REPORT NUMBER: SPNCAP-KAR-16-001

NEW CAR ASSESSMENT PROGRAM (NCAP)

SIDE IMPACT POLE TEST

FCA US LCC

2016 JEEP PATRIOT SPORT 5-DOOR MPV

NHTSA No: M20160308

PREPARED BY:

KARCO ENGINEERING, LLC.

9270 HOLLY ROAD

ADELANTO, CA 92301

OCTOBER 19, 2015

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

OFFICE OF CRASHWORTHINESS STANDARDS

MAIL CODE: NVS-111

1200 NEW JERSEY AVE, SE, ROOM W43-410

WASHINGTON, D.C. 20590

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

Prepared By: _____

Mr. Javier J. Martinez, Project Engineer
KARCO Engineering, LLC.

Reviewed By: _____

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

Approved By: _____

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

Approval Date: October 19, 2015

FINAL REPORT ACCEPTANCE BY OCWS:

_____

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

Date: _____

_____

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

Date: _____

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
SPNCAP-KAR-16-001		

4. Title and Subtitle	5. Report Date
Final Report of New Car Assessment Program Side Impact Pole Testing of 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308	October 19, 2015 **6. Performing Organization Code** KAR
7. Authors Mr. Javier J. Martinez, Project Engineer, KARCO Mr. Frank Richardson, Program Manager, KARCO	**8. Performing Organization Report No.** TR-P35004-03-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.** DTNH22-14-00355
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, Oct. 6 - 19, 2015 **14. Sponsoring Agency Code** NVS-111

15. Supplementary Notes

16. Abstract

A 32.2 km/h (20 mph) 75 deg. oblique impact side PINCAP test was conducted on the subject 2016 Jeep Patriot Sport 5-Door MPV in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. The test was conducted at the KARCO Engineering, LLC. facility in Adelanto, California on October 6, 2015.

The impact velocity was 32.72 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 20.6 deg. C. The target vehicle's maximum post-test static crush was 452 mm located at level 4. The test vehicle's occupant performance data is as follows:

Measurement Description	Driver ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})		1000	414.2
Resultant Lower Spine Acceleration	g	82	45
Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	3942
Maximum Thoracic Rib Deflection	mm	38	35
Maximum Abdominal Rib Deflection	mm	45	32

The two doors on the struck side of the vehicle were jammed shut and did not separate from the body at the hinges or latches. The opposite doors did not open during the side impact event. The roof seam seperated on the driver side upon impact.

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

19. Security Classification of this report	20. Security Classification of this page	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	106	

TABLE OF CONTENTS

SECTION 1
TEST PURPOSE AND PROCEDURE

This side impact test is part of the MY 2016 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number DTNH22-14-00355. The purpose of this test is to generate comparative side impact performance in a 2016 Jeep Patriot Sport 5-Door MPV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated September 2013.

SECTION 2
SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2016 Jeep Patriot Sport 5-Door MPV. The subject vehicle was towed into the rigid pole at an angle of 75.5° and a velocity of 32.72 km/h. The test was conducted by KARCO Engineering, LLC. in Adelanto, California on October 6, 2015. Pre- and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

One Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure, dated September 2013. Camera locations and other pertinent camera information are included in this report.

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

Primary and Redundant Head CG tri-axial accelerometers
Thorax upper, middle and lower rib displacement potentiometers
Abdomen upper and lower rib displacement potentiometers
Lower spine (12) tri-axial accelerometers
Iliac load cell
Acetabulum load cell

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

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

Measurement Description	Units	Passenger ATD (SID-IIs)	
		IARV	Result
Head Injury Criteria (HIC_{36})		1000	414.2
Lower Spine (T12) Resultant Acceleration	g	82	45
Total Pelvic Force (sum of acetabular and iliac forces	N	5525	3942
Maximum Thoracic Rib Deflection	mm	38*	35
Maximum Abdominal Rib Deflection	mm	45*	32

**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	Yes	No
Seat Belt Load Limiter	Yes	Yes	Yes	No
Other	No		No	

GENERAL COMMENTS

Both the front and rear doors on the struck side of the vehicle were jammed shut while remaining closed and latched. There was separation at the roof seam but none at the hinges or latches. Both doors 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: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15

CONVERSION FACTORS

Quantity	Typical Application	Std Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	miles/hr	km/hr	1.609344
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.574
Pressure	Tire Pressures	lbf/in^2	kPa	6.895
Temperature	General Use	^oF	^oC	=(Tf -32)/1.8
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf-ft	N•m	1.355

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20160308
Model Year	2016
Make	Jeep
Model	Patriot Sport
Body Style	5-Door MPV
VIN	1C4NJPBB3GD532579
Body Color	Eco Green Pearl
Odometer Reading (km / mi)	182 / 113
Engine Displacement (L)	2.4
Type / No. of Cylinders	Inline - 4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	6
Overdrive	Yes
Final Drive	Front
Roof Rack	Yes
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks	No
Power Window Auto-Reverse	No
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	Yes
Driver Load Limiter	Yes
Rear Pass. Load Limiter	Yes
Other Safety Restraint	Brake Assist, Electronic Poll Mitigation

Does Owner's Manual provide instructions to turn off automatic door locks?	No

DATA FROM CERTIFICATION LABEL

Manufactured By	FCA US LCC
Date of Manufacture	Aug-15
Vehicle Type	5-Door MPV

GVWR (kg)	2012
GAWR Front (kg)	1080
GAWR Rear (kg)	1044

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				419.0	*A*
DSC x 68.04 (kg)				340.2	*B*
Cargo Weight (RCLW) (kg)				78.8	*A-B*

VEHICLE SEAT TYPE

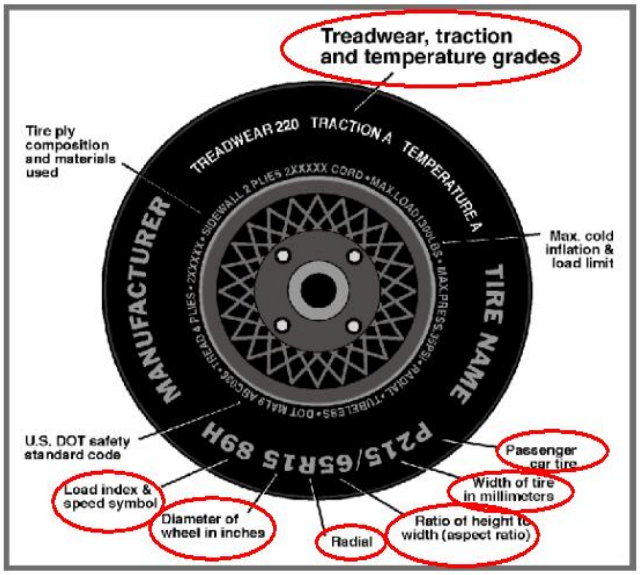
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable w/ Lever	Adjustable w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat			Yes		Yes		
Third Row Seat							

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15



Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	P205/70R16	P205/70R16
Tire Size on Vehicle	P205/70R16	P205/70R16
Tire Manufacturer	Goodyear	Goodyear
Tire Model	Eagle LS²	Eagle LS²
Treadware	400	400
Traction Grade	A	A
Temperature Grade	B	B
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel	2 Polyester, 2 Steel
Load Index/Speed Symbol	96T	96T
Tire Material	Polyester, Steel	Polyester, Steel
DOT Safety Code Left	M60W CUER 2615	M60W CUER 2615
DOT Safety Code Right	M60W CUER 2615	M60W CUER 2615

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	240	240	240	240
Tire Placard	kPa	240	240	240	240
Owner's Manual	kPa	240	240	240	240
As Tested	kPa	240	240	240	240

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	435.0	287.0		453.0	338.5		451.0	347.5	
Right	kg	422.0	309.5		430.0	353.0		422.0	361.5	
Ratio	%	59.0%	41.0%	100.0%	56.1%	43.9%	100.0%	55.2%	44.8%	100.0%
Total	kg	857.0	596.5	1453.5	883.0	691.5	1574.5	873.0	709.0	1582.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1453.5	A
Actual Weight of 1 P572 O ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	78.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1581.3	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 -9.0 kg)? ☒ **Yes** ☐ **No**

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	°	-1.0	-1.0	0.0	Yes
Front Passenger Sill Angle (front-to-rear)*	°	0.2	-0.9	0.2	Yes
Front Bumper-Line Angle (left-to-right)**	°	-1.2	-0.3	-0.4	Yes
Rear Bumper-Line Angle (left-to-right)**	°	-1.0	-0.3	-0.3	Yes
Vehicle CG (Aft of Front Axle)	mm	1081	1156	1180	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	-5	4	7	

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

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

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Trunk Soft Trim	7.0
Spare Tire Tools	18.0
Ballast / Equipment Added	83.5

Test Height Adjustable Setting (If Applicable)	

DATA SHEET NO. 2

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

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	Fixed	Fixed	14.5
Front Passenger Seat	Fixed	Fixed	14.7
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle	As Tested SCRP Height	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid Fore/Aft	Forwardmost
Driver Seat	14.5	595	Max			
			Mid	573	584	595
			Min			
Front Passenger Seat	14.7	601	Max			
			Mid	581	593	601
			Min			
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed

DATA SHEET NO. 2 … (CONTINUED)

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

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15

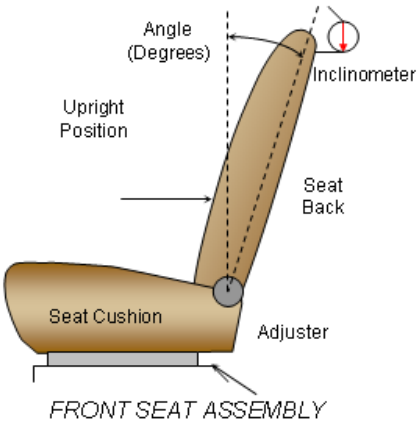
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	260	39	50	7
Front Passenger Seat	260	39	48	7
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

*Detent zero (0) is the forward most detent

SEAT BACK ADJUSTMENT

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



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/Seated Dummy	84.1	36	2.4	
Front Passenger Seat	78.7	34	2.2	
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	Fixed	Fixed	22.0	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	22.0	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

*Detent zero (0) is the forward most detent

DATA SHEET NO. 2 … (CONTINUED)

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

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total No. of Positions	Placed in Position
Driver Seat	3	H

HEAD RESTRAINT ADJUSTMENT

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

	Total No. of Positions	Placed in Position
Driver Seat	4	Full Down / Full Forward

DATA SHEET NO. 2 … (CONTINUED)

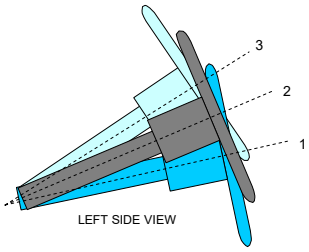
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15

STEERING COLUMN ADJUSTMENT

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

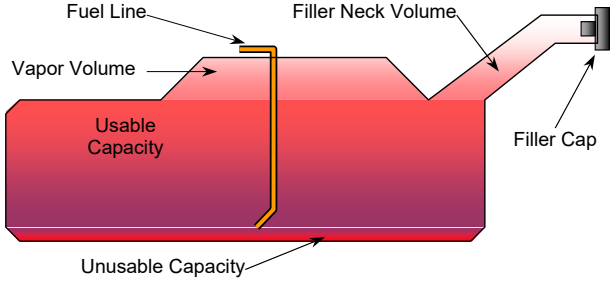


STEERING COLUMN ASSEMBLY

	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	20.6	Fixed
Geometric Center - Position 2	23.8	Fixed
Uppermost - Position 3	27.1	Fixed
Telescoping Steering Wheel Travel		Fixed
Test Position	23.8	Fixed

FUEL PUMP

The vehicle is equipped with an electric fuel pump.



VEHICLE FUEL TANK ASSEMBLY

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	51.48
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	47.89
Actual amount of Solvent Used in Test	47.87
1/3 of Usable Capacity	15.96

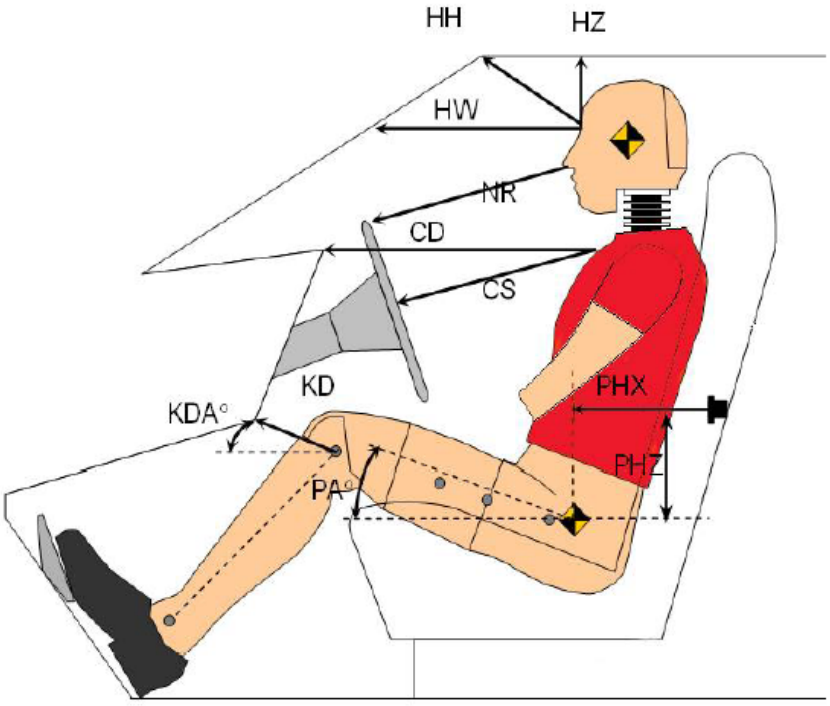
Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in the Form No. 1? ☒ **Yes** ☐ **No**

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15



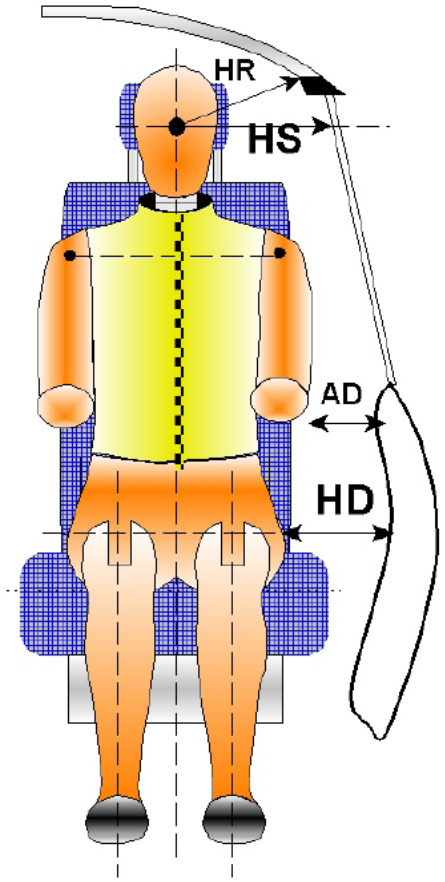
Driver Code	Description	Driver	
		Length (mm)	Angle (º)
HH	Head to Header	516	
HW	Head to Windshield	765	
HZ	Head to Roof	305	
NR	Nose to Rim	269	
CD	Chest to Dash	457	
CS	Chest to Steering Wheel	202	
KD(L)/KDA(L)°	Left Knee to Dash	126	32.4
KD(R)/KDA(R)°	Right Knee to Dash	130	36.2
PAX°	Pelvic Tilt Angle (x-axis)		20.1
PAY°	Pelvic Tilt Angle (y-axis)		0.4
PHX	Hip Point to Striker (x-axis)	284	
PHZ	Hip Point to Striker (z-axis)	125	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15



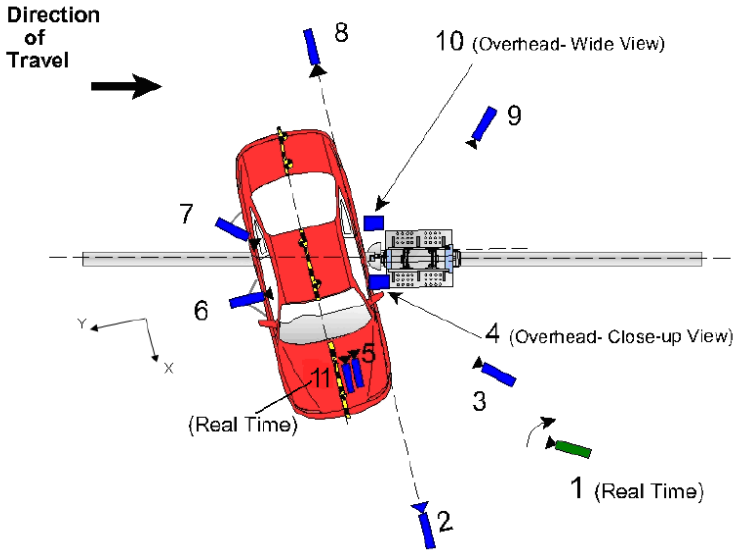
Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	274
HS	Head to Side Window	mm	405
AD	Arm to Door	mm	164
HD	Hip Point to Door	mm	150

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15



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

Camera No.	View	Coordinates (m)			Lens (mm)	Film Speed (fps)
		X*	Y*	Z*		
1	Real Time Pan View of Impact	8.89	46.57	-3.04		30
2	Front Ground Level - Impact View	8.34	-0.05	-0.93	24	1000
3	Impact Side 45° - Forward Pole View	4.10	-2.15	-1.15	8.5	1000
4	Overhead Close-Up View of Impact	0.00	0.00	-5.79	12.5	1000
5	On-Board - Dummy Front View	1.55	0.52	-1.63	25	1000
6	On-Board - Dummy Side View	0.02	1.65	-1.33	14	1000
7	On-Board - Dummy Rear Oblique View	-0.82	1.71	-1.35	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	1.48	0.46	-1.54		30

*All measurements accurate to ±6 mm

INSTRUMENTATION

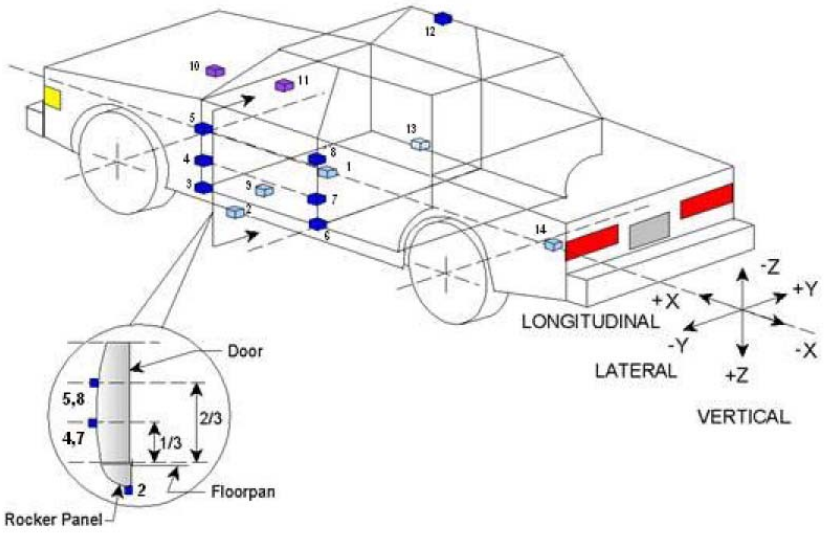
Driver Dummy Channels	16
Vehicle Structure Accelerometers	18
Pole Load Cells	8
Total	42

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15



Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1650	40	-419
2	Left Floor Sill	2341	-764	-266
3	A-Pillar Sill	2893	-790	-523
4	A-Pillar Low	2893	-790	-691
5	A-Pillar Mid	2893	-790	-995
6	B-Pillar Sill	1902	-724	-392
7	B-Pillar Low	1902	-724	-841
8	B-Pillar Mid	1902	-724	-1077
9	Driver Seat Track	2110	-207	-457
10	Engine Top	3674	173	-871
11	Firewall	3305	277	-678
12	Right Roof	2049	543	-1602
13	Right Floor Sill	1920	685	-365
14	Rear Floorpan	926	60	-462

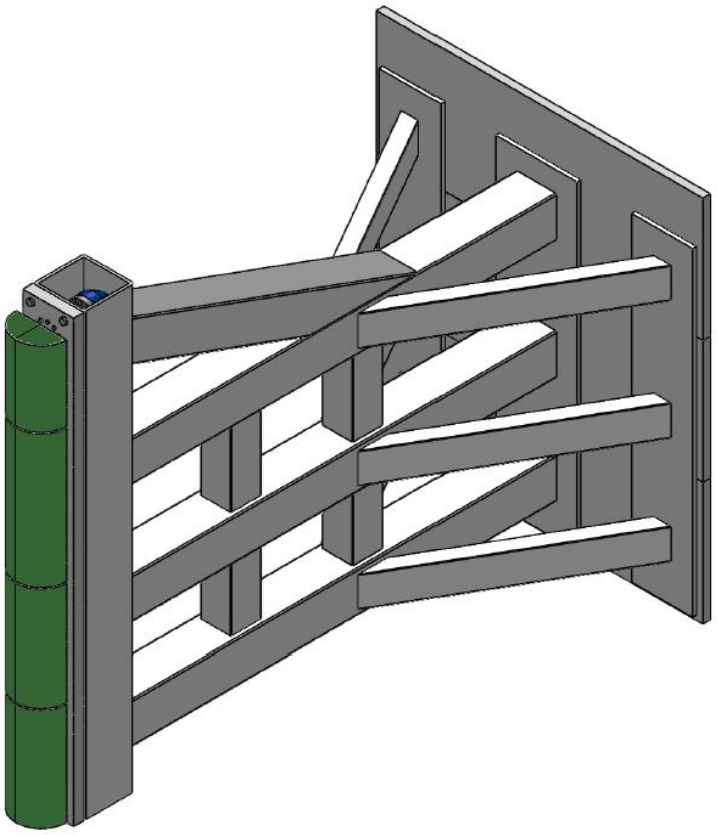
Reference: X – Rear surface of vehicle (+ forward)
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 7

RIGID POLE LOAD CELL DATA

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15



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

DATA SHEET NO. 8

POST-TEST OBSERVATIONS

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver SID-IIs Dummy
Face	Curtain Airbag
Top of Head	Curtain Airbag, Headrest
Left Side of Head	Curtain Airbag
Back of Head	Curtain Airbag, Headrest
Left Shoulder	Torso/Pelvis Airbag, Door Panel
Upper Torso	Torso/Pelvis Airbag, Seat
Lower Torso	Torso/Pelvis Airbag, Seat
Left Hip	Seat, Torso/Pelvis Airbag, Door Panel
Left Knee	Knee Bolster, Right 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	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	N/A	No	N/A
Seat Disengagement from Floor Pan	No	No	No	No
Seat Back Movement from Initial Position	No	No	No	No
Seat Back Collapse	No	No	No	No

POST-TEST STRUCTURAL OBSERVATIONS

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

DATA SHEET NO. 8 … (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

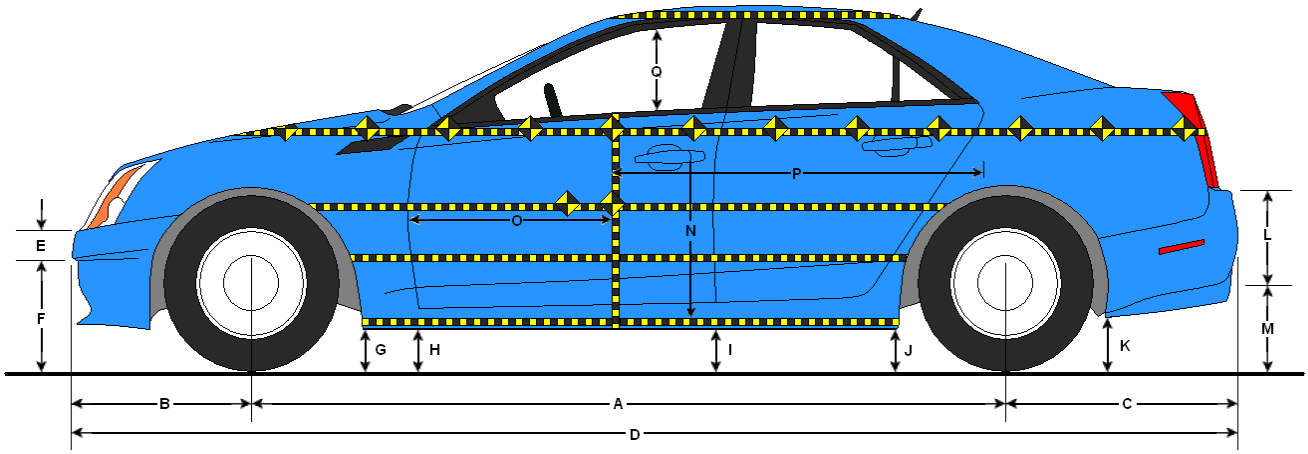
Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		1117
Actual Impact Point (Aft of Front Axle)	mm		1131
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	-14
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	75.1
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.72
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.71

DATA SHEET NO. 9

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15



LEFT SIDE VIEW

All measurements in mm with tolerance of ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

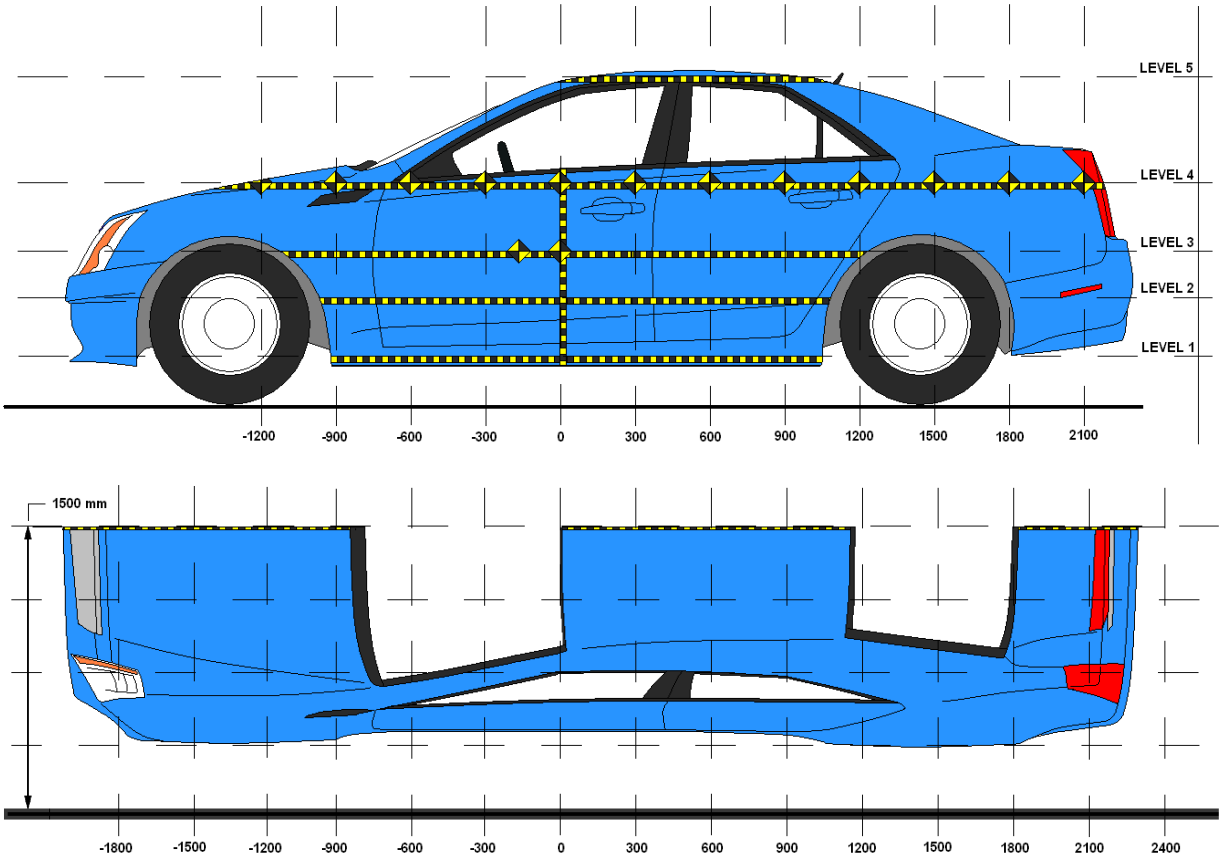
Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2633	2537	-96
B	Front Axle to FSOV	912	938	26
C	Rear Axle to RSOV	892	918	26
D	Total Length at Centerline	4426	4393	-33
E	Front Bumper Thickness	116	114	-2
F	Fromt Bumper Bottom to Ground	523	545	22
G	Sill Height at Front Wheel Well	271	258	-13
H	Sill Height at Front Door Leading Edge	298	289	-9
I	Sill Height at B-Pillar	329	348	19
J1	Sill Height at Rear Wheel Well	268	289	21
J2	Pinch Weld Height at Rear Wheel Well	259	272	13
K	Sill Height Aft of Rear Wheel Well	350	366	16
L	Rear Bumper Thickness	179	179	0
M	Rear Bumper Bottom to Ground	499	524	25
N	Sill Height to Bottom of Front Window Sill	725	705	-20
O	Front Door Leading Edge to Impact CL	611	512	-99
P	Rear Door Trailing Edge to Impact CL	1287	1150	-137
Q	Front Window Opening	436	456	20
R	Right Side Length	3213	3231	18
S	Left Side Length	3216	3078	-138
T	Vehicle Width at B-Pillar	1757	1602	-155

DATA SHEET NO. 10

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15



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

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	324	375	150
2	Occupant H-Point	671	444	150
3	Mid-Door	708	445	150
4	Window Sill	1002	452	150
5	Window Top	1580	279	150

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

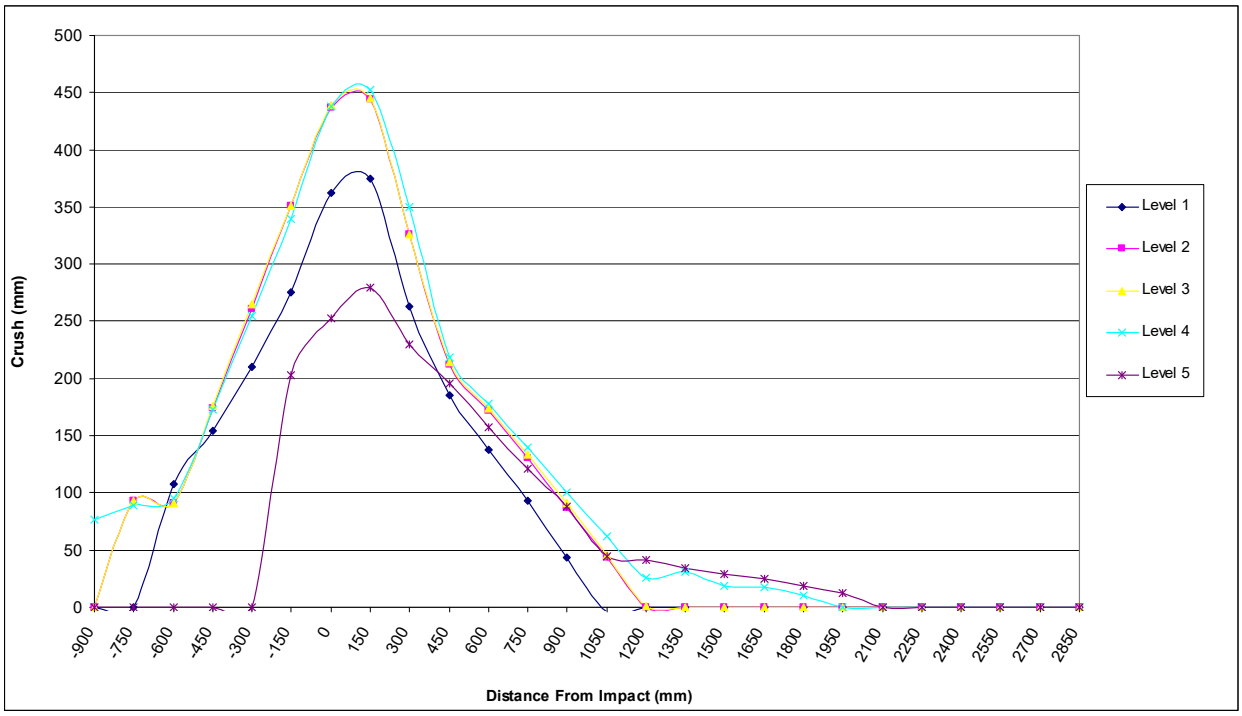
	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900				691					768					77	
-750		613	612	677			706	705	766			93	93	89	
-600	662	632	631	663		770	723	722	758		108	91	91	95	
-450	666	631	629	652		820	805	805	825		154	174	176	173	
-300	664	630	628	642		874	891	893	897		210	261	265	255	
-150	663	628	627	636	880	938	979	978	976	1083	275	351	351	340	203
0	662	626	626	633	878	1024	1063	1065	1071	1131	362	437	439	438	253
150	662	623	624	632	877	1037	1067	1069	1084	1156	375	444	445	452	279
300	663	620	623	631	879	926	946	949	981	1109	263	326	326	350	230
450	664	619	623	632	879	849	831	837	850	1075	185	212	214	218	196
600	666	621	625	633	880	804	793	799	811	1037	138	172	174	178	157
750	668	622	627	634	881	761	752	761	774	1002	93	130	134	140	121
900	671	623	629	636	883	714	710	720	736	971	43	87	91	100	88
1050	674	623	629	647	887	670	666	675	709	932	-4	43	46	62	45
1200			606	642	890			607	668	931			1	26	41
1350				647	894				678	928				31	34
1500				661	898				680	927				19	29
1650				668	903				686	928				18	25
1800				679	909				689	928				10	19
1950				695	918				695	930				0	12
2100															
2250															
2400															
2550															
2700															
2850															

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15

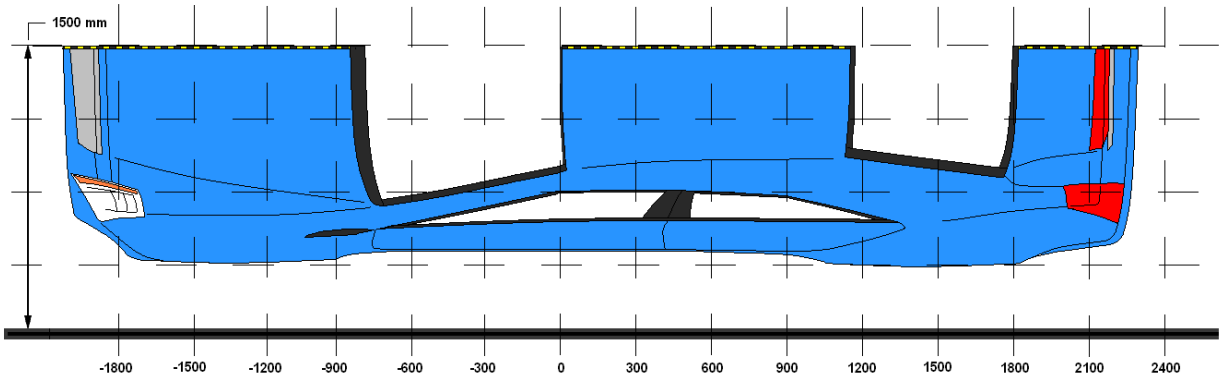


DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15



DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	1950	5	918	930	12
2	1350	5	894	928	34
3	750	4	634	774	140
4	300	4	631	981	350
5	-300	3	628	893	265
6	-900	4	691	768	77

DATA SHEET NO. 12

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15

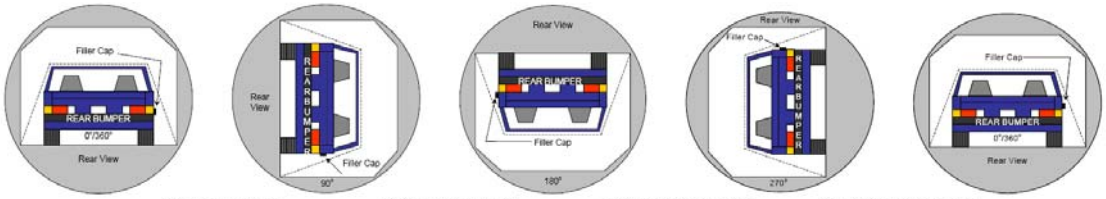
Temperature at Time of Impact: 20.6° C Test Time: 12:05 PM

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

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

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

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



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

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	81	300	381
90° To 180°	82	300	382
180° To 270°	77	300	377
270° To 360°	79	300	379

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

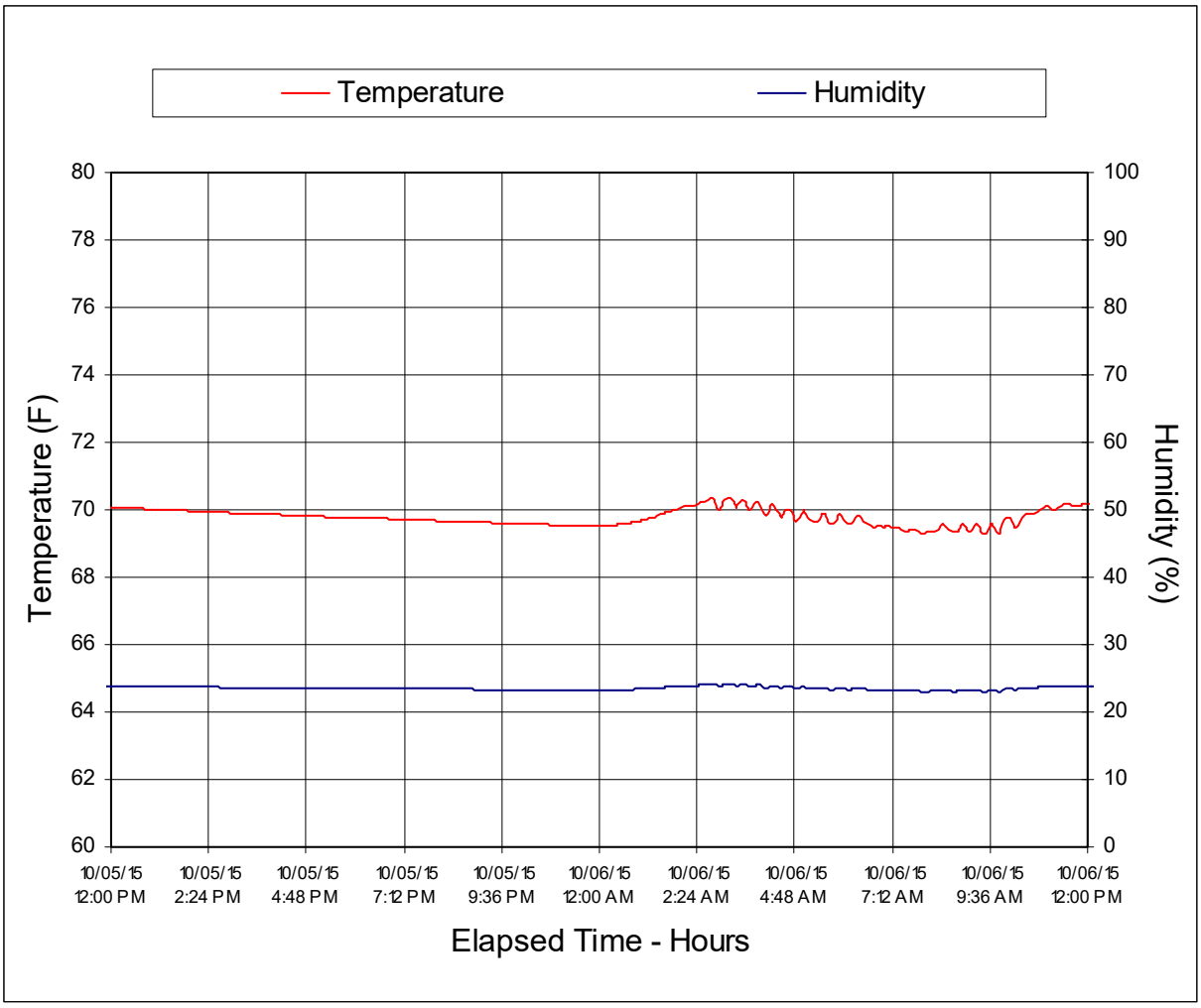
Test Phase	Spillage Location
0° To 90°	No Spillage Occurred
90° To 180°	No Spillage Occurred
180° To 270°	No Spillage Occurred
270° To 360°	No Spillage Occurred

DATA SHEET NO. 13

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2016 Jeep Patriot Sport 5-Door MPV NHTSA No. M20160308

Test Program: NCAP Side Pole Impact Test Test Date: 10/6/15



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS … (CONTINUED)

TABLE OF PHOTOGRAPHS … (CONTINUED)

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

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

FIGURE 3. Pre-Test Frontal View of Test Vehicle

FIGURE 4. Post-Test Frontal View of Test Vehicle

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

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

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

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

FIGURE 9. Pre-Test Left Rear ¾ View of Test Vehicle

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

FIGURE 11. Pre-Test Rear View of Test Vehicle

FIGURE 12. Post-Test Rear View of Test Vehicle

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

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

FIGURE 15. Pre-Test Overhead View of Test Area

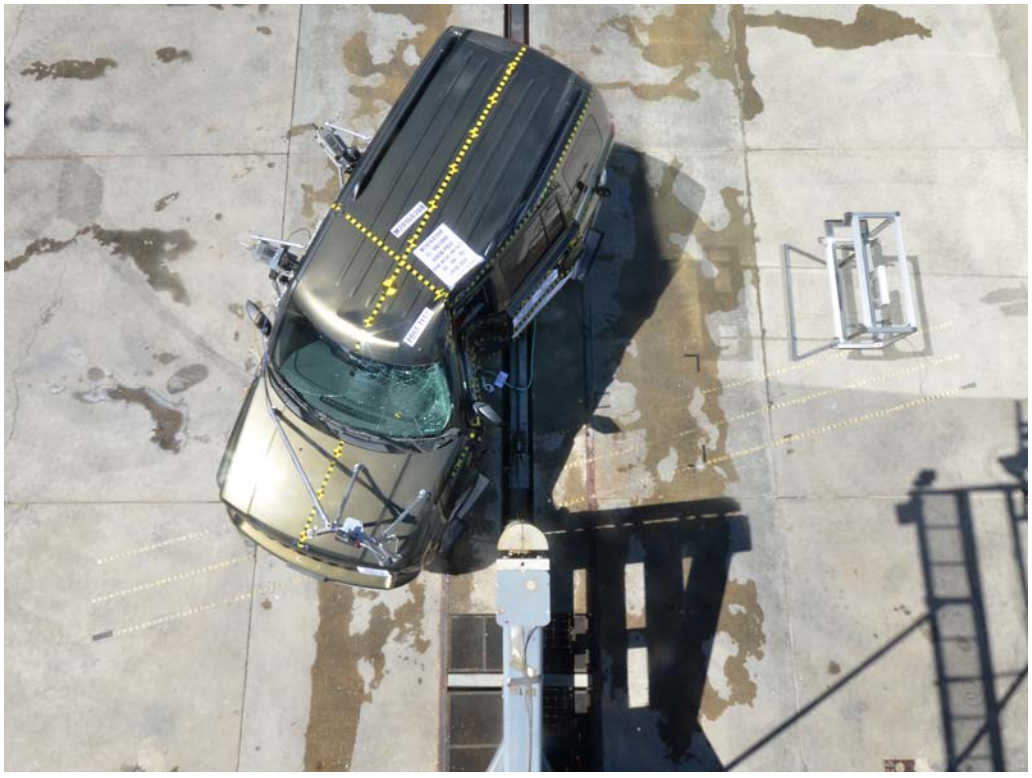


FIGURE 16. Post-Test Overhead View of Test Area

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

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

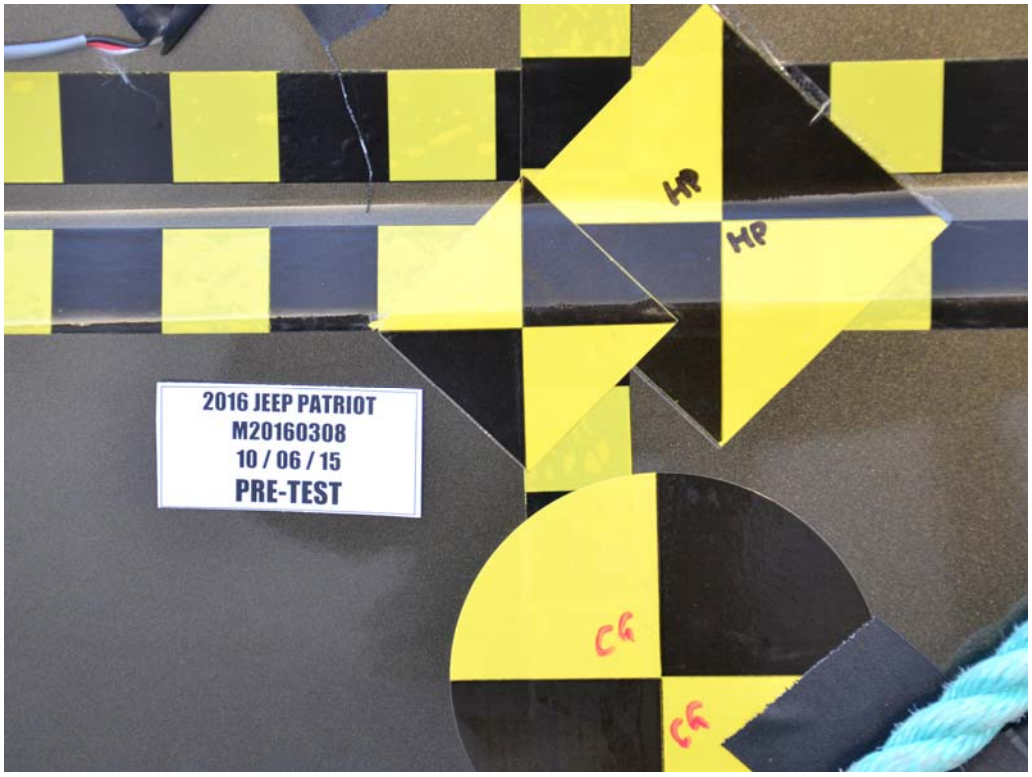


FIGURE 19. Pre-Test Close-Up View of Impact Point Target

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

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

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

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

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

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

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

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

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

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

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

FIGURE 31. Pre-Test Left Side View of Dummy's Head Showing Head is Level

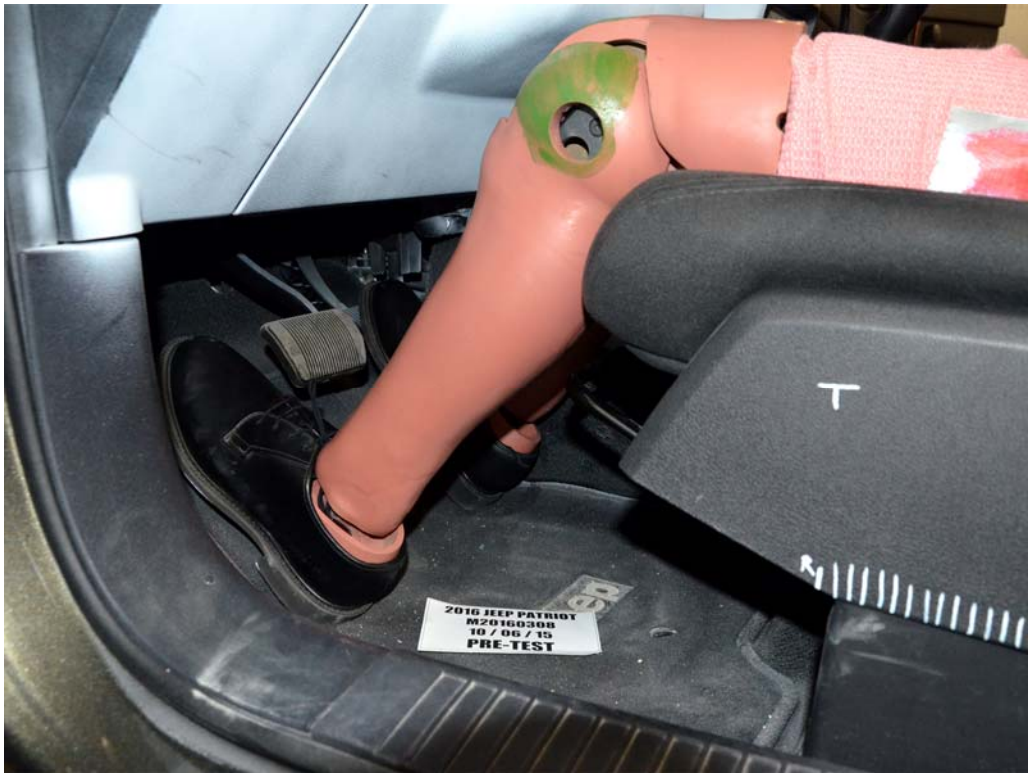


FIGURE 32. Pre-Test Placement of Dummy's Feet

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

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

FIGURE 35. View of Disengaged Parking Brake

FIGURE 36. Pre-Test View of Parking Brake

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

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

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

FIGURE 40. Pre-Test Dummy and Door Clearance View

FIGURE 41. Post-Test Dummy and Door Clearance View

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

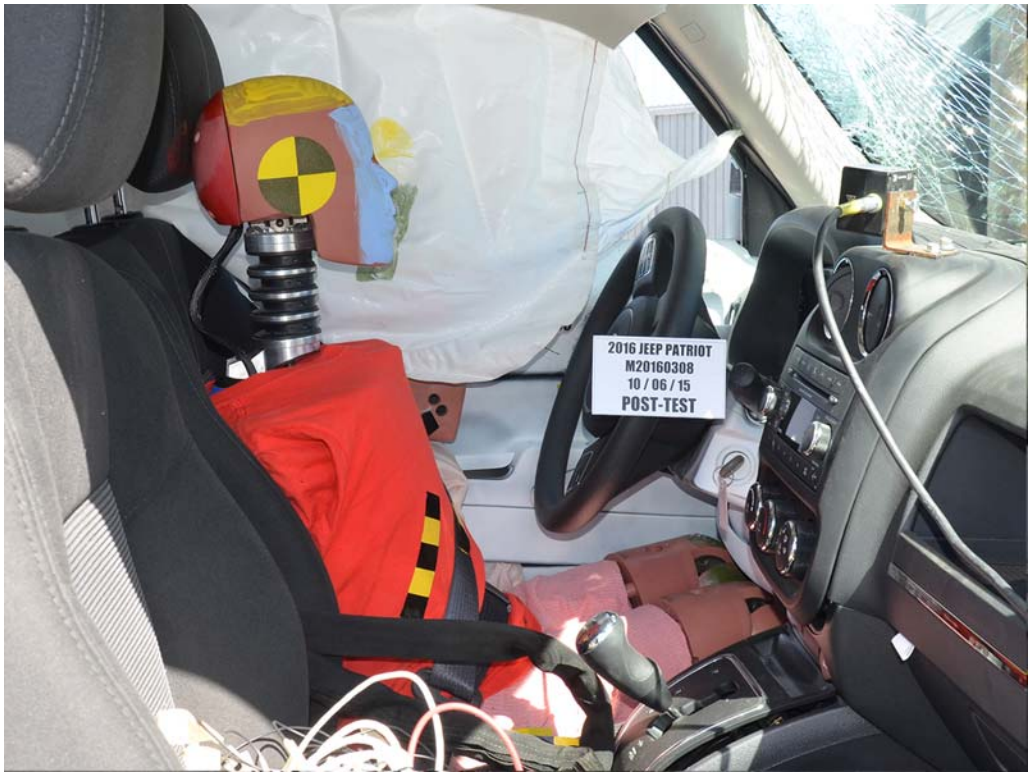


FIGURE 43. Post-Test Right Side View of Dummy and Front Seat of Occupant Compartment

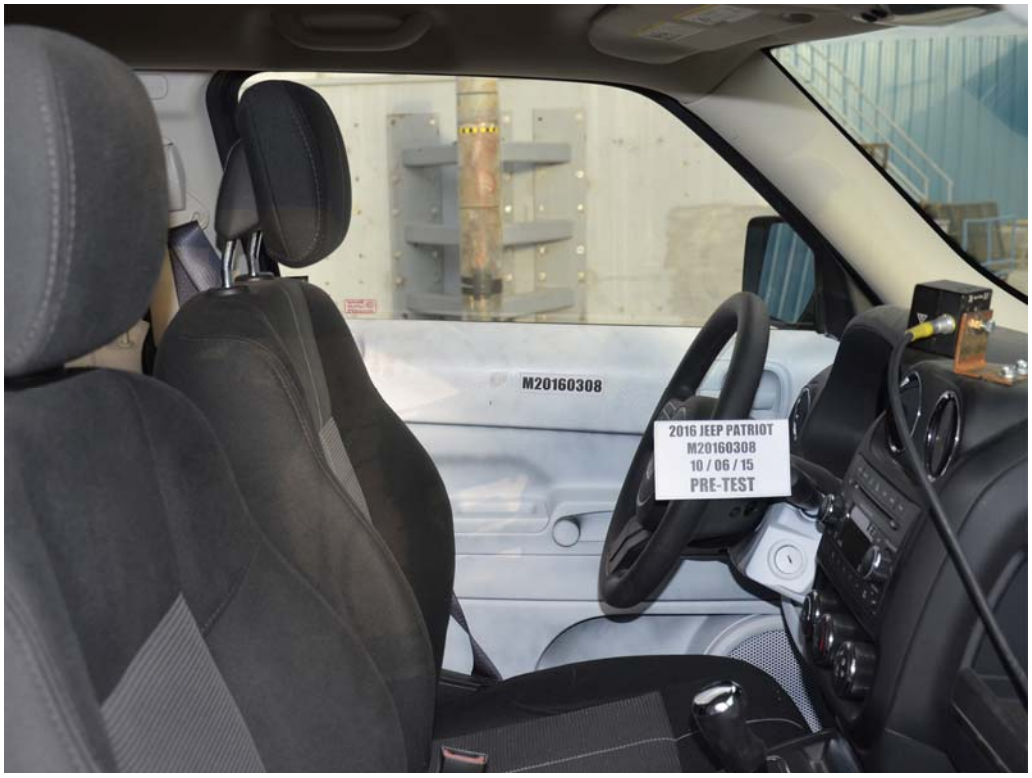


FIGURE 44. Pre-Test Inner Door Panel View

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

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

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

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

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

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

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

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

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

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

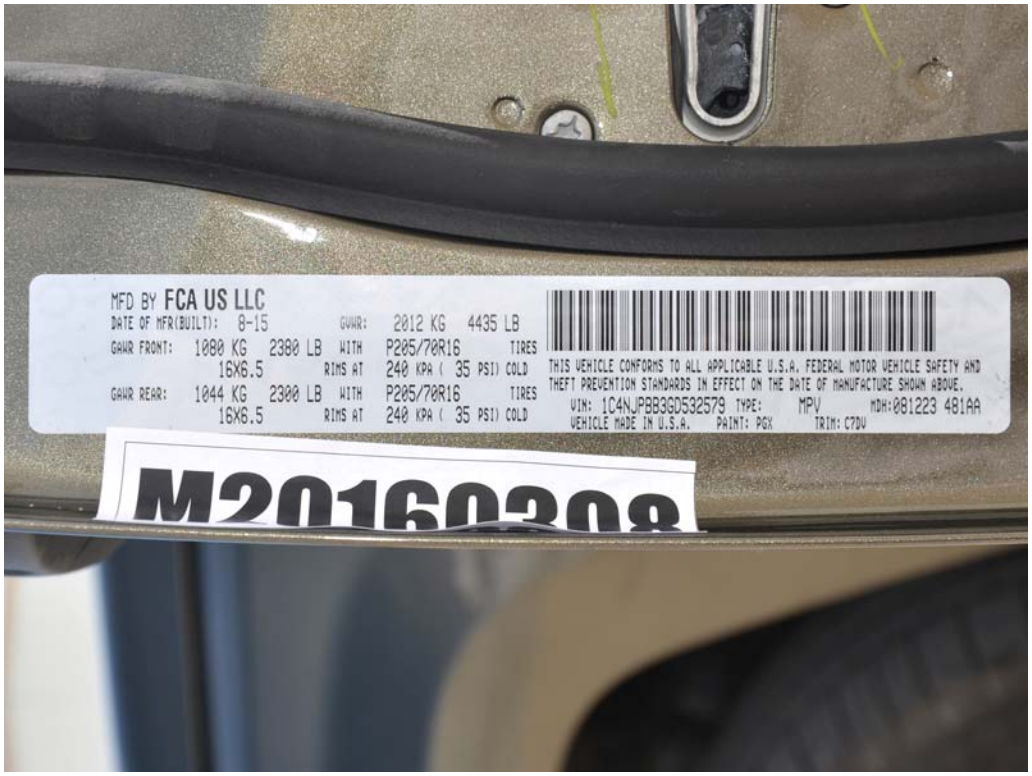


FIGURE 55. Close-Up View of Vehicle's Certification Label

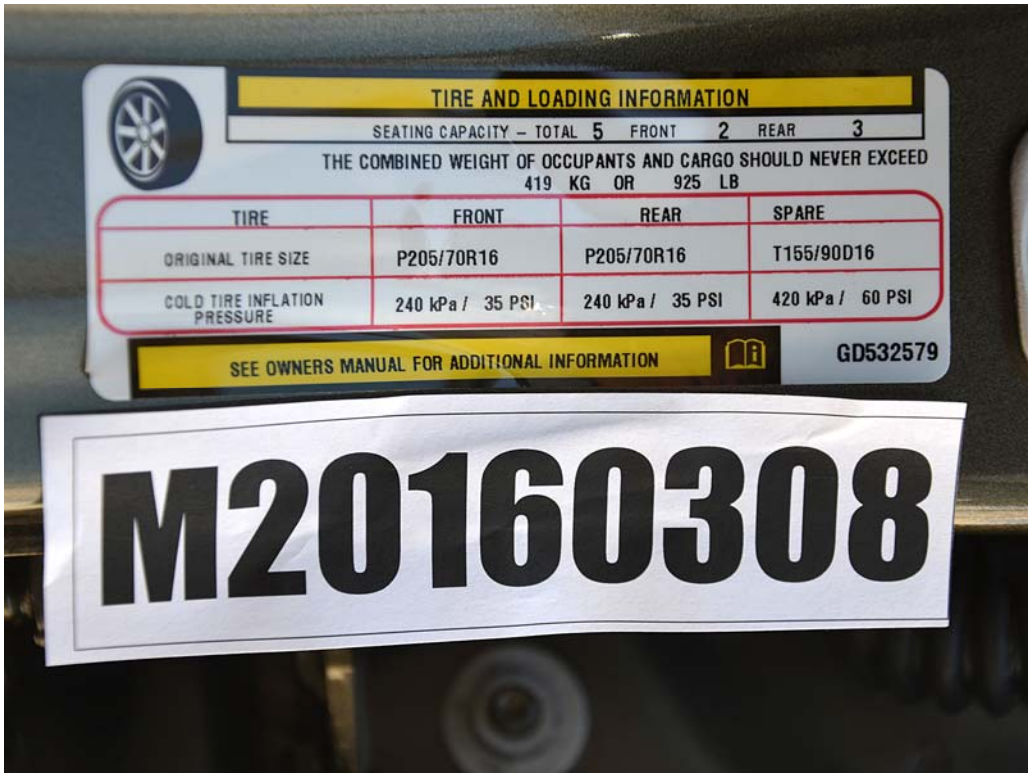


FIGURE 56. Close-Up View of Vehicle's Tire Information Placard or Label

FIGURE 57. Pre-Test Pole Barrier Front View

FIGURE 58. Post-Test Pole Barrier Front View

FIGURE 59. Pre-Test Pole Barrier Side View

FIGURE 60. Post-Test Pole Barrier Side View

FIGURE 61. Pre-Test Ballast View

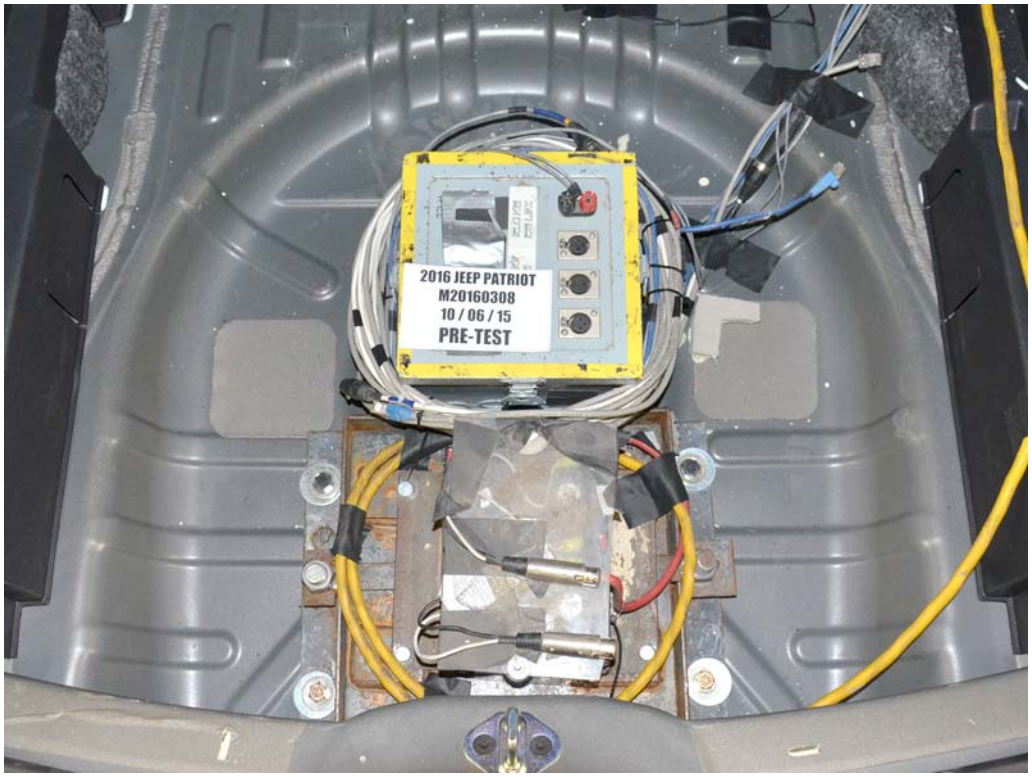


FIGURE 61a. Pre-Test Ballast View

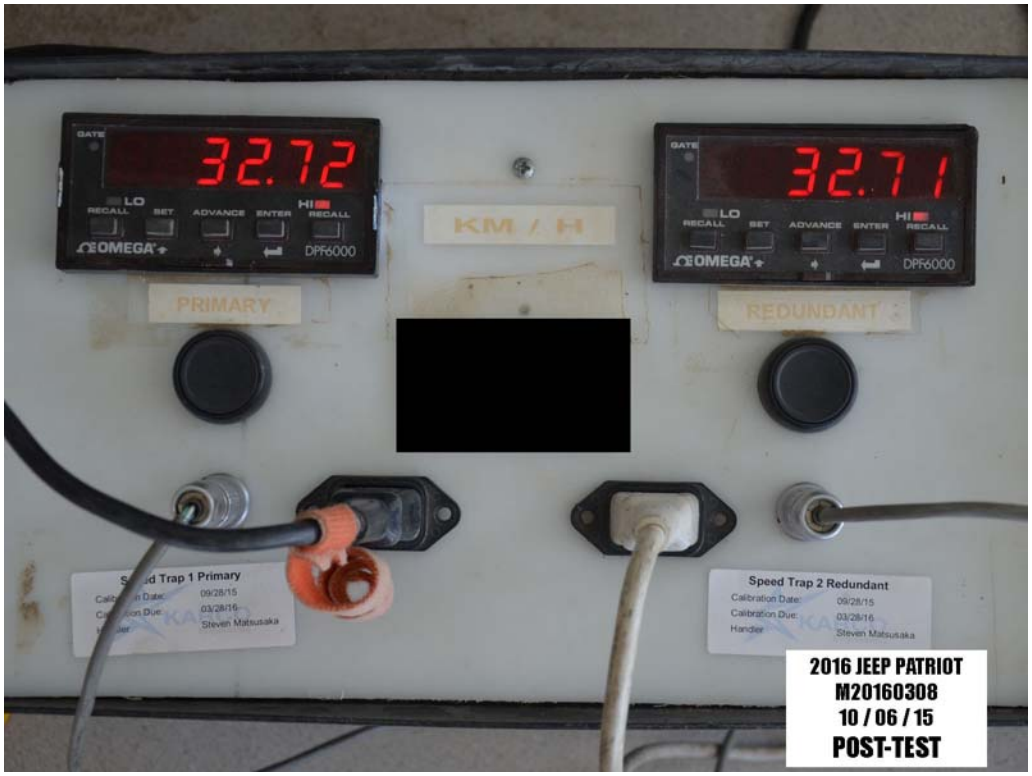


FIGURE 62. Post-Test Primary and Redundant Speed Trap Read-Out

FIGURE 63. FMVSS No. 301 Static Rollover 0 Degrees

FIGURE 64. FMVSS No. 301 Static Rollover 90 Degrees

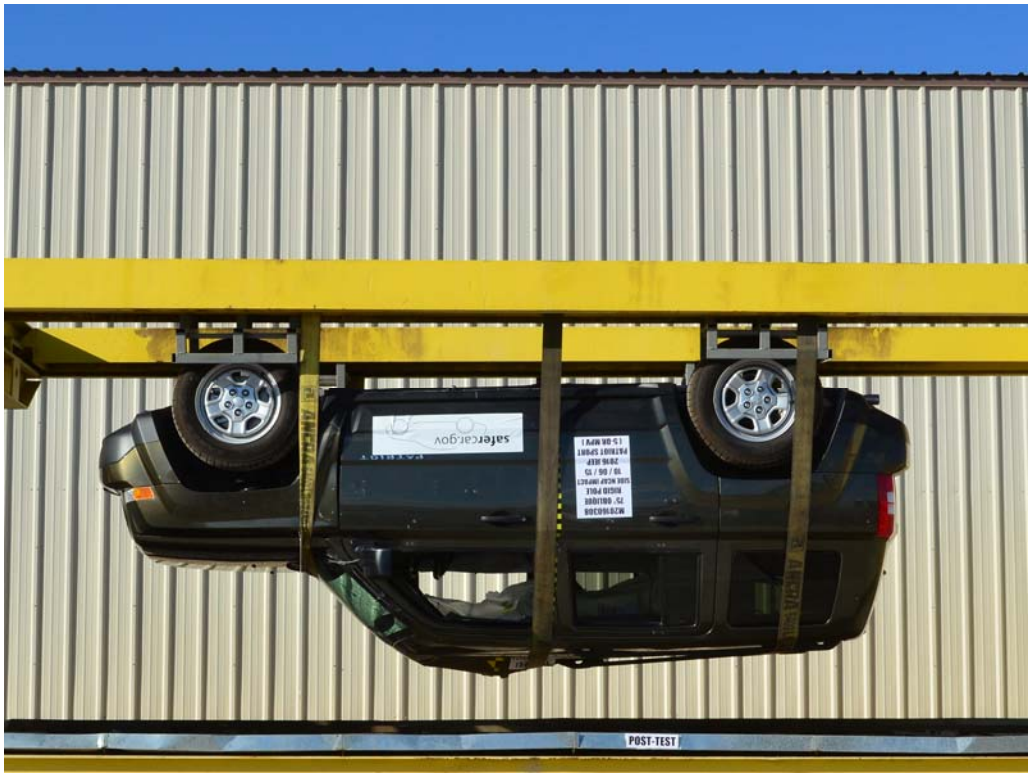


FIGURE 65. FMVSS No. 301 Static Rollover 180 Degrees

FIGURE 66. FMVSS No. 301 Static Rollover 270 Degrees

FIGURE 67. FMVSS No. 301 Static Rollover 360 Degrees

FIGURE 68. Impact Event

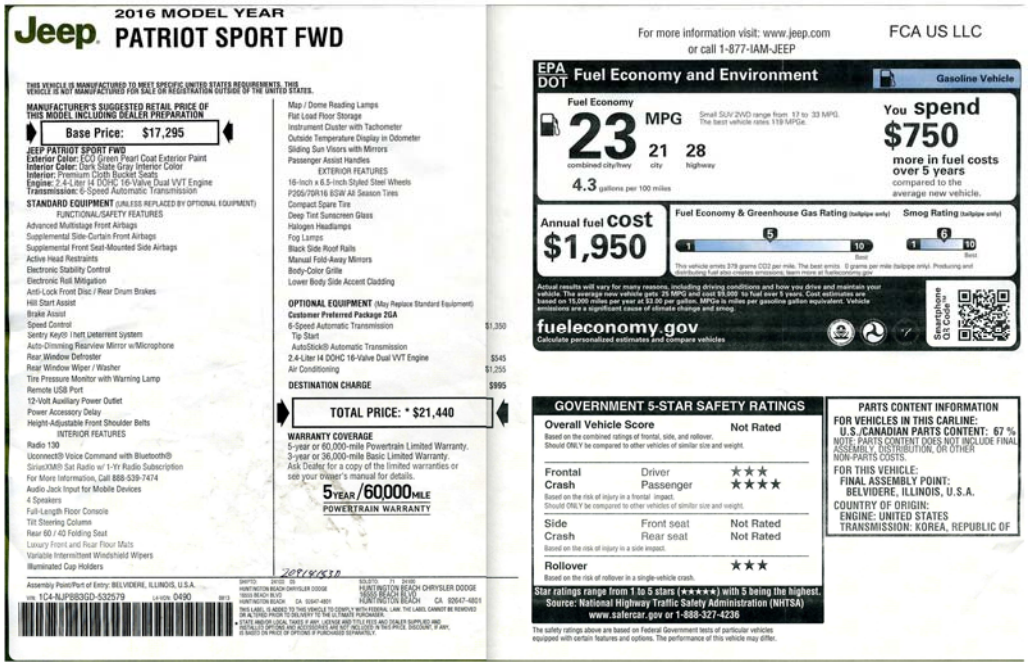
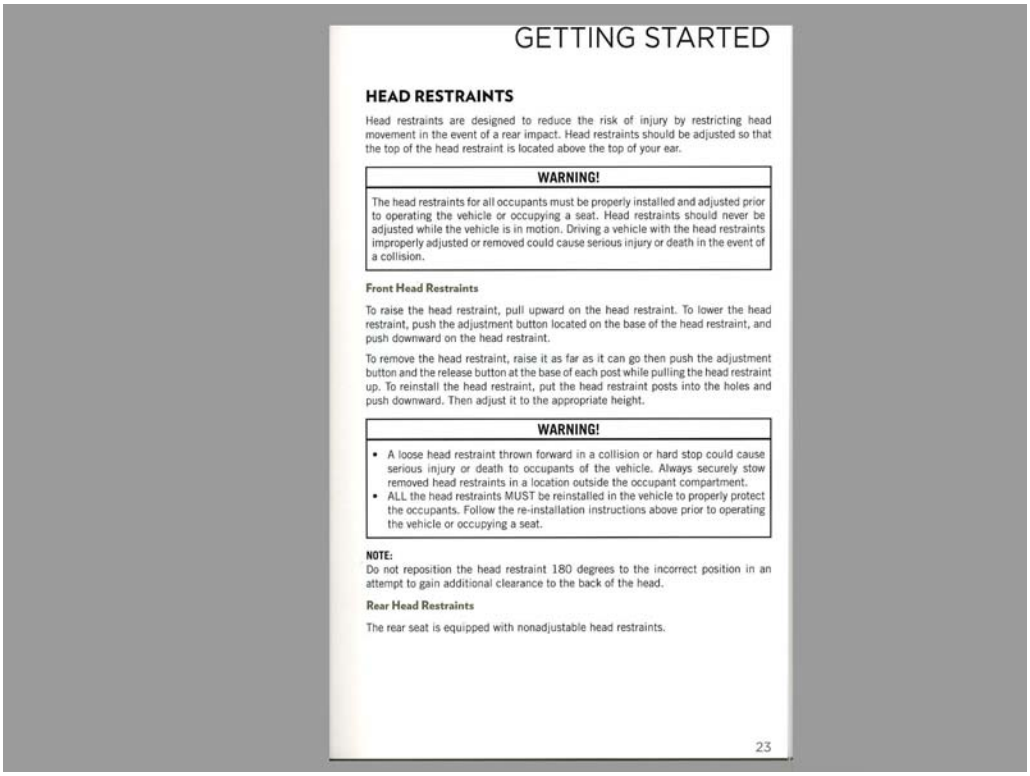


FIGURE 69. Monroney Label



GETTING STARTED

HEAD RESTRAINTS

Head restraints are designed to reduce the risk of injury by restricting head movement in the event of a rear impact. Head restraints should be adjusted so that the top of the head restraint is located above the top of your ear.

WARNING!

The head restraints for all occupants must be properly installed and adjusted prior to operating the vehicle or occupying a seat. Head restraints should never be adjusted while the vehicle is in motion. Driving a vehicle with the head restraints improperly adjusted or removed could cause serious injury or death in the event of a collision.

Front Head Restraints

To raise the head restraint, pull upward on the head restraint. To lower the head restraint, push the adjustment button located on the base of the head restraint, and push downward on the head restraint.

To remove the head restraint, raise it as far as it can go then push the adjustment button and the release button at the base of each post while pulling the head restraint up. To reinstall the head restraint, put the head restraint posts into the holes and push downward. Then adjust it to the appropriate height.

WARNING!

- A loose head restraint thrown forward in a collision or hard stop could cause serious injury or death to occupants of the vehicle. Always securely stow removed head restraints in a location outside the occupant compartment.
- ALL the head restraints MUST be reinstalled in the vehicle to properly protect the occupants. Follow the re-installation instructions above prior to operating the vehicle or occupying a seat.

NOTE:
Do not reposition the head restraint 180 degrees to the incorrect position in an attempt to gain additional clearance to the back of the head.

Rear Head Restraints

The rear seat is equipped with nonadjustable head restraints.

23

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

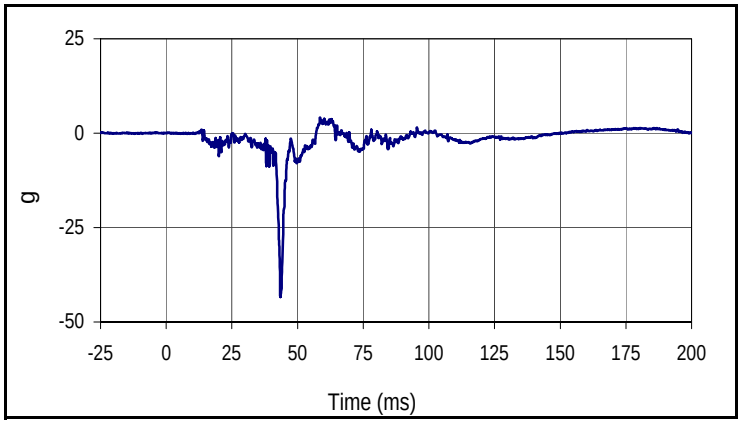
Load Cell Pole Barrier #5 Force (Y)

Load Cell Pole Barrier #6 Force (Y)

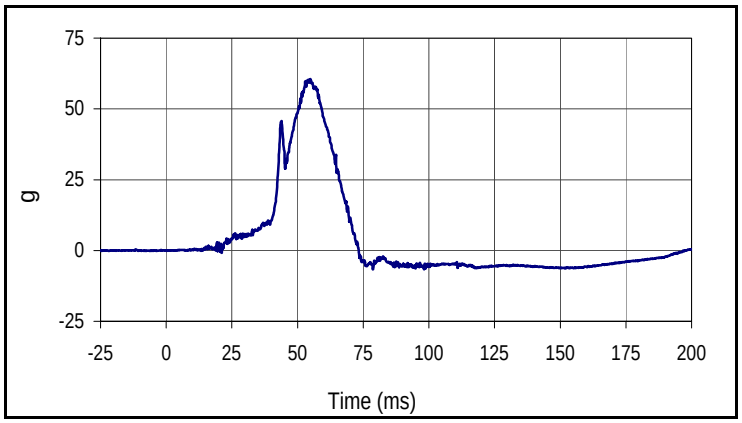
Load Cell Pole Barrier #7 Force (Y)

Load Cell Pole Barrier #8 Force (Y)

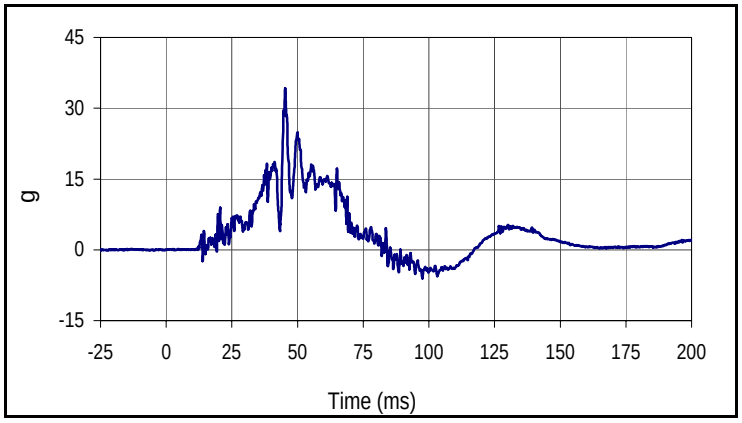
Test Vehicle:	2016 Jeep Patriot Sport 5-Door MPV	Test Date:	10/6/15
Test Program:	NCAP Side Pole Impact Test	NHTSA No.:	M20160308



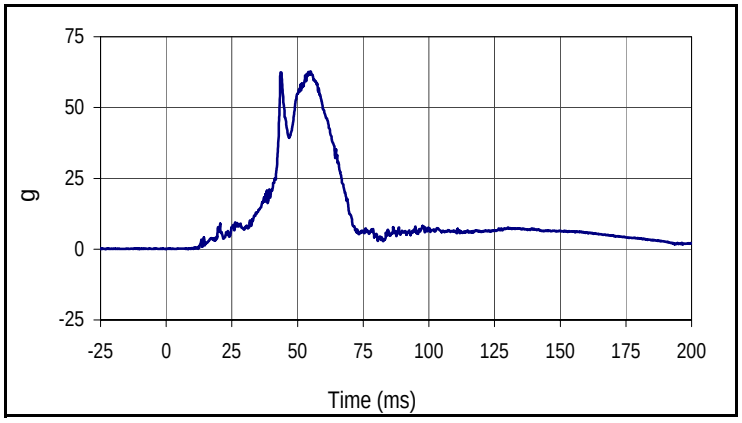
Curve Description			
Driver Head Acceleration X Primary			
Plot No.		SAE Class	Units
001		1000	g
Max	Time	Min	Time
4.2	58.6	-43.4	43.5



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.		SAE Class	Units
002		1000	g
Max	Time	Min	Time
60.5	54.9	-6.7	78.7

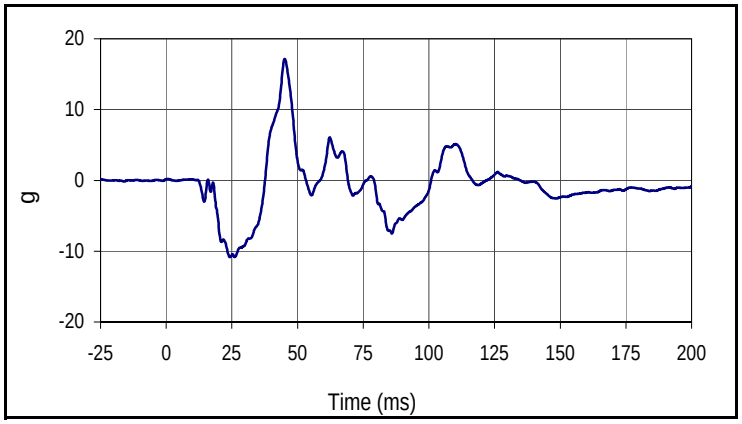


Curve Description			
Driver Head Acceleration Z Primary			
Plot No.		SAE Class	Units
003		1000	g
Max	Time	Min	Time
34.2	45.3	-6.0	97.5

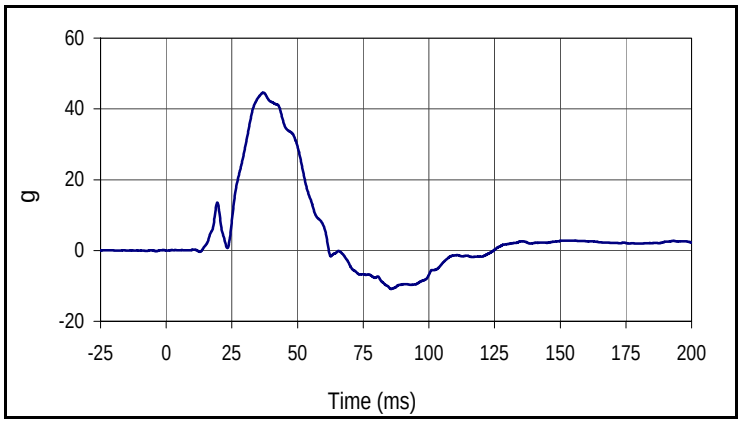


Curve Description			
Driver Head Acceleration Primary Res.			
Plot No.		SAE Class	Units
004		1000	g
Max	Time	Min	Time
62.8	54.9	0.0	8.4

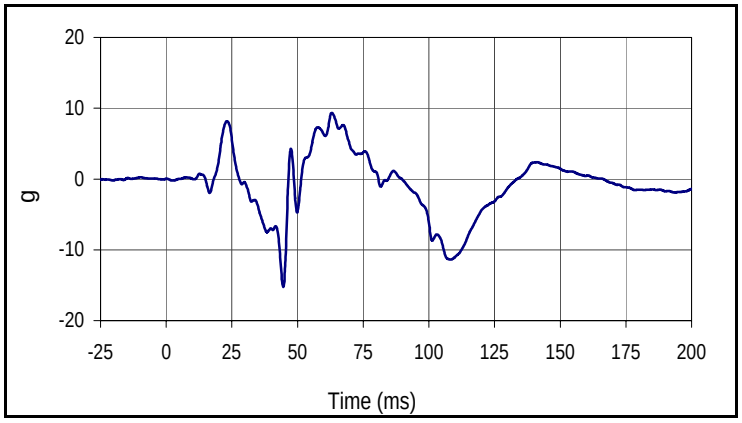
Test Vehicle:	2016 Jeep Patriot Sport 5-Door MPV	Test Date:	10/6/15
Test Program:	NCAP Side Pole Impact Test	NHTSA No.:	M20160308



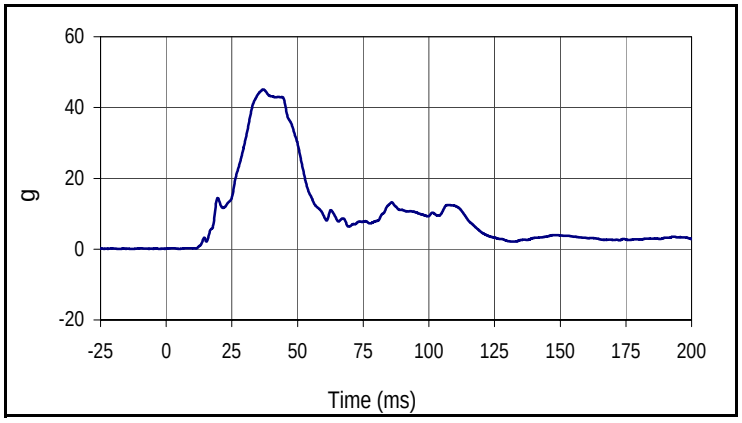
Curve Description			
Driver Lower Spine T12 Acceleration X			
Plot No.		SAE Class	Units
005		180	g
Max	Time	Min	Time
17.2	45.1	-10.8	24.3



Curve Description			
Driver Lower Spine T12 Acceleration Y			
Plot No.		SAE Class	Units
006		180	g
Max	Time	Min	Time
44.6	36.9	-10.9	85.6

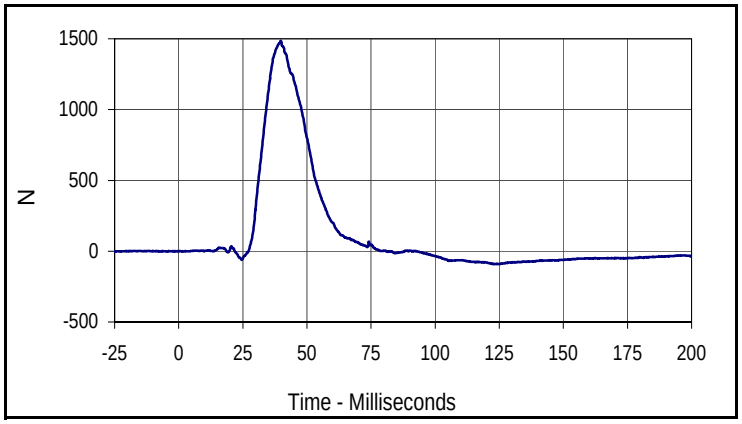


Curve Description			
Driver Lower Spine T12 Acceleration Z			
Plot No.		SAE Class	Units
007		180	g
Max	Time	Min	Time
9.3	63.0	-15.3	44.6

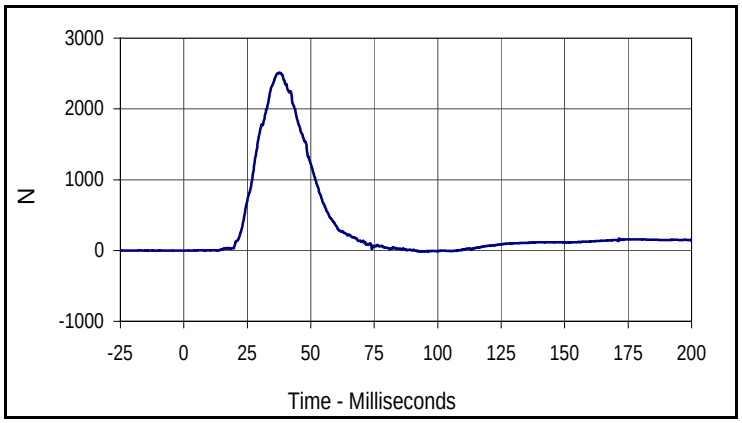


Curve Description			
Driver Lower Spine T12 Acceleration Res.			
Plot No.		SAE Class	Units
008		180	g
Max	Time	Min	Time
45.1	36.9	0.1	4.8

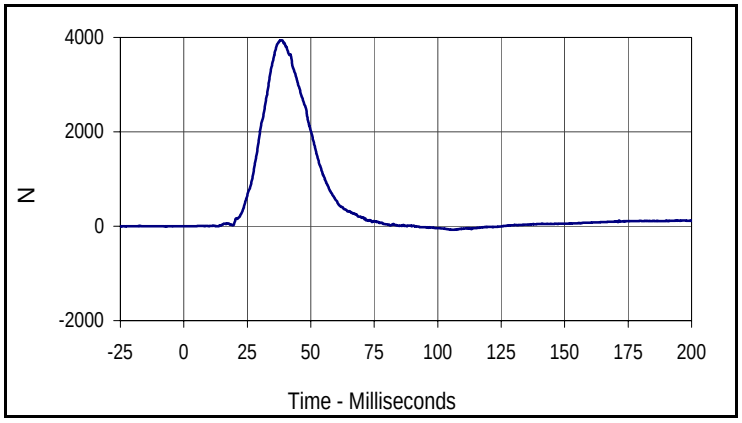
Test Vehicle:	2016 Jeep Patriot Sport 5-Door MPV	Test Date:	10/6/15
Test Program:	NCAP Side Pole Impact Test	NHTSA No.:	M20160308



Curve Description			
Driver Iliac Wing Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
009	0	600	N
Max	Time	Min	Time
1486.5	39.8	-91.0	125.1



Curve Description			
Driver Acetabulum Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
010	0	600	N
Max	Time	Min	Time
2509.7	37.8	-16.2	92.9



Curve Description			
Driver Total Pelvic Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
011	0	600	N
Max	Time	Min	Time
3942.0	38.6	-76.5	105.3

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

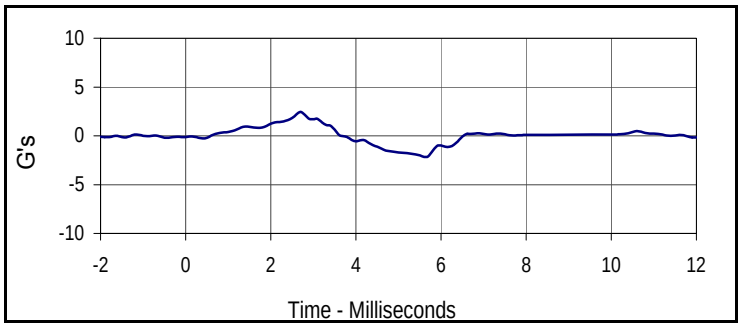
Test Program:	SID IIs External Measurements	Test Date:	10/5/15
ATD Serial No.:	299	Test I.D.:	N/A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	35	Pass
A	Sitting Height	mm	772 - 788	780	Pass
B	Shoulder Pivot Height	mm	437 - 453	445	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	141 - 151	145	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	102	Pass
F	Thigh Clearance	mm	119 - 135	125	Pass
G	Head Breadth	mm	140 - 148	145	Pass
H	Head Back from Backline	mm	40 - 46	44	Pass
I	Head Depth	mm	178 - 188	184	Pass
J	Head Circumference	mm	541 - 551	545	Pass
K	Buttock to Knee Length	mm	514 - 540	527	Pass
L	Popliteal Height	mm	343 - 369	352	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	401	Pass
N	Buttock Popliteal Length	mm	416 - 442	432	Pass
O	Chest Depth w/o Jacket	mm	195 - 211	202	Pass
P	Foot Length	mm	216 - 232	221	Pass
Q	Hip Breadth with Pelvic Plug	mm	313 -323	315	Pass
R	Arm Length	mm	249 - 259	252	Pass
S	Knee Joint to Seatback	mm	477 - 493	481	Pass
V	Shoulder Width	mm	341 - 357	352	Pass
W	Foot Width	mm	78 - 94	86	Pass
Y	Chest Circumference with Jacket	mm	851 - 881	872	Pass
Z	Waist Circumference	mm	760 - 791	774	Pass
			Overall Test Results		Pass

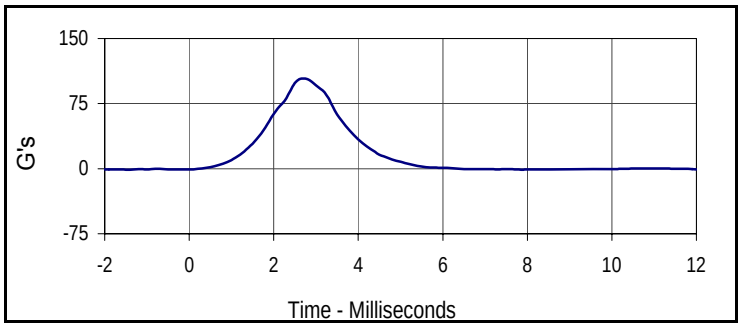
Test Program:	SID IIs Head Drop Test	Test Date:	10/5/15
ATD Serial No.:	299	Test I.D.:	299HD087

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	402	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.2	Pass
	Min	%		35.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.2	Pass
Peak Head Resultant Acceleration		G's	115 to 137	126.0	Pass
Peak Head X Acceleration		G's	<15	2.5	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	1.3	Pass
			Overall Test Results		Pass

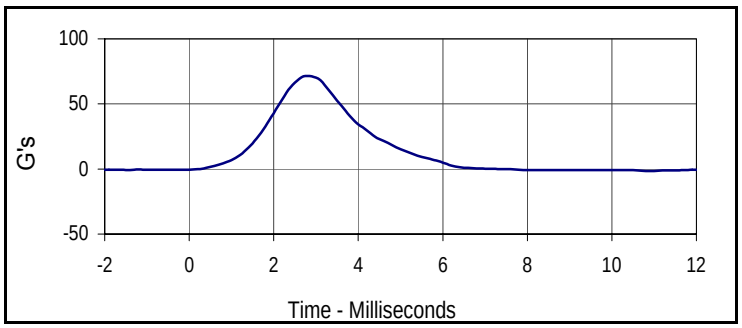
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
126.0	2.7	0.3	0.2



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.5	2.7	-2.2	5.6



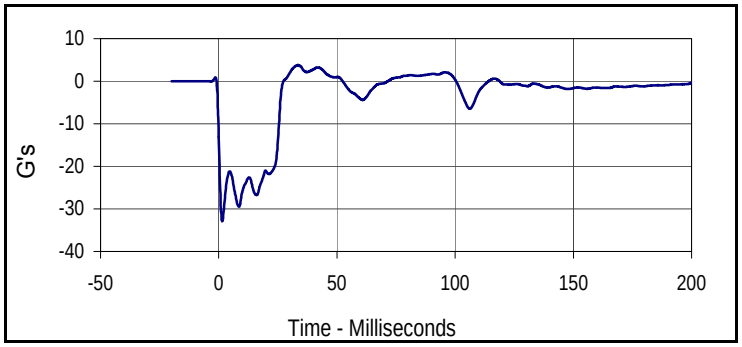
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
104.0	2.7	-1.5	-3.4



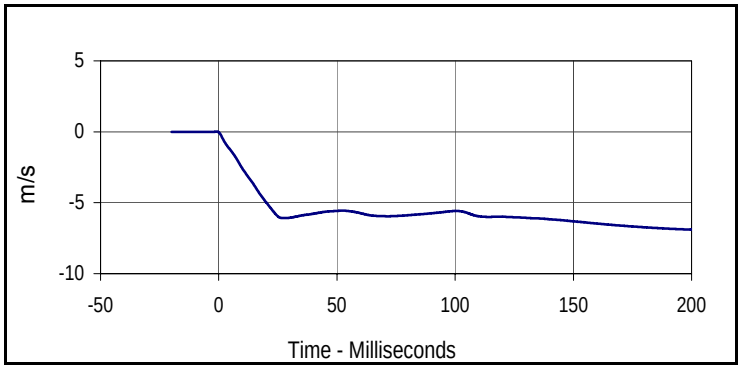
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
71.5	2.8	-1.6	10.9

Test Program:	SID IIs Neck Flexion Test	Test Date:	10/5/15
ATD Serial No.:	299	Test I.D.:	299NB087

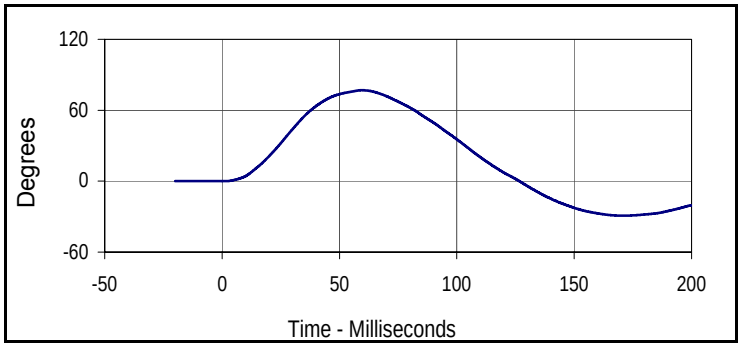
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	447	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.2	Pass
	Min	%		35.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.2	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.60	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.59	Pass
	15 msec	m/s	-3.30 to -4.10	-3.77	Pass
	20 msec	m/s	-4.40 to -5.40	-4.96	Pass
	25 msec	m/s	-5.40 to -6.10	-5.96	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.08	Pass
D-Plane Rotation	Max	Degrees	71 to 81	76.9	Pass
	Time	msec	50 to 70	59.7	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-41.5	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	105.5	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
3.8	0.0	-32.9	0.0

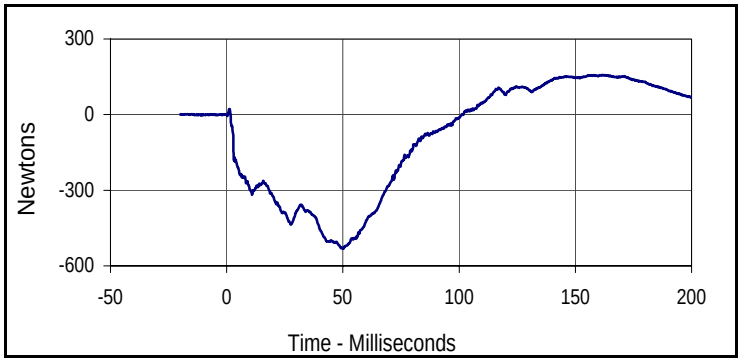


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.9	-6.9	199.9

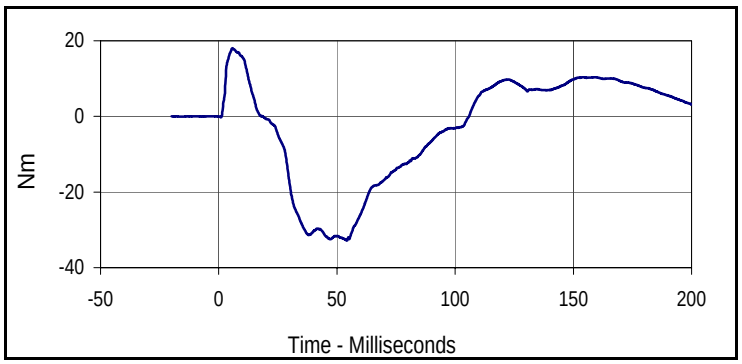


Curve Description			
D-Plane Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
76.9	59.7	-29.2	171.0

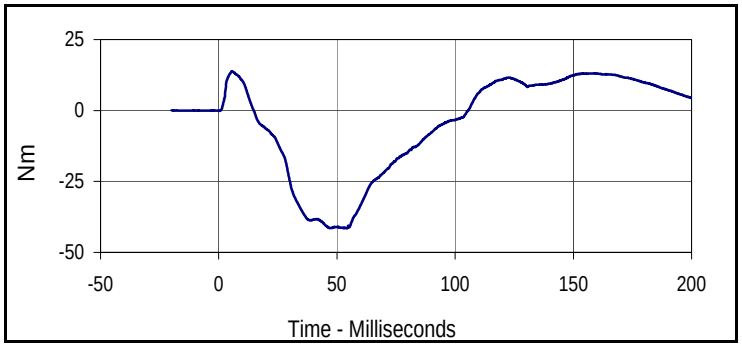
Test Program:	SID IIs Neck Flexion Test	Test Date:	10/5/15
ATD Serial No.:	299	Test I.D.:	299NB087



Curve Description			
Neck Force Y			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
157.3	161.4	-531.1	49.9



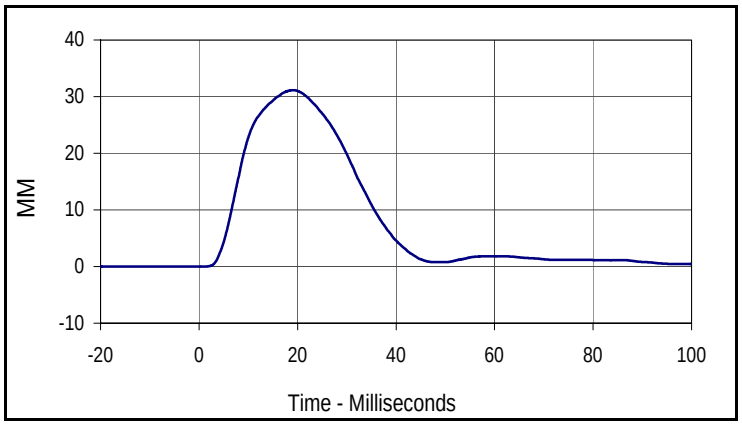
Curve Description			
Neck Moment X			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
18.0	5.8	-32.8	54.2



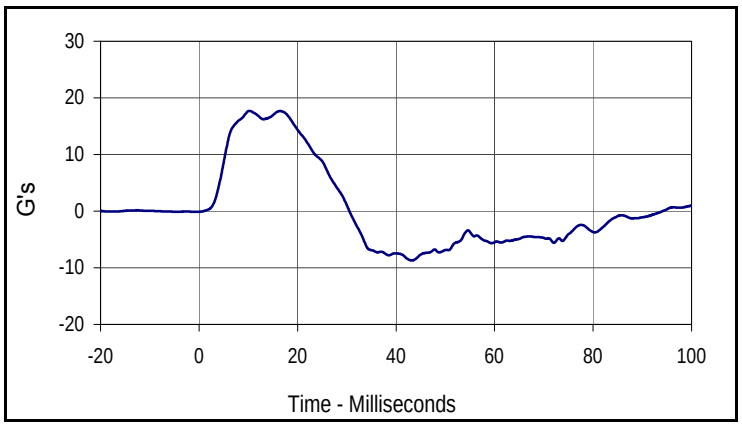
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
006	FIL	600	Nm
Max	Time	Min	Time
13.8	5.7	-41.5	54.3

Test Program:	SID IIs Shoulder Impact Test	Test Date:	10/5/15
ATD Serial No.:	299	Test I.D.:	299SH087

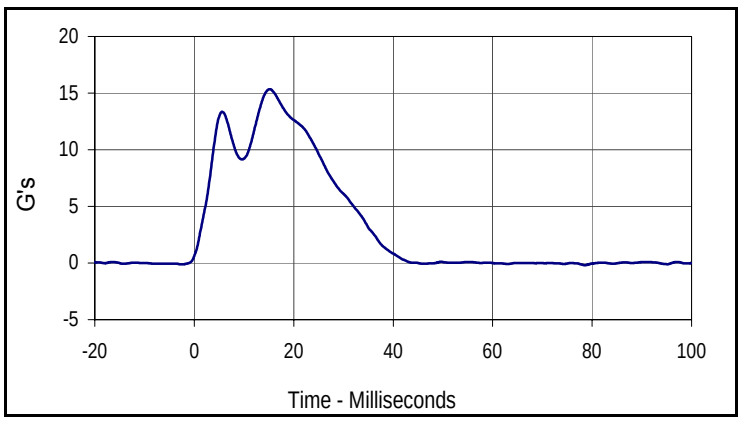
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	492	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.2	Pass
	Min	%		35.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.1	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.29	Pass
Peak Shoulder Deflection		mm	28 to 37	31.1	Pass
Peak Lateral Spine Acceleratrion Y		G's	17 to 22	17.7	Pass
Peak Impactor Acceleration		G's	13 to 18	15.3	Pass
			Overall Test Results		Pass



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
31.1	19.0	0.0	-9.9



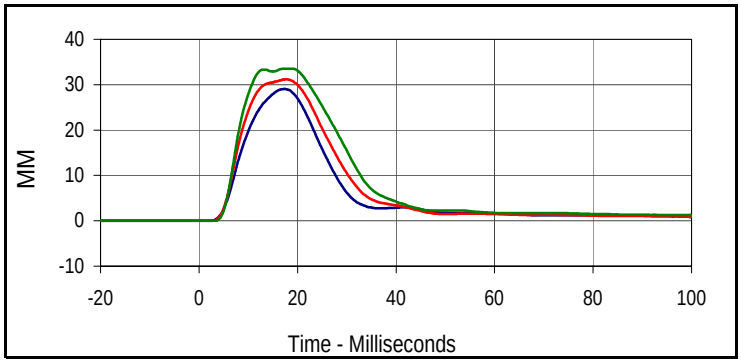
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
17.7	10.3	-8.7	43.2



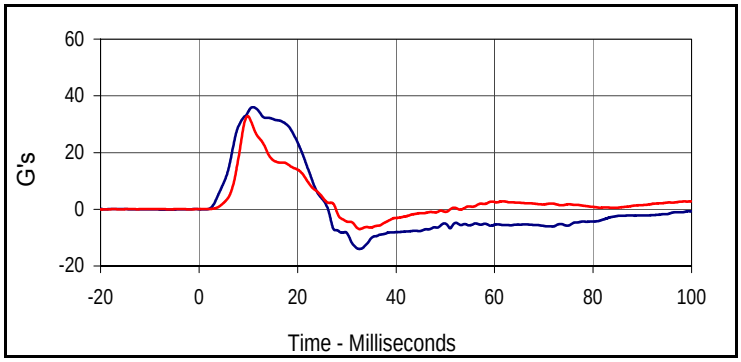
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.3	15.2	-0.2	78.6

Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	10/5/15
ATD Serial No.:	299	Test I.D.:	299TWA087

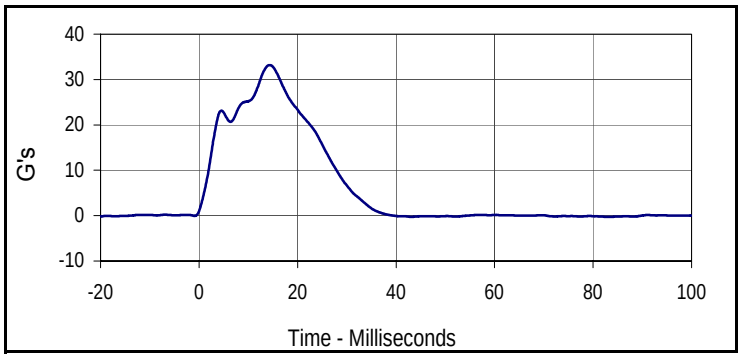
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	537	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.2	Pass
	Min	%		35.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.1	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.69	Pass
Peak Shoulder Deflection		mm	31 to 40	37.5	Pass
Peak Upper Thorax Rib Deflection		mm	25 to 32	29.0	Pass
Peak Middle Thorax Rib Deflection		mm	30 to 36	31.2	Pass
Peak Lower Thorax Rib Deflection		mm	32 to 38	33.5	Pass
Peak Upper Spine Y Acceleration		G's	34 to 43	36.0	Pass
Peak Lower Spine Y Acceleration		G's	29 to 37	32.9	Pass
Peak Impactor Acceleration		G's	30 to 36	33.2	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
29.0	17.4	0.0	-15.6
Middle Thorax Deflection			
Max	Time	Min	Time
31.2	17.7	0.0	-14.3
Lower Thorax Deflection			
Max	Time	Min	Time
33.5	18.1	0.0	-15.3

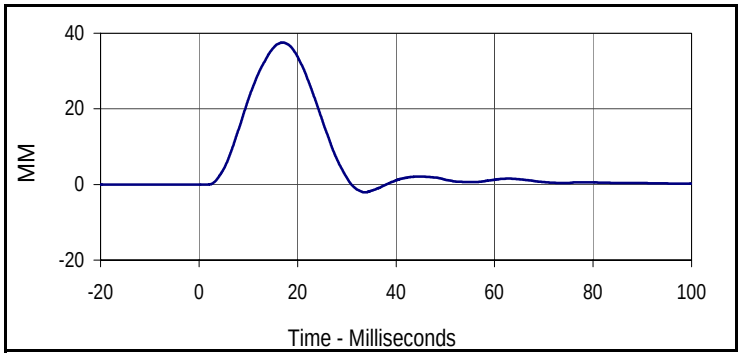


Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
36.0	10.9	-14.0	32.5
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
32.9	9.9	-7.0	32.6



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
33.2	14.3	-0.3	82.8

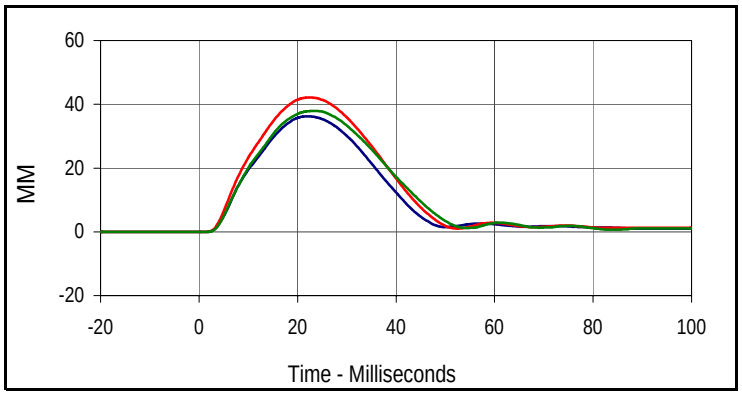
Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	10/5/15
ATD Serial No.:	299	Test I.D.:	299TWA087



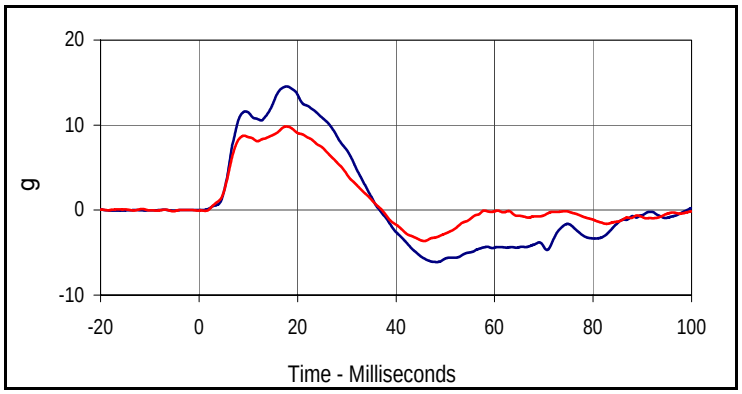
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
37.5	17.0	-2.1	33.6

Test Program:	SID IIs Thorax without Arm Impact Test	Test Date:	10/5/15
ATD Serial No.:	299	Test I.D.:	299TWOA087

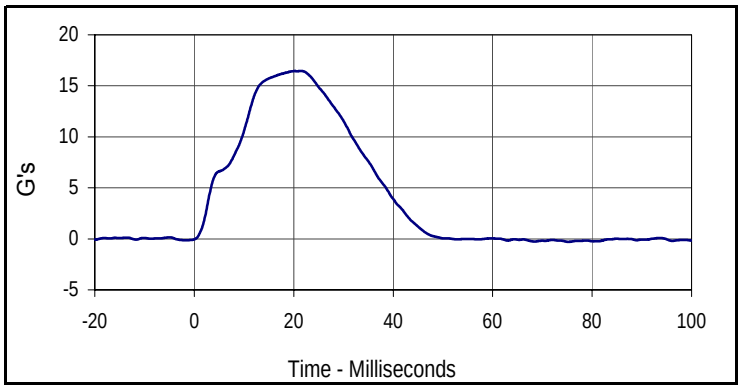
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	582	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.2	Pass
	Min	%		35.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.0	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.30	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	36.2	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	42.2	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	37.9	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	14.5	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	9.8	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
36.2	22.0	0.0	-3.1
Middle Thorax Deflection			
Max	Time	Min	Time
42.2	22.4	0.0	-0.8
Lower Thorax Deflection			
Max	Time	Min	Time
37.9	23.4	0.0	0.4



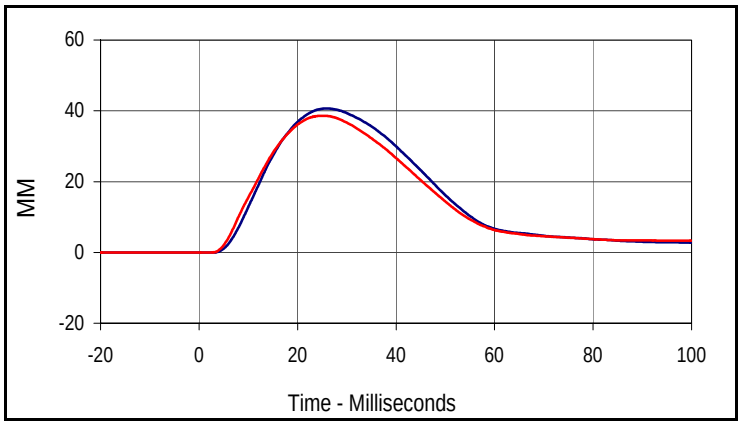
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	g
Max	Time	Min	Time
14.5	17.7	-6.1	48.3
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.8	17.7	-3.7	45.7



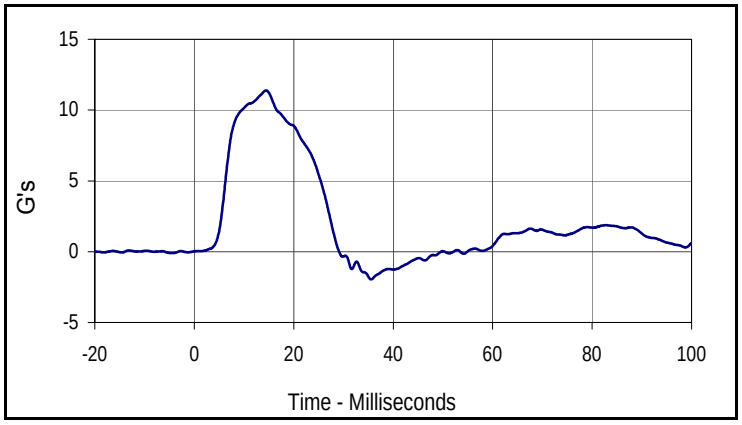
Curve Description			
Impactor Accleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.5	21.4	-0.3	75.2

Test Program:	SID IIs Abdomen Impact Test	Test Date:	10/5/15
ATD Serial No.:	299	Test I.D.:	299ABD087

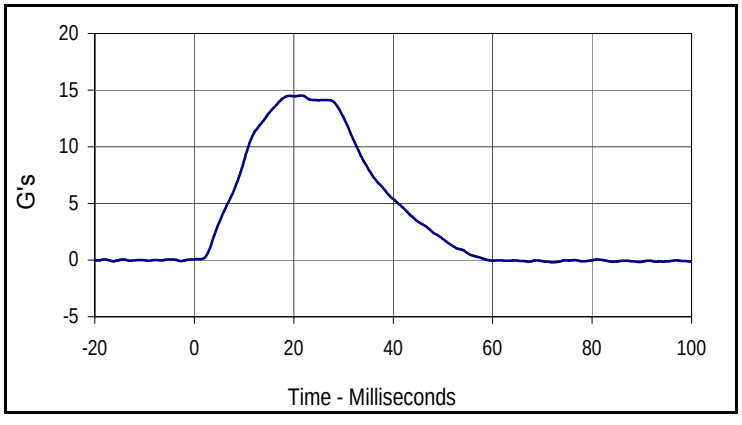
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	627	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.2	Pass
	Min	%		35.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.0	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.33	Pass
Peak Upper Abdominal Rib Deflection		mm	36 to 47	40.6	Pass
Peak Lower Abdominal Rib Deflection		mm	33 to 44	38.6	Pass
Peak Lower Spine Y Acceleration		G's	9 to 14	11.4	Pass
Peak Impactor Acceleration		G's	12 to 16	14.5	Pass
			Overall Test Results		Pass



Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
40.6	26.0	0.0	0.6
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
38.6	25.0	0.0	1.5

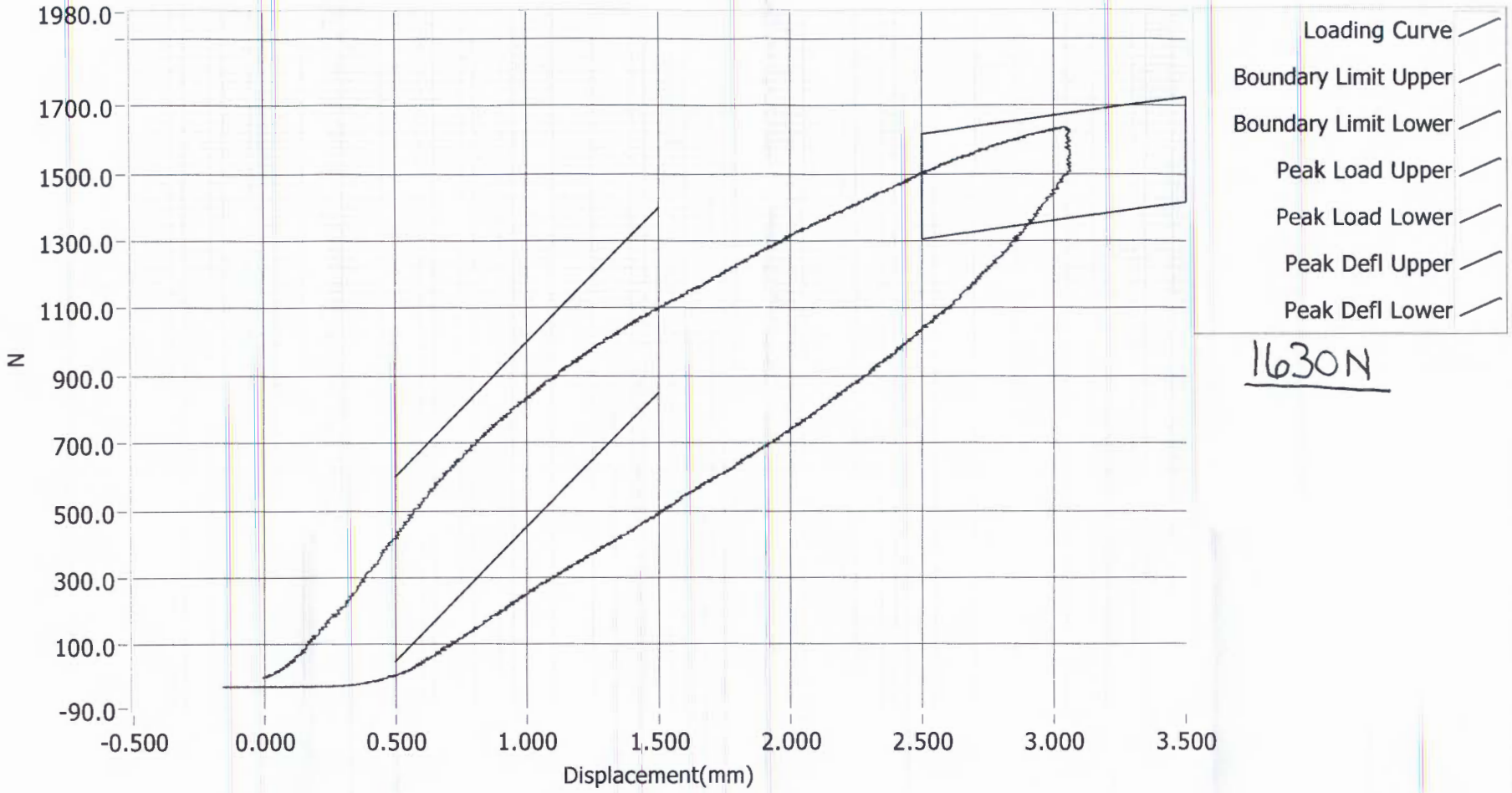


Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
11.4	14.5	-2.0	35.6



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.5	21.6	-0.2	0.0

Resultant Data - SIDIIs Plug Compression



1630N

ATD Calibration Lab

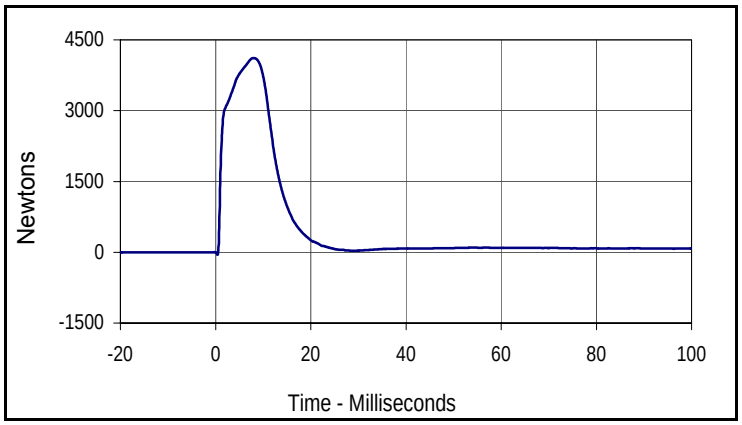
M20150207 Post Test

Test ID	Part Serial Number	Test Date	Test Time
	70730	12/12/2013	10:35 PM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

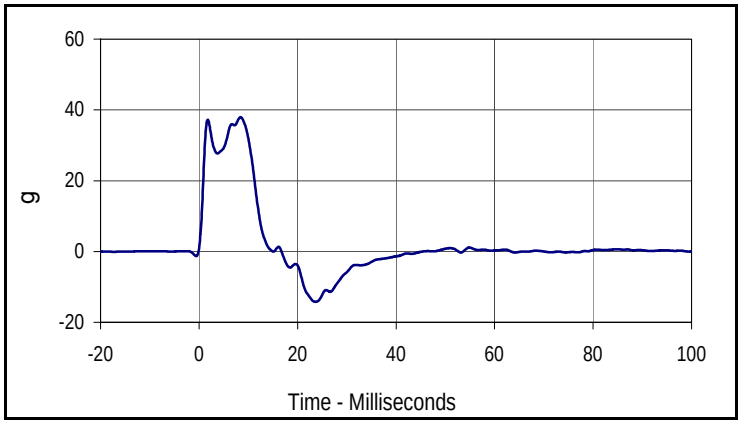
Current Date : 12/12/2013 Current Time : 22:36:06

Test Program:	SID IIs Pelvis Acetabulum Impact Test	Test Date:	10/5/15
ATD Serial No.:	299	Test I.D.:	299ACET087

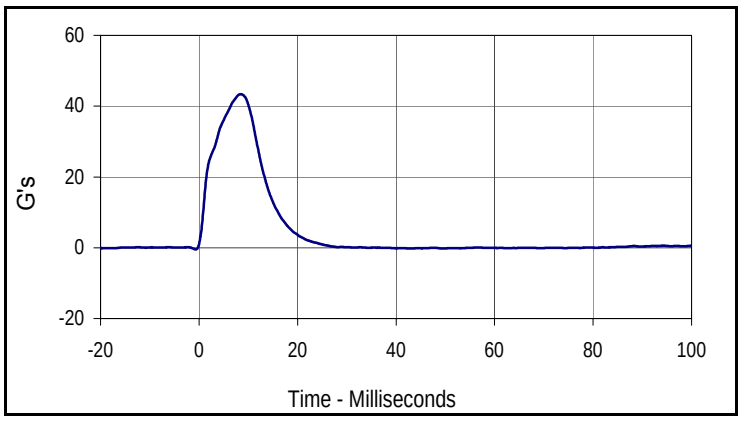
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	672	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.2	Pass
	Min	%		35.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.0	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.71	Pass
Peak Acetabulum Force Y		Newtons	3600 to 4300	4112.6	Pass
Peak Pelvis Y Acceleration After 6 msec.		G's	34 to 42	37.9	Pass
Peak Impactor Acceleration		G's	38 to 47	43.4	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4112.6	7.9	-48.6	0.4



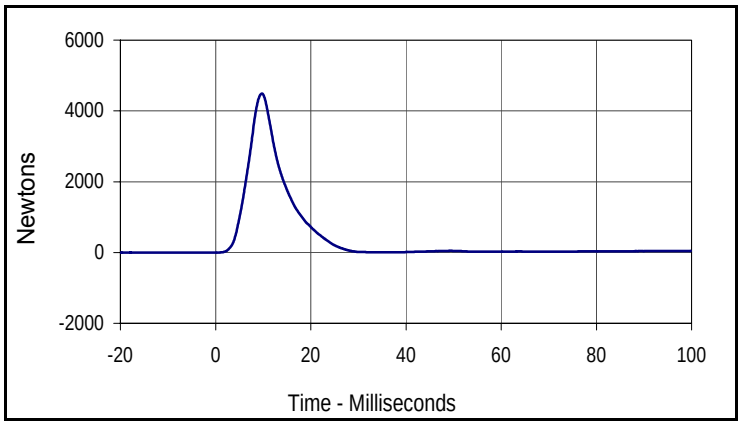
Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	g
Max	Time	Min	Time
37.9	8.4	-14.2	23.6



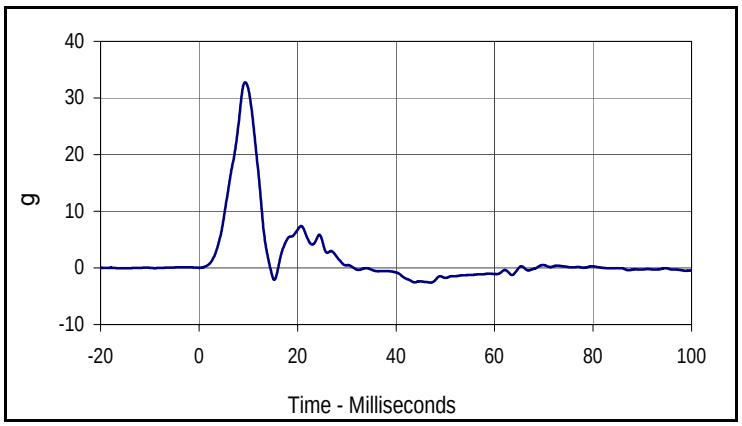
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
43.4	8.4	-0.5	-0.7

Test Program:	SID IIs Pelvis Iliac Calibration	Test Date:	10/5/15
ATD Serial No.:	299	Test I.D.:	299PL087

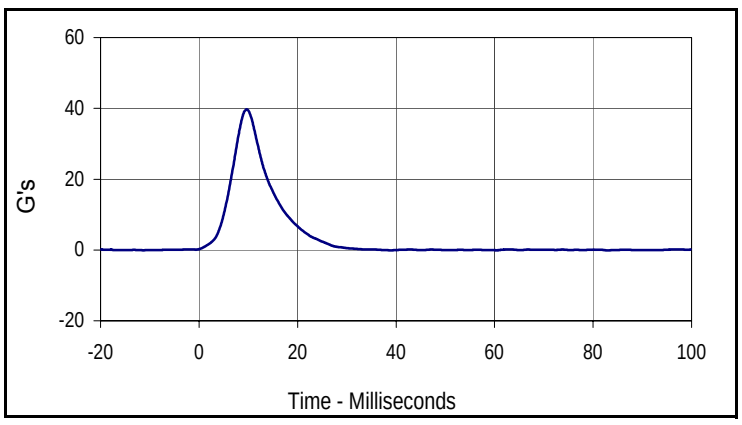
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	717	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.2	Pass
	Min	%		35.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.0	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.33	Pass
Peak Illiac Force		Newtons	4100 to 5100	4489.4	Pass
Peak Pelvis Y Acceleration		G's	28 to 39	32.8	Pass
Peak Impactor Acceleration		G's	36 to 45	39.7	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4489.4	9.7	-2.4	-17.1



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	g
Max	Time	Min	Time
32.8	9.4	-2.6	47.0



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
39.7	9.7	-0.1	83.0

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

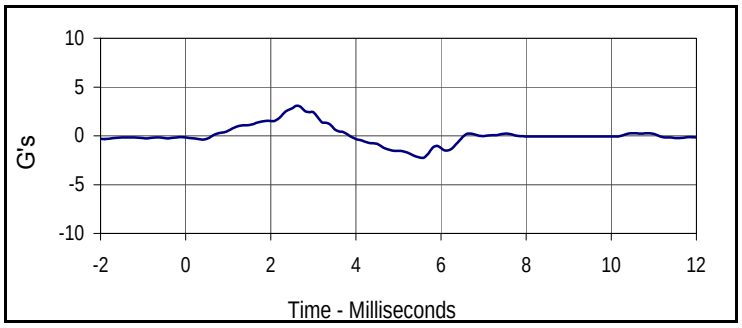
Test Program:	SID IIs External Measurements	Test Date:	10/7/15
ATD Serial No.:	299	Test I.D.:	N/A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	35	Pass
A	Sitting Height	mm	772 - 788	780	Pass
B	Shoulder Pivot Height	mm	437 - 453	445	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	141 - 151	145	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	102	Pass
F	Thigh Clearance	mm	119 - 135	125	Pass
G	Head Breadth	mm	140 - 148	145	Pass
H	Head Back from Backline	mm	40 - 46	44	Pass
I	Head Depth	mm	178 - 188	184	Pass
J	Head Circumference	mm	541 - 551	545	Pass
K	Buttock to Knee Length	mm	514 - 540	527	Pass
L	Popliteal Height	mm	343 - 369	352	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	401	Pass
N	Buttock Popliteal Length	mm	416 - 442	432	Pass
O	Chest Depth w/o Jacket	mm	195 - 211	202	Pass
P	Foot Length	mm	216 - 232	221	Pass
Q	Hip Breadth with Pelvic Plug	mm	313 -323	315	Pass
R	Arm Length	mm	249 - 259	252	Pass
S	Knee Joint to Seatback	mm	477 - 493	481	Pass
V	Shoulder Width	mm	341 - 357	352	Pass
W	Foot Width	mm	78 - 94	86	Pass
Y	Chest Circumference with Jacket	mm	851 - 881	872	Pass
Z	Waist Circumference	mm	760 - 791	774	Pass
			Overall Test Results		Pass

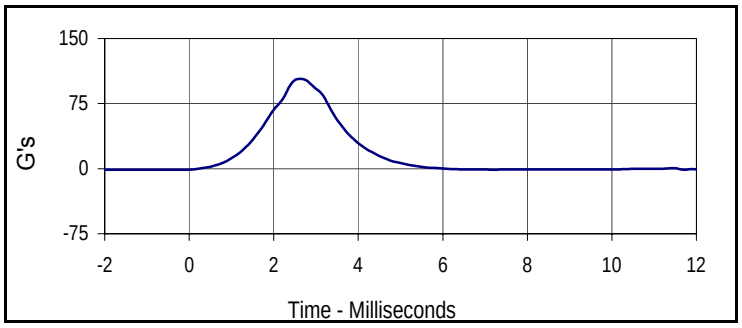
Test Program:	SID IIs Head Drop Test	Test Date:	10/7/15
ATD Serial No.:	299	Test I.D.:	299HD088

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	402	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		34.9	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.0	Pass
Peak Head Resultant Acceleration		G's	115 to 137	126.0	Pass
Peak Head X Acceleration		G's	<15	3.1	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	1.4	Pass
			Overall Test Results		Pass

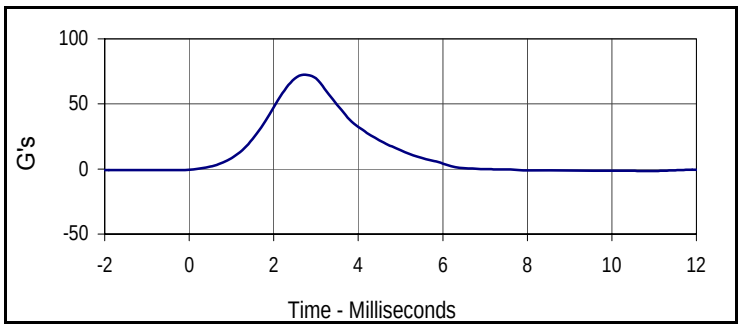
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
126.0	2.7	0.3	0.2



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
3.1	2.6	-2.2	5.5



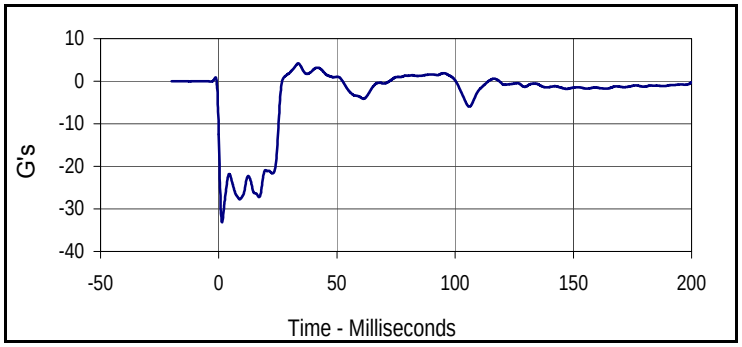
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
103.5	2.6	-1.6	-20.0



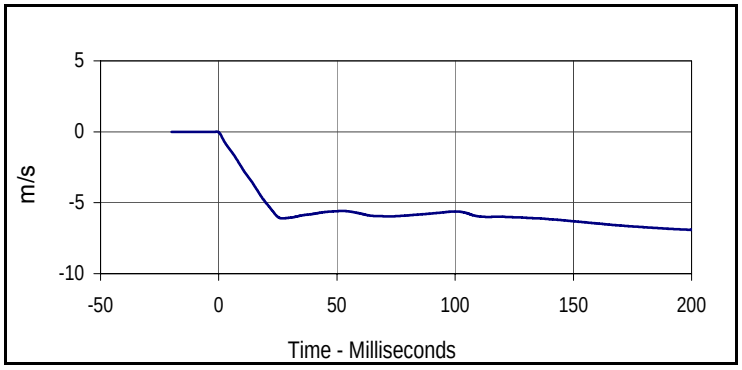
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
72.5	2.7	-1.5	10.7

Test Program:	SID IIs Neck Flexion Test	Test Date:	10/7/15
ATD Serial No.:	299	Test I.D.:	299NB088

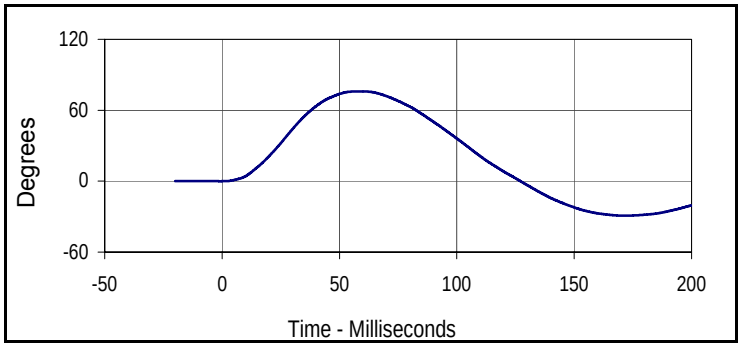
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	447	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		34.9	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	34.9	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.62	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.59	Pass
	15 msec	m/s	-3.30 to -4.10	-3.78	Pass
	20 msec	m/s	-4.40 to -5.40	-5.01	Pass
	25 msec	m/s	-5.40 to -6.10	-6.01	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.10	Pass
D-Plane Rotation	Max	Degrees	71 to 81	76.0	Pass
	Time	msec	50 to 70	58.8	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-41.2	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	105.5	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
4.2	0.0	-33.2	0.0

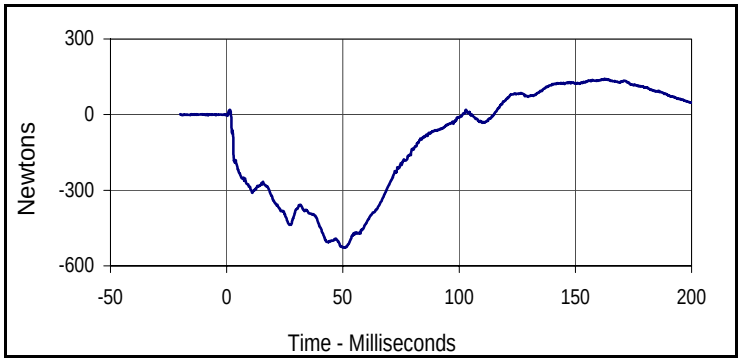


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.9	-6.9	199.9

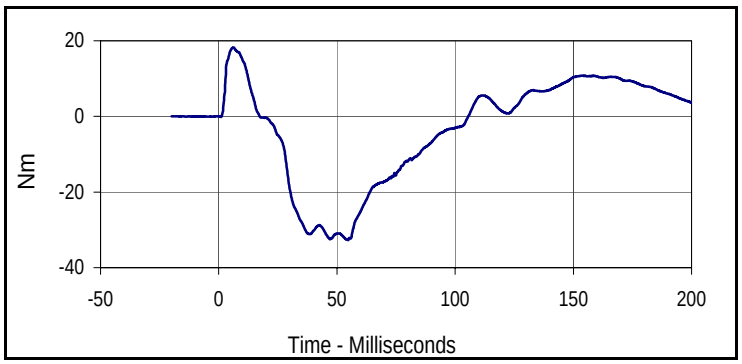


Curve Description			
D-Plane Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
76.0	58.8	-29.2	171.6

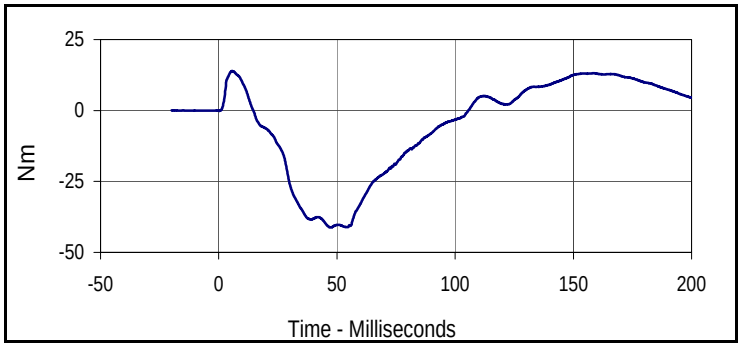
Test Program:	SID IIs Neck Flexion Test	Test Date:	10/7/15
ATD Serial No.:	299	Test I.D.:	299NB088



Curve Description			
Neck Force Y			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
142.7	162.6	-528.1	50.4



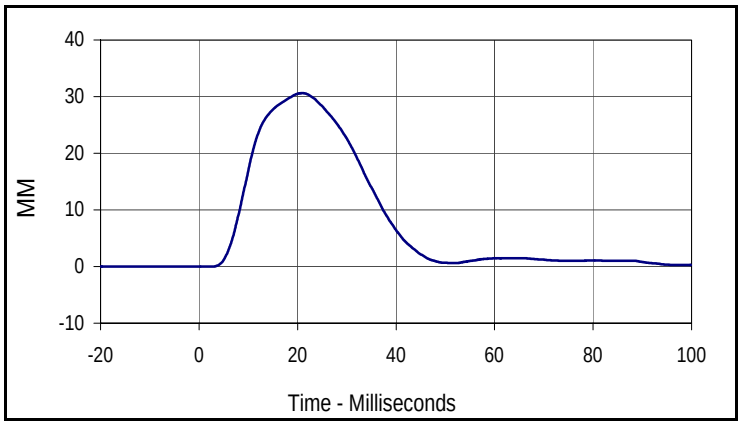
Curve Description			
Neck Moment X			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
18.2	6.3	-32.7	54.7



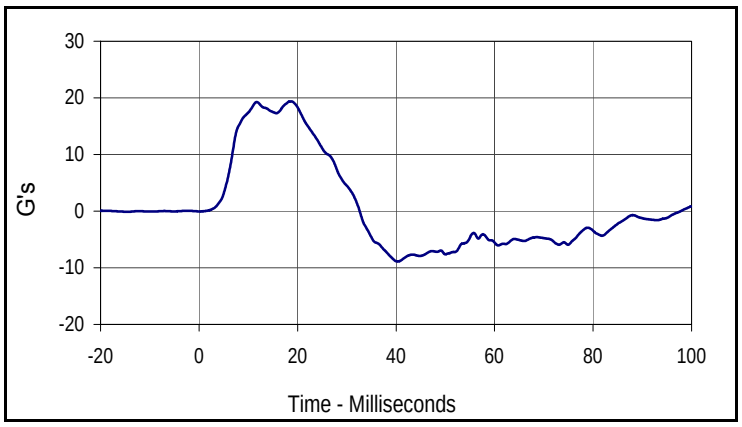
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
006	FIL	600	Nm
Max	Time	Min	Time
13.9	5.7	-41.2	47.2

Test Program:	SID IIs Shoulder Impact Test	Test Date:	10/7/15
ATD Serial No.:	299	Test I.D.:	299SH088

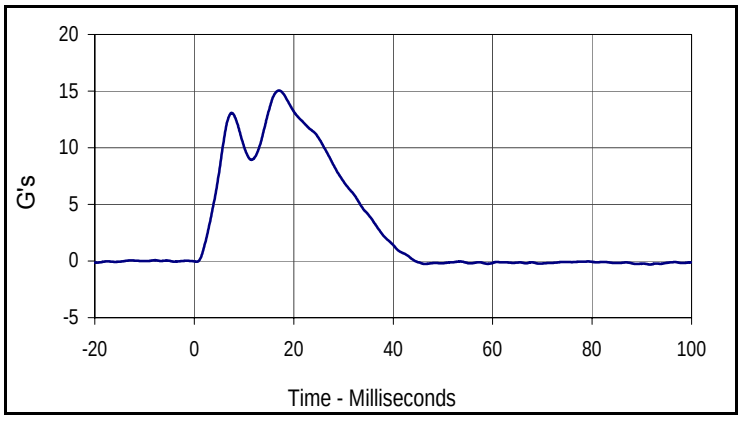
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	492	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		34.9	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	34.9	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.32	Pass
Peak Shoulder Deflection		mm	28 to 37	30.6	Pass
Peak Lateral Spine Acceleratrion Y		G's	17 to 22	19.4	Pass
Peak Impactor Acceleration		G's	13 to 18	15.0	Pass
			Overall Test Results		Pass



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
30.6	21.0	0.0	-2.9



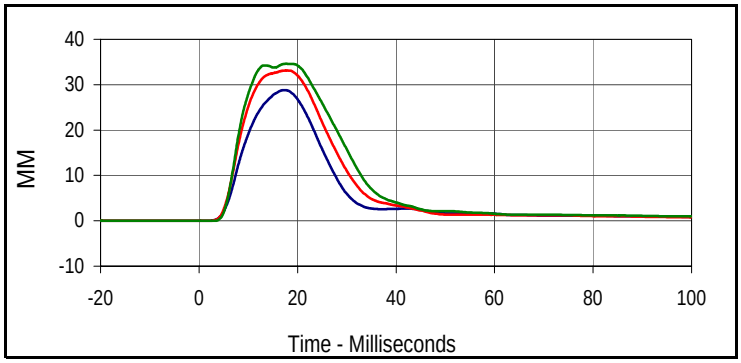
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
19.4	18.6	-8.9	40.4



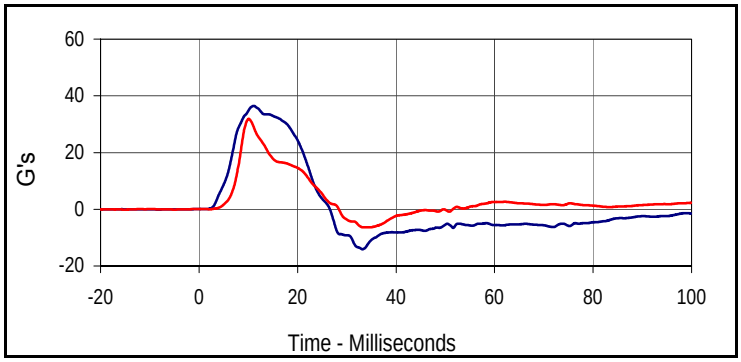
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.0	17.0	-0.3	91.7

Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	10/7/15
ATD Serial No.:	299	Test I.D.:	299TWA088

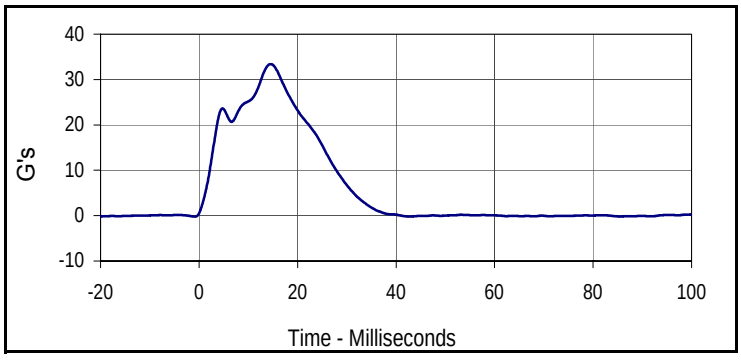
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	537	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		34.9	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.0	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.68	Pass
Peak Shoulder Deflection		mm	31 to 40	37.2	Pass
Peak Upper Thorax Rib Deflection		mm	25 to 32	28.8	Pass
Peak Middle Thorax Rib Deflection		mm	30 to 36	33.1	Pass
Peak Lower Thorax Rib Deflection		mm	32 to 38	34.6	Pass
Peak Upper Spine Y Acceleration		G's	34 to 43	36.4	Pass
Peak Lower Spine Y Acceleration		G's	29 to 37	31.8	Pass
Peak Impactor Acceleration		G's	30 to 36	33.4	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
28.8	17.4	0.0	-18.2
Middle Thorax Deflection			
Max	Time	Min	Time
33.1	17.8	0.0	-16.5
Lower Thorax Deflection			
Max	Time	Min	Time
34.6	17.7	0.0	-17.5

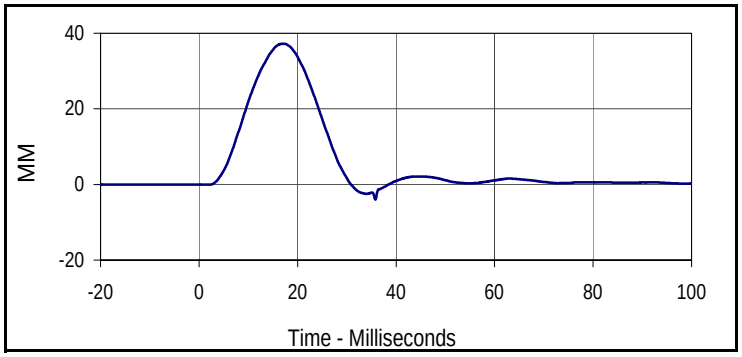


Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
36.4	11.1	-14.1	33.2
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
31.8	10.1	-6.4	34.5



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
33.4	14.6	-0.2	-0.9

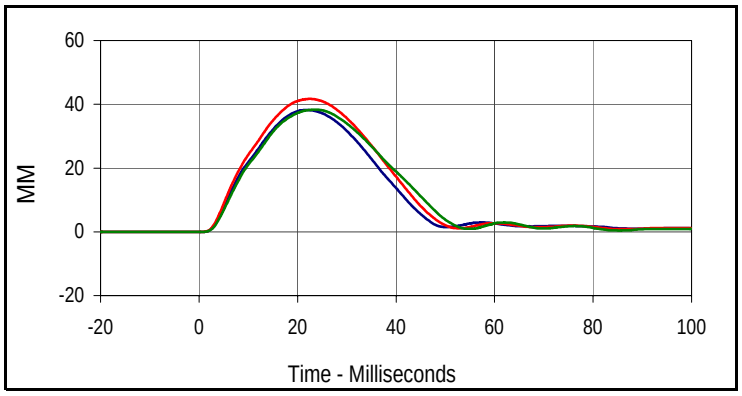
Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	10/7/15
ATD Serial No.:	299	Test I.D.:	299TWA088



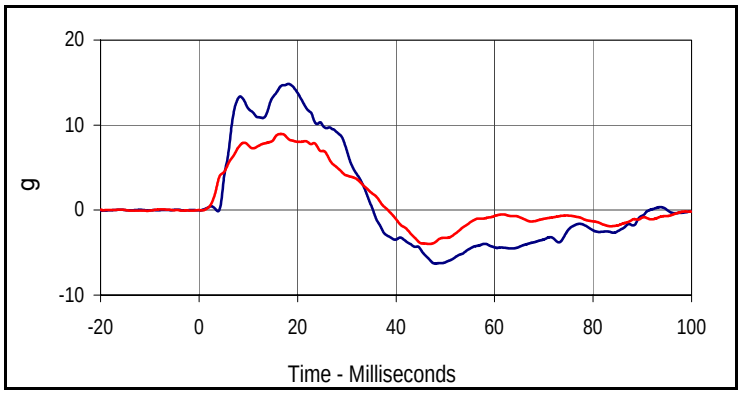
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
37.2	17.2	-4.0	35.8

Test Program:	SID IIs Thorax without Arm Impact Test	Test Date:	10/7/15
ATD Serial No.:	299	Test I.D.:	299TWOA088

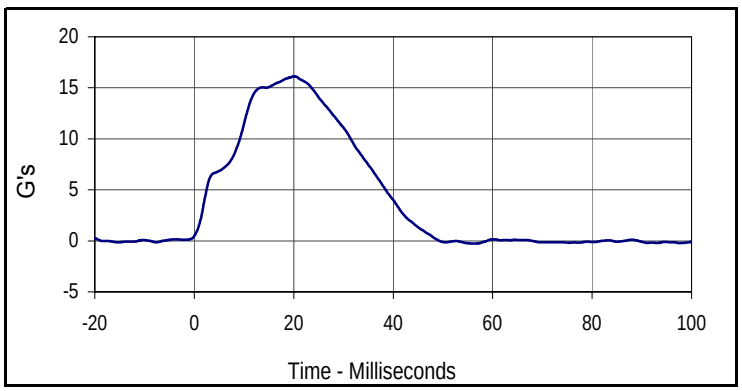
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	582	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		34.9	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	34.9	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.30	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	38.2	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	41.7	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	38.3	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	14.8	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	9.0	Pass
Peak Impactor Acceleration		G's	14 to 18	16.1	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
38.2	21.7	0.0	-10.5
Middle Thorax Deflection			
Max	Time	Min	Time
41.7	22.5	0.0	-5.7
Lower Thorax Deflection			
Max	Time	Min	Time
38.3	23.4	0.0	-8.5



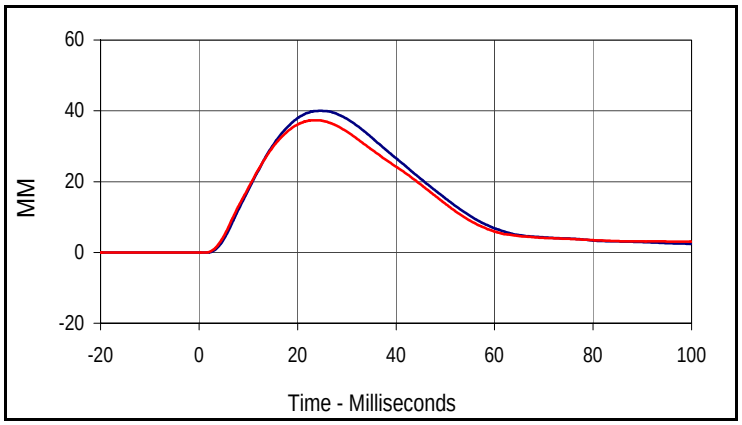
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	g
Max	Time	Min	Time
14.8	18.2	-6.3	48.0
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.0	16.7	-4.0	46.7



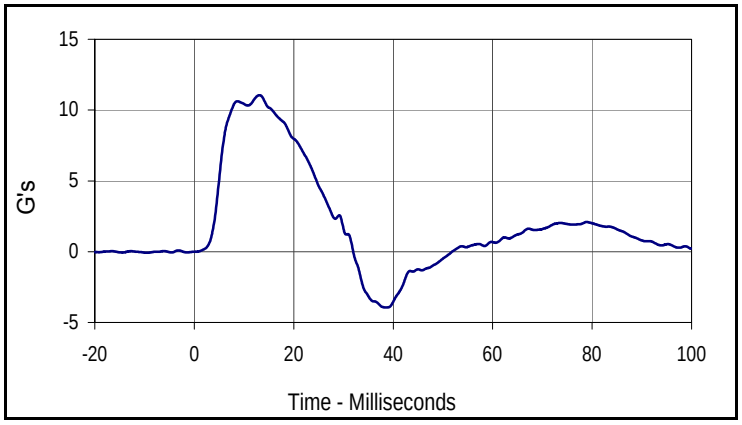
Curve Description			
Impactor Accleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.1	20.2	-0.3	55.8

Test Program:	SID IIs Abdomen Impact Test	Test Date:	10/7/15
ATD Serial No.:	299	Test I.D.:	299ABD088

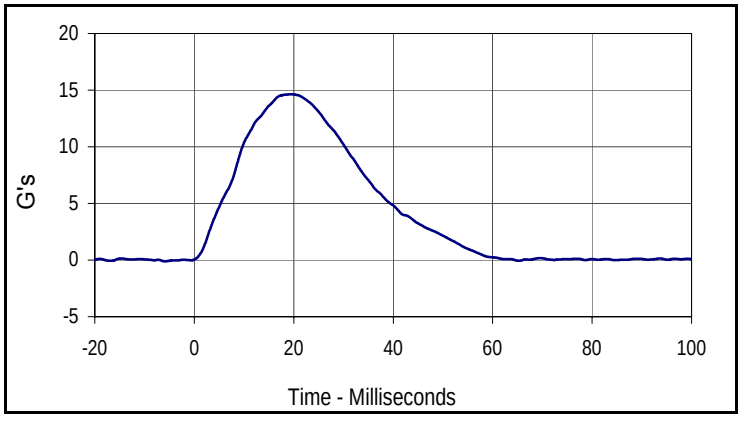
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	627	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		34.9	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	34.9	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.31	Pass
Peak Upper Abdominal Rib Deflection		mm	36 to 47	40.0	Pass
Peak Lower Abdominal Rib Deflection		mm	33 to 44	37.4	Pass
Peak Lower Spine Y Acceleration		G's	9 to 14	11.1	Pass
Peak Impactor Acceleration		G's	12 to 16	14.6	Pass
			Overall Test Results		Pass



Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
40.0	24.8	0.0	-20.0
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
37.4	23.6	0.0	-5.1

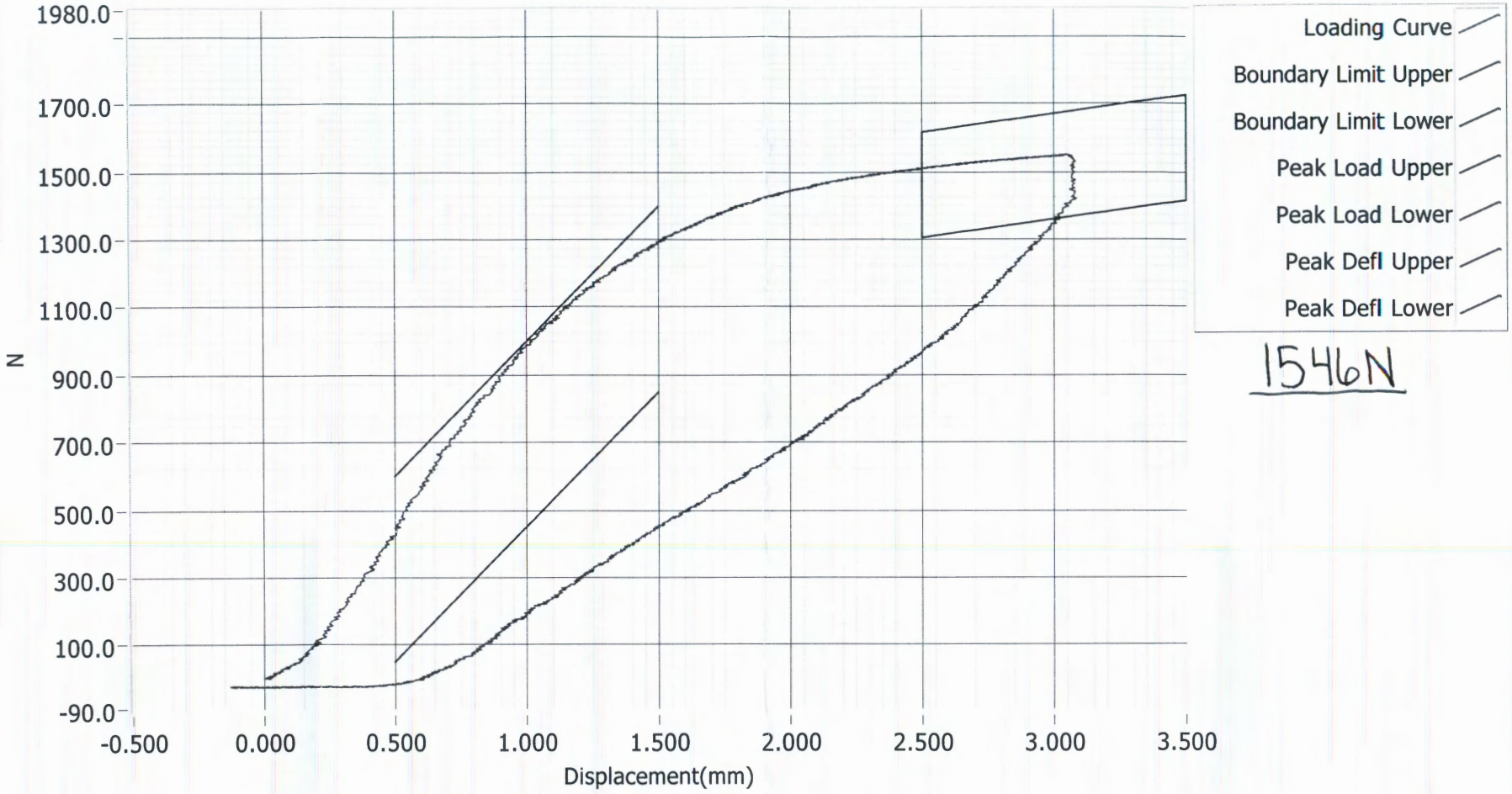


Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
11.1	13.1	-3.9	38.6



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.6	19.4	-0.1	-5.9

Resultant Data - SIDIIs Plug Compression



1546N

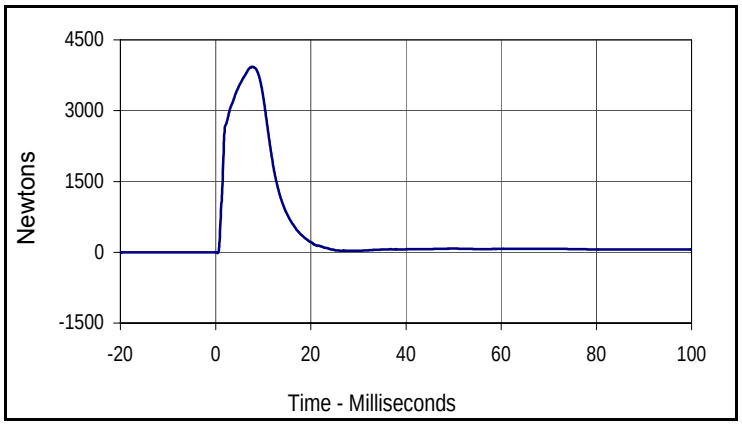
ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	70990	12/13/2013	10:56 PM
Cert ID	**ATD Serial Number**	**ATD Type**	
	N/A	SIDIIs	

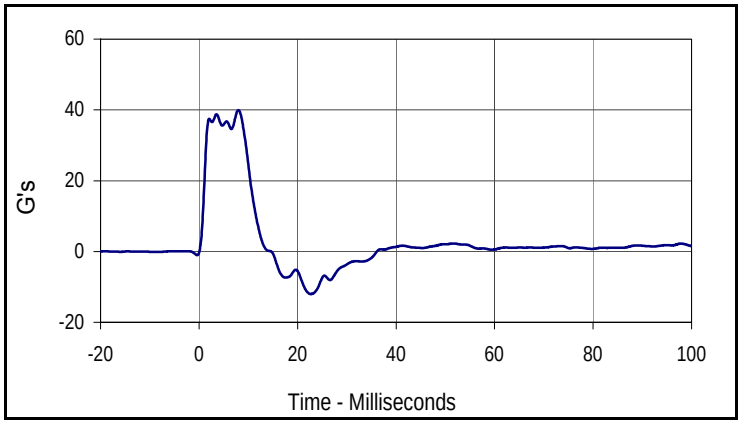
Current Date : 12/13/2013 Current Time : 22:57:25

Test Program:	SID IIs Pelvis Acetabulum Impact Test	Test Date:	10/7/15
ATD Serial No.:	299	Test I.D.:	299ACET088

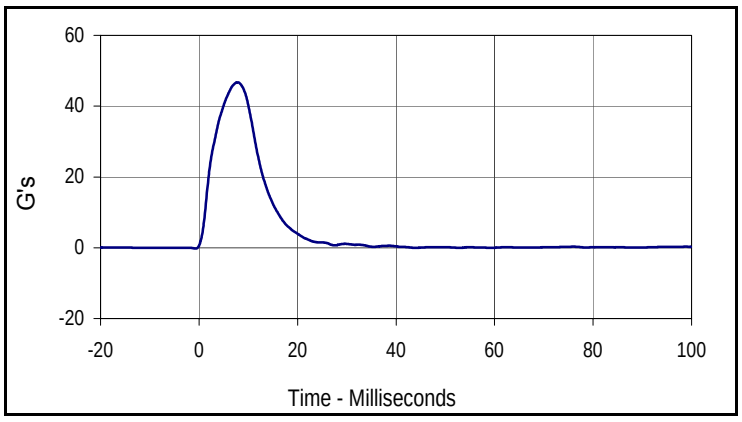
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	672	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		34.9	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	34.9	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.70	Pass
Peak Acetabulum Force Y		Newtons	3600 to 4300	3927.2	Pass
Peak Pelvis Y Acceleration After 6 msec.		G's	34 to 42	39.9	Pass
Peak Impactor Acceleration		G's	38 to 47	46.7	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3927.2	7.7	-16.5	0.5



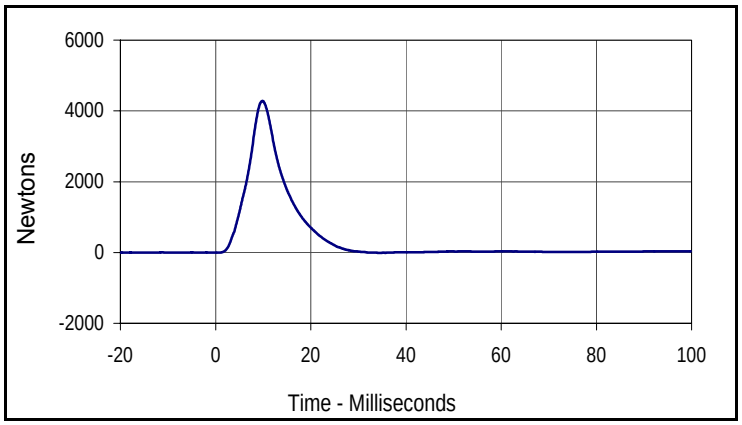
Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
39.9	8.0	-12.0	22.7



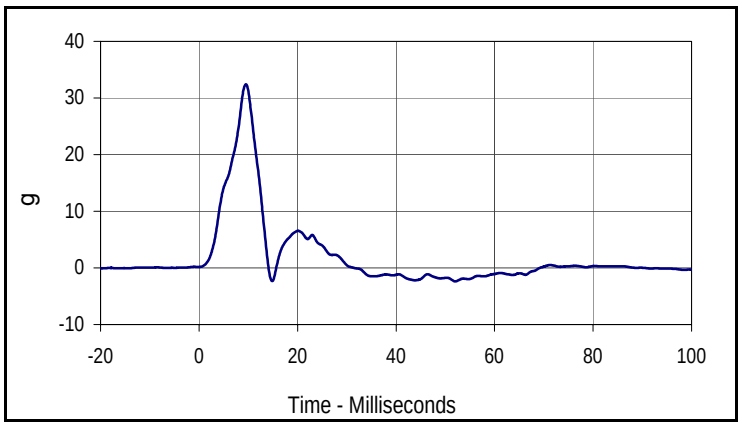
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
46.7	7.8	-0.2	-0.7

Test Program:	SID IIs Pelvis Iliac Calibration	Test Date:	10/7/15
ATD Serial No.:	299	Test I.D.:	299PL088

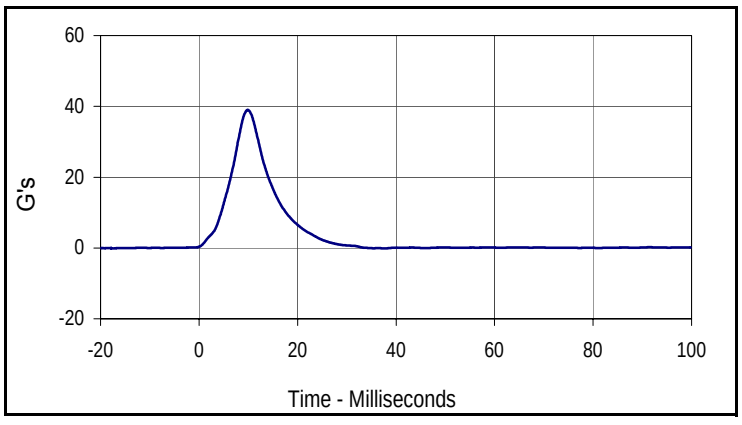
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	717	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		34.9	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.0	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.35	Pass
Peak Illiac Force		Newtons	4100 to 5100	4280.7	Pass
Peak Pelvis Y Acceleration		G's	28 to 39	32.4	Pass
Peak Impactor Acceleration		G's	36 to 45	39.0	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4280.7	9.8	-8.7	34.6



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	g
Max	Time	Min	Time
32.4	9.5	-2.4	52.0



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
39.0	9.9	-0.1	37.6

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 299		
				Serial Number	Manufacturer	Calibration
Head Accelerometers	Primary		X	P51929	Endevco	9/23/15
			Y	P50086	Endevco	9/23/15
			Z	P51931	Endevco	9/23/15
	Redundant		X	P68604	Endevco	9/23/15
			Y	P51934	Endevco	9/23/15
			Z	P58736	Endevco	9/23/15
Displacement Potentiometers	Thoracic Rib	Upper	Y	1143	FTSS	5/14/15
		Middle	Y	1160	FTSS	5/14/15
		Lower	Y	1213	FTSS	5/14/15
	Abdominal Rib	Upper	Y	1218	FTSS	5/14/15
		Lower	Y	1177	FTSS	9/17/15
Lower Spine Accelerometers (T12)			X	04I20-Z04	Endevco	5/14/15
			Y	06A07-R08	Endevco	5/14/15
			Z	P58795	Endevco	5/14/15
Acetabulum Load Cell			Y	272	Denton	5/1/15
Iliac Wing Load Cell			Y	284	Denton	6/23/15
Pelvis Plug (Struck Side)				70720	FTSS	12/12/13
Pelvis Plug (Non-Struck Side)				70695	FTSS	12/12/13

TABLE 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	A147385	MSI	6/20/15
Vehicle Center of Gravity	Y	A145492	MSI	6/20/15
Vehicle Center of Gravity	Z	A147414	MSI	6/20/15
Left Floor Sill	Y	A145496	MSI	6/21/15
A-Pillar Sill	Y	A160376	MSI	6/19/15
A-Pillar Low	Y	A145924	MSI	6/19/15
A-Pillar Mid	Y	A148304	MSI	7/8/15
B-Pillar Sill	Y	A147391	MSI	7/7/15
B-Pillar Low	Y	A145461	MSI	6/19/15
B-Pillar Mid	Y	A145445	MSI	6/21/15
Driver Seat	Y	A147420	MSI	6/20/15
Engine Top	X	A145936	MSI	6/20/15
Engine Top	Y	A148220	MSI	6/21/15
Firewall	Y	A147460	MSI	7/8/15
Right Roof	Y	A148185	MSI	7/7/15
Right Floor Sill	Y	A148252	MSI	6/21/15
Rear Floorpan	X	A147400	MSI	7/7/15
Rear Floorpan	Y	A147406	MSI	6/19/15

TABLE 3 – Pole Instrumentation

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