

REPORT NUMBER: SPNCAP-KAR-12-050

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

**FORD MOTOR CO.
2012 FORD SUPERDUTY F-250 CREW CAB 4-DOOR TRUCK**

NHTSA No: MC0209

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



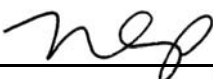
FEBRUARY 23, 2012


FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE: NVS-111
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Approval Date: February 23, 2012

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: _____

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16. Abstract <p>A 32.2 km/h (20 mph) 75 deg. oblique impact Side NCAP Test was conducted on the subject 2012 Ford SuperDuty F-250 Crew Cab 4-door truck in accordance with the specifications of the Office of Crash Worthiness 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 February 9, 2012.</p> <p>The impact velocity was 32.7 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 20.0 deg. C. The target vehicle's maximum post-test static crush was 699 mm located at level 4. The test vehicle's occupant performance data is as follows:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th rowspan="2" style="text-align: center;">Measurement Description</th> <th colspan="3" style="text-align: center;">Driver ATD (SID-IIs)</th> </tr> <tr> <th style="text-align: center;">Units</th> <th style="text-align: center;">Threshold</th> <th style="text-align: center;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td style="text-align: center;">g</td> <td style="text-align: center;">1000</td> <td style="text-align: center;">642.7</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td style="text-align: center;">g</td> <td style="text-align: center;">82</td> <td style="text-align: center;">64.1</td> </tr> <tr> <td>Total Pelvic Force (Sum of Acetabular and Iliac Forces)</td> <td style="text-align: center;">N</td> <td style="text-align: center;">5525</td> <td style="text-align: center;">3933</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">38</td> <td style="text-align: center;">49</td> </tr> <tr> <td>Maximum Abdominal Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">45</td> <td style="text-align: center;">40</td> </tr> </tbody> </table> <p>The two 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. The driver ATD's maximum thoracic rib deflection exceeded its threshold. The driver's seat rotated toward the passenger's seat due to impact.</p>				Measurement Description	Driver ATD (SID-IIs)			Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	g	1000	642.7	Resultant Lower Spine Acceleration	g	82	64.1	Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	3933	Maximum Thoracic Rib Deflection	mm	38	49	Maximum Abdominal Rib Deflection	mm	45	40
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17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Admin. Technical Reference Division 1200 New Jersey Ave., SE Room W43-410 Washington, DC 20590																												
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SECTION 1
TEST PURPOSE AND PROCEDURE

This side impact test is part of the MY 2012 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 of a 2012 Ford SuperDuty F-250 Crew Cab 4-door truck. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated August 2011.

SECTION 2

SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2012 Ford SuperDuty F-250 Crew Cab 4-door truck. The subject vehicle was towed into the rigid pole at an angle of 74.8° and a velocity of 32.7 km/h. The test was conducted by KARCO Engineering, LLC. in Adelanto, California on February 9, 2012. 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 August 2011. Camera locations and other pertinent camera information are included in this report.

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

- 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.

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	642.7
Lower Spine (T12) Resultant Acceleration	g	82	64.1
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3933
Maximum Thoracic Rib Deflection	mm	38*	49
Maximum Abdominal Rib Deflection	mm	45*	40

*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	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

Both the front and rear doors on the struck side of the vehicle remained closed and latched. There was no separation at the hinges or latches. Both doors on the non-struck side remained closed and latched. The driver ATD's maximum thoracic rib deflection exceeded its threshold. The driver's seat rotated toward the passenger's seat due to impact.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209

Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12

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	°F	°C	$=(T_f - 32)/1.8$
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: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209
 Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	MC0209
Model Year	2012
Make	Ford
Model	SuperDuty F-250 Crew Cab
Body Style	4-Door Truck
VIN	1FT7W2A64CEA49544
Body Color	Sterling Gray Metallic
Odometer Reading (km / mi)	23 / 14
Engine Displacement (L)	6.2
Type / No. of Cylinders	V-8
Engine Placement	Longitudinal
Transmission Type	Automatic
Transmission Speeds	6
Overdrive	Yes
Final Drive	Rear
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
All Wheel Drive (AWD)	No

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks	Yes
Power Window Auto-Reverse	Yes
Other Optional Feature	None
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head/Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso/Pelvis Airbag	No
Rear Pass. Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensioner	No
Driver Load Limiter	Yes
Rear Pass. Load Limiter	No
Other Safety Restraint	None

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Co.
Date of Manufacture	Sep-11
Vehicle Type	Truck

GVWR (kg)	4536
GAWR Front (kg)	2064
GAWR Rear (kg)	2767

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity	3	3		6
Capacity Weight (VCW) (kg)				1531.0
DSC x 68.04 (kg)				408.2
Cargo Weight (RCLW) (kg)				136.0

A
B
A-B

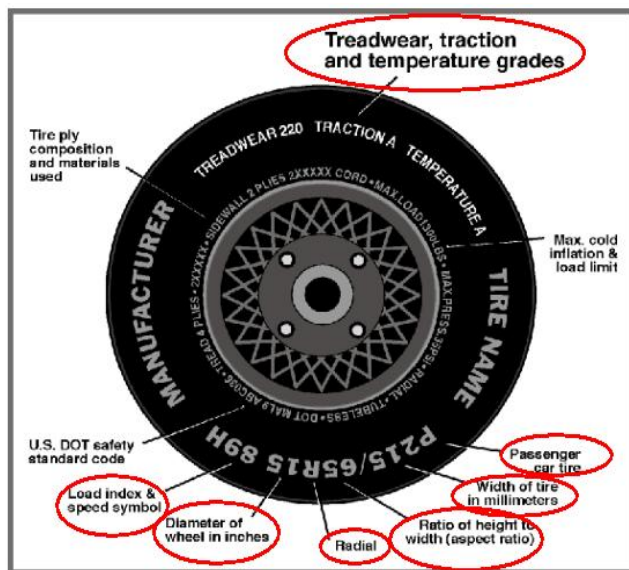
VEHICLE SEAT TYPE

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

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209
 Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	450	550
Recommended Tire Size	LT245/75R17	LT245/75R17

VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	550	550
Tire Size on Vehicle	LT245/75R17	LT245/75R17
Tire Manufacturer	General	General
Tire Name	Grabber	Grabber
Tire Type	Light Truck	Light Truck
Tire Width	245	245
Aspect Ratio	75	75
Radial	Yes	Yes
Wheel Diameter	17	17
Load Index/Speed Symbol	121/118 S	121/118 S
Treadware	N/A	N/A
Traction Grade	N/A	N/A
Temperature Grade	N/A	N/A
Tire Material	Polyester, Polyamide, Steel	Polyester, Polyamide, Steel

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209
 Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	290	355	215	280
Tire Placard	kPa	450	450	550	550
Owner's Manual	kPa	450	450	550	550
As Tested	kPa	450	450	550	550

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	833.5	686.0		857.5	755.5		856.0	771.0	
Right	kg	813.0	642.0		825.5	715.0		818.5	710.5	
Ratio	%	55.4%	44.6%	100.0%	53.4%	46.6%	100.0%	53.1%	46.9%	100.0%
Total	kg	1646.5	1328.0	2974.5	1683.0	1470.5	3153.5	1674.5	1481.5	3156.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2974.5	A
Actual Weight of 1 P572 O ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	136.0	C
Calculated Vehicle Target Wt (TVTW)	kg	3159.5	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

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Non-Struck Door Panels	7.0
Ballast / Equipment Added	176.1

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209
 Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	°	-0.8	-0.7	-0.7	Yes
Front Passenger Sill Angle (front-to-rear)*	°	-0.7	-0.6	0.0	Yes
Front Bumper-Line Angle (left-to-right)**	°	0.0	0.0	-0.1	Yes
Rear Bumper-Line Angle (left-to-right)**	°	-0.2	-0.2	-0.3	Yes
Vehicle CG (Aft of Front Axle)	mm	1779	1858	1870	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	19	20	27	

*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. 2

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

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209
 Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12

SEAT POSITIONING

The driver's seat is set to the forward most position where the ATD will not contact any interior panels at the mid-height and mid-angle position. The front center seat (if applicable) and right front passenger's seat should be set in a similar manner as the driver's seat. The struck side rear passenger's seat, rear center seat, and non-struck side rear passenger's seats should be set to the rearmost, lowest, mid-angle position.

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	Fixed	Fixed	Fixed
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat	Fixed	Fixed	Fixed
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	Fixed	945	Max	939	942	945
			Mid	939	942	945
			Min	939	942	945
Front Passenger Seat	Fixed	936	Max	930	933	936
			Mid	930	933	936
			Min	930	933	936
Front Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
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

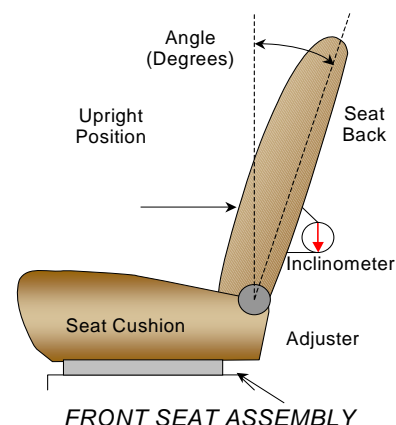
Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209
 Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12

SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	203	46	0	0
Front Passenger Seat	221	50	0	0
Front Center Seat	Fixed	Fixed	Fixed	Fixed
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

SEAT BACK ADJUSTMENT

The driver's seat back is positioned such that the dummy's head is level. The right front passenger seat back is set to the same angle as the driver's seat.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/Seated Dummy	48.6	27	8.5	3
Front Passenger Seat	48.9	27	8.5	3
Front Center Seat	Fixed	Fixed	Fixed	Fixed
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

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

DATA SHEET NO. 2 ... (CONTINUED)

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

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209
 Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12

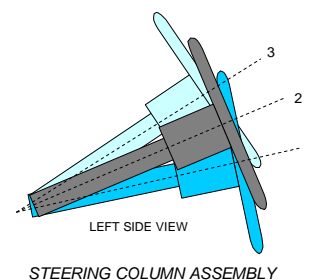
HEAD RESTRAINT ADJUSTMENT

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	3	Full Down

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.



	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	22.8	158
Geometric Center - Position 2	24.7	168
Uppermost - Position 3	26.6	179
Telescoping Steering Wheel Travel		21
Test Position	24.7	168

DATA SHEET NO. 2 ... (CONTINUED)

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

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209
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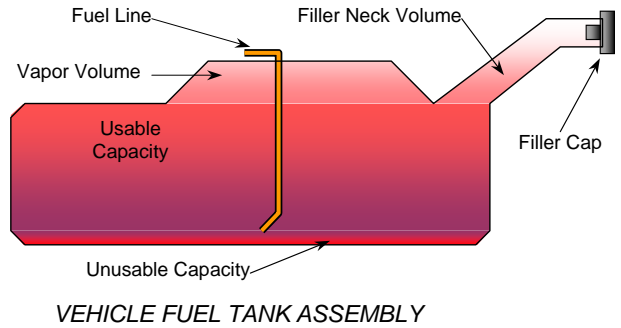
FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	132.48
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	123.20
Actual amount of Solvent Used in Test	123.20
1/3 of Usable Capacity	44.16

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**

FUEL PUMP

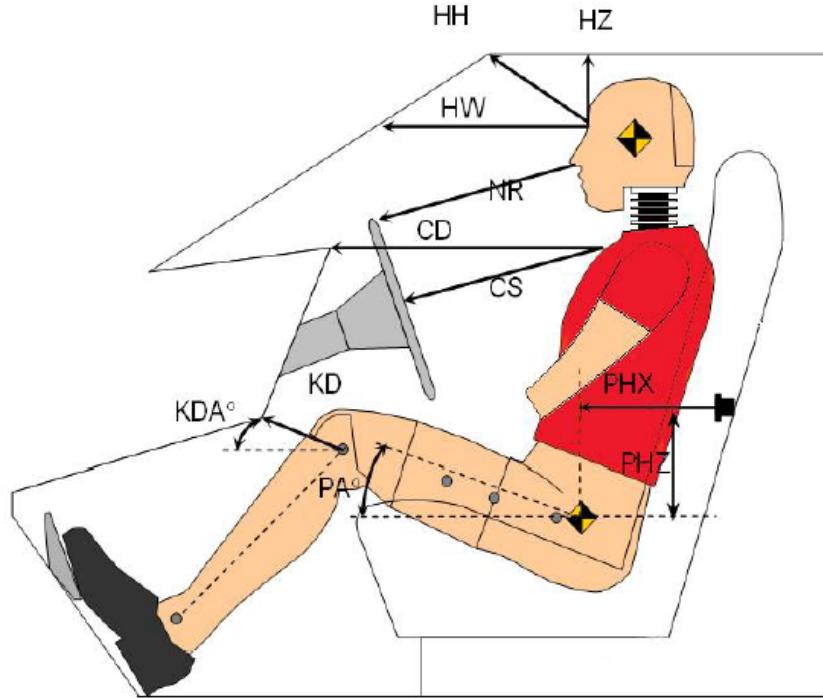
The vehicle is equipped with an electric fuel pump. The electric fuel pump operates for 2 seconds to pressurize the fuel system following the actuation of the ignition. If no attempt has been made to start the engine within 2 seconds following ignition actuation the fuel pump will shut off. The fuel pump operates continuously while the engine is running. If the engine stalls the fuel pump is deactivated. Also, a fuel pump shut-off switch is provided, designed to stop fuel flow to the engine if the vehicle sustains an impact above a certain magnitude.



DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209
 Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12



DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	396	
HW	Head to Windshield	684	
HZ	Head to Roof	272	
NR	Nose to Rim	284	
CD	Chest to Dash	491	
CS	Chest to Steering Wheel	240	
KD(L)/KDA(L)°	Left Knee to Dash	174	30.2
KD(R)/KDA(R)°	Right Knee to Dash	174	36.2
PAX°	Pelvic Tilt Angle (x-axis)		20.4
PAY°	Pelvic Tilt Angle (y-axis)		0.4
PHX	Hip Point to Striker (x-axis)	462	
PHZ	Hip Point to Striker (z-axis)	2	

DATA SHEET NO. 4

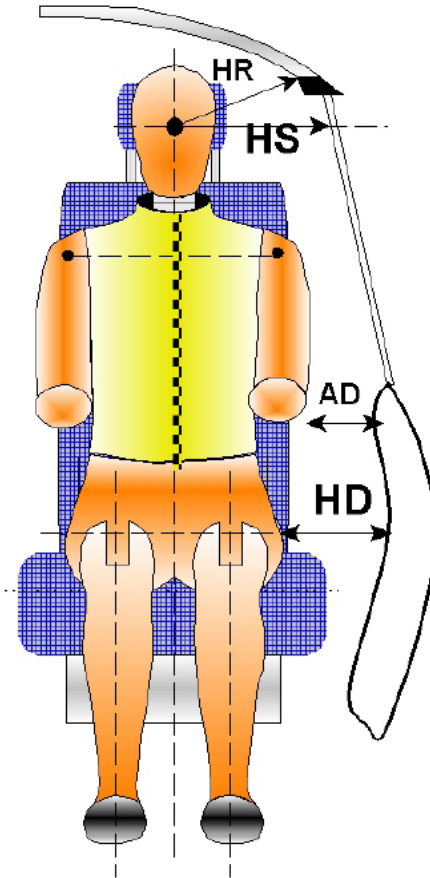
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck

NHTSA No. MC0209

Test Program: NCAP Side Pole Impact Test

Test Date: 02/09/12



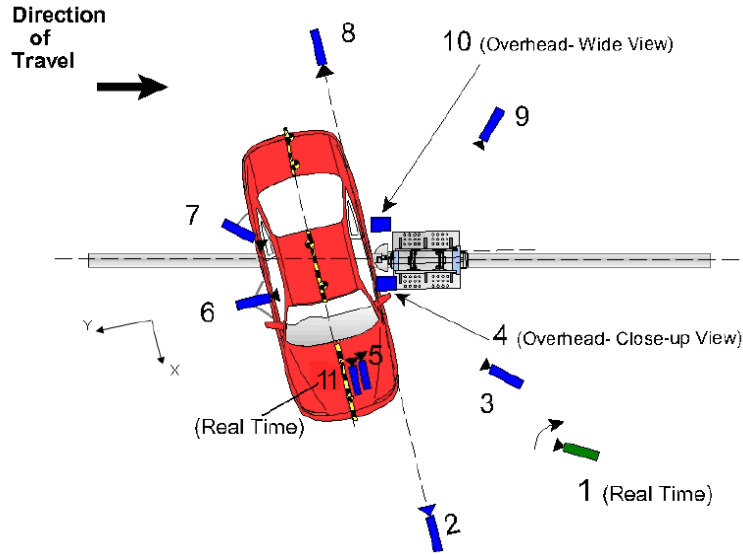
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	279
HS	Head to Side Window	mm	369
AD	Arm to Door	mm	165
HD	H-Point to Door	mm	236

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209
 Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12



CAMERA LOCATIONS AND DATA

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	1.61	0.43	-1.69	35	1000
6	On-Board - Dummy Side View	0.02	1.86	-1.44	14	1000
7	On-Board - Dummy Rear Oblique View	-0.91	1.86	-1.44	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	1.60	0.48	-1.69		30

Reference from Point of Impact for X and Y; from Ground for Z):

+X = Forward of Vehicle, +Y = Right of Vehicle, +Z = Down

*All measurements accurate to ±6 mm

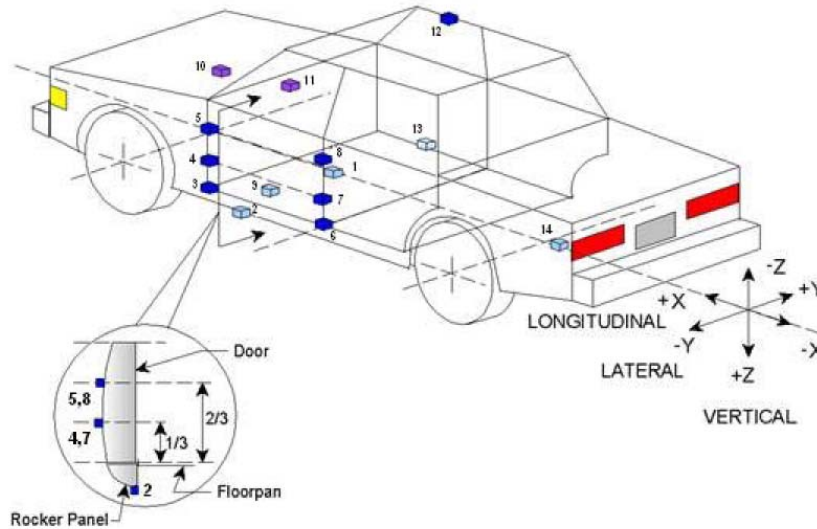
INSTRUMENTATION

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

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209
 Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12



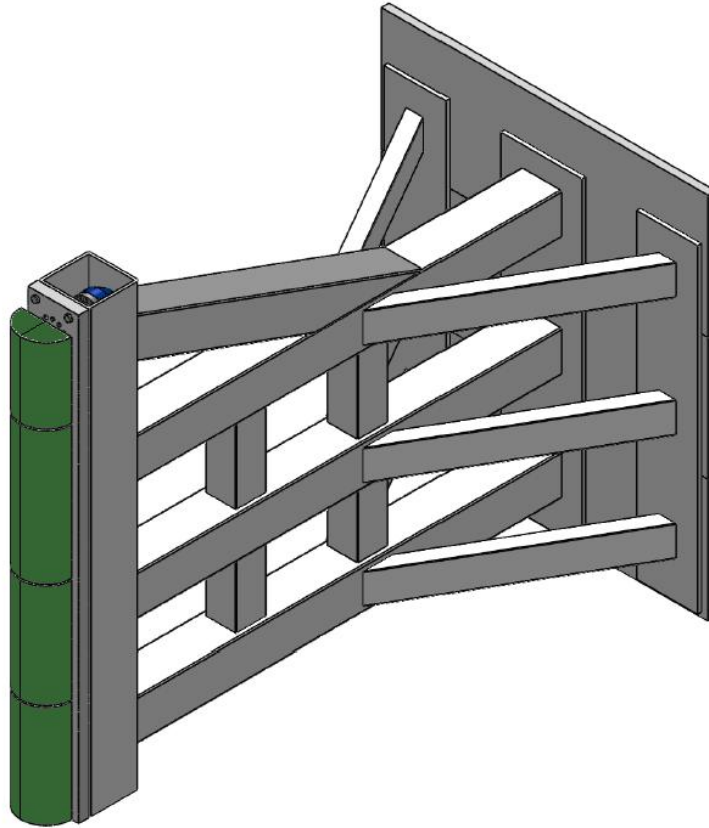
VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	3109	50	-641
2	Left Floor Sill	3868	-483	-408
3	A-Pillar Sill	4584	-877	-591
4	A-Pillar Low	4584	-877	-815
5	A-Pillar Mid	4584	-877	-1185
6	B-Pillar Sill	3302	-843	-620
7	B-Pillar Low	3302	-843	-885
8	B-Pillar Mid	3302	-843	-1150
9	Driver Seat Track	3807	-703	-740
10	Engine Top	5346	110	-1004
11	Firewall	5022	-365	-1256
12	Right Roof	3470	544	-1450
13	Right Floor Sill	3215	835	-600
14	Rear Floorpan	1145	439	-735

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: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209
Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12



RIGID POLE LOAD CELL LOCATIONS

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

DATA SHEET NO. 8

POST-TEST OBSERVATIONS

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209
 Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12

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, Head Restraint
Left Shoulder	Seat, Torso/Pelvis Airbag, Door Panel
Upper Torso	Seat, Door Panel
Lower Torso	Seat, Torso/Pelvis Airbag, Door Panel
Left Hip	Seat
Left Knee	Door Panel, Right Knee

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
Sill Separation	No Separation
Windshield Damage	Broken
Side Window Damage	Left Front Window Broken
Other Notable Effects	Left Front Door Skin Separation

DATA SHEET NO. 8 ... (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209
 Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side Driver		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No	No	
Knee Airbag	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	

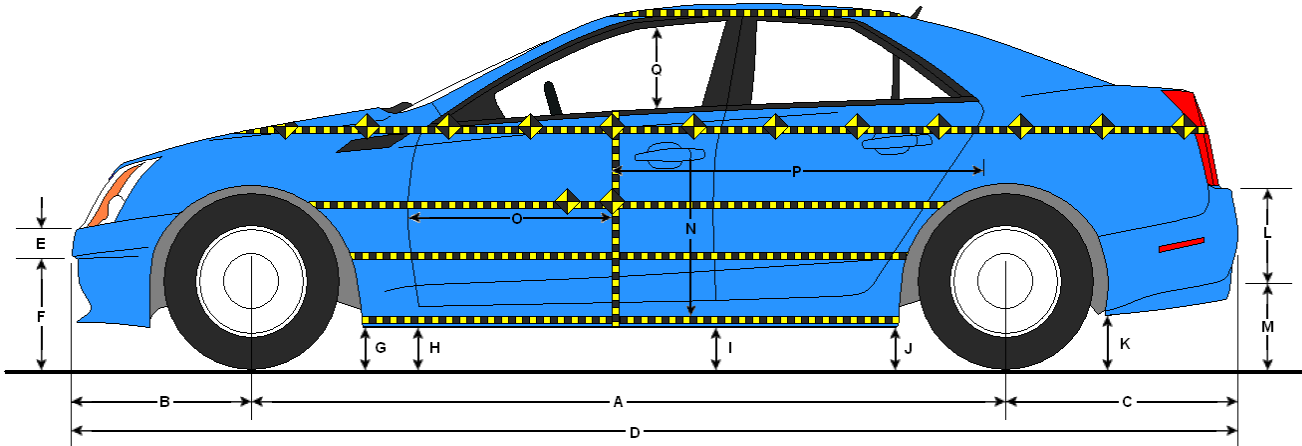
IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		1337
Actual Impact Point (Aft of Front Axle)	mm		1324
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	13
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	74.8
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.7
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.7

DATA SHEET NO. 9

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209
 Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3984	3818	-166
B	Front Axle to FSOV	979	1043	64
C	Rear Axle to RSOV	1321	1358	37
D	Total Length at Centerline	6257	6219	-38
E	Front Bumper Thickness	242	242	0
F	Front Bumper Bottom to Ground	391	409	18
G	Sill Height at Front Wheel Well	423	396	-27
H	Sill Height at Front Door Leading Edge	425	403	-22
I	Sill Height at B-Pillar	455	421	-34
J1	Sill Height at Rear Wheel Well	499	467	-32
J2	Pinch Weld Height at Rear Wheel Well	436	401	-35
K	Sill Height Aft of Rear Wheel Well	525	513	-12
L	Rear Bumper Thickness	247	249	2
M	Rear Bumper Bottom to Ground	506	458	-48
N	Sill Height to Bottom of Front Window Sill	650	841	191
O	Front Door Leading Edge to Impact CL	728	555	-173
P	Rear Door Trailing Edge to Impact CL	1449	1108	-341
Q	Front Window Opening	628	630	2
R	Right Side Length	5527	5583	56
S	Left Side Length	5522	5327	-195
T	Vehicle Width at B-Pillar	2024	1767	-257

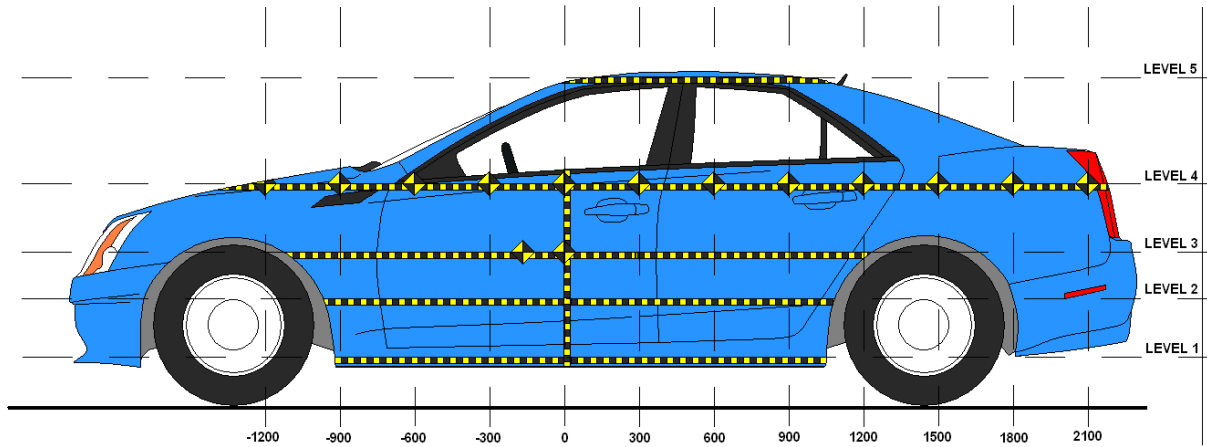
All measurements in mm with tolerance of ± 3mm

DATA SHEET NO. 10

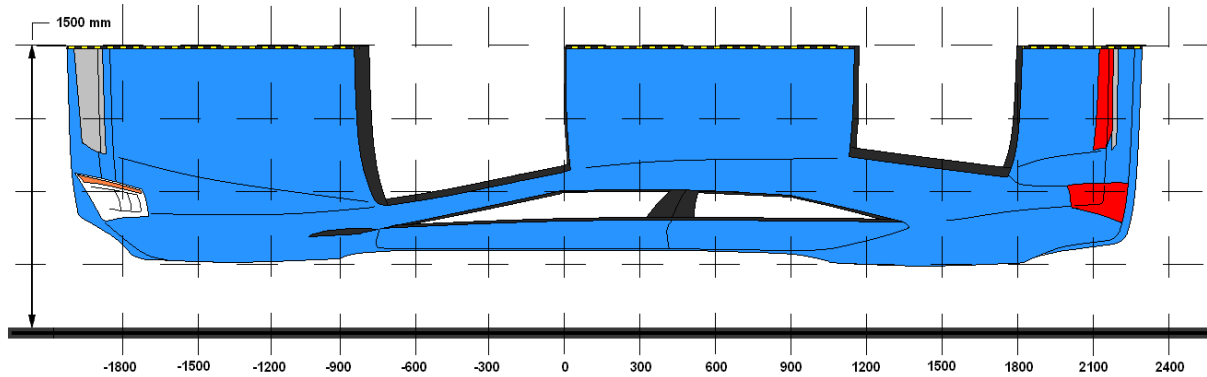
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209

Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12



LEFT SIDE VIEW



OVERHEAD VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	519	519	0
2	Occupant H-Point	889	644	0
3	Mid-Door	939	659	0
4	Window Sill	1173	699	0
5	Window Top	1861	491	0

DATA SHEET NO. 10 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209

Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12

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		488	499	522			691	698	703			203	199	181	
-750	537	504	502	519		778	729	723	724		241	225	221	205	
-600	545	502	499	517		659	726	738	812		114	224	239	295	
-450	543	500	497	514		755	835	846	902		212	335	349	388	
-300	540	498	495	510		851	937	950	1001		311	439	455	491	
-150	538	497	494	506	749	959	1048	1060	1109	1139	421	551	566	603	390
0	537	496	493	503	749	1056	1140	1152	1202	1240	519	644	659	699	491
150	537	495	492	501	747	1001	1093	1105	1159	1224	464	598	613	658	477
300	536	494	491	499	747	864	952	964	1025	1130	328	458	473	526	383
450	535	494	491	498	746	902	894	890	906	1013	367	400	399	408	267
600	535	495	492	497	747	1007	934	930	937	1120	472	439	438	440	373
750	536	496	492	496	747	952	902	896	884	1070	416	406	404	388	323
900	539	496	492	496	747	901	859	852	833	1020	362	363	360	337	273
1050	541	496	492	496	747	848	815	806	784	968	307	319	314	288	221
1200	543	496	492	496	747	799	769	758	735	920	256	273	266	239	173
1350	546	496	492	498	746	749	718	707	688	865	203	222	215	190	119
1500	547	496	493	498	750	717	670	668	677	936	170	174	175	179	186
1650	559	507	503	507		675	627	624	630		116	120	121	123	
1800	561	510	506	507		669	625	622	624		108	115	116	117	
1950	564	510	505	508		665	618	614	620		101	108	109	112	
2100	548	509	506	509		640	612	610	615		92	103	104	106	
2250		486	485	510			580	581	611			94	96	101	
2400				510					605					95	
2550				511					599					88	
2700															
2850															

DATA SHEET NO. 10 ... (CONTINUED)

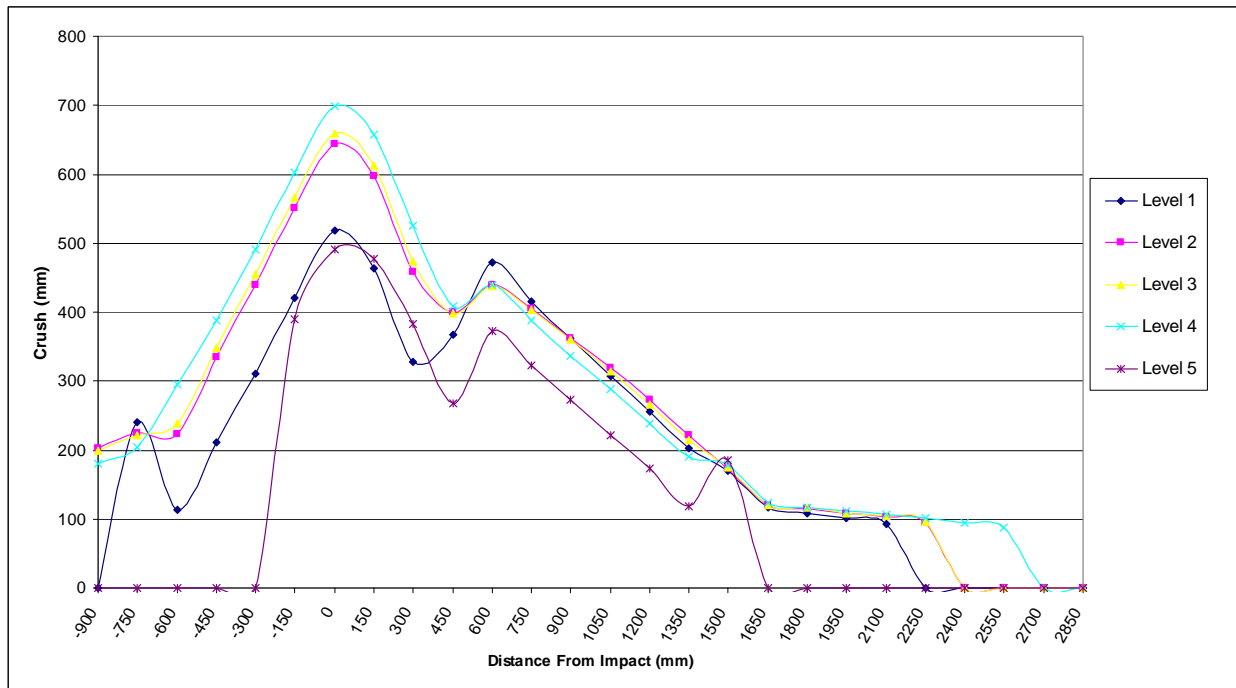
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck

NHTSA No. MC0209

Test Program: NCAP Side Pole Impact Test

Test Date: 02/09/12

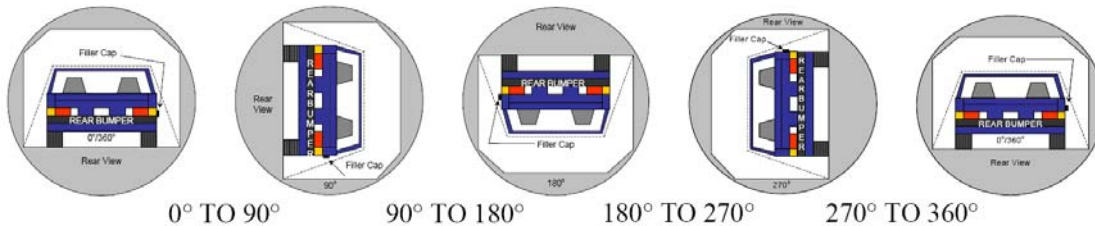


DATA SHEET NO. 11

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209
 Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12
 Temperature at Time of Impact: 20.0° C Test Time: 10:55 AM

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



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	85	300	385
90° To 180°	82	300	382
180° To 270°	78	300	378
270° To 360°	79	300	379

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

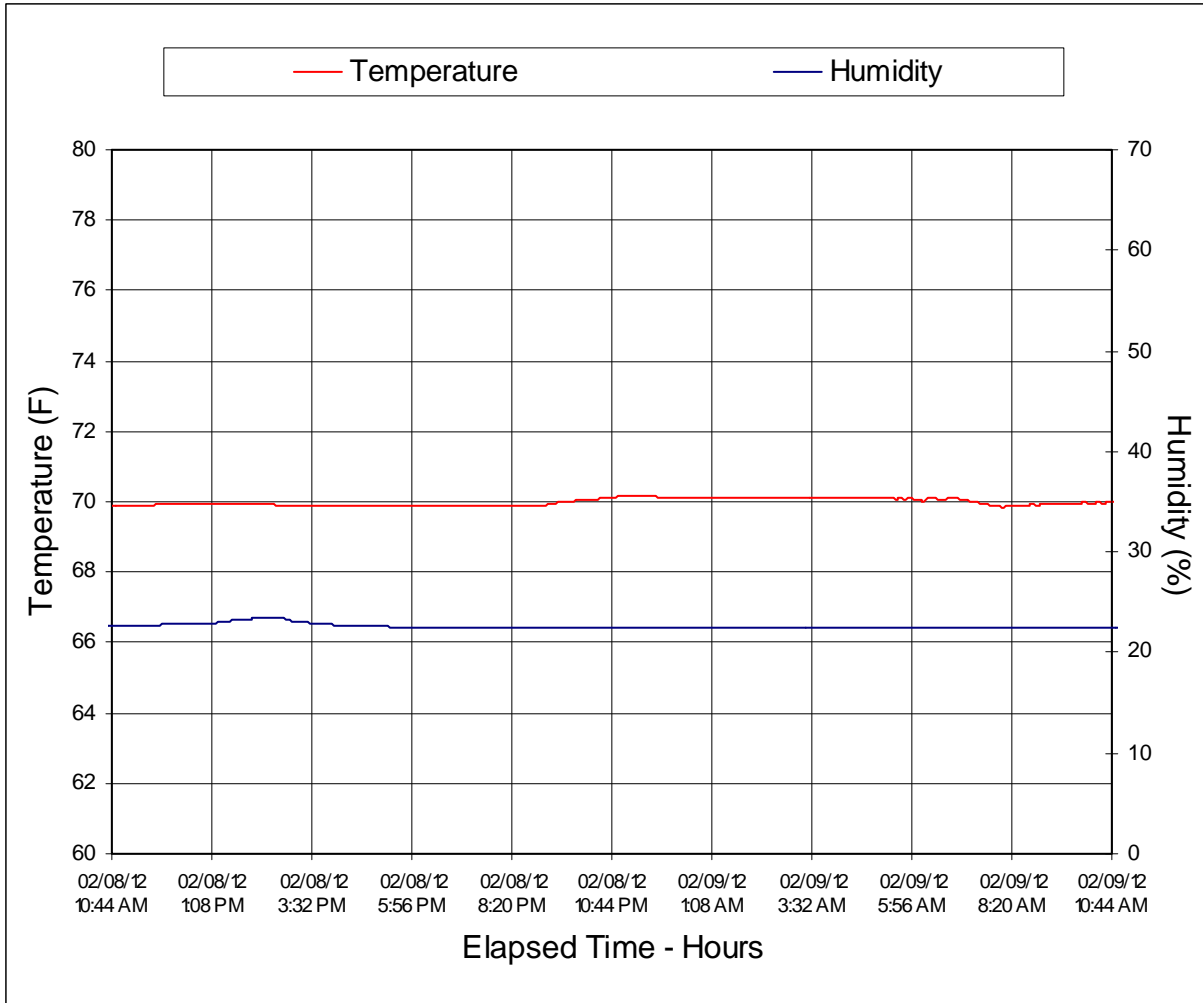
Test Phase	Spillage Location
0° To 90°	No Spillage Occurred
90° To 180°	No Spillage Occurred
180° To 270°	No Spillage Occurred
270° To 360°	No Spillage Occurred

DATA SHEET NO. 14

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2012 Ford SuperDuty F-250 Crew Cab 4-Door Truck NHTSA No. MC0209

Test Program: NCAP Side Pole Impact Test Test Date: 02/09/12



**APPENDIX A
PHOTOGRAPHS**

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FIGURE 1. As-Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



FIGURE 2. As-Delivered Left Rear $\frac{3}{4}$ 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 $\frac{3}{4}$ View of Test Vehicle



FIGURE 6. Post-Test Left Front $\frac{3}{4}$ 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 Vehicle and Pole



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



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



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



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



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



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

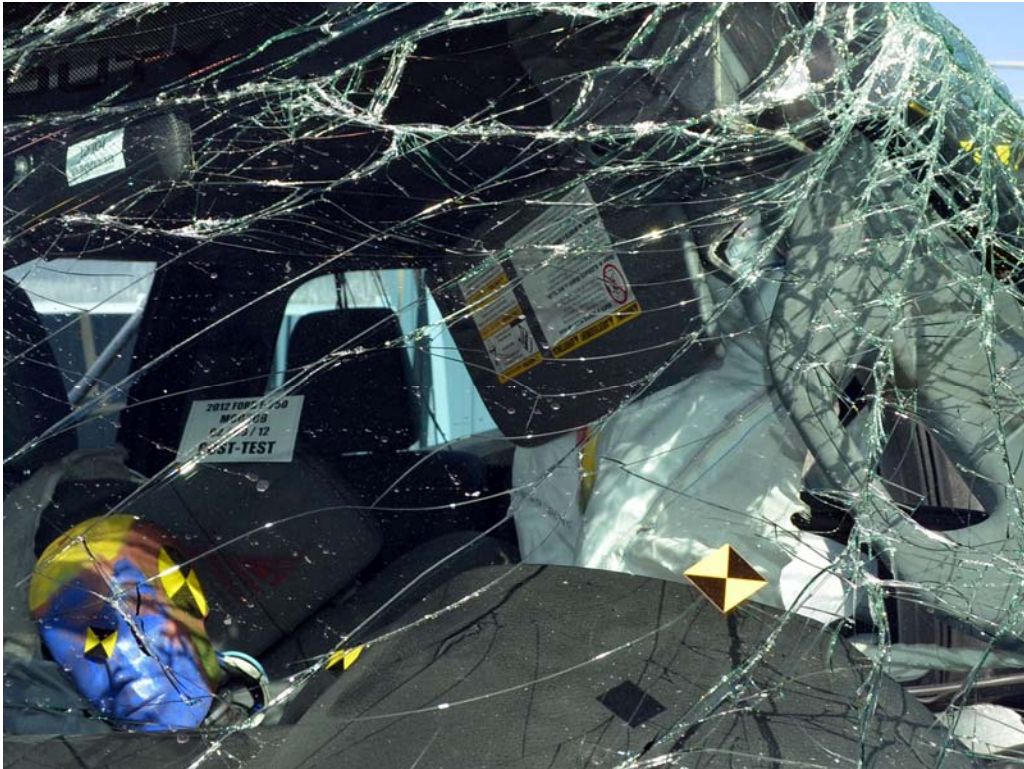


FIGURE 22. Post-Test Front Close-Up View of Dummy



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



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



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



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



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



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



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



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



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



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



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



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



FIGURE 35. 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 Driver Dummy and Door Clearance



FIGURE 41. Post-Test Driver Dummy and Door Clearance



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



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



FIGURE 44. Pre-Test Inner Driver Door Panel View



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



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

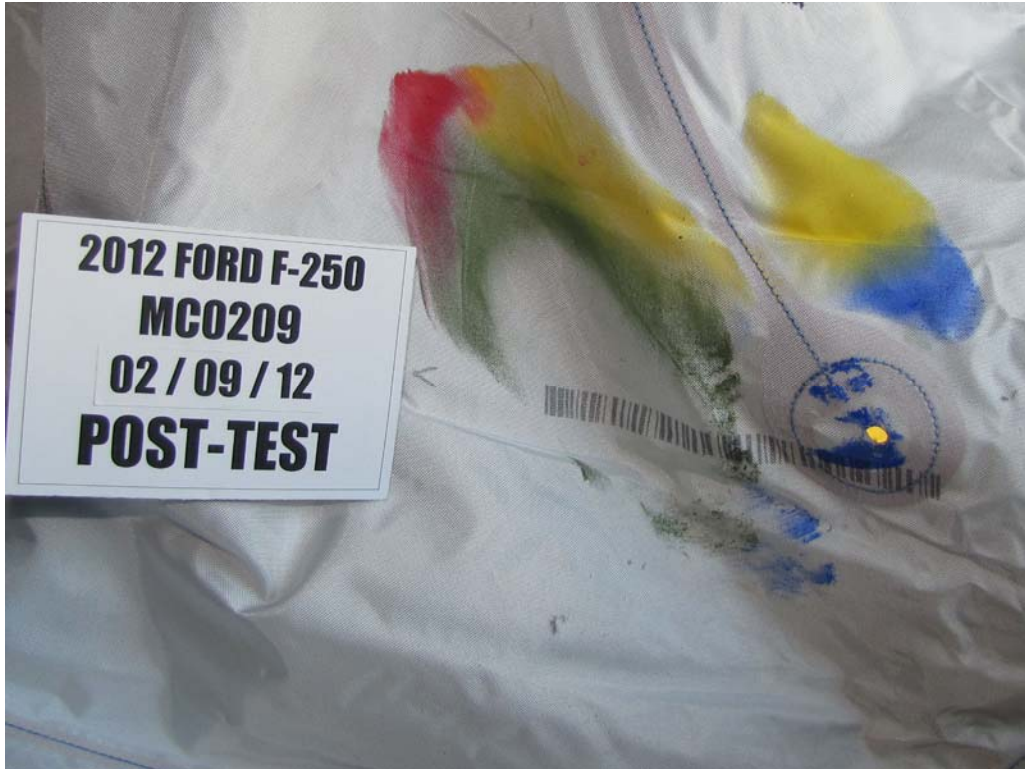


FIGURE 47. Post-Test Dummy Close-Up Head Contact with Side Airbag View



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



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



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



FIGURE 54. Close-Up View of Vehicle's Certification Label



FIGURE 55. Close-Up View of Vehicle's Tire Information Placard



FIGURE 56. Pre-Test Pole Barrier Front View



FIGURE 57. Post-Test Pole Barrier Front View



FIGURE 58. Pre-Test Pole Barrier Side View



FIGURE 59. Post-Test Pole Barrier Side View

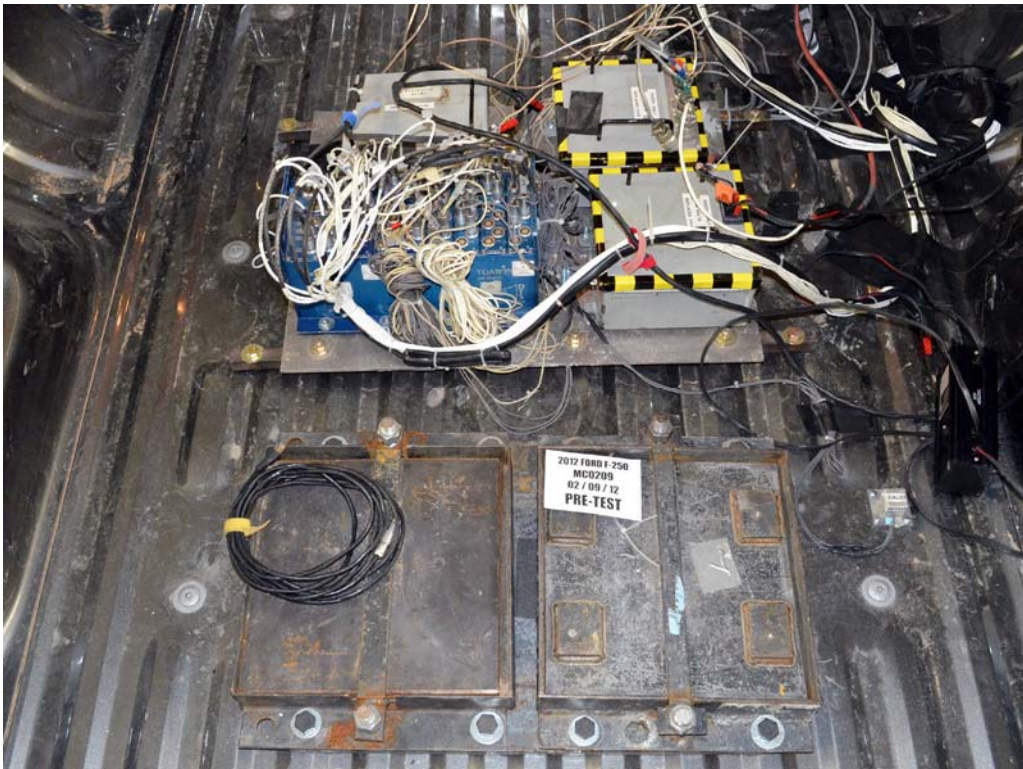


FIGURE 60. Pre-Test Ballast View



FIGURE 61. Post-Test Primary and Redundant Speed Trap Read-Out

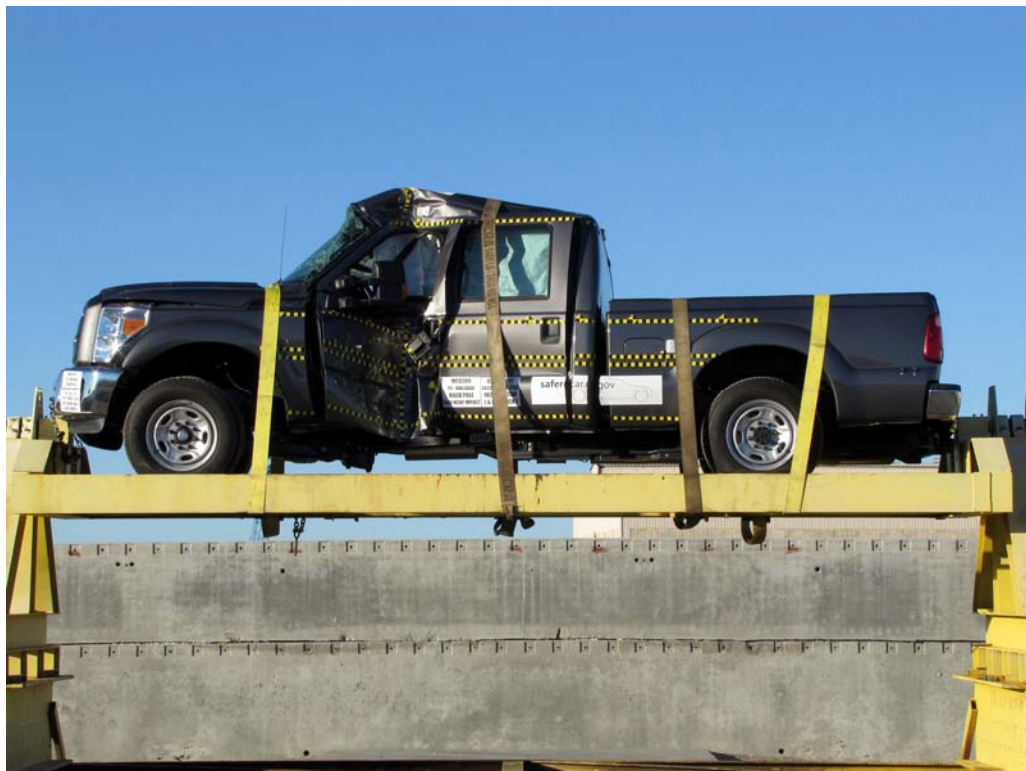


FIGURE 62. FMVSS No. 301-305 Rollover 0 Degrees



FIGURE 63. FMVSS No. 301-305 Rollover 90 Degrees



FIGURE 64. FMVSS No. 301-305 Rollover 180 Degrees



FIGURE 65. FMVSS No. 301-305 Rollover 270 Degrees

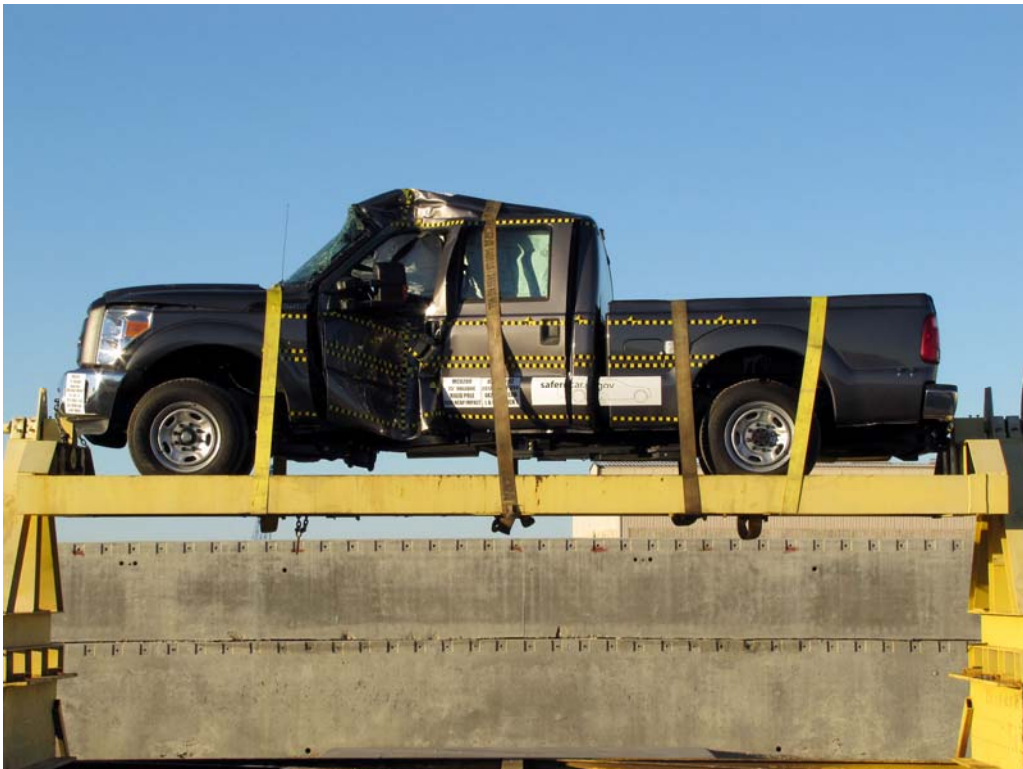


FIGURE 66. FMVSS No. 301-305 Rollover 360 Degrees

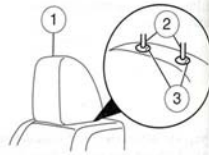
Seating and Safety Restraints

Front row center non-adjustable head restraint (if equipped)

Vehicle's equipped with a front center seat will have head restraints that are non-adjustable.

The non-adjustable head restraints consist of:

- a trimmed energy absorbing foam and structure (1),
- two steel stems (2),
- and two guide sleeve unlock/remove buttons (3).



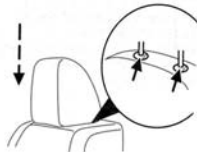
To remove the non-adjustable head restraint, do the following:

Simultaneously press and hold both unlock/remove buttons, then pull up on the head restraint.



To reinstall the non-adjustable head restraint, do the following:

1. Insert the two stems into the guide sleeve collars.
2. Push the head restraint down until it locks.



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Seating and Safety Restraints

To reinstall the adjustable head restraint, do the following:

1. Insert the two stems (2) into the guide sleeve collars.
2. Push the head restraint down until it locks.



Properly adjust the head restraint so that the top of the head restraint is even with the top of your head and positioned as close as possible to the back of your head. For occupants of extremely tall stature, adjust the head restraint to its full up position.

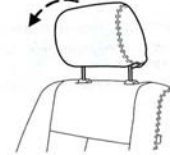
WARNING: To minimize the risk of neck injury in the event of a crash, head restraints must be installed properly.

Tilting head restraints (if equipped)

The front head restraints may have a tilting feature for extra comfort. To tilt the head restraint, do the following:

1. Adjust the seatback to an upright driving/riding position.
2. Pivot the head restraint forward towards your head to the desired location.

After the head restraint reaches the forward-most tilt position, pivoting it forward again will then release it to the rearward un-tilted position.



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FIGURE 69. Head Restraint Use and Adjustment
Information from Vehicle Manual

APPENDIX B
DUMMY RESPONSE DATA

LIST OF DATA PLOTS

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

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

www.NHTSA.dot.gov

Additional Driver Dummy Instrumentation Data

Driver Head Acceleration 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)

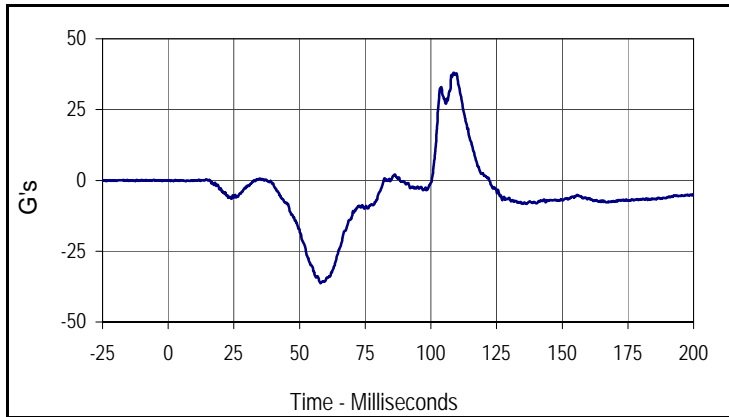
Left B-Pillar Sill Acceleration
Left Lower B-Pillar Acceleration (Y)
Left Mid B-Pillar Acceleration (Y)
Driver Seat Track at Dummy Hip Point Acceleration (Y)
Engine Top Acceleration (X)
Engine Top Acceleration (Y)
Firewall Center Acceleration (Y)
Right Roof at Vertical Impact Reference Line Acceleration (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

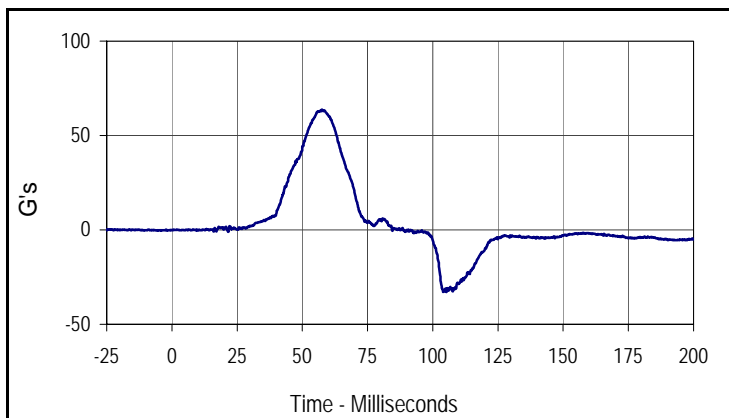
Load Cell Pole Barrier #1 Force (Y)
Load Cell Pole Barrier #2 Force (Y)
Load Cell Pole Barrier #3 Force (Y)
Load Cell Pole Barrier #4 Force (Y)
Load Cell Pole Barrier #5 Force (Y)
Load Cell Pole Barrier #6 Force (Y)
Load Cell Pole Barrier #7 Force (Y)
Load Cell Pole Barrier #8 Force (Y)

Test Vehicle: 2012 Ford SD F250 Crew Cab 4-Door Truck
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test

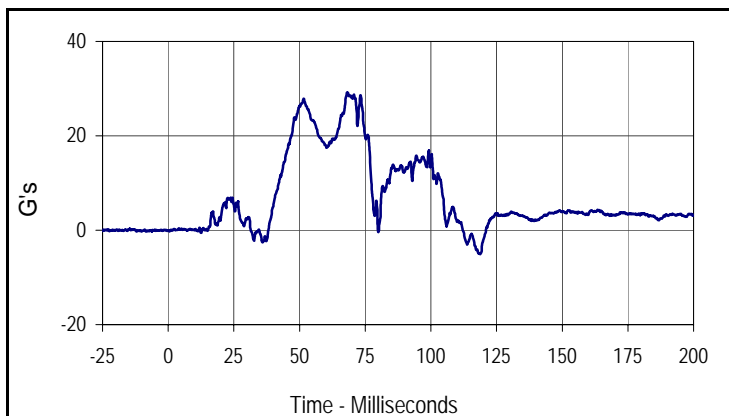
Test Date: 2/9/12
 NHTSA No.: MC0209



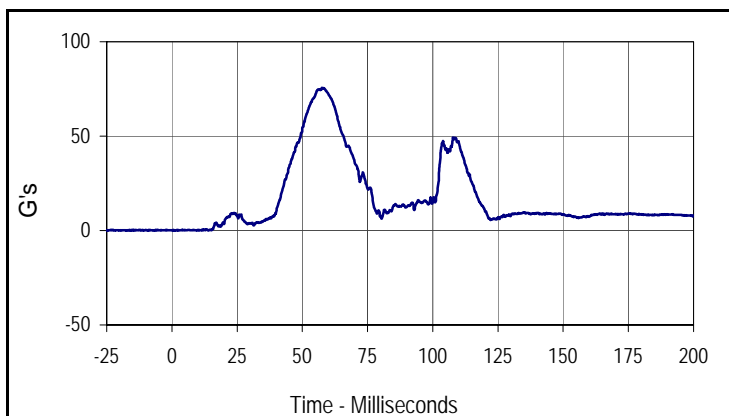
Curve Description			
Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
38.0	108.6	-36.3	58.0



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
63.7	57.6	-33.0	105.3



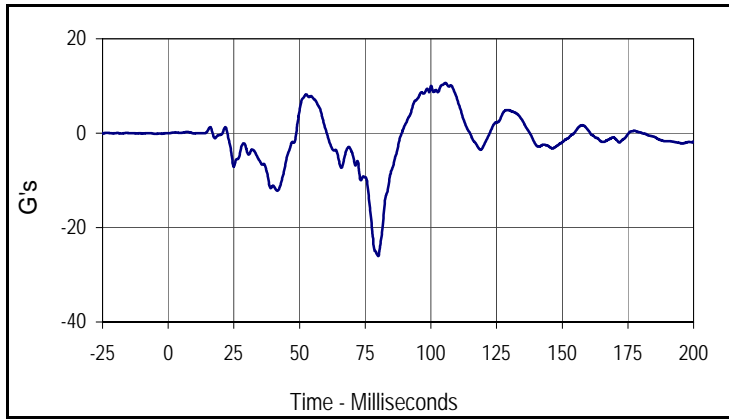
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
29.2	68.2	-5.1	118.7



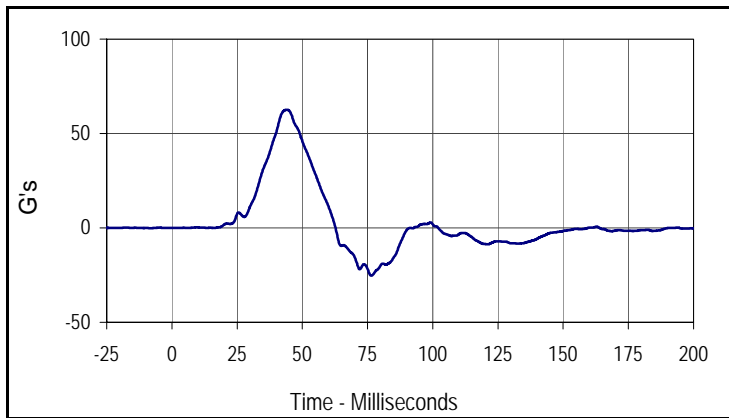
Curve Description			
Driver Head Acceleration Primary Res.			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
75.6	57.6	0.0	13.9

Test Vehicle: 2012 Ford SD F250 Crew Cab 4-Door Truck
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test

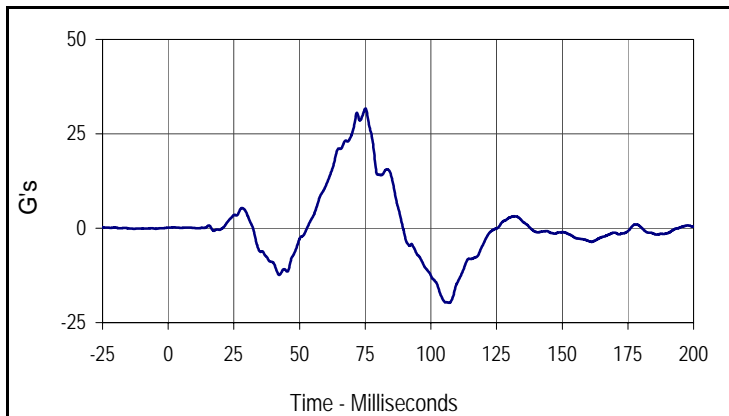
Test Date: 2/9/12
 NHTSA No.: MC0209



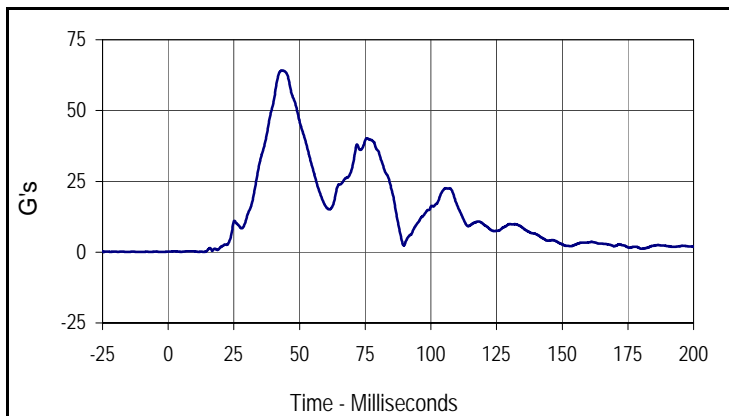
Curve Description			
Driver Lower Spine T12 Acceleration X			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
10.6	105.5	-26.0	80.0



Curve Description			
Driver Lower Spine T12 Acceleration Y			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
62.6	44.0	-25.3	76.4



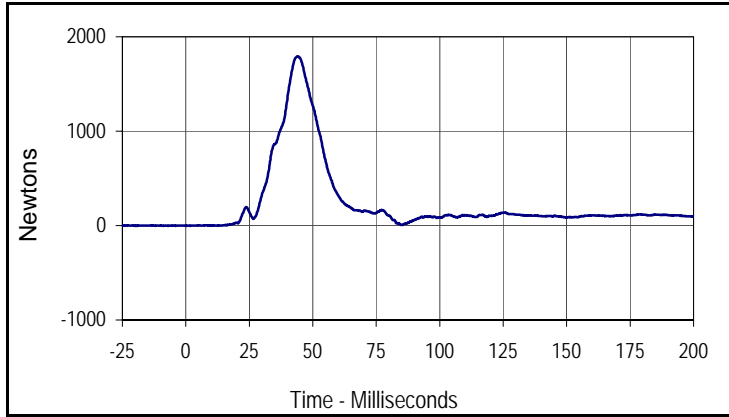
Curve Description			
Driver Lower Spine T12 Acceleration Z			
Plot No.	Type	SAE Class	Units
007	FIL	180	G's
Max	Time	Min	Time
31.7	75.1	-19.8	107.0



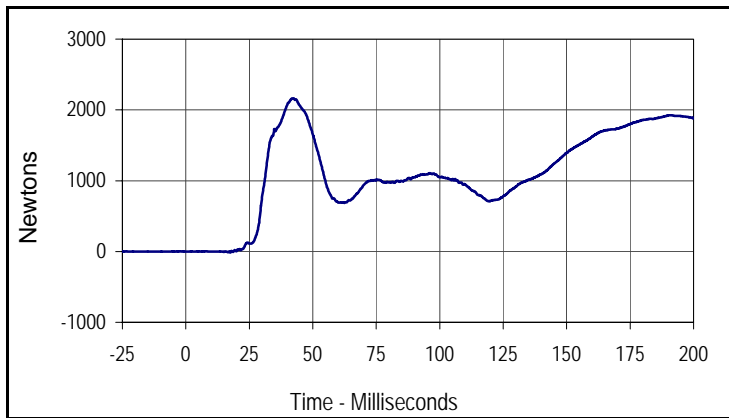
Curve Description			
Driver Lower Spine T12 Acceleration Res.			
Plot No.	Type	SAE Class	Units
008	RES	180	G's
Max	Time	Min	Time
64.1	43.4	0.1	13.7

Test Vehicle: 2012 Ford SD F250 Crew Cab 4-Door Truck
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test

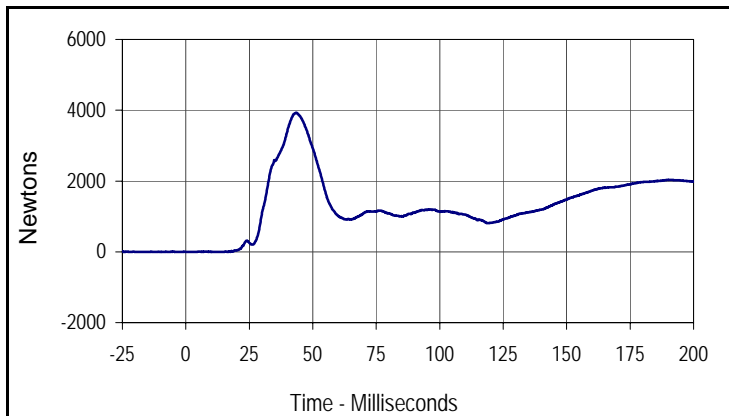
Test Date: 2/9/12
 NHTSA No.: MC0209



Curve Description			
Driver Iliac Wing Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
009	FIL	600	Newtons
Max	Time	Min	Time
1794.2	44.0	-3.2	0.1



Curve Description			
Driver Acetabulum Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
010	FIL	600	Newtons
Max	Time	Min	Time
2164.9	42.2	-15.7	17.5



Curve Description			
Driver Total Pelvic Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
011	SUM	600	Newtons
Max	Time	Min	Time
3933.3	43.5	-3.1	0.1

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: 2/7/12

ATD Serial No.: 299

Test I.D.: N/A



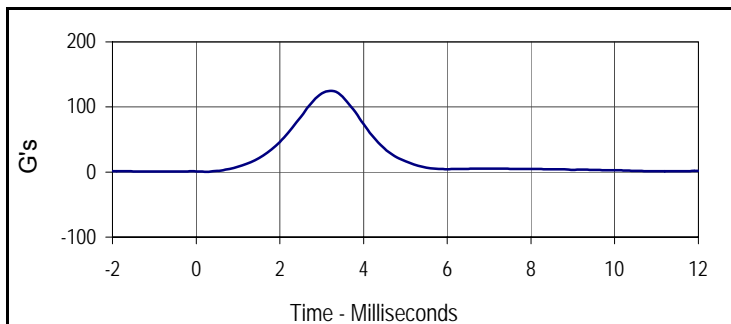
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
A Sitting Height	mm	772 - 788	779	Pass
B Shoulder Pivot Height	mm	437 - 453	445	Pass
C H-Point Height	mm	79 - 89	84	Pass
D H-Point from Seatback	mm	141 - 151	146	Pass
E Shoulder Pivot from Backline	mm	97 - 107	103	Pass
F Thigh Clearance	mm	119 - 135	126	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	185	Pass
J Head Circumference	mm	541 - 551	546	Pass
K Buttock to Knee Length	mm	514 - 540	527	Pass
L Popliteal Height	mm	343 - 369	356	Pass
M Knee Pivot to Floor Height	mm	392 - 409	401	Pass
N Buttock Popliteal Length	mm	416 - 442	429	Pass
O Chest Depth w/o Jacket	mm	195 - 211	201	Pass
P Foot Length	mm	216 - 232	220	Pass
Q Hip Breadth with Pelvic Plug	mm	313 - 323	318	Pass
R Arm Length	mm	249 - 259	256	Pass
S Knee Joint to Seatback	mm	477 - 493	485	Pass
V Shoulder Width	mm	341 - 357	351	Pass
W Foot Width	mm	78 - 94	92	Pass
Y Chest Circumference with Jacket	mm	851 - 881	875	Pass
Z Waist Circumference	mm	760 - 791	774	Pass
Overall Test Results				Pass

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

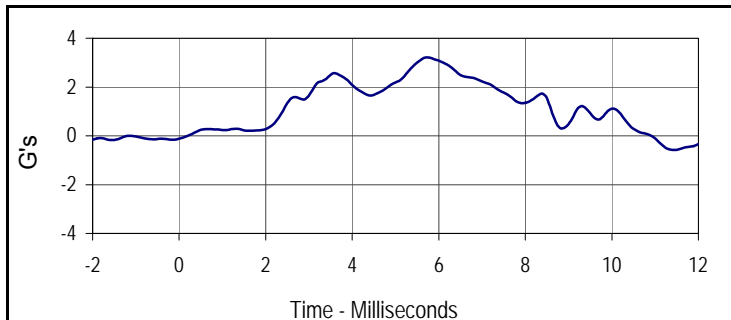
Test Date: 2/7/12
 Test I.D.: 299HD033



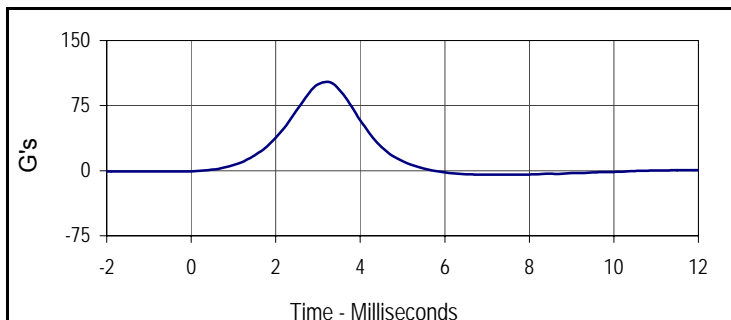
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	250	Pass
Temperature During Soak	Max	18.9 to 25.6	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	34.0	Pass
	Min		28.5	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	31.7	Pass
Peak Head Resultant Acceleration	G's	115 to 137	124.9	Pass
Peak Head X Acceleration	G's	<15	3.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	13.3	Pass
Overall Test Results				Pass



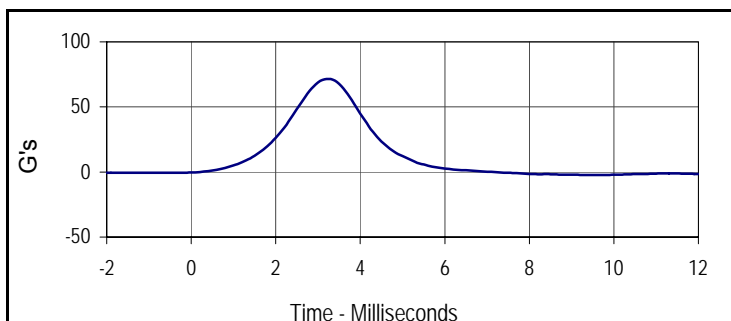
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
124.9	3.2	0.3	0.2



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
3.2	5.7	-0.2	-1.5



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
102.3	3.2	-4.7	7.3



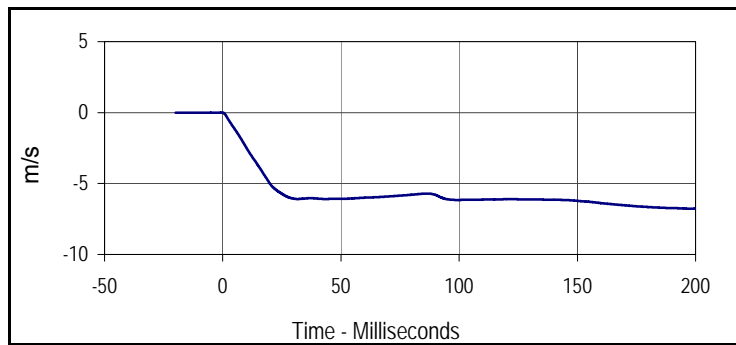
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
71.6	3.2	-2.4	9.6

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

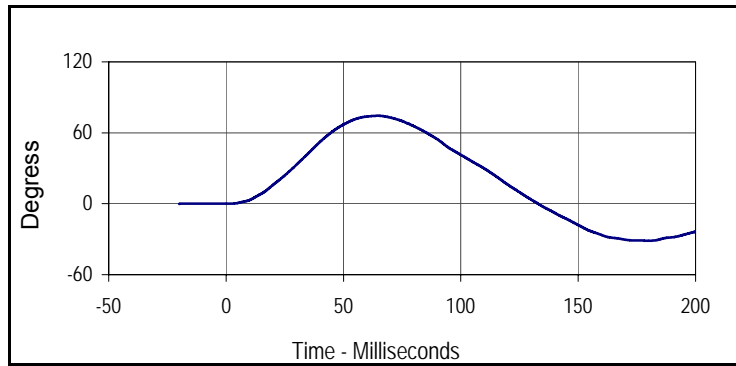
Test Date: 2/7/12
 Test I.D.: 299NB033



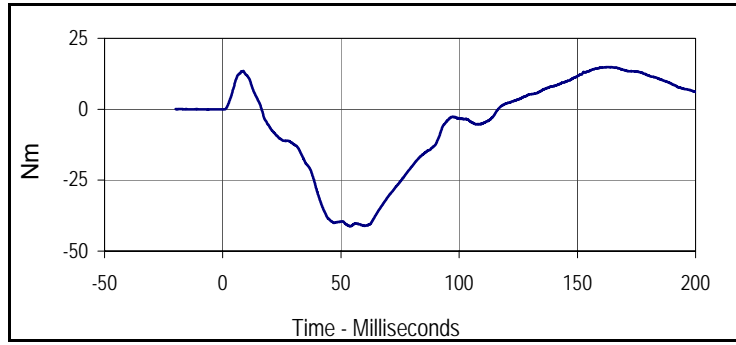
Tested Parameter	Units	Specification	Result	Pass/Fail	
Neck Assembly Soak Time	Minutes	≥240	280	Pass	
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass	
	Min		20.7	Pass	
Humidity During Soak	Max	10.0 to 70.0	34.0	Pass	
	Min		28.5	Pass	
Laboratory Temperature During Test	°C	20.6 to 22.2	20.7	Pass	
Laboratory Humidity During Test	%	10.0 to 70.0	33.8	Pass	
Pendulum Velocity	m/s	5.51 to 5.63	5.59	Pass	
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.48	Pass
	15 msec	m/s	-3.30 to -4.10	-3.74	Pass
	20 msec	m/s	-4.40 to -5.40	-5.02	Pass
	25 msec	m/s	-5.40 to -6.10	-5.72	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.16	Pass
D-Plane Rotation	Max	Degrees	71 to 81	74.4	Pass
	Time	msec	50 to 70	64.7	Pass
Peak Occipital Condyle Moment	Nm	-36 to -44	-41.2	Pass	
Decaying Moment Time to Cross 0 Nm	msec	102 to 126	116.5	Pass	
Overall Test Results			Pass	Pass	



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.6	-6.8	200.0



Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
74.4	64.7	-31.2	180.6



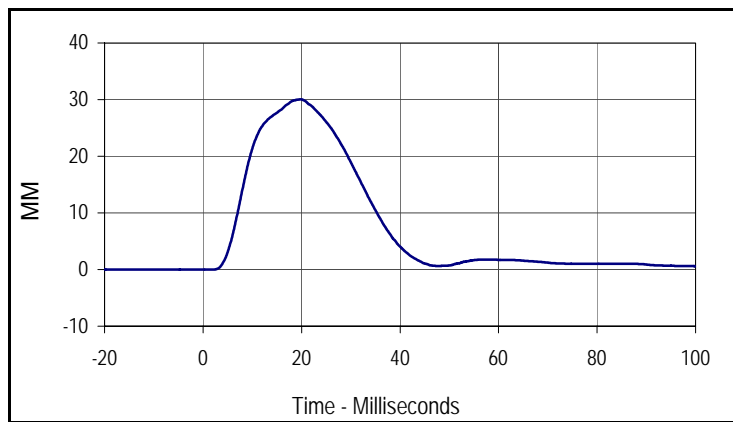
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
14.9	162.4	-41.2	53.8

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

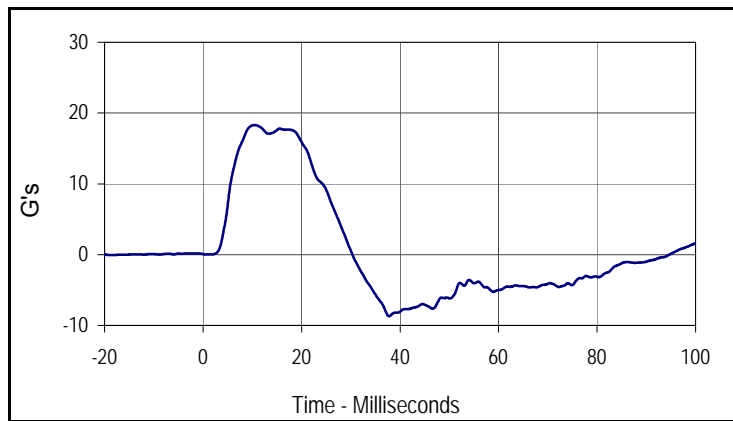
Test Date: 2/7/12
 Test I.D.: 299SH033



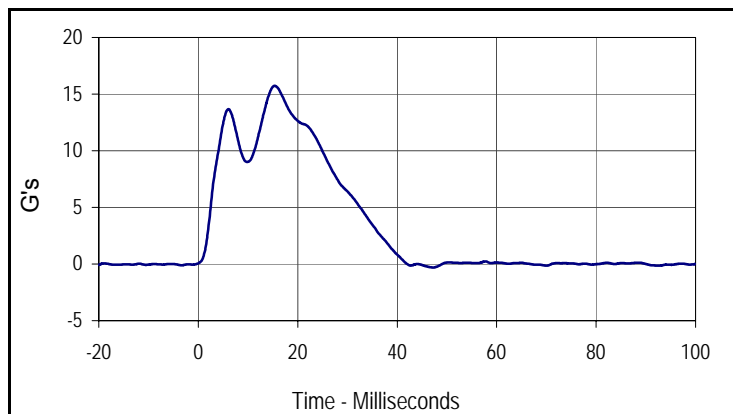
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	320	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	34.0	Pass
	Min		28.5	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	20.8	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	32.7	Pass
Impactor Velocity	m/s	4.20 to 4.40	4.36	Pass
Peak Shoulder Deflection	mm	28 to 37	30.0	Pass
Peak Lateral Spine Acceleration Y	G's	17 to 22	18.3	Pass
Peak Impactor Acceleration	G's	13 to 18	15.7	Pass
Overall Test Results			Pass	Pass



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
30.0	19.8	0.0	-5.1



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.3	10.5	-8.7	37.8



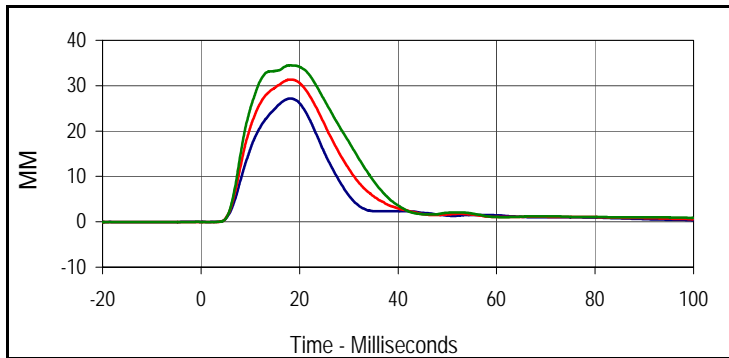
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.7	15.3	-0.3	47.2

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

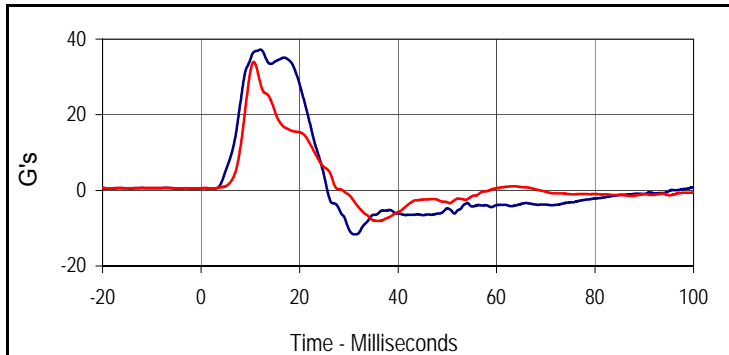
Test Date: 2/7/12
 Test I.D.: 299TWA033



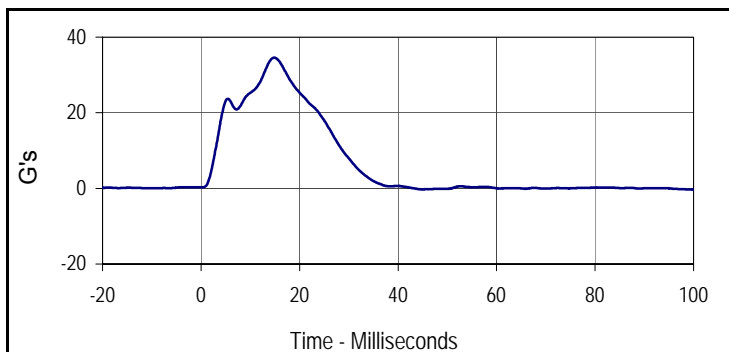
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	350	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	34.0	Pass
	Min		28.5	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.5	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.7	Pass
Peak Shoulder Deflection	mm	31 to 40	34.4	Pass
Peak Upper Thorax Rib Deflection	mm	25 to 32	27.2	Pass
Peak Middle Thorax Rib Deflection	mm	30 to 36	31.4	Pass
Peak Lower Thorax Rib Deflection	mm	32 to 38	34.5	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	37.2	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	34.0	Pass
Peak Impactor Acceleration	G's	30 to 36	34.6	Pass
Overall Test Results				Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
27.2	18.2	0.0	-6.3
Middle Thorax Deflection			
Max	Time	Min	Time
31.4	18.2	-0.1	-16.9
Lower Thorax Deflection			
Max	Time	Min	Time
34.5	18.1	0.0	-11.3



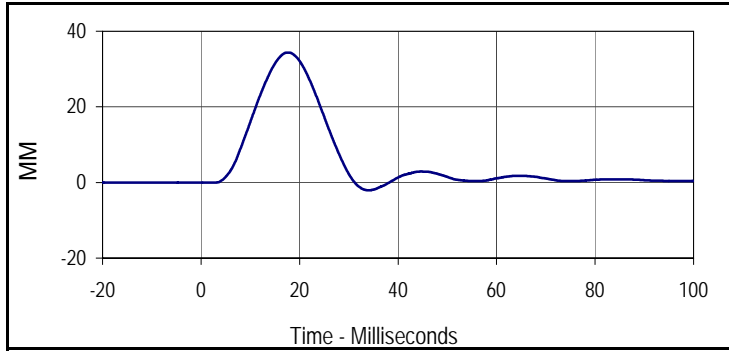
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
37.2	12.0	-11.6	31.1
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
34.0	10.7	-8.1	36.1



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
34.6	14.9	-0.3	99.0

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

Test Date: 2/7/12
 Test I.D.: 299TWA033



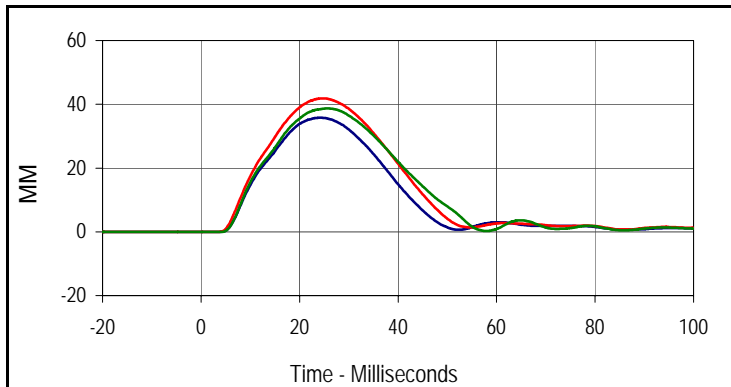
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
34.4	17.8	-2.1	34.0

Test Program: SID IIs Thorax without Arm Impact Test
 ATD Serial No.: 299

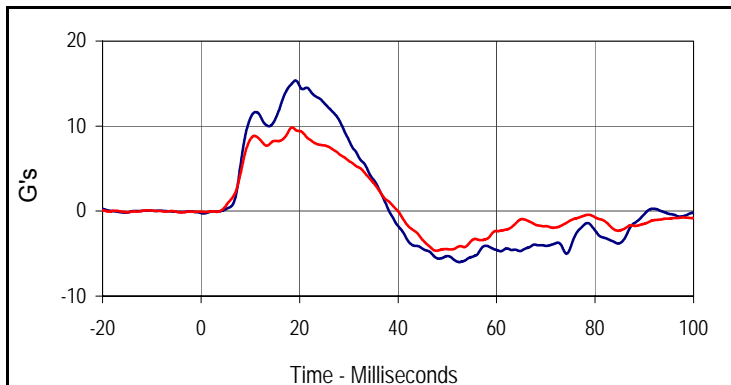
Test Date: 2/7/12
 Test I.D.: 299TWOA033



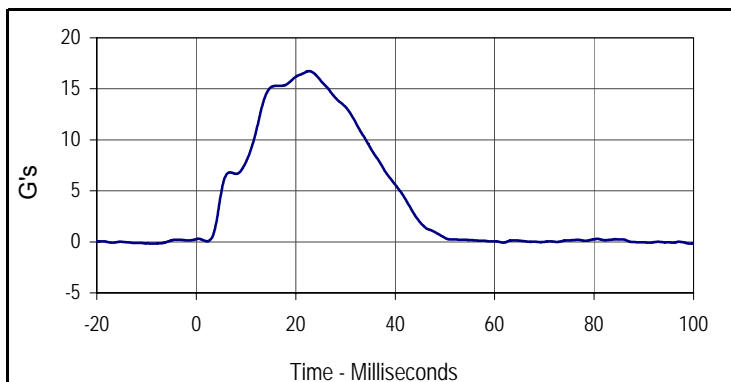
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	380	Pass
Temperature During Soak	Max	18.9 to 25.6	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	34.0	Pass
	Min		28.5	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.9	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.30	Pass
Peak Upper Thorax Rib Deflection	mm	32 to 40	35.8	Pass
Peak Middle Thorax Rib Deflection	mm	39 to 45	41.9	Pass
Peak Lower Thorax Rib Deflection	mm	35 to 43	38.7	Pass
Peak Upper Spine Y Acceleration	G's	13 to 17	15.4	Pass
Peak Lower Spine Y Acceleration	G's	7 to 11	9.9	Pass
Peak Impactor Acceleration	G's	14 to 18	16.7	Pass
Overall Test Results				Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
35.8	24.1	0.0	-7.2
Middle Thorax Deflection			
Max	Time	Min	Time
41.9	24.7	0.0	-8.2
Lower Thorax Deflection			
Max	Time	Min	Time
38.7	25.6	0.0	-6.1



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.4	19.2	-6.0	52.4
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.9	18.5	-4.7	47.7



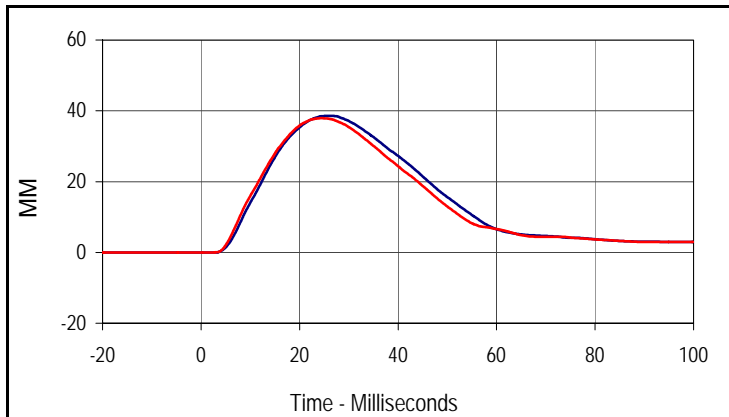
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.7	22.7	-0.2	99.3

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

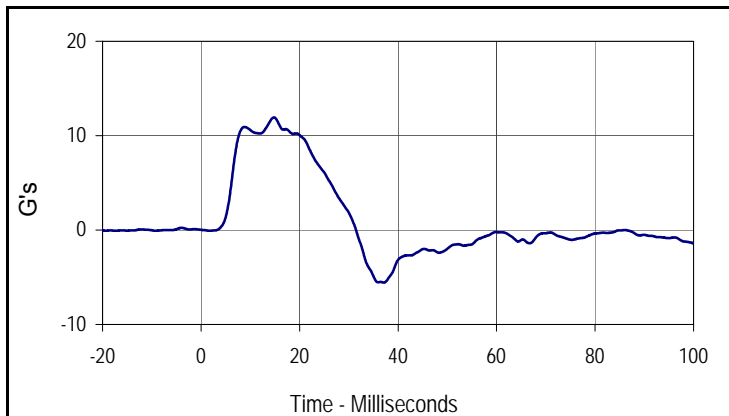
Test Date: 2/7/12
 Test I.D.: 299ABD033



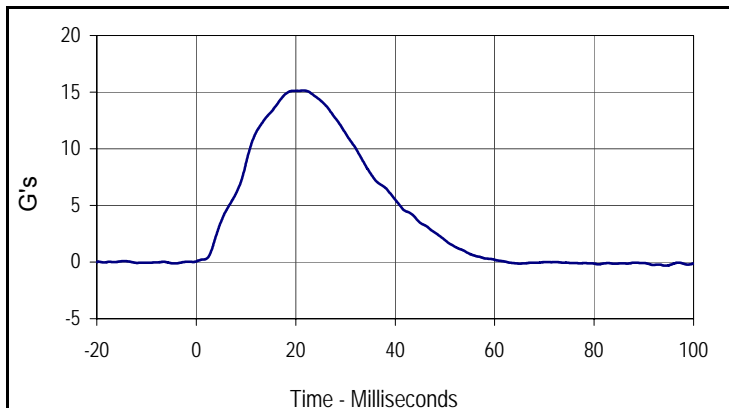
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	400	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	34.0	Pass
	Min		28.5	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	20.8	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	32.3	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Upper Abdominal Rib Deflection	mm	36 to 47	38.6	Pass
Peak Lower Abdominal Rib Deflection	mm	33 to 44	37.9	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	11.9	Pass
Peak Impactor Acceleration	G's	12 to 16	15.1	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
38.6	26.1	0.0	-5.8
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
37.9	24.5	0.0	-9.8



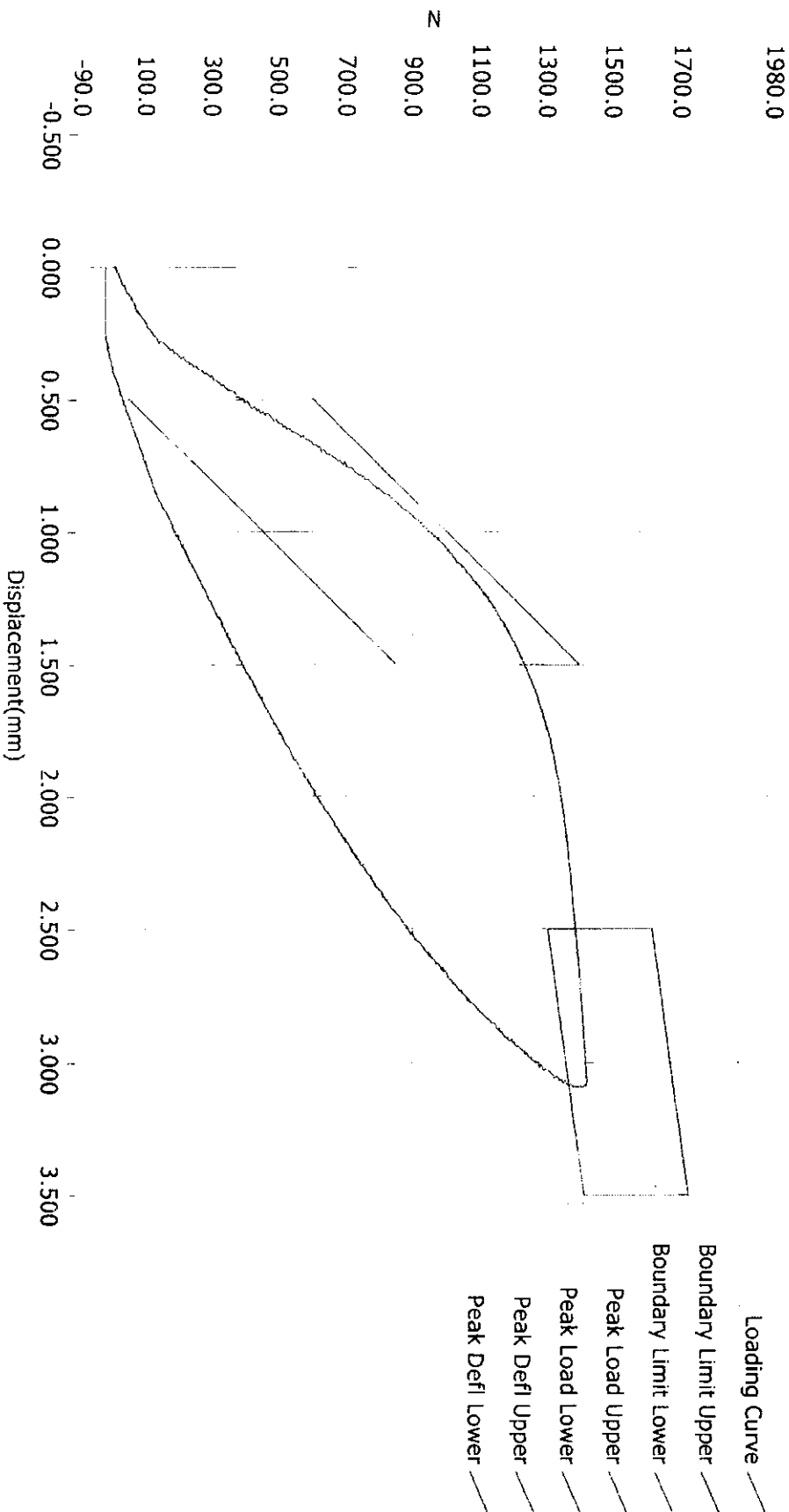
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
11.9	14.8	-5.6	37.1



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.1	21.5	-0.3	94.4

MC0209 PRE TEST

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

<u>Test ID</u>	<u>Part Serial Number</u>	<u>Test Date</u>	<u>Test Time</u>
<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
	36409	SIDIIs	

Current Date : 9/23/2010

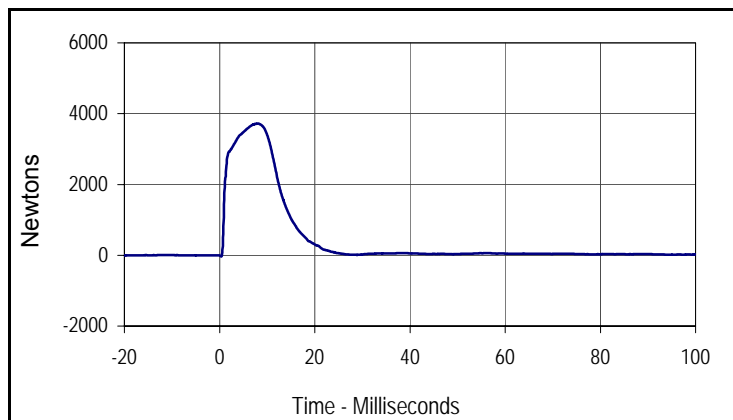
Current Time : 07:55:27

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

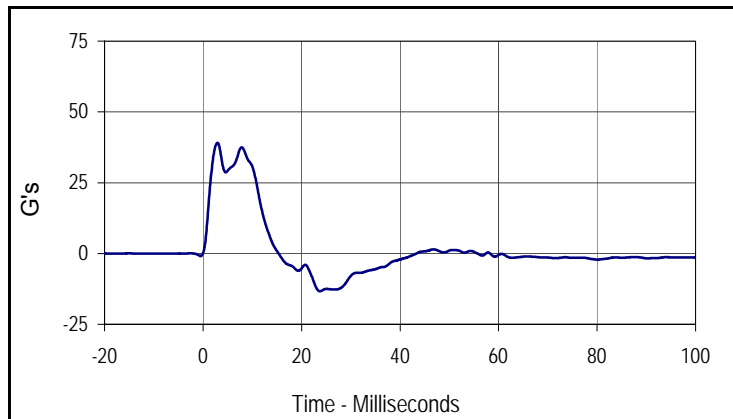
Test Date: 2/7/12
 Test I.D.: 299ACET033



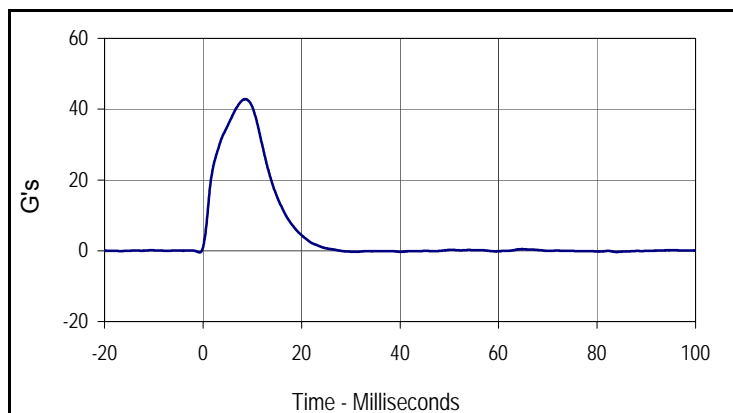
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	410	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	34.0	Pass
	Min		28.5	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	32.2	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.7	Pass
Peak Acetabulum Force Y	Newtons	3600 to 4300	3721.4	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	37.5	Pass
Peak Impactor Acceleration	G's	38 to 47	42.8	Pass
Overall Test Results				Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3721.4	8.0	-31.3	0.4



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
39.1	2.9	-13.3	23.7



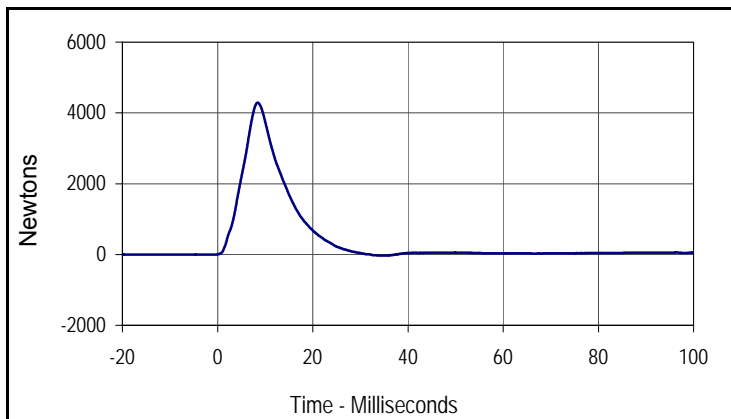
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
42.8	8.6	-0.5	-0.7

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

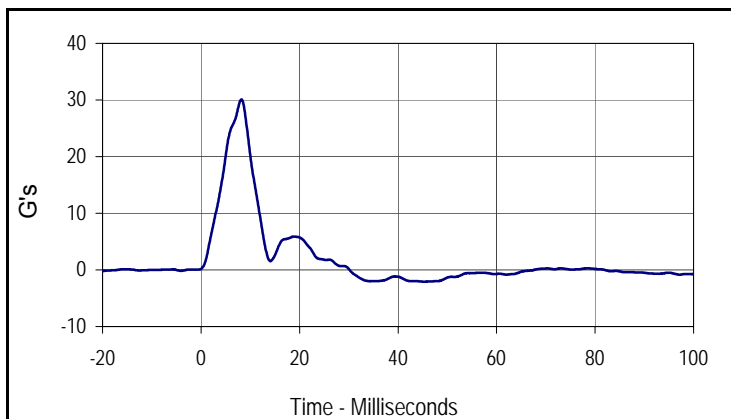
Test Date: 2/7/12
 Test I.D.: 299PL033



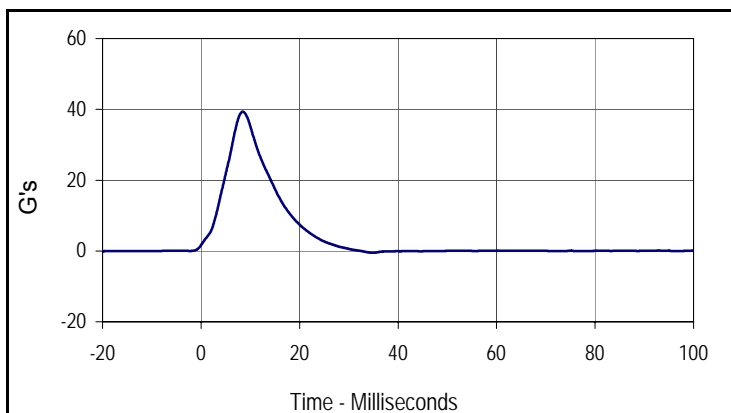
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	470	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	34.0	Pass
	Min		28.5	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.2	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Iliac Force	Newtons	4100 to 5100	4288.2	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	30.1	Pass
Peak Impactor Acceleration	G's	36 to 45	39.4	Pass
Overall Test Results				Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4288.2	8.4	-32.7	35.1



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
30.1	8.2	-2.1	45.3



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
39.4	8.5	-0.5	34.9

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

Test Program: SID IIs External Measurements

Test Date: 2/10/12

ATD Serial No.: 299

Test I.D.: N/A



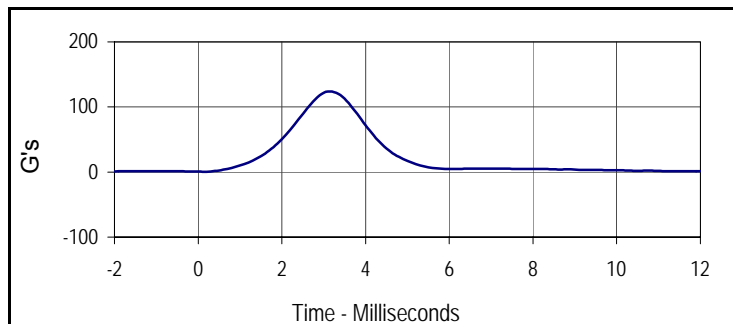
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A Sitting Height	mm	772 - 788	778	Pass
B Shoulder Pivot Height	mm	437 - 453	444	Pass
C H-Point Height	mm	79 - 89	84	Pass
D H-Point from Seatback	mm	141 - 151	146	Pass
E Shoulder Pivot from Backline	mm	97 - 107	103	Pass
F Thigh Clearance	mm	119 - 135	126	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	185	Pass
J Head Circumference	mm	541 - 551	546	Pass
K Buttock to Knee Length	mm	514 - 540	528	Pass
L Popliteal Height	mm	343 - 369	356	Pass
M Knee Pivot to Floor Height	mm	392 - 409	401	Pass
N Buttock Popliteal Length	mm	416 - 442	429	Pass
O Chest Depth w/o Jacket	mm	195 - 211	201	Pass
P Foot Length	mm	216 - 232	220	Pass
Q Hip Breadth with Pelvic Plug	mm	313 - 323	318	Pass
R Arm Length	mm	249 - 259	256	Pass
S Knee Joint to Seatback	mm	477 - 493	485	Pass
V Shoulder Width	mm	341 - 357	350	Pass
W Foot Width	mm	78 - 94	92	Pass
Y Chest Circumference with Jacket	mm	851 - 881	875	Pass
Z Waist Circumference	mm	760 - 791	774	Pass
Overall Test Results				Pass

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

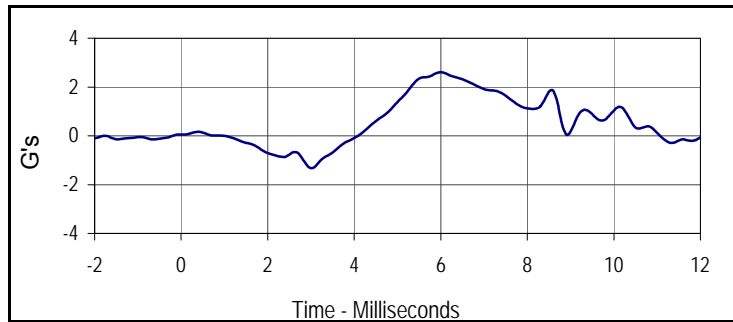
Test Date: 2/10/12
 Test I.D.: 299HD034



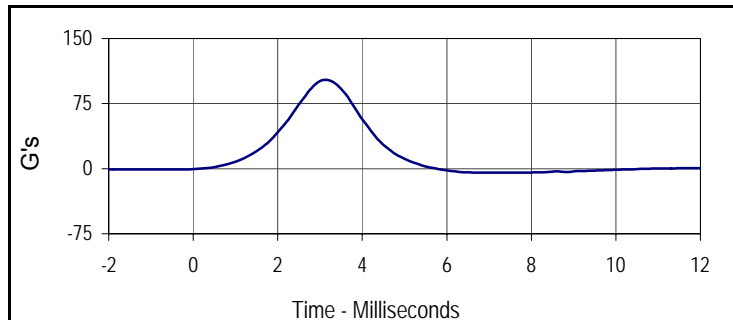
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	250	Pass
Temperature During Soak	Max	18.9 to 25.6	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	35.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	32.4	Pass
Peak Head Resultant Acceleration	G's	115 to 137	123.9	Pass
Peak Head X Acceleration	G's	<15	2.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	13.7	Pass
Overall Test Results				Pass



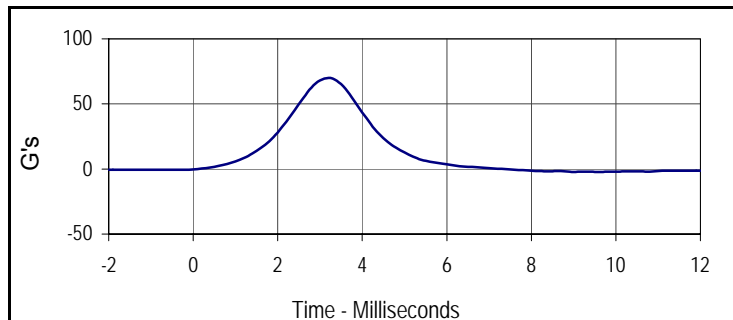
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
123.9	3.2	0.3	0.1



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.6	6.0	-1.3	3.0



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
102.3	3.1	-4.7	7.3



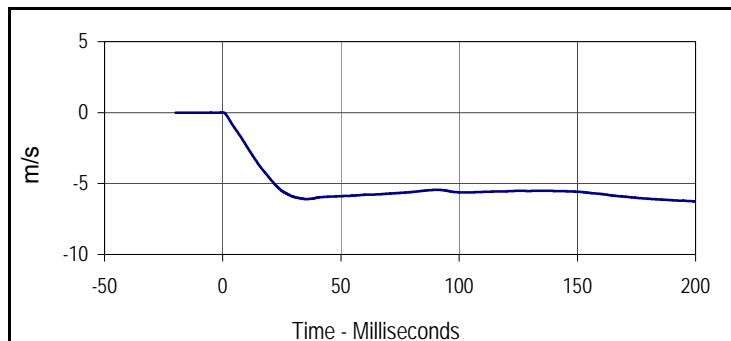
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
70.0	3.2	-2.2	9.0

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

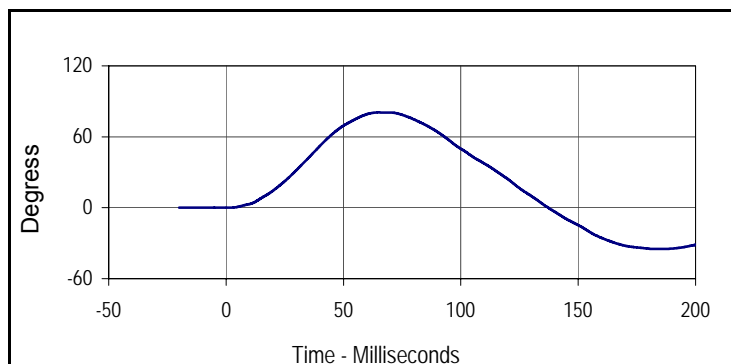
Test Date: 2/10/12
 Test I.D.: 299NB034



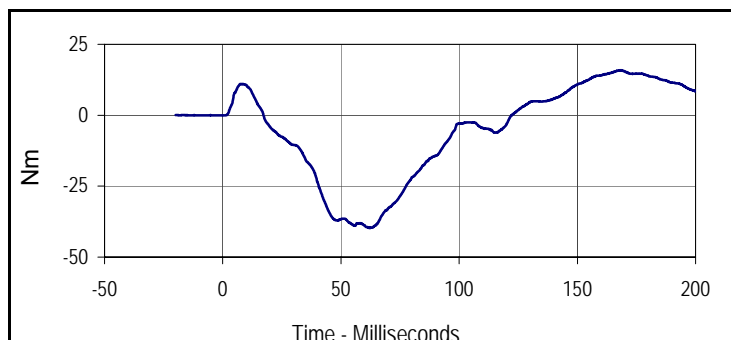
Tested Parameter	Units	Specification	Result	Pass/Fail	
Neck Assembly Soak Time	Minutes	≥240	280	Pass	
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass	
	Min		20.7	Pass	
Humidity During Soak	Max	10.0 to 70.0	35.0	Pass	
	Min		29.0	Pass	
Laboratory Temperature During Test	°C	20.6 to 22.2	21.0	Pass	
Laboratory Humidity During Test	%	10.0 to 70.0	34.2	Pass	
Pendulum Velocity	m/s	5.51 to 5.63	5.59	Pass	
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.34	Pass
	15 msec	m/s	-3.30 to -4.10	-3.61	Pass
	20 msec	m/s	-4.40 to -5.40	-4.66	Pass
	25 msec	m/s	-5.40 to -6.10	-5.52	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.10	Pass
D-Plane Rotation	Max	Degrees	71 to 81	80.6	Pass
	Time	msec	50 to 70	64.9	Pass
Peak Occipital Condyle Moment	Nm	-36 to -44	-39.7	Pass	
Decaying Moment Time to Cross 0 Nm	msec	102 to 126	122.3	Pass	
Overall Test Results				Pass	



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.2	-6.3	200.0



Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
80.6	64.9	-34.9	182.6



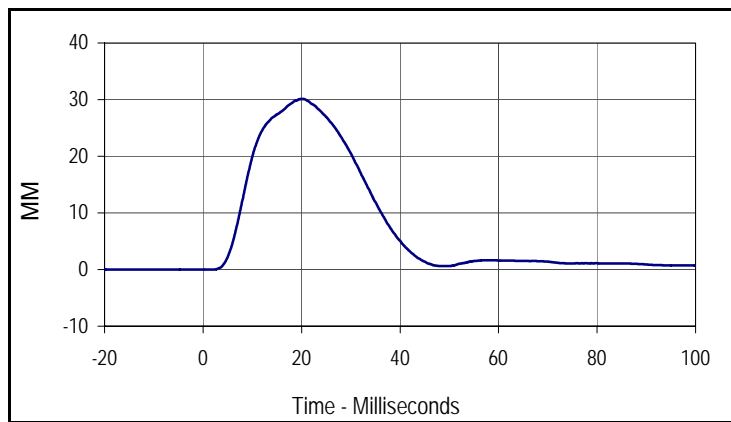
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
15.9	168.3	-39.7	61.9

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

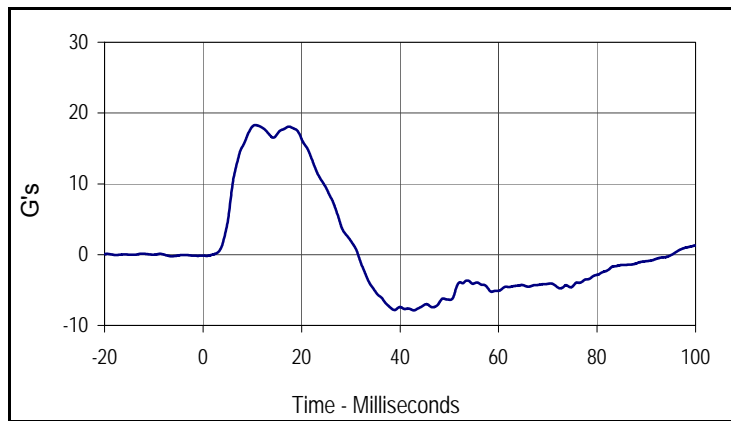
Test Date: 2/10/12
 Test I.D.: 299SH034



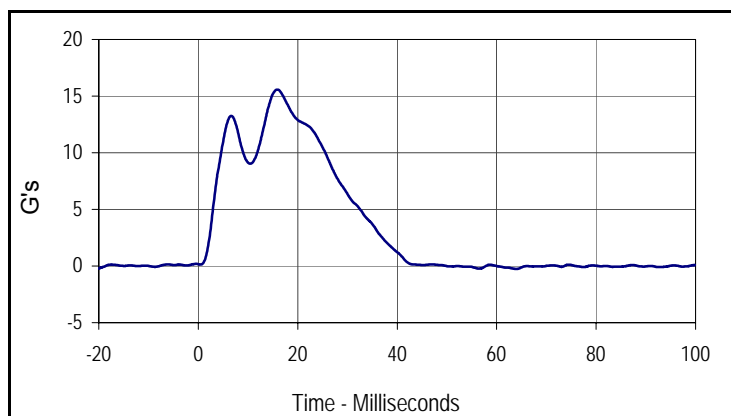
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	320	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	35.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	20.8	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	31.5	Pass
Impactor Velocity	m/s	4.20 to 4.40	4.37	Pass
Peak Shoulder Deflection	mm	28 to 37	30.1	Pass
Peak Lateral Spine Acceleration Y	G's	17 to 22	18.3	Pass
Peak Impactor Acceleration	G's	13 to 18	15.6	Pass
Overall Test Results				Pass



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
30.1	20.1	0.0	-17.6



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.3	10.5	-7.9	42.8



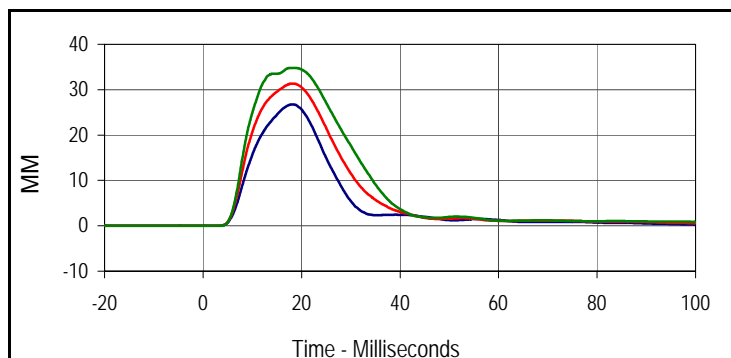
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.6	15.9	-0.3	64.0

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

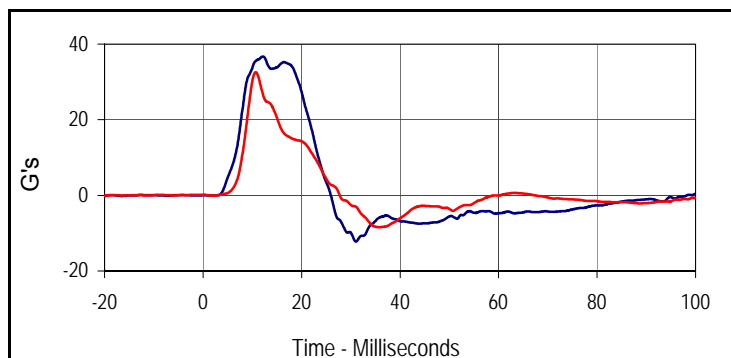
Test Date: 2/10/12
 Test I.D.: 299TWA034



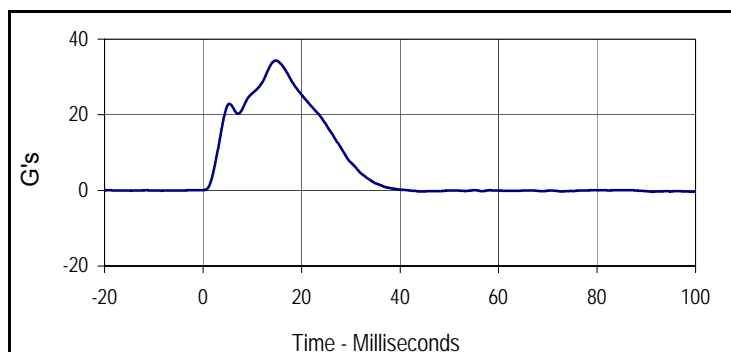
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	350	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	35.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.8	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.7	Pass
Peak Shoulder Deflection	mm	31 to 40	33.3	Pass
Peak Upper Thorax Rib Deflection	mm	25 to 32	26.7	Pass
Peak Middle Thorax Rib Deflection	mm	30 to 36	31.3	Pass
Peak Lower Thorax Rib Deflection	mm	32 to 38	34.8	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	36.7	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	32.6	Pass
Peak Impactor Acceleration	G's	30 to 36	34.3	Pass
Overall Test Results				Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
26.7	18.1	0.0	-5.7
Middle Thorax Deflection			
Max	Time	Min	Time
31.3	18.2	0.0	-6.0
Lower Thorax Deflection			
Max	Time	Min	Time
34.8	17.9	0.0	-6.1



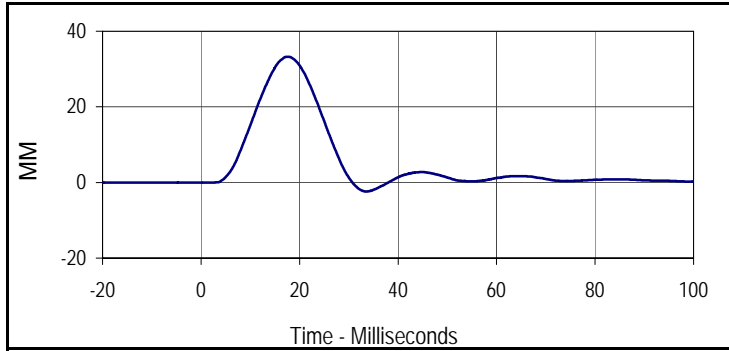
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
36.7	12.1	-12.2	31.0
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
32.6	10.7	-8.4	35.7



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
34.3	14.8	-0.4	99.5

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

Test Date: 2/10/12
 Test I.D.: 299TWA034



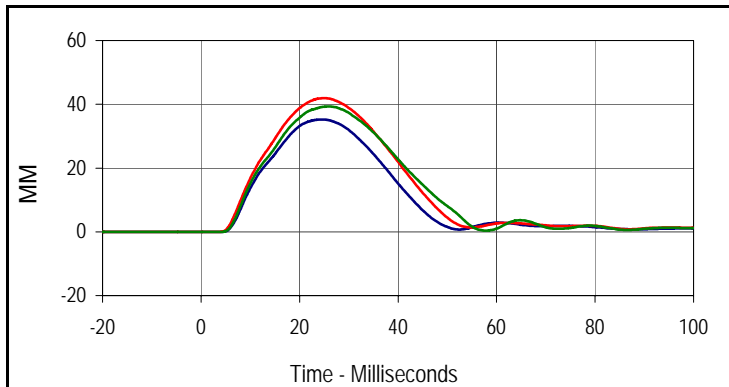
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
33.3	17.5	-2.4	33.5

Test Program: SID IIs Thorax without Arm Impact Test
 ATD Serial No.: 299

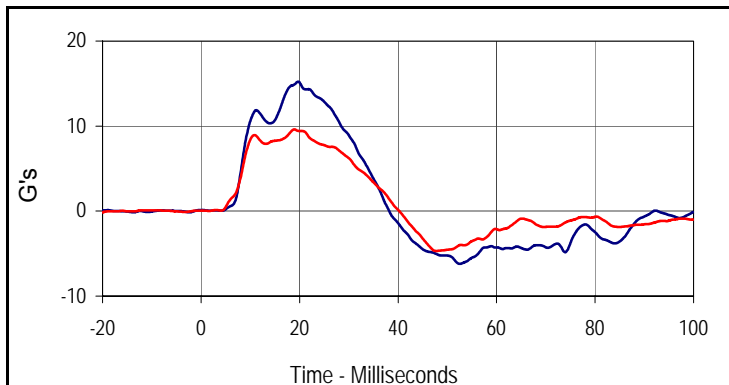
Test Date: 2/10/12
 Test I.D.: 299TWOA034



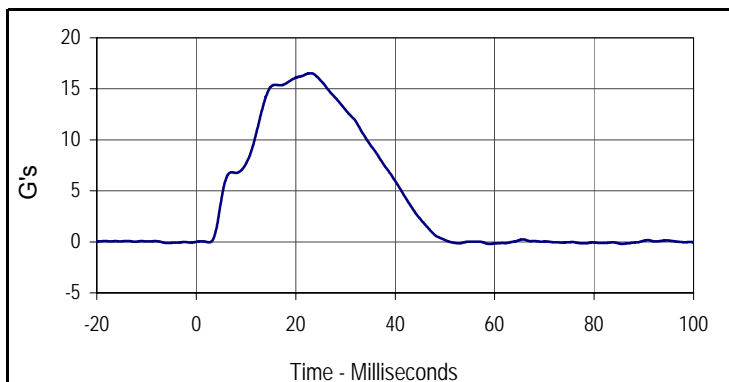
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	380	Pass
Temperature During Soak	Max	18.9 to 25.6	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	35.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.9	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.28	Pass
Peak Upper Thorax Rib Deflection	mm	32 to 40	35.2	Pass
Peak Middle Thorax Rib Deflection	mm	39 to 45	41.9	Pass
Peak Lower Thorax Rib Deflection	mm	35 to 43	39.4	Pass
Peak Upper Spine Y Acceleration	G's	13 to 17	15.2	Pass
Peak Lower Spine Y Acceleration	G's	7 to 11	9.6	Pass
Peak Impactor Acceleration	G's	14 to 18	16.5	Pass
Overall Test Results				Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
35.2	24.7	0.0	-3.5
Middle Thorax Deflection			
Max	Time	Min	Time
41.9	25.2	0.0	1.3
Lower Thorax Deflection			
Max	Time	Min	Time
39.4	25.9	0.0	3.5



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.2	19.7	-6.2	52.5
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.6	18.9	-4.7	47.8



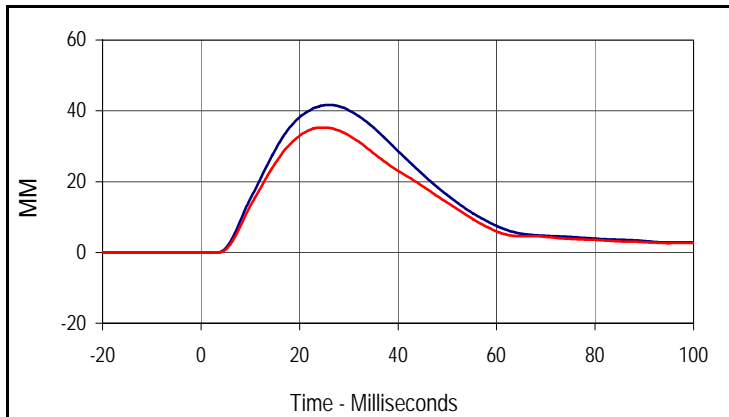
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.5	23.0	-0.2	0.0

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

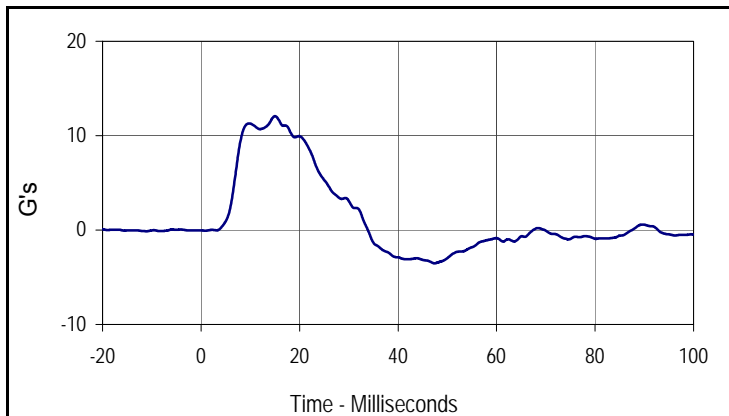
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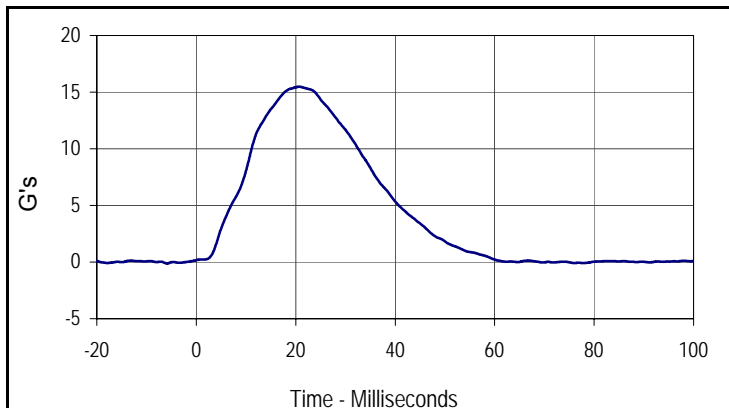
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	400	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	35.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	20.7	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	31.8	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Upper Abdominal Rib Deflection	mm	36 to 47	41.7	Pass
Peak Lower Abdominal Rib Deflection	mm	33 to 44	35.2	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	12.1	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
41.7	25.9	0.0	-17.7
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
35.2	24.4	0.0	-17.7



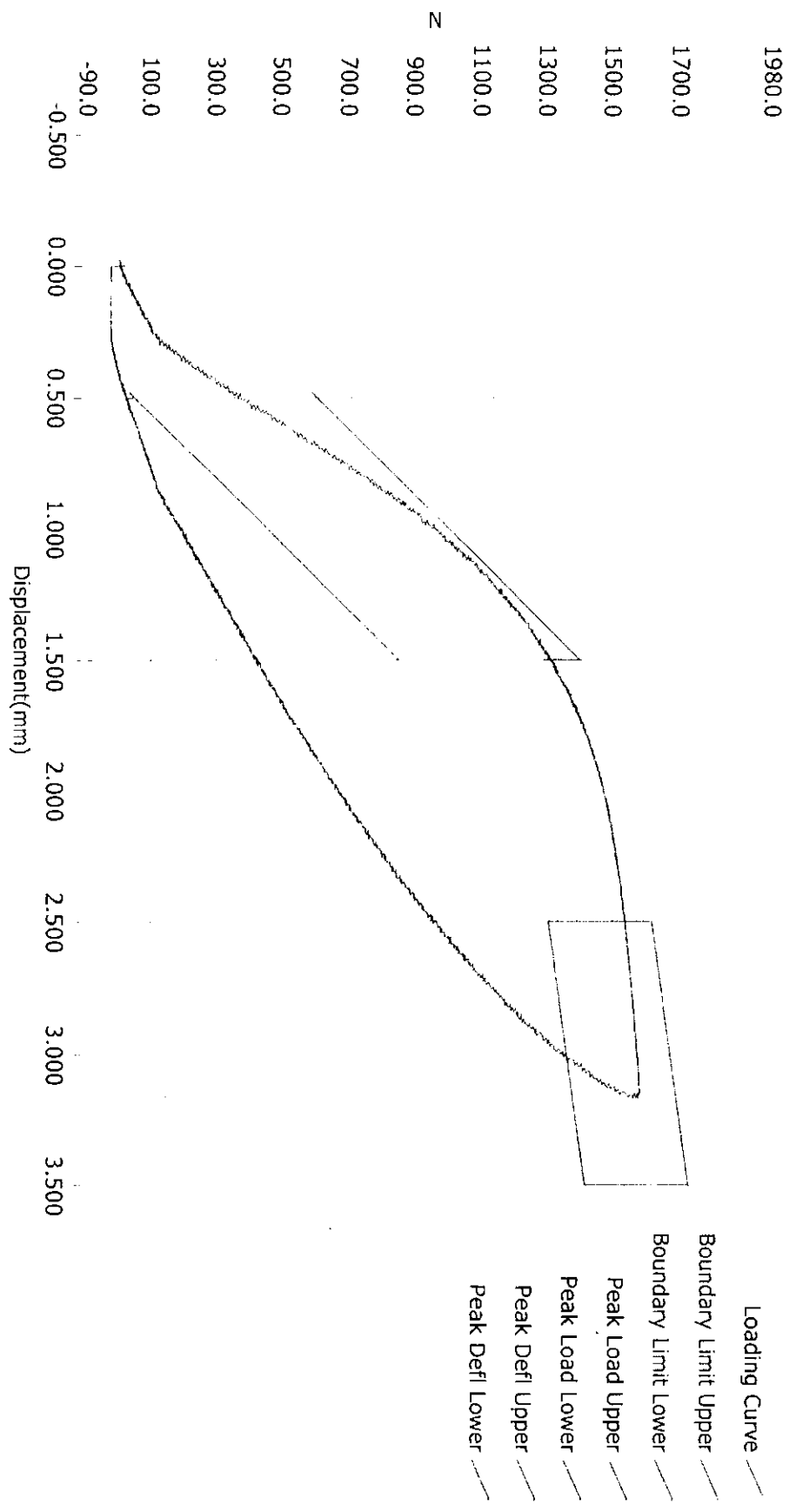
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
12.1	15.0	-3.5	47.4



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.5	20.7	-0.1	-5.9

MC0209 POST TEST

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
36746	SIDIIs		

Current Date : 10/5/2010

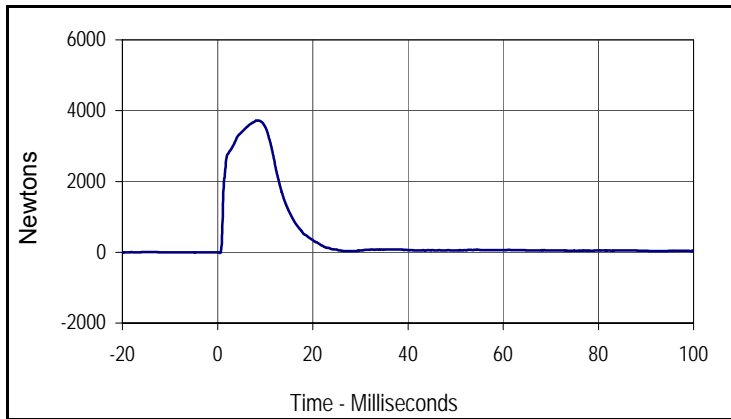
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Test Program: SID IIs Pelvis Acetabulum Impact Test
 ATD Serial No.: 299

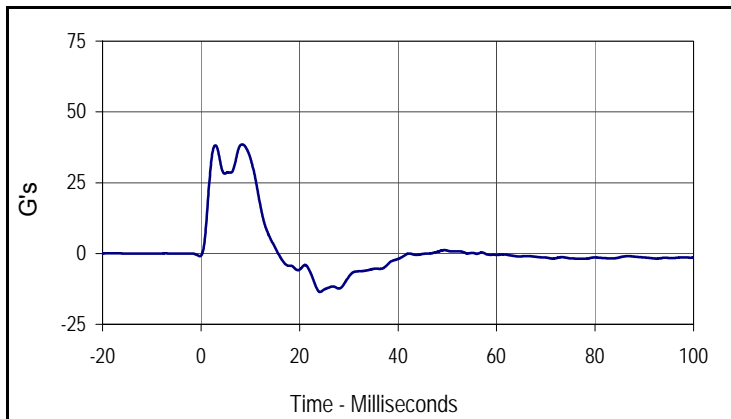
Test Date: 2/10/12
 Test I.D.: 299ACET034



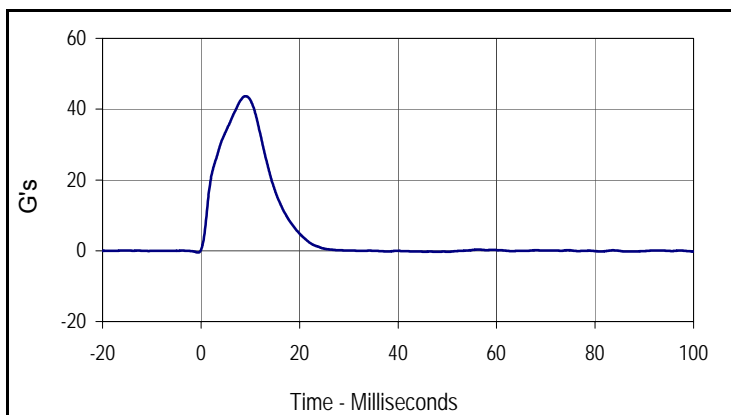
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	410	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	35.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	32.1	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.7	Pass
Peak Acetabulum Force Y	Newtons	3600 to 4300	3720.7	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	38.5	Pass
Peak Impactor Acceleration	G's	38 to 47	43.7	Pass
Overall Test Results				Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3720.7	8.4	-23.7	0.6



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
38.5	8.4	-13.6	24.1



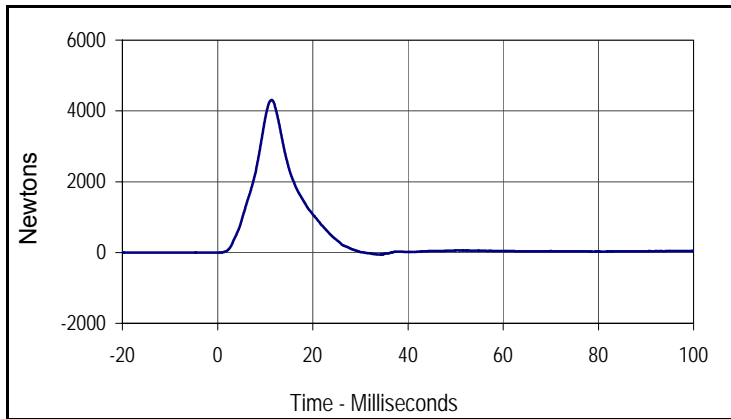
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
43.7	9.0	-0.5	-0.6

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

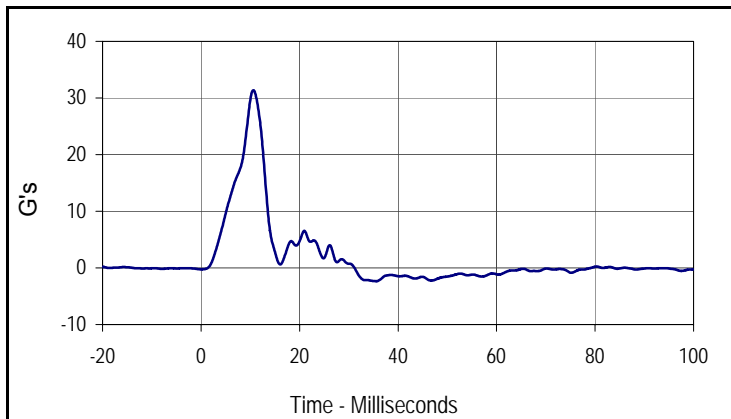
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 Test I.D.: 299PL034



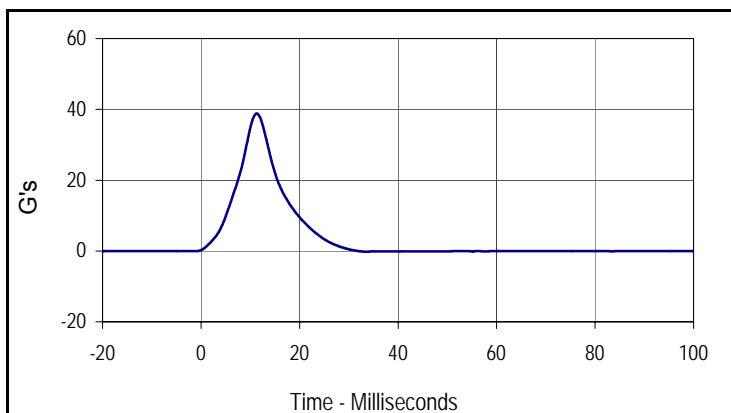
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	470	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	35.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	20.8	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.0	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Iliac Force	Newtons	4100 to 5100	4307.9	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	31.4	Pass
Peak Impactor Acceleration	G's	36 to 45	38.8	Pass
Overall Test Results				Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4307.9	11.3	-58.5	34.4



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
31.4	10.6	-2.3	35.6



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
38.8	11.3	-0.2	33.3

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (SID-IIs)

			SID-IIs S/N		
			Serial Number	Manufacturer	Calibration
Head Accelerometers			X		
			Y		
			Z		
Displacement Potentiometers	Shoulder		Y		
	Thoracic Rib	Upper	Y		
		Middle	Y		
		Lower	Y		
	Abdominal Rib	Upper	Y		
		Lower	Y		
Lower Spine Accelerometers (T12)			X		
			Y		
			Z		
Acetabulum Load Cell			Y		
Iliac Wing Load Cell			Y		
Pelvis Plug (Struck Side)					
Pelvis Plug (Non-Struck Side)					

TABLE 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X			
Vehicle Center of Gravity	Y			
Vehicle Center of Gravity	Z			
Left Floor Sill	Y			
A-Pillar Sill	Y			
A-Pillar Low	Y			
A-Pillar Mid	Y			
B-Pillar Sill	Y			
B-Pillar Low	Y			
B-Pillar Mid	Y			
Driver Seat	Y			
Engine Top	X			
Engine Top	Y			
Firewall	Y			
Right Roof	Y			
Right Floor Sill	Y			
Rear Floorpan	X			
Rear Floorpan	Y			

TABLE 3 – Pole Instrumentation

	Serial Number	Manufacturer	Calibration Date
Load Cell 1			
Load Cell 2			
Load Cell 3			
Load Cell 4			
Load Cell 5			
Load Cell 6			
Load Cell 7			
Load Cell 8			