

REPORT NUMBER: SPNCAP-MCW-11-003

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

**MERCEDES BENZ
2011 MERCEDES BENZ C300 4-DOOR SEDAN**

NHTSA NUMBER: MB 0500

**PREPARED BY:
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TEST DATE: 23 SEPTEMBER 2010

REPORT DATE: 29 SEPTEMBER 2010

FINAL REPORT

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Test Vehicle: 2011 Mercedes Benz C300 4-Door Sedan
Test Program: SPNCAP

NHTSA Number: MB 0500
Test Date: September 23, 2010

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Division Chief, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

Date: _____

COTR, New Car Assessment Program
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Technical Report Documentation Page

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15. Supplementary Notes																					
16. Abstract A 32.2 km/h (20 mph), 75° oblique Side NCAP Test was conducted on the subject 2011 Mercedes Benz C300 4-door sedan 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 Medical College of Wisconsin (MCW) in Milwaukee, Wisconsin on 23 September 2010. The impact velocity was 31.96 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 24 °C. The test vehicle's post-test maximum static crush was 455 mm at level 3. The test vehicle's occupant performance is as follows: <table border="1" data-bbox="154 1333 1356 1522"> <thead> <tr> <th></th> <th>Units</th> <th>Driver ATD (SIDIIIs) Threshold</th> <th>Resultant</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/a</td> <td>1000</td> <td>331.1</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>G's</td> <td>82</td> <td>46.3</td> </tr> <tr> <td>Combined Acetabular and Iliac Pelvic Force</td> <td>NWT</td> <td>5525</td> <td>4268.1</td> </tr> </tbody> </table> The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.							Units	Driver ATD (SIDIIIs) Threshold	Resultant	Head Injury Criteria (HIC ₃₆)	N/a	1000	331.1	Resultant Lower Spine Acceleration	G's	82	46.3	Combined Acetabular and Iliac Pelvic Force	NWT	5525	4268.1
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17. Key Words New Car Assessment Program (NCAP) Side impact Pole Part 572V SID-IIIs			18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Reference Division 1200 New Jersey Ave, SE, Room W43-410 Washington, D.C. 20590																		
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TABLE OF CONTENTS

<u>Section</u>		<u>Page</u> <u>No.</u>
1	Test Purpose and Procedure	1
2	Summary of Test Results	2
3	Occupant and Vehicle Information	3
<u>Data Sheet</u>		<u>Page</u>
<u>No.</u>		<u>No.</u>
1	General Test and Vehicle Parameter Data	5
2	Seat, Seat Belt, Steering Wheel Adjustment, and Fuel System Data	9
3	Dummy Longitudinal Clearance Dimensions	11
4	Dummy Lateral Clearance Dimensions	12
5	Camera and Instrumentation Data	13
6	Vehicle Accelerometer Locations	15
7	Rigid Pole Load Cell Data	16
8	Post Test Observations	17
9	Vehicle Profile Measurements	19
10	Vehicle Exterior Crush Measurements	20
11A	FMVSS No. 301 Fuel Integrity Post-Impact Data	23
11B	FMVSS No. 301 Propulsion Battery Integrity Post-Impact Data	25
12	Dummy/Vehicle Temperature Stabilization Data	27
<u>Appendix</u>		
A	Photographs	A
B	Vehicle and Dummy Response Data Plots	B
C	Dummy Configuration and Performance Verification Data	C

Test Vehicle: 2011 Mercedes Benz C300 4-Door Sedan
Test Program: SPNCAP

NHTSA Number: MB 0500
Test Date: September 23, 2010

SECTION 1

TEST PURPOSE AND PROCEDURE

This side impact test was conducted as part of the FY'10 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-09-D-00123. The purpose of this test is to generate comparative side impact performance in a 2011 Mercedes Benz C300 4-door sedan. The side impact test was conducted in accordance with the Office of Crashworthiness Standards's Side NCAP Pole Laboratory Test Procedure, dated July 2010.

SECTION 2

SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2011 Mercedes Benz C300 4-door sedan. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 31.96 km/h. The test was conducted at the Medical College of Wisconsin, in Milwaukee, Wisconsin, on 23 September 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 (1) Part 572V (SID-IIs) dummy, serial number 298, was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure, dated July 2010. Each SID-IIs was instrumented in the following locations:

- Head center of gravity tri-axial (X, Y, Z) accelerometers (primary and redundant)
- Thorax upper, middle, and lower rib (Y) displacement potentiometers
- Abdomen upper and lower rib (Y) displacement potentiometers
- Lower spine tri-axial (X, Y, Z) accelerometers
- Iliac wing (Y) force load cell
- Acetabulum (Y) force load cell

The test vehicle was instrumented with twenty-one (21) structural accelerometers and three (3) angular rate sensors. The rigid pole was instrumented with eight (8) loadcells. All data channels were recorded with a fully self contained on-board DTS TDAS Pro Data Acquisition System. The data were digitally sampled at 12.5 kHz and processed according to SAEJ211-1 (March 1995).

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

All of the above was conducted in accordance to the Report Laboratory Test Procedure for New Car Assessment Program Side Impact Rigid Pole Testing dated July 2010.

2.2 GENERAL COMMENTS

The test vehicle sustained a maximum static crush of 455 mm at level 3, 0 mm rearward of the vertical impact line.

Test summaries, post test observations, vehicle, pole, camera, and occupant measurements are presented in datasheets 1-16. Appendix A contains the still photograph prints. Appendix B contains selected driver SID-II's response data traces. Appendix C contains the SID-II's configuration and performance verification data.

OCCUPANT SUMMARY	
Injury Criteria	Driver (P1)
HIC36	331.1
T1 (ms)	43.5
T2 (ms)	67.6
Resultant Lower Spine Acceleration	46.3
Sum of Pelvic Forces	4268.1
Iliac wing	2185
Acetabular	2271.8

Head Injury Criterion (HIC) is the standardized calculation using resultant head acceleration to assess head injury. Generally, a higher HIC represents an increase in the likelihood of a serious head injury. HIC36 specifies a time 'window' of 36 milliseconds over which the integral is calculated. T1 and T2 represent the time of the lower and upper bounds of the window in which the HIC is calculated.

The resultant lower spine acceleration is the single equivalent of the X, Y, and Z accelerations.

The sum of the pelvic forces is used to assess the likelihood of injury to the pelvis during a side impact crash. Higher pelvic forces correspond to an increase in the likelihood of sustaining a severe pelvis injury.

SUPPLEMENTAL RESTRAINT INFORMATION				
Restraint Type	Left Front (Driver)		Left Rear (Passenger)	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes – Steering wheel	Did not deploy	No	N/a
Knee Airbag	Yes	Did not deploy	No	N/a
Side Curtain Airbag	Yes – Side header	Deployed properly	Yes – Side header	Deployed properly
Side Torso Airbag	Yes – Seat back	Deployed properly	No	N/a
Side Pelvis Airbag	Yes	Deployed properly	No	N/a
Seat Belt Pretensioner	Yes	Deployed properly	No	N/a
Seat Belt Load Limiter	Yes	N/a	No	N/a
Other	No	N/a	No	N/a

These test data and report can be found in detail on the NHTSA website at www.nhtsa.dot.gov.

A brief summary of the crash test can be located at www.safercar.gov

TEST NOTES

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

VEHICLE INFORMATION	
NHTSA No.	MB 0500
Model Year	2011
Make	Mercedes Benz
Model	C300
Body Style	4 – door sedan
VIN	WDDGF5EBXBA415995
Body Color	Silver
Delivery Date	September 1, 2010
Odometer eading (km/mi)	48 mi
Dealer	Concourse Motors
Transmission	Automatic
Final Drive	Rear
Type/No. of Cylinders	6
Engine Displacement (L)	3.0
Engine Placement	Longitudinal
Roof Rack	No
Sunroof/T-Top	No
Tinted Glass	No
Traction Control	Yes
Power Brakes	Yes
Front Disc	Yes
Rear Disc	Yes

VEHICLE OPTIONS	
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	Yes
Driver Torso/Pelvis Airbag	No
Driver Pelvis Airbag	Yes
Driver Knee Airbag	Yes
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	Yes
Other	Yes

Does owner's manual provide instructions to turn off automatic door locks?

Yes

DATA FROM CERTIFICATION LABEL			
Manufacturer	Mercedes Benz	GVWR (kg)	2060
		GAWR Front(kg)	1010
Date of Manufacture	June 2010	GAWR Rear (kg)	1090

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION				
	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	3	N/a	5
Capacity Weight (VCW) kg				380
DSC X 68.04 kg				340.2
Cargo Weight (RCLW) †				39.8

(A)

(B)

(A-B)†

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

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	X					X	
Rear or Second Row Seat			X	X		N/a	
Third Row Seat	N/a				N/a		

TEST VEHICLE AXLE WEIGHTS										
	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	427.3	368.8		433.6	405.1		445.4	406.0	
Right	kg	425.9	374.7		436.8	402.8		429.1	404.6	
Ratio	%	53.4	46.6		51.9	48.1		51.9	48.1	
Totals	kg	853.2	743.5	1596.7	870.4	807.9	1678.3	874.5	810.6	1685.1

TARGET TEST WEIGHT CALCULATION			
	Units		
Total Delivered Weight (UVW)	kg	1596.7	(A)
Sum of Actual Weight of 1 P572 ATDs Used	kg	48.6	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	39.8	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	1685.1	(A + B + C)

TEST VEHICLE ATTITUDES AND CG				
	Units	As delivered	As tested	Fully loaded
Driver Door Sill Angle (Front to Rear)	Deg.	-0.1	-0.1	-0.5
Front Pass. Door Sill Angle (Front to Rear)	Deg.	-0.3	-0.4	-0.1
Front Bumper Angle (Left to Right)	Deg.	0.4	0.6	0.7
Rear Bumper Angle (Left to Right)	Deg.	0.0	0.0	0.1
Vehicle CG (Aft of Front Axle)	mm	1285.2	1328.6	1327.7
Vehicle CG Left (+) / Right (-) from Long. Centerline)	Mm	-2.49	-0.48	9.31

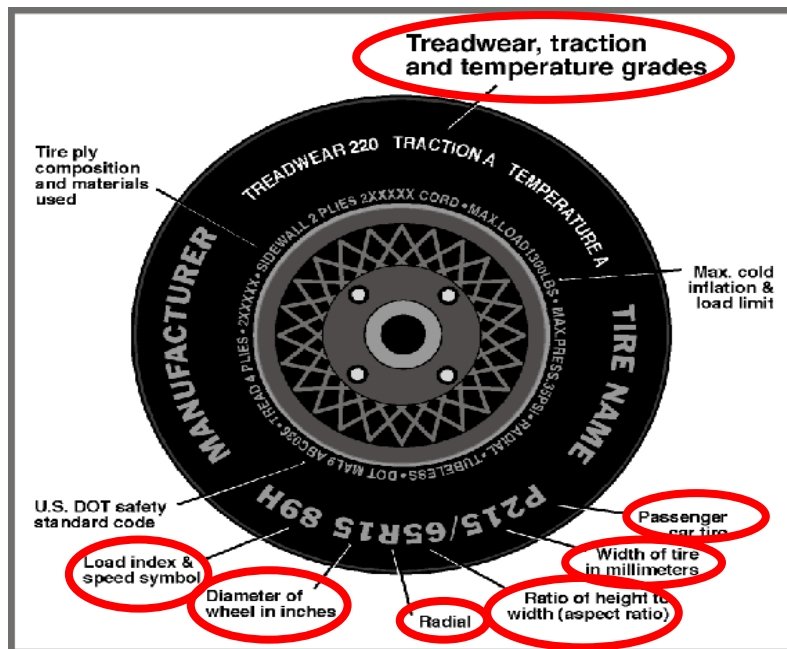
DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA (CONTINUED)

GENERAL VEHICLE TEST DATA		
Measurement Description	Units	Value
Weight of Ballast in Cargo Area	kg	39.8
Weight of Vehicle Components Removed	kg	6.62

BALLAST INFORMATION	
Mass of Ballast Added (kg)	4.54 kg
Location	Glove compartment
<u>Components Removed from Test Vehicle</u> Non-struck front and rear door glasses, right rear tail-light Non-struck front and rear door interior panels	

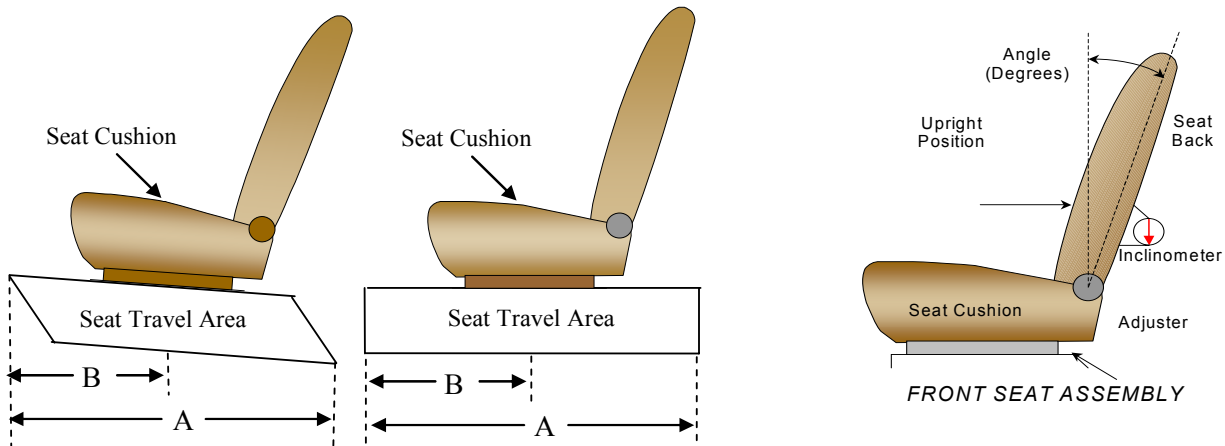
TEST VEHICLE VERTICAL IMPACT LINE DATA		
Measured Parameter	Units	Value
Target Impact Point Aft of Front Axle	mm	1320 mm rearward of front axle
Actual Impact Point	mm	1325 mm rearward of front axle

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



VEHICLE TIRE INFORMATION		
Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold / Test Pressure (kPa)	190	230
Recommended Tire Size	P225/45R17	P245/40R17
Tire Size on Vehicle	P225/45R17	P245/40R17
Tire Manufacturer	Michelin	Michelin
Tire Model	HX MXM4	HX MXM4
Treadware	300	300
Traction	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2	2
Tire Plies Body	5	5
Load Index & Speed Symbol	91H	91H
Tire Material	Polyester cord, polyamide cord, and steel cord	Polyester cord, polyamide cord, and steel cord
DOT Safety Code (Right)	B98A	B96C
DOT Safety Code (Right)	B98A	B96C

DATA SHEET NO. 2
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA



Seat fore/aft positions

The total seat travel was measured from forward most position to rearmost position, irrespective of vertical seat height in those positions. The seat was set at the longitudinal mid position with the SCRL at its mid-angle position.

SEAT FORE/AFT POSITION		
	Total Fore/Aft travel	Position
Driver Seat	288 mm	145 mm
Front Passenger Seat	285 mm	Placed even w/ driver's seat
Rear Seat – Struck Side	Non - adjustable	As positioned
Rear Seat – Non Struck Side	Non - adjustable	As positioned

‡Full forward = notch 0; test position with respect to notch 0

Seat back position

The driver and passenger seat back is positioned according to the manufacturers designated angle.

SEAT BACK POSITION		
	Degrees	Detent
Driver Seat Back Angle w/ Seated Dummy	21.0	7
Front Passenger Seat Back Angle	21.4	7
Struck Side Rear Seat Back Angle	29.5	N/a
Non-Struck Side Rear Pass. Seat Back Angle	29.7	N/a

‡Full upright = notch 0; test position with respect to notch 0

Seat belt position

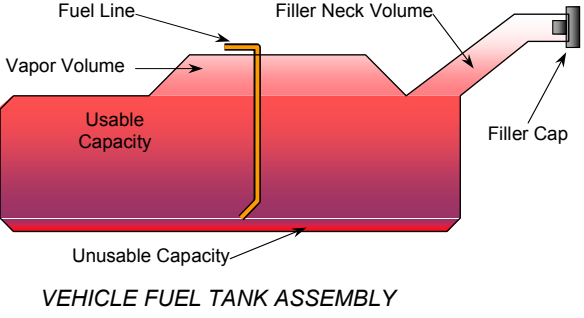
The adjustable anchorage locations are positioned according to the manufacture's specifications.

SEAT BELT ADJUSTABLE ANCHORAGE (D-RING)		
	Total No. of Positions	Placement
Driver Seat	5	Highest position

‡Test position is with respect to highest position

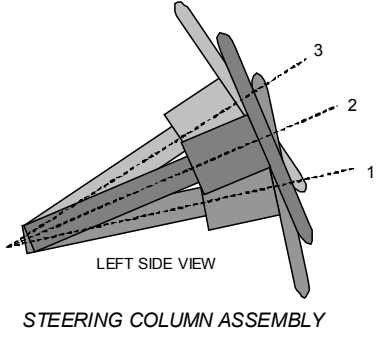
DATA SHEET NO. 2
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA
(CONTINUED)

Fuel Tank Information

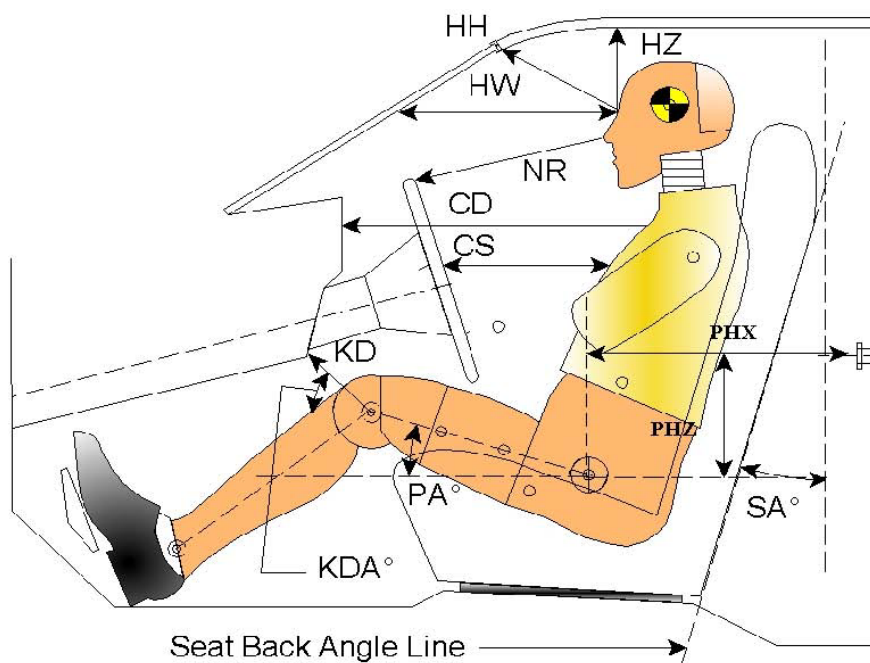
FUEL TANK CAPACITY DATA			
Description	Units	Value	
Usable Capacity of Standard Equipment Fuel Tank	L	66.2	
Usable Capacity of Optional Equipment Fuel Tank	L	0.0	
Usable Capacity of Standard Tank as Specified in Owner's Manual	L	66.2	
Usable Capacity of Optional Tank as Specified in Owner's Manual	L	0.0	
Amount of Stoddard Added for Test	L	61.6	
% Usable Capacity (92%-94%)	%	93.1	
1/3 of Usable Capacity			22.1

Steering Wheel Information

Steering wheel and column adjustments are placed according to the manufacturer's specifications.

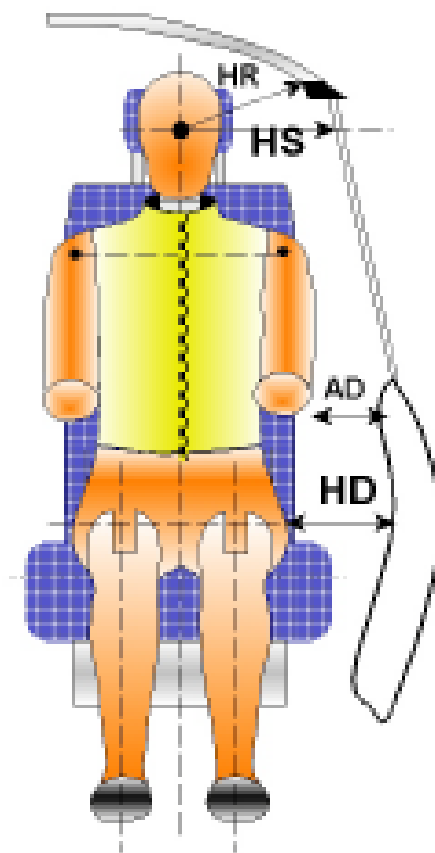
STEERING COLUMN POSITIONING		
Adjustable Column	Yes	
Steering Wheel Angle in Lower Most Position, Position 1	23.6°	
Steering Wheel Angle in Geometric Center, Position 2	26.2°	
Steering Wheel Angle in Upper Most Position, Position 3	28.8°	
Steering Wheel Fore/Aft Travel	58 mm	
Test Position	Steering wheel positioned 26.2° relative to side sill panel. The steering column also had a telescope adjustment and it was set in the mid position	

DATA SHEET NUMBER NO. 3
SID-II's LONGITUDINAL CLEARANCES



Driver code	Measurement Description	Left Front Seat	
		Length (mm)	Angle (°)
HH	Head to Header	227	52.6
HW	Head to Windshield	512	0.0
HZ	Head to Roof	169	90.0
NR	Nose to Rim	251	-6.7
CD	Chest to Dash	421	24.6
CS	Chest to Steering Wheel	188	11.0
KDL	Left Knee to Dash	136	
KDA	Left Knee to Dash		20.1
KDR	Right Knee to Dash	121	
KDA	Right Knee to Dash		26.1
PA	Pelvic Angle	17.7	
PHX	H-Point to Striker (X-Axis)	267	
PHZ	H-Point to Striker (Z-Axis)	205	
SA	Seat Back Angle	21.0	

DATA SHEET NUMBER NO. 4
SID HIII LATERAL CLEARANCES

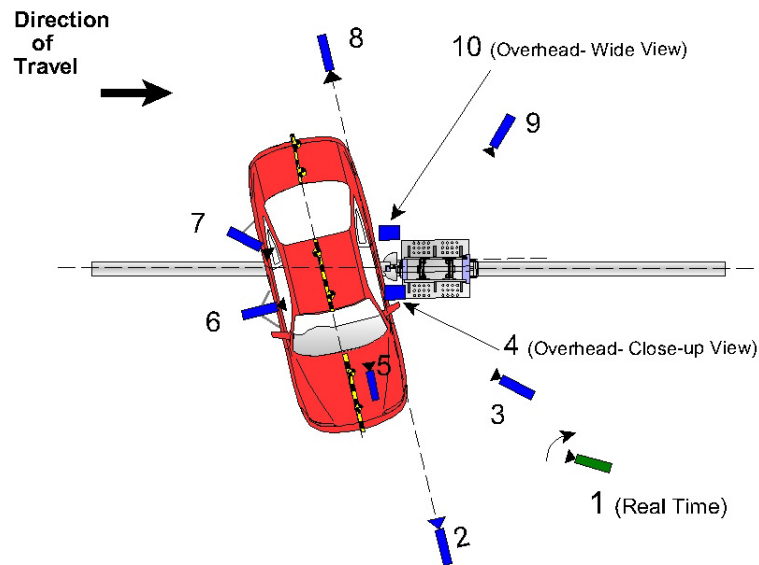


SID HIII LATERAL CLEARANCE MEASUREMENTS			
Code	Measurement description	Units	Left front seat
HR	Head to Side Header	mm	225
HS	Head to Side Window	mm	344
SD	Shoulder to Door	mm	126
AD	Arm to Door	mm	132
HD	H-Point to Door	mm	205 *

* Measured w/ plug in

DATA SHEET NO. 5 **CAMERA AND INSTRUMENTATION DATA**

Camera Locations



	View	Coordinates †			Angle °	Lens mm	Rate fps
		X	Y	Z			
		mm	mm	mm			
1	Rear Time (24 – 30 fps) Pan View of Impact	-	-	-	-	-	24
2	Front ground Level – Impact View	11887	194	-1477	6.6	50	1000
3	Impact Side 45° - Forward View of Pole	7315	-3202	-1382	11.6	35	1000
4	Overhead Close – Up View of Impact	228	1372	-5906	90	12.5	1000
5	Onboard – Dummy Front View	866	384	-1260	12.7	25	1000
6	Onboard – Dummy Side View	-108	1704	-1067	14.1	12.5	1000
7	Onboard – Dummy Rear Oblique View	-1109	1713	-1104	16.2	12.5	1000
8	Rear Ground Level – Impact View	-10973	-914	-1225	4.6	50	1000
9	Impact Side 45° - Rearward Pole View	-6401	-8230	-1371	12.0	35	1000
10	Overhead Wide – View Impact	457	452	-5889	90	8	1000
11	Real – Time (24 – 30 fps) Dummy Front View	936	1279	-1231	13.2	25	24

Origin

X

Y

Z

Impact Point

Impact Point

Ground

Orientation

X

Y

Z

+ (X) Forward

+ (Y) Right

+ (Z) Down

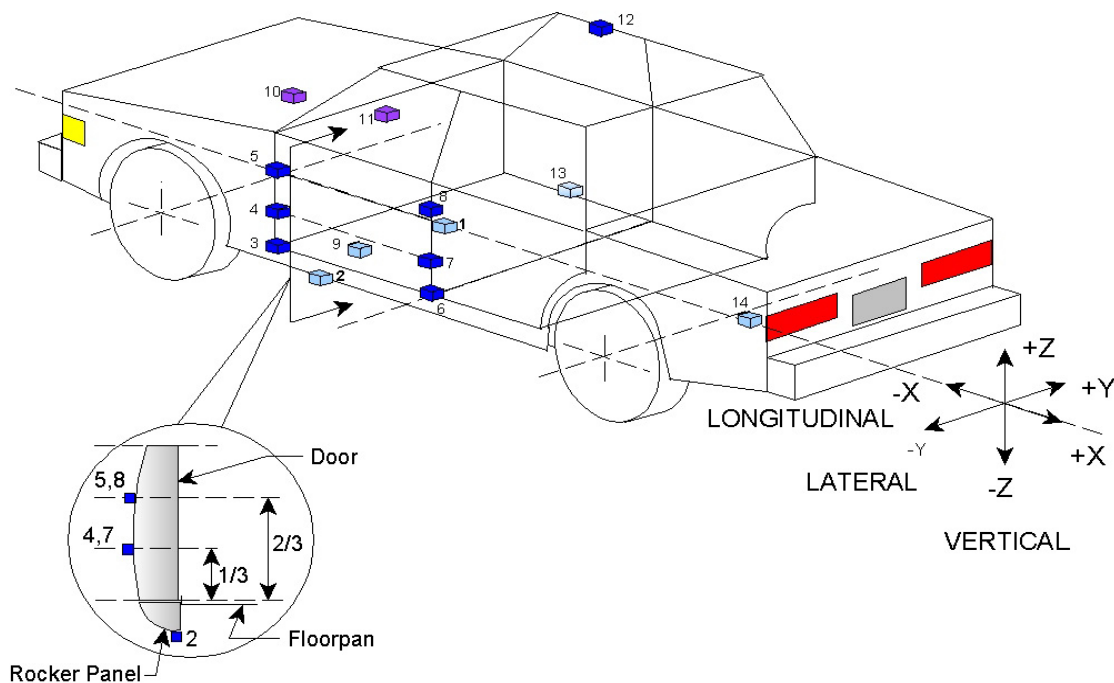
**All measurements accurate to +/- 6 mm*

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

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA (CONTINUED)

INSTRUMENTATION	
	Number of channels
Driver Dummy	19
Vehicle Structure	23
Pole Load Cells	8
Contact Switches	0
Total No. of Data Channels	50

DATA SHEET NO. 6
VEHICLE ACCELEROMETER LOCATIONS



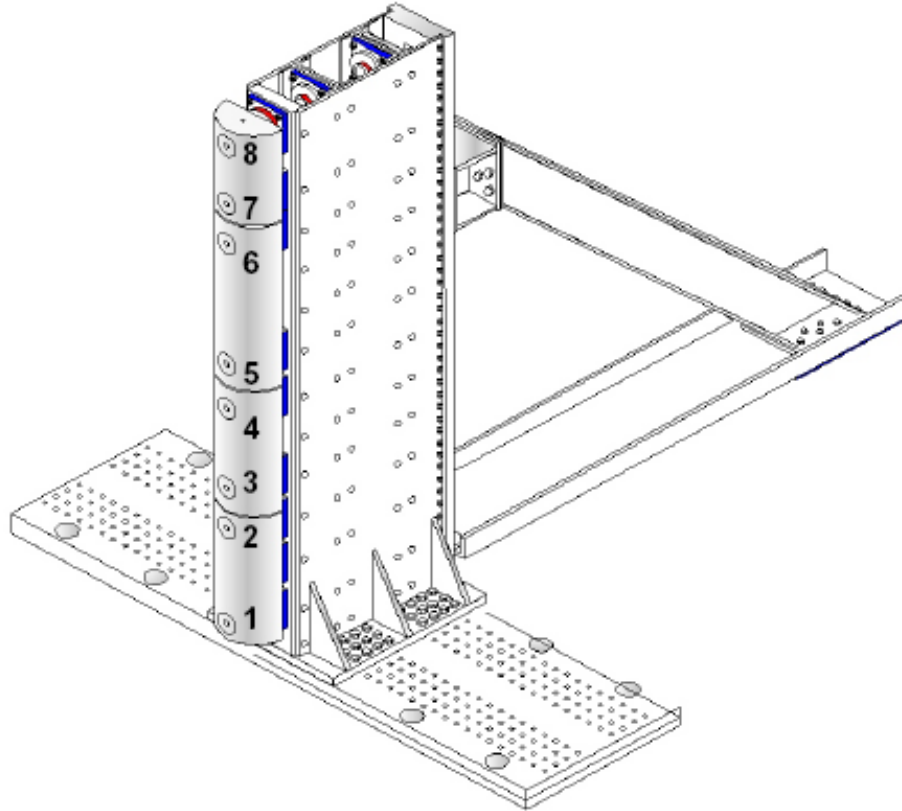
TEST VEHICLE ACCELEROMETER LOCATIONS				
Loc. no.	Accelerometer location	Measurements (mm)		
		X	Y	Z
A	Vehicle CG Accelerometer	2782	-76	-115
	Vehicle CG Sensor			
B	Left Floor Sill	2441	-747	271
C	A Pillar Sill	3229	-744	291
D	A Pillar Low	3142	-775	137
E	A Pillar Mid	3162	-773	-17
F	B Pillar Sill	2209	-757	277
G	B Pillar Low	2223	-782	123
H	B Pillar Mid	2175	-778	-197
I	Driver Seat	2624	-644	122
J	Firewall	3561	349	-274
K	Right Roof	2741	827	270
L	Engine Top	3936	12	-331
M	Right Floor Sill	2709	736	286
N	Rear Floorpan	1071	2	-47

Origin
X Rear Bumper
Y Midline of Vehicle
Z Top of Rear Bumper

Orientation
X +(X) Forward
Y +(Y) Right
Z +(Z) Down

DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA

FOIL 300K RIGID POLE



RIGID POLE LOAD CELL LOCATIONS	
ID	Height From Ground (mm)
1	77
2	477
3	632
4	969
5	1167
6	1638
7	1808
8	2030

*Measured from top of platform

DATA SHEET NUMBER NO. 8
POST TEST OBSERVATIONS

TEST DUMMY INFORMATION AND CONTACT POINTS	
Description	Driver dummy
Dummy Type / Serial No.	SID-IIs/321
Head Contact	Side of head to side curtain airbag
Upper Torso Contact	To torso airbag
Lower Torso Contact	Top to torso airbag; pelvis to pelvic airbag
Left Knee Contact	To front of armrest, ~ 380 mm below windshield
Right Knee Contact	To left knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION		
Description	Front	Rear
Left Side Doors	Jammed shut	Jammed shut
Right Side Doors	Remained closed and operational	Remained closed and operational
Hatch and Other Doors	N/a	N/a
Seat Movement	~85 mm of seat crush	None noted
Seat Back Failure	None	None

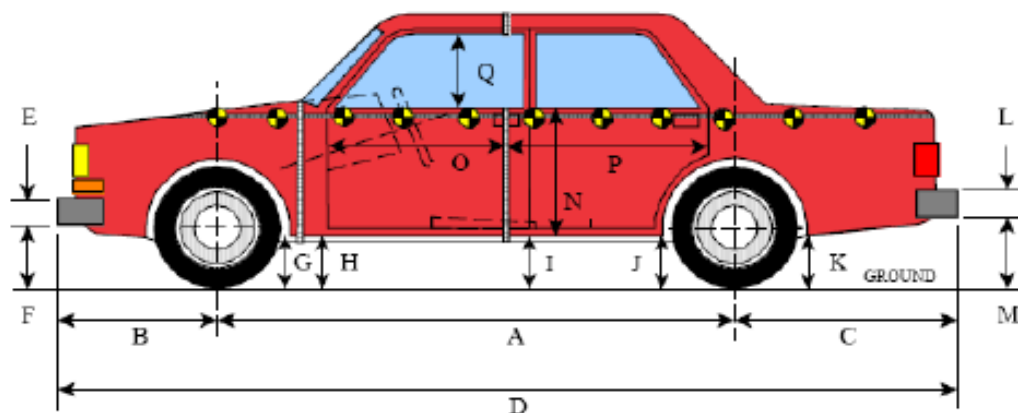
POST TEST STRUCTURAL OBSERVATIONS	
Critical Areas of Performance	Observations/Conclusions
Pillar Performance	No damage
Sill Separation	Max sill separation of 114 mm at B-pillar; door remained latched
Windshield Damage	Cracking along entire windshield
Window Damage	Shattered at impact
Other Notable Effects	None noted

**DATA SHEET NUMBER NO. 8
 POST TEST OBSERVATIONS (CONTINUED)**

SUPPLEMENTAL RESTRAINT INFORMATION				
Restraint type	Left Front (Driver)		Left Rear (Passenger)	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes – Steering wheel	Did not deploy	No	N/a
Knee Airbag	Yes	Did not deploy	No	N/a
Side Curtain Airbag	Yes – Side header	Deployed properly	Yes – Side header	Deployed properly
Side Torso Airbag	Yes – Seat back	Deployed properly	No	N/a
Side Pelvis Airbag	Yes	Deployed properly	No	N/a
Seat Belt Pretensioner	Yes	Deployed properly	No	N/a
Seat Belt Load Limiter	Yes	N/a	No	N/a
Other	No	N/a	No	N/a

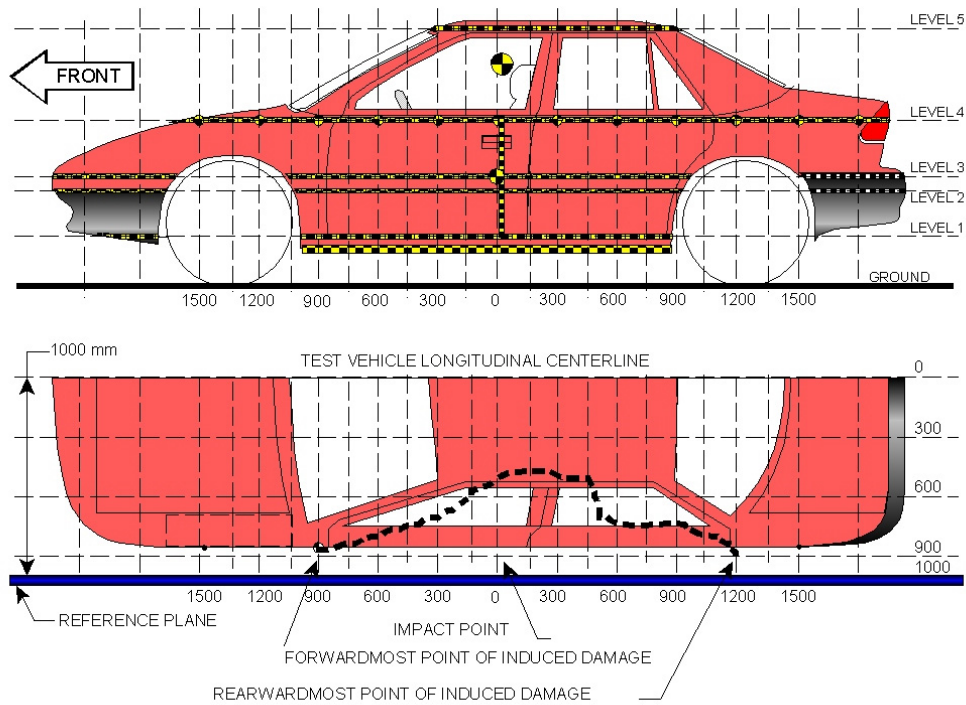
IMPACT SPEED				
Measured Parameter	Units	Specification	Range	Value
Horizontal Offset	mm	N/a	+/- 38	-5
Primary Speed Trap	kmh	32.2	30.4-32.0	32.0
Redundant Speed Trap	kmh	32.2	30.4-32.0	32.0

DATA SHEET NUMBER NO. 9
VEHICLE PROFILE MEASUREMENTS



VEHICLE PRE- AND POST- TEST MEASUREMENT INFORMATION				
Code	Description	Pre test	Post test	Difference
		mm	mm	mm
A	Wheelbase	2760	2617	-143
B	Front Axle to Front Side of Vehicle	537	584	47
C	Rear Axle to Rear Side of Vehicle	933	933	0
D1	Total Length at Left Side	4236	4134	-102
D2	Total Length at Centerline	4630	4607	-23
D3	Total Length at Right Side	4236	4245	9
E	Front Bumper Thickness	279	279	0
F	Front Bumper Bottom to Ground	197	249	52
G	Sill Height at Front Wheel Well	256	239	-17
H	Sill Height at Front Door Leading Edge	264	264	0
I	Sill Height at B-Pillar	281	308	27
J1	Sill Height at Rear Wheel Well	144	169	25
J2	Pinch Weld Height at Rear Wheel Well	287	332	45
K	Sill Height Aft of Rear Wheel Well	305	332	27
L	Rear Bumper Thickness	175	175	0
M	Rear Bumper Bottom to Ground	397	396	-1
N	Sill Height to Window Bottom Sill	699	700	1
O	Front Door Leading Edge to Impact C/L	1096	857	-239
P	Rear Door Trailing Edge to Impact C/L	840	840	0
Q	Front Window Opening	452	432	-20
R	Right Side Length	4236	4245	9
S	Left Side Length	4236	4134	-102
T	Vehicle Width at B-Pillar	1772	1645	-127

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH MEASUREMENTS



NOTE: All measurements are in millimeters (mm)

VEHICLE STATIC CRUSH SUMMARY		
Level	Measurement Description	Height Above Ground (mm)
1	Sill Top	380
2	Occupant H-Point	478
3	Mid-Door	606
4	Window Sill	916
5	Window Top	1316

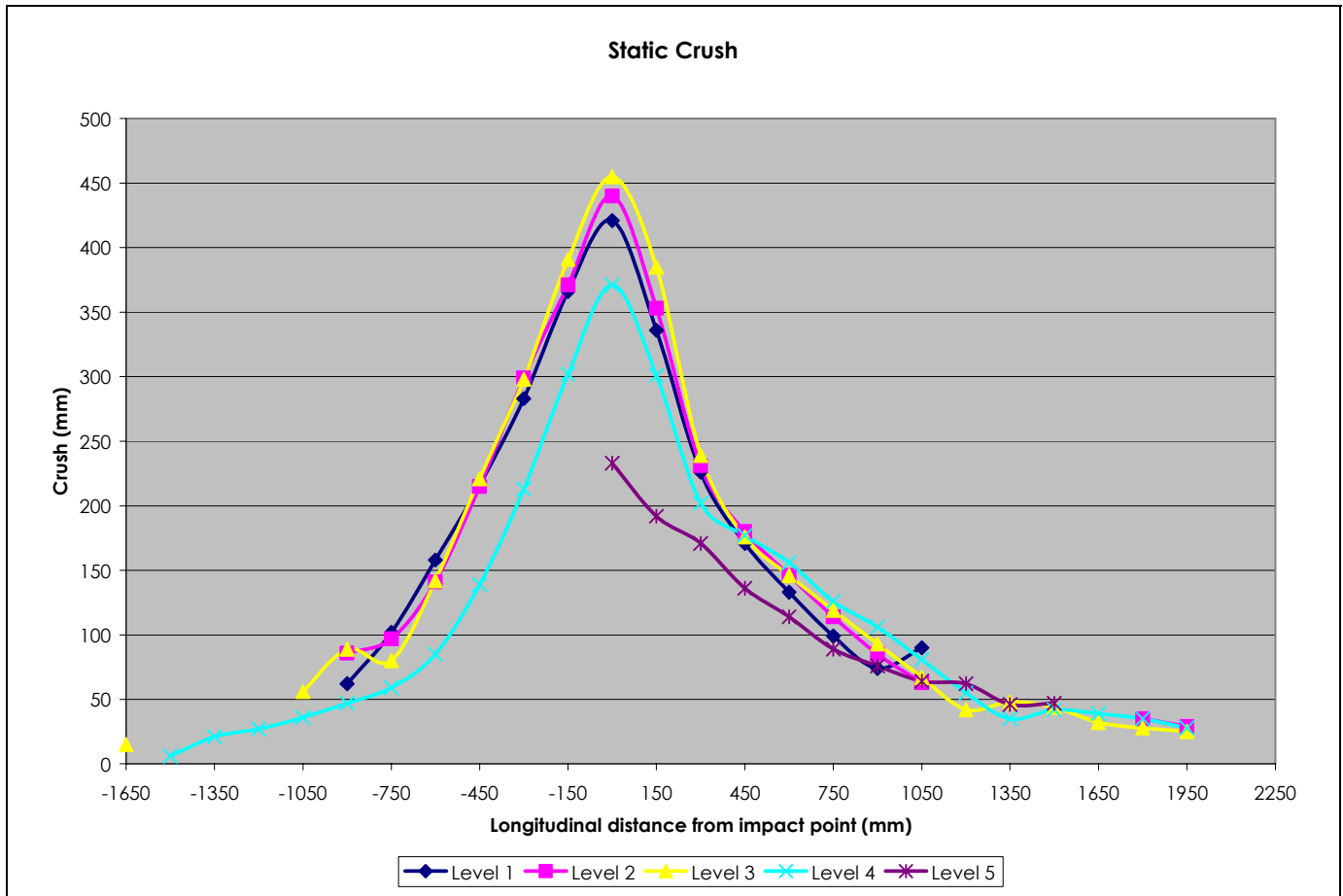
All vehicle measurements taken at the vertical impact line.

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

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

TEST VEHICLE STATIC CRUSH																
Level		1			2			3			4			5		
		380			478			606			916			1316		
		Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush	Pre	Post	Crush
DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT	-1650							292	307	15						
	-1500										368	374	6			
	-1350										364	385	21			
	-1200										362	389	27			
	-1050							279	353	56	360	396	36			
	-900	313	375	62	294	380	86	292	381	89	359	406	47			
	-750	313	415	102	301	398	97	290	370	80	356	415	59			
	-600	311	469	158	299	440	141	289	431	142	362	447	85			
	-450	310	526	216	298	513	215	286	507	221	355	494	139			
	-300	310	593	283	297	596	299	284	582	298	359	572	213			
	-150	307	673	366	296	667	371	282	673	391	362	664	302			
	0	306	727	421	296	736	440	281	736	455	364	735	371	557	790	233
	150	305	641	336	295	648	353	280	665	385	367	668	301	583	775	192
	300	304	530	226	294	525	231	279	518	239	370	572	202	585	756	171
	450	304	475	171	293	473	180	279	455	176	375	552	177	603	739	136
	600	305	438	133	294	440	146	279	425	146	380	536	156	603	717	114
	750	304	403	99	295	409	114	281	400	119	385	511	126	613	702	89
	900	304	378	74	297	382	85	283	376	93	389	495	106	608	684	76
	1050	305	395	90	295	358	63	285	352	67	394	475	81	598	662	64
	1200							283	325	42	400	455	55	577	639	62
	1350							276	324	48	404	439	35	558	604	46
	1500							276	320	44	409	451	42	529	576	47
	1650							294	326	32	416	455	39			
	1800				300	335	35	315	343	28	425	460	35			
	1950				327	356	29	330	355	25	436	464	28			
	2100															
	2250															

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



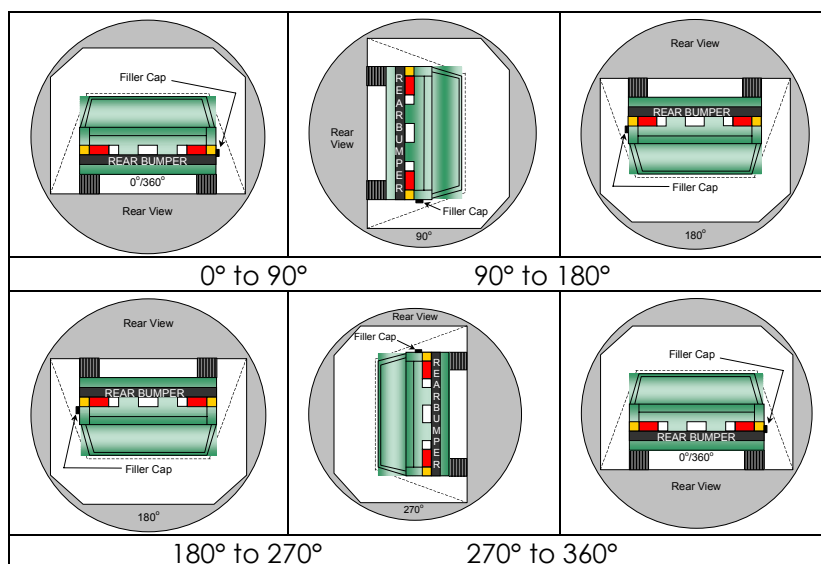
MAXIMUM CRUSH DATA					
	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush (mm)	421	440	455	371	233
Distance from Impact (mm)	0	0	0	0	0

DATA SHEET NO. 11A
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 24° C Test Time: 12:30 pm

STODDARD SOLVENT SPILLAGE MEASUREMENTS				
Period	Description	Maximum Allowable Spillage	Spillage	
			Amount	Location
A	From Impact Until Vehicle Motion Ceases	1 oz	0	N/a
B	5 Minutes After Vehicle Motion Ceases	5 oz	0	N/a
C	Next 25 Minutes	1 oz/minute	0	N/a

FMVSS 301 STATIC ROLLOVER



FMVSS301 STATIC ROLLOVER DATA			
Test phase	Rotation Time (sec.)	Hold Time (sec.)	Total Time (sec.)
Tolerance	60-180	>= 300	-
0° to 90°	63	300	363
90° to 180°	66	300	366
180° to 270°	68	300	368
270° to 360°	67	300	367

DATA SHEET NO. 11A
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA (CONTINUED)

FMVSS301 STATIC ROLLOVER - SPILLAGE				
	First Five Minutes (oz)	Sixth Minute (oz)	Seventh Minute (oz)	Eighth Minute (oz)
Max Allowable Leakage	5.0	1.0	1.0	1.0
0° to 90°	0	0	0	N/a
90° to 180°	0	0	0	N/a
180° to 270°	0	0	0	N/a
270° to 360°	0	0	0	N/a

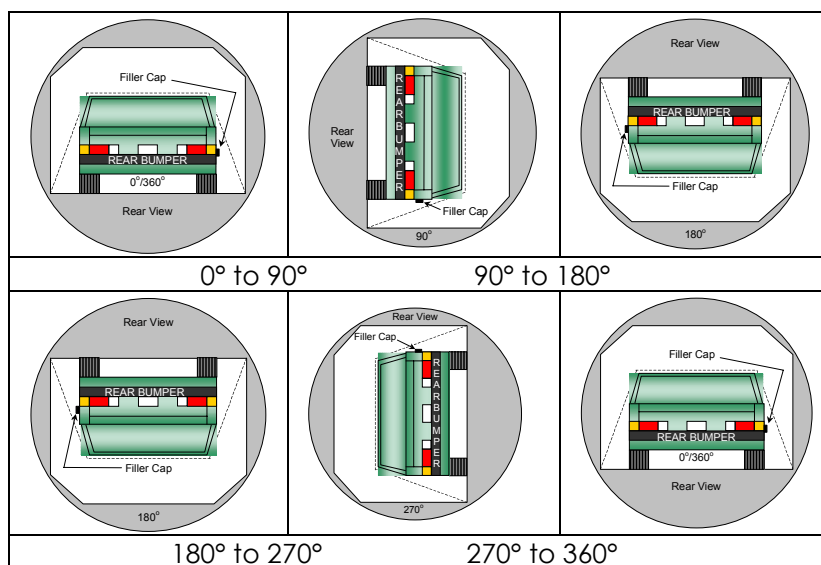
SPILLAGE LOCATION(s)	
0° to 90°	N/a
90° to 180°	N/a
180° to 270°	N/a
270° to 360°	N/a

DATA SHEET NO. 11B
FMVSS 305 PROPULSION BATTERY INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: N/a Test Time: N/a

ELECTROLYTE SPILLAGE MEASUREMENTS				
Period	Description	Maximum Allowable Spillage	Spillage	
			Amount	Location
A	From Impact Until Vehicle Motion Ceases	1 oz	0	N/a
B	5 Minutes After Vehicle Motion Ceases	5 oz	0	N/a
C	Next 25 Minutes	1 oz/minute	0	N/a

FMVSS 305 STATIC ROLLOVER



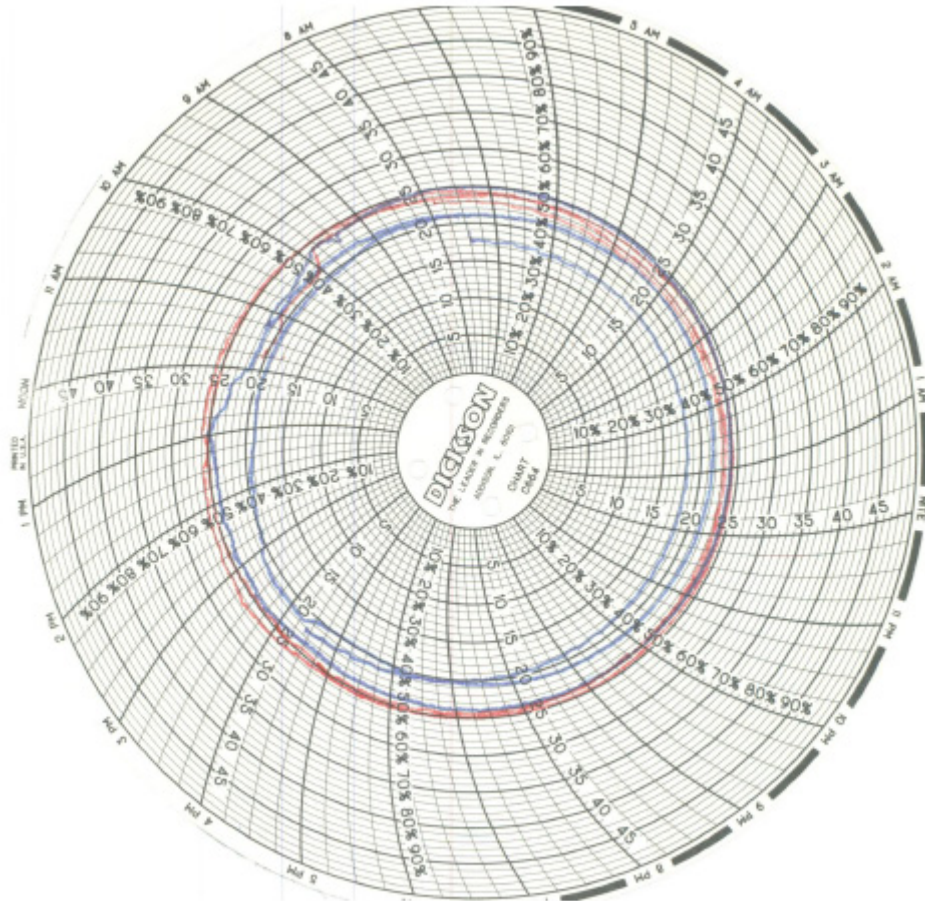
FMVSS305 STATIC ROLLOVER DATA			
Test phase	Rotation Time (sec.)	Hold Time (sec.)	Total Time (sec.)
Tolerance	60-180	>= 300	-
0° to 90°	N/a	N/a	N/a
90° to 180°	N/a	N/a	N/a
180° to 270°	N/a	N/a	N/a
270° to 360°	N/a	N/a	N/a

DATA SHEET NO. 11B
FMVSS 305 PROPULSION BATTERY INTEGRITY POST IMPACT DATA (CONTINUED)

FMVSS305 ELECTROLYTE SPILLAGE				
	First Five Minutes (oz)	Sixth Minute (oz)	Seventh Minute (oz)	Eighth Minute (oz)
Max Allowable Leakage	5.0	1.0	1.0	1.0
0° to 90°	N/a	N/a	N/a	N/a
90° to 180°	N/a	N/a	N/a	N/a
180° to 270°	N/a	N/a	N/a	N/a
270° to 360°	N/a	N/a	N/a	N/a

ELECTROLYTE SPILLAGE LOCATION(s)	
0° to 90°	N/a
90° to 180°	N/a
180° to 270°	N/a
270° to 360°	N/a

DATA SHEET NO. 12
DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA



Test Vehicle: 2011 Mercedes Benz C300 4-Door Sedan
Test Program: SPNCAP

NHTSA Number: MB 0500
Test Date: September 23, 2010

APPENDIX A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

Figure	Photograph Description	Page
001	As Delivered Right Front Three-Quarter View of Test Vehicle	A-4
002	As Delivered Left Rear Three-Quarter View of Test Vehicle	A-4
003	Pre-Test Frontal View of Test Vehicle	A-5
004	Post- Test Frontal View of Test Vehicle	A-5
005	Pre-Test Left Front Three-Quarter View of Test Vehicle	A-6
006	Post- Test Left Front Three-Quarter View of Test Vehicle	A-6
007	Pre-Test Left Side View of Test Vehicle	A-7
008	Post- Test Left Side View of Test Vehicle	A-7
009	Pre-Test Left Rear Three-Quarter View of Test Vehicle	A-8
010	Post- Test Left Rear Three-Quarter View of Test Vehicle	A-8
011	Pre-Test Rear View of Test Vehicle	A-9
012	Post- Test Rear View of Test Vehicle	A-9
013	Pre-Test Right Side View of Test Vehicle	A-10
014	Post- Test Right Side View of Test Vehicle	A-10
015	Pre- Test Overhead View of Test Vehicle and Pole	A-11
016	Post- Test Overhead View of Test Vehicle and Pole	A-11
017	Pre- Test Left Side View of Pole Positioned Against Side of Vehicle at Ideal Impact Point	A-12
018	Pre- Test Right Side View of Pole Positioned Against Side of Vehicle at Ideal Impact Point	A-12
019	Pre- Test Close-Up View of Impact Point Target	A-13
020	Post- Test Close-Up View of Impact Point Target Showing Impact Location	A-13
021	Pre- Test Front Close-Up View of Dummy	A-14
022	Post- Test Front Close-Up View of Dummy	A-14
023	Pre- Test Left Side View of Dummy Showing Belt, Chalking, and Contact Switches	A-15
024	Pre- Test Left Side View of Dummy Shoulder and Driver Door Top View	A-15
025	Pre- Test Left Side View of Dummy Shoulder and Driver Door Top View	A-16
026	Pre- Test Frontal View of Seat Back Prior to Dummy Positioning	A-16
027	Pre- Test Frontal View of Dummy Head and Shoulders in Relation to Head Restraint	A-17
028	Pre- Test Frontal View of Seat Pan Prior to Dummy Positioning	A-17
029	Pre- Test Overhead View of Dummy Thighs on Seat Pan	A-18
030	Pre- Test View of Dummy's Neck Showing Position of Adjustable Neck Bracket	A-18
031	Pre- Test View of Dummy's Head Showing Dummy's Head is Level	A-19
032	Pre- Test Placement of Dummy's Feet	A-19
033	Pre- Test View of Belt Anchorage for Dummy	A-20
034	Pre- Test Left Side View of Steering Wheel	A-20
035	Pre- Test View of Parking Brake	A-21
036	Pre- Test Close-Up Left Side View of Driver Seat Track	A-21
037	Pre - Test Close-Up Left Side View of Driver Seat Back	A-22
038	Pre- Test Close-Up View of Driver Seat Back or Head Restraint	A-22
039	Pre- Test Dummy and Driver Door Clearance View	A-23

LIST OF PHOTOGRAPHS (CONTINUED)

Figure	Photograph Description	Page
040	Post- Test Dummy and Driver Door Clearance View	A-23
041	Pre- Test Right Side View of Dummy and Front Seat Occupant Compartment	A-24
042	Post- Test Right Side View of Dummy and Front Seat Occupant Compartment	A-24
043	Pre- Test Inner Driver Door Panel View	A-25
044	Post- Test Inner Driver Door Panel View Showing Dummy Contact Locations	A-25
045	Post- Test Dummy Close-Up Head Contact with Vehicle View	A-26
046	Post- Test Dummy Close-Up Head Contact with Side Airbag View	A-26
047	Post- Test Dummy Close-Up Torso Contact with Vehicle Interior View	A-27
048	Post- Test Dummy Close-Up Torso Contact with Side Airbag View	A-27
049	Post- Test Dummy Close-Up Pelvis Contact with Vehicle Interior View	A-28
050	Post- Test Dummy Close-Up Pelvis Contact with Side Airbag View	A-28
051	Pre- Test View of Fuel Filler Cap or Fuel Filler Neck	A-29
052	Post- Test View of Fuel Filler Cap or Fuel Filler Neck	A-29
053	Close-Up View of Vehicle's Certification Label	A-30
054	Close-up View of Vehicle's Tire Information Placard or Label	A-30
055	Pre- Test Pole Barrier Front View	A-31
056	Post- Test Pole Barrier Front View	A-31
057	Pre- Test Pole Barrier Side View	A-32
058	Post- Test Pole Barrier Side View	A-32
059	Pre- Test Ballast View	A-33
060	Post- Test Primary and Redundant Speed Trap Read-Out	A-33
061	FMVSS No. 301/305 Rollover 0°	A-34
062	FMVSS No. 301/305 Rollover 90°	A-34
063	FMVSS No. 301/305 Rollover 180°	A-35
064	FMVSS No. 301/305 Rollover 270°	A-35
065	FMVSS No. 301/305 Rollover 360°	A-36
066	Impact Event	A-36
067	Monroney label	A-37
068	Head Restraint Use and Adjustment Information from Vehicle Manual	A-37



Figure 001: As delivered right front three-quarter view of test vehicle



Figure 002: As delivered left rear three-quarter view of test vehicle



Figure 003: Pre-test frontal view of test vehicle



Figure 004: Post-test frontal view of test vehicle



Figure 005: Pre-test left front three-quarter view of test vehicle



Figure 006: Post-test left front three-quarter view of test vehicle



Figure 007: Pre-test left side view of test vehicle



Figure 008: Post-test left side view of test vehicle



Figure 009: Pre-test left rear three-quarter view of test vehicle



Figure 010: Post-test left rear three-quarter view of test vehicle



Figure 011: Pre-test rear view of test vehicle



Figure 012: Post-test rear view of test vehicle



Figure 013: Pre-test right side view of test vehicle



Figure 014: Post-test right side view of test vehicle

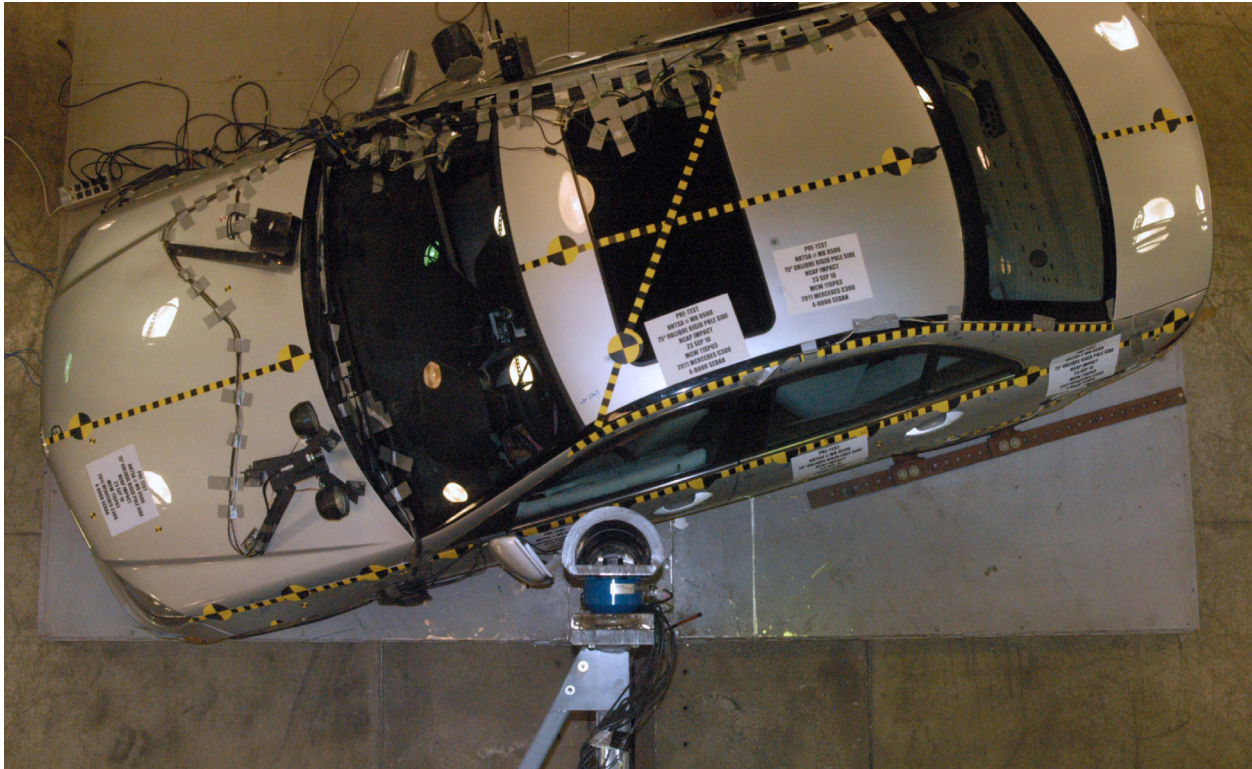


Figure 015: Pre-test overhead view of test vehicle and pole

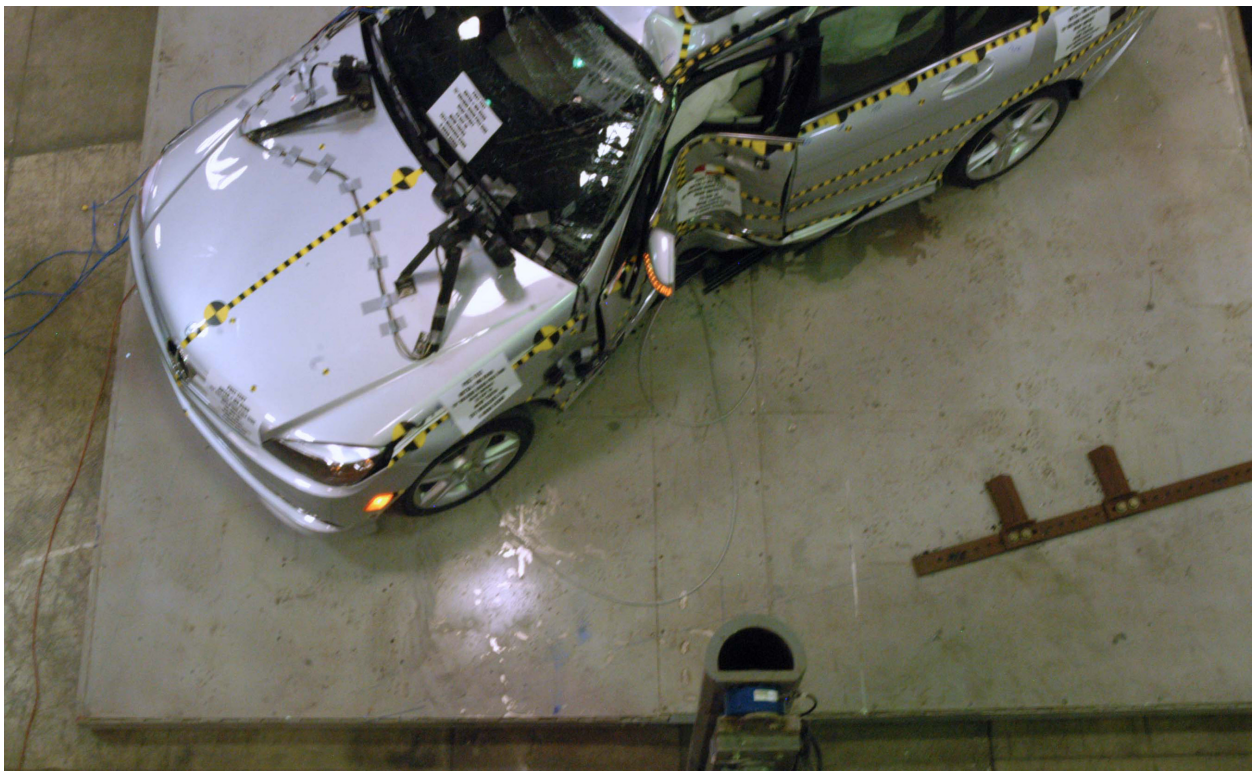


Figure 016: Post-test overhead view of test vehicle and pole



Figure 017: Pre-test left side view of pole positioned against side of vehicle at impact point



Figure 018: Pre-test right side view of pole positioned against side of vehicle at impact point



Figure 019: Pre-test close-up view of impact point target



Figure 020: Post-test close-up view of impact point target showing impact location



Figure 021: Pre-test front close-up view of dummy



Figure 022: Post-test front close-up view of dummy



Figure 023: Pre-test left side view of dummy showing belt, chalking, and contact switches



Figure 024: Pre-test left side view of dummy shoulder and driver top view



Figure 025: Post-test left side view of dummy shoulder and driver top view



Figure 026: Pre-test frontal view of seat back prior to dummy positioning



Figure 027: Pre-test frontal view of dummy head and shoulders in relation to head restraint



Figure 028: Pre-test frontal view of seat pan prior to dummy positioning



Figure 029: Pre-test overhead view of dummy thighs on seat pan



Figure 030: Pre test view of dummy's neck showing position of adjustable neck bracket

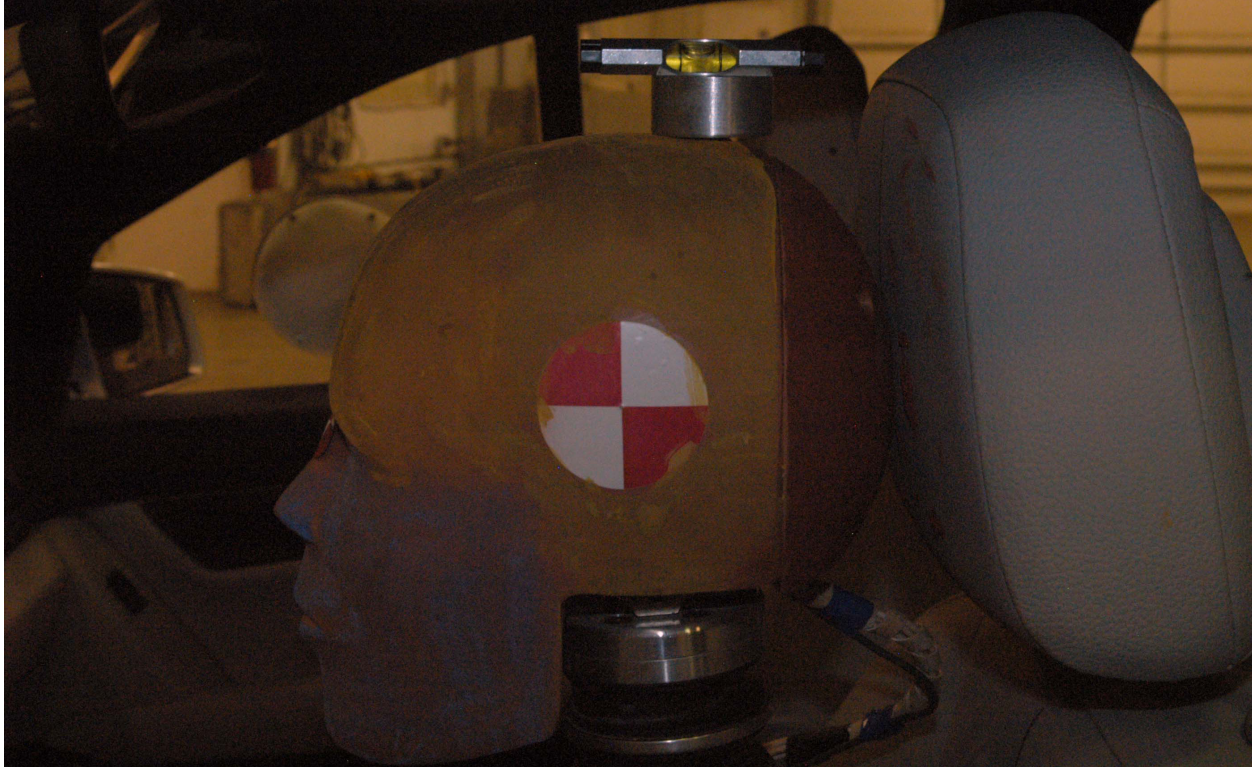


Figure 031: Pre-test view of dummy's head showing dummy's head is level



Figure 032: Pre- test placement of dummy's feet

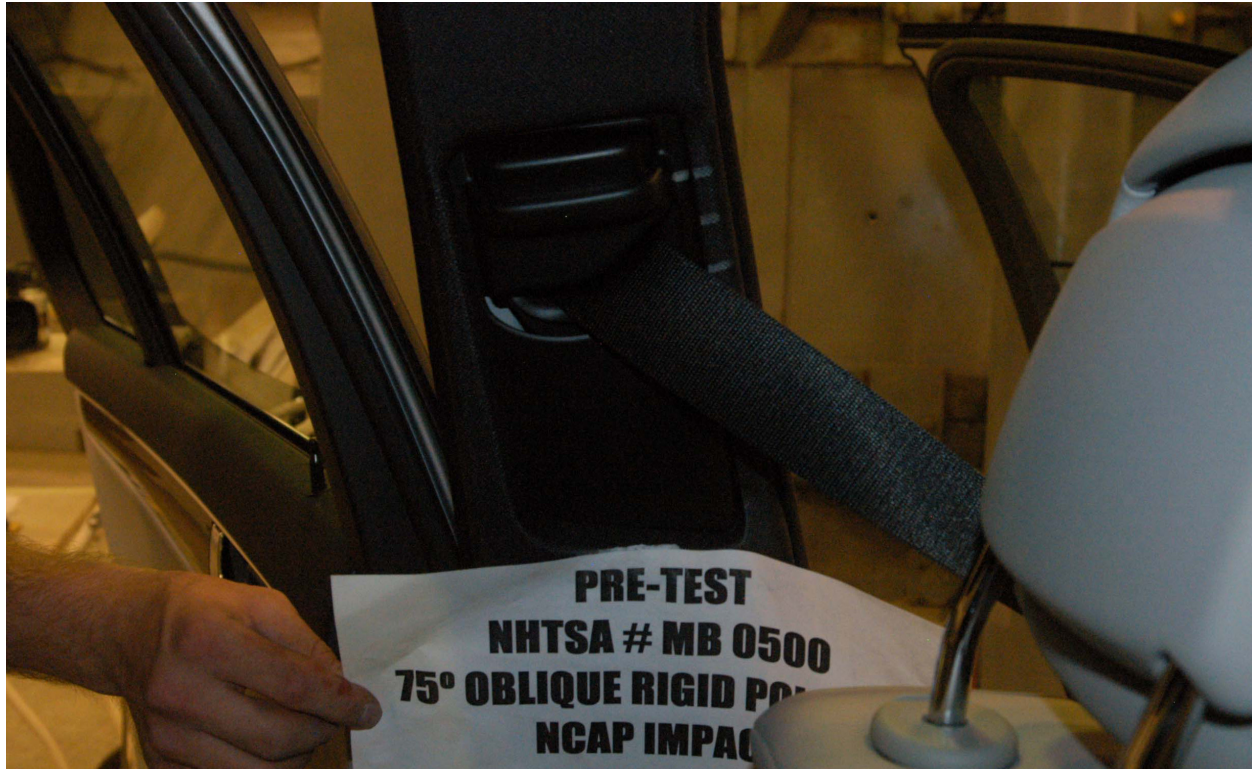


Figure 033: Pre-test view of belt anchorage for dummy

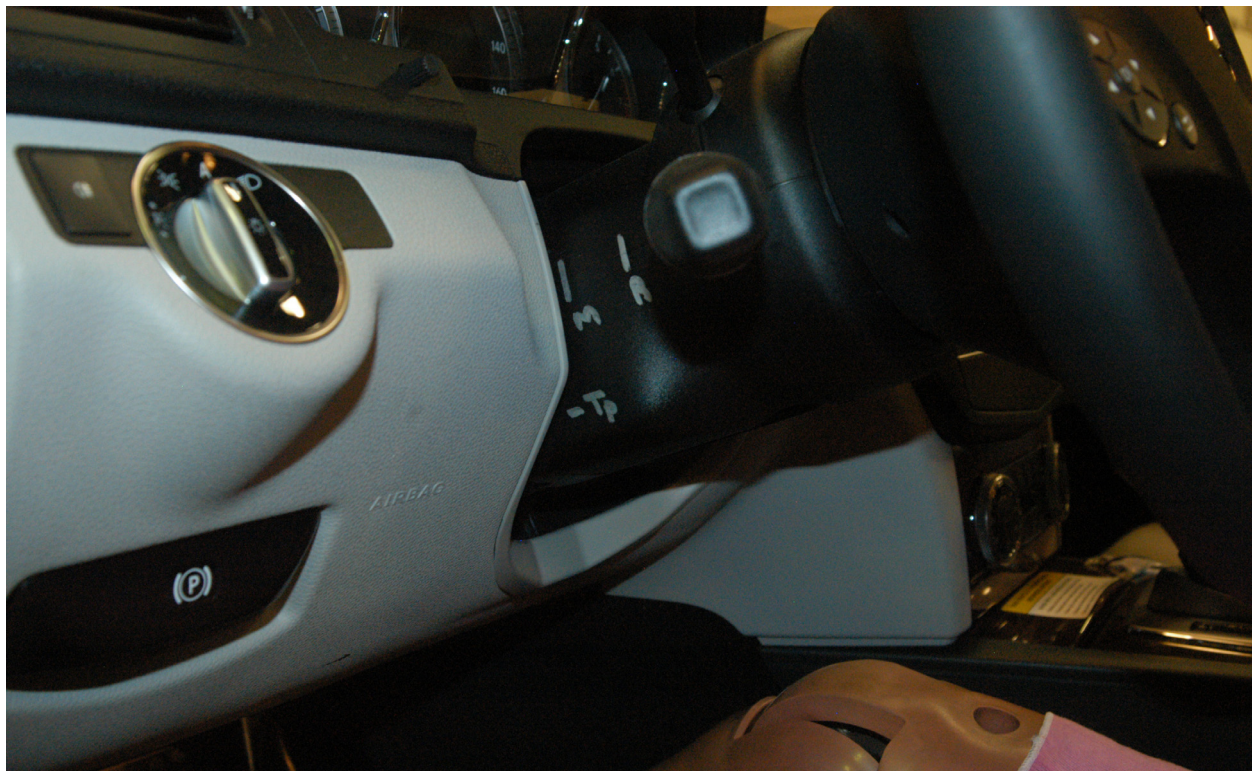


Figure 034: Pre-test left side view of steering wheel



Figure 035: Pre-test view of parking brake



Figure 036: Pre-test close-up left side view of driver seat track



Figure 037: Pre-test close-up left side view of driver seat back



Figure 038: Pre-test close-up view of driver seat back or head restraint



Figure 039: Pre-test dummy and driver door clearance view



Figure 040: Post-test dummy and driver door clearance view



Figure 041: Pre-test right side view of dummy and front seat occupant compartment



Figure 042: Post-test right side view of dummy and front seat occupant compartment



Figure 043: Pre-test inner driver door panel



Figure 044: Post-test inner driver door panel showing dummy contact locations



Figure 045: Post-test dummy close-up head contact with vehicle view



Figure 046 Post-test dummy close-up head contact with side airbag view

Figure 047: Post-test dummy close-up torso contact with vehicle interior view - N/a

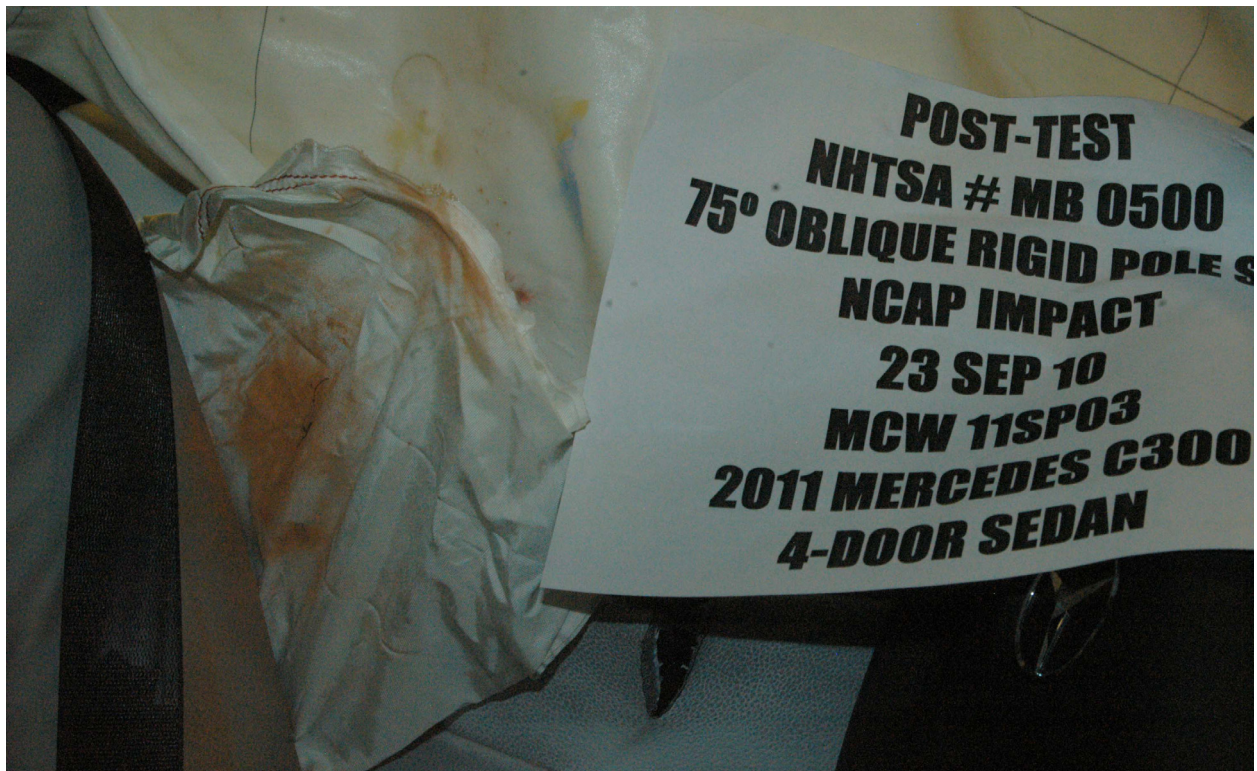


Figure 048: Post-test dummy close-up torso contact with side airbag view

Figure 049: Post-test dummy close-up pelvis contact with vehicle interior view - N/a



Figure 050: Post-test dummy close-up pelvis contact with side airbag view



Figure 051: Pre-test view of fuel filler cap/neck



Figure 052: Post-test view of fuel filler cap/neck



Figure 053: Close-up view of vehicle's certification label

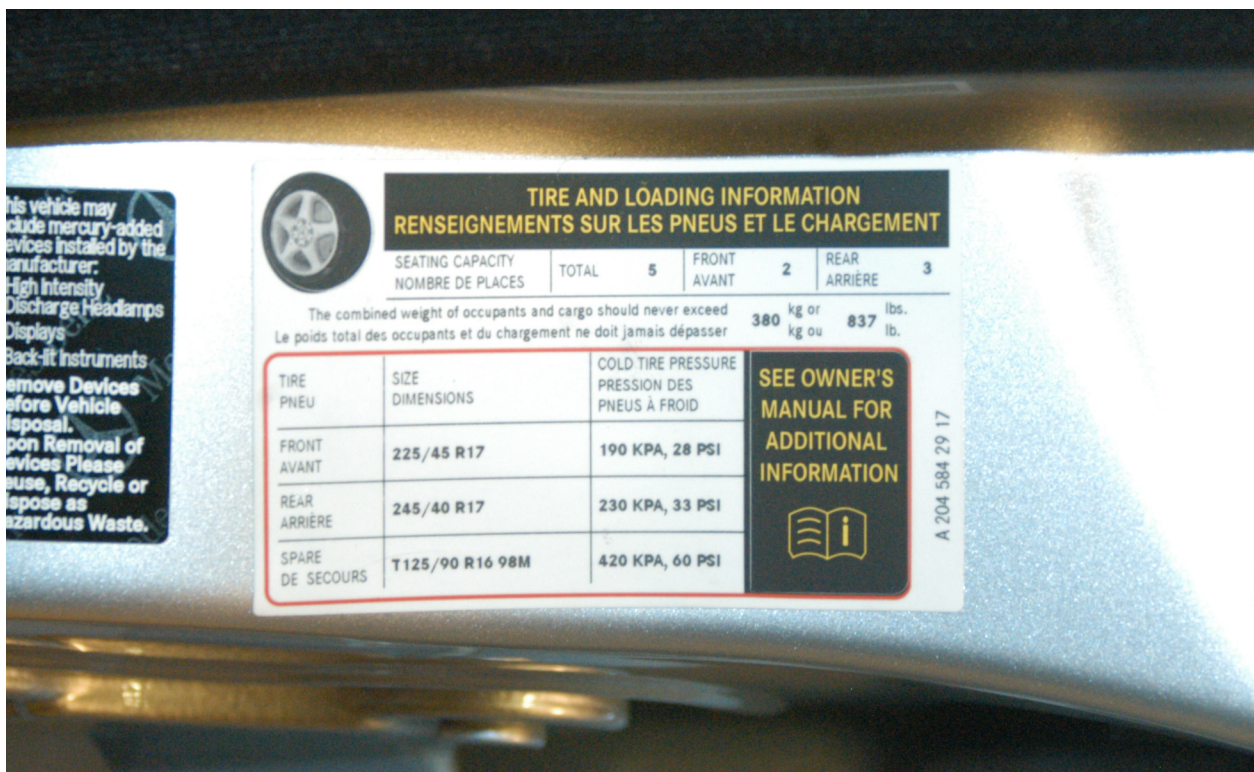


Figure 054: Close-up view of vehicle's tire information placard/label

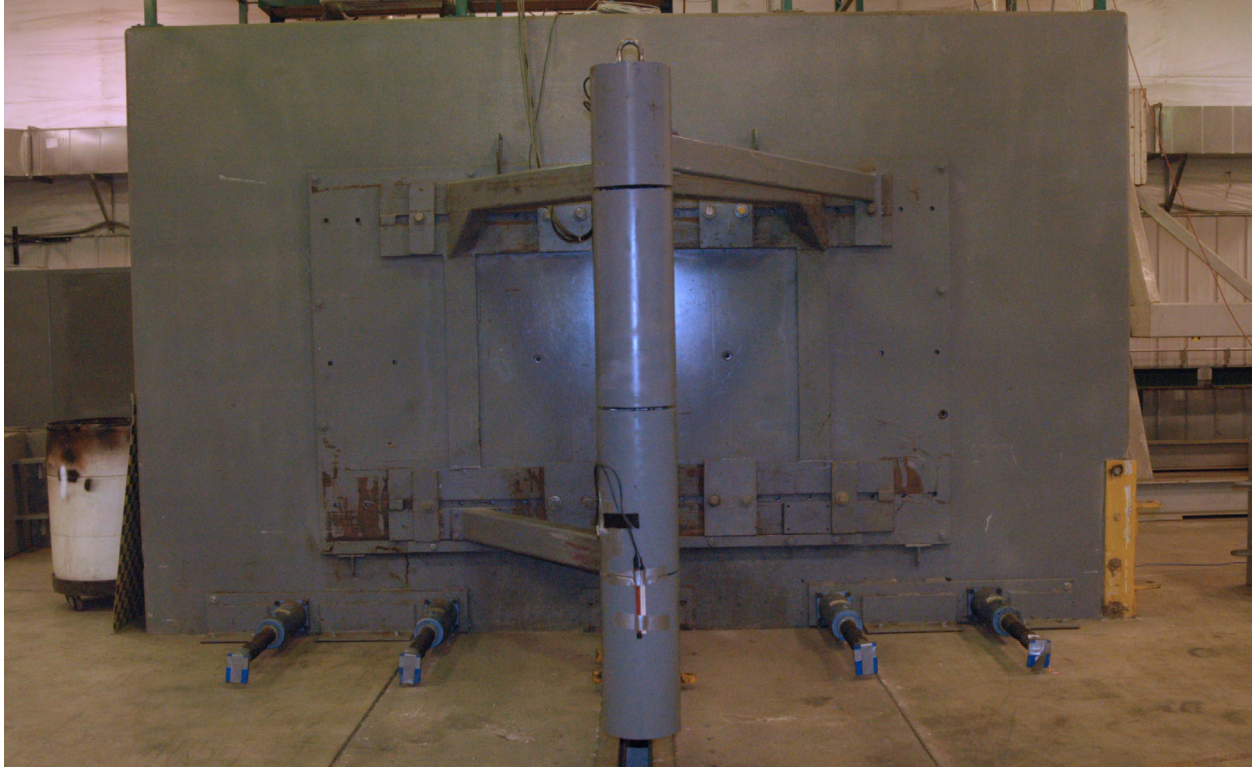


Figure 055: Pre-test pole barrier front view



Figure 056: Post-test pole barrier front view

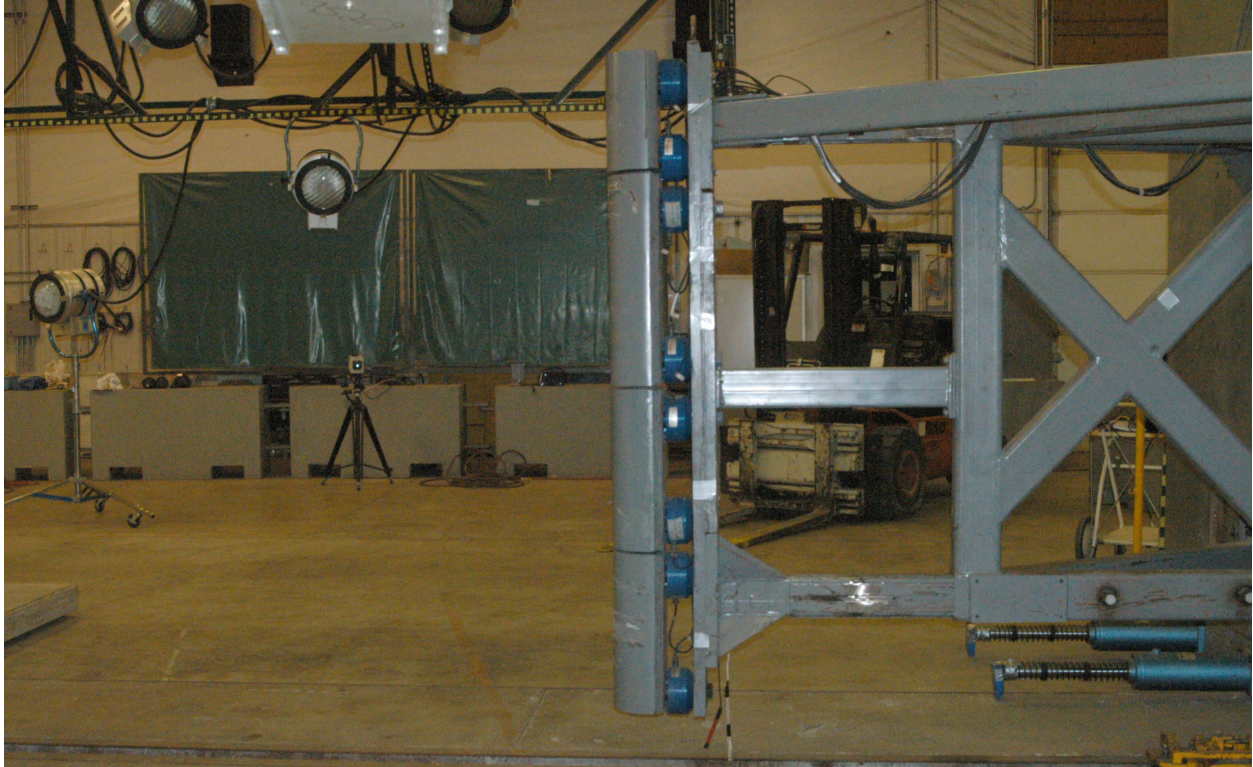


Figure 057: Pre-test pole barrier side view

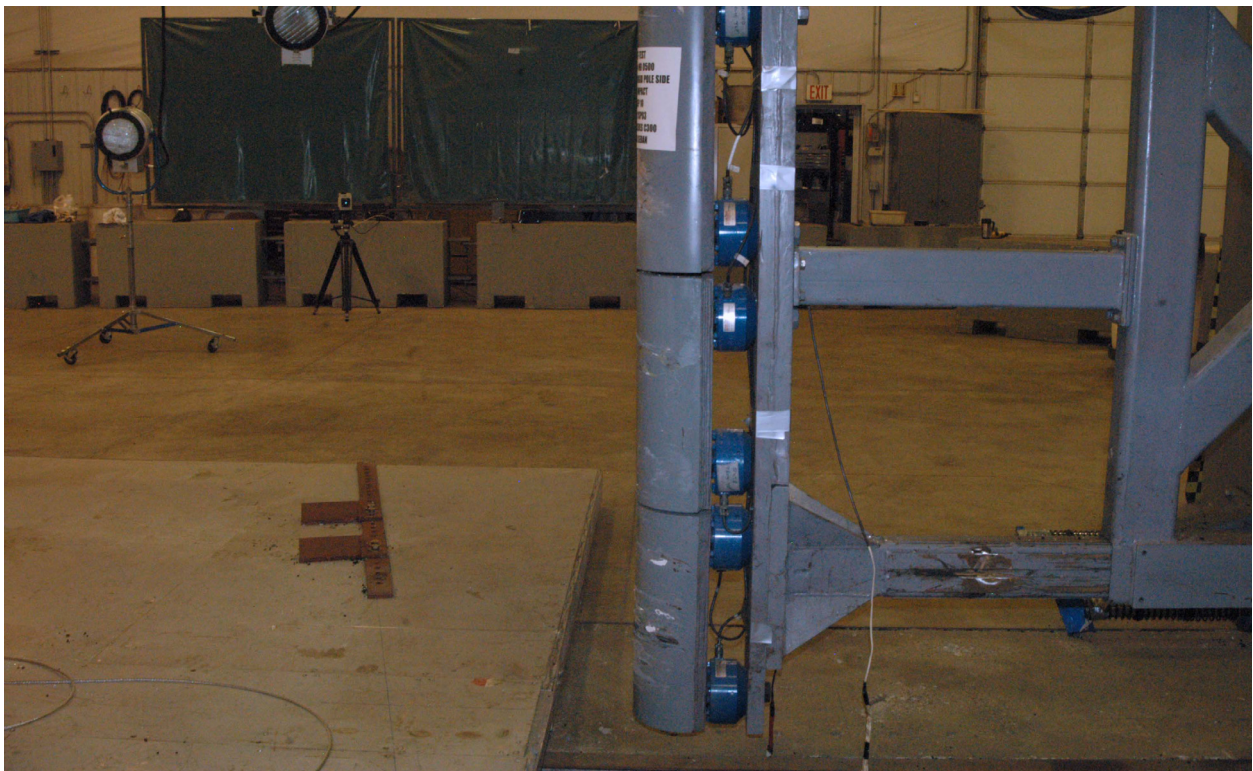


Figure 058: Post-test pole barrier side view



Figure 059: Pre-test ballast view

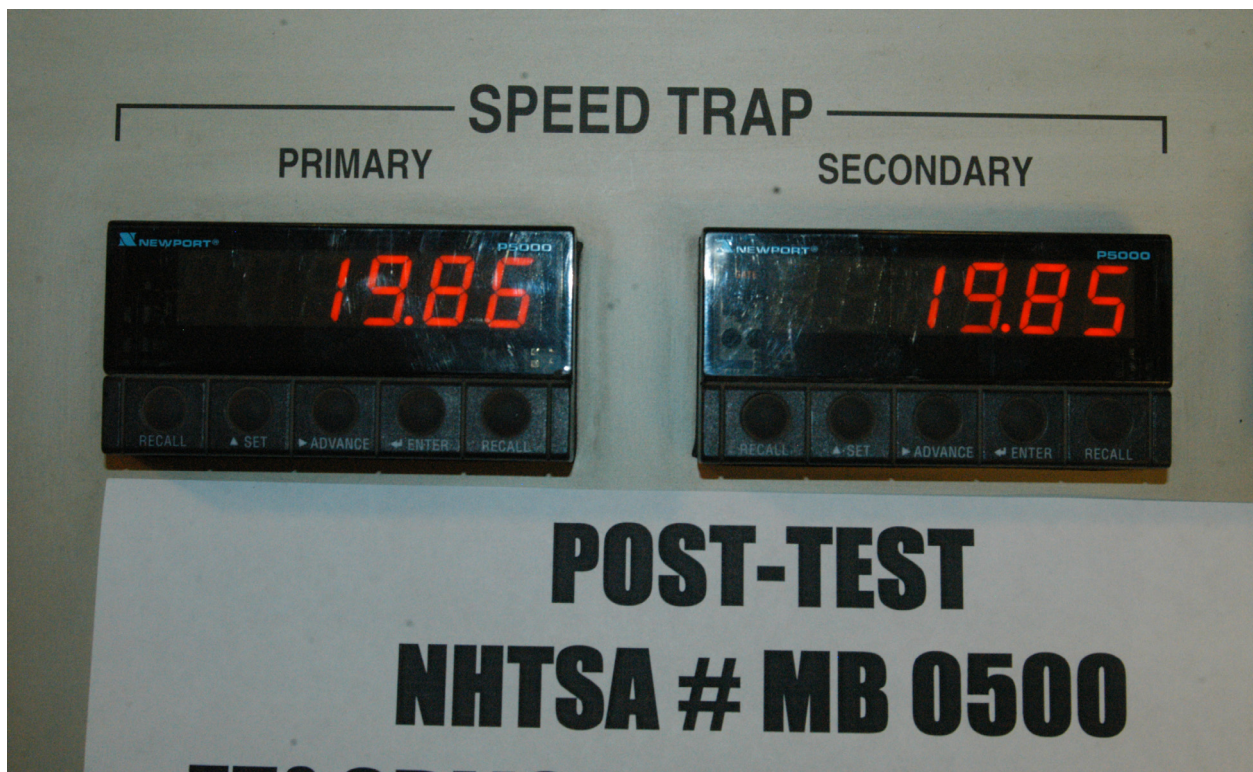


Figure 060: Post-test primary and redundant speed trap read-out



Figure 061: FMVSS No. 301 0°



Figure 062: FMVSS No. 301 90°



Figure 063: FMVSS No. 301 180°

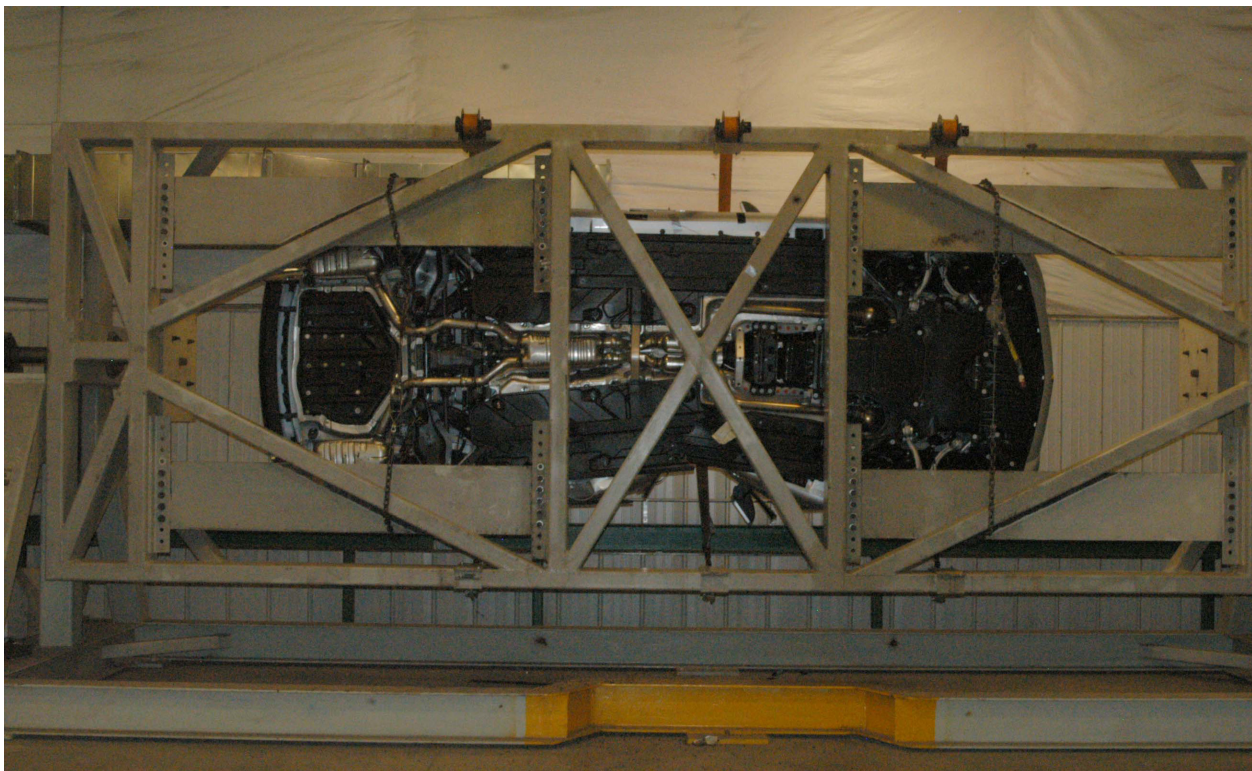


Figure 064: FMVSS No. 301 270°



Figure 065: FMVSS No. 301 360°



Figure 066: Impact event

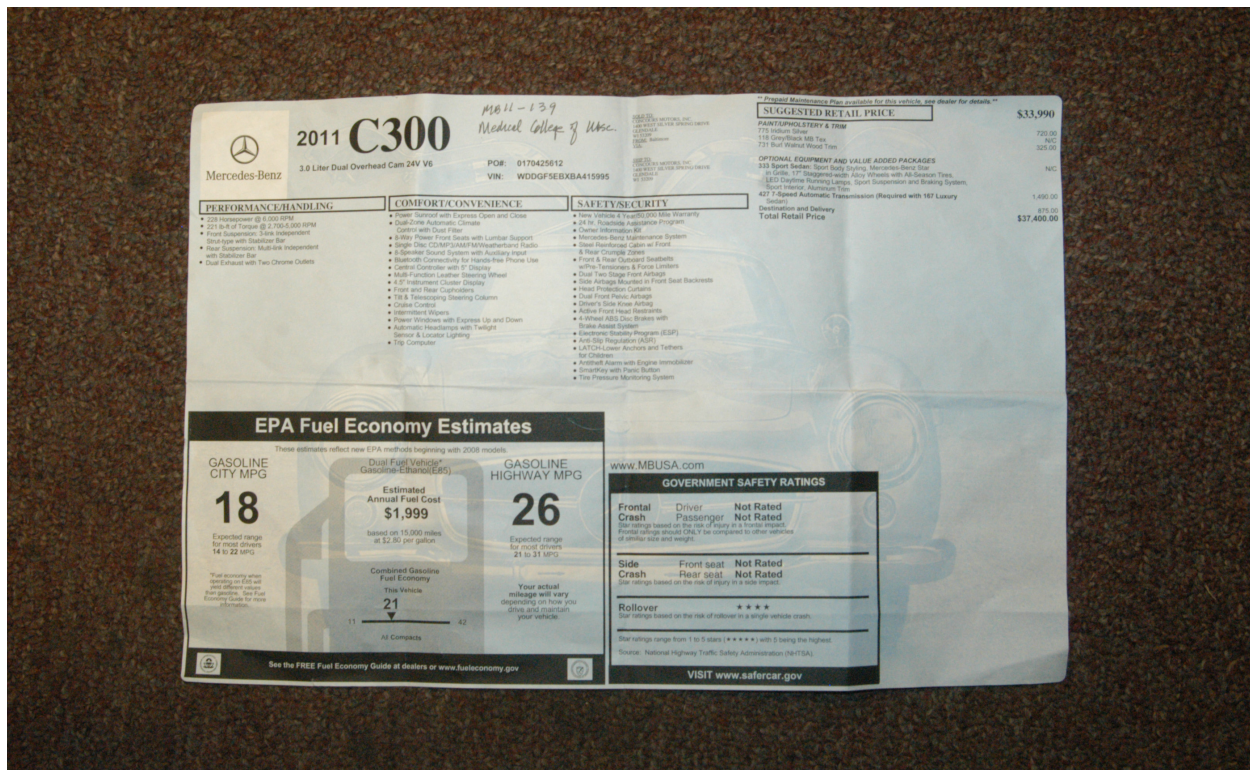


Figure 067: Monroney label

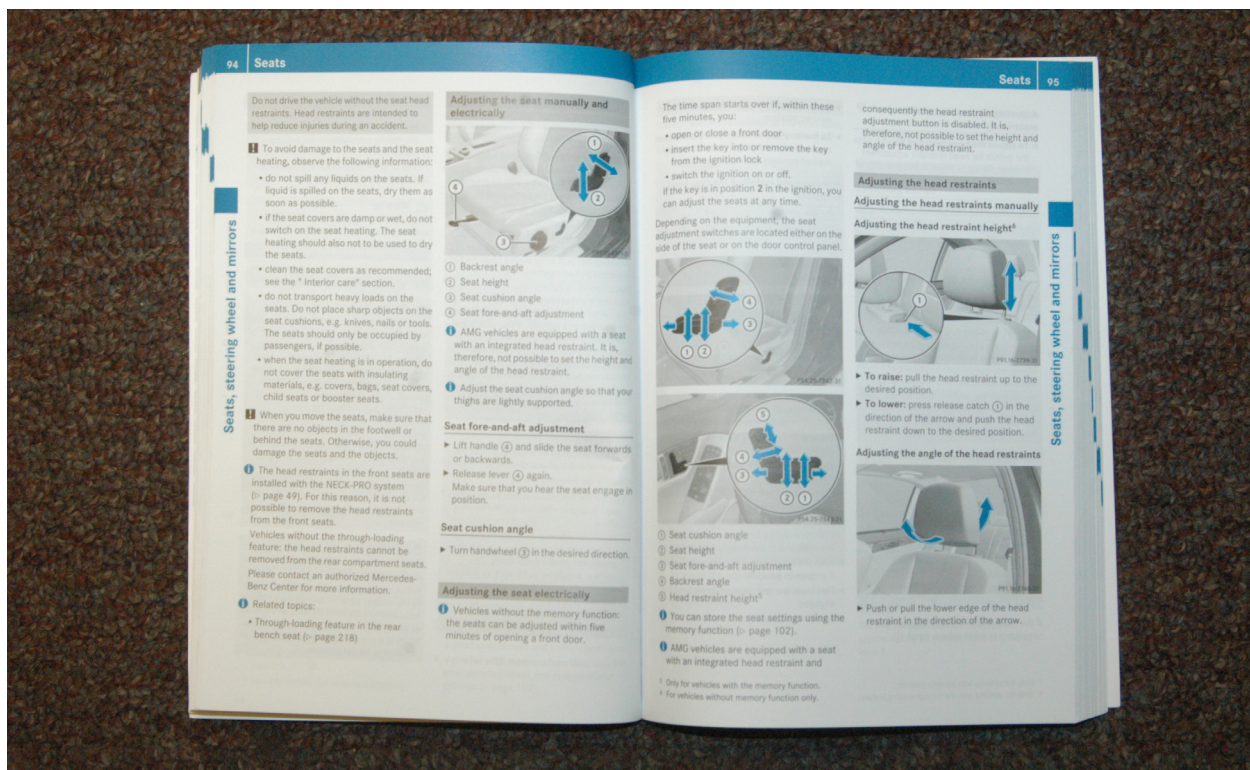


Figure 068: Head restraint use and adjustment information from vehicle manual

Test Vehicle: 2011 Mercedes Benz C300 4-Door Sedan
Test Program: SPNCAP

NHTSA Number: MB 0500
Test Date: September 23, 2010

APPENDIX B
ATD AND VEHICLE RESPONSE DATA

The following plots are provided in the test report

Data Plot	Description	Page
1	Driver Head Acceleration (X) Primary vs. Time	B-4
2	Driver Head Acceleration (Y) Primary vs. Time	B-5
3	Driver Head Acceleration (Z) Primary vs. Time	B-6
4	Driver Head Resultant Acceleration Primary vs. Time	B-7
5	Driver Lower Spine T ₁₂ Acceleration (X) vs. Time	B-8
6	Driver Lower Spine T ₁₂ Acceleration (Y) vs. Time	B-9
7	Driver Lower Spine T ₁₂ Acceleration (Z) vs. Time	B-10
8	Driver Lower Spine T ₁₂ Resultant Acceleration vs. Time	B-11
9	Driver Iliac Wing Force (Y) on Impact Side vs. Time	B-12
10	Driver Acetabulum Force (Y) on Impact Side vs. Time	B-13
11	Driver Total Pelvis Force (Y) on Impact Side vs. Time	B-14

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 Pelvis Contact Switch
Vehicle 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 Middle A-Pillar Acceleration (Y)
Left B-Pillar Sill Acceleration (Y)
Left Lower B-Pillar Acceleration (Y)
Left Middle 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)

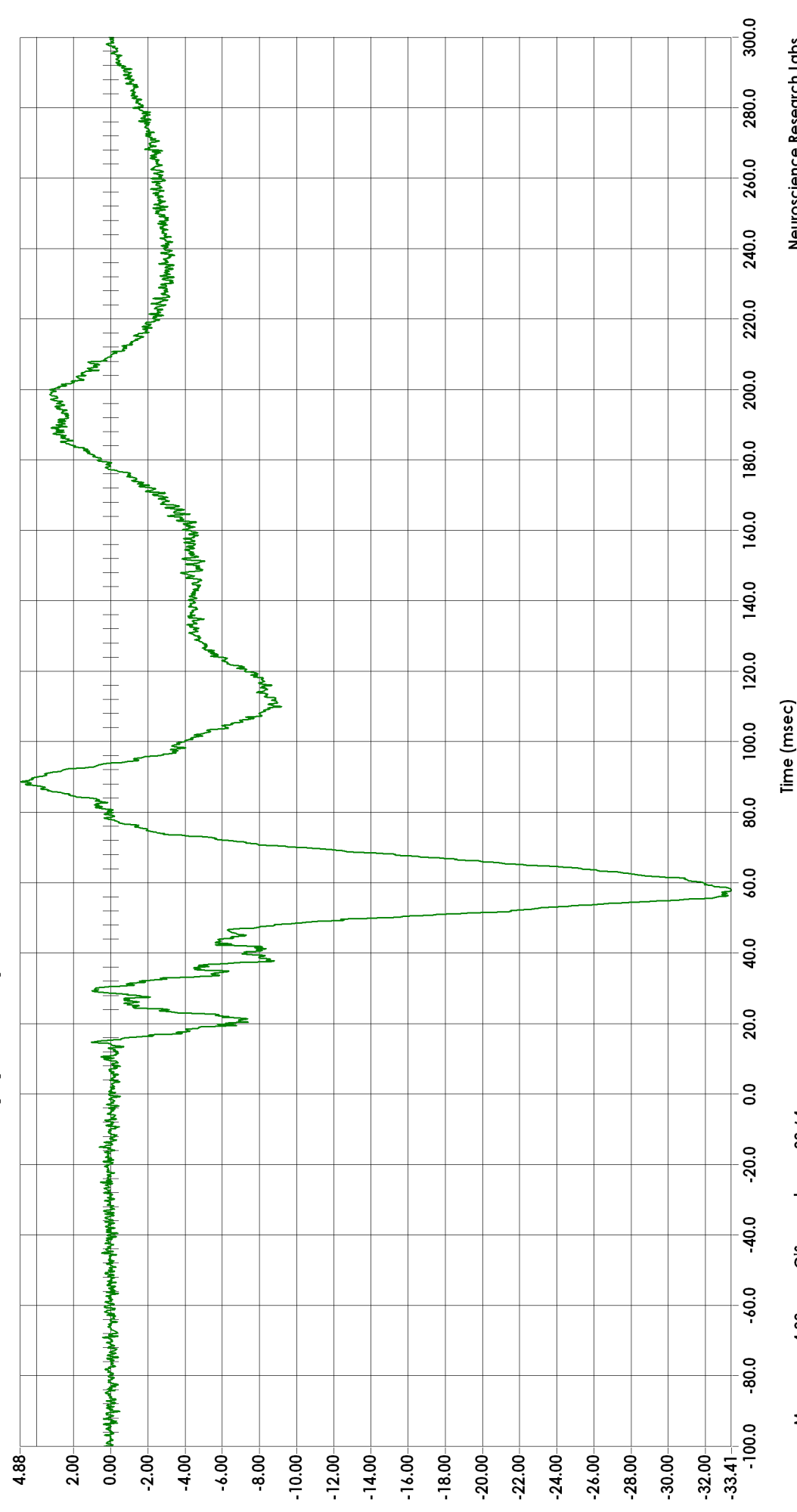
Pole Instrumentation Data

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 ID	11SP03	Filter	CFC1000
Date	09-23-2010	Sampling Rate (Hz)	12500
Description	2011 Mercedes Benz C Class 4-Door Sedan PINCAP	Number of Points	10000
		Prefrigger Points	1250
		Sensor Location	HDCG
		Sensor Info	ENDEVCO 7264C-2KTZ-2-240
		Serial Number	P22041



G's Driver Head Acceleration (X) Primary vs. Time



Max	4.88	G's	at	88.64	msec
Min	-33.41	G's	at	57.84	msec

11SP03 Plot 001

Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295

Test ID

11SP03

Date

09-23-2010

Description

2011 Mercedes Benz C Class 4-Door Sedan PINCAP

Filter

CFC1000

Sampling Rate (Hz)

12500

Number of Points

10000

Pretrigger Points

1250

Sensor Location

HDCG

Sensor Info

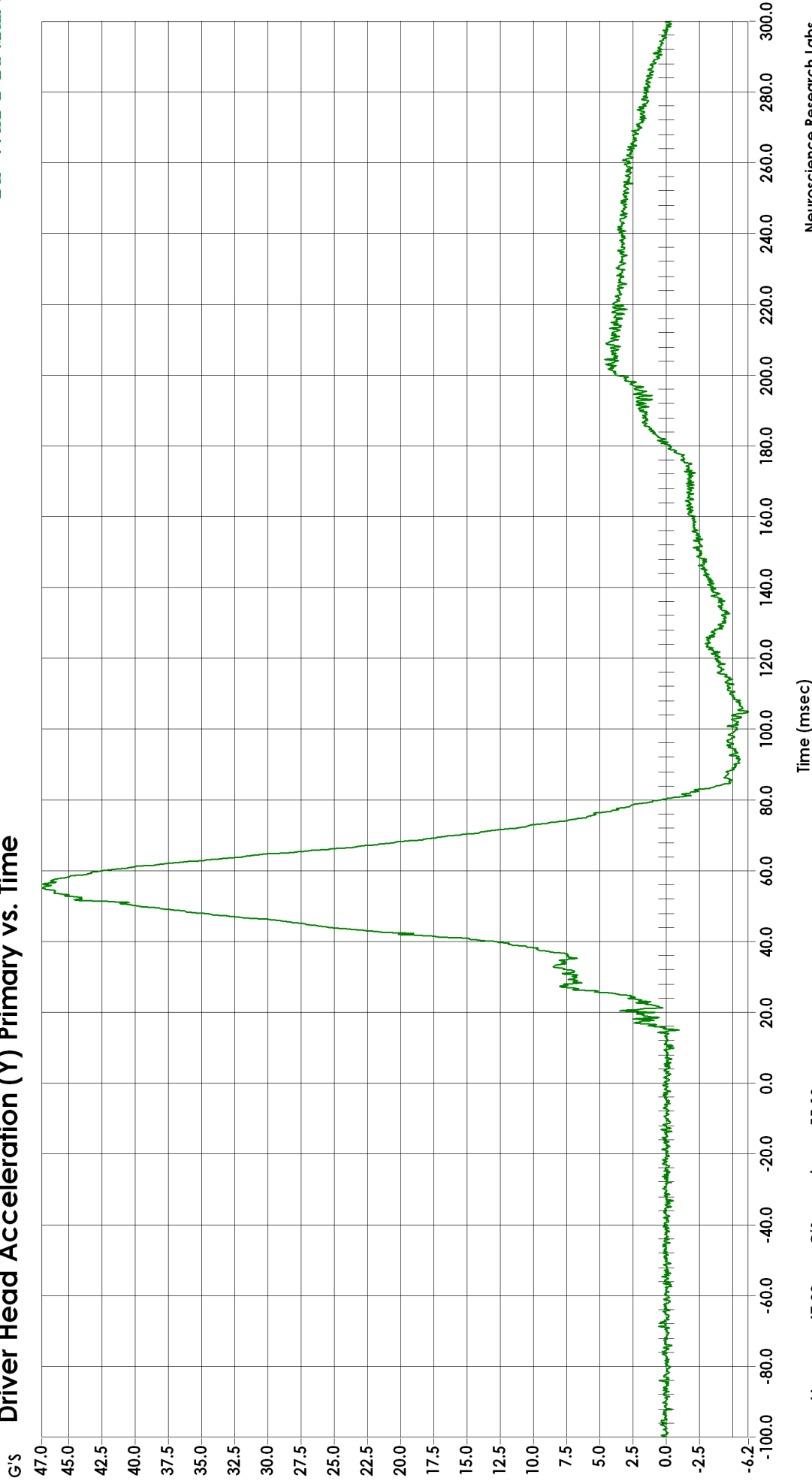
ENDEVCO 7264C-2KTZ-2-240

Serial Number

P24562



Driver Head Acceleration (Y) Primary vs. Time



Max

47.02

G's

at

55.12

msec

Min

-6.21

G's

at

104.96

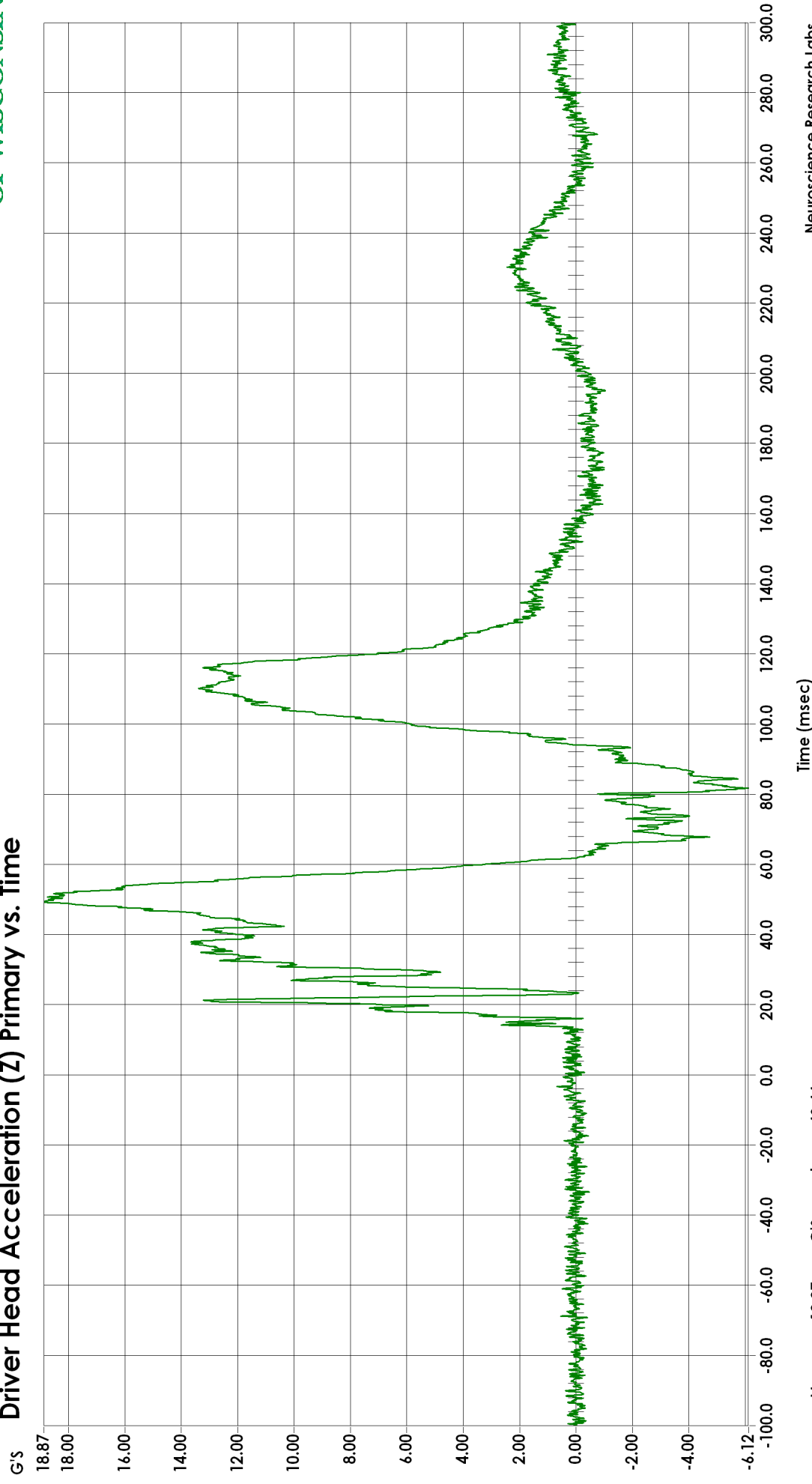
msec

11SP03 Plot 002

Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295

Test ID	11SP03	Filter	CFC1000
Date	09-23-2010	Sampling Rate (Hz)	12500
Description	2011 Mercedes Benz C Class 4-Door Sedan PINCAP	Number of Points	10000
		Pretrigger Points	1250
		Sensor Location	HDCG
		Sensor Info	ENDEVCO 7264C-2KTZ-2-300
		Serial Number	P22322

Driver Head Acceleration (Z) Primary vs. Time

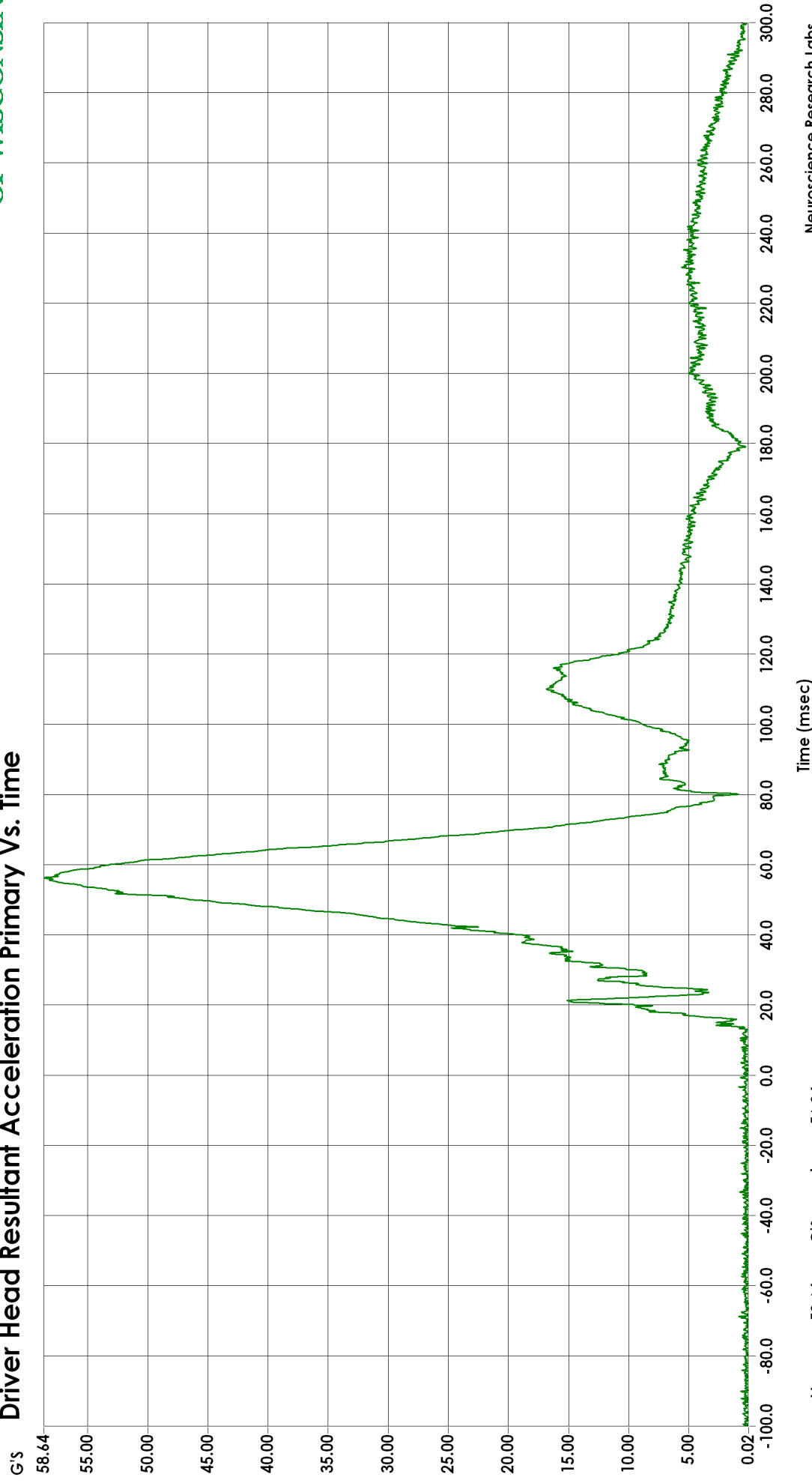


Max	18.87	G's	at	49.44	msec
Min	-6.12	G's	at	81.68	msec

11SP03 Plot 003

Test ID	11SP03	Filter	CFC1000	Sensor Location	HDCG
Date	09-23-2010	Sampling Rate (Hz)	12500	Sensor Info	
Description	2011 Mercedes Benz C Class 4-Door Sedan PINCAP	Number of Points	10000	Serial Number	
		Prefrigger Points	1250		

Driver Head Resultant Acceleration Primary Vs. Time



Max	58.64	G's	at	56.24	msec
Min	0.02	G's	at	-64.96	msec

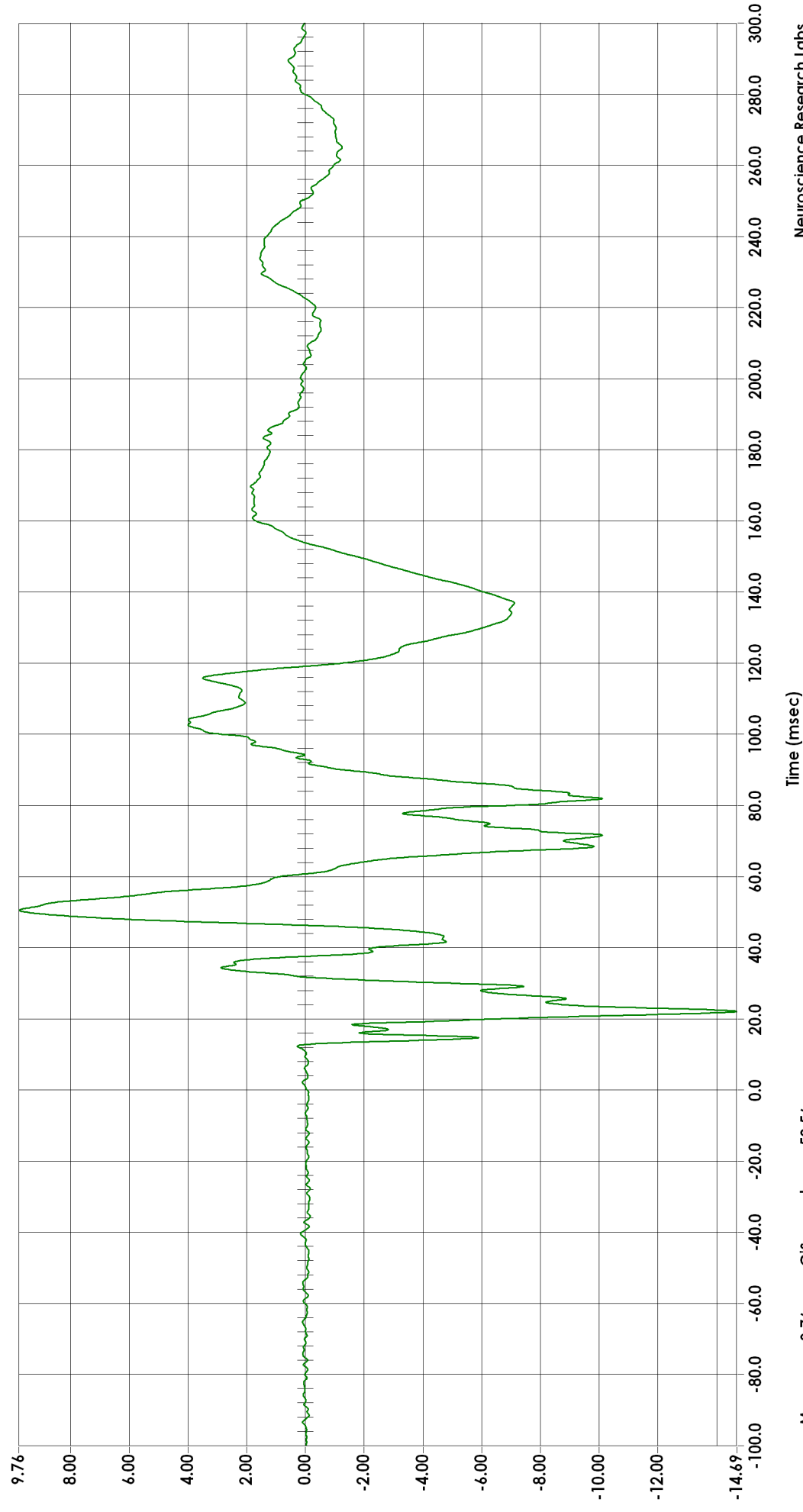
11SP03 Plot 056

Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295



Test ID	11SP03	Filter	CFC180	Sensor Location	SPNL
Date	09-23-2010	Sampling Rate (Hz)	12500	Sensor Info	ENDEVCO 7264C-2KTZ-2-240
Description	2011 Mercedes Benz C Class 4-Door Sedan PINCAP	Number of Points	10000	Serial Number	P21661
		Prefrigger Points	1250		

G's Driver Lower Spine T12 Acceleration (X) vs. Time



Max	9.76	G's	at	50.56	msec
Min	-14.69	G's	at	22.08	msec

11SP03 Plot 012

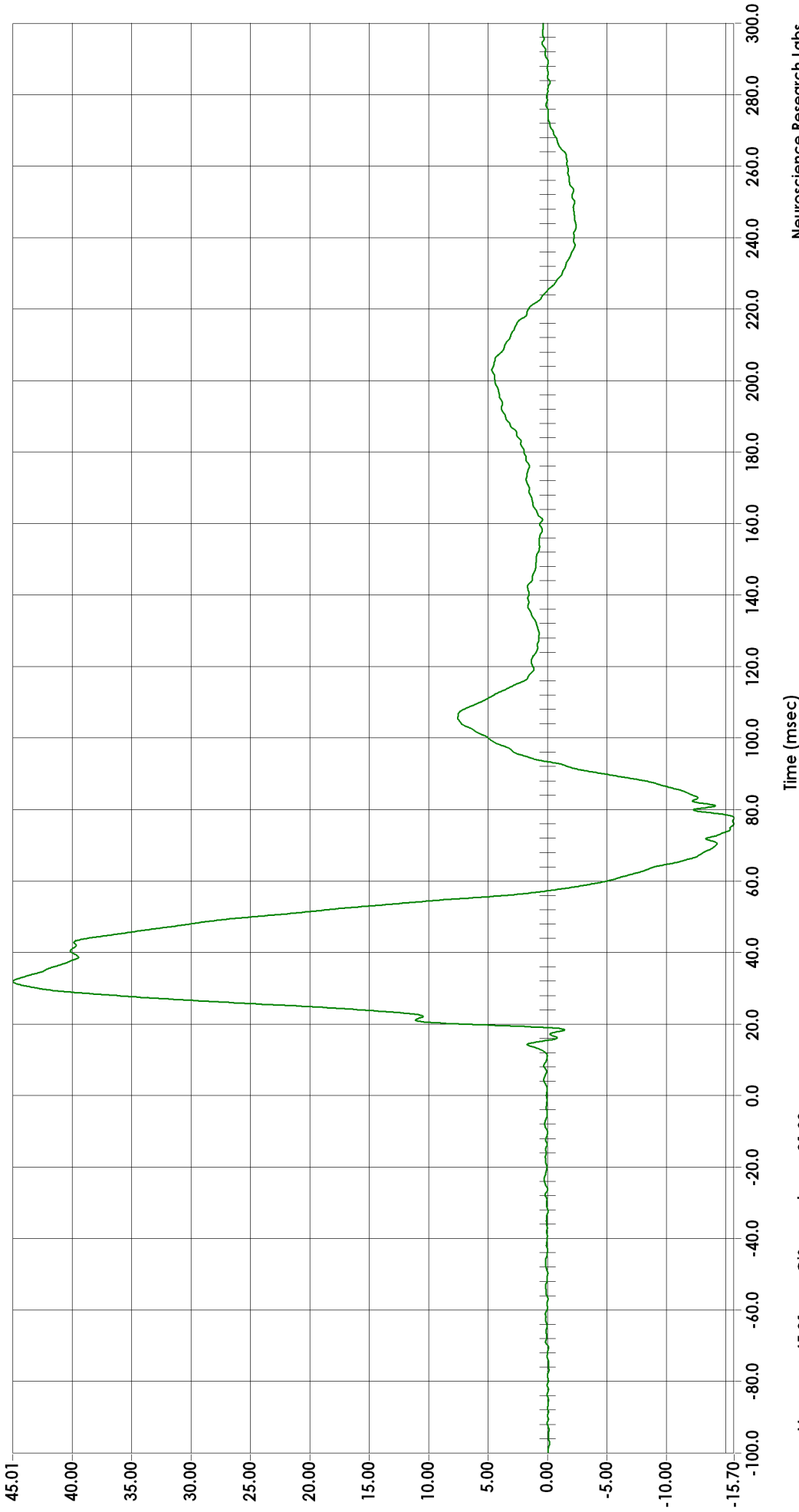
Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295

Test ID	11SP03	Filter	CFC180
Date	09-23-2010	Sampling Rate (Hz)	12500
Description	2011 Mercedes Benz C Class 4-Door Sedan PINCAP	Number of Points	10000
		Pretrigger Points	1250



Sensor Location	SPNL
Sensor Info	ENDEVCO 7264C-2KTZ-2-240
Serial Number	P24682

Driver Lower Spine T12 Acceleration (Y) vs. Time



Max	45.01	G's	at	31.92	msec
Min	-15.70	G's	at	77.60	msec

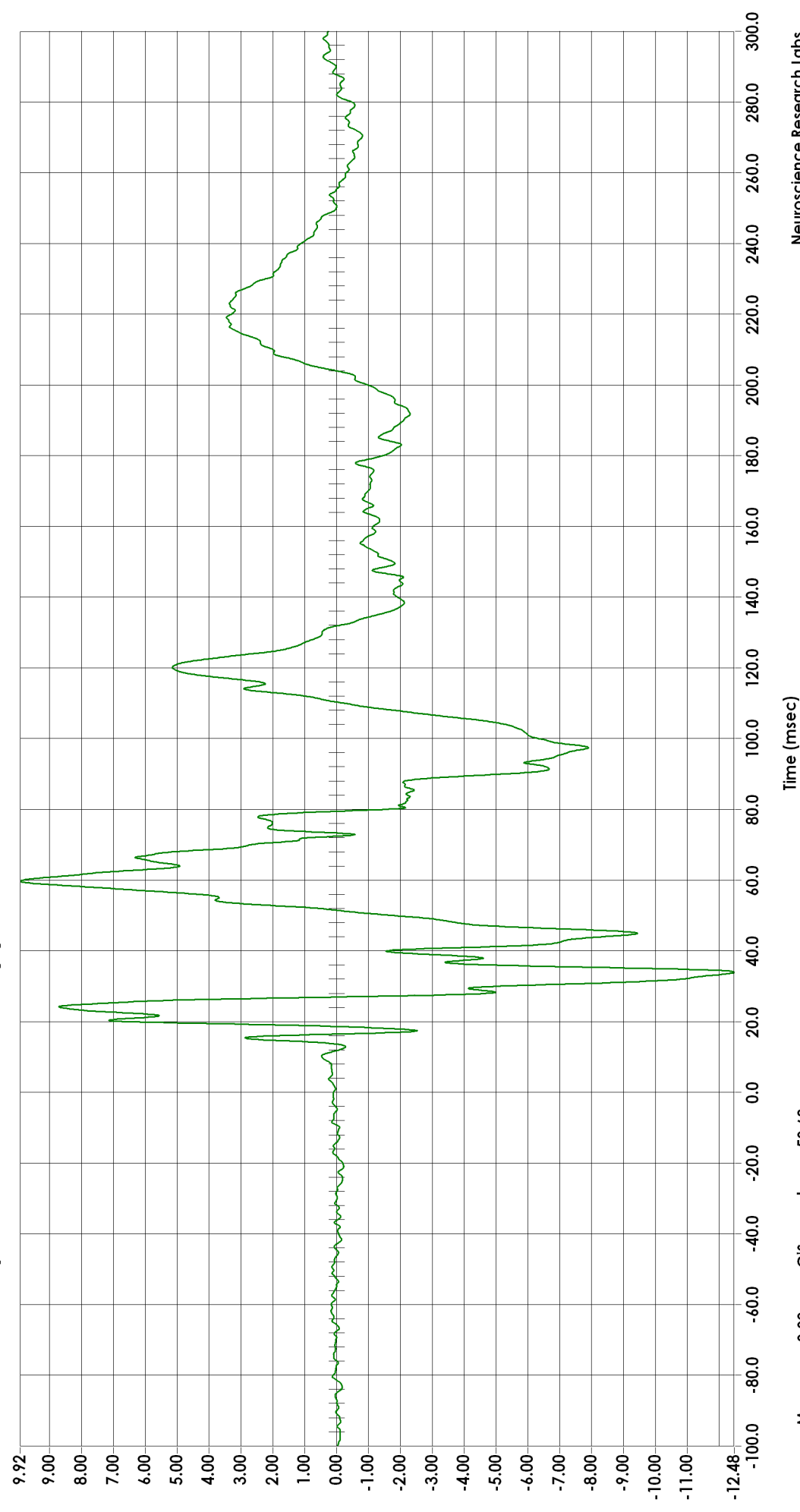
11SP03 Plot 013

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Milwaukee, WI 53295



Test ID	11SP03	Filter	CFC180
Date	09-23-2010	Sampling Rate (Hz)	12500
Description	2011 Mercedes Benz C Class 4-Door Sedan PINCAP	Number of Points	10000
		Prefrigger Points	1250
		Sensor Location	SPNL
		Sensor Info	ENDEVCO 7264C-2KTZ-2-240
		Serial Number	P21788

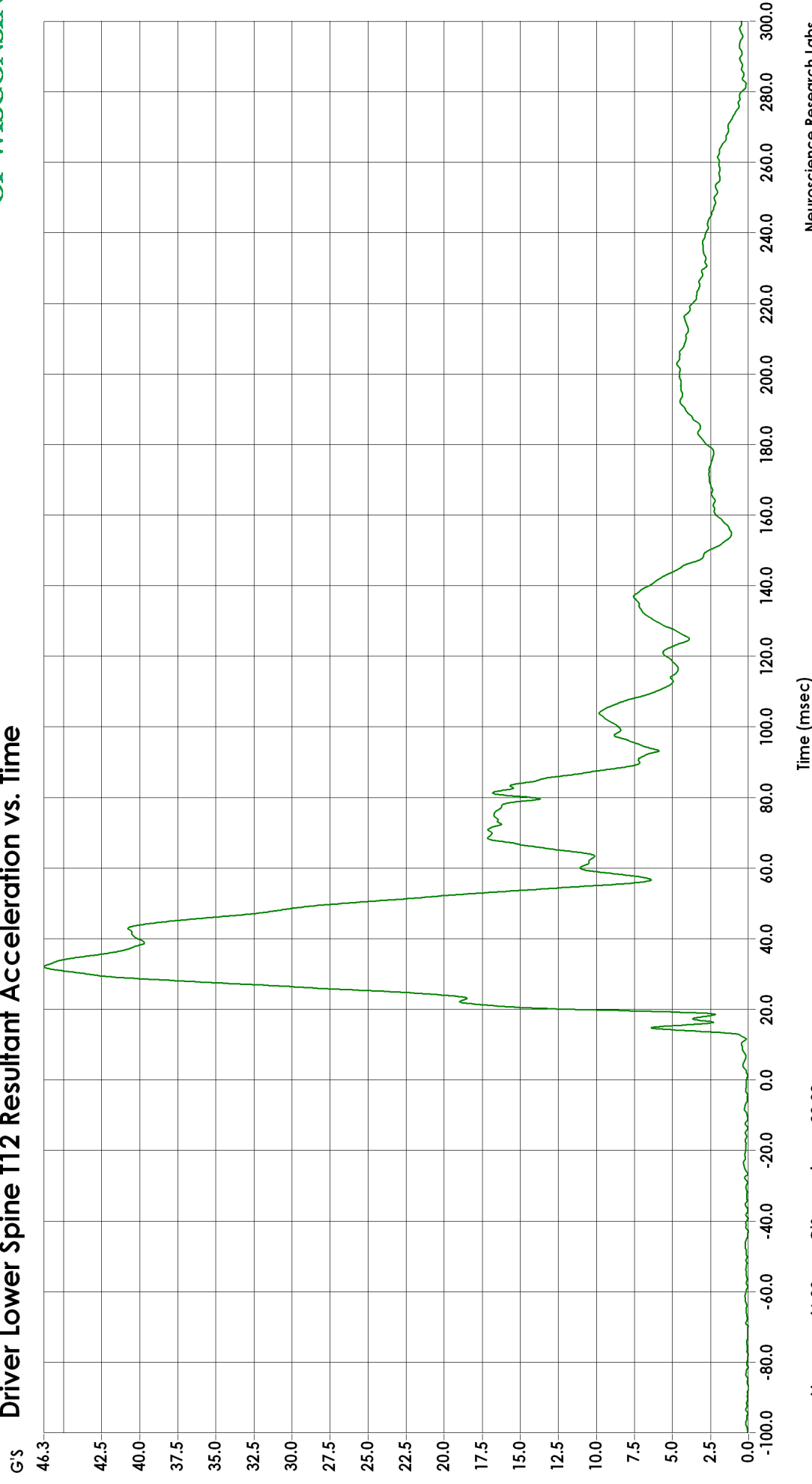
G's Driver Lower Spine T12 Acceleration (Z) vs. Time



Neuroscience Research Labs
5000 West National Ave
Research 151
Milwaukee, WI 53295

Test ID	11SP03	Filter	CFC180	Sensor Location	SPNL
Date	09-23-2010	Sampling Rate (Hz)	12500	Sensor Info	
Description	2011 Mercedes Benz C Class 4-Door Sedan PINCAP	Number of Points	10000	Serial Number	
		Pretrigger Points	1250		

Driver Lower Spine T12 Resultant Acceleration vs. Time

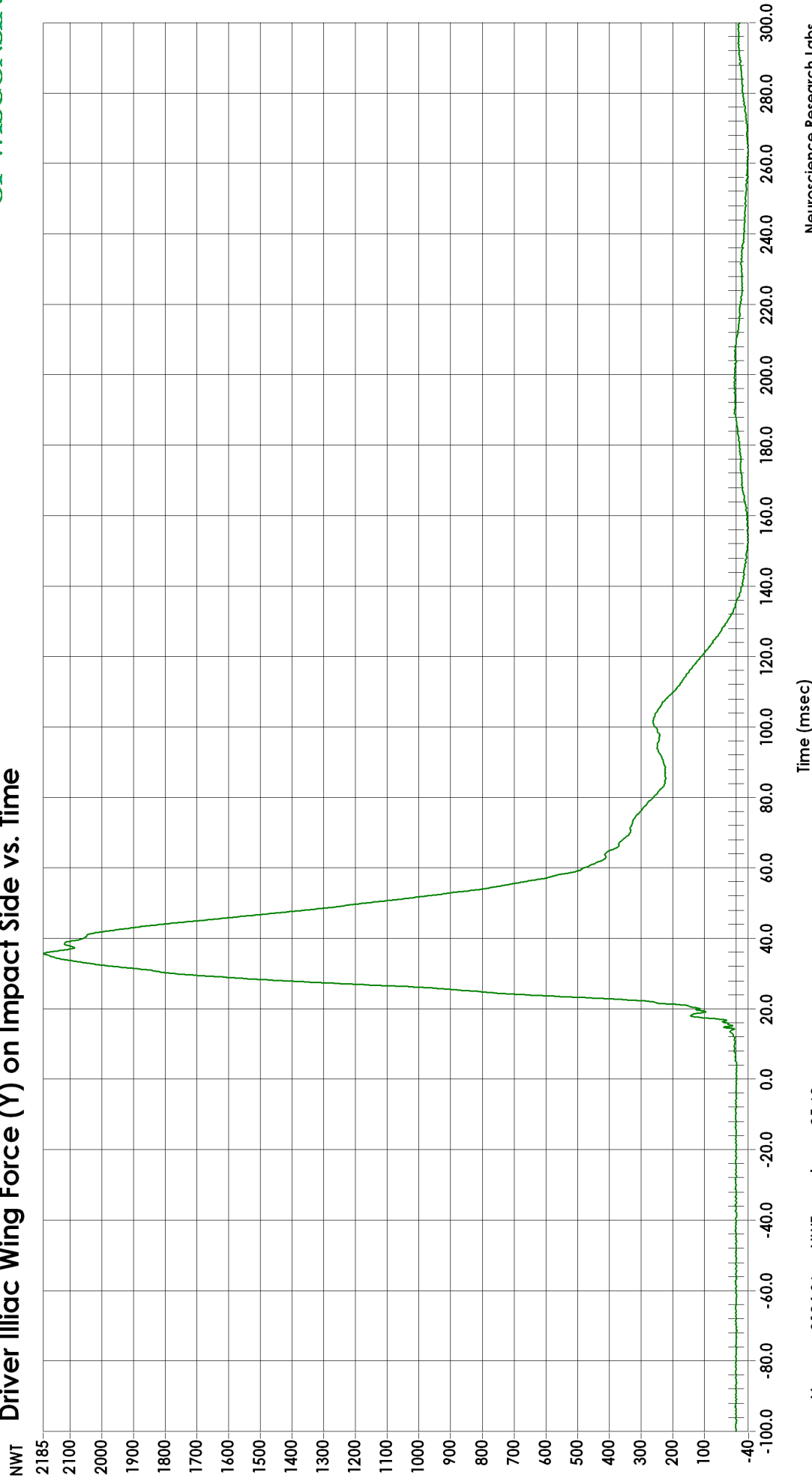


Max	46.29	G's	at	32.08	msec
Min	0.01	G's	at	-87.68	msec

11SP03 Plot 057

Test ID	11SP03	Filter	CFC600
Date	09-23-2010	Sampling Rate (Hz)	12500
Description	2011 Mercedes Benz C Class 4-Door Sedan PINCAP	Number of Points	10000
		Pretrigger Points	1250
		Sensor Location	PVIL
		Sensor Info	Denton 3228J
		Serial Number	3228J_283

Driver Iliac Wing Force (Y) on Impact Side vs. Time

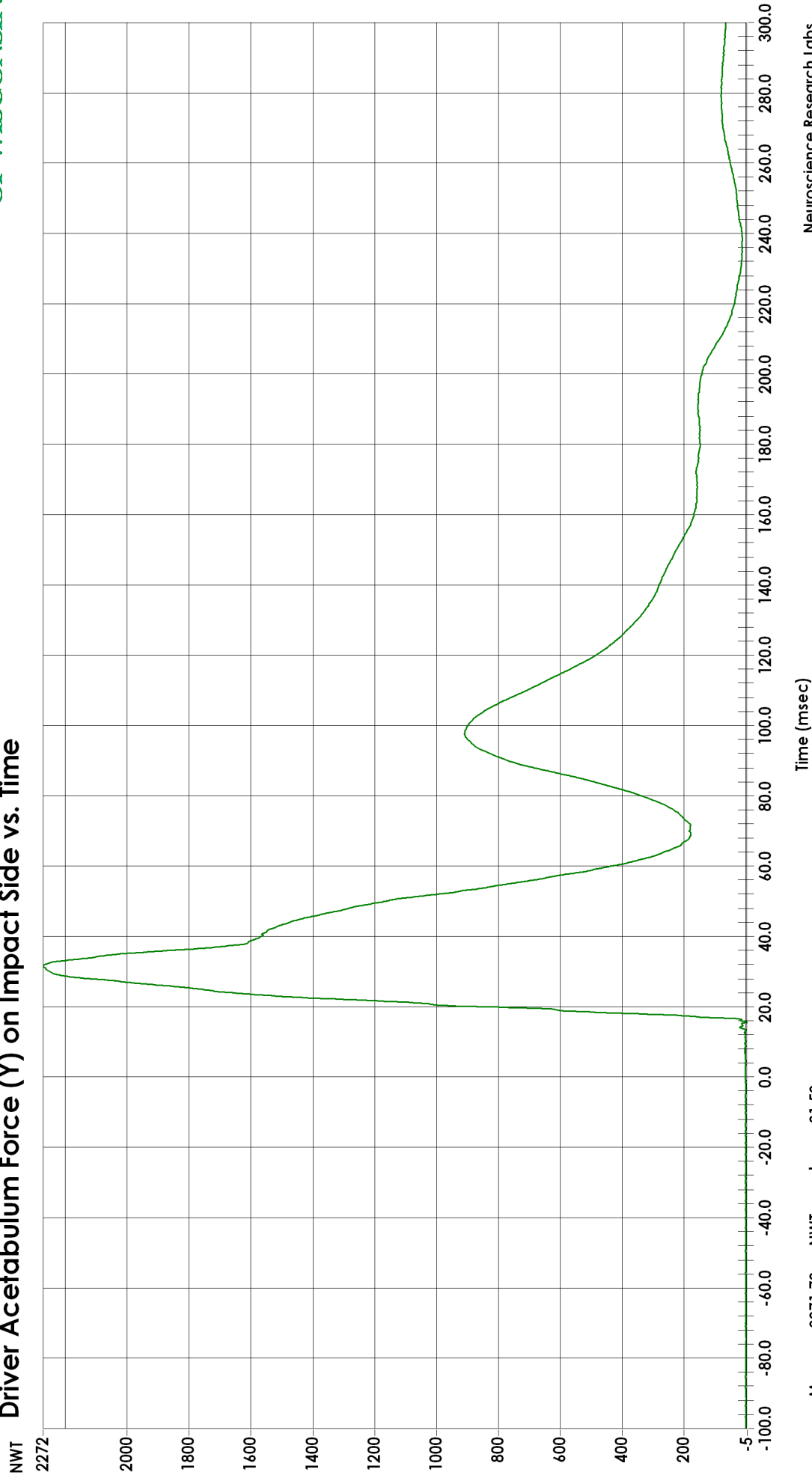


Max	2184.96	NWT	at	35.68	msec
Min	-39.72	NWT	at	264.00	msec

11SP03 Plot 015

Test ID	11SP03	Filter	CFC600
Date	09-23-2010	Sampling Rate (Hz)	12500
Description	2011 Mercedes Benz C Class 4-Door Sedan PINCAP	Number of Points	10000
		Pretrigger Points	1250
		Sensor Location	PVHP
		Sensor Info	Denton 3249J
		Serial Number	3249J_270

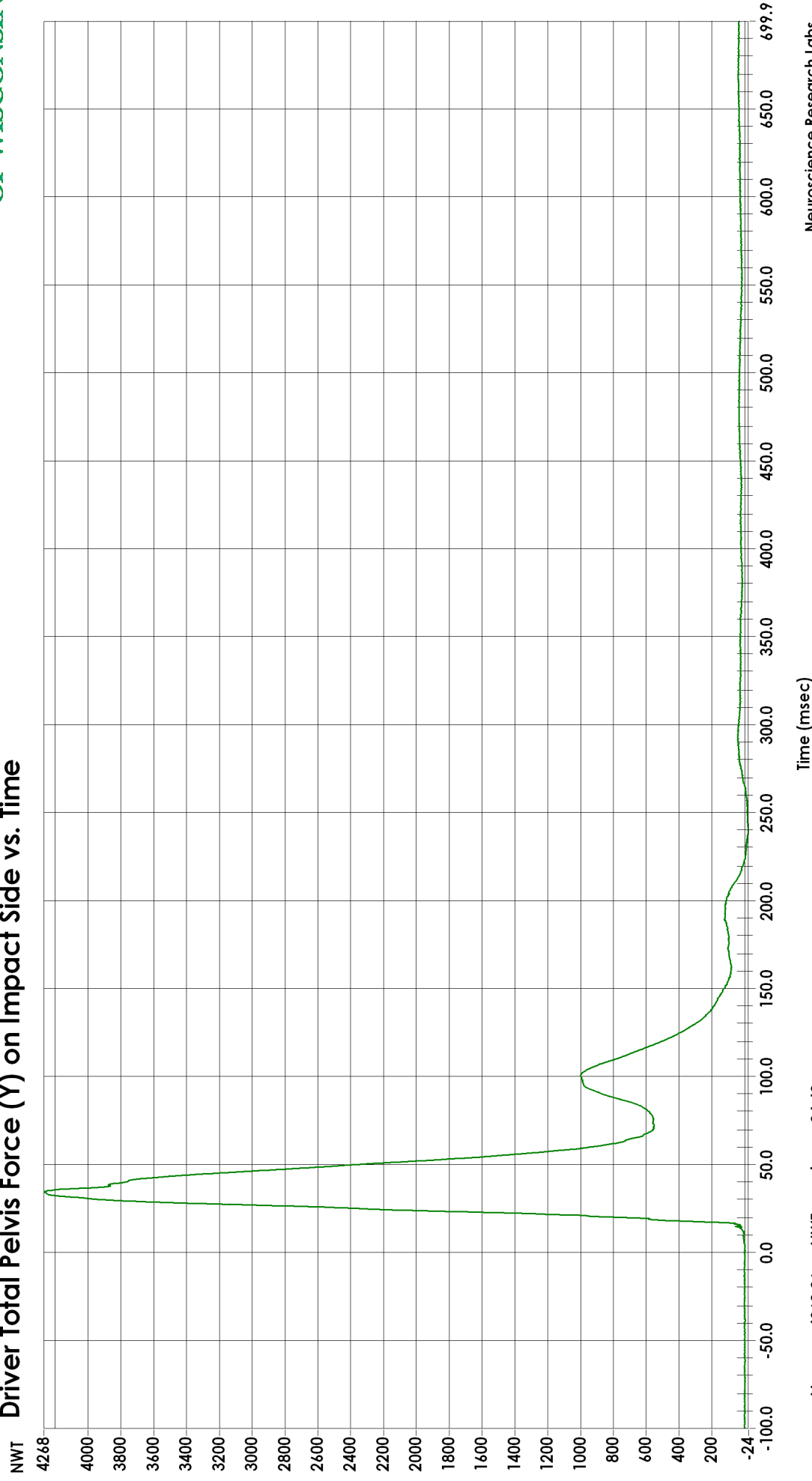
Driver Acetabulum Force (Y) on Impact Side vs. Time



Max	2271.78	NWT	at	31.52	msec
Min	-4.70	NWT	at	15.60	msec

Test ID	11SP03	Filter	CFC600
Date	12-22-2010	Sampling Rate (Hz)	12500
Description	2011 Mercedes Benz C Class 4-Door Sedan, 75 Degree Rigid Side Pole NCAP Test	Number of Points	10000
		Pretigger Points	1250
		Sensor Location	
		Sensor Info	
		Serial Number	

Driver Total Pelvis Force (Y) on Impact Side vs. Time



Max	4268.36	NWT	at	34.40	msec
Min	-24.08	NWT	at	240.80	msec

11SP03 Plot 045

Test Vehicle: 2011 Mercedes Benz C300 4-Door Sedan
Test Program: SPNCAP

NHTSA Number: MB 0500
Test Date: September 23, 2010

APPENDIX C
ATD CALIBRATION DATA

**VERIFICATION TEST RESULTS SUMMARY
 PRE AND POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SIDIIs Serial Number 298 Test Sequences 3 & 4

TEST	PRE		POST	
	COMMENTS	BY	COMMENTS	BY
EXTERNAL DIMENSIONS	Pass	Mike Rawski	Pass	Mike Rawski
LATERAL THORAX WITH ARM IMPACT	Pass	Mike Rawski	Pass	Mike Rawski
LATERAL THORAX WITHOUT ARM IMPACT TEST	Pass	Mike Rawski	Pass	Mike Rawski
LATERAL PELVIS ACETABULUM IMPACT TEST	Pass	Mike Rawski	Pass	Mike Rawski
LATERAL PELVIS ILIAC IMPACT TEST	Pass	Mike Rawski	Pass	Mike Rawski
LATERAL SHOULDER IMPACT TEST	Pass	Mike Rawski	Pass	Mike Rawski
LATERAL ABDOMEN IMPACT TEST	Pass	Mike Rawski	Pass	Mike Rawski
SIDIIs LATERAL NECK TEST	Pass	Mike Rawski	Pass	Mike Rawski
SIDIIs LATERAL HEAD DROP	Pass	Mike Rawski	Pass	Mike Rawski

**VERIFICATION TEST RESULTS SUMMARY
 PRE AND POST TEST (CONTINUED)**

CONFIGURED FOR LEFT SIDE IMPACT

SIDIIs Serial Number 298

Test Sequences 3 & 4

TEST	PRE		POST	
	COMMENTS	BY	COMMENTS	BY
EXTERNAL DIMENSIONS	Pass	Mike Rawski	Pass	Mike Rawski
LATERAL THORAX WITH ARM IMPACT	Pass	Mike Rawski	Pass	Mike Rawski
LATERAL THORAX WITHOUT ARM IMPACT TEST	Pass	Mike Rawski	Pass	Mike Rawski
LATERAL PELVIS ACETABULUM IMPACT TEST	Pass	Mike Rawski	Pass	Mike Rawski
LATERAL PELVIS ILIAC IMPACT TEST	Pass	Mike Rawski	Pass	Mike Rawski
LATERAL SHOULDER IMPACT TEST	Pass	Mike Rawski	Pass	Mike Rawski
LATERAL ABDOMEN IMPACT TEST	Pass	Mike Rawski	Pass	Mike Rawski
SIDIIs LATERAL NECK TEST	Pass	Mike Rawski	Pass	Mike Rawski
SIDIIs LATERAL HEAD DROP	Pass	Mike Rawski	Pass	Mike Rawski

SUMMARY
SIDIIs PRE AND POST VERIFICATION

CONFIGURED FOR LEFT SIDE IMPACT

LATERAL PELVIS ILIAC IMPACT TEST

TEST PARAMETER	SPEC	PRE	POST
Date	-	9-10-10	10-8-10
Sequential Test Number	-	3	4
Temperature (°C)	20.6-22.2	21.9	22.1
Relative Humidity (%)	10-70	30.7	29.6
Pendulum Speed (m/s)	4.2-4.4	4.25	4.20
Peak Impactor Acceleration (G)	36-45	43.8	43.6
Max Lateral Pelvis Acceleration (G)	28-39	35.1	35.9
Max Iliac Force (N)	4.10-5.10	4.85	5.08

LATERAL PELVIS ACETABULUM IMPACT TEST

TEST PARAMETER	SPEC	PRE	POST
Date	-	9-9-10	10-8-10
Sequential Test Number	-	3	4
Temperature (°C)	20.6-22.2	22.0	22.2
Relative Humidity (%)	10-70	31.1	29.9
Pendulum Speed (m/s)	6.6-6.8	6.73	6.73
Peak Impactor Acceleration (G)	38-47	45.3	46.0
Peak Lateral Pelvis Acceleration (G)	N/A	-	-
Peak Lateral Pelvis Acceleration after 6ms (G)	34-42	39.8	40.3
Peak Acetabulum Force (kN)	3.60-4.30	4.15	4.13

LATERAL THORAX WITHOUT ARM IMPACT TEST

TEST PARAMETER	SPEC	PRE	POST
Date	-	9-9-10	10-8-10
Sequential Test Number	-	3	4
Temperature (°C)	20.6-22.2	22.1	21.6
Relative Humidity (%)	10-70	31.2	30.7
Pendulum Speed (m/s)	4.2-4.4	4.25	4.25
Peak Upper Rib Deflection (mm)	32-40	34.9	34.4
Peak Middle Rib Deflection (mm)	39-45	41.3	41.1
Peak Lower Rib Deflection (mm)	35-43	40.8	41.2
Peak Upper Spine Acceleration (G)	13-17	14.9	16.4
Peak Lower Spine Acceleration (G)	7-11	9.91	10.5
Peak Impactor Acceleration (G)	14-18	16.2	17.0

SUMMARY
SIDIIs PRE AND POST VERIFICATION (CONTINUED)

CONFIGURED FOR LEFT SIDE IMPACT

LATERAL THORAX WITH ARM IMPACT TEST

TEST PARAMETER	SPEC	PRE	POST
Date	-	9-9-10	10-8-10
Sequential Test Number	-	3	4
Temperature (°C)	20.6-22.2	22.1	21.3
Relative Humidity (%)	10-70	31.4	31.1
Pendulum Speed (m/s)	6.6-6.8	6.70	6.70
Peak Shoulder Deflection (mm)	31-40	33.9	31.3
Peak Upper Rib Deflection (mm)	25-32	28.4	27.0
Peak Middle Rib Deflection (mm)	30-36	33.8	32.2
Peak Lower Rib Deflection (mm)	32-38	36.7	35.8
Peak Upper Spine Acceleration (G)	34-43	40.5	40.6
Peak Lower Spine Acceleration (G)	29-37	32.7	34.0
Peak Impactor Acceleration after 5 ms (G)	30-36	32.3	34.3

LATERAL ABDOMINAL IMPACT TEST

TEST PARAMETER	SPEC	PRE	POST
Date	-	9-9-10	10-8-10
Sequential Test Number	-	3	4
Temperature (°C)	20.6-22.2	22.2	21.9
Relative Humidity (%)	10-70	31.1	30.4
Pendulum Speed (m/s)	4.2-4.4	4.3	4.30
Peak Upper Rib Deflection (mm)	36-47	43.8	40.1
Peak Lower Rib Deflection (mm)	33-44	39.7	39.4
Peak Lower Spine Acceleration (G)	9-14	11.7	11.5
Peak Impactor Acceleration (G)	12-16	14.5	15.0

LATERAL SHOULDER IMPACT TEST

TEST PARAMETER	SPEC	PRE	POST
Date	-	9-9-10	10-7-10
Sequential Test Number	-	3	4
Temperature (°C)	20.6-22.2	22.1	21.3
Relative Humidity (%)	10-70	32.0	29.2
Pendulum Speed (m/s)	4.2-4.4	4.3	4.30
Peak Shoulder Deflection (mm)	28-37	32.4	33.6
Peak Upper Spine Lateral Acceleration (G)	17-22	19.9	19.6
Peak Impactor Acceleration (G)	13-18	16.2	16.4

SUMMARY
SIDIIs PRE AND POST VERIFICATION (CONTINUED)

CONFIGURED FOR LEFT SIDE IMPACT

LATERAL NECK

TEST PARAMETER	SPEC	PRE	POST
Date	-	9-8-10	10-7-10
Sequential Test Number	-	3	4
Temperature (°C)	20.6-22.2	22.1	21.3
Relative Humidity (%)	10-70	33.4	29.8
Pendulum Speed (m/s)	5.51-5.63	5.58	5.57
Pendulum Pulse 10ms (m/s)	2.20-2.80	2.60	2.502
Pendulum Pulse 15ms (m/s)	3.30-4.10	3.933	3.798
Pendulum Pulse 20ms (m/s)	4.40-5.40	5.394	5.179
Pendulum Pulse 25ms (m/s)	5.40-6.10	5.643	5.857
Pendulum Pulse between 25ms and 100ms (m/s)	5.50-6.20	5.665	5.884
Max D-Plane rotation (deg)	71-81	72.49	71.90
Time of Max D-Plane Rotation (ms)	50-70	63.0	66.00
Max OC Moment during Rotation (Nm)	36-44	40.60	41.19
Time of Moment Decay from Peak to 0 Nm (ms)	102-126	126.0	126.0

LATERAL HEAD DROP

TEST PARAMETER	SPEC	PRE	POST
Date	-	9-7-10	9-28-10
Sequential Test Number	-	3	4
Temperature (°C)	20.6-22.2	21.6	20.7
Relative Humidity (%)	10-70	43.7	30.3
Resultant Max (G)	115-137	123.05	117.57
Longitudinal Max (G)	<15	2.96	0.92

SUMMARY
SIDIIs PRE AND POST VERIFICATION (CONTINUED)

CONFIGURED FOR LEFT SIDE IMPACT

MEASUREMENTS

TEST PARAMETER	SPEC	PRE	POST
Date	-	9-10-10	10-8-10
Sequential Test Number	-	3	4
Temperature (°C)	20.6-22.2	21.9	21.8
Relative Humidity (%)	10-70	31.0	29.7
Sitting Height	780 ±8.0	774	774
Shoulder Pivot Height	445 ±8.0	446	445
H-Point Height	84 ±5.0	87	86
H-Point from Seat Back	146 ±5.0	145	150
Shoulder Pivot from Backline	102 ±5.0	98	100
Thigh Clearance	127 ±8.0	122	120
Head Breadth	144 ±4.0	143	142
Head Back from Backline	43 ±3.0	45	45
Head Depth	183 ±5.0	180	179
Head Circumference	546 ±5.0	542	545
Buttock to Knee Length	527 ±13.0	521	521
Popliteal Height	356 ±13.0	355	355
Knee Pivot to Floor Height	401 ±8.0	398	398
Buttock Popliteal Length	429 ±13.0	430	430
Chest Depth w/o Jacket	203 ±8.0	201	201
Foot Length	224 ±8.0	226	221
Hip Breadth	318 ±5.0	318	320
Arm Length	254 ±5.0	254	253
Knee Joint to Seat Back	458 ±8.0	460	461
Shoulder Width	349 ±8.0	348	348
Foot Width	86 ±8.0	84	85
Chest Circumference w/Jacket	866 ±15.0	852	860
Waist Circumference	776 ±15.0	778	781

**DUMMY INSPECTION LIST
 PRE AND POST TEST
 CONFIGURED FOR LEFT SIDE IMPACT**

		SIDII's 298			
		PRE	POST	PRE	POST
	Date	9-3-10	9-24-10		
	Performed By	Mike Rawski	Mike Rawski		
PART	INSPECTION	RESULT	RESULT	RESULT	RESULT
Skin	Visual	Pass	Pass		
Head	Visual, Ballast, Accelerometer Mount	Pass	Pass		
Neck	Visual and Palpated, Cable Torque	Pass	Pass		
Spine Box	Visual, Ballast, Weldment, Accelerometer Mount	Pass	Pass		
Rib Cage	Visual, Palpated, Measured, Stiffness	Pass	Pass		
Sternum	Visual	Pass	Pass		
Lumbar Spine	Visual	Pass	Pass		
Abdomen	Visual	Pass	Pass		
Pelvis	Visual, Palpated, Accelerometer Mount	Pass	Pass		
Upper Legs	Visual	Pass	Pass		
Knees	Visual, Stops, Inserts	Pass	Pass		
Lower Legs	Visual, Range of Motion	Pass	Pass		
Ankles	Visual, Range of Motion	Pass	Pass		
Feet	Visual, Range of Motion	Pass	Pass		
Joints	1 to 2 G Range	Pass	Pass		
Other		-	-		