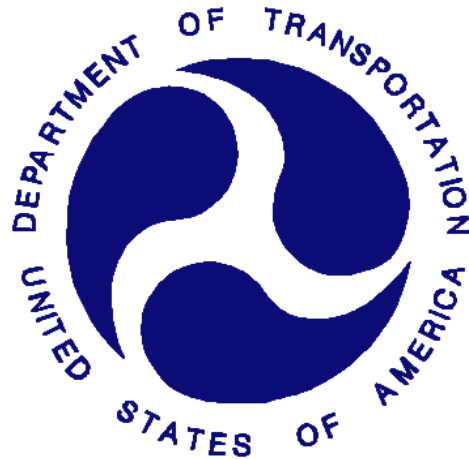


REPORT NUMBER: SPNCAP-MGA-2015-042

**NEW CAR ASSESSMENT PROGRAM (NCAP)
Side Impact Pole Test**

**MAZDA MOTOR CORPORATION
2015 Mazda CX-9 Sport SUV
NHTSA No.: M20155400**

**MGA RESEARCH CORPORATION
5000 Warren Road
Burlington, WI 53105**



Test Date: December 12, 2014

Final Report Date: February 19, 2015

FINAL REPORT

**U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Office of Crashworthiness Standards
Mail Code: NVS-111
1200 New Jersey Ave, SE
Room W43-410
Washington, DC 20590**

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Prepared by: 
Donna Janovicz, Project Manager

Approved by: 
Ben Fischer, Project Engineer

Approval Date: February 19, 2015

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

1. Report No. SPNCAP-MGA-2015-042	2. Government Accession No.	3. Recipient's Catalog No.																													
4. Title and Subtitle Final Report of New Car Assessment Program Side Impact Pole Testing of a 2015 Mazda CX-9 Sport SUV, NHTSA No.: M20155400		5. Report Date February 19, 2015																													
		6. Performing Organization Code MGA																													
7. Author(s) Donna Janovicz, Project Manager Ben Fischer, Project Engineer		8. Performing Organization Report No. SPNCAP-MGA-2015-042																													
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		14. Sponsoring Agency Code NVS-111																													
15. Supplementary Notes																															
16. Abstract A 32.20 km/h, 75° oblique impact Side NCAP Test was conducted on the subject 2015 Mazda CX-9 Sport 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 MGA Research Corporation in Burlington, Wisconsin on December 12, 2014. The impact velocity was 32.2 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21.1°C. The test vehicle post-test maximum crush was 456 mm at level 3. The test vehicle's performance was as follows: <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="2"></th> <th colspan="2">Driver ATD (SID-IIs)</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>338</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>Gs</td> <td>82</td> <td>38</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>3687</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38*</td> <td>13</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td>mm</td> <td>45*</td> <td>20</td> </tr> </tbody> </table> *Proposed IARV The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.						Driver ATD (SID-IIs)		Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	338	Resultant Lower Spine Acceleration	Gs	82	38	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3687	Maximum Thoracic Rib Deflection	mm	38*	13	Maximum Abdomen Rib Deflection	mm	45*	20
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SECTION 1

TEST PURPOSE AND PROCEDURE

This side impact test is part of the MY 2015 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-09-D-00124. The purpose of this test is to generate comparative side impact performance in a 2015 Mazda CX-9 Sport SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated September 2013.

SECTION 2 SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2015 Mazda CX-9 Sport SUV. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.2 km/h. The test was conducted by MGA Research Corporation in Burlington, Wisconsin on December 12, 2014. Pre-test 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) dummy was instrumented accordingly:

Primary and Redundant Head CG Triaxial Accelerometers
Thorax Upper, Middle, and Lower Rib Displacement Potentiometers
Abdomen Upper Rib and Lower Rib Displacement Potentiometers
Lower Spine (T12) Triaxial 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	Driver ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	338
Resultant Lower Spine Acceleration	Gs	82	38
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3687
Maximum Thoracic Rib Deflection	mm	38*	13
Maximum Abdominal Rib Deflection	mm	45*	20

*Proposed IARV

Supplemental restraint information is given below:

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

The test data can be found on the NHTSA website at www.nhtsa.dot.gov

GENERAL COMMENTS

Driver Seat Track Y has no valid data after 19 ms.

MGA does not endorse or certify products. The manufacturer's name appears solely for identification purposes.

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Mazda CX-9 Sport SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. M20155400
Test Date: 12/12/2014

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20155400	Traction Control System (TCS)	Yes
Model Year	2015	Auto-Leveling System	No
Make	Mazda	Automatic Door Locks (ADL)	Yes
Model	CX-9	Power Window Auto-Reverse	Yes
Body Style	SUV	Other Optional Feature	N/A
VIN	JM3TB2BA0F0448621	Driver Front Airbag	Yes
Body Color	Blue Reflex Mica	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	228 / 142	Driver Head/Torso Airbag	No
Engine Displacement (L)	3.7	Driver Torso Airbag	No
Type/No. Cylinders	6	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Lateral	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	No
Transmission Speeds	6	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	Front	Rear Pass. Torso Airbag	No
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	No	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	No
Power Seats	Driver Only	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	No
		Other Restraint Feature	N/A

Does owner's manual provide instructions to turn off automatic door locks?	N/A
--	-----

DATA FROM CERTIFICATION LABEL

Manufactured By	Mazda Motor Corporation	GVWR (kg)	2645
Date of Manufacture	09/14	GAWR Front (kg)	1276
Vehicle Type	MPV	GAWR Rear (kg)	1400

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3	2	7	
Capacity Weight (VCW) (kg)				539	(A)
DSC x 68.04 kg				476	(B)
Rated Cargo and Luggage Weight (RCLW) (kg)				63	(A-B)

VEHICLE SEAT TYPE

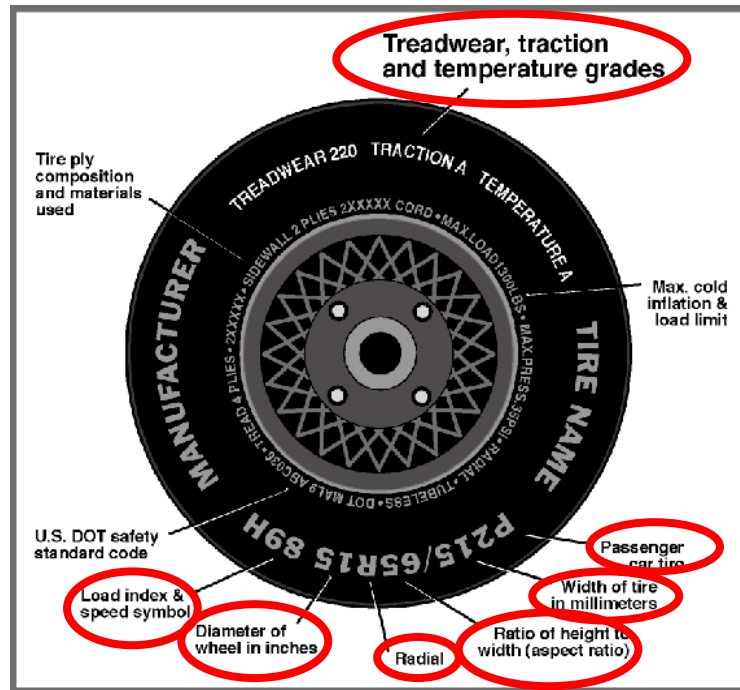
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						Manual	Power
Front Seat	X					w/lever	Driver only
Rear or Second Row			X			w/lever	
Third Row Seat			X		X		

DATA SHEET NO. 1 (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Mazda CX-9 Sport SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20155400
 Test Date: 12/12/2014

VEHICLE TIRE INFORMATION



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	250	250
Recommended Tire Size	P245/60R18	P245/60R18
Tire Size on Vehicle	P245/60R18	P245/60R18
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Dueler H/L 400	Dueler H/L 400
Treadwear	300	300
Traction	A	A
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	104H	104H
Tire Material	Rubber	Rubber
DOT Safety Code Left	H4L2 DEC 3214	H4L2 DEC 3214
DOT Safety Code Right	H4L2 DEC 3214	H4L2 DEC 3214

DATA SHEET NO. 1 (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Mazda CX-9 Sport SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20155400
 Test Date: 12/12/2014

TEST PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kpa	276	279	276	276
Tire Placard	kpa	250	250	250	250
Owner's Manual	kpa				
As Tested	kpa	250	250	250	250

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	561.5	404.5		585.0	451.0		580.5	454.5	
Right	kg	540.0	402.5		544.0	437.0		544.5	443.5	
Ratio	%	57.7	42.3		56.0	44.0		55.6	44.4	
Totals	kg	1101.5	807.0	1908.5	1129.0	888.0	2017.0	1125.0	898.0	2023.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1908.5	(A)
Actual Weight of 1 P572V ATD (SID-IIs) ATD Used	kg	52.2	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	63	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2023.7	(A+B+C)

Does the measured As Tested Vehicle Weight lie within the required weight range (i.e. Calculated Test Vehicle Target Weight – 4.5 kg to 9 kg)? **YES**

TEST VEHICLE ATTITUDES AND CG

	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	deg	-2.2	-2.1	-2.0	Yes
Front Pass. Sill Angle (front-to-rear)*	deg	-2.3	-2.3	-2.2	Yes
Front Bumper Angle (left-to-right)**	deg	0.0	-0.4	-0.4	Yes
Rear Bumper Angle (left-to-right)**	deg	-0.5	-0.9	-0.9	Yes
Vehicle CG (Aft of Front Axle)	mm	1216	1266	1276	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	10	22	19	

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

*** The "As Tested" vehicle attitude measurements must be equal to or between the "As Delivered" and "Fully Loaded" vehicle attitude measurements.

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast (if any)	0.0
Lift gate trim	8.2

Test height adjustable suspension setting, if applicable:	Not Applicable
---	----------------

DATA SHEET NO. 2
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA

Test Vehicle: 2015 Mazda CX-9 Sport SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20155400
 Test Date: 12/12/2014

SEAT POSITIONING

The driver's seat, front center seat (if applicable), and right 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 seats should be set to the rear-most, lowest, mid-angle position.

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	27.0	12.2	19.6
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 (Mid) (°)	As Tested SCR Height (mm)	SCR Height Position	SCR Height (mm)		
				Rear- most	Mid- Fore/Aft	Forward- Most
Driver Seat	19.6	23	Max	46	46	46
			Mid	23	23	23
			Min	0	0	0
Front Passenger Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
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: 2015 Mazda CX-9 Sport SUV
 Test Program: NCAP Side Pole Impact Test

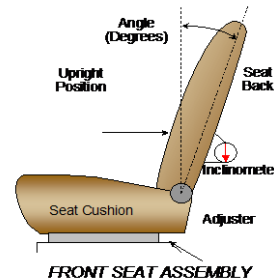
NHTSA No. M20155400
 Test Date: 12/12/2014

SEAT FORE/AFT POSITIONS

Seat	Total Fore/Aft Travel		Test Position from Forward-most Position	
	mm	Detents	mm	Detent
Driver Seat	264		0	
Front Passenger Seat	264	27 (1 st as 1)	0	0 th (1 st as 0)
Front Center Seat				
Struck Side Rear Seat	306	3 (1 st as 1)	306	2 nd (1 st as 0)
Non-Struck Side Rear Seat	306	3 (1 st as 1)	306	2 nd (1 st as 0)
Rear Center Seat	306	3 (1 st as 1)	306	2 nd (1 st as 0)

SEAT BACK ANGLE 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 as the driver's seat back. The struck-side rear passenger seat back is positioned in accordance with the information provided by the manufacturer on Form No. 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	Total Seat Back Angle Range		Test Position from Vertical	
	Degrees	Detents	Degree	Detent
Driver Seat w/Seated Dummy	93.7		4.9	
Front Passenger Seat	72.1	37 (1 st as 1)	5.5	3 rd (1 st as 0)
Front Center Seat				
Struck Side Rear Seat	9.2	5 (1 st as 1)	9.7	0 th (1 st as 0)
Non-Struck Side Rear Seat	9.2	5 (1 st as 1)	9.7	0 th (1 st as 0)
Rear Center Seat	9.2	5 (1 st as 1)	9.7	0 th (1 st as 0)

Seat back angles measured on headrest post.

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total # of Positions	Placed in Position #
Driver Seat	4 detents (1 st as 1)	0 (uppermost as 0)

HEAD RESTRAINT ADJUSTMENT

Head restraints are adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	4	Lowest

DATA SHEET NO. 2 (CONTINUED)
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

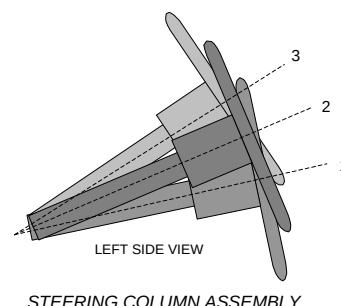
Test Vehicle: 2015 Mazda CX-9 Sport SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20155400
 Test Date: 12/12/2014

STEERING COLUMN ADJUSTMENT

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

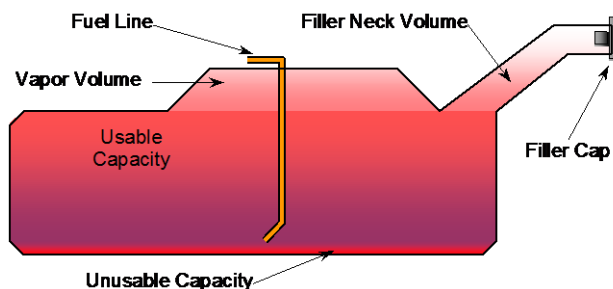
	Degrees	Fore/Aft Position (mm)
Lowermost, Position 1	65.4	318
Geometric Center, Position 2	62.7	293
Uppermost, Position 3	60.0	268
Telescoping Steering Wheel Travel		50
Test Position	62.7	293



FUEL PUMP

Describe the fuel pump type, details about how it operates and the location of the fuel filler pipe.

The vehicle is equipped with an electric fuel pump. The fuel pump operates when starter or engine is activated. The fuel pipe is on the left side.



VEHICLE FUEL TANK ASSEMBLY

FUEL TANK CAPACITY DATA

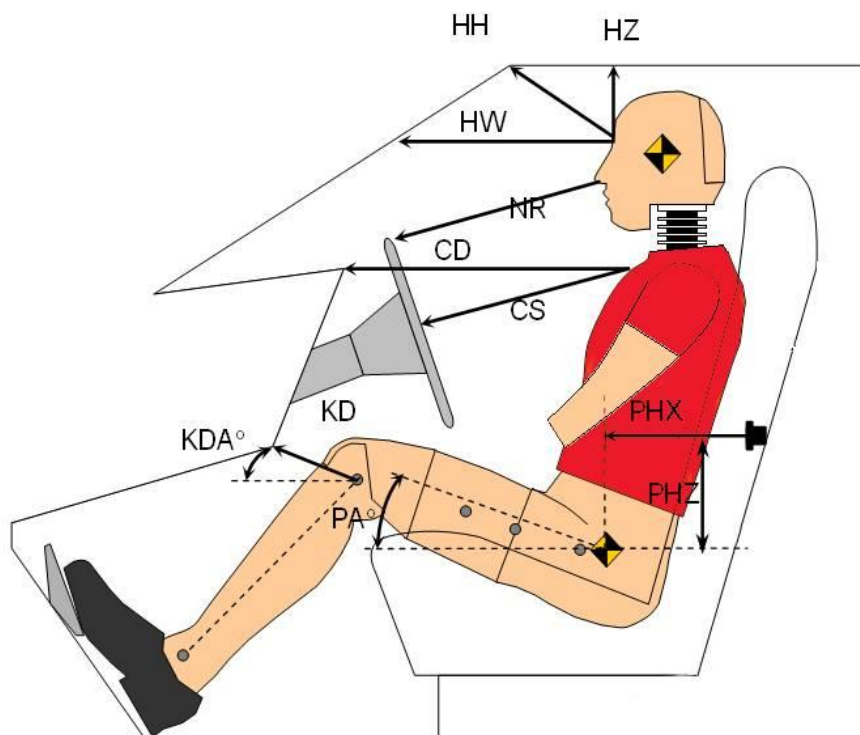
	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	76.1
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of Standard Tank as Specified in Owner's Manual	76.0
Usable Capacity of Optional Tank as Specified in Owner's Manual	
93% of Usable Capacity	70.8
Actual Amount of Solvent Used	70.8
1/3 of Usable Capacity	25.4

Is the actual amount of solvent used in the test equal to 93% $\pm$ 1% of the Usable Capacity stated in Form No. 1? **YES**

**.DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS**

Test Vehicle: 2015 Mazda CX-9 Sport SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. M20155400
Test Date: 12/12/2014



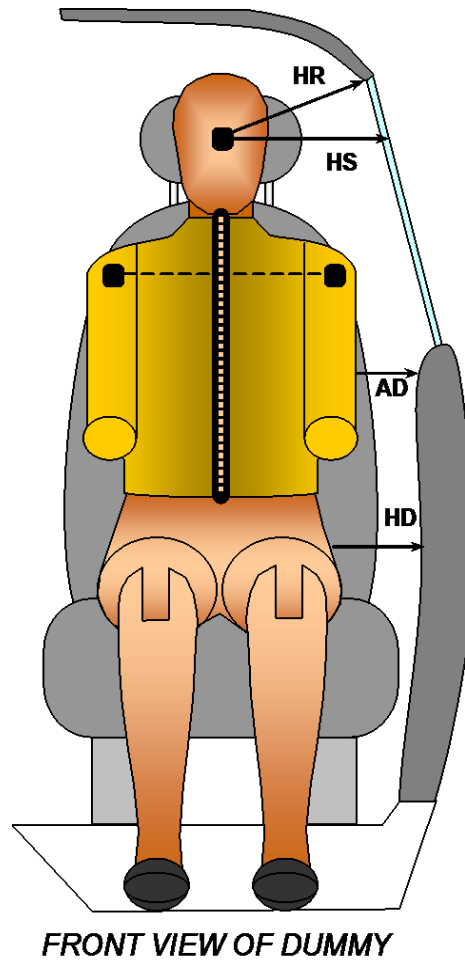
LEFT SIDE VIEW

Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	236	
HW	Head to Windshield	585	
HZ	Head to Roof Liner	189	
NR	Nose to Rim	208	
CD	Chest to Dashboard	396	
CS	Chest to Steering Wheel	143	
KDL/KDAL°	Left Knee to Dash	85	30.3
KDR/KDAR°	Right Knee to Dash	75	33.1
PAX°	Pelvic Tilt Angle (X-Axis)		18.1
PAY°	Pelvic Tilt Angle (Y-Axis)		-0.4
PHX	Hip Point to Striker (X-Axis)	417	
PHZ	Hip Point to Striker (Z-Axis)	95	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Mazda CX-9 Sport SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. M20155400
Test Date: 12/12/2014

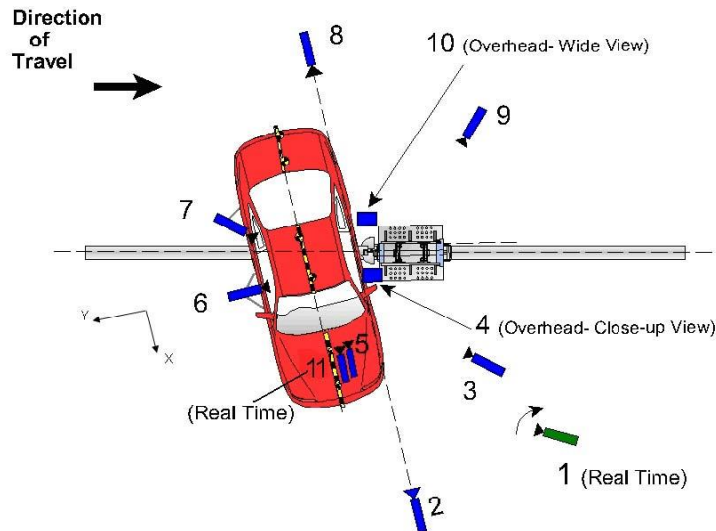


Code	Measurement Description	Driver
		Length (mm)
HR	Head to Side Header	264
HS	Head to Side Window	386
AD	Arm to Door	194
HD	Hip Point to Door	210

DATA SHEET NO. 5 **CAMERA AND INSTRUMENTATION DATA**

Test Vehicle: 2015 Mazda CX-9 Sport SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20155400
 Test Date: 12/12/2014



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

Camera No.	View	Coordinates (mm)			Lens (mm)	Film Speed (fps)
		X*	Y*	Z*		
1	Real-Time Pan View					30
2	Front Ground Level	-60	5310	-1620	24	1000
3	Impact Side 45° Forward	-2510	5310	-1620	20	1000
4	Overhead Closeup	50	0	-4520	50	1000
5	Onboard – Driver Front				16	1000
6	Onboard – Driver Side				8	1000
7	Onboard – Driver Rear				8	1000
8	Rear Ground Level	-60	-5450	-1690	24	1000
9	Impact Side 45° Rearward	-3400	-3240	-1760	20	1000
10	Overhead Wide View	540	0	-4600	14	1000
11	Real-Time Dummy Front View					30

* All measurements accurate to ± 6 mm

Note: Vehicle was at a 75° angle to the rigid pole.

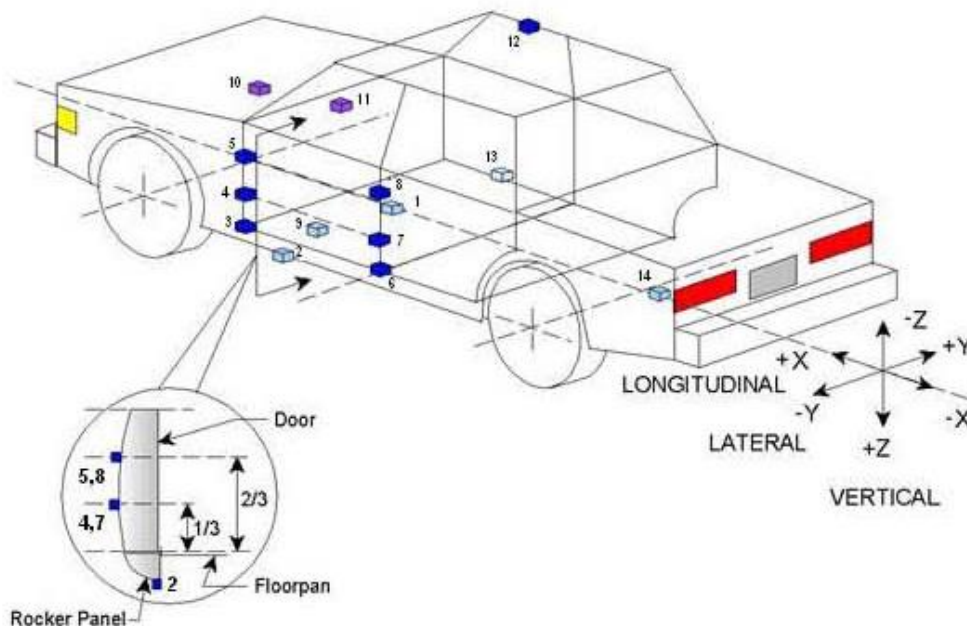
Explain why camera(s) did not operate as intended: None

INSTRUMENTATION	Number of Channels
Driver Dummy	16
Vehicle Structure	18
Pole Load Cells	8
TOTAL	42

DATA SHEET NO. 6 **VEHICLE ACCELEROMETER DATA**

Test Vehicle: 2015 Mazda CX-9 Sport SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. M20155400
Test Date: 12/12/2014



	Accelerometer Location			
	ID	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2807	0	-480
2	Left Floor Sill	3216	-732	-258
3	A Pillar Sill	3444	-732	-252
4	A Pillar Low	3421	-870	-699
5	A Pillar Mid	3413	-875	-880
6	B Pillar Sill	2293	-727	-268
7	B Pillar Low	2317	-770	-736
8	B Pillar Mid	2291	-745	-950
9	Driver Seat Track	2608	-395	-430
10	Engine Top	4358	-10	-830
11	Firewall	3945	43	-994
12	Right Roof	2270	550	-1703
13	Right Floor Sill	3191	732	-263
14	Rear Floorpan	726	0	-705

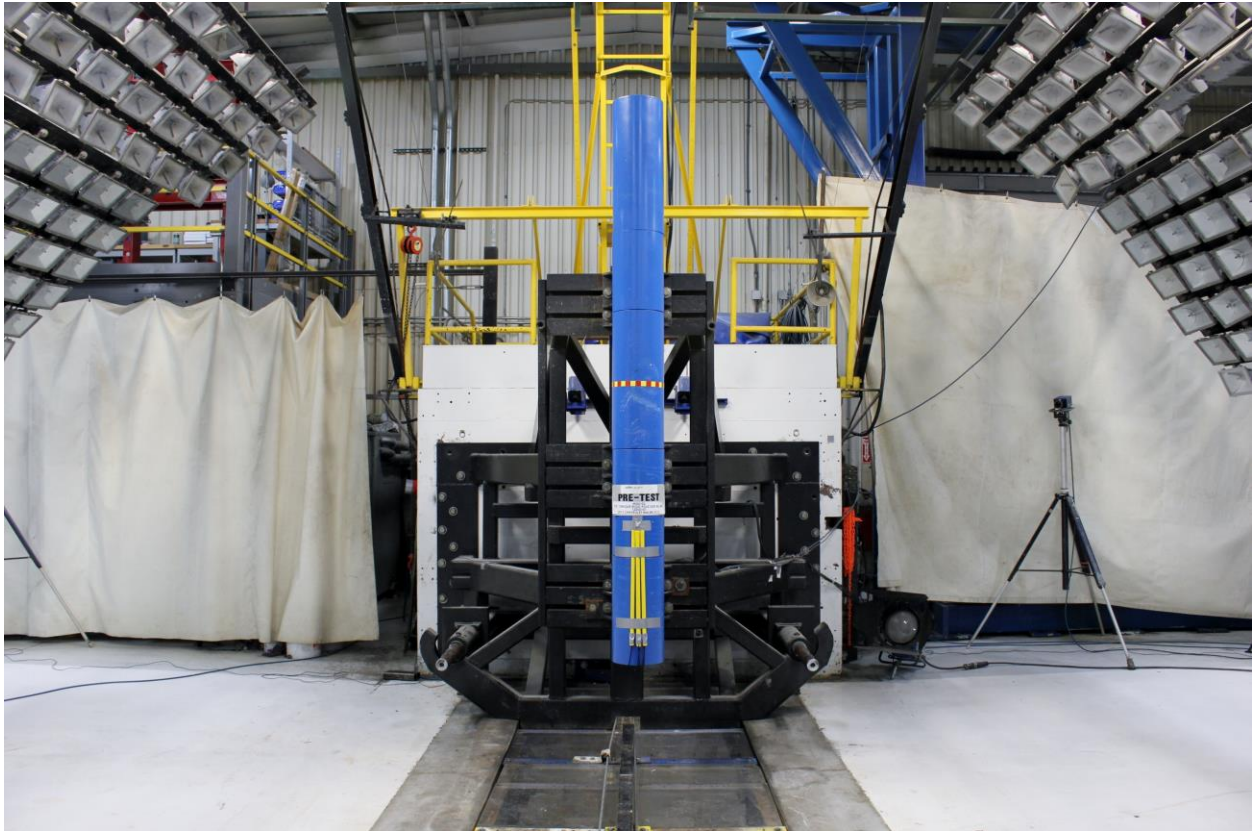
Reference:

X – Test Vehicle Rear Bumper (+forward)
Y – Test Vehicle Centerline (+ to right)
Z – Ground Plane (+ down)

DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA

Test Vehicle: 2015 Mazda CX-9 Sport SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. M20155400
Test Date: 12/12/2014



254 mm Diameter Rigid Pole

Load Cell Locations	
ID	Height From Impact Surface (mm)
1	182
2	470
3	698
4	986
5	1212
6	1641
7	1854
8	2053

**DATA SHEET NO. 8
POST-TEST OBSERVATIONS**

Test Vehicle: 2015 Mazda CX-9 Sport SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. M20155400
Test Date: 12/12/2014

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Driver SID-IIs Dummy
Face	Curtain Airbag
Top of Head	Curtain Airbag
Left Side of Head	Curtain Airbag
Back of Head	Curtain Airbag, Headrest
Left Shoulder	Side Airbag, Seatback
Upper Torso	Side Airbag, Seatback
Lower Torso	Side Airbag, Seatback
Left Hip	Side Airbag, Seatpan
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 Systems Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)	N/A	N/A	N/A	N/A	N/A

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No Separation
Sill Separation	None
Windshield Damage	Cracked
Side Window Damage	Left Front Window Broken
Other Notable Effects	None

DATA SHEET NO. 8 (CONTINUED)
POST-TEST OBSERVATIONS

Test Vehicle: 2015 Mazda CX-9 Sport SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. M20155400
Test Date: 12/12/2014

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

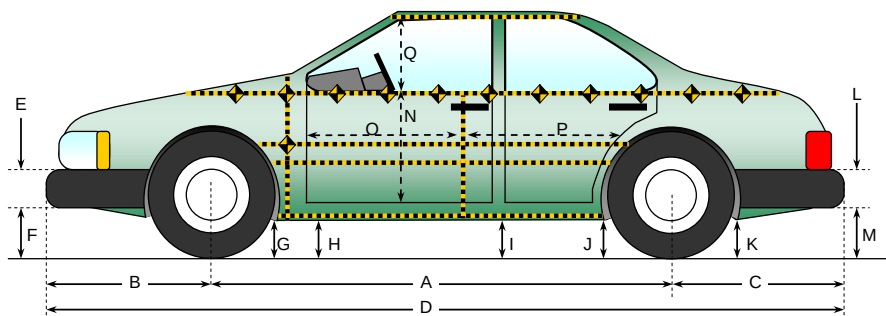
VEHICLE SPEED, VEHICLE ANGLE AT IMPACT, AND IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		1049
Actual Impact Point (Aft of Front Axle)	mm		1060
Horizontal Offset (+forward / -rearward)	mm	+/- 38 of Intended Impact Point	-11
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	deg	75 +/- 3	75
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.18
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.17

DATA SHEET NO. 9 **VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2015 Mazda CX-9 Sport SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20155400
 Test Date: 12/12/2014



All measurements in (mm) with tolerance of ± 3 mm

LEFT SIDE VIEW

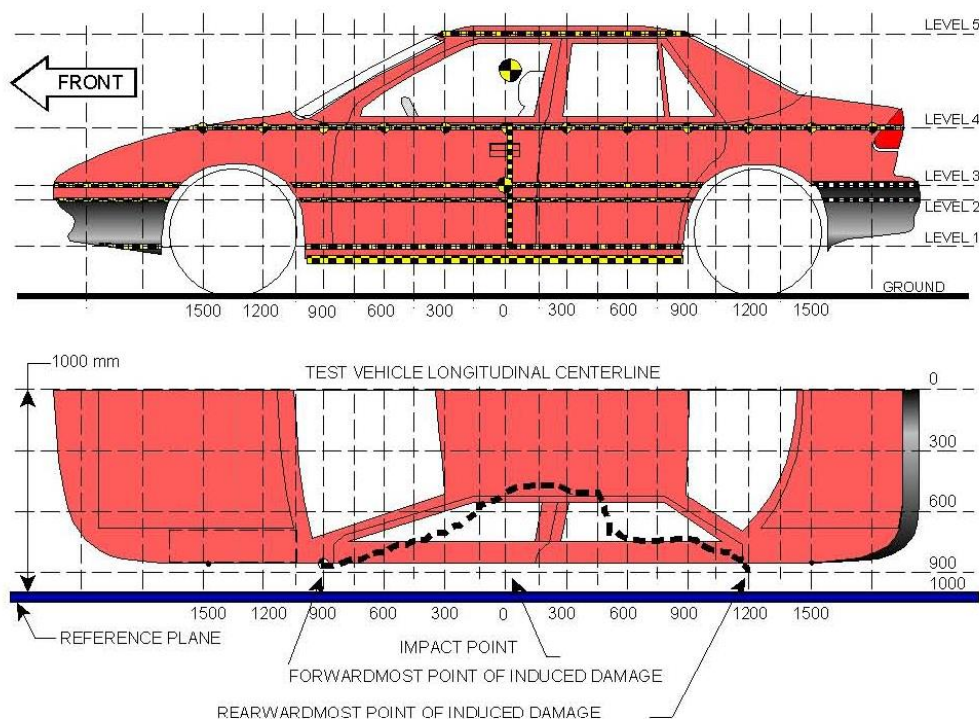
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2875	2792	83
B	Front Axle to FSOV	1091	1133	-42
C	Rear Axle to RSOV	1130	1135	-5
D	Total Vehicle Length at Centerline	5096	5060	36
E	Front Bumper Thickness	112	112	0
F	Front Bumper Bottom to Ground	263	304	-41
G	Sill Height at Front Wheel Well	231	235	-4
H	Sill Height at Front Door Leading Edge	234	238	-4
I	Sill Height at B-Pillar	244	276	-32
J1	Sill Height at Rear Wheel Well	255	267	-12
J2	Pinch Weld Height at Rear Wheel Well	251	262	-11
K	Sill Height Aft of Rear Wheel Well	303	321	-18
L	Rear Bumper Thickness	112	112	0
M	Rear Bumper Bottom to Ground	372	373	-1
N	Sill Height to Bottom of Front Window Sill	956	942	14
O	Front Door Leading Edge to Impact CL	570	397	173
P	Rear Door Trailing Edge to Impact CL	1432	1308	124
Q	Front Window Opening	399	347	52
R	Right Side Length	3980	3993	-13
S	Left Side Length	3980	3810	170
T	Vehicle Width at B-Pillars	1922	1835	87

DATA SHEET NO. 10 VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Mazda CX-9 Sport SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No. M20155400
Test Date: 12/12/2014



NOTE: The measurements are taken along the vertical impact reference line.
Vehicle measurements forward of the vertical impact reference line are negative.

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	414	420	0
2	Mid Door	703	455	0
3	Occupant Hip Point	744	456	75
4	Window Sill	1105	390	0
5	Window Top	1590	178	75

DATA SHEET NO. 10 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Mazda CX-9 Sport SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20155400
 Test Date: 12/12/2014

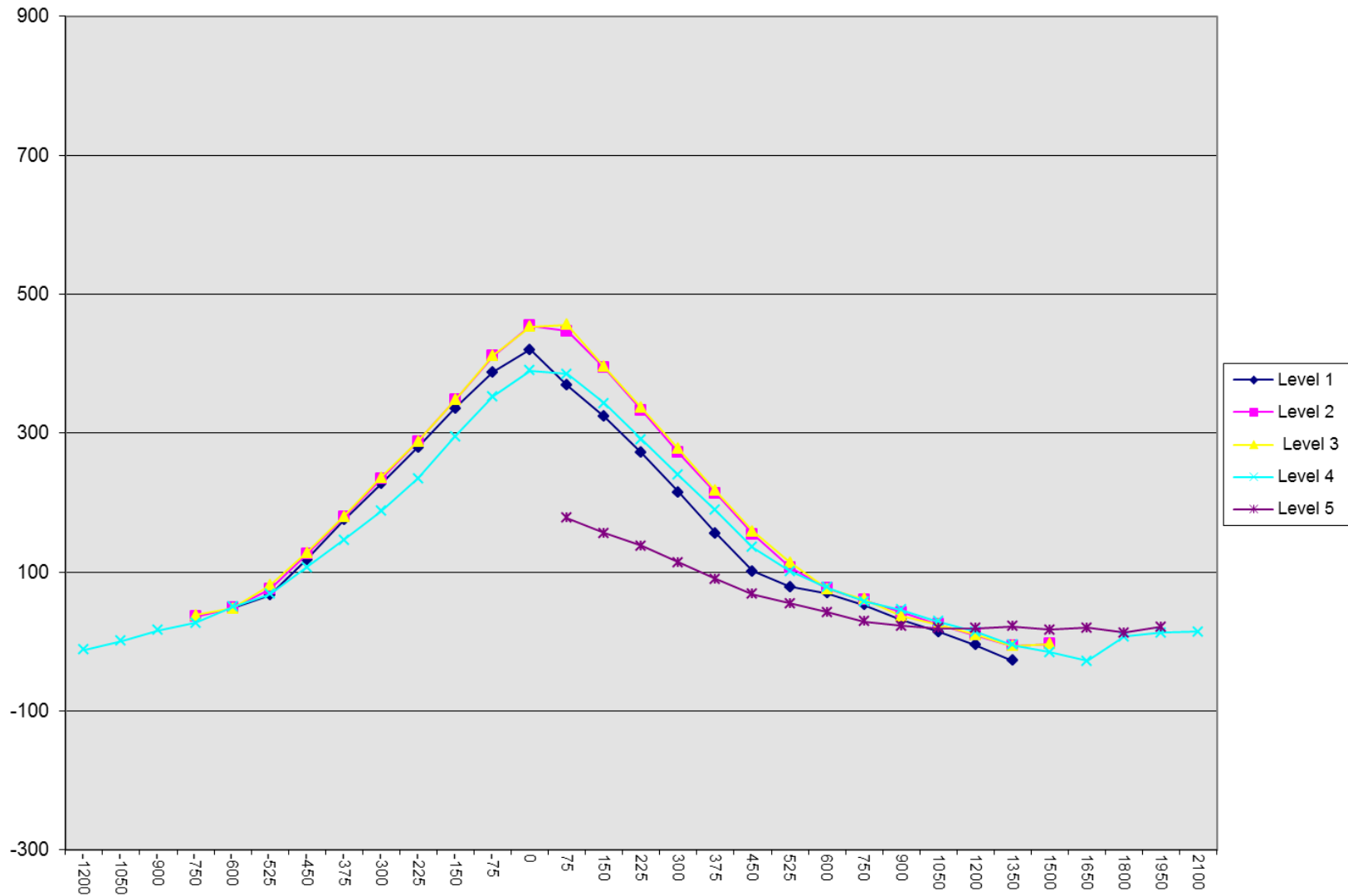
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1200				325					313					-12	
-1050				301					302					1	
-900				282					298					16	
-750		134	132	263			170	170	290			36	38	27	
-600	160	138	137	246		208	187	185	296		48	49	48	50	
-525	157	145	143	240		224	220	224	308		67	75	81	68	
-450	157	145	144	233		275	271	272	340		118	126	128	107	
-375	155	144	143	230		330	323	323	376		175	179	180	146	
-300	155	144	141	225		382	378	377	413		227	234	236	188	
-225	154	143	141	219		434	431	429	454		280	288	288	235	
-150	153	142	140	213		489	490	488	508		336	348	348	295	
-75	153	141	139	210		541	552	551	563		388	411	412	353	
0	153	140	139	208		573	595	592	598		420	455	453	390	
75	154	140	138	205	460	523	587	594	590	638	369	447	456	385	178
150	154	140	138	203	456	478	534	534	546	612	324	394	396	343	156
225	154	140	138	200	450	426	473	475	491	588	272	333	337	291	138
300	154	140	138	199	449	369	412	416	439	563	215	272	278	240	114
375	156	140	139	198	448	312	354	356	387	538	156	214	217	189	90
450	156	140	139	195	446	257	295	298	331	514	101	155	159	136	68
525	157	142	140	192	442	236	249	254	293	497	79	107	114	101	55
600	156	143	139	192	442	226	220	215	270	484	70	77	76	78	42
750	158	143	140	188	442	211	203	201	246	471	53	60	61	58	29
900	160	143	141	186	442	192	185	178	232	465	32	42	37	46	23
1050	161	145	143	184	445	175	170	168	213	464	14	25	25	29	19
1200	163	145	144	181	446	158	154	154	195	465	-5	9	10	14	19
1350	166	138	137	177	446	139	132	131	172	468	-27	-6	-6	-5	22
1500		132	131	176	452		129	128	161	469		-3	-3	-15	17
1650				178	458				150	478				-28	20
1800				180	465				187	478				7	13
1950				183	475				196	496				13	21
2100				190					204					14	

Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush pile grid is established prior to the test based on an estimated impact point. The final distance from impact is determined after the final dummy positioning and the pole is aligned with the center of gravity of the dummy's head.

DATA SHEET NO. 10 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Mazda CX-9 Sport SUV
Test Program: NCAP Side Pole Impact Test

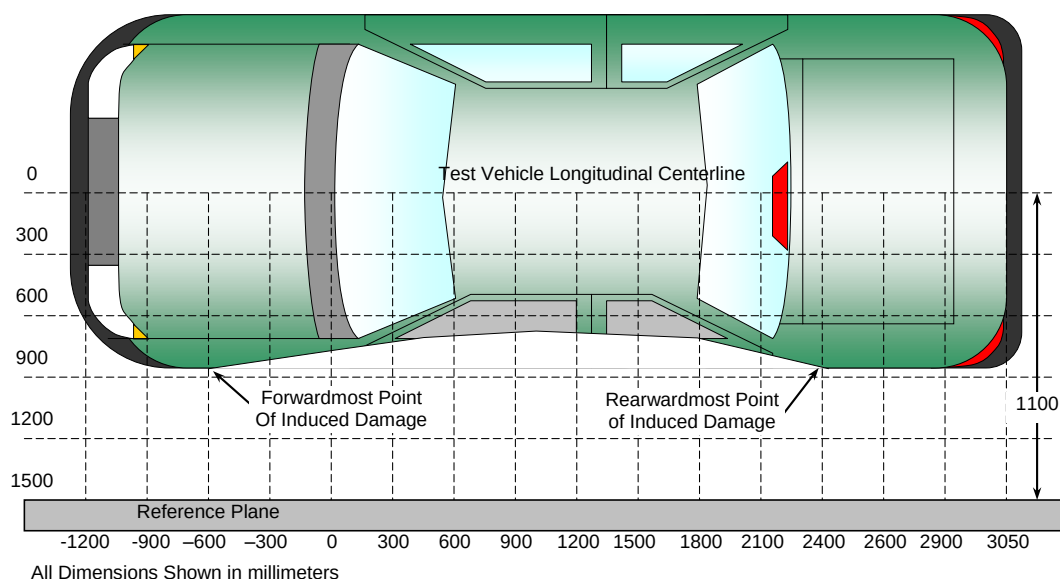
NHTSA No. M20155400
Test Date: 12/12/2014



DATA SHEET NO. 11 **VEHICLE DAMAGE PROFILE DISTANCES**

Test Vehicle: 2015 Mazda CX-9 Sport SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20155400
 Test Date: 12/12/2014



TOP VIEW

DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	575	3	139	217	78
2	345	3	138	383	245
3	115	3	138	558	420
4	-115	3	139	524	385
5	-345	3	142	346	204
6	-575	3	139	185	46

DATA SHEET NO. 12
FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2015 Mazda CX-9 Sport SUV
 Test Program: NCAP Side Pole Impact Test

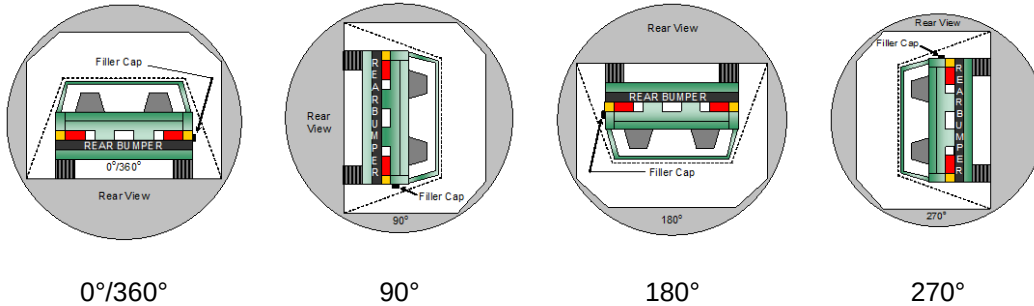
NHTSA No. M20155400
 Test Date: 12/12/2014

Test Time: 10:11 am

Temperature: 21.1°C

- A. From impact until vehicle motion ceases: 0 oz.
 (Maximum Allowable = 1 ounce)
 B. For the 5 minute period after motion ceases: None
 (Maximum allowable = 5 ounces)
 C. For the following 25 minutes: None
 (Maximum allowable = 1 oz./minute)
 D. Spillage Details: None

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	109	300	409
90° to 180°	111	300	411
180° to 270°	107	300	407
270° to 360°	113	300	413

FMVSS 301 ROLLOVER SPILLAGE TABLE (units in ounces)

Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eight Minute
0° to 90°	0	0	0	0
90° to 180°	0	0	0	0
180° to 270°	0	0	0	0
270° to 360°	0	0	0	0

ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	
90° to 180°	
180° to 270°	
270° to 360°	

DATA SHEET NO. 13
DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle: 2015 Mazda CX-9 Sport SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No. M20155400
 Test Date: 12/12/2014

