

REPORT NUMBER: SNCAP-KAR-11-041

**NEW CAR ASSESSMENT PROGRAM (NCAP)
MOVING DEFORMABLE BARRIER SIDE IMPACT TEST**

**NISSAN MOTOR CO., LTD.
2011 NISSAN ALTIMA 2.5 4-DOOR SEDAN**

NHTSA No: MB5201

**PREPARED BY:
KARCO ENGINEERING, LLC.
9270 HOLLY ROAD
ADELANTO, CA 92301**



NOVEMBER 18, 2010

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
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ROOM W43-410
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16. Abstract

A 55/28 km/h 90 deg. Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2011 Nissan Altima 2.5 4-Door Sedan in accordance with the specifications of the Office of Crash Worthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. The test was conducted at KARCO Engineering, LLC in Adelanto, CA, on November 18, 2010.

The impact velocity of the Moving Deformable Barrier was 62.32 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 23.9 deg. C. The target vehicle's maximum post-test static crush was 281 mm located at level 2. The test vehicle's occupant performance data is as follows:

Measurement Description	Driver ATD (ES-2re)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	328.5
Maximum Thorax Rib Deflection	mm	44	32.9
Total Abdominal Force	N	2500	1179
Pubic Symphysis Force	N	6000	1975

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	332.2
Lower Spine Resultant Acceleration	g	82	47
Total Pelvic Force (Sum of Acetubular and Iliac Forces)	N	5525	3919

The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches, and the opposite doors did not open during the side impact event.

17. Key Words New Car Assessment Program (NCAP) Side Impact Moving Deformable Barrier (MDB) ES-2re SID-IIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Admin. Technical Reference Division 1200 New Jersey Ave., SE Room W43-410 Washington, DC 20590	
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SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

This moving deformable barrier side impact test is part of the MY 2011 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number DTNH22-09-D-00122. The purpose of this test is to generate comparative side impact performance in a 2011 Nissan Altima 2.5 4-Door Sedan. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated January 2010.

SUMMARY

A 2011 Nissan Altima 2.5 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 62.32 km/h (38.73 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by KARCO Engineering, LLC. in Adelanto, California, on November 18, 2010. Pre- and post-test photographs of the test vehicle, the MDB, and the dummies (ES-2re and SID-IIs) are included in Appendix A of this report.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated January 2010. The side impact event was documented by 11 cameras. Camera locations are included in Data Sheet No. 5 of this report.

The dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)

Head Accelerometers

Thorax Rib 1 to Rib 3 Potentiometers

Abdomen Forward, Middle, and Rear Load Cells

Lower Spine Accelerometers

Pubic Load Cell

PASSENGER ATD (SID-IIs)

Head Accelerometers

Thorax Upper, Middle and Lower Rib Potentiometers

Abdomen Upper and Lower Rib Potentiometers
 Lower Spine Accelerometers
 Iliac Load Cell
 Acetabulum Load Cell

Dummy injury values were recorded as follows:

Measurement Description	Units	Driver ATD (ES-2re)	
		Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	328.5
Maximum Thorax Rib Deflection	mm	44	32.9
Combined Abdominal Force	N	2500	1179
Pubic Symphysis Force	N	6000	1975

Measurement Description	Units	Passenger ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	332.2
Lower Spine (T12) Resultant Acceleration	g	82	47
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3919

Supplemental restraint information is given below:

Restraint Type	Left Front (Driver)		Left Rear (Passenger)	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No	No	
Knee Airbag	No		No	
Side Airbag 1 (Torso/Pelvis)	Yes	Yes	No	
Side Airbag 2 (Curtain)	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes	Yes	No	
Other				

GENERAL COMMENTS

Both the front and rear doors on the struck side of the vehicle remained closed and latched. There was no separation at the hinges or latches. Both doors on the non-struck side remained closed and latched. There were no ATD values that exceeded limits.

SECTION 2

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

NHTSA No. MB5201

Test Program: MDB Side Impact Test

Test Date: 11/18/10

CONVERSION FACTORS

Quantity	Typical Application	Std Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	miles/hr	km/hr	1.609344
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.573
Pressure	Tire Pressures	lbf/in ²	kPa	7.0
Volume	Liquid	gal	liter	3.785
Temperature	General Use	°F	°C	$=(t_f - 32)/1.8$
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf/ft	Nm	1.355

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

NHTSA No. MB5201

Test Program: MDB Side Impact Test

Test Date: 11/18/10

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	MB5201
Model Year	2011
Make	Nissan
Model	Altima 2.5
Body Style	4-Door Sedan
VIN	1N4AL2AP1BN409509
Body Color	Brilliant Silver
Delivery Date	10/29/2010
Odometer Reading (km / mi)	154/96
Dealer	Buena Park Nissan
Transmission	CVT
Final Drive	Front
Type / No. of Cylinders	Inline 4
Engine Displacement (L)	2.5
Engine Placement	Transverse
Roof Rack	No
Sunroof / T-Top	No
Tinted Glass	No
Traction Control	No
Power Brakes	Yes
Front Disc	Yes
Rear Disc	Yes

Anti-Lock Brakes	Yes
All Wheel Drive	No
Power Steering	Yes
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head/Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso/Pelvis Airbag	No
Rear Pass. Pelvis Airbag	No
Pretensioners	Yes
Load Limiters	Yes
Automatic Door Locks	Yes
Bucket Seats	Yes
Tilt Steering	Yes
Other	
Other	

Does Owner's Manual provide instructions to turn off automatic door locks?

No

DATA FROM CERTIFICATION LABEL

Manufactured By	Nissan Motor Co., Ltd.
Date of Manufacture	Sep-10

GVWR (kg)	1941
GAWR Front (kg)	1017
GAWR Rear (kg)	993

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity	2	3		5
Capacity Weight (VCW) (kg)				408.0
DSC x 68.04 (kg)				340.2
Cargo Weight (RCLW) (kg)				67.8

A

B

A-B

VEHICLE SEAT TYPE

Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						w/ Lever	w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat		Yes			Yes		
Third Row Seat							

DATA SHEET NO. 1 ... (CONTINUED)

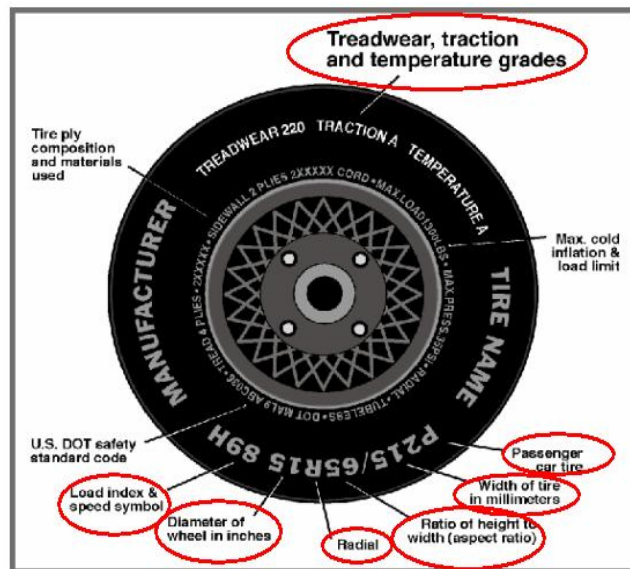
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

NHTSA No. MB5201

Test Program: MDB Side Impact Test

Test Date: 11/18/10



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	300	300
Cold Pressure (kpa)	220	220
Recommended Tire Size	P215/60R16	P215/60R16
Tire Size on Vehicle	P215/60R16	P215/60R16
Tire Model	ContiProContact	ContiProContact
Tire Manufacturer	Continental	Continental
Treadwear	540	540
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Nylon	1 Polyester, 2 Steel, 1 Nylon
Load Index/Speed Symbol	94T	94T
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Right	A3X8 3WH 3210	A3X8 3WH 3210
DOT Safety Code Left	A3X8 3WH 3210	A3X8 3WH 3210

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan NHTSA No. MB5201
 Test Program: MDB Side Impact Test Test Date: 11/18/10

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	430.5	290.0		464.5	373.0		470.0	381.0	
Right	kg	425.0	281.0		424.5	351.0		418.5	349.5	
Ratio	%	60.0%	40.0%	100.0%	55.1%	44.9%	100.0%	54.9%	45.1%	100.0%
Total	kg	855.5	571.0	1426.5	889.0	724.0	1613.0	888.5	730.5	1619.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1426.5	A
Actual Weight of 2 P572 ATDs Used	kg	125.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	67.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1619.3	A+B+C

TEST VEHICLE ATTITUDES

Condition	Units	LF	RF	LR	RR	CG (Aft of Front Axle)
Fully Loaded	mm	713	731	682	691	1252
As Tested	mm	719	724	682	694	1245

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheelbase	mm	2774
Total Vehicle Length at Left Side	mm	3346
Total Vehicle Length at Centerline	mm	4844
Total Vehicle Length at Right Side	mm	3346
Weight of Ballast in Cargo Area	kg	57.0
Weight of Vehicle Components Removed	kg	32.5
Amount of Stoddard Solvent in Fuel Tank	L	70.40

Vehicle components removed to make Target Vehicle Test Weight:

Spare tire and tools (16.0 kg), Non-struck side door panels and windows (9.0 kg), Trunk lining
and mat (6.5 kg), Non-struck side mirror (1.0 kg)

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Target Impact Point Aft of Front Axle	mm	447
Actual Impact Point Aft of Front Axle	mm	465

DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

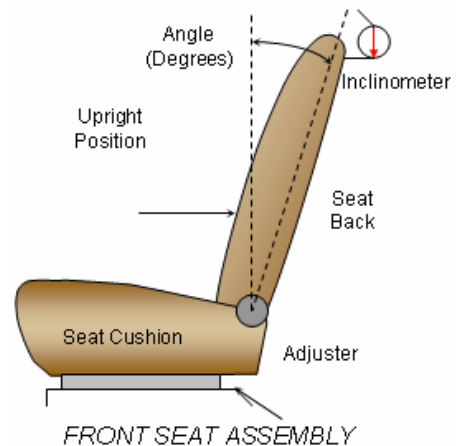
NHTSA No. MB5201

Test Program: MDB Side Impact Test

Test Date: 11/18/10

NOMINAL DESIGN RIDING POSITION

The driver's seat back is set to the manufacturer's designated seat back angle. The passenger's seat back is set to level the passenger ATD's head transverse instrumentation platform as close as possible. The driver's seat back angle is measured at the headrest post and the passenger's seat back angle is measured at the seat back. Both angles are measured using a digital inclinometer.



SEAT BACK ANGLES

	Degrees (°)
Driver w/Seated Dummy	8.6
Passenger w/Seated Dummy	26.3

SEAT FORE/AFT POSITION

Seat travel is measured from the forward most possible position to the rear most possible position with the seat set at mid angle and lowest height. The driver's seat is set to the middle of the fore-aft travel. The passenger's seat is fixed.

SEAT FORE/AFT POSITIONS

Seating Position	Total Fore/Aft Travel	Placed in Position
Driver Seat	238 mm	119 mm
Rear Seat	Fixed	Fixed

SEAT BELT UPPER ANCHORAGE

The seat belt upper anchorage is positioned to the manufacturer's design position, the driver for a 50th percentile adult male ATD, the left rear passenger for a 5th percentile adult female ATD. Position zero (0) is the uppermost position. The rear passenger upper anchorage is fixed.

SEAT BELT UPPER ANCHORAGES

Seating Position	Total No. of Positions	Placed in Position
Driver Seat	4	0
Rear Seat	Fixed	Fixed

DATA SHEET NO. 2 ... (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

NHTSA No. MB5201

Test Program: MDB Side Impact Test

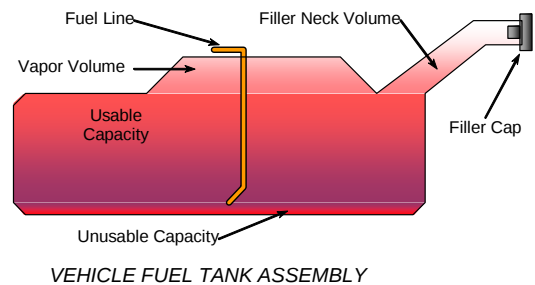
Test Date: 11/18/10

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	75.70
Usable Capacity of "Optional Tank"	
Usable Capacity Used for FMVSS 301	75.70
Actual Amount of Stoddard Solvent Used	70.40

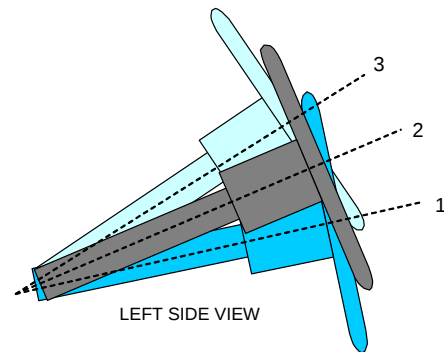
FUEL PUMP

The test vehicle is equipped with an electric fuel pump. The fuel pump will pump fuel for 1.0 second after the ignition is switched to "on", while the engine is running, and for 1.5 seconds after the engine stops running. The fuel filler door is located on the left rear fender. The standard fuel tank occupies the area under the rear seat.



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. A digital inclinometer is used to measure a plate which is placed across the rim of the steering wheel for angular measurements. A tape measure is used with a reference mark on the steering column to measure telescoping travel.



STEERING COLUMN POSITIONING

	Degrees	Fore-Aft Position (mm)
Lowermost Position, No. 1	17.5	0
Geometric Center Position, No. 2	25.0	20
Uppermost Position, No. 3	32.5	40
Telescoping Steering Wheel Travel		40
Test Position	23.5	20

DATA SHEET NO. 3

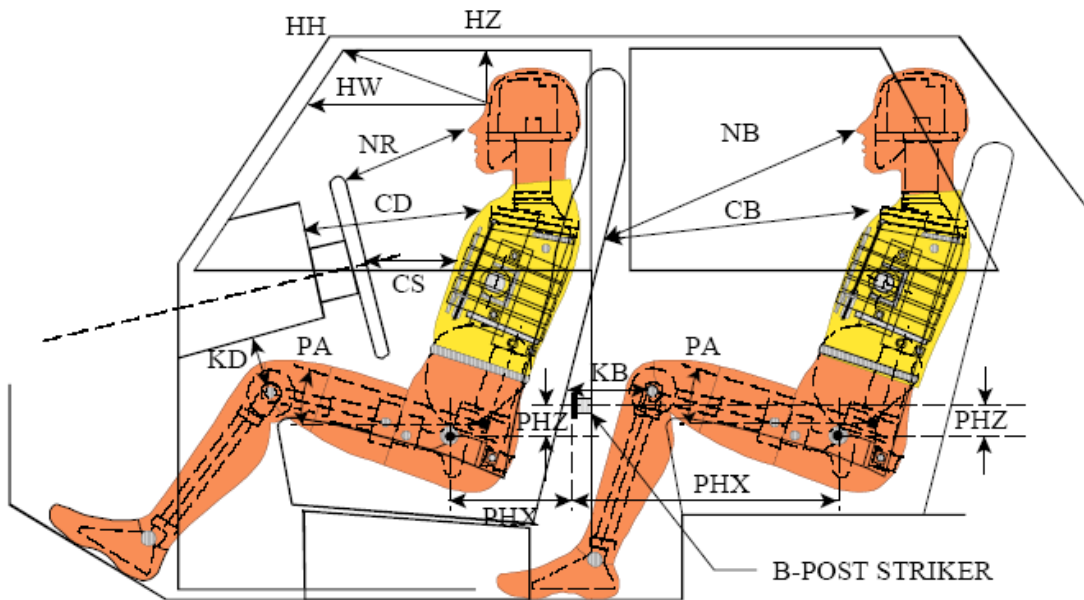
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

NHTSA No. MB5201

Test Program: MDB Side Impact Test

Test Date: 11/18/10



LEFT SIDE VIEW

NOTE: 2-DOOR VEHICLE SHOWN.
REAR DUMMY PHX & PHZ
MEASUREMENTS FOR A 4-DOOR
VEHICLE WOULD USE THE C-POST
STRIKER AS A REFERENCE POINT

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Description	Driver		Passenger	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Head to Header	409	16.5		
HW		Head to Windshield	629	0.0		
HZ	HZ	Head to Roof	173	90.0	238	90.0
NR	NB	Nose to Rim/Seat Back	463	12.6	572	9.8
CD	CB	Chest to Dash/Seat Back	614	2.1	540	12.2
CS		Chest to Steering Wheel	370	13.0		
KDL	KBL	Left Knee to Dash/Seat Back	173	26.1	265	44.8
KDR	KBR	Right Knee to Dash/Seat Back	169	28.9	268	46.8
PA	PA	Pelvic Angle		18.9		25.1
PHX	PHX	H-Point to Striker (x-axis)	198	0.0	297	0.0
PHZ	PHZ	H-Point to Striker (z-axis)	125	90.0	308	90.0
SA	SA	Seat Back Angle		8.6		26.3

DATA SHEET NO. 4

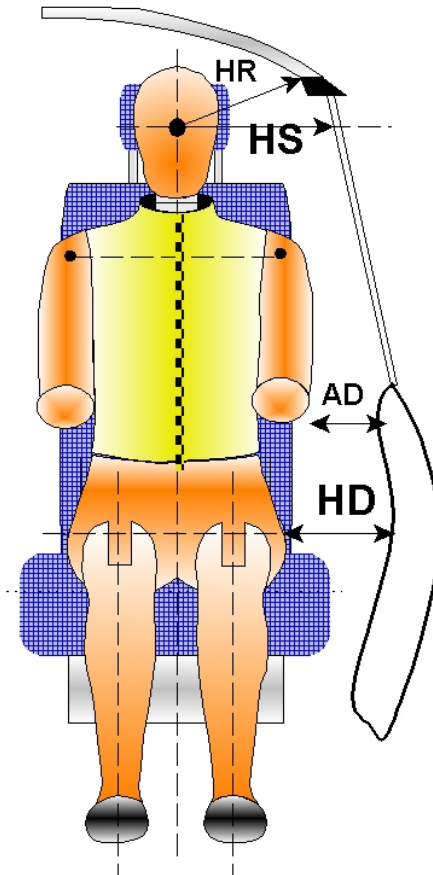
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

NHTSA No. MB5201

Test Program: MDB Side Impact Test

Test Date: 11/18/10



DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	197	250
HS	Head to Side Window	mm	316	331
AD	Arm to Door	mm	102	157
HD	H-Point to Door	mm	156	181

DATA SHEET NO. 5

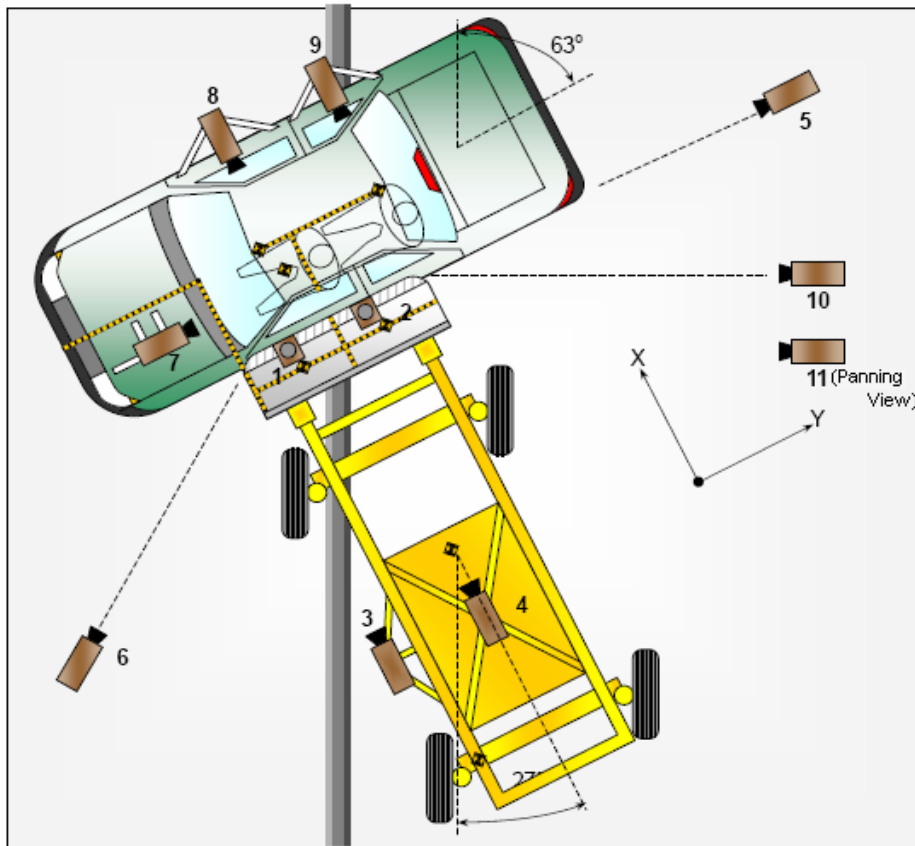
CAMERA LOCATIONS AND DATA

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

NHTSA No. MB5201

Test Program: MDB Side Impact Test

Test Date: 11/18/10



CAMERA LOCATIONS AND DATA

Camera No.	View	Coordinates (mm)			Angle (°)	Lens (mm)	Film Speed (fps)
		X*	Y*	Z*			
1	Overhead Overall	1220	2287	-5486	90	14	1000
2	Overhead Close-Up	609	2287	-5102	90	Zoom	1000
3	Left Impact Point (MDB)	-2134	0	-1143	7.5	25	1000
4	Side Overall (MDB)	-3912	838	-1829	11.9	12	1000
5	Rear	-64	2485	-1348	0	105	1000
6	Left Front	-2266	-3564	-1475	0	24	1000
7	Driver Front (On-Board)	422	-612	628	7.6	35	1000
8	Driver Side (On-Board)	1590	777	459	6.3	14	1000
9	Passenger Side (On-Board)	1621	1714	493	10.4	14	1000
10	Real Time Overall					Zoom	30
11	Real Time Inrun					Zoom	30

Reference: Impact Point Projected to Ground

+X = To Front of MDB, +Y = To Right of MDB, +Z = Down

*All measurements accurate to ± 6 mm

DATA SHEET NO. 6

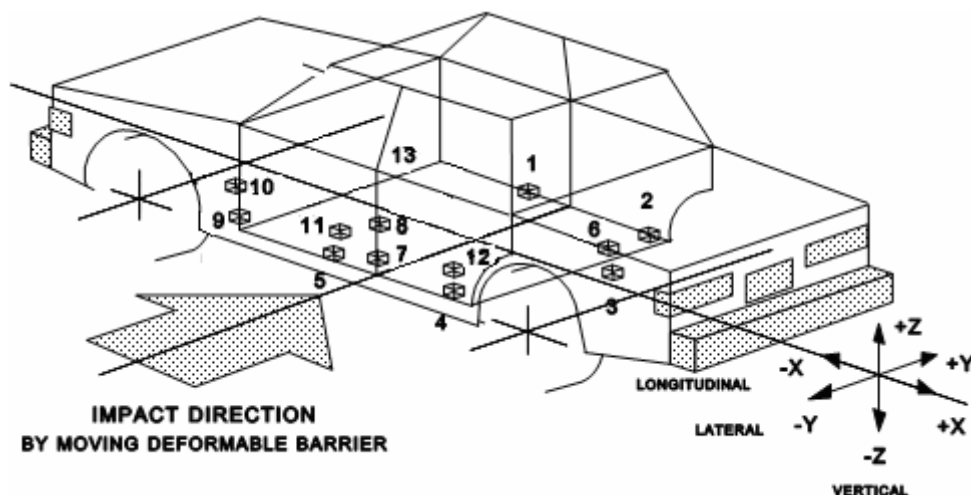
VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

NHTSA No. MB5201

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Test Date: 11/18/10



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Right Sill at Front Seat	2701	715	355
2	Right Sill at Rear Seat	1745	718	364
3	Rear Floorpan Above Axle	682	469	480
4	Left Sill at Rear Door	1868	-705	182
5	Left Sill at Front Door	2786	-714	198
6	Right Rear Occupant Compartment	2127	445	206
7	B-Pillar Lower	2190	-726	831
8	B-Pillar Mid	2190	-726	464
9	A-Pillar Lower	3369	-747	809
10	A-Pillar Mid	3369	-747	563
11	Front Seat Track	2723	-571	224
12	Rear Seat Structure			
13	Vehicle CG	2104	0	307

Reference: X – Rear surface of vehicle (+ forward)
 Y – Vehicle centerline (+ to right)
 Z – Ground plane (+ up)

DATA SHEET NO. 7

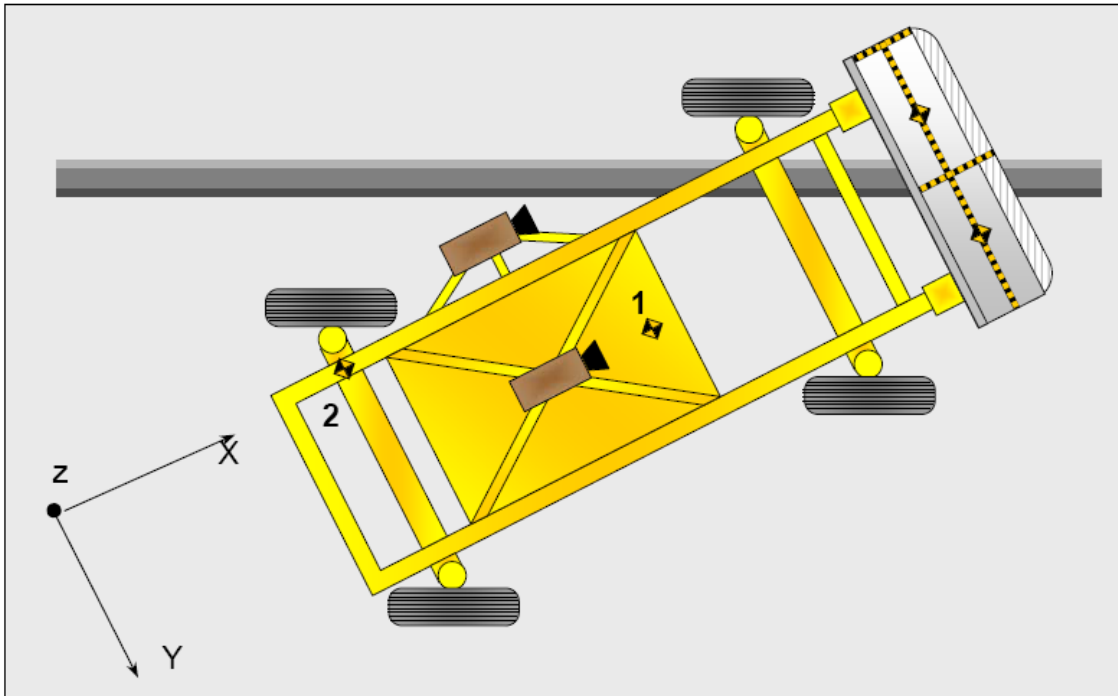
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

NHTSA No. MB5201

Test Program: MDB Side Impact Test

Test Date: 11/18/10



MDB ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Measurement		
		X	Y	Z
1	MDB CG	-1195	0	-430
2	MDB Rear	-2642	-593	-608

Reference: X – Face of MDB (+ forward)
Y – MDB centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 8**TEST VEHICLE SUMMARY OF RESULTS**Test Vehicle: 2011 Nissan Altima 2.5 4-Door SedanNHTSA No. MB5201Test Program: MDB Side Impact TestTest Date: 11/18/10**MAXIMUM EXTERIOR CRUSH**

Level	Description	Units	Maximum Crush	Above Ground
1	Sill Top Height	mm	83	252
2	Occupant H-Point Height	mm	281	520
3	Mid-Door Height	mm	268	621
4	Window Sill Height	mm	177	896
5	Window Top Height	mm	60	1385
	Maximum Penetration	mm	281	

INSTRUMENTATION

Driver Dummy Channels	16
Passenger Dummy Channels	16
Airbag Timing Sensors	4
Vehicle Structure Accelerometers	21
MDB Accelerometers	5
Total No. of Contact Switches	8
Total	70

CAMERA COVERAGE

High-Speed Vehicle On-Board	3
High-Speed Vehicle Off-Board	4
High-Speed MDB On-Board	2
Real Time	2
Total	11

DATA SHEET NO. 9**MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS**Test Vehicle: 2011 Nissan Altima 2.5 4-Door SedanNHTSA No. MB5201Test Program: MDB Side Impact TestTest Date: 11/18/10**MDB SPECIFICATIONS**

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1251
Overall Length including Honeycomb Face	4023
Wheel Base of Framework Carriage	2595
CG location aft of Front Axle	1118

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	402	298	
Right	kg	377	292	
Ratio	%	56.9%	43.1%	
Totals	kg	779	590	1368

SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.32
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.26
MDB CL to Target Vehicle CL	degrees	88.5-91.5	89.2

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

Vertical Location			From Centerline		Max. Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
1	Center of Bumper	432	300	Left	175
2	Top of Bumper	533	800	Right	104
3	Mid Level	686	800	Right	125
4	Top of Stack	813	800	Right	175

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	2

DATA SHEET NO. 10
POST-TEST OBSERVATIONS

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

NHTSA No. MB5201

Test Program: MDB Side Impact Test

Test Date: 11/18/10

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Dummy Type/Serial No.	ES-2re, S/N: F035	SID-IIs, S/N: 307
Head Contact	Curtain Airbag, Side Header, Head Restraint	Curtain Airbag, Side Header, Center Seat Back
Upper Torso Contact	Side Bolster, Torso/Pelvis Airbag	Side Bolster, Door Panel
Lower Torso Contact	Torso/Pelvis Airbag, Door Panel	Door Panel
Left Knee Contact	Right Knee	Door Panel, Right Knee
Right Knee Contact	Left Knee	Left Knee

POST-TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Door Opening	Jammed shut	Jammed shut
Right Side Door Opening	Remained closed and operational	Remained closed and operational
Hatch and Other Doors	Remained closed and operational	Remained closed and operational
Seat Movement	None	None
Seatback Failure	No	No

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions	
Pillar Performance	No separation occurred	
Sill Separation	No separation occurred	
Windshield Damage	Cracked	
Window Damage	Broken	Broken
Other Notable Effects	Left rear door skin separation	

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Installed	Deployed	Installed	Deployed
Frontal Airbag	Yes	No	No	
Knee Airbag	No		No	
Side Airbag 1 (Torso/Pelvis)	Yes	Yes	No	
Side Airbag 2 (Curtain)	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes	Yes	No	
Other				

MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	+18 (Right)
Vertical Offset	mm	+/- 20	+5 (Up)

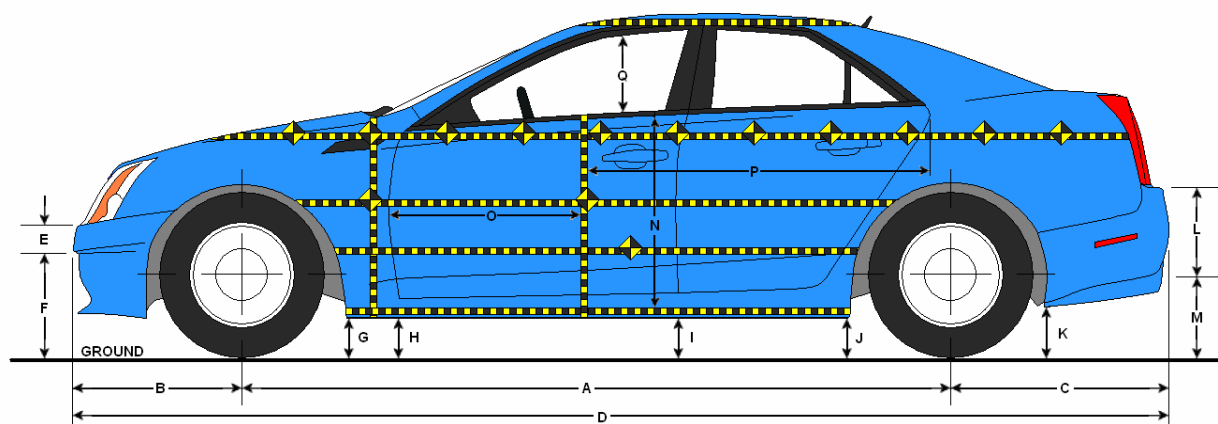
DATA SHEET NO. 11
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

NHTSA No. MB5201

Test Program: MDB Side Impact Test

Test Date: 11/18/10



LEFT SIDE VIEW

VEHICLE PRE AND POST-TEST MEASUREMENT INFORMATION

Code	Dimension	Measurement (mm)		
		Pre	Post	Difference
A	Wheelbase	2774	2766	-8
B	Front Axle to FSOV	975	975	0
C	Rear Axle to RSOV	1095	1098	3
D	Total Length at Centerline	4844	4839	-5
E	Front Bumper Thickness	311	310	-1
F	Front Bumper Bottom to Ground	241	250	9
G	Sill Height at Front Wheel Well	193	198	5
H	Sill Height at Front Door Leading Edge	188	218	30
I	Sill Height at B-Pillar	168	236	68
J1	Sill Height at Rear Wheel Well	166	261	95
J2	Pinch Weld Height at Rear Wheel Well	172	214	42
K	Sill Height Aft of Rear Wheel Well	181	224	43
L	Rear Bumper Thickness	308	310	2
M	Bottom of Rear Bumper to Ground	246	292	46
N	Sill Height to Window Bottom Sill	586	592	6
O	Front Door Leading Edge to Impact CL	764	737	-27
P	Rear Door Trailing Edge to Impact CL	1431	1326	-105
Q	Front Window Opening	422	435	13
R	Right Side Length	3346	3349	3
S	Left Side Length	3346	3320	-26
T	Vehicle Width at B-Pillar	1735	1682	-53

All measurements in mm with tolerance of ± 3 mm

DATA SHEET NO. 12

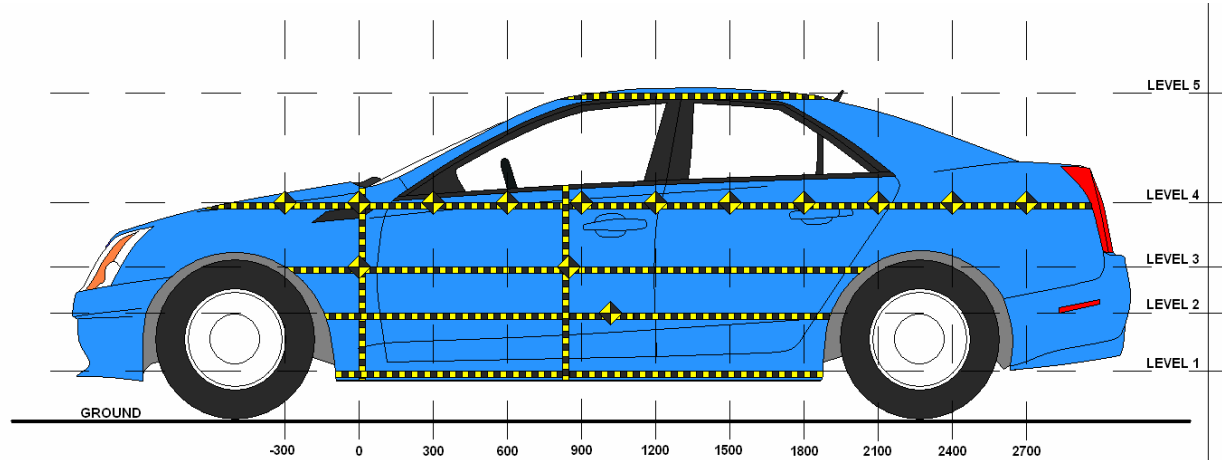
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

NHTSA No. MB5201

Test Program: MDB Side Impact Test

Test Date: 11/18/10



LEFT SIDE VIEW

Level	Description	Height Above Ground (mm)
1	Sill Top Height	252
2	Occupant H-Point Height	520
3	Mid-Door Height	621
4	Window Sill Height	896
5	Window Top Height	1385

DATA SHEET NO. 12 ... (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

NHTSA No. MB5201

Test Program: MDB Side Impact Test

Test Date: 11/18/10

	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300				728					750					22	
-150			596	711				613	729				17	18	
0	620	600	602	700		679	634	633	721		59	34	31	21	
150	642	604	605	689		725	822	794	702		83	218	189	13	
300	644	604	605	682		719	850	844	746		75	246	239	64	
450	644	604	605	677		714	864	868	796		70	260	263	119	
600	644	606	606	675		712	874	874	817		68	268	268	142	
750	644	606	607	673		716	884	855	822		72	278	248	149	
900	644	607	608	672	944	720	888	846	836	979	76	281	238	164	35
1050	644	608	608	671	940	721	886	840	848	994	77	278	232	177	54
1200	644	610	610	670	940	721	857	816	833	1000	77	247	206	163	60
1350	643	611	610	671	943	715	812	785	816	991	72	201	175	145	48
1500	643	612	611	670	944	705	760	757	789	982	62	148	146	119	38
1650	643	613	613	670	948	690	698	692	745	974	47	85	79	75	26
1800	631	613	613	668	957	662	623	638	667	970	31	10	25	-1	13
1950			610	666	957			532	578	964			-78	-88	7
2100				663					496					-167	
2250				663					429					-234	
2400				668					697					29	
2550				675					694					19	
2700				685					697					12	
2850															

MAXIMUM CRUSH DATA

	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush (mm)	83	281	268	177	60
Distance from Impact (mm)	150	900	600	1050	1200

DATA SHEET NO. 12 ... (CONTINUED)

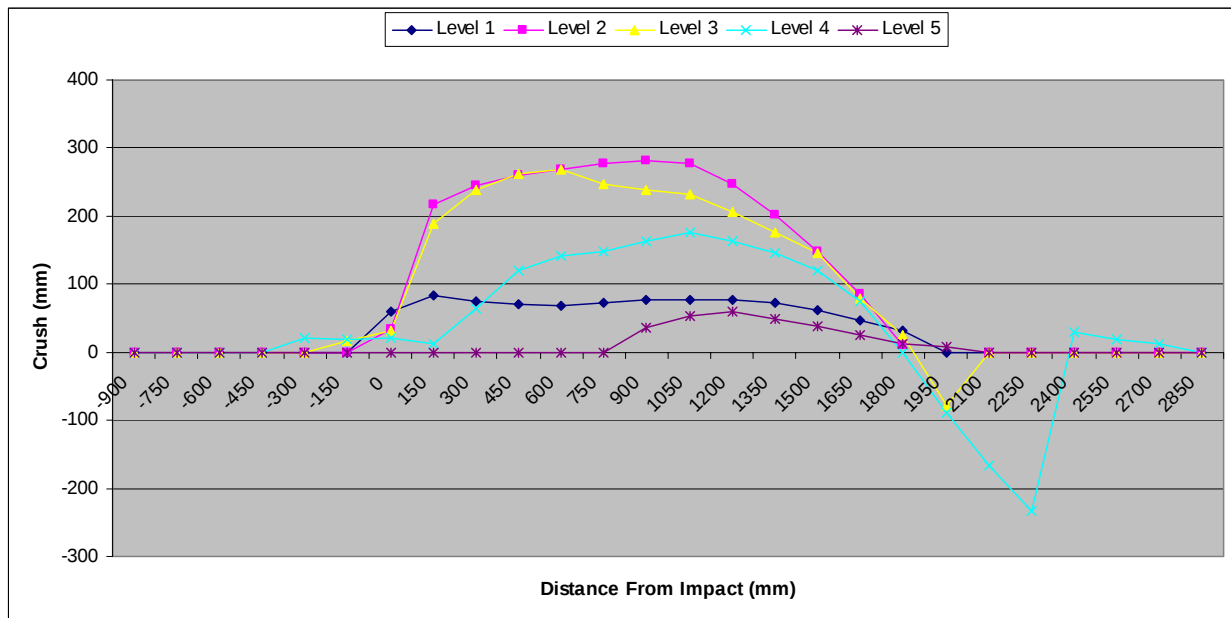
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

NHTSA No. MB5201

Test Program: MDB Side Impact Test

Test Date: 11/18/10



DATA SHEET NO. 13

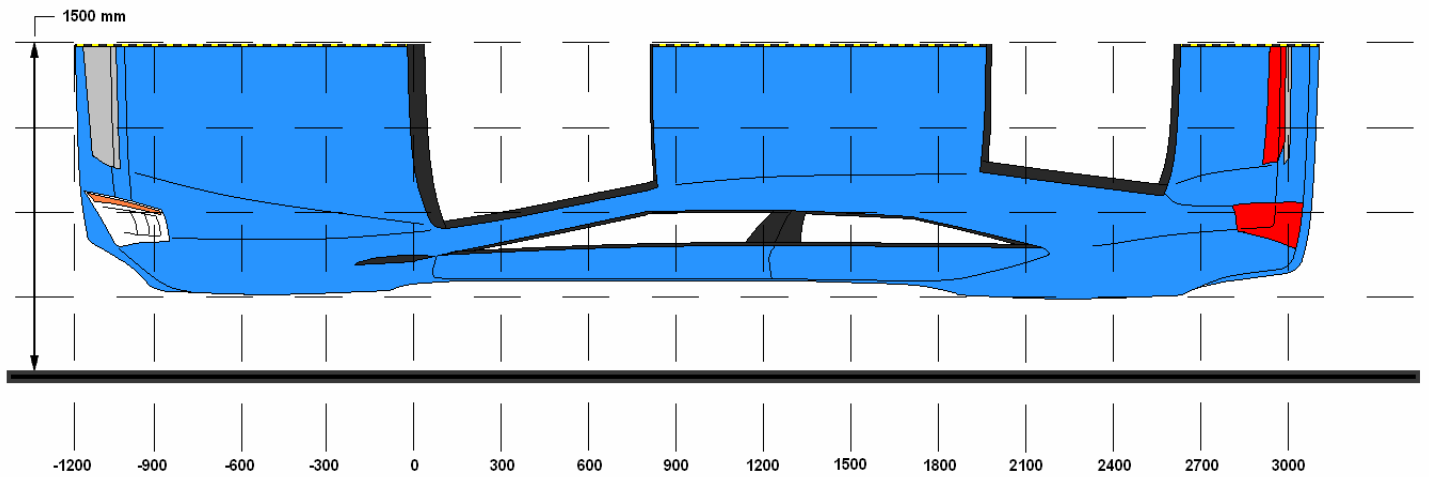
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

NHTSA No. MB5201

Test Program: MDB Side Impact Test

Test Date: 11/18/10



TOP VIEW

DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	2700	4	685	697	12
2	2100	4	663	496	-167
3	1500	2	612	760	148
4	900	2	607	888	281
5	300	2	604	850	246
6	-300	4	728	750	22

DATA SHEET NO. 14

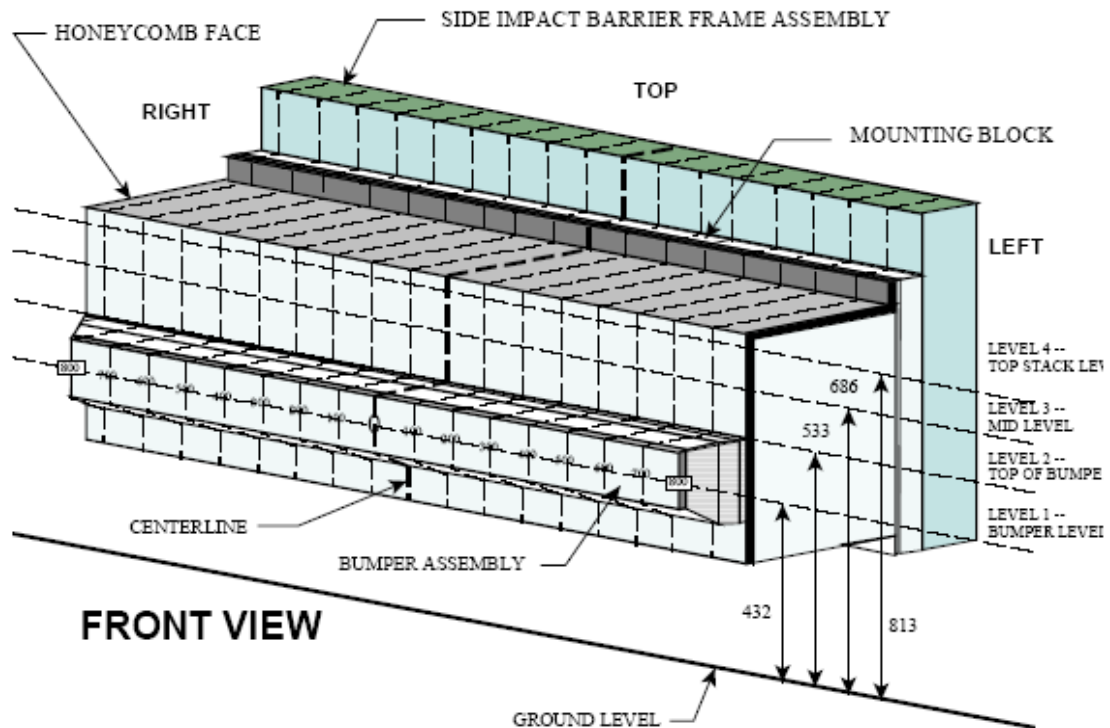
EXTERIOR STATIC CRUSH FOR IMPACTOR FACE

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

NHTSA No. MB5201

Test Program: MDB Side Impact Test

Test Date: 11/18/10



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	171	154	152	151	146	149	151	156	163	165	168	175	163	155	136	151	164
2	104	94	88	81	72	64	59	58	65	76	79	73	57	57	59	64	72
3	125	77	49	34	28	24	22	27	41	64	83	62	34	36	41	54	84
4	175	134	95	70	50	41	34	31	31	49	82	66	34	22	24	34	67

All dimensions in millimeters.

DATA SHEET NO. 15

FMVSS NO. 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

NHTSA No. MB5201

Test Program: MDB Side Impact Test

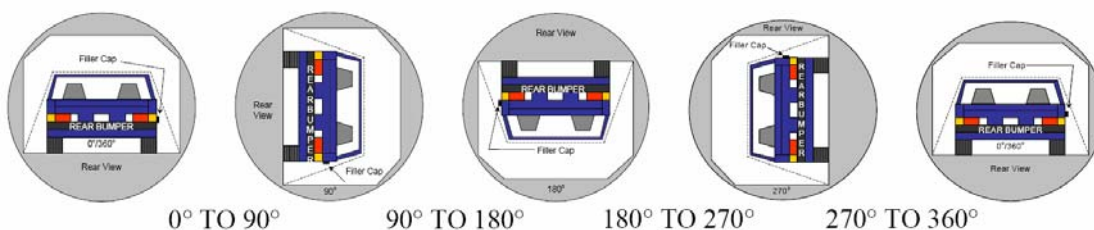
Test Date: 11/18/10

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 23.9° C

Test Time: 11:50 PM

- A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable = 1 oz.)
- B. For the 5 minute period after motion ceases: 0 oz.
(Maximum allowable = 5 oz.)
- C. For the following 25 minutes: 0 oz.
(Maximum allowable = 1 oz./minute)
- D. Spillage Details: No spillage occurred



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	83	300	383
90° To 180°	84	300	384
180° To 270°	78	300	378
270° To 360°	81	300	381

FMVSS 301 SPILLAGE TABLE

Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° To 90°	0			
90° To 180°	0			
180° To 270°	0			
270° To 360°	0			

SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° To 90°	None
90° To 180°	None
180° To 270°	None
270° To 360°	None

DATA SHEET NO. 16

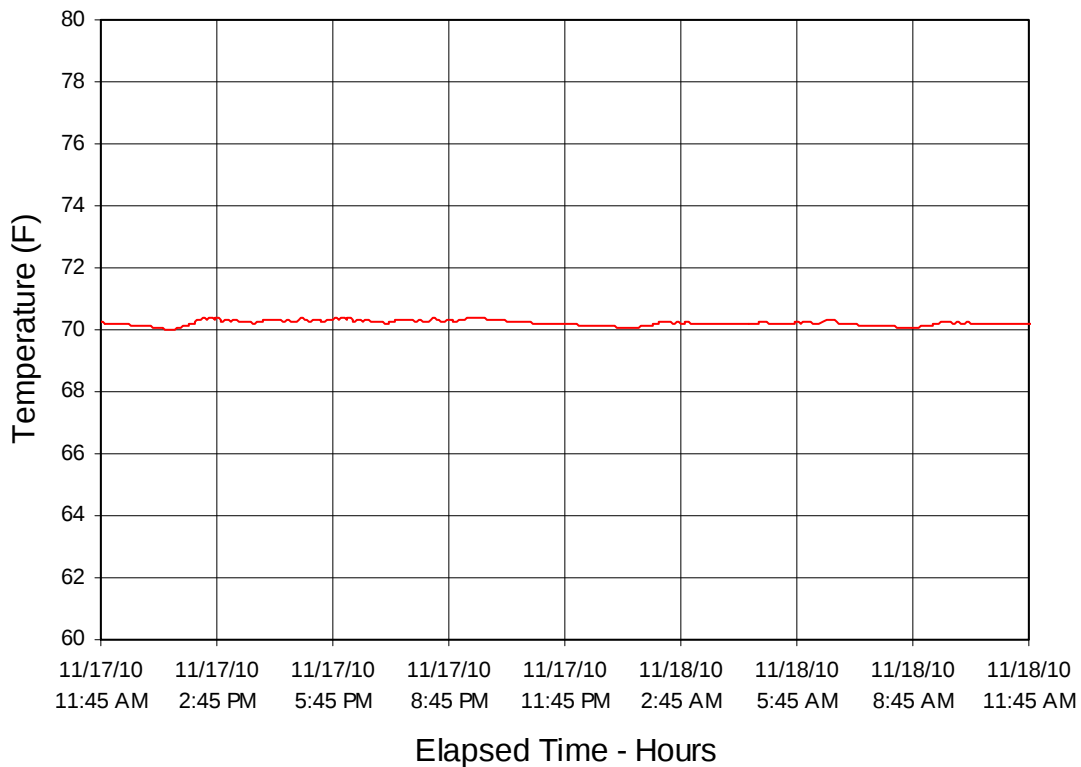
DUMMY / VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan

NHTSA No. MB5201

Test Program: MDB Side Impact Test

Test Date: 11/18/10



APPENDIX A
PHOTOGRAPHS

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FIGURE 1. As-Delivered Right Front Three-Quarter View of Test Vehicle



FIGURE 2. As-Delivered Left Rear Three-Quarter View of Test Vehicle



FIGURE 3. Pre-Test Frontal View of Test Vehicle



FIGURE 4. Post-Test Frontal View of Test Vehicle



FIGURE 5. Pre-Test Left Front Three-Quarter View of the Test Vehicle



FIGURE 6. Post-Test Left Front Three-Quarter View of the Test Vehicle



FIGURE 7. Pre-Test Left Side View of Test Vehicle



FIGURE 8. Post-Test Left Side View of Test Vehicle



FIGURE 9. Pre-Test Left Rear Three-Quarter View of Test Vehicle



FIGURE 10. Post-Test Left Rear Three-Quarter View of Impact Zone



FIGURE 11. Pre-Test Rear View of Test Vehicle



FIGURE 12. Post-Test Rear View of Test Vehicle



FIGURE 13. Pre-Test Right Side View of Test Vehicle



FIGURE 14. Post-Test Right Side View of Test Vehicle



FIGURE 15. Pre-Test Overhead View of Test Vehicle with MDB Positioned Against Side of Test Vehicle



FIGURE 16. Post-Test Overhead View of Test Vehicle and MDB



FIGURE 17. Pre-Test Left Side View of MDB Positioned
Against Side of Test Vehicle at Ideal Impact Point



FIGURE 18. Pre-Test Right Side View of MDB Positioned
Against Side of Test Vehicle at Ideal Impact Point



FIGURE 19. Pre-Test Close-Up View of Impact Point Target



FIGURE 20. Post-Test Close-Up View of Impact Point Target
Showing Impact Point Location



FIGURE 21. Pre-Test Left Front Door Latch Close-Up



FIGURE 22. Post-Test Left Front Door Latch Close-Up



FIGURE 23. Pre-Test Left Rear Door Latch Close-Up



FIGURE 24. Post-Test Left Rear Door Latch Close-Up



FIGURE 25. Pre-Test Front Close-Up View of Driver Dummy



FIGURE 26. Post-Test Front Close-Up View of Driver Dummy



FIGURE 27. Pre-Test Left Side View of Driver Dummy
Showing Belt, Chalking, and Contact Switches



FIGURE 28. Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View



FIGURE 29. Post-Test Left Side View of Driver Dummy Shoulder and Door Top View



FIGURE 30. Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning



FIGURE 31. Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint



FIGURE 32. Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning



FIGURE 33. Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan



FIGURE 34. Pre-Test Placement of Driver Dummy's Feet



FIGURE 35. Pre-Test View of Belt Anchorage for Driver Dummy



FIGURE 36. Pre-Test Left Side View of Steering Wheel



FIGURE 37. Pre-Test View of Parking Brake

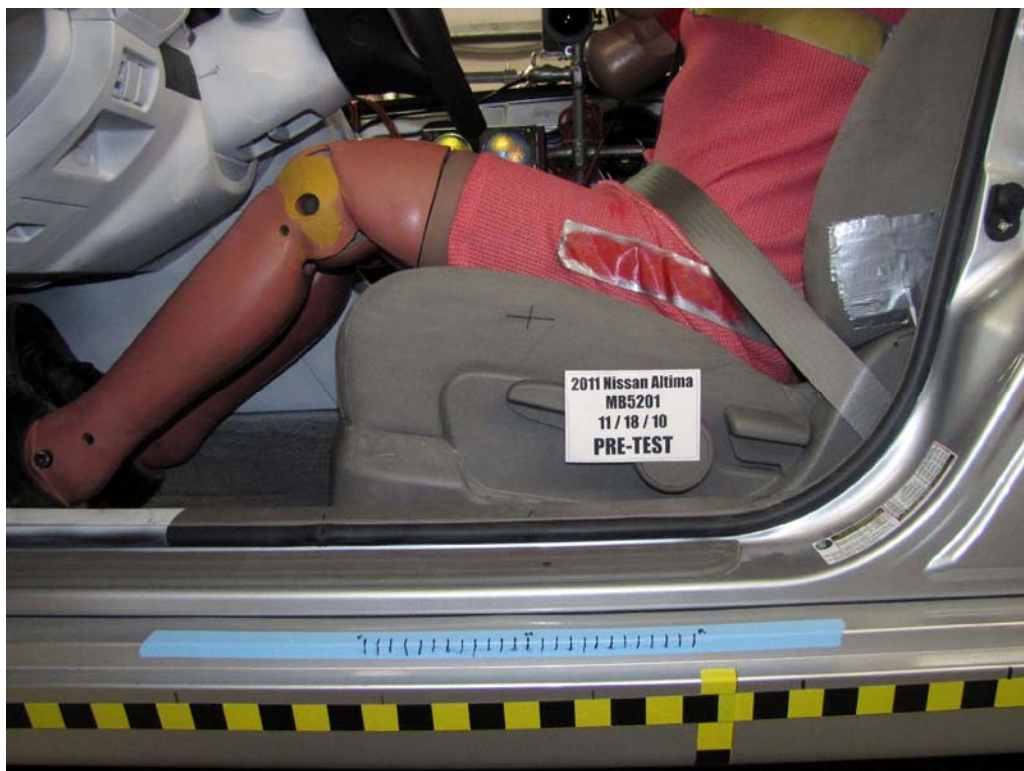


FIGURE 38. Pre-Test Close-Up Left Side View of Driver Seat Track



FIGURE 39. Pre-Test Close-Up Left Side View of Driver Seat Back



FIGURE 40. Pre-Test Close-Up View of Driver Seat Back or Head Restraint



FIGURE 41. Pre-Test Driver Dummy and Door Clearance View



FIGURE 42. Post-Test Driver Dummy and Door Clearance View



FIGURE 43. Pre-Test Right Side View of Driver Dummy and Front Seat Occupant Compartment



FIGURE 44. Post-Test Right Side View of Driver Dummy and Front Seat Occupant Compartment



FIGURE 45. Pre-Test Driver Inner Door Panel View



FIGURE 46. Post-Test Driver Dummy Inner Door Panel View
Showing Driver Dummy Contact Locations



FIGURE 47. Post-Test Driver Dummy Close-Up Head Contact with Vehicle Interior View



FIGURE 48. Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View

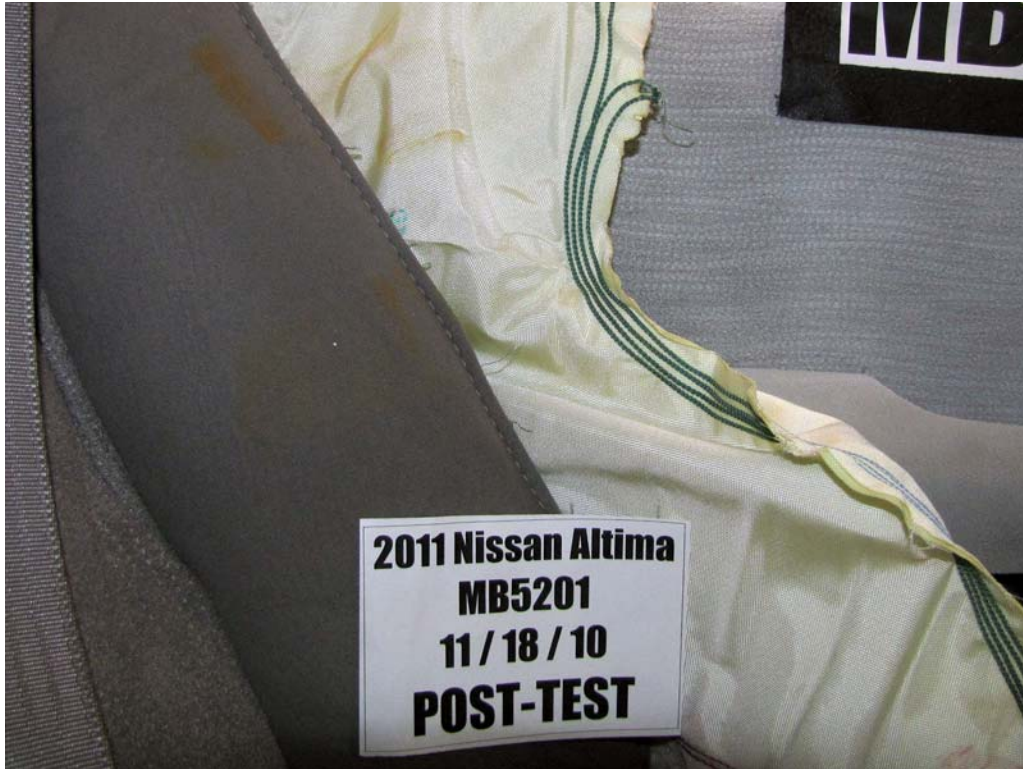


FIGURE 49. Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View



FIGURE 50. Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View



FIGURE 51. Post-Test Driver Dummy Close-Up Pelvis Contact with Vehicle Interior View



FIGURE 52. Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View



FIGURE 53. Pre-Test Left Side View of Rear Passenger Dummy
Showing Belt, Chalking, and Contact Switches



FIGURE 54. Pre-Test Left Side View of Rear Passenger Dummy
Shoulder and Door Top View



FIGURE 55. Post-Test Left Side View of Rear Passenger Dummy
Shoulder and Door Top View



FIGURE 56. Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning



FIGURE 57. Pre-Test Frontal View of Rear Passenger Dummy
Head and Shoulders in Relation to Head Restraint



FIGURE 58. Pre-Test Overhead View of Rear Passenger
Seat Pan Prior to Dummy Positioning



FIGURE 59. Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan



FIGURE 60. Pre-Test View of Rear Passenger Dummy's Neck
Showing Position of Adjustable Neck Bracket



FIGURE 61. Pre-Test View of Rear Passenger Dummy's Head
Showing Dummy's Head is Level



FIGURE 62. Pre-Test Placement of Rear Passenger Dummy's Feet



FIGURE 63. Pre-Test View of Belt Anchorage for Rear Passenger Dummy



FIGURE 64. Pre-Test Close-Up Left Side View of Rear Passenger Seat Track



FIGURE 65. Pre-Test Close-Up Left Side View of Rear Passenger Seat Back

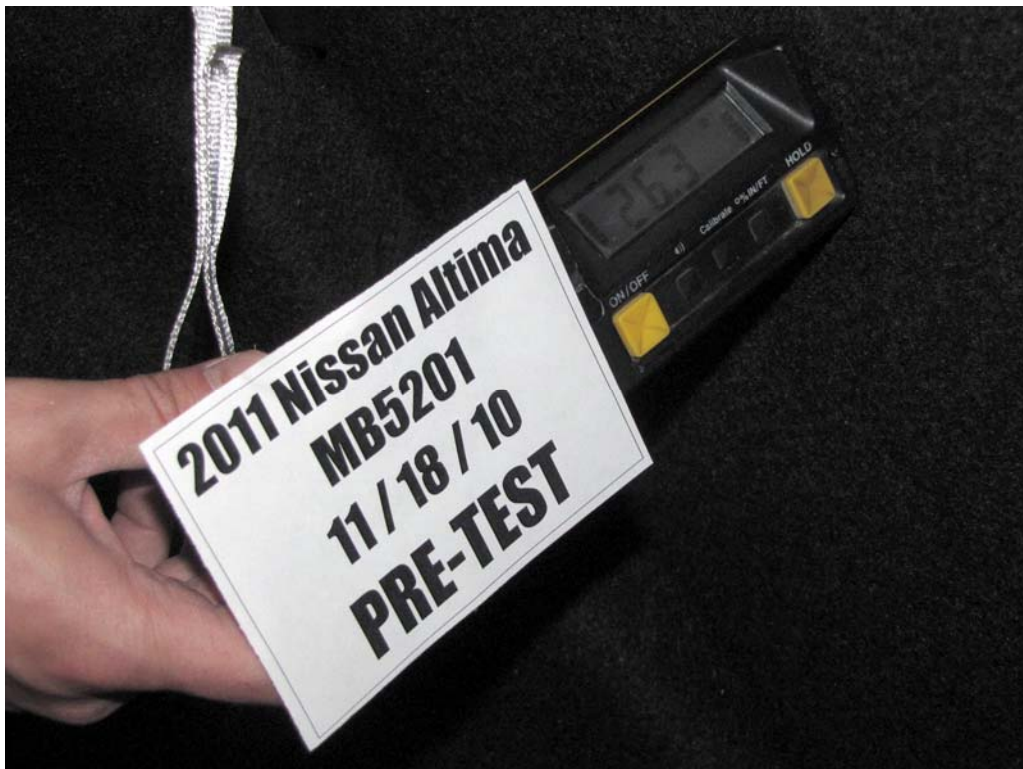


FIGURE 66. Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint



FIGURE 67. Pre-Test Rear Passenger Dummy and Door Clearance View



FIGURE 68. Post-Test Rear Passenger Dummy and Door Clearance View



FIGURE 69. Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



FIGURE 70. Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



FIGURE 71. Pre-Test Rear Passenger Inner Door Panel View



FIGURE 72. Post-Test Rear Passenger Inner Door Panel View
Showing Rear Passenger Dummy Contact Locations



FIGURE 73. Post-Test Rear Passenger Dummy Close-Up
Head Contact with Vehicle Interior View



FIGURE 74. Post-Test Rear Passenger Dummy Close-Up
Head Contact with Side Airbag View



FIGURE 75. Post-Test Rear Passenger Dummy Close-Up
Torso Contact with Vehicle Interior View

Photograph Not Applicable

Vehicle Not Equipped
With Rear Passenger
Side Airbag

FIGURE 76. Post-Test Rear Passenger Dummy Close-Up
Torso Contact with Side Airbag View



FIGURE 77. Post-Test Rear Passenger Dummy Close-Up
Pelvis Contact with Vehicle Interior View

Photograph Not Applicable

Vehicle Not Equipped
With Rear Passenger
Side Airbag

FIGURE 78. Post-Test Rear Passenger Dummy Close-Up
Pelvis Contact with Side Airbag View



FIGURE 79. Pre-Test View of Fuel Filler Cap



FIGURE 80. Post-Test View of Fuel Filler Cap



FIGURE 81. Pre-Test Front View of MDB Impactor Face



FIGURE 82. Post-Test Front View of MDB Impactor Face



FIGURE 83. Pre-Test Top View of MDB Impactor Face



FIGURE 84. Post-Test Top View of MDB Impactor Face



FIGURE 85. Pre-Test Left Side View of MDB Impactor Face



FIGURE 86. Post-Test Left Side View of MDB Impactor Face



FIGURE 87. Pre-Test Right Side View of MDB Impactor Face



FIGURE 88. Post-Test Right Side View of MDB Impactor Face



FIGURE 89. Close-Up View of Vehicle's Certification Label



FIGURE 90. Close-Up View of Vehicle's Tire Information Placard



FIGURE 91. Pre-Test Ballast View



FIGURE 92. Post-Test Primary and Redundant Speed Trap Read-Out



FIGURE 93. FMVSS No. 301/305 Rollover 0 Degrees



FIGURE 94. FMVSS No. 301/305 Rollover 90 Degrees



FIGURE 95. FMVSS No. 301/305 Rollover 180 Degrees



FIGURE 96. FMVSS No. 301/305 Rollover 270 Degrees



FIGURE 97. FMVSS No. 301/305 Rollover 360 Degrees



FIGURE 98. Impact Event

2011 ALTIMA 2.5

MADE TO DRIVE. BUILT TO LAST.

Standard Equipment Included at No Extra Charge

MECHANICAL & PERFORMANCE

- 2.5-Liter DOHC 16-Valve 4-Cylinder Engine
- 175 Horsepower and 180 lb-ft Torque (305)
- 175 Horsepower and 175 lb-ft Torque (CAL)
- Xtronic CVT™
- (Continuously Variable Transmission)
- Sequential Multi-Point Fuel Injection System
- Front and Rear Stabilizer Bars
- Power Rack-and-Pinion Steering
- Independent Front Suspension
- Independent Multi-Link Rear Suspension
- Power-Assisted Vented Front Disc Brakes
- Power-Assisted Rear Disc Brakes
- 18" Steel Wheels w/Full Wheel Covers
- P215-60R16 All-Season Tires

SAFETY & SECURITY

- Nissan Advanced Air Bag System (AABS)
- Driver & Front-Passenger
- Side Impact Supplemental Air Bags
- Road-Mounted Curtain
- Side Impact Supplemental Air Bags
- Front-Seat Active Head Restraints
- Front Seat Belts w/Pre-tensioners,
- Load Limiters & Adjustable Upper Anchors
- 3-Point ALNEX™ Seat Belts for All
- Seating Positions (Driver Side Only)
- Lower Anchors & Tethers for Children (LATCH)
- Child Safety Rear Door Locks
- Zone Body Construction w/Front & Rear
- Crumple Zones
- Anti-lock Braking System (ABS)
- Electronic Brake Force Distribution (EBD)
- Traction Control System (TCS)
- Vehicle Dynamic Control (VDC)
- Tire Pressure Monitoring System (TPMS)
- Vehicle Security System (VSS)
- Nissan Vehicle Immobilizer System
- Emergency Inside Trunk Release

COMFORT & CONVENIENCE

- Continuously Reclining Front Bucket Seats
- Cloth Seat Trim
- 80/20 Split Fold-Down Rear Seat w/Lock
- Tilt/Telescopic Steering Column
- Cruise Control w/Steering Wheel Controls
- Speed-Sensitive Variable Intermittent
- Windshield Wipers w/Mist Function
- Audio Pre-Amp w/6 Speakers
- Tip Computer w/Outside Temperature Gauge
- Vehicle Information Display
- Air Conditioning w/Cabin Microfilter

EXTERIOR FEATURES

- Halogen Headlights
- Dual Power Sideview Mirrors
- Dual Chrome-Tipped Exhaust Finishers
- Body-Color Side Moldings
- Body-Color Fenders & Sideview Mirrors
- UV-Reducing Solar Glass

Interior Features

- Rear-Passenger Floor Vents
- Push Button Ignition
- Power Windows w/One-Touch Driver
- Auto Up/Down w/Auto Reverse Feature
- Power Door Locks w/Auto Door Locking System
- Dual 12-Volt DC Power Outlets
- Dual Sun Visors w/Driver Side Vanity Mirror
- Front Map Lights and Bungees Storage
- Three Cup Holders in Center Console
- Rear Center Armrest w/Dual Cup Holders
- Front & Rear Doors w/Bottle Holders & Map Pockets
- Front Console w/Sliding Armrest
- Dual Level Storage

Manufacturer's Suggested Retail Base Price: \$19,900.00

Options Included by Manufacturer:

FLOOR & TRUNK MAT SET 175.00

Destination Charge: 750.00

Total* \$20,825.00

EPA Fuel Economy Estimates

CITY MPG	Estimated Annual Fuel Cost	HIGHWAY MPG
23	\$1,665	32

Expected range for most drivers: 19 to 27 MPG

based on 15,000 miles at \$3.00 per gallon

Expected range for most drivers: 26 to 38 MPG

Combined Fuel Economy

27

12 to 50

At MIDSIZE CARS

Your actual mileage will vary depending on how you drive and maintain your vehicle.

See the FREE Fuel Economy Guide at dealers or www.fueleconomy.gov

GOVERNMENT SAFETY RATINGS

Frontal Crash	Driver Passenger	To Be Rated
★★★★	★★★★	★★★★

Star ratings based on the risk of injury in a frontal impact. Frontal ratings should ONLY be compared to other vehicles of similar size and weight.

Side Crash	Front seat Rear seat	To Be Rated
★★★★	★★★★	★★★★

Star ratings based on the risk of injury in a side impact.

Rollover	To Be Rated
★★★★	★★★★

Star ratings based on the risk of rollover in a single vehicle crash.

Star ratings range from 1 to 5 stars (★★★★★), with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA).

www.safercar.gov or 1-888-327-4236

DELIVERY

VEHICLE COLORS:
EXT: BRILLIANT SILVER
INT: FROST

FINAL ASSEMBLY POINT:
CANTON

TRANSPORT METHOD:
TRUCK

DEALER:
BUENA PARK NISSAN
6501 AUTO CENTER DRIVE
BUENA PARK, CA 90621

VIN: 1N4AL2AP18N409509
EMS: CALIFORNIA EMISSIONS
MDL: 13011-409509 K23-K
OPT: A-C01L93

20100913232652AS0993

FIGURE 99. Monroney Label

HEAD RESTRAINTS

WARNING

Head restraints supplement the other safety restraint systems. They may provide additional protection against injury in certain rear-end collisions. Adjust the head restraints properly, as specified in this section. Check the adjustment after someone else uses the seat. Do not attach anything to the head restraint stalks or remove the head restraint. Do not use the seat if the head restraint has been removed. If the head restraint was removed, reinstall and properly adjust the head restraint before an occupant uses the seating position. Failure to follow these instructions can reduce the effectiveness of the head restraints. This may increase the risk of serious injury or death in a collision.

The illustration shows the seating position equipped with head restraints. All of the head restraints are adjustable.

▲ Indicates the seating position is equipped with a head restraint.

Components

1. Head restraint
2. Adjustment notches
3. Lock knob
4. Stalks
5. Release knob

Adjustment

Adjust the head restraint so the center is level with the center of the seat occupant's ears.

To raise the head restraint, pull it up.

To lower, push and hold the lock knob and push the head restraint down.

Removal

Use the following procedure to remove the adjustable head restraints:

1. Pull the head restraint up to the highest position.
2. Push and hold the lock knob and release knob.
3. Remove the head restraint from the seat.
4. Store the head restraint properly so it is not loose in the vehicle.

Reinstall

Reinstall and properly adjust the head restraint before an occupant uses the seating position.

Install

1. Align the head restraint stalks with the holes in the seat. Make sure the head restraint is facing the correct direction.
2. Push and hold the lock knob and push the head restraint down.
3. Properly adjust the head restraint before an occupant uses the seating position.

Front-seat Active Head Restraints

The Active Head Restraint moves forward affording the force that the seatback exerts from the occupant in a rear-end collision. The movement of the head restraint helps support the occupant's head by reducing its backward movement and helping absorb some of the forces that may lead to whiplash-type injuries.

Active Head Restraints are effective for collisions at the 16-mph speed in which it is said that whiplash injury occurs most.

FIGURE 100. Driver Head Restraint Use and Adjustment
Information from Vehicle Manual

Photograph Not Applicable

Vehicle Not Equipped
With Adjustable Rear
Passenger Head Restraint

FIGURE 101. Left Rear Passenger Head Restraint Use and Adjustment
Information from Vehicle Manual

APPENDIX B
DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

Plot		Page
1	Driver Head Acceleration (X) Primary vs. Time	B-1
2	Driver Head Acceleration (Y) Primary vs. Time	B-1
3	Driver Head Acceleration (Z) Primary vs. Time	B-1
4	Driver Head Resultant Acceleration Primary vs. Time	B-1
5	Driver Upper Thorax Rib Deflection (Y) vs. Time	B-2
6	Driver Middle Thorax Rib Deflection (Y) vs. Time	B-2
7	Driver Lower Thorax Rib Deflection (Y) vs. Time	B-2
8	Driver Thorax Rib Deflection Maximum vs. Time	B-2
9	Driver Anterior Abdominal Force (Y) vs. Time	B-3
10	Driver Middle Abdominal Force (Y) vs. Time	B-3
11	Driver Posterior Abdominal Force (Y) vs. Time	B-3
12	Driver Total Abdominal Force (Y) vs. Time	B-3
13	Driver Pubic Symphysis Force (Y) vs. Time	B-4
14	Passenger Head Acceleration (X) vs. Time Primary	B-5
15	Passenger Head Acceleration (Y) vs. Time Primary	B-5
16	Passenger Head Acceleration (Z) vs. Time Primary	B-5
17	Passenger Head Resultant Acceleration Primary vs. Time	B-5
18	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-6
19	Passenger Lower Spine T12 Acceleration (Y) vs. Time	B-6
20	Passenger Lower Spine T12 Acceleration (Z) vs. Time	B-6
21	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-6
22	Passenger Iliac Force on Impact Side (Y) vs. Time	B-7
23	Passenger Acetabulum Force on Impact Side (Y) vs. Time	B-7
24	Passenger Total Pelvic Force on Impact Side (Y) vs. Time	B-7

The following additional data for this test can be obtained from the Research and Development section of the NHTSA website. The website can be found at

www.NHTSA.dot.gov.

Driver & Passenger Dummy Instrumentation Data

Driver Lower Spine T12 Acceleration (X)

Driver Lower Spine T12 Acceleration (Y)

Driver Lower Spine T12 Acceleration (Z)

Passenger Upper Thorax Rib Deflection (Y)

Passenger Middle Thorax Rib Deflection (Y)

Passenger Lower Thorax Rib Deflection (Y)
Passenger Upper Abdomen Rib Deflection (Y)
Passenger Lower Abdomen Rib Deflection (Y)
Driver Head Acceleration Redundant (X)
Driver Head Acceleration Redundant (Y)
Driver Head Acceleration Redundant (Z)
Driver Shoulder Contact Switch
Driver Torso Contact Switch
Driver Pelvis Contact Switch
Passenger Head Acceleration Redundant (X)
Passenger Head Acceleration Redundant (Y)
Passenger Head Acceleration Redundant (Z)
Passenger Shoulder Contact Switch
Passenger Torso Contact Switch
Passenger Pelvis Contact Switch

Vehicle Instrumentation Data

Driver Side Airbag Timing
Driver Side Curtain Airbag Timing
Passenger Side Airbag Timing (if applicable)
Passenger Side Curtain Airbag Timing (if different from Driver)
Right Side Sill at Front Seat Acceleration (X)
Right Side Sill at Front Seat Acceleration (Y)
Right Side Sill at Front Seat Acceleration (Z)
Right Side Sill at Rear Seat Acceleration (X)
Right Side Sill at Rear Seat Acceleration (Y)
Right Side Sill at Rear Seat Acceleration (Z)
Rear Floorpan Above Axle Acceleration (X)
Rear Floorpan Above Axle Acceleration (Y)
Rear Floorpan Above Axle Acceleration (Z)
Left Side Sill at Front Seat Acceleration (Y)
Left Side Sill at Rear Seat Acceleration (Y)
Right Rear Occupant Compartment Acceleration (Y)
Lower A-Post Acceleration (Y)
Upper A-Post Acceleration (Y)
Lower B-Post Acceleration (Y)
Upper B-Post Acceleration (Y)

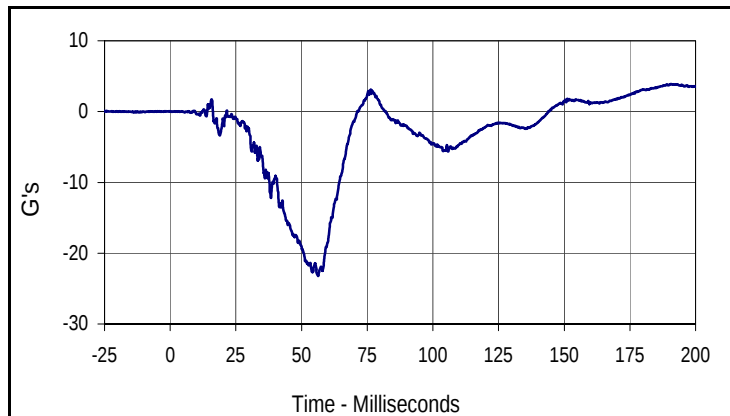
Front Seat Track Acceleration (Y)
Rear Seat Track Acceleration (Y)
Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)

MDB Instrumentation Data

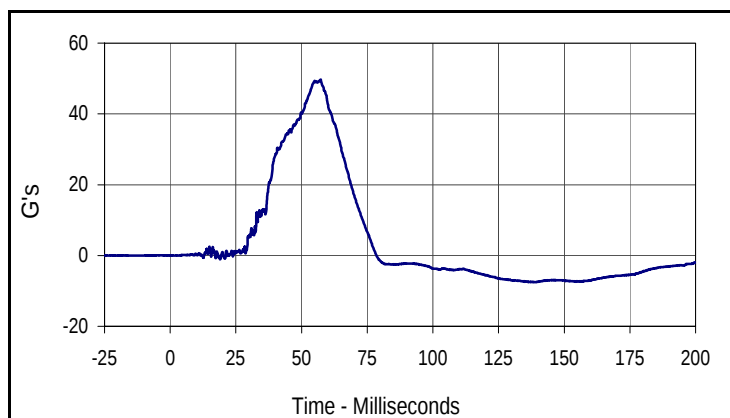
MDB Center of Gravity Acceleration (X)
MDB Center of Gravity Acceleration (Y)
MDB Center of Gravity Acceleration (Z)
MDB Rear Acceleration (X)
MDB Rear Acceleration (Y)
Left MDB Contact Switch
Right MDB Contact Switch

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

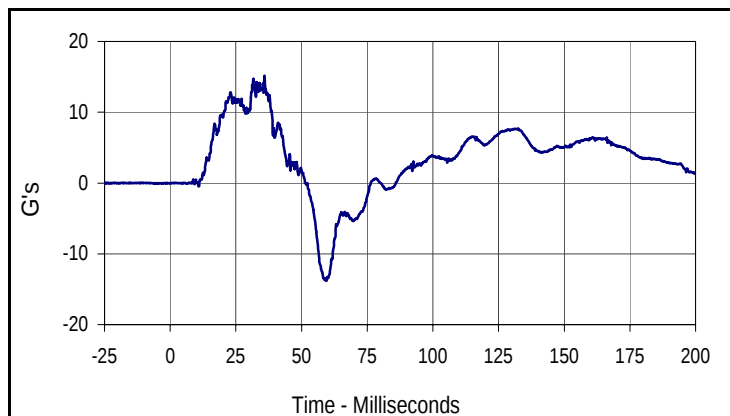
Test Date: 11/18/10
 NHTSA No.: MB5201



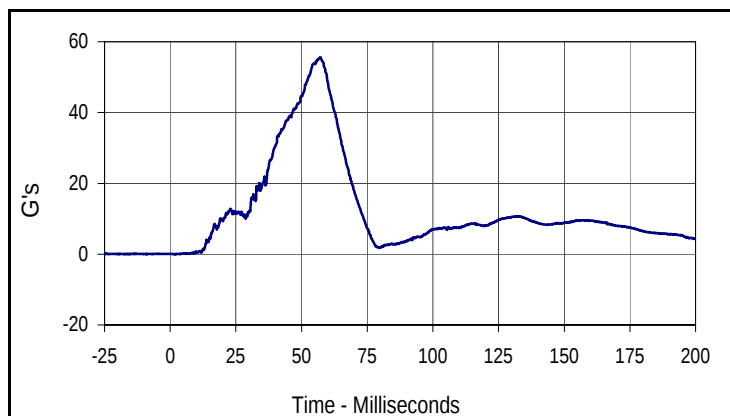
Curve Description			
Driver Head Acceleration X Primary			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
3.9	190.7	-23.2	56.4



Curve Description			
Driver Head Acceleration Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
49.7	57.2	-7.5	139.0



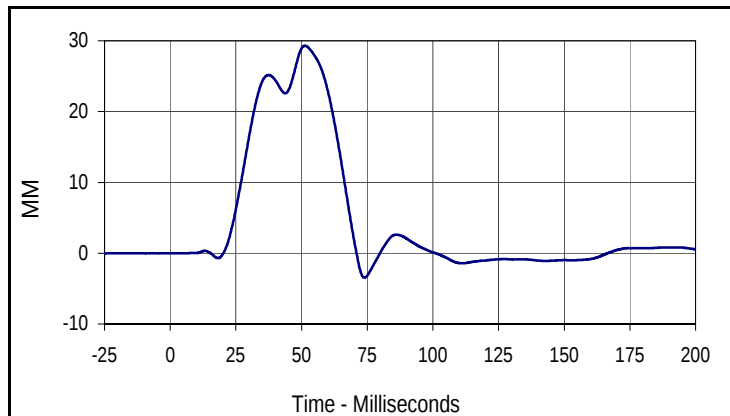
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Driver Head Acceleration Z Primary			
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Max	Time	Min	Time
15.2	35.9	-13.8	59.4



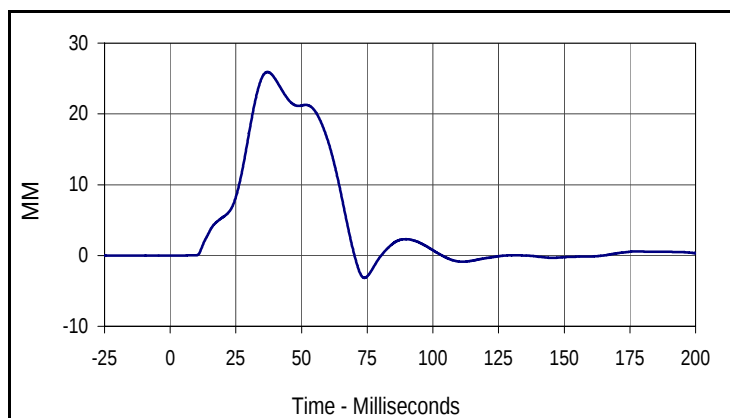
Curve Description			
Driver Head Resultant Acceleration Primary			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
55.6	57.2	0.0	1.2

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

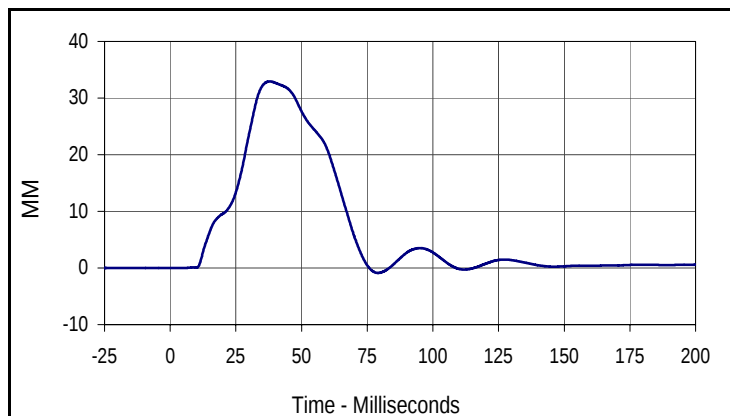
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 NHTSA No.: MB5201



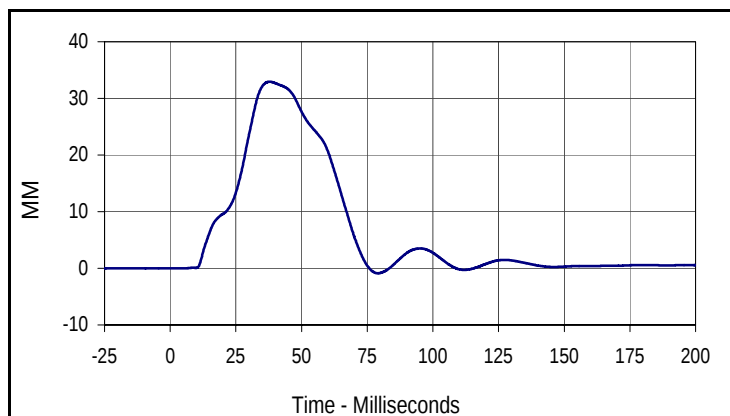
Curve Description			
Driver Upper Thorax Rib Deflection Y			
CURNO	Type	SAE Class	Units
007	FIL	180	MM
Max	Time	Min	Time
29.3	51.3	-3.5	73.9



Curve Description			
Driver Middle Thorax Rib Deflection Y			
CURNO	Type	SAE Class	Units
008	FIL	180	MM
Max	Time	Min	Time
25.9	37.0	-3.2	73.9



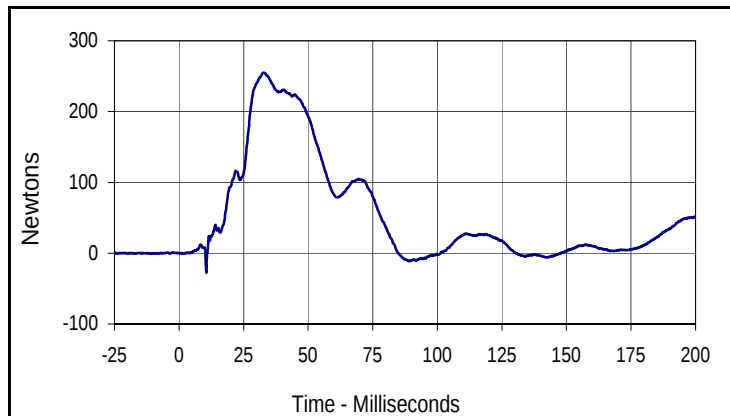
Curve Description			
Driver Lower Thorax Rib Deflection Y			
CURNO	Type	SAE Class	Units
009	FIL	180	MM
Max	Time	Min	Time
32.9	37.9	-0.9	79.1



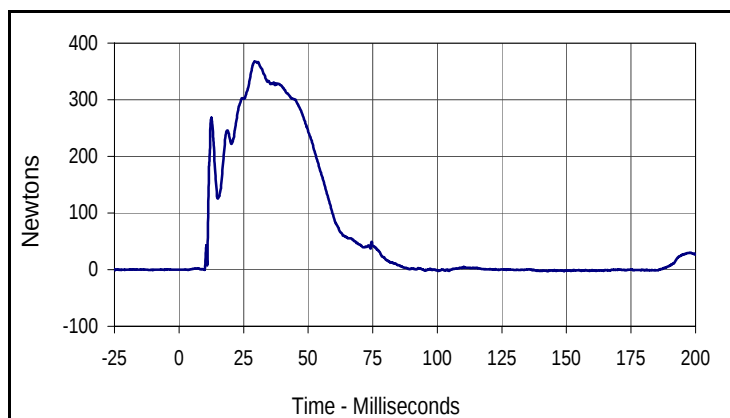
Curve Description			
Driver Thorax Rib Deflection Maximum			
CURNO	Type	SAE Class	Units
010	FIL	180	MM
Max	Time	Min	Time
32.9	37.9	-0.9	79.1

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

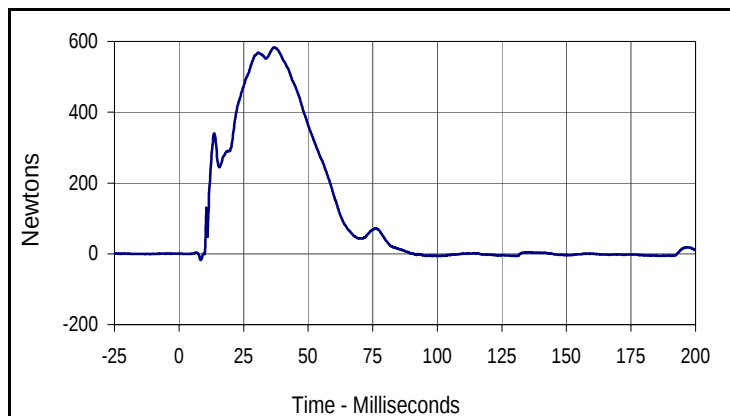
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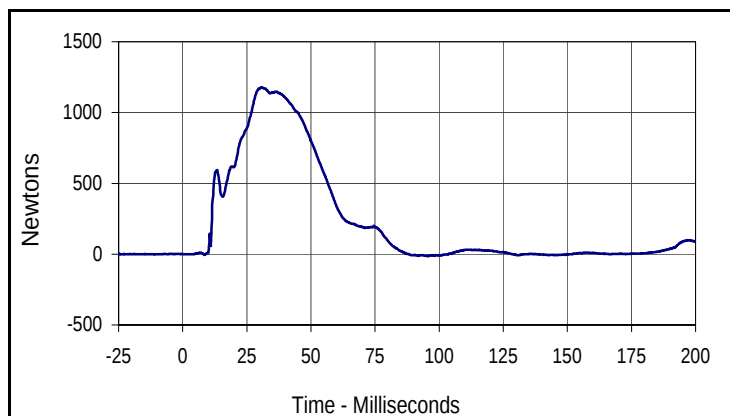
Curve Description			
Driver Anterior Abdominal Force Y			
CURNO	Type	SAE Class	Units
013	FIL	600	Newtons
Max	Time	Min	Time
255.0	32.6	-27.4	10.5



Curve Description			
Driver Middle Abdominal Force Y			
CURNO	Type	SAE Class	Units
014	FIL	600	Newtons
Max	Time	Min	Time
367.4	29.3	-2.8	149.0



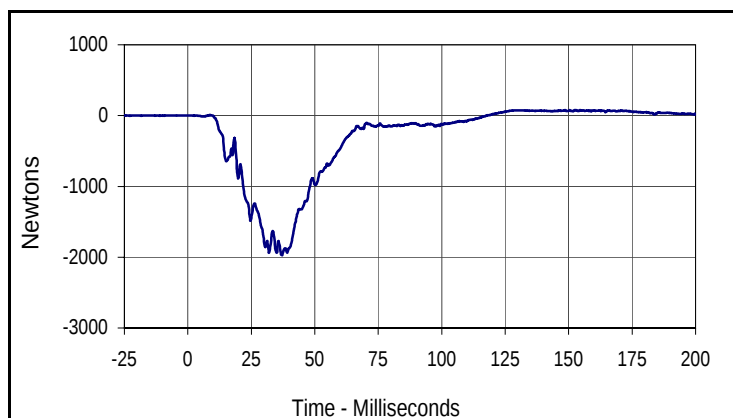
Curve Description			
Driver Posterior Abdominal Force Y			
CURNO	Type	SAE Class	Units
015	FIL	600	Newtons
Max	Time	Min	Time
583.0	36.7	-17.5	8.4



Curve Description			
Driver Total Abdominal Force			
CURNO	Type	SAE Class	Units
013	RES	600	Newtons
Max	Time	Min	Time
1179.0	30.7	-14.0	95.6

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

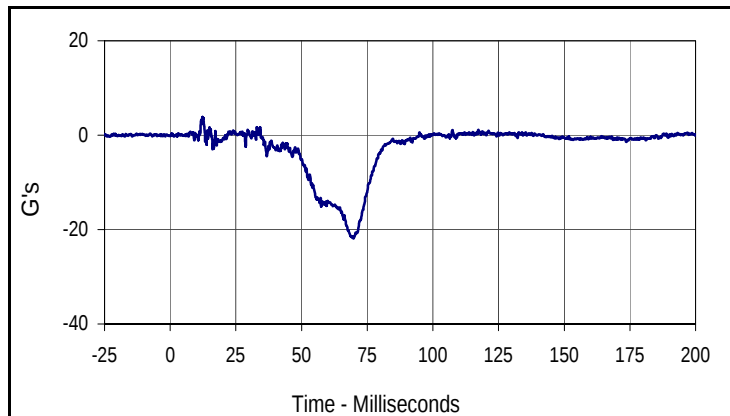
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 NHTSA No.: MB5201



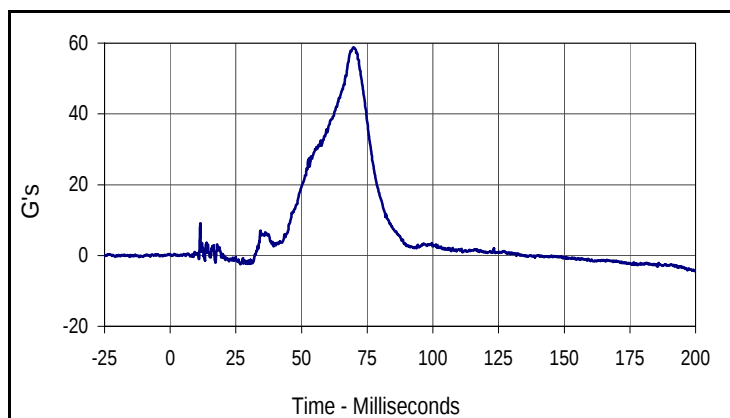
Curve Description			
Driver Pubic Symphysis Force Y			
CURNO	Type	SAE Class	Units
016	FIL	600	Newtons
Max	Time	Min	Time
79.8	148.6	-1974.6	37.2

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

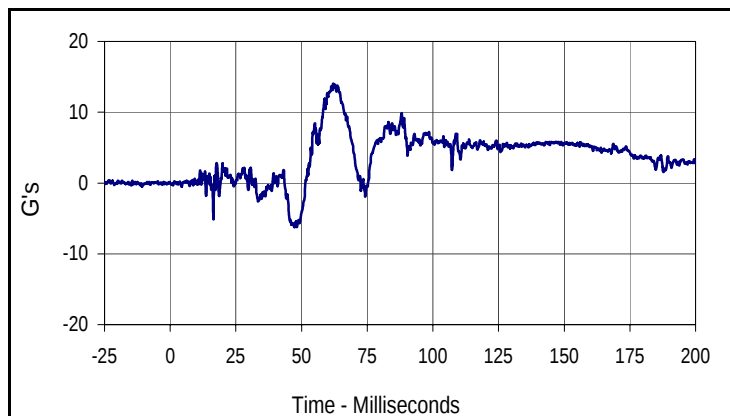
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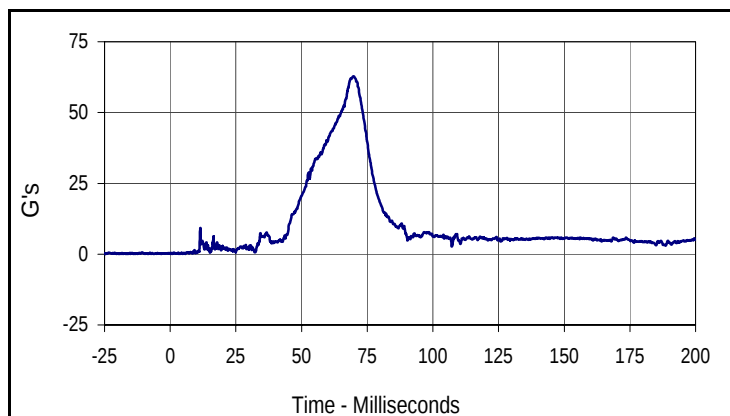
Curve Description			
Passenger Head Acceleration X Primary			
CURNO	Type	SAE Class	Units
021	FIL	1000	G's
Max	Time	Min	Time
3.9	12.3	-21.9	69.8



Curve Description			
Passenger Head Acceleration Y Primary			
CURNO	Type	SAE Class	Units
022	FIL	1000	G's
Max	Time	Min	Time
58.7	69.6	-4.3	199.9



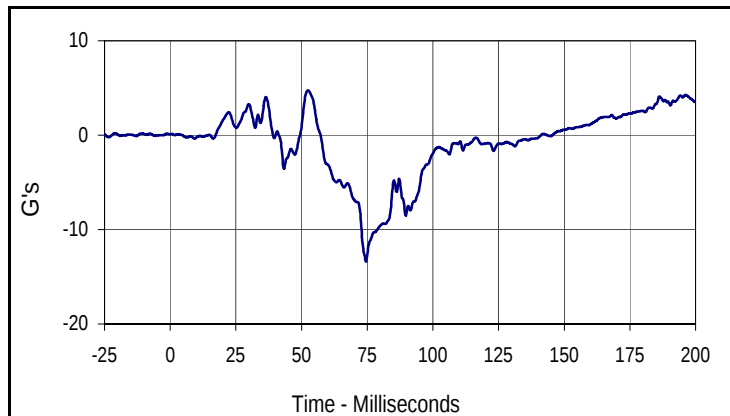
Curve Description			
Passenger Head Acceleration Z Primary			
CURNO	Type	SAE Class	Units
023	FIL	1000	G's
Max	Time	Min	Time
14.0	62.1	-6.3	47.3



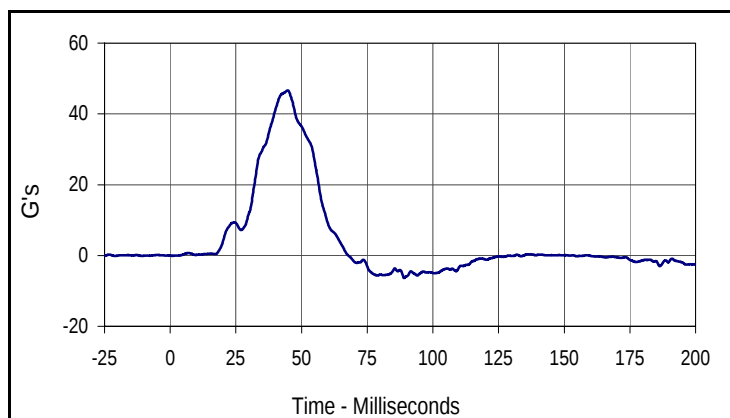
Curve Description			
Passenger Head Acceleration Resultant Primary			
CURNO	Type	SAE Class	Units
021	RES	1000	G's
Max	Time	Min	Time
62.8	69.7	0.0	3.4

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

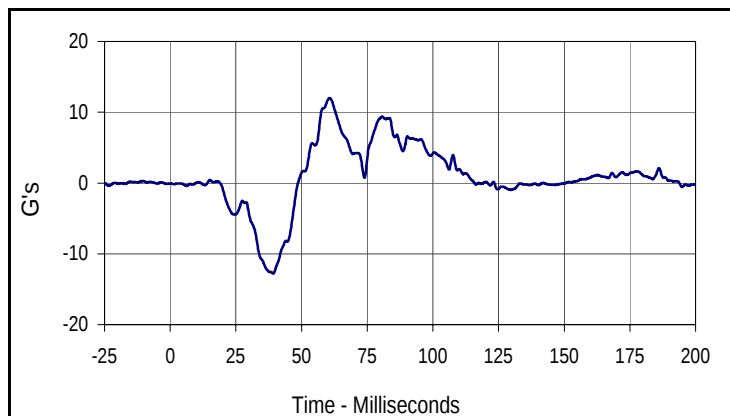
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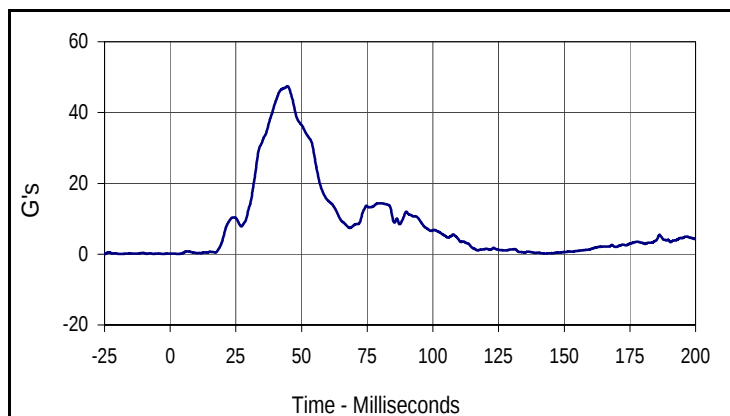
Curve Description			
Passenger Lower Spine T12 Acceleration X			
CURNO	Type	SAE Class	Units
037	FIL	180	G's
Max	Time	Min	Time
4.8	52.4	-13.4	74.5



Curve Description			
Passenger Lower Spine T12 Acceleration Y			
CURNO	Type	SAE Class	Units
038	FIL	180	G's
Max	Time	Min	Time
46.6	44.7	-6.4	89.0



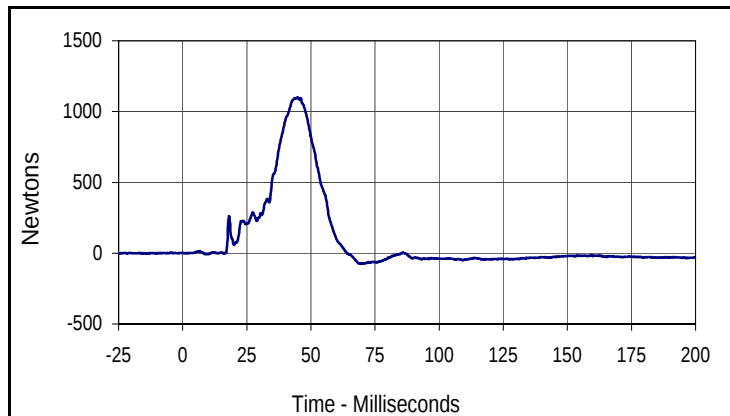
Curve Description			
Passenger Lower Spine T12 Acceleration Z			
CURNO	Type	SAE Class	Units
039	FIL	180	G's
Max	Time	Min	Time
12.0	60.7	-12.8	39.2



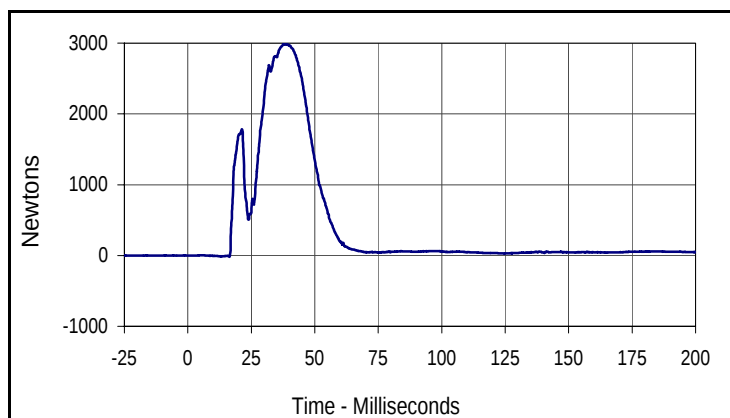
Curve Description			
Passenger Lower Spine T12 Acceleration Resultant			
CURNO	Type	SAE Class	Units
037	RES	180	G's
Max	Time	Min	Time
47.4	44.7	0.1	3.5

Test Vehicle: 2011 Nissan Altima 2.5 4-Door Sedan
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

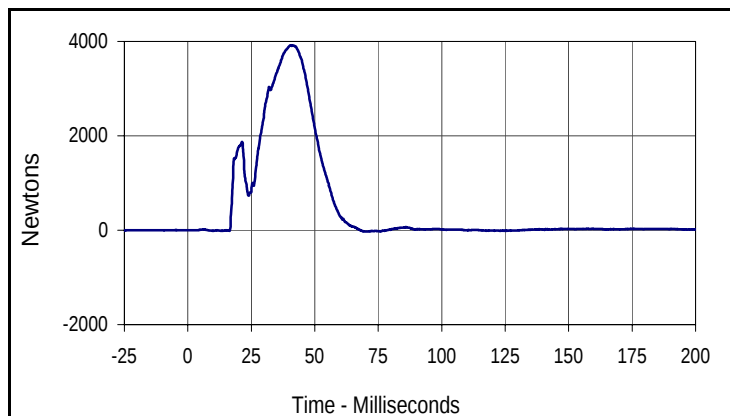
Test Date: 11/18/10
 NHTSA No.: MB5201



Curve Description			
Passenger Iliac Wing Force on Impact Side Y			
CURNO	Type	SAE Class	Units
043	FIL	600	Newtons
Max	Time	Min	Time
1102.8	44.7	-75.6	70.3



Curve Description			
Passenger Acetabulum Force on Impact Side Y			
CURNO	Type	SAE Class	Units
042	FIL	600	Newtons
Max	Time	Min	Time
2987.2	38.6	-17.0	16.4



Curve Description			
Passenger Total Pelvic Force			
CURNO	Type	SAE Class	Units
042	SUM	600	Newtons
Max	Time	Min	Time
3918.9	40.5	-29.1	70.2

APPENDIX C
DUMMY CALIBRATION DATA

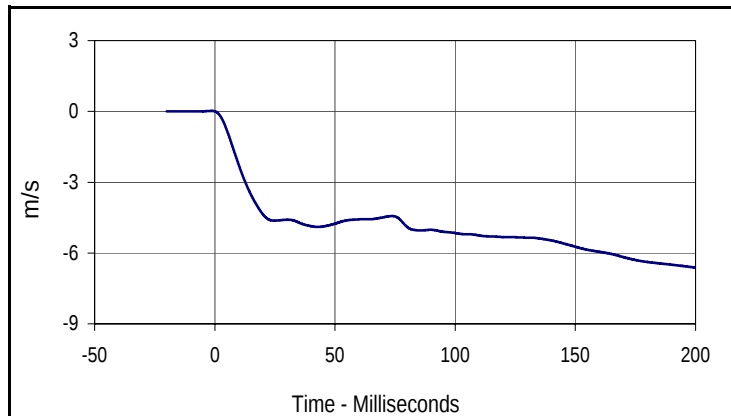
APPENDIX C
PRE-TEST / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program: ES2re Neck Calibration
 ATD Serial No.: F035

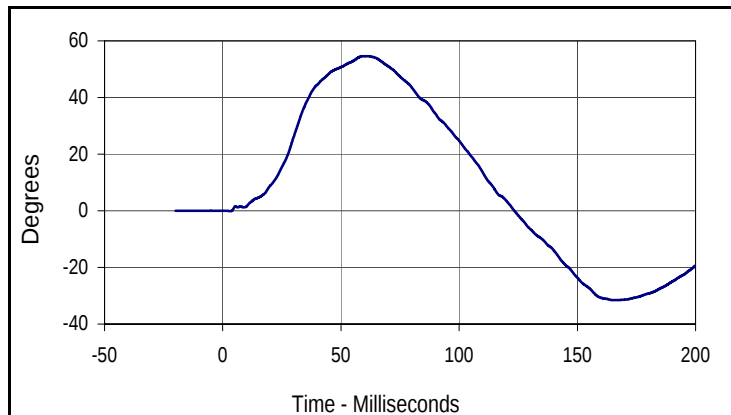
Test Date: 11/11/10
 Test I.D.: NB11A



Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	3.30 to 3.50	3.35	Pass
Pendulum Deceleration	1 msec	m/s	0.0 to -.050	-0.047	Pass
	3 msec	m/s	-.250 to -.375	-0.318	Pass
	14 msec	m/s	-3.20 to -3.70	-3.31	Pass
Headform Rotation	Max	Degrees	49.0 to 58.0	54.6	Pass
	Time	msec	54.0 to 66.0	61.0	Pass
Maximum Rotation To Time Zero Crossing		msec	53.0 to 88.0	62.4	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.3	-6.6	200.0



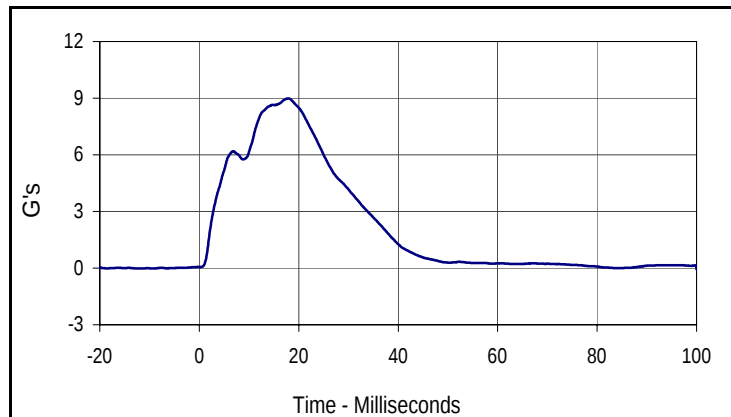
Curve Description			
Headform Rotation			
CURNO	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
54.6	61.0	-31.6	164.9

Test Program: ES2re Shoulder Calibration
 ATD Serial No.: F035

Test Date: 11/11/10
 Test I.D.: SH11A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.20 to 4.40	4.24	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	9.0	Pass
Overall Test Results			Pass	



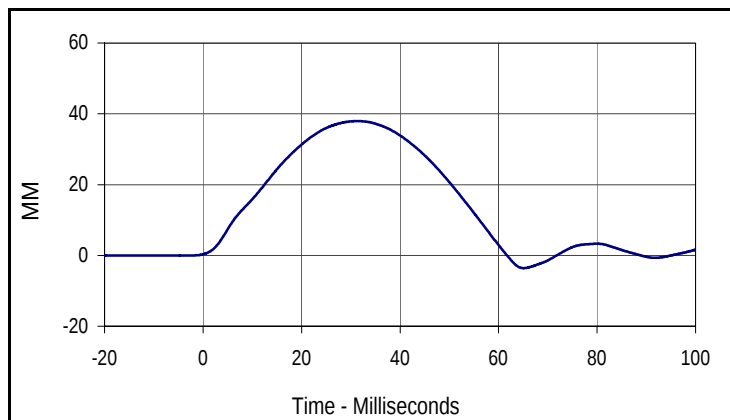
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
9.0	17.9	0.0	-12.4

Test Program: ES2re Rib Module Calibration
 ATD Serial No.: F035 Rib #1

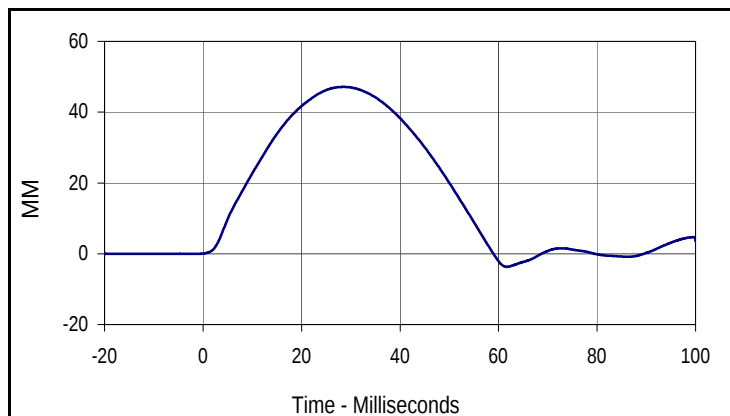
Test Date: 11/11/10
 Test I.D.: RIB11A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Rib Deflection at 459 MM Drop Height	MM	36 to 40	37.9	Pass
Peak Rib Deflection at 815 MM Drop Height	MM	46 to 51	47.1	Pass
Overall Test Results			Pass	



Curve Description			
Upper Rib Deflection (459 MM Drop Height)			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
37.9	31.4	-3.6	65.1



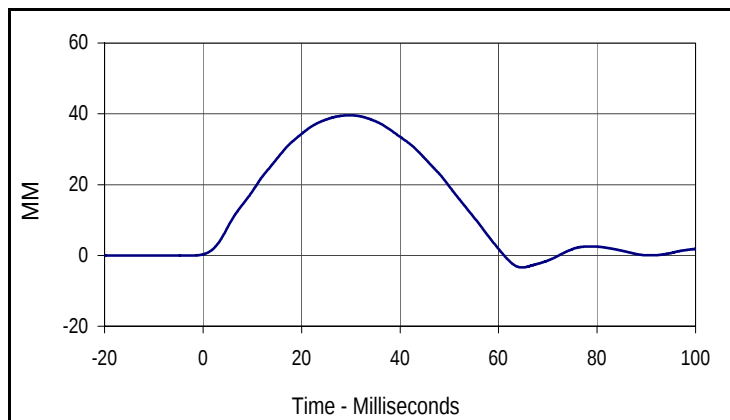
Curve Description			
Upper Rib Deflection (815 MM Drop Height)			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
47.1	28.6	-3.7	61.7

Test Program: ES2re Rib Module Calibration
 ATD Serial No.: F035 Rib #2

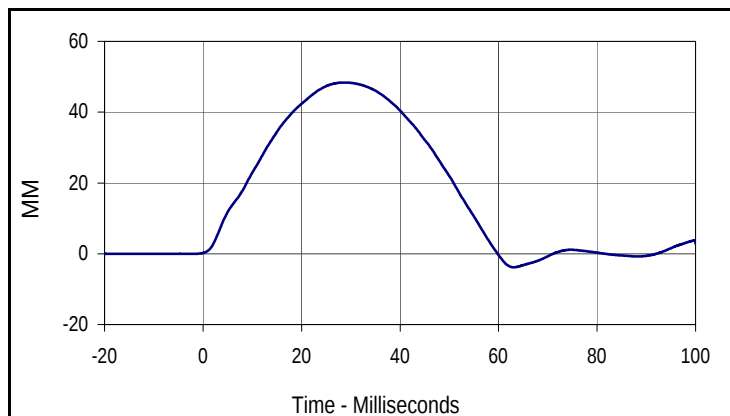
Test Date: 11/11/10
 Test I.D.: RIB11B



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Rib Deflection at 459 MM Drop Height	MM	36 to 40	39.6	Pass
Peak Rib Deflection at 815 MM Drop Height	MM	46 to 51	48.4	Pass
Overall Test Results			Pass	



Curve Description			
Middle Rib Deflection (459 MM Drop Height)			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
39.6	29.7	-3.4	64.7



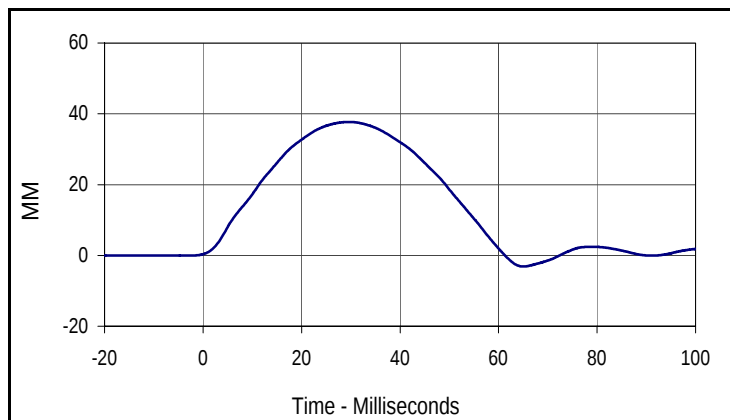
Curve Description			
Middle Rib Deflection (815 MM Drop Height)			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
48.4	28.7	-3.8	63.1

Test Program: ES2re Rib Module Calibration
 ATD Serial No.: F035 Rib #3

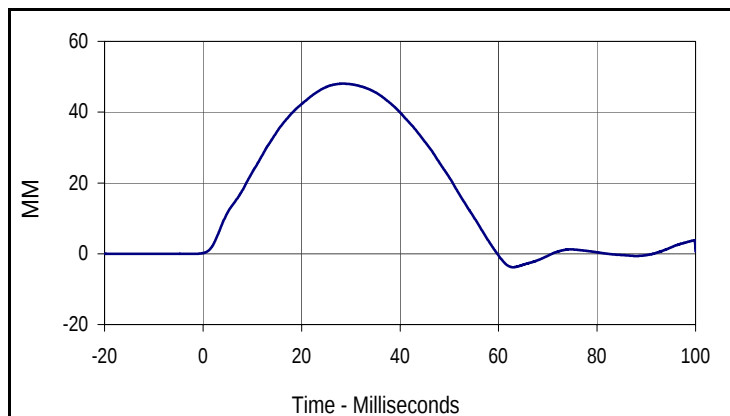
Test Date: 11/11/10
 Test I.D.: RIB11C



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Rib Deflection at 459 MM Drop Height	MM	36 to 40	37.7	Pass
Peak Rib Deflection at 815 MM Drop Height	MM	46 to 51	48.0	Pass
Overall Test Results			Pass	



Curve Description			
Lower Rib Deflection (459 MM Drop Height)			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
37.7	29.6	-3.1	65.0



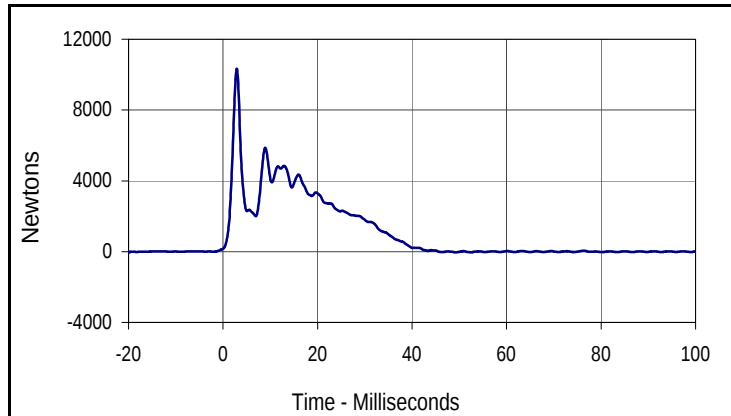
Curve Description			
Lower Rib Deflection (815 MM Drop Height)			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
48.0	28.4	-3.8	63.0

Test Program: ES2re Thorax Calibration
 ATD Serial No.: F035

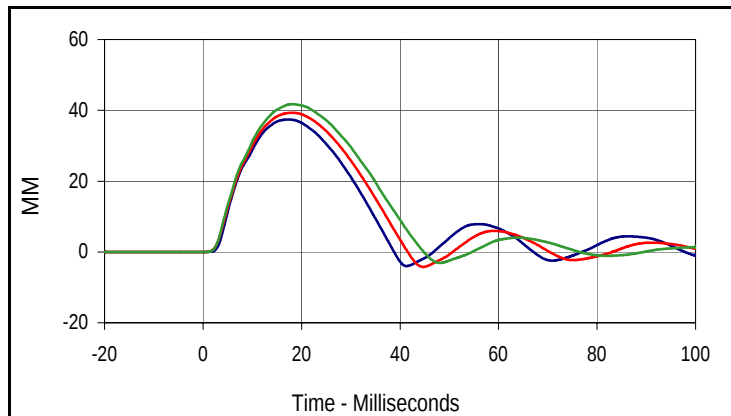
Test Date: 11/11/10
 Test I.D.: TH11A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	5.40 to 5.60	5.43	Pass
Impactor Force	N	5100 to 6200	5865.4	Pass
	msec	> 6.0 msec	8.9	Pass
Upper Rib Deflection	MM	34 to 41	37.4	Pass
Middle Rib Deflection	MM	37 to 45	39.3	Pass
Lower Rib Deflection	MM	37 to 44	41.7	Pass
Overall Test Results			Pass	



Curve Description			
Impactor Force			
CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
10331.5	2.9	-47.1	49.2



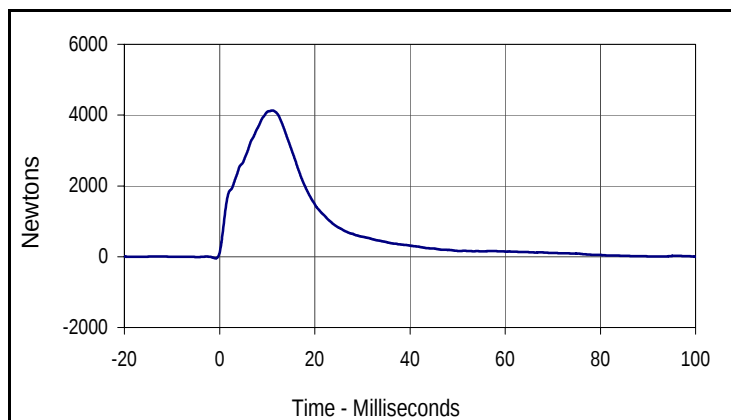
Curve Description			
Upper, Middle, Lower Rib Deflections			
CURNO(s)	Type	SAE Class	Units
002-003-004	FIL	180	MM
Max (Upper)	Time	Min (Upper)	Time
37.4	17.3	-4.0	41.3
Max (Middle)	Time	Min (Middle)	Time
39.3	18.2	-4.2	44.7
Max (Lower)	Time	Min (Lower)	Time
41.7	18.1	-3.1	48.1

Test Program: ES2re Abdomen Calibration
 ATD Serial No.: F035

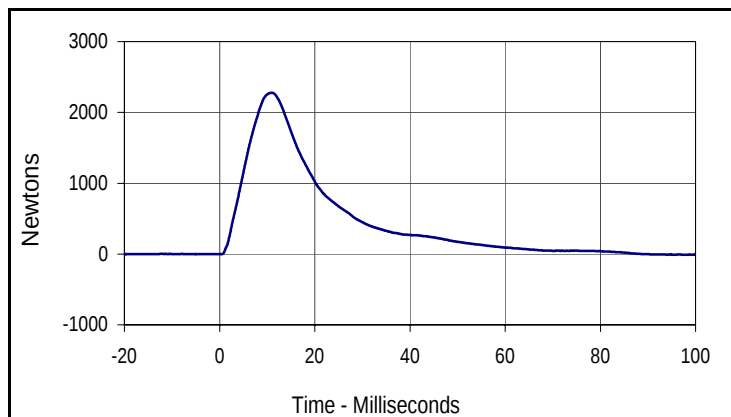
Test Date: 11/11/10
 Test I.D.: ABD11A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	3.90 to 4.10	3.94	Pass
Impactor Force	N	4000 to 4800	4133.3	Pass
	msec	10.6 to 13.0	11.1	Pass
Abdominal Force	N	2200 to 2700	2276.0	Pass
	msec	10.0 to 12.3	11.1	Pass
Overall Test Results				Pass



Curve Description			
Impactor Force			
CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4133.3	11.1	-44.4	-0.8



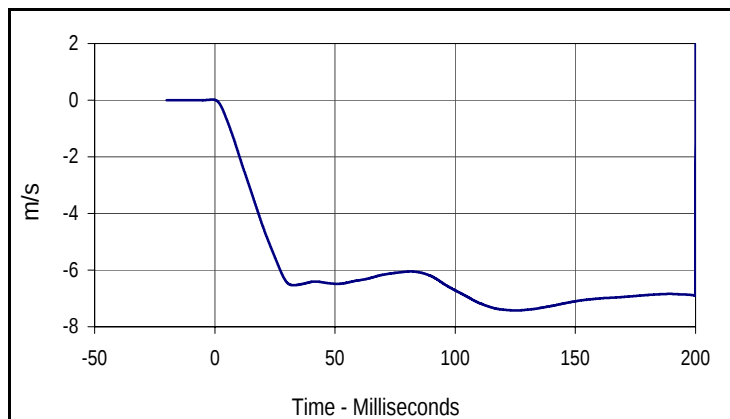
Curve Description			
Abdomen Sum Resultant			
CURNO	Type	SAE Class	Units
002	RES	600	Newtons
Max	Time	Min	Time
2276.0	11.1	-9.4	97.8

Test Program: ES2re Lumbar Spine Calibration
 ATD Serial No.: F035

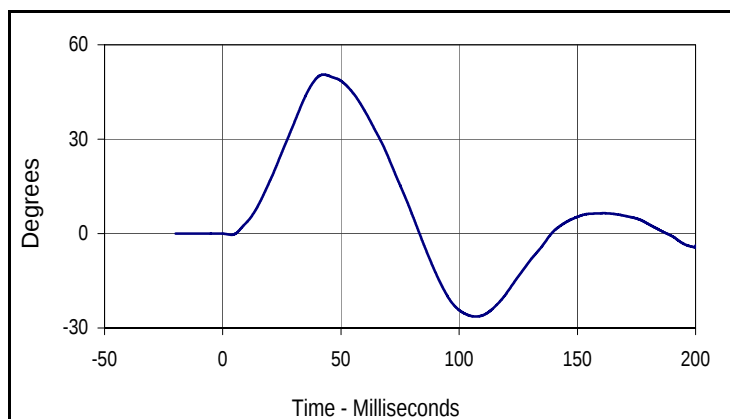
Test Date: 11/11/10
 Test I.D.: SP11A



Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.95 to 6.15	6.09	Pass
Pendulum Deceleration	1 msec	m/s	0.0 to -.050	-0.030	Pass
	3.7 msec	m/s	-.240 to -.425	-0.415	Pass
	27 msec	m/s	-5.80 to -6.50	-5.96	Pass
	30 msec	m/s	< -6.50	-6.43	Pass
Headform Rotation	Max	Degrees	45.0 to 55.0	50.5	Pass
	Time	msec	39.0 to 53.0	42.6	Pass
Maximum Rotation To Time Zero Crossing		msec	37.0 to 57.0	40.7	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
3.7	200.0	-7.4	125.3



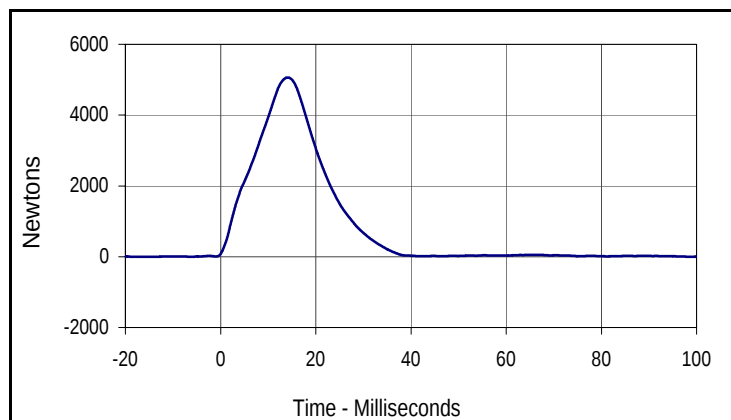
Curve Description			
Headform Rotation			
CURNO	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
50.5	42.6	-26.4	107.0

Test Program: ES2re Pelvis Calibration
 ATD Serial No.: F035

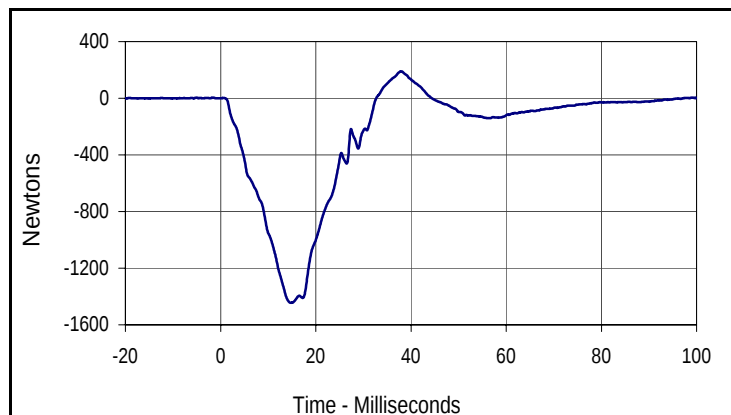
Test Date: 11/11/10
 Test I.D.: PL11A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.20 to 4.40	4.28	Pass
Impactor Force	N	4700 to 5400	5063.5	Pass
	msec	11.8 to 16.1	14.2	Pass
Pubic Symphysis Load	N	-1230 to -1590	-1444.5	Pass
	msec	12.2 to 17.0	14.8	Pass
Overall Test Results				Pass



Curve Description			
Impactor Force			
CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
5063.5	14.2	-3.3	-17.5



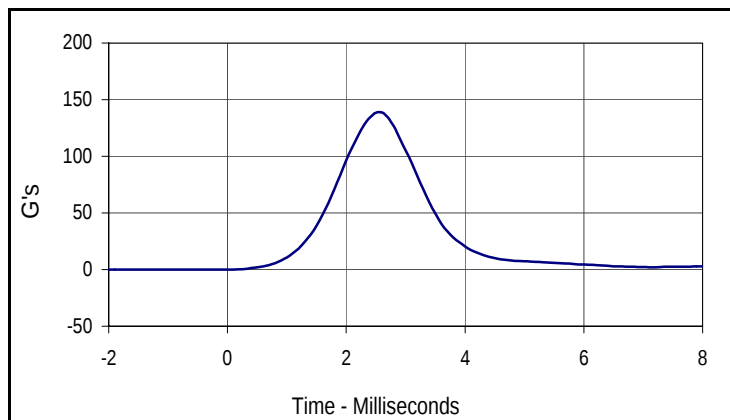
Curve Description			
Pubic FY			
CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
190.1	38.0	-1444.5	14.8

Test Program: ES2re Lateral Head Drop Calibration
 ATD Serial No.: F035

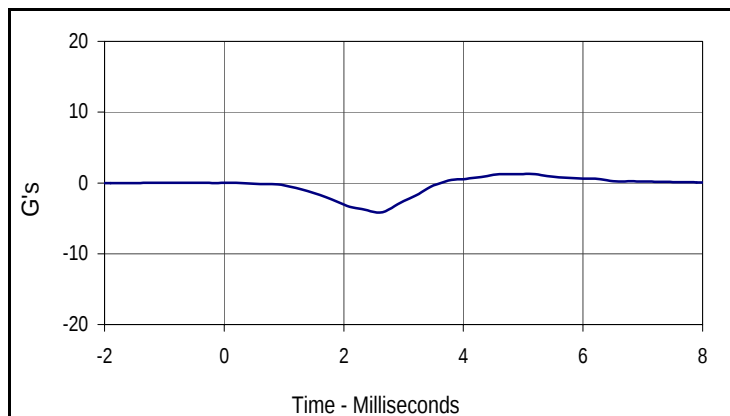
Test Date: 11/11/10
 Test I.D.: HD11A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	125 to 155	138.6	Pass
Peak Longitudinal Acceleration	G's	≤15	4.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	5.3	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
138.6	2.6	0.0	-0.2



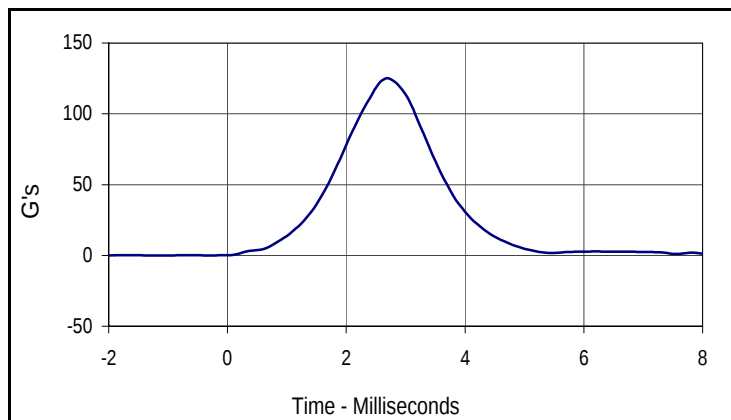
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.3	5.1	-4.2	2.6

Test Program: SID IIs Lateral Head Drop Calibration
 ATD Serial No.: 307

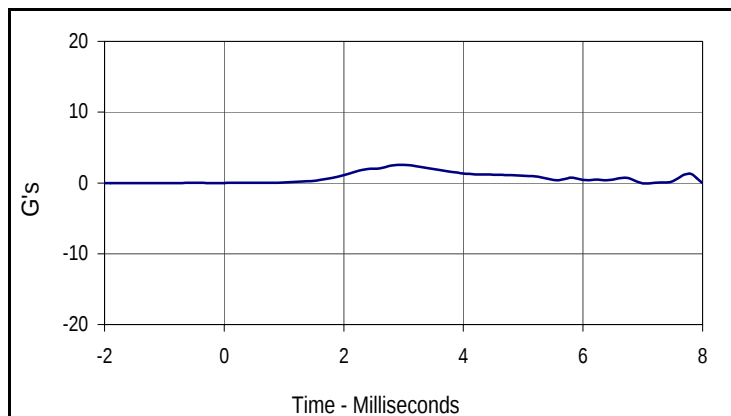
Test Date: 11/11/10
 Test I.D.: HDF11A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	115 to 137	125.1	Pass
Peak Longitudinal Acceleration	G's	≤15	2.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	3.8	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
125.1	2.7	0.0	-0.4



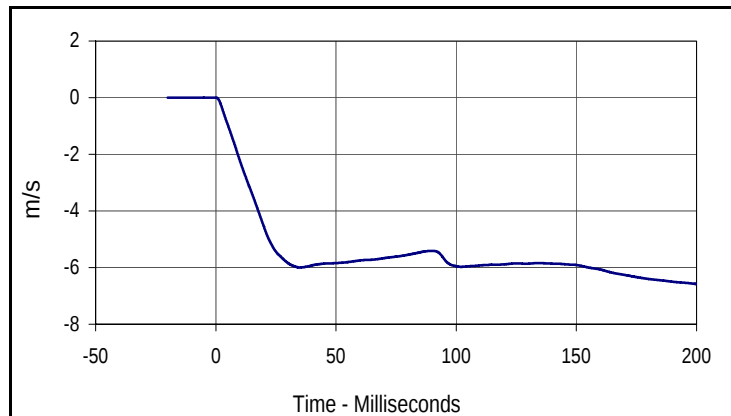
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.6	2.9	0.0	-1.6

Test Program: SID IIs Neck Calibration
 ATD Serial No.: 307

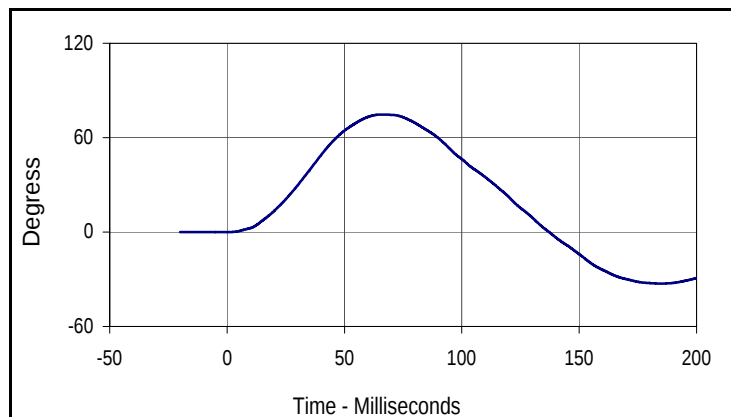
Test Date: 11/11/10
 Test I.D.: NBF11A



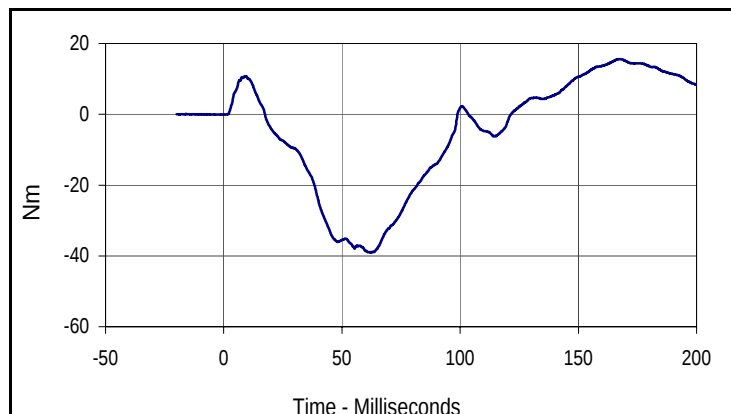
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.55	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.2	Pass
	15 msec	m/s	-3.30 to -4.10	-3.4	Pass
	20 msec	m/s	-4.40 to -5.40	-4.6	Pass
	25 msec	m/s	-5.40 to -6.10	-5.4	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.0	Pass
Translation-Rotation	Max	Degrees	71.0 to 81.0	74.7	Pass
	Time	msec	50.0 to 70.0	65.5	Pass
Peak Occipital Condyle Moment		Nm	-36.0 to -44.0	-39.0	Pass
Decaying Moment Time to Cross 0 Nm		msec	102.0 to 126.0	121.5	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.2	-6.6	200.0



Curve Description			
Maximum Translation Rotation			
CURNO	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
74.7	65.5	-32.7	184.8



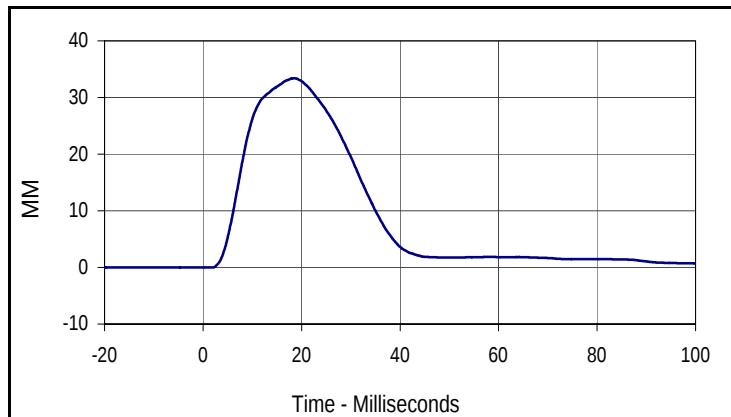
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
15.6	167.2	-39.0	62.5

Test Program: SID IIs Shoulder Calibration
 ATD Serial No.: 307

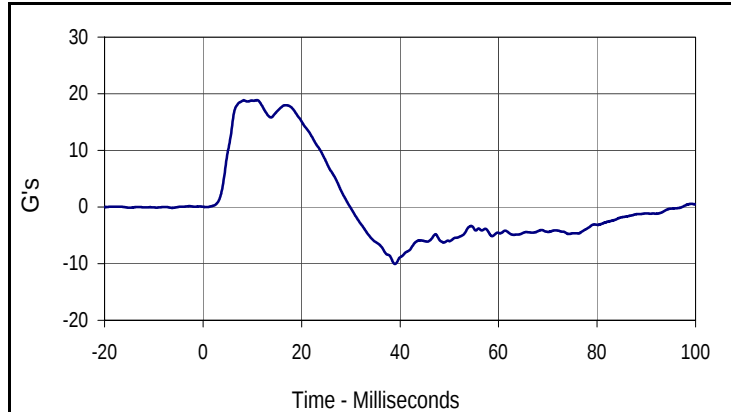
Test Date: 11/11/10
 Test I.D.: SHF11A



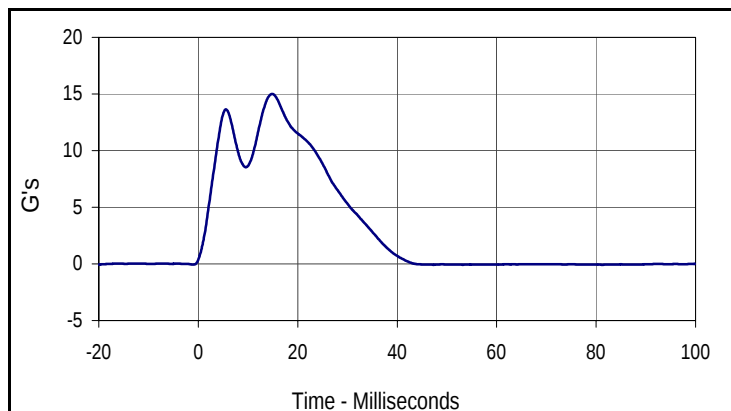
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity	m/s	4.20 to 4.40	4.28	Pass
Shoulder Deflection	MM	28 to 37	33.4	Pass
Peak Upper Spine Y Acceleration	G's	17 to 22	18.9	Pass
Peak Impactor Acceleration	G's	13 to 18	15.0	Pass
Overall Test Results			Pass	



Curve Description			
Shoulder Acceleration			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
33.4	18.6	0.0	1.0



Curve Description			
Upper Spine Y Acceleration			
CURNO	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.9	11.0	-10.0	39.0



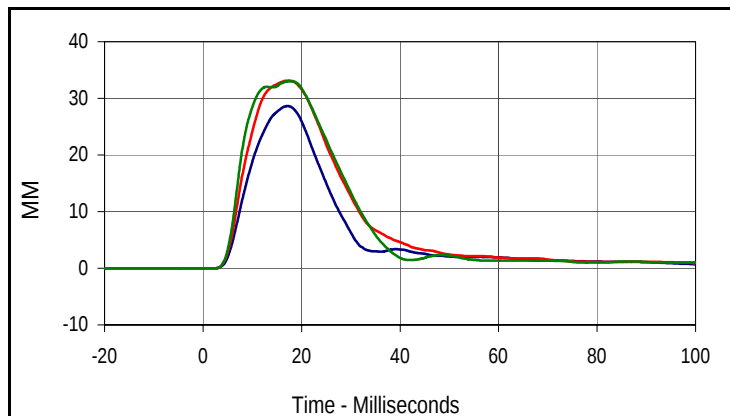
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.0	14.8	-0.1	81.3

Test Program: SID IIs Thorax with Arm Calibration
 ATD Serial No.: 307

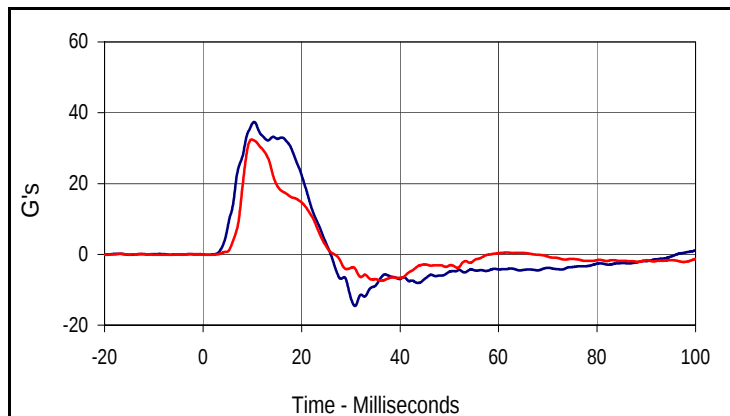
Test Date: 11/11/10
 Test I.D.: THF11A



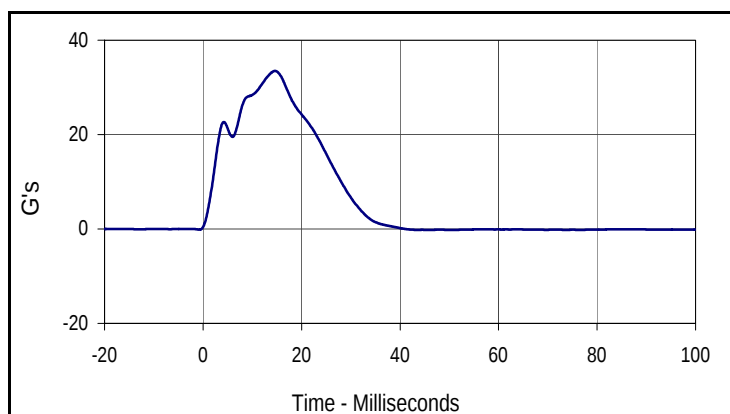
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity	m/s	6.60 to 6.80	6.68	Pass
Shoulder Deflection	MM	31 to 40	34.7	Pass
Upper Thorax Rib Deflection	MM	25 to 32	28.6	Pass
Middle Thorax Rib Deflection	MM	30 to 36	33.1	Pass
Lower Thorax Rib Deflection	MM	32 to 38	33.0	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	37.4	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	32.5	Pass
Peak Impactor Acceleration After 5 msec.	G's	30 to 36	33.5	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
28.6	17.2	0.0	-12.8
Middle Thorax Deflection			
Max	Time	Min	Time
33.1	17.4	0.0	-3.0
Lower Thorax Deflection			
Max	Time	Min	Time
33.0	17.5	0.0	-5.1



Curve Description			
Upper Spine Y Acceleration			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
37.4	10.4	-14.6	30.8
Lower Spine Y Acceleration			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
32.5	9.9	-7.5	36.2



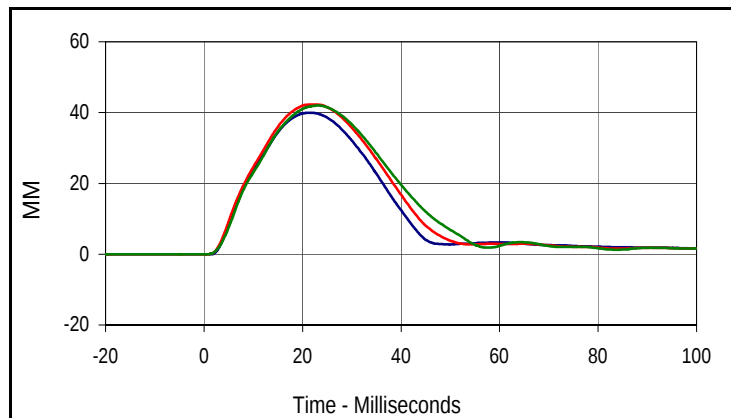
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
33.5	14.6	-0.2	50.4

Test Program: SID IIs Thorax w/o Arm Calibration
 ATD Serial No.: 307

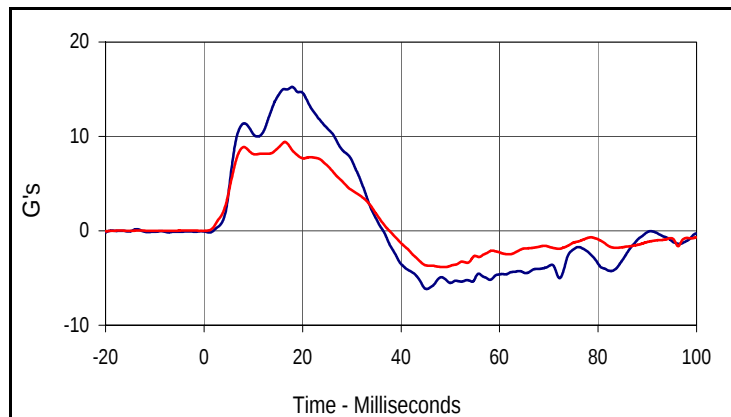
Test Date: 11/11/10
 Test I.D.: TOA11A



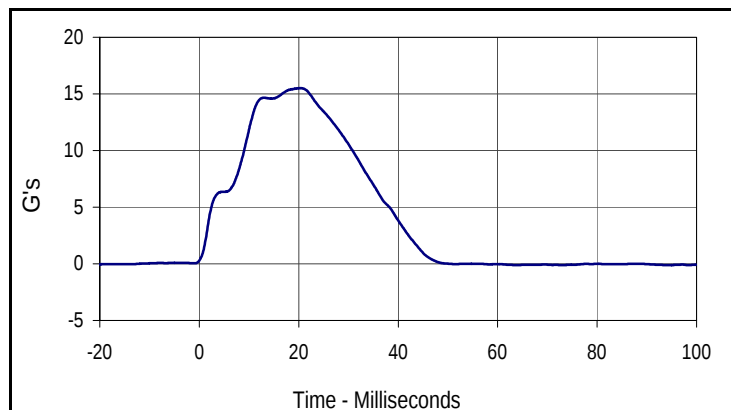
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity	m/s	4.20 to 4.40	4.27	Pass
Upper Thorax Rib Deflection	MM	32 to 40	40.0	Pass
Middle Thorax Rib Deflection	MM	39 to 45	42.3	Pass
Lower Thorax Rib Deflection	MM	35 to 43	42.0	Pass
Peak Upper Spine Y Acceleration	G's	13 to 17	15.2	Pass
Peak Lower Spine Y Acceleration	G's	7 to 11	9.4	Pass
Peak Impactor Acceleration	G's	14 to 18	15.5	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
40.0	21.5	0.0	-12.8
Middle Thorax Deflection			
Max	Time	Min	Time
42.3	22.2	0.0	-18.7
Lower Thorax Deflection			
Max	Time	Min	Time
42.0	23.3	0.0	-10.8



Curve Description			
Upper Spine Y Acceleration			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.2	17.9	-6.2	45.2
Lower Spine Y Acceleration			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.4	16.4	-3.8	49.0



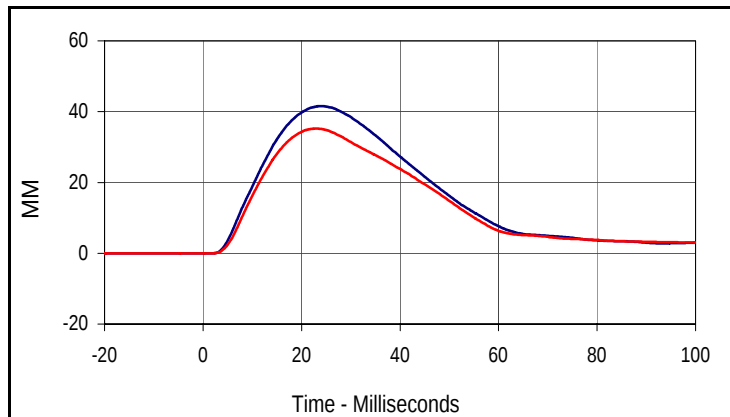
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
15.5	20.3	-0.1	94.1

Test Program: SID IIs Abdomen Calibration
 ATD Serial No.: 307

Test Date: 11/11/10
 Test I.D.: ABDF11A

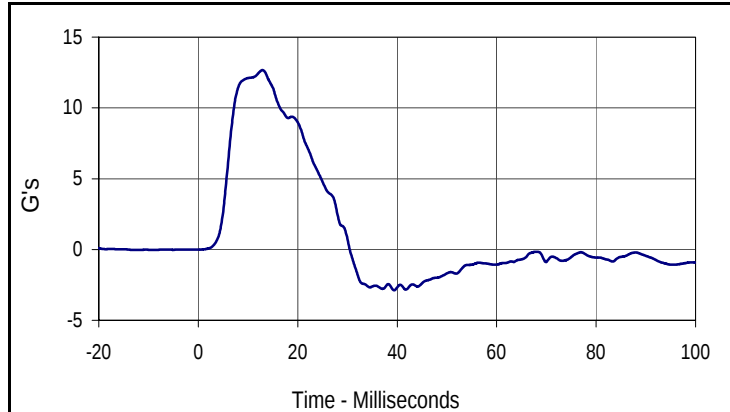


Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity	m/s	4.20 to 4.40	4.28	Pass
Upper Abdominal Rib Deflection	MM	36 to 47	41.6	Pass
Lower Abdominal Rib Deflection	MM	33 to 44	35.2	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	12.7	Pass
Peak Impactor Acceleration	G's	12 to 16	14.6	Pass
Overall Test Results			Pass	

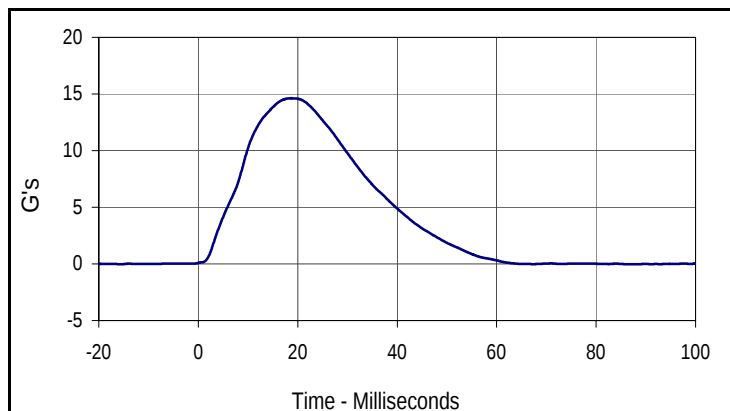


Curve Description			
Upper Abdominal Rib Deflection			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
41.6	23.8	0.0	-15.9

Curve Description			
Lower Abdominal Rib Deflection			
CURNO	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
35.2	23.1	0.0	-17.3



Curve Description			
Lower Spine Y Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
12.7	12.9	-2.9	39.4



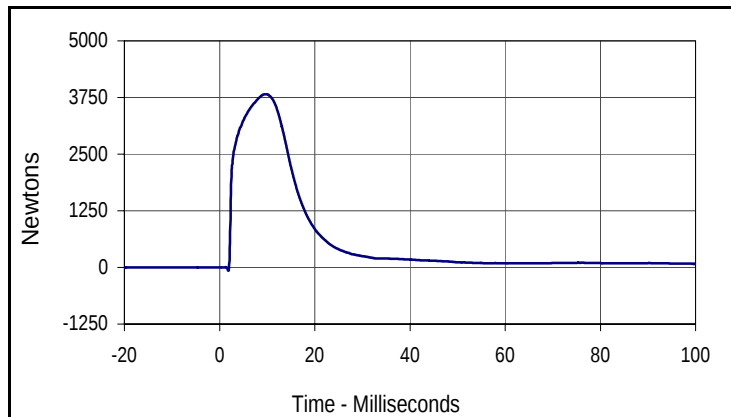
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.6	18.7	0.0	88.0

Test Program: SID IIs Pelvis Acetabulum Calibration
 ATD Serial No.: 307

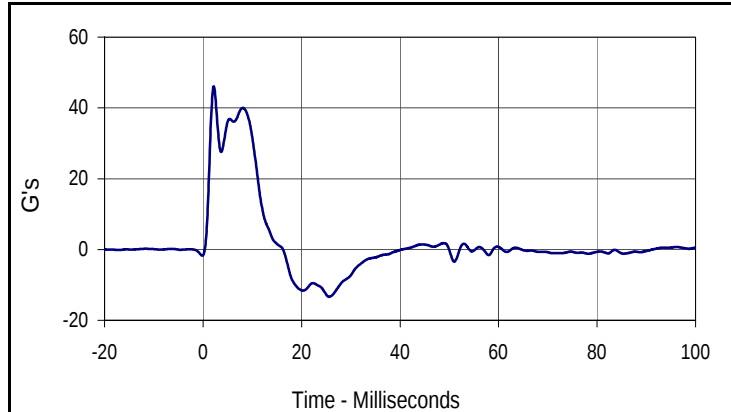
Test Date: 11/11/10
 Test I.D.: PA11A



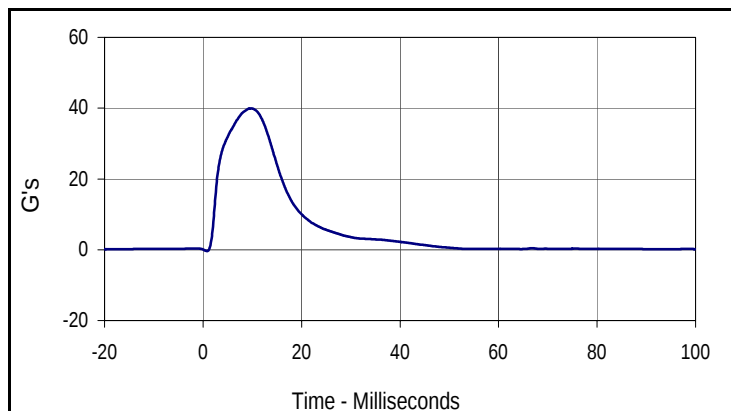
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity	m/s	6.60 to 6.80	6.68	Pass
Peak Acetabulum Force	Newtons	3600 to 4300	3822.2	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	40.0	Pass
Peak Impactor Acceleration	G's	38 to 47	39.9	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Acetabulum Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3822.2	9.6	-68.8	1.8



Curve Description			
Pelvis Y Acceleration			
CURNO	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
46.1	2.2	-13.4	25.6



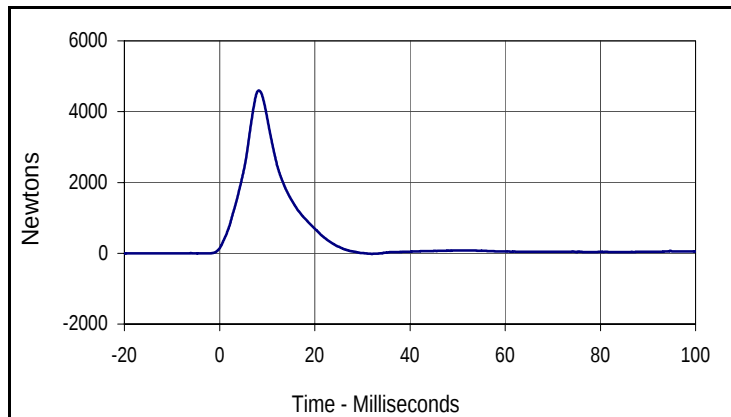
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
39.9	9.7	-0.4	0.8

Test Program: SID IIs Pelvis Iliac Calibration
 ATD Serial No.: 307

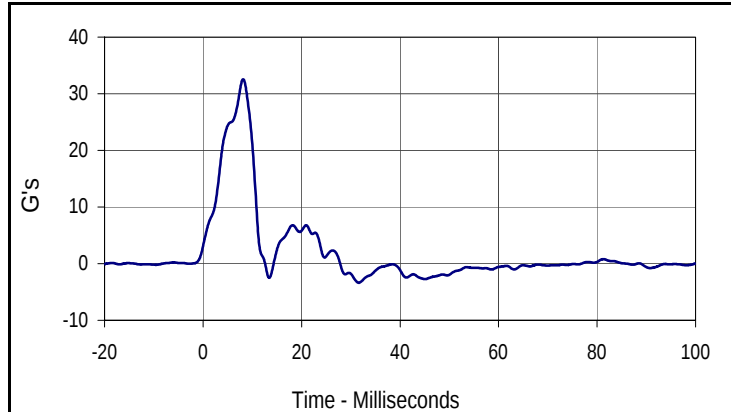
Test Date: 11/11/10
 Test I.D.: PLF11A



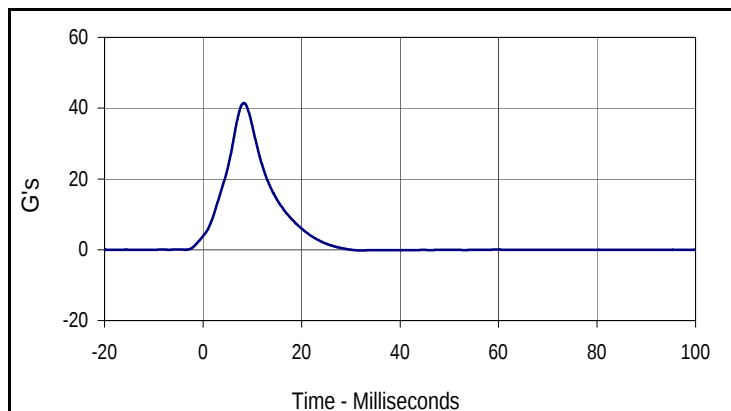
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity	m/s	4.2 to 4.4	4.27	Pass
Peak Iliac Force	Newtons	4100 to 5100	4597.7	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	32.6	Pass
Peak Impactor Acceleration	G's	36 to 45	41.4	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Iliac Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4597.7	8.3	-17.8	32.0



Curve Description			
Pelvis Y Acceleration			
CURNO	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
32.6	8.1	-3.4	31.6



Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
41.4	8.3	-0.2	31.9

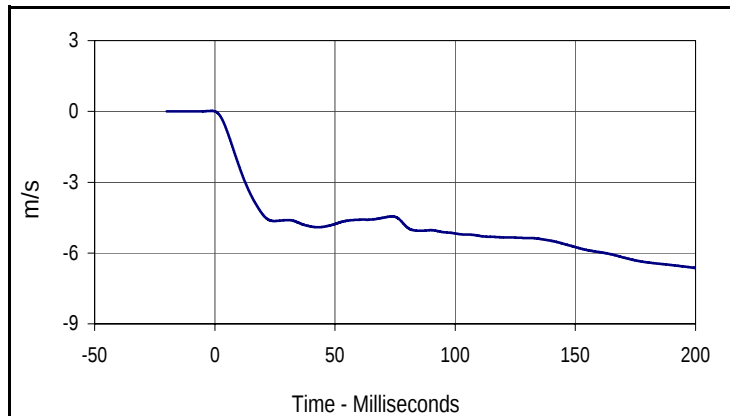
APPENDIX C
POST-TEST / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program: ES2re Neck Calibration
 ATD Serial No.: F035

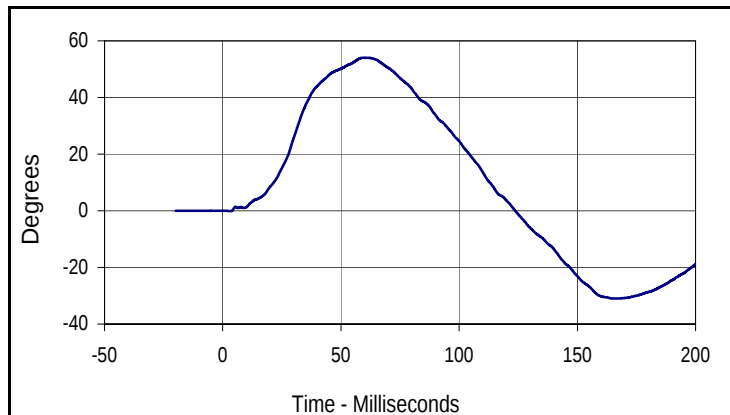
Test Date: 11/23/10
 Test I.D.: NB11B



Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	3.30 to 3.50	3.36	Pass
Pendulum Deceleration	1 msec	m/s	0.0 to -.050	-0.050	Pass
	3 msec	m/s	-.250 to -.375	-0.327	Pass
	14 msec	m/s	-3.20 to -3.70	-3.33	Pass
Headform Rotation	Max	Degrees	49.0 to 58.0	54.1	Pass
	Time	msec	54.0 to 66.0	61.0	Pass
Maximum Rotation To Time Zero Crossing		msec	53.0 to 88.0	62.8	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.4	-6.6	200.0



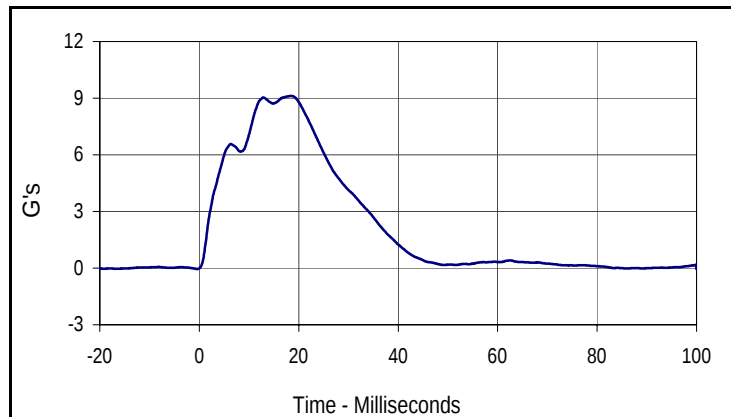
Curve Description			
Headform Rotation			
CURNO	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
54.1	61.0	-31.0	164.9

Test Program: ES2re Shoulder Calibration
 ATD Serial No.: F035

Test Date: 11/23/10
 Test I.D.: SH11B



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.20 to 4.40	4.25	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	9.12	Pass
Overall Test Results			Pass	



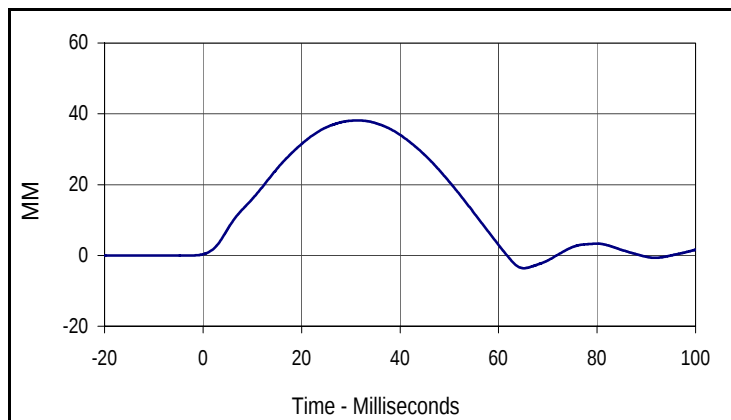
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
9.1	18.5	0.0	-0.4

Test Program: ES2re Rib Module Calibration
 ATD Serial No.: F035 Rib #1

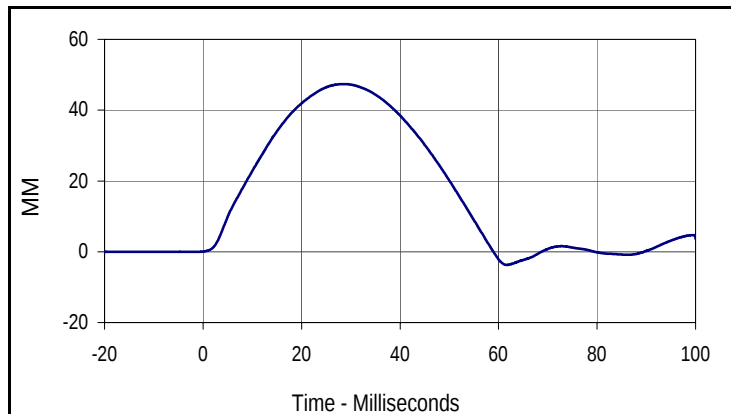
Test Date: 11/23/10
 Test I.D.: RIB11D



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Rib Deflection at 459 MM Drop Height	MM	36 to 40	38.1	Pass
Peak Rib Deflection at 815 MM Drop Height	MM	46 to 51	47.4	Pass
Overall Test Results			Pass	



Curve Description			
Upper Rib Deflection (459 MM Drop Height)			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
38.1	31.4	-3.6	65.1



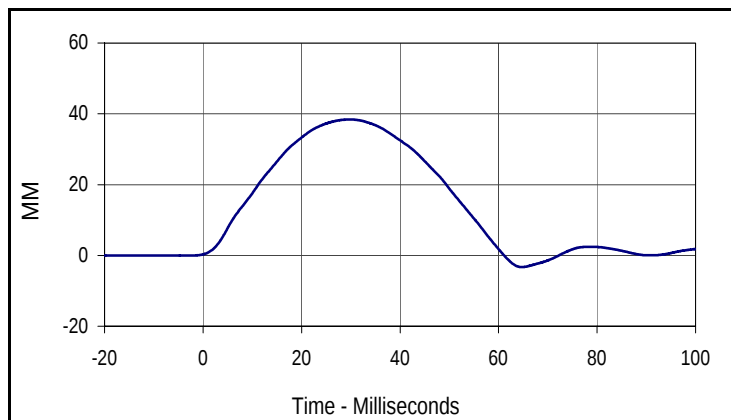
Curve Description			
Upper Rib Deflection (815 MM Drop Height)			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
47.4	28.6	-3.7	61.7

Test Program: ES2re Rib Module Calibration
 ATD Serial No.: F035 Rib #2

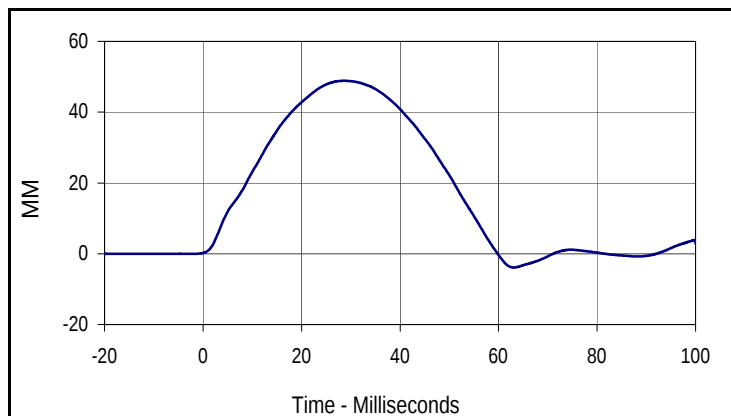
Test Date: 11/23/10
 Test I.D.: RIB11E



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Rib Deflection at 459 MM Drop Height	MM	36 to 40	38.4	Pass
Peak Rib Deflection at 815 MM Drop Height	MM	46 to 51	48.8	Pass
Overall Test Results			Pass	



Curve Description			
Middle Rib Deflection (459 MM Drop Height)			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
38.4	29.7	-3.3	64.7



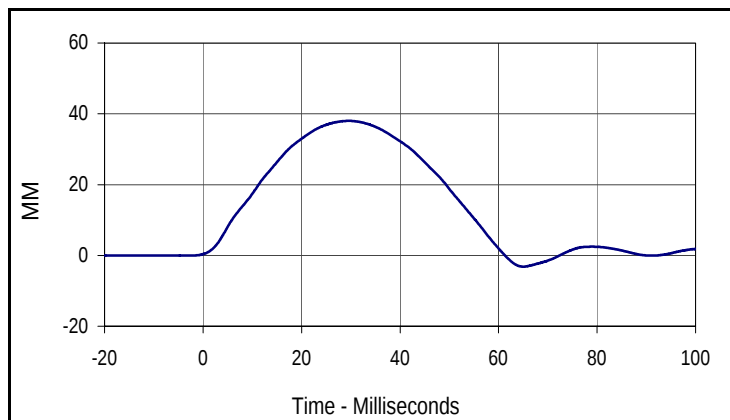
Curve Description			
Middle Rib Deflection (815 MM Drop Height)			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
48.8	28.7	-3.9	63.1

Test Program: ES2re Rib Module Calibration
 ATD Serial No.: F035 Rib #3

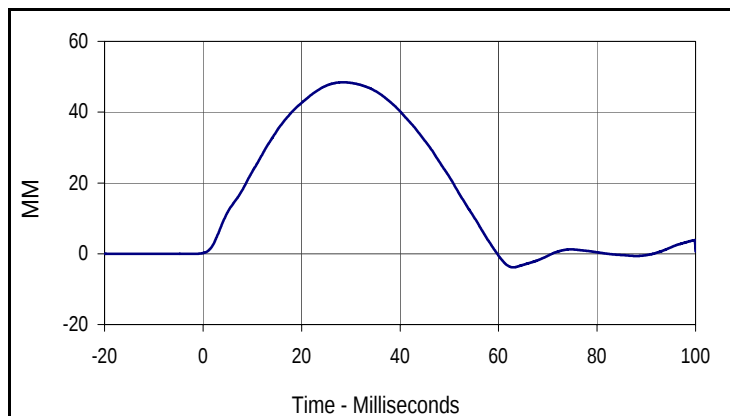
Test Date: 11/23/10
 Test I.D.: RIB11F



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Rib Deflection at 459 MM Drop Height	MM	36 to 40	38.0	Pass
Peak Rib Deflection at 815 MM Drop Height	MM	46 to 51	48.4	Pass
Overall Test Results			Pass	



Curve Description			
Lower Rib Deflection (459 MM Drop Height)			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
38.0	29.6	-3.2	65.0



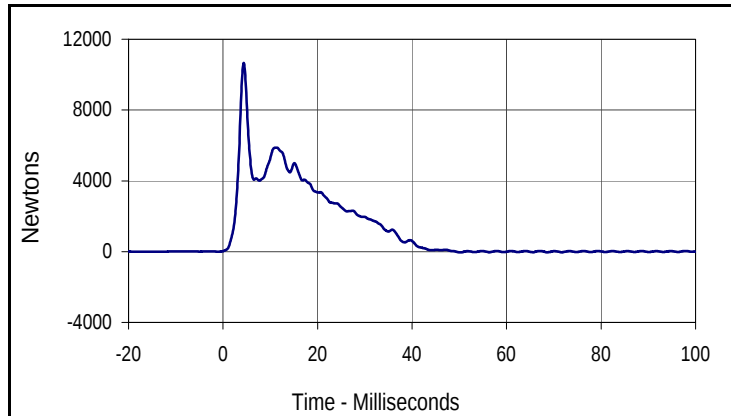
Curve Description			
Lower Rib Deflection (815 MM Drop Height)			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
48.4	28.4	-3.8	63.0

Test Program: ES2re Thorax Calibration
 ATD Serial No.: F035

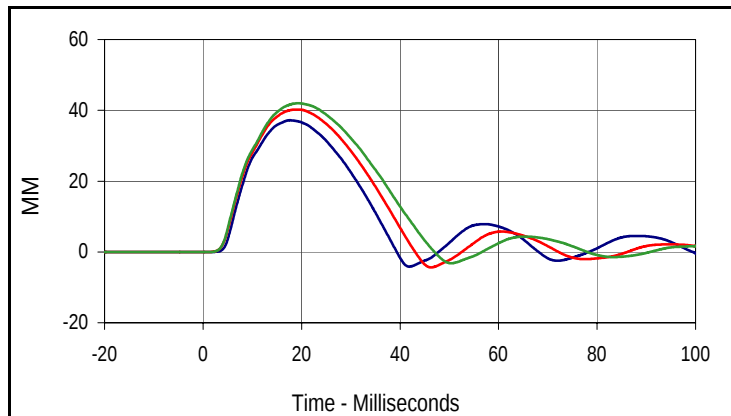
Test Date: 11/23/10
 Test I.D.: TH11B



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	5.40 to 5.60	5.44	Pass
Impactor Force	N	5100 to 6200	5879.2	Pass
	msec	> 6.0 msec	11.3	Pass
Upper Rib Deflection	MM	34 to 41	37.2	Pass
Middle Rib Deflection	MM	37 to 45	40.2	Pass
Lower Rib Deflection	MM	37 to 44	42.0	Pass
Overall Test Results			Pass	



Curve Description			
Impactor Force			
CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
10653.2	4.4	-44.7	50.3



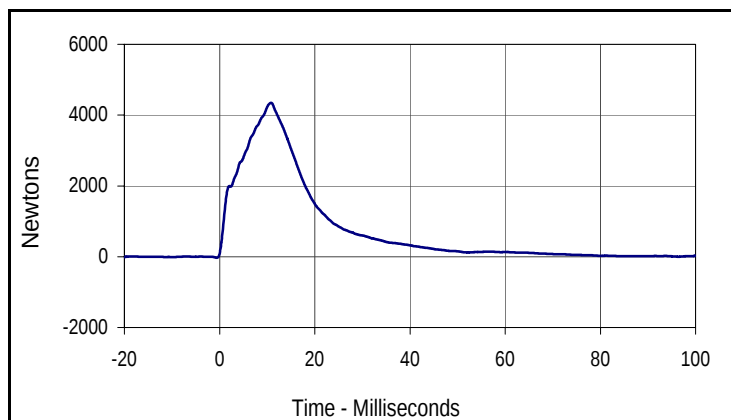
Curve Description			
Upper, Middle, Lower Rib Deflections			
CURNO(s)	Type	SAE Class	Units
002-003-004	FIL	180	MM
Max (Upper)	Time	Min (Upper)	Time
37.2	17.6	-4.2	41.9
Max (Middle)	Time	Min (Middle)	Time
40.2	19.1	-4.4	46.3
Max (Lower)	Time	Min (Lower)	Time
42.0	19.3	-3.2	50.4

Test Program: ES2re Abdomen Calibration
 ATD Serial No.: F035

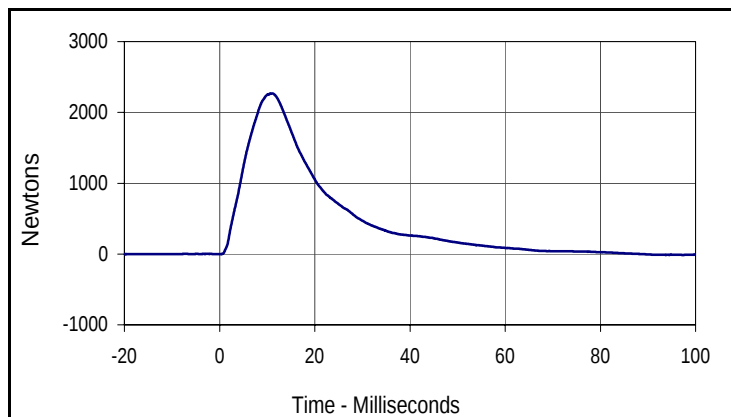
Test Date: 11/23/10
 Test I.D.: ABD11B



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	3.90 to 4.10	3.95	Pass
Impactor Force	N	4000 to 4800	4349.3	Pass
	msec	10.6 to 13.0	10.8	Pass
Abdominal Force	N	2200 to 2700	2269.4	Pass
	msec	10.0 to 12.3	11.1	Pass
Overall Test Results				Pass



Curve Description			
Impactor Force			
CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4349.3	10.8	-29.0	-0.6



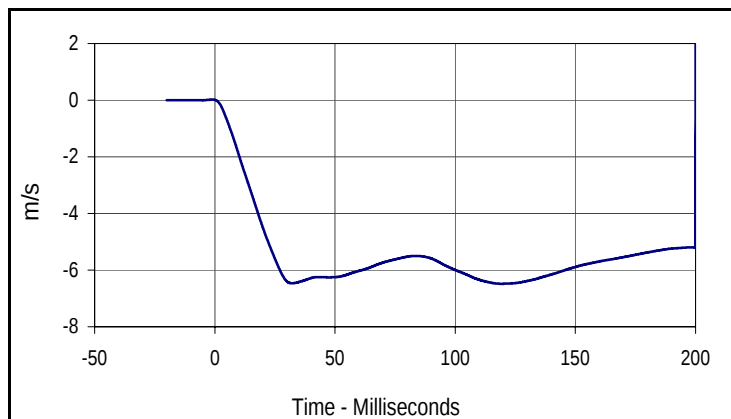
Curve Description			
Abdomen Sum Resultant			
CURNO	Type	SAE Class	Units
002	RES	600	Newtons
Max	Time	Min	Time
2269.4	11.1	-12.8	97.4

Test Program: ES2re Lumbar Spine Calibration
 ATD Serial No.: F035

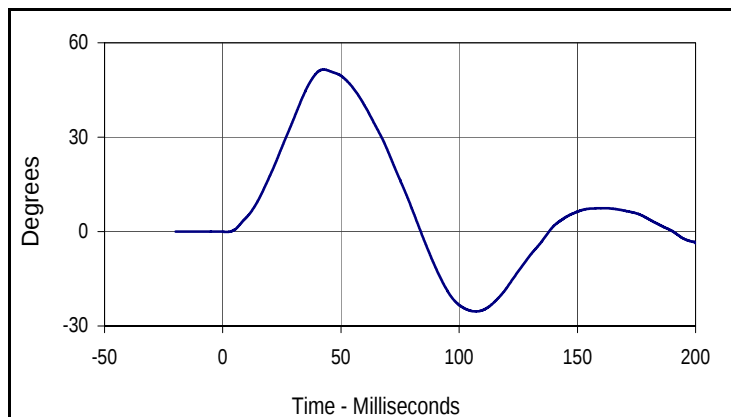
Test Date: 11/23/10
 Test I.D.: SP11B



Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.95 to 6.15	6.00	Pass
Pendulum Deceleration	1 msec	m/s	0.0 to -.050	-0.029	Pass
	3.7 msec	m/s	-.240 to -.425	-0.412	Pass
	27 msec	m/s	-5.80 to -6.50	-5.98	Pass
	30 msec	m/s	< -6.50	-6.40	Pass
Headform Rotation	Max	Degrees	45.0 to 55.0	51.5	Pass
	Time	msec	39.0 to 53.0	42.6	Pass
Maximum Rotation To Time Zero Crossing		msec	37.0 to 57.0	41.2	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
3.7	200.0	-6.5	119.2



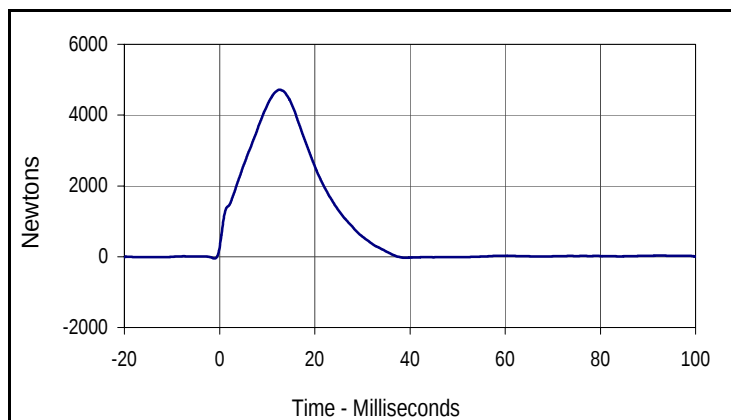
Curve Description			
Headform Rotation			
CURNO	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
51.5	42.6	-25.4	107.0

Test Program: ES2re Pelvis Calibration
 ATD Serial No.: F035

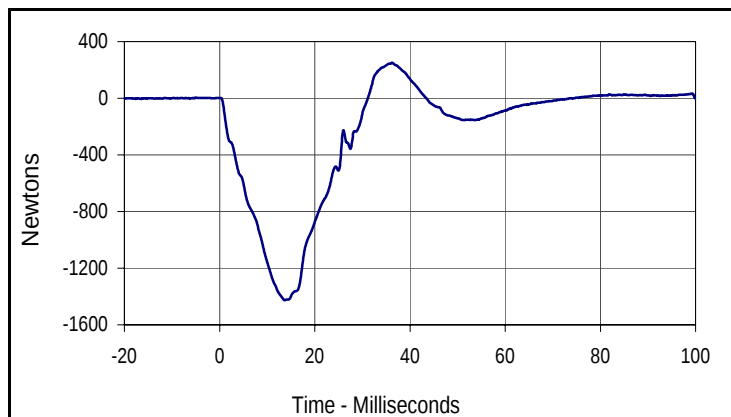
Test Date: 11/23/10
 Test I.D.: PL11B



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.20 to 4.40	4.27	Pass
Impactor Force	N	4700 to 5400	4719.7	Pass
	msec	11.8 to 16.1	12.6	Pass
Pubic Symphysis Load	N	-1230 to -1590	-1427.0	Pass
	msec	12.2 to 17.0	13.7	Pass
Overall Test Results				Pass



Curve Description			
Impactor Force			
CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4719.7	12.6	-48.3	-1.1



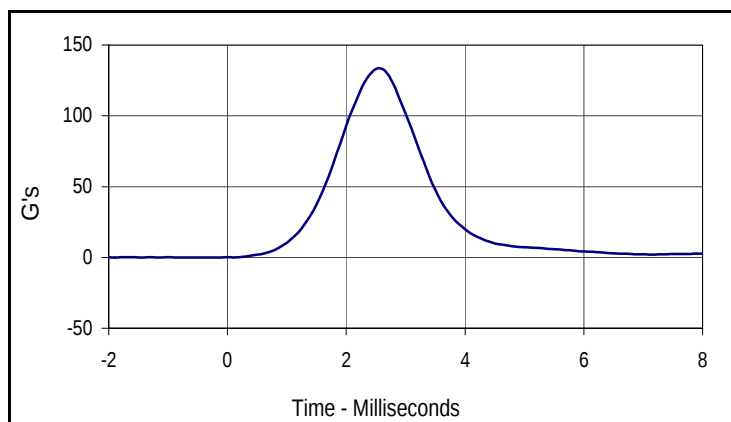
Curve Description			
Pubic FY			
CURNO	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
250.1	36.3	-1427.0	13.7

Test Program: ES2re Lateral Head Drop Calibration
 ATD Serial No.: F035

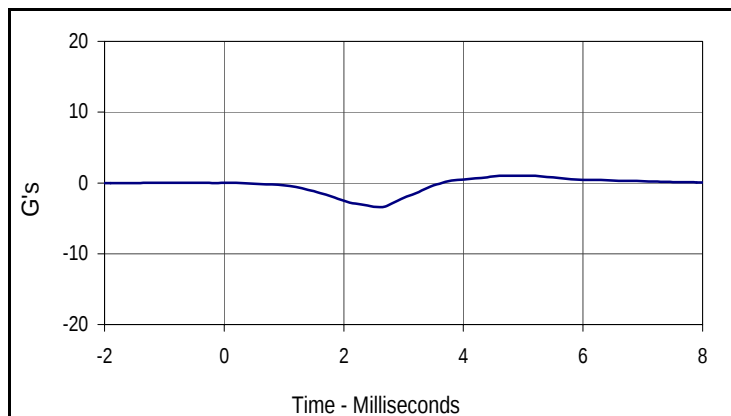
Test Date: 11/23/10
 Test I.D.: HD11B



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	125 to 155	133.4	Pass
Peak Longitudinal Acceleration	G's	≤15	3.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	5.4	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
133.4	2.6	0.0	-0.2



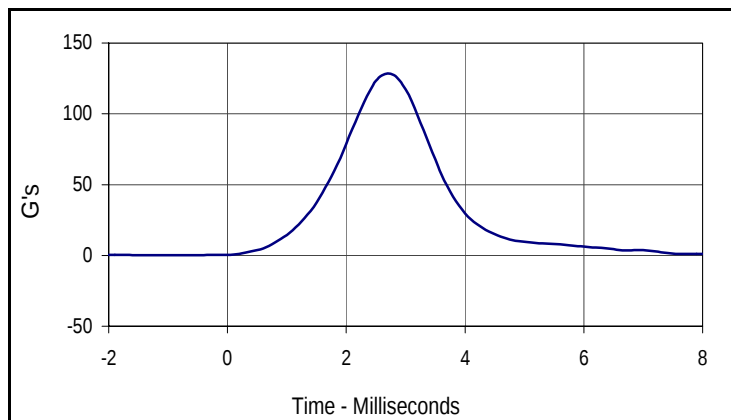
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.0	5.1	-3.4	2.6

Test Program: SID IIs Lateral Head Drop Calibration
 ATD Serial No.: 307

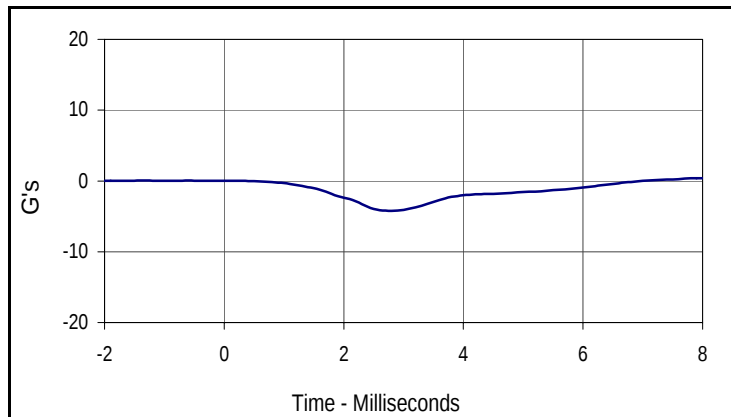
Test Date: 11/23/10
 Test I.D.: HDF11B



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	115 to 137	128.6	Pass
Peak Longitudinal Acceleration	G's	≤15	4.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	7.6	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
128.6	2.7	0.2	-1.3



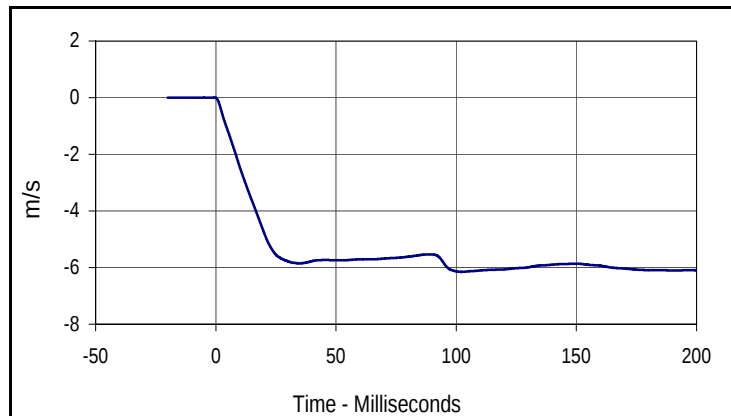
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.0	-1.4	-4.2	2.8

Test Program: SID IIs Neck Calibration
 ATD Serial No.: 307

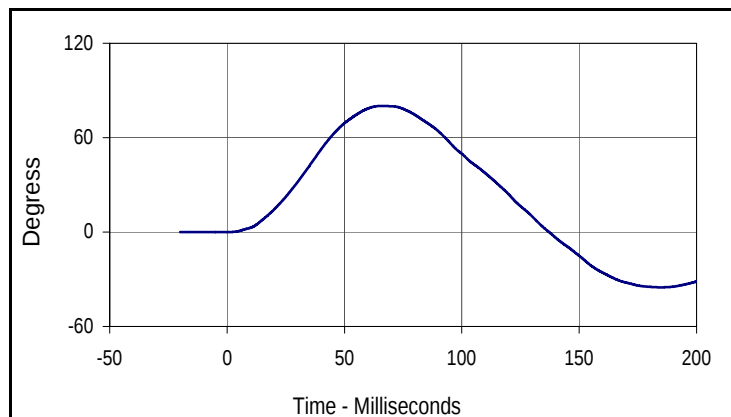
Test Date: 11/23/10
 Test I.D.: NBF11B



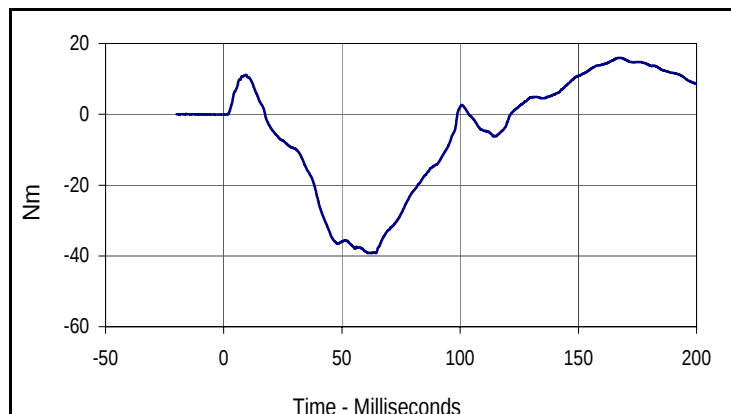
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.56	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.5	Pass
	15 msec	m/s	-3.30 to -4.10	-3.6	Pass
	20 msec	m/s	-4.40 to -5.40	-4.8	Pass
	25 msec	m/s	-5.40 to -6.10	-5.5	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.1	Pass
Translation-Rotation	Max	Degrees	71.0 to 81.0	80.2	Pass
	Time	msec	50.0 to 70.0	65.6	Pass
Peak Occipital Condyle Moment		Nm	-36.0 to -44.0	-39.3	Pass
Decaying Moment Time to Cross 0 Nm		msec	102.0 to 126.0	121.4	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.6	-6.2	102.0



Curve Description			
Maximum Translation Rotation			
CURNO	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
80.2	65.6	-35.1	184.8



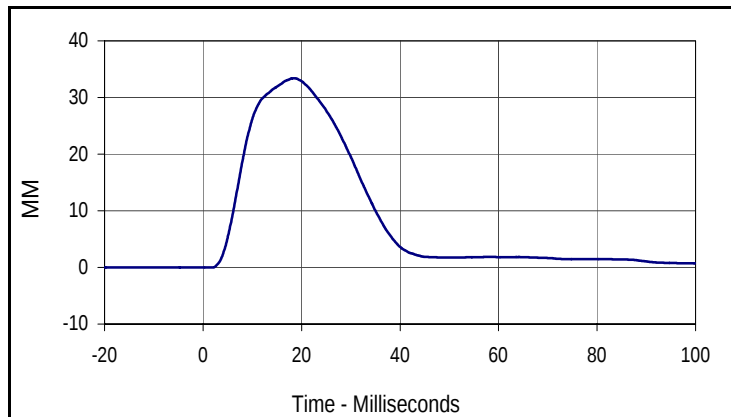
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
16.0	167.2	-39.3	64.4

Test Program: SID IIs Shoulder Calibration
 ATD Serial No.: 307

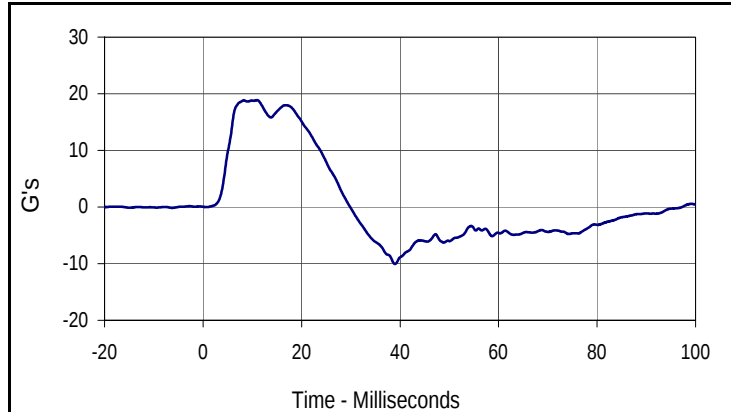
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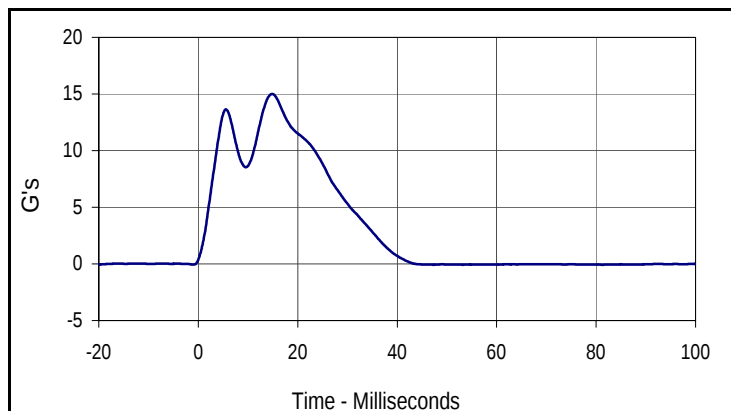
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity	m/s	4.20 to 4.40	4.33	Pass
Shoulder Deflection	MM	28 to 37	33.4	Pass
Peak Upper Spine Y Acceleration	G's	17 to 22	18.9	Pass
Peak Impactor Acceleration	G's	13 to 18	15.0	Pass
Overall Test Results			Pass	



Curve Description			
Shoulder Acceleration			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
33.4	18.6	0.0	1.0



Curve Description			
Upper Spine Y Acceleration			
CURNO	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.9	11.0	-10.0	39.0



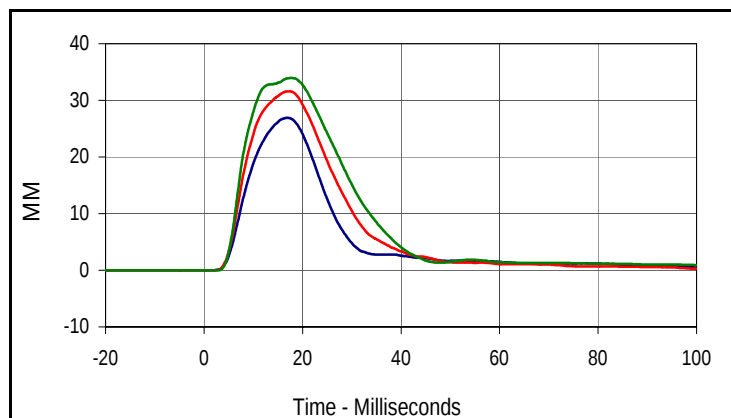
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.0	14.8	-0.1	81.3

Test Program: SID IIs Thorax with Arm Calibration
 ATD Serial No.: 307

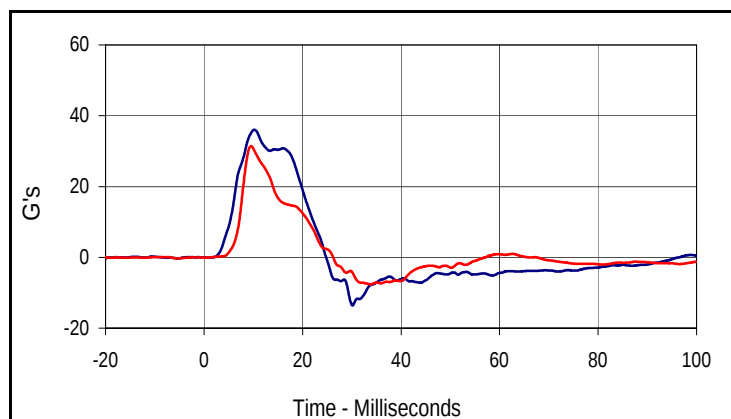
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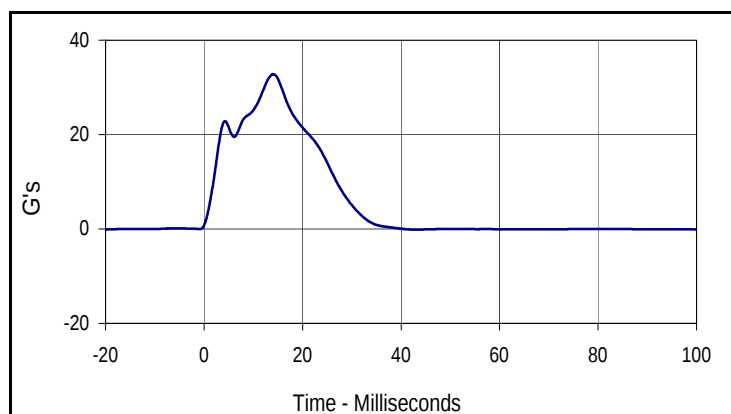
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity	m/s	6.60 to 6.80	6.71	Pass
Shoulder Deflection	MM	31 to 40	33.9	Pass
Upper Thorax Rib Deflection	MM	25 to 32	26.9	Pass
Middle Thorax Rib Deflection	MM	30 to 36	31.6	Pass
Lower Thorax Rib Deflection	MM	32 to 38	33.9	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	36.1	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	31.4	Pass
Peak Impactor Acceleration After 5 msec.	G's	30 to 36	32.8	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
26.9	16.9	0.0	-14.0
Middle Thorax Deflection			
Max	Time	Min	Time
31.6	17.0	0.0	-15.2
Lower Thorax Deflection			
Max	Time	Min	Time
33.9	17.7	0.0	-12.2



Curve Description			
Upper Spine Y Acceleration			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
36.1	10.2	-13.6	30.1
Lower Spine Y Acceleration			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
31.4	9.5	-7.6	33.7



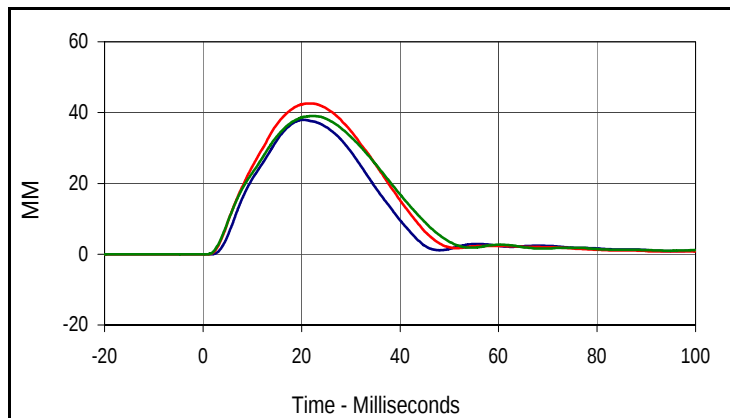
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
32.8	14.1	-0.1	42.8

Test Program: SID IIs Thorax w/o Arm Calibration
 ATD Serial No.: 307

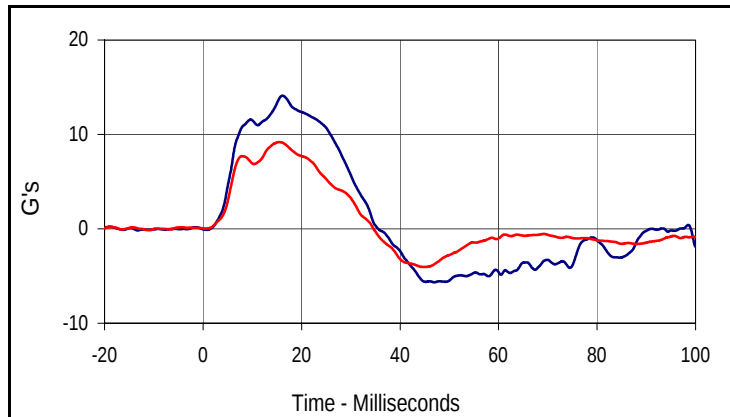
Test Date: 11/23/10
 Test I.D.: TOA11B



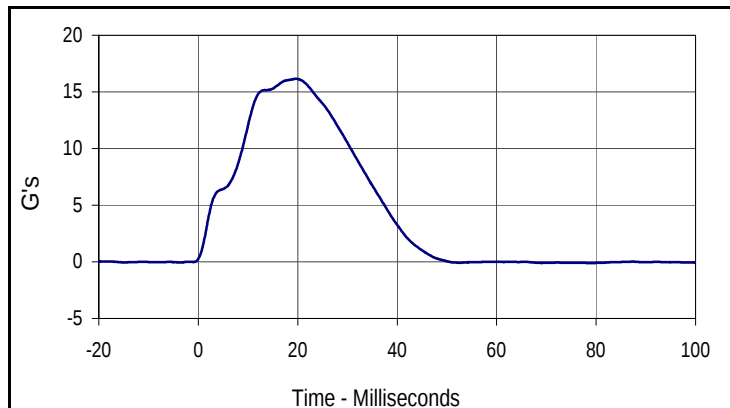
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity	m/s	4.20 to 4.40	4.33	Pass
Upper Thorax Rib Deflection	MM	32 to 40	38.0	Pass
Middle Thorax Rib Deflection	MM	39 to 45	42.6	Pass
Lower Thorax Rib Deflection	MM	35 to 43	39.0	Pass
Peak Upper Spine Y Acceleration	G's	13 to 17	14.1	Pass
Peak Lower Spine Y Acceleration	G's	7 to 11	9.2	Pass
Peak Impactor Acceleration	G's	14 to 18	16.2	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
38.0	20.3	0.0	-10.1
Middle Thorax Deflection			
Max	Time	Min	Time
42.6	21.6	0.0	-14.5
Lower Thorax Deflection			
Max	Time	Min	Time
39.0	22.2	0.0	0.8



Curve Description			
Upper Spine Y Acceleration			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.1	16.1	-5.7	47.0
Lower Spine Y Acceleration			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.2	15.4	-4.0	44.6



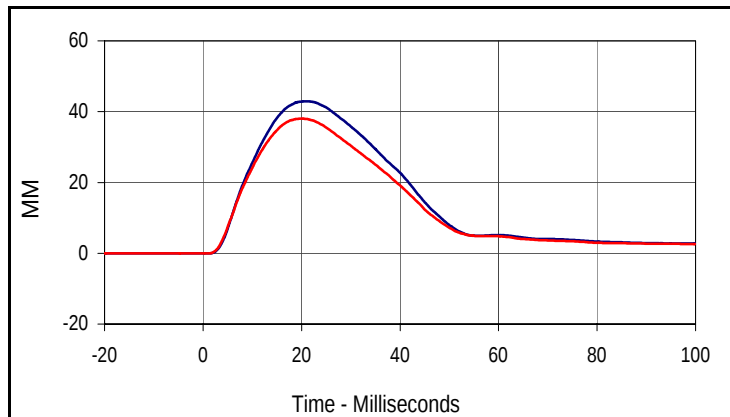
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.2	19.7	-0.1	78.6

Test Program: SID IIs Abdomen Calibration
 ATD Serial No.: 307

Test Date: 11/23/10
 Test I.D.: ABDF11B

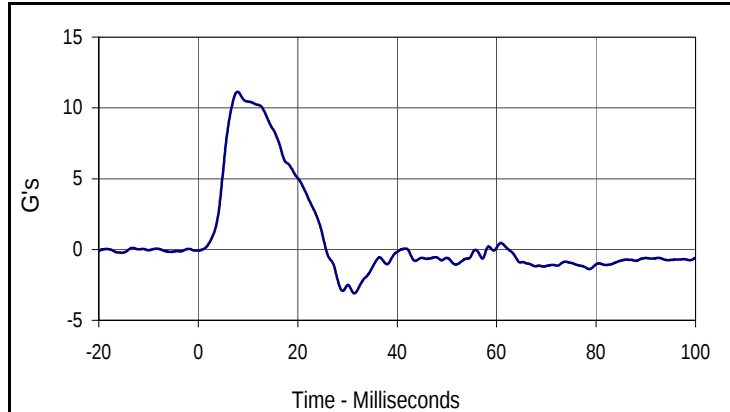


Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity	m/s	4.20 to 4.40	4.34	Pass
Upper Abdominal Rib Deflection	MM	36 to 47	43.0	Pass
Lower Abdominal Rib Deflection	MM	33 to 44	38.1	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	11.1	Pass
Peak Impactor Acceleration	G's	12 to 16	14.3	Pass
Overall Test Results			Pass	

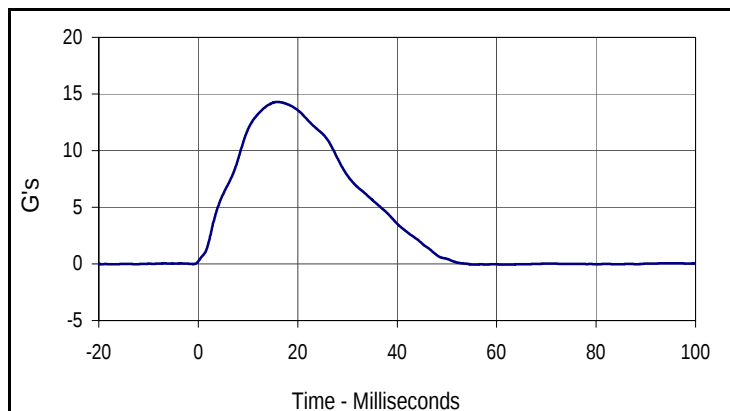


Curve Description			
Upper Abdominal Rib Deflection			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
43.0	20.9	0.0	-16.3

Curve Description			
Lower Abdominal Rib Deflection			
CURNO	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
38.1	20.0	0.0	-2.5



Curve Description			
Lower Spine Y Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
11.1	7.9	-3.1	31.4



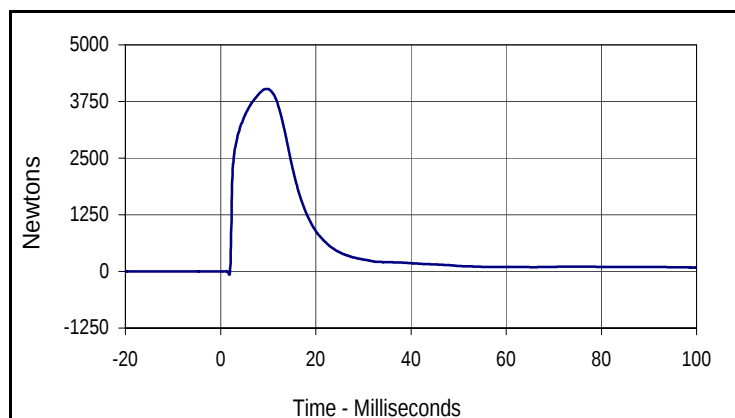
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.3	15.9	-0.1	55.4

Test Program: SID IIs Pelvis Acetabulum Calibration
 ATD Serial No.: 307

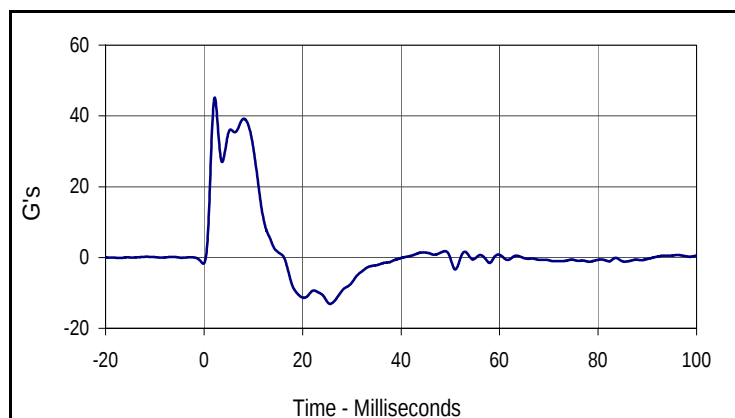
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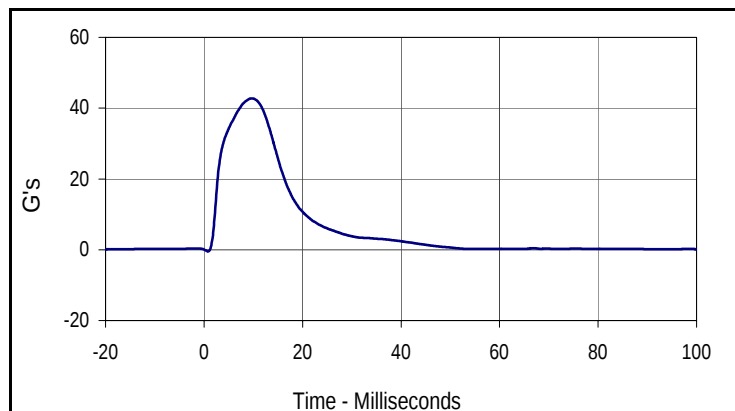
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity	m/s	6.60 to 6.80	6.71	Pass
Peak Acetabulum Force	Newtons	3600 to 4300	4027.5	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	39.2	Pass
Peak Impactor Acceleration	G's	38 to 47	42.7	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Acetabulum Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4027.5	9.6	-72.5	1.8



Curve Description			
Pelvis Y Acceleration			
CURNO	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
45.2	2.2	-13.1	25.6



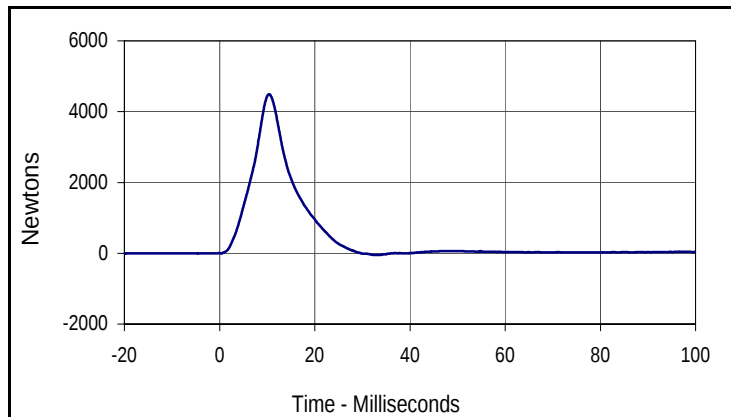
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
42.7	9.7	-0.4	0.8

Test Program: SID IIs Pelvis Iliac Calibration
 ATD Serial No.: 307

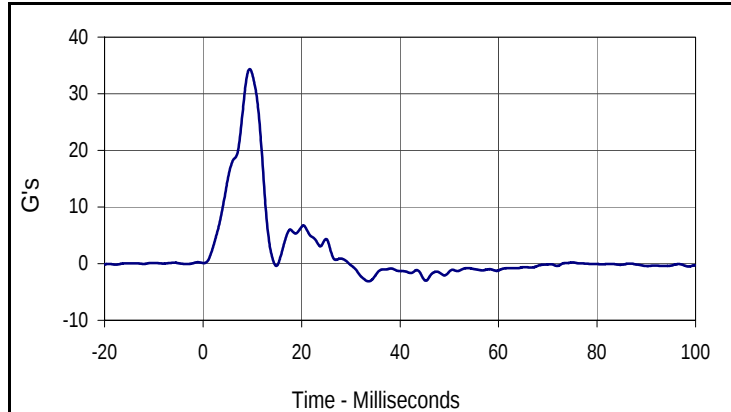
Test Date: 11/23/10
 Test I.D.: PLF11B



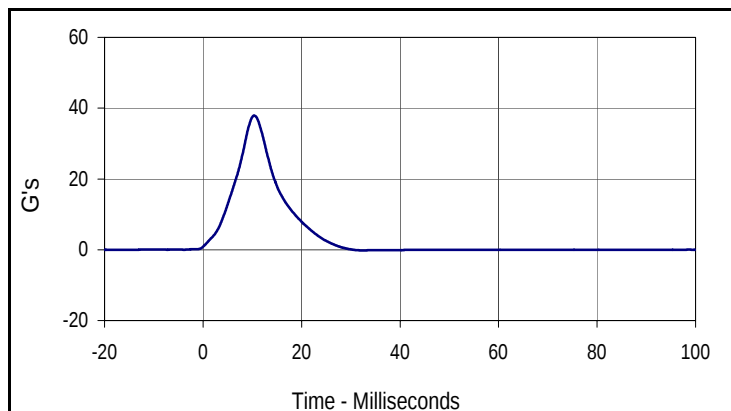
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity	m/s	4.2 to 4.4	4.36	Pass
Peak Iliac Force	Newtons	4100 to 5100	4490.8	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	34.4	Pass
Peak Impactor Acceleration	G's	36 to 45	37.9	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Iliac Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4490.8	10.4	-48.5	33.0



Curve Description			
Pelvis Y Acceleration			
CURNO	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
34.4	9.5	-3.1	33.6



Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
37.9	10.4	-0.2	32.3