

REPORT NUMBER: SPNCAP-KAR-11-049

**NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST**

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

NHTSA No: MB5206

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



DECEMBER 14, 2010

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
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15. Supplementary Notes																								
16. Abstract A 32.2 km/h (20 mph) 75° oblique impact Side NCAP test was conducted on the subject 2011 Nissan Murano S 5-Door MPV in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. The test was conducted at the KARCO Engineering, LLC. facility in Adelanto, California on December 14, 2010. The impact velocity was 31.48 km/h and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 23.3° C. The test vehicle's post-test maximum crush was 514 mm at level 3. The test vehicle's performance was as follows: <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Passenger ATD</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td></td> <td>1000</td> <td>463.8</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>G</td> <td>82</td> <td>46</td> </tr> <tr> <td>Combined Acetabulum and Iliac Pelvic Force</td> <td>N</td> <td>5525</td> <td>3991</td> </tr> </tbody> </table> The two doors on the struck side of the vehicle did not separate from the vehicle at the hinges or latches. The opposite side doors did not open during the impact event.						Measurement Description	Passenger ATD			Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	463.8	Resultant Lower Spine Acceleration	G	82	46	Combined Acetabulum and Iliac Pelvic Force	N	5525	3991
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17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V 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 Washington, DC 20590																				
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SECTION 1
TEST PURPOSE AND PROCEDURE

This 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 No. 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 Side NCAP Pole Laboratory Test Procedure, dated January 25, 2010.

SECTION 2

SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2011 Nissan Murano S 5-Door MPV. The subject vehicle was towed into the rigid pole at an angle of 74.3° and a velocity of 31.48 km/h. The test was conducted by KARCO Engineering, LLC. in Adelanto, California, on December 14, 2010. Pre-test and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

One Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure, dated January 25, 2010. Camera location and other pertinent camera information are included in this report.

The Part 572V (SID-IIs) dummy was instrumented as follows:

- Head CG Triaxial Accelerometers
- Thorax Upper, Middle, and Lower Rib Displacement Potentiometers
- Abdomen Upper and Lower Rib Displacement Potentiometers
- Lower Spine Triaxial Accelerometers
- Iliac Load Cell
- Acetabulum Load Cell

Appendix B contains the vehicle and dummy response data. Dummy configuration and performance verification data can be found in Appendix C of this report.

The following table summarizes the results of the test:

Dummy	HIC (36ms)	Resultant Lower Spine Acceleration	Pelvic Force (N)	
SID-IIs 5th Percentile Adult Female	464	46	Iliac Wing	1224
			Acetabular	3004
			Sum	3991

SUPPLEMENTAL RESTRAINT INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	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	

GENERAL COMMENTS

Both of the struck side doors of the test vehicle remained closed and latched and were jammed shut after the impact. There was no separation at the hinges or the latches. The non-struck side doors remained closed and latched. There were no driver injury values that exceeded their limits. There was no FMVSS 301 Stoddard solvent spillage as a result of the impact. The driver's side sill separated beneath the left rear door.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION

Test Vehicle: 2011 Nissan Murano S 5-Door MPV NHTSA No. MB5206
Test Program: 32 km/h (20 mph) Side Impact NCAP 75°Rigid Pole Test Date: 12/14/10

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 PARAMATER DATA

Test Vehicle: 2011 Nissan Murano S 5-Door MPV NHTSA No. MB5206
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75°Rigid Pole Test Date: 12/14/10

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	MB5206
Model Year	2011
Make	Nissan
Model	Murano S
Body Style	5-Door MPV
VIN	JN8AZ1MU9BW051028
Body Color	Brilliant Silver
Delivery Date	11/12/2010
Odometer Reading (km / mi)	196 / 122
Dealer	Miller Nissan Inc.
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. Toso/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)	2327
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

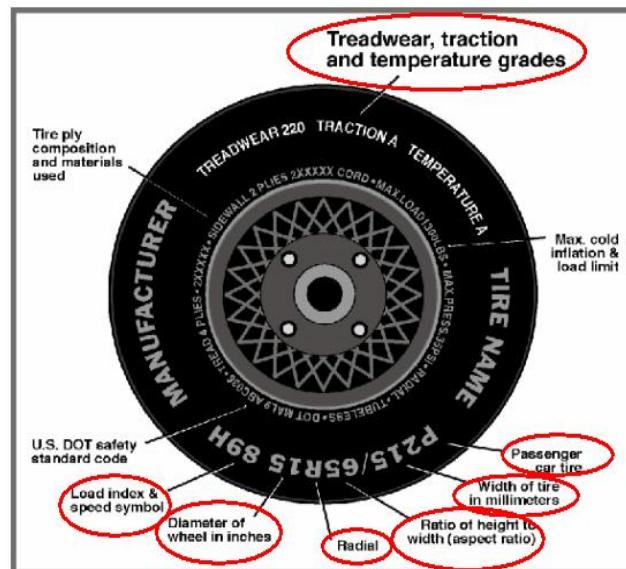
VEHICLE SEAT TYPE

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 PARAMATER DATA

Test Vehicle: 2011 Nissan Murano S 5-Door MPV NHTSA No. MB5206
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75°Rigid Pole Test Date: 12/14/10



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 3ML3 3510	V4VK 3ML3 3510
DOT Safety Code Left	V4VK 3ML3 3510	V4VK 3ML3 3510

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMATER DATA

Test Vehicle: 2011 Nissan Murano S 5-Door MPV NHTSA No. MB5206
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75°Rigid Pole Test Date: 12/14/10

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	532.5	363.0		549.0	414.0		546.0	417.0	
Right	kg	508.0	348.0		506.0	391.0		508.5	394.0	
Ratio	%	59.4%	40.6%	100.0%	56.7%	43.3%	100.0%	56.5%	43.5%	100.0%
Total	kg	1040.5	711.0	1751.5	1055.0	805.0	1860.0	1054.5	811.0	1865.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1751.5	A
Actual Weight of 1 P572V ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	67.8	C
Calculated Vehicle Target Wt (TVTWT)	kg	1868.3	A+B+C

TEST VEHICLE ATTITUDES

Condition	Units	As Delivered	As Tested	Fully Loaded
Driver Door Sill Angle (front-to-rear)	Deg	0.4	0.5	0.5
Front Passenger Sill Angle (front-to-rear)	Deg	0.3	0.2	0.2
Front Bumper Angle (left-to-right)	Deg	-0.1	-0.1	-0.4
Rear Bumper Angle (left-to-right)	Deg	0.2	0.0	0.0
Vehicle CG (Aft of Front Axle)	mm	1148	1224	1229
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	18	29	26

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Weight of Ballast in Cargo Area	kg	80.0
Weight of Vehicle Components Removed	kg	60.0

Vehicle components removed to make Target Vehicle Test Weight:

Non-struck side door panels (11.0 kg), Non-struck side windows (8.5 kg), Spare tire (20.5 kg),
Tools (4.5 kg), Rear carpeting (14.0 kg), Non-struck side mirror (1.5 kg)

TEST VEHICLE IMPACT POINT DATA

Measurement Description	Units	Value
Vertical Impact Reference Line (Aft of Front Axle)	mm	1120
Actual Impact Point (Aft of Front Axle)	mm	1100
Impact Point Difference (- forward/+ rearward)	mm	-20

DATA SHEET NO. 2

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

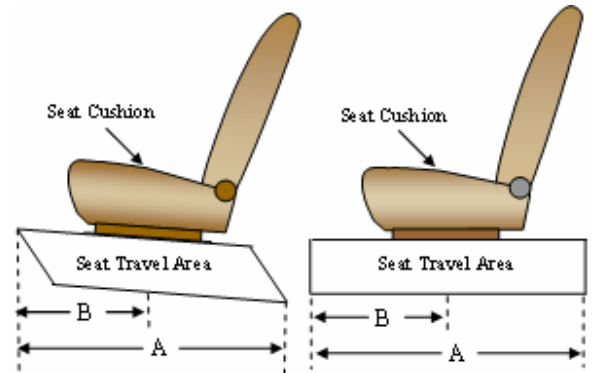
NHTSA No. MB5206

Test Program: 32 km/h (20 mph) Side Impact NCAP 75°Rigid Pole

Test Date: 12/14/10

SEAT FORE / AFT POSITIONING

The total seat travel is measured from the forward most possible position to the rearmost possible position with the seat set at mid angle and lowest height. The driver's seat is set to the forward most position where the ATD will not contact any interior panels at the mid angle and mid height positions.

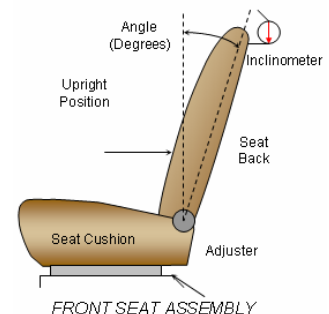


SEAT FORE/AFT POSITIONS

Seating Position	Total Fore-Aft Travel	Placed in Position	Cushion Range	Placed in Position
Driver Seat	240 mm	0 mm	14.7 - 19.1	16.9
Front Passenger Seat	240 mm	0 mm	Fixed	Fixed
Rear Seat - Struck Side	Fixed	Fixed	Fixed	Fixed
Rear Seat - Non-Struck Side	Fixed	Fixed	Fixed	Fixed

SEAT BACK ANGLE POSITIONING

The procedure for the driver is as follows: the seat back is set to level the driver ATD's (SID-IIs) head transverse instrumentation platform; seat back angle is measured at the headrest post using a digital inclinometer. Detent zero (0) is the full forward position.



SEAT BACK ANGLE POSITIONS

Seating Position	Degrees	Detent
Driver Seat Back Angle w/Seated Dummy	9.4	0
Front Passenger Seat Back Angle	9.4	0
Struck Side Rear Seat Back Angle	3.5	0
Non-Struck Side Rear Seat Back Angle	3.5	0

SEAT BELT UPPER ANCHORAGE POSITIONING

The seat belt upper anchorage is positioned to the manufacturer's design position 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

DATA SHEET NO. 2 ... (CONTINUED)

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

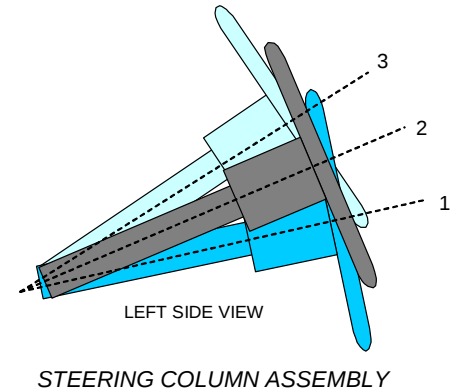
NHTSA No. MB5206

Test Program: 32 km/h (20 mph) Side Impact NCAP 75°Rigid Pole

Test Date: 12/14/10

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 placed across the rim of the steering wheel for angle. A tape measure is used with a reference mark on the steering column to measure telescoping travel.

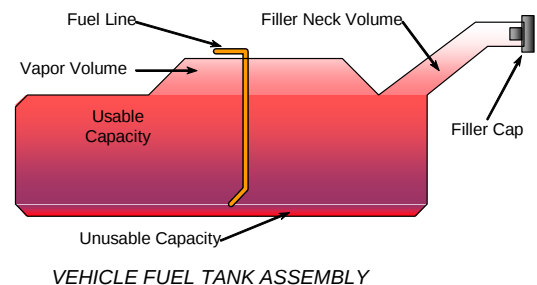


STEERING COLUMN POSITIONS

	Angle (°)	Fore-Aft Position (mm)
Lowermost Position, No. 1	16.5	0
Geometric Center Position, No. 2	22.6	20
Uppermost Position, No. 3	31.5	40
Steering Wheel Travel	15.0	40
Test Position	22.6	20

FUEL PUMP

The test vehicle is equipped with an electric fuel pump. The fuel pump is activated when the ignition is turned on. The fuel filler door is located on the left rear fender. The standard fuel tank occupies the area under the rear seat on the left side of the vehicle.



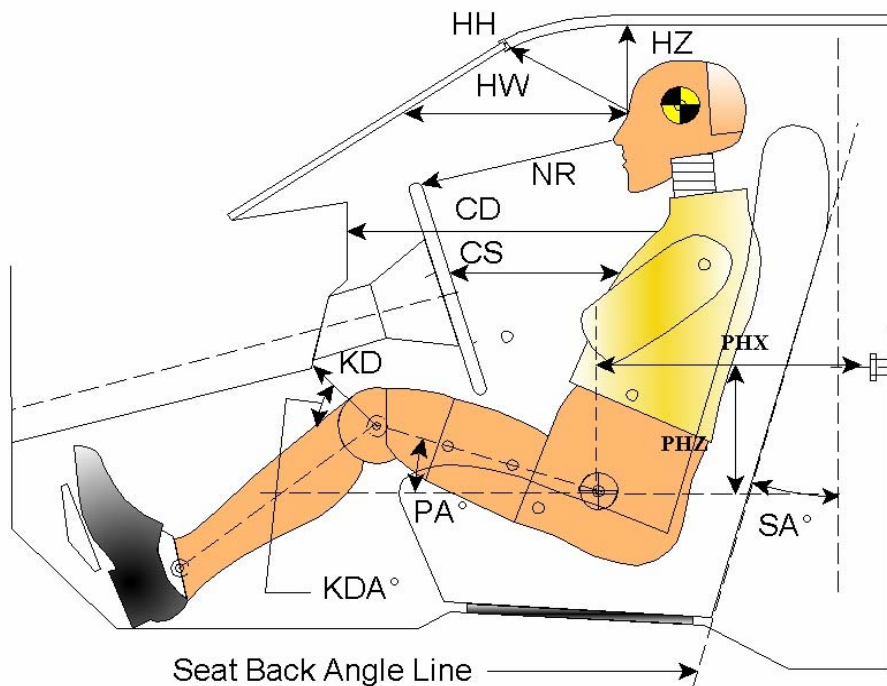
FUEL CAPACITY DATA

Description	Liters
Usable Capacity of "Standard Tank"	81.38
Usable Capacity of "Optional Tank"	
Usable Capacity of Standard Tank as Specified In Owner's Manual	
Usable Capacity of Optional Tank as Specified in Owner's Manual	
92 - 94% of Usable Capacity	74.87 to 76.5
Actual Amount of Stoddard Solvent Used	75.70
1/3 of Usable Capacity	27.13

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Nissan Murano S 5-Door MPV NHTSA No. MB5206
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test Date: 12/14/10



DUMMY LONGITUDINAL CLEARANCE DIMENSIONS (S/N: 299)

Driver Code	Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	246	53.8
HW	Head to Windshield	673	
HZ	Head to Roof	190	
NR	Nose to Rim	190	16.2
CD	Chest to Dash	389	12.0
CS	Chest to Steering Wheel	150	33.8
KDL / KDAL°	Left Knee to Dash	94	47.3
KDR / KDAR°	Right Knee to Dash	70	
PA°	Pelvic Angle		18.4
PHX	H-Point to Striker (x-direction)	385	
PHZ	H-Point to Striker (z-direction)	80	
SA°	Seat Back Angle		9.4

DATA SHEET NO. 4

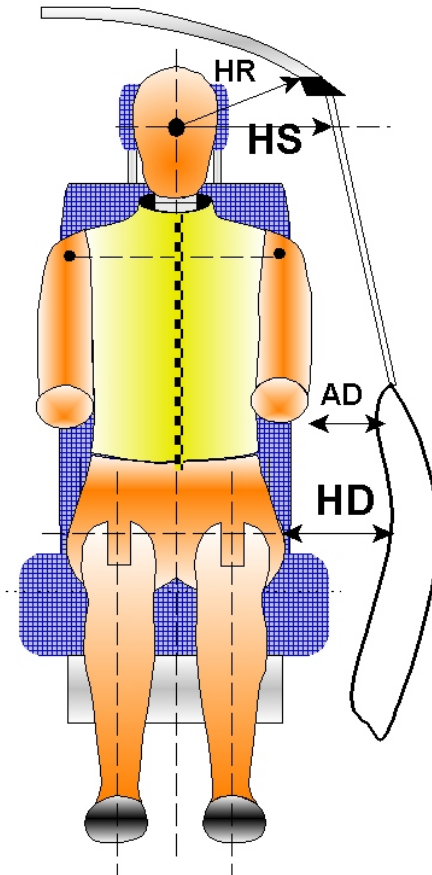
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5206

Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole

Test Date: 12/14/10



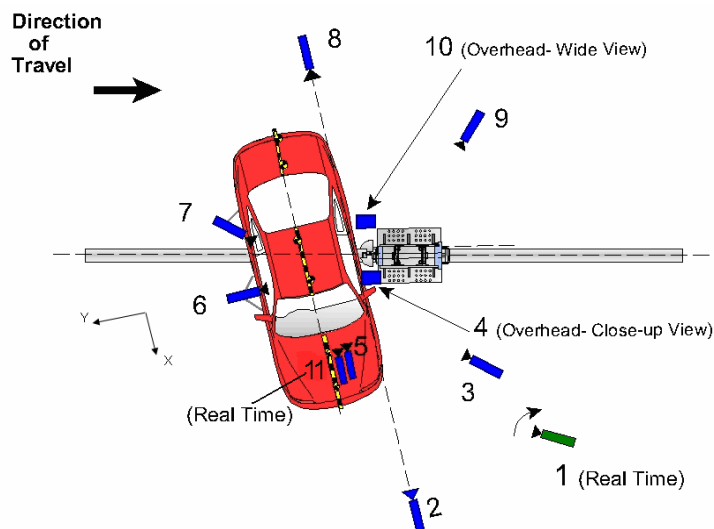
DUMMY LATERAL CLEARANCE DIMENSIONS (S/N: 299)

Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	253
HS	Head to Side Window	mm	395
AD	Arm to Door	mm	173
HD	H-Point to Door	mm	189

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2011 Nissan Murano S 5-Door MPV NHTSA No. MB5206
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test Date: 12/14/10



Reference: +X = Forward of Vehicle (from Point of Impact)
 +Y = Right of Vehicle (from Point of Impact)
 +Z = Down (from Ground)

CAMERA LOCATIONS

Camera No.	View	Coordinates (m)			Lens (mm)	Film Speed (fps)
		X*	Y*	Z*		
1	Real Time Pan View of Impact	8.89	46.57	-3.04		30
2	Front Ground Level - Impact View	8.34	-0.05	-0.93	24	1000
3	Impact Side 45° - Forward Pole View	4.10	-2.15	-1.15	8.5	1000
4	Overhead Close-Up View of Impact	0.00	0.00	-5.79	12.5	1000
5	On-Board - Dummy Front View	0.00	0.06	-1.10	35	400
6	On-Board - Dummy Side View	-0.15	0.05	-1.10	14	1000
7	On-Board - Dummy Rear Oblique View	-0.30	0.05	-1.10	20	1000
8	Rear Ground Level - Impact View	-6.12	-6.23	-0.96	24	1000
9	Impact Side 45° - Rearward Pole View	-8.02	0.04	-1.01	35	1000
10	Overhead Wide View of Impact	-0.06	0.22	-5.79	14	1000
11	Real Time Dummy Front View	-0.90	0.03	-1.10		30

* All measurements accurate to ± 3 mm

NOTE: Vehicle was at a 15° angle to the rigid pole

INSTRUMENTATION

	Number of Channels
Driver Dummy	16
Vehicle Structure	21
Pole Load Cells	8
Contact Switches	3
Airbag Timing Sensor	2
Total No. of Data Channels	50

DATA SHEET NO. 6

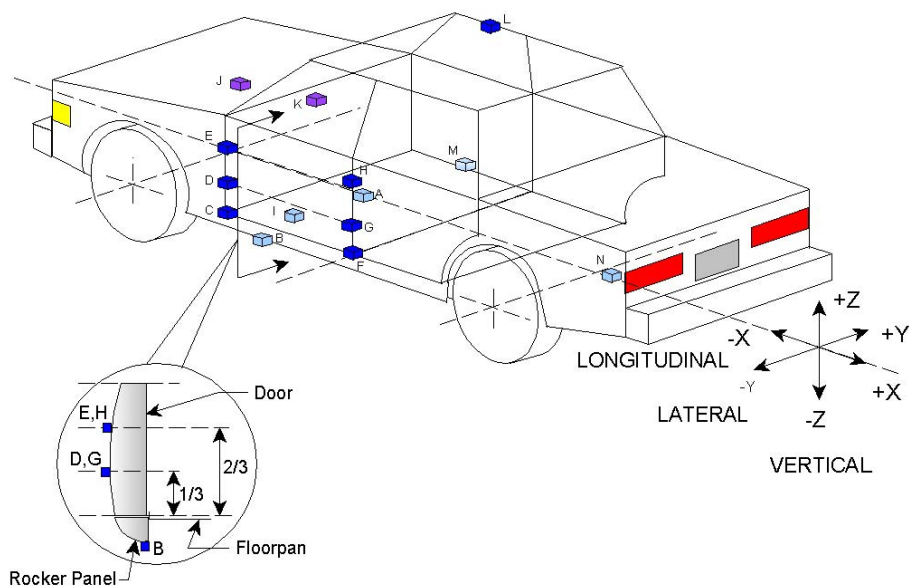
VEHICLE ACCELEROMETER DATA

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5206

Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole

Test Date: 12/14/10



VEHICLE ACCELEROMETER LOCATIONS

	Sensor Description	Coordinates (mm)		
		X	Y	Z
A	Vehicle CG Accelerometer	2010	0	-410
	Vehicle CG ARS	2010	0	-410
B	Left Floor Sill	3103	-795	-305
C	A-Pillar Sill	3279	-840	-427
D	A-Pillar Lower	3279	-840	-735
E	A-Pillar Mid	3279	-840	-996
F	B-Pillar Sill	2164	-750	-446
G	B-Pillar Lower	2164	-750	-708
H	B-Pillar Mid	2164	-750	-957
I	Driver Seat	2509	-583	-446
J	Engine Top	3773	83	-973
K	Firewall	3665	394	-1033
L	Right Roof Sill	2330	531	-1667
M	Right Floor Sill	2131	711	-407
N	Rear Floorpan	925	460	-536

Reference: X = + Forward
Y = + To Right
Z = + Down

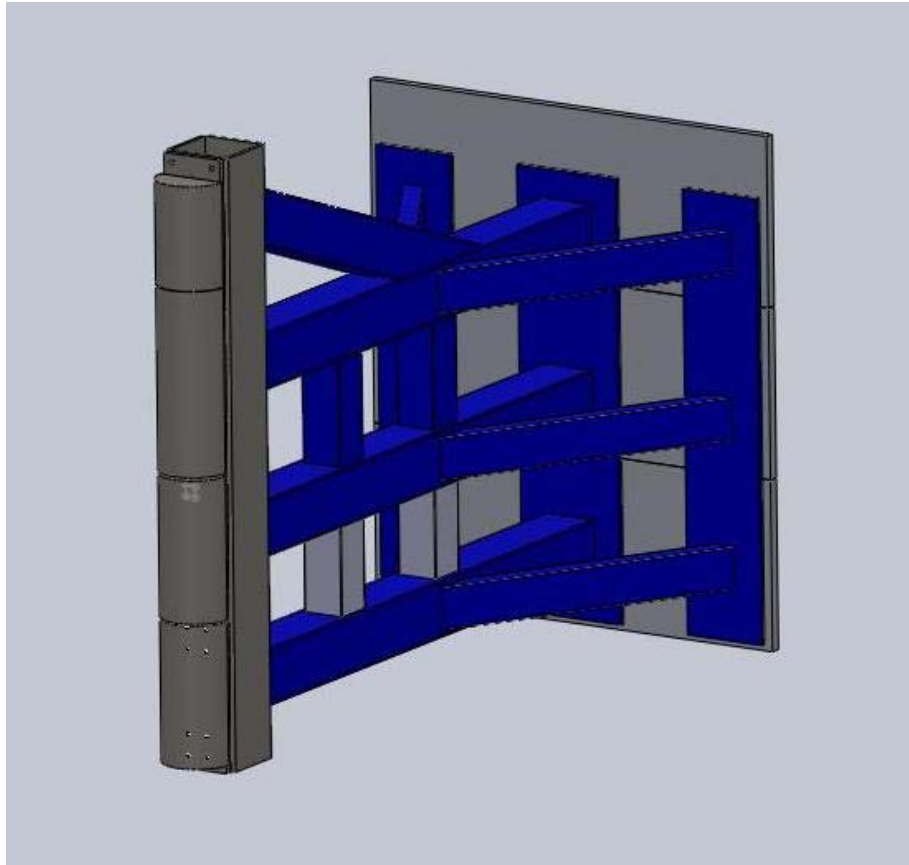
DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5206

Test Program: 32 km/h (20 mph) Side Impact NCAP 75°Rigid Pole

Test Date: 12/14/10



RIGID POLE LOAD CELL LOCATIONS

ID	Units	Height From Ground
1	mm	87
2	mm	468
3	mm	648
4	mm	978
5	mm	1168
6	mm	1651
7	mm	1816
8	mm	2057

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2011 Nissan Murano S 5-Door MPV NHTSA No. MB5206
Test Program: 32 km/h (20 mph) Side Impact NCAP 75°Rigid Pole Test Date: 12/14/10

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Driver Dummy
Dummy Type/Serial No.	P572V (SID-IIs) / Serial No. 299
Head Contact	Curtain Airbag, Head Restraint
Upper Torso Contact	Torso/Pelvis Airbag, Door Panel
Lower Torso Contact	Torso/Pelvis Airbag, Door Panel
Left Knee Contact	Knee Bolster
Right Knee Contact	None

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
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	Separation under left rear door
Windshield Damage	Broken
Window Damage	Left front window broken
Other Notable Effects	Driver door skin separation, Separation on left rear roof

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				

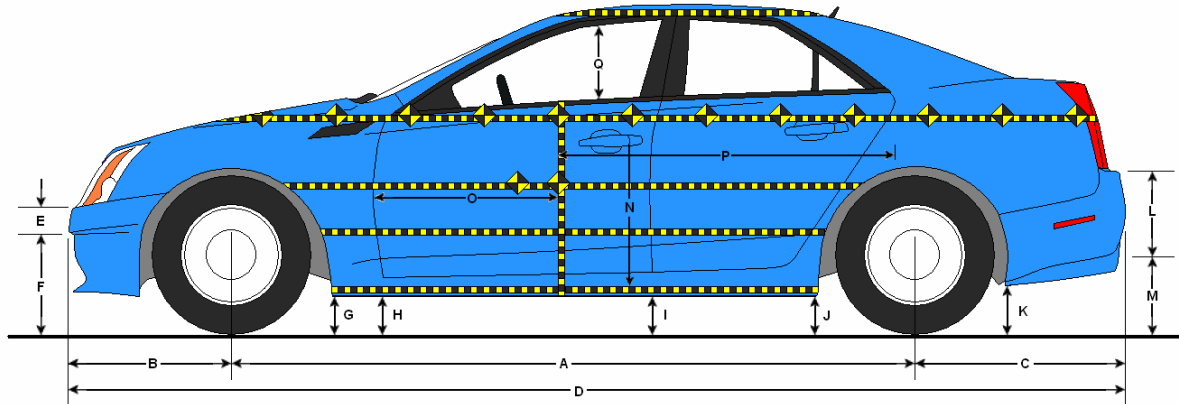
VEHICLE SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset From Vertical Reference Line	mm	+/- 38	-20 (Left)
Trap No. 1 Velocity (Primary)	km/h	30.4 to 33.0	31.5
Trap No. 2 Velocity (Redundant)	km/h	30.4 to 33.0	31.4

DATA SHEET NO. 9

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Nissan Murano S 5-Door MPV NHTSA No. MB5206
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75°Rigid Pole Test Date: 12/14/10



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Vehicle Wheelbase	2827	2726	-101
B	Front Axle to FSOV	993	1009	16
C	Rear Axle to RSOV	995	1026	31
D1	Total Vehicle Length at Left Side	3257	3137	-120
D2	Total Vehicle Length at Centerline	4805	4762	-43
D3	Total Vehicle Length at Right Side	3255	3269	14
E	Front Bumper Thickness	177	174	-3
F	Front Bumper Bottom to Ground	550	591	41
G	Sill Height at Front Wheel Well	345	349	4
H	Sill Height at Front Door Leading Edge	347	350	3
I	Sill Height at B-Pillar	348	368	20
J1	Sill Height at Rear Wheel Well	348	385	37
J2	Pinch Weld Height at Rear Wheel Well	310	328	18
K	Sill Aft of Rear Wheel Well	343	360	17
L	Rear Bumper Thickness	173	173	0
M	Rear Bumper Bottom to Ground	545	552	7
N	Sill Height to Window Bottom Sill	655	737	82
O	Front Door Leading Edge to Impact CL	586	441	-145
P	Rear Door Trailing Edge to Impact CL	1491	1360	-131
Q	Front Window Opening	447	454	7
R	Right Side Length	3255	3269	14
S	Left Side Length	3257	3137	-120
T	Vehicle Width at B-Pillar	1861	1711	-150

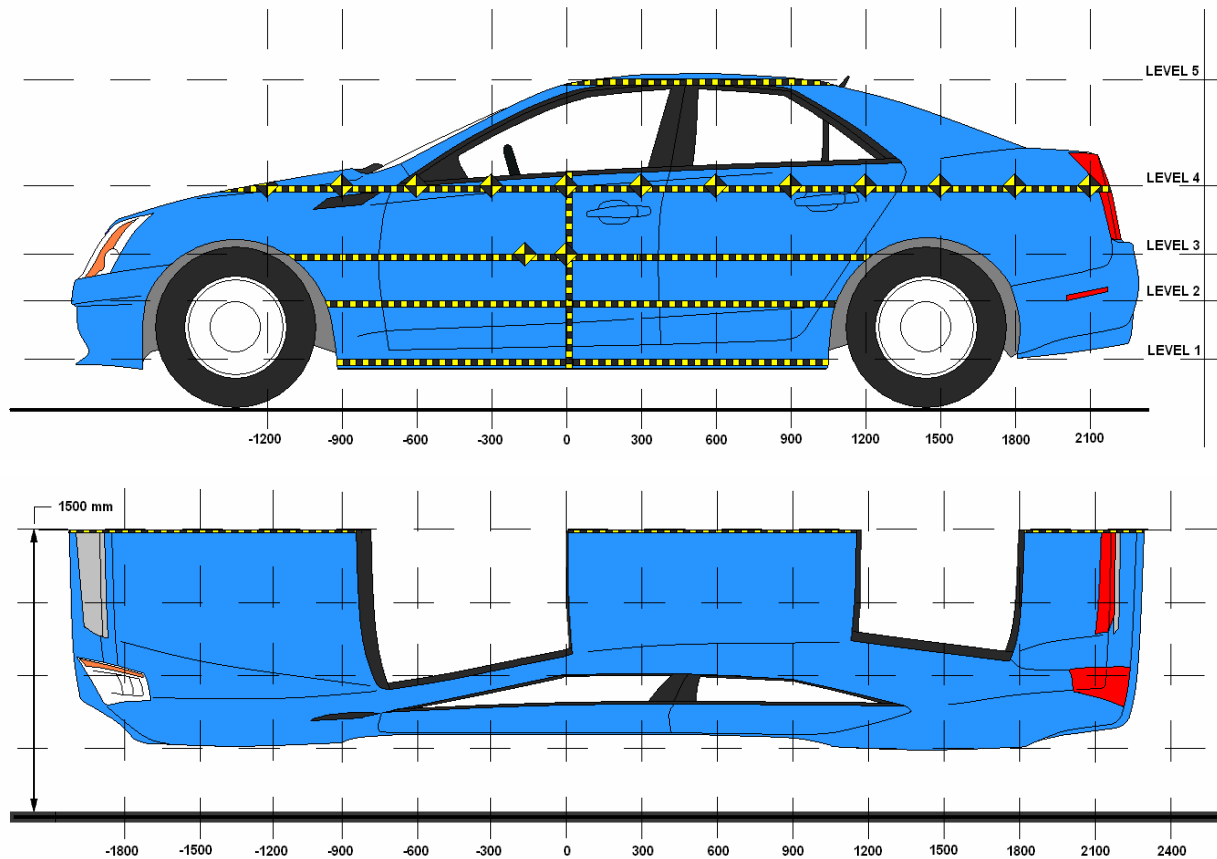
* All measurements accurate to ± 3 mm

DATA SHEET NO. 10

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Nissan Murano S 5-Door MPV NHTSA No. MB5206

Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test Date: 12/14/10



NOTE: All measurements are in millimeters (mm)

Level	Description	Height Above Ground (mm)
1	Sill Top Height	375
2	Occupant H-Point Height	736
3	Mid-Door Height	770
4	Window Sill Height	1099
5	Window Top Height	1621

DATA SHEET NO. 10 ... (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5206

Test Program: 32 km/h (20 mph) Side Impact NCAP 75°Rigid Pole

Test Date: 12/14/10

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900				673					743					70	
-750		559	559	660			637	638	733			78	79	73	
-600	617	564	565	649		700	651	647	741		83	87	82	92	
-450	609	575	575	644		776	772	769	792		167	197	194	148	
-300	603	574	574	637		858	888	886	881		255	314	312	244	
-150	601	572	571	631		945	988	988	987		344	416	417	356	
0	600	570	569	625		1018	1082	1083	1089		418	512	514	464	
150	600	569	568	620	909	996	1061	1063	1077	1141	396	492	495	457	232
300	600	568	566	614	878	947	931	933	955	1102	347	363	367	341	224
450	602	567	566	609	872	902	817	817	844	1062	300	250	251	235	190
600	603	568	566	601	869	780	761	760	795	1025	177	193	194	194	156
750	605	569	567	598	870	733	726	726	764	995	128	157	159	166	125
900	609	571	569	597	871	689	693	693	734	972	80	122	124	137	101
1050	619	568	568	598	875	651	656	658	708	955	32	88	90	110	80
1200	628	561	561	600	882	614	620	619	682	950	-14	59	58	82	68
1350		559	558	608	892		584	585	665	956		25	27	57	64
1500				607	907				642	966				35	59
1650				612	925				659	978				47	53
1800				621					660					39	
1950				636					669					33	
2100															
2250															
2400															
2550															
2700															
2850															

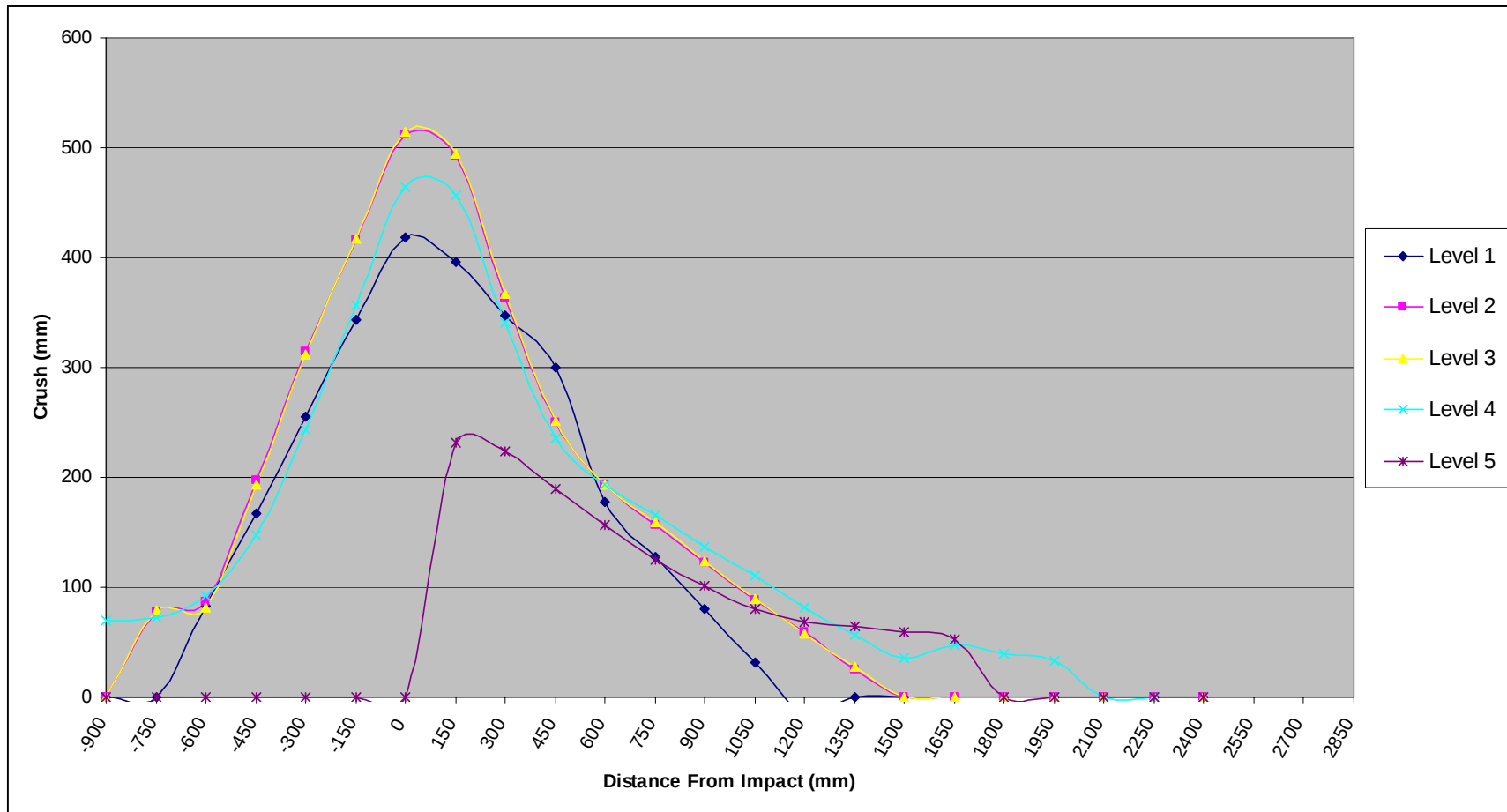
MAXIMUM CRUSH DATA

	Units	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush	mm	418	512	514	464	232
Distance From Impact	mm	0	0	0	0	150

DATA SHEET NO. 10 ... (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Nissan Murano S 5-Door MPV
Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole

NHTSA No. MB5206
Test Date: 12/14/10



DATA SHEET NO. 11

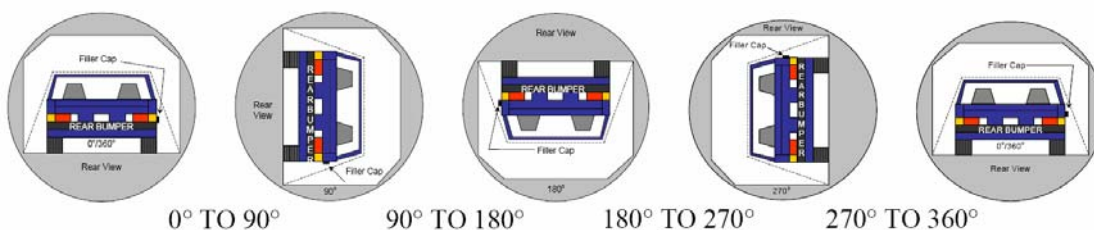
FMVSS NO. 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2011 Nissan Murano S 5-Door MPV NHTSA No. MB5206
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test Date: 12/14/10

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 23.3° C Test Time: 10:50 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°	80	300	380
90° To 180°	82	300	382
180° To 270°	77	300	377
270° To 360°	79	300	379

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. 12

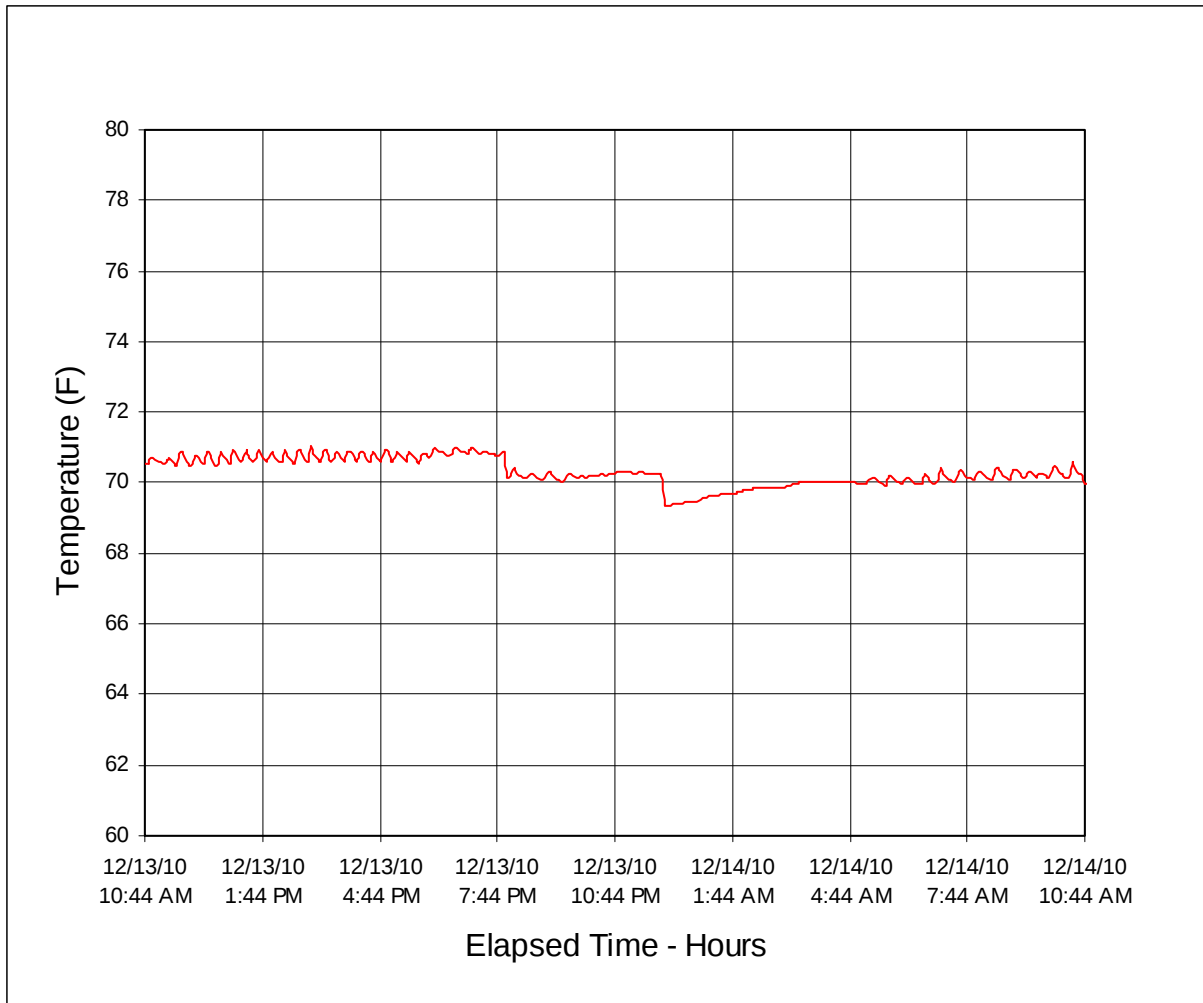
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2011 Nissan Murano S 5-Door MPV

NHTSA No. MB5206

Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole

Test Date: 12/14/10



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 Test Vehicle



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



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

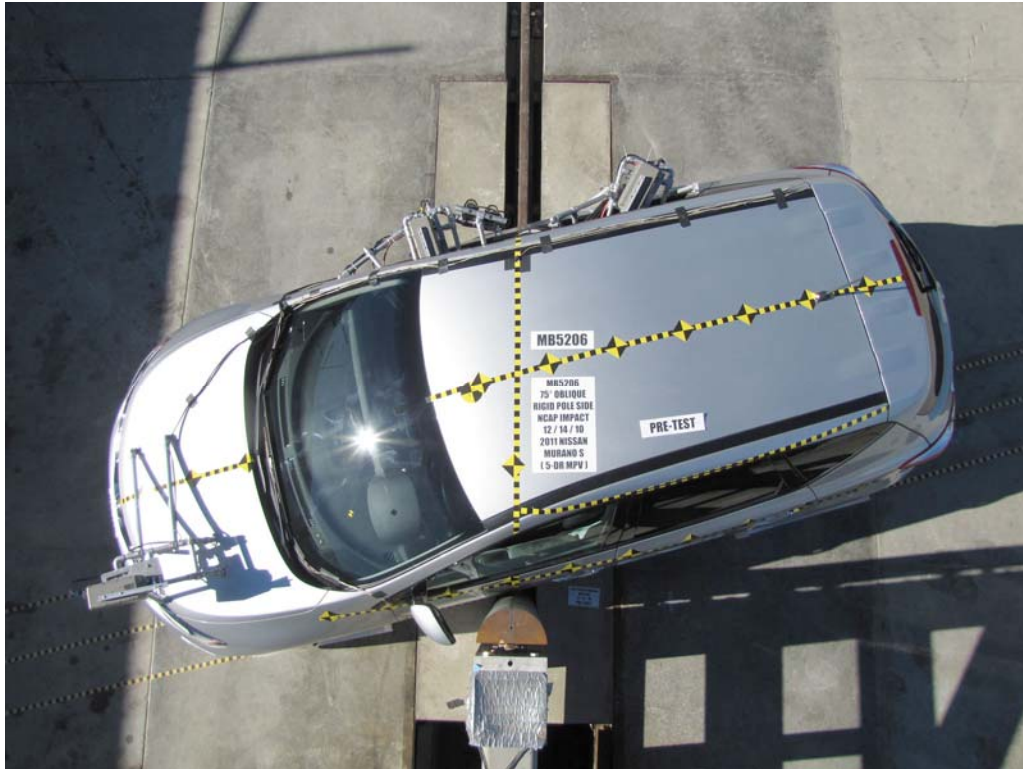


FIGURE 15. Pre-Test Overhead View of Test Vehicle and Pole



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



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



FIGURE 18. Pre-Test Right Side View of Pole
Positioned Against Side of 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 Location



FIGURE 21. Pre-Test Front Close-Up View of Dummy



FIGURE 22. Post-Test Front Close-Up View of Dummy



FIGURE 23. Pre-Test Left Side View of Dummy Showing Belt, Chalking, and Contact Switches



FIGURE 24. Pre-Test Left Side View of Dummy Shoulder and Driver Door Top View



FIGURE 25. Post-Test Left Side View of Dummy Shoulder and Door Top View



FIGURE 26. Pre-Test Frontal View of Seat Back Prior to Dummy



FIGURE 27. Pre-Test Frontal View of Dummy Head and Shoulders
in Relation to Head Restraint



FIGURE 28. Pre-Test Frontal View of Seat Pan Prior to Dummy Positioning



FIGURE 29. Pre-Test Overhead View of Dummy Thighs on Seat Pan



FIGURE 30. Pre-Test View of Dummy's Neck Showing Position of Adjustable Neck Bracket



FIGURE 31. Pre-Test View of Dummy's Head Showing Dummy's Head Is Level

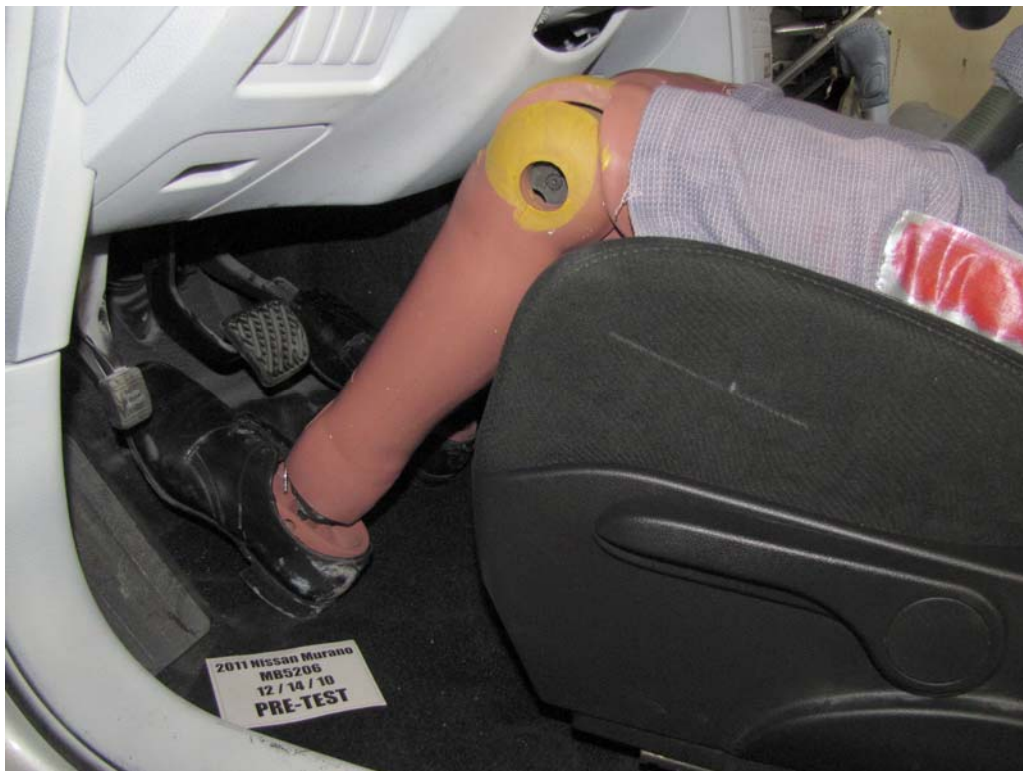


FIGURE 32. Pre-Test Placement of Dummy's Feet

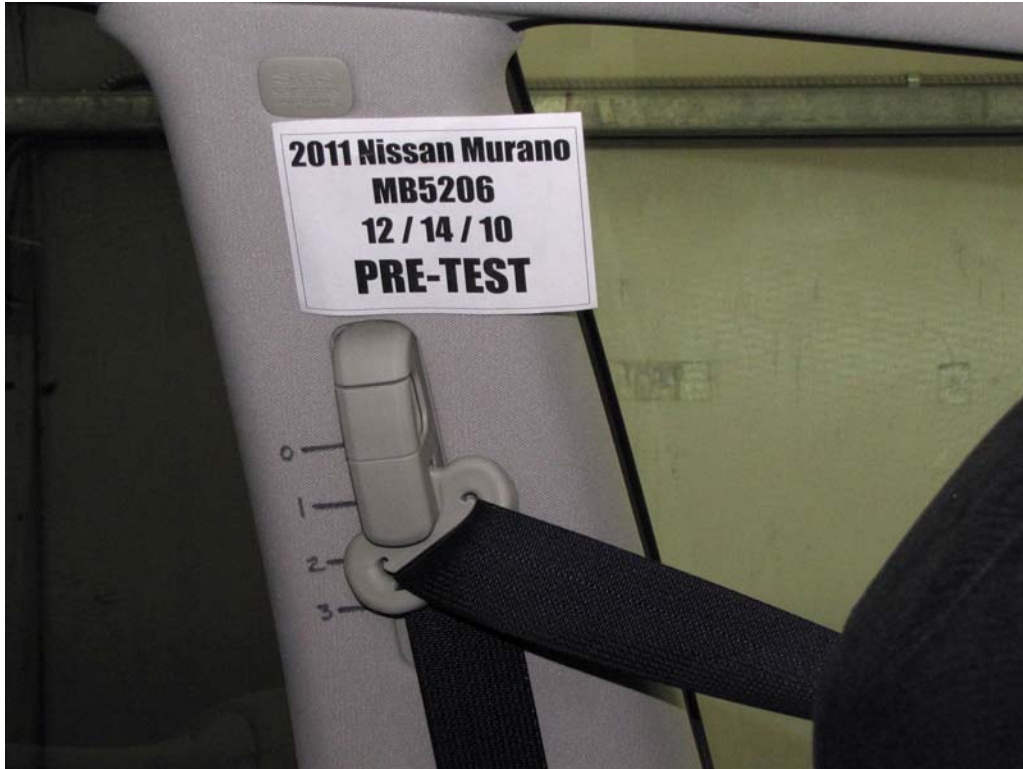


FIGURE 33. Pre-Test View of Belt Anchorage for Dummy



FIGURE 34. Pre-Test Left Side View of Steering Wheel



FIGURE 35. Pre-Test View of Parking Brake



FIGURE 36. Pre-Test Close-Up Left Side View of Driver Seat Track



FIGURE 37. Pre-Test Close-Up Left Side View of Driver Seat Back



FIGURE 38. Pre-Test Close-Up View of Driver Seat Back or Head Restraint



FIGURE 39. Pre-Test Driver Dummy and Door Clearance



FIGURE 40. Post-Test Driver Dummy and Door Clearance



FIGURE 41. Pre-Test Right Side View of Dummy and Front Seat Occupant Compartment



FIGURE 42. Post-Test Right Side View of Dummy and Front Seat Occupant Compartment



FIGURE 43. Pre-Test Inner Driver Door Panel View



FIGURE 44. Post-Test Inner Driver Door Panel View
Showing Dummy Contact Locations



FIGURE 45. Post-Test Dummy Close-Up Head Contact with Vehicle Interior View



FIGURE 46. Post-Test Dummy Close-Up Head Contact with Side Airbag View



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



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



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

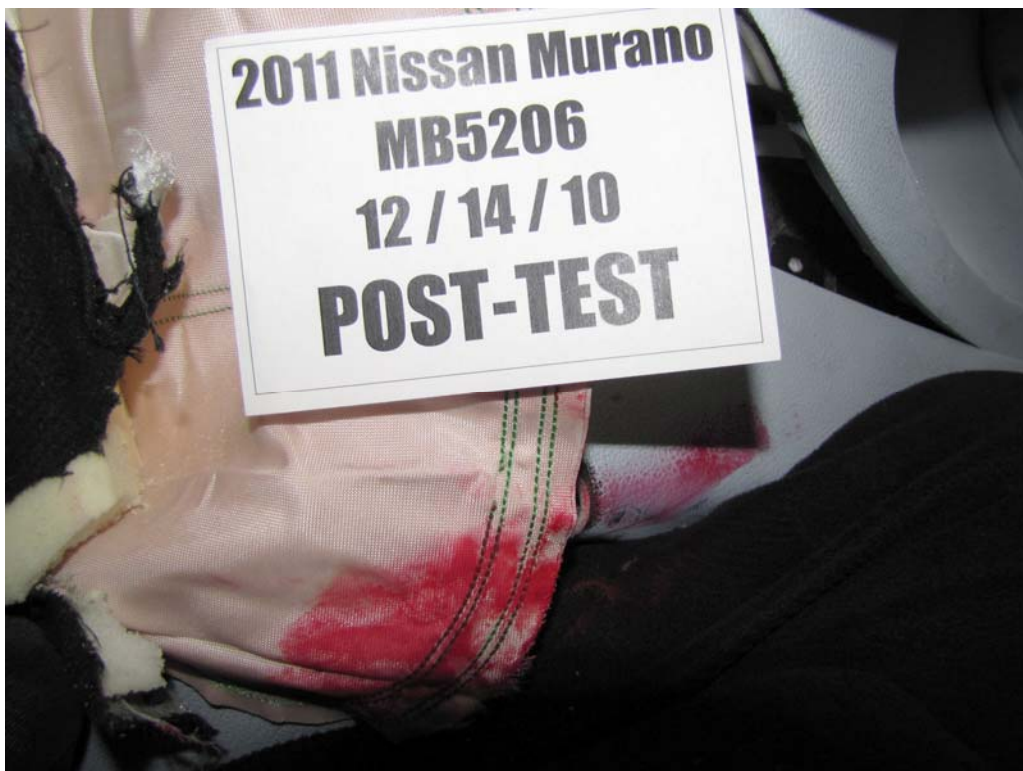


FIGURE 50. Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View



FIGURE 51. Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



FIGURE 52. Post-Test View of Fuel Filler Cap or Fuel Filler Neck



FIGURE 53. Close-Up View of Vehicle's Certification Label



FIGURE 54. Close-Up View of Vehicle's Tire Information Placard



FIGURE 55. Pre-Test Pole Barrier Front View



FIGURE 56. Post-Test Pole Barrier Front View



FIGURE 57. Pre-Test Pole Barrier Side View



FIGURE 58. Post-Test Pole Barrier Side View

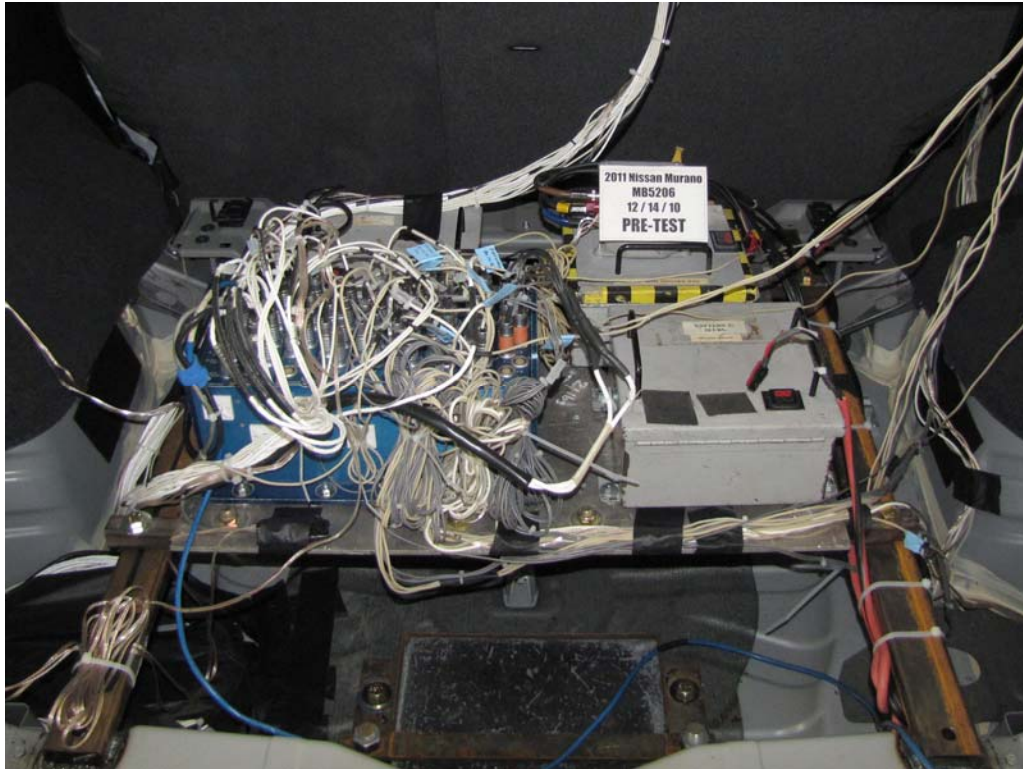


FIGURE 59. Pre-Test Ballast View



FIGURE 60. Post-Test Primary and Redundant Speed Trap Read-Out

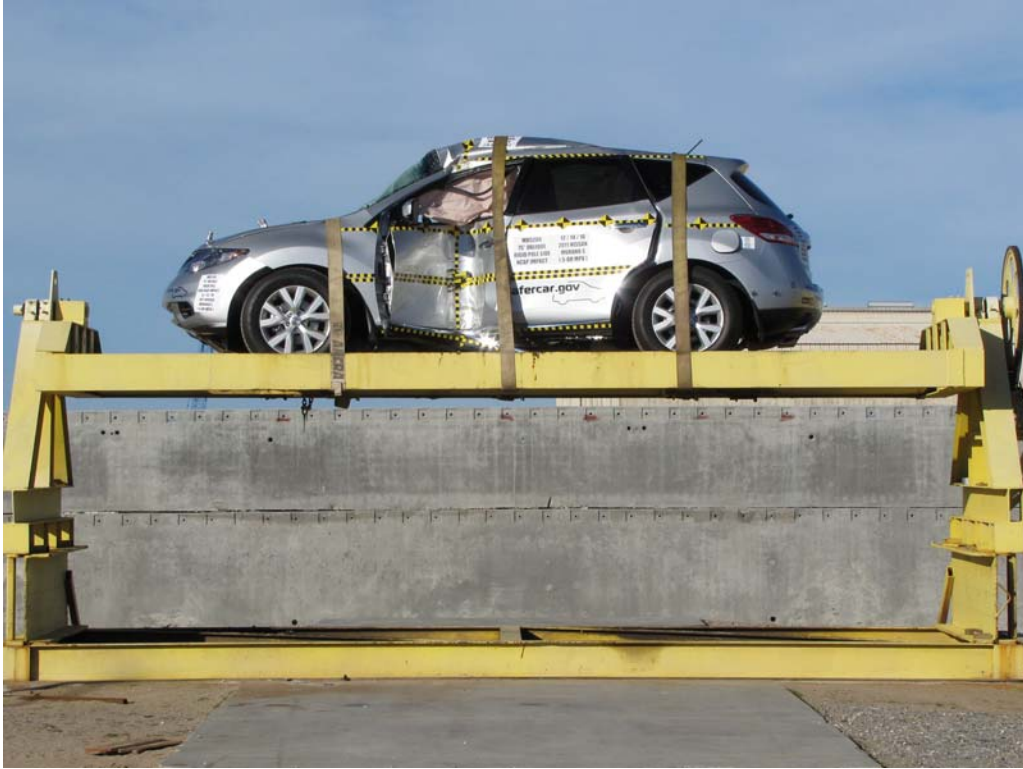


FIGURE 61. FMVSS No. 301-305 Rollover 0 Degrees

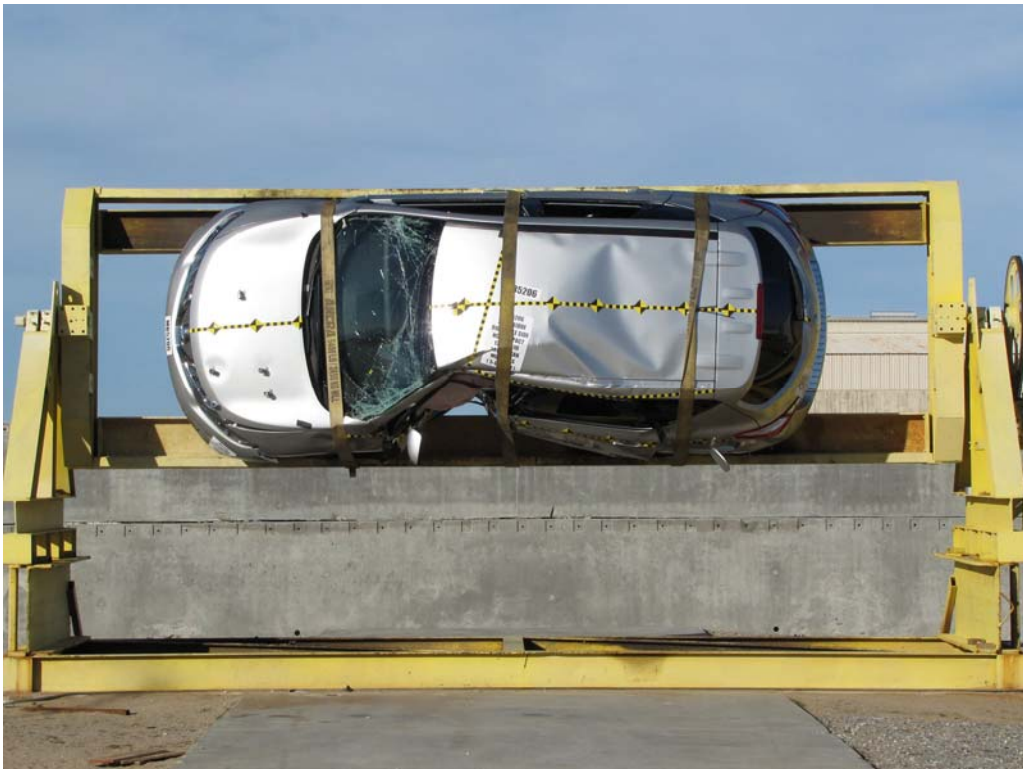


FIGURE 62. FMVSS No. 301-305 Rollover 90 Degrees



FIGURE 63. FMVSS No. 301-305 Rollover 180 Degrees



FIGURE 64. FMVSS No. 301-305 Rollover 270 Degrees

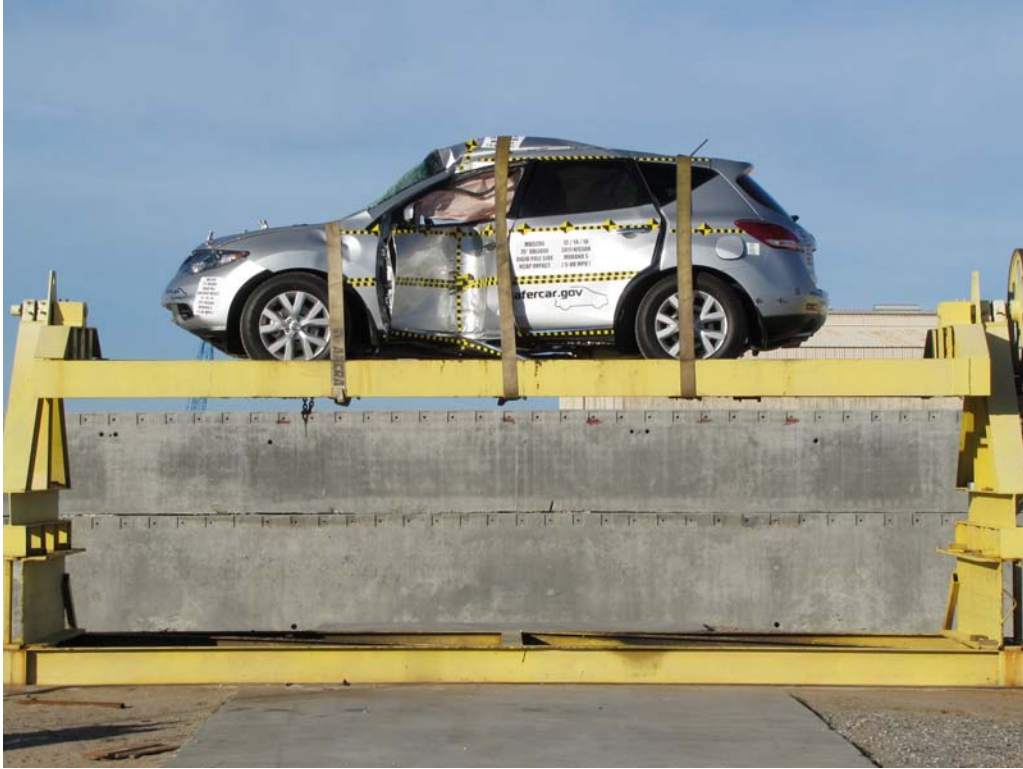


FIGURE 65. FMVSS No. 301-305 Rollover 360 Degrees



FIGURE 66. Impact Event

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

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2	Driver Head Acceleration (Y) Primary	B-1
3	Driver Head Acceleration(Z) Primary	B-1
4	Driver Head Resultant Primary	B-1
5	Driver Lower Spine T12 Acceleration (X)	B-2
6	Driver Lower Spine T12 Acceleration (Y)	B-2
7	Driver Lower Spine T12 Acceleration (Z)	B-2
8	Driver Lower Spine Y12 Resultant Acceleration	B-2
9	Driver Iliac Wing Force on Impact Side (Y)	B-3
10	Driver Acetabulum Force on Impact Side (Y)	B-3
11	Driver Total Pelvis Force on Impact Side (Y)	B-3

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.

Additional Driver Dummy Instrumentation Data

Driver Head Acceleration (X) Redundant
 Driver Head Acceleration (Y) Redundant
 Driver Head Acceleration (Z) Redundant
 Driver Upper Thorax Rib Deflection (Y)
 Driver Middle Thorax Rib Deflection (Y)
 Driver Lower Thorax Rib Deflection (Y)
 Driver Upper Abdomen Rib Deflection (Y)
 Driver Lower Abdomen Rib Deflection (Y)
 Driver Shoulder Contact Switch
 Driver Torso Contact Switch
 Driver Pelvis Contact Switch
 Center of Gravity Acceleration (X)
 Vehicle Center of Gravity Acceleration (Y)
 Vehicle Center of Gravity Acceleration (Z)
 Vehicle Center of Gravity Angular Rate About X (Roll)
 Vehicle Center of Gravity Angular Rate About Y (Pitch)
 Vehicle Center of Gravity Angular Rate About Z (Yaw)

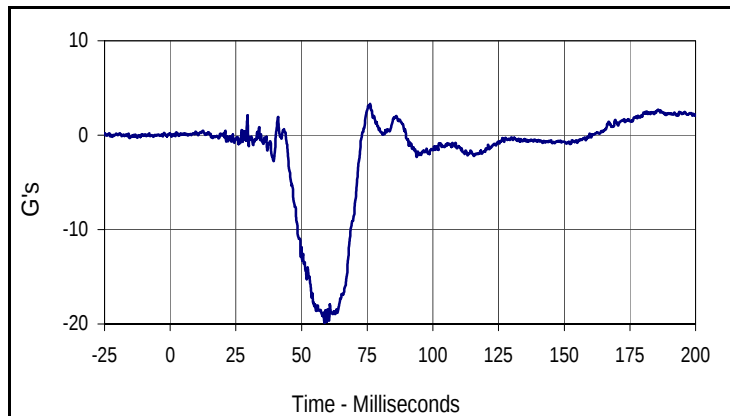
Left Floor Sill Acceleration (Y)
Left A-Pillar Sill Acceleration (Y)
Left Lower A-Pillar Acceleration (Y)
Left Mid A-Pillar Acceleration (Y)
Left B-Pillar Sill Acceleration (Y)
Left Lower B-Pillar Acceleration (Y)
Left Mid B-Pillar Acceleration (Y)
Driver Seat Track at Dummy H-Point Acceleration (Y)
Engine Top Acceleration (X)
Engine Top Acceleration (Y)
Firewall Center Acceleration (Y)
Right Roof at Vertical Impact Reference Line Acceleration (Y)
Right Sill at Vertical Impact Reference Line Acceleration (Y)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)
Driver Side Airbag Timing
Driver Side Curtain Airbag Timing

Pole Instrumentation Data

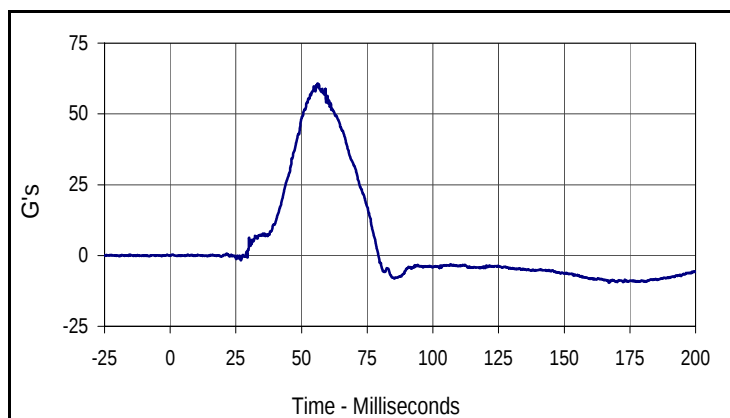
Load Cell Pole Barrier #1 Force (Y)
Load Cell Pole Barrier #2 Force (Y)
Load Cell Pole Barrier #3 Force (Y)
Load Cell Pole Barrier #4 Force (Y)
Load Cell Pole Barrier #5 Force (Y)
Load Cell Pole Barrier #6 Force (Y)
Load Cell Pole Barrier #7 Force (Y)
Load Cell Pole Barrier #8 Force (Y)

Test Vehicle: 2011 Nissan Murano S 5-Door MPV
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test

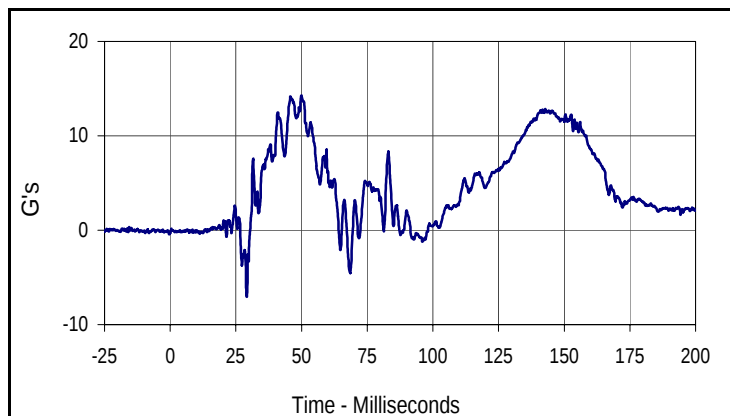
Test Date: 12/14/10
 NHTSA No.: MB5206



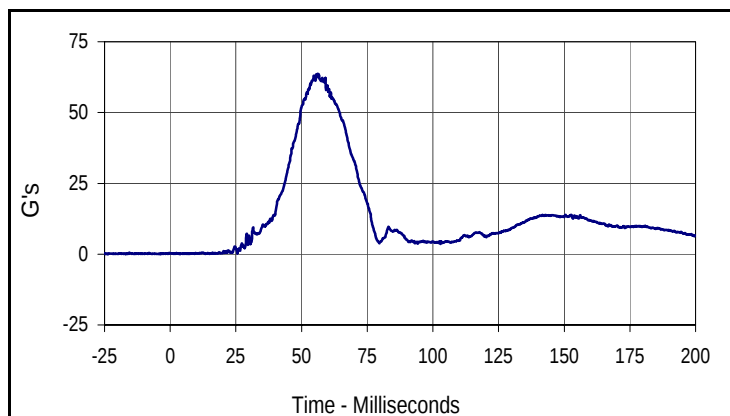
Curve Description			
Driver Head Acceleration X Primary			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
3.3	76.1	-19.9	58.8



Curve Description			
Driver Head Acceleration Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
60.8	56.1	-9.6	167.1



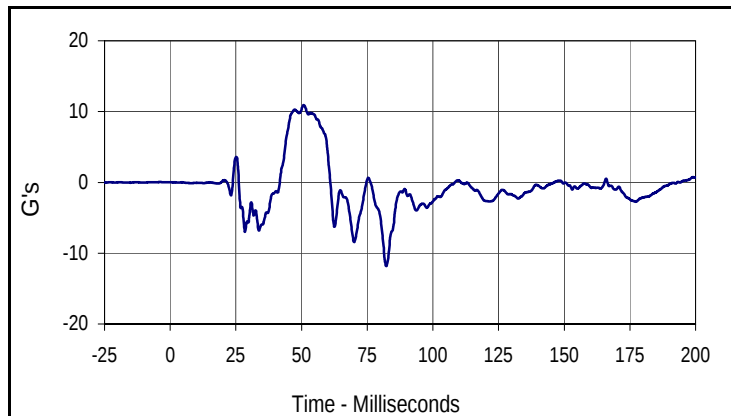
Curve Description			
Driver Head Acceleration Z Primary			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
14.3	50.0	-7.1	29.2



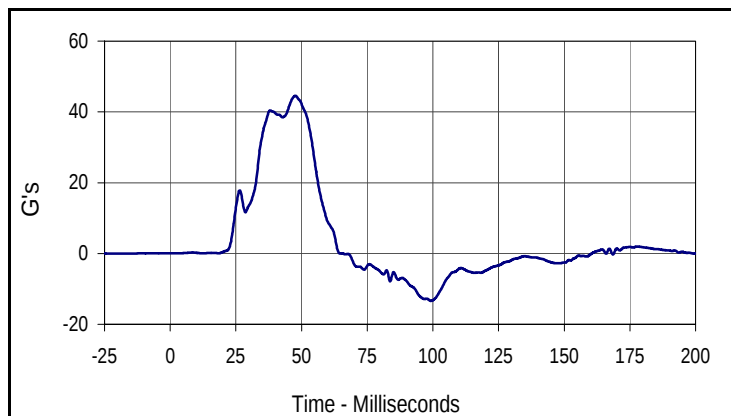
Curve Description			
Driver Head Acceleration Primary Res.			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
63.7	56.1	0.0	3.7

Test Vehicle: 2011 Nissan Murano S 5-Door MPV
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test

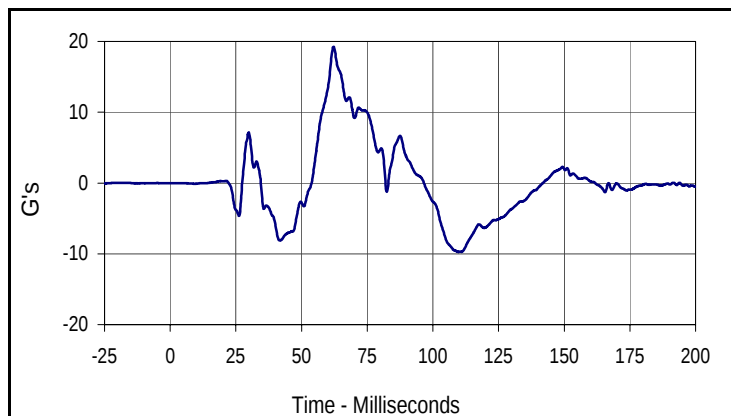
Test Date: 12/14/10
 NHTSA No.: MB5206



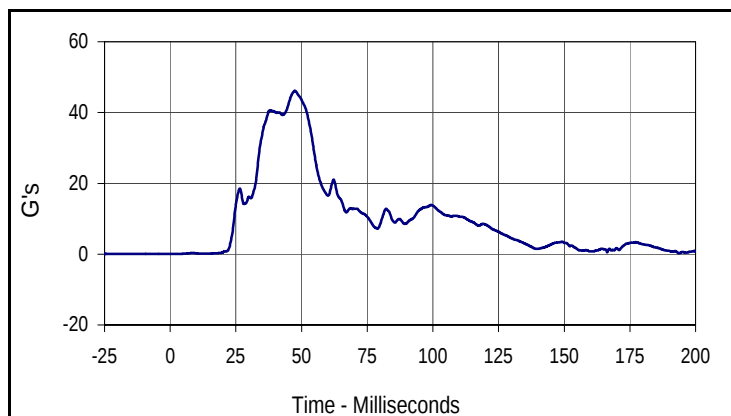
Curve Description			
Driver Lower Spine T12 Acceleration X			
CURNO	Type	SAE Class	Units
012	FIL	180	G's
Max	Time	Min	Time
10.9	50.8	-11.8	82.2



Curve Description			
Driver Lower Spine T12 Acceleration Y			
CURNO	Type	SAE Class	Units
013	FIL	180	G's
Max	Time	Min	Time
44.6	47.6	-13.4	99.2



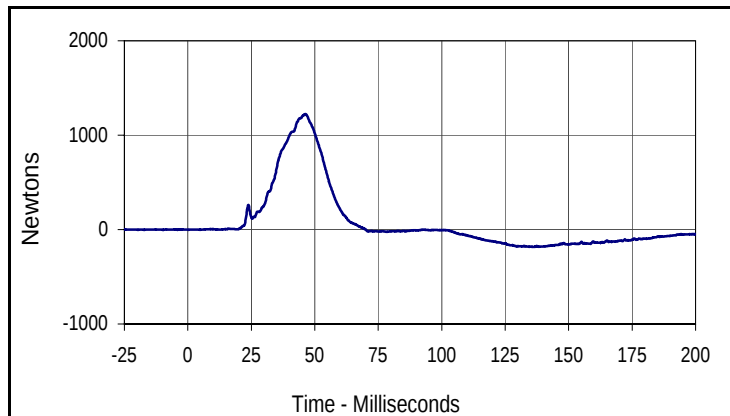
Curve Description			
Driver Lower Spine T12 Acceleration Z			
CURNO	Type	SAE Class	Units
014	FIL	180	G's
Max	Time	Min	Time
19.3	62.2	-9.7	109.7



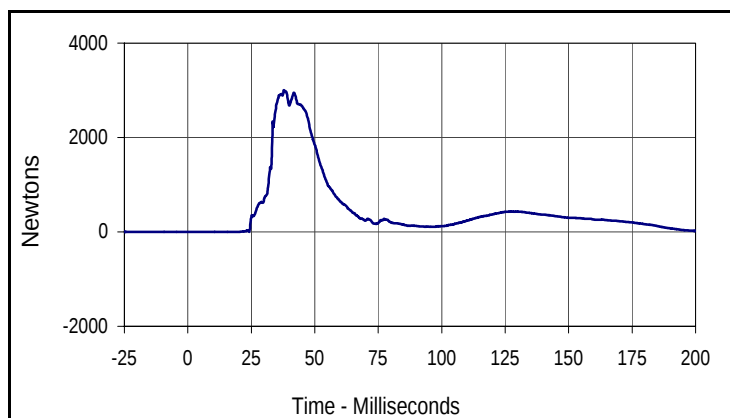
Curve Description			
Driver Lower Spine T12 Acceleration Res.			
CURNO	Type	SAE Class	Units
012	RES	180	G's
Max	Time	Min	Time
46.1	47.4	0.0	0.8

Test Vehicle: 2011 Nissan Murano S 5-Door MPV
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test

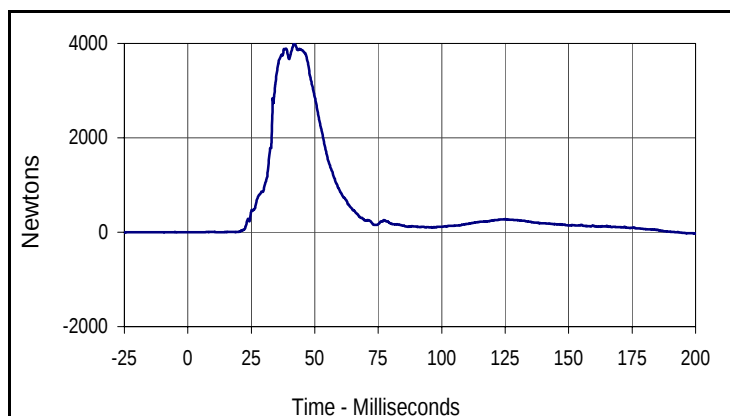
Test Date: 12/14/10
 NHTSA No.: MB5206



Curve Description			
Driver Iliac Wing Force on Impact Side Y			
CURNO	Type	SAE Class	Units
015	FIL	600	Newtons
Max	Time	Min	Time
1223.5	46.4	-184.4	136.4



Curve Description			
Driver Acetabulum Force on Impact Side Y			
CURNO	Type	SAE Class	Units
016	FIL	600	Newtons
Max	Time	Min	Time
3003.9	37.9	-1.3	13.4



Curve Description			
Driver Total Pelvic Force on Impact Side Y			
CURNO	Type	SAE Class	Units
015	SUM	600	Newtons
Max	Time	Min	Time
3991.1	41.9	-26.5	200.0

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

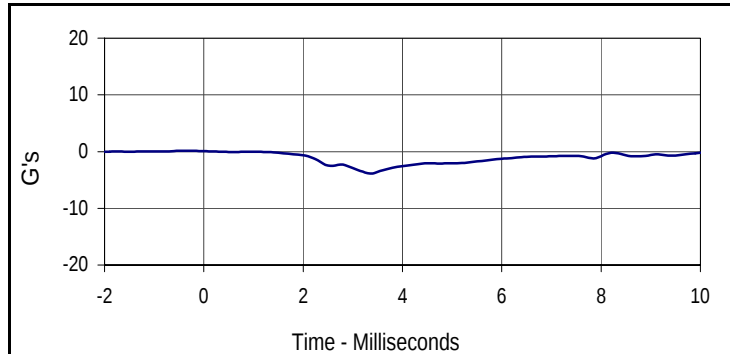
APPENDIX C
PRE-TEST / SID-IIs CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program: SID IIs Lateral Head Drop Calibration
 ATD Serial No.: 299

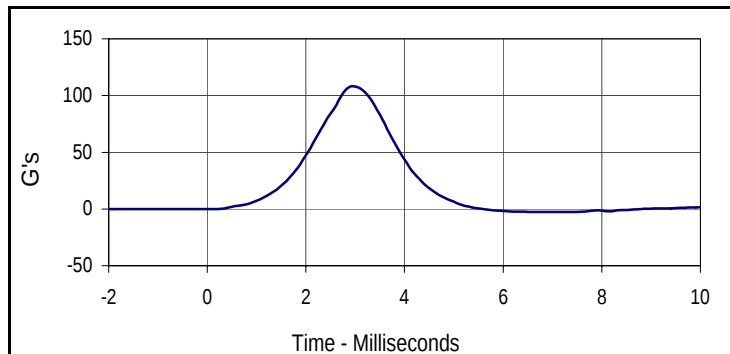
Test Date: 12/10/10
 Test I.D.: HDP12B



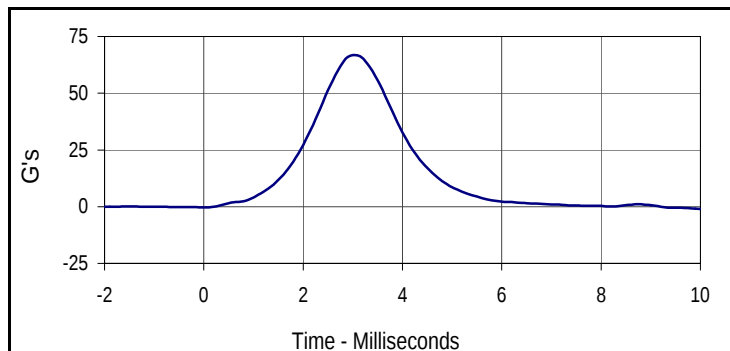
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Peak Resultant Acceleration	G's	115 to 137	127.0	Pass
Peak Longitudinal Acceleration	G's	≤15	3.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	8.5	Pass
Overall Test Results			Pass	



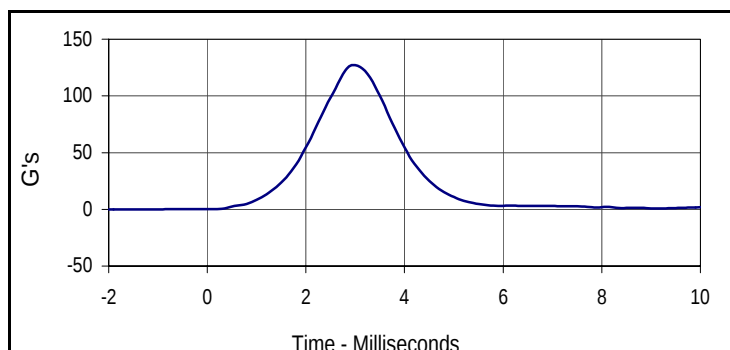
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
0.1	-0.4	-3.9	3.4



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
108.0	2.9	-2.6	7.1



Curve Description			
Head Z			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
66.8	3.0	-1.1	10.0



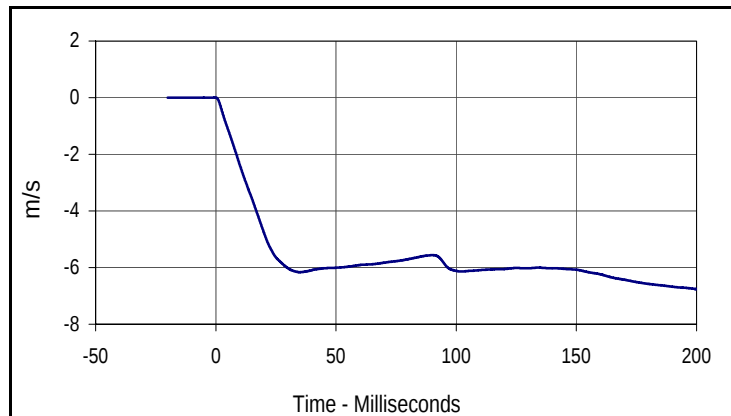
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
127.0	3.0	0.0	-1.7

Test Program: SID IIs Neck Calibration
 ATD Serial No.: 299

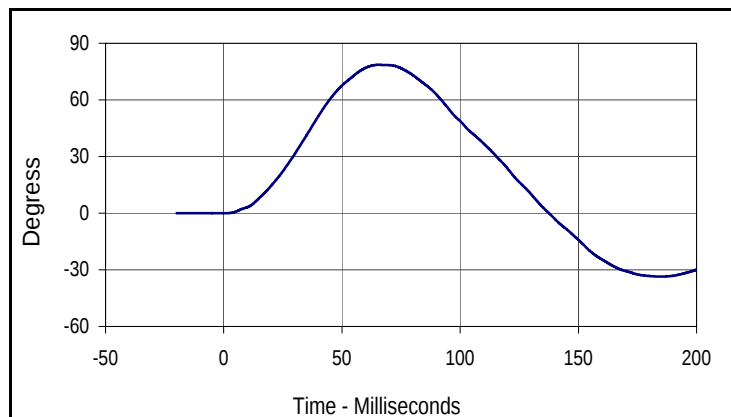
Test Date: 12/10/10
 Test I.D.: NBP12B



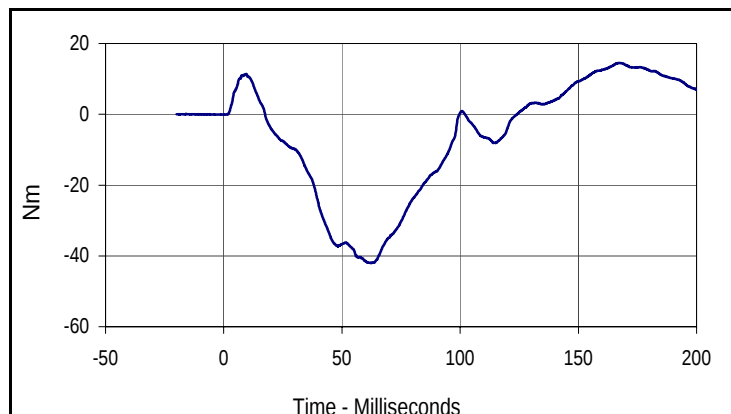
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity		%	10 to 70	29	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.6	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.4	Pass
	15 msec	m/s	-3.30 to -4.10	-3.6	Pass
	20 msec	m/s	-4.40 to -5.40	-4.8	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	78.6	Pass
	Time	msec	50.0 to 70.0	65.6	Pass
Peak Occipital Condyle Moment		Nm	-36.0 to -44.0	-42.0	Pass
Decaying Moment Time to Cross 0 Nm		msec	102.0 to 126.0	124.1	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	-6.8	200.0



Curve Description			
Maximum Translation Rotation			
CURNO	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
78.6	65.6	-33.6	184.8



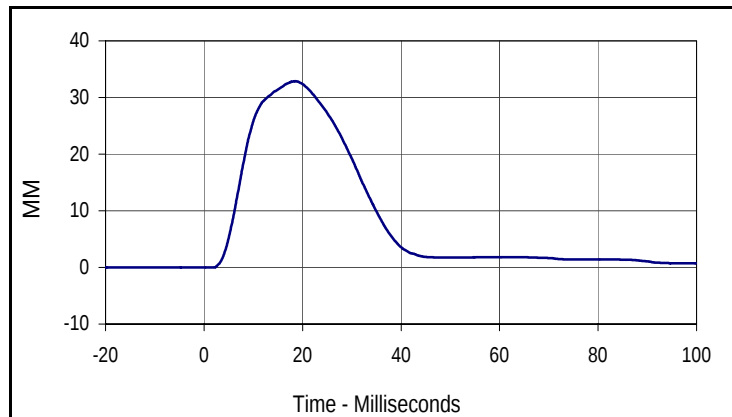
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
14.5	167.2	-42.0	62.5

Test Program: SID IIs Shoulder Calibration
 ATD Serial No.: 299

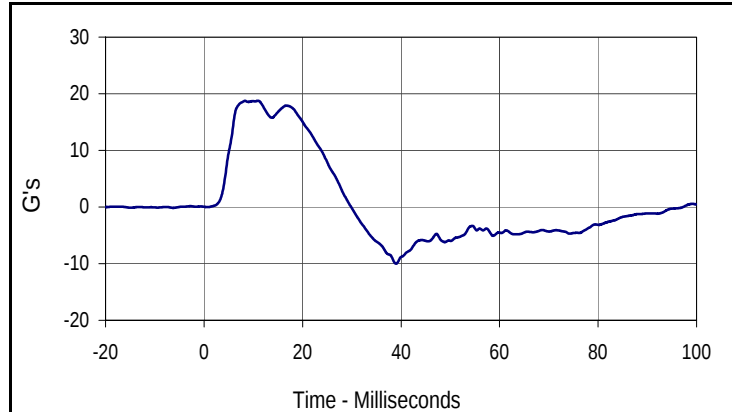
Test Date: 12/10/10
 Test I.D.: SHP12B



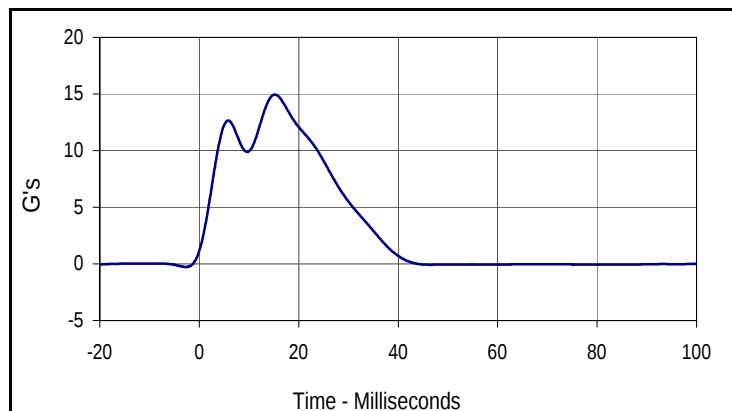
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity	m/s	4.20 to 4.40	4.31	Pass
Shoulder Deflection	MM	28 to 37	32.9	Pass
Peak Upper Spine Y Acceleration	G's	17 to 22	18.8	Pass
Peak Impactor 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
32.9	18.6	0.0	1.0



Curve Description			
Upper Spine Y Acceleration			
CURNO	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.8	11.0	-10.0	39.0



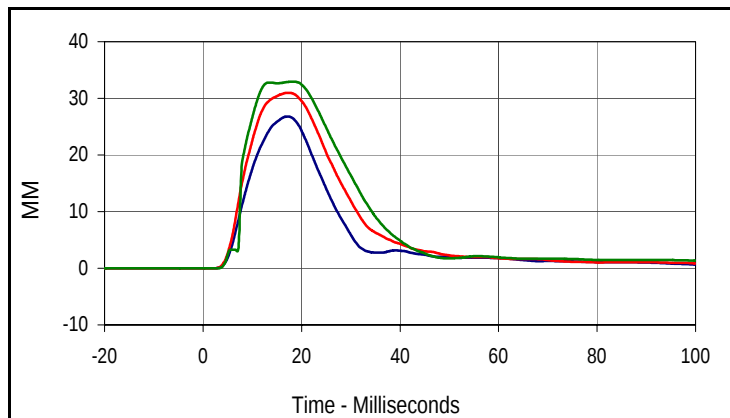
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
14.9	15.2	-0.3	-2.7

Test Program: SID IIs Thorax with Arm Calibration
 ATD Serial No.: 299

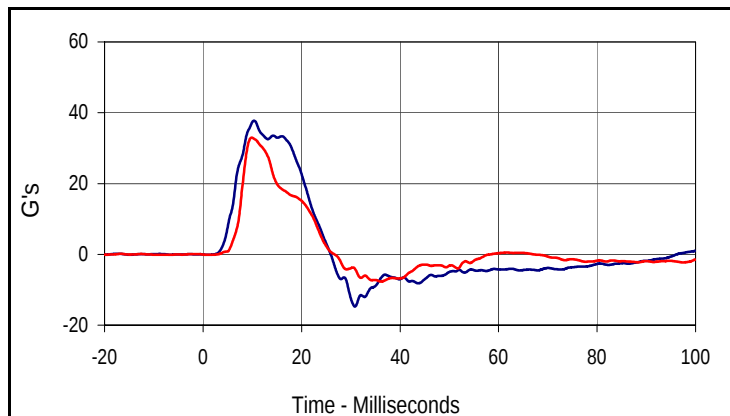
Test Date: 12/10/10
 Test I.D.: TWAP12B



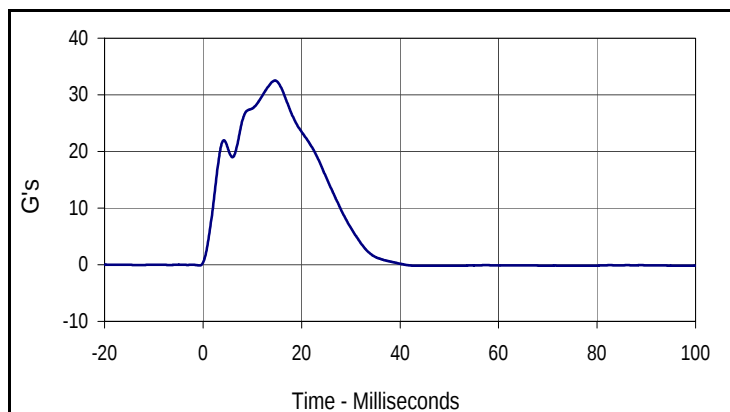
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity	m/s	6.60 to 6.80	6.69	Pass
Shoulder Deflection	MM	31 to 40	36.4	Pass
Upper Thorax Rib Deflection	MM	25 to 32	26.8	Pass
Middle Thorax Rib Deflection	MM	30 to 36	31.0	Pass
Lower Thorax Rib Deflection	MM	32 to 38	32.9	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	37.8	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	32.9	Pass
Peak Impactor Acceleration After 5 msec.	G's	30 to 36	32.5	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
26.8	17.2	0.0	-12.8
Middle Thorax Deflection			
Max	Time	Min	Time
31.0	17.4	0.0	-3.0
Lower Thorax Deflection			
Max	Time	Min	Time
32.9	18.4	0.0	-17.7



Curve Description			
Upper Spine Y Acceleration			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
37.8	10.4	-14.8	30.8
Lower Spine Y Acceleration			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
32.9	9.9	-7.7	36.2



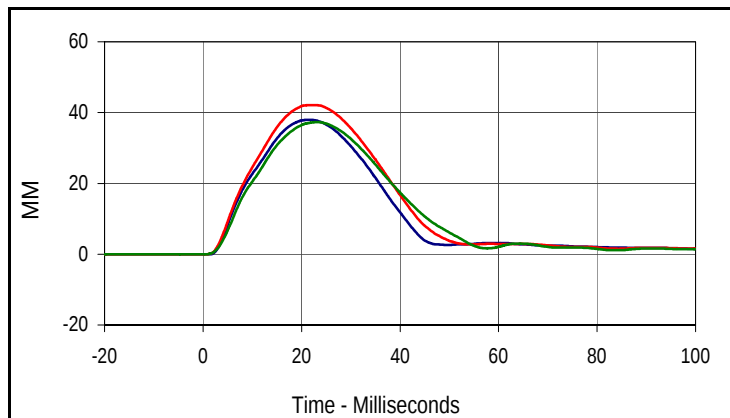
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
32.5	14.6	-0.2	50.4

Test Program: SID IIs Thorax w/o Arm Calibration
 ATD Serial No.: 299

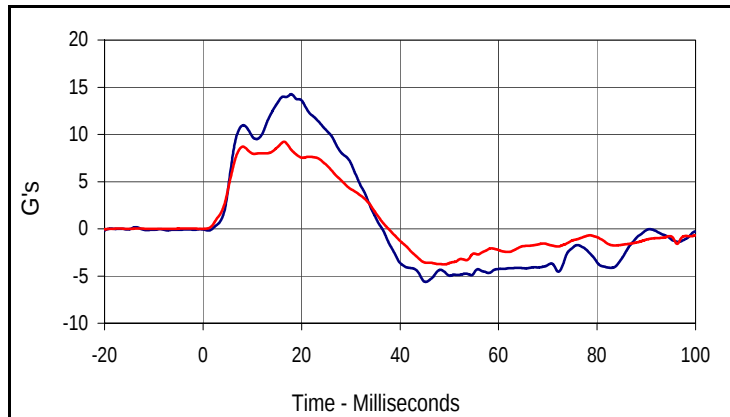
Test Date: 12/10/10
 Test I.D.: TOAP12B



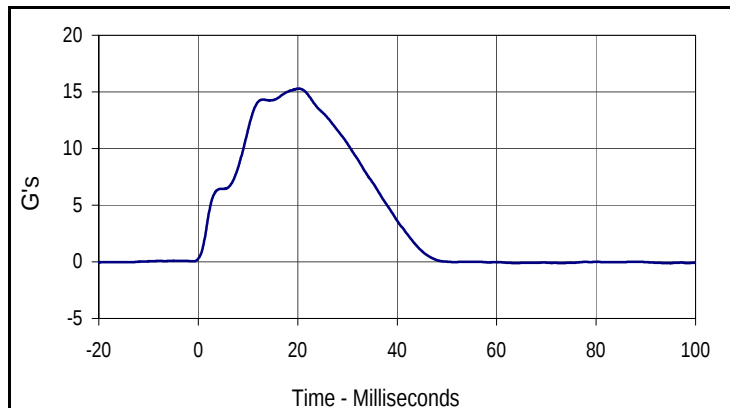
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity	m/s	4.20 to 4.40	4.24	Pass
Upper Thorax Rib Deflection	MM	32 to 40	38.0	Pass
Middle Thorax Rib Deflection	MM	39 to 45	42.1	Pass
Lower Thorax Rib Deflection	MM	35 to 43	37.3	Pass
Peak Upper Spine Y Acceleration	G's	13 to 17	14.3	Pass
Peak Lower Spine Y Acceleration	G's	7 to 11	9.2	Pass
Peak Impactor Acceleration	G's	14 to 18	15.3	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
38.0	21.5	0.0	-12.8
Middle Thorax Deflection			
Max	Time	Min	Time
42.1	22.2	0.0	-18.7
Lower Thorax Deflection			
Max	Time	Min	Time
37.3	23.3	0.0	-10.8



Curve Description			
Upper Spine Y Acceleration			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.3	17.9	-5.6	45.2
Lower Spine Y Acceleration			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.2	16.4	-3.8	49.0



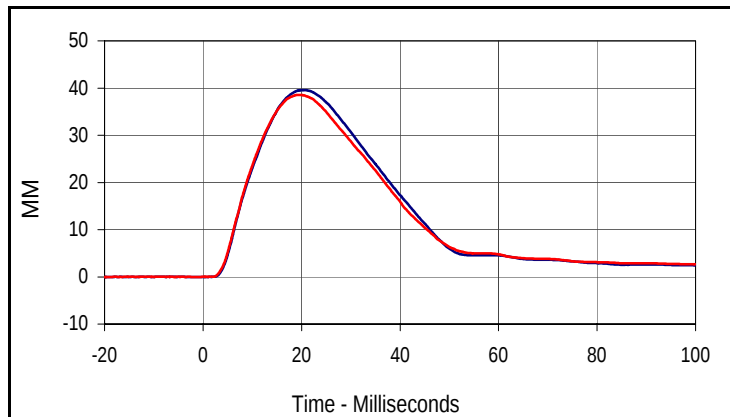
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
15.3	20.2	-0.1	94.1

Test Program: SID IIs Abdomen Calibration
 ATD Serial No.: 299

Test Date: 12/10/10
 Test I.D.: ABDP12B

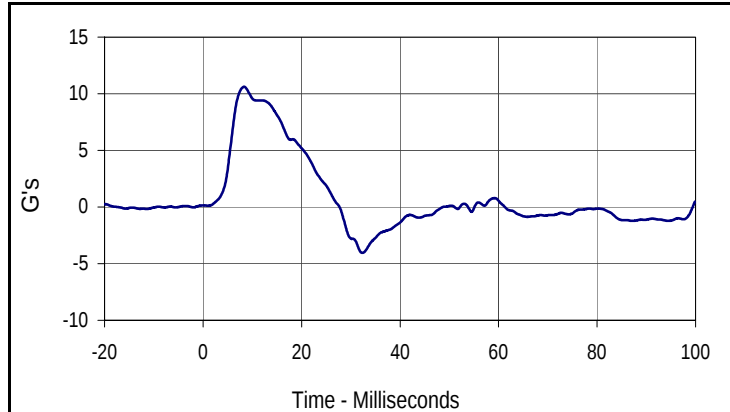


Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Pendulum Velocity	m/s	4.20 to 4.40	4.37	Pass
Upper Abdominal Rib Deflection	MM	36 to 47	39.6	Pass
Lower Abdominal Rib Deflection	MM	33 to 44	38.6	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	10.6	Pass
Peak Impactor Acceleration	G's	12 to 16	14.7	Pass
Overall Test Results			Pass	

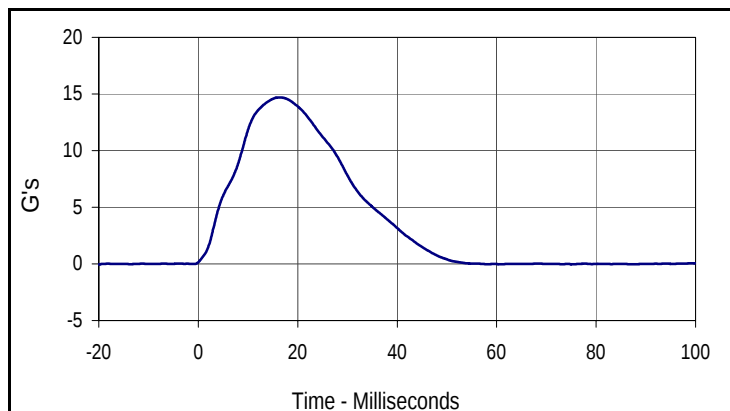


Curve Description			
Upper Abdominal Rib Deflection			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
39.6	20.2	0.0	-2.7

Curve Description			
Lower Abdominal Rib Deflection			
CURNO	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
38.6	19.5	0.0	-2.3



Curve Description			
Lower Spine Y Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
10.6	8.3	-4.1	32.4



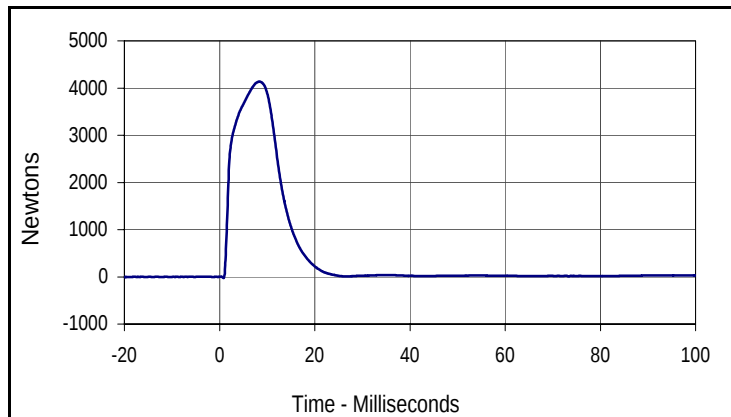
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.7	16.3	0.0	-20.0

Test Program: SID IIs Pelvis Acetabulum Calibration
 ATD Serial No.: 299

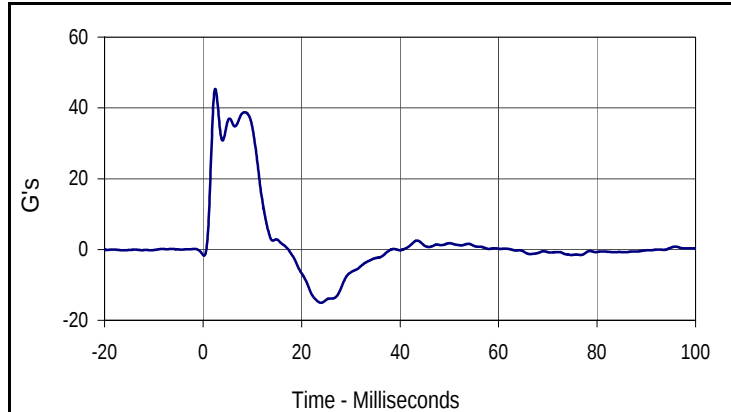
Test Date: 12/10/10
 Test I.D.: PAP12B



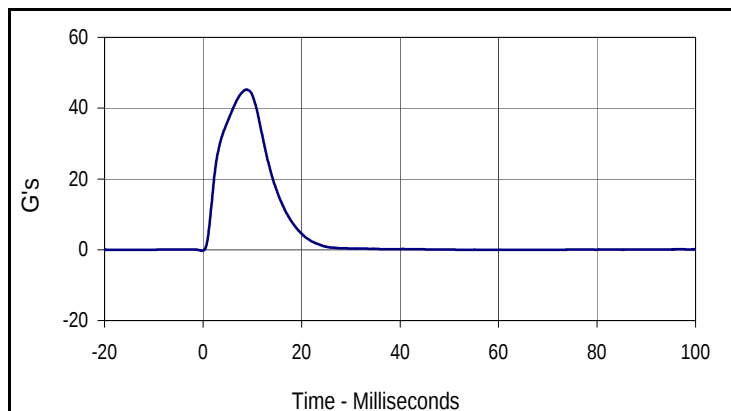
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Pendulum Velocity	m/s	6.60 to 6.80	6.68	Pass
Peak Acetabulum Force	Newtons	3600 to 4300	4137.1	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	38.8	Pass
Peak Impactor Acceleration	G's	38 to 47	45.2	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Acetabulum Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4137.1	8.4	-22.2	0.8



Curve Description			
Pelvis Y Acceleration			
CURNO	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
45.4	2.5	-15.1	24.0



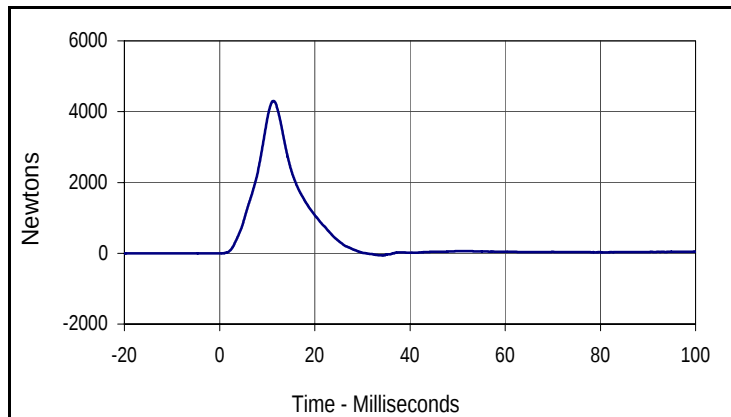
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
45.2	8.8	-0.3	-0.2

Test Program: SID IIs Pelvis Iliac Calibration
 ATD Serial No.: 299

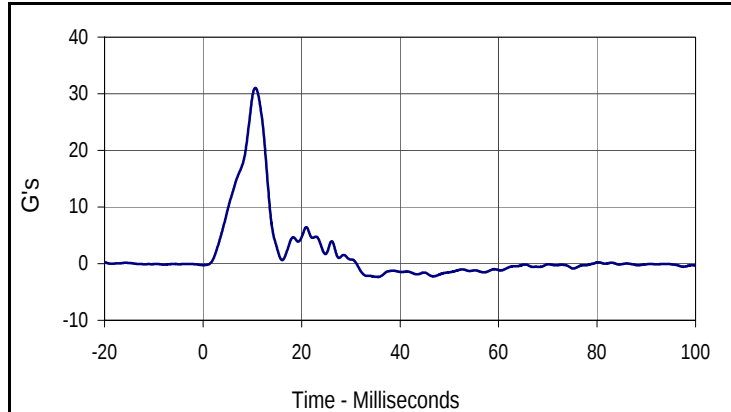
Test Date: 12/10/10
 Test I.D.: PLP12B



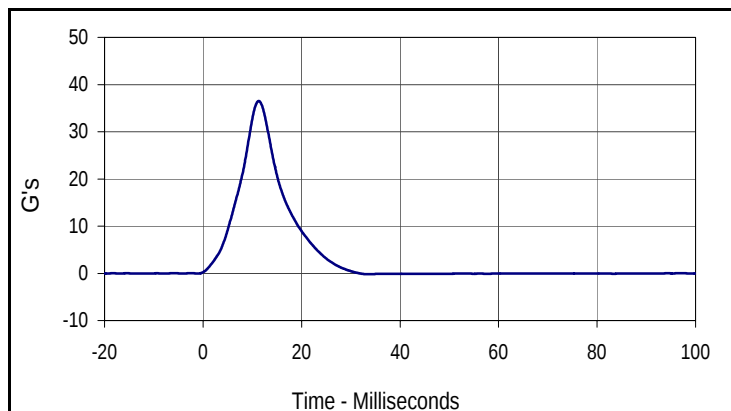
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Pendulum Velocity	m/s	4.2 to 4.4	4.38	Pass
Peak Iliac Force	Newtons	4100 to 5100	4301.5	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	31.0	Pass
Peak Impactor Acceleration	G's	36 to 45	36.5	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Iliac Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4301.5	11.3	-61.8	34.3



Curve Description			
Pelvis Y Acceleration			
CURNO	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
31.0	10.6	-2.3	35.6



Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
36.5	11.3	-0.2	33.3

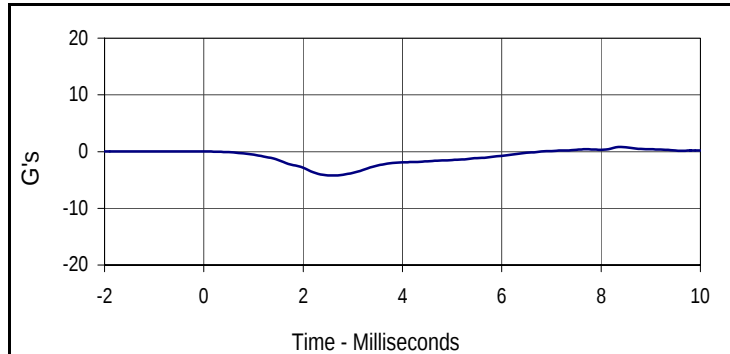
APPENDIX C
POST-TEST / SID-IIs CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program: SID IIs Lateral Head Drop Calibration
 ATD Serial No.: 299

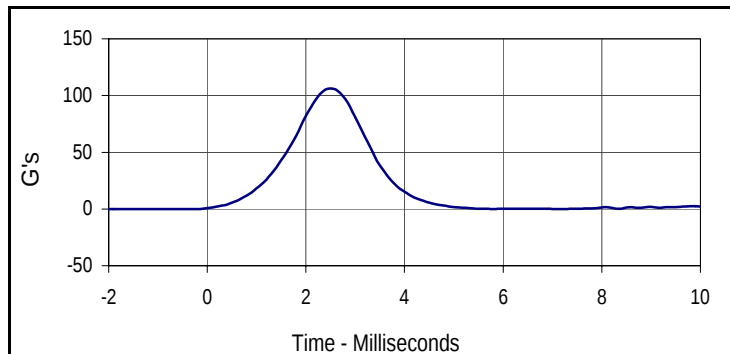
Test Date: 12/15/10
 Test I.D.: HDP12B



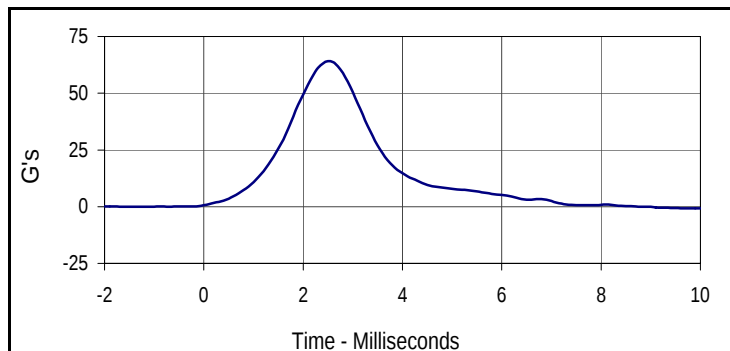
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.9	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Peak Resultant Acceleration	G's	115 to 137	124.3	Pass
Peak Longitudinal Acceleration	G's	≤15	4.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	6.6	Pass
Overall Test Results			Pass	



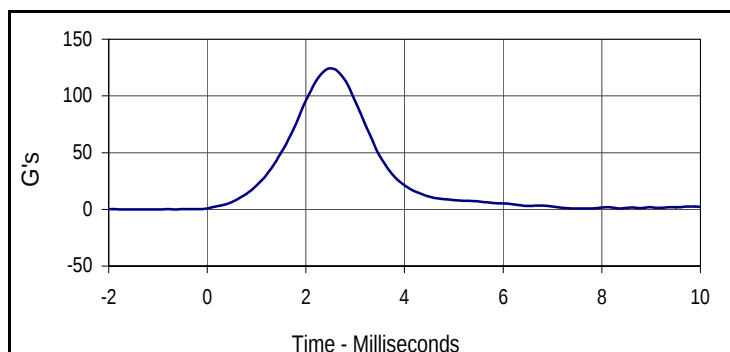
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
0.8	8.4	-4.2	2.6



Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
106.4	2.5	-0.1	-0.2



Curve Description			
Head Z			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
64.1	2.5	-0.7	9.7



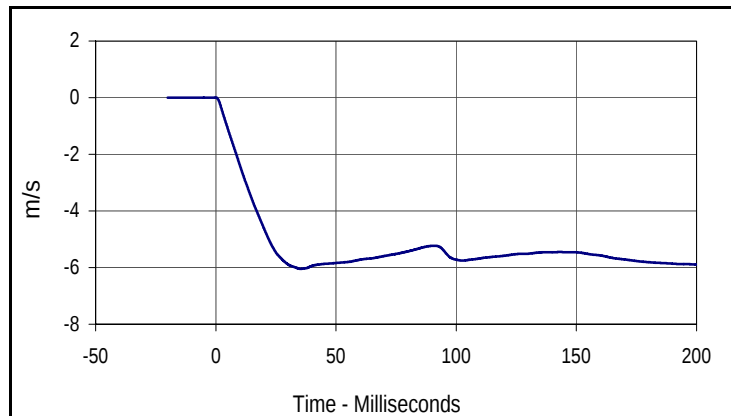
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
124.3	2.5	0.0	-1.3

Test Program: SID IIs Neck Calibration
 ATD Serial No.: 299

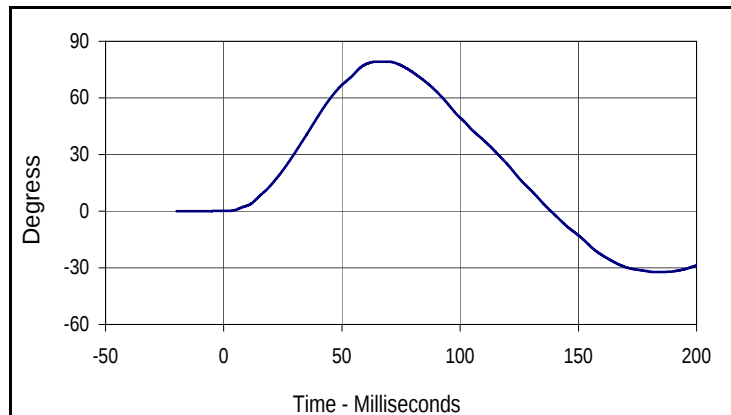
Test Date: 12/15/10
 Test I.D.: NBP12C



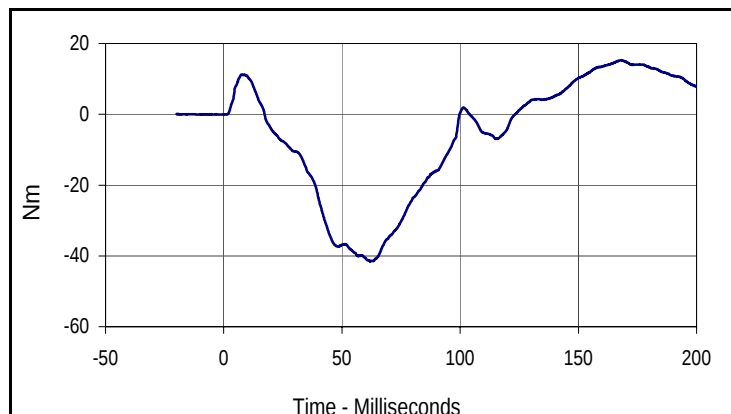
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity		%	10 to 70	29	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.6	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.4	Pass
	15 msec	m/s	-3.30 to -4.10	-3.6	Pass
	20 msec	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	-6.0	Pass
Translation-Rotation	Max	Degrees	71.0 to 81.0	79.2	Pass
	Time	msec	50.0 to 70.0	64.9	Pass
Peak Occipital Condyle Moment		Nm	-36.0 to -44.0	-41.5	Pass
Decaying Moment Time to Cross 0 Nm		msec	102.0 to 126.0	123.3	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	-6.0	35.3



Curve Description			
Maximum Translation Rotation			
CURNO	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
79.2	64.9	-32.3	182.6



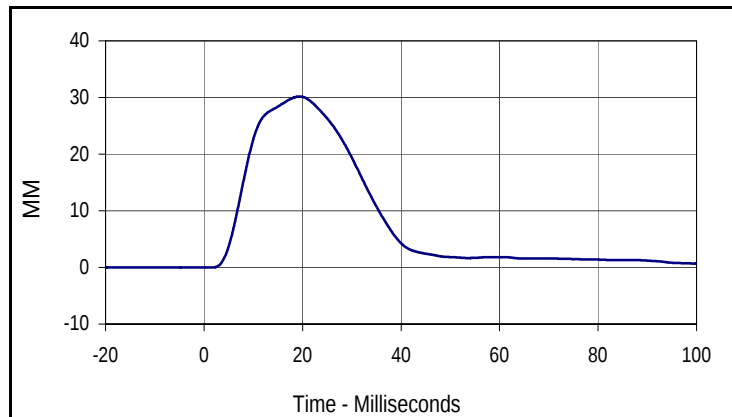
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
15.3	168.3	-41.5	61.9

Test Program: SID IIs Shoulder Calibration
 ATD Serial No.: 299

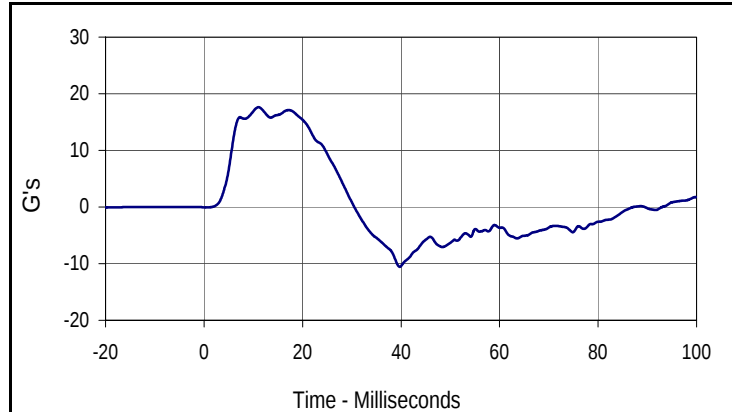
Test Date: 12/15/10
 Test I.D.: SHP12C



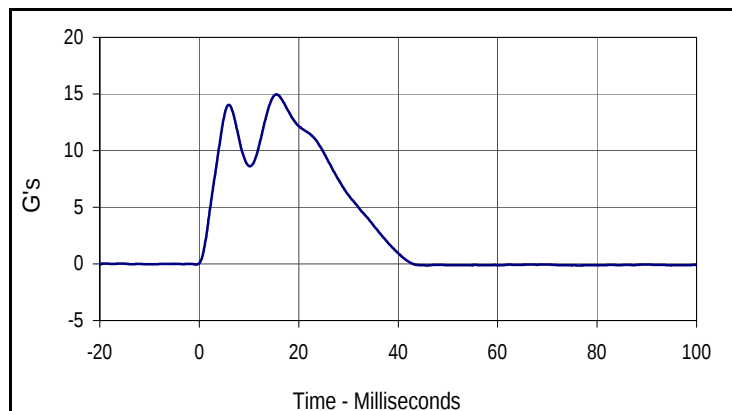
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Pendulum Velocity	m/s	4.20 to 4.40	4.29	Pass
Shoulder Deflection	MM	28 to 37	30.2	Pass
Peak Upper Spine Y Acceleration	G's	17 to 22	17.6	Pass
Peak Impactor Acceleration	G's	13 to 18	15.0	Pass
Overall Test Results			Pass	



Curve Description			
Shoulder Deflection			
CURNO	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
30.2	19.4	0.0	1.6



Curve Description			
Upper Spine Y Acceleration			
CURNO	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
17.6	11.0	-10.6	39.7



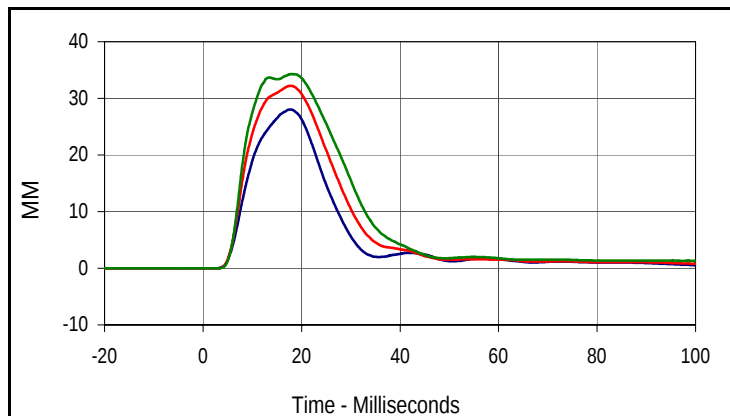
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.0	15.5	-0.1	45.8

Test Program: SID IIs Thorax with Arm Calibration
 ATD Serial No.: 299

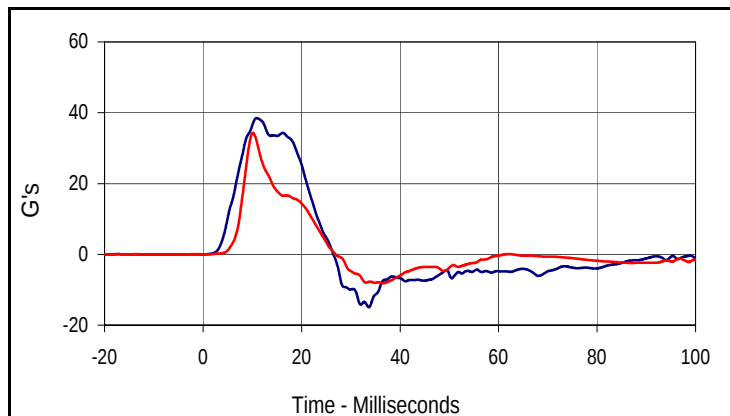
Test Date: 12/15/10
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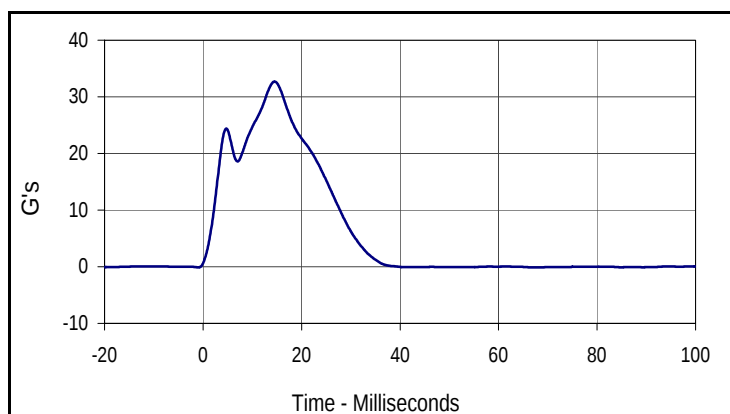
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Pendulum Velocity	m/s	6.60 to 6.80	6.67	Pass
Shoulder Deflection	MM	31 to 40	37.2	Pass
Upper Thorax Rib Deflection	MM	25 to 32	28.0	Pass
Middle Thorax Rib Deflection	MM	30 to 36	32.2	Pass
Lower Thorax Rib Deflection	MM	32 to 38	34.3	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	38.5	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	34.3	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
28.0	17.7	0.0	-17.7
Middle Thorax Deflection			
Max	Time	Min	Time
32.2	17.7	0.0	-0.5
Lower Thorax Deflection			
Max	Time	Min	Time
34.3	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
38.5	10.8	-14.9	33.7
Lower Spine Y Acceleration			
CURNO	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
34.3	10.1	-8.2	36.5



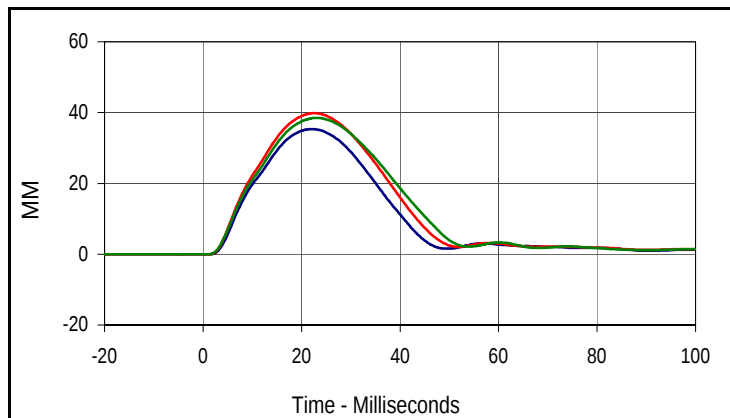
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
32.7	14.5	-0.2	0.0

Test Program: SID IIs Thorax w/o Arm Calibration
 ATD Serial No.: 299

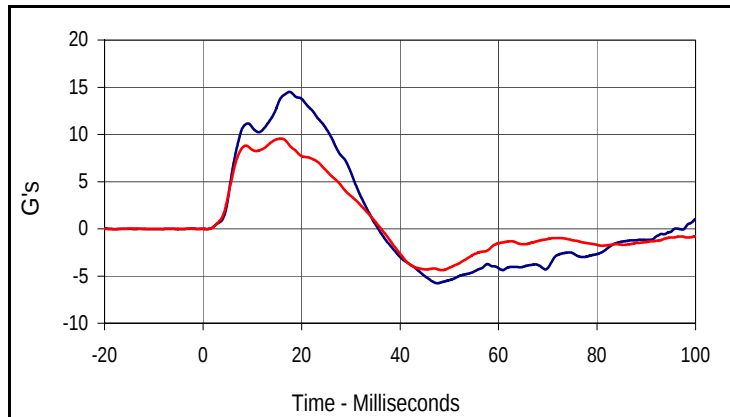
Test Date: 12/15/10
 Test I.D.: TOAP12C



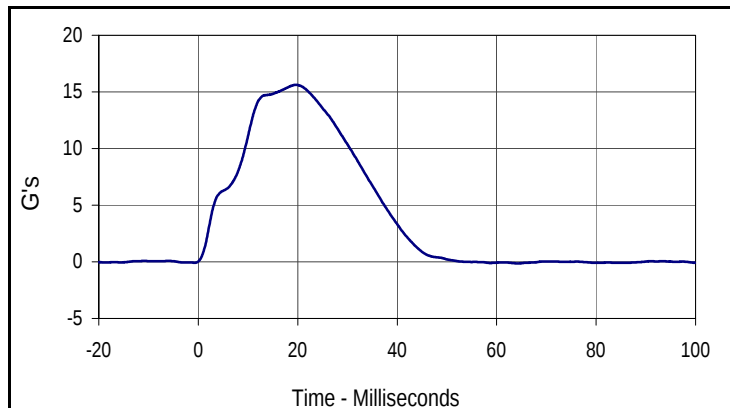
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Pendulum Velocity	m/s	4.20 to 4.40	4.34	Pass
Upper Thorax Rib Deflection	MM	32 to 40	35.3	Pass
Middle Thorax Rib Deflection	MM	39 to 45	39.8	Pass
Lower 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
35.3	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



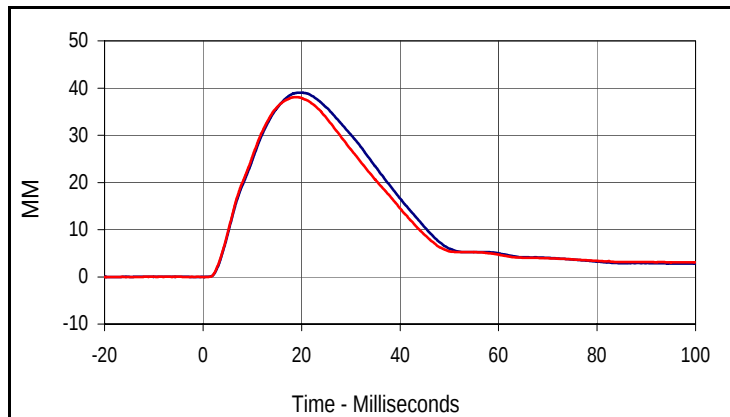
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
15.6	19.6	-0.1	64.3

Test Program: SID IIs Abdomen Calibration
 ATD Serial No.: 299

Test Date: 12/15/10
 Test I.D.: ABDP12C

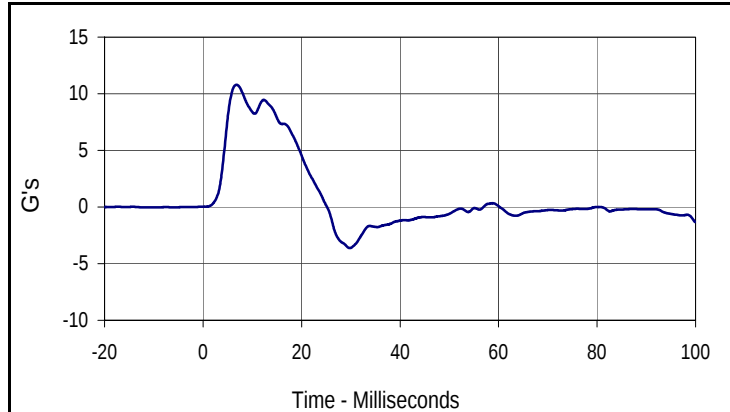


Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Pendulum Velocity	m/s	4.20 to 4.40	4.35	Pass
Upper Abdominal Rib Deflection	MM	36 to 47	39.0	Pass
Lower Abdominal Rib Deflection	MM	33 to 44	38.1	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	10.8	Pass
Peak Impactor Acceleration	G's	12 to 16	13.7	Pass
Overall Test Results			Pass	

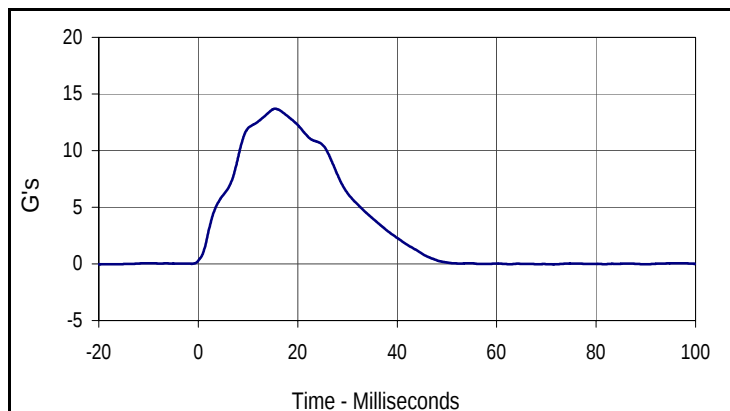


Curve Description			
Upper Abdominal Rib Deflection			
CURNO	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
39.0	19.7	0.0	-1.2

Curve Description			
Lower Abdominal Rib Deflection			
CURNO	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
38.1	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
10.8	6.8	-3.6	29.8



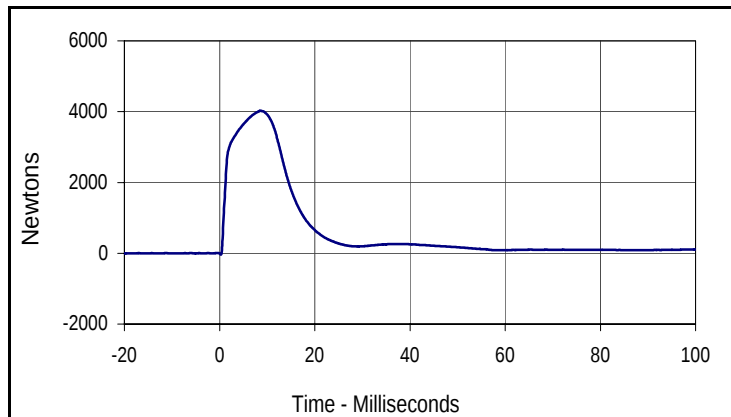
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
13.7	15.5	0.0	71.4

Test Program: SID IIs Pelvis Acetabulum Calibration
 ATD Serial No.: 299

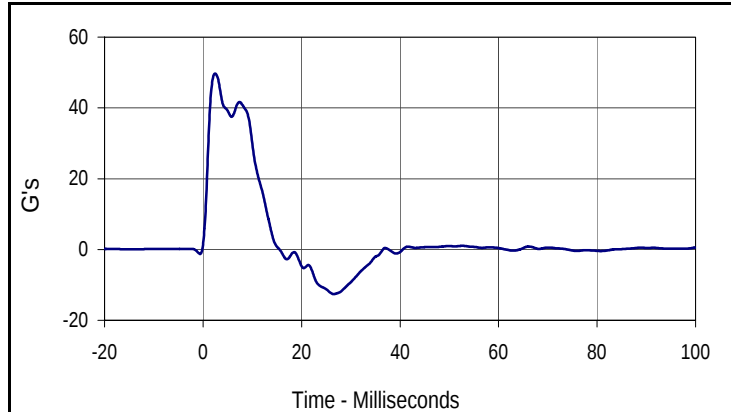
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 Test I.D.: PAP12C



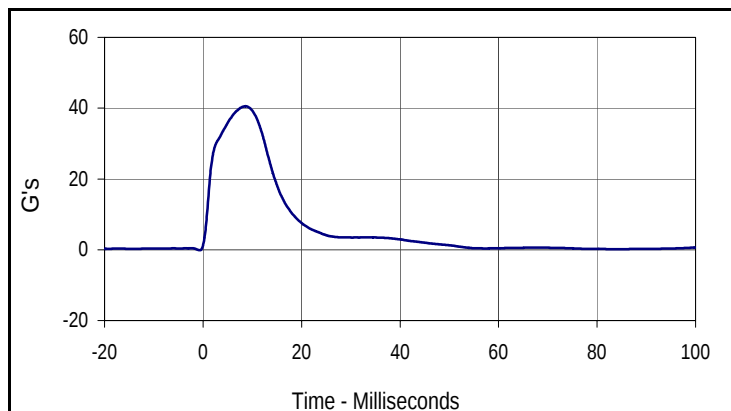
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Pendulum Velocity	m/s	6.60 to 6.80	6.71	Pass
Peak Acetabulum Force	Newtons	3600 to 4300	4025.0	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	41.7	Pass
Peak Impactor Acceleration	G's	38 to 47	40.5	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Acetabulum Force			
CURNO	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4025.0	8.6	-34.9	0.3



Curve Description			
Pelvis Y Acceleration			
CURNO	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
49.7	2.4	-12.6	26.5



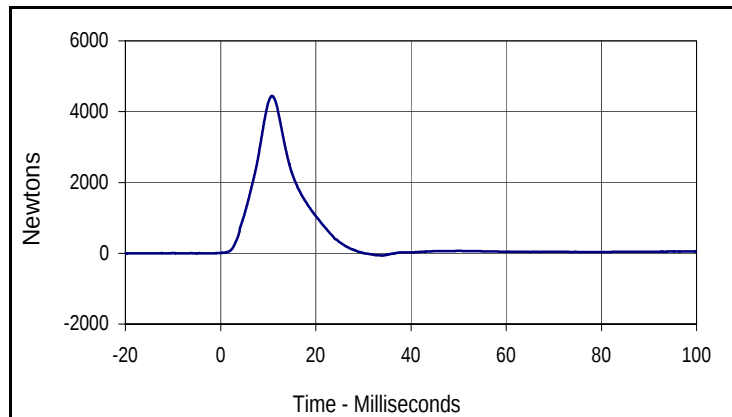
Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
40.5	8.7	-0.2	-0.7

Test Program: SID IIs Pelvis Iliac Calibration
 ATD Serial No.: 299

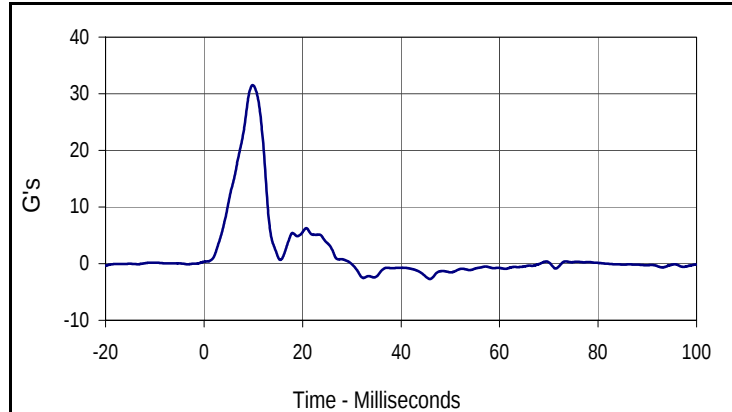
Test Date: 12/15/10
 Test I.D.: PLP12C



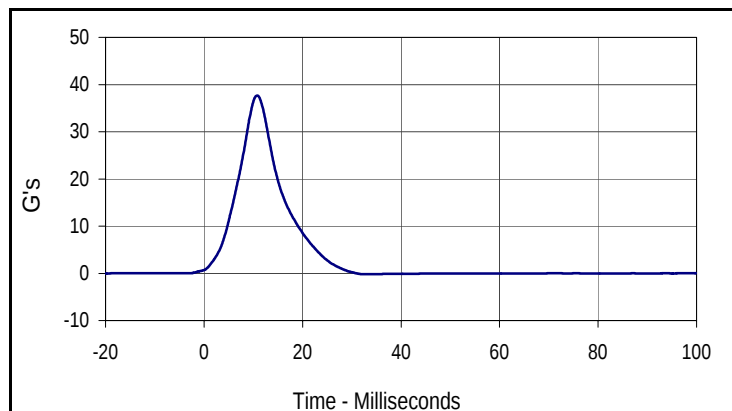
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Pendulum Velocity	m/s	4.2 to 4.4	4.39	Pass
Peak Iliac Force	Newtons	4100 to 5100	4442.1	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	31.5	Pass
Peak Impactor Acceleration	G's	36 to 45	37.7	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
31.5	9.9	-2.7	45.9



Curve Description			
Impactor Acceleration			
CURNO	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
37.7	10.8	-0.2	32.5