REPORT NUMBER: SPNCAP-KAR-15-030

NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST

MERDECED-BENZ U.S. INTL., INC

2015 MERCEDES-BENZ C300 4-DOOR SEDAN

NHTSA No: M20154301

PREPARED BY:

KARCO ENGINEERING, LLC.

9270 HOLLY ROAD

ADELANTO, CA 92301

APRIL 27, 2015

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

OFFICE OF CRASHWORTHINESS STANDARDS

MAIL CODE: NVS-111

1200 NEW JERSEY AVE, SE, ROOM W43-410

WASHINGTON, D.C. 20590

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared By: Matthew S. Hubbard

Mr. Matthew S. Hubbard, Test Engineer
KARCO Engineering, LLC.

Reviewed By: _____

Mr. Michael L. Dunlap, Director of Operations
KARCO Engineering, LLC.

Approved By: Frank D Richardson

Mr. Frank D. Richardson, Program Manager
KARCO Engineering, LLC.

Approval Date: April 27, 2015

FINAL REPORT ACCEPTANCE BY OCWS:

_____

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

Date: _____

_____

COTR, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

Date: _____

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
SPNCAP-KAR-15-030		

4. Title and Subtitle	5. Report Date
Final Report of New Car Assessment Program Side Impact Pole Testing of a 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301	April 27, 2015 **6. Performing Organization Code** KAR
7. Authors Mr. Matthew S. Hubbard, Test Engineer, KARCO Mr. Frank Richardson, Program Manager, KARCO	**8. Performing Organization Report No.** TR-P35004-01-NC
9. Performing Organization Name and Address KARCO Engineering, LLC. 9270 Holly Rd. Adelanto, CA 92301	**10. Work Unit No.** **11. Contract or Grant No.** DTNH22-09-D-00122
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NVS-111) 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C. 20590	**13. Type of Report and Period Covered** Final Test Report, April 13 - 27, 2015 **14. Sponsoring Agency Code** NVS-111

15. Supplementary Notes

16. Abstract

A 32.2 km/h (20 mph) 75° oblique impact Side NCAP Test was conducted on the subject 2015 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 KARCO Engineering, LLC. facility in Adelanto, California on April 13, 2015.

The impact velocity was 31.85 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 24.4° C. The target vehicle's maximum post-test static crush was 302 mm located at level 3. The test vehicle's occupant performance data is as follows:

Measurement Description	Driver ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})		1000	247.7
Resultant Lower Spine Acceleration	g	82	43
Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	3420
Maximum Thoracic Rib Deflection	mm	38	27
Maximum Abdominal Rib Deflection	mm	45	23

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

17. Key Words	18. Distribution Statement
New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs	Copies of this report are available from: National Highway Traffic Safety Admin. Technical Information Services Division, NPO-411 1200 New Jersey Ave., SE Washington, DC 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833

19. Security Classification of this report	20. Security Classification of this page	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	104	

TABLE OF CONTENTS

SECTION 1
TEST PURPOSE AND PROCEDURE

This side impact test is part of the MY2015 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number DTNH22-09-D-00122. The purpose of this test is to generate comparative side impact performance in a 2015 Mercedes-Benz C300 4-door sedan. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated September 2013.

SECTION 2
SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2015 Mercedes-Benz C300 4-door sedan. The subject vehicle was towed into the rigid pole at an angle of 76.9° and a velocity of 31.85 km/h. The test was conducted by KARCO Engineering, LLC. in Adelanto, California on April 13, 2015. Pre- 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 September 2013. Camera locations and other pertinent camera information are included in this report.

The Part 572V (SID-IIs) was instrumented accordingly:

Primary and Redundant Head CG tri-axial accelerometers
Thorax upper, middle and lower rib displacement potentiometers
Abdomen upper and lower rib displacement potentiometers
Lower spine (12) tri-axial 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. Appendix D contains the test equipment and instrumentation calibration data.

Injury readings for the SID-IIs dummy were recorded as follows:

Measurement Description	Units	Passenger ATD (SID-IIs)	
		IARV	Result
Head Injury Criteria (HIC_{36})		1000	247.7
Lower Spine (T12) Resultant Acceleration	g	82	43
Total Pelvic Force (sum of acetabular and iliac forces	N	5525	3420
Maximum Thoracic Rib Deflection	mm	38*	27
Maximum Abdominal Rib Deflection	mm	45*	23

**Proposed IARV*

Supplemental restraint information is given below:

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	Yes	No	No	
Side Airbag 1 (Curtain)	Yes	Yes	Yes	Yes
Side Airbag 2 (Torso/Pelvis)	Yes	Yes	No	
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes	Yes	No	
Other	No		No	

GENERAL COMMENTS

The doors on the struck side of the vehicle remained closed and latched. There was no separation at the hinges or latches. The doors on the non-struck side remained closed and latched. There was no ATD injury value that exceeded its limit. The non-struck side curtain airbag deployed.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15

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	29.574
Pressure	Tire Pressures	lbf/in^2	kPa	6.895
Temperature	General Use	^oF	^oC	=(Tf -32)/1.8
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf-ft	N•m	1.355

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20154301
Model Year	2015
Make	Mercedes-Benz
Model	C300
Body Style	4-Door Sedan
VIN	55SWF4JB1FU055484
Body Color	Steel Grey
Odometer Reading (km / mi)	11 / 7
Engine Displacement (L)	2.0
Type / No. of Cylinders	Inline 4
Engine Placement	Longitudinal
Transmission Type	Automatic
Transmission Speeds	7
Overdrive	Yes
Final Drive	Rear
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks	Yes
Power Window Auto-Reverse	Yes
Other Optional Feature	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	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
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensioner	No
Driver Load Limiter	Yes
Rear Pass. Load Limiter	No
Other Safety Restraint	No

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Mercedes-Benz U.S. Intl., INC
Date of Manufacture	Mar-15
Vehicle Type	Passenger Car

GVWR (kg)	2085
GAWR Front (kg)	990
GAWR Rear (kg)	1125

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				360.0	*A*
DSC x 68.04 (kg)				340.2	*B*
Cargo Weight (RCLW) (kg)				19.8	*A-B*

VEHICLE SEAT TYPE

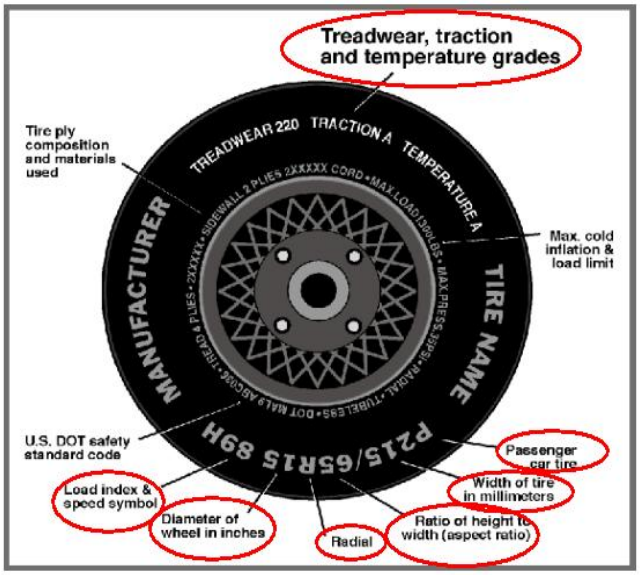
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						w/ Lever	w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat			Yes		Yes		
Third Row Seat							

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15



Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	350	350
Cold Pressure (kPa)	270	310
Recommended Tire Size	225/50R17	225/50R17
Tire Size on Vehicle	225/50R17	225/50R17
Tire Manufacturer	Continental	Continental
Tire Model	ContiPro Contact SSR	ContiPro Contact SSR
Treadware	400	400
Traction Grade	AA	AA
Temperature Grade	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 1 Steel, 1 Polyamide	1 Polyester, 1 Steel, 1 Polyamide
Load Index/Speed Symbol	94H	94H
Tire Material	Polyester, Steel, Polyamide	Polyester, Steel, Polyamide
DOT Safety Code Left	A340 WBN3 5214	A340 WBN3 5214
DOT Safety Code Right	A340 WBN3 5214	A340 WBN3 5214

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	274	275	273	270
Tire Placard	kPa	270	270	310	310
Owner's Manual	kPa	270	270	310	310
As Tested	kPa	270	270	310	310

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	424.0	366.5		428.0	380.5		435.5	400.5	
Right	kg	414.5	351.0		429.5	379.5		419.0	367.5	
Ratio	%	53.9%	46.1%	100.0%	53.0%	47.0%	100.0%	52.7%	47.3%	100.0%
Total	kg	838.5	717.5	1556.0	857.5	760.0	1617.5	854.5	768.0	1622.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1556.0	A
Actual Weight of 1 P572 O ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	19.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1624.8	A+B+C

Does the measured As Tested Vehicle Weight lie within the required weight range (i.e. Calculated Test Vehicle Target Weight -4.5 kg to -9.0 kg)? ☒ **Yes** ☐ **No**

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	°	0.0	-0.1	-0.1	Yes
Front Passenger Sill Angle (front-to-rear)*	°	-0.4	-0.4	-0.5	Yes
Front Bumper-Line Angle (left-to-right)**	°	0.0	-0.3	-0.3	Yes
Rear Bumper-Line Angle (left-to-right)**	°	0.3	-0.4	-0.4	Yes
Vehicle CG (Aft of Front Axle)	mm	1307	1332	1342	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	12	0	24	

*ND=Nose Down (-), NU=Nose Up (+) **LD=Left Down (-), LU=Left Up (+)

***The "As Tested" vehicle attitude angle measurements must be within "As Delivered" and the "Fully Loaded" vehicle attitude measurements at each location. Indicate "Yes" or "No" for "Meets Requirement"

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Tail Lights	2.0
Rear Bumper Cover	8.5
Non-Struck Side Door Panels	6.0
Non-Struck Side Windows and Trim	11.0
Trunk Trim	7.0
Non-Struck Side Outboard Mirror	1.5
Front Brake Calipers	14.0
Passenger Side Floormats	5.0
Ballast / Equipment Added	62.0

Test Height Adjustable Setting (If Applicable)	

DATA SHEET NO. 2

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

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15

SEAT POSITIONING

The driver's seat, front center seat (if applicable), and front passenger's seat should be set to the forward most, mid-height, mid-angle position. The struck side rear passenger's seat, rear center seat, and non-struck side rear passenger's seat should be set to the rear most, lowest, mid-angle position.

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	9.4	0.0	4.7
Front Passenger Seat	9.6	0.0	4.8
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle	As Tested SCRP Height	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid Fore/Aft	Forwardmost
Driver Seat	4.7	538	Max	550	563	575
			Mid	513	525	538
			Min	475	488	500
Front Passenger Seat	4.8	542	Max	552	567	581
			Mid	515	560	542
			Min	477	492	507
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed

DATA SHEET NO. 2 … (CONTINUED)

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

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15

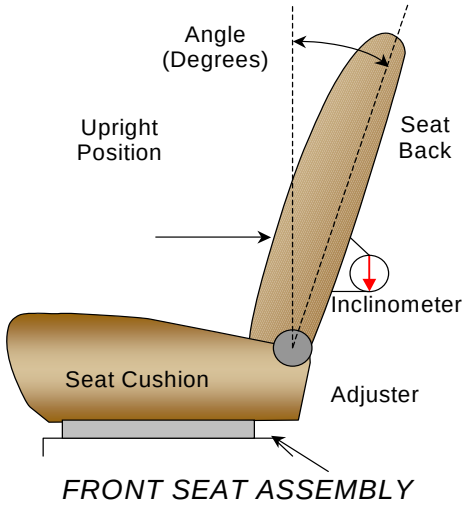
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	260		0	
Front Passenger Seat	260		0	
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

*Detent zero (0) is the forward most detent

SEAT BACK ADJUSTMENT

The driver's seat back is positioned such that the dummy's head is level. The front center and front passenger's seat backs are positioned in a similar manner to the driver's seat. The struck side rear passenger seat back is positioned in accordance with the information provided by the manufacturer in Form 1 for the 5th percentile female dummy in a Side NCAP MDB Test. The rear center and non-struck side rear passenger's seat back is set to match the struck side rear seat back. Seat back angle is measured at the seatback.



FRONT SEAT ASSEMBLY

Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/Seated Dummy	63.1		14.2	
Front Passenger Seat	64.0		14.5	
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

*Detent zero (0) is the forward most detent

DATA SHEET NO. 2 … (CONTINUED)

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

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1. The positions are marked H, M1, …, L from top to bottom.

	Total No. of Positions	Placed in Position
Driver Seat	4	H

HEAD RESTRAINT ADJUSTMENT

The driver's head restraint is adjusted to the lowest and most full forward in-use position.

	Total No. of Positions	Placed in Position
Driver Seat	56mm Vertical Adjustment 5 (0-4) detents Horizontal	Full Down, Full Forward

DATA SHEET NO. 2 … (CONTINUED)

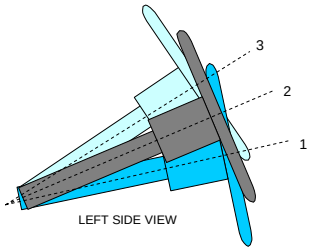
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the center of the geometric locus it describes when it moves through its full range of motion.

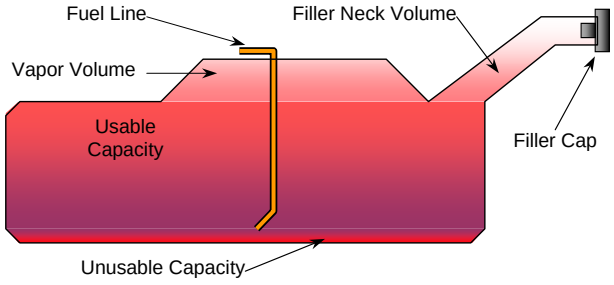


STEERING COLUMN ASSEMBLY

	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	19.3	87
Geometric Center - Position 2	21.4	114.5
Uppermost - Position 3	23.6	142
Telescoping Steering Wheel Travel		55
Test Position	21.4	114.5

FUEL PUMP

The vehicle is equipped with an electric fuel pump. The fuel pump is in operation if the ignition is switched to the "ON" position. After about 15 seconds the pump switches back to the standby mode, if the engine is not started.



VEHICLE FUEL TANK ASSEMBLY

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	66.00
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)	
Usable Capacity of "Optional Tank" (see Owner's Manual)	
93% of Usable Capacity	61.38
Actual amount of Solvent Used in Test	61.38
1/3 of Usable Capacity	22.00

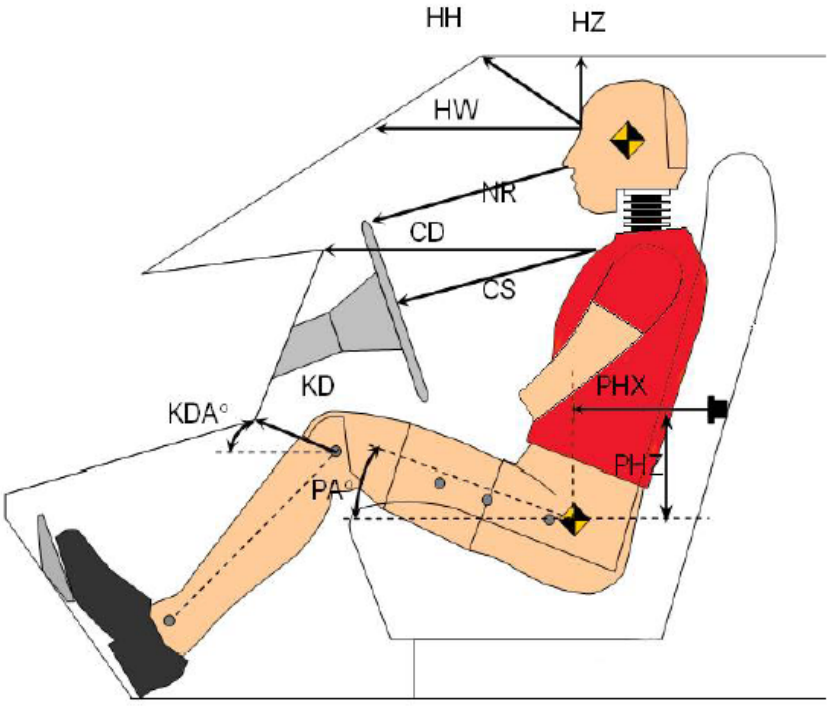
Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in the Form No. 1? ☒ **Yes** ☐ **No**

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15



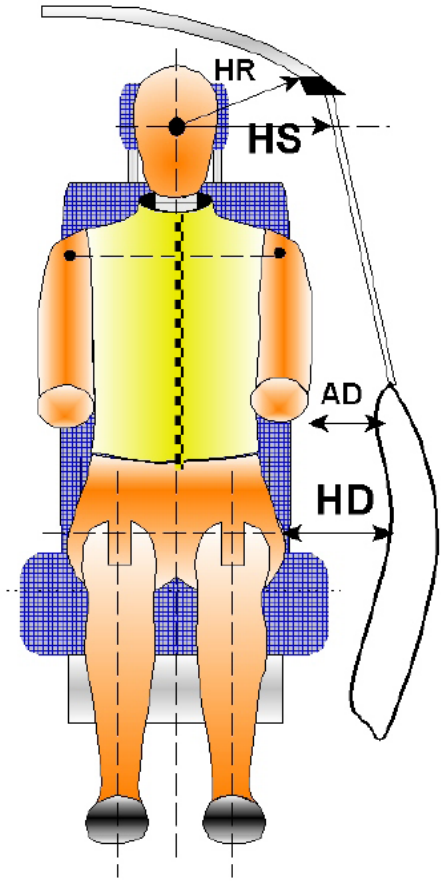
Driver Code	Description	Driver	
		Length (mm)	Angle (º)
HH	Head to Header	280	
HW	Head to Windshield	595	
HZ	Head to Roof	180	
NR	Nose to Rim	263	
CD	Chest to Dash	427	
CS	Chest to Steering Wheel	205	
KD(L)/KDA(L)°	Left Knee to Dash	143	43.5
KD(R)/KDA(R)°	Right Knee to Dash	106	37.1
PAX°	Pelvic Tilt Angle (x-axis)		20.2
PAY°	Pelvic Tilt Angle (y-axis)		0.3
PHX	Hip Point to Striker (x-axis)	278	
PHZ	Hip Point to Striker (z-axis)	210	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15



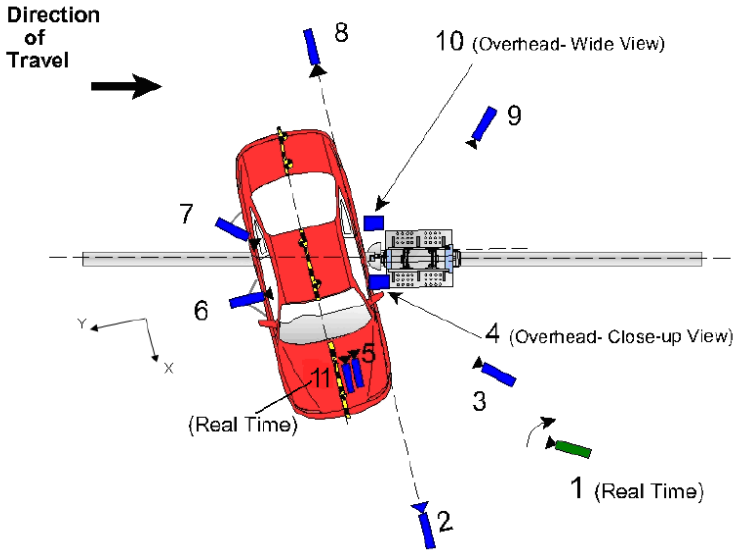
Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	224
HS	Head to Side Window	mm	357
AD	Arm to Door	mm	146
HD	Hip Point to Door	mm	151

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15



Reference from Point of Impact for X and Y; from Ground for Z):
+X = Forward of Vehicle, +Y = Right of Vehicle, +Z = Down

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	1.53	0.54	-1.44	35	1000
6	On-Board - Dummy Side View	-0.11	1.70	-1.16	14	1000
7	On-Board - Dummy Rear Oblique View	-0.86	1.80	-1.26	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	1.52	0.40	-1.42		30

*All measurements accurate to ±6 mm

INSTRUMENTATION

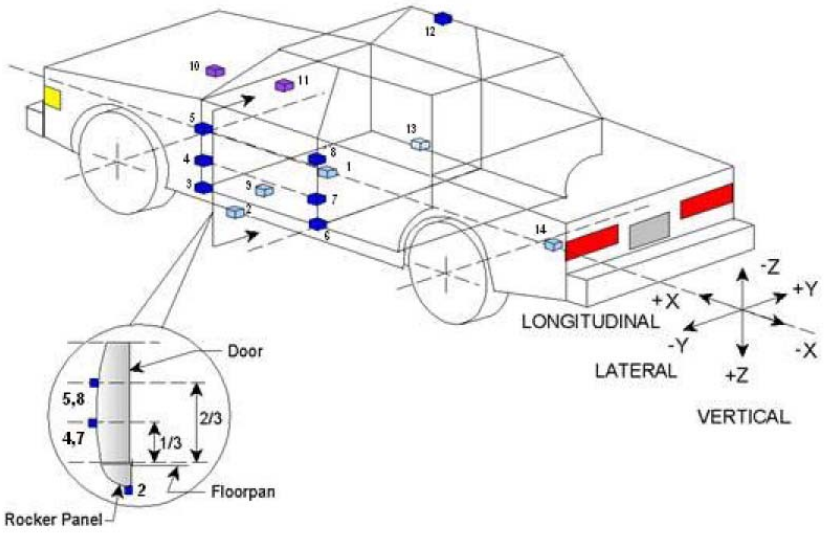
Driver Dummy Channels	16
Vehicle Structure Accelerometers	18
Pole Load Cells	8
Total	42

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15



Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1982	0	-452
2	Left Floor Sill	2870	-760	-198
3	A-Pillar Sill	3186	-786	-378
4	A-Pillar Low	3186	-786	-578
5	A-Pillar Mid	3186	-786	-834
6	B-Pillar Sill	2120	-712	-412
7	B-Pillar Low	2120	-712	-612
8	B-Pillar Mid	2120	-712	-910
9	Driver Seat Track	2442	-160	-280
10	Engine Top	4095	-19	-840
11	Firewall	3431	370	-810
12	Right Roof	2230	481	-1450
13	Right Floor Sill	2046	720	-412
14	Rear Floorpan	774	15	-561

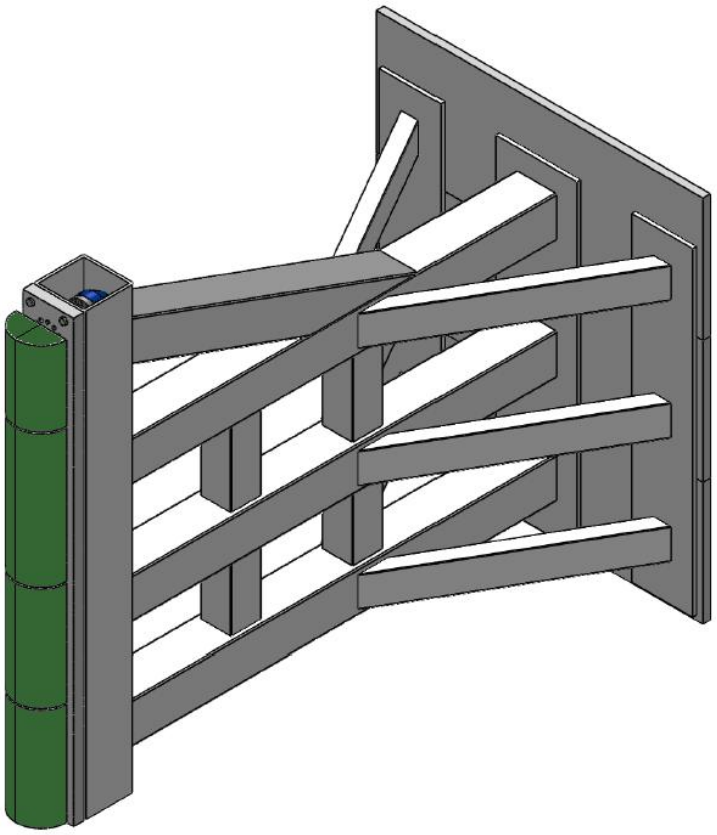
Reference: X – Rear surface of vehicle (+ forward)
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 7

RIGID POLE LOAD CELL DATA

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15



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: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver SID-IIs Dummy
Face	Curtain Airbag
Top of Head	Curtain Airbag
Left Side of Head	Curtain Airbag
Back of Head	Curtain Airbag, Headrest
Left Shoulder	Torso/Pelvis Airbag, Door Panel
Upper Torso	Seat
Lower Torso	Seat, Torso/Pelvis Airbag
Left Hip	Seat, Torso/Pelvis Airbag, Door Panel
Left Knee	None

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/Other Door
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge System Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)	N/A	N/A	N/A	N/A	N/A

POST-TEST SEAT PERFORMANCE

Description	Struck Side		Non-Struck Side	
	Front	Rear	Front	Rear
Seat Movement Along Seat Track	No	No	No	No
Seat Disengagement from Floor Pan	No	No	No	No
Seat Back Movement from Initial Position	No	No	No	No
Seat Back Collapse	No	No	No	No

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No separation occurred
Sill Separation	No separation occurred
Windshield Damage	Broken
Side Window Damage	Left front window broken
Other Notable Effects	None

DATA SHEET NO. 8 … (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

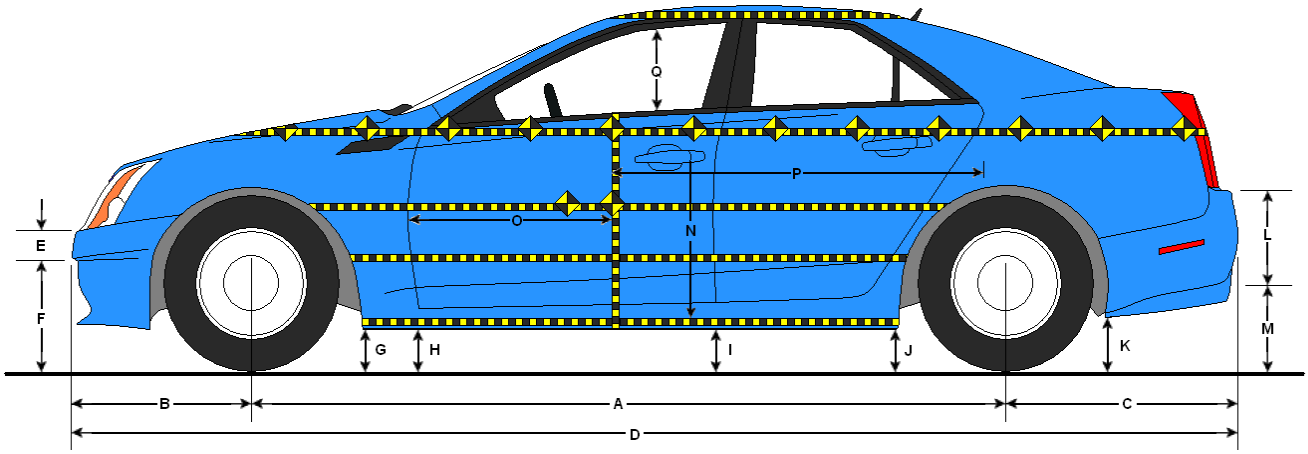
Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		1366
Actual Impact Point (Aft of Front Axle)	mm		1372
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	-6
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	76.9
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	31.85
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	31.83

DATA SHEET NO. 9

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15



LEFT SIDE VIEW

All measurements in mm with tolerance of ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

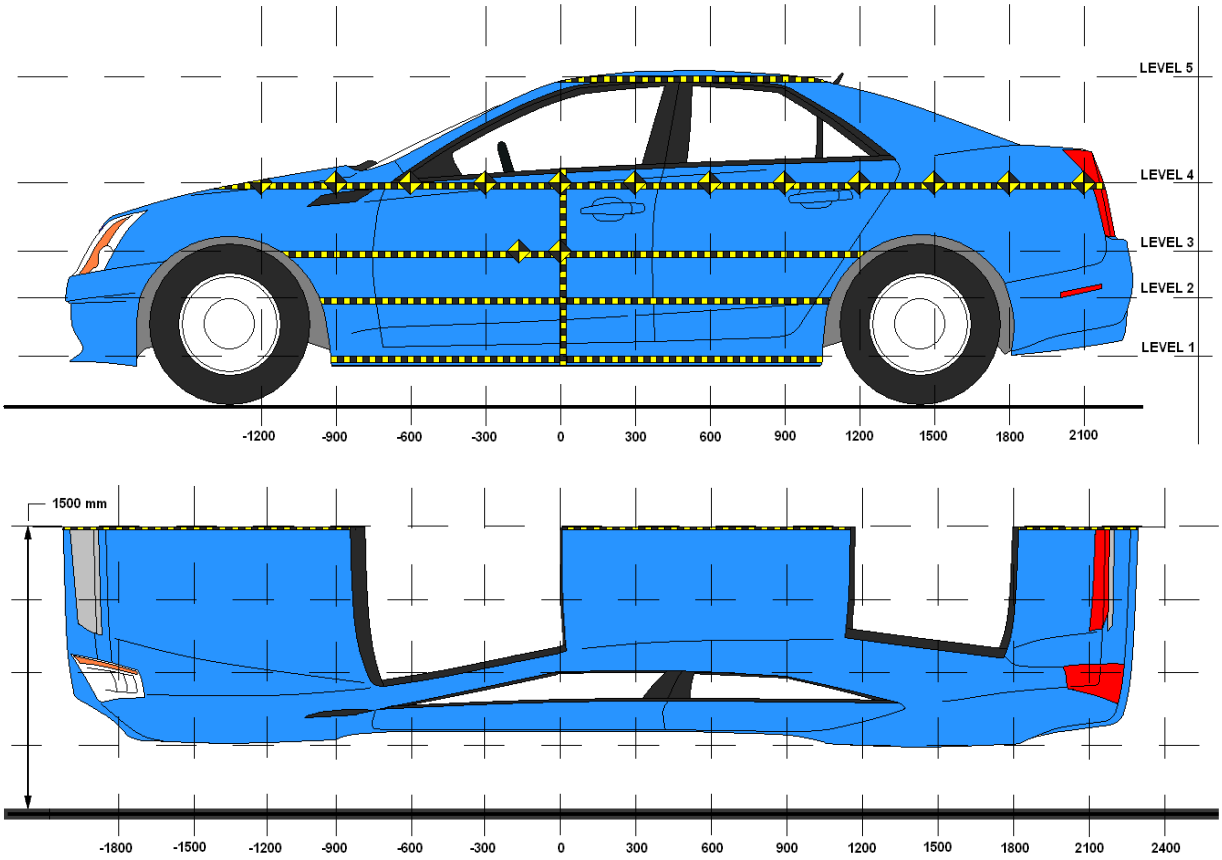
Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2835	2801	-34
B	Front Axle to FSOV	794	805	11
C	Rear Axle to RSOV	1040	1055	15
D	Total Length at Centerline	4648	4661	13
E	Front Bumper Thickness	58	58	0
F	Fromt Bumper Bottom to Ground	406	436	30
G	Sill Height at Front Wheel Well	245	250	5
H	Sill Height at Front Door Leading Edge	242	246	4
I	Sill Height at B-Pillar	265	255	-10
J1	Sill Height at Rear Wheel Well	236	249	13
J2	Pinch Weld Height at Rear Wheel Well	194	199	5
K	Sill Height Aft of Rear Wheel Well	538	534	-4
L	Rear Bumper Thickness	110	109	-1
M	Rear Bumper Bottom to Ground	443	422	-21
N	Sill Height to Bottom of Front Window Sill	642	647	5
O	Front Door Leading Edge to Impact CL	699	637	-62
P	Rear Door Trailing Edge to Impact CL	1441	1393	-48
Q	Front Window Opening	422	440	18
R	Right Side Length	3292	3299	7
S	Left Side Length	3289	3251	-38
T	Vehicle Width at B-Pillar	1797	1740	-57

DATA SHEET NO. 10

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15



NOTE: All measurements in mm with tolerance of ± 3mm

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	309	246	0
2	Occupant H-Point	539	285	0
3	Mid-Door	675	302	0
4	Window Sill	914	263	0
5	Window Top	1411	72	0

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

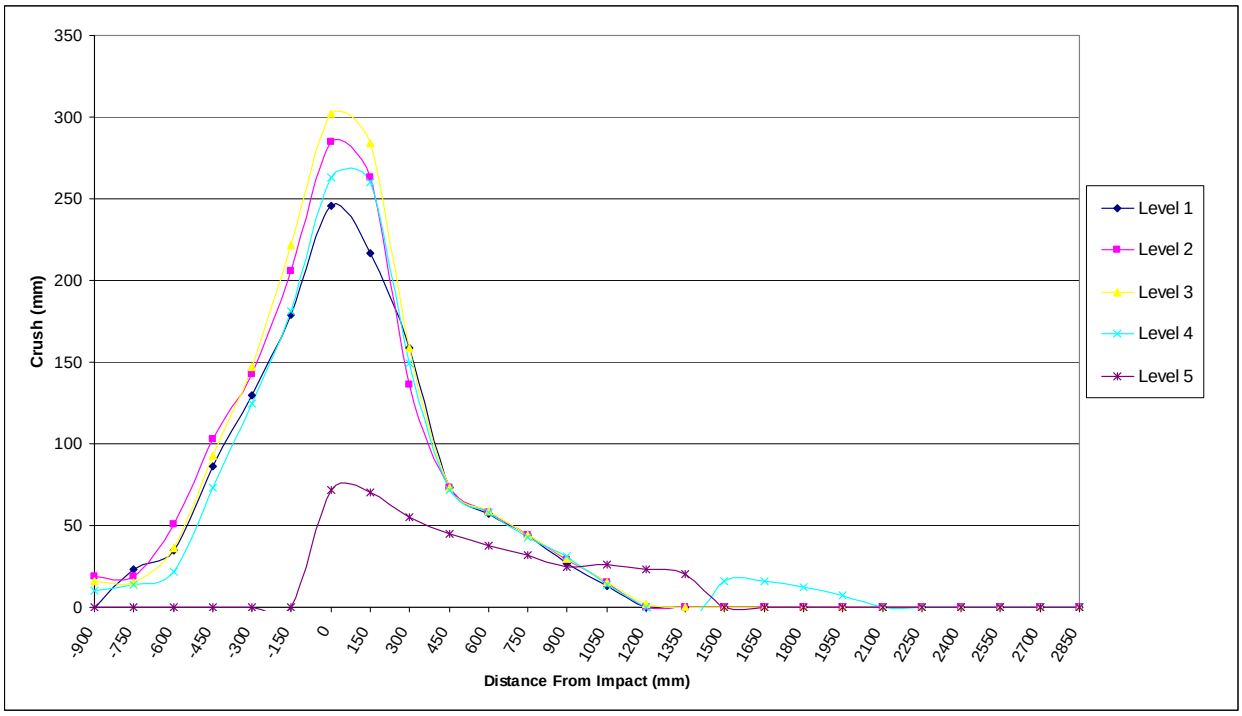
	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	641	613	614	722		640	632	630	732		-1	19	16	10	
-750	643	612	610	703		666	631	625	717		23	19	15	14	
-600	642	610	607	692		677	661	643	714		35	51	36	22	
-450	641	608	604	678		727	711	697	751		86	103	93	73	
-300	639	607	602	666		769	750	749	791		130	143	147	125	
-150	638	607	601	656		817	813	823	837		179	206	222	181	
0	637	608	600	648	895	883	893	902	911	967	246	285	302	263	72
150	637	610	600	629	913	854	873	884	889	983	217	263	284	260	70
300	636	612	602	625	929	795	748	761	774	984	159	136	159	149	55
450	638	615	605	642	937	711	688	678	714	982	73	73	73	72	45
600	640	618	607	643	944	697	676	666	701	982	57	58	59	58	38
750	642	621	612	646	947	686	665	656	689	979	44	44	44	43	32
900	644	624	616	645	953	671	653	646	676	978	27	29	30	31	25
1050	644	622	618	646	952	657	637	633	660	978	13	15	15	14	26
1200			610	653	959			612	653	982			2	0	23
1350				645	974				632	994				-13	20
1500				646					662					16	
1650				654					670					16	
1800				666					678					12	
1950				686					693					7	
2100															
2250															
2400															
2550															
2700															
2850															

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15

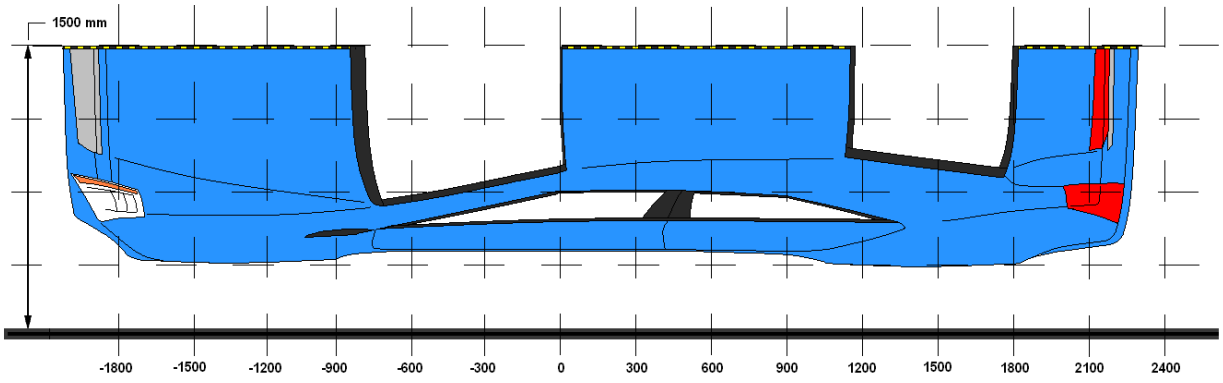


DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15



DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	1950	4	686	693	7
2	1350	5	974	994	20
3	750	3	612	656	44
4	300	3	602	761	159
5	-300	5	602	749	147
6	-900	2	613	632	19

DATA SHEET NO. 12

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15

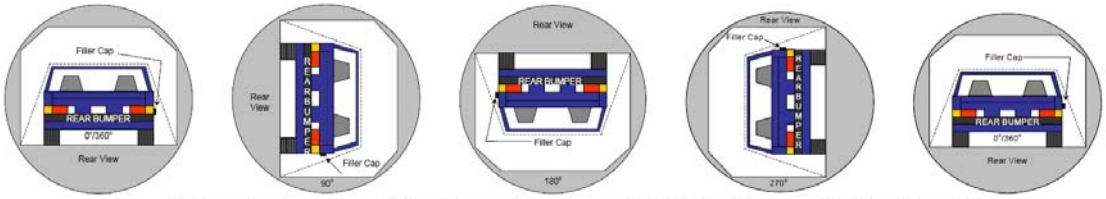
Temperature at Time of Impact: 24.4° C Test Time: 12:17 PM

A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable = 1 oz.)

B. For the 5 minute period after motion ceases: 0 oz.
(Maximum allowable = 5 oz.)

C. For the following 25 minutes: 0 oz.
(Maximum allowable = 1 oz./minute)

D. Spillage Details: There was no Stoddard solvent spillage.



0° TO 90° 90° TO 180° 180° TO 270° 270° TO 360°

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	85	300	385
90° To 180°	82	300	382
180° To 270°	78	300	378
270° To 360°	84	300	384

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

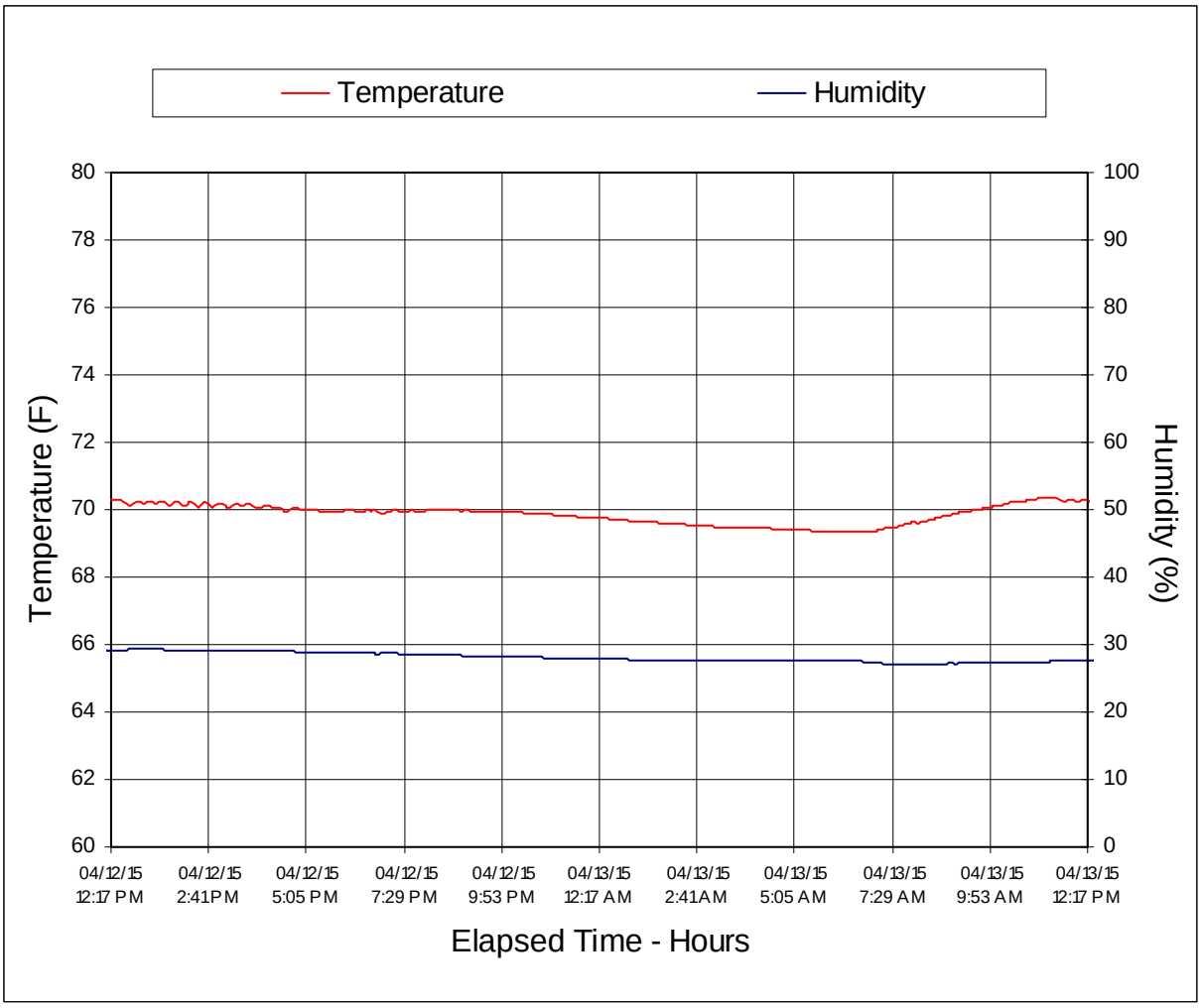
Test Phase	Spillage Location
0° To 90°	No Spillage Occurred
90° To 180°	No Spillage Occurred
180° To 270°	No Spillage Occurred
270° To 360°	No Spillage Occurred

DATA SHEET NO. 13

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2015 Mercedes-Benz C300 4-Door Sedan NHTSA No. M20154301

Test Program: NCAP Side Pole Impact Test Test Date: 04/13/15



APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS … (CONTINUED)

FIGURE 1. As-Delivered Right Front ¾ View of Test Vehicle

FIGURE 2. As-Delivered Left Rear ¾ View of Test Vehicle

FIGURE 3. Pre-Test Frontal View of Test Vehicle

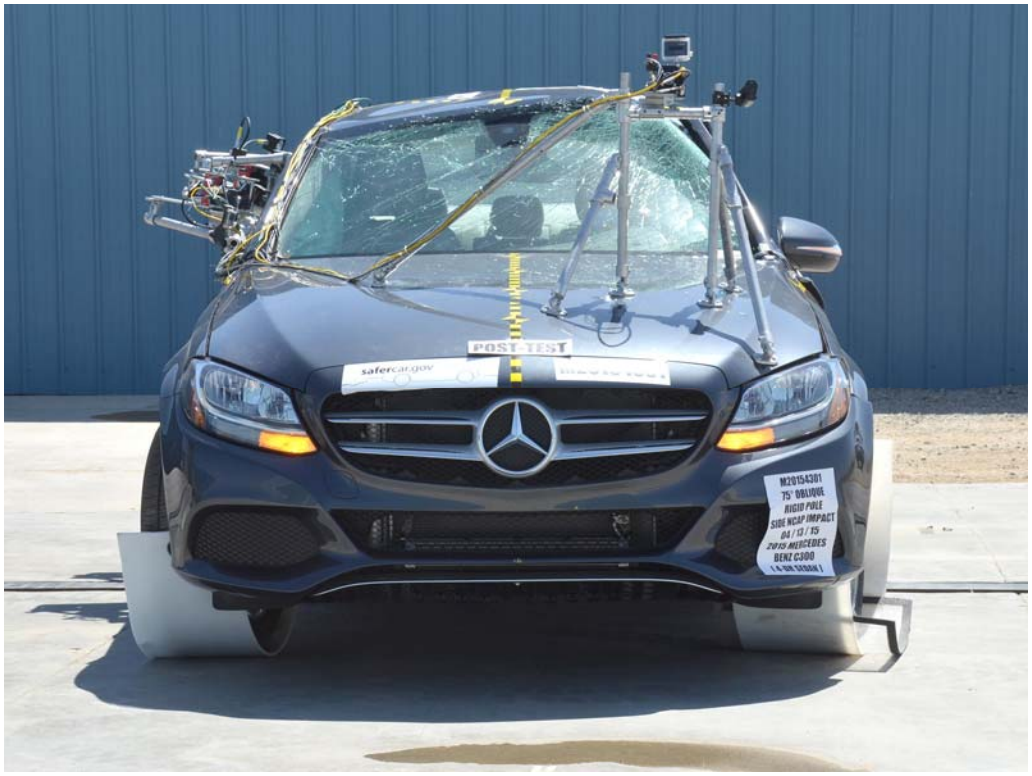


FIGURE 4. Post-Test Frontal View of Test Vehicle

FIGURE 5. Pre-Test Left Front ¾ View of Test Vehicle

FIGURE 6. Post-Test Left Front ¾ 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 ¾ View of Test Vehicle

FIGURE 10. Post-Test Left Rear ¾ View of Test Vehicle

FIGURE 11. Pre-Test Rear View of Test Vehicle

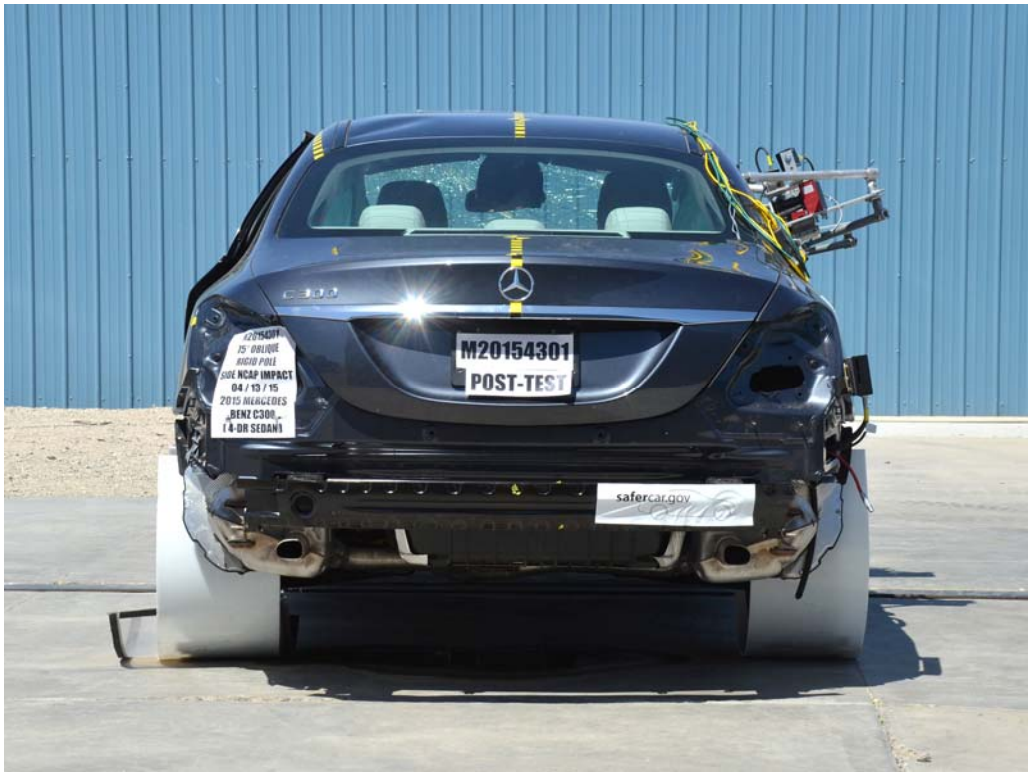


FIGURE 12. Post-Test Rear View of Test Vehicle

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 Area

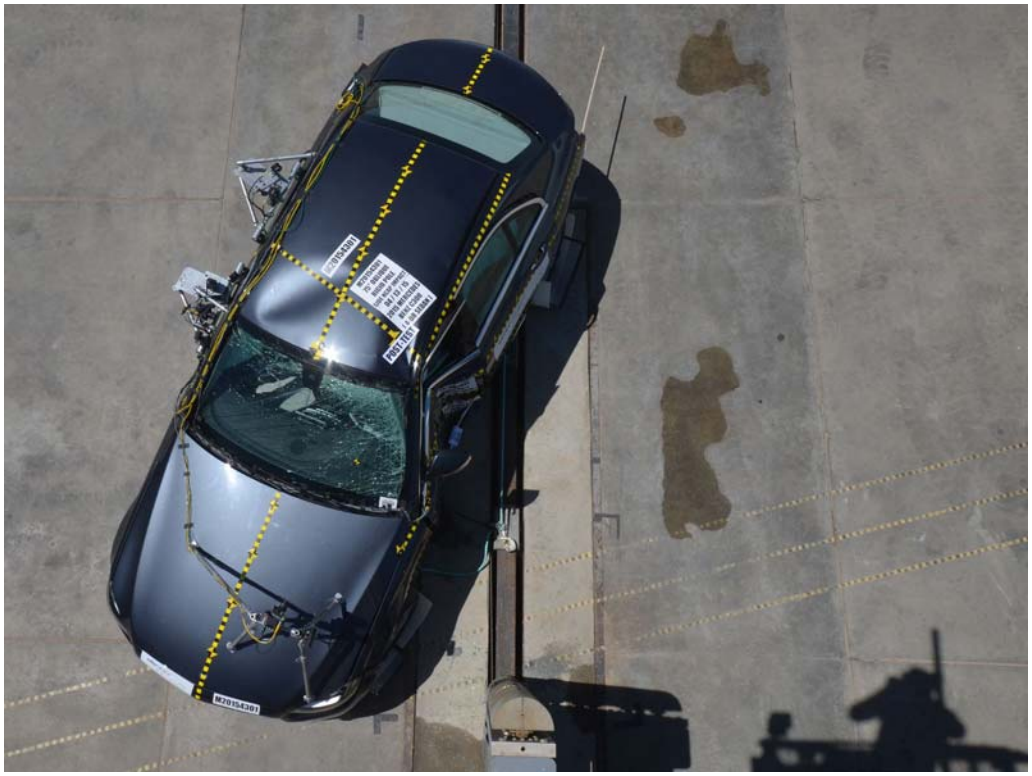


FIGURE 16. Post-Test Overhead View of Test Area

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

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

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 Head and Chest

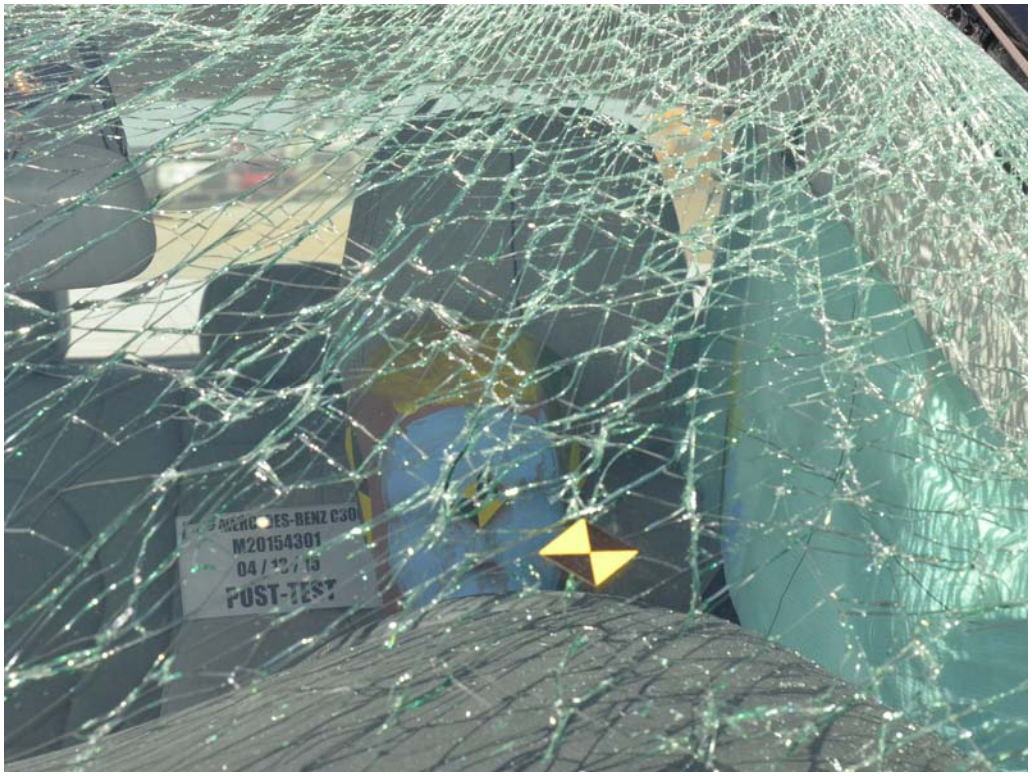


FIGURE 22. Post-Test Front Close-Up View of Dummy

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

FIGURE 24. Pre-Test Left Side View of Dummy Shoulder and 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 Positioning

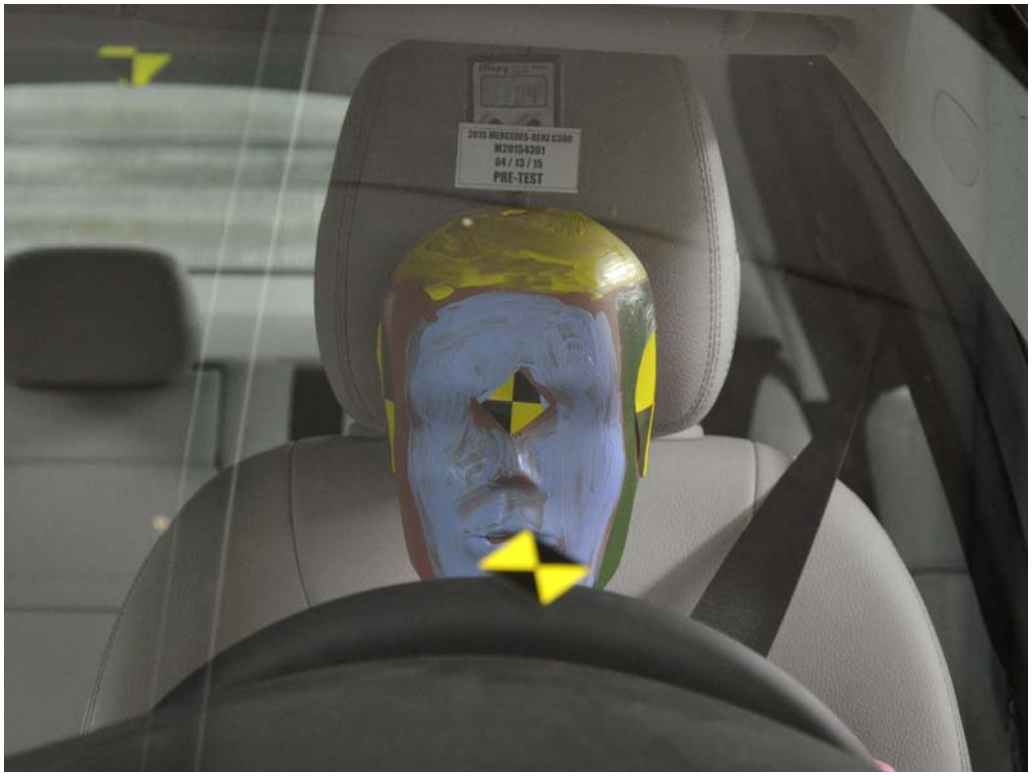


FIGURE 27. Pre-Test Frontal Close-Up View of
Dummy Head and Shoulders in Relation to Head Restraint

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

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

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

FIGURE 31. Pre-Test Left Side View of Dummy's Head Showing 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. View of Disengaged Parking Brake

FIGURE 36. Pre-Test View of Parking Brake

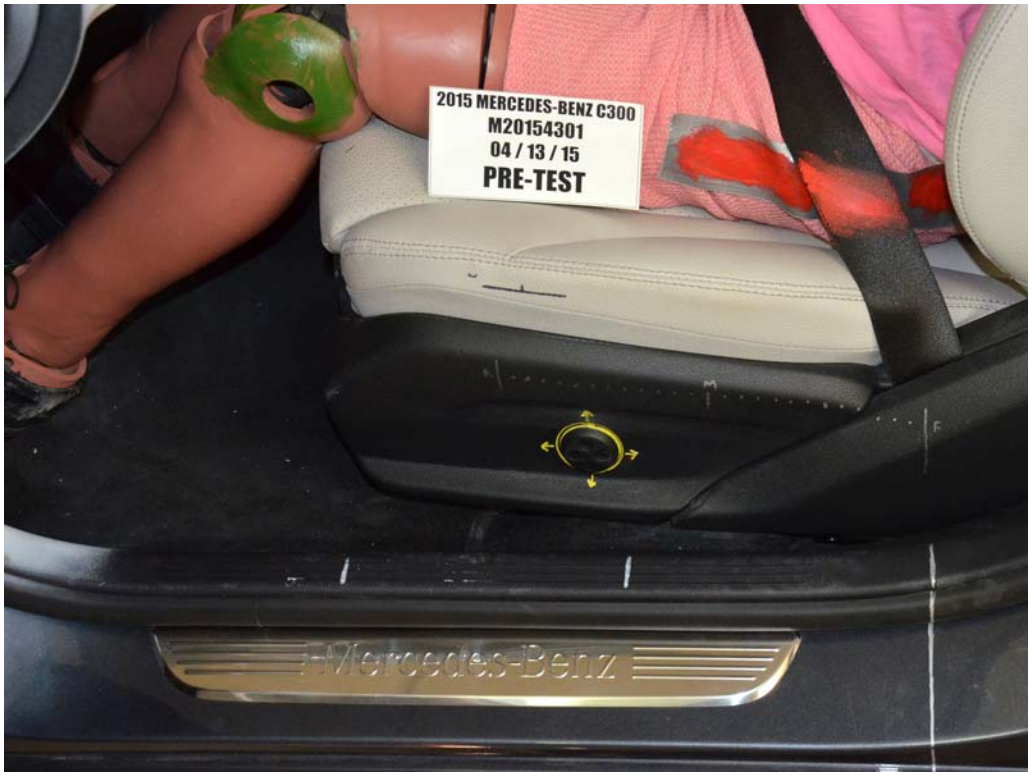


FIGURE 37. Pre-Test Close-Up Left Side View of Driver Seat Track

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

FIGURE 39. Pre-Test Close-Up View of Driver Seat Back or Head Restraint

FIGURE 40. Pre-Test Dummy and Door Clearance View

FIGURE 41. Post-Test Dummy and Door Clearance View

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

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

FIGURE 44. Pre-Test Inner Door Panel View

FIGURE 45. Post-Test Inner Door Panel View
Showing Dummy Contact Locations

FIGURE 46. Post-Test Dummy Close-Up Head Contact with Vehicle Interior View

FIGURE 47. Post-Test Dummy Close-Up Head Contact With Side Airbag View

FIGURE 48. Post-Test Dummy Close-Up Torso Contact With Vehicle Interior View

FIGURE 49. Post-Test Dummy Close-Up Torso Contact With Side Airbag View

FIGURE 50. Post-Test Dummy Close-Up Pelvis Contact With Vehicle Interior View

FIGURE 51. Post-Test Dummy Close-Up Pelvis Contact With Side Airbag View

Photograph Not Applicable

No Driver Dummy Knee Contact with Vehicle Interior

FIGURE 52. Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View

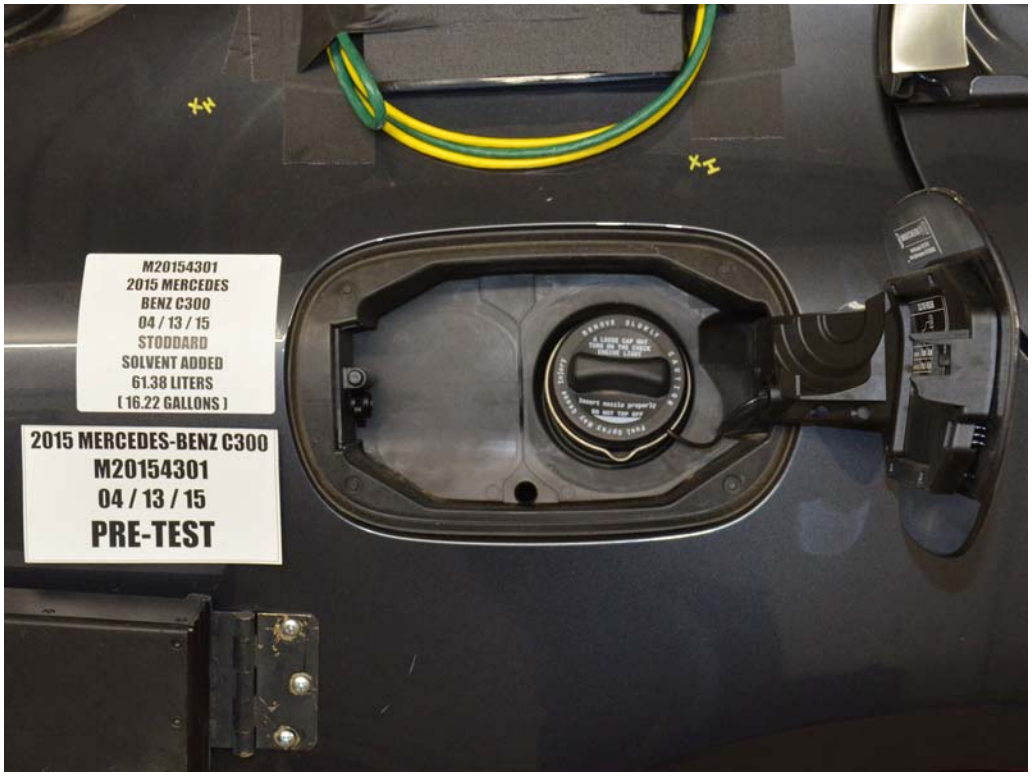


FIGURE 53. Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

FIGURE 54. Post-Test View of Fuel Filler Cap or Fuel Filler Neck

FIGURE 55. Close-Up View of Vehicle's Certification Label

FIGURE 56. Close-Up View of Vehicle's Tire Information Placard or Label

FIGURE 57. Pre-Test Pole Barrier Front View

FIGURE 58. Post-Test Pole Barrier Front View

FIGURE 59. Pre-Test Pole Barrier Side View

FIGURE 60. Post-Test Pole Barrier Side View

FIGURE 61. Pre-Test Ballast View

FIGURE 62. Post-Test Primary and Redundant Speed Trap Read-Out

FIGURE 63. FMVSS No. 301 Static Rollover 0 Degrees

FIGURE 64. FMVSS No. 301 Static Rollover 90 Degrees

FIGURE 65. FMVSS No. 301 Static Rollover 180 Degrees

FIGURE 66. FMVSS No. 301 Static Rollover 270 Degrees

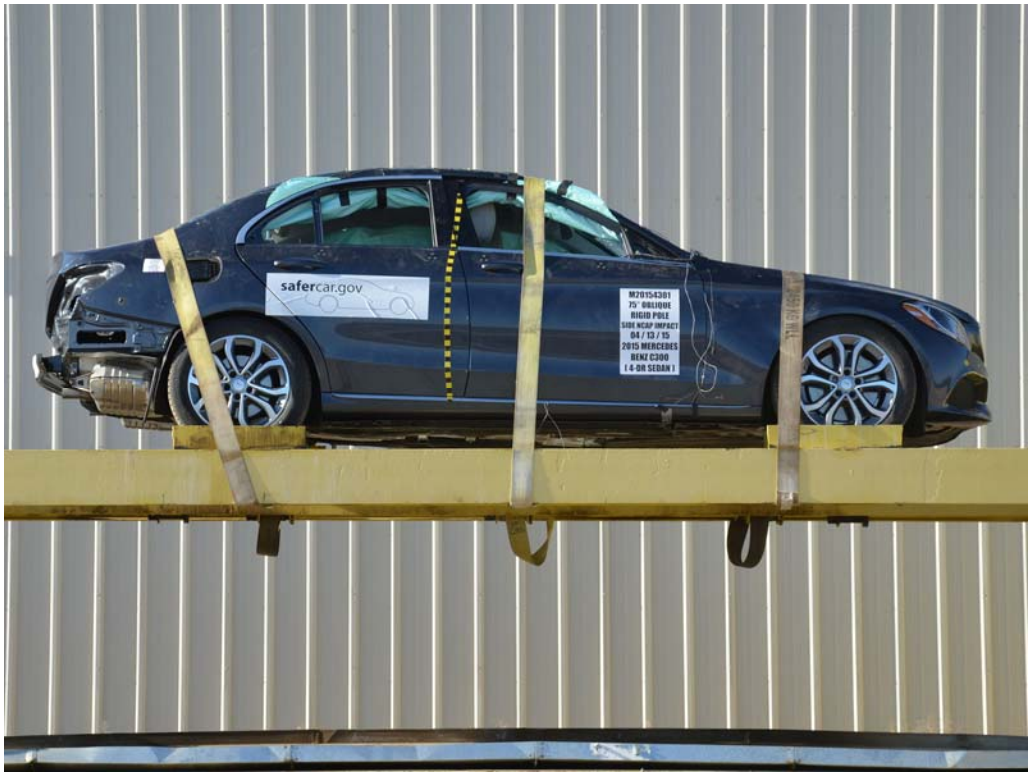


FIGURE 67. FMVSS No. 301 Static Rollover 360 Degrees

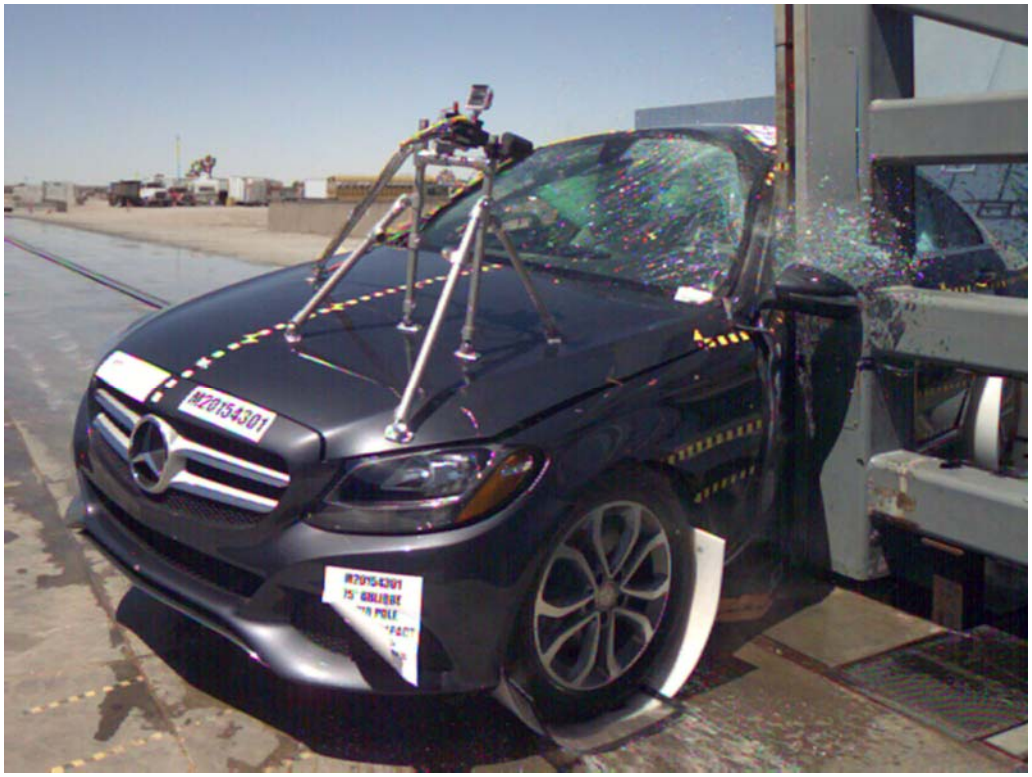
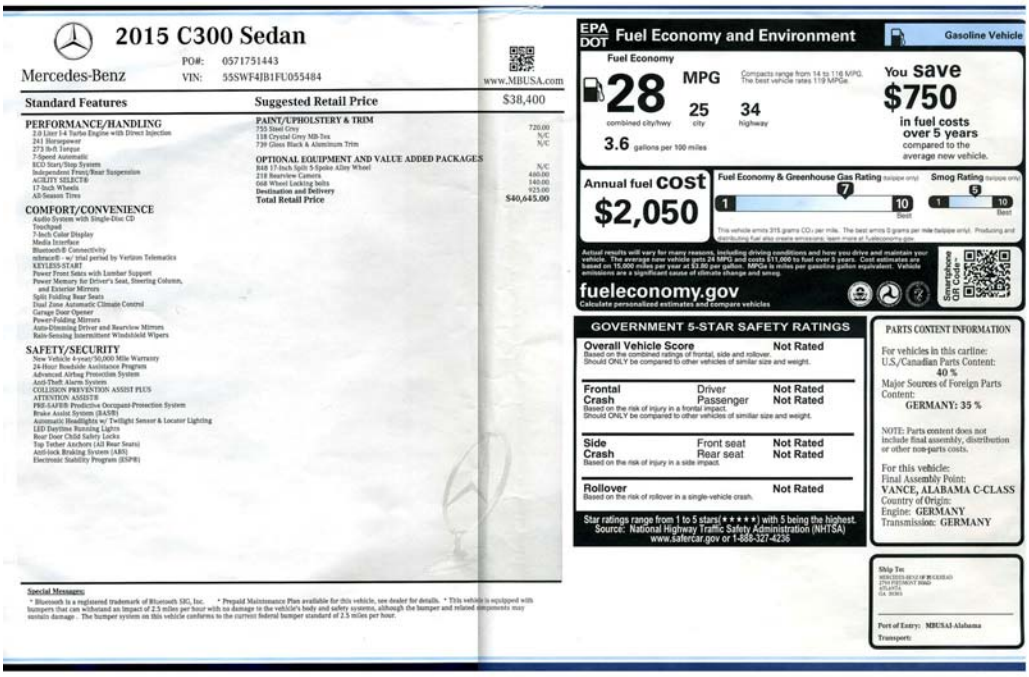


FIGURE 68. Impact Event



2015 C300 Sedan

Mercedes-Benz

PO#: 0571751443

VIN: 55SWF4JB1FU055484

www.MBUSA.com

Standard Features — **Suggested Retail Price** $38,400

PERFORMANCE/HANDLING
2.0 Liter I-4 Turbo Engine with Direct Injection
241 Horsepower
273 lb-ft Torque
7-Speed Automatic
ECO Start/Stop System
Independent Front/Rear Suspension
AGILITY SELECT®
17-Inch Wheels
All-Season Tires

COMFORT/CONVENIENCE
Audio System with Single-Disc CD
Touchpad
7-Inch Color Display
Media Interface
Bluetooth® Connectivity
mbrace®- w/ trial period by Verizon Telematics
KEYLESS-START
Power Front Seats with Lumbar Support
Power Memory for Driver's Seat, Steering Column, and Exterior Mirrors
Split Folding Rear Seats
Dual Zone Automatic Climate Control
Garage Door Opener
Power-Folding Mirrors
Auto-Dimming Driver and Rearview Mirrors
Rain-Sensing Intermittent Windshield Wipers

SAFETY/SECURITY
New Vehicle 4-year/50,000 Mile Warranty
24-Hour Roadside Assistance Program
Advanced Airbag Protection System
Anti-Theft Alarm System
COLLISION PREVENTION ASSIST PLUS
ATTENTION ASSIST®
PRE-SAFE® Predictive Occupant-Protection System
Brake Assist System (BAS®)
Automatic Headlights w/ Twilight Sensor & Locator Lighting
LED Daytime Running Lights
Rear Door Child Safety Locks
Top Tether Anchors (All Rear Seats)
Anti-lock Braking System (ABS)
Electronic Stability Program (ESP®)

PAINT/UPHOLSTERY & TRIM
755 Steel Grey 720.00
118 Crystal Grey MB-Tex N/C
739 Gloss Black & Aluminum Trim N/C

OPTIONAL EQUIPMENT AND VALUE ADDED PACKAGES
868 17-Inch Split 5-Spoke Alloy Wheel N/C
218 Rearview Camera 460.00
068 Wheel Locking bolts 140.00
Destination and Delivery 925.00
Total Retail Price $40,645.00

Special Messages:
* Bluetooth is a registered trademark of Bluetooth SIG, Inc. * Prepaid Maintenance Plan available for this vehicle, see dealer for details. * This vehicle is equipped with bumpers that can withstand an impact of 2.5 miles per hour with no damage to the vehicle's body and safety systems, although the bumper and related components may sustain damage. The bumper system on this vehicle conforms to the current federal bumper standard of 2.5 miles per hour.

EPA DOT **Fuel Economy and Environment** — Gasoline Vehicle

Fuel Economy
28 MPG combined city/hwy — 25 city — 34 highway
Compacts range from 14 to 116 MPG. The best vehicle rates 119 MPGe.
3.6 gallons per 100 miles

You save **$750** in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost **$2,050**

Fuel Economy & Greenhouse Gas Rating (tailpipe only): 7 (1 – 10, Best)
Smog Rating (tailpipe only): 5 (1 – 10, Best)

This vehicle emits 315 grams CO2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions; learn more at fueleconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 24 MPG and costs $11,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $3.80 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score — Not Rated
Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.

Frontal Crash — Driver: Not Rated; Passenger: Not Rated
Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.

Side Crash — Front seat: Not Rated; Rear seat: Not Rated
Based on the risk of injury in a side impact.

Rollover — Not Rated
Based on the risk of rollover in a single-vehicle crash.

Star ratings range from 1 to 5 stars(★★★★★) with 5 being the highest.
Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

PARTS CONTENT INFORMATION

For vehicles in this carline:
U.S./Canadian Parts Content: 40 %
Major Sources of Foreign Parts Content:
GERMANY: 35 %

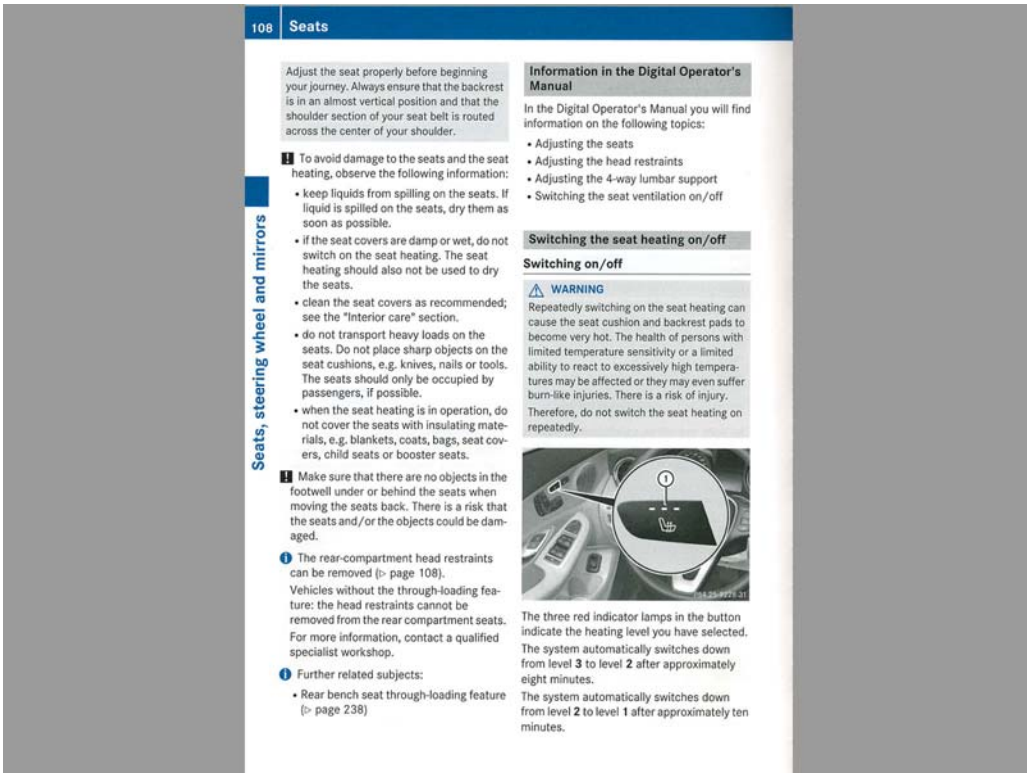
NOTE: Parts content does not include final assembly, distribution or other non-parts costs.

For this vehicle:
Final Assembly Point:
VANCE, ALABAMA C-CLASS
Country of Origin:
Engine: GERMANY
Transmission: GERMANY

Ship To:

Port of Entry: MBUSAI Alabama
Transport:

FIGURE 69. Monroney Label



108 Seats

Seats, steering wheel and mirrors

Adjust the seat properly before beginning your journey. Always ensure that the backrest is in an almost vertical position and that the shoulder section of your seat belt is routed across the center of your shoulder.

! To avoid damage to the seats and the seat heating, observe the following information:
- keep liquids from spilling on the seats. If liquid is spilled on the seats, dry them as soon as possible.
- if the seat covers are damp or wet, do not switch on the seat heating. The seat heating should also not be used to dry the seats.
- clean the seat covers as recommended; see the "Interior care" section.
- do not transport heavy loads on the seats. Do not place sharp objects on the seat cushions, e.g. knives, nails or tools. The seats should only be occupied by passengers, if possible.
- when the seat heating is in operation, do not cover the seats with insulating materials, e.g. blankets, coats, bags, seat covers, child seats or booster seats.

! Make sure that there are no objects in the footwell under or behind the seats when moving the seats back. There is a risk that the seats and/or the objects could be damaged.

i The rear-compartment head restraints can be removed (▷ page 108).
Vehicles without the through-loading feature: the head restraints cannot be removed from the rear compartment seats.
For more information, contact a qualified specialist workshop.

i Further related subjects:
- Rear bench seat through-loading feature (▷ page 238)

Information in the Digital Operator's Manual

In the Digital Operator's Manual you will find information on the following topics:
- Adjusting the seats
- Adjusting the head restraints
- Adjusting the 4-way lumbar support
- Switching the seat ventilation on/off

Switching the seat heating on/off

Switching on/off

⚠ WARNING
Repeatedly switching on the seat heating can cause the seat cushion and backrest pads to become very hot. The health of persons with limited temperature sensitivity or a limited ability to react to excessively high temperatures may be affected or they may even suffer burn-like injuries. There is a risk of injury.
Therefore, do not switch the seat heating on repeatedly.

The three red indicator lamps in the button indicate the heating level you have selected.
The system automatically switches down from level **3** to level **2** after approximately eight minutes.
The system automatically switches down from level **2** to level **1** after approximately ten minutes.

FIGURE 70. Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

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 Redundant (X)
Driver Head Acceleration Redundant (Y)
Driver Head Acceleration Redundant (Z)
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)

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
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

Left Lower B-Pillar Acceleration (Y)

Left Mid B-Pillar Acceleration (Y)

Driver Seat Track at Dummy Hip 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)

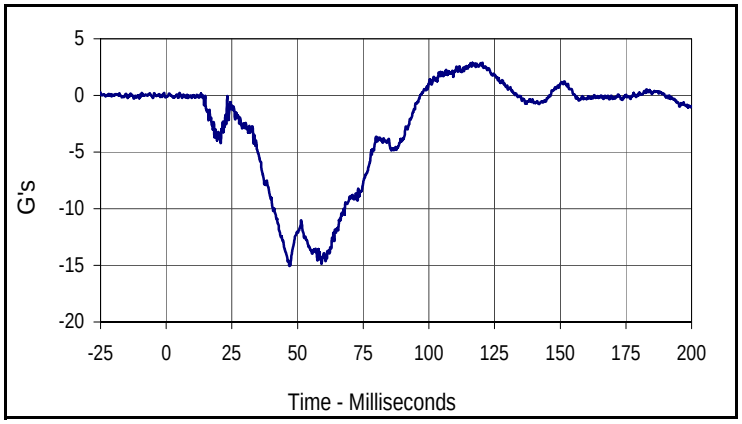
Load Cell Pole Barrier #5 Force (Y)

Load Cell Pole Barrier #6 Force (Y)

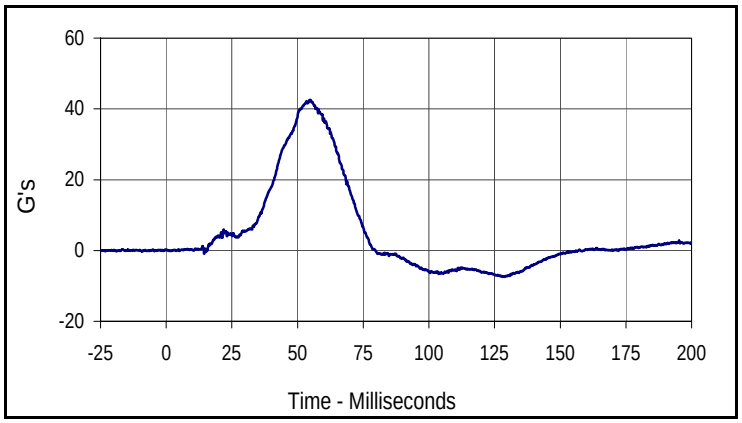
Load Cell Pole Barrier #7 Force (Y)

Load Cell Pole Barrier #8 Force (Y)

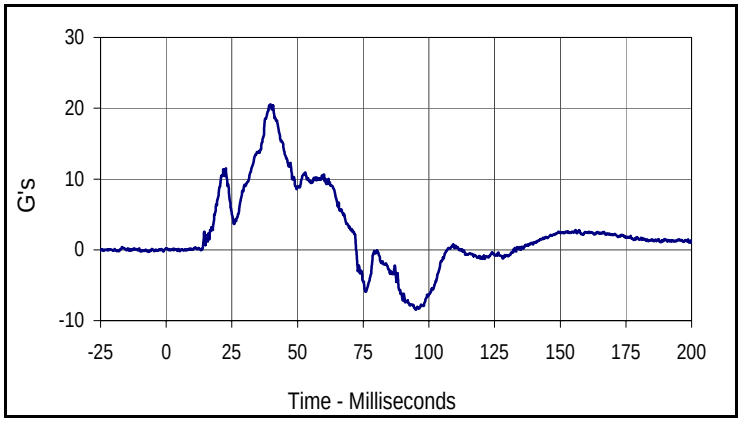
Test Vehicle:	2015 Mercedes-Benz C300 4-Door Sedan	Test Date:	4/13/15
Test Program:	NCAP Side Pole Impact Test	NHTSA No.:	M20154301



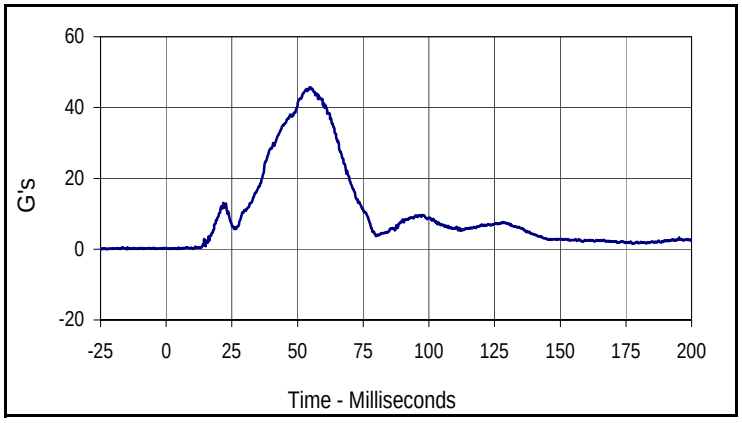
Curve Description			
Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
2.9	116.6	-15.0	47.0



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
42.6	54.9	-7.5	128.1

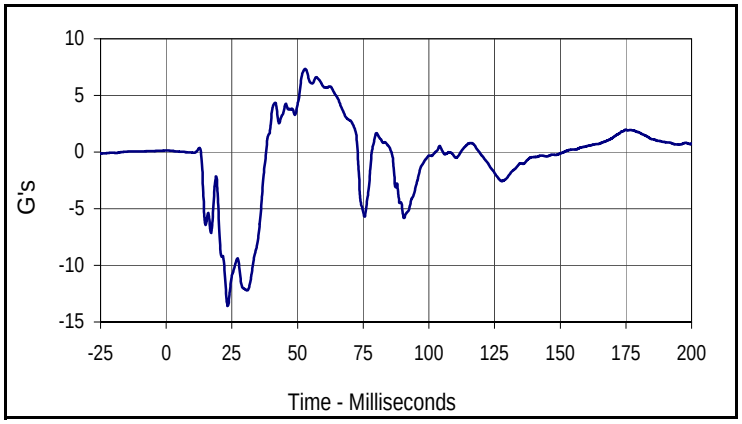


Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
20.6	39.7	-8.5	95.0

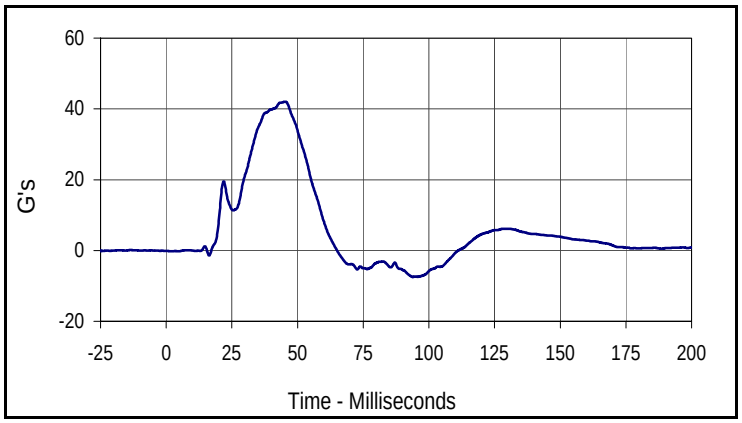


Curve Description			
Driver Head Acceleration Primary Res.			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
45.7	54.9	0.0	3.7

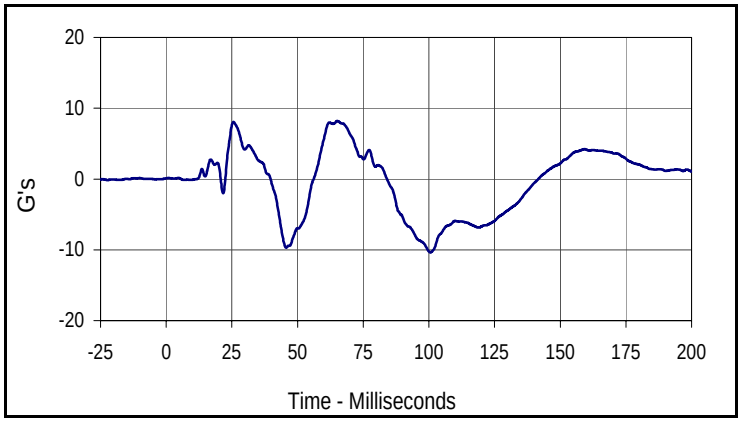
Test Vehicle:	2015 Mercedes-Benz C300 4-Door Sedan	Test Date:	4/13/15
Test Program:	NCAP Side Pole Impact Test	NHTSA No.:	M20154301



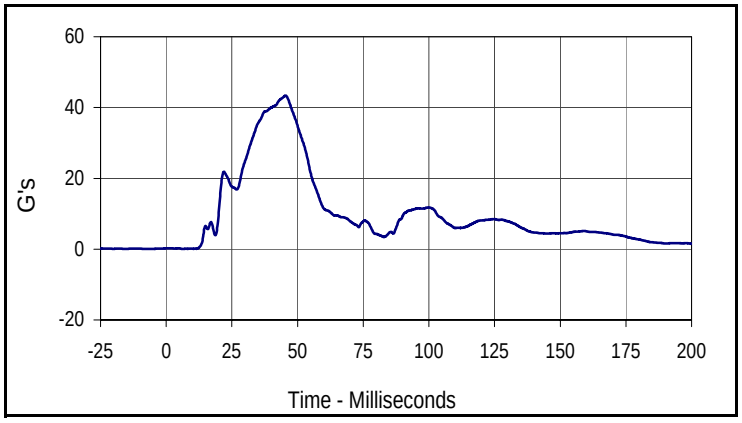
Curve Description			
Driver Lower Spine T12 Acceleration X			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
7.3	52.9	-13.6	23.4



Curve Description			
Driver Lower Spine T12 Acceleration Y			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
42.0	45.3	-7.5	93.9

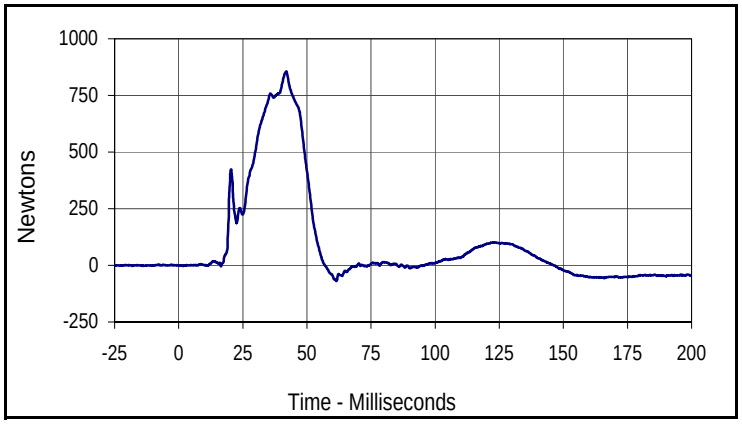


Curve Description			
Driver Lower Spine T12 Acceleration Z			
Plot No.	Type	SAE Class	Units
007	FIL	180	G's
Max	Time	Min	Time
8.2	65.2	-10.4	100.6

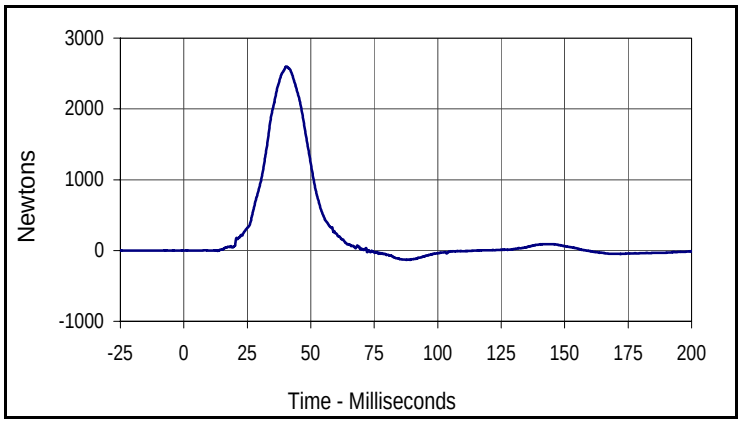


Curve Description			
Driver Lower Spine T12 Acceleration Res.			
Plot No.	Type	SAE Class	Units
008	RES	180	G's
Max	Time	Min	Time
43.3	45.4	0.1	5.9

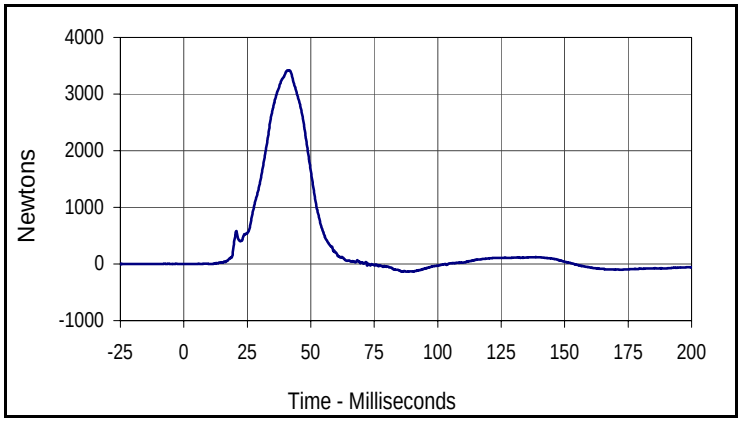
Test Vehicle:	2015 Mercedes-Benz C300 4-Door Sedan	Test Date:	4/13/15
Test Program:	NCAP Side Pole Impact Test	NHTSA No.:	M20154301



Curve Description			
Driver Iliac Wing Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
009	FIL	600	Newtons
Max	Time	Min	Time
855.7	41.9	-68.9	61.5



Curve Description			
Driver Acetabulum Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
010	FIL	600	Newtons
Max	Time	Min	Time
2596.3	40.3	-133.7	87.6



Curve Description			
Driver Total Pelvic Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
011	SUM	600	Newtons
Max	Time	Min	Time
3419.6	41.0	-138.2	88.1

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

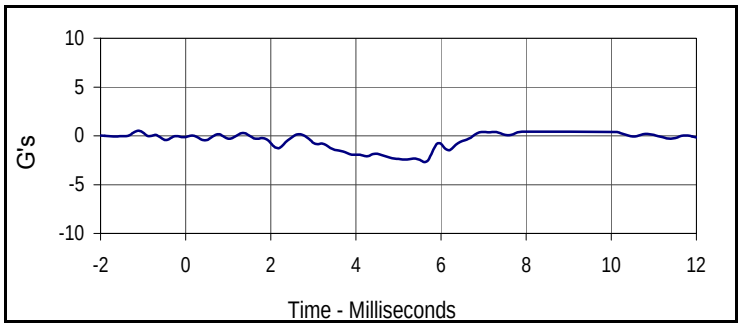
Test Program:	SID IIs External Measurements	Test Date:	3/16/15
ATD Serial No.:	299	Test I.D.:	N/A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
A	Sitting Height	mm	772 - 788	780	Pass
B	Shoulder Pivot Height	mm	437 - 453	445	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	141 - 151	145	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	102	Pass
F	Thigh Clearance	mm	119 - 135	125	Pass
G	Head Breadth	mm	140 - 148	145	Pass
H	Head Back from Backline	mm	40 - 46	44	Pass
I	Head Depth	mm	178 - 188	184	Pass
J	Head Circumference	mm	541 - 551	545	Pass
K	Buttock to Knee Length	mm	514 - 540	527	Pass
L	Popliteal Height	mm	343 - 369	352	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	401	Pass
N	Buttock Popliteal Length	mm	416 - 442	432	Pass
O	Chest Depth w/o Jacket	mm	195 - 211	202	Pass
P	Foot Length	mm	216 - 232	221	Pass
Q	Hip Breadth with Pelvic Plug	mm	313 -323	315	Pass
R	Arm Length	mm	249 - 259	252	Pass
S	Knee Joint to Seatback	mm	477 - 493	481	Pass
V	Shoulder Width	mm	341 - 357	352	Pass
W	Foot Width	mm	78 - 94	86	Pass
Y	Chest Circumference with Jacket	mm	851 - 881	872	Pass
Z	Waist Circumference	mm	760 - 791	774	Pass
			Overall Test Results		Pass

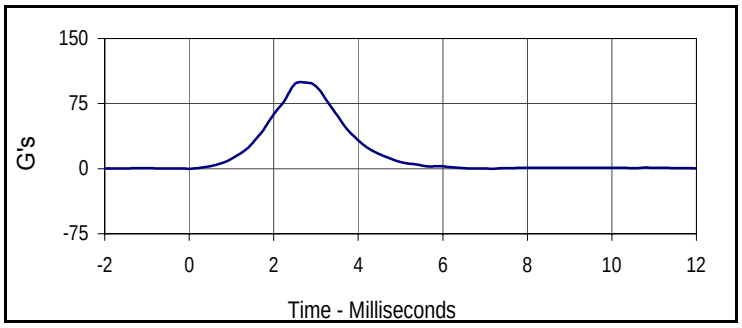
Test Program:	SID IIs Head Drop Test	Test Date:	3/16/15
ATD Serial No.:	299	Test I.D.:	299HD084

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	301	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.2	Pass
	Min	%		29.5	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Peak Head Resultant Acceleration		G's	115 to 137	121.9	Pass
Peak Head X Acceleration		G's	<15	2.7	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	1.0	Pass
			Overall Test Results		Pass

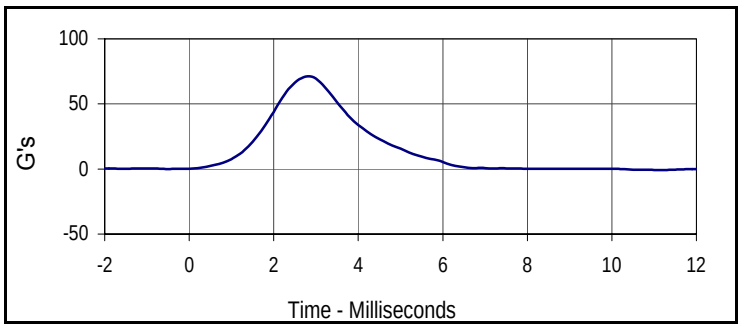
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
121.9	2.8	0.1	-16.0



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.5	-1.1	-2.7	5.6



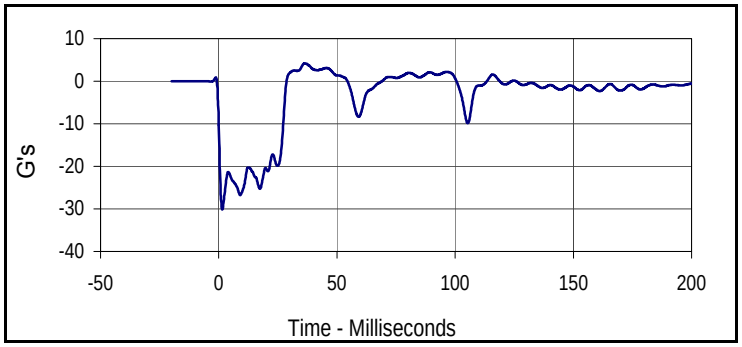
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
99.7	2.6	-0.2	-8.5



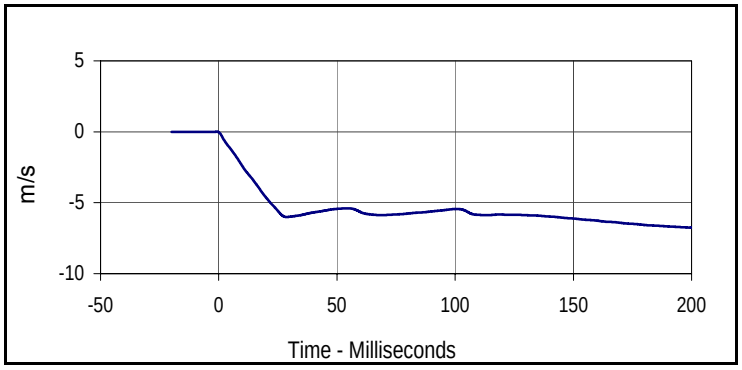
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
71.2	2.8	-0.8	11.1

Test Program:	SID IIs Neck Flexion Test	Test Date:	3/16/15
ATD Serial No.:	299	Test I.D.:	299NB084

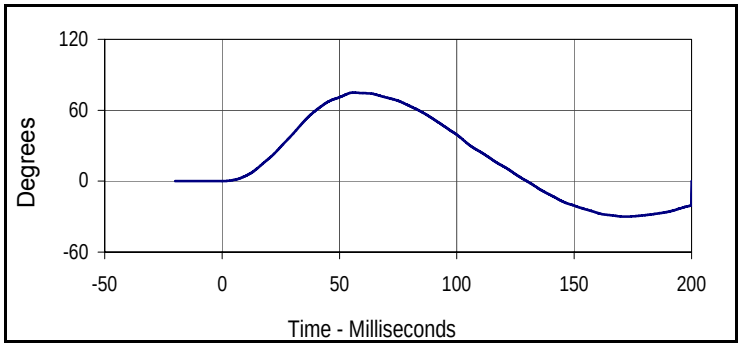
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	346	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.2	Pass
	Min	%		29.5	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.8	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.56	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.42	Pass
	15 msec	m/s	-3.30 to -4.10	-3.50	Pass
	20 msec	m/s	-4.40 to -5.40	-4.63	Pass
	25 msec	m/s	-5.40 to -6.10	-5.57	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.01	Pass
D-Plane Rotation	Max	Degrees	71 to 81	75.0	Pass
	Time	msec	50 to 70	56.1	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-39.5	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	106.0	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
4.2	0.0	-30.1	0.0

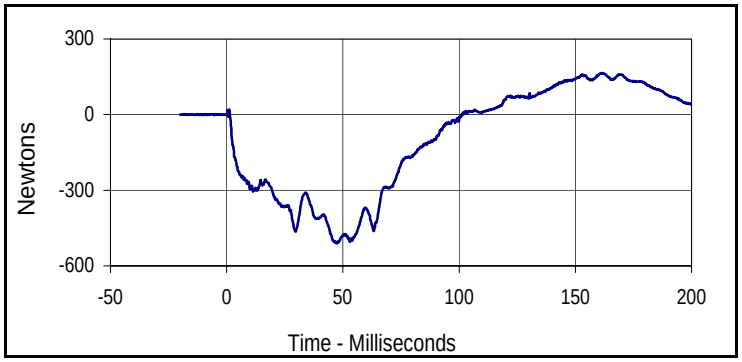


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.8	-6.8	199.9

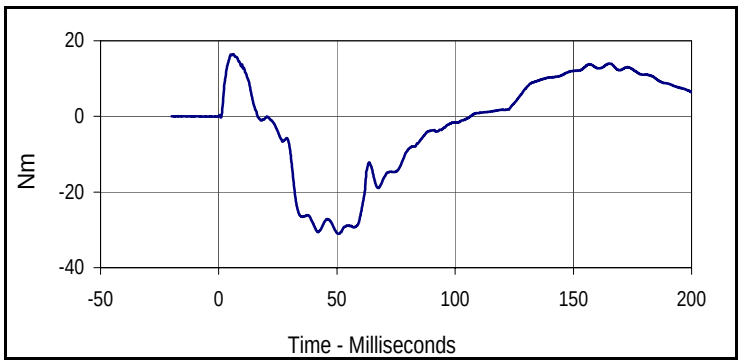


Curve Description			
D-Plane Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
75.0	56.1	-30.0	171.7

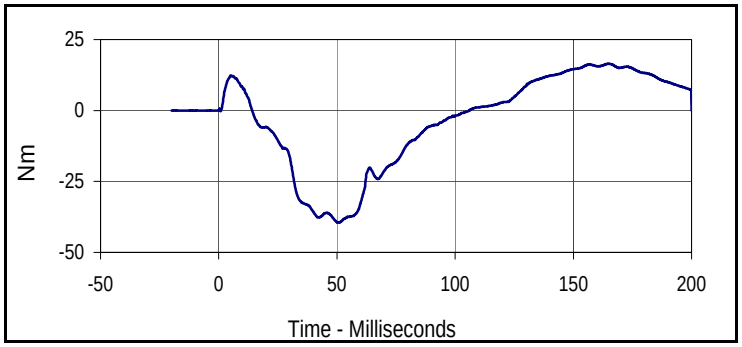
Test Program:	SID IIs Neck Flexion Test	Test Date:	3/16/15
ATD Serial No.:	299	Test I.D.:	299NB084



Curve Description			
Neck Force Y			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
164.9	161.5	-510.8	47.3



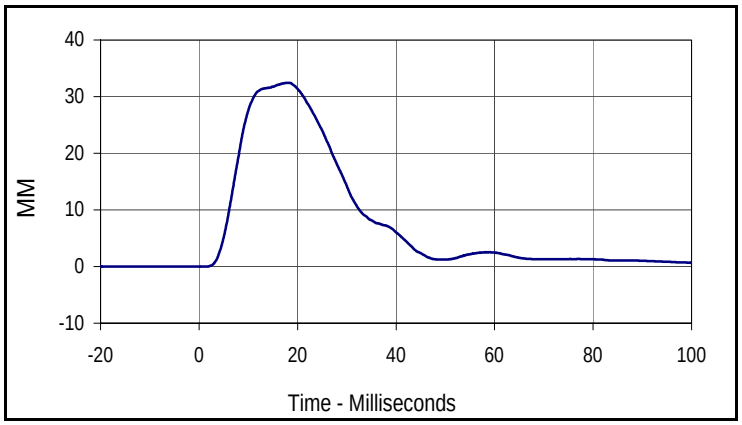
Curve Description			
Neck Moment X			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
16.5	6.2	-31.1	50.5



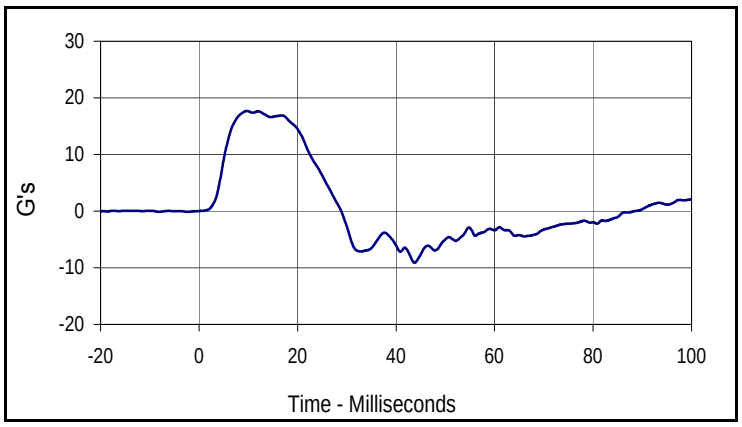
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
006	FIL	600	Nm
Max	Time	Min	Time
16.5	164.9	-39.5	50.7

Test Program:	SID IIs Shoulder Impact Test	Test Date:	3/16/15
ATD Serial No.:	299	Test I.D.:	299SH084

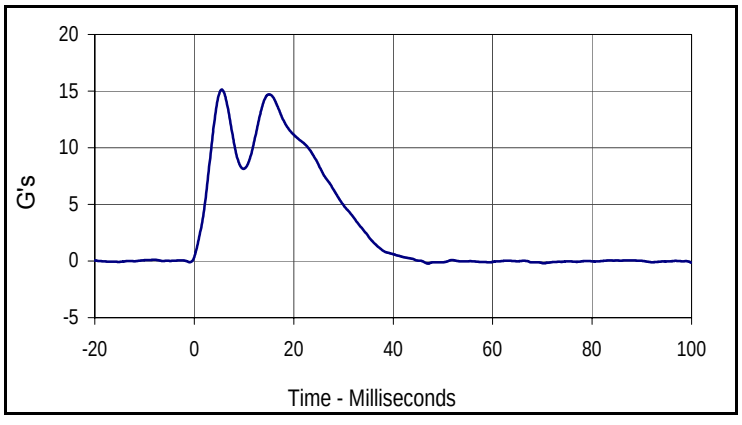
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	391	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.2	Pass
	Min	%		29.5	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.27	Pass
Peak Shoulder Deflection		mm	28 to 37	32.4	Pass
Peak Lateral Spine Acceleratrion Y		G's	17 to 22	17.7	Pass
Peak Impactor Acceleration		G's	13 to 18	15.1	Pass
			Overall Test Results		Pass



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
32.4	18.4	0.0	-19.2



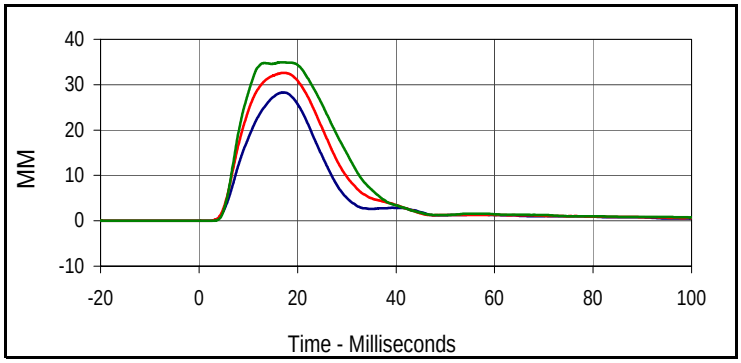
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
17.7	9.7	-9.1	43.7



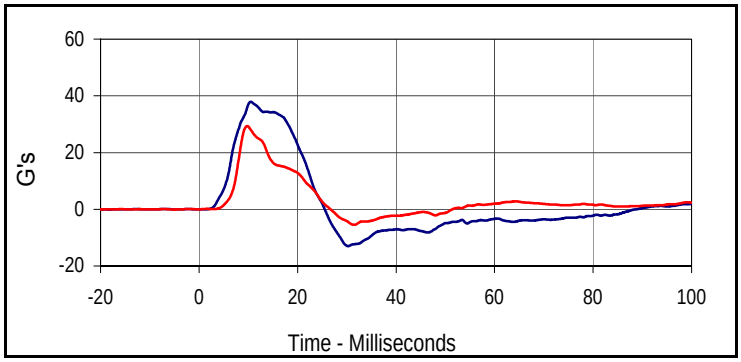
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.1	5.5	-0.2	47.0

Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	3/16/15
ATD Serial No.:	299	Test I.D.:	299TWA084

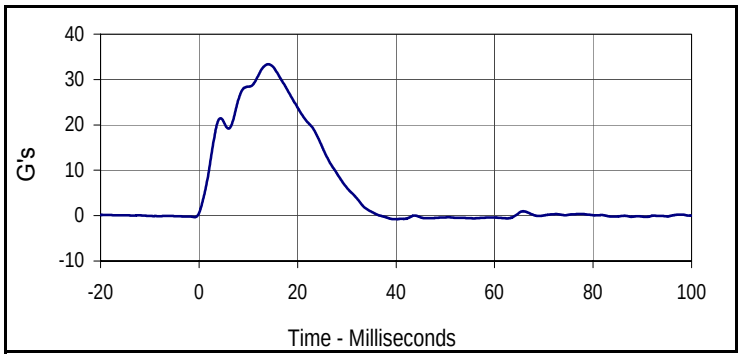
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	436	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.2	Pass
	Min	%		29.5	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.8	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.72	Pass
Peak Shoulder Deflection		mm	31 to 40	35.9	Pass
Peak Upper Thorax Rib Deflection		mm	25 to 32	28.3	Pass
Peak Middle Thorax Rib Deflection		mm	30 to 36	32.6	Pass
Peak Lower Thorax Rib Deflection		mm	32 to 38	34.9	Pass
Peak Upper Spine Y Acceleration		G's	34 to 43	37.9	Pass
Peak Lower Spine Y Acceleration		G's	29 to 37	29.3	Pass
Peak Impactor Acceleration		G's	30 to 36	33.4	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
28.3	17.1	0.0	-2.3
Middle Thorax Deflection			
Max	Time	Min	Time
32.6	17.2	0.0	-2.2
Lower Thorax Deflection			
Max	Time	Min	Time
34.9	16.6	0.0	-3.1

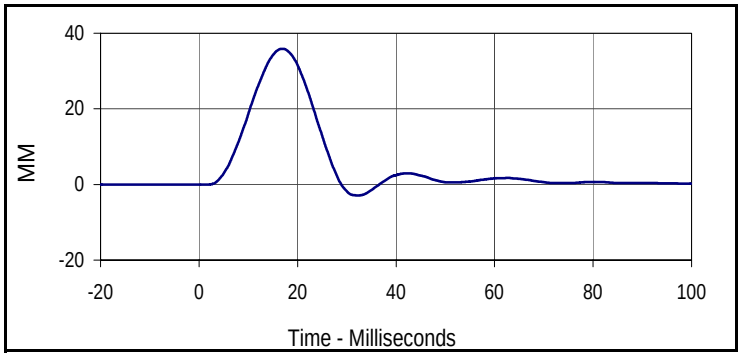


Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
37.9	10.5	-13.0	30.2
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
29.3	9.7	-5.5	31.5



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
33.4	14.1	-0.8	39.8

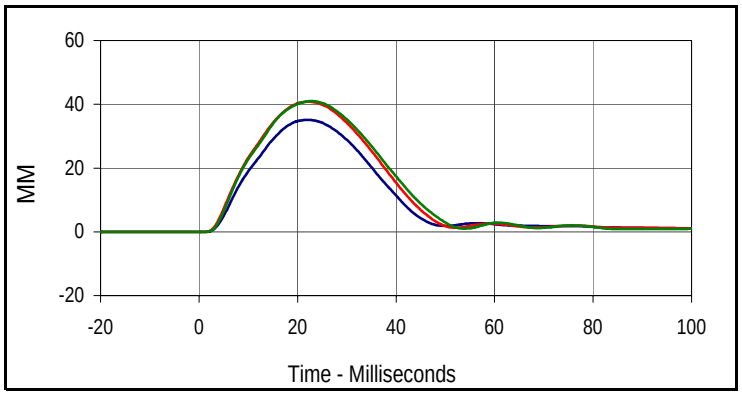
Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	3/16/15
ATD Serial No.:	299	Test I.D.:	299TWA084



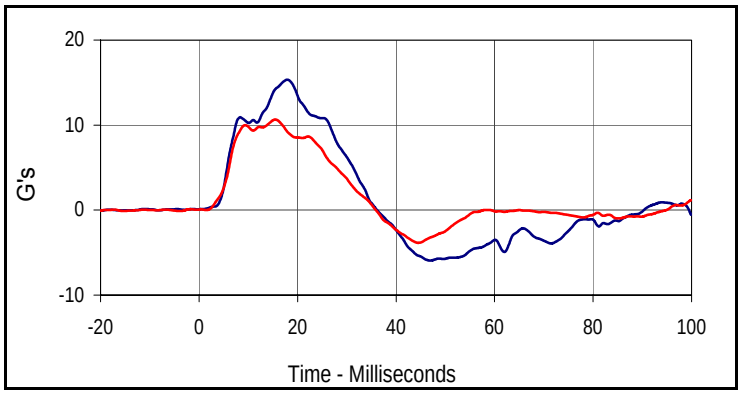
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
35.9	16.9	-2.9	32.2

Test Program:	SID IIs Thorax without Arm Impact Test	Test Date:	3/16/15
ATD Serial No.:	299	Test I.D.:	299TWOA084

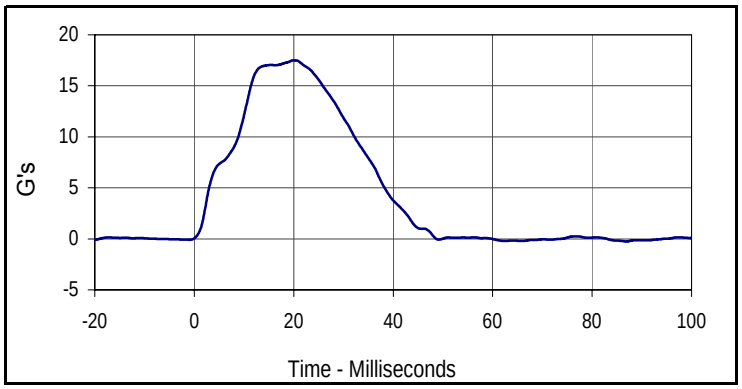
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	481	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.2	Pass
	Min	%		29.5	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.8	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.35	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	35.1	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	40.8	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	41.0	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	15.3	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	10.6	Pass
Peak Impactor Acceleration		G's	14 to 18	17.5	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
35.1	22.1	0.0	-6.2
Middle Thorax Deflection			
Max	Time	Min	Time
40.8	22.1	0.0	-20.0
Lower Thorax Deflection			
Max	Time	Min	Time
41.0	22.7	0.0	-1.3



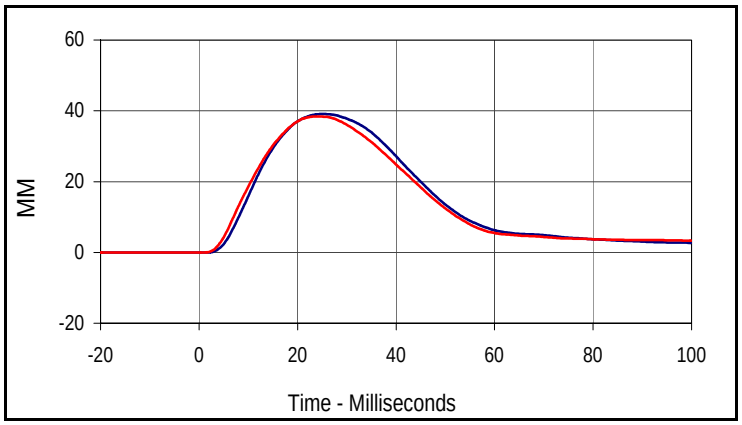
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.3	17.9	-5.9	46.9
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
10.6	15.5	-3.8	44.5



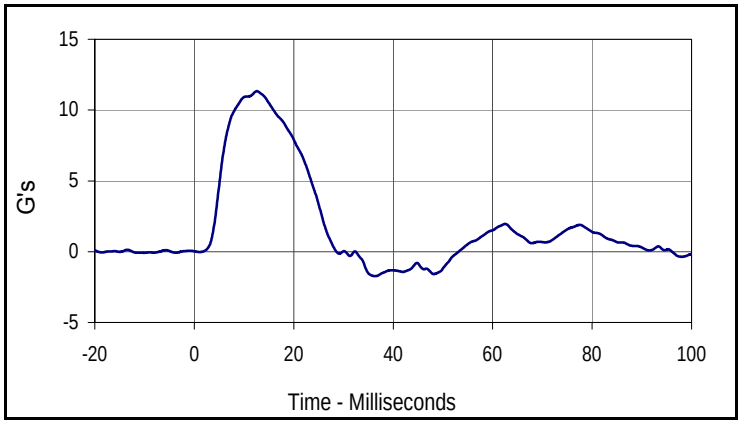
Curve Description			
Impactor Accleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
17.5	20.2	-0.3	86.9

Test Program:	SID IIs Abdomen Impact Test	Test Date:	3/16/15
ATD Serial No.:	299	Test I.D.:	299ABD084

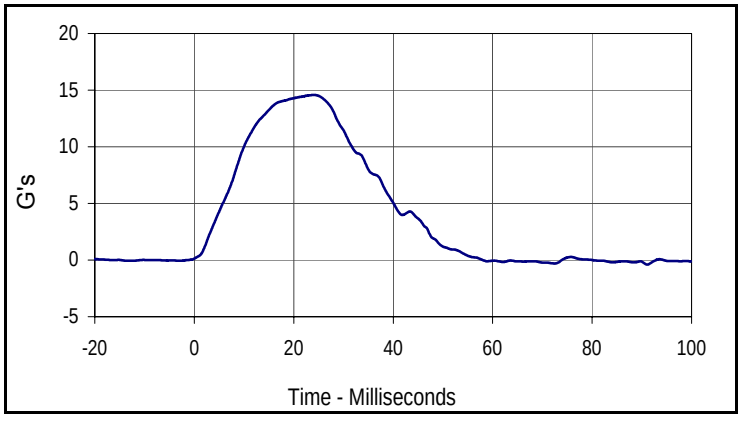
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	526	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.2	Pass
	Min	%		29.5	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.7	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.33	Pass
Peak Upper Abdominal Rib Deflection		mm	36 to 47	39.1	Pass
Peak Lower Abdominal Rib Deflection		mm	33 to 44	38.4	Pass
Peak Lower Spine Y Acceleration		G's	9 to 14	11.3	Pass
Peak Impactor Acceleration		G's	12 to 16	14.6	Pass
			Overall Test Results		Pass



Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
39.1	25.2	0.0	-6.7
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
38.4	23.6	0.0	-6.0

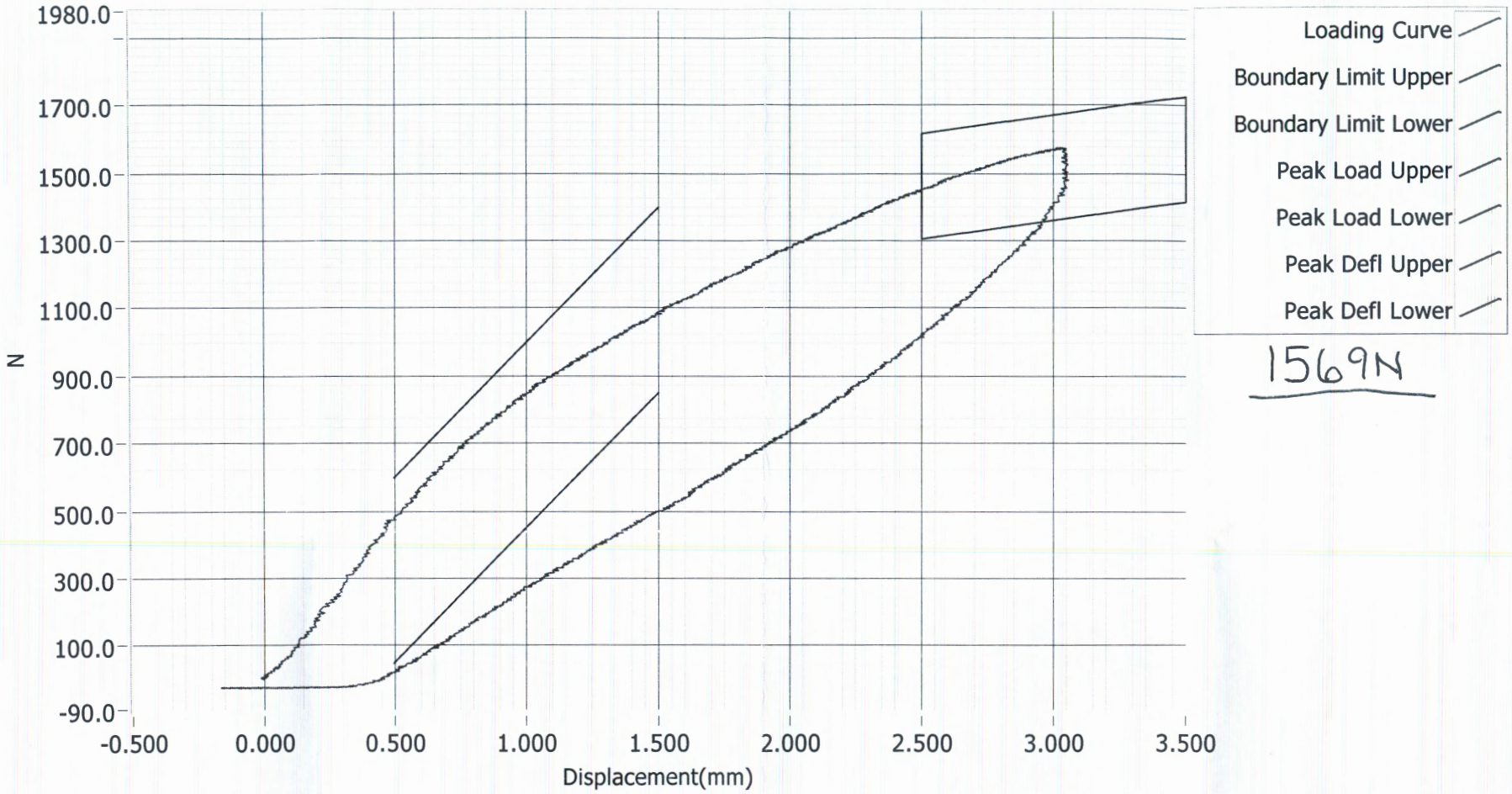


Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
11.3	12.6	-1.7	36.4



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.6	24.0	-0.4	91.1

Resultant Data - SIDIIs Plug Compression



1569N

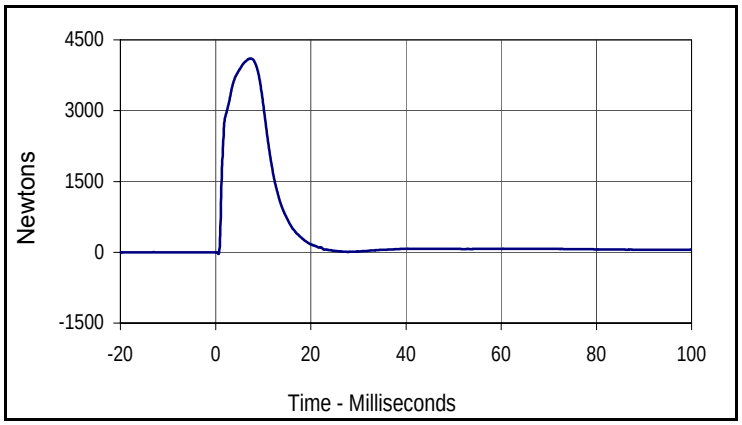
ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	70987	12/13/2013	10:53 PM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

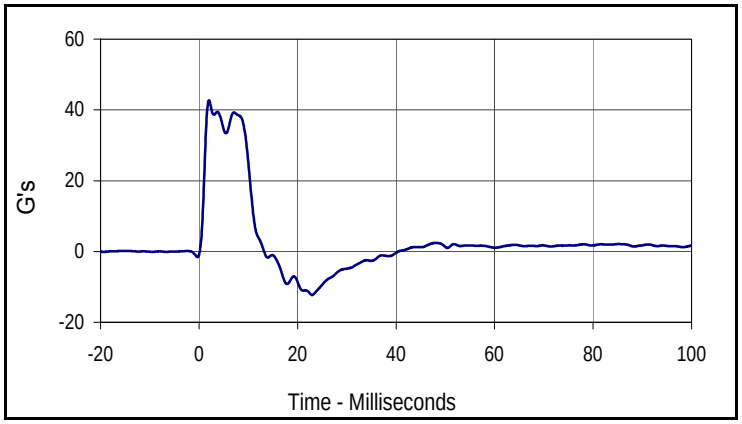
Current Date : 12/13/2013 Current Time : 22:54:35

Test Program:	SID IIs Pelvis Acetabulum Impact Test	Test Date:	3/16/15
ATD Serial No.:	299	Test I.D.:	299ACET084

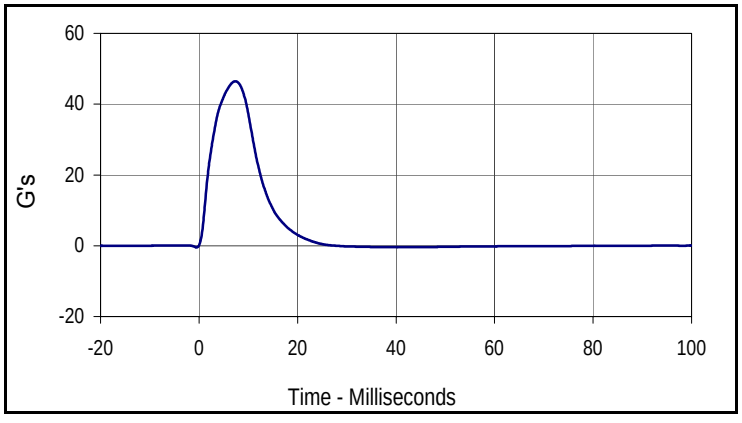
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	571	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.2	Pass
	Min	%		29.5	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.6	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.73	Pass
Peak Acetabulum Force Y		Newtons	3600 to 4300	4103.7	Pass
Peak Pelvis Y Acceleration After 6 msec.		G's	34 to 42	39.3	Pass
Peak Impactor Acceleration		G's	38 to 47	46.5	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4103.7	7.4	-34.1	0.6



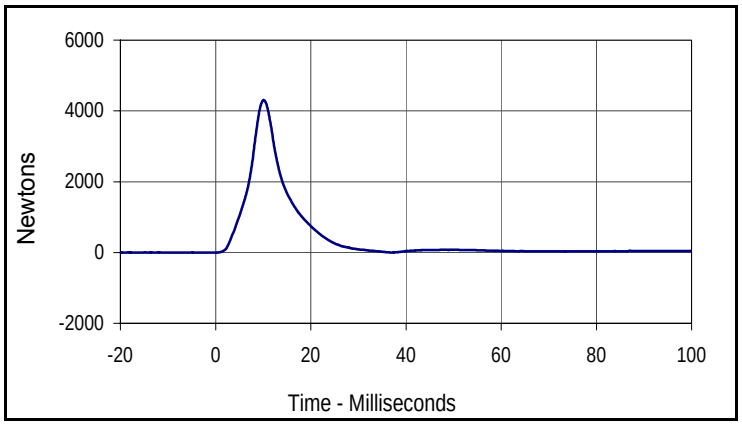
Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
42.8	2.0	-12.3	22.9



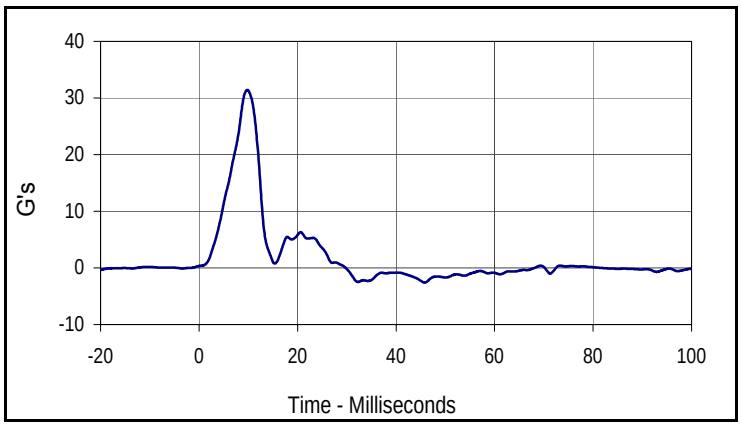
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
46.5	7.4	-0.4	-0.5

Test Program:	SID IIs Pelvis Iliac Calibration	Test Date:	3/16/15
ATD Serial No.:	299	Test I.D.:	299PL084

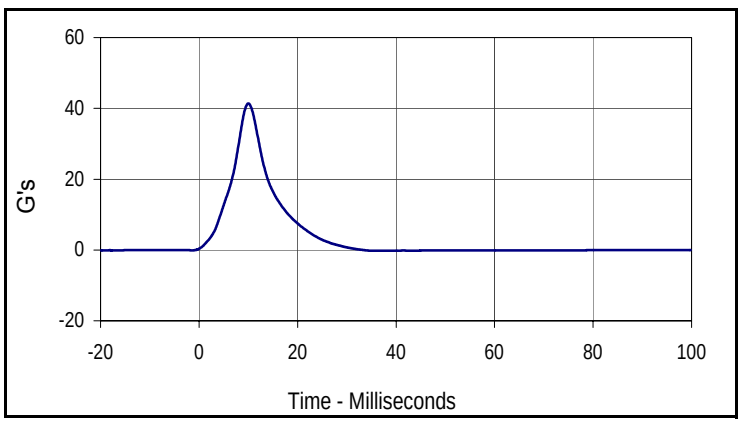
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	616	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.2	Pass
	Min	%		29.5	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.5	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.33	Pass
Peak Illiac Force		Newtons	4100 to 5100	4308.2	Pass
Peak Pelvis Y Acceleration		G's	28 to 39	31.4	Pass
Peak Impactor Acceleration		G's	36 to 45	41.4	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4308.2	10.1	-2.2	37.0



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
31.4	9.8	-2.6	45.8



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
41.4	10.0	-0.2	35.5

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

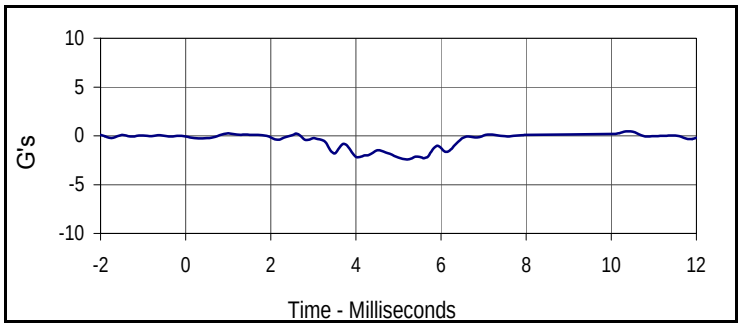
Test Program:	SID IIs External Measurements	Test Date:	4/14/15
ATD Serial No.:	299	Test I.D.:	N/A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	34	Pass
A	Sitting Height	mm	772 - 788	780	Pass
B	Shoulder Pivot Height	mm	437 - 453	445	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	141 - 151	145	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	102	Pass
F	Thigh Clearance	mm	119 - 135	125	Pass
G	Head Breadth	mm	140 - 148	145	Pass
H	Head Back from Backline	mm	40 - 46	44	Pass
I	Head Depth	mm	178 - 188	184	Pass
J	Head Circumference	mm	541 - 551	545	Pass
K	Buttock to Knee Length	mm	514 - 540	527	Pass
L	Popliteal Height	mm	343 - 369	352	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	401	Pass
N	Buttock Popliteal Length	mm	416 - 442	432	Pass
O	Chest Depth w/o Jacket	mm	195 - 211	202	Pass
P	Foot Length	mm	216 - 232	221	Pass
Q	Hip Breadth with Pelvic Plug	mm	313 -323	315	Pass
R	Arm Length	mm	249 - 259	252	Pass
S	Knee Joint to Seatback	mm	477 - 493	481	Pass
V	Shoulder Width	mm	341 - 357	352	Pass
W	Foot Width	mm	78 - 94	86	Pass
Y	Chest Circumference with Jacket	mm	851 - 881	872	Pass
Z	Waist Circumference	mm	760 - 791	774	Pass
			Overall Test Results		Pass

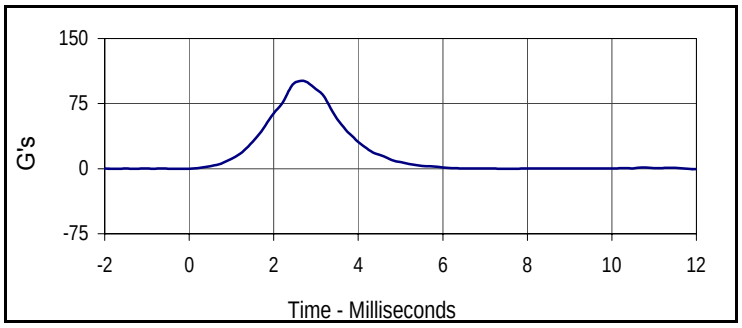
Test Program:	SID IIs Head Drop Test	Test Date:	4/14/15
ATD Serial No.:	299	Test I.D.:	299HD085

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	320	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.4	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	34.1	Pass
	Min	%		33.7	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	33.7	Pass
Peak Head Resultant Acceleration		G's	115 to 137	125.0	Pass
Peak Head X Acceleration		G's	<15	2.4	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	0.6	Pass
			Overall Test Results		Pass

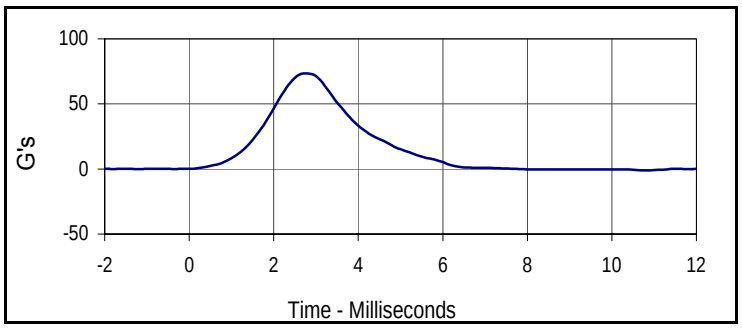
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
125.0	2.7	0.0	-18.8



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.5	10.4	-2.4	5.2



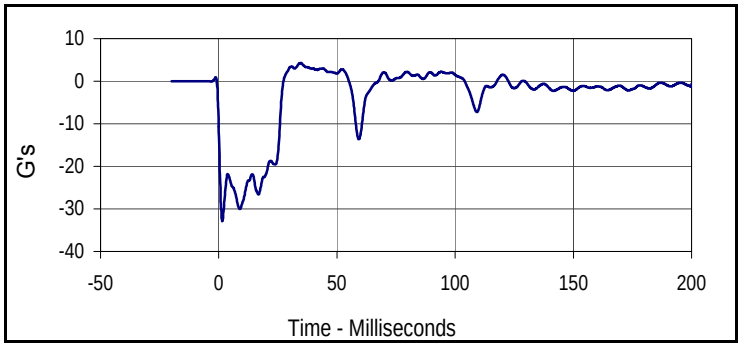
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
101.2	2.7	-0.6	12.0



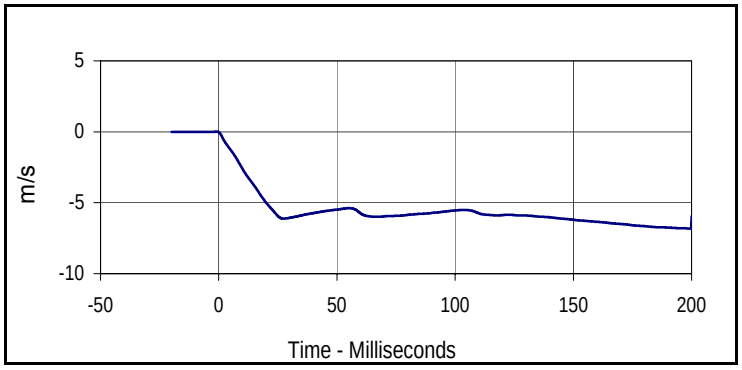
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
73.5	2.8	-1.1	10.8

Test Program:	SID IIs Neck Flexion Test	Test Date:	4/14/15
ATD Serial No.:	299	Test I.D.:	299NB085

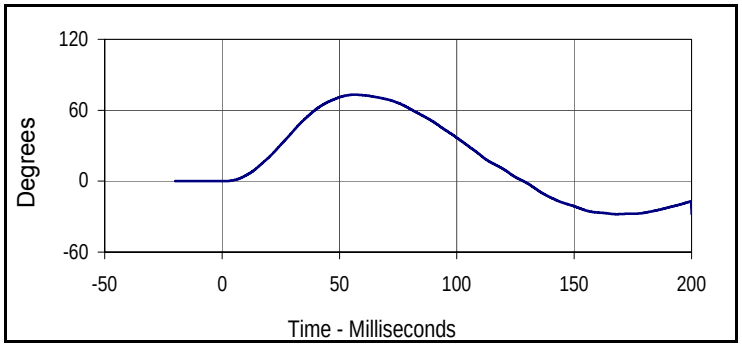
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	365	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.4	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	34.1	Pass
	Min	%		33.7	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	33.8	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.55	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.60	Pass
	15 msec	m/s	-3.30 to -4.10	-3.79	Pass
	20 msec	m/s	-4.40 to -5.40	-4.98	Pass
	25 msec	m/s	-5.40 to -6.10	-5.94	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.12	Pass
D-Plane Rotation	Max	Degrees	71 to 81	73.1	Pass
	Time	msec	50 to 70	56.4	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-38.3	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	106.3	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
4.3	0.0	-32.8	0.0

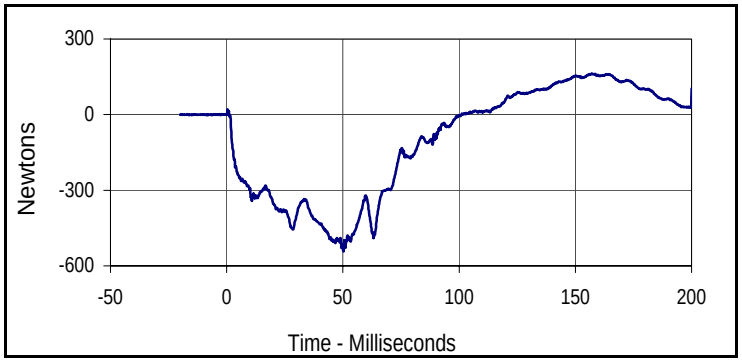


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.8	-6.8	199.9

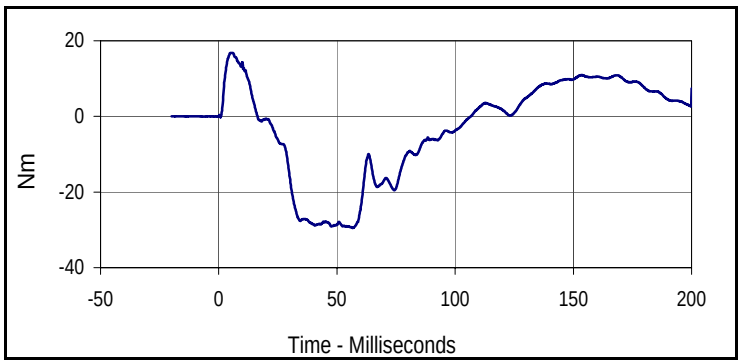


Curve Description			
D-Plane Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
73.1	56.4	-27.9	168.1

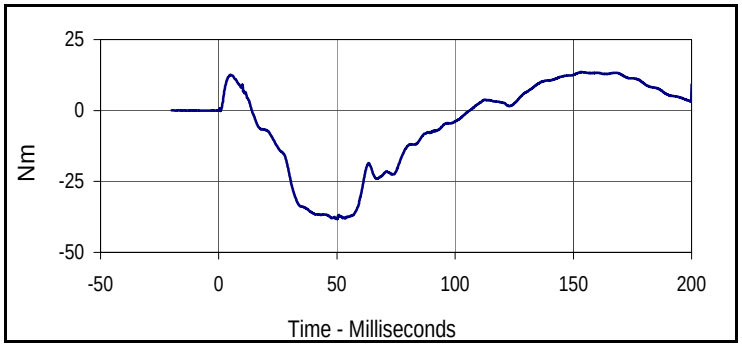
Test Program:	SID IIs Neck Flexion Test	Test Date:	4/14/15
ATD Serial No.:	299	Test I.D.:	299NB085



Curve Description			
Neck Force Y			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
162.4	157.1	-543.2	50.2



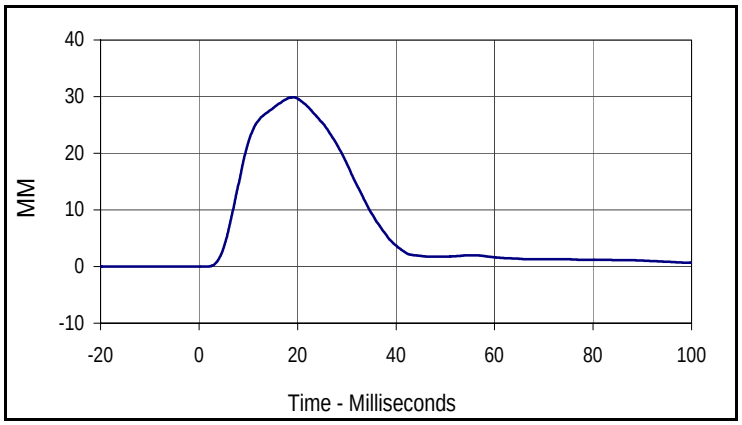
Curve Description			
Neck Moment X			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
16.8	5.5	-29.5	56.6



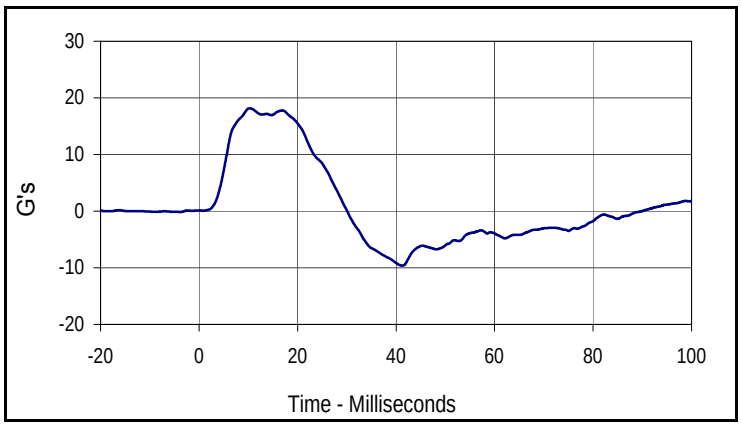
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
006	FIL	600	Nm
Max	Time	Min	Time
13.6	153.3	-38.3	50.2

Test Program:	SID IIs Shoulder Impact Test	Test Date:	4/14/15
ATD Serial No.:	299	Test I.D.:	299SH085

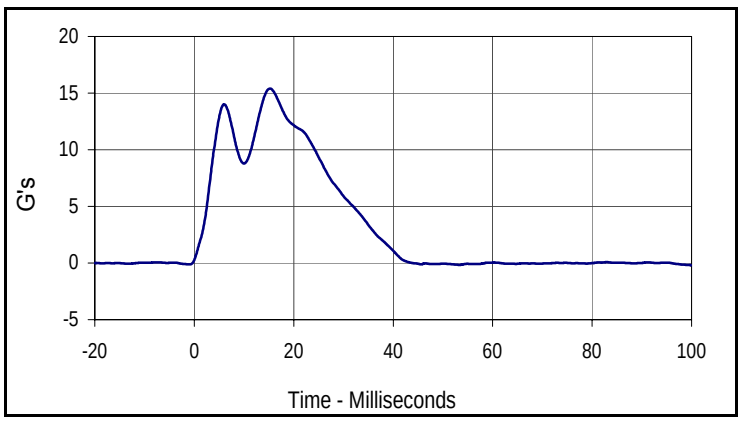
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	410	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.4	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	34.1	Pass
	Min	%		33.7	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	33.8	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.36	Pass
Peak Shoulder Deflection		mm	28 to 37	29.9	Pass
Peak Lateral Spine Acceleratrion Y		G's	17 to 22	18.2	Pass
Peak Impactor Acceleration		G's	13 to 18	15.4	Pass
			Overall Test Results		Pass



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
29.9	19.2	0.0	-18.9



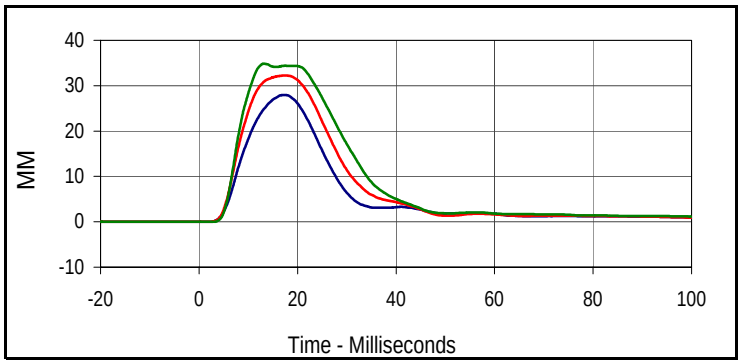
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.2	10.3	-9.6	41.3



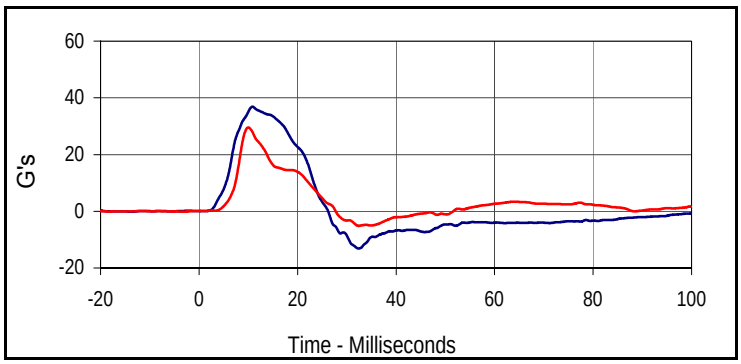
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.4	15.2	-0.2	99.9

Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	4/14/15
ATD Serial No.:	299	Test I.D.:	299TWA085

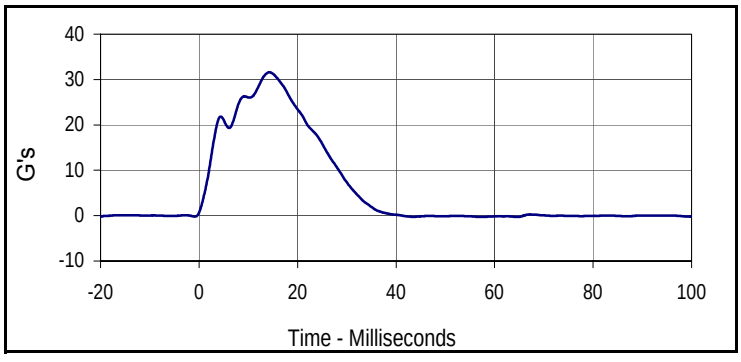
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	455	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.4	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	34.1	Pass
	Min	%		33.7	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	33.8	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.73	Pass
Peak Shoulder Deflection		mm	31 to 40	35.8	Pass
Peak Upper Thorax Rib Deflection		mm	25 to 32	27.9	Pass
Peak Middle Thorax Rib Deflection		mm	30 to 36	32.2	Pass
Peak Lower Thorax Rib Deflection		mm	32 to 38	34.8	Pass
Peak Upper Spine Y Acceleration		G's	34 to 43	36.9	Pass
Peak Lower Spine Y Acceleration		G's	29 to 37	29.6	Pass
Peak Impactor Acceleration		G's	30 to 36	31.6	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
27.9	17.4	0.0	-5.3
Middle Thorax Deflection			
Max	Time	Min	Time
32.2	17.5	0.0	1.4
Lower Thorax Deflection			
Max	Time	Min	Time
34.8	13.2	0.0	-6.5

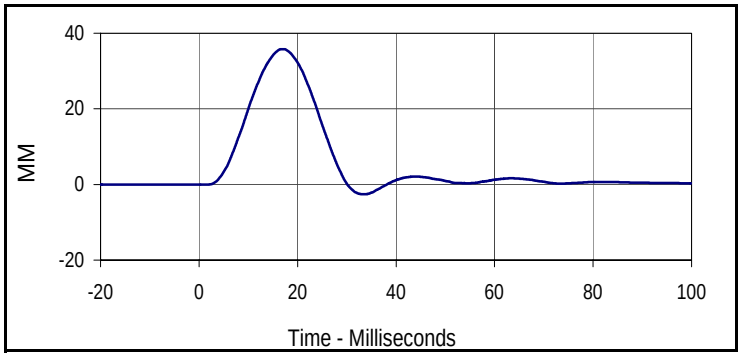


Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
36.9	10.8	-13.1	32.4
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
29.6	10.0	-5.2	32.4



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
31.6	14.3	-0.3	64.7

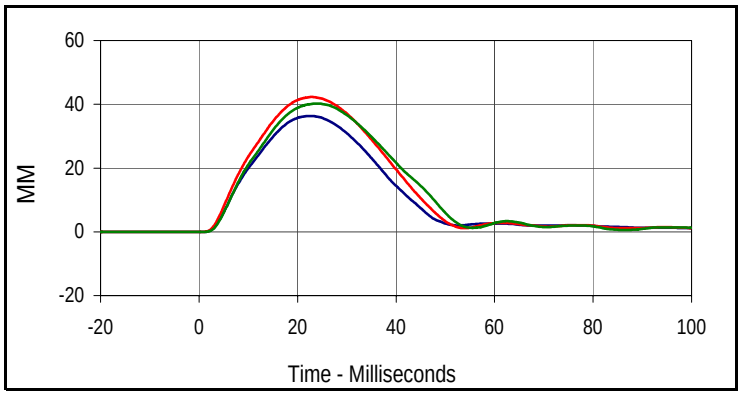
Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	4/14/15
ATD Serial No.:	299	Test I.D.:	299TWA085



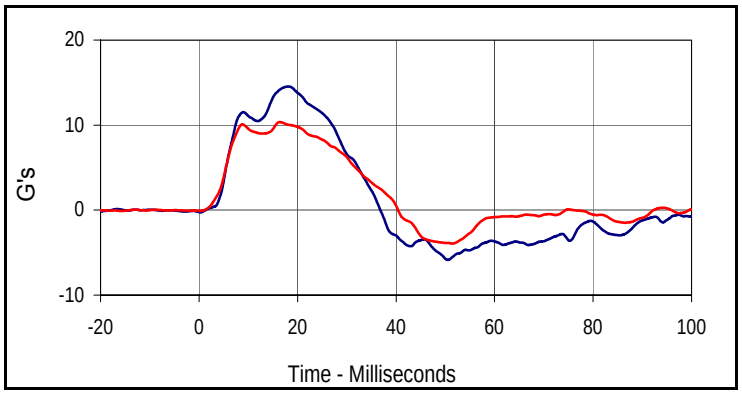
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
35.8	17.1	-2.6	33.5

Test Program:	SID IIs Thorax without Arm Impact Test	Test Date:	4/14/15
ATD Serial No.:	299	Test I.D.:	299TWOA085

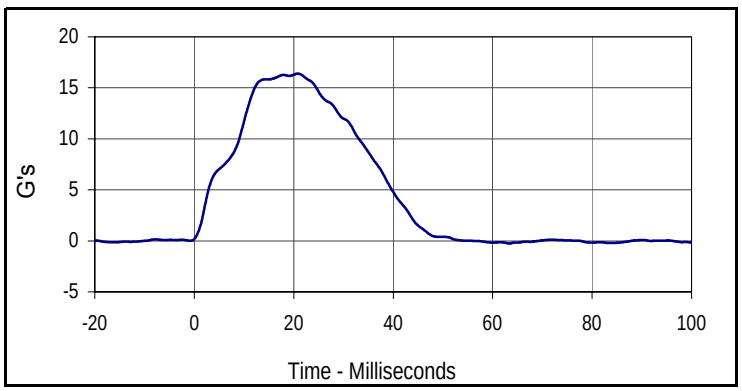
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	500	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.4	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	34.1	Pass
	Min	%		33.7	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	33.9	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.22	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	36.3	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	42.3	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	40.2	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	14.5	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	10.4	Pass
Peak Impactor Acceleration		G's	14 to 18	16.4	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
36.3	22.6	0.0	-11.5
Middle Thorax Deflection			
Max	Time	Min	Time
42.3	22.9	0.0	-16.6
Lower Thorax Deflection			
Max	Time	Min	Time
40.2	24.0	0.0	-16.4



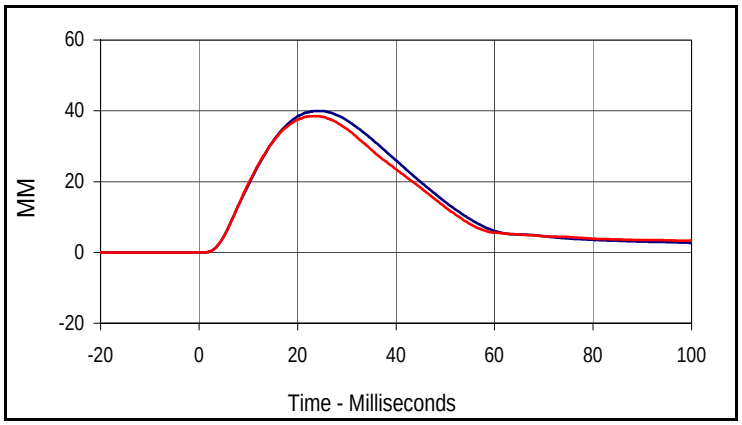
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.5	18.2	-5.9	50.5
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
10.4	16.4	-3.9	51.4



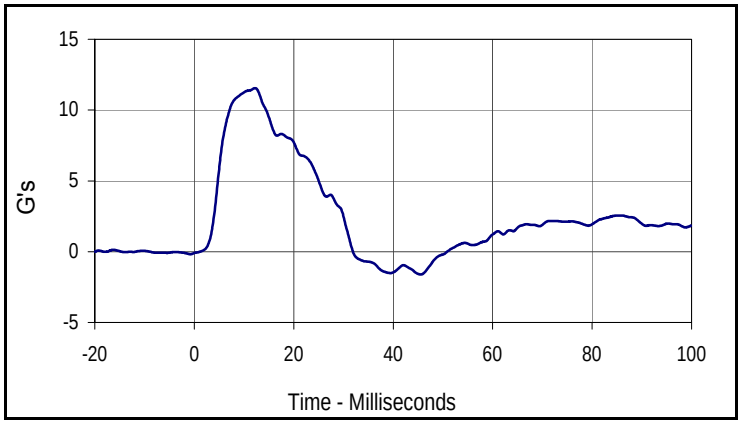
Curve Description			
Impactor Accleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.4	20.8	-0.3	63.4

Test Program:	SID IIs Abdomen Impact Test	Test Date:	4/14/15
ATD Serial No.:	299	Test I.D.:	299ABD085

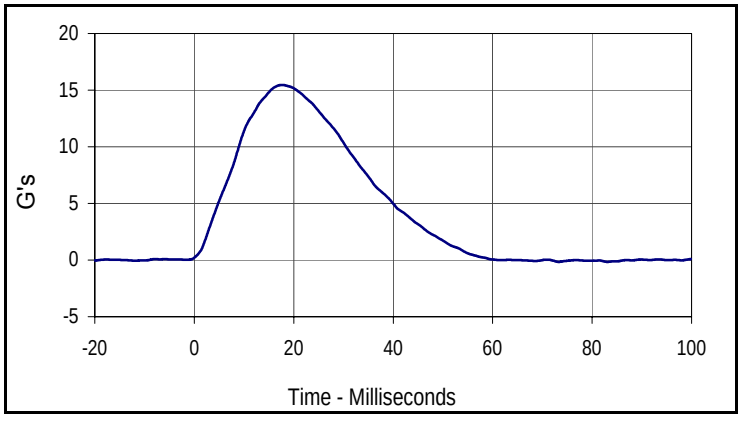
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	545	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.4	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	34.1	Pass
	Min	%		33.7	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	34.0	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.37	Pass
Peak Upper Abdominal Rib Deflection		mm	36 to 47	40.0	Pass
Peak Lower Abdominal Rib Deflection		mm	33 to 44	38.5	Pass
Peak Lower Spine Y Acceleration		G's	9 to 14	11.6	Pass
Peak Impactor Acceleration		G's	12 to 16	15.5	Pass
			Overall Test Results		Pass



Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
40.0	24.2	0.0	-12.4
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
38.5	23.3	0.0	-12.4

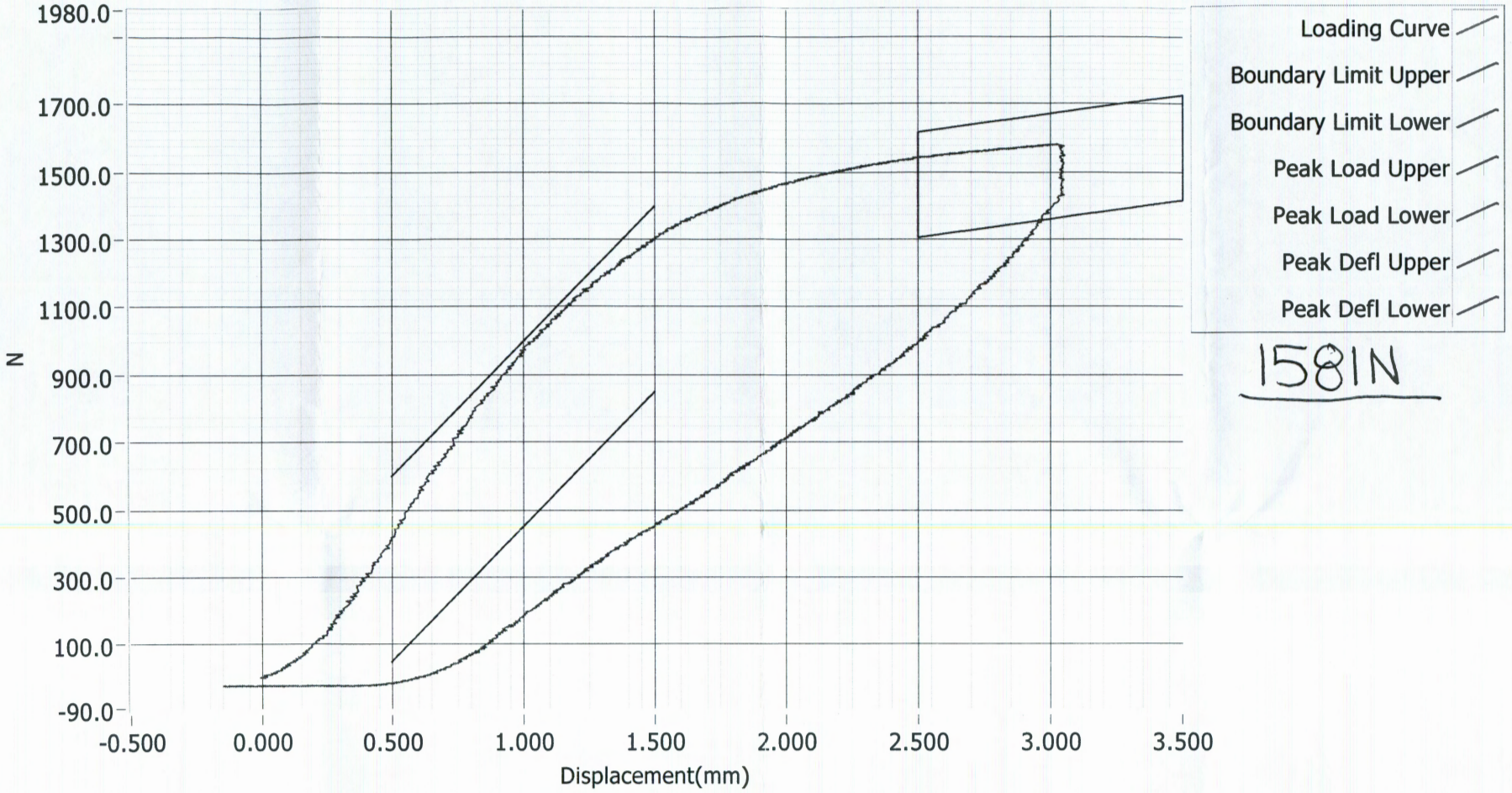


Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
11.6	12.2	-1.6	45.5



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.5	17.6	-0.2	73.3

Resultant Data - SIDIIs Plug Compression



158 N

ATD Calibration Lab

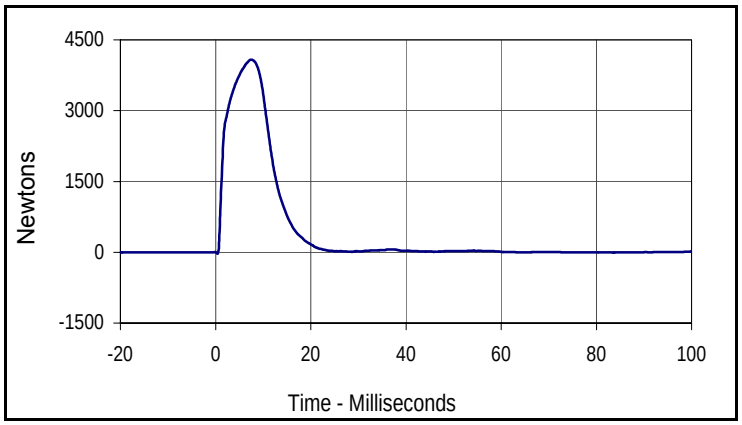
M20154301 Post Test

Test ID	Part Serial Number	Test Date	Test Time
	70951	12/13/2013	8:54 PM
Cert ID	**ATD Serial Number**	**ATD Type**	
	N/A	SIDIIs	

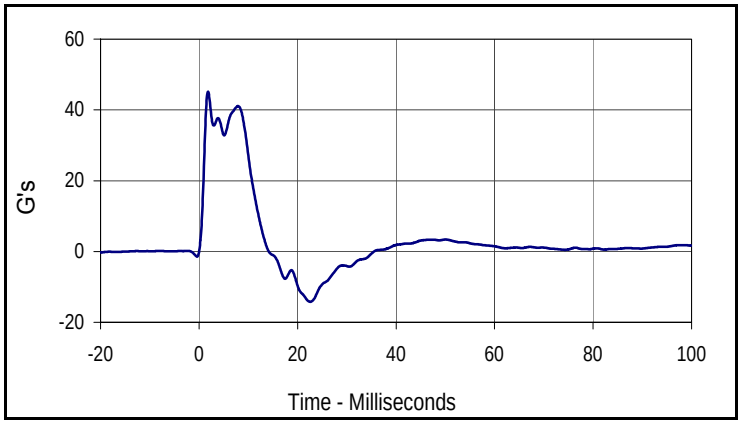
Current Date : 12/13/2013 Current Time : 20:54:43

Test Program:	SID IIs Pelvis Acetabulum Impact Test	Test Date:	4/14/15
ATD Serial No.:	299	Test I.D.:	299ACET085

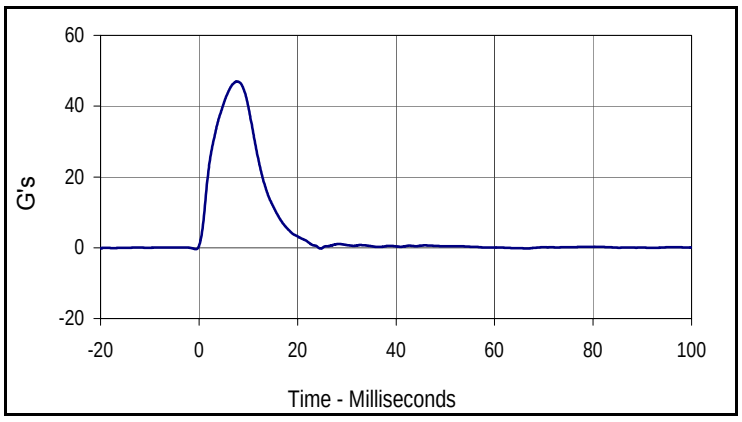
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	590	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.4	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	34.1	Pass
	Min	%		33.7	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	34.1	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.61	Pass
Peak Acetabulum Force Y		Newtons	3600 to 4300	4081.0	Pass
Peak Pelvis Y Acceleration After 6 msec.		G's	34 to 42	41.1	Pass
Peak Impactor Acceleration		G's	38 to 47	47.0	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4081.0	7.4	-26.7	0.4



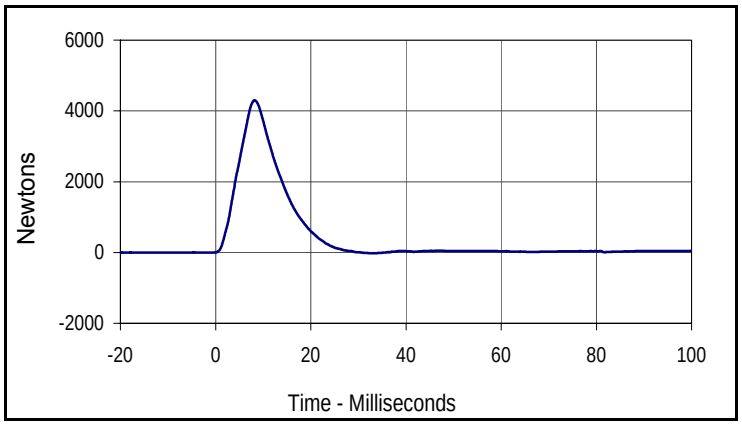
Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
45.2	1.8	-14.2	22.6



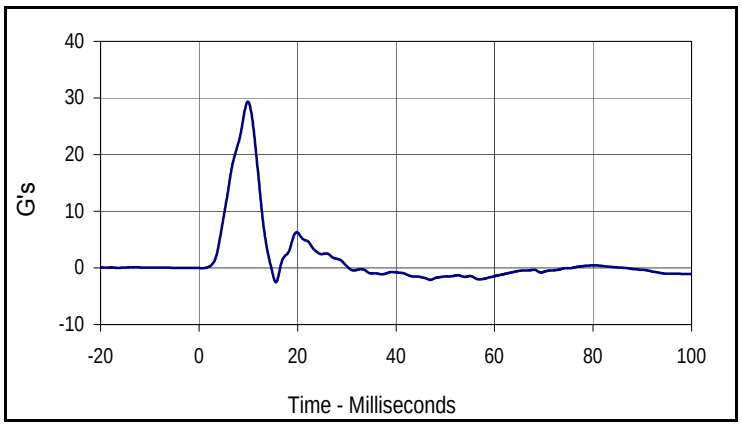
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
47.0	7.7	-0.4	-0.7

Test Program:	SID IIs Pelvis Iliac Calibration	Test Date:	4/14/15
ATD Serial No.:	299	Test I.D.:	299PL085

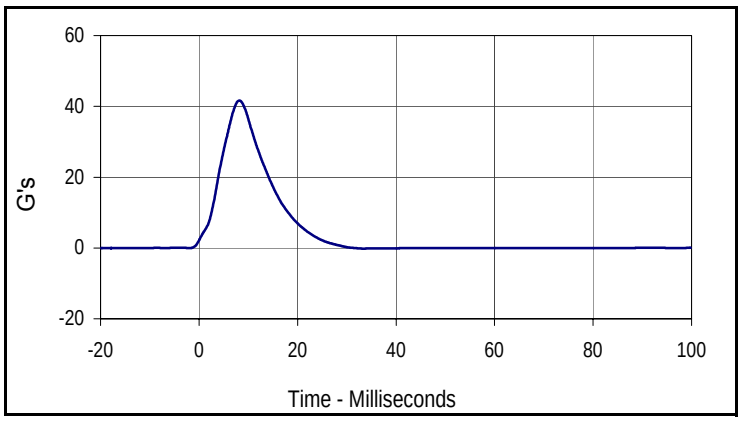
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	635	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.4	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	34.1	Pass
	Min	%		33.7	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	34.0	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.28	Pass
Peak Illiac Force		Newtons	4100 to 5100	4298.3	Pass
Peak Pelvis Y Acceleration		G's	28 to 39	29.4	Pass
Peak Impactor Acceleration		G's	36 to 45	41.6	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4298.3	8.2	-19.7	33.0



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
29.4	9.9	-2.5	15.6



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
41.6	8.2	-0.2	33.4

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 299		
				Serial Number	Manufacturer	Calibration
Head Accelerometers	Primary		X	P58736	Endevco	4/315
			Y	P51929	Endevco	4/3/15
			Z	P51934	Endevco	4/3/15
	Redundant		X	P68604	Endevco	4/3/15
			Y	P51931	Endevco	4/3/15
			Z	P51939	Endevco	4/3/15
Displacement Potentiometers	Thoracic Rib	Upper	Y	1143	FTSS	4/6/15
		Middle	Y	1160	FTSS	4/6/15
		Lower	Y	1213	FTSS	4/6/15
	Abdominal Rib	Upper	Y	1218	FTSS	4/6/15
		Lower	Y	1234	FTSS	4/6/15
Lower Spine Accelerometers (T12)			X	04I20-Z04	Endevco	4/6/15
			Y	06A07-R08	Endevco	4/6/15
			Z	P58795	Endevco	4/6/15
Acetabulum Load Cell			Y	272	Denton	5/1/14
Iliac Wing Load Cell			Y	284	Denton	5/1/14
Pelvis Plug (Struck Side)				70744	FTSS	12/12/13
Pelvis Plug (Non-Struck Side)				70684	FTSS	12/12/13

TABLE 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	A152866	MSI	3/23/15
Vehicle Center of Gravity	Y	A152839	MSI	3/23/15
Vehicle Center of Gravity	Z	A152858	MSI	3/23/15
Left Floor Sill	Y	A147410	MSI	3/25/15
A-Pillar Sill	Y	A148310	MSI	3/24/15
A-Pillar Low	Y	A152867	MSI	3/24/15
A-Pillar Mid	Y	A147439	MSI	3/23/15
B-Pillar Sill	Y	A148184	MSI	3/25/15
B-Pillar Low	Y	A147388	MSI	3/24/15
B-Pillar Mid	Y	A148213	MSI	3/25/15
Driver Seat	Y	A148187	MSI	3/23/15
Engine Top	X	A152864	MSI	3/25/15
Engine Top	Y	A148314	MSI	3/25/15
Firewall	Y	A152869	MSI	3/25/15
Right Roof	Y	A152856	MSI	3/25/15
Right Floor Sill	Y	A148291	MSI	3/25/15
Rear Floorpan	X	A148323	MSI	3/24/15
Rear Floorpan	Y	A148192	MSI	3/24/15

TABLE 3 – Pole Instrumentation

	Serial Number	Manufacturer	Calibration Date
Load Cell 1	131822A	Interface	3/30/15
Load Cell 2	132304A	Interface	3/30/15
Load Cell 3	19477	Interface	3/30/15
Load Cell 4	19325	Interface	3/30/15
Load Cell 5	131827A	Interface	3/30/15
Load Cell 6	132302A	Interface	3/30/15
Load Cell 7	19267	Interface	3/30/15
Load Cell 8	19321	Interface	3/30/15