

**REPORT NUMBER: SPNCAP-KAR-16-006
NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST**

**MAZDA MOTORS CORPORATION
2016 MAZDA CX-3 TOURING SUV**

NHTSA No: M20165401

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



NOVEMBER 30, 2015

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
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16. Abstract A 32.2 km/h (20 mph) 75 deg. oblique impact side PINCAP test was conducted on the subject 2016 Mazda CX-3 Touring SUV 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 November 16, 2015. The impact velocity was 32.84 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 5.0 deg. C. The target vehicle's maximum post-test static crush was 344 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>287.2</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>g</td> <td>82</td> <td>31</td> </tr> <tr> <td>Total Pelvic Force (Sum of Acetabular and Iliac Forces)</td> <td>N</td> <td>5525</td> <td>2797</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38</td> <td>21</td> </tr> <tr> <td>Maximum Abdominal Rib Deflection</td> <td>mm</td> <td>45</td> <td>17</td> </tr> </tbody> </table> 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.				Measurement Description	Driver ATD (SID-IIs)			Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	287.2	Resultant Lower Spine Acceleration	g	82	31	Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	2797	Maximum Thoracic Rib Deflection	mm	38	21	Maximum Abdominal Rib Deflection	mm	45	17
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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 2016 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number DTNH22-14-D-00355. The purpose of this test is to generate comparative side impact performance in a 2016 Mazda CX-3 Touring SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure date October 2015.

SECTION 2

SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2016 Mazda CX-3 Touring SUV. The subject vehicle was towed into the rigid pole at an angle of 74.6° and a velocity of 32.84 km/h. The test was conducted by KARCO Engineering, LLC. in Adelanto, California on November 16, 2015. Pre- and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report. The Appendix A photographs note the test vehicle as a 5-door hatchback however the report will classify the test vehicle as a SUV.

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 October 2015. 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	287.2
Lower Spine (T12) Resultant Acceleration	g	82	31
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2797
Maximum Thoracic Rib Deflection	mm	38*	21
Maximum Abdominal Rib Deflection	mm	45*	17

*Proposed IARV

Supplemental restraint information is given below:

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

GENERAL COMMENTS

Both the front and rear doors on the struck side of the vehicle were jammed shut while remaining closed and latched. The hood was also jammed shut with the front driver window and windshield broken. 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: 2016 Mazda CX-3 Touring SUV NHTSA No. M20165401
Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15

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	°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: 2016 Mazda CX-3 Touring SUV NHTSA No. M20165401
 Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20165401
Model Year	2016
Make	Mazda
Model	CX-3 Touring
Body Style	SUV
VIN	JM1DKBC74G0109538
Body Color	Dynamic Blue Mica
Odometer Reading (km / mi)	237 / 147
Engine Displacement (L)	2.0
Type / No. of Cylinders	Inline 4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	6
Overdrive	Yes
Final Drive	Front
Roof Rack	No
Sunroof / T-Top	Yes
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	Yes
Power Window Auto-Reverse	Yes
Other Optional Feature	Yes
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head/Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso/Pelvis Airbag	No
Rear Pass. Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensioner	No
Driver Load Limiter	Yes
Rear Pass. Load Limiter	No
Other Safety Restraint	No

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

Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Mazda Motors Corporation
Date of Manufacture	Jul-15
Vehicle Type	SUV

GVWR (kg)	1742
GAWR Front (kg)	933
GAWR Rear (kg)	812

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				385.0	A
DSC x 68.04 (kg)				340.2	B
Cargo Weight (RCLW) (kg)				44.8	A-B

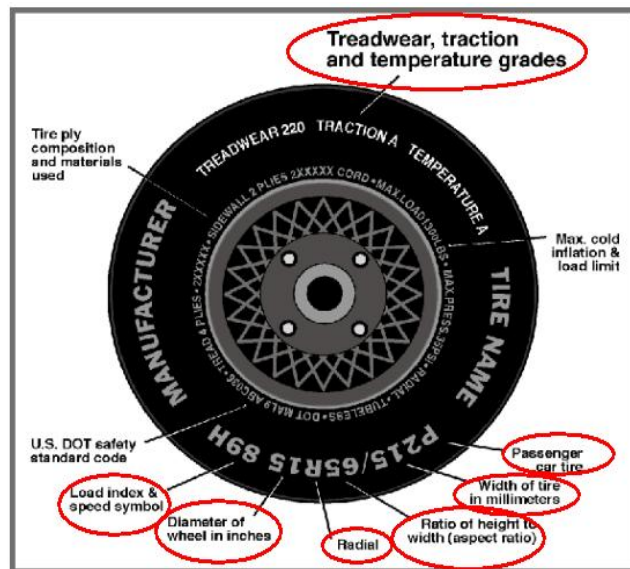
VEHICLE SEAT TYPE

Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
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 Mazda CX-3 Touring SUV NHTSA No. M20165401
 Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15



Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	275	275
Cold Pressure (kPa)	250	230
Recommended Tire Size	P215/60R16	P215/60R16
Tire Size on Vehicle	P215/60R16	P215/60R16
Tire Manufacturer	Yokohama	Yokohama
Tire Model	Avid S34	Avid S34
Treadware	320	320
Traction Grade	B	B
Temperature Grade	A	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	94H	94H
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Left	FDF1 PKD 2515	FDF1 PKD 2515
DOT Safety Code Right	FDF1 PKD 2515	FDF1 PKD 2515

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2016 Mazda CX-3 Touring SUV NHTSA No. M20165401
 Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	250	250	230	230
Tire Placard	kPa	250	250	230	230
Owner's Manual	kPa	250	250	230	230
As Tested	kPa	250	250	230	230

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	389.0	246.5		424.0	272.0		405.0	292.5	
Right	kg	388.0	246.5		399.5	259.5		390.0	281.0	
Ratio	%	61.2%	38.8%	100.0%	60.8%	39.2%	100.0%	58.1%	41.9%	100.0%
Total	kg	777.0	493.0	1270.0	823.5	531.5	1355.0	795.0	573.5	1368.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1270.0	A
Actual Weight of 1 P572V ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	44.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1363.8	A+B+C

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

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

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	°	-0.1	-0.1	-0.1	Yes
Front Passenger Sill Angle (front-to-rear)*	°	-0.3	-0.1	-0.1	Yes
Front Bumper-Line Angle (left-to-right)**	°	-1.3	-1.2	-1.2	Yes
Rear Bumper-Line Angle (left-to-right)**	°	-0.1	-0.1	-0.4	Yes
Vehicle CG (Aft of Front Axle)	mm	1081	1148	1168	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	2	8	18	

*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 Mazda CX-3 Touring SUV NHTSA No. M20165401
Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Trunk Trim and Tire Tools	10.0
Spare Tire	12.0
Non-Struck Side Door Trim and Windows	13.5
Ballast / Equipment Added	54.0

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: 2016 Mazda CX-3 Touring SUV NHTSA No. M20165401
 Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15

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	3.3	0.0	1.7
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	1.7	569	Max			
			Mid	560	569	578
			Min			
Front Passenger Seat	Fixed	575	Max			
			Mid	565	575	584
			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 Mazda CX-3 Touring SUV NHTSA No. M20165401
 Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15

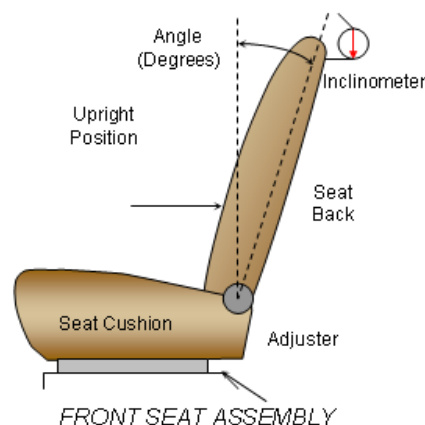
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	260	26	0	0
Front Passenger Seat	262	26	0	0
Front Center Seat				
Struck Side Rear Seat	Fixed		Fixed	
Non-Struck Side Rear Seat	Fixed		Fixed	
Rear Center Seat	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	65.1	35	-5.4	1
Front Passenger Seat	65.5	35	-4.6	1
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	Fixed		Fixed	
Non-Struck Side Rear Seat	Fixed		Fixed	
Rear Center Seat	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 Mazda CX-3 Touring SUV NHTSA No. M20165401
Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15

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	3	Full Down

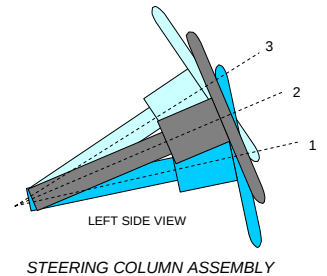
DATA SHEET NO. 2 ... (CONTINUED)

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

Test Vehicle: 2016 Mazda CX-3 Touring SUV NHTSA No. M20165401
 Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15

STEERING COLUMN ADJUSTMENT

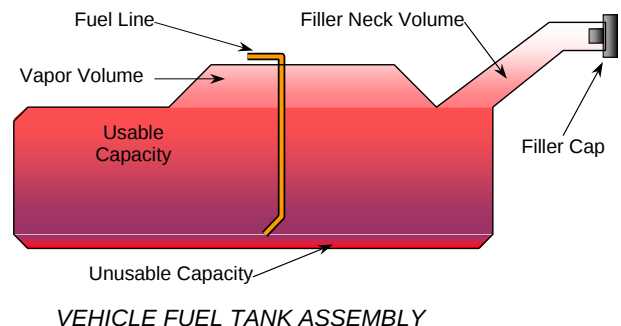
Steering wheel and column adjustments are made so that the steering wheel hub is at the center of the geometric locus it describes when it moves through its full range of motion.



	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	21.2	97
Geometric Center - Position 2	23.7	122
Uppermost - Position 3	26.1	147
Telescoping Steering Wheel Travel		50
Test Position	23.7	122

FUEL PUMP

The vehicle is equipped with an electric fuel pump.



FUEL TANK CAPACITY

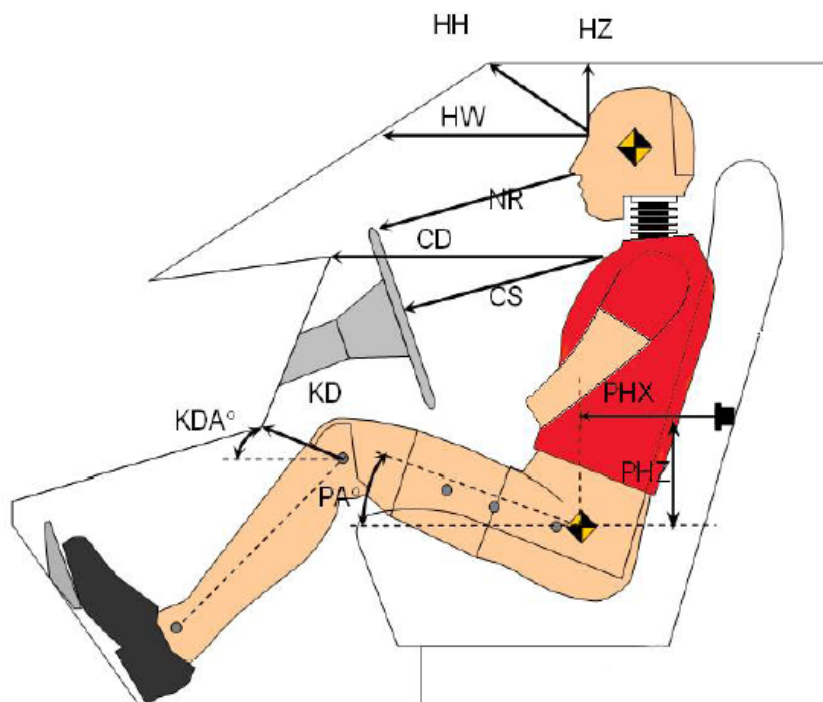
Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	48.07
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)	
Usable Capacity of "Optional Tank" (see Owner's Manual)	
93% of Usable Capacity	44.71
Actual amount of Solvent Used in Test	44.70
1/3 of Usable Capacity	16.02

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: 2016 Mazda CX-3 Touring SUV NHTSA No. M20165401
 Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15

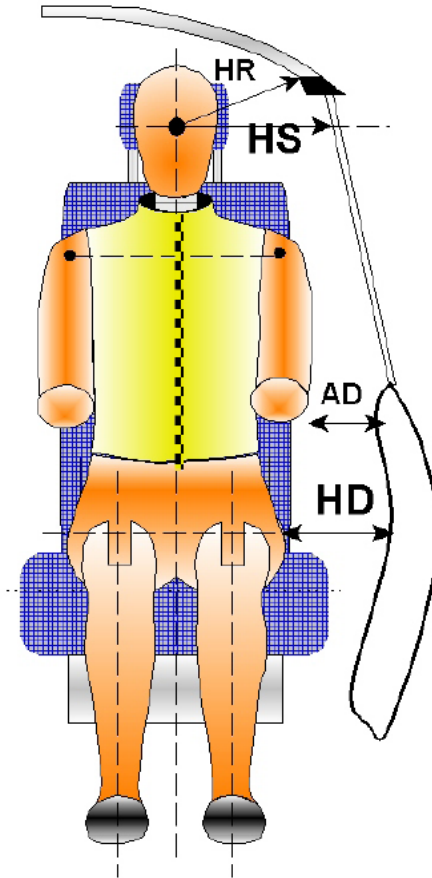


Driver Code	Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	299	
HW	Head to Windshield	583	
HZ	Head to Roof	218	
NR	Nose to Rim	220	
CD	Chest to Dash	397	
CS	Chest to Steering Wheel	156	
KD(L)/KDA(L)°	Left Knee to Dash	113	44.6
KD(R)/KDA(R)°	Right Knee to Dash	113	44.8
PAX°	Pelvic Tilt Angle (x-axis)		19.7
PAY°	Pelvic Tilt Angle (y-axis)		0.3
PHX	Hip Point to Striker (x-axis)	296	
PHZ	Hip Point to Striker (z-axis)	192	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Mazda CX-3 Touring SUV NHTSA No. M20165401
Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15

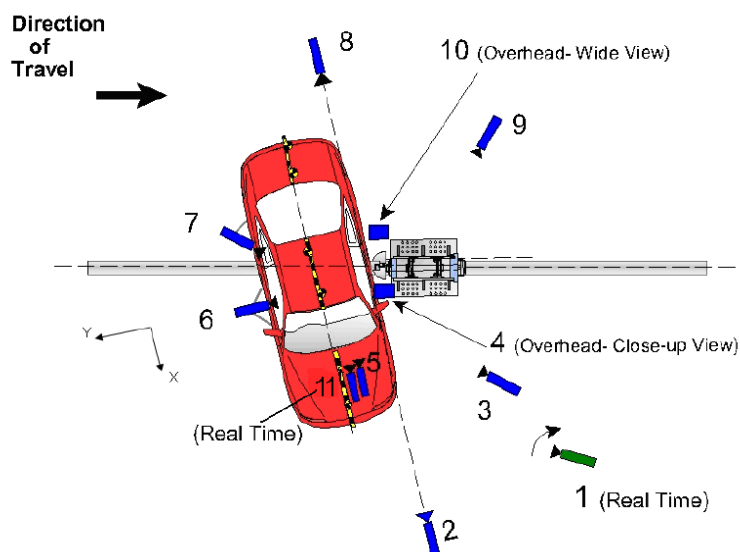


Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	251
HS	Head to Side Window	mm	295
AD	Arm to Door	mm	162
HD	Hip Point to Door	mm	160

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2016 Mazda CX-3 Touring SUV NHTSA No. M20165401
 Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15



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	1.56	0.53	-1.42	35	1000
6	On-Board - Dummy Side View	0.04	1.60	-1.24	14	1000
7	On-Board - Dummy Rear Oblique View	-0.89	1.57	-1.31	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	1.53	0.56	-1.38		30

*All measurements accurate to ± 6 mm

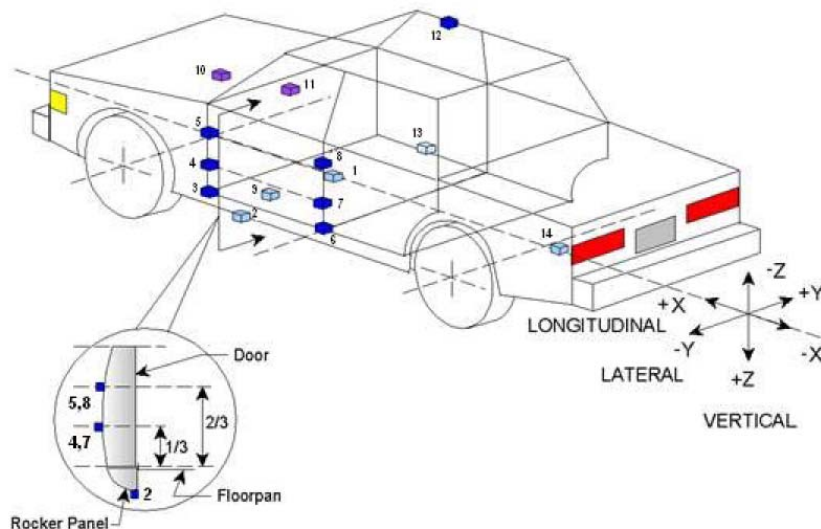
INSTRUMENTATION

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 Mazda CX-3 Touring SUV NHTSA No. M20165401
 Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15



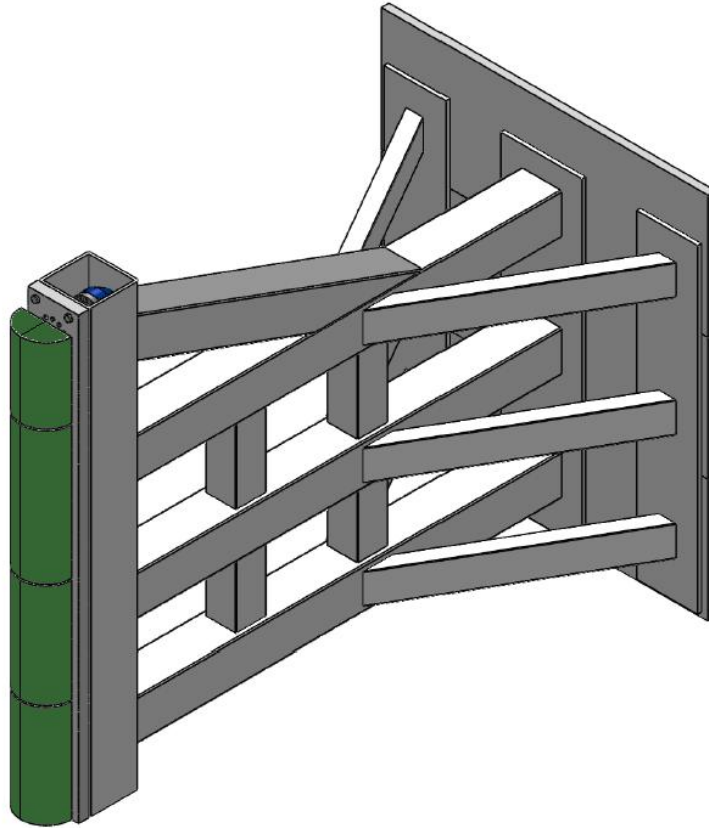
Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2630	0	-450
2	Left Floor Sill	1820	-690	-380
3	A-Pillar Sill	1390	-780	-430
4	A-Pillar Low	1380	-780	-710
5	A-Pillar Mid	1380	-780	-870
6	B-Pillar Sill	2510	-700	-430
7	B-Pillar Low	2500	-750	-650
8	B-Pillar Mid	2495	-710	-970
9	Driver Seat Track	2440	-155	-385
10	Engine Top	850	100	-840
11	Firewall	1070	30	-800
12	Right Roof	2300	500	-1475
13	Right Floor Sill	2670	685	-375
14	Rear Floorpan	2630	-40	-650

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 Mazda CX-3 Touring SUV NHTSA No. M20165401
Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15



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 Mazda CX-3 Touring SUV NHTSA No. M20165401
 Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15

TEST DUMMY INFORMATION AND CONTACT POINTS

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

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	No
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	Yes
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 Mazda CX-3 Touring SUV NHTSA No. M20165401
 Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15

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	No	
Seat Belt Load Limiter	Yes	Yes	No	

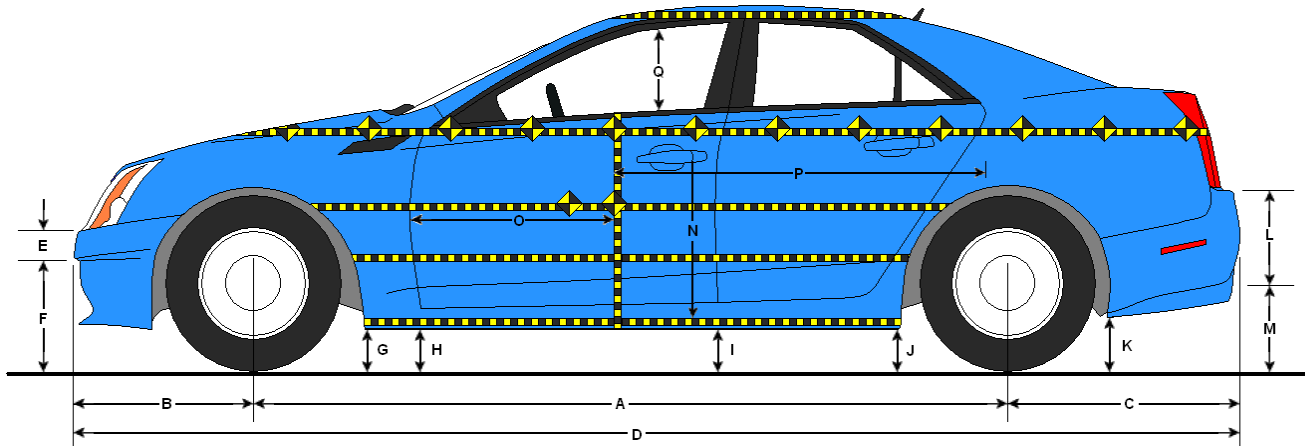
IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		1120
Actual Impact Point (Aft of Front Axle)	mm		1094
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	26
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	74.6
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.84
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.81

DATA SHEET NO. 9

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2016 Mazda CX-3 Touring SUV NHTSA No. M20165401
 Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15



LEFT SIDE VIEW

All measurements in mm with tolerance of ± 3 mm

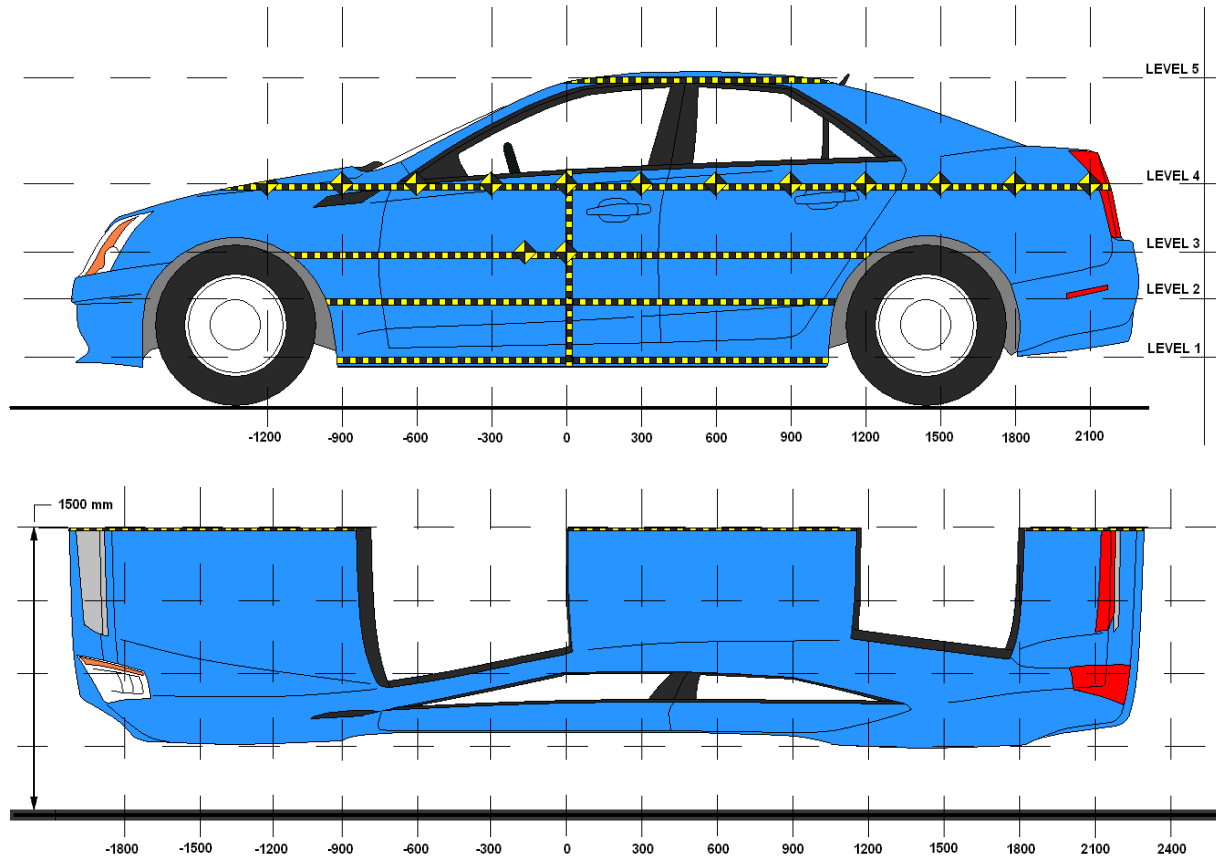
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2566	2540	-26
B	Front Axle to FSOV	916	907	-9
C	Rear Axle to RSOV	796	806	10
D	Total Length at Centerline	4268	4254	-14
E	Front Bumper Thickness	349	351	2
F	Front Bumper Bottom to Ground	302	328	26
G	Sill Height at Front Wheel Well	218	258	40
H	Sill Height at Front Door Leading Edge	221	271	50
I	Sill Height at B-Pillar	232	290	58
J1	Sill Height at Rear Wheel Well	235	327	92
J2	Pinch Weld Height at Rear Wheel Well	184	259	75
K	Sill Height Aft of Rear Wheel Well	279	359	80
L	Rear Bumper Thickness	134	131	-3
M	Rear Bumper Bottom to Ground	356	442	86
N	Sill Height to Bottom of Front Window Sill	754	750	-4
O	Front Door Leading Edge to Impact CL	605	557	-48
P	Rear Door Trailing Edge to Impact CL	1368	1289	-79
Q	Front Window Opening	361	373	12
R	Right Side Length	3176	3184	8
S	Left Side Length	3177	3109	-68
T	Vehicle Width at B-Pillar	1705	1624	-81

DATA SHEET NO. 10

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 Mazda CX-3 Touring SUV NHTSA No. M20165401
 Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15



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	269	308	0
2	Occupant H-Point	553	334	0
3	Mid-Door	662	344	0
4	Window Sill	970	282	0
5	Window Top	1421	155	0

DATA SHEET NO. 10 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 Mazda CX-3 Touring SUV NHTSA No. M20165401
 Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15

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			622	769				657	793				35	24	
-750		629	640	738			669	679	783			40	39	45	
-600	667	644	645	720		718	704	702	761		51	60	57	41	
-450	672	644	643	708		796	774	767	810		124	130	124	102	
-300	674	642	640	640		849	827	827	806		175	185	187	166	
-150	674	641	637	712		918	898	908	925		244	257	271	213	
0	674	640	636	710	927	982	974	980	992	1082	308	334	344	282	155
150	674	641	636	709	926	953	959	971	988	1080	279	318	335	279	154
300	674	643	637	704	931	867	858	857	882	1052	193	215	220	178	121
450	671	646	639	704	936	791	768	760	812	1031	120	122	121	108	95
600	667	649	642	704	939	761	749	742	803	1012	94	100	100	99	73
750	662	651	646	705	943	731	730	725	784	1001	69	79	79	79	58
900	655	648	647	705	946	698	703	703	764	994	43	55	56	59	48
1050		630	642	704	948		661	677	744	988		31	35	40	40
1200				713	950				733	985				20	35
1350				704	955				705	986				1	31
1500				710	963				740	990				30	27
1650				724					751					27	
1800				757					779					22	
1950															
2100															
2250															
2400															
2550															
2700															
2850															

DATA SHEET NO. 10 ... (CONTINUED)

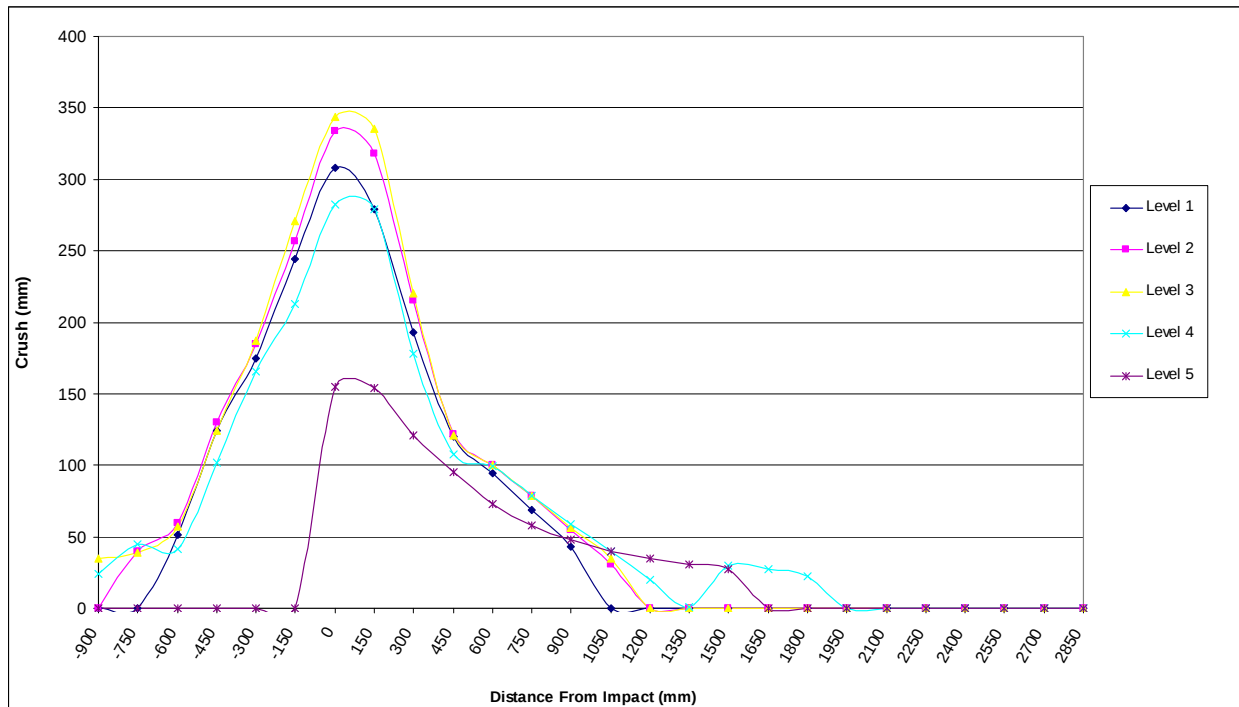
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 Mazda CX-3 Touring SUV

NHTSA No. M20165401

Test Program: NCAP Side Pole Impact Test

Test Date: 11/16/15

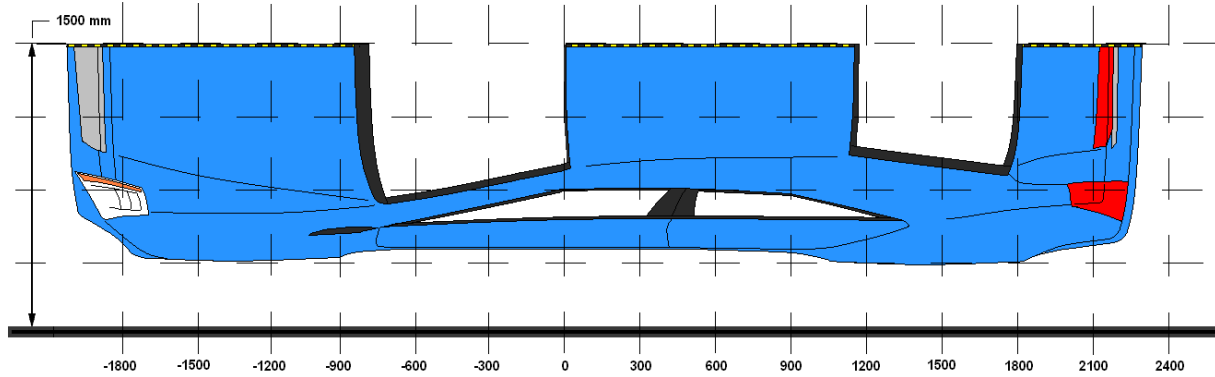


DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2016 Mazda CX-3 Touring SUV NHTSA No. M20165401

Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15



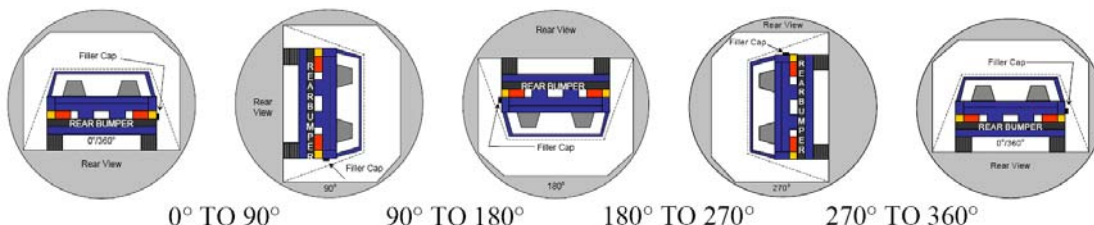
DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	1800	4	757	779	22
2	1350	5	955	986	31
3	750	3	646	725	79
4	150	3	636	971	335
5	-450	2	644	774	130
6	-900	3	622	657	35

DATA SHEET NO. 12

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2016 Mazda CX-3 Touring SUV NHTSA No. M20165401
 Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15
 Temperature at Time of Impact: 5.0° C Test Time: 3:40 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.



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	87	303	390
90° To 180°	86	303	389
180° To 270°	85	350	435
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

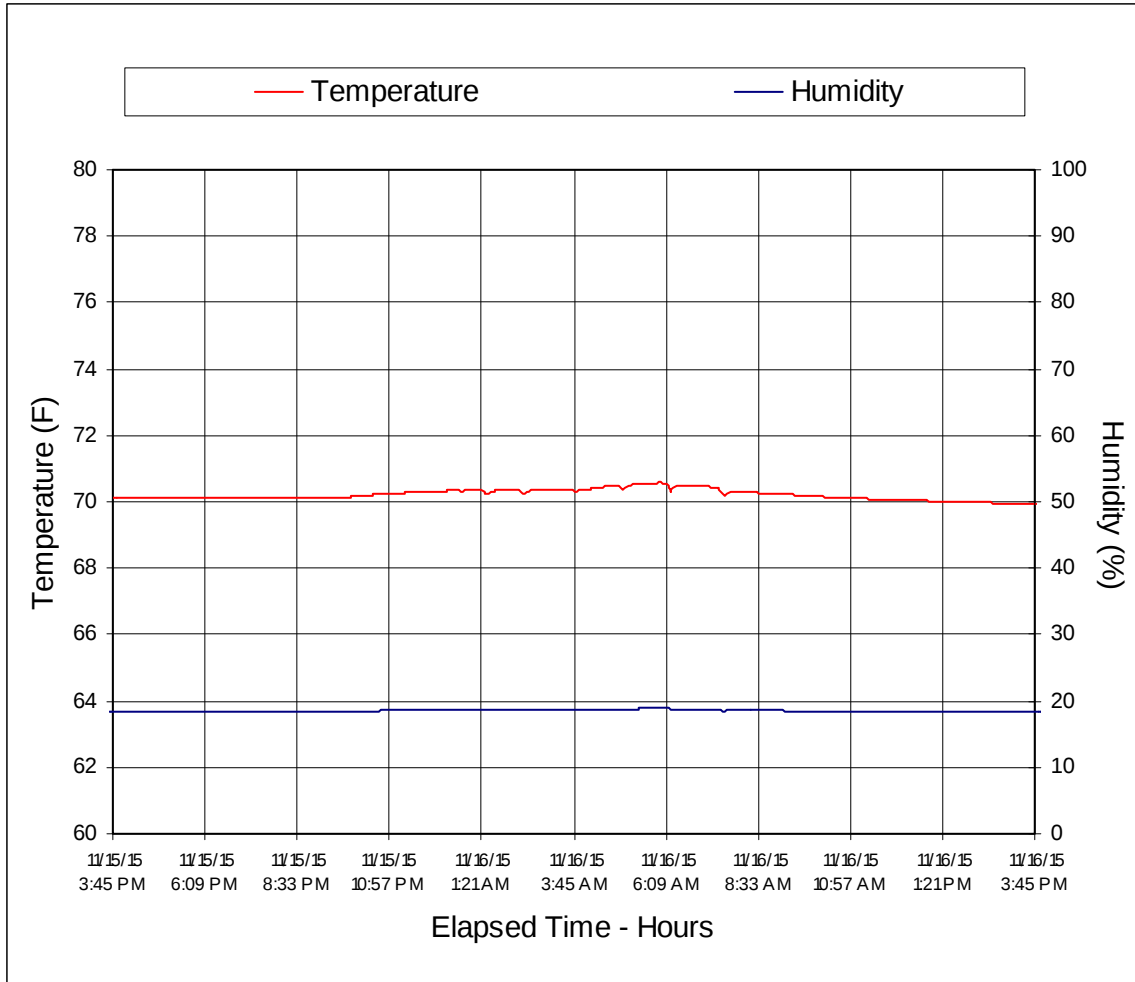
Test Phase	Spillage Location
0° To 90°	No Spillage Occurred
90° To 180°	No Spillage Occurred
180° To 270°	No Spillage Occurred
270° To 360°	No Spillage Occurred

DATA SHEET NO. 13

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2016 Mazda CX-3 Touring SUV NHTSA No. M20165401

Test Program: NCAP Side Pole Impact Test Test Date: 11/16/15



APPENDIX A
PHOTOGRAPHS

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



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



FIGURE 3. Pre-Test Frontal View of Test Vehicle



FIGURE 4. Post-Test Frontal View of Test Vehicle



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



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



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



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



FIGURE 9. Pre-Test Left Rear $\frac{3}{4}$ 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

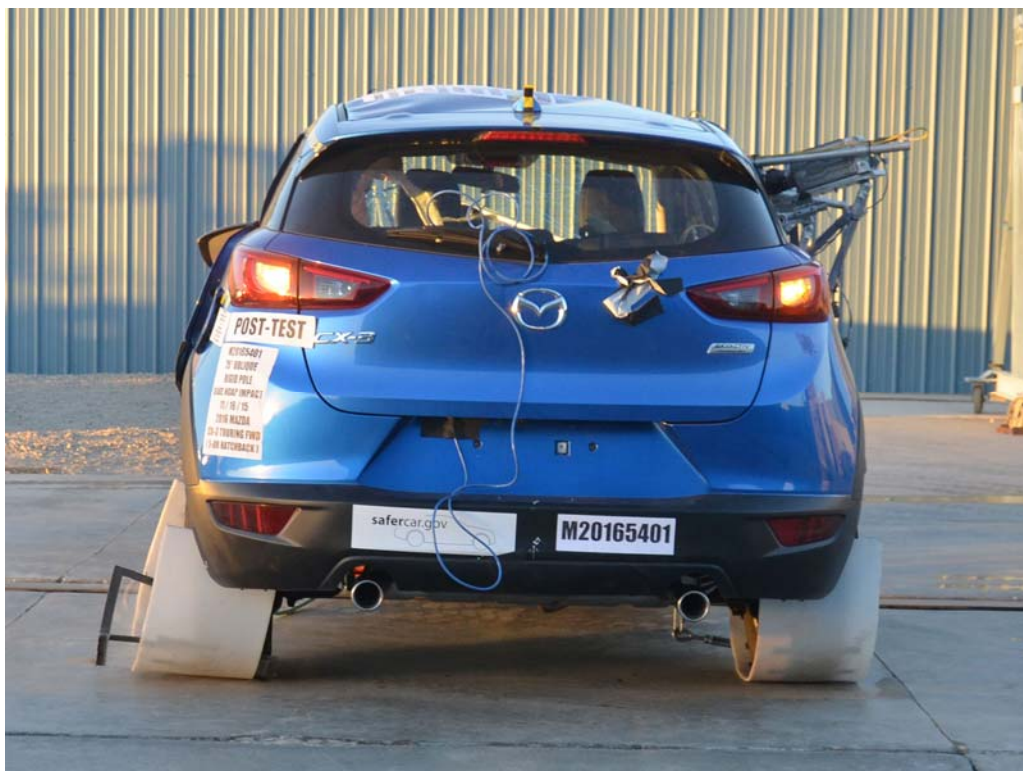


FIGURE 12. Post-Test Rear View of Test Vehicle



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



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

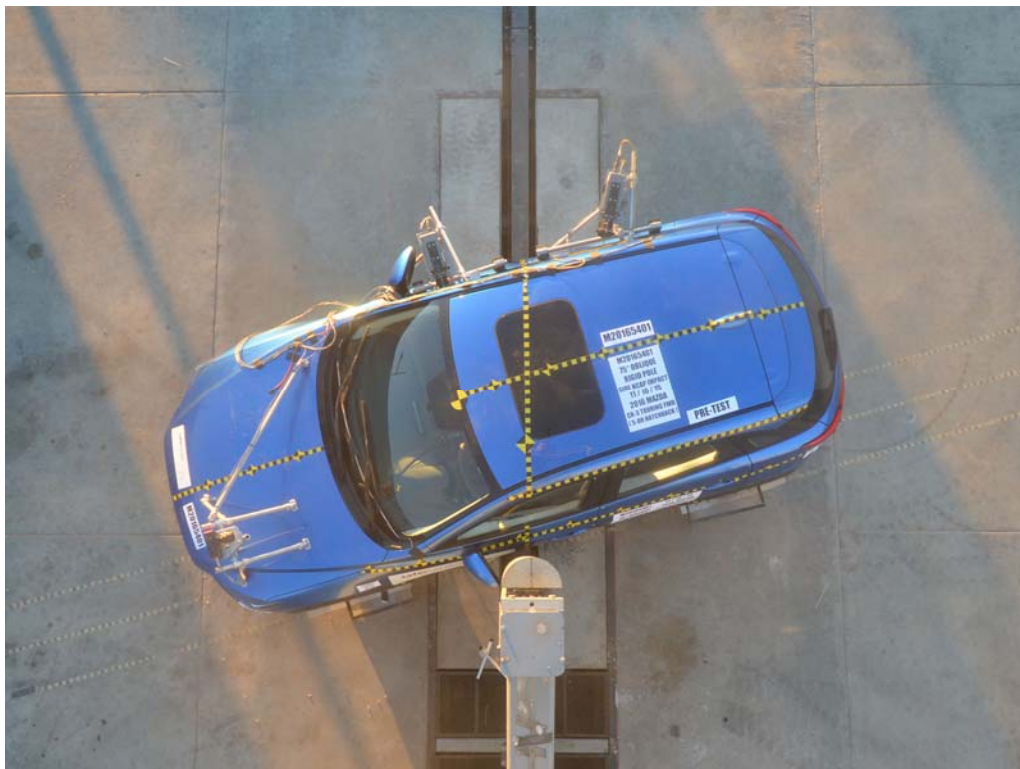


FIGURE 15. Pre-Test Overhead View of Test Area

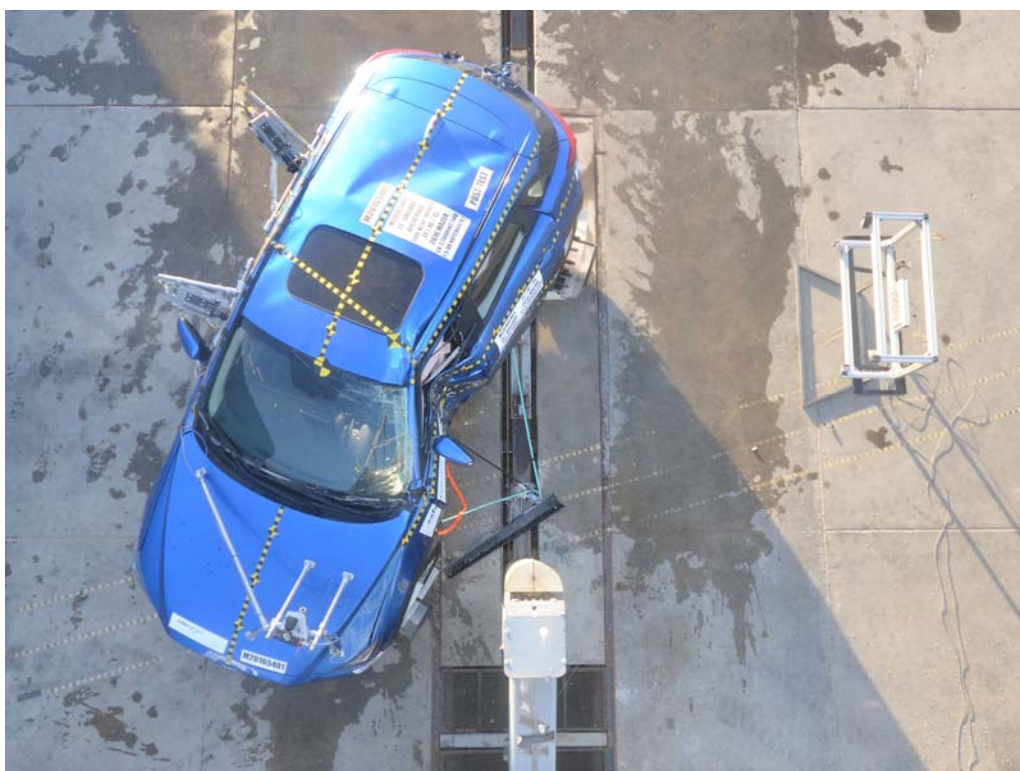


FIGURE 16. Post-Test Overhead View of Test Area



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

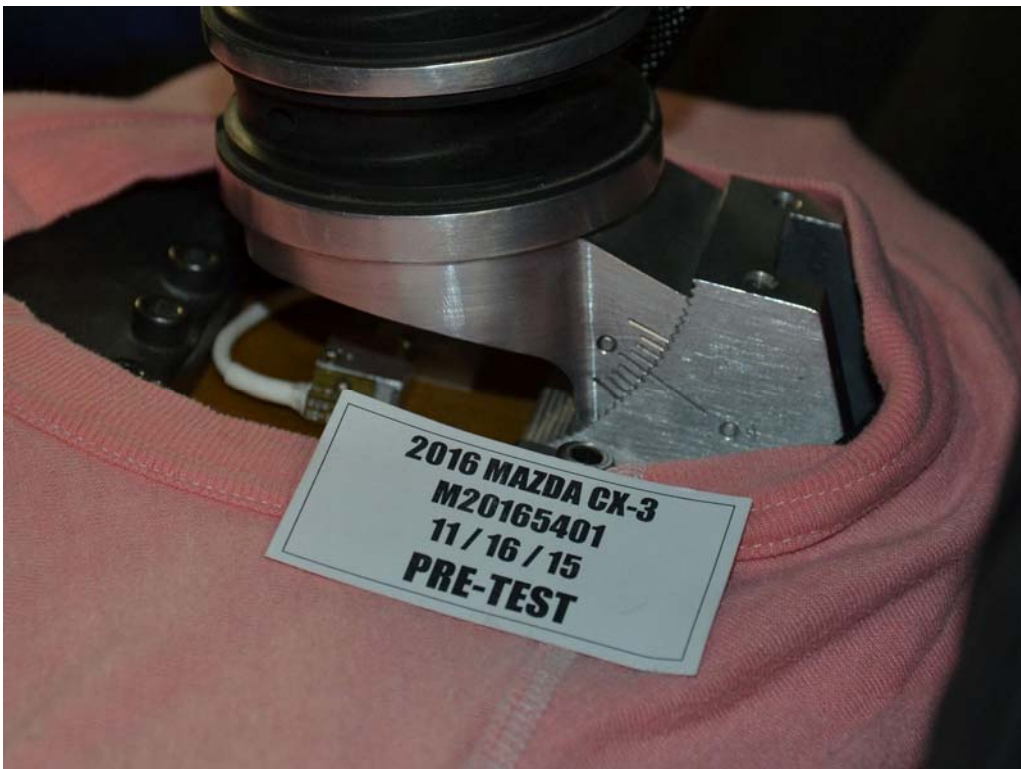


FIGURE 30. Pre-Test Left Side View of Dummy's Neck
Showing Position of Adjustable Neck Bracket



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

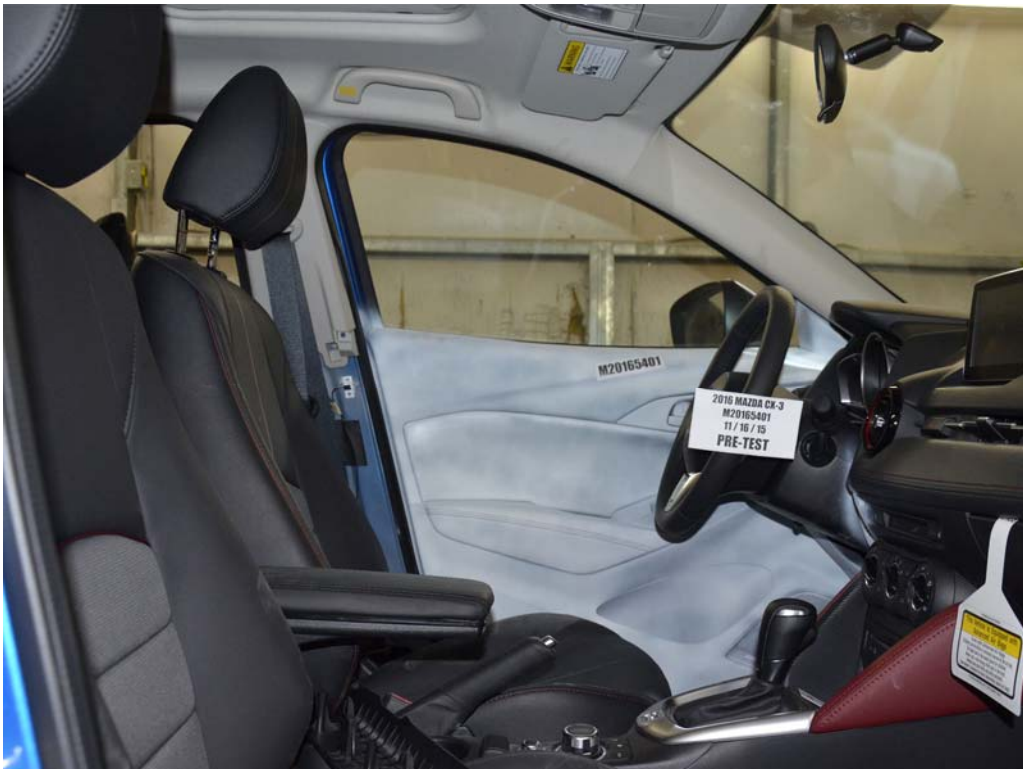


FIGURE 44. Pre-Test Inner Door Panel View



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

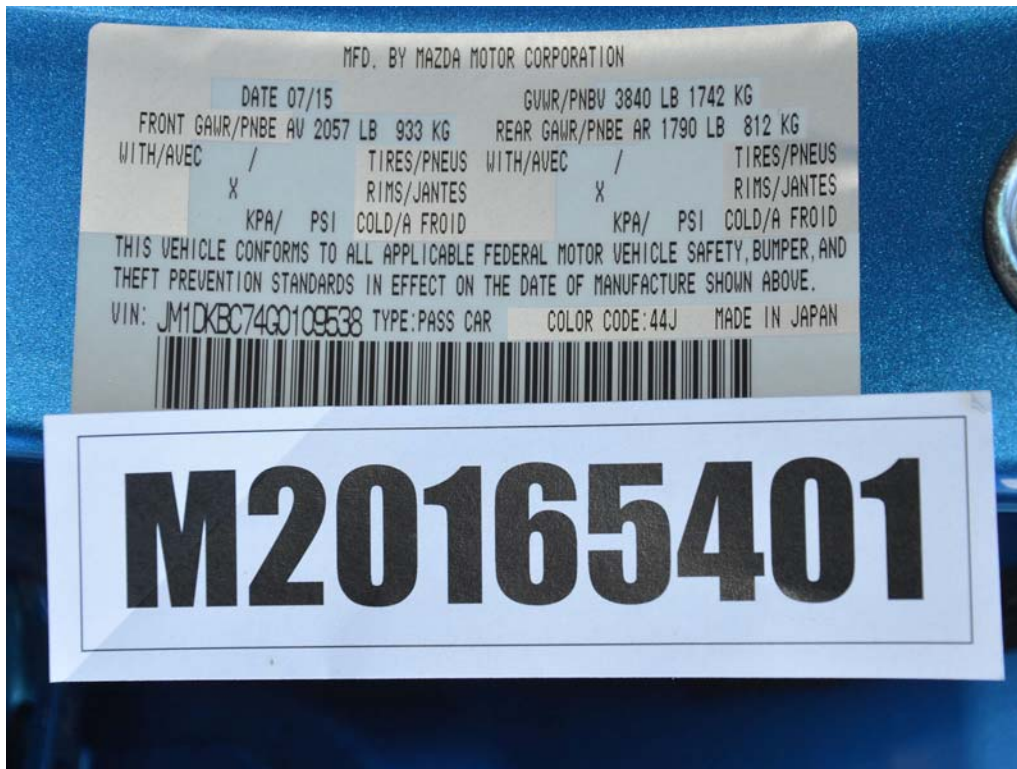


FIGURE 55. Close-Up View of Vehicle's Certification Label

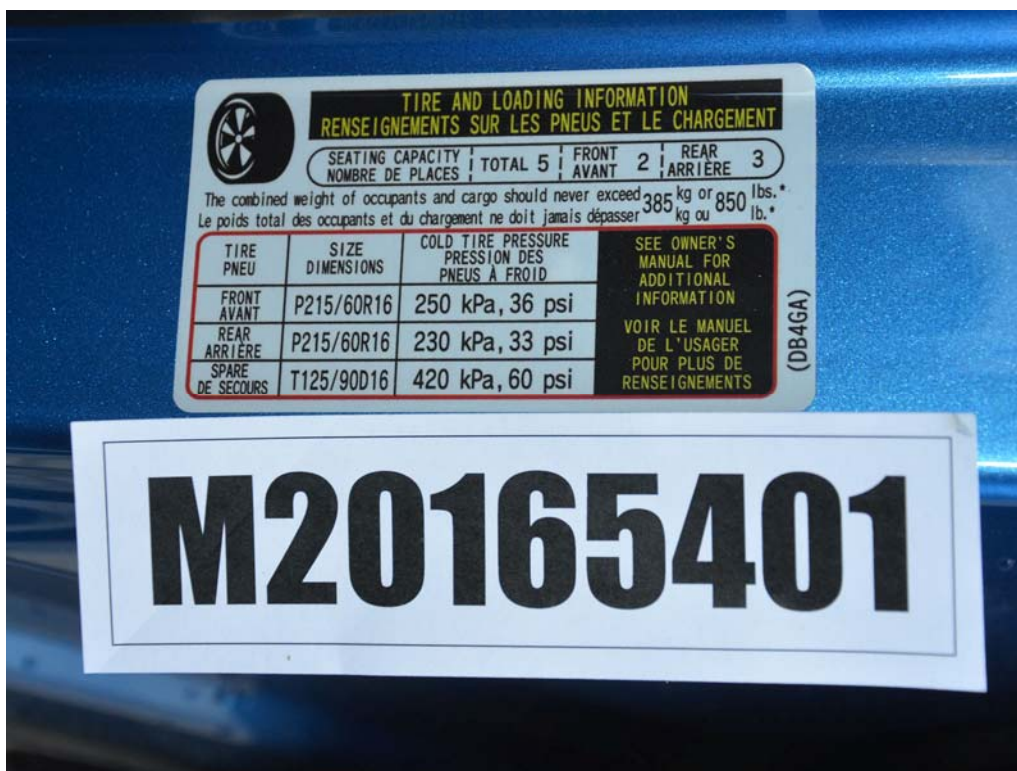


FIGURE 56. Close-Up View of Vehicle's Tire Information Placard or Label



FIGURE 57. Pre-Test Pole Barrier Front View



FIGURE 58. Post-Test Pole Barrier Front View



FIGURE 59. Pre-Test Pole Barrier Side View



FIGURE 60. Post-Test Pole Barrier Side View



FIGURE 61. Pre-Test Ballast View



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



FIGURE 63. FMVSS No. 301 Static Rollover 0 Degrees

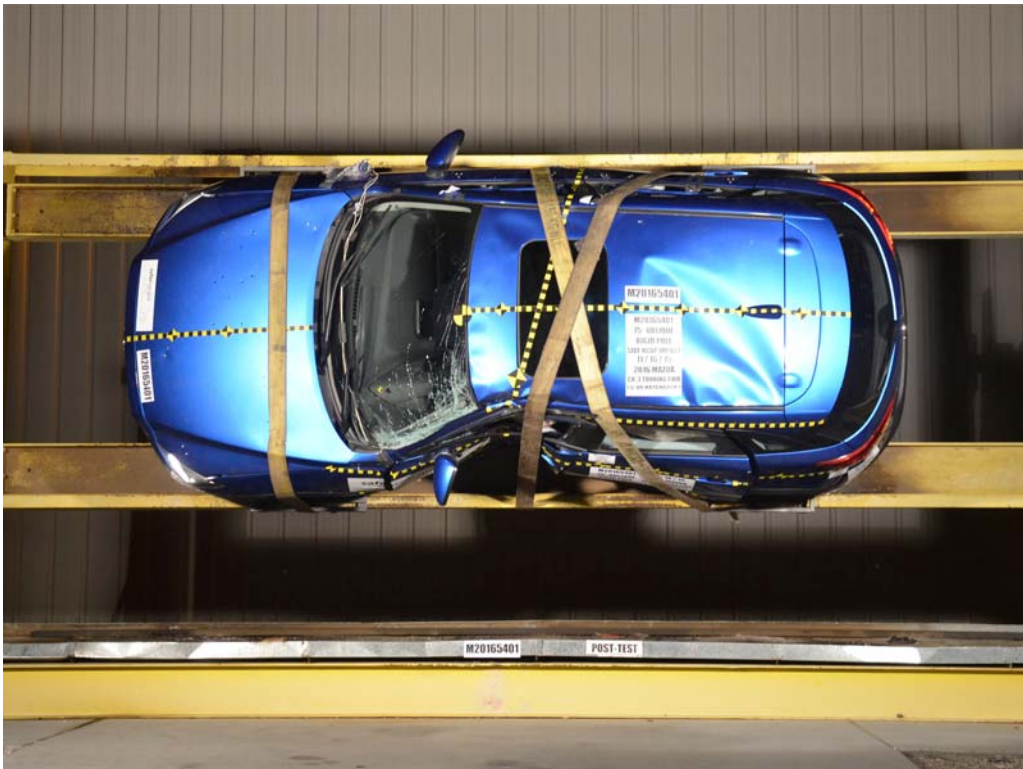


FIGURE 64. FMVSS No. 301 Static Rollover 90 Degrees



FIGURE 65. FMVSS No. 301 Static Rollover 180 Degrees



FIGURE 66. FMVSS No. 301 Static Rollover 270 Degrees



FIGURE 67. FMVSS No. 301 Static Rollover 360 Degrees

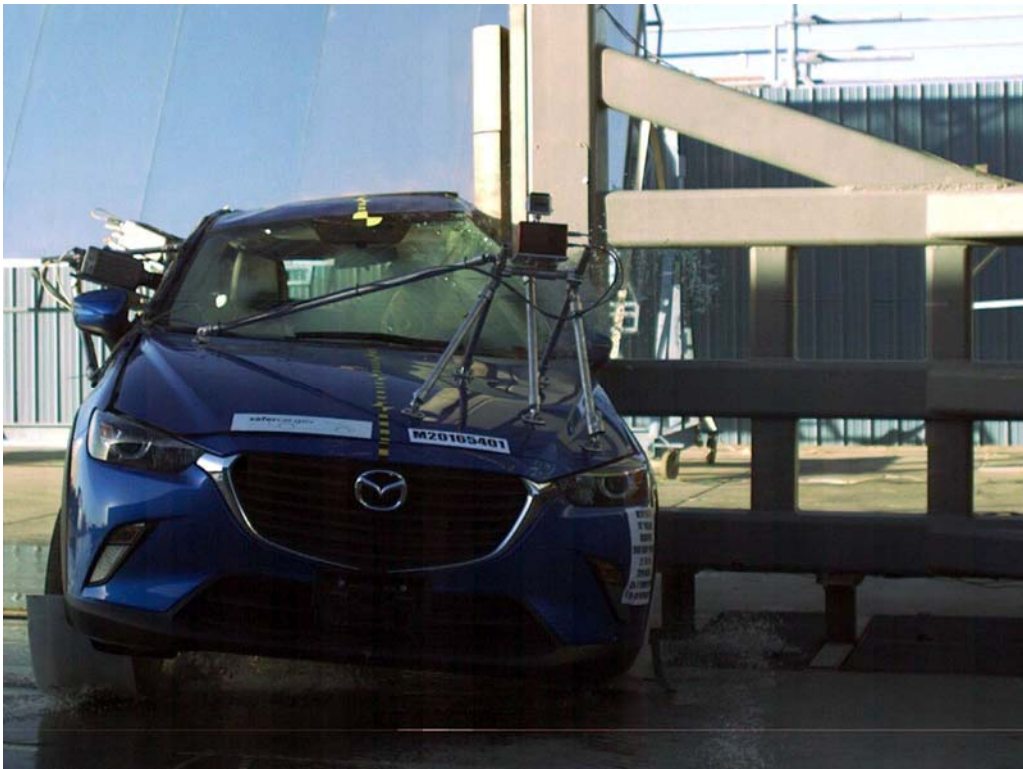


FIGURE 68. Impact Event

[illegible]

FIGURE 69. Monroney Label

Essential Safety Equipment Seats

Head Restraints

Your vehicle is equipped with head restraints on all outboard seats and the rear center seat. The head restraints are intended to help protect you and the passengers from neck injury.

WARNING

Always drive with the head restraints installed when seats are being used and make sure they are properly adjusted. In addition, always raise the head restraints mentioned below when they are being used:

Driving with the head restraints adjusted too low or removed is dangerous. With no support behind your head, your neck could be seriously injured in a collision.

(Head restraints which must be raised for use)

- All rear seat head restraints

Height Adjustment

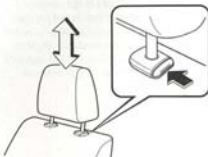
Adjust the head restraint so that the center is even with the top of the passenger's ears.



To raise a head restraint, pull it up to the desired position.

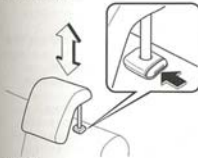
To lower the head restraint, press the stop-catch release, then push the head restraint down.

Front outboard seat

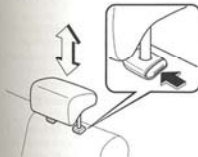


Rear outboard seat

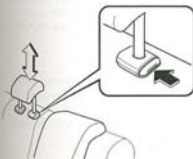
Except Mexico



Mexico



Rear center seat



Removal/Installation

To remove the head restraint, pull it up while pressing the stop-catch.

To install the head restraint, insert the legs into the holes while pressing the stop-catch.

WARNING

Always drive with the head restraints installed when seats are being used and make sure they are properly installed:

Driving with the head restraints not installed is dangerous. With no support behind your head, your neck could be seriously injured in a collision.

After installing a head restraint, try lifting it to make sure that it does not pull out:

Driving with an unsecured head restraint is dangerous as the effectiveness of the head restraint will be compromised which could cause it to unexpectedly detach from the seat.

CAUTION

- When installing a head restraint, make sure that it is installed correctly with the front of the head restraint facing forward. If the head restraint is installed incorrectly, it could detach from the seat during a collision and result in injury.
- The head restraints on each of the front and rear seats are specialized to each seat. Do not switch around the head restraint positions. If a head restraint is not installed to its correct seat position, the effectiveness of the head restraint during a collision will be compromised which could cause injury.

2-8

2-9

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

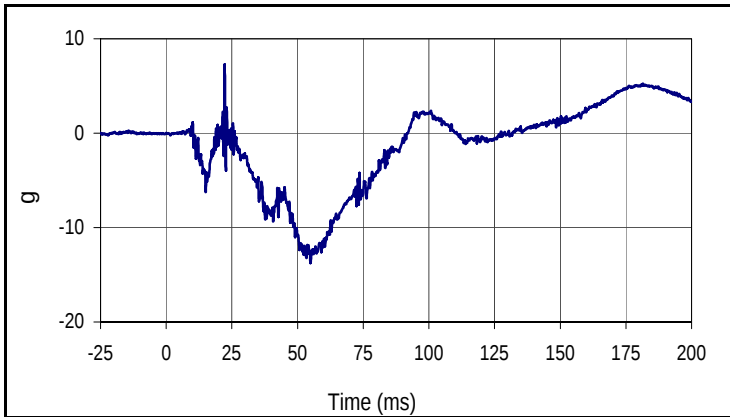
Left B-Pillar Sill Acceleration
Left Lower B-Pillar Acceleration (Y)
Left Mid B-Pillar Acceleration (Y)
Driver Seat Track at Dummy Hip Point Acceleration (Y)
Engine Top Acceleration (X)
Engine Top Acceleration (Y)
Firewall Center Acceleration (Y)
Right Roof at Vertical Impact Reference Line Acceleration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

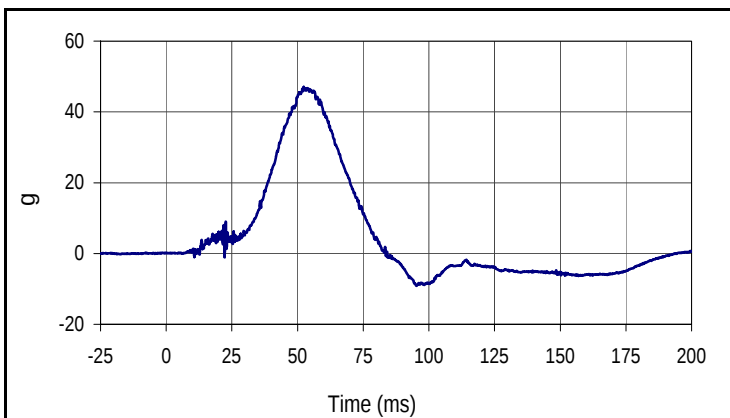
Load Cell Pole Barrier #1 Force (Y)
Load Cell Pole Barrier #2 Force (Y)
Load Cell Pole Barrier #3 Force (Y)
Load Cell Pole Barrier #4 Force (Y)
Load Cell Pole Barrier #5 Force (Y)
Load Cell Pole Barrier #6 Force (Y)
Load Cell Pole Barrier #7 Force (Y)
Load Cell Pole Barrier #8 Force (Y)

Test Vehicle: 2016 Mazda CX-3 Touring SUV
 Test Program: NCAP Side Pole Impact Test

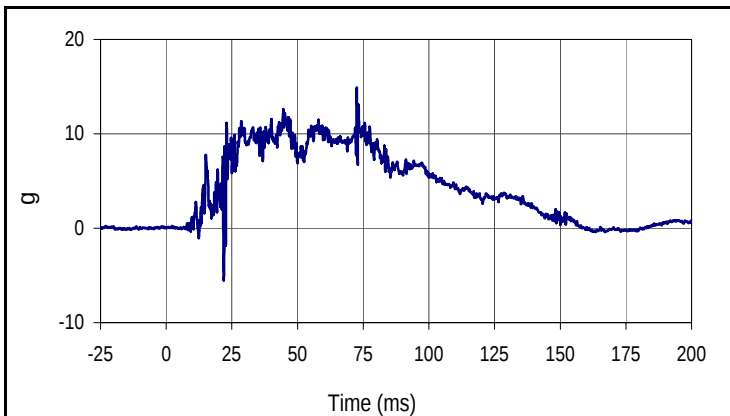
Test Date: 11/16/15
 NHTSA No.: M20165401



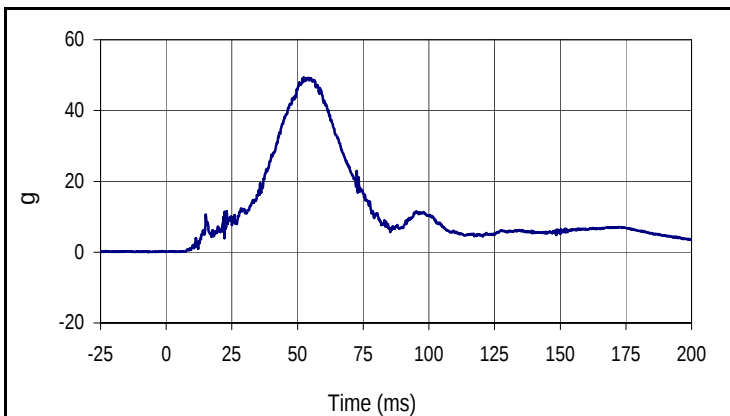
Curve Description			
Driver Head Acceleration X Primary			
Plot No.		SAE Class	Units
001		1000	g
Max	Time	Min	Time
7.2	22.3	-13.8	54.9



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.		SAE Class	Units
002		1000	g
Max	Time	Min	Time
47.1	52.4	-9.2	95.2



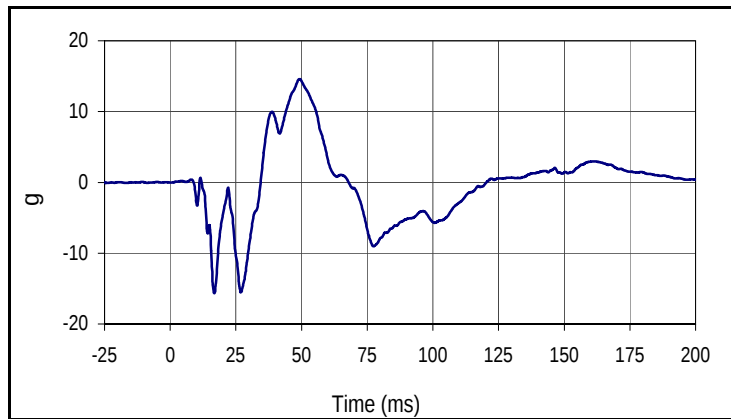
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.		SAE Class	Units
003		1000	g
Max	Time	Min	Time
14.9	72.6	-5.5	21.9



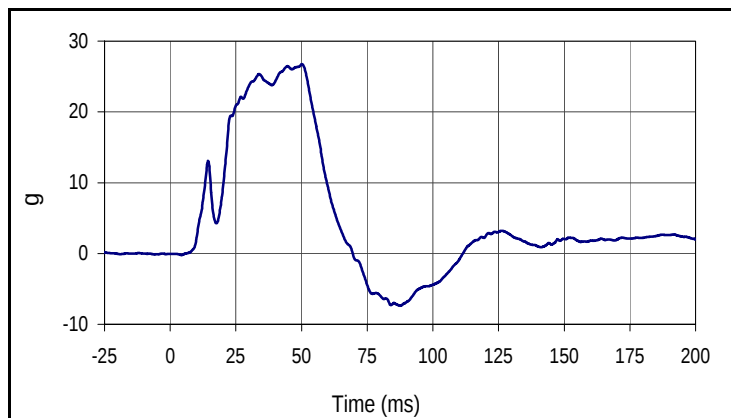
Curve Description			
Driver Head Acceleration Primary Res.			
Plot No.		SAE Class	Units
004		1000	g
Max	Time	Min	Time
49.3	52.4	0.0	3.8

Test Vehicle: 2016 Mazda CX-3 Touring SUV
 Test Program: NCAP Side Pole Impact Test

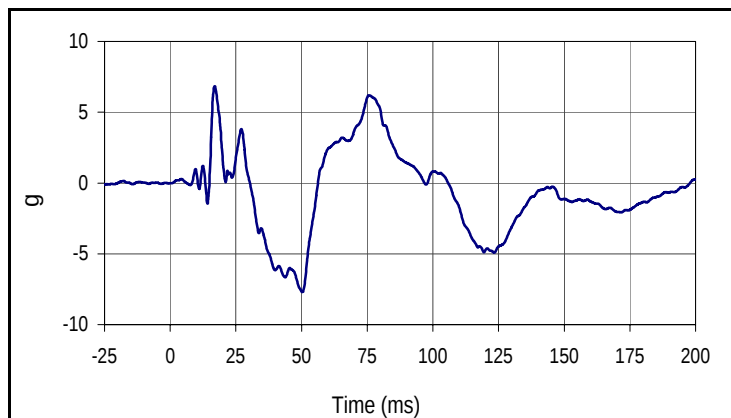
Test Date: 11/16/15
 NHTSA No.: M20165401



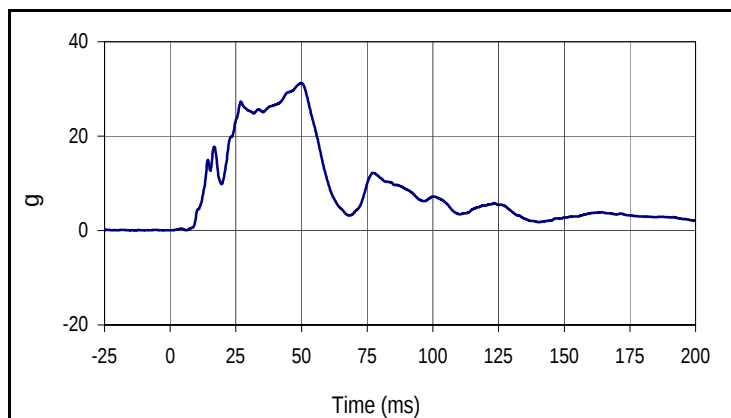
Curve Description			
Driver Lower Spine T12 Acceleration X			
Plot No.		SAE Class	Units
005		180	g
Max	Time	Min	Time
14.6	49.2	-15.7	16.8



Curve Description			
Driver Lower Spine T12 Acceleration Y			
Plot No.		SAE Class	Units
006		180	g
Max	Time	Min	Time
26.7	50.2	-7.4	87.5



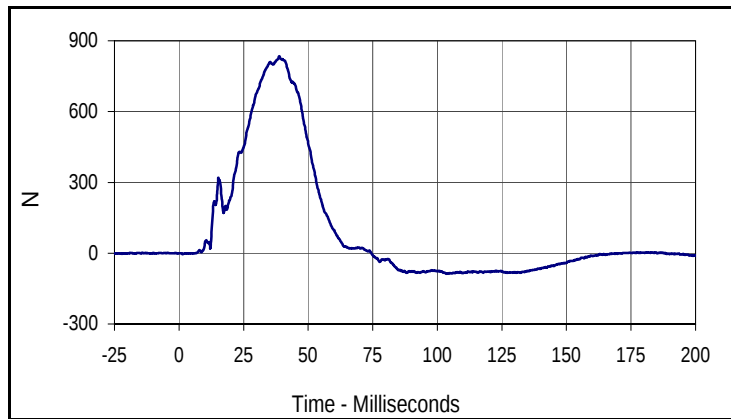
Curve Description			
Driver Lower Spine T12 Acceleration Z			
Plot No.		SAE Class	Units
007		180	g
Max	Time	Min	Time
6.8	16.9	-7.7	50.3



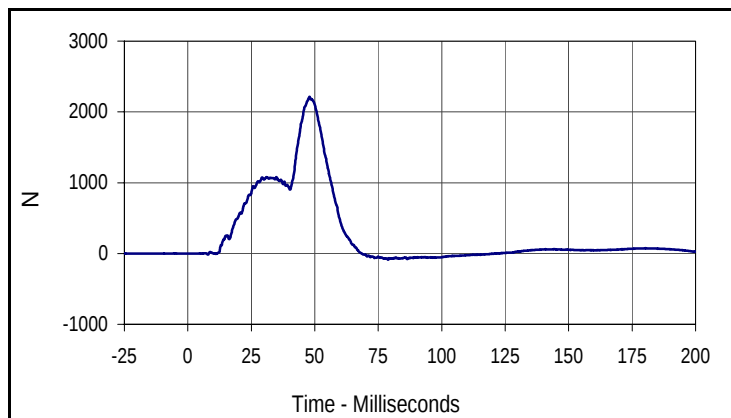
Curve Description			
Driver Lower Spine T12 Acceleration Res.			
Plot No.		SAE Class	Units
008		180	g
Max	Time	Min	Time
31.3	50.0	0.1	0.0

Test Vehicle: 2016 Mazda CX-3 Touring SUV
 Test Program: NCAP Side Pole Impact Test

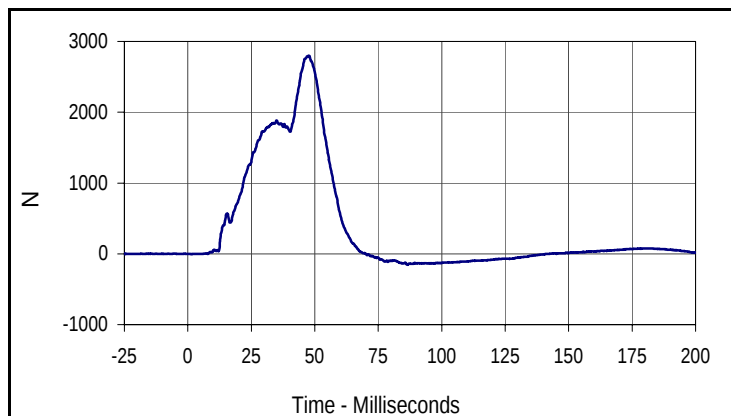
Test Date: 11/16/15
 NHTSA No.: M20165401



Curve Description			
Driver Iliac Wing Force on Impact Side Y			
Plot No.		SAE Class	Units
009		600	N
Max	Time	Min	Time
835.0	38.8	-87.7	103.5



Curve Description			
Driver Acetabulum Force on Impact Side Y			
Plot No.		SAE Class	Units
010		600	N
Max	Time	Min	Time
2214.4	48.0	-89.1	78.9



Curve Description			
Driver Total Pelvic Force on Impact Side Y			
Plot No.		SAE Class	Units
011		600	N
Max	Time	Min	Time
2796.9	47.9	-153.7	86.5

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: 11/13/15
 Test I.D.: N/A



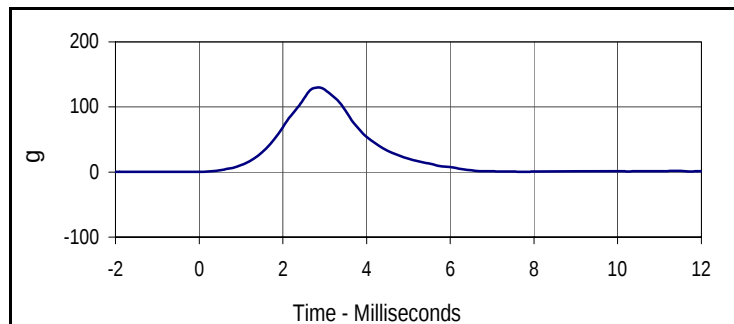
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	23	Pass
A	Sitting Height	mm	772 - 788	780	Pass
B	Shoulder Pivot Height	mm	437 - 453	445	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	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

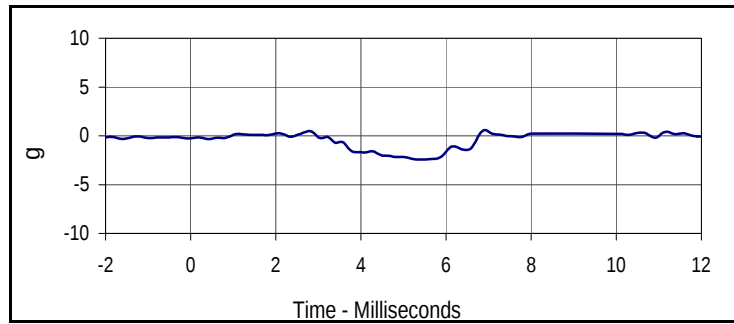
Test Date: 11/13/15
 Test I.D.: 299HD089



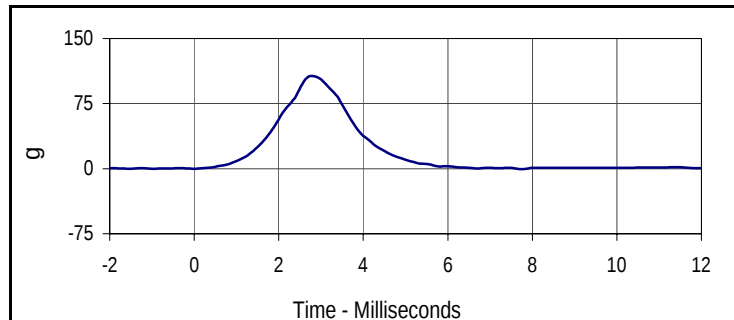
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	372	Pass
Temperature During Soak	Max	18.9 to 25.6	21.6	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	23.3	Pass
	Min		22.9	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	23.0	Pass
Peak Head Resultant Acceleration	g	115 to 137	129.9	Pass
Peak Head X Acceleration	g	<15	2.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	0.5	Pass
Overall Test Results				Pass



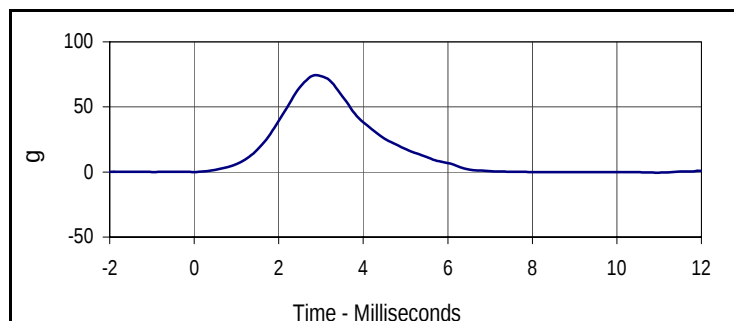
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	g
Max	Time	Min	Time
129.9	2.8	0.2	-17.5



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	g
Max	Time	Min	Time
0.6	6.9	-2.4	5.3



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	g
Max	Time	Min	Time
106.7	2.8	-0.5	7.8



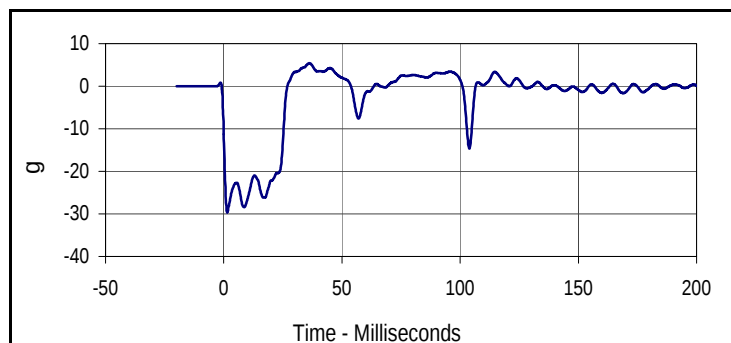
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	g
Max	Time	Min	Time
74.5	2.9	-0.5	11.0

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

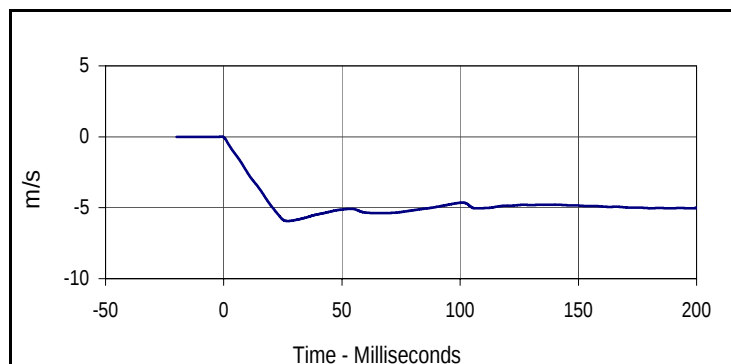
Test Date: 11/13/15
 Test I.D.: 299NB089



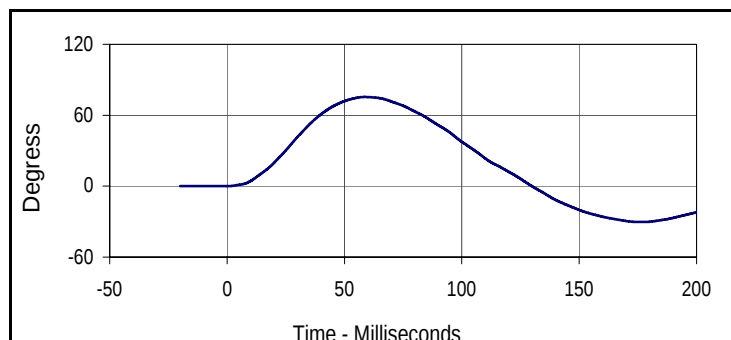
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	417	Pass
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	23.3	Pass
	Min		22.9	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	23.1	Pass
Pendulum Velocity	m/s	5.51 to 5.63	5.55	Pass
Pendulum Deceleration	10 msec	-2.20 to -2.80	-2.52	Pass
	15 msec	-3.30 to -4.10	-3.64	Pass
	20 msec	-4.40 to -5.40	-4.85	Pass
	25 msec	-5.40 to -6.10	-5.84	Pass
	25-100 msec	-5.50 to -6.20	-5.94	Pass
D-Plane Rotation	Max	71 to 81	75.5	Pass
	Time	50 to 70	58.7	Pass
Peak Occipital Condyle Moment	Nm	-36 to -44	-41.3	Pass
Decaying Moment Time to Cross 0 Nm	msec	102 to 126	104.9	Pass
Overall Test Results			Pass	



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	g
Max	Time	Min	Time
5.4	0.0	-29.6	0.0



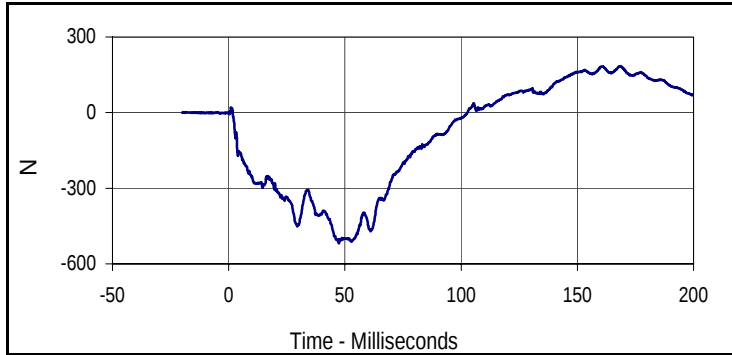
Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.9	-5.9	26.9



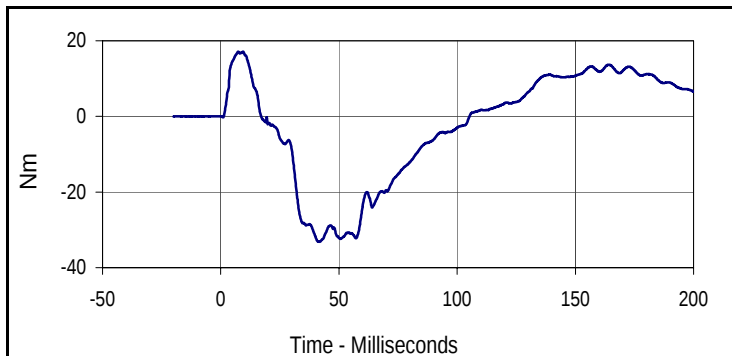
Curve Description			
D-Plane Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degress
Max	Time	Min	Time
75.5	58.7	-30.3	175.9

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

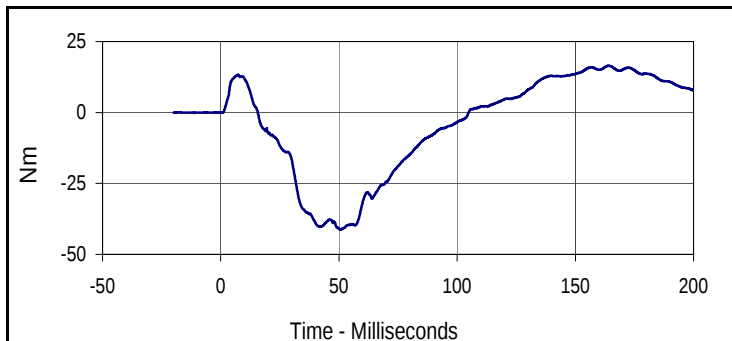
Test Date: 11/13/15
 Test I.D.: 299NB089



Curve Description			
Neck Force Y			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
184.9	168.7	-518.5	47.4



Curve Description			
Neck Moment X			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
17.1	9.4	-33.2	41.9



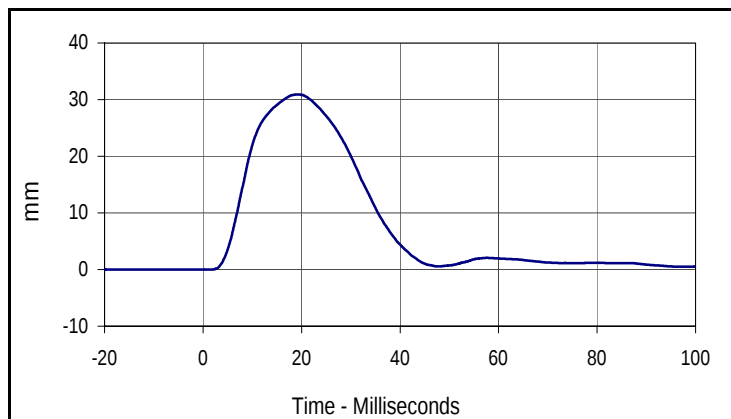
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
006	FIL	600	Nm
Max	Time	Min	Time
16.5	164.0	-41.3	50.7

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

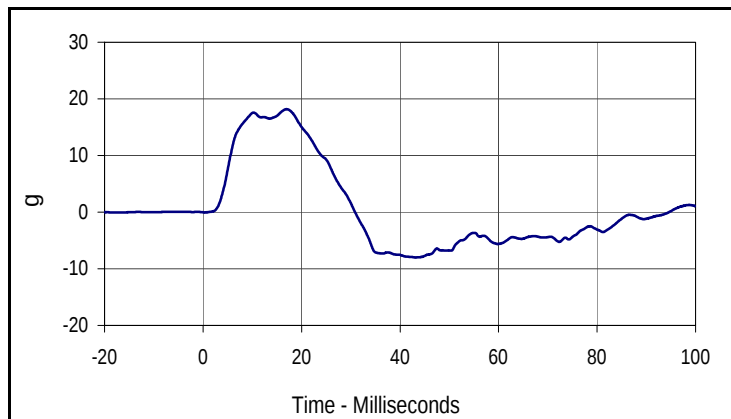
Test Date: 11/13/15
 Test I.D.: 299SH089



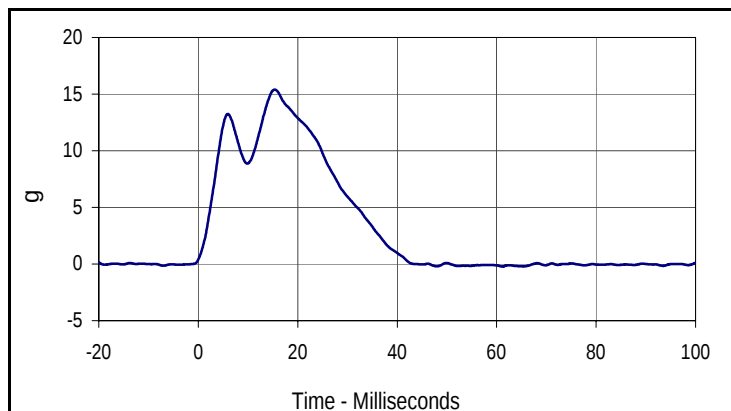
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	462	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	23.3	Pass
	Min	%		22.9	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	23.1	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.22	Pass
Peak Shoulder Deflection		mm	28 to 37	30.9	Pass
Peak Lateral Spine Acceleration Y		g	17 to 22	18.2	Pass
Peak Impactor Acceleration		g	13 to 18	15.4	Pass
Overall Test Results				Pass	



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	mm
Max	Time	Min	Time
30.9	19.1	0.0	-6.8



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	g
Max	Time	Min	Time
18.2	17.0	-8.0	43.1



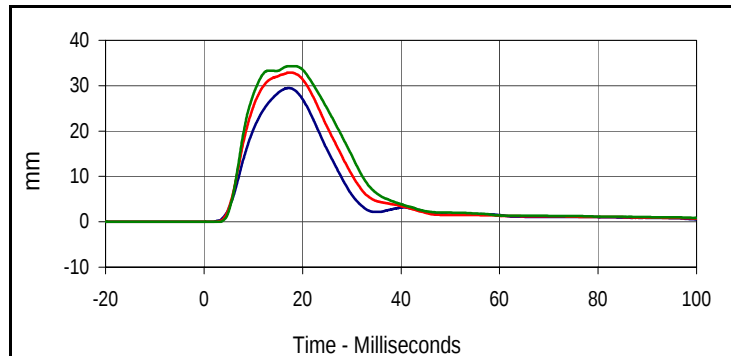
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	g
Max	Time	Min	Time
15.4	15.4	-0.2	61.1

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

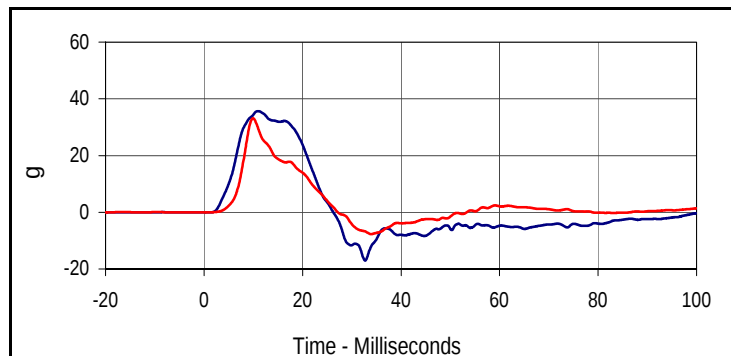
Test Date: 11/13/15
 Test I.D.: 299TWA089



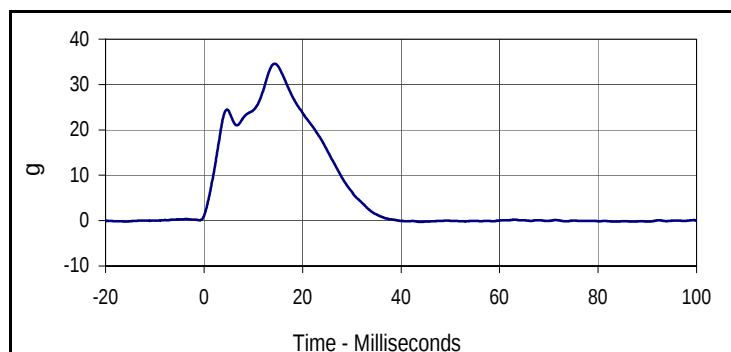
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	507	Pass
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	23.3	Pass
	Min		22.9	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	23.2	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.67	Pass
Peak Shoulder Deflection	mm	31 to 40	37.5	Pass
Peak Upper Thorax Rib Deflection	mm	25 to 32	29.5	Pass
Peak Middle Thorax Rib Deflection	mm	30 to 36	32.9	Pass
Peak Lower Thorax Rib Deflection	mm	32 to 38	34.3	Pass
Peak Upper Spine Y Acceleration	g	34 to 43	35.7	Pass
Peak Lower Spine Y Acceleration	g	29 to 37	33.1	Pass
Peak Impactor Acceleration	g	30 to 36	34.6	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	mm
Max	Time	Min	Time
29.5	17.2	0.0	-12.6
Middle Thorax Deflection			
Max	Time	Min	Time
32.9	17.5	0.0	-14.0
Lower Thorax Deflection			
Max	Time	Min	Time
34.3	17.4	0.0	-16.3



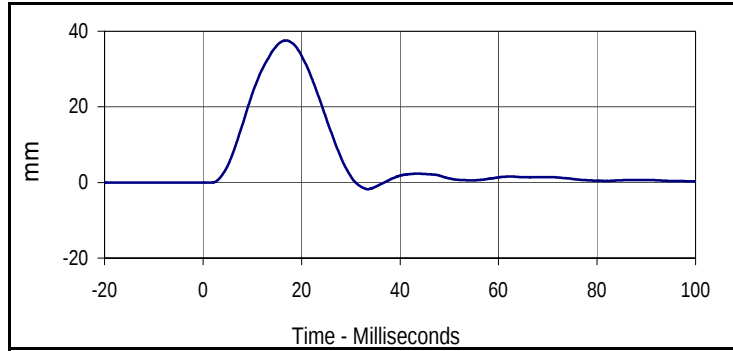
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	g
Max	Time	Min	Time
35.7	10.9	-17.0	32.7
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	g
Max	Time	Min	Time
33.1	9.9	-7.7	34.0



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	g
Max	Time	Min	Time
34.6	14.3	-0.3	43.9

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

Test Date: 11/13/15
Test I.D.: 299TWA089



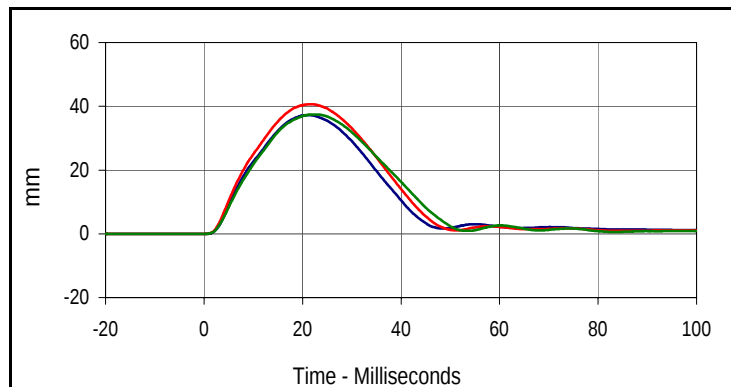
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	mm
Max	Time	Min	Time
37.5	17.0	-1.8	33.5

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

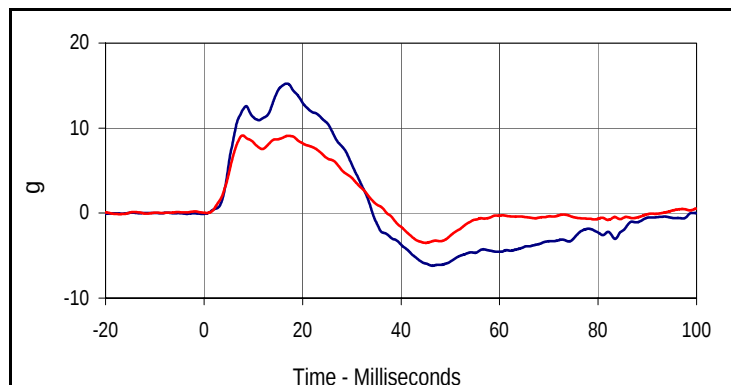
Test Date: 11/13/15
 Test I.D.: 299TWOA089



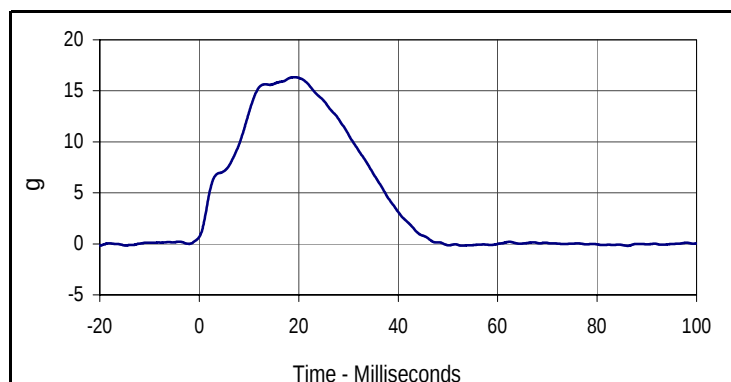
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	552	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	23.3	Pass
	Min	%		22.9	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	23.3	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.31	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	37.2	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	40.6	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	37.5	Pass
Peak Upper Spine Y Acceleration		g	13 to 17	15.2	Pass
Peak Lower Spine Y Acceleration		g	7 to 11	9.1	Pass
Peak Impactor Acceleration		g	14 to 18	16.3	Pass
Overall Test Results				Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	mm
Max	Time	Min	Time
37.2	21.1	0.0	-14.6
Middle Thorax Deflection			
Max	Time	Min	Time
40.6	21.7	0.0	-15.0
Lower Thorax Deflection			
Max	Time	Min	Time
37.5	22.3	0.0	-3.8



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	g
Max	Time	Min	Time
15.2	16.8	-6.2	46.4
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	g
Max	Time	Min	Time
9.1	7.8	-3.5	45.0



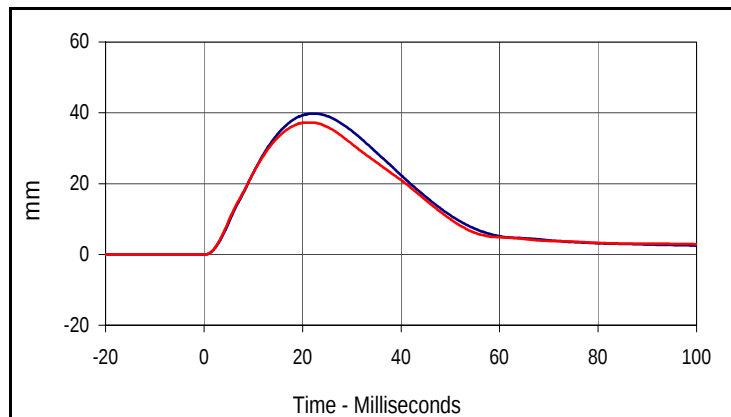
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	g
Max	Time	Min	Time
16.3	19.1	-0.2	86.2

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

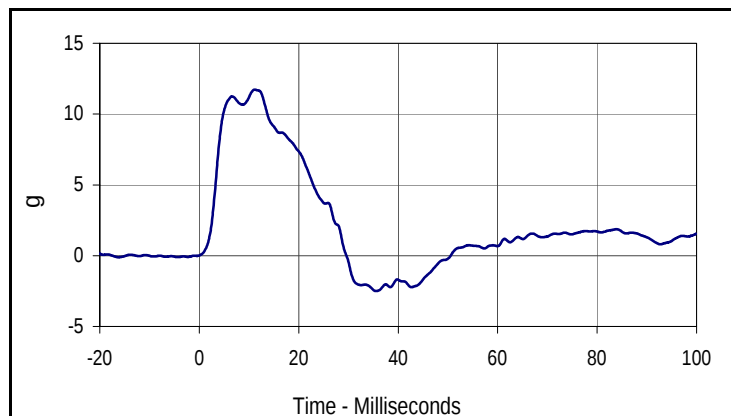
Test Date: 11/13/15
 Test I.D.: 299ABD089



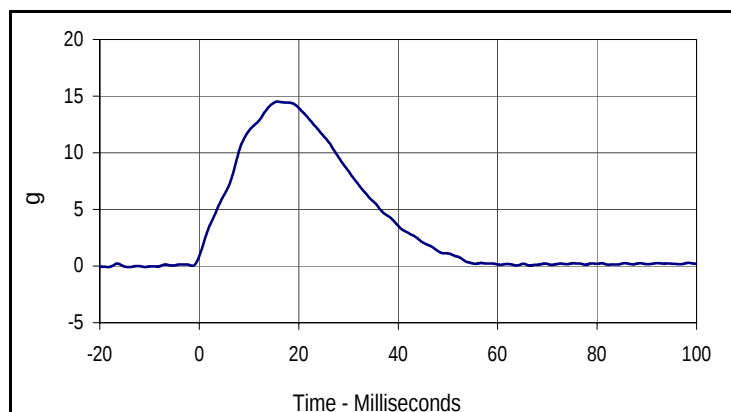
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	597	Pass
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	23.3	Pass
	Min		22.9	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	23.2	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.31	Pass
Peak Upper Abdominal Rib Deflection	mm	36 to 47	39.8	Pass
Peak Lower Abdominal Rib Deflection	mm	33 to 44	37.2	Pass
Peak Lower Spine Y Acceleration	g	9 to 14	11.7	Pass
Peak Impactor Acceleration	g	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
39.8	22.0	0.0	-14.5
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	mm
Max	Time	Min	Time
37.2	21.2	0.0	-18.9

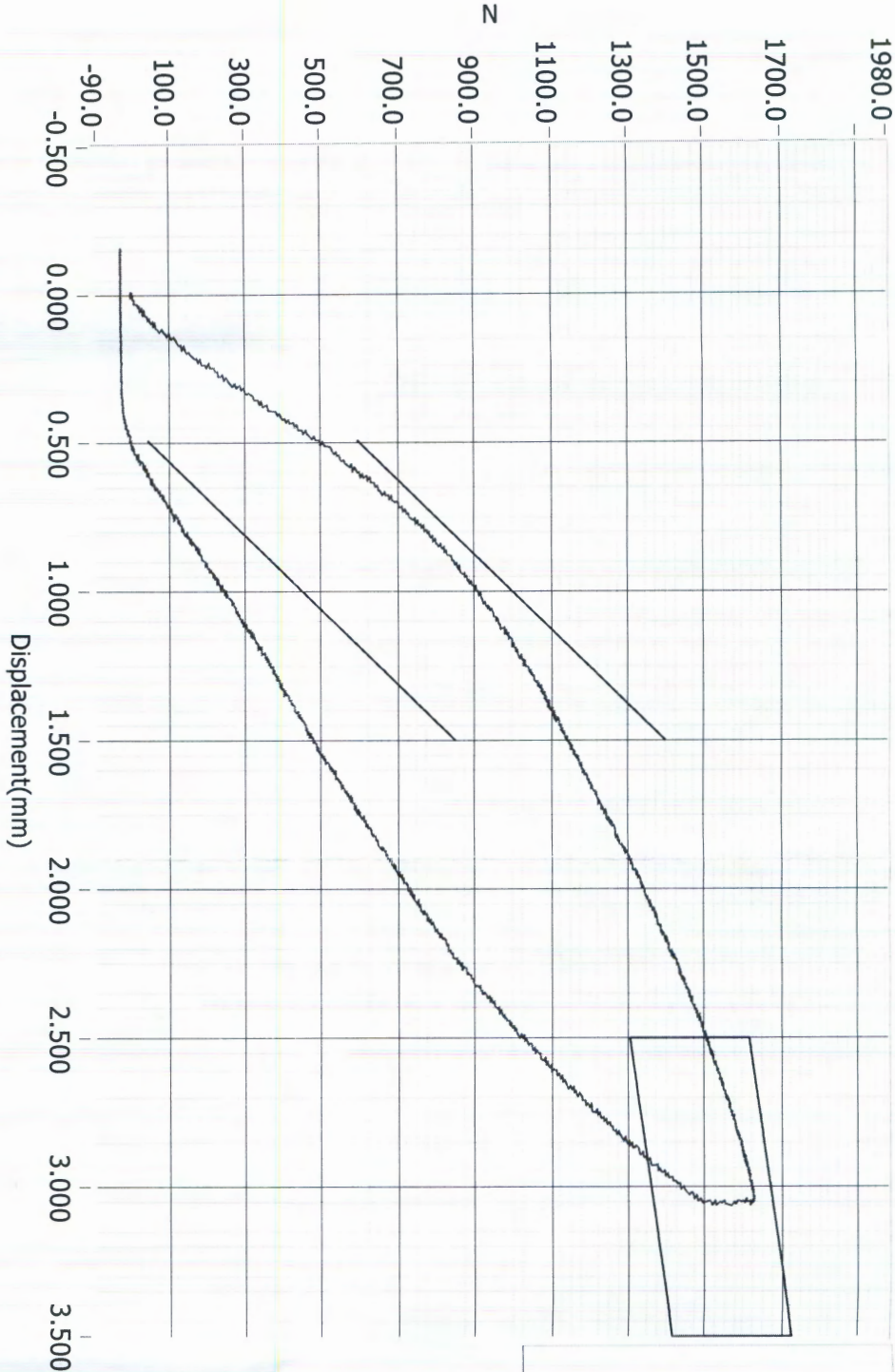


Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	g
Max	Time	Min	Time
11.7	11.1	-2.5	35.6



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	g
Max	Time	Min	Time
14.5	15.7	-0.1	-10.9

Resultant Data - SIDIIs Plug Compression



- Loading Curve
- Boundary Limit Upper
- Boundary Limit Lower
- Peak Load Upper
- Peak Load Lower
- Peak Defl Upper
- Peak Defl Lower

1624N

ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	70994	12/13/2013	11:01 PM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

Current Date : 12/13/2013

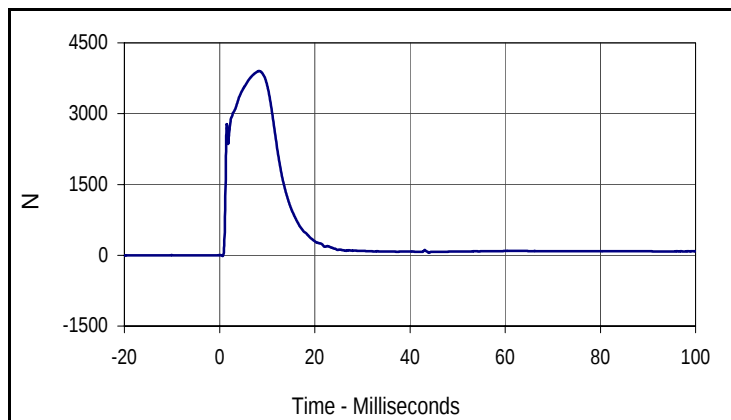
Current Time : 23:02:13

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

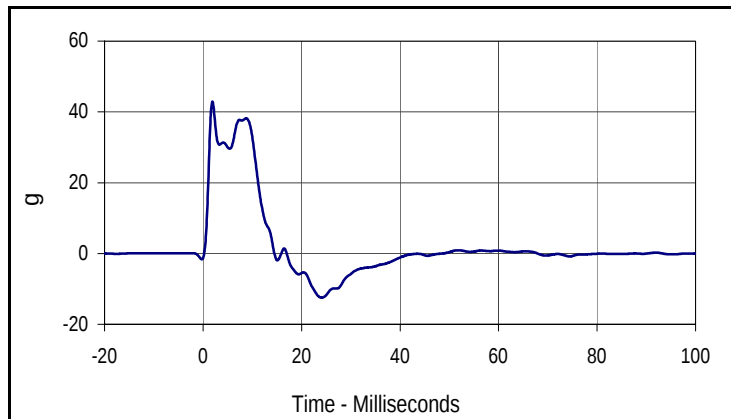
Test Date: 11/13/15
 Test I.D.: 299ACET089



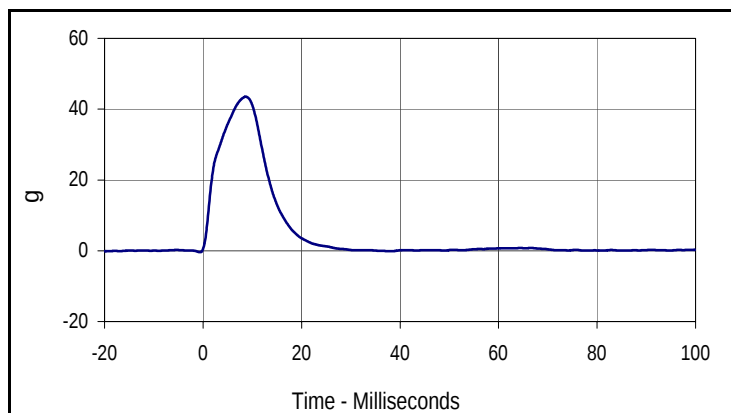
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	642	Pass
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	23.3	Pass
	Min		22.9	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	23.1	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.68	Pass
Peak Acetabulum Force Y	N	3600 to 4300	3901.1	Pass
Peak Pelvis Y Acceleration After 6 msec.	g	34 to 42	38.2	Pass
Peak Impactor Acceleration	g	38 to 47	43.5	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	N
Max	Time	Min	Time
3901.1	8.3	-17.2	0.7



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	g
Max	Time	Min	Time
42.9	1.9	-12.5	24.1



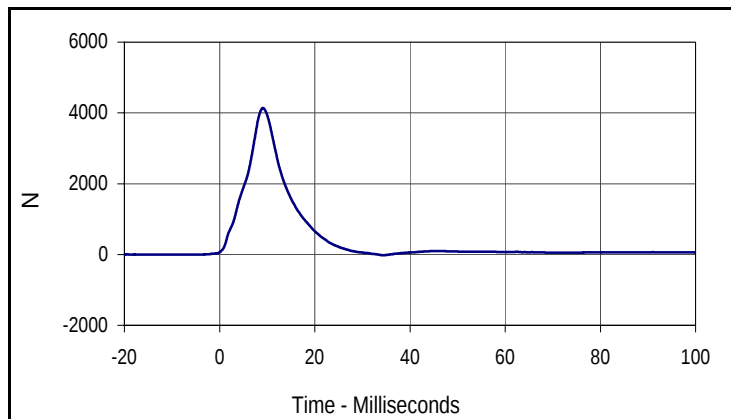
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	g
Max	Time	Min	Time
43.5	8.7	-0.4	-0.6

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

Test Date: 11/13/15
 Test I.D.: 299PL089



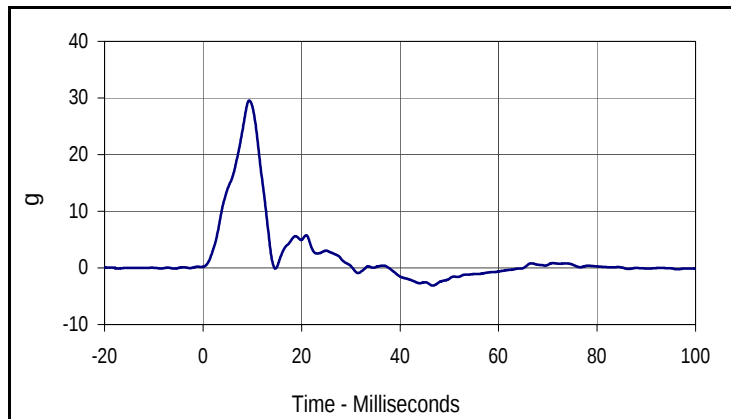
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	687	Pass
Temperature During Soak	Max °C	20.6 to 22.2	21.6	Pass
	Min °C		21.2	Pass
Humidity During Soak	Max %	10.0 to 70.0	23.3	Pass
	Min %		22.9	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	22.9	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.32	Pass
Peak Iliac Force	N	4100 to 5100	4140.0	Pass
Peak Pelvis Y Acceleration	g	28 to 39	29.6	Pass
Peak Impactor Acceleration	g	36 to 45	38.2	Pass
Overall Test Results			Pass	



Curve Description

Pelvis Iliac Force

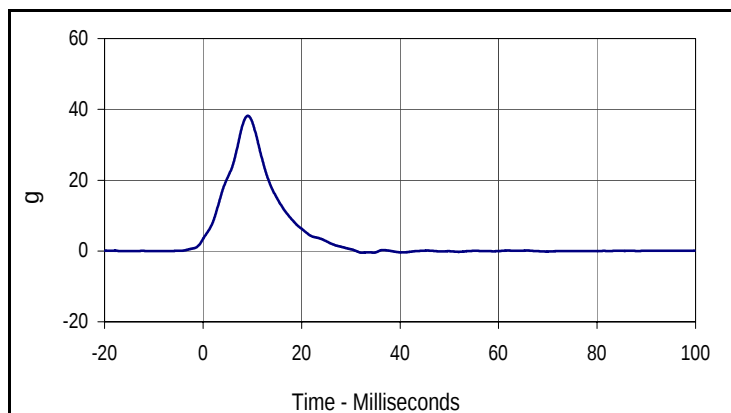
Plot No.	Type	SAE Class	Units
001	FIL	600	N
Max	Time	Min	Time
4140.0	9.1	-21.2	34.4



Curve Description

Pelvis Y Acceleration

Plot No.	Type	SAE Class	Units
002	FIL	180	g
Max	Time	Min	Time
29.6	9.4	-3.1	46.6



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
003	FIL	180	g
Max	Time	Min	Time
38.2	9.1	-0.5	32.3

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

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

Test Date: 11/20/15
 Test I.D.: N/A



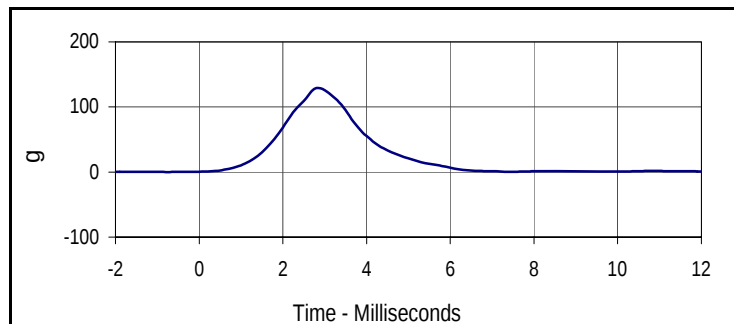
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity		%	10 to 70	25	Pass
A	Sitting Height	mm	772 - 788	780	Pass
B	Shoulder Pivot Height	mm	437 - 453	445	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	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

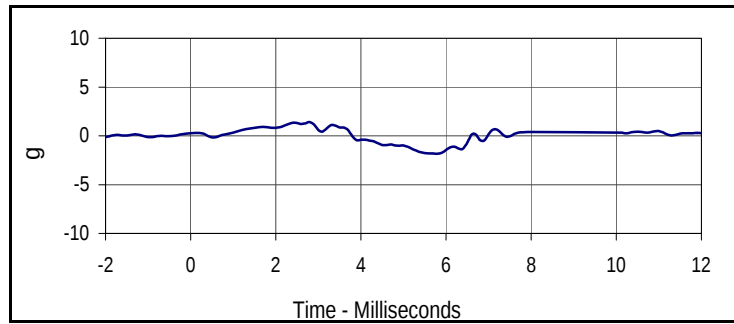
Test Date: 11/20/15
 Test I.D.: 299HD090



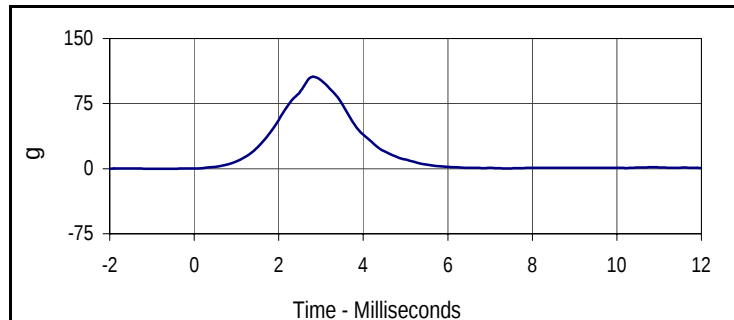
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	372	Pass
Temperature During Soak	Max	18.9 to 25.6	21.5	Pass
	Min		21.5	Pass
Humidity During Soak	Max	10.0 to 70.0	25.1	Pass
	Min		25.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	25.1	Pass
Peak Head Resultant Acceleration	g	115 to 137	129.3	Pass
Peak Head X Acceleration	g	<15	1.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	0.7	Pass
Overall Test Results				Pass



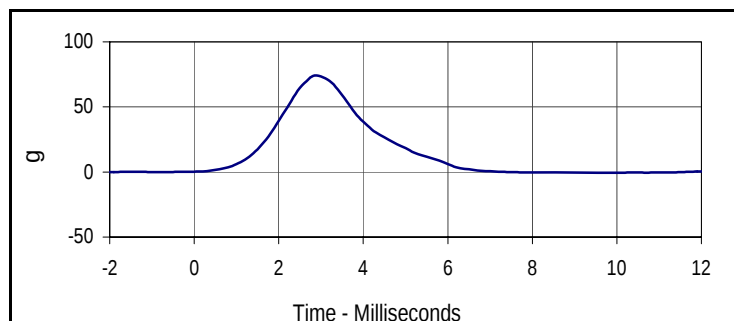
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	g
Max	Time	Min	Time
129.3	2.8	0.0	-0.7



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	g
Max	Time	Min	Time
1.4	2.8	-1.8	5.8



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	g
Max	Time	Min	Time
106.2	2.8	-0.8	-10.8



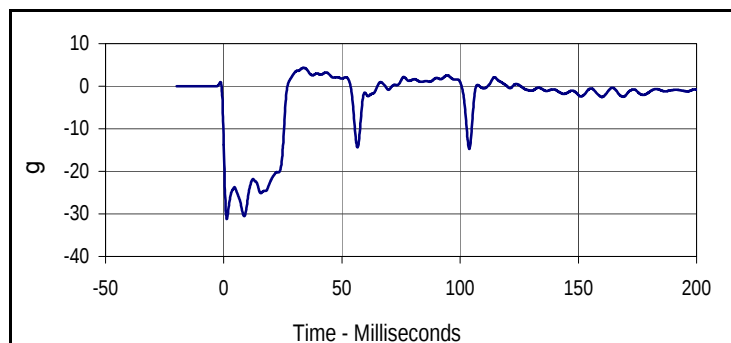
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	g
Max	Time	Min	Time
74.3	2.9	-0.5	10.1

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

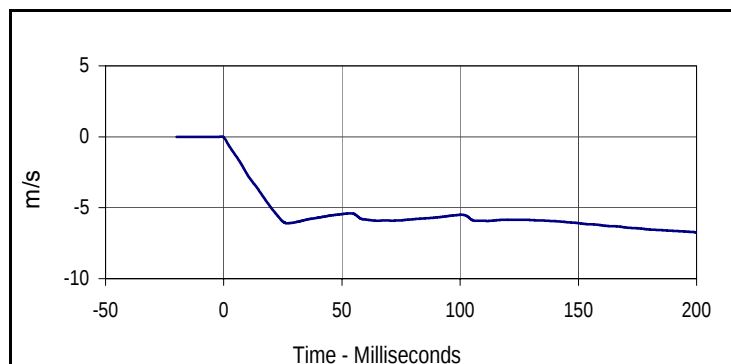
Test Date: 11/20/15
 Test I.D.: 299NB090



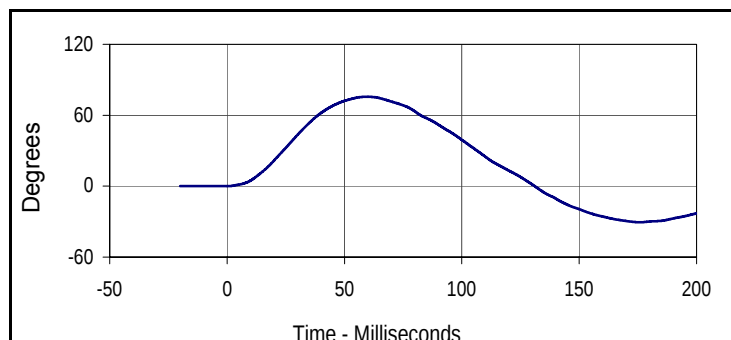
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	417	Pass
Temperature During Soak	Max	20.6 to 22.2	21.5	Pass
	Min		21.5	Pass
Humidity During Soak	Max	10.0 to 70.0	25.1	Pass
	Min		25.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	25.1	Pass
Pendulum Velocity	m/s	5.51 to 5.63	5.60	Pass
Pendulum Deceleration	10 msec	-2.20 to -2.80	-2.67	Pass
	15 msec	-3.30 to -4.10	-3.81	Pass
	20 msec	-4.40 to -5.40	-5.00	Pass
	25 msec	-5.40 to -6.10	-5.98	Pass
	25-100 msec	-5.50 to -6.20	-6.09	Pass
D-Plane Rotation	Max	71 to 81	75.5	Pass
	Time	50 to 70	60.4	Pass
Peak Occipital Condyle Moment	Nm	-36 to -44	-40.5	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
Max	Time	Min	Time
4.3	0.0	-31.2	0.0



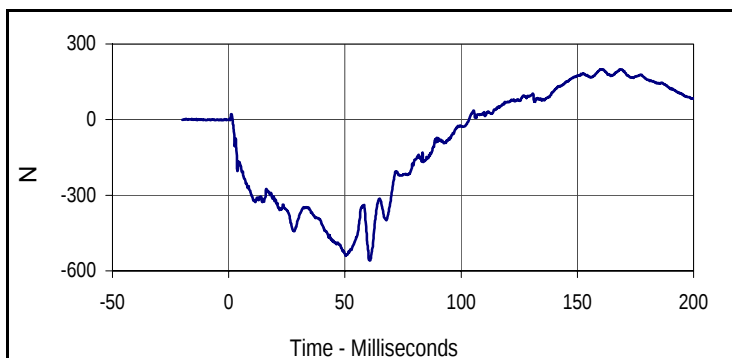
Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.9	-6.7	199.9



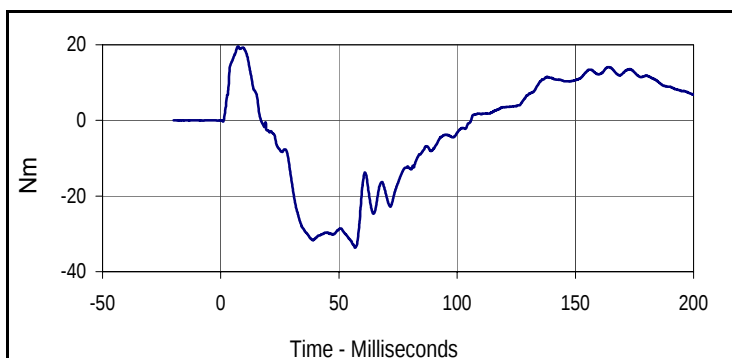
Curve Description			
D-Plane Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
75.5	60.4	-30.5	175.7

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

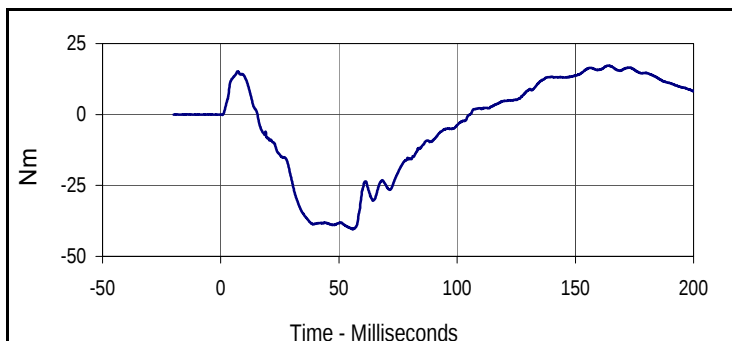
Test Date: 11/20/15
 Test I.D.: 299NB090



Curve Description			
Neck Force Y			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
200.2	168.3	-558.4	60.8



Curve Description			
Neck Moment X			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
19.6	7.3	-33.7	56.8



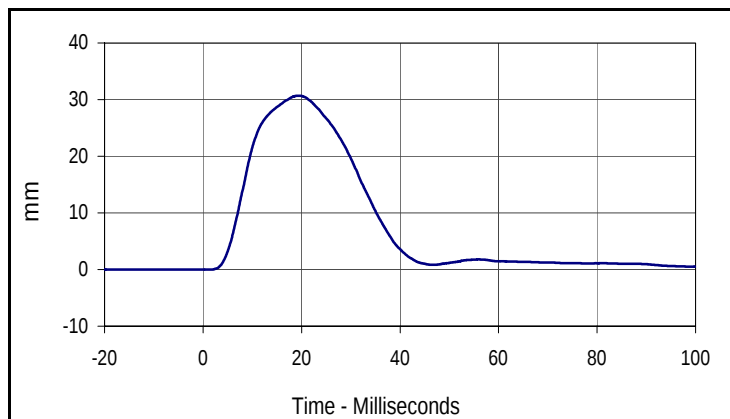
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
006	FIL	600	Nm
Max	Time	Min	Time
17.3	163.8	-40.5	55.8

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

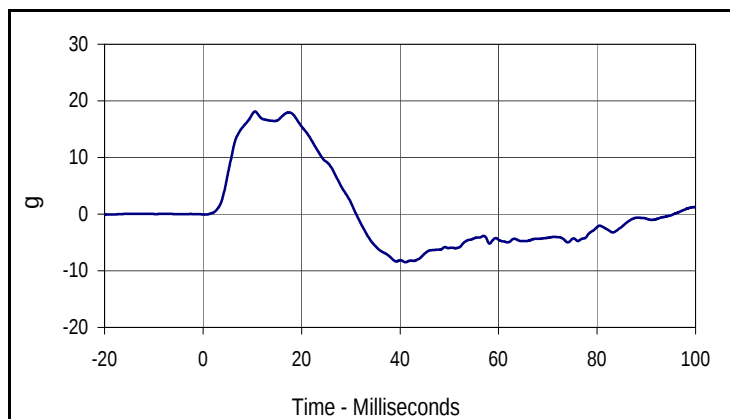
Test Date: 11/20/15
 Test I.D.: 299SH090



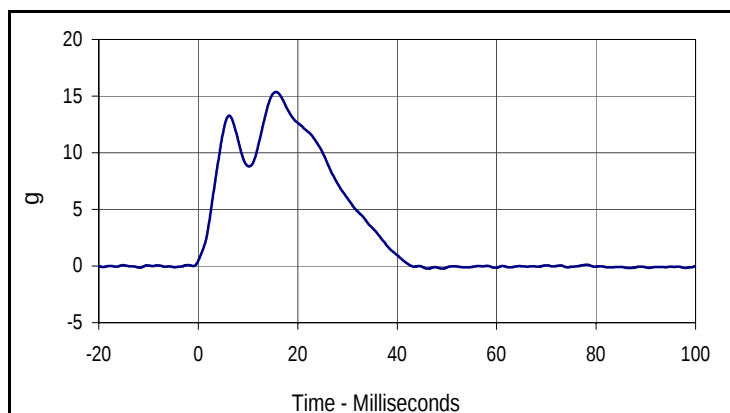
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	462	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.5	Pass
Humidity During Soak	Max	%	10.0 to 70.0	25.1	Pass
	Min	%		25.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	25.1	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.31	Pass
Peak Shoulder Deflection		mm	28 to 37	30.7	Pass
Peak Lateral Spine Acceleration Y		g	17 to 22	18.1	Pass
Peak Impactor Acceleration		g	13 to 18	15.4	Pass
Overall Test Results				Pass	



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	mm
Max	Time	Min	Time
30.7	19.4	0.0	-16.8



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	g
Max	Time	Min	Time
18.1	10.5	-8.5	41.1



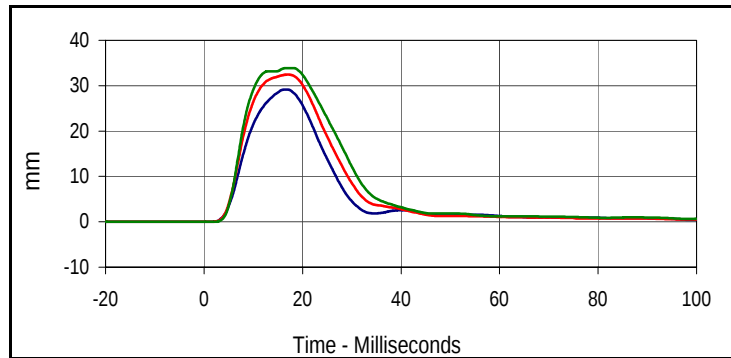
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	g
Max	Time	Min	Time
15.4	15.6	-0.2	49.0

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

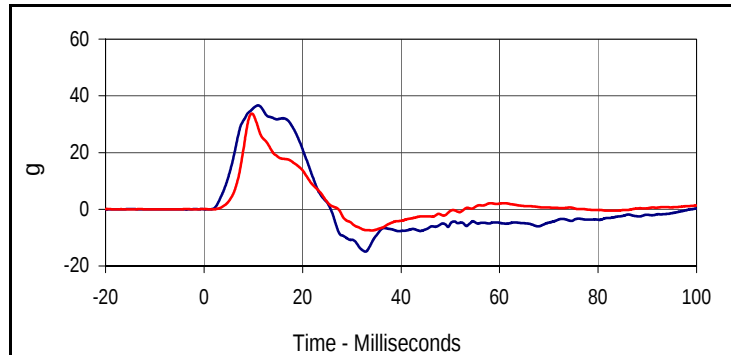
Test Date: 11/20/15
 Test I.D.: 299TWA090



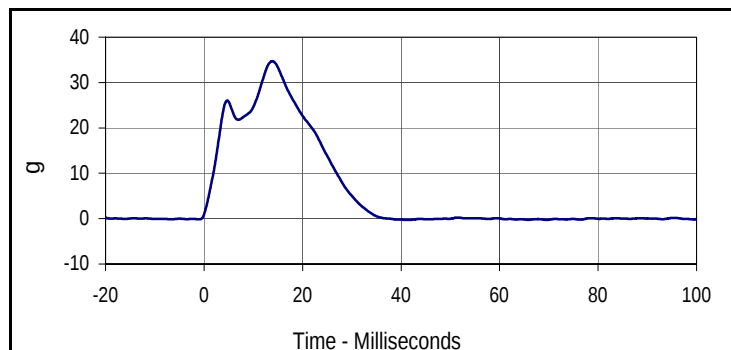
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	507	Pass
Temperature During Soak	Max	20.6 to 22.2	21.5	Pass
	Min		21.5	Pass
Humidity During Soak	Max	10.0 to 70.0	25.1	Pass
	Min		25.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	25.0	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.73	Pass
Peak Shoulder Deflection	mm	31 to 40	37.2	Pass
Peak Upper Thorax Rib Deflection	mm	25 to 32	29.1	Pass
Peak Middle Thorax Rib Deflection	mm	30 to 36	32.4	Pass
Peak Lower Thorax Rib Deflection	mm	32 to 38	33.9	Pass
Peak Upper Spine Y Acceleration	g	34 to 43	36.7	Pass
Peak Lower Spine Y Acceleration	g	29 to 37	33.8	Pass
Peak Impactor Acceleration	g	30 to 36	34.7	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	mm
Max	Time	Min	Time
29.1	16.6	0.0	-5.2
Middle Thorax Deflection			
Max	Time	Min	Time
32.4	17.0	0.0	-3.1
Lower Thorax Deflection			
Max	Time	Min	Time
33.9	17.1	0.0	-2.4



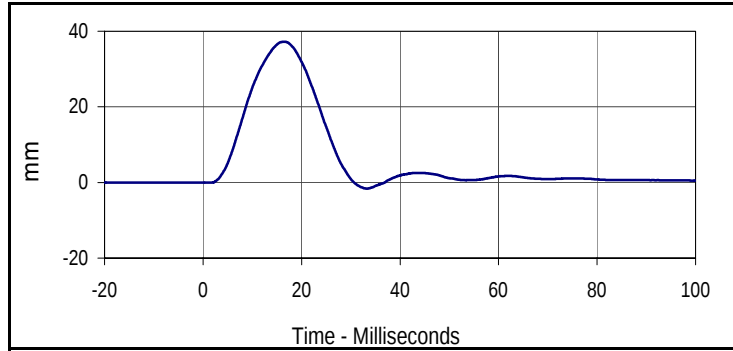
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	g
Max	Time	Min	Time
36.7	11.0	-14.9	32.8
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	g
Max	Time	Min	Time
33.8	9.7	-7.5	34.2



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	g
Max	Time	Min	Time
34.7	13.9	-0.3	69.5

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

Test Date: 11/20/15
Test I.D.: 299TWA090



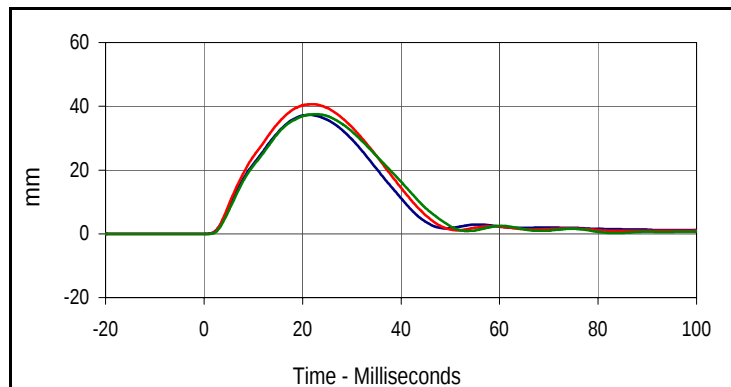
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	mm
Max	Time	Min	Time
37.2	16.4	-1.6	33.3

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

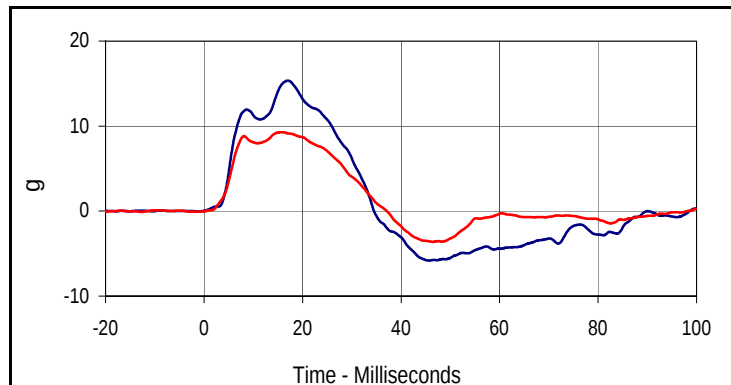
Test Date: 11/20/15
 Test I.D.: 299TWOA090



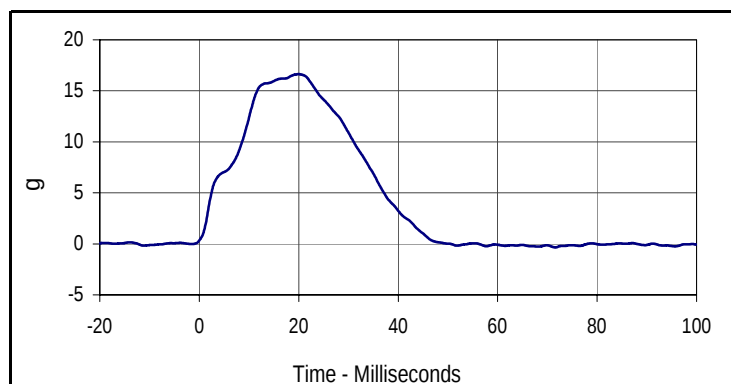
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	552	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.5	Pass
	Min	°C		21.5	Pass
Humidity During Soak	Max	%	10.0 to 70.0	25.1	Pass
	Min	%		25.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	25.1	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.32	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	37.4	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	40.7	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	37.5	Pass
Peak Upper Spine Y Acceleration		g	13 to 17	15.3	Pass
Peak Lower Spine Y Acceleration		g	7 to 11	9.3	Pass
Peak Impactor Acceleration		g	14 to 18	16.6	Pass
Overall Test Results				Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	mm
Max	Time	Min	Time
37.4	21.5	0.0	-2.6
Middle Thorax Deflection			
Max	Time	Min	Time
40.7	22.1	0.0	-8.8
Lower Thorax Deflection			
Max	Time	Min	Time
37.5	22.7	0.0	0.0



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	g
Max	Time	Min	Time
15.3	17.0	-5.8	45.6
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	g
Max	Time	Min	Time
9.3	15.7	-3.6	46.5



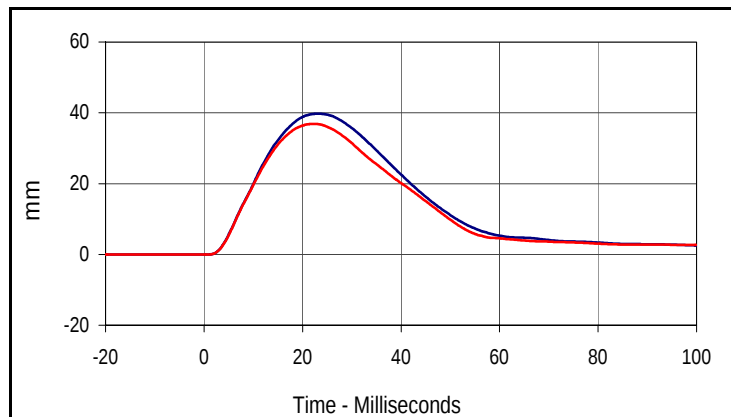
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	g
Max	Time	Min	Time
16.6	20.0	-0.3	71.6

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

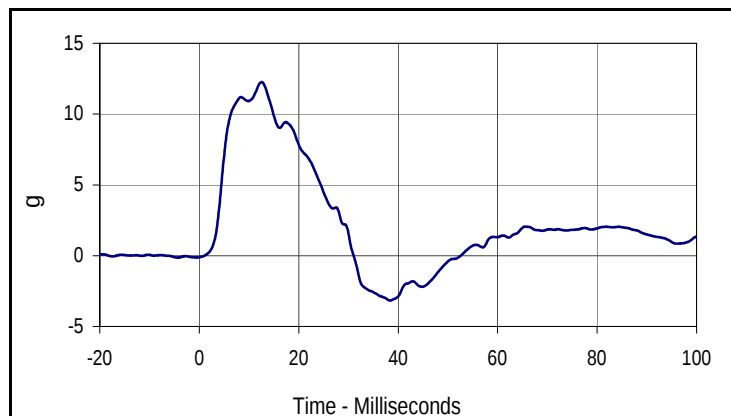
Test Date: 11/20/15
 Test I.D.: 299ABD090



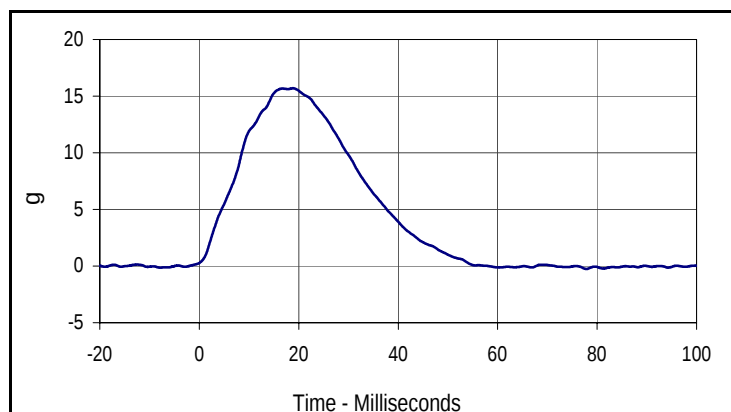
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	597	Pass
Temperature During Soak	Max °C	20.6 to 22.2	21.5	Pass
	Min °C		21.5	Pass
Humidity During Soak	Max %	10.0 to 70.0	25.1	Pass
	Min %		25.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	25.1	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.32	Pass
Peak Upper Abdominal Rib Deflection	mm	36 to 47	39.7	Pass
Peak Lower Abdominal Rib Deflection	mm	33 to 44	36.9	Pass
Peak Lower Spine Y Acceleration	g	9 to 14	12.3	Pass
Peak Impactor Acceleration	g	12 to 16	15.7	Pass
Overall Test Results			Pass	



Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	mm
Max	Time	Min	Time
39.7	23.2	0.0	-6.7
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	mm
Max	Time	Min	Time
36.9	22.1	0.0	-14.5

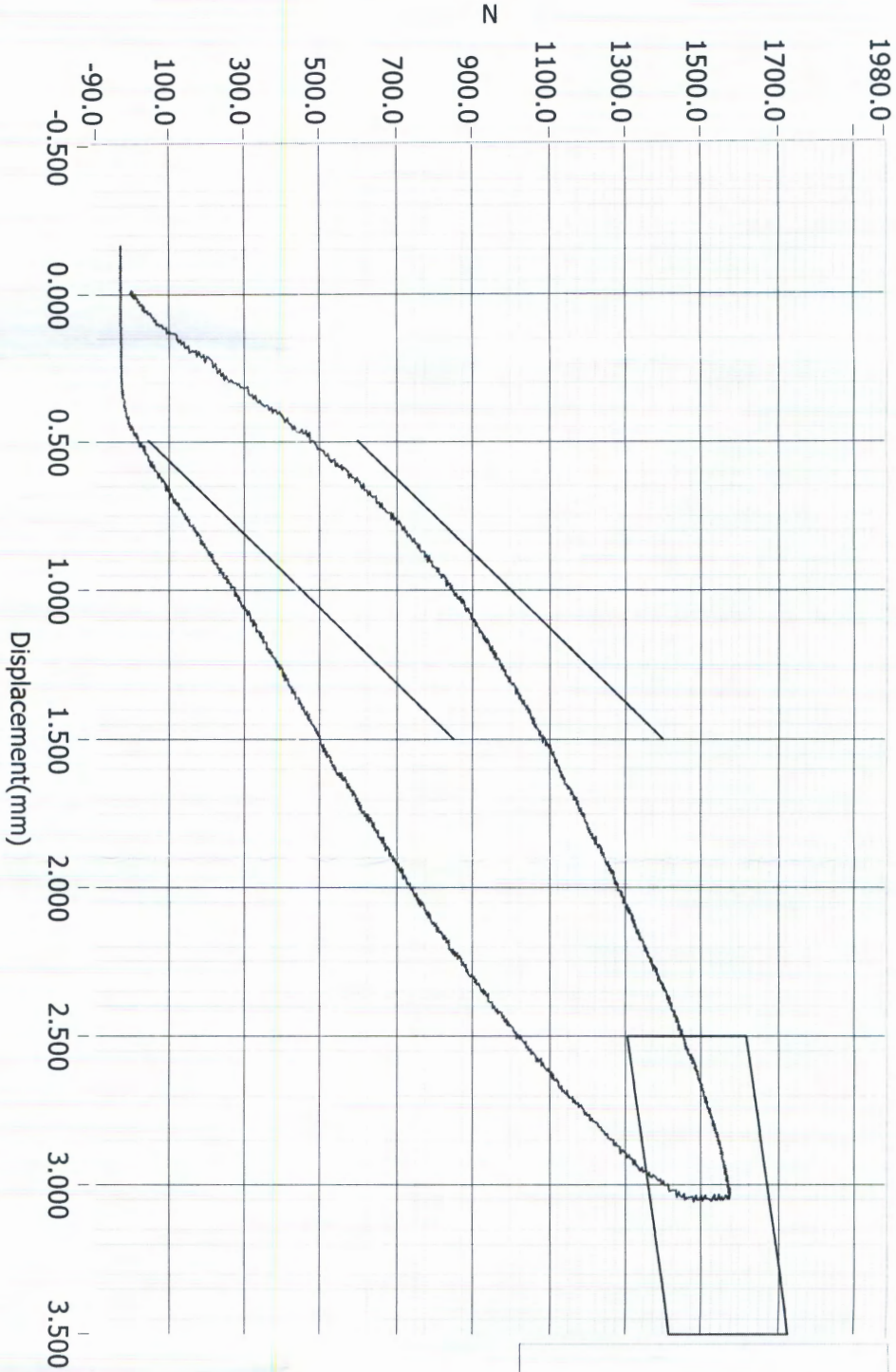


Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	g
Max	Time	Min	Time
12.3	12.5	-3.2	38.4



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	g
Max	Time	Min	Time
15.7	18.9	-0.3	77.8

Resultant Data - SIDIIs Plug Compression



Loading Curve
Boundary Limit Upper
Boundary Limit Lower
Peak Load Upper
Peak Load Lower
Peak Defl Upper
Peak Defl Lower

1569N

ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

70987

12/13/2013

10:53 PM

Cert ID

ATD Serial Number

ATD Type

N/A

SIDIIs

Current Date : 12/13/2013

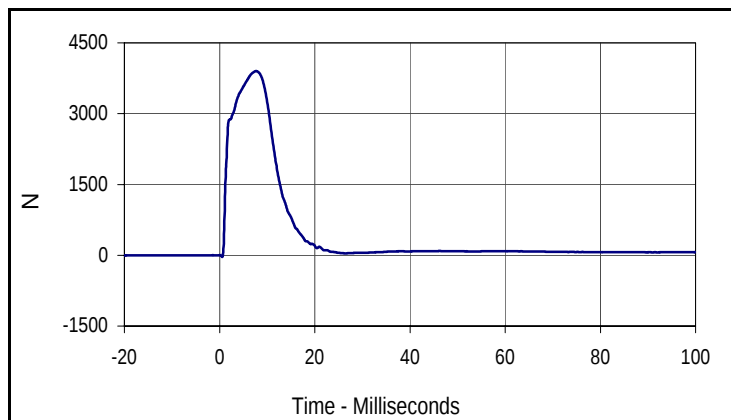
Current Time : 22:54:35

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

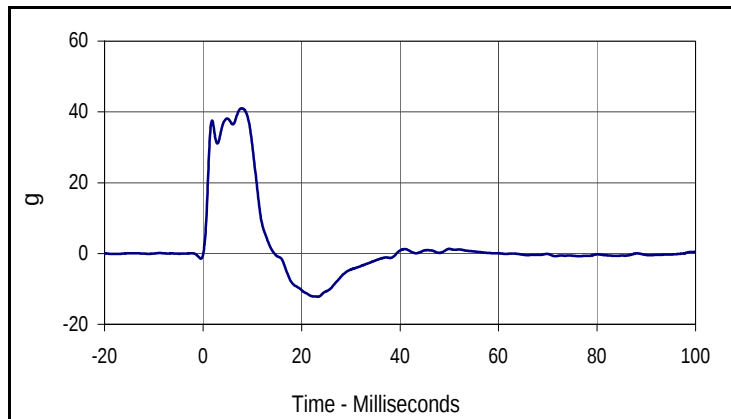
Test Date: 11/20/15
 Test I.D.: 299ACET090



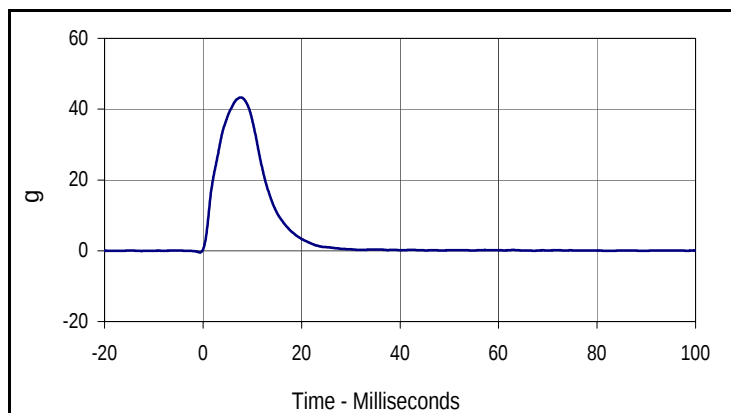
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	642	Pass
Temperature During Soak	Max	20.6 to 22.2	21.5	Pass
	Min		21.5	Pass
Humidity During Soak	Max	10.0 to 70.0	25.1	Pass
	Min		25.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	25.0	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.69	Pass
Peak Acetabulum Force Y	N	3600 to 4300	3900.9	Pass
Peak Pelvis Y Acceleration After 6 msec.	g	34 to 42	41.0	Pass
Peak Impactor Acceleration	g	38 to 47	43.3	Pass
Overall Test Results				Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	N
Max	Time	Min	Time
3900.9	7.6	-33.0	0.6



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	g
Max	Time	Min	Time
41.0	7.8	-12.2	23.3



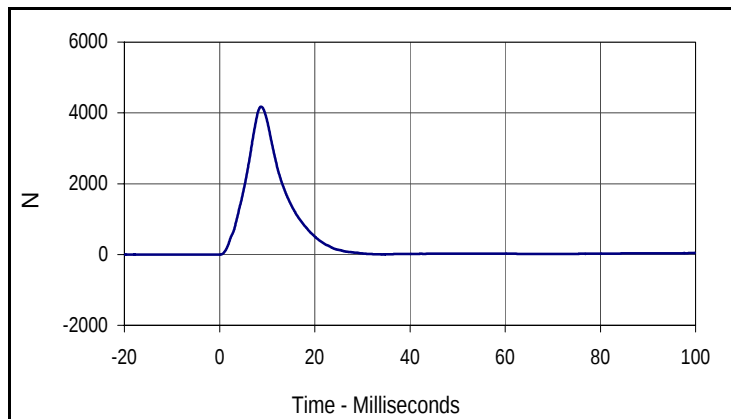
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	g
Max	Time	Min	Time
43.3	7.6	-0.5	-0.7

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

Test Date: 11/20/15
 Test I.D.: 299PL090



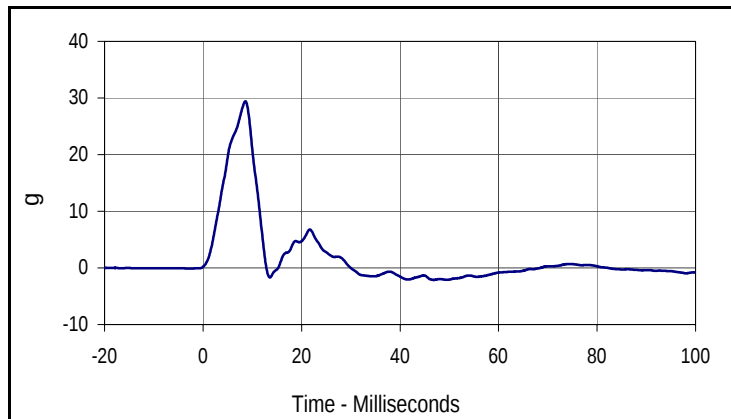
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	687	Pass
Temperature During Soak	Max	20.6 to 22.2	21.5	Pass
	Min		21.5	Pass
Humidity During Soak	Max	10.0 to 70.0	25.1	Pass
	Min		25.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	25.0	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.36	Pass
Peak Iliac Force	N	4100 to 5100	4176.7	Pass
Peak Pelvis Y Acceleration	g	28 to 39	29.4	Pass
Peak Impactor Acceleration	g	36 to 45	38.5	Pass
Overall Test Results			Pass	



Curve Description

Pelvis Iliac Force

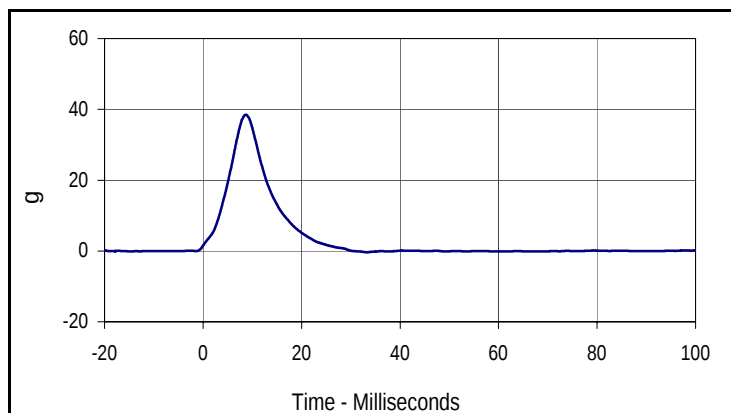
Plot No.	Type	SAE Class	Units
001	FIL	600	N
Max	Time	Min	Time
4176.7	8.7	-2.7	-1.6



Curve Description

Pelvis Y Acceleration

Plot No.	Type	SAE Class	Units
002	FIL	180	g
Max	Time	Min	Time
29.4	8.6	-2.1	46.8



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
003	FIL	180	g
Max	Time	Min	Time
38.5	8.7	-0.4	33.3

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	11/12/15
		Middle	Y	1160	FTSS	11/12/15
		Lower	Y	1213	FTSS	11/12/15
	Abdominal Rib	Upper	Y	1218	FTSS	11/12/15
		Lower	Y	1177	FTSS	9/17/15
Lower Spine Accelerometers (T12)			X	04I20-Z04	Endevco	11/12/15
			Y	06A07-R08	Endevco	11/12/15
			Z	P58795	Endevco	11/12/15
Acetabulum Load Cell			Y	272	Denton	5/1/15
Iliac Wing Load Cell			Y	284	Denton	6/23/15
Pelvis Plug (Struck Side)				70736	FTSS	12/12/13
Pelvis Plug (Non-Struck Side)				70740	FTSS	12/12/13

TABLE 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	A160341	MSI	6/20/15
Vehicle Center of Gravity	Y	A145964	MSI	6/20/15
Vehicle Center of Gravity	Z	A148322	MSI	6/20/15
Left Floor Sill	Y	A145980	MSI	6/21/15
A-Pillar Sill	Y	A104832	MSI	6/19/15
A-Pillar Low	Y	A104810	MSI	6/19/15
A-Pillar Mid	Y	A159398	MSI	7/8/15
B-Pillar Sill	Y	A145989	MSI	7/7/15
B-Pillar Low	Y	A160692	MSI	6/19/15
B-Pillar Mid	Y	A160725	MSI	6/21/15
Driver Seat	Y	A160688	MSI	6/20/15
Engine Top	X	A148316	MSI	6/20/15
Engine Top	Y	A152835	MSI	6/21/15
Firewall	Y	A152855	MSI	7/8/15
Right Roof	Y	A160357	MSI	7/7/15
Right Floor Sill	Y	A159437	MSI	6/21/15
Rear Floorpan	X	A148211	MSI	7/7/15
Rear Floorpan	Y	A148236	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