

REPORT NUMBER: SNCAP-CAL-10-02

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

**FORD MOTOR COMPANY
2010 FORD TRANSIT CONNECT
WAGON**

NHTSA NUMBER: MA0218

**PREPARED BY:
CALSPAN CORPORATION
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Test Date: 9/29/09

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
RULEMAKING
OFFICE OF CRASHWORTHINESS STANDARDS
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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 Ford Transit Connect Wagon 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 9/29/09. The impact velocity of the Moving Deformable Barrier (MDB) was 62.2 km/h, and the ambient temperature at the struck side (driver side) of the vehicle was 21°C. The target vehicle's maximum post test static crush was 254 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;">42.9</td> <td style="text-align: center;">39.1</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td style="text-align: center;">44.8</td> <td style="text-align: center;">48.1</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td style="text-align: center;">52.7</td> <td style="text-align: center;">46.9</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td style="text-align: center;">49.0</td> <td style="text-align: center;">47.4</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td style="text-align: center;">53.0</td> <td style="text-align: center;">63.8</td> </tr> <tr> <td>HIC</td> <td style="text-align: center;">36.3</td> <td style="text-align: center;">346.1</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	42.9	39.1	Left Lower Rib (LLR) Accel., g	44.8	48.1	Lower Spine (T ₁₂) Accel., g	52.7	46.9	Thoracic Trauma Index (TTI)	49.0	47.4	Pelvis (PEV) Accel., g	53.0	63.8	HIC	36.3	346.1
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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. DTNH22-03-D-22005. The purpose of this test was to evaluate side impact protection in a 2010 Ford Transit Connect Wagon manufactured by Ford Motor Company. The side impact test was conducted in accordance with the Laboratory Test Procedure for New Car Assessment Program Side Impact Testing dated July 1997.

SECTION 2

SUMMARY OF NCAP SIDE IMPACT TEST

A model year 2010 Ford Transit Connect Wagon 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 62.2 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 1846 kg and the test weight of the MDB was 1362.5 kg. The test was conducted at the Calspan Corporation Transportation Sciences Center on 9/29/09.

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/HIII's) 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 July 1997. 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 254 mm at level 3, 750 mm rearward of the left vertical impact point. The driver and passenger SID/HIII's, Serial Nos. 905 and 906 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	36.3	31.6	67.6	49.0	53.0
Passenger	346.1	66.6	100.0	47.4	63.8

SUPPLEMENTAL RESTRAINT INFORMATION

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

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 Ford Transit Connect	NHTSA No.	MA0218
Test Program:	NCAP Side Impact	Test Date:	9/29/09

TEST VEHICLE INFORMATION AND VEHICLE OPTIONS

Make	Ford Motor Company	Driver Front Airbag	Yes
Model	Transit Connect	Driver Side Curtain Airbag	No
Body Style	Wagon	Driver Side Head/Torso Airbag	Yes
NHTSA No.	MA0218	Driver Pretensioners	Yes
VIN	NM0KS9AN0AT010655	Driver Load Limiters	Yes
Color	White	Driver Power Seats	No
Engine Disp.(L)	2.0	Rear Pass. Side Curtain Airbag	No
Engine Cylinders	4	Rear Pass. Side Torso Airbag	No
Engine Placement	Longitudinal	Rear Pass. Pretensioners	No
Transmission Type	Automatic	Rear Pass. Load Limiters	No
Transmission Speeds	4 w/OD	Rear Pass. Power Seats	NA
Final Drive	Front	Tilt Wheel	Yes
Air Conditioning	Yes	Anti-lock Brakes	Yes
Power Steering	Yes	Traction Control	Yes
Power Brakes	Yes	Power Windows	No
Delivery Date	9/14/09	Power Door Locks	No
Odometer Reading (km)	241	Automatic Door Locks (ADL)	No
Dealer	Bob Ferrando FLM Sales Girard PA, 16417	Owner's Manual Details Instructions on Disabling ADLs	NA

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company	GVWR (kg)	2252
Date of Manufacture	07/09	GAWR Front (kg)	1128
		GAWR Rear (kg)	1239

VEHICLE CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket/	Bench		
Number Of Occupants	2	2		4
Capacity Wt. (VCW) (kg)				673
Cargo Wt. (RCLW) (kg)				400.8

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

Test Vehicle:	2010 Ford Transit Connect	NHTSA No.	MA0218
Test Program:	NCAP Side Impact	Test Date:	9/29/09

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	440	352		513	481		483	476	
Right	kg	430	334		442	419		450	437	
Ratio	%	55.9	44.1		51.5	48.5		50.5	49.5	
Totals	kg	870.0	686.0	1556.0	955.0	900.0	1855.0	933.0	913.0	1846.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1556
Weight of 2 P572E ATDs (81.2 kg each)	kg	162.4
Rated Cargo/Luggage Weight (RCLW)	kg	136.0 (maximum)
Calculated Vehicle Target Weight (TVTW)	kg	1854.4

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

Weight of Ballast (including instrumentation package and cameras): 392.4 kg

TEST VEHICLE ATTITUDES

	Units	LF	RF	LR	RR
As Delivered	mm	725	794	729	792
Fully Loaded	mm	705	765	721	771
As Tested	mm	714	766	724	774

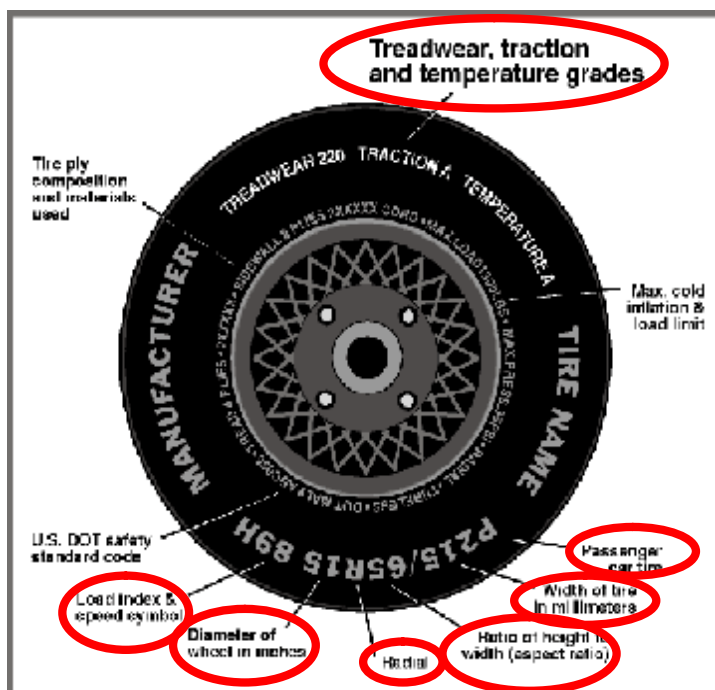
TEST VEHICLE VERTICAL IMPACT LINE AND CG

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2914
Target Impact Point Aft of Front Axle	mm	517
Actual Impact Point Aft of Front Axle	mm	0
As Tested CG (aft of front axle)	mm	1441

DATA SHEET NO. 2

TEST VEHICLE TIRE INFORMATION

Test Vehicle:	2010 Ford Transit Connect	NHTSA No.	MA0218
Test Program:	NCAP Side Impact	Test Date:	9/29/09



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	340	340
Cold / Test Pressure (kPa)	250	250
Recommended Tire Size	P205/65R15	P205/65R15
Tire Size on Vehicle	P205/65R15	P205/65R15
Tire Manufacturer	Continental	Continental
Tire Name	ContiProContact	ContiProContact
Tire Type	Passenger	Passenger
Tire Width (mm)	205	205
Ratio of Height to Width (aspect ratio)	65	65
Radial	Radial	Radial
Wheel Diameter	15	15
Load Index & Speed Symbol	95T	95T
Treadwear	540	540
Traction Grade	A	A
Temperature Grade	A	A

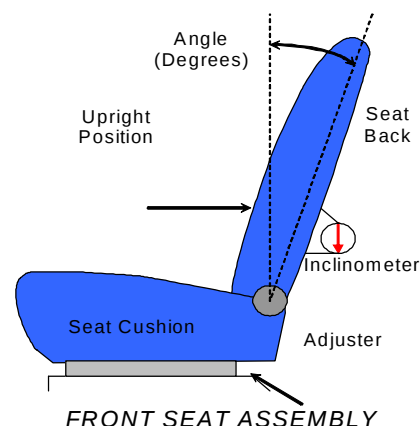
DATA SHEET NO. 3

TEST VEHICLE INFORMATION

Test Vehicle:	2010 Ford Transit Connect	NHTSA No.	MA0218
Test Program:	NCAP Side Impact	Test Date:	9/29/09

NORMAL DESIGN RIDING POSITION

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

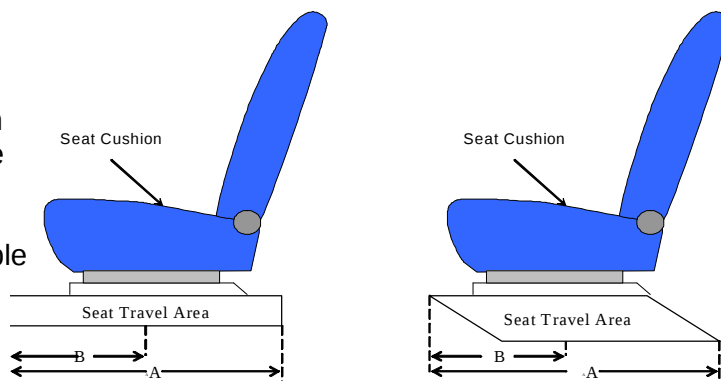


SEAT BACK POSITION

	Driver Seat	Rear Seat
Test Detent (forward-most detent defined as 0)	NA	FIXED
Angle (deg. from forward-most locking position)	25.8	FIXED
Alternative Measurements to Verify Test Position	-	FIXED

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)	296	FIXED
Test Position (B) (mm)	148	FIXED
Test Detent (forward-most detent defined as 0)	8	FIXED
Total Number of Detents (including 0)	0-22	FIXED

DATA SHEET NO. 3 (CONTINUED)

TEST VEHICLE INFORMATION

Test Vehicle: 2010 Ford Transit Connect

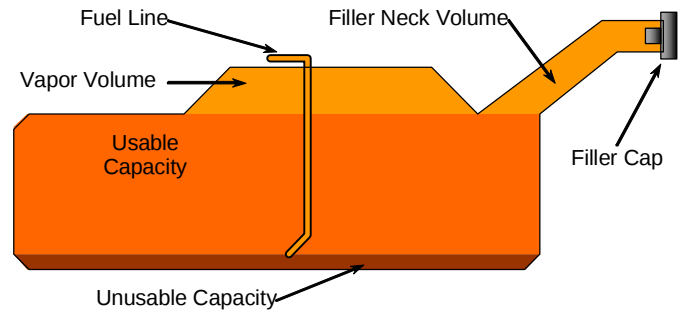
NHTSA No. MA0218

Test Program: NCAP Side Impact

Test Date: 9/29/09

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.



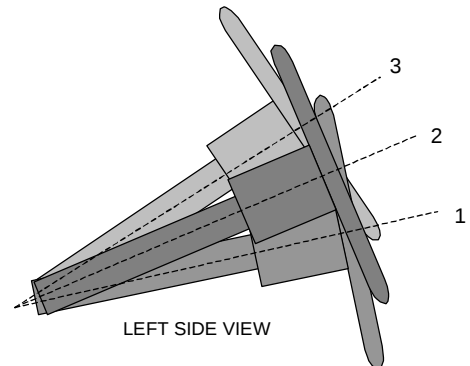
VEHICLE FUEL TANK ASSEMBLY

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard" Fuel Tank	56.0
Usable Capacity of "Optional" Fuel Tank	-
Stoddard Used For Test (92%-94% of Fuel Tank Usable Capacity)	52.2

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	178	72.3	-
Geometric Center Position No. 2 *	191	65.8	-
Uppermost Position No. 3	204	59.3	-

* Test position

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

Test Vehicle:	2010 Ford Transit Connect	NHTSA No.	MA0218
Test Program:	NCAP Side Impact	Test Date:	9/29/09

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	62.2
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.2

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

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	0 mm forward/rearward
Vertical Offset	mm	+/-20	5 mm above

DATA SHEET NO. 5
POST TEST OBSERVATIONS

Test Vehicle:	2010 Ford Transit Connect	NHTSA No.	MA0218
Test Program:	NCAP Side Impact	Test Date:	9/29/09

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat SID/HIII	Rear Seat SID/HIII
Dummy Type / Serial No.	SID/HIII / 905	SID/HIII / 906
Head Contact	Airbag	Side Door Glass
Upper Torso Contact	Airbag	Door Skin
Lower Torso Contact	Airbag and Door Skin Arm Rest	Door Skin
Left Knee Contact	Door Skin	Door Skin
Right Knee Contact	Left Knee	Left Knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Locked/Unlocked Doors	Unlocked	Unlocked
Left Side Door Opening	Closed / Inoperable	Closed / Operable
Right Side Door Opening	Closed / Inoperable	Closed / Operable
Seat Movement	0 mm	None
Seat Back Failure	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	OK
Sill Separation	NONE
Windshield Damage	NONE
Window Damage	BOTH SIDE DOOR WINDOWS 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	NA	Yes	NA	NA
Side Head/Torso Combination Airbag	Yes	NA	NA	NA
Curtain Airbag	No	No	No	No

DATA SHEET NO. 6

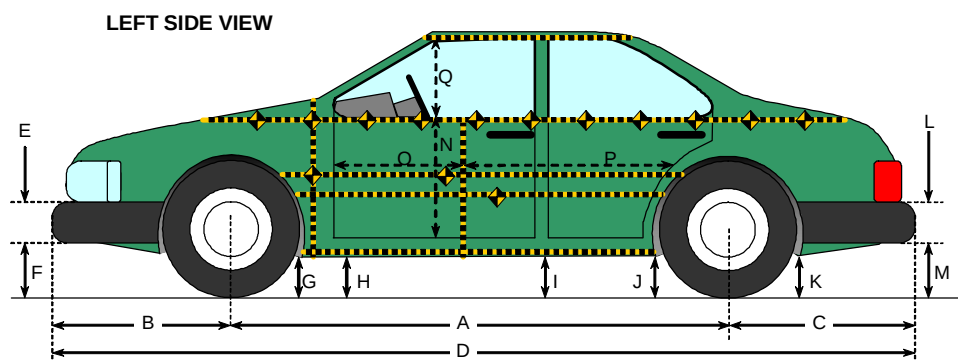
VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2010 Ford Transit Connect

NHTSA No. MA0218

Test Program: NCAP Side Impact

Test Date: 9/29/09



All Measurements in mm

Code	Measurement Description	Pre-Test (delivered)	Pre-Test (as tested)	Post-Test (as tested)	Difference
A	Wheelbase	2914	2914	2901	13
B	Front Axle to FSOV	914	914	919	-5
C	Rear Axle to RSOV	745	745	737	8
D	Total Length at Centerline	4573	4573	4557	16
E	Front Bumper Thickness	95	95	95	0
F	Front Bumper Bottom to Ground	445	434	453	-19
G	Sill Height at Front Wheel Well	250	232	238	-6
H	Sill Height at Front Door Leading Edge	244	225	234	-9
I	Sill Height at "B" Pillar	270	245	262	-17
J1	Sill Height at Rear Wheel Well	254	227	254	-27
J2	Pinch Weld Height at Rear Wheel Well	288	262	294	-32
K	Sill Height Aft of Rear Wheel Well	325	293	298	-5
L	Rear Bumper Thickness	165	165	165	0
M	Rear Bumper Bottom to Ground	358	330	328	2
N	Sill Height to Window Bottom Sill	720	720	685	35
O	Front Door Leading Edge to Impact CL	926	926	849	77
P	Rear Door Trailing Edge to Impact CL	1154	1154	1096	58
Q	Front Window Opening	579	579	583	-4
R	Right Side Length	4506	4506	4467	39
S	Left Side Length	4504	4504	4497	7
T	Vehicle Width at "B" Post	1755	1755	1513	242

DATA SHEET NO. 7

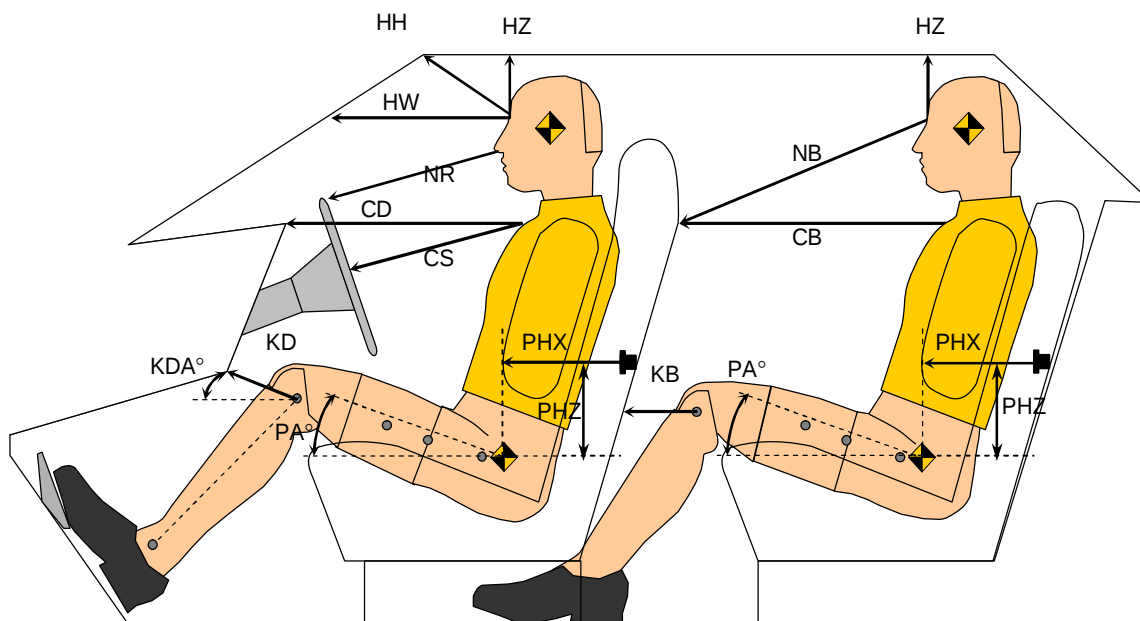
SID/HIII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2010 Ford Transit Connect

NHTSA No. MA0218

Test Program: NCAP Side Impact

Test Date: 9/29/09

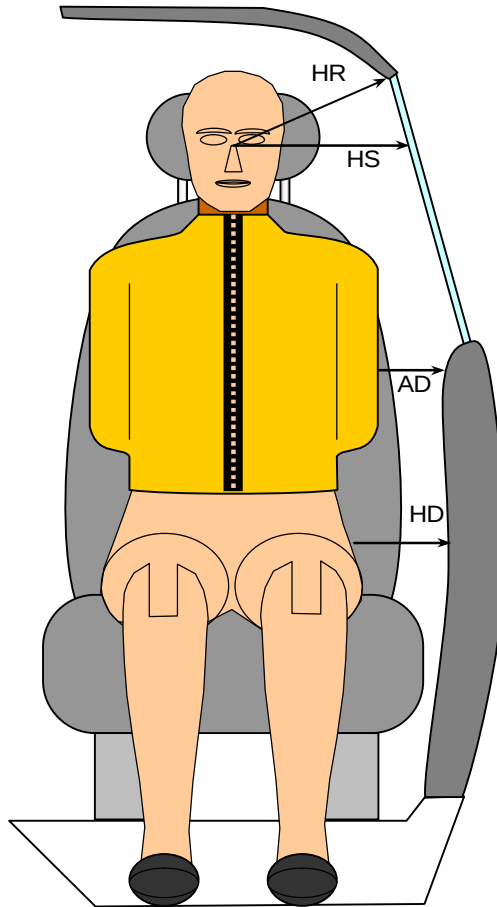


Driver Code	Pass. Code	Measurement Description	Driver S/N 905		Passenger S/N 906	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	539			
HW		Head to Windshield	779			
HZ	HZ	Head to Roof	494		485	
NR	NB	Nose to Rim/Nose to Seatback	433		609	
CD	CB	Chest to Dash or Seatback	587		528	
CS		Chest to Steering Wheel	286			
KDL	KBL	Left Knee to Dash or Seatback	134	29	185	17
KDR	KBR	Right Knee to Dash or Seatback	129	29	205	15
PA	PA	Pelvic Angle		23.3		24.2
PHX	PHX	H-Point to Striker (X-Axis)	280		331	
PHZ	PHZ	H-Point to Striker (Z-Axis)	261		180	

DATA SHEET NO. 8

SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle:	2010 Ford Transit Connect	NHTSA No.	MA0218
Test Program:	NCAP Side Impact	Test Date:	9/29/09



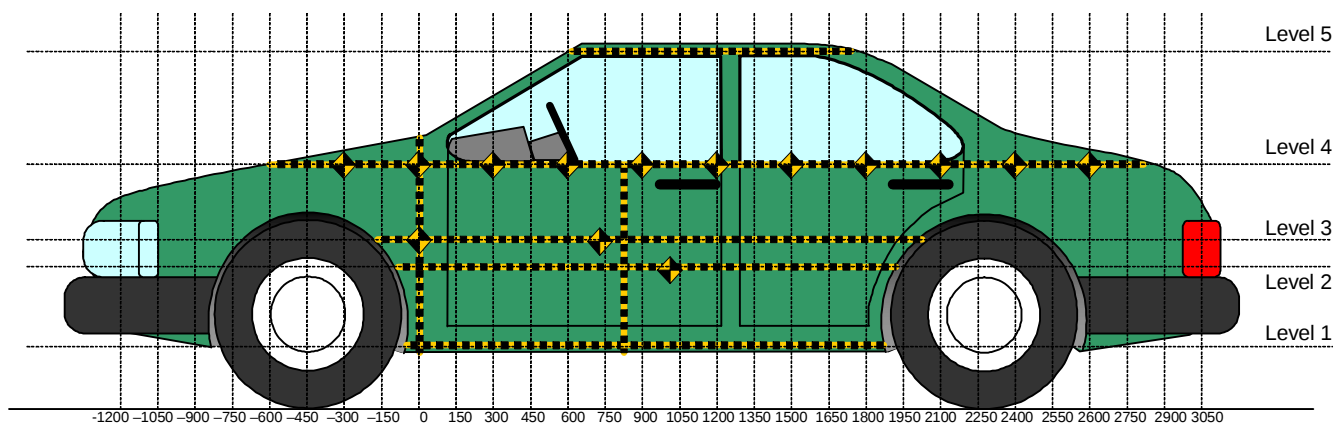
FRONT VIEW OF DUMMY

Code	Measurement Description	Units	Driver S/N 905	Passenger S/N 906
HR	Head to Side Header	mm	381	380
HS	Head to Side Window	mm	447	378
AD ₁	Arm to Door (at upper rib level)	mm	99	135
AD ₂	Arm to Door (at lower rib level)	mm	119	127
HD	H-Point to Door	mm	181	181

DATA SHEET NO. 9

VEHICLE SIDE MEASUREMENTS

Test Vehicle:	2010 Ford Transit Connect	NHTSA No.	MA0218
Test Program:	NCAP Side Impact	Test Date:	9/29/09



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.

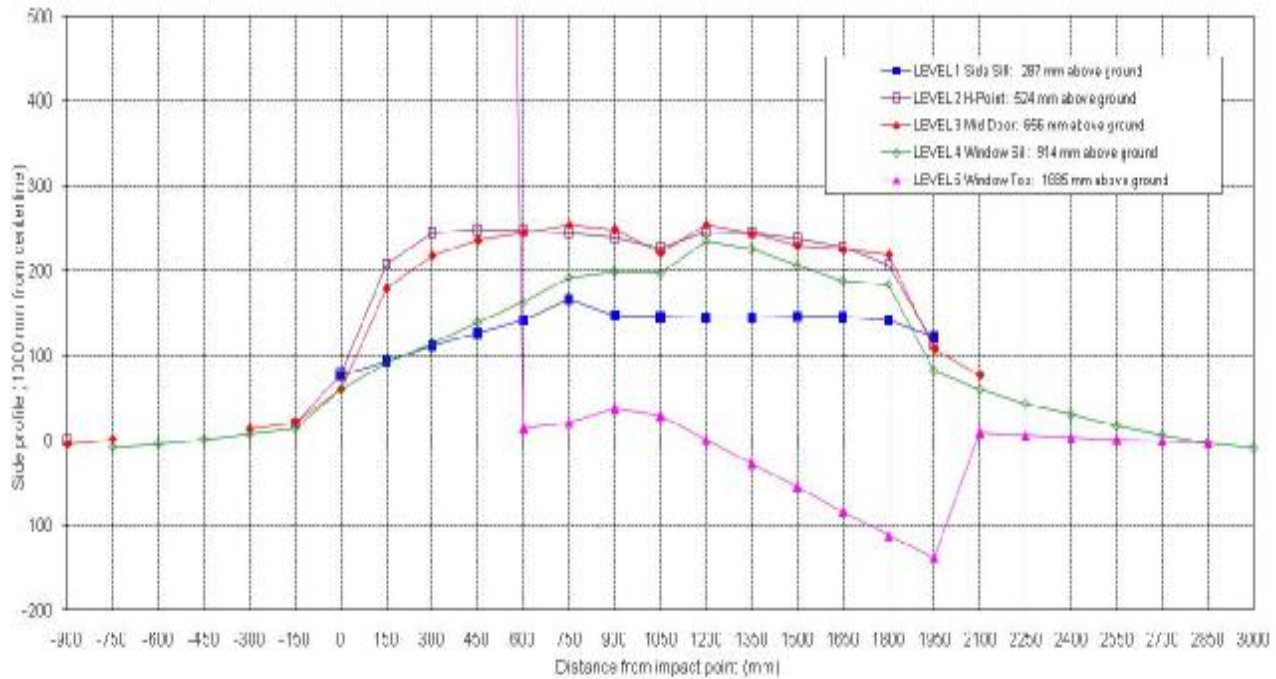
Level	Measurement Description	Maximum Exterior Static Crush	Height Above Ground	Distance From Impact
1	Sill Top	166	287	750
2	Occupant H-Point	248	524	450
3	Mid Door	254	656	750
4	Window Sill	235	914	1200
5	Window	37	1685	900
	Maximum Penetration	254		

DATA SHEET NO. 10

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2010 Ford Transit Connect
Test Program: NCAP Side Impact

NHTSA No. MA0218
Test Date: 9/29/09



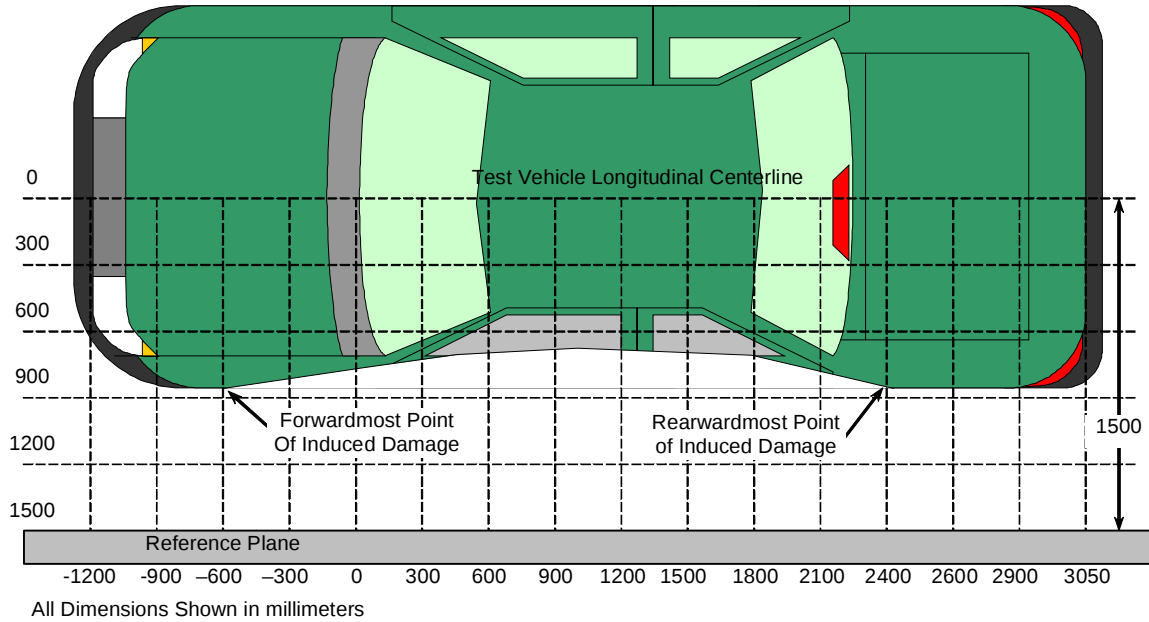
NOTE: All dimensions are in millimeters with a tolerance of ±1 mm

LEVEL	HEIGHT (mm)		900	750	600	450	300	150	0	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700	2850	3000
LEVEL 1		PRE	--	--	--	--	--	--	155	137	135	135	136	137	139	139	139	139	139	139	139	139	--	--	--	--	--	--	--
SIDE	287	POST	--	--	--	--	--	--	253	230	206	212	222	237	239	238	233	240	242	244	241	211	--	--	--	--	--	--	--
SILL		CRUSH	N/A	N/A	N/A	N/A	N/A	N/A	77	95	112	126	142	165	147	143	144	144	146	145	142	122	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LEVEL 2		PRE	167	--	--	--	--	128	121	148	142	144	144	145	145	145	145	146	146	146	148	148	141	--	--	--	--	--	--
H	524	POST	167	--	--	--	--	158	220	326	390	392	391	390	383	380	382	381	384	376	355	254	--	--	--	--	--	--	--
POINT		CRUSH	0	N/A	N/A	N/A	N/A	10	73	208	242	246	247	242	239	227	246	245	238	226	206	113	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LEVEL 3		PRE	192	139	--	--	128	121	143	140	136	132	129	125	122	132	133	133	134	134	123	134	109	--	--	--	--	--	--
MID	656	POST	190	139	--	--	128	122	203	319	334	308	234	280	234	233	237	267	324	349	344	242	186	--	--	--	--	--	--
DOOR		CRUSH	0	1	N/A	N/A	13	11	60	139	218	236	242	234	249	221	224	244	236	223	219	108	77	N/A	N/A	N/A	N/A	N/A	N/A
LEVEL 4		PRE	--	216	188	176	168	150	128	132	146	142	141	139	142	134	136	134	134	133	126	137	141	146	149	132	135	161	187
WINDOW	914	POST	--	205	184	177	170	157	218	243	261	282	284	278	244	231	231	260	340	323	320	219	201	189	179	170	162	138	133
SILL		CRUSH	N/A	-8	-4	1	7	14	60	91	112	139	162	182	180	197	223	228	206	188	184	82	60	45	50	17	6	-3	-8
LEVEL 5		PRE	--	--	--	--	--	--	--	--	--	242	282	281	276	276	273	272	269	268	268	270	271	271	272	274	276	289	--
WINDOW	1065	POST	--	--	--	--	--	--	--	--	--	230	289	282	212	207	216	240	274	284	126	152	180	270	272	272	276	277	--
TOP		CRUSH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8	14	21	51	29	1	-20	-22	-84	-112	-128	9	6	3	1	0	-3	N/A

DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle:	2010 Ford Transit Connect	NHTSA No.	MA0218
Test Program:	NCAP Side Impact	Test Date:	9/29/09



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)	2850	914	161	158	-3
2	2190	914	144	194	50
3	1530	524	146	382	236
4	870	656	125	375	250
5	210	524	147	370	223
6 (LF)	-450	914	176	177	1

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

DATA SHEET NO. 12

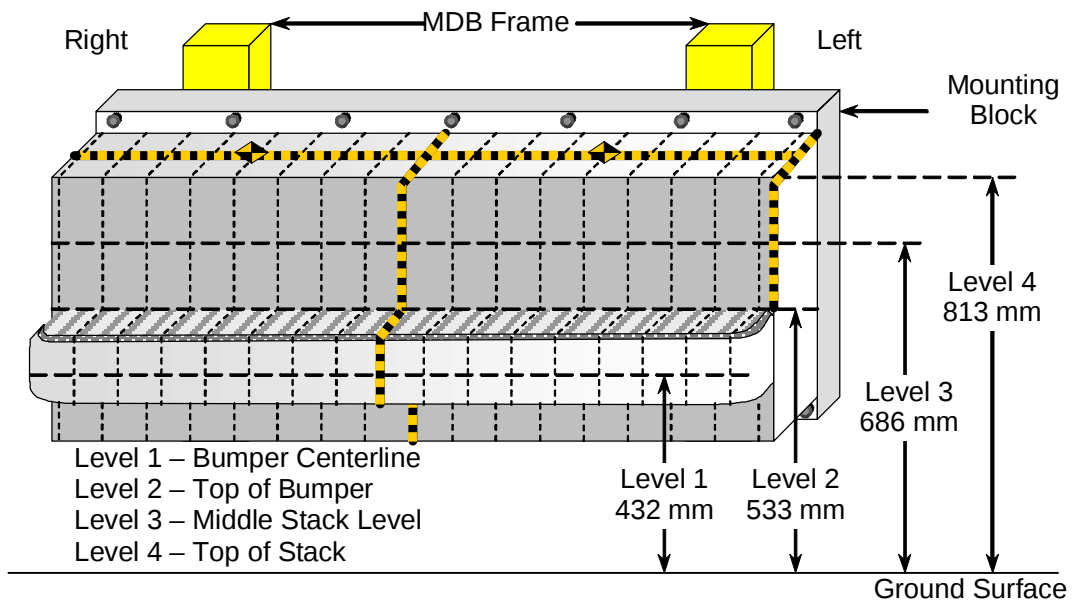
DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2010 Ford Transit Connect

NHTSA No. MA0218

Test Program: NCAP Side Impact

Test Date: 9/29/09



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	501	509	512	565	578	581	584	569	549	571	562	565	555	535	535	510	505
STACK		CRUSH	100	83	60	45	34	31	20	31	64	47	44	30	60	75	90	105	116
LEVEL 3		PRE	411	411	412	412	412	412	412	412	413	412	412	412	412	412	412	412	412
MID	686	POST	411	424	437	475	497	512	480	381	383	433	491	491	438	381	369	454	529
LEVEL		CRUSH	97	87	75	60	50	40	32	31	30	21	21	21	21	31	43	58	83
LEVEL 2		PRE	411	412	412	412	412	412	412	412	413	412	412	412	412	412	412	412	412
TOP	533	POST	299	306	308	311	318	318	320	325	326	328	332	331	333	332	332	332	341
BUMPER		CRUSH	112	106	104	95	94	94	92	87	87	84	80	81	79	80	80	80	75
LEVEL 1		PRE	501	513	513	513	513	513	513	514	514	514	514	514	514	514	514	514	505
MID	430	POST	366	385	389	391	393	393	392	393	394	397	398	397	397	395	393	391	374
BUMPER		CRUSH	135	128	124	122	120	120	121	121	120	117	116	117	117	119	121	123	131
*Heights measured above ground level																			

*Heights measured above ground level

DATA SHEET NO. 13

VEHICLE ACCELEROMETER LOCATIONS

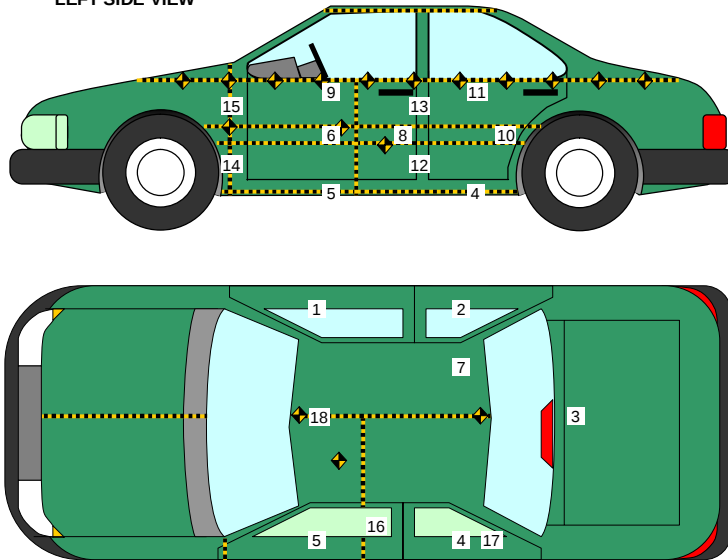
Test Vehicle: 2010 Ford Transit Connect

NHTSA No. MA0218

Test Program: NCAP Side Impact

Test Date: 9/29/09

LEFT SIDE VIEW



Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	2943	645	350
2	Right Sill at Rear Seat	2007	645	421
3	Rear Floorpan Above Axle	1181	-65	548
4	Left Sill at Rear Door	1995	-649	416
5	Left Sill at Front Door	2876	-642	330
6	Left Front Door C/L**	-	-	-
7	Rear Occupant Compartment	2069	375	374
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	2163	-654	510
13	Left Middle B-Post	2120	-660	1080
14	Left Lower A-Post	3092	-646	359
15	Left Middle A-Post	3158	-682	1099
16	Front Seat Track	2234	-538	444
17	Rear Seat Track or Structure	1220	-697	578
18	Vehicle CG	2415	28	518

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

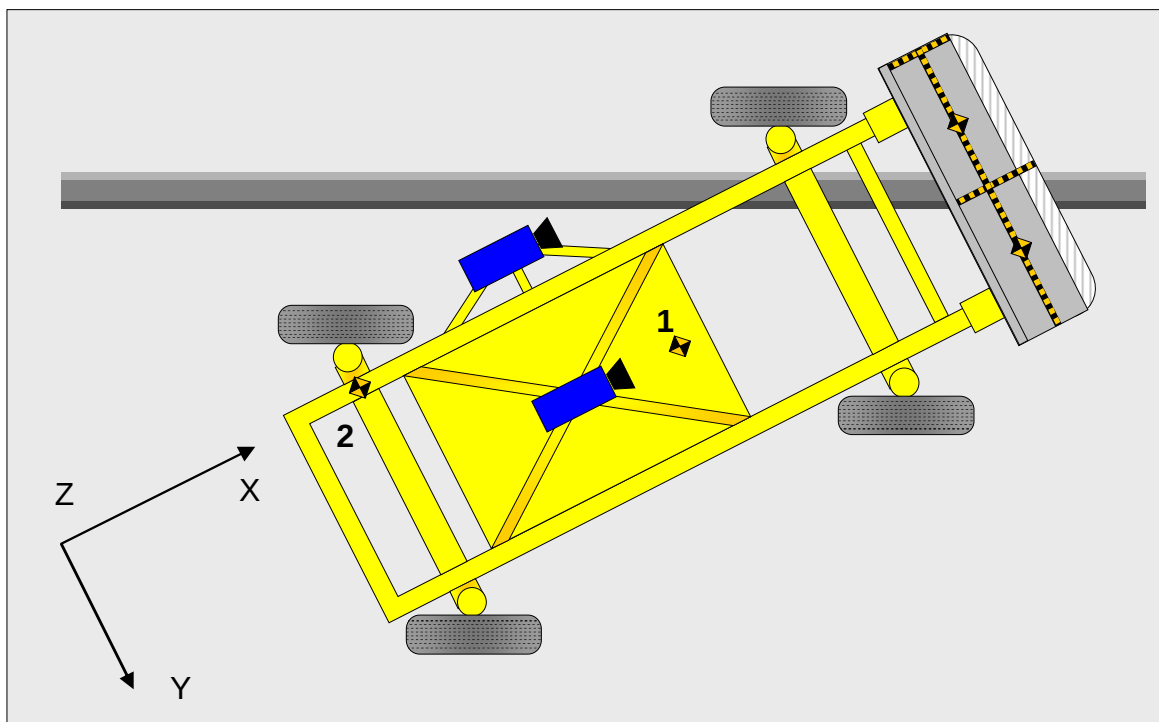
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2010 Ford Transit Connect

NHTSA No. MA0218

Test Program: NCAP Side Impact

Test Date: 9/29/09



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 Ford Transit Connect

NHTSA No. MA0218

Test Program: NCAP Side Impact

Test Date: 9/29/09

	Elements	Pre-Test (mm)
1	Total Length	4573
2	Total Width	1755
3	Bumper Top Height	537
4	Bumper Bottom Height	434
5	Longitudinal Member Top Height	572
6	Distance between Longitudinal Members	1077
7	Longitudinal Member Width	85
8	Engine Top Height	838
9	Engine Bottom Height	245
10	Engine and gearbox width	503
11	Front bumper-engine distance	428
12	Front shock absorber fixing height	909
13	Bonnet leading edge height	743
14	Front shock absorber fixing width	1100
15	Front bumper – front axle distance	915
16	Front axle – a pillar distance	417
17	A-pillar – B-pillar distance	1143
18	B-Pillar – rear axle distance	1352
19	B-pillar – C-pillar distance	990
20	Roof sill bottom height	1601
21	Roof sill top height	1888
22	Floor sill bottom height	318
23	Floor sill top height	393

DATA SHEET NO. 16

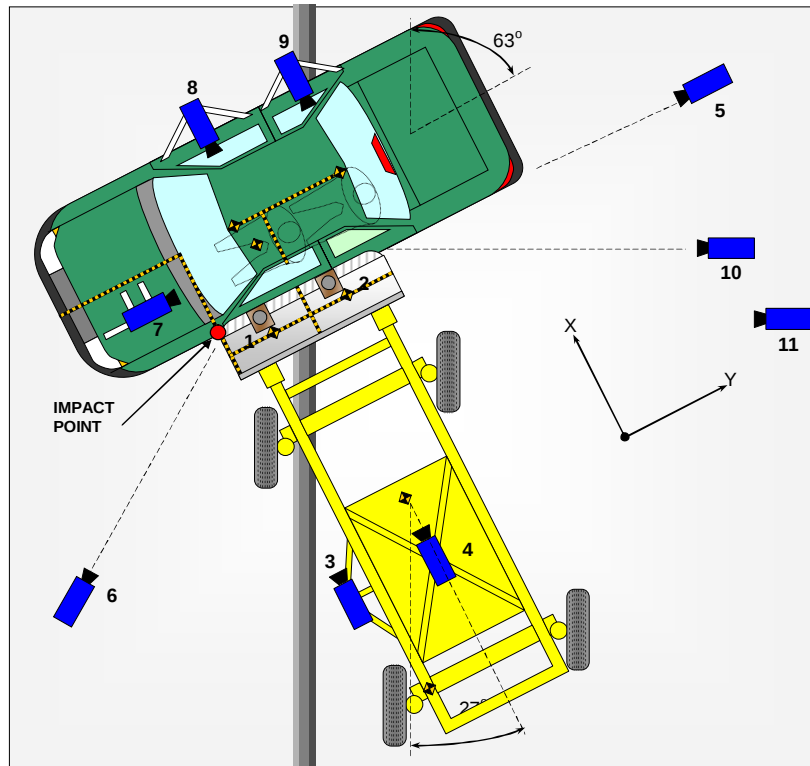
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2010 Ford Transit Connect

NHTSA No. MA0218

Test Program: NCAP Side Impact

Test Date: 9/29/09



No.	Camera View	Location (mm)			Angle (deg)	Lens (mm)	Film Speed (fps)
		X	Y	Z			
1	Overhead Overall	72	812	-4880	-90	8	500
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	0	11560	974	0.7	50	1000
6	Left Side, Ground Level, Overall	2637	2014	951	2.1	28	1000
7	Vehicle Onboard Front SID/HIII, Front	441	671	1375	3.7	25	1000
8	Vehicle Onboard Front SID/HIII, Side	1721	651	1105	4.1	12.5	1000
9	Vehicle Onboard Rear SID/HIII, Side	1709	1161	1099	6.5	12.5	1000
10	Secondary Impact Point	4721	3111	984	3.0	25	500
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

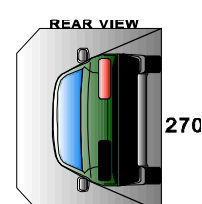
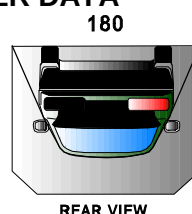
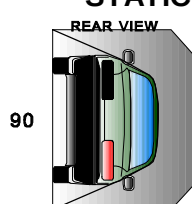
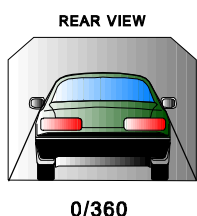
Test Vehicle:	2010 Ford Transit Connect	NHTSA No.	MA0218
Test Program:	NCAP Side Impact	Test Date:	9/29/09

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



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	13	seconds	5	minutes	6	minutes	13	seconds	7	minutes
180°-270°	1	minutes	01	seconds	5	minutes	6	minutes	1	seconds	7	minutes
270°-360°	1	minutes	05	seconds	5	minutes	6	minutes	5	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

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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-17: Pre-Test Right Side View



Figure A-18: Post-Test Right Side 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 ¾ View of Left Side Doors



Figure A-48: Post-Test Left Front ¾ 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

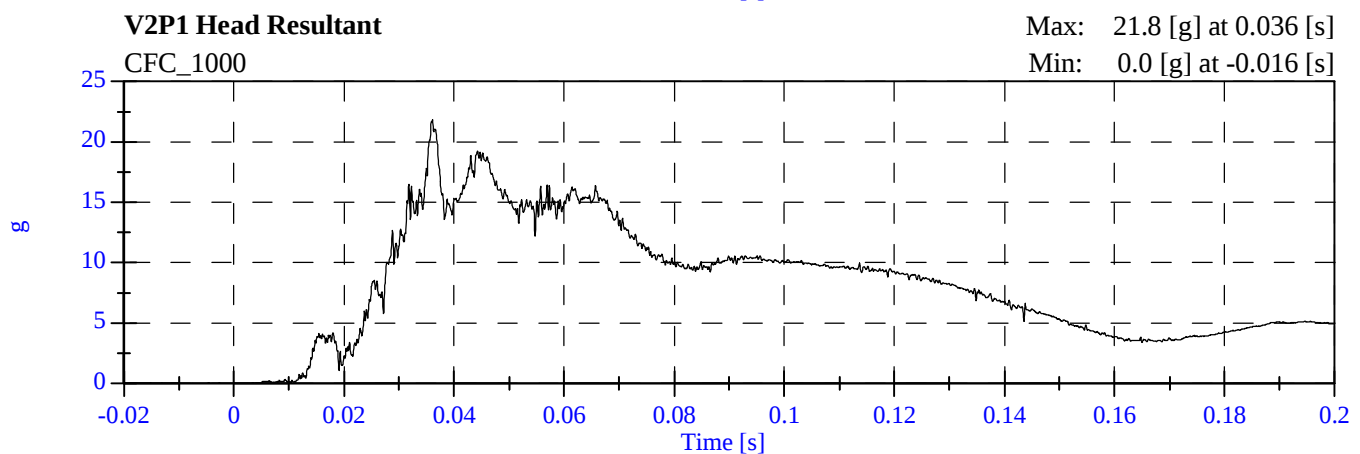
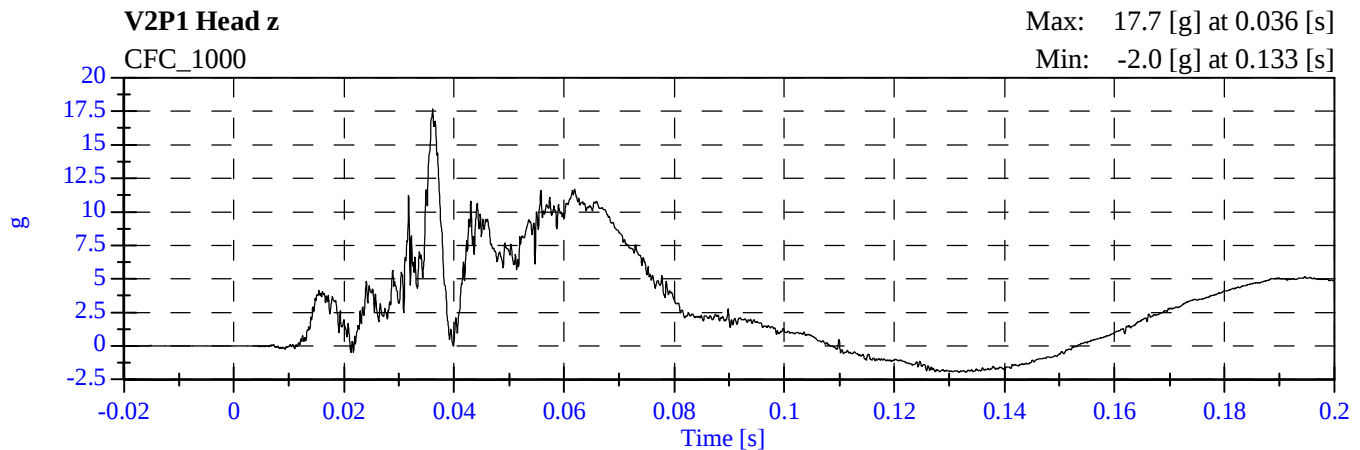
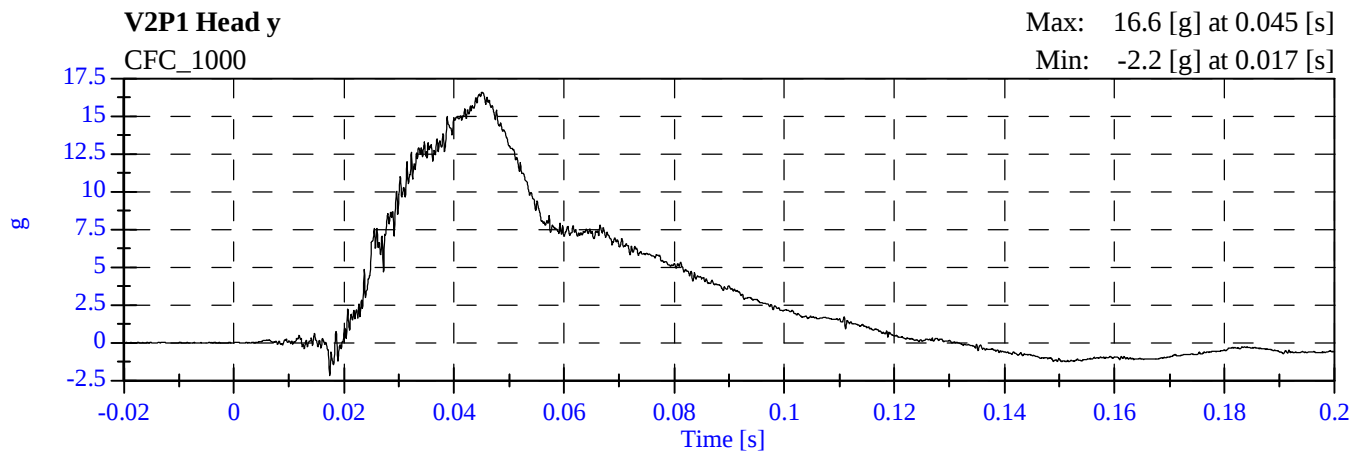
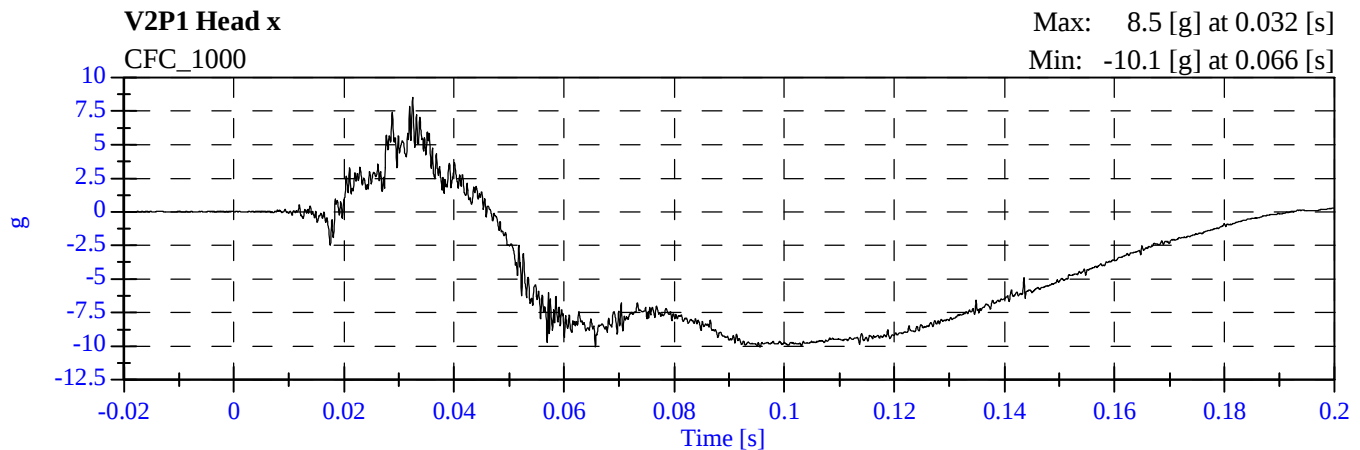
V2P1 Head Ax	V2A1 Right Front Sill Ax
V2P1 Head Ay	V2A1 Right Front Sill Ay
V2P1 Head Az	V2A1 Right Front Sill Az
V2P1 Upper Neck Fx	V2A2 Right Rear Sill Ax
V2P1 Upper Neck Fy	V2A2 Right Rear Sill Ay
V2P1 Upper Neck Fz	V2A2 Right Rear Sill Az
V2P1 Upper Neck Mx	V2A3 Rear Floorpan Ax
V2P1 Upper Neck My	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	V2A6 Left Front Door C/L Ay
V2P1 Lower Rib Redundant Ay	V2A7 Right Rear Compartment Ay
V2P1 Lower Spine Ay	V2A8 Left Front Door Midrear Ay
V2P1 Lower Spine Redundant Ay	V2A9 Left Front Door Upper C/L Ay
V2P1 Pelvic Ay	V2A10 Left Rear Door Midrear Ay
V2P1 Pelvic Redundant Ay	V2A11 Left Rear Door Upper C/L Ay
V2P4 Head Ax	V2A12 Left Lower B Post Ay
V2P4 Head Ay	V2A13 Left Mid B Post Ay
V2P4 Head Az	V2A14 Left Lower A Post Ay
V2P4 Upper Neck Fx	V2A15 Left Mid A Post Ay
V2P4 Upper Neck Fy	V2A16 Front Seat Track Ay
V2P4 Upper Neck Fz	V2A17 Rear Seat Track Ay
V2P4 Upper Neck Mx	V2A18 Target CG Ax
V2P4 Upper Neck My	V2A18 Target CG Ay
V2P4 Upper Neck Mz	V2A18 Target CG Az
V2P4 Upper Rib Ay	V1 Moving Barrier CG Ax
V2P4 Upper Rib Redundant Ay	V1 Moving Barrier CG Ay
V2P4 Lower Rib Ay	V1 Moving Barrier CG Az
V2P4 Lower Rib Redundant Ay	V1 Moving Barrier Left Rail Ax
V2P4 Lower Spine Ay	V1 Moving Barrier Left Rail Ay
V2P4 Lower Spine Redundant Ay	
V2P4 Pelvic Ay	
V2P4 Pelvic Redundant Ay	

TEST NOTES

The following data anomalies occurred:

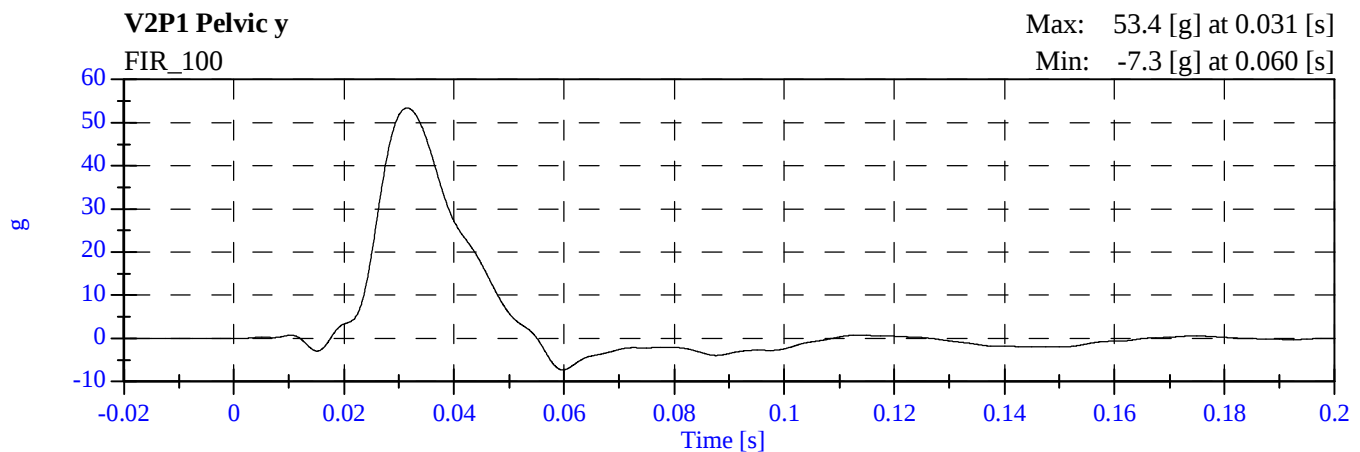
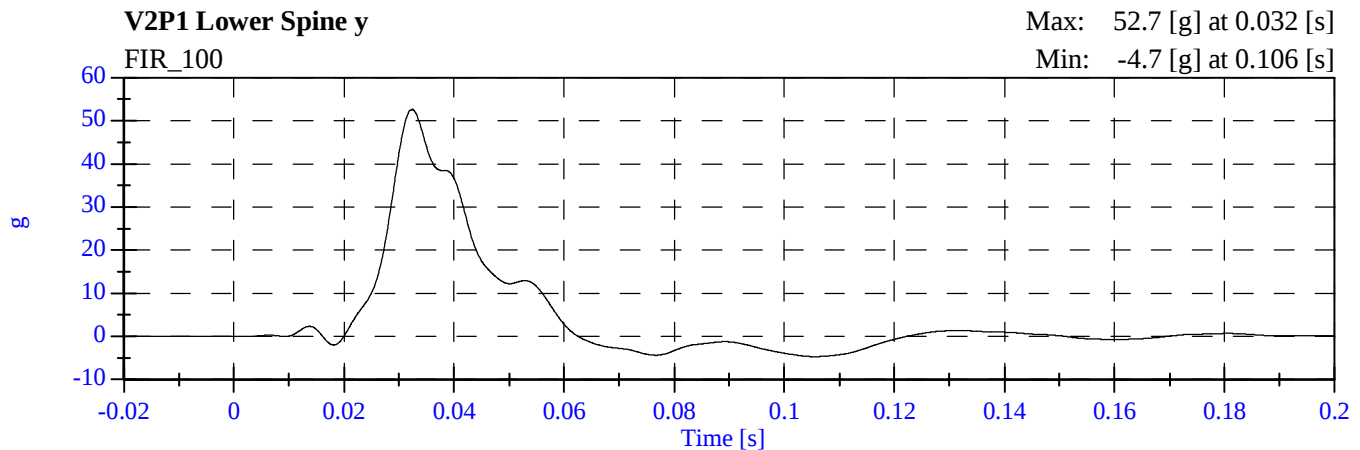
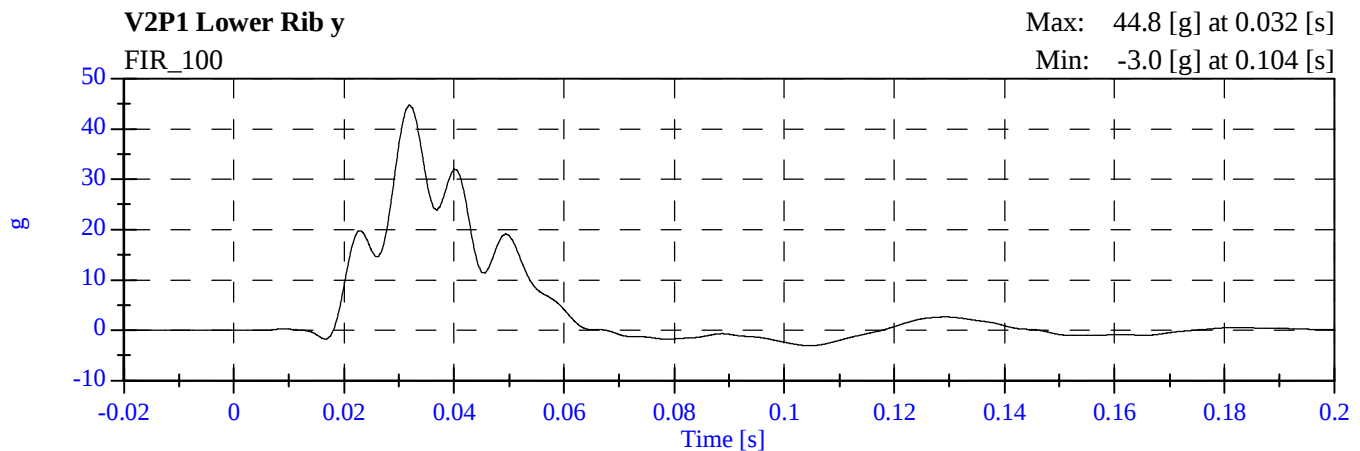
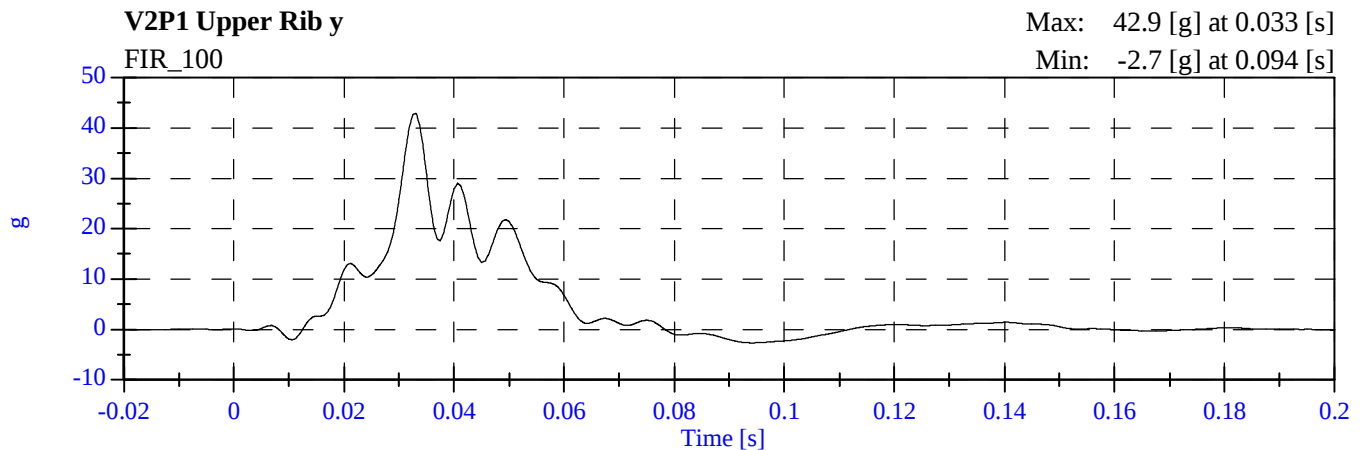
Side NCAP 2010 Ford Transit Connect

MA0218 - September 29, 2009



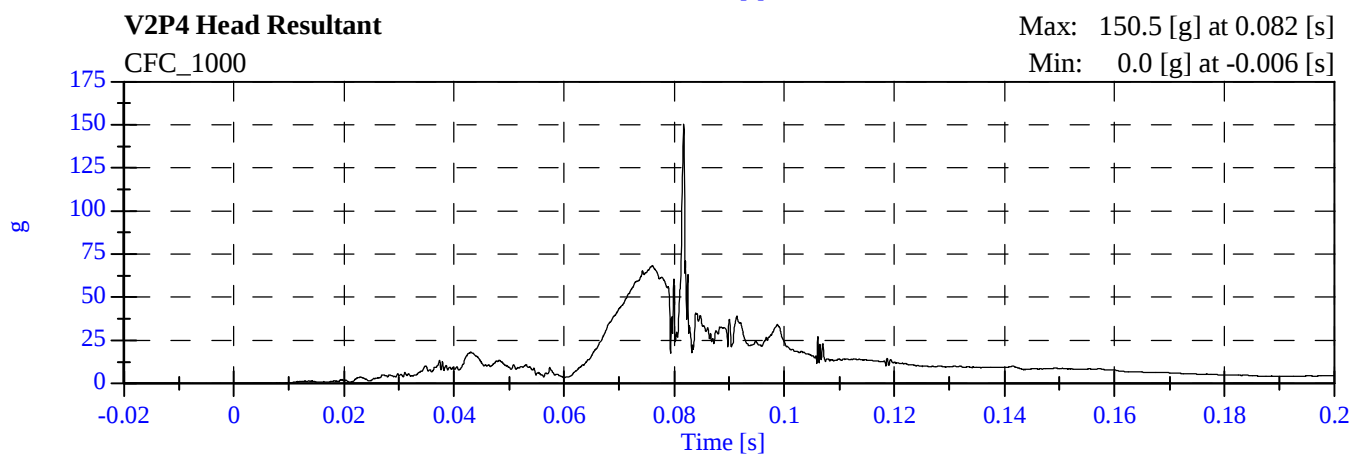
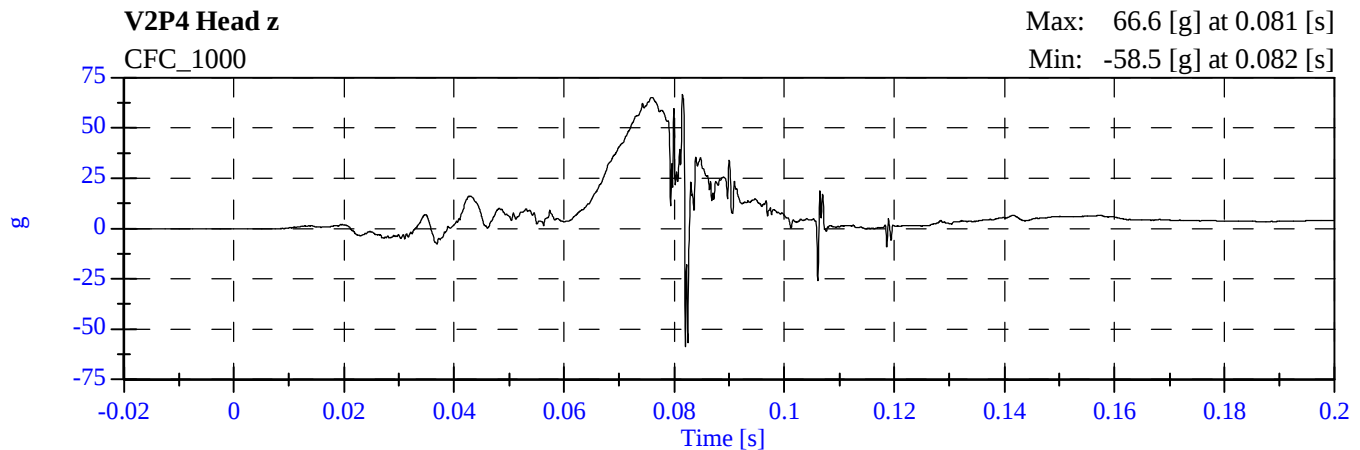
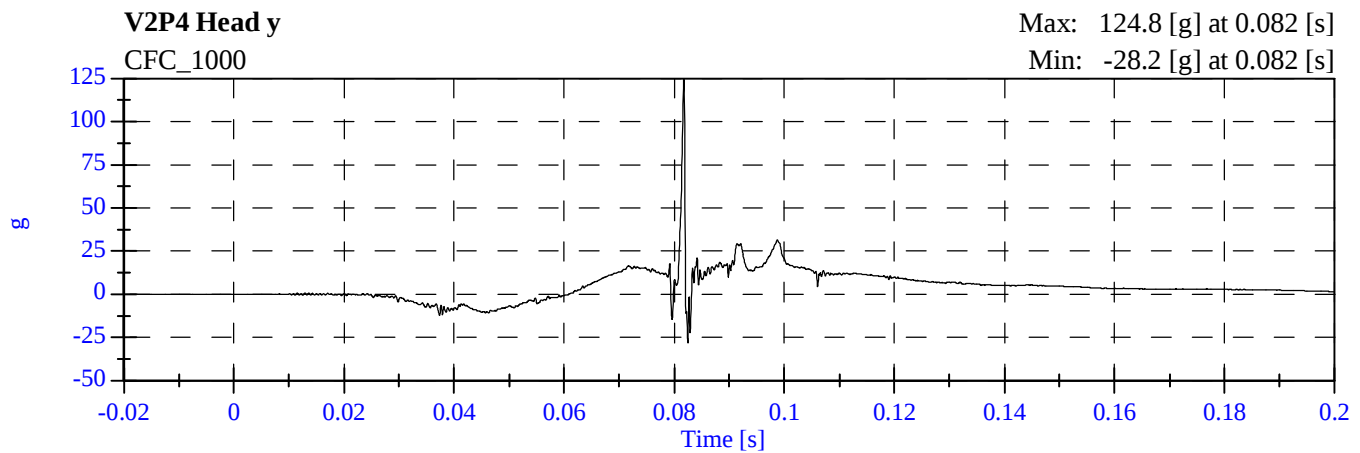
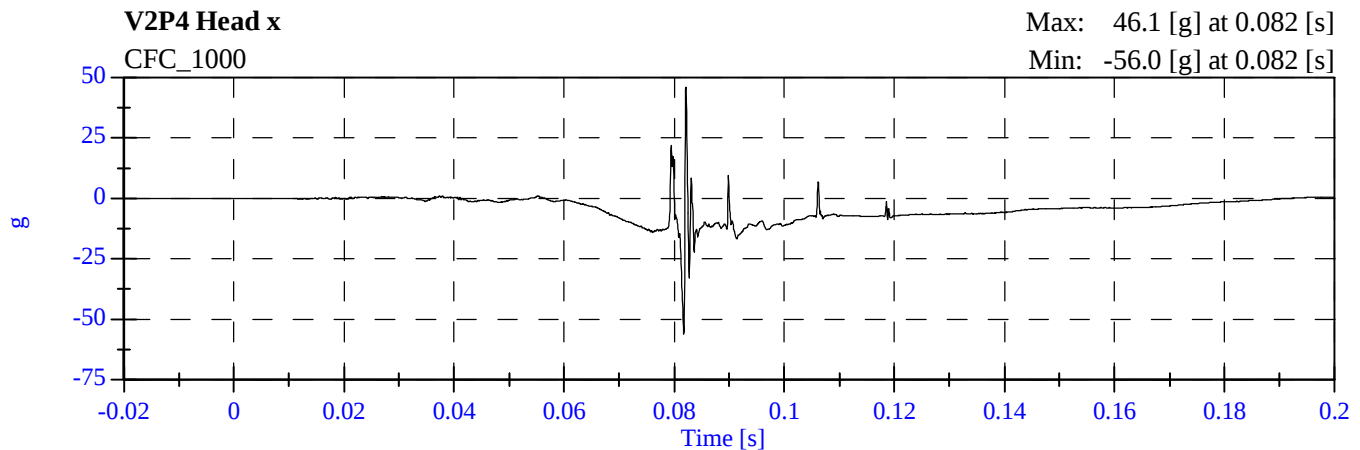
Side NCAP 2010 Ford Transit Connect

MA0218 - September 29, 2009



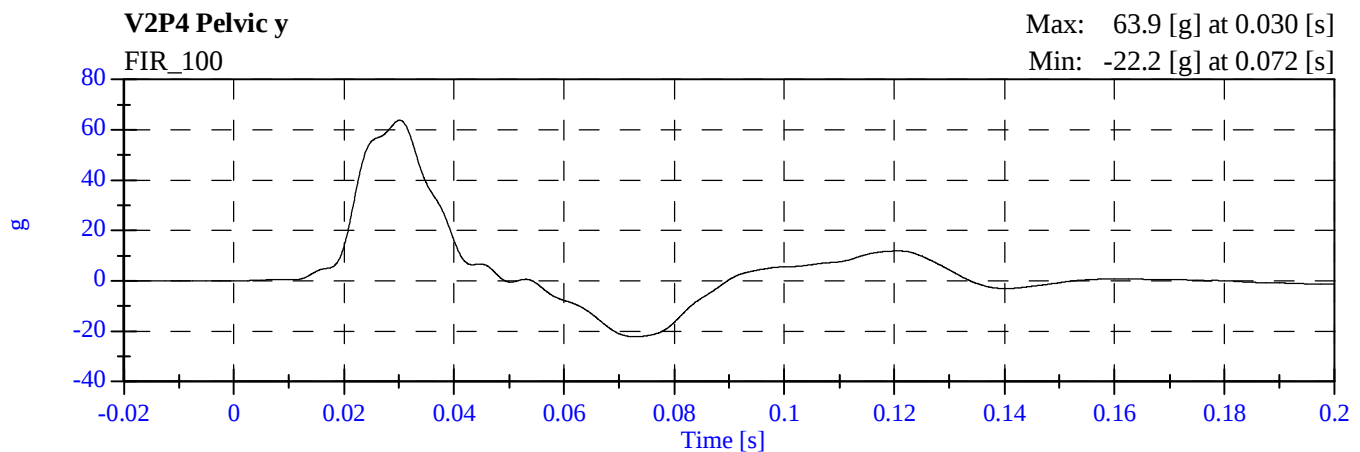
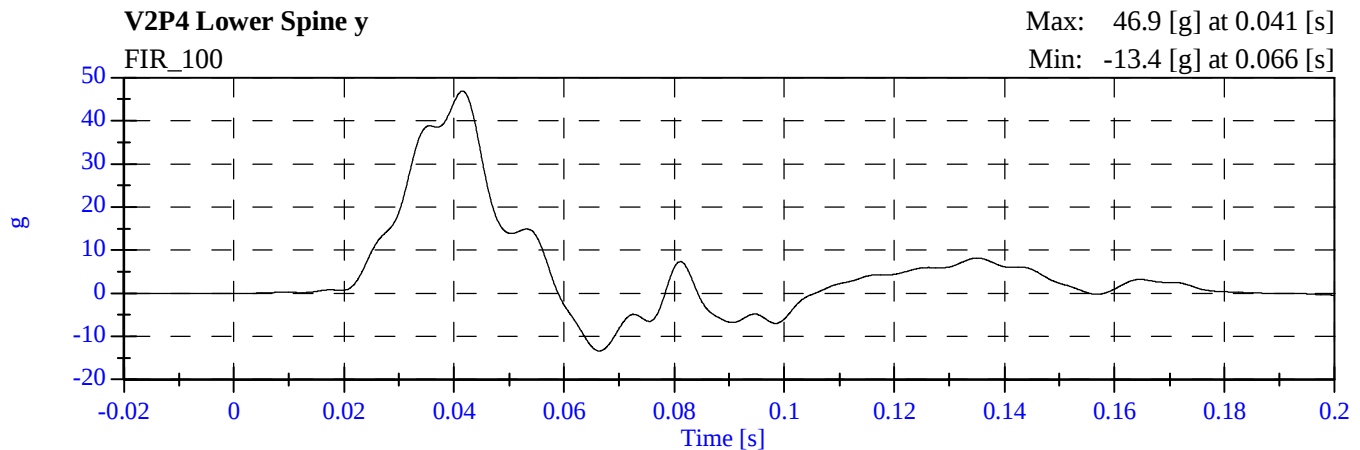
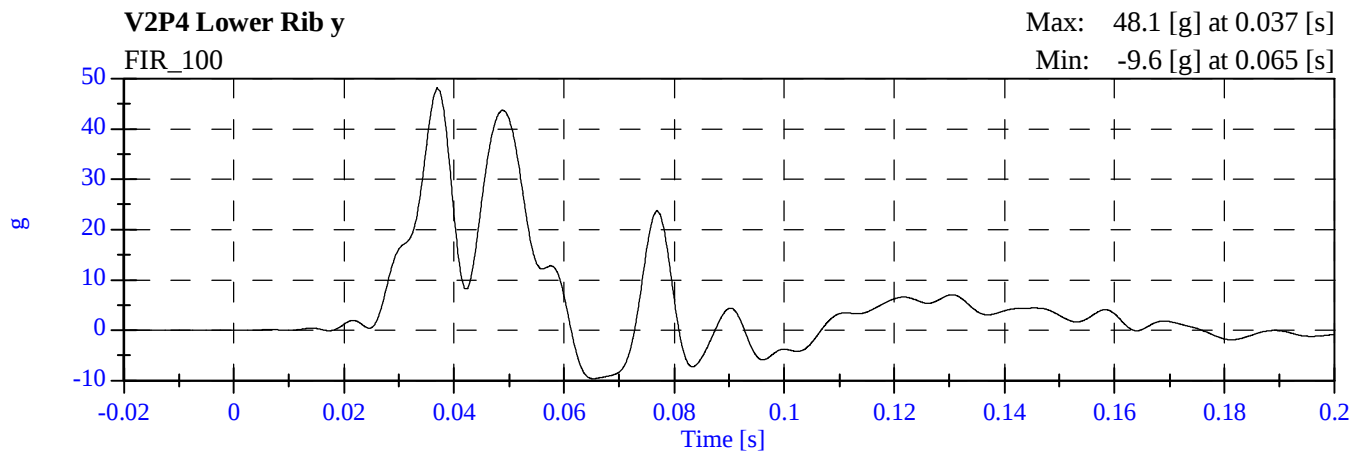
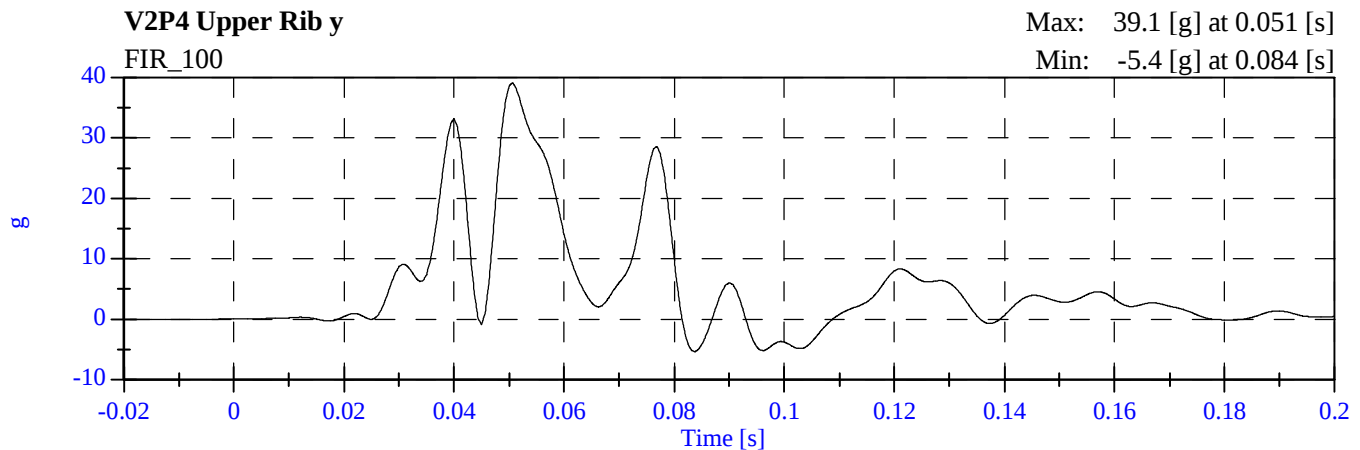
Side NCAP 2010 Ford Transit Connect

MA0218 - September 29, 2009



Side NCAP 2010 Ford Transit Connect

MA0218 - September 29, 2009



APPENDIX C

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

SUMMARY
SID H3 PRE & POST TEST CALIBRATION

CONFIGURED FOR LEFT SIDE IMPACT

Date: 5-09 and 6-09 to 11-09

Sequential Test Number:

1 & 2

Laboratory Technician:

A. Rudniski

TEST PARAMETER	SPECIFICATION	SID H3 NO.: 905		SID H3 NO.: 906	
		PRE TEST	POST TEST	PRE TEST	POST TEST
SH- Seated Height (mm)	889 - 909	905	906	904	905
RH- Rib Height (mm)	501 - 521	511	510	510	510
HP- Hip Pivot Height (mm)	99 ref.	99	99	99	99
RD- Rib from Back Line (mm)	229 - 241	235	234	234	235
KV- Knee Pivot from Back Line (mm)	511 - 526	519	519	521	520
SW- Knee Pivot to Floor (mm)	490 - 505	499	499	497	498
HW- Hip Width (mm)	356 - 391	371	370	370	372
THORAX IMPACTS					
TEMPERATURE (C)	18.9 - 25.5	22.2	21.1	22.2	21.1
RELATIVE HUMIDITY (%)	10 - 70	55	40	52	40
PROBE SPEED (m/s)	4.27 - 4.33	4.31	4.29	4.28	4.30
UPPER RIB (g's)	37 - 46	40.33	38.81	39.91	41.98
LOWER RIB (g's)	37 - 46	39.78	37.19	38.18	40.70
LOWER SPINE (g's)	15 - 22	20.83	18.91	20.38	19.99
PELVIS IMPACT					
TEMPERATURE (C)	18.9 - 25.5	22.2	21.1	23.3	21.1
RELATIVE HUMIDITY (%)	10 - 70	54	42	52	40
PROBE SPEED (m/s)	4.27 - 4.33	4.30	4.29	4.29	4.31
PELVIS (g's)	40 - 60	41.50	42.93	49.82	44.32

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: 5-09 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: 5-09 Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 – 909	905
RH- Rib Height (mm)	502 – 520	511
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	499
HW- Hip Width (mm)	356 - 391	371

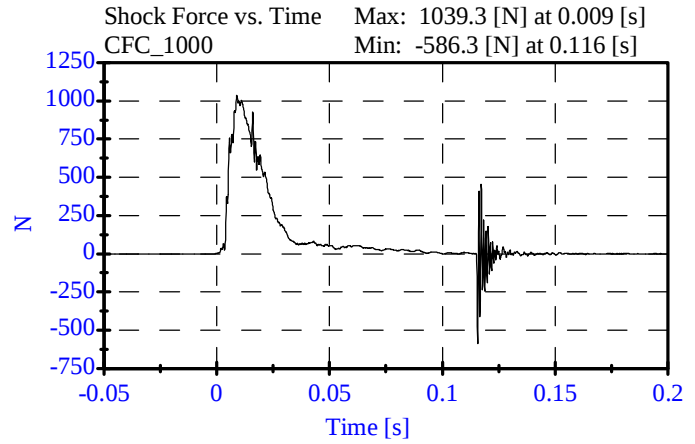
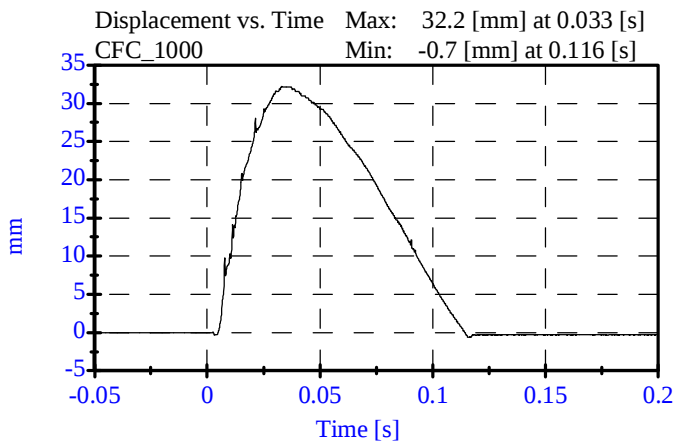
REMARKS: None

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

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
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

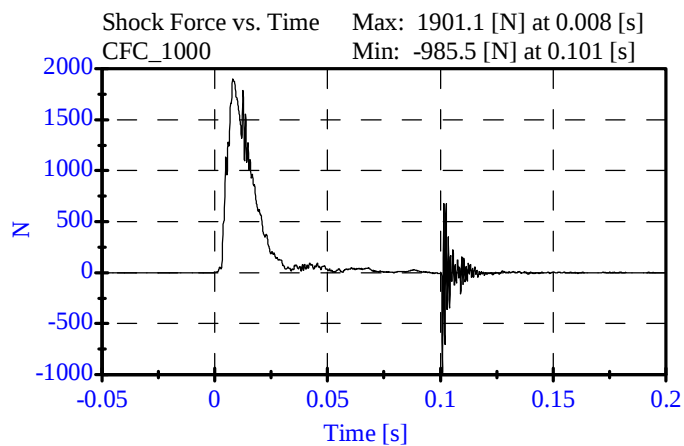
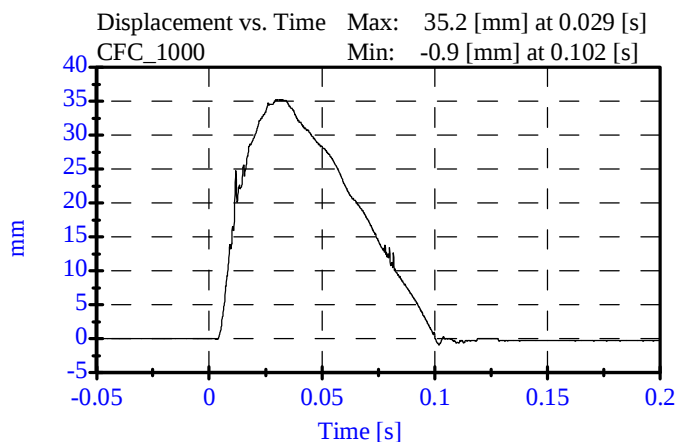
ATD Serial No: 905

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

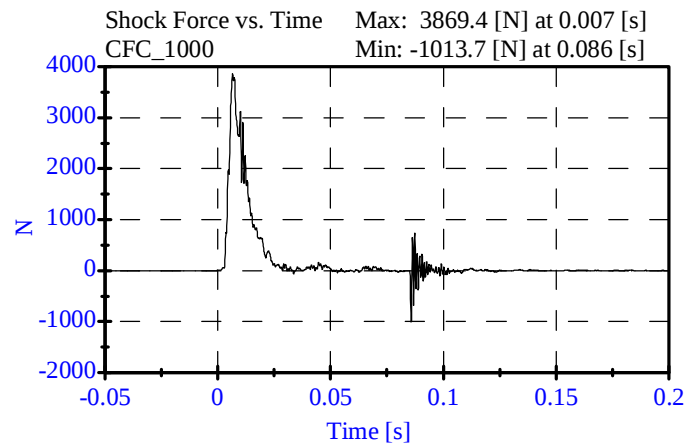
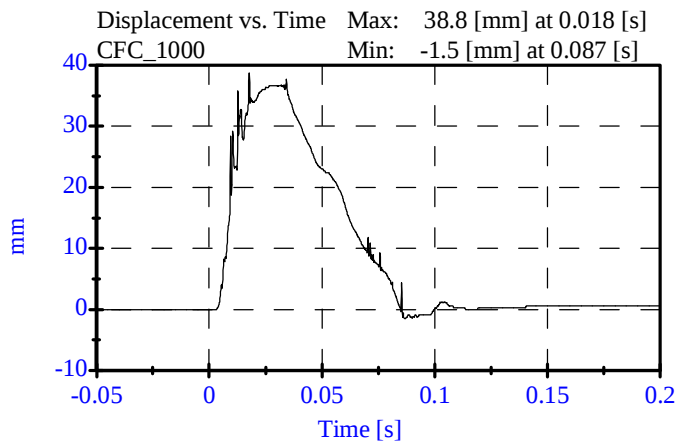
ATD Serial No: 905

Date: 05-28-09

Sequential Test Number: 1 File: 905SH1 05-28-09

Laboratory Technician: A. Rudniski

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:	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		

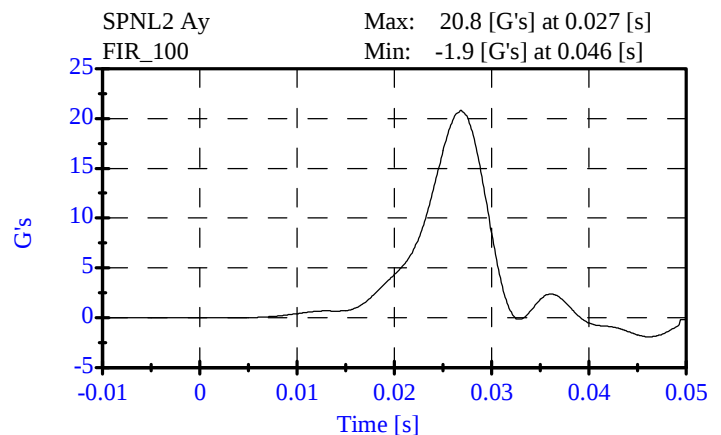
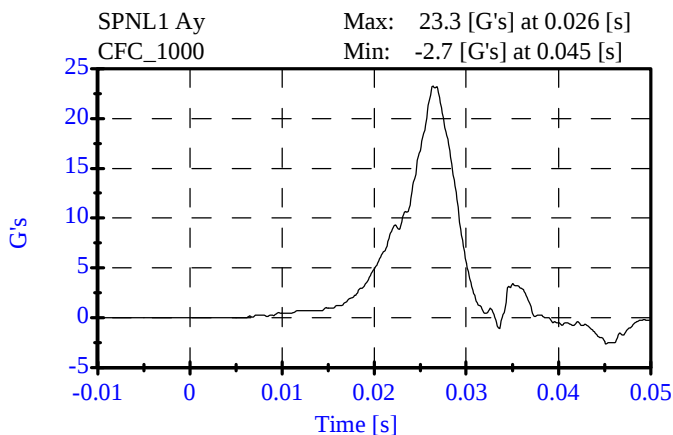
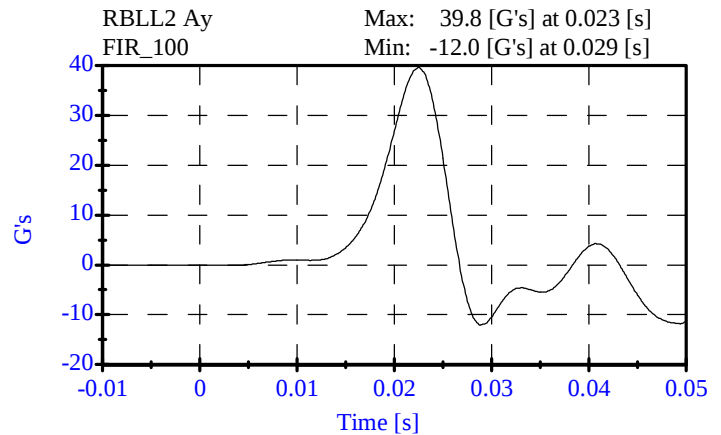
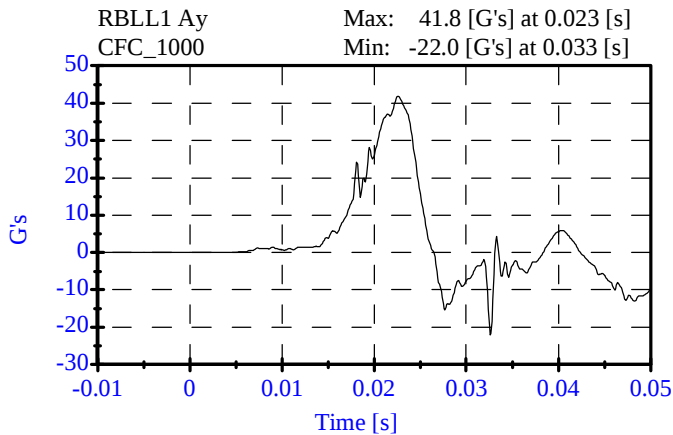
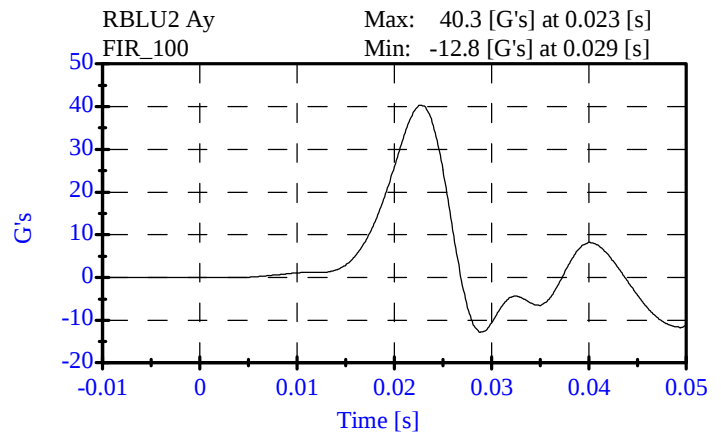
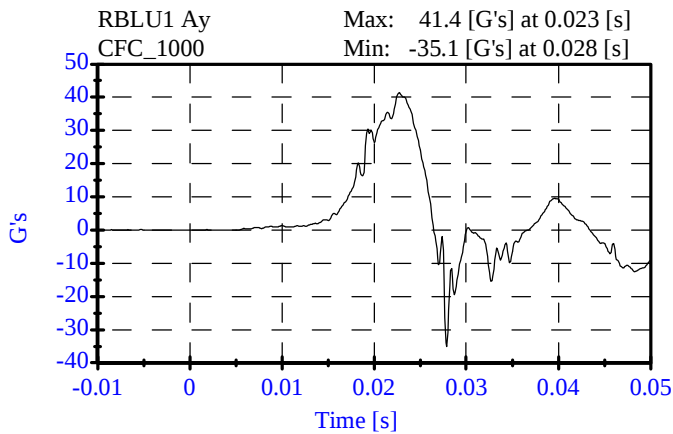


Thorax Impact Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 905
Date: 05-29-09

Sequential Test Number: 1 File: 905T1 05-29-09
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 %	55.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.31 m/s	Passed
Upper Rib Acceleration:	37.00-46.00 G's	40.33 G's	Passed
Lower Rib Acceleration:	37.00-46.00 G's	39.78 G's	Passed
Lower Spine Acceleration:	15.00-22.00 G's	20.83 G's	Passed

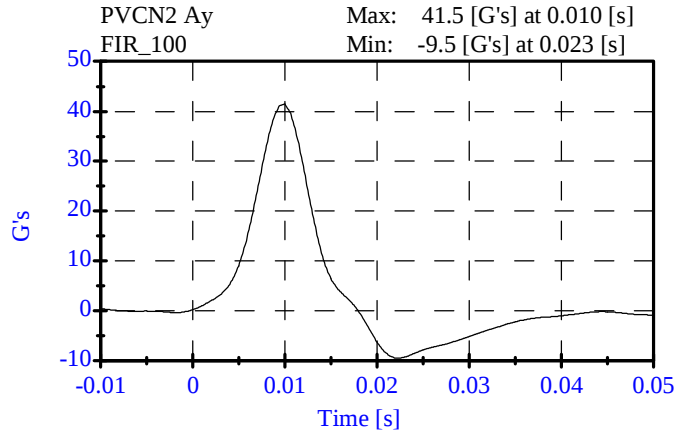
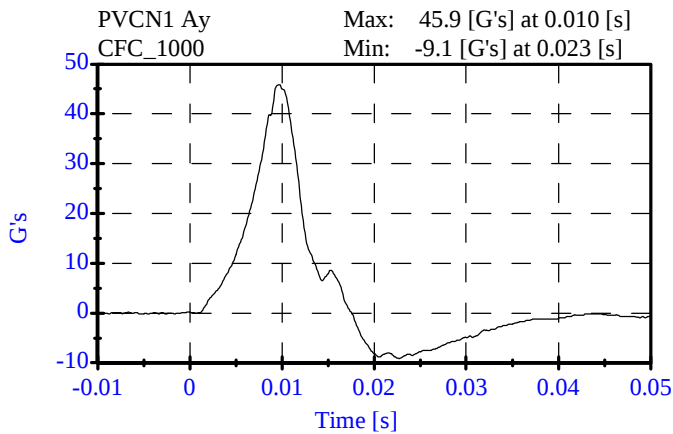


Pelvis Impact Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 905
Date: 05-29-09

Sequential Test Number: 1 File: 905P 05-29-09
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
Probe Velocity:	4.27- 4.33 m/s	4.30 m/s	Passed
Pelvis Y Acceleration:	40.00-60.00 G's	41.50 G's	Passed
Time Above 20 Gs	3.0-7.0 ms	6.4 ms	Passed

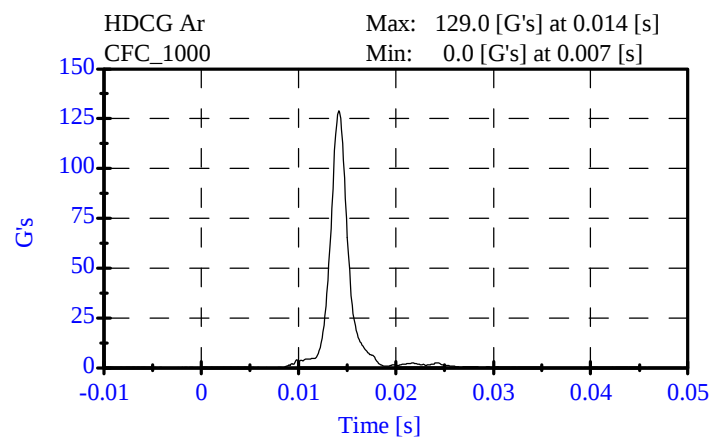
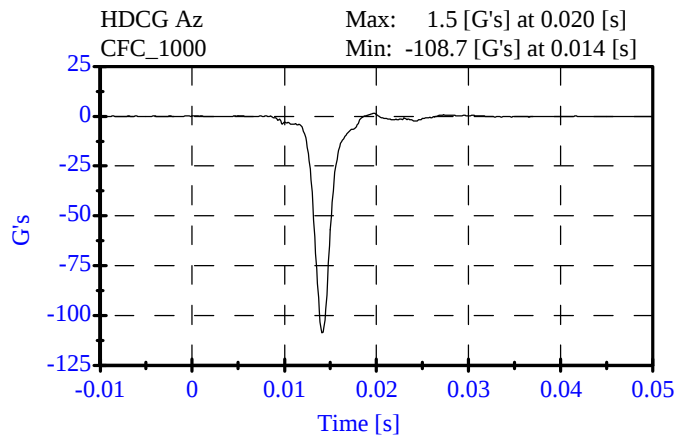
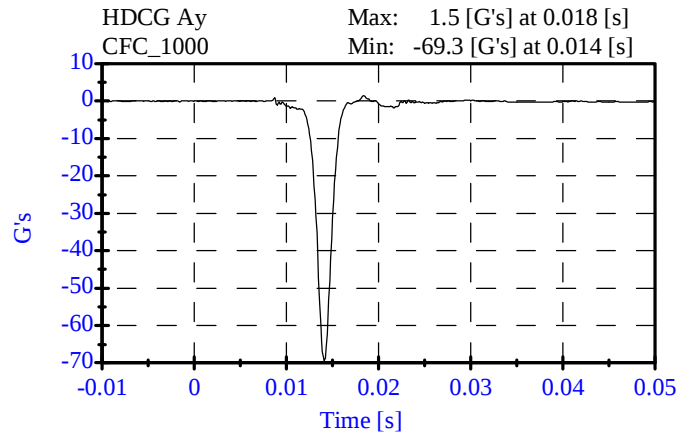
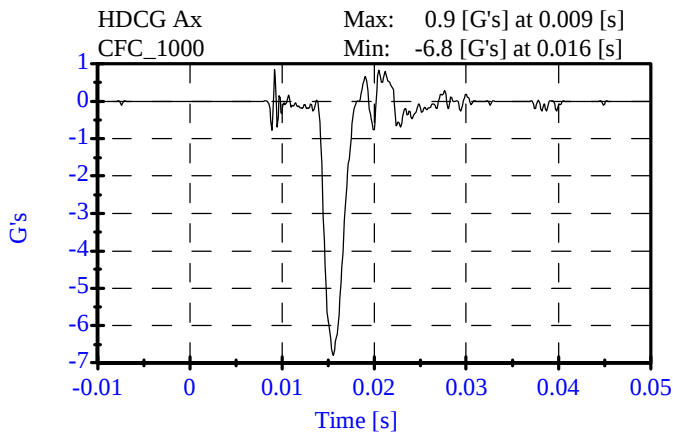


Head Drop Test **Pre-Test** **CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 905
Date: 05-20-09

Sequential Test Number: 1 File: 905H2 05-20-09
Laboratory Technician: A.Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.6 C	22.2 C	Passed
Lab Humidity:	10-70 %	24.00 %	Passed
Peak Resultant Accel.:	120-150 Gs	128.96 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	0.86 Gs	Passed
Curve PerCent NonModal:	< 15%	1.93 %	Passed



Neck Flexion Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 905
Date: 09-15-09

Sequential Test Number: 1 File: 905N 09-15-09
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 %	61.00 %	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	2.05 m/s	Passed
Delta V at 20 ms:	4.12- 5.10 m/s	4.25 m/s	Passed
Delta V at 30 ms:	5.73- 7.01 m/s	6.08 m/s	Passed
Delta V between 40-70 ms:	6.27- 7.64 m/s	7.49 m/s	Passed
D PLANE ROTATION			
Maximum Rotation:	66.0-82.0 Deg	73.30 Deg	Passed
Rotation Angle Decay:	58.0-67.0 ms	61.50 ms	Passed
MOMENT ABOUT THE OCCIPITAL CONDYLE			
Max Occipital Moment:	73.00- 88.00 N-m	77.85 N-m	Passed
Occipital Moment Decay:	49.0-64.0 ms	60.00 ms	Passed
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT			
Moment to Rotation Peak:	2.0-16.0 ms	11.20 ms	Passed

Neck Flexion Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

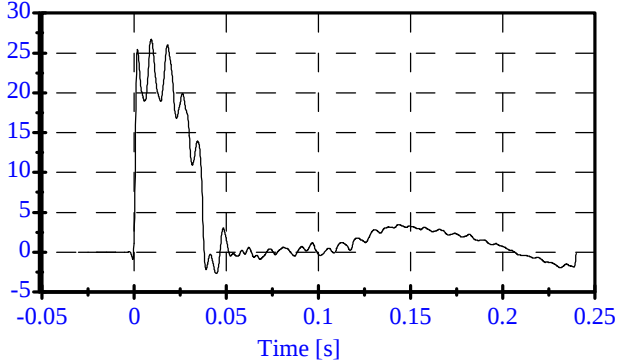
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Date: 09-15-09

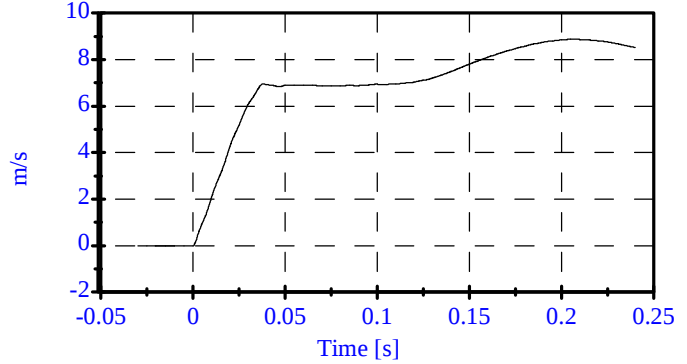
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Laboratory Technician: A. Rudniski

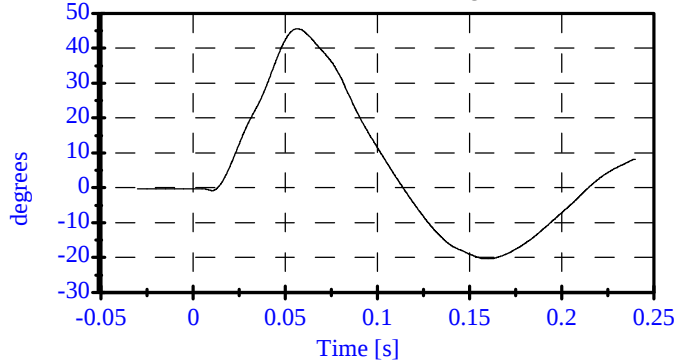
Pend Ax
CFC_180
Max: 26.7 [] at 0.009 [s]
Min: -2.7 [] at 0.045 [s]



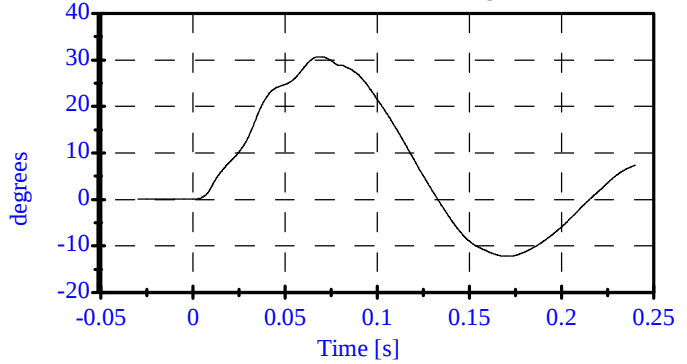
Pend Vx
CFC_180
Max: 8.9 [m/s] at 0.206 [s]
Min: -0.0 [m/s] at -0.000 [s]



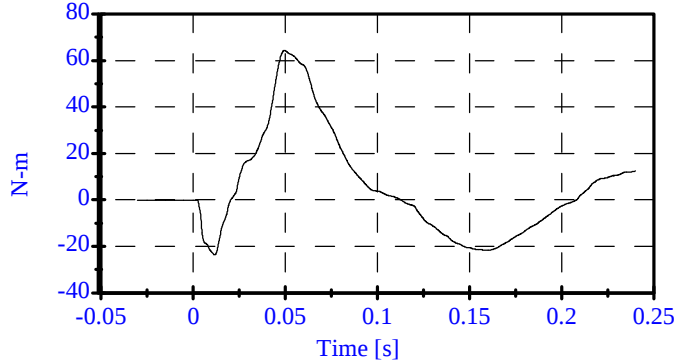
Head Rot
CFC_180
Max: 45.6 [degrees] at 0.057 [s]
Min: -20.4 [degrees] at 0.160 [s]



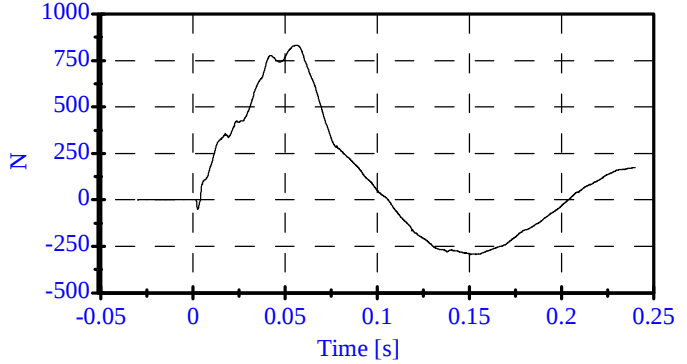
Arm Rot
CFC_180
Max: 30.7 [degrees] at 0.069 [s]
Min: -12.2 [degrees] at 0.171 [s]



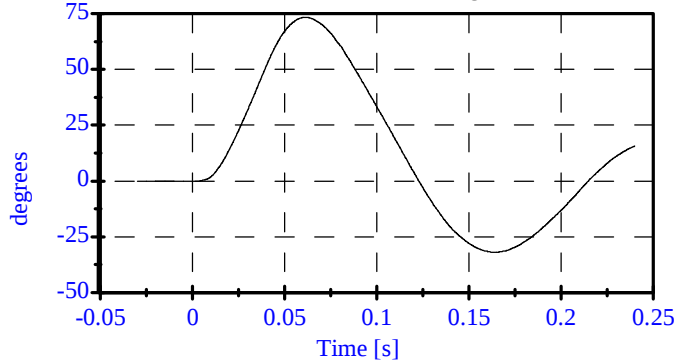
Neck Mx
CFC_600
Max: 64.3 [N-m] at 0.050 [s]
Min: -23.6 [N-m] at 0.012 [s]



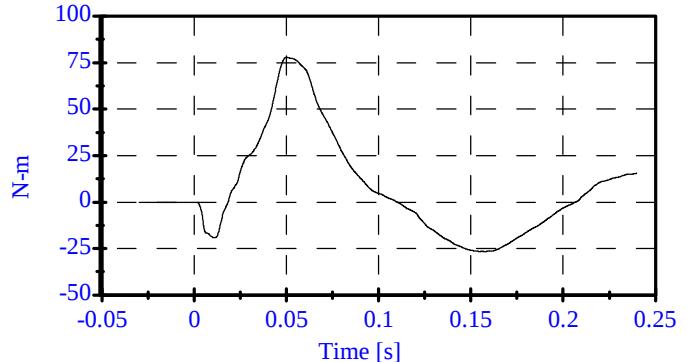
Neck Fy
CFC_1000
Max: 832.1 [N] at 0.056 [s]
Min: -293.4 [N] at 0.151 [s]



Tot Rot
CFC_180
Max: 73.3 [degrees] at 0.061 [s]
Min: -31.9 [degrees] at 0.164 [s]



MOCX
Max: 77.9 [N-m] at 0.050 [s]
Min: -26.6 [N-m] at 0.154 [s]



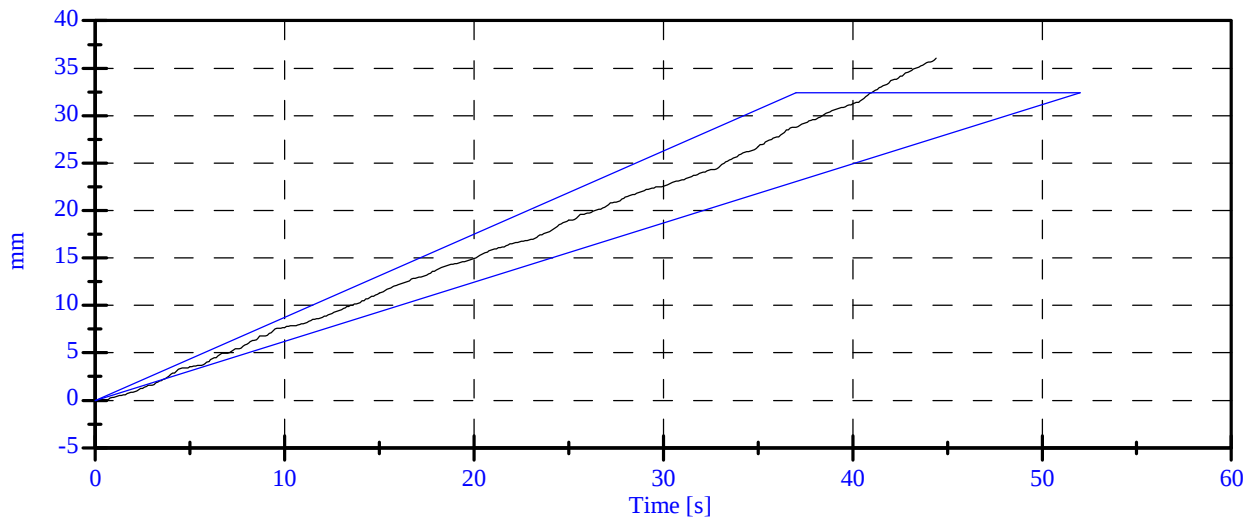
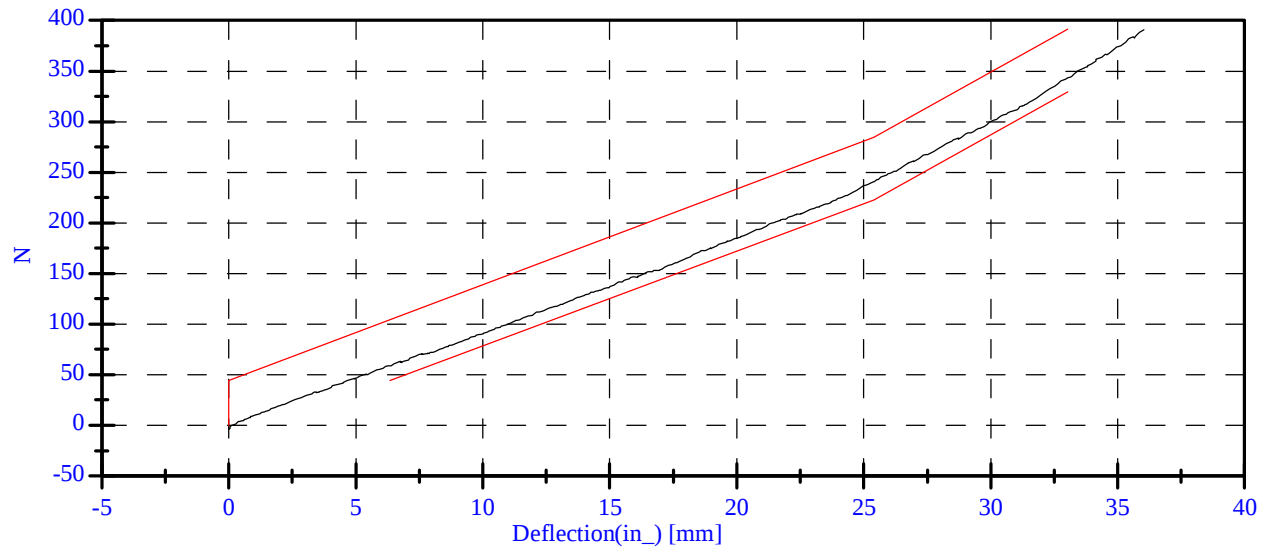
Abdominal Compression Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 269
Date: 05-21-09

Sequential Test Number: 1 File: 905Ab 05-21-09
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 %	28.00 %	Passed
Force at 12.95 mm :	104.00-162.00 N	118.11 N	Passed
Force at 19.05 mm :	162.98-220.99 N	174.98 N	Passed
Force at 25.40 mm :	221.97-280.02 N	240.97 N	Passed
Force at 33.02 mm :	324.99-391.00 N	343.04 N	Passed

ABDOMINAL COMPRESSION TEST



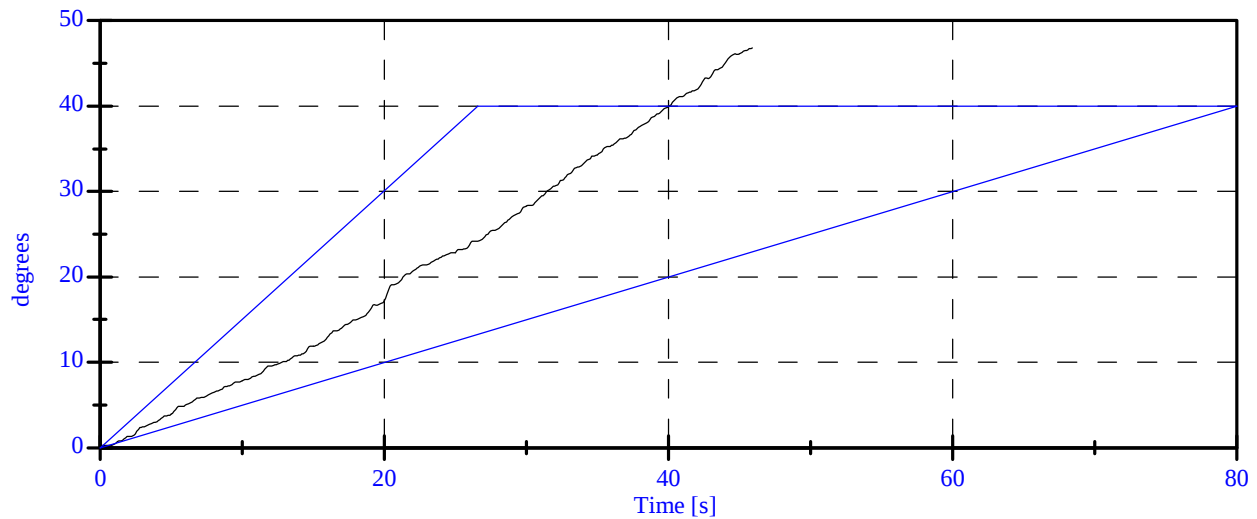
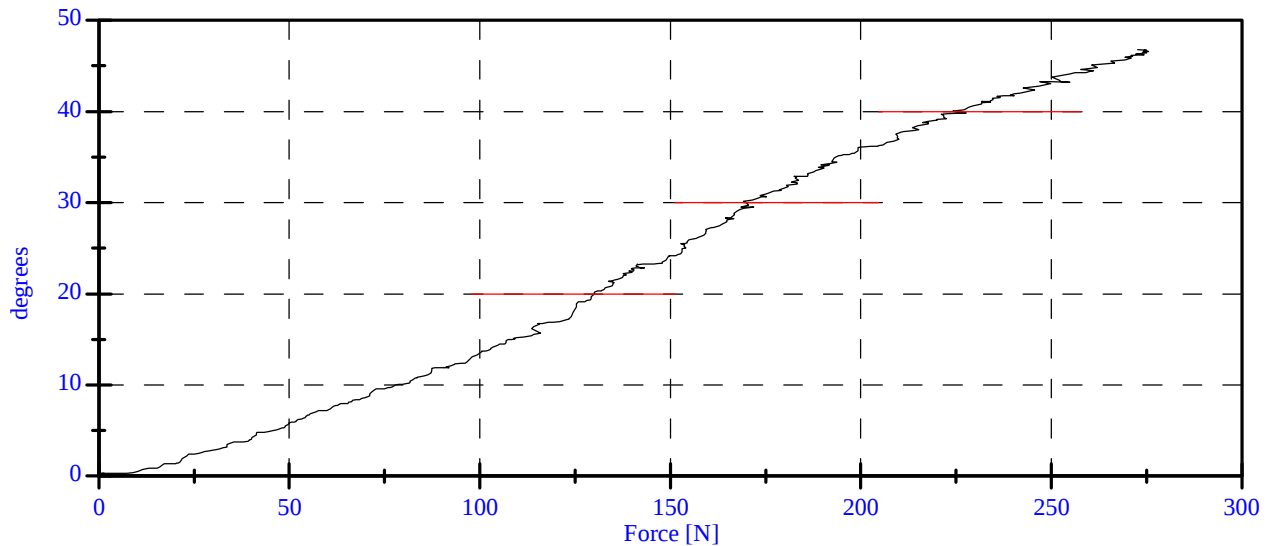
Lumbar Spine Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 905
Date: 06-01-09

Sequential Test Number: 1 File: 905 Spine 06-01-09
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 %	31.00 %	Passed
Force at 0 Deg:	0.00-26.69 N	1.30 N	Passed
Force at 20 Deg:	97.86-151.24 N	130.05 N	Passed
Force at 30 Deg:	151.24-204.62 N	170.01 N	Passed
Force at 40 Deg:	204.62-258.00 N	224.07 N	Passed
Return Angle	12 Deg Max	8.93 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: 5-09 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.: 906

CONFIGURED FOR LEFT SIDE IMPACT

**CALIBRATION TEST RESULTS SUMMARY
PRE-TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 906 Sequential Test Number: 1
Date: 6-09 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.: 906 Sequential Test Number: 1
Date: 6-09 Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	904
RH- Rib Height (mm)	502 - 520	510
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	521
KV- Knee Pivot to Floor (mm)	490 - 505	497
HW- Hip Width (mm)	356 - 391	370

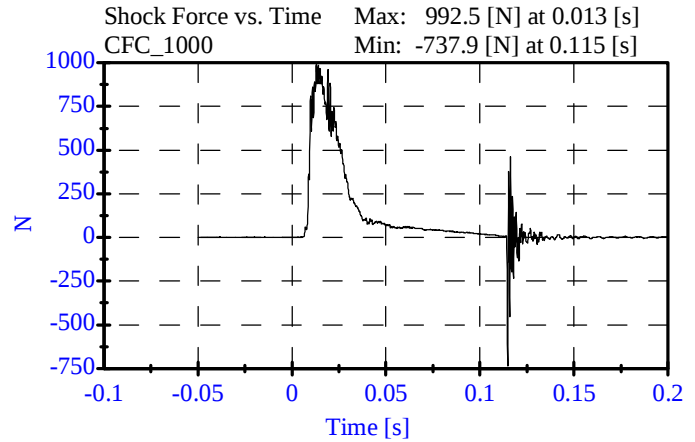
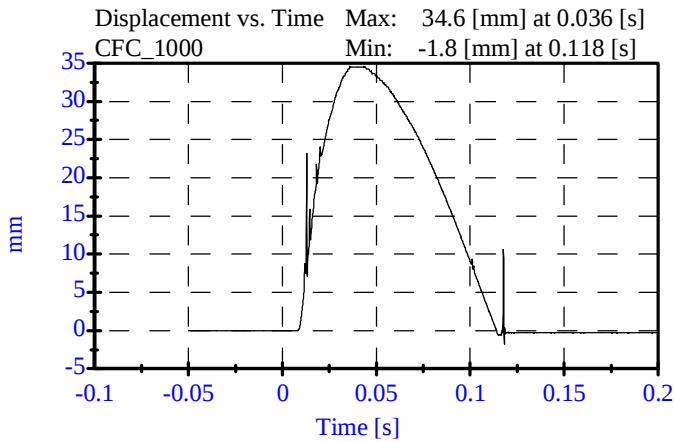
REMARKS: None

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

ATD Serial No: 906
Date: 06-10-09

Sequential Test Number: 1 File: 906SL1 06-10-09
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 %	48.00 %	Passed
Displacement:	30.00-35.00 mm	34.55 mm	Passed
Maximum Force:	836.00-1125.00 N	992.49 N	Passed
Impact Test Velocity:	3.05 m/s		
Damper Identification:	906		
Damper Setting:	5		



Shock Test Medium (4.27 m/s)

PRE TEST

CONFIGURED FOR LEFT SIDE IMPACT

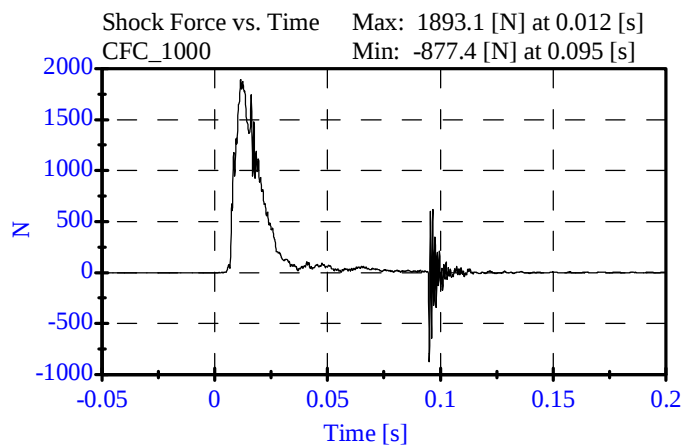
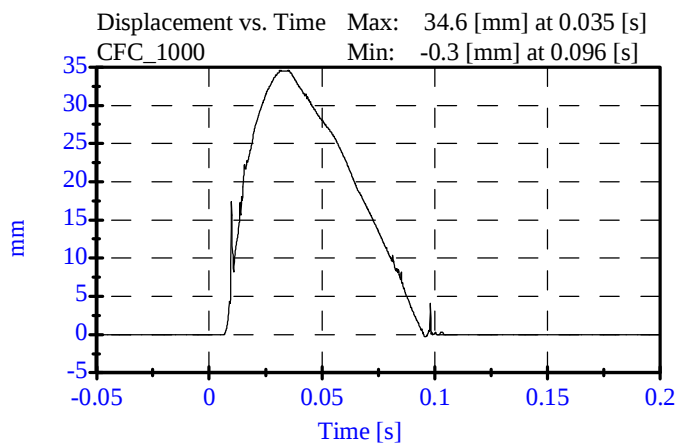
ATD Serial No: 906

Date: 06-10-09

Sequential Test Number: 1 File: 906SM1 06-10-09

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 %	48.00 %	Passed
Displacement:	32.00-37.00 mm	34.59 mm	Passed
Maximum Force:	1730.00-2099.00 N	1893.14 N	Passed
Impact Test Velocity:	4.27 m/s		
Damper Identification:	906		
Damper Setting:	5		



Shock Test High (6.10 m/s)

PRE TEST

CONFIGURED FOR LEFT SIDE IMPACT

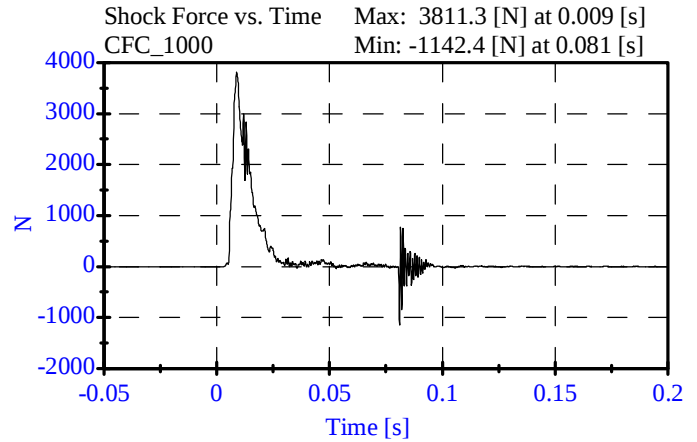
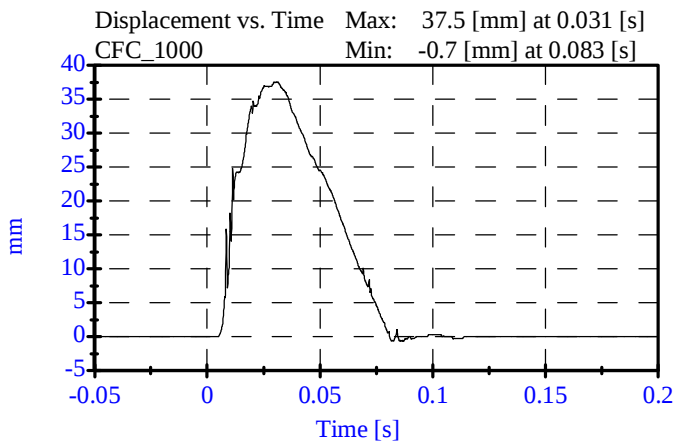
ATD Serial No: 906

Date: 06-10-09

Sequential Test Number: 1 File: 906SH 06-10-09

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 %	48.00 %	Passed
Displacement:	33.00-40.00 mm	37.53 mm	Passed
Maximum Force:	3741.00-4448.00 N	3811.26 N	Passed
Impact Test Velocity:	6.10 m/s		
Damper Identification:	906		
Damper Setting:	5		

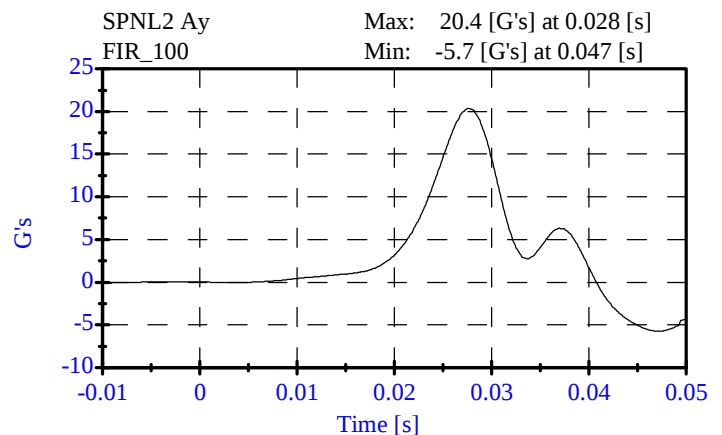
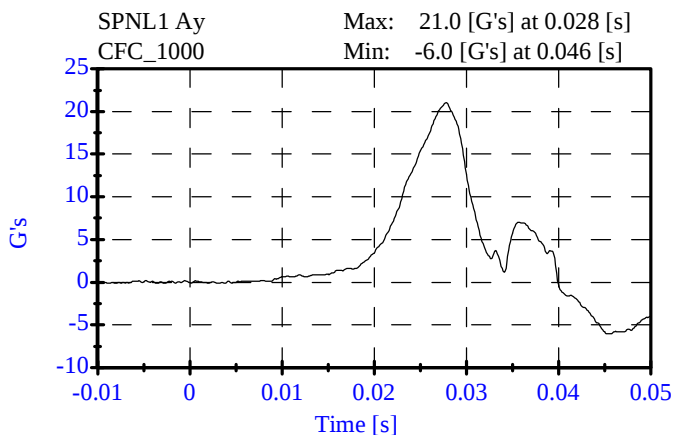
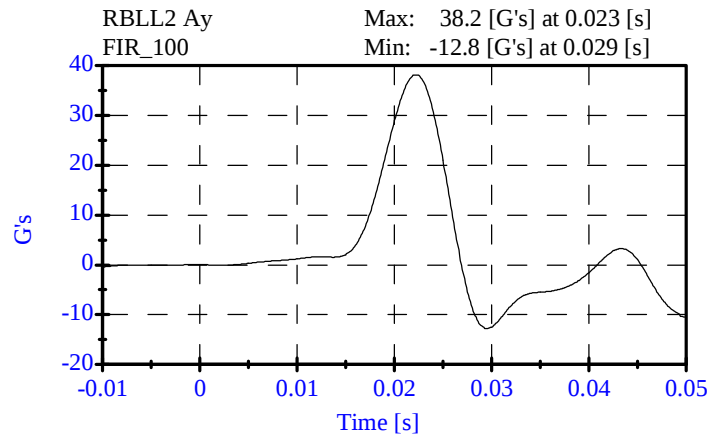
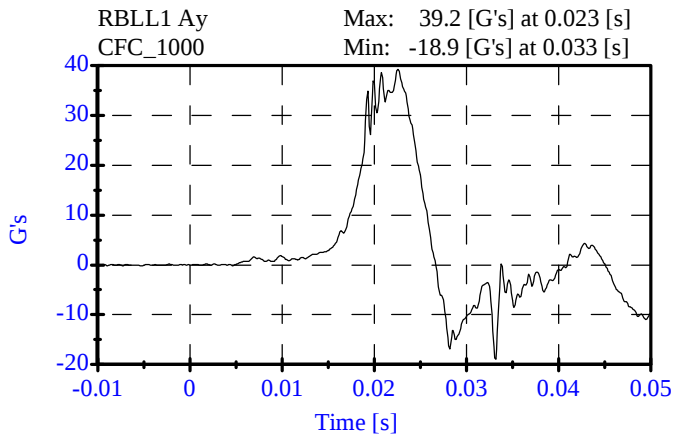
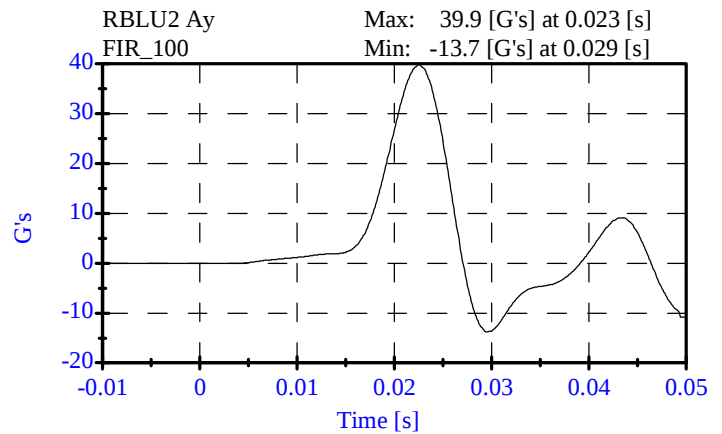
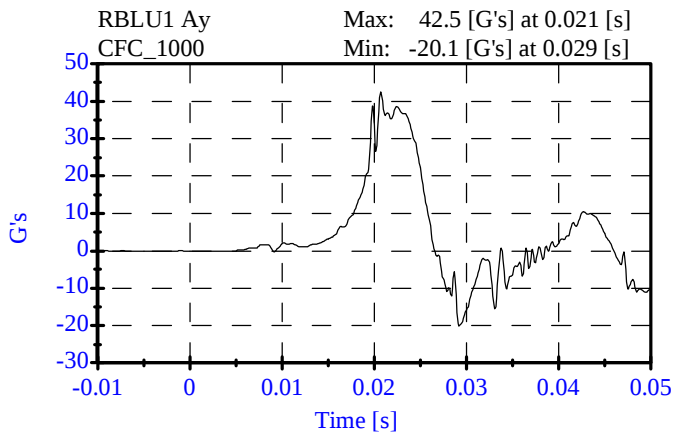


Thorax Impact Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 906
Date: 06-11-09

Sequential Test Number: 1 File: 906T2 06-11-09
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 %	52.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.28 m/s	Passed
Upper Rib Acceleration:	37.00-46.00 G's	39.91 G's	Passed
Lower Rib Acceleration:	37.00-46.00 G's	38.18 G's	Passed
Lower Spine Acceleration:	15.00-22.00 G's	20.38 G's	Passed

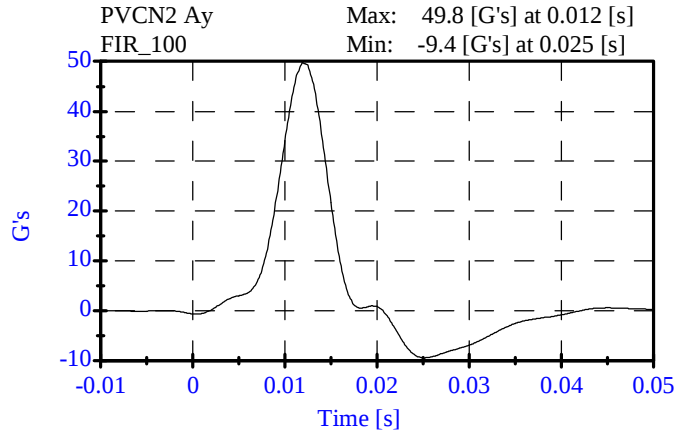
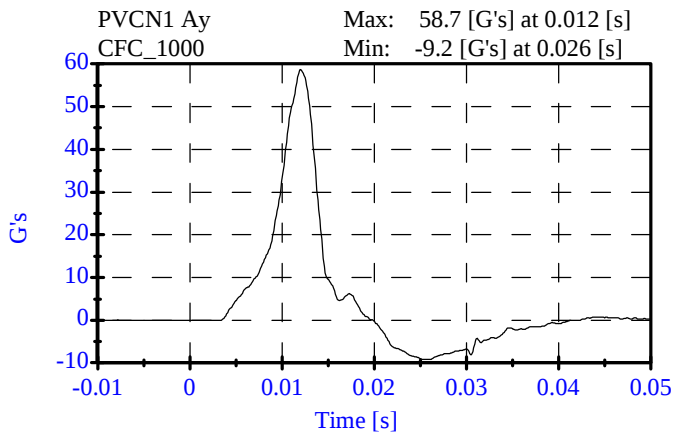


Pelvis Impact Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 906
Date: 06-11-09

Sequential Test Number: 1 File: 906P 06-11-09
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	23.3 C	Passed
Lab Humidity:	10-70 %	52.00 %	Passed
Probe Velocity:	4.27- 4.33 m/s	4.29 m/s	Passed
Pelvis Y Acceleration:	40.00-60.00 G's	49.82 G's	Passed
Time Above 20 Gs	3.0-7.0 ms	6.3 ms	Passed

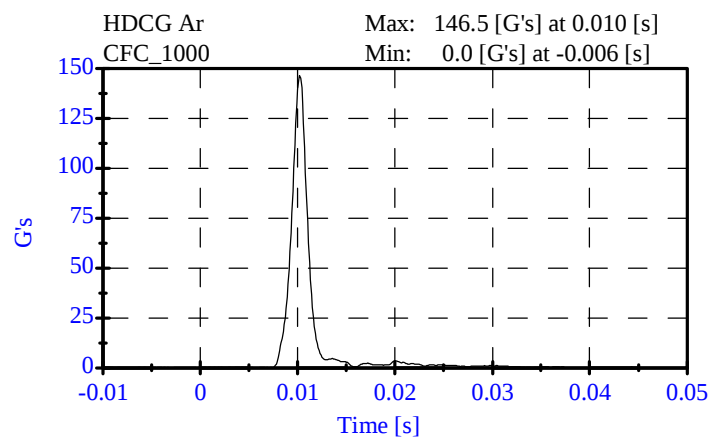
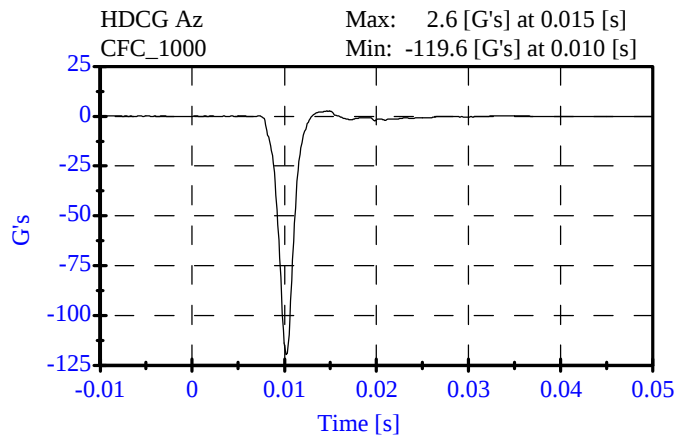
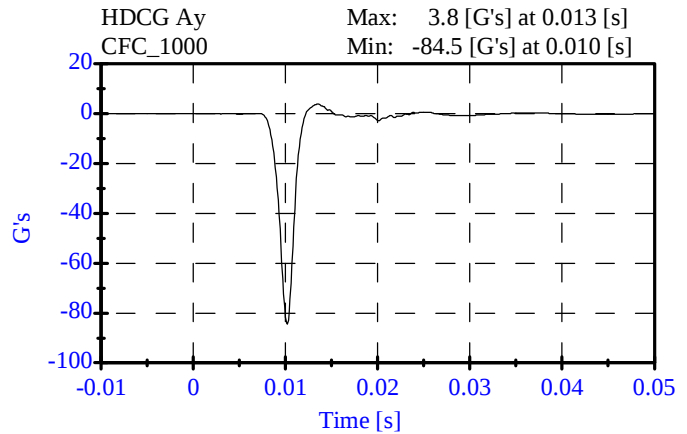
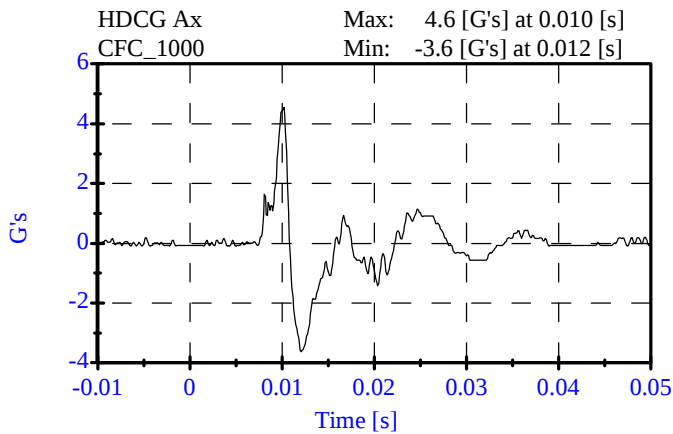


Head Drop Test **Pre-Test** **CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 906
Date: 06-09-09

Sequential Test Number: 1 File: 906H 06-09-09
Laboratory Technician: A.Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.6 C	22.2 C	Passed
Lab Humidity:	10-70 %	60.00 %	Passed
Peak Resultant Accel.:	120-150 Gs	146.46 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	4.56 Gs	Passed
Curve PerCent NonModal:	< 15%	3.11 %	Passed



Neck Test**Pre-Test****CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 906

Date: 06-09-09

Sequential Test Number: 1 File: 906N 06-09-09

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 %	60.00 %	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	2.13 m/s	Passed
Delta V at 20 ms:	4.12- 5.10 m/s	4.36 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	7.07 m/s	Passed
D PLANE ROTATION			
Maximum Rotation:	66.0-82.0 Deg	71.93 Deg	Passed
Rotation Angle Decay:	58.0-67.0 ms	60.30 ms	Passed
MOMENT ABOUT THE OCCIPITAL CONDYLE			
Max Occipital Moment:	73.00- 88.00 Nm	79.47 Nm	Passed
Occipital Moment Decay:	49.0-64.0 ms	59.70 ms	Passed
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT			
Moment to Rotation Peak:	2.0-16.0 ms	10.90 ms	Passed

Neck Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

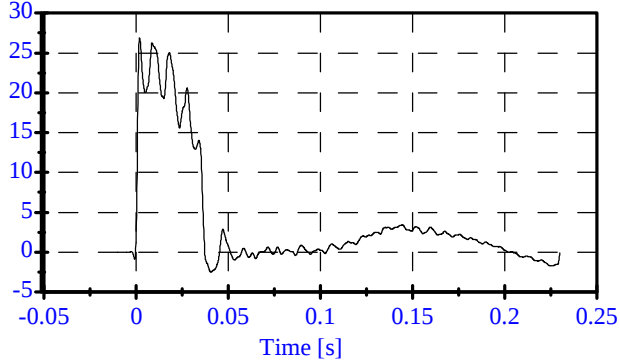
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Date: 06-09-09

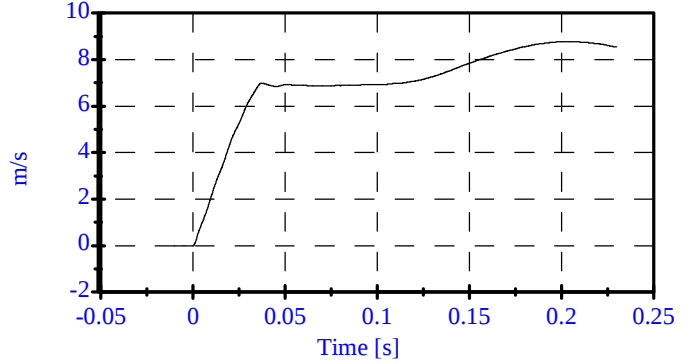
Sequential Test Number: 1 File: 906N 06-09-09

Laboratory Technician: A. Rudniski

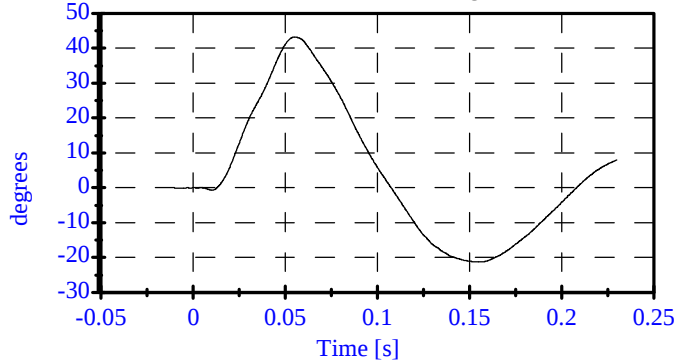
Pend Ax
CFC_180
Max: 26.9 [] at 0.002 [s]
Min: -2.5 [] at 0.041 [s]



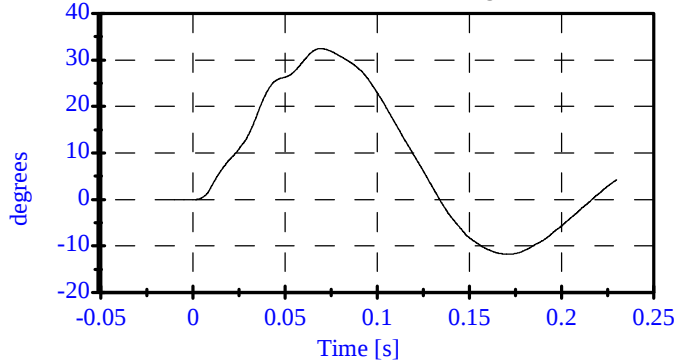
Pend Vx
CFC_180
Max: 8.8 [m/s] at 0.205 [s]
Min: -0.0 [m/s] at -0.000 [s]



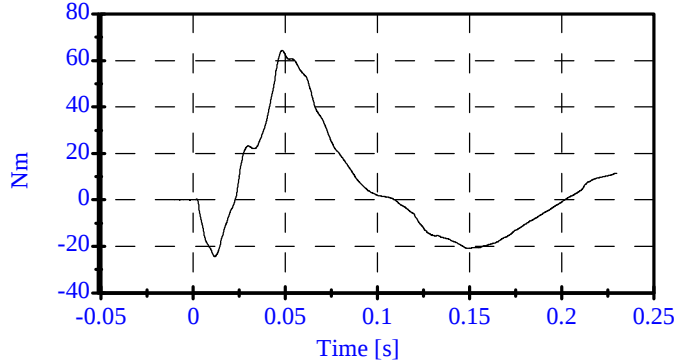
Head Rot
CFC_180
Max: 43.2 [degrees] at 0.055 [s]
Min: -21.3 [degrees] at 0.155 [s]



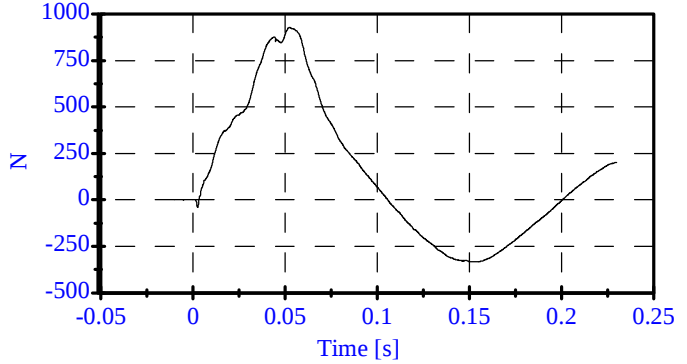
Arm Rot
CFC_180
Max: 32.5 [degrees] at 0.069 [s]
Min: -11.8 [degrees] at 0.171 [s]



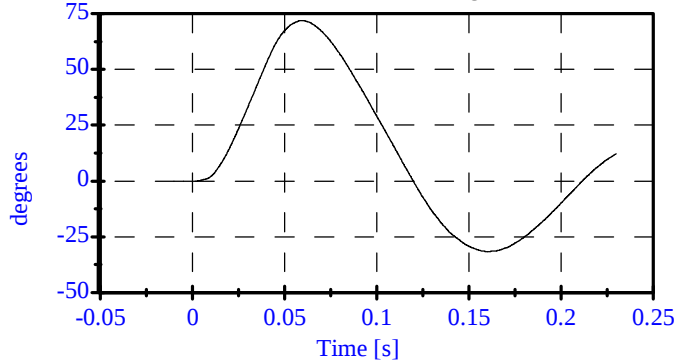
Neck Mx
CFC_600
Max: 64.3 [Nm] at 0.048 [s]
Min: -24.3 [Nm] at 0.012 [s]



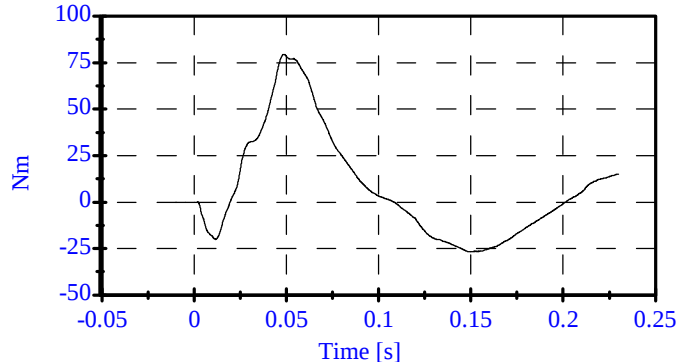
Neck Fy
CFC_1000
Max: 927.9 [N] at 0.052 [s]
Min: -333.9 [N] at 0.154 [s]



Tot Rot
CFC_180
Max: 71.9 [degrees] at 0.059 [s]
Min: -31.6 [degrees] at 0.160 [s]



MOCX
Max: 79.5 [Nm] at 0.049 [s]
Min: -26.8 [Nm] at 0.150 [s]



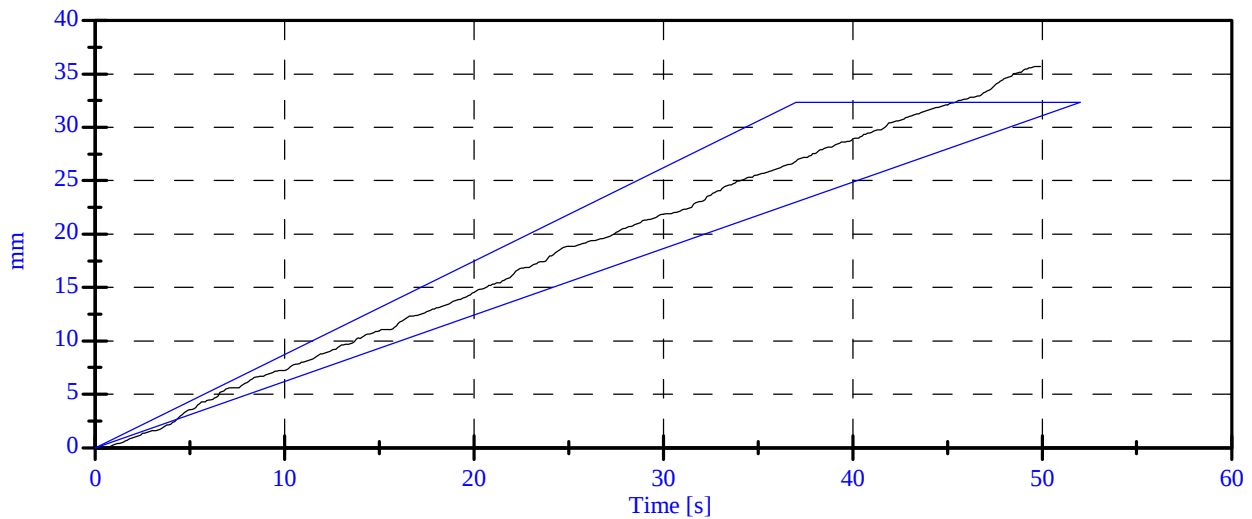
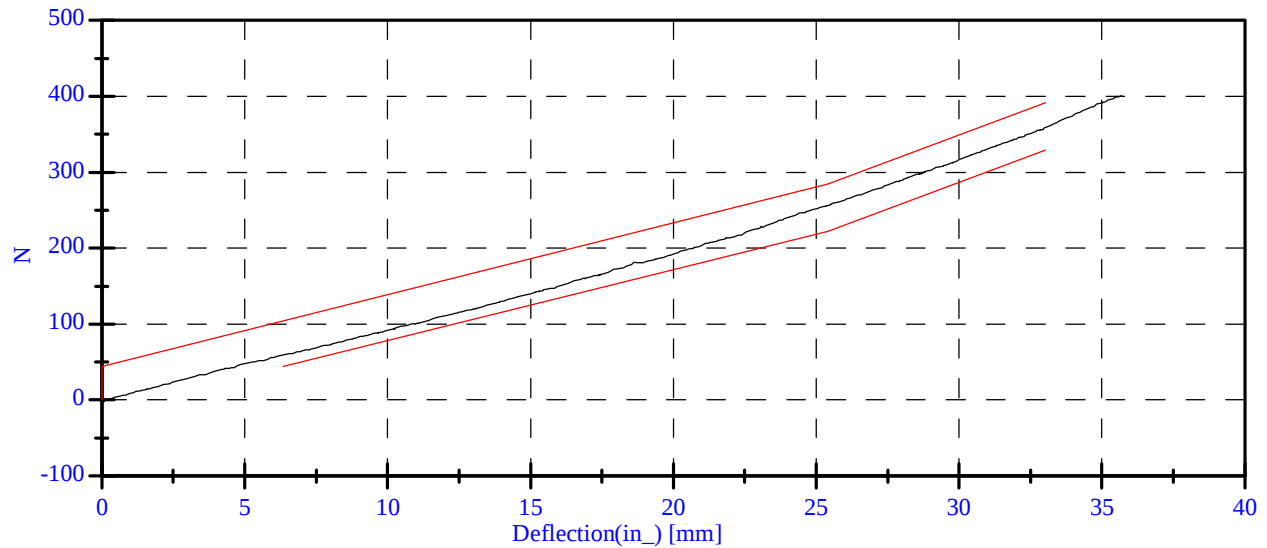
Abdominal Compression Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 906
Date: 06-11-09

Sequential Test Number: 1 File: 906Ab 06-11-09
Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.5 C	22.8 C	Passed
Lab Humidity:	10-70 %	53.00 %	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	182.32 N	Passed
Force at 25.40 mm :	221.97-280.02 N	255.33 N	Passed
Force at 33.02 mm :	324.99-391.00 N	359.36 N	Passed

ABDOMINAL COMPRESSION TEST



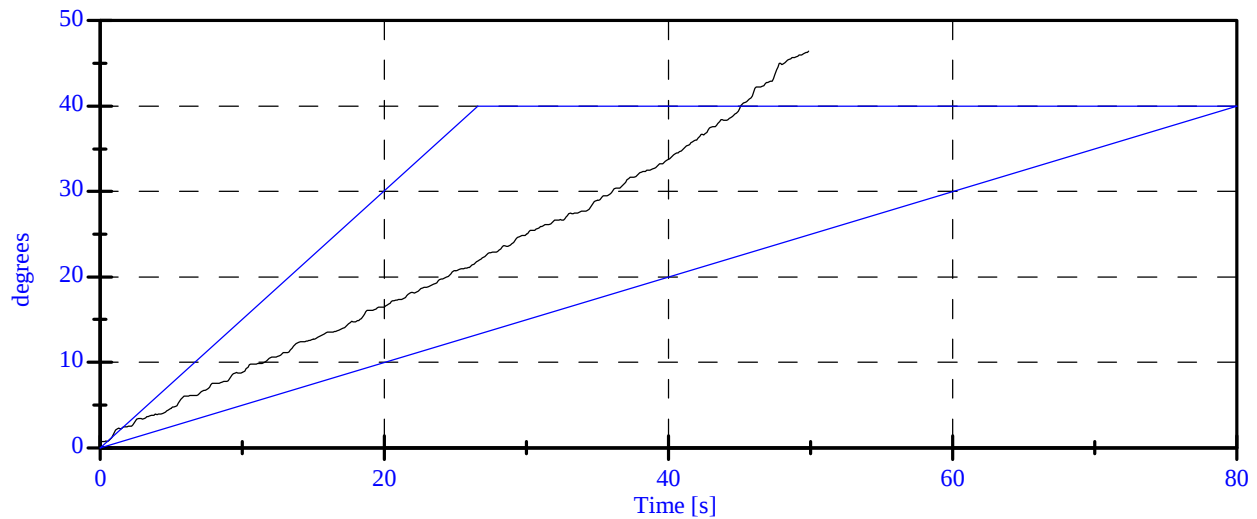
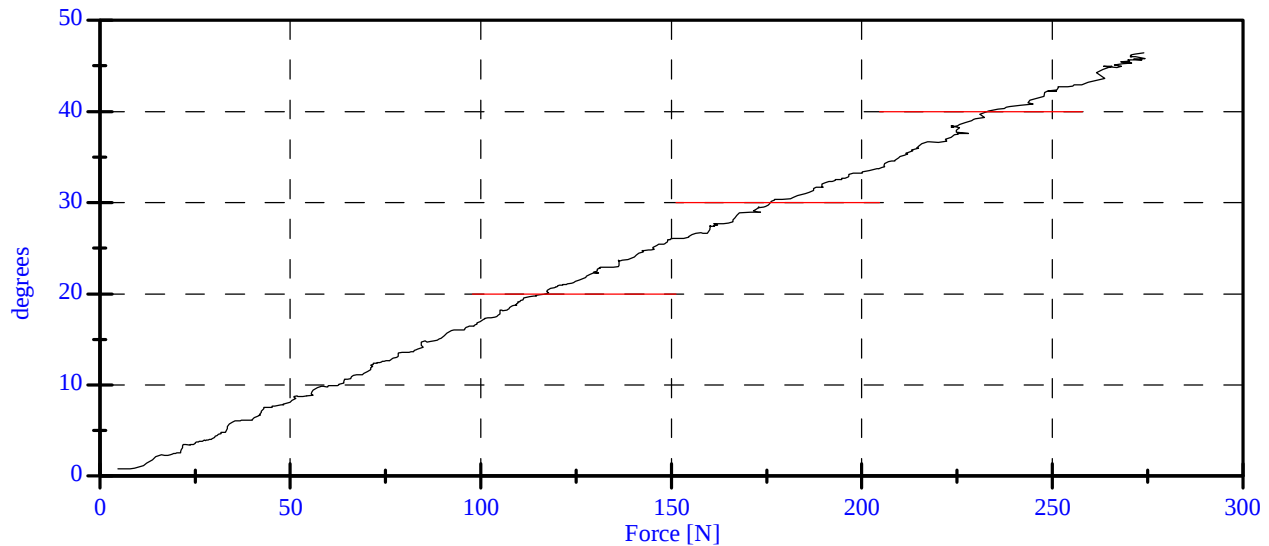
Lumbar Spine Test
Pre-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 906
Date: 06-11-09

Sequential Test Number: 1 File: 906Spine 06-11-09
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 %	52.00 %	Passed
Force at 0 Deg:	0.00-26.69 N	4.70 N	Passed
Force at 20 Deg:	97.86-151.24 N	117.00 N	Passed
Force at 30 Deg	151.24-204.62 N	175.75 N	Passed
Force at 40 Deg	204.62-258.00 N	233.21 N	Passed
Return Angle	12 Deg Max	6.68 deg	Passed

LUMBAR SPINE FLEXION TEST



PRE-TEST DUMMY INSPECTION LIST

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 906 Sequential Test Number: 1
 Date: 6-09 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: 2
Date: 11-09 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: 2
Date: 11-09 Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	906
RH- Rib Height (mm)	502 - 520	510
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	519
KV- Knee Pivot to Floor (mm)	490 - 505	499
HW- Hip Width (mm)	356 - 391	370

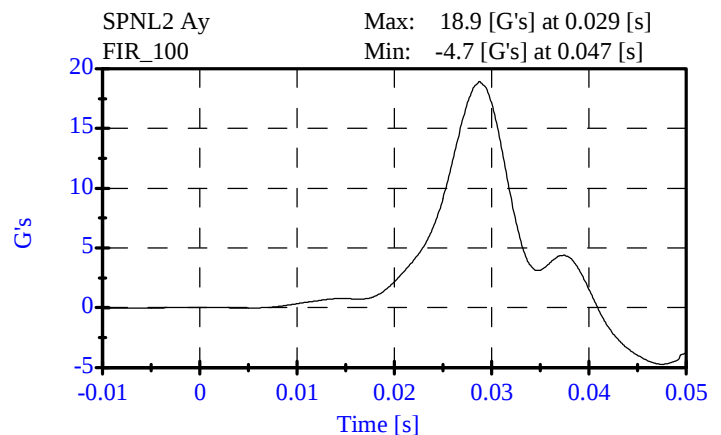
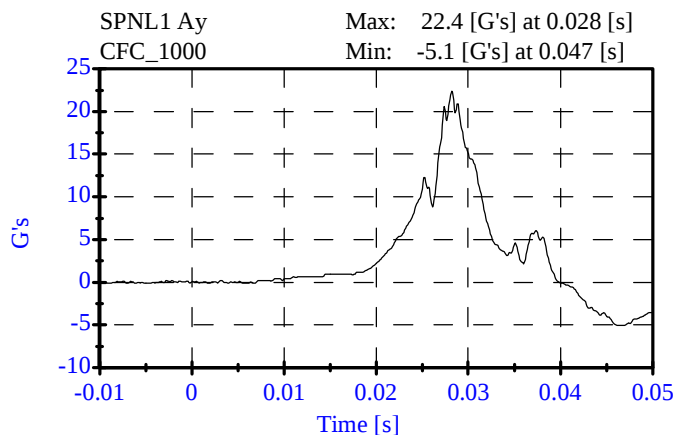
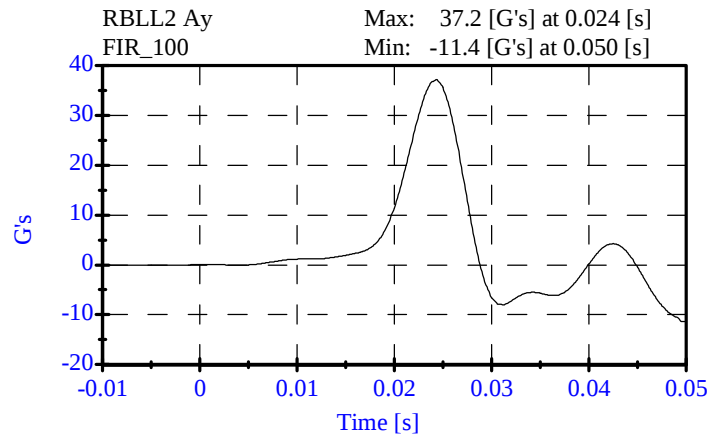
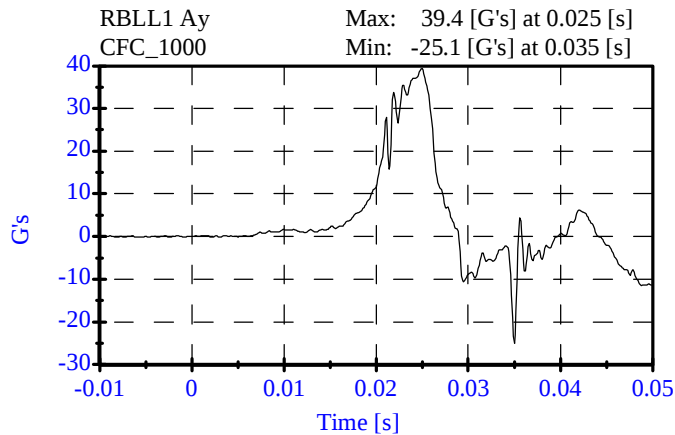
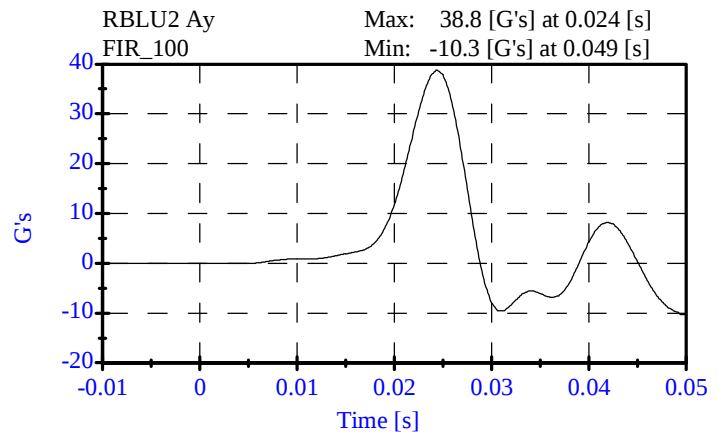
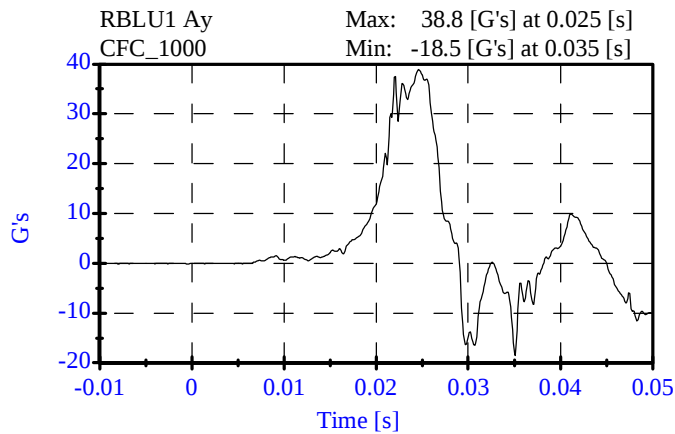
REMARKS: None

Thorax Impact Test
Post-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

Post-Test

CONFIGURED FOR LEFT SIDE IMPACT

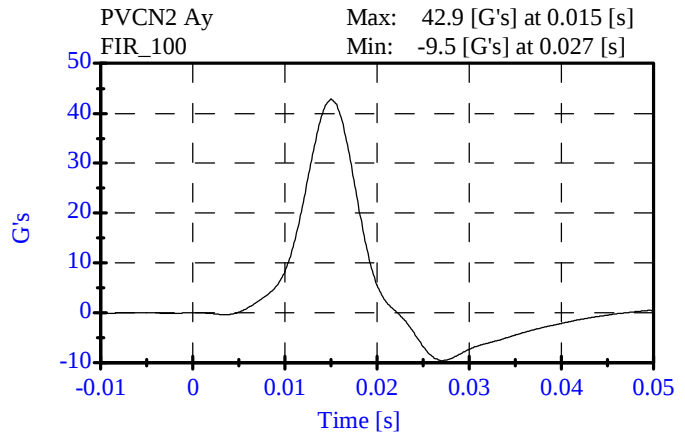
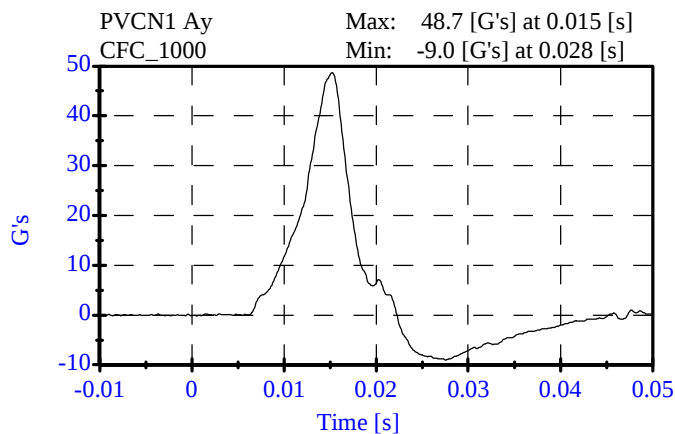
ATD Serial No: 905

Date: 11-9-09

Sequential Test Number: 1 File: 905P 11-09-09

Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
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

Post-Test

CONFIGURED FOR LEFT SIDE IMPACT

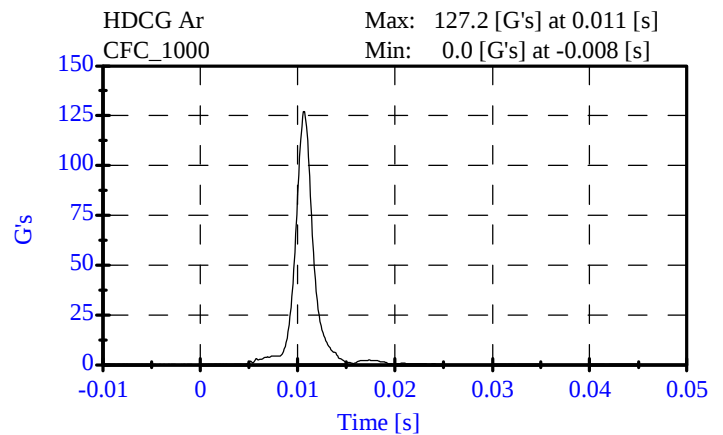
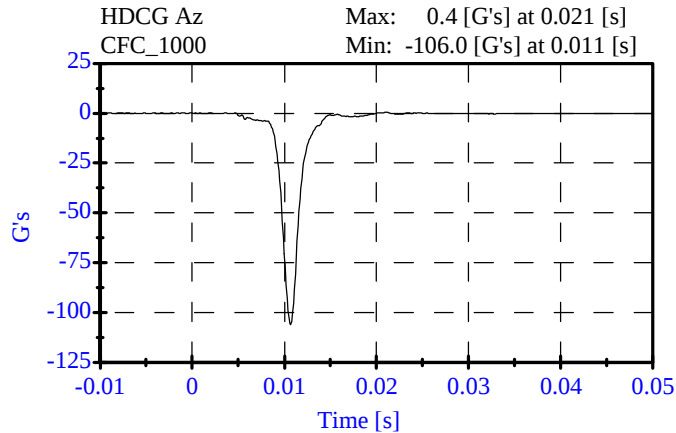
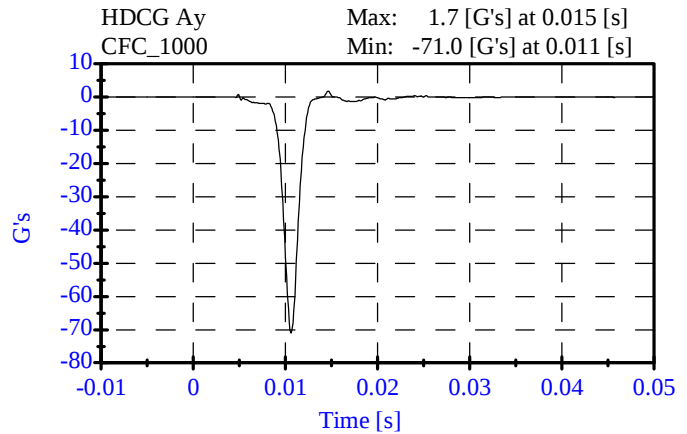
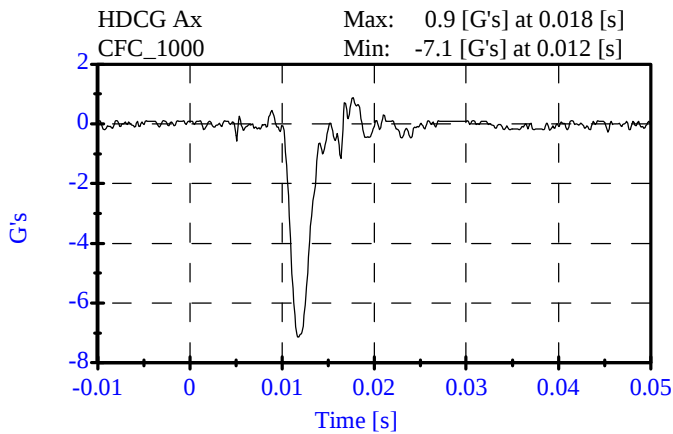
ATD Serial No: 905

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

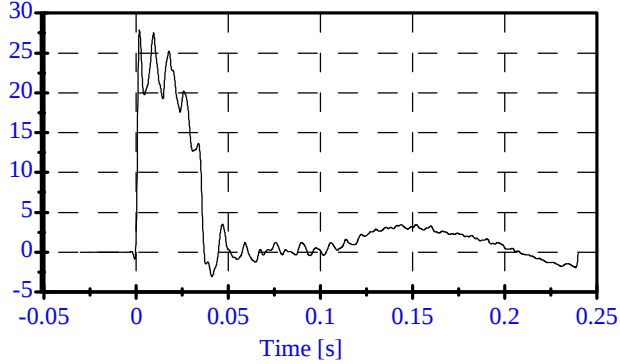
ATD Serial No: 905

Date: 11-10-09

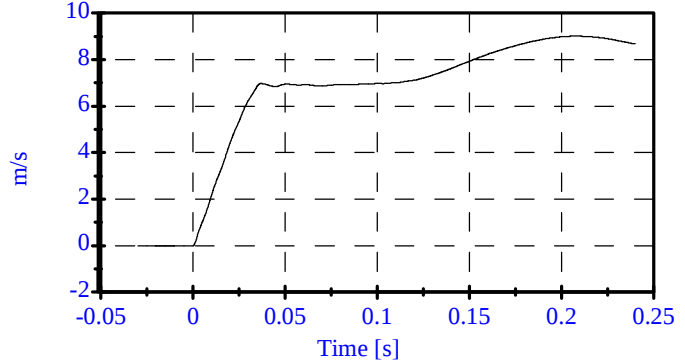
Sequential Test Number: 1 File: 905N9 11-10-09

Laboratory Technician: A. Rudniski

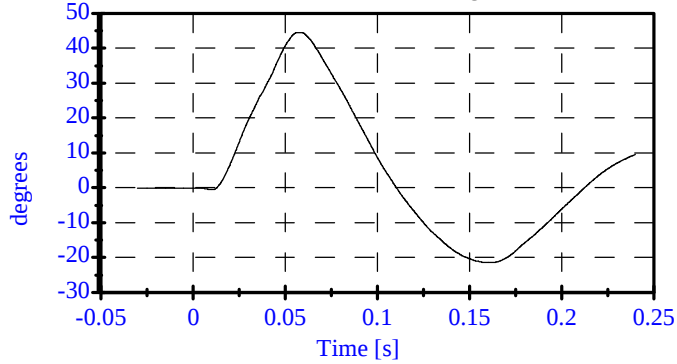
Pend Ax
CFC_180
Max: 27.9 [] at 0.002 [s]
Min: -3.0 [] at 0.041 [s]



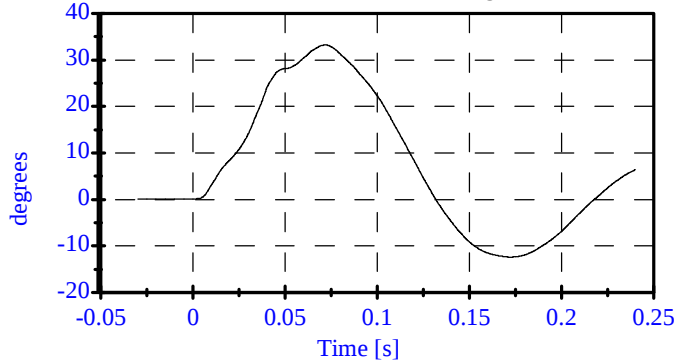
Pend Vx
CFC_180
Max: 9.0 [m/s] at 0.208 [s]
Min: -0.0 [m/s] at -0.000 [s]



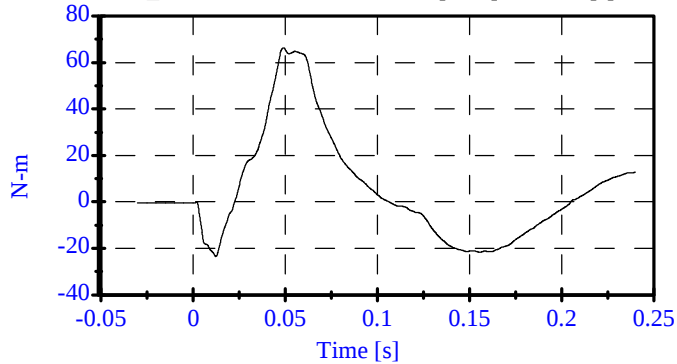
Head Rot
CFC_180
Max: 44.6 [degrees] at 0.058 [s]
Min: -21.5 [degrees] at 0.162 [s]



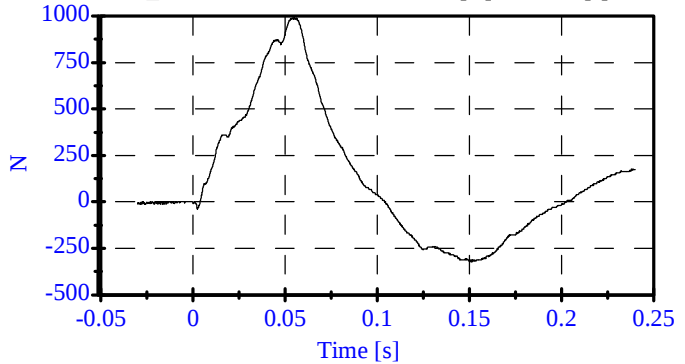
Arm Rot
CFC_180
Max: 33.2 [degrees] at 0.072 [s]
Min: -12.4 [degrees] at 0.172 [s]



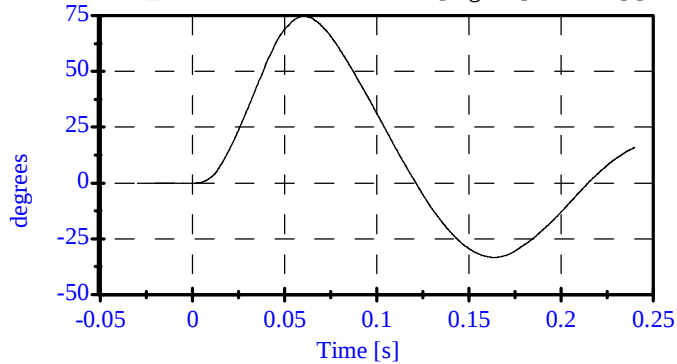
Neck Mx
CFC_600
Max: 66.3 [N-m] at 0.049 [s]
Min: -23.5 [N-m] at 0.012 [s]



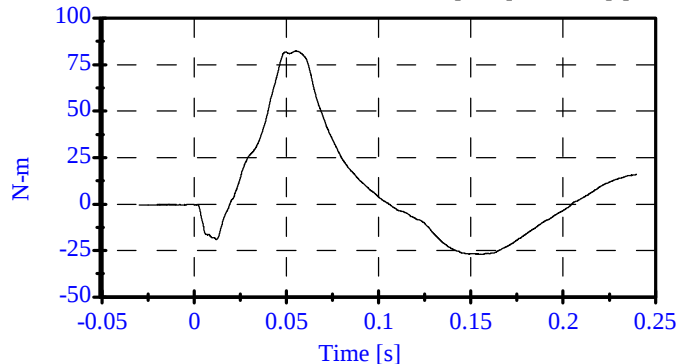
Neck Fy
CFC_1000
Max: 993.1 [N] at 0.055 [s]
Min: -322.3 [N] at 0.151 [s]



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]



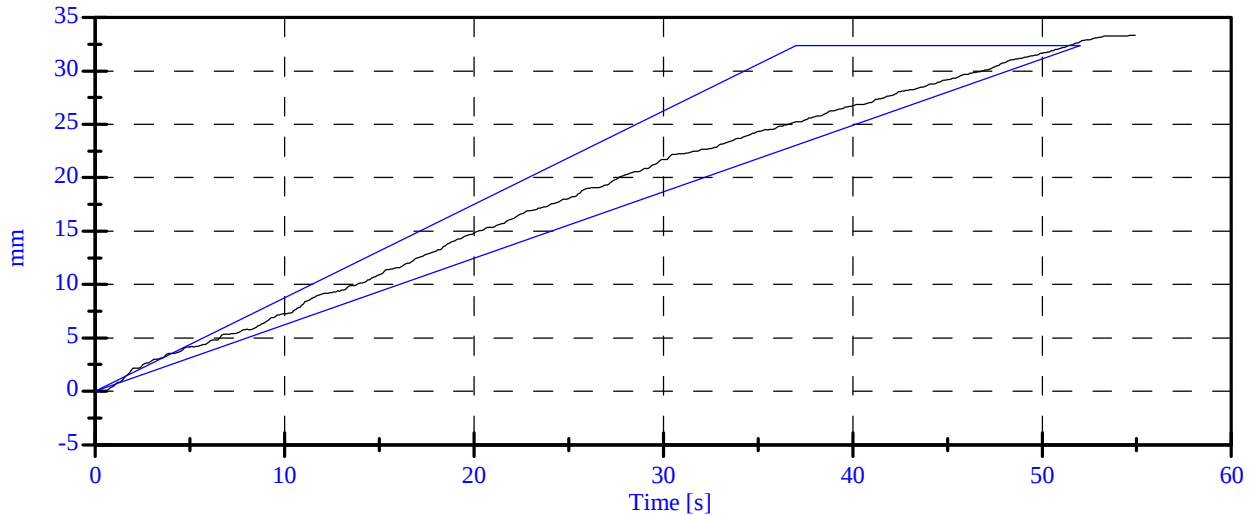
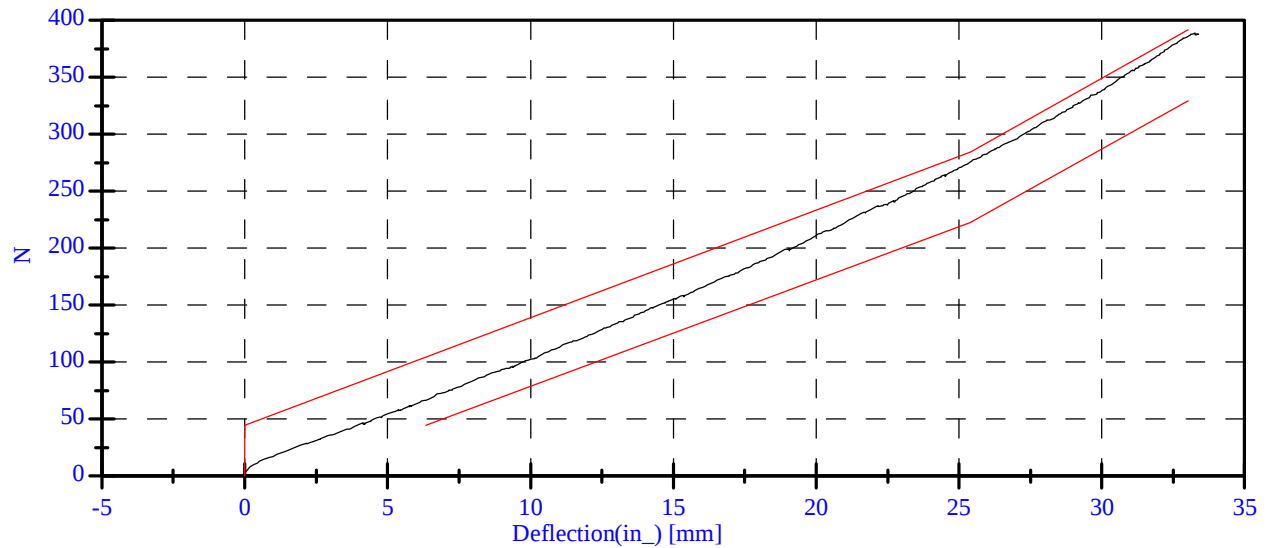
Abdominal Compression Test
Post-Test
CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 906
Date: 11-06-09

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



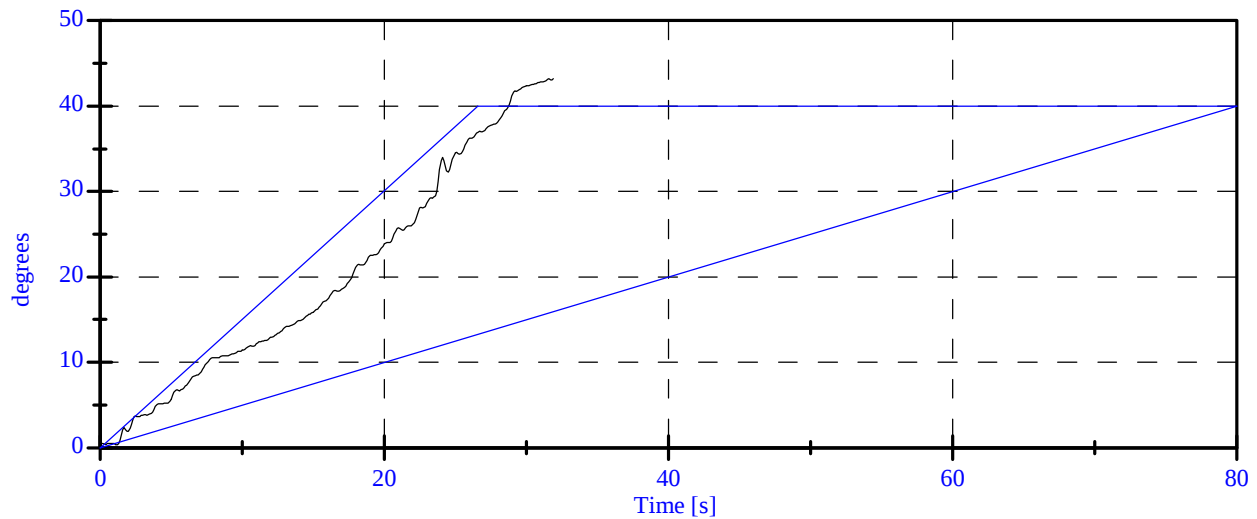
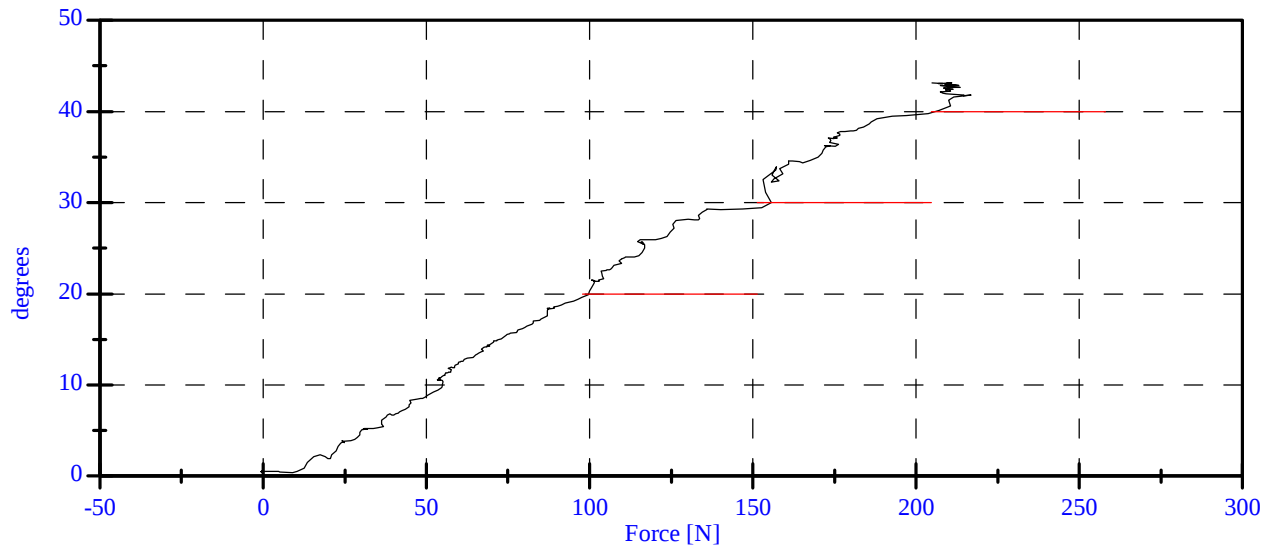
Lumbar Spine Test
Post-Test
CONFIGURED FOR LEFT SIDE IMPACT

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

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

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
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



POST TEST DUMMY INSPECTION LIST
CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 905 Sequential Test Number: 2
 Date: 11-09 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.: 906

CONFIGURED FOR LEFT SIDE IMPACT

**CALIBRATION TEST RESULTS SUMMARY
POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 906 Sequential Test Number: 2
Date: 11-09 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.: 906 Sequential Test Number: 2
Date: 11-09 Laboratory Technician: A. Rudniski

TEST PARAMETER	SPECIFICATION	TEST RESULTS
SH- Seated Height (mm)	889 - 909	905
RH- Rib Height (mm)	502 - 520	510
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	520
KV- Knee Pivot to Floor (mm)	490 - 505	498
HW- Hip Width (mm)	356 - 391	372

REMARKS: None

Thorax Impact

Pre-Test

CONFIGURED FOR LEFT SIDE IMPACT

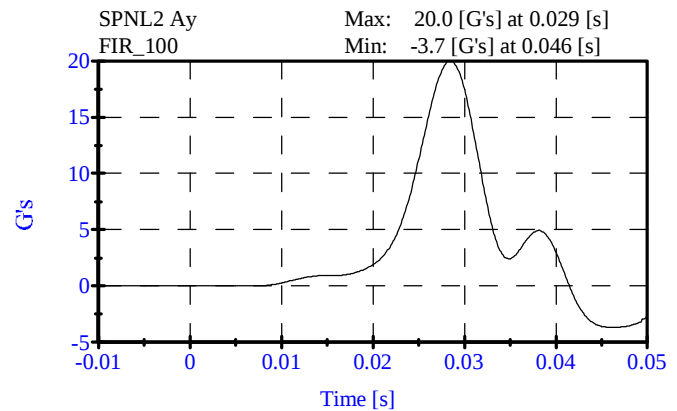
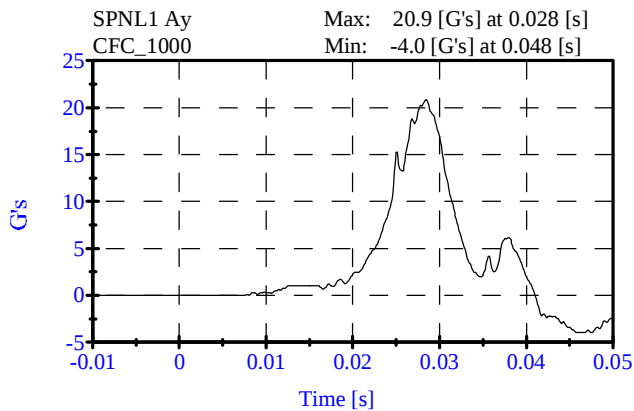
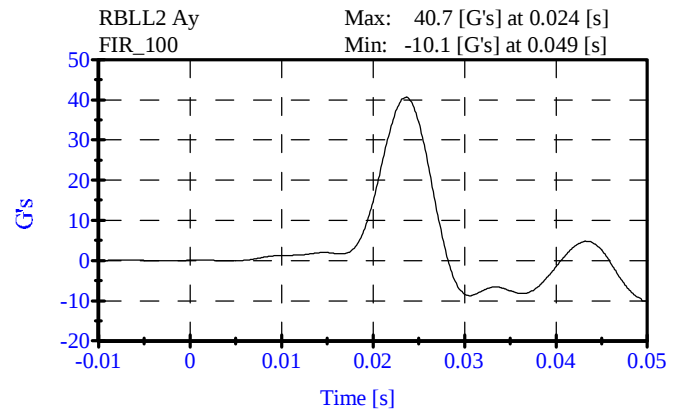
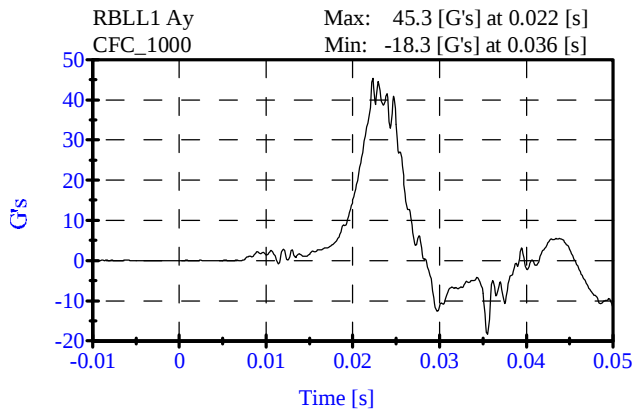
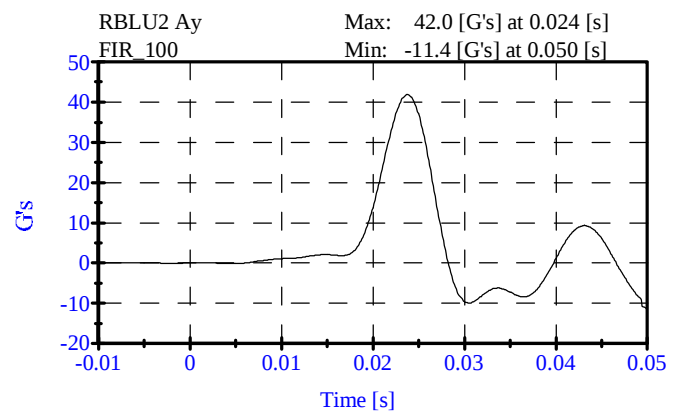
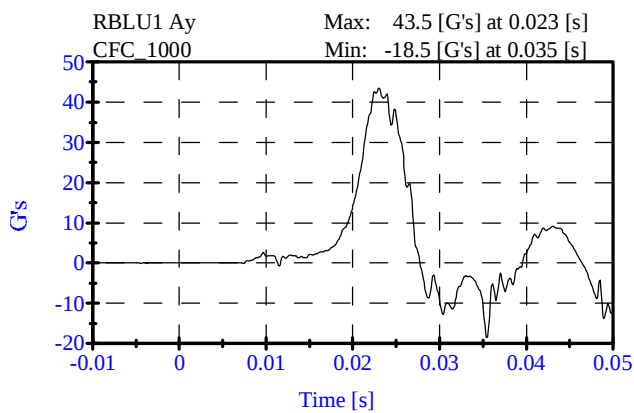
ATD Serial No: 906

Date: 11-6-09

Sequential Test Number: 1 File: 906L 11-6-09

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	4.30 m/s	Passed
Upper Rib Acceleration:	37.00-46.00 G's	41.98 G's	Passed
Lower Rib Acceleration:	37.00-46.00 G's	40.70 G's	Passed
Lower Spine Acceleration:	15.00-22.00 G's	19.99 G's	Passed



Pelvic Impact Test

Post-Test

CONFIGURED FOR LEFT SIDE IMPACT

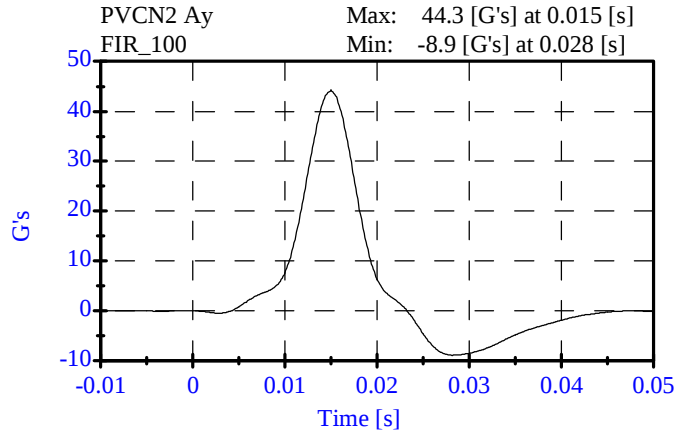
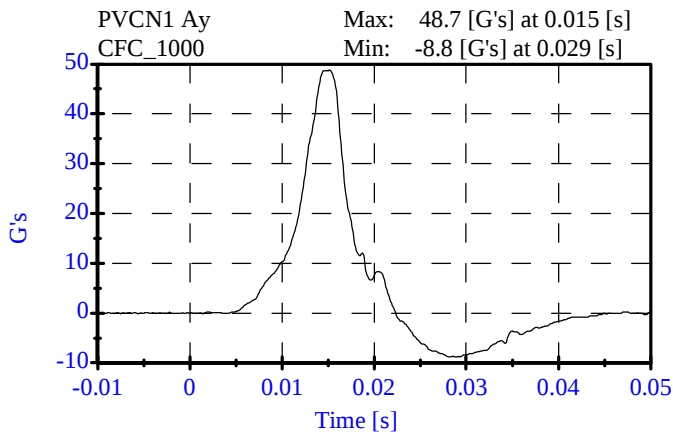
ATD Serial No: 906

Date: 11-6-09

Sequential Test Number: 1 File: 906P 11-6-09

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	4.31 m/s	Passed
Pelvis Y Acceleration:	40.00-60.00 G's	44.32 G's	Passed
Time Above 20 Gs	3.0-7.0 ms	6.4 ms	Passed

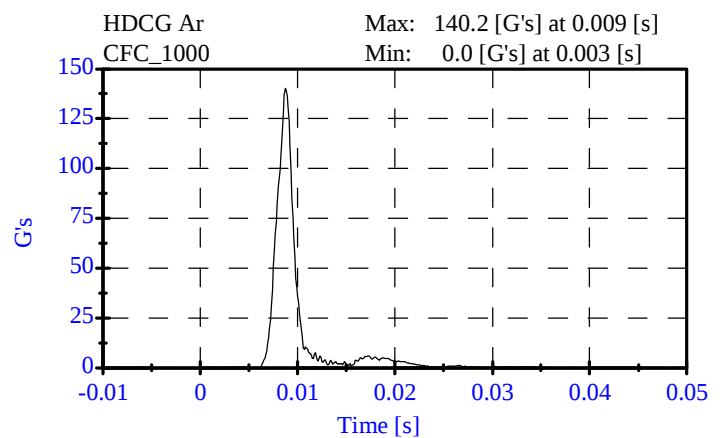
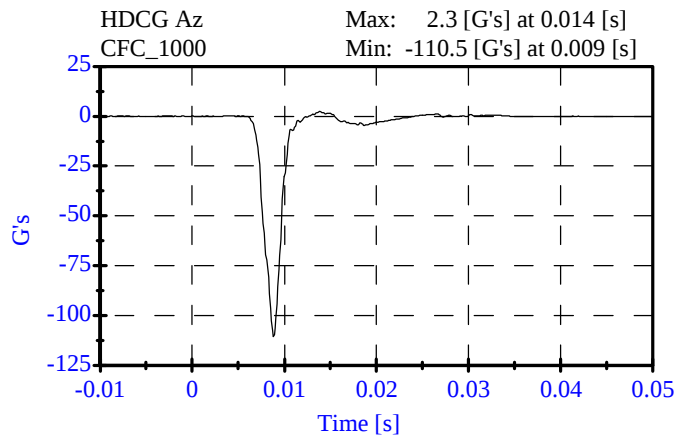
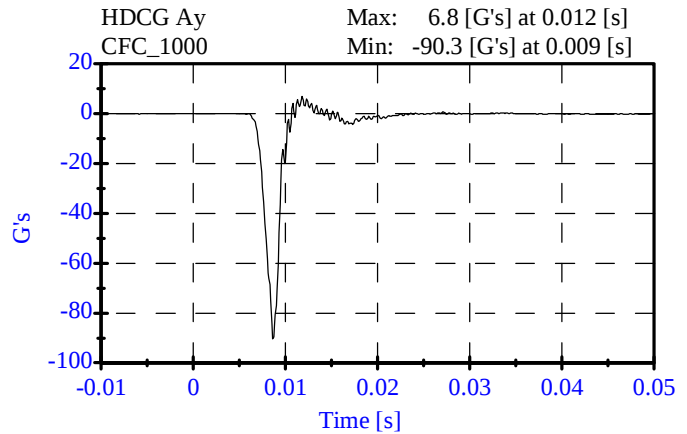
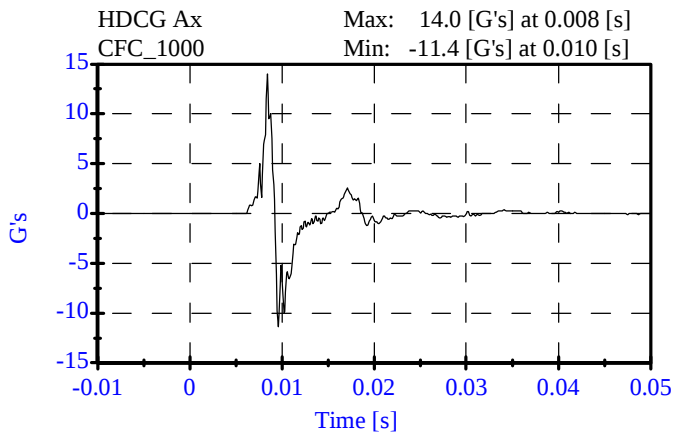


Head drop Test **Post-Test** **CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 906
Date: 11-4-09

Sequential Test Number: 1 File: 906H 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	140.20 Gs	Passed
Peak Lateral Accel.:	15 Gs Max	14.00 Gs	Passed
Curve PerCent NonModal:	< 15%	7.45 %	Passed



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

ATD Serial No: 906

Sequential Test Number: 1 File: 906N2 11-11-09

Date: 11-11-09

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	2.18 m/s	Passed
Delta V at 20 ms:	4.12- 5.10 m/s	4.33 m/s	Passed
Delta V at 30 ms:	5.73- 7.01 m/s	6.15 m/s	Passed
Delta V between 40-70 ms:	6.27- 7.64 m/s	7.64 m/s	Passed
D PLANE ROTATION			
Maximum Rotation:	66.0-82.0 Deg	70.87 Deg	Passed
Rotation Angle Decay:	58.0-67.0 ms	58.50 ms	Passed
MOMENT ABOUT THE OCCIPITAL CONDYLE			
Max Occipital Moment:	73.00- 88.00 Nm	79.33 Nm	Passed
Occipital Moment Decay:	49.0-64.0 ms	57.30 ms	Passed
HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT			
Moment to Rotation Peak:	2.0-16.0 ms	11.30 ms	Passed

Neck Flexion Test
Post-Test
CONFIGURED FOR LEFT SIDE IMPACT

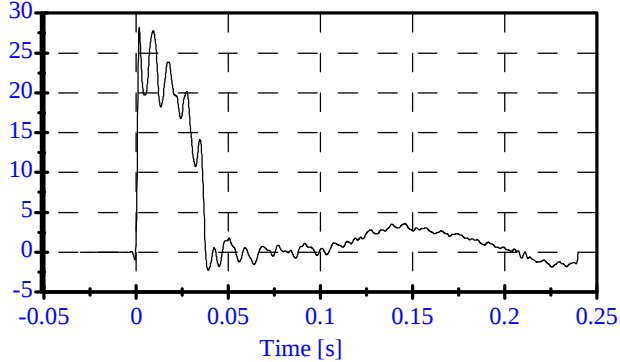
ATD Serial No: 906

Date: 11-11-09

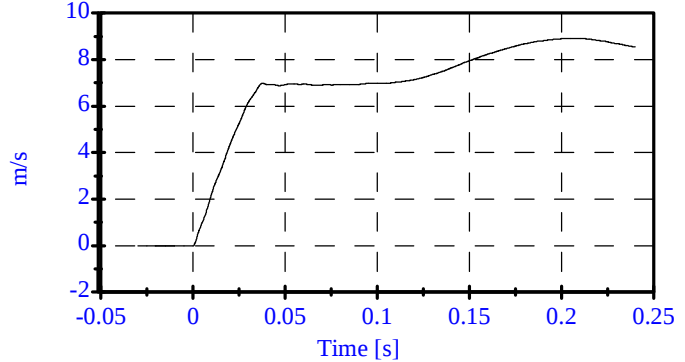
Sequential Test Number: 1 File: 906N2 11-11-09

Laboratory Technician: A. Rudniski

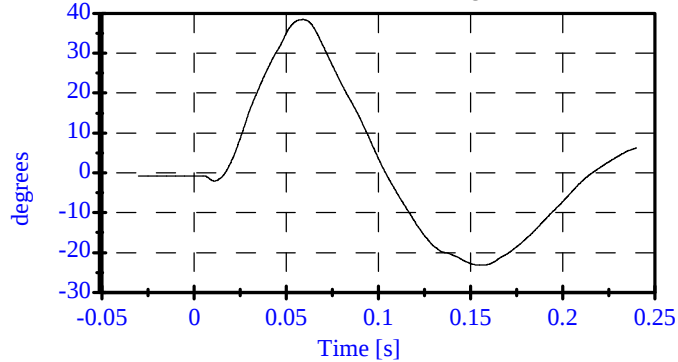
Pend Ax
CFC_180
Max: 28.2 [] at 0.002 [s]
Min: -2.2 [] at 0.039 [s]



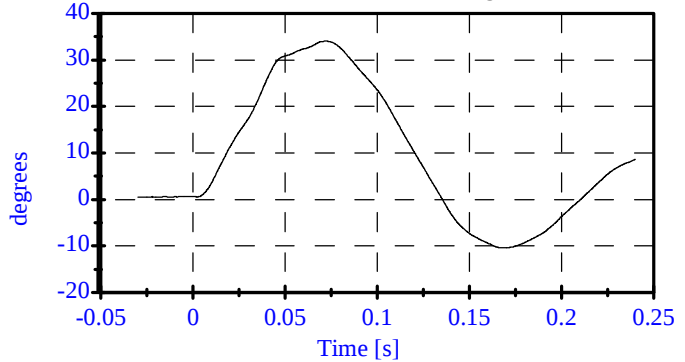
Pend Vx
CFC_180
Max: 8.9 [m/s] at 0.208 [s]
Min: -0.0 [m/s] at -0.000 [s]



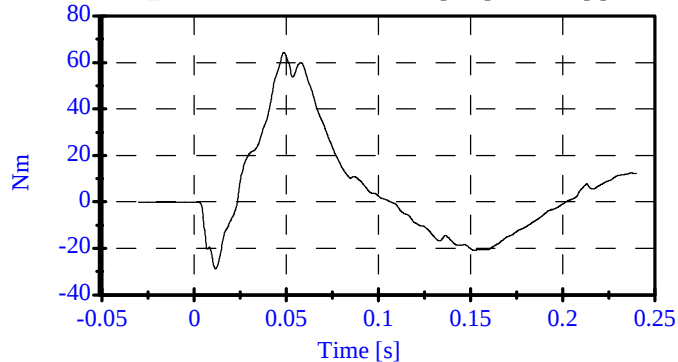
Head Rot
CFC_180
Max: 38.5 [degrees] at 0.059 [s]
Min: -23.1 [degrees] at 0.157 [s]



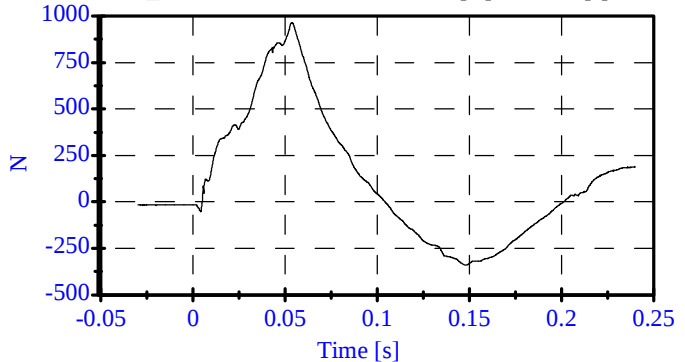
Arm Rot
CFC_180
Max: 34.1 [degrees] at 0.072 [s]
Min: -10.4 [degrees] at 0.169 [s]



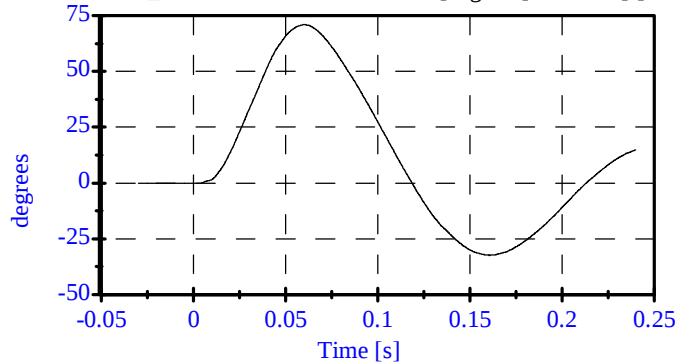
Neck Mx
CFC_600
Max: 64.4 [Nm] at 0.049 [s]
Min: -28.9 [Nm] at 0.012 [s]



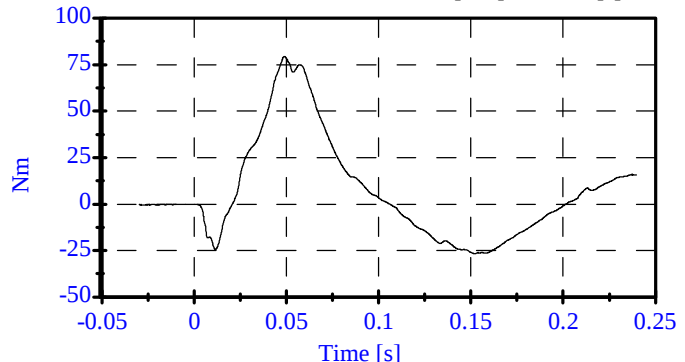
Neck Fy
CFC_1000
Max: 965.5 [N] at 0.054 [s]
Min: -339.8 [N] at 0.148 [s]



Tot Rot
CFC_180
Max: 70.9 [degrees] at 0.060 [s]
Min: -32.3 [degrees] at 0.161 [s]



MOCX
Max: 79.3 [Nm] at 0.049 [s]
Min: -26.6 [Nm] at 0.152 [s]



Ab compression

Post-Test

CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 906

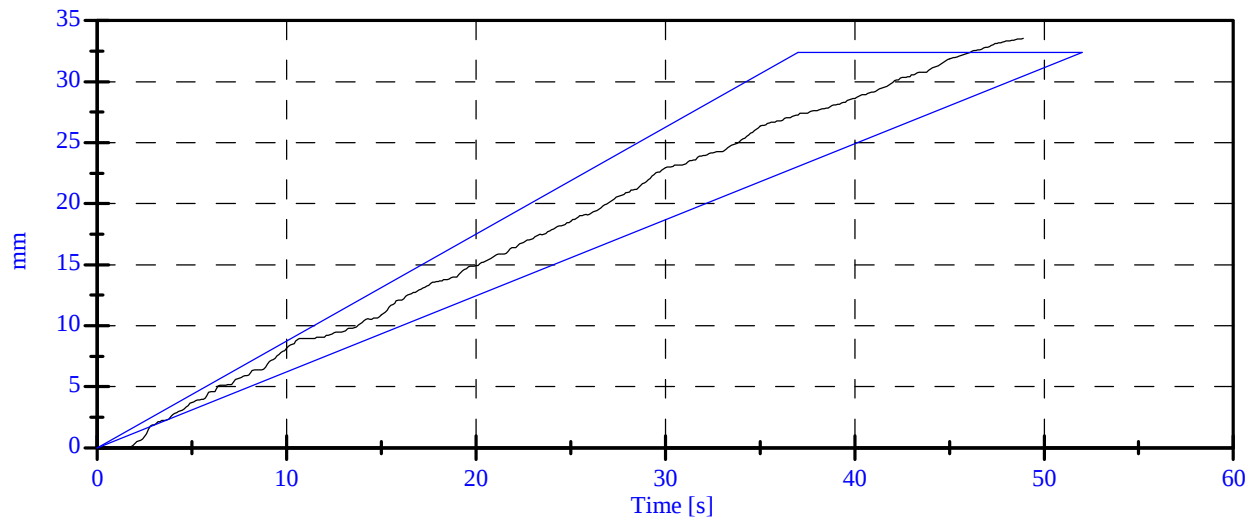
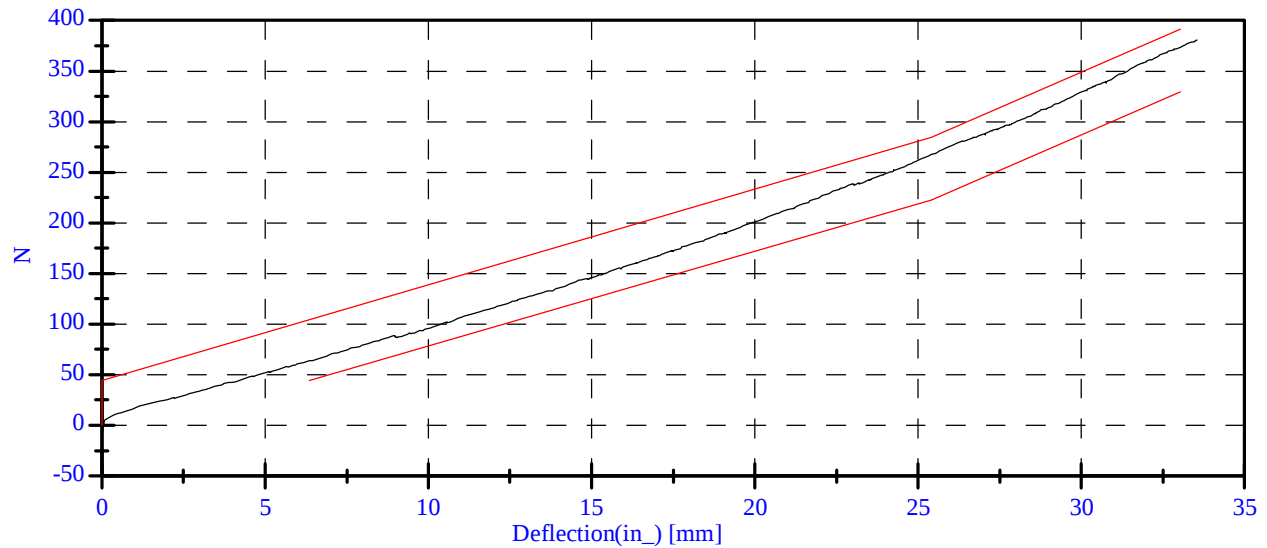
Date: 11-6-09

Sequential Test Number: 1 File: 906Ab 11-5-09

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
Force at 12.95 mm :	104.00-162.00 N	125.74 N	Passed
Force at 19.05 mm :	162.98-220.99 N	189.62 N	Passed
Force at 25.40 mm :	221.97-280.02 N	267.37 N	Passed
Force at 33.02 mm :	324.99-391.00 N	373.96 N	Passed

ABDOMINAL COMPRESSION TEST



Lumbar Spine Test

Post-Test

CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 906

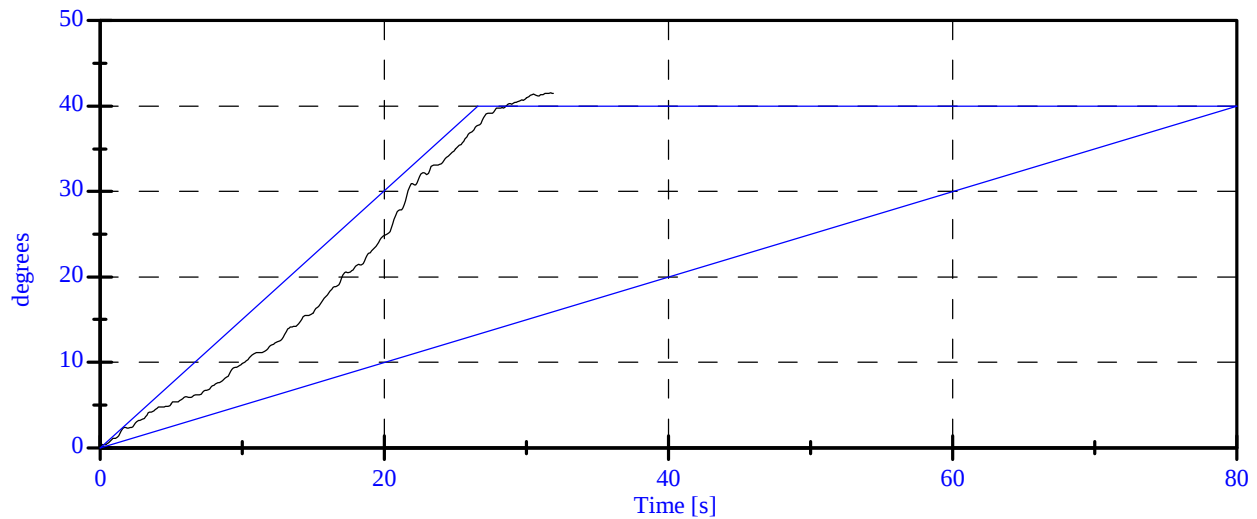
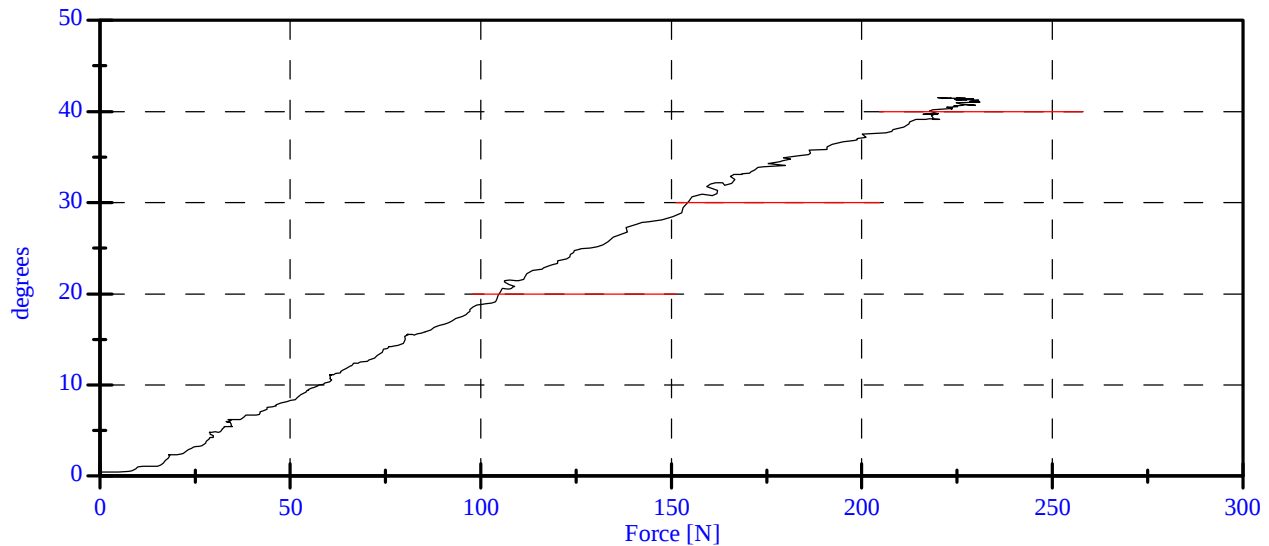
Date: 11-6-09

Sequential Test Number: 1 File: 906Spine

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
Force at 0 Deg:	0.00-26.69 N	1.30 N	Passed
Force at 20 Deg:	97.86-151.24 N	104.46 N	Passed
Force at 30 Deg	151.24-204.62 N	154.60 N	Passed
Force at 40 Deg	204.62-258.00 N	217.80 N	Passed
Return Angle	12 Deg Max	9.07 deg	Passed

LUMBAR SPINE FLEXION TEST



POST TEST DUMMY INSPECTION LIST

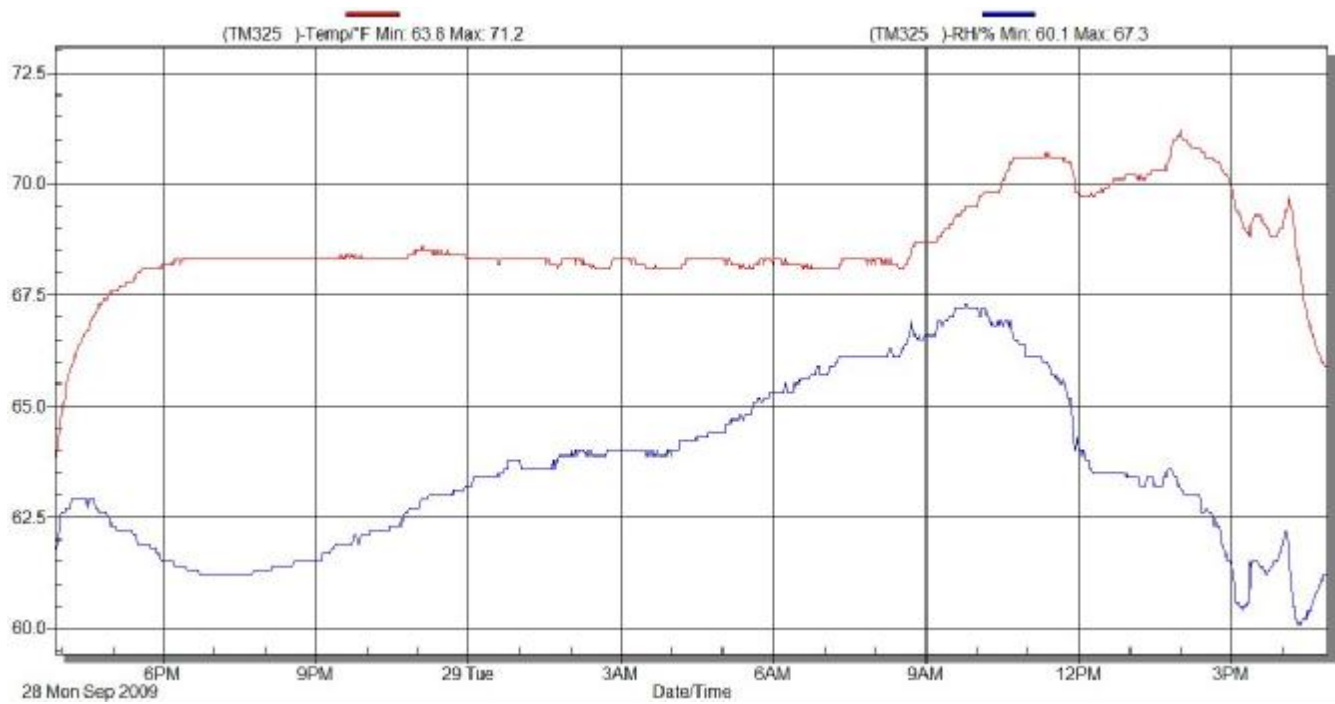
CONFIGURED FOR LEFT SIDE IMPACT

SID H3 Serial No.: 906 Sequential Test Number: 2
 Date: 11-09 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



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	ENDEVCO	P58757	9/24/2009
HEAD AY	ENDEVCO	P58911	9/24/2009
HEAD AZ	ENDEVCO	P58887	9/24/2009
UPPER NECK FX	DENTON	1647Fx	4/20/2009
UPPER NECK FY	DENTON	1647Fy	4/20/2009
UPPER NECK FZ	DENTON	1647Fz	4/20/2009
UPPER NECK MX	DENTON	1647Mx	4/20/2009
UPPER NECK MY	DENTON	1647My	4/20/2009
UPPER NECK MZ	DENTON	1647Mz	4/20/2009
UPPER RIB	ENDEVCO	P59010	9/25/2009
LOWER RIB	ENDEVCO	P59017	9/25/2009
LOWER SPINE	ENDEVCO	P59019	9/25/2009
PELVIS	ENDEVCO	P58777	9/25/2009
UPPER RIB REDUNDANT	ENDEVCO	P58981	9/25/2009
LOWER RIB REDUNDANT	ENDEVCO	P58788	9/25/2009
LOWER SPINE REDUNDANT	ENDEVCO	P58979	9/25/2009
PELVIS REDUNDANT	ENDEVCO	P59018	9/25/2009

	REAR SID/HIII NO.: 906		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD AX	ENDEVCO	J24876	9/23/2009
HEAD AY	ENDEVCO	J14687	9/18/2009
HEAD AZ	ENDEVCO	AJ7M2	9/18/2009
UPPER NECK FX	DENTON	280Fx	5/28/2009
UPPER NECK FY	DENTON	280Fy	5/28/2009
UPPER NECK FZ	DENTON	280Fz	5/28/2009
UPPER NECK MX	DENTON	280Mx	5/28/2009
UPPER NECK MY	DENTON	280My	5/28/2009
UPPER NECK MZ	DENTON	280MZ	5/28/2009
UPPER RIB	ENDEVCO	J32365	9/23/2009
LOWER RIB	ENDEVCO	J36648	9/23/2009
LOWER SPINE	ENDEVCO	AJ5P0	9/23/2009
PELVIS	ENDEVCO	J23805	9/23/2009
UPPER RIB REDUNDANT	ENDEVCO	J18742	9/23/2009
LOWER RIB REDUNDANT	ENDEVCO	J19338	9/23/2009
LOWER SPINE REDUNDANT	ENDEVCO	J19561	9/23/2009
PELVIS REDUNDANT	ENDEVCO	J27464	9/23/2009

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)	ENDEVCO	P16671	9/25/2009
RIGHT FRONT SILL (Y)	ENDEVCO	P32288	9/25/2009
RIGHT FRONT SILL (Z)	ENDEVCO	P23885	4/2/2009
RIGHT REAR SILL (X)	ENDEVCO	P35757	9/25/2009
RIGHT REAR SILL (Y)	ENDEVCO	P23899	9/25/2009
RIGHT REAR SILL (Z)	ENDEVCO	P21399	9/25/2009
REAR FLOORPAN ABOVE AXLE (X)	ENDEVCO	P35803	9/25/2009
REAR FLOORPAN ABOVE AXLE (Y)	ENDEVCO	P35811	9/25/2009
REAR FLOORPAN ABOVE AXLE (Z)	ENDEVCO	P35789	9/25/2009
LEFT REAR SILL (Y)	ENDEVCO	P23788	9/25/2009
LEFT FRONT SILL (Y)	ENDEVCO	P23926	9/25/2009
LEFT FRONT DOOR CENTERLINE (Y)	-	-	-
RIGHT REAR SEAT OCCUPANT COMP. (Y)	ENDEVCO	P16862	9/25/2009
MID REAR OF LEFT FRONT DOOR (Y)	-	-	-
LEFT FRONT DOOR UPPER C/L (Y)	-	-	-
MID REAR OF LEFT REAR DOOR (Y)	-	-	-
LEFT REAR DOOR UPPER C/L (Y)	-	-	-
LOWER LEFT B- PILLAR (Y)	ENDEVCO	P17283	9/25/2009
MIDDLE LEFT B-PILLAR (Y)	ENDEVCO	P23873	9/25/2009
LOWER LEFT A-PILLAR (Y)	ENDEVCO	P26259	9/25/2009
UPPER LEFT A-PILLAR (Y)	ENDEVCO	P19222	9/25/2009
FRONT SEAT TRACK (Y)	ENDEVCO	P23960	9/25/2009
REAR SEAT TRACK (Y)	ENDEVCO	P26266	9/25/2009
VEHICLE CG (X)	ENDEVCO	P23993	9/25/2009
VEHICLE CG (Y)	ENDEVCO	P23164	9/25/2009
VEHICLE CG (Z)	ENDEVCO	P23939	9/25/2009
MDB CG (X)	ENDEVCO	C16680	4/9/2009
MDB CG (Y)	ENDEVCO	C14948	4/9/2009
MDB CG (Z)	ENDEVCO	CP30	4/9/2009
MDB REAR FRAME MEMBER (X)	ENDEVCO	C15007	4/9/2009
MDB REAR FRAME MEMBER (Y)	ENDEVCO	C16499	4/9/2009

REMARKS: None