REPORT NUMBER: SPNCAP-KAR-12-014

NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST

CHRYSLER GROUP LLC
2012 FIAT 500 3-DOOR HATCHBACK

NHTSA No: MC0327

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

NOVEMBER 24, 2011

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

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Approval Date: November 24, 2011

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 DOCUMENTATON PAGE

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4. Title and Subtitle	5. Report Date
Final Report of New Car Assessment Program Side Impact Pole Testing of 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327	November 24, 2011
	6. Performing Organization Code KAR
7. Authors Mr. Denver Schaffarzick, Project Engineer, KARCO Mr. Frank Richardson, Program Manager, KARCO	**8. Performing Organization Report No.** TR-P31007-05-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, Nov. 10 - Nov. 24, 2011
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15. Supplementary Notes

16. Abstract

A 32.2 km/h (20 mph) 75 deg. oblique impact Side NCAP Test was conducted on the subject 2012 Fiat 500 3-door hatchback 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 November 10, 2011.

The impact velocity was 32.1 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 13.3 deg. C. The target vehicle's maximum post-test static crush was 354 mm located at level 2. The test vehicle's occupant performance data is as follows:

Measurement Description	Driver ATD (ES-2re)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})		1000	224.5
Resultant Lower Spine Acceleration	mm	82	54
Total Pelvic Force (Sum of Acetubular and Iliac Forces)	N	5525	4906
Maximum Thoracic Rib Deflection	N	38	36
Maximum Abdominal Rib Deflection	mm	45	21

The door on the struck side of the vehicle did not separate from the body at the hinges or latches, and the opposite door 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 Reference Division 1200 New Jersey Ave., SE Room W43-410 Washington, DC 20590

19. Security Classification of this report	20. Security Classification of this page	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	101	

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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 in a 2012 Fiat 500 3-door hatchback. 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 Fiat 500 3-door hatchback. The subject vehicle was towed into the rigid pole at an angle of 74.4° and a velocity of 32.1 km/h. The test was conducted by KARCO Engineering, LLC. in Adelanto, California, on November 10, 2011. 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	224.5
Lower Spine (T12) Resultant Acceleration	g	82	54
Total Pelvic Force (sum of acetabular and iliac forces	N	5525	4906
Maximum Thoracic Rib Deflection	mm	38*	36
Maximum Abdominal Rib Deflection	mm	45*	21

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

GENERAL COMMENTS

The door on the struck side of the vehicle remained closed and latched. There was no separation at the hinges or latches. The door on the non-struck side remained closed and latched. There were no ATD values that exceeded limits.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11

CONVERSION FACTORS

Quantity	Typical Application	Std Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	miles/hr	km/hr	1.609344
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.573
Pressure	Tire Pressures	lbf/in^2	kPa	7.0
Temperature	General Use	^oF	^oC	=(tf -32)/1.8
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf/ft	Nm	1.355

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	MC0327
Model Year	2012
Make	Fiat
Model	500
Body Style	3-Door Hatchback
VIN	3C3CFFAR6CT119548
Body Color	Grigio
Odometer Reading (km / mi)	58 / 36
Engine Displacement (L)	1.4
Type / No. of Cylinders	Inline 4
Engine Placement	Transverse
Transmission Type	Manual
Transmission Speeds	5
Overdrive	Yes
Final Drive	Front
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	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 Pretensione	No
Driver Load Limiter	Yes
Rear Pass. Load Limiter	No
Other Safety Restraint	Active Headrestraint

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Chrysler Group LLC
Date of Manufacture	May-11
Vehicle Type	Passenger

GVWR (kg)	1497
GAWR Front (kg)	850
GAWR Rear (kg)	810

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	2		4	
Capacity Weight (VCW) (kg)				340.0	*A*
DSC x 68.04 (kg)				272.2	*B*
Cargo Weight (RCLW) (kg)				67.8	*A-B*

VEHICLE SEAT TYPE

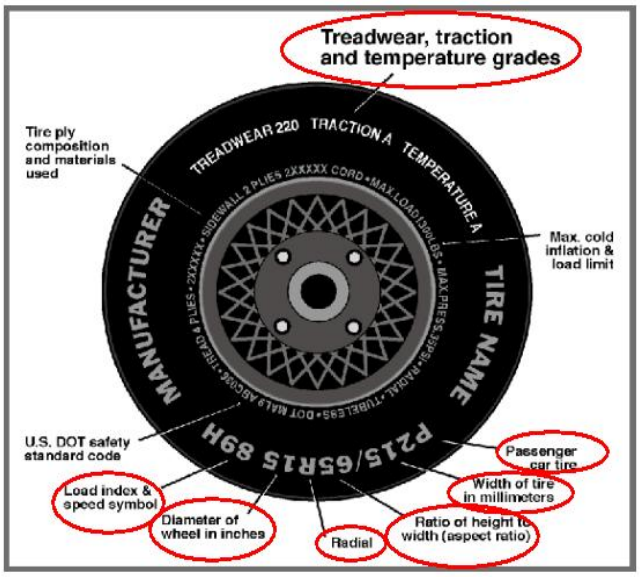
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable w/ Lever	Adjustable w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat		Yes			Yes		
Third Row Seat							

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	230	210
Recommended Tire Size	185/55R15	185/55R15

VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	350	350
Tire Size on Vehicle	185/55R15	185/55R15
Tire Manufacturer	Continental	Continental
Tire Name	ContiPro Contact	ContiPro Contact
Tire Type	Passenger	Passenger
Tire Width	185	185
Aspect Ratio	55	55
Radial	Yes	Yes
Wheel Diameter	15	15
Load Index/Speed Symbol	82H	82H
Treadware	500	500
Traction Grade	AA	AA
Temperature Grade	A	A
Tire Material	Polyester, Steel, Polyamide	Polyester, Steel, Polyamide

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	220	220	210	230
Tire Placard	kPa	230	230	210	210
Owner's Manual	kPa	230	230	210	210
As Tested	kPa	230	230	210	210

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	354.5	196.0		373.5	241.5		369.5	251.5	
Right	kg	326.5	194.5		342.0	225.5		331.5	235.5	
Ratio	%	63.6%	36.4%	100.0%	60.5%	39.5%	100.0%	59.0%	41.0%	100.0%
Total	kg	681.0	390.5	1071.5	715.5	467.0	1182.5	701.0	487.0	1188.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1071.5	A
Actual Weight of 1 P572 O ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	67.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1188.3	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 kg)? ☒ **Yes** ☐ **No**

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Rear Trim Panel	2.5
Non-Struck Side Door Window	3.0
Door Panel and Trim	6.0
Wheel Covers	2.0
Door Speaker	0.5
Outboard Mirror	1.0
Tire Pump	2.5
Non-Struck Side Rear Window	1.5
Ballast / Equipment Added	71.5

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	°	-0.6	-0.2	0.0	Yes
Front Passenger Sill Angle (front-to-rear)*	°	-0.3	-0.4	-0.4	Yes
Front Bumper-Line Angle (left-to-right)**	°	0.0	0.0	0.0	Yes
Rear Bumper-Line Angle (left-to-right)**	°	-0.4	-0.2	-0.1	Yes
Vehicle CG (Aft of Front Axle)	mm	840	910	945	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	19	28	32	

*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 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11

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	4.1	0.0	2.0
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat			

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	2.0	589	Max	584	587	589
			Mid	584	587	589
			Min	584	587	589
Front Passenger Seat	Fixed	585	Max	580	583	585
			Mid	580	583	585
			Min	580	583	585
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			Max			
			Mid			
			Min			

DATA SHEET NO. 2 … (CONTINUED)

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

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

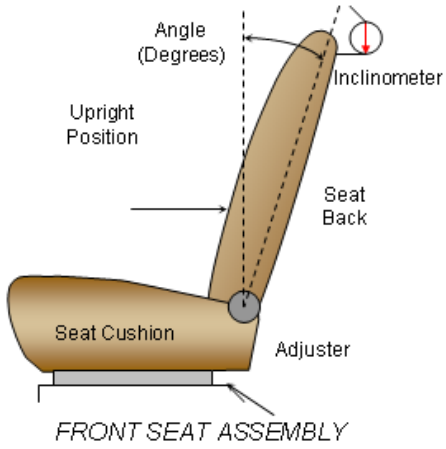
Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11

SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	211	22	0	0
Front Passenger Seat	211	22	0	0
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat				

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	41.4	23	11.0	0
Front Passenger Seat	39.7	23	11.0	0
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				

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1.

	Total No. of Positions	Placed in Position
Driver Seat	Fixed	Fixed

DATA SHEET NO. 2 … (CONTINUED)

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

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11

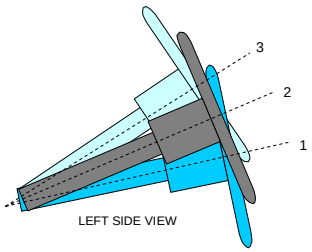
HEAD RESTRAINT ADJUSTMENT

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	4 Vertical	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.

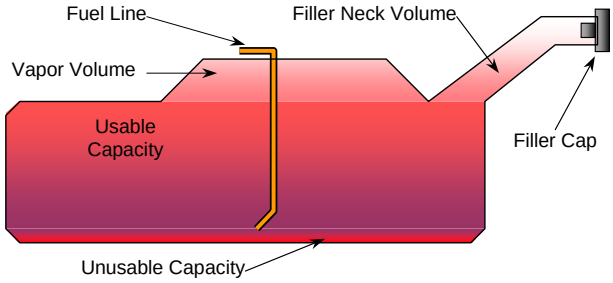


STEERING COLUMN ASSEMBLY

	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	23.7	0
Geometric Center - Position 2	26.2	0
Uppermost - Position 3	28.7	0
Telescoping Steering Wheel Travel		0
Test Position	26.2	0

FUEL PUMP

The vehicle is equipped with an electric fuel pump. The fuel pump will pump fuel when the ignition key is turned to the "on" position.



VEHICLE FUEL TANK ASSEMBLY

DATA SHEET NO. 2 … (CONTINUED)

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

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	40.12
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	37.32
Actual amount of Solvent Used in Test	37.32
1/3 of Usable Capacity	13.37

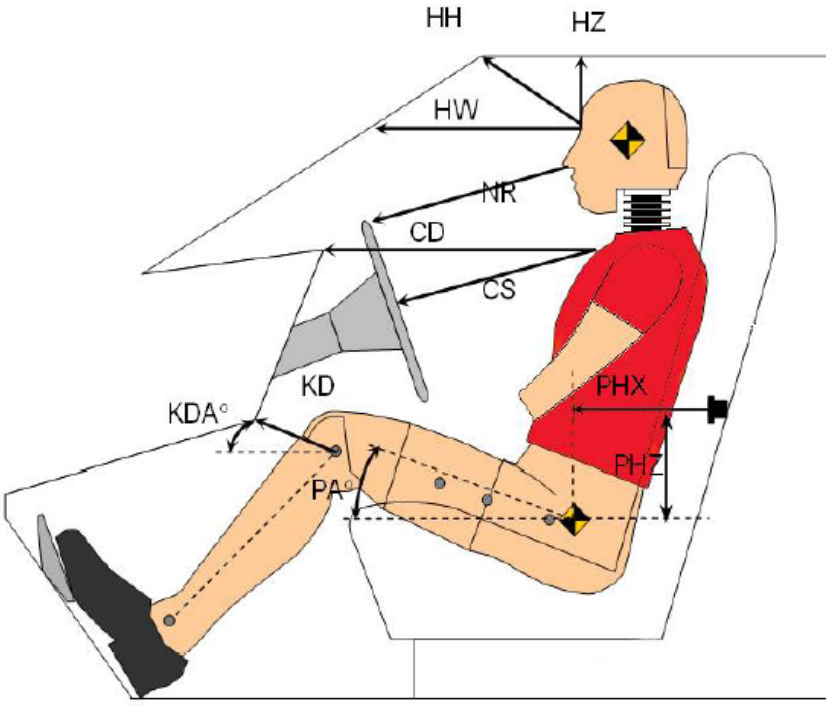
Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in the Form No. 1? ☒ **Yes** ☐ **No**

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11



DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

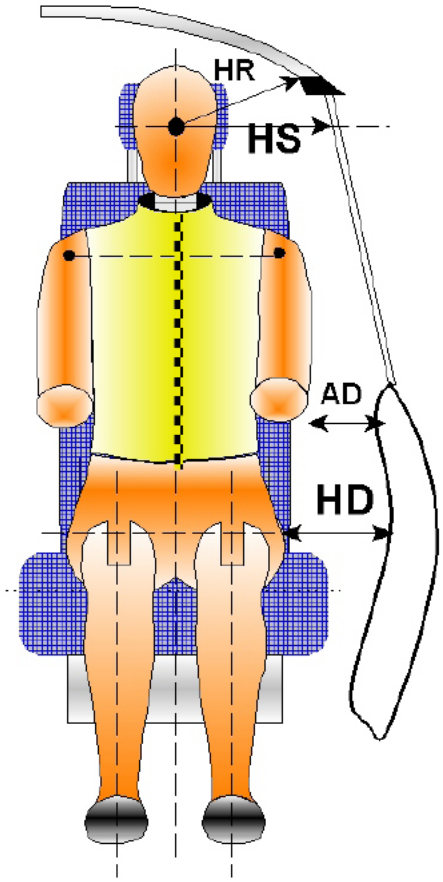
Driver Code	Description	Driver	
		Length (mm)	Angle (º)
HH	Head to Header	274	
HW	Head to Windshield	585	
HZ	Head to Roof	240	
NR	Nose to Rim	270	
CD	Chest to Dash	453	
CS	Chest to Steering Wheel	181	
KD(L)/KDA(L)°	Left Knee to Dash	121	33.3
KD(R)/KDA(R)°	Right Knee to Dash	50	
PAX°	Pelvic Tilt Angle (x-axis)		17.6
PAY°	Pelvic Tilt Angle (y-axis)		0.1
PHX	Hip Point to Striker (x-axis)	552	
PHZ	Hip Point to Striker (z-axis)	102	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11



DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

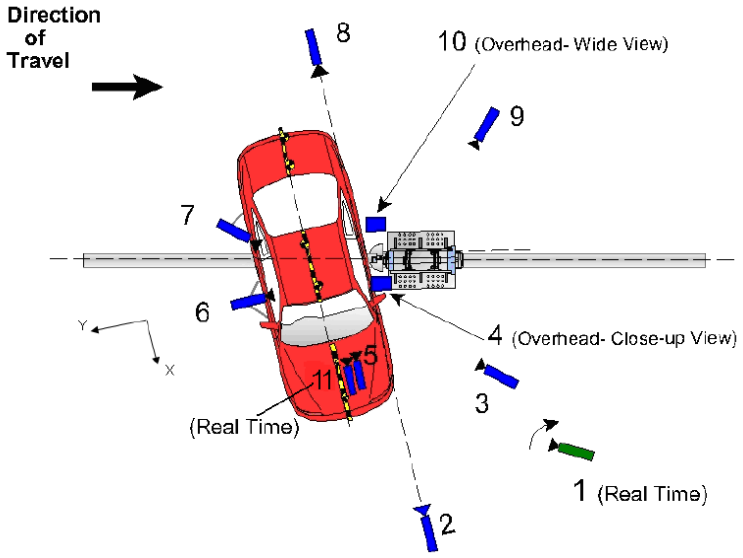
Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	216
HS	Head to Side Window	mm	303
AD	Arm to Door	mm	123
HD	H-Point to Door	mm	182

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11



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	1.02	0.44	-1.27	24	1000
6	On-Board - Dummy Side View	-0.01	1.42	-1.12	14	1000
7	On-Board - Dummy Rear Oblique View	-0.83	1.42	-1.18	14	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	1.02	0.47	-1.24		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

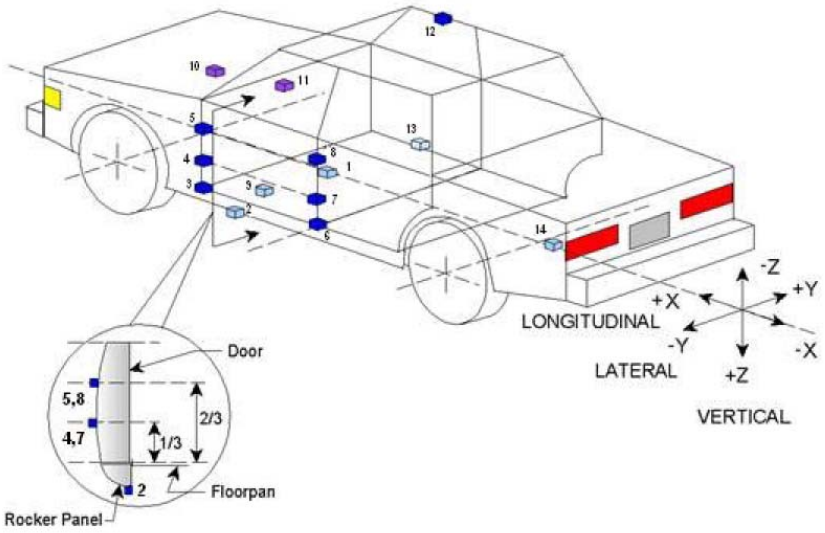
Driver Dummy Channels	16
Vehicle Structure Accelerometers	18
Pole Load Cells	8
Total	42

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1217	0	-315
2	Left Floor Sill	2259	-565	-180
3	A-Pillar Sill	2304	-703	-412
4	A-Pillar Low	2304	-703	-660
5	A-Pillar Mid	2304	-703	-815
6	B-Pillar Sill			
7	B-Pillar Low			
8	B-Pillar Mid			
9	Driver Seat Track	1605	-522	-367
10	Engine Top	2988	382	-722
11	Firewall	2671	217	-860
12	Right Roof	1447	480	-1480
13	Right Floor Sill	1322	635	-325
14	Rear Floorpan	235	-380	-498

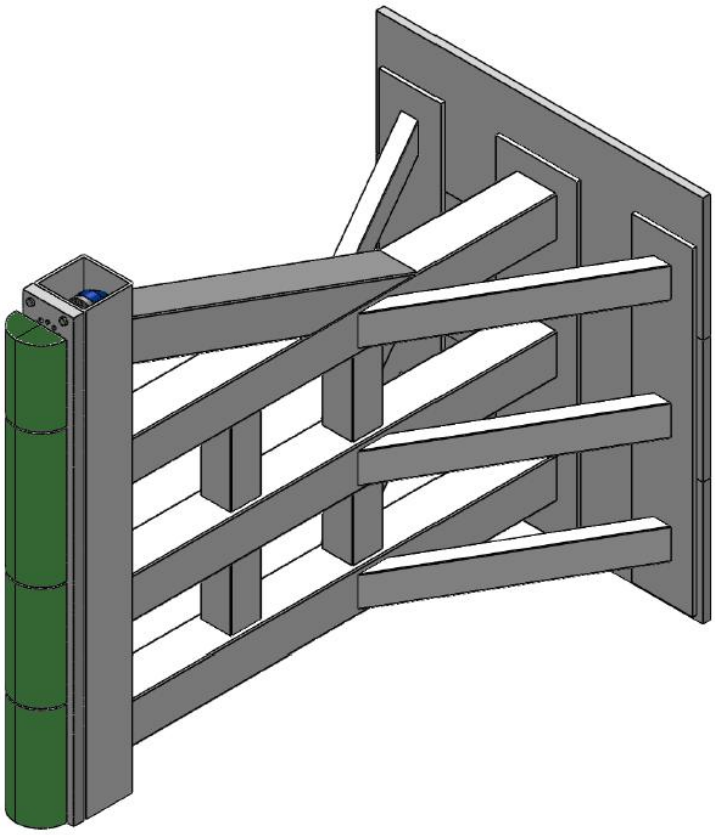
Reference: X – Rear surface of vehicle (+ forward)
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 7

RIGID POLE LOAD CELL DATA

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11



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 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11

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	Curtain Airbag, Side Airbag
Upper Torso	Side Airbag, Seat
Lower Torso	Side Airbag
Left Hip	Side Airbag, Door Panel
Left Knee	Door Panel

POST-TEST DOOR PERFORMANCE

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

DATA SHEET NO. 8 … (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11

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

IMPACT POINT LOCATION DATA

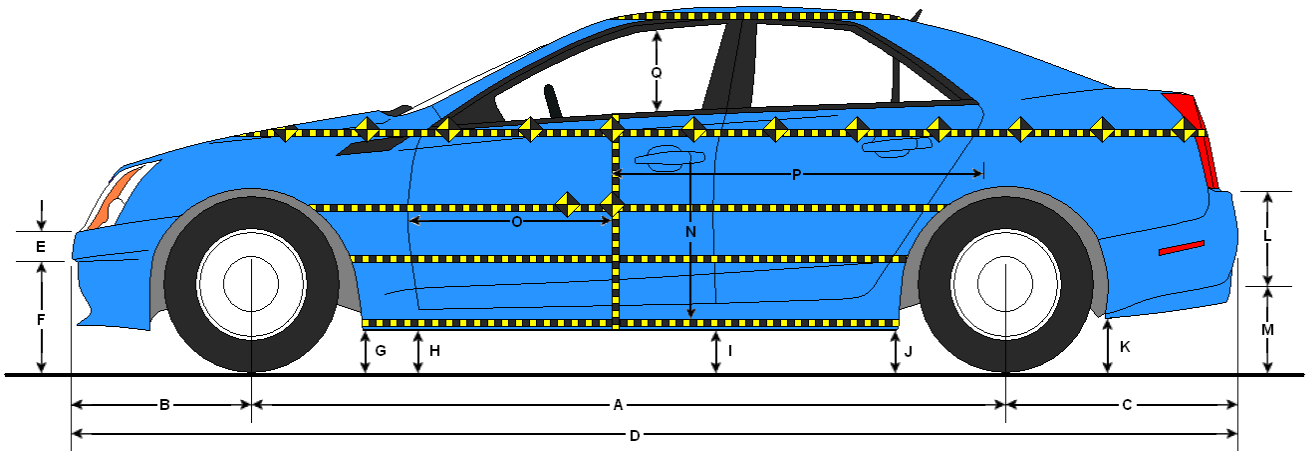
Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		984
Actual Impact Point (Aft of Front Axle)	mm		973
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	11
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	74.4
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.1
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.1

DATA SHEET NO. 9

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2305	2260	-45
B	Front Axle to FSOV	709	715	6
C	Rear Axle to RSOV	528	540	12
D	Total Length at Centerline	3488	3515	27
E	Front Bumper Thickness	283	282	-1
F	Front Bumper Bottom to Ground	221	252	31
G	Sill Height at Front Wheel Well	176	207	31
H	Sill Height at Front Door Leading Edge	185	213	28
I	Sill Height at B-Pillar	201	238	37
J1	Sill Height at Rear Wheel Well	196	244	48
J2	Pinch Weld Height at Rear Wheel Well	177	211	34
K	Sill Height Aft of Rear Wheel Well	326	363	37
L	Rear Bumper Thickness	343	344	1
M	Rear Bumper Bottom to Ground	285	315	30
N	Sill Height to Bottom of Front Window Sill	638	656	18
O	Front Door Leading Edge to Impact CL	570	504	-66
P	Rear Door Trailing Edge to Impact CL	1154	409	-745
Q	Front Window Opening	400	412	12
R	Right Side Length	2654	2663	9
S	Left Side Length	2650	2572	-78
T	Vehicle Width at B-Pillar	1583	1545	-38

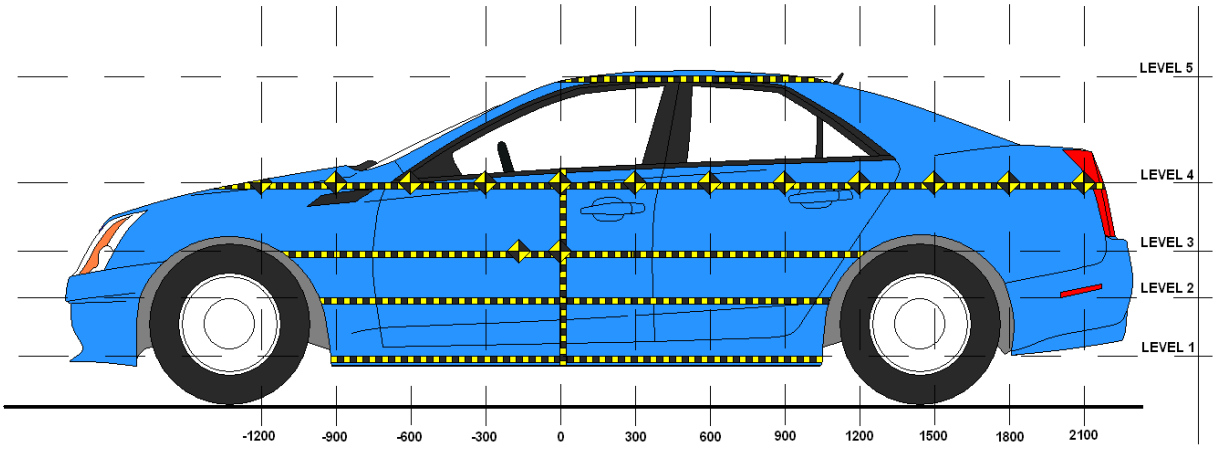
All measurements in mm with tolerance of ± 3mm

DATA SHEET NO. 10

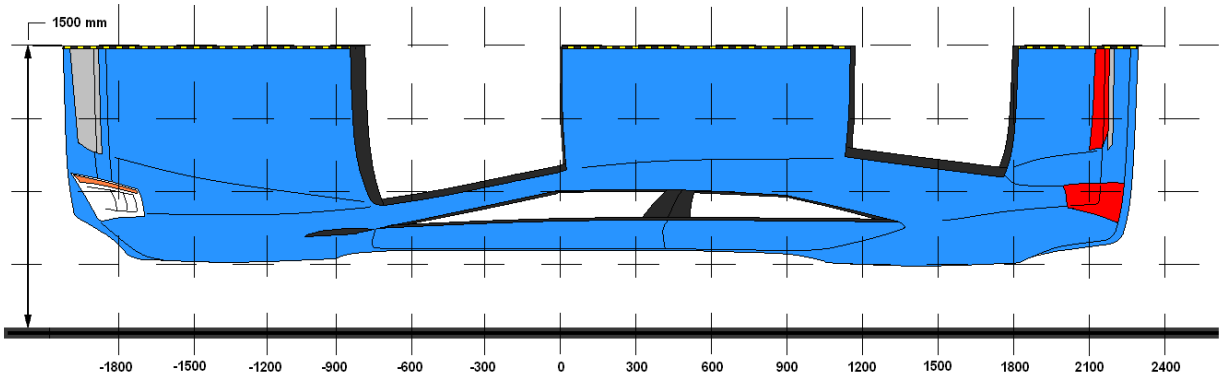
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11



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	255	285	0
2	Occupant H-Point	594	354	0
3	Mid-Door	687	353	0
4	Window Sill	937	295	150
5	Window Top	1423	161	0

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

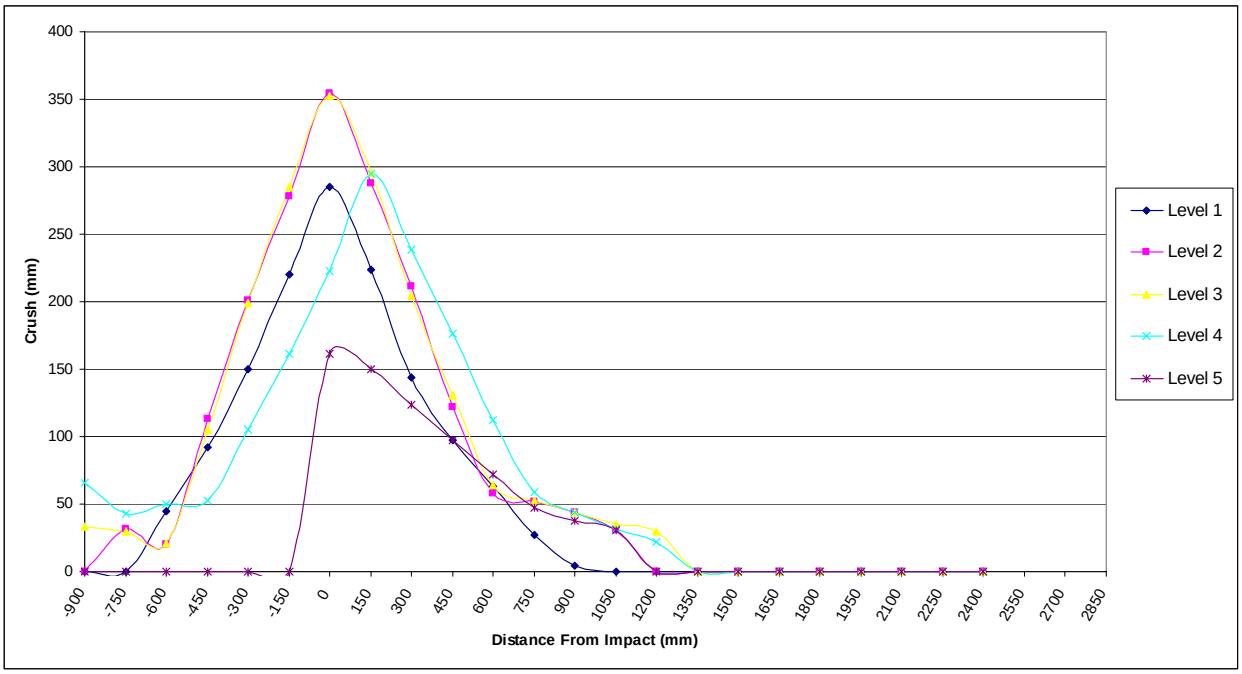
	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900			699	813				732	879				33	66	
-750		686	703	787			718	733	830			32	30	43	
-600	733	697	700	772		778	717	721	822		45	20	21	50	
-450	743	695	697	767		835	808	802	820		92	113	105	53	
-300	744	692	694	759		894	893	893	864		150	201	199	105	
-150	745	691	692	755		965	969	977	916		220	278	285	161	
0	747	690	691	753	947	1032	1044	1044	976	1108	285	354	353	223	161
150	748	692	692	752	947	972	980	988	1047	1097	224	288	296	295	150
300	749	694	694	754	950	893	905	898	993	1074	144	211	204	239	124
450	751	697	697	756	954	848	819	828	932	1051	97	122	131	176	97
600	751	701	702	760	959	814	759	766	872	1031	63	58	64	112	72
750	752	708	709	766	967	779	760	762	825	1014	27	52	53	59	47
900	749	714	717	775	979	753	758	761	819	1017	4	44	44	44	38
1050		695	717	787	1009		726	752	819	1040		31	35	32	31
1200			702	800				732	822				30	22	
1350															
1500															
1650															
1800															
1950															
2100															
2250															
2400															
2550															
2700															
2850															

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11



DATA SHEET NO. 11

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11

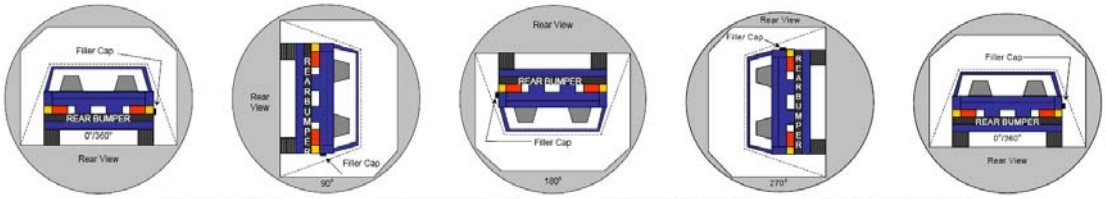
Temperature at Time of Impact: 13.3° C Test Time: 10:25 AM

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



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°	74	300	374
90° To 180°	78	300	378
180° To 270°	75	300	375
270° To 360°	82	300	382

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

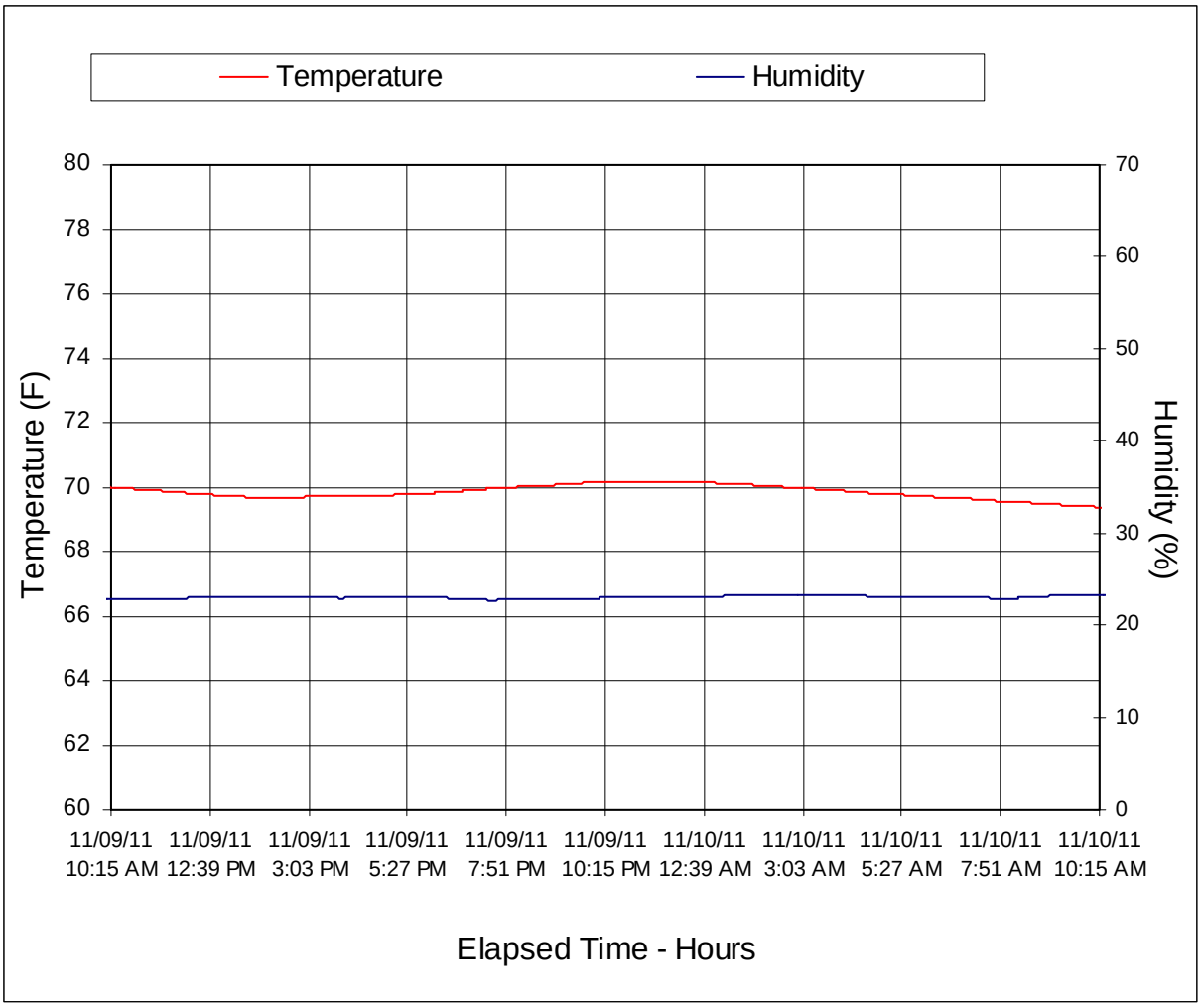
Test Phase	Spillage Location
0° To 90°	No Spillage Occurred
90° To 180°	No Spillage Occurred
180° To 270°	No Spillage Occurred
270° To 360°	No Spillage Occurred

DATA SHEET NO. 14

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2012 Fiat 500 3-Door Hatchback NHTSA No. MC0327

Test Program: NCAP Side Pole Impact Test Test Date: 11/10/11



APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS … (CONTINUED)

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

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

FIGURE 3. Pre-Test Frontal View of Test Vehicle

FIGURE 4. Post-Test Frontal View of Test Vehicle

FIGURE 5. Pre-Test Left Front Three-Quarter View of Test Vehicle

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

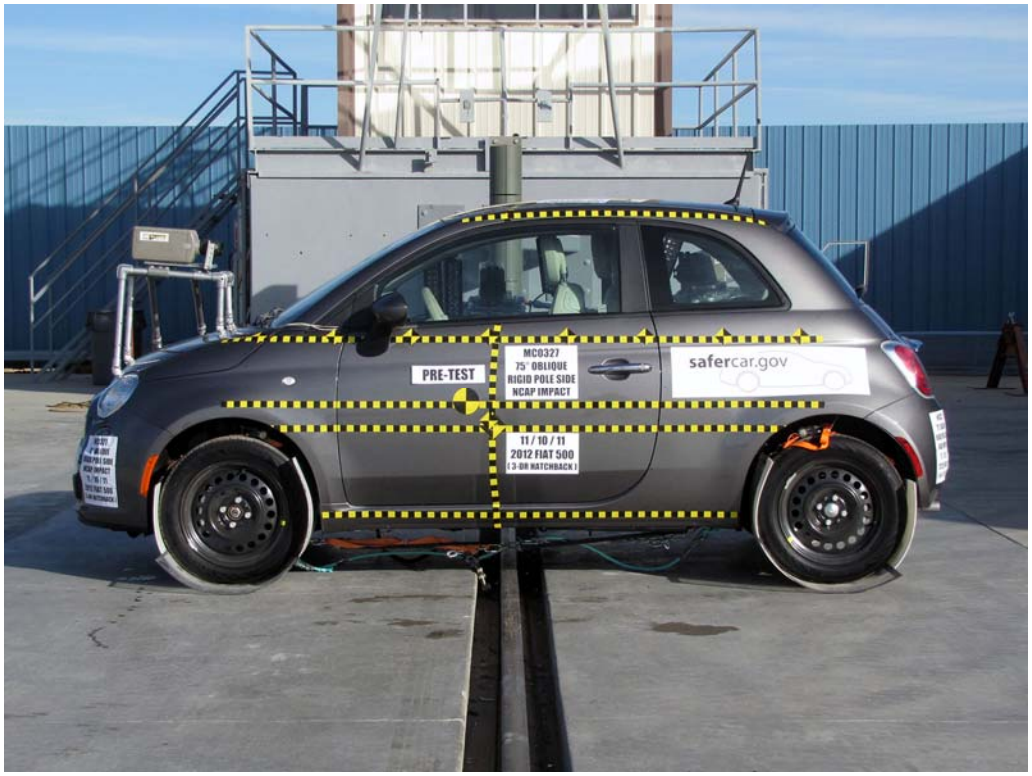


FIGURE 7. Pre-Test Left Side View of Test Vehicle

FIGURE 8. Post-Test Left Side View of Test Vehicle

FIGURE 9. Pre-Test Left Rear Three-Quarter View of Test Vehicle

FIGURE 10. Post-Test Left Rear Three-Quarter View of Test Vehicle

FIGURE 11. Pre-Test Rear View of Test Vehicle

FIGURE 12. Post-Test Rear View of Test Vehicle

FIGURE 13. Pre-Test Right Side View of Test Vehicle

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

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

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

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

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

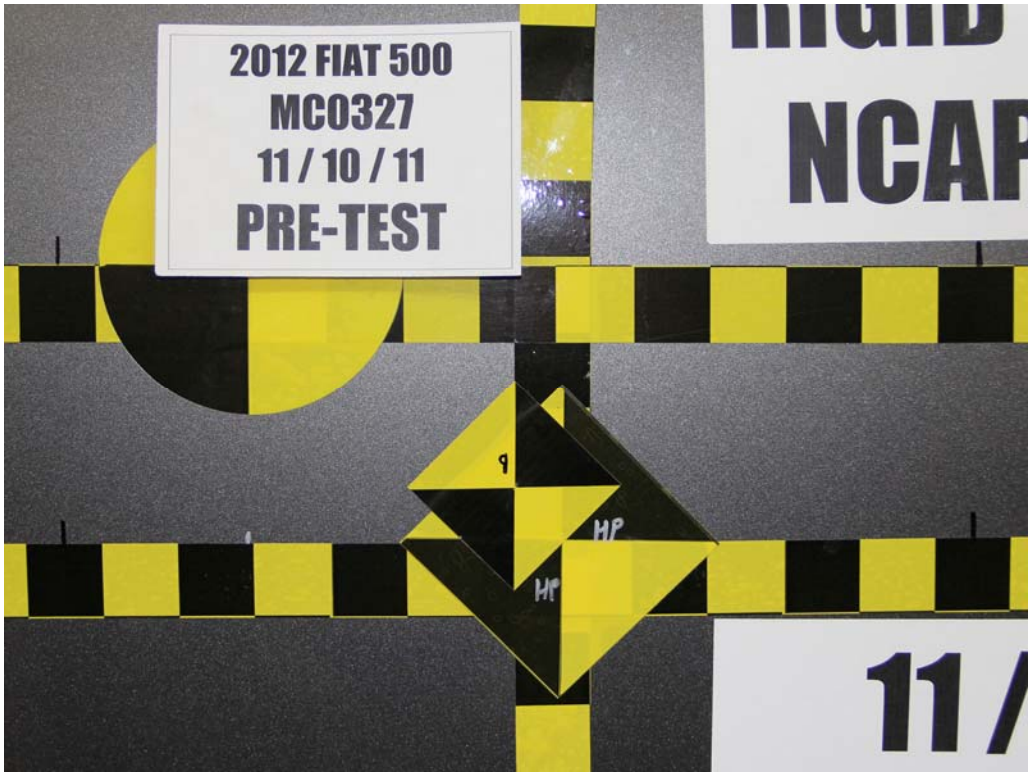


FIGURE 19. Pre-Test Close-Up View of Impact Point Target

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

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

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

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

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

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

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

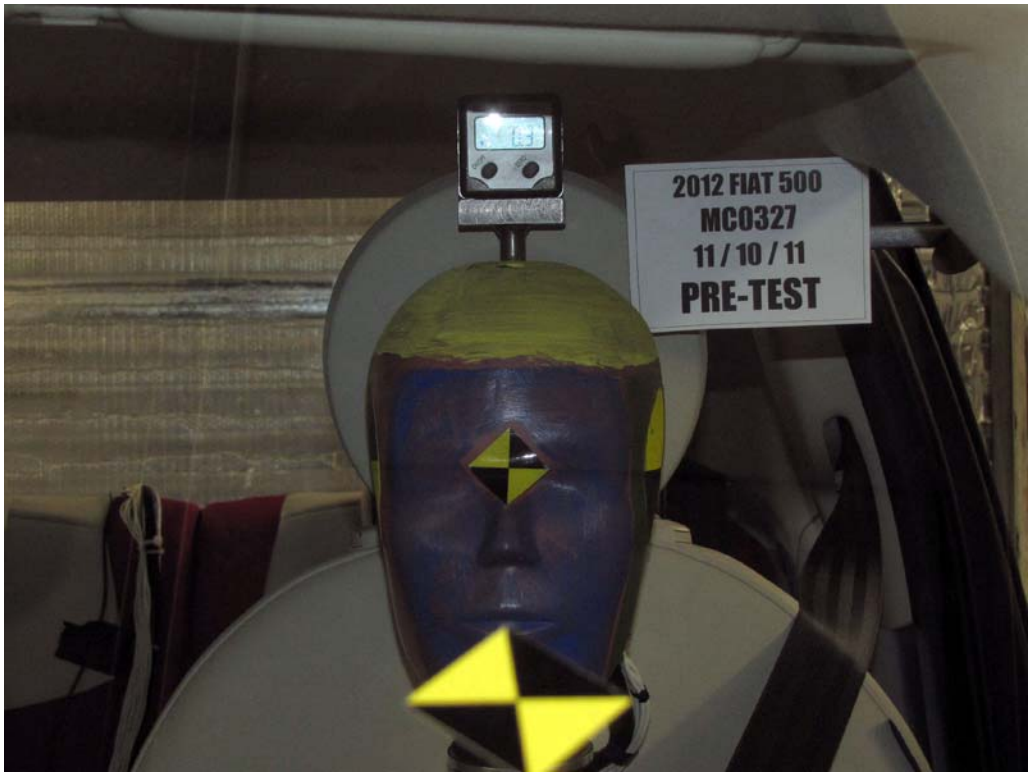


FIGURE 27. Pre-Test Frontal View of Dummy Head and Shoulders in Relation to Head Restraint

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

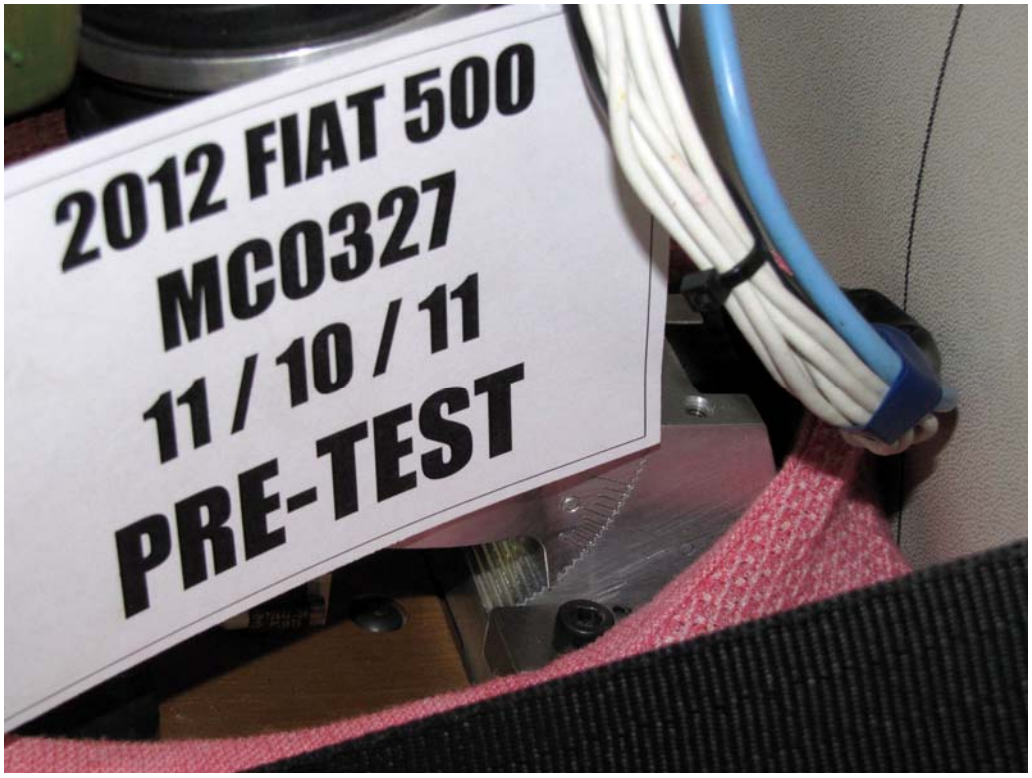


FIGURE 30. Pre-Test View of Dummy's Neck Showing Position of Adjustable Neck Bracket

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

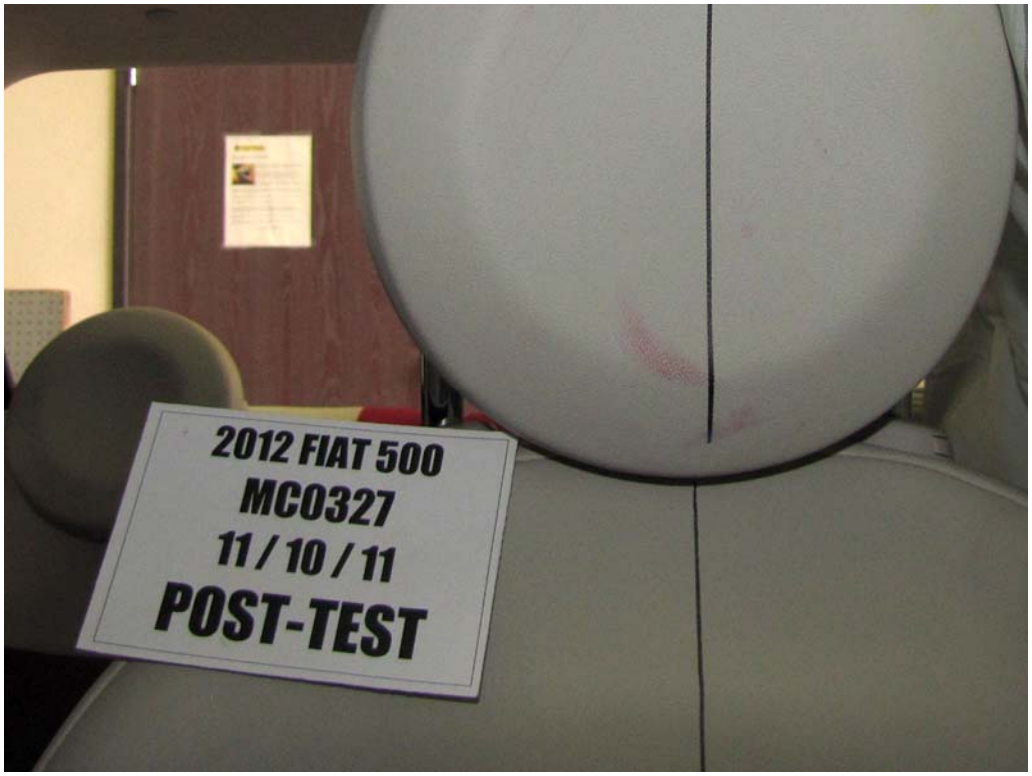


FIGURE 46. Post-Test Dummy Close-Up Head Contact with Vehicle Interior View

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

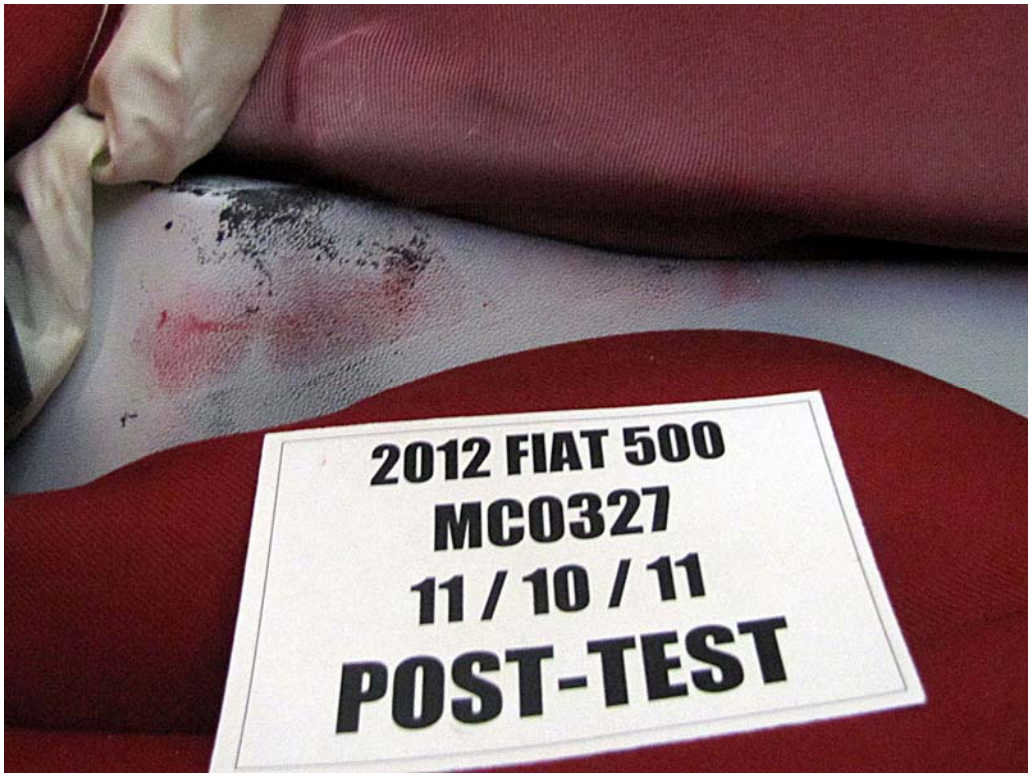


FIGURE 50. Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View

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

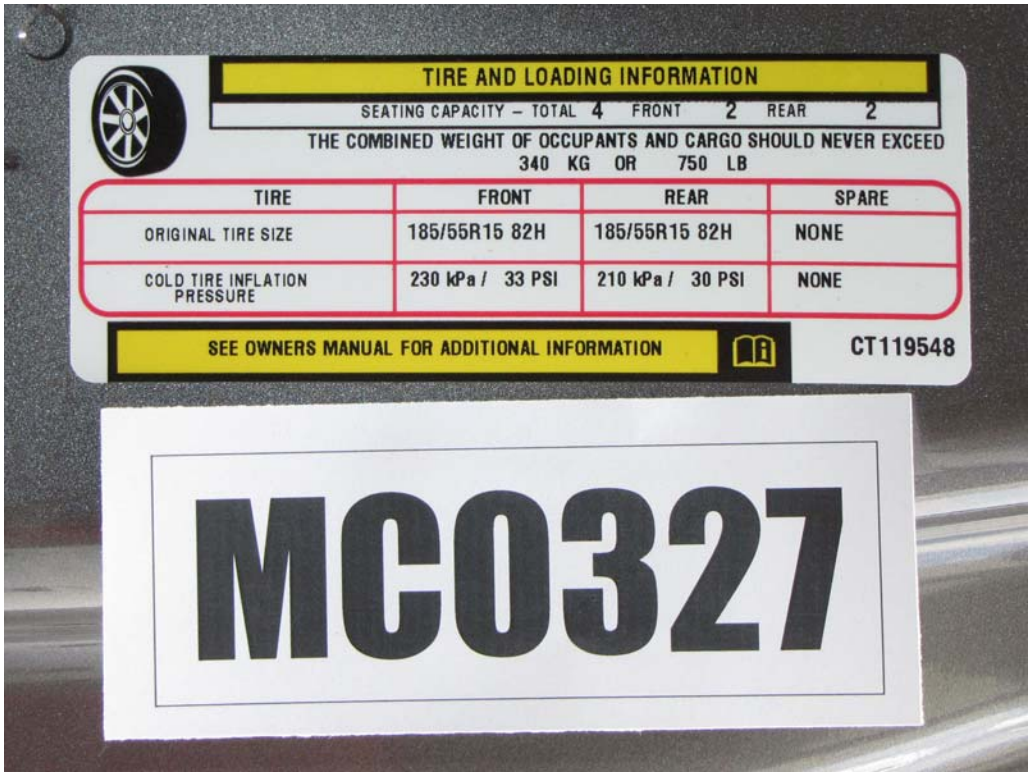


FIGURE 55. Close-Up View of Vehicle's Tire Information Placard

FIGURE 56. Pre-Test Pole Barrier Front View

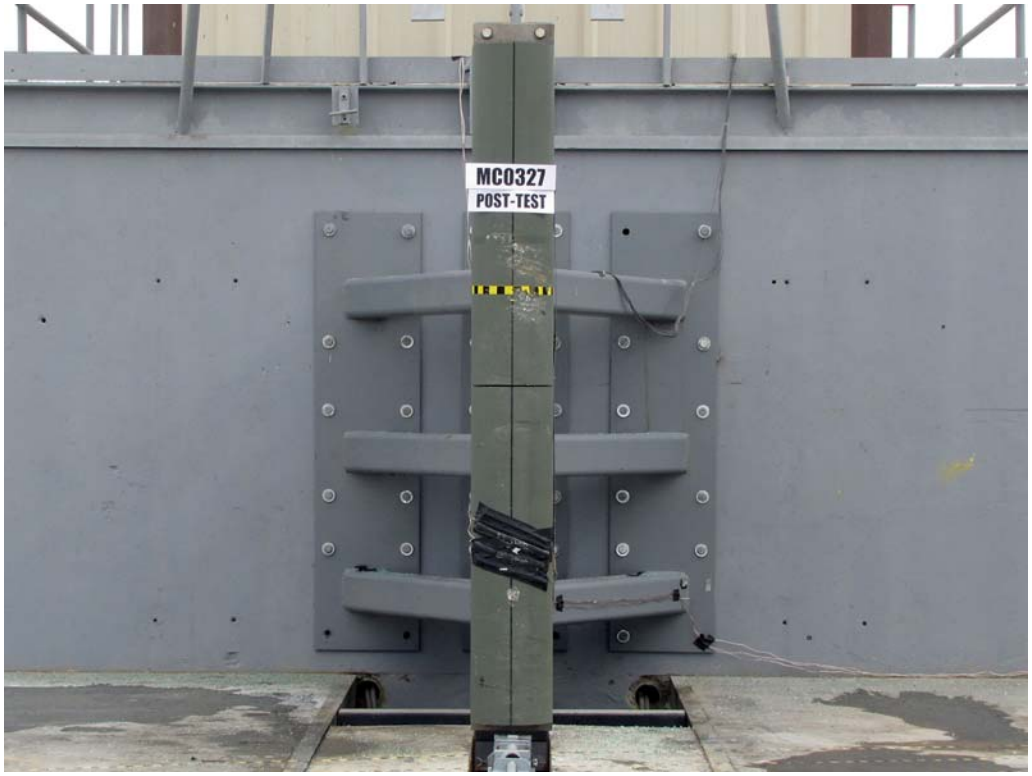


FIGURE 57. Post-Test Pole Barrier Front View

FIGURE 58. Pre-Test Pole Barrier Side View

FIGURE 59. Post-Test Pole Barrier Side View

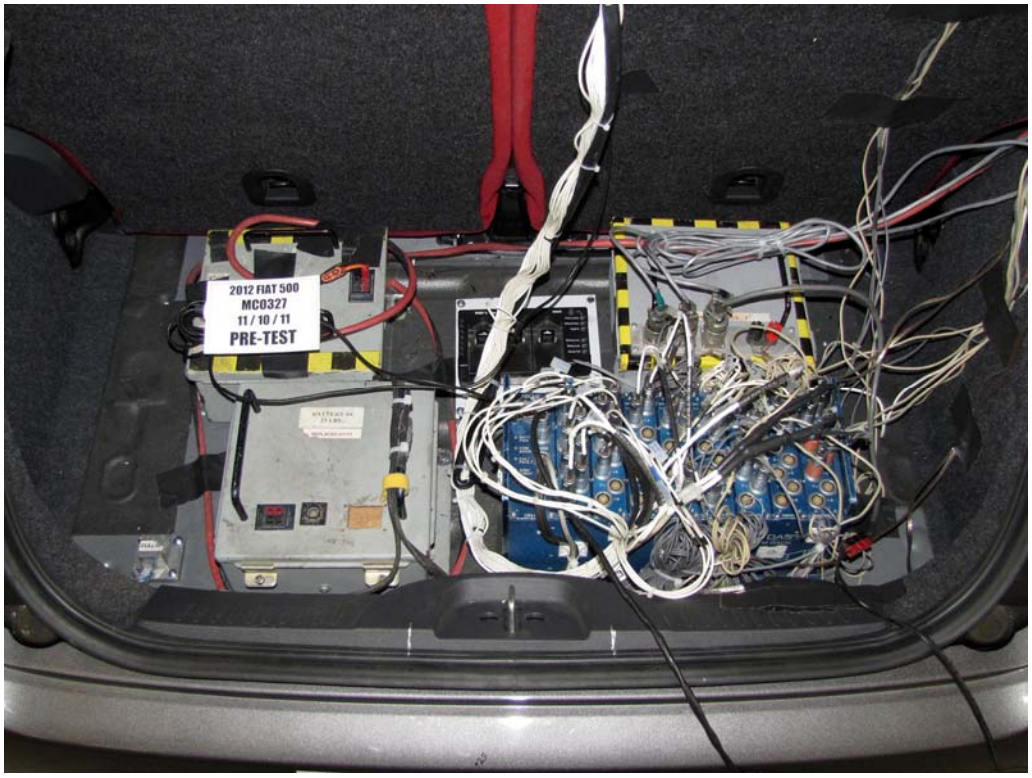


FIGURE 60. Pre-Test Ballast View

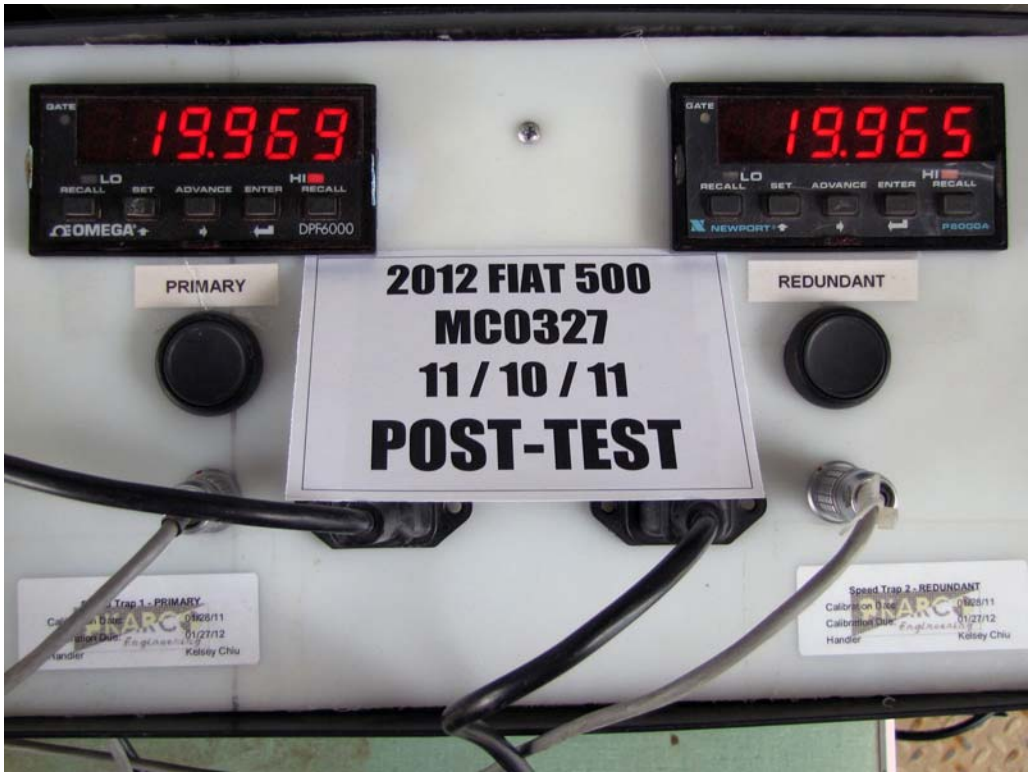


FIGURE 61. Post-Test Primary and Redundant Speed Trap Read-Out

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

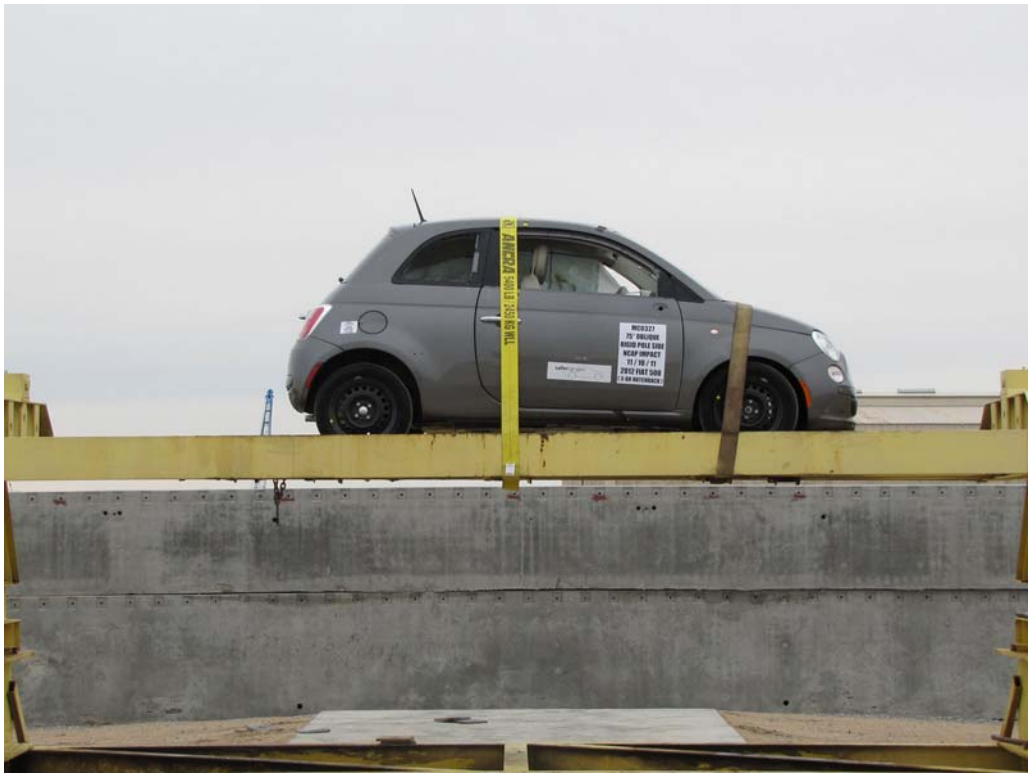


FIGURE 66. FMVSS No. 301-305 Rollover 360 Degrees

FIGURE 67. Impact Event

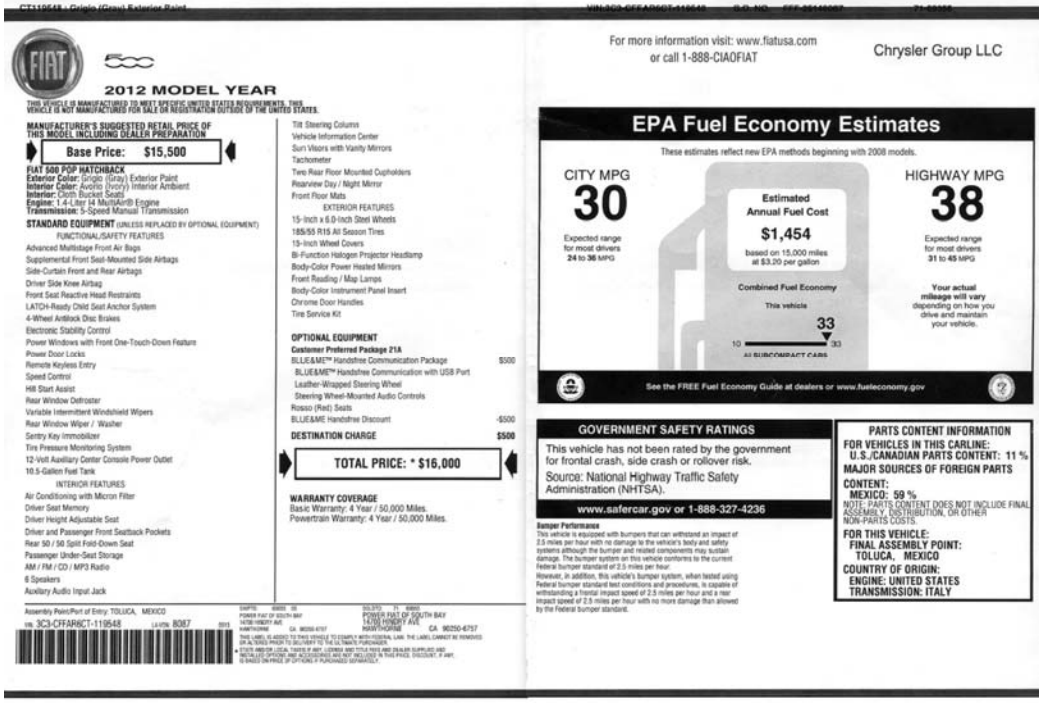


FIGURE 68. Monroney Label

Photograph Not Applicable

No Head Restraint Use and Adjustment Information in Vehicle's Owner's Manual

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

APPENDIX B
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)

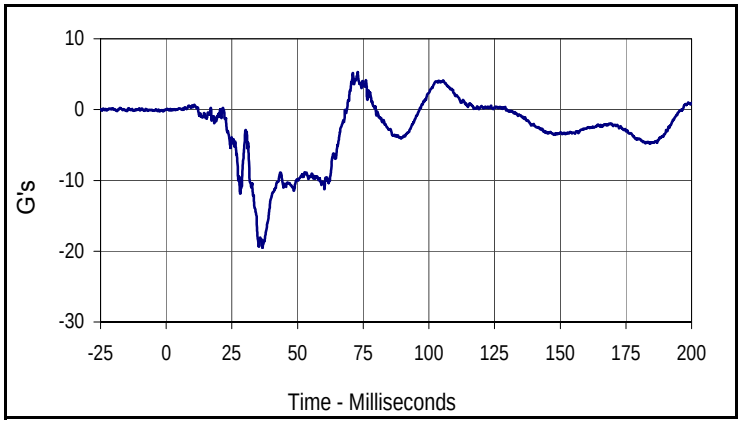
Load Cell Pole Barrier #5 Force (Y)

Load Cell Pole Barrier #6 Force (Y)

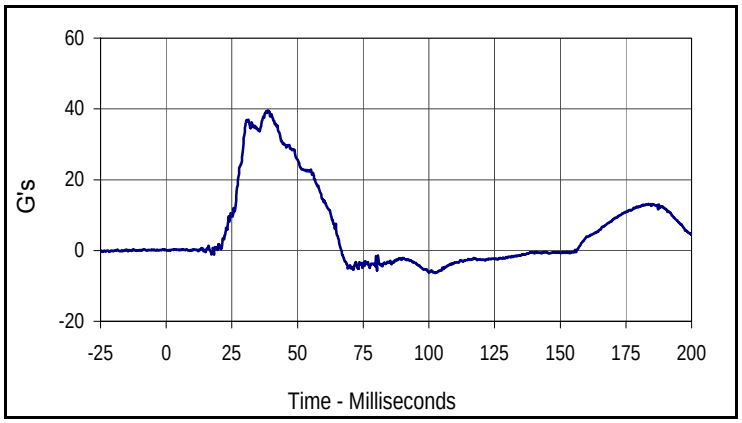
Load Cell Pole Barrier #7 Force (Y)

Load Cell Pole Barrier #8 Force (Y)

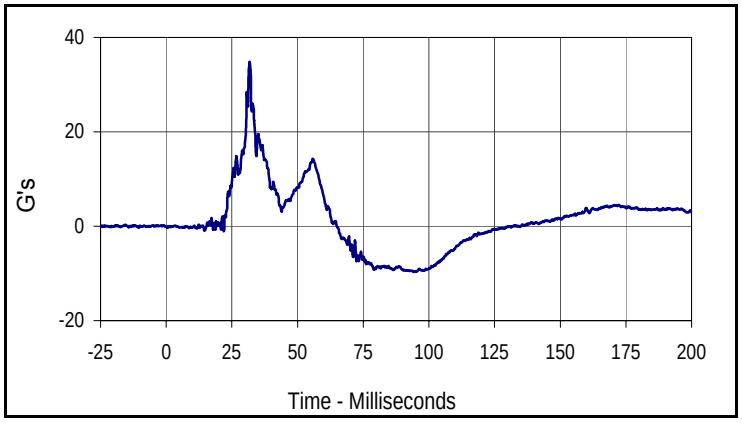
Test Vehicle:	2012 Fiat 500 3-Door Hatchback	Test Date:	11/10/11
Test Program:	32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test	NHTSA No.:	MC0327



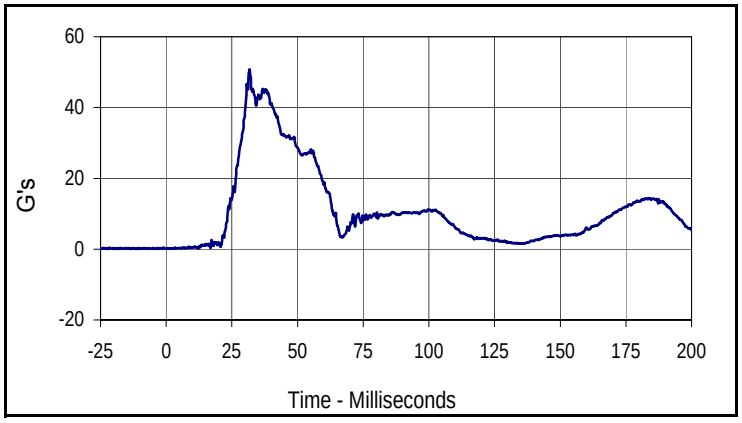
Curve Description			
Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
5.3	72.9	-19.5	36.7



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
39.6	38.8	-6.3	102.4

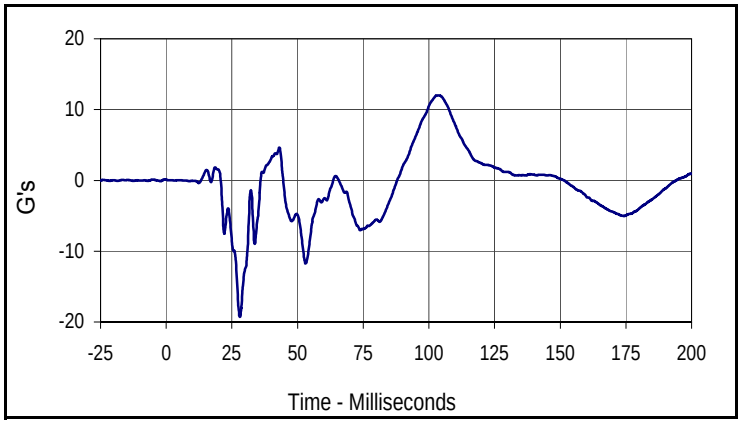


Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
34.8	31.8	-9.7	94.2

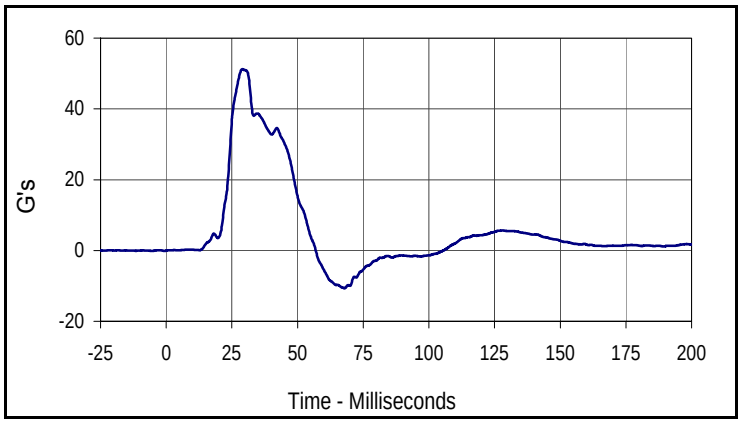


Curve Description			
Driver Head Acceleration Primary Res.			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
50.8	31.8	0.1	0.8

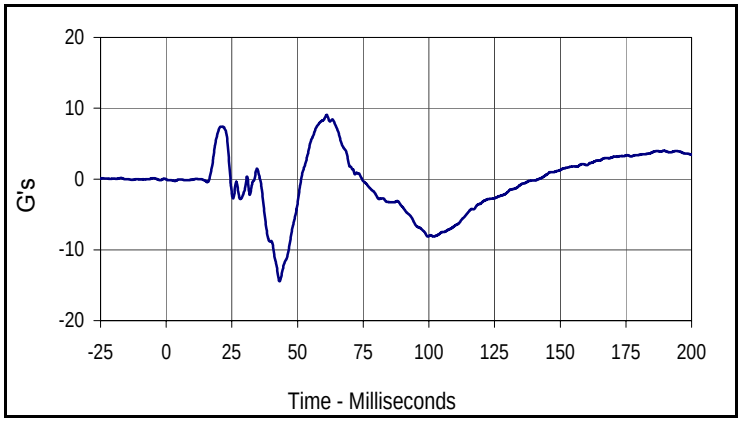
Test Vehicle:	2012 Fiat 500 3-Door Hatchback	Test Date:	11/10/11
Test Program:	32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test	NHTSA No.:	MC0327



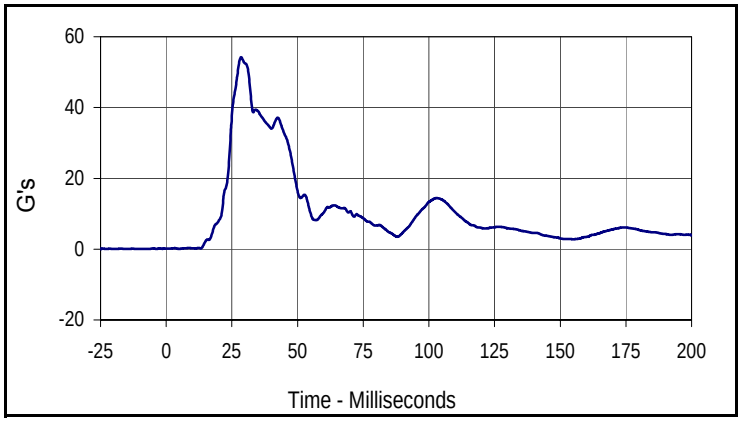
Curve Description			
Driver Lower Spine T12 Acceleration X			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
12.0	103.4	-19.3	28.1



Curve Description			
Driver Lower Spine T12 Acceleration Y			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
51.2	29.0	-10.7	67.8

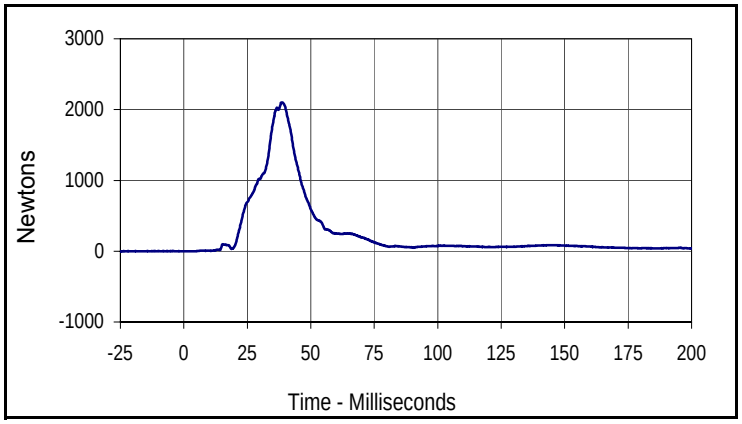


Curve Description			
Driver Lower Spine T12 Acceleration Z			
Plot No.	Type	SAE Class	Units
007	FIL	180	G's
Max	Time	Min	Time
9.0	61.1	-14.5	43.2

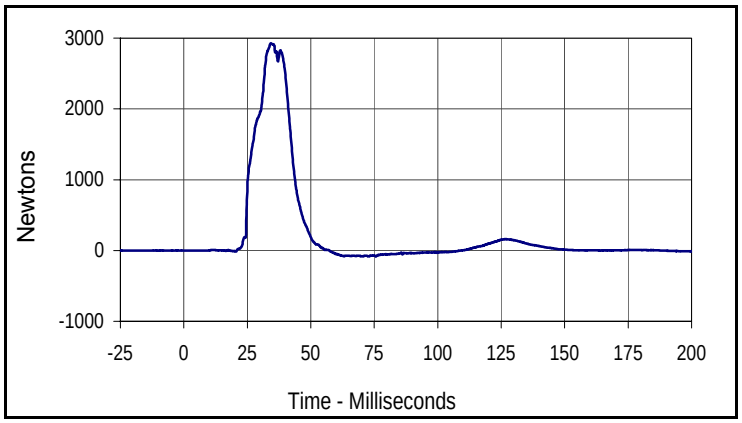


Curve Description			
Driver Lower Spine T12 Acceleration Res.			
Plot No.	Type	SAE Class	Units
008	RES	180	G's
Max	Time	Min	Time
54.2	28.5	0.1	4.8

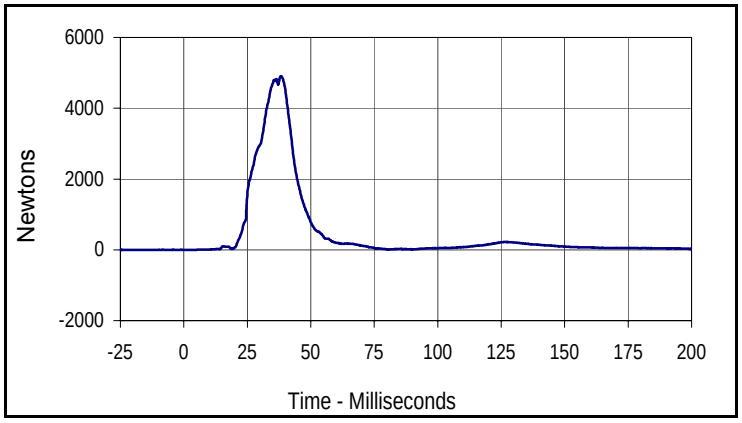
Test Vehicle:	2012 Fiat 500 3-Door Hatchback	Test Date:	11/10/11
Test Program:	32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test	NHTSA No.:	MC0327



Curve Description			
Driver Iliac Wing Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
009	FIL	600	Newtons
Max	Time	Min	Time
2102.4	38.7	-1.9	2.8



Curve Description			
Driver Acetabulum Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
010	FIL	600	Newtons
Max	Time	Min	Time
2929.6	34.3	-82.3	72.9



Curve Description			
Driver Total Pelvic Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
011	SUM	600	Newtons
Max	Time	Min	Time
4906.2	38.2	-2.6	2.7

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

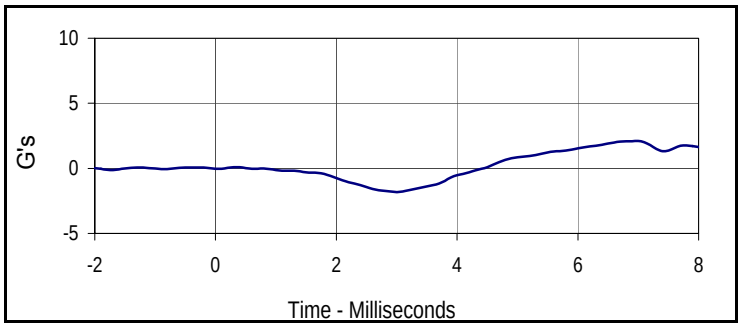
Test Program:	SID IIs External Measurements	Test Date:	10/19/11
ATD Serial No.:	299	Test I.D.:	N/A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
A	Sitting Height	mm	772 - 788	776	Pass
B	Shoulder Pivot Height	mm	437 - 453	442	Pass
C	H-Point Height	mm	79 - 89	80	Pass
D	H-Point from Seatback	mm	141 - 151	147	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	101	Pass
F	Thigh Clearance	mm	119 - 135	125	Pass
G	Head Breadth	mm	140 - 148	146	Pass
H	Head Back from Backline	mm	40 - 46	45	Pass
I	Head Depth	mm	178 - 188	186	Pass
J	Head Circumference	mm	541 - 551	548	Pass
K	Buttock to Knee Length	mm	514 - 540	527	Pass
L	Popliteal Height	mm	343 - 369	351	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	399	Pass
N	Buttock Popliteal Length	mm	416 - 442	429	Pass
O	Chest Depth w/o Jacket	mm	195 - 211	200	Pass
P	Foot Length	mm	216 - 232	220	Pass
Q	Hip Breadth with Pelvic Plug	mm	313 -323	316	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	878	Pass
Z	Waist Circumference	mm	760 - 791	773	Pass
			Overall Test Results		Pass

Test Program:	SID IIs Head Drop Test	Test Date:	10/19/11
ATD Serial No.:	299	Test I.D.:	299HD021

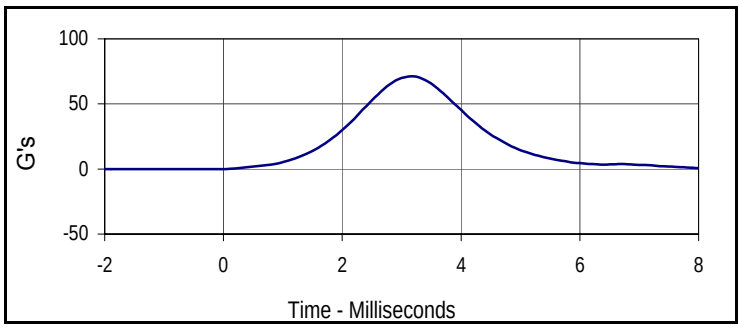
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	240	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.6	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Peak Head Resultant Acceleration		G's	115 to 137	124.6	Pass
Peak Head X Acceleration		G's	<15	1.8	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	14.5	Pass
			Overall Test Results		Pass

Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
124.6	3.1	0.0	-2.0



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.5	6.0	-1.8	3.0

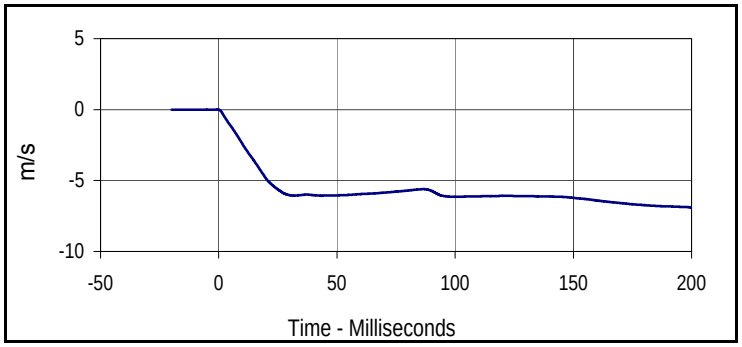
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
102.3	3.1	-1.7	6.6



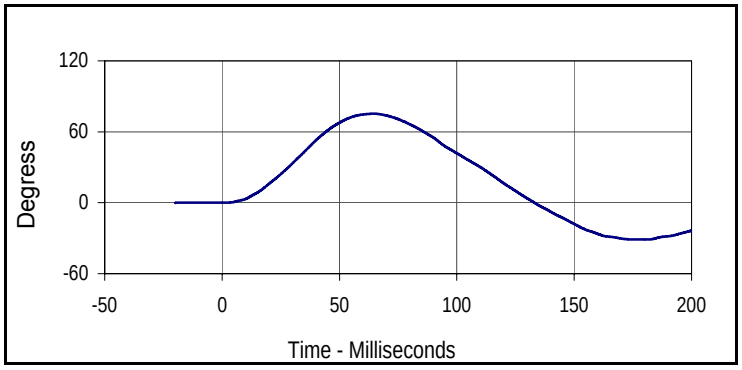
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
71.2	3.2	-0.5	0.0

Test Program:	SID IIs Neck Flexion Test	Test Date:	10/19/11
ATD Serial No.:	299	Test I.D.:	299NB021

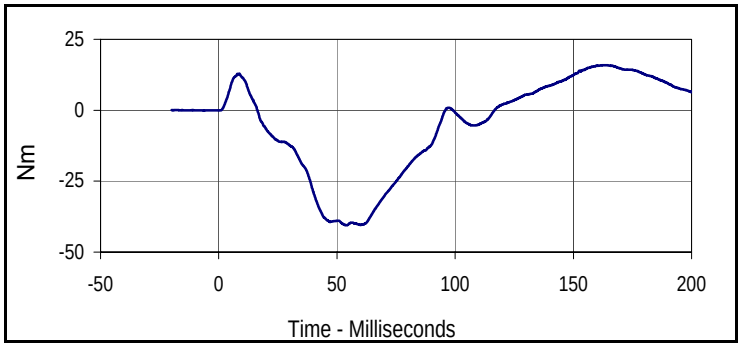
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	270	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.57	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.42	Pass
	15 msec	m/s	-3.30 to -4.10	-3.62	Pass
	20 msec	m/s	-4.40 to -5.40	-4.86	Pass
	25 msec	m/s	-5.40 to -6.10	-5.63	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.15	Pass
D-Plane Rotation	Max	Degrees	71 to 81	75.3	Pass
	Time	msec	50 to 70	64.7	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-40.5	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	116.7	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	-0.6	-6.9	200.0



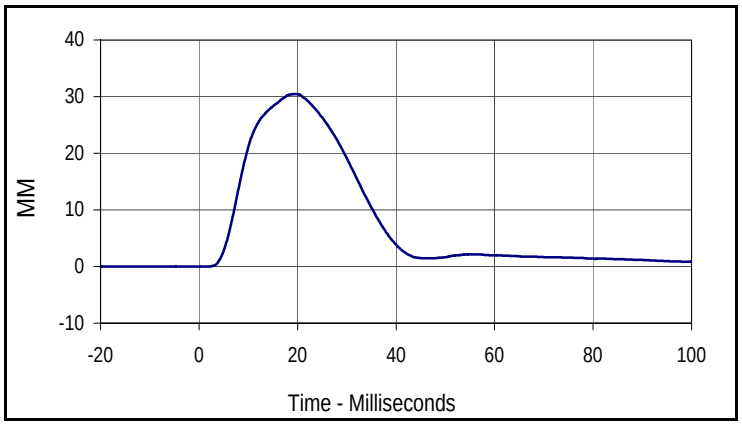
Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
75.3	64.7	-31.1	180.8



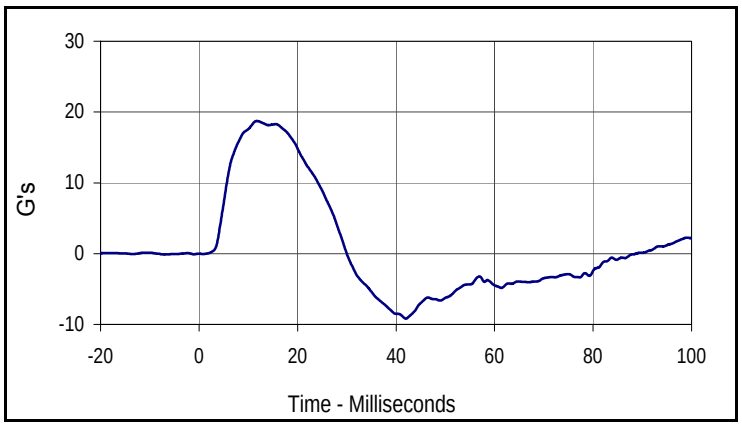
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
15.9	162.4	-40.5	53.8

Test Program:	SID IIs Shoulder Impact Test	Test Date:	10/19/11
ATD Serial No.:	299	Test I.D.:	299SH021

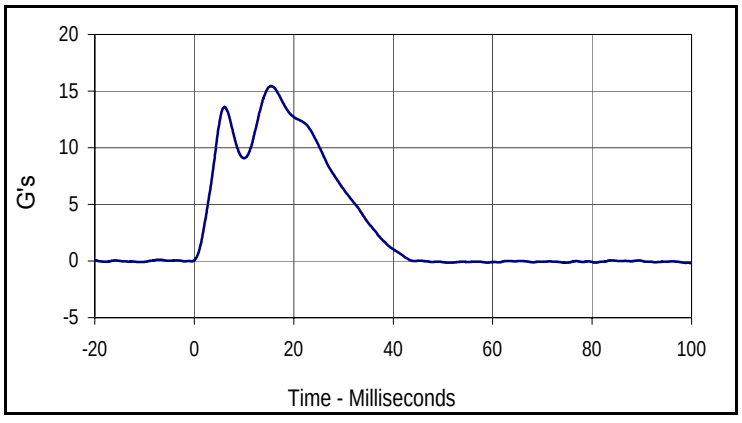
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	305	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.4	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.30	Pass
Peak Shoulder Deflection		mm	28 to 37	30.5	Pass
Peak Lateral Spine Acceleratrion Y		G's	17 to 22	18.7	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
30.5	19.4	0.0	-18.1



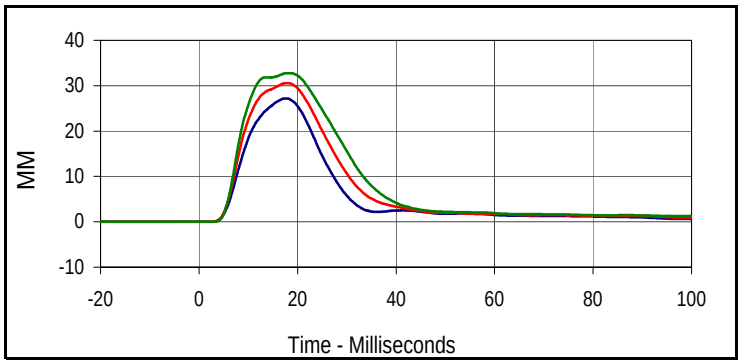
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.7	11.7	-9.2	42.0



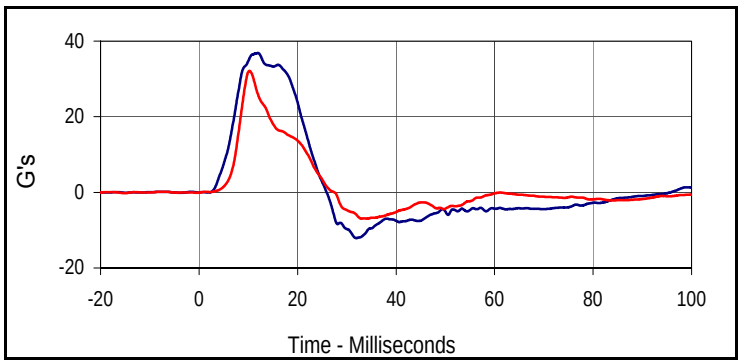
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.4	15.4	-0.2	99.9

Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	10/19/11
ATD Serial No.:	299	Test I.D.:	299TWA021

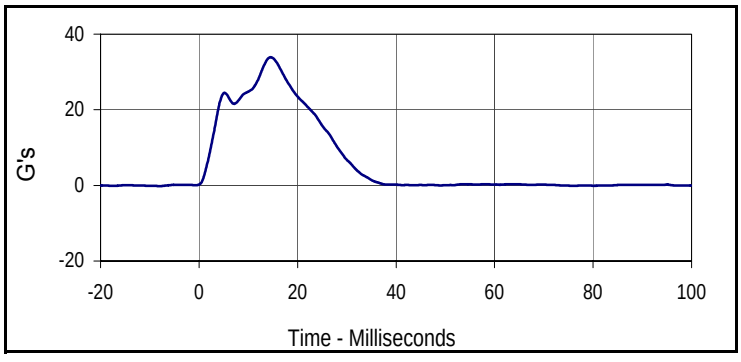
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	350	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.5	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.6	Pass
Peak Shoulder Deflection		mm	31 to 40	34.9	Pass
Peak Upper Thorax Rib Deflection		mm	25 to 32	27.2	Pass
Peak Middle Thorax Rib Deflection		mm	30 to 36	30.6	Pass
Peak Lower Thorax Rib Deflection		mm	32 to 38	32.7	Pass
Peak Upper Spine Y Acceleration		G's	34 to 43	36.8	Pass
Peak Lower Spine Y Acceleration		G's	29 to 37	32.1	Pass
Peak Impactor Acceleration		G's	30 to 36	33.9	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	17.6	0.0	-7.4
Middle Thorax Deflection			
Max	Time	Min	Time
30.6	17.9	0.0	-8.8
Lower Thorax Deflection			
Max	Time	Min	Time
32.7	17.7	0.0	-7.7

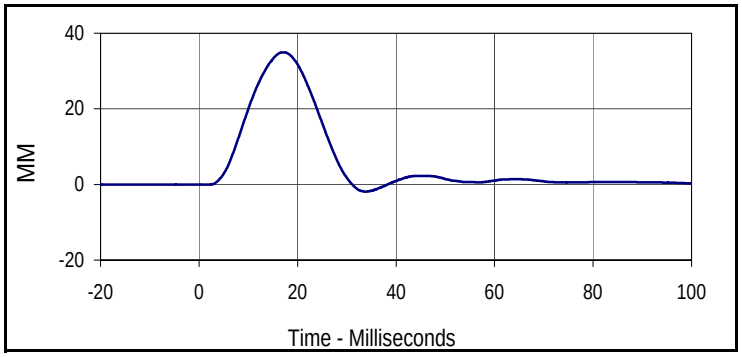


Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
36.8	11.9	-12.1	32.0
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
32.1	10.2	-6.9	34.2



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
33.9	14.5	-0.2	-8.0

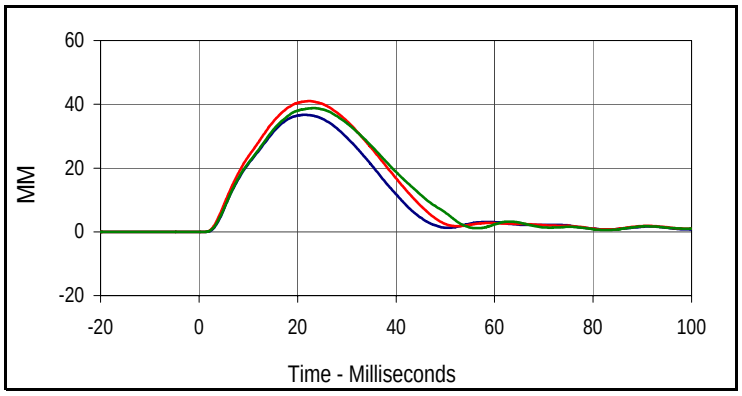
Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	10/19/11
ATD Serial No.:	299	Test I.D.:	299TWA021



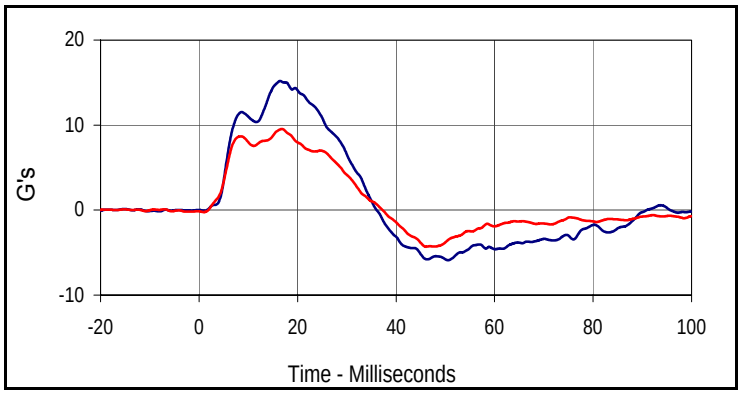
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
34.9	16.9	-1.9	33.8

Test Program:	SID IIs Thorax without Arm Impact Test	Test Date:	10/19/11
ATD Serial No.:	299	Test I.D.:	299TWOA021

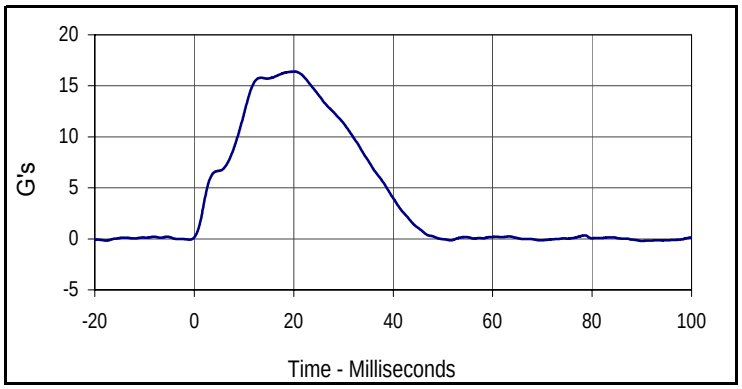
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	385	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.2	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	36.7	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	41.0	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	38.8	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	15.2	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	9.5	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
36.7	21.3	0.0	-4.0
Middle Thorax Deflection			
Max	Time	Min	Time
41.0	22.4	0.0	-19.5
Lower Thorax Deflection			
Max	Time	Min	Time
38.8	23.4	0.0	-5.6



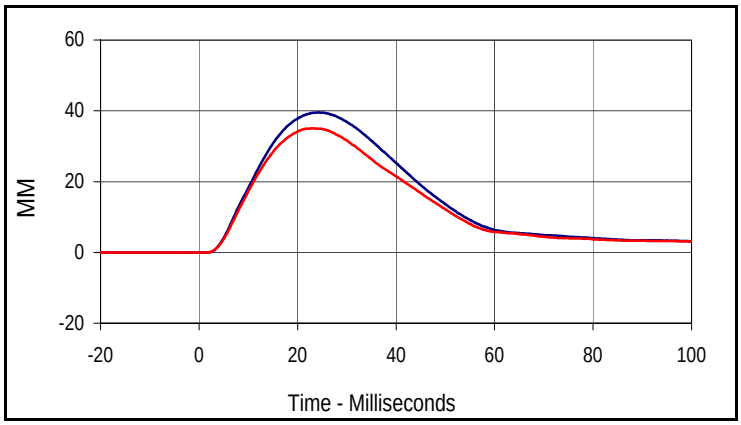
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.2	16.5	-5.9	50.6
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.5	16.8	-4.3	46.1



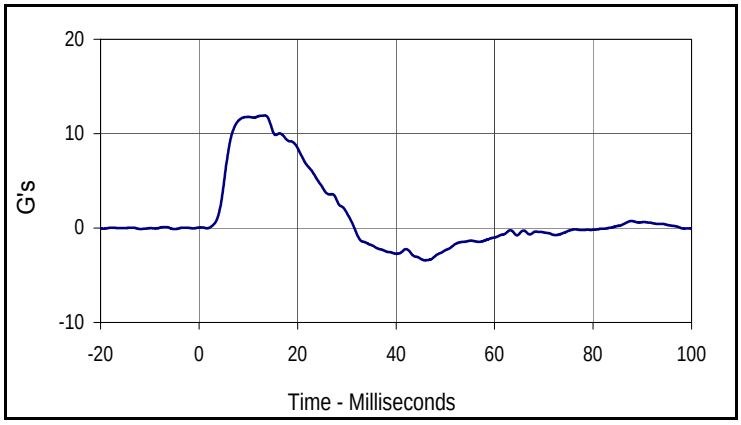
Curve Description			
Impactor Accleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.4	20.1	-0.2	90.0

Test Program:	SID IIs Abdomen Impact Test	Test Date:	10/19/11
ATD Serial No.:	299	Test I.D.:	299ABD021

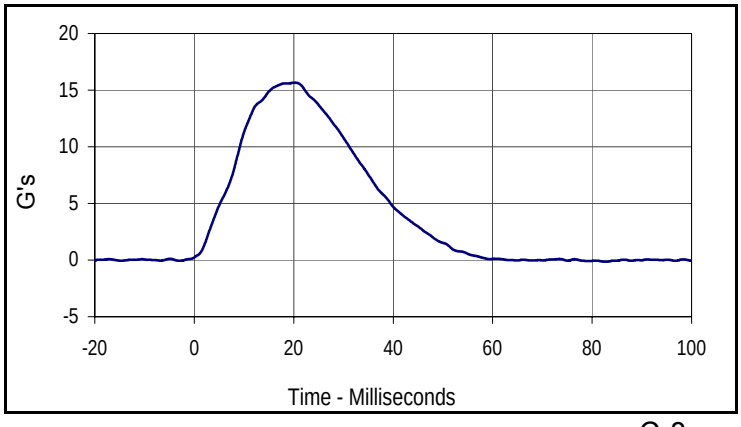
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	470	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Upper Abdominal Rib Deflection		mm	36 to 47	39.5	Pass
Peak Lower Abdominal Rib Deflection		mm	33 to 44	35.0	Pass
Peak Lower Spine Y Acceleration		G's	9 to 14	11.9	Pass
Peak Impactor Acceleration		G's	12 to 16	15.7	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
39.5	24.3	0.0	-10.9
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
35.0	23.1	0.0	-8.6



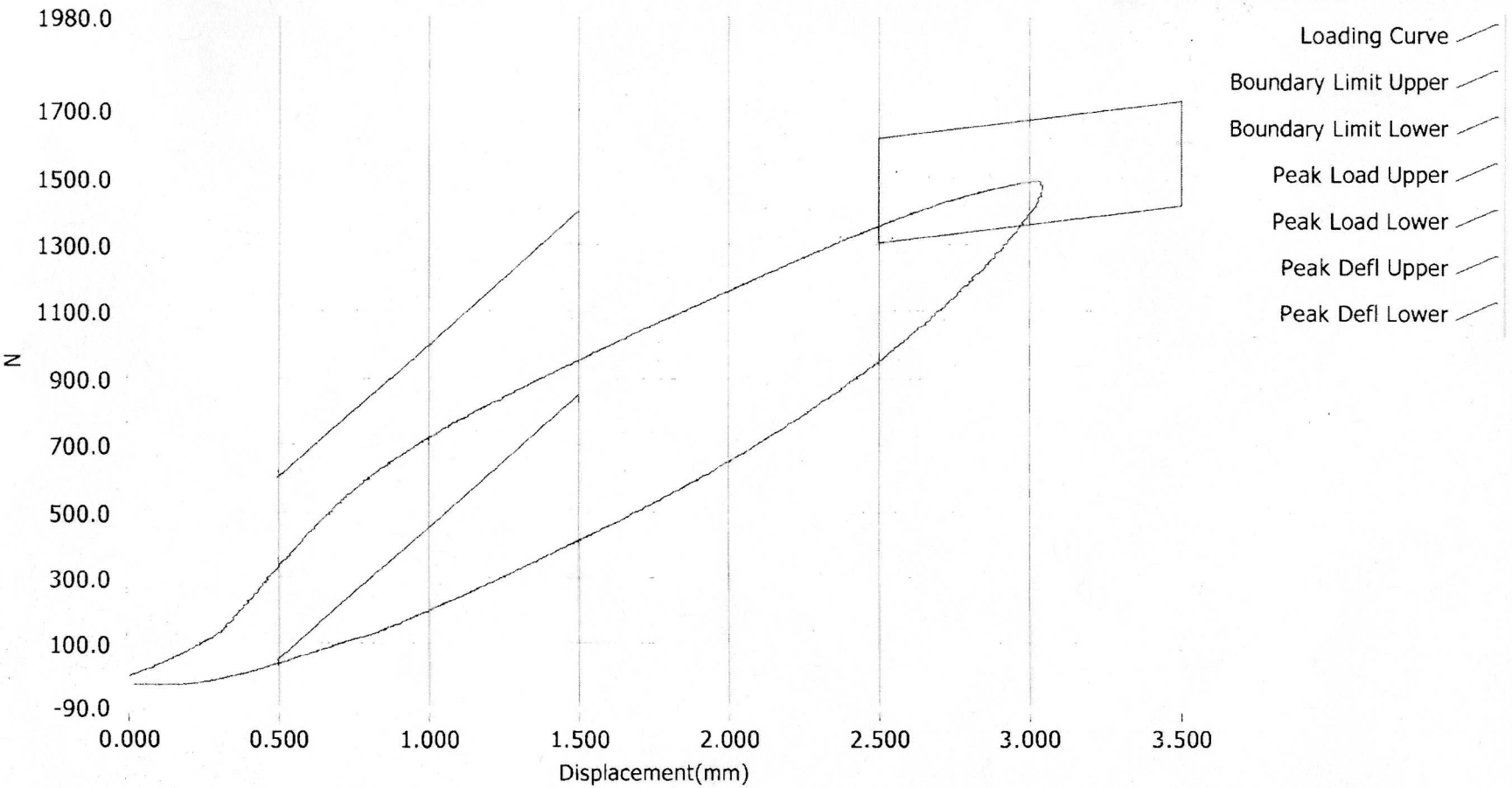
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
11.9	13.4	-3.4	45.8



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.7	20.2	-0.2	82.8

MC0327 PRE TEST CAL

Resultant Data - SIDIIs Plug Compression



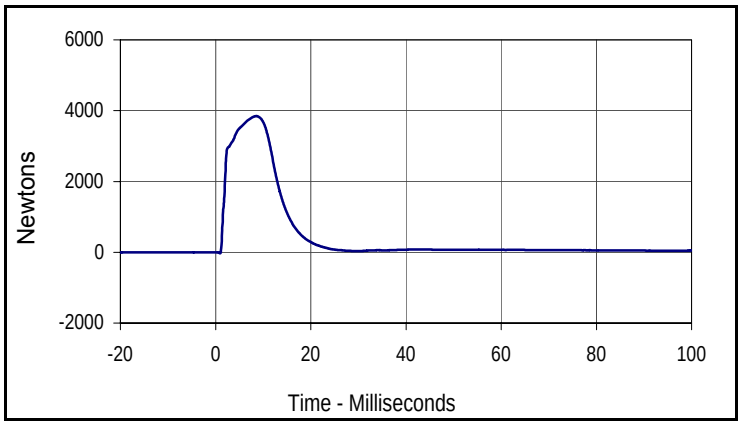
ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
		9/24/2010	2:31 AM
Cert ID	ATD Serial Number	ATD Type	
	36532	SIDIIs	

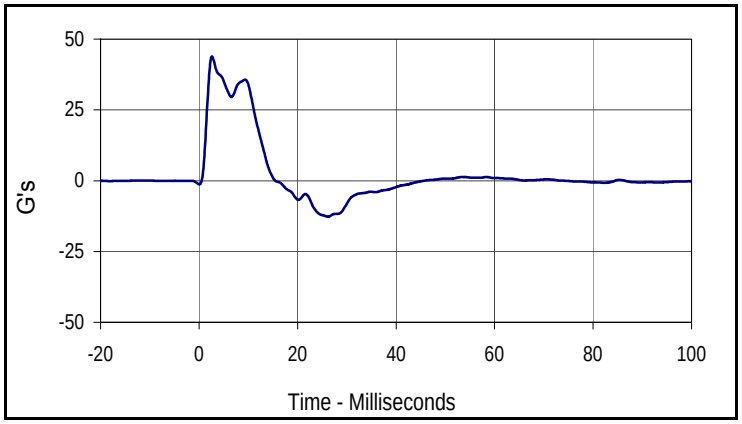
Current Date : 9/24/2010 Current Time : 02:32:13

Test Program:	SID IIs Pelvis Acetabulum Impact Test	Test Date:	10/19/11
ATD Serial No.:	299	Test I.D.:	299ACET021

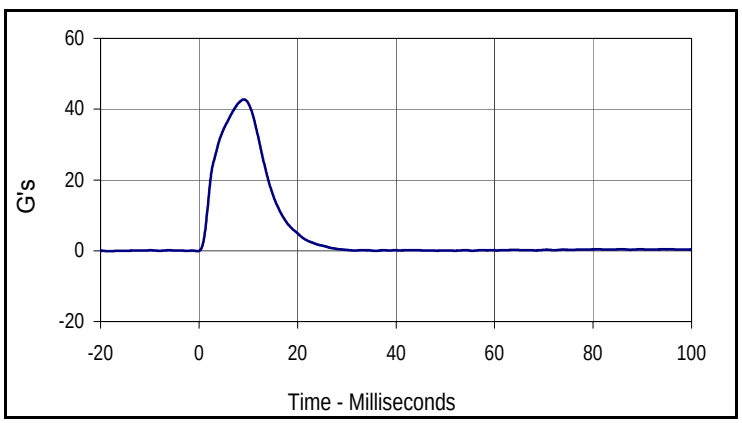
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	455	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.6	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.7	Pass
Peak Acetabulum Force Y		Newtons	3400 to 4200	3845.4	Pass
Peak Pelvis Y Acceleration After 6 msec.		G's	34 to 42	35.7	Pass
Peak Impactor Acceleration		G's	38 to 47	42.7	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3845.4	8.6	-30.1	1.0



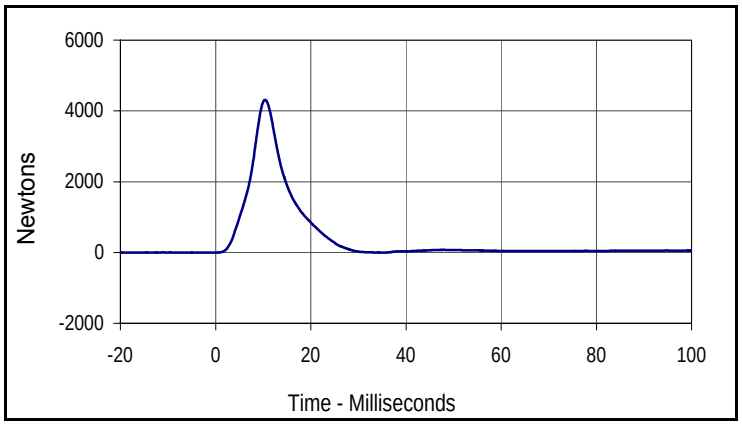
Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
43.9	2.6	-12.7	26.2



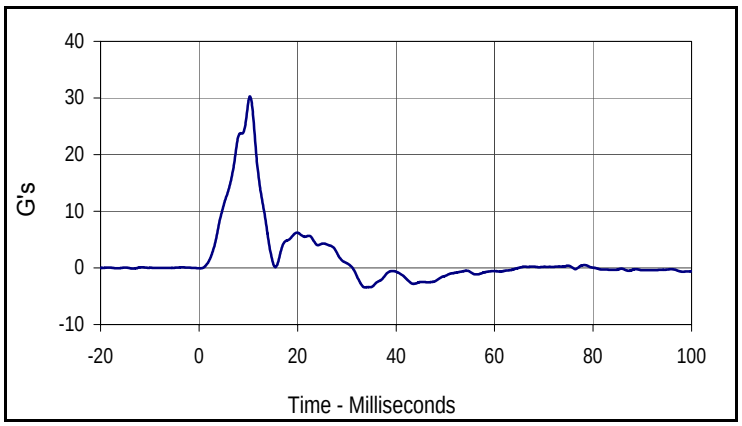
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
42.7	9.1	-0.1	-17.9

Test Program:	SID IIs Pelvis Iliac Calibration	Test Date:	10/19/11
ATD Serial No.:	299	Test I.D.:	299PL021

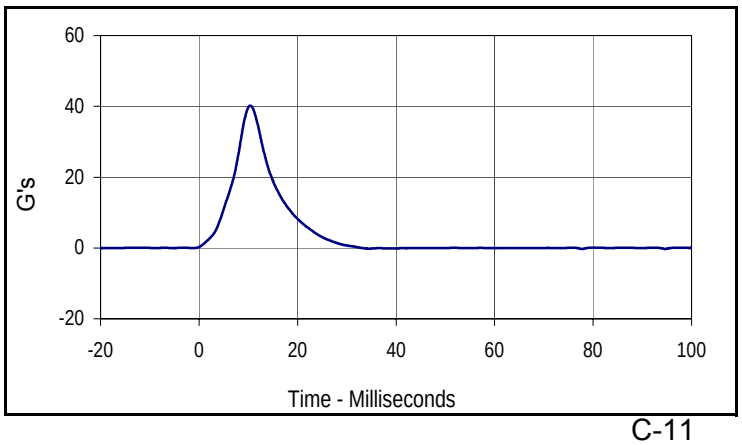
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	490	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.9	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.6	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Illiac Force		Newtons	4100 to 5100	4313.9	Pass
Peak Pelvis Y Acceleration		G's	28 to 39	30.3	Pass
Peak Impactor Acceleration		G's	36 to 45	40.2	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4313.9	10.4	-6.7	35.2



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
30.3	10.3	-3.4	33.7



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
40.2	10.4	-0.3	77.8

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

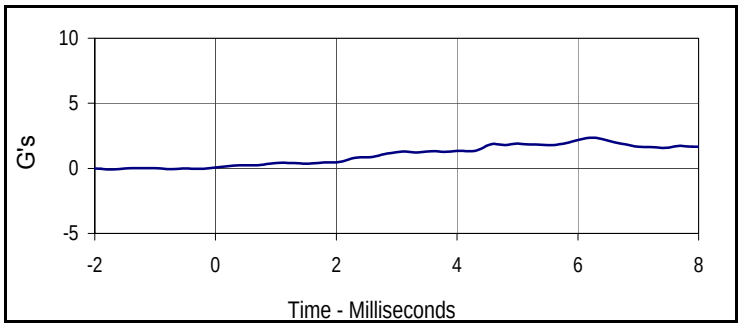
Test Program:	SID IIs External Measurements	Test Date:	11/11/11
ATD Serial No.:	299	Test I.D.:	N/A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	32	Pass
A	Sitting Height	mm	772 - 788	777	Pass
B	Shoulder Pivot Height	mm	437 - 453	443	Pass
C	H-Point Height	mm	79 - 89	80	Pass
D	H-Point from Seatback	mm	141 - 151	147	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	101	Pass
F	Thigh Clearance	mm	119 - 135	125	Pass
G	Head Breadth	mm	140 - 148	146	Pass
H	Head Back from Backline	mm	40 - 46	46	Pass
I	Head Depth	mm	178 - 188	186	Pass
J	Head Circumference	mm	541 - 551	548	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	399	Pass
N	Buttock Popliteal Length	mm	416 - 442	429	Pass
O	Chest Depth w/o Jacket	mm	195 - 211	200	Pass
P	Foot Length	mm	216 - 232	220	Pass
Q	Hip Breadth with Pelvic Plug	mm	313 -323	316	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	878	Pass
Z	Waist Circumference	mm	760 - 791	773	Pass
			Overall Test Results		Pass

Test Program:	SID IIs Head Drop Test	Test Date:	11/11/11
ATD Serial No.:	299	Test I.D.:	299HD022

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	255	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.5	Pass
Peak Head Resultant Acceleration		G's	115 to 137	125.1	Pass
Peak Head X Acceleration		G's	<15	2.2	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	9.9	Pass
			Overall Test Results		Pass

Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
125.1	3.0	0.0	-1.4



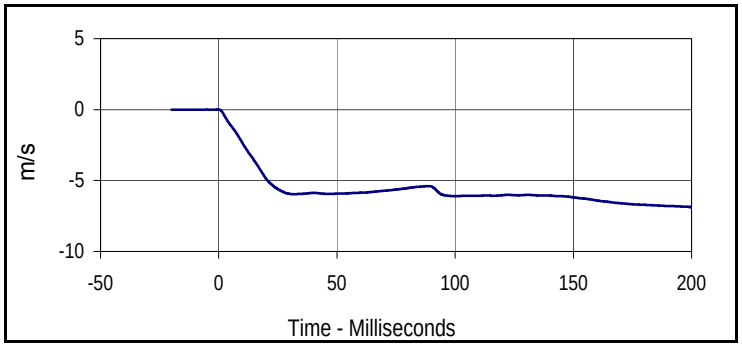
Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.2	6.0	-0.1	-1.7

Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
101.6	3.0	-2.0	7.9

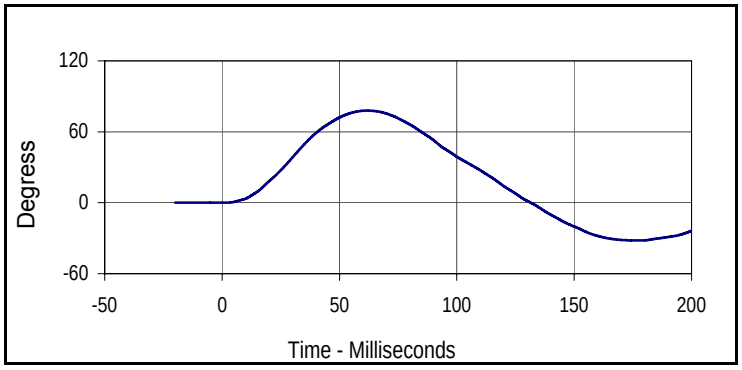
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
73.0	3.0	-0.7	0.0

Test Program:	SID IIs Neck Flexion Test	Test Date:	11/11/11
ATD Serial No.:	299	Test I.D.:	299NB022

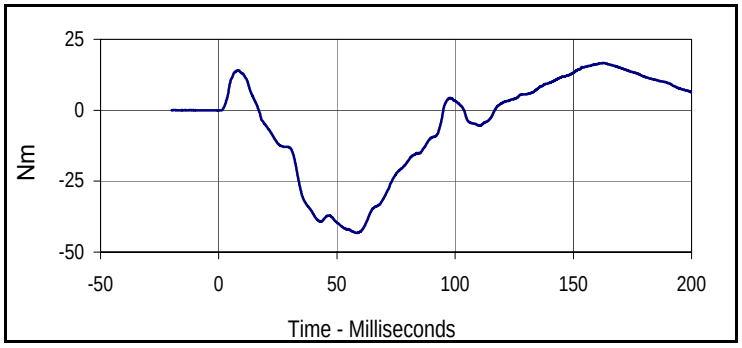
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	240	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.57	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.35	Pass
	15 msec	m/s	-3.30 to -4.10	-3.58	Pass
	20 msec	m/s	-4.40 to -5.40	-4.87	Pass
	25 msec	m/s	-5.40 to -6.10	-5.61	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.11	Pass
D-Plane Rotation	Max	Degrees	71 to 81	77.9	Pass
	Time	msec	50 to 70	61.7	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-43.3	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	116.8	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	-0.4	-6.9	200.0



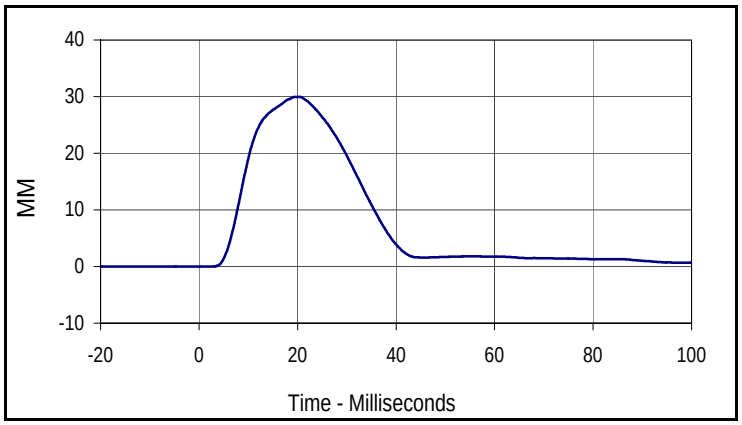
Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
77.9	61.7	-31.9	178.8



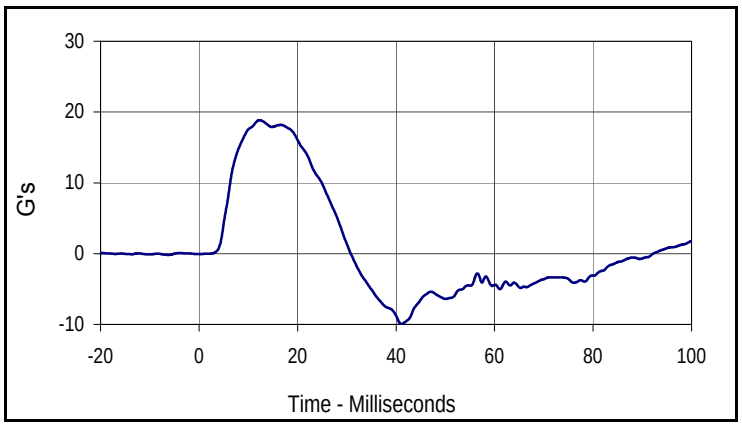
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
16.6	162.7	-43.3	58.2

Test Program:	SID IIs Shoulder Impact Test	Test Date:	11/11/11
ATD Serial No.:	299	Test I.D.:	299SH022

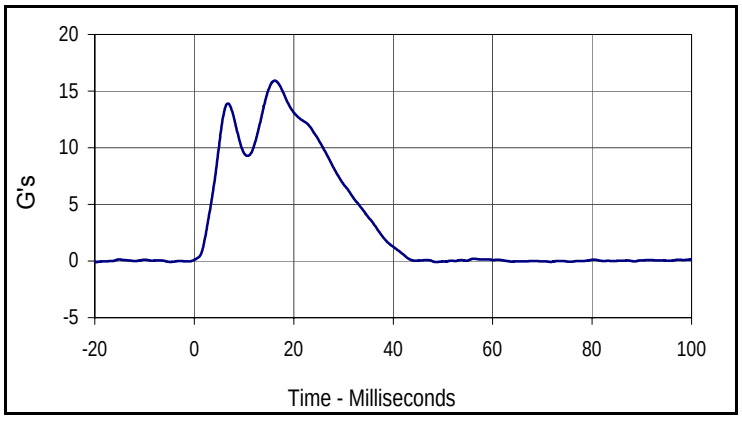
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	290	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.4	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.29	Pass
Peak Shoulder Deflection		mm	28 to 37	30.0	Pass
Peak Lateral Spine Acceleratrion Y		G's	17 to 22	18.9	Pass
Peak Impactor Acceleration		G's	13 to 18	15.9	Pass
			Overall Test Results		Pass



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
30.0	20.4	0.0	-3.2



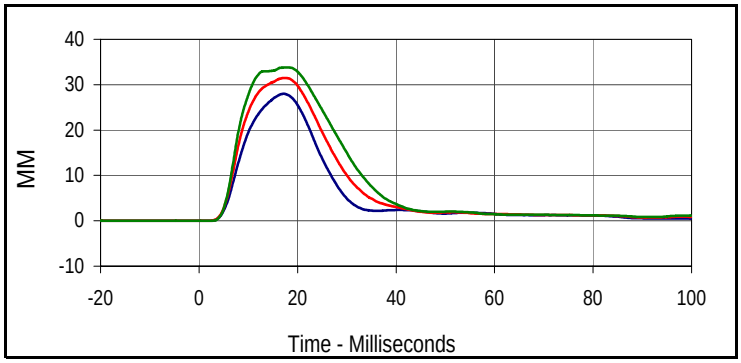
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.9	12.3	-10.0	41.1



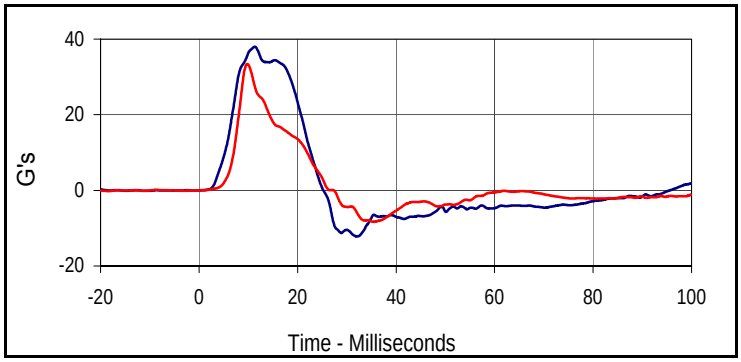
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.9	16.2	-0.1	48.7

Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	11/11/11
ATD Serial No.:	299	Test I.D.:	299TWA022

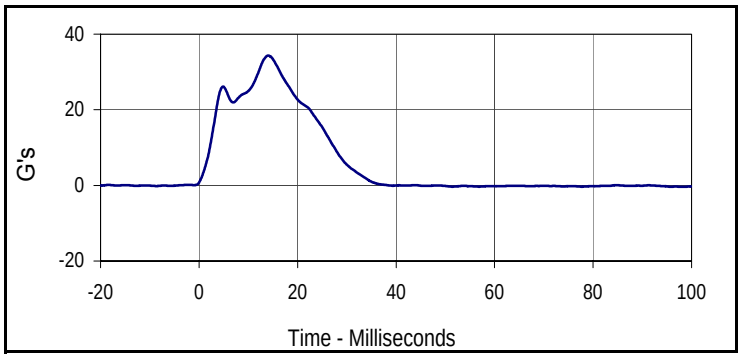
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	355	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.5	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.6	Pass
Peak Shoulder Deflection		mm	31 to 40	36.0	Pass
Peak Upper Thorax Rib Deflection		mm	25 to 32	28.0	Pass
Peak Middle Thorax Rib Deflection		mm	30 to 36	31.5	Pass
Peak Lower Thorax Rib Deflection		mm	32 to 38	33.8	Pass
Peak Upper Spine Y Acceleration		G's	34 to 43	38.0	Pass
Peak Lower Spine Y Acceleration		G's	29 to 37	33.4	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
28.0	17.2	0.0	-14.1
Middle Thorax Deflection			
Max	Time	Min	Time
31.5	17.4	0.0	-6.2
Lower Thorax Deflection			
Max	Time	Min	Time
33.8	17.3	0.0	-7.4

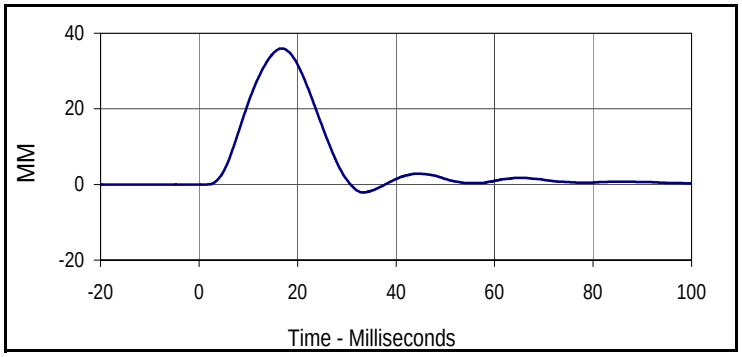


Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
38.0	11.3	-12.2	32.0
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
33.4	9.8	-8.3	35.5



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
34.3	14.1	-0.4	98.0

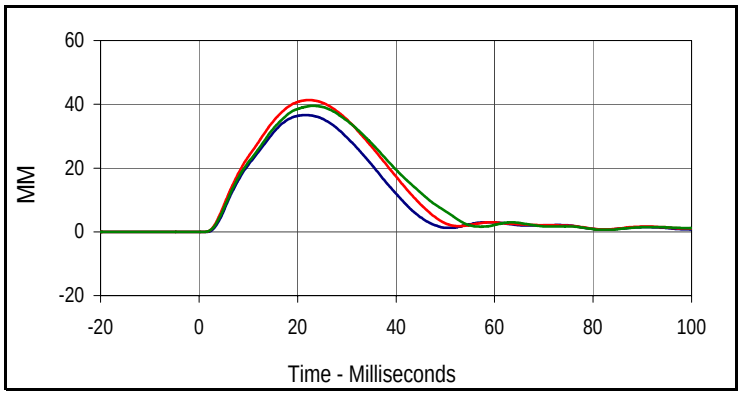
Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	11/11/11
ATD Serial No.:	299	Test I.D.:	299TWA022



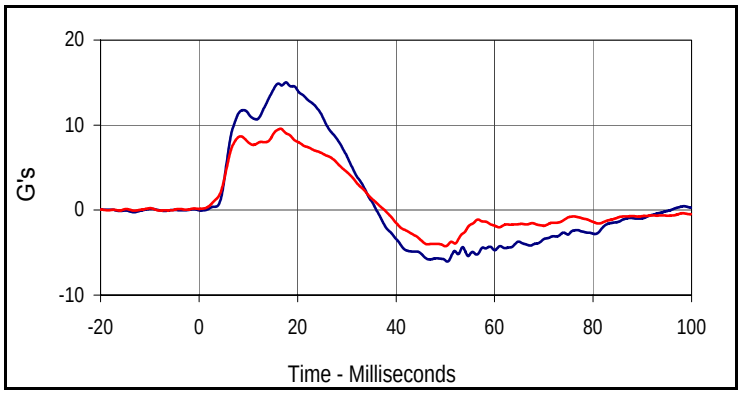
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
36.0	16.6	-2.1	33.3

Test Program:	SID IIs Thorax without Arm Impact Test	Test Date:	11/11/11
ATD Serial No.:	299	Test I.D.:	299TWOA022

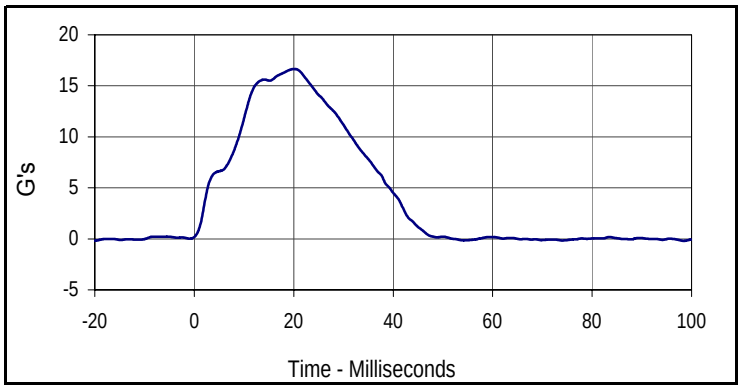
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	370	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.6	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.2	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	36.6	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	41.3	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	39.5	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	15.0	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	9.6	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
36.6	21.6	0.0	-13.2
Middle Thorax Deflection			
Max	Time	Min	Time
41.3	22.4	0.0	-20.0
Lower Thorax Deflection			
Max	Time	Min	Time
39.5	23.1	0.0	-11.6



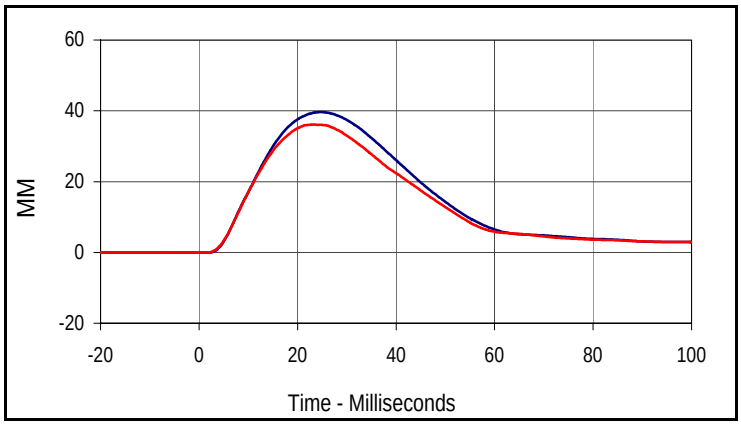
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.0	17.6	-6.1	50.4
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.6	16.6	-4.3	50.0



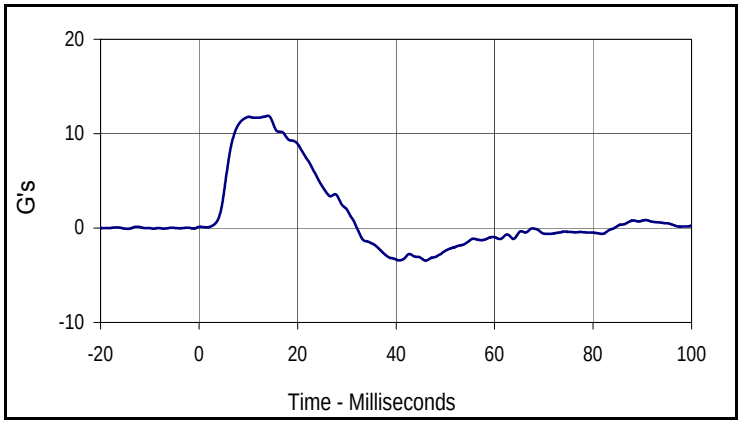
Curve Description			
Impactor Accleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.7	20.2	-0.2	98.4

Test Program:	SID IIs Abdomen Impact Test	Test Date:	11/11/11
ATD Serial No.:	299	Test I.D.:	299ABD022

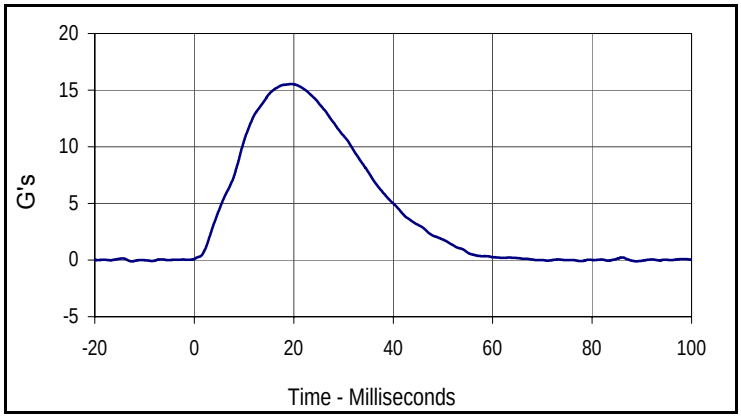
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	390	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.0	Pass
Laboratory 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	39.6	Pass
Peak Lower Abdominal Rib Deflection		mm	33 to 44	36.1	Pass
Peak Lower Spine Y Acceleration		G's	9 to 14	11.9	Pass
Peak Impactor Acceleration		G's	12 to 16	15.6	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
39.6	24.5	0.0	-11.9
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
36.1	23.2	0.0	-13.2



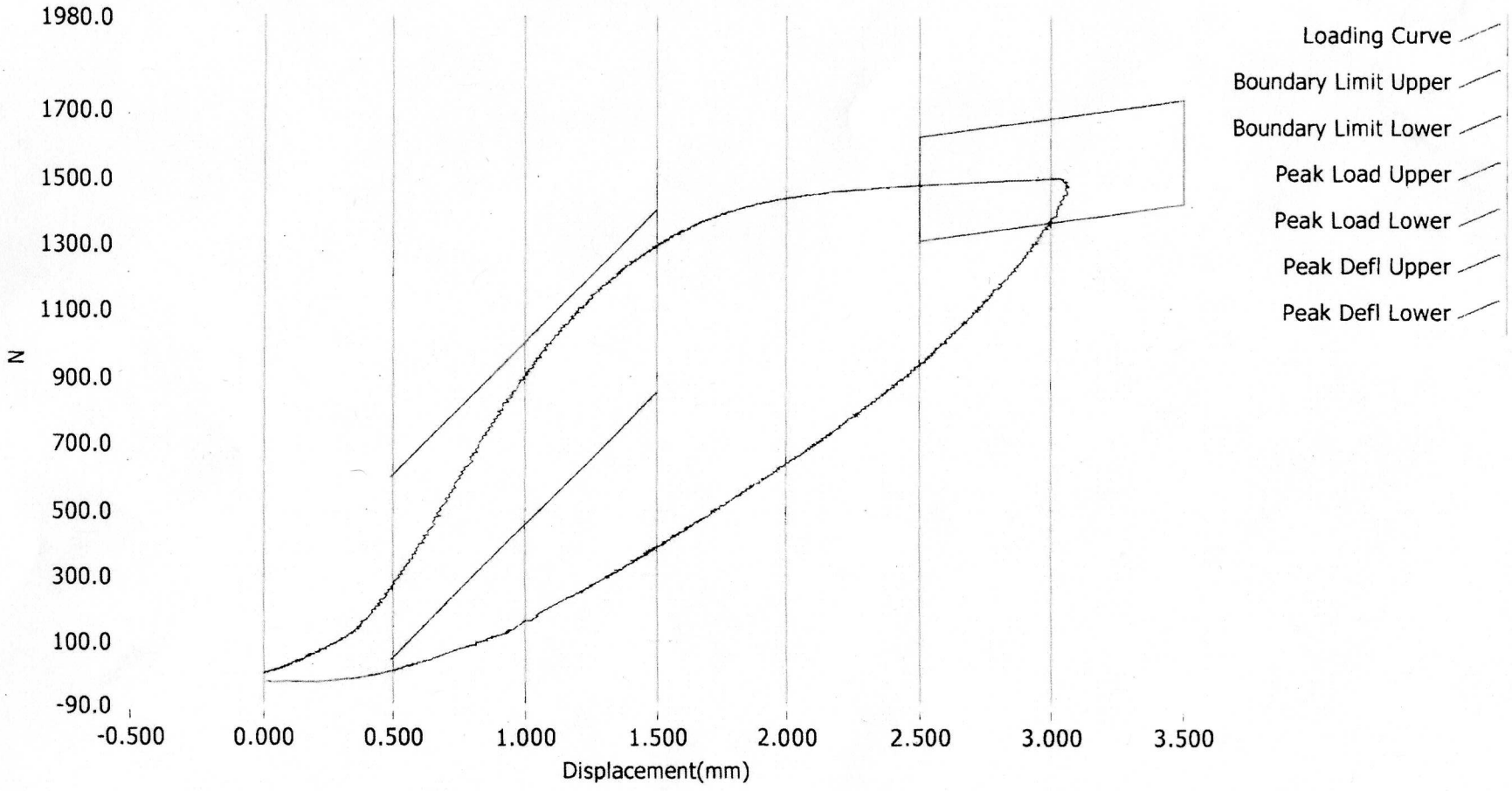
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
11.9	14.0	-3.4	46.0



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.6	19.6	-0.1	-12.6

MC0327 POST TEST CAL

Resultant Data - SIDIIs Plug Compression



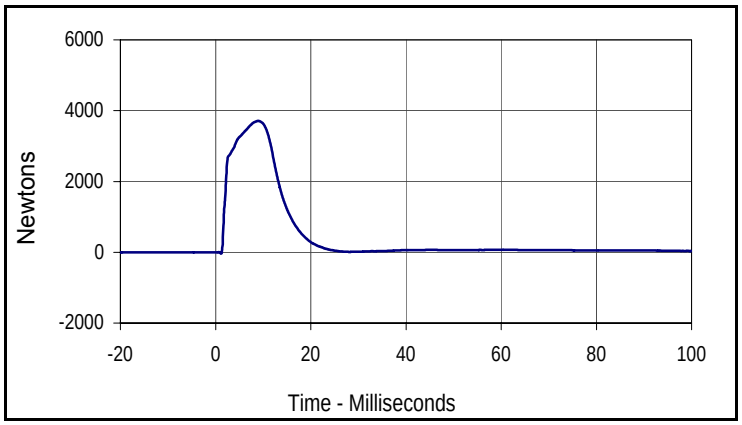
ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
		9/22/2010	10:16 AM
Cert ID	ATD Serial Number	ATD Type	
	36264	SIDIIs	

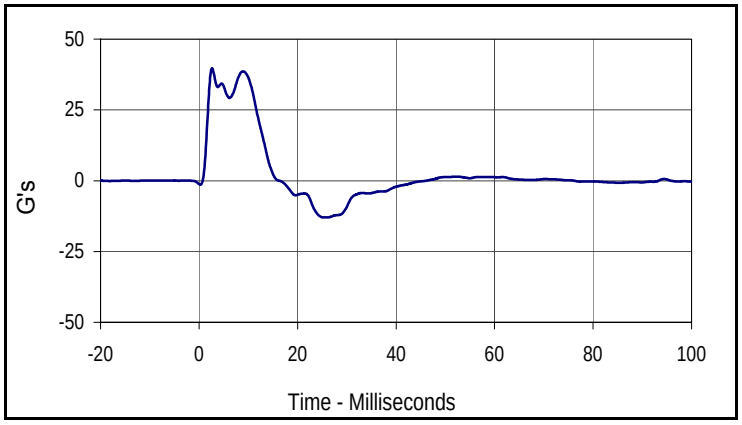
Current Date : 9/22/2010 Current Time : 10:17:38

Test Program:	SID IIs Pelvis Acetabulum Impact Test	Test Date:	11/11/11
ATD Serial No.:	299	Test I.D.:	299ACET022

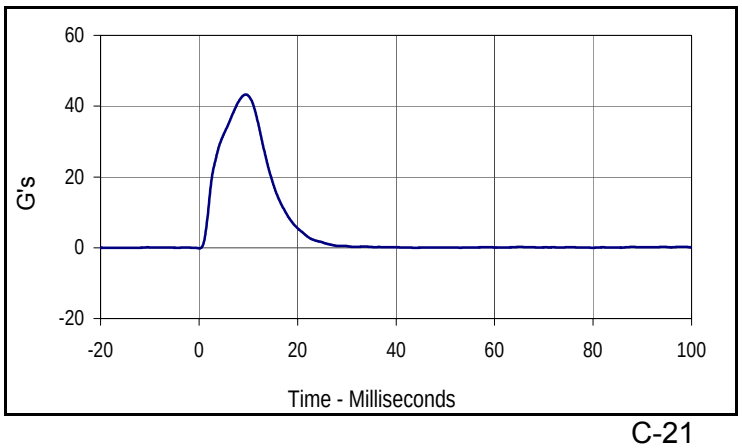
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	455	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	20.9	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.9	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.6	Pass
Peak Acetabulum Force Y		Newtons	3400 to 4200	3708.9	Pass
Peak Pelvis Y Acceleration After 6 msec.		G's	34 to 42	38.6	Pass
Peak Impactor Acceleration		G's	38 to 47	43.3	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3708.9	9.0	-41.2	1.2



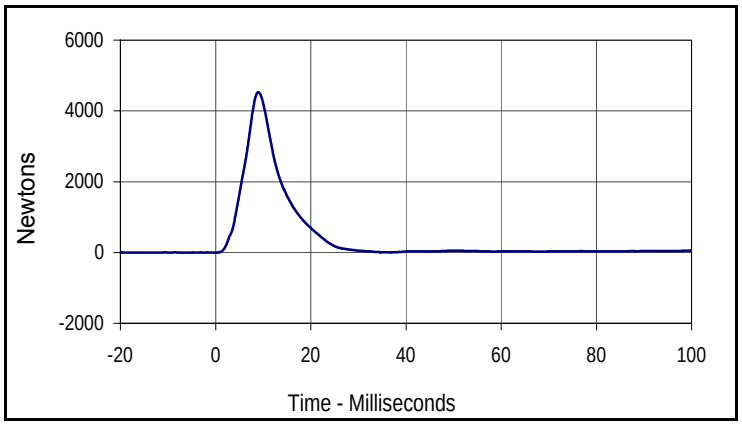
Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
39.7	2.6	-12.9	25.2



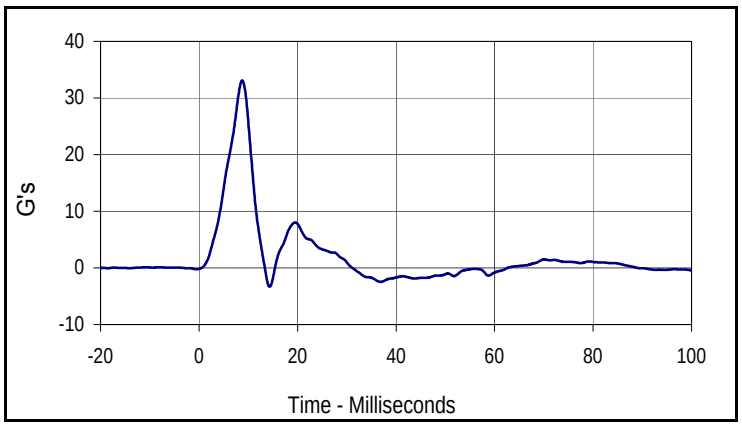
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
43.3	9.5	-0.2	0.0

Test Program:	SID IIs Pelvis Iliac Calibration	Test Date:	11/11/11
ATD Serial No.:	299	Test I.D.:	299PL022

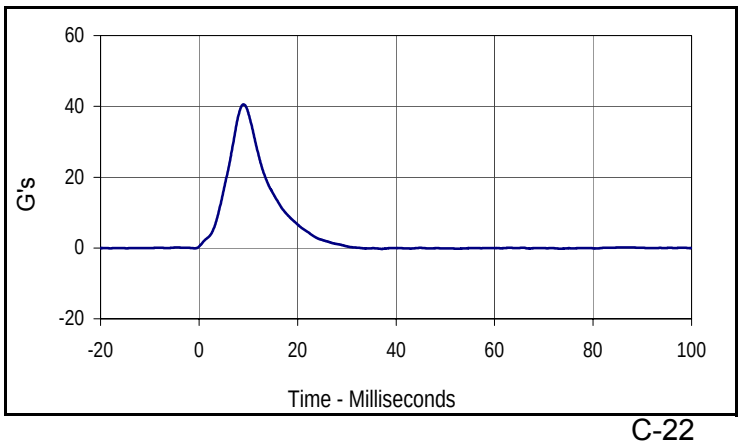
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	495	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	20.9	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.9	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Illiac Force		Newtons	4100 to 5100	4529.2	Pass
Peak Pelvis Y Acceleration		G's	28 to 39	33.1	Pass
Peak Impactor Acceleration		G's	36 to 45	40.6	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4529.2	9.0	-2.6	0.2



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
33.1	8.8	-3.3	14.3



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
40.6	9.0	-0.3	37.1

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			X	P51926	Endevco	8/8/11
			Y	P51929	Endevco	8/8/11
			Z	P51934	Endevco	8/8/11
Displacement Potentiometers	Shoulder		Y	1074	FTSS	8/8/11
	Thoracic Rib	Upper	Y	1143	FTSS	8/8/11
		Middle	Y	1160	FTSS	8/8/11
		Lower	Y	1213	FTSS	8/8/11
	Abdominal Rib	Upper	Y	1218	FTSS	8/8/11
		Lower	Y	1234	FTSS	8/8/11
Lower Spine Accelerometers (T12)			X	P63999	Endevco	8/5/11
			Y	P58872	Endevco	8/4/11
			Z	P58795	Endevco	8/4/11
Acetabulum Load Cell			Y	272	Denton	7/22/11
Iliac Wing Load Cell			Y	284	Denton	7/22/11
Pelvis Plug (Struck Side)				36280	FTSS	9/22/10
Pelvis Plug (Non-Struck Side)				36527	FTSS	9/24/10

TABLE 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	Ketx5a	ICSensor	6/20/11
Vehicle Center of Gravity	Y	Ketx5b	ICSensor	6/20/11
Vehicle Center of Gravity	Z	Ketx5c	ICSensor	6/20/11
Left Floor Sill	Y	Keva508	Endevco	8/2/11
A-Pillar Sill	Y	J36724	Endevco	3/30/11
A-Pillar Low	Y	BY98H	Endevco	3/15/11
A-Pillar Mid	Y	J24288	Endevco	3/22/11
B-Pillar Sill	Y	N/A	N/A	N/A
B-Pillar Low	Y	N/A	N/A	N/A
B-Pillar Mid	Y	N/A	N/A	N/A
Driver Seat	Y	J24533	Endevco	4/1/11
Engine Top	X	BI60H	Endevco	7/22/11
Engine Top	Y	AR17	Endevco	7/22/11
Firewall	Y	BF83H	Endevco	3/31/11
Right Roof	Y	AJ4N9	Endevco	3/30/11
Right Floor Sill	Y	BG29H	Endevco	5/6/11
Rear Floorpan	X	Ketx12a	Endevco	7/20/11
Rear Floorpan	Y	Ketx12y	Endevco	7/21/11

TABLE 3 – Pole Instrumentation

	Serial Number	Manufacturer	Calibration Date
Load Cell 1	131822A	Interface	8/8/11
Load Cell 2	132304A	Interface	8/8/11
Load Cell 3	19477	Interface	8/8/11
Load Cell 4	19325	Interface	8/8/11
Load Cell 5	131827A	Interface	8/8/11
Load Cell 6	132302A	Interface	8/8/11
Load Cell 7	19267	Interface	8/8/11
Load Cell 8	19321	Interface	8/8/11