REPORT NUMBER: SPNCAP-KAR-15-024

NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST

FORD MOTOR CO.

2015 FORD MUSTANG 2-DOOR COUPE

NHTSA No: M20150220

PREPARED BY:

KARCO ENGINEERING, LLC.

9270 HOLLY ROAD

ADELANTO, CA 92301

JANUARY 22, 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

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Approval Date: January 22, 2015

FINAL REPORT ACCEPTANCE BY OCWS:

_____

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

Date: _____

_____

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

Date: _____

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
SPNCAP-KAR-15-024		

4. Title and Subtitle	5. Report Date
Final Report of New Car Assessment Program Side Impact Pole Testing of a 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220	January 22, 2015
	6. Performing Organization Code KAR
7. Authors Mr. Balbino A. Beltran, Project Engineer, KARCO Mr. Frank Richardson, Program Manager, KARCO	**8. Performing Organization Report No.** TR-P34004-09-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.** DTNH22-09-D-00122
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NVS-111) 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C. 20590	**13. Type of Report and Period Covered** Final Test Report, Jan. 8 - 22, 2015 **14. Sponsoring Agency Code** NVS-111

15. Supplementary Notes

16. Abstract

A 32.2 km/h (20 mph) 75° oblique impact Side NCAP Test was conducted on the subject 2015 Ford Mustang 2-door coupe 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 January 8, 2015.

The impact velocity was 32.05 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 17.8° C. The target vehicle's maximum post-test static crush was 362 mm located at level 3. The test vehicle's occupant performance data is as follows:

Measurement Description	Driver ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})		1000	468.6
Resultant Lower Spine Acceleration	g	82	34
Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	3082
Maximum Thoracic Rib Deflection	mm	38	24
Maximum Abdominal Rib Deflection	mm	45	16

The door on the struck side of the vehicle did not separate from the body at the hinges or latches. The opposite door did not open during the side impact event.

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

19. Security Classification of this report	20. Security Classification of this page	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	104	

TABLE OF CONTENTS

SECTION 1
TEST PURPOSE AND PROCEDURE

This side impact test is part of the MY 2015 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number DTNH22-09-D-00122. The purpose of this test is to generate comparative side impact performance in a 2015 Ford Mustang 2-door coupe. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated September 2013.

SECTION 2
SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2015 Ford Mustang 2-door coupe. The subject vehicle was towed into the rigid pole at an angle of 74.61° and a velocity of 32.05 km/h. The test was conducted by KARCO Engineering, LLC. in Adelanto, California on January 8, 2015. Pre- and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

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

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

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

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

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

Measurement Description	Units	Passenger ATD (SID-IIs)	
		IARV	Result
Head Injury Criteria (HIC_{36})		1000	468.6
Lower Spine (T12) Resultant Acceleration	g	82	34
Total Pelvic Force (sum of acetabular and iliac forces	N	5525	3082
Maximum Thoracic Rib Deflection	mm	38*	24
Maximum Abdominal Rib Deflection	mm	45*	16

**Proposed IARV*

Supplemental restraint information is given below:

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

GENERAL COMMENTS

The door on the struck side of the vehicle remained closed and latched. There was no separation at the hinges or latches. The door on the non-struck side remained closed and latched. There was no ATD injury value that exceeded its limit.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15

CONVERSION FACTORS

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

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20150220
Model Year	2015
Make	Ford
Model	Mustang
Body Style	2-Door Coupe
VIN	1FA6P8AM1F5313713
Body Color	Ingot Silver Metallic
Odometer Reading (km / mi)	97 / 60
Engine Displacement (L)	3.7
Type / No. of Cylinders	V6
Engine Placement	Longitudinal
Transmission Type	Automatic
Transmission Speeds	6
Overdrive	Yes
Final Drive	Rear
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks	No
Power Window Auto-Reverse	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	No
Rear Pass. Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensioner	No
Driver Load Limiter	Yes
Rear Pass. Load Limiter	No
Other Safety Restraint	No

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Co.
Date of Manufacture	Oct-14
Vehicle Type	Passenger Car

GVWR (kg)	2032
GAWR Front (kg)	982
GAWR Rear (kg)	1055

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	2		4	
Capacity Weight (VCW) (kg)				303.0	*A*
DSC x 68.04 (kg)				272.2	*B*
Cargo Weight (RCLW) (kg)				30.8	*A-B*

VEHICLE SEAT TYPE

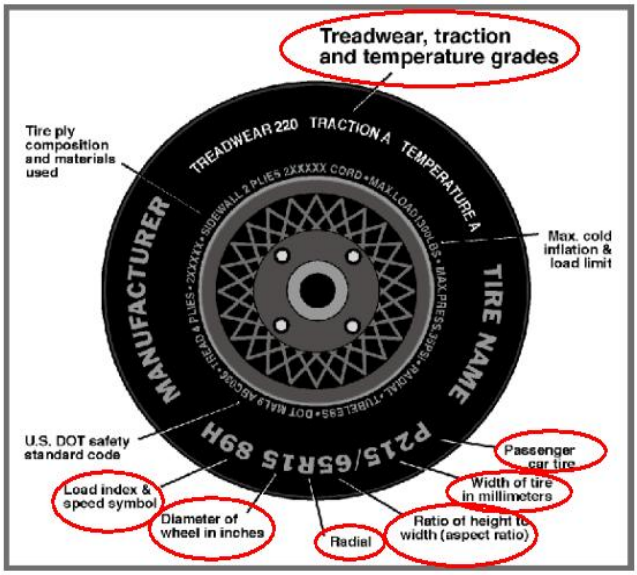
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						w/ Lever	w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat		Yes			Yes		
Third Row Seat							

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15



Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	350	350
Cold Pressure (kPa)	220	220
Recommended Tire Size	P235/55R17	P235/55R17
Tire Size on Vehicle	P235/55R17	P235/55R17
Tire Manufacturer	Hankook	Hankook
Tire Model	Ventus S1 Noble	Ventus S1 Noble
Treadware	700	700
Traction Grade	B	B
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Steel, 2 Polyester, 2 Nylon	2 Steel, 2 Polyester, 2 Nylon
Load Index/Speed Symbol	99H	99H
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Left	T73F 1AH 2314	T73F 1AH 2314
DOT Safety Code Right	T73F 1AH 2314	T73F 1AH 2314

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	230	230	230	230
Tire Placard	kPa	220	220	220	220
Owner's Manual	kPa	220	220	220	220
As Tested	kPa	220	220	220	220

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	441.0	372.5		429.0	397.0		454.0	410.5	
Right	kg	422.0	362.5		437.0	408.5		421.5	390.0	
Ratio	%	54.0%	46.0%	100.0%	51.8%	48.2%	100.0%	52.2%	47.8%	100.0%
Total	kg	863.0	735.0	1598.0	866.0	805.5	1671.5	875.5	800.5	1676.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1598.0	A
Actual Weight of 1 P572 O ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	30.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1677.8	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	-0.4	-0.5	Yes
Front Passenger Sill Angle (front-to-rear)*	°	-0.4	-0.5	-0.5	Yes
Front Bumper-Line Angle (left-to-right)**	°	-0.3	-0.7	-0.8	Yes
Rear Bumper-Line Angle (left-to-right)**	°	-0.1	-0.4	-0.5	Yes
Vehicle CG (Aft of Front Axle)	mm	1249	1309	1297	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	15	-10	26	

*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: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Non-Struck Side Door Panel	4.0
Non-Struck Side Window	5.0
Front Brake Calipers	11.0
Non-Struck Side Outboard Mirror	1.0
Rear Tailights	3.0
Rear Bumper Cover	8.0
Ballast / Equipment Added	59.0

Test Height Adjustable Setting (If Applicable)	

DATA SHEET NO. 2

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

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15

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	5.0	0.0	2.5
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle	As Tested SCRP Height	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid Fore/Aft	Forwardmost
Driver Seat	2.5	495	Max	472	483	495
			Mid	472	483	495
			Min	472	483	495
Front Passenger Seat	Fixed	528	Max	496	509	528
			Mid	496	509	528
			Min	496	509	528
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed

DATA SHEET NO. 2 … (CONTINUED)

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

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15

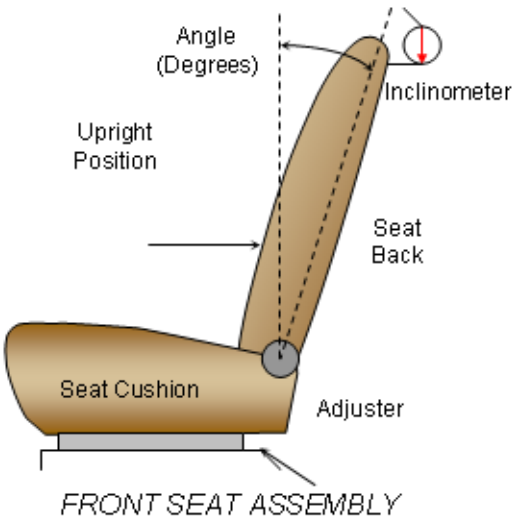
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	255	38	0	0
Front Passenger Seat	253	38	0	0
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

*Detent zero (0) is the forward most detent

SEAT BACK ADJUSTMENT

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



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/Seated Dummy	58.3	30	4.0	12
Front Passenger Seat	58.1	30	3.9	12
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: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15

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	Fixed	Fixed

HEAD RESTRAINT ADJUSTMENT

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

	Total No. of Positions	Placed in Position
Driver Seat	3 Vertical, 12 Horizontal	Full Down, Full Forward

DATA SHEET NO. 2 … (CONTINUED)

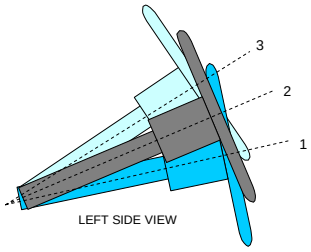
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15

STEERING COLUMN ADJUSTMENT

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

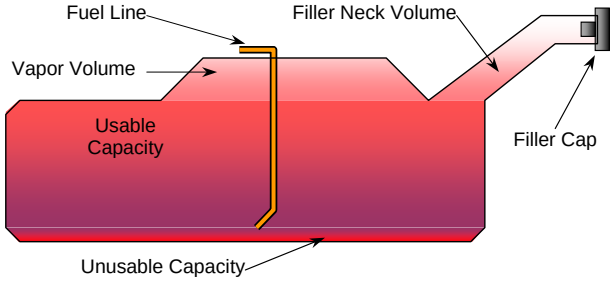


STEERING COLUMN ASSEMBLY

	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	17.2	145
Geometric Center - Position 2	20.2	165
Uppermost - Position 3	23.1	185
Telescoping Steering Wheel Travel		40
Test Position	20.2	165

FUEL PUMP

The vehicle is equipped with an electric fuel pump. The fuel pump operates when the ignition is switched to the “ON” position.



VEHICLE FUEL TANK ASSEMBLY

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	60.56
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	56.32
Actual amount of Solvent Used in Test	56.32
1/3 of Usable Capacity	20.19

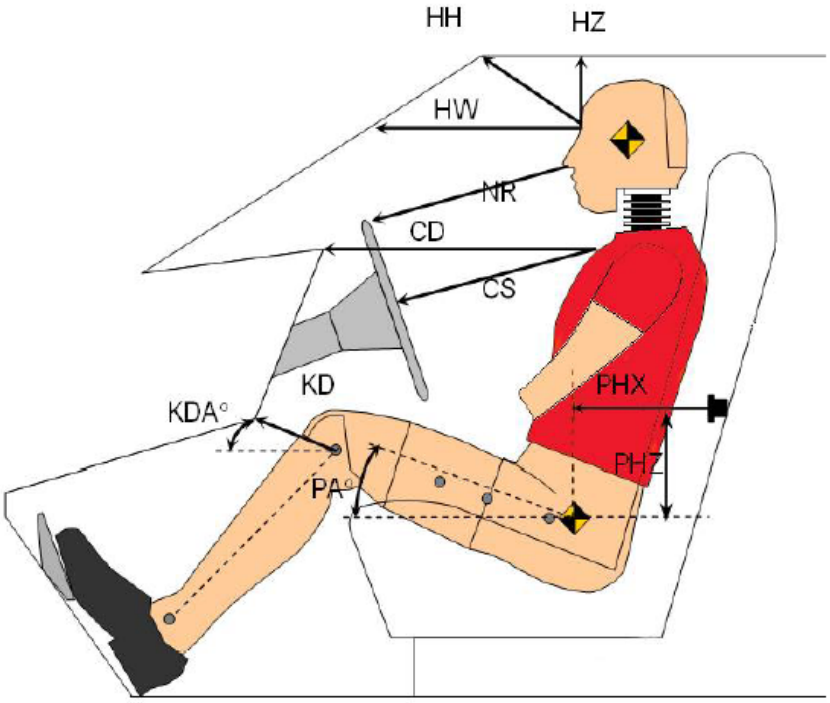
Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in the Form No. 1? ☒ **Yes** ☐ **No**

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15



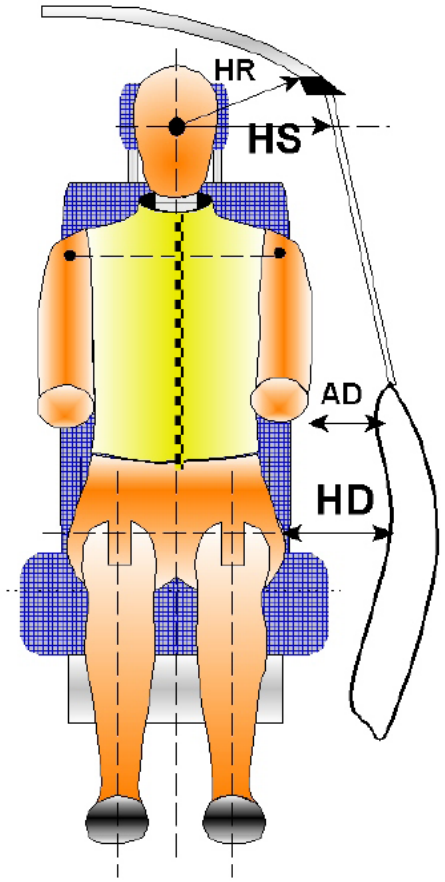
Driver Code	Description	Driver	
		Length (mm)	Angle (º)
HH	Head to Header	244	
HW	Head to Windshield	572	
HZ	Head to Roof	167	
NR	Nose to Rim	199	
CD	Chest to Dash	418	
CS	Chest to Steering Wheel	167	
KD(L)/KDA(L)°	Left Knee to Dash	135	33.3
KD(R)/KDA(R)°	Right Knee to Dash	124	26.3
PAX°	Pelvic Tilt Angle (x-axis)		20.3
PAY°	Pelvic Tilt Angle (y-axis)		0.3
PHX	Hip Point to Striker (x-axis)	600	
PHZ	Hip Point to Striker (z-axis)	199	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15



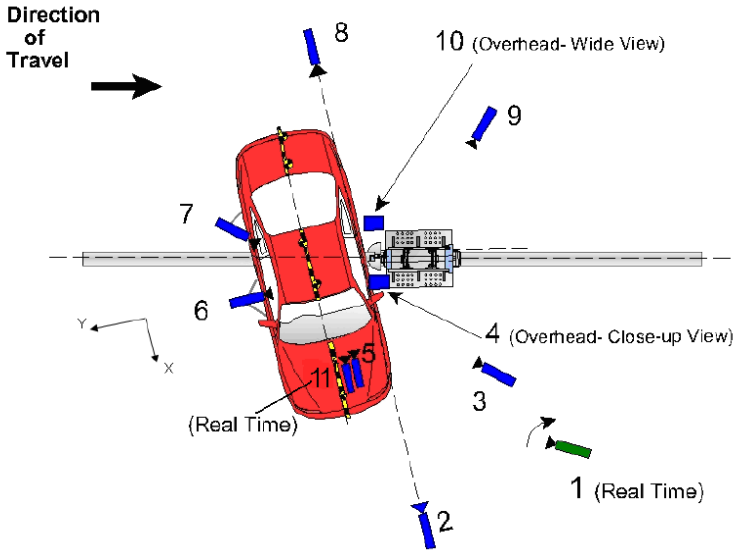
Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	234
HS	Head to Side Window	mm	369
AD	Arm to Door	mm	172
HD	Hip Point to Door	mm	262

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15



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	1.53	0.56	-1.45	35	1000
6	On-Board - Dummy Side View	0.11	168.00	-1.03	14	1000
7	On-Board - Dummy Rear Oblique View	-1.01	1.70	-1.07	20	1000
8	Rear Ground Level - Impact View	-6.12	-6.23	-0.96	24	1000
9	Impact Side 45° - Rearward Pole View	-8.02	0.04	-1.01	35	1000
10	Overhead Wide View of Impact	-0.06	0.22	-5.79	14	1000
11	Real Time Dummy Front View	1.52	0.58	-1.45		30

*All measurements accurate to ±6 mm

INSTRUMENTATION

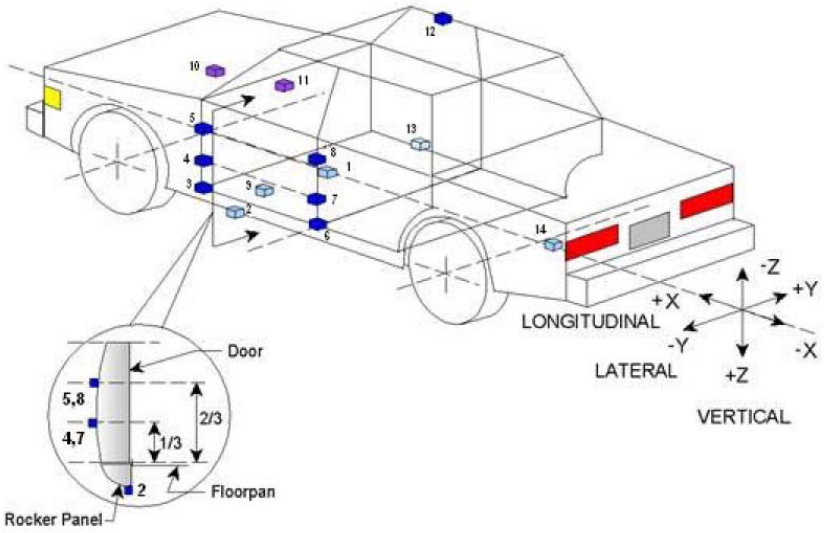
Driver Dummy Channels	16
Vehicle Structure Accelerometers	18
Pole Load Cells	8
Total	42

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15



Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1802	0	-389
2	Left Floor Sill	2665	-758	-153
3	A-Pillar Sill	2951	-845	-322
4	A-Pillar Low	2951	-845	-535
5	A-Pillar Mid	2951	-815	-746
6	B-Pillar Sill			
7	B-Pillar Low			
8	B-Pillar Mid			
9	Driver Seat Track	2025	-218	-309
10	Engine Top	2596	-40	-903
11	Firewall	3330	-54	-928
12	Right Roof	1972	552	-1350
13	Right Floor Sill	1990	695	-313
14	Rear Floorpan	873	0	-52

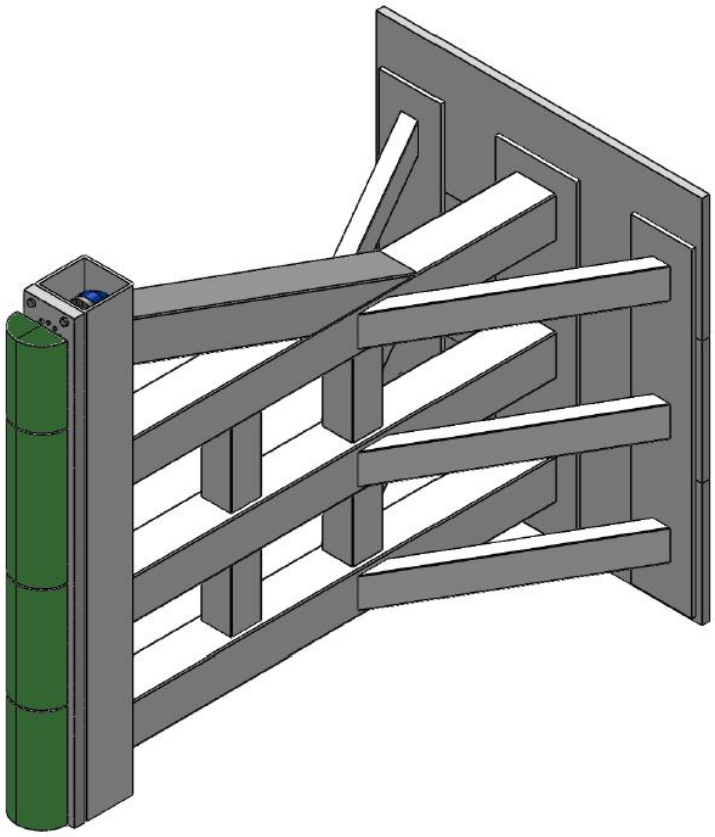
Reference: X – Rear surface of vehicle (+ forward)
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 7

RIGID POLE LOAD CELL DATA

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15



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: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver SID-IIs Dummy
Face	None
Top of Head	Curtain Airbag
Left Side of Head	Curtain Airbag
Back of Head	Curtain Airbag, Headrest
Left Shoulder	Seat, Torso/Pelvis Airbag
Upper Torso	None
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	N/A	Yes	N/A	Yes
Total Separation from Vehicle at Hinges or Latches	No	N/A	No	N/A	No
Latch or Hinge System Pulled Out of Their Anchorages	No	N/A	No	N/A	No
Disengaged from Latched Position	No	N/A	No	N/A	No
Latch Separated from Striker	No	N/A	No	N/A	No
Jammed Shut	Yes	N/A	No	N/A	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)	N/A	N/A	N/A	N/A	N/A

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

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

DATA SHEET NO. 8 … (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15

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	No	
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes	Yes	No	
Other	No		No	

IMPACT POINT LOCATION DATA

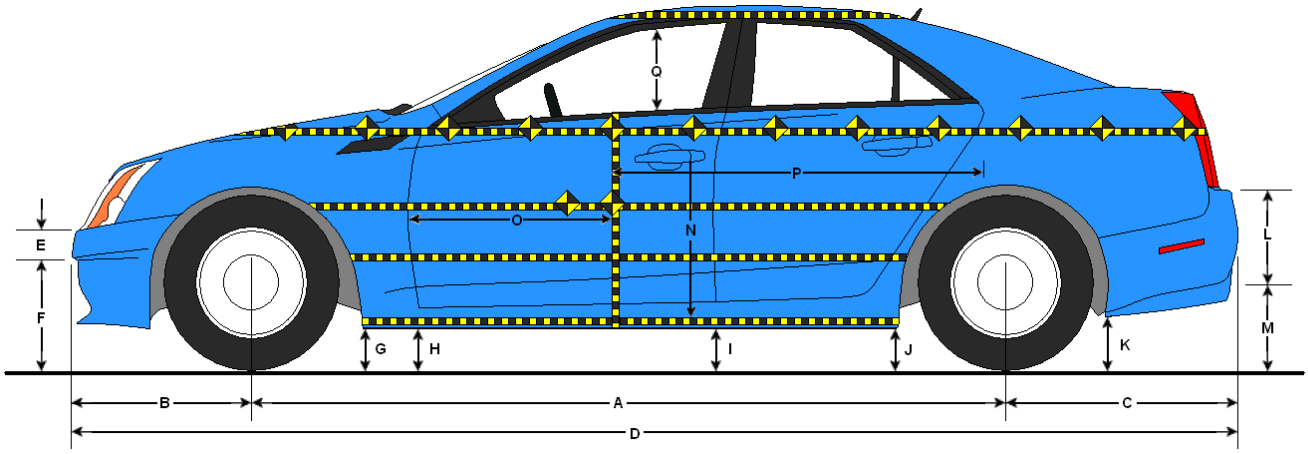
Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		1329
Actual Impact Point (Aft of Front Axle)	mm		1352
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	-23
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	74.6
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.05
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.03

DATA SHEET NO. 9

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15



LEFT SIDE VIEW

All measurements in mm with tolerance of ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

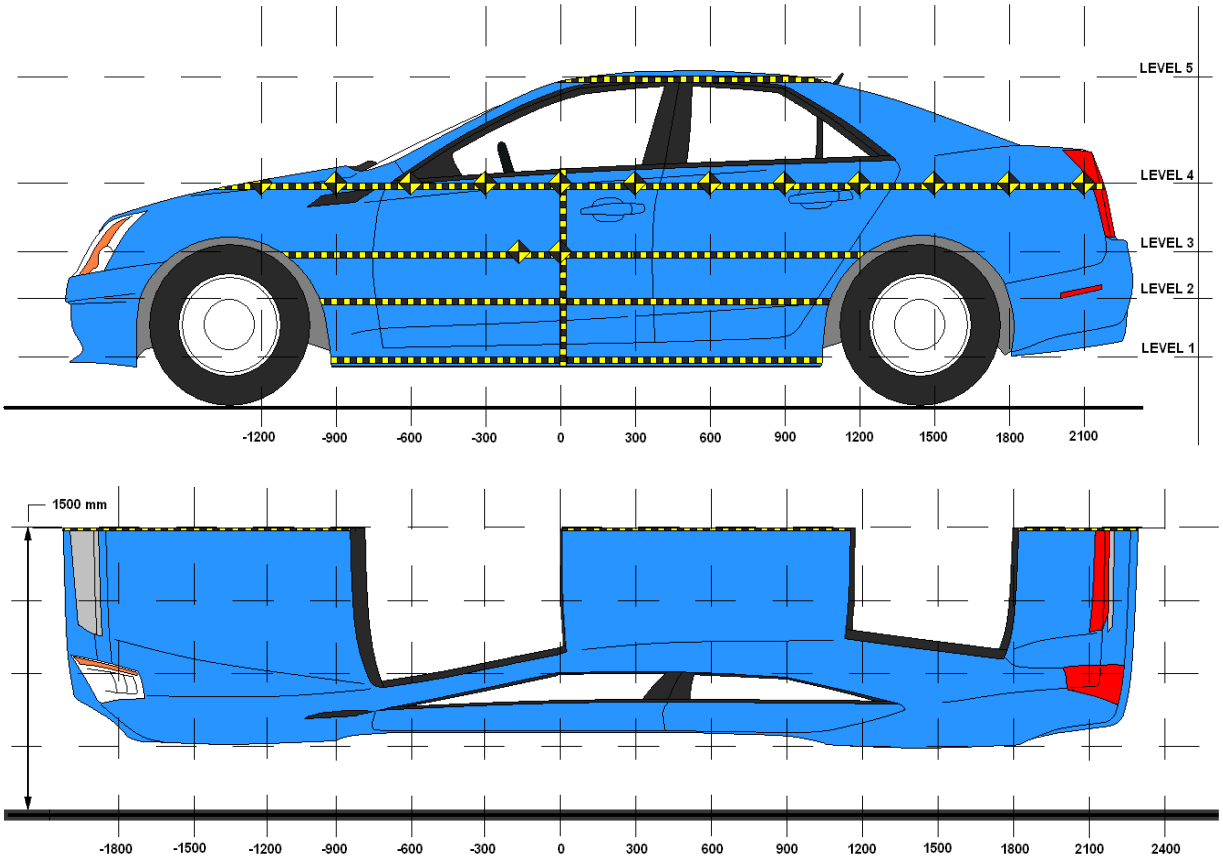
Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2716	2674	-42
B	Front Axle to FSOV	933	938	5
C	Rear Axle to RSOV	1044	1062	18
D	Total Length at Centerline	4688	4675	-13
E	Front Bumper Thickness	126	126	0
F	Fromt Bumper Bottom to Ground	384	459	75
G	Sill Height at Front Wheel Well	166	259	93
H	Sill Height at Front Door Leading Edge	210	269	59
I	Sill Height at B-Pillar	235	233	-2
J1	Sill Height at Rear Wheel Well	188	214	26
J2	Pinch Weld Height at Rear Wheel Well	136	185	49
K	Sill Height Aft of Rear Wheel Well	408	462	54
L	Rear Bumper Thickness	113	113	0
M	Rear Bumper Bottom to Ground	402	425	23
N	Sill Height to Bottom of Front Window Sill	641	655	14
O	Front Door Leading Edge to Impact CL	635	542	-93
P	Rear Door Trailing Edge to Impact CL	1710	1937	227
Q	Front Window Opening	276	262	-14
R	Right Side Length	3198	3210	12
S	Left Side Length	3198	3138	-60
T	Vehicle Width at B-Pillar	1820	1770	-50

DATA SHEET NO. 10

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15



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

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	217	299	0
2	Occupant H-Point	489	348	0
3	Mid-Door	586	362	0
4	Window Sill	896	307	0
5	Window Top	1288	149	150

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

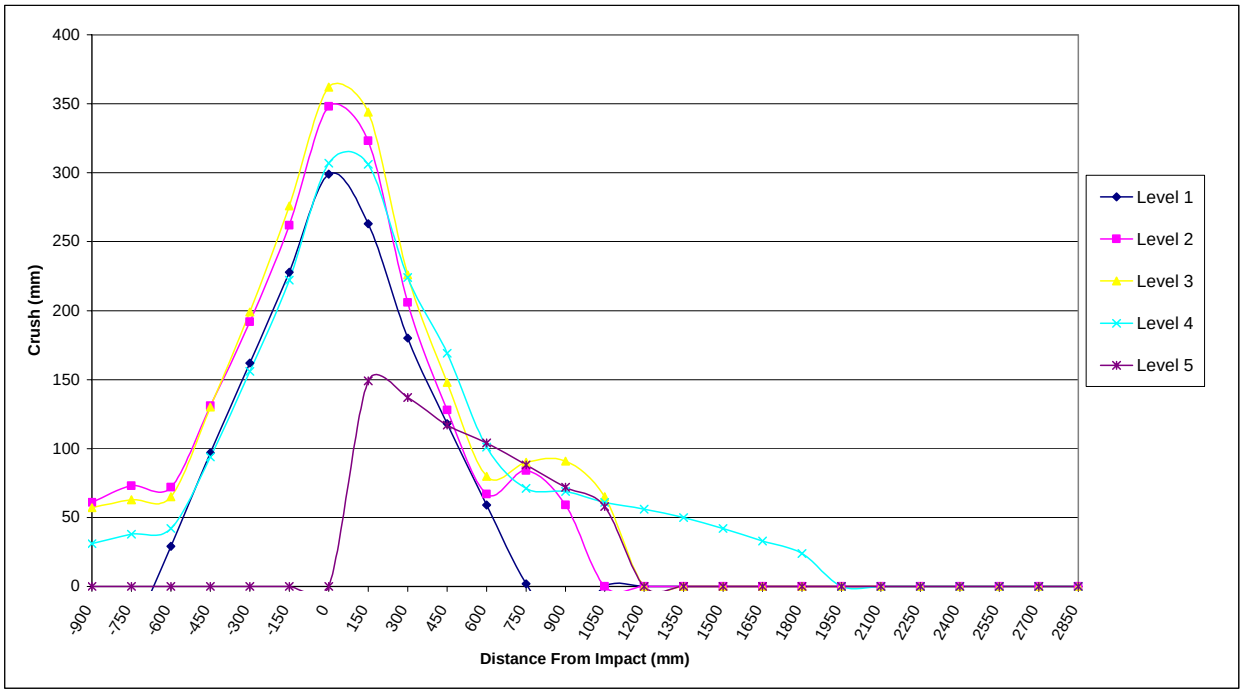
	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	618	573	574	653		524	634	631	684		-94	61	57	31	
-750	646	594	581	646		610	667	644	684		-36	73	63	38	
-600	647	598	583	641		676	670	648	683		29	72	65	42	
-450	643	599	583	639		740	730	713	733		97	131	130	94	
-300	640	600	585	636		802	792	784	792		162	192	199	156	
-150	637	601	586	638		865	863	862	860		228	262	276	222	
0	640	602	587	637		939	950	949	944		299	348	362	307	
150	639	604	590	639	866	902	927	934	945	1015	263	323	344	306	149
300	636	606	592	641	864	816	812	818	865	1001	180	206	226	224	137
450	636	608	594	643	869	754	736	742	812	986	118	128	148	169	117
600	641	609	596	647	871	700	676	676	748	975	59	67	80	101	104
750	640	600	595	655	879	642	684	685	726	967	2	84	90	71	88
900	616	573	575	650	890	584	632	666	719	962	-32	59	91	69	72
1050			551	633	913			616	694	971			65	61	58
1200				621					677					56	
1350				621					671					50	
1500				627					669					42	
1650				642					675					33	
1800				661					685					24	
1950															
2100															
2250															
2400															
2550															
2700															
2850															

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15

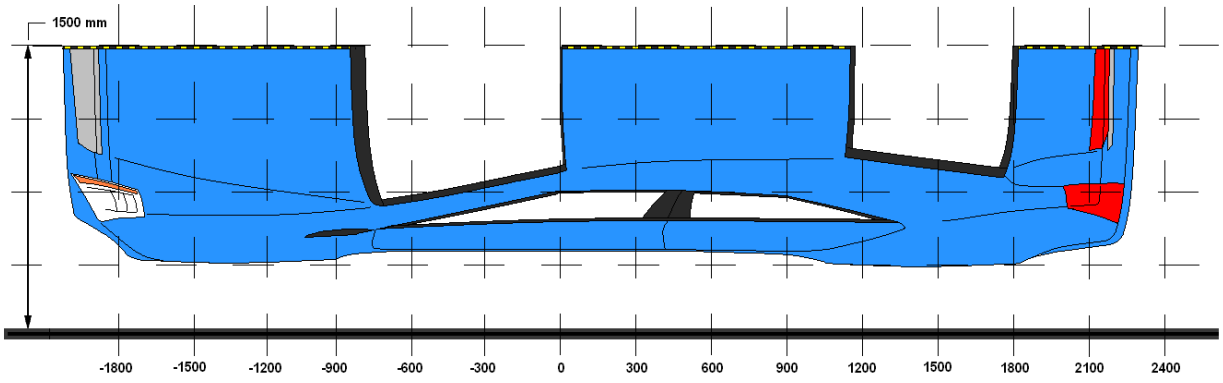


DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15



DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	1800	4	661	685	24
2	1350	4	621	671	50
3	750	3	595	685	90
4	150	3	590	934	344
5	-450	2	599	730	131
6	-900	2	573	634	61

DATA SHEET NO. 12

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15

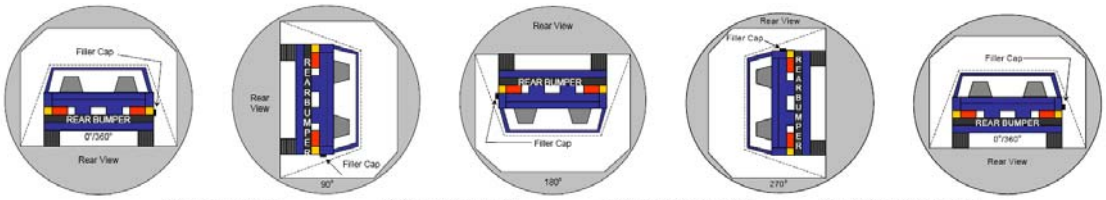
Temperature at Time of Impact: 17.8° C Test Time: 11:49 AM

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

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

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

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



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

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	84	300	384
90° To 180°	81	300	381
180° To 270°	78	300	378
270° To 360°	82	300	382

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

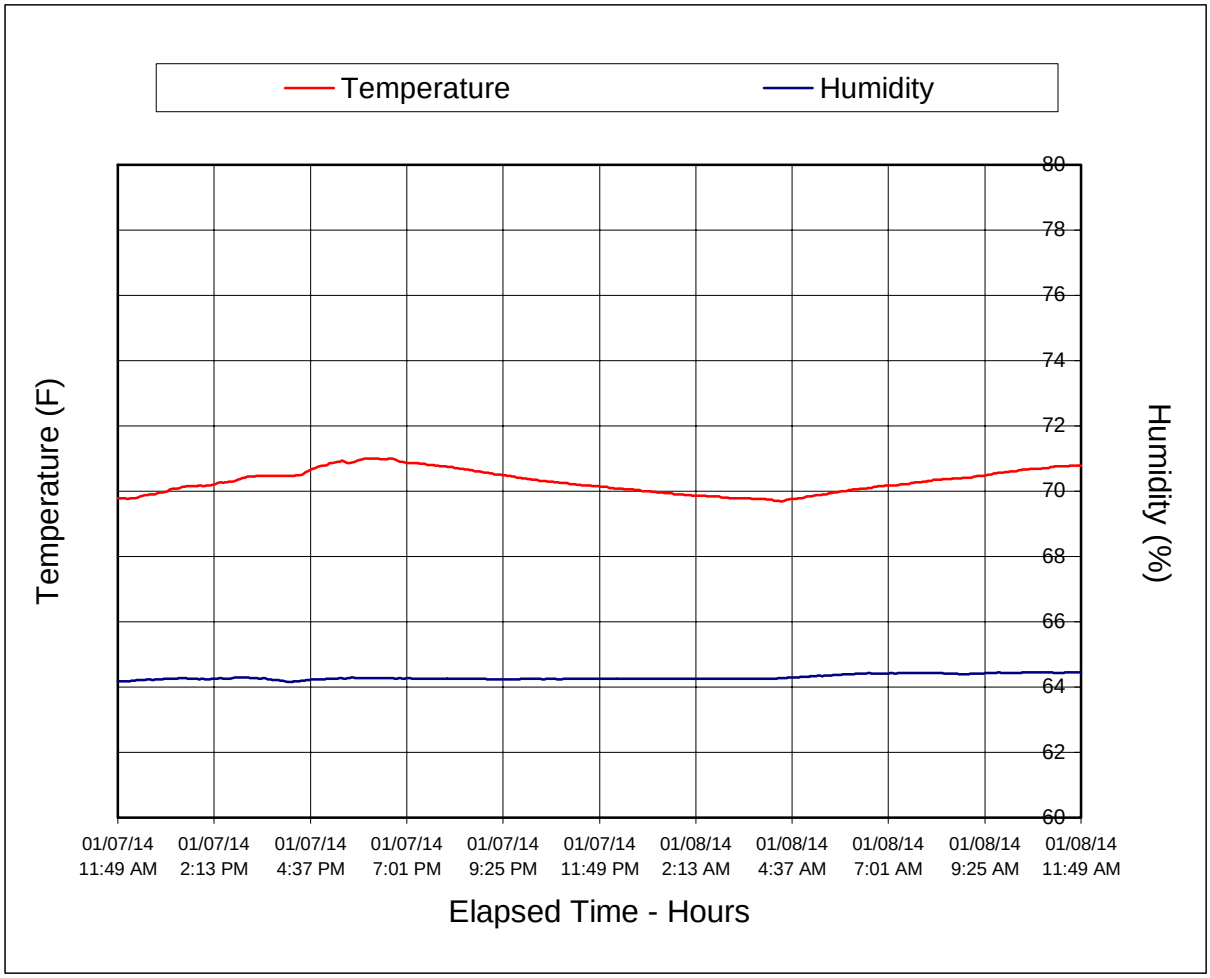
Test Phase	Spillage Location
0° To 90°	No Spillage Occurred
90° To 180°	No Spillage Occurred
180° To 270°	No Spillage Occurred
270° To 360°	No Spillage Occurred

DATA SHEET NO. 13

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150220

Test Program: NCAP Side Pole Impact Test Test Date: 01/08/15



APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS … (CONTINUED)

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

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

FIGURE 3. Pre-Test Frontal View of Test Vehicle

FIGURE 4. Post-Test Frontal View of Test Vehicle

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

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

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

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

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

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

FIGURE 11. Pre-Test Rear View of Test Vehicle

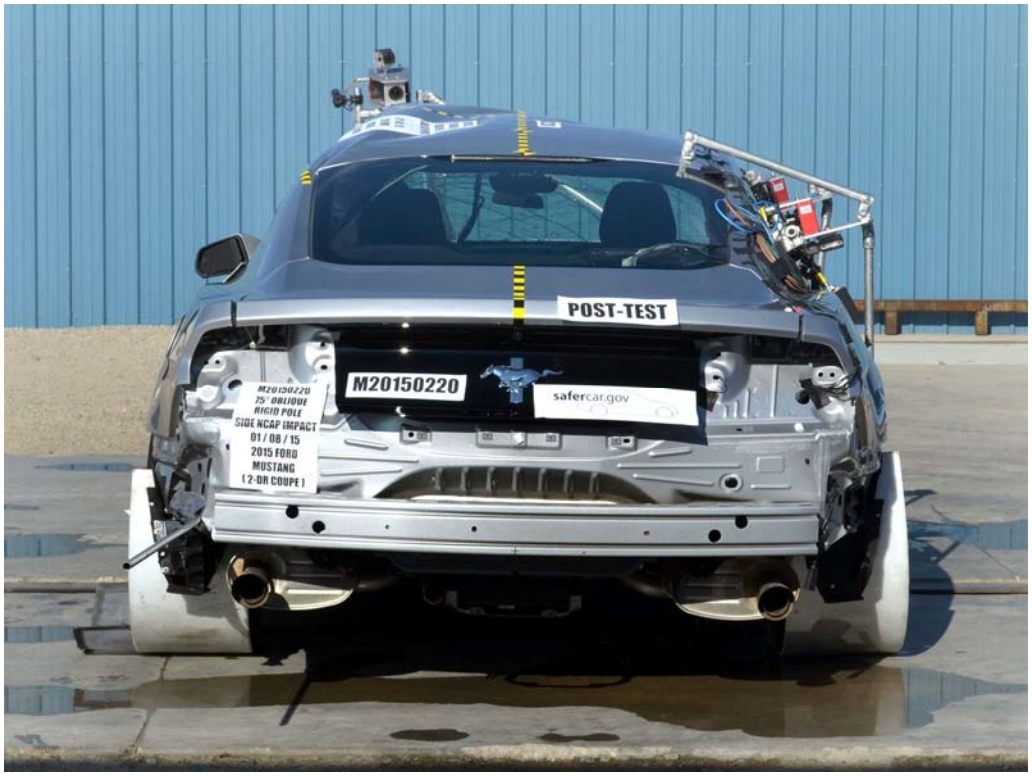


FIGURE 12. Post-Test Rear View of Test Vehicle

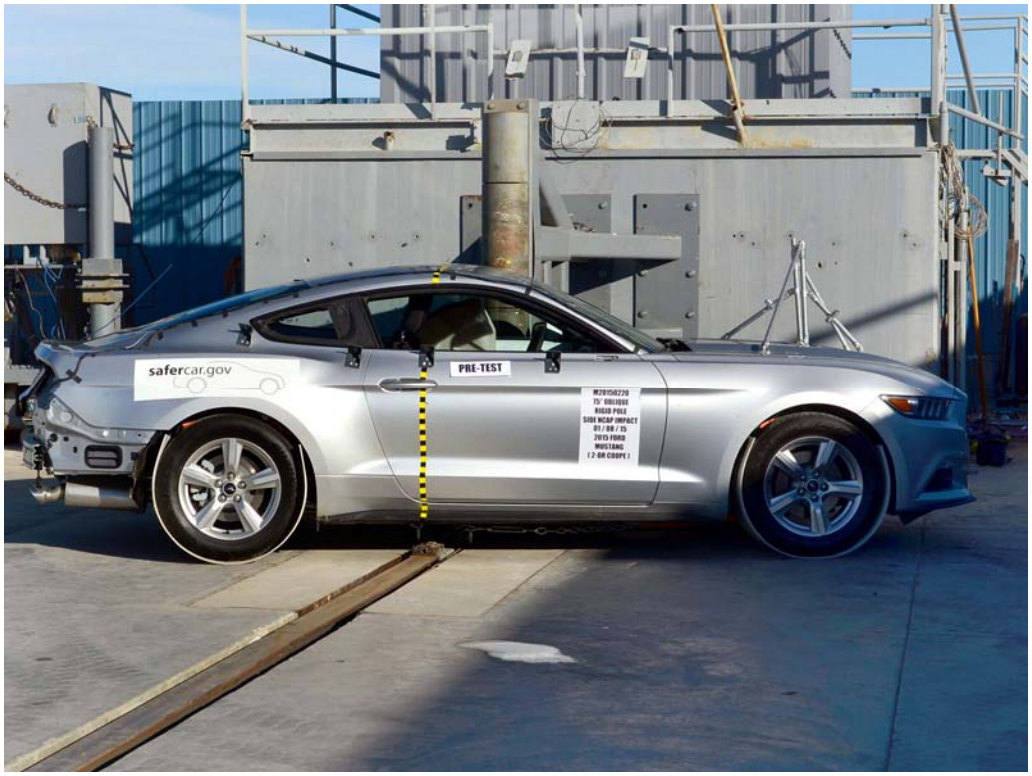


FIGURE 13. Pre-Test Right Side View of Test Vehicle

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

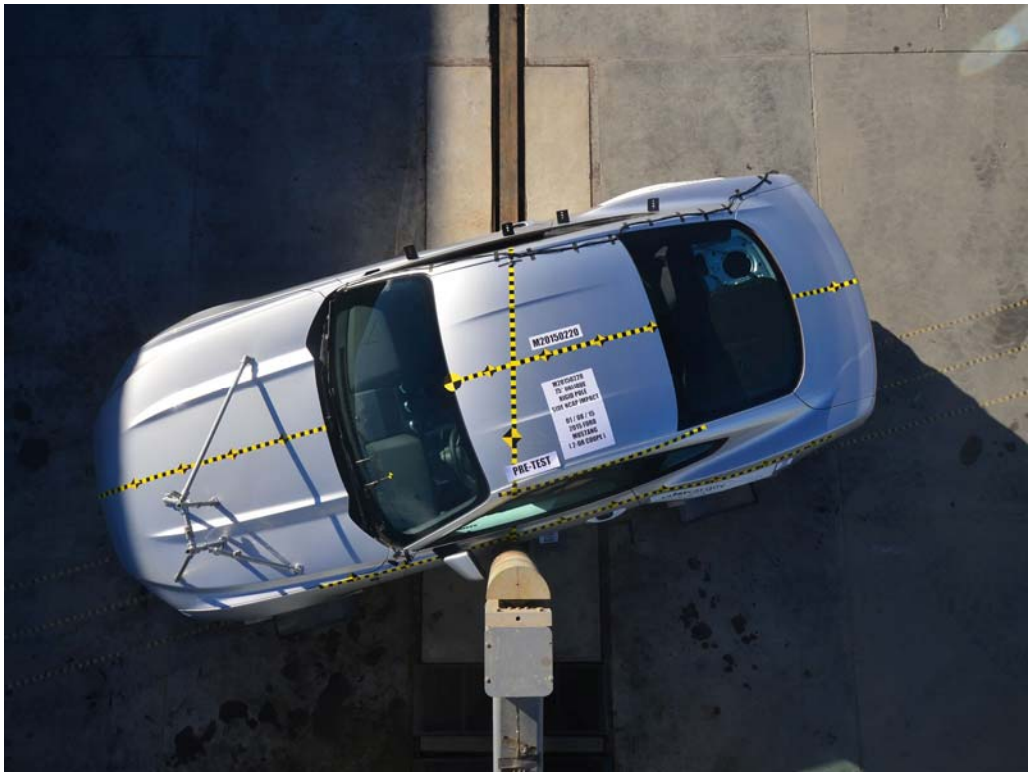


FIGURE 15. Pre-Test Overhead View of Test Area

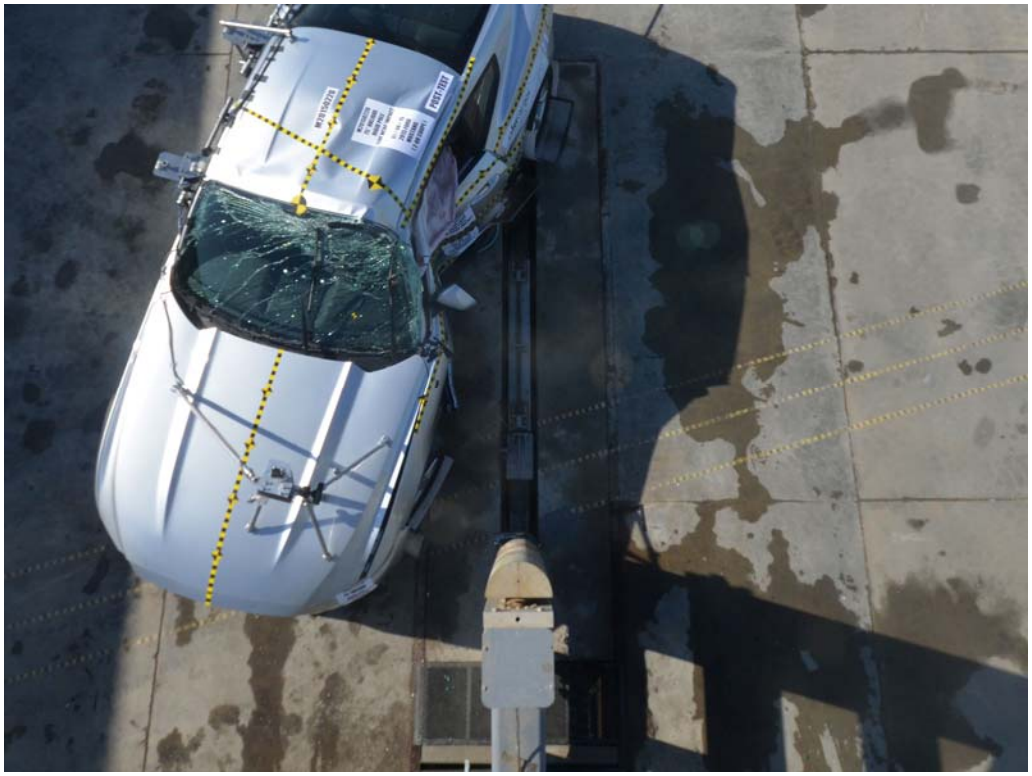


FIGURE 16. Post-Test Overhead View of Test Area

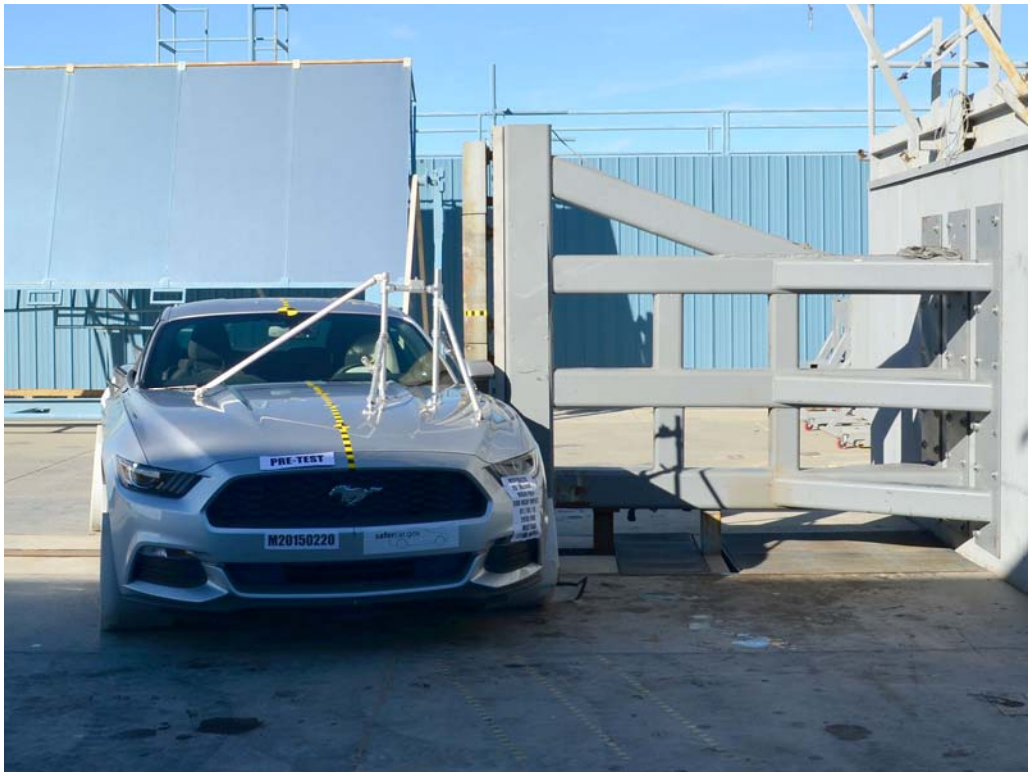


FIGURE 17. Pre-Test Left Side View of Pole
Positioned Against Side of Vehicle

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

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

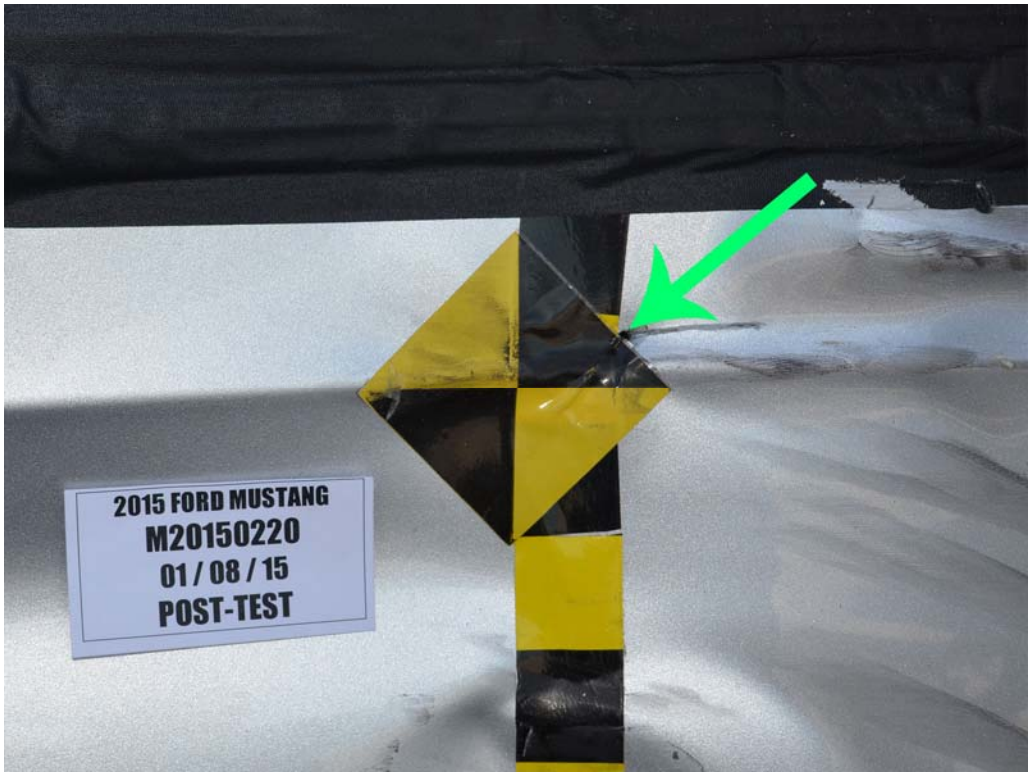


FIGURE 20. Post-Test Close-Up View of Impact Point Target
Showing Impact Location

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

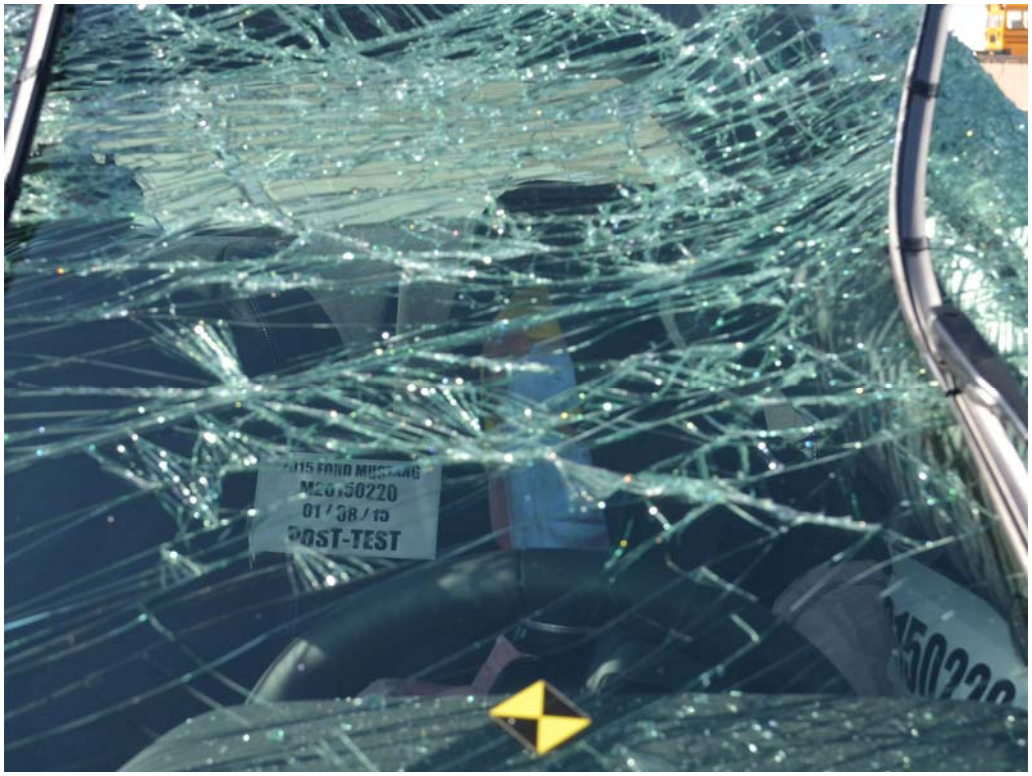


FIGURE 22. Post-Test Front Close-Up View of Dummy

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

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

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

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

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

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

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

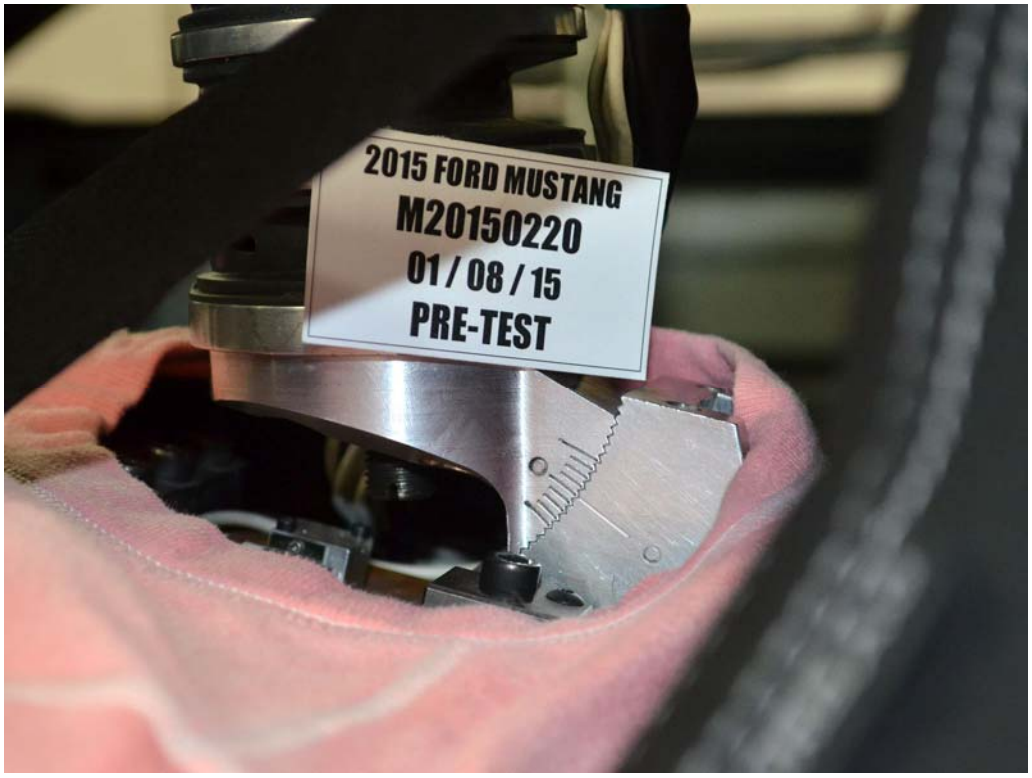


FIGURE 30. Pre-Test Left Side View of Dummy's Neck
Showing Position of Adjustable Neck Bracket

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

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

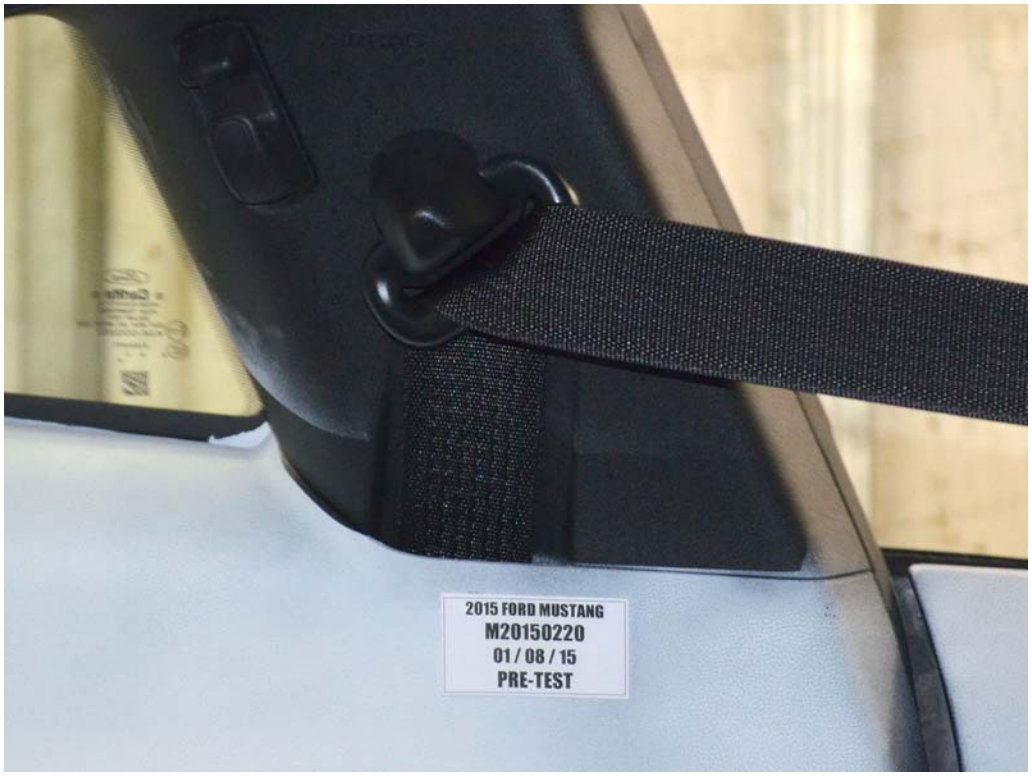


FIGURE 33. Pre-Test View of Belt Anchorage for Dummy

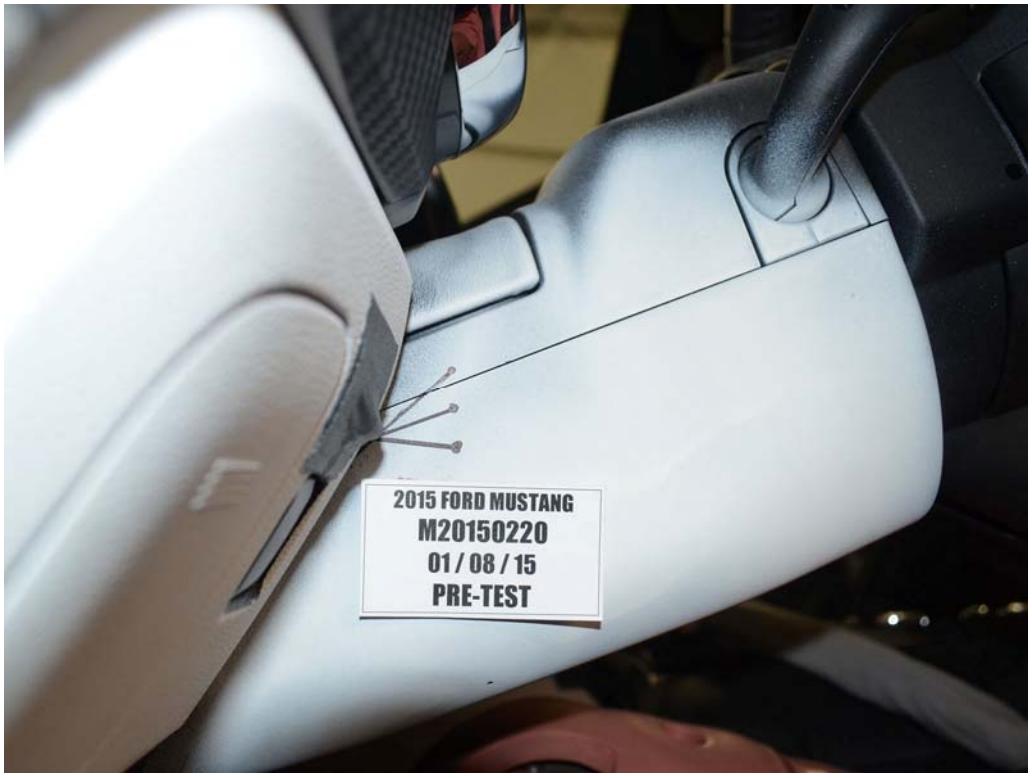


FIGURE 34. Pre-Test Left Side View of Steering Wheel

FIGURE 35. View of Disengaged Parking Brake

FIGURE 36. Pre-Test View of Parking Brake

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

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

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

FIGURE 40. Pre-Test Dummy and Door Clearance View

FIGURE 41. Post-Test Dummy and Door Clearance View

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

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

FIGURE 44. Pre-Test Inner Door Panel View

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

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

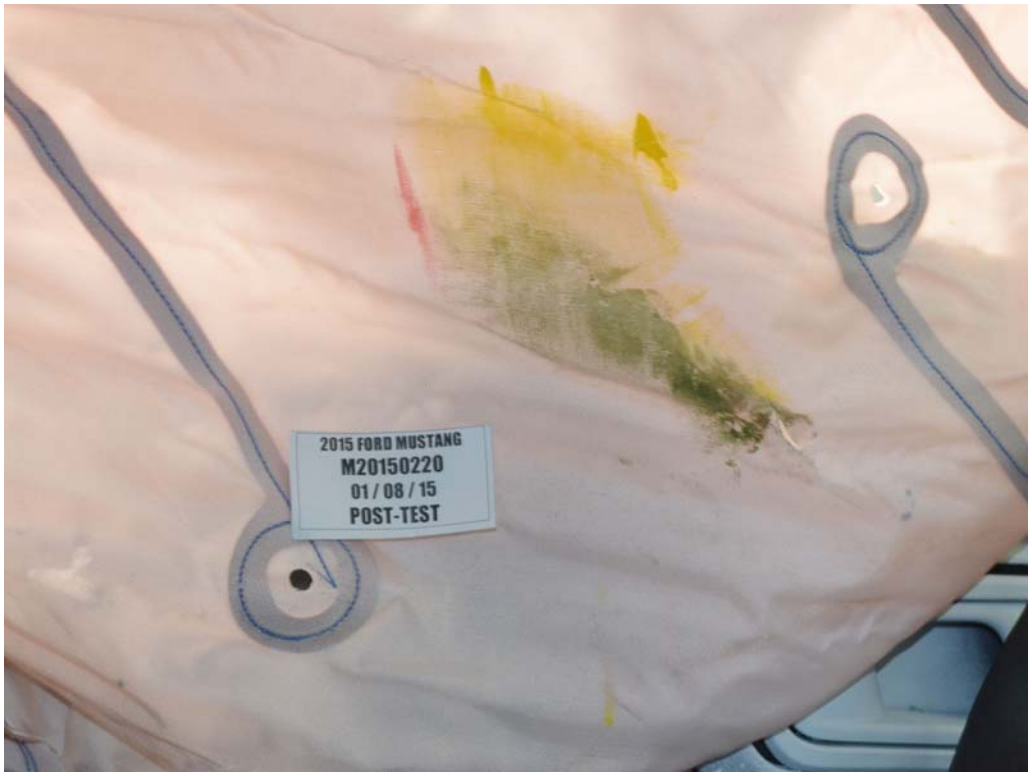


FIGURE 47. Post-Test Dummy Close-Up Head Contact With Side Airbag View

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

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

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

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

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

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

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

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

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

FIGURE 57. Pre-Test Pole Barrier Front View

FIGURE 58. Post-Test Pole Barrier Front View

FIGURE 59. Pre-Test Pole Barrier Side View

FIGURE 60. Post-Test Pole Barrier Side View

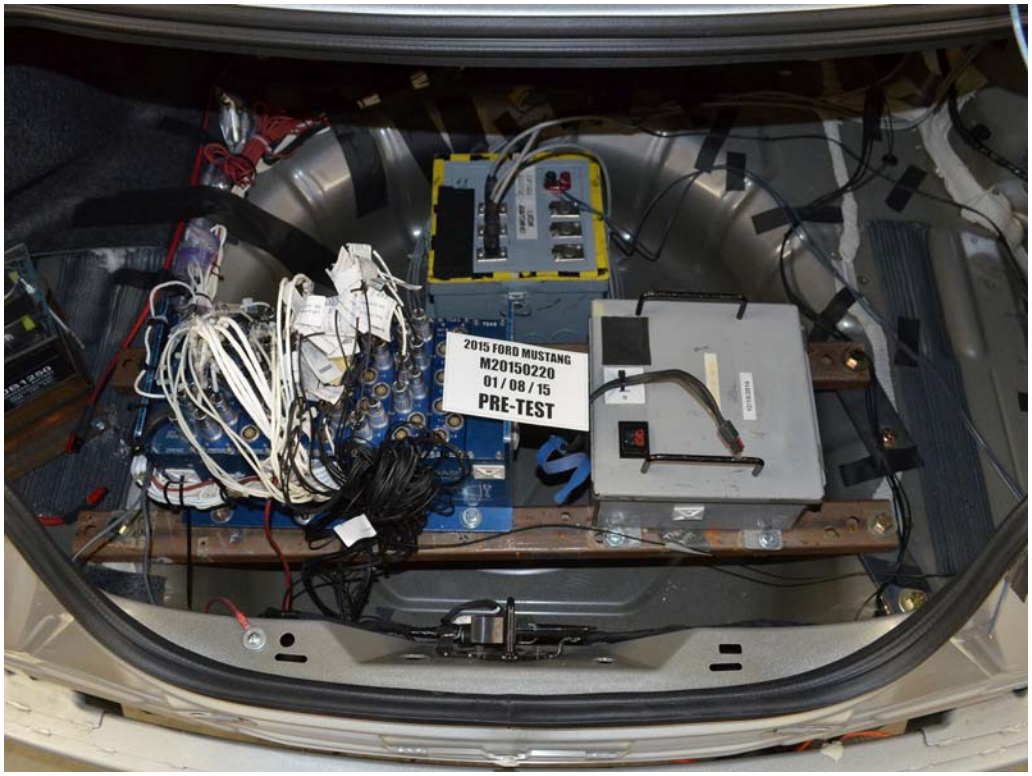


FIGURE 61. Pre-Test Ballast View

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

FIGURE 63. FMVSS No. 301 Static Rollover 0 Degrees

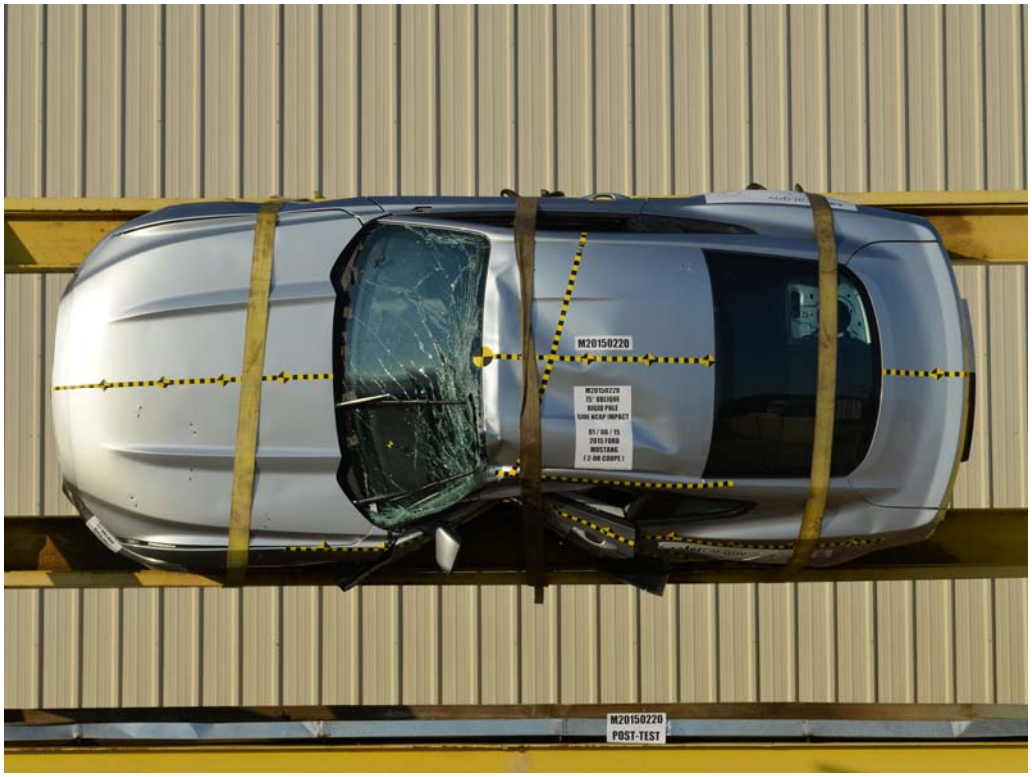


FIGURE 64. FMVSS No. 301 Static Rollover 90 Degrees

FIGURE 65. FMVSS No. 301 Static Rollover 180 Degrees

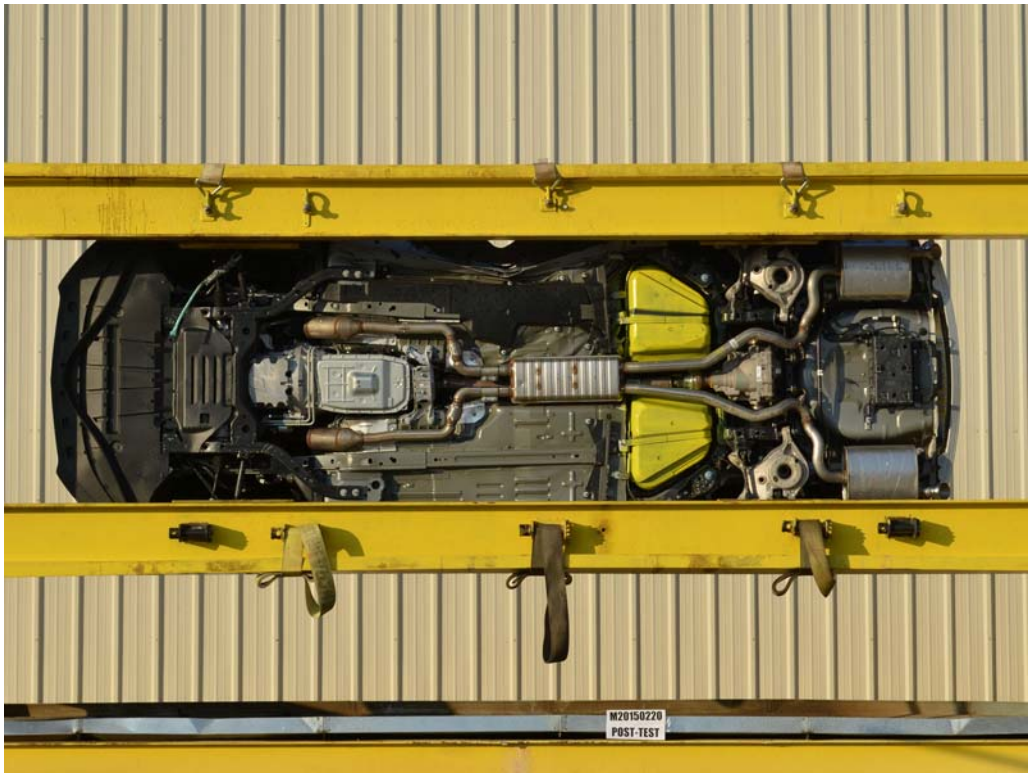


FIGURE 66. FMVSS No. 301 Static Rollover 270 Degrees

FIGURE 67. FMVSS No. 301 Static Rollover 360 Degrees

FIGURE 68. Impact Event

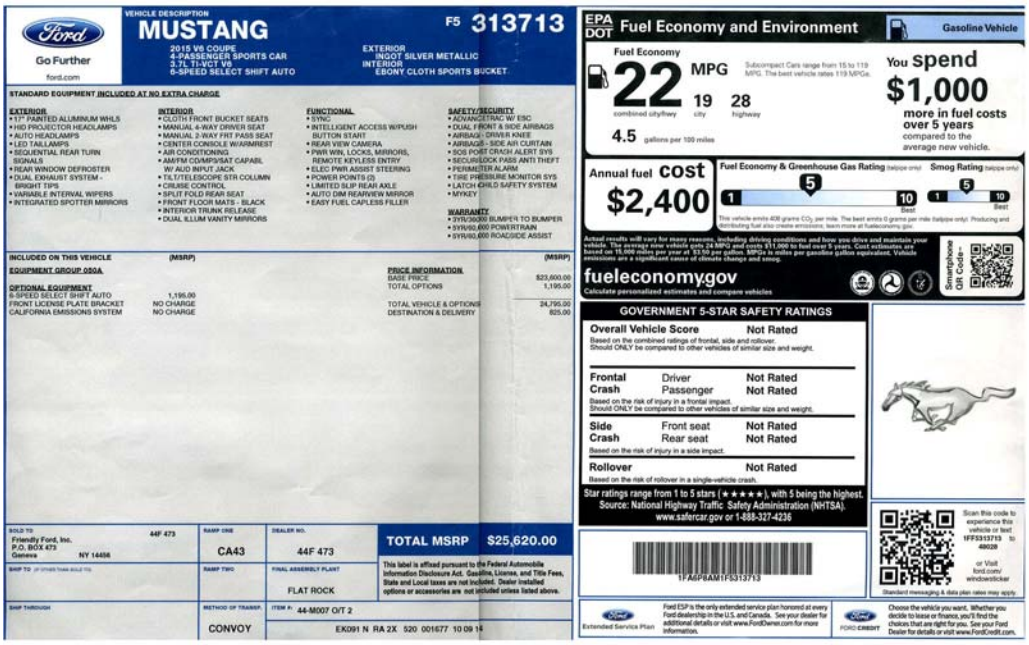


FIGURE 69. Monroney Label

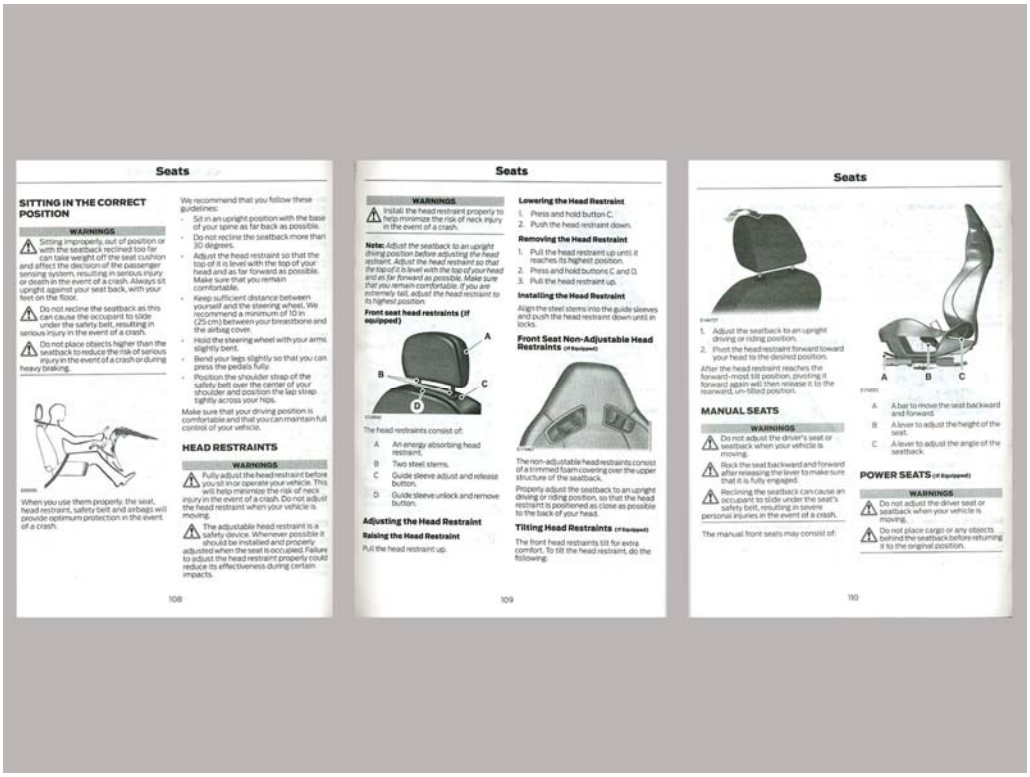


FIGURE 70. Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

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

Additional Driver Dummy Instrumentation Data

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

Vehicle Instrumentation Data

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

Left B-Pillar Sill Acceleration

Left Lower B-Pillar Acceleration (Y)

Left Mid B-Pillar Acceleration (Y)

Driver Seat Track at Dummy Hip Point Acceleration (Y)

Engine Top Acceleration (X)

Engine Top Acceleration (Y)

Firewall Center Acceleration (Y)

Right Roof at Vertical Impact Reference Line Acceleration (Y)

Right Sill at Vertical Impact Reference Line Acceleration (Y)

Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)

Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)

Pole Instrumentation Data

Load Cell Pole Barrier #1 Force (Y)

Load Cell Pole Barrier #2 Force (Y)

Load Cell Pole Barrier #3 Force (Y)

Load Cell Pole Barrier #4 Force (Y)

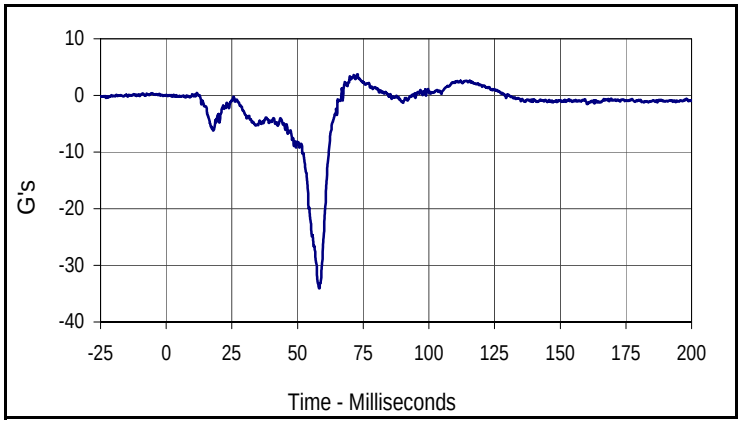
Load Cell Pole Barrier #5 Force (Y)

Load Cell Pole Barrier #6 Force (Y)

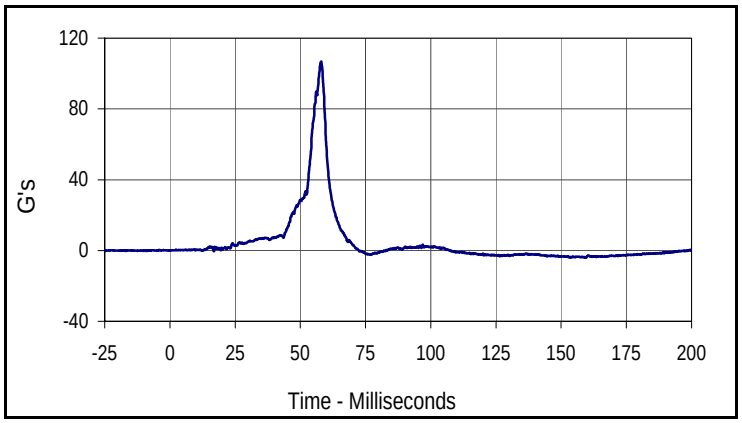
Load Cell Pole Barrier #7 Force (Y)

Load Cell Pole Barrier #8 Force (Y)

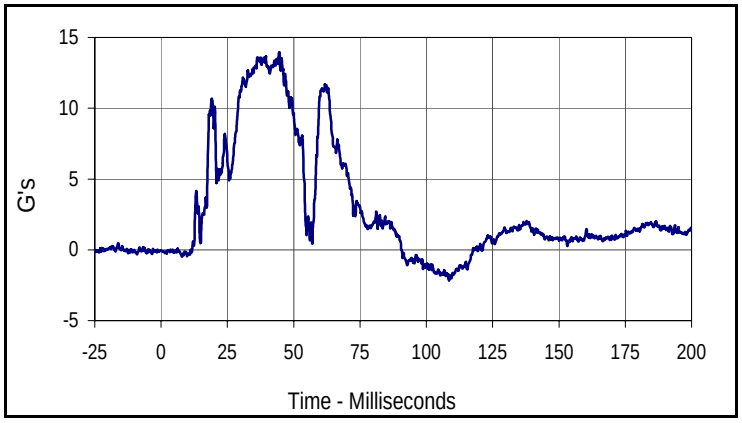
Test Vehicle:	2015 Ford Mustang 2-Door Coupe	Test Date:	1/8/14
Test Program:	NCAP Side Pole Impact Test	NHTSA No.:	M20150220



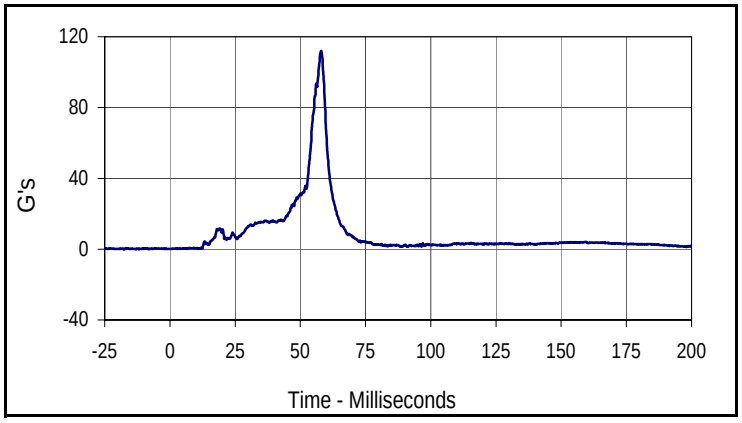
Curve Description			
Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
3.7	72.8	-34.1	58.3



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
106.7	58.0	-4.0	159.2

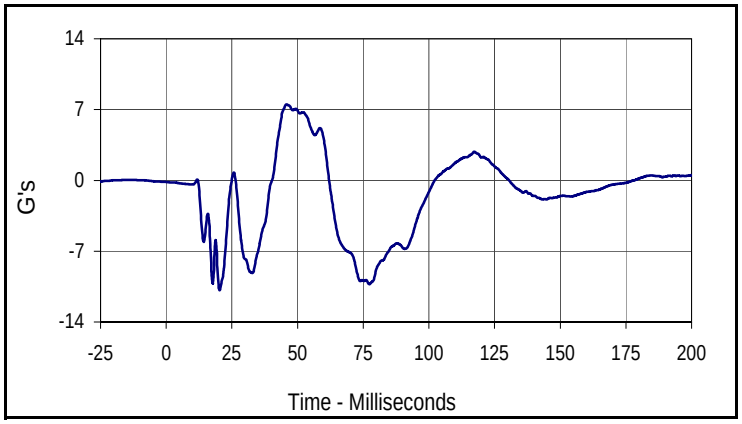


Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
14.0	44.6	-2.1	108.5

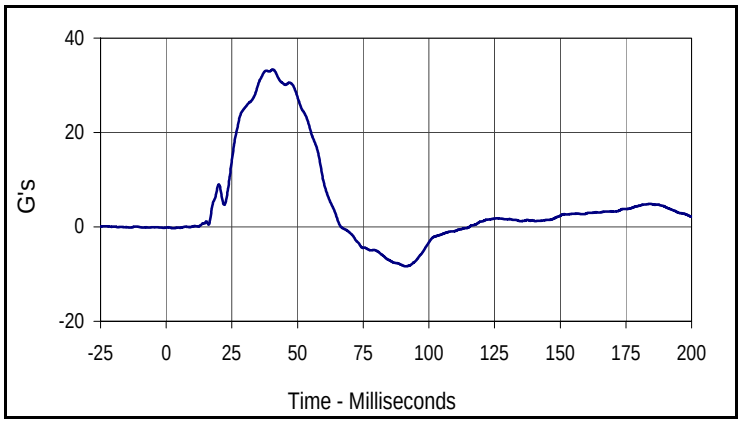


Curve Description			
Driver Head Acceleration Primary Res.			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
112.0	58.0	0.1	0.0

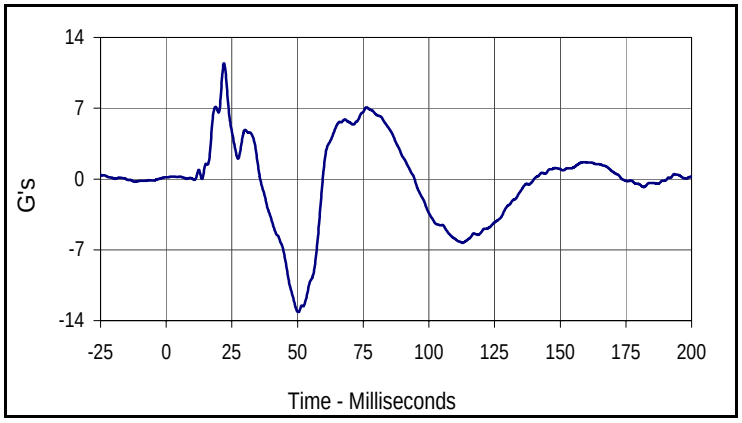
Test Vehicle:	2015 Ford Mustang 2-Door Coupe	Test Date:	1/8/14
Test Program:	NCAP Side Pole Impact Test	NHTSA No.:	M20150220



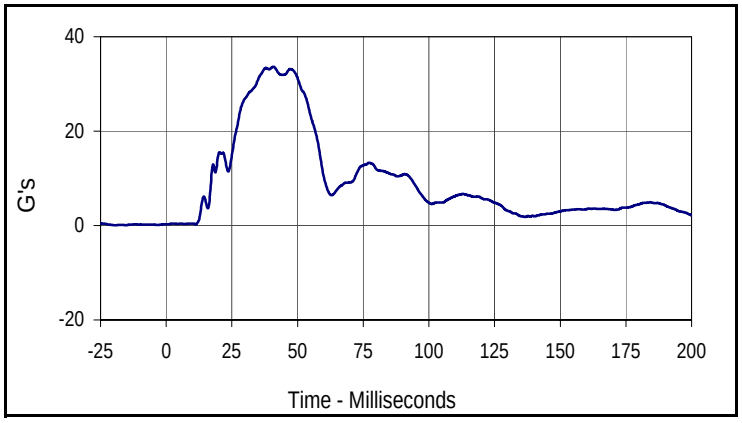
Curve Description			
Driver Lower Spine T12 Acceleration X			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
7.5	45.7	-10.9	20.3



Curve Description			
Driver Lower Spine T12 Acceleration Y			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
33.3	40.6	-8.3	91.1

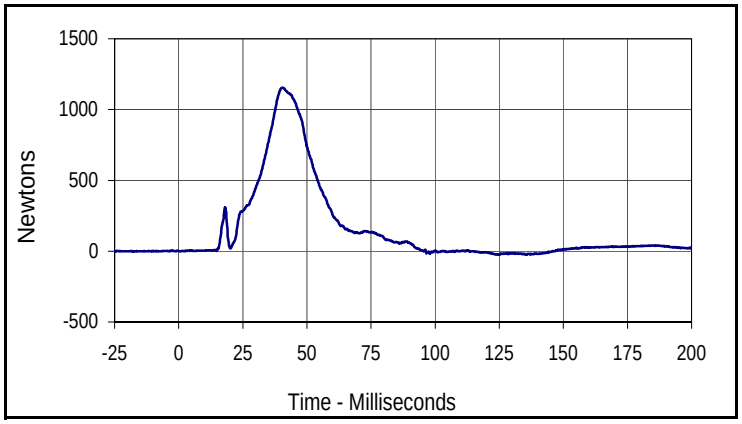


Curve Description			
Driver Lower Spine T12 Acceleration Z			
Plot No.	Type	SAE Class	Units
007	FIL	180	G's
Max	Time	Min	Time
11.4	22.0	-13.1	50.4

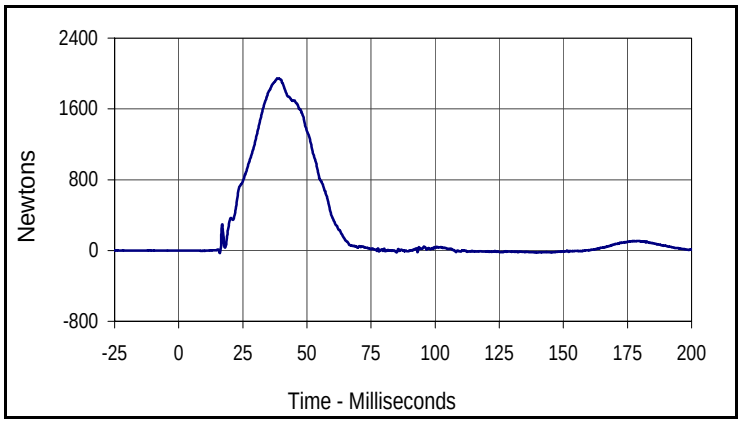


Curve Description			
Driver Lower Spine T12 Acceleration Res.			
Plot No.	Type	SAE Class	Units
008	RES	180	G's
Max	Time	Min	Time
33.7	40.7	0.2	11.3

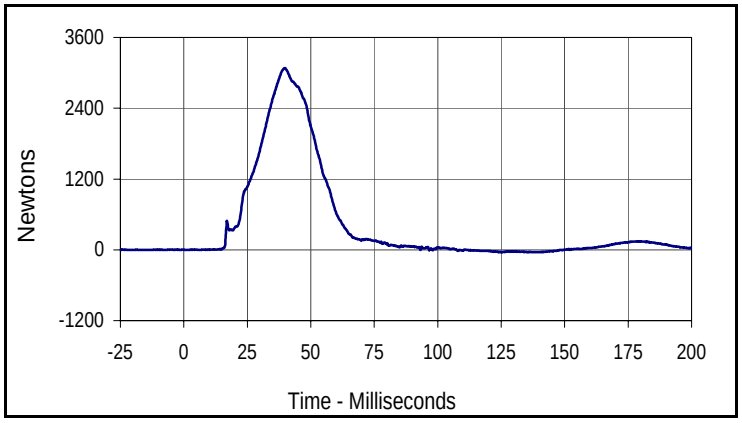
Test Vehicle:	2015 Ford Mustang 2-Door Coupe	Test Date:	1/8/14
Test Program:	NCAP Side Pole Impact Test	NHTSA No.:	M20150220



Curve Description			
Driver Iliac Wing Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
009	FIL	600	Newtons
Max	Time	Min	Time
1154.3	40.5	-24.3	124.2



Curve Description			
Driver Acetabulum Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
010	FIL	600	Newtons
Max	Time	Min	Time
1944.4	38.7	-31.1	16.0



Curve Description			
Driver Total Pelvic Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
011	SUM	600	Newtons
Max	Time	Min	Time
3081.8	39.9	-42.3	125.3

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

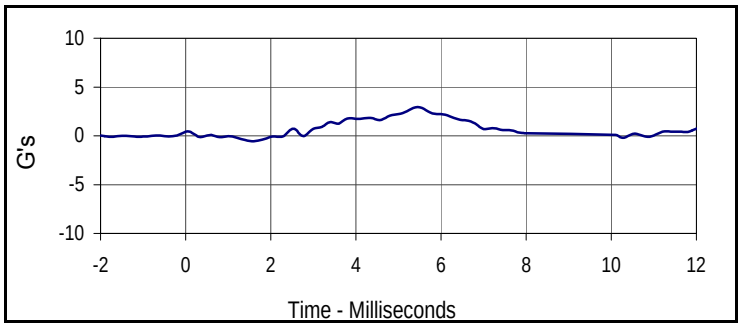
Test Program:	SID IIs External Measurements	Test Date:	12/10/14
ATD Serial No.:	299	Test I.D.:	N/A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	31	Pass
A	Sitting Height	mm	772 - 788	780	Pass
B	Shoulder Pivot Height	mm	437 - 453	445	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	141 - 151	145	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	102	Pass
F	Thigh Clearance	mm	119 - 135	125	Pass
G	Head Breadth	mm	140 - 148	145	Pass
H	Head Back from Backline	mm	40 - 46	44	Pass
I	Head Depth	mm	178 - 188	184	Pass
J	Head Circumference	mm	541 - 551	545	Pass
K	Buttock to Knee Length	mm	514 - 540	527	Pass
L	Popliteal Height	mm	343 - 369	352	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	401	Pass
N	Buttock Popliteal Length	mm	416 - 442	432	Pass
O	Chest Depth w/o Jacket	mm	195 - 211	202	Pass
P	Foot Length	mm	216 - 232	221	Pass
Q	Hip Breadth with Pelvic Plug	mm	313 -323	315	Pass
R	Arm Length	mm	249 - 259	252	Pass
S	Knee Joint to Seatback	mm	477 - 493	481	Pass
V	Shoulder Width	mm	341 - 357	352	Pass
W	Foot Width	mm	78 - 94	86	Pass
Y	Chest Circumference with Jacket	mm	851 - 881	872	Pass
Z	Waist Circumference	mm	760 - 791	774	Pass
			Overall Test Results		Pass

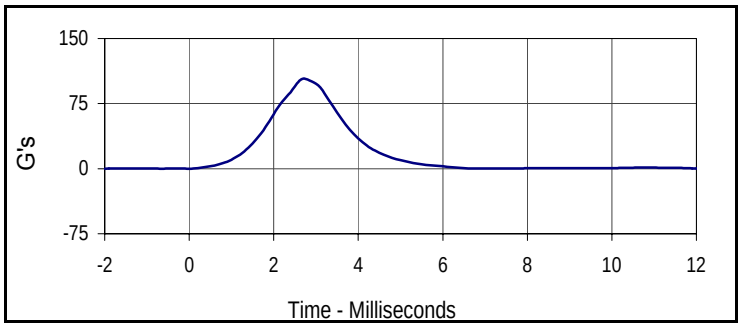
Test Program:	SID IIs Head Drop Test	Test Date:	12/10/14
ATD Serial No.:	299	Test I.D.:	299HD081

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	344	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	22.1	Pass
	Min	°C		21.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.2	Pass
	Min	%		30.8	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.8	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.9	Pass
Peak Head Resultant Acceleration		G's	115 to 137	125.0	Pass
Peak Head X Acceleration		G's	<15	2.9	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	1.2	Pass
			Overall Test Results		Pass

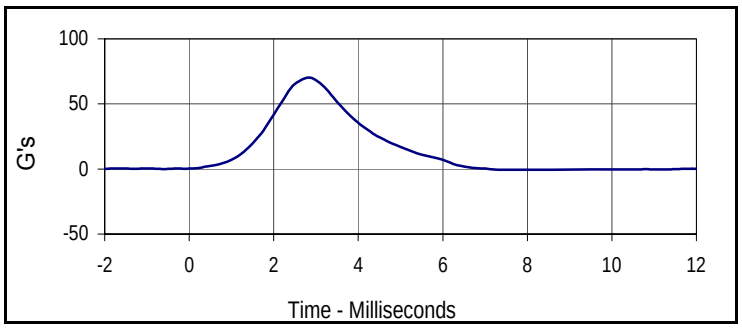
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
125.0	2.7	0.0	-0.6



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.9	5.5	-0.6	1.6



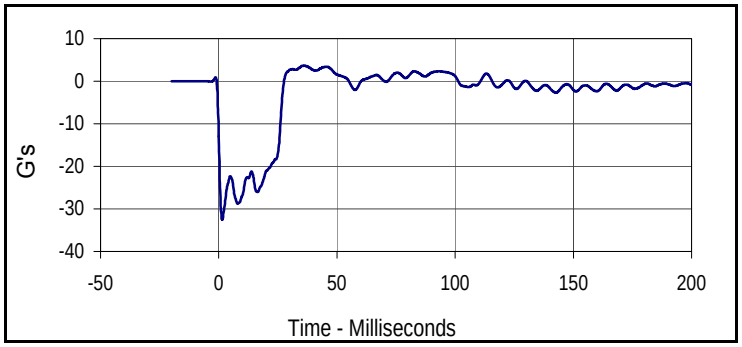
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
104.1	2.7	0.0	-0.6



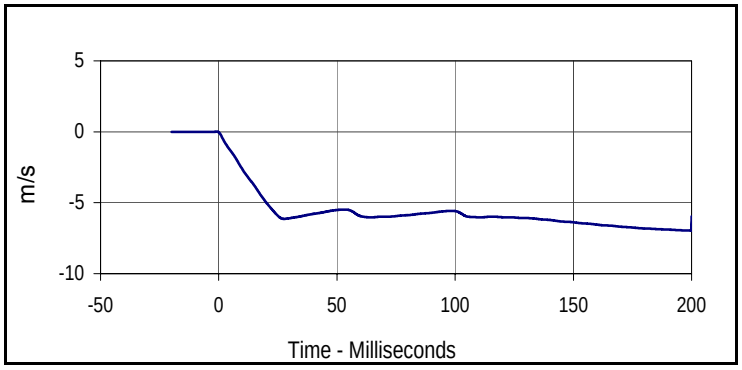
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
70.3	2.8	-0.6	8.0

Test Program:	SID IIs Neck Flexion Test	Test Date:	12/10/14
ATD Serial No.:	299	Test I.D.:	299NB081

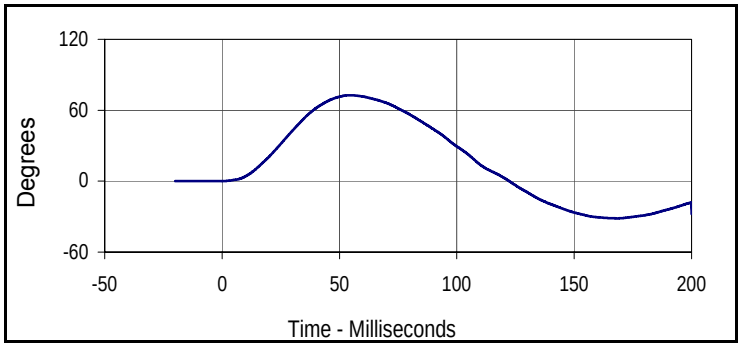
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	389	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	22.1	Pass
	Min	°C		21.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.2	Pass
	Min	%		30.8	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	22.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.0	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.51	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.64	Pass
	15 msec	m/s	-3.30 to -4.10	-3.77	Pass
	20 msec	m/s	-4.40 to -5.40	-4.97	Pass
	25 msec	m/s	-5.40 to -6.10	-5.92	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.14	Pass
D-Plane Rotation	Max	Degrees	71 to 81	72.8	Pass
	Time	msec	50 to 70	54.5	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-42.1	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	115.3	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
3.7	0.0	-32.6	0.0

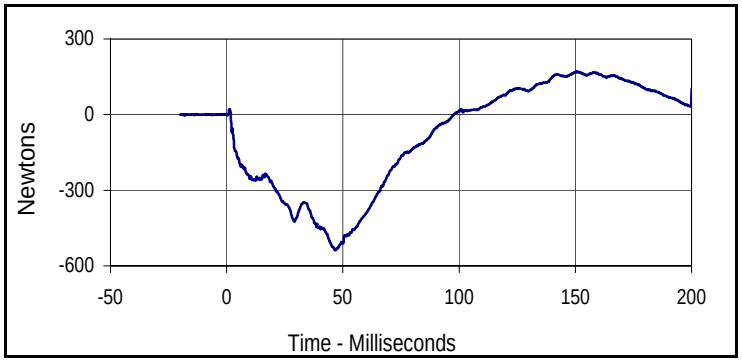


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.9	-7.0	199.9

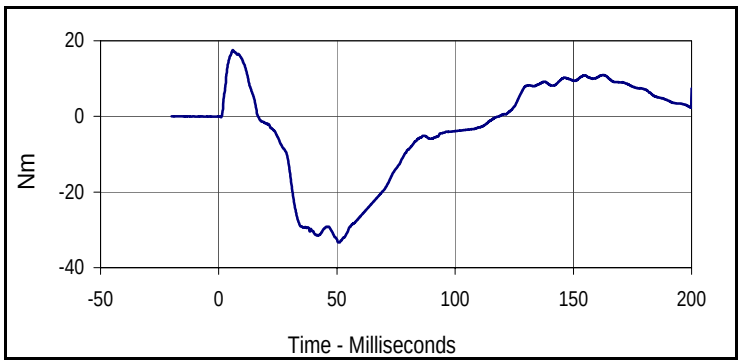


Curve Description			
D-Plane Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
72.8	54.5	-31.5	168.3

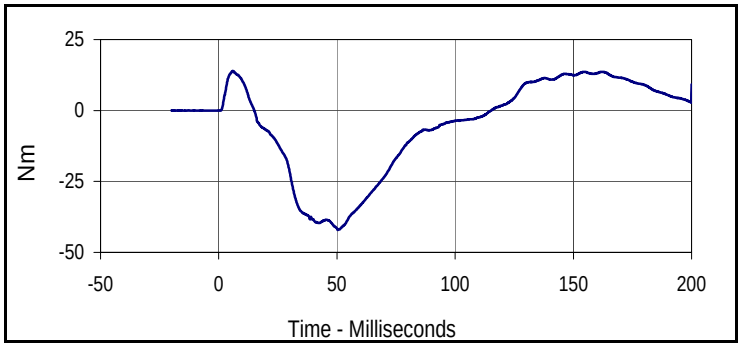
Test Program:	SID IIs Neck Flexion Test	Test Date:	12/10/14
ATD Serial No.:	299	Test I.D.:	299NB081



Curve Description			
Neck Force Y			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
171.3	150.6	-537.3	46.5



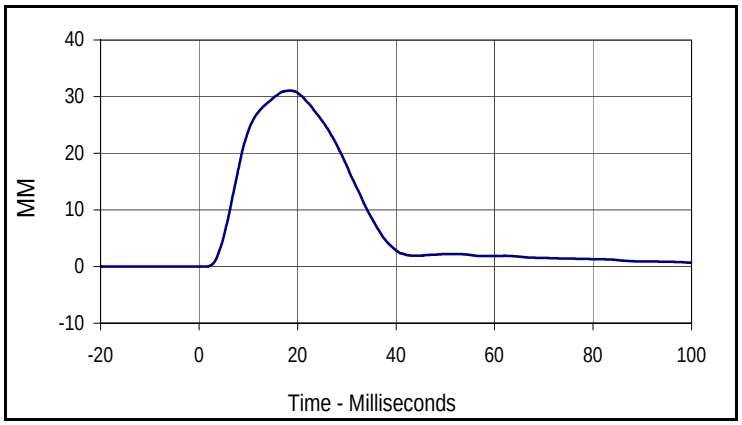
Curve Description			
Neck Moment X			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
17.5	6.0	-33.3	50.7



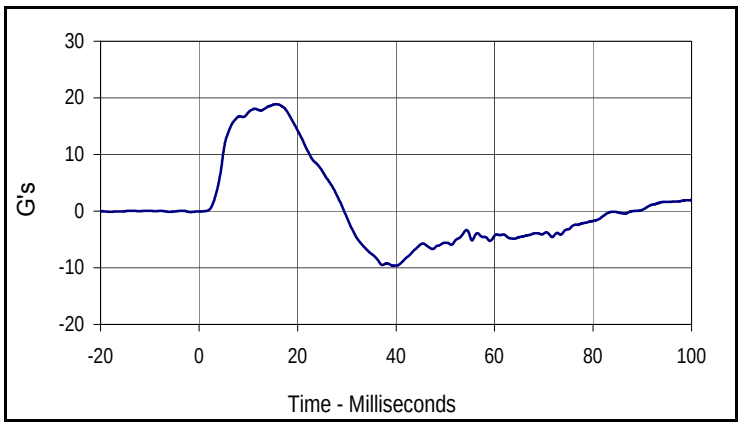
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
006	FIL	600	Nm
Max	Time	Min	Time
14.0	5.8	-42.1	50.3

Test Program:	SID IIs Shoulder Impact Test	Test Date:	12/10/14
ATD Serial No.:	299	Test I.D.:	299SH081

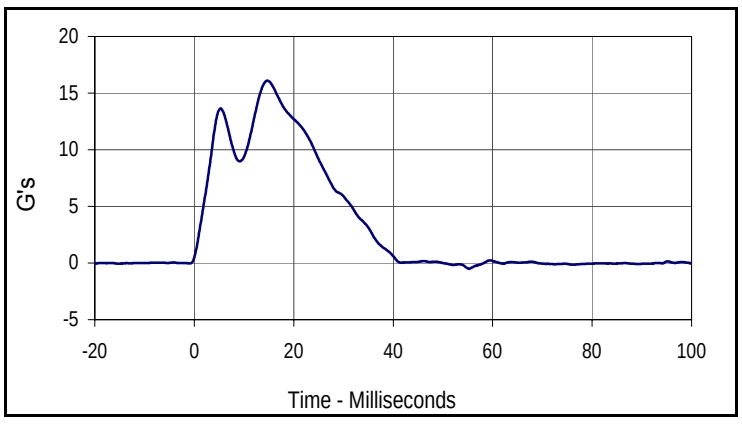
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	434	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	22.1	Pass
	Min	°C		21.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.2	Pass
	Min	%		30.8	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	22.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.0	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.33	Pass
Peak Shoulder Deflection		mm	28 to 37	31.0	Pass
Peak Lateral Spine Acceleratrion Y		G's	17 to 22	18.9	Pass
Peak Impactor Acceleration		G's	13 to 18	16.1	Pass
			Overall Test Results		Pass



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
31.0	18.3	0.0	-20.0



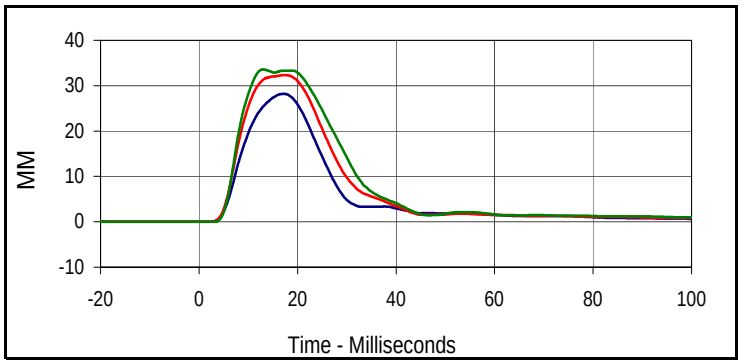
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.9	15.7	-9.6	39.4



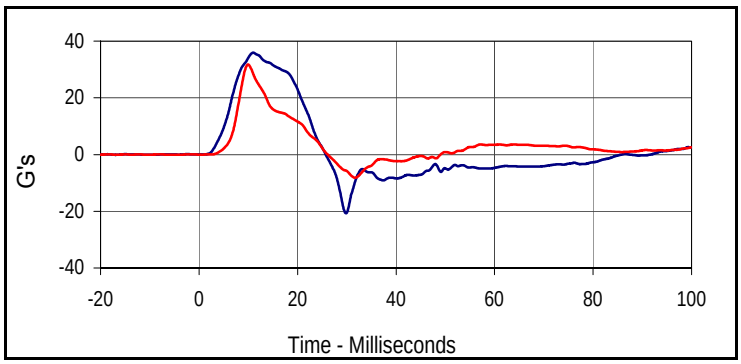
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
16.1	14.7	-0.5	55.2

Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	12/10/14
ATD Serial No.:	299	Test I.D.:	299TWA081

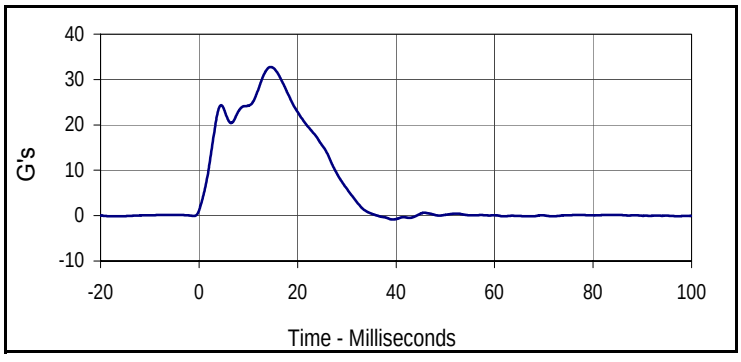
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	479	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	22.1	Pass
	Min	°C		21.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.2	Pass
	Min	%		30.8	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	22.0	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.0	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.71	Pass
Peak Shoulder Deflection		mm	31 to 40	36.5	Pass
Peak Upper Thorax Rib Deflection		mm	25 to 32	28.2	Pass
Peak Middle Thorax Rib Deflection		mm	30 to 36	32.3	Pass
Peak Lower Thorax Rib Deflection		mm	32 to 38	33.6	Pass
Peak Upper Spine Y Acceleration		G's	34 to 43	35.9	Pass
Peak Lower Spine Y Acceleration		G's	29 to 37	31.7	Pass
Peak Impactor Acceleration		G's	30 to 36	32.8	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
28.2	17.2	0.0	-14.9
Middle Thorax Deflection			
Max	Time	Min	Time
32.3	17.3	0.0	-17.6
Lower Thorax Deflection			
Max	Time	Min	Time
33.6	13.0	0.0	-15.6

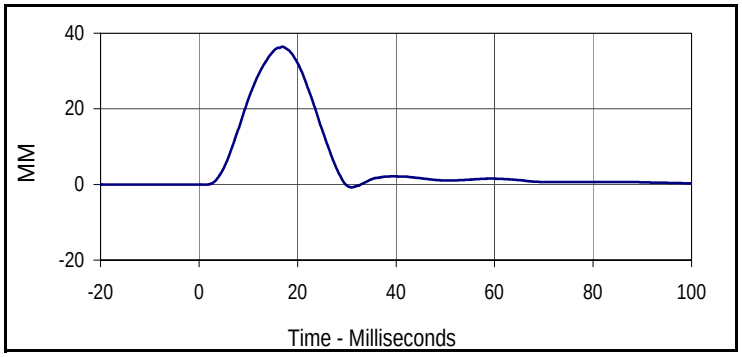


Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
35.9	11.0	-20.7	29.8
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
31.7	9.9	-8.2	31.6



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
32.8	14.6	-0.9	39.2

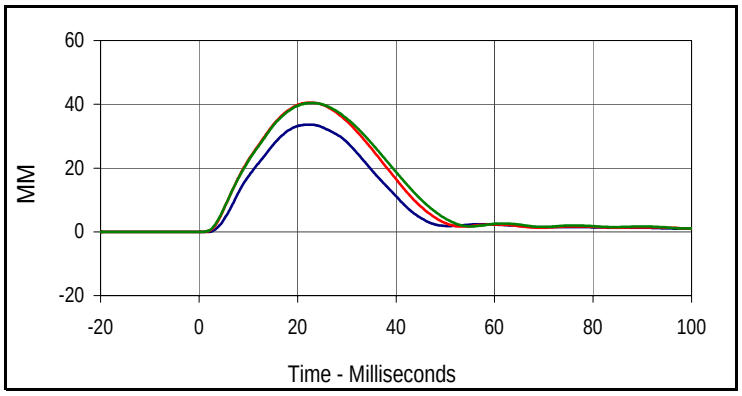
Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	12/10/14
ATD Serial No.:	299	Test I.D.:	299TWA081



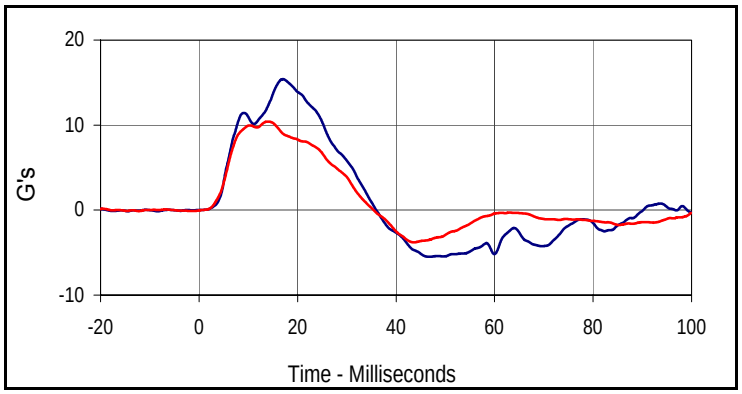
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
36.5	16.9	-0.7	30.9

Test Program:	SID IIs Thorax without Arm Impact Test	Test Date:	12/10/14
ATD Serial No.:	299	Test I.D.:	299TWOA081

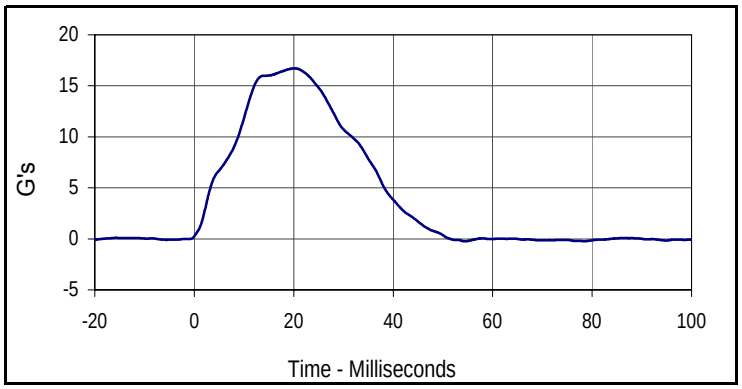
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	524	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	22.1	Pass
	Min	°C		21.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.2	Pass
	Min	%		30.8	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	22.0	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.1	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.33	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	33.6	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	40.5	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	40.4	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	15.4	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	10.4	Pass
Peak Impactor Acceleration		G's	14 to 18	16.7	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
33.6	22.0	0.0	-4.9
Middle Thorax Deflection			
Max	Time	Min	Time
40.5	22.8	0.0	-5.1
Lower Thorax Deflection			
Max	Time	Min	Time
40.4	22.9	0.0	-1.1



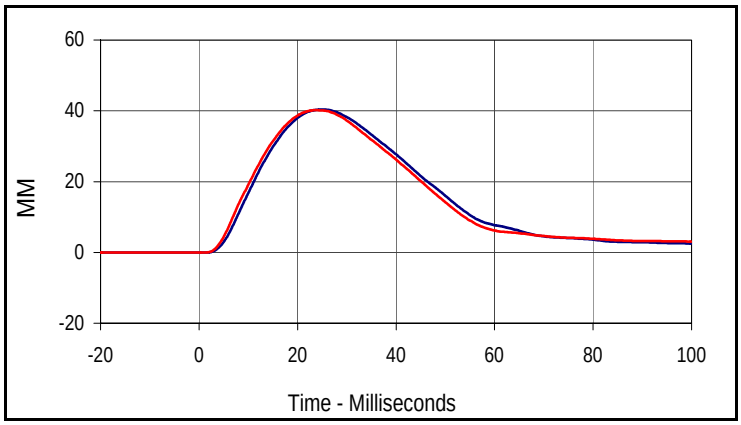
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.4	17.0	-5.5	46.9
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
10.4	14.0	-3.8	43.6



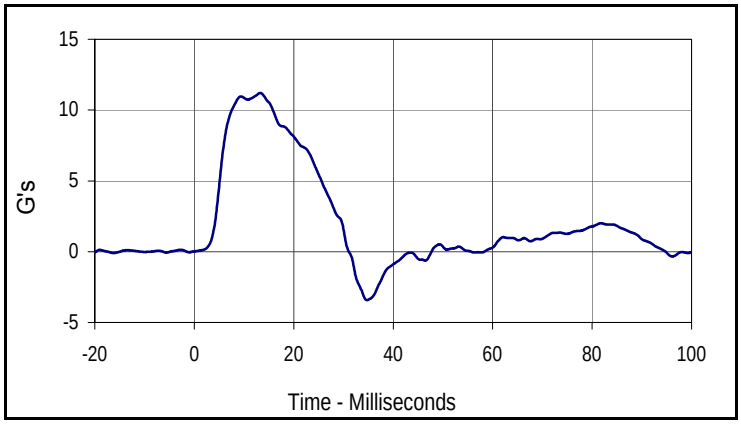
Curve Description			
Impactor Accleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.7	20.1	-0.2	54.4

Test Program:	SID IIs Abdomen Impact Test	Test Date:	12/10/14
ATD Serial No.:	299	Test I.D.:	299ABD081

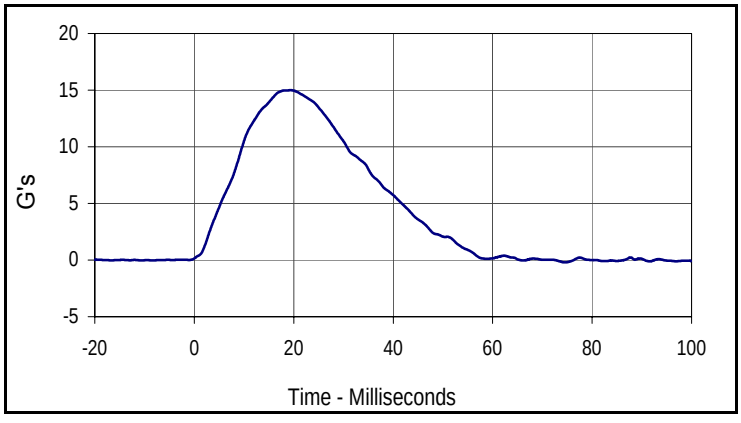
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	569	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	22.1	Pass
	Min	°C		21.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.2	Pass
	Min	%		30.8	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.9	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.2	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.34	Pass
Peak Upper Abdominal Rib Deflection		mm	36 to 47	40.4	Pass
Peak Lower Abdominal Rib Deflection		mm	33 to 44	40.2	Pass
Peak Lower Spine Y Acceleration		G's	9 to 14	11.2	Pass
Peak Impactor Acceleration		G's	12 to 16	15.0	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
40.4	25.2	0.0	-2.5
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
40.2	24.0	0.0	-6.5

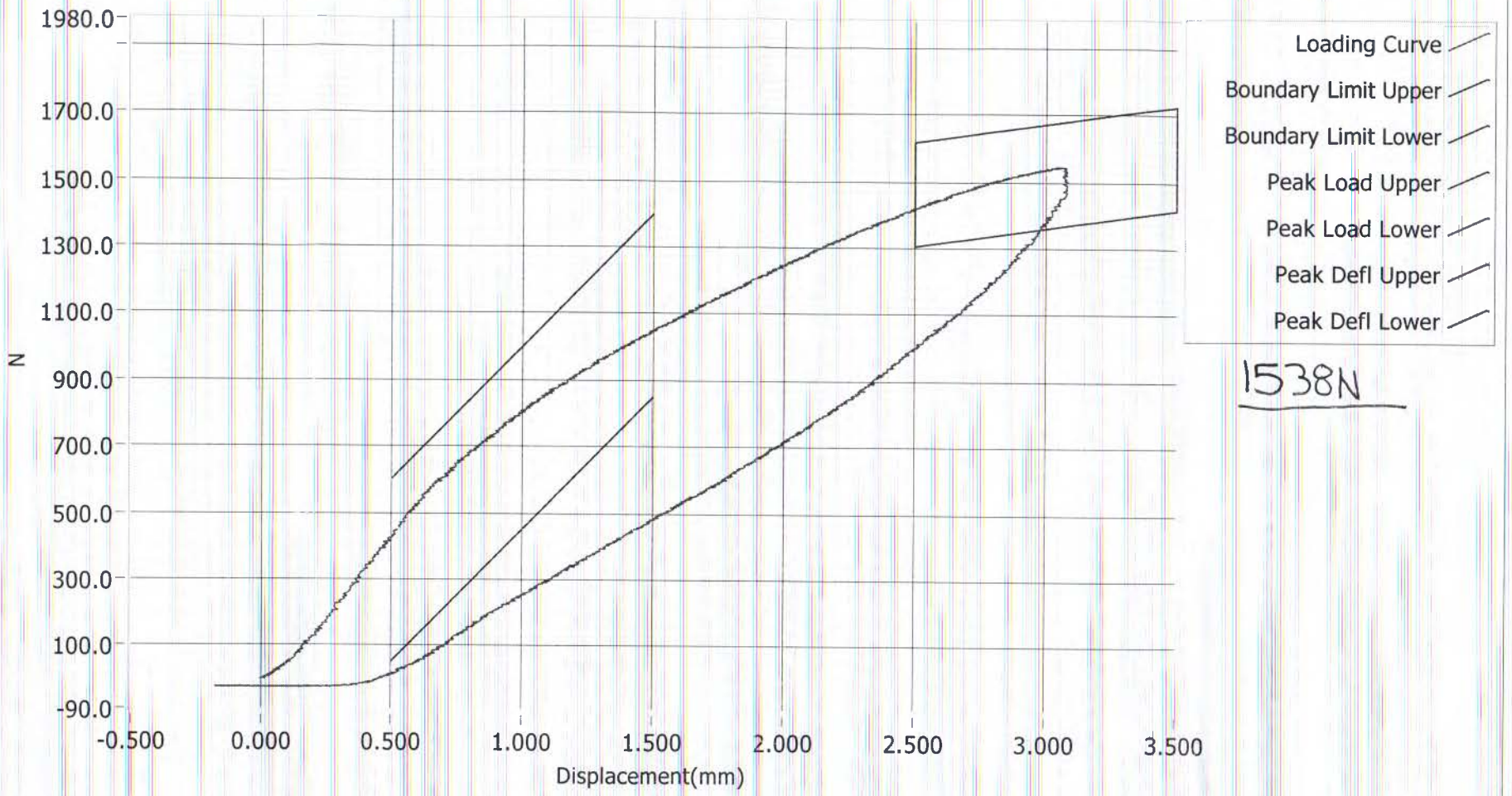


Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
11.2	13.3	-3.4	34.8



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.0	19.3	-0.2	74.6

Resultant Data - SIDIIs Plug Compression



1538N

ATD Calibration Lab

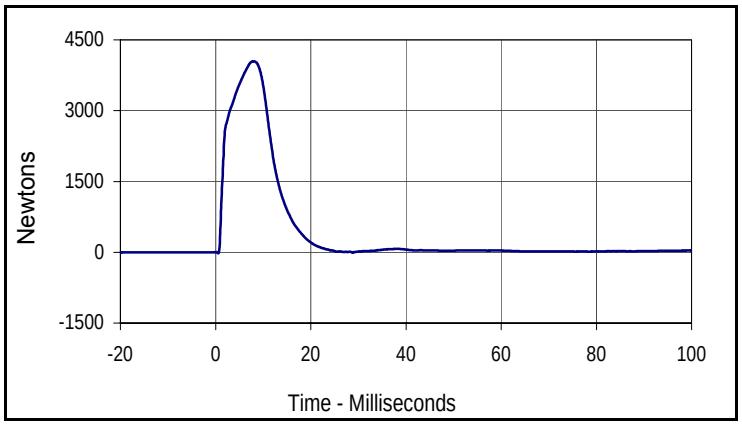
M20150220 Pre-Test

Test ID	Part Serial Number	Test Date	Test Time
	70623	12/12/2013	8:09 PM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

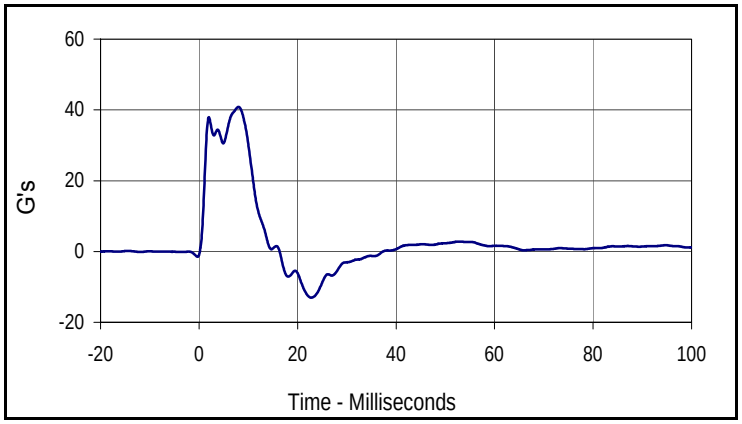
Current Date : 12/12/2013 Current Time : 20:09:43

Test Program:	SID IIs Pelvis Acetabulum Impact Test	Test Date:	12/10/14
ATD Serial No.:	299	Test I.D.:	299ACET081

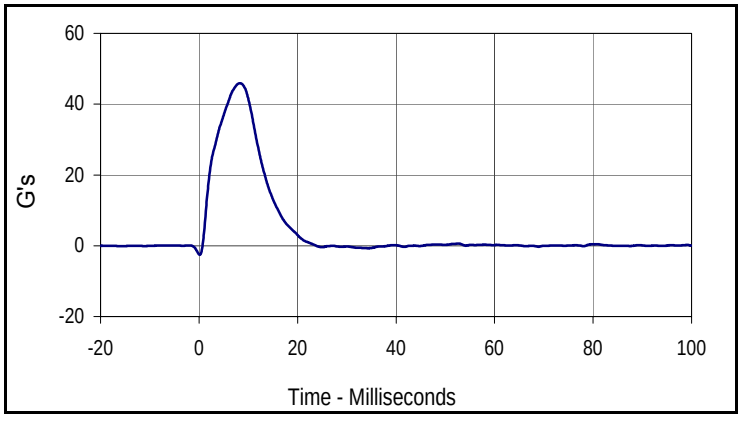
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	614	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	22.1	Pass
	Min	°C		21.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.2	Pass
	Min	%		30.8	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.9	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.2	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.69	Pass
Peak Acetabulum Force Y		Newtons	3600 to 4300	4045.9	Pass
Peak Pelvis Y Acceleration After 6 msec.		G's	34 to 42	40.9	Pass
Peak Impactor Acceleration		G's	38 to 47	45.9	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4045.9	8.1	-25.3	0.6



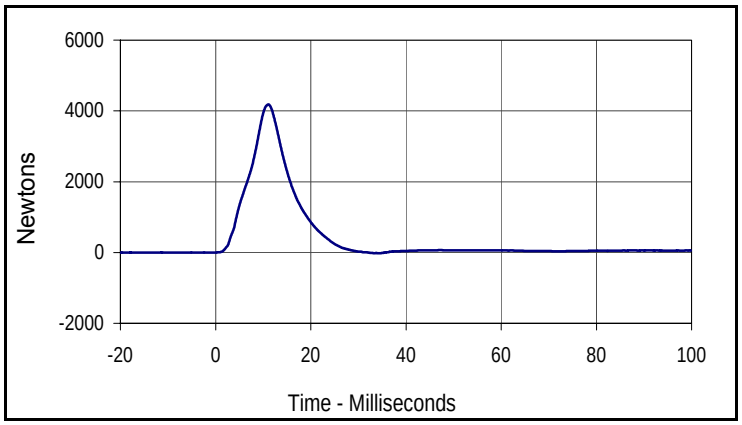
Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
40.9	8.0	-13.0	22.8



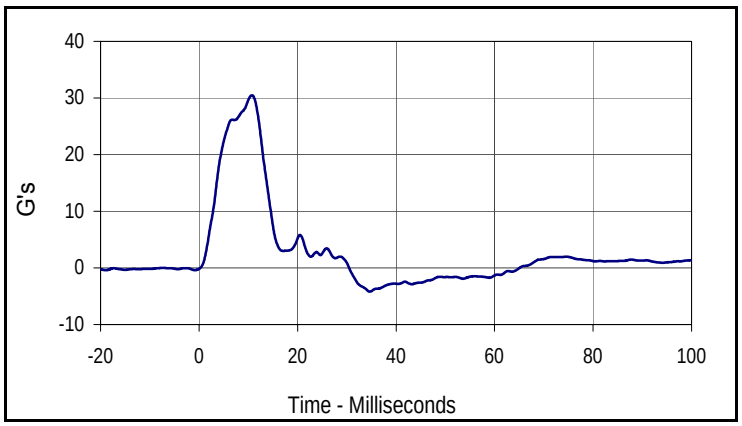
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
45.9	8.3	-2.6	0.1

Test Program:	SID IIs Pelvis Iliac Calibration	Test Date:	12/10/14
ATD Serial No.:	299	Test I.D.:	299PL081

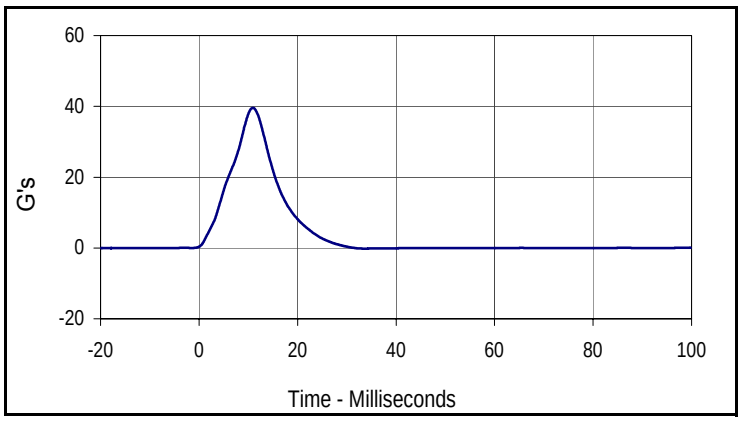
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	659	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	22.1	Pass
	Min	°C		21.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.2	Pass
	Min	%		30.8	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.8	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.2	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.33	Pass
Peak Illiac Force		Newtons	4100 to 5100	4185.9	Pass
Peak Pelvis Y Acceleration		G's	28 to 39	30.5	Pass
Peak Impactor Acceleration		G's	36 to 45	39.6	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4185.9	11.1	-22.2	34.3



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
30.5	10.7	-4.2	34.7



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
39.6	10.9	-0.2	33.5

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

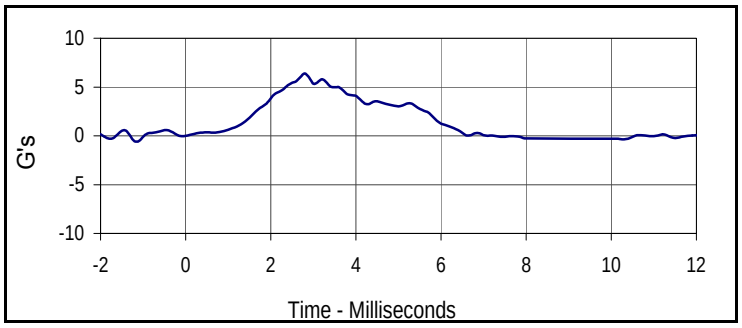
Test Program:	SID IIs External Measurements	Test Date:	1/9/15
ATD Serial No.:	299	Test I.D.:	N/A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	36	Pass
A	Sitting Height	mm	772 - 788	780	Pass
B	Shoulder Pivot Height	mm	437 - 453	445	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	141 - 151	145	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	102	Pass
F	Thigh Clearance	mm	119 - 135	125	Pass
G	Head Breadth	mm	140 - 148	145	Pass
H	Head Back from Backline	mm	40 - 46	44	Pass
I	Head Depth	mm	178 - 188	184	Pass
J	Head Circumference	mm	541 - 551	545	Pass
K	Buttock to Knee Length	mm	514 - 540	527	Pass
L	Popliteal Height	mm	343 - 369	352	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	401	Pass
N	Buttock Popliteal Length	mm	416 - 442	432	Pass
O	Chest Depth w/o Jacket	mm	195 - 211	202	Pass
P	Foot Length	mm	216 - 232	221	Pass
Q	Hip Breadth with Pelvic Plug	mm	313 -323	315	Pass
R	Arm Length	mm	249 - 259	252	Pass
S	Knee Joint to Seatback	mm	477 - 493	481	Pass
V	Shoulder Width	mm	341 - 357	352	Pass
W	Foot Width	mm	78 - 94	86	Pass
Y	Chest Circumference with Jacket	mm	851 - 881	872	Pass
Z	Waist Circumference	mm	760 - 791	774	Pass
			Overall Test Results		Pass

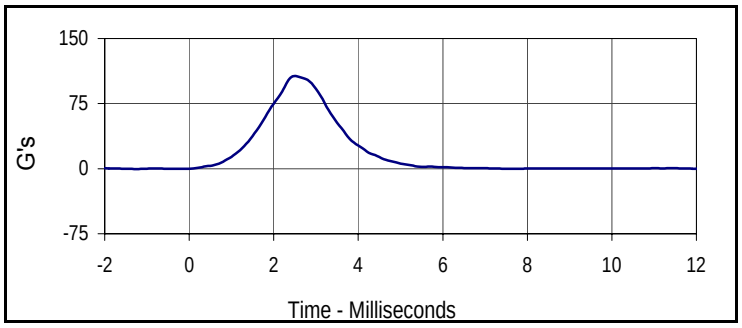
Test Program:	SID IIs Head Drop Test	Test Date:	1/9/15
ATD Serial No.:	299	Test I.D.:	299HD082

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	266	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.1	Pass
	Min	%		35.8	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.9	Pass
Peak Head Resultant Acceleration		G's	115 to 137	133.9	Pass
Peak Head X Acceleration		G's	<15	6.4	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	1.5	Pass
			Overall Test Results		Pass

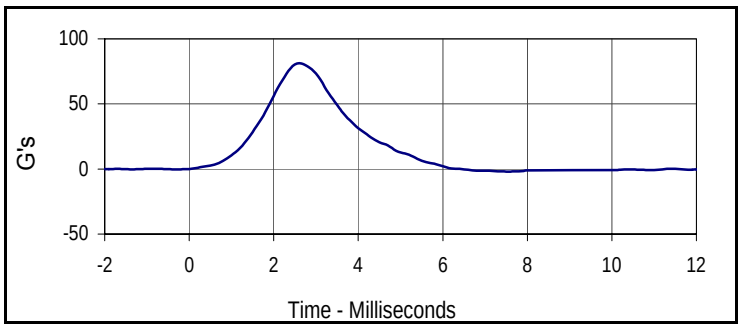
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
133.9	2.5	0.0	0.0



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
6.4	2.8	-0.5	-1.2



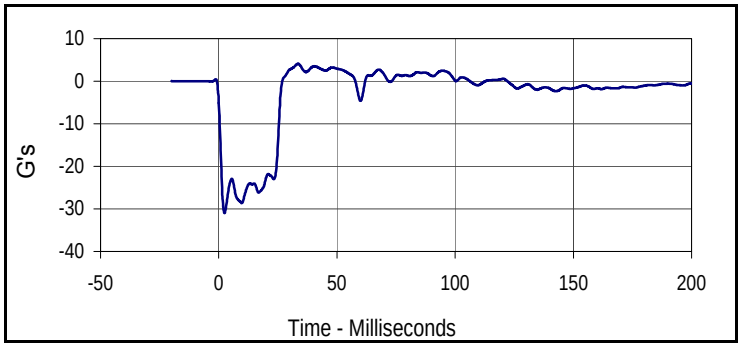
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
107.0	2.5	-0.4	-1.2



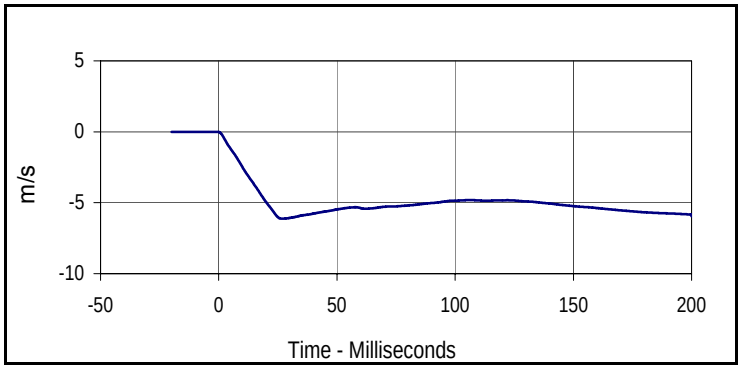
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
81.3	2.6	-2.0	7.6

Test Program:	SID IIs Neck Flexion Test	Test Date:	1/9/15
ATD Serial No.:	299	Test I.D.:	299NB082

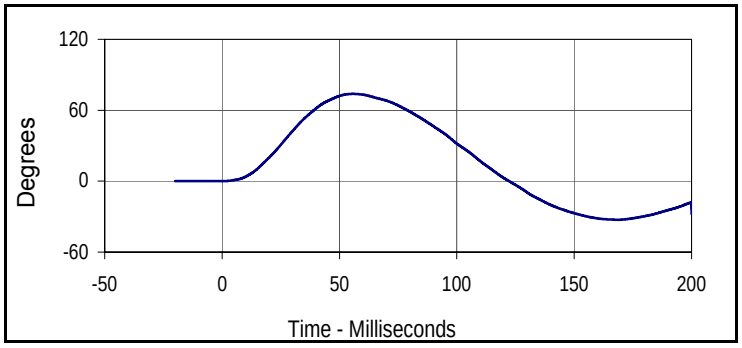
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	311	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.1	Pass
	Min	%		35.8	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.9	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.54	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.48	Pass
	15 msec	m/s	-3.30 to -4.10	-3.72	Pass
	20 msec	m/s	-4.40 to -5.40	-4.95	Pass
	25 msec	m/s	-5.40 to -6.10	-6.01	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.12	Pass
D-Plane Rotation	Max	Degrees	71 to 81	73.9	Pass
	Time	msec	50 to 70	55.8	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-40.1	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	105.0	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
4.1	0.0	-31.0	0.0

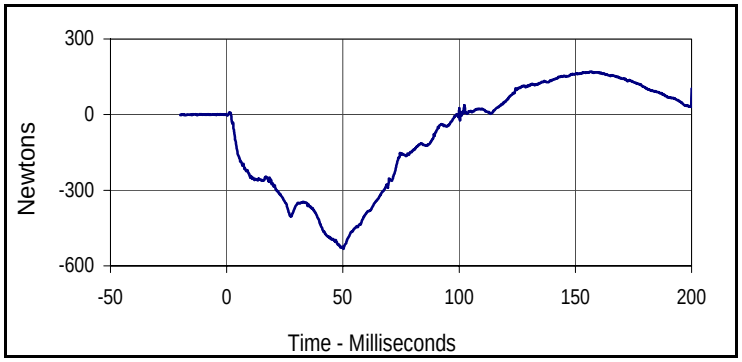


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.8	-6.1	26.9

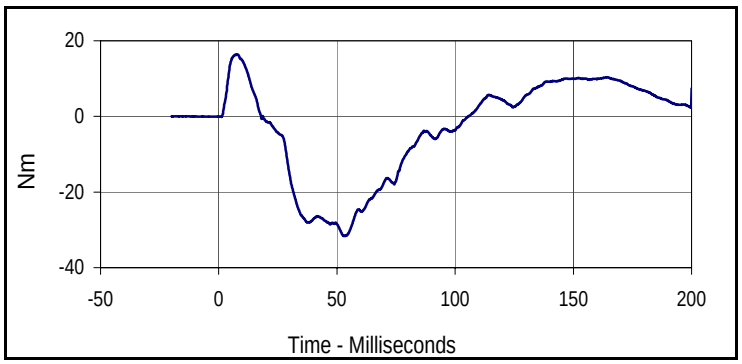


Curve Description			
D-Plane Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
73.9	55.8	-32.6	168.6

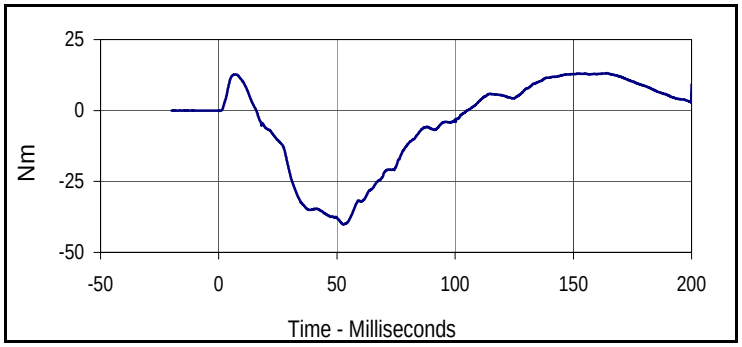
Test Program:	SID IIs Neck Flexion Test	Test Date:	1/9/15
ATD Serial No.:	299	Test I.D.:	299NB082



Curve Description			
Neck Force Y			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
170.7	156.4	-532.7	50.2



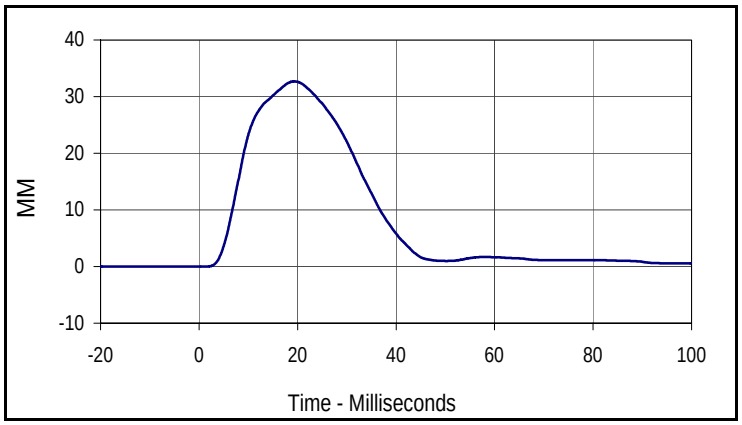
Curve Description			
Neck Moment X			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
16.4	7.6	-31.7	53.5



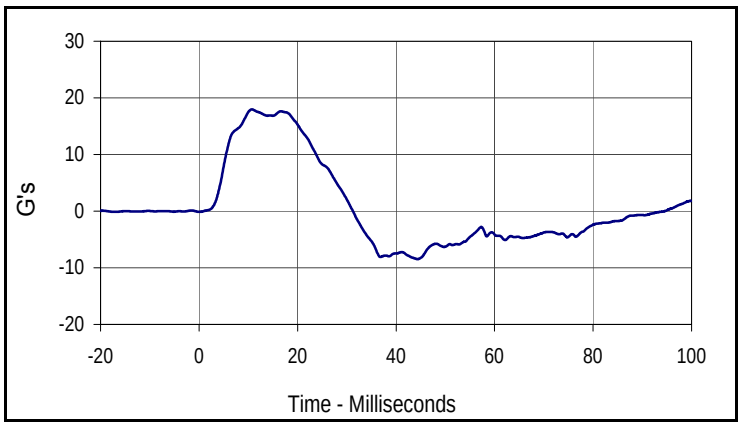
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
006	FIL	600	Nm
Max	Time	Min	Time
13.1	164.1	-40.1	52.7

Test Program:	SID IIs Shoulder Impact Test	Test Date:	1/9/15
ATD Serial No.:	299	Test I.D.:	299SH082

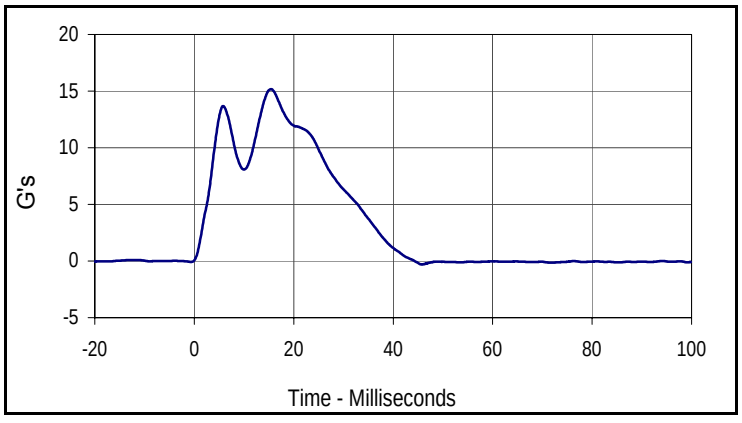
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	356	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.1	Pass
	Min	%		35.8	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.8	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.33	Pass
Peak Shoulder Deflection		mm	28 to 37	32.7	Pass
Peak Lateral Spine Acceleratrion Y		G's	17 to 22	18.0	Pass
Peak Impactor Acceleration		G's	13 to 18	15.2	Pass
			Overall Test Results		Pass



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
32.7	19.3	0.0	-18.8



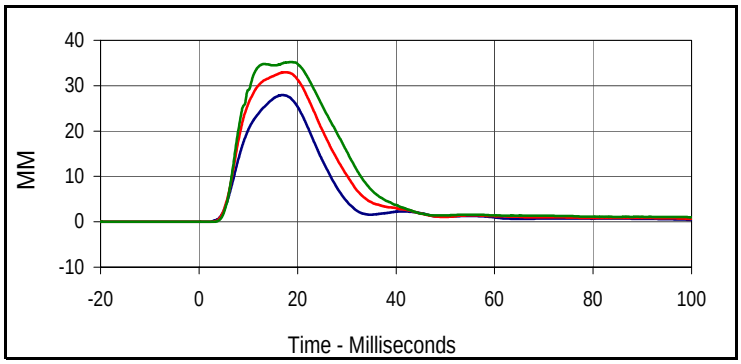
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.0	10.7	-8.5	44.4



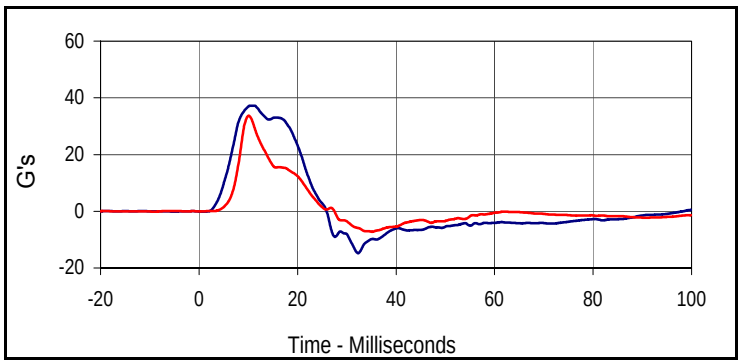
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.2	15.4	-0.3	45.8

Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	1/9/15
ATD Serial No.:	299	Test I.D.:	299TWA082

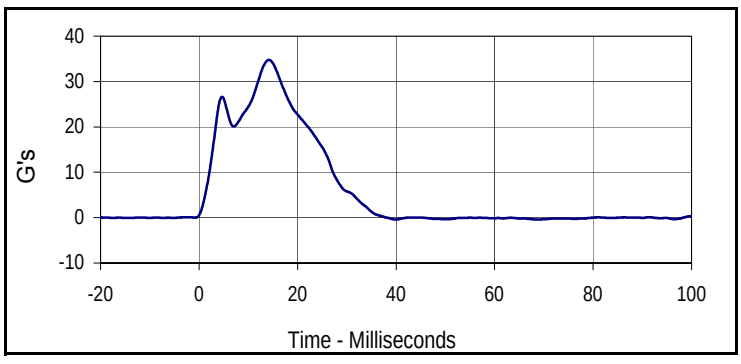
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	401	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.1	Pass
	Min	%		35.8	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.8	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.72	Pass
Peak Shoulder Deflection		mm	31 to 40	36.1	Pass
Peak Upper Thorax Rib Deflection		mm	25 to 32	27.9	Pass
Peak Middle Thorax Rib Deflection		mm	30 to 36	33.0	Pass
Peak Lower Thorax Rib Deflection		mm	32 to 38	35.2	Pass
Peak Upper Spine Y Acceleration		G's	34 to 43	37.3	Pass
Peak Lower Spine Y Acceleration		G's	29 to 37	33.7	Pass
Peak Impactor Acceleration		G's	30 to 36	34.8	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
27.9	16.9	0.0	-4.9
Middle Thorax Deflection			
Max	Time	Min	Time
33.0	17.4	0.0	-4.5
Lower Thorax Deflection			
Max	Time	Min	Time
35.2	18.5	0.0	-6.7

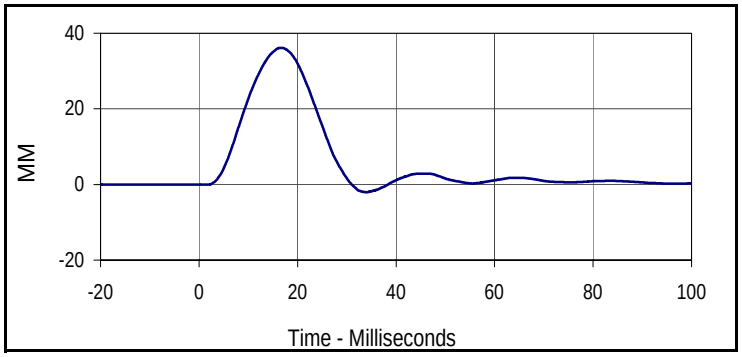


Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
37.3	11.2	-14.8	32.3
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
33.7	10.1	-7.2	35.1



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
34.8	14.2	-0.4	68.8

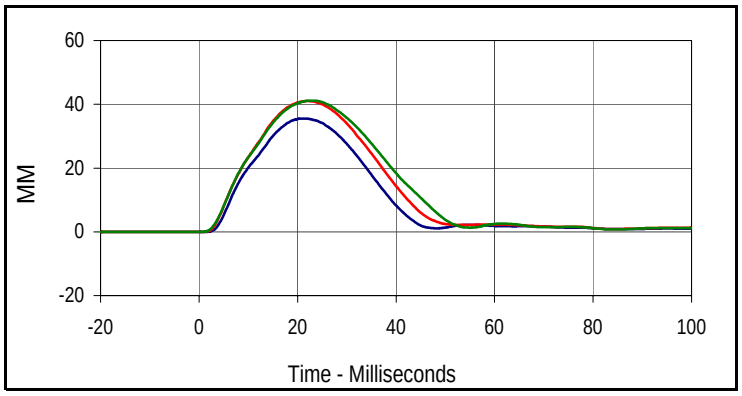
Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	1/9/15
ATD Serial No.:	299	Test I.D.:	299TWA082



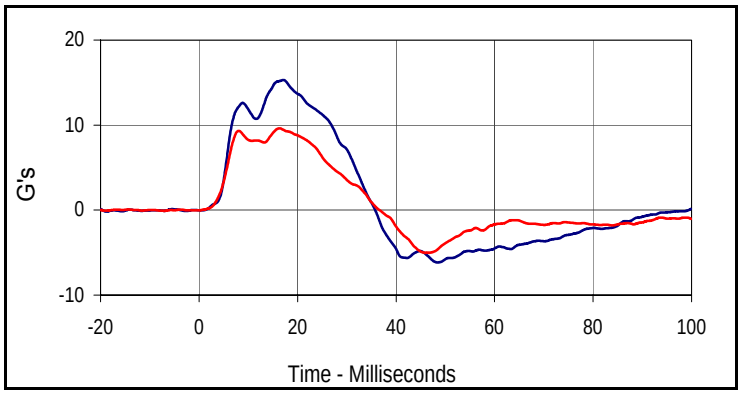
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
36.1	16.5	-2.0	34.0

Test Program:	SID IIs Thorax without Arm Impact Test	Test Date:	1/9/15
ATD Serial No.:	299	Test I.D.:	299TWOA082

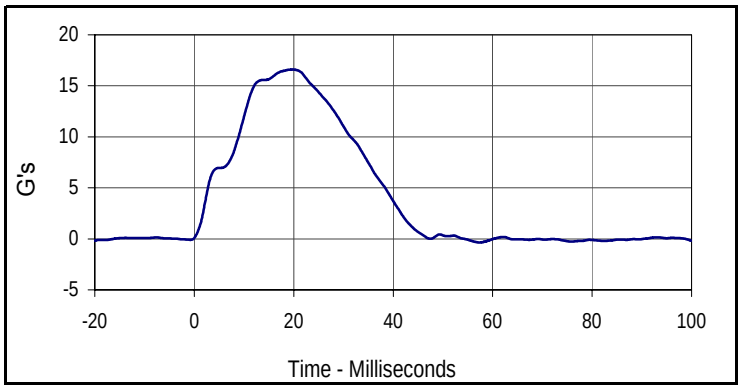
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	446	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.1	Pass
	Min	%		35.8	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.9	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.32	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	35.5	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	41.0	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	41.1	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	15.3	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	9.6	Pass
Peak Impactor Acceleration		G's	14 to 18	16.6	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
35.5	21.1	0.0	-1.3
Middle Thorax Deflection			
Max	Time	Min	Time
41.0	21.9	0.0	0.0
Lower Thorax Deflection			
Max	Time	Min	Time
41.1	23.1	0.0	-0.4



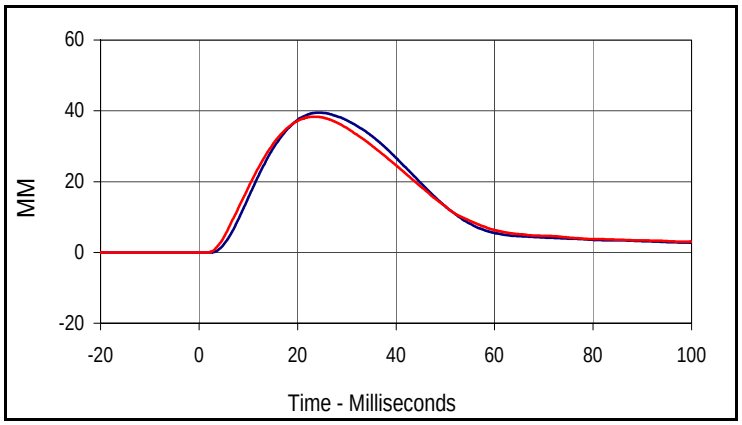
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.3	17.1	-6.2	48.4
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.6	16.3	-5.0	46.8



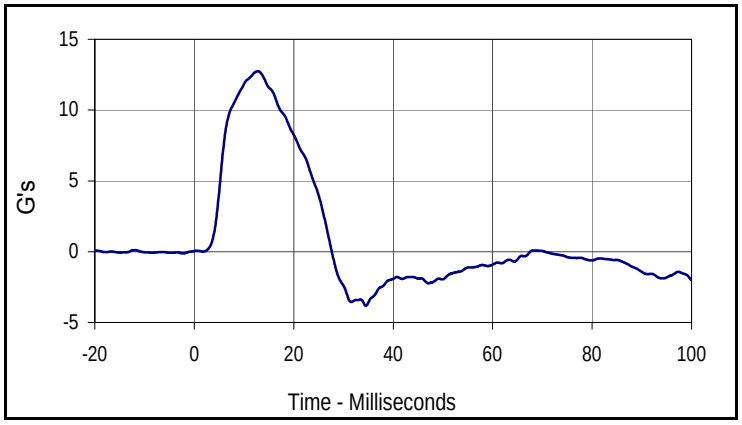
Curve Description			
Impactor Accleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.6	19.7	-0.4	57.4

Test Program:	SID IIs Abdomen Impact Test	Test Date:	1/9/15
ATD Serial No.:	299	Test I.D.:	299ABD082

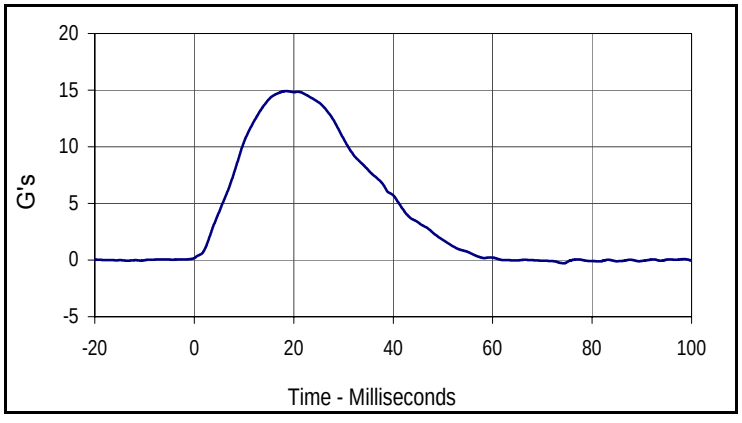
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	491	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.1	Pass
	Min	%		35.8	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.9	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.32	Pass
Peak Upper Abdominal Rib Deflection		mm	36 to 47	39.5	Pass
Peak Lower Abdominal Rib Deflection		mm	33 to 44	38.3	Pass
Peak Lower Spine Y Acceleration		G's	9 to 14	12.7	Pass
Peak Impactor Acceleration		G's	12 to 16	14.9	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
39.5	24.3	0.0	-14.9
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
38.3	23.4	0.0	-20.0

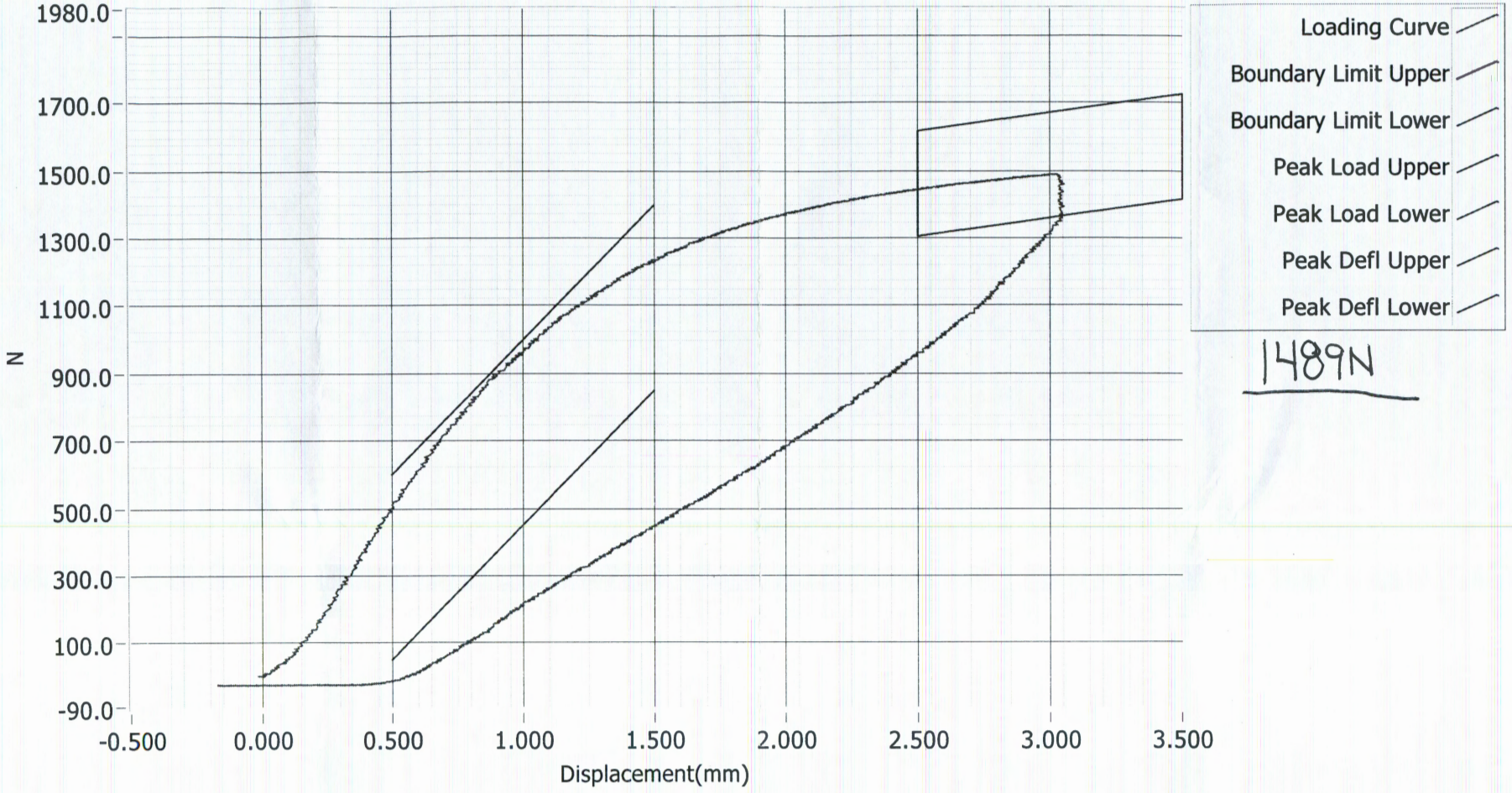


Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
12.7	12.8	-3.8	34.5



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.9	18.4	-0.3	74.3

Resultant Data - SIDIIs Plug Compression



1489N

ATD Calibration Lab

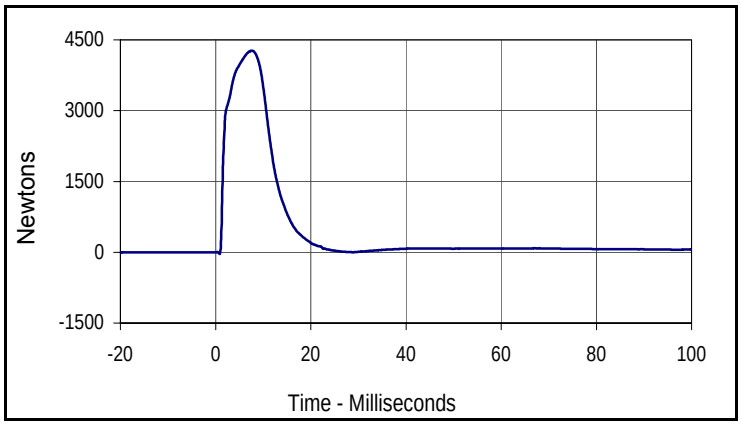
M20150220 Post-Test

Test ID	Part Serial Number	Test Date	Test Time
	70793	12/13/2013	4:18 PM
Cert ID	**ATD Serial Number**	**ATD Type**	
	N/A	SIDIIs	

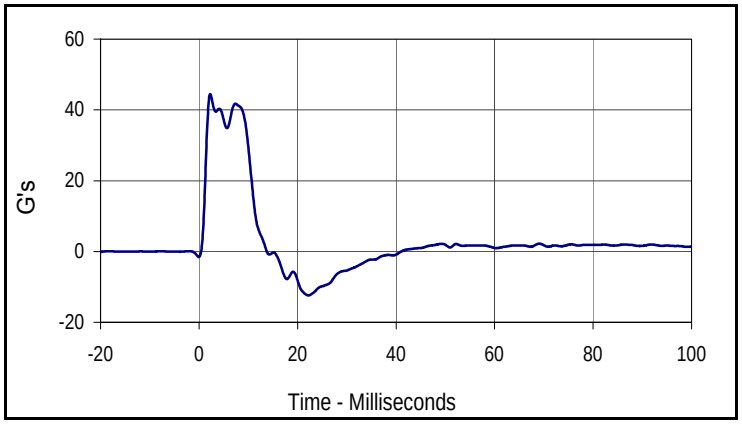
Current Date : 12/13/2013 Current Time : 16:18:44

Test Program:	SID IIs Pelvis Acetabulum Impact Test	Test Date:	1/9/15
ATD Serial No.:	299	Test I.D.:	299ACET082

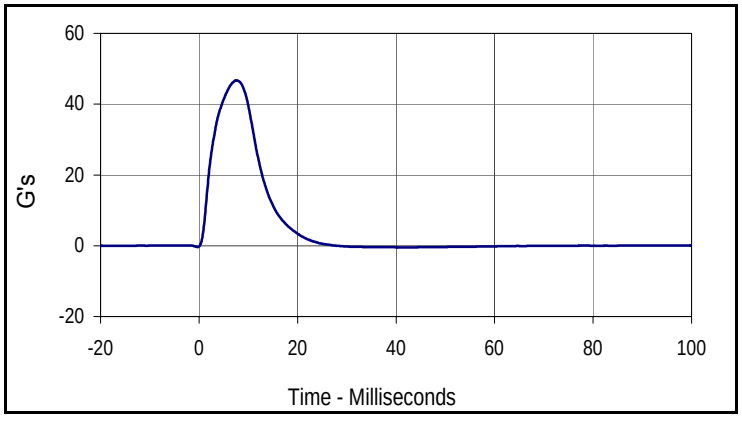
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	536	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.1	Pass
	Min	%		35.8	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	36.0	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.72	Pass
Peak Acetabulum Force Y		Newtons	3600 to 4300	4269.5	Pass
Peak Pelvis Y Acceleration After 6 msec.		G's	34 to 42	41.7	Pass
Peak Impactor Acceleration		G's	38 to 47	46.7	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4269.5	7.6	-33.9	0.9



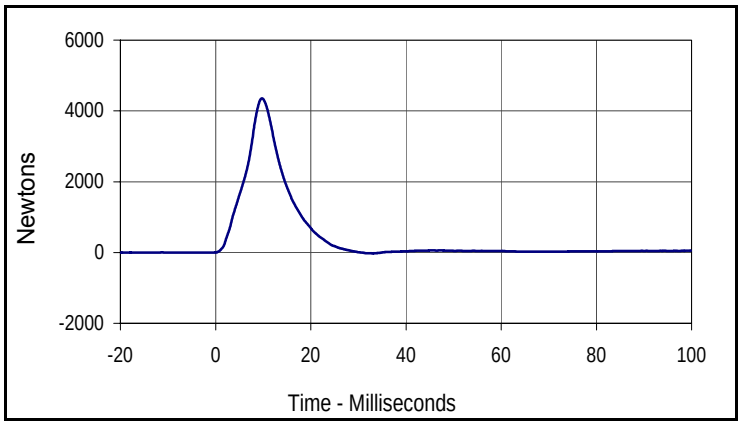
Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
44.5	2.3	-12.4	22.2



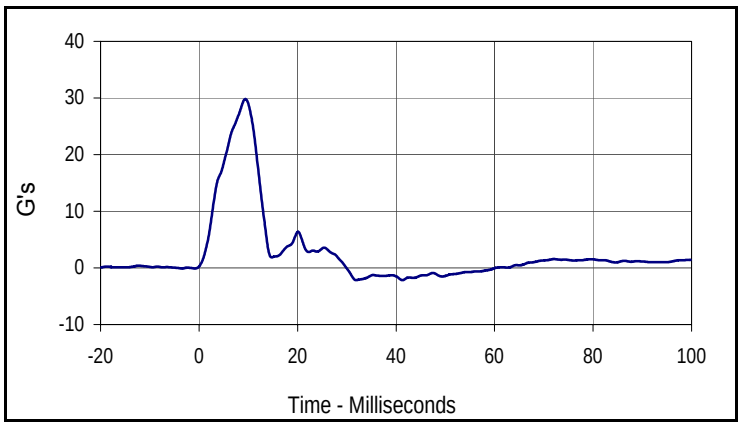
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
46.7	7.6	-0.5	41.2

Test Program:	SID IIs Pelvis Iliac Calibration	Test Date:	1/9/15
ATD Serial No.:	299	Test I.D.:	299PL082

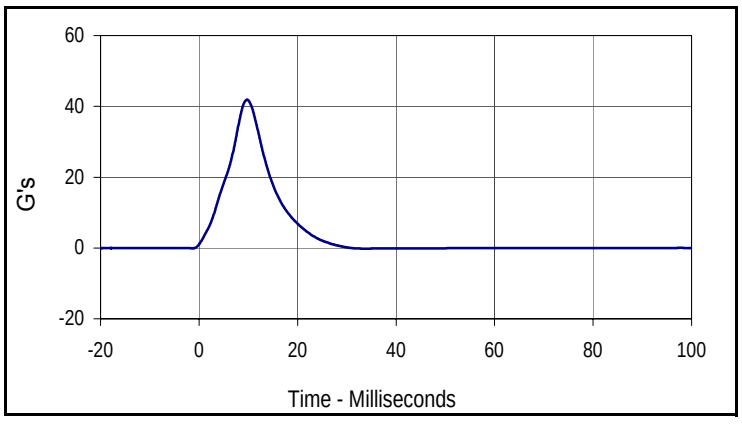
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	581	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.1	Pass
	Min	%		35.8	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	36.1	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.34	Pass
Peak Illiac Force		Newtons	4100 to 5100	4352.6	Pass
Peak Pelvis Y Acceleration		G's	28 to 39	29.8	Pass
Peak Impactor Acceleration		G's	36 to 45	41.9	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4352.6	9.7	-25.3	33.0



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
29.8	9.4	-2.2	31.9



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
41.9	9.7	-0.2	34.1

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	P58736	Endevco	10/6/14
			Y	P51929	Endevco	10/6/14
			Z	P51934	Endevco	10/6/14
	Redundant		X	P68604	Endevco	10/6/14
			Y	P51931	Endevco	10/6/14
			Z	P51939	Endevco	10/6/14
Displacement Potentiometers	Thoracic Rib	Upper	Y	1143	FTSS	10/7/14
		Middle	Y	1160	FTSS	10/7/14
		Lower	Y	1213	FTSS	10/7/14
	Abdominal Rib	Upper	Y	1218	FTSS	10/7/14
		Lower	Y	1234	FTSS	10/7/14
Lower Spine Accelerometers (T12)			X	04I20-Z04	Endevco	10/7/14
			Y	06A07-R08	Endevco	10/7/14
			Z	P58795	Endevco	10/7/14
Acetabulum Load Cell			Y	272	Denton	5/1/14
Iliac Wing Load Cell			Y	284	Denton	5/1/14
Pelvis Plug (Struck Side)				72814	FTSS	2/8/14
Pelvis Plug (Non-Struck Side)				70940	FTSS	12/13/13

TABLE 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	A147468	MSI	9/11/14
Vehicle Center of Gravity	Y	A147432	MSI	9/11/14
Vehicle Center of Gravity	Z	A147476	MSI	9/11/14
Left Floor Sill	Y	A147477	MSI	9/11/14
A-Pillar Sill	Y	A147469	MSI	9/11/14
A-Pillar Low	Y	A145471	MSI	8/16/14
A-Pillar Mid	Y	A147450	MSI	9/11/14
B-Pillar Sill	Y	N/A	N/A	N/A
B-Pillar Low	Y	N/A	N/A	N/A
B-Pillar Mid	Y	N/A	N/A	N/A
Driver Seat	Y	A148281	MSI	9/23/14
Engine Top	X	A147458	MSI	9/11/14
Engine Top	Y	A147478	MSI	9/11/14
Firewall	Y	A147459	MSI	9/11/14
Right Roof	Y	A147461	MSI	9/11/14
Right Floor Sill	Y	A147473	MSI	9/11/14
Rear Floorpan	X	A147441	MSI	9/11/14
Rear Floorpan	Y	A147463	MSI	9/11/14

TABLE 3 – Pole Instrumentation

	Serial Number	Manufacturer	Calibration Date
Load Cell 1	131822A	Interface	5/20/14
Load Cell 2	132304A	Interface	5/20/14
Load Cell 3	19477	Interface	5/20/14
Load Cell 4	19325	Interface	5/20/14
Load Cell 5	131827A	Interface	5/20/14
Load Cell 6	132302A	Interface	5/21/14
Load Cell 7	19267	Interface	5/21/14
Load Cell 8	19321	Interface	5/21/14