

REPORT NUMBER: SPNCAP-KAR-14-018

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

**TOYOTA MOTOR CORPORATION
2014 TOYOTA 4RUNNER SR5 5-DOOR MPV**

NHTSA No: M20145104

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



APRIL 30, 2014

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
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				14. Sponsoring Agency Code NVS-111																												
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16. Abstract A 32.2 km/h (20 mph) 75 deg. oblique impact Side NCAP Test was conducted on the subject 2014 Toyota 4Runner SR5 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 April 16, 2014. The impact velocity was 31.60 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 31.7 deg. C. The target vehicle's maximum post-test static crush was 496 mm located at level 3. The test vehicle's occupant performance data is as follows: <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD (SID-IIs)</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td></td> <td>1000</td> <td>507.3</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>g</td> <td>82</td> <td>43</td> </tr> <tr> <td>Total Pelvic Force (Sum of Acetabular and Iliac Forces)</td> <td>N</td> <td>5525</td> <td>3982</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38</td> <td>18</td> </tr> <tr> <td>Maximum Abdominal Rib Deflection</td> <td>mm</td> <td>45</td> <td>19</td> </tr> </tbody> </table> The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches. The opposite doors did not open during the side impact event.						Measurement Description	Driver ATD (SID-IIs)			Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	507.3	Resultant Lower Spine Acceleration	g	82	43	Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	3982	Maximum Thoracic Rib Deflection	mm	38	18	Maximum Abdominal Rib Deflection	mm	45	19
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17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs				18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Admin. Technical Information Services Division, NPO-411 1200 New Jersey Ave., SE Washington, DC 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833																												
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SECTION 1

TEST PURPOSE AND PROCEDURE

This side impact test is part of the MY 2014 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 2014 Toyota 4Runner SR5 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 2014 Toyota 4Runner SR5 5-door MPV. The subject vehicle was towed into the rigid pole at an angle of 75.5° and a velocity of 31.60 km/h. The test was conducted by KARCO Engineering, LLC. in Adelanto, California on April 16, 2014. 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	507.3
Lower Spine (T12) Resultant Acceleration	g	82	43
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3982
Maximum Thoracic Rib Deflection	mm	38*	18
Maximum Abdominal Rib Deflection	mm	45*	19

*Proposed IARV

Supplemental restraint information is given below:

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No	No	
Knee Airbag	Yes	No	No	
Side Airbag 1 (Curtain)	Yes	Yes	Yes	Yes
Side Airbag 2 (Torso/Pelvis)	Yes	Yes	No	
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes	Yes	No	
Other	No		No	

GENERAL COMMENTS

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

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104
Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14

CONVERSION FACTORS

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

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104
 Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20145104
Model Year	2014
Make	Toyota
Model	4Runner SR5
Body Style	5-Door MPV
VIN	JTEZU5JR3E5074492
Body Color	Nautical Blue Metallic
Odometer Reading (km / mi)	100 / 62
Engine Displacement (L)	4.0
Type / No. of Cylinders	V6
Engine Placement	Longitudinal
Transmission Type	Automatic
Transmission Speeds	5
Overdrive	Yes
Final Drive	Rear
Roof Rack	Yes
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes

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

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

Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Toyota Motor Corporation
Date of Manufacture	Feb-14
Vehicle Type	MPV

GVWR (kg)	2765
GAWR Front (kg)	1270
GAWR Rear (kg)	1515

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				515.0	A
DSC x 68.04 (kg)				340.2	B
Cargo Weight (RCLW) (kg)				136.0	A-B

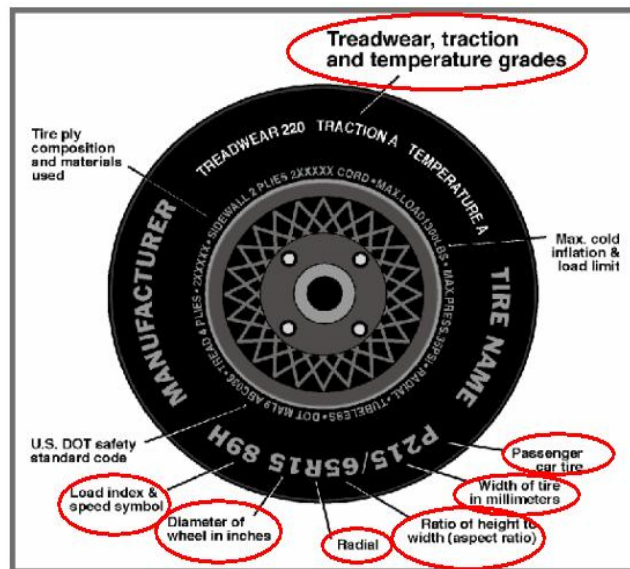
VEHICLE SEAT TYPE

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

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104
 Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14



Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	300	300
Cold Pressure (kPa)	220	220
Recommended Tire Size	P265/70R17	P265/70R17
Tire Size on Vehicle	P265/70R17	P265/70R17
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Dueler HT	Dueler HT
Treadware	N/A	N/A
Traction Grade	N/A	N/A
Temperature Grade	N/A	N/A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Nylon	2 Polyester, 2 Steel, 1 Nylon
Load Index/Speed Symbol	113S	113S
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Left	EL70 DDL 0714	EL70 DDL 0714
DOT Safety Code Right	EL70 DDL 0714	EL70 DDL 0714

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104
 Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14

TIRE PRESSURES

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

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	542.0	482.0		563.0	568.0		542.5	576.0	
Right	kg	486.0	473.5		485.5	546.0		478.0	568.5	
Ratio	%	51.8%	48.2%	100.0%	48.5%	51.5%	100.0%	47.1%	52.9%	100.0%
Total	kg	1028.0	955.5	1983.5	1048.5	1114.0	2162.5	1020.5	1144.5	2165.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1983.5	A
Actual Weight of 1 P572 O ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	136.0	C
Calculated Vehicle Target Wt (TVTW)	kg	2168.5	A+B+C

Does the measured As Tested Vehicle Weight lie within the required weight range (i.e.

Calculated Test Vehicle Target Weight -4.5 kg to -9.0 kg)? ☒ Yes ☐ No

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	°	-0.3	-0.3	0.4	Yes
Front Passenger Sill Angle (front-to-rear)*	°	-0.4	-0.3	0.3	Yes
Front Bumper-Line Angle (left-to-right)**	°	0.0	-0.1	-0.1	Yes
Rear Bumper-Line Angle (left-to-right)**	°	-0.3	-0.3	0.0	Yes
Vehicle CG (Aft of Front Axle)	mm	1344	1438	1475	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	26	37	27	

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

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

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104

Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Trunk Soft Trim	10.0
Spare Tire Tools	3.5
Ballast / Equipment Added	136.7

Test Height Adjustable Setting (If Applicable)	
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DATA SHEET NO. 2**SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA**

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104
 Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14

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	11.0	0.0	5.5
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	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	5.5	844	Max	844	854	864
			Mid	824	834	844
			Min	804	814	824
Front Passenger Seat	Fixed	845	Max	825	835	845
			Mid	825	835	845
			Min	825	835	845
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: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104
 Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14

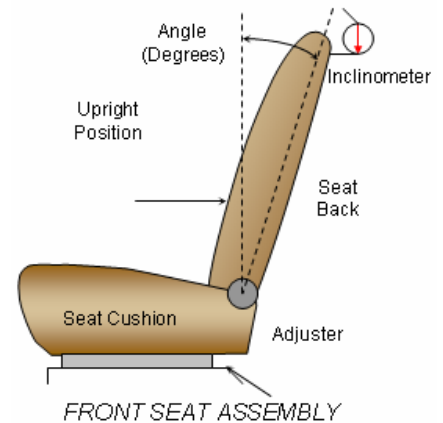
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	219		0	
Front Passenger Seat	220	23	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	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	52.6		6.1	
Front Passenger Seat	53.2	27	6.1	
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	16.0	5	10.3	0
Non-Struck Side Rear Seat	16.0	5	10.3	0
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: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104

Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14

SEAT BELT ANCHORAGE ADJUSTMENT

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

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

HEAD RESTRAINT ADJUSTMENT

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

	Total No. of Positions	Placed in Position
Driver Seat	3	Full Down

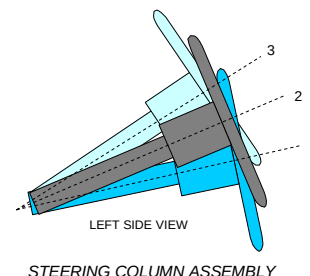
DATA SHEET NO. 2 ... (CONTINUED)

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

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104
 Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14

STEERING COLUMN ADJUSTMENT

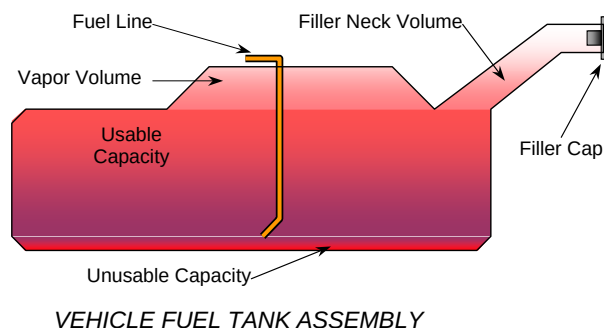
Steering wheel and column adjustments are made so that the steering wheel hub is at the center of the geometric locus it describes when it moves through its full range of motion.



	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	24.8	89
Geometric Center - Position 2	26.6	108
Uppermost - Position 3	28.4	126
Telescoping Steering Wheel Travel		37
Test Position	26.6	108

FUEL PUMP

The vehicle is equipped with an electric fuel pump.



FUEL TANK CAPACITY

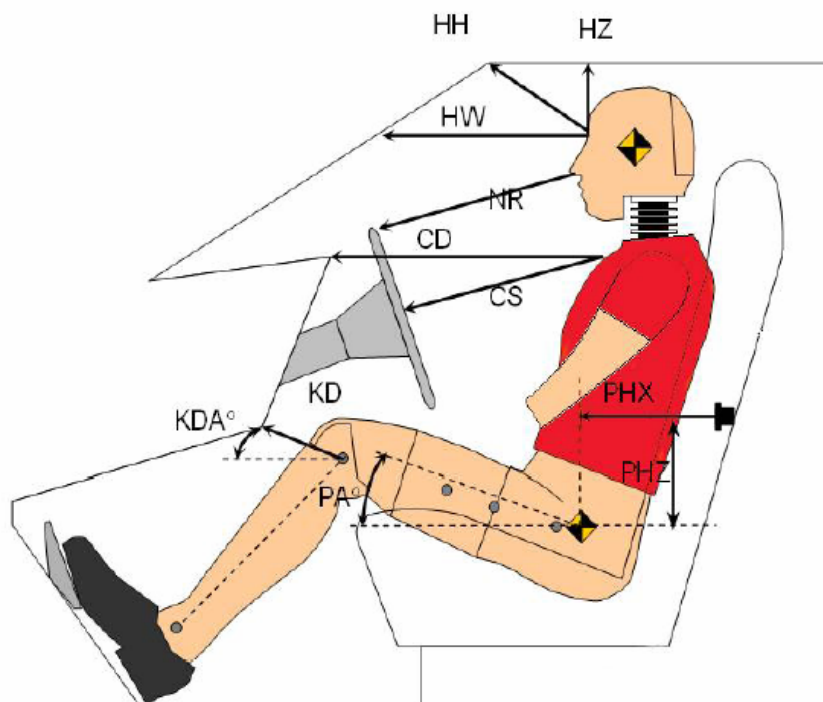
Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	87.06
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)	
Usable Capacity of "Optional Tank" (see Owner's Manual)	
93% of Usable Capacity	80.96
Actual amount of Solvent Used in Test	80.96
1/3 of Usable Capacity	29.02

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

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104
 Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14

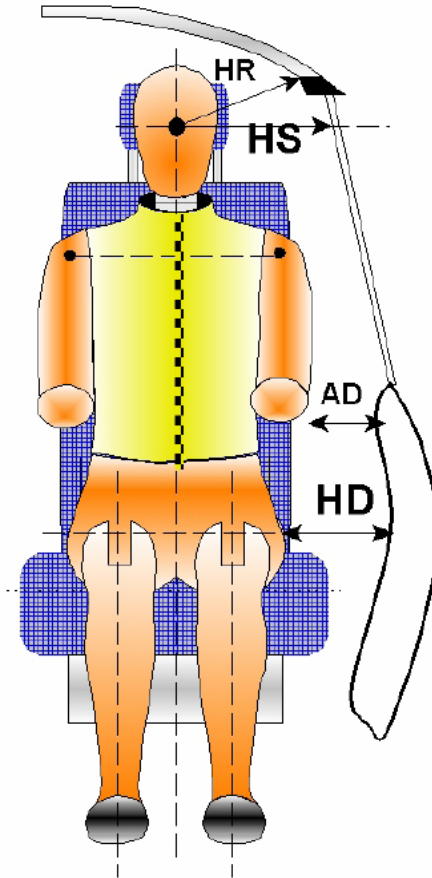


Driver Code	Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	394	
HW	Head to Windshield	656	
HZ	Head to Roof	251	
NR	Nose to Rim	276	
CD	Chest to Dash	450	
CS	Chest to Steering Wheel	205	
KD(L)/KDA(L)°	Left Knee to Dash	131	30.4
KD(R)/KDA(R)°	Right Knee to Dash	126	30.9
PAX°	Pelvic Tilt Angle (x-axis)		18.2
PAY°	Pelvic Tilt Angle (y-axis)		0.0
PHX	Hip Point to Striker (x-axis)	335	
PHZ	Hip Point to Striker (z-axis)	131	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104
Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14

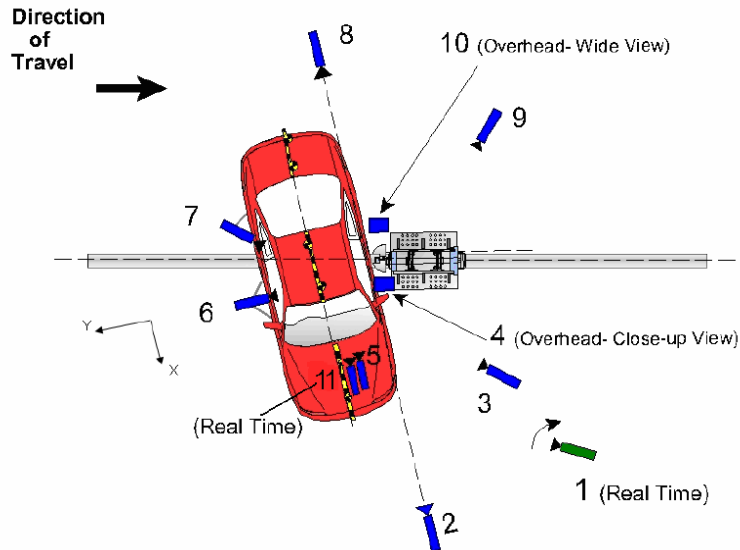


Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	265
HS	Head to Side Window	mm	365
AD	Arm to Door	mm	163
HD	Hip Point to Door	mm	168

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104
 Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14



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	1.62	0.48	-1.65	35	1000
6	On-Board - Dummy Side View	-0.01	1.78	-1.34	14	1000
7	On-Board - Dummy Rear Oblique View	-1.00	1.84	-1.39	20	1000
8	Rear Ground Level - Impact View	-6.12	-6.23	-0.96	24	1000
9	Impact Side 45° - Rearward Pole View	-8.02	0.04	-1.01	35	1000
10	Overhead Wide View of Impact	-0.06	0.22	-5.79	14	1000
11	Real Time Dummy Front View	1.59	0.53	-1.64		30

*All measurements accurate to ± 6 mm

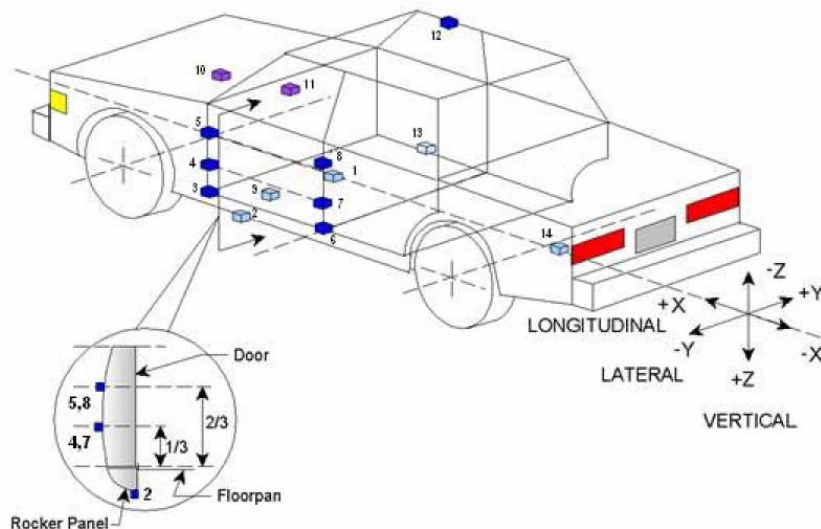
INSTRUMENTATION

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

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104
 Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14



Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1985	0	-557
2	Left Floor Sill	3164	-390	-320
3	A-Pillar Sill	3351	-865	-545
4	A-Pillar Low	3351	-865	-744
5	A-Pillar Mid	3351	-865	-992
6	B-Pillar Sill	2234	-771	-571
7	B-Pillar Low	2234	-771	-757
8	B-Pillar Mid	2234	-771	-981
9	Driver Seat Track	2660	-239	-644
10	Engine Top	4137	-218	-955
11	Firewall	3603	-124	-1044
12	Right Roof	2442	472	-1762
13	Right Floor Sill	2235	721	-522
14	Rear Floorpan	1170	-15	-746

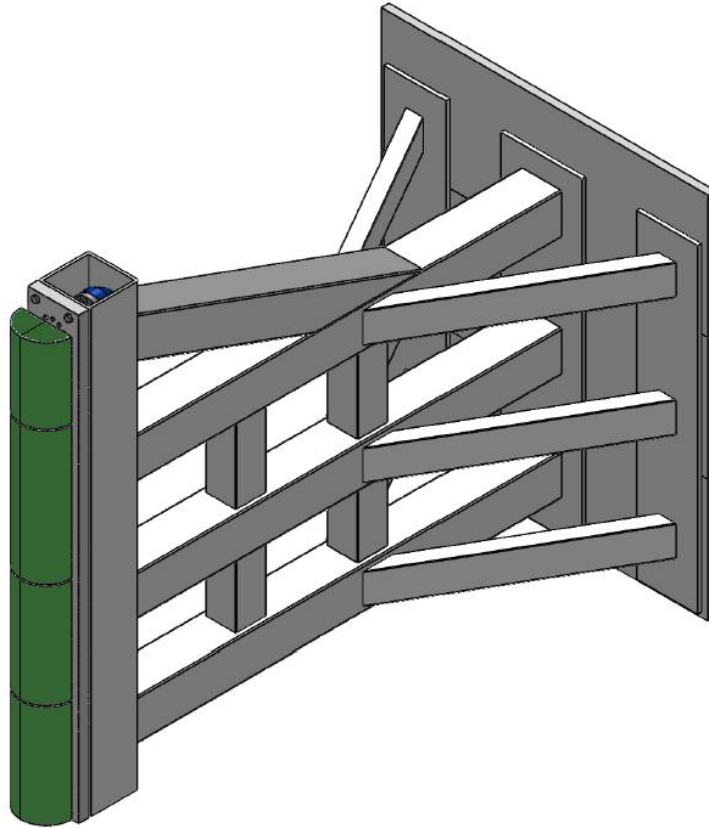
Reference: X – Rear surface of vehicle (+ forward)
 Y – Vehicle centerline (+ to right)
 Z – Ground plane (+ down)

DATA SHEET NO. 7

RIGID POLE LOAD CELL DATA

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104

Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14



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: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14**TEST DUMMY INFORMATION AND CONTACT POINTS**

Dummy Body Part	Driver SID-IIs Dummy
Face	Curtain Airbag
Top of Head	Headrest
Left Side of Head	Curtain Airbag
Back of Head	Curtain Airbag, Headrest
Left Shoulder	Torso/Pelvis Airbag
Upper Torso	Seat
Lower Torso	Seat
Left Hip	Seat, Torso/Pelvis 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	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge System Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)	N/A	N/A	N/A	N/A	N/A

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

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

DATA SHEET NO. 8 ... (CONTINUED)**POST-TEST OBSERVATIONS**Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

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

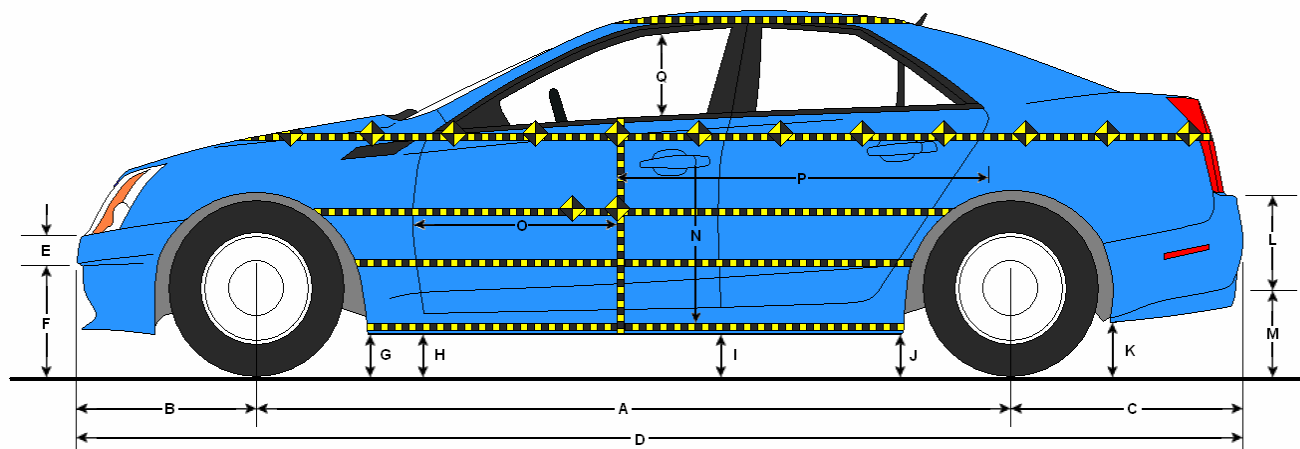
IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		1187
Actual Impact Point (Aft of Front Axle)	mm		1225
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	-38
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	75.5
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	31.60
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	31.55

DATA SHEET NO. 9

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104
 Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14



LEFT SIDE VIEW

All measurements in mm with tolerance of ± 3 mm

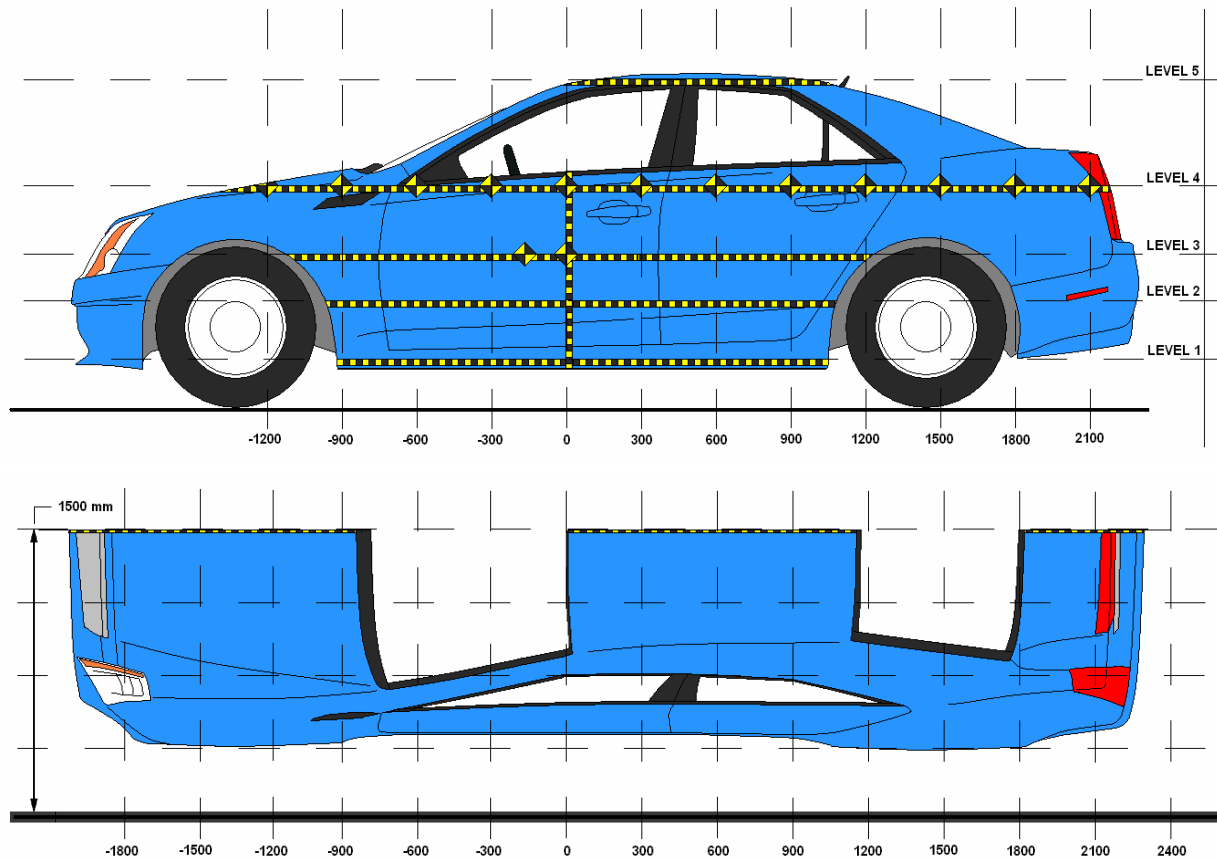
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2791	2752	-39
B	Front Axle to FSOV	920	928	8
C	Rear Axle to RSOV	1122	1127	5
D	Total Length at Centerline	4832	4806	-26
E	Front Bumper Thickness	184	181	-3
F	Front Bumper Bottom to Ground	497	525	28
G	Sill Height at Front Wheel Well	449	455	6
H	Sill Height at Front Door Leading Edge	449	459	10
I	Sill Height at B-Pillar	453	476	23
J1	Sill Height at Rear Wheel Well	458	481	23
J2	Pinch Weld Height at Rear Wheel Well	410	433	23
K	Sill Height Aft of Rear Wheel Well	454	475	21
L	Rear Bumper Thickness	113	111	-2
M	Rear Bumper Bottom to Ground	529	540	11
N	Sill Height to Bottom of Front Window Sill	694	683	-11
O	Front Door Leading Edge to Impact CL	627	490	-137
P	Rear Door Trailing Edge to Impact CL	1472	1351	-121
Q	Front Window Opening	465	485	20
R	Right Side Length	3363	3385	22
S	Left Side Length	3364	3320	-44
T	Vehicle Width at B-Pillar	1831	1735	-96

DATA SHEET NO. 10

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104
 Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14



NOTE: All measurements in mm with tolerance of $\pm 3\text{mm}$

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	483	424	0
2	Occupant H-Point	850	494	0
3	Mid-Door	877	496	0
4	Window Sill	1177	452	0
5	Window Top	1715	272	-150

DATA SHEET NO. 10 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104
 Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14

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		538	539	672			608	610	734			70	71	62	
-750		561	561	662			643	643	737			82	82	75	
-600	636	578	579	651		732	684	679	727		96	106	100	76	
-450	639	582	582	643	856	832	765	766	794	1048	193	183	184	151	192
-300	634	581	581	637	853	902	871	872	885	1118	268	290	291	248	265
-150	632	581	580	634	854	973	980	979	984	1126	341	399	399	350	272
0	635	581	580	630	853	1059	1075	1076	1082	1068	424	494	496	452	215
150	631	583	581	626	856	1014	1039	1043	1059	1012	383	456	462	433	156
300	639	583	582	622	857	892	916	918	932	971	253	333	336	310	114
450	635	585	584	623	859	789	778	779	813	952	154	193	195	190	93
600	636	588	587	623	860	768	722	721	754	943	132	134	134	131	83
750	635	592	591	622	860	744	705	704	737	935	109	113	113	115	75
900	638	597	596	623	860	721	690	690	719	931	83	93	94	96	71
1050	622	580	581	624	861	683	652	652	701	925	61	72	71	77	64
1200		552	562	622	863		604	611	681	922		52	49	59	59
1350			543	620	863			571	664	917			28	44	54
1500				619	864				670	912				51	48
1650				618	863				663	907				45	44
1800				618	863				657	902				39	39
1950				622	865				654	902				32	37
2100				630					659					29	
2250															
2400															
2550															
2700															
2850															

DATA SHEET NO. 10 ... (CONTINUED)

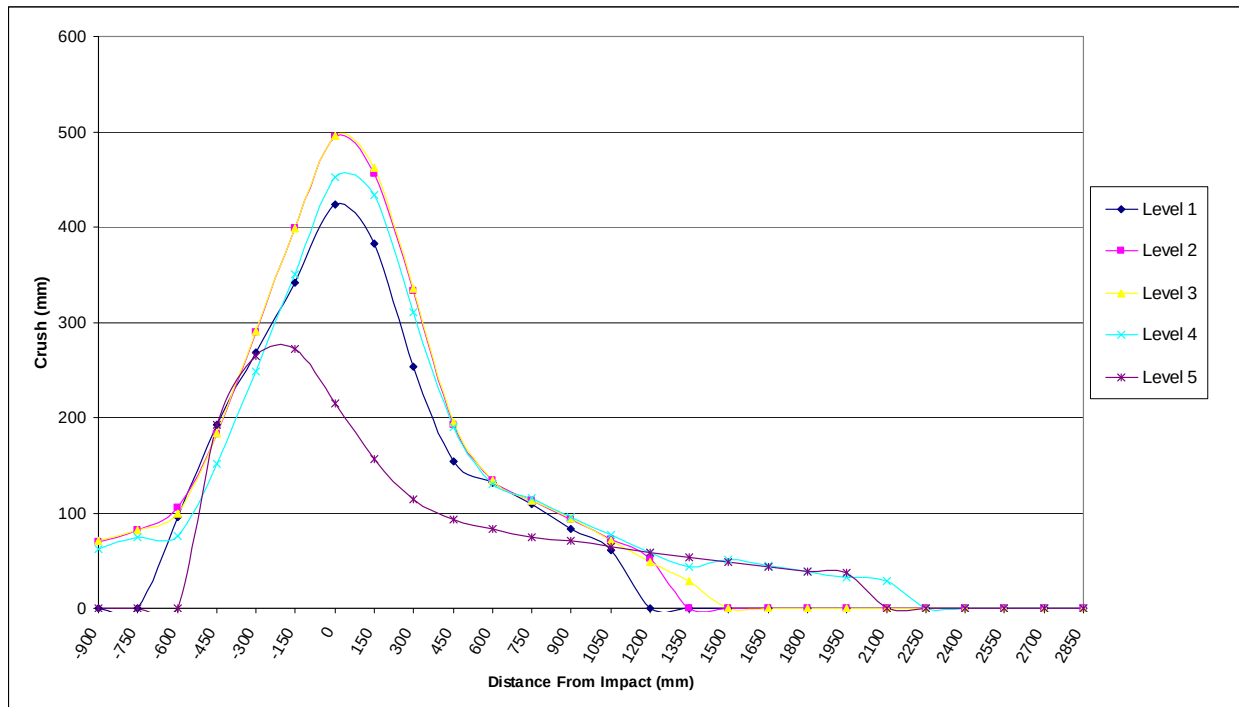
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV

NHTSA No. M20145104

Test Program: NCAP Side Pole Impact Test

Test Date: 04/16/14

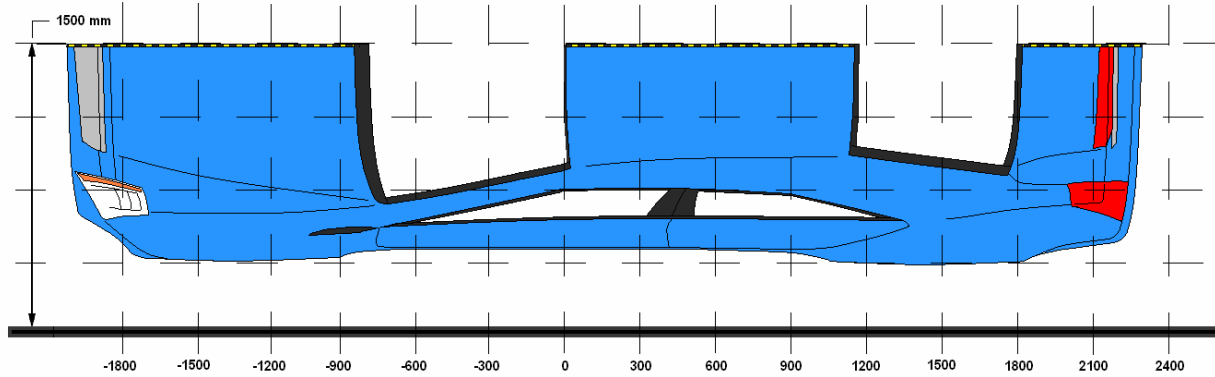


DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104

Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14



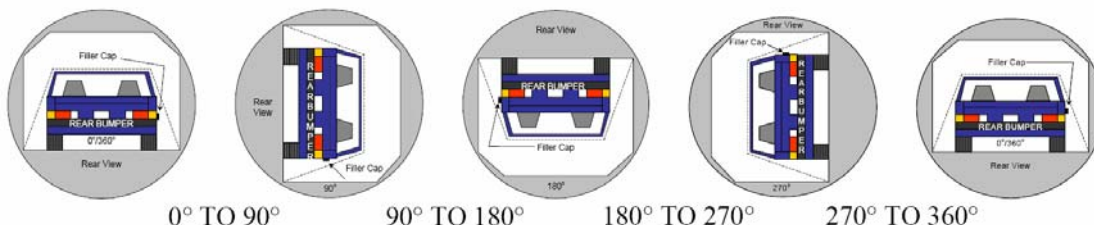
DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	2100	4	630	659	29
2	1500	4	619	670	51
3	900	4	623	719	96
4	300	3	582	918	336
5	-300	3	581	872	291
6	-900	3	539	610	71

DATA SHEET NO. 12

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV NHTSA No. M20145104
 Test Program: NCAP Side Pole Impact Test Test Date: 04/16/14
 Temperature at Time of Impact: 31.7° C Test Time: 11:22 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: There was no Stoddard solvent spillage.



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	83	300	383
90° To 180°	84	300	384
180° To 270°	81	300	381
270° To 360°	86	300	386

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

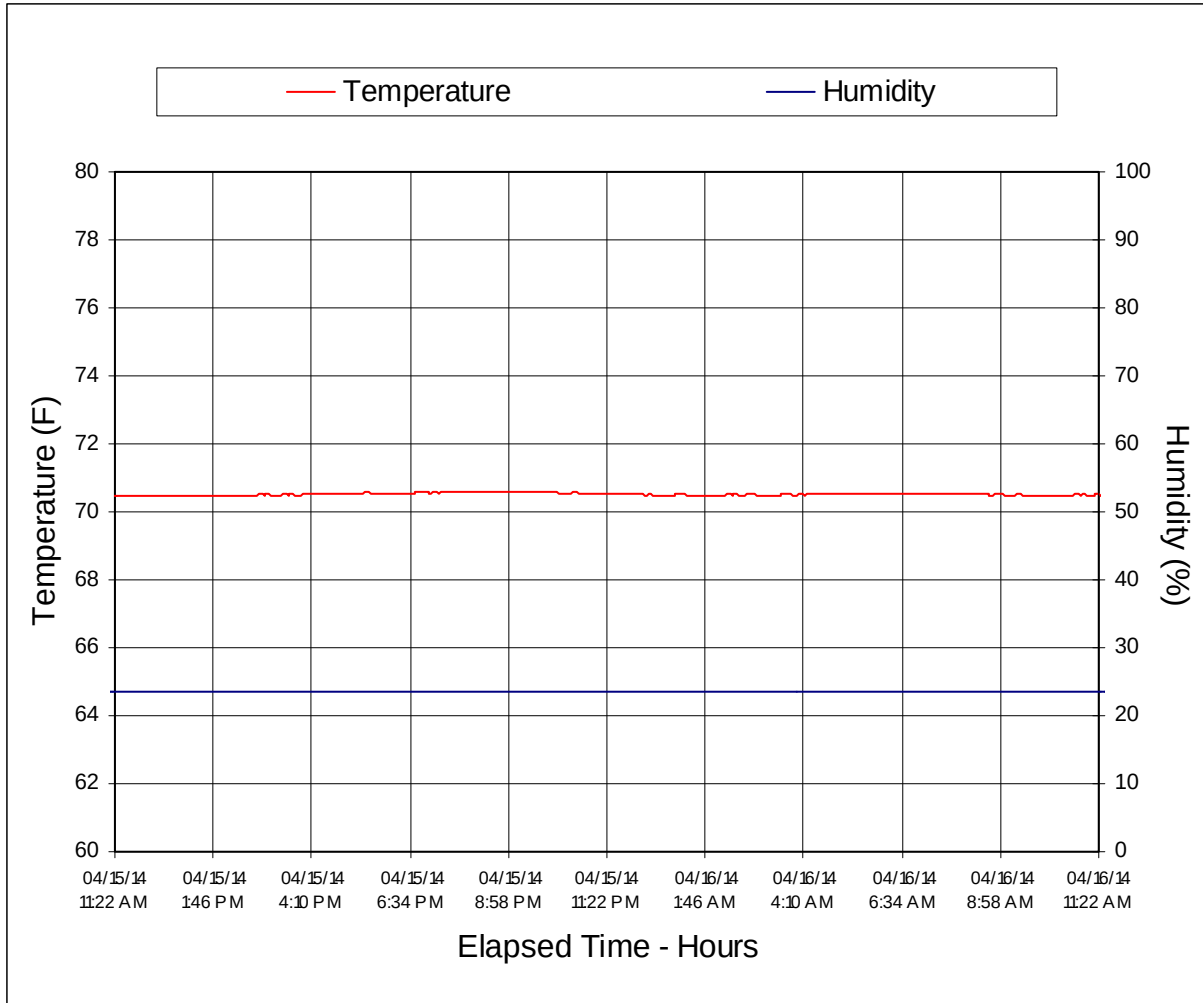
DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV

NHTSA No. M20145104

Test Program: NCAP Side Pole Impact Test

Test Date: 04/16/14



APPENDIX A
PHOTOGRAPHS

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



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



FIGURE 3. Pre-Test Frontal View of Test Vehicle

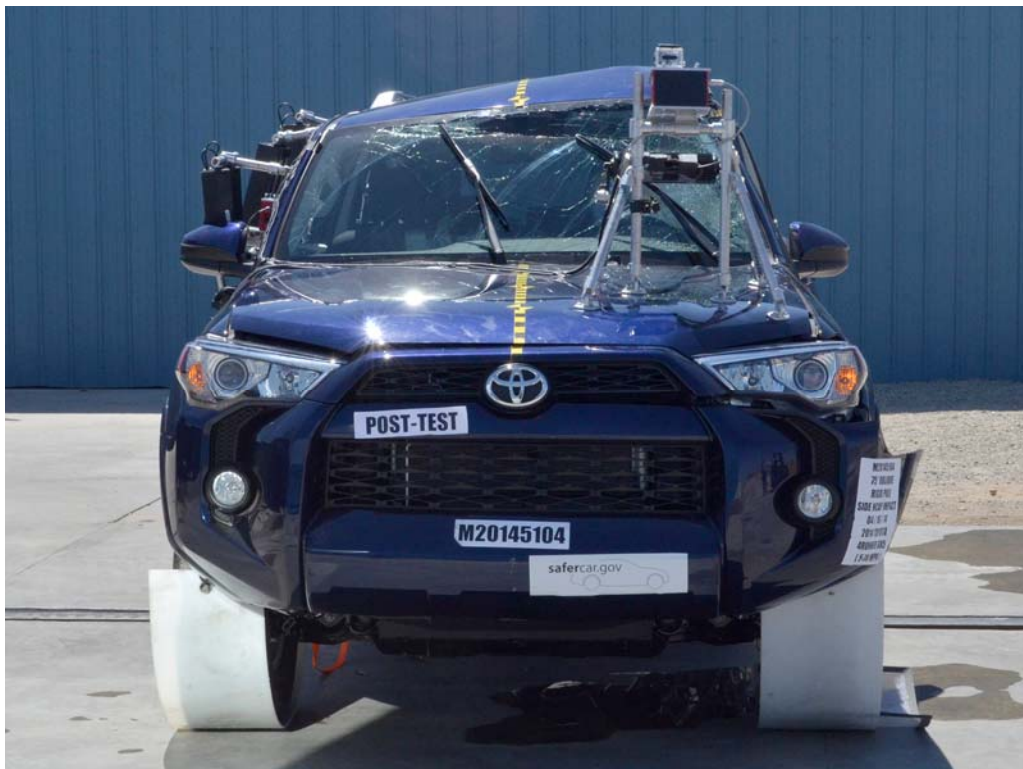


FIGURE 4. Post-Test Frontal View of Test Vehicle



FIGURE 5. Pre-Test Left Front 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 $\frac{3}{4}$ View of Test Vehicle



FIGURE 10. Post-Test Left Rear $\frac{3}{4}$ 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

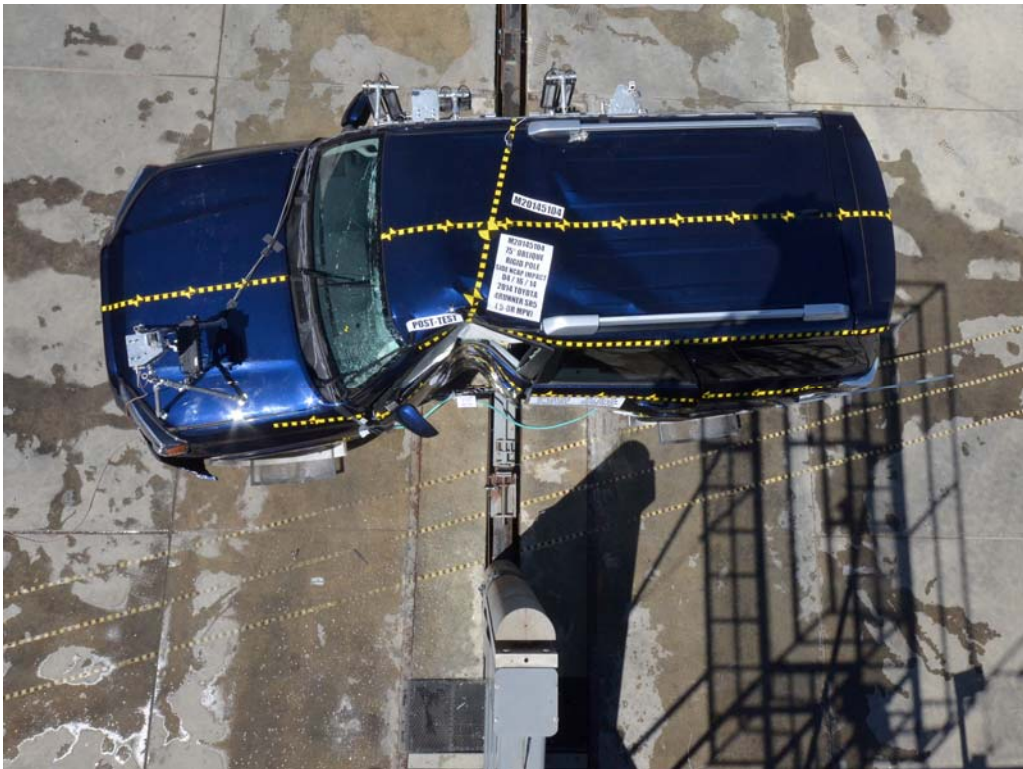


FIGURE 16. Post-Test Overhead View of Test Area



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

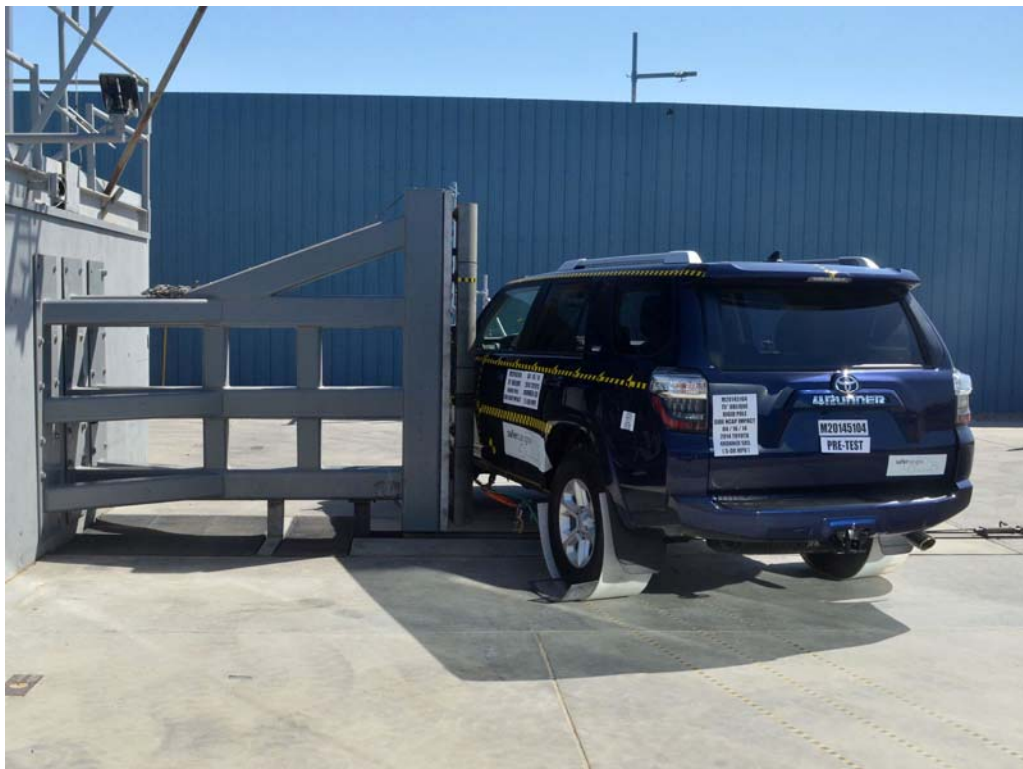


FIGURE 18. Pre-Test Right Side View of Pole
Positioned Against Side of Vehicle



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

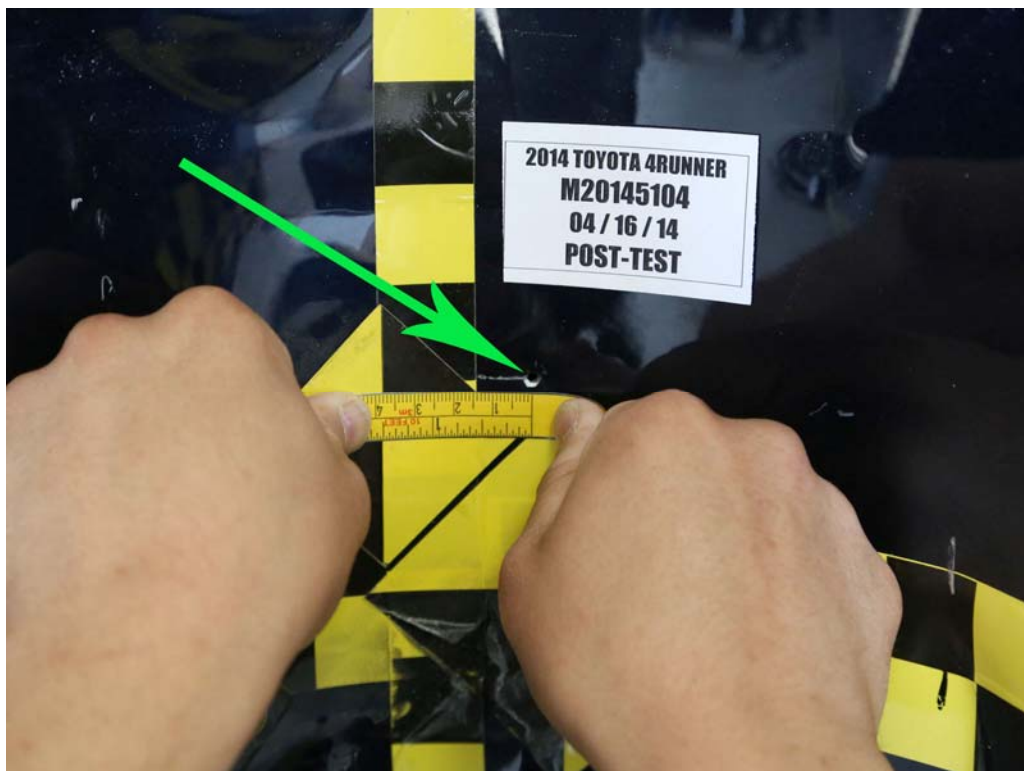


FIGURE 20. Post-Test Close-Up View of Impact Point Target
Showing Impact Location



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

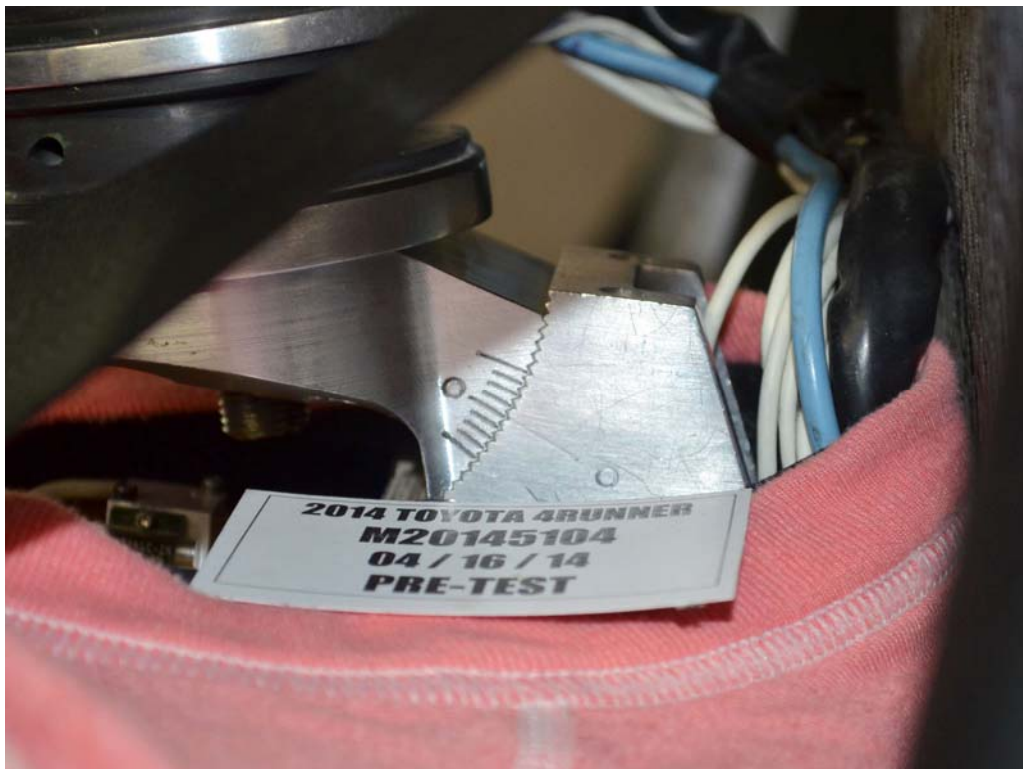


FIGURE 30. Pre-Test Left Side View of Dummy's Neck
Showing Position of Adjustable Neck Bracket



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

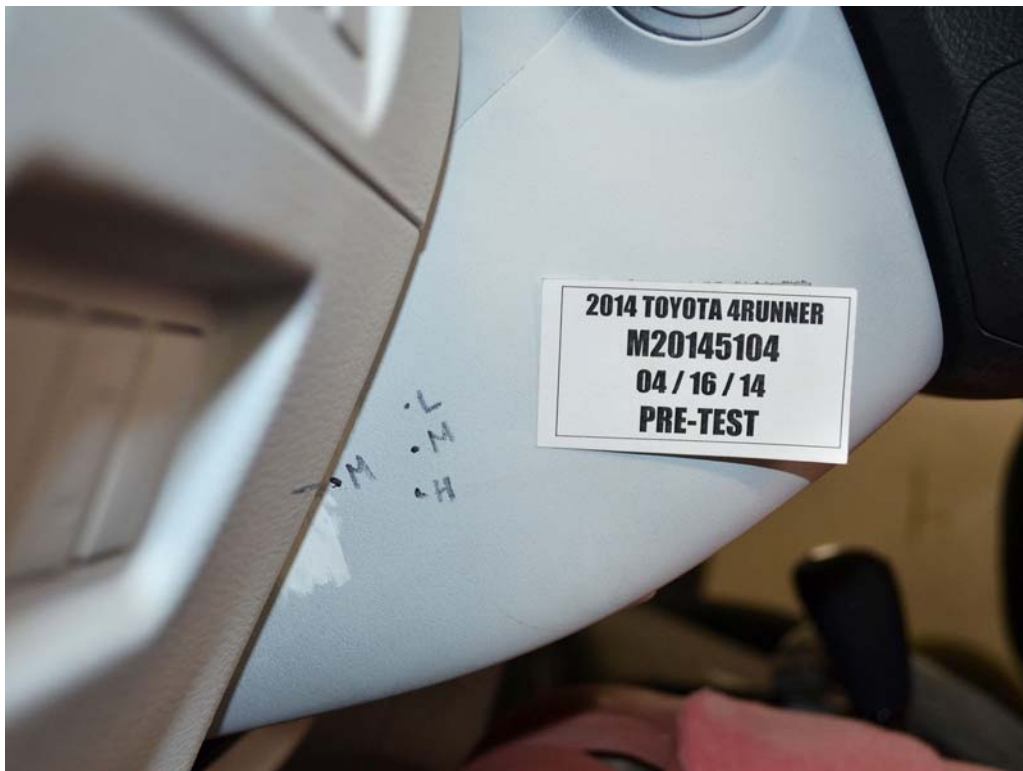


FIGURE 34. Pre-Test Left Side View of Steering Wheel



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

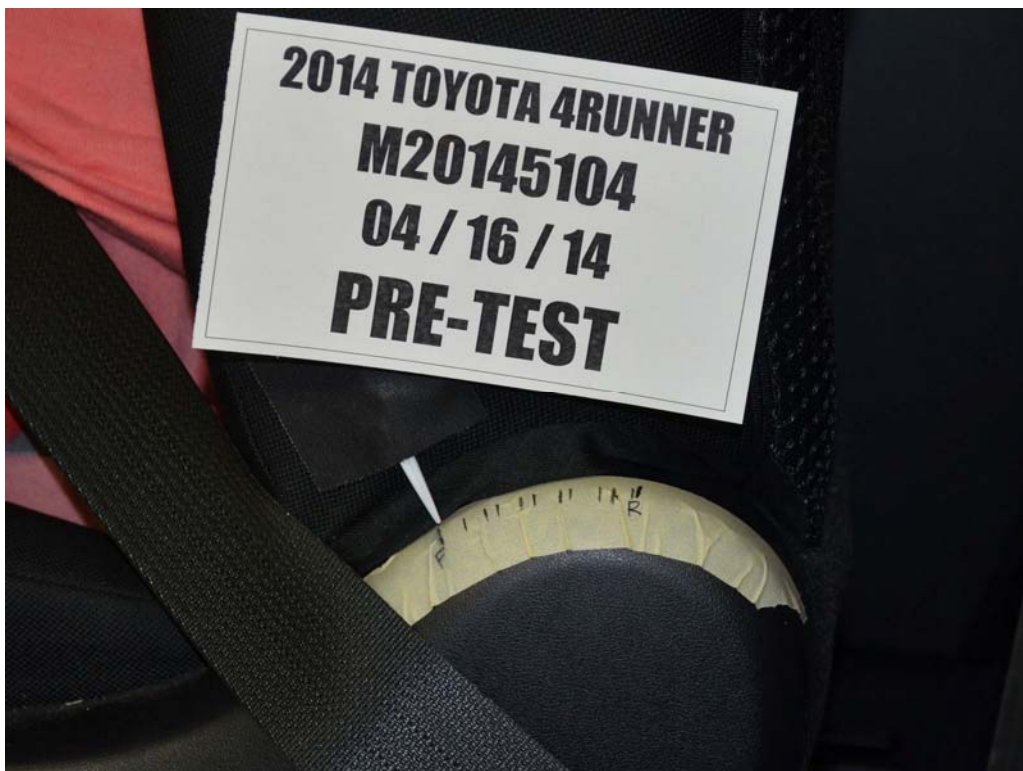


FIGURE 38. Pre-Test Close-Up Left Side View of Driver Seat Back



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

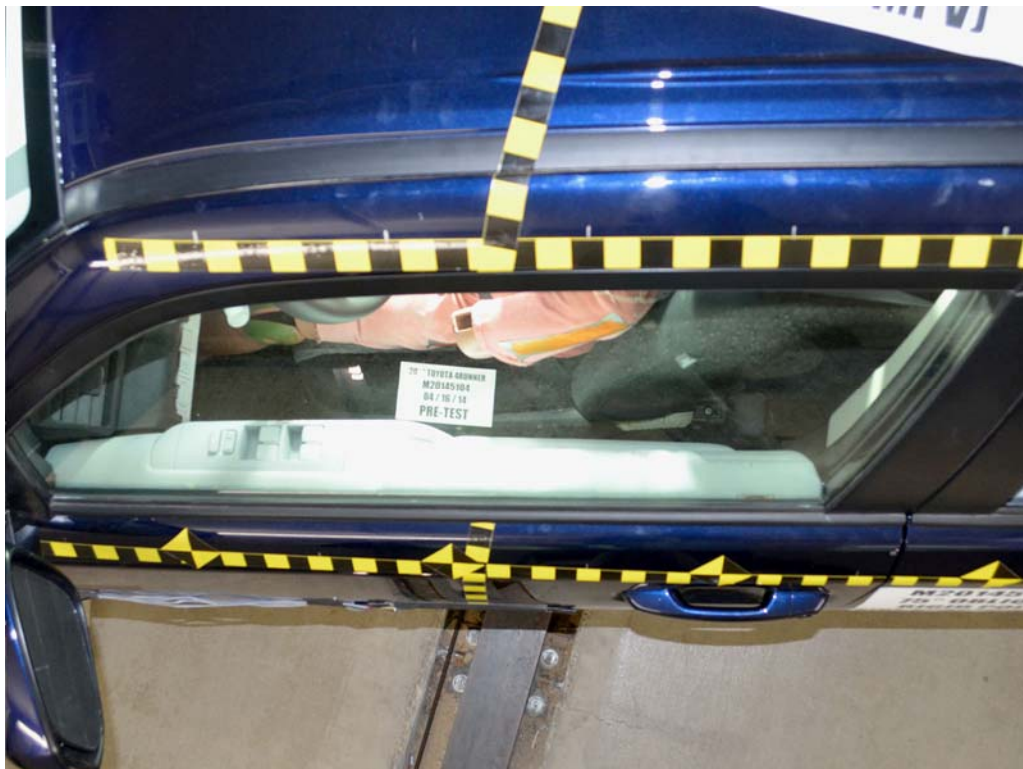


FIGURE 40. Pre-Test Dummy and Door Clearance View



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

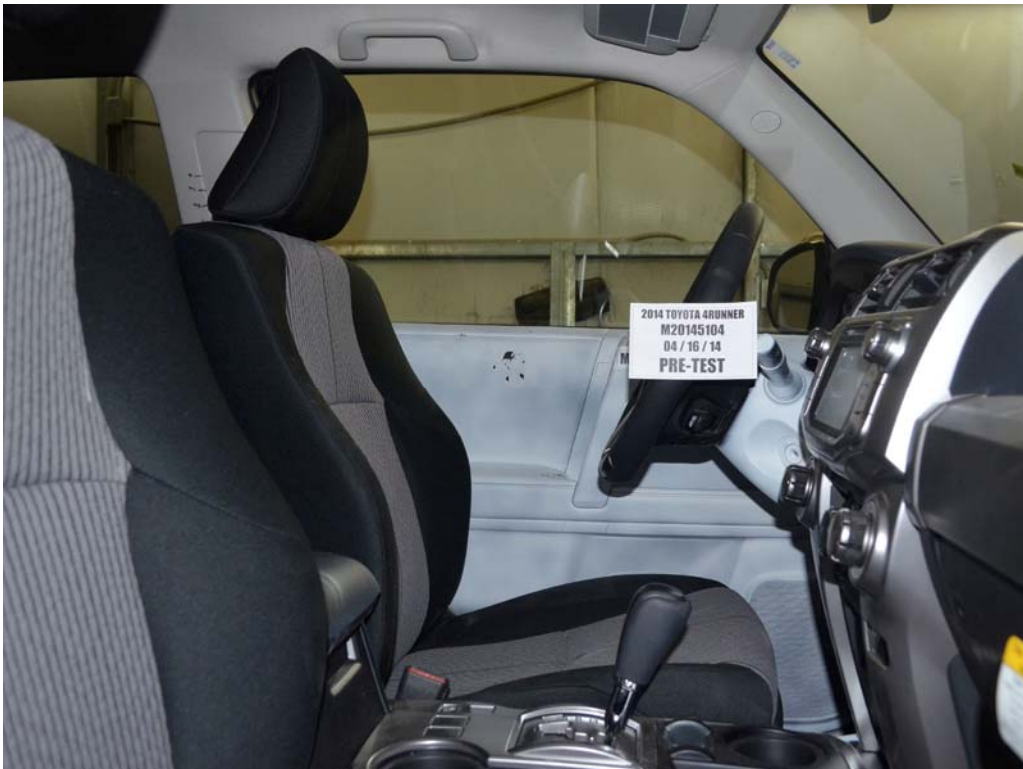


FIGURE 44. Pre-Test Inner Door Panel View



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

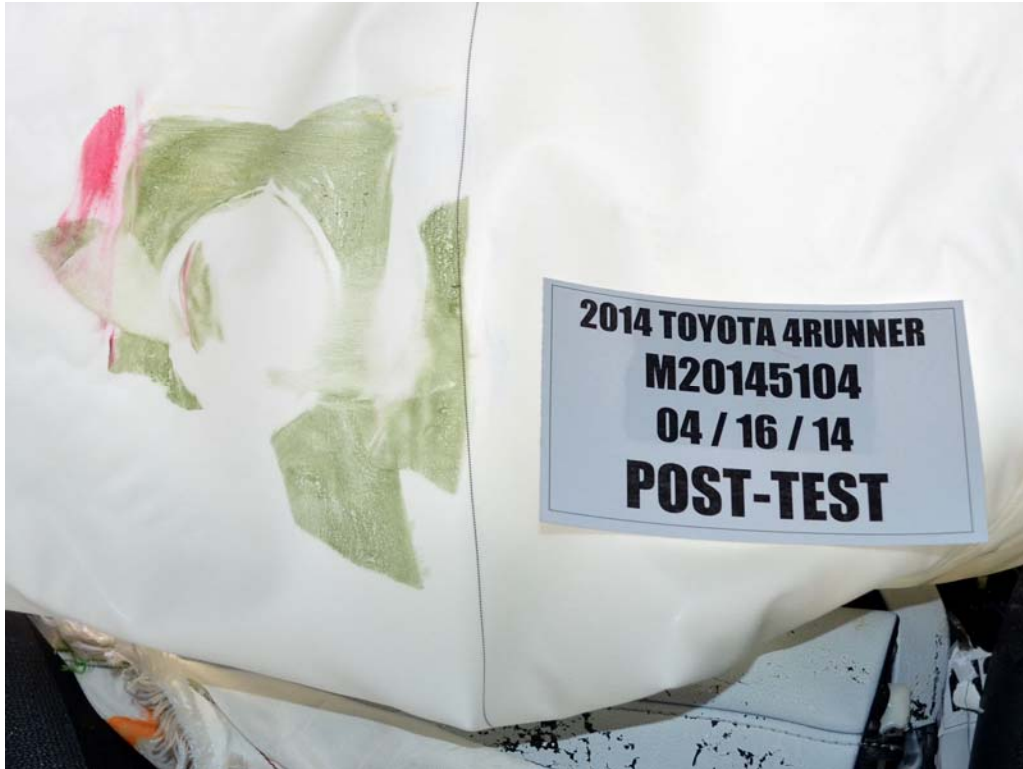


FIGURE 47. Post-Test Dummy Close-Up Head Contact With Side Airbag View

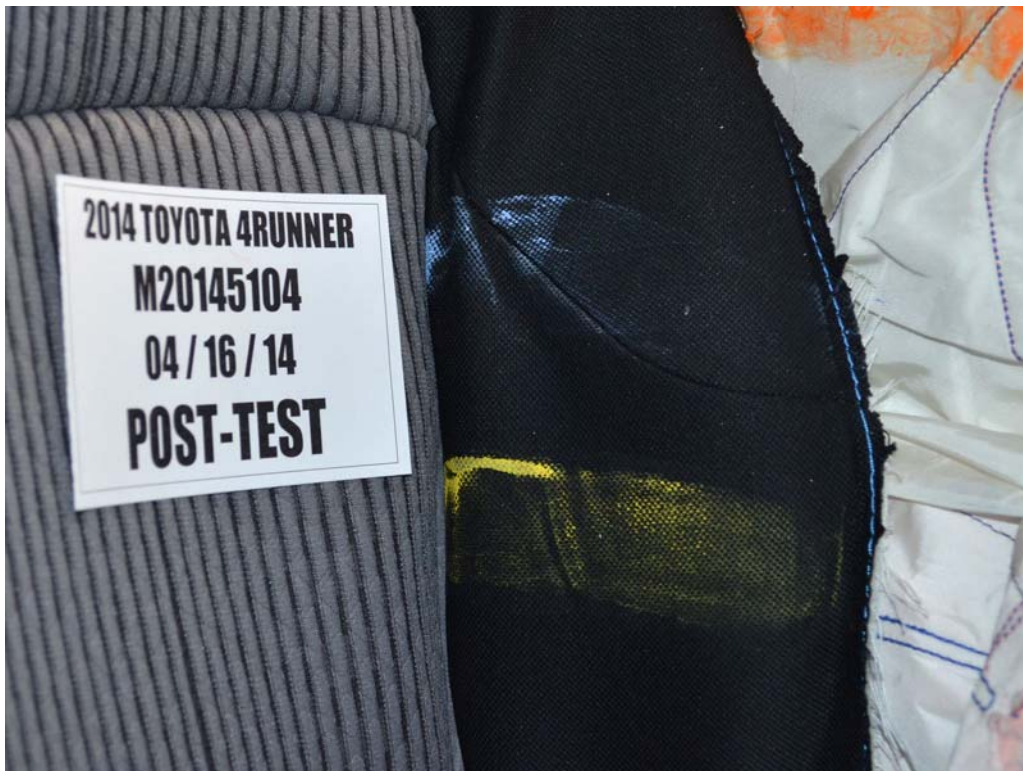


FIGURE 48. Post-Test Dummy Close-Up Torso Contact With Vehicle Interior View



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

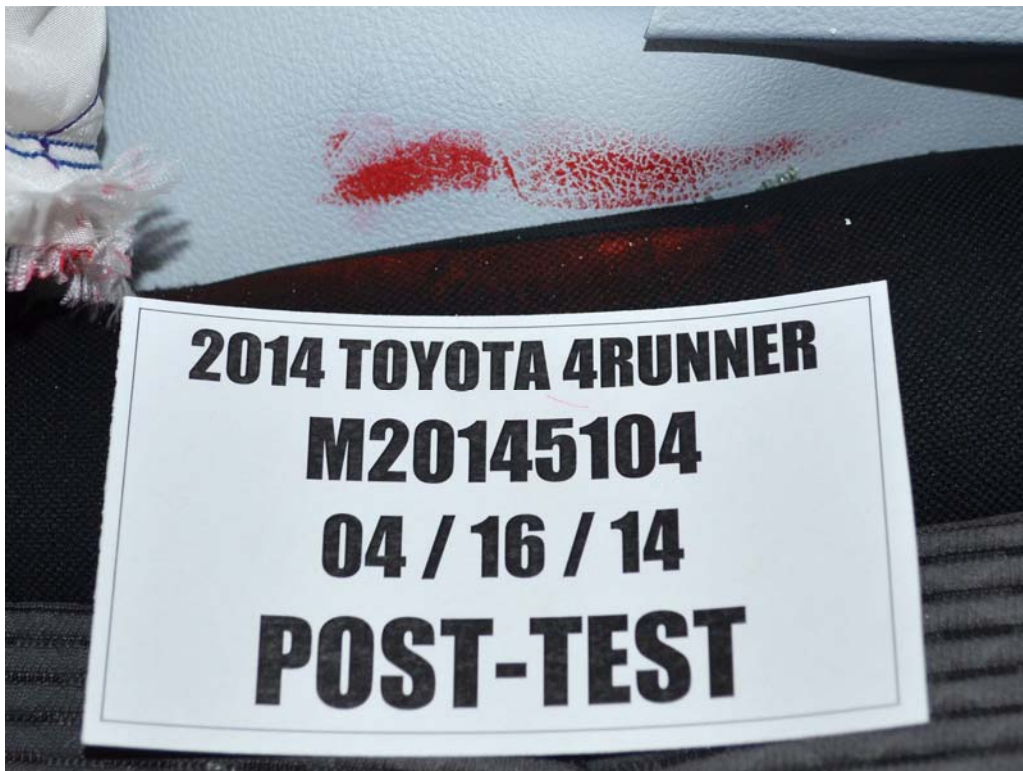


FIGURE 50. Post-Test Dummy Close-Up Pelvis Contact With Vehicle Interior View

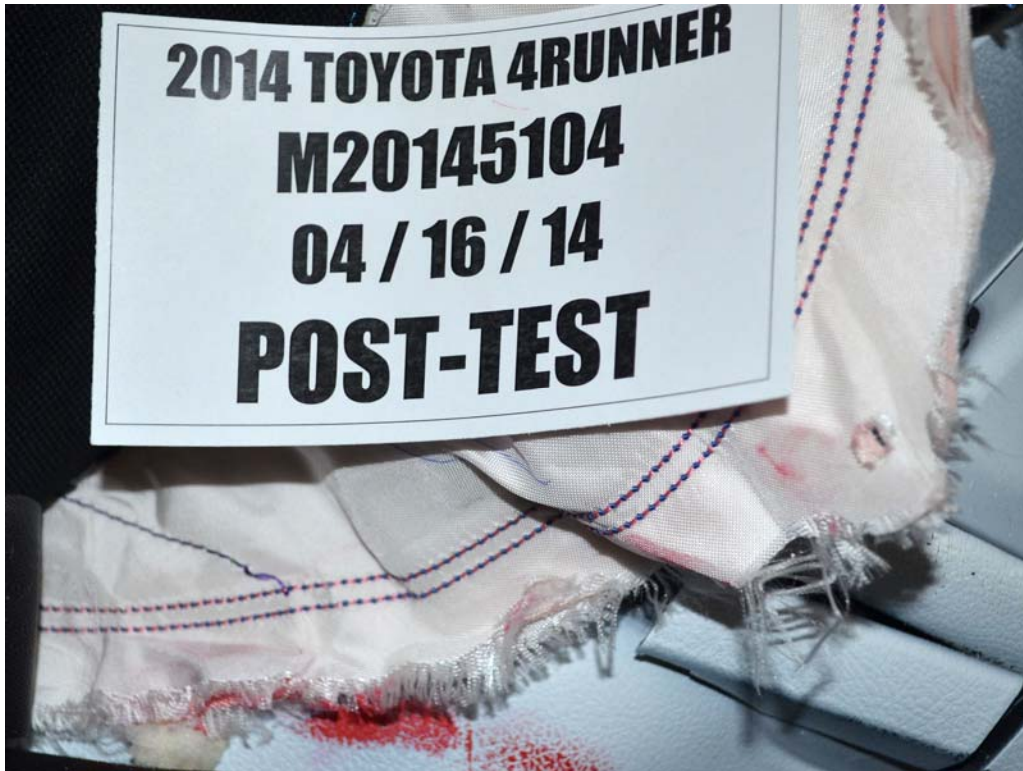


FIGURE 51. Post-Test Dummy Close-Up Pelvis Contact With Side Airbag View

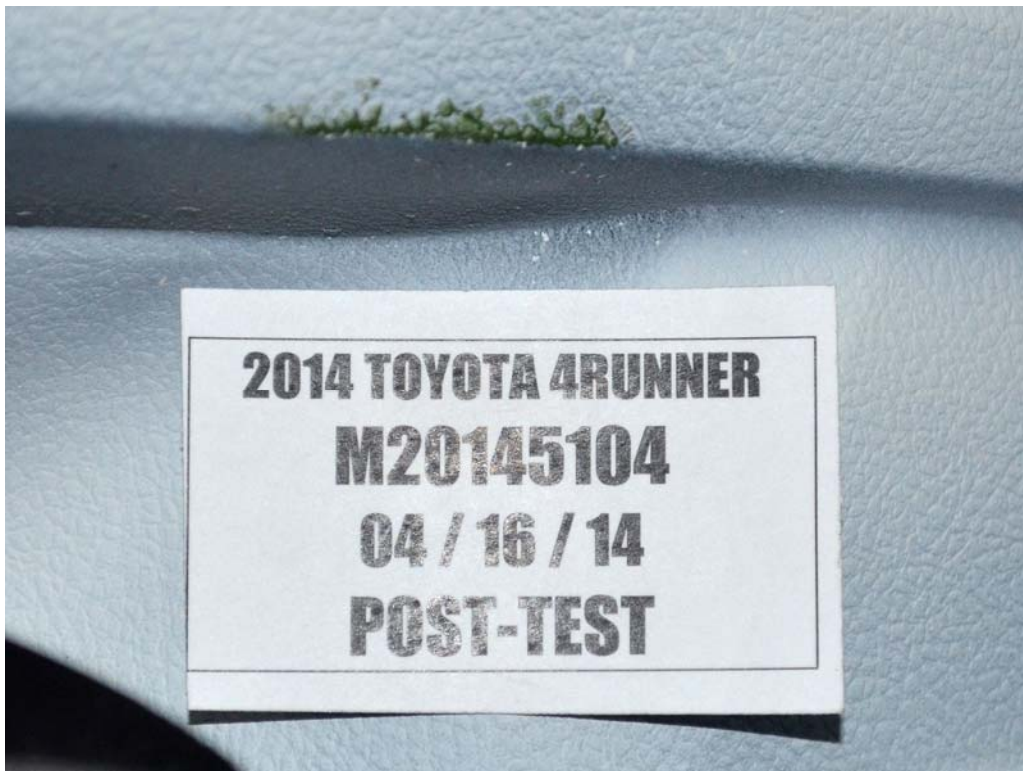


FIGURE 52. Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View



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

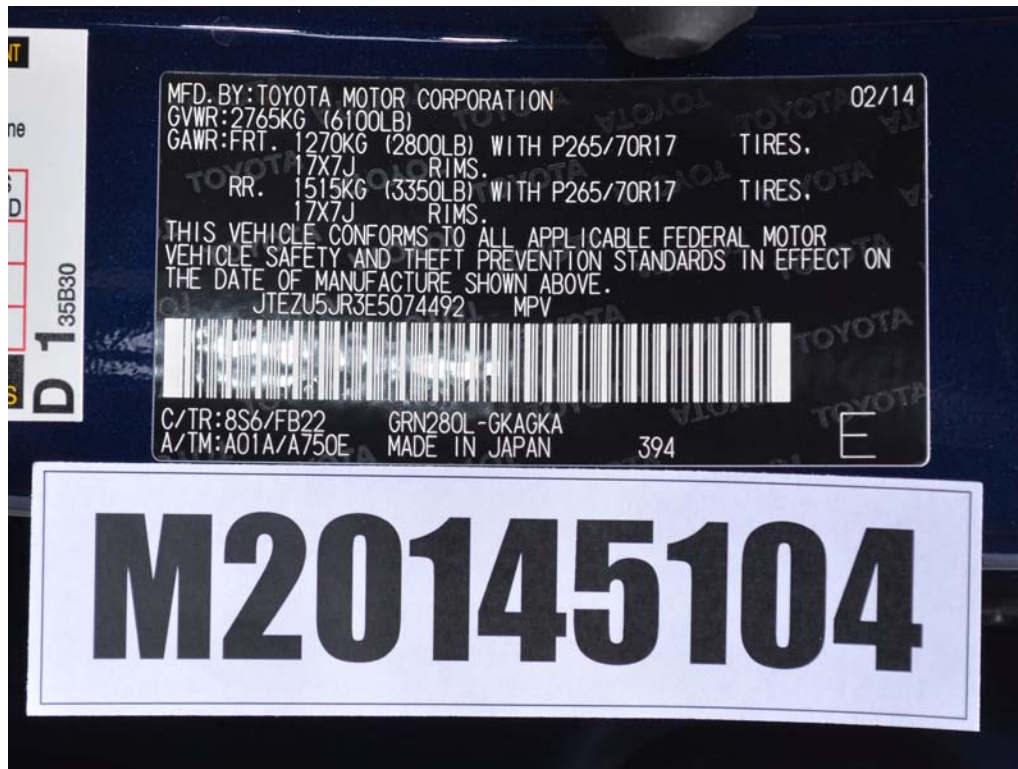


FIGURE 55. Close-Up View of Vehicle's Certification Label



FIGURE 55a. Close-Up View of Vehicle's Reduced Load Carrying Capacity Label

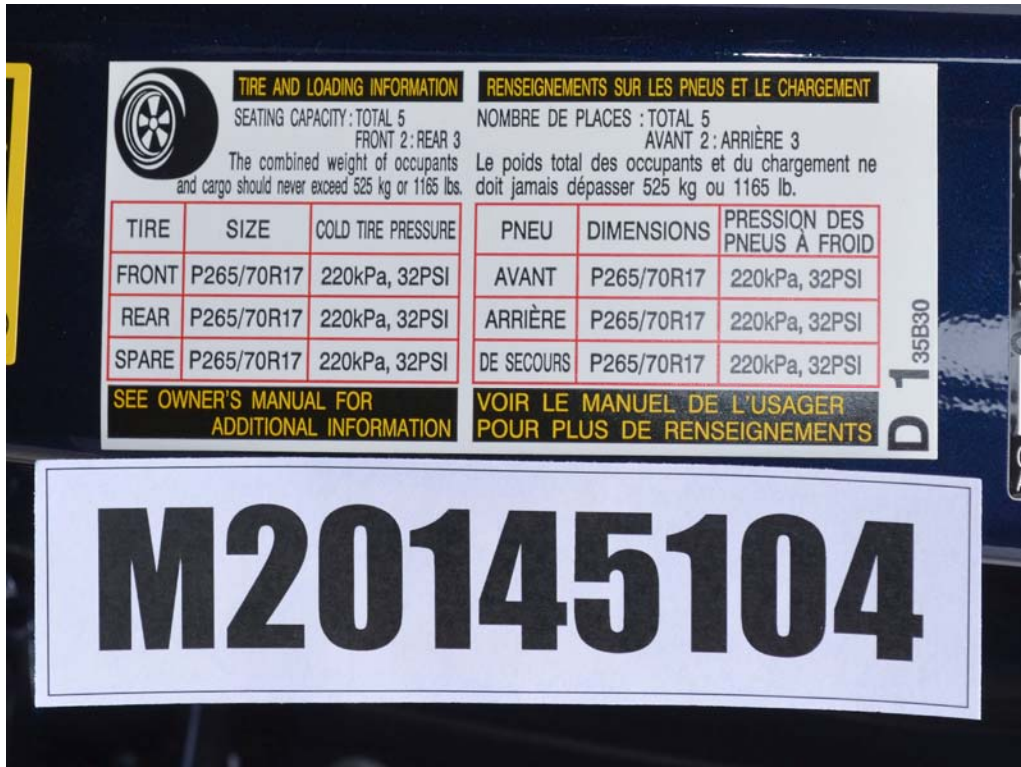


FIGURE 56. Close-Up View of Vehicle's Tire Information Placard or Label



FIGURE 57. Pre-Test Pole Barrier Front View



FIGURE 58. Post-Test Pole Barrier Front View



FIGURE 59. Pre-Test Pole Barrier Side View



FIGURE 60. Post-Test Pole Barrier Side View



FIGURE 61. Pre-Test Ballast View



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



FIGURE 63. FMVSS No. 301 Static Rollover 0 Degrees

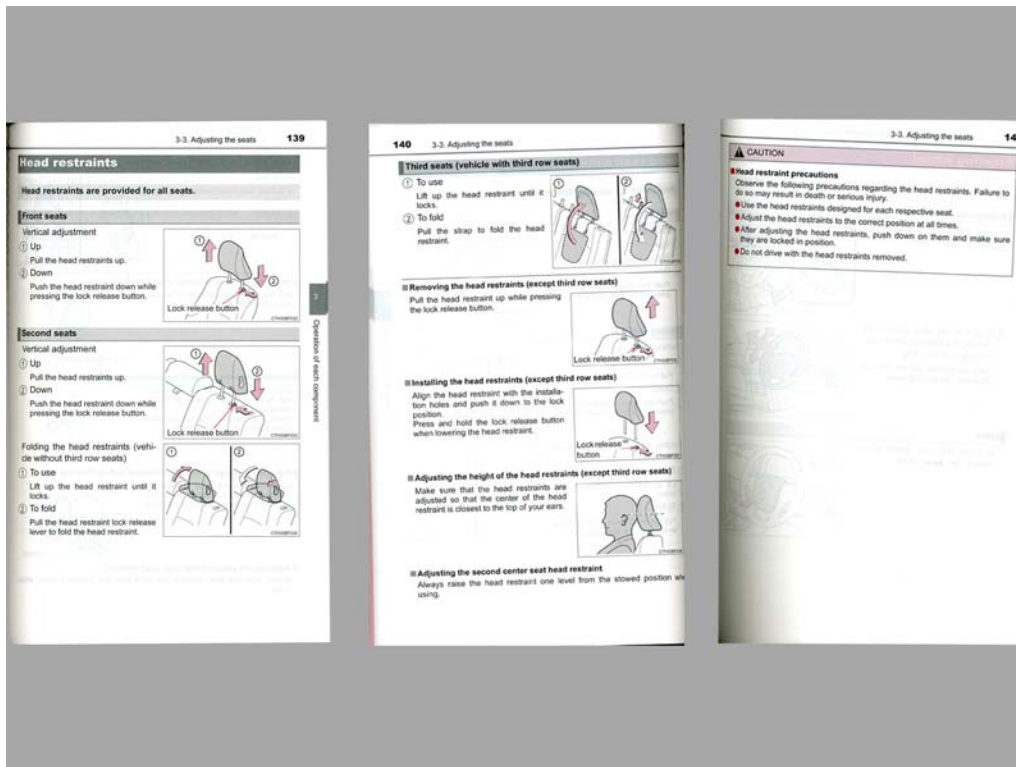


FIGURE 70. Head Restraint Use and Adjustment
Information from Vehicle Owner's Manual

APPENDIX B
DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

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

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

www.NHTSA.dot.gov

Additional Driver Dummy Instrumentation Data

Driver Head Acceleration Redundant (X)
Driver Head Acceleration Redundant (Y)
Driver Head Acceleration Redundant (Z)
Driver Upper Thorax Rib Deflection (Y)
Driver Middle Thorax Rib Deflection (Y)
Driver Lower Thorax Rib Deflection (Y)
Driver Upper Abdomen Rib Deflection (Y)
Driver Lower Abdomen Rib Deflection (Y)

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Left Floor Sill Acceleration (Y)
Left A-Pillar Sill Acceleration (Y)
Left Lower A-Pillar Acceleration (Y)
Left Mid A-Pillar Acceleration (Y)

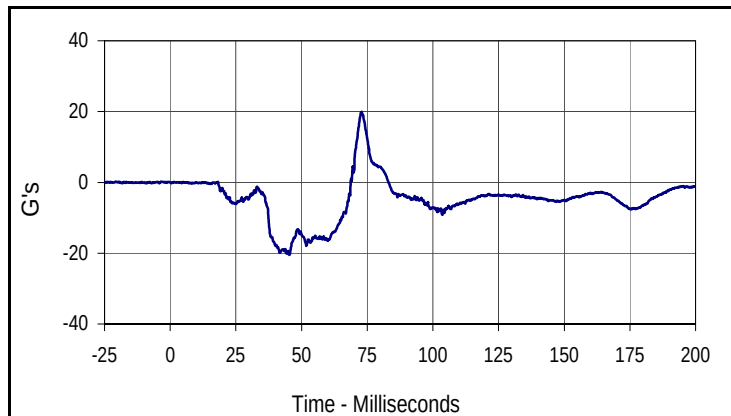
Left B-Pillar Sill Acceleration
Left Lower B-Pillar Acceleration (Y)
Left Mid B-Pillar Acceleration (Y)
Driver Seat Track at Dummy Hip Point Acceleration (Y)
Engine Top Acceleration (X)
Engine Top Acceleration (Y)
Firewall Center Acceleration (Y)
Right Roof at Vertical Impact Reference Line Acceleration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

Pole Instrumentation Data

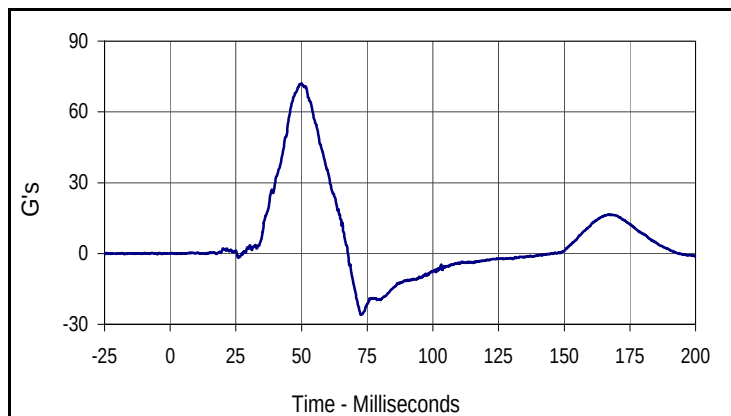
Load Cell Pole Barrier #1 Force (Y)
Load Cell Pole Barrier #2 Force (Y)
Load Cell Pole Barrier #3 Force (Y)
Load Cell Pole Barrier #4 Force (Y)
Load Cell Pole Barrier #5 Force (Y)
Load Cell Pole Barrier #6 Force (Y)
Load Cell Pole Barrier #7 Force (Y)
Load Cell Pole Barrier #8 Force (Y)

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test

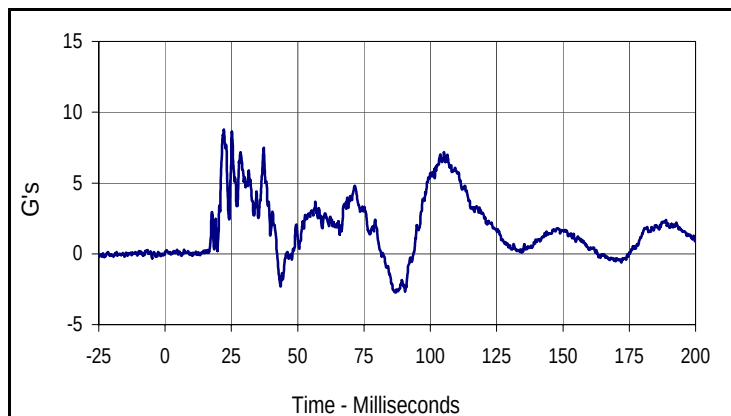
Test Date: 4/16/14
 NHTSA No.: M20145104



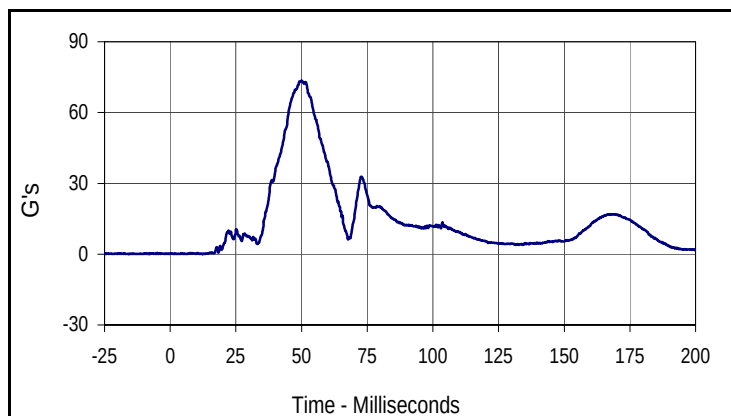
Curve Description			
Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
20.0	72.8	-20.5	45.3



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
72.0	50.0	-25.9	72.6



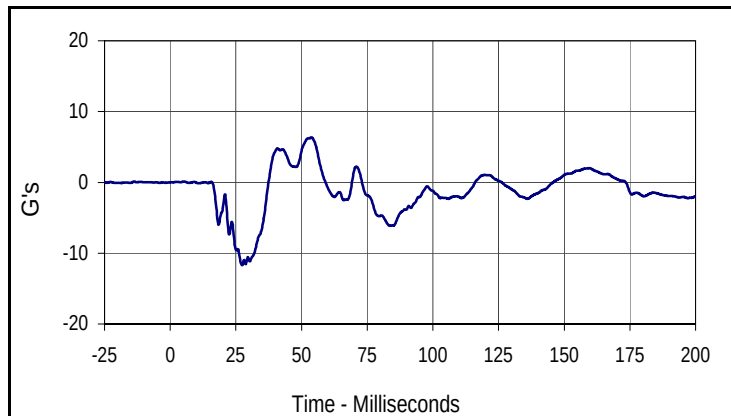
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
8.8	22.2	-2.7	86.9



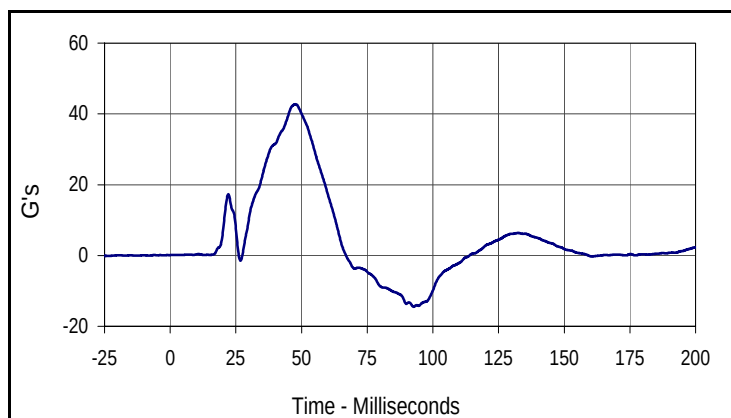
Curve Description			
Driver Head Acceleration Primary Res.			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
73.6	50.0	0.0	12.4

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test

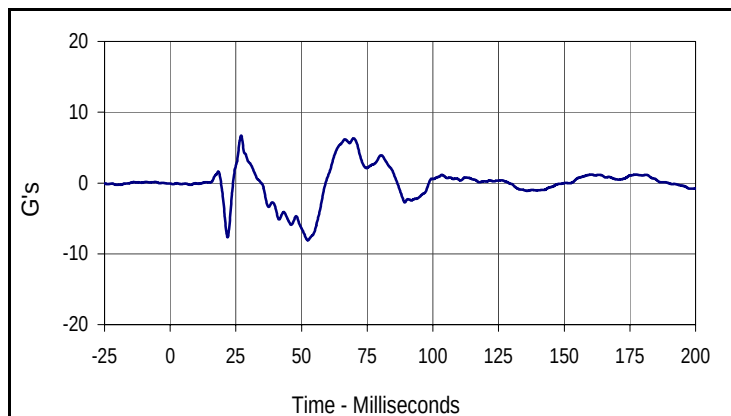
Test Date: 4/16/14
 NHTSA No.: M20145104



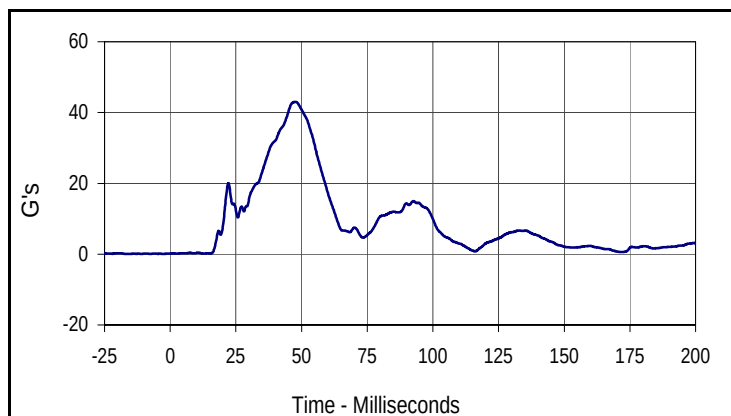
Curve Description			
Driver Lower Spine T12 Acceleration X			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
6.3	53.7	-11.7	27.4



Curve Description			
Driver Lower Spine T12 Acceleration Y			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
42.7	47.7	-14.5	92.6



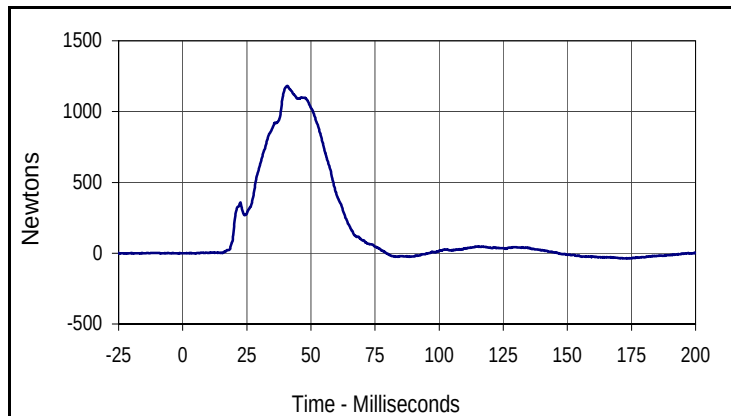
Curve Description			
Driver Lower Spine T12 Acceleration Z			
Plot No.	Type	SAE Class	Units
007	FIL	180	G's
Max	Time	Min	Time
6.7	27.0	-8.1	52.4



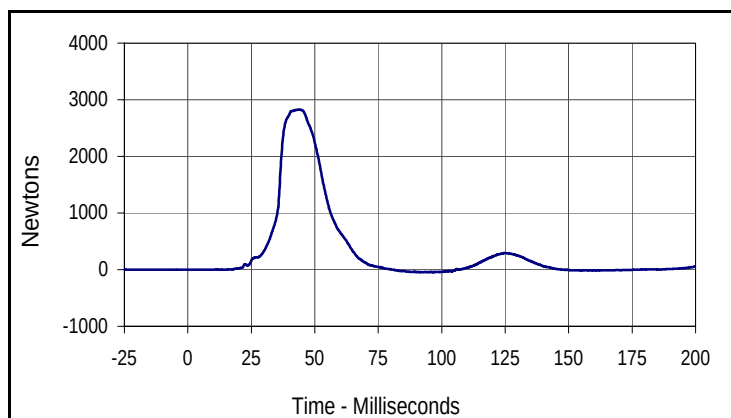
Curve Description			
Driver Lower Spine T12 Acceleration Res.			
Plot No.	Type	SAE Class	Units
008	RES	180	G's
Max	Time	Min	Time
43.0	47.7	0.1	0.0

Test Vehicle: 2014 Toyota 4Runner SR5 5-Door MPV
 Test Program: 32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test

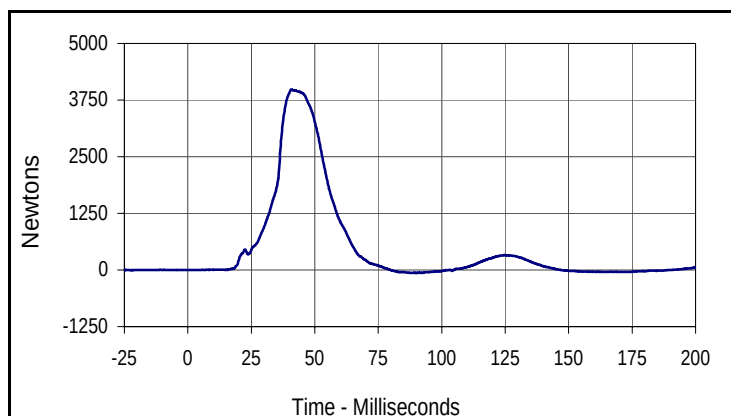
Test Date: 4/16/14
 NHTSA No.: M20145104



Curve Description			
Driver Iliac Wing Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
009	FIL	600	Newtontons
Max	Time	Min	Time
1181.8	40.8	-37.6	173.6



Curve Description			
Driver Acetabulum Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
010	FIL	600	Newtontons
Max	Time	Min	Time
2828.1	43.9	-48.0	91.1



Curve Description			
Driver Total Pelvic Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
011	SUM	600	Newtontons
Max	Time	Min	Time
3982.2	40.9	-68.9	89.8

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

Test Program: SID IIs External Measurements
 ATD Serial No.: 299

Test Date: 4/14/14
 Test I.D.: N/A



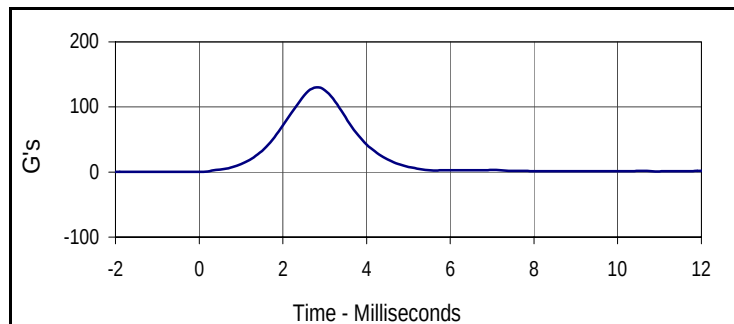
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	28	Pass
A	Sitting Height	mm	772 - 788	780	Pass
B	Shoulder Pivot Height	mm	437 - 453	445	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	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
 ATD Serial No.: 299

Test Date: 4/14/14
 Test I.D.: 299HD069



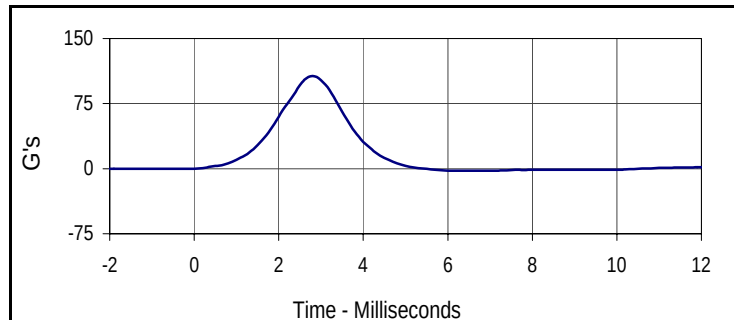
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	550	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.3	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	28.3	Pass
	Min	%		27.4	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	28.2	Pass
Peak Head Resultant Acceleration		G's	115 to 137	130.2	Pass
Peak Head X Acceleration		G's	<15	5.8	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	2.4	Pass
Overall Test Results				Pass	



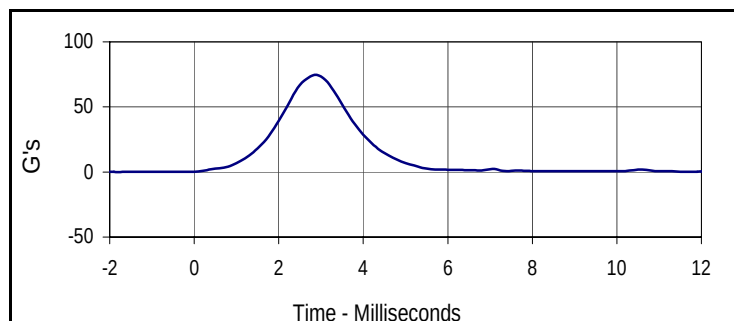
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
130.2	2.8	0.1	-0.5



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.8	3.3	-0.1	-1.8



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
107.0	2.8	-2.4	6.4



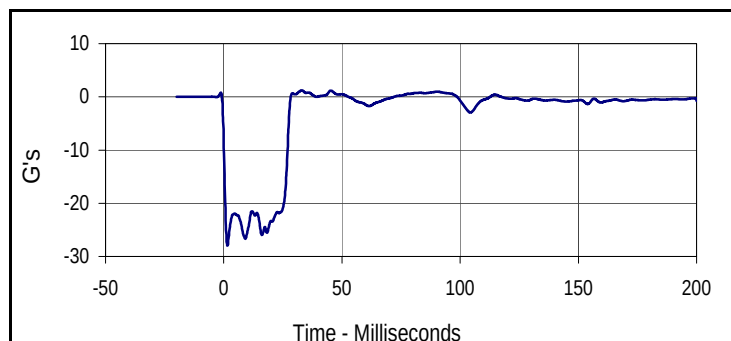
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
74.7	2.9	0.0	-1.8

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

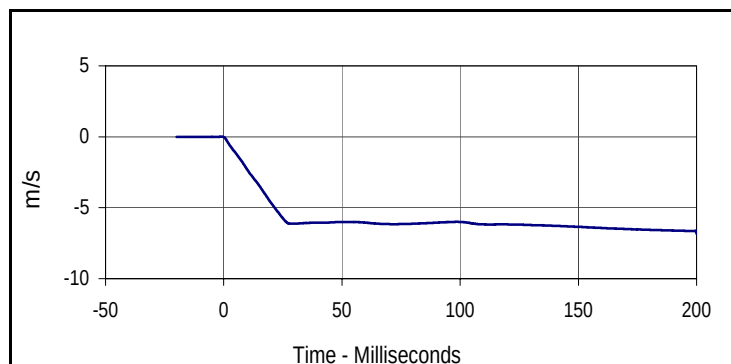
Test Date: 4/14/14
 Test I.D.: 299NB069



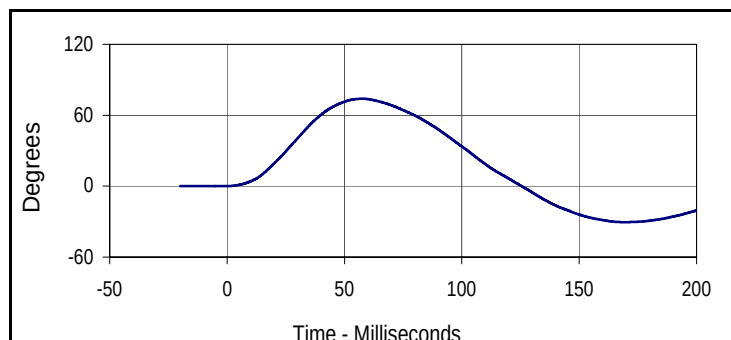
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	615	Pass
Temperature During Soak	Max	20.6 to 22.2	21.3	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	28.3	Pass
	Min		27.4	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	28.0	Pass
Pendulum Velocity	m/s	5.51 to 5.63	5.57	Pass
Pendulum Deceleration	10 msec	-2.20 to -2.80	-2.33	Pass
	15 msec	-3.30 to -4.10	-3.44	Pass
	20 msec	-4.40 to -5.40	-4.65	Pass
	25 msec	-5.40 to -6.10	-5.74	Pass
	25-100 msec	-5.50 to -6.20	-6.16	Pass
D-Plane Rotation	Max	71 to 81	74.0	Pass
	Time	50 to 70	57.5	Pass
Peak Occipital Condyle Moment	Nm	-36 to -44	-38.5	Pass
Decaying Moment Time to Cross 0 Nm	msec	102 to 126	105.3	Pass
Overall Test Results			Pass	



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
1.2	0.0	-28.0	0.0



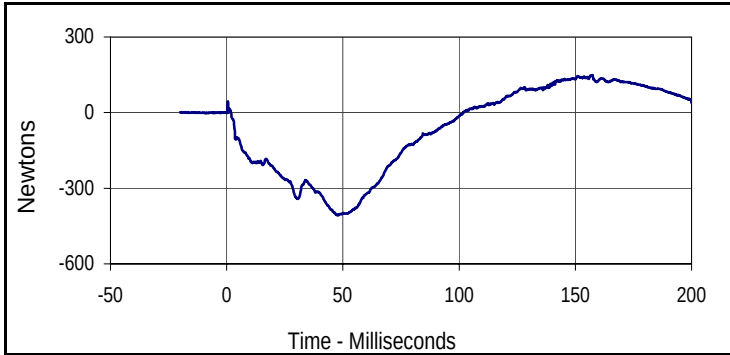
Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.8	-6.8	200.0



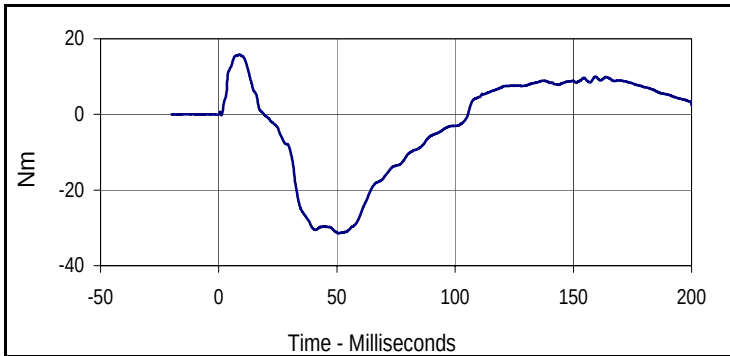
Curve Description			
D-Plane Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
74.0	57.5	-30.4	169.2

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

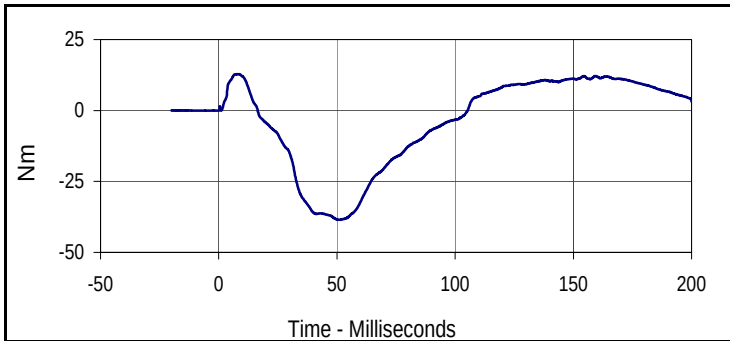
Test Date: 4/14/14
 Test I.D.: 299NB069



Curve Description			
Neck Force Y			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
148.4	157.4	-407.5	47.6



Curve Description			
Neck Moment X			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
15.8	8.8	-31.4	50.5



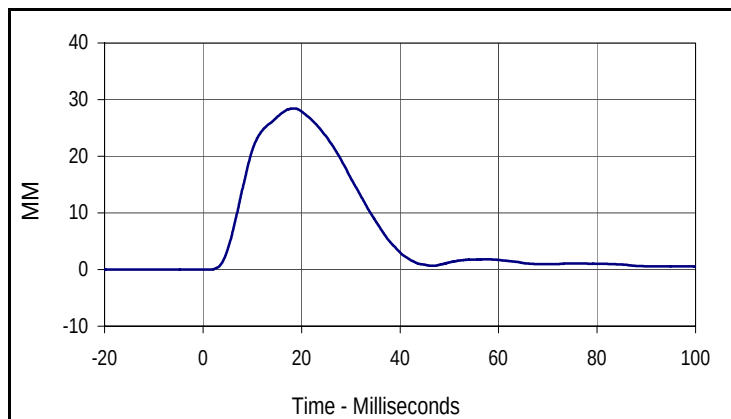
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
006	FIL	600	Nm
Max	Time	Min	Time
12.8	8.3	-38.5	50.6

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

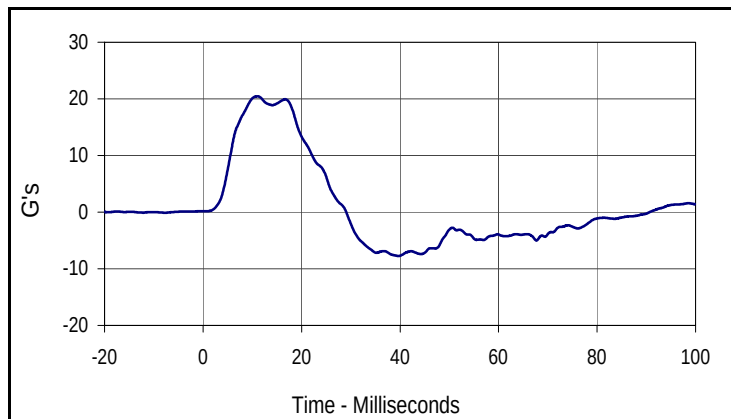
Test Date: 4/14/14
 Test I.D.: 299SH069



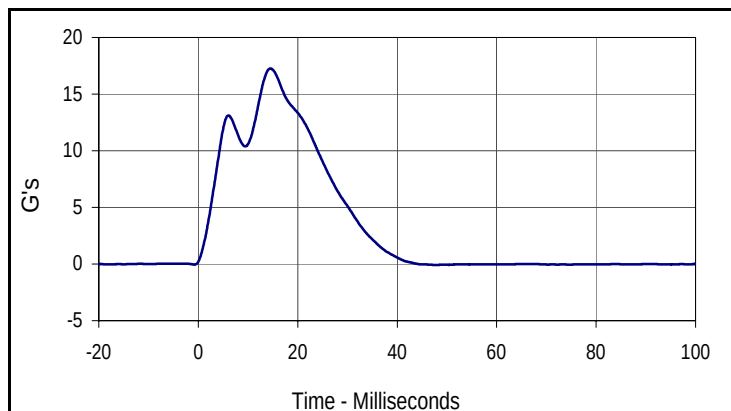
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	690	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.3	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	28.3	Pass
	Min	%		27.4	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	28.0	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.34	Pass
Peak Shoulder Deflection		mm	28 to 37	28.4	Pass
Peak Lateral Spine Acceleration Y		G's	17 to 22	20.4	Pass
Peak Impactor Acceleration		G's	13 to 18	17.3	Pass
Overall Test Results				Pass	



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
28.4	18.5	0.0	-17.0



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
20.4	11.1	-7.7	39.6



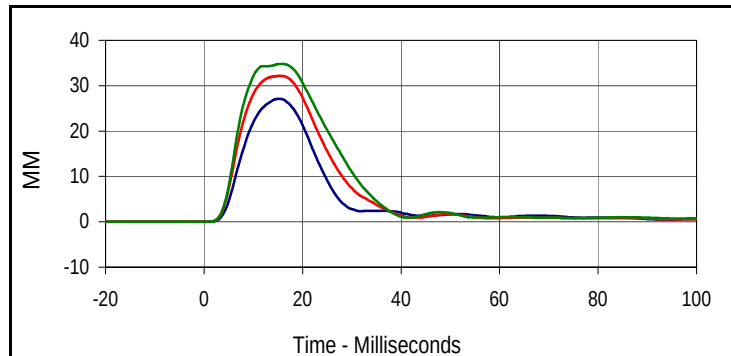
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
17.3	14.5	-0.1	47.7

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

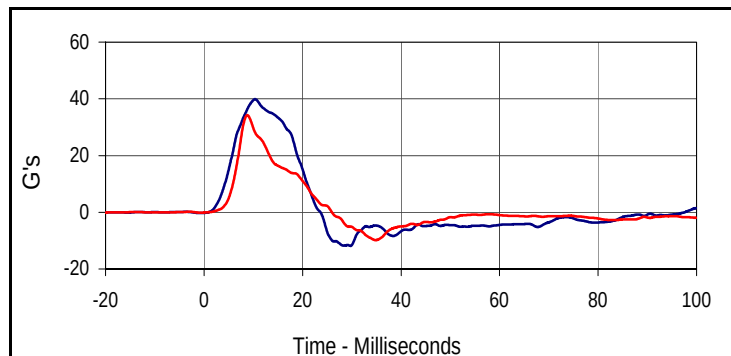
Test Date: 4/14/14
 Test I.D.: 299TWA069



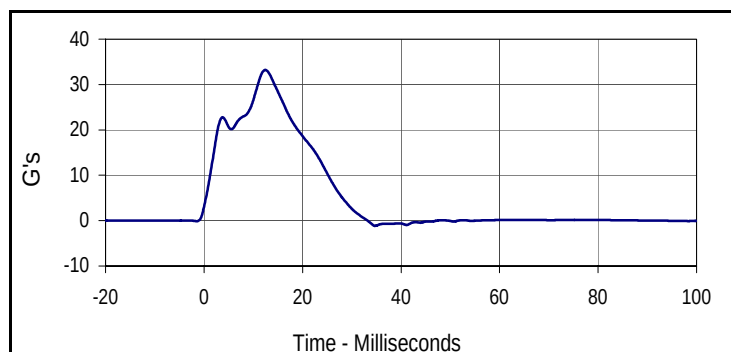
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	740	Pass
Temperature During Soak	Max	20.6 to 22.2	21.3	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	28.3	Pass
	Min		27.4	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	27.8	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.79	Pass
Peak Shoulder Deflection	mm	31 to 40	32.6	Pass
Peak Upper Thorax Rib Deflection	mm	25 to 32	27.1	Pass
Peak Middle Thorax Rib Deflection	mm	30 to 36	32.2	Pass
Peak Lower Thorax Rib Deflection	mm	32 to 38	34.8	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	39.9	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	34.2	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
27.1	15.2	0.0	-13.2
Middle Thorax Deflection			
Max	Time	Min	Time
32.2	15.4	0.0	-12.6
Lower Thorax Deflection			
Max	Time	Min	Time
34.8	15.4	0.0	-11.5



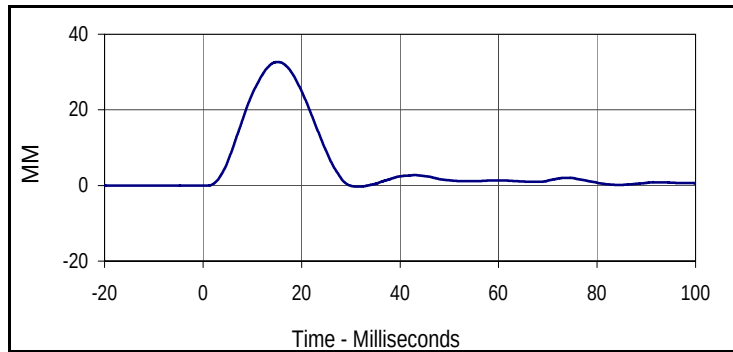
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
39.9	10.3	-11.8	29.7
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
34.2	8.8	-9.8	34.8



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
33.2	12.4	-1.1	34.7

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

Test Date: 4/14/14
 Test I.D.: 299TWA069



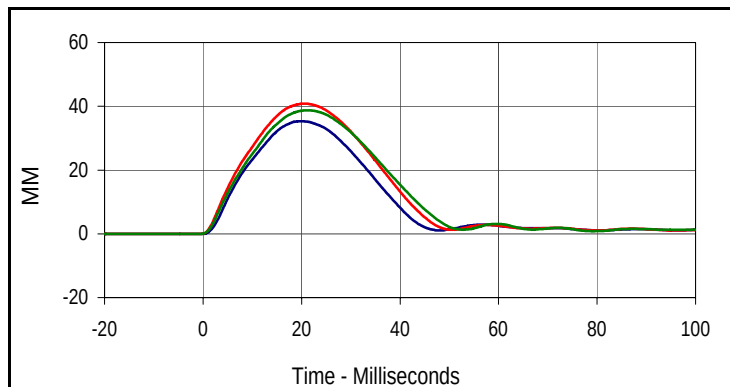
Curve Description			
Shoulder Deflection Y			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
32.6	15.1	-0.3	31.7

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

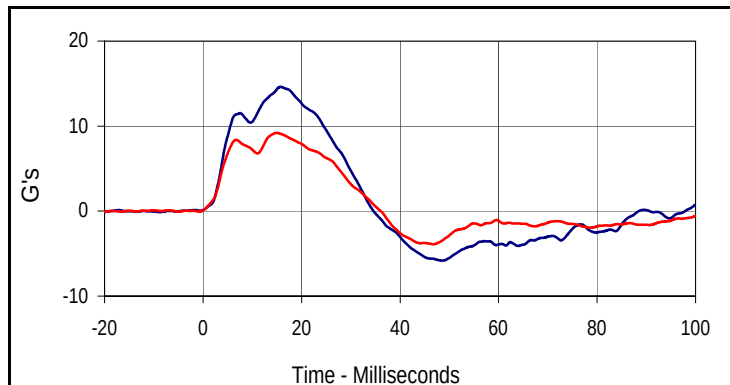
Test Date: 4/14/14
 Test I.D.: 299TWOA069



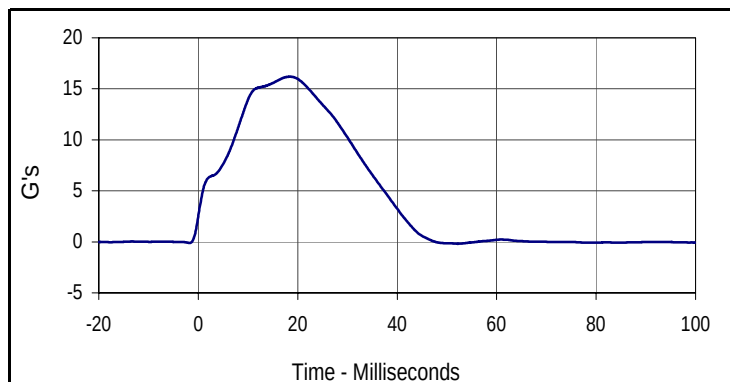
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	795	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.3	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	28.3	Pass
	Min	%		27.4	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	27.7	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.35	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	35.3	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	40.8	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	38.8	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	14.6	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	9.2	Pass
Peak Impactor Acceleration		G's	14 to 18	16.2	Pass
Overall Test Results				Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
35.3	19.9	0.0	-3.7
Middle Thorax Deflection			
Max	Time	Min	Time
40.8	20.9	0.0	-3.7
Lower Thorax Deflection			
Max	Time	Min	Time
38.8	21.2	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
14.6	15.7	-5.8	48.6
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.2	15.0	-3.9	46.7



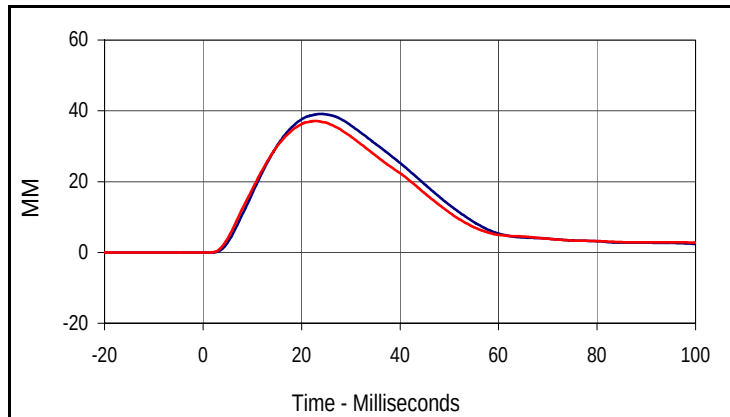
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.2	18.4	-0.2	52.2

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

Test Date: 4/14/14
 Test I.D.: 299ABD069

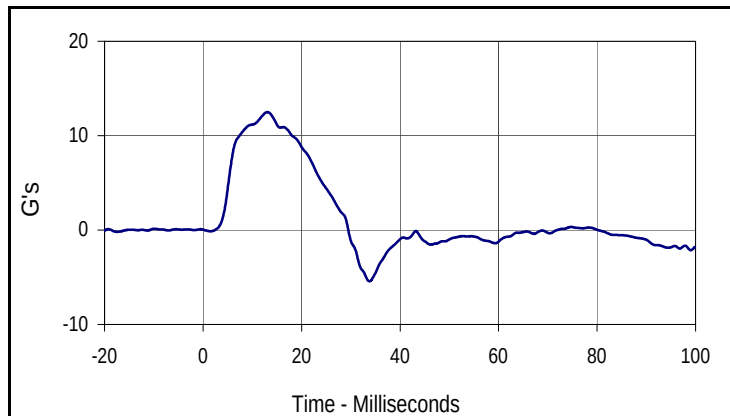


Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	855	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.3	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	28.3	Pass
	Min	%		27.4	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	27.6	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.34	Pass
Peak Upper Abdominal Rib Deflection		mm	36 to 47	39.1	Pass
Peak Lower Abdominal Rib Deflection		mm	33 to 44	37.1	Pass
Peak Lower Spine Y Acceleration		G's	9 to 14	12.5	Pass
Peak Impactor Acceleration		G's	12 to 16	15.4	Pass
Overall Test Results				Pass	

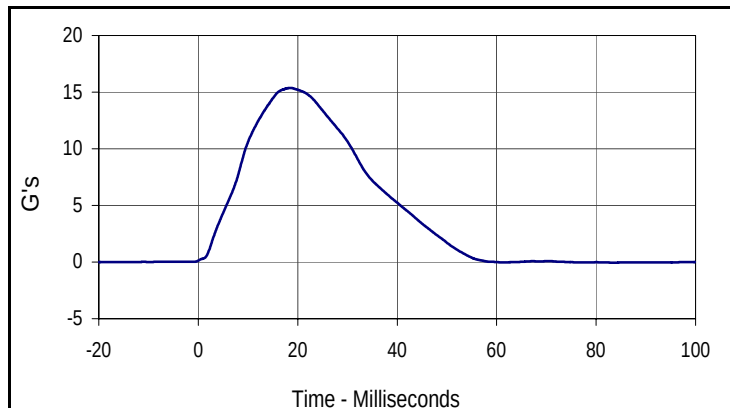


Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
39.1	23.9	0.0	-4.1

Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
37.1	22.8	0.0	-3.8

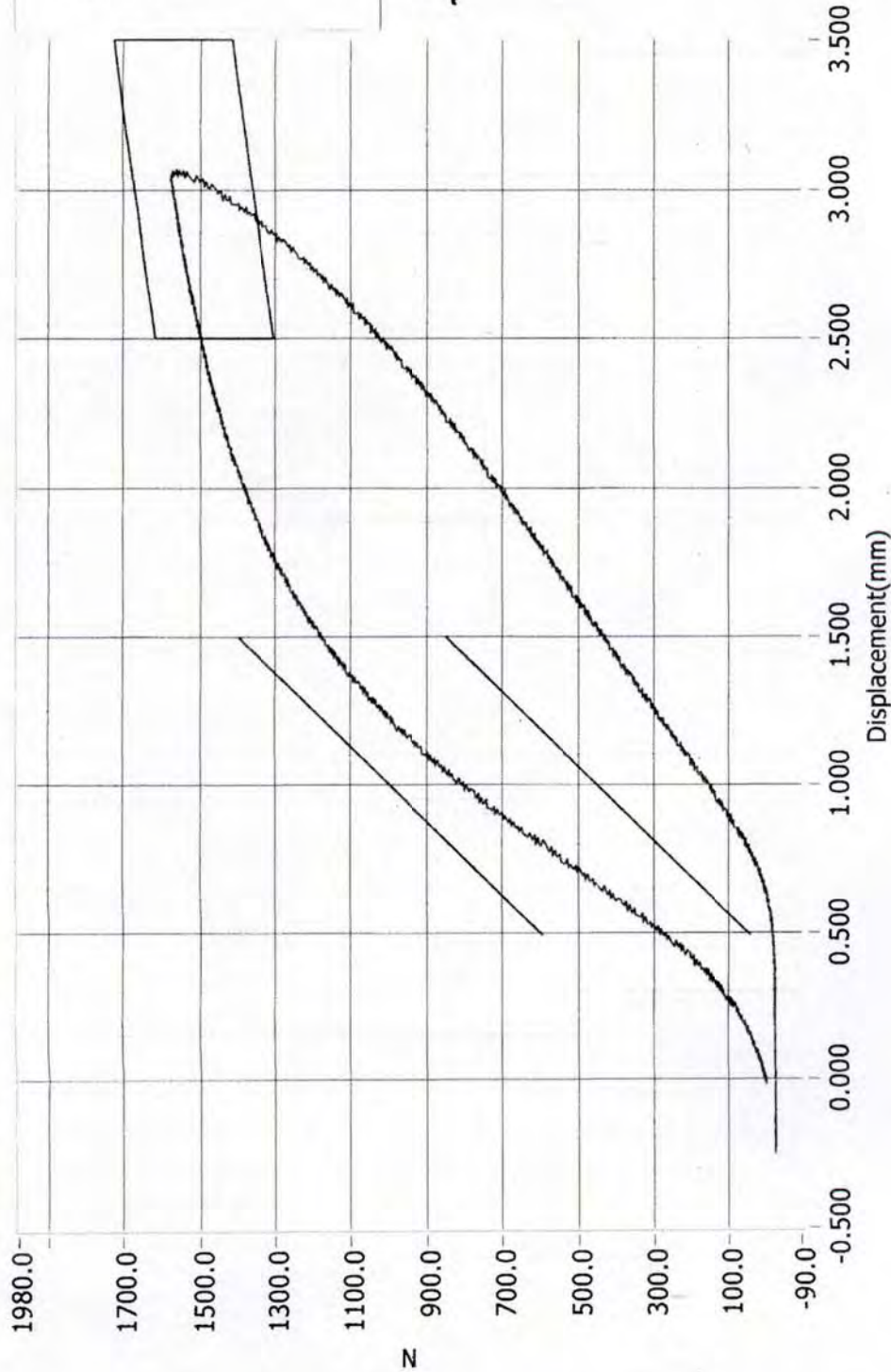


Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
12.5	13.1	-5.4	33.8



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.4	18.5	-0.1	83.7

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	63386	1/28/2013	6:08 PM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

M20145105 POST TEST

Current Date : 1/28/2013

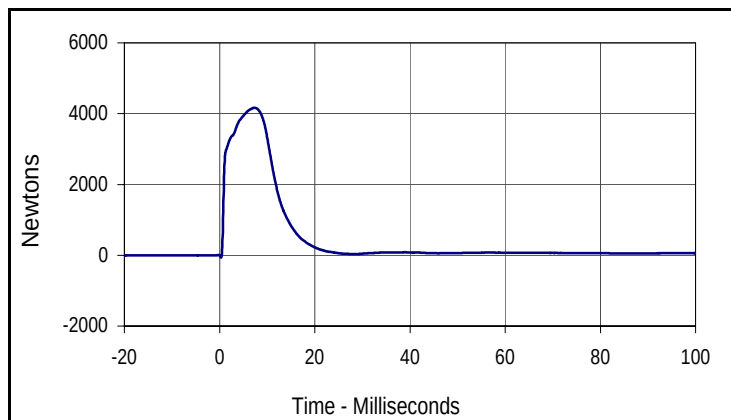
Current Time : 18:09:29

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

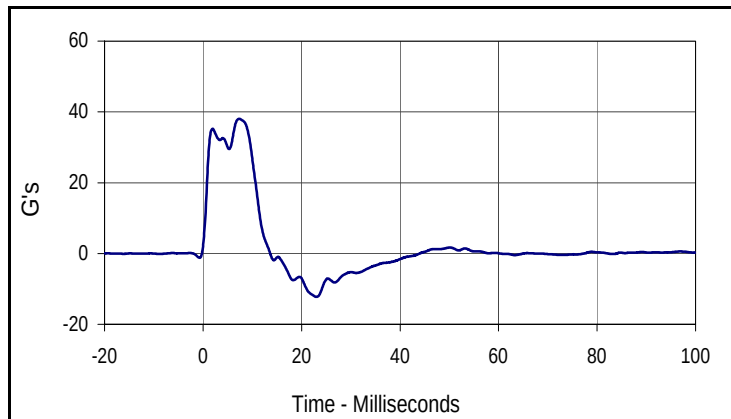
Test Date: 4/14/14
 Test I.D.: 299ACET069



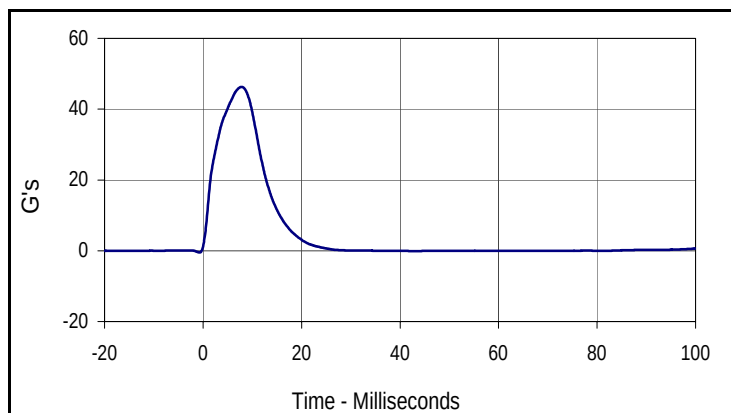
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	930	Pass
Temperature During Soak	Max	20.6 to 22.2	21.3	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	28.3	Pass
	Min		27.4	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	27.5	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.72	Pass
Peak Acetabulum Force Y	Newtons	3600 to 4300	4164.2	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	38.1	Pass
Peak Impactor Acceleration	G's	38 to 47	46.3	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4164.2	7.3	-69.0	0.3



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
38.1	7.3	-12.3	23.0



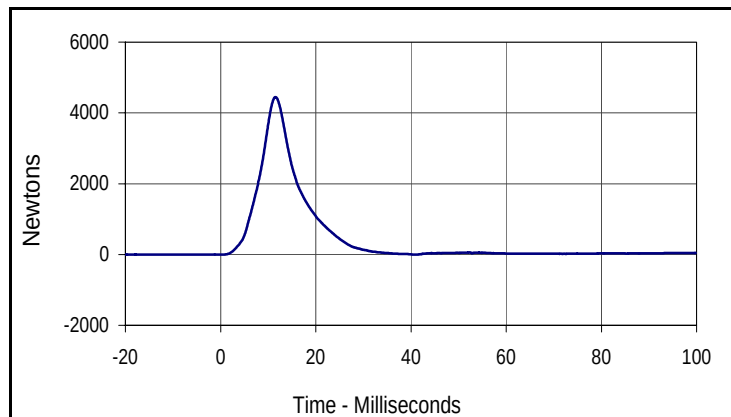
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
46.3	7.8	-0.5	-0.7

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

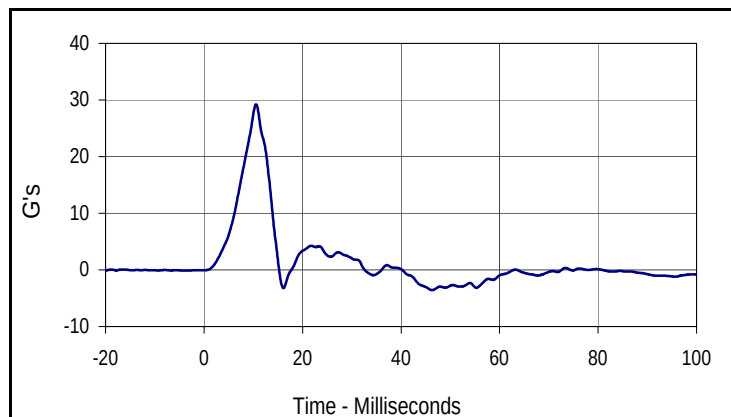
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 Test I.D.: 299PL069



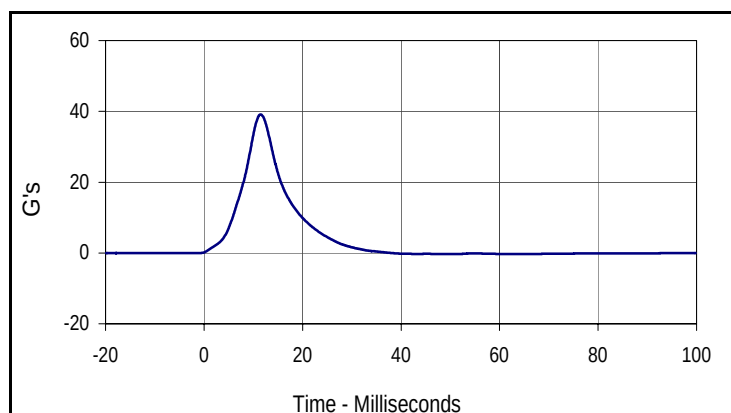
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	995	Pass
Temperature During Soak	Max	20.6 to 22.2	21.3	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	28.3	Pass
	Min		27.4	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	27.4	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.29	Pass
Peak Iliac Force	Newtons	4100 to 5100	4446.0	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	29.2	Pass
Peak Impactor Acceleration	G's	36 to 45	39.1	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4446.0	11.5	-1.8	-3.2



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
29.2	10.6	-3.6	46.3



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
39.1	11.5	-0.3	51.2

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

Test Program: SID IIs External Measurements
 ATD Serial No.: 299

Test Date: 4/21/14
 Test I.D.: N/A



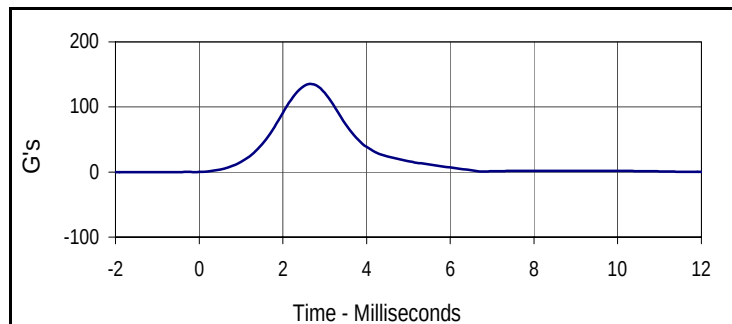
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	27	Pass
A	Sitting Height	mm	772 - 788	780	Pass
B	Shoulder Pivot Height	mm	437 - 453	445	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	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
 ATD Serial No.: 299

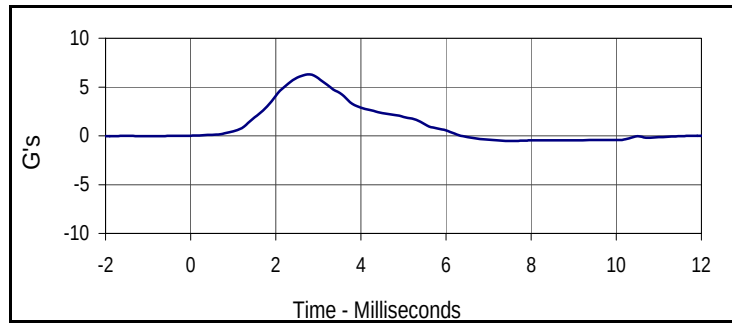
Test Date: 4/21/14
 Test I.D.: 299HD070



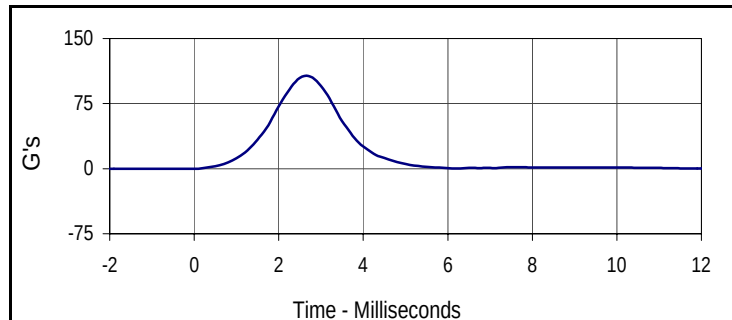
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	480	Pass
Temperature During Soak	Max	18.9 to 25.6	21.2	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	26.7	Pass
	Min		26.1	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	26.6	Pass
Peak Head Resultant Acceleration	G's	115 to 137	135.3	Pass
Peak Head X Acceleration	G's	<15	6.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	1.6	Pass
Overall Test Results				Pass



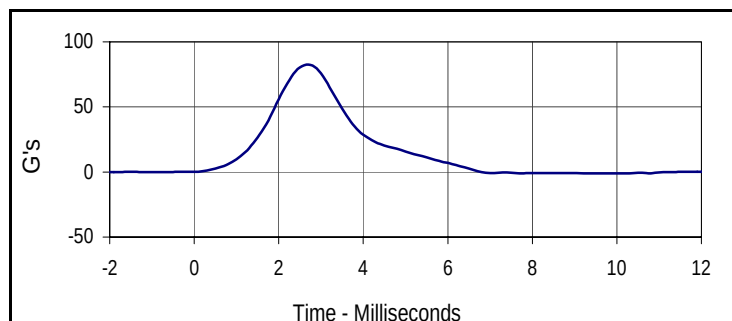
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
135.3	2.7	0.0	-0.9



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
6.3	2.8	0.0	-1.2



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
107.0	2.7	-0.1	0.0



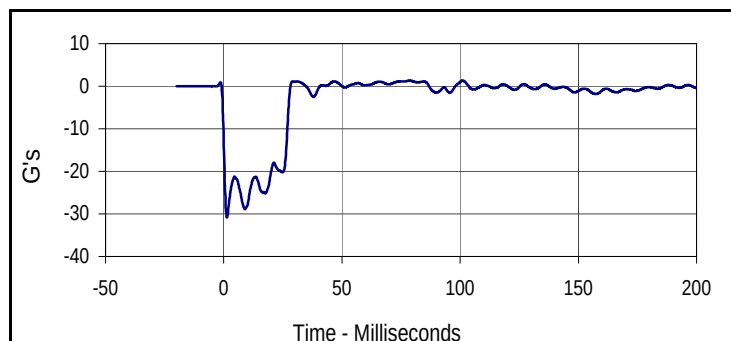
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
82.6	2.7	-1.2	10.3

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

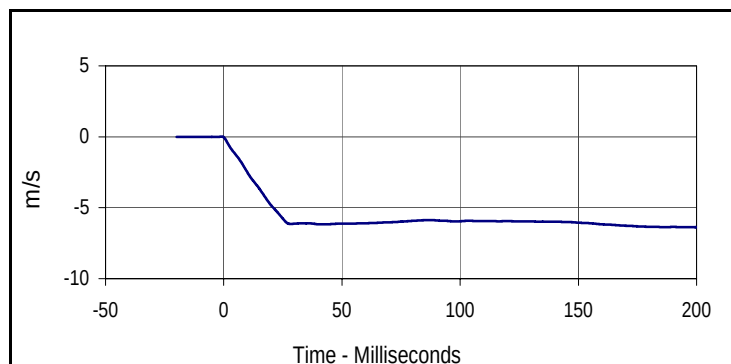
Test Date: 4/21/14
 Test I.D.: 299NB070



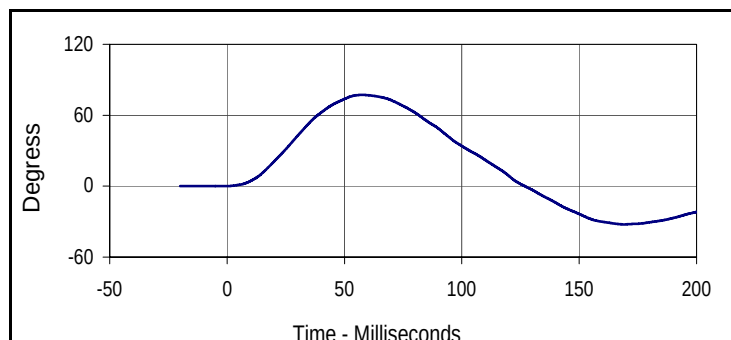
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	545	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.2	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	26.7	Pass
	Min	%		26.1	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	26.5	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.58	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.51	Pass
	15 msec	m/s	-3.30 to -4.10	-3.64	Pass
	20 msec	m/s	-4.40 to -5.40	-4.82	Pass
	25 msec	m/s	-5.40 to -6.10	-5.77	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.16	Pass
D-Plane Rotation	Max	Degrees	71 to 81	77.2	Pass
	Time	msec	50 to 70	57.6	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-40.9	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	113.5	Pass
Overall Test Results				Pass	



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
1.3	0.0	-30.9	0.0



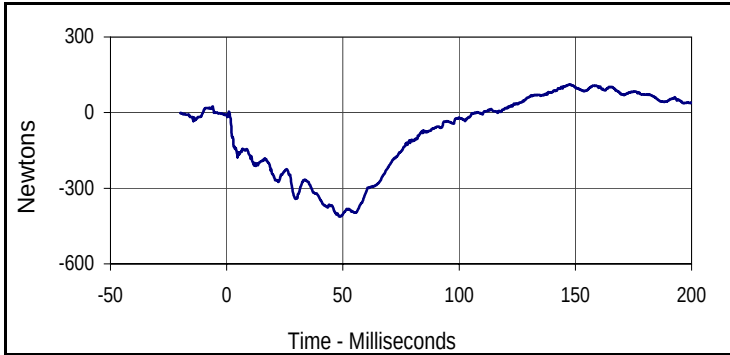
Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.9	-6.4	194.7



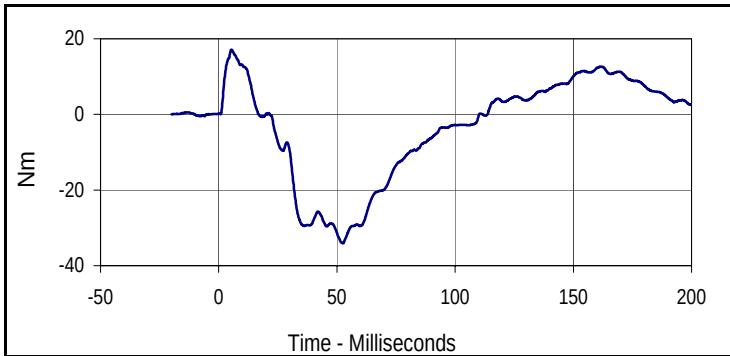
Curve Description			
D-Plane Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
77.2	57.6	-32.3	169.1

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

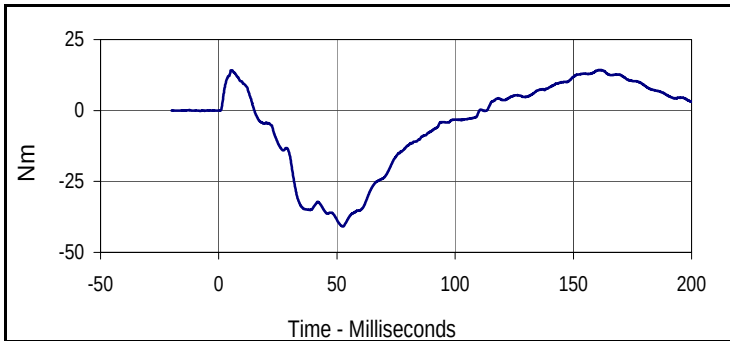
Test Date: 4/21/14
 Test I.D.: 299NB070



Curve Description			
Neck Force Y			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
112.5	147.9	-412.0	48.6



Curve Description			
Neck Moment X			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
17.1	5.3	-34.1	52.6



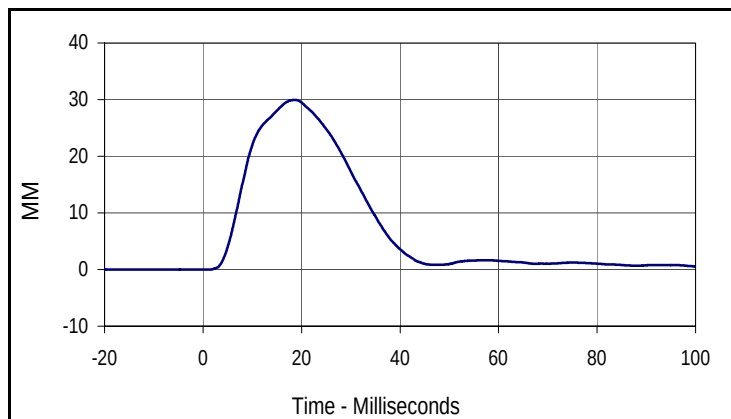
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
006	FIL	600	Nm
Max	Time	Min	Time
14.3	161.7	-40.9	52.5

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

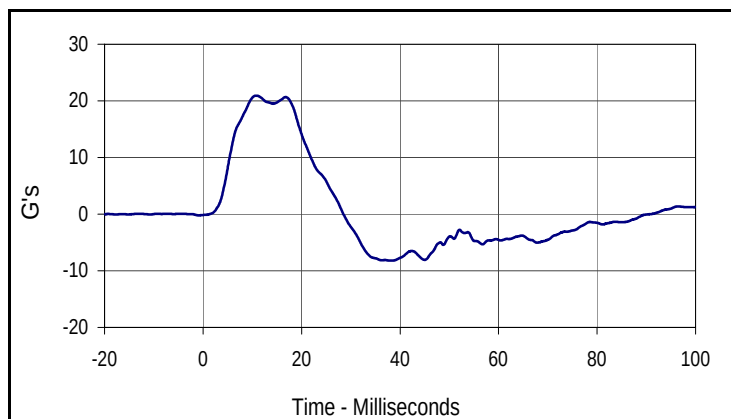
Test Date: 4/21/14
 Test I.D.: 299SH070



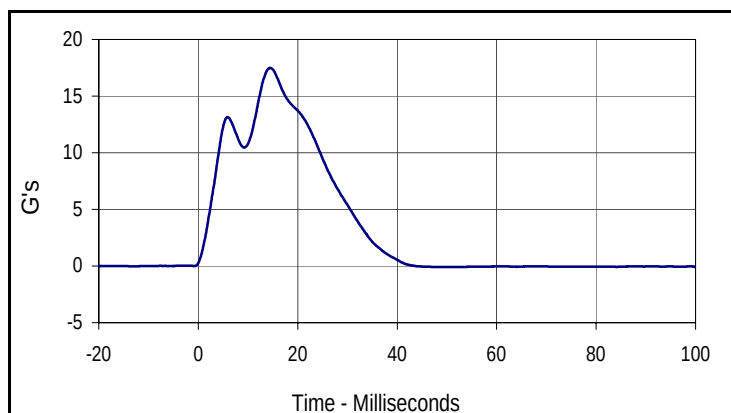
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	620	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.2	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	26.7	Pass
	Min	%		26.1	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	26.4	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.30	Pass
Peak Shoulder Deflection		mm	28 to 37	29.9	Pass
Peak Lateral Spine Acceleration Y		G's	17 to 22	20.9	Pass
Peak Impactor Acceleration		G's	13 to 18	17.5	Pass
Overall Test Results				Pass	



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
29.9	18.7	0.0	-11.7



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
20.9	10.7	-8.2	37.8



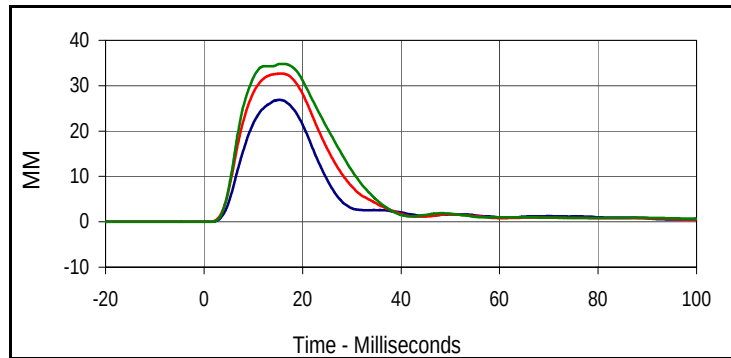
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
17.5	14.5	-0.1	99.9

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

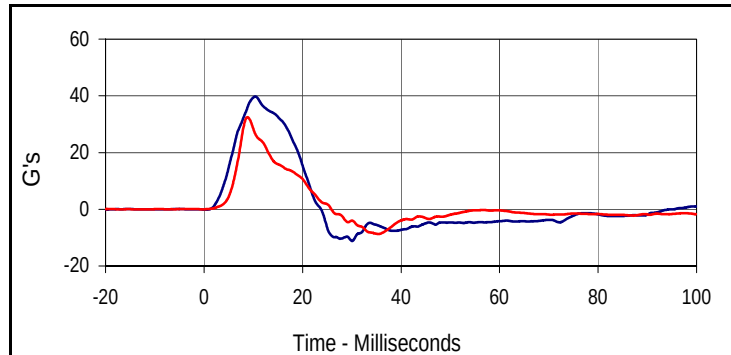
Test Date: 4/21/14
 Test I.D.: 299TWA070



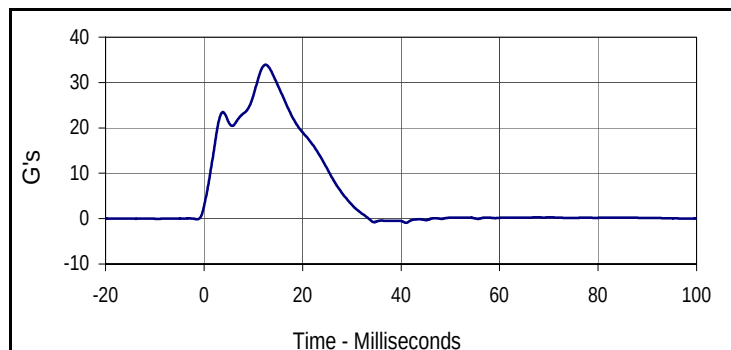
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	670	Pass
Temperature During Soak	Max	20.6 to 22.2	21.2	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	26.7	Pass
	Min		26.1	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	26.4	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.75	Pass
Peak Shoulder Deflection	mm	31 to 40	33.0	Pass
Peak Upper Thorax Rib Deflection	mm	25 to 32	26.9	Pass
Peak Middle Thorax Rib Deflection	mm	30 to 36	32.7	Pass
Peak Lower Thorax Rib Deflection	mm	32 to 38	34.8	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	39.7	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	32.5	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
26.9	15.3	0.0	-13.4
Middle Thorax Deflection			
Max	Time	Min	Time
32.7	15.4	0.0	-7.1
Lower Thorax Deflection			
Max	Time	Min	Time
34.8	15.6	0.0	-13.1



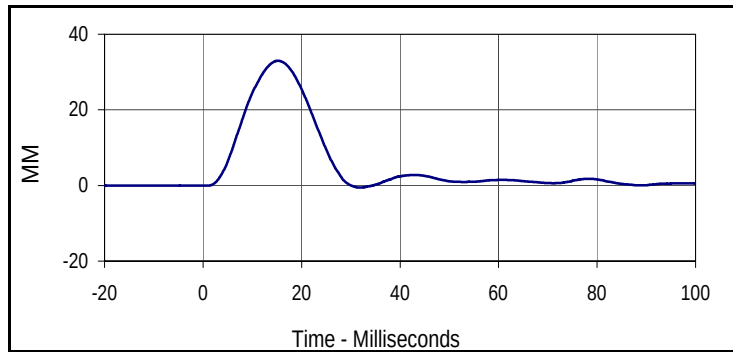
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
39.7	10.4	-11.2	30.1
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
32.5	8.8	-8.7	35.4



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
33.9	12.5	-0.9	41.0

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

Test Date: 4/21/14
 Test I.D.: 299TWA070



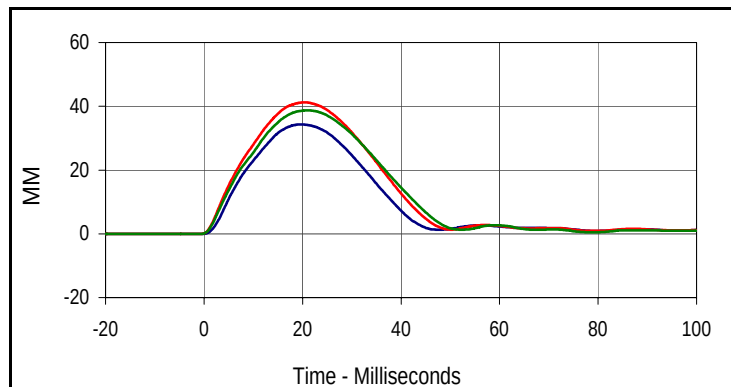
Curve Description			
Shoulder Deflection Y			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
33.0	15.2	-0.5	31.7

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

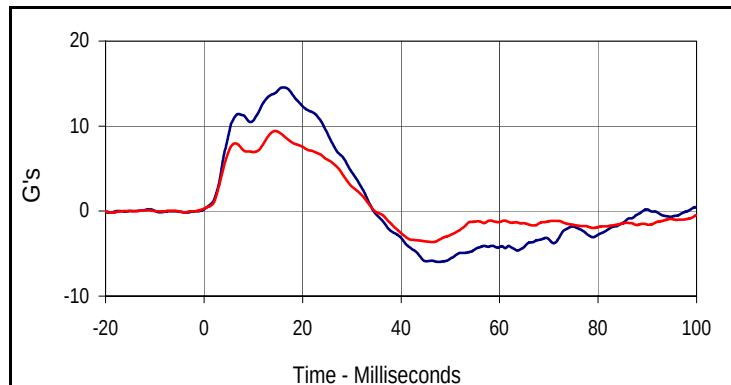
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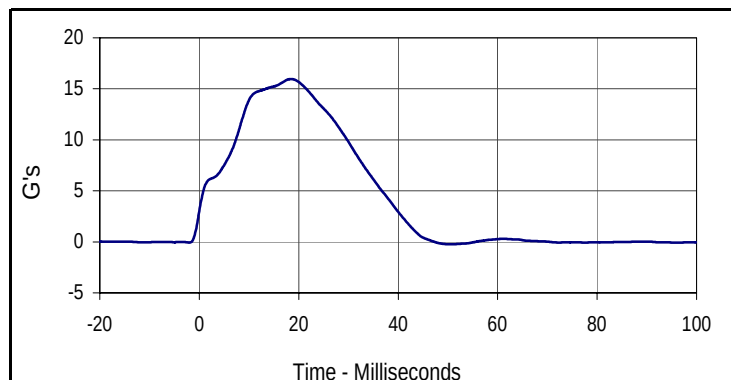
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	725	Pass
Temperature During Soak	Max	18.9 to 25.6	21.2	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	26.7	Pass
	Min		26.1	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	26.3	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.34	Pass
Peak Upper Thorax Rib Deflection	mm	32 to 40	34.3	Pass
Peak Middle Thorax Rib Deflection	mm	39 to 45	41.2	Pass
Peak Lower Thorax Rib Deflection	mm	35 to 43	38.7	Pass
Peak Upper Spine Y Acceleration	G's	13 to 17	14.5	Pass
Peak Lower Spine Y Acceleration	G's	7 to 11	9.4	Pass
Peak Impactor Acceleration	G's	14 to 18	16.0	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
34.3	19.6	0.0	-11.4
Middle Thorax Deflection			
Max	Time	Min	Time
41.2	20.3	0.0	-10.6
Lower Thorax Deflection			
Max	Time	Min	Time
38.7	21.0	0.0	-3.6



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.5	16.1	-6.0	47.5
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.4	14.4	-3.7	46.5



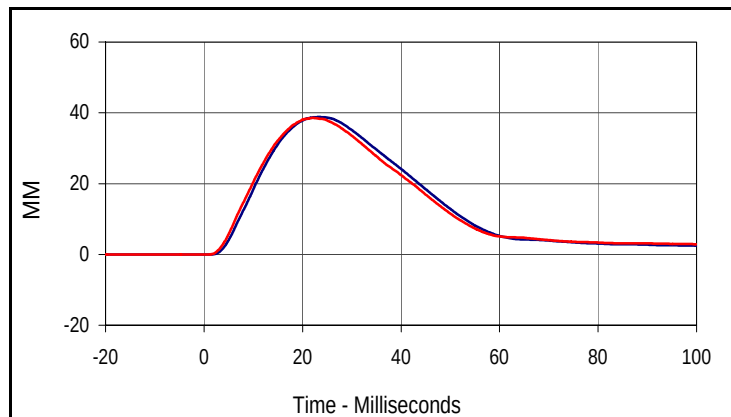
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.0	18.4	-0.2	50.5

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

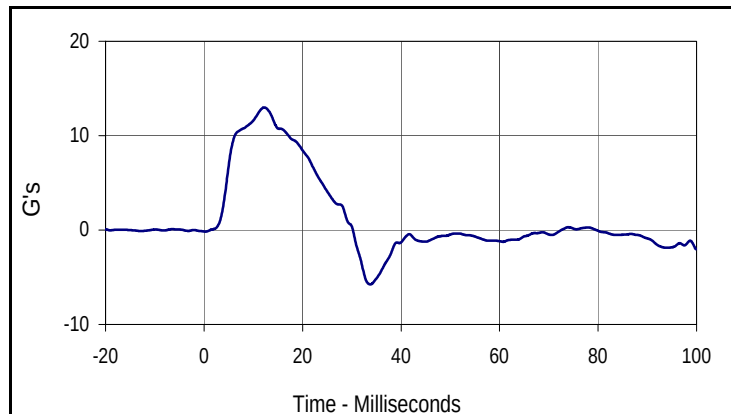
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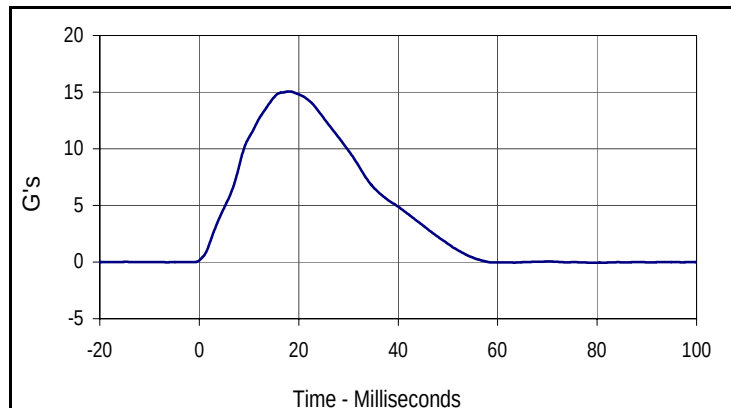
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	785	Pass
Temperature During Soak	Max °C	20.6 to 22.2	21.2	Pass
	Min °C		21.1	Pass
Humidity During Soak	Max %	10.0 to 70.0	26.7	Pass
	Min %		26.1	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	26.2	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.29	Pass
Peak Upper Abdominal Rib Deflection	mm	36 to 47	38.8	Pass
Peak Lower Abdominal Rib Deflection	mm	33 to 44	38.5	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	13.0	Pass
Peak Impactor Acceleration	G's	12 to 16	15.1	Pass
Overall Test Results			Pass	



Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
38.8	23.4	0.0	-11.9
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
38.5	22.1	0.0	-3.7

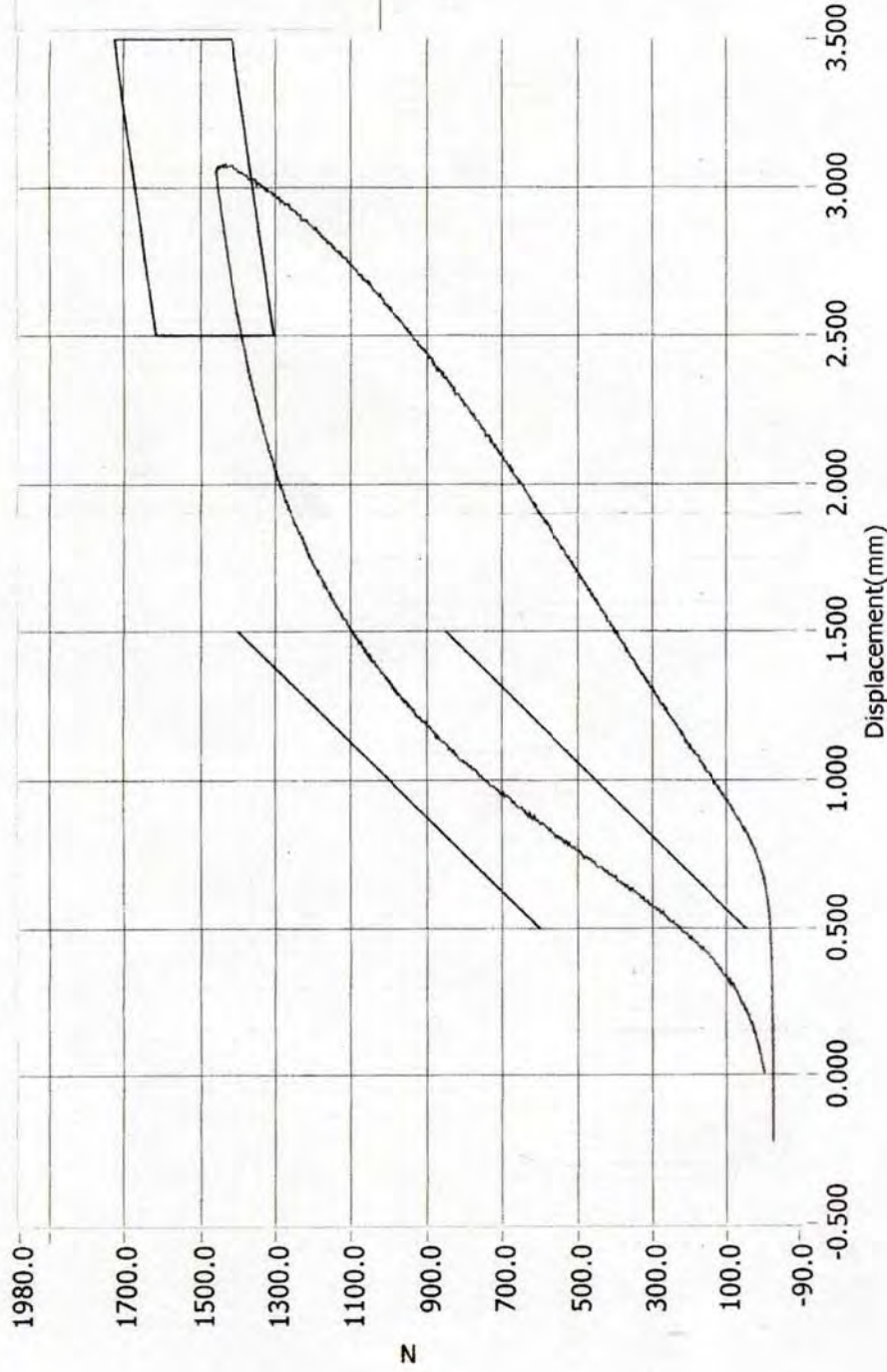


Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
13.0	12.2	-5.7	33.7



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.1	18.1	-0.1	79.0

Resultant Data - SIDIIs Plug Compression



1454N

ATD Calibration Lab

<u>Test ID</u>	<u>Part Serial Number</u>	<u>Test Date</u>	<u>Test Time</u>
	63071	1/19/2013	2:26 AM
<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
	N/A	SIDIIs	

M20145104 POST TEST

Current Date : 1/19/2013

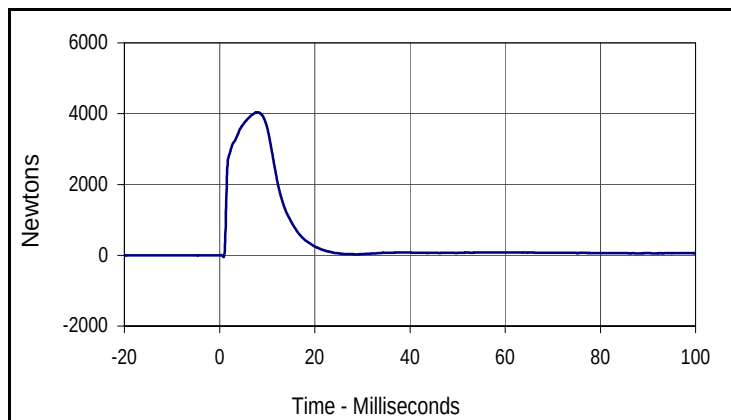
Current Time : 02:26:41

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

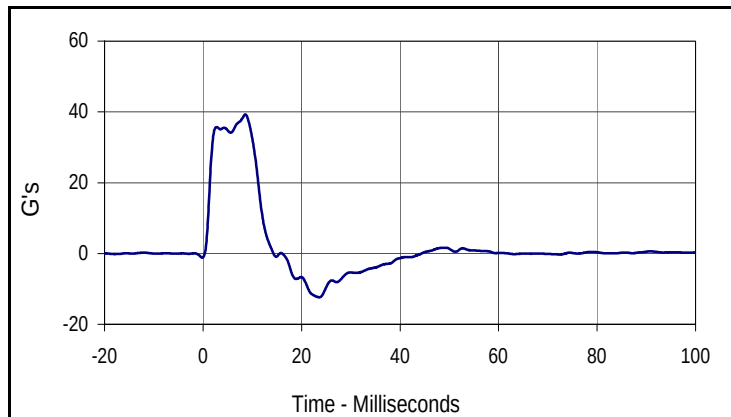
Test Date: 4/21/14
 Test I.D.: 299ACET070



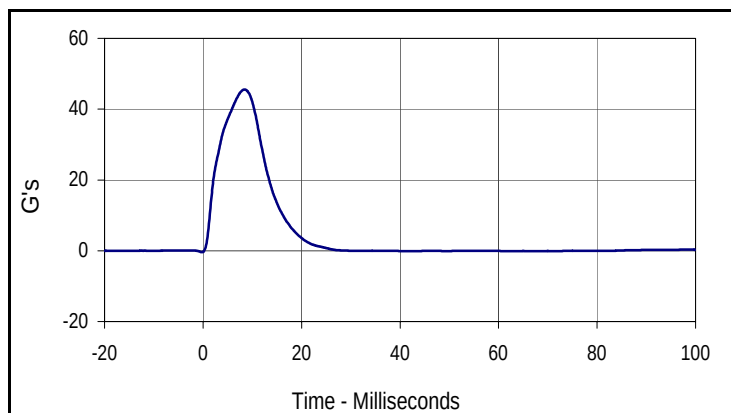
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	860	Pass
Temperature During Soak	Max	20.6 to 22.2	21.2	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	26.7	Pass
	Min		26.1	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	26.1	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.75	Pass
Peak Acetabulum Force Y	Newtons	3600 to 4300	4041.5	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	39.3	Pass
Peak Impactor Acceleration	G's	38 to 47	45.6	Pass
Overall Test Results				Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4041.5	7.9	-47.4	0.9



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
39.3	8.6	-12.4	23.6



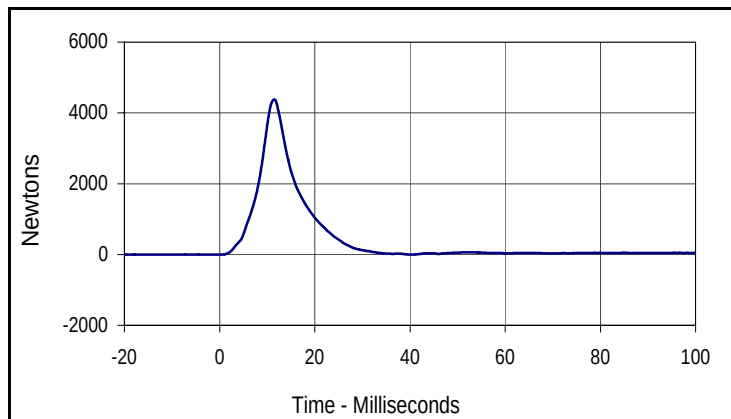
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
45.6	8.4	-0.4	-0.2

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

Test Date: 4/21/14
 Test I.D.: 299PL070



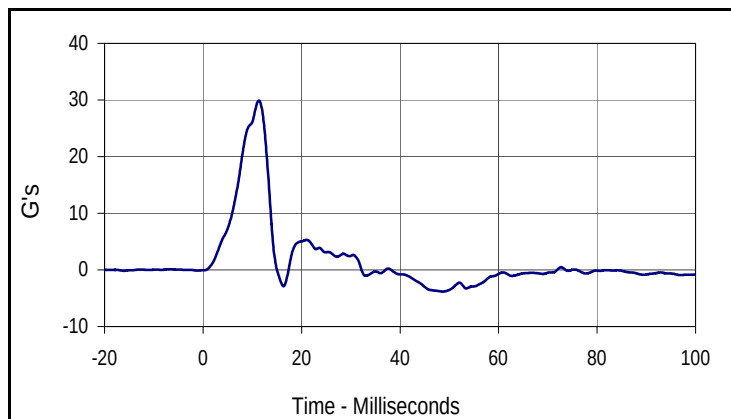
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	925	Pass
Temperature During Soak	Max	20.6 to 22.2	21.2	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	26.7	Pass
	Min		26.1	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	26.1	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.30	Pass
Peak Iliac Force	Newtons	4100 to 5100	4381.2	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	29.9	Pass
Peak Impactor Acceleration	G's	36 to 45	39.7	Pass
Overall Test Results			Pass	



Curve Description

Pelvis Iliac Force

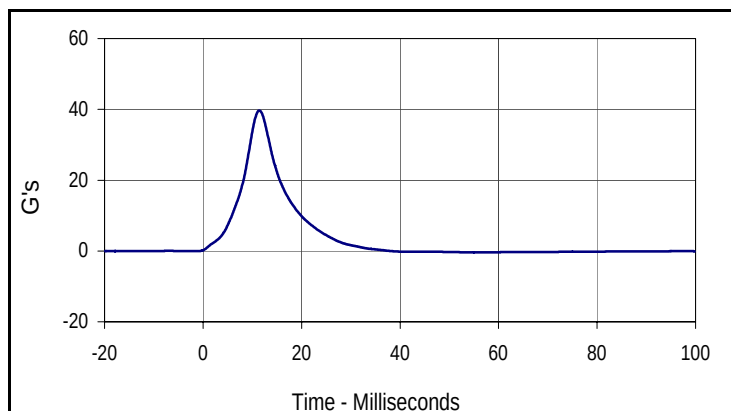
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4381.2	11.5	-5.2	40.4



Curve Description

Pelvis Y Acceleration

Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
29.9	11.3	-3.8	48.7



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
39.7	11.4	-0.4	59.4

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 299		
				Serial Number	Manufacturer	Calibration
Head Accelerometers	Primary		X	P51926	Endevco	10/14/13
			Y	P51929	Endevco	10/14/13
			Z	P51934	Endevco	10/14/13
	Redundant		X	P68604	Endevco	10/14/13
			Y	P51931	Endevco	10/14/13
			Z	P51939	Endevco	10/14/13
Displacement Potentiometers	Shoulder		Y	1293	FTSS	6/21/13
	Thoracic Rib	Upper	Y	1143	FTSS	5/2/13
		Middle	Y	1160	FTSS	5/2/13
		Lower	Y	1213	FTSS	5/2/13
	Abdominal Rib	Upper	Y	1218	FTSS	5/2/13
		Lower	Y	1234	FTSS	5/2/13
Lower Spine Accelerometers (T12)			X	P63999	Endevco	10/15/13
			Y	P58872	Endevco	10/15/13
			Z	P58795	Endevco	10/15/13
Acetabulum Load Cell			Y	272	Denton	4/19/13
Iliac Wing Load Cell			Y	284	Denton	4/19/13
Pelvis Plug (Struck Side)				63064	FTSS	1/19/13
Pelvis Plug (Non-Struck Side)				47770	FTSS	10/28/11

TABLE 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	Ketx12x	ICSensor	4/4/14
Vehicle Center of Gravity	Y	Ketx12y	ICSensor	4/4/14
Vehicle Center of Gravity	Z	Ketx12z	ICSensor	4/4/14
Left Floor Sill	Y	13496	Endevco	11/15/13
A-Pillar Sill	Y	A136712	Endevco	3/20/14
A-Pillar Low	Y	A136734	Endevco	3/20/14
A-Pillar Mid	Y	A136696	Endevco	3/20/14
B-Pillar Sill	Y	A136668	Endevco	3/20/14
B-Pillar Low	Y	A136690	Endevco	3/20/14
B-Pillar Mid	Y	A136697	Endevco	3/20/14
Driver Seat	Y	A136702	Endevco	3/20/14
Engine Top	X	13728	Endevco	10/22/13
Engine Top	Y	13722	Endevco	10/19/13
Firewall	Y	13645	Endevco	10/22/13
Right Roof	Y	A135436	Endevco	2/22/14
Right Floor Sill	Y	A135451	Endevco	2/22/14
Rear Floorpan	X	MS22891	Endevco	2/22/14
Rear Floorpan	Y	A135448	Endevco	2/22/14

TABLE 3 – Pole Instrumentation

	Serial Number	Manufacturer	Calibration Date
Load Cell 1	131822A	Interface	10/21/13
Load Cell 2	132304A	Interface	10/21/13
Load Cell 3	19477	Interface	10/21/13
Load Cell 4	19325	Interface	10/22/13
Load Cell 5	131827A	Interface	10/22/13
Load Cell 6	132302A	Interface	10/22/13
Load Cell 7	19267	Interface	10/22/13
Load Cell 8	19321	Interface	10/22/13