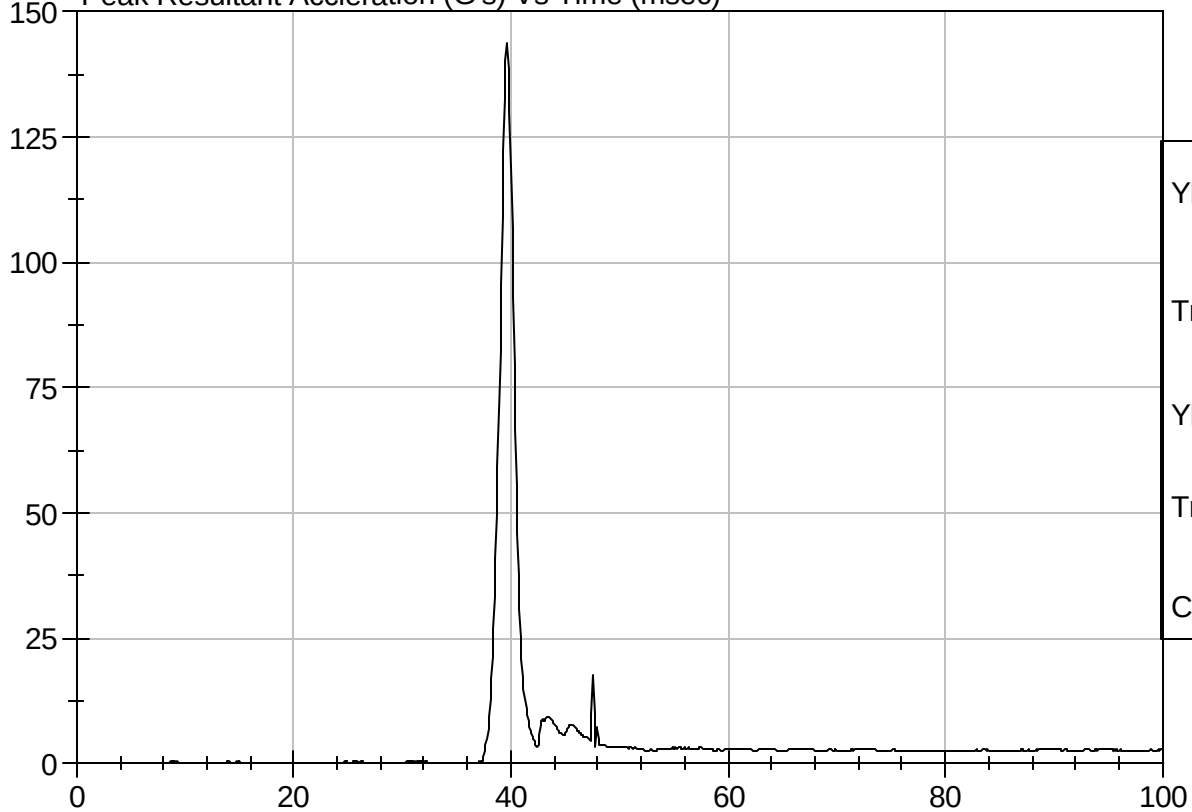
Test Description: Head Drop

Test Date: 09/14/2005

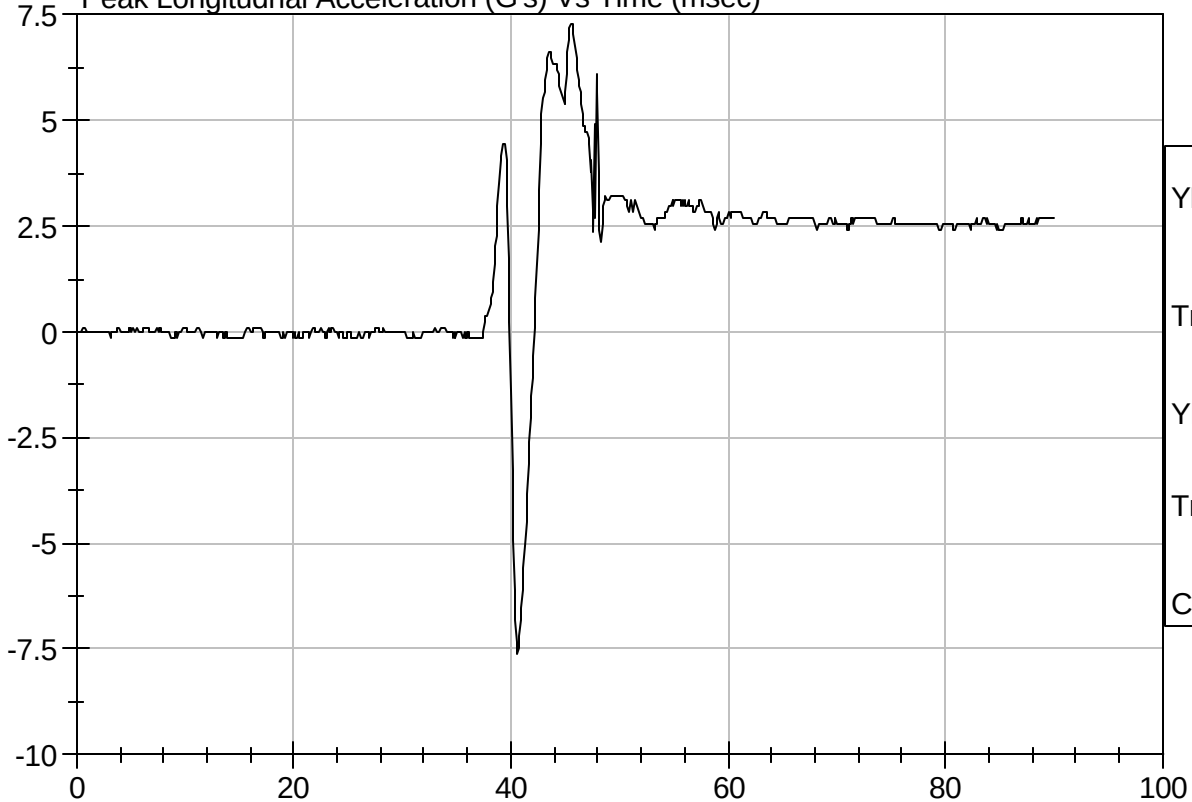
Component: D052551

Speed: 0 ft/s, 0.00 m/s

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



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



SID Calibration Data Sheet
Side Impact Dummy
Thorax Impact Test

ATD Serial No: 904

Test I.D: D052552

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Velocity	m/s	4.22 - 4.31	4.31	Pass
Upper Rib	G's	37 - 46	44	Pass
Lower Rib	G's	37 - 46	41	Pass
Lower Spine	G's	15 - 22	21	Pass
Overall Test Results				Pass


Laboratory Technician

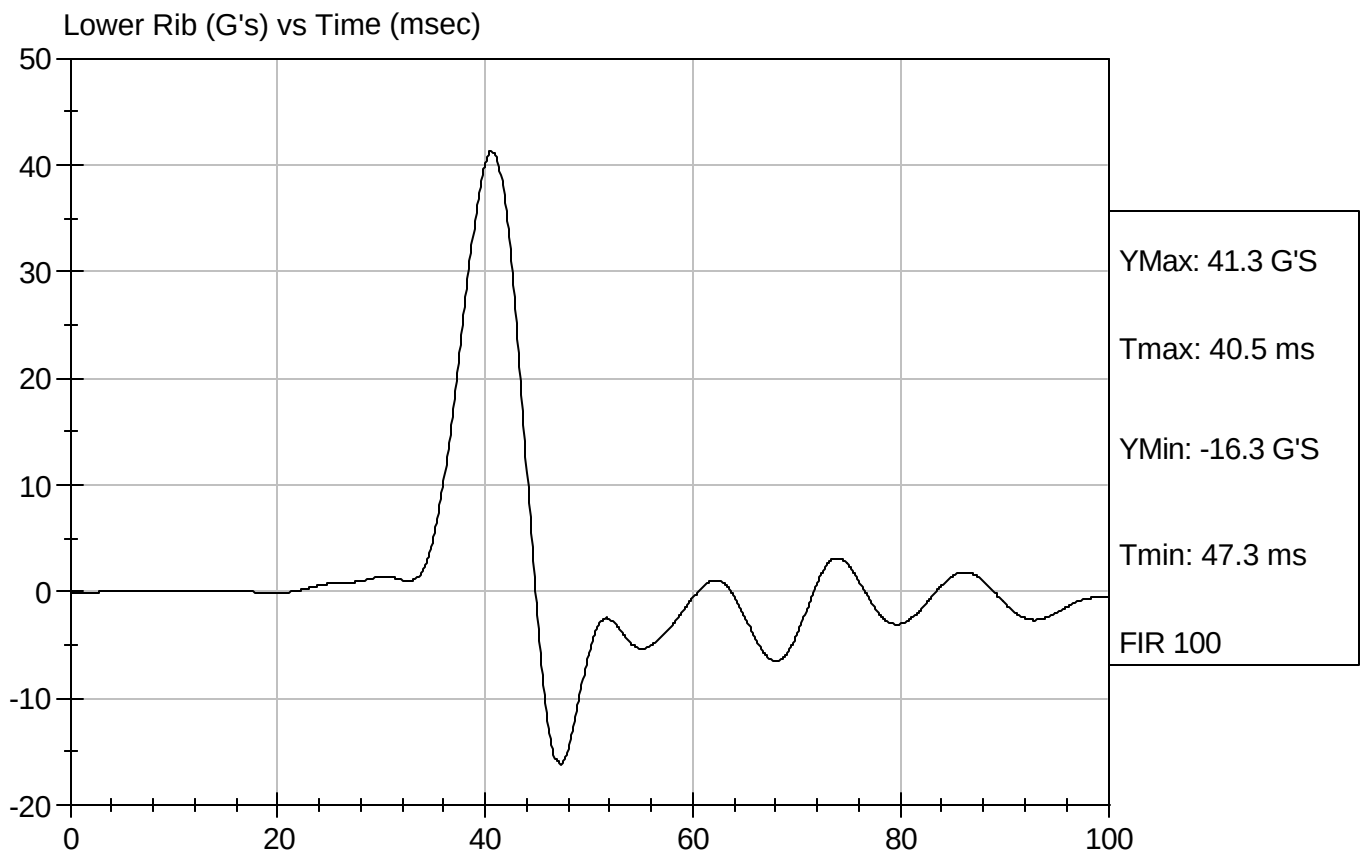
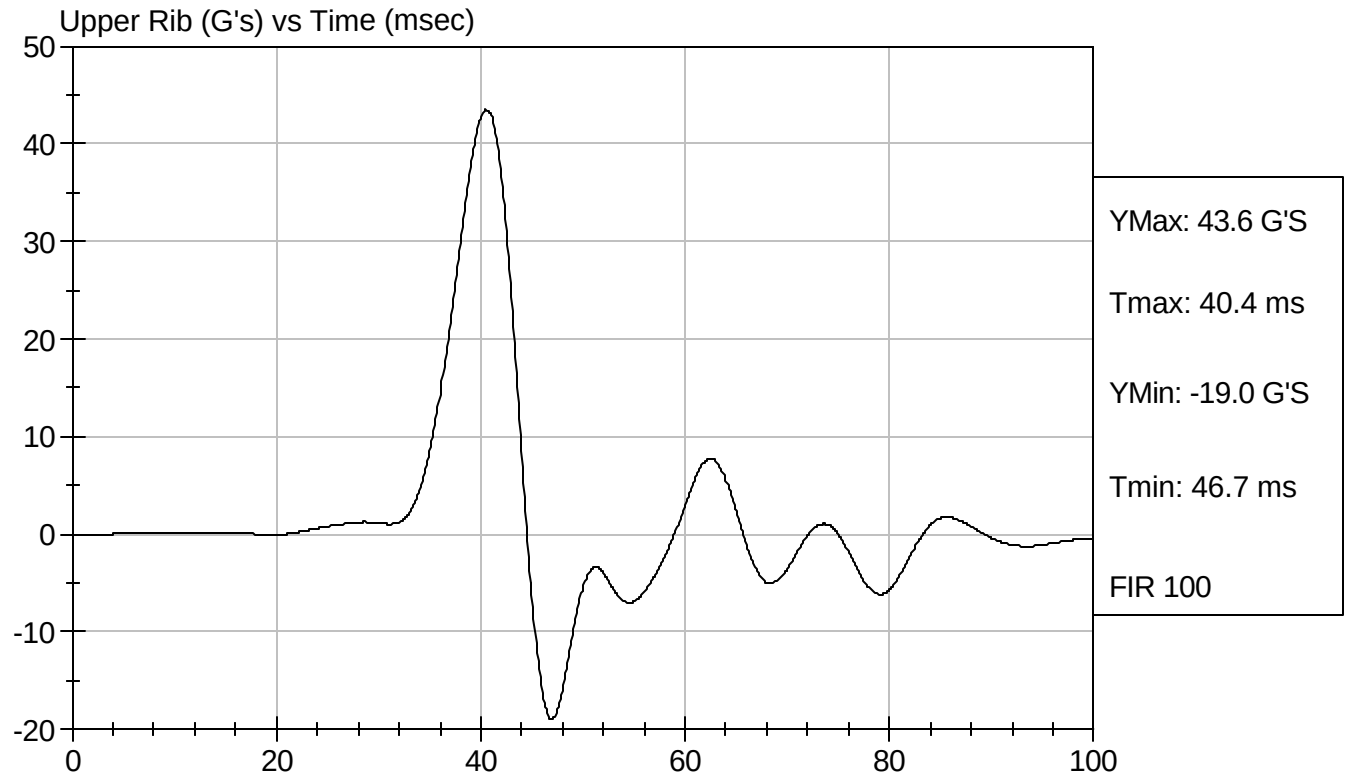

Approved By

09/16/2005
Test Date



Test Desc: Thorax Impact
Component ID: D052552

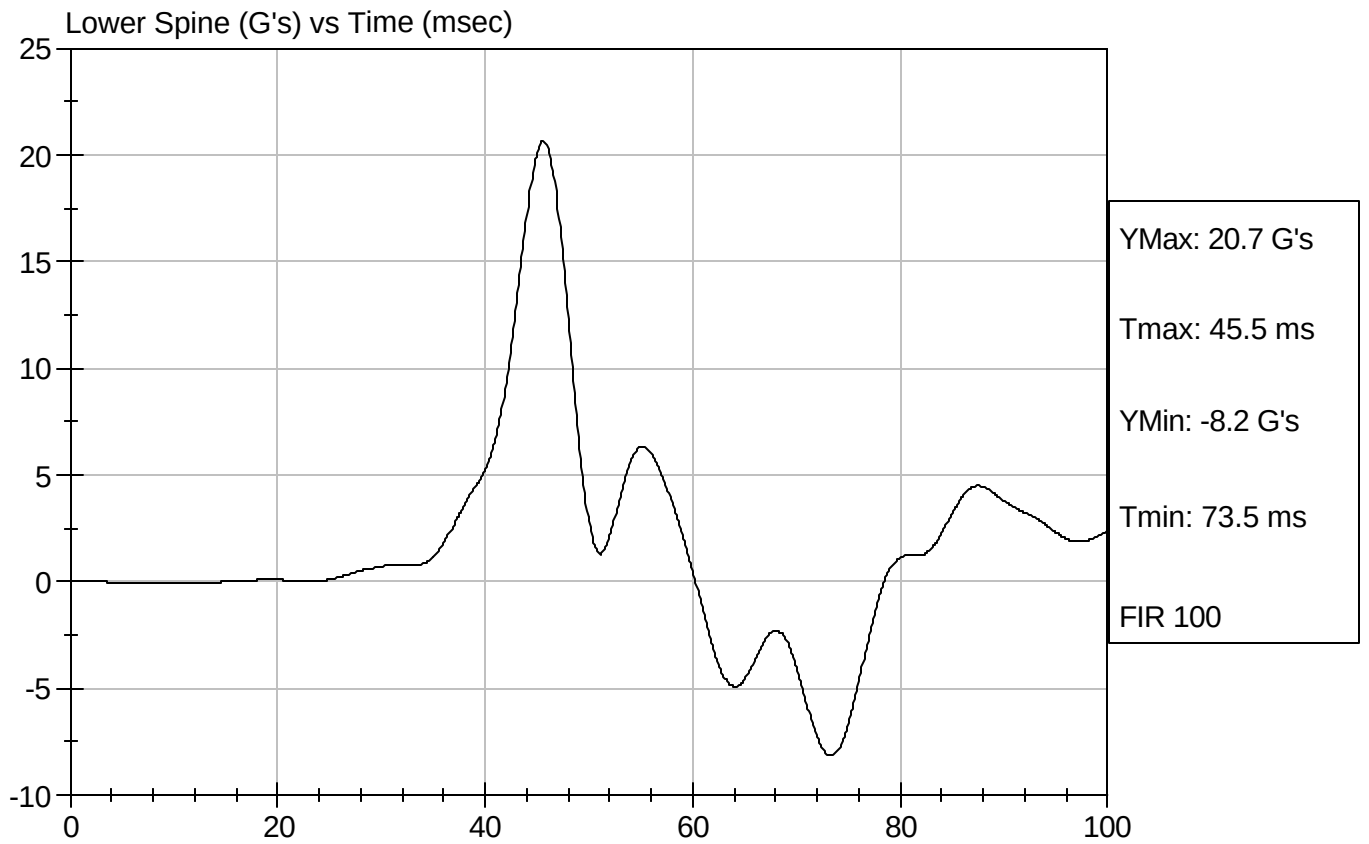
Test Date: 09/16/2005
Speed: 14.13 ft/sec, 4.31 m/sec





Test Desc: Thorax Impact
Component ID: D052552

Test Date: 09/16/2005
Speed: 14.13 ft/sec, 4.31 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Test

ATD Serial No: 904

Test I.D: D052553

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

Jessica Gall
Laboratory Technician

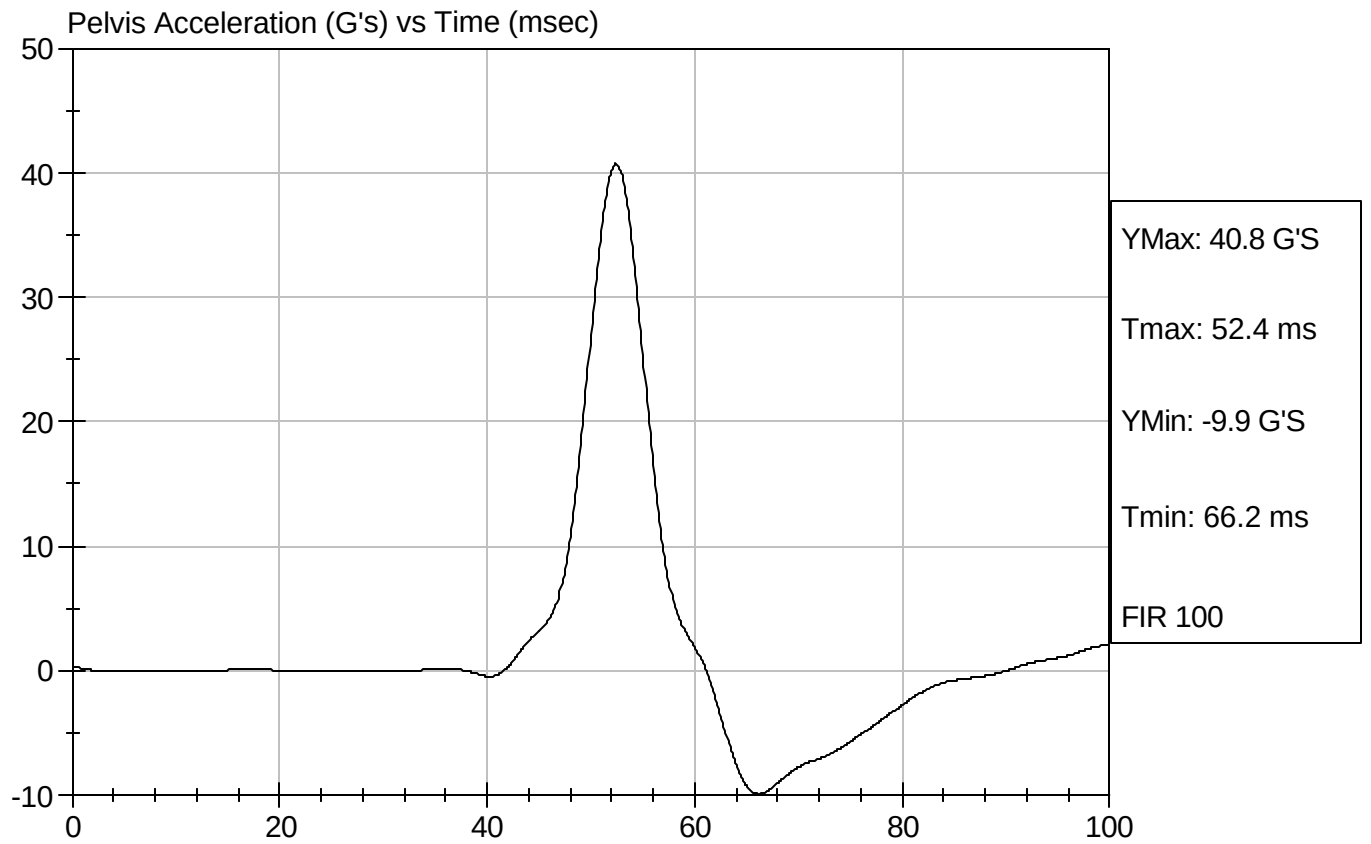
David Winkelbauer
Approved By

09/16/2005
Test Date



Test Desc: Pelvis Impact
Component ID: D052553

Test Date: 09/16/2005
Speed: 14.2 ft/sec, 4.33 m/sec



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

ATD Serial No: 904

Test I.D: D052554

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Force At 12.7 mm	N	104 -162	138	Pass
Force At 19 mm	N	163 - 222	187	Pass
Force At 25.4 mm	N	222 - 280	254	Pass
Force At 33 mm	N	325 - 391	350	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

David Winkelbauer
Approved By

09/15/2005
Test Date

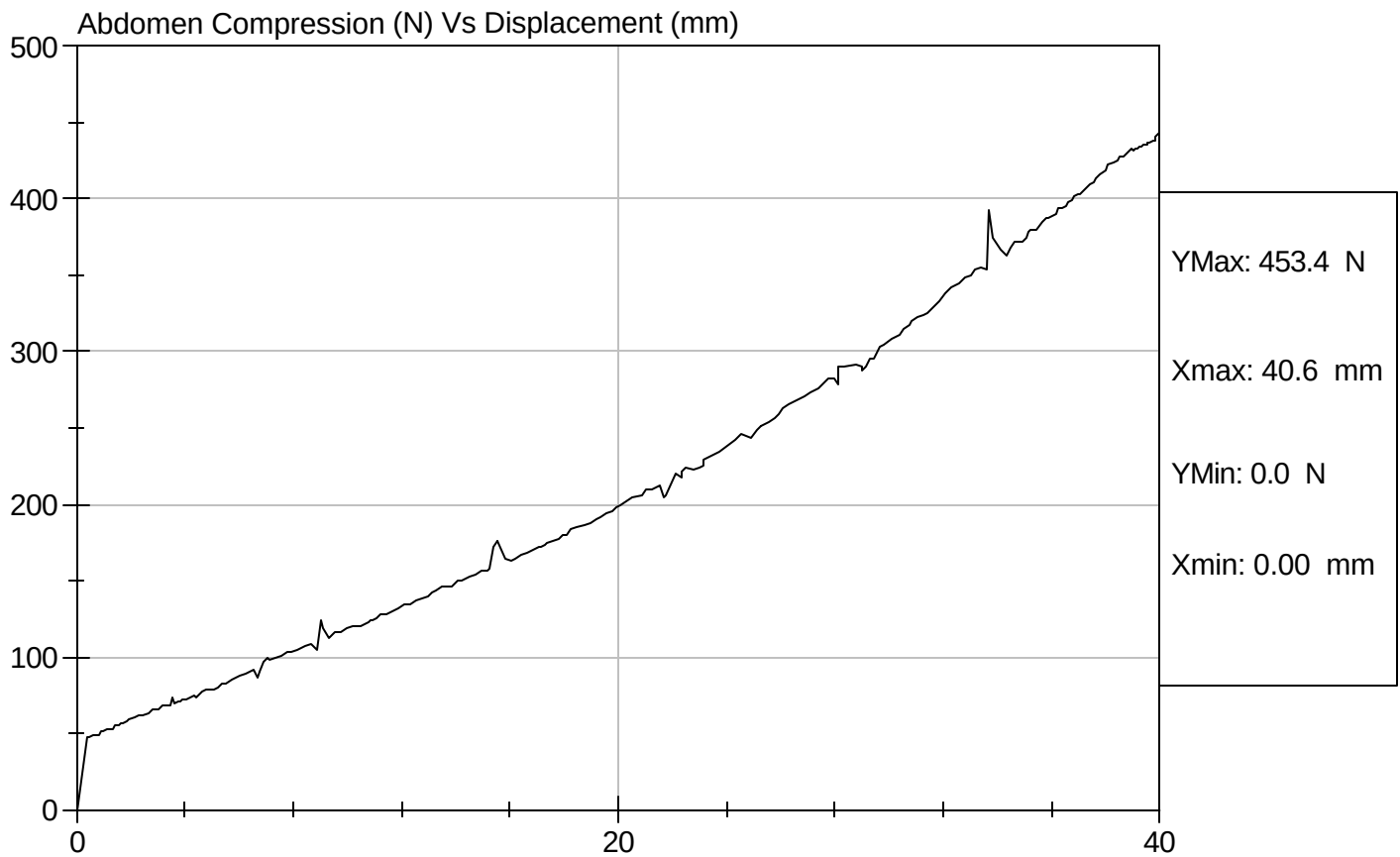


Test Description: Abdomen Compression

Test Date: 09/15/2005

Component: D052554

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 904

Test I.D: D052555

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	38	Pass
Force At 0 deg	N	0 - 26.7	0.0	Pass
Force At 20 deg	N	97.9 - 151.2	136.7	Pass
Force At 30 deg	N	151.2 - 204.6	198.8	Pass
Force At 40 deg	N	204.6 - 258.0	206.6	Pass
Return Angle	Deg	12 Maximum	4	Pass
			Overall Test Results	Pass

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

09/15/2005
Test Date

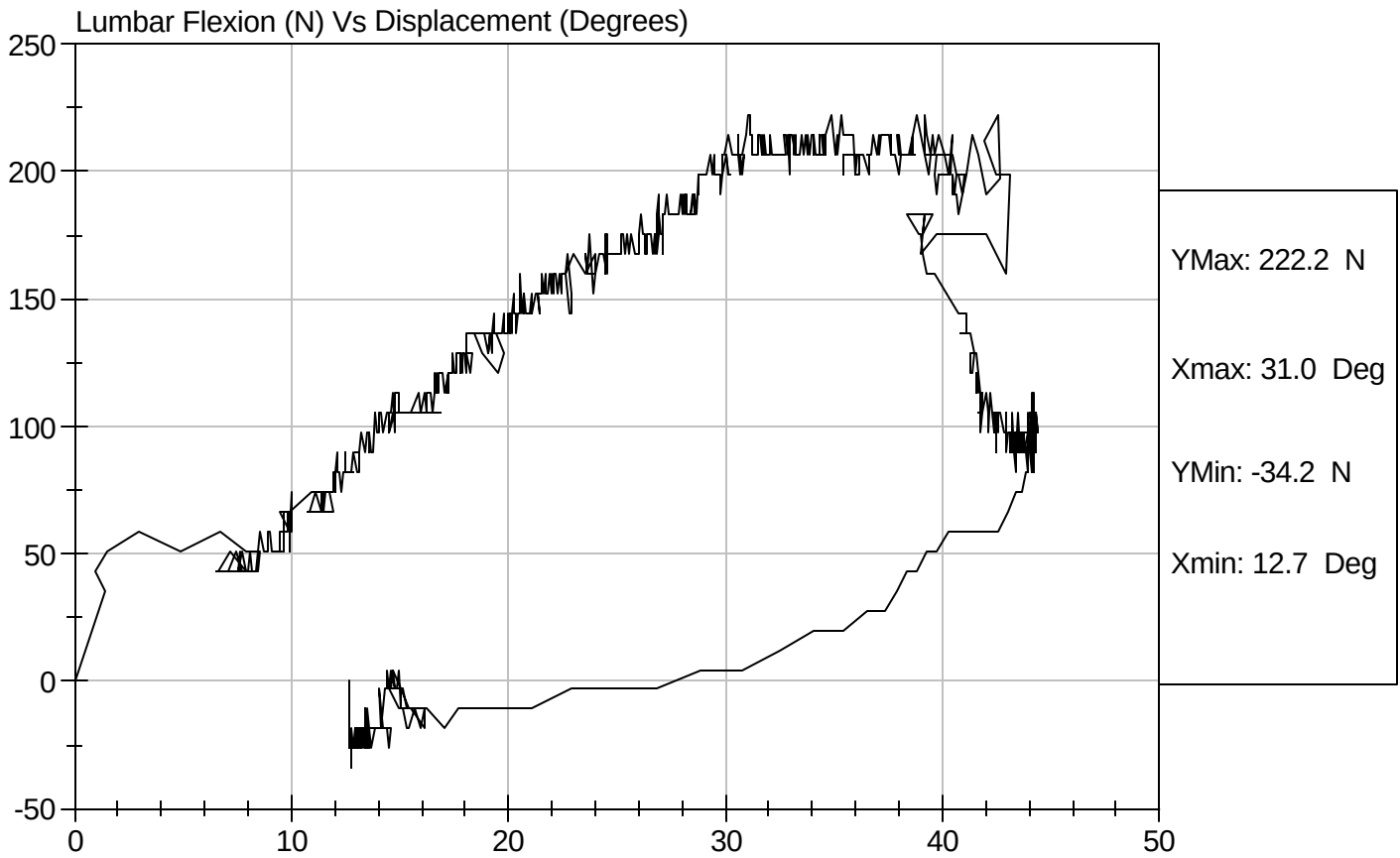


Test Description: Lumbar Flexion

Test Date: 09/15/2005

Component: D052555

Speed: 0 ft/sec, 0 m/sec

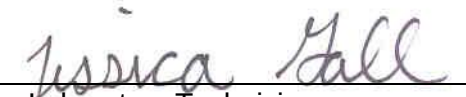


SID Calibration Data Sheet
Side Impact Dummy (SID)
Neck Pendulum Test

ATD Serial No: 904

Test I.D: D052559

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	7.07	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.47	Pass
	20 msec	m/s	4.12 to 5.10	4.88	Pass
	30 msec	m/s	5.73 to 7.01	6.90	Pass
	40 to 70 msec	m/s	6.27 to 7.64	7.23	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	78	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	60	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	77	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	52	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	4	Pass


 Laboratory Technician


 Approved By

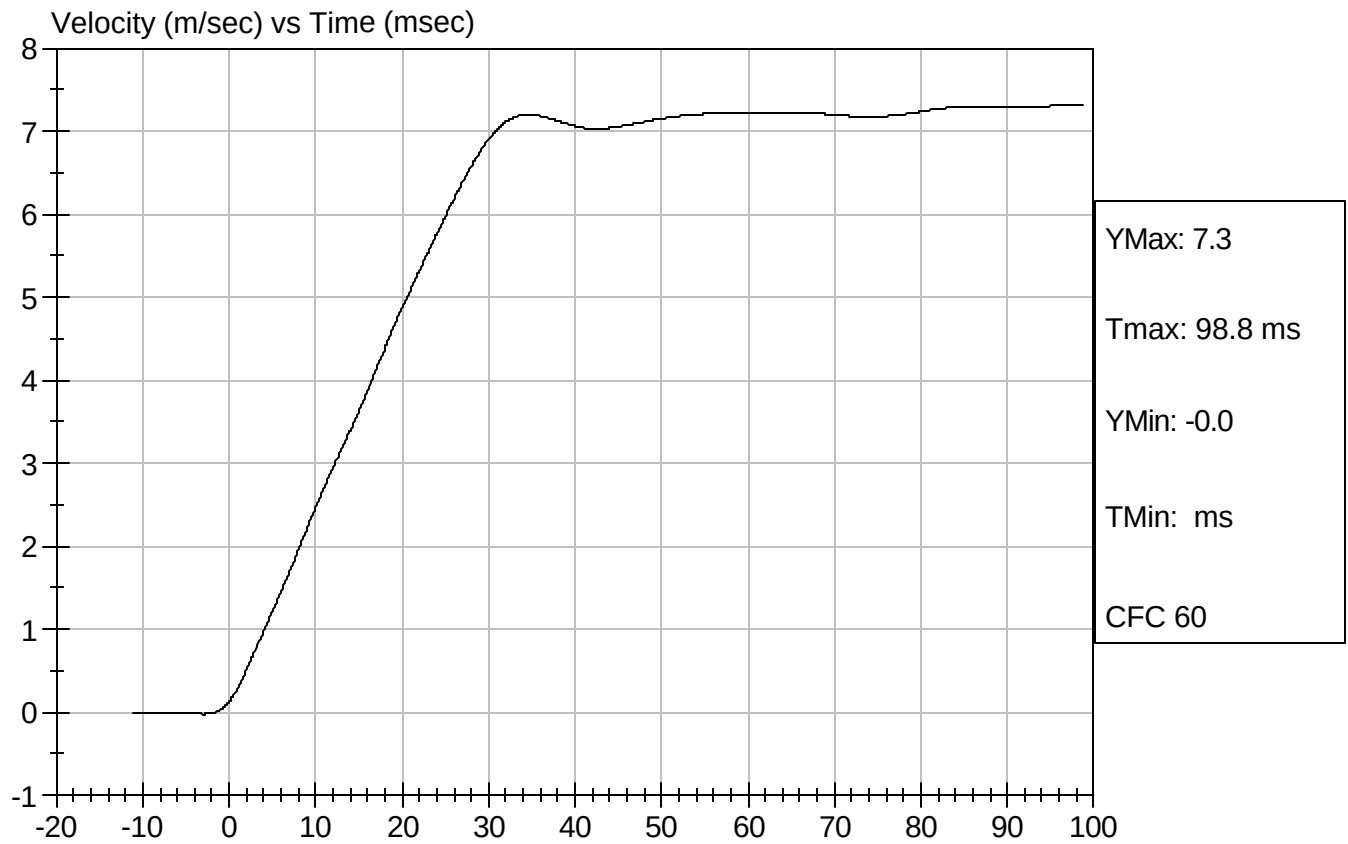
09/15/2005

Test Date



Test Desc: Neck Bending
Component ID: D052559

Test Date: 09/15/2005
Speed: 23.21 ft/sec, 7.07 m/sec

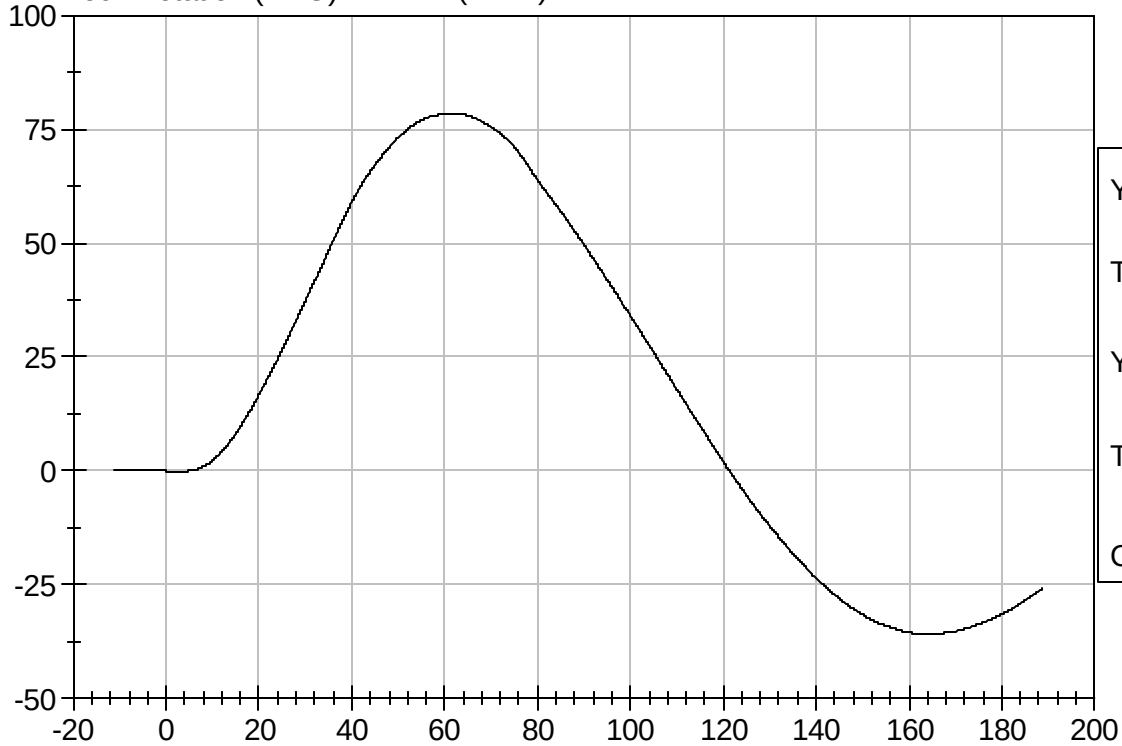




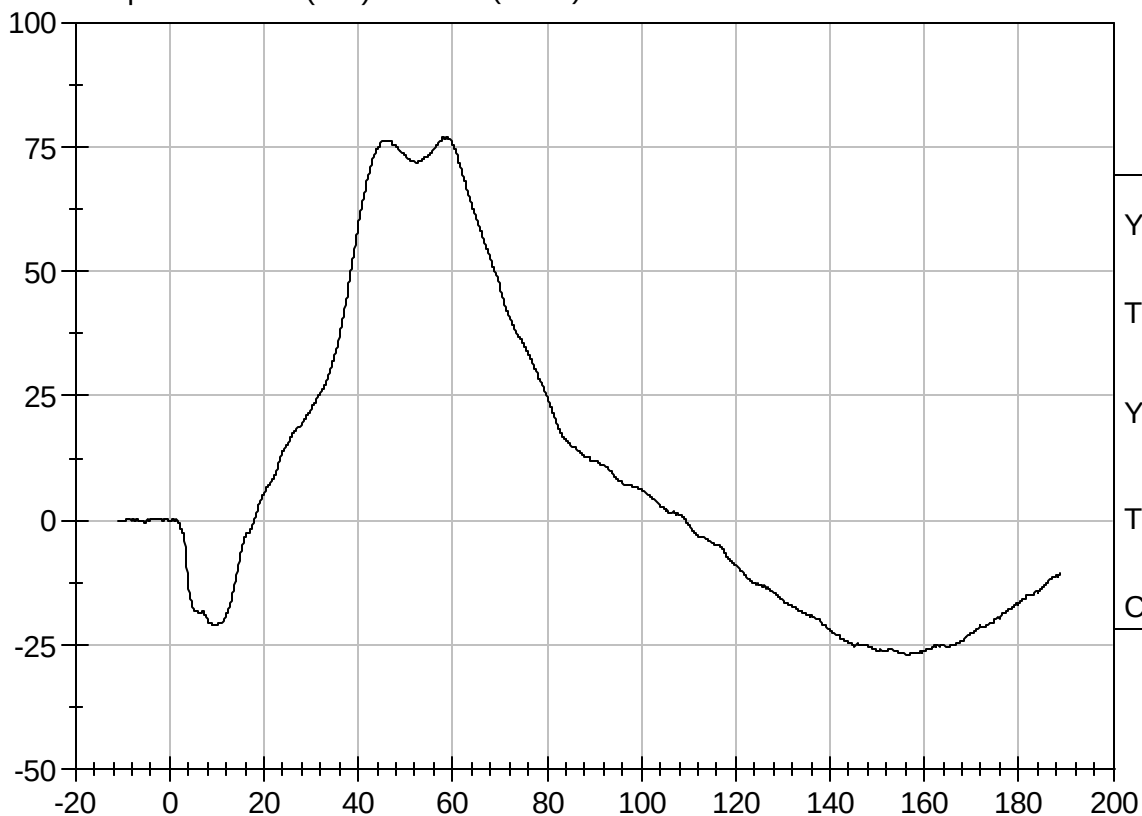
Test Desc: Neck Bending
Component ID: D052559

Test Date: 09/15/2005
Speed: 23.21 ft/sec, 7.07 m/sec

Neck Rotation (DEG) vs Time (msec)



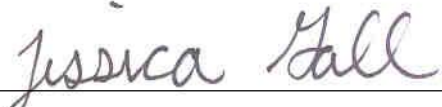
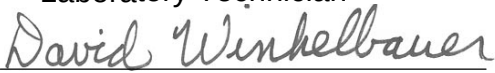
Occipital Moment (Nm) vs Time (msec)



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


Laboratory Technician

Approved By

09/19/2005

Test Date

CERTIFICATION DATA

Dummy Serial Number: 271

Calibration Test Results Summary

Dummy Serial Number: 271

Pre-Test Calibration

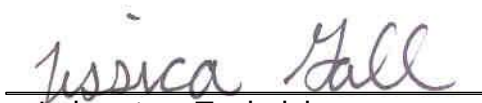
External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all pendulum test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis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

SID Calibration Data Sheet
Side Impact Dummy
External Measurements

ATD Serial No: 271

Test I.D: D05234

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


Laboratory Technician


Approved By

08/23/2005

Test Date

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

ATD Serial No: 271

Test I.D: D052421

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	46	Pass
Peak Resultant Acceleration	G's	120 to 150	125	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-11	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

David Winkelbauer
Approved By

09/01/2005
Test Date



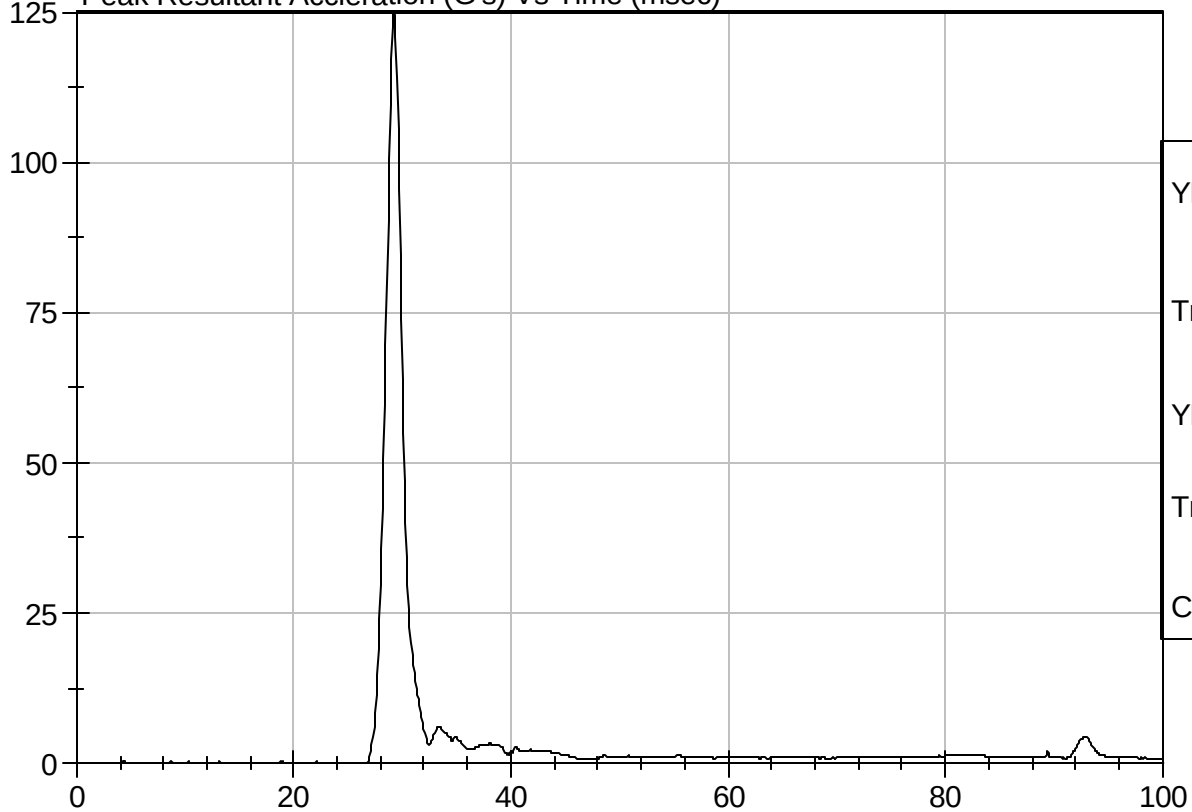
Test Description: Head Drop

Test Date: 09/01/2005

Component: D052421

Speed: 0 ft/s, 0.00 m/s

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



YMax: 125.0 G

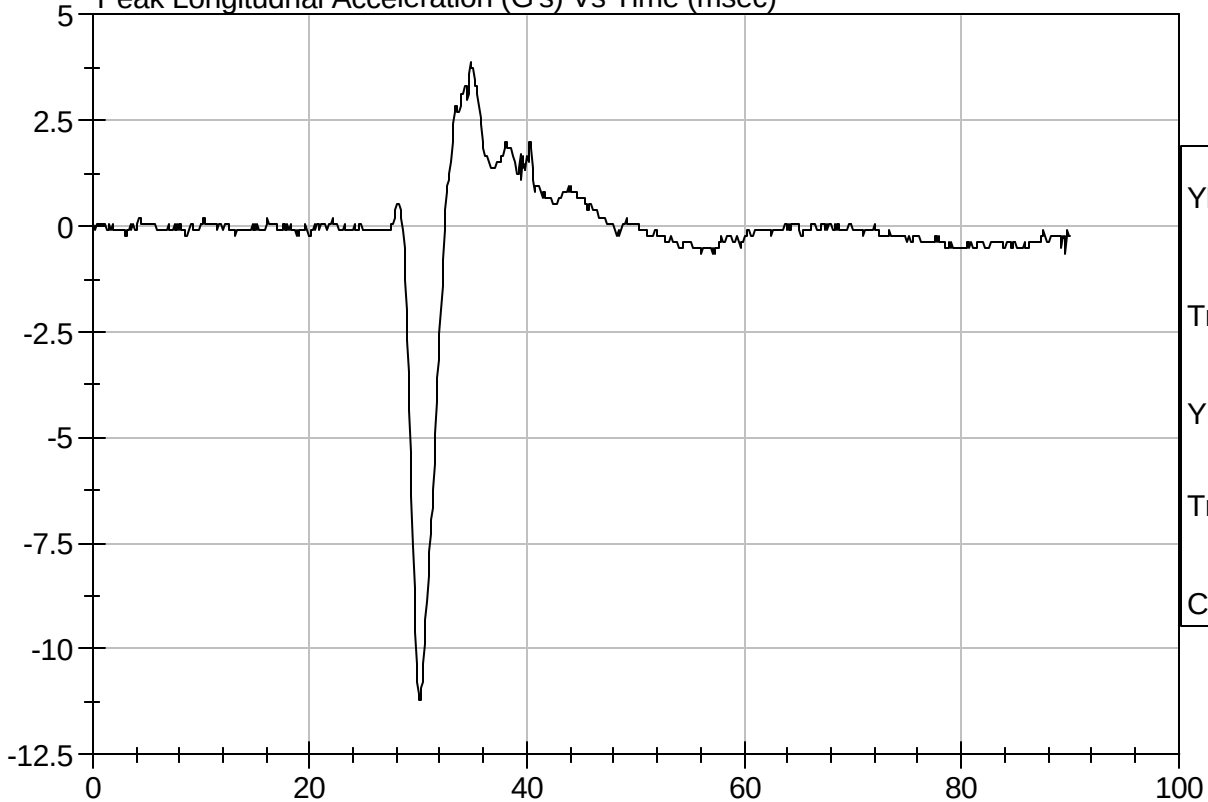
Tmax: 29.2 ms

YMin: 0.1 G

Tmin: -0.6 ms

CFC 1000

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



YMax: 3.9 G

Tmax: 34.8 ms

YMin: -11.2 G

Tmin: 30.1 ms

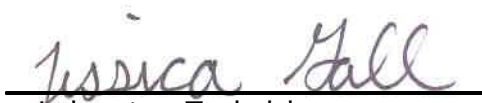
CFC 1000

SID Calibration Data Sheet
Side Impact Dummy
Thorax Impact Test

ATD Serial No: 271

Test I.D: D052422

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Probe Velocity	m/s	4.22 - 4.31	4.30	Pass
Upper Rib	G's	37 - 46	44	Pass
Lower Rib	G's	37 - 46	45	Pass
Lower Spine	G's	15 - 22	21	Pass
Overall Test Results				Pass


Laboratory Technician

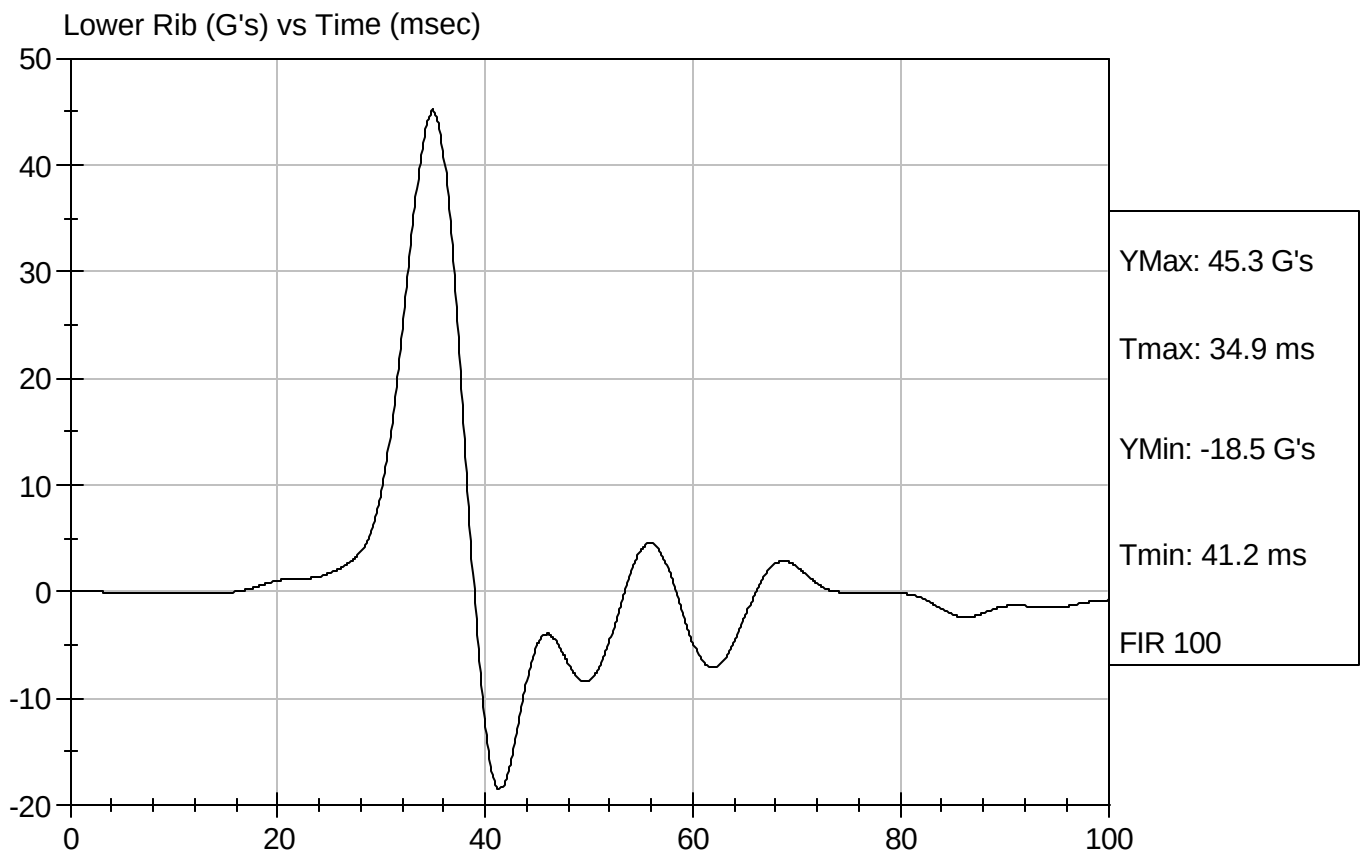
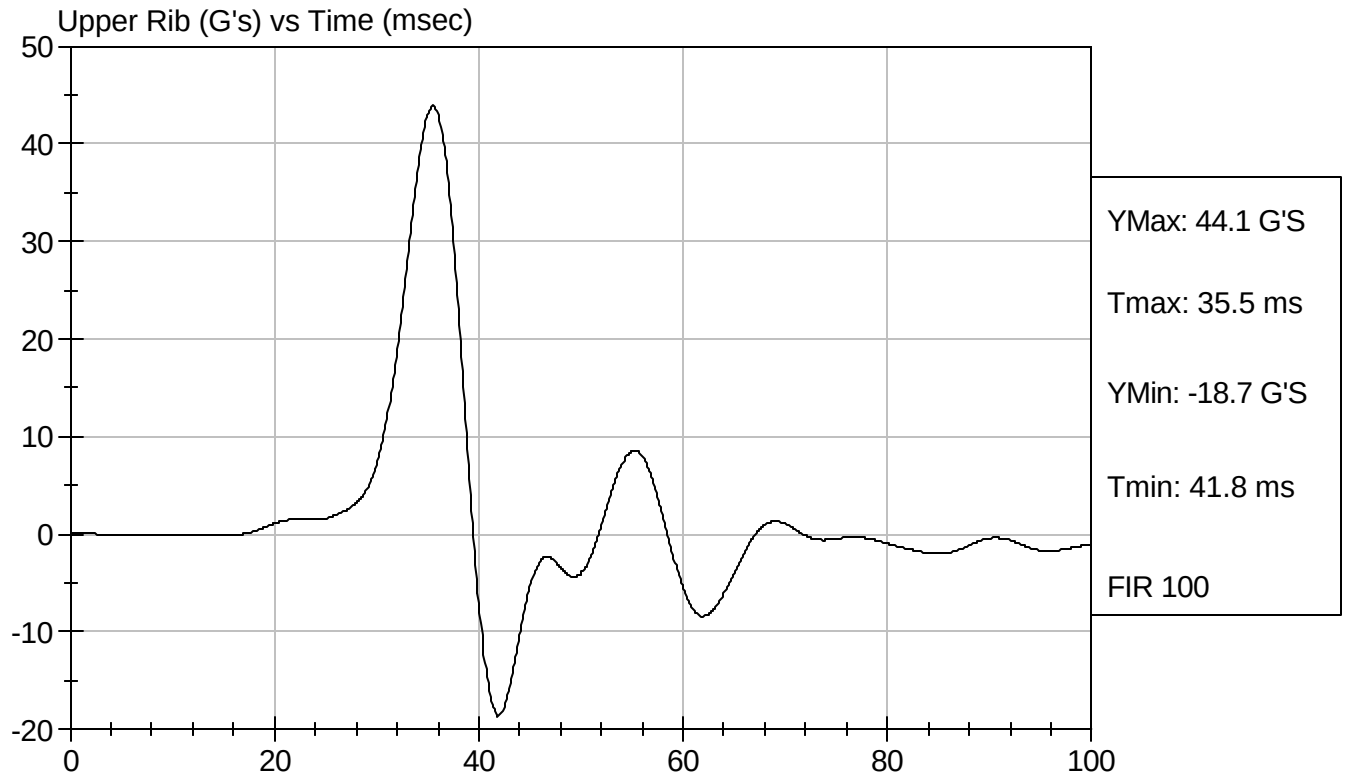

Approved By

09/02/2005
Test Date



Test Desc: Thorax Impact
Component ID: D052422

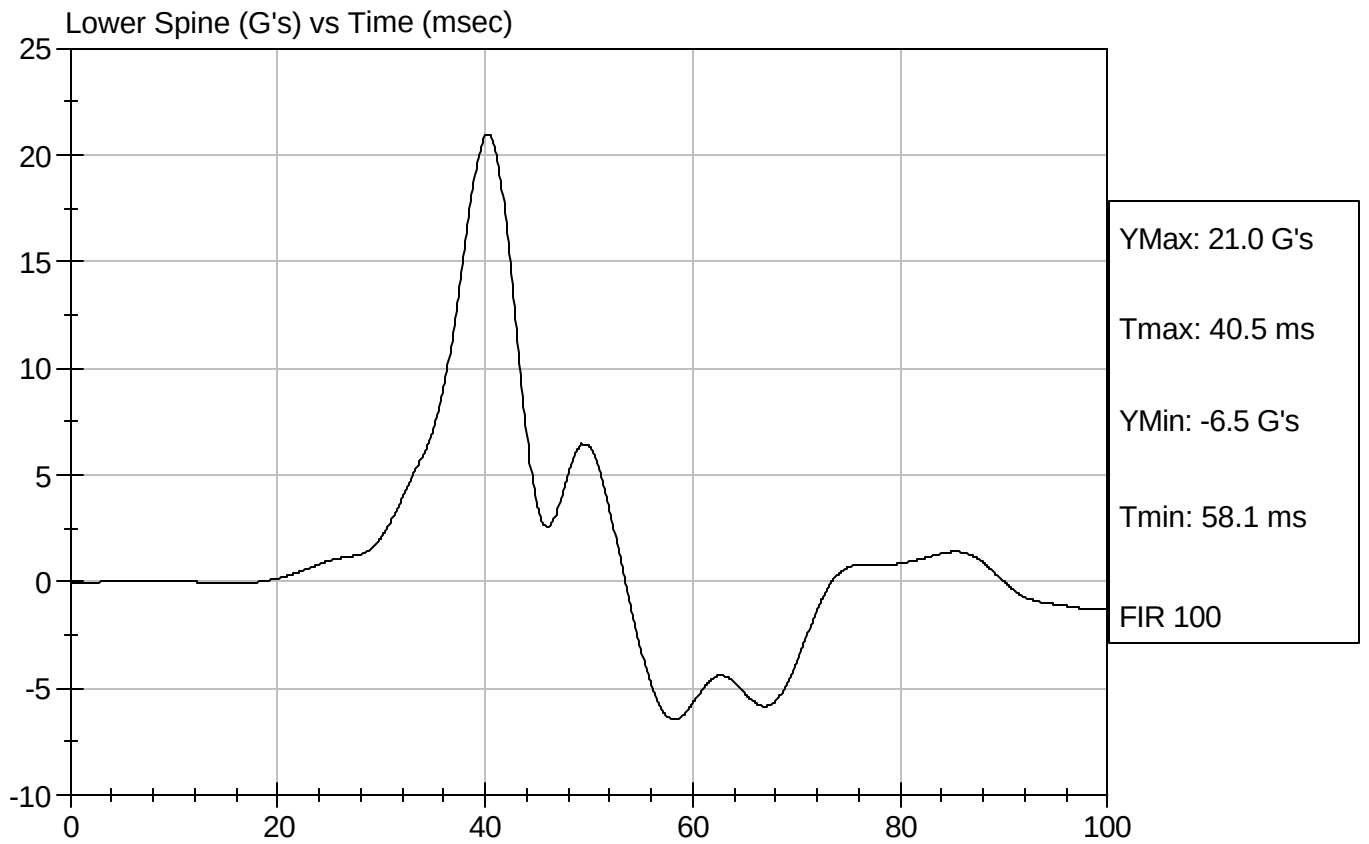
Test Date: 09/02/2005
Speed: 14.1 ft/sec, 4.30 m/sec





Test Desc: Thorax Impact
Component ID: D052422

Test Date: 09/02/2005
Speed: 14.1 ft/sec, 4.30 m/sec



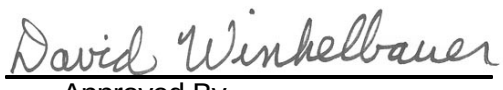
SID Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Test

ATD Serial No: 271

Test I.D: D052423

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	40	Pass
Probe Velocity	m/s	4.27 - 4.33	4.33	Pass
Pelvis Acceleration	G's	40 - 60	45	Pass
			Overall Test Results	Pass


Laboratory Technician

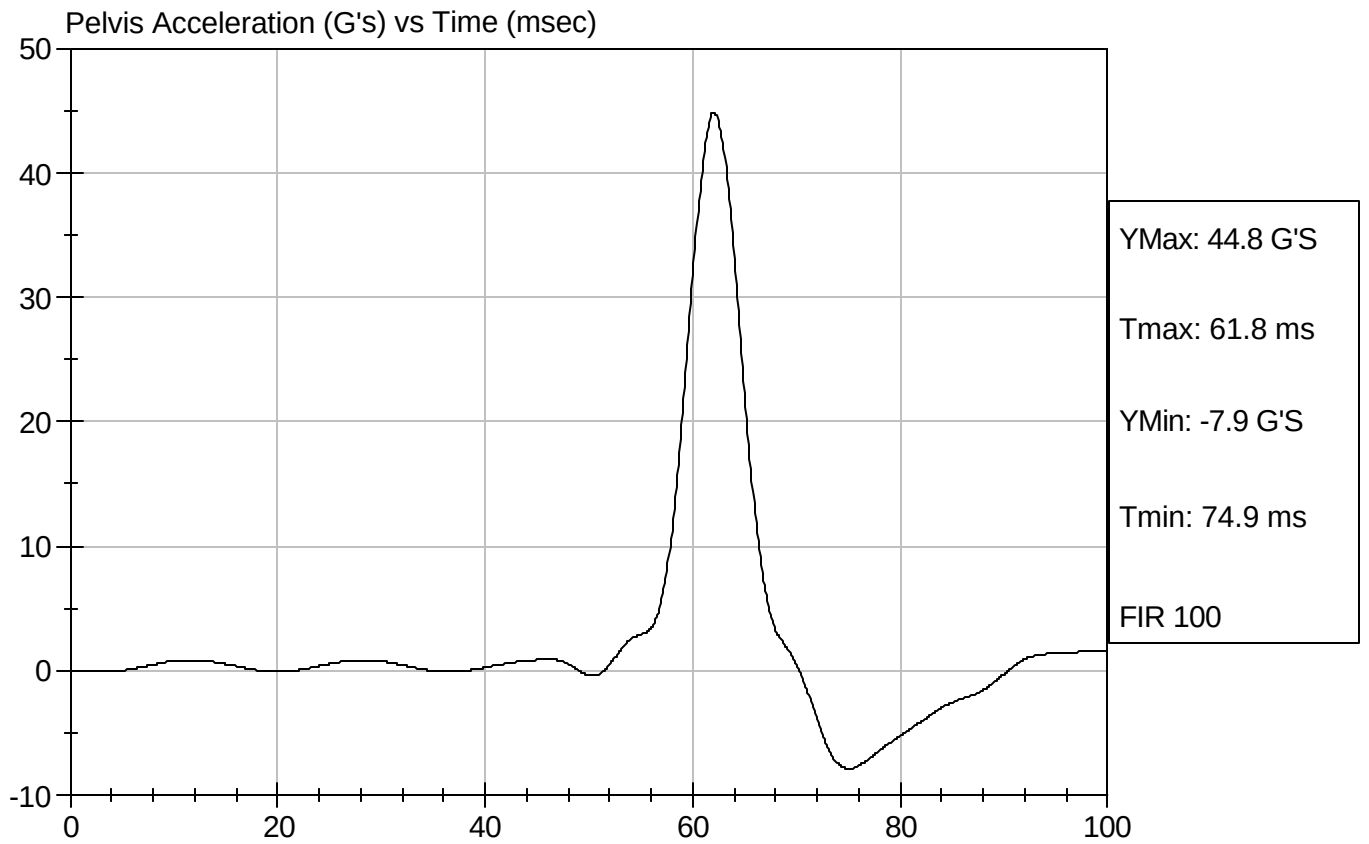

Approved By

09/01/2005
Test Date



Test Desc: Pelvis Impact
Component ID: D052423

Test Date: 09/01/2005
Speed: 14.19 ft/sec, 4.33 m/sec



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

ATD Serial No: 271

Test I.D: D052424

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Force At 12.7 mm	N	104 -162	137	Pass
Force At 19 mm	N	163 - 222	194	Pass
Force At 25.4 mm	N	222 - 280	266	Pass
Force At 33 mm	N	325 - 391	373	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

David Winkelbauer
Approved By

09/01/2005
Test Date

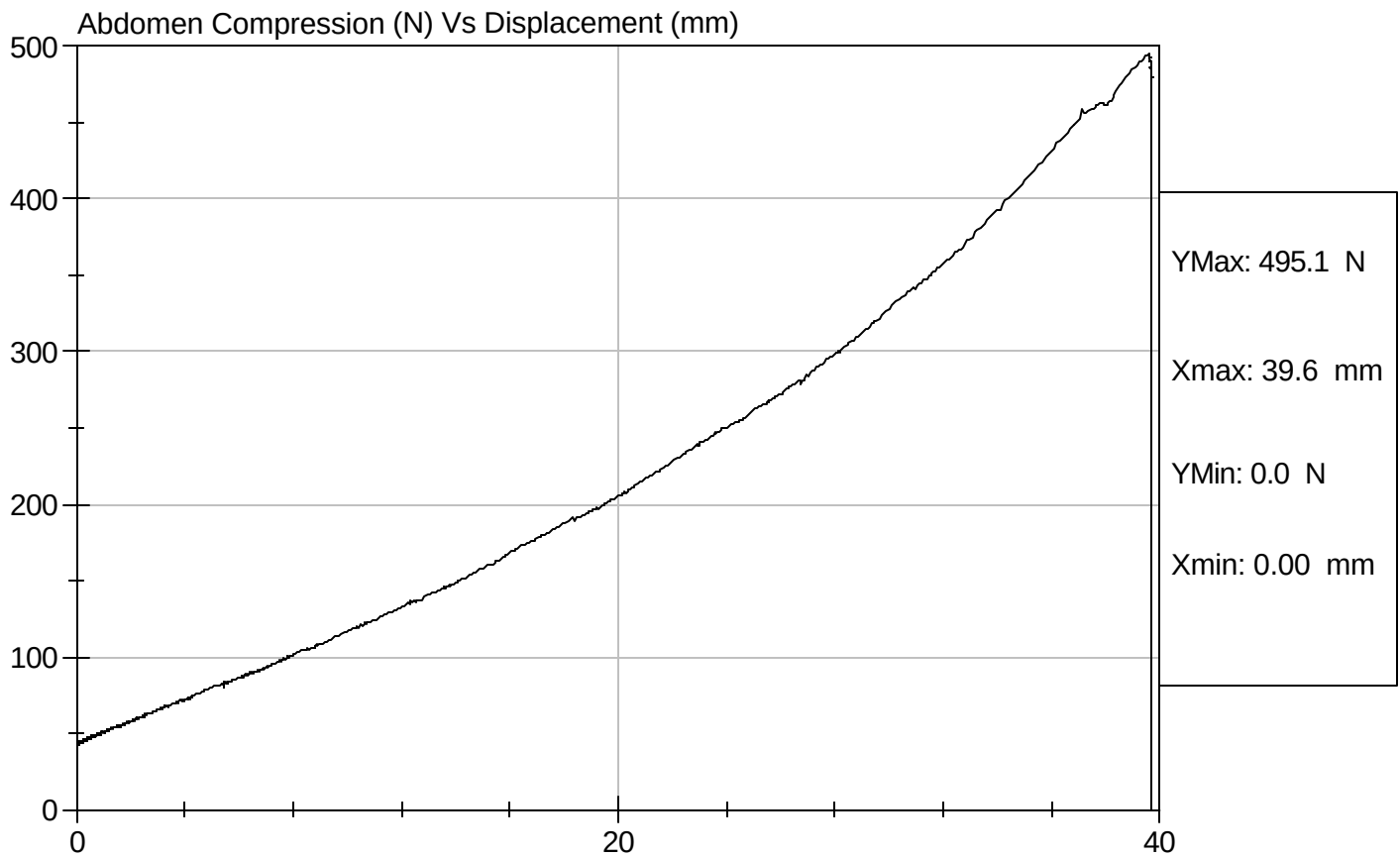


Test Description: Abdomen Compression

Test Date: 09/01/2005

Component: D052424

Speed: 0 ft/sec, 0 m/sec



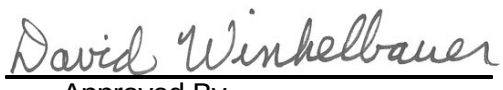
SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 037

Test I.D: D052425

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Force At 0 deg	N	0 - 26.7	0.0	Pass
Force At 20 deg	N	97.9 - 151.2	125.7	Pass
Force At 30 deg	N	151.2 - 204.6	166.3	Pass
Force At 40 deg	N	204.6 - 258.0	222.2	Pass
Return Angle	Deg	12 Maximum	4	Pass
Overall Test Results			Pass	


Laboratory Technician


Approved By

09/01/2005

Test Date

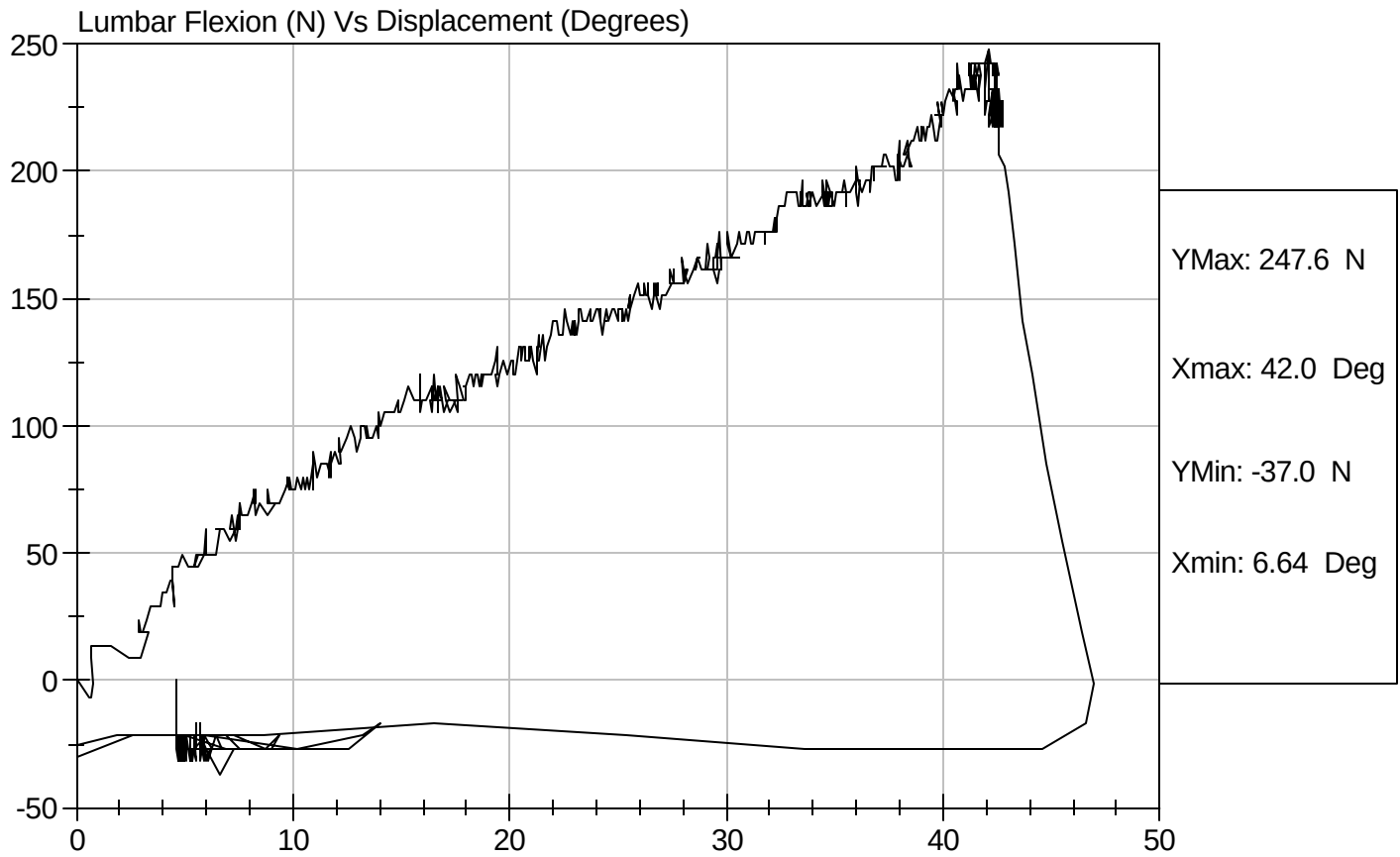


Test Description: Lumbar Flexion

Test Date: 09/01/2005

Component: D052425

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet
Side Impact Dummy (SID)
Neck Pendulum Test

ATD Serial No: 271

Test I.D: D052429

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	45	Pass
Impact Velocity		m/s	6.89 to 7.13	7.07	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.35	Pass
	20 msec	m/s	4.12 to 5.10	4.69	Pass
	30 msec	m/s	5.73 to 7.01	6.62	Pass
	40 to 70 msec	m/s	6.27 to 7.64	7.24	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	75	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	61	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	12	Pass


 Laboratory Technician


 Approved By

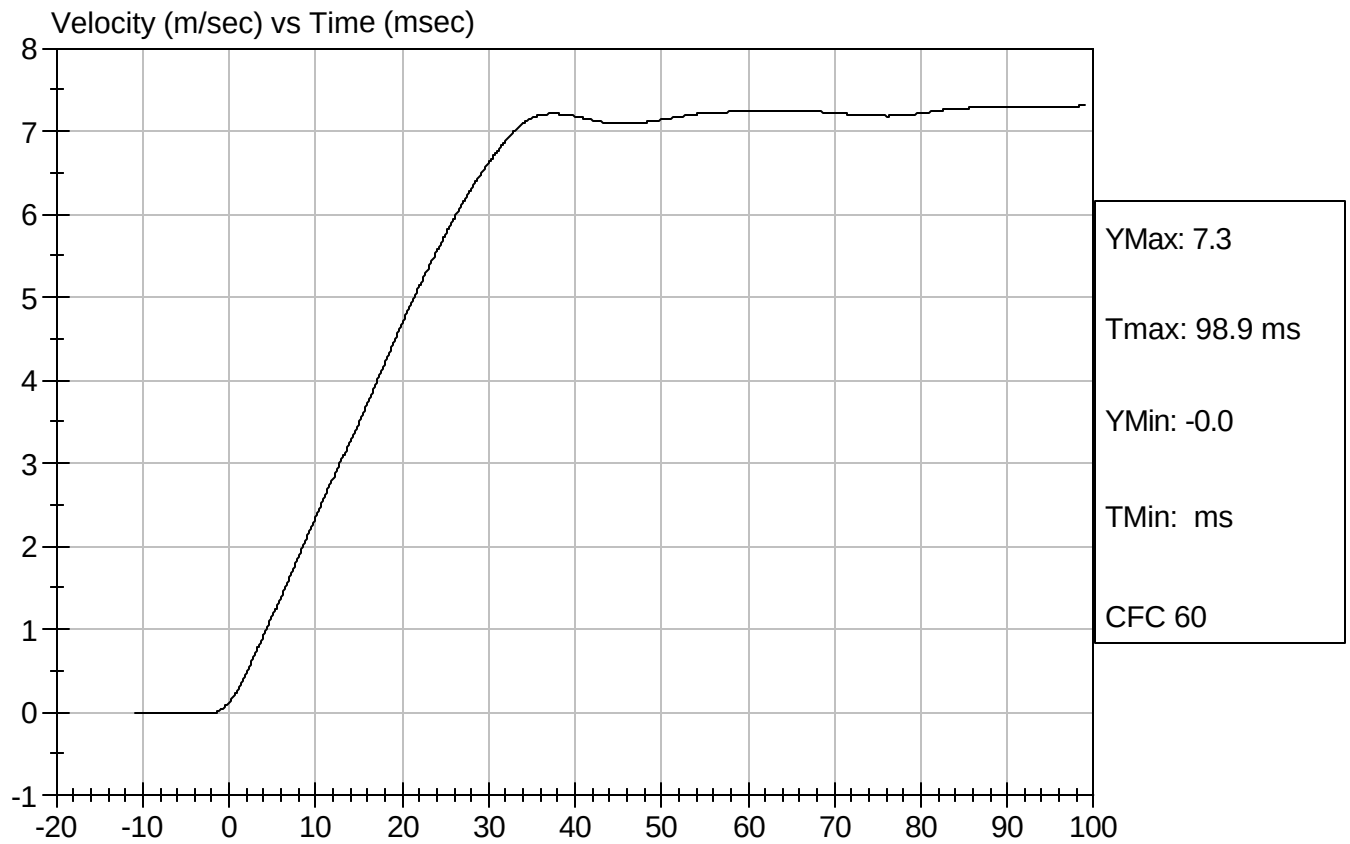
09/01/2005

Test Date



Test Desc: Neck Bending
Component ID: D052429

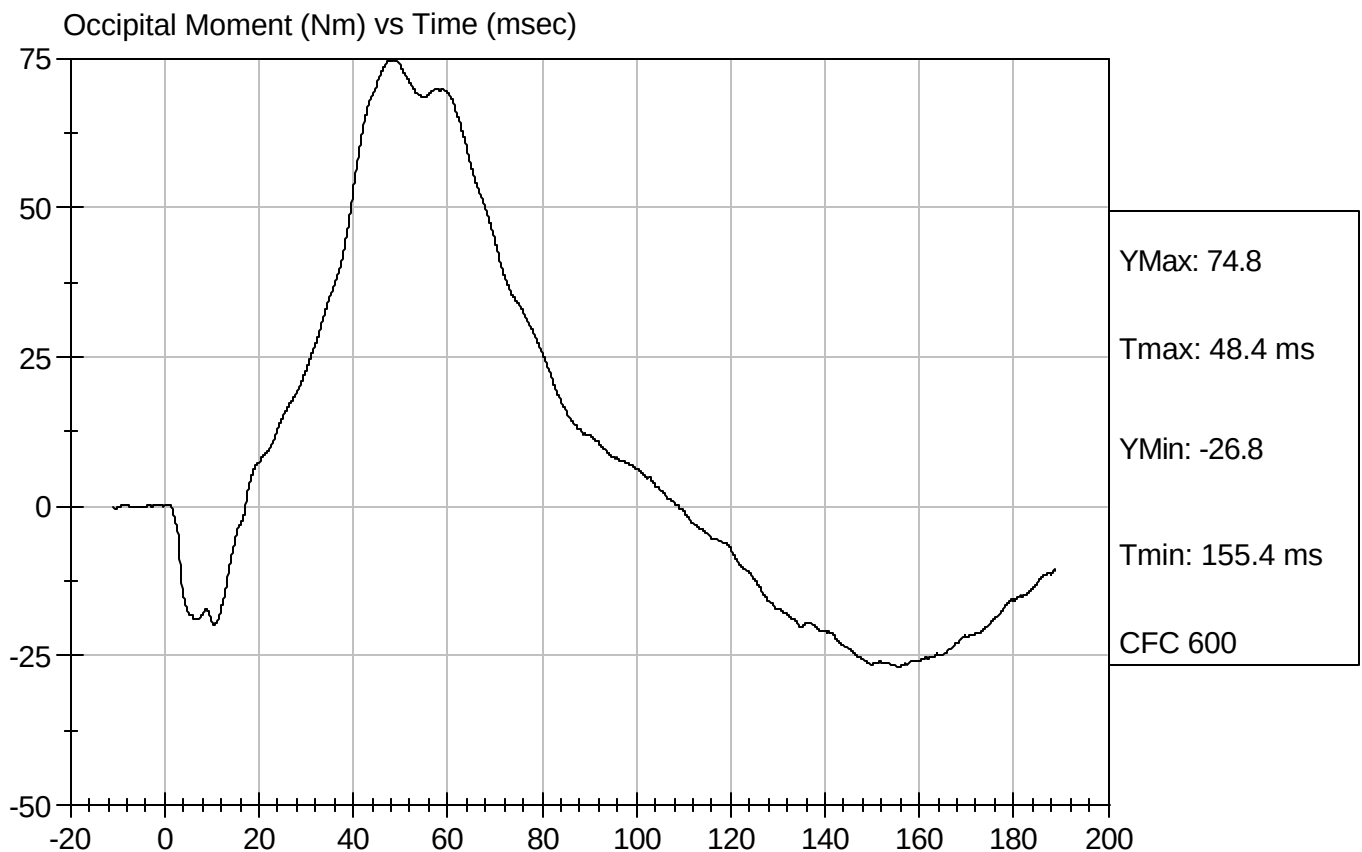
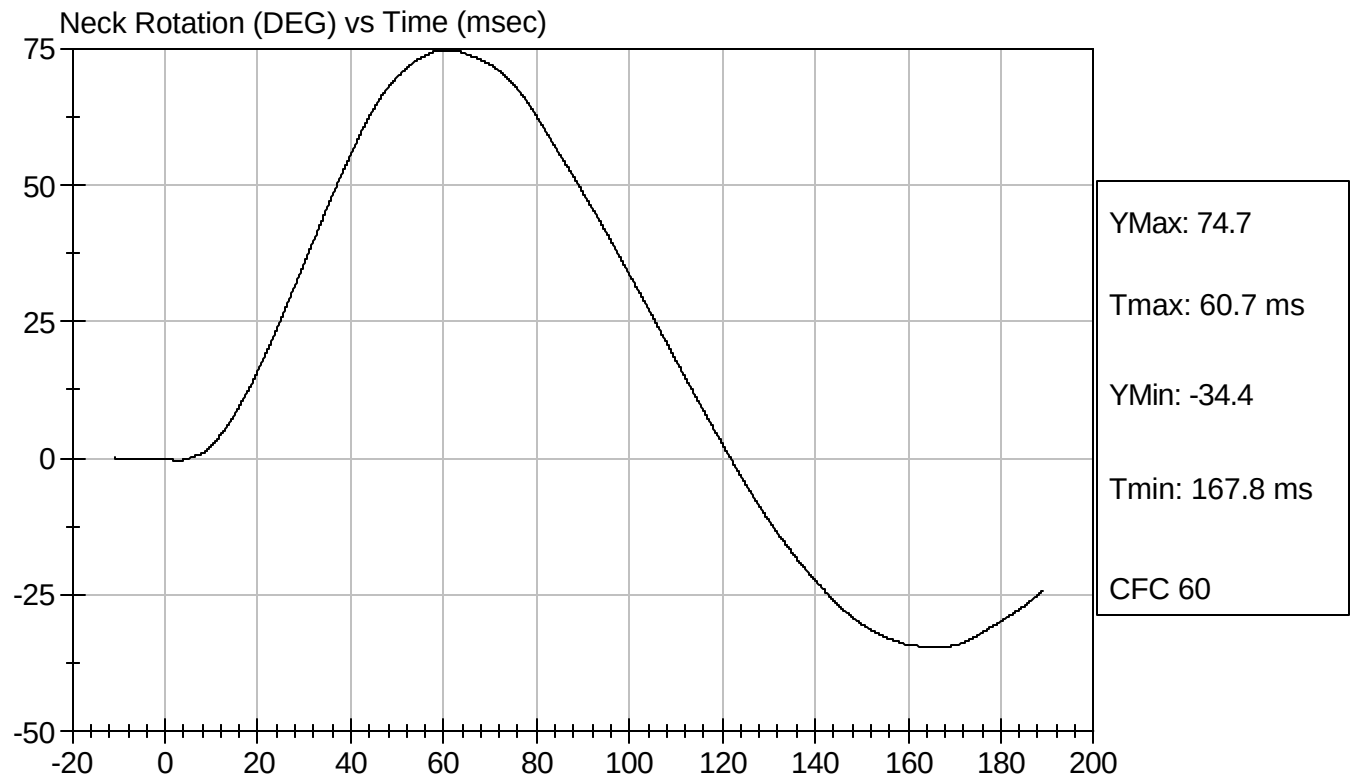
Test Date: 09/01/2005
Speed: 23.19 ft/sec, 7.07 m/sec





Test Desc: Neck Bending
Component ID: D052429

Test Date: 09/01/2005
Speed: 23.19 ft/sec, 7.07 m/sec



Calibration Test Results Summary

Dummy Serial Number: 271

Post-Test Calibration

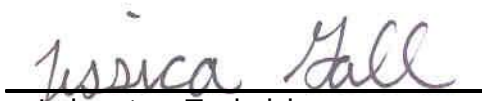
External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all pendulum test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis 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 Calibration Data Sheet
Side Impact Dummy
Head Drop Calibration (Lateral)

ATD Serial No: 271

Test I.D: D052541

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	39	Pass
Peak Resultant Acceleration	G's	120 to 150	124	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-8	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

09/14/2005

Test Date



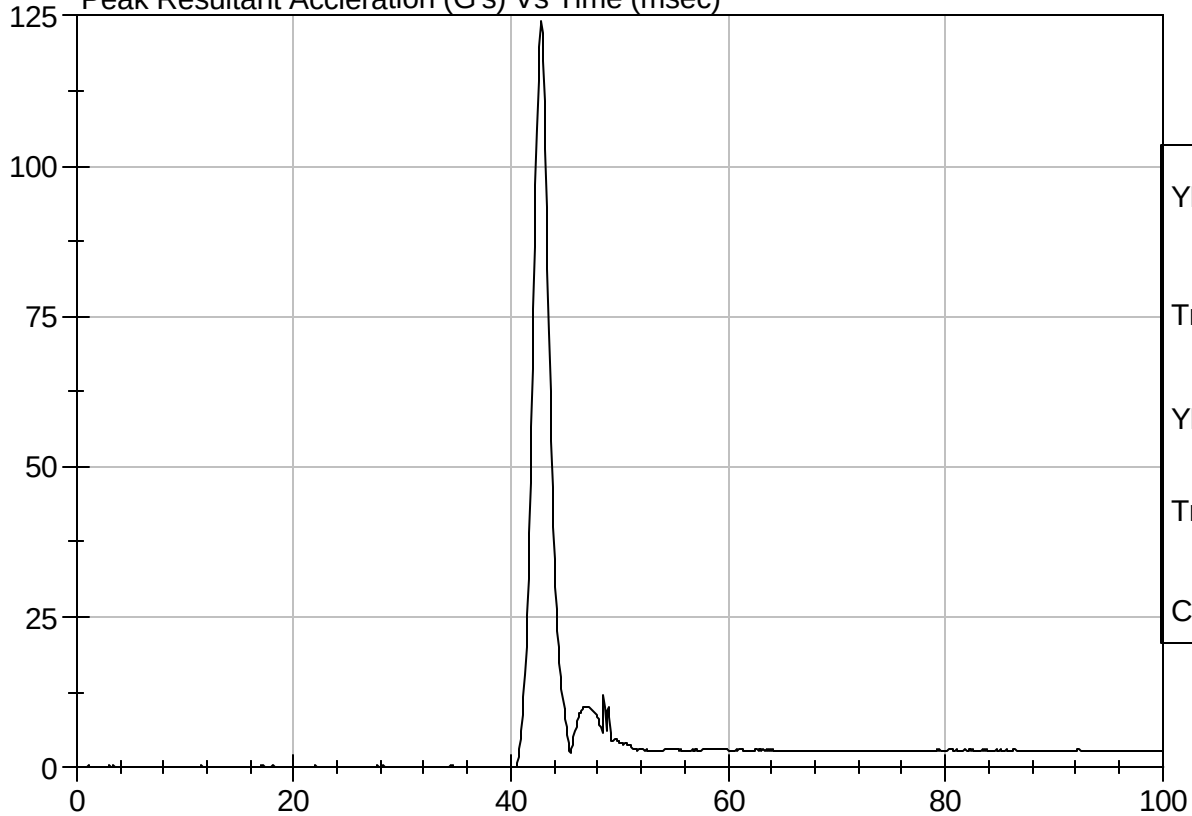
Test Description: Head Drop

Test Date: 09/14/2005

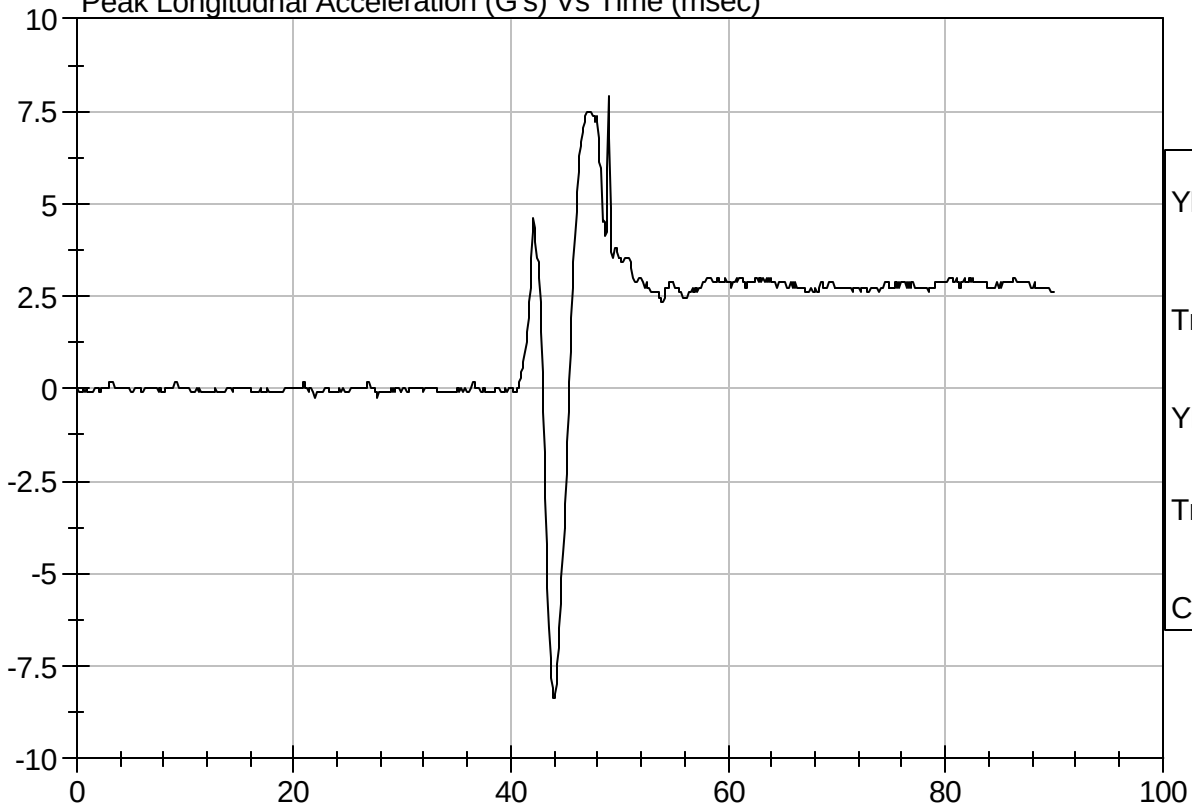
Component: D052541

Speed: 0 ft/s, 0.00 m/s

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



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



SID Calibration Data Sheet
Side Impact Dummy
Thorax Impact Test

ATD Serial No: 271

Test I.D: D052542

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	44	Pass
Probe Velocity	m/s	4.22 - 4.31	4.26	Pass
Upper Rib	G's	37 - 46	43	Pass
Lower Rib	G's	37 - 46	44	Pass
Lower Spine	G's	15 - 22	20	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

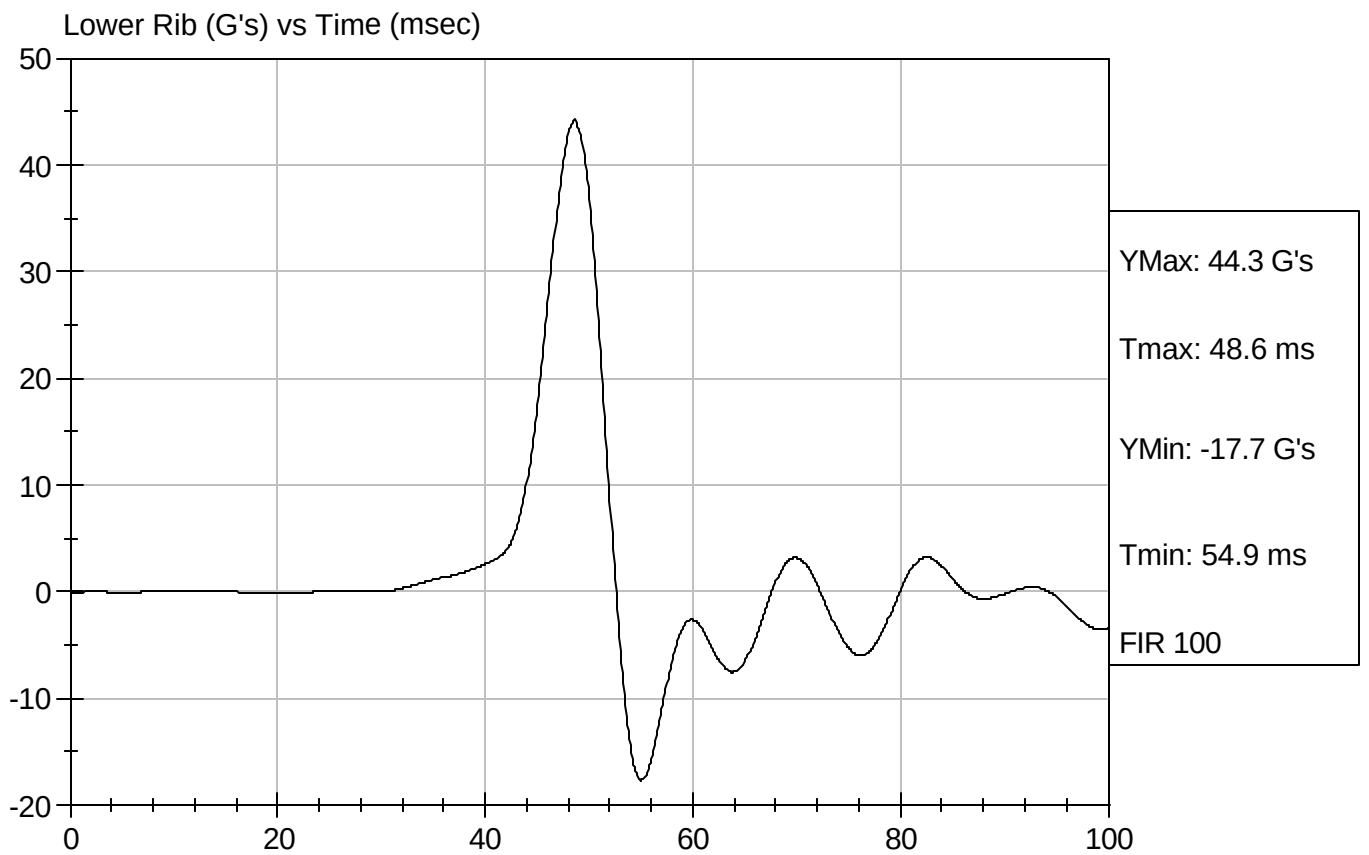
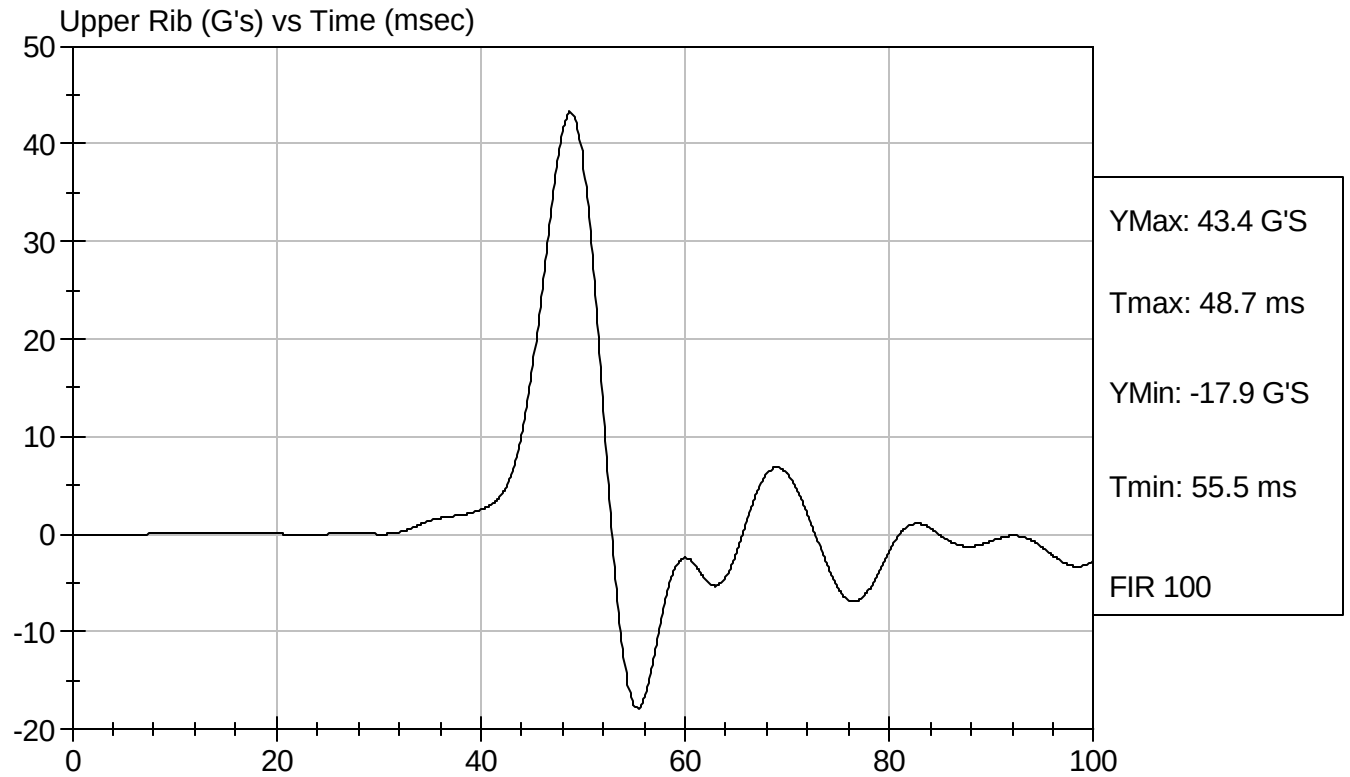
David Winkelbauer
Approved By

09/16/2005
Test Date



Test Desc: Thorax Impact
Component ID: D052542

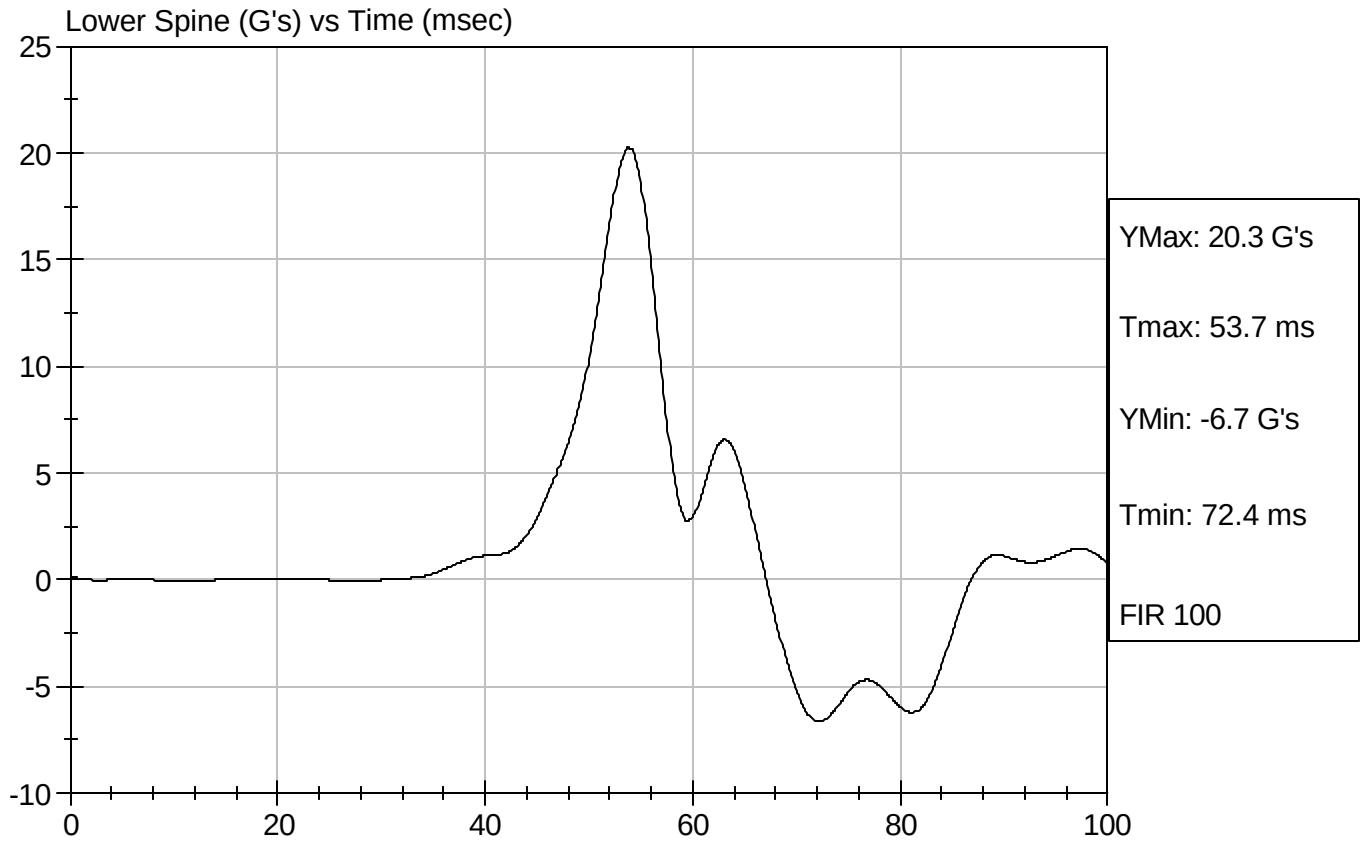
Test Date: 09/16/2005
Speed: 13.99 ft/sec, 4.26 m/sec





Test Desc: Thorax Impact
Component ID: D052542

Test Date: 09/16/2005
Speed: 13.99 ft/sec, 4.26 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Test

ATD Serial No: 271

Test I.D: D052543

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	47	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	42	Pass
Overall Test Results			Pass	

Jessica Gall
Laboratory Technician

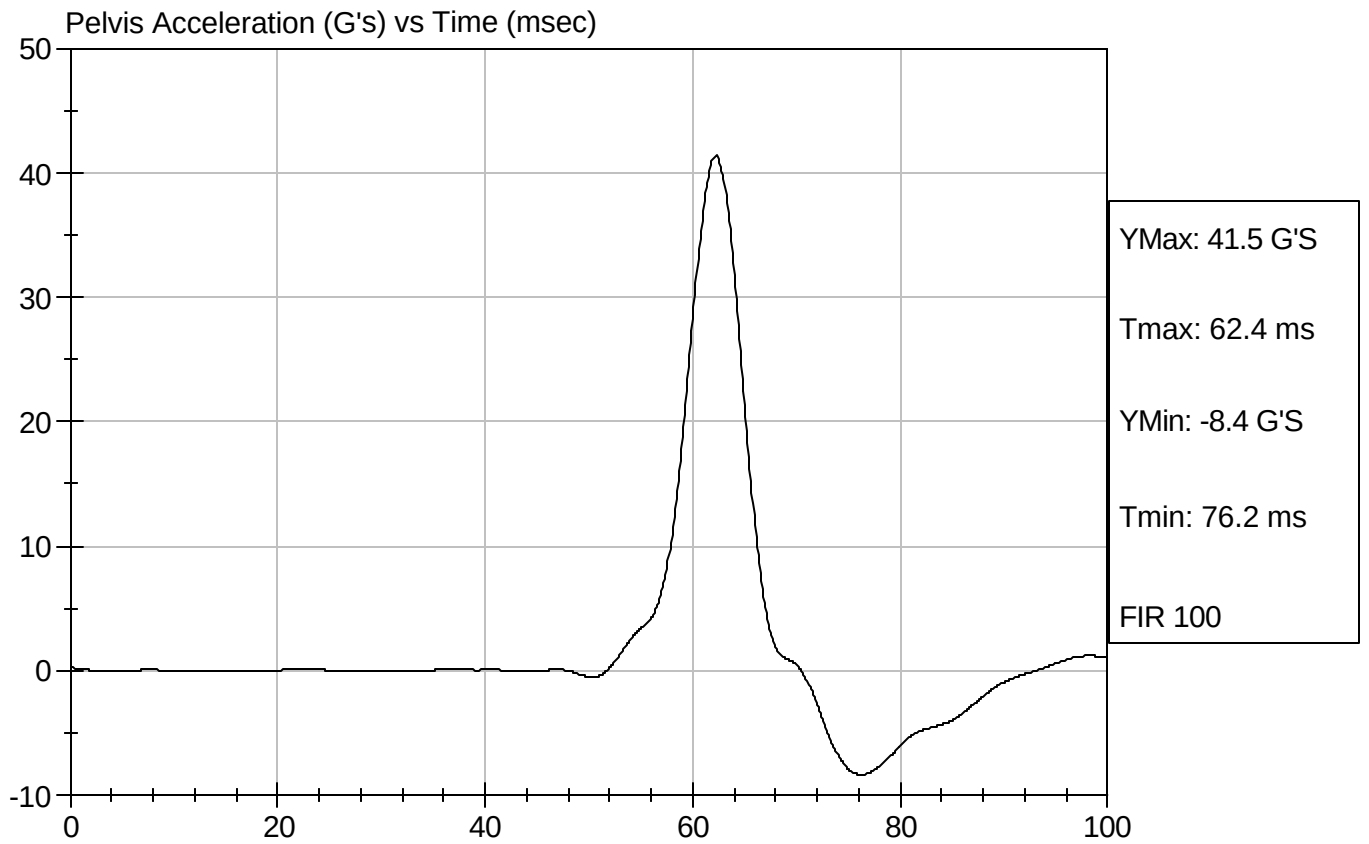
David Winkelbauer
Approved By

09/19/2005
Test Date



Test Desc: Pelvis Impact
Component ID: D052543

Test Date: 09/19/2005
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: D052544

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	37	Pass
Force At 12.7 mm	N	104 -162	145	Pass
Force At 19 mm	N	163 - 222	201	Pass
Force At 25.4 mm	N	222 - 280	274	Pass
Force At 33 mm	N	325 - 391	367	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

David Winkelbauer
Approved By

09/15/2005
Test Date

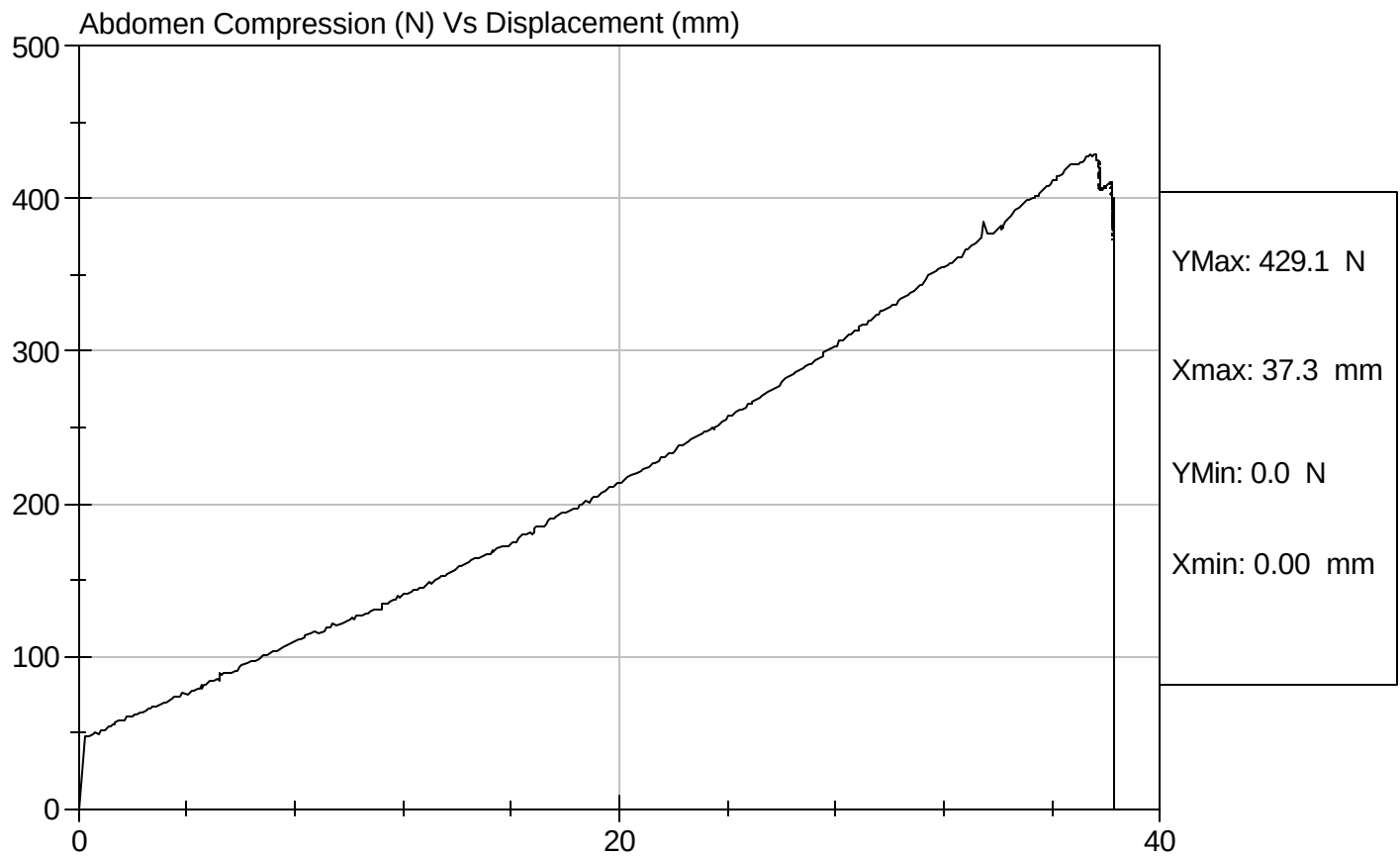


Test Description: Abdomen Compression

Test Date: 09/15/2005

Component: D052544

Speed: 0 ft/sec, 0 m/sec



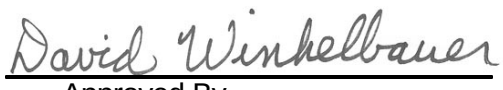
SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 271

Test I.D: D052545

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	38	Pass
Force At 0 deg	N	0 - 26.7	0.0	Pass
Force At 20 deg	N	97.9 - 151.2	149.5	Pass
Force At 30 deg	N	151.2 - 204.6	188.3	Pass
Force At 40 deg	N	204.6 - 258.0	234.9	Pass
Return Angle	Deg	12 Maximum	2	Pass
			Overall Test Results	Pass


Laboratory Technician


Approved By

09/15/2005

Test Date

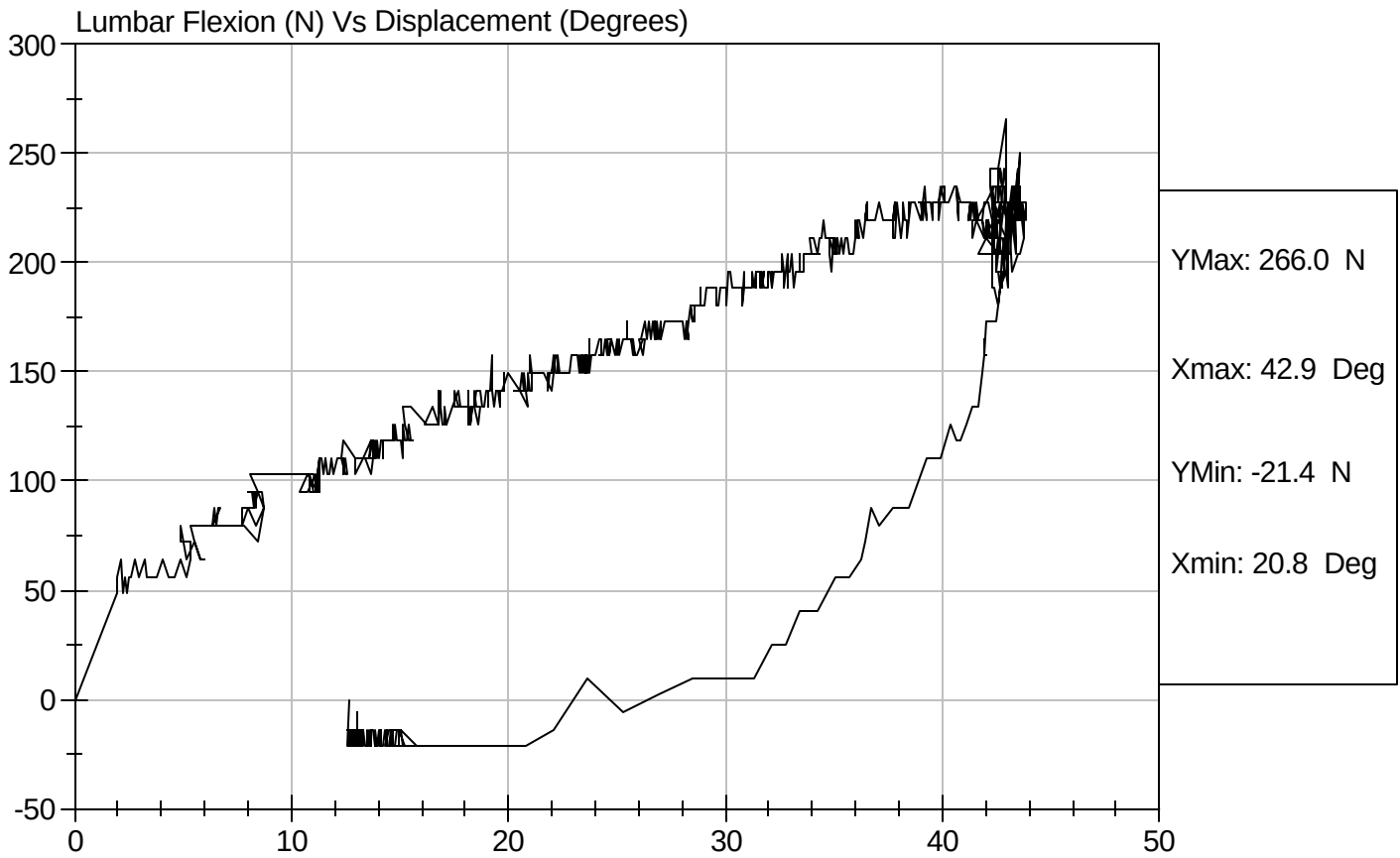


Test Description: Lumbar Flexion

Test Date: 09/15/2005

Component: D052545

Speed: 0 ft/sec, 0 m/sec

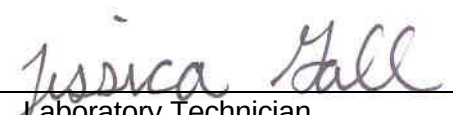


SID Calibration Data Sheet
Side Impact Dummy (SID)
Neck Pendulum Test

ATD Serial No: 271

Test I.D: D052549

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	39	Pass
Impact Velocity		m/s	6.89 to 7.13	7.07	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.33	Pass
	20 msec	m/s	4.12 to 5.10	4.60	Pass
	30 msec	m/s	5.73 to 7.01	6.41	Pass
	40 to 70 msec	m/s	6.27 to 7.64	7.24	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	74	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	61	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	78	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	61	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	12	Pass


 Laboratory Technician


 Approved By

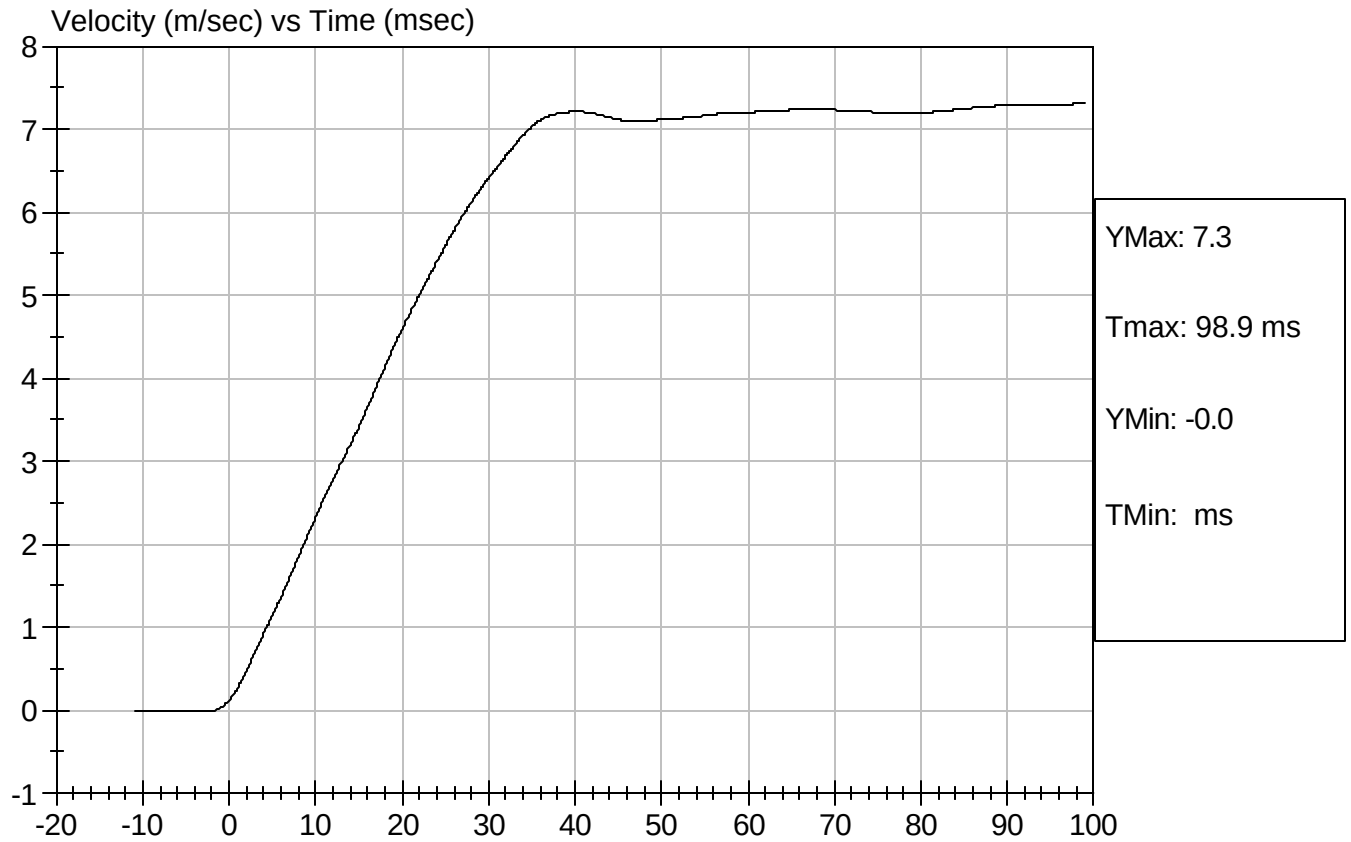
09/15/2005

Test Date



Test Desc: Neck Bending
Component ID: D052549

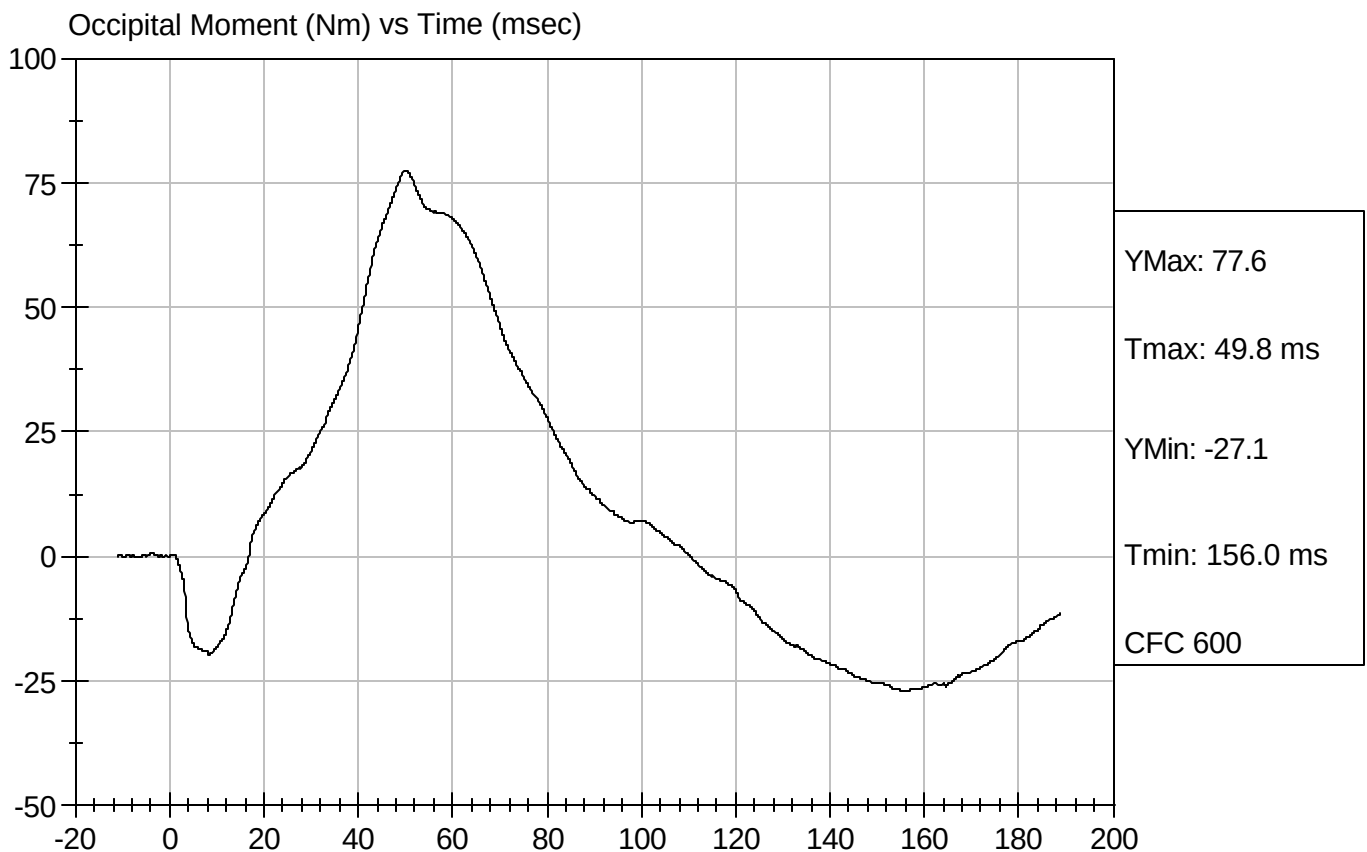
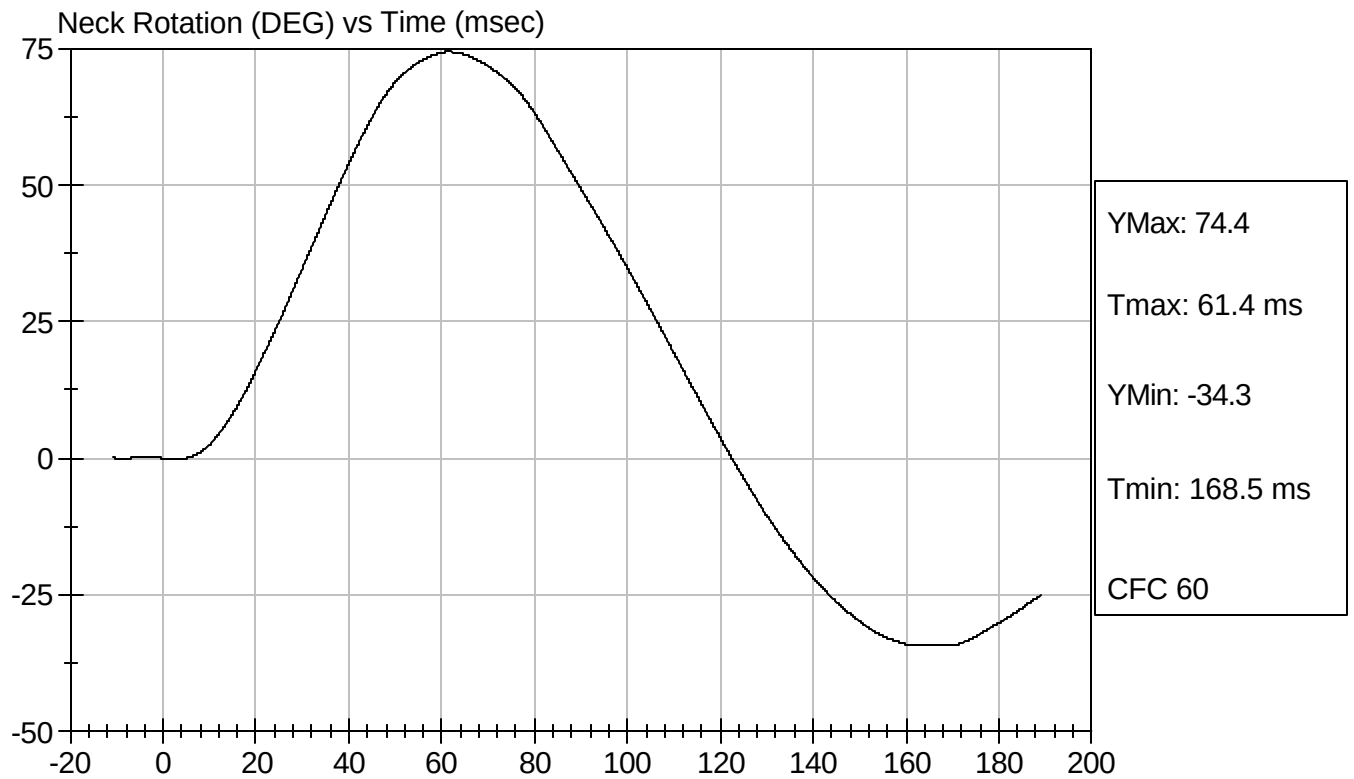
Test Date: 09/15/2005
Speed: 23.21 ft/sec, 7.07 m/sec





Test Desc: Neck Bending
Component ID: D052549

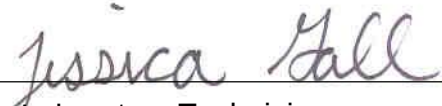
Test Date: 09/15/2005
Speed: 23.21 ft/sec, 7.07 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Inspection Checklist

ATD Serial No: 271

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


Laboratory Technician

Approved By

09/19/2005

Test Date