REPORT NUMBER: SINCAP-KAR-15-023

NEW CAR ASSESSMENT PROGRAM (NCAP)
MOVING DEFORMABLE BARRIER SIDE IMPACT TEST

FORD MOTOR CO.

2015 FORD MUSTANG 2-DOOR COUPE

NHTSA No: M20150221

PREPARED BY:

KARCO ENGINEERING, LLC.

9270 HOLLY ROAD

ADELANTO, CA 92301

JANUARY 21, 2015

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

OFFICE OF CRASHWORTHINESS STANDARDS

MAIL CODE: NVS-111

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Approval Date: January 21, 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

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Final Report of New Car Assessment Program Side Impact MDB Testing of a 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221	January 21, 2015
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9. Performing Organization Name and Address KARCO Engineering, LLC. 9270 Holly Rd. Adelanto, CA 92301	**10. Work Unit No.**
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15. Supplementary Notes

16. Abstract

A 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2015 Ford Mustang 2-door coupe in accordance with the specifications of the Office of Crash Worthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. The test was conducted at the KARCO Engineering, LLC. facility in Adelanto, California on January 7, 2015.

The impact velocity of the Moving Deformable Barrier was 61.62 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 22.2° C. The target vehicle's maximum post-test static crush was 175 mm located at level 3. The test vehicle's occupant performance data is as follows:

Measurement Description	Driver ATD (ES-2re)		
	Units	IARV	Result
Head Injury Criteria (HIC_{36})		1000	111.6
Maximum Thoracic Rib Deflection	mm	44	18
Total Abdominal Force	N	2500	604
Pubic Symphysis Force	N	6000	997

Measurement Description	Passenger ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC_{36})		1000	599.5
Resultant Lower Spine Acceleration	g	82	61
Total Pelvic Force (Sum of Acetubular and Iliac Forces)	N	5525	3001
Maximum Thoracic Rib Deflection	mm	38*	40
Maximum Abdominal Rib Deflection	mm	45*	22

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

** Proposed IARV*

17. Key Words		18. Distribution Statement	
New Car Assessment Program (NCAP) Side Impact Moving Deformable Barrier (MDB) ES-2re SID-IIs		Copies of this report are available from: National Highway Traffic Safety Administration 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	159	

TABLE OF CONTENTS

SECTION 1
TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test is part of the MY2015 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 2015 Ford Mustang 2-door coupe was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.62 km/h (38.29 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by KARCO Engineering, LLC. in Adelanto, California, on January 7, 2015. Pre- and post-test photographs of the test vehicle, the MDB and the dummies (ES-2re and SID-IIs) are included in Appendix A of this report.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated September 2013. The side impact event was documented by 11 cameras. Camera locations are included in Data Sheet No. 5 of this report.

The dummy was instrumented in the following manner:

DRIVER ATD (ES-2re)
Primary and redundant head CG tri-axial accelerometers
Chest upper rib, middle rib and lower rib y-axis displacement potentiometers
Abdomen forward, middle, and rear y-axis load cells
Lower spine (12) tri-axial accelerometers
Pubic symphysis y-axis load cell

PASSENGER ATD (SID-IIs)
Primary and redundant head CG tri-axial accelerometers
Chest upper rib, middle rib and lower rib y-axis displacement potentiometers
Abdomen upper rib and lower rib y-axis displacement potentiometers
Lower spine (12) tri-axial accelerometers
Acetabulum and iliac wing y-axis load cells

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 of this report contains the test equipment and instrumentation calibration data.

Dummy injury readings were recorded as follows:

Measurement Description	Units	Driver ATD (ES-2re)	
		Threshold	Result
Head Injury Criteria (HIC_{36})		1000	111.6
Maximum Thoracic Rib Deflection	mm	44	18
Combined Abdominal Force	N	2500	604
Pubic Symphysis Force	N	6000	997

Measurement Description	Units	Passenger ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC_{36})		1000	599.5
Lower Spine (T12) Resultant Acceleration	g	82	61
Total Pelvic Force (sum of acetabular and iliac forces	N	5525	3001
Maximum Thoracic Rib Deflection	mm	38*	40
Maximum Abdominal Rib Deflection	mm	45*	22

**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 value that exceeded its limits.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15

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. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20150221
Model Year	2015
Make	Ford
Model	Mustang
Body Style	2-Door Coupe
VIN	1FA6P8AM5F5308269
Body Color	Competition Orange
Odometer Reading (km / mi)	283 / 176
Engine Displacement (L)	3.7
Type / No. of Cylinders	V6
Engine Placement	Longitudinal
Transmission Type	Manual
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	Yes
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	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 Pretensione	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? No

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
DSC x 68.04 (kg)				272.2
Cargo Weight (RCLW) (kg)				30.8

VEHICLE SEAT TYPE

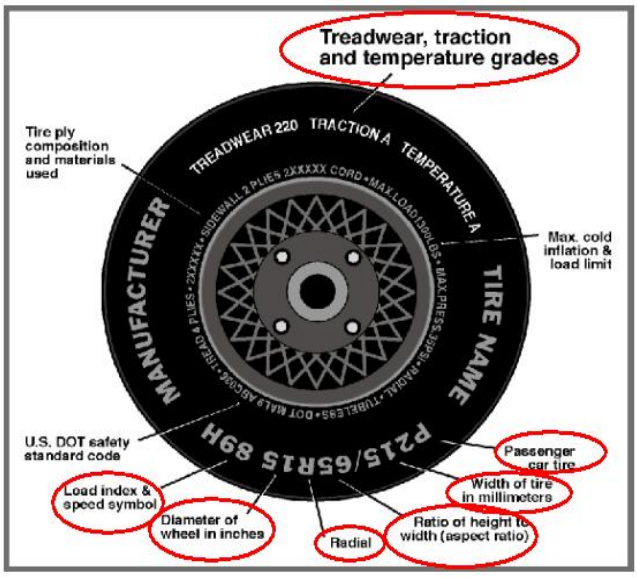
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable w/ Lever	Adjustable w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat		Yes			Yes		
Third Row Seat							

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15



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	Steel, Polyester, Nylon	Steel, Polyester, 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. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	225	225	225	225
Tire Placard	kPa	220	220	220	220
Owner's Manual	kPa	220	220	220	220
As Tested	kPa	220	220	220	220

MDB TIRE SPECIFICATIONS

	Units	Requirement	LF	RF	LR	RR
Tire Size		P205/75R15	P205/75R15	P205/75R15	P205/75R15	P205/75R15
Tire Pressure	kPa	200 ± 21	200	200	200	200

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	417.0	363.5		446.5	441.0		448.5	438.5	
Right	kg	432.5	382.5		431.0	425.5		433.0	429.0	
Ratio	%	53.2%	46.8%	100.0%	50.3%	49.7%	100.0%	50.4%	49.6%	100.0%
Total	kg	849.5	746.0	1595.5	877.5	866.5	1744.0	881.5	867.5	1749.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1595.5	A
Actual Weight of 2 P572 ATDs Used	kg	125.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	30.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1751.3	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	Fully Loaded	As Tested	Meets Requirement***
LF	mm	720	717	Yes
RF	mm	725	725	Yes
LR	mm	698	700	Yes
RR	mm	713	709	Yes
Vehicle CG (Aft of Front Axle)	mm	1348	1350	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	12	15	

***The “As Tested” vehicle attitude measurements must be equal to or within ±10 mm of the “Fully Loaded” vehicle attitude measurements at each wheel well. 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. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Rear Bumper Cover	7.5
Left Front Headlight	3.0
Rear Trunk Trim	2.5
Non-Struck Side Door Panel	4.0
Non-Struck Side Glass	5.0
Rear Window	1.0
Ballast / Equipment Added	58.8

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. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15

SEAT POSITIONING

The driver's seat, front center seat (if applicable), and right front passenger's seat should be set to the mid-track, lowest, mid-angle position. The struck side rear passenger's seat, rear center seat, and non-struck side rear passenger's seats should be set to the rearmost, lowest, mid-angle position.

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	5.1	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	513	Max	498	513	528
			Mid	498	513	528
			Min	498	513	528
Front Passenger Seat	Fixed	405	Max	405	405	405
			Mid	405	405	405
			Min	405	405	405
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. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15

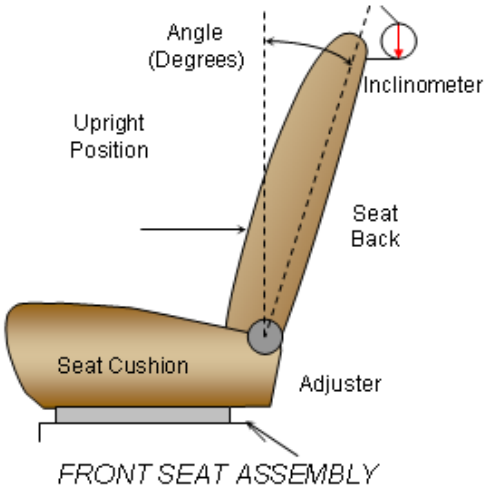
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	256	38	132	19
Front Passenger Seat	255	38	127	19
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 to the manufacturer's designated design angle. The right front passenger's seat back is positioned in a similar manner as the driver's seat back. The struck side rear seat back is positioned such that the dummy's head is level. The rear center and non-struck side rear outboard seat backs are positioned in a similar manner as the struck side rear seat back. Seat back angle is measured at the head rest post.



SEAT BACK POSITION

Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/Seated Dummy	66.4	31	3.3	17
Front Passenger Seat	60.6	31	3.0	17
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. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15

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
Rear Seat	Fixed	Fixed

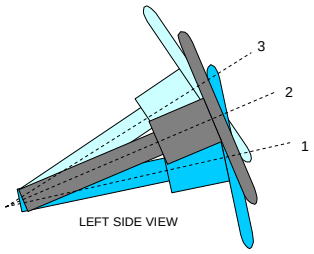
HEAD RESTRAINT ADJUSTMENT

The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger'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, 13 Horizontal	Full Up, Full Forward
Rear Seat	Fixed	Fixed

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	16.3	83
Geometric Center - Position 2	19.2	105
Uppermost - Position 3	22.1	126
Telescoping Steering Wheel Travel		43
Test Position	19.2	105

DATA SHEET NO. 2 … (CONTINUED)

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

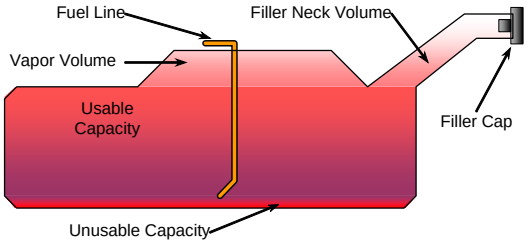
Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15

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

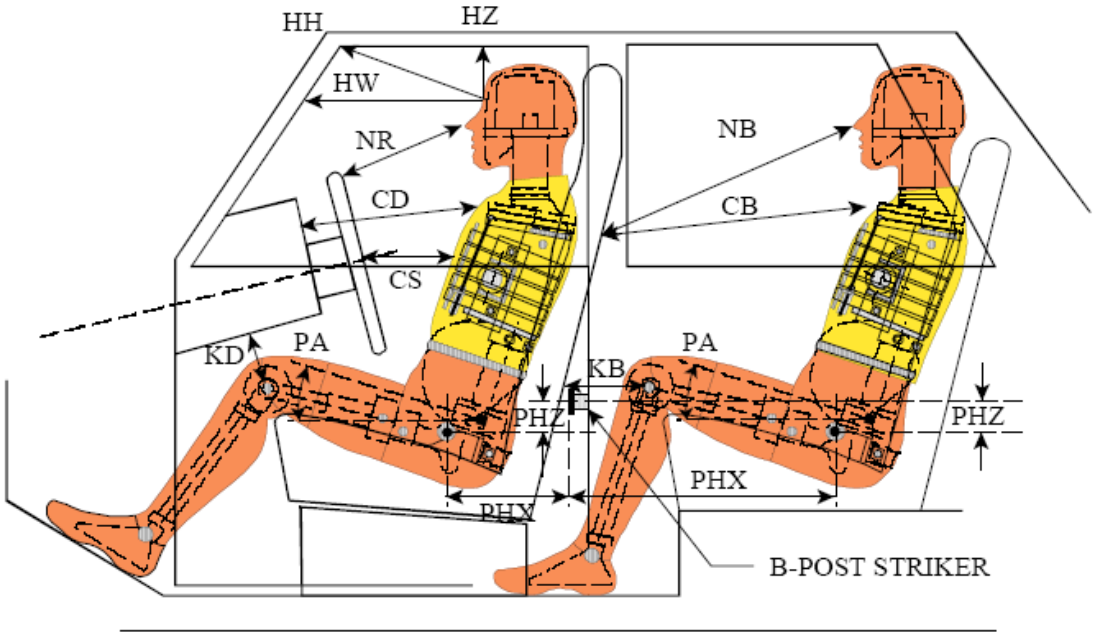
Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in the Form No. 1? ☒ **Yes** ☐ **No**

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15



LEFT SIDE VIEW

NOTE: 2-DOOR VEHICLE SHOWN. REAR DUMMY PHX & PHZ MEASUREMENTS FOR A 4-DOOR VEHICLE WOULD USE THE C-POST STRIKER AS A REFERENCE POINT

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

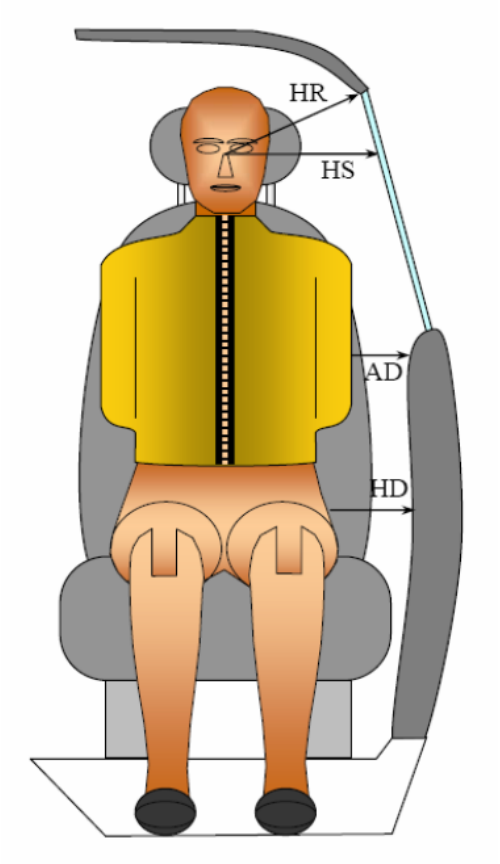
Driver Code	Pass. Code	Description	Driver		Passenger	
			Length (mm)	Angle (º)	Length (mm)	Angle (º)
HH		Head to Header	344			
HW		Head to Windshield	486			
HZ	HZ	Head to Roof	160		194	
NR	NB	Nose to Rim/Seat Back	394		476	
CD	CB	Chest to Dash/Seat Back	560		456	
CS		Chest to Steering Wheel	304			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	200	27.4	166	22.2
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	185	26.0	155	20.8
PAX°	PAX°	Pelvic Tilt Angle X		19.7		28.8
	PAY°	Pelvic Tilt Angle Y		0.4		0.2
PHX	PHX	Hip Point to Striker (x-axis)	452		320	
PHZ	PHZ	Hip Point to Striker (z-axis)	200		168	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15



DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

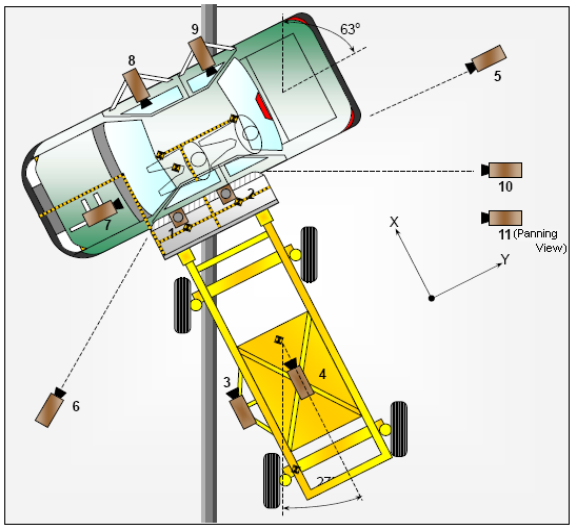
Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	183	226
HS	Head to Side Window	mm	304	382
AD	Arm to Door	mm	121	139
HD	H-Point to Door	mm	175	140

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15



CAMERA LOCATIONS AND DATA

No.	View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	1220	2287	-5486	14	1000
2	Overhead Close-Up	609	2287	-5102	35	1000
3	Left Impact Point (MDB)	-2134	0	-1143	25	1000
4	Side Overall (MDB)	-3912	838	-1829	12.5	1000
5	Rear	-64	2485	-1348	85	1000
6	Left Front	-2266	-3564	-1475	24	1000
7	Driver Front (On-Board)	541	-864	-786	24	1000
8	Driver Side (On-Board)	1794	1080	-389	12	1000
9	Passenger Side (On-Board)	1703	1859	-472	12	1000
10	Real Time Overall				Zoom	30
11	Real Time Inrun				Zoom	30

Reference: Impact Point Projected to Ground; +X = To Front of MDB, +Y = To Right of MDB, +Z = Down

*All measurements accurate to ±6 mm

INSTRUMENTATION

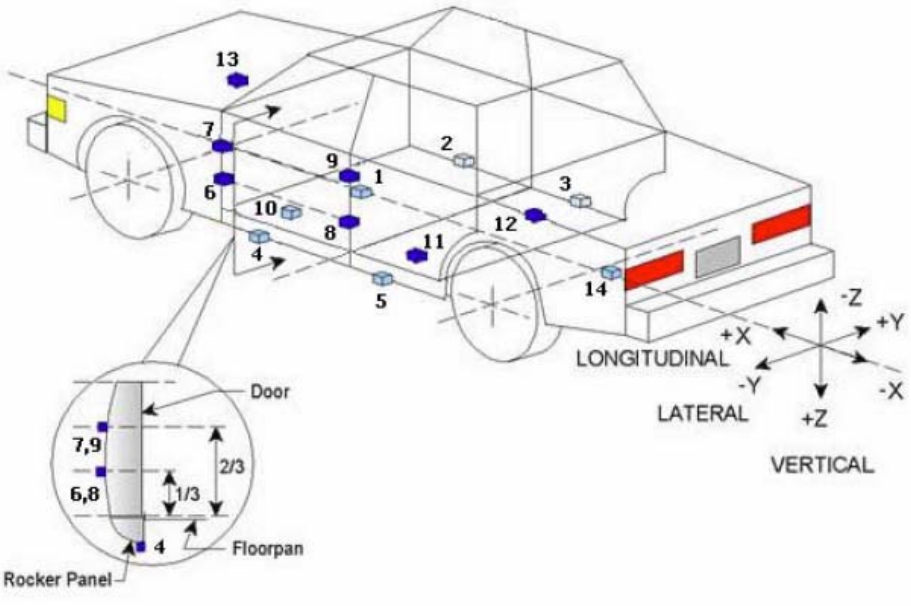
Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	22
MDB Accelerometers	5
Total	59

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1853	0	-491
2	Right Sill at Front Seat	2536	704	-251
3	Right Sill at Rear Seat			
4	Left Sill at Front Door	2339	-747	-157
5	Left Sill at Rear Door	1649	-749	-152
6	A-Pillar Lower	3042	-815	-462
7	A-Pillar Middle	3042	-815	-728
8	B-Pillar Lower			
9	B-Pillar Middle			
10	Front Seat Track	2271	-180	-256
11	Rear Seat Structure			
12	Right Rear Occupant Compartment	1980	320	-175
13	Engine Block	3662	-31	-909
14	Rear Floorpan Above Axle	1050	0	-498

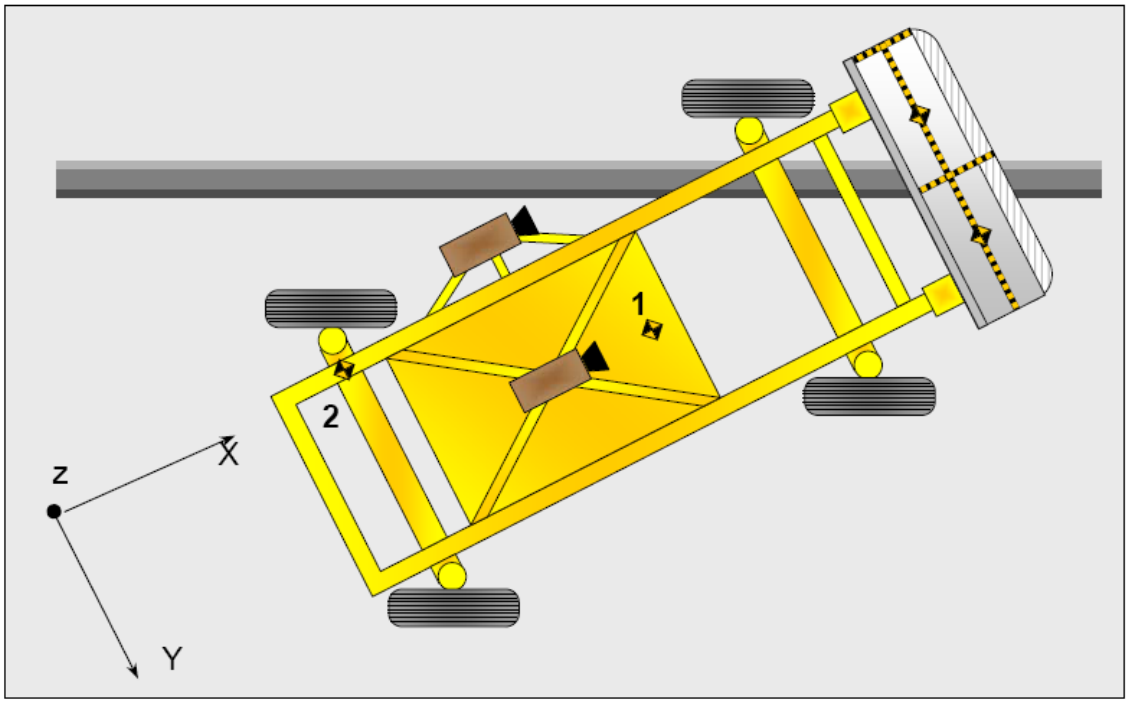
Reference: X – Rear surface of vehicle (+ forward)
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 7

MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15



MDB ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Measurement		
		X	Y	Z
1	MDB CG	-1195	0	-430
2	MDB Rear	-2642	-593	-608

Reference: X – Face of MDB (+ forward)
Y – MDB centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 8

POST-TEST OBSERVATIONS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	Curtain Airbag, Side Header	Curtain Airbag, C-Pillar Trim
Top of Head	Side Header	C-Pillar Trim, Right Seat Back
Left Side of Head	Side Header	Curtain Airbag, C-Pillar Trim
Back of Head	Side Header, Head Rest	Curtain Airbag, C-Pillar Trim, Right Seat Back
Left Shoulder	Torso/Pelvis Airbag	Door Panel
Upper Torso	Seat, Torso/Pelvis Airbag	Door Panel
Lower Torso	Seat, Torso/Pelvis Airbag	Door Panel, Seat
Left Hip	Seat, Torso/Pelvis Airbag	Seat
Left Knee	Door Panel, Right Knee	Door Panel, Right Knee

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/Other
	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

DATA SHEET NO. 8 … (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

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

DATA SHEET NO. 8 … (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15

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
Vehicle Wheel Base	mm		2718
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		422
Actual Impact Point (Aft of Front Axle)	mm		413
Horizontal Offset (+ forward / - rearward)	mm	± 50 of Intended Impact Point	9
Vertical Offset (+ down / - up)	mm	± 20 of Intended Impact Point	14

DATA SHEET NO. 9

MDB SUMMARY OF RESULTS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1251
Overall Length including Honeycomb Face	4023
Wheel Base of Framework Carriage	2595
CG location aft of Front Axle	1118

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	401.8	298.0	699.8
Right	kg	376.9	291.6	668.5
Ratio	%	56.9%	43.1%	100.0%
Totals	kg	778.7	589.6	1368.3

SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.62
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.60
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.7
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	62.9
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26.0 to 28.0	27.8

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

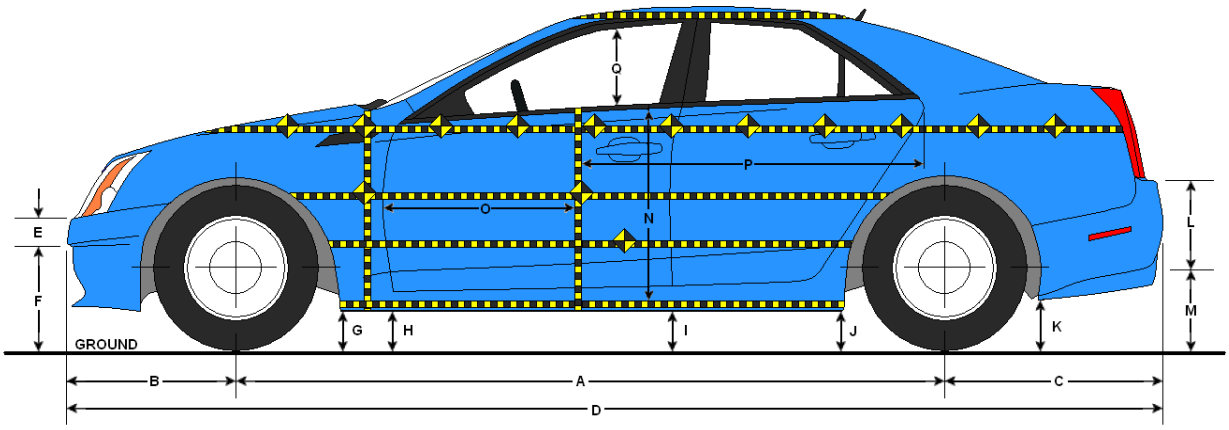
Vertical Location			From Centerline		Max. Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	800	Right	294
B	Top of Bumper	533	800	Right	225
C	Mid Level	686	700	Right	212
D	Top of Stack	813	800	Right	219

DATA SHEET NO. 10

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2718	2714	-4
B	Front Axle to FSOV	939	937	-2
C	Rear Axle to RSOV	1083	1057	-26
D	Total Length at Centerline	4739	4707	-32
E	Front Bumper Thickness	124	125	1
F	Fromt Bumper Bottom to Ground	378	408	30
G	Sill Height at Front Wheel Well	155	191	36
H	Sill Height at Front Door Leading Edge	186	217	31
I	Sill Height at B-Pillar	202	221	19
J1	Sill Height at Rear Wheel Well	180	209	29
J2	Pinch Weld Height at Rear Wheel Well	135	160	25
K	Sill Height Aft of Rear Wheel Well	300	409	109
L	Rear Bumper Thickness	177	111	-66
M	Rear Bumper Bottom to Ground	415	396	-19
N	Sill Height to Bottom of Front Window Sill	674	662	-12
O	Front Door Leading Edge to Impact CL	561	546	-15
P	Rear Door Trailing Edge to Impact CL	1991	2352	361
Q	Front Window Opening	260	260	0
R	Right Side Length	3205	3202	-3
S	Left Side Length	3203	3199	-4
T	Vehicle Width at B-Pillar	1807	1773	-34

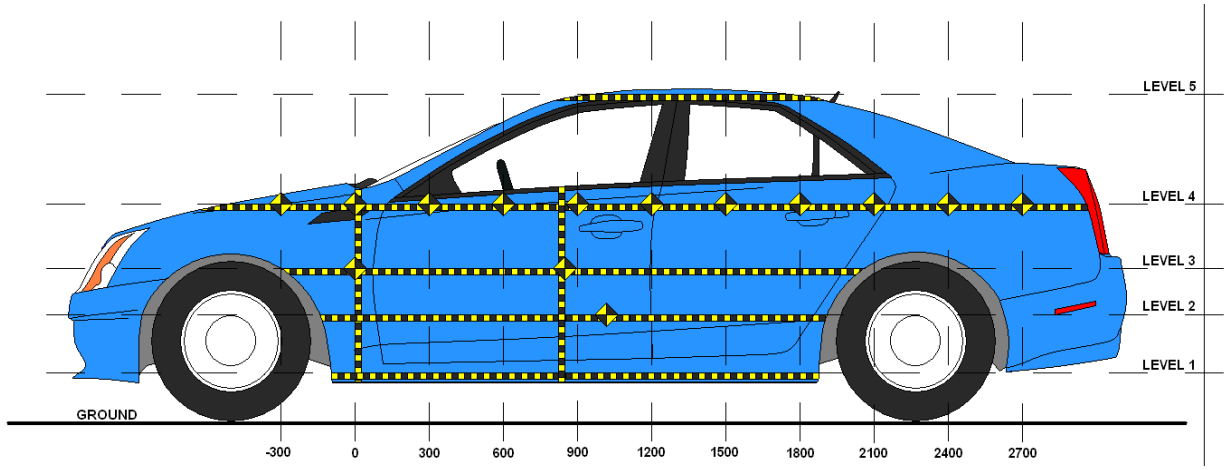
All measurements in mm with tolerance of ± 3mm

DATA SHEET NO. 11

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	194	17	600
2	Occupant H-Point	475	150	300
3	Mid-Door	593	175	1050
4	Window Sill	875	64	900
5	Window Top	1284	14	1950

DATA SHEET NO. 11 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

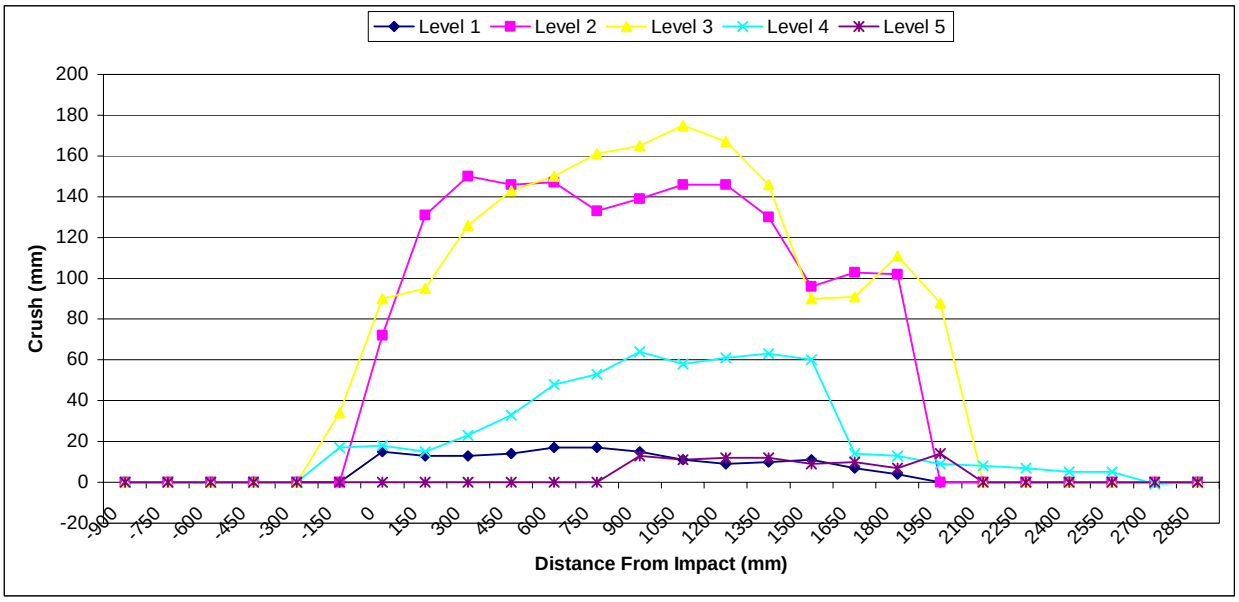
	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300															
-150			560	650				594	667				34	17	
0	617	569	571	642		632	641	661	660		15	72	90	18	
150	642	592	579	636		655	723	674	651		13	131	95	15	
300	646	598	581	631		659	748	707	654		13	150	126	23	
450	641	599	581	630		655	745	724	663		14	146	143	33	
600	638	599	581	625		655	746	731	673		17	147	150	48	
750	636	600	582	628		653	733	743	681		17	133	161	53	
900	634	600	584	628	886	649	739	749	692	899	15	139	165	64	13
1050	636	602	586	630	875	647	748	761	688	886	11	146	175	58	11
1200	636	604	588	631	873	645	750	755	692	885	9	146	167	61	12
1350	634	606	590	633	875	644	736	736	696	887	10	130	146	63	12
1500	636	606	592	636	883	647	702	682	696	892	11	96	90	60	9
1650	638	598	593	642	889	645	701	684	656	899	7	103	91	14	10
1800	610	570	575	642	902	614	672	686	655	909	4	102	111	13	7
1950			548	627	919			636	636	933			88	9	14
2100				614					622					8	
2250				612					619					7	
2400				619					624					5	
2550				633					638					5	
2700				653					652					-1	
2850				677					677					0	

DATA SHEET NO. 11 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15

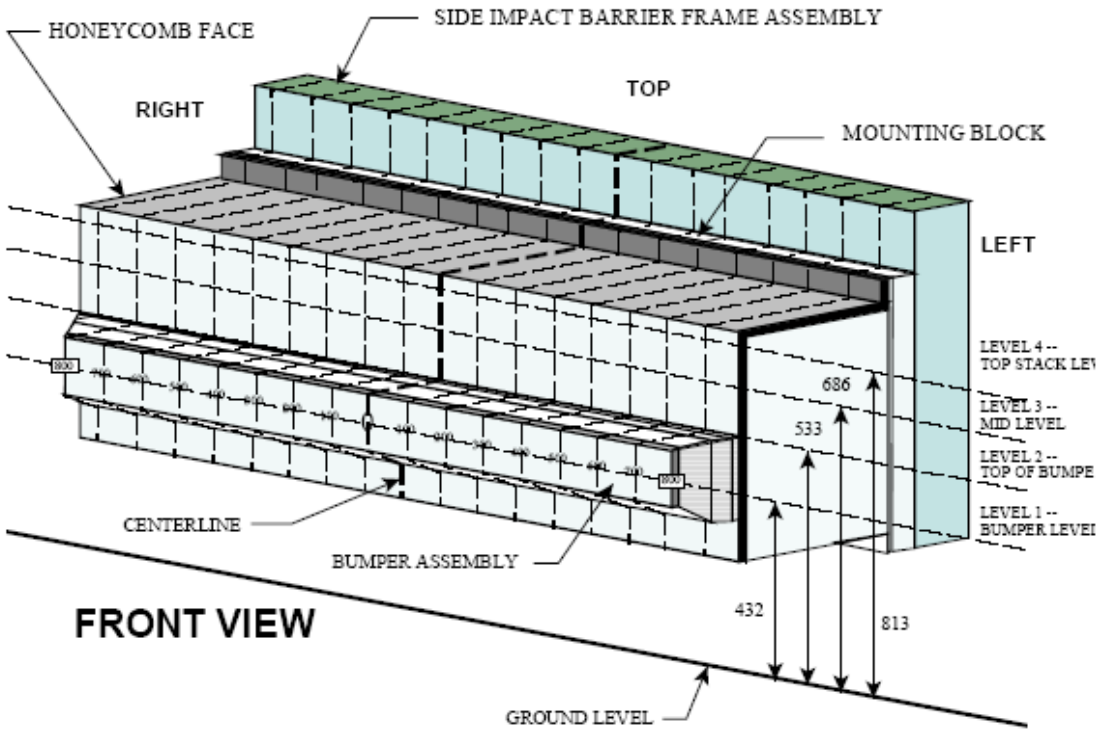


DATA SHEET NO. 12

MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	294	285	287	269	245	231	217	214	210	209	209	207	208	224	221	210	219
2	225	222	222	197	170	163	155	152	153	149	147	141	138	142	150	158	162
3	181	212	182	132	100	83	72	68	62	67	72	80	97	137	149	150	152
4	219	217	187	147	93	63	59	56	58	65	77	90	132	177	197	185	187

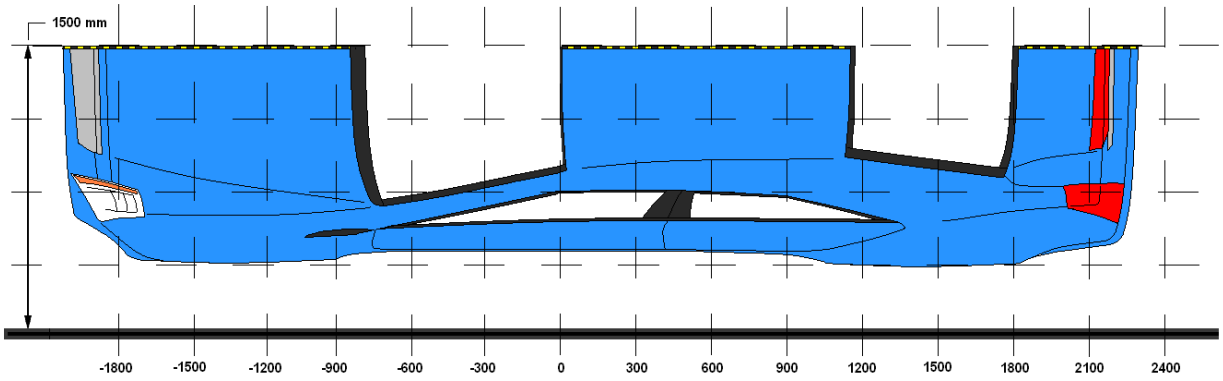
All dimensions in millimeters.

DATA SHEET NO. 13

VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	2850	4	677	677	0
2	2250	4	612	619	7
3	650	2	598	701	103
4	1050	3	586	761	175
5	450	2	599	745	146
6	-150	3	560	594	34

MDB DAMAGE PROFILE DISTANCES

DPD	From MDB Centerline		Level	Crush (mm)
	Distance (mm)	Direction		
1	800	Left	1	219
2	500	Left	1	224
3	200	Left	1	209
4	200	Right	1	217
5	500	Right	1	269
6	800	Right	1	294

DATA SHEET NO. 14

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15

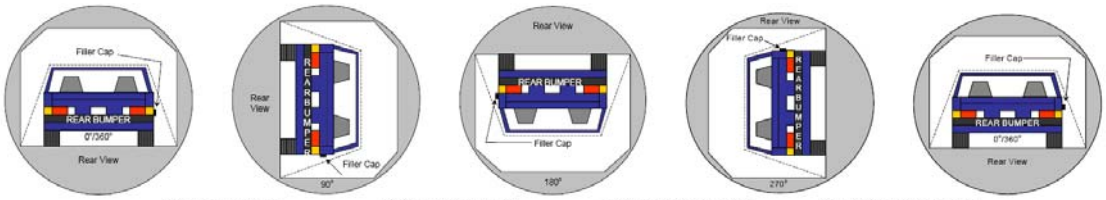
Temperature at Time of Impact: 22.2° C Test Time: 1:01 PM

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°	86	300	386
90° To 180°	79	300	379
180° To 270°	77	300	377
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

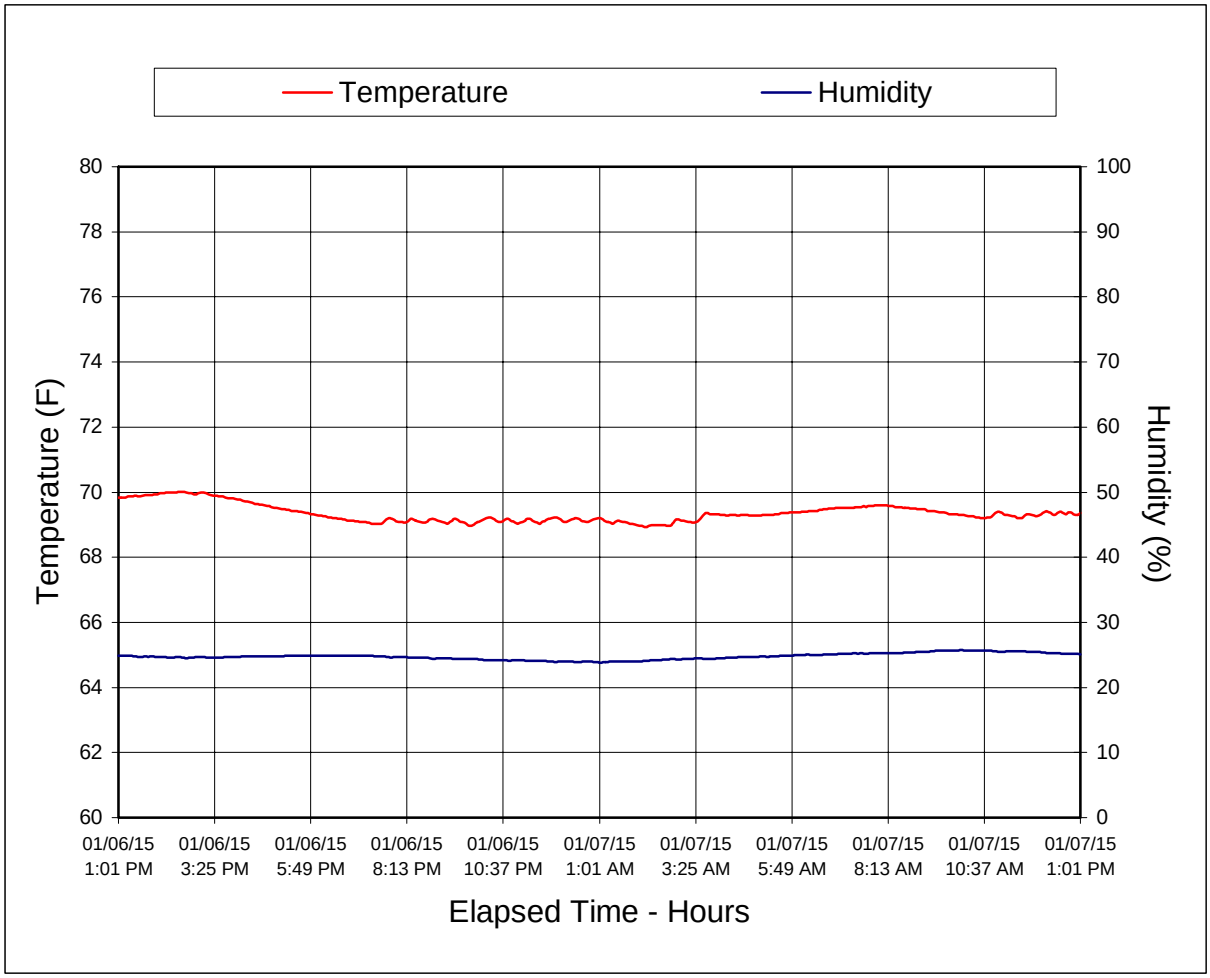
Test Phase	Spillage Location
0° To 90°	N/A
90° To 180°	N/A
180° To 270°	N/A
270° To 360°	N/A

DATA SHEET NO. 15

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2015 Ford Mustang 2-Door Coupe NHTSA No. M20150221

Test Program: NCAP MDB Side Impact Test Test Date: 01/07/15



APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS … (CONTINUED)

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

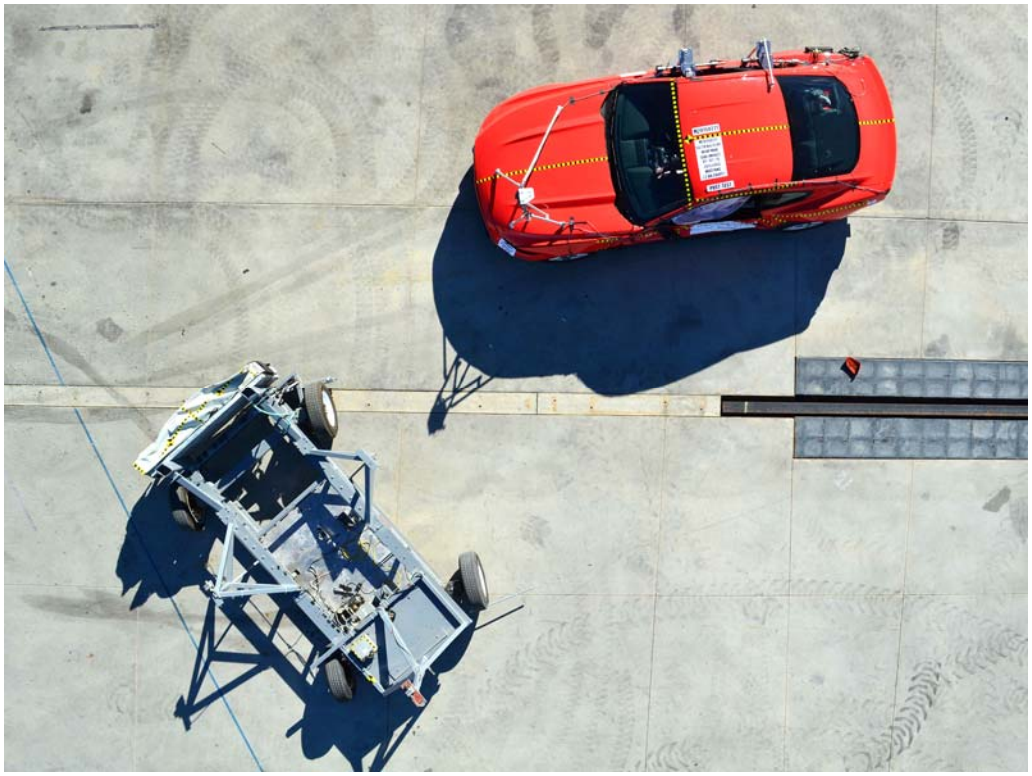


FIGURE 16. Post-Test Overhead View of Test Area

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

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

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

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

FIGURE 21. Pre-Test Left Front Door Latch Close-Up

FIGURE 22. Post-Test Left Front Door Latch Close-Up

FIGURE 23. Pre-Test Left Rear Door Latch Close-Up

FIGURE 24. Post-Test Left Rear Door Latch Close-Up

FIGURE 25. Pre-Test Front Close-Up View of Driver Dummy

FIGURE 26. Post-Test Front Close-Up View of Driver Dummy

FIGURE 27. Pre-Test Left Side View of Driver Dummy
Showing Belt and Chalking

FIGURE 28. Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View

FIGURE 29. Post-Test Left Side View of Driver Dummy Shoulder and Door Top View

FIGURE 30. Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning

FIGURE 31. Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint

FIGURE 32. Pre-Test Overhead View of Driver Seat Pan Prior to Dummy Positioning

FIGURE 33. Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan

FIGURE 34. Pre-Test Placement of Driver Dummy's Feet

FIGURE 35. Pre-Test View of Belt Anchorage for Driver Dummy

FIGURE 36. Pre-Test Left Side View of Steering Wheel

FIGURE 37. View of Disengaged Parking Brake

FIGURE 38. Pre-Test View of Parking Brake

FIGURE 39. Pre-Test Close-Up Left Side View of Driver Seat Track

FIGURE 40. Pre-Test Close-Up Left Side View of Driver Seat Back

FIGURE 41. Pre-Test Close-Up View of Driver Seat Back or Head Restraint

FIGURE 42. Pre-Test Driver Dummy and Door Clearance View

FIGURE 43. Post-Test Driver Dummy and Door Clearance View

FIGURE 44. Pre-Test Right Side View of Driver Dummy
and Front Seat Occupant Compartment

FIGURE 45. Post-Test Right Side View of Driver Dummy
and Front Seat Occupant Compartment

FIGURE 46. Pre-Test Driver Inner Door Panel View

FIGURE 47. Post-Test Driver Inner Door Panel View
Showing Driver Dummy Contact Locations

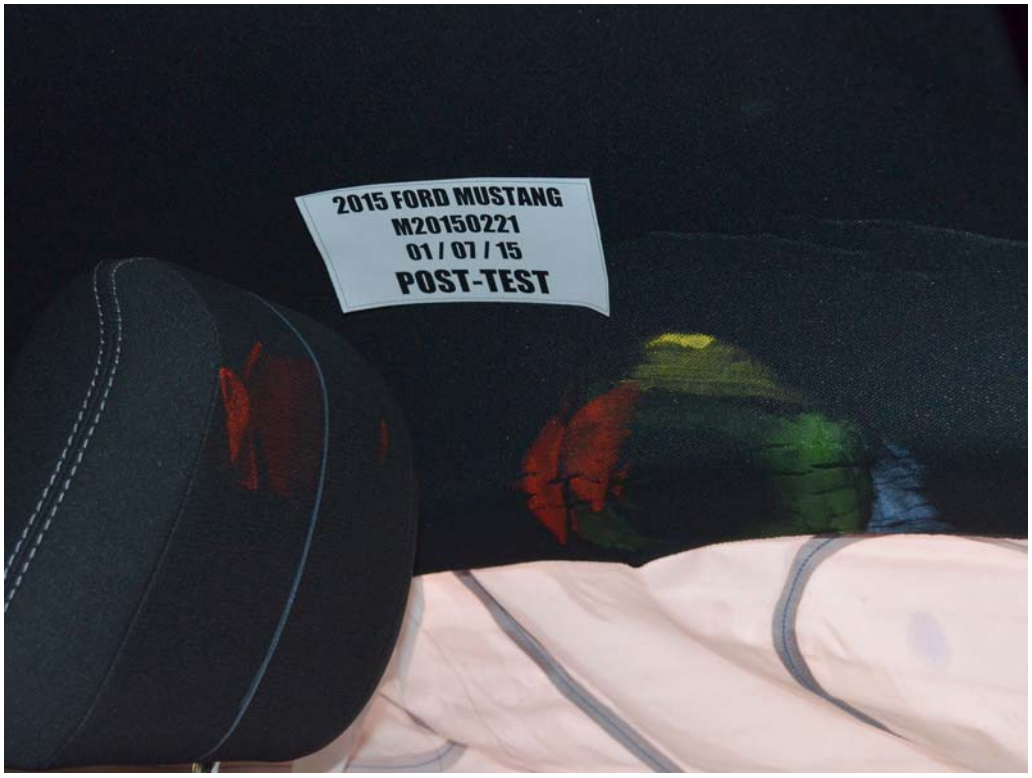


FIGURE 48. Post-Test Driver Dummy Close-Up Head Contact
with Vehicle Interior View

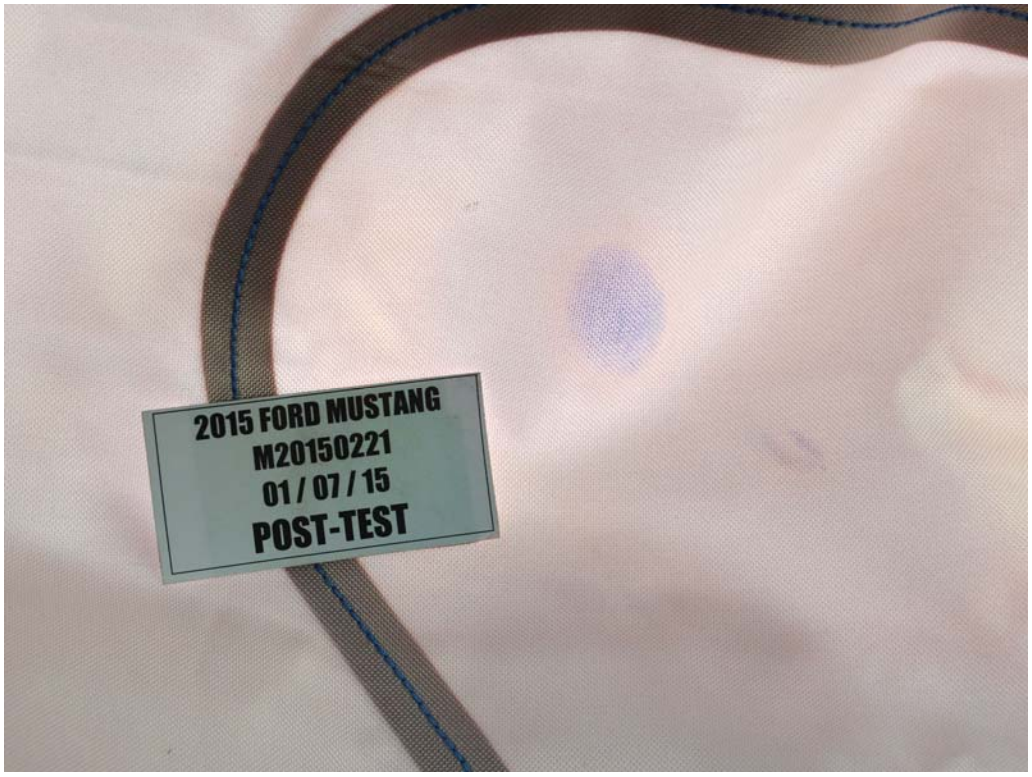


FIGURE 49. Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View

FIGURE 50. Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View

FIGURE 51. Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View

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

FIGURE 53. Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View

FIGURE 54. Post-Test Driver Dummy Close-Up Knee Contact View

FIGURE 55. Pre-Test Left Side View of Rear Passenger Dummy Showing Belt and Chalking

FIGURE 56. Pre-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View

FIGURE 57. Post-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View

FIGURE 58. Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning

FIGURE 59. Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint

FIGURE 60. Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning

FIGURE 61. Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan

FIGURE 62. Pre-Test View of Rear Passenger Dummy's Neck
Showing Position of Adjustable Neck Bracket

FIGURE 63. Pre-Test View of Rear Passenger Dummy's Head
Showing Dummy's Head is Level

FIGURE 64. Pre-Test Placement of Rear Passenger Dummy's Feet

FIGURE 65. Pre-Test View of Belt Anchorage for Rear Passenger Dummy

FIGURE 66. Pre-Test Close-Up Left Side View of Rear Passenger Seat Track

FIGURE 67. Pre-Test Close-Up Left Side View of Rear Passenger Seat Back

FIGURE 68. Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint

FIGURE 69. Pre-Test Rear Passenger Dummy and Door Clearance View

FIGURE 70. Post-Test Rear Passenger Dummy and Door Clearance View

FIGURE 71. Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment

FIGURE 72. Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment

FIGURE 73. Pre-Test Rear Passenger Inner Door Panel View

FIGURE 74. Post-Test Rear Passenger Inner Door Panel View
Showing Rear Passenger Dummy Contact Locations

FIGURE 75. Post-Test Rear Passenger Dummy Close-Up
Head Contact with Vehicle Interior View

FIGURE 76. Post-Test Rear Passenger Dummy Close-Up
Head Contact with Side Airbag View

FIGURE 77. Post-Test Rear Passenger Dummy Close-Up
Torso Contact with Vehicle Interior View

Photograph Not Applicable

Vehicle Not Equipped with
Rear Passenger Side Airbag

FIGURE 78. Post-Test Rear Passenger Dummy Close-Up
Torso Contact with Side Airbag View

FIGURE 79. Post-Test Rear Passenger Dummy Close-Up
Pelvis Contact with Vehicle Interior View

Photograph Not Applicable

Vehicle Not Equipped with
Rear Passenger Side Airbag

FIGURE 80. Post-Test Rear Passenger Dummy Close-Up
Pelvis Contact with Side Airbag View

FIGURE 81. Post-Test Rear Passenger Dummy Close-Up Knee Contact View

FIGURE 82. Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

FIGURE 83. Post-Test View of Fuel Filler Cap or Fuel Filler Neck

FIGURE 84. Pre-Test Front View of MDB Impactor Face

FIGURE 85. Post-Test Front View of MDB Impactor Face

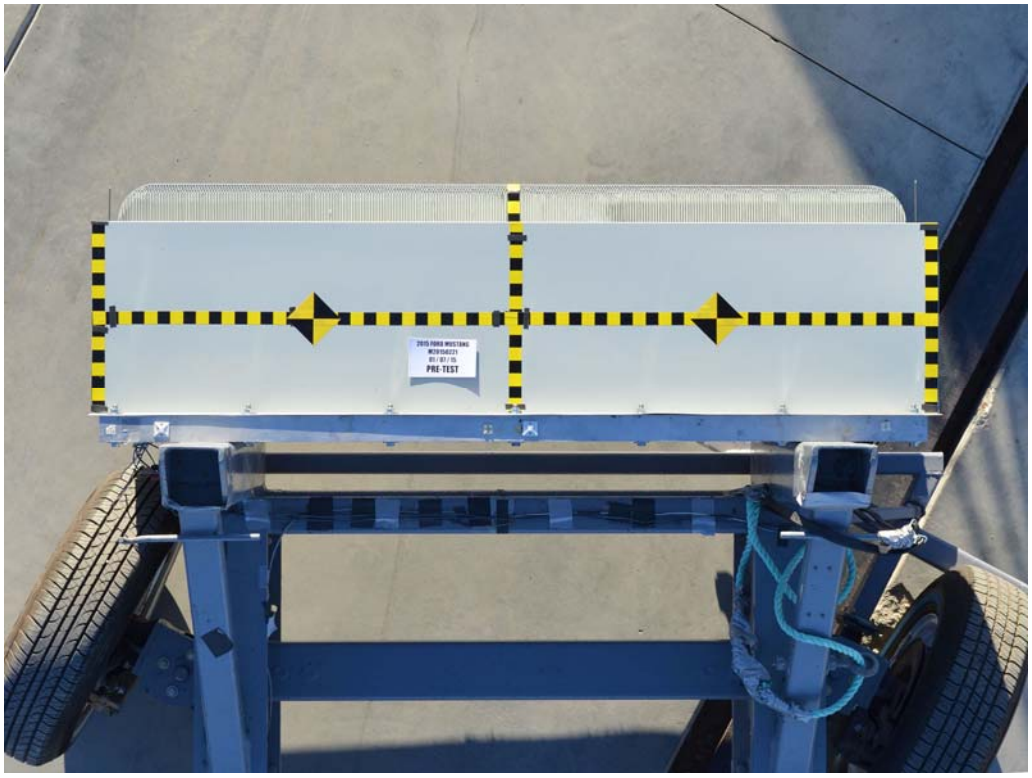


FIGURE 86. Pre-Test Top View of MDB Impactor Face

FIGURE 87. Post-Test Top View of MDB Impactor Face

FIGURE 88. Pre-Test Left Side View of MDB Impactor Face

FIGURE 89. Post-Test Left Side View of MDB Impactor Face

FIGURE 90. Pre-Test Right Side View of MDB Impactor Face

FIGURE 91. Post-Test Right Side View of MDB Impactor Face

FIGURE 92. Close-Up View of Vehicle's Certification Label

FIGURE 93. Close-Up View of Vehicle's Tire Information Placard or Label

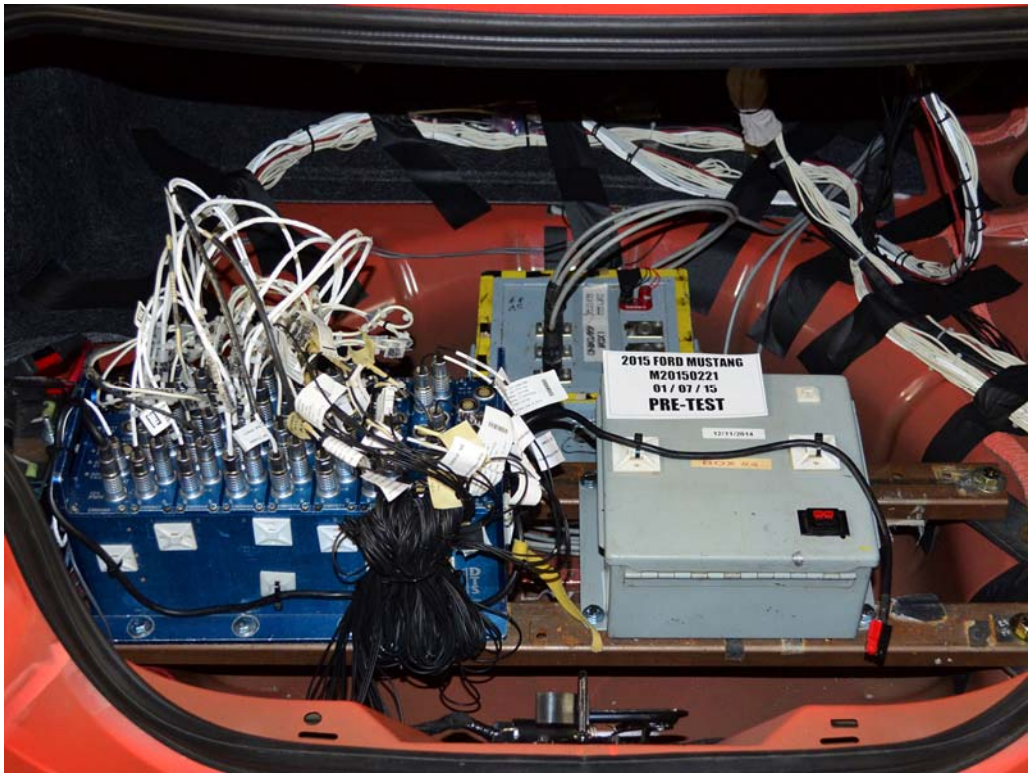


FIGURE 94. Pre-Test Ballast View

FIGURE 95. Post-Test Primary and Redundant Speed Trap Read-Out

FIGURE 96. FMVSS No. 301 Static Rollover 0 Degrees

FIGURE 97. FMVSS No. 301 Static Rollover 90 Degrees

FIGURE 98. FMVSS No. 301 Static Rollover 180 Degrees

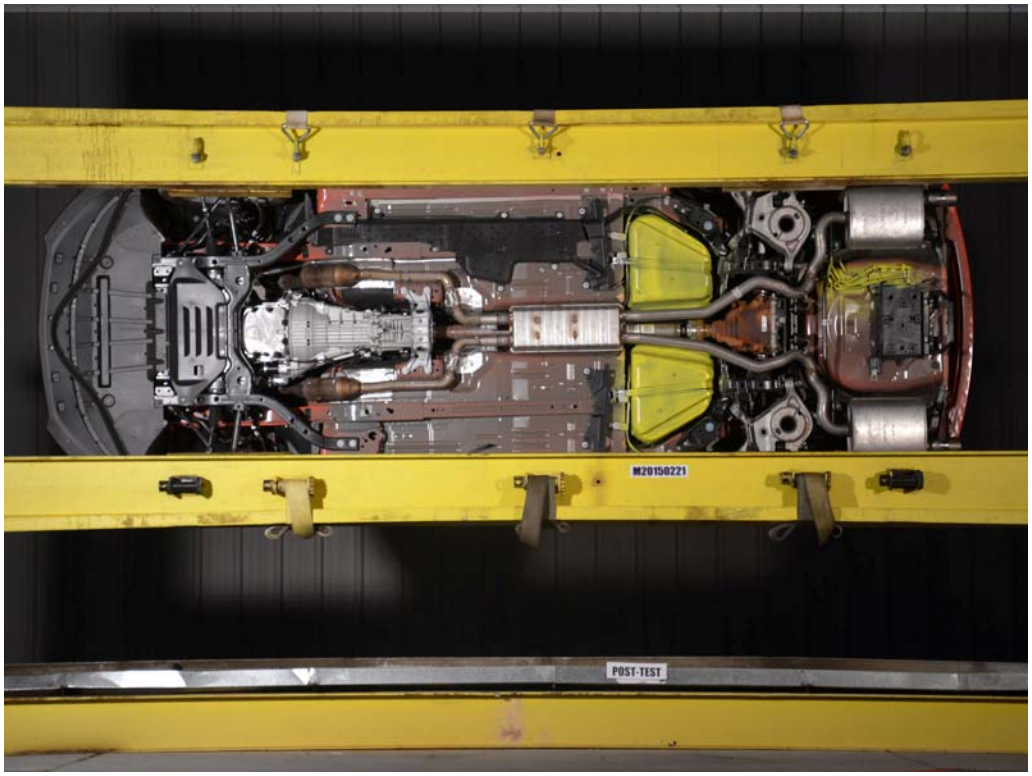


FIGURE 99. FMVSS No. 301 Static Rollover 270 Degrees

FIGURE 100. FMVSS No. 301 Static Rollover 360 Degrees

FIGURE 101. Impact Event

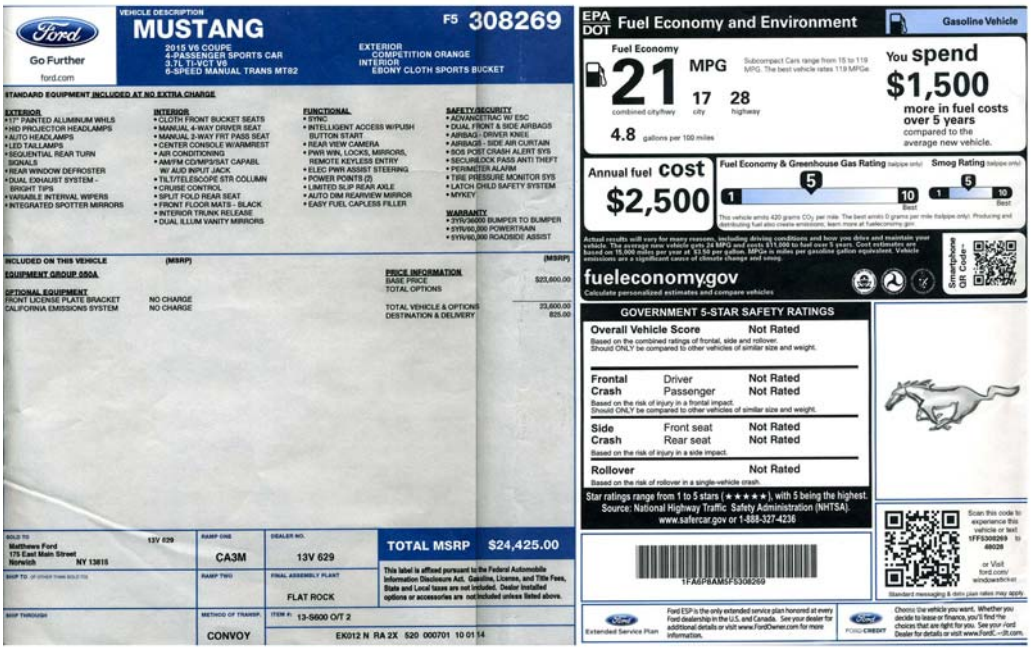


FIGURE 102. Monroney Label

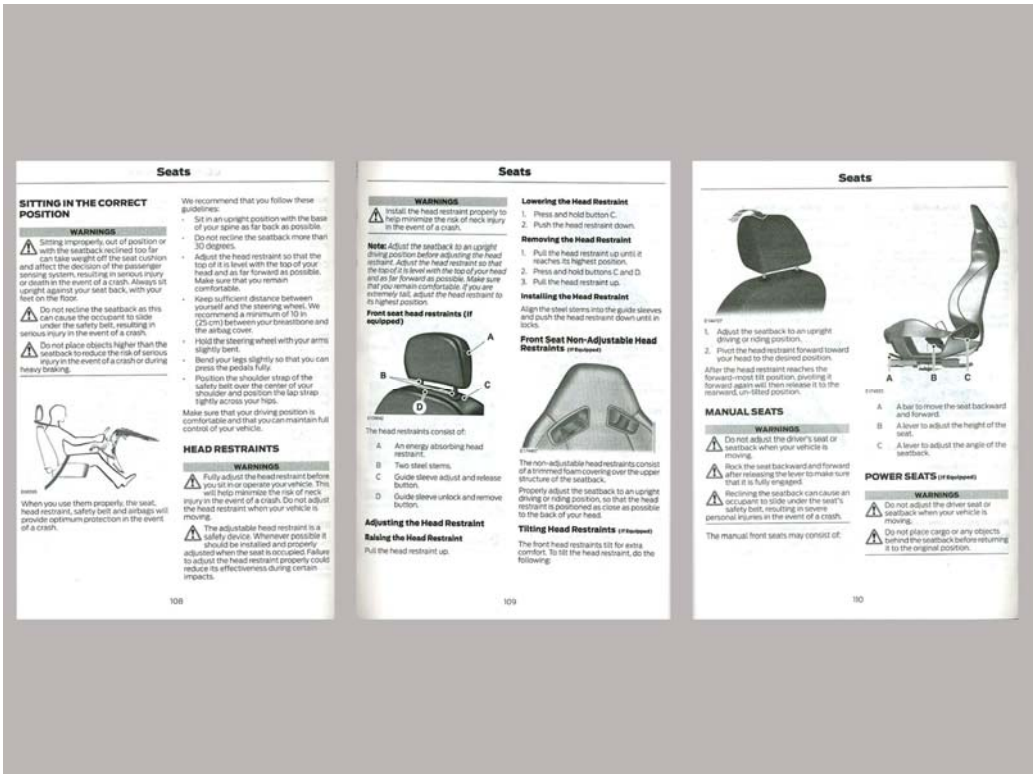


FIGURE 103. Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

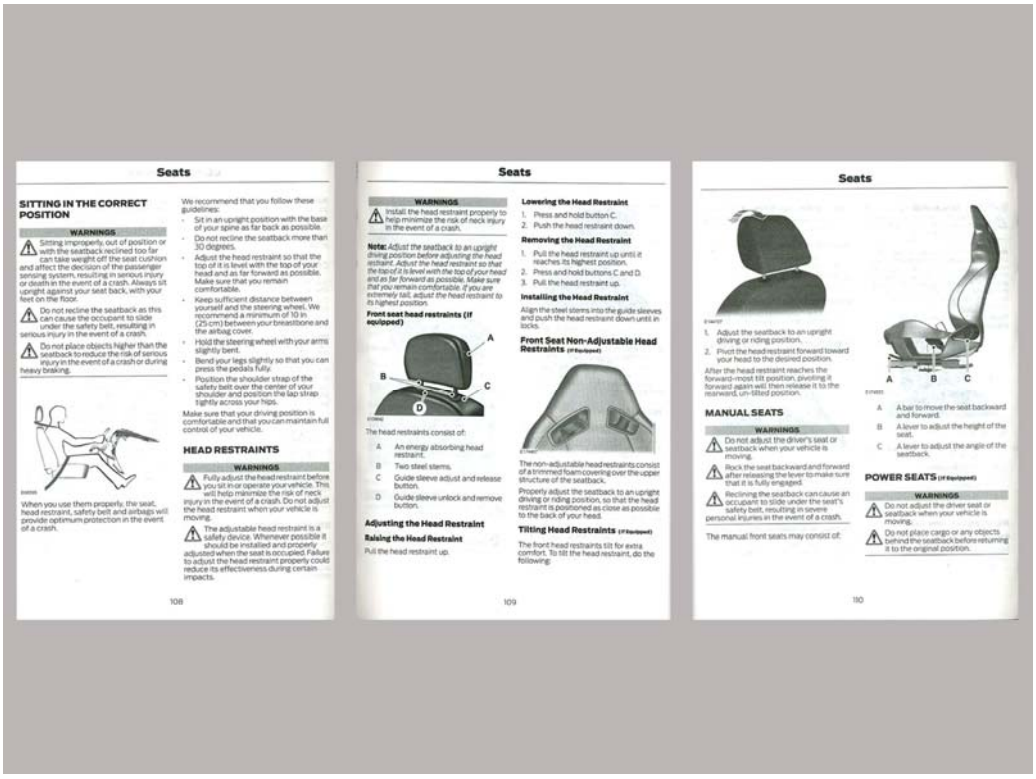


FIGURE 104. Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B

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 (www.NHTSA.dot.gov)

Additional Driver & Passenger Dummy Instrumentation Data

Driver Lower Spine T12 Acceleration (X)

Driver Lower Spine T12 Acceleration (Y)

Driver Lower Spine T12 Acceleration (Z)

Passenger Upper Thorax Rib Deflection (Y)

Passenger Middle Thorax Rib Deflection (Y)

Passenger Lower Thorax Rib Deflection (Y)

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

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Right Side Sill at Front Seat Acceleration (X)
Right Side Sill at Front Seat Acceleration (Y)
Right Side Sill at Front Seat Acceleration (Z)
Right Side Sill at Rear Seat Acceleration (X)
Right Side Sill at Rear Seat Acceleration (Y)
Right Side Sill at Rear Seat Acceleration (Z)
Left Side Sill at Front Seat Acceleration (Y)
Left Side Sill at Rear Seat Acceleration (Y)
Lower A-Post Acceleration (Y)
Middle A-Post Acceleration (Y)
Lower B-Post Acceleration (Y)
Middle B-Post Acceleration (Y)
Front Seat Track Acceleration (Y)
Rear Seat Structure Acceleration (Y)
Right Rear Occupant Compartment Acceleration (Y)
Engine Block (X)
Engine Block (Y)
Rear Floorpan Above Axle Acceleration (X)
Rear Floorpan Above Axle Acceleration (Y)
Rear Floorpan Above Axle Acceleration (Z)

MDB Instrumentation Data

MDB Center of Gravity Acceleration (X)

MDB Center of Gravity Acceleration (Y)

MDB Center of Gravity Acceleration (Z)

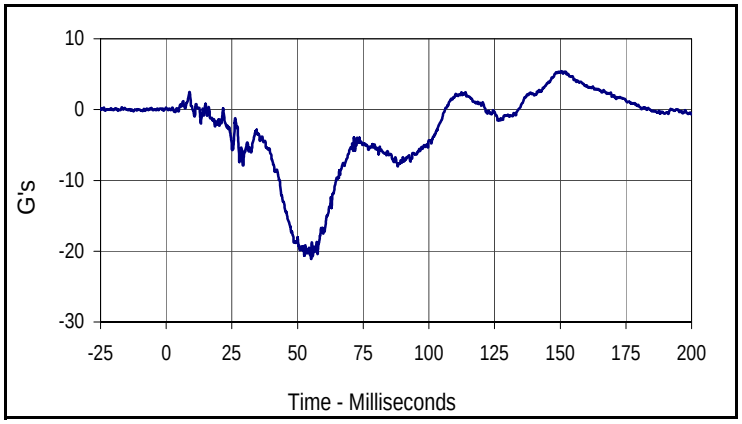
MDB Rear Acceleration (X)

MDB Rear Acceleration (Y)

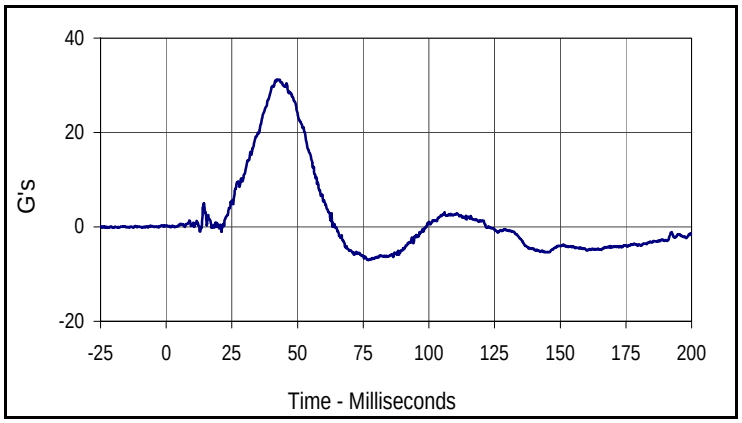
Left MDB Contact Switch

Right MDB Contact Switch

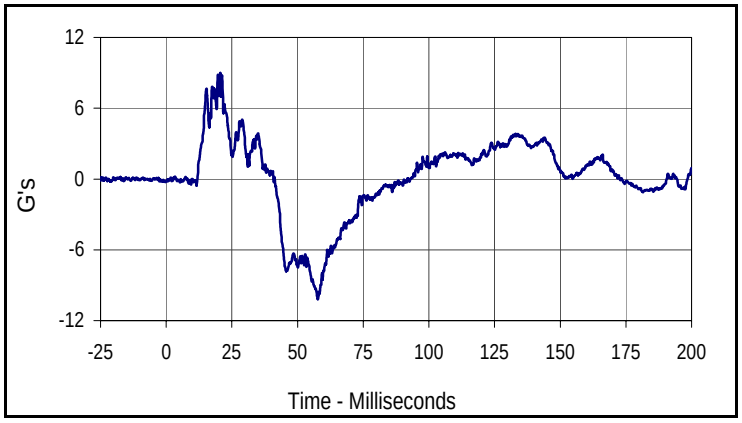
Test Vehicle:	2015 Ford Mustang 2-Door Coupe	NHTSA No.:	M20150221
Test Program:	NCAP MDB Side Impact Test	Test Date:	1/7/15



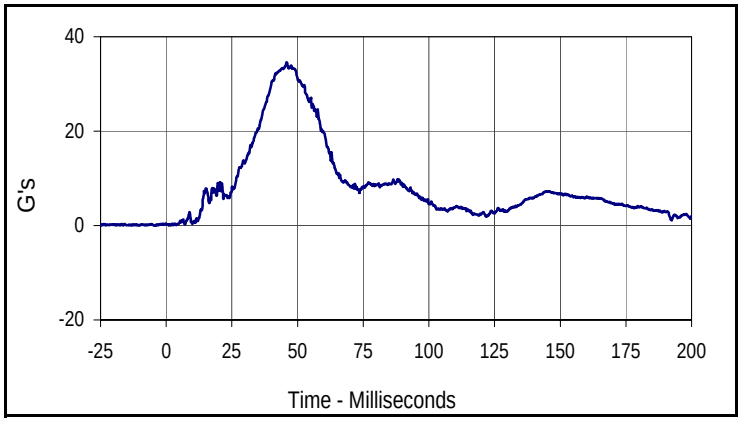
Curve Description			
Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
5.4	150.6	-21.1	55.1



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
31.2	42.2	-7.0	76.8

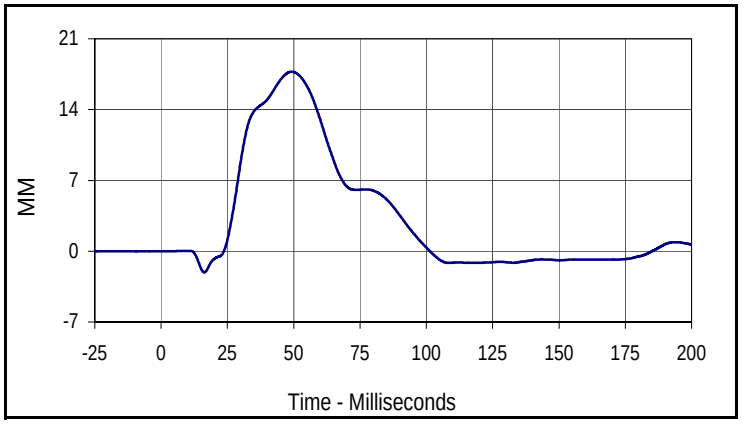


Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
9.0	20.5	-10.2	57.7

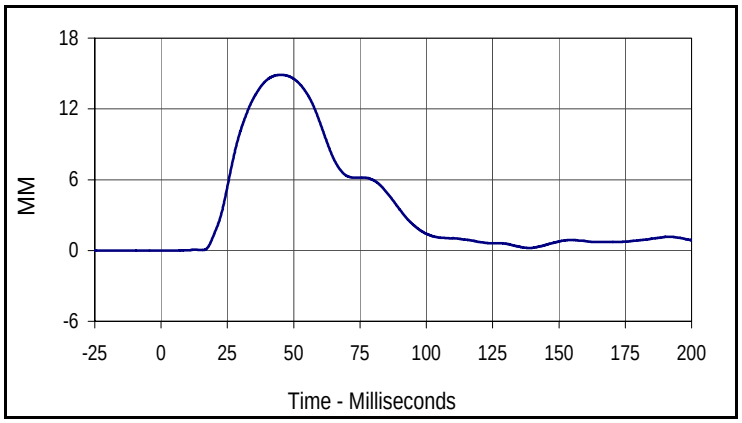


Curve Description			
Driver Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
34.6	45.9	0.1	1.9

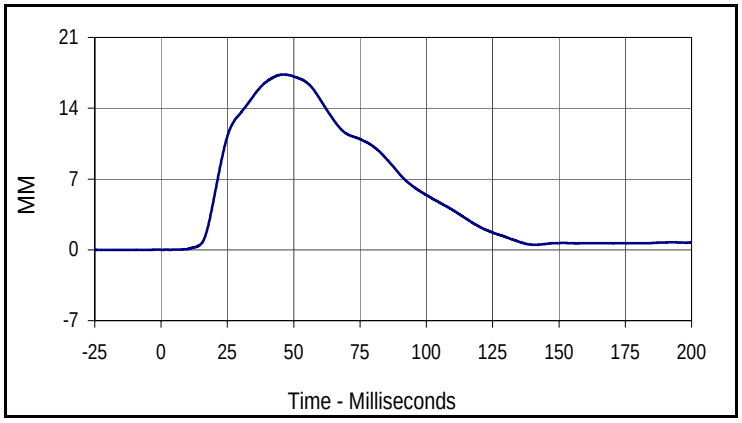
Test Vehicle:	2015 Ford Mustang 2-Door Coupe	NHTSA No.:	M20150221
Test Program:	NCAP MDB Side Impact Test	Test Date:	1/7/15



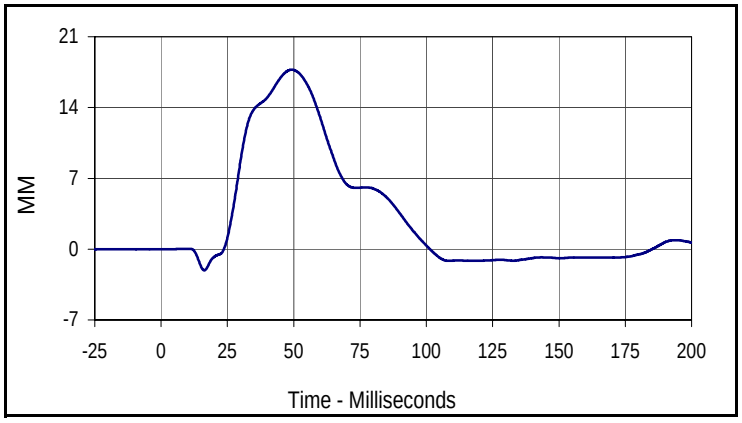
Curve Description			
Driver Upper Thorax Rib Deflection Y			
Plot No.	Type	SAE Class	Units
005	FIL	180	MM
Max	Time	Min	Time
17.7	49.2	-2.1	16.2



Curve Description			
Driver Middle Thorax Rib Deflection Y			
Plot No.	Type	SAE Class	Units
006	FIL	180	MM
Max	Time	Min	Time
14.9	45.0	0.0	4.5

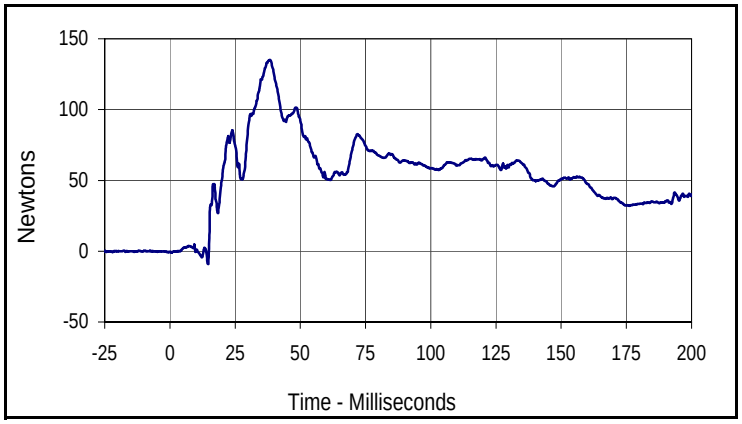


Curve Description			
Driver Lower Thorax Rib Deflection Y			
Plot No.	Type	SAE Class	Units
007	FIL	180	MM
Max	Time	Min	Time
17.3	46.2	0.0	3.2

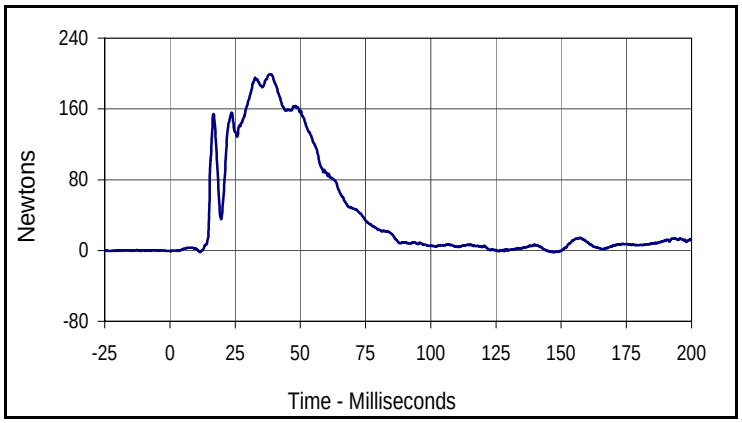


Curve Description			
Driver Thorax Rib Deflection Maximum			
Plot No.	Type	SAE Class	Units
010	FIL	180	MM
Max	Time	Min	Time
17.7	49.2	-2.1	16.2

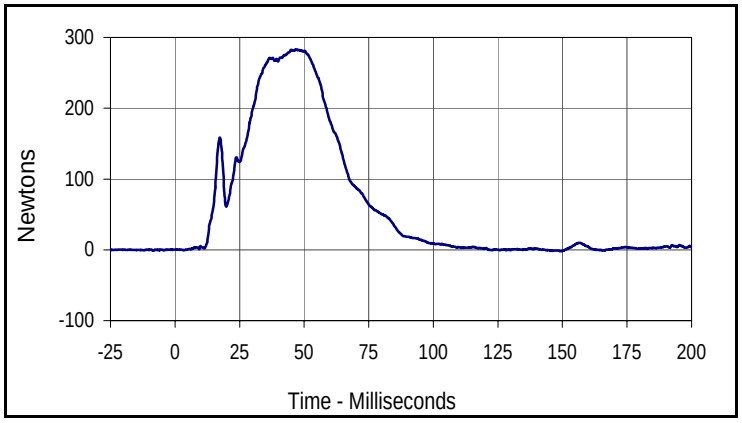
Test Vehicle:	2015 Ford Mustang 2-Door Coupe	NHTSA No.:	M20150221
Test Program:	NCAP MDB Side Impact Test	Test Date:	1/7/15



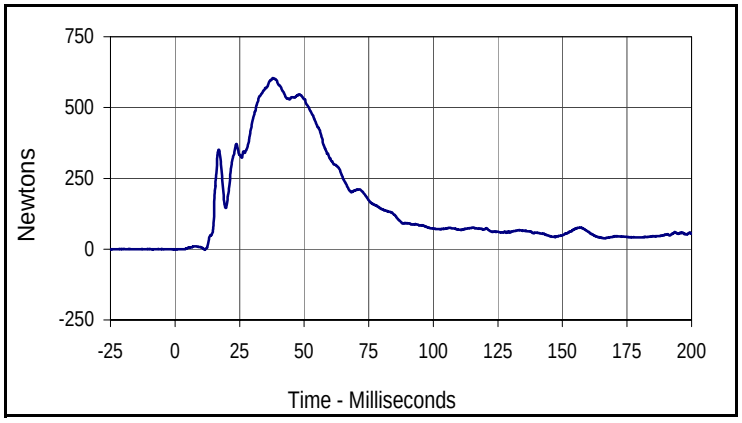
Curve Description			
Driver Anterior Abdominal Force Y			
Plot No.	Type	SAE Class	Units
008	FIL	600	Newtons
Max	Time	Min	Time
135.2	38.3	-9.1	14.6



Curve Description			
Driver Middle Abdominal Force Y			
Plot No.	Type	SAE Class	Units
009	FIL	600	Newtons
Max	Time	Min	Time
199.2	38.6	-2.1	11.6

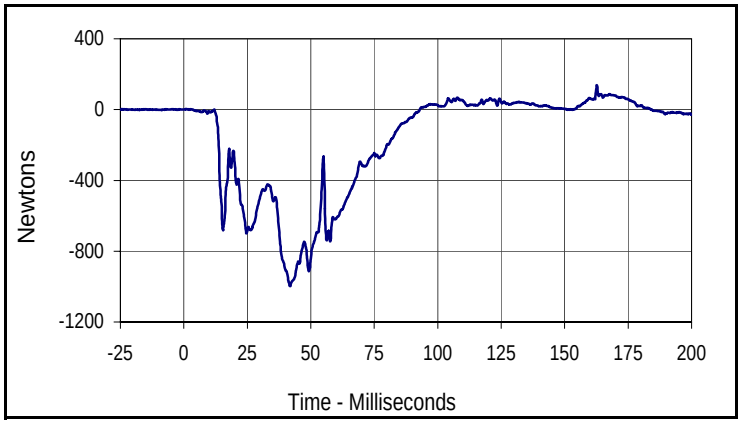


Curve Description			
Driver Posterior Abdominal Force Y			
Plot No.	Type	SAE Class	Units
011	FIL	600	Newtons
Max	Time	Min	Time
283.1	46.9	-2.0	149.2



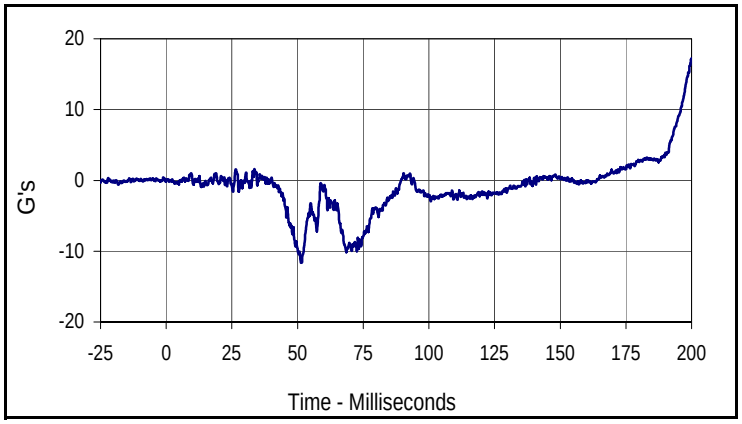
Curve Description			
Driver Total Abdominal Force			
Plot No.	Type	SAE Class	Units
012	SUM	600	Newtons
Max	Time	Min	Time
604.3	37.9	-2.0	11.5

Test Vehicle:	2015 Ford Mustang 2-Door Coupe	NHTSA No.:	M20150221
Test Program:	NCAP MDB Side Impact Test	Test Date:	1/7/15

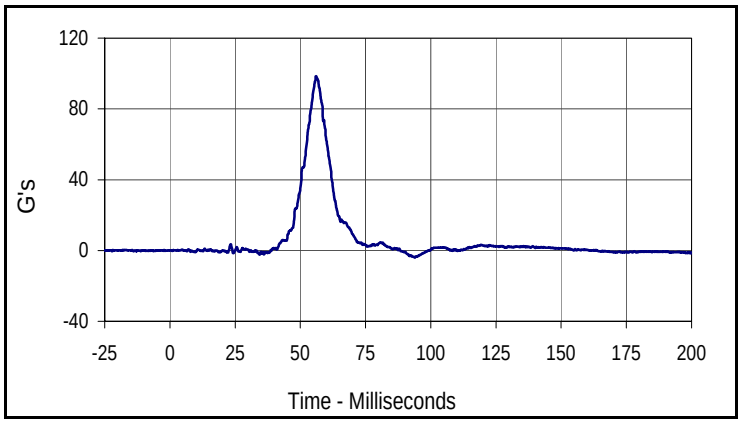


Curve Description			
Driver Pubic Symphysis Force Y			
Plot No.	Type	SAE Class	Units
013	FIL	600	Newtons
Max	Time	Min	Time
138.7	162.6	-997.4	41.8

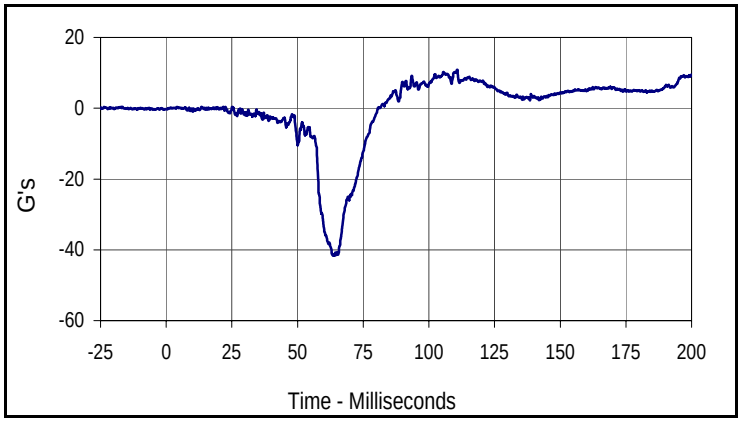
Test Vehicle:	2015 Ford Mustang 2-Door Coupe	NHTSA No.:	M20150221
Test Program:	NCAP MDB Side Impact Test	Test Date:	1/7/15



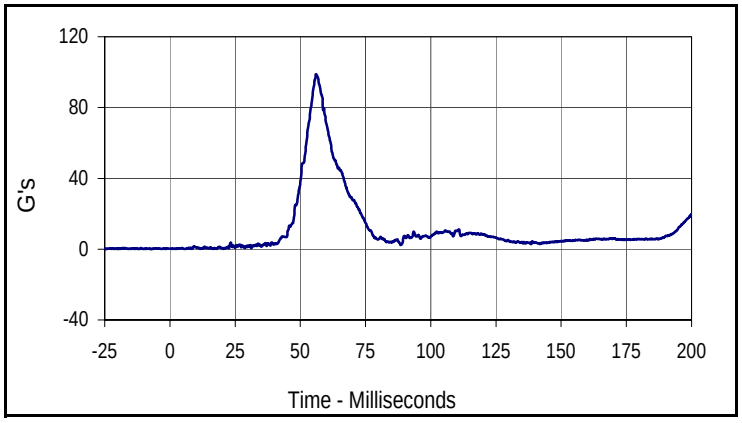
Curve Description			
Passenger Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
014	FIL	1000	G's
Max	Time	Min	Time
17.2	200.0	-11.6	51.3



Curve Description			
Passenger Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
015	FIL	1000	G's
Max	Time	Min	Time
98.4	56.0	-3.9	93.8

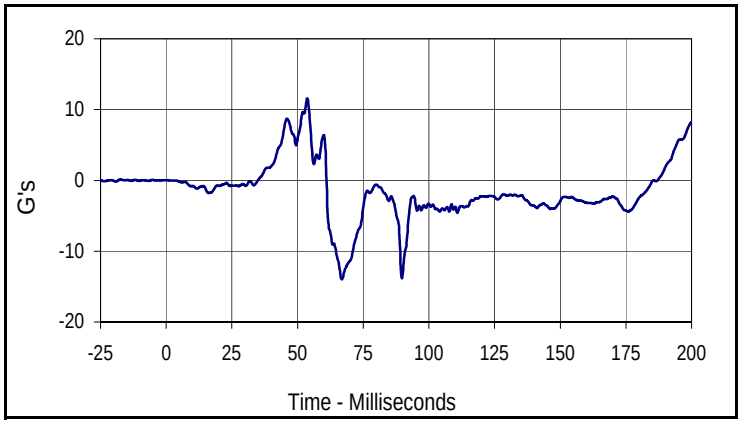


Curve Description			
Passenger Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
016	FIL	1000	G's
Max	Time	Min	Time
10.9	110.8	-41.7	64.1

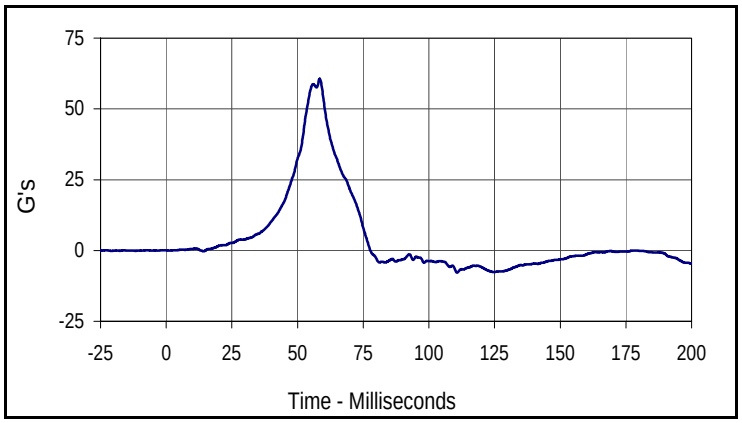


Curve Description			
Passenger Head Acceleration Resultant Primary			
Plot No.	Type	SAE Class	Units
017	RES	1000	G's
Max	Time	Min	Time
98.9	56.0	0.1	5.6

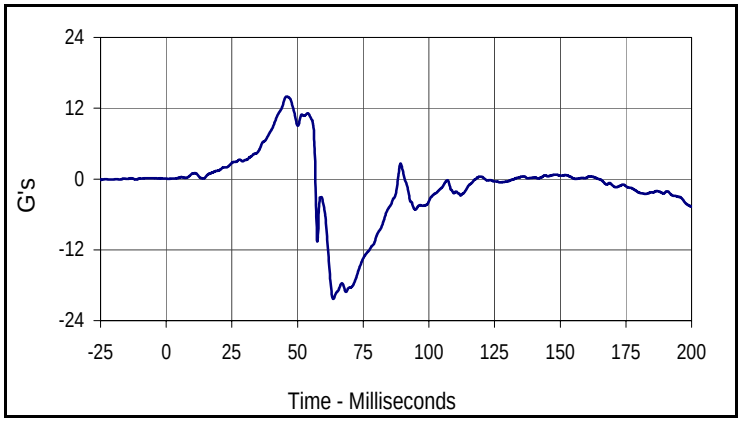
Test Vehicle:	2015 Ford Mustang 2-Door Coupe	NHTSA No.:	M20150221
Test Program:	NCAP MDB Side Impact Test	Test Date:	1/7/15



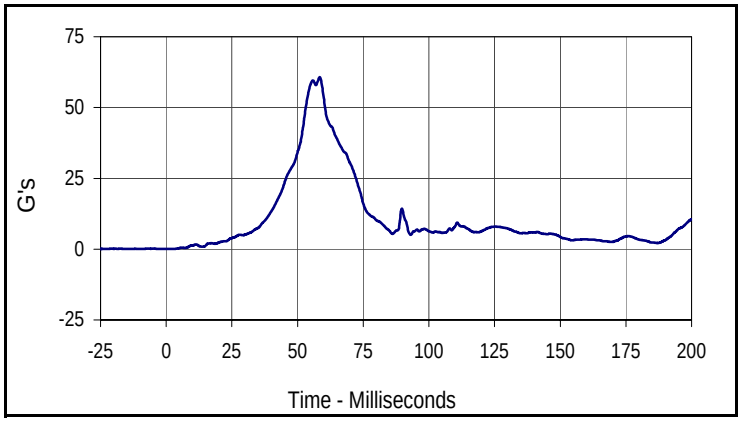
Curve Description			
Passenger Lower Spine T12 Acceleration X			
Plot No.	Type	SAE Class	Units
019	FIL	180	G's
Max	Time	Min	Time
11.6	53.7	-14.0	66.9



Curve Description			
Passenger Lower Spine T12 Acceleration Y			
Plot No.	Type	SAE Class	Units
020	FIL	180	G's
Max	Time	Min	Time
60.6	58.5	-7.8	110.7

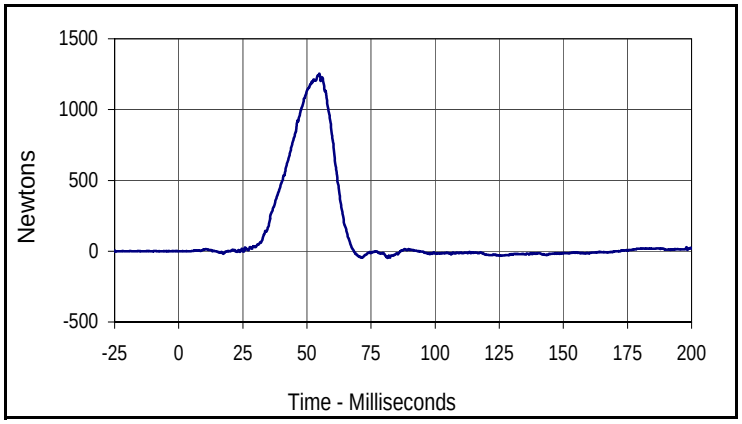


Curve Description			
Passenger Lower Spine T12 Acceleration Z			
Plot No.	Type	SAE Class	Units
021	FIL	180	G's
Max	Time	Min	Time
13.9	45.9	-20.3	63.5

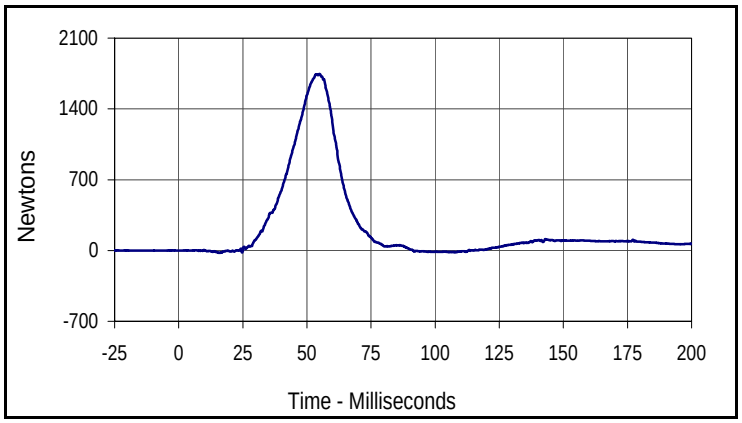


Curve Description			
Passenger Lower Spine T12 Acceleration Resultant			
Plot No.	Type	SAE Class	Units
022	RES	180	G's
Max	Time	Min	Time
60.8	58.5	0.0	0.9

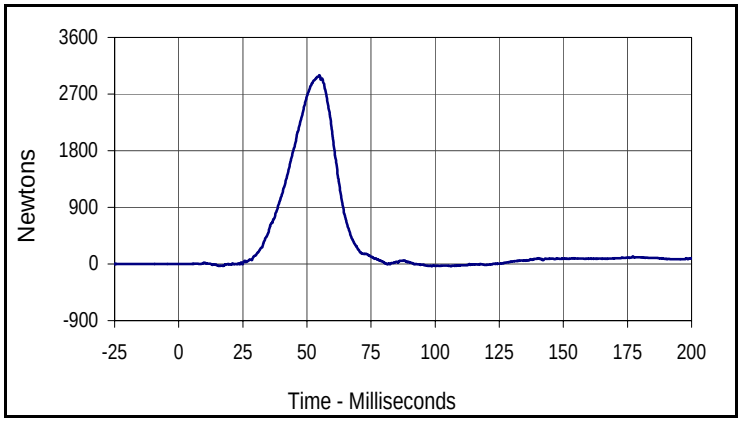
Test Vehicle:	2015 Ford Mustang 2-Door Coupe	NHTSA No.:	M20150221
Test Program:	NCAP MDB Side Impact Test	Test Date:	1/7/15



Curve Description			
Passenger Iliac Wing Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
023	FIL	600	Newtons
Max	Time	Min	Time
1253.8	54.9	-47.1	81.4



Curve Description			
Passenger Acetabulum Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
024	FIL	600	Newtons
Max	Time	Min	Time
1747.0	54.9	-22.7	16.1



Curve Description			
Passenger Total Pelvic Force			
Plot No.	Type	SAE Class	Units
018	SUM	600	Newtons
Max	Time	Min	Time
3000.7	54.9	-37.4	106.3

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

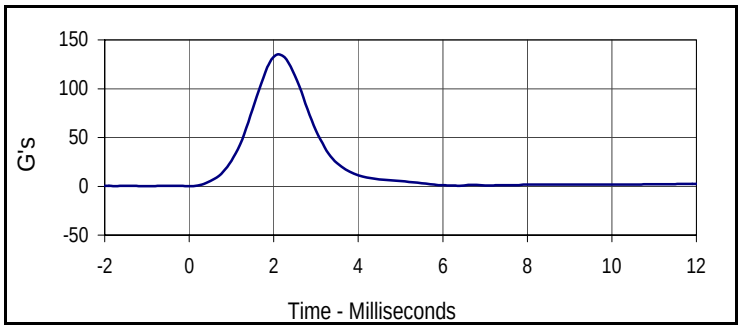
APPENDIX C
PRE-TEST / ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program:	ES2re External Measurements	Test Date:	12/11/14
ATD Serial No.:	F037	Test I.D.:	N/A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		^{o}C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	30.0	Pass
1	Sitting Height	mm	900 - 918	909	Pass
2	Seat to Shoulder Joint	mm	558 - 572	564	Pass
3	Seat to Lower Face of Thoracic Spine Box	mm	346 - 356	350	Pass
4	Seat to Hip Joint (Center of Bolt)	mm	97 - 103	99	Pass
5	Sole to Seat, Sitting	mm	333 - 451	395	Pass
6	Head Width	mm	152 - 158	156	Pass
7	Shoulder / Arm Width	mm	461 - 479	470	Pass
8	Thorax Width	mm	322 - 332	326	Pass
9	Abdomen Width	mm	273 - 287	280	Pass
10	Pelvis Lap Width	mm	359 - 373	363	Pass
11	Head Depth	mm	196 - 206	201	Pass
12	Thorax Depth	mm	262 - 272	270	Pass
13	Abdomen Width	mm	194 - 204	199	Pass
14	Pelvis Depth	mm	235 - 245	240	Pass
15	Back of Buttocks to Hip Joint (Center of Bolt)	mm	150 - 160	155	Pass
16	Back of Buttocks to Front Knee	mm	597 - 615	608	Pass
			Overall Test Results		Pass

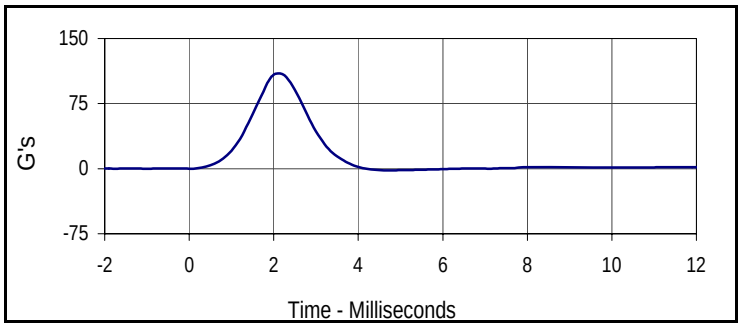
Test Program:	ES2re Head Drop Test	Test Date:	12/11/14
ATD Serial No.:	F037	Test I.D.:	F037HD068

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	301	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	39.1	Pass
	Min	%		38.7	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	39.0	Pass
Peak Head Resultant Acceleration		G's	125 to 155	135.1	Pass
Peak Head X Acceleration		G's	≤15	10.4	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	4.0	Pass
			Overall Test Results		Pass

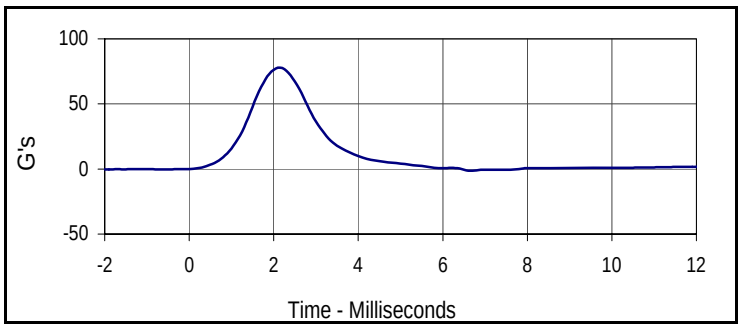


Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
135.1	2.1	0.1	0.0

Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
10.4	2.6	0.1	-0.9



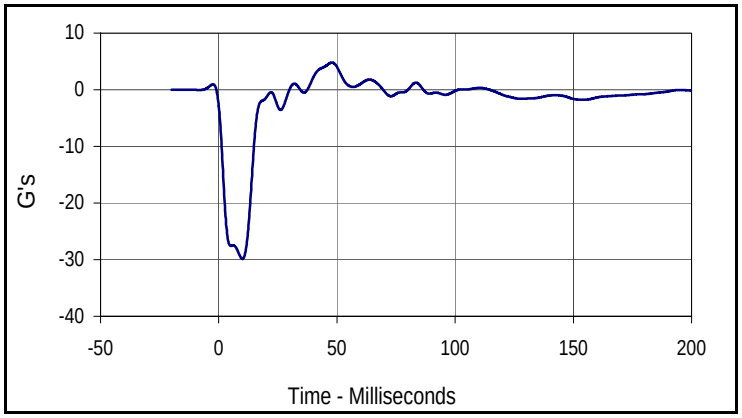
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
110.0	2.1	-2.0	4.8



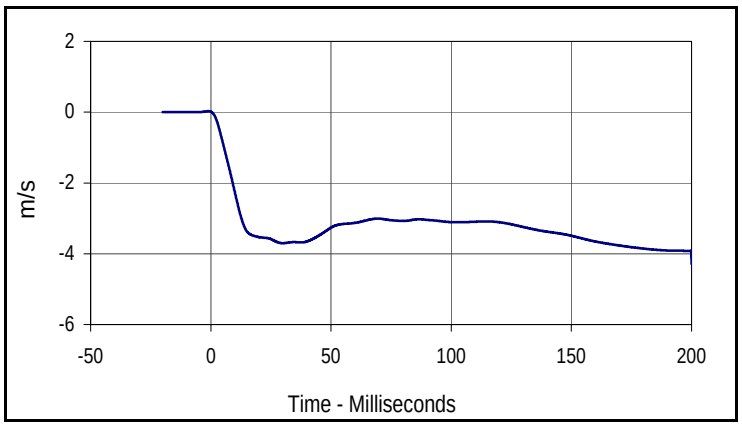
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
77.9	2.1	-1.4	6.7

Test Program:	ES2re Neck Flexion Test	Test Date:	12/11/14
ATD Serial No.:	F037	Test I.D.:	F037NB068

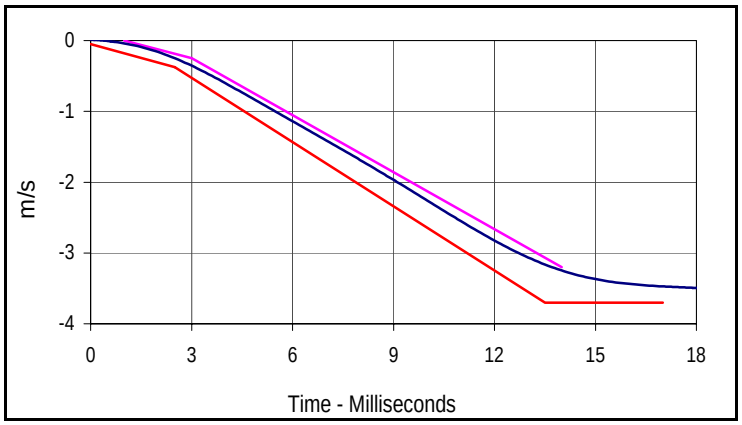
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	336	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	39.1	Pass
	Min	%		38.7	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	39.0	Pass
Pendulum Velocity		m/s	3.3 to 3.5	3.45	Pass
Headform Flexion	Max	Degrees	49 to 59	52.2	Pass
	Time	msec	54 to 66	56.4	Pass
Headform Flexion Decay (Peak to Zero)		msec	53 to 88	58.1	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
4.8	47.9	-29.9	10.0



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.0	-4.3	200.0

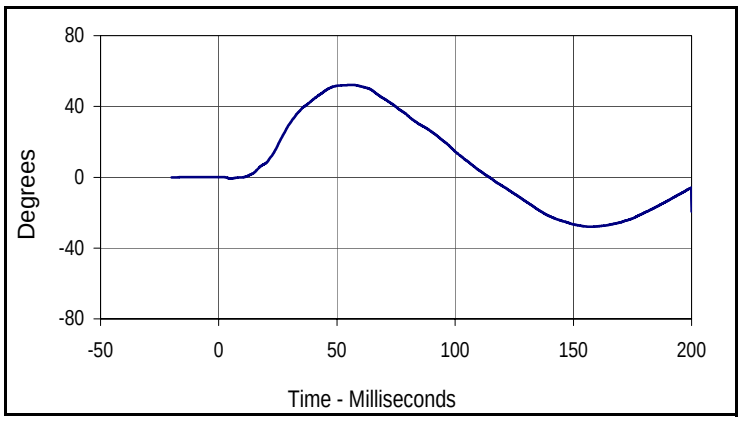


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.0	-4.3	200.0

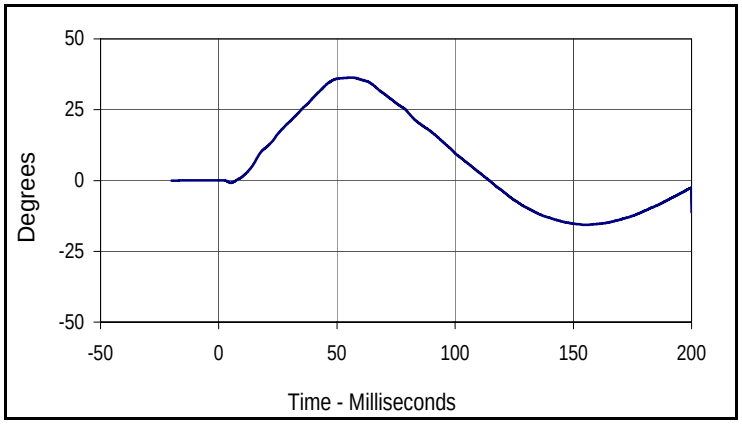
Velocity Corridors

Upper Boundary		Lower Boundary	
Time (msec)	Velocity (m/s)	Time (msec)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.0	-0.03	2.5	-0.375
14.0	-3.20	13.5	-3.70
		17.0	-3.70

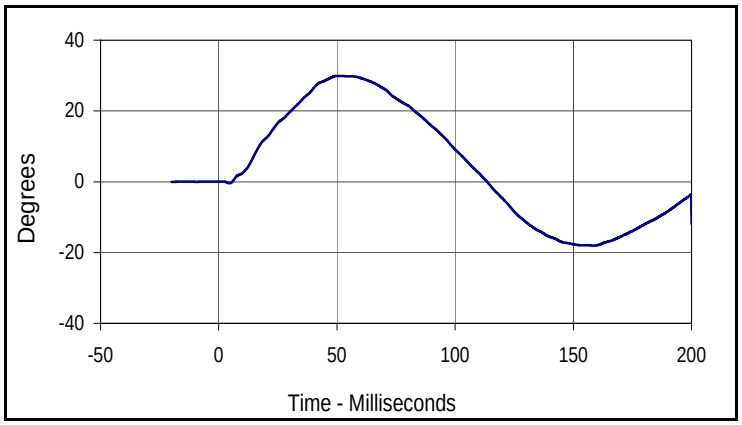
Test Program:	ES2re Neck Flexion Test	Test Date:	12/11/14
ATD Serial No.:	F037	Test I.D.:	F037NB068



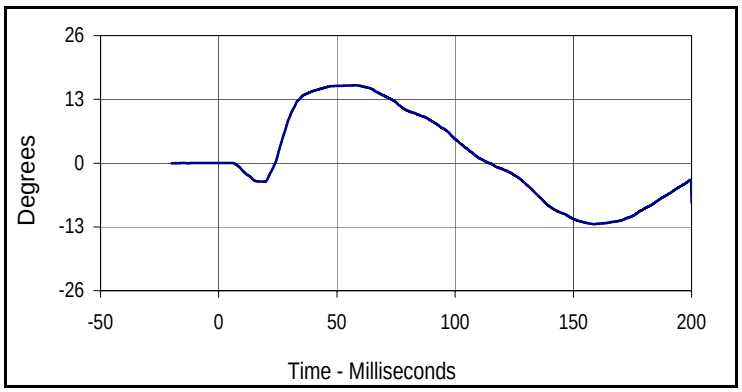
Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
52.2	56.4	-27.9	157.2



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
36.4	56.3	-15.7	155.1



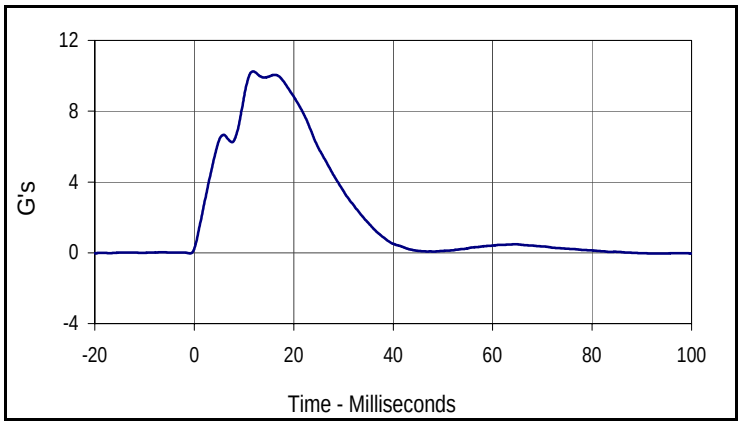
Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
29.9	50.2	-18.1	158.5



Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
006	FIL	180	Degrees
Max	Time	Min	Time
15.9	57.7	-12.4	159.0

Test Program:	ES2re Shoulder Impact Test	Test Date:	12/11/14
ATD Serial No.:	F037	Test I.D.:	F037SH068

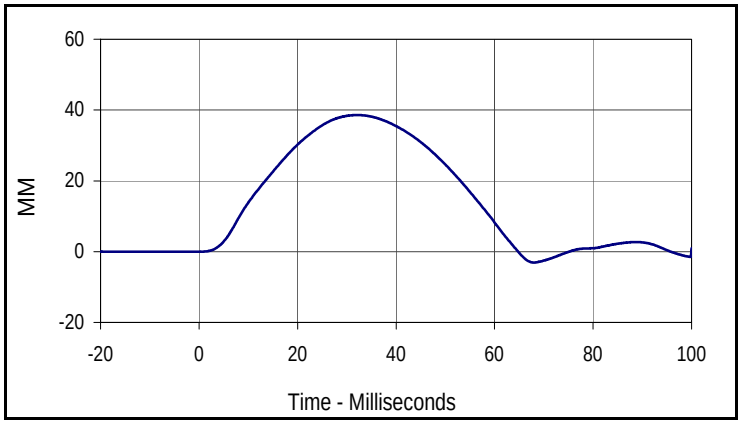
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	401	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	39.1	Pass
	Min	%		38.7	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	39.1	Pass
Pendulum Speed		m/s	4.2 to 4.4	4.32	Pass
Peak Impactor Acceleration		G's	7.5 to 10.5	10.3	Pass
			Overall Test Results		Pass



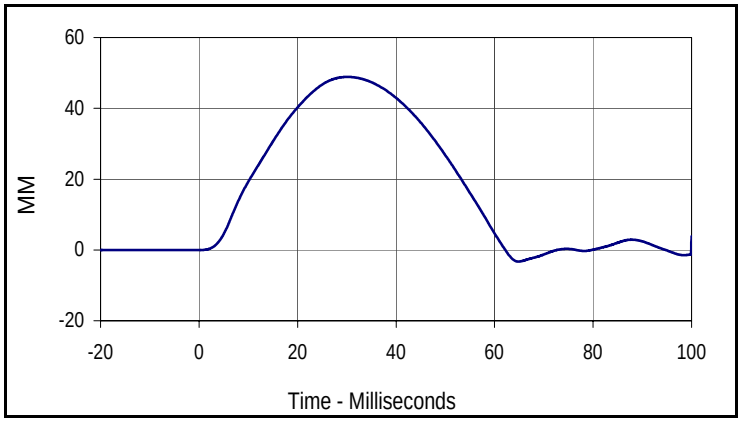
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
10.3	11.8	0.0	93.1

Test Program:	ES2re Thorax - Rib Drop Test	Test Date:	12/11/14
ATD Serial No.:	F037 Rib # 1	Test I.D.:	F037RB1068

Tested Parameter		Units	Specification	Result	Pass/Fail
Rib Module Soak Time		Minutes	≥240	456	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	39.1	Pass
	Min	%		38.7	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	39.0	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height		mm	36 to 40	38.6	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height		mm	46 to 51	48.9	Pass
			Overall Test Results		Pass



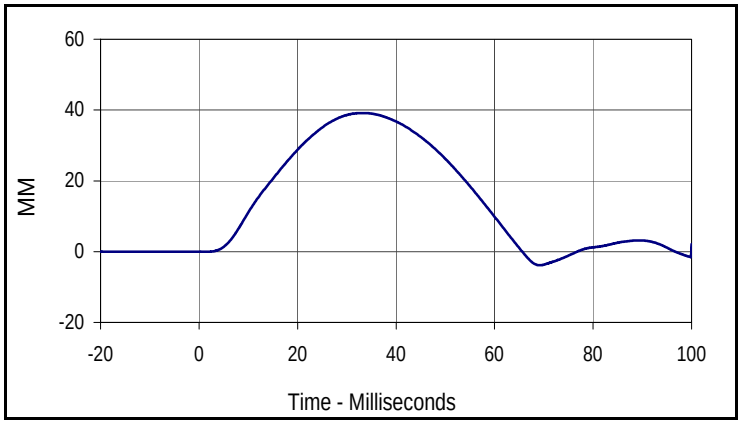
Curve Description			
Upper Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
38.6	32.1	-3.1	68.0



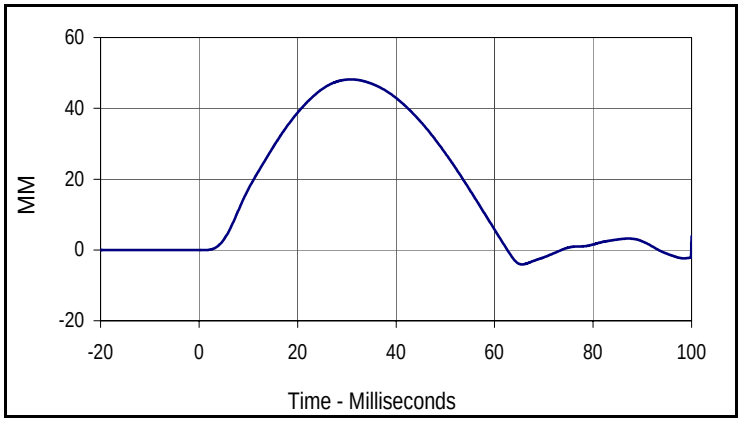
Curve Description			
Upper Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
48.9	30.1	-3.3	64.9

Test Program:	ES2re Thorax - Rib Drop Test	Test Date:	12/11/14
ATD Serial No.:	F037 Rib # 2	Test I.D.:	F037RB2068

Tested Parameter		Units	Specification	Result	Pass/Fail
Rib Module Soak Time		Minutes	≥240	501	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	39.1	Pass
	Min	%		38.7	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	38.9	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height		mm	36 to 40	39.2	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height		mm	46 to 51	48.2	Pass
			Overall Test Results		Pass



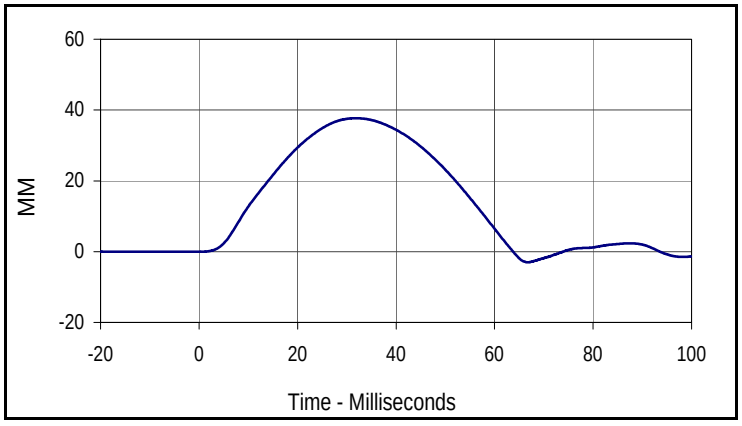
Curve Description			
Middle Rib Deflection (459 MM Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
39.2	33.3	-3.8	69.2



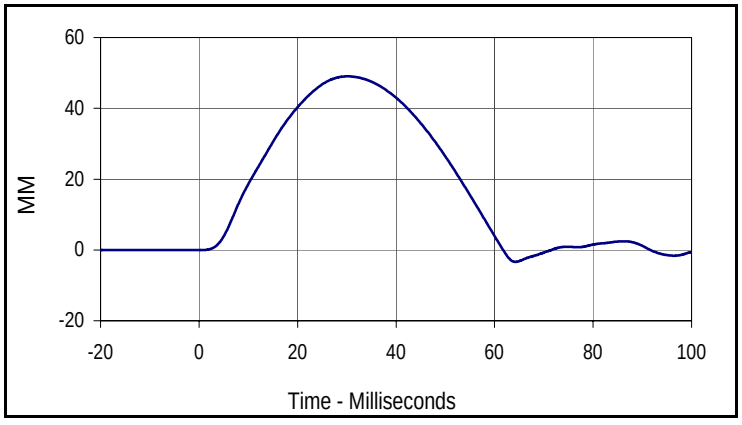
Curve Description			
Middle Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
48.2	30.8	-4.1	65.6

Test Program:	ES2re Thorax - Rib Drop Test	Test Date:	12/11/14
ATD Serial No.:	F037 Rib # 3	Test I.D.:	F037RB3068

Tested Parameter		Units	Specification	Result	Pass/Fail
Rib Module Soak Time		Minutes	≥240	546	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	39.1	Pass
	Min	%		38.7	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	38.8	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height		mm	36 to 40	37.7	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height		mm	46 to 51	49.0	Pass
			Overall Test Results		Pass



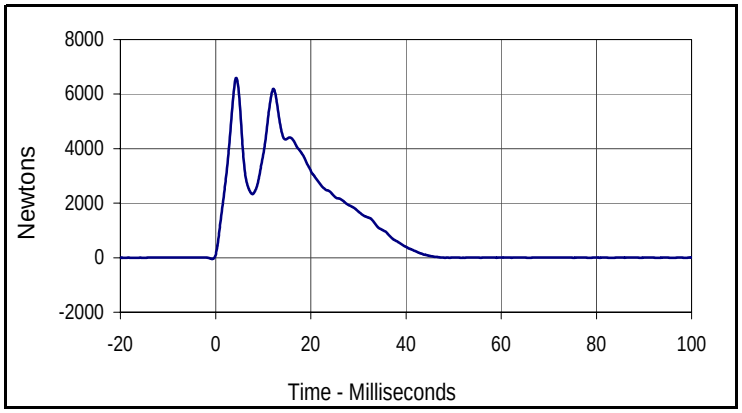
Curve Description			
Lower Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
37.7	31.8	-3.0	66.7



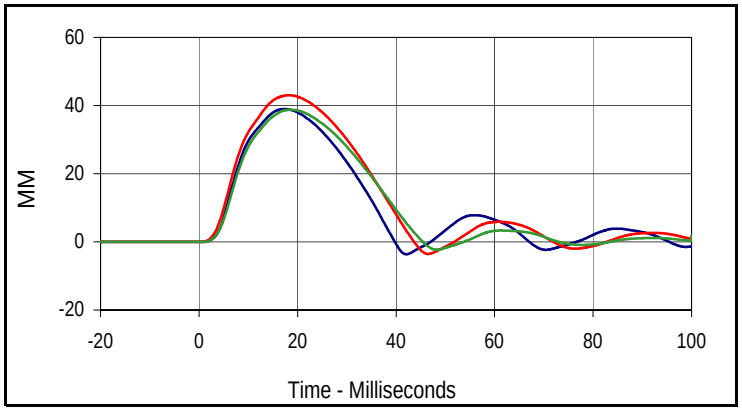
Curve Description			
Lower Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
49.0	30.2	-3.4	64.2

Test Program:	ES2re Thorax - Full Body Impact Test	Test Date:	12/11/14
ATD Serial No.:	F037	Test I.D.:	F037TH068

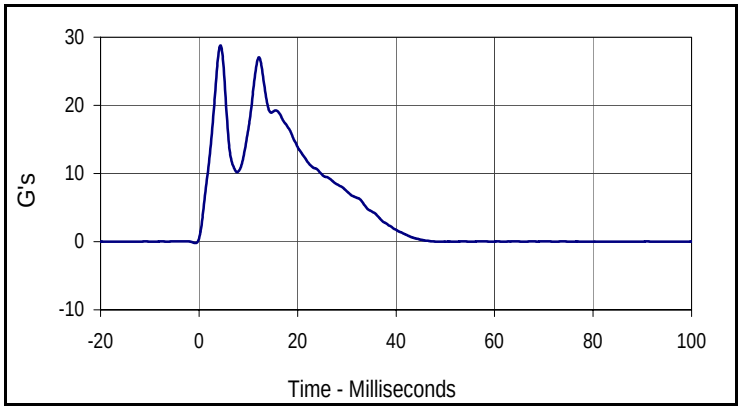
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	591	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	39.1	Pass
	Min	%		38.7	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	38.7	Pass
Peak Impactor Velocity		m/s	5.4 to 5.6	5.45	Pass
Peak Impactor Force		N	5100 to 6200	6191.5	Pass
		msec	> 6.0 msec	12.2	Pass
Peak Upper Rib Deflection		mm	34 to 41	39.0	Pass
Peak Middle Rib Deflection		mm	37 to 45	43.0	Pass
Peak Lower Rib Deflection		mm	37 to 44	38.8	Pass
			Overall Test Results		Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
6590.3	4.4	-47.4	-0.7



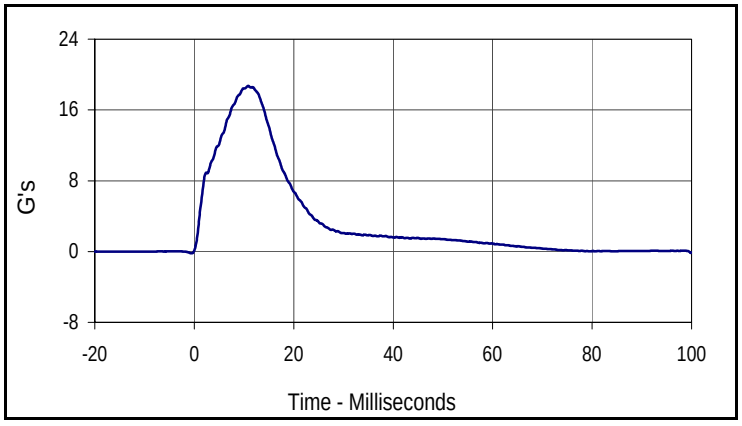
Curve Description			
Upper, Middle, Lower Rib Deflections			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max (Upper)	Time	Min (Upper)	Time
39.0	17.3	-3.6	42.1
Max (Middle)	Time	Min (Middle)	Time
43.0	18.3	-3.5	46.5
Max (Lower)	Time	Min (Lower)	Time
38.8	18.6	-2.3	48.3



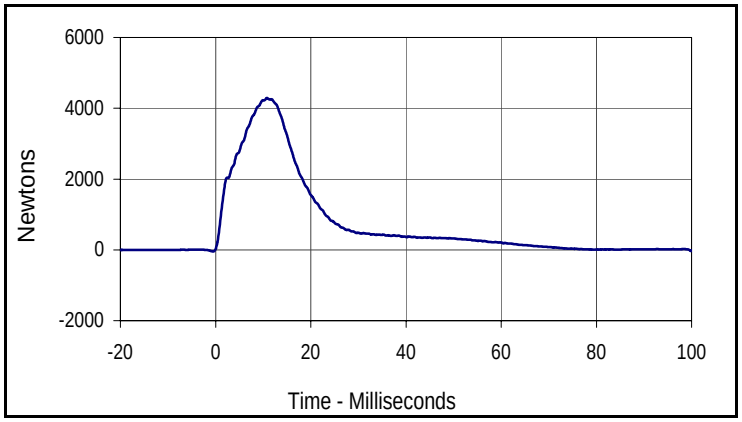
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
28.8	4.4	-0.2	-0.7

Test Program:	ES2re Abdomen Impact Test	Test Date:	12/11/14
ATD Serial No.:	F037	Test I.D.:	F037ABD068

Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	661	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	39.1	Pass
	Min	%		38.7	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	38.7	Pass
Probe Velocity		m/s	3.9 to 4.1	4.05	Pass
Peak Impactor Force		N	4000 to 4800	4287.0	Pass
		msec	10.6 to 13.0	10.8	Pass
Sum of Abdominal Forces		N	2200 to 2700	2474.5	Pass
		msec	10.0 to 12.3	11.0	Pass
			Overall Test Results		Pass

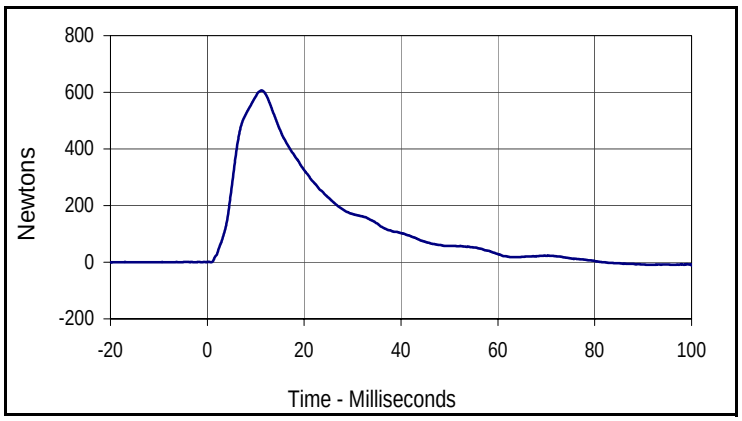


Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
18.7	10.8	-0.2	-0.6

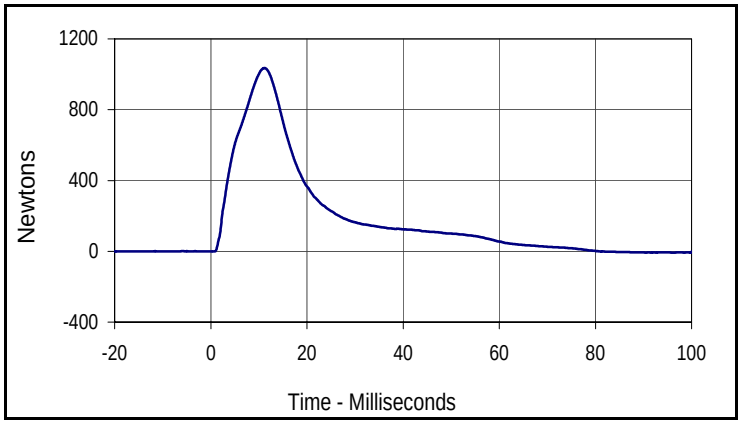


Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
002	FIL	180	Newtons
Max	Time	Min	Time
4287.0	10.8	-44.9	-0.6

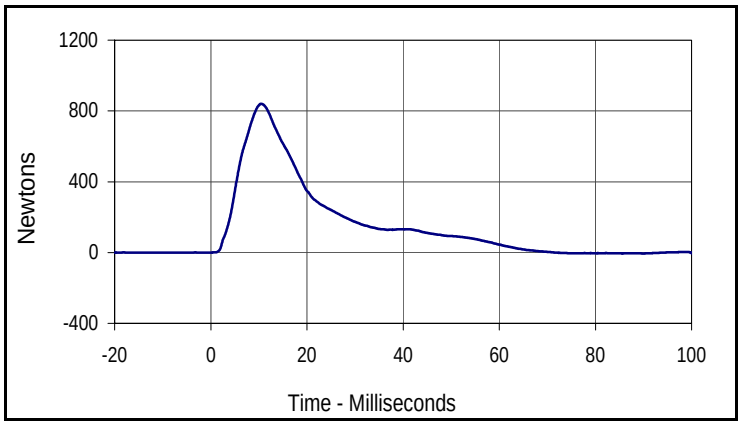
Test Program:	ES2re Abdomen Impact Test	Test Date:	12/11/14
ATD Serial No.:	F037	Test I.D.:	F037ABD068



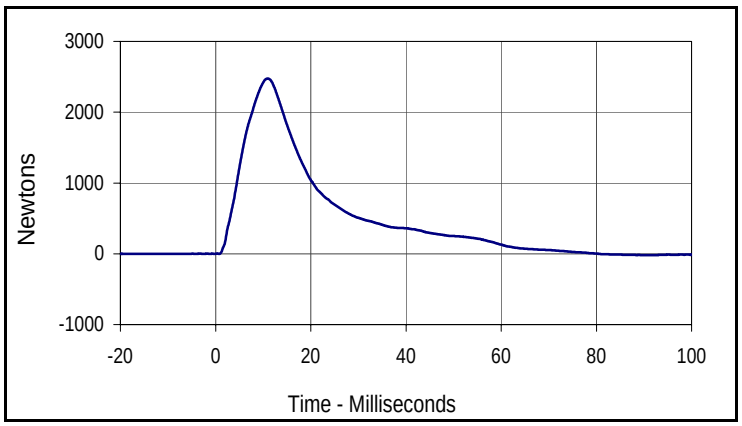
Curve Description			
Front Abdomen Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
606.5	11.2	-10.8	100.0



Curve Description			
Middle Abdomen Force			
Plot No.	Type	SAE Class	Units
004	FIL	600	Newtons
Max	Time	Min	Time
1035.2	11.2	-7.5	96.2



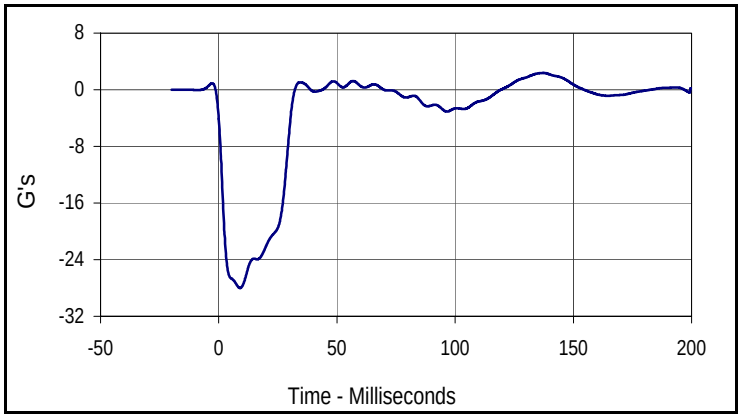
Curve Description			
Rear Abdomen Force			
Plot No.	Type	SAE Class	Units
005	FIL	600	Newtons
Max	Time	Min	Time
840.7	10.5	-6.3	170.0



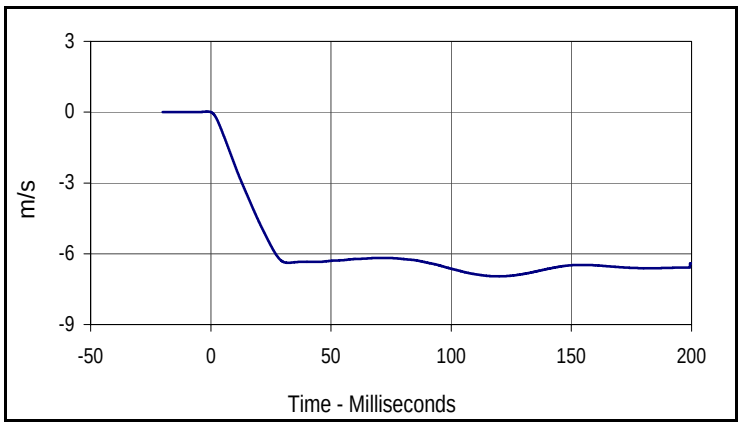
Curve Description			
Abdomen Sum Resultant			
Plot No.	Type	SAE Class	Units
006	RES	600	Newtons
Max	Time	Min	Time
2474.5	11.0	-20.8	90.5

Test Program:	ES2re Lumbar Flexion Test	Test Date:	12/11/14
ATD Serial No.:	F037	Test I.D.:	F037LB068

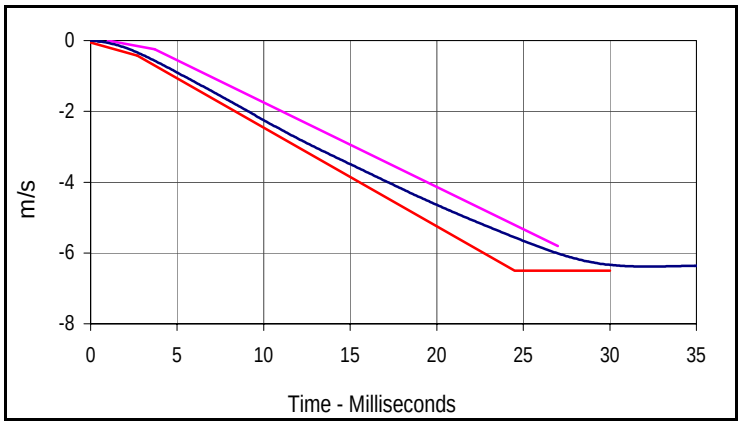
Tested Parameter		Units	Specification	Result	Pass/Fail
Lumbar Spine Assembly Soak Time		Minutes	≥240	736	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	39.1	Pass
	Min	%		38.7	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	38.7	Pass
Pendulum Velocity		m/s	5.95 to 6.15	5.98	Pass
Headform Rotation	Max	Degrees	45 to 55	48.5	Pass
	Time	msec	39 to 53	40.3	Pass
Time of Decay to Zero Angle from Peak		msec	37 to 57	46.0	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
2.4	137.8	-28.0	9.6



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	60	m/s
Max	Time	Min	Time
0.0	-0.8	-7.0	119.9

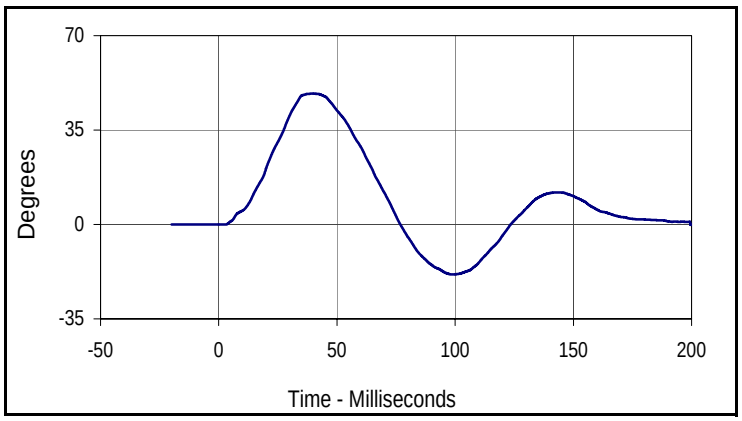


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	60	m/s
Max	Time	Min	Time
0.0	-0.8	-7.0	119.9

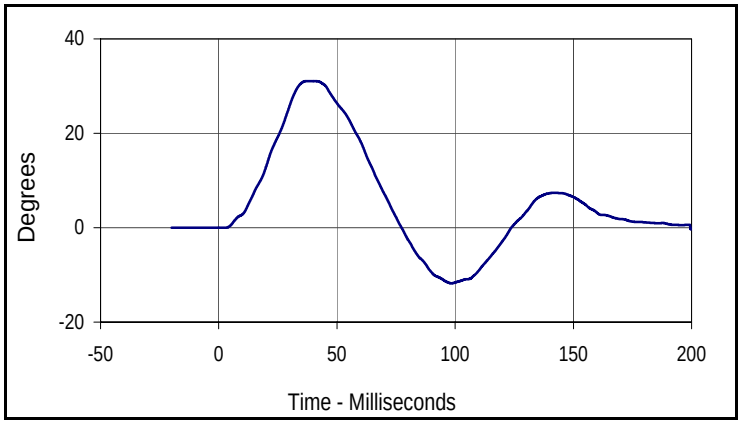
Velocity Corridors

Upper Boundary		Lower Boundary	
Time (msec)	Velocity (m/s)	Time (msec)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.7	-0.24	2.7	-0.425
27.0	-5.80	24.5	-6.50
		30.0	-6.50

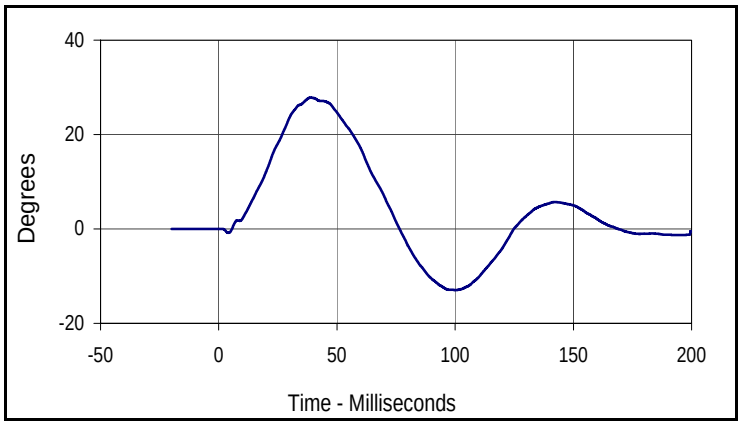
Test Program:	ES2re Lumbar Flexion Test	Test Date:	12/11/14
ATD Serial No.:	F037	Test I.D.:	F037LB068



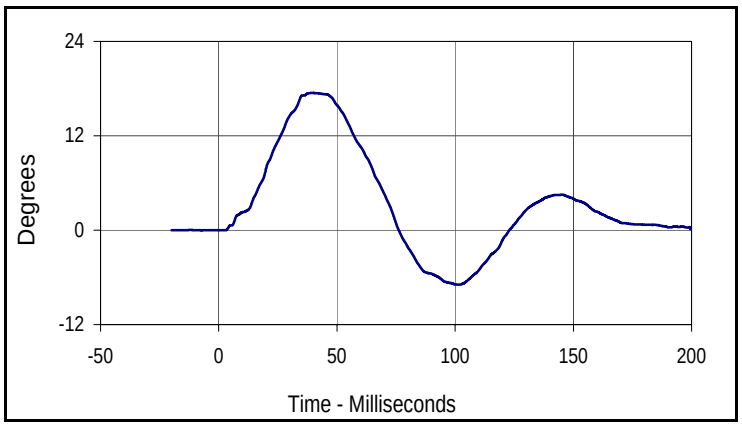
Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
48.5	40.3	-18.6	99.6



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
31.1	40.5	-11.8	99.0



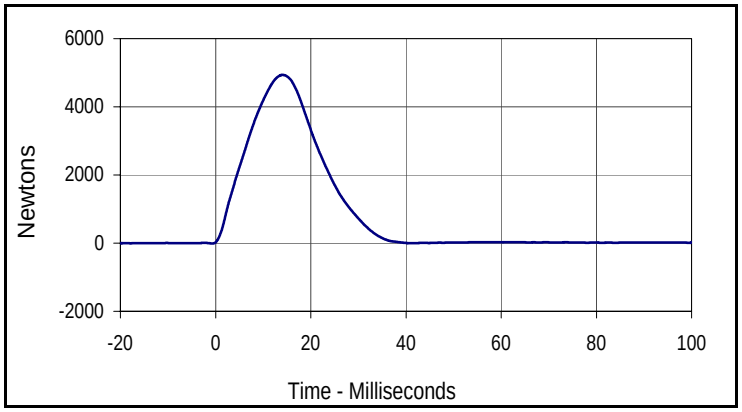
Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
27.8	39.4	-13.0	100.8



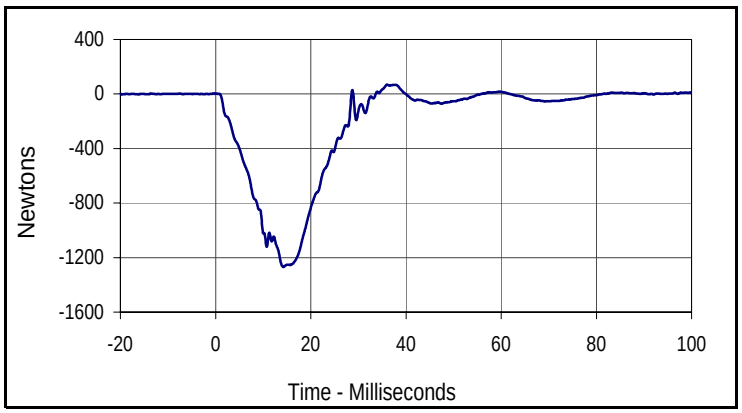
Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
006	FIL	180	Degrees
Max	Time	Min	Time
17.4	40.3	-6.9	102.3

Test Program:	ES2re Pelvis Impact Test	Test Date:	12/11/14
ATD Serial No.:	F037	Test I.D.:	F037PL068

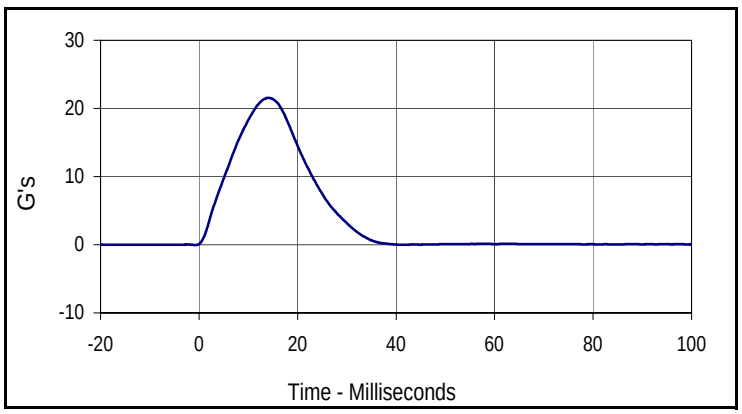
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	791	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	39.1	Pass
	Min	%		38.7	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	38.9	Pass
Pendulum Velocity		m/s	4.2 to 4.4	4.35	Pass
Peak Impactor Force		N	4700 to 5400	4936.9	Pass
		msec	11.8 to 16.1	14.1	Pass
Peak Pubic Symphysis Load		N	-1230 to -1590	-1268.5	Pass
		msec	12.2 to 17.0	14.2	Pass
			Overall Test Results		Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4936.9	14.1	-9.9	-0.7



Curve Description			
Pubic Symphysis Force Y			
Plot No.	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
69.3	36.0	-1268.5	14.2



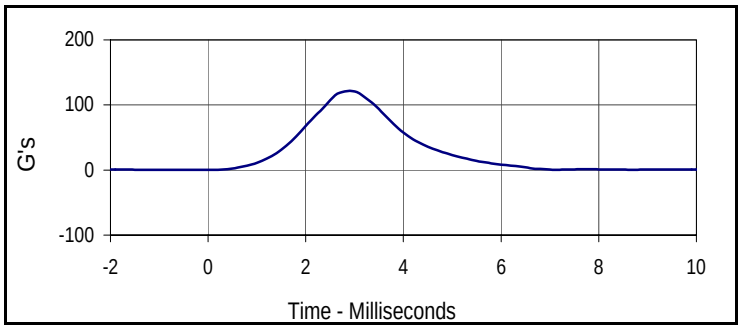
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
21.6	14.1	0.0	-0.7

Test Program:	SID IIs External Measurements	Test Date:	12/12/14
ATD Serial No.:	307	Test I.D.:	N/A

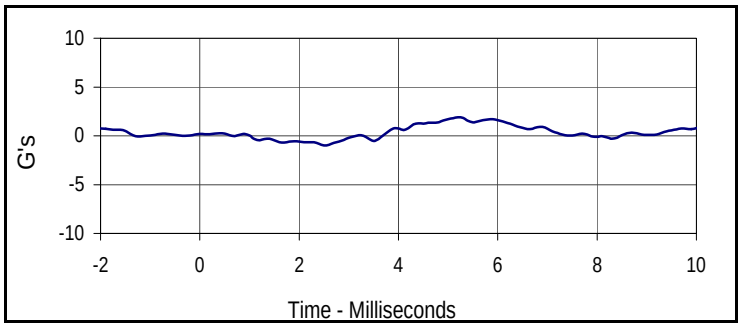
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	38	Pass
A	Sitting Height	mm	772 - 788	778	Pass
B	Shoulder Pivot Height	mm	437 - 453	443	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	141 - 151	144	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	102	Pass
F	Thigh Clearance	mm	119 - 135	128	Pass
G	Head Breadth	mm	140 - 148	145	Pass
H	Head Back from Backline	mm	40 - 46	43	Pass
I	Head Depth	mm	178 - 188	185	Pass
J	Head Circumference	mm	541 - 551	546	Pass
K	Buttock to Knee Length	mm	514 - 540	525	Pass
L	Popliteal Height	mm	343 - 369	351	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	400	Pass
N	Buttock Popliteal Length	mm	416 - 442	432	Pass
O	Chest Depth w/o Jacket	mm	195 - 211	205	Pass
P	Foot Length	mm	216 - 232	223	Pass
Q	Hip Breadth with Pelvic Plug	mm	313 -323	319	Pass
R	Arm Length	mm	249 - 259	254	Pass
S	Knee Joint to Seatback	mm	477 - 493	483	Pass
V	Shoulder Width	mm	341 - 357	351	Pass
W	Foot Width	mm	78 - 94	89	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:	12/12/14
ATD Serial No.:	307	Test I.D.:	307HD077

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	296	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	38.5	Pass
	Min	%		38.2	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	38.4	Pass
Peak Head Resultant Acceleration		G's	115 to 137	121.8	Pass
Peak Head X Acceleration		G's	<15	1.9	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	1.1	Pass
			Overall Test Results		Pass

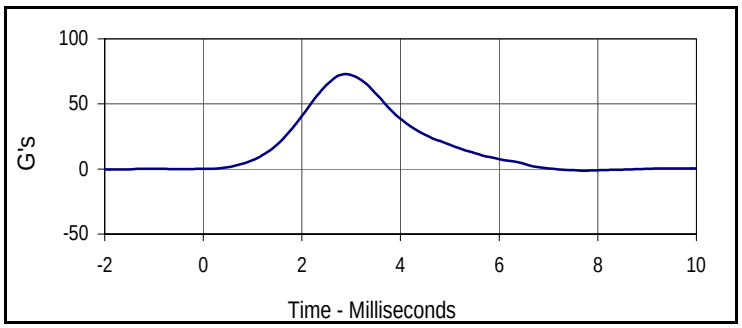


Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
121.8	2.9	0.2	-0.5



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.9	5.2	-1.0	2.5

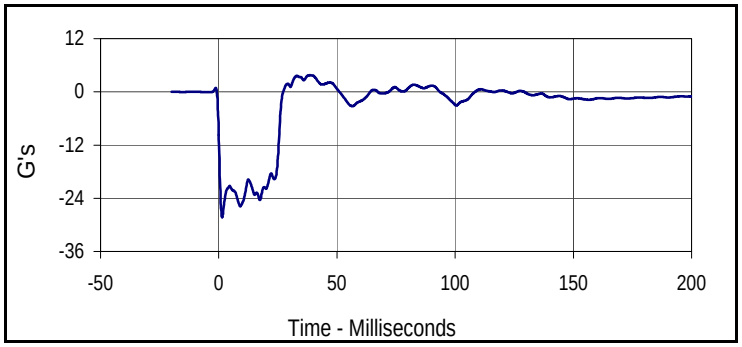
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
97.5	2.9	-0.3	6.9



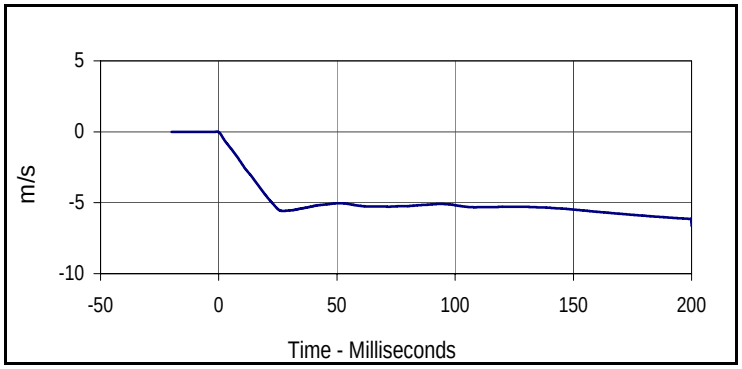
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
72.9	2.9	-1.3	7.7

Test Program:	SID IIs Neck Flexion Test	Test Date:	12/12/14
ATD Serial No.:	307	Test I.D.:	307NB077

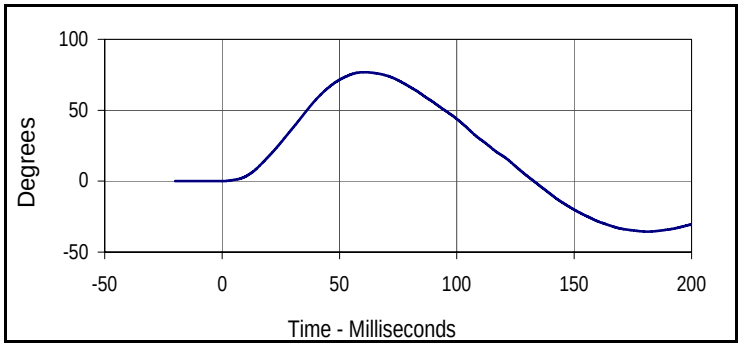
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	341	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	38.5	Pass
	Min	%		38.2	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	38.5	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.58	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.31	Pass
	15 msec	m/s	-3.30 to -4.10	-3.38	Pass
	20 msec	m/s	-4.40 to -5.40	-4.50	Pass
	25 msec	m/s	-5.40 to -6.10	-5.45	Pass
	25-100 msec	m/s	-5.50 to -6.20	-5.58	Pass
D-Plane Rotation	Max	Degrees	71 to 81	76.8	Pass
	Time	msec	50 to 70	60.1	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-43.2	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	120.0	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
3.8	0.0	-28.3	0.0

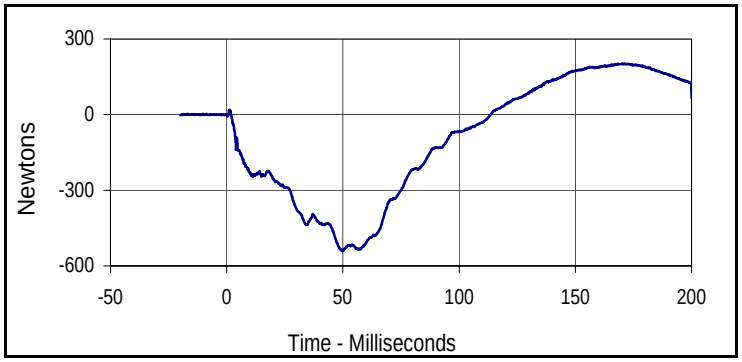


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.8	-6.6	200.0

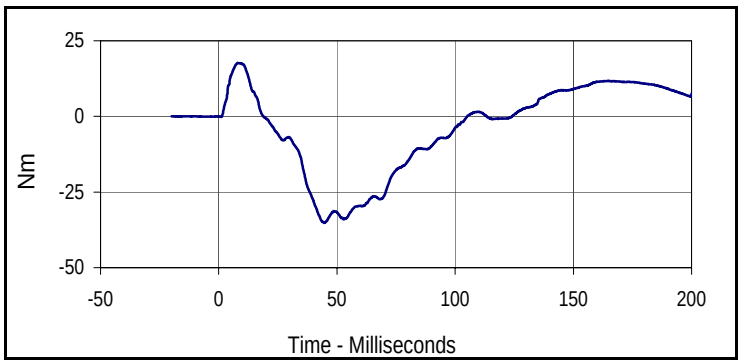


Curve Description			
D-Plane Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
76.8	60.1	-35.5	181.2

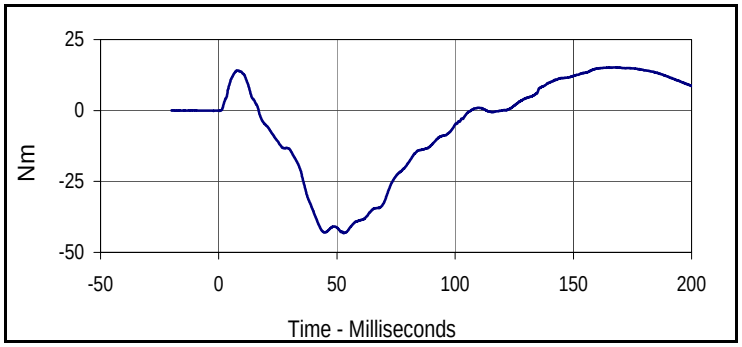
Test Program:	SID IIs Neck Flexion Test	Test Date:	12/12/14
ATD Serial No.:	307	Test I.D.:	307NB077



Curve Description			
Neck Force Y			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
202.4	171.3	-541.0	50.1



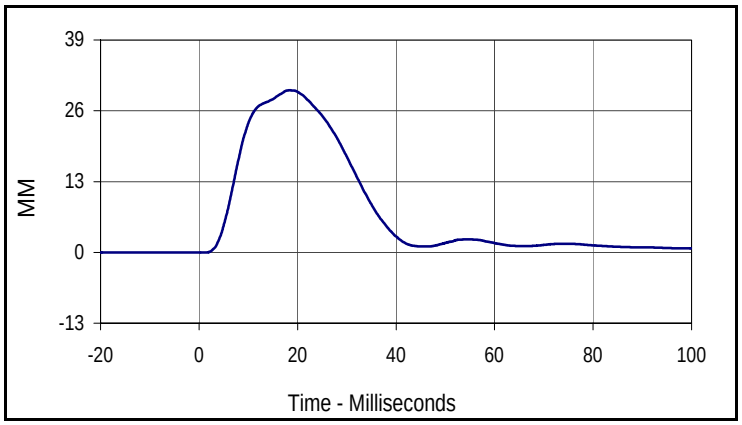
Curve Description			
Neck Moment X			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
17.7	8.0	-35.2	44.6



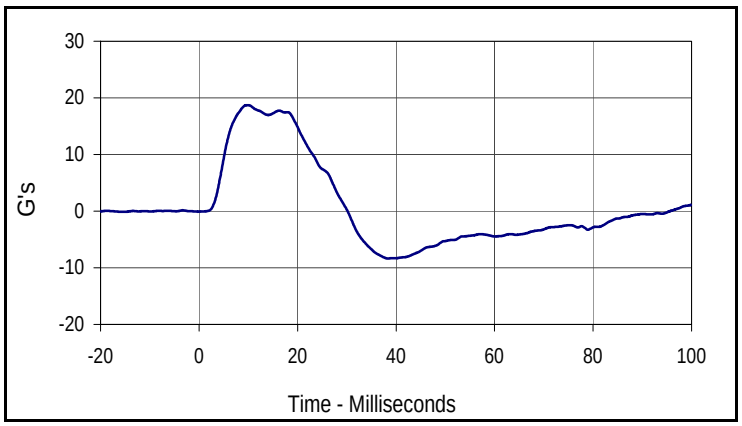
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
006	FIL	600	Nm
Max	Time	Min	Time
15.2	165.7	-43.2	52.8

Test Program:	SID IIs Shoulder Impact Test	Test Date:	12/12/14
ATD Serial No.:	307	Test I.D.:	307SH077

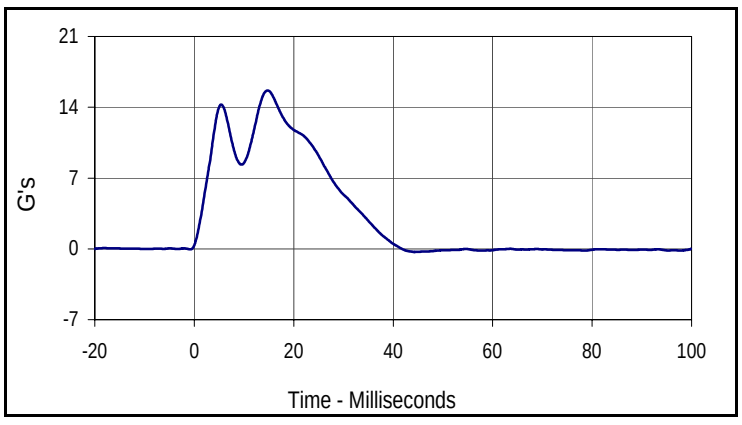
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	396	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	38.5	Pass
	Min	%		38.2	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	38.4	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.34	Pass
Peak Shoulder Deflection		mm	28 to 37	29.7	Pass
Peak Lateral Spine Acceleratrion Y		G's	17 to 22	18.7	Pass
Peak Impactor Acceleration		G's	13 to 18	15.7	Pass
			Overall Test Results		Pass



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
29.7	18.4	0.0	-4.4



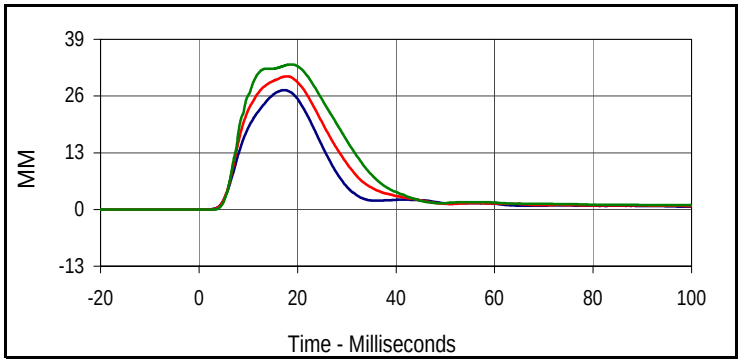
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.7	10.0	-8.4	38.3



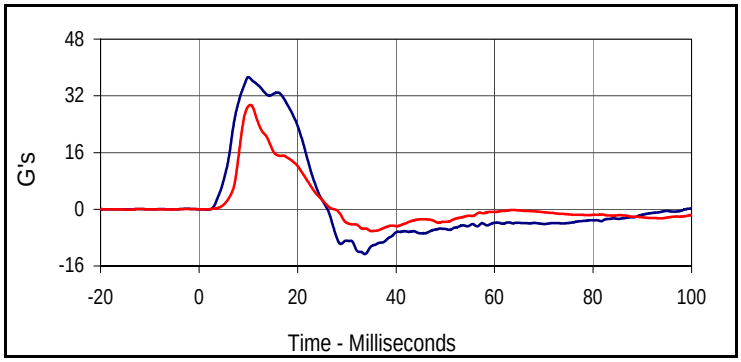
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.7	14.8	-0.3	100.0

Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	12/12/14
ATD Serial No.:	307	Test I.D.:	307TWA077

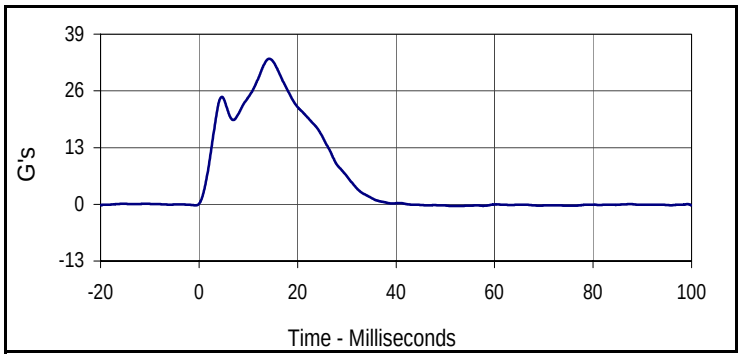
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	441	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	38.5	Pass
	Min	%		38.2	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	38.4	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.62	Pass
Peak Shoulder Deflection		mm	31 to 40	34.5	Pass
Peak Upper Thorax Rib Deflection		mm	25 to 32	27.3	Pass
Peak Middle Thorax Rib Deflection		mm	30 to 36	30.5	Pass
Peak Lower Thorax Rib Deflection		mm	32 to 38	33.2	Pass
Peak Upper Spine Y Acceleration		G's	34 to 43	37.3	Pass
Peak Lower Spine Y Acceleration		G's	29 to 37	29.4	Pass
Peak Impactor Acceleration		G's	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
27.3	17.4	0.0	-1.0
Middle Thorax Deflection			
Max	Time	Min	Time
30.5	17.9	0.0	-0.5
Lower Thorax Deflection			
Max	Time	Min	Time
33.2	18.5	0.0	-18.4

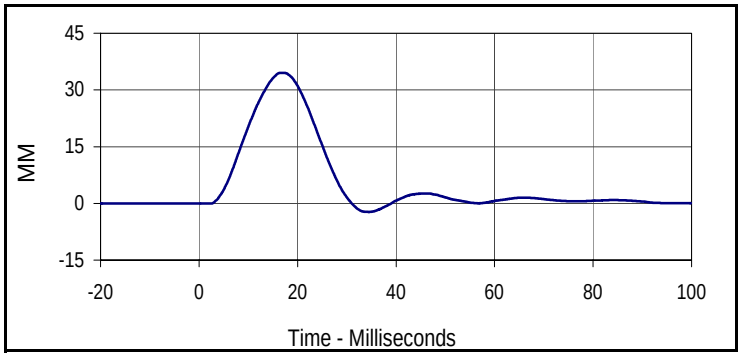


Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
37.3	10.0	-12.6	33.7
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
29.4	10.4	-6.2	35.0



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
33.4	14.2	-0.4	52.7

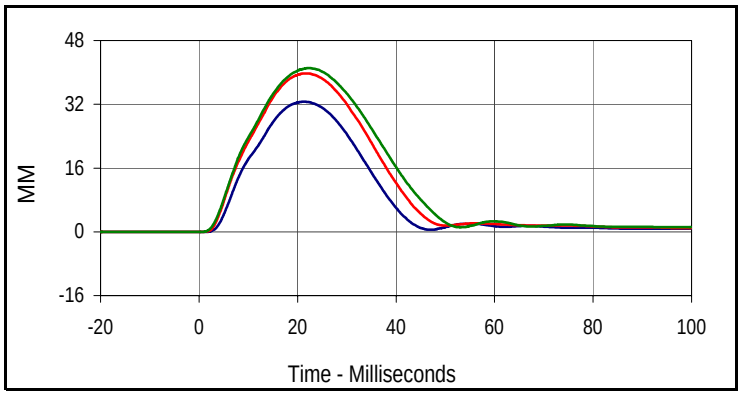
Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	12/12/14
ATD Serial No.:	307	Test I.D.:	307TWA077



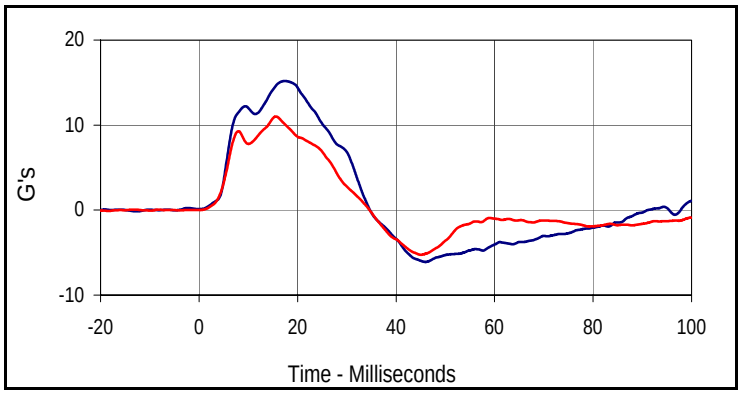
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
34.5	17.0	-2.3	34.5

Test Program:	SID IIs Thorax without Arm Impact Test	Test Date:	12/12/14
ATD Serial No.:	307	Test I.D.:	307TWOA077

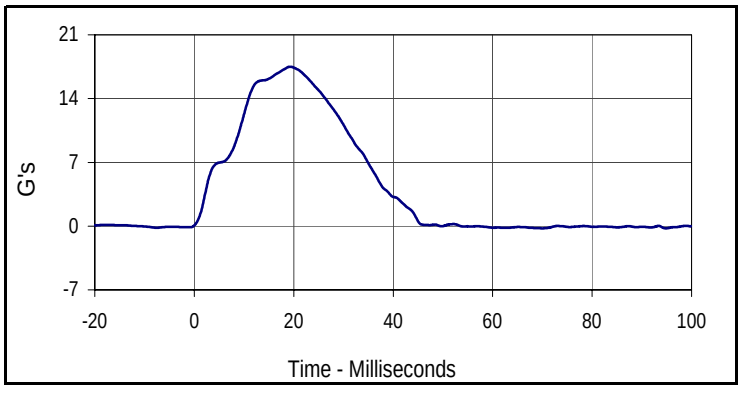
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	496	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	38.5	Pass
	Min	%		38.2	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	38.3	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.38	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	32.6	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	39.8	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	41.1	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	15.2	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	11.0	Pass
Peak Impactor Acceleration		G's	14 to 18	17.5	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
32.6	21.3	0.0	-2.8
Middle Thorax Deflection			
Max	Time	Min	Time
39.8	21.6	0.0	0.2
Lower Thorax Deflection			
Max	Time	Min	Time
41.1	22.3	0.0	-0.1



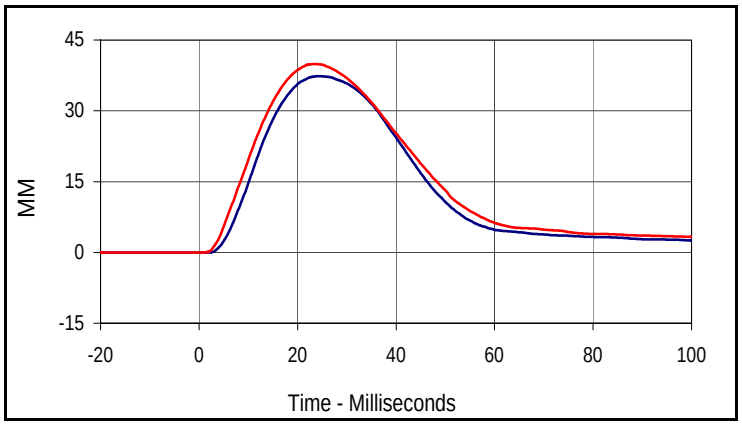
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.2	17.5	-6.1	46.0
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
11.0	15.6	-5.3	45.1



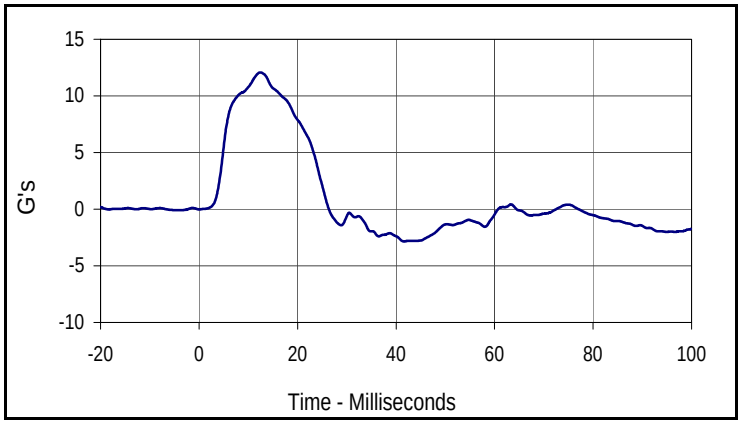
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
17.5	19.3	-0.2	94.8

Test Program:	SID IIs Abdomen Impact Test	Test Date:	12/12/14
ATD Serial No.:	307	Test I.D.:	307ABD077

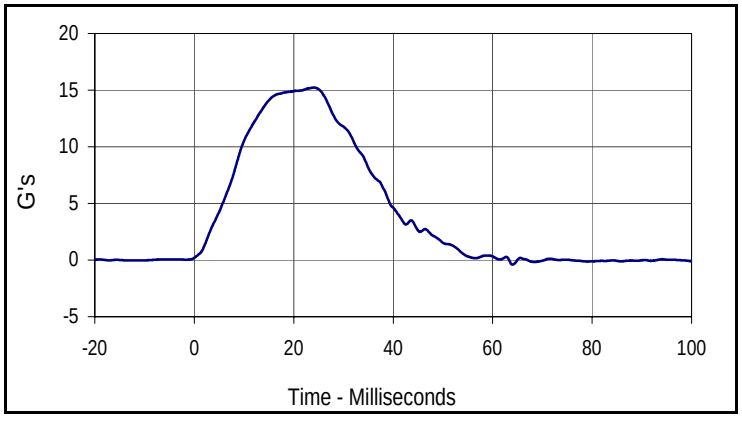
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	551	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	38.5	Pass
	Min	%		38.2	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	38.2	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.35	Pass
Peak Upper Abdominal Rib Deflection		mm	36 to 47	37.3	Pass
Peak Lower Abdominal Rib Deflection		mm	33 to 44	39.9	Pass
Peak Lower Spine Y Acceleration		G's	9 to 14	12.1	Pass
Peak Impactor Acceleration		G's	12 to 16	15.2	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
37.3	24.1	0.0	-9.3
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
39.9	23.5	0.0	-12.5

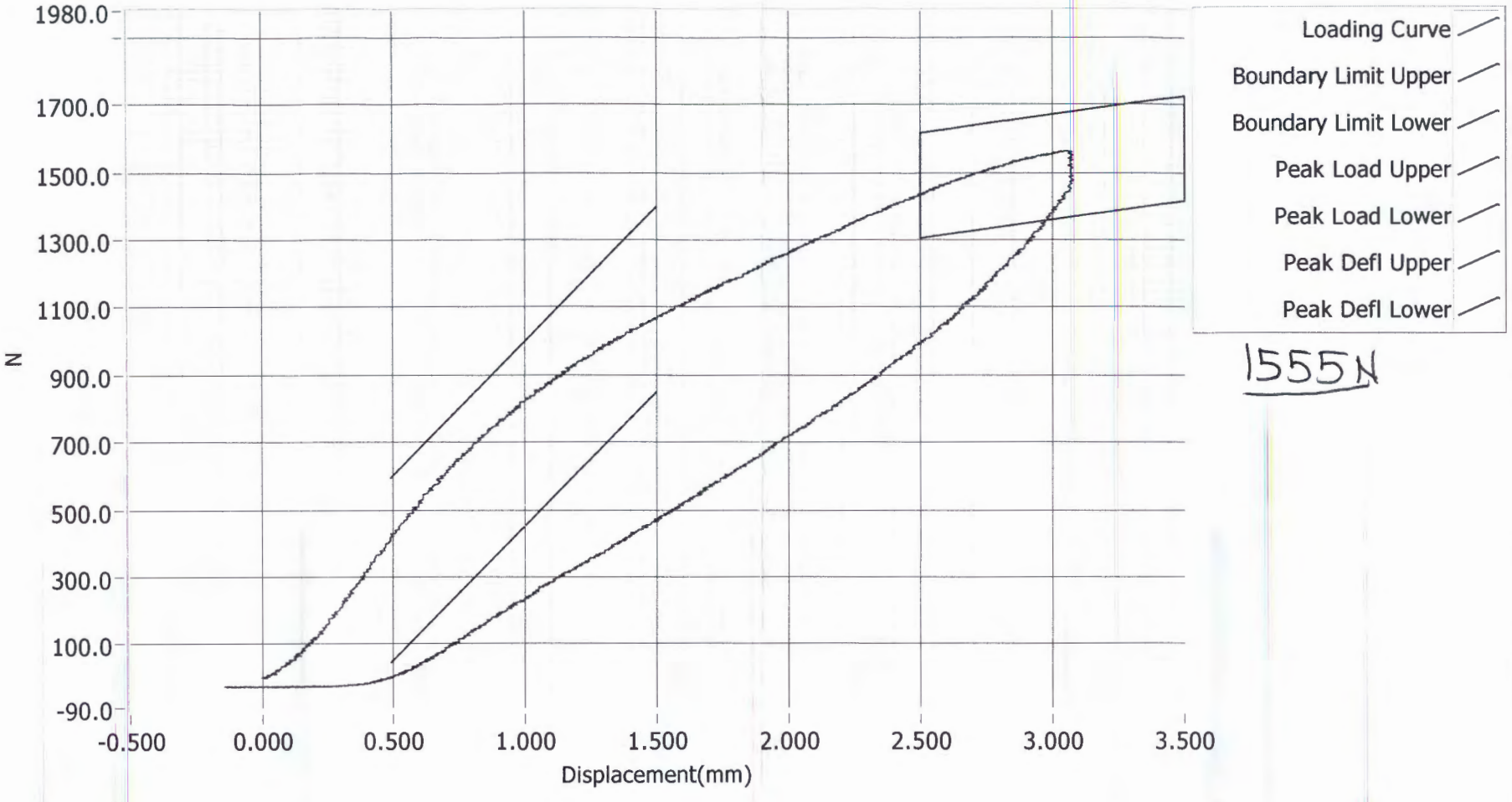


Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
12.1	12.5	-2.8	41.6



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.2	24.0	-0.4	64.0

Resultant Data - SIDIIs Plug Compression



1555N

ATD Calibration Lab

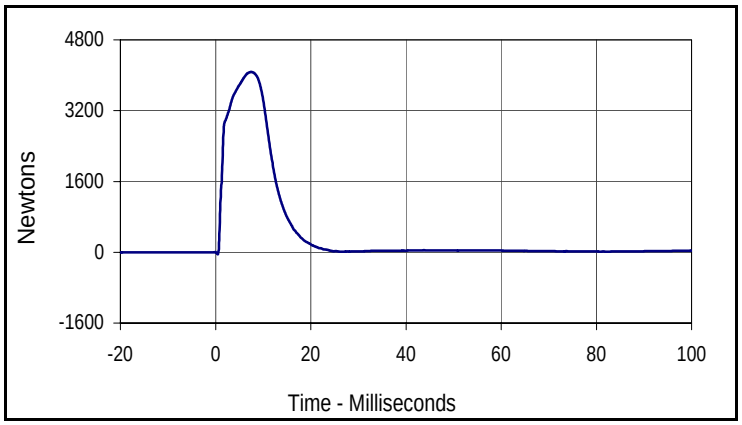
M20150221 Pre Test

Test ID	Part Serial Number	Test Date	Test Time
	70732	12/12/2013	10:37 PM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

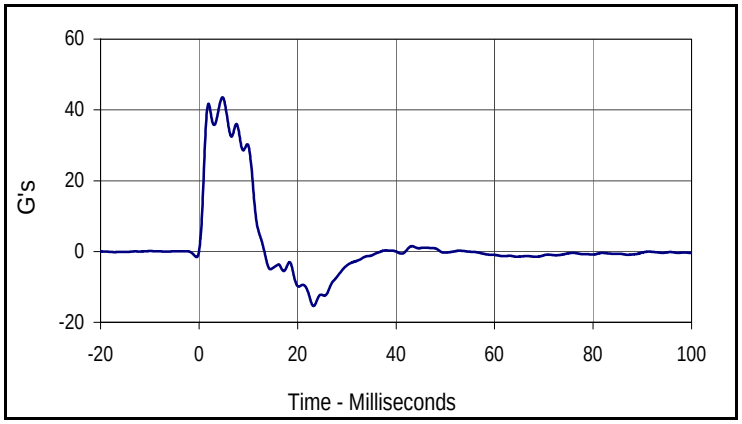
Current Date : 12/12/2013 Current Time : 22:38:17

Test Program:	SID IIs Pelvis Acetabulum Impact Test	Test Date:	12/12/14
ATD Serial No.:	307	Test I.D.:	307ACET077

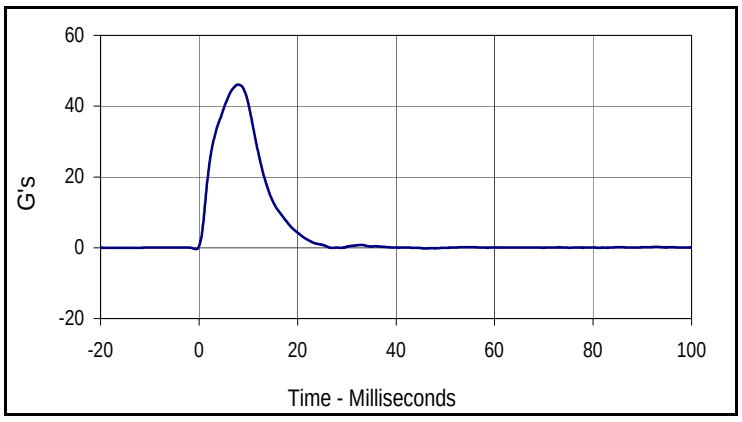
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	601	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	38.5	Pass
	Min	%		38.2	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	38.2	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.67	Pass
Peak Acetabulum Force Y		Newtons	3600 to 4300	4073.9	Pass
Peak Pelvis Y Acceleration After 6 msec.		G's	34 to 42	36.0	Pass
Peak Impactor Acceleration		G's	38 to 47	46.1	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4073.9	7.5	-45.1	0.5



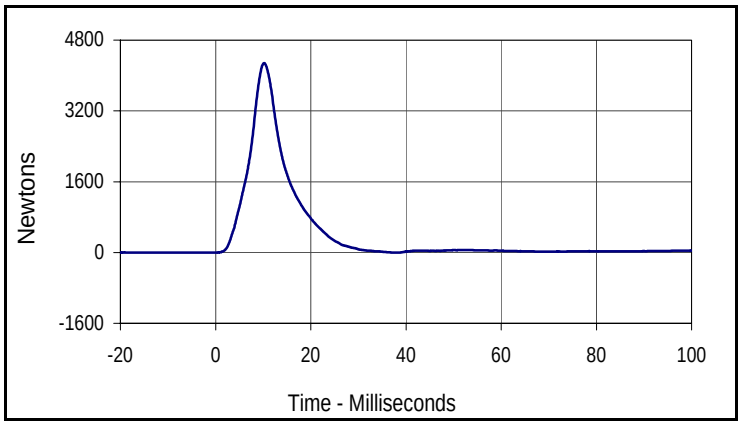
Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
43.6	4.8	-15.4	23.2



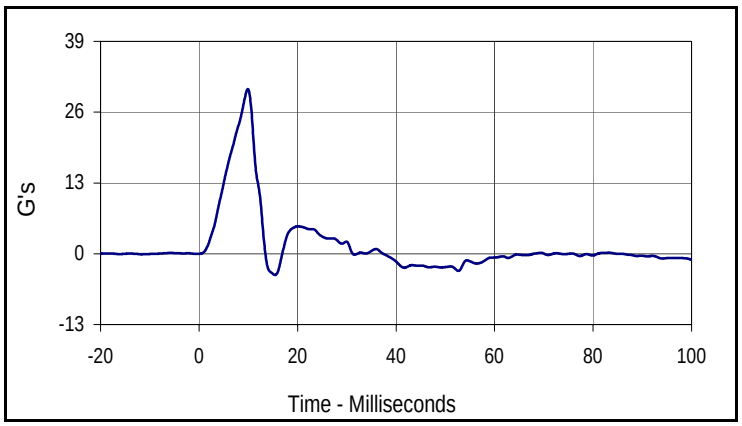
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
46.1	7.9	-0.4	-0.6

Test Program:	SID IIs Pelvis Iliac Calibration	Test Date:	12/12/14
ATD Serial No.:	307	Test I.D.:	307PL077

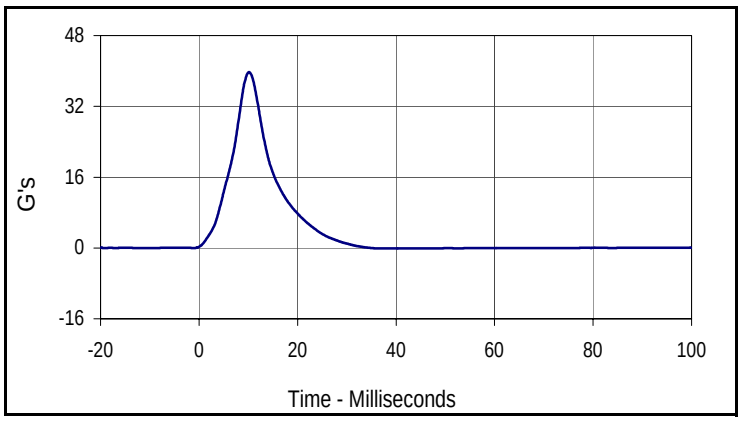
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	656	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	38.5	Pass
	Min	%		38.2	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	38.2	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.26	Pass
Peak Illiac Force		Newtons	4100 to 5100	4282.0	Pass
Peak Pelvis Y Acceleration		G's	28 to 39	30.2	Pass
Peak Impactor Acceleration		G's	36 to 45	39.7	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4282.0	10.2	-3.6	37.8



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
30.2	9.9	-3.9	15.5



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
39.7	10.1	-0.1	37.5

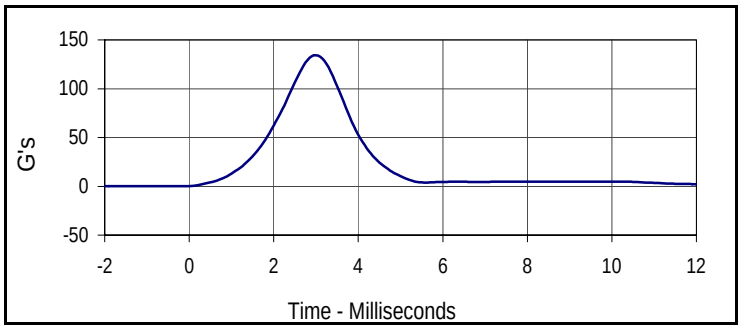
APPENDIX C
POST-TEST / ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program:	ES2re External Measurements	Test Date:	1/8/15
ATD Serial No.:	F037	Test I.D.:	N/A

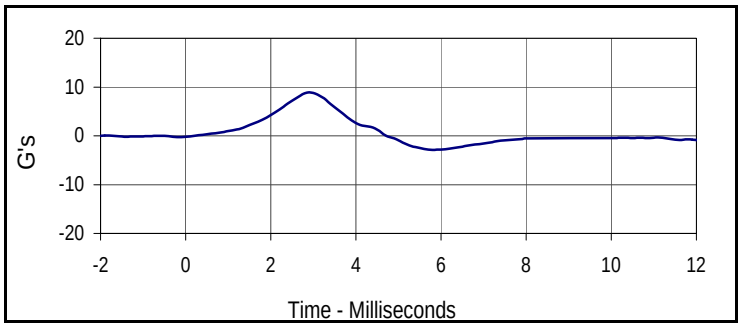
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		^{o}C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	30.0	Pass
1	Sitting Height	mm	900 - 918	909	Pass
2	Seat to Shoulder Joint	mm	558 - 572	564	Pass
3	Seat to Lower Face of Thoracic Spine Box	mm	346 - 356	350	Pass
4	Seat to Hip Joint (Center of Bolt)	mm	97 - 103	99	Pass
5	Sole to Seat, Sitting	mm	333 - 451	395	Pass
6	Head Width	mm	152 - 158	156	Pass
7	Shoulder / Arm Width	mm	461 - 479	470	Pass
8	Thorax Width	mm	322 - 332	326	Pass
9	Abdomen Width	mm	273 - 287	280	Pass
10	Pelvis Lap Width	mm	359 - 373	363	Pass
11	Head Depth	mm	196 - 206	201	Pass
12	Thorax Depth	mm	262 - 272	270	Pass
13	Abdomen Width	mm	194 - 204	199	Pass
14	Pelvis Depth	mm	235 - 245	240	Pass
15	Back of Buttocks to Hip Joint (Center of Bolt)	mm	150 - 160	155	Pass
16	Back of Buttocks to Front Knee	mm	597 - 615	608	Pass
			Overall Test Results		Pass

Test Program:	ES2re Head Drop Test	Test Date:	1/8/15
ATD Serial No.:	F037	Test I.D.:	F037HD069

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	362	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	45.0	Pass
	Min	%		42.3	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	42.4	Pass
Peak Head Resultant Acceleration		G's	125 to 155	134.3	Pass
Peak Head X Acceleration		G's	≤15	8.9	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	7.8	Pass
			Overall Test Results		Pass

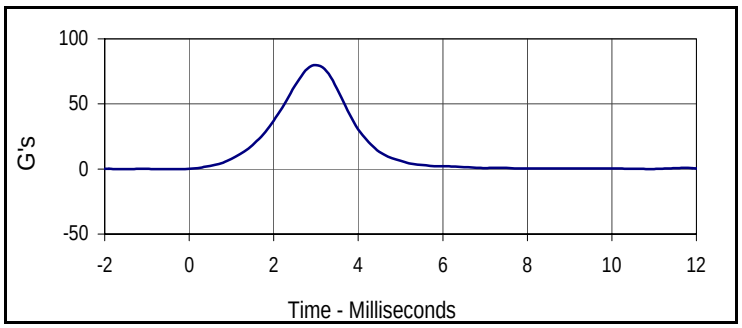


Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
134.3	3.0	0.0	-0.5



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
8.9	2.9	-2.9	5.8

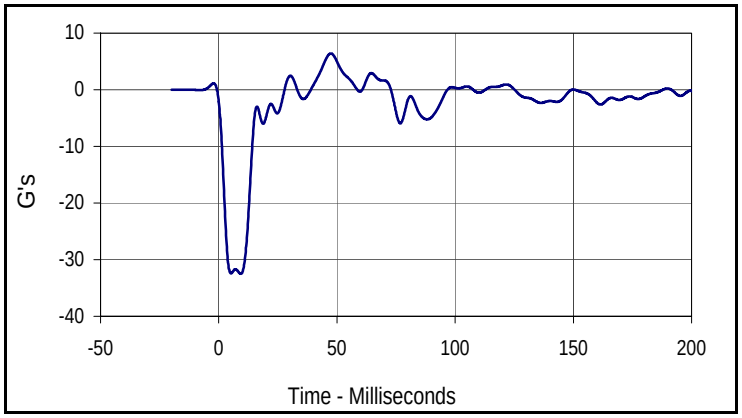
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
107.5	3.0	-4.8	10.2



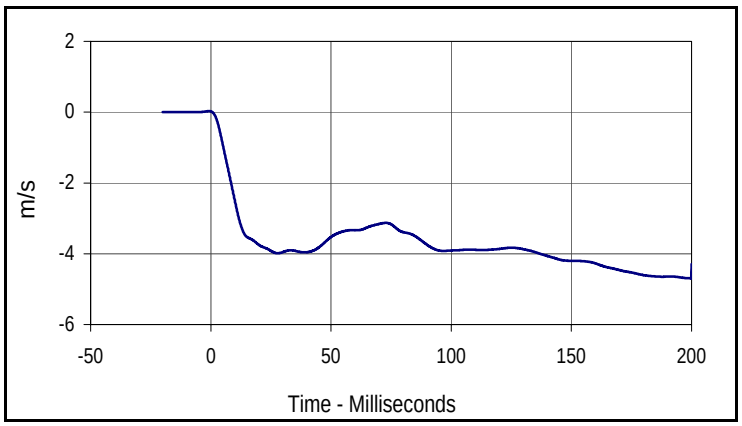
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
79.9	3.0	-0.2	-0.7

Test Program:	ES2re Neck Flexion Test	Test Date:	1/8/15
ATD Serial No.:	F037	Test I.D.:	F037NB069

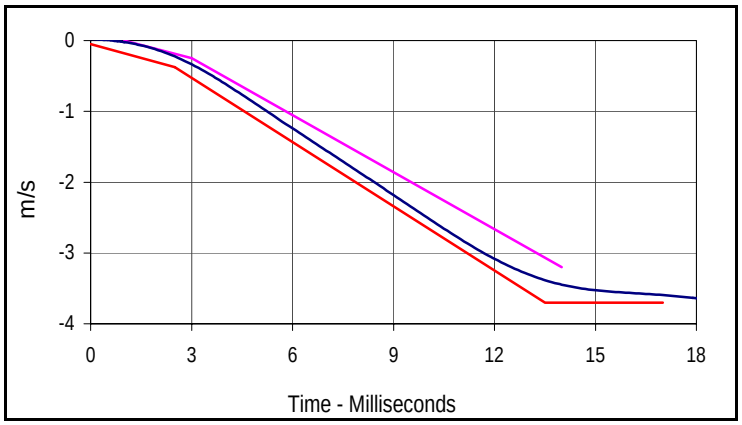
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	397	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	45.0	Pass
	Min	%		42.3	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	42.7	Pass
Pendulum Velocity		m/s	3.3 to 3.5	3.41	Pass
Headform Flexion	Max	Degrees	49 to 59	53.5	Pass
	Time	msec	54 to 66	56.4	Pass
Headform Flexion Decay (Peak to Zero)		msec	53 to 88	64.5	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
6.4	47.4	-32.5	9.3



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	60	m/s
Max	Time	Min	Time
0.0	-0.7	-4.7	199.9

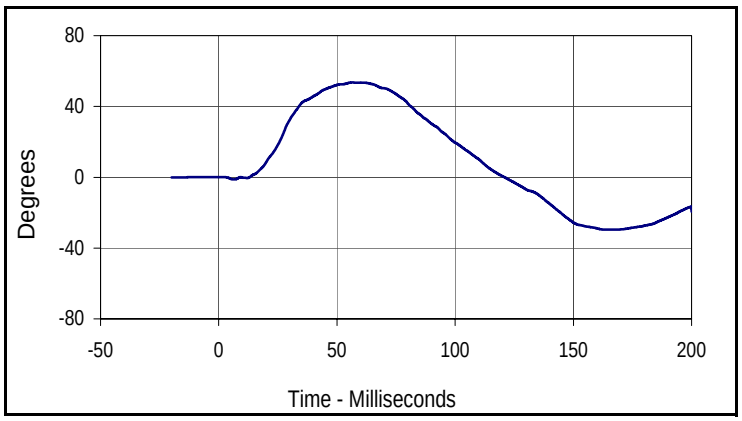


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	60	m/s
Max	Time	Min	Time
0.0	-0.7	-4.7	199.9

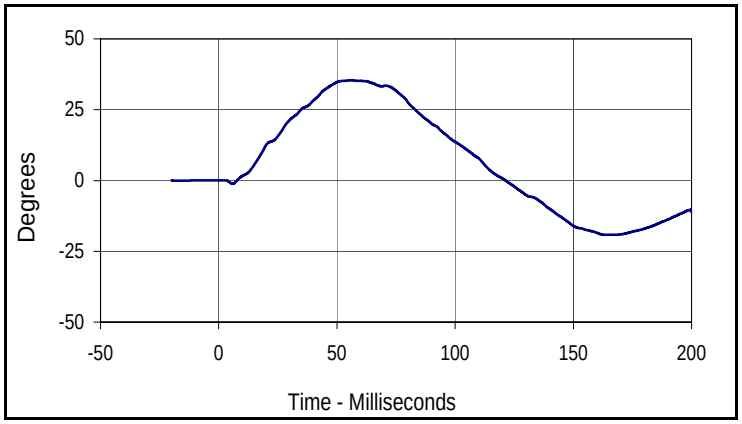
Velocity Corridors

Upper Boundary		Lower Boundary	
Time (msec)	Velocity (m/s)	Time (msec)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.0	-0.03	2.5	-0.375
14.0	-3.20	13.5	-3.70
		17.0	-3.70

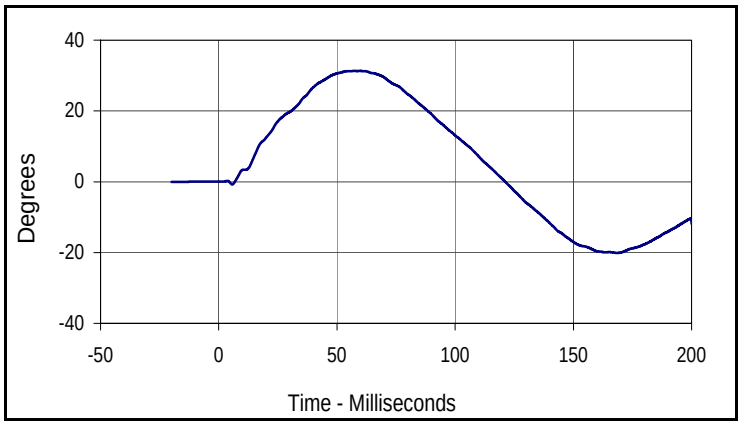
Test Program:	ES2re Neck Flexion Test	Test Date:	1/8/15
ATD Serial No.:	F037	Test I.D.:	F037NB069



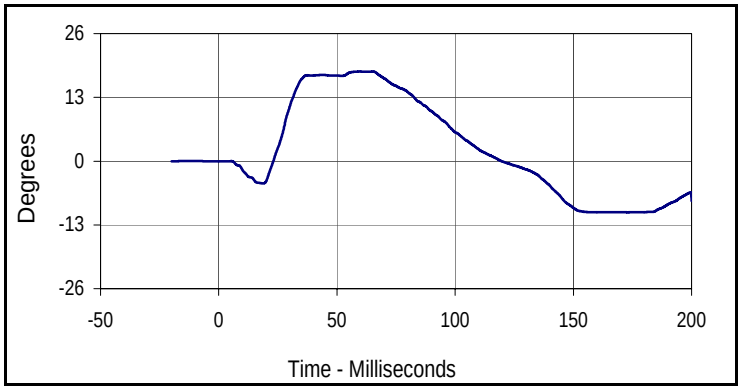
Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
53.5	56.4	-29.6	163.9



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
35.4	56.1	-19.2	164.1



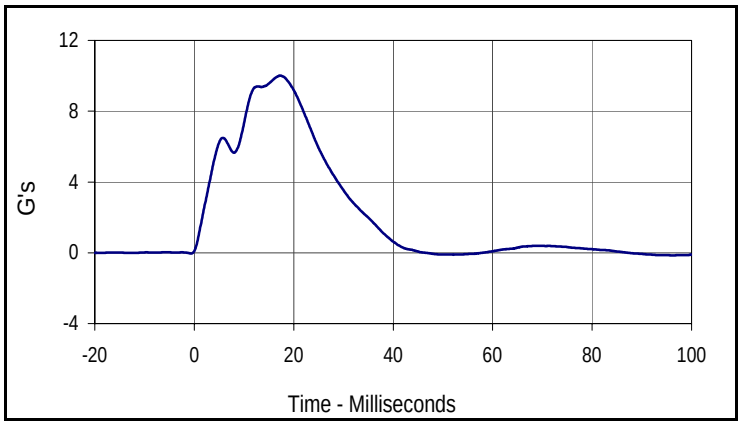
Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
31.3	59.7	-20.1	168.6



Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
006	FIL	180	Degrees
Max	Time	Min	Time
18.3	59.6	-10.4	173.1

Test Program:	ES2re Shoulder Impact Test	Test Date:	1/8/15
ATD Serial No.:	F037	Test I.D.:	F037SH069

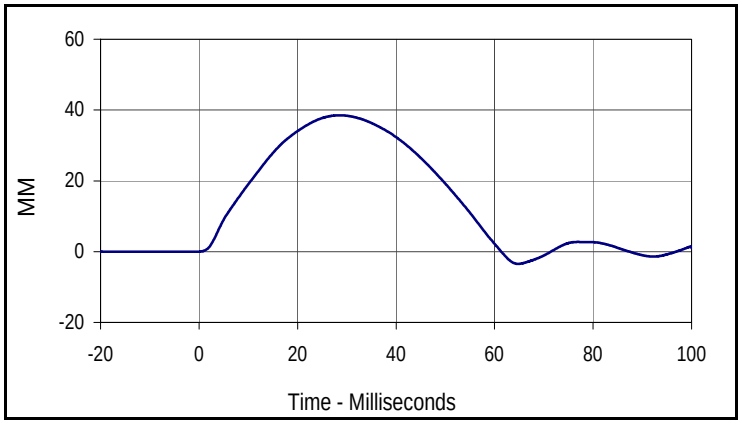
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	462	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	45.0	Pass
	Min	%		42.3	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	42.8	Pass
Pendulum Speed		m/s	4.2 to 4.4	4.32	Pass
Peak Impactor Acceleration		G's	7.5 to 10.5	10.0	Pass
			Overall Test Results		Pass



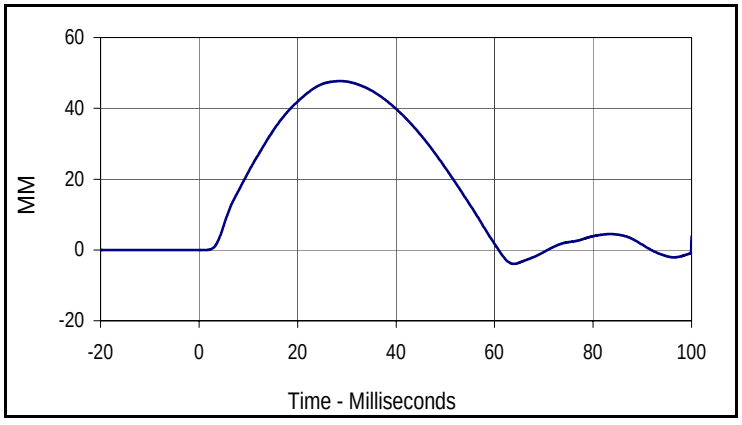
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
10.0	17.3	-0.1	96.2

Test Program:	ES2re Thorax - Rib Drop Test	Test Date:	1/8/15
ATD Serial No.:	F037 Rib # 1	Test I.D.:	F037RB1069

Tested Parameter		Units	Specification	Result	Pass/Fail
Rib Module Soak Time		Minutes	≥240	517	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	45.0	Pass
	Min	%		42.3	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	43.2	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height		mm	36 to 40	38.5	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height		mm	46 to 51	47.7	Pass
			Overall Test Results		Pass



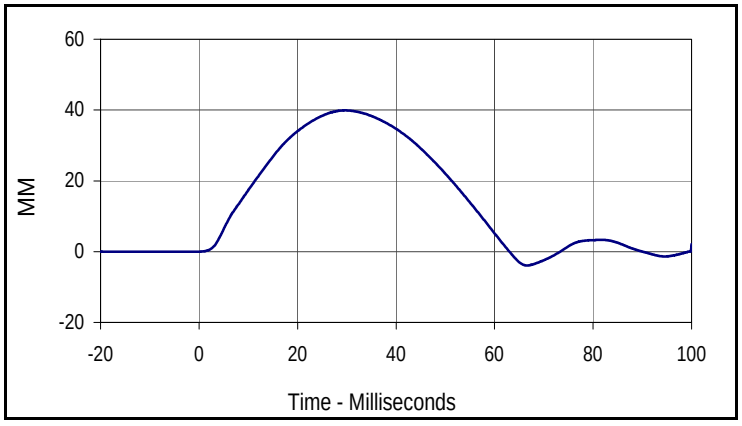
Curve Description			
Upper Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
38.5	28.6	-3.5	64.8



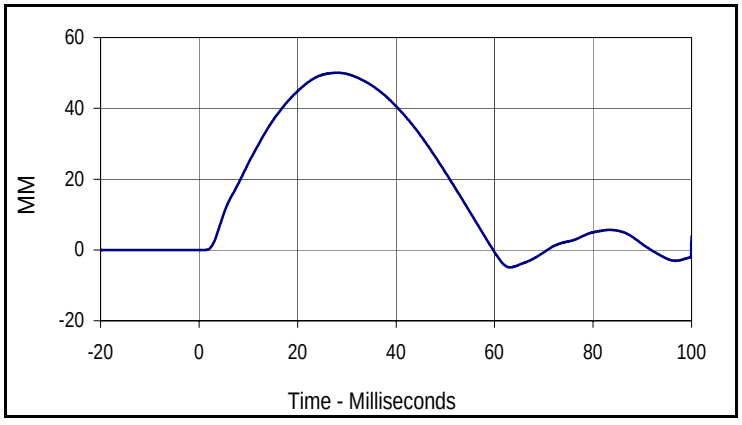
Curve Description			
Upper Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
47.7	28.6	-3.9	63.9

Test Program:	ES2re Thorax - Rib Drop Test	Test Date:	1/8/15
ATD Serial No.:	F037 Rib # 2	Test I.D.:	F037RB2069

Tested Parameter		Units	Specification	Result	Pass/Fail
Rib Module Soak Time		Minutes	≥240	562	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	45.0	Pass
	Min	%		42.3	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	43.5	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height		mm	36 to 40	39.9	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height		mm	46 to 51	50.1	Pass
			Overall Test Results		Pass



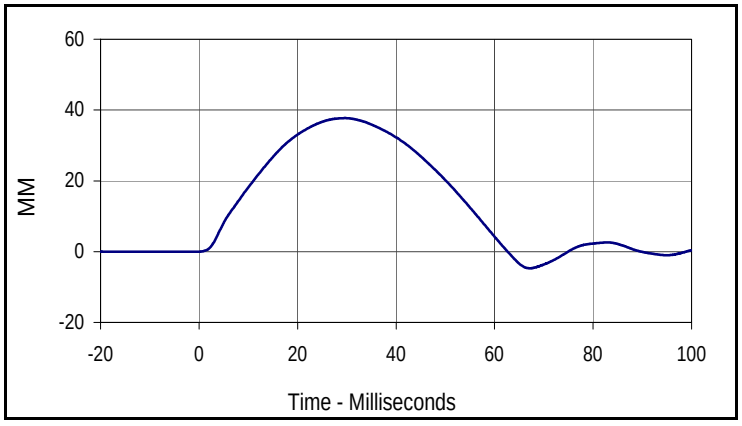
Curve Description			
Middle Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
39.9	29.7	-3.9	66.6



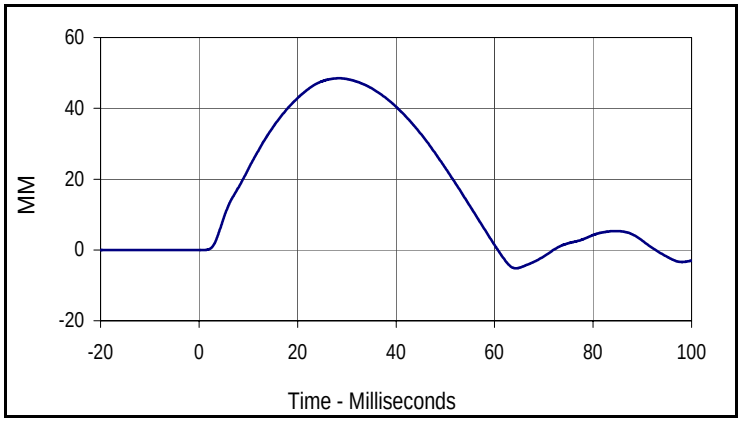
Curve Description			
Middle Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
50.1	28.1	-4.9	63.2

Test Program:	ES2re Thorax - Rib Drop Test	Test Date:	1/8/15
ATD Serial No.:	F037 Rib # 3	Test I.D.:	F037RB3069

Tested Parameter		Units	Specification	Result	Pass/Fail
Rib Module Soak Time		Minutes	≥240	607	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	45.0	Pass
	Min	%		42.3	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	43.6	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height		mm	36 to 40	37.7	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height		mm	46 to 51	48.5	Pass
			Overall Test Results		Pass



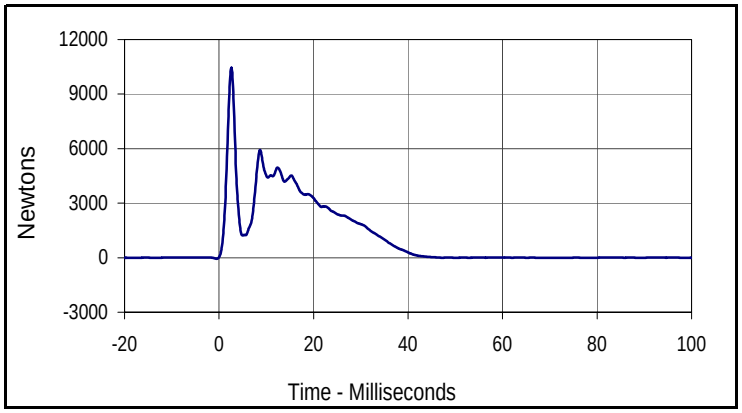
Curve Description			
Lower Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
37.7	29.7	-4.7	67.2



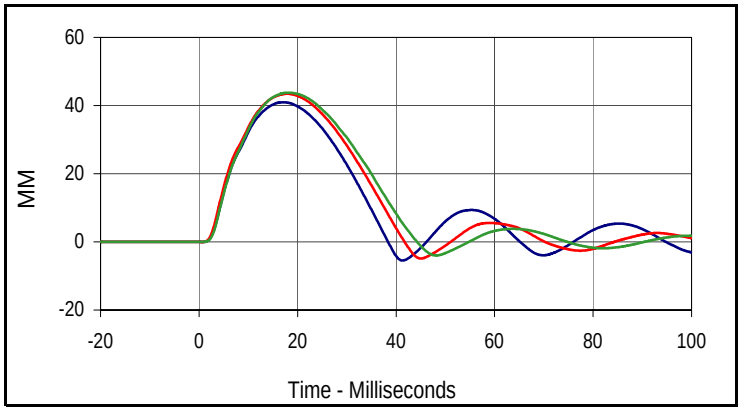
Curve Description			
Lower Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
48.5	28.5	-5.2	64.3

Test Program:	ES2re Thorax - Full Body Impact Test	Test Date:	1/8/15
ATD Serial No.:	F037	Test I.D.:	F037TH069

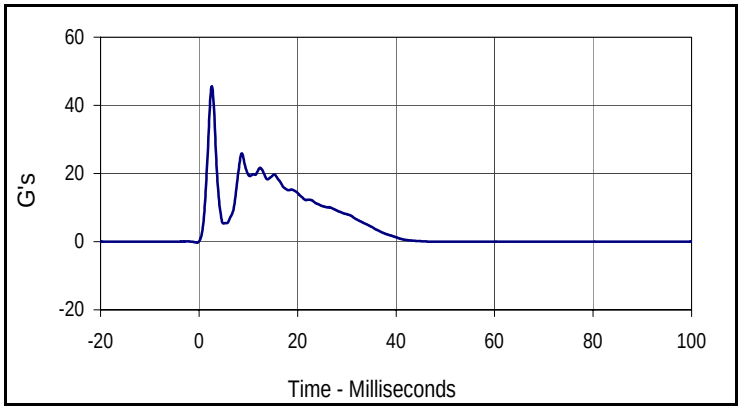
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	652	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	45.0	Pass
	Min	%		42.3	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	43.8	Pass
Peak Impactor Velocity		m/s	5.4 to 5.6	5.49	Pass
Peak Impactor Force		N	5100 to 6200	5930.1	Pass
		msec	> 6.0 msec	8.7	Pass
Peak Upper Rib Deflection		mm	34 to 41	41.0	Pass
Peak Middle Rib Deflection		mm	37 to 45	43.4	Pass
Peak Lower Rib Deflection		mm	37 to 44	43.8	Pass
			Overall Test Results		Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
10448.3	2.6	-56.7	-0.5



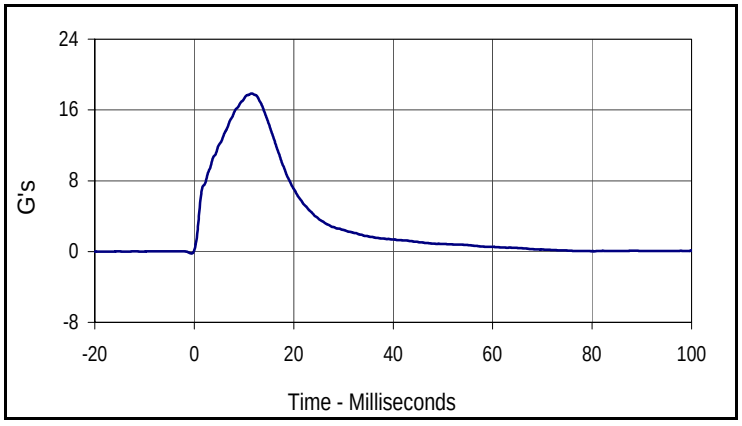
Curve Description			
Upper, Middle, Lower Rib Deflections			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max (Upper)	Time	Min (Upper)	Time
41.0	17.0	-5.5	41.3
Max (Middle)	Time	Min (Middle)	Time
43.4	17.9	-4.9	45.0
Max (Lower)	Time	Min (Lower)	Time
43.8	18.1	-4.0	48.1



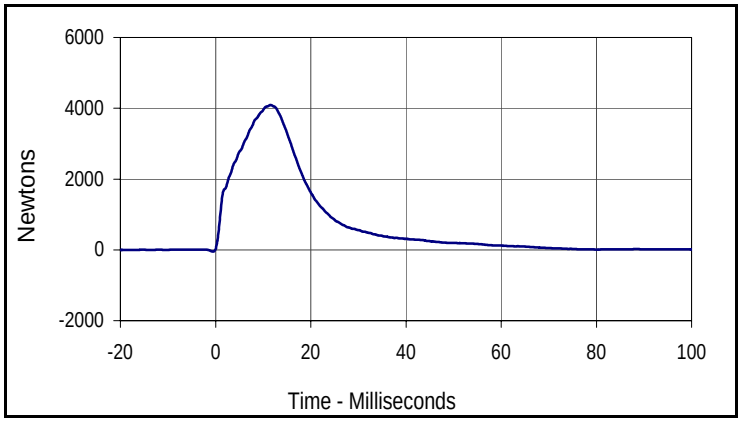
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
45.6	2.6	-0.2	-0.5

Test Program:	ES2re Abdomen Impact Test	Test Date:	1/8/15
ATD Serial No.:	F037	Test I.D.:	F037ABD069

Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	722	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	45.0	Pass
	Min	%		42.3	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	45.0	Pass
Probe Velocity		m/s	3.9 to 4.1	4.02	Pass
Peak Impactor Force		N	4000 to 4800	4091.9	Pass
		msec	10.6 to 13.0	11.5	Pass
Sum of Abdominal Forces		N	2200 to 2700	2355.8	Pass
		msec	10.0 to 12.3	10.9	Pass
			Overall Test Results		Pass

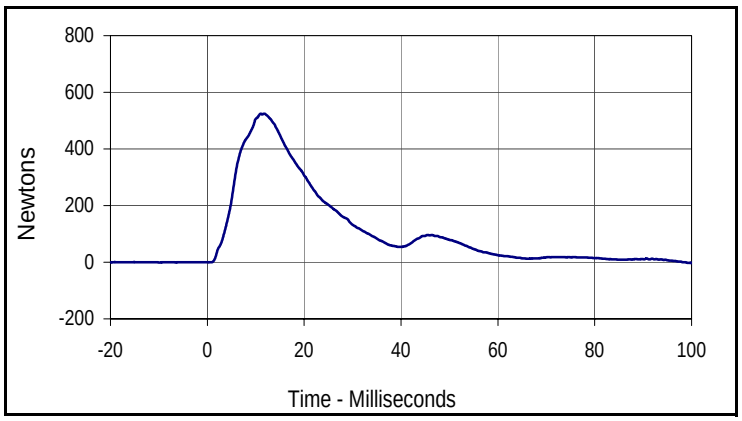


Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
17.9	11.5	-0.2	-0.5

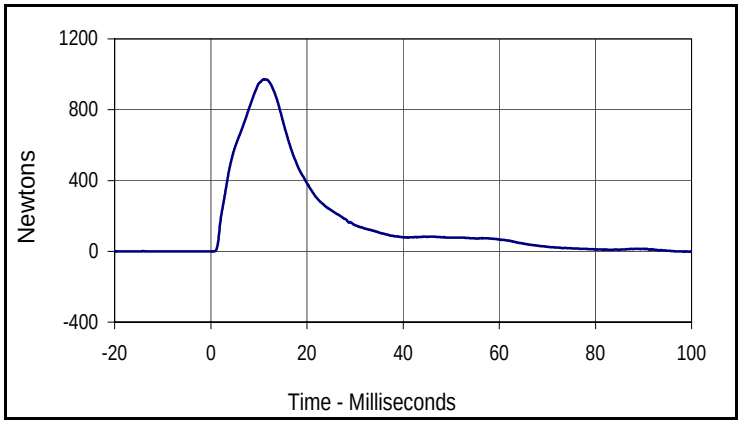


Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
002	FIL	180	Newtons
Max	Time	Min	Time
4091.9	11.5	-49.7	-0.5

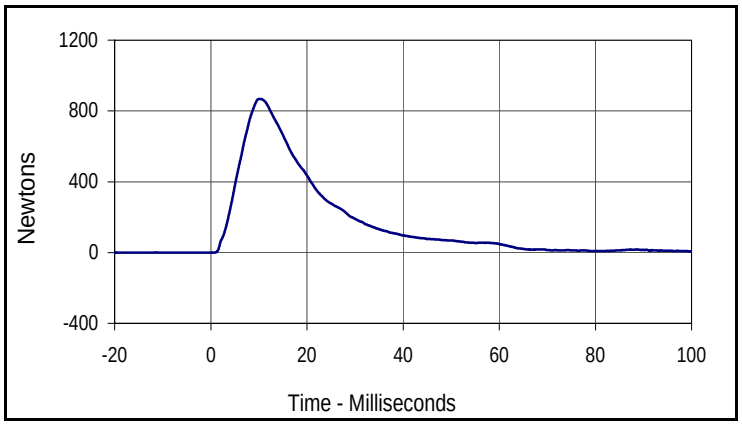
Test Program:	ES2re Abdomen Impact Test	Test Date:	1/8/15
ATD Serial No.:	F037	Test I.D.:	F037ABD069



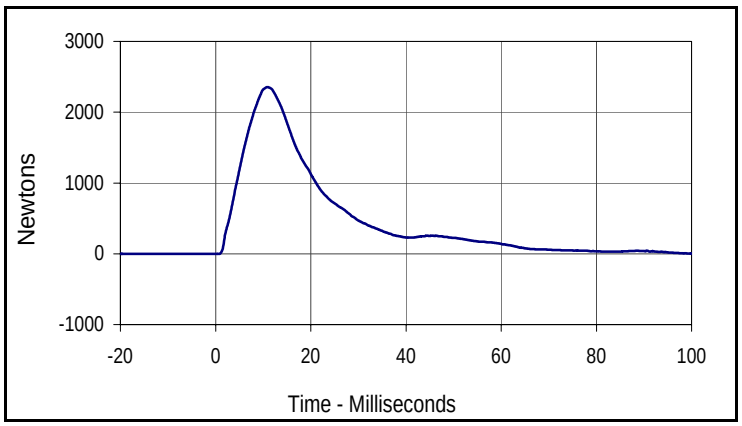
Curve Description			
Front Abdomen Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
524.6	11.8	-8.2	105.2



Curve Description			
Middle Abdomen Force			
Plot No.	Type	SAE Class	Units
004	FIL	600	Newtons
Max	Time	Min	Time
971.5	11.2	-3.8	105.2



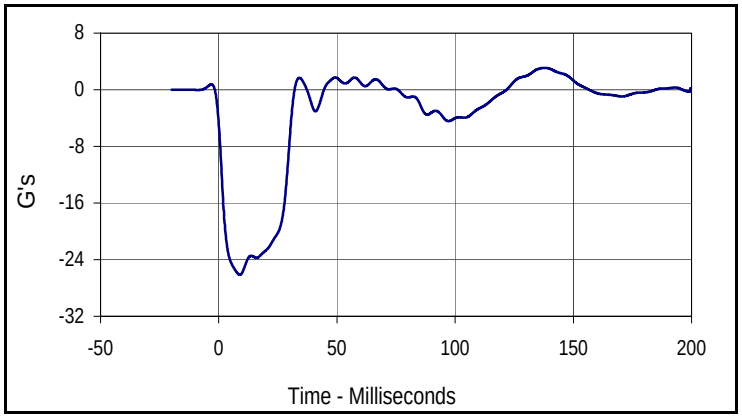
Curve Description			
Rear Abdomen Force			
Plot No.	Type	SAE Class	Units
005	FIL	600	Newtons
Max	Time	Min	Time
868.1	10.5	-0.9	121.5



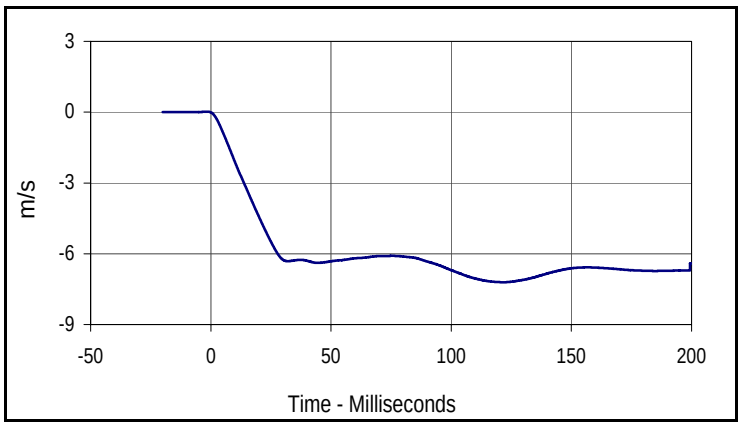
Curve Description			
Abdomen Sum Resultant			
Plot No.	Type	SAE Class	Units
006	RES	600	Newtons
Max	Time	Min	Time
2355.8	10.9	-1.5	-9.5

Test Program:	ES2re Lumbar Flexion Test	Test Date:	1/8/15
ATD Serial No.:	F037	Test I.D.:	F037LB069

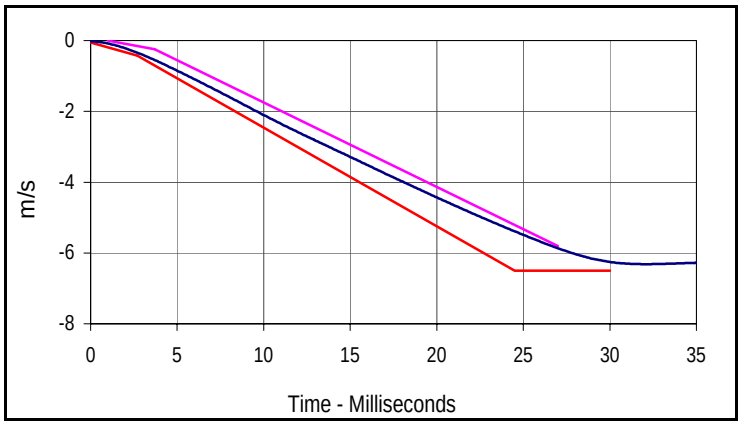
Tested Parameter		Units	Specification	Result	Pass/Fail
Lumbar Spine Assembly Soak Time		Minutes	≥240	797	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	45.0	Pass
	Min	%		42.3	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	44.3	Pass
Pendulum Velocity		m/s	5.95 to 6.15	6.03	Pass
Headform Rotation	Max	Degrees	45 to 55	48.8	Pass
	Time	msec	39 to 53	41.6	Pass
Time of Decay to Zero Angle from Peak		msec	37 to 57	44.7	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
3.1	138.6	-26.1	9.5



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.1	-7.2	122.3

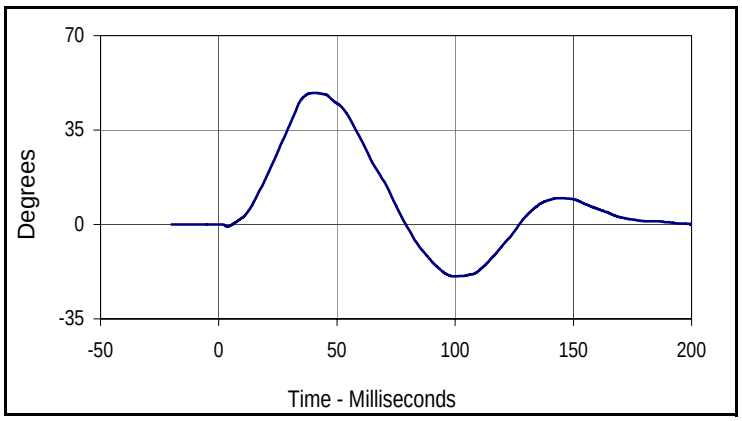


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.1	-7.2	122.3

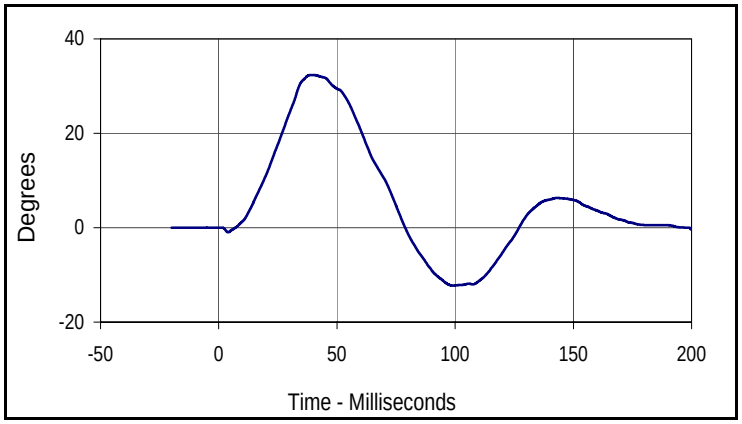
Velocity Corridors

Upper Boundary		Lower Boundary	
Time (msec)	Velocity (m/s)	Time (msec)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.7	-0.24	2.7	-0.425
27.0	-5.80	24.5	-6.50
		30.0	-6.50

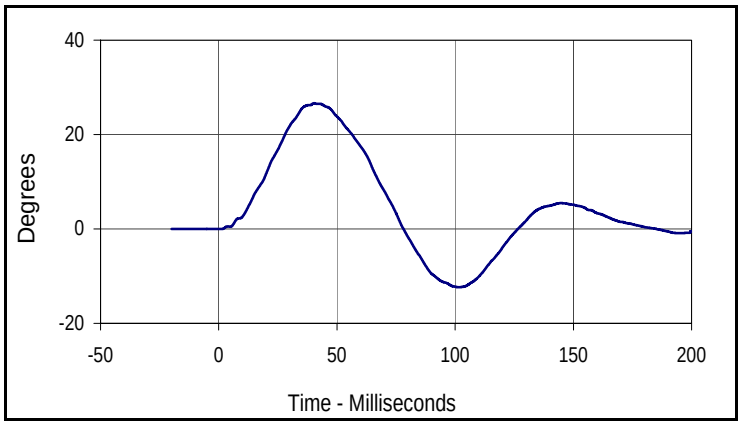
Test Program:	ES2re Lumbar Flexion Test	Test Date:	1/8/15
ATD Serial No.:	F037	Test I.D.:	F037LB069



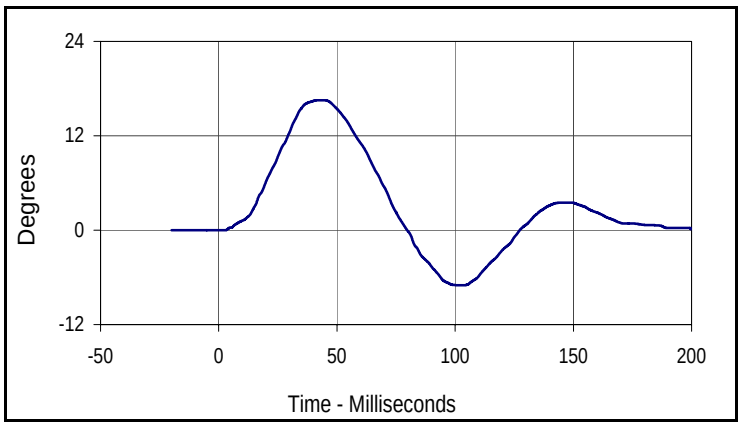
Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
48.8	41.6	-19.2	99.8



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
32.4	39.5	-12.3	99.6



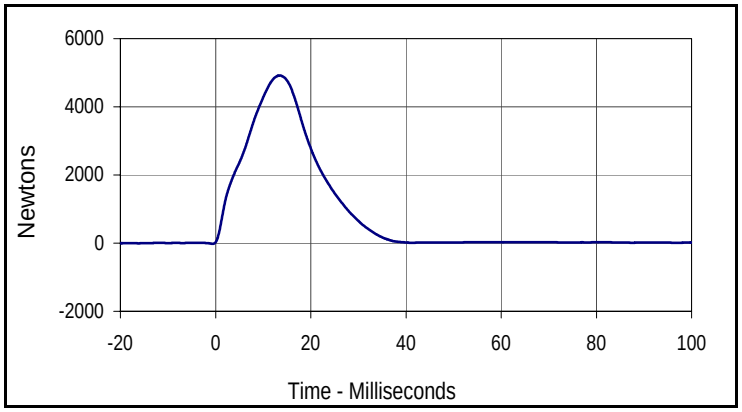
Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
26.6	40.9	-12.4	102.1



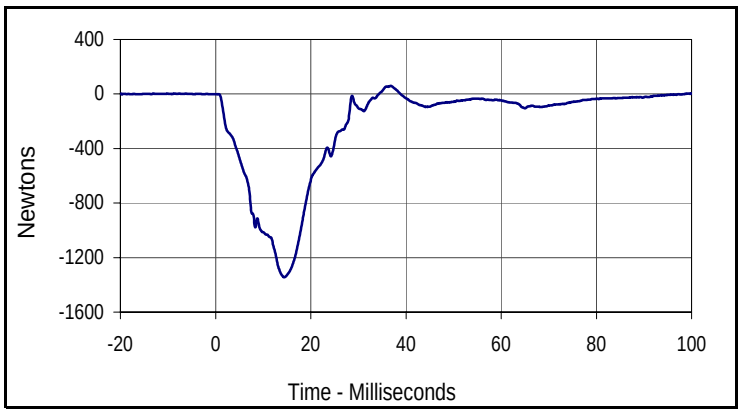
Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
006	FIL	180	Degrees
Max	Time	Min	Time
16.5	43.0	-7.0	103.1

Test Program:	ES2re Pelvis Impact Test	Test Date:	1/8/15
ATD Serial No.:	F037	Test I.D.:	F037PL069

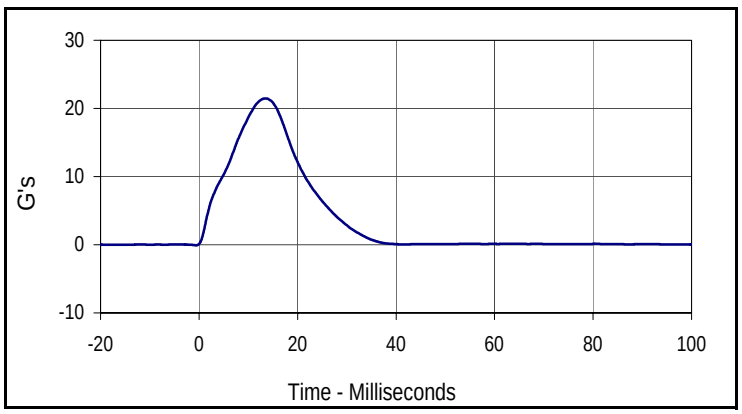
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	852	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	45.0	Pass
	Min	%		42.3	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	44.2	Pass
Pendulum Velocity		m/s	4.2 to 4.4	4.32	Pass
Peak Impactor Force		N	4700 to 5400	4920.0	Pass
		msec	11.8 to 16.1	13.5	Pass
Peak Pubic Symphysis Load		N	-1230 to -1590	-1344.2	Pass
		msec	12.2 to 17.0	14.4	Pass
			Overall Test Results		Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4920.0	13.5	-17.7	-0.6



Curve Description			
Pubic Symphysis Force Y			
Plot No.	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
60.5	36.8	-1344.2	14.4



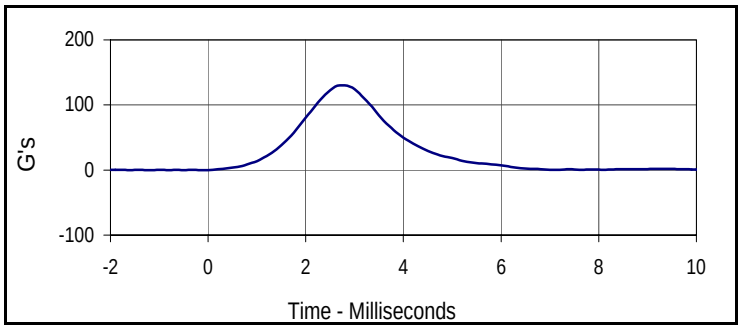
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
21.5	13.5	-0.1	-0.6

Test Program:	SID IIs External Measurements	Test Date:	1/9/15
ATD Serial No.:	307	Test I.D.:	N/A

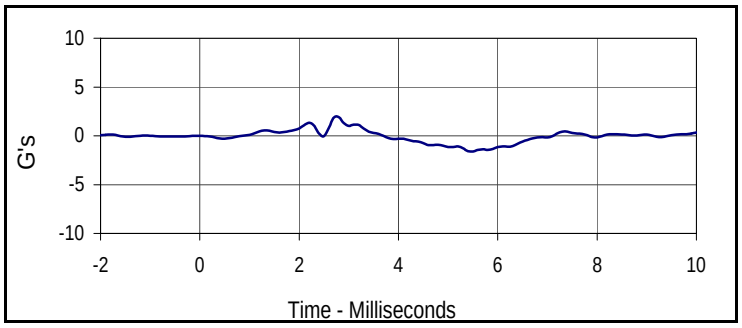
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	45	Pass
A	Sitting Height	mm	772 - 788	778	Pass
B	Shoulder Pivot Height	mm	437 - 453	443	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	141 - 151	144	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	102	Pass
F	Thigh Clearance	mm	119 - 135	128	Pass
G	Head Breadth	mm	140 - 148	145	Pass
H	Head Back from Backline	mm	40 - 46	43	Pass
I	Head Depth	mm	178 - 188	185	Pass
J	Head Circumference	mm	541 - 551	546	Pass
K	Buttock to Knee Length	mm	514 - 540	525	Pass
L	Popliteal Height	mm	343 - 369	351	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	400	Pass
N	Buttock Popliteal Length	mm	416 - 442	432	Pass
O	Chest Depth w/o Jacket	mm	195 - 211	205	Pass
P	Foot Length	mm	216 - 232	223	Pass
Q	Hip Breadth with Pelvic Plug	mm	313 -323	319	Pass
R	Arm Length	mm	249 - 259	254	Pass
S	Knee Joint to Seatback	mm	477 - 493	483	Pass
V	Shoulder Width	mm	341 - 357	351	Pass
W	Foot Width	mm	78 - 94	89	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.:	307	Test I.D.:	307HD078

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	286	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	45.2	Pass
	Min	%		44.9	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	44.9	Pass
Peak Head Resultant Acceleration		G's	115 to 137	130.4	Pass
Peak Head X Acceleration		G's	<15	1.9	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	1.4	Pass
			Overall Test Results		Pass

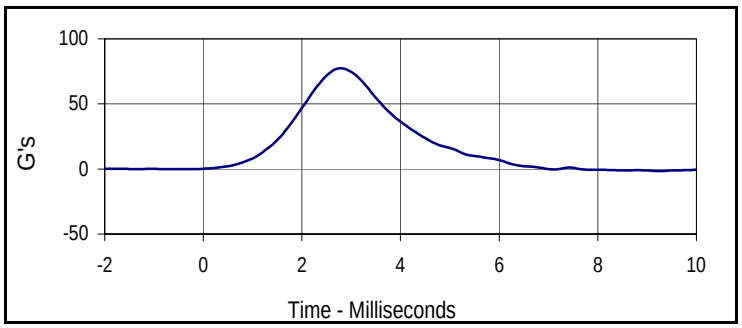


Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
130.4	2.7	0.0	-0.1



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.9	2.8	-1.6	5.5

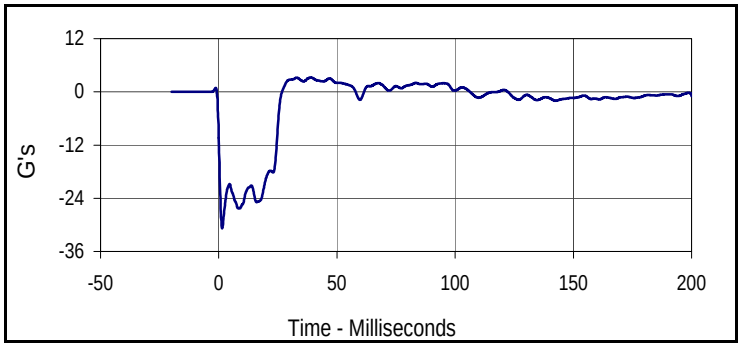
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
105.2	2.7	-0.5	7.9



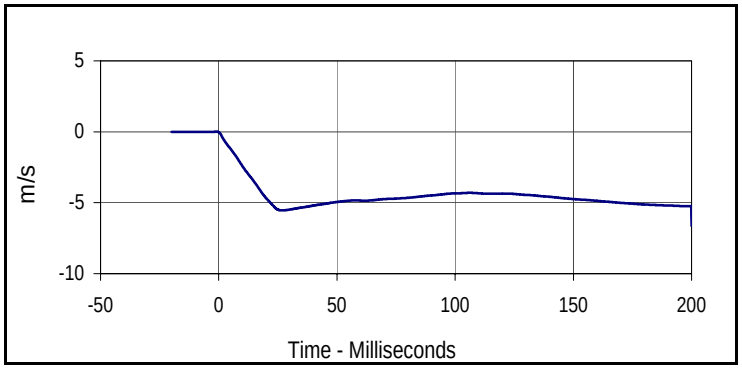
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
77.5	2.8	-1.5	9.3

Test Program:	SID IIs Neck Flexion Test	Test Date:	1/9/15
ATD Serial No.:	307	Test I.D.:	307NB078

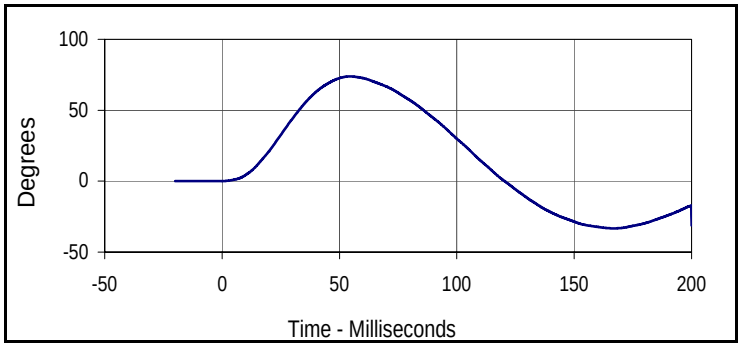
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	331	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	45.2	Pass
	Min	%		44.9	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	44.9	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.62	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.42	Pass
	15 msec	m/s	-3.30 to -4.10	-3.52	Pass
	20 msec	m/s	-4.40 to -5.40	-4.67	Pass
	25 msec	m/s	-5.40 to -6.10	-5.49	Pass
	25-100 msec	m/s	-5.50 to -6.20	-5.54	Pass
D-Plane Rotation	Max	Degrees	71 to 81	73.8	Pass
	Time	msec	50 to 70	54.5	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-40.8	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	104.2	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
3.3	0.0	-30.8	0.0

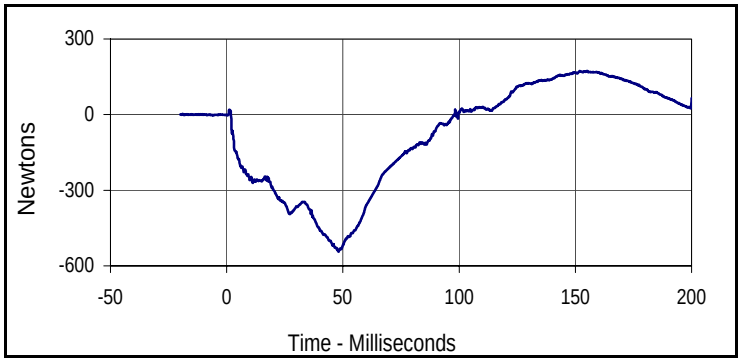


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.8	-6.6	200.0

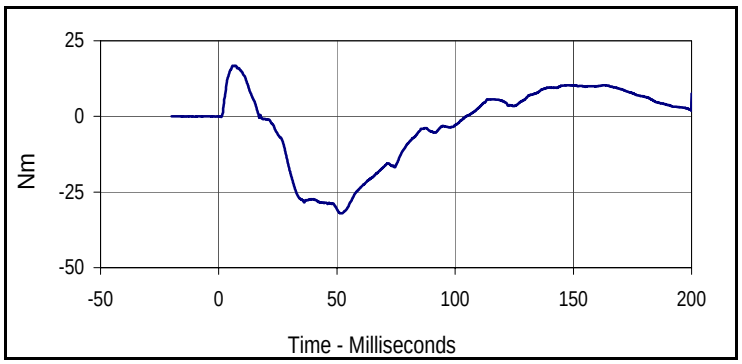


Curve Description			
D-Plane Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
73.8	54.5	-33.2	166.9

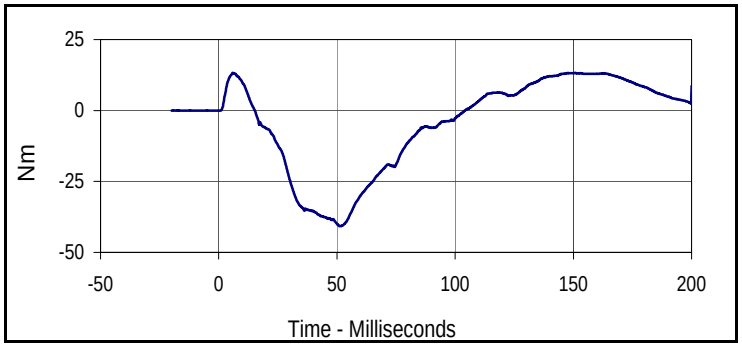
Test Program:	SID IIs Neck Flexion Test	Test Date:	1/9/15
ATD Serial No.:	307	Test I.D.:	307NB078



Curve Description			
Neck Force Y			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
173.5	151.9	-543.6	48.1



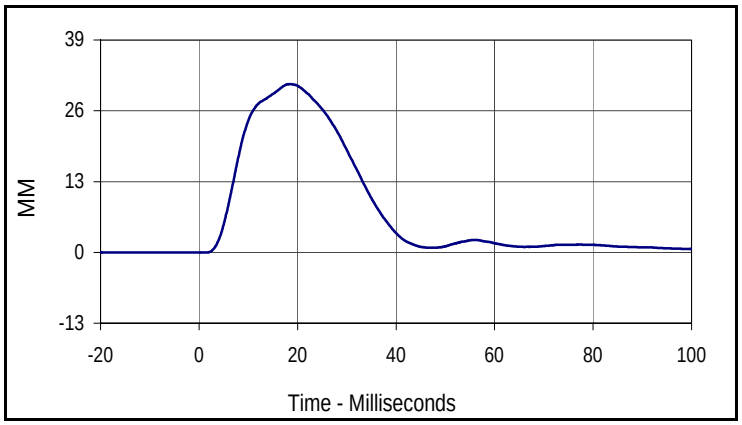
Curve Description			
Neck Moment X			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
16.8	6.0	-32.0	52.0



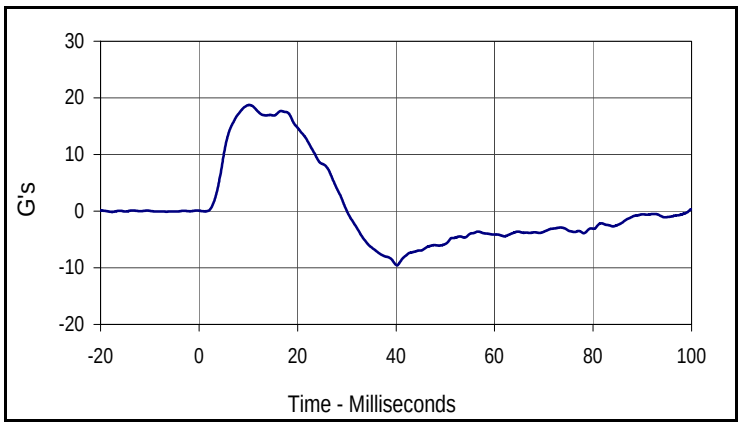
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
006	FIL	600	Nm
Max	Time	Min	Time
13.3	150.5	-40.8	51.5

Test Program:	SID IIs Shoulder Impact Test	Test Date:	1/9/15
ATD Serial No.:	307	Test I.D.:	307SH078

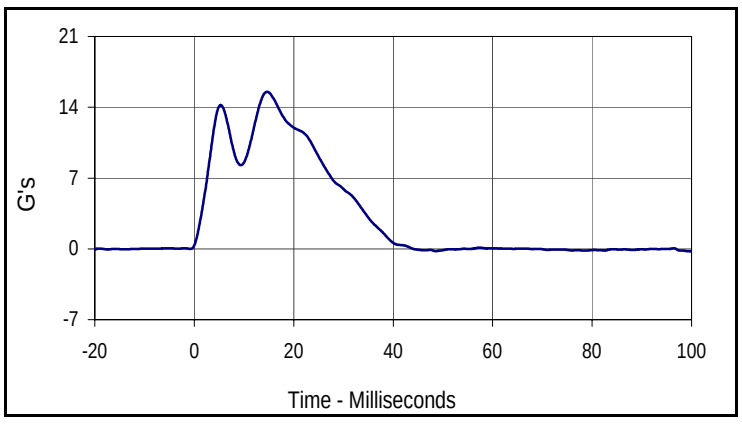
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	386	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	45.2	Pass
	Min	%		44.9	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	45.0	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.33	Pass
Peak Shoulder Deflection		mm	28 to 37	30.9	Pass
Peak Lateral Spine Acceleratrion Y		G's	17 to 22	18.7	Pass
Peak Impactor Acceleration		G's	13 to 18	15.5	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	18.3	0.0	-17.2



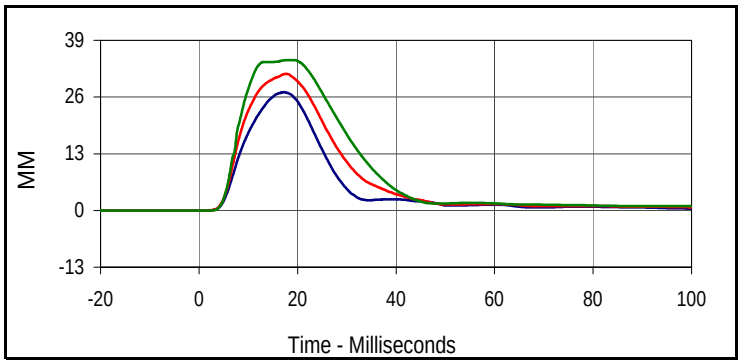
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.7	10.2	-9.6	40.2



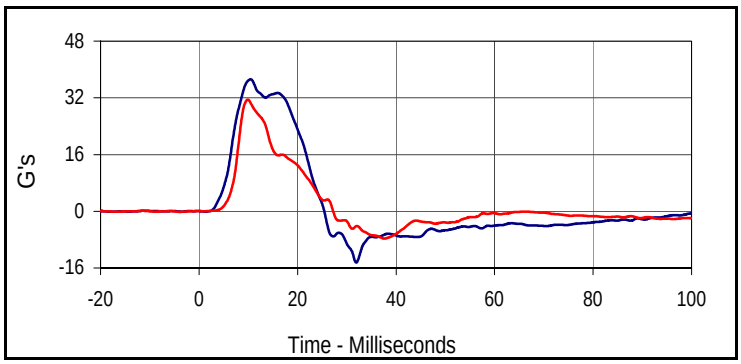
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.5	14.6	-0.3	100.0

Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	1/9/15
ATD Serial No.:	307	Test I.D.:	307TWA078

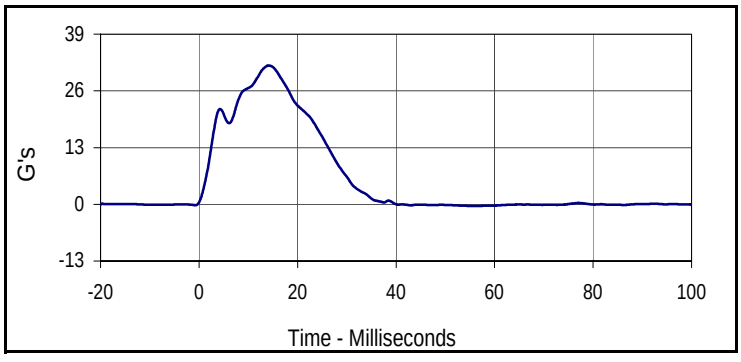
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	431	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	45.2	Pass
	Min	%		44.9	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	45.2	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.63	Pass
Peak Shoulder Deflection		mm	31 to 40	33.7	Pass
Peak Upper Thorax Rib Deflection		mm	25 to 32	27.1	Pass
Peak Middle Thorax Rib Deflection		mm	30 to 36	31.3	Pass
Peak Lower Thorax Rib Deflection		mm	32 to 38	34.5	Pass
Peak Upper Spine Y Acceleration		G's	34 to 43	37.2	Pass
Peak Lower Spine Y Acceleration		G's	29 to 37	31.5	Pass
Peak Impactor Acceleration		G's	30 to 36	31.8	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
27.1	17.2	0.0	-0.9
Middle Thorax Deflection			
Max	Time	Min	Time
31.3	17.8	0.0	-2.0
Lower Thorax Deflection			
Max	Time	Min	Time
34.5	18.6	0.0	-16.6

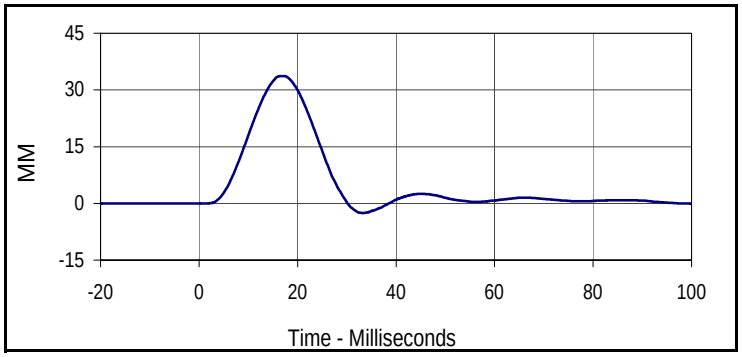


Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
37.2	10.5	-14.5	31.9
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
31.5	9.9	-7.7	37.7



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
31.8	14.2	-0.4	56.8

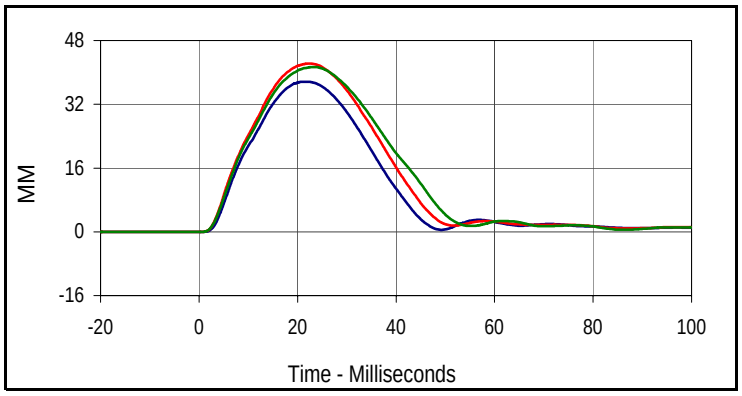
Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	1/9/15
ATD Serial No.:	307	Test I.D.:	307TWA078



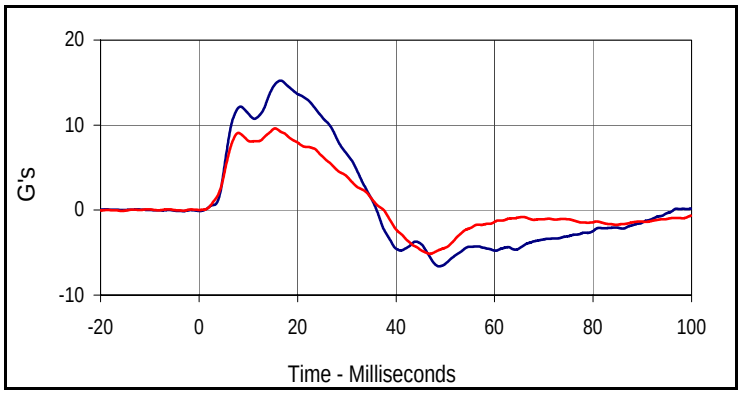
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
33.7	16.9	-2.5	33.3

Test Program:	SID IIs Thorax without Arm Impact Test	Test Date:	1/9/15
ATD Serial No.:	307	Test I.D.:	307TWOA078

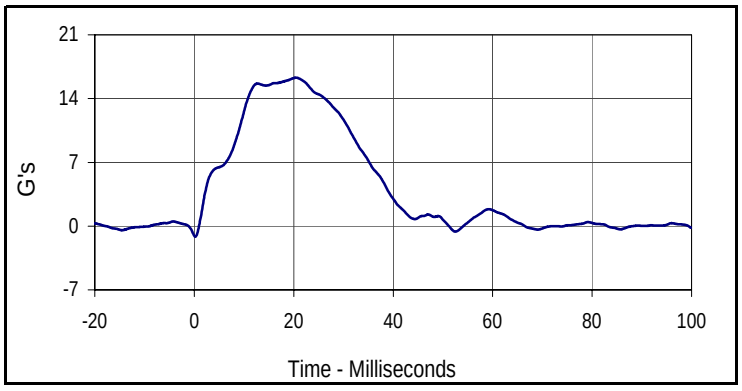
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	486	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	45.2	Pass
	Min	%		44.9	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	45.1	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.32	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	37.7	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	42.3	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	41.4	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	15.2	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	9.6	Pass
Peak Impactor Acceleration		G's	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
37.7	21.8	0.0	-14.7
Middle Thorax Deflection			
Max	Time	Min	Time
42.3	22.4	0.0	-20.0
Lower Thorax Deflection			
Max	Time	Min	Time
41.4	23.5	0.0	-10.9



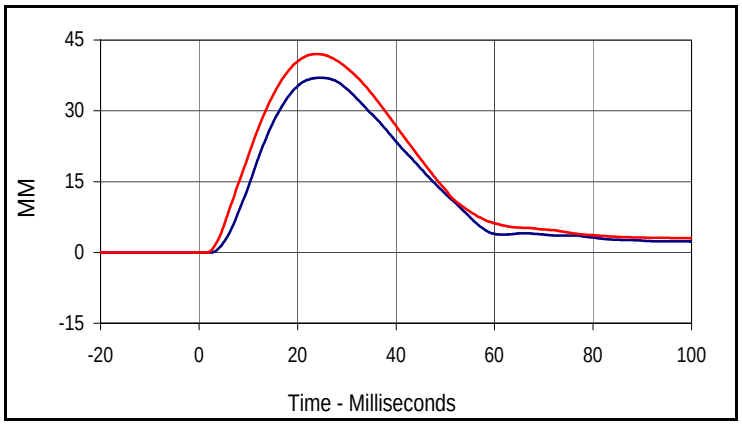
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.2	16.6	-6.6	48.7
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.6	15.4	-5.1	46.9



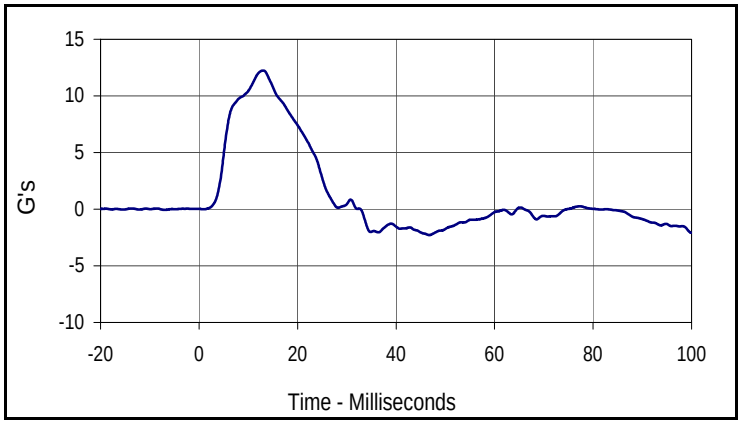
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.3	20.5	-1.2	0.2

Test Program:	SID IIs Abdomen Impact Test	Test Date:	1/9/15
ATD Serial No.:	307	Test I.D.:	307ABD078

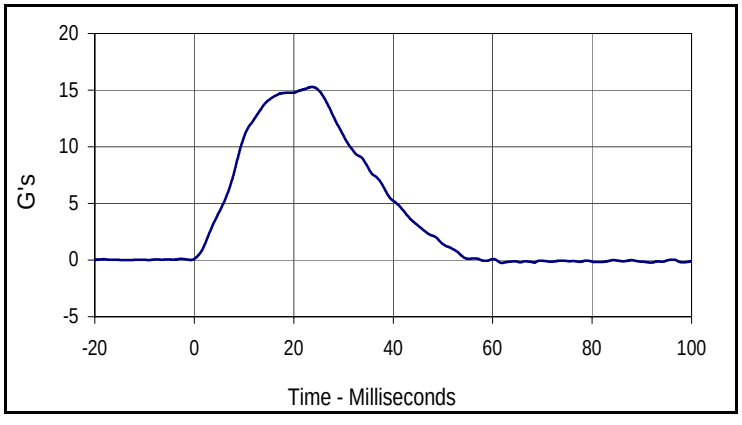
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	541	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	45.2	Pass
	Min	%		44.9	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	45.1	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.37	Pass
Peak Upper Abdominal Rib Deflection		mm	36 to 47	37.0	Pass
Peak Lower Abdominal Rib Deflection		mm	33 to 44	42.0	Pass
Peak Lower Spine Y Acceleration		G's	9 to 14	12.2	Pass
Peak Impactor Acceleration		G's	12 to 16	15.3	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
37.0	24.6	0.0	-13.2
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
42.0	23.8	0.0	-12.5

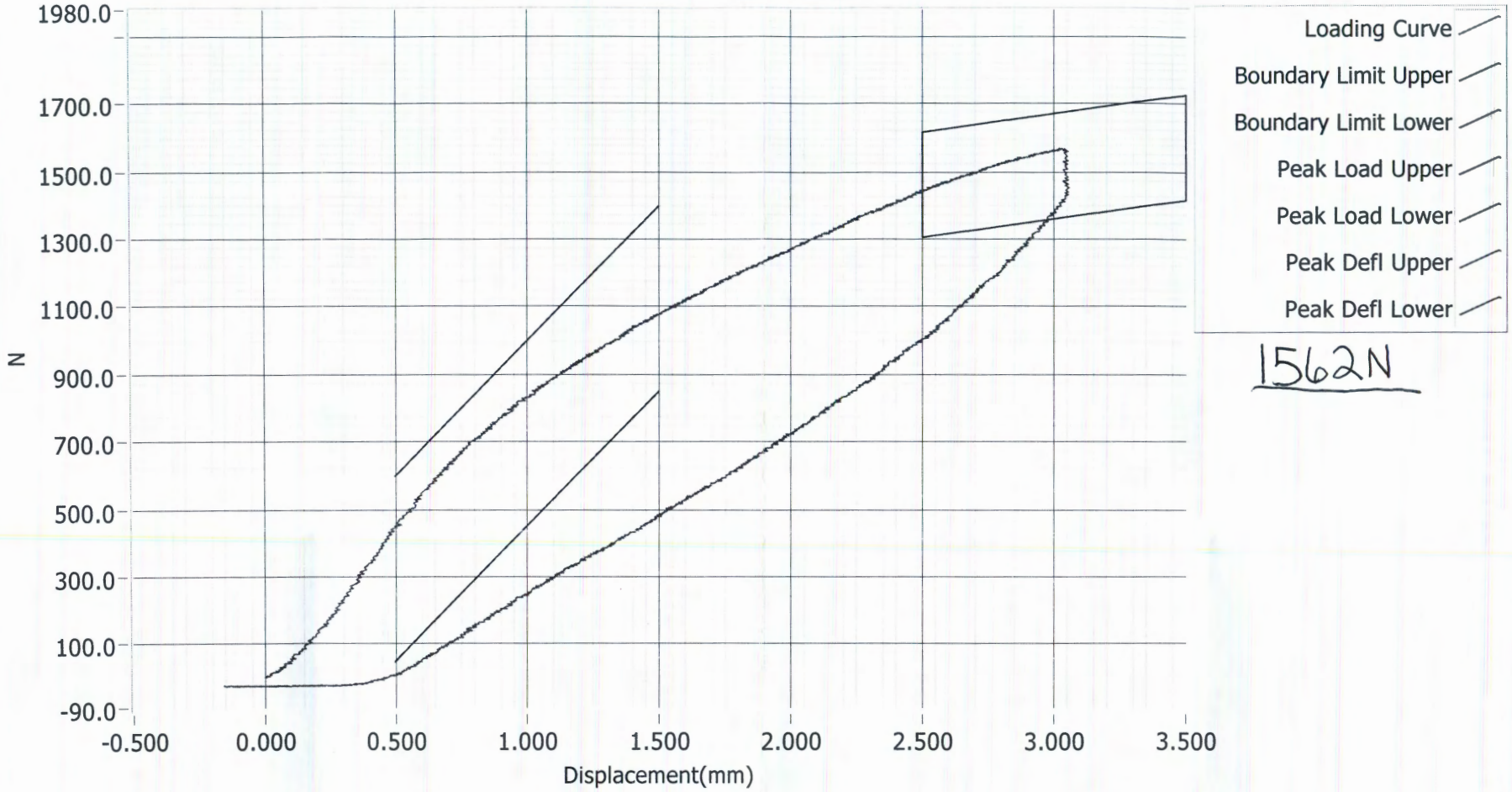


Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
12.2	13.0	-2.3	46.8



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.3	23.7	-0.3	61.9

Resultant Data - SIDIIs Plug Compression



1562N

ATD Calibration Lab

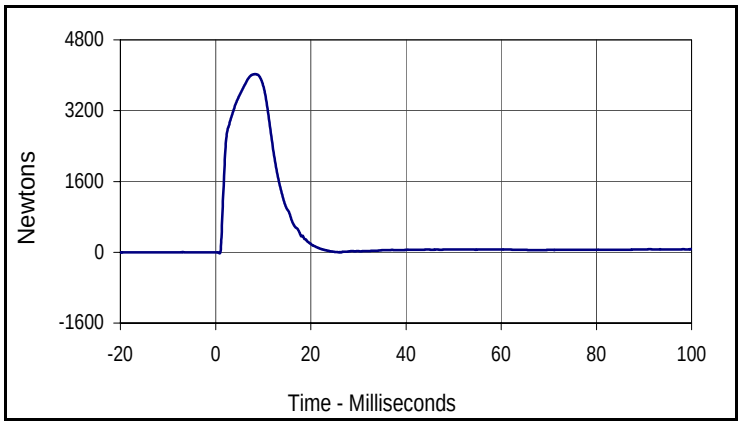
M20150221 Post Test

Test ID	Part Serial Number	Test Date	Test Time
	70981	12/13/2013	10:48 PM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

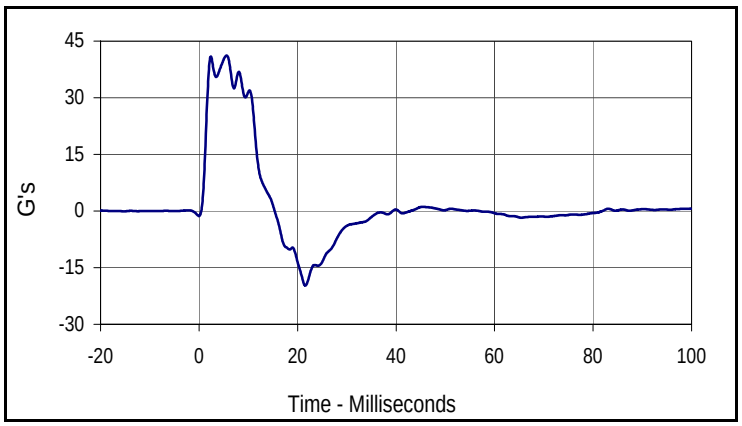
Current Date : 12/13/2013 Current Time : 22:48:58

Test Program:	SID IIs Pelvis Acetabulum Impact Test	Test Date:	1/9/15
ATD Serial No.:	307	Test I.D.:	307ACET078

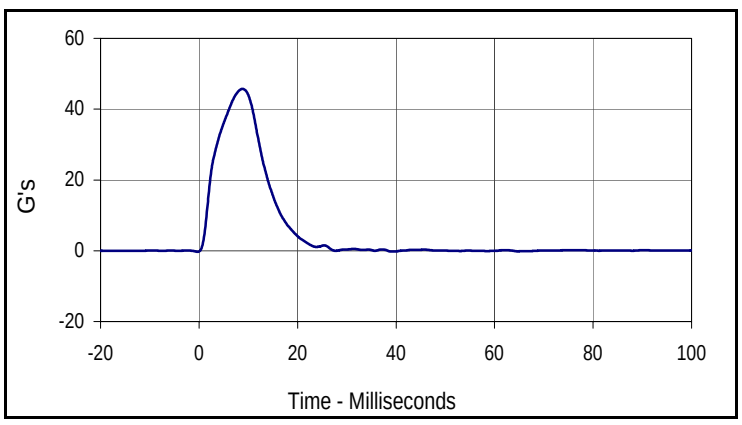
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	591	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	45.2	Pass
	Min	%		44.9	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	45.0	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.72	Pass
Peak Acetabulum Force Y		Newtons	3600 to 4300	4025.8	Pass
Peak Pelvis Y Acceleration After 6 msec.		G's	34 to 42	40.2	Pass
Peak Impactor Acceleration		G's	38 to 47	45.7	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4025.8	8.3	-26.6	0.9



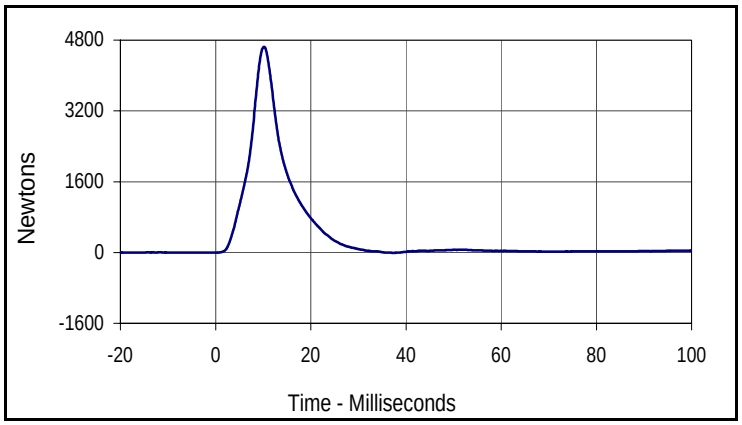
Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
41.2	5.6	-19.7	21.6



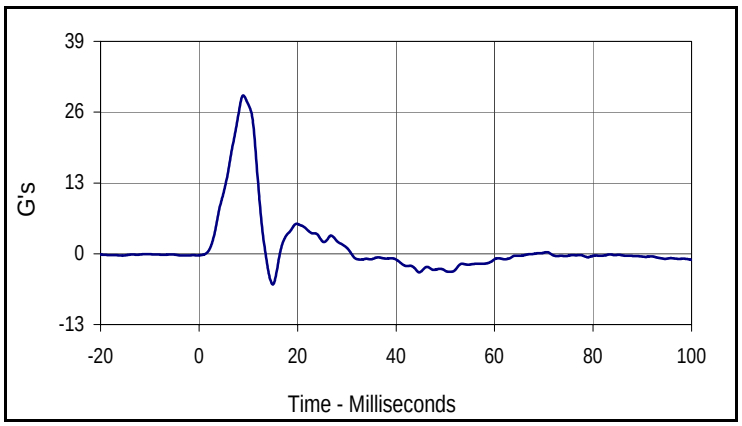
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
45.7	8.8	-0.3	-0.3

Test Program:	SID IIs Pelvis Iliac Calibration	Test Date:	1/9/15
ATD Serial No.:	307	Test I.D.:	307PL078

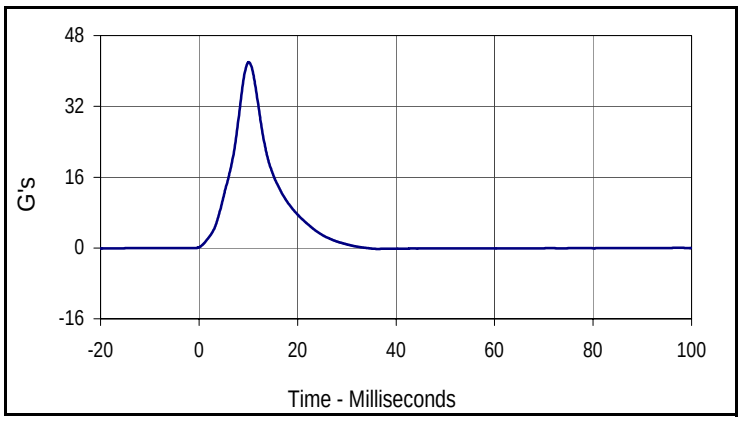
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	646	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	45.2	Pass
	Min	%		44.9	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	44.9	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.33	Pass
Peak Illiac Force		Newtons	4100 to 5100	4649.9	Pass
Peak Pelvis Y Acceleration		G's	28 to 39	29.1	Pass
Peak Impactor Acceleration		G's	36 to 45	42.0	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4649.9	10.2	-10.8	37.4



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
29.1	9.0	-5.6	15.0



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
42.0	10.1	-0.2	36.2

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (ES-2re)

			ES-2re S/N F037		
			Serial Number	Manufacturer	Calibration
Head Accelerometers	Primary	X	P58858	Endevco	10/11/14
		Y	P58865	Endevco	10/11/14
		Z	P58867	Endevco	10/11/14
	Redundant	X	P58859	Endevco	10/11/14
		Y	P58866	Endevco	10/11/14
		Z	P58873	Endevco	10/11/14
Thorax Rib Displacement Potentiometers	Upper	Y	209	FTSS	10/12/14
	Middle	Y	210	FTSS	10/12/14
	Lower	Y	207	FTSS	10/12/14
Abdomen Load Cells	Forward	Y	1504	Denton	5/1/14
	Middle	Y	1505	Denton	5/1/14
	Rear	Y	1506	Denton	5/1/14
Lower Spine Accelerometers (T12)		X	P16336	Endevco	10/11/14
		Y	P52027	Endevco	10/11/14
		Z	P58877	Endevco	10/11/14
Pubic Symphysis Load Cell		Y	DG6784	Denton	5/15/14

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 307		
				Serial Number	Manufacturer	Calibration
Head Accelerometers		Primary	X	P58900	Endevco	9/29/14
			Y	P58902	Endevco	9/29/14
			Z	P58983	Endevco	9/29/14
		Redundant	X	P58901	Endevco	9/29/14
			Y	P58906	Endevco	9/29/14
			Z	P58989	Endevco	9/29/14
Displacement Potentiometers	Thoracic Rib	Upper	Y	1249	FTSS	9/30/14
		Middle	Y	1265	FTSS	9/30/14
		Lower	Y	1277	FTSS	9/30/14
	Abdominal Rib	Upper	Y	1286	FTSS	9/30/14
		Lower	Y	1290	FTSS	9/30/14
Lower Spine Accelerometers (T12)			X	P59007	Endevco	9/30/14
			Y	P59015	Endevco	9/30/14
			Z	P58995	Endevco	9/30/14
Acetabulum Load Cell			Y	260	Denton	5/8/14
Iliac Wing Load Cell			Y	272	Denton	4/4/14
Pelvis Plug (Struck Side)				70650	FTSS	12/12/13
Pelvis Plug (Non-Struck Side)				72941	FTSS	2/8/14

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	A147472	MSI	8/14/14
	Vehicle Center of Gravity	Y	A148274	MSI	8/13/14
	Vehicle Center of Gravity	Z	A147470	MSI	8/13/14
2	Right Sill at Front Seat	X	A148200	MSI	8/14/14
	Right Sill at Front Seat	Y	A148238	MSI	8/14/14
	Right Sill at Front Seat	Z	A148206	MSI	8/16/14
3	Right Sill at Rear Seat	X	N/A	N/A	N/A
	Right Sill at Rear Seat	Y	N/A	N/A	N/A
	Right Sill at Rear Seat	Z	N/A	N/A	N/A
4	Left Sill at Front Door	Y	A147466	MSI	9/20/14
5	Left Sill at Rear Door	Y	A145481	MSI	10/8/14
6	Left A-Post Lower	Y	A147444	MSI	8/16/14
7	Left A-Post Middle	Y	A147455	MSI	8/13/14
8	Left B-Post Lower	Y	N/A	N/A	N/A
9	Left B-Post Middle	Y	N/A	N/A	N/A
10	Front Seat Track	Y	A145492	MSI	8/8/14
11	Rear Seat Structure	Y	N/A	N/A	N/A
12	Right Rear Occ. Compartment	Y	A145469	MSI	8/16/14
13	Engine Block	X	A145454	MSI	8/16/14
	Engine Block	Y	A145439	MSI	8/8/14
14	Rear Floorpan Above Axle	X	A145448	MSI	8/22/14
	Rear Floorpan Above Axle	Y	A145470	MSI	8/16/14
	Rear Floorpan Above Axle	Z	A145479	MSI	8/16/14

TABLE 4 – MDB Instrumentation

		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	A128040	MSI	10/3/14
MDB Center of Gravity	Y	A124105	MSI	10/3/14
MDB Center of Gravity	Z	A104832	MSI	10/3/14
Left Frame at Rear Axle Centerline	X	A104798	MSI	10/3/14
Left Frame at Rear Axle Centerline	Y	A104808	MSI	10/3/14