

REPORT NUMBER: SNCAP-CAL-10-4

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

**MITSUBISHI MOTORS CORPORATION
2010 MITSUBISHI LANCER ES
4-DOOR SEDAN**

NHTSA NUMBER: MA5600

**PREPARED BY:
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Test Date: November 19, 2009

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
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RULEMAKING
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Technical Report Documentation Page

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16. Abstract A 55/28 kph 90° Impact Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2010 Mitsubishi Lancer ES 4-Door Sedan in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted at the Calspan Corporation Crash Test Facility in Buffalo, New York, on November 19, 2009. The impact velocity of the Moving Deformable Barrier (MDB) was 62.0 km/h, and the ambient temperature at the struck side (driver side) of the vehicle was 21.7°C. The target vehicle's maximum post test static crush was 231 mm at level 3. The test vehicle's occupant performance is as follows: <table style="margin-left: auto; margin-right: auto; border: none;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>DRIVER</u></th> <th style="text-align: center;"><u>PASS.</u></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) Accel., g</td> <td style="text-align: center;">31.8</td> <td style="text-align: center;">52.9</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td style="text-align: center;">24.3</td> <td style="text-align: center;">52.8</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td style="text-align: center;">31.0</td> <td style="text-align: center;">75.9</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td style="text-align: center;">31</td> <td style="text-align: center;">64</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td style="text-align: center;">44</td> <td style="text-align: center;">99</td> </tr> <tr> <td>HIC</td> <td style="text-align: center;">192.6</td> <td style="text-align: center;">389.1</td> </tr> </tbody> </table> The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.					<u>DRIVER</u>	<u>PASS.</u>	Left Upper Rib (LUR) Accel., g	31.8	52.9	Left Lower Rib (LLR) Accel., g	24.3	52.8	Lower Spine (T ₁₂) Accel., g	31.0	75.9	Thoracic Trauma Index (TTI)	31	64	Pelvis (PEV) Accel., g	44	99	HIC	192.6	389.1
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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, 1200 New Jersey Ave. SE Washington, D.C. 20590																						
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SECTION 1

PURPOSE AND TEST PROCEDURE

PURPOSE

This side impact test was conducted as part of the FY' 2010 test program sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-09-D-00126. The purpose of this test was to evaluate side impact protection in a 2010 Mitsubishi Lancer ES 4-Door Sedan manufactured by Mitsubishi Motors Corporation. The side impact test was conducted in accordance with the Laboratory Test Procedure for New Car Assessment Program Side Impact Testing dated November 2002.

SECTION 2

SUMMARY OF NCAP SIDE IMPACT TEST

A model year 2010 Mitsubishi Lancer ES 4-Door Sedan was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.0 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 1558.0 kg and the test weight of the MDB was 1362.5 kg. The test was conducted at the Calspan Corporation Transportation Sciences Center on November 19, 2009.

One (1) real-time motion picture camera and ten (10) high-speed motion picture cameras were used to document the impact event. The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera. Camera locations and pertinent camera information are documented in the data sheets. Pre- and post-test photographs of the vehicle and Side Impact Dummies (SID/HIIIs) can be found in Appendix A.

Two 50th percentile adult male SID/HIII's were placed in the driver (P1) and left rear passenger (P4) 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-one (21) structural accelerometers and the MDB was instrumented with five (5) accelerometers.

2.2 GENERAL COMMENTS

The test vehicle sustained a maximum static crush of 231 mm at level 3, 750 mm rearward of the left vertical impact point. The driver and passenger SID/HIII's, Serial Nos. 905 and 270 respectively, were calibrated just prior to this test.

Test data and observations are presented in this section of the report. Appendix A contains the still photograph prints. Appendix B contains the driver and passenger SID/HIII's, vehicle, and MDB response data traces. Appendix C contains the SID/HIII's configuration and performance verification data. Appendix D contains the test equipment information.

The occupant data is summarized below:

ATD position	HIC(36)	T ₁	T ₂	TTI (G's)	Peak Pelvis (G's)
Driver	192.6	41.1	69.9	31	44
Passenger	389.1	46.1	67.3	64	99

SUPPLEMENTAL RESTRAINT INFORMATION

Restraint Type	Left Front (Driver)		Left Rear (Passenger)	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	No	NA	NA
Side Torso Airbag	Yes	Yes	NA	NA
Side Head/Torso Combination Airbag	NA	NA	NA	NA
Curtain Airbag	Yes	Yes	Yes	Yes

The test instrumentation data listed in Appendix B can be found on the NHTSA website:
www.nhtsa.dot.gov.

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

Test Vehicle:	2010 Mitsubishi Lancer ES	NHTSA No.	MA5600
Test Program:	NCAP Side Impact	Test Date:	November 19, 2009

TEST VEHICLE INFORMATION AND VEHICLE OPTIONS

Make	Mitsubishi Motors Corporation	Driver Front Airbag	Yes
Model	Lancer ES	Driver Side Curtain Airbag	Yes
Body Style	4-Door Sedan	Driver Side Torso Airbag	Yes
NHTSA No.	MA5600	Driver Pretensioners	Yes
VIN	JA32U2FU4AU002734	Driver Load Limiters	Yes
Color	Red	Driver Power Seats	No
Engine Disp.(L)	2.0	Rear Pass. Side Curtain Airbag	Yes
Engine Cylinders	4	Rear Pass. Side Torso Airbag	No
Engine Placement	Lateral	Rear Pass. Pretensioners	No
Transmission Type	Automatic	Rear Pass. Load Limiters	No
Transmission Speeds	CVT	Rear Pass. Power Seats	No
Final Drive	Front	Tilt Wheel	Yes
Air Conditioning	Yes	Anti-lock Brakes	Yes
Power Steering	Yes	Traction Control	Yes
Power Brakes	Yes	Power Windows	Yes
Delivery Date	10/30/09	Power Door Locks	Yes
Odometer Reading (km)	21	Automatic Door Locks (ADL)	No
Dealer	Crown Mitsubishi	Owner's Manual Details Instructions on Disabling ADLs	NA

DATA FROM CERTIFICATION LABEL

Manufactured By	Mitsubishi Motors Corporation	GVWR (kg)	1850
Date of Manufacture	July 2009	GAWR Front (kg)	1010
		GAWR Rear (kg)	910

VEHICLE CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number Of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				375.0
Cargo Wt. (RCLW) (kg)				34.8

DATA SHEET NO. 1 (continued)**GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle:	2010 Mitsubishi Lancer ES	NHTSA No.	MA5600
Test Program:	NCAP Side Impact	Test Date:	November 19, 2009

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			Fully Loaded (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	413.0	283.0		451.0	381.0		450.5	369.5	
Right	kg	412.0	259.0		419.0	316.0		421.0	317.0	
Ratio	%	60.4	39.6		55.5	44.5		55.9	44.1	
Totals	kg	825.0	542.0	1367.0	870.0	697.0	1567.0	871.5	686.5	1558.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1367.0
Weight of 2 P572E ATDs (81.2 kg each)	kg	162.4
Rated Cargo/Luggage Weight (RCLW)	kg	34.8
Calculated Vehicle Target Weight (TVTW)	kg	1564.2

* Actual As Tested Weight (ATW) will be TVTW -4.5/-9.1 kg

Weight of Ballast (including instrumentation package and cameras): 28.6 kg

TEST VEHICLE ATTITUDES

	Units	LF	RF	LR	RR
As Delivered	mm	715	723	717	720
Fully Loaded	mm	701	720	684	695
As Tested	mm	705	720	684	696

TEST VEHICLE VERTICAL IMPACT LINE AND CG

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2635
Target Impact Point Aft of Front Axle	mm	378
Actual Impact Point Aft of Front Axle	mm	382
As Tested CG (aft of front axle)	mm	1161

TEST VEHICLE TIRE INFORMATION

NHTSA No. MA5600

Test Date: November 19, 2009



2-5

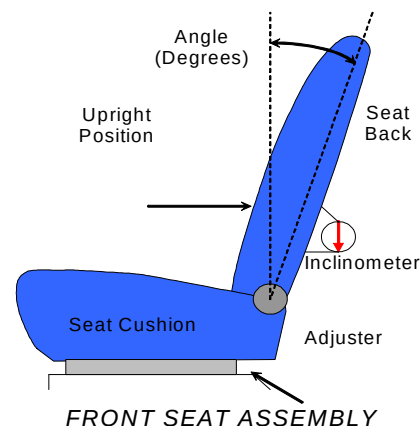
DATA SHEET NO. 3

TEST VEHICLE INFORMATION

Test Vehicle:	2010 Mitsubishi Lancer ES	NHTSA No.	MA5600
Test Program:	NCAP Side Impact	Test Date:	November 19, 2009

NORMAL DESIGN RIDING POSITION

The driver and passenger seat back is positioned to the manufacturer's designated angle.

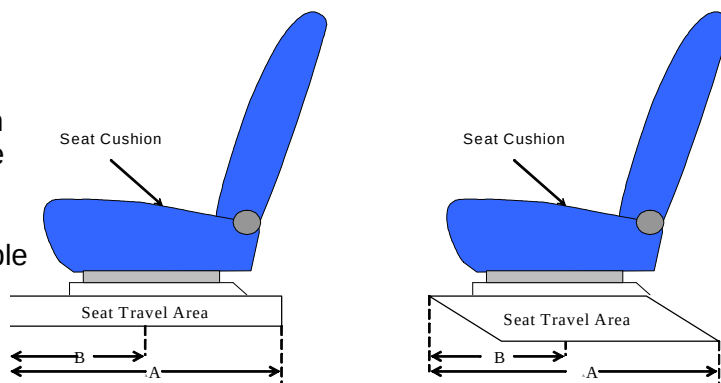


SEAT BACK POSITION

	Driver Seat	Rear Seat
Test Detent (forward-most detent defined as 0)	2	N/A
Angle (deg. from forward-most locking position)	-3.1	N/A
Alternative Measurements to Verify Test Position	None	N/A

SEAT FORE/AFT POSITIONS

The total seat travel was measured from forward most position to rearmost position irrespective of vertical seat height in those positions. The seat was set at the longitudinal mid position with vertical adjustment at the lowest position obtainable for both the driver and passenger.



SEAT FORE/AFT POSITION

	Driver Seat	Rear Seat
Total Fore/Aft Travel (A) (mm)	262	N/A
Test Position (B) (mm)	120	N/A
Test Detent (forward-most detent defined as 0)	10	N/A
Total Number of Detents (including 0)	22	N/A

DATA SHEET NO. 3 (CONTINUED)

TEST VEHICLE INFORMATION

Test Vehicle: 2010 Mitsubishi Lancer ES

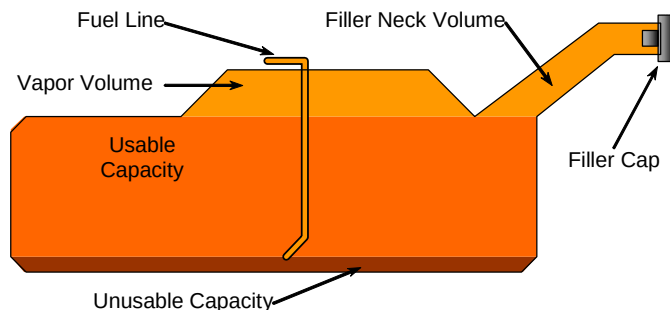
NHTSA No. MA5600

Test Program: NCAP Side Impact

Test Date: November 19, 2009

FUEL SYSTEM INFORMATION

The test vehicle is equipped with an electric fuel pump. The fuel pump operates for approximately two seconds after the ignition is placed in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies the area under the rear seat.



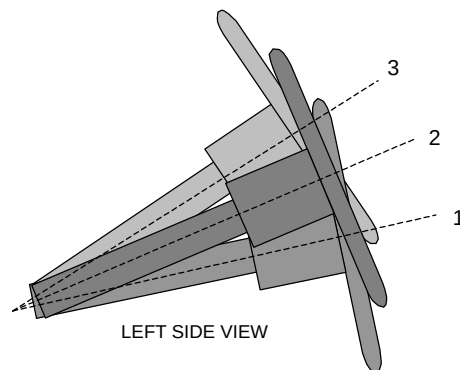
VEHICLE FUEL TANK ASSEMBLY

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard" Fuel Tank	58.7
Usable Capacity of "Optional" Fuel Tank	NA
Stoddard Used For Test (92%-94% of Fuel Tank Usable Capacity)	54.6

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 Position (mm)	Tilt (degrees)	Tilt (detent)
Lowermost Position No. 1	NA	18.6	NA
Geometric Center Position No. 2 *	NA	21.1	NA
Uppermost Position No. 3	NA	23.6	NA

* Test position

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

Test Vehicle:	2010 Mitsubishi Lancer ES	NHTSA No.	MA5600
Test Program:	NCAP Side Impact	Test Date:	November 19, 2009

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1250
Overall Length Including Honeycomb Face	4120
Wheel base of Framework Carriage	2590
Tread of Framework Carriage (front & rear)	1875
C.G. Location aft of Front Axle	1104

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	409.5	281.5	
Right	kg	372.5	299.0	
Ratio	%	57.4	42.6	
Totals	kg	782.0	580.5	1362.5

MDB SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.0
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	*
Impact angle with respect to impactor	°	88.5° to 91.5°	90.8°

* Redundant speed readout did not function properly

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

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	4 mm rearward
Vertical Offset	mm	+/-20	7 mm above

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

Test Vehicle:	2010 Mitsubishi Lancer ES	NHTSA No.	MA5600
Test Program:	NCAP Side Impact	Test Date:	November 19, 2009

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat SID/HIII	Rear Seat SID/HIII
Dummy Type / Serial No.	SID/HIII / 905	SID/HIII / 270
Head Contact	Side of Head – Side Curtain Airbag	Side of Head – Side Curtain Airbag
Upper Torso Contact	Seat Torso Airbag	Rear Left Door
Lower Torso Contact	Seat Torso Airbag	Rear Left Door Armrest
Left Knee Contact	Left Front Door	No Contact
Right Knee Contact	No Contact	No Contact

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. Jammed shut	Door remained closed and latched. Jammed shut
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	Minor cracking on left front side
Window Damage	Left Front and Left Rear Window shattered
Other Notable Effects	None

SUPPLEMENTAL RESTRAINT INFORMATION

Restraint Type	Left Front (Driver)		Left Rear (Passenger)	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	No	NA	NA
Side Torso Airbag	Yes	Yes	NA	NA
Side Head/Torso Combination Airbag	NA	NA	NA	NA
Curtain Airbag	Yes	Yes	Yes	Yes

DATA SHEET NO. 6

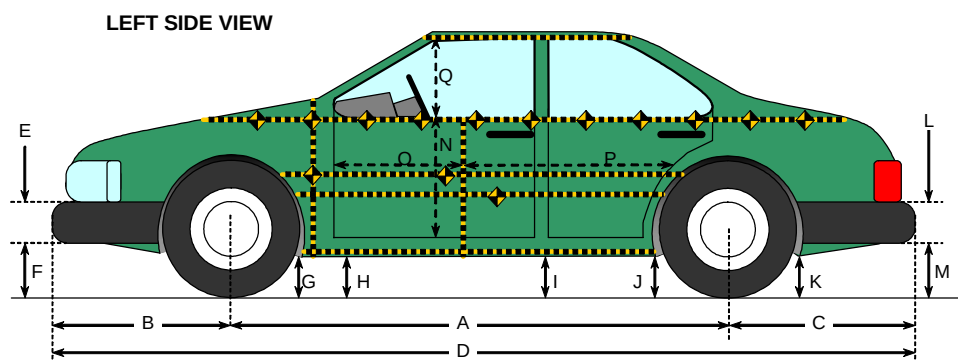
VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2010 Mitsubishi Lancer ES

NHTSA No. MA5600

Test Program: NCAP Side Impact

Test Date: November 19, 2009



All Measurements in mm

Code	Measurement Description	Pre-Test (delivered)	Pre-Test (as tested)	Post-Test (as tested)	Difference
A	Wheelbase	2635	2635	2632	3
B	Front Axle to FSOV	958	958	957	1
C	Rear Axle to RSOV	982	982	983	-1
D	Total Length at Centerline	4574	4574	4572	2
E	Front Bumper Thickness	120	120	120	0
F	Front Bumper Bottom to Ground	435	433	430	3
G	Sill Height at Front Wheel Well	183	166	205	-39
H	Sill Height at Front Door Leading Edge	213	194	222	-28
I	Sill Height at "B" Pillar	220	194	218	-24
J1	Sill Height at Rear Wheel Well	210	181	179	2
J2	Pinch Weld Height at Rear Wheel Well	227	197	188	9
K	Sill Height Aft of Rear Wheel Well	245	208	220	-12
L	Rear Bumper Thickness	262	262	262	0
M	Rear Bumper Bottom to Ground	382	346	345	1
N	Sill Height to Window Bottom Sill	724	724	676	48
O	Front Door Leading Edge to Impact CL	723	723	709	14
P	Rear Door Trailing Edge to Impact CL	1139	1139	1097	42
Q	Front Window Opening	402	402	385	17
R	Right Side Length	4442	4442	4441	1
S	Left Side Length	4438	4438	4430	8
T	Vehicle Width at "B" Post	1749	1749	1563	186

DATA SHEET NO. 7

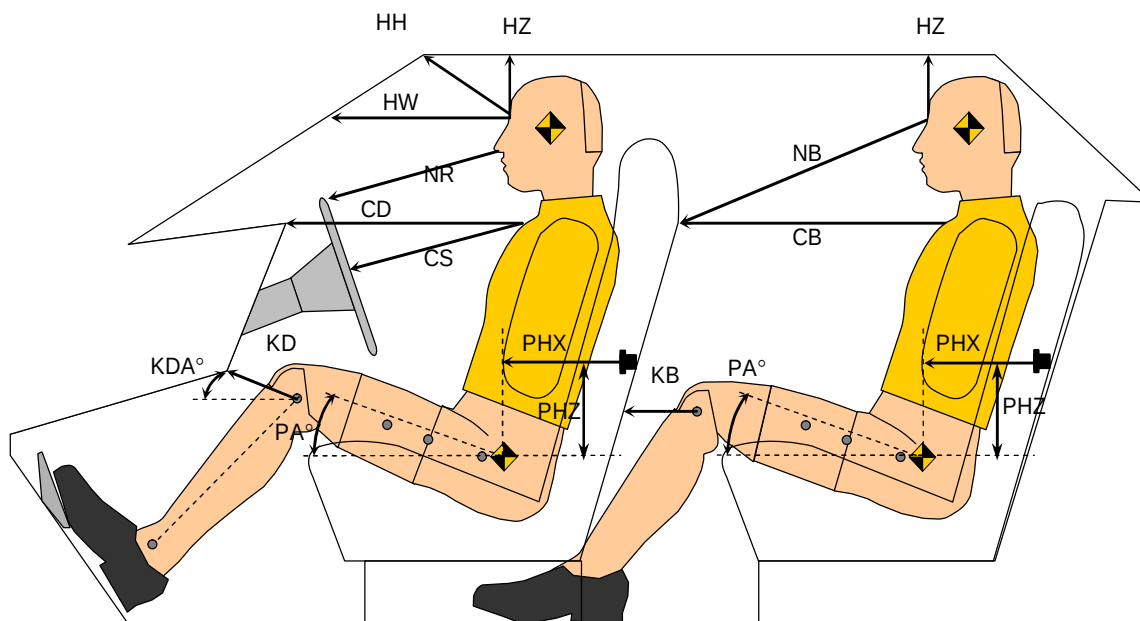
SID/HIII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2010 Mitsubishi Lancer ES

NHTSA No. MA5600

Test Program: NCAP Side Impact

Test Date: November 19, 2009

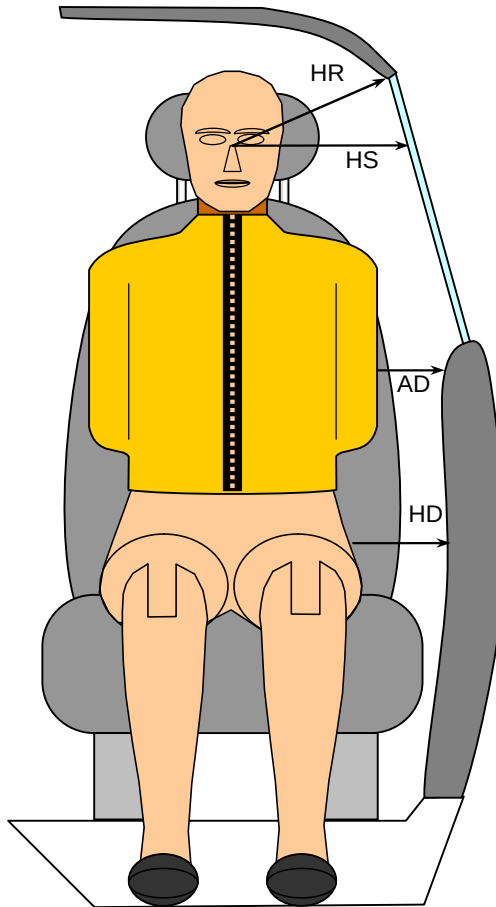


Driver Code	Pass. Code	Measurement Description	Driver S/N 905		Passenger S/N 270	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	535			
HW		Head to Windshield	665			
HZ	HZ	Head to Roof	175		134	
NR	NB	Nose to Rim/Nose to Seatback	442		639	
CD	CB	Chest to Dash or Seatback	598		564	
CS		Chest to Steering Wheel	325			
KDL	KBL	Left Knee to Dash or Seatback	197	25	207	19
KDR	KBR	Right Knee to Dash or Seatback	192	24	207	19
PA	PA	Pelvic Angle		24.2		25.0
PHX	PHX	H-Point to Striker (X-Axis)	180		194	
PHZ	PHZ	H-Point to Striker (Z-Axis)	202		288	

DATA SHEET NO. 8

SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle:	2010 Mitsubishi Lancer ES	NHTSA No.	MA5600
Test Program:	NCAP Side Impact	Test Date:	November 19, 2009



FRONT VIEW OF DUMMY

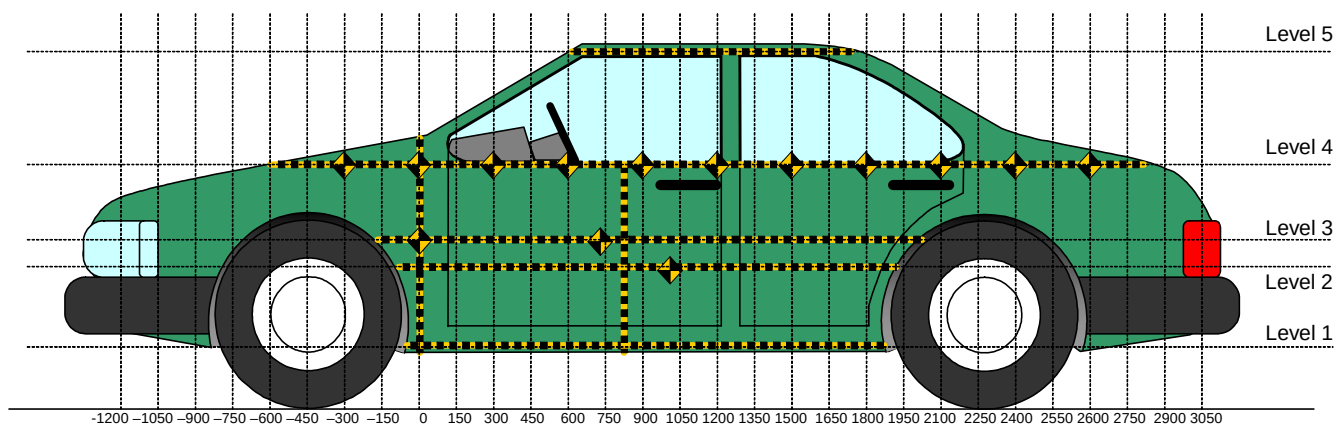
Code	Measurement Description	Units	Driver S/N 905	Passenger S/N 270
HR	Head to Side Header	mm	215	186
HS	Head to Side Window	mm	334	339 ⁽¹⁾
AD ₁	Arm to Door (at upper rib level)	mm	104	135
AD ₂	Arm to Door (at lower rib level)	mm	121	131
HD	H-Point to Door	mm	153	211

⁽¹⁾ Measured to non-movable window

DATA SHEET NO. 9

VEHICLE SIDE MEASUREMENTS

Test Vehicle:	2010 Mitsubishi Lancer ES	NHTSA No.	MA5600
Test Program:	NCAP Side Impact	Test Date:	November 19, 2009



All Measurements Shown in mm

LEFT SIDE VIEW

Measurements are taken with vehicle in the as tested condition.
 Measurements along the vertical 750 mm.
 All measurements below in mm.

Level	Measurement Description	Maximum Exterior Static Crush	Height Above Ground	Distance From Impact
1	Sill Top	35	231	750
2	Occupant H-Point	217	497	900
3	Mid Door	231	615	750
4	Window Sill	191	872	750
5	Window	2	1418	1350
	Maximum Penetration	231		

DATA SHEET NO. 10

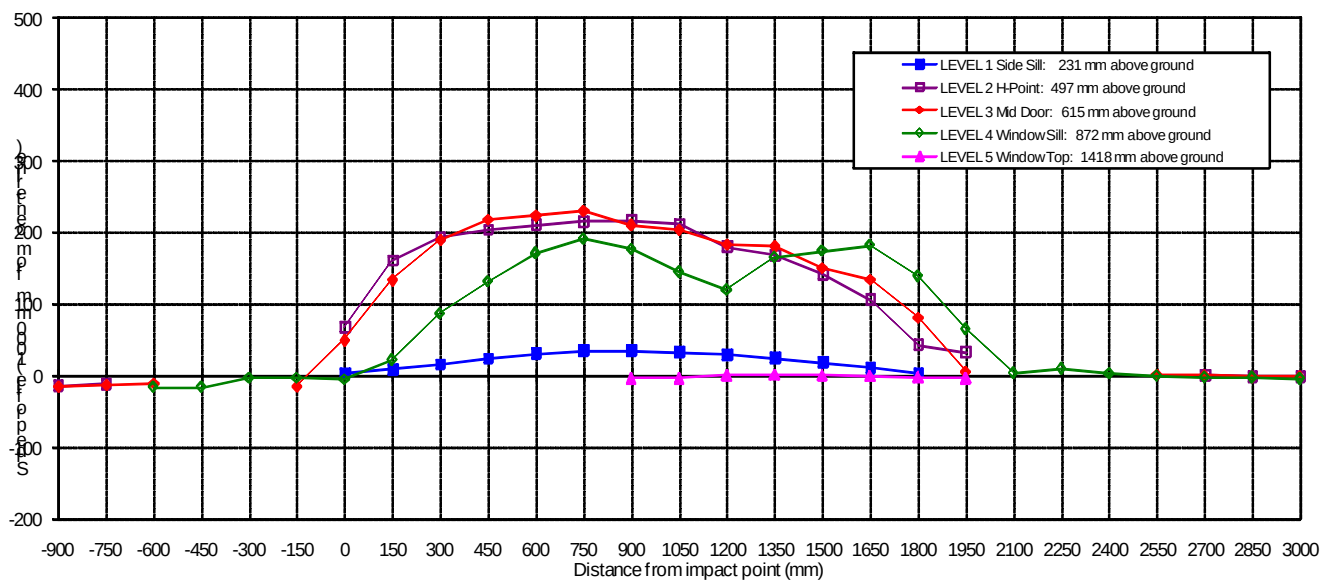
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2010 Mitsubishi Lancer ES

NHTSA No. MA5600

Test Program: NCAP Side Impact

Test Date: November 19, 2009



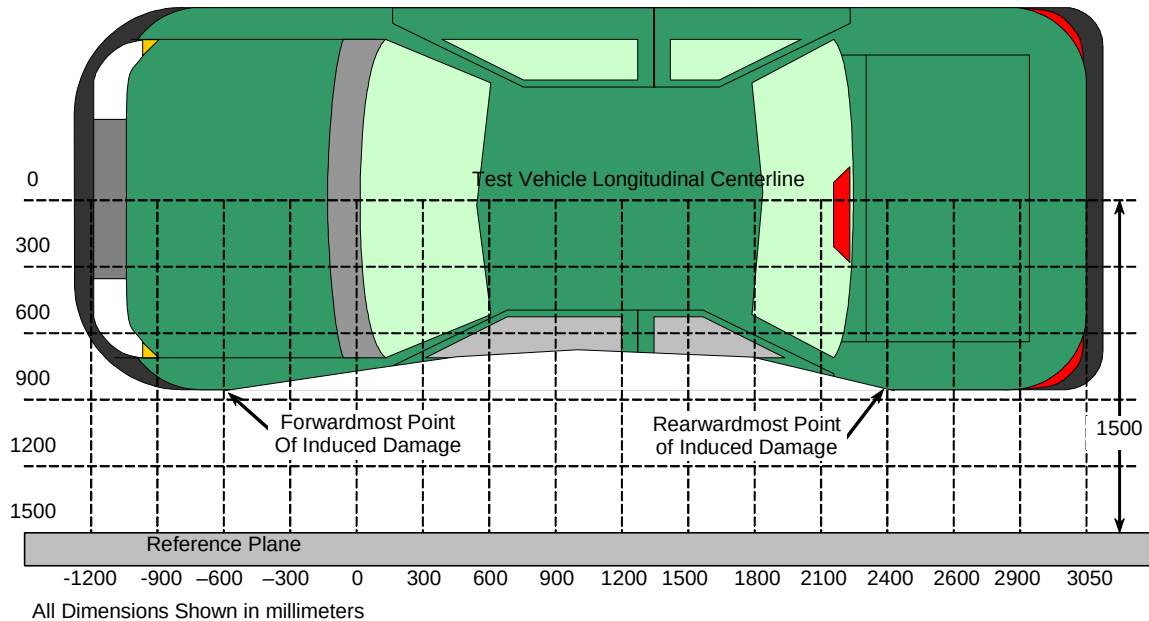
NOTE: All dimensions are in millimeters with a tolerance of ± 3 mm

			DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								</
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DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle:	2010 Mitsubishi Lancer ES	NHTSA No.	MA5600
Test Program:	NCAP Side Impact	Test Date:	November 19, 2009



TOP VIEW

DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1 (LR)	2550	3	129	131	2
2	2010	4	139	180	41
3	1470	4	139	311	172
4	930	2	144	360	216
5	390	3	134	342	208
6 (LF)	-150	4	180	177	-3

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

DATA SHEET NO. 12

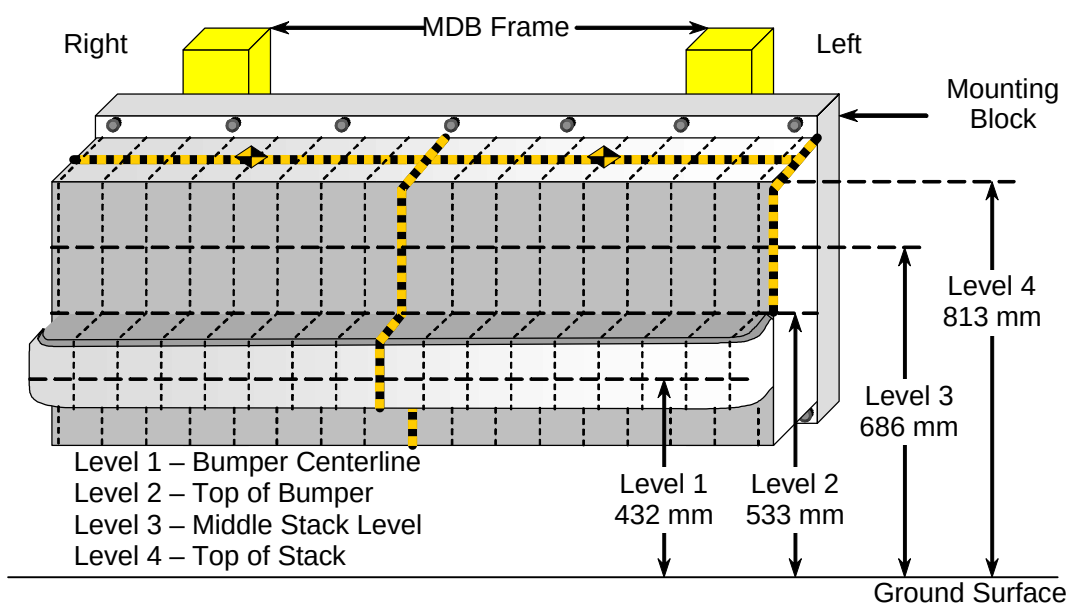
DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2010 Mitsubishi Lancer ES

NHTSA No. MA5600

Test Program: NCAP Side Impact

Test Date: November 19, 2009



			NOTE: All dimensions are in millimeters with a tolerance of ±3 mm																		
			DISTANCE RIGHT OF CENTER (mm)										DISTANCE LEFT OF CENTER (mm)								
LEVEL	HEIGHT AT CL (mm)*		-800	-700	-600	-500	-400	-300	-200	-100	0	100	200	300	400	500	600	700	800		
LEVEL 4		PRE	411	412	412	412	412	412	413	413	413	413	413	413	413	413	413	413	412		
TOP	811	POST	362	395	394	382	363	319	314	336	367	390	390	391	391	371	342	300	230		
STACK		CRUSH	49	17	18	30	49	93	99	77	46	23	23	22	22	42	71	113	182		
LEVEL 3		PRE	411	411	412	412	412	412	412	412	413	412	412	412	412	412	412	412	412		
MID	682	POST	382	412	408	400	388	355	348	371	393	403	404	401	397	390	377	342	275		
LEVEL		CRUSH	29	-1	4	12	24	57	64	41	20	9	8	11	15	22	35	70	137		
LEVEL 2		PRE	411	412	412	412	412	412	412	412	413	412	412	412	412	412	412	412	412		
TOP	542	POST	369	364	363	356	353	340	346	354	362	359	352	346	341	335	330	319	306		
BUMPER		CRUSH	42	48	49	56	59	72	66	58	51	53	60	66	71	77	82	93	106		
LEVEL 1		PRE	501	513	513	513	513	513	513	514	514	514	514	514	514	514	514	514	505		
MID	430	POST	392	408	401	394	384	371	371	377	383	388	388	383	377	372	363	341	318		
BUMPER		CRUSH	109	105	112	119	129	142	142	137	131	126	126	131	137	142	151	173	187		
*Heights measured above ground level.																					

*Heights measured above ground level.

DATA SHEET NO. 13

VEHICLE ACCELEROMETER LOCATIONS

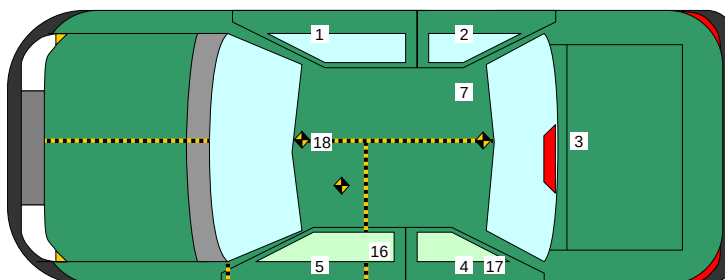
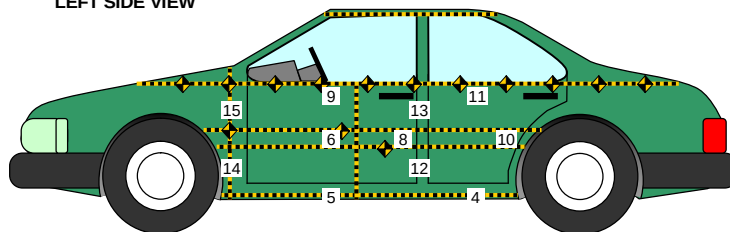
Test Vehicle: 2010 Mitsubishi Lancer ES

NHTSA No. MA5600

Test Program: NCAP Side Impact

Test Date: November 19, 2009

LEFT SIDE VIEW



Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	2649	643	302
2	Right Sill at Rear Seat	1811	648	322
3	Rear Floorpan Above Axle	1012	-34	619
4	Left Sill at Rear Door	1824	-640	316
5	Left Sill at Front Door	2651	-641	315
6	Left Front Door C/L**	-	-	-
7	Rear Occupant Compartment	1949	337	214
8	Left Front Door Mid-Rear**	-	-	-
9	Left Front Door Upper C/L**	-	-	-
10	Left Rear Door Mid-Rear**	-	-	-
11	Left Rear Door Upper C/L**	-	-	-
12	Left Lower B-Post	2086	-659	385
13	Left Middle B-Post	2002	-667	942
14	Left Lower A-Post	3081	-607	365
15	Left Middle A-Post	3057	-652	983
16	Front Seat Track	2117	-538	319
17	Rear Seat Track or Structure	1111	-527	540
18	Vehicle CG	2414	25	465

Reference Points X - Test Vehicle Rear Bumper (+ forward)

Y - Test Vehicle Centerline (+ to right)

Z - Ground Plane (+ down)

** Accelerometer was not requested by the COTR.

DATA SHEET NO. 14

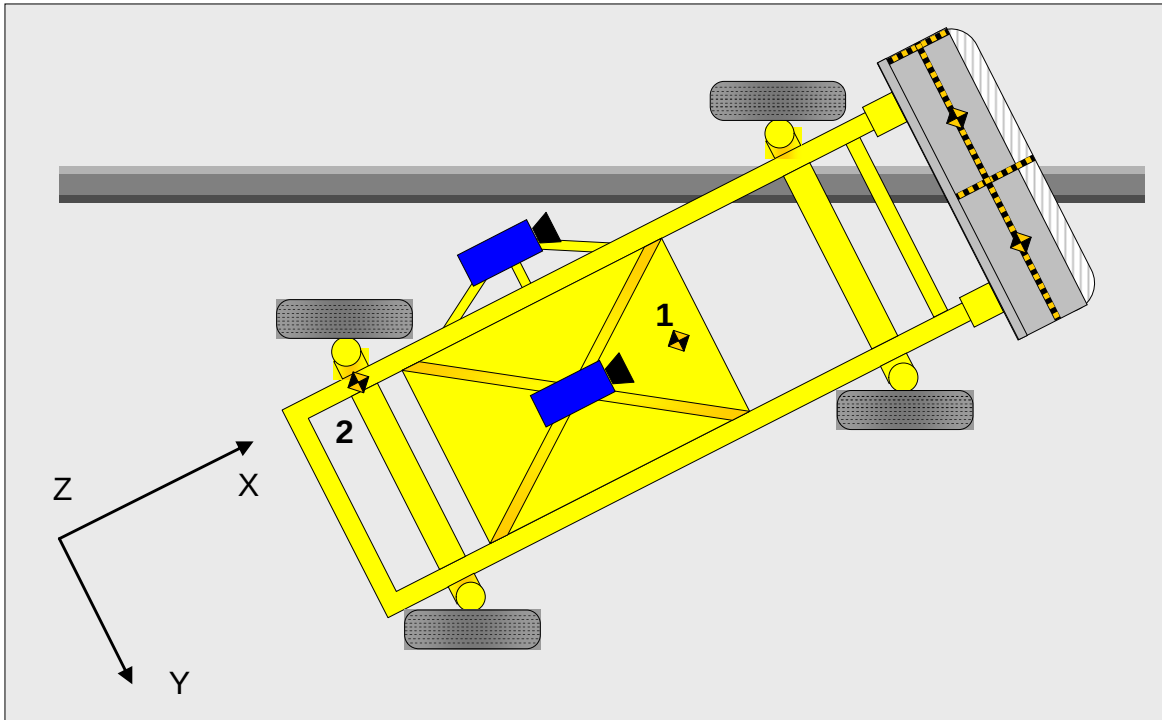
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2010 Mitsubishi Lancer ES

NHTSA No. MA5600

Test Program: NCAP Side Impact

Test Date: November 19, 2009



Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	MDB CG	1859	0	-330
2	MDB Rear	386	-660	-660

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

DATA SHEET NO. 15**VEHICLE STRUCTURAL MEASUREMENTS**

Test Vehicle: 2010 Mitsubishi Lancer ES

NHTSA No. MA5600

Test Program: NCAP Side Impact

Test Date: November 19, 2009

	Elements	Pre-Test (mm)
1	Total Length	4574
2	Total Width	1749
3	Bumper Top Height	552
4	Bumper Bottom Height	436
5	Longitudinal Member Top Height	536
6	Distance between Longitudinal Members	1039
7	Longitudinal Member Width	76
8	Engine Top Height	812
9	Engine Bottom Height	184
10	Engine and gearbox width	482
11	Front bumper-engine distance	465
12	Front shock absorber fixing height	909
13	Bonnet leading edge height	755
14	Front shock absorber fixing width	1124
15	Front bumper – front axle distance	958
16	Front axle – a pillar distance	491
17	A-pillar – B-pillar distance	1081
18	B-Pillar – rear axle distance	1062
19	B-pillar – C-pillar distance	1043
20	Roof sill bottom height	1323
21	Roof sill top height	1420
22	Floor sill bottom height	252
23	Floor sill top height	361

DATA SHEET NO. 16

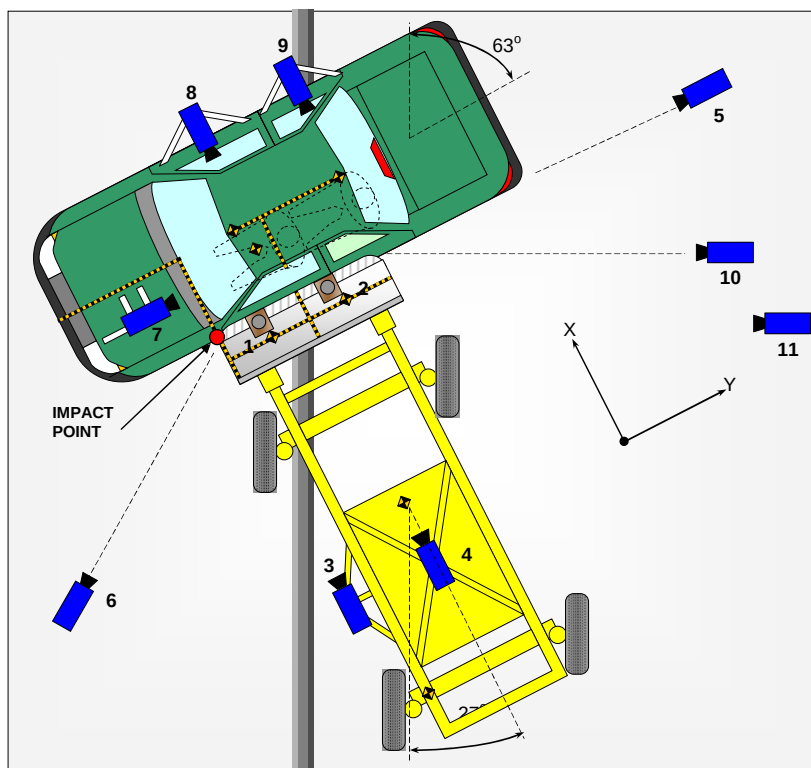
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2010 Mitsubishi Lancer ES

NHTSA No. MA5600

Test Program: NCAP Side Impact

Test Date: November 19, 2009



No.	Camera View	Location (mm)			Angle (deg)	Lens (mm)	Film Speed (fps)
		X	Y	Z			
1	Overhead Overall	72	812	-4880	-90	8	1000
2	Overhead Close-up	195	855	-4880	-90	28	1000
3	MDB Onboard, Impact Point Close-up	-1470	0	-847	0	13	500
4	MDB Onboard, Centerline of Impact	-1140	838	-1587	-17	7.5	500
5	Right Side, Ground Level, Overall	180	10250	922	-2	50	1000
6	Left Side, Ground Level, Overall	-1830	-1305	1020	-1	50	1000
7	Vehicle Onboard Front SID/HIII, Front	540	-470	1270	-5	25	500
8	Vehicle Onboard Front SID/HIII, Side	1540	885	1110	-6	12.5	500
9	Vehicle Onboard Rear SID/HIII, Side	1550	1815	1150	-8	12.5	500
10	Secondary Impact Point	5085	3290	960	-6	28	1000
11	Real Time Coverage						30

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

DATA SHEET NO. 17
SUMMARY OF FMVSS 301 DATA

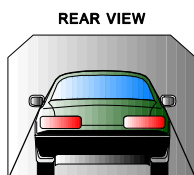
Test Vehicle:	2010 Mitsubishi Lancer ES	NHTSA No.	MA5600
Test Program:	NCAP Side Impact	Test Date:	November 19, 2009

FUEL SYSTEM INTEGRITY POST IMPACT DATA

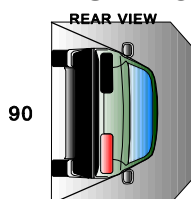
Time Interval	FMVSS 301 Maximum Allowable Spillage	Spillage (g)
Impact Until Motion Ceases	28 g	0
First Five Minutes Following Impact	142 g	0
Next 25 Minutes	28 g / 1 minute	0

Spillage Location(s)	None
----------------------	------

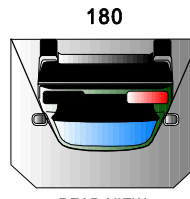
STATIC ROLLOVER DATA



0/360

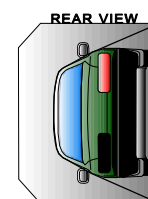


90



180

REAR VIEW



270

Rollover Stage	Rotation Time (spec. 1 -3 min)				FMVSS 301 Hold Time		Total Time				Next Whole Minute Interval	
0° - 90°	1	minutes	09	seconds	5	minutes	6	minutes	9	seconds	7	minutes
90° - 180°	1	minutes	08	seconds	5	minutes	6	minutes	8	seconds	7	minutes
180°-270°	1	minutes	03	seconds	5	minutes	6	minutes	3	seconds	7	minutes
270°-360°	1	minutes	04	seconds	5	minutes	6	minutes	4	seconds	7	minutes

Rollover Stage	Spillage (g)			
	First 5 min. from onset of rotation	6 th min.	7 th min.	8 th min. (if required)
0° - 90°	0	0	0	0
90° - 180°	0	0	0	0
180°-270°	0	0	0	0
270°-360°	0	0	0	0
FMVSS 301 Maximum Allowable (for each 90° stage)	142	28	28	28

Rollover Stage	Spillage Location(s)
0° - 90°	None
90° - 180°	None
180°-270°	None
270°-360°	None

APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

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A-5	Pre-Test Front View	A-6
A-6	Post-Test Front View	A-6
A-7	Pre-Test Left Front $\frac{3}{4}$ View	A-7
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A-9	Pre-Test Left Side View	A-8
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A-14	Post-Test Rear View	A-10
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A-18	Post-Test Right Side View	A-12
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A-29	Pre-Test Left Side View of Aligned MDB and Vehicle	A-18
A-30	Pre-Test Right Side View of Aligned MDB and Vehicle	A-18
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A-39	Pre-Test Left Occupant Compartment View of Driver	A-23
A-40	Post-Test Left Occupant Compartment View of Driver	A-23
A-41	Pre-Test Left Occupant Compartment View of Passenger	A-24
A-42	Post-Test Left Occupant Compartment View of Passenger	A-24
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A-54	Rollover 360 Degrees	A-30
A-55	Impact Photo	A-31



Figure A-1: As Received Left Front $\frac{3}{4}$ View



Figure A-2: As Received Right Rear $\frac{3}{4}$ View



Figure A-3: Vehicle Certification Label



Figure A-4: Vehicle Tire Placard Label



Figure A-5: Pre-Test Front View



Figure A-6: Post-Test Front View



Figure A-7: Pre-Test Left Front $\frac{3}{4}$ View



Figure A-8: Post-Test Left Front $\frac{3}{4}$ View



Figure A-9: Pre-Test Left Side View



Figure A-10: Post-Test Left Side View



Figure A-11: Pre-Test Left Rear $\frac{3}{4}$ View



Figure A-12: Post-Test Left Rear $\frac{3}{4}$ View



Figure A-13: Pre-Test Rear View



Figure A-14: Post-Test Rear View



Figure A-15: Pre-Test Right Rear $\frac{3}{4}$ View



Figure A-16: Post-Test Right Rear $\frac{3}{4}$ View





Figure A-19: Pre-Test Right Front $\frac{3}{4}$ View



Figure A-20: Post-Test Right Front $\frac{3}{4}$ View



Figure A-21: Pre-Test Frontal View of MDB Impactor Face



Figure A-22: Post-Test Frontal View of MDB Impactor Face



Figure A-23: Pre-Test Left Side View of MDB Impactor Face



Figure A-24: Post-Test Left Side View of MDB Impactor Face



Figure A-25: Pre-Test Right Side View of MDB Impactor Face



Figure A-26: Post-Test Right Side View of MDB Impactor Face



Figure A-27: Pre-Test Top View of MDB Impactor Face



Figure A-28: Post-Test Top View of MDB Impactor Face



Figure A-29: Pre-Test Left Side View of Aligned MDB and Vehicle



Figure A-30: Pre-Test Right Side View of Aligned MDB and Vehicle



Figure A-31: Pre-Test Overhead View of Aligned MDB and Vehicle



Figure A-32: Post-Test Overhead View of MDB and Vehicle



Figure A-33: Pre-Test Close-Up View of Impact Point Target



Figure A-34: Post-Test Close-Up View of Impact Point Target



Figure A-35: Pre-Test Right Occupant Compartment View of Driver



Figure A-36: Post-Test Right Occupant Compartment View of Driver



Figure A-37: Pre-Test Right Occupant Compartment View of Passenger

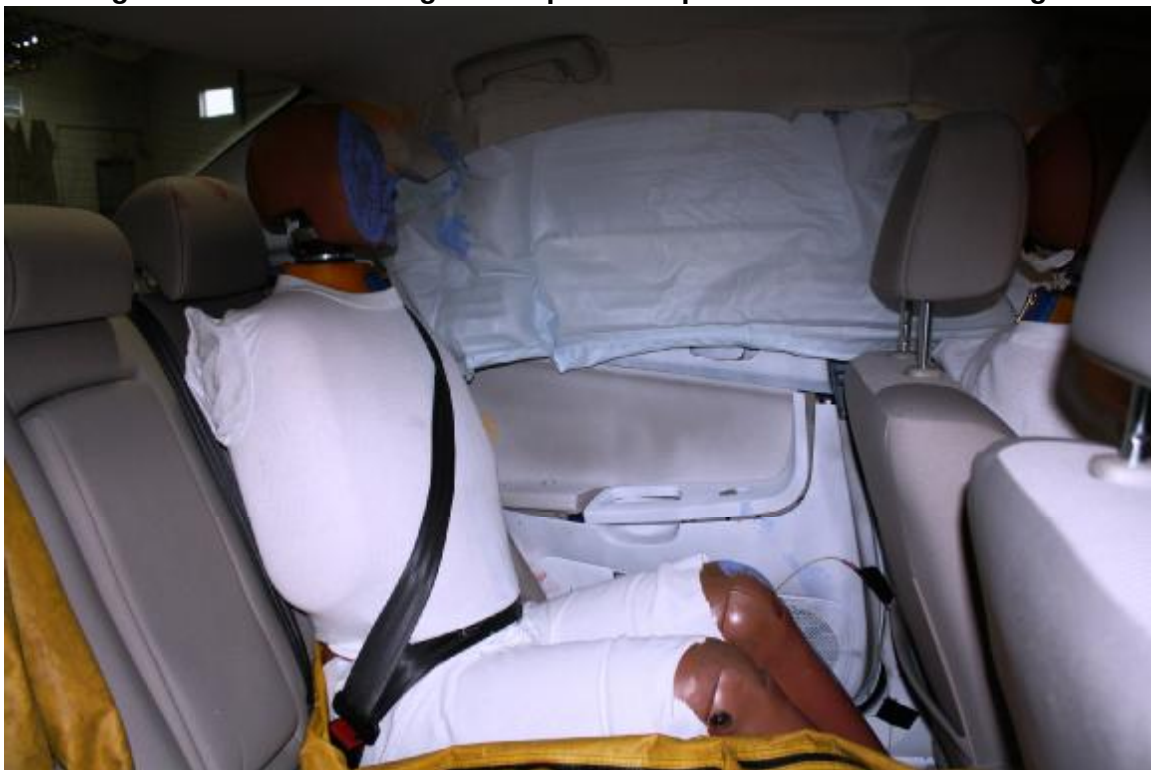


Figure A-38: Post-Test Right Occupant Compartment View of Passenger



Figure A-39: Pre-Test Left Occupant Compartment View of Driver



Figure A-40: Post-Test Left Occupant Compartment View of Driver



Figure A-41: Pre-Test Left Occupant Compartment View of Passenger



Figure A-42: Post-Test Left Occupant Compartment View of Passenger



Figure A-43: Pre-Test Left Front Interior Trim



Figure A-44: Post-Test Left Front Interior Trim



Figure A-45: Pre-Test Left Rear Interior Trim



Figure A-46: Post-Test Left Rear Interior Trim



Figure A-47: Pre-Test Left Front $\frac{3}{4}$ View of Left Side Doors



Figure A-48: Post-Test Left Front $\frac{3}{4}$ View of Left Side Doors



Figure A-49: Pre-Test Left Rear $\frac{3}{4}$ View of Left Side Doors



Figure A-50: Post-Test Left Rear $\frac{3}{4}$ View of Left Side Doors

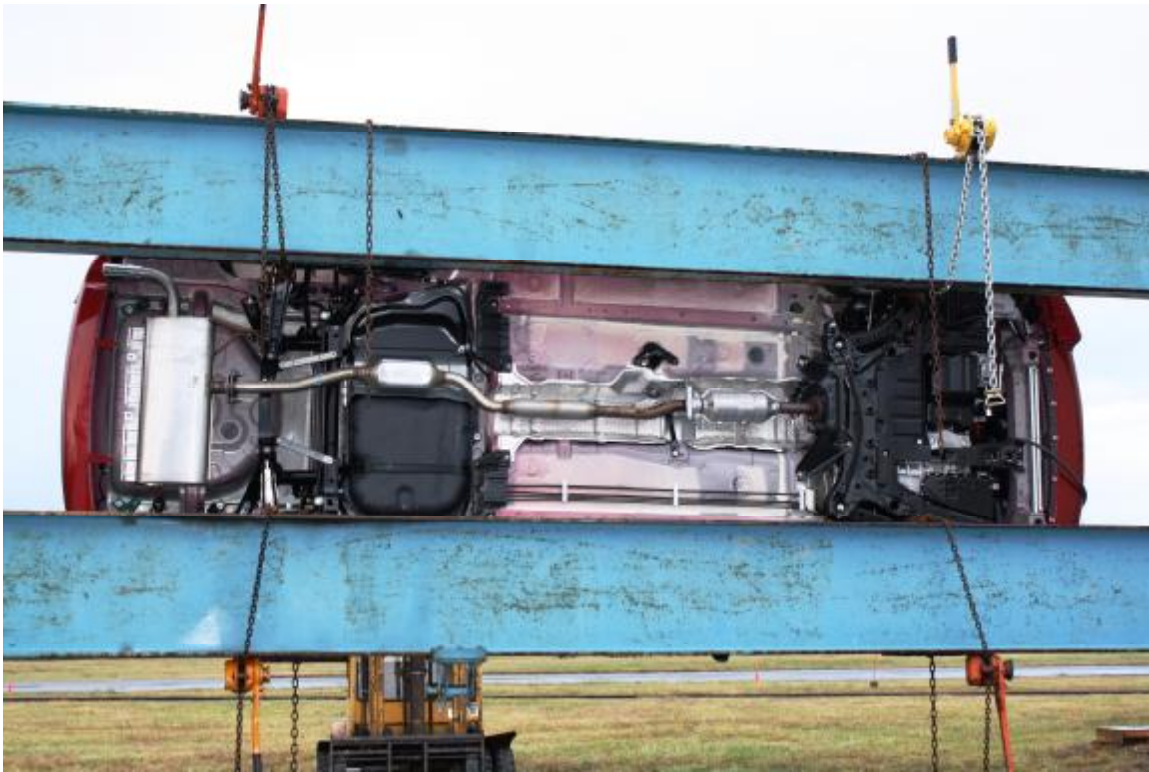


Figure A-51: Rollover 90 Degrees



Figure A-52: Rollover 180 Degrees



Figure A-53: Rollover 270 Degrees



Figure A-54: Rollover 360 Degrees



Figure A-55: Impact Photo

APPENDIX B
SID/HIII, VEHICLE AND MDB RESPONSE DATA
(SAE sign convention)

DATA CHANNEL FILTER CLASS SUMMARY

Data Type	SAE Filter Class
Dummy Head Accelerations	CFC 1000
Rib Accelerations	FIR 100
Spine Accelerations	FIR 100
Pelvis Accelerations	FIR 100

DATA CHANNEL TITLE KEY

Prefix	Suffix
V1 = Vehicle 1 (Moving Barrier)	Ax = Acceleration, X-direction
V2 = Vehicle 2 (Test Vehicle)	Ay = Acceleration, Y-direction
P1 = Left Front Seating Position (Driver)	Az = Acceleration, Z-direction
P4 = Left Second Row Seating Position (Passenger)	Fx = Force, X-direction
A1-A18 = Accelerometer Location Number	Fy = Force, Y-direction
	Fz = Force, Z-direction
	Mx = Moment about X
	My = Moment about Y
	Mz = Moment about Z

TABLE OF DATA PLOTS

PLOT	PLOT NAME[UNITS, CHANNEL FILTER CLASS]	PAGE
1	V2P1 Head Ax [g, CFC_1000]	B-5
2	V2P1 Head Ay [g, CFC_1000]	B-5
3	V2P1 Head Az [g, CFC_1000]	B-5
4	V2P1 Head Ar [g, CFC_1000]	B-5
5	V1P1 Upper Rib Ay [g, FIR_100]	B-6
6	V1P1 Lower Rib Ay [g, FIR_100]	B-6
7	V1P1 Lower Spine Ay [g, FIR_100]	B-6
8	V1P1 Pelvic Ay [g, FIR_100]	B-6
9	V2P4 Head Ax [g, CFC_1000]	B-7
10	V2P4 Head Ay [g, CFC_1000]	B-7
11	V2P4 Head Az [g, CFC_1000]	B-7
12	V2P4 Head Ar [g, CFC_1000]	B-7
13	V1P4 Upper Rib Ay [g, FIR_100]	B-8
14	V1P4 Lower Rib Ay [g, FIR_100]	B-8
15	V1P4 Lower Spine Ay [g, FIR_100]	B-8
16	V1P4 Pelvic Ay [g, FIR_100]	B-8

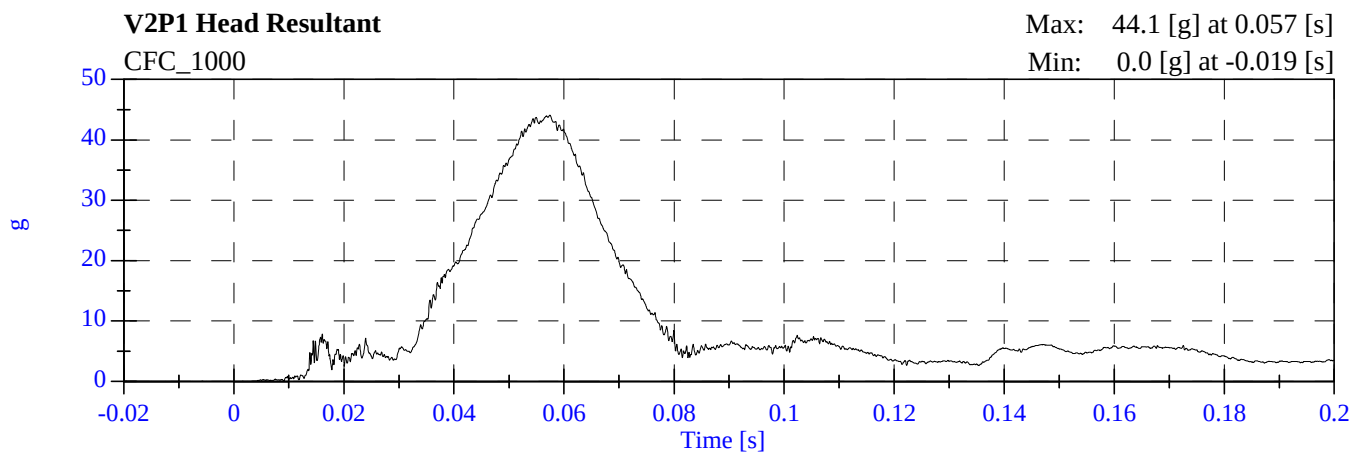
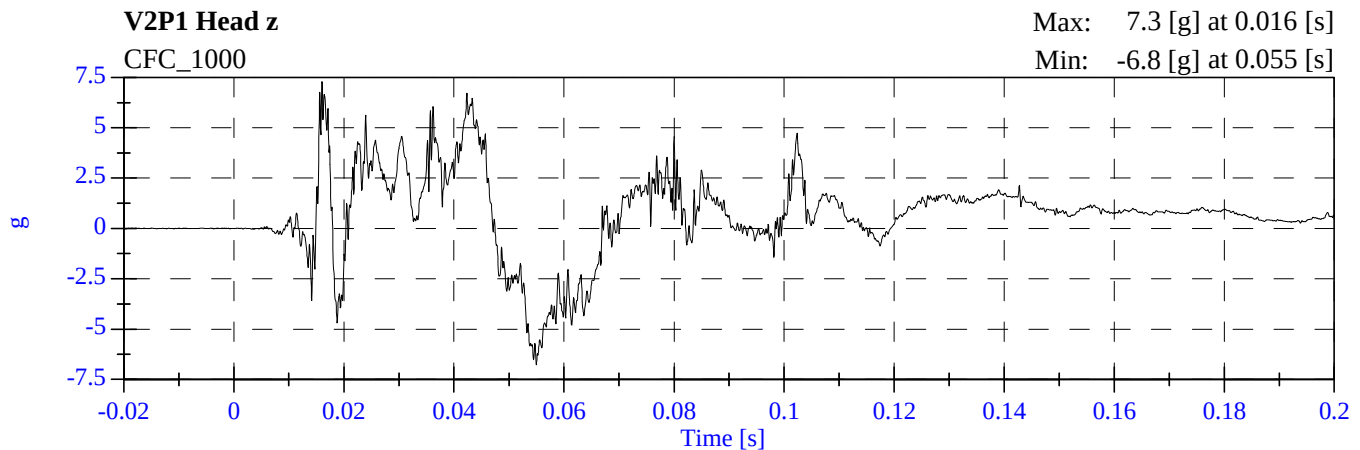
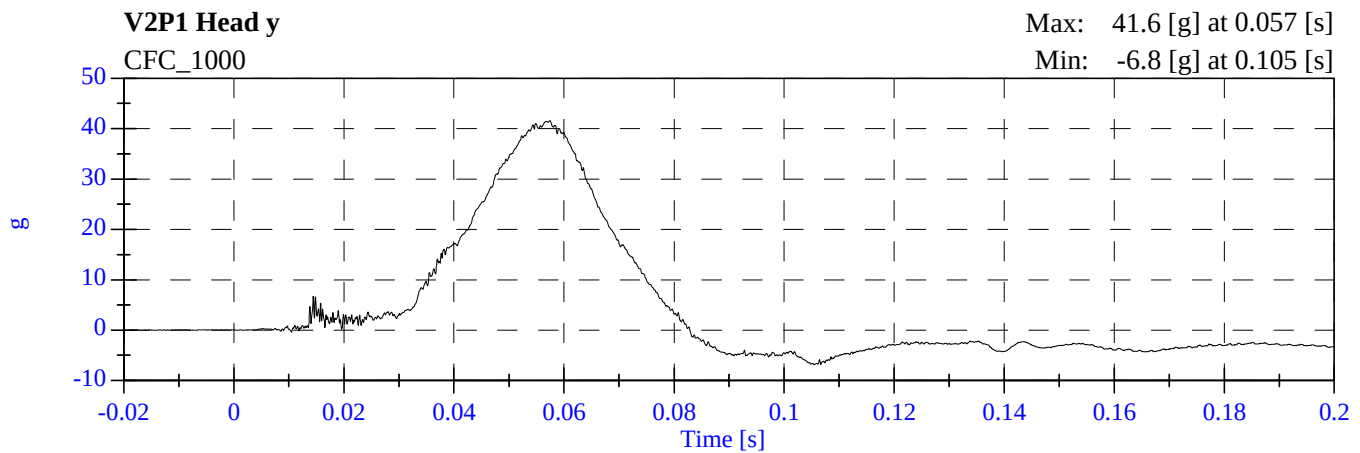
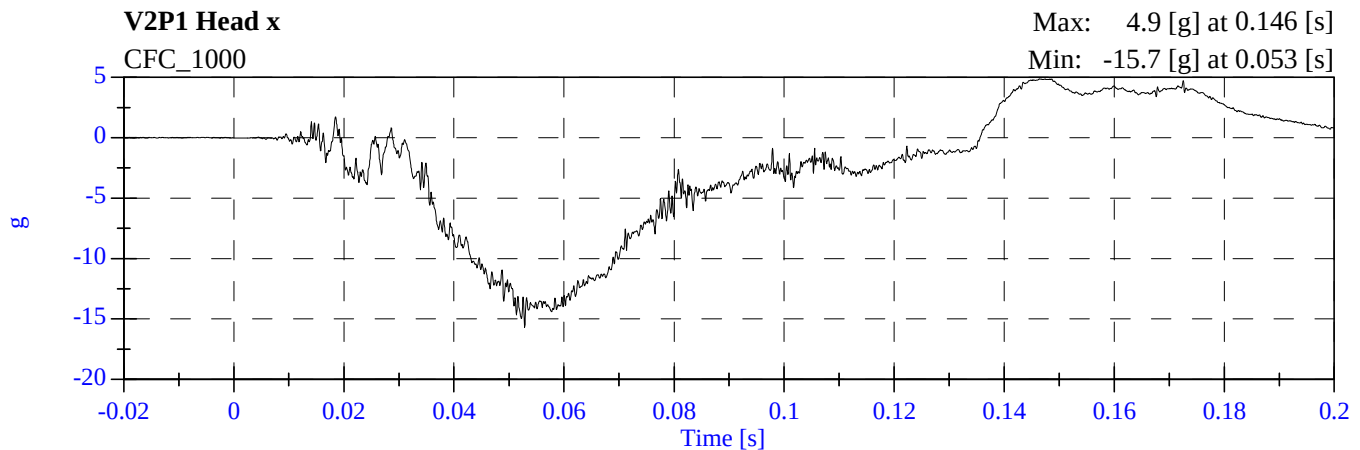
The following dummy, vehicle and load cell response data can be found in the research and development section of the NHTSA website at: www.nhtsa.dot.gov

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V2P1 Head Ay	V2A1 Right Front Sill Ay
V2P1 Head Az	V2A1 Right Front Sill Az
V2P1 Upper Neck Fx	V2A2 Right Rear Sill Ax
V2P1 Upper Neck Fy	V2A2 Right Rear Sill Ay
V2P1 Upper Neck Fz	V2A2 Right Rear Sill Az
V2P1 Upper Neck Mx	V2A3 Rear Floorpan Ax
V2P1 Upper Neck My	V2A3 Rear Floorpan Ay
V2P1 Upper Neck Mz	V2A3 Rear Floorpan Az
V2P1 Upper Rib Ay	V2A4 Left Rear Sill Ay
V2P1 Upper Rib Redundant Ay	V2A5 Left Front Sill Ay
V2P1 Lower Rib Ay	V2A7 Right Rear Compartment Ay
V2P1 Lower Rib Redundant Ay	V2A12 Left Lower B Post Ay
V2P1 Lower Spine Ay	V2A13 Left Mid B Post Ay
V2P1 Lower Spine Redundant Ay	V2A14 Left Lower A Post Ay
V2P1 Pelvic Ay	V2A15 Left Mid A Post Ay
V2P1 Pelvic Redundant Ay	V2A16 Front Seat Track Ay
V2P4 Head Ax	V2A17 Rear Seat Track Ay
V2P4 Head Ay	V2A18 Target CG Ax
V2P4 Head Az	V2A18 Target CG Ay
V2P4 Upper Neck Fx	V2A18 Target CG Az
V2P4 Upper Neck Fy	V1 Moving Barrier CG Ax
V2P4 Upper Neck Fz	V1 Moving Barrier CG Ay
V2P4 Upper Neck Mx	V1 Moving Barrier CG Az
V2P4 Upper Neck My	V1 Moving Barrier Left Rail Ax
V2P4 Upper Neck Mz	V1 Moving Barrier Left Rail Ay
V2P4 Upper Rib Ay	
V2P4 Upper Rib Redundant Ay	
V2P4 Lower Rib Ay	
V2P4 Lower Rib Redundant Ay	
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V2P4 Pelvic Ay	
V2P4 Pelvic Redundant Ay	

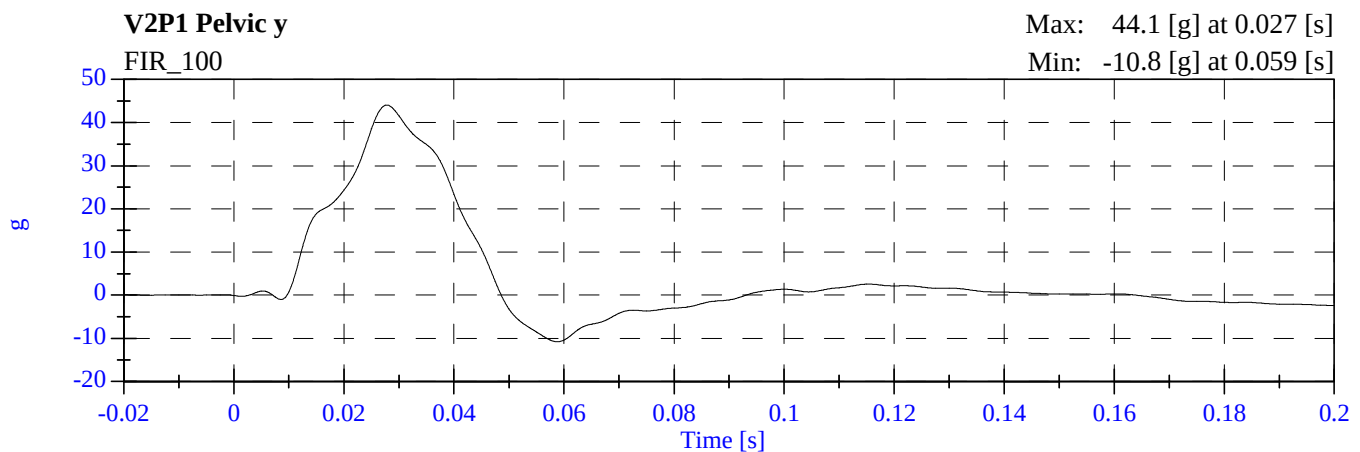
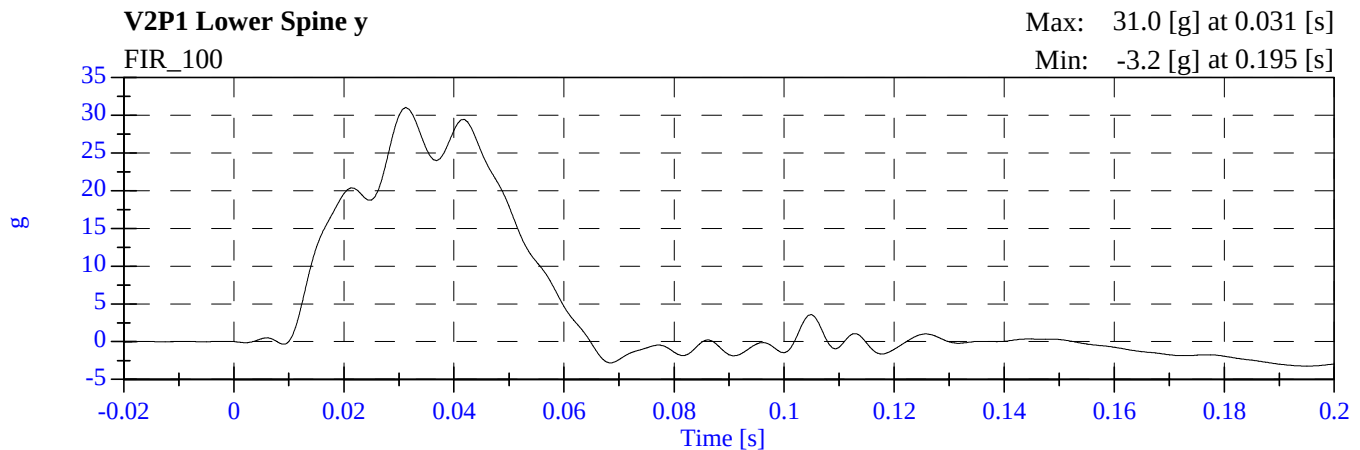
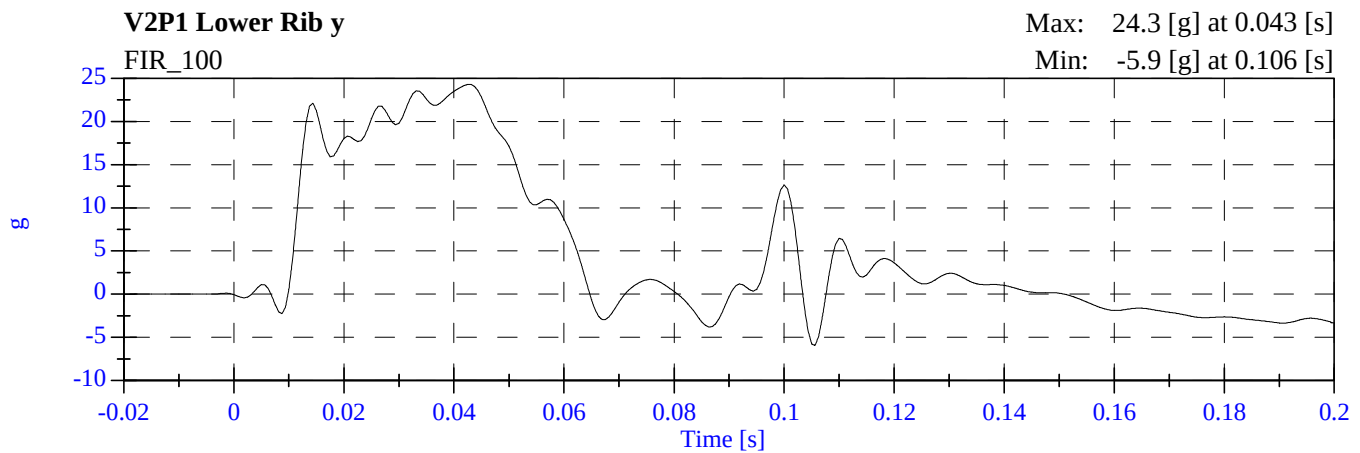
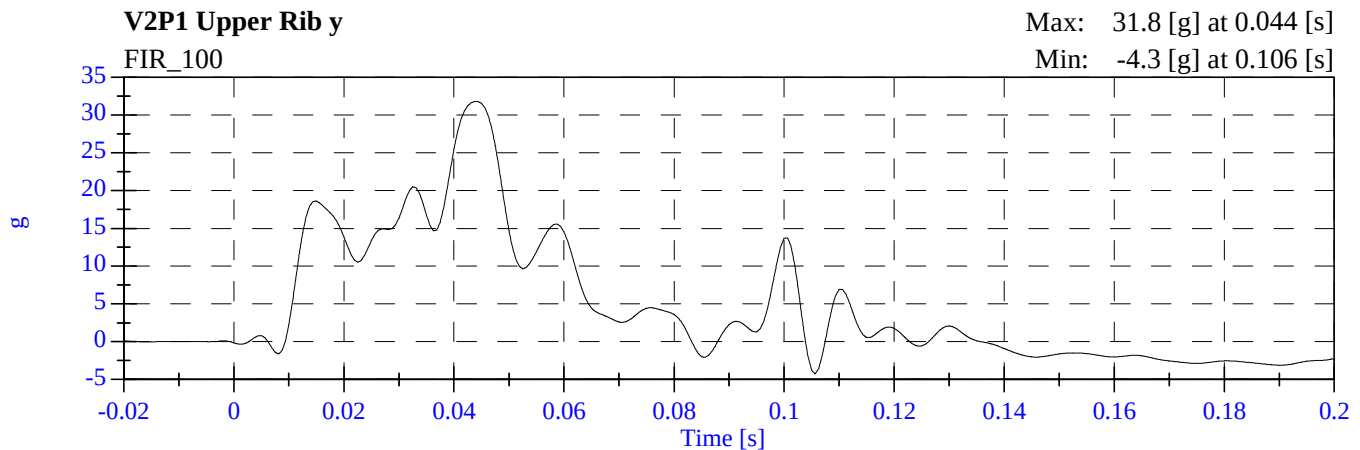
TEST NOTES

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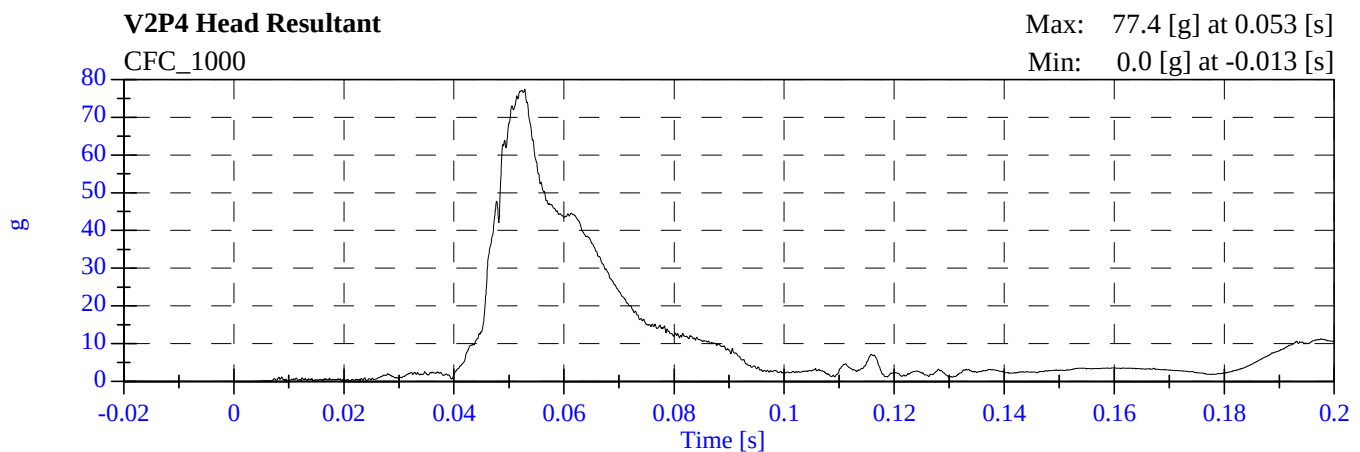
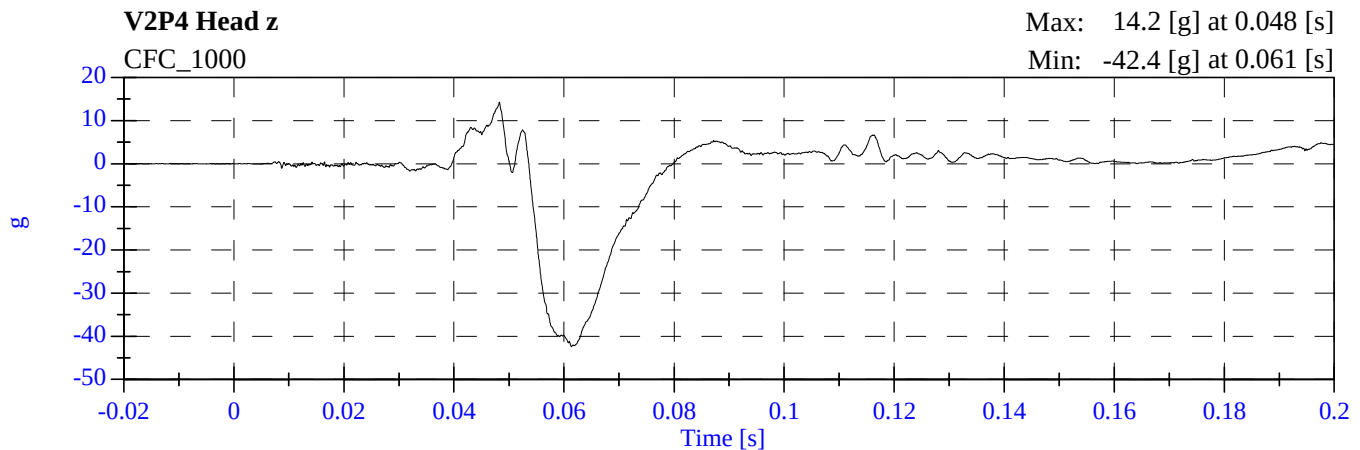
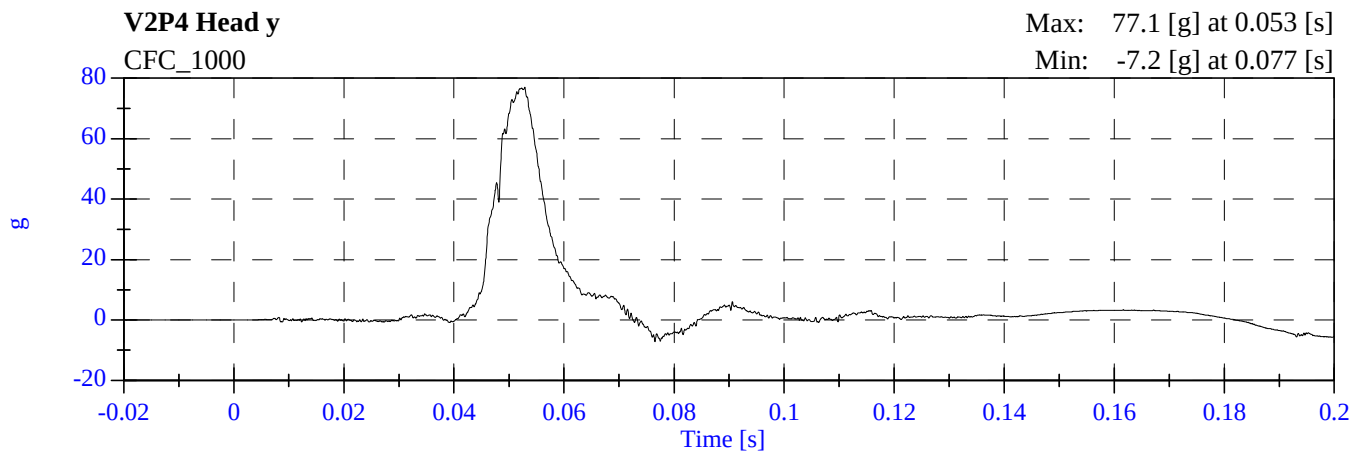
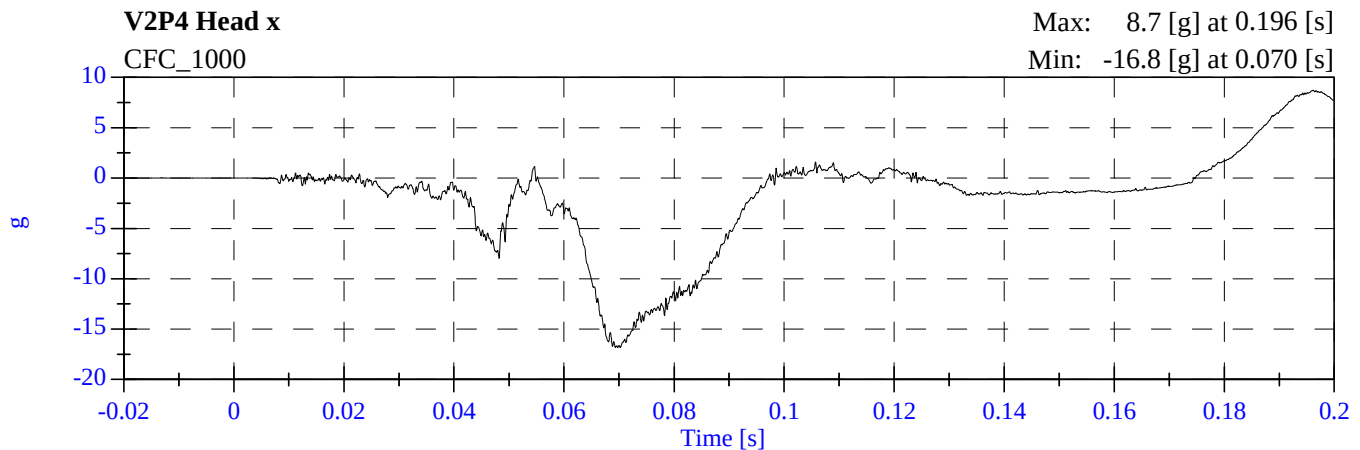
Side NCAP - 2010 Mitsubishi Lancer MA5600 - November 19, 2009



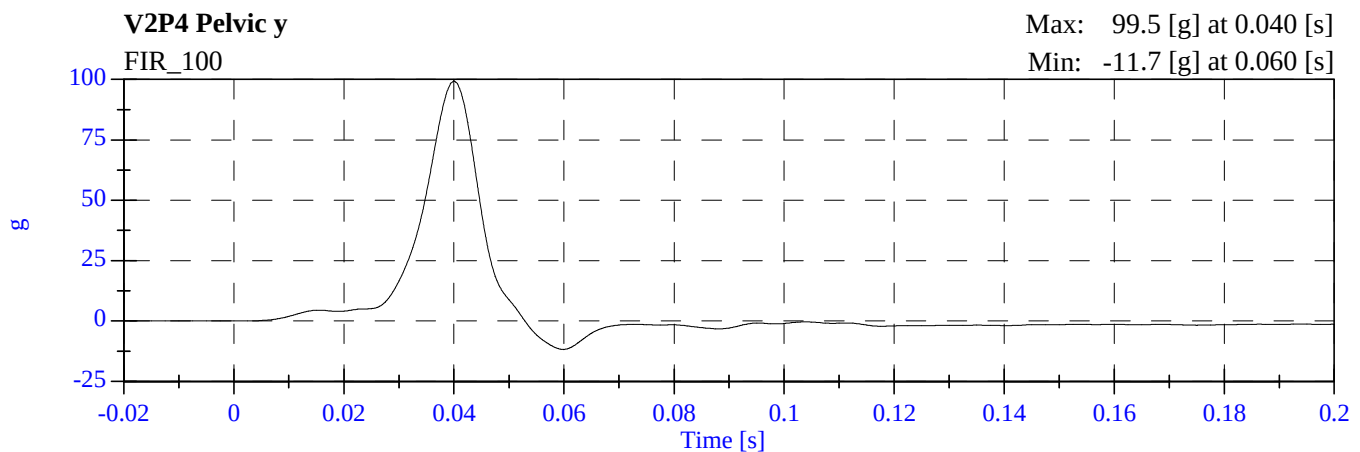
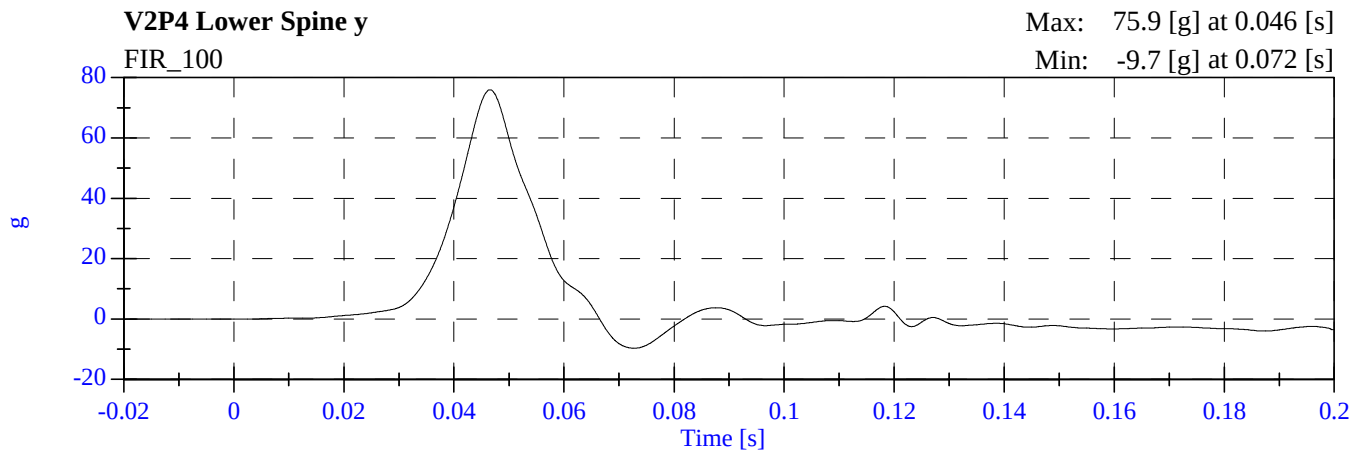
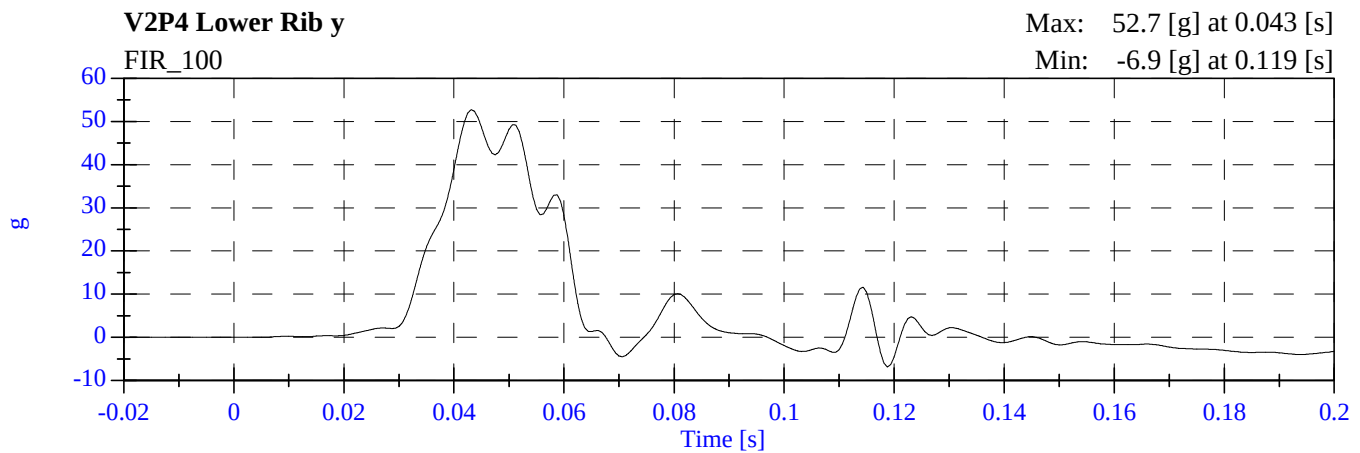
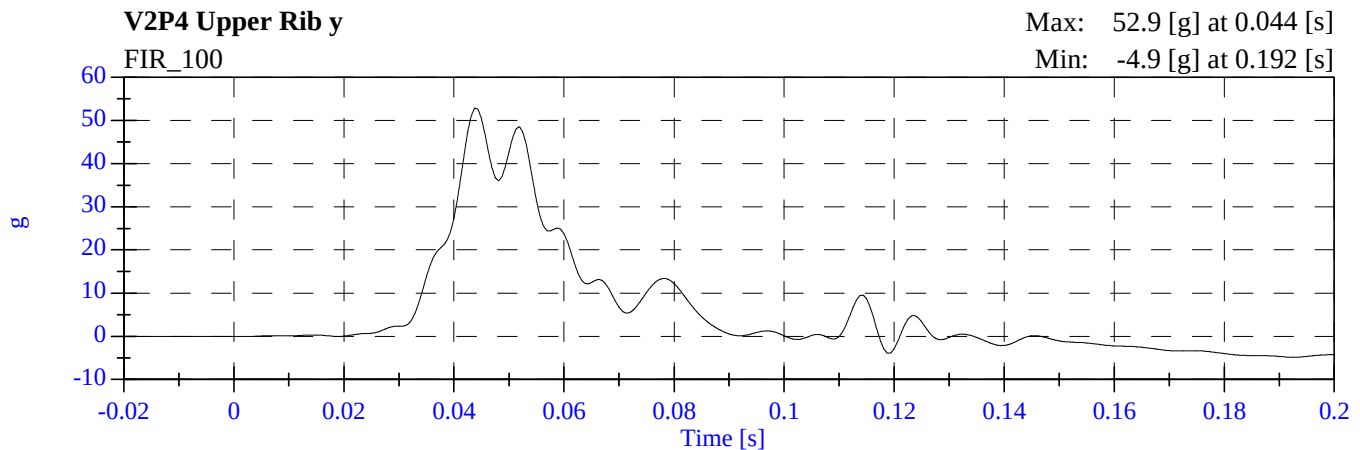
Side NCAP - 2010 Mitsubishi Lancer MA5600 - November 19, 2009



Side NCAP - 2010 Mitsubishi Lancer MA5600 - November 19, 2009



Side NCAP - 2010 Mitsubishi Lancer MA5600 - November 19, 2009



APPENDIX C

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

SUMMARY
SID H3 PRE & POST TEST CALIBRATION

CONFIGURED FOR LEFT SIDE IMPACT

Date: 11/10/09;11/16/09; 12/17/09;12/17/09 Sequential Test Number: 1
Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	SID H3 NO.: 905		SID H3 NO.: 270	
		PRE TEST	POST TEST	PRE TEST	POST TEST
SH- Seated Height (mm)	889 - 909	899	899	899	899
RH- Rib Height (mm)	501 - 521	511	511	505	504
HP- Hip Pivot Height (mm)	99 ref.	99	99	99	99
RD- Rib from Back Line (mm)	229 - 241	239	240	234	235
KV- Knee Pivot from Back Line (mm)	511 - 526	521	519	518	519
SW- Knee Pivot to Floor (mm)	490 - 505	493	495	495	495
HW- Hip Width (mm)	356 - 391	384	384	384	384
THORAX IMPACTS					
TEMPERATURE (C)	18.9 - 25.5	21.1	21.1	21.7	21.1
RELATIVE HUMIDITY (%)	10 - 70	40	20	26	20
PROBE SPEED (m/s)	4.27 - 4.33	4.29	4.28	4.29	4.28
UPPER RIB (g's)	37 - 46	38.81	45.24	38.92	39.37
LOWER RIB (g's)	37 - 46	37.19	42.22	38.45	39.94
LOWER SPINE (g's)	15 - 22	18.91	20.49	20.37	21.78
PELVIS IMPACT					
TEMPERATURE (C)	18.9 - 25.5	21.1	21.1	21.7	21.1
RELATIVE HUMIDITY (%)	10 - 70	42	20	27	20
PROBE SPEED (m/s)	4.27 - 4.33	4.29	4.28	4.29	4.28
PELVIS (g's)	40 - 60	42.39	47.27	43.14	42.26

REMARKS: None

CALIBRATION TEST RESULTS

PRE-TEST

SID H3 NO.: 905

CONFIGURED FOR LEFT SIDE IMPACT

**CALIBRATION TEST RESULTS SUMMARY
PRE-TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 905 Sequential Test Number: 1
Date: 11/10/09 Laboratory Technician: A. Rudniski

TEST	COMMENTS
EXTERNAL DIMENSIONS	Passed all requirements.
THORACIC SHOCK ABSORBER TEST	Passed all requirements.
LATERAL THORAX IMPACT TEST	Passed all requirements.
LATERAL PELVIS IMPACT TEST	Passed all requirements.
HEAD DROP TEST*	Passed all requirements.
LATERAL NECK BEND TEST*	Passed all requirements.
ABDOMINAL COMPRESSION TEST*	Passed all requirements.
LUMBAR FLEXION TEST*	Passed all requirements.

* Test not required for SID certification.

REMARKS: None

**EXTERNAL DIMENSIONS
PRE-TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 905 Sequential Test Number: 1
Date: 11/4/09 Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 – 909	899
RH- Rib Height (mm)	502 – 520	511
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 – 241	239
KH- Knee Pivot from Back Line (mm)	511 – 526	521
KV- Knee Pivot to Floor (mm)	490 – 505	493
HW- Hip Width (mm)	356 - 391	384

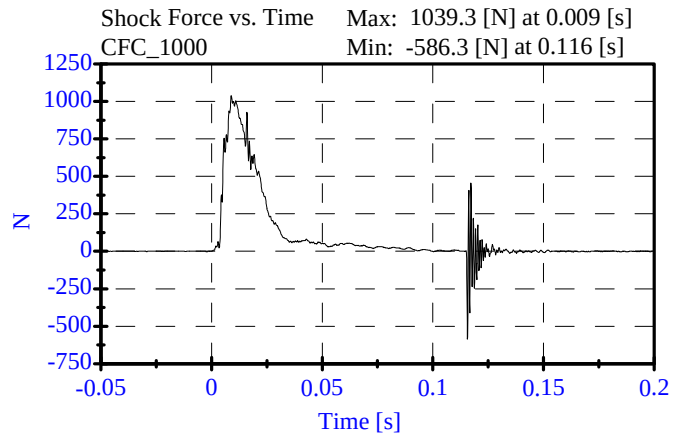
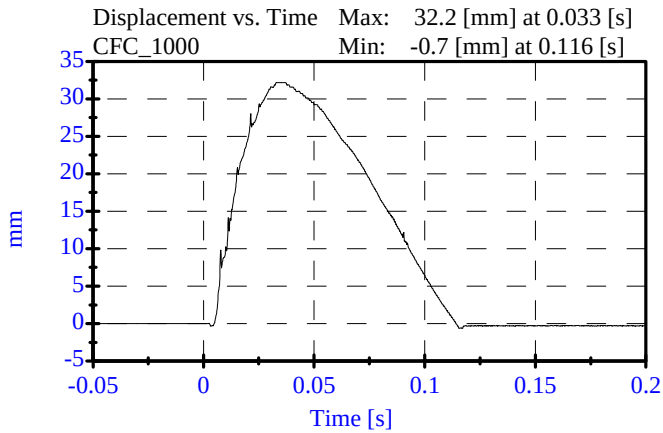
REMARKS: None

Shock Test Low (3.05 m/s)
PRE TEST
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 905
Date: 05-28-09

Sequential Test Number: 1 File: 905SL 05-28-09
Laboratory Technician: A. Rudniski

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.5 C	22.2 C	Passed
Lab Humidity:	10-70 %	57.00 %	Passed
Displacement:	30.00-35.00 mm	32.21 mm	Passed
Maximum Force:	836.00-1125.00 N	1039.30 N	Passed
Impact Test Velocity:	3.05 m/s		
Damper Identification:	905		
Damper Setting:	5		



Shock Test Medium (4.27 m/s)

PRE TEST

CONFIGURED FOR LEFT SIDE IMPACT

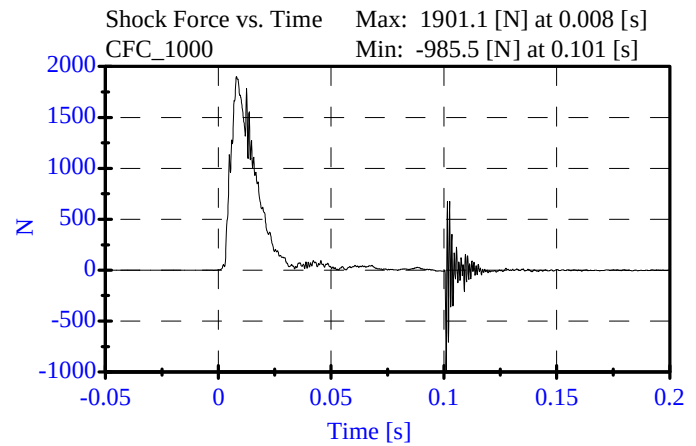
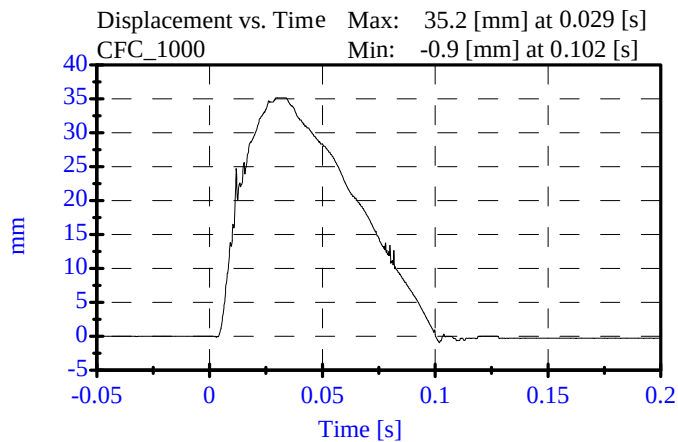
ATD Serial No: 905

Date: 05-28-09

Sequential Test Number: 1 File: 905SM 05-28-09

Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	22.2 C	Passed
Lab Humidity:	10-70 %	54.00 %	Passed
Displacement:	32.00-37.00 mm	35.17 mm	Passed
Maximum Force:	1730.00-2099.00 N	1901.14 N	Passed
Impact Test Velocity:	4.27 m/s		
Damper Identification:	905		
Damper Setting:	5		

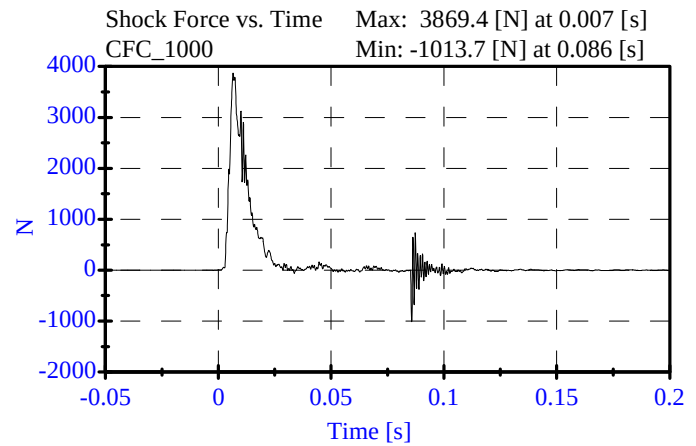
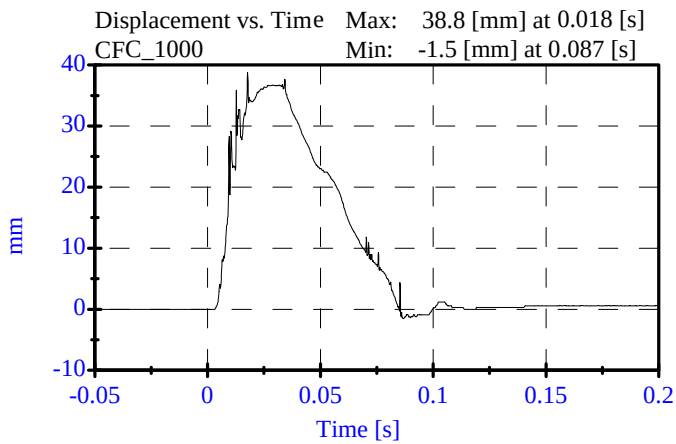


Shock Test High (6.10 m/s)
PRE TEST
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 905
Date: 05-28-09

Sequential Test Number: 1 File: 905SH1 05-28-09
Laboratory Technician: A. Rudniski

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.5 C	22.2 C	Passed
Lab Humidity:	10-70 %	54.00 %	Passed
Displacement:	33.00-40.00 mm	38.78 mm	Passed
Maximum Force:	3741.00-4448.00 N	3869.43 N	Passed
Impact Test Velocity:	6.10 m/s		
Damper Identification:	905		
Damper Setting:	5		

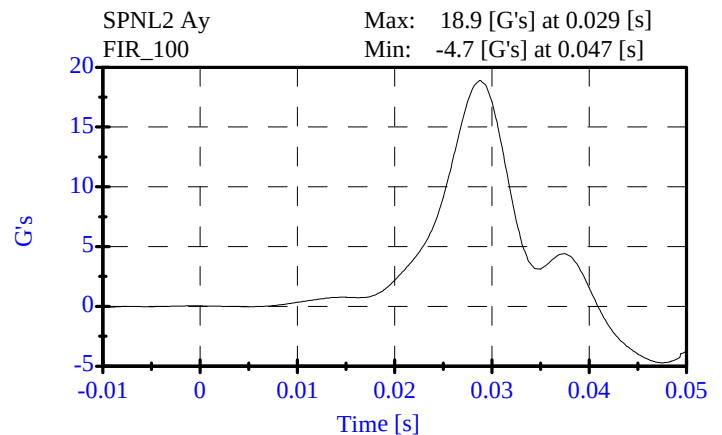
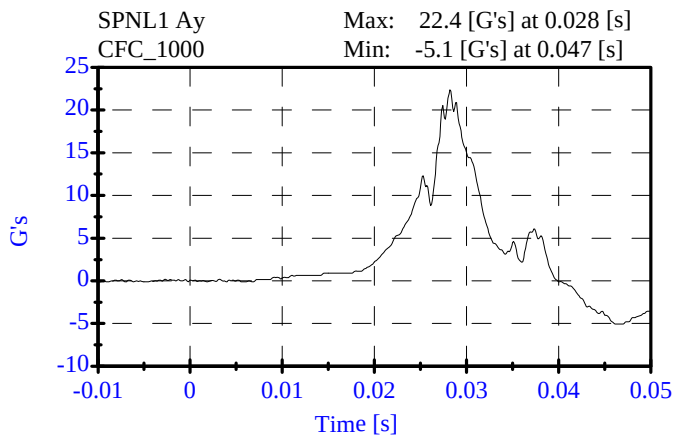
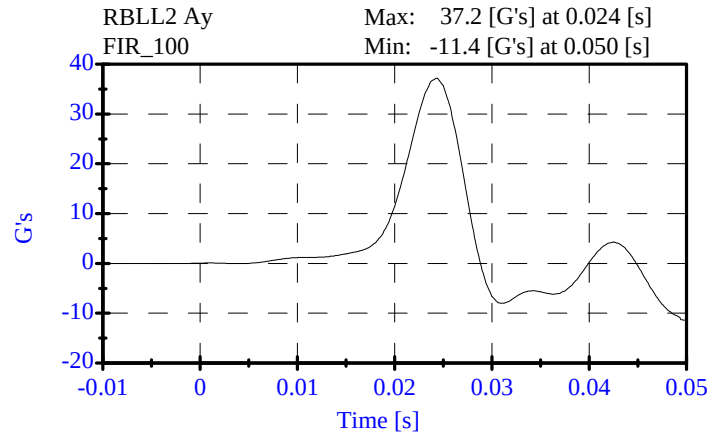
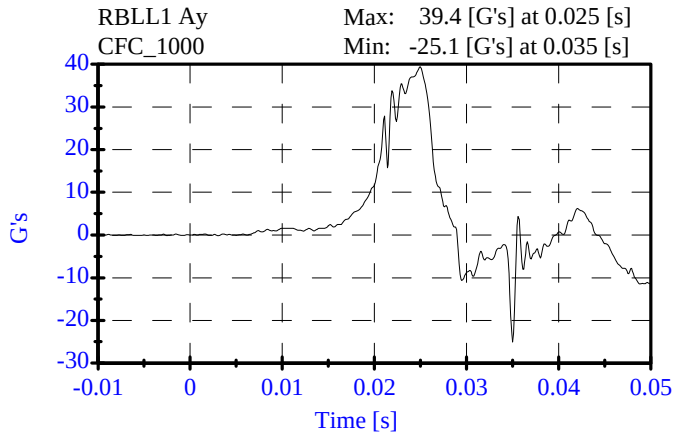
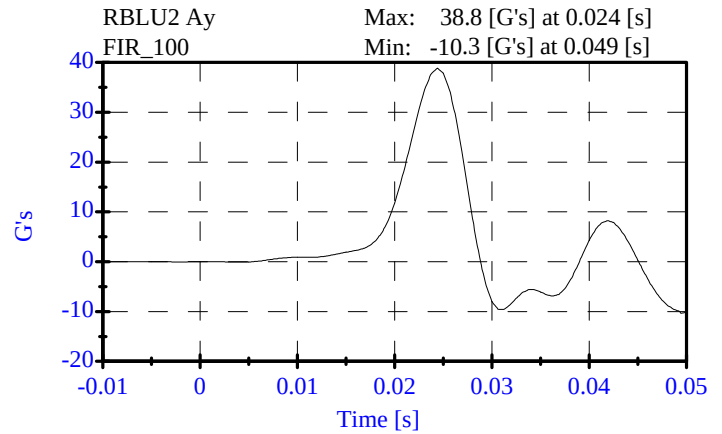
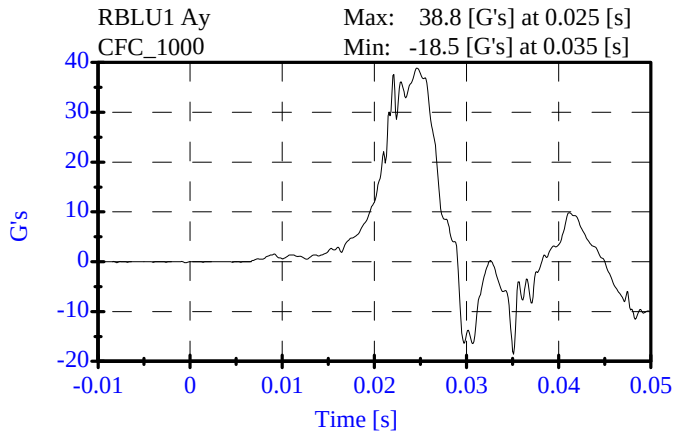


Thorax Impact Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 905
Date: 11-6-09

Sequential Test Number: 1 File: 905T1 11-06-09
Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	40.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.29 m/s	Passed
Upper Rib Acceleration:	37.00-46.00 G's	38.81 G's	Passed
Lower Rib Acceleration:	37.00-46.00 G's	37.19 G's	Passed
Lower Spine Acceleration:	15.00-22.00 G's	18.91 G's	Passed

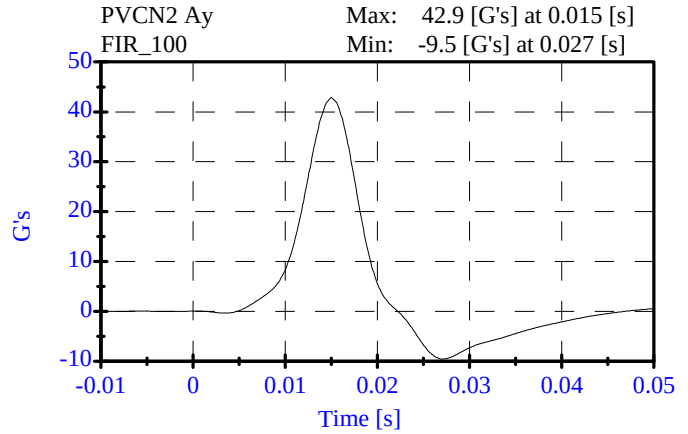
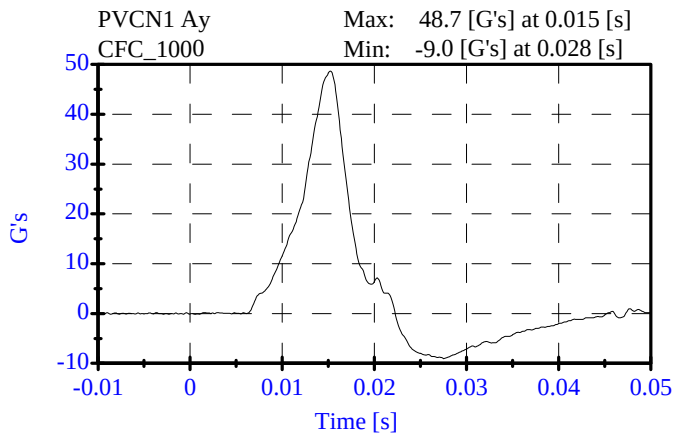


Pelvic Impact Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 905
Date: 11-9-09

Sequential Test Number: 1 File: 905P 11-09-09
Laboratory Technician: A. Rudniski

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	42.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.29 m/s	Passed
Pelvis Y Acceleration:	40.00-60.00 G's	42.93 G's	Passed
Time Above 20 Gs	3.0-7.0 ms	6.4 ms	Passed

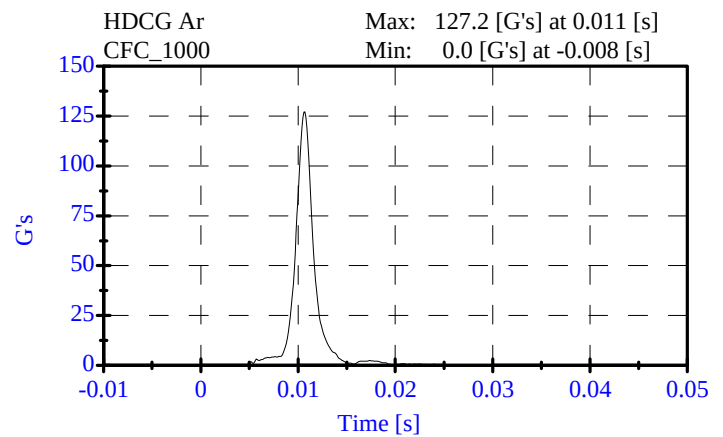
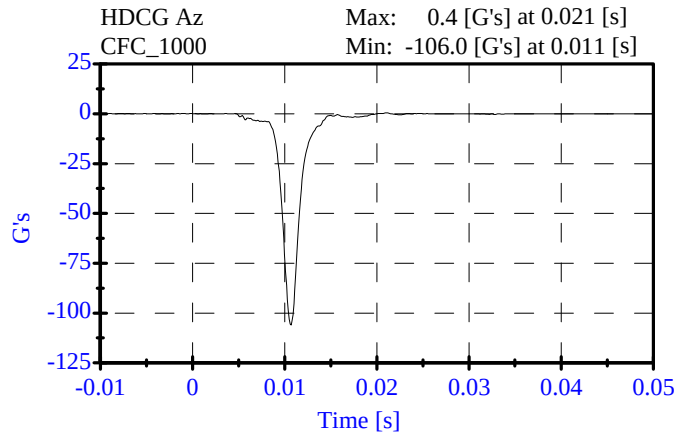
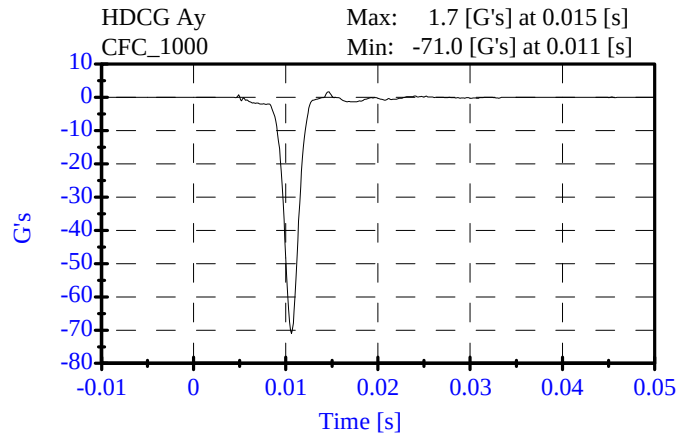
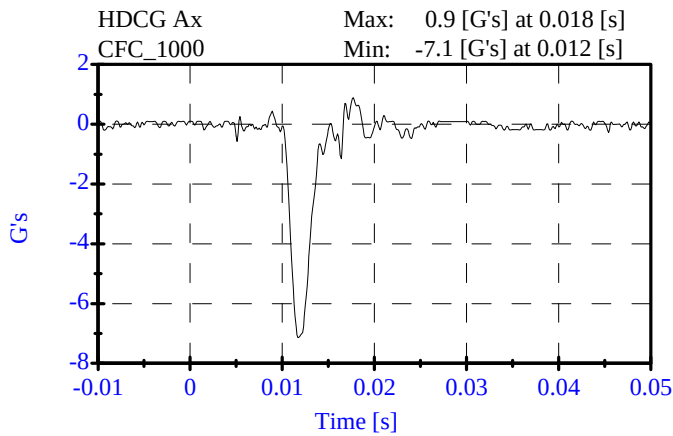


Head drop Test **Pre-Test** **CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 905
Date: 11-4-09

Sequential Test Number: 1 File: 905H 11-4-09
Laboratory Technician: A.Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.6 C	21.7 C	Passed
Lab Humidity:	10-70 %	43.00 %	Passed
Peak Resultant Accel.:	120-150 Gs	127.15 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	0.89 Gs	Passed
Curve PerCent NonModal:	< 15%	1.84 %	Passed



Neck Flexion Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 905
Date: 11-10-09

Sequential Test Number: 1 File: 905N9 11-10-09
Laboratory Technician: A. Rudnski

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	20.6-22.2 C	21.1 C	Passed
Lab Humidity:	10-70 %	37.00 %	Passed
Impact Velocity:	6.89- 7.13 m/s	7.00 m/s	Passed
PENDULUM DELTA V			
Delta V at 10 ms:	1.96- 2.55 m/s	2.15 m/s	Passed
Delta V at 20 ms:	4.12- 5.10 m/s	4.38 m/s	Passed
Delta V at 30 ms:	5.73- 7.01 m/s	6.23 m/s	Passed
Delta V between 40-70 ms:	6.27- 7.64 m/s	7.62 m/s	Passed
D PLANE ROTATION			
Maximum Rotation:	66.0-82.0 Deg	74.81 Deg	Passed
Rotation Angle Decay:	58.0-67.0 ms	61.10 ms	Passed
MOMENT ABOUT THE OCCIPITAL CONDYLE			
Max Occipital Moment:	73.00- 88.00 N-m	82.35 N-m	Passed
Occipital Moment Decay:	49.0-64.0 ms	50.50 ms	Passed
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT			
Moment to Rotation Peak:	2.0-16.0 ms	5.00 ms	Passed

Neck Flexion Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

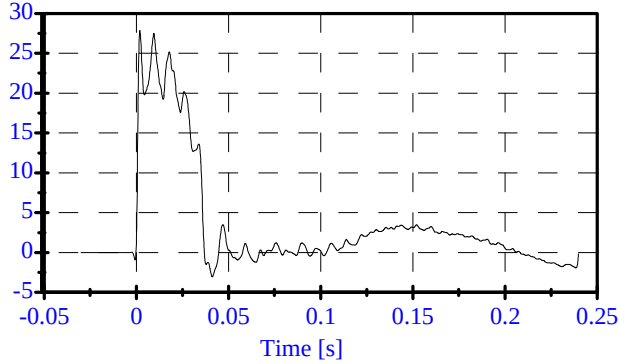
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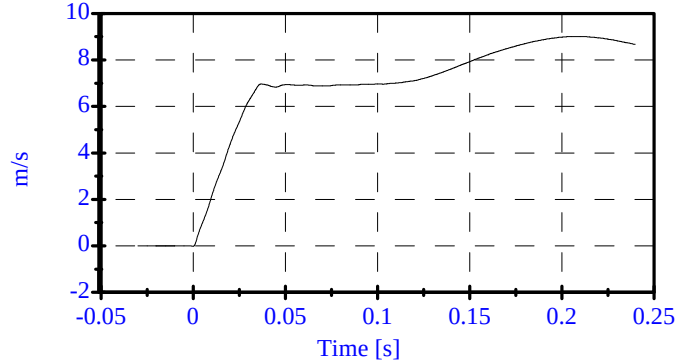
Sequential Test Number: 1 File: 905N9 11-10-09

Laboratory Technician: A. Rudniski

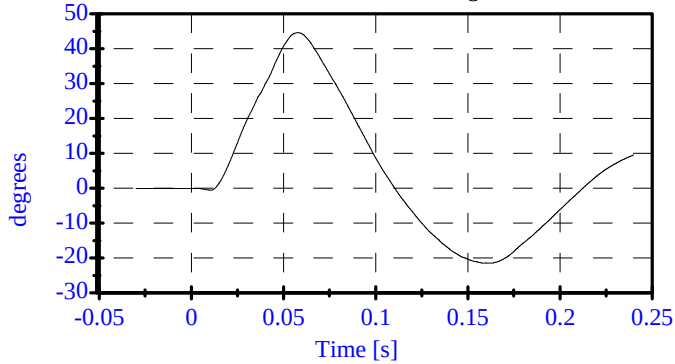
Pend Ax
CFC_180
Max: 27.9 [] at 0.002 [s]
Min: -3.0 [] at 0.041 [s]



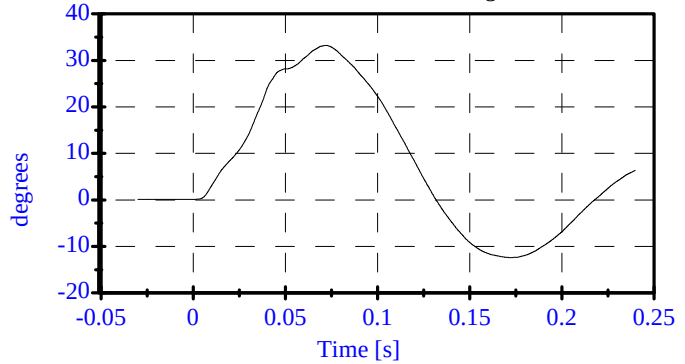
Pend Vx
CFC_180
Max: 9.0 [m/s] at 0.208 [s]
Min: -0.0 [m/s] at -0.000 [s]



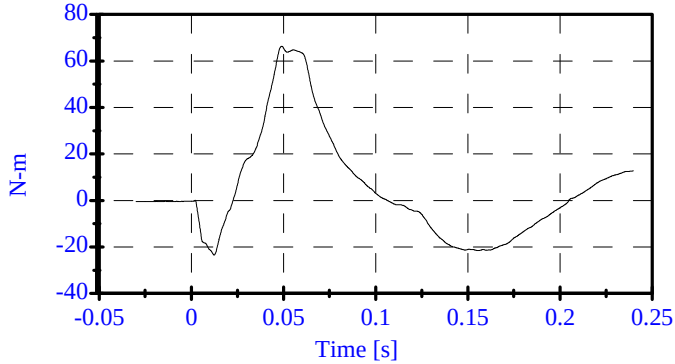
Head Rot
CFC_180
Max: 44.6 [degrees] at 0.058 [s]
Min: -21.5 [degrees] at 0.162 [s]



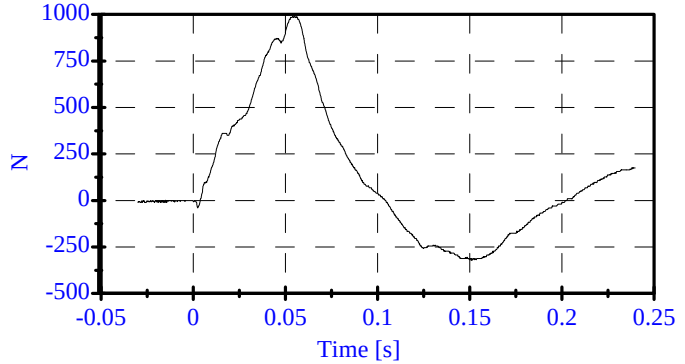
Arm Rot
CFC_180
Max: 33.2 [degrees] at 0.072 [s]
Min: -12.4 [degrees] at 0.172 [s]



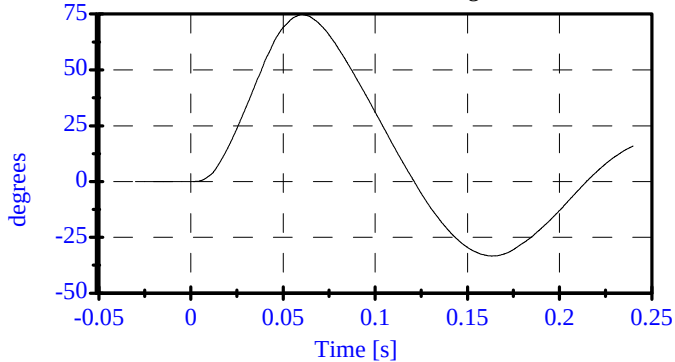
Neck Mx
CFC_600
Max: 66.3 [N-m] at 0.049 [s]
Min: -23.5 [N-m] at 0.012 [s]



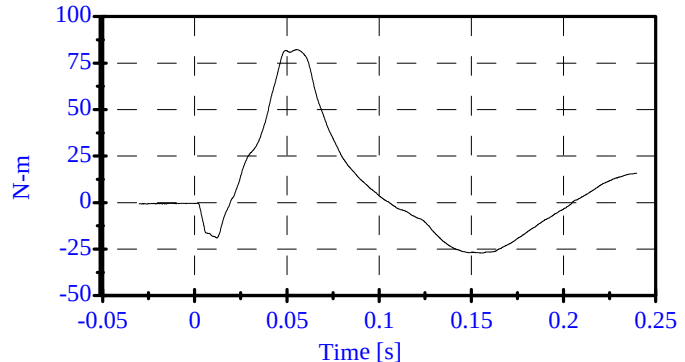
Neck Fy
CFC_1000
Max: 993.1 [N] at 0.055 [s]
Min: -322.3 [N] at 0.151 [s]



Tot Rot
CFC_180
Max: 74.8 [degrees] at 0.060 [s]
Min: -33.3 [degrees] at 0.163 [s]



MOCX
Max: 82.3 [N-m] at 0.055 [s]
Min: -27.1 [N-m] at 0.156 [s]



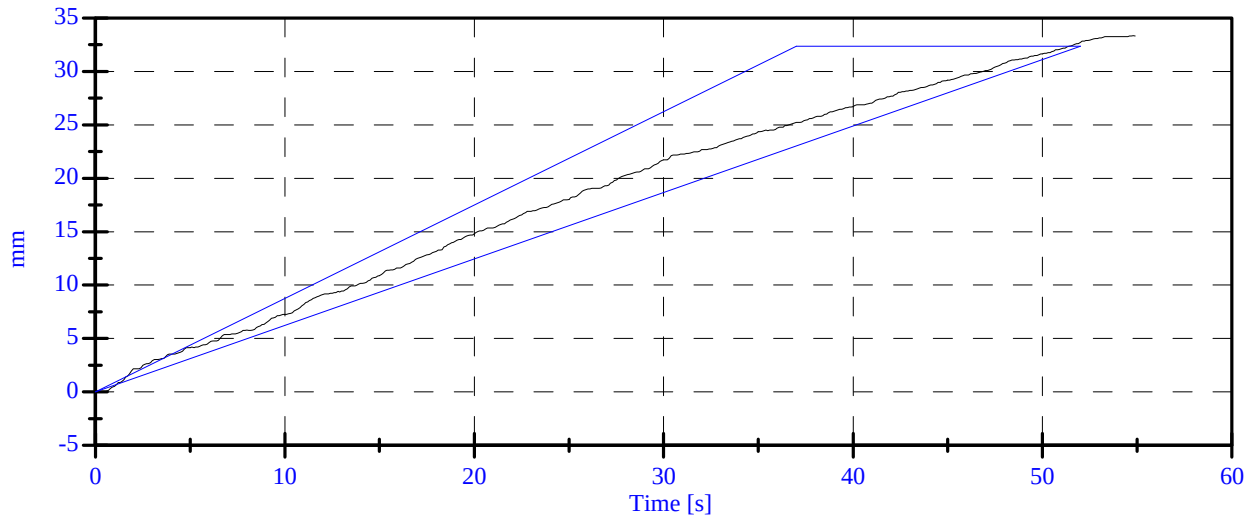
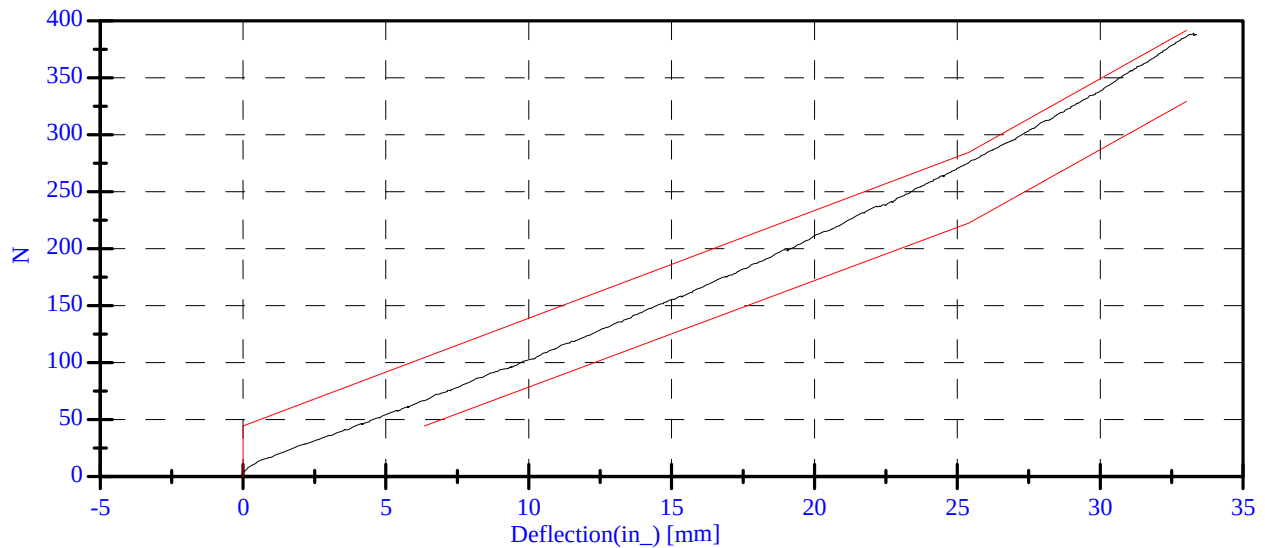
Abdominal Compression Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 906
Date:

Sequential Test Number: 1 File: 905Ab 11-06-09
Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	39.00 %	Passed
Force at 12.95 mm :	104.00-162.00 N	133.40 N	Passed
Force at 19.05 mm :	162.98-220.99 N	199.11 N	Passed
Force at 25.40 mm :	221.97-280.02 N	275.40 N	Passed
Force at 33.02 mm :	324.99-391.00 N	385.65 N	Passed

ABDOMINAL COMPRESSION TEST



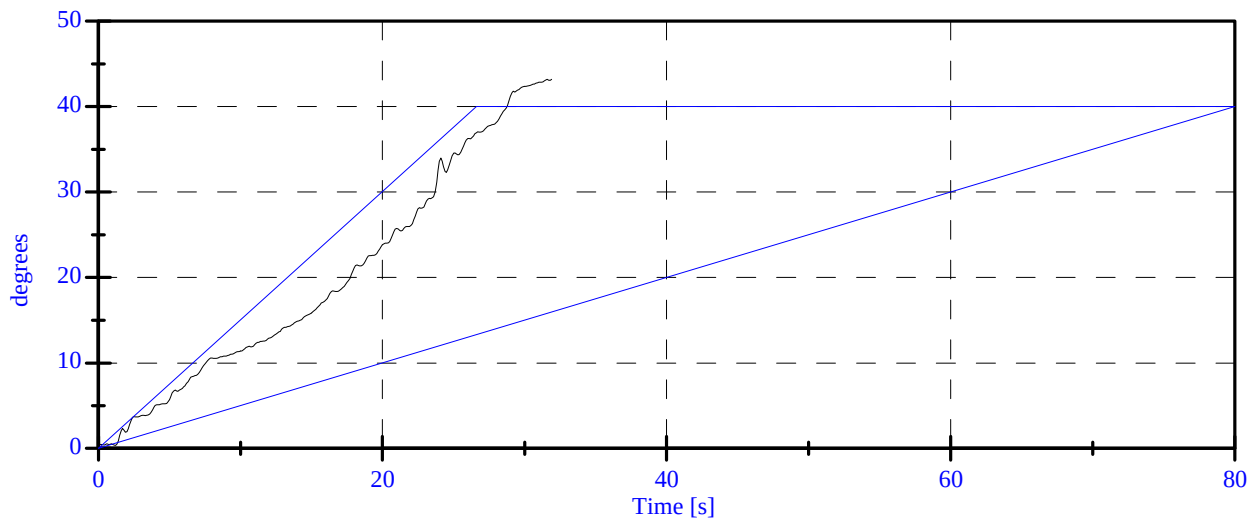
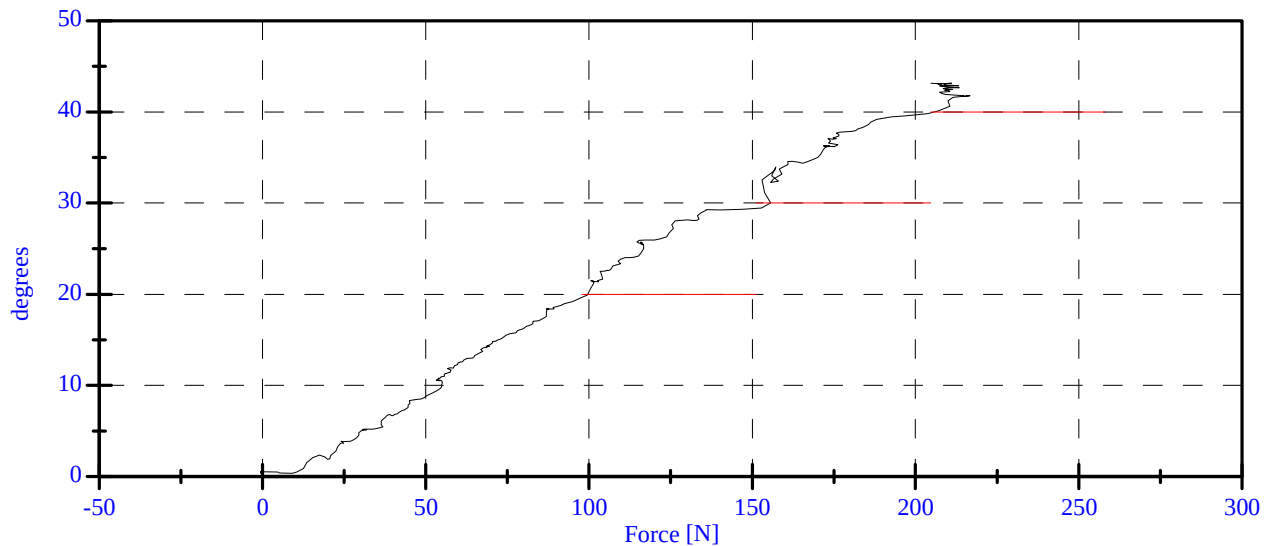
Lumbar Spine Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 905
Date: 11-06-09

Sequential Test Number: 1 File: 905Spine 11-06-09
Laboratory Technician: A. Rudniski

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	40.00 %	Passed
Force at 0 Deg:	0.00-26.69 N	9.14 N	Passed
Force at 20 Deg:	97.86-151.24 N	99.50 N	Passed
Force at 30 Deg:	151.24-204.62 N	155.65 N	Passed
Force at 40 Deg:	204.62-258.00 N	207.09 N	Passed
Return Angle	12 Deg Max	11.15 deg	Passed

LUMBAR SPINE FLEXION TEST



PRE-TEST DUMMY INSPECTION LIST
CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 905 Sequential Test Number: 1
 Date: 11/4/09 Laboratory Technician: A. Rudniski

PART	ITEMS CHECKED	COMMENTS
SKIN	VISUAL INSPECTION	OK
HEAD	VISUAL, BALLAST, ACCELEROMETER MOUNT	OK
NECK	VISUAL, CABLE TORQUE	OK
SPINE BOX	VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT	OK
RIB CAGE	VISUAL, MEASURE, STIFFENERS	OK
STERNUM	VISUAL	OK
LUMBAR SPINE	VISUAL	OK
ABDOMEN	VISUAL	OK
PELVIS	VISUAL, PALPATE, ACCELEROMETER MOUNT	OK
UPPER LEGS	VISUAL	OK
KNEES	VISUAL, STOPS, INSERTS	OK
LOWER LEGS	VISUAL, RANGE OF MOTION	OK
ANKLES	VISUAL, RANGE OF MOTION	OK
FEET	VISUAL, RANGE OF MOTION	OK
JOINTS	1 TO 2 g RANGE	OK
OTHER	NONE	-

REMARKS: None

CALIBRATION TEST RESULTS

PRE-TEST

SID H3 NO.: 270

CONFIGURED FOR LEFT SIDE IMPACT

**CALIBRATION TEST RESULTS SUMMARY
PRE-TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 270 Sequential Test Number: 1
Date: 11/16/09 Laboratory Technician: A. Rudniski

TEST	COMMENTS
EXTERNAL DIMENSIONS	Passed all requirements.
THORACIC SHOCK ABSORBER TEST	Passed all requirements.
LATERAL THORAX IMPACT TEST	Passed all requirements.
LATERAL PELVIS IMPACT TEST	Passed all requirements.
HEAD DROP TEST*	Passed all requirements.
LATERAL NECK BEND TEST*	Passed all requirements.
ABDOMINAL COMPRESSION TEST*	Passed all requirements.
LUMBAR FLEXION TEST*	Passed all requirements.

* Test not required for SID certification.

REMARKS: None

**EXTERNAL DIMENSIONS
PRE-TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 270 Sequential Test Number: 1
Date: 11/16/09 Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	899
RH- Rib Height (mm)	502 - 520	505
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 - 241	234
KH- Knee Pivot from Back Line (mm)	511 - 526	518
KV- Knee Pivot to Floor (mm)	490 - 505	495
HW- Hip Width (mm)	356 - 391	384

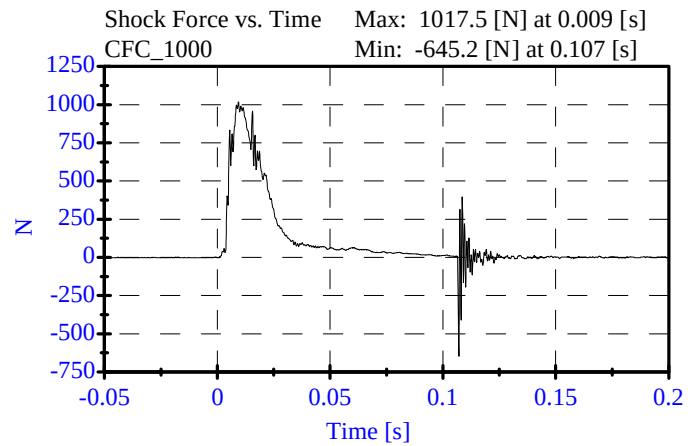
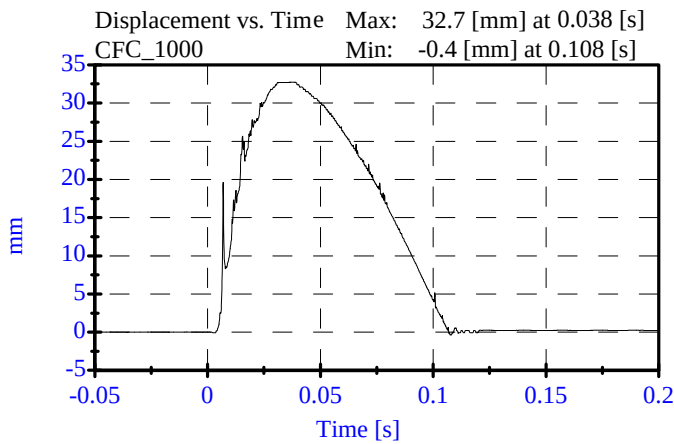
REMARKS: None

Shock Test Low (3.05 m/s)
PRE TEST
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 04-06-09

Sequential Test Number: 1 File: 270SL 04-06-09
Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	22.2 C	Passed
Lab Humidity:	10-70 %	28.00 %	Passed
Displacement:	30.00-35.00 mm	32.73 mm	Passed
Maximum Force:	836.00-1125.00 N	1017.49 N	Passed
Impact Test Velocity:	3.05 m/s		
Damper Identification:	270		
Damper Setting:	5		



Shock Test Medium (4.27 m/s)

PRE TEST

CONFIGURED FOR LEFT SIDE IMPACT

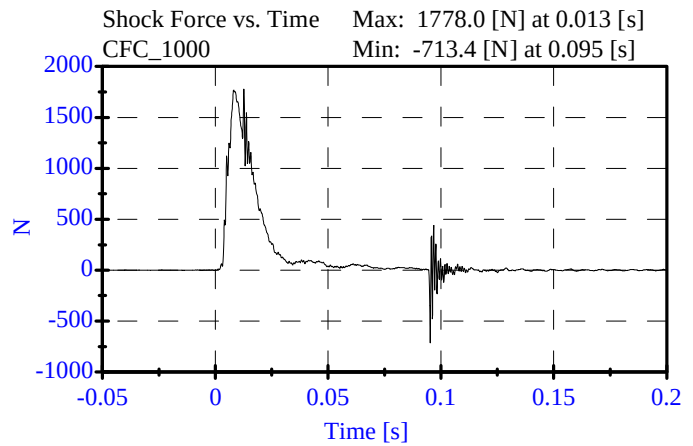
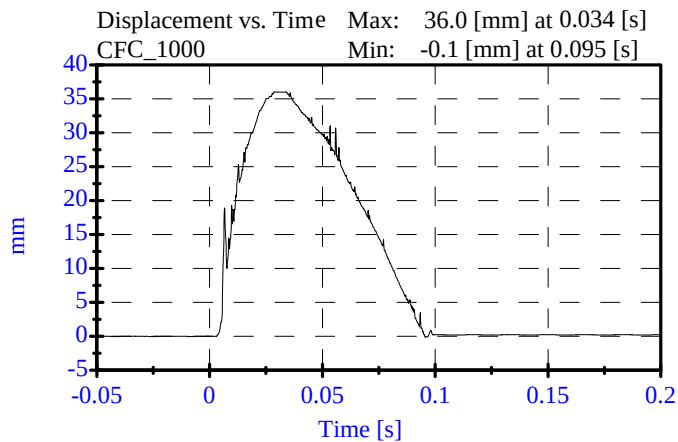
ATD Serial No: 270

Date: 04-06-09

Sequential Test Number: 1 File: 270SM 04-06-09

Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	22.2 C	Passed
Lab Humidity:	10-70 %	28.00 %	Passed
Displacement:	32.00-37.00 mm	36.02 mm	Passed
Maximum Force:	1730.00-2099.00 N	1778.00 N	Passed
Impact Test Velocity:	4.27 m/s		
Damper Identification:	270		
Damper Setting:	5		

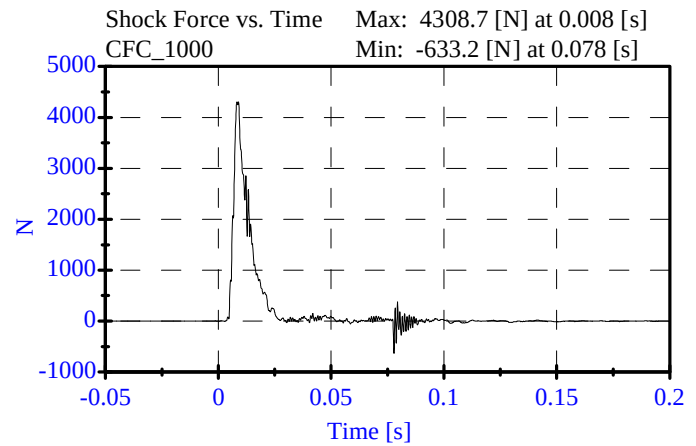
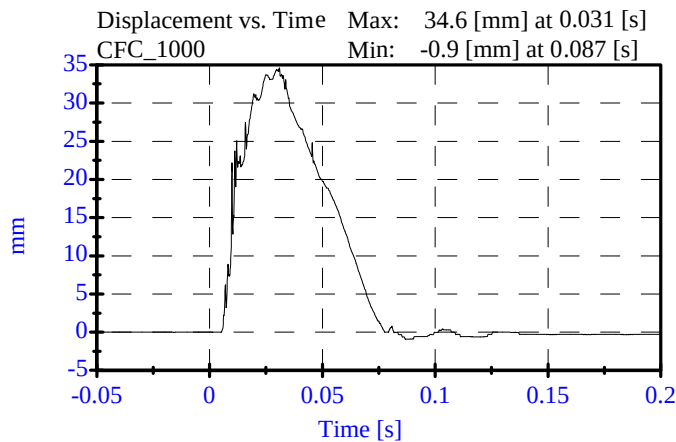


Shock Test High (6.10 m/s)
PRE TEST
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 04-06-09

Sequential Test Number: 1 File: 270SH2 04-06-09
Laboratory Technician: A. Rudniski

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.5 C	22.2 C	Passed
Lab Humidity:	10-70 %	28.00 %	Passed
Displacement:	33.00-40.00 mm	34.65 mm	Passed
Maximum Force:	3741.00-4448.00 N	4308.68 N	Passed
Impact Test Velocity:	6.10 m/s		
Damper Identification:	270		
Damper Setting:	5		

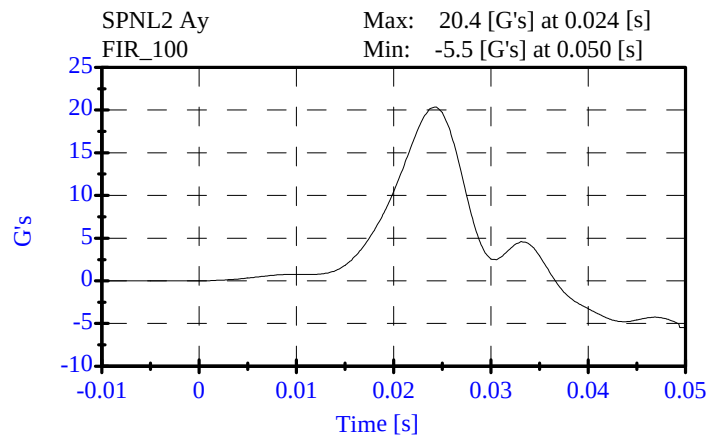
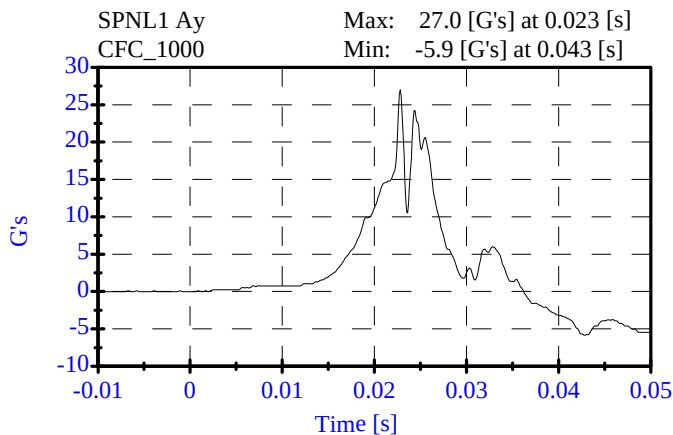
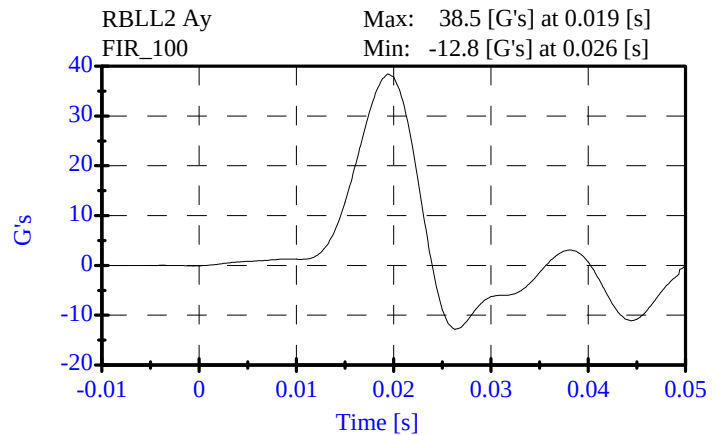
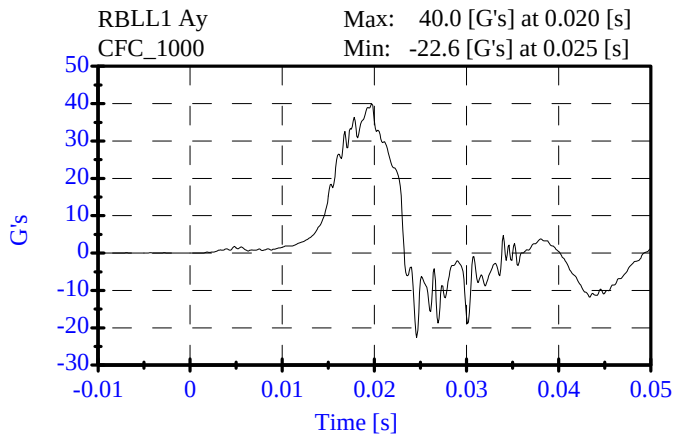
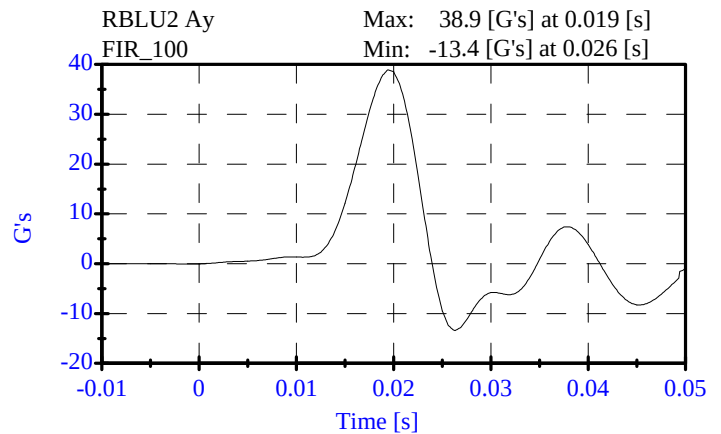
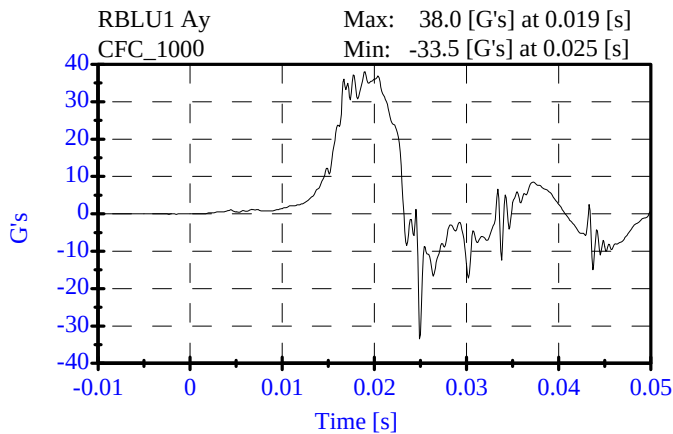


Thorax Impact Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 11-16-09

Sequential Test Number: 1 File: 270T 11-16-09
Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	26.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.29 m/s	Passed
Upper Rib Acceleration:	37.00-46.00 G's	38.92 G's	Passed
Lower Rib Acceleration:	37.00-46.00 G's	38.45 G's	Passed
Lower Spine Acceleration:	15.00-22.00 G's	20.37 G's	Passed

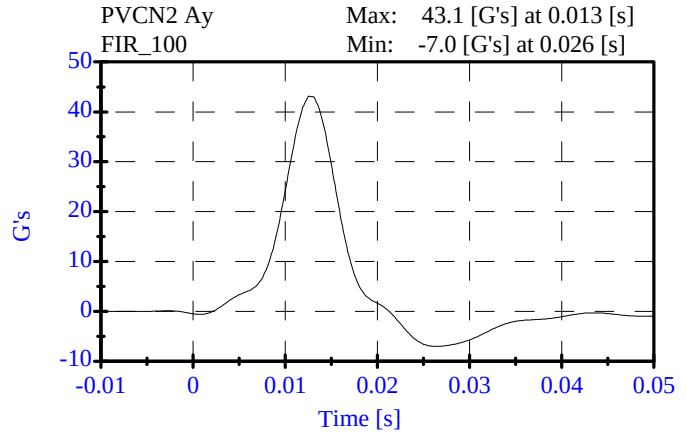
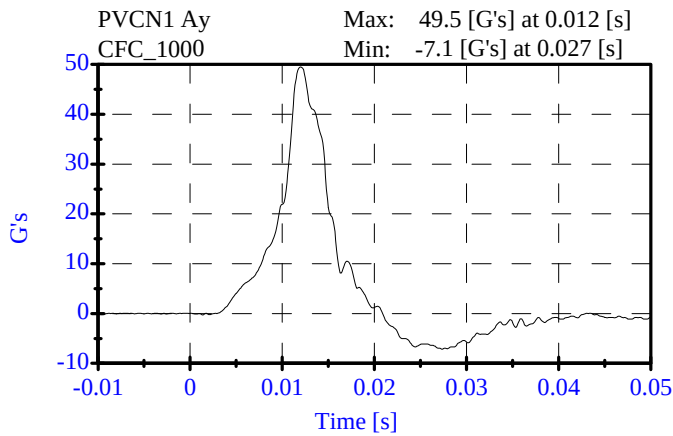


Pelvic Impact Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 11-16-09

Sequential Test Number: 1 File: 270P2 11-16-09
Laboratory Technician: A. Rudniski

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	27.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.29 m/s	Passed
Pelvis Y Acceleration:	40.00-60.00 G's	43.14 G's	Passed
Time Above 20 Gs	3.0-7.0 ms	6.3 ms	Passed

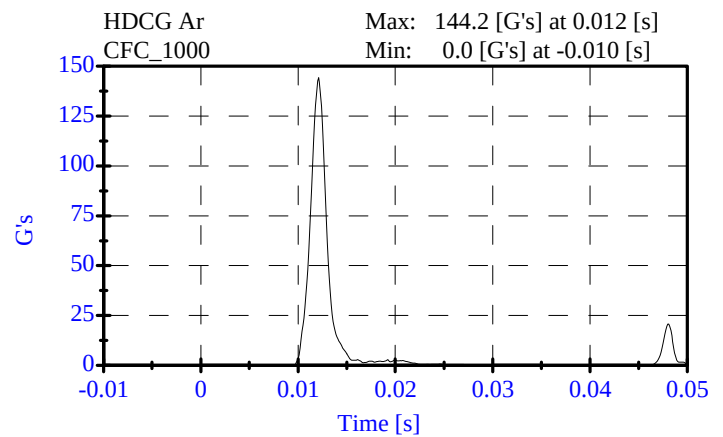
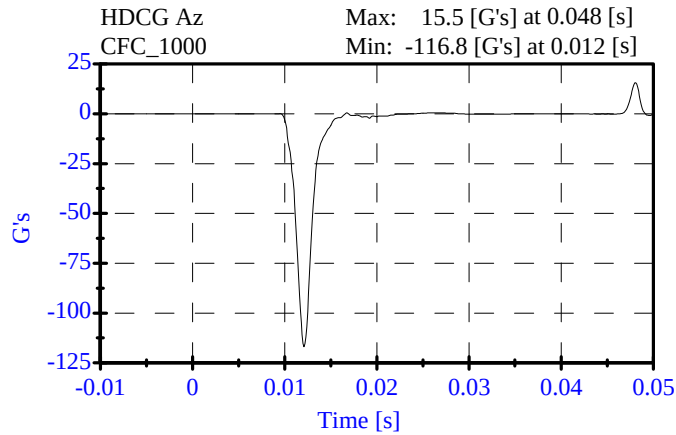
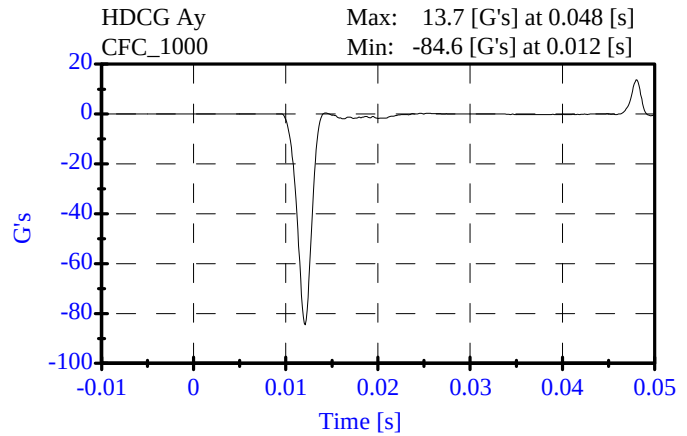
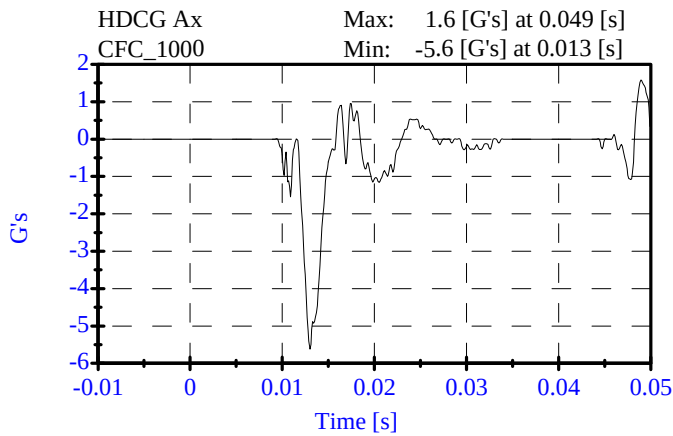


Head Drop Test **Pre-Test** **CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 270
Date: 11-16-09

Sequential Test Number: 1 File: 270H 11-16-09
Laboratory Technician: A.Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.6 C	21.7 C	Passed
Lab Humidity:	10-70 %	27.00 %	Passed
Peak Resultant Accel.:	120-150 Gs	144.22 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	1.58 Gs	Passed
Curve PerCent NonModal:	< 15%	14.36 %	Passed



Neck Flexion Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 11-16-09

Sequential Test Number: 1 File: 270N 11-16-09
Laboratory Technician: A. Rudnski

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	20.6-22.2 C	21.7 C	Passed
Lab Humidity:	10-70 %	27.00 %	Passed
Impact Velocity:	6.89- 7.13 m/s	7.00 m/s	Passed
PENDULUM DELTA V			
Delta V at 10 ms:	1.96- 2.55 m/s	2.27 m/s	Passed
Delta V at 20 ms:	4.12- 5.10 m/s	4.56 m/s	Passed
Delta V at 30 ms:	5.73- 7.01 m/s	6.34 m/s	Passed
Delta V between 40-70 ms:	6.27- 7.64 m/s	7.56 m/s	Passed
D PLANE ROTATION			
Maximum Rotation:	66.0-82.0 Deg	68.34 Deg	Passed
Rotation Angle Decay:	58.0-67.0 ms	59.70 ms	Passed
MOMENT ABOUT THE OCCIPITAL CONDYLE			
Max Occipital Moment:	73.00- 88.00 N-m	78.54 N-m	Passed
Occipital Moment Decay:	49.0-64.0 ms	54.80 ms	Passed
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT			
Moment to Rotation Peak:	2.0-16.0 ms	10.60 ms	Passed

Neck Flexion Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

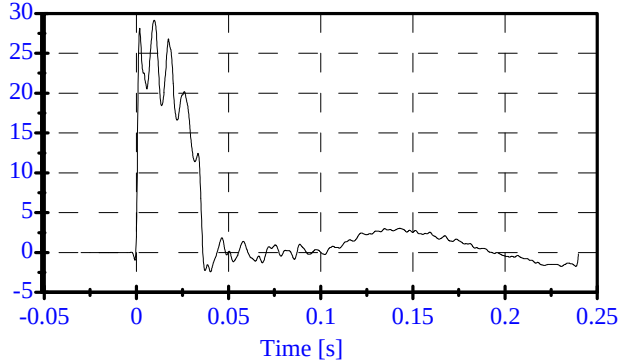
ATD Serial No: 270

Date: 11-16-09

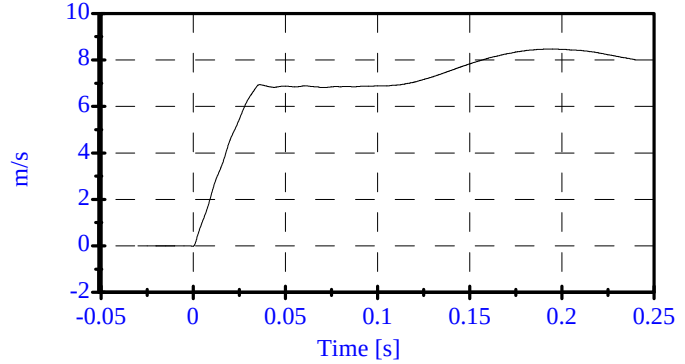
Sequential Test Number: 1 File: 270N 11-16-09

Laboratory Technician: A. Rudniski

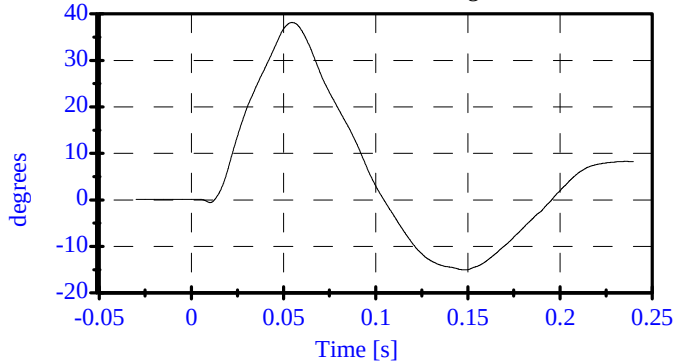
Pend Ax
CFC_180
Max: 29.2 [] at 0.010 [s]
Min: -2.4 [] at 0.040 [s]



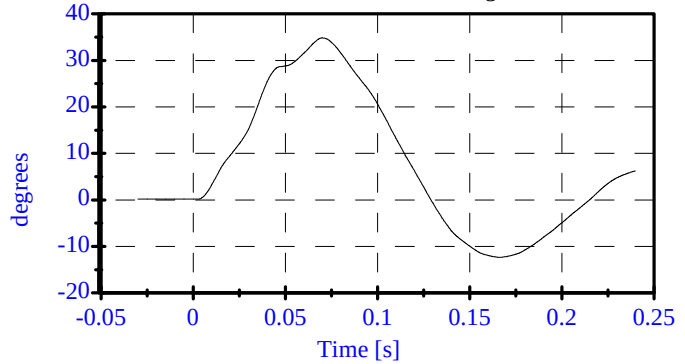
Pend Vx
CFC_180
Max: 8.5 [m/s] at 0.193 [s]
Min: -0.0 [m/s] at -0.000 [s]



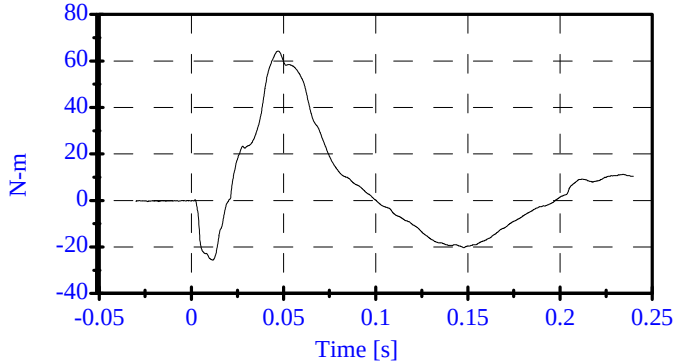
Head Rot
CFC_180
Max: 38.2 [degrees] at 0.055 [s]
Min: -15.0 [degrees] at 0.149 [s]



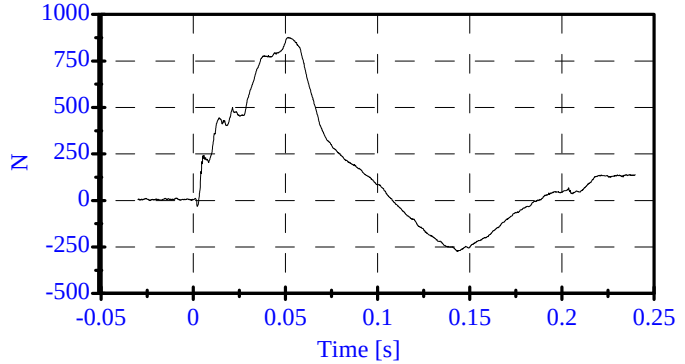
Arm Rot
CFC_180
Max: 34.9 [degrees] at 0.070 [s]
Min: -12.3 [degrees] at 0.166 [s]



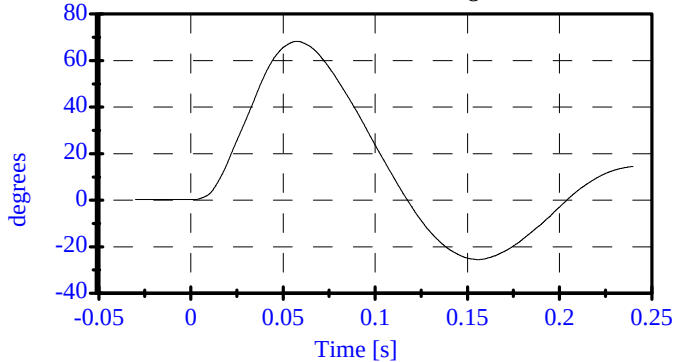
Neck Mx
CFC_600
Max: 64.3 [N-m] at 0.047 [s]
Min: -25.7 [N-m] at 0.012 [s]



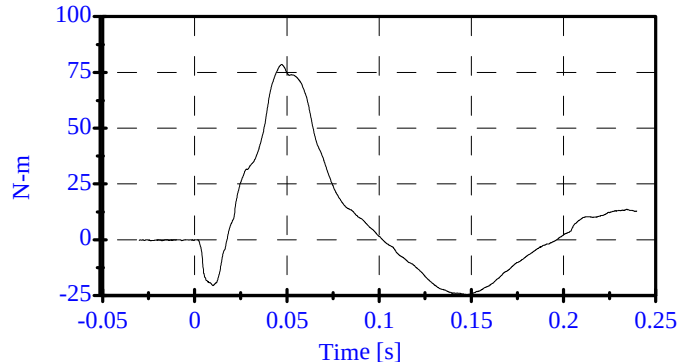
Neck Fy
CFC_1000
Max: 877.1 [N] at 0.052 [s]
Min: -274.0 [N] at 0.143 [s]



Tot Rot
CFC_180
Max: 68.3 [degrees] at 0.058 [s]
Min: -25.6 [degrees] at 0.156 [s]



MOCX
Max: 78.5 [N-m] at 0.047 [s]
Min: -24.7 [N-m] at 0.147 [s]



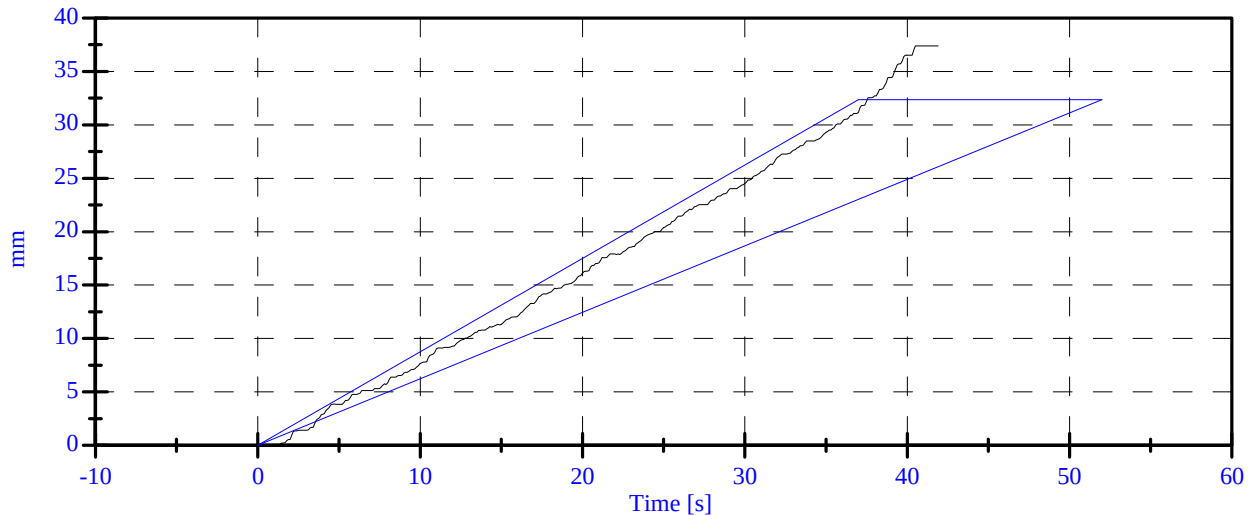
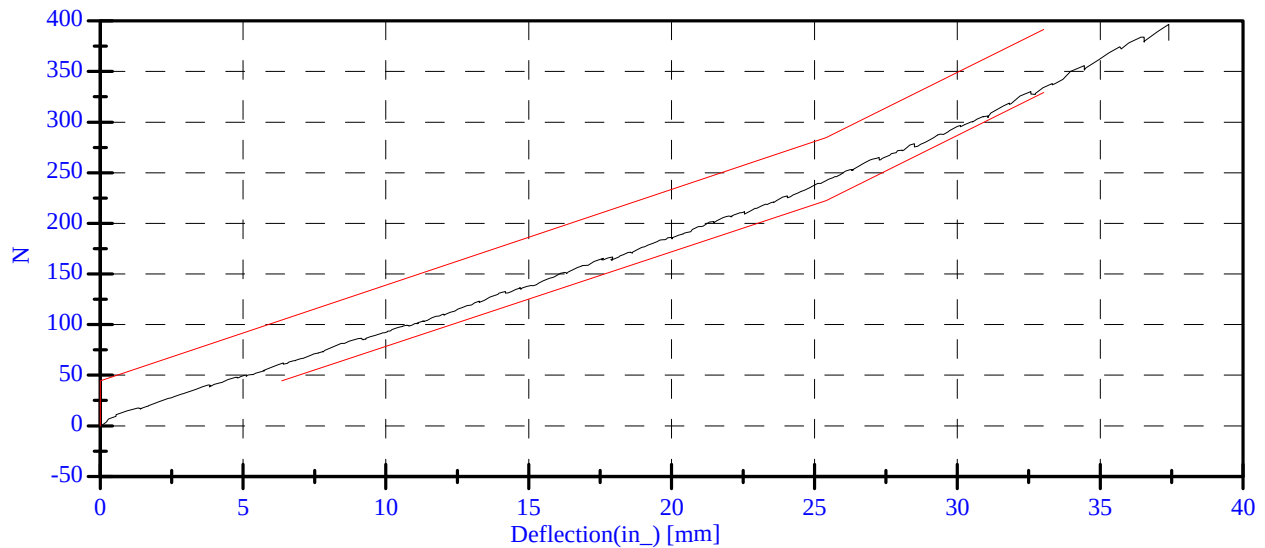
Abdominal Compression Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 11-16-09

Sequential Test Number: 1 File: 270AB 11-16-09
Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	27.00 %	Passed
Force at 12.95 mm :	104.00-162.00 N	119.53 N	Passed
Force at 19.05 mm :	162.98-220.99 N	176.84 N	Passed
Force at 25.40 mm :	221.97-280.02 N	241.82 N	Passed
Force at 33.02 mm :	324.99-391.00 N	333.81 N	Passed

ABDOMINAL COMPRESSION TEST



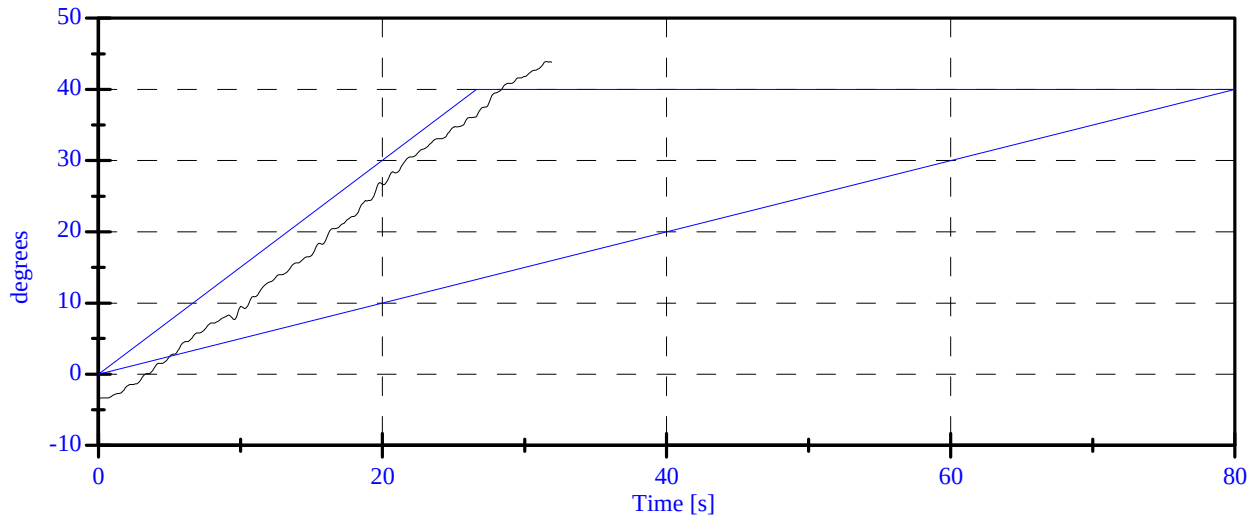
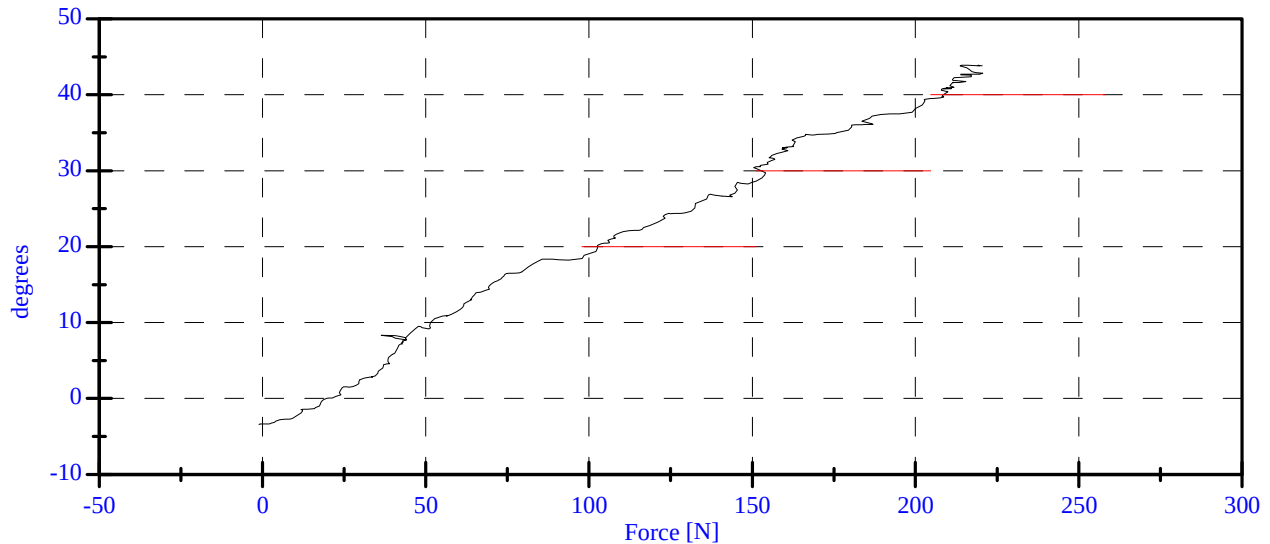
Lumbar Flexion Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 11-16-09

Sequential Test Number: 1 File: 270SP 11-16-09
Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	27.00 %	Passed
Force at 0 Deg:	0.00-26.69 N	19.58 N	Passed
Force at 20 Deg:	97.86-151.24 N	102.63 N	Passed
Force at 30 Deg:	151.24-204.62 N	152.77 N	Passed
Force at 40 Deg:	204.62-258.00 N	208.66 N	Passed
Return Angle	12 Deg Max	9.73 deg	Passed

LUMBAR SPINE FLEXION TEST



PRE-TEST DUMMY INSPECTION LIST
CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 270 Sequential Test Number: 1
 Date: 11/16/09 Laboratory Technician: A. Rudniski

PART	ITEMS CHECKED	COMMENTS
SKIN	VISUAL INSPECTION	OK
HEAD	VISUAL, BALLAST, ACCELEROMETER MOUNT	OK
NECK	VISUAL, CABLE TORQUE	OK
SPINE BOX	VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT	OK
RIB CAGE	VISUAL, MEASURE, STIFFENERS	OK
STERNUM	VISUAL	OK
LUMBAR SPINE	VISUAL	OK
ABDOMEN	VISUAL	OK
PELVIS	VISUAL, PALPATE, ACCELEROMETER MOUNT	OK
UPPER LEGS	VISUAL	OK
KNEES	VISUAL, STOPS, INSERTS	OK
LOWER LEGS	VISUAL, RANGE OF MOTION	OK
ANKLES	VISUAL, RANGE OF MOTION	OK
FEET	VISUAL, RANGE OF MOTION	OK
JOINTS	1 TO 2 g RANGE	OK
OTHER	NONE	-

REMARKS: None

CALIBRATION TEST RESULTS

POST TEST

SID H3 NO.: 905

CONFIGURED FOR LEFT SIDE IMPACT

**CALIBRATION TEST RESULTS SUMMARY
POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 905 Sequential Test Number: 1
Date: 12/17/09 Laboratory Technician: A. Rudniski

TEST	COMMENTS
EXTERNAL DIMENSIONS	Passed all requirements.
LATERAL THORAX IMPACT TEST	Passed all requirements.
LATERAL PELVIS IMPACT TEST	Passed all requirements.
HEAD DROP TEST*	Passed all requirements.
LATERAL NECK BEND TEST*	Passed all requirements.
ABDOMINAL COMPRESSION TEST*	Passed all requirements.
LUMBAR FLEXION TEST*	Passed all requirements.

* Test not required for SID certification.

REMARKS: None

**EXTERNAL DIMENSIONS
POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 905 Sequential Test Number: 1
Date: 11/23/09 Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	899
RH- Rib Height (mm)	502 - 520	511
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 - 241	240
KH- Knee Pivot from Back Line (mm)	511 - 526	519
KV- Knee Pivot to Floor (mm)	490 - 505	495
HW- Hip Width (mm)	356 - 391	384

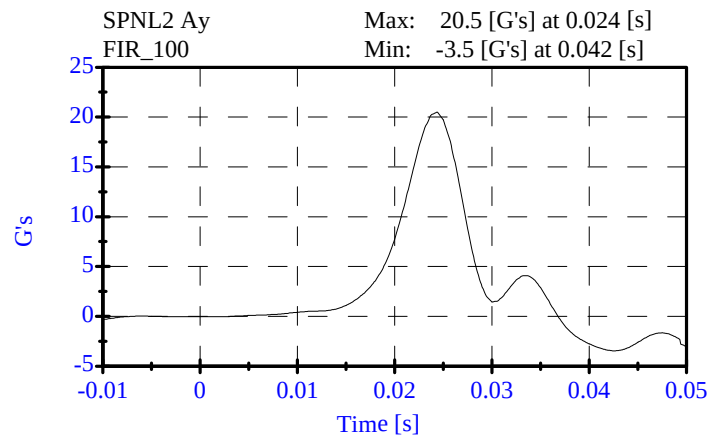
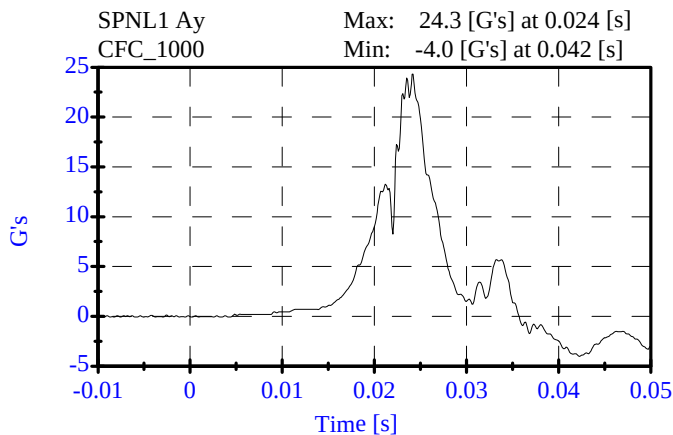
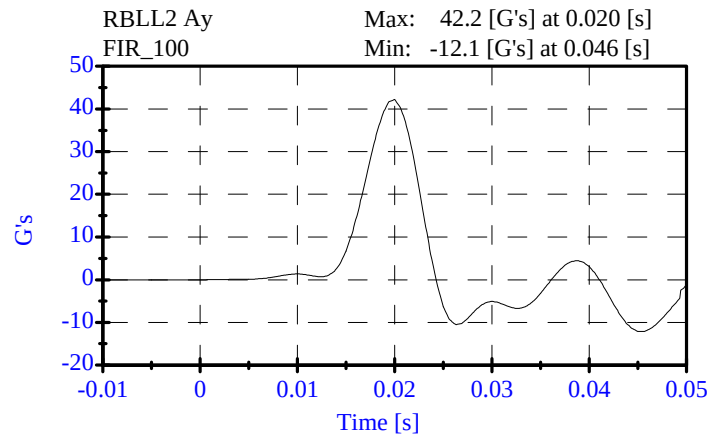
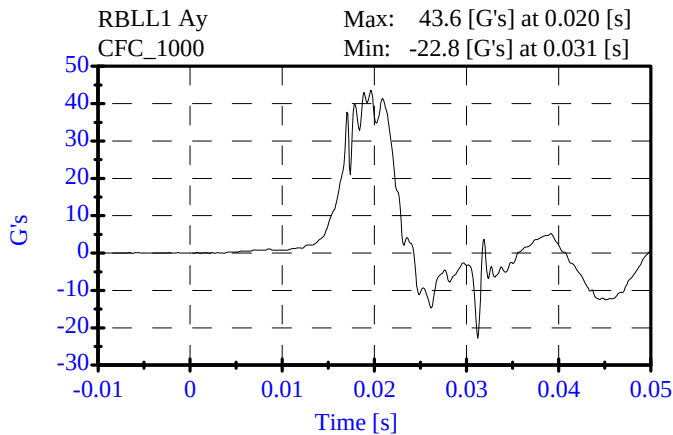
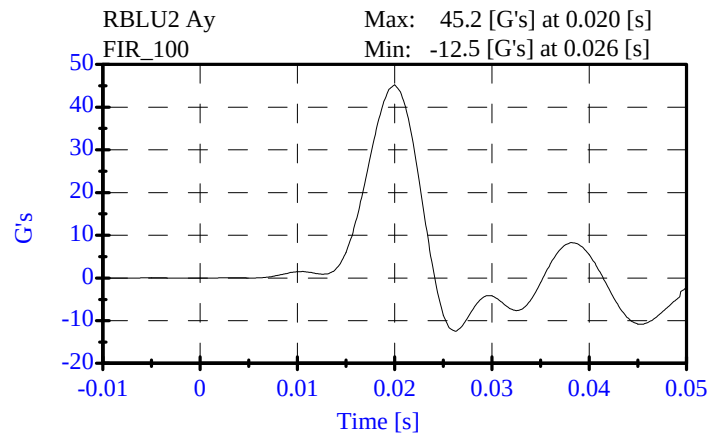
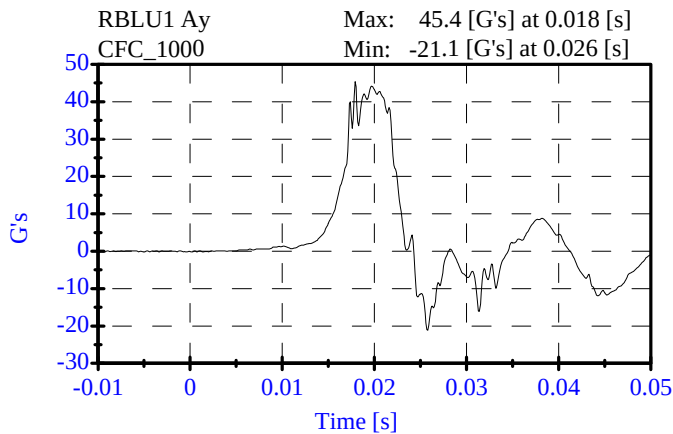
REMARKS: None

Thorax Impact Test
Post-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 905
Date: 12-17-19

Sequential Test Number: 1 File: 905T 12-17-09
Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	20.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.28 m/s	Passed
Upper Rib Acceleration:	37.00-46.00 G's	45.24 G's	Passed
Lower Rib Acceleration:	37.00-46.00 G's	42.22 G's	Passed
Lower Spine Acceleration:	15.00-22.00 G's	20.49 G's	Passed



Pelvic Impact Test

Post-Test

CONFIGURED FOR LEFT SIDE IMPACT

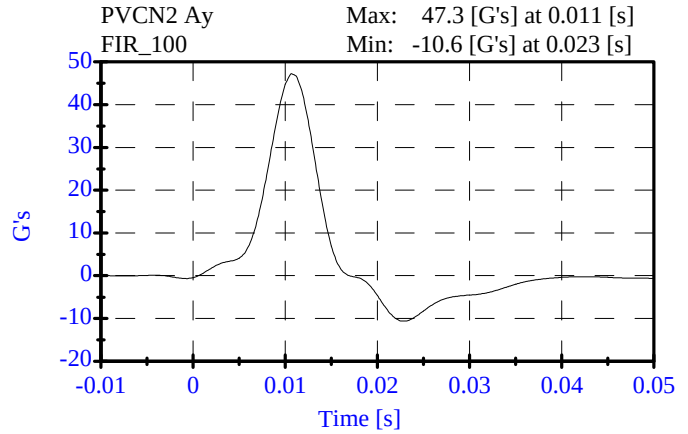
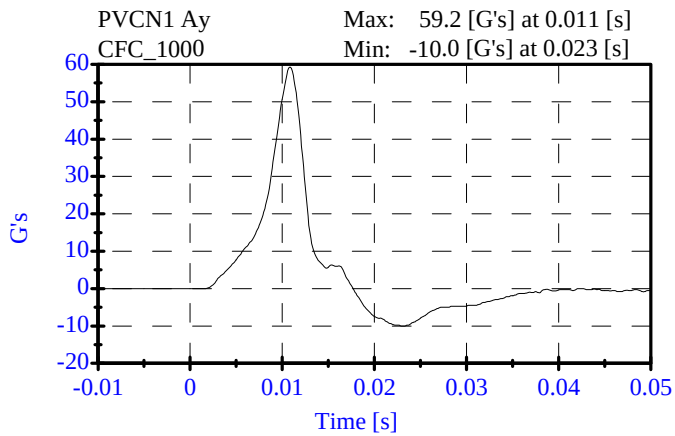
ATD Serial No: 905

Date: 12-17-09

Sequential Test Number: 1 File: 905P 12-17-09

Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	20.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.28 m/s	Passed
Pelvis Y Acceleration:	40.00-60.00 G's	47.27 G's	Passed
Time Above 20 Gs	3.0-7.0 ms	6.1 ms	Passed



Head Drop Test

Post-Test

CONFIGURED FOR LEFT SIDE IMPACT

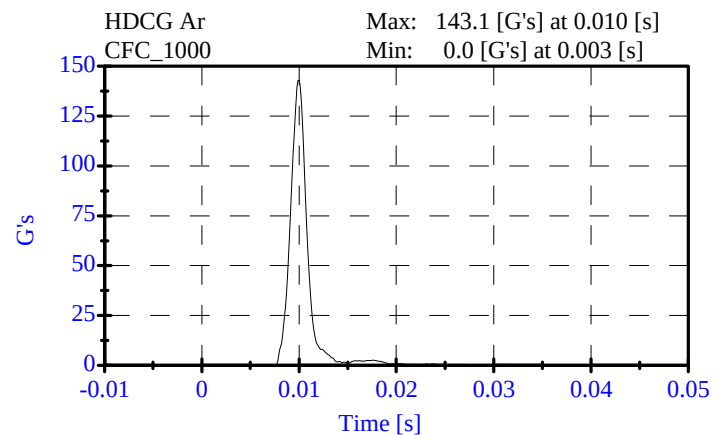
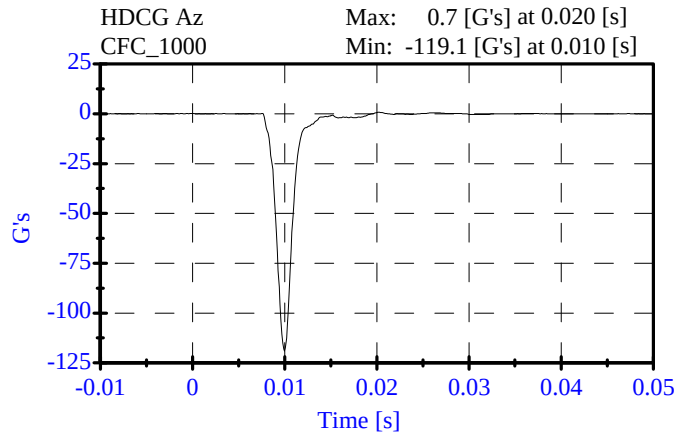
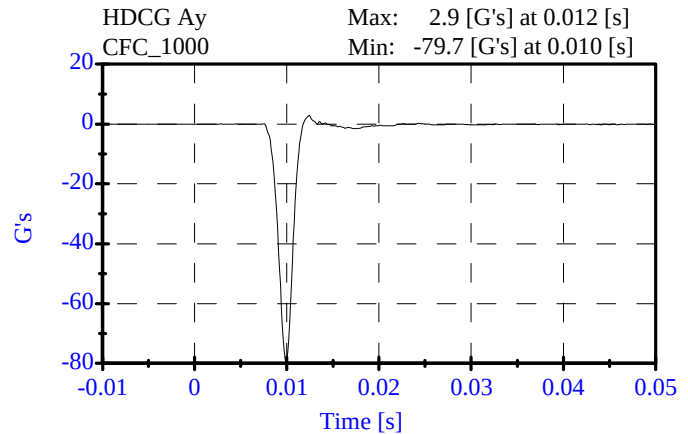
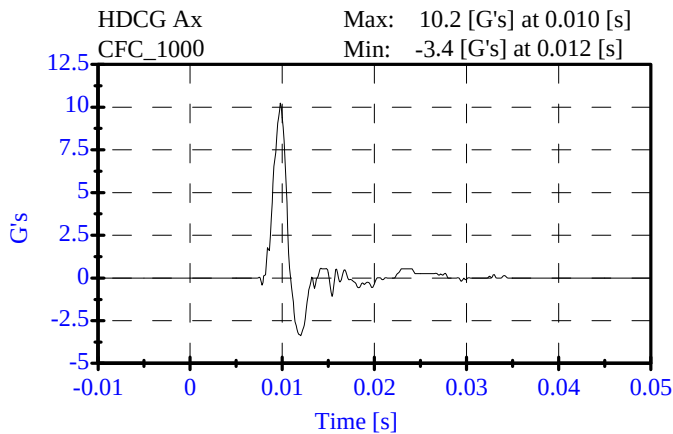
ATD Serial No: 905

Date: 12-16-09

Sequential Test Number: 1 File: 905H 12-16-09

Laboratory Technician: A.Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.6 C	21.1 C	Passed
Lab Humidity:	10-70 %	32.00 %	Passed
Peak Resultant Accel.:	120-150 Gs	143.08 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	10.23 Gs	Passed
Curve PerCent NonModal:	< 15%	1.77 %	Passed



Neck Flexion Test**Post-Test****CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 905

Sequential Test Number: 1 File: 905N1 12-16-09

Date: 12-16-09

Laboratory Technician: A. Rudnski

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	20.6-22.2 C	21.1 C	Passed
Lab Humidity:	10-70 %	28.00 %	Passed
Impact Velocity:	6.89- 7.13 m/s	6.99 m/s	Passed
PENDULUM DELTA V			
Delta V at 10 ms:	1.96- 2.55 m/s	2.20 m/s	Passed
Delta V at 20 ms:	4.12- 5.10 m/s	4.59 m/s	Passed
Delta V at 30 ms:	5.73- 7.01 m/s	6.48 m/s	Passed
Delta V between 40-70 ms:	6.27- 7.64 m/s	7.58 m/s	Passed
D PLANE ROTATION			
Maximum Rotation:	66.0-82.0 Deg	68.22 Deg	Passed
Rotation Angle Decay:	58.0-67.0 ms	59.30 ms	Passed
MOMENT ABOUT THE OCCIPITAL CONDYLE			
Max Occipital Moment:	73.00- 88.00 Nm	73.22 Nm	Passed
Occipital Moment Decay:	49.0-64.0 ms	56.50 ms	Passed
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT			
Moment to Rotation Peak:	2.0-16.0 ms	9.60 ms	Passed

Neck Flexion Test
Post-Test
CONFIGURED FOR LEFT SIDE IMPACT

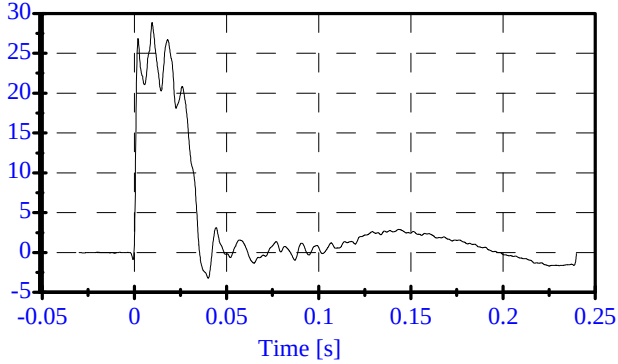
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Date: 12-16-09

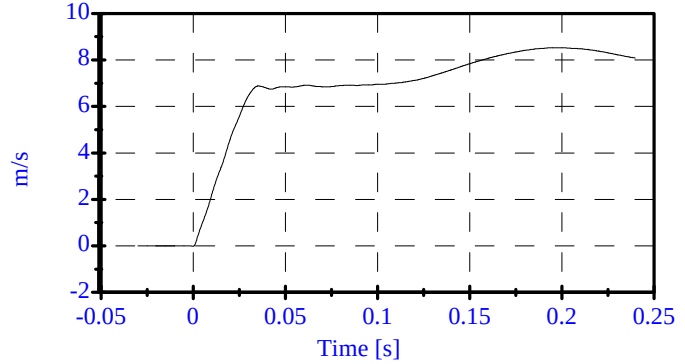
Sequential Test Number: 1 File: 905N1 12-16-09

Laboratory Technician: A. Rudniski

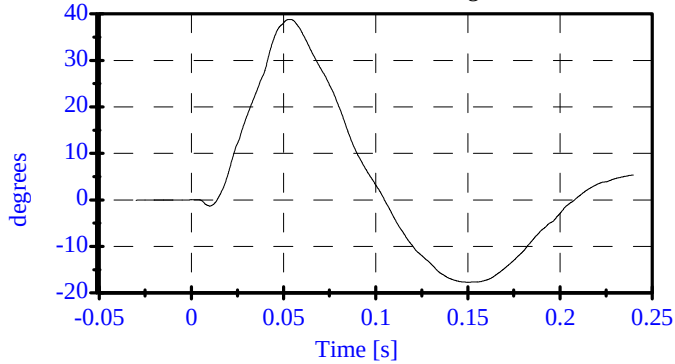
Pend Ax
CFC_180
Max: 28.9 [] at 0.010 [s]
Min: -3.2 [] at 0.040 [s]



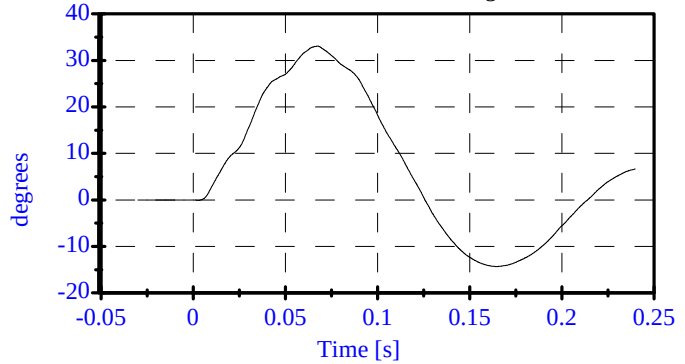
Pend Vx
CFC_180
Max: 8.5 [m/s] at 0.197 [s]
Min: -0.0 [m/s] at -0.000 [s]



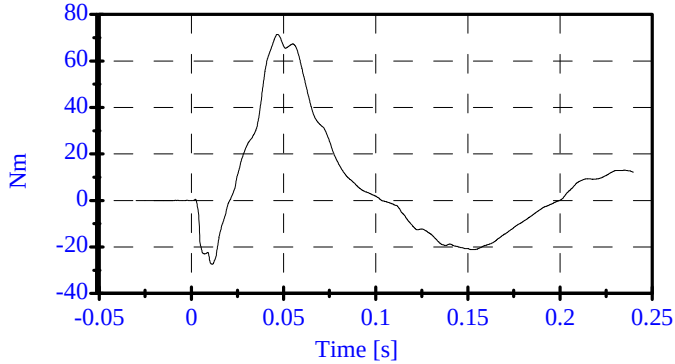
Head Rot
CFC_180
Max: 38.8 [degrees] at 0.053 [s]
Min: -17.7 [degrees] at 0.151 [s]



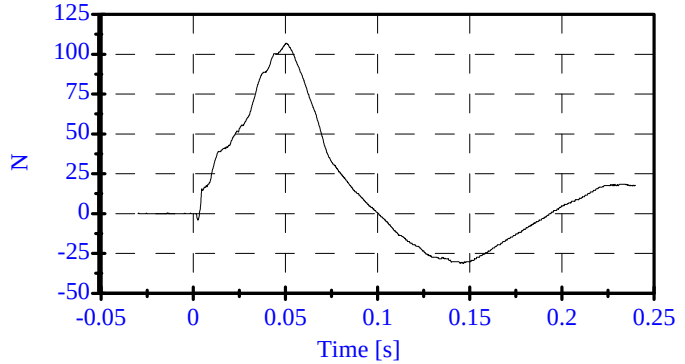
Arm Rot
CFC_180
Max: 33.1 [degrees] at 0.067 [s]
Min: -14.3 [degrees] at 0.165 [s]



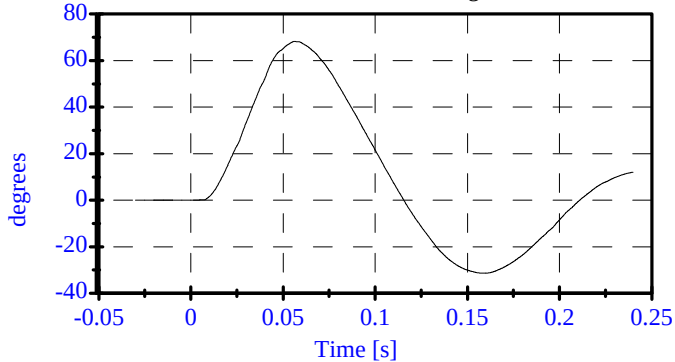
Neck Mx
CFC_600
Max: 71.4 [Nm] at 0.047 [s]
Min: -27.5 [Nm] at 0.011 [s]



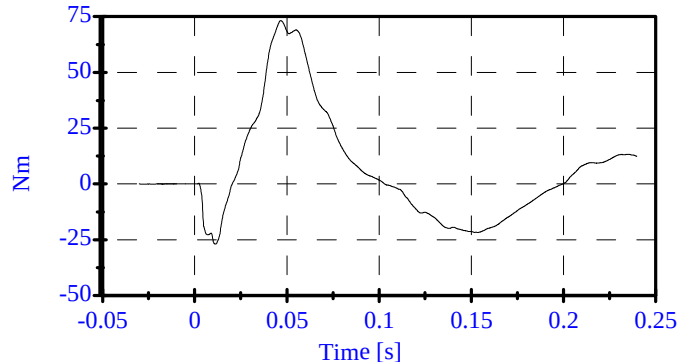
Neck Fy
CFC_1000
Max: 106.9 [N] at 0.051 [s]
Min: -31.3 [N] at 0.147 [s]



Tot Rot
CFC_180
Max: 68.2 [degrees] at 0.056 [s]
Min: -31.3 [degrees] at 0.159 [s]



MOCX
Max: 73.2 [Nm] at 0.047 [s]
Min: -26.9 [Nm] at 0.011 [s]



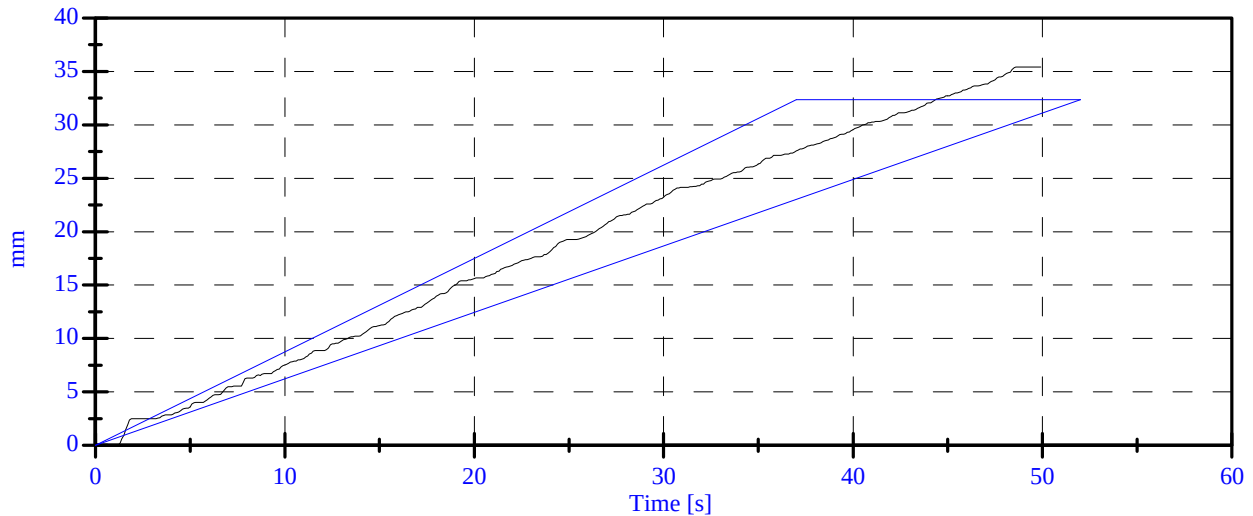
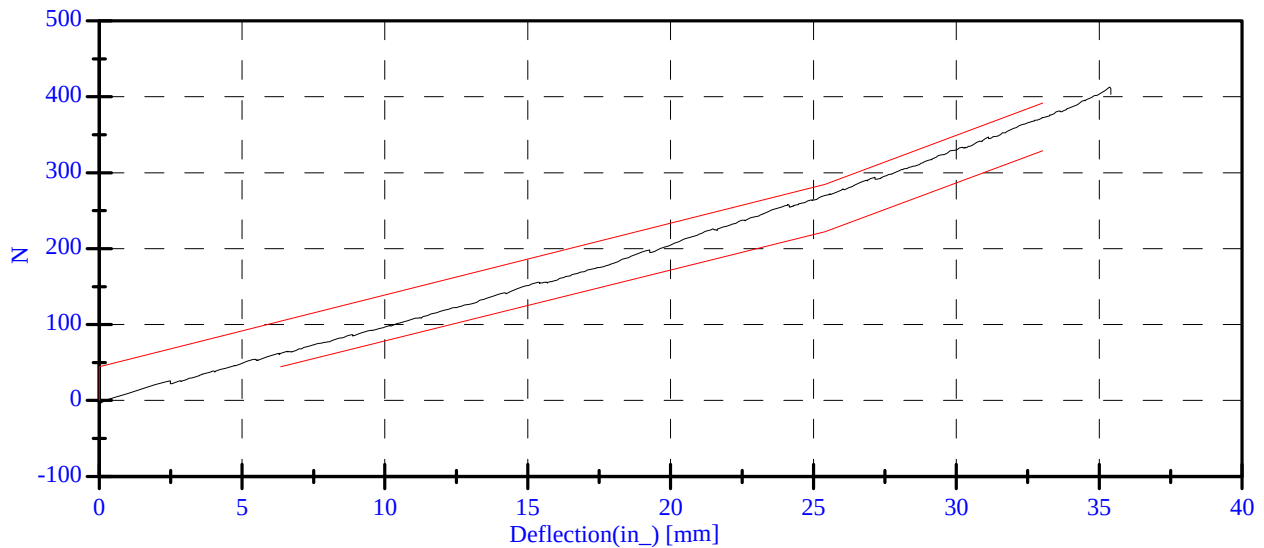
Abdomen Compression Test
Post-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 905
Date: 11-30-09

Sequential Test Number: 1 File: 905AB 11-23-09
Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.7 C	Passed
Lab Humidity:	10-70 %	37.00 %	Passed
Force at 12.95 mm :	104.00-162.00 N	126.83 N	Passed
Force at 19.05 mm :	162.98-220.99 N	196.19 N	Passed
Force at 25.40 mm :	221.97-280.02 N	269.93 N	Passed
Force at 33.02 mm :	324.99-391.00 N	371.77 N	Passed

ABDOMINAL COMPRESSION TEST



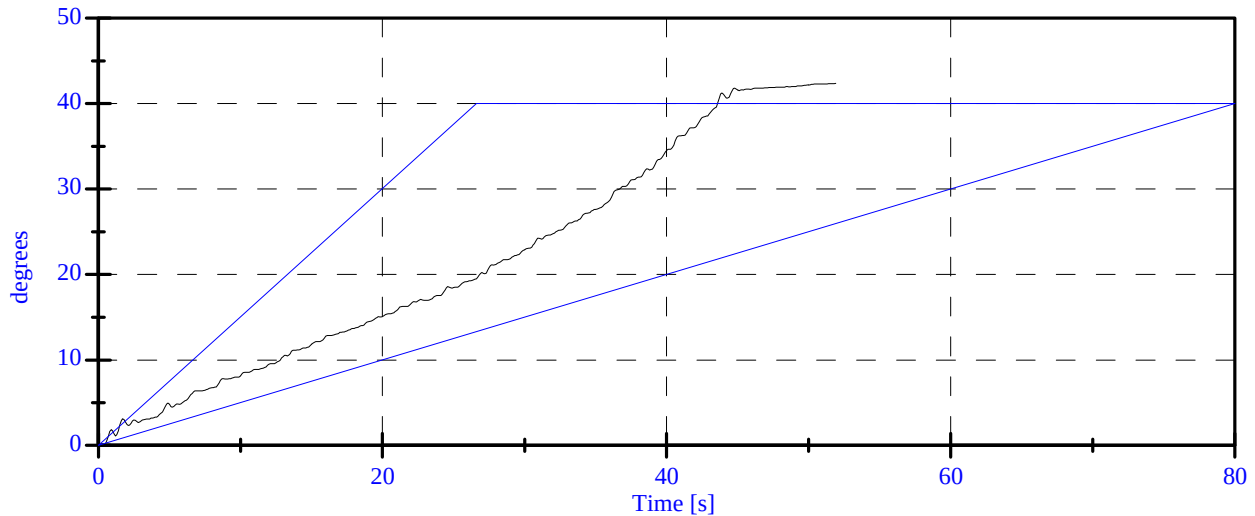
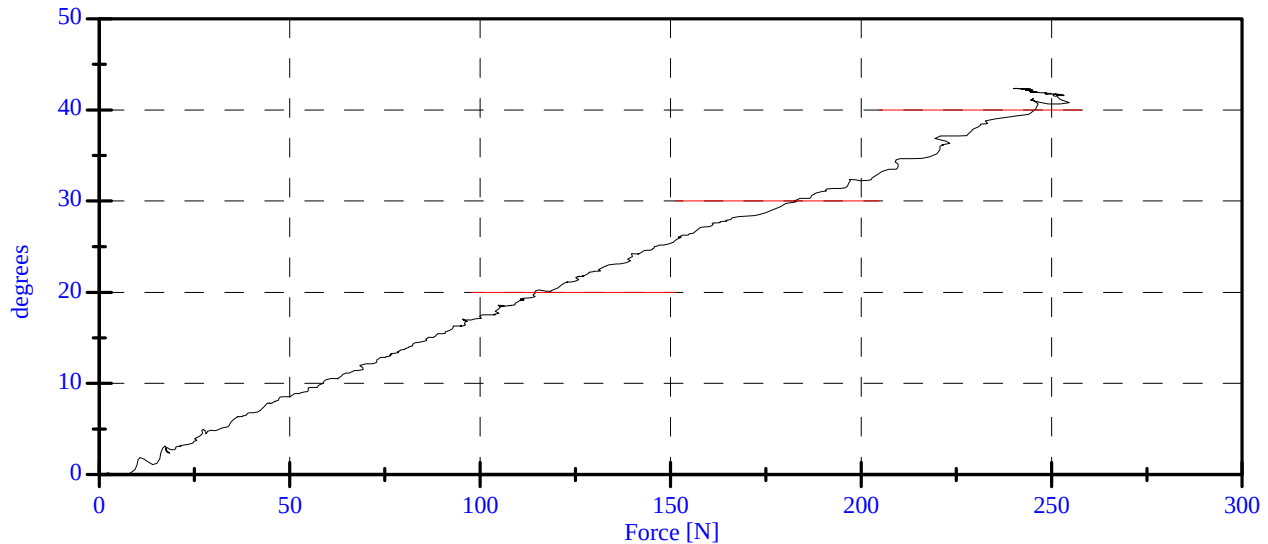
Lumbar Flexion Test
Post-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 905
Date: 11-23-09

Sequential Test Number: 1 File: 905SP 11-23-09
Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	37.00 %	Passed
Force at 0 Deg:	0.00-26.69 N	2.35 N	Passed
Force at 20 Deg:	97.86-151.24 N	118.56 N	Passed
Force at 30 Deg	151.24-204.62 N	182.28 N	Passed
Force at 40 Deg	204.62-258.00 N	245.74 N	Passed
Return Angle	12 Deg Max	9.46 deg	Passed

LUMBAR SPINE FLEXION TEST



POST TEST DUMMY INSPECTION LIST
CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 905 Sequential Test Number: 1
 Date: 11/23/09 Laboratory Technician: A. Rudniski

PART	ITEMS CHECKED	COMMENTS
SKIN	VISUAL INSPECTION	OK
HEAD	VISUAL, BALLAST, ACCELEROMETER MOUNT	OK
NECK	VISUAL, CABLE TORQUE	OK
SPINE BOX	VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT	OK
RIB CAGE	VISUAL, MEASURE, STIFFENERS	OK
STERNUM	VISUAL	OK
LUMBAR SPINE	VISUAL	OK
ABDOMEN	VISUAL	OK
PELVIS	VISUAL, PALPATE, ACCELEROMETER MOUNT	OK
UPPER LEGS	VISUAL	OK
KNEES	VISUAL, STOPS, INSERTS	OK
LOWER LEGS	VISUAL, RANGE OF MOTION	OK
ANKLES	VISUAL, RANGE OF MOTION	OK
FEET	VISUAL, RANGE OF MOTION	OK
JOINTS	1 TO 2 g RANGE	OK
OTHER	NONE	-

REMARKS: None

CALIBRATION TEST RESULTS

POST TEST

SID H3 NO.: 270

CONFIGURED FOR LEFT SIDE IMPACT

**CALIBRATION TEST RESULTS SUMMARY
POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 270 Sequential Test Number: 1
Date: 12/17/09 Laboratory Technician: A. Rudniski

TEST	COMMENTS
EXTERNAL DIMENSIONS	Passed all requirements.
LATERAL THORAX IMPACT TEST	Passed all requirements.
LATERAL PELVIS IMPACT TEST	Passed all requirements.
HEAD DROP TEST*	Passed all requirements.
LATERAL NECK BEND TEST*	Passed all requirements.
ABDOMINAL COMPRESSION TEST*	Passed all requirements.
LUMBAR FLEXION TEST*	Passed all requirements.

* Test not required for SID certification.

REMARKS: None

**EXTERNAL DIMENSIONS
POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 270 Sequential Test Number: 1
Date: 11/23/09 Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	899
RH- Rib Height (mm)	502 - 520	504
HP- Hip Pivot Height (mm)	99 ref.	99
RD- Rib from Back Line (mm)	229 - 241	235
KH- Knee Pivot from Back Line (mm)	511 - 526	519
KV- Knee Pivot to Floor (mm)	490 - 505	495
HW- Hip Width (mm)	356 - 391	384

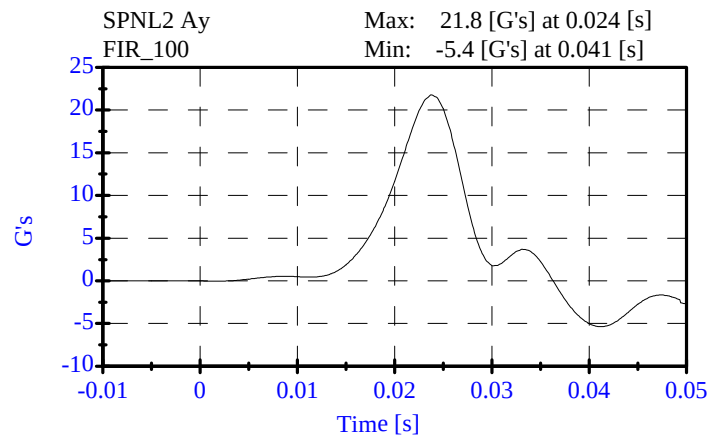
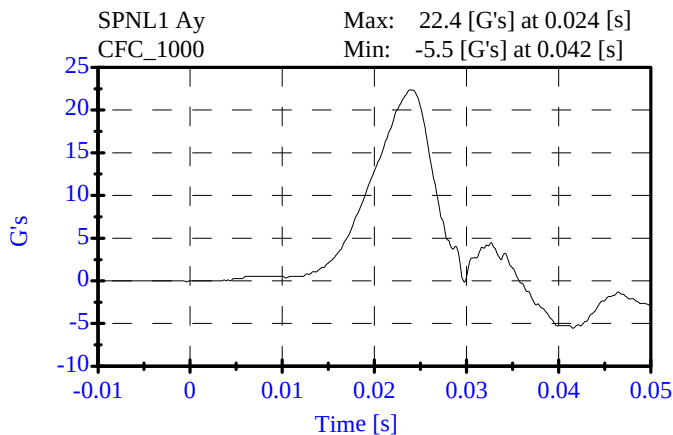
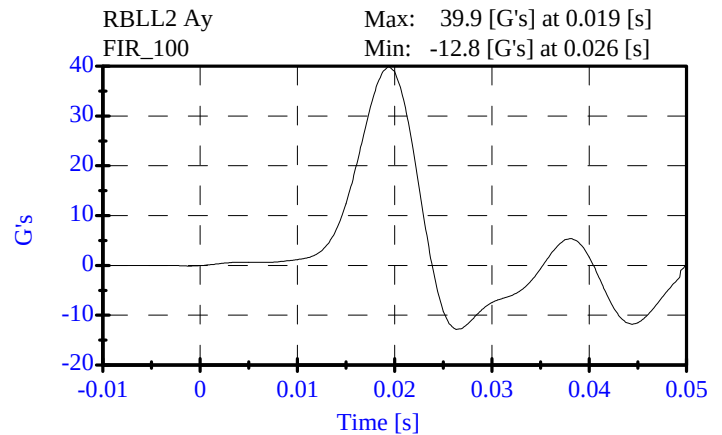
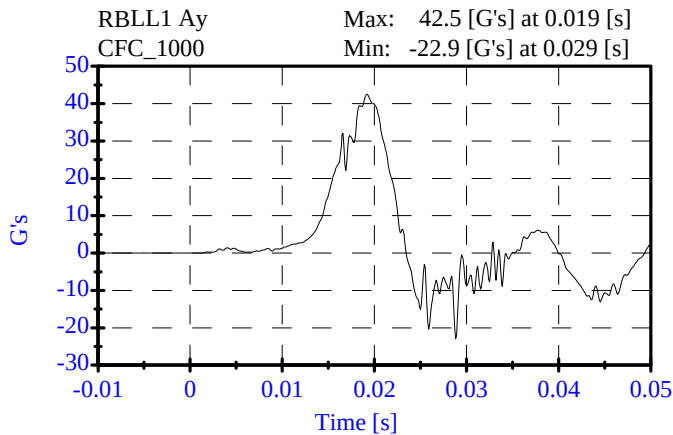
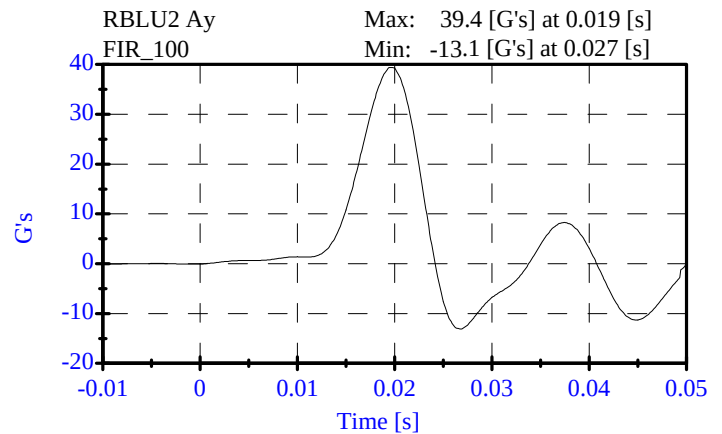
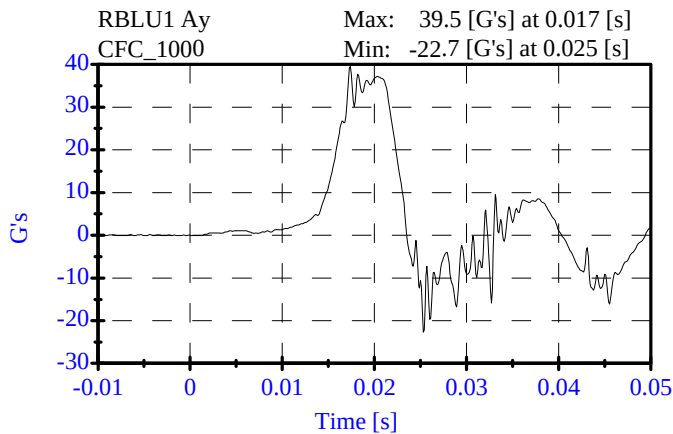
REMARKS: None

Thorax Impact Test
Post-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 12-17-09

Sequential Test Number: 1 File: 270T 12-17-09
Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	20.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.28 m/s	Passed
Upper Rib Acceleration:	37.00-46.00 G's	39.37 G's	Passed
Lower Rib Acceleration:	37.00-46.00 G's	39.94 G's	Passed
Lower Spine Acceleration:	15.00-22.00 G's	21.78 G's	Passed



Pelvic Impact Test

Post-Test

CONFIGURED FOR LEFT SIDE IMPACT

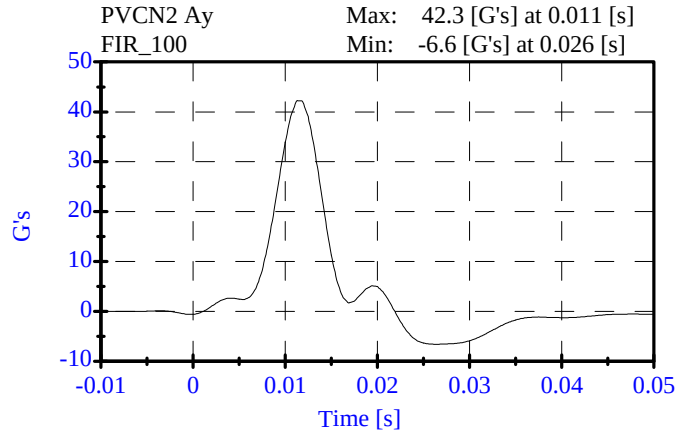
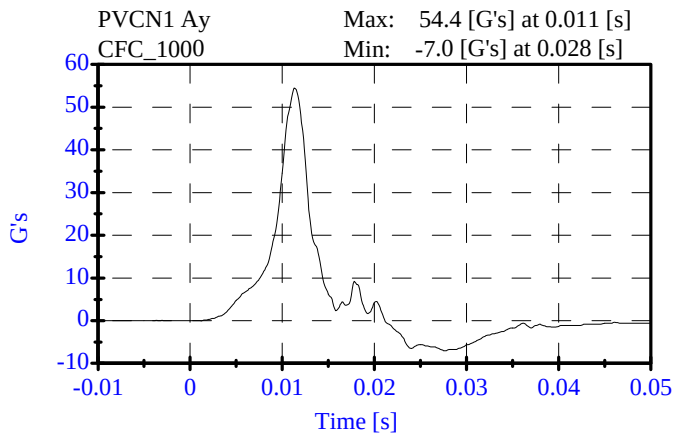
ATD Serial No: 270

Date: 12-17-09

Sequential Test Number: 1 File: 270P1 12-17-09

Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	20.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.28 m/s	Passed
Pelvis Y Acceleration:	40.00-60.00 G's	42.26 G's	Passed
Time Above 20 Gs	3.0-7.0 ms	5.5 ms	Passed



Head Drop Test

Post-Test

CONFIGURED FOR LEFT SIDE IMPACT

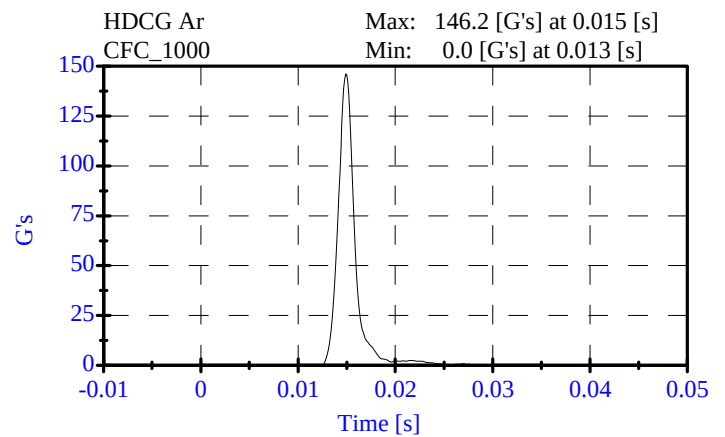
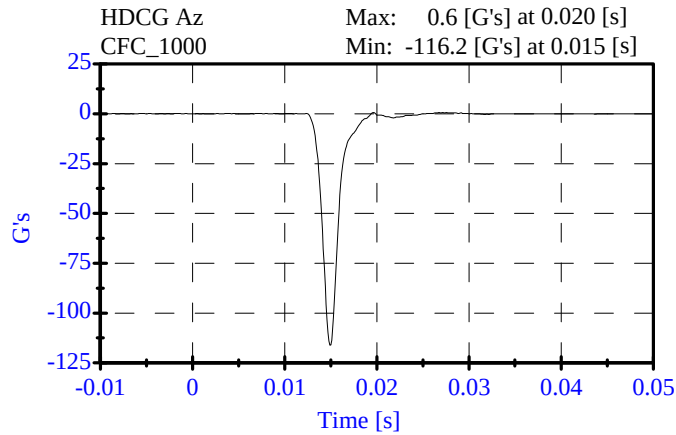
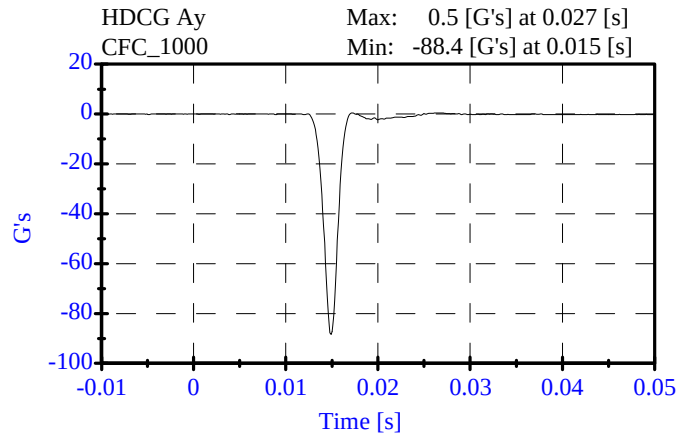
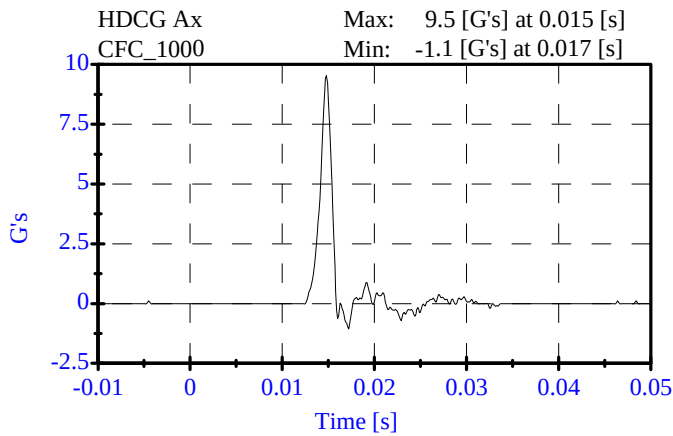
ATD Serial No: 270

Date: 12-16-09

Sequential Test Number: 1 File: 270H1 12-16-09

Laboratory Technician: A.Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.6 C	21.1 C	Passed
Lab Humidity:	10-70 %	28.00 %	Passed
Peak Resultant Accel.:	120-150 Gs	146.24 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	9.54 Gs	Passed
Curve PerCent NonModal:	< 15%	2.16 %	Passed



Neck Flexion Test**Post-Test****CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 270

Date: 12-17-09

Sequential Test Number: 1 File: 270N4 12-16-09

Laboratory Technician: A. Rudnski

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	20.6-22.2 C	21.1 C	Passed
Lab Humidity:	10-70 %	20.00 %	Passed
Impact Velocity:	6.89- 7.13 m/s	6.99 m/s	Passed
PENDULUM DELTA V			
Delta V at 10 ms:	1.96- 2.55 m/s	1.97 m/s	Passed
Delta V at 20 ms:	4.12- 5.10 m/s	4.21 m/s	Passed
Delta V at 30 ms:	5.73- 7.01 m/s	6.17 m/s	Passed
Delta V between 40-70 ms:	6.27- 7.64 m/s	7.57 m/s	Passed
D PLANE ROTATION			
Maximum Rotation:	66.0-82.0 Deg	67.94 Deg	Passed
Rotation Angle Decay:	58.0-67.0 ms	59.60 ms	Passed
MOMENT ABOUT THE OCCIPITAL CONDYLE			
Max Occipital Moment:	73.00- 88.00 N-m	82.01 N-m	Passed
Occipital Moment Decay:	49.0-64.0 ms	50.80 ms	Passed
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT			
Moment to Rotation Peak:	2.0-16.0 ms	9.60 ms	Passed

Neck Flexion Test
Post-Test
CONFIGURED FOR LEFT SIDE IMPACT

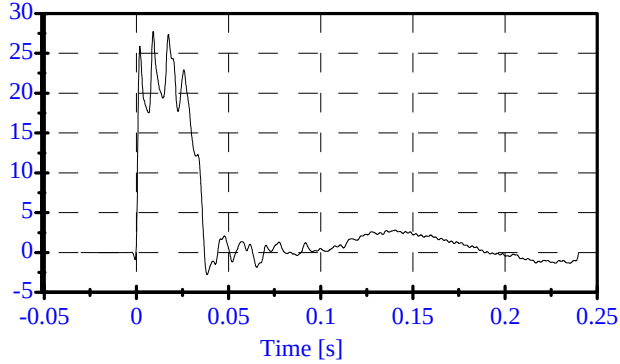
ATD Serial No: 270

Date: 12-17-09

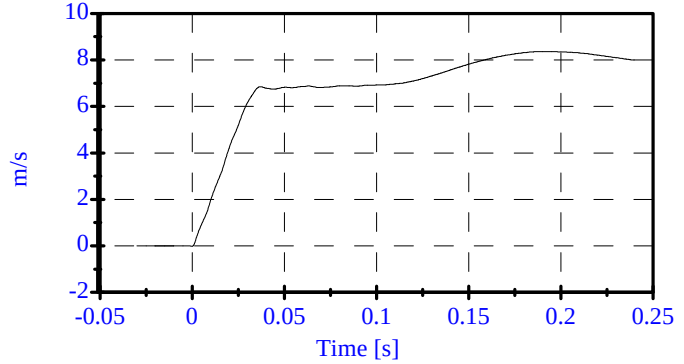
Sequential Test Number: 1 File: 270N4 12-16-09

Laboratory Technician: A. Rudniski

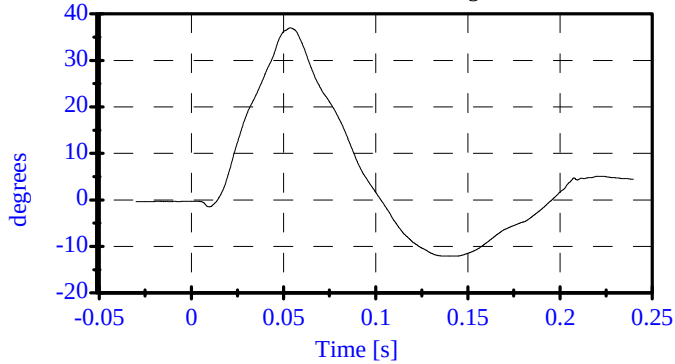
Pend Ax
CFC_180
Max: 27.8 [] at 0.009 [s]
Min: -2.8 [] at 0.038 [s]



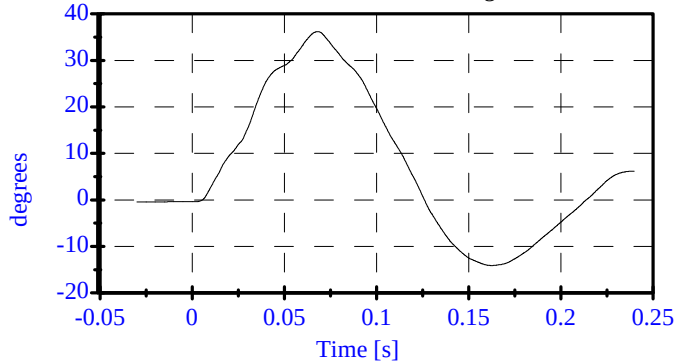
Pend Vx
CFC_180
Max: 8.4 [m/s] at 0.191 [s]
Min: -0.0 [m/s] at -0.000 [s]



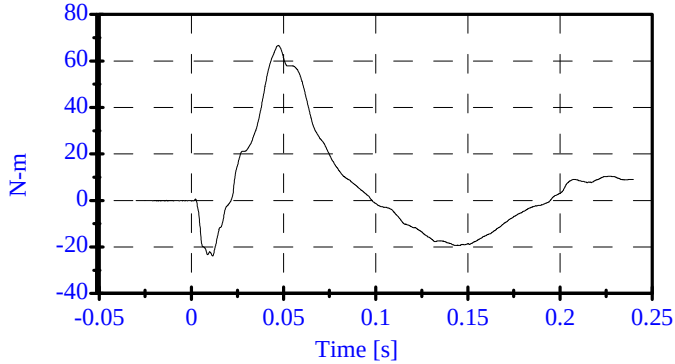
Head Rot
CFC_180
Max: 37.0 [degrees] at 0.054 [s]
Min: -12.1 [degrees] at 0.143 [s]



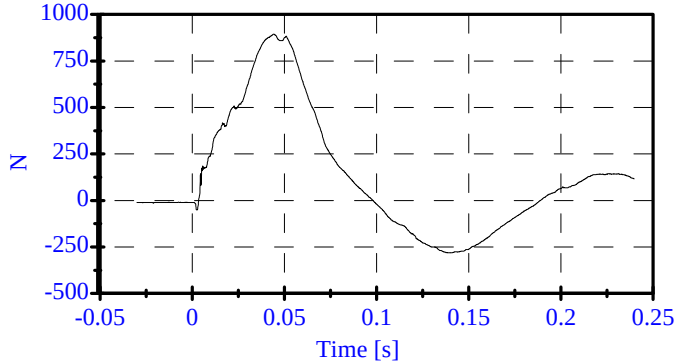
Arm Rot
CFC_180
Max: 36.2 [degrees] at 0.068 [s]
Min: -14.1 [degrees] at 0.162 [s]



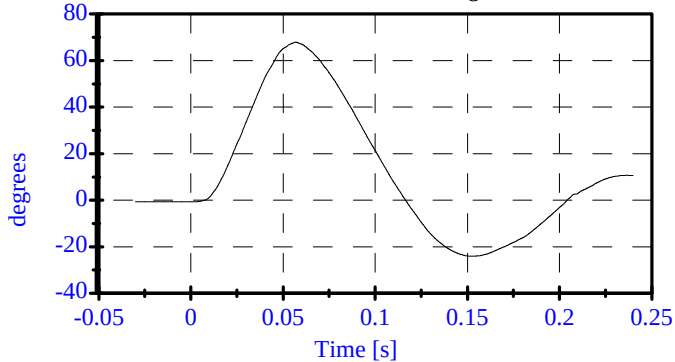
Neck Mx
CFC_600
Max: 66.7 [N-m] at 0.047 [s]
Min: -23.9 [N-m] at 0.012 [s]



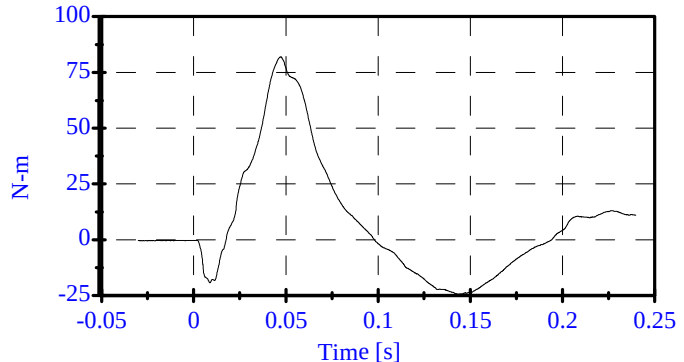
Neck Fy
CFC_1000
Max: 894.3 [N] at 0.044 [s]
Min: -282.4 [N] at 0.139 [s]



Tot Rot
CFC_180
Max: 67.9 [degrees] at 0.057 [s]
Min: -24.0 [degrees] at 0.152 [s]



MOCX
Max: 82.0 [N-m] at 0.047 [s]
Min: -24.3 [N-m] at 0.144 [s]



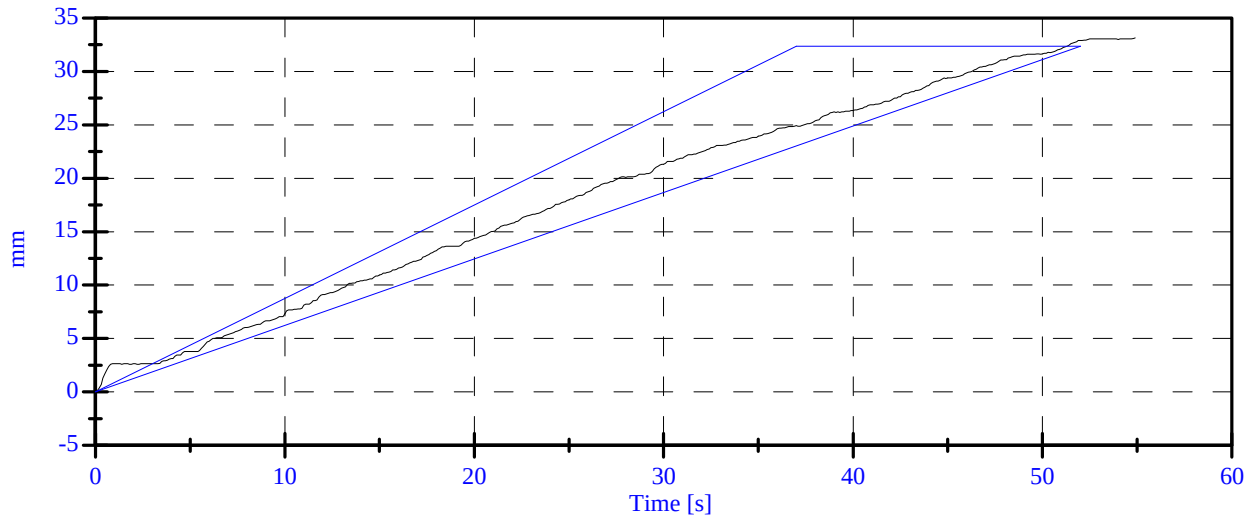
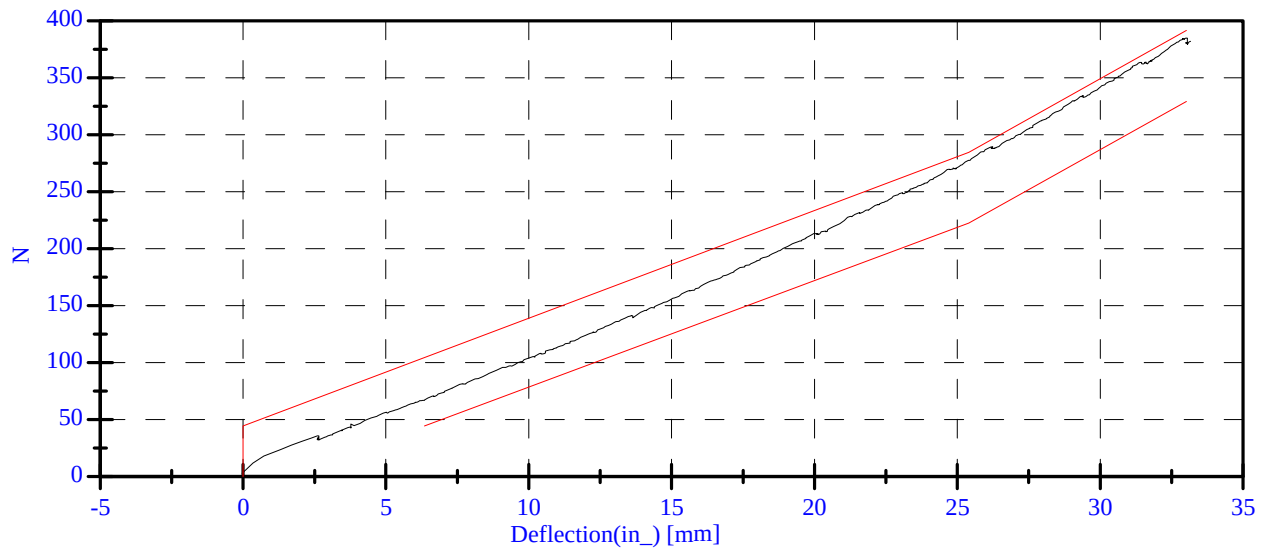
Abdominal Compression Test
Post-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 11-23-09

Sequential Test Number: 1 File: 270AB 11-23-09
Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	37.00 %	Passed
Force at 12.95 mm :	104.00-162.00 N	135.23 N	Passed
Force at 19.05 mm :	162.98-220.99 N	202.03 N	Passed
Force at 25.40 mm :	221.97-280.02 N	277.59 N	Passed
Force at 33.02 mm :	324.99-391.00 N	384.92 N	Passed

ABDOMINAL COMPRESSION TEST



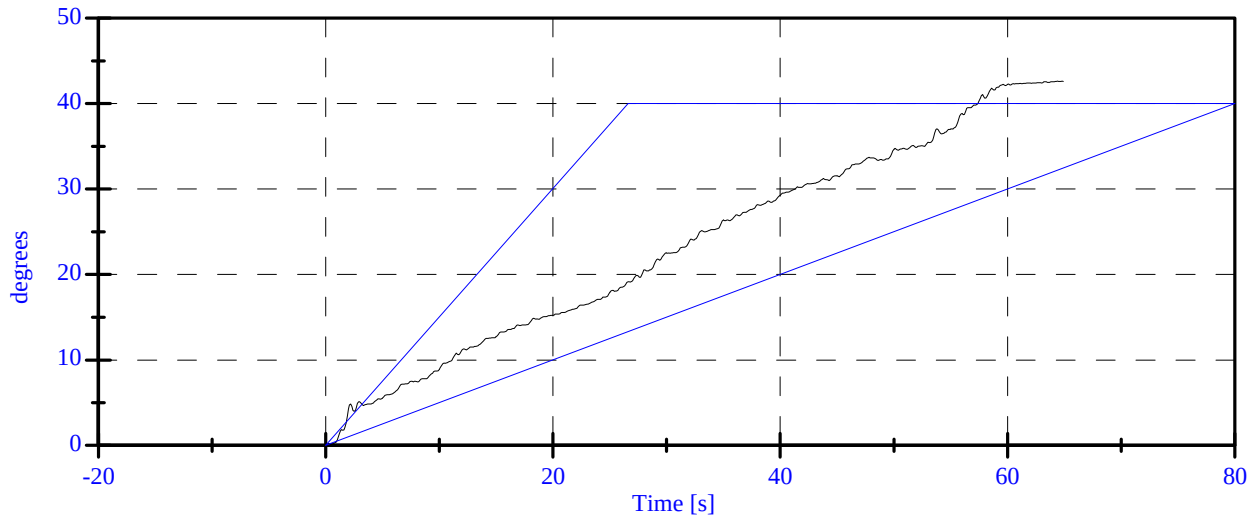
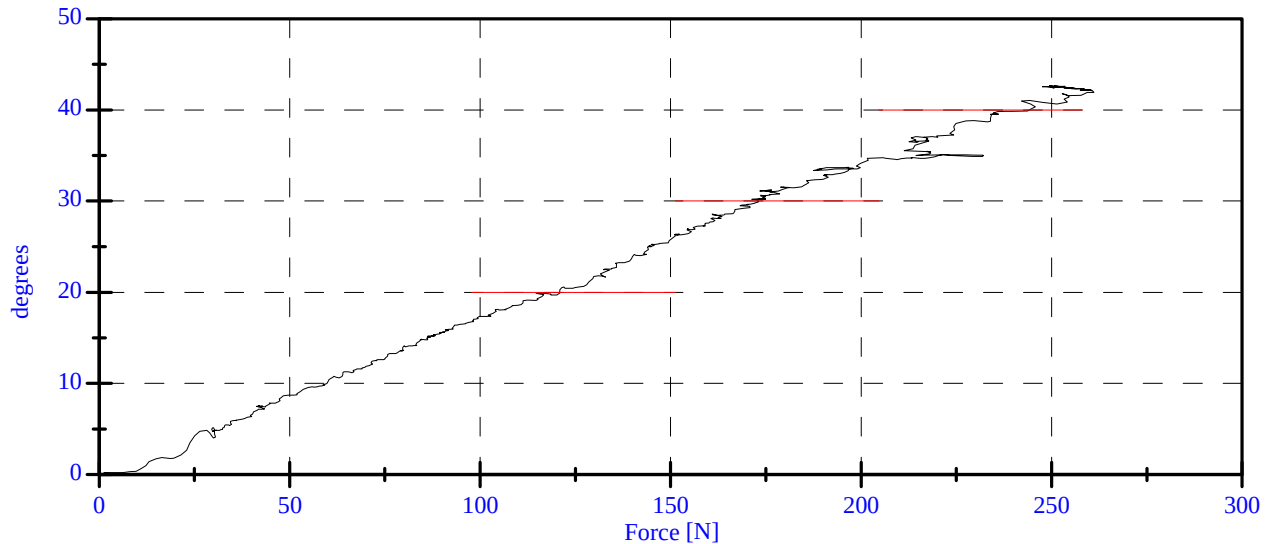
Lumbar Flexion Test
Post-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 270
Date: 11-23-09

Sequential Test Number: 1 File: 270SP 11-23-09
Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	21.1 C	Passed
Lab Humidity:	10-70 %	37.00 %	Passed
Force at 0 Deg:	0.00-26.69 N	1.83 N	Passed
Force at 20 Deg:	97.86-151.24 N	115.95 N	Passed
Force at 30 Deg:	151.24-204.62 N	172.88 N	Passed
Force at 40 Deg:	204.62-258.00 N	244.18 N	Passed
Return Angle	12 Deg Max	8.58 deg	Passed

LUMBAR SPINE FLEXION TEST



POST TEST DUMMY INSPECTION LIST
CONFIGURED FOR LEFT SIDE IMPACT

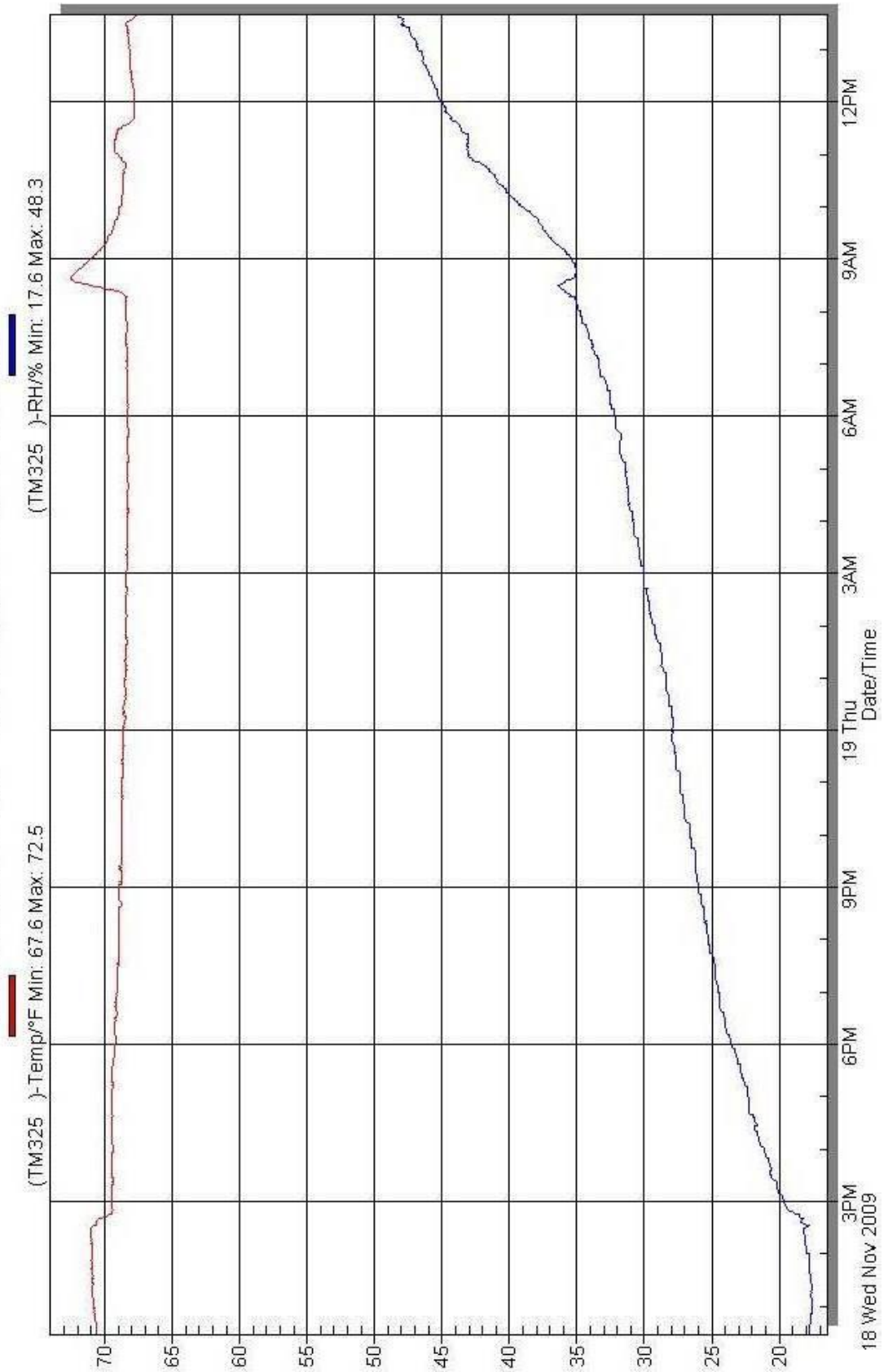
SID H3 Serial No.: 270 Sequential Test Number: 1
Date: 11/23/09 Laboratory Technician: A. Rudniski

PART	ITEMS CHECKED	COMMENTS
SKIN	VISUAL INSPECTION	OK
HEAD	VISUAL, BALLAST, ACCELEROMETER MOUNT	OK
NECK	VISUAL, CABLE TORQUE	OK
SPINE BOX	VISUAL, BALLAST, WELDMENT, ACCELEROMETER MOUNT	OK
RIB CAGE	VISUAL, MEASURE, STIFFENERS	OK
STERNUM	VISUAL	OK
LUMBAR SPINE	VISUAL	OK
ABDOMEN	VISUAL	OK
PELVIS	VISUAL, PALPATE, ACCELEROMETER MOUNT	OK
UPPER LEGS	VISUAL	OK
KNEES	VISUAL, STOPS, INSERTS	OK
LOWER LEGS	VISUAL, RANGE OF MOTION	OK
ANKLES	VISUAL, RANGE OF MOTION	OK
FEET	VISUAL, RANGE OF MOTION	OK
JOINTS	1 TO 2 g RANGE	OK
OTHER	NONE	-

REMARKS: None

TEMPERATURE TRACE

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APPENDIX D

TEST EQUIPMENT AND CALIBRATION INFORMATION

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

SID/HIII INSTRUMENTATION

	FRONT SID/HIII NO.: 905		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	AC-P58757	ENDEVCO	24-Sep-09
HEAD AY	AC-P58911	ENDEVCO	24-Sep-09
HEAD AZ	AC-P58887	ENDEVCO	24-Sep-09
HEAD AX (Redundant)	AC-P58791	ENDEVCO	24-Sep-09
HEAD AY (Redundant)	AC-P58888	ENDEVCO	24-Sep-09
HEAD AZ (Redundant)	AC-P58904	ENDEVCO	24-Sep-09
UPPER NECK FX	LC-1647Fx	DENTON	20-Apr-09
UPPER NECK FY	LC-1647Fy	DENTON	20-Apr-09
UPPER NECK FZ	LC-1647Fz	DENTON	20-Apr-09
UPPER NECK MX	LC-1647Mx	DENTON	20-Apr-09
UPPER NECK MY	LC-1647My	DENTON	20-Apr-09
UPPER NECK MZ	LC-1647Mz	DENTON	20-Apr-09
UPPER RIB	AC-P59010	ENDEVCO	25-Sep-09
LOWER RIB	AC-P59017	ENDEVCO	25-Sep-09
LOWER SPINE	AC-P59019	ENDEVCO	25-Sep-09
PELVIS	AC-P58777	ENDEVCO	25-Sep-09
UPPER RIB REDUNDANT	AC-P58981	ENDEVCO	25-Sep-09
LOWER RIB REDUNDANT	AC-P58788	ENDEVCO	25-Sep-09
LOWER SPINE REDUNDANT	AC-P58979	ENDEVCO	25-Sep-09
PELVIS REDUNDANT	AC-P59018	ENDEVCO	25-Sep-09

	REAR SID/HIII NO.: 270		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	AC-P58998	ENDEVCO	24-Jul-09
HEAD AY	AC-P58909	ENDEVCO	24-Jul-09
HEAD AZ	AC-P51279	ENDEVCO	24-Jul-09
HEAD AX (Redundant)	AC-P58780	ENDEVCO	24-Jul-09
HEAD AY (Redundant)	AC-P58997	ENDEVCO	24-Jul-09
HEAD AZ (Redundant)	AC-P58912	ENDEVCO	24-Jul-09
UPPER NECK FX	LC-498Fx	DENTON	20-Apr-09
UPPER NECK FY	LC-498Fy	DENTON	20-Apr-09
UPPER NECK FZ	LC-498Fz	DENTON	20-Apr-09
UPPER NECK MX	LC-498Mx	DENTON	20-Apr-09
UPPER NECK MY	LC-498My	DENTON	20-Apr-09
UPPER NECK MZ	LC-498Mz	DENTON	20-Apr-09
UPPER RIB	AC-P51969	ENDEVCO	24-Jul-09
LOWER RIB	AC-P51950	ENDEVCO	24-Jul-09
LOWER SPINE	AC-P51970	ENDEVCO	24-Jul-09
PELVIS	AC-P51946	ENDEVCO	24-Jul-09
UPPER RIB REDUNDANT	AC-P51948	ENDEVCO	24-Jul-09
LOWER RIB REDUNDANT	AC-P51974	ENDEVCO	24-Jul-09
LOWER SPINE REDUNDANT	AC-P51965	ENDEVCO	24-Jul-09
PELVIS REDUNDANT	AC-P51945	ENDEVCO	24-Jul-09

REMARKS: None

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

VEHICLE AND MDB INSTRUMENTATION

	VEHICLE AND MDB INSTRUMENTS		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
RIGHT FRONT SILL (X)	AC-P17283	ENDEVCO	25-Sep-09
RIGHT FRONT SILL (Y)	AC-P23939	ENDEVCO	25-Sep-09
RIGHT FRONT SILL (Z)	AC-P23993	ENDEVCO	25-Sep-09
RIGHT REAR SILL (X)	AC-P35811	ENDEVCO	25-Sep-09
RIGHT REAR SILL (Y)	AC-P35789	ENDEVCO	25-Sep-09
RIGHT REAR SILL (Z)	AC-P35803	ENDEVCO	25-Sep-09
REAR FLOORPAN ABOVE AXLE (X)	AC-P35757	ENDEVCO	25-Sep-09
REAR FLOORPAN ABOVE AXLE (Y)	AC-P21399	ENDEVCO	25-Sep-09
REAR FLOORPAN ABOVE AXLE (Z)	AC-P23899	ENDEVCO	25-Sep-09
LEFT REAR SILL (Y)	AC-P23960	ENDEVCO	25-Sep-09
LEFT FRONT SILL (Y)	AC-P26269	ENDEVCO	25-Sep-09
RIGHT REAR SEAT OCCUPANT COMP. (Y)	AC-P16862	ENDEVCO	25-Sep-09
LOWER LEFT B- PILLAR (Y)	AC-P19359	ENDEVCO	04-Nov-09
MIDDLE LEFT B-PILLAR (Y)	AC-P23926	ENDEVCO	25-Sep-09
LOWER LEFT A-PILLAR (Y)	AC-P35788	ENDEVCO	25-Sep-09
UPPER LEFT A-PILLAR (Y)	AC-P13329	ENDEVCO	29-Jul-09
FRONT SEAT TRACK (Y)	AC-P16286	ENDEVCO	09-Nov-09
REAR SEAT TRACK (Y)	AC-P16576	ENDEVCO	04-Nov-09
VEHICLE CG (X)	AC-P23885	ENDEVCO	04-Nov-09
VEHICLE CG (Y)	AC-P16671	ENDEVCO	25-Sep-09
VEHICLE CG (Z)	AC-P32288	ENDEVCO	25-Sep-09
MDB CG (X)	AC-C16680	ENDEVCO	09-Nov-09
MDB CG (Y)	AC-C14948	ENDEVCO	09-Nov-09
MDB CG (Z)	AC-CP30	ENDEVCO	09-Nov-09
MDB REAR FRAME MEMBER (X)	AC-C15007	ENDEVCO	09-Nov-09
MDB REAR FRAME MEMBER (Y)	AC-C16499	ENDEVCO	09-Nov-09

REMARKS: None