

REPORT NUMBER: SNCAP-KAR-11-050

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

**NISSAN MOTOR CO., LTD.
2011 NISSAN MURANO S 5-DOOR MPV**

NHTSA No: MB5207

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



DECEMBER 15, 2010

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
1200 NEW JERSEY AVE, SE
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 Murano S 5-Door MPV 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 December 15, 2010.

The impact velocity of the Moving Deformable Barrier was 61.83 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 13.9 deg. C. The target vehicle's maximum post-test static crush was 300 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	73.1
Maximum Thorax Rib Deflection	mm	44	20.5
Total Abdominal Force	N	2500	633
Pubic Symphysis Force	N	6000	2258

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	170.2
Lower Spine Resultant Acceleration	g	82	42
Total Pelvic Force (Sum of Acetubular and Iliac Forces)	N	5525	4530

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 Murano S 5-Door MPV. 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 Murano S 5-Door MPV 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 61.83 km/h (38.42 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 December 15, 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	73.1
Maximum Thorax Rib Deflection	mm	44	20.5
Combined Abdominal Force	N	2500	633
Pubic Symphysis Force	N	6000	2258

Measurement Description	Units	Passenger ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	170.2
Lower Spine (T12) Resultant Acceleration	g	82	42
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4530

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	No	No	
Seat Belt Load Limiter	Yes	No	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 Murano S 5-Door MPV

NHTSA No. MB5207

Test Program: MDB Side Impact Test

Test Date: 12/15/10

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 Murano S 5-Door MPV

NHTSA No. MB5207

Test Program: MDB Side Impact Test

Test Date: 12/15/10

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	MB5207
Model Year	2011
Make	Nissan
Model	Murano S
Body Style	5-Door MPV
VIN	JN8AZ1MU5BW051222
Body Color	Graphite Blue
Delivery Date	11/12/2010
Odometer Reading (km / mi)	156/97
Dealer	Buena Park Nissan
Transmission	CVT
Final Drive	Front
Type / No. of Cylinders	V6
Engine Displacement (L)	3.5
Engine Placement	Transverse
Roof Rack	No
Sunroof / T-Top	No
Tinted Glass	Yes
Traction Control	Yes
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)	2328
GAWR Front (kg)	1219
GAWR Rear (kg)	1117

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)

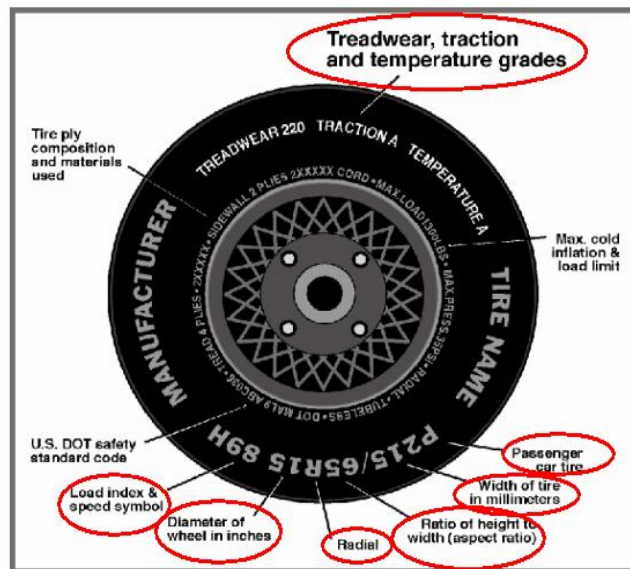
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5207

Test Program: MDB Side Impact Test

Test Date: 12/15/10



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	300	300
Cold Pressure (kpa)	230	230
Recommended Tire Size	P235/65R18	P235/65R18
Tire Size on Vehicle	P235/65R18	P235/65R18
Tire Model	Eagle LS	Eagle LS
Tire Manufacturer	Goodyear	Goodyear
Treadwear	360	360
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Nylon	2 Polyester, 2 Steel, 1 Nylon
Load Index/Speed Symbol	104T	104T
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Right	V4VK 3MLR 3510	V4VK 3MLR 3510
DOT Safety Code Left	V4VK 3MLR 3510	V4VK 3MLR 3510

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5207

Test Program: MDB Side Impact Test

Test Date: 12/15/10

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	534.5	356.5		575.5	438.0		580.5	444.0	
Right	kg	502.0	347.0		505.5	405.5		500.0	411.0	
Ratio	%	59.6%	40.4%	100.0%	56.2%	43.8%	100.0%	55.8%	44.2%	100.0%
Total	kg	1036.5	703.5	1740.0	1081.0	843.5	1924.5	1080.5	855.0	1935.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1740.0	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 (TVTWT)	kg	1932.8	A+B+C

TEST VEHICLE ATTITUDES

Condition	Units	LF	RF	LR	RR	CG (Aft of Front Axle)
Fully Loaded	mm	842	853	837	848	1246
As Tested	mm	845	845	839	849	1236

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheelbase	mm	2821
Total Vehicle Length at Left Side	mm	3257
Total Vehicle Length at Centerline	mm	4823
Total Vehicle Length at Right Side	mm	3252
Weight of Ballast in Cargo Area	kg	76.0
Weight of Vehicle Components Removed	kg	60.0
Amount of Stoddard Solvent in Fuel Tank	L	75.70

Vehicle components removed to make Target Vehicle Test Weight:

Non-struck side windows (8.5 kg), Non-struck side door panels (11.0 kg), Spare tire and tools (25.0 kg), Cargo area lining (14.0 kg), Non-struck side mirror (1.5 kg)

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Target Impact Point Aft of Front Axle	mm	470
Actual Impact Point Aft of Front Axle	mm	488

DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

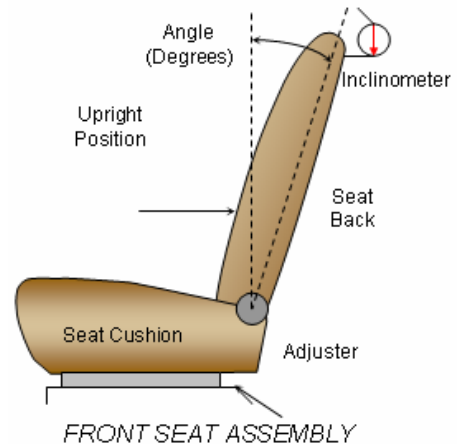
NHTSA No. MB5207

Test Program: MDB Side Impact Test

Test Date: 12/15/10

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. Seat back angles are measured at the headrest posts using a digital inclinometer.



SEAT BACK ANGLES

	Degrees (°)
Driver w/Seated Dummy	1.0
Passenger w/Seated Dummy	3.2

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	240 mm	120 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.

SEAT BELT UPPER ANCHORAGES

Seating Position	Total No. of Positions	Placed in Position
Driver Seat	4	0
Rear Seat	4	3

DATA SHEET NO. 2 ... (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5207

Test Program: MDB Side Impact Test

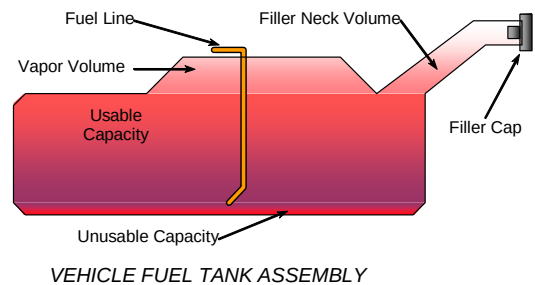
Test Date: 12/15/10

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	81.38
Usable Capacity of "Optional Tank"	
Usable Capacity Used for FMVSS 301	81.38
Actual Amount of Stoddard Solvent Used	75.70

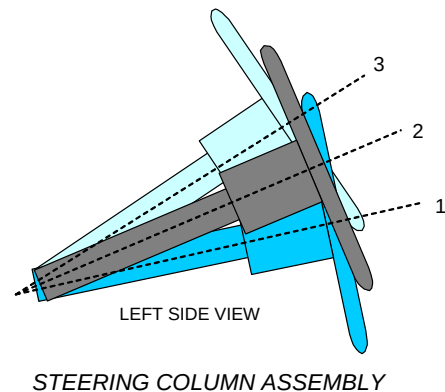
FUEL PUMP

The test vehicle is equipped with an electric fuel pump. The fuel pump will operate when the ignition is turned to the "ON" position. 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	16.7	0
Geometric Center Position, No. 2	24.2	20
Uppermost Position, No. 3	31.6	40
Telescoping Steering Wheel Travel		40
Test Position	22.9	20

DATA SHEET NO. 3

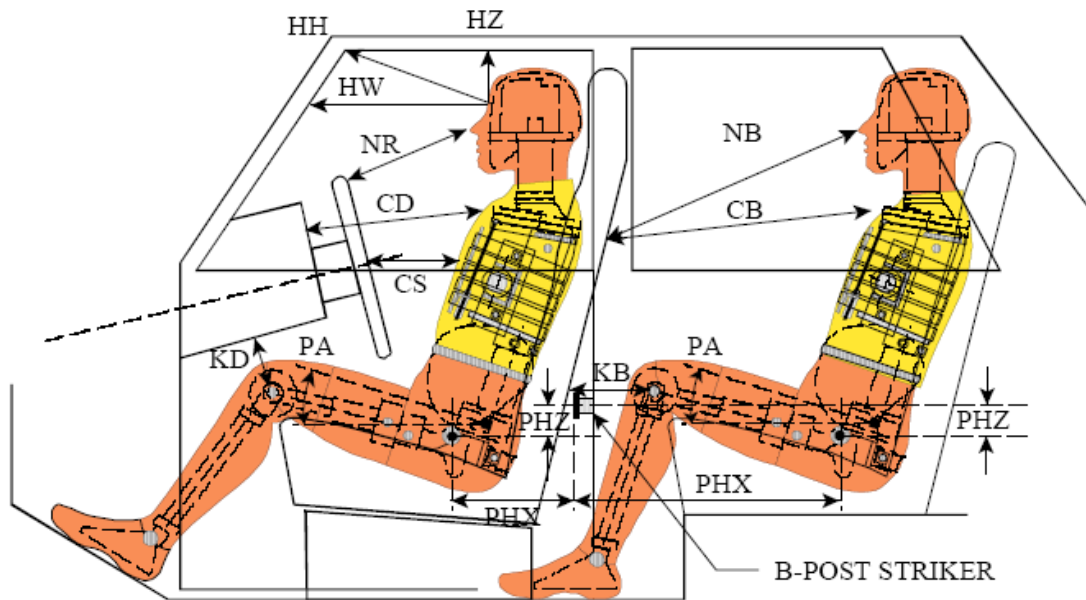
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5207

Test Program: MDB Side Impact Test

Test Date: 12/15/10



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	361	12.9		
HW		Head to Windshield	595	0.0		
HZ	HZ	Head to Roof	120	90.0	315	90.0
NR	NB	Nose to Rim/Seat Back	420	20.4	539	8.8
CD	CB	Chest to Dash/Seat Back	540	5.3	572	4.7
CS		Chest to Steering Wheel	303	20.5		
KDL	KBL	Left Knee to Dash/Seat Back	110	31.9	321	12.5
KDR	KBR	Right Knee to Dash/Seat Back	93	35.3	318	14.3
PA	PA	Pelvic Angle		15.0		20.5
PHX	PHX	H-Point to Striker (x-axis)	220	0.0	286	0.0
PHZ	PHZ	H-Point to Striker (z-axis)	71	90.0	264	90.0
SA	SA	Seat Back Angle		1.0		3.2

DATA SHEET NO. 4

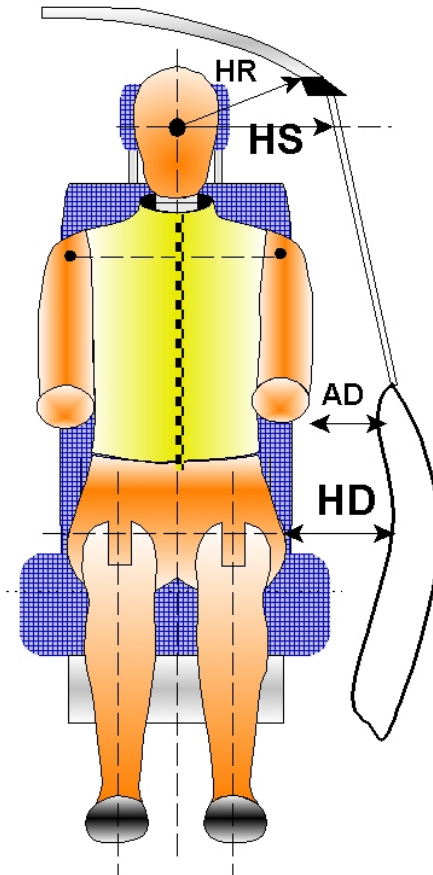
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

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DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	197	286
HS	Head to Side Window	mm	329	393
AD	Arm to Door	mm	115	188
HD	H-Point to Door	mm	169	184

DATA SHEET NO. 5

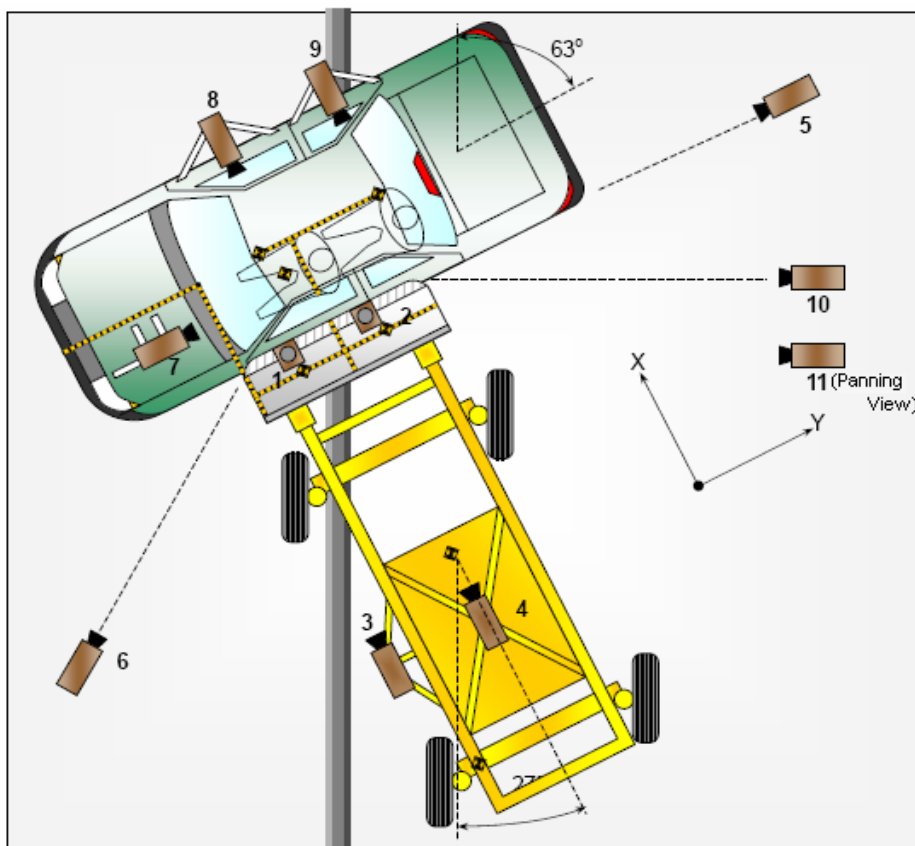
CAMERA LOCATIONS AND DATA

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5207

Test Program: MDB Side Impact Test

Test Date: 12/15/10



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)	499	-852	-654	6.1	35	1000
8	Driver Side (On-Board)	1631	676	-499	7.6	14	1000
9	Passenger Side (On-Board)	1588	1563	-536	13.9	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

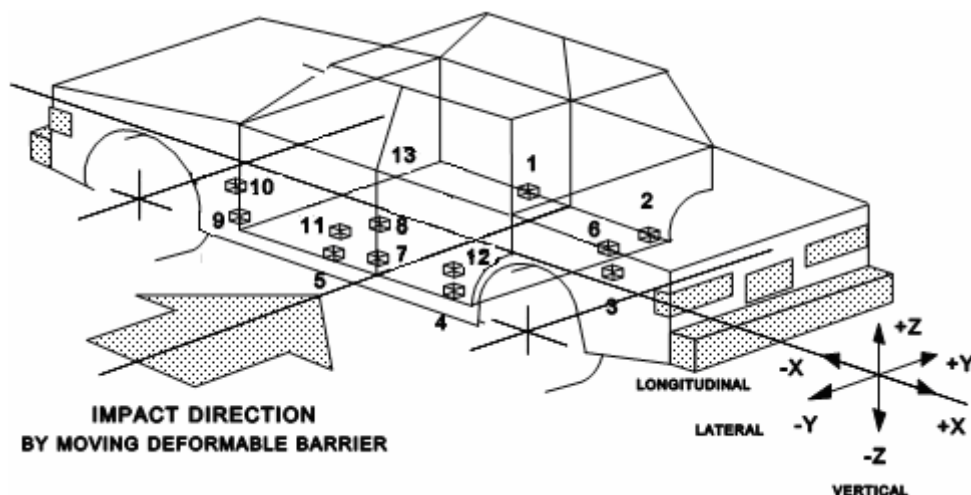
VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

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VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Right Sill at Front Seat	2776	740	414
2	Right Sill at Rear Seat	1892	740	439
3	Rear Floorpan Above Axle	968	485	540
4	Left Sill at Rear Door	1659	-730	295
5	Left Sill at Front Door	2845	-730	295
6	Right Rear Occupant Compartment	1985	340	362
7	B-Pillar Lower	2110	-773	620
8	B-Pillar Mid	2110	-773	924
9	A-Pillar Lower	3247	-840	727
10	A-Pillar Mid	3247	-840	874
11	Front Seat Track	2404	-570	465
12	Rear Seat Structure			
13	Vehicle CG	2005	0	358

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

DATA SHEET NO. 7

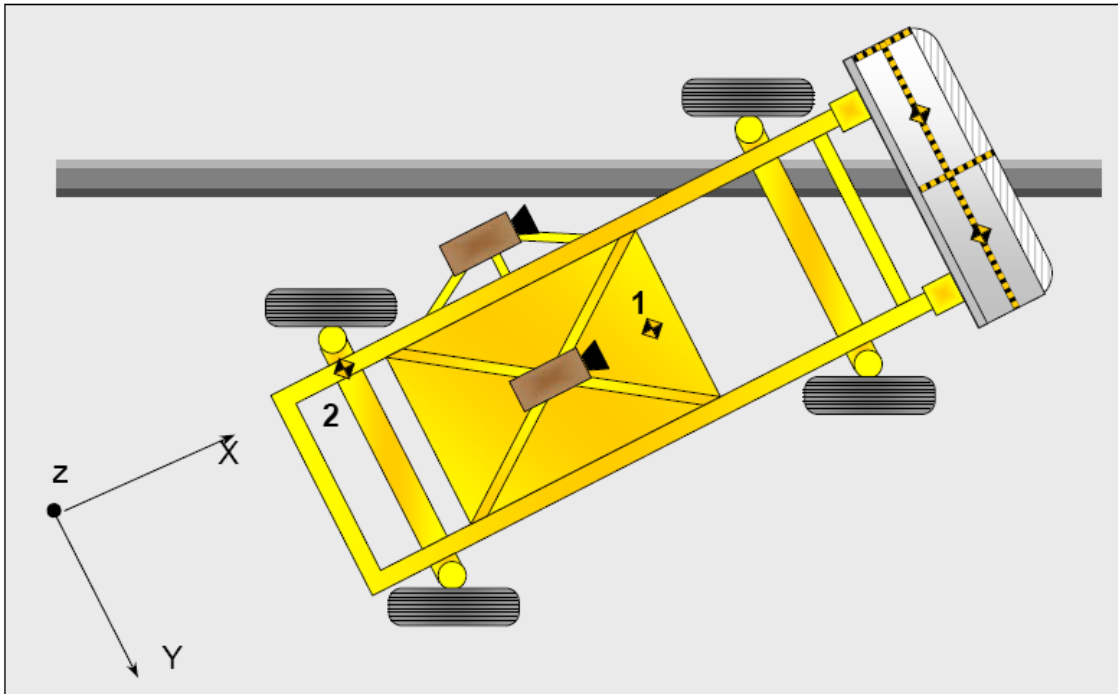
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

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Test Program: MDB Side Impact Test

Test Date: 12/15/10



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 Murano S 5-Door MPVNHTSA No. MB5207Test Program: MDB Side Impact TestTest Date: 12/15/10**MAXIMUM EXTERIOR CRUSH**

Level	Description	Units	Maximum Crush	Above Ground
1	Sill Top Height	mm	123	367
2	Occupant H-Point Height	mm	300	719
3	Mid-Door Height	mm	297	759
4	Window Sill Height	mm	123	1061
5	Window Top Height	mm	16	1601
	Maximum Penetration	mm	300	

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 Murano S 5-Door MPVNHTSA No. MB5207Test Program: MDB Side Impact TestTest Date: 12/15/10**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	61.83
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.80
MDB CL to Target Vehicle CL	degrees	88.5-91.5	89.1

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	800	Right	238
2	Top of Bumper	533	800	Right	114
3	Mid Level	686	600	Left	159
4	Top of Stack	813	800	Left	145

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	2

DATA SHEET NO. 10
POST-TEST OBSERVATIONS

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5207

Test Program: MDB Side Impact Test

Test Date: 12/15/10

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, Head Restraint, Center Head Restraint
Upper Torso Contact	Torso/Pelvis Airbag	Door Panel
Lower Torso Contact	Torso/Pelvis Airbag, Door Panel	Door Panel
Left Knee Contact	Door Panel, Steering Column	Door Panel, Right Knee
Right Knee Contact	None	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	None	
Window Damage	None	None
Other Notable Effects	None	

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	No	No	
Seat Belt Load Limiter	Yes	No	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)

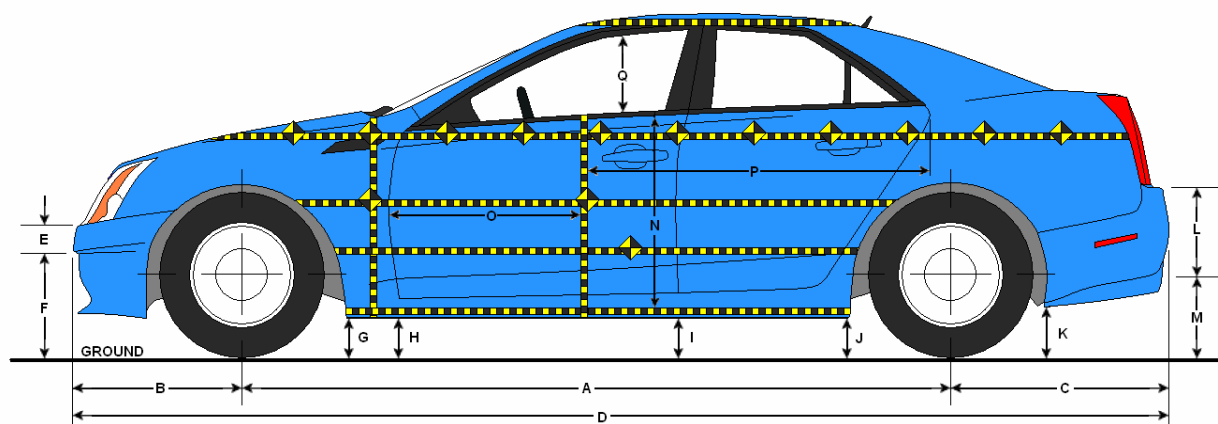
DATA SHEET NO. 11
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5207

Test Program: MDB Side Impact Test

Test Date: 12/15/10



LEFT SIDE VIEW

VEHICLE PRE AND POST-TEST MEASUREMENT INFORMATION

Code	Dimension	Measurement (mm)		
		Pre	Post	Difference
A	Wheelbase	2821	2814	-7
B	Front Axle to FSOV	994	998	4
C	Rear Axle to RSOV	1009	1006	-3
D	Total Length at Centerline	4823	4818	-5
E	Front Bumper Thickness	178	178	0
F	Front Bumper Bottom to Ground	543	552	9
G	Sill Height at Front Wheel Well	321	360	39
H	Sill Height at Front Door Leading Edge	321	332	11
I	Sill Height at B-Pillar	314	347	33
J1	Sill Height at Rear Wheel Well	310	361	51
J2	Pinch Weld Height at Rear Wheel Well	275	329	54
K	Sill Height Aft of Rear Wheel Well	289	367	78
L	Rear Bumper Thickness	165	165	0
M	Bottom of Rear Bumper to Ground	497	586	89
N	Sill Height to Window Bottom Sill	658	670	12
O	Front Door Leading Edge to Impact CL	770	757	-13
P	Rear Door Trailing Edge to Impact CL	1308	1282	-26
Q	Front Window Opening	440	504	64
R	Right Side Length	3252	3253	1
S	Left Side Length	3257	3223	-34
T	Vehicle Width at B-Pillar	1863	1739	-124

All measurements in mm with tolerance of ± 3 mm

DATA SHEET NO. 12

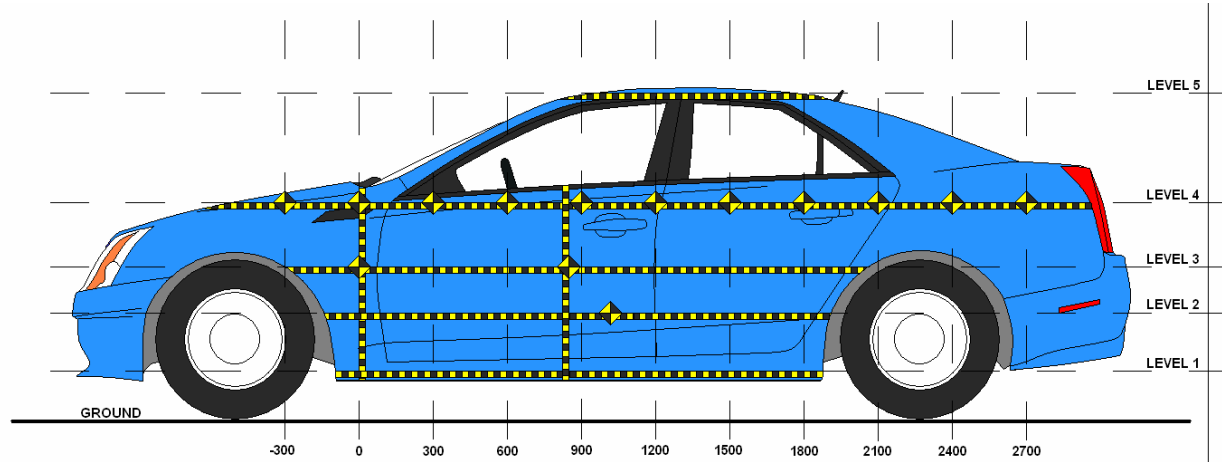
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5207

Test Program: MDB Side Impact Test

Test Date: 12/15/10



LEFT SIDE VIEW

Level	Description	Height Above Ground (mm)
1	Sill Top Height	367
2	Occupant H-Point Height	719
3	Mid-Door Height	759
4	Window Sill Height	1061
5	Window Top Height	1601

DATA SHEET NO. 12 ... (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5207

Test Program: MDB Side Impact Test

Test Date: 12/15/10

	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				678					695					17	
-300				661					687					26	
-150		557	556	652			576	577	665			19	21	13	
0		559	560	642			577	578	654			18	18	12	
150	602	569	572	636		645	724	716	638		43	155	144	2	
300	600	572	571	628		657	789	784	673		57	217	213	45	
450	599	569	569	624		670	812	811	676		71	243	242	52	
600	598	567	566	618		681	820	821	680		83	253	255	62	
750	598	565	564	613	879	690	828	828	679	886	92	263	264	66	7
900	598	563	563	605	875	699	824	825	681	889	101	261	262	76	14
1050	599	563	561	601	874	710	799	792	687	888	111	236	231	86	14
1200	599	563	561	594	875	720	779	779	702	891	121	216	218	108	16
1350	601	563	561	592	877	724	839	837	703	891	123	276	276	111	14
1500	603	564	562	589	878	723	864	858	703	893	120	300	296	114	15
1650	606	565	564	590	882	721	862	858	713	895	115	297	294	123	13
1800	609	556	558	591	884	709	851	855	704	898	100	295	297	113	14
1950		552	552	593	891		725	741	663	903		173	189	70	12
2100			552	597	896			647	623	909			95	26	13
2250				602	905				662	918				60	13
2400				609	915				657	926				48	11
2550				622	930				645	940				23	10
2700				640	963				657	973				17	10
2850															

MAXIMUM CRUSH DATA

	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush (mm)	123	300	297	123	16
Distance from Impact (mm)	1350	1500	1800	1650	1200

DATA SHEET NO. 12 ... (CONTINUED)

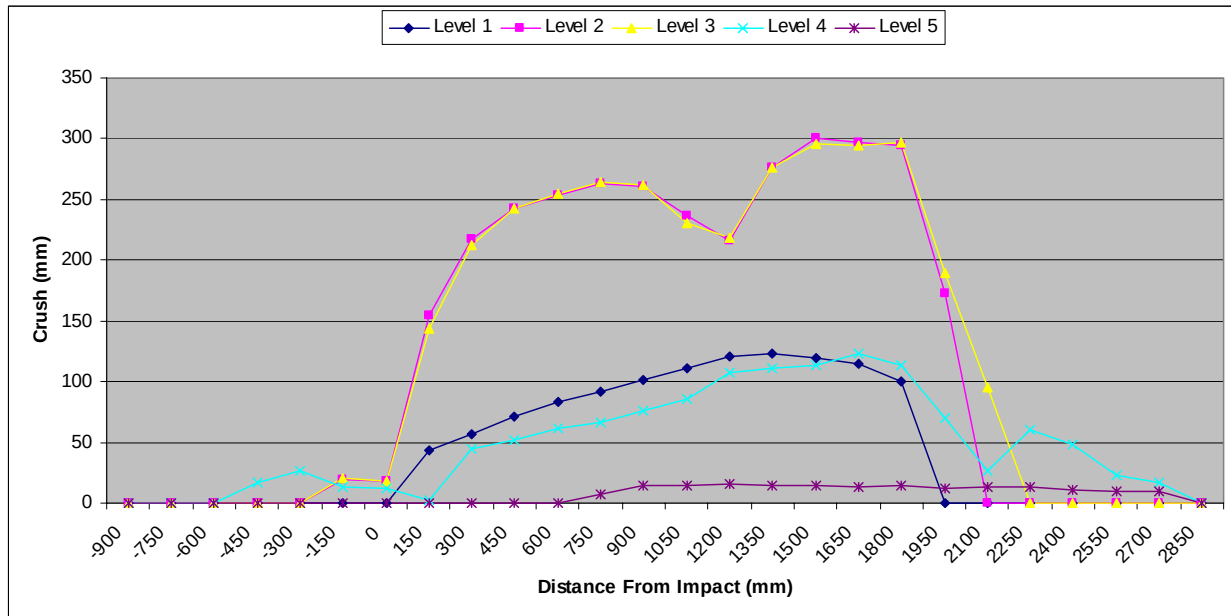
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5207

Test Program: MDB Side Impact Test

Test Date: 12/15/10



DATA SHEET NO. 13

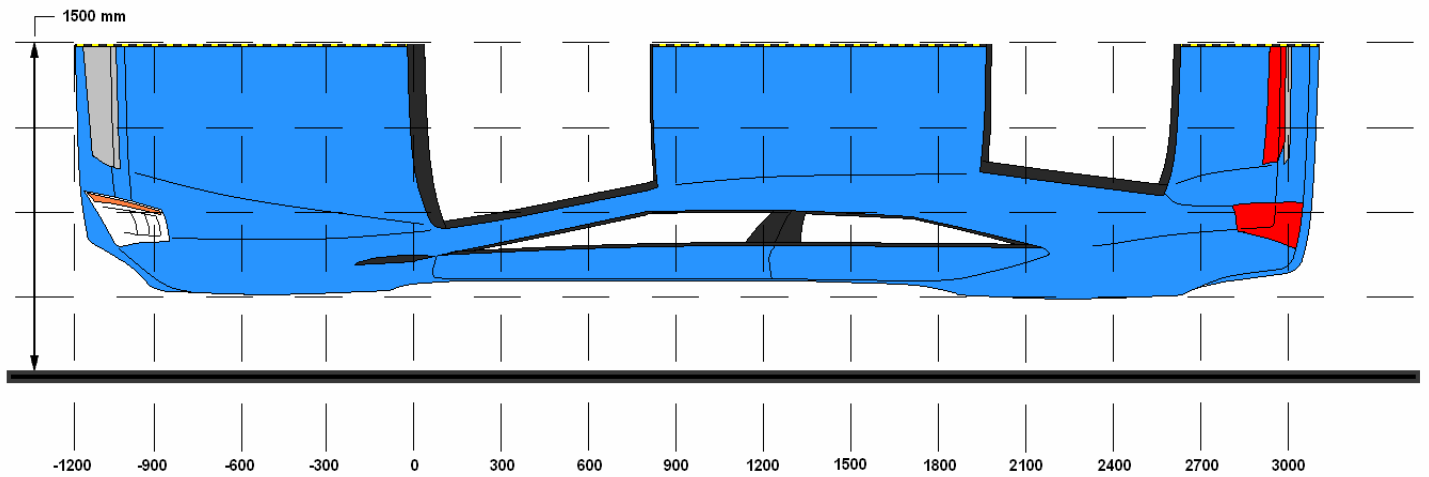
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5207

Test Program: MDB Side Impact Test

Test Date: 12/15/10



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	640	657	17
2	2100	3	552	647	95
3	1500	2	564	864	300
4	900	3	563	825	262
5	300	2	572	789	217
6	-300	4	661	687	26

DATA SHEET NO. 14

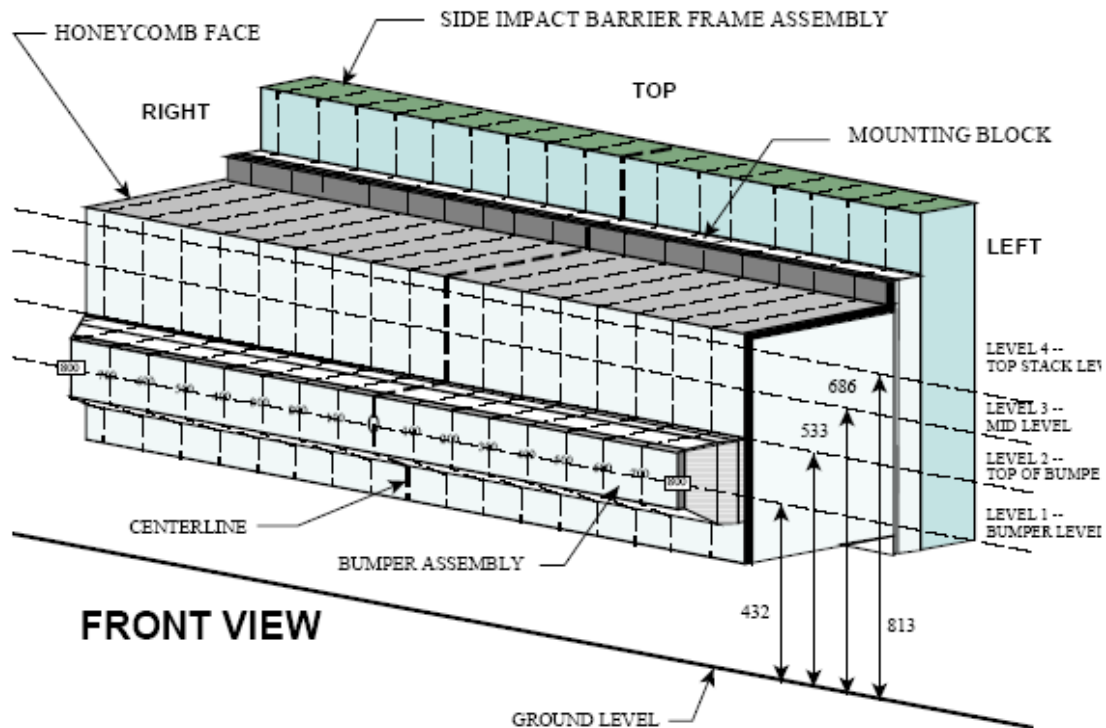
EXTERIOR STATIC CRUSH FOR IMPACTOR FACE

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5207

Test Program: MDB Side Impact Test

Test Date: 12/15/10



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	238	219	217	214	214	223	216	214	216	211	208	206	206	206	211	211	226
2	114	108	104	96	89	84	80	88	87	84	86	91	94	97	99	102	106
3	79	48	44	42	47	67	107	98	75	54	46	44	44	47	159	75	116
4	73	62	51	47	52	75	119	118	81	62	54	53	55	67	79	100	145

All dimensions in millimeters.

DATA SHEET NO. 15

FMVSS NO. 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5207

Test Program: MDB Side Impact Test

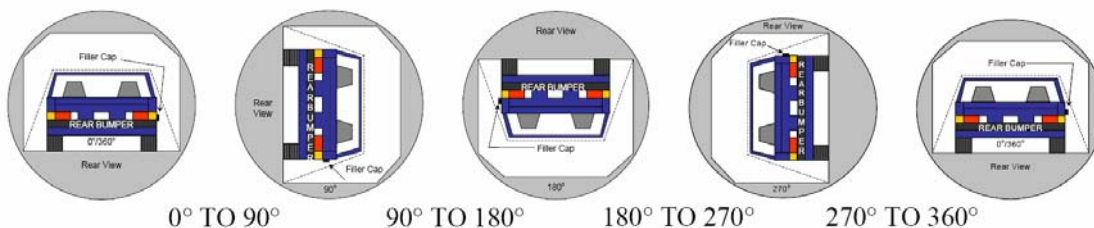
Test Date: 12/15/10

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 13.9° C

Test Time: 11:30 AM

- 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°	81	300	381
90° To 180°	83	300	383
180° To 270°	78	300	378
270° To 360°	77	300	377

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

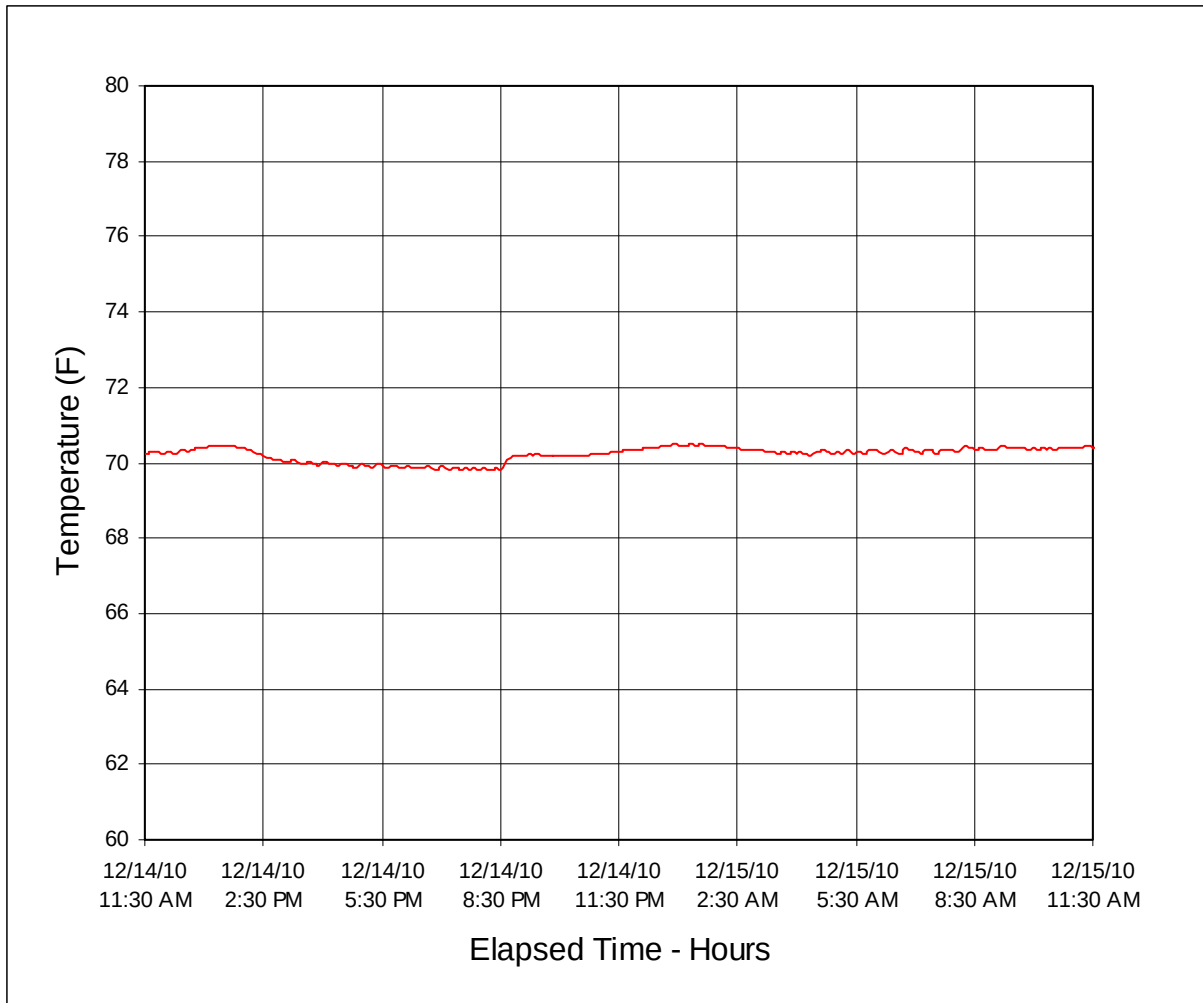
DUMMY / VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5207

Test Program: MDB Side Impact Test

Test Date: 12/15/10



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

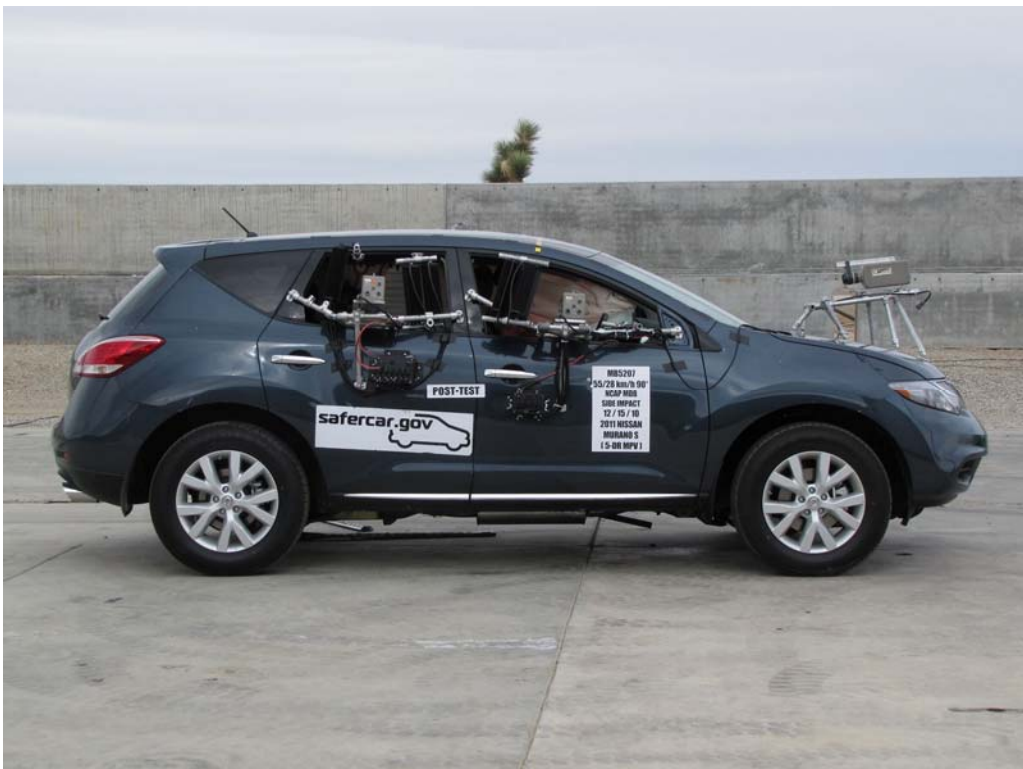


FIGURE 14. Post-Test Right Side View of Test Vehicle

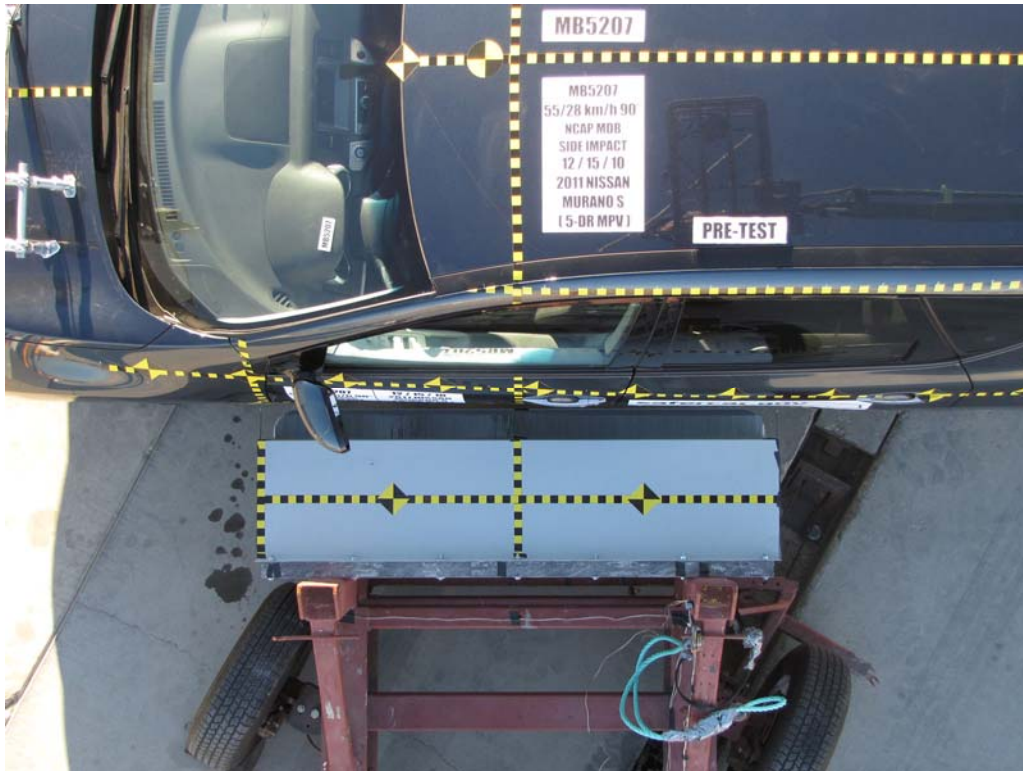


FIGURE 15. Pre-Test Overhead View of Test Vehicle
with MDB Positioned Against Side of Test Vehicle



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

Photograph Not Available

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

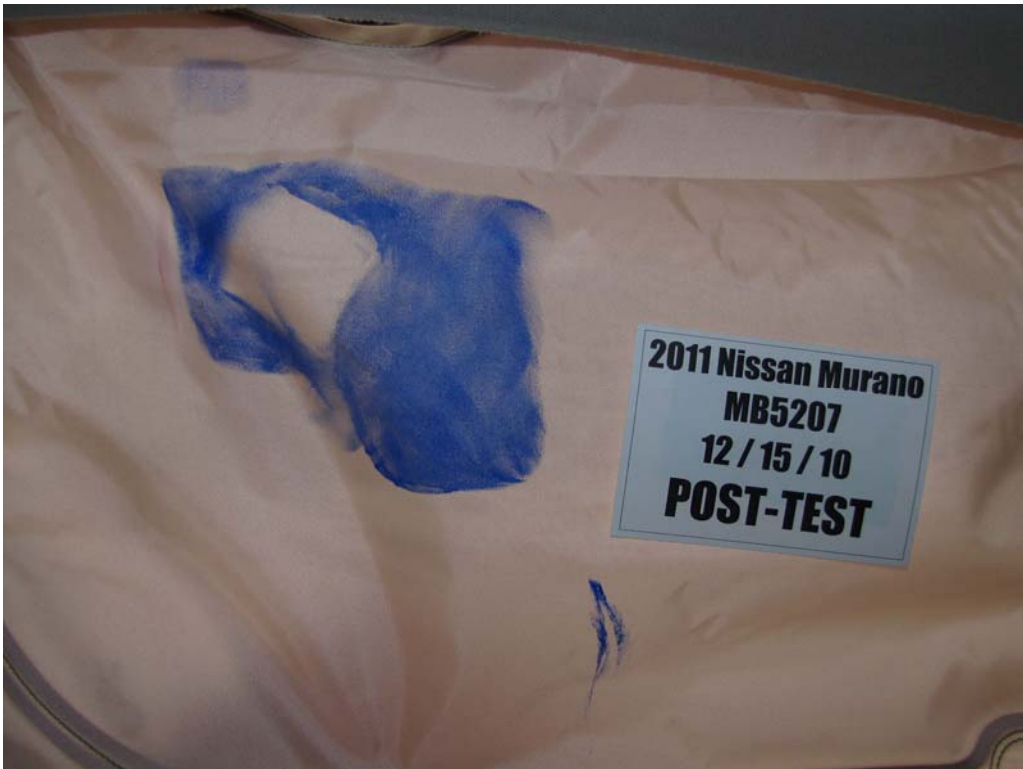


FIGURE 48. Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View



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

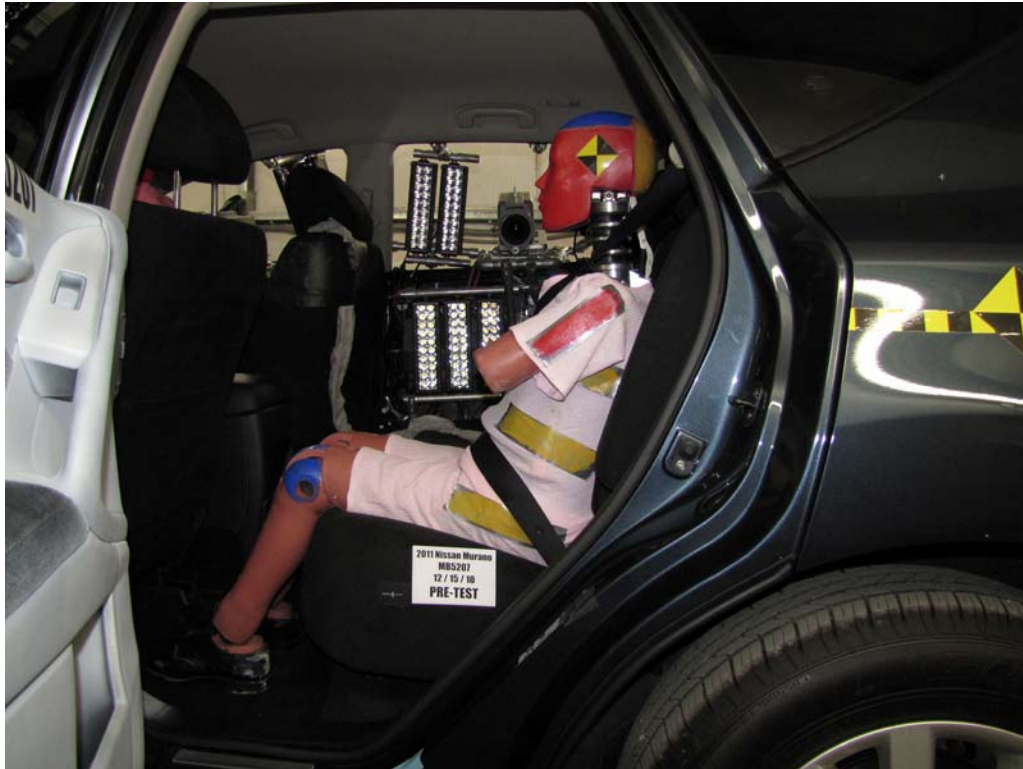


FIGURE 53. Pre-Test Left Side View of Rear Passenger Dummy
Showing Belt, Chalking, and Contact Switches



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

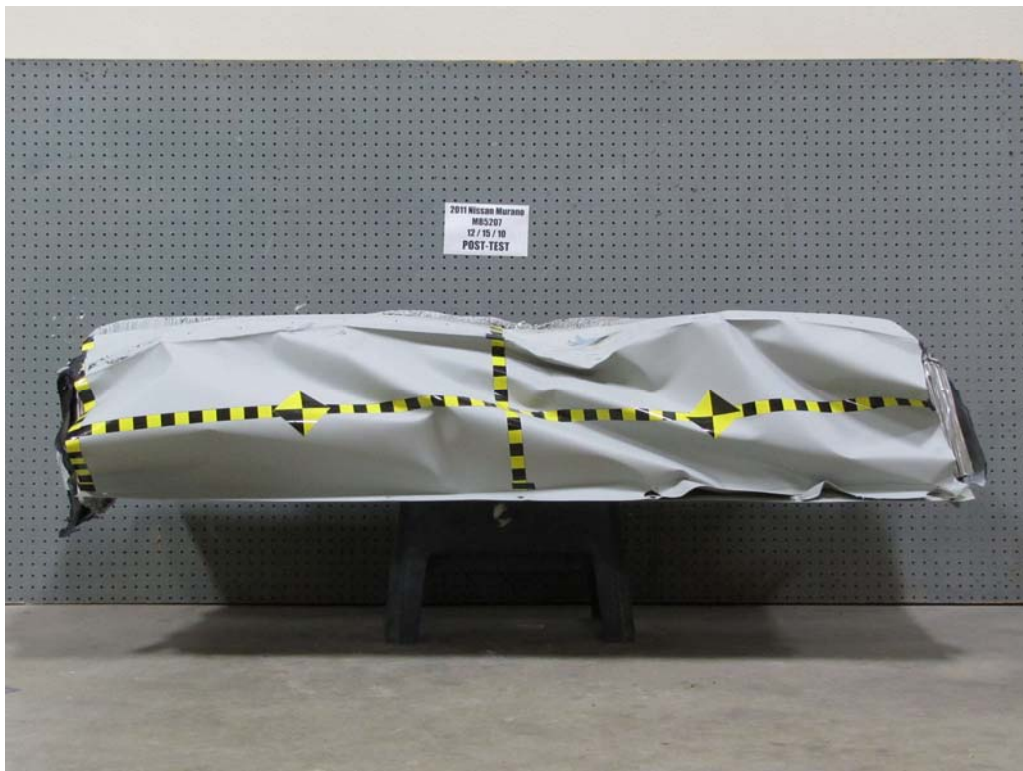


FIGURE 84. Post-Test Top View of MDB Impactor Face



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

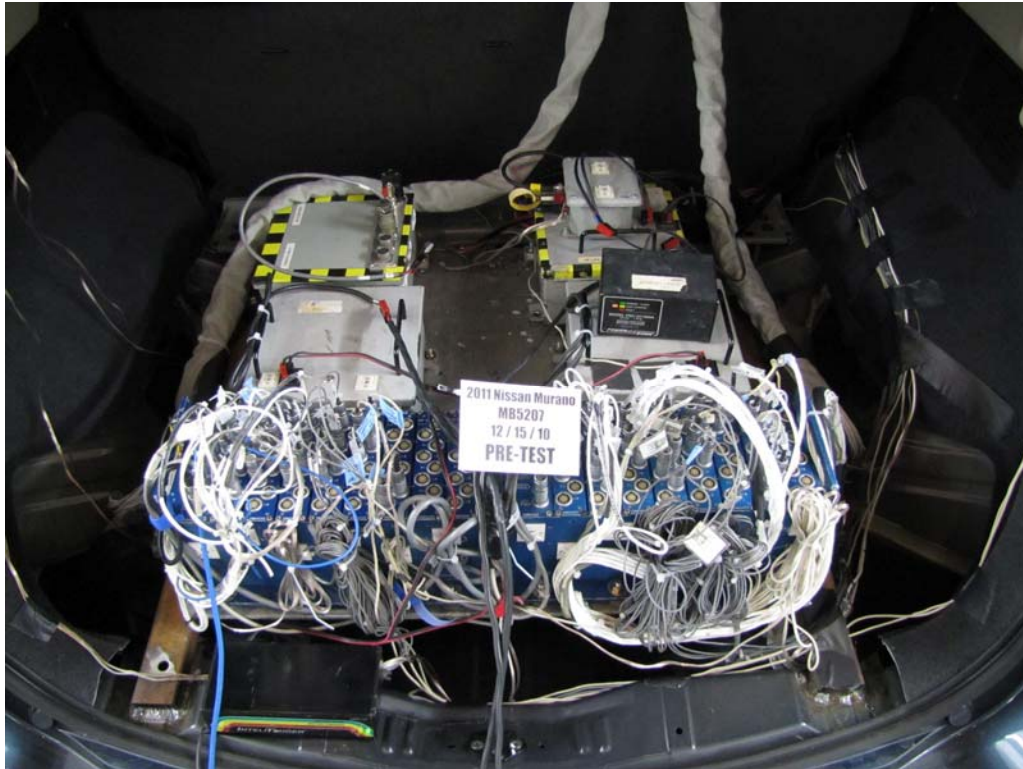


FIGURE 91. Pre-Test Ballast View



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

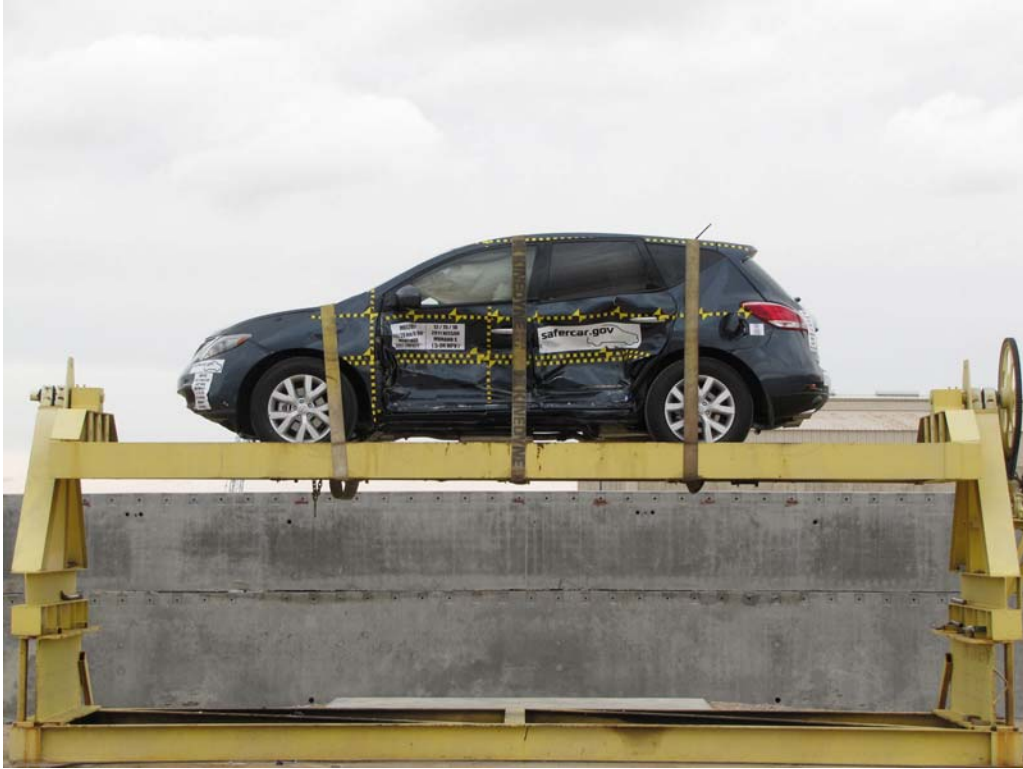


FIGURE 97. FMVSS No. 301/305 Rollover 360 Degrees



FIGURE 98. Impact Event



2011 MURANO S FWD

The Premium Crafted Crossover

Standard Equipment Included at No Extra Charge

MECHANICAL & PERFORMANCE
 260 HP 3.5 Ltr DCiC V6 Engine
 Intelligent Xtronic CVT™
 Continuously Variable Transmission
 Vehicle-Speed-Sensitive Power
 Rack-and-Pinion Steering
 Front Wheel Drive
 Front and Rear Stabilizer Bars
 4-Wheel Independent Suspension
 4-Wheel Power Vented Disc Brakes
 18-inch Aluminum Alloy Wheels w/Center Caps
 Temporary Use Spare Tire
 P235/65R18 All-Season Tires

SAFETY & SECURITY
 Nissan Advanced Air Bag System (AABS)
 Seat-Mounted Driver & Front
 Passenger Side-Impact Supplemental
 Air Bags
 Roof-Mounted Curtain Side-Impact
 Supplemental Air Bags for Front & Rear
 Seat Outboard Occupant Head Protection
 Supplemental Air Bag
 Active Head Restraints
 3-Point ELR/ALR Seat Belts For All
 Seating Positions (Driver ELR Only)
 Front Seat Belts w/Pre-tensioners
 and Load Limiters
 Seatbelts w/Height Adjustable Upper Anchors
 for Outboard Passengers
 Lower Anchors and Tethers for Children
 (LATCH)
 Child Safety Rear Door Locks
 Energy-Absorbing Steering Column
 Zone Body Construction w/Front & Rear
 Crumple Zones
 High-Strength Side Door Guard Beams
 4-Wheel Anti-Lock Braking System (ABS)
 Vehicle Dynamic Control (VDC) w/
 Traction Control System (TCS)
 Electronic Brake Force Distribution (EBD)
 and Brake Assist (BA)
 Tire Pressure Monitoring System (TPMS)
 Nissan Vehicle Immobilizer

COMFORT & CONVENIENCE
 6-Way Manual Driver Seat w/Manual
 Lumbar Support
 6-Way Manual Front Passenger Seat
 60/40 Split Fold-Flat Rear Seats
 Cloth Seats
 Aluminum Trim Accents

Leather-Wrapped Shift Knob
 Tiltting & Telescoping Steering Column
 Cruise Control w/Illuminated Steering Wheel-
 Mounted Switches
 4-Spoke Urethane Steering Wheel
 AM/FM/CD In-Dash Charger Audio System with
 MP3/WMA Reader and Six Speakers
 Auxiliary Audio Input Jack
 Dual-Zone Automatic Temperature Control
 w/Front & Rear Vents
 Nissan Intelligent Key™ w/Push Button
 Ignition, Keyless Entry (2 keys), and
 Push Button Door Request Switch (front
 doors & trunk)
 Power Front Windows w/One-Touch Auto
 Up/Down and Safety Reverse Feature
 Power Auto Door Locks
 Manual Day/Night Rearview Mirror
 Ambient Lighting
 Sun Visor w/Illuminated Vanity Mirrors
 and Extensions
 Overhead Console w/Toolless Storage
 Four Cup Holders
 Driver and Front Passenger Seatback Pockets
 Three 10-Volt DC Power Outlets

EXTERIOR
 Halogen Headlights
 LED Rear Tailights
 Body-Colored Power Sideview Mirrors
 Dual Exhaust with Chrome Finishers
 Body-Color Front and Rear Bumpers
 Driver and Front Passenger Seatback Pockets
 Three 10-Volt DC Power Outlets
 UV-Reducing Solar Glass

**Manufacturer's Suggested
 Retail Base Price:** \$28,500.00
Options Included by Manufacturer
 SLASH GUARDS 125.00
 FLOOR MATS & CARPETED
 CARDO MAT 185.00
Destination Charge: \$600.00
Total* \$29,610.00

EPA Fuel Economy Estimates

CITY MPG

18

Expected range
for most drivers
14 to 22 MPG

**Estimated
 Annual Fuel Cost**
\$2,250

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

Combined Fuel Economy
 This Vehicle
20
 at 50%
 10 30

HIGHWAY MPG

23

Expected range
for most drivers
19 to 27 MPG

**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 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 To Be Rated
Star ratings based on the risk of injury in a side impact.		
Rollover		★★★★
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		

This Vehicle qualifies for Nissan's
Security+Plus Vehicle Protection Plan
 The only service agreement backed by Nissan!
 Ask your dealer for details, or call 1-800-NISSAN-1
 for more information

VIN: JNBAZ1M1232038AS5093
 EMS: 50 STATE EMISSIONS
 MDL: 23111-051222 RAQ-G
 OPT: 0-810C05.92

20101011232038AS5093

*Does not include dealer installed options and accessories, local taxes or license fees. This label has been applied pursuant to federal law. Do not remove prior to delivery to the ultimate purchaser.

FIGURE 99. Monroney Label

HEAD RESTRAINTS

WARNING

Head restraints supplement the other vehicle safety 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 (stake) 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 positions equipped with head restraints. 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. Stake

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.
3. Remove the head restraint from the seat.
4. Store the head restraint properly in a secure place so it is not loose in the vehicle.
5. Install and properly adjust the head restraint before an occupant uses the seating position.

Install

1. Align the head restraint stake with the holes in the seat. Make sure that the head restraint is facing the correct direction. The stake with the adjustment notches (▲) must be installed in the hole with the lock knob (●).

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 Restraint

The Active Head Restraint moves forward tilting the base that the seatback reclines 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 force that may lead to whiplash-type injuries.

Active Head Restraints are effective for collisions at low to medium speeds in which it is said that whiplash injury occurs most.

Active Head Restraints operate only in certain rear-end collisions. After the collision, the head restraints return to their original position.

Adjustment

Adjust the head restraint so the center is level with the center of your eyes.

To raise the head restraint, pull it up.

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

Safety — Seats, seat belts and supplemental restraint system 1-11

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

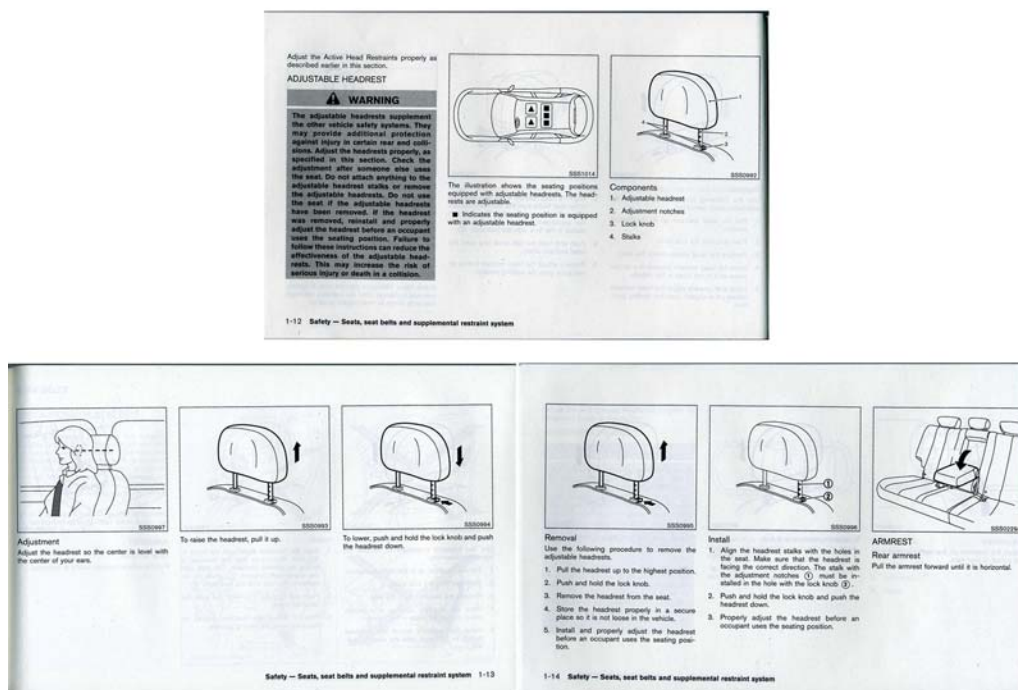


FIGURE 101. Left Rear Passenger Head Restraint Use and Adjustment
Information from Vehicle Manual

APPENDIX B
DUMMY RESPONSE DATA

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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
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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
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19	Passenger Lower Spine T12 Acceleration (Y) vs. Time	B-6
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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)

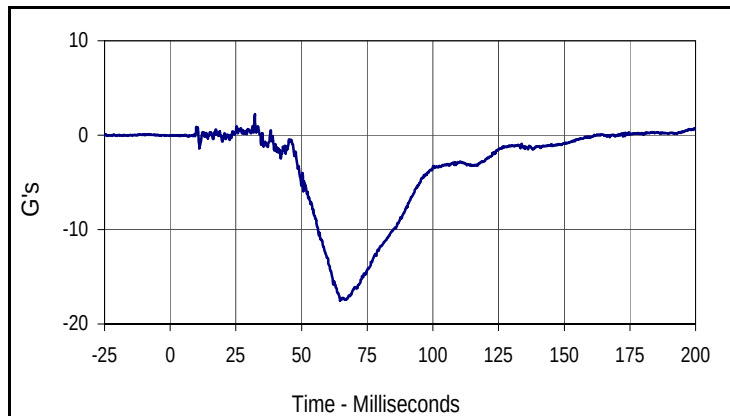
Front Seat Track Acceleration (Y)
Rear Seat Track Acceleration (Y)
Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)

MDB Instrumentation Data

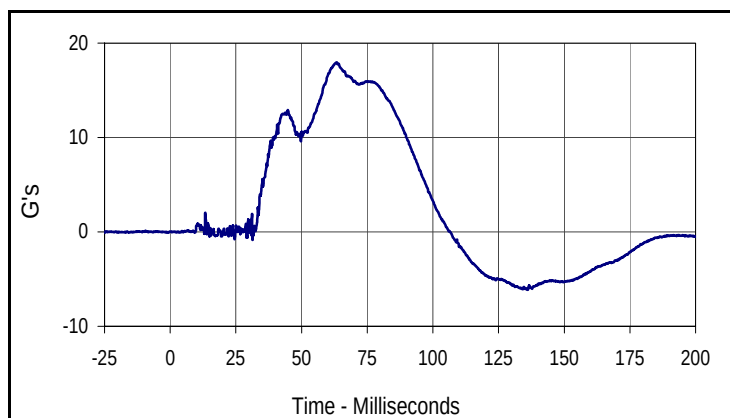
MDB Center of Gravity Acceleration (X)
MDB Center of Gravity Acceleration (Y)
MDB Center of Gravity Acceleration (Z)
MDB Rear Acceleration (X)
MDB Rear Acceleration (Y)
Left MDB Contact Switch
Right MDB Contact Switch

Test Vehicle: 2011 Nissan Murano S 5-Door MPV
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

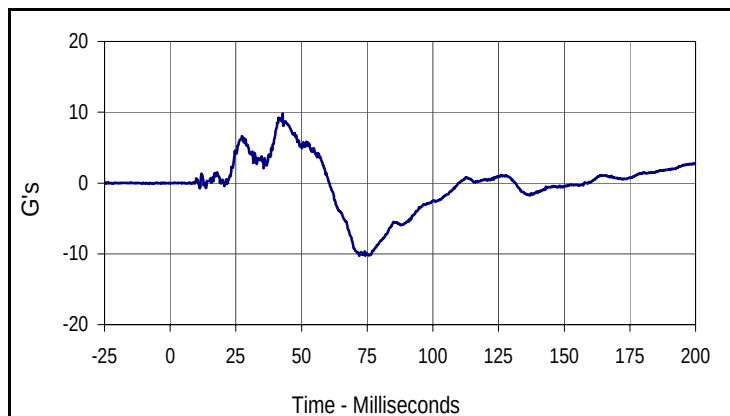
Test Date: 12/15/10
 NHTSA No.: MB5207



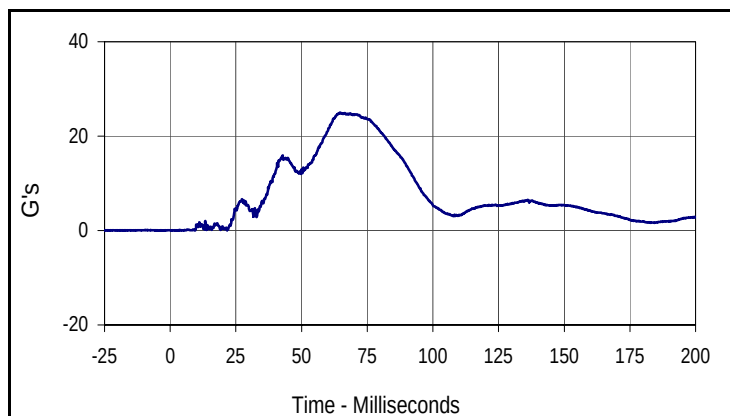
Curve Description			
Driver Head Acceleration X Primary			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
2.2	32.2	-17.5	64.7



Curve Description			
Driver Head Acceleration Y Primary			
CURNO	Type	SAE Class	Units
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Max	Time	Min	Time
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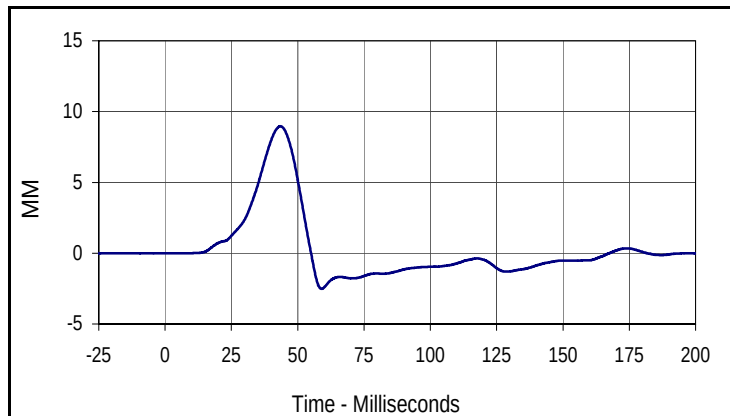
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Max	Time	Min	Time
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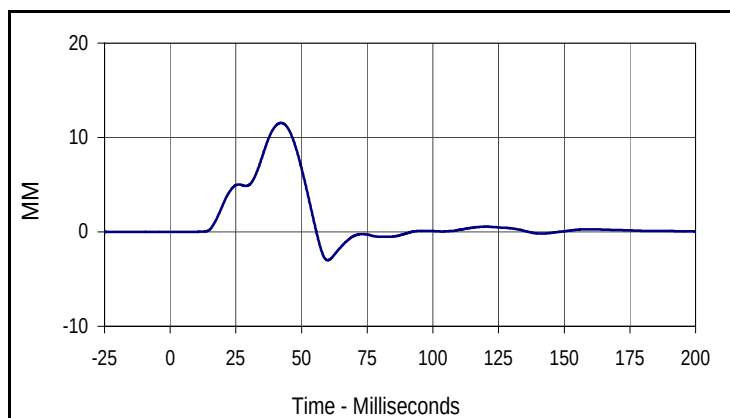
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Driver Head Resultant Acceleration Primary			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
25.0	64.7	0.0	3.2

Test Vehicle: 2011 Nissan Murano S 5-Door MPV
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

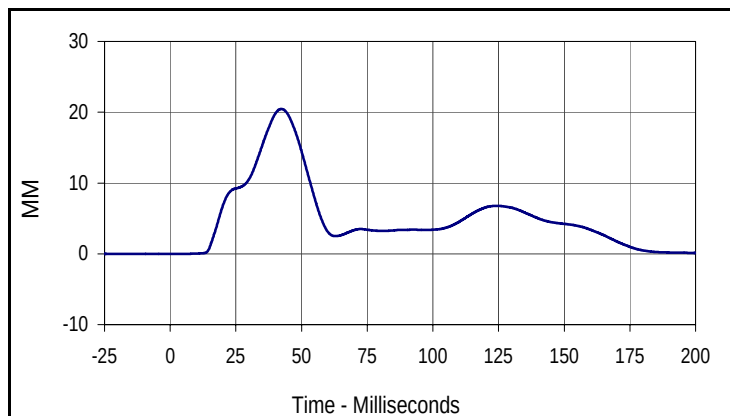
Test Date: 12/15/10
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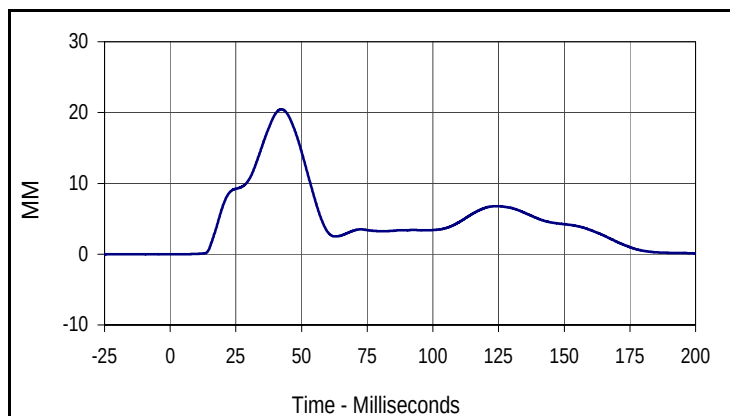
Curve Description			
Driver Upper Thorax Rib Deflection Y			
CURNO	Type	SAE Class	Units
007	FIL	180	MM
Max	Time	Min	Time
9.0	43.5	-2.5	59.0



Curve Description			
Driver Middle Thorax Rib Deflection Y			
CURNO	Type	SAE Class	Units
008	FIL	180	MM
Max	Time	Min	Time
11.5	42.2	-3.0	59.9



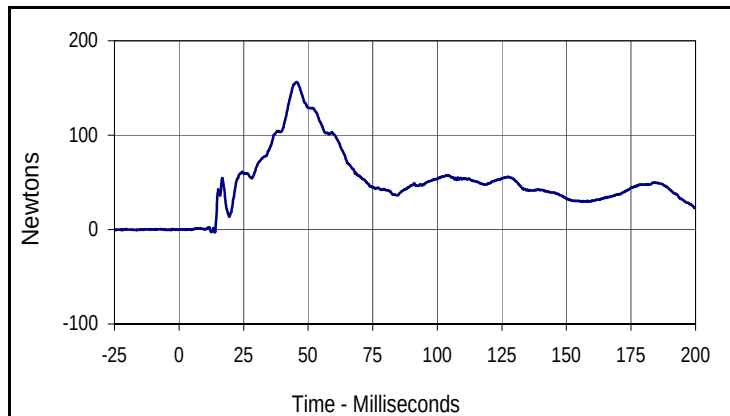
Curve Description			
Driver Lower Thorax Rib Deflection Y			
CURNO	Type	SAE Class	Units
009	FIL	180	MM
Max	Time	Min	Time
20.5	42.3	0.0	2.4



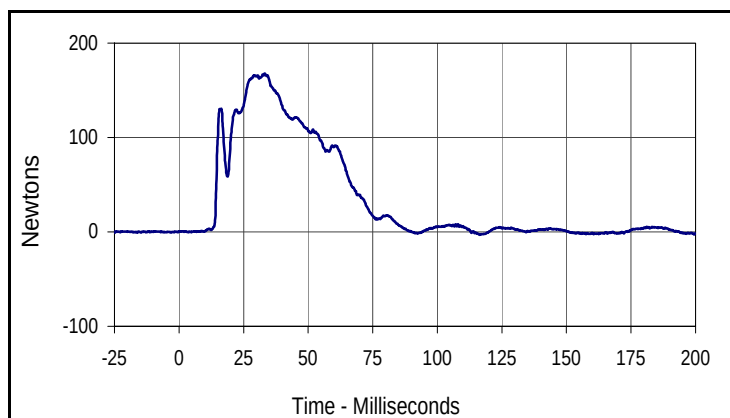
Curve Description			
Driver Thorax Rib Deflection Maximum			
CURNO	Type	SAE Class	Units
010	FIL	180	MM
Max	Time	Min	Time
20.5	42.3	0.0	2.4

Test Vehicle: 2011 Nissan Murano S 5-Door MPV
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

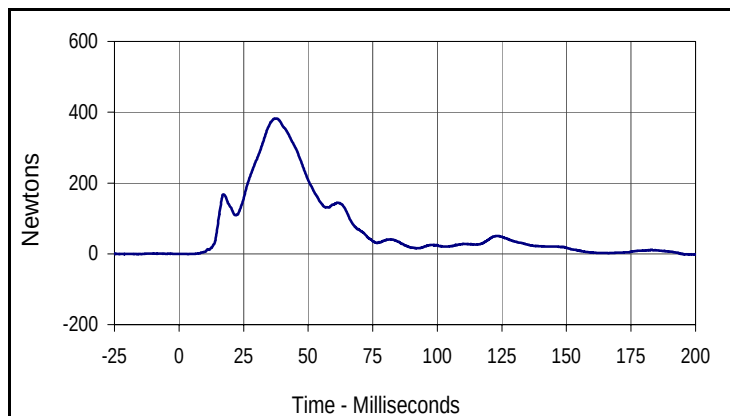
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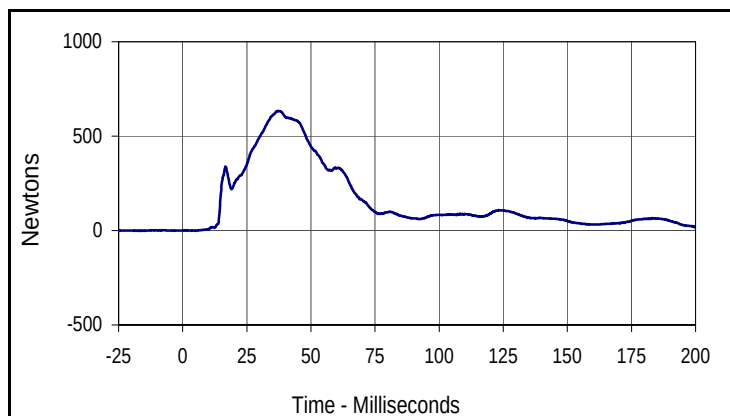
Curve Description			
Driver Anterior Abdominal Force Y			
CURNO	Type	SAE Class	Units
013	FIL	600	Newtons
Max	Time	Min	Time
156.2	45.5	-2.9	13.9



Curve Description			
Driver Middle Abdominal Force Y			
CURNO	Type	SAE Class	Units
014	FIL	600	Newtons
Max	Time	Min	Time
167.9	33.2	-3.0	116.4



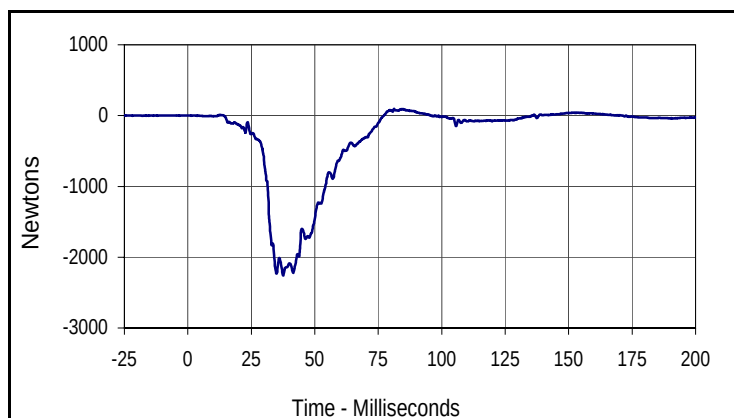
Curve Description			
Driver Posterior Abdominal Force Y			
CURNO	Type	SAE Class	Units
015	FIL	600	Newtons
Max	Time	Min	Time
382.6	37.5	-2.2	197.9



Curve Description			
Driver Total Abdominal Force			
CURNO	Type	SAE Class	Units
013	RES	600	Newtons
Max	Time	Min	Time
633.3	37.4	-1.2	3.5

Test Vehicle: 2011 Nissan Murano S 5-Door MPV
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

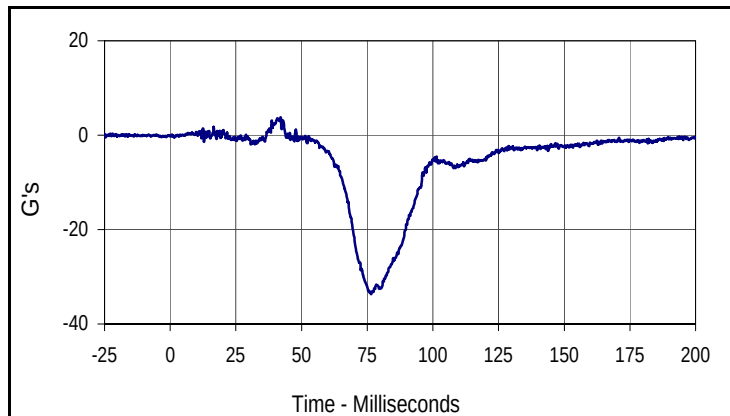
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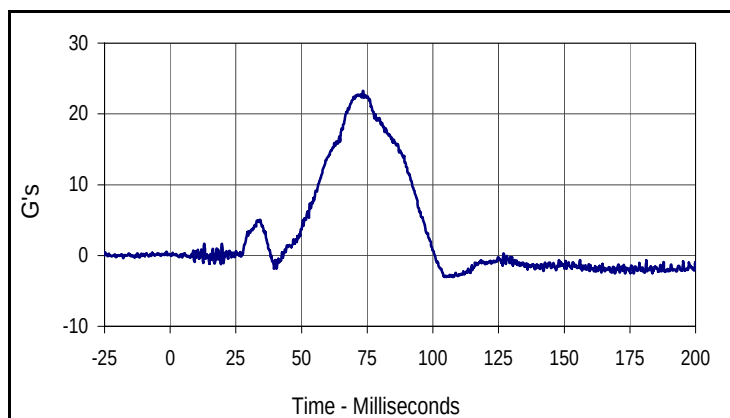
Curve Description			
Driver Pubic Symphysis Force Y			
CURNO	Type	SAE Class	Units
016	FIL	600	Newtons
Max	Time	Min	Time
94.7	81.2	-2258.5	37.6

Test Vehicle: 2011 Nissan Murano S 5-Door MPV
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

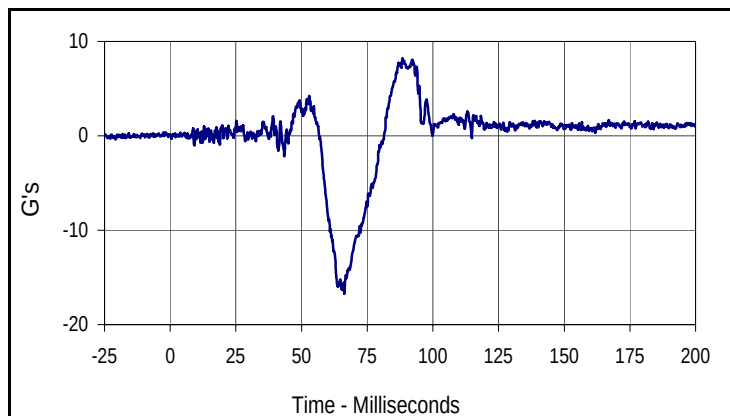
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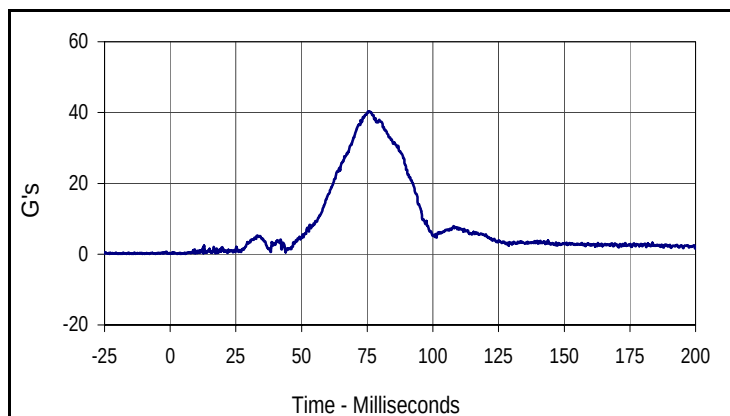
Curve Description			
Passenger Head Acceleration X Primary			
CURNO	Type	SAE Class	Units
021	FIL	1000	G's
Max	Time	Min	Time
3.8	42.0	-33.7	76.5



Curve Description			
Passenger Head Acceleration Y Primary			
CURNO	Type	SAE Class	Units
022	FIL	1000	G's
Max	Time	Min	Time
23.3	73.4	-3.0	107.9



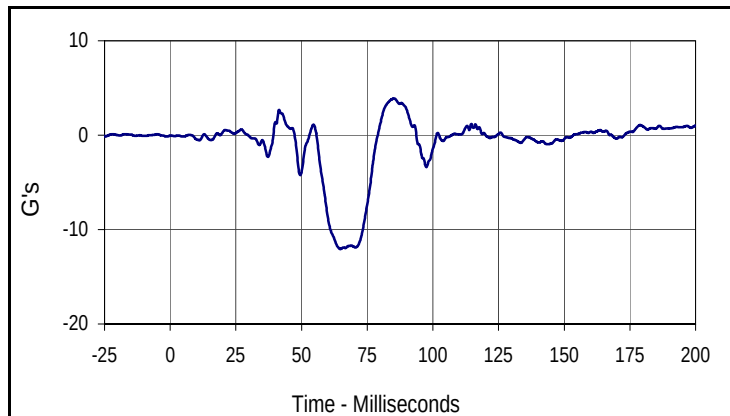
Curve Description			
Passenger Head Acceleration Z Primary			
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023	FIL	1000	G's
Max	Time	Min	Time
8.2	88.4	-16.7	66.3



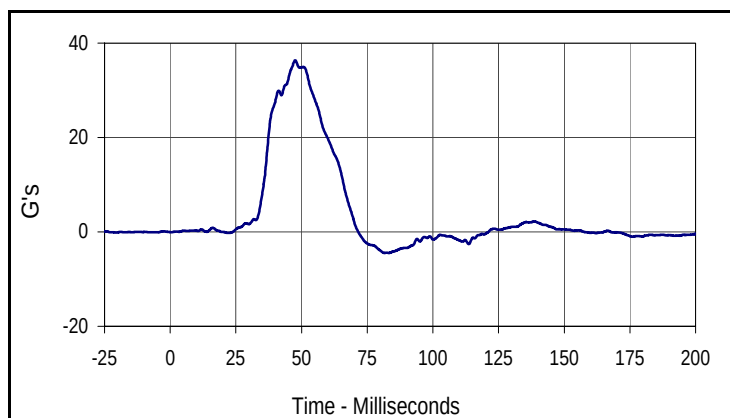
Curve Description			
Passenger Head Acceleration Resultant Primary			
CURNO	Type	SAE Class	Units
021	RES	1000	G's
Max	Time	Min	Time
40.4	75.7	0.0	2.6

Test Vehicle: 2011 Nissan Murano S 5-Door MPV
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

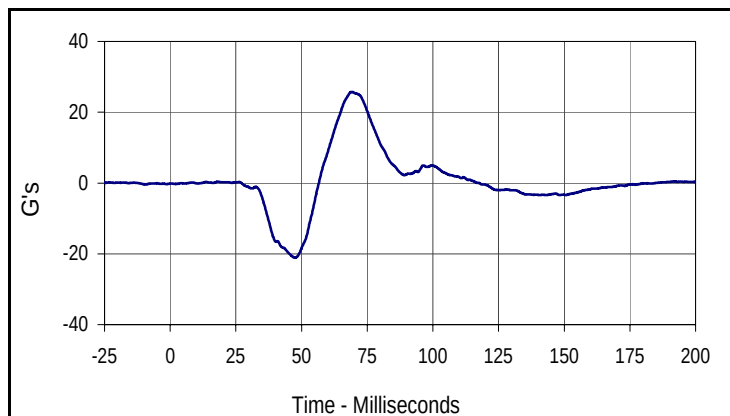
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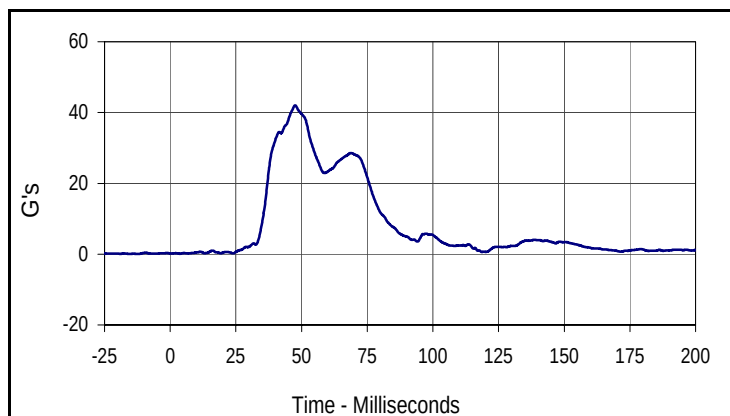
Curve Description			
Passenger Lower Spine T12 Acceleration X			
CURNO	Type	SAE Class	Units
037	FIL	180	G's
Max	Time	Min	Time
3.9	85.2	-12.1	64.8



Curve Description			
Passenger Lower Spine T12 Acceleration Y			
CURNO	Type	SAE Class	Units
038	FIL	180	G's
Max	Time	Min	Time
36.3	47.5	-4.5	83.2



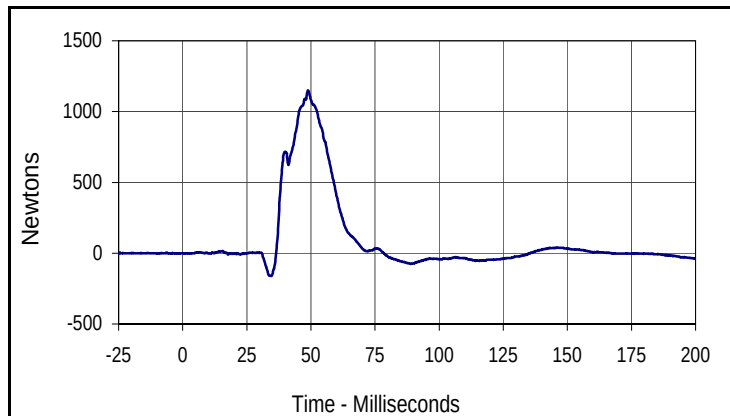
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Passenger Lower Spine T12 Acceleration Z			
CURNO	Type	SAE Class	Units
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Max	Time	Min	Time
25.7	69.1	-21.1	47.5



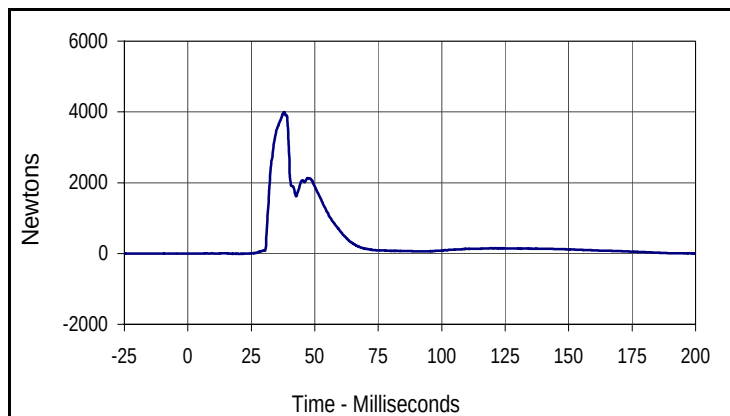
Curve Description			
Passenger Lower Spine T12 Acceleration Resultant			
CURNO	Type	SAE Class	Units
037	RES	180	G's
Max	Time	Min	Time
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Test Vehicle: 2011 Nissan Murano S 5-Door MPV
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

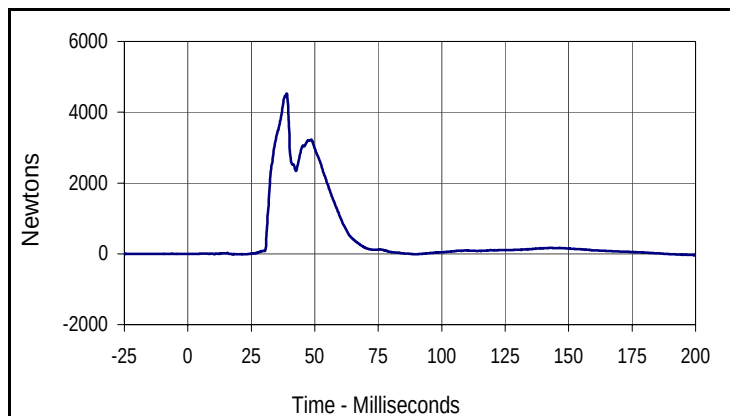
Test Date: 12/15/10
 NHTSA No.: MB5207



Curve Description			
Passenger Iliac Wing Force on Impact Side Y			
CURNO	Type	SAE Class	Units
043	FIL	600	Newtons
Max	Time	Min	Time
1149.0	48.8	-161.7	34.6



Curve Description			
Passenger Acetabulum Force on Impact Side Y			
CURNO	Type	SAE Class	Units
042	FIL	600	Newtons
Max	Time	Min	Time
3992.6	38.0	-10.6	20.5



Curve Description			
Passenger Total Pelvic Force			
CURNO	Type	SAE Class	Units
042	SUM	600	Newtons
Max	Time	Min	Time
4529.8	38.9	-35.7	199.2

APPENDIX C
DUMMY CALIBRATION DATA

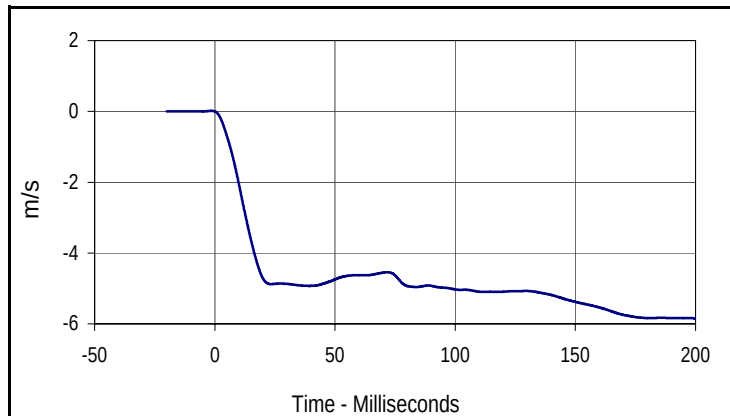
APPENDIX C
PRE-TEST / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

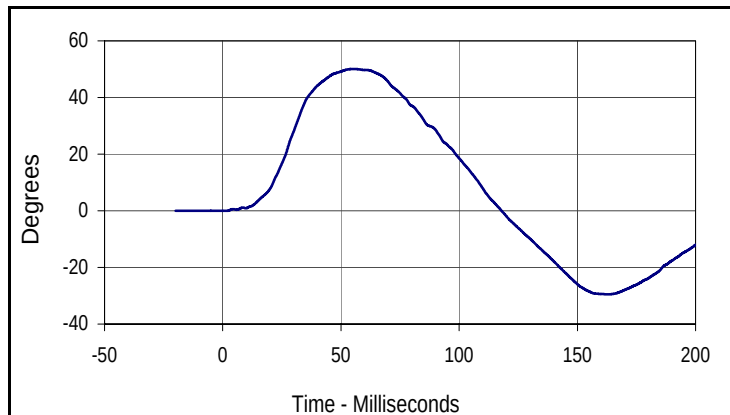
Test Date: 12/8/10
 Test I.D.: NB12B



Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	29	Pass
Pendulum Velocity		m/s	3.30 to 3.50	3.36	Pass
Pendulum Deceleration	1 msec	m/s	0.0 to -.050	-0.046	Pass
	3 msec	m/s	-.250 to -.375	-0.291	Pass
	14 msec	m/s	-3.20 to -3.70	-3.33	Pass
Headform Rotation	Max	Degrees	49.0 to 58.0	50.0	Pass
	Time	msec	54.0 to 66.0	56.2	Pass
Maximum Rotation To Time Zero Crossing		msec	53.0 to 88.0	61.8	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	-1.3	-5.8	200.0



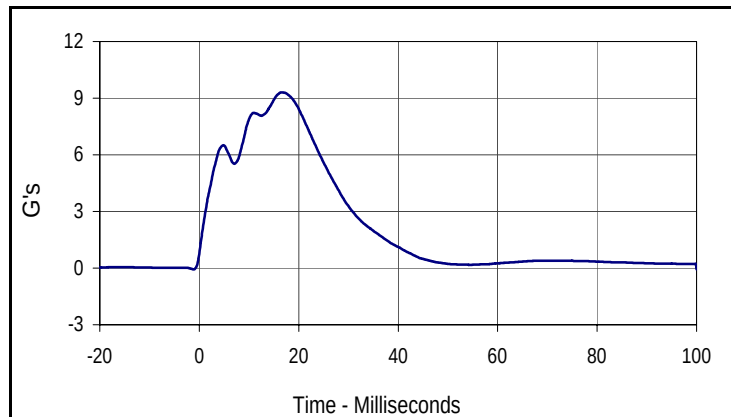
Curve Description			
Headform Rotation			
CURNO	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
50.0	56.2	-29.5	162.5

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

Test Date: 12/8/10
 Test I.D.: SH12B



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Probe Velocity	m/s	4.20 to 4.40	4.24	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	9.31	Pass
Overall Test Results			Pass	



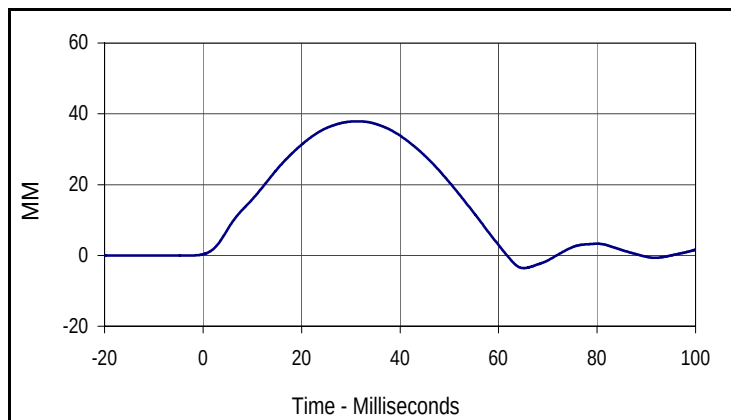
Curve Description			
Probe Accel			
CURNO	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
9.3	16.6	-0.1	-1.2

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

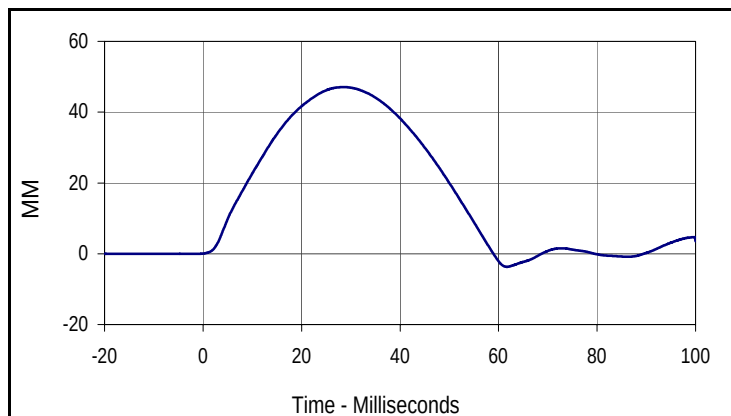
Test Date: 12/8/10
 Test I.D.: RIB12D



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	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



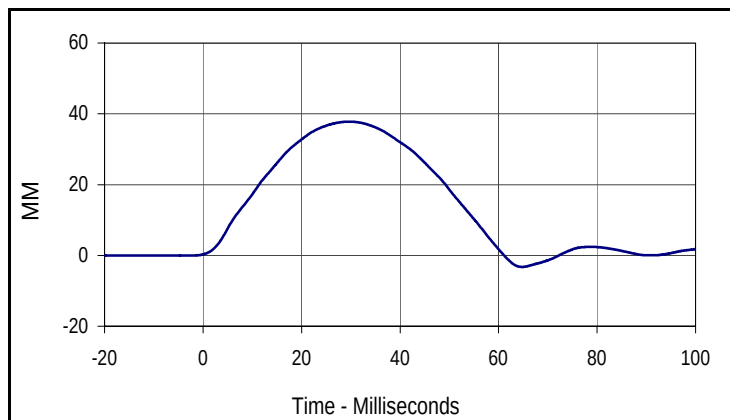
Curve Description			
Upper Rib Deflection (815 MM Drop Height)			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
47.1	28.6	-3.7	61.7

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

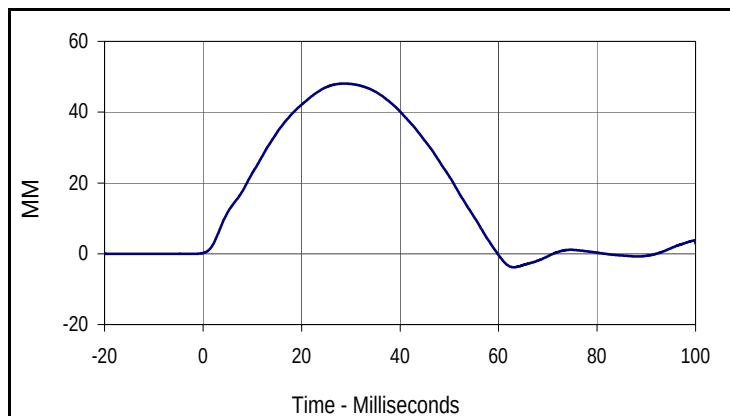
Test Date: 12/8/10
 Test I.D.: RIB12E



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Peak Rib Deflection at 459 MM Drop Height	MM	36 to 40	37.8	Pass
Peak Rib Deflection at 815 MM Drop Height	MM	46 to 51	48.1	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
37.8	29.7	-3.3	64.7



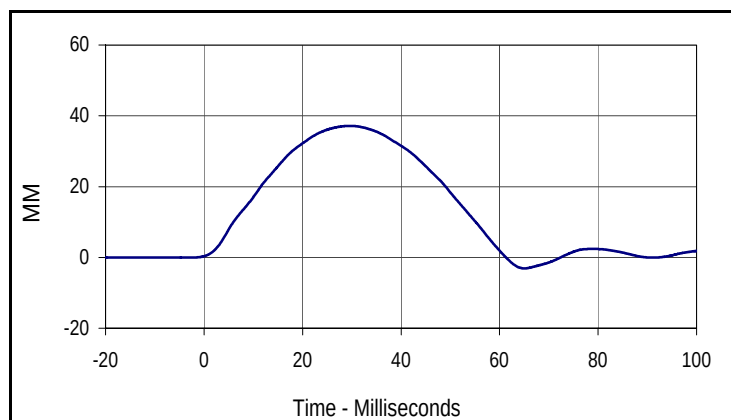
Curve Description			
Middle Rib Deflection (815 MM Drop Height)			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
48.1	28.7	-3.8	63.1

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

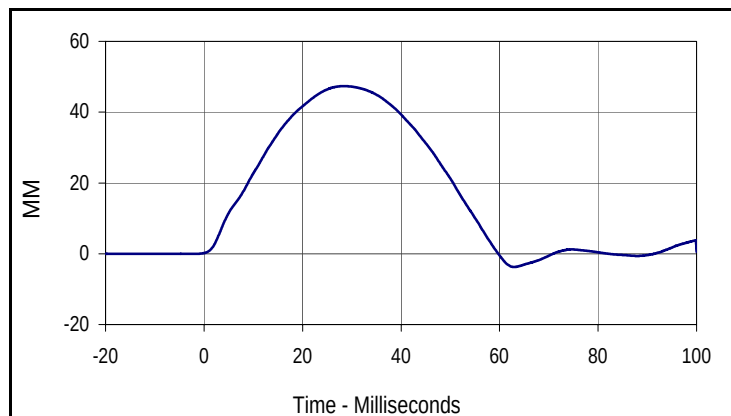
Test Date: 12/8/10
 Test I.D.: RIB12F



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Peak Rib Deflection at 459 MM Drop Height	MM	36 to 40	37.2	Pass
Peak Rib Deflection at 815 MM Drop Height	MM	46 to 51	47.4	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
37.2	29.6	-3.1	65.0



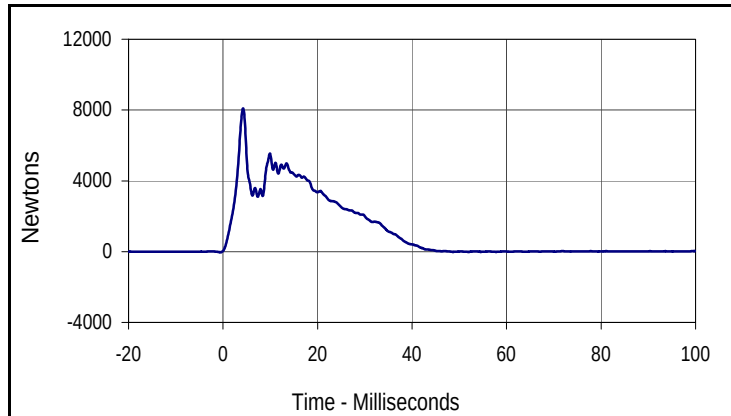
Curve Description			
Lower Rib Deflection (815 MM Drop Height)			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
47.4	28.4	-3.8	63.0

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

Test Date: 12/8/10
 Test I.D.: TH12B



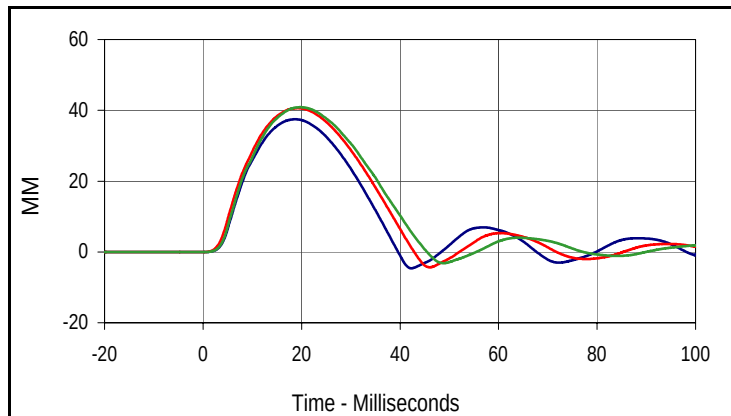
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Probe Velocity	m/s	5.40 to 5.60	5.43	Pass
Impactor Force	N	5100 to 6200	5539.0	Pass
	msec	> 6.0 msec	9.9	Pass
Upper Rib Deflection	MM	34 to 41	37.5	Pass
Middle Rib Deflection	MM	37 to 45	40.6	Pass
Lower Rib Deflection	MM	37 to 44	40.9	Pass
Overall Test Results			Pass	



Curve Description

Impactor Force

CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
8079.8	4.3	-33.1	-0.6



Curve Description

Upper, Middle, Lower Rib Deflections

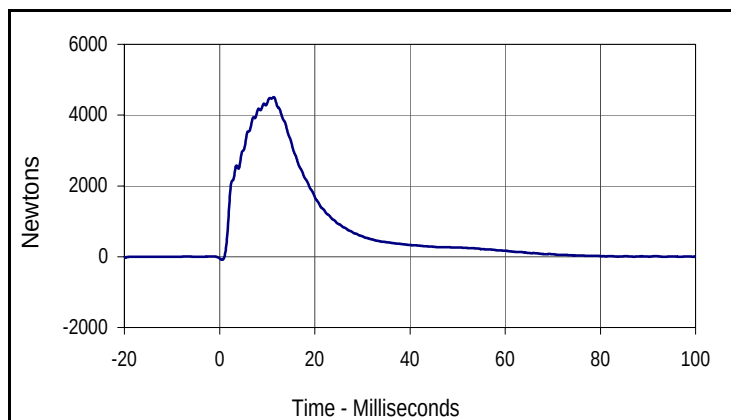
CURNO(s)	Type	SAE Class	Units
002-003-004	FIL	180	MM
Max (Upper)	Time	Min (Upper)	Time
37.5	18.7	-4.6	42.3
Max (Middle)	Time	Min (Middle)	Time
40.6	19.3	-4.3	46.0
Max (Lower)	Time	Min (Lower)	Time
40.9	19.8	-3.2	48.8

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

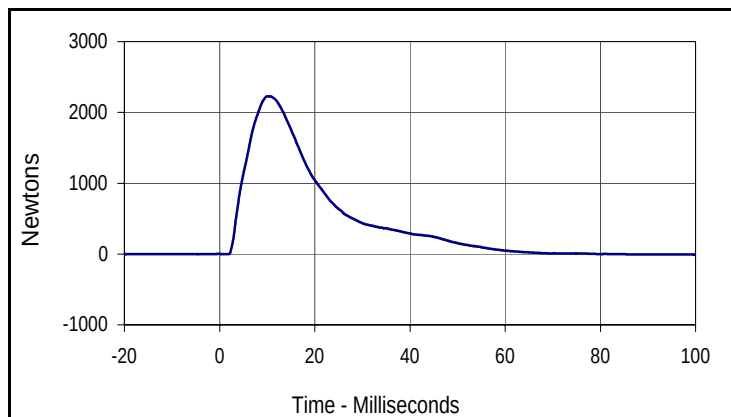
Test Date: 12/8/10
 Test I.D.: ABD12B



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Probe Velocity	m/s	3.90 to 4.10	3.98	Pass
Impactor Force	N	4000 to 4800	4505.9	Pass
	msec	10.6 to 13.0	11.4	Pass
Abdominal Force	N	2200 to 2700	2228.0	Pass
	msec	10.0 to 12.3	10.1	Pass
Overall Test Results				Pass



Curve Description			
Impactor Force			
CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4505.9	11.4	-85.7	0.6



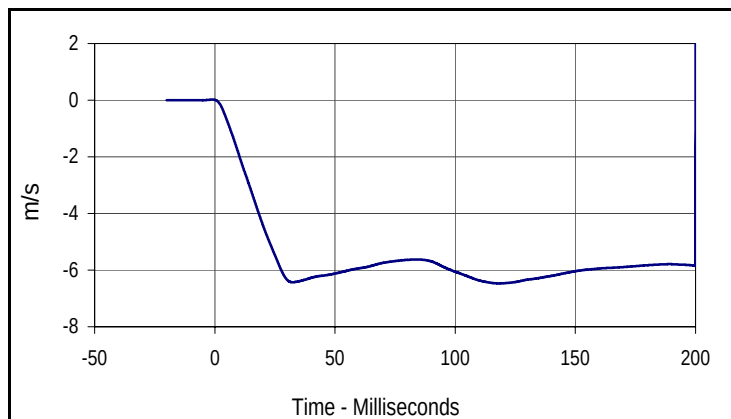
Curve Description			
Abdomen Sum Resultant			
CURNO	Type	SAE Class	Units
002	RES	600	Newtons
Max	Time	Min	Time
2228.0	10.1	-8.1	99.7

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

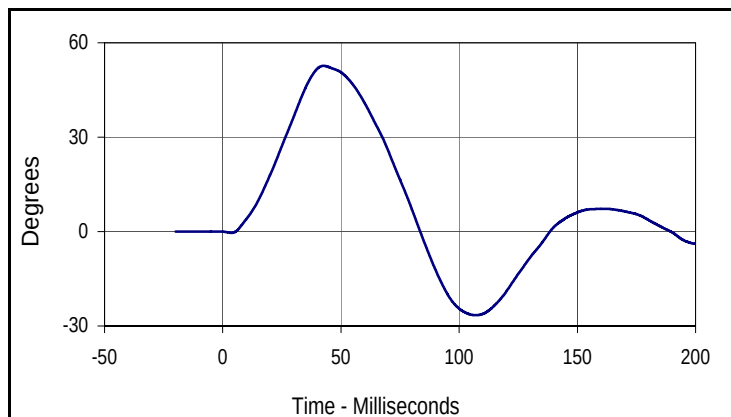
Test Date: 12/8/10
 Test I.D.: SP12B



Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	29	Pass
Pendulum Velocity		m/s	5.95 to 6.15	6.00	Pass
Pendulum Deceleration	1 msec	m/s	0.0 to -.050	-0.027	Pass
	3.7 msec	m/s	-.240 to -.425	-0.415	Pass
	27 msec	m/s	-5.80 to -6.50	-5.88	Pass
	30 msec	m/s	< -6.50	-6.34	Pass
Headform Rotation	Max	Degrees	45.0 to 55.0	52.7	Pass
	Time	msec	39.0 to 53.0	42.6	Pass
Maximum Rotation To Time Zero Crossing		msec	37.0 to 57.0	41.0	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	118.1



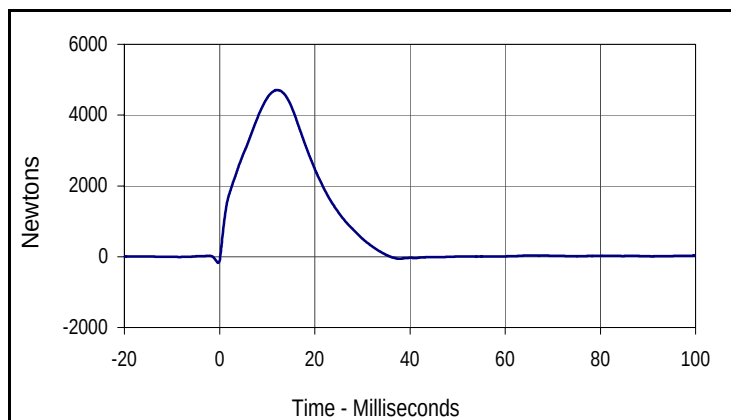
Curve Description			
Headform Rotation			
CURNO	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
52.7	42.6	-26.6	107.0

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

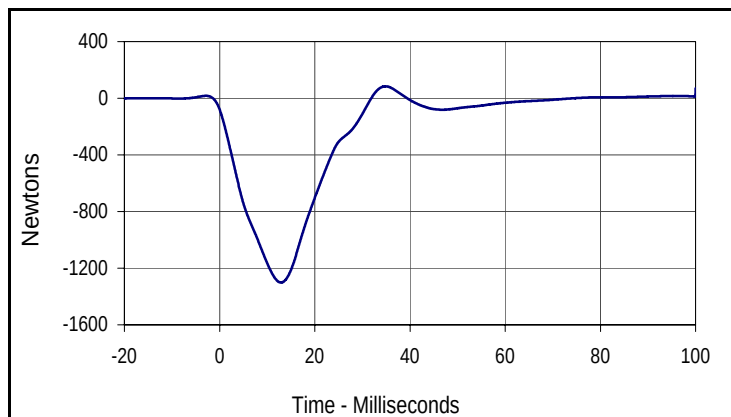
Test Date: 12/8/10
 Test I.D.: PL12B



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Probe Velocity	m/s	4.20 to 4.40	4.27	Pass
Impactor Force	N	4700 to 5400	4706.1	Pass
	msec	11.8 to 16.1	12	Pass
Pubic Symphysis Load	N	-1230 to -1590	-1301.1	Pass
	msec	12.2 to 17.0	12.9	Pass
Overall Test Results				Pass



Curve Description			
Impactor Force			
CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4706.1	12.0	-175.2	-0.3



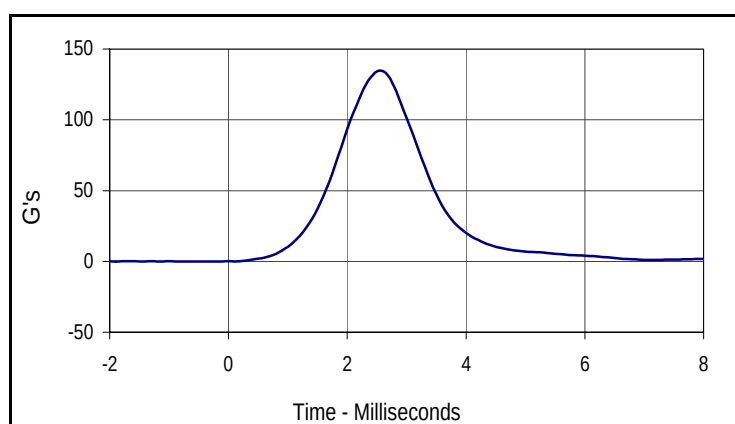
Curve Description			
Pubic FY			
CURNO	Type	SAE Class	Units
002	FIL	60	Newtons
Max	Time	Min	Time
84.3	34.8	-1301.1	12.9

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

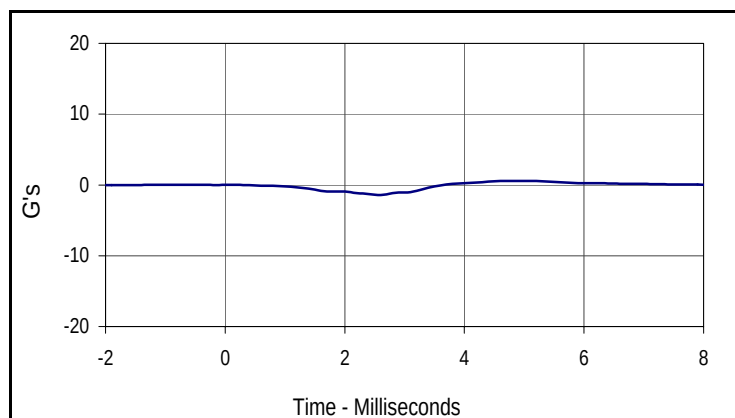
Test Date: 12/8/10
 Test I.D.: HD12B



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Peak Resultant Acceleration	G's	125 to 155	134.4	Pass
Peak Longitudinal Acceleration	G's	≤15	1.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	5.2	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
134.4	2.6	0.0	-0.2



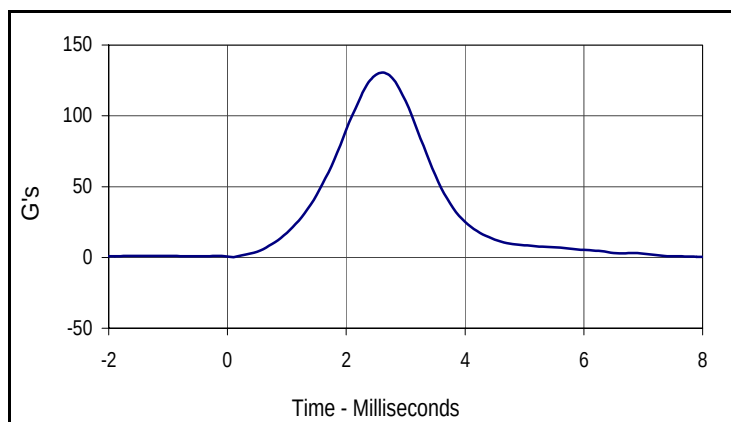
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.6	5.1	-1.4	2.6

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

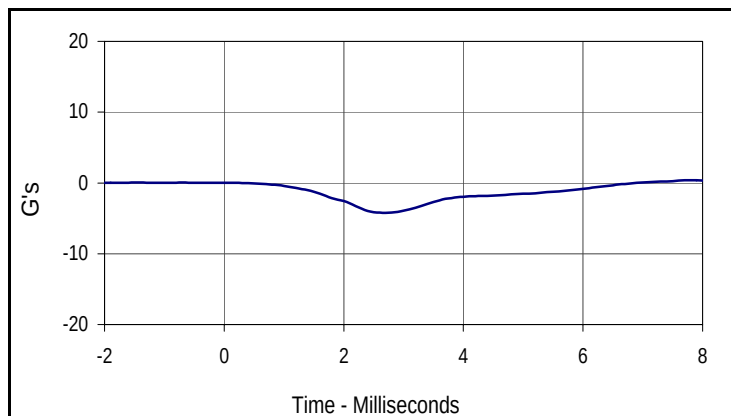
Test Date: 12/8/10
 Test I.D.: HDF12B



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Peak Resultant Acceleration	G's	115 to 137	130.5	Pass
Peak Longitudinal Acceleration	G's	≤15	4.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	6.6	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
130.5	2.6	0.2	0.1



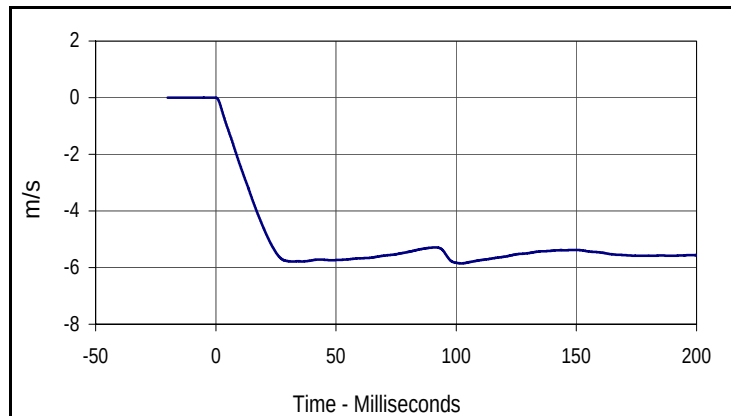
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.0	-1.5	-4.2	2.7

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

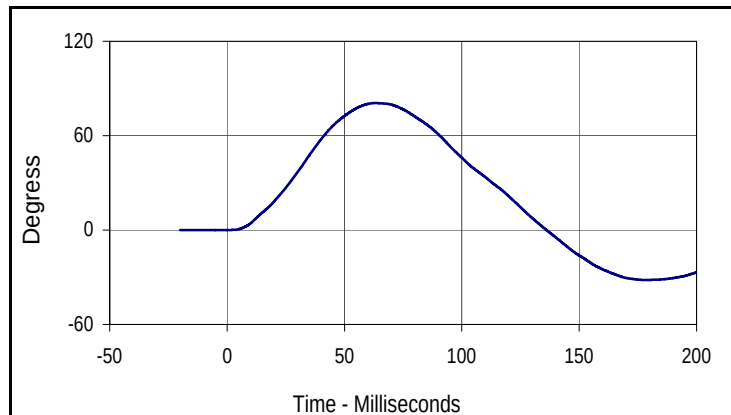
Test Date: 12/8/10
 Test I.D.: NBF12B



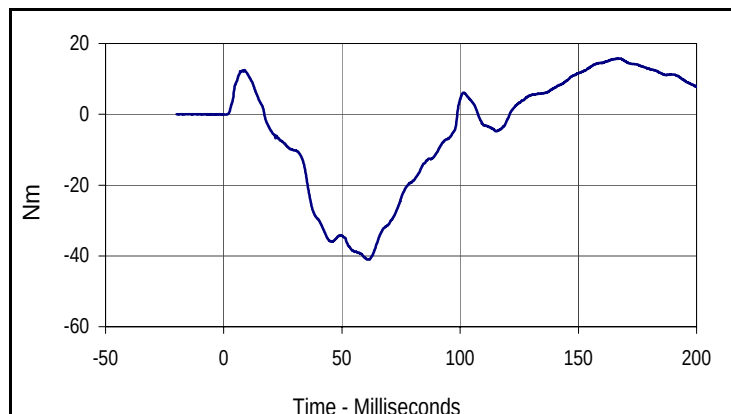
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.53	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.4	Pass
	15 msec	m/s	-3.30 to -4.10	-3.6	Pass
	20 msec	m/s	-4.40 to -5.40	-4.6	Pass
	25 msec	m/s	-5.40 to -6.10	-5.5	Pass
	25-100 msec	m/s	-5.50 to -6.20	-5.8	Pass
Translation-Rotation	Max	Degrees	71.0 to 81.0	80.7	Pass
	Time	msec	50.0 to 70.0	63.1	Pass
Peak Occipital Condyle Moment		Nm	-36.0 to -44.0	-41.0	Pass
Decaying Moment Time to Cross 0 Nm		msec	102.0 to 126.0	121.0	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	-0.3	-5.9	102.1



Curve Description			
Maximum Translation Rotation			
CURNO	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
80.7	63.1	-31.7	178.4



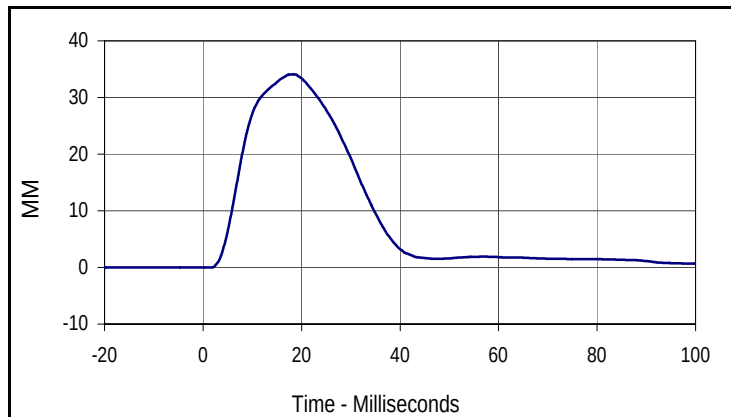
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
15.8	167.3	-41.0	61.5

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

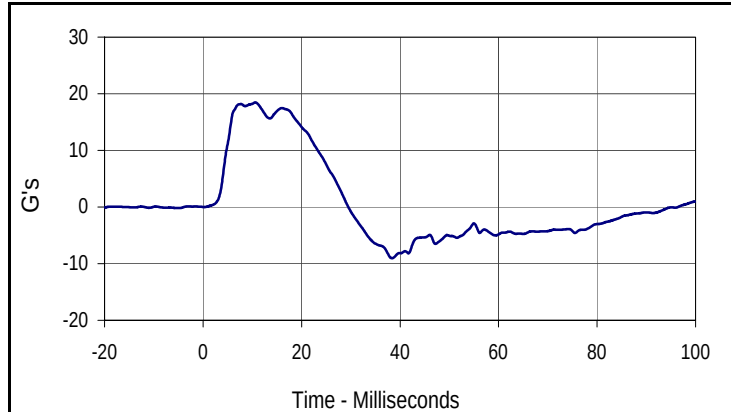
Test Date: 12/8/10
 Test I.D.: SHF12B



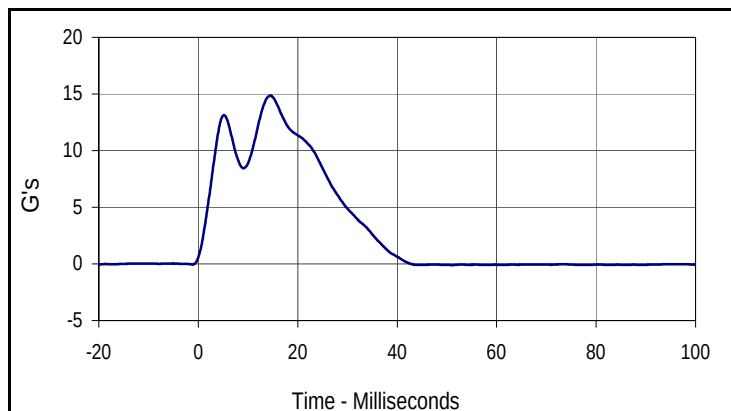
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Pendulum Velocity	m/s	4.20 to 4.40	4.32	Pass
Shoulder Deflection	MM	28 to 37	34.1	Pass
Peak Upper Spine Y Acceleration	G's	17 to 22	18.5	Pass
Peak Impactor Acceleration	G's	13 to 18	14.9	Pass
Overall Test Results			Pass	



Curve Description			
Shoulder Acceleration			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
34.1	18.3	0.0	1.8



Curve Description			
Upper Spine Y Acceleration			
CURNO	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.5	10.6	-9.0	38.4



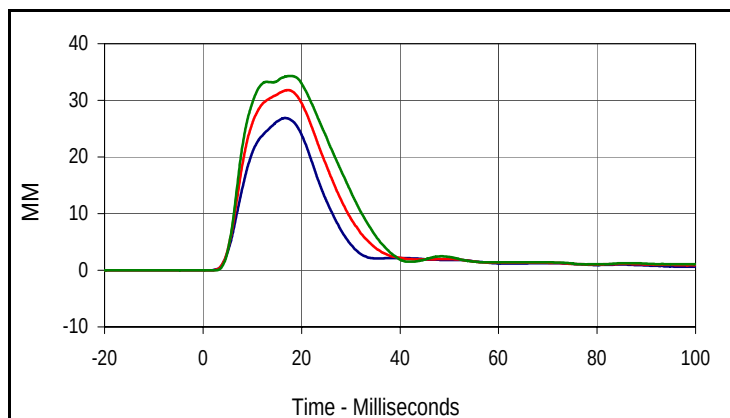
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
14.9	14.5	-0.1	51.1

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

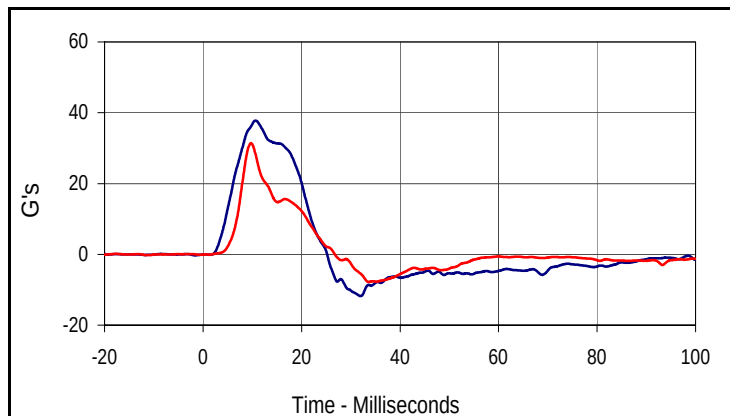
Test Date: 12/8/10
 Test I.D.: THF12B



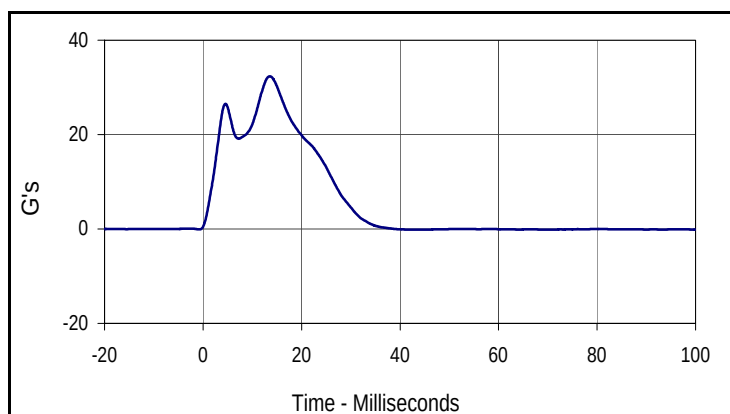
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Pendulum Velocity	m/s	6.60 to 6.80	6.76	Pass
Shoulder Deflection	MM	31 to 40	34.0	Pass
Upper Thorax Rib Deflection	MM	25 to 32	26.9	Pass
Middle Thorax Rib Deflection	MM	30 to 36	31.8	Pass
Lower Thorax Rib Deflection	MM	32 to 38	34.3	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	37.8	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	32.4	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	16.7	0.0	-8.9
Middle Thorax Deflection			
Max	Time	Min	Time
31.8	17.2	0.0	-10.9
Lower Thorax Deflection			
Max	Time	Min	Time
34.3	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
37.8	10.6	-11.8	32.0
Lower Spine Y Acceleration			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
31.4	9.7	-7.8	33.7



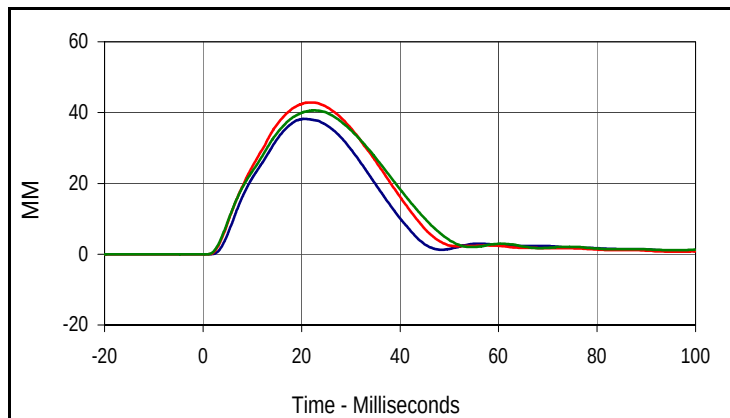
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
32.4	13.5	-0.1	44.6

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

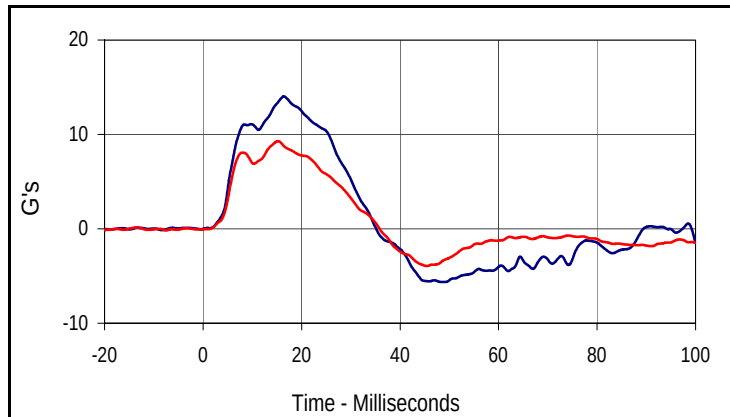
Test Date: 12/8/10
 Test I.D.: TOA12B



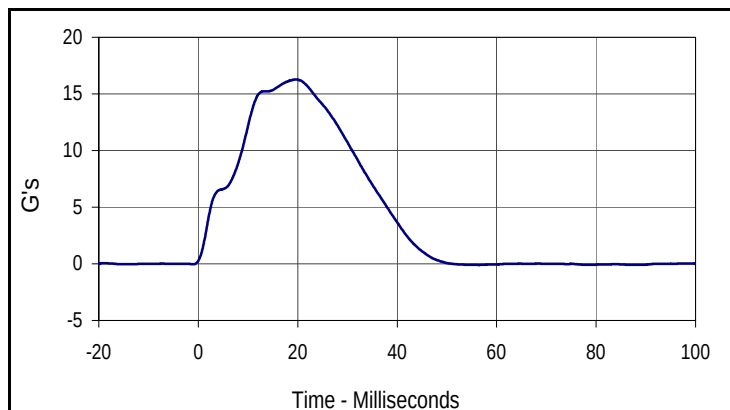
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Pendulum Velocity	m/s	4.20 to 4.40	4.35	Pass
Upper Thorax Rib Deflection	MM	32 to 40	38.2	Pass
Middle Thorax Rib Deflection	MM	39 to 45	42.8	Pass
Lower Thorax Rib Deflection	MM	35 to 43	40.6	Pass
Peak Upper Spine Y Acceleration	G's	13 to 17	14.0	Pass
Peak Lower Spine Y Acceleration	G's	7 to 11	9.3	Pass
Peak Impactor Acceleration	G's	14 to 18	16.3	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
38.2	20.8	0.0	-4.1
Middle Thorax Deflection			
Max	Time	Min	Time
42.8	22.0	0.0	-13.4
Lower Thorax Deflection			
Max	Time	Min	Time
40.6	22.6	0.0	-3.3



Curve Description			
Upper Spine Y Acceleration			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.0	16.4	-5.6	48.2
Lower Spine Y Acceleration			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.3	15.2	-3.9	45.4



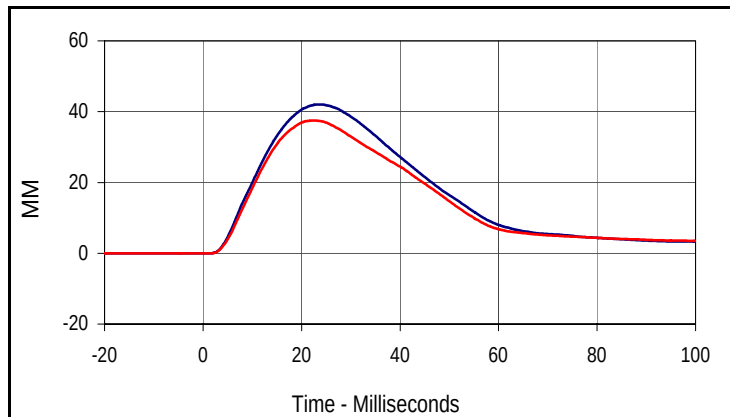
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.3	19.7	-0.1	56.5

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

Test Date: 12/8/10
 Test I.D.: ABDF12B

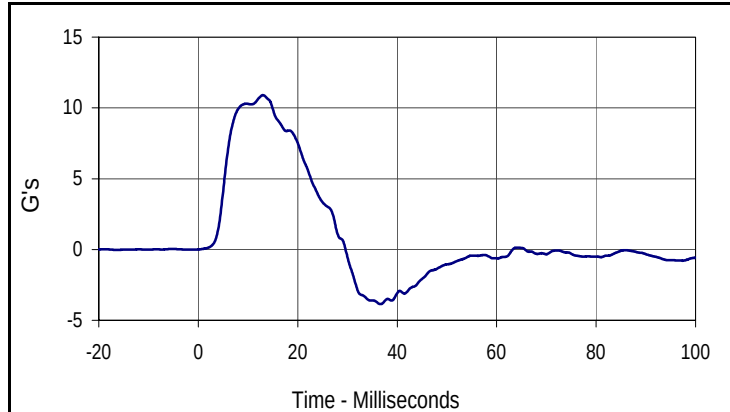


Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Pendulum Velocity	m/s	4.20 to 4.40	4.28	Pass
Upper Abdominal Rib Deflection	MM	36 to 47	42.0	Pass
Lower Abdominal Rib Deflection	MM	33 to 44	37.5	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	10.9	Pass
Peak Impactor Acceleration	G's	12 to 16	13.9	Pass
Overall Test Results			Pass	

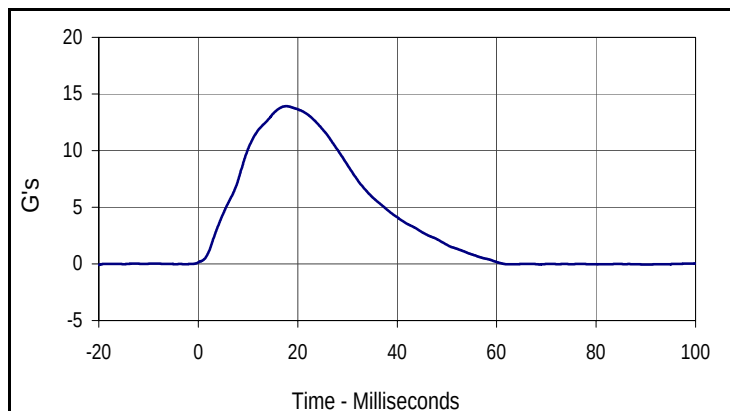


Curve Description			
Upper Abdominal Rib Deflection			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
42.0	23.5	0.0	-6.3

Curve Description			
Lower Abdominal Rib Deflection			
CURNO	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
37.5	22.3	0.0	-5.6



Curve Description			
Lower Spine Y Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
10.9	13.0	-3.9	36.7



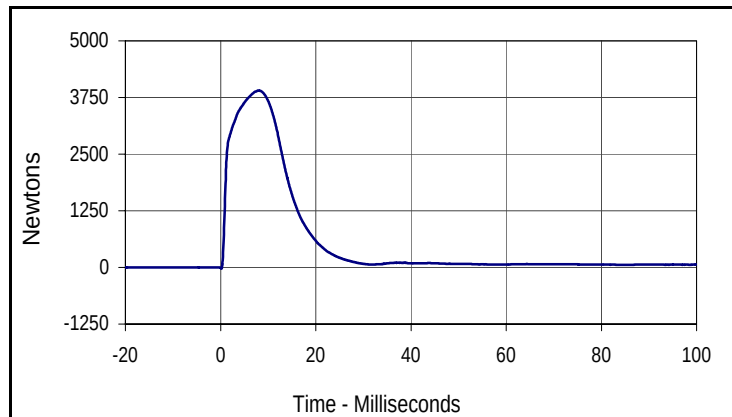
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
13.9	17.7	-0.1	-20.0

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

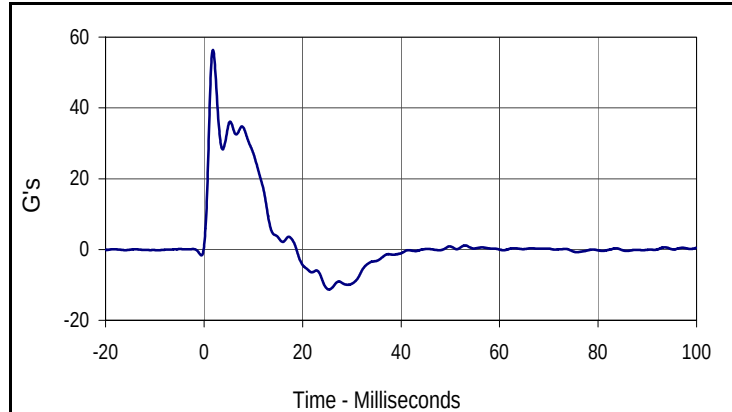
Test Date: 12/8/10
 Test I.D.: PA12B



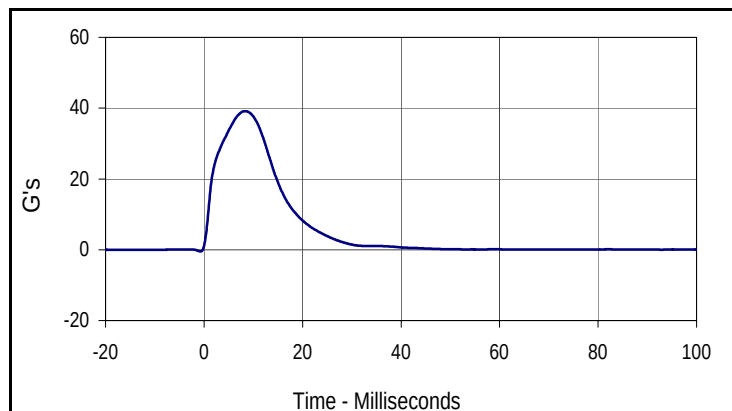
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Pendulum Velocity	m/s	6.60 to 6.80	6.68	Pass
Peak Acetabulum Force	Newtons	3600 to 4300	3904.3	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	34.8	Pass
Peak Impactor Acceleration	G's	38 to 47	39.2	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Acetabulum Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3904.3	7.9	-27.3	0.2



Curve Description			
Pelvis Y Acceleration			
CURNO	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
56.4	1.8	-11.3	25.4



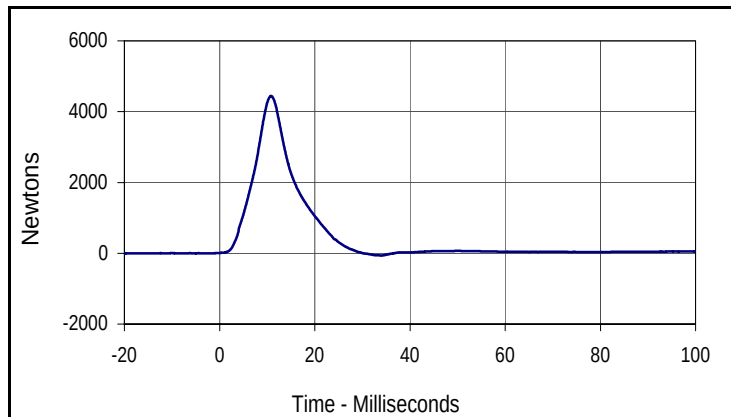
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
39.2	8.3	-0.5	-0.7

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

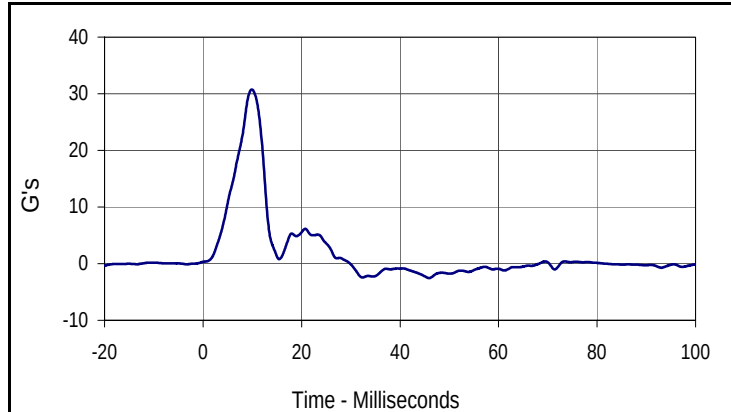
Test Date: 12/8/10
 Test I.D.: PLF12B



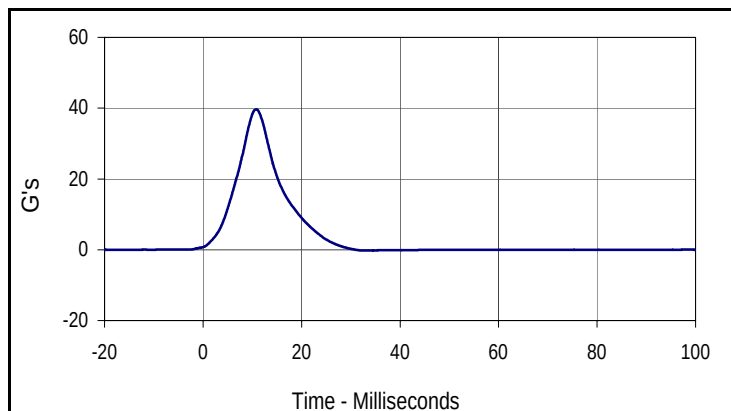
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Pendulum Velocity	m/s	4.2 to 4.4	4.30	Pass
Peak Iliac Force	Newtons	4100 to 5100	4442.1	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	30.8	Pass
Peak Impactor Acceleration	G's	36 to 45	39.7	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Iliac Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4442.1	10.8	-63.2	34.1



Curve Description			
Pelvis Y Acceleration			
CURNO	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
30.8	9.9	-2.6	45.9



Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
39.7	10.8	-0.2	32.6

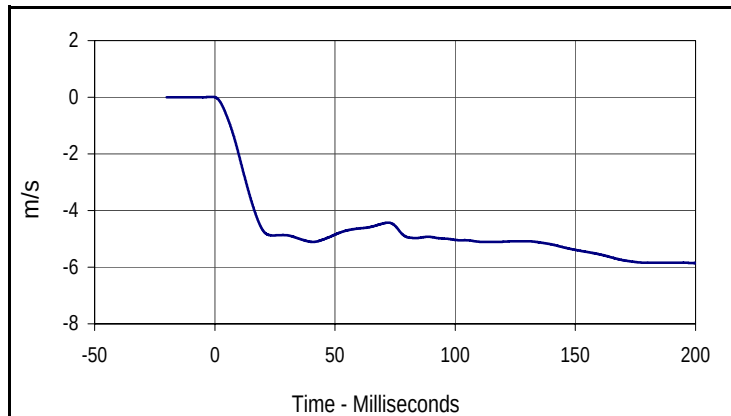
APPENDIX C
POST-TEST / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

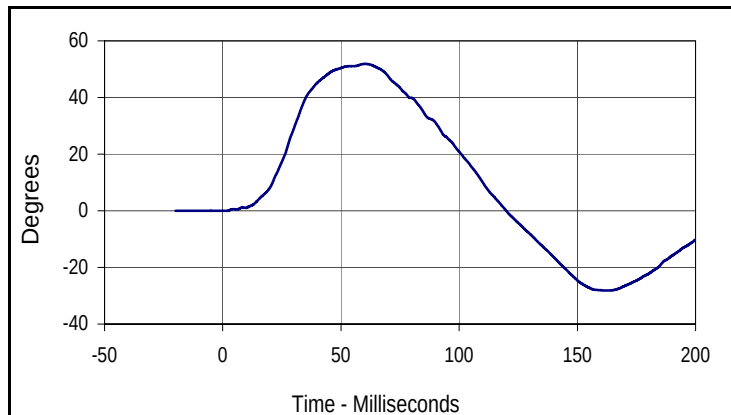
Test Date: 12/17/10
 Test I.D.: NB12C



Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	28	Pass
Pendulum Velocity		m/s	3.30 to 3.50	3.34	Pass
Pendulum Deceleration	1 msec	m/s	0.0 to -.050	-0.040	Pass
	3 msec	m/s	-.250 to -.375	-0.277	Pass
	14 msec	m/s	-3.20 to -3.70	-3.31	Pass
Headform Rotation	Max	Degrees	49.0 to 58.0	51.8	Pass
	Time	msec	54.0 to 66.0	60.5	Pass
Maximum Rotation To Time Zero Crossing		msec	53.0 to 88.0	59.5	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	-5.9	200.0



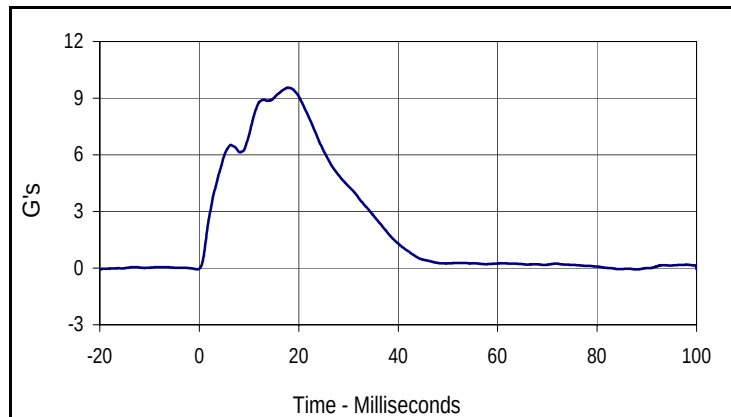
Curve Description			
Headform Rotation			
CURNO	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
51.8	60.5	-28.1	162.6

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

Test Date: 12/17/10
 Test I.D.: SH12C



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Probe Velocity	m/s	4.20 to 4.40	4.25	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	9.55	Pass
Overall Test Results			Pass	



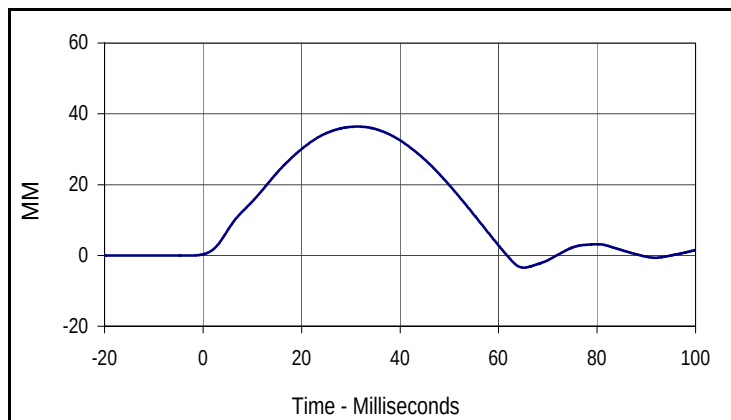
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
9.6	17.9	-0.1	88.0

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

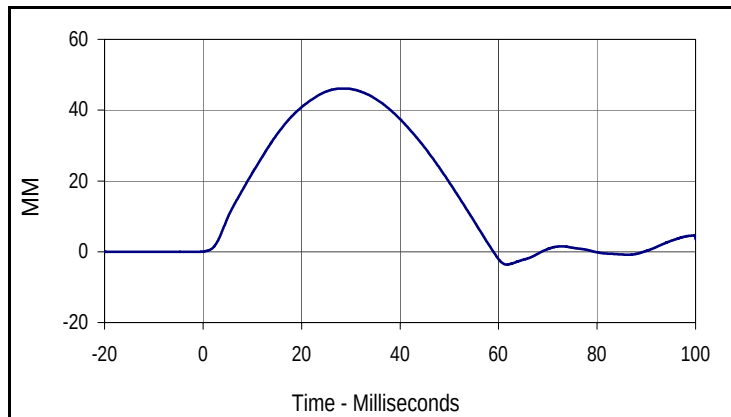
Test Date: 12/17/10
 Test I.D.: RIB12H



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Peak Rib Deflection at 459 MM Drop Height	MM	36 to 40	36.4	Pass
Peak Rib Deflection at 815 MM Drop Height	MM	46 to 51	46.1	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
36.4	31.4	-3.5	65.1



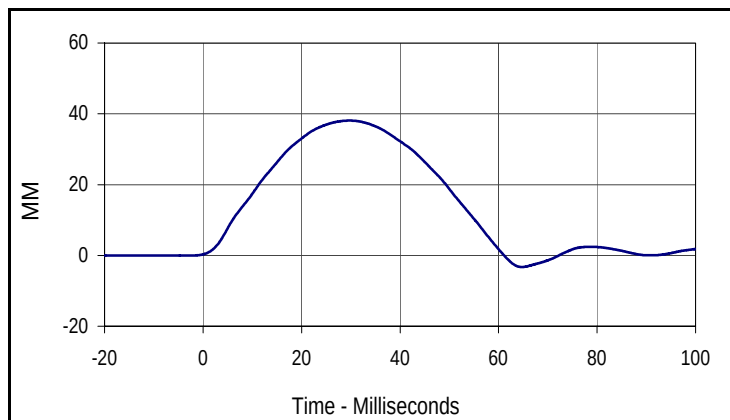
Curve Description			
Upper Rib Deflection (815 MM Drop Height)			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
46.1	28.6	-3.6	61.7

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

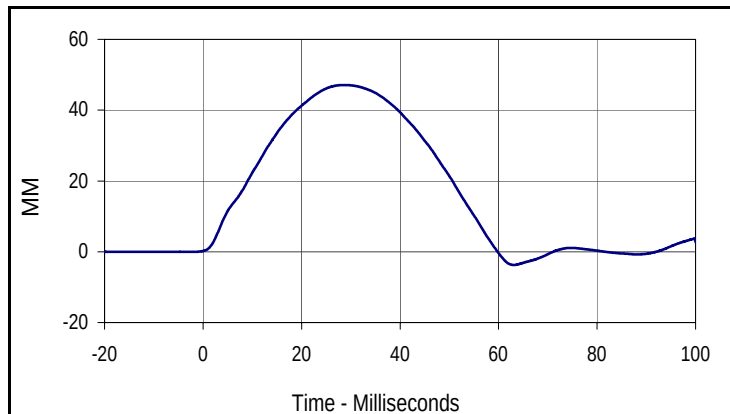
Test Date: 12/17/10
 Test I.D.: RIB12I



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	28	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	47.1	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
38.1	29.7	-3.3	64.7



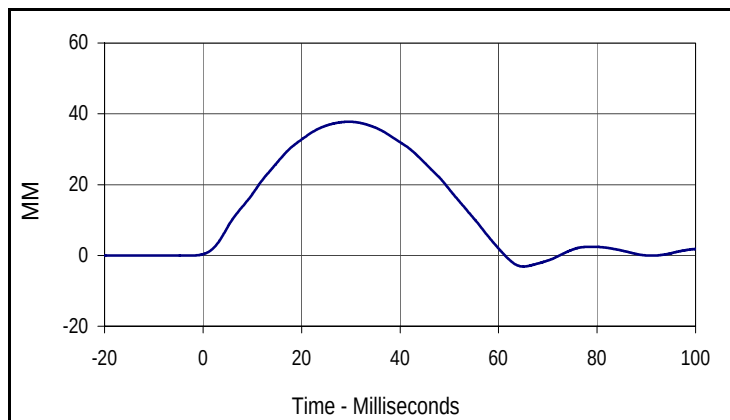
Curve Description			
Middle Rib Deflection (815 MM Drop Height)			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
47.1	28.7	-3.7	63.1

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

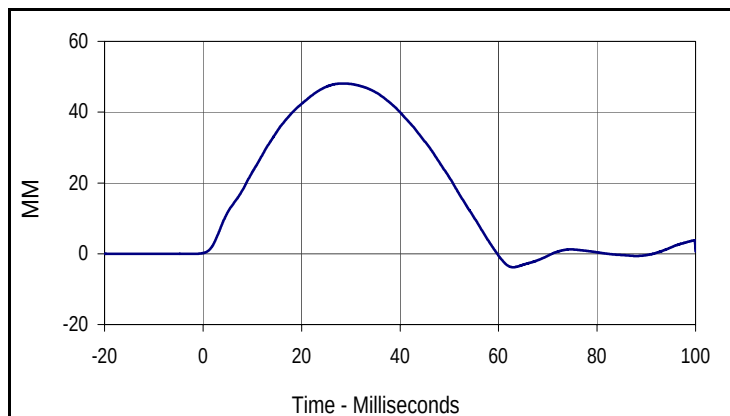
Test Date: 12/17/10
 Test I.D.: RIB12J



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Peak Rib Deflection at 459 MM Drop Height	MM	36 to 40	37.8	Pass
Peak Rib Deflection at 815 MM Drop Height	MM	46 to 51	48.1	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
37.8	29.6	-3.1	65.0



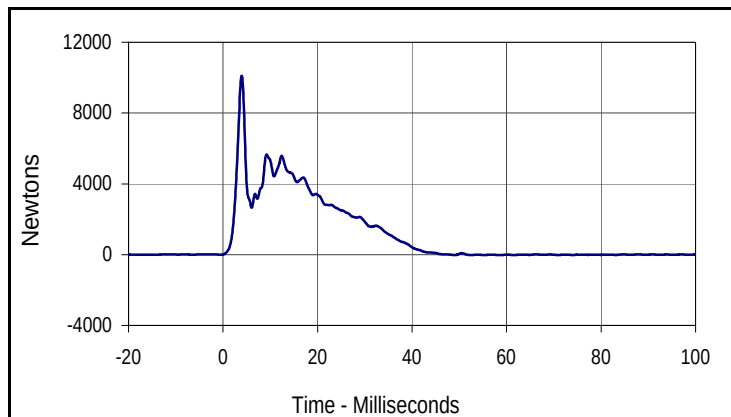
Curve Description			
Lower Rib Deflection (815 MM Drop Height)			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
48.1	28.4	-3.8	63.0

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

Test Date: 12/17/10
 Test I.D.: TH12C



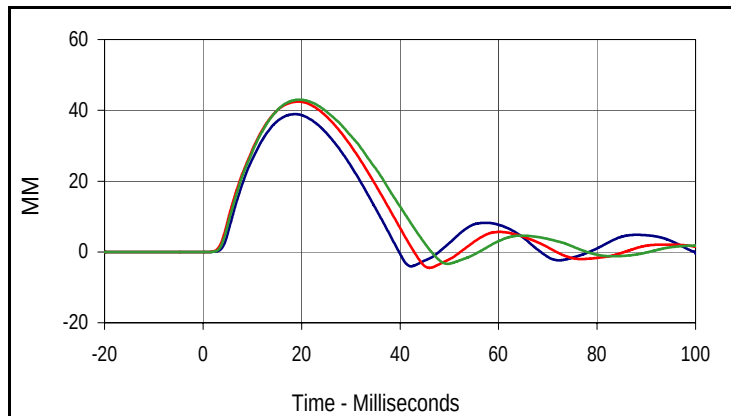
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Probe Velocity	m/s	5.40 to 5.60	5.44	Pass
Impactor Force	N	5100 to 6200	5659.3	Pass
	msec	> 6.0 msec	9.2	Pass
Upper Rib Deflection	MM	34 to 41	38.9	Pass
Middle Rib Deflection	MM	37 to 45	42.5	Pass
Lower Rib Deflection	MM	37 to 44	43.0	Pass
Overall Test Results			Pass	



Curve Description

Impactor Force

CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
10103.1	4.0	-29.8	49.0



Curve Description

Upper, Middle, Lower Rib Deflections

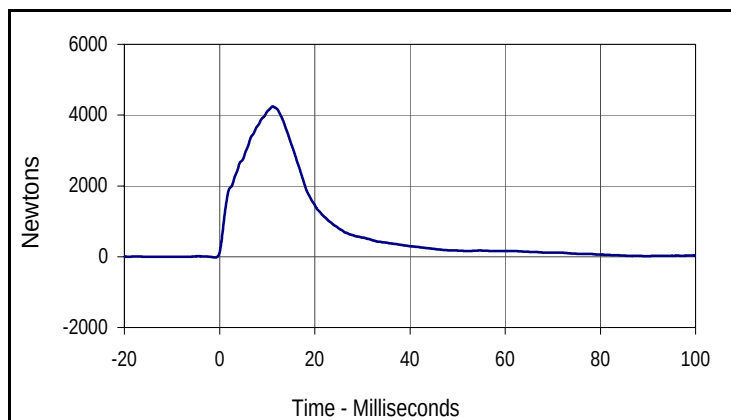
CURNO(s)	Type	SAE Class	Units
002-003-004	FIL	180	MM
Max (Upper)	Time	Min (Upper)	Time
38.9	18.7	-4.1	42.2
Max (Middle)	Time	Min (Middle)	Time
42.5	19.4	-4.5	46.0
Max (Lower)	Time	Min (Lower)	Time
43.0	19.5	-3.4	49.7

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

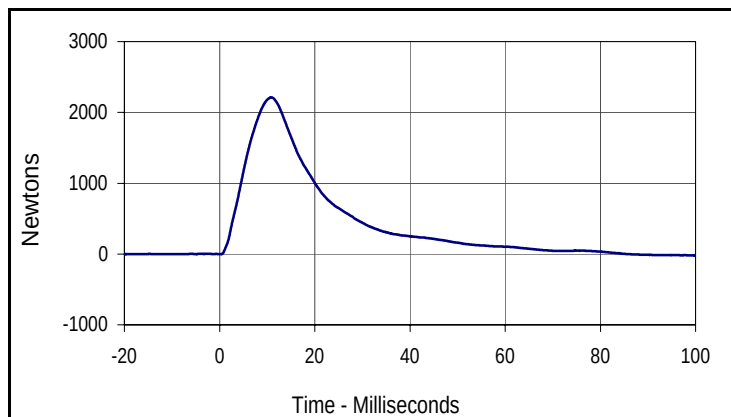
Test Date: 12/17/10
 Test I.D.: ABD12C



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Probe Velocity	m/s	3.90 to 4.10	3.96	Pass
Impactor Force	N	4000 to 4800	4243.5	Pass
	msec	10.6 to 13.0	11.2	Pass
Abdominal Force	N	2200 to 2700	2211.7	Pass
	msec	10.0 to 12.3	10.9	Pass
Overall Test Results				Pass



Curve Description			
Impactor Force			
CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4243.5	11.2	-22.9	-0.9



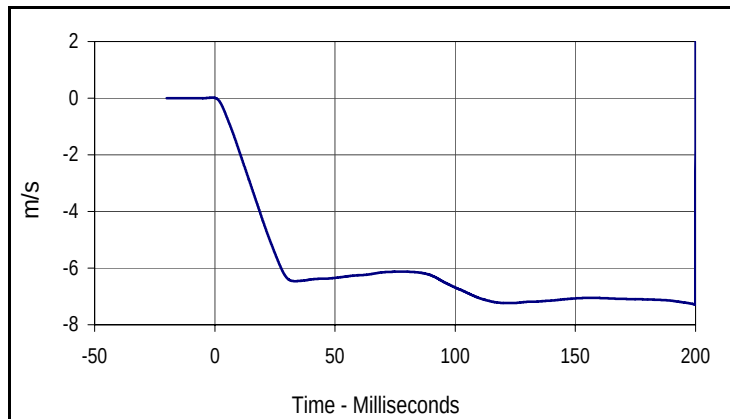
Curve Description			
Abdomen Sum Resultant			
CURNO	Type	SAE Class	Units
002	RES	600	Newtons
Max	Time	Min	Time
2211.7	10.9	-18.2	98.8

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

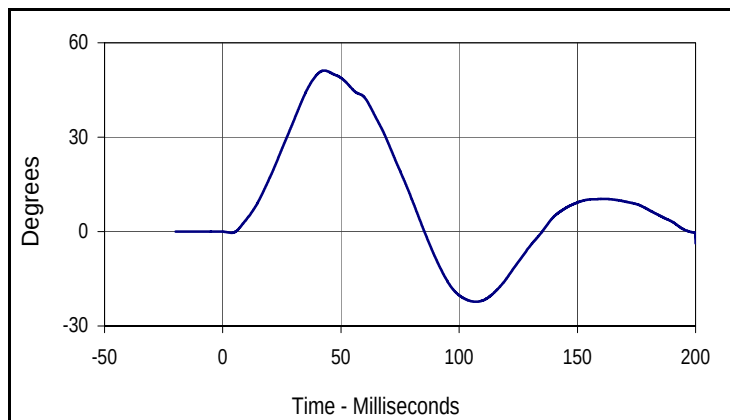
Test Date: 12/17/10
 Test I.D.: SP12C



Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	28	Pass
Pendulum Velocity		m/s	5.95 to 6.15	6.04	Pass
Pendulum Deceleration	1 msec	m/s	0.0 to -.050	-0.028	Pass
	3.7 msec	m/s	-.240 to -.425	-0.400	Pass
	27 msec	m/s	-5.80 to -6.50	-5.89	Pass
	30 msec	m/s	< -6.50	-6.35	Pass
Headform Rotation	Max	Degrees	45.0 to 55.0	51.2	Pass
	Time	msec	39.0 to 53.0	43.0	Pass
Maximum Rotation To Time Zero Crossing		msec	37.0 to 57.0	42.3	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
3.5	200.0	-7.3	199.9



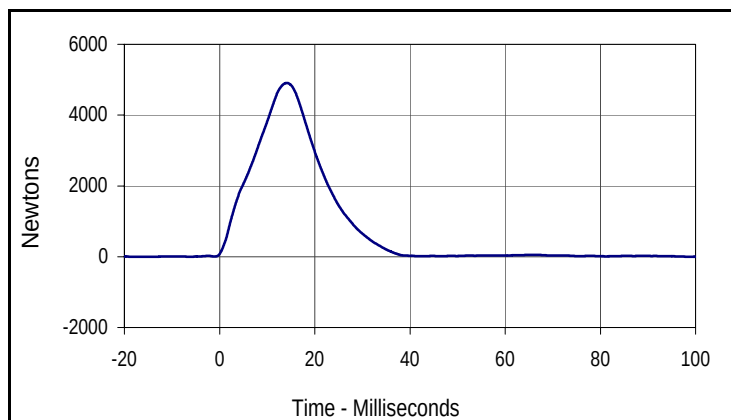
Curve Description			
Headform Rotation			
CURNO	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
51.2	43.0	-22.3	107.0

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

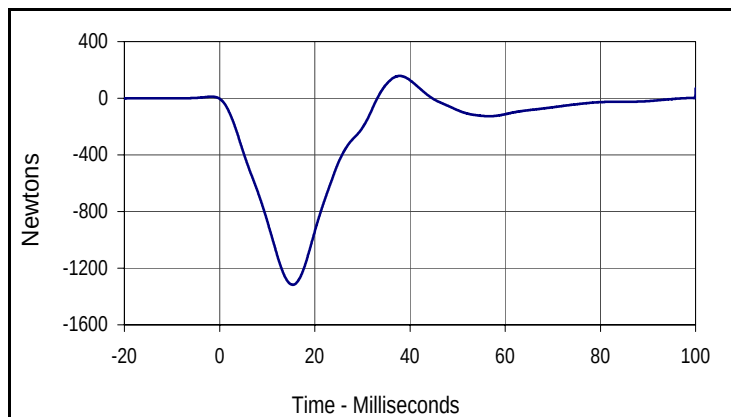
Test Date: 12/17/10
 Test I.D.: PL12C



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Probe Velocity	m/s	4.20 to 4.40	4.31	Pass
Impactor Force	N	4700 to 5400	4908.3	Pass
	msec	11.8 to 16.1	14.1	Pass
Pubic Symphysis Load	N	-1230 to -1590	-1316.8	Pass
	msec	12.2 to 17.0	15.4	Pass
Overall Test Results				Pass



Curve Description			
Impactor Force			
CURNO	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4908.3	14.1	-3.3	-17.5



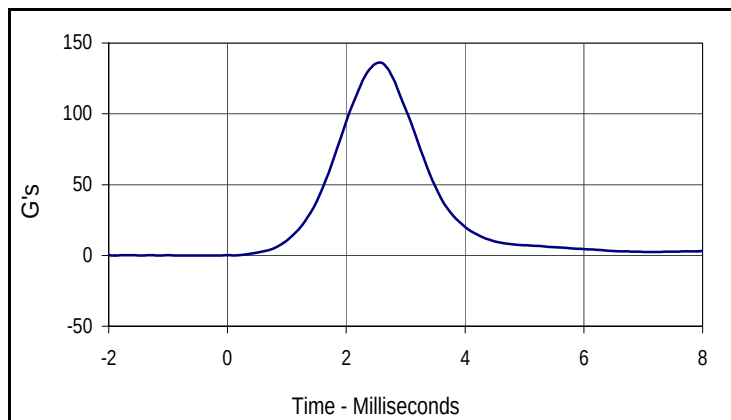
Curve Description			
Pubic FY			
CURNO	Type	SAE Class	Units
002	FIL	60	Newtons
Max	Time	Min	Time
157.7	37.9	-1316.8	15.4

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

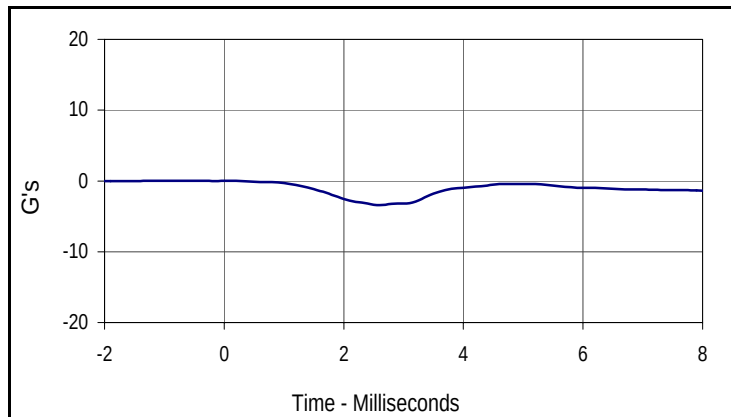
Test Date: 12/17/10
 Test I.D.: HD12C



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Peak Resultant Acceleration	G's	125 to 155	135.9	Pass
Peak Longitudinal Acceleration	G's	≤15	3.4	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
135.9	2.6	0.0	-0.2



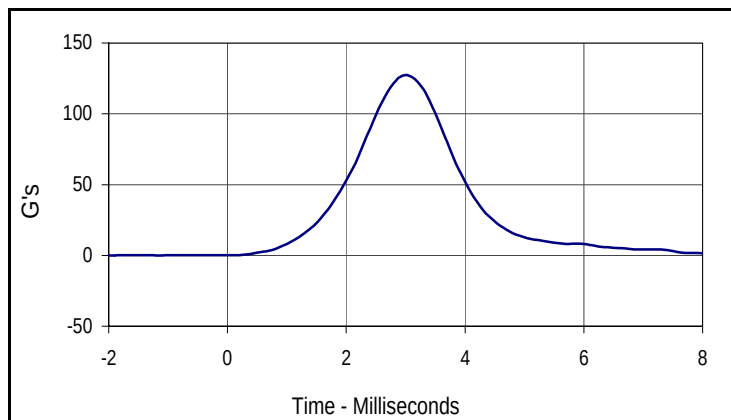
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.0	0.1	-3.4	2.6

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

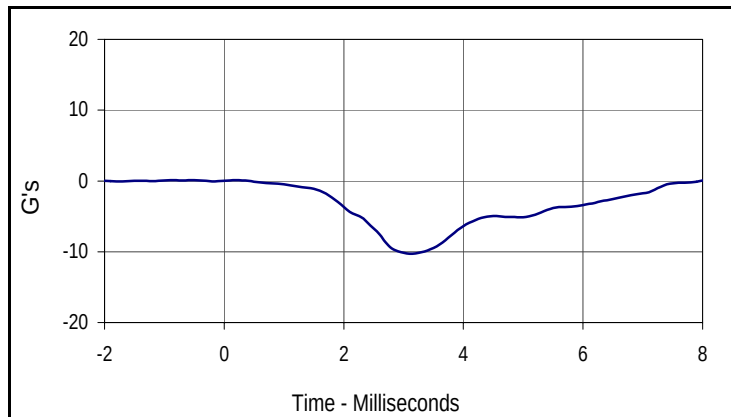
Test Date: 12/17/10
 Test I.D.: HDF12C



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Peak Resultant Acceleration	G's	115 to 137	127.3	Pass
Peak Longitudinal Acceleration	G's	≤15	10.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	10.0	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
127.3	3.0	0.0	-1.1



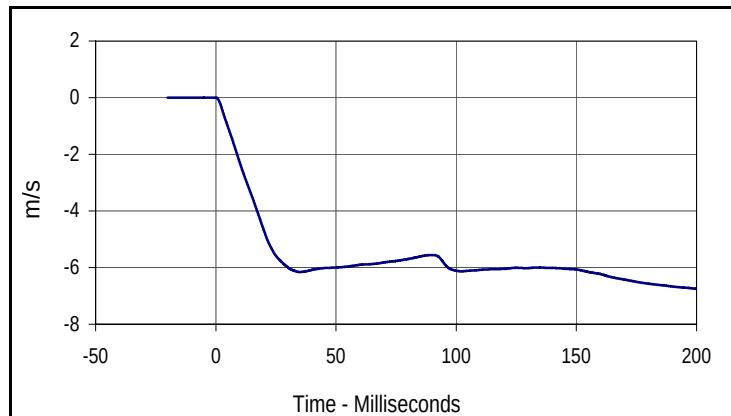
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.1	-0.5	-10.3	3.1

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

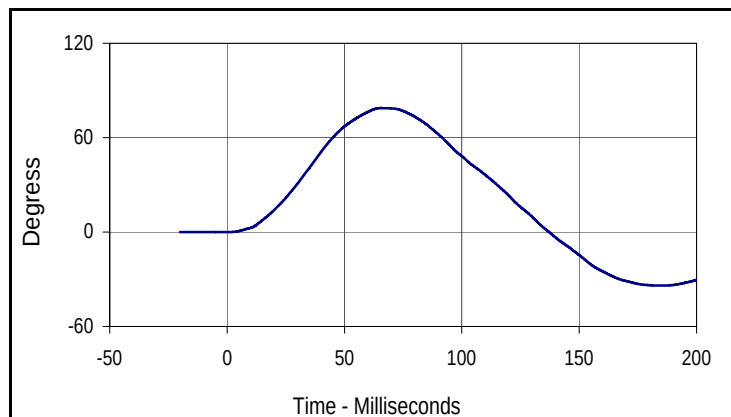
Test Date: 12/17/10
 Test I.D.: NBF12C



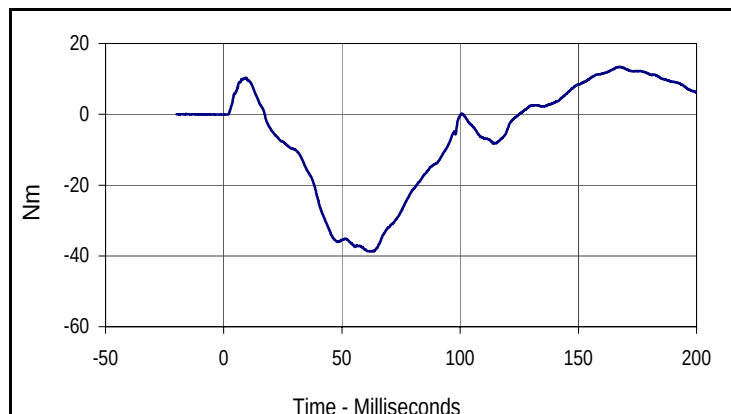
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	28	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.52	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.3	Pass
	15 msec	m/s	-3.30 to -4.10	-3.5	Pass
	20 msec	m/s	-4.40 to -5.40	-4.7	Pass
	25 msec	m/s	-5.40 to -6.10	-5.6	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.2	Pass
Translation-Rotation	Max	Degrees	71.0 to 81.0	78.8	Pass
	Time	msec	50.0 to 70.0	65.6	Pass
Peak Occipital Condyle Moment		Nm	-36.0 to -44.0	-38.8	Pass
Decaying Moment Time to Cross 0 Nm		msec	102.0 to 126.0	125.0	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	-0.4	-6.8	200.0



Curve Description			
Maximum Translation Rotation			
CURNO	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
78.8	65.6	-34.1	184.8



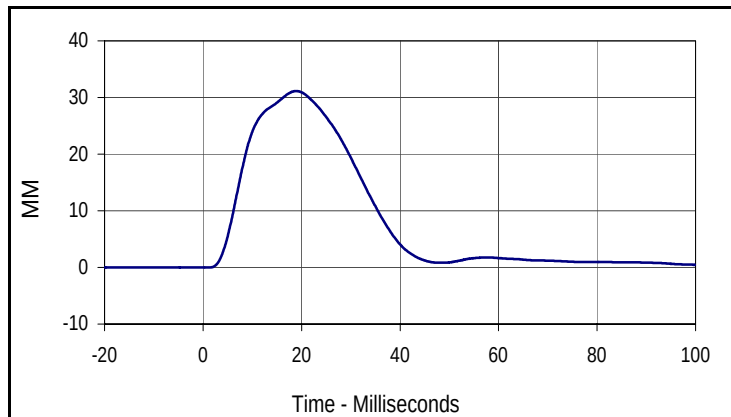
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
13.4	167.2	-38.8	62.5

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

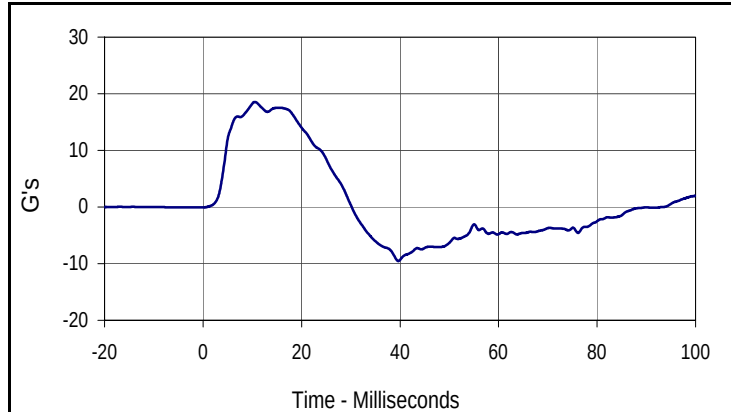
Test Date: 12/17/10
 Test I.D.: SHF12C



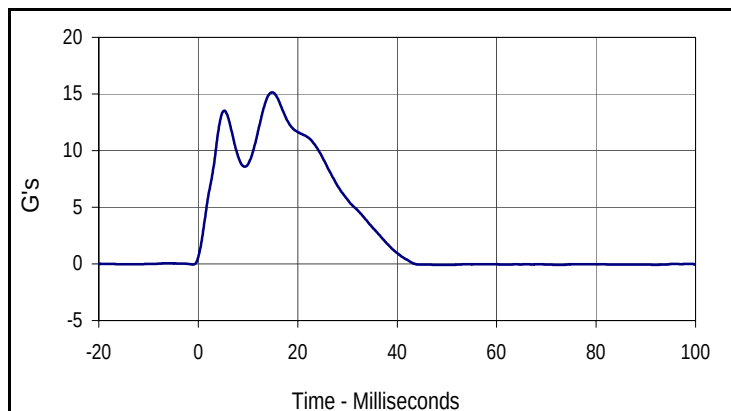
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Pendulum Velocity	m/s	4.20 to 4.40	4.27	Pass
Shoulder Deflection	MM	28 to 37	31.1	Pass
Peak Upper Spine Y Acceleration	G's	17 to 22	18.6	Pass
Peak Impactor Acceleration	G's	13 to 18	15.1	Pass
Overall Test Results			Pass	



Curve Description			
Shoulder Deflection			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
31.1	18.9	0.0	1.1



Curve Description			
Upper Spine Y Acceleration			
CURNO	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.6	10.5	-9.5	39.6



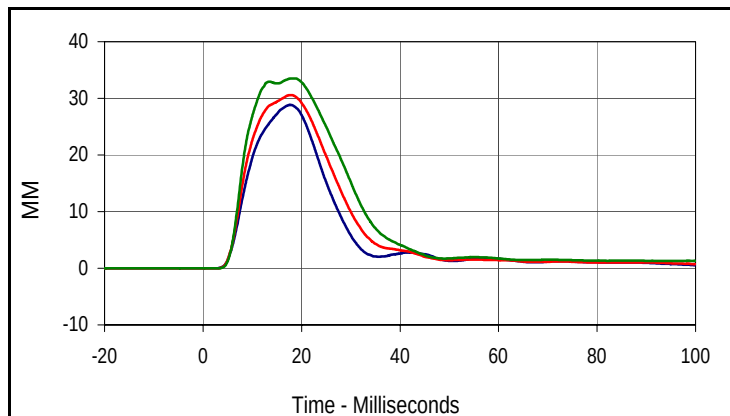
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.1	14.9	-0.1	48.1

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

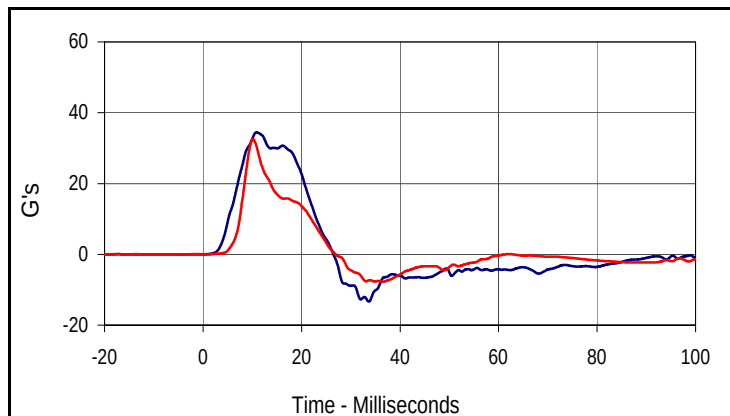
Test Date: 12/17/10
 Test I.D.: THF12C



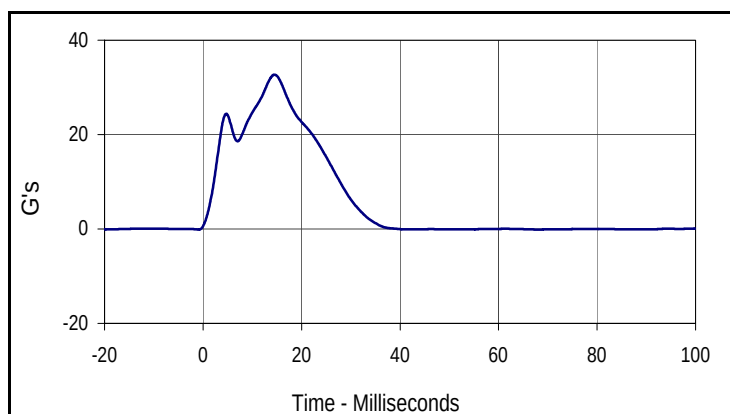
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Pendulum Velocity	m/s	6.60 to 6.80	6.74	Pass
Shoulder Deflection	MM	31 to 40	35.4	Pass
Upper Thorax Rib Deflection	MM	25 to 32	28.8	Pass
Middle Thorax Rib Deflection	MM	30 to 36	30.6	Pass
Lower Thorax Rib Deflection	MM	32 to 38	33.5	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	34.5	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	32.6	Pass
Peak Impactor Acceleration After 5 msec.	G's	30 to 36	32.7	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
28.8	17.7	0.0	-17.7
Middle Thorax Deflection			
Max	Time	Min	Time
30.6	17.7	0.0	-0.5
Lower Thorax Deflection			
Max	Time	Min	Time
33.5	18.0	0.0	-1.1



Curve Description			
Upper Spine Y Acceleration			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
34.5	10.8	-13.3	33.7
Lower Spine Y Acceleration			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
32.6	10.1	-7.7	36.5



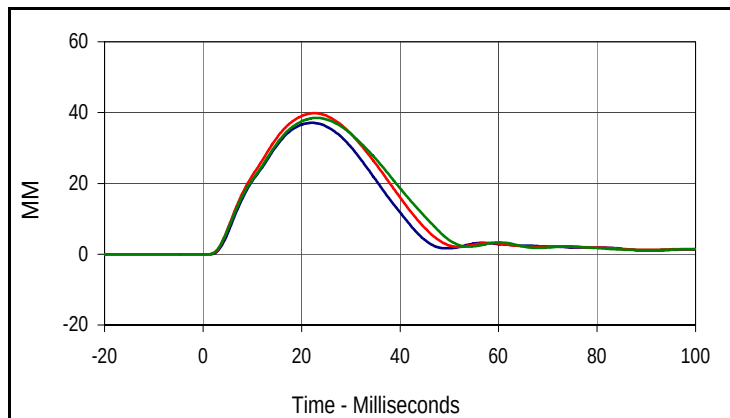
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
32.7	14.5	-0.1	68.4

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

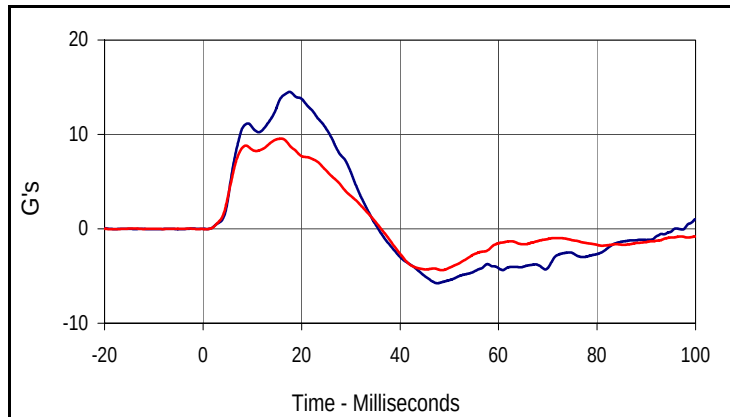
Test Date: 12/17/10
 Test I.D.: TOA12C



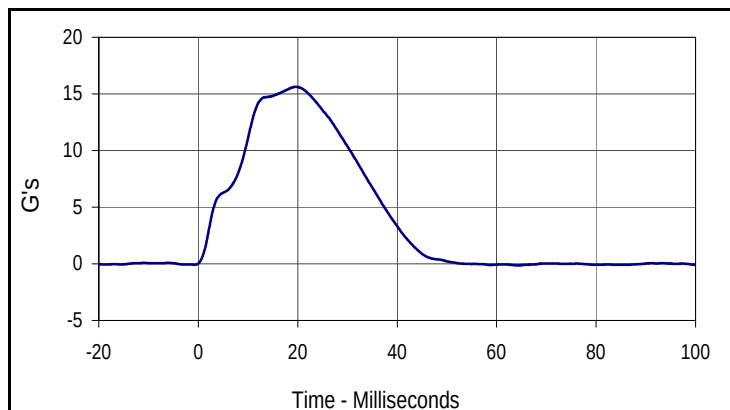
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Pendulum Velocity	m/s	4.20 to 4.40	4.33	Pass
Upper Thorax Rib Deflection	MM	32 to 40	37.1	Pass
Middle Thorax Rib Deflection	MM	39 to 45	39.8	Pass
Lower Thorax Rib Deflection	MM	35 to 43	38.5	Pass
Peak Upper Spine Y Acceleration	G's	13 to 17	14.5	Pass
Peak Lower Spine Y Acceleration	G's	7 to 11	9.5	Pass
Peak Impactor Acceleration	G's	14 to 18	15.6	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
37.1	22.2	0.0	-18.2
Middle Thorax Deflection			
Max	Time	Min	Time
39.8	22.6	0.0	-2.8
Lower Thorax Deflection			
Max	Time	Min	Time
38.5	23.0	0.0	-15.9



Curve Description			
Upper Spine Y Acceleration			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.5	17.6	-5.8	47.5
Lower Spine Y Acceleration			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.5	15.8	-4.4	48.5



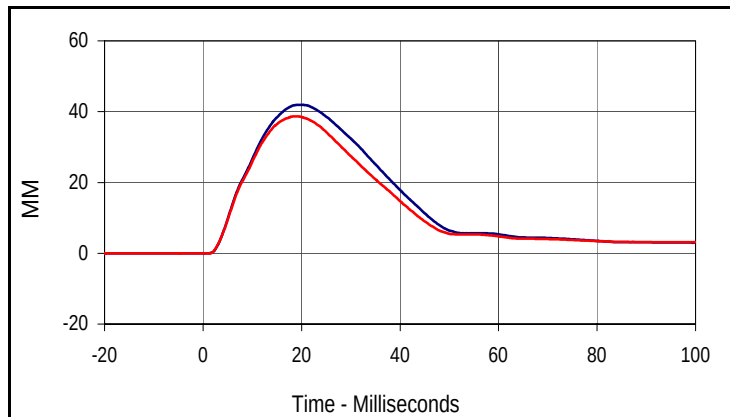
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
15.6	19.6	-0.1	64.3

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

Test Date: 12/17/10
 Test I.D.: ABDF12C

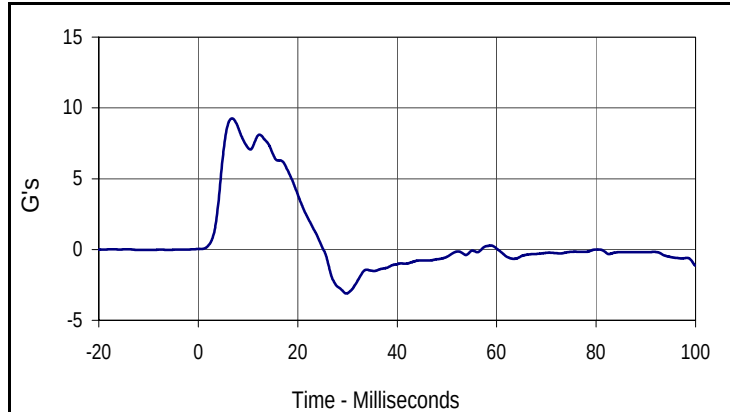


Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Pendulum Velocity	m/s	4.20 to 4.40	4.27	Pass
Upper Abdominal Rib Deflection	MM	36 to 47	42.0	Pass
Lower Abdominal Rib Deflection	MM	33 to 44	38.7	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	9.2	Pass
Peak Impactor Acceleration	G's	12 to 16	12.4	Pass
Overall Test Results			Pass	

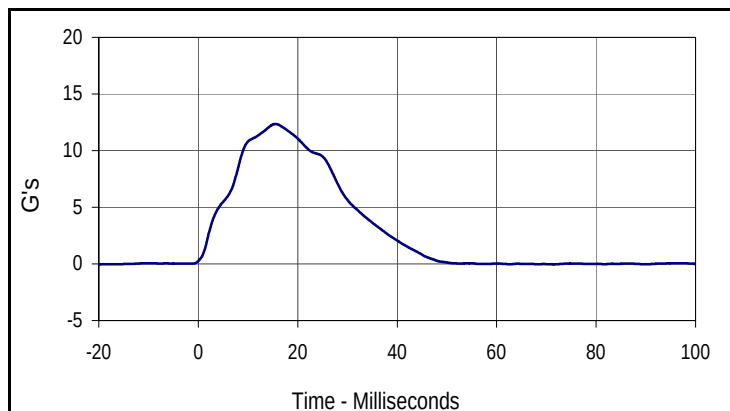


Curve Description			
Upper Abdominal Rib Deflection			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
42.0	19.7	0.0	-1.2

Curve Description			
Lower Abdominal Rib Deflection			
CURNO	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
38.7	18.7	0.0	0.1



Curve Description			
Lower Spine Y Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
9.2	6.8	-3.1	29.8



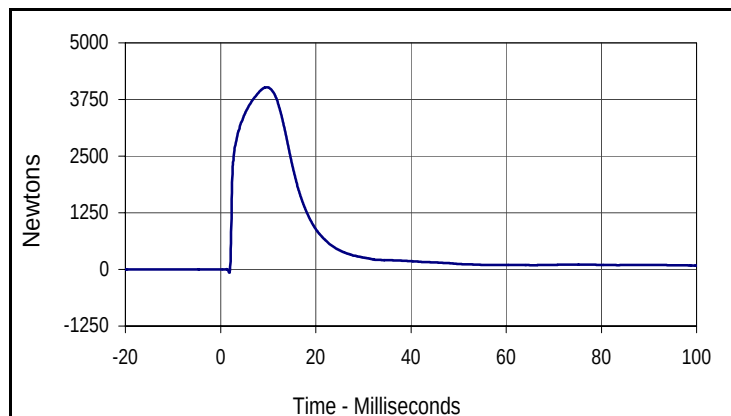
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
12.4	15.5	0.0	71.4

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

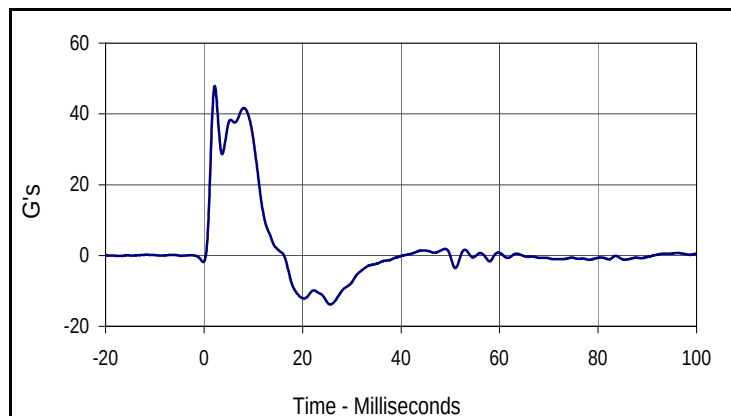
Test Date: 12/17/10
 Test I.D.: PA12C



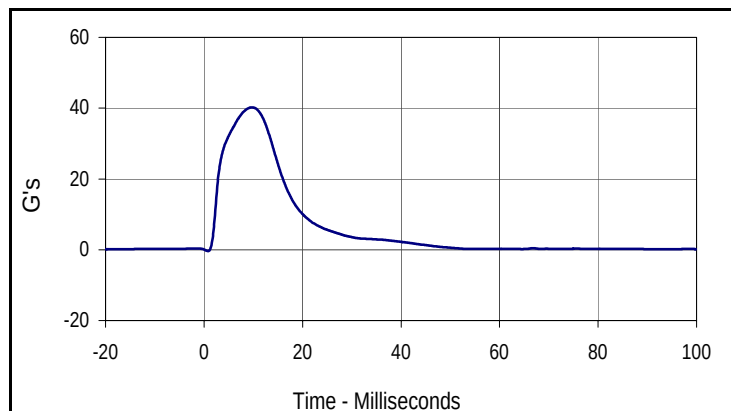
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Pendulum Velocity	m/s	6.60 to 6.80	6.69	Pass
Peak Acetabulum Force	Newtons	3600 to 4300	4019.3	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	41.6	Pass
Peak Impactor Acceleration	G's	38 to 47	40.2	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Acetabulum Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4019.3	9.6	-72.4	1.8



Curve Description			
Pelvis Y Acceleration			
CURNO	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
47.9	2.2	-13.9	25.6



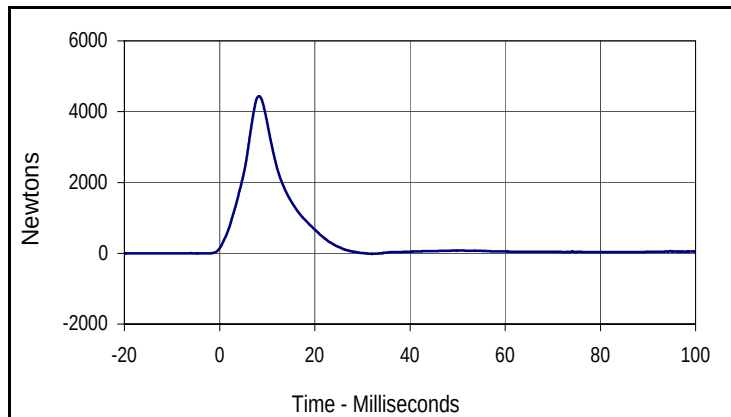
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
40.2	9.7	-0.4	0.8

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

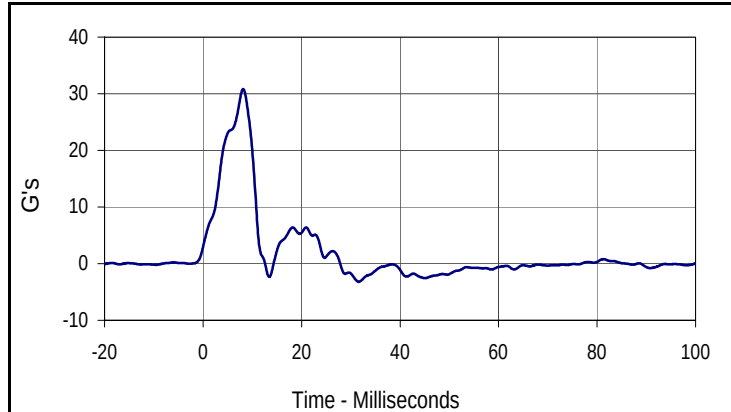
Test Date: 12/17/10
 Test I.D.: PLF12C



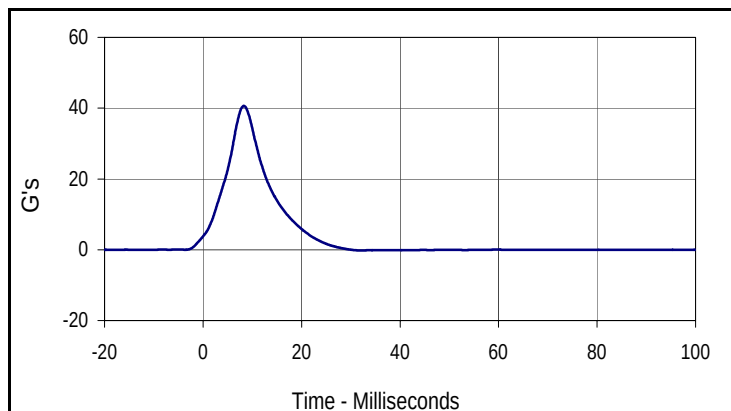
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Pendulum Velocity	m/s	4.2 to 4.4	4.27	Pass
Peak Iliac Force	Newtons	4100 to 5100	4437.5	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	30.8	Pass
Peak Impactor Acceleration	G's	36 to 45	40.6	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Iliac Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4437.5	8.3	-16.7	32.0



Curve Description			
Pelvis Y Acceleration			
CURNO	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
30.8	8.1	-3.2	31.6



Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
40.6	8.3	-0.2	31.9