

**REPORT NUMBER: SPNCAP-KAR-16-005
NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST**

**TOYOTA MOTOR CORPORATION
2016 LEXUS ES 350 4-DOOR SEDAN**

NHTSA No: M20165101

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

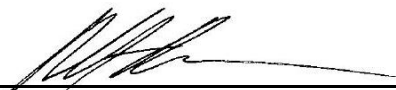


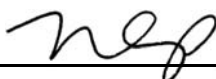
NOVEMBER 25, 2015

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE: NVS-111
1200 NEW JERSEY AVE, SE, ROOM W43-410
WASHINGTON, D.C. 20590**

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

Prepared By: 
Mr. Robert S. Ramos, Project Engineer
KARCO Engineering, LLC.

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

Approved By: 
Mr. Frank D. Richardson, Program Manager
KARCO Engineering, LLC.

Approval Date: November 25, 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-KAR-16-005	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 2016 Lexus ES 350 4-Door Sedan NHTSA No. M20165101		5. Report Date November 25, 2015																												
		6. Performing Organization Code KAR																												
7. Authors Mr. Robert S. Ramos, Project Engineer, KARCO Mr. Frank Richardson, Program Manager, KARCO		8. Performing Organization Report No. TR-P35004-04-NC																												
9. Performing Organization Name and Address KARCO Engineering, LLC. 9270 Holly Rd. Adelanto, CA 92301		10. Work Unit No.																												
		11. Contract or Grant No. DTNH22-14-D-00355																												
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NRM-110) 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C. 20590		13. Type of Report and Period Covered Final Test Report, November 11 - 25, 2015																												
		14. Sponsoring Agency Code NRM-110																												
15. Supplementary Notes																														
16. Abstract A 32.2 km/h (20 mph) 75 deg. oblique impact side PINCAP test was conducted on the subject 2016 Lexus ES 350 4-door sedan 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 11, 2015. The impact velocity was 32.54 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 15.0 deg. C. The target vehicle's maximum post-test static crush was 443 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>551.5</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>g</td> <td>82</td> <td>42</td> </tr> <tr> <td>Total Pelvic Force (Sum of Acetabular and Iliac Forces)</td> <td>N</td> <td>5525</td> <td>3480</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>26</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	551.5	Resultant Lower Spine Acceleration	g	82	42	Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	3480	Maximum Thoracic Rib Deflection	mm	38	21	Maximum Abdominal Rib Deflection	mm	45	26
Measurement Description	Driver ATD (SID-IIs)																													
	Units	Threshold	Result																											
Head Injury Criteria (HIC ₃₆)		1000	551.5																											
Resultant Lower Spine Acceleration	g	82	42																											
Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	3480																											
Maximum Thoracic Rib Deflection	mm	38	21																											
Maximum Abdominal Rib Deflection	mm	45	26																											
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																												
19. Security Classification of this report UNCLASSIFIED	20. Security Classification of this page UNCLASSIFIED	21. No. of Pages 106	22. Price																											

TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
1	Test Purpose and Procedure	1
2	Summary of Test Results	2
3	Occupant and Vehicle Information / Data Sheets	4
<u>Data Sheet</u>		<u>Page</u>
1	General Test and Vehicle Parameter Data	5
2	Seat, Seat Belt, Steering Wheel Adjustment, and Fuel System Data	9
3	Dummy Longitudinal Clearance Dimensions	13
4	Dummy Lateral Clearance Dimensions	14
5	Camera and Instrumentation Data	15
6	Test Vehicle Accelerometer Locations	16
7	Rigid Pole Load Cell Data	17
8	Post-Test Observations	18
9	Test Vehicle Profile Measurements	20
10	Test Vehicle Exterior Crush Measurements	21
11	Vehicle Damage Profile Distances	24
12	FMVSS No. 301 Static Rollover Results	25
13	Dummy/Vehicle Temperature and Humidity Stabilization	26
<u>Appendix</u>		<u>Page</u>
A	Photographs	A
B	Vehicle and Dummy Response Data Plots	B
C	Dummy Configuration and Performance Verification Data	C
D	Test Equipment and Instrumentation Calibration Data	D

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 Lexus ES 350 4-door sedan. 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 Lexus ES 350 4-door sedan. The subject vehicle was towed into the rigid pole at an angle of 75.7° and a velocity of 32.54 km/h. The test was conducted by KARCO Engineering, LLC. in Adelanto, California on November 11, 2015. Pre- and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

One Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure, dated 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	551.5
Lower Spine (T12) Resultant Acceleration	g	82	42
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3480
Maximum Thoracic Rib Deflection	mm	38*	21
Maximum Abdominal Rib Deflection	mm	45*	26

**Proposed IARV*

Supplemental restraint information is given below:

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No	No	
Knee Airbag	Yes	No	No	
Side Airbag 1 (Curtain)	Yes	Yes	Yes	Yes
Side Airbag 2 (Torso/Pelvis)	Yes	Yes	Yes	Yes
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. 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 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15

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 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
 Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20165101
Model Year	2016
Make	Lexus
Model	ES 350
Body Style	4-Door Sedan
VIN	JTHBK1GG3G2217065
Body Color	Atomic Silver
Odometer Reading (km / mi)	21 / 13
Engine Displacement (L)	3.5
Type / No. of Cylinders	V6
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	Yes
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks	Yes
Power Window Auto-Reverse	Yes
Other Optional Feature	No
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	Yes
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head/Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso/Pelvis Airbag	Yes
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	Toyota Motor Corporation
Date of Manufacture	Jul-15
Vehicle Type	Passenger Car

GVWR (kg)	2132
GAWR Front (kg)	1191
GAWR Rear (kg)	1152

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				407.0	A
DSC x 68.04 (kg)				340.2	B
Cargo Weight (RCLW) (kg)				66.8	A-B

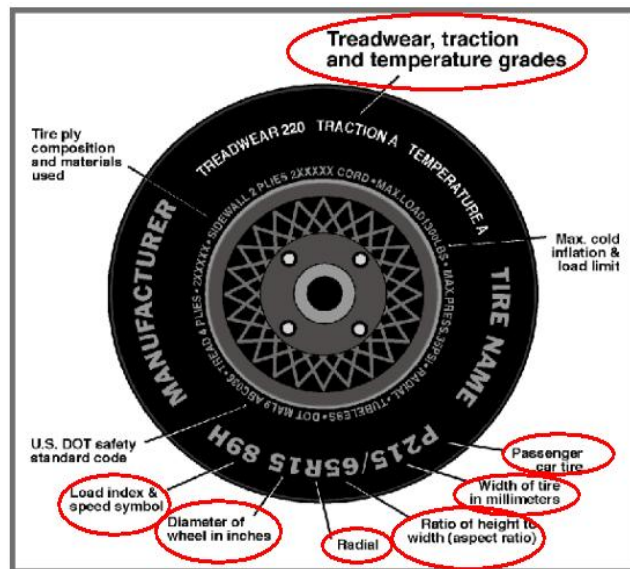
VEHICLE SEAT TYPE

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

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2016 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
 Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15



Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	350	350
Cold Pressure (kPa)	230	230
Recommended Tire Size	P215/55R17	P215/55R17
Tire Size on Vehicle	P215/55R17	P215/55R17
Tire Manufacturer	Michelin	Michelin
Tire Model	Primacy MXV4	Primacy MXV4
Treadware	500	500
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 1 Polyamide, 2 Steel	1 Polyester, 1 Polyamide, 2 Steel
Load Index/Speed Symbol	93V	93V
Tire Material	Polyester, Polyamide, Steel	Polyester, Polyamide, Steel
DOT Safety Code Left	M33F 009X 0515	M33F 009X 0515
DOT Safety Code Right	M33F 009X 0515	M33F 009X 0515

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2016 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
 Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	230	230	230	230
Tire Placard	kPa	230	230	230	230
Owner's Manual	kPa	230	230	230	230
As Tested	kPa	230	230	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	506.0	312.0		524.5	355.0		523.0	369.0	
Right	kg	499.0	315.0		505.5	355.5		497.0	356.0	
Ratio	%	61.6%	38.4%	100.0%	59.2%	40.8%	100.0%	58.5%	41.5%	100.0%
Total	kg	1005.0	627.0	1632.0	1030.0	710.5	1740.5	1020.0	725.0	1745.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1632.0	A
Actual Weight of 1 P572V ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	66.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1747.8	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)*	°	-0.4	-0.2	0.1	Yes
Front Passenger Sill Angle (front-to-rear)*	°	-0.4	-0.2	0.1	Yes
Front Bumper-Line Angle (left-to-right)**	°	-0.6	-0.2	-0.2	Yes
Rear Bumper-Line Angle (left-to-right)**	°	-0.2	-0.4	-0.5	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 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Trunk Trim	7.0
Spare Tire	14.5
Spare Tire Tools	3.0
Ballast / Equipment Added	66.5

Test Height Adjustable Setting (If Applicable)	
--	--

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

Test Vehicle: 2016 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
 Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15

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	10.5	0.0	5.3
Front Passenger Seat	10.3	0.0	5.2
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 SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid Fore/Aft	Forwardmost
Driver Seat	5.3	504	Max	502	510	524
			Mid	483	491	504
			Min	463	472	483
Front Passenger Seat	5.2	507	Max	507	518	526
			Mid	487	498	507
			Min	466	478	488
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 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
 Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15

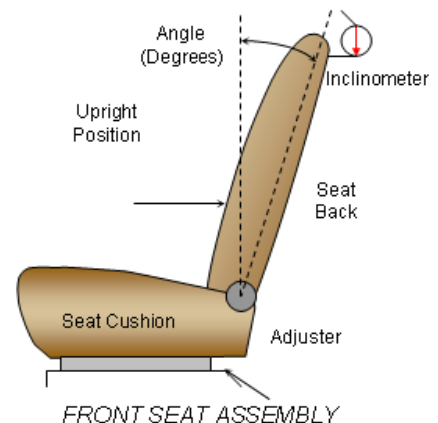
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	260		0	
Front Passenger Seat	260		0	
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

*Detent zero (0) is the forward most detent

SEAT BACK ADJUSTMENT

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



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/Seated Dummy	50.8		-2.4	
Front Passenger Seat	52.2		-2.4	
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

*Detent zero (0) is the forward most detent

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

Test Vehicle: 2016 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15

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	4	H

HEAD RESTRAINT ADJUSTMENT

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

	Total No. of Positions	Placed in Position
Driver Seat	2 (0-1) Vertical Adjustment 4 (0-3) Horizontal Adjustment	Full Down / Full Forward

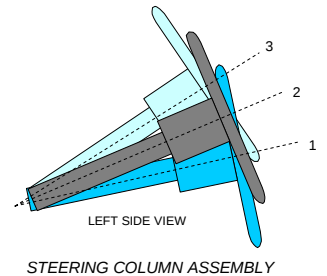
DATA SHEET NO. 2 ... (CONTINUED)

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

Test Vehicle: 2016 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
 Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15

STEERING COLUMN ADJUSTMENT

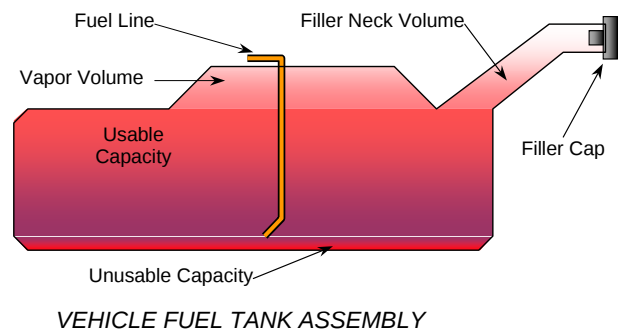
Steering wheel and column adjustments are made so that the steering wheel hub is at the center of the geometric locus it describes when it moves through its full range of motion.



	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	19.6	98
Geometric Center - Position 2	22.5	119
Uppermost - Position 3	25.4	140
Telescoping Steering Wheel Travel		42
Test Position	22.5	119

FUEL PUMP

The vehicle is equipped with an electric fuel pump.



FUEL TANK CAPACITY

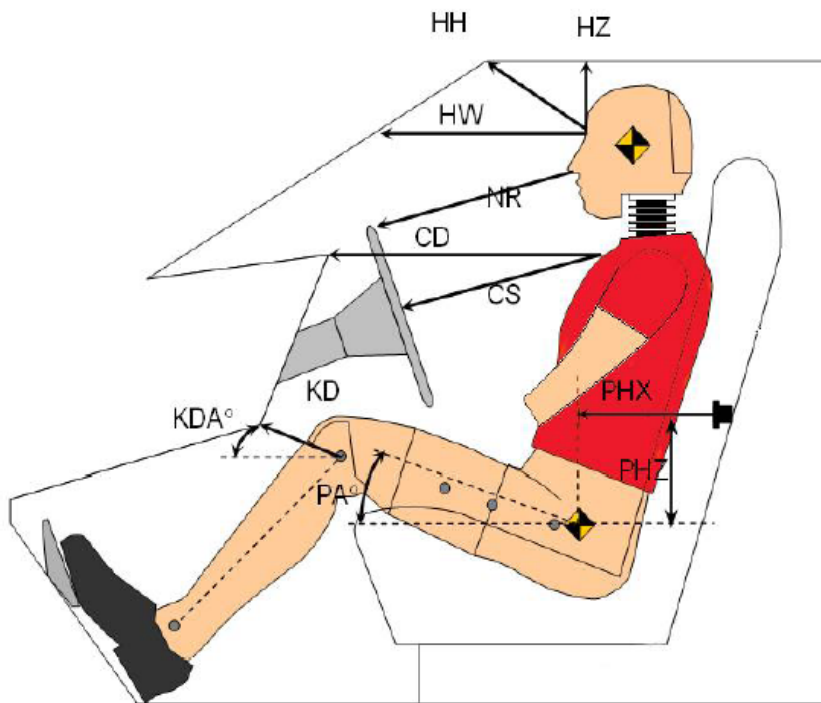
Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	63.44
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)	
Usable Capacity of "Optional Tank" (see Owner's Manual)	
93% of Usable Capacity	59.00
Actual amount of Solvent Used in Test	59.00
1/3 of Usable Capacity	21.15

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 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
 Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15

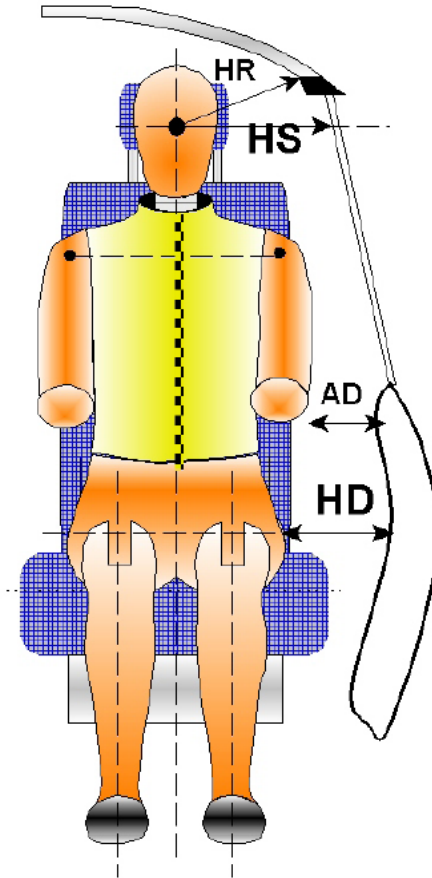


Driver Code	Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	225	
HW	Head to Windshield	631	
HZ	Head to Roof	163	
NR	Nose to Rim	233	
CD	Chest to Dash	404	
CS	Chest to Steering Wheel	166	
KD(L)/KDA(L)°	Left Knee to Dash	130	20.2
KD(R)/KDA(R)°	Right Knee to Dash	124	25.7
PAX°	Pelvic Tilt Angle (x-axis)		21.1
PAY°	Pelvic Tilt Angle (y-axis)		0.0
PHX	Hip Point to Striker (x-axis)	398	
PHZ	Hip Point to Striker (z-axis)	234	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15

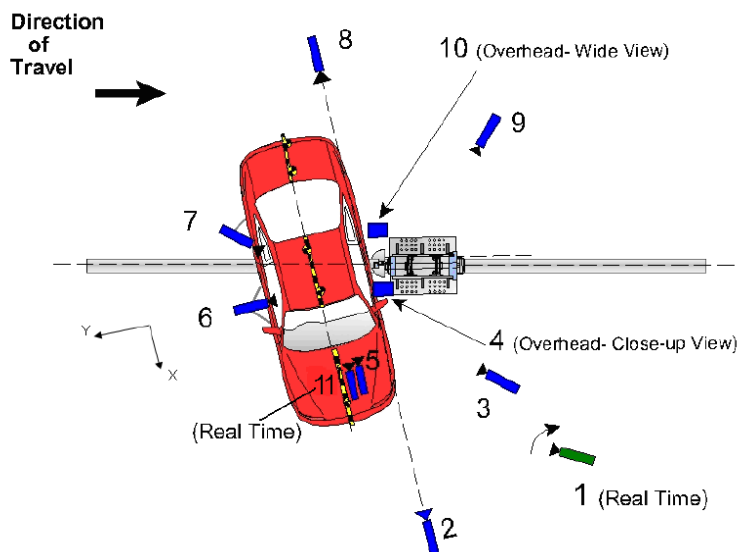


Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	237
HS	Head to Side Window	mm	377
AD	Arm to Door	mm	177
HD	Hip Point to Door	mm	223

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2016 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
 Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15



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	0.51	-1.42	35	1000
6	On-Board - Dummy Side View	-0.10	1.73	-1.05	14	1000
7	On-Board - Dummy Rear Oblique View	-1.00	1.72	-1.07	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	1.57	0.62	-1.46		30

*All measurements accurate to ± 6 mm

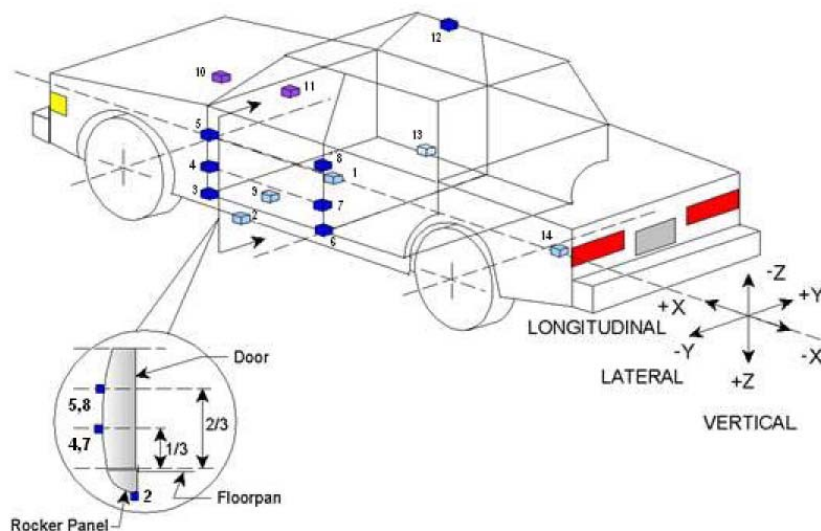
INSTRUMENTATION

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 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
 Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15

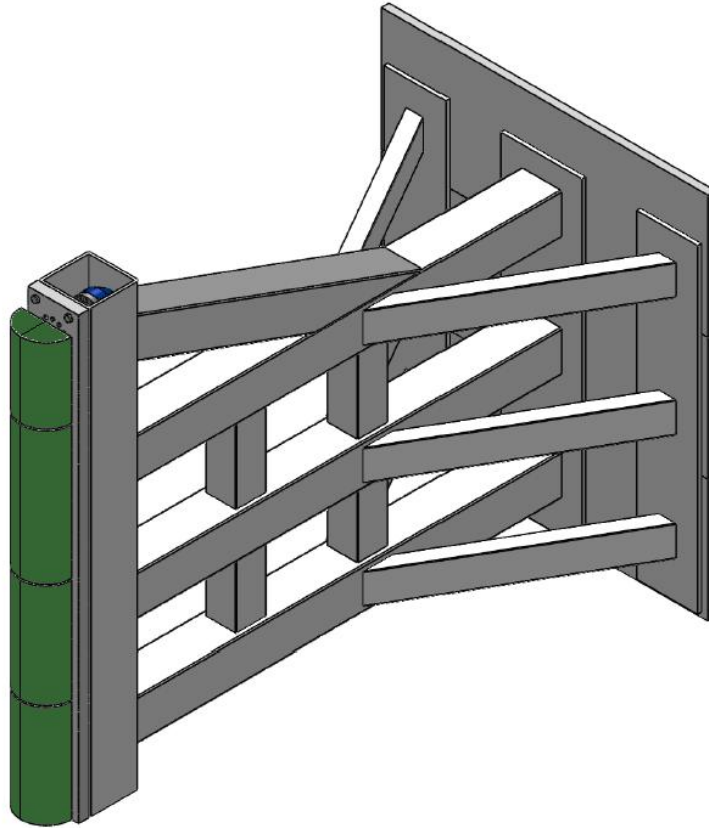


Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1770	0	-275
2	Left Floor Sill	2180	-850	-220
3	A-Pillar Sill	3105	-820	-370
4	A-Pillar Low	3105	-820	-570
5	A-Pillar Mid	3105	-820	-880
6	B-Pillar Sill	1989	-760	-470
7	B-Pillar Low	1989	-755	-570
8	B-Pillar Mid	1989	-770	-825
9	Driver Seat Track	2110	-220	-280
10	Engine Top	3952	130	-840
11	Firewall	3539	170	-845
12	Right Roof	2160	650	-1450
13	Right Floor Sill	1875	725	-320
14	Rear Floorpan	569	-20	-450

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 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15



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 Lexus ES 350 4-Door Sedan NHTSA No. M20165101Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15**TEST DUMMY INFORMATION AND CONTACT POINTS**

Dummy Body Part	Driver SID-IIs Dummy
Face	Curtain Airbag
Top of Head	Curtain Airbag
Left Side of Head	Curtain Airbag
Back of Head	Curtain Airbag, Headrest
Left Shoulder	Torso/Pelvis Airbag
Upper Torso	Seat
Lower Torso	Seat, Torso/Pelvis Airbag
Left Hip	Seat, Torso/Pelvis Airbag
Left Knee	Door Panel, Right Knee

POST-TEST DOOR PERFORMANCE

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

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No separation occurred
Sill Separation	No separation occurred
Windshield Damage	Broken
Side Window Damage	Driver window broken
Other Notable Effects	Sunroof lifted from closed position

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

Test Vehicle: 2016 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
 Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

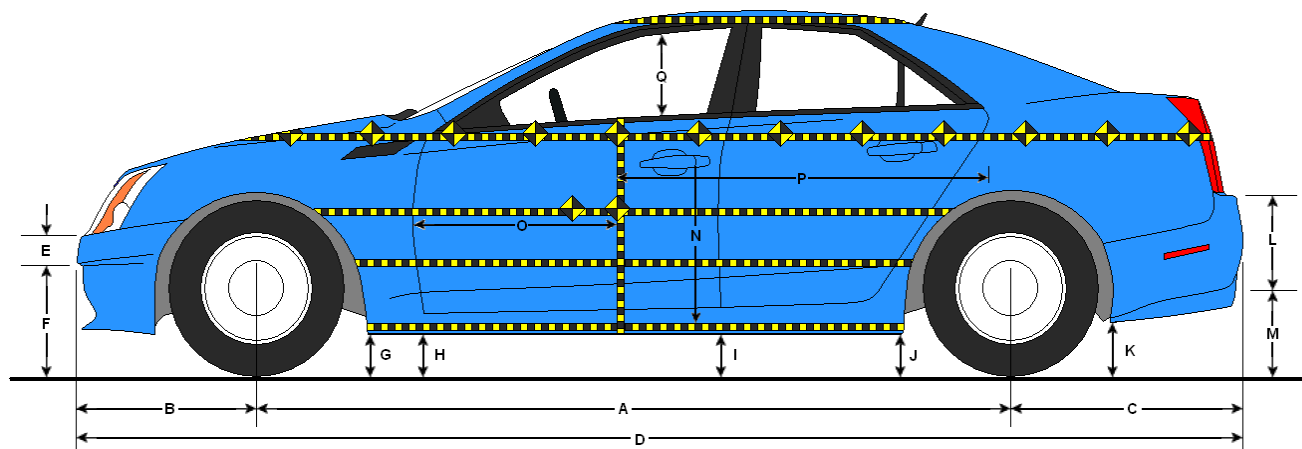
IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		1095
Actual Impact Point (Aft of Front Axle)	mm		1103
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	-8
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	75.7
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.54
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.48

DATA SHEET NO. 9

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2016 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
 Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15



LEFT SIDE VIEW

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

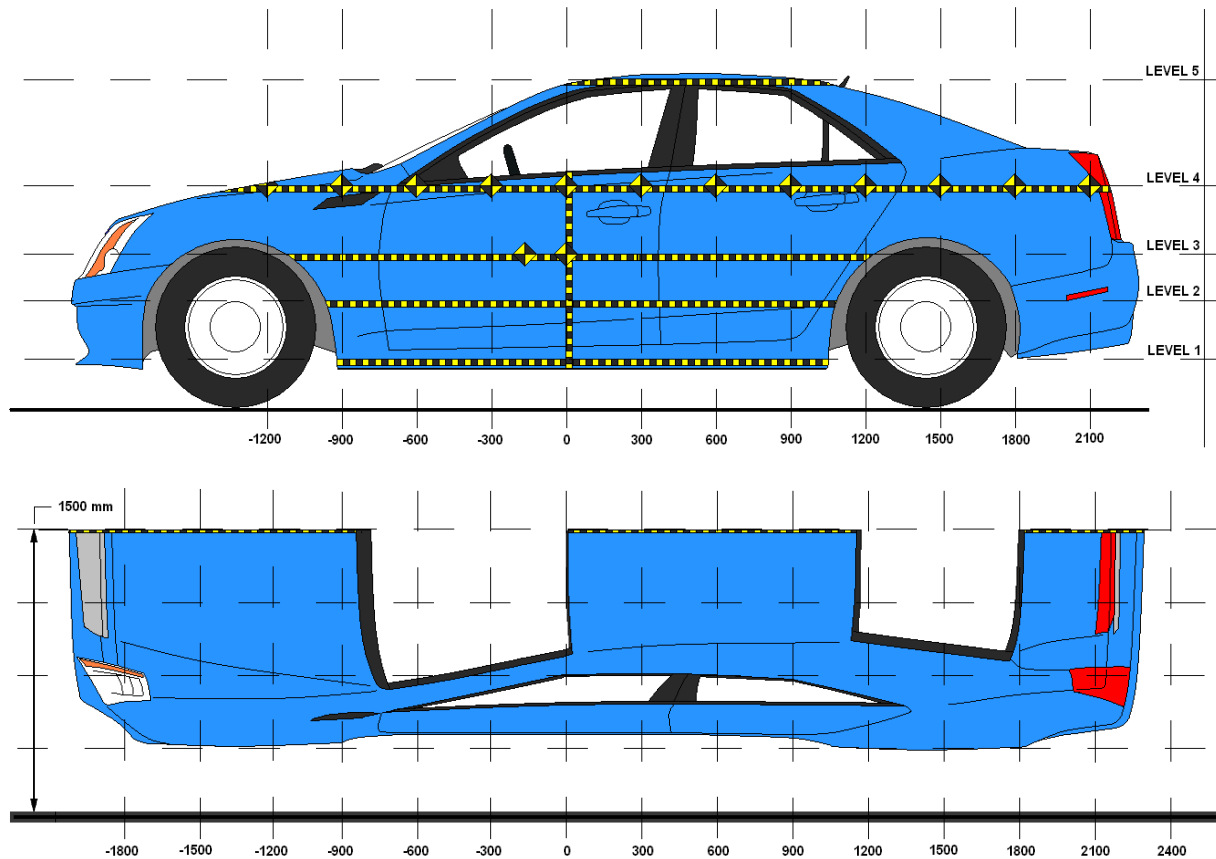
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2812	2732	-80
B	Front Axle to FSOV	995	1023	28
C	Rear Axle to RSOV	1077	1099	22
D	Total Length at Centerline	4885	4854	-31
E	Front Bumper Thickness	321	324	3
F	Front Bumper Bottom to Ground	280	315	35
G	Sill Height at Front Wheel Well	184	191	7
H	Sill Height at Front Door Leading Edge	185	186	1
I	Sill Height at B-Pillar	232	260	28
J1	Sill Height at Rear Wheel Well	204	239	35
J2	Pinch Weld Height at Rear Wheel Well	218	249	31
K	Sill Height Aft of Rear Wheel Well	234	252	18
L	Rear Bumper Thickness	245	245	0
M	Rear Bumper Bottom to Ground	402	419	17
N	Sill Height to Bottom of Front Window Sill	687	675	-12
O	Front Door Leading Edge to Impact CL	618	519	-99
P	Rear Door Trailing Edge to Impact CL	1693	1595	-98
Q	Front Window Opening	403	441	38
R	Right Side Length	3296	3316	20
S	Left Side Length	3294	3195	-99
T	Vehicle Width at B-Pillar	1798	1680	-118

DATA SHEET NO. 10

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
 Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15



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	238	392	0
2	Occupant H-Point	542	438	0
3	Mid-Door	673	443	0
4	Window Sill	929	415	150
5	Window Top	1388	205	150

DATA SHEET NO. 10 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
 Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15

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				696					748					52	
-750		596	603	684			669	674	748			73	71	64	
-600	624	599	605	674		734	684	675	720		110	85	70	46	
-450	629	601	604	662		798	784	762	787		169	183	158	125	
-300	631	603	604	635		865	870	858	850		234	267	254	215	
-150	631	604	603	649		934	958	952	951		303	354	349	302	
0	630	605	604	645		1022	1043	1047	1052		392	438	443	407	
150	629	607	604	643	910	1006	1030	1041	1058	1115	377	423	437	415	205
300	627	609	606	642	914	911	917	927	954	1082	284	308	321	312	168
450	626	610	607	642	918	845	825	831	862	1051	219	215	224	220	133
600	625	612	609	643	921	793	776	768	791	1020	168	164	159	148	99
750	624	615	612	645	923	752	749	745	772	997	128	134	133	127	74
900	622	618	614	646	925	715	723	723	753	978	93	105	109	107	53
1050	620	619	617	648	924	683	700	702	734	969	63	81	85	86	45
1200	627	613	617	650	923	659	672	679	714	959	32	59	62	64	36
1350		591	602	654	920		624	639	694	951		33	37	40	31
1500			594	638	918			627	658	946			33	20	28
1650				659	918				659	944				0	26
1800				666					692					26	
1950				675					695					20	
2100				683					700					17	
2250															
2400															
2550															
2700															
2850															

DATA SHEET NO. 10 ... (CONTINUED)

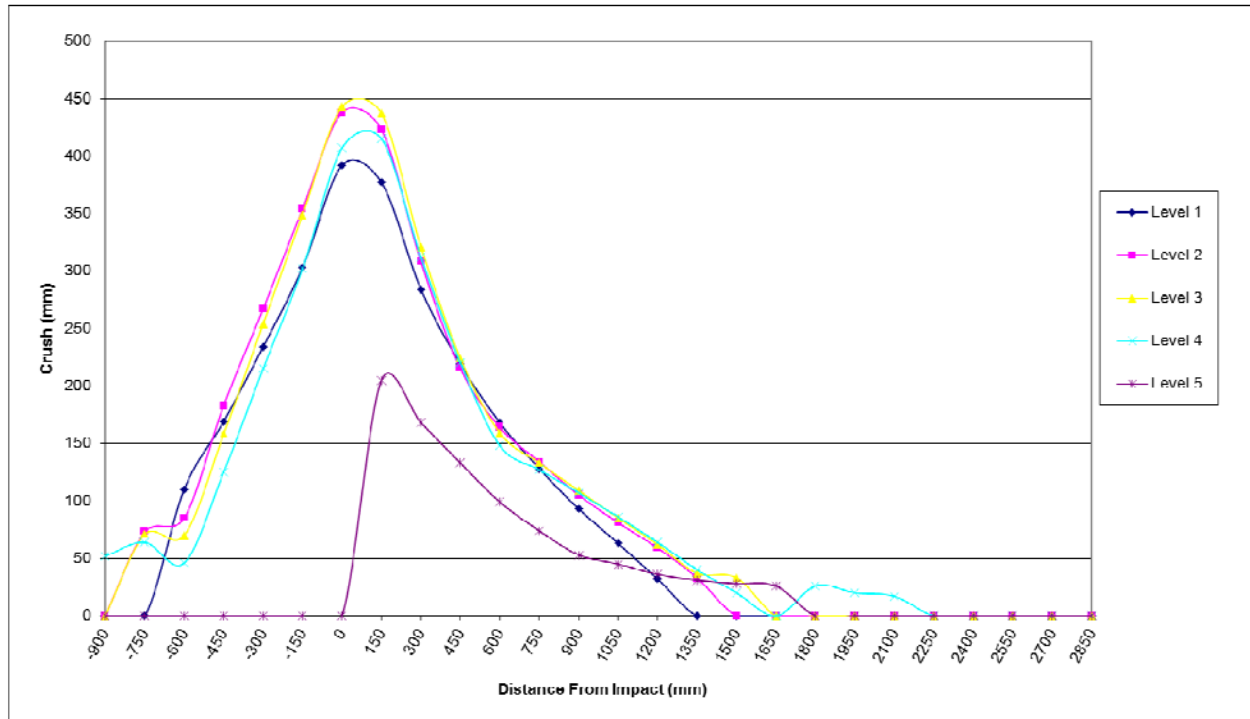
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2016 Lexus ES 350 4-Door Sedan

NHTSA No. M20165101

Test Program: NCAP Side Pole Impact Test

Test Date: 11/11/15

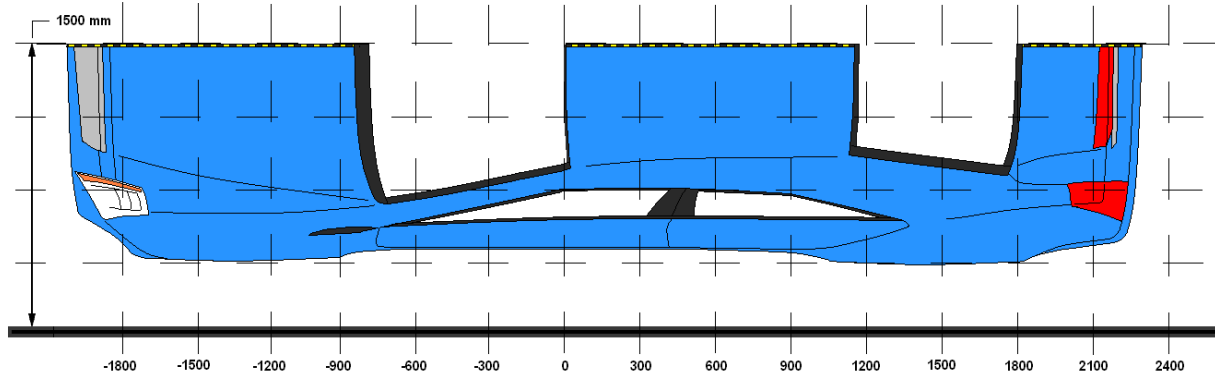


DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2016 Lexus ES 350 4-Door Sedan NHTSA No. M20165101

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



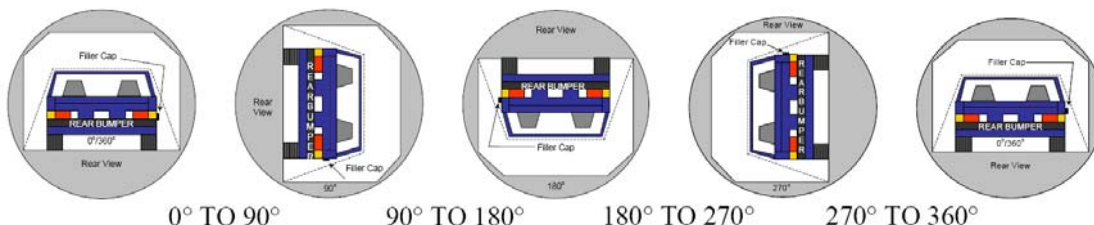
DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	2100	4	683	700	17
2	1500	3	594	627	33
3	900	3	614	723	109
4	300	3	606	927	321
5	-300	2	603	870	267
6	-900	4	696	748	52

DATA SHEET NO. 12

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2016 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
 Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15
 Temperature at Time of Impact: 15.0° C Test Time: 12:20 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°	80	300	380
90° To 180°	84	300	384
180° To 270°	78	300	378
270° To 360°	83	300	383

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			

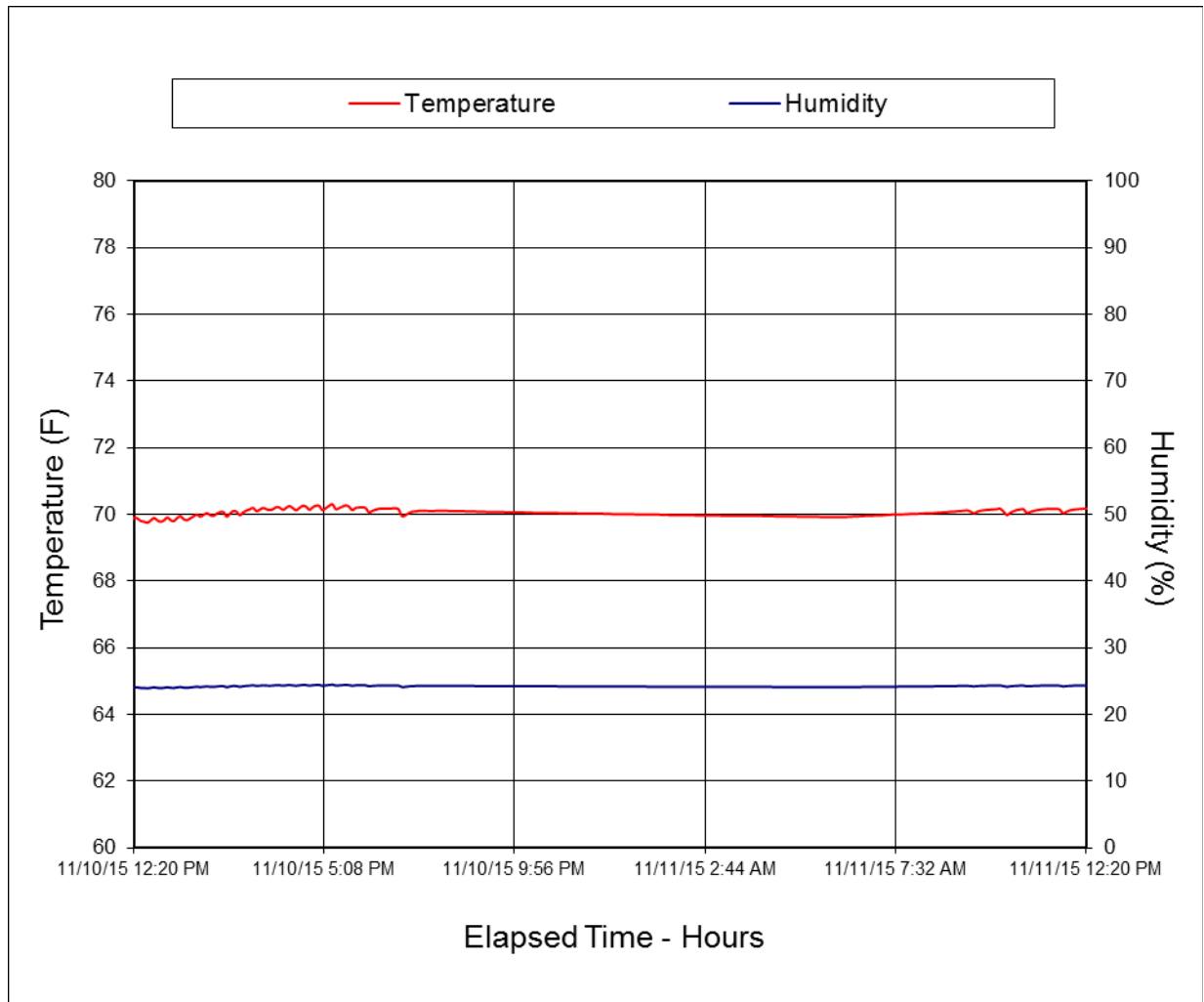
SOLVENT SPILLAGE LOCATION TABLE

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 Lexus ES 350 4-Door Sedan NHTSA No. M20165101
Test Program: NCAP Side Pole Impact Test Test Date: 11/11/15



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

Figure		Page
1	As Delivered Right Front $\frac{3}{4}$ View of Test Vehicle	A-1
2	As Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle	A-1
3	Pre-Test Frontal View of Test Vehicle	A-2
4	Post-Test Frontal View of Test Vehicle	A-2
5	Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle	A-3
6	Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle	A-3
7	Pre-Test Left Side View of Test Vehicle	A-4
8	Post-Test Left Side View of Test Vehicle	A-4
9	Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle	A-5
10	Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle	A-5
11	Pre-Test Rear View of Test Vehicle	A-6
12	Post-Test Rear View of Test Vehicle	A-6
13	Pre-Test Right Side View of Test Vehicle	A-7
14	Post-Test Right Side View of Test Vehicle	A-7
15	Pre-Test Overhead View of Test Area	A-8
16	Post-Test Overhead View of Test Area	A-8
17	Pre-Test Left Side View of Pole Positioned Against Side of Vehicle	A-9
18	Pre-Test Right Side View of Pole Positioned Against Side of Vehicle	A-9
19	Pre-Test Close-Up View of Impact Point Target	A-10
20	Post-Test Close-Up View of Impact Point Target Showing Impact Location	A-10
21	Pre-Test Front Close-Up View of Dummy Head and Chest	A-11
22	Post-Test Front Close-Up View of Dummy	A-11
23	Pre-Test Left Side View of Dummy Showing Belt and Chalking	A-12
24	Pre-Test Left Side View of Dummy Shoulder and Door Top View	A-12
25	Post-Test Left Side View of Dummy Shoulder and Door Top View	A-13
26	Pre-Test Frontal View of Seat Back Prior to Dummy Positioning	A-13
27	Pre-Test Frontal Close-Up View of Dummy Head and Shoulders in Relation to Head Restraint	A-14
28	Pre-Test Overhead View of Seat Pan Prior to Dummy Positioning	A-14
29	Pre-Test Overhead View of Dummy Thighs on Seat Pan	A-15
30	Pre-Test Left Side View of Dummy's Neck Showing Position of Adjustable Neck Bracket	A-15
31	Pre-Test Left Side View of Dummy's Head Showing Dummy's Head is Level	A-16
32	Pre-Test Placement of Dummy's Feet	A-16
33	Pre-Test View of Belt Anchorage for Dummy	A-17
34	Pre-Test Left Side View of Steering Wheel	A-17
35	View of Disengaged Parking Brake	A-18

TABLE OF PHOTOGRAPHS ... (CONTINUED)

Figure		Page
36	Pre-Test View of Parking Brake	A-18
37	Pre-Test Close-Up Left Side View of Driver Seat Track	A-19
38	Pre-Test Close-Up Left Side View of Driver Seat Back	A-19
39	Pre-Test Close-Up View of Driver Seat Back or Head Restraint	A-20
40	Pre-Test Dummy and Door Clearance View	A-20
41	Post-Test Dummy and Door Clearance View	A-21
42	Pre-Test Right Side View of Dummy and Front Seat of Occupant Compartment	A-21
43	Post-Test Right Side View of Dummy and Front Seat of Occupant Compartment	A-22
44	Pre-Test Inner Door Panel View	A-22
45	Post-Test Inner Door Panel View Showing Dummy Contact Locations	A-23
46	Post-Test Dummy Close-Up Head Contact with Vehicle Interior View	A-23
47	Post-Test Dummy Close-Up Head Contact with Side Airbag View	A-24
48	Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View	A-24
49	Post-Test Dummy Close-Up Torso Contact with Side Airbag View	A-25
50	Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View	A-25
51	Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View	A-26
52	Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View	A-26
53	Pre-Test View of Fuel Filler Cap or Fuel Filler Neck	A-27
54	Post-Test View of Fuel Filler Cap or Fuel Filler Neck	A-27
55	Close-Up View of Vehicle's Certification Label	A-28
55a	Close-Up View of Vehicle's Load Reduction Label	A-28
56	Close-Up View of Vehicle's Tire Information Placard or Label	A-29
57	Pre-Test Pole Barrier Front View	A-29
58	Post-Test Pole Barrier Front View	A-30
59	Pre-Test Pole Barrier Side View	A-30
60	Post-Test Pole Barrier Side View	A-31
61	Pre-Test Ballast View	A-31
62	Post-Test Primary and Redundant Speed Trap Read-Out	A-32
63	FMVSS No. 301 Static Rollover 0 Degrees	A-32
64	FMVSS No. 301 Static Rollover 90 Degrees	A-33
65	FMVSS No. 301 Static Rollover 180 Degrees	A-33
66	FMVSS No. 301 Static Rollover 270 Degrees	A-34
67	FMVSS No. 301 Static Rollover 360 Degrees	A-34
68	Impact Event	A-35
69	Monroney Label	A-35

TABLE OF PHOTOGRAPHS ... (CONTINUED)

Figure		Page
70	Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-36



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

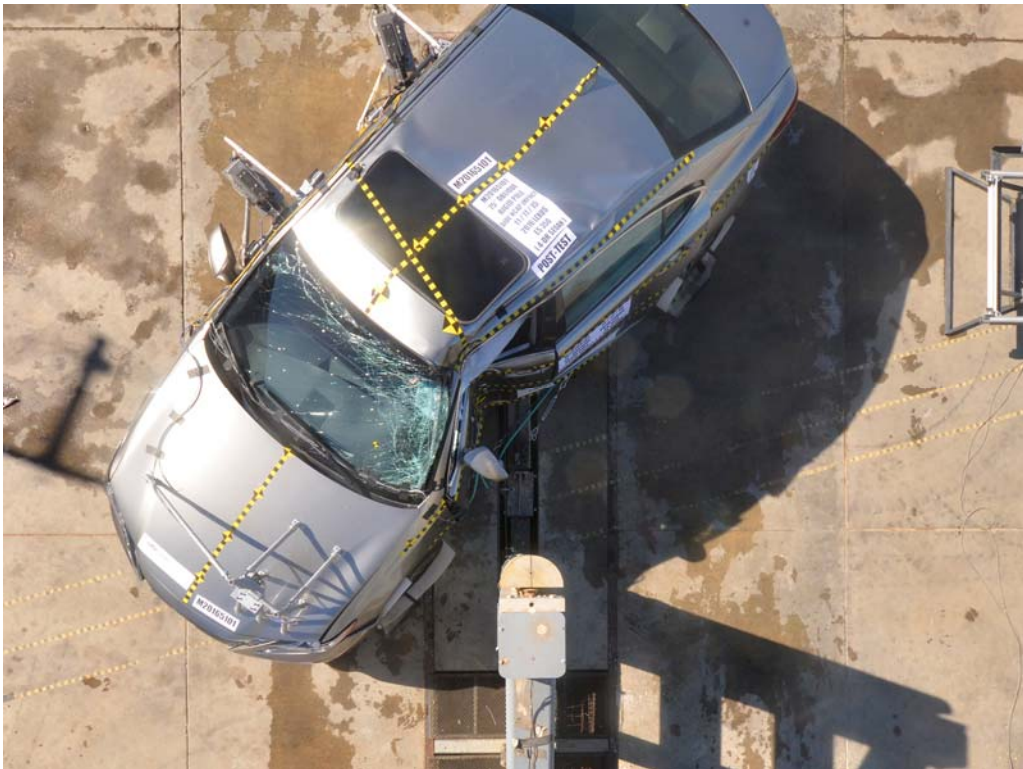


FIGURE 16. Post-Test Overhead View of Test Area



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

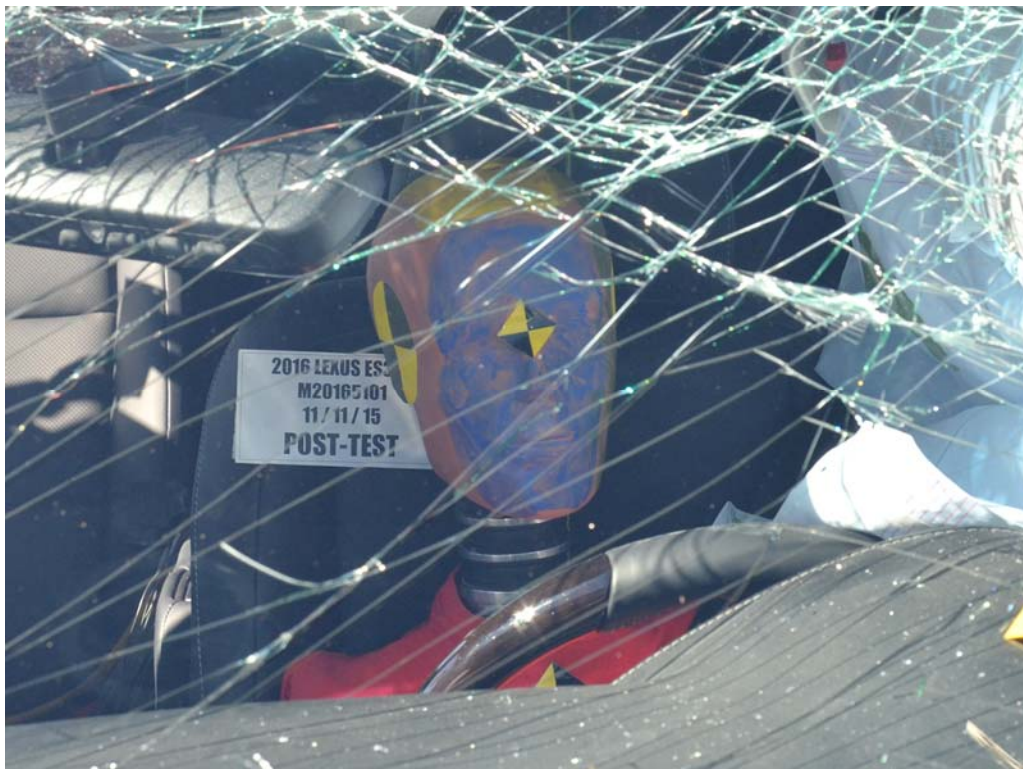


FIGURE 22. Post-Test Front Close-Up View of Dummy



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

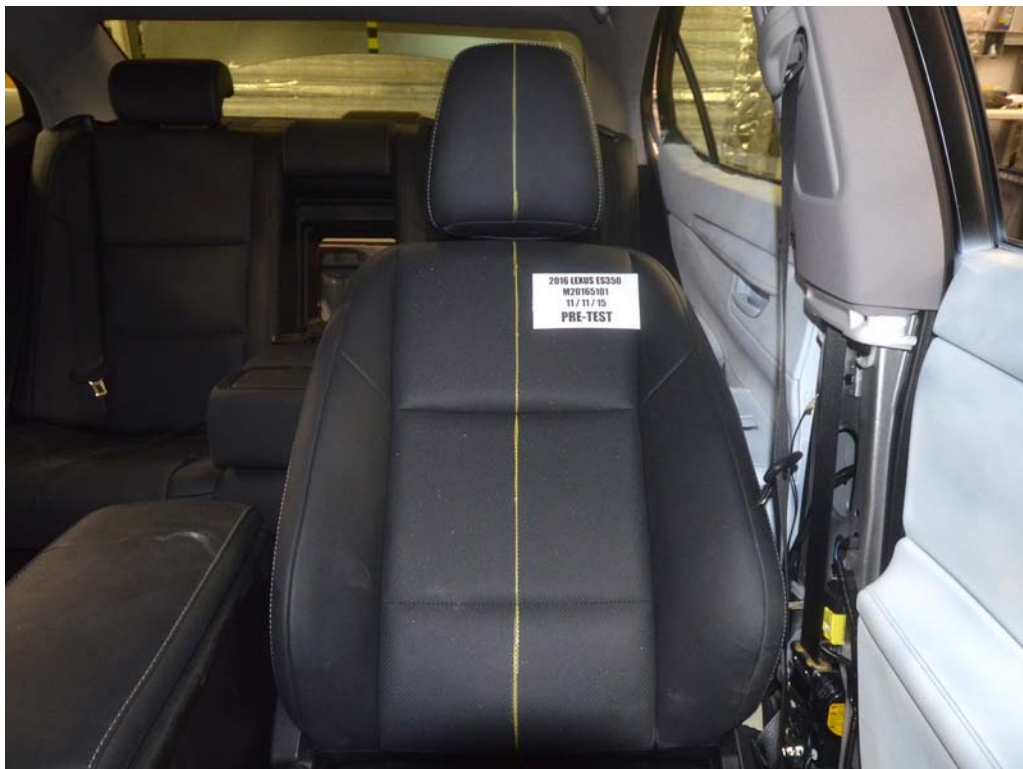


FIGURE 26. Pre-Test Frontal View of Seat Back Prior to Dummy Positioning



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

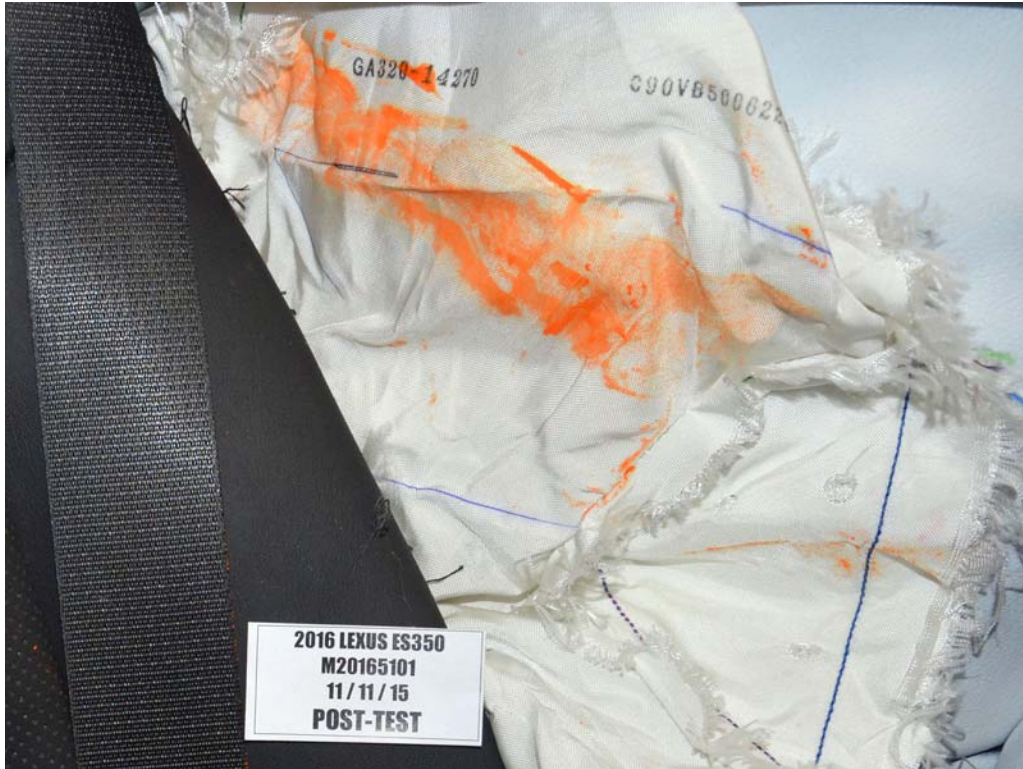


FIGURE 49. Post-Test Dummy Close-Up Torso Contact With Side Airbag View



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

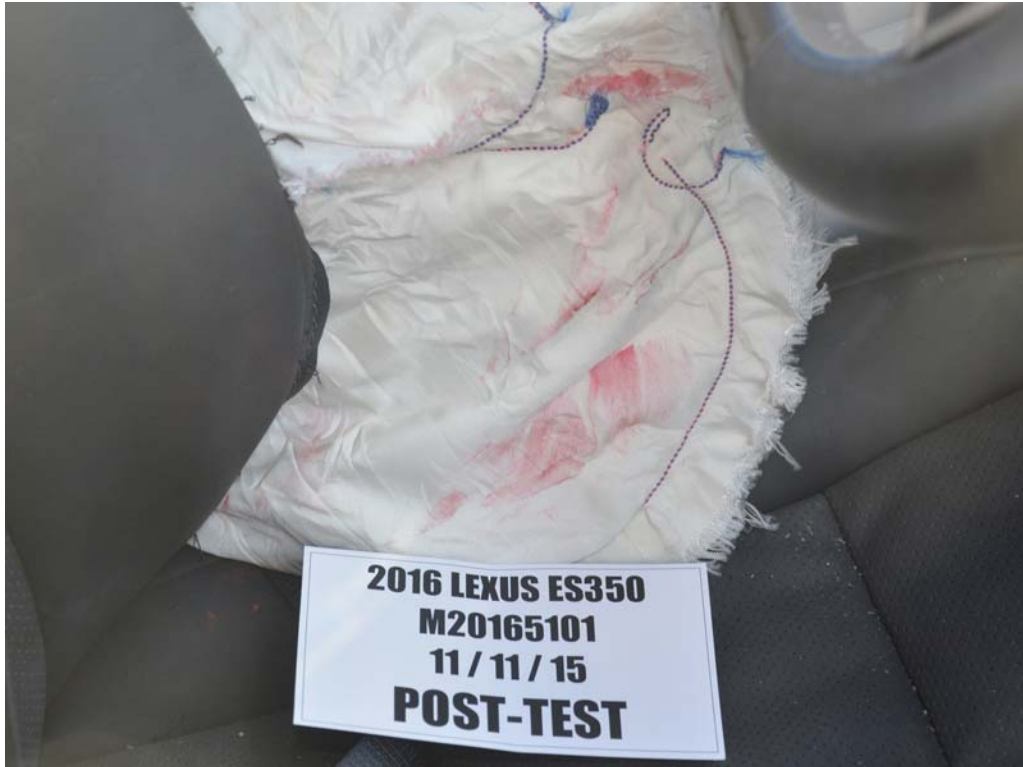


FIGURE 51. Post-Test Dummy Close-Up Pelvis Contact With Side Airbag View



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

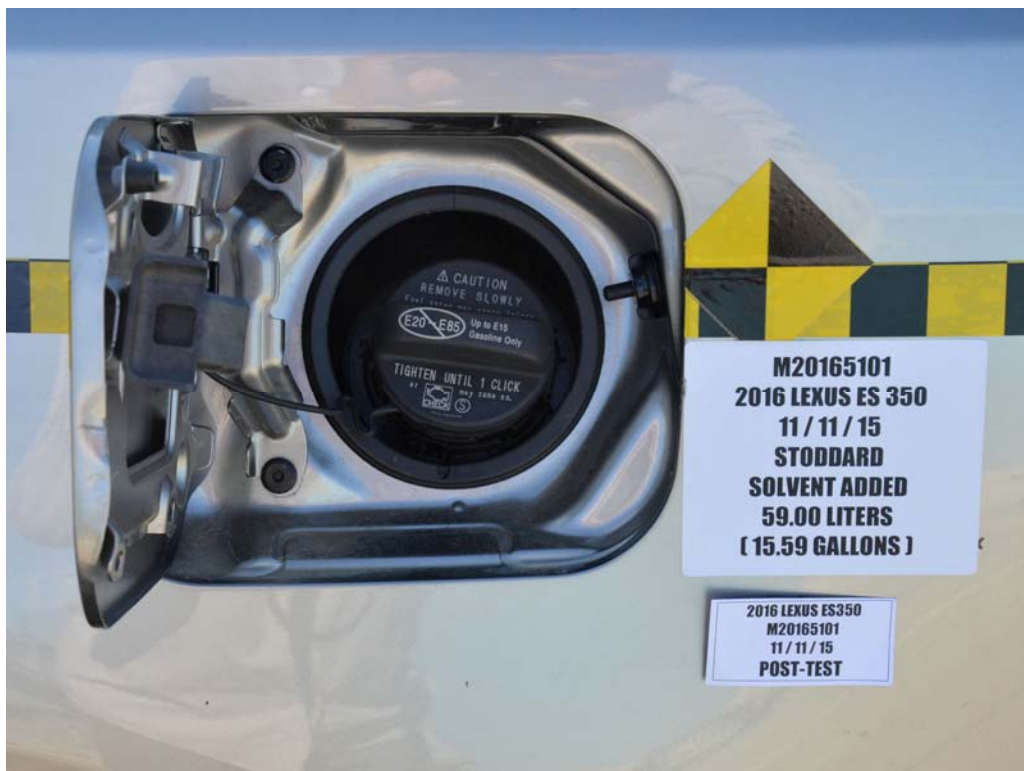


FIGURE 54. Post-Test View of Fuel Filler Cap or Fuel Filler Neck



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

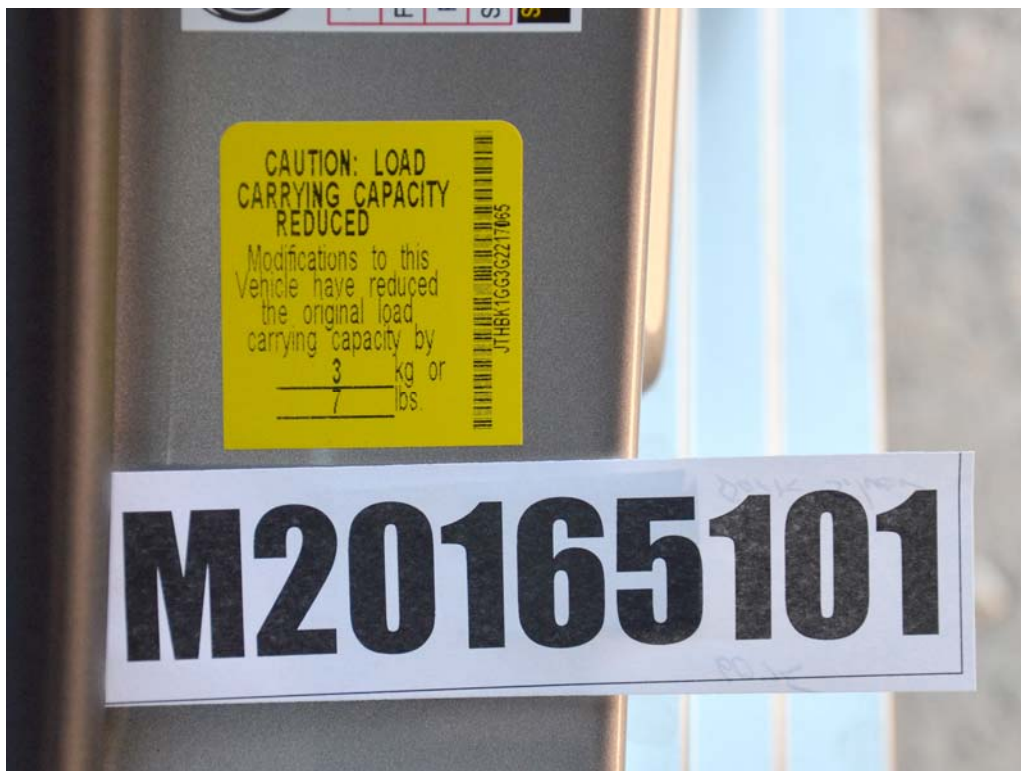


FIGURE 55a. Close-Up View of Vehicle's Load Reduction label



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

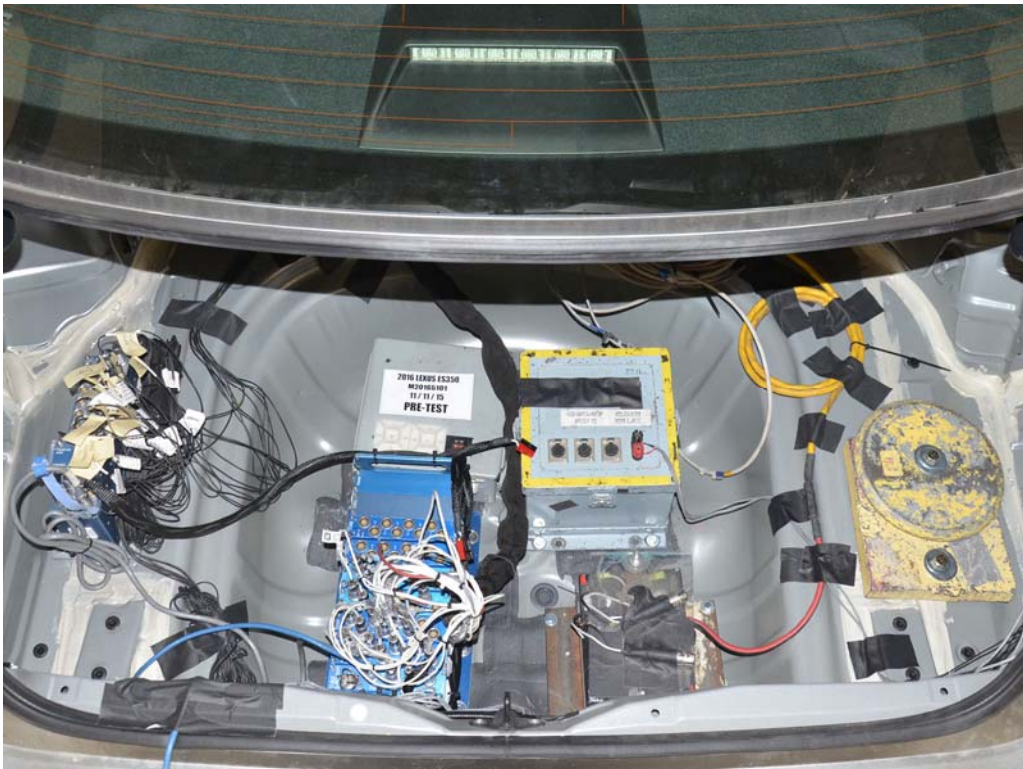


FIGURE 61. Pre-Test Ballast View



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



FIGURE 63. FMVSS No. 301 Static Rollover 0 Degrees

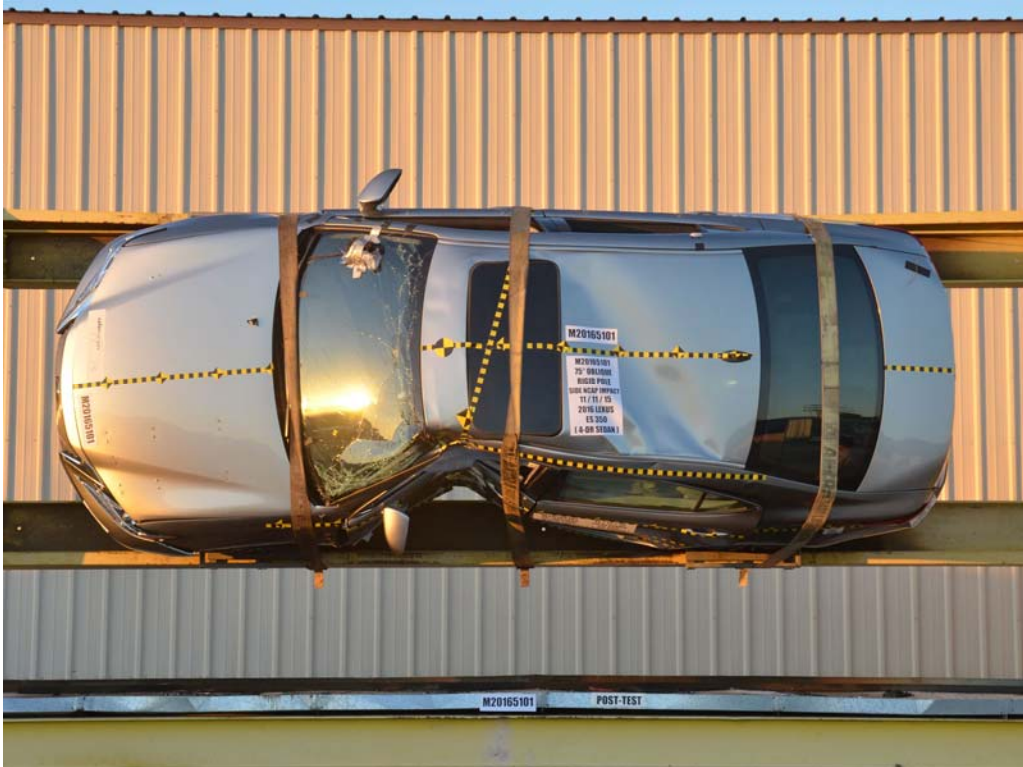


FIGURE 64. FMVSS No. 301 Static Rollover 90 Degrees



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



LEXUS

The Pursuit of Perfection

DESCRIPTION: 2016 / 2000 ES350 4-DR SEDAN
 COLOR: ATOMIC SILVER
 VIN: JTHBK1GG3G2210505
 PORT/PLANT: Long Beach, CA

Owner Name: Lexus America
 Address: Lexus Chicago
 4870 KEARNY MESA ROAD
 CHICAGO IL 60631

Ship to (Owner, unless otherwise indicated)

STANDARD EQUIPMENT		MANUFACTURER'S SUGGESTED RETAIL PRICE		
STANDARD FEATURES	3.5 Liter 268HP Four Cam 24-Valve V8 Engine - All-Aluminum Engine Construction & Dual V-TEC 4-Wheel Independent MacPherson Strut-Type Suspension with Gas Pressure Shock Absorbers - Front and Rear Stabilizer Bars 215/55R17 Aluminum Alloy Split 10-Spoke Wheels 215/55R17 All-Season Tires - Dual Fr Airbags, Dual Fr Knee Airbags, Fr & Rr Seat-Mounted Side Impact Airbags, Fr & Rr Side Curtain Airbags, Supplemental Restraint Sys (SRS) 3-Point Safety Belts for All Seating Positions - Fr & Rr Outboard Seatbelt Pretensioners with Force Limiters / Energy Managing Crumple Zones, Side Door Beams - Theft-Deterrent System w/ Engine Immobilizer - Vehicle Stability Control (VSC) with TRAC 4-Wheel Anti-Lock Braking System (ABS) with Electronic Brakeforce Distribution (EBD), and Brake Assist (BA) - Smart Start Technology	- SmartAccess with Push Button Start/Stop - Drive Mode Select (Eco, Normal, Sport) - Lexus Enform Safety Connect: Automatic Collision Notification, Stolen Vehicle Detection, Emergency Assist Button (SOS), and Roadside Assistance - Lexus Enform Service: Connected 1-year trial subscription included - Automatic Over/Off LED Low Beam and Halogen High Beam Headlamps w/ Integrated Foglamps, LED Daytime Running Lights (DRL) / Intermittent Wipers w/Mist Cycle 10-Way Driver's & Passenger's (including Lumbar) Power Seats - Electrochromic Heated Outside Mirrors - Automatic Dual Zone Climate Control - One-Touch Open/Close Per Tilt-and-Slide Moonroof - Lexus Premium Audio System with Automatic Sound Levelizer (ASL) & MP3 Player Connectivity (mini-plug and 8-Speakers, Bluetooth Technology, USB Audio Plug, SiriusXM Satellite Radio 3-Month All Access (trial subscription) - Lexus Personalized Settings / Carpeted Floor Mats	\$ 38,000.00 -- Blind Spot Monitor w/Rear Cross Traffic Alert -- 17" Split 10-Spoke Machined Finish Wheels -- Heated and Ventilated Front Seats -- Intuitive Parking Assist -- Premium Package: Lexus Memory Sys for Driver's Seat, Outside Mirrors & Steering Wheel, Power Tilt-and-Telescopic Steering Wheel, Wood Interior Trim, Remote Keyless Entry-Limited Memory -- Wood & Leather Trimmed Steering Wheel -- Trunk Mat, Cargo Net, Wheel Locks & Key Gloves	500.00 40.00 600.00 40.00 730.00 300.00 255.00

EPA DOT Fuel Economy and Environment



24 MPG
combined city/highway

31 mpg
city/highway

4.2 gallons per 100 miles

Gasoline Vehicle

You spend \$500 more in fuel costs over 5 years compared to the average new vehicle.

SUB-TOTAL \$ 40,965.00

DELIVERY, PROCESSING AND HANDLING 940.00

TOTAL \$ 41,905.00

Annual fuel cost \$1,900

Fuel Economy & Greenhouse Gas Rating



1 5 10

Best Worst

This vehicle emits 308 grams CO2 per mile. The best emits 10 grams per mile less than this. Producing and driving this vehicle may contribute to global climate change and smog.

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score Not Rated
 Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.

Frontal Crash	Driver Passenger	Not Rated
Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.		
Side Crash	Front seat Rear seat	Not Rated Not Rated
Based on the risk of injury in a side impact.		
Rollover	★★★★★	
Based on the risk of rollover in a single-vehicle crash.		

Star ratings range from 1 to 5 stars (★★★★★) with the highest.

Source: National Highway Traffic Safety Administration (NHTSA)

www.safercar.gov or 1-888-327-4236

APPLICABLE FEDERAL TAXES NOT INCLUDED

Manufacturer's suggested retail price includes destination charge, dealer prep, taxes, license, title, and applicable fees. Dealer may receive additional incentives. Dealer's actual price may vary. Dealer's actual price may vary. Dealer's actual price may vary.

LEXUS NEW VEHICLE LIMITED WARRANTY

3-year/50,000-mile powertrain warranty
 5-year/100,000-mile bumper-to-bumper warranty
 10-year/100,000-mile corrosion warranty

New Vehicle Limited Service Drive for details.

LEASING IS PLEASED TO OFFER THE FOLLOWING OWNER SUPPORT PACKAGE WITH EACH NEW LEASE:

- 24-hour 24-hour roadside assistance
- Complimentary loaner car (subject to availability)
- 24-hour 24-hour roadside assistance
- 24-hour 24-hour roadside assistance

An extended service contract may be available. For leasing, see dealer for details.

239C97 580 2003 -4531

FIGURE 69. Monroney Label

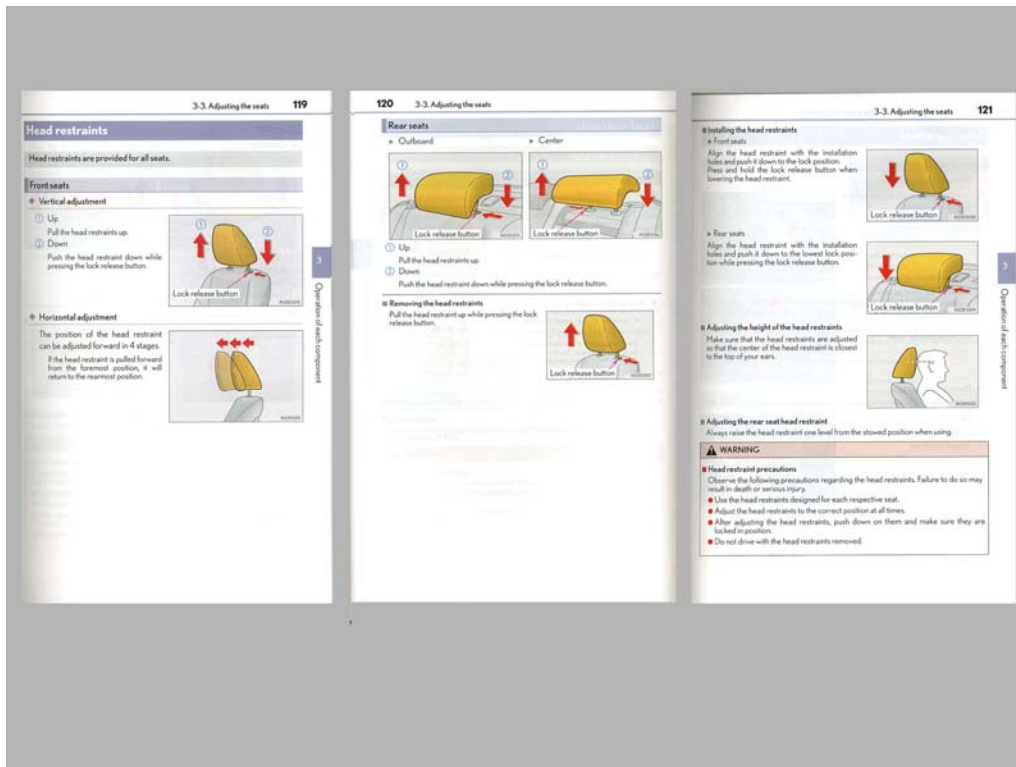


FIGURE 70. Head Restraint Use and Adjustment
Information from Vehicle Owner's Manual

APPENDIX B
DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

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

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

www.NHTSA.dot.gov

Additional Driver Dummy Instrumentation Data

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

Vehicle Instrumentation Data

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

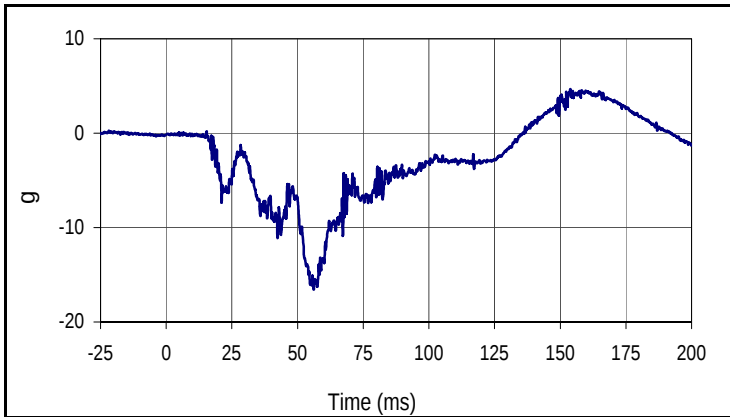
Left B-Pillar Sill Acceleration
Left Lower B-Pillar Acceleration (Y)
Left Mid B-Pillar Acceleration (Y)
Driver Seat Track at Dummy Hip Point Acceleration (Y)
Engine Top Acceleration (X)
Engine Top Acceleration (Y)
Firewall Center Acceleration (Y)
Right Roof at Vertical Impact Reference Line Acceleration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

Pole Instrumentation Data

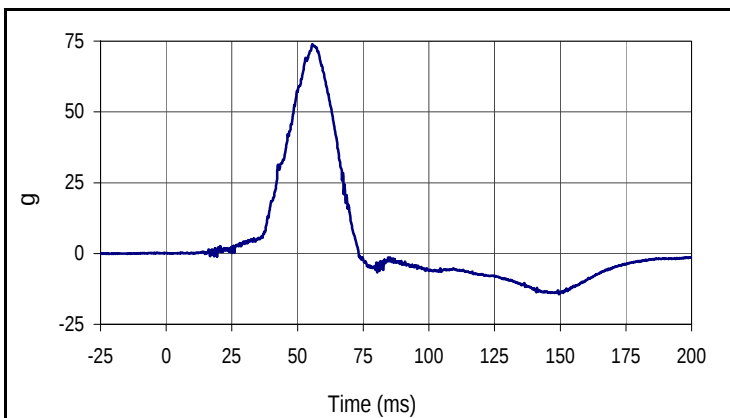
Load Cell Pole Barrier #1 Force (Y)
Load Cell Pole Barrier #2 Force (Y)
Load Cell Pole Barrier #3 Force (Y)
Load Cell Pole Barrier #4 Force (Y)
Load Cell Pole Barrier #5 Force (Y)
Load Cell Pole Barrier #6 Force (Y)
Load Cell Pole Barrier #7 Force (Y)
Load Cell Pole Barrier #8 Force (Y)

Test Vehicle: 2016 Lexus ES 350 4-Door Sedan
 Test Program: NCAP Side Pole Impact Test

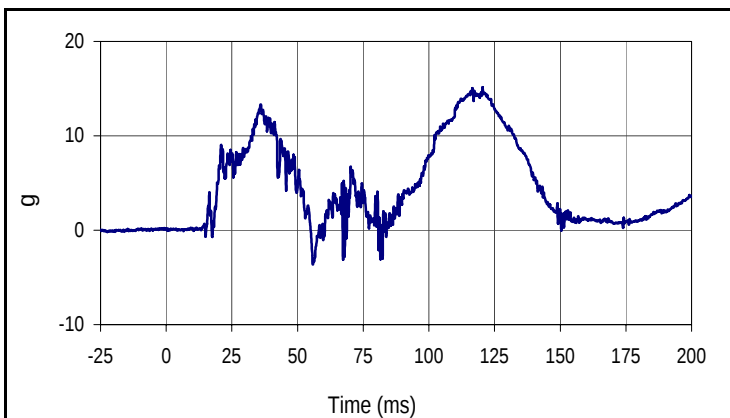
Test Date: 11/11/15
 NHTSA No.: M20165101



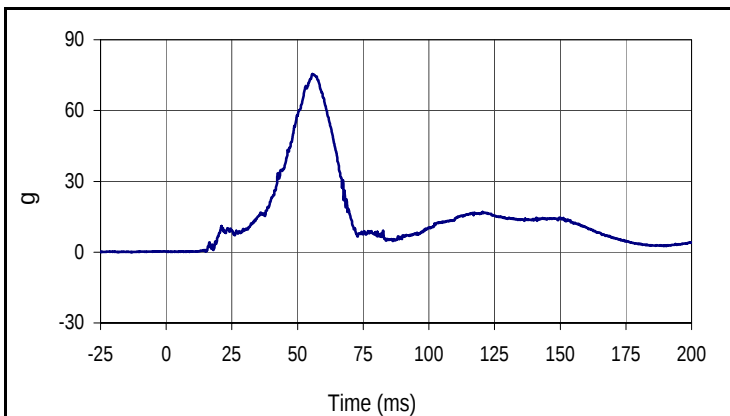
Curve Description			
Driver Head Acceleration X Primary			
Plot No.		SAE Class	Units
001		1000	g
Max	Time	Min	Time
4.7	153.8	-16.6	56.1



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.		SAE Class	Units
002		1000	g
Max	Time	Min	Time
73.9	55.6	-14.4	149.5



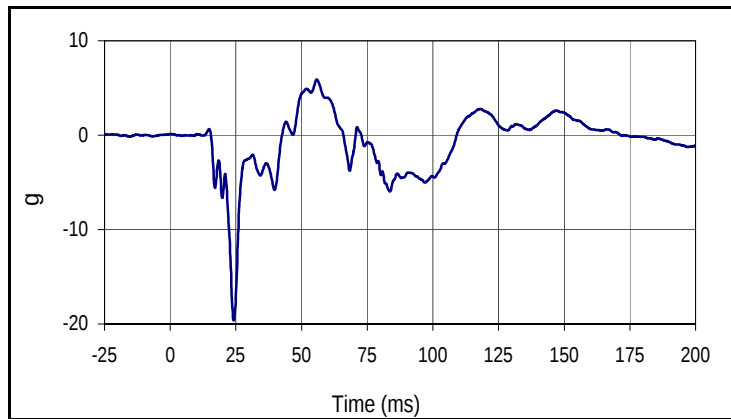
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.		SAE Class	Units
003		1000	g
Max	Time	Min	Time
15.1	120.4	-3.6	55.9



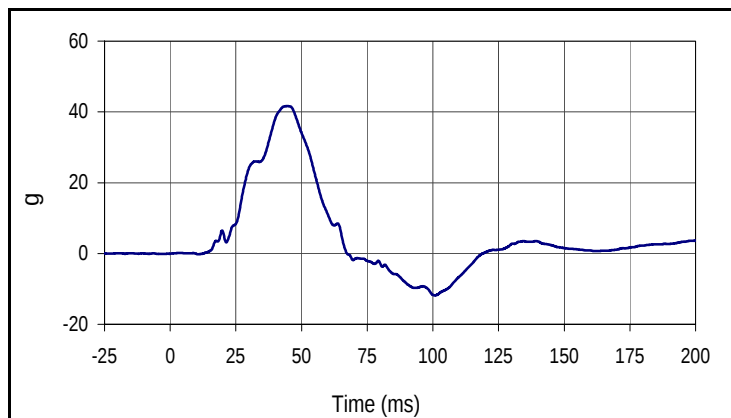
Curve Description			
Driver Head Acceleration Primary Res.			
Plot No.		SAE Class	Units
004		1000	g
Max	Time	Min	Time
75.5	55.6	0.1	4.7

Test Vehicle: 2016 Lexus ES 350 4-Door Sedan
 Test Program: NCAP Side Pole Impact Test

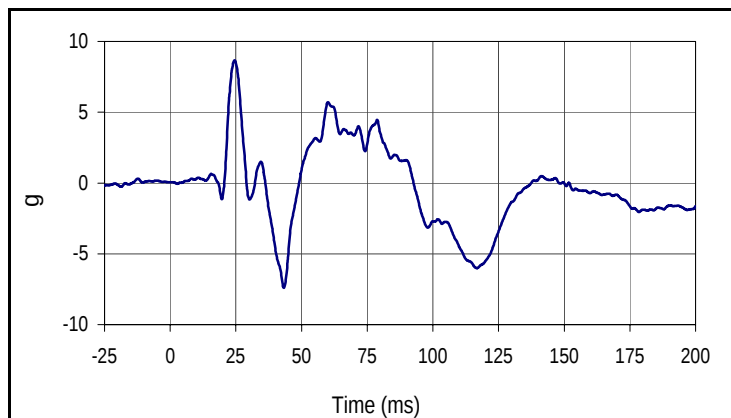
Test Date: 11/11/15
 NHTSA No.: M20165101



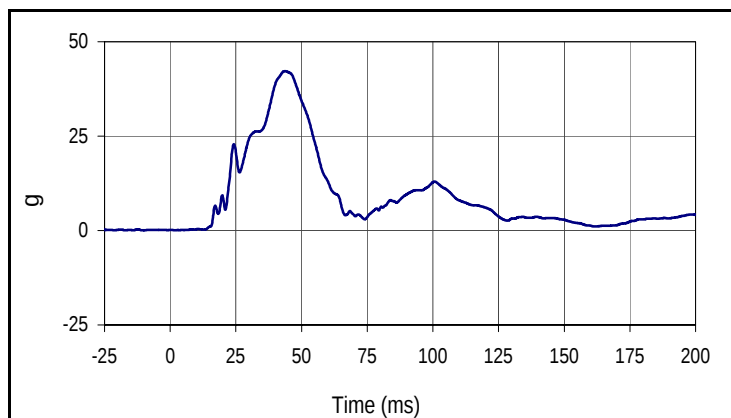
Curve Description			
Driver Lower Spine T12 Acceleration X			
Plot No.		SAE Class	Units
005		180	g
Max	Time	Min	Time
5.9	55.8	-19.6	24.2



Curve Description			
Driver Lower Spine T12 Acceleration Y			
Plot No.		SAE Class	Units
006		180	g
Max	Time	Min	Time
41.6	44.7	-11.8	100.8



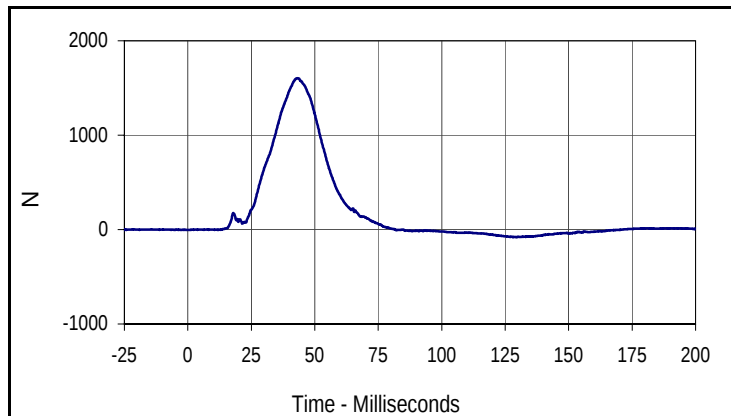
Curve Description			
Driver Lower Spine T12 Acceleration Z			
Plot No.		SAE Class	Units
007		180	g
Max	Time	Min	Time
8.7	24.5	-7.4	43.2



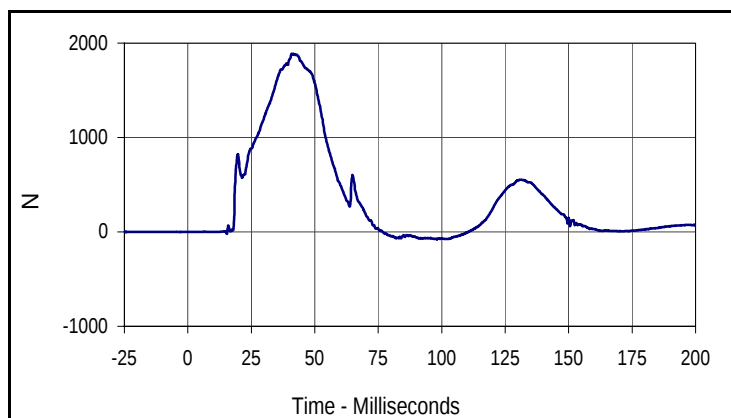
Curve Description			
Driver Lower Spine T12 Acceleration Res.			
Plot No.		SAE Class	Units
008		180	g
Max	Time	Min	Time
42.2	43.6	0.1	1.9

Test Vehicle: 2016 Lexus ES 350 4-Door Sedan
 Test Program: NCAP Side Pole Impact Test

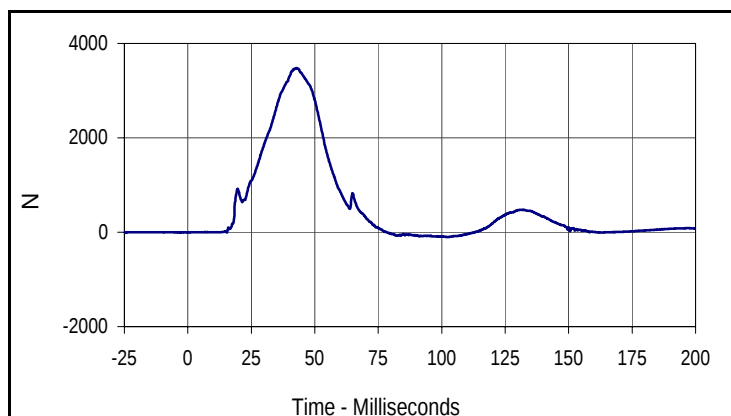
Test Date: 11/11/15
 NHTSA No.: M20165101



Curve Description			
Driver Iliac Wing Force on Impact Side Y			
Plot No.		SAE Class	Units
009		600	N
Max	Time	Min	Time
1603.0	43.0	-81.2	129.4



Curve Description			
Driver Acetabulum Force on Impact Side Y			
Plot No.		SAE Class	Units
010		600	N
Max	Time	Min	Time
1888.1	41.6	-76.8	98.1



Curve Description			
Driver Total Pelvic Force on Impact Side Y			
Plot No.		SAE Class	Units
011		600	N
Max	Time	Min	Time
3479.7	42.8	-101.2	101.8

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

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

Test Date: 10/7/15
 Test I.D.: N/A



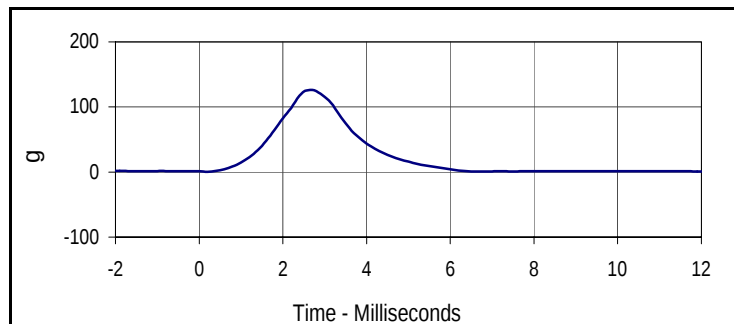
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	35	Pass
A	Sitting Height	mm	772 - 788	780	Pass
B	Shoulder Pivot Height	mm	437 - 453	445	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm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

Test Program: SID IIs Head Drop Test
 ATD Serial No.: 299

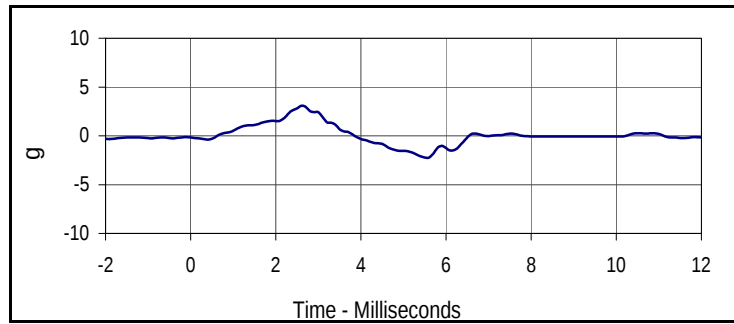
Test Date: 10/7/15
 Test I.D.: 299HD088



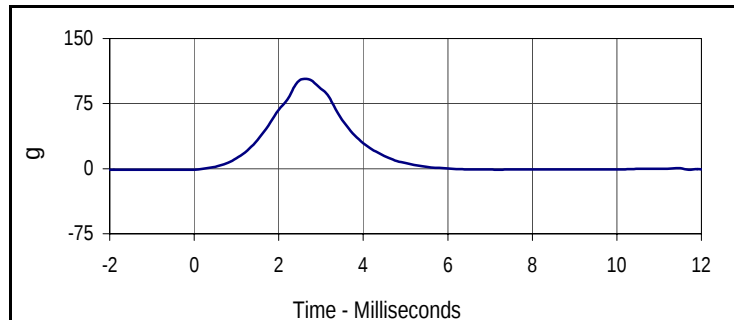
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	402	Pass
Temperature During Soak	Max	18.9 to 25.6	21.6	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	35.0	Pass
	Min		34.9	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory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



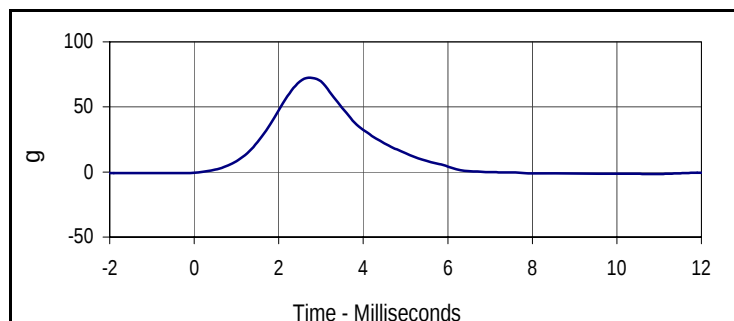
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	g
Max	Time	Min	Time
126.0	2.7	0.3	0.2



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



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



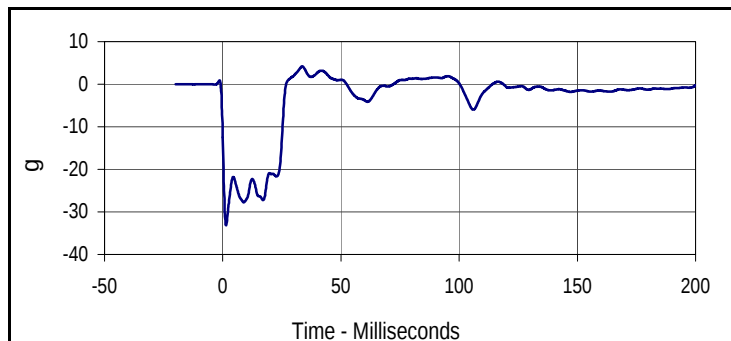
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	g
Max	Time	Min	Time
72.5	2.7	-1.5	10.7

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

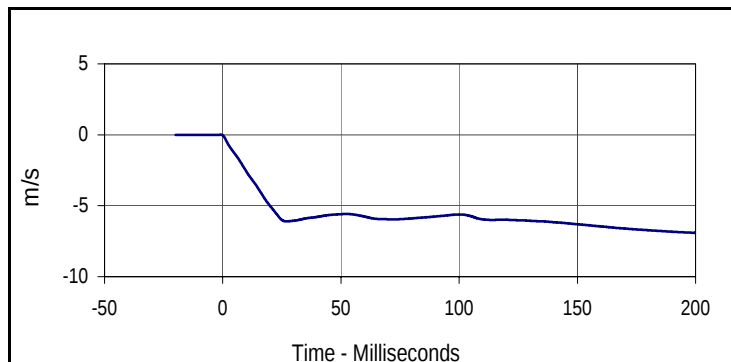
Test Date: 10/7/15
 Test I.D.: 299NB088



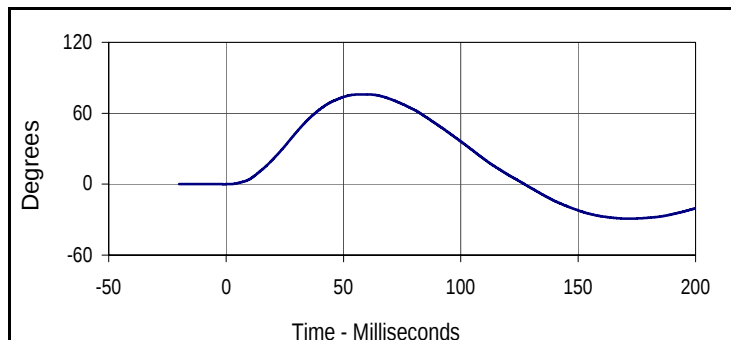
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	447	Pass
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	35.0	Pass
	Min		34.9	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass
Laboratory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



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



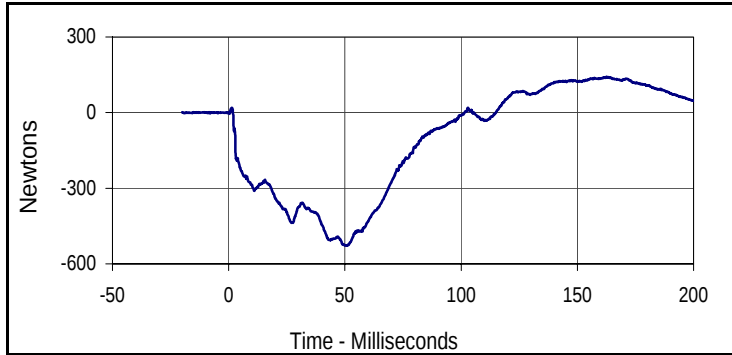
Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.9	-6.9	199.9



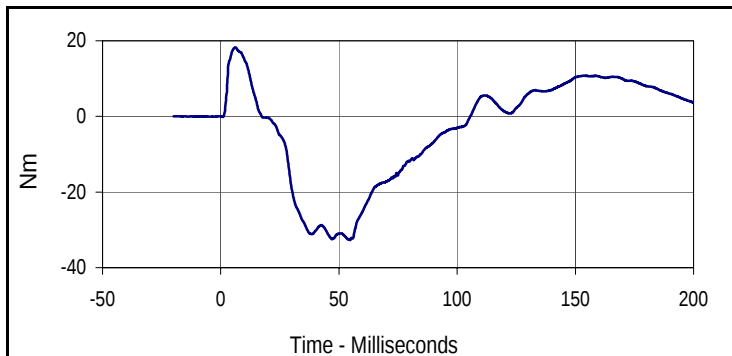
Curve Description			
D-Plane Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
76.0	58.8	-29.2	171.6

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

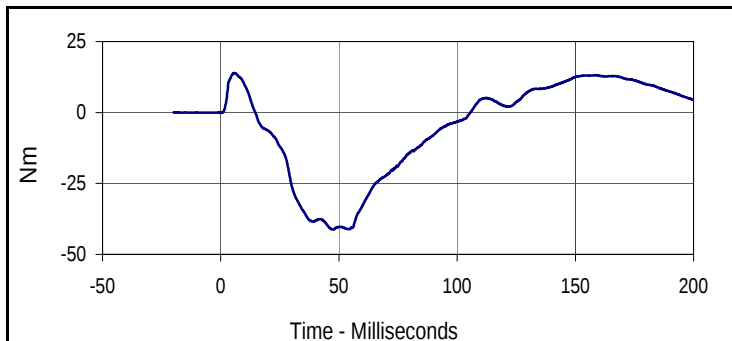
Test Date: 10/7/15
 Test I.D.: 299NB088



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



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



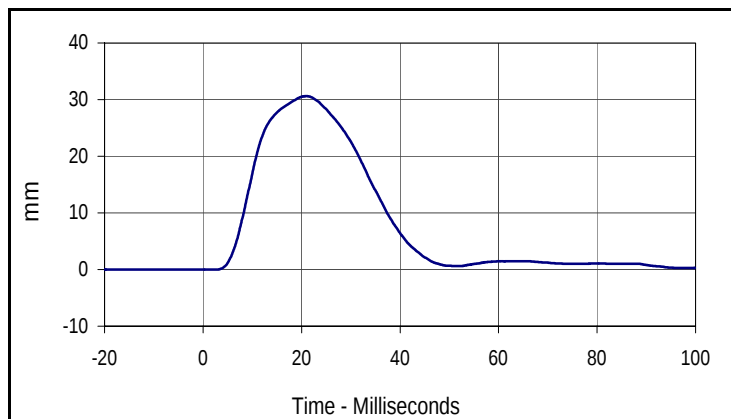
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
006	FIL	600	Nm
Max	Time	Min	Time
13.9	5.7	-41.2	47.2

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

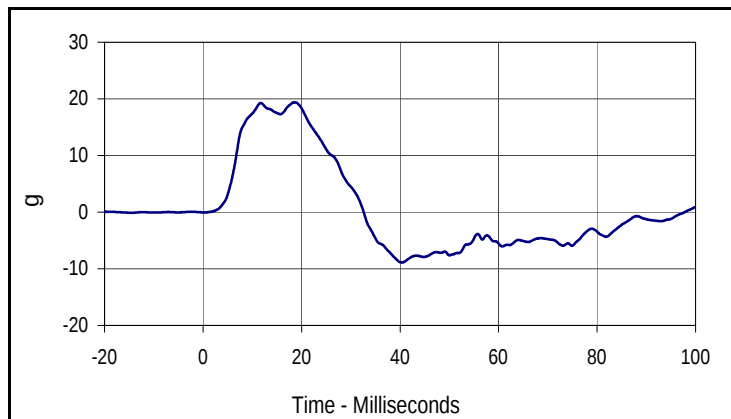
Test Date: 10/7/15
 Test I.D.: 299SH088



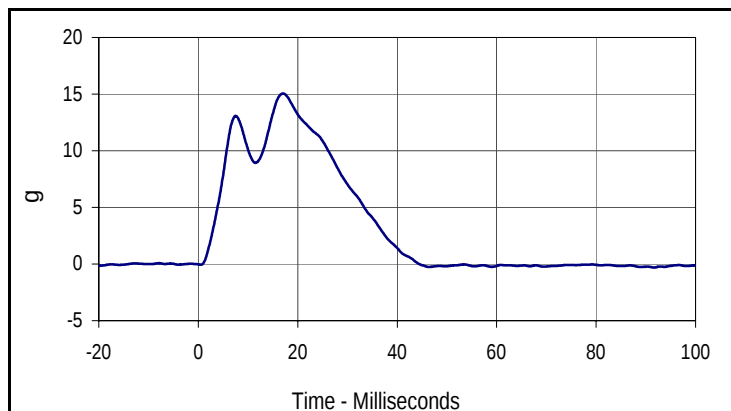
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	492	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		34.9	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory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



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



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



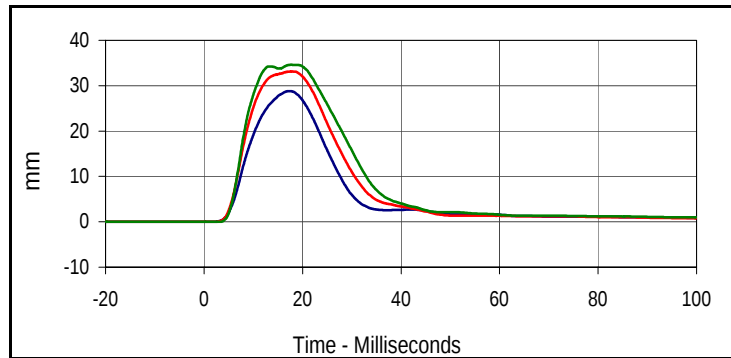
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	g
Max	Time	Min	Time
15.0	17.0	-0.3	91.7

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

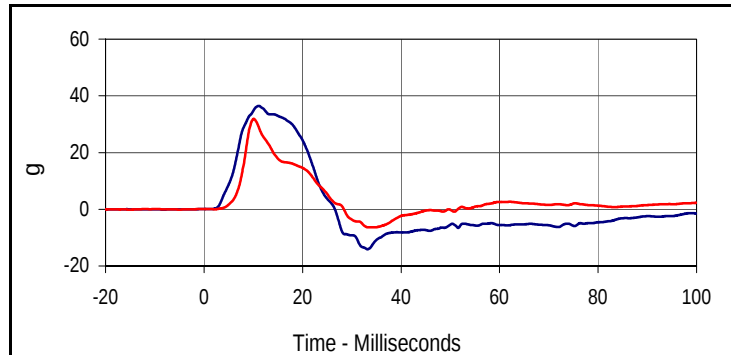
Test Date: 10/7/15
 Test I.D.: 299TWA088



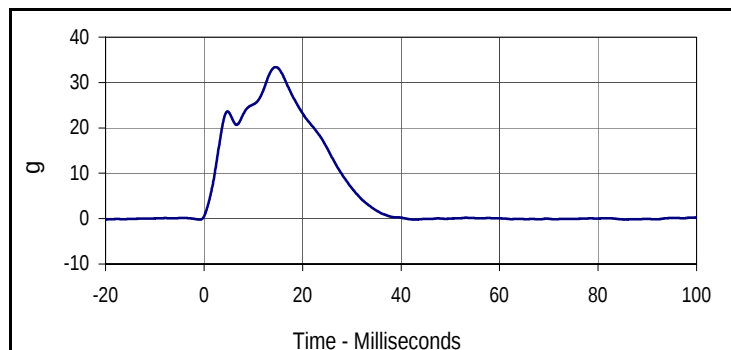
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	537	Pass
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	35.0	Pass
	Min		34.9	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity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



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



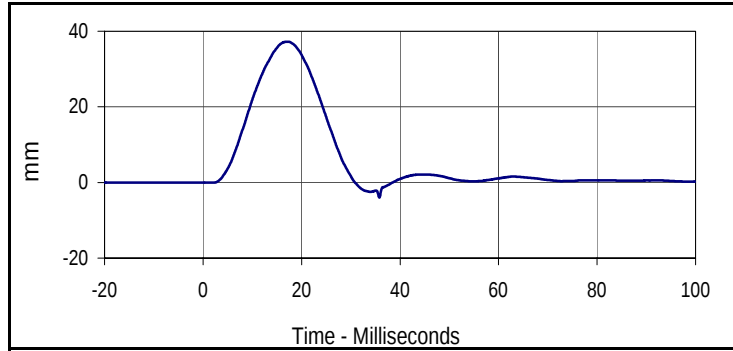
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	g
Max	Time	Min	Time
36.4	11.1	-14.1	33.2
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	g
Max	Time	Min	Time
31.8	10.1	-6.4	34.5



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

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

Test Date: 10/7/15
 Test I.D.: 299TWA088



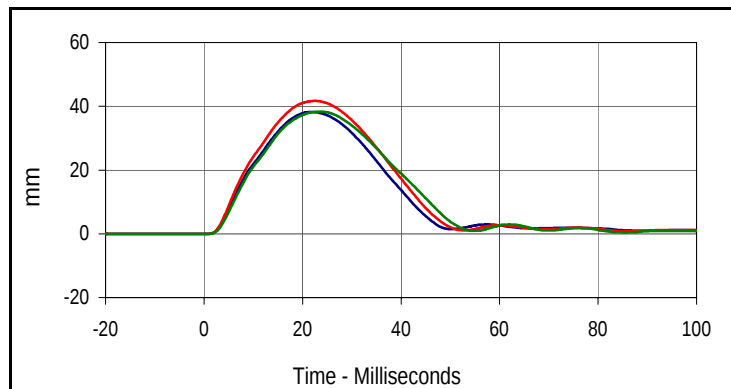
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	mm
Max	Time	Min	Time
37.2	17.2	-4.0	35.8

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

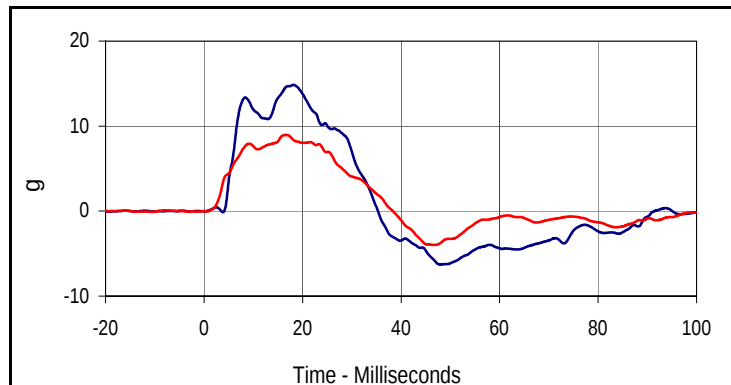
Test Date: 10/7/15
 Test I.D.: 299TWOA088



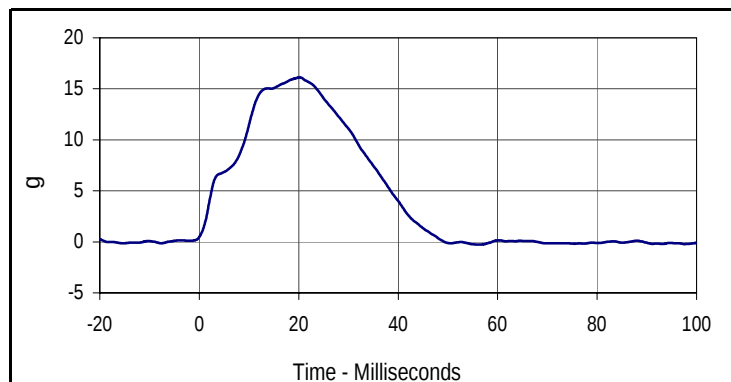
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	582	Pass
Temperature During Soak	Max	18.9 to 25.6	21.6	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	35.0	Pass
	Min		34.9	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity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



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



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



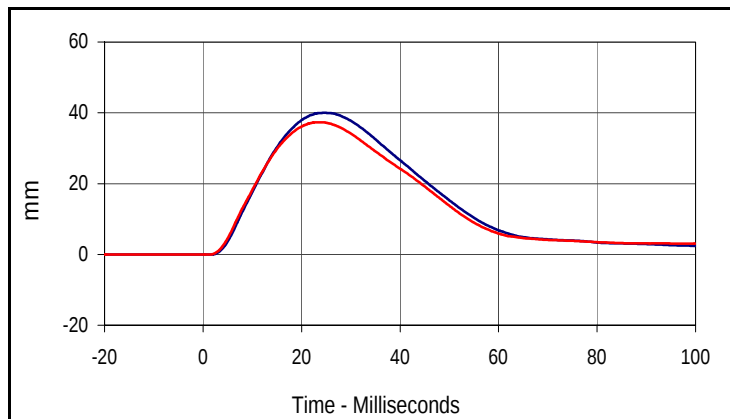
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	g
Max	Time	Min	Time
16.1	20.2	-0.3	55.8

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

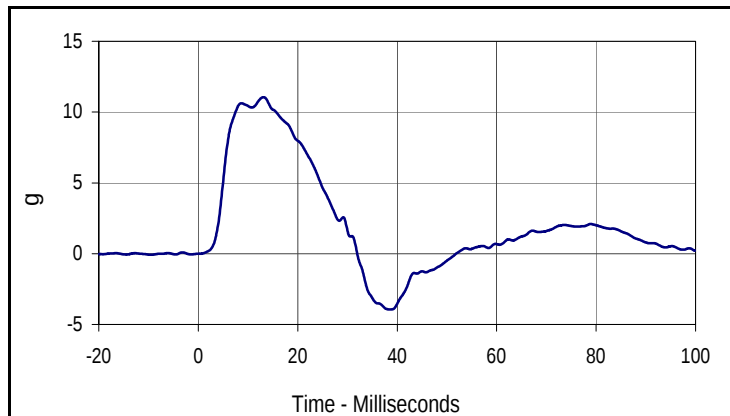
Test Date: 10/7/15
 Test I.D.: 299ABD088



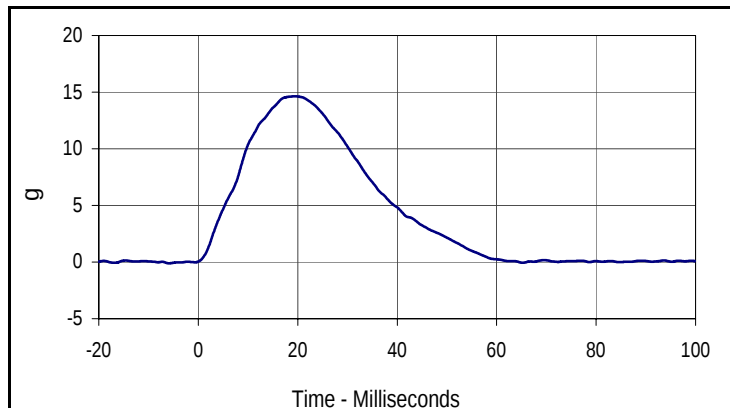
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	627	Pass
Temperature During Soak	Max °C	20.6 to 22.2	21.6	Pass
	Min °C		21.1	Pass
Humidity During Soak	Max %	10.0 to 70.0	35.0	Pass
	Min %		34.9	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory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



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



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



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

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

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

Current Date : 12/13/2013

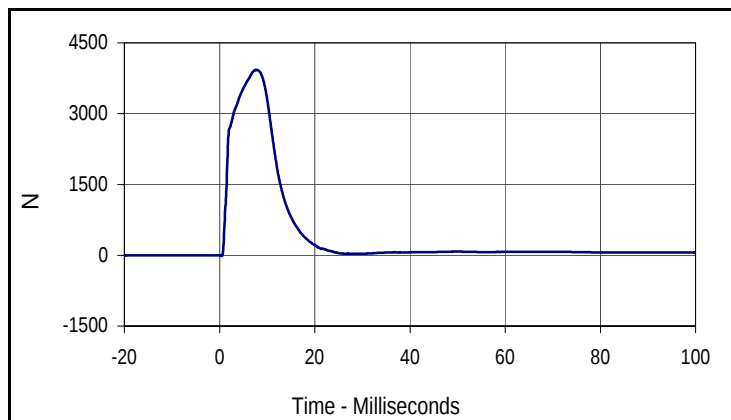
Current Time : 22:57:25

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

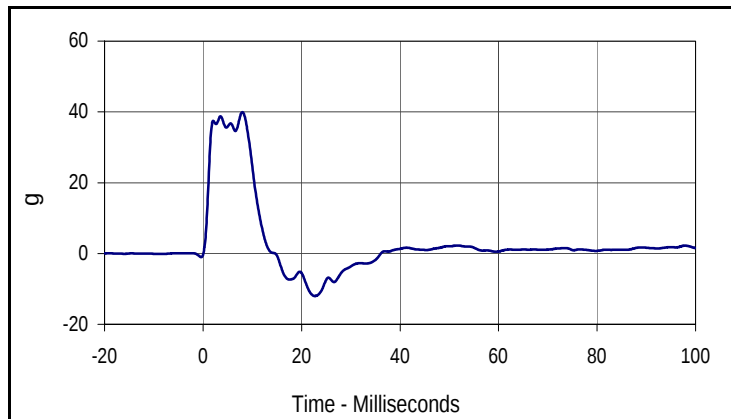
Test Date: 10/7/15
 Test I.D.: 299ACET088



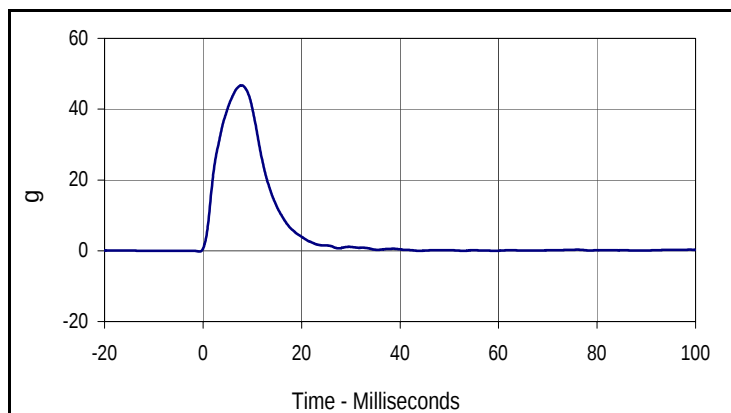
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	672	Pass
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	35.0	Pass
	Min		34.9	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity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



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



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



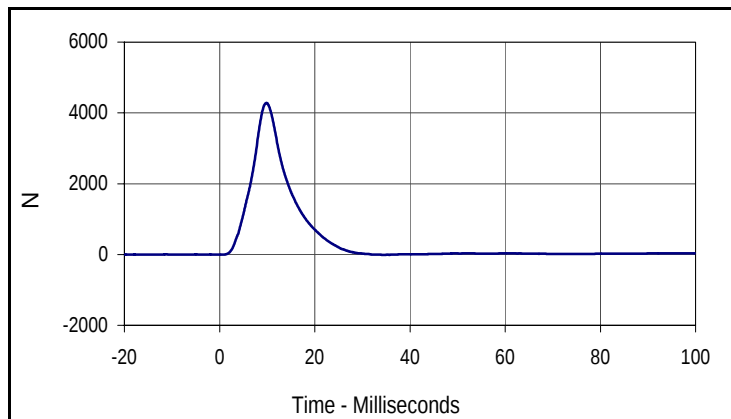
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	g
Max	Time	Min	Time
46.7	7.8	-0.2	-0.7

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

Test Date: 10/7/15
 Test I.D.: 299PL088



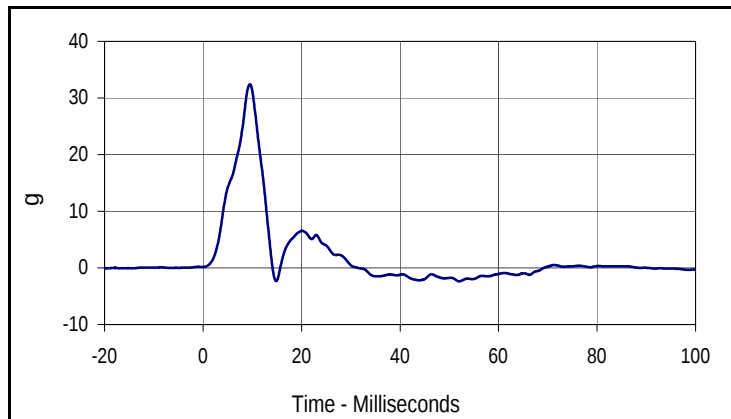
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	717	Pass
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	35.0	Pass
	Min		34.9	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity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



Curve Description

Pelvis Iliac Force

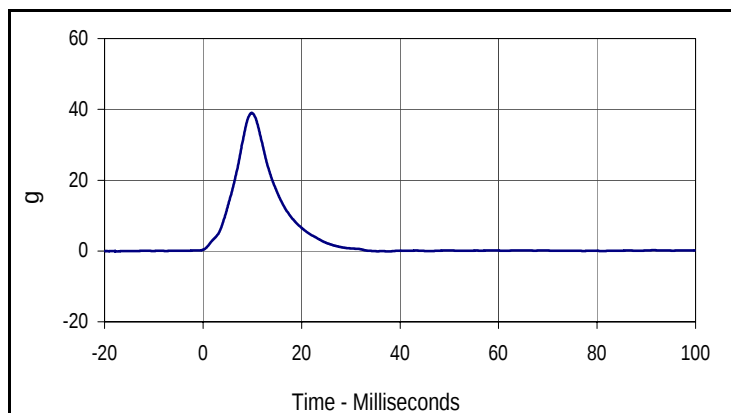
Plot No.	Type	SAE Class	Units
001	FIL	600	N
Max	Time	Min	Time
4280.7	9.8	-8.7	34.6



Curve Description

Pelvis Y Acceleration

Plot No.	Type	SAE Class	Units
002	FIL	180	g
Max	Time	Min	Time
32.4	9.5	-2.4	52.0



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
003	FIL	180	g
Max	Time	Min	Time
39.0	9.9	-0.1	37.6

APPENDIX C
POST-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



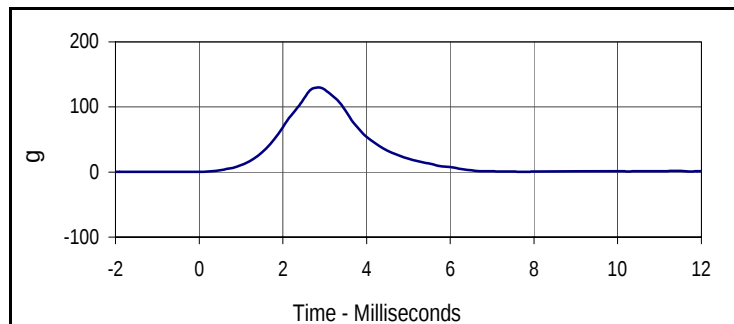
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	23	Pass
A	Sitting Height	mm	772 - 788	780	Pass
B	Shoulder Pivot Height	mm	437 - 453	445	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm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

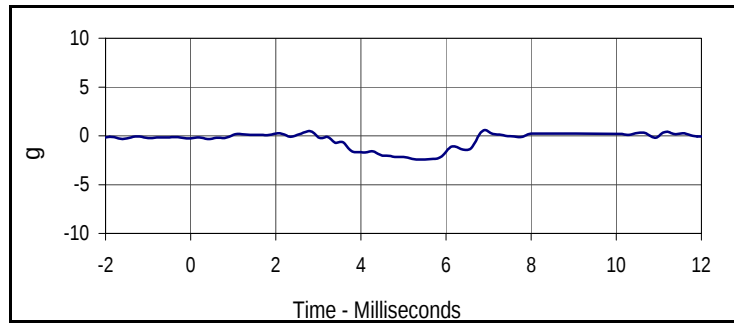
Test Date: 11/13/15
 Test I.D.: 299HD089



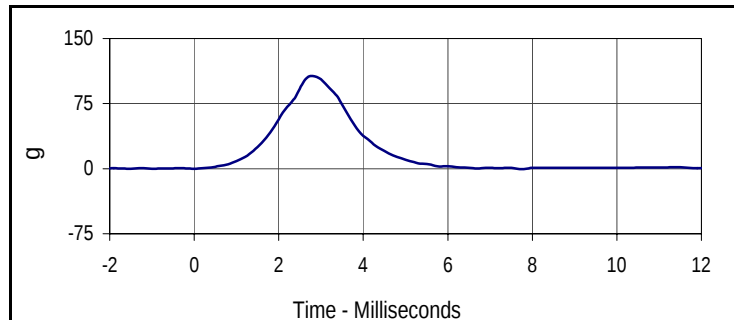
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	372	Pass
Temperature During Soak	Max	18.9 to 25.6	21.6	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	23.3	Pass
	Min		22.9	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory 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



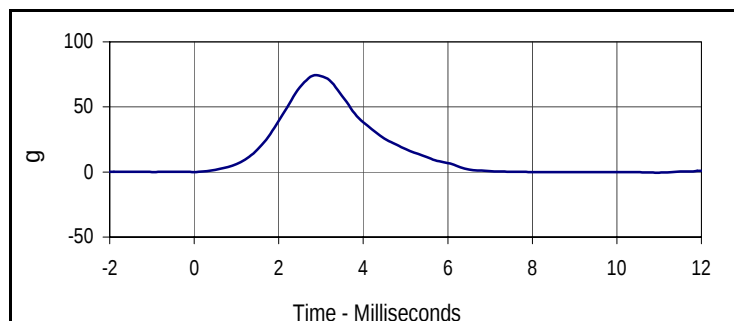
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	g
Max	Time	Min	Time
129.9	2.8	0.2	-17.5



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



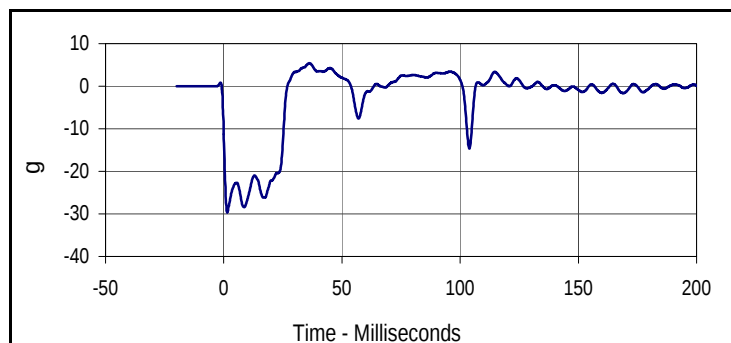
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	g
Max	Time	Min	Time
74.5	2.9	-0.5	11.0

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

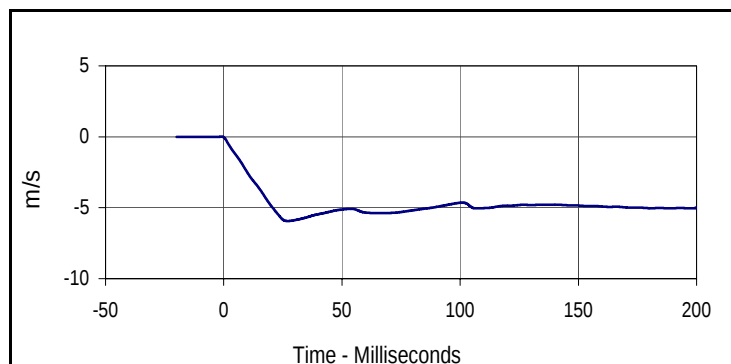
Test Date: 11/13/15
 Test I.D.: 299NB089



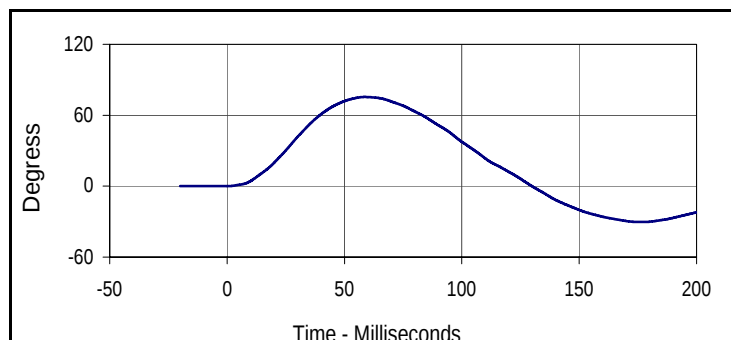
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	417	Pass
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	23.3	Pass
	Min		22.9	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.5	Pass
Laboratory 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



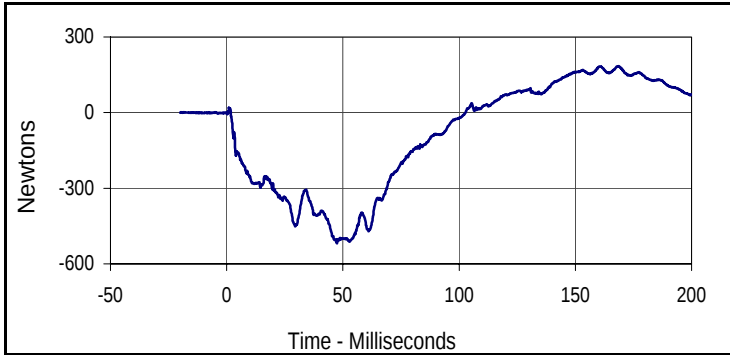
Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.9	-5.9	26.9



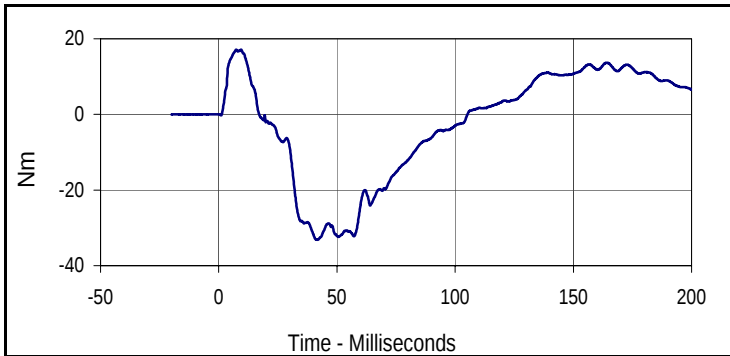
Curve Description			
D-Plane Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degress
Max	Time	Min	Time
75.5	58.7	-30.3	175.9

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

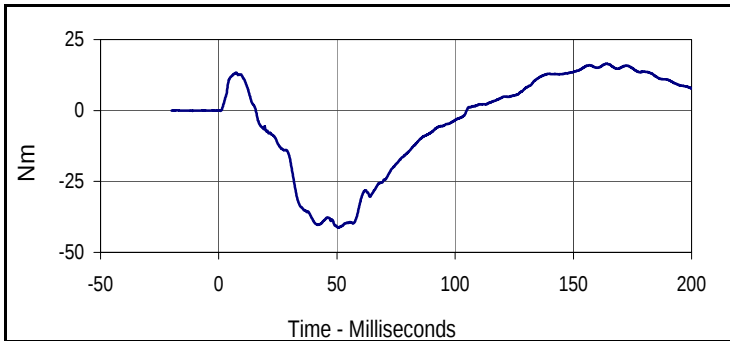
Test Date: 11/13/15
 Test I.D.: 299NB089



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



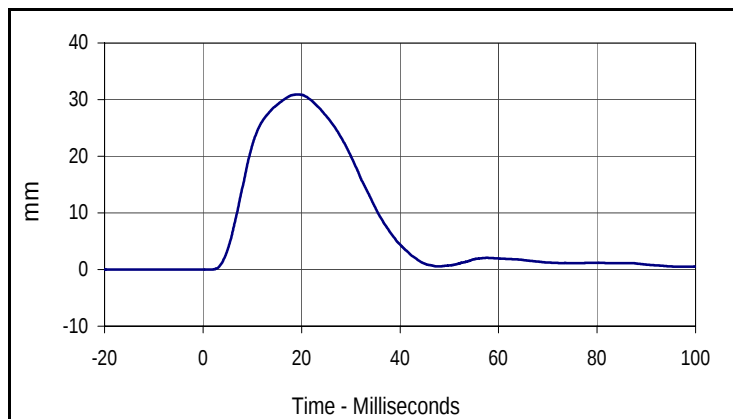
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
006	FIL	600	Nm
Max	Time	Min	Time
16.5	164.0	-41.3	50.7

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

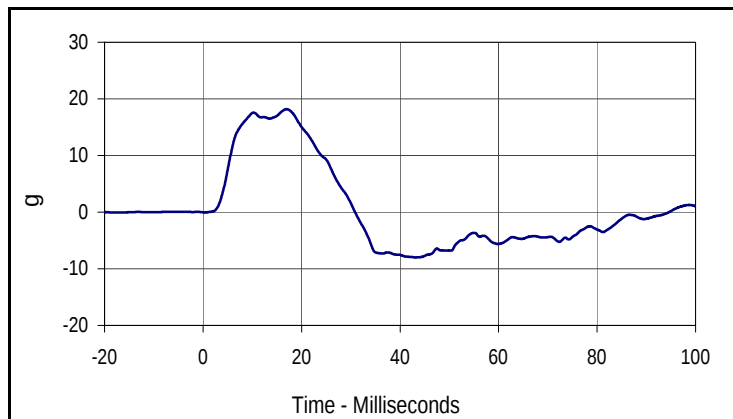
Test Date: 11/13/15
 Test I.D.: 299SH089



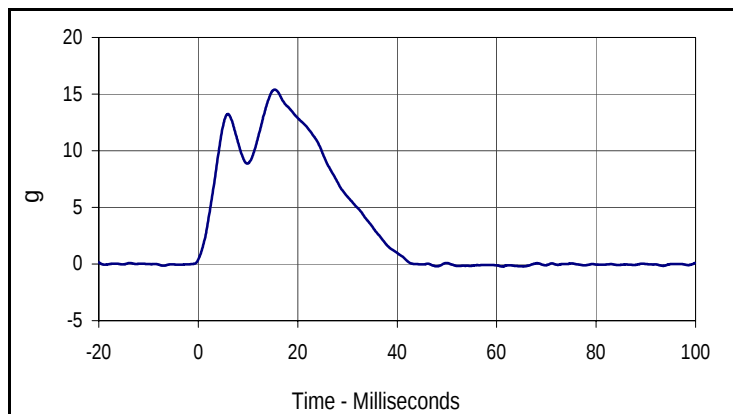
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	462	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	23.3	Pass
	Min	%		22.9	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	23.1	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.32	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



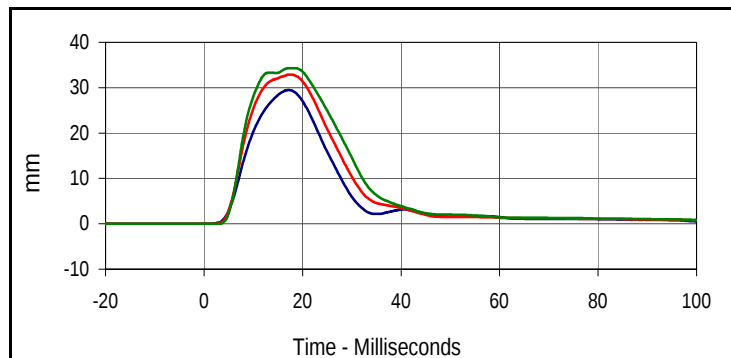
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	g
Max	Time	Min	Time
15.4	15.4	-0.2	61.1

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

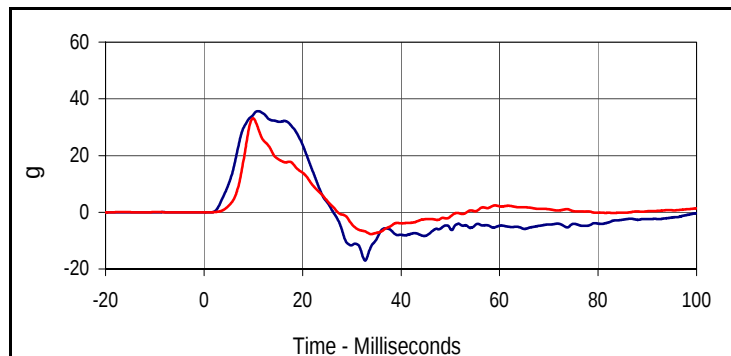
Test Date: 11/13/15
 Test I.D.: 299TWA089



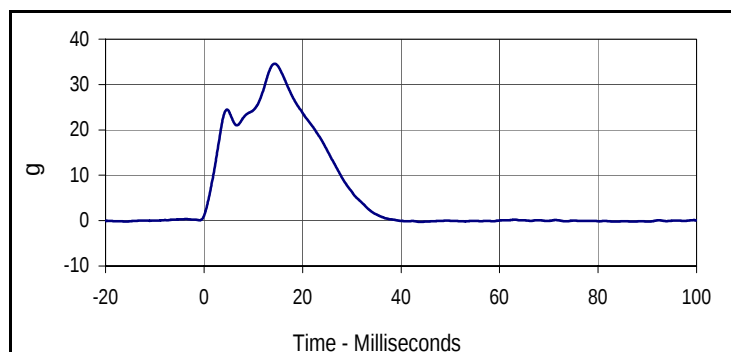
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	507	Pass
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	23.3	Pass
	Min		22.9	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity 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



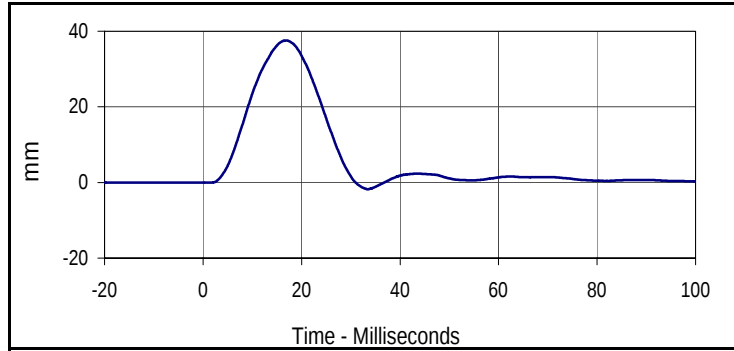
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	g
Max	Time	Min	Time
35.7	10.9	-17.0	32.7
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	g
Max	Time	Min	Time
33.1	9.9	-7.7	34.0



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



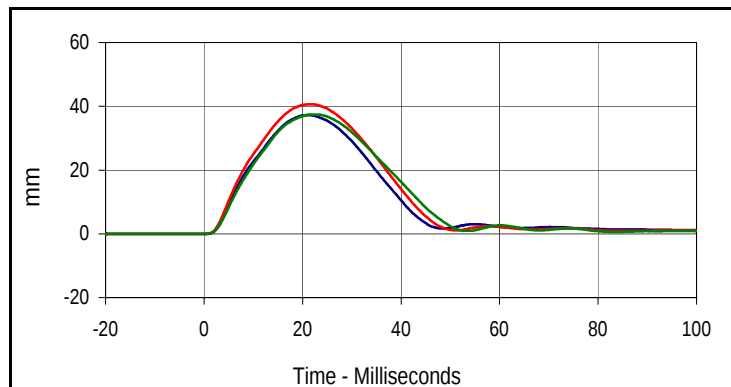
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	mm
Max	Time	Min	Time
37.5	17.0	-1.8	33.5

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

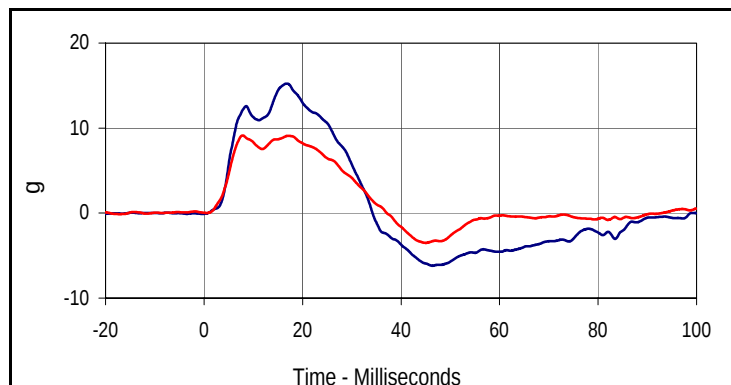
Test Date: 11/13/15
 Test I.D.: 299TWOA089



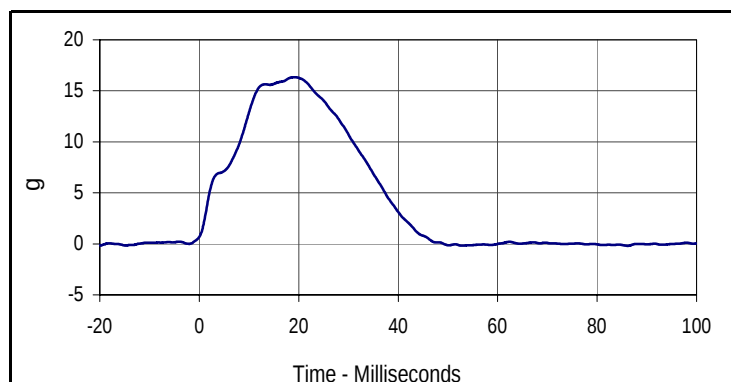
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	552	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.2	Pass
Humidity During Soak	Max	%	10.0 to 70.0	23.3	Pass
	Min	%		22.9	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory 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



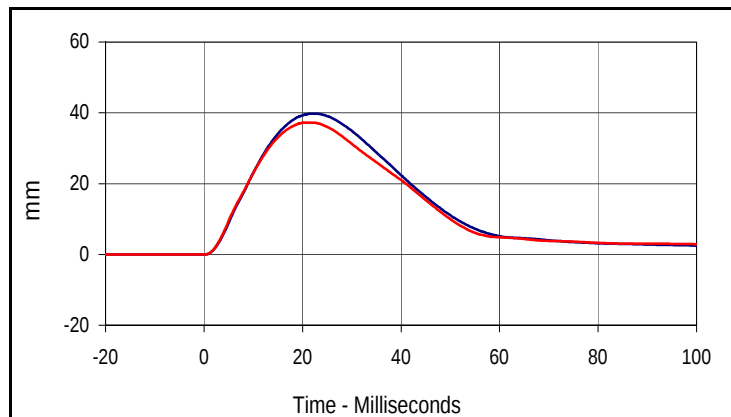
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	g
Max	Time	Min	Time
16.3	19.1	-0.2	86.2

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

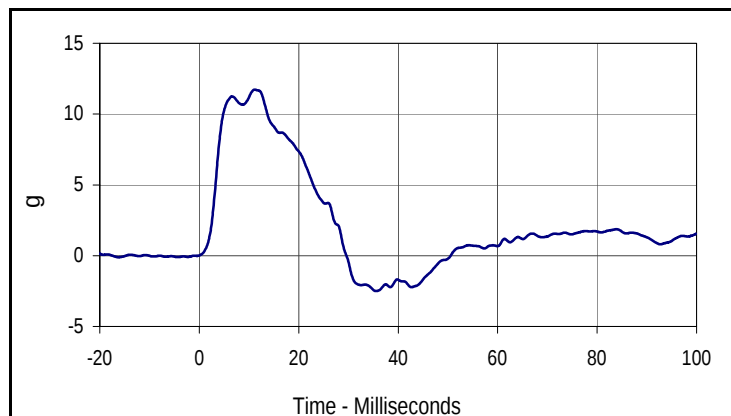
Test Date: 11/13/15
 Test I.D.: 299ABD089



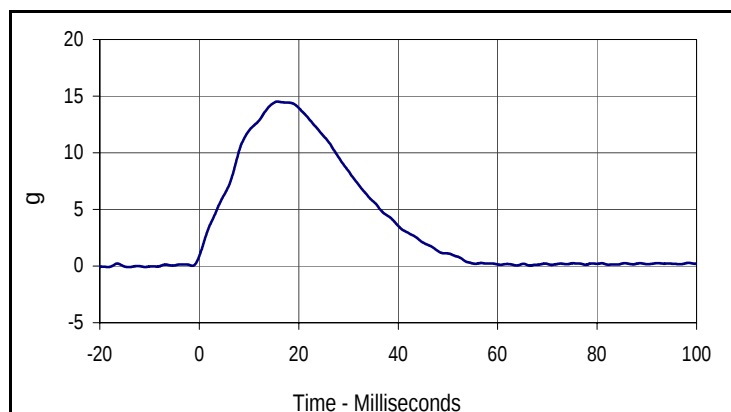
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	597	Pass
Temperature During Soak	Max °C	20.6 to 22.2	21.6	Pass
	Min °C		21.2	Pass
Humidity During Soak	Max %	10.0 to 70.0	23.3	Pass
	Min %		22.9	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory 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

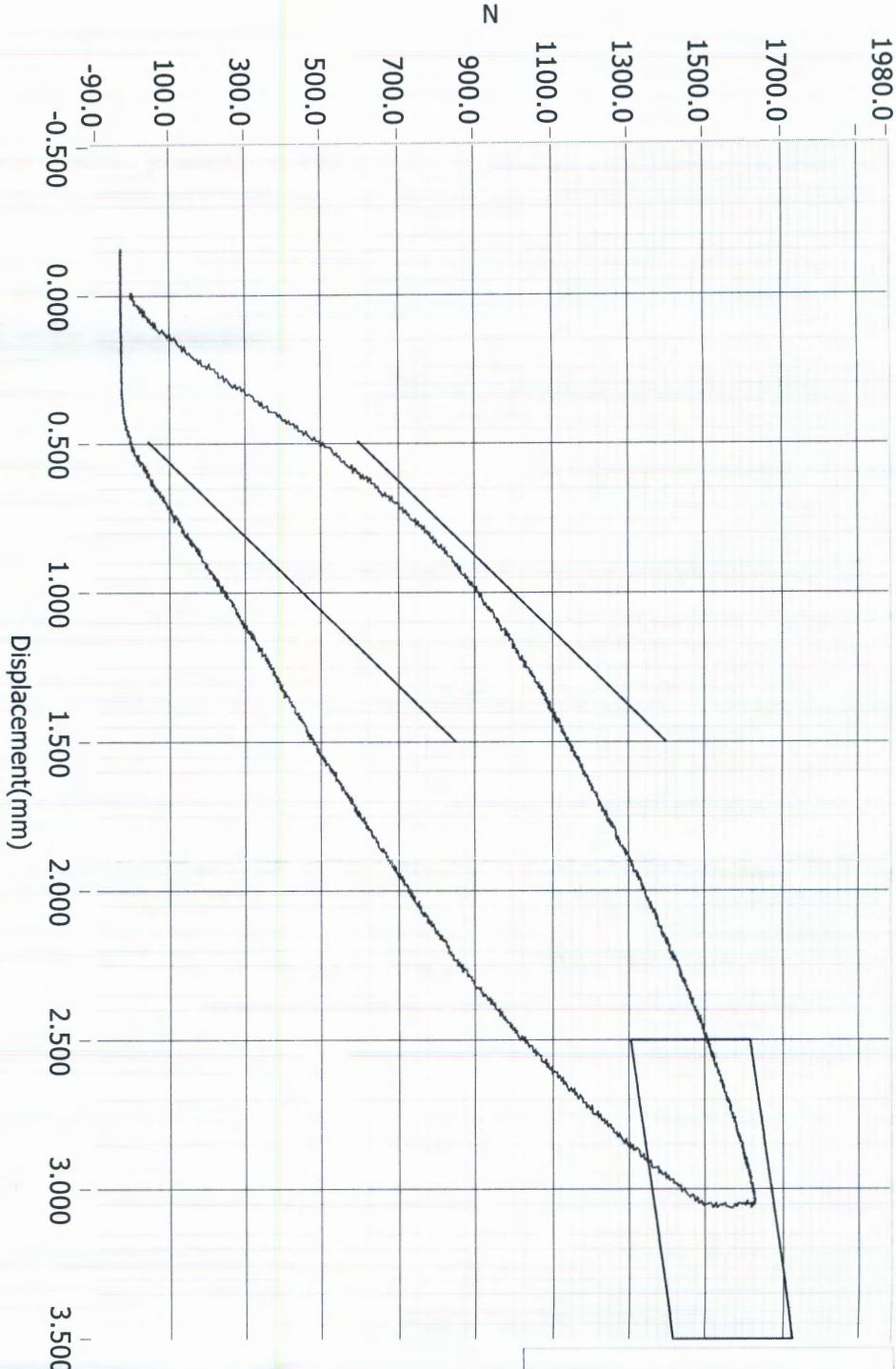


Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	g
Max	Time	Min	Time
11.7	11.1	-2.5	35.6



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	

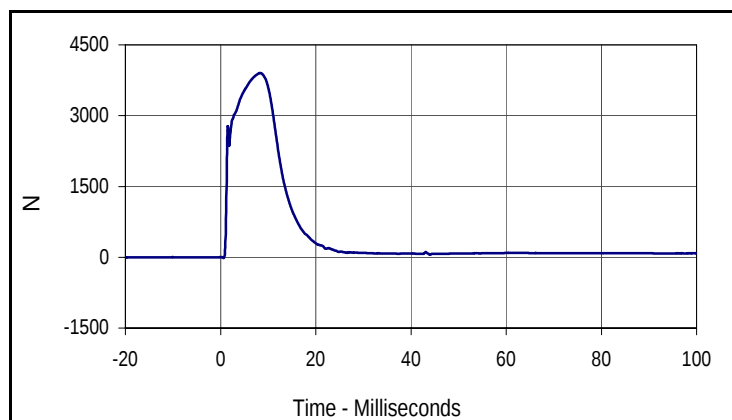
Current Date : 12/13/2013 Current Time : 23:02:13

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

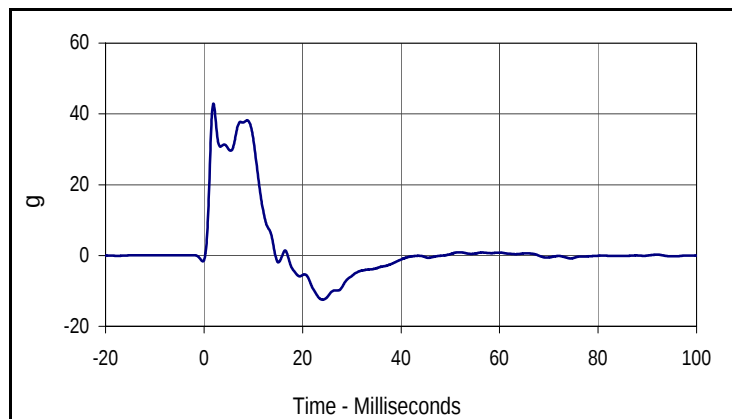
Test Date: 11/13/15
 Test I.D.: 299ACET089



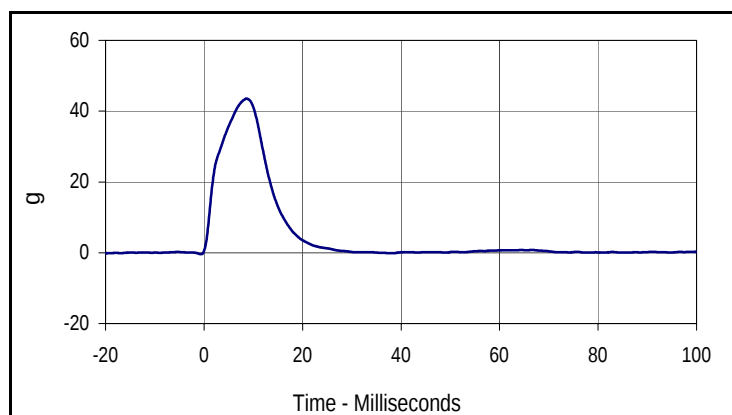
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	642	Pass
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	23.3	Pass
	Min		22.9	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity 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



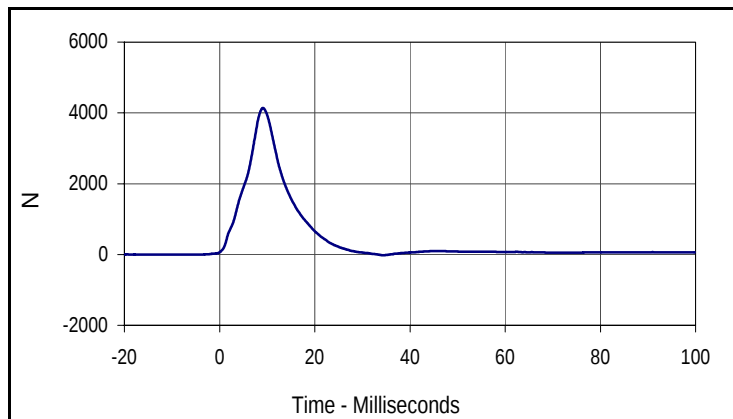
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	g
Max	Time	Min	Time
43.5	8.7	-0.4	-0.6

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

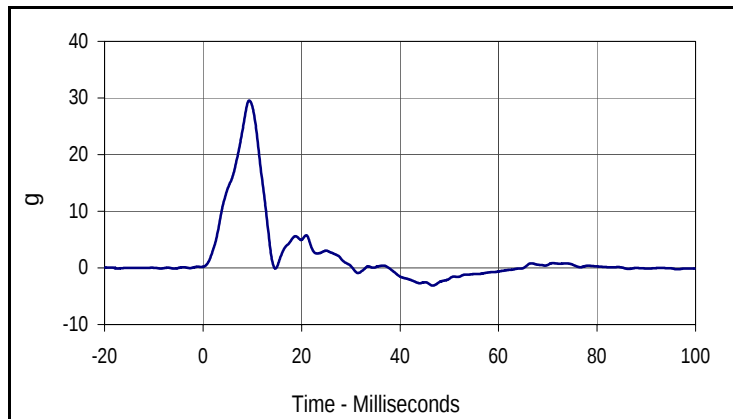
Test Date: 11/13/15
 Test I.D.: 299PL089



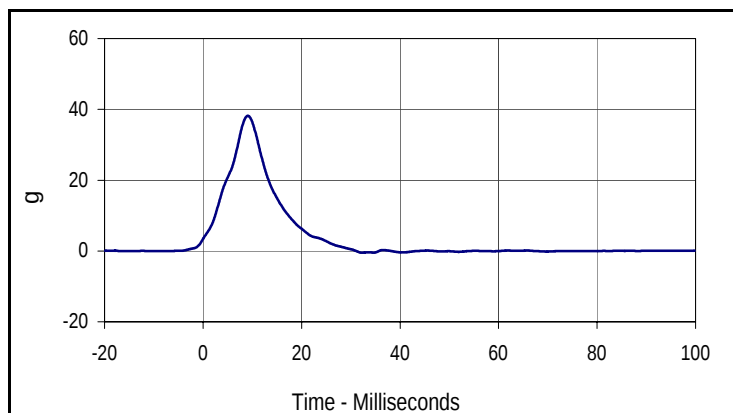
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	687	Pass
Temperature During Soak	Max °C	20.6 to 22.2	21.6	Pass
	Min °C		21.2	Pass
Humidity During Soak	Max %	10.0 to 70.0	23.3	Pass
	Min %		22.9	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory 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 D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 299		
				Serial Number	Manufacturer	Calibration
Head Accelerometers	Primary		X	P51929	Endevco	9/23/15
			Y	P50086	Endevco	9/23/15
			Z	P51931	Endevco	9/23/15
	Redundant		X	P68604	Endevco	9/23/15
			Y	P51934	Endevco	9/23/15
			Z	P58736	Endevco	9/23/15
Displacement Potentiometers	Thoracic Rib	Upper	Y	1143	FTSS	5/14/15
		Middle	Y	1160	FTSS	5/14/15
		Lower	Y	1213	FTSS	5/14/15
	Abdominal Rib	Upper	Y	1218	FTSS	5/14/15
		Lower	Y	1177	FTSS	9/17/15
Lower Spine Accelerometers (T12)			X	04I20-Z04	Endevco	5/14/15
			Y	06A07-R08	Endevco	5/14/15
			Z	P58795	Endevco	5/14/15
Acetabulum Load Cell			Y	272	Denton	5/1/15
Iliac Wing Load Cell			Y	284	Denton	6/23/15
Pelvis Plug (Struck Side)				70635	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	A160353	MSI	6/20/15
Vehicle Center of Gravity	Y	A159422	MSI	6/20/15
Vehicle Center of Gravity	Z	A160384	MSI	6/20/15
Left Floor Sill	Y	A159404	MSI	6/21/15
A-Pillar Sill	Y	A145531	MSI	6/19/15
A-Pillar Low	Y	A145968	MSI	6/19/15
A-Pillar Mid	Y	A145954	MSI	7/8/15
B-Pillar Sill	Y	A160370	MSI	7/7/15
B-Pillar Low	Y	A160360	MSI	6/19/15
B-Pillar Mid	Y	A159444	MSI	6/21/15
Driver Seat	Y	A159446	MSI	6/20/15
Engine Top	X	A159405	MSI	6/20/15
Engine Top	Y	A162195	MSI	6/21/15
Firewall	Y	A152847	MSI	7/8/15
Right Roof	Y	A160719	MSI	7/7/15
Right Floor Sill	Y	A159407	MSI	6/21/15
Rear Floorpan	X	A148195	MSI	7/7/15
Rear Floorpan	Y	A148256	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