

REPORT NUMBER: SINCAP-KAR-15-006

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

**FUJI HEAVY INDUSTRIES LTD.
2015 SUBARU OUTBACK 2.5i 5-DOOR MPV**

NHTSA No: O20155502

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



NOVEMBER 5, 2014

FINAL REPORT

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

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. SINCAP-KAR-15-006	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Final Report of New Car Assessment Program Side Impact MDB Testing of a 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502		5. Report Date November 5, 2014
		6. Performing Organization Code KAR
7. Authors Mr. Balbino A. Beltran, Project Engineer, KARCO Mr. Frank Richardson, Program Manager, KARCO		8. Performing Organization Report No. TR-P34181-01-NC
9. Performing Organization Name and Address KARCO Engineering, LLC. 9270 Holly Rd. Adelanto, CA 92301		10. Work Unit No.
		11. Contract or Grant No. DTNH22-09-D-00122
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NVS-111) 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C. 20590		13. Type of Report and Period Covered Final Test Report, Oct. 22 - Nov. 5, 2014
		14. Sponsoring Agency Code NVS-111
15. Supplementary Notes		

16. Abstract

A 55/28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2015 Subaru Outback 2.5i 5-door MPV 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 October 22, 2014.

The impact velocity of the Moving Deformable Barrier was 62.25 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 26.7° C. The target vehicle's maximum post-test static crush was 181 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	68.7
Maximum Thoracic Rib Deflection	mm	44	12
Total Abdominal Force	N	2500	853
Pubic Symphysis Force	N	6000	1220

Measurement Description	Passenger ATD (SID-II's)		
	Units	IARV	Result
Head Injury Criteria (HIC ₃₆)		1000	223.1
Resultant Lower Spine Acceleration	g	82	51
Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	2343
Maximum Thoracic Rib Deflection	mm	38*	18
Maximum Abdominal Rib Deflection	mm	45*	13

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

* Proposed IARV

17. Key Words New Car Assessment Program (NCAP) Side Impact Moving Deformable Barrier (MDB) ES-2re SID-IIs		18. Distribution Statement 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 UNCLASSIFIED	20. Security Classification of this page UNCLASSIFIED	21. No. of Pages 159	22. Price

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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 Subaru Outback 2.5i 5-door MPV. 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 Subaru Outback 2.5i 5-door MPV 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 62.25 km/h (38.68 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 October 22, 2014. 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	68.7
Maximum Thoracic Rib Deflection	mm	44	12
Combined Abdominal Force	N	2500	853
Pubic Symphysis Force	N	6000	1220

Measurement Description	Units	Passenger ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	223.1
Lower Spine (T12) Resultant Acceleration	g	82	51
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2343
Maximum Thoracic Rib Deflection	mm	38*	18
Maximum Abdominal Rib Deflection	mm	45*	13

*Proposed IARV

Supplemental restraint information is given below:

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

GENERAL COMMENTS

The two doors on the struck side of the vehicle remained closed and latched. There was no separation at the hinges or latches. The doors on the non-struck side remained closed and latched. There were no ATD values that exceeded limits.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14

CONVERSION FACTORS

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

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
 Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	O20155502
Model Year	2015
Make	Subaru
Model	Outback 2.5i
Body Style	5-Door MPV
VIN	4S4BSAAC1F3220784
Body Color	Lapis Blue Pearl
Odometer Reading (km / mi)	47 / 29
Engine Displacement (L)	2.5
Type / No. of Cylinders	H-4
Engine Placement	Longitudinal
Transmission Type	Automatic
Transmission Speeds	CVT
Overdrive	Yes
Final Drive	AWD
Roof Rack	Yes
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks	No
Power Window Auto-Reverse	Yes
Other Optional Feature	No
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head/Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso/Pelvis Airbag	No
Rear Pass. Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensioner	No
Driver Load Limiter	Yes
Rear Pass. Load Limiter	No
Other Safety Restraint	Front Seat Cushion Airbags

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Fuji Heavy Industries LTD.
Date of Manufacture	Aug-14
Vehicle Type	MPV

GVWR (kg)	2130
GAWR Front (kg)	1150
GAWR Rear (kg)	1200

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity	2	3		5
Capacity Weight (VCW) (kg)				408.0
DSC x 68.04 (kg)				340.2
Cargo Weight (RCLW) (kg)				67.8

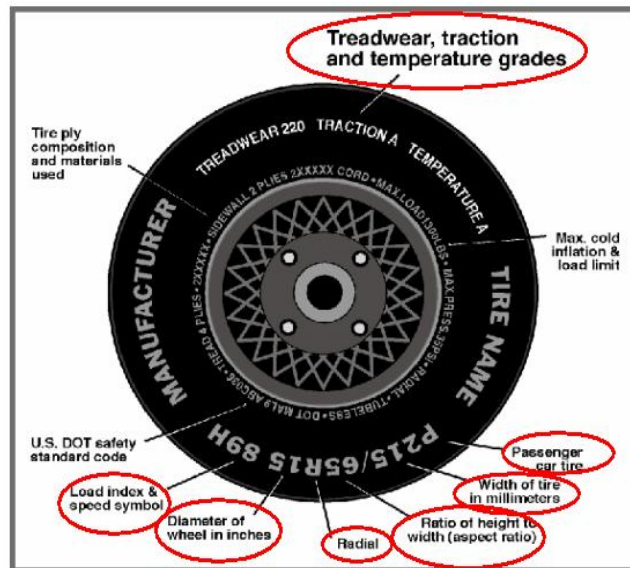
VEHICLE SEAT TYPE

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

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
 Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14



Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	300	300
Cold Pressure (kPa)	240	230
Recommended Tire Size	P255/65R17	P255/65R17
Tire Size on Vehicle	P255/65R17	P255/65R17
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Dueler H/P	Dueler H/P
Treadware	500	500
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Nylon	1 Polyester, 2 Steel, 1 Nylon
Load Index/Speed Symbol	102H	102H
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Left	OB2Y HP8 3114	OB2Y HP8 3114
DOT Safety Code Right	OB2Y HP8 3114	OB2Y HP8 3114

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
 Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	270	255	255	255
Tire Placard	kPa	240	240	230	230
Owner's Manual	kPa	240	240	230	230
As Tested	kPa	240	240	230	230

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	456.0	354.0		516.0	460.5		514.5	444.0	
Right	kg	474.0	358.0		445.5	406.5		459.5	416.5	
Ratio	%	56.6%	43.4%	100.0%	52.6%	47.4%	100.0%	53.1%	46.9%	100.0%
Total	kg	930.0	712.0	1642.0	961.5	867.0	1828.5	974.0	860.5	1834.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1642.0	A
Actual Weight of 2 P572 ATDs Used	kg	125.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	67.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1834.8	A+B+C

Does the measured As Tested Vehicle Weight lie within the required weight range (i.e. Calculated Test Vehicle Target Weight -4.5 kg to -9.0 kg)? ☒ Yes ☐ No

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement***
LF	mm	797	801	Yes
RF	mm	816	813	Yes
LR	mm	797	792	Yes
RR	mm	809	805	Yes
Vehicle CG (Aft of Front Axle)	mm	1288	1302	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	36	54	

***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 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Non-Struck Side Door Panels	6.5
Cargo Area Trim	6.0
Spare Tire and Tools	19.5
Hub Caps	2.5
Ballast / Equipment Added	100.0

Test Height Adjustable Setting (If Applicable)	
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DATA SHEET NO. 2**SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA**Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14**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	4.0	0.0	2.0
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	2.0	630	Max	622	630	640
			Mid	622	630	640
			Min	622	630	640
Front Passenger Seat	Fixed	573	Max	563	573	581
			Mid	563	573	581
			Min	563	573	581
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 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
 Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14

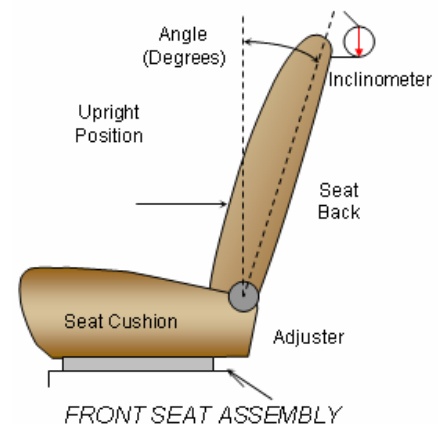
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	250	26	125	13
Front Passenger Seat	248	26	124	13
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 headrest post.



SEAT BACK POSITION

Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/Seated Dummy	66.7	33	2.9	6
Front Passenger Seat	63.9	33	2.0	6
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	11.5	4	6.9	0
Non-Struck Side Rear Seat	11.9	4	7.1	0
Rear Center Seat	Fixed to RR	Fixed to RR	Fixed to RR	Fixed to RR

*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 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
 Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1. The positions are marked H, M1,..., L from top to bottom.

	Total No. of Positions	Placed in Position
Driver Seat	4	M1
Rear Seat	Fixed	Fixed

HEAD RESTRAINT ADJUSTMENT

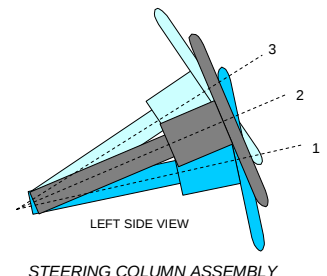
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total No. of Positions	Placed in Position
Driver Seat	3 Vertical, 5 Horizontal	Full Up, Full Forward
Rear Seat	2 Vertical	Full Down

STEERING COLUMN ADJUSTMENT

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

	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	21.4	85
Geometric Center - Position 2	22.9	103
Uppermost - Position 3	24.5	120
Telescoping Steering Wheel Travel		35
Test Position	22.9	103



DATA SHEET NO. 2 ... (CONTINUED)

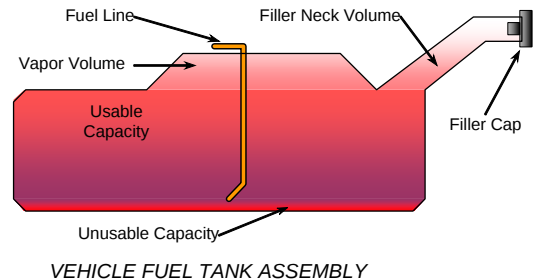
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14

FUEL PUMP

The vehicle is equipped with an electric fuel pump.

The fuel pump operates for a few seconds after the ignition is switched to the "ON" position. The fuel pump will continue to operate only while the engine is running.



FUEL TANK CAPACITY

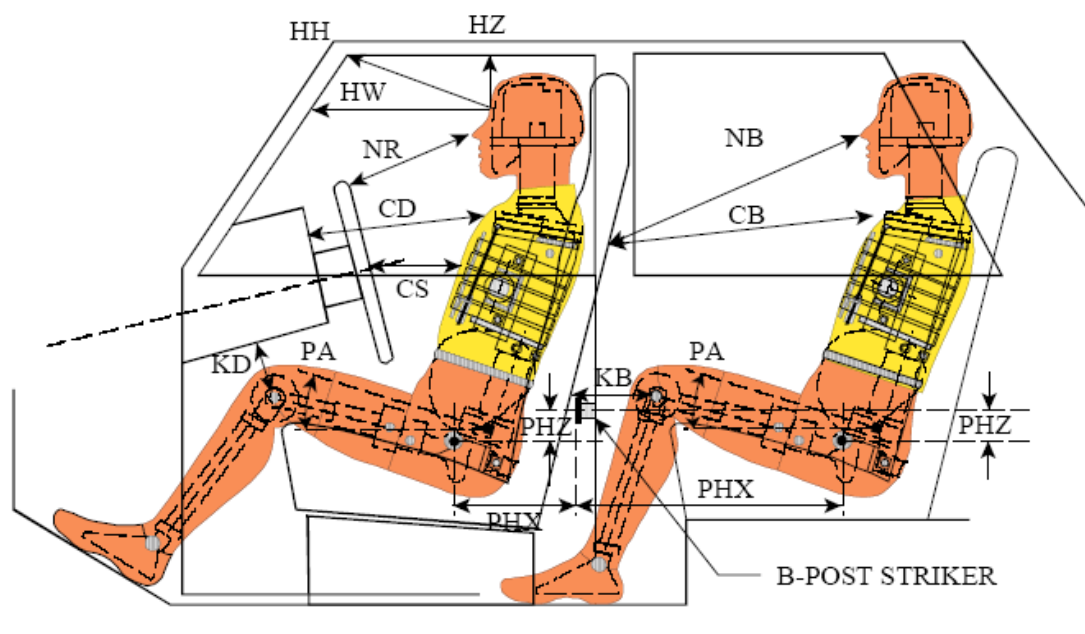
Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	70.02
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)	
Usable Capacity of "Optional Tank" (see Owner's Manual)	
93% of Usable Capacity	65.14
Actual amount of Solvent Used in Test	65.14
1/3 of Usable Capacity	23.34

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

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
 Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14



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

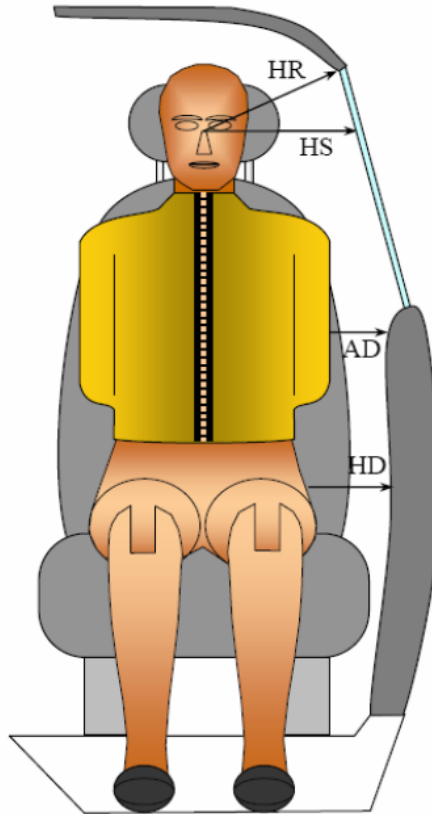
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Description	Driver		Passenger	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Head to Header	378			
HW		Head to Windshield	617			
HZ	HZ	Head to Roof	192		292	
NR	NB	Nose to Rim/Seat Back	447		555	
CD	CB	Chest to Dash/Seat Back	548		550	
CS		Chest to Steering Wheel	310			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	168	31.3	315	28.9
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	155	34.8	310	29.0
PAX°	PAX°	Pelvic Tilt Angle X		15.9		22.2
	PAY°	Pelvic Tilt Angle Y		0.4		0.4
PHX	PHX	Hip Point to Striker (x-axis)	217		272	
PHZ	PHZ	Hip Point to Striker (z-axis)	195		304	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14



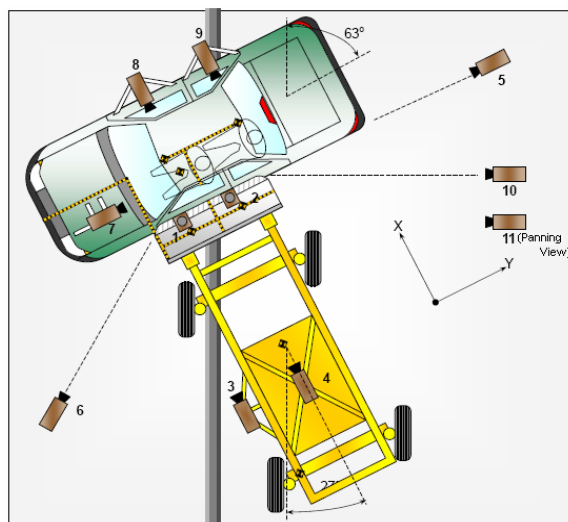
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	217	268
HS	Head to Side Window	mm	337	356
AD	Arm to Door	mm	114	173
HD	H-Point to Door	mm	155	172

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
 Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14



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)	624	-910	-747	24	1000
8	Driver Side (On-Board)	1645	825	-474	12	1000
9	Passenger Side (On-Board)	1712	1592	-527	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

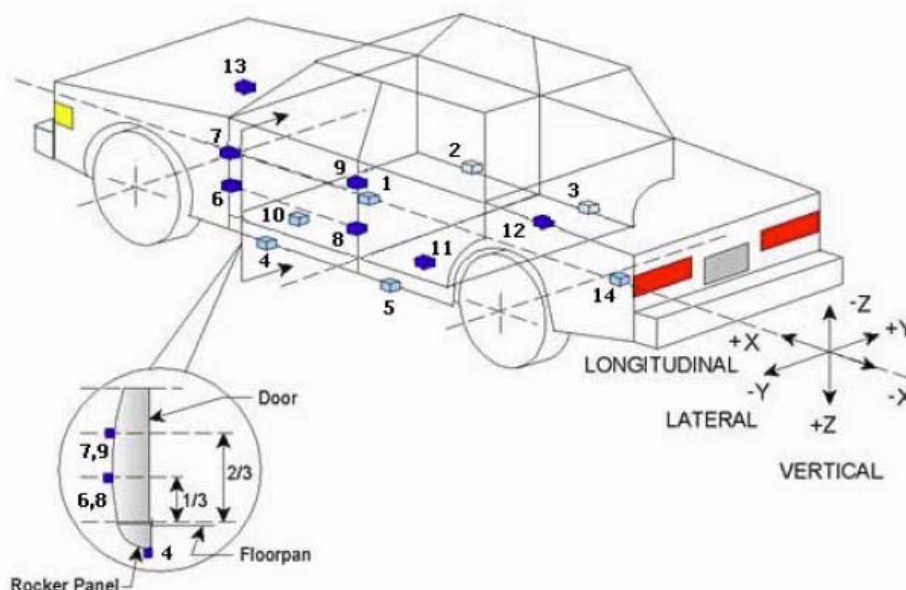
INSTRUMENTATION

Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	23
MDB Accelerometers	5
Total	60

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
 Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

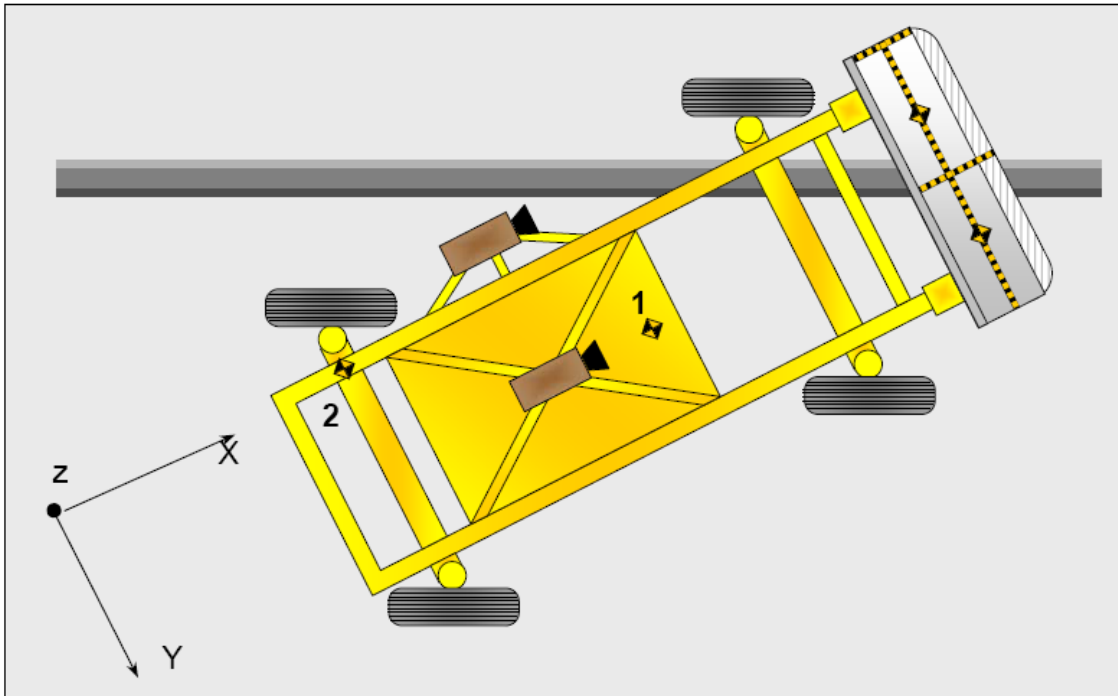
Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1908	0	-477
2	Right Sill at Front Seat	2773	721	-432
3	Right Sill at Rear Seat	1884	719	-432
4	Left Sill at Front Door	2772	-740	-283
5	Left Sill at Rear Door	1839	-752	-283
6	A-Pillar Lower	3210	-813	-693
7	A-Pillar Middle	3210	-813	-896
8	B-Pillar Lower	2165	-753	-595
9	B-Pillar Middle	2165	-753	-981
10	Front Seat Track	2441	-216	-367
11	Rear Seat Structure			
12	Right Rear Occupant Compartment	2030	404	-317
13	Engine Block	4061	30	-675
14	Rear Floorpan Above Axle	932	-303	-626

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 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14



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 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
 Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	Curtain Airbag	Curtain Airbag
Top of Head	Side Header	Curtain Airbag
Left Side of Head	Curtain Airbag, Side Header	Curtain Airbag
Back of Head	Curtain Airbag, Side Header, Headrest	Curtain Airbag, Center Seat Back, Center Headrest
Left Shoulder	Curtain Airbag, Torso/Pelvis Airbag	Door Panel
Upper Torso	Seat, Torso/Pelvis Airbag	Door Panel
Lower Torso	Seat, Torso/Pelvis Airbag	Seat, Door Panel
Left Hip	Seat, Torso/Pelvis Airbag, Door Panel	Seat, Door Panel
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	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge System Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)	N/A	N/A	N/A	N/A	N/A

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

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14

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	None
Other Notable Effects	None

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

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2746
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		433
Actual Impact Point (Aft of Front Axle)	mm		427
Horizontal Offset (+ forward / - rearward)	mm	± 50 of Intended Impact Point	6
Vertical Offset (+ down / - up)	mm	± 20 of Intended Impact Point	12

DATA SHEET NO. 9**MDB SUMMARY OF RESULTS**

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
 Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14

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	62.25
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.24
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	88.9
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	62.5
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26.0 to 28.0	26.4

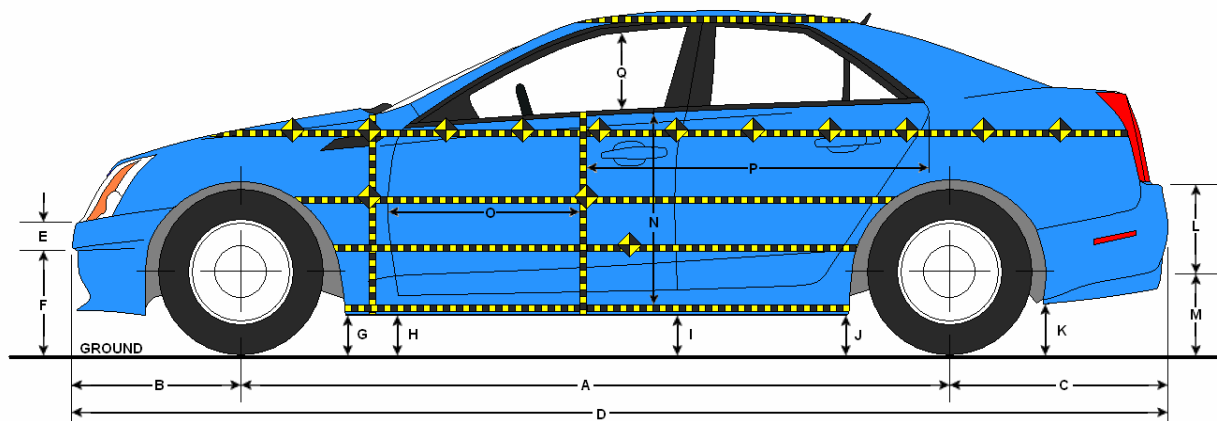
MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

Vertical Location			From Centerline		Max. Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	800	Left	262
B	Top of Bumper	533	800	Left	202
C	Mid Level	686	800	Left	212
D	Top of Stack	813	800	Left	217

DATA SHEET NO. 10

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
 Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2746	2730	-16
B	Front Axle to FSOV	998	1007	9
C	Rear Axle to RSOV	1073	1073	0
D	Total Length at Centerline	4817	4810	-7
E	Front Bumper Thickness	97	97	0
F	Front Bumper Bottom to Ground	499	503	4
G	Sill Height at Front Wheel Well	273	287	14
H	Sill Height at Front Door Leading Edge	273	285	12
I	Sill Height at B-Pillar	287	288	1
J1	Sill Height at Rear Wheel Well	282	289	7
J2	Pinch Weld Height at Rear Wheel Well	267	281	14
K	Sill Height Aft of Rear Wheel Well	273	291	18
L	Rear Bumper Thickness	134	134	0
M	Rear Bumper Bottom to Ground	498	519	21
N	Sill Height to Bottom of Front Window Sill	678	651	-27
O	Front Door Leading Edge to Impact CL	805	783	-22
P	Rear Door Trailing Edge to Impact CL	1435	1408	-27
Q	Front Window Opening	434	460	26
R	Right Side Length	3214	3219	5
S	Left Side Length	3216	3199	-17
T	Vehicle Width at B-Pillar	1826	1729	-97

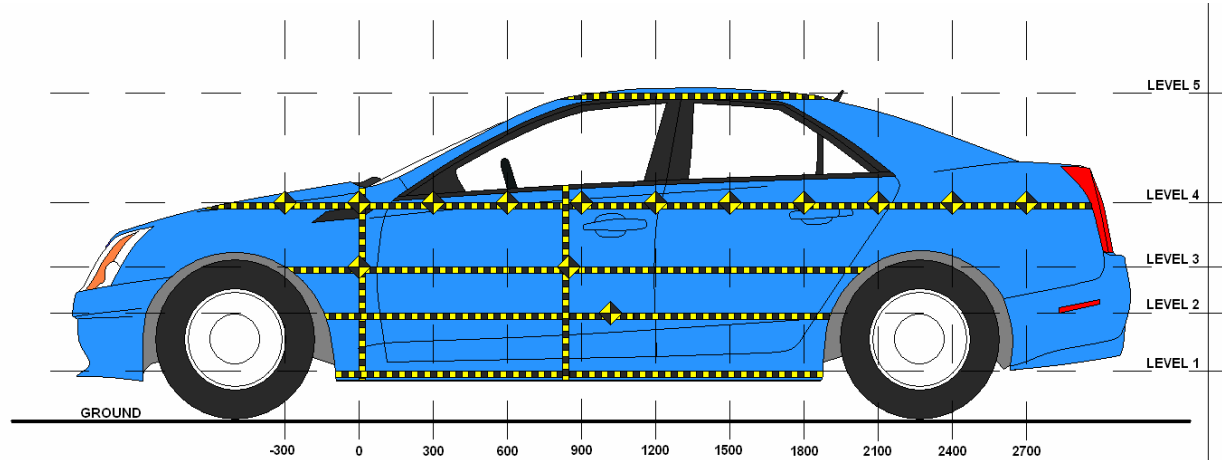
All measurements in mm with tolerance of ± 3 mm

DATA SHEET NO. 11

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502

Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	317	18	450
2	Occupant H-Point	644	167	1650
3	Mid-Door	722	181	1650
4	Window Sill	941	118	1500
5	Window Top	1536	7	1350

DATA SHEET NO. 11 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
 Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14

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				639					643					4	
-150			585	641				597	645				12	4	
0	616	592	592	634		633	610	606	640		17	18	14	6	
150	630	600	599	629		648	651	668	678		18	51	69	49	
300	651	601	598	620		669	683	713	667		18	82	115	47	
450	658	600	597	613		676	704	741	667		18	104	144	54	
600	657	599	595	611		672	719	752	670		15	120	157	59	
750	656	599	594	611	899	670	724	754	669	902	14	125	160	58	3
900	654	598	593	611	894	667	724	747	683	899	13	126	154	72	5
1050	653	598	593	597	896	666	719	725	637	902	13	121	132	40	6
1200	653	600	594	612	899	663	690	711	662	906	10	90	117	50	7
1350	654	601	595	611	901	662	719	752	728	908	8	118	157	117	7
1500	655	601	595	610	903	660	748	774	728	909	5	147	179	118	6
1650	653	601	596	610	904	654	768	777	697	909	1	167	181	87	5
1800	618	596	594	611	904	613	735	741	674	908	-5	139	147	63	4
1950		587	585	613	904		626	653	648	907		39	68	35	3
2100				612	905				622	908				10	3
2250				610	907				628	908				18	1
2400				615	910				627	910				12	0
2550				630	916				636	916				6	0
2700				643	927				645	925				2	-2
2850				658					657					-1	

DATA SHEET NO. 11 ... (CONTINUED)

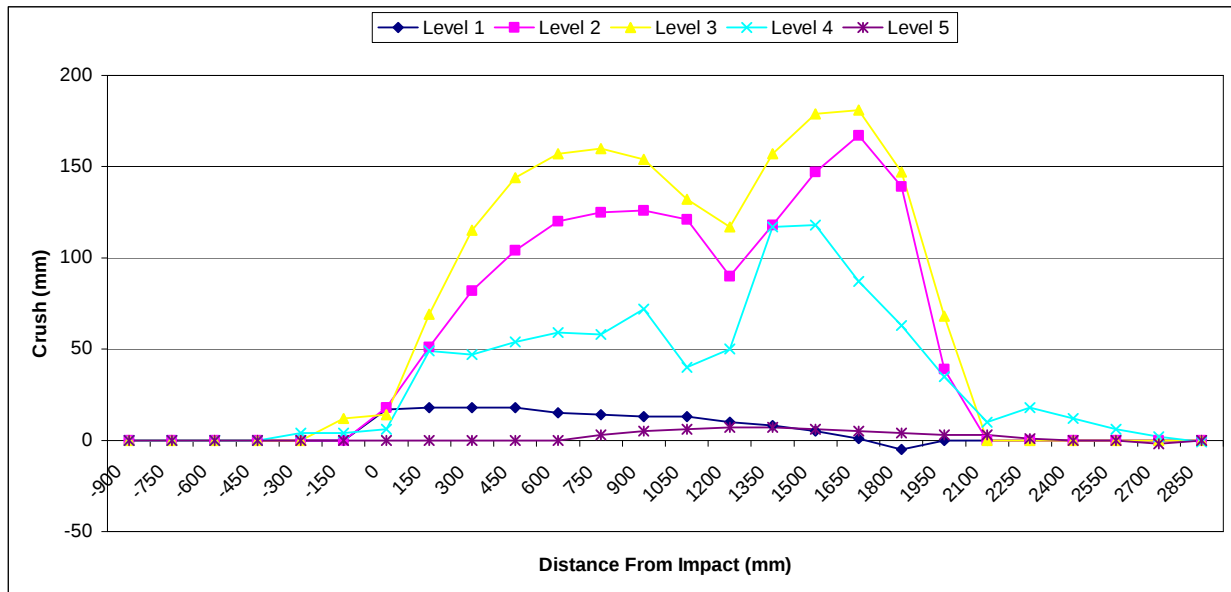
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV

NHTSA No. O20155502

Test Program: NCAP MDB Side Impact Test

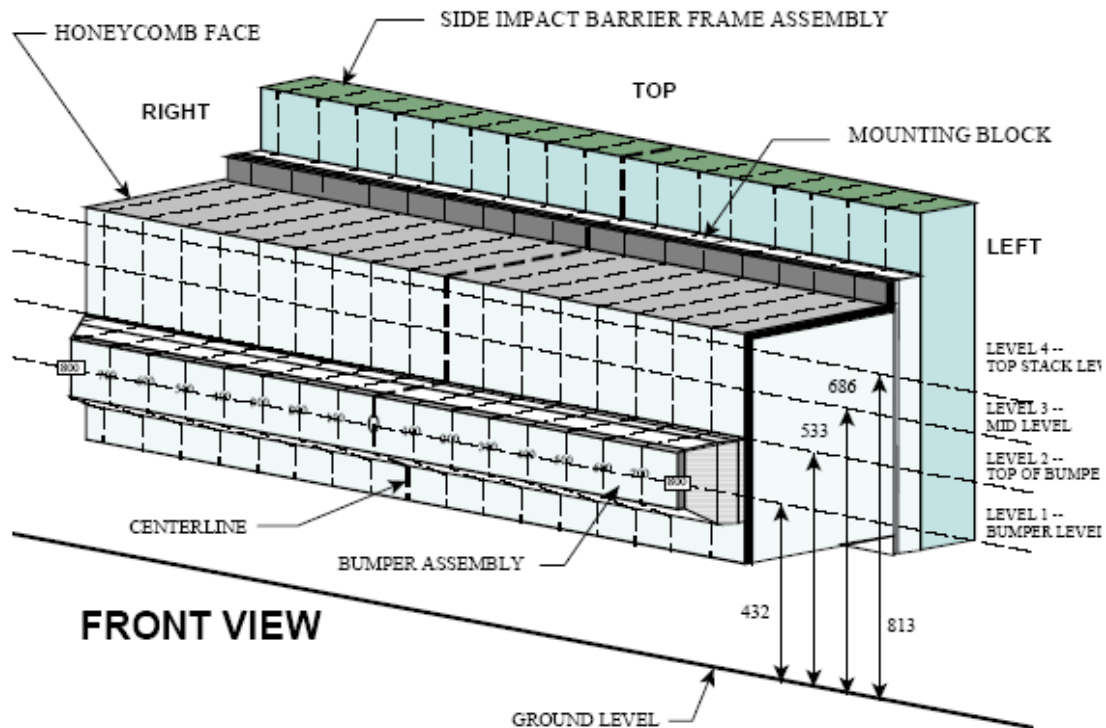
Test Date: 10/22/14



DATA SHEET NO. 12

MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
 Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

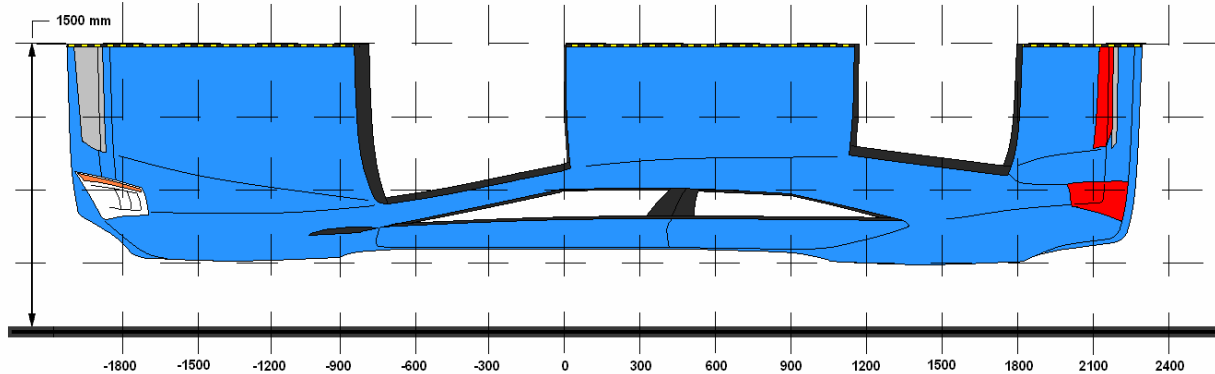
Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	262	239	249	249	249	251	250	249	244	242	244	244	242	244	244	245	262
2	200	202	202	200	197	184	182	192	197	194	192	192	192	192	192	195	202
3	117	112	122	143	147	174	161	142	127	120	112	112	117	127	147	172	212
4	134	112	107	112	127	154	172	146	122	113	112	122	127	132	142	172	217

All dimensions in millimeters.

DATA SHEET NO. 13

VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
 Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	2850	4	658	657	-1
2	2250	4	610	628	18
3	1650	3	596	777	181
4	900	3	593	747	154
5	300	3	598	713	115
6	-300	4	639	643	4

MDB DAMAGE PROFILE DISTANCES

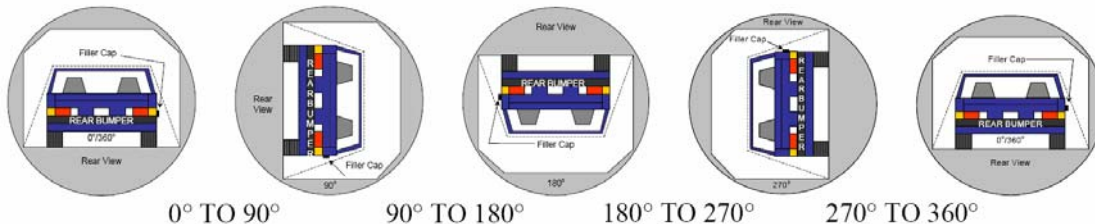
DPD	From MDB Centerline		Level	Crush (mm)
	Distance (mm)	Direction		
1	800	Left	1	262
2	500	Left	1	244
3	200	Left	1	244
4	200	Right	1	250
5	500	Right	1	249
6	800	Right	1	262

DATA SHEET NO. 14

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502
 Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14
 Temperature at Time of Impact: 26.7° C Test Time: 11:28 AM

- A. From impact until vehicle motion ceases: 0 oz.
 (Maximum allowable = 1 oz.)
- B. For the 5 minute period after motion ceases: 0 oz.
 (Maximum allowable = 5 oz.)
- C. For the following 25 minutes: 0 oz.
 (Maximum allowable = 1 oz./minute)
- D. Spillage Details: There was no Stoddard solvent spillage.



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	84	300	384
90° To 180°	80	300	380
180° To 270°	76	300	376
270° To 360°	83	300	383

FMVSS 301 SPILLAGE TABLE

Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° To 90°	0			
90° To 180°	0			
180° To 270°	0			
270° To 360°	0			

SOLVENT SPILLAGE LOCATION TABLE

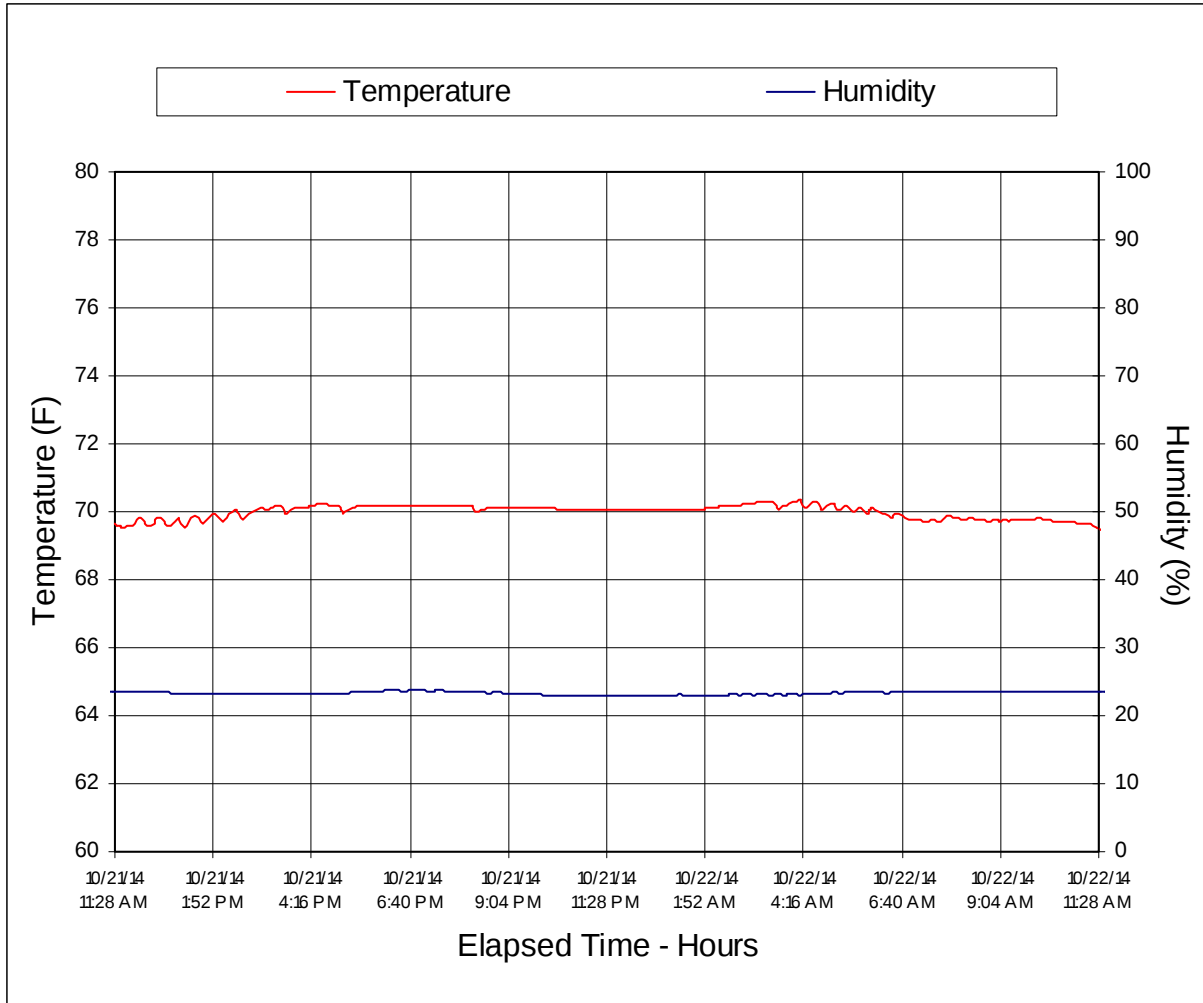
Test Phase	Spillage Location
0° To 90°	N/A
90° To 180°	N/A
180° To 270°	N/A
270° To 360°	N/A

DATA SHEET NO. 15

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV NHTSA No. O20155502

Test Program: NCAP MDB Side Impact Test Test Date: 10/22/14



APPENDIX A
PHOTOGRAPHS

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97	FMVSS No. 301 Static Rollover 90 Degrees	A-49
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99	FMVSS No. 301 Static Rollover 270 Degrees	A-50
100	FMVSS No. 301 Static Rollover 360 Degrees	A-50
101	Impact Event	A-51
102	Monroney Label	A-51
103	Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-52
104	Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-52



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



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



FIGURE 3. Pre-Test Frontal View of Test Vehicle



FIGURE 4. Post-Test Frontal View of Test Vehicle



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



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



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



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



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



FIGURE 10. Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



FIGURE 11. Pre-Test Rear View of Test Vehicle



FIGURE 12. Post-Test Rear View of Test Vehicle



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



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



FIGURE 15. Pre-Test Overhead View of Test Area



FIGURE 16. Post-Test Overhead View of Test Area



FIGURE 17. Pre-Test Left Side View of 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

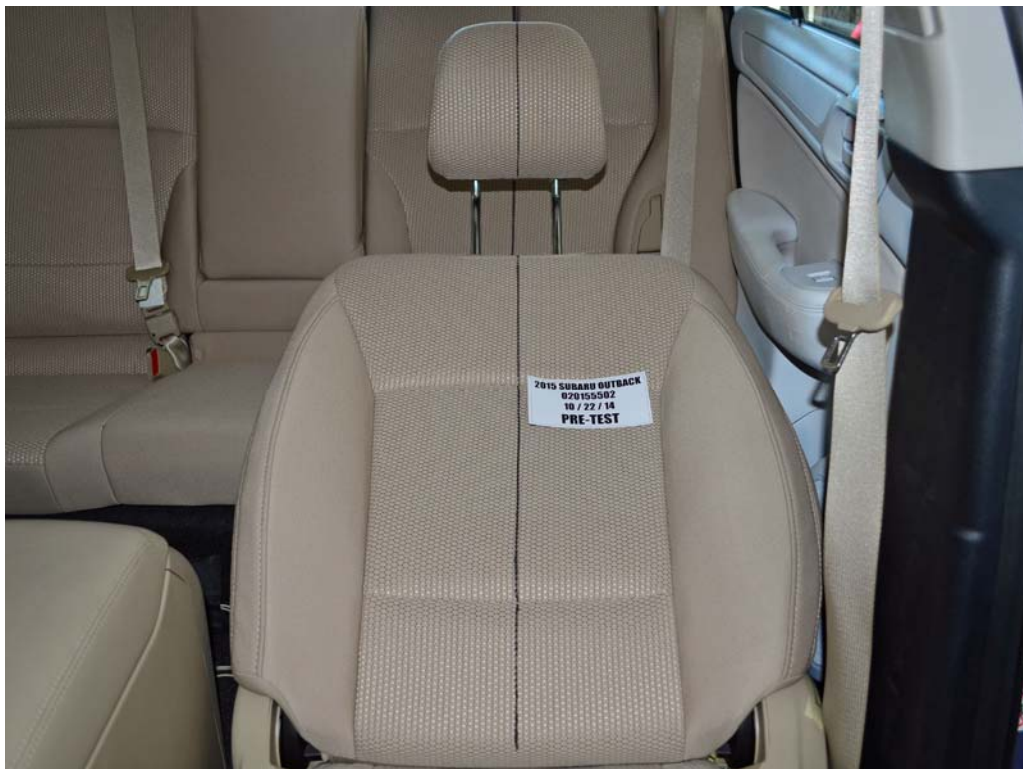


FIGURE 30. Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning



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

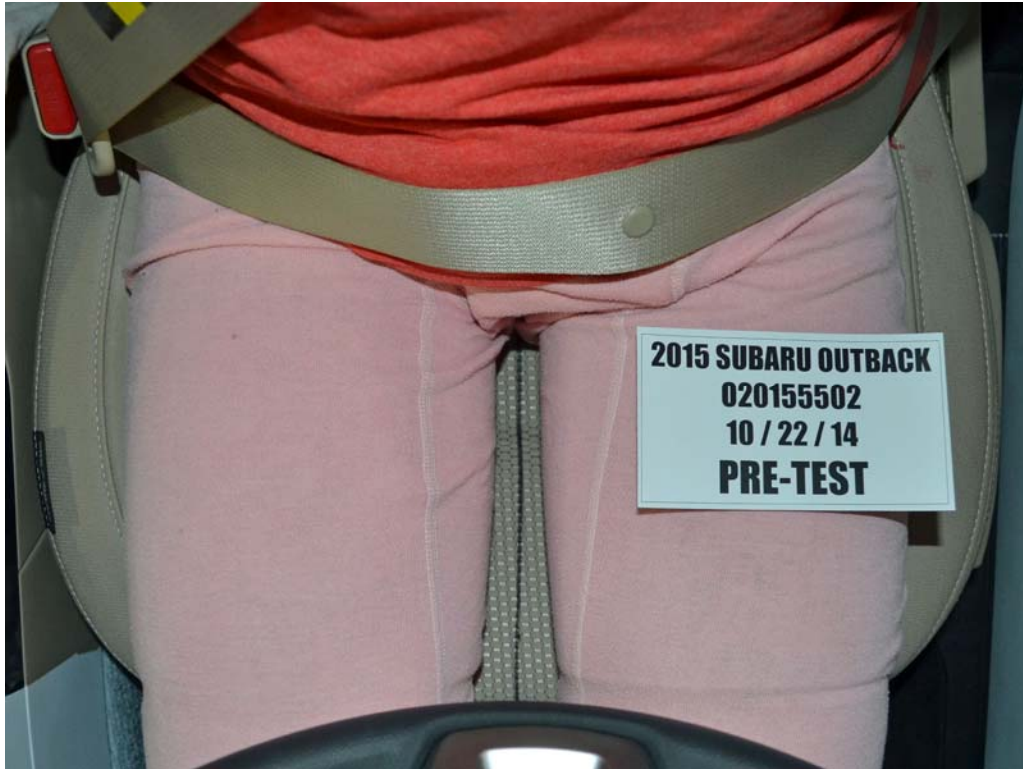


FIGURE 33. Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan



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

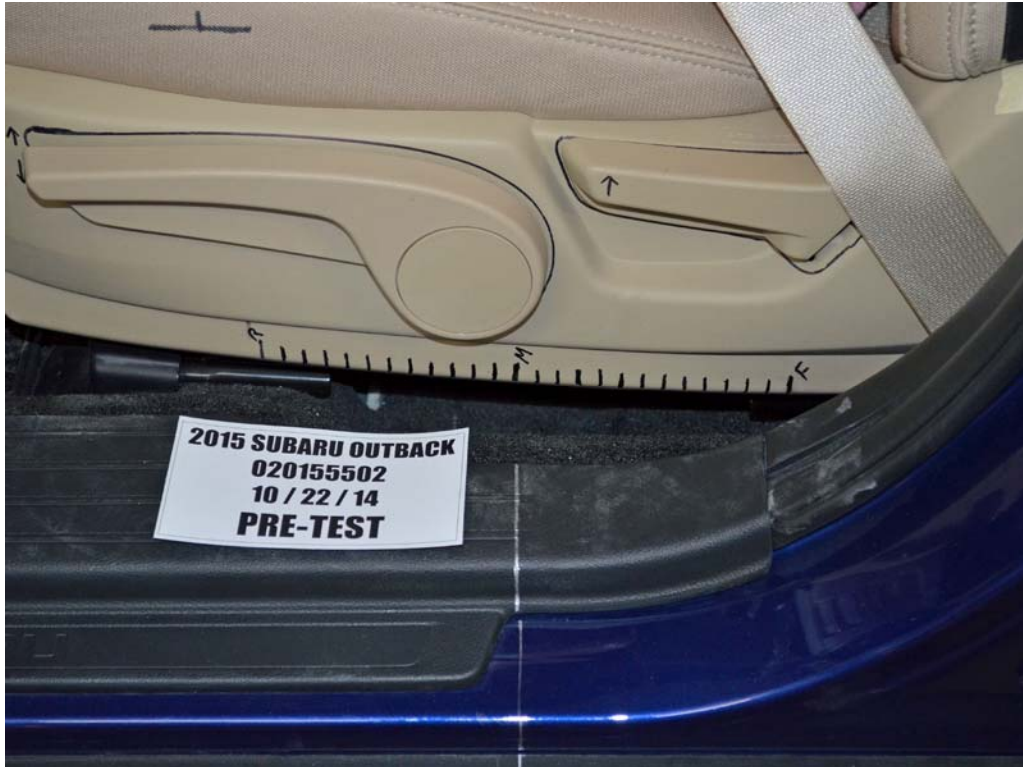


FIGURE 39. Pre-Test Close-Up Left Side View of Driver Seat Track



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

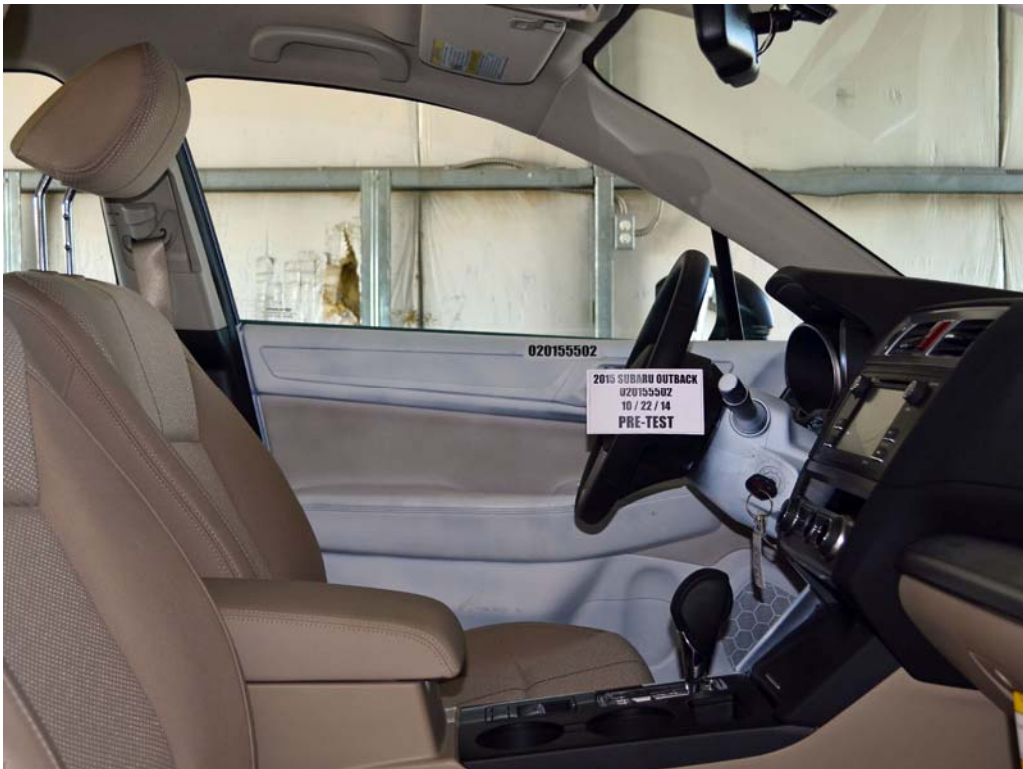


FIGURE 46. Pre-Test Driver Inner Door Panel View



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

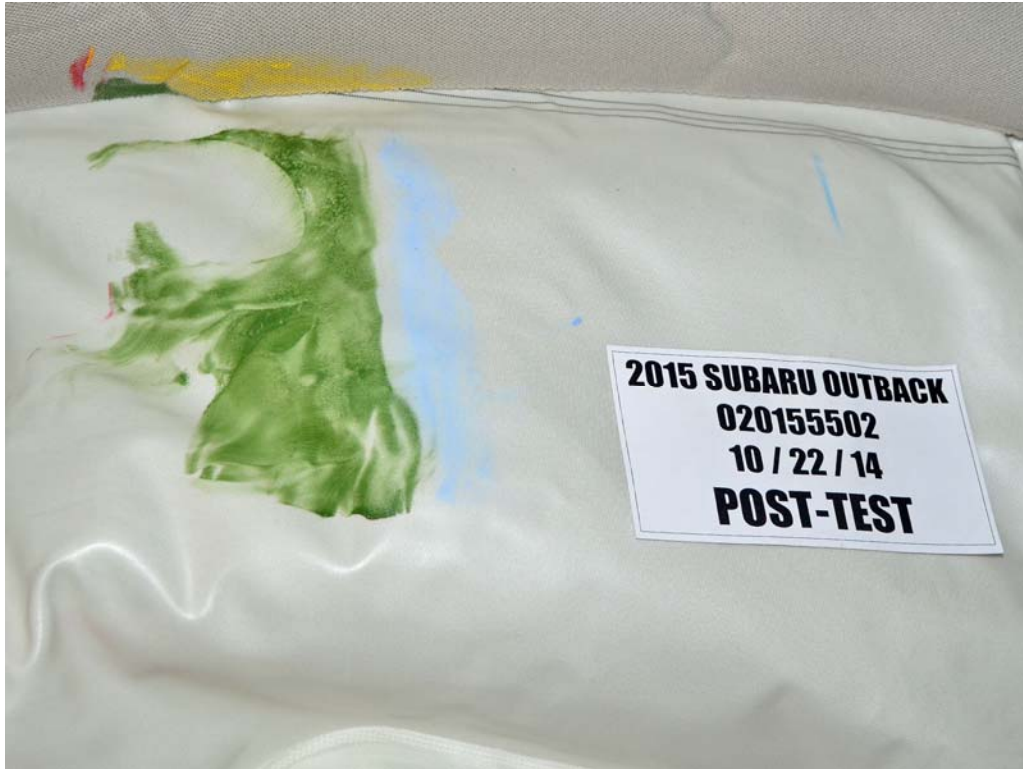


FIGURE 49. Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View



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

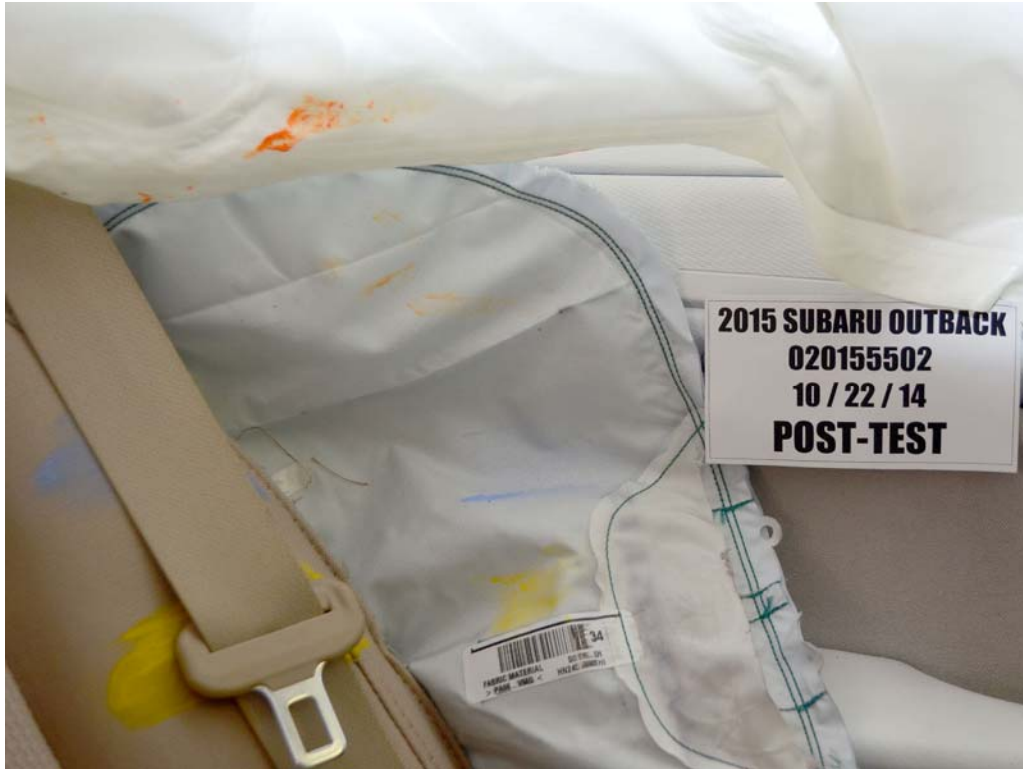


FIGURE 51. Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View

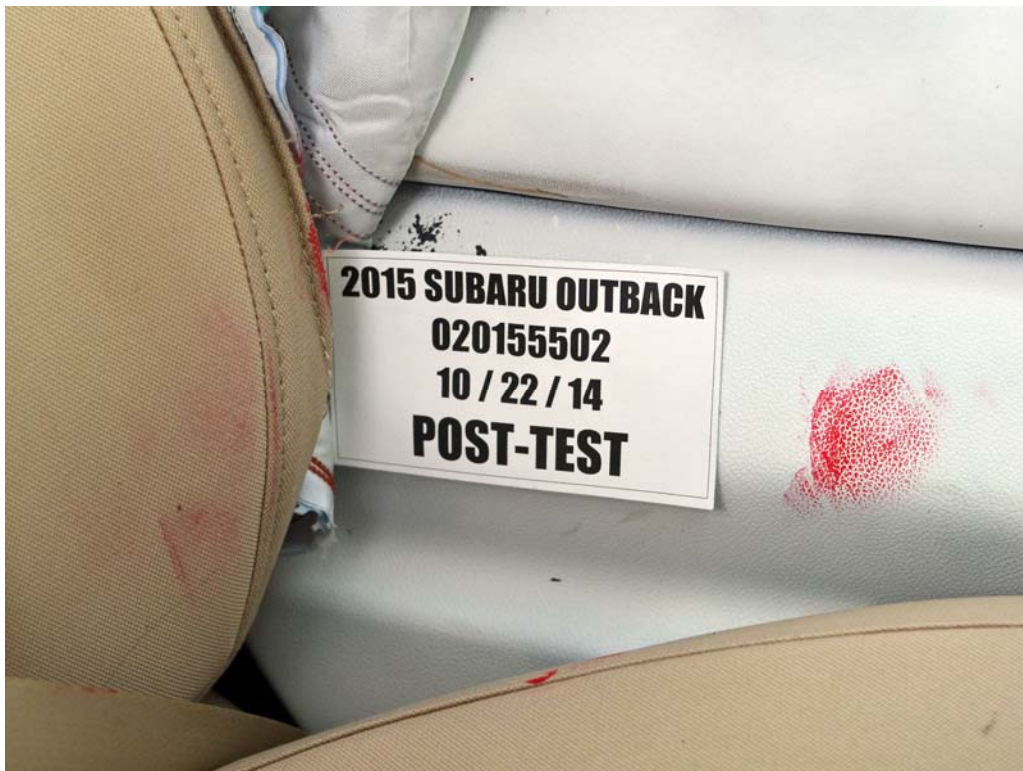


FIGURE 52. Post-Test Driver Dummy Close-Up Pelvis Contact
with Vehicle Interior View

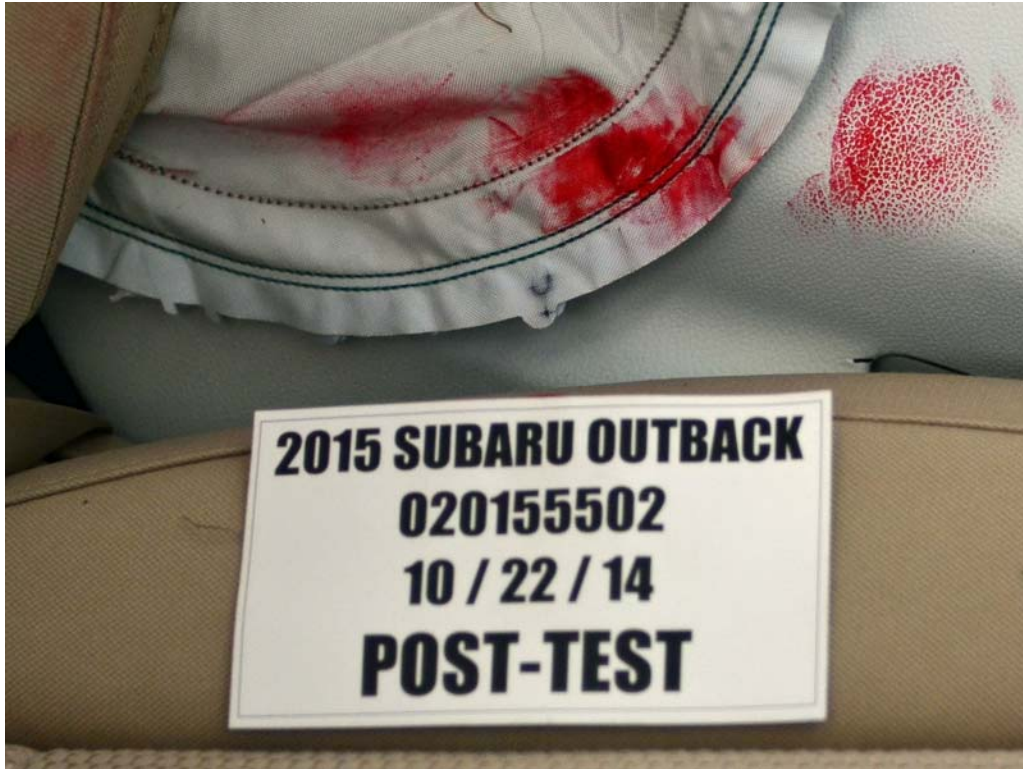


FIGURE 53. Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View

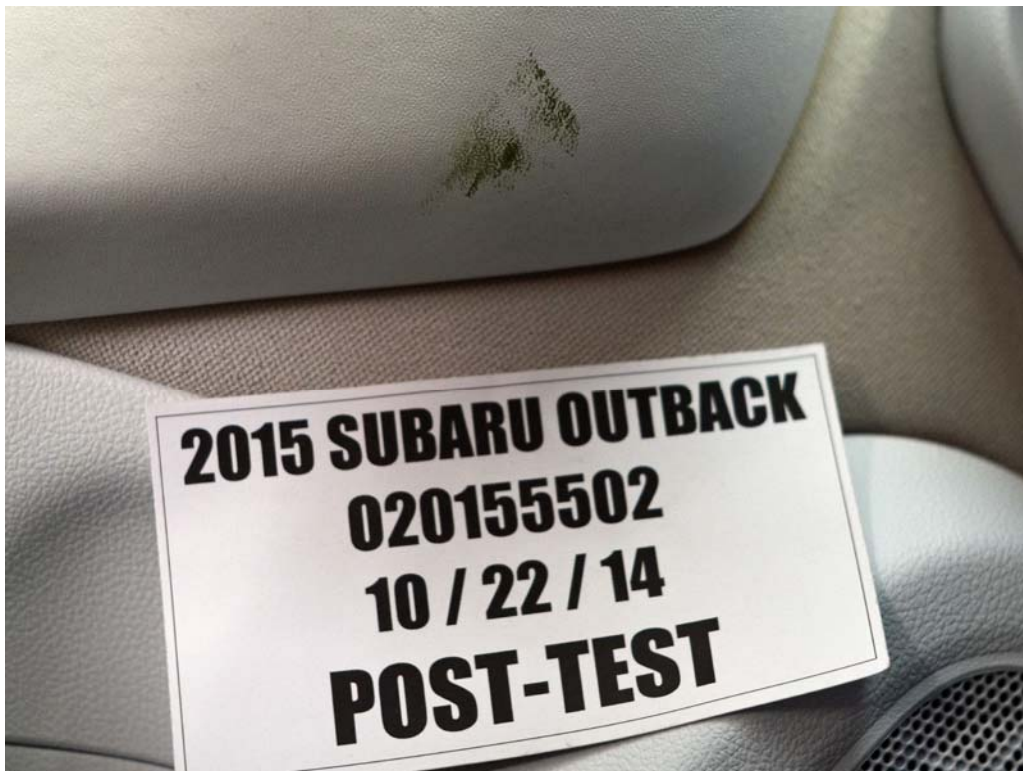


FIGURE 54. Post-Test Driver Dummy Close-Up Knee Contact View



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

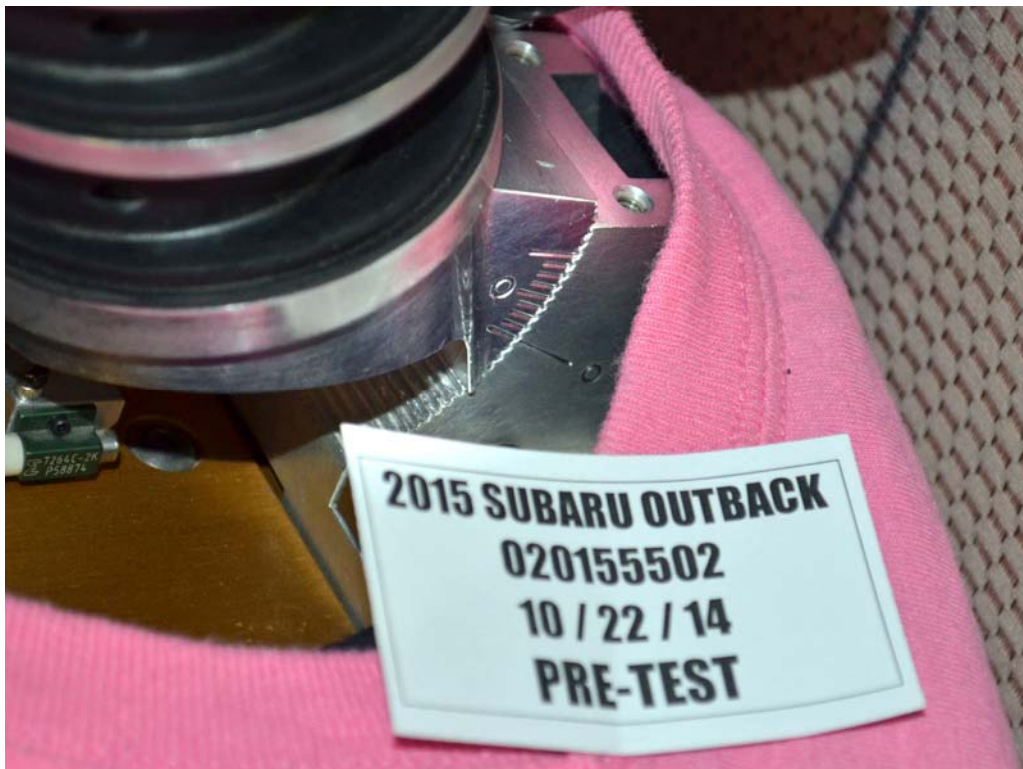


FIGURE 62. Pre-Test View of Rear Passenger Dummy's Neck
Showing Position of Adjustable Neck Bracket

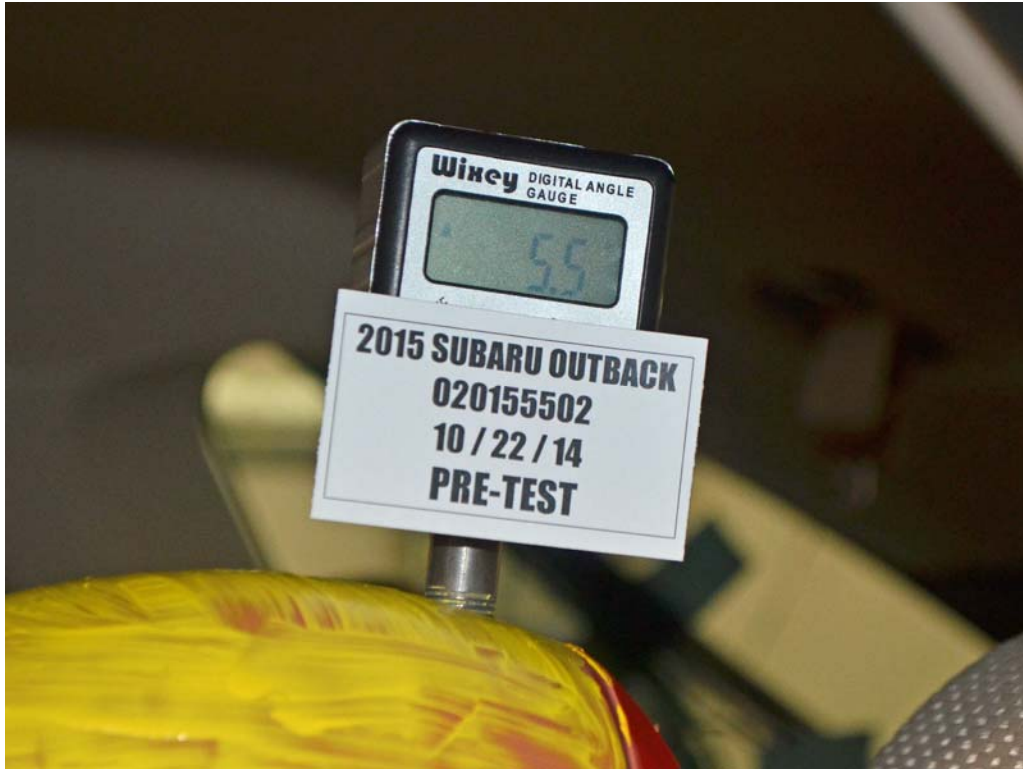


FIGURE 63. Pre-Test View of Rear Passenger Dummy's Head
Showing Dummy's Head is Level



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



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

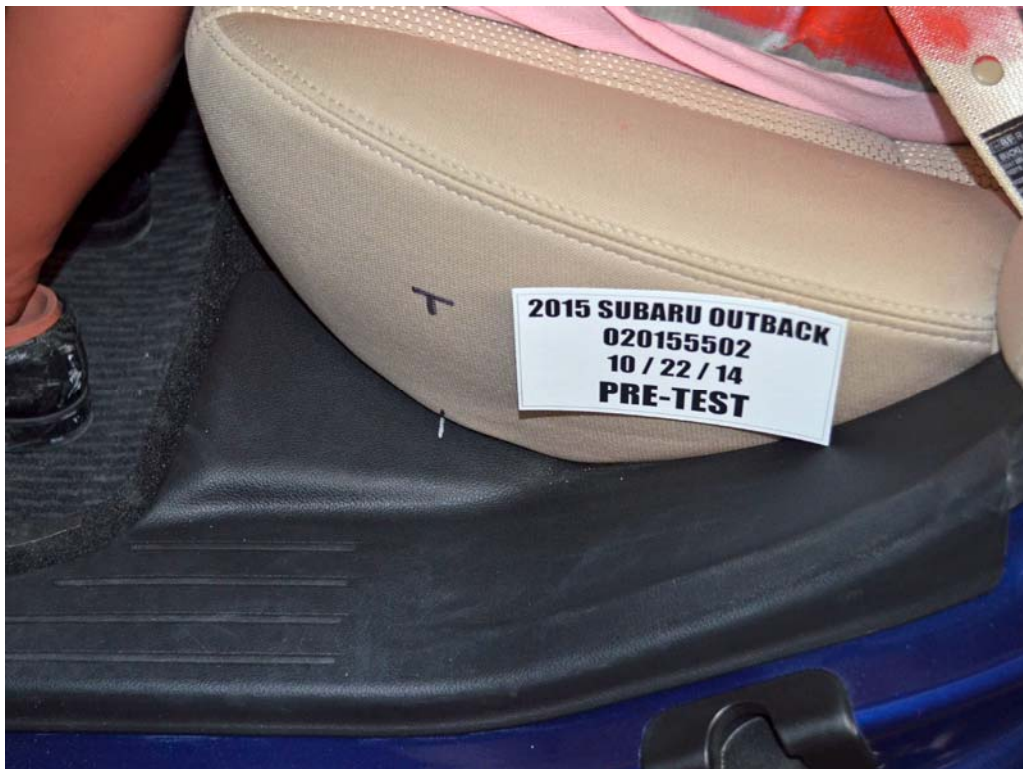


FIGURE 66. Pre-Test Close-Up Left Side View of Rear Passenger Seat Track



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

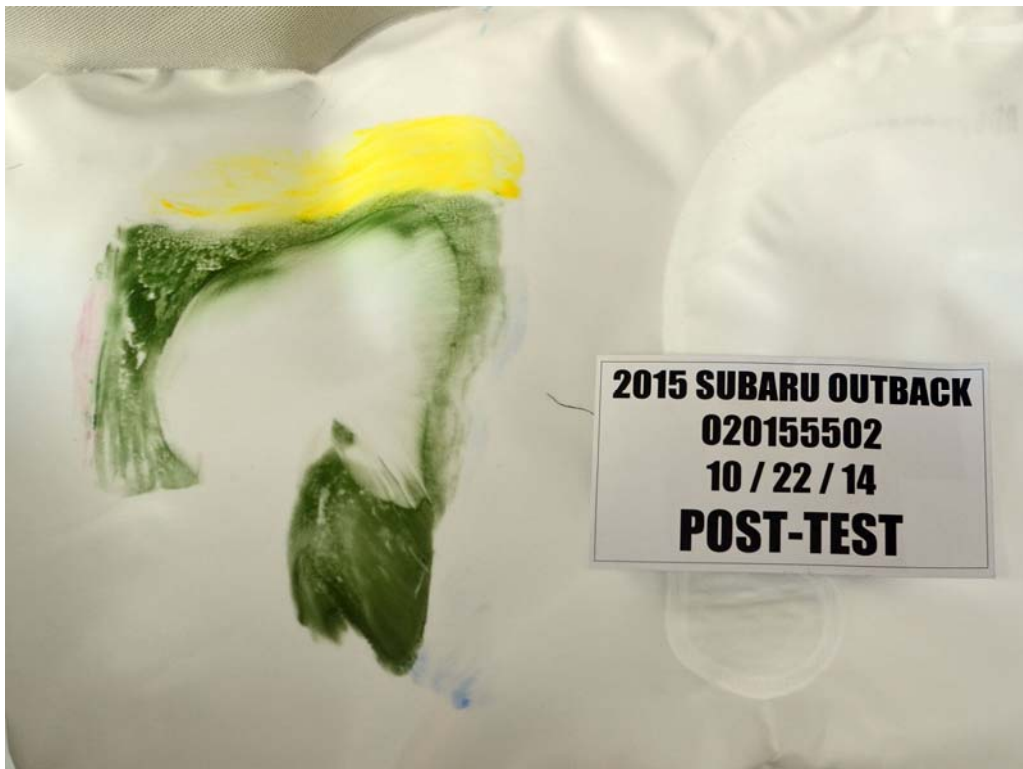


FIGURE 76. Post-Test Rear Passenger Dummy Close-Up
Head Contact with Side Airbag View

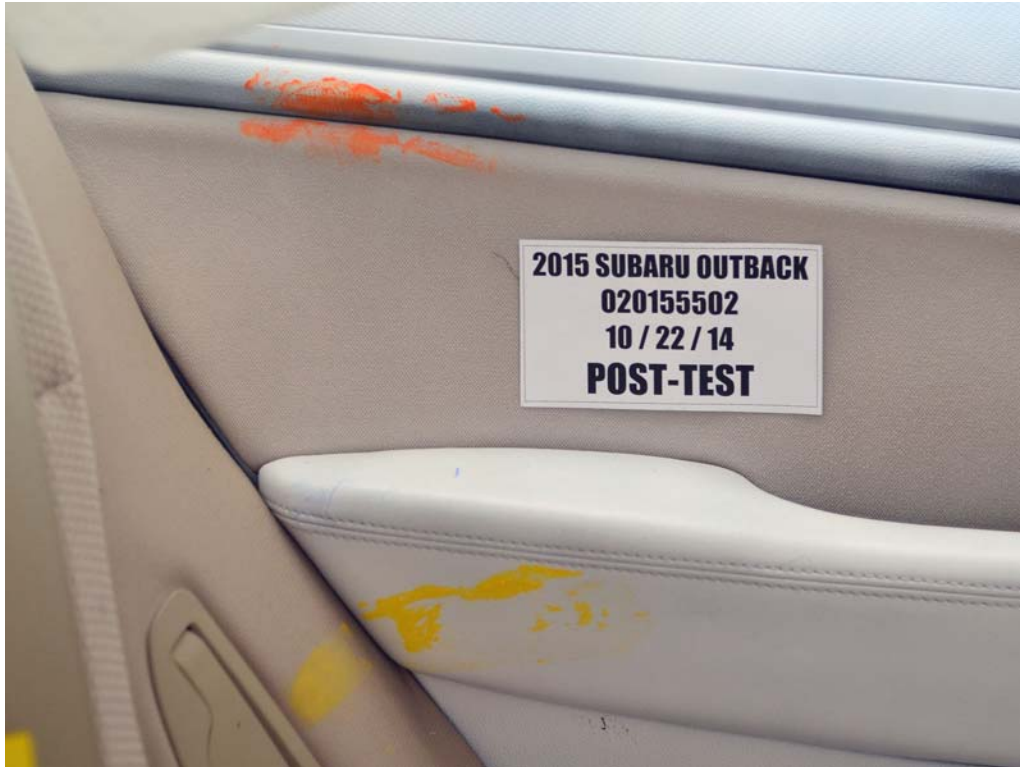


FIGURE 77. Post-Test Rear Passenger Dummy Close-Up
Torso Contact with Vehicle Interior View

Photograph Not Applicable

Vehicle Not Equipped with
Rear Passenger Side Airbags

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 Airbags

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

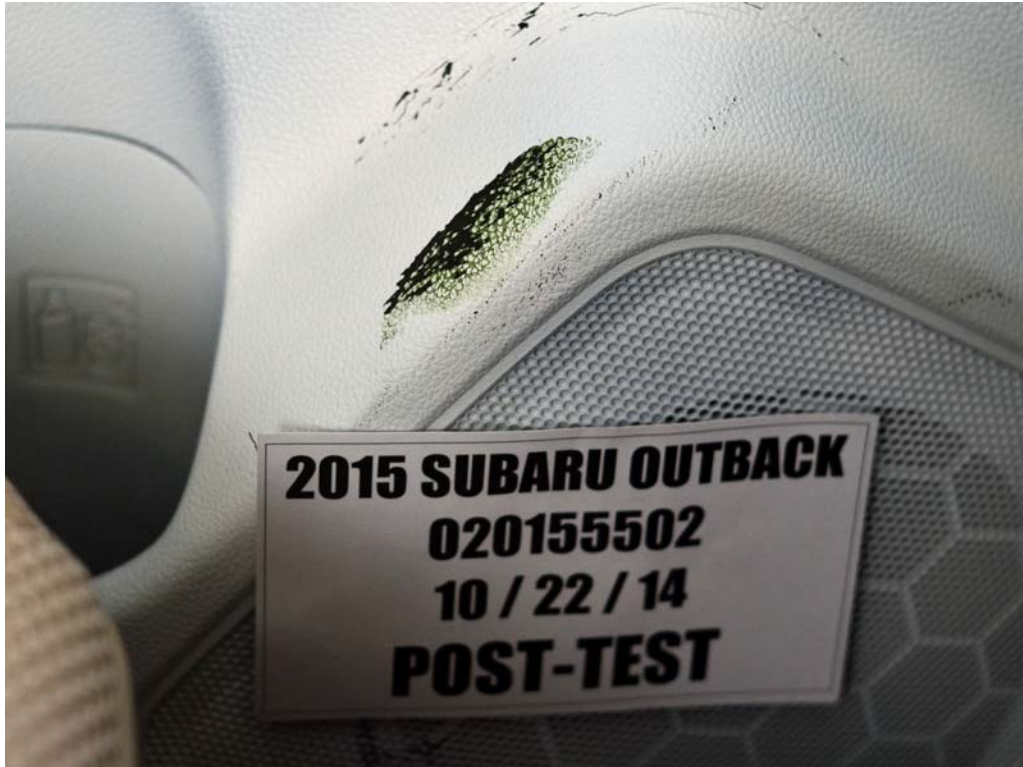


FIGURE 81. Post-Test Rear Passenger Dummy Close-Up Knee Contact View



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

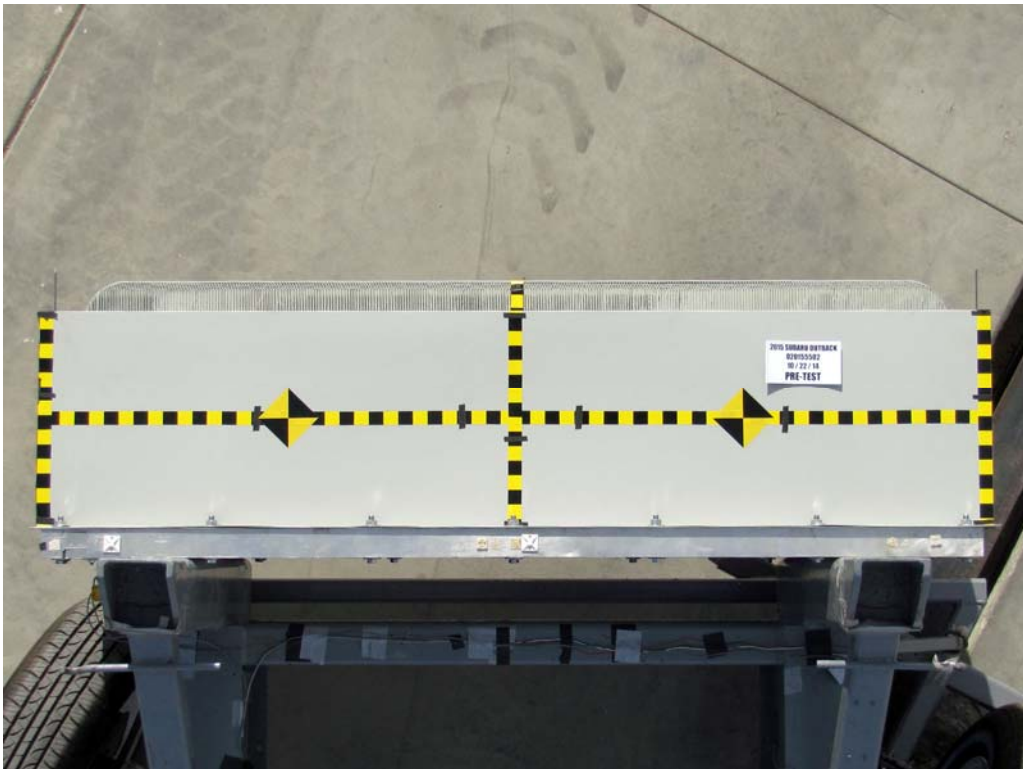


FIGURE 86. Pre-Test Top View of MDB Impactor Face



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

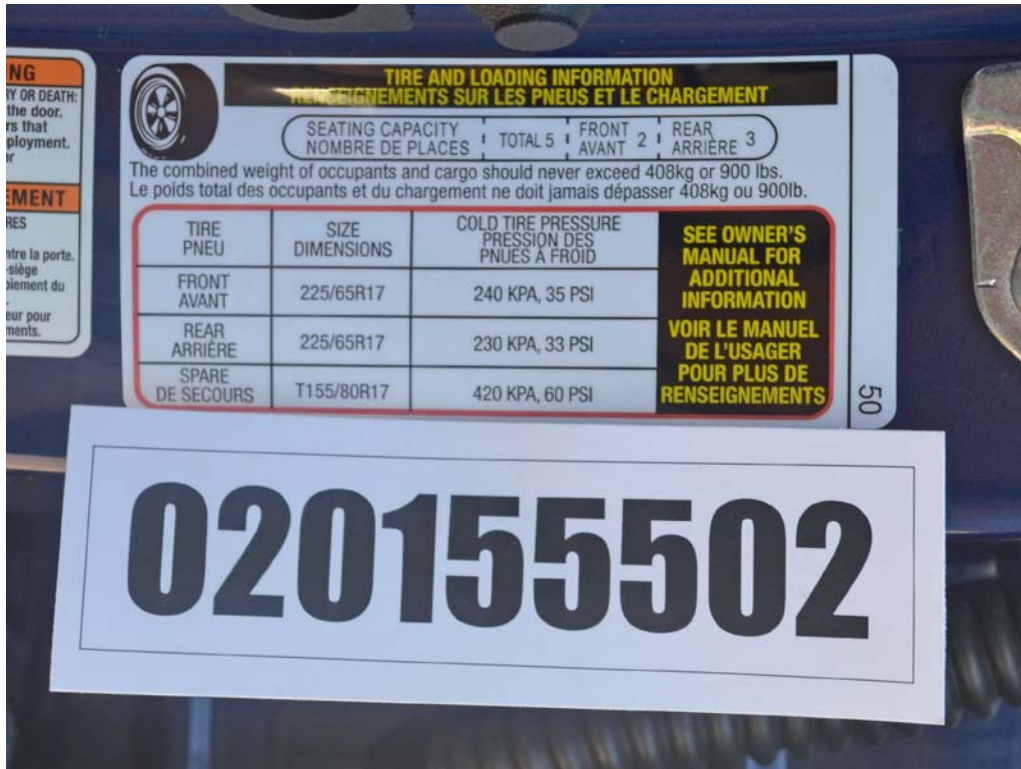


FIGURE 93. Close-Up View of Vehicle's Tire Information Placard or Label

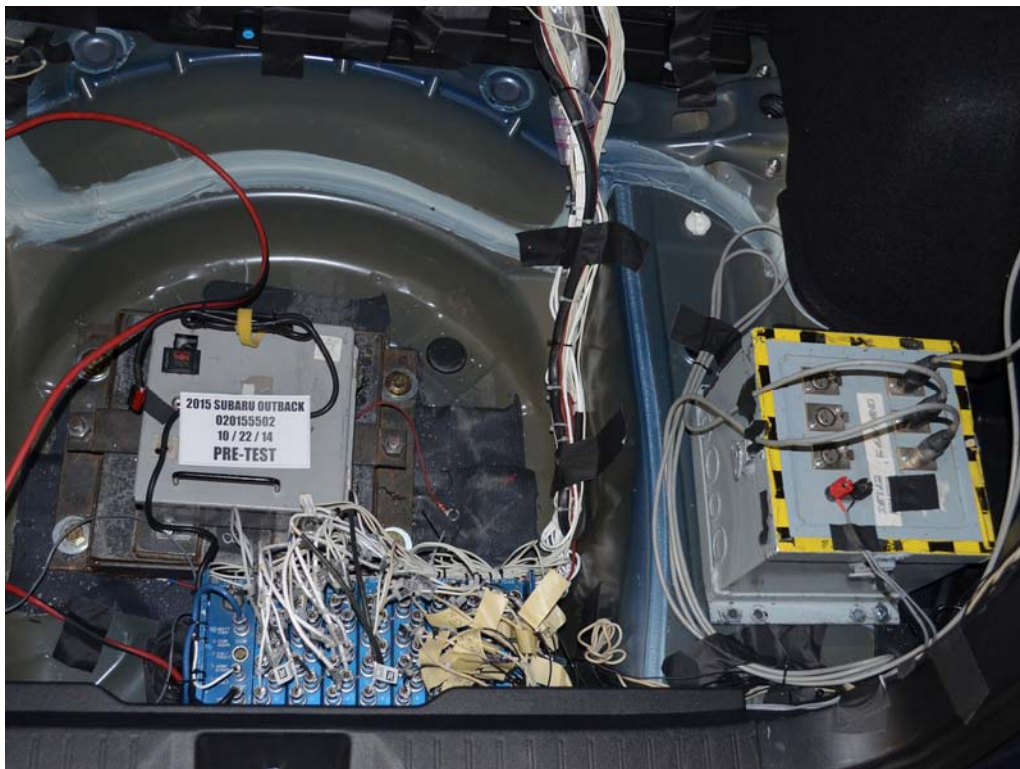


FIGURE 94. Pre-Test Ballast View

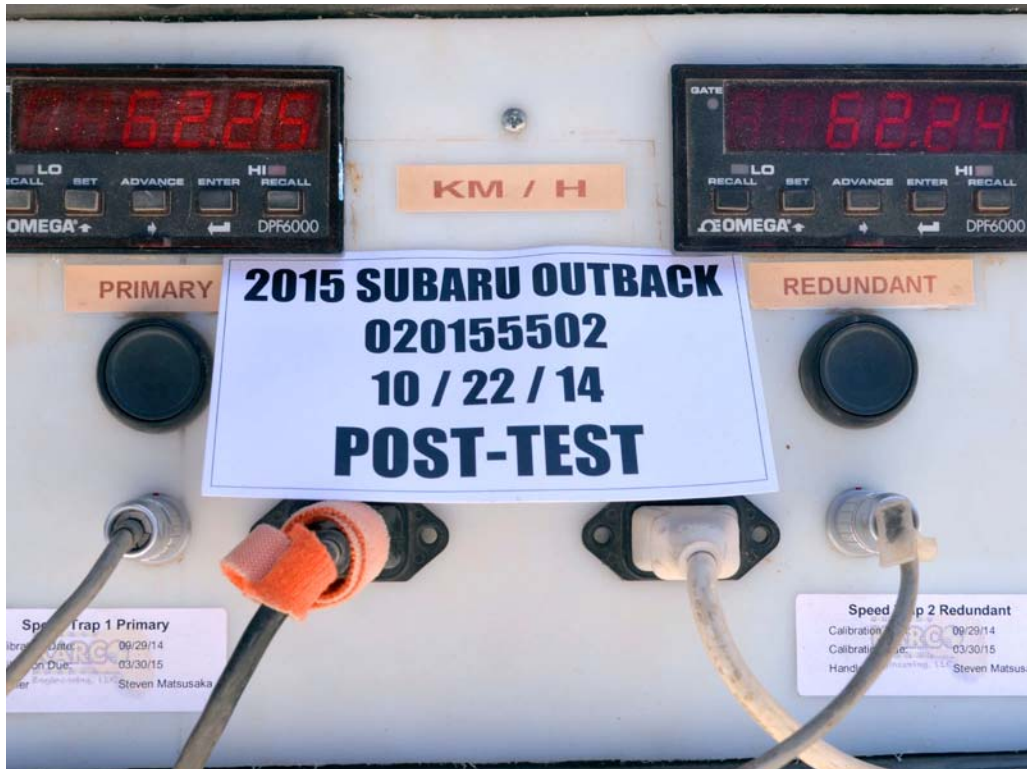


FIGURE 95. Post-Test Primary and Redundant Speed Trap Read-Out



FIGURE 96. FMVSS No. 301 Static Rollover 0 Degrees



FIGURE 99. FMVSS No. 301 Static Rollover 270 Degrees



FIGURE 100. FMVSS No. 301 Static Rollover 360 Degrees

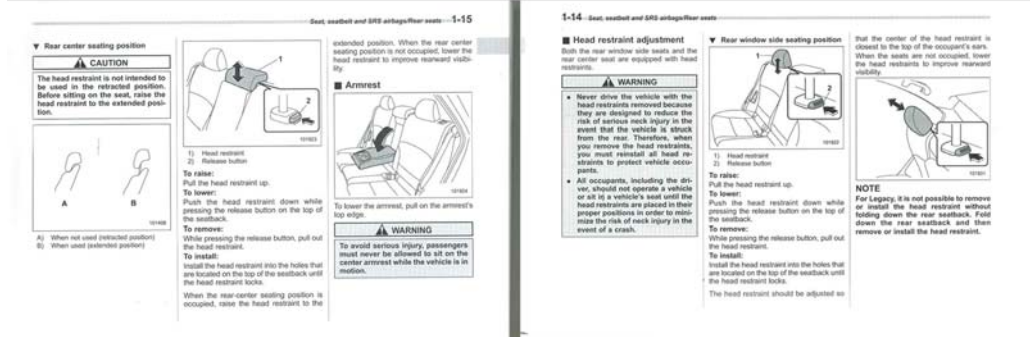
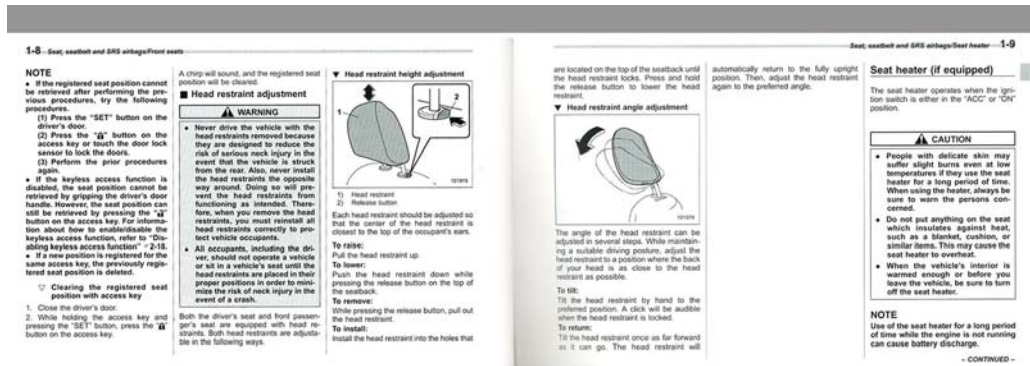


FIGURE 103. Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

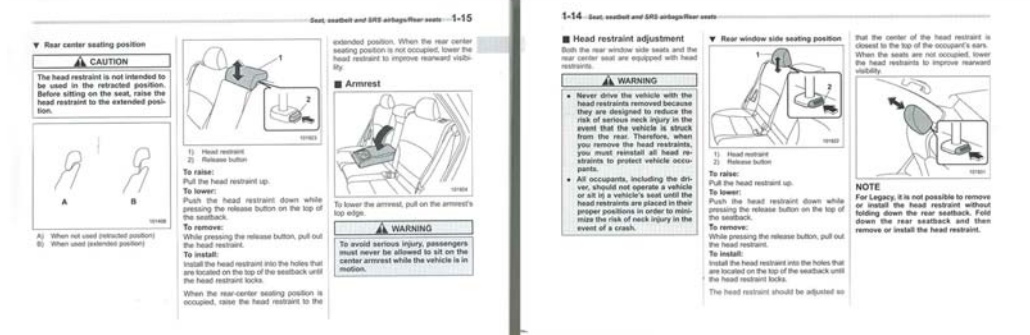
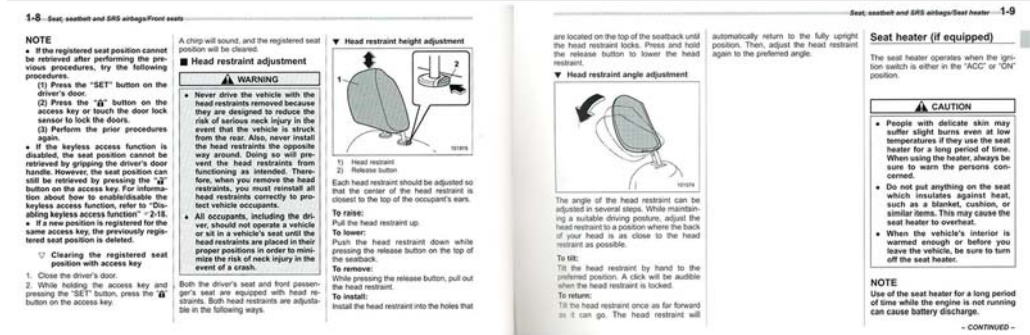


FIGURE 104. Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B
DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

Plot		Page
1	Driver Head Acceleration (X) Primary vs. Time	B-1
2	Driver Head Acceleration (Y) Primary vs. Time	B-1
3	Driver Head Acceleration (Z) Primary vs. Time	B-1
4	Driver Head Resultant Acceleration Primary vs. Time	B-1
5	Driver Upper Thorax Rib Deflection (Y) vs. Time	B-2
6	Driver Middle Thorax Rib Deflection (Y) vs. Time	B-2
7	Driver Lower Thorax Rib Deflection (Y) vs. Time	B-2
8	Driver Thorax Rib Deflection Maximum vs. Time	B-2
9	Driver Anterior Abdominal Force (Y) vs. Time	B-3
10	Driver Middle Abdominal Force (Y) vs. Time	B-3
11	Driver Posterior Abdominal Force (Y) vs. Time	B-3
12	Driver Total Abdominal Force (Y) vs. Time	B-3
13	Driver Pubic Symphysis Force (Y) vs. Time	B-4
14	Passenger Head Acceleration (X) vs. Time Primary	B-5
15	Passenger Head Acceleration (Y) vs. Time Primary	B-5
16	Passenger Head Acceleration (Z) vs. Time Primary	B-5
17	Passenger Head Resultant Acceleration Primary vs. Time	B-5
18	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-6
19	Passenger Lower Spine T12 Acceleration (Y) vs. Time	B-6
20	Passenger Lower Spine T12 Acceleration (Z) vs. Time	B-6
21	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-6
22	Passenger Iliac Force on Impact Side (Y) vs. Time	B-7
23	Passenger Acetabulum Force on Impact Side (Y) vs. Time	B-7
24	Passenger Total Pelvic Force on Impact Side (Y) vs. Time	B-7

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)

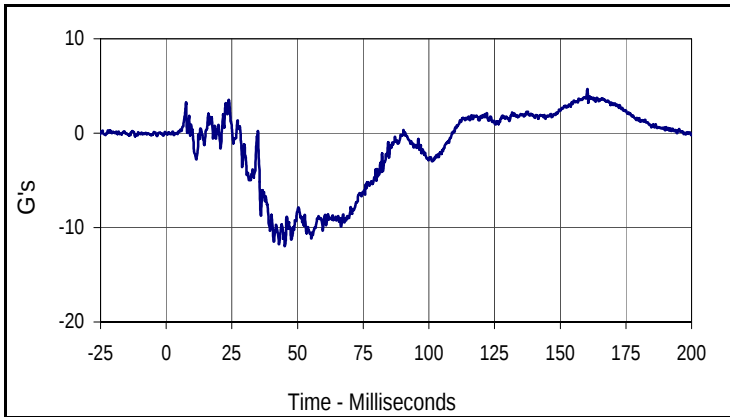
MDB Rear Acceleration (Y)

Left MDB Contact Switch

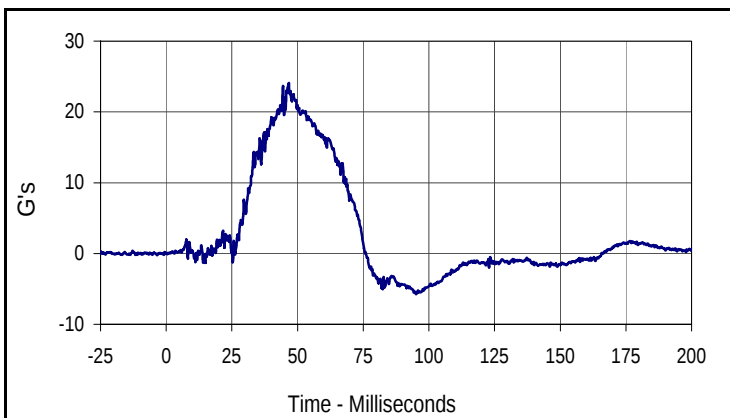
Right MDB Contact Switch

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

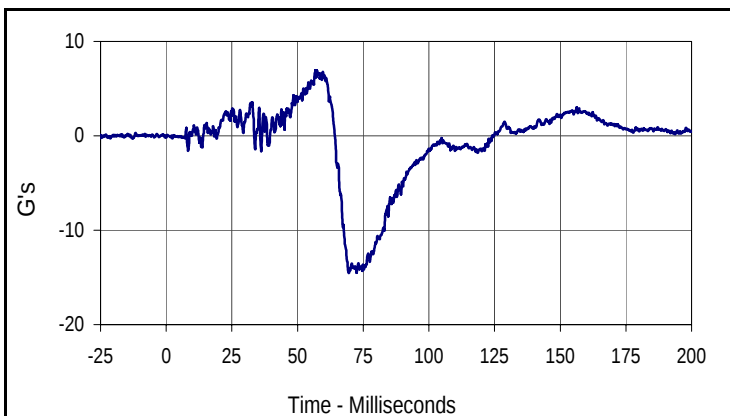
NHTSA No.: O20155502
 Test Date: 10/22/14



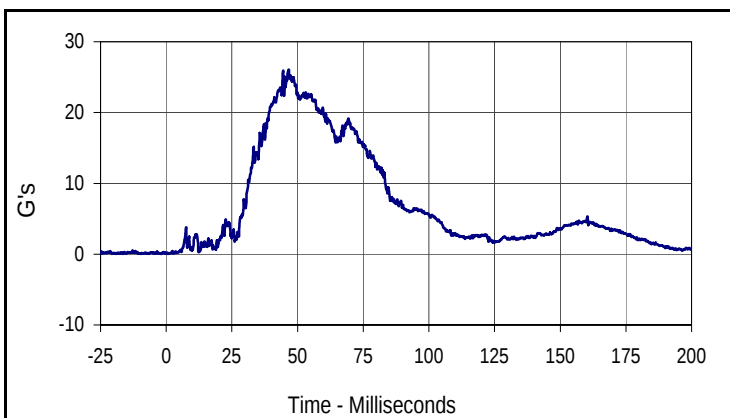
Curve Description			
Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
4.7	160.4	-12.0	45.1



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
24.1	46.6	-5.7	95.1



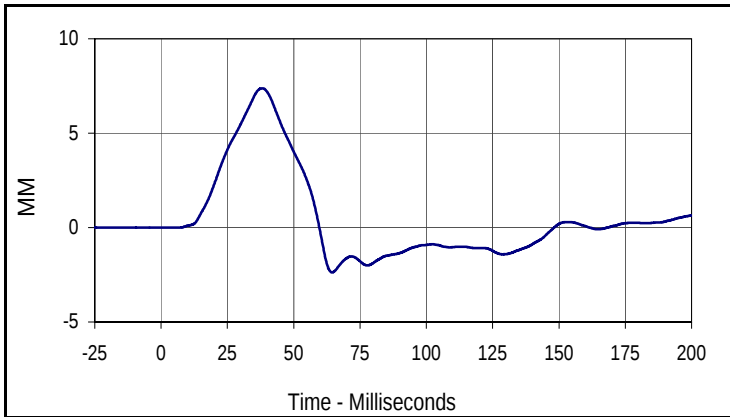
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
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Max	Time	Min	Time
7.0	57.4	-14.5	69.5



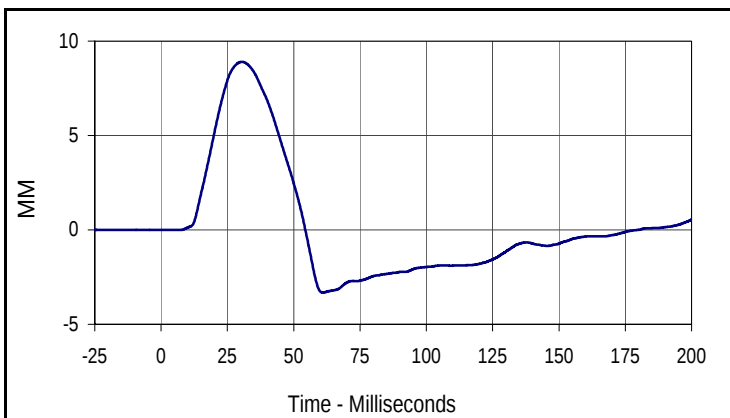
Curve Description			
Driver Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
26.1	46.6	0.0	0.9

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

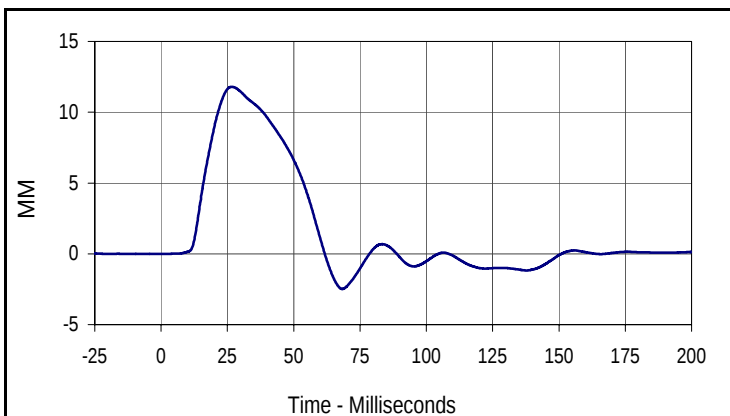
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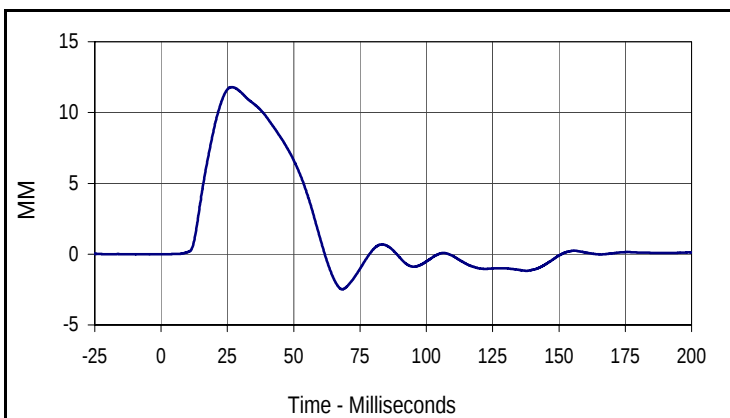
Curve Description			
Driver Upper Thorax Rib Deflection Y			
Plot No.	Type	SAE Class	Units
005	FIL	180	MM
Max	Time	Min	Time
7.4	38.1	-2.4	64.5



Curve Description			
Driver Middle Thorax Rib Deflection Y			
Plot No.	Type	SAE Class	Units
006	FIL	180	MM
Max	Time	Min	Time
8.9	30.5	-3.3	61.0



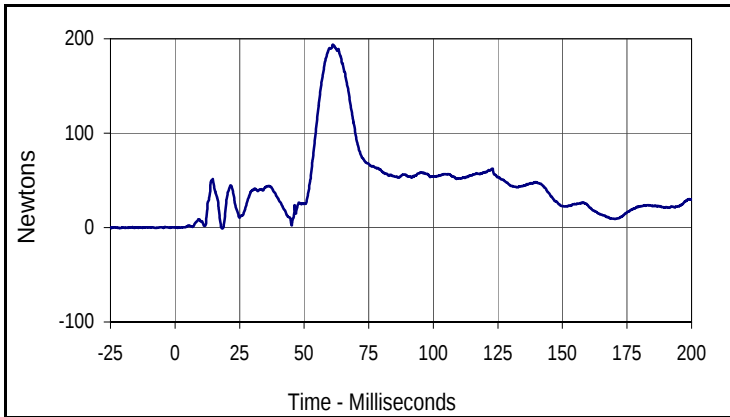
Curve Description			
Driver Lower Thorax Rib Deflection Y			
Plot No.	Type	SAE Class	Units
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Max	Time	Min	Time
11.8	26.6	-2.5	68.3



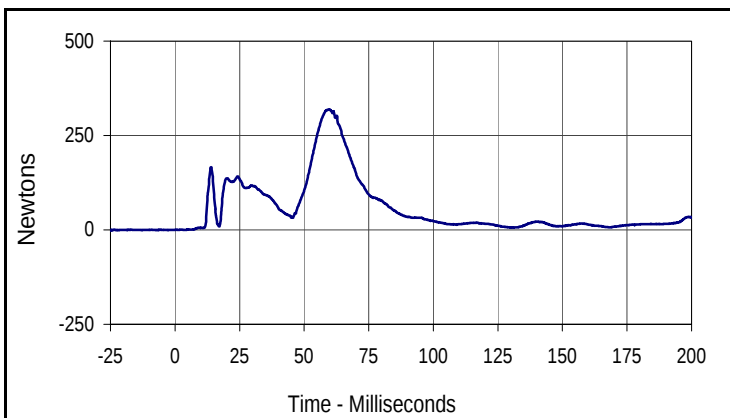
Curve Description			
Driver Thorax Rib Deflection Maximum			
Plot No.	Type	SAE Class	Units
008	FIL	180	MM
Max	Time	Min	Time
11.8	26.6	-2.5	68.3

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

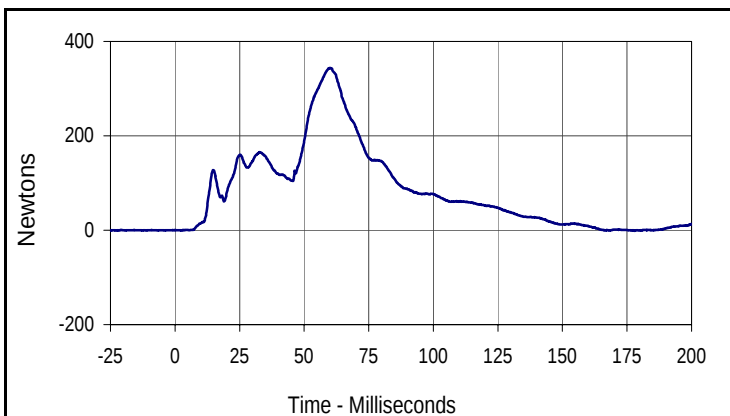
NHTSA No.: O20155502
 Test Date: 10/22/14



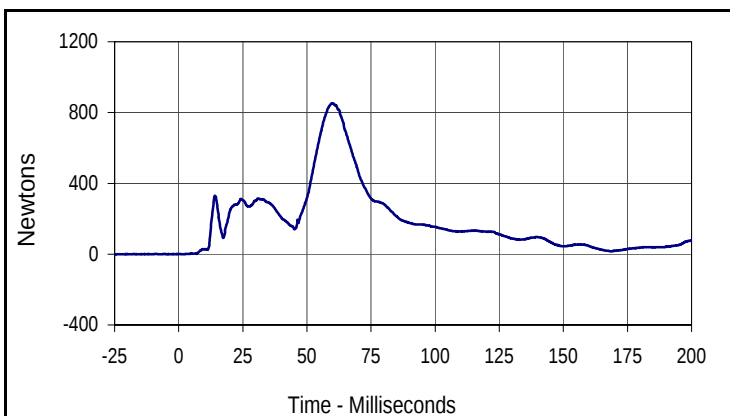
Curve Description			
Driver Anterior Abdominal Force Y			
Plot No.	Type	SAE Class	Units
009	FIL	600	Newtons
Max	Time	Min	Time
193.9	61.1	-1.1	18.4



Curve Description			
Driver Middle Abdominal Force Y			
Plot No.	Type	SAE Class	Units
010	FIL	600	Newtons
Max	Time	Min	Time
319.9	59.7	-0.1	4.4



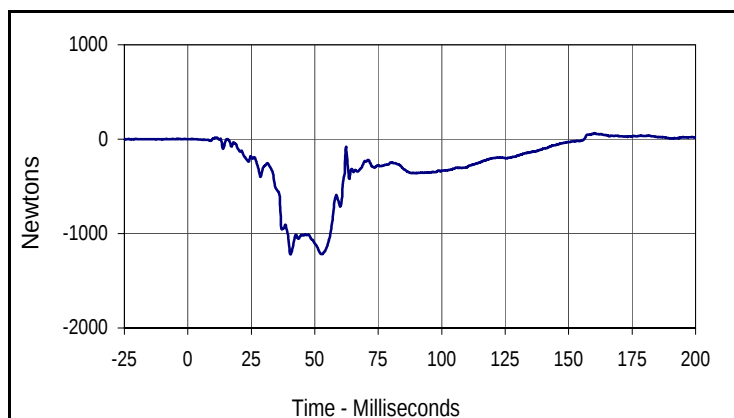
Curve Description			
Driver Posterior Abdominal Force Y			
Plot No.	Type	SAE Class	Units
011	FIL	600	Newtons
Max	Time	Min	Time
343.5	60.0	-1.1	178.1



Curve Description			
Driver Total Abdominal Force			
Plot No.	Type	SAE Class	Units
012	SUM	600	Newtons
Max	Time	Min	Time
853.5	59.8	0.0	1.1

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

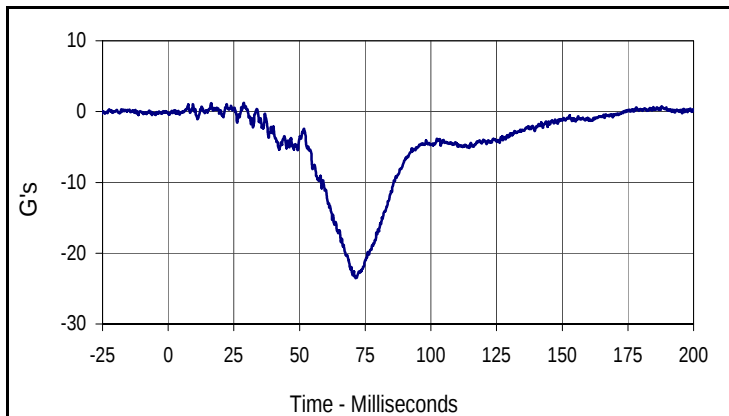
NHTSA No.: O20155502
 Test Date: 10/22/14



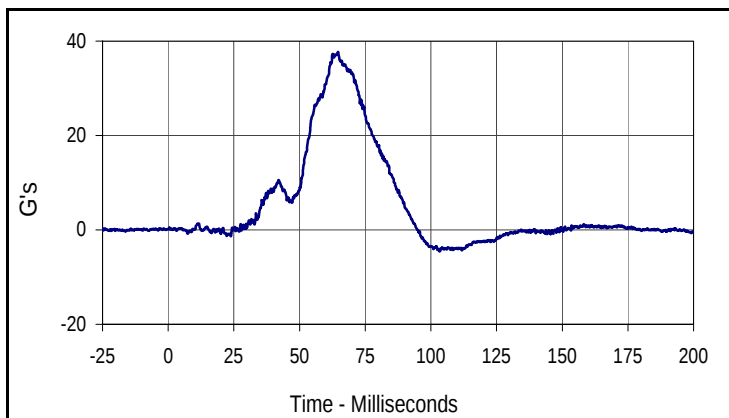
Curve Description			
Driver Pubic Symphysis Force Y			
Plot No.	Type	SAE Class	Units
013	FIL	600	Newtons
Max	Time	Min	Time
63.4	160.2	-1219.6	40.4

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

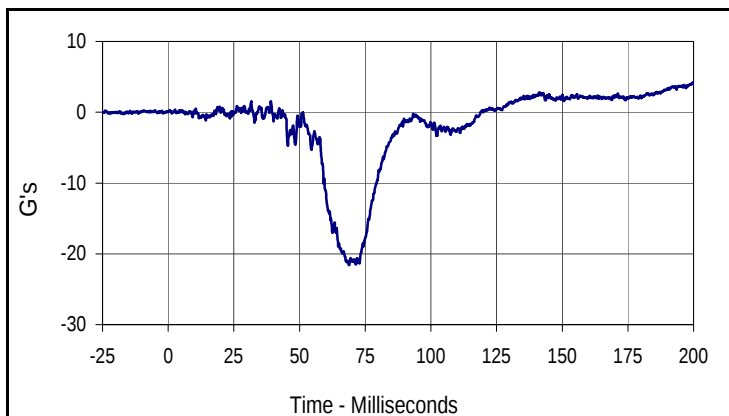
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 Test Date: 10/22/14



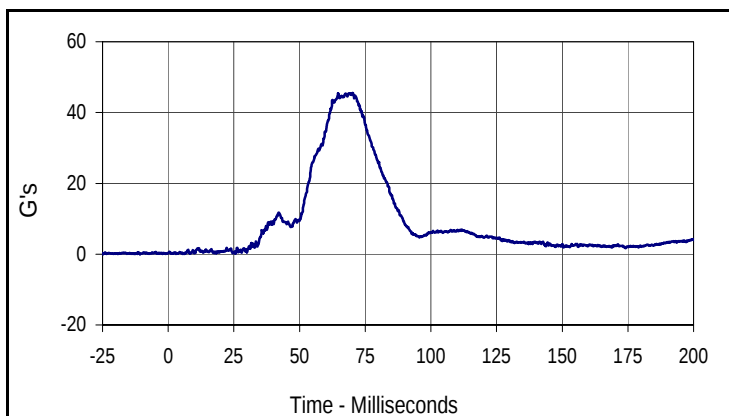
Curve Description			
Passenger Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
014	FIL	1000	G's
Max	Time	Min	Time
1.3	28.7	-23.6	71.4



Curve Description			
Passenger Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
015	FIL	1000	G's
Max	Time	Min	Time
37.7	64.6	-4.6	103.4



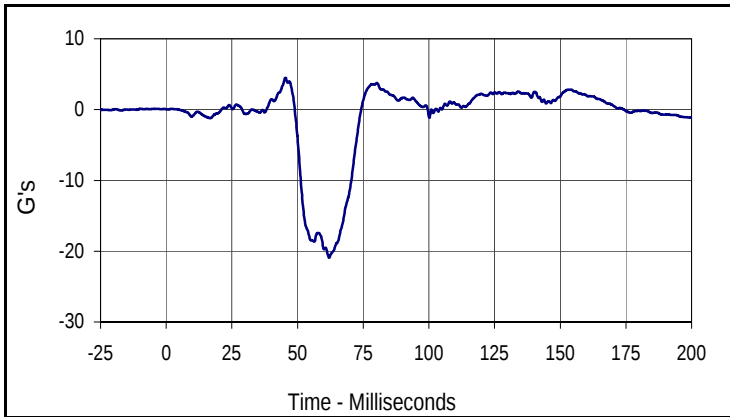
Curve Description			
Passenger Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
016	FIL	1000	G's
Max	Time	Min	Time
4.2	199.8	-21.6	68.8



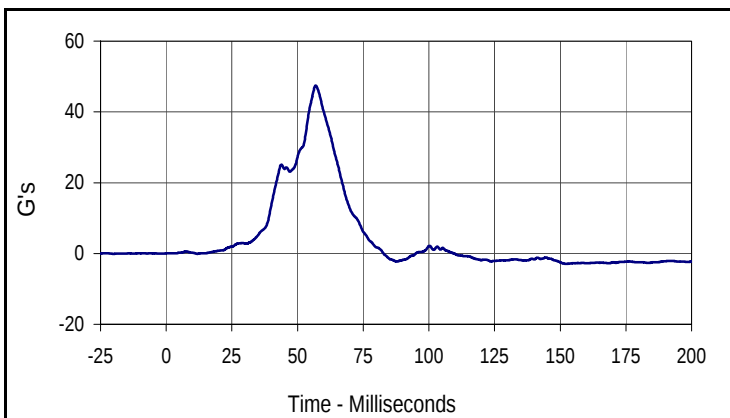
Curve Description			
Passenger Head Acceleration Resultant Primary			
Plot No.	Type	SAE Class	Units
017	RES	1000	G's
Max	Time	Min	Time
45.5	70.3	0.1	6.1

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

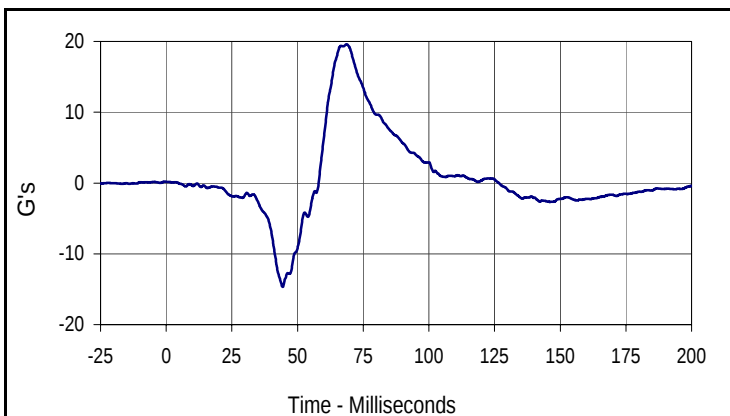
NHTSA No.: O20155502
 Test Date: 10/22/14



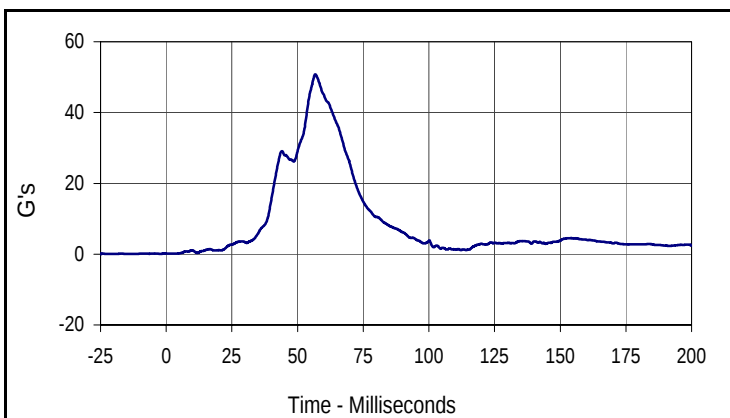
Curve Description			
Passenger Lower Spine T12 Acceleration X			
Plot No.	Type	SAE Class	Units
018	FIL	180	G's
Max	Time	Min	Time
4.5	45.4	-20.9	62.0



Curve Description			
Passenger Lower Spine T12 Acceleration Y			
Plot No.	Type	SAE Class	Units
019	FIL	180	G's
Max	Time	Min	Time
47.4	56.9	-2.9	152.2



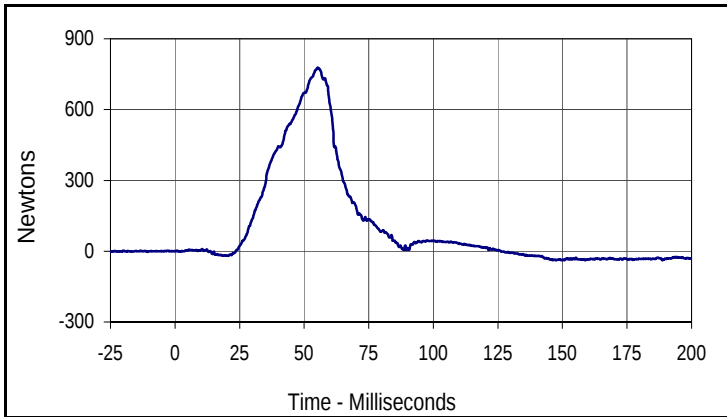
Curve Description			
Passenger Lower Spine T12 Acceleration Z			
Plot No.	Type	SAE Class	Units
020	FIL	180	G's
Max	Time	Min	Time
19.6	68.6	-14.7	44.4



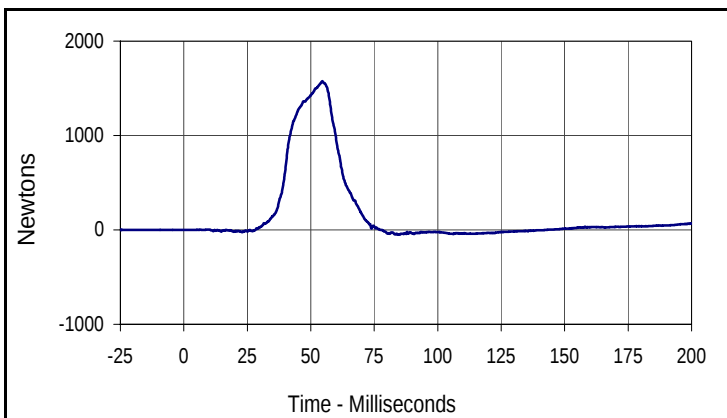
Curve Description			
Passenger Lower Spine T12 Acceleration Res.			
Plot No.	Type	SAE Class	Units
021	RES	180	G's
Max	Time	Min	Time
50.8	56.7	0.1	4.1

Test Vehicle: 2015 Subaru Outback 2.5i 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

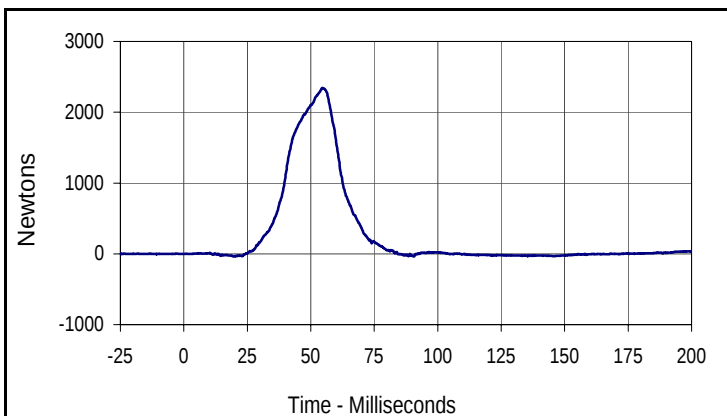
NHTSA No.: O20155502
 Test Date: 10/22/14



Curve Description			
Passenger Iliac Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
022	FIL	600	Newtons
Max	Time	Min	Time
777.5	55.2	-39.0	188.6



Curve Description			
Passenger Acetabulum Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
023	FIL	600	Newtons
Max	Time	Min	Time
1575.2	54.5	-52.0	84.6



Curve Description			
Passenger Total Pelvic Force			
Plot No.	Type	SAE Class	Units
024	SUM	600	Newtons
Max	Time	Min	Time
2343.1	54.6	-37.2	19.8

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

Test Program: ES2re External Measurements
 ATD Serial No.: F037

Test Date: 9/15/14
 Test I.D.: N/A



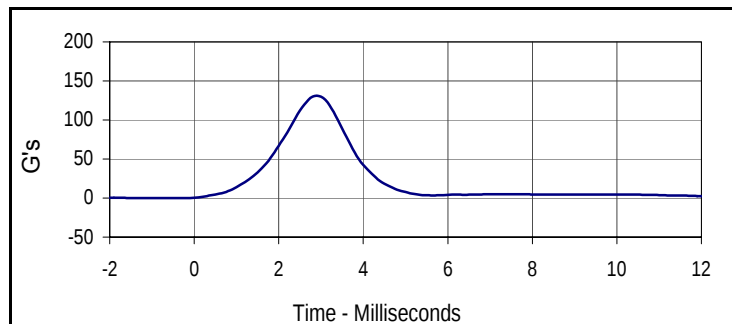
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	30.0	Pass
1	Sitting Height	mm	900 - 918	909	Pass
2	Seat to Shoulder Joint	mm	558 - 572	564	Pass
3	Seat to Lower Face of Thoracic Spine Box	mm	346 - 356	350	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
 ATD Serial No.: F037

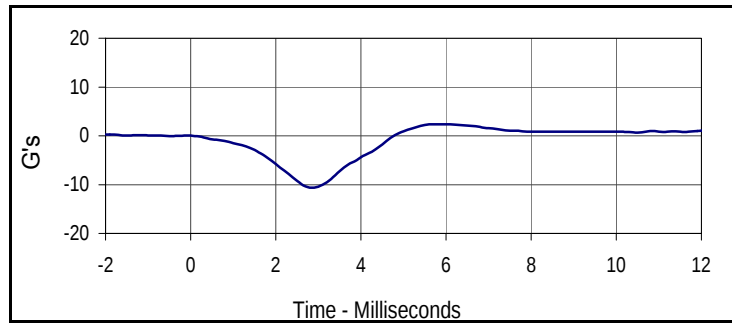
Test Date: 9/15/14
 Test I.D.: F037HD063



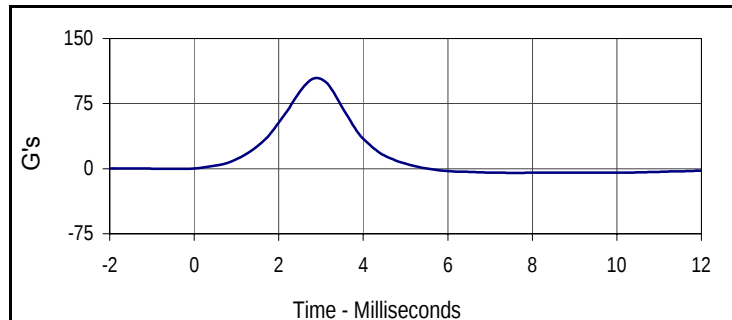
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	342	Pass
Temperature During Soak	Max	20.6 to 22.2	21.5	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	37.1	Pass
	Min		36.3	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	36.6	Pass
Peak Head Resultant Acceleration	G's	125 to 155	131.2	Pass
Peak Head X Acceleration	G's	≤15	10.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	5.8	Pass
Overall Test Results				Pass



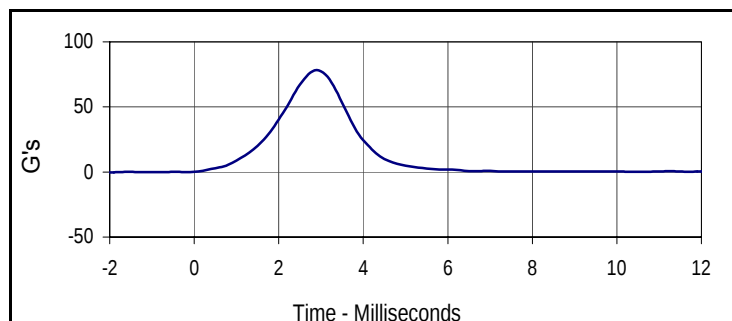
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
131.2	2.9	0.0	-0.6



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.4	5.9	-10.6	2.8



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
104.8	2.9	-4.8	7.7



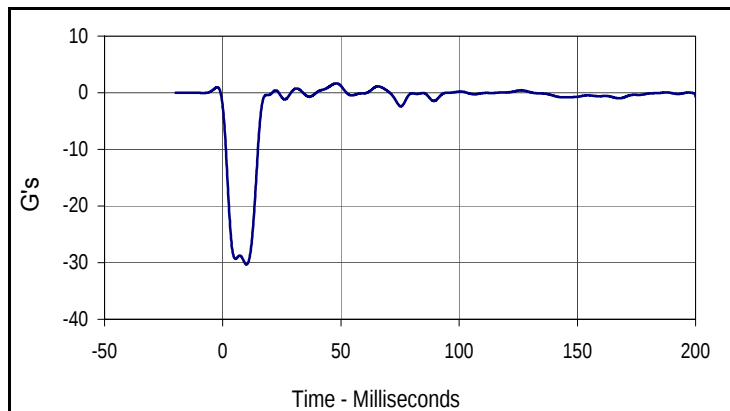
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
78.2	2.9	-0.2	-2.0

Test Program: ES2re Neck Flexion Test
 ATD Serial No.: F037

Test Date: 9/15/14
 Test I.D.: F037NB063



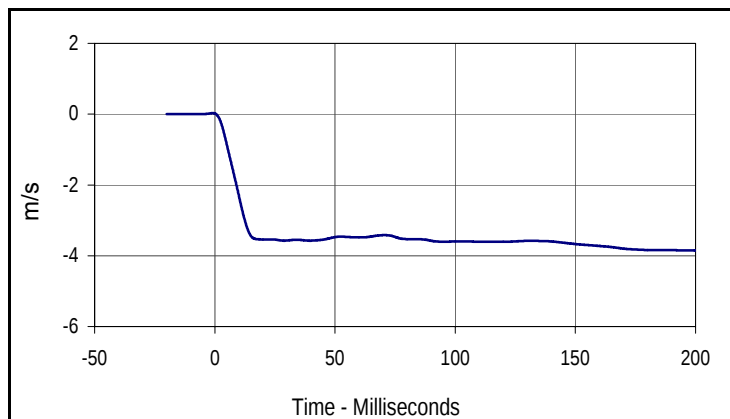
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	377	Pass
Temperature During Soak	Max	20.6 to 22.2	21.5	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	37.1	Pass
	Min		36.3	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	37.1	Pass
Pendulum Velocity	m/s	3.3 to 3.5	3.44	Pass
Headform Flexion	Max	49 to 59	56.3	Pass
	Time	54 to 66	54.9	Pass
Headform Flexion Decay (Peak to Zero)	msec	53 to 88	67.1	Pass
Overall Test Results				Pass



Curve Description

Pendulum Deceleration

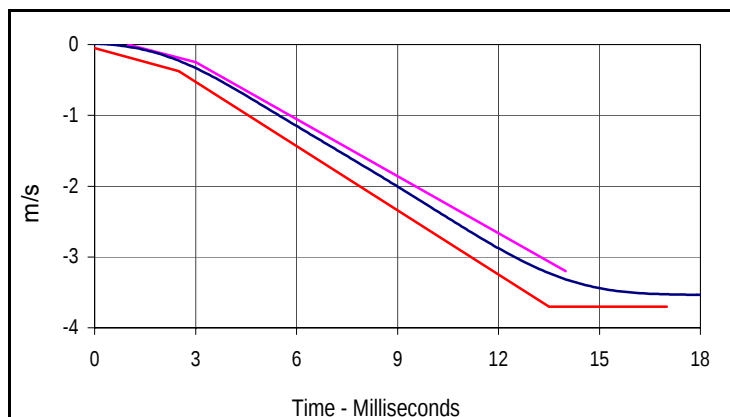
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
1.7	48.0	-30.3	10.0



Curve Description

Pendulum Velocity

Plot No.	Type	SAE Class	Units
002	FIL	60	m/s
Max	Time	Min	Time
0.0	-0.9	-3.8	199.9



Curve Description

Pendulum Velocity

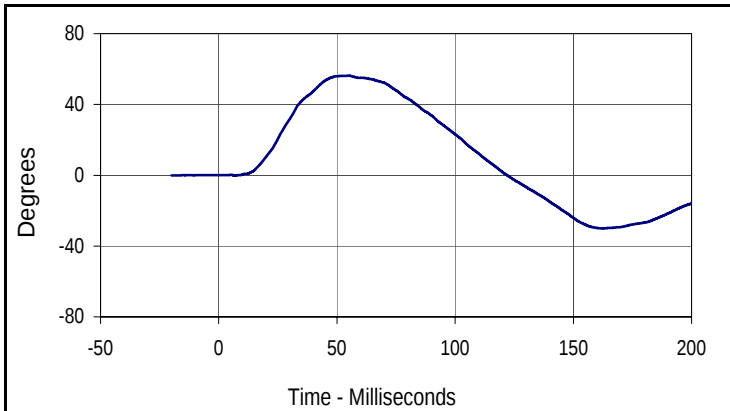
Plot No.	Type	SAE Class	Units
002	FIL	60	m/s
Max	Time	Min	Time
0.0	-0.9	-3.8	199.9

Velocity Corridors

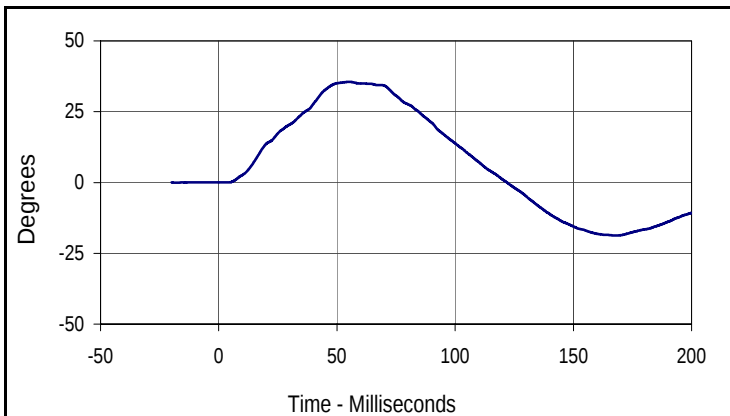
Upper Boundary		Lower Boundary	
Time (msec)	Velocity (m/s)	Time (msec)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.0	-0.03	2.5	-0.375
14.0	-3.20	13.5	-3.70
		17.0	-3.70

Test Program: ES2re Neck Flexion Test
 ATD Serial No.: F037

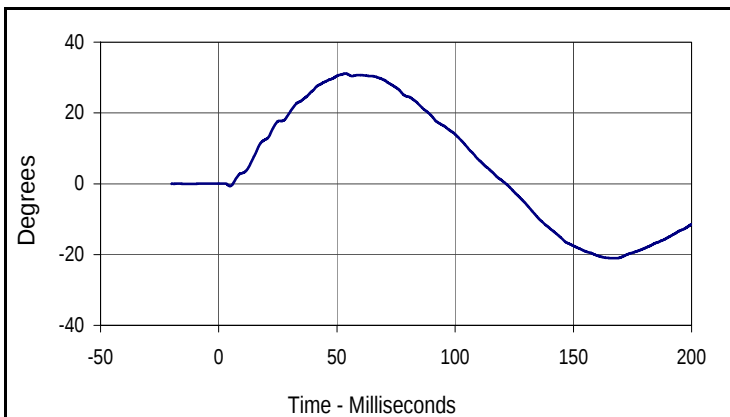
Test Date: 9/15/14
 Test I.D.: F037NB063



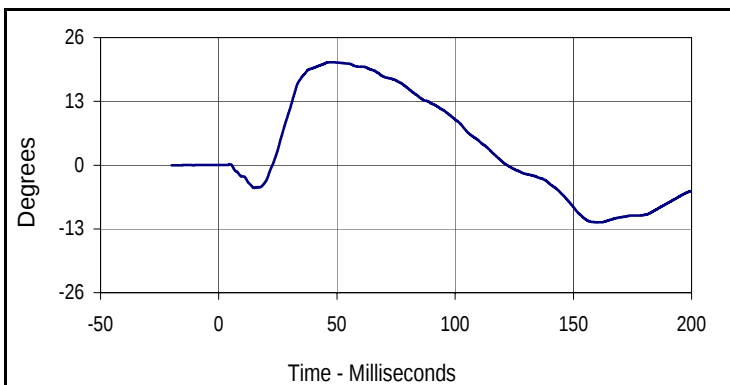
Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
56.3	54.9	-30.0	162.3



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
35.6	55.1	-18.7	169.0



Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
31.1	53.6	-21.0	167.5



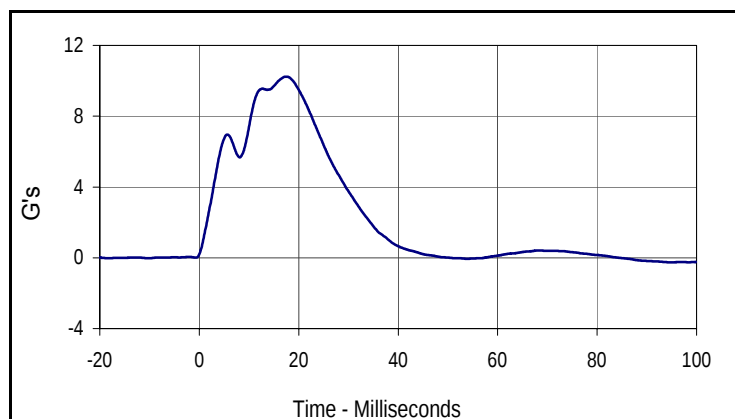
Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
006	FIL	180	Degrees
Max	Time	Min	Time
21.0	46.6	-11.7	161.5

Test Program: ES2re Shoulder Impact Test
 ATD Serial No.: F037

Test Date: 9/15/14
 Test I.D.: F037SH063



Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	442	Pass
Temperature During Soak	Max	20.6 to 22.2	21.5	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	37.1	Pass
	Min		36.3	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	36.7	Pass
Pendulum Speed	m/s	4.2 to 4.4	4.32	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	10.2	Pass
Overall Test Results				Pass



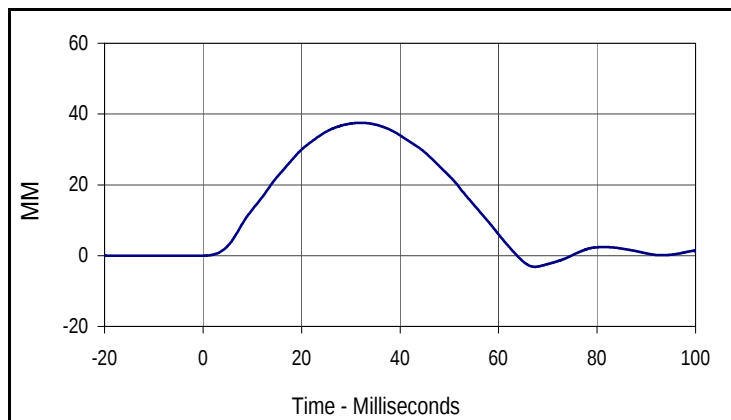
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
10.2	17.4	-0.3	94.9

Test Program: ES2re Thorax - Rib Drop Test
 ATD Serial No.: F037 Rib # 1

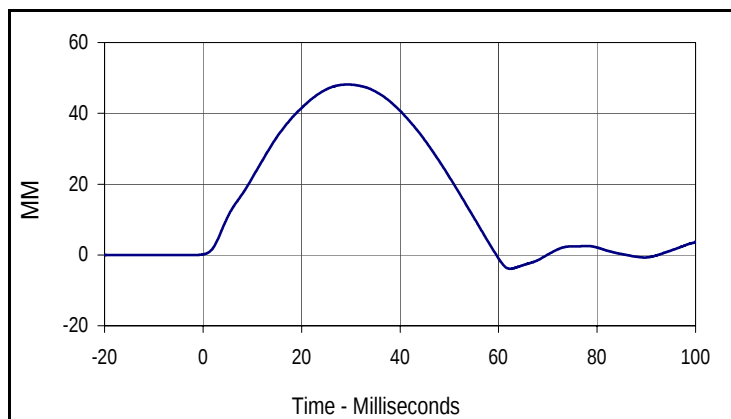
Test Date: 9/15/14
 Test I.D.: F037RB1063



Tested Parameter	Units	Specification	Result	Pass/Fail
Rib Module Soak Time	Minutes	≥240	497	Pass
Temperature During Soak	Max	20.6 to 22.2	21.5	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	37.1	Pass
	Min		36.3	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	36.3	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height	mm	36 to 40	37.5	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height	mm	46 to 51	48.1	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
37.5	32.1	-3.2	67.4



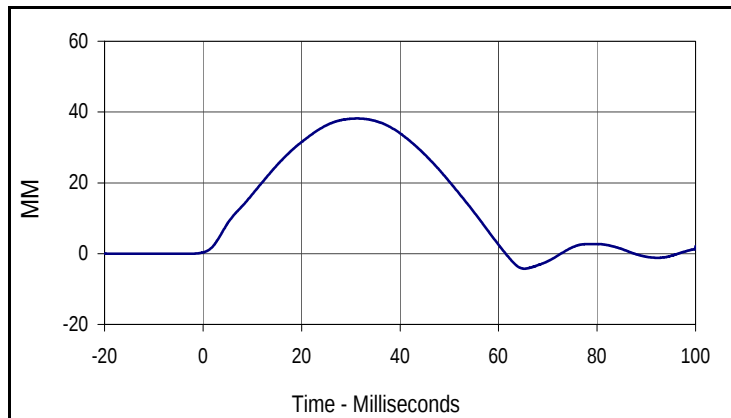
Curve Description			
Upper Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
48.1	29.4	-3.9	62.4

Test Program: ES2re Thorax - Rib Drop Test
 ATD Serial No.: F037 Rib # 2

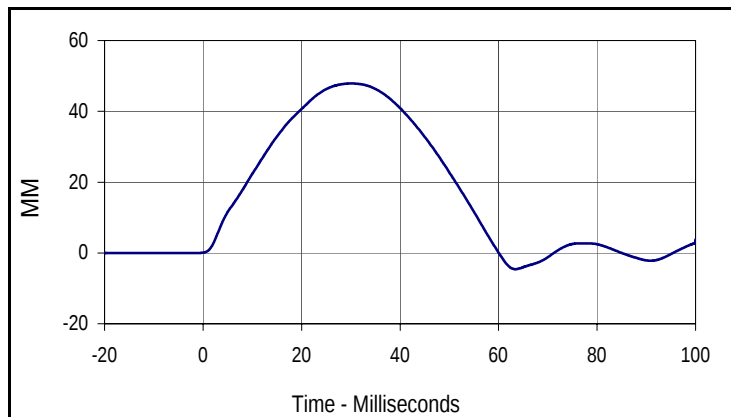
Test Date: 9/15/14
 Test I.D.: F037RB2063



Tested Parameter	Units	Specification	Result	Pass/Fail
Rib Module Soak Time	Minutes	≥240	542	Pass
Temperature During Soak	Max	20.6 to 22.2	21.5	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	37.1	Pass
	Min		36.3	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	36.3	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height	mm	36 to 40	38.2	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height	mm	46 to 51	47.9	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
38.2	31.3	-4.3	65.3



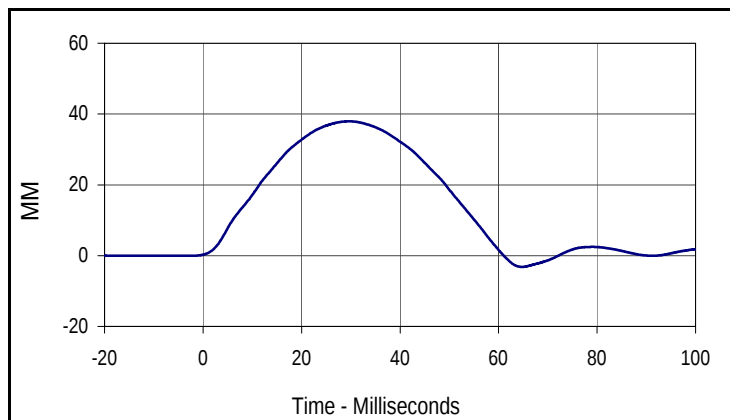
Curve Description			
Middle Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
47.9	30.1	-4.6	63.4

Test Program: ES2re Thorax - Rib Drop Test
 ATD Serial No.: F037 Rib # 3

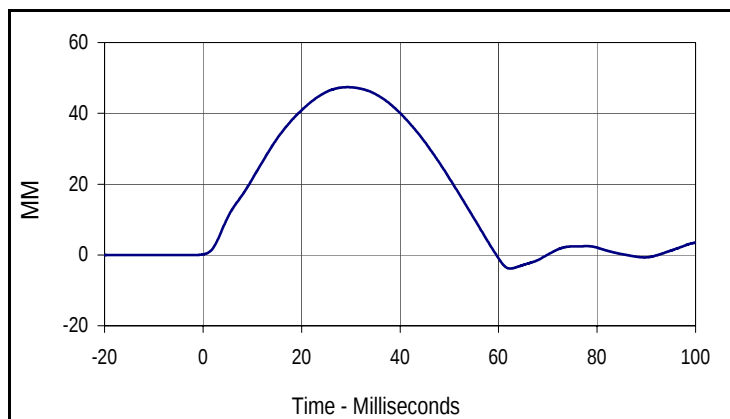
Test Date: 9/15/14
 Test I.D.: F037RB3063



Tested Parameter	Units	Specification	Result	Pass/Fail
Rib Module Soak Time	Minutes	≥240	587	Pass
Temperature During Soak	Max	20.6 to 22.2	21.5	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	37.1	Pass
	Min		36.3	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	36.5	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height	mm	36 to 40	37.9	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height	mm	46 to 51	47.4	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
37.9	29.6	-3.2	64.7



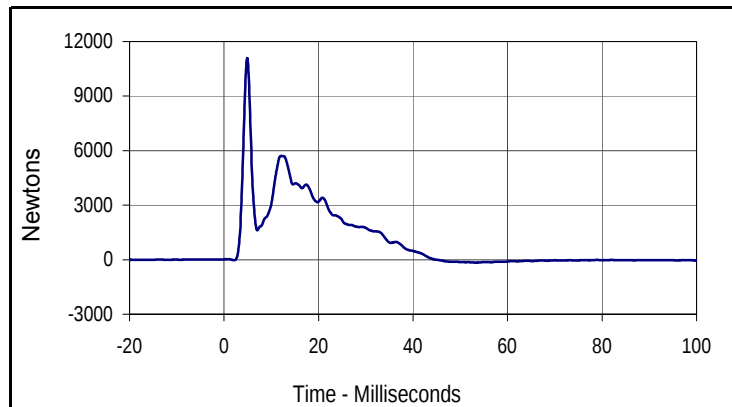
Curve Description			
Lower Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
47.4	29.4	-3.9	62.4

Test Program: ES2re Thorax - Full Body Impact Test
 ATD Serial No.: F037

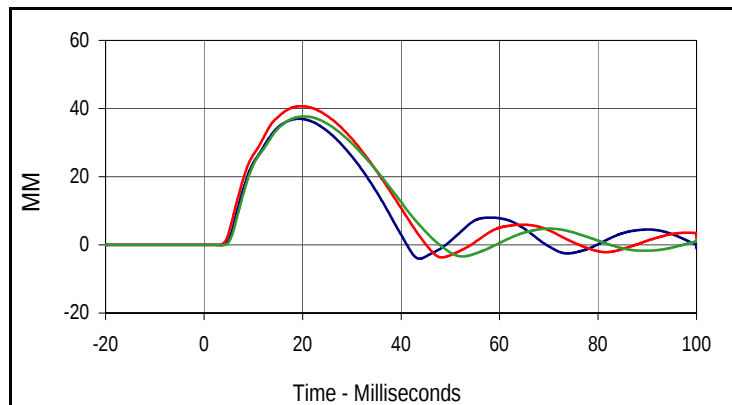
Test Date: 9/15/14
 Test I.D.: F037TH063



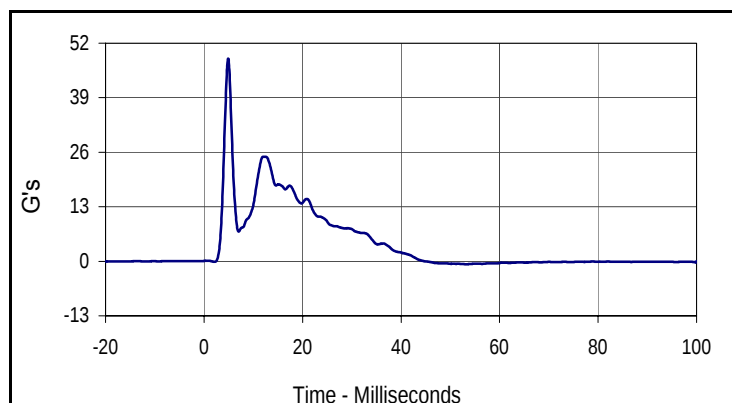
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	632	Pass
Temperature During Soak	Max °C	20.6 to 22.2	21.5	Pass
	Min °C		21.2	Pass
Humidity During Soak	Max %	10.0 to 70.0	37.1	Pass
	Min %		36.3	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	36.7	Pass
Peak Impactor Velocity	m/s	5.4 to 5.6	5.55	Pass
Peak Impactor Force	N	5100 to 6200	5711.8	Pass
	msec	> 6.0 msec	12	Pass
Peak Upper Rib Deflection	mm	34 to 41	37.0	Pass
Peak Middle Rib Deflection	mm	37 to 45	40.7	Pass
Peak Lower Rib Deflection	mm	37 to 44	37.7	Pass
Overall Test Results				Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
11078.8	4.9	-163.3	53.3



Curve Description			
Upper, Middle, Lower Rib Deflections			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max (Upper)	Time	Min (Upper)	Time
37.0	19.2	-4.1	43.7
Max (Middle)	Time	Min (Middle)	Time
40.7	19.7	-3.7	48.3
Max (Lower)	Time	Min (Lower)	Time
37.7	20.3	-3.4	52.5



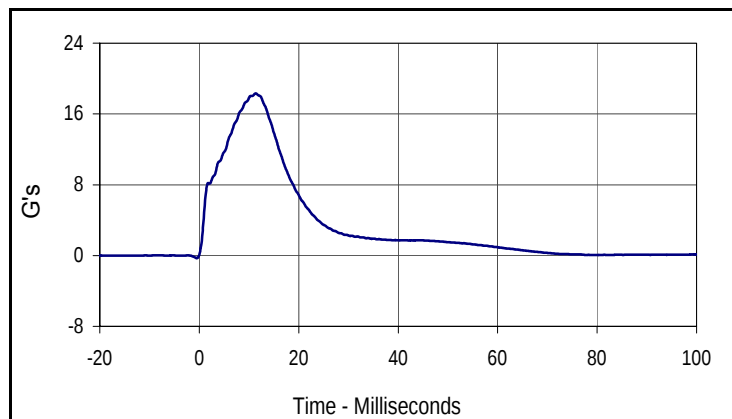
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
48.4	4.9	-0.7	53.3

Test Program: ES2re Abdomen Impact Test
 ATD Serial No.: F037

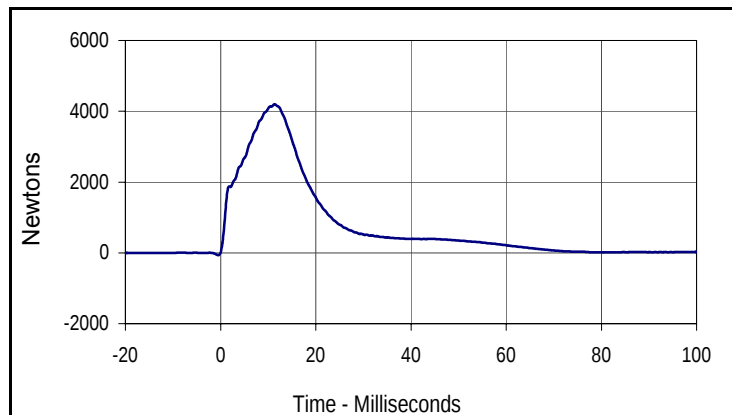
Test Date: 9/15/14
 Test I.D.: F037ABD063



Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	702	Pass
Temperature During Soak	Max	20.6 to 22.2	21.5	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	37.1	Pass
	Min		36.3	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	36.3	Pass
Probe Velocity	m/s	3.9 to 4.1	3.93	Pass
Peak Impactor Force	N	4000 to 4800	4196.9	Pass
	msec	10.6 to 13.0	11.3	Pass
Sum of Abdominal Forces	N	2200 to 2700	2437.5	Pass
	msec	10.0 to 12.3	11.0	Pass
Overall Test Results				Pass



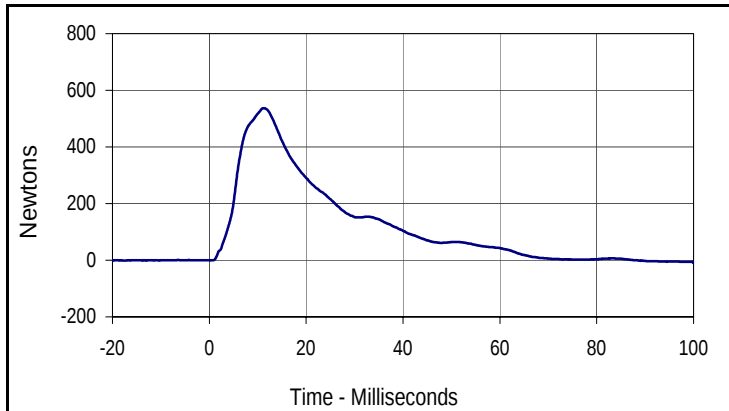
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
18.3	11.3	-0.3	-0.5



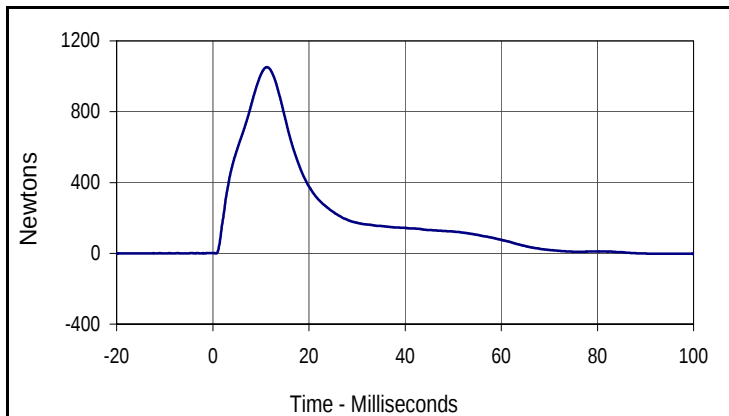
Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
002	FIL	180	Newtons
Max	Time	Min	Time
4196.9	11.3	-65.1	-0.5

Test Program: ES2re Abdomen Impact Test
 ATD Serial No.: F037

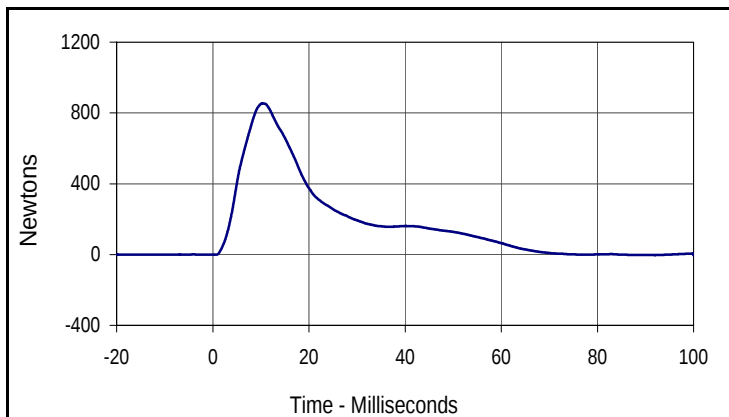
Test Date: 9/15/14
 Test I.D.: F037ABD063



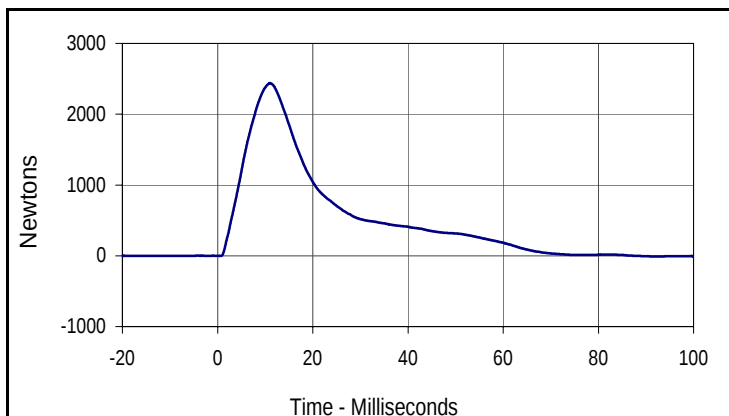
Curve Description			
Front Abdomen Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
536.8	11.1	-10.3	100.7



Curve Description			
Middle Abdomen Force			
Plot No.	Type	SAE Class	Units
004	FIL	600	Newtons
Max	Time	Min	Time
1051.3	11.2	-6.4	100.6



Curve Description			
Rear Abdomen Force			
Plot No.	Type	SAE Class	Units
005	FIL	600	Newtons
Max	Time	Min	Time
854.1	10.3	-7.1	103.4



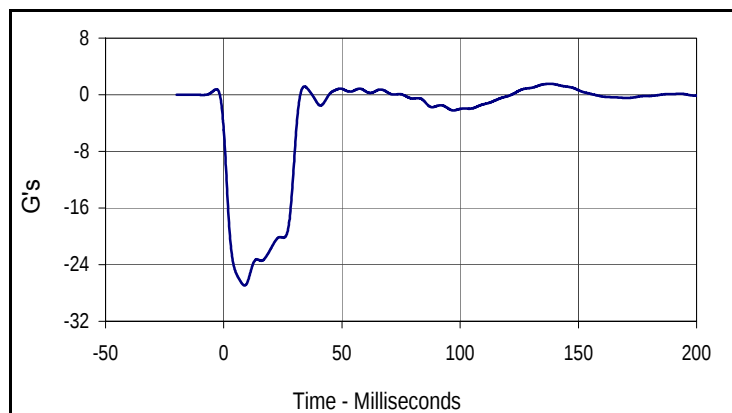
Curve Description			
Abdomen Sum Resultant			
Plot No.	Type	SAE Class	Units
006	RES	600	Newtons
Max	Time	Min	Time
2437.5	11.0	-22.0	100.6

Test Program: ES2re Lumbar Flexion Test
 ATD Serial No.: F037

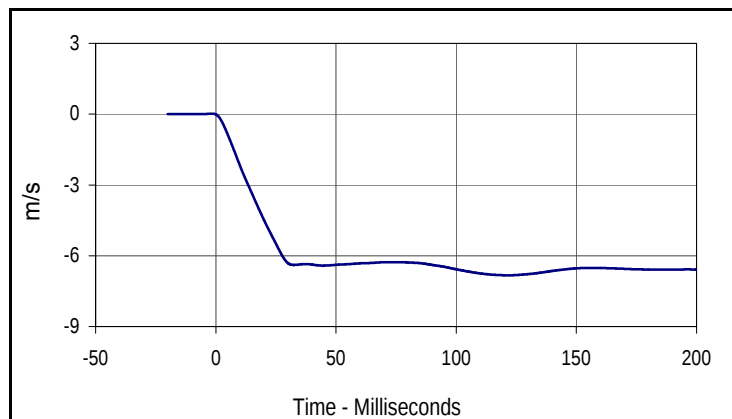
Test Date: 9/15/14
 Test I.D.: F037LB063



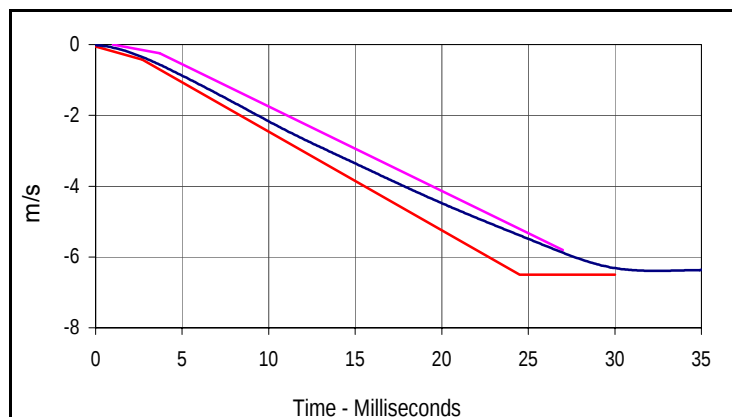
Tested Parameter	Units	Specification	Result	Pass/Fail
Lumbar Spine Assembly Soak Time	Minutes	≥240	777	Pass
Temperature During Soak	Max	20.6 to 22.2	21.5	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	37.1	Pass
	Min		36.3	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	36.4	Pass
Pendulum Velocity	m/s	5.95 to 6.15	6.10	Pass
Headform Rotation	Max	45 to 55	51.3	Pass
	Time	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
1.5	138.6	-26.9	9.4



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.1	-6.8	122.3



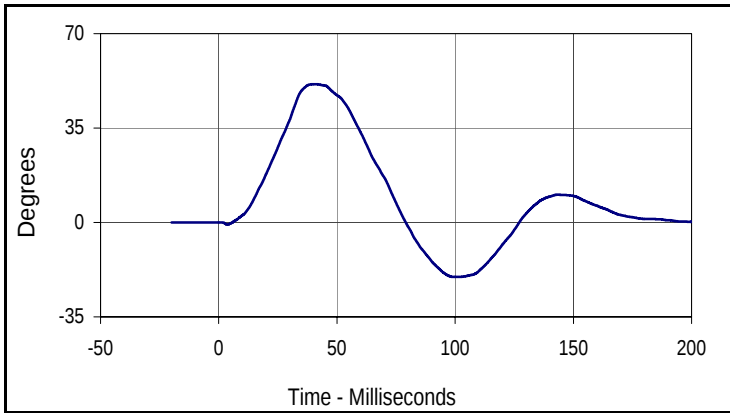
Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.1	-6.8	122.3

Velocity Corridors

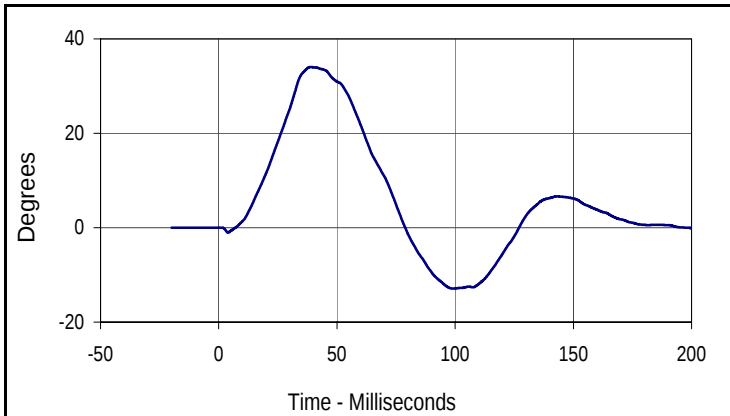
Upper Boundary		Lower Boundary	
Time (msec)	Velocity (m/s)	Time (msec)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.7	-0.24	2.7	-0.425
27.0	-5.80	24.5	-6.50
		30.0	-6.50

Test Program: ES2re Lumbar Flexion Test
 ATD Serial No.: F037

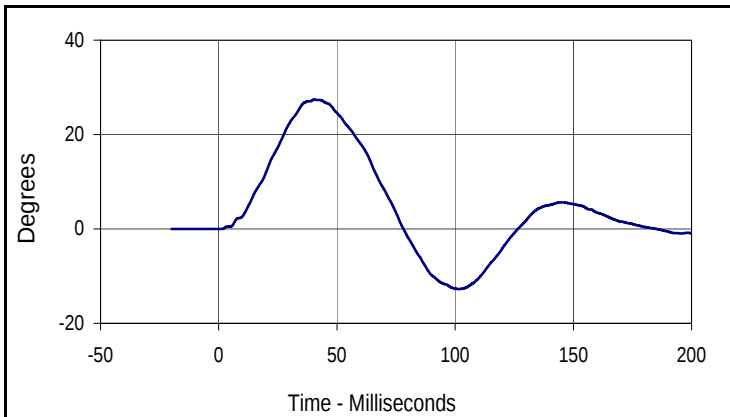
Test Date: 9/15/14
 Test I.D.: F037LB063



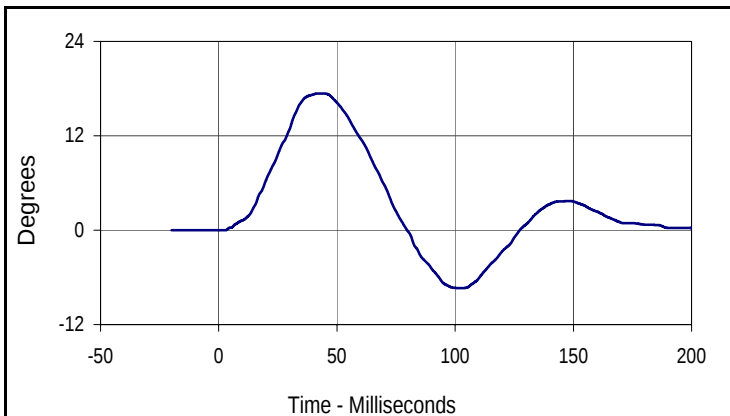
Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
51.3	41.6	-20.2	99.8



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
34.0	39.5	-12.9	99.6



Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
27.5	40.9	-12.7	102.1



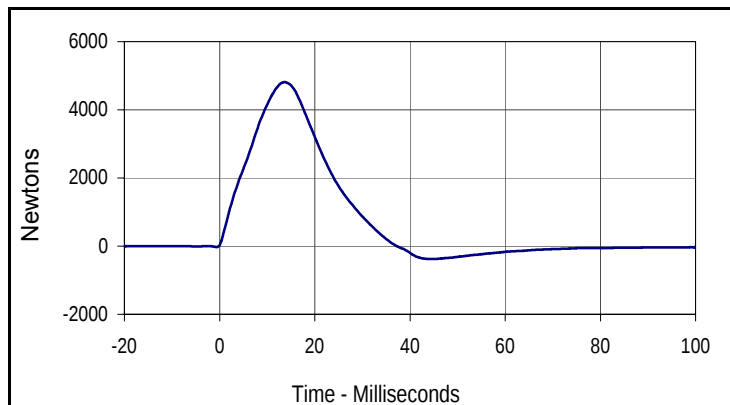
Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
006	FIL	180	Degrees
Max	Time	Min	Time
17.4	43.0	-7.4	103.1

Test Program: ES2re Pelvis Impact Test
 ATD Serial No.: F037

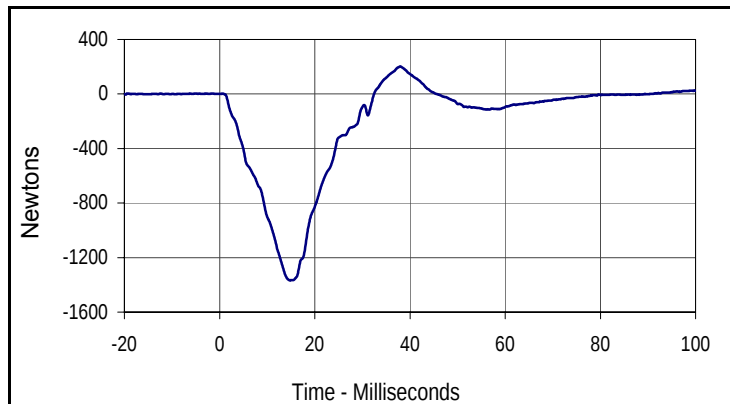
Test Date: 9/15/14
 Test I.D.: F037PL063



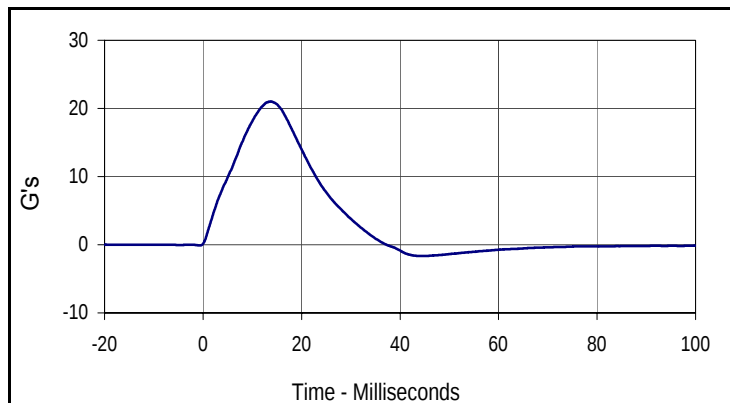
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	832	Pass
Temperature During Soak	Max	20.6 to 22.2	21.5	Pass
	Min		21.2	Pass
Humidity During Soak	Max	10.0 to 70.0	37.1	Pass
	Min		36.3	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	36.6	Pass
Pendulum Velocity	m/s	4.2 to 4.4	4.32	Pass
Peak Impactor Force	N	4700 to 5400	4814.3	Pass
	msec	11.8 to 16.1	13.7	Pass
Peak Pubic Symphysis Load	N	-1230 to -1590	-1366.7	Pass
	msec	12.2 to 17.0	14.8	Pass
Overall Test Results				Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4814.3	13.7	-380.1	44.6



Curve Description			
Pubic Symphysis Force Y			
Plot No.	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
201.7	38.0	-1366.7	14.8



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
21.0	13.7	-1.7	44.6

Test Program: SID IIs External Measurements
 ATD Serial No.: 307

Test Date: 9/16/14
 Test I.D.: N/A



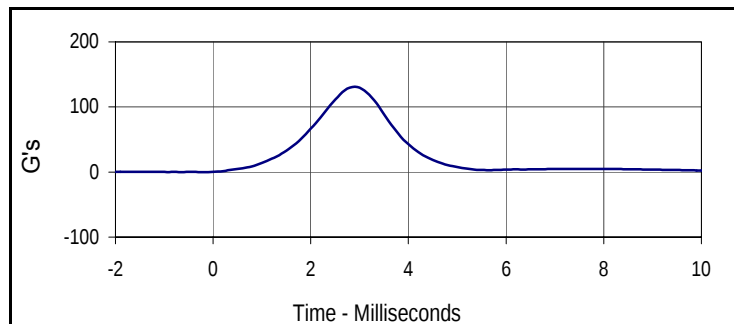
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	43	Pass
A	Sitting Height	mm	772 - 788	778	Pass
B	Shoulder Pivot Height	mm	437 - 453	443	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	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
 ATD Serial No.: 307

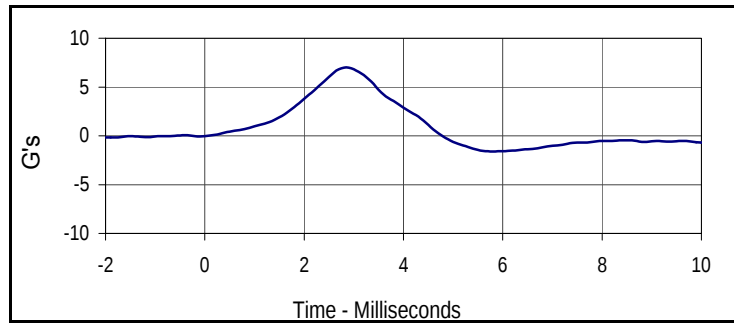
Test Date: 9/16/14
 Test I.D.: 307HD071



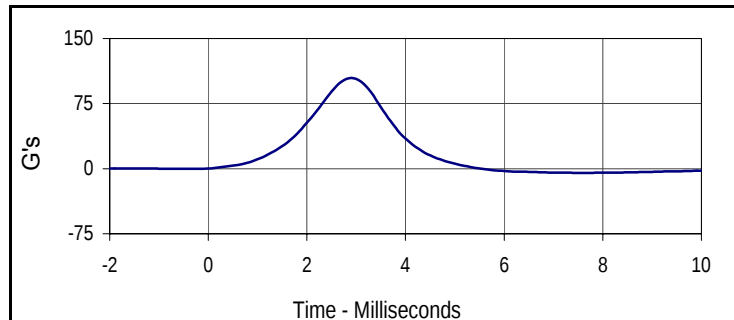
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	415	Pass
Temperature During Soak	Max	18.9 to 25.6	21.6	Pass
	Min		21.4	Pass
Humidity During Soak	Max	10.0 to 70.0	43.1	Pass
	Min		42.2	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	42.9	Pass
Peak Head Resultant Acceleration	G's	115 to 137	131.0	Pass
Peak Head X Acceleration	G's	<15	7.0	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	3.7	Pass
Overall Test Results				Pass



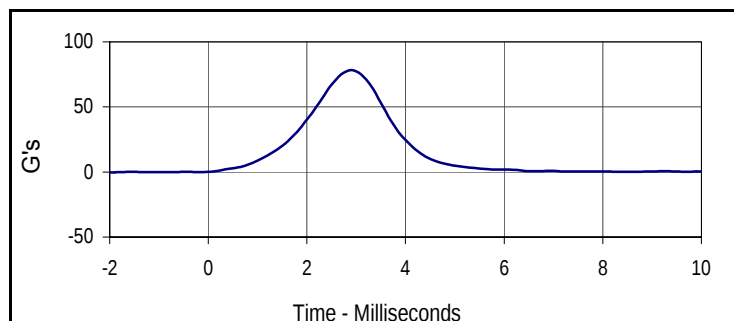
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
131.0	2.9	0.0	-0.6



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
7.0	2.8	-1.6	5.8



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
104.8	2.9	-4.8	7.7



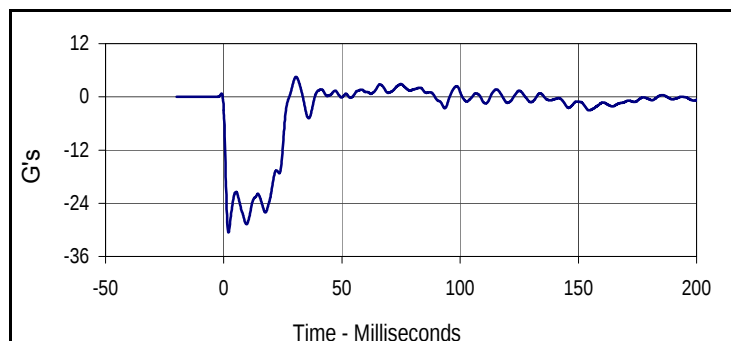
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
78.2	2.9	-0.2	-2.0

Test Program: SID IIs Neck Flexion Test
 ATD Serial No.: 307

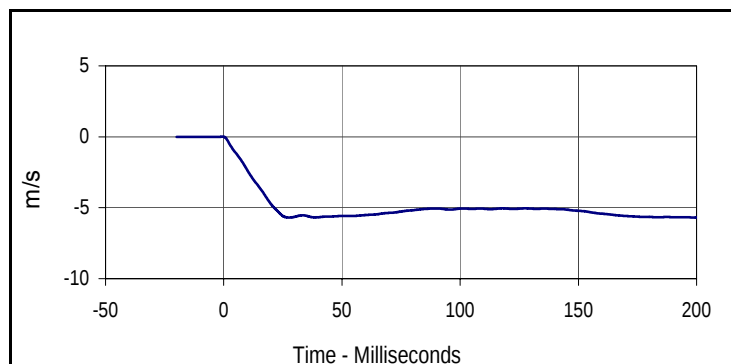
Test Date: 9/16/14
 Test I.D.: 307NB071



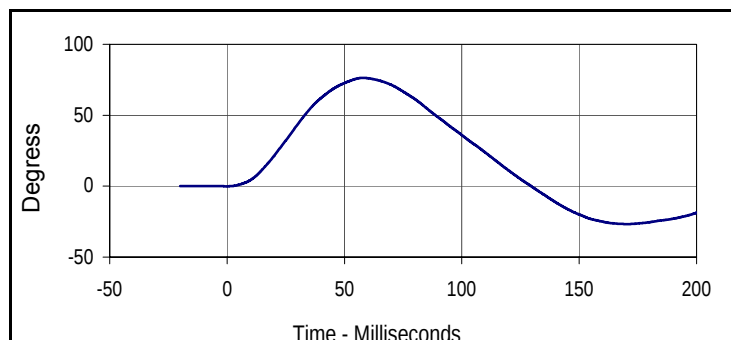
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	490	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	43.1	Pass
	Min	%		42.2	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	42.7	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.52	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.36	Pass
	15 msec	m/s	-3.30 to -4.10	-3.55	Pass
	20 msec	m/s	-4.40 to -5.40	-4.74	Pass
	25 msec	m/s	-5.40 to -6.10	-5.58	Pass
	25-100 msec	m/s	-5.50 to -6.20	-5.69	Pass
D-Plane Rotation	Max	Degrees	71 to 81	76.3	Pass
	Time	msec	50 to 70	58.0	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-43.6	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	110.1	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
4.5	0.0	-30.6	0.0



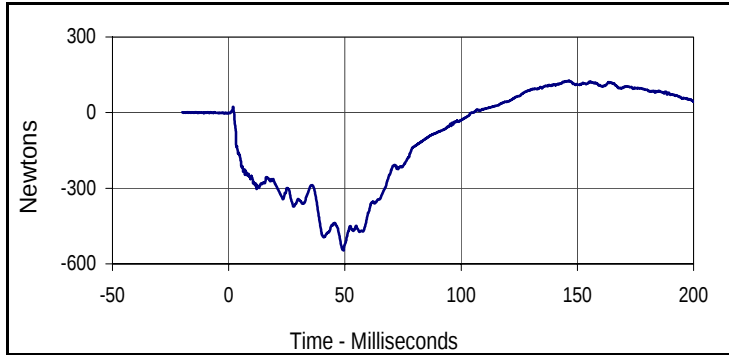
Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.4	-5.7	200.0



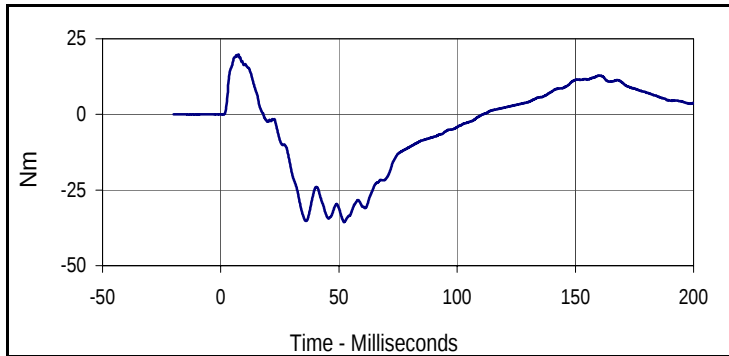
Curve Description			
D-Plane Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degress
Max	Time	Min	Time
76.3	58.0	-26.7	170.4

Test Program: SID IIs Neck Flexion Test
 ATD Serial No.: 307

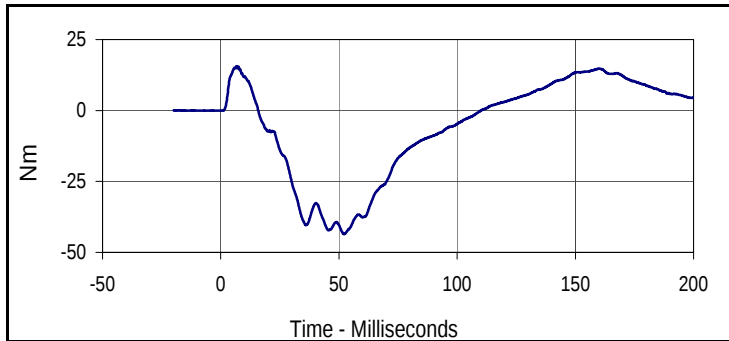
Test Date: 9/16/14
 Test I.D.: 307NB071



Curve Description			
Neck Force Y			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
126.9	146.3	-546.7	49.4



Curve Description			
Neck Moment X			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
19.8	7.5	-35.6	52.2



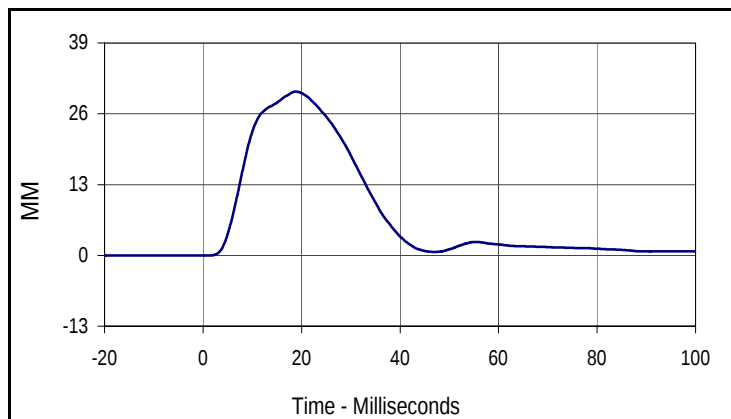
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
006	FIL	600	Nm
Max	Time	Min	Time
15.6	6.7	-43.6	52.1

Test Program: SID IIs Shoulder Impact Test
 ATD Serial No.: 307

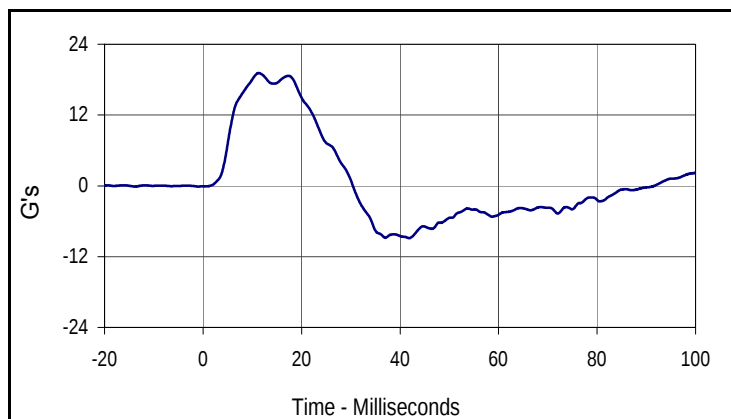
Test Date: 9/16/14
 Test I.D.: 307SH071



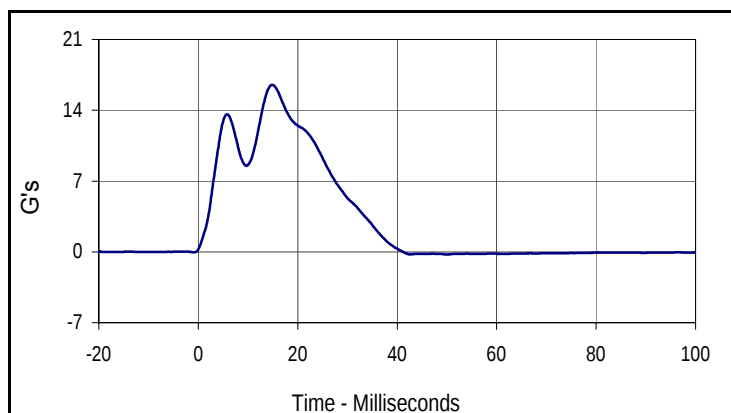
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	545	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	43.1	Pass
	Min	%		42.2	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	42.6	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.32	Pass
Peak Shoulder Deflection		mm	28 to 37	30.1	Pass
Peak Lateral Spine Acceleration Y		G's	17 to 22	19.1	Pass
Peak Impactor Acceleration		G's	13 to 18	16.5	Pass
Overall Test Results				Pass	



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
30.1	18.8	0.0	-3.8



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
19.1	11.3	-8.9	41.9



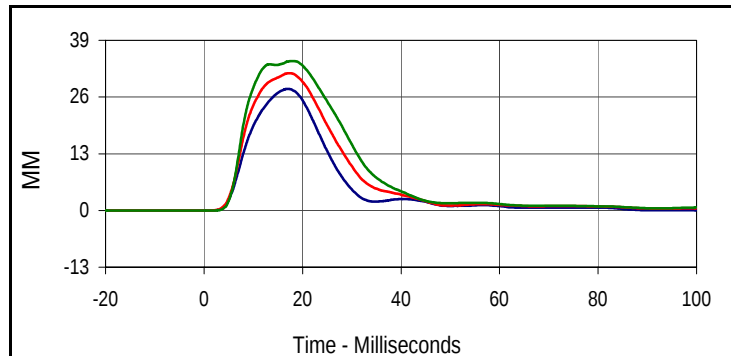
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
16.5	14.9	-0.3	49.9

Test Program: SID IIs Thorax with Arm Impact Test
 ATD Serial No.: 307

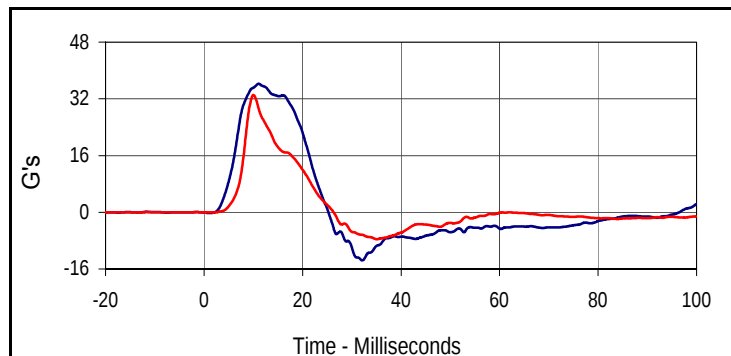
Test Date: 9/16/14
 Test I.D.: 307TWA071



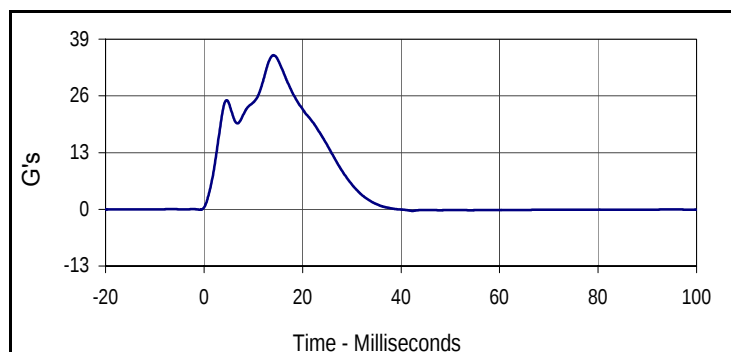
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	590	Pass
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass
	Min		21.4	Pass
Humidity During Soak	Max	10.0 to 70.0	43.1	Pass
	Min		42.2	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	42.5	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.71	Pass
Peak Shoulder Deflection	mm	31 to 40	35.1	Pass
Peak Upper Thorax Rib Deflection	mm	25 to 32	27.8	Pass
Peak Middle Thorax Rib Deflection	mm	30 to 36	31.4	Pass
Peak Lower Thorax Rib Deflection	mm	32 to 38	34.2	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	36.2	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	33.1	Pass
Peak Impactor Acceleration	G's	30 to 36	35.3	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
27.8	16.9	0.0	-10.6
Middle Thorax Deflection			
Max	Time	Min	Time
31.4	17.4	0.0	-7.3
Lower Thorax Deflection			
Max	Time	Min	Time
34.2	17.8	0.0	-11.7



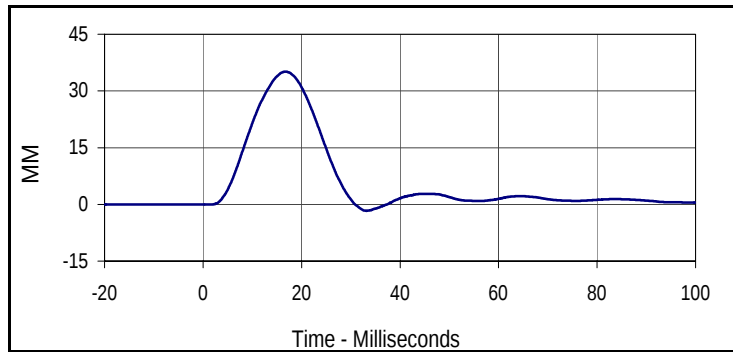
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
36.2	11.1	-13.6	32.1
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
33.1	10.0	-7.6	35.1



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
35.3	14.1	-0.4	42.3

Test Program: SID IIs Thorax with Arm Impact Test
 ATD Serial No.: 307

Test Date: 9/16/14
 Test I.D.: 307TWA071



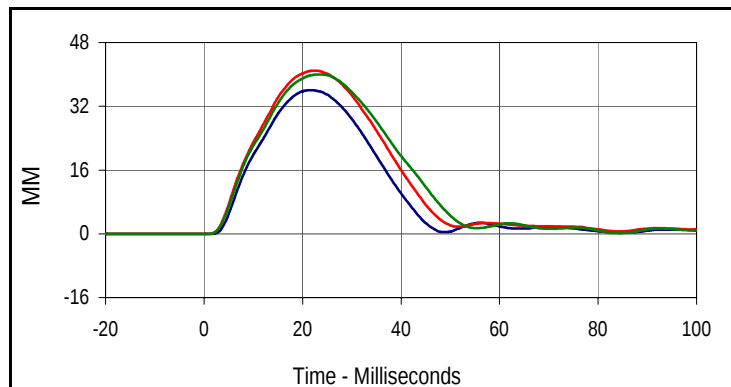
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
35.1	16.7	-1.7	33.2

Test Program: SID IIs Thorax without Arm Impact Test
 ATD Serial No.: 307

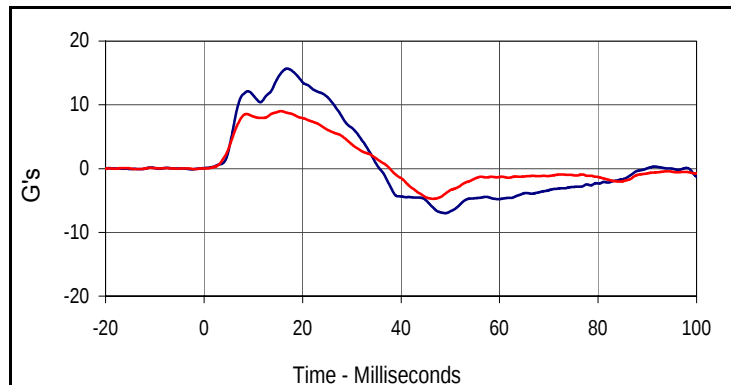
Test Date: 9/16/14
 Test I.D.: 307TWOA071



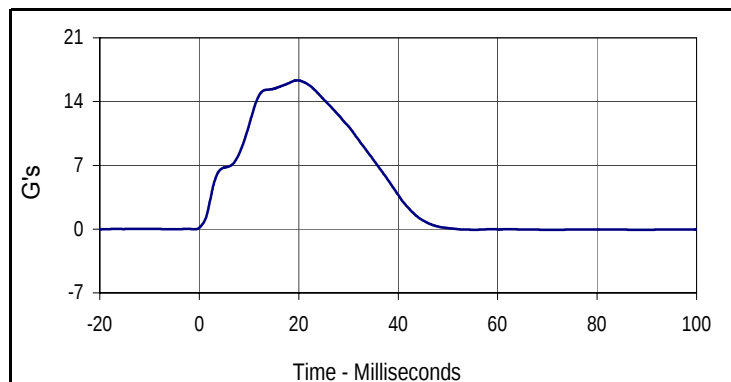
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	640	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	43.1	Pass
	Min	%		42.2	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	42.4	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.33	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	36.0	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	40.9	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	40.0	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	15.7	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	9.0	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
36.0	21.4	0.0	-18.2
Middle Thorax Deflection			
Max	Time	Min	Time
40.9	22.4	0.0	-0.1
Lower Thorax Deflection			
Max	Time	Min	Time
40.0	23.4	0.0	-19.7



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.7	16.9	-7.0	49.0
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.0	15.6	-4.7	46.6



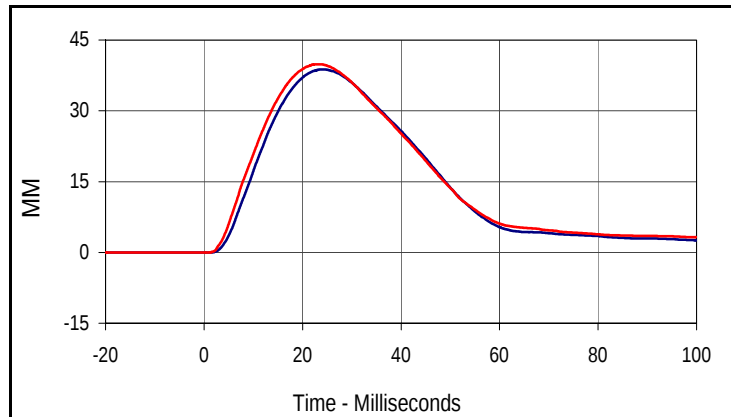
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.3	19.7	-0.1	87.6

Test Program: SID IIs Abdomen Impact Test
 ATD Serial No.: 307

Test Date: 9/16/14
 Test I.D.: 307ABD071

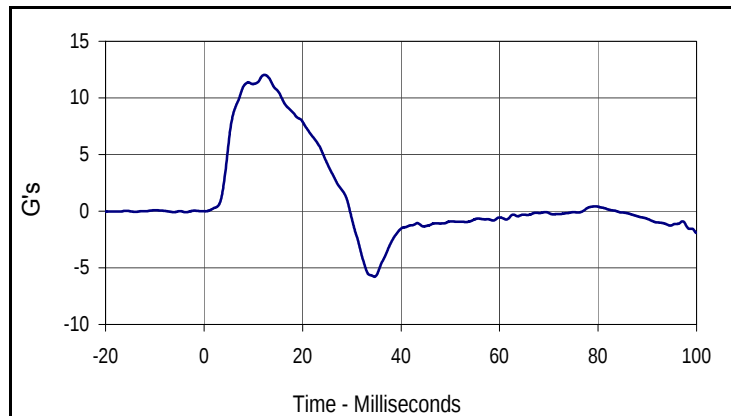


Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	675	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	43.1	Pass
	Min	%		42.2	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	42.3	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.35	Pass
Peak Upper Abdominal Rib Deflection		mm	36 to 47	38.8	Pass
Peak Lower Abdominal Rib Deflection		mm	33 to 44	39.9	Pass
Peak Lower Spine Y Acceleration		G's	9 to 14	12.0	Pass
Peak Impactor Acceleration		G's	12 to 16	14.8	Pass
Overall Test Results				Pass	

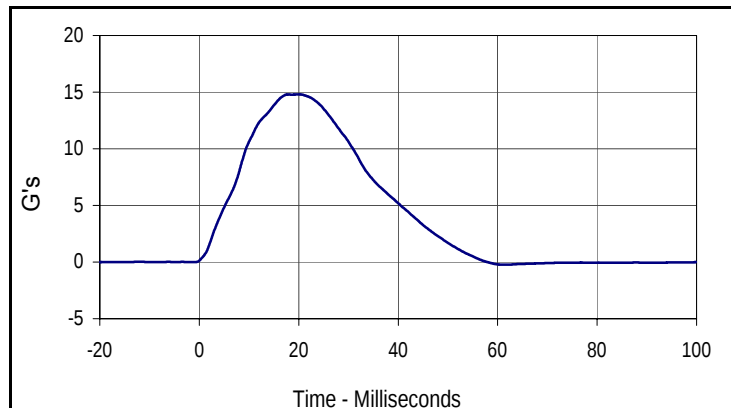


Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
38.8	24.1	0.0	-1.6

Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
39.9	23.2	0.0	-12.1

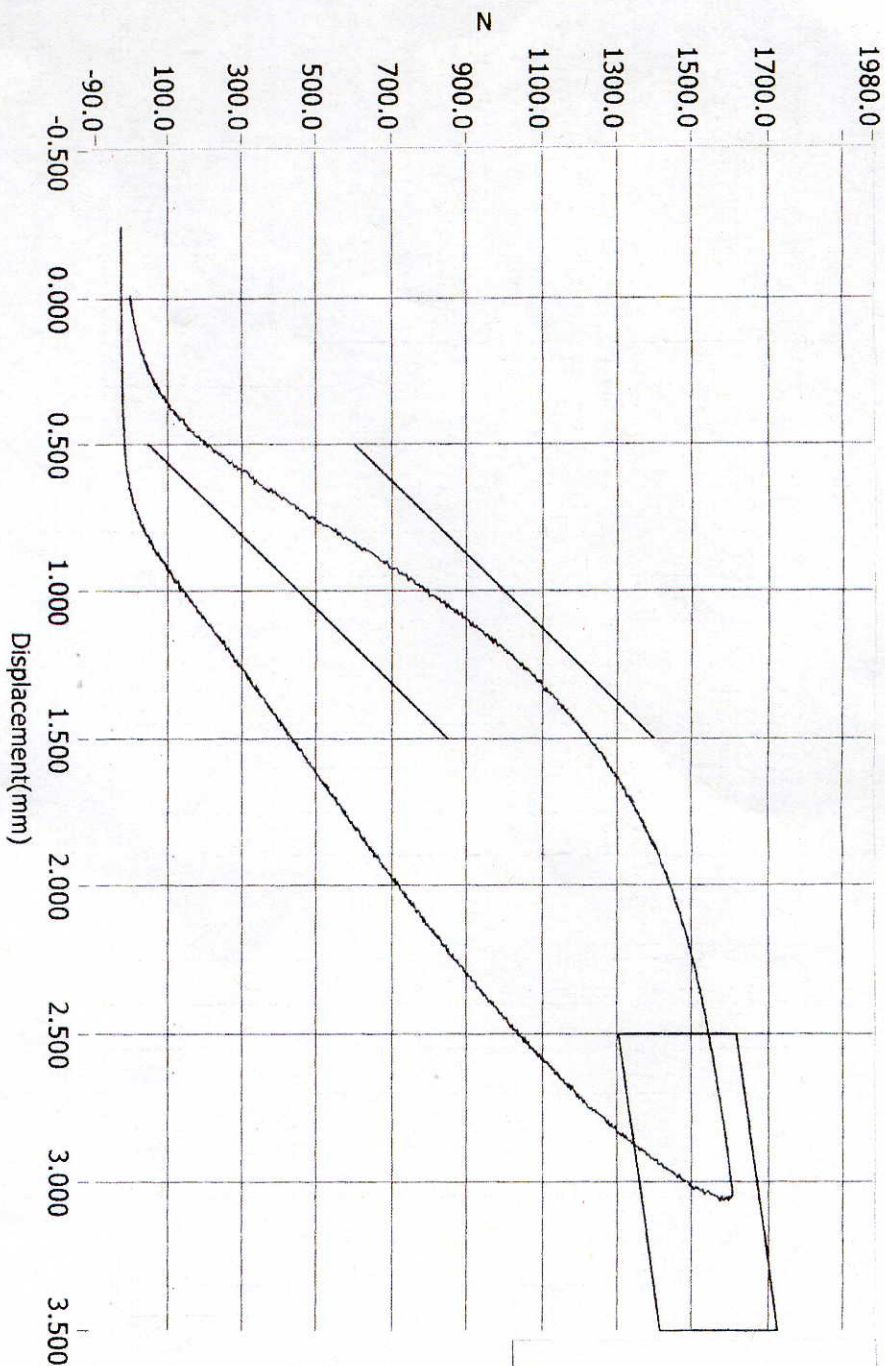


Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
12.0	12.2	-5.8	34.6



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.8	20.0	-0.2	61.3

Resultant Data - SIDIIs Plug Compression



1604N

ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

O20155502 PRE TEST

ft ID

ATD Serial Number

ATD Type

N/A

SIDIIs

Current Date : 1/23/2013

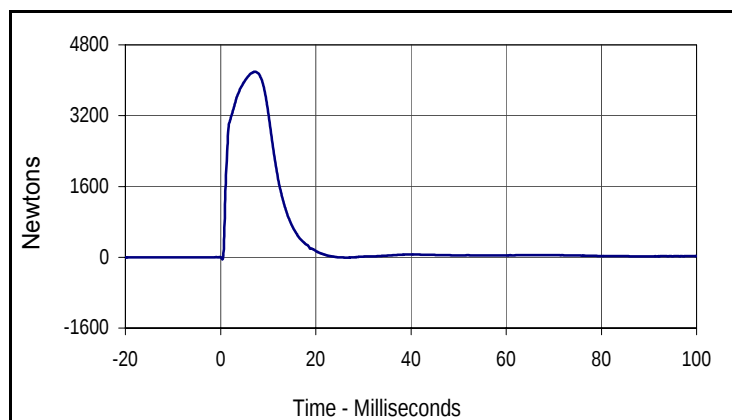
Current Time : 20:03:24

Test Program: SID IIs Pelvis Acetabulum Impact Test
 ATD Serial No.: 307

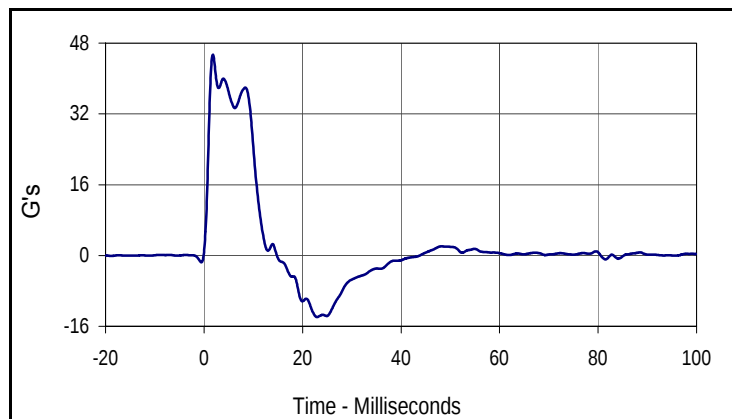
Test Date: 9/16/14
 Test I.D.: 307ACET071



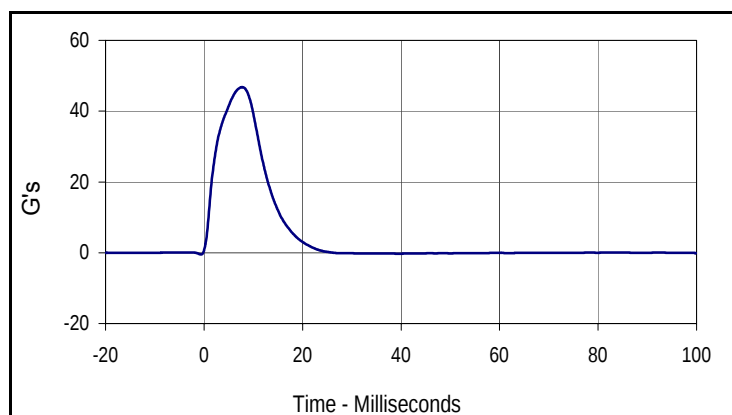
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	720	Pass
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass
	Min		21.4	Pass
Humidity During Soak	Max	10.0 to 70.0	43.1	Pass
	Min		42.2	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	42.3	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.63	Pass
Peak Acetabulum Force Y	Newtons	3600 to 4300	4193.2	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	37.9	Pass
Peak Impactor Acceleration	G's	38 to 47	46.8	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4193.2	7.2	-42.1	0.4



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
45.4	1.8	-13.9	23.0



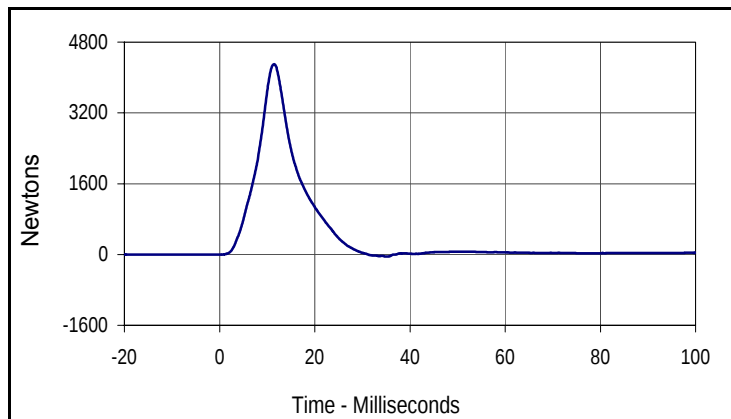
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
46.8	7.7	-0.5	-0.6

Test Program: SID IIs Pelvis Iliac Calibration
 ATD Serial No.: 307

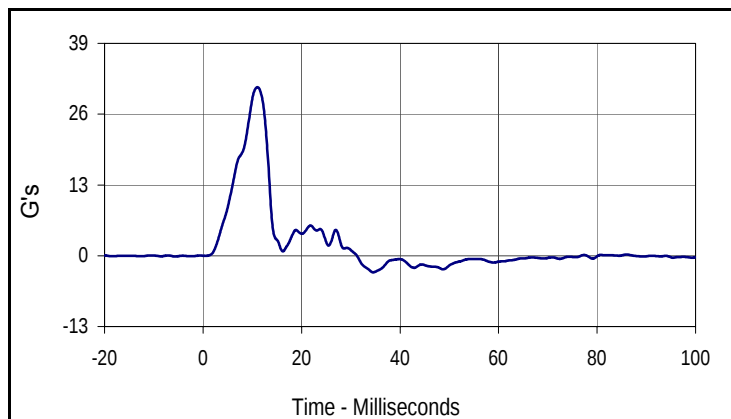
Test Date: 9/16/14
 Test I.D.: 307PL071



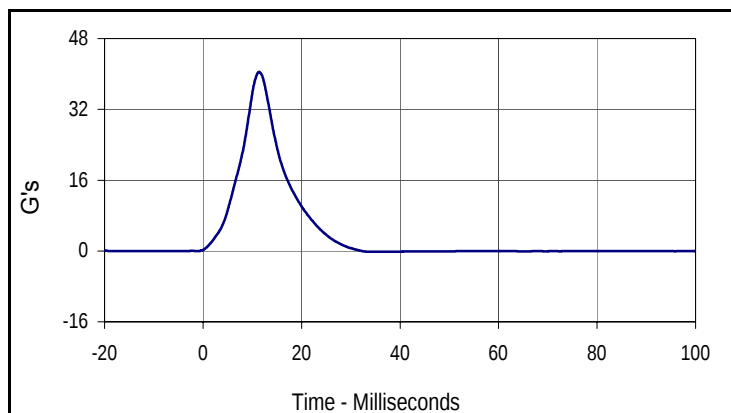
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	790	Pass
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass
	Min		21.4	Pass
Humidity During Soak	Max	10.0 to 70.0	43.1	Pass
	Min		42.2	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	42.2	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.37	Pass
Peak Iliac Force	Newtons	4100 to 5100	4301.8	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	31.0	Pass
Peak Impactor Acceleration	G's	36 to 45	40.5	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4301.8	11.4	-47.1	34.9



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
31.0	11.0	-3.1	34.6



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
40.5	11.4	-0.2	35.5

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

Test Program: ES2re External Measurements
 ATD Serial No.: F037

Test Date: 10/23/14
 Test I.D.: N/A



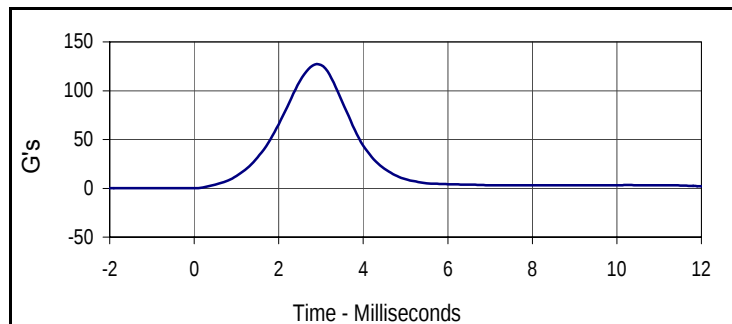
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	30.0	Pass
1	Sitting Height	mm	900 - 918	909	Pass
2	Seat to Shoulder Joint	mm	558 - 572	564	Pass
3	Seat to Lower Face of Thoracic Spine Box	mm	346 - 356	350	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
 ATD Serial No.: F037

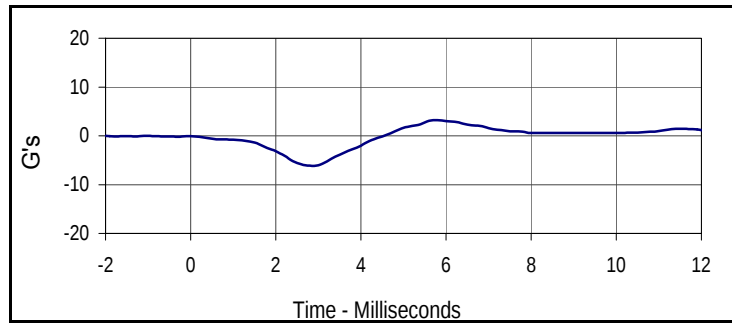
Test Date: 10/23/14
 Test I.D.: F037HD064



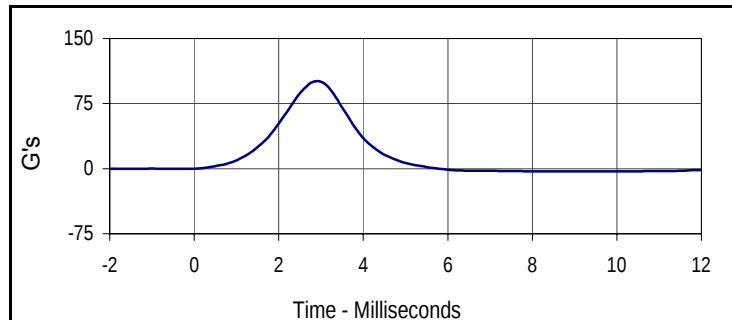
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	250	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.2	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	21.9	Pass
	Min	%		21.1	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	21.1	Pass
Peak Head Resultant Acceleration		G's	125 to 155	127.3	Pass
Peak Head X Acceleration		G's	≤15	6.1	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	7.3	Pass
Overall Test Results				Pass	



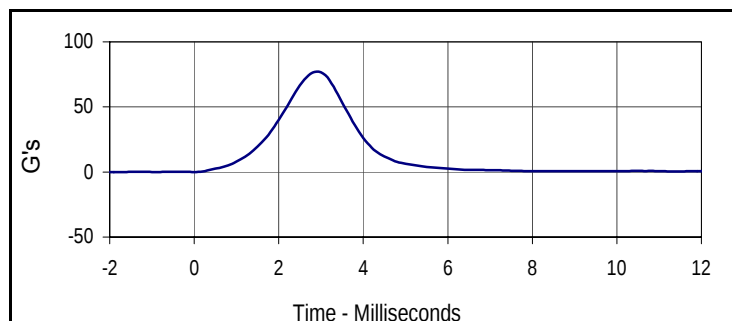
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
127.3	2.9	0.0	-2.0



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
3.2	5.7	-6.1	2.9



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
101.1	2.9	-3.2	10.2



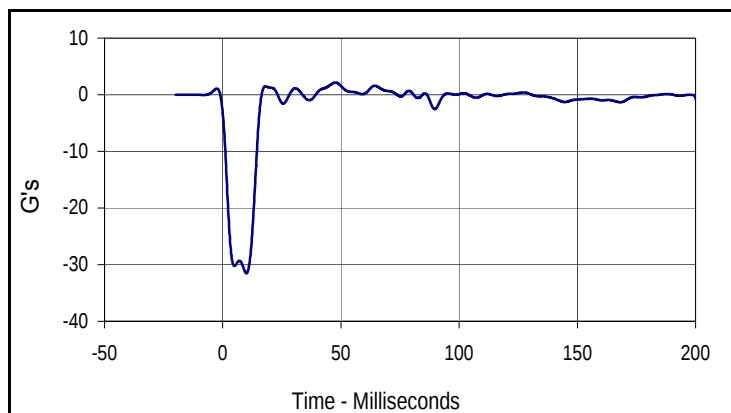
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
77.2	2.9	-0.1	-1.7

Test Program: ES2re Neck Flexion Test
 ATD Serial No.: F037

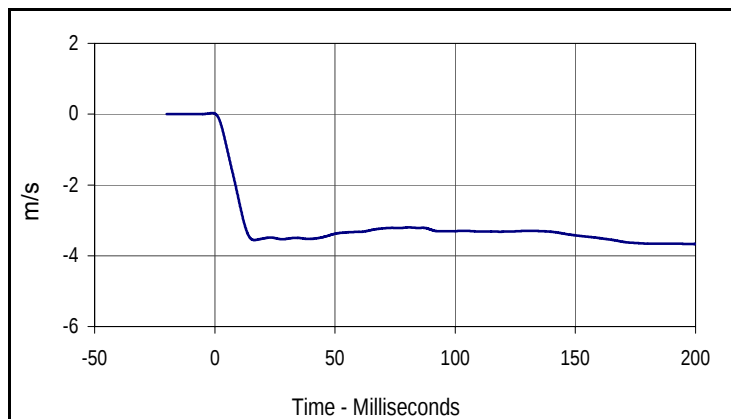
Test Date: 10/23/14
 Test I.D.: F037NB064



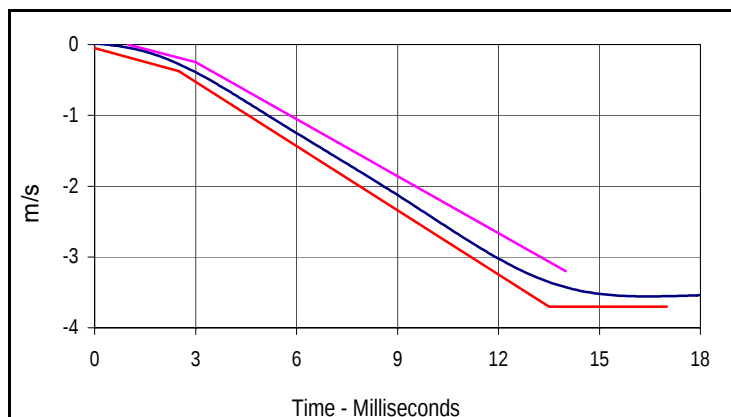
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	285	Pass
Temperature During Soak	Max	20.6 to 22.2	21.2	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	21.9	Pass
	Min		21.1	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	21.2	Pass
Pendulum Velocity	m/s	3.3 to 3.5	3.41	Pass
Headform Flexion	Max	49 to 59	56.4	Pass
	Time	54 to 66	55.6	Pass
Headform Flexion Decay (Peak to Zero)	msec	53 to 88	67.4	Pass
Overall Test Results				Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
2.2	47.7	-31.5	10.0



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.1	-3.7	199.9



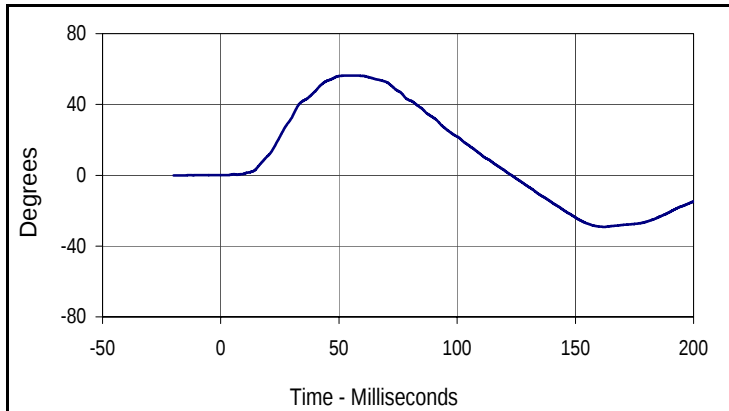
Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.1	-3.7	199.9

Velocity Corridors

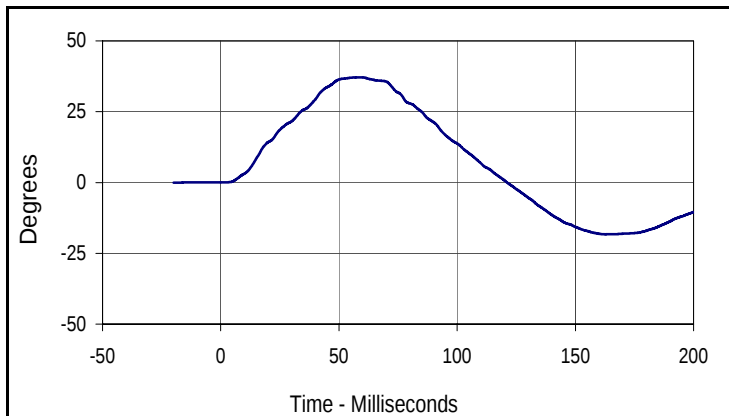
Upper Boundary		Lower Boundary	
Time (msec)	Velocity (m/s)	Time (msec)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.0	-0.03	2.5	-0.375
14.0	-3.20	13.5	-3.70
		17.0	-3.70

Test Program: ES2re Neck Flexion Test
 ATD Serial No.: F037

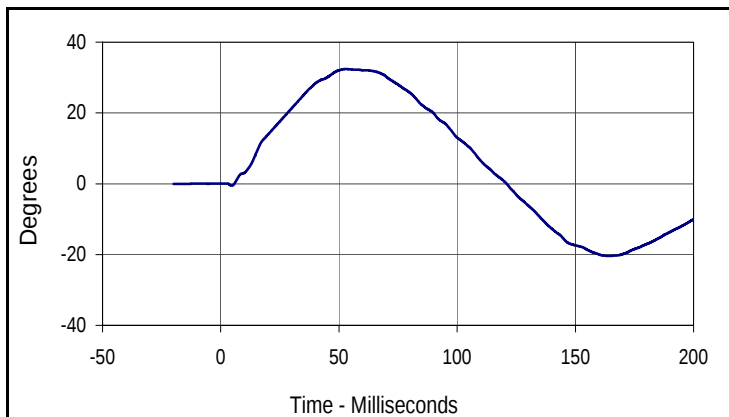
Test Date: 10/23/14
 Test I.D.: F037NB064



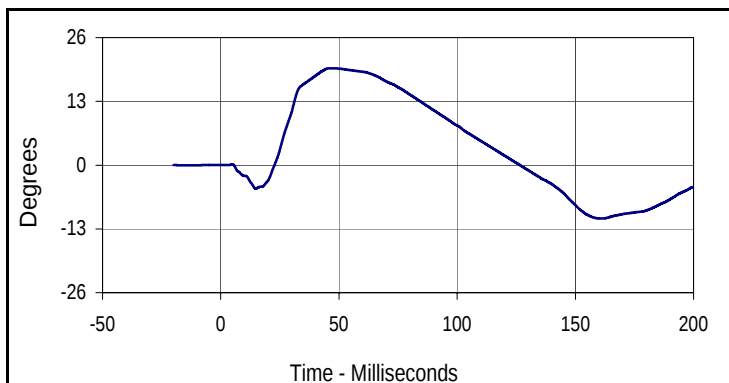
Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
56.4	55.6	-29.2	162.2



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
37.1	59.8	-18.3	162.7



Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
32.4	52.9	-20.4	164.1



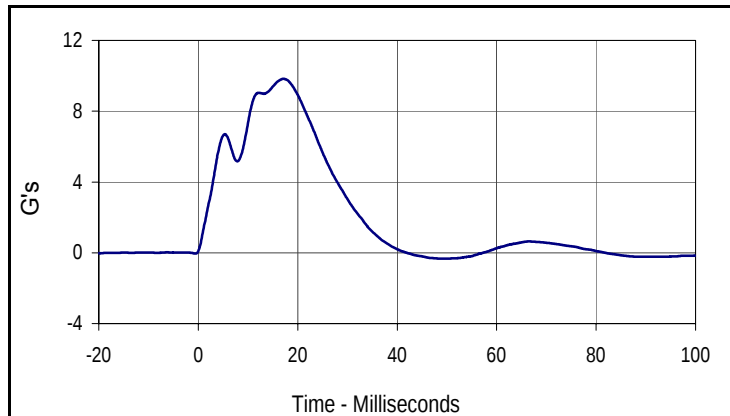
Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
006	FIL	180	Degrees
Max	Time	Min	Time
19.7	45.7	-10.9	160.0

Test Program: ES2re Shoulder Impact Test
 ATD Serial No.: F037

Test Date: 10/23/14
 Test I.D.: F037SH064



Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	350	Pass
Temperature During Soak	Max	20.6 to 22.2	21.2	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	21.9	Pass
	Min		21.1	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	21.3	Pass
Pendulum Speed	m/s	4.2 to 4.4	4.30	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	9.8	Pass
Overall Test Results				Pass



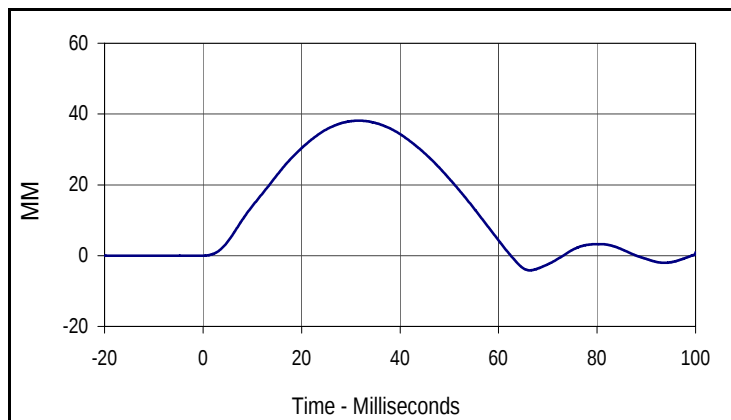
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
9.8	17.2	-0.3	48.8

Test Program: ES2re Thorax - Rib Drop Test
 ATD Serial No.: F037 Rib # 1

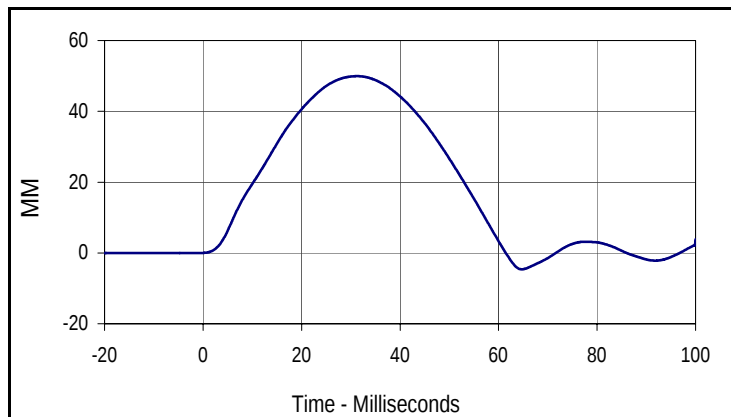
Test Date: 10/23/14
 Test I.D.: F037RB1064



Tested Parameter	Units	Specification	Result	Pass/Fail
Rib Module Soak Time	Minutes	≥240	405	Pass
Temperature During Soak	Max	20.6 to 22.2	21.2	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	21.9	Pass
	Min		21.1	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	21.3	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height	mm	36 to 40	38.1	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height	mm	46 to 51	49.9	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
38.1	31.6	-4.2	66.3



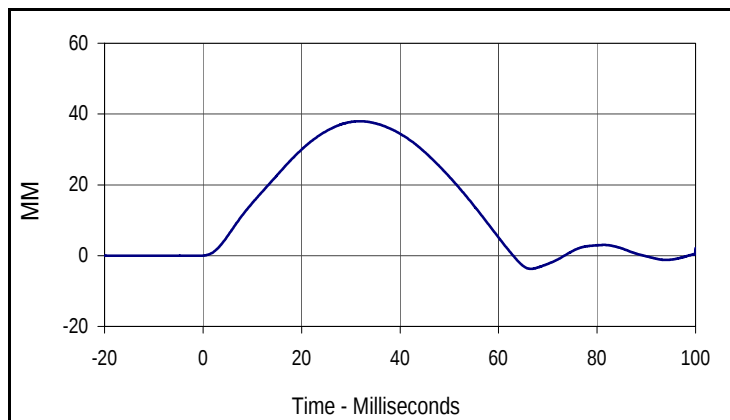
Curve Description			
Upper Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
49.9	31.3	-4.6	64.7

Test Program: ES2re Thorax - Rib Drop Test
 ATD Serial No.: F037 Rib # 2

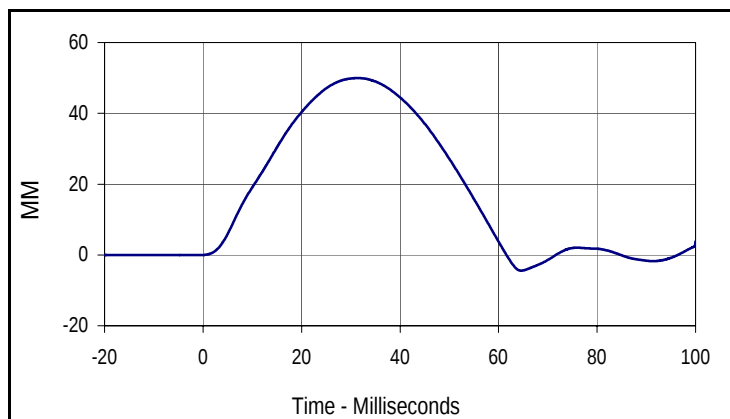
Test Date: 10/23/14
 Test I.D.: F037RB2064



Tested Parameter	Units	Specification	Result	Pass/Fail
Rib Module Soak Time	Minutes	≥240	450	Pass
Temperature During Soak	Max	20.6 to 22.2	21.2	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	21.9	Pass
	Min		21.1	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	21.3	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height	mm	36 to 40	37.9	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height	mm	46 to 51	50.0	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
37.9	31.9	-3.7	66.6



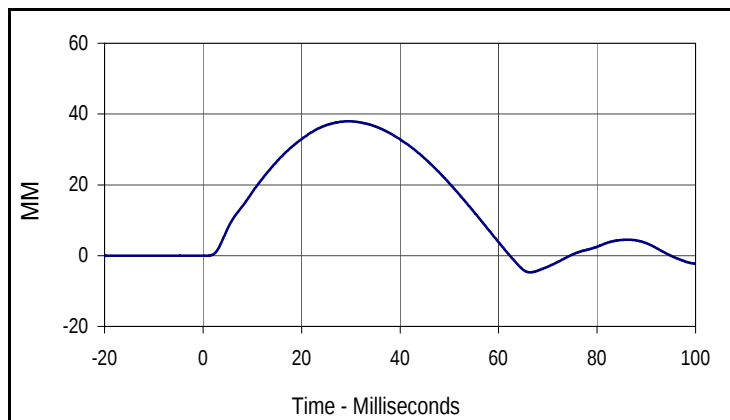
Curve Description			
Middle Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
50.0	31.4	-4.4	64.6

Test Program: ES2re Thorax - Rib Drop Test
 ATD Serial No.: F037 Rib # 3

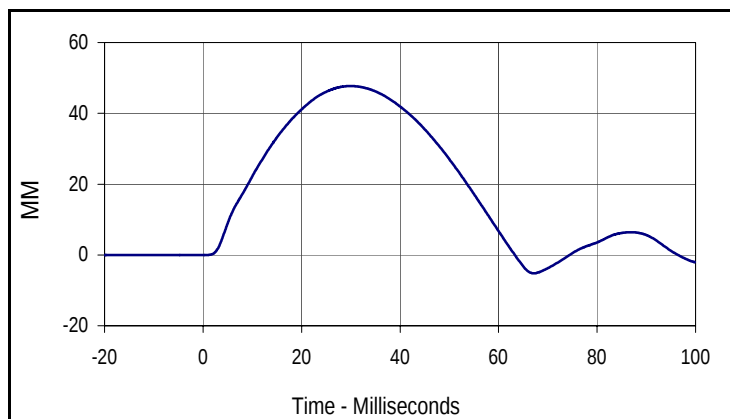
Test Date: 10/23/14
 Test I.D.: F037RB3064



Tested Parameter	Units	Specification	Result	Pass/Fail
Rib Module Soak Time	Minutes	≥240	495	Pass
Temperature During Soak	Max	20.6 to 22.2	21.2	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	21.9	Pass
	Min		21.1	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	21.4	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height	mm	36 to 40	38.0	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height	mm	46 to 51	47.7	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
38.0	29.6	-4.7	66.4



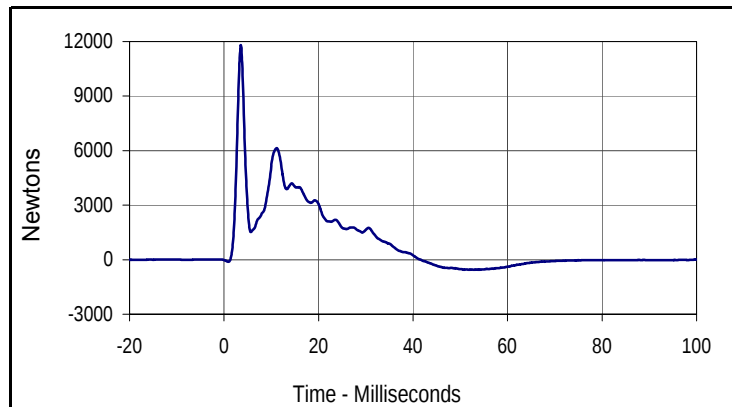
Curve Description			
Lower Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
47.7	29.9	-5.2	67.1

Test Program: ES2re Thorax - Full Body Impact Test
 ATD Serial No.: F037

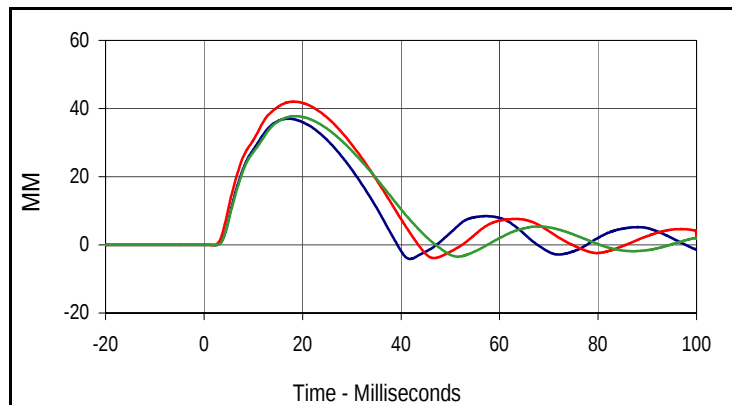
Test Date: 10/23/14
 Test I.D.: F037TH064



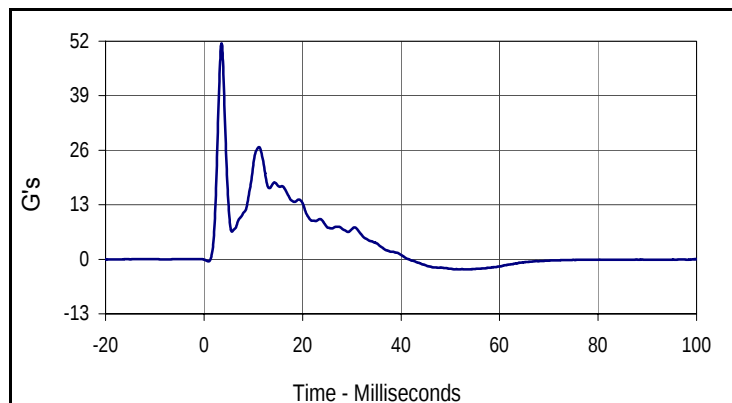
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	540	Pass
Temperature During Soak	Max °C	20.6 to 22.2	21.2	Pass
	Min °C		21.1	Pass
Humidity During Soak	Max %	10.0 to 70.0	21.9	Pass
	Min %		21.1	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	21.4	Pass
Peak Impactor Velocity	m/s	5.4 to 5.6	5.49	Pass
Peak Impactor Force	N	5100 to 6200	6132.3	Pass
	msec	> 6.0 msec	11.1	Pass
Peak Upper Rib Deflection	mm	34 to 41	37.0	Pass
Peak Middle Rib Deflection	mm	37 to 45	42.0	Pass
Peak Lower Rib Deflection	mm	37 to 44	37.8	Pass
Overall Test Results				Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
11797.7	3.6	-554.5	53.9



Curve Description			
Upper, Middle, Lower Rib Deflections			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max (Upper)	Time	Min (Upper)	Time
37.0	17.1	-4.1	41.8
Max (Middle)	Time	Min (Middle)	Time
42.0	18.2	-3.9	46.7
Max (Lower)	Time	Min (Lower)	Time
37.8	18.6	-3.4	51.5



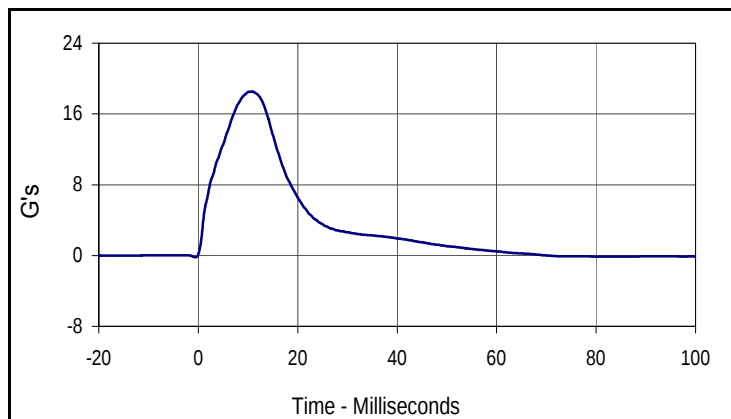
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
51.5	3.6	-2.4	53.9

Test Program: ES2re Abdomen Impact Test
 ATD Serial No.: F037

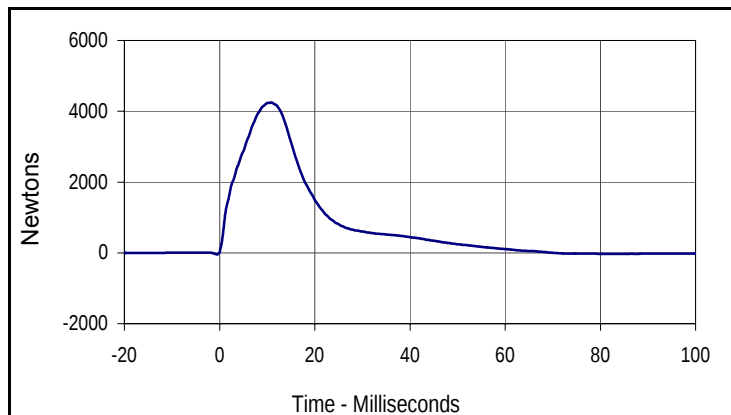
Test Date: 10/23/14
 Test I.D.: F037ABD064



Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	610	Pass
Temperature During Soak	Max	20.6 to 22.2	21.2	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	21.9	Pass
	Min		21.1	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	21.9	Pass
Probe Velocity	m/s	3.9 to 4.1	4.00	Pass
Peak Impactor Force	N	4000 to 4800	4244.1	Pass
	msec	10.6 to 13.0	10.9	Pass
Sum of Abdominal Forces	N	2200 to 2700	2515.5	Pass
	msec	10.0 to 12.3	10.8	Pass
Overall Test Results				Pass



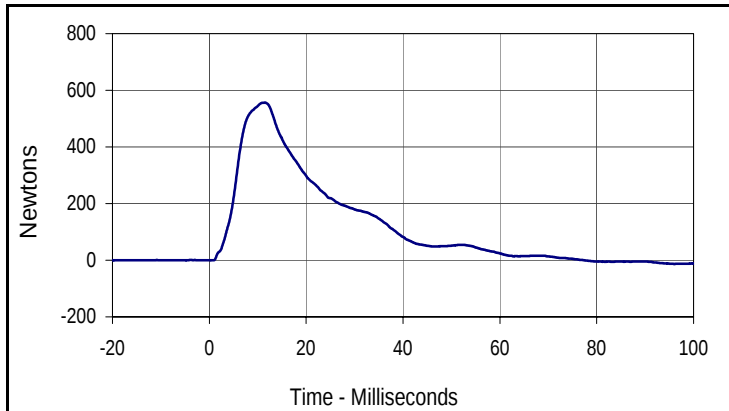
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
18.5	10.9	-0.2	-0.6



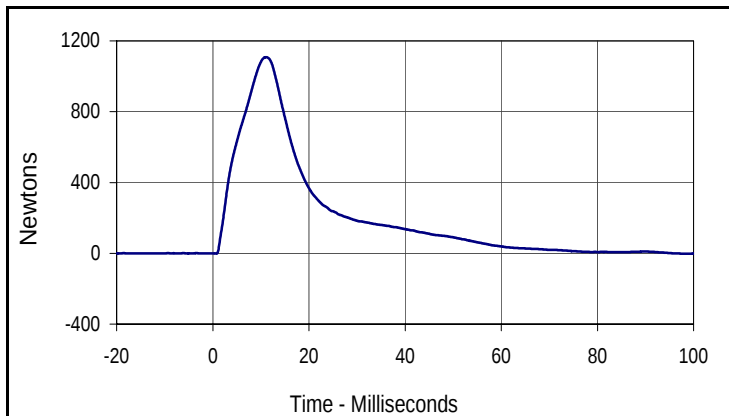
Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
002	FIL	180	Newtons
Max	Time	Min	Time
4244.1	10.9	-43.6	-0.6

Test Program: ES2re Abdomen Impact Test
 ATD Serial No.: F037

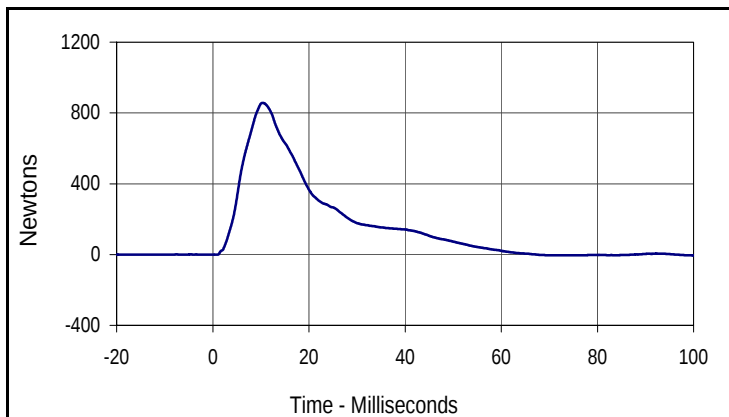
Test Date: 10/23/14
 Test I.D.: F037ABD064



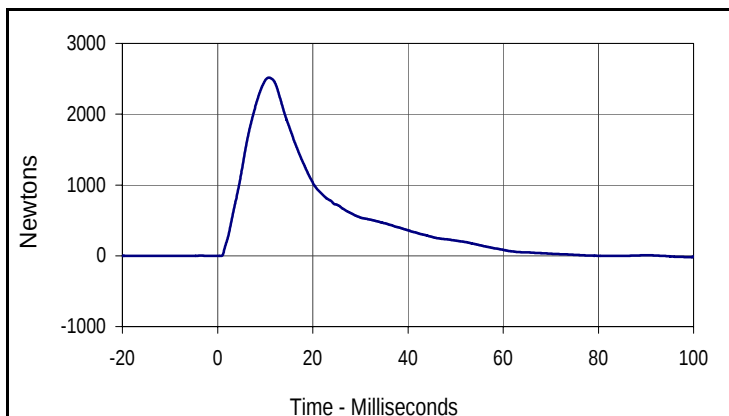
Curve Description			
Front Abdomen Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
556.5	11.5	-13.4	96.0



Curve Description			
Middle Abdomen Force			
Plot No.	Type	SAE Class	Units
004	FIL	600	Newtons
Max	Time	Min	Time
1107.5	11.1	-2.5	99.0



Curve Description			
Rear Abdomen Force			
Plot No.	Type	SAE Class	Units
005	FIL	600	Newtons
Max	Time	Min	Time
856.6	10.4	-6.3	170.0



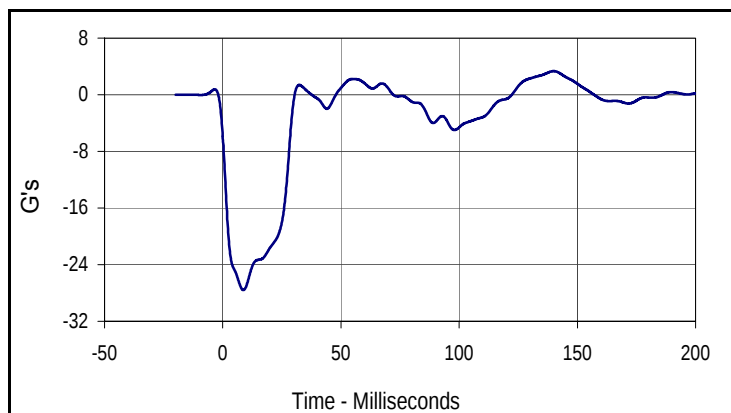
Curve Description			
Abdomen Sum Resultant			
Plot No.	Type	SAE Class	Units
006	RES	600	Newtons
Max	Time	Min	Time
2515.5	10.8	-19.0	99.0

Test Program: ES2re Lumbar Flexion Test
 ATD Serial No.: F037

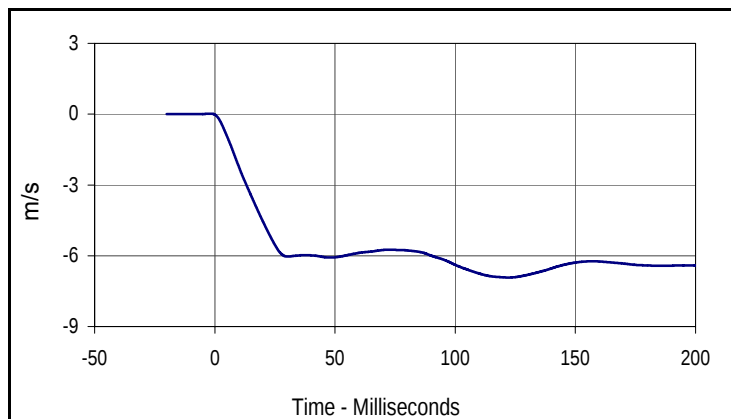
Test Date: 10/23/14
 Test I.D.: F037LB064



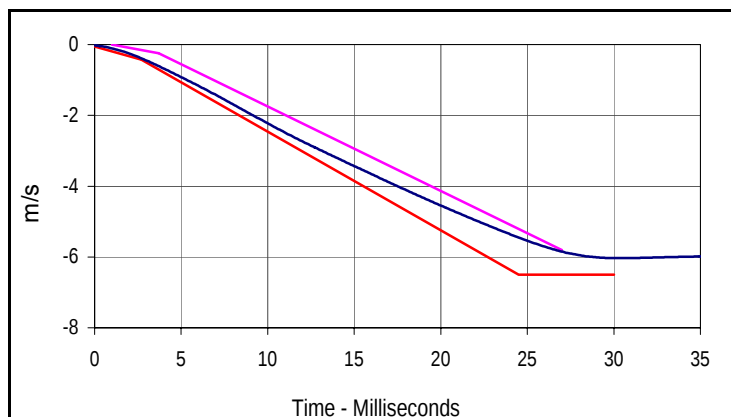
Tested Parameter	Units	Specification	Result	Pass/Fail
Lumbar Spine Assembly Soak Time	Minutes	≥240	685	Pass
Temperature During Soak	Max	20.6 to 22.2	21.2	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	21.9	Pass
	Min		21.1	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	21.7	Pass
Pendulum Velocity	m/s	5.95 to 6.15	6.05	Pass
Headform Rotation	Max	45 to 55	49.4	Pass
	Time	39 to 53	44.8	Pass
Time of Decay to Zero Angle from Peak	msec	37 to 57	41.5	Pass
Overall Test Results				Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
3.3	140.6	-27.6	9.3



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.3	-6.9	122.9



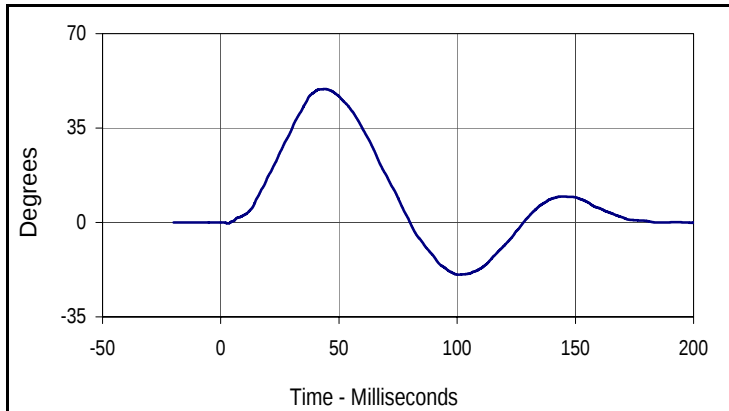
Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.3	-6.9	122.9

Velocity Corridors

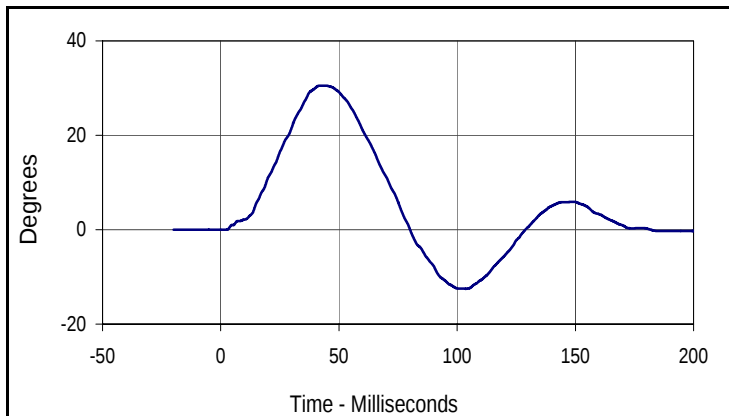
Upper Boundary		Lower Boundary	
Time (msec)	Velocity (m/s)	Time (msec)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.7	-0.24	2.7	-0.425
27.0	-5.80	24.5	-6.50
		30.0	-6.50

Test Program: ES2re Lumbar Flexion Test
 ATD Serial No.: F037

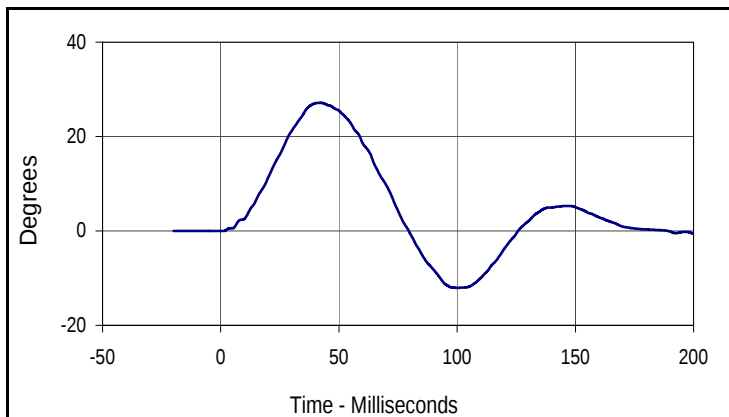
Test Date: 10/23/14
 Test I.D.: F037LB064



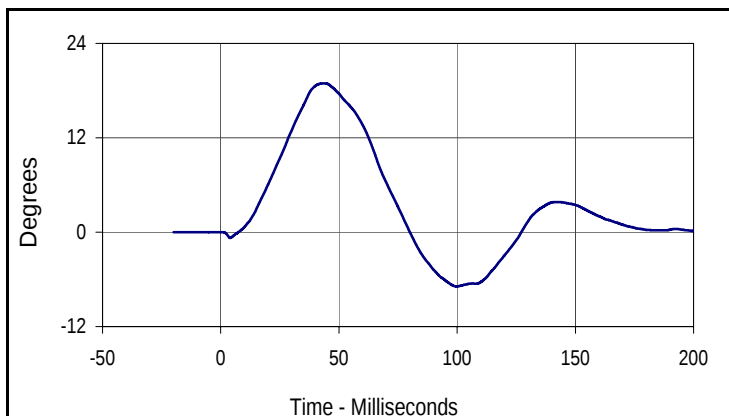
Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
49.4	44.8	-19.4	101.0



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
30.5	45.0	-12.5	104.3



Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
27.2	42.8	-12.1	100.6



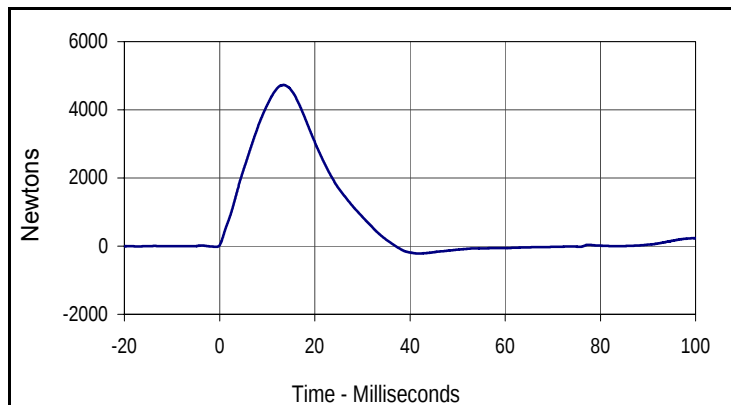
Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
006	FIL	180	Degrees
Max	Time	Min	Time
18.9	44.4	-6.9	100.4

Test Program: ES2re Pelvis Impact Test
 ATD Serial No.: F037

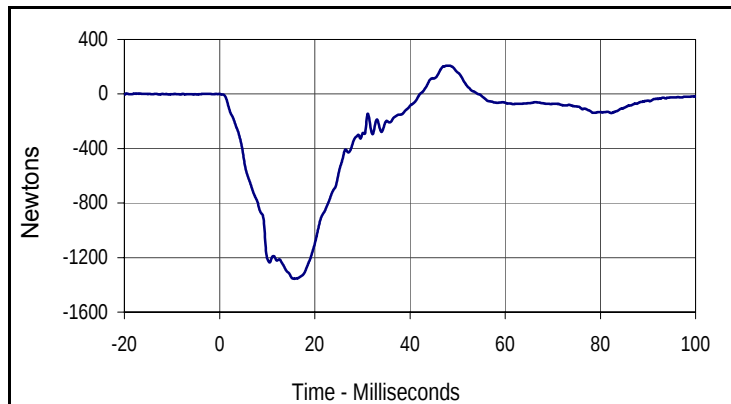
Test Date: 10/23/14
 Test I.D.: F037PL064



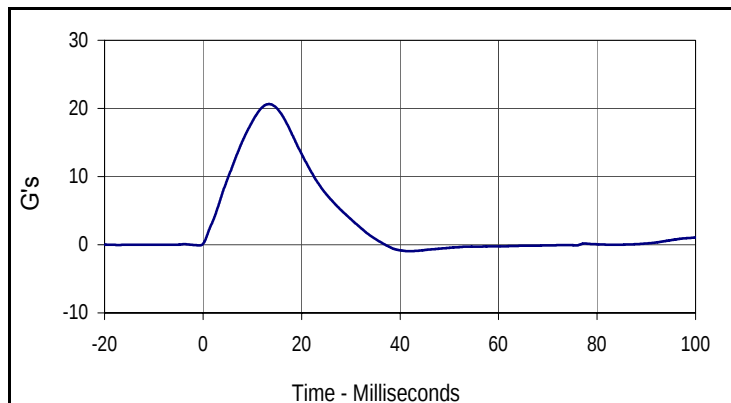
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	740	Pass
Temperature During Soak	Max	20.6 to 22.2	21.2	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	21.9	Pass
	Min		21.1	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	21.9	Pass
Pendulum Velocity	m/s	4.2 to 4.4	4.29	Pass
Peak Impactor Force	N	4700 to 5400	4728.1	Pass
	msec	11.8 to 16.1	13.4	Pass
Peak Pubic Symphysis Load	N	-1230 to -1590	-1354.8	Pass
	msec	12.2 to 17.0	15.7	Pass
Overall Test Results				Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4728.1	13.4	-217.5	41.8



Curve Description			
Pubic Symphysis Force Y			
Plot No.	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
208.6	48.3	-1354.8	15.7



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
20.6	13.4	-0.9	41.8

Test Program: SID IIs External Measurements
 ATD Serial No.: 307

Test Date: 10/24/14
 Test I.D.: N/A



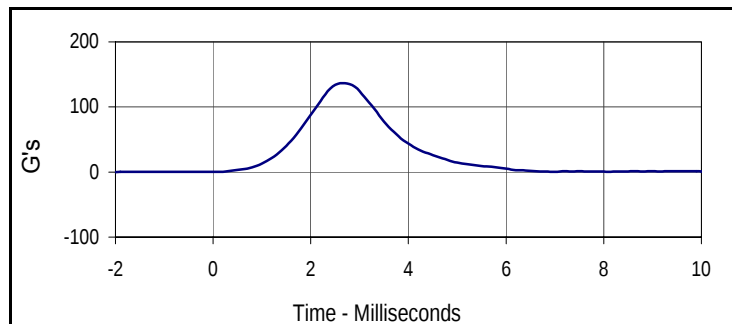
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	20	Pass
A	Sitting Height	mm	772 - 788	778	Pass
B	Shoulder Pivot Height	mm	437 - 453	443	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	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
 ATD Serial No.: 307

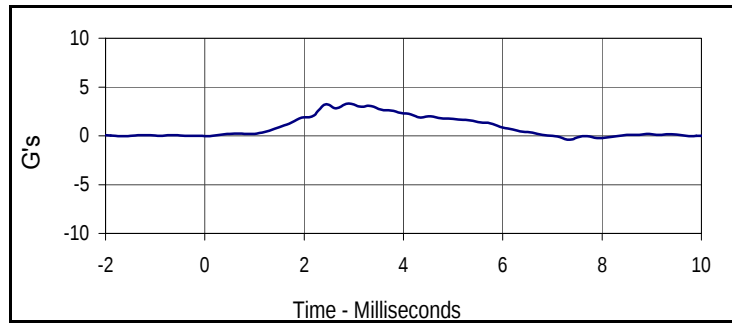
Test Date: 10/24/14
 Test I.D.: 307HD072



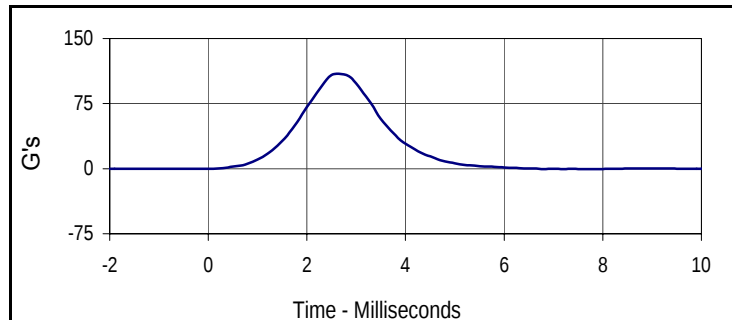
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	300	Pass
Temperature During Soak	Max	18.9 to 25.6	21.3	Pass
	Min		21.0	Pass
Humidity During Soak	Max	10.0 to 70.0	20.4	Pass
	Min		20.1	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	20.3	Pass
Peak Head Resultant Acceleration	G's	115 to 137	136.7	Pass
Peak Head X Acceleration	G's	<15	3.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	1.0	Pass
Overall Test Results				Pass



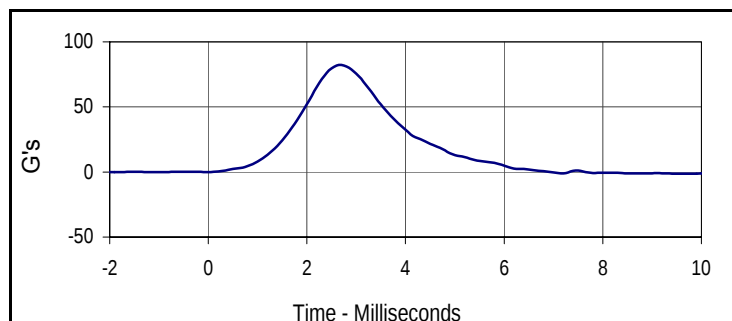
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
136.7	2.6	0.1	-2.0



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
3.3	2.9	0.0	-1.6



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
109.5	2.6	-0.7	7.9



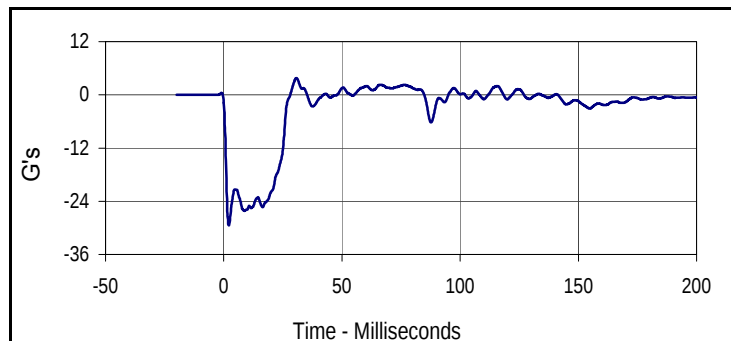
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
82.3	2.7	-1.4	9.7

Test Program: SID IIs Neck Flexion Test
 ATD Serial No.: 307

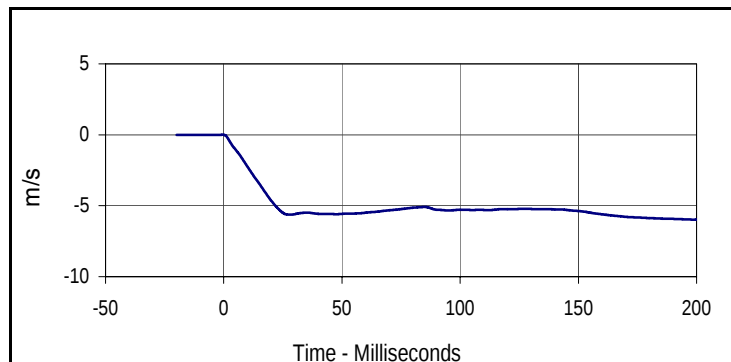
Test Date: 10/24/14
 Test I.D.: 307NB072



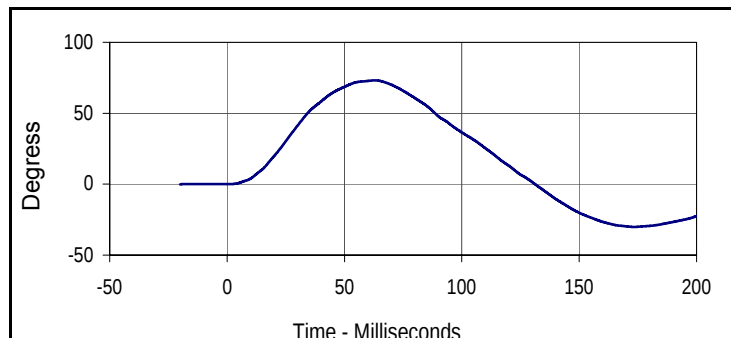
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	375	Pass
Temperature During Soak	Max	20.6 to 22.2	21.3	Pass
	Min		21.0	Pass
Humidity During Soak	Max	10.0 to 70.0	20.4	Pass
	Min		20.1	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	20.3	Pass
Pendulum Velocity	m/s	5.51 to 5.63	5.57	Pass
Pendulum Deceleration	10 msec	-2.20 to -2.80	-2.24	Pass
	15 msec	-3.30 to -4.10	-3.44	Pass
	20 msec	-4.40 to -5.40	-4.62	Pass
	25 msec	-5.40 to -6.10	-5.50	Pass
	25-100 msec	-5.50 to -6.20	-5.63	Pass
D-Plane Rotation	Max	71 to 81	73.2	Pass
	Time	50 to 70	63.0	Pass
Peak Occipital Condyle Moment	Nm	-36 to -44	-39.4	Pass
Decaying Moment Time to Cross 0 Nm	msec	102 to 126	112.7	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	-29.5	0.0



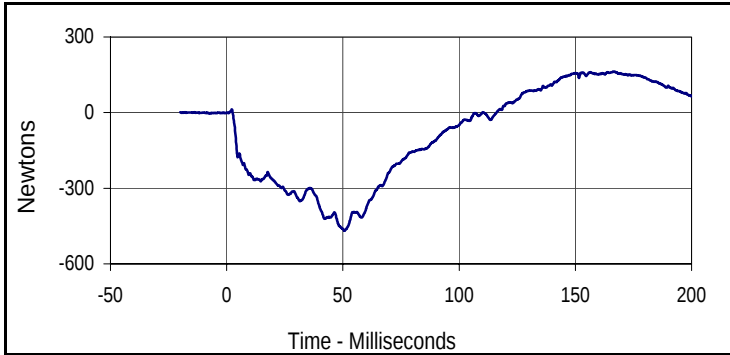
Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
002	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.4	-6.0	200.0



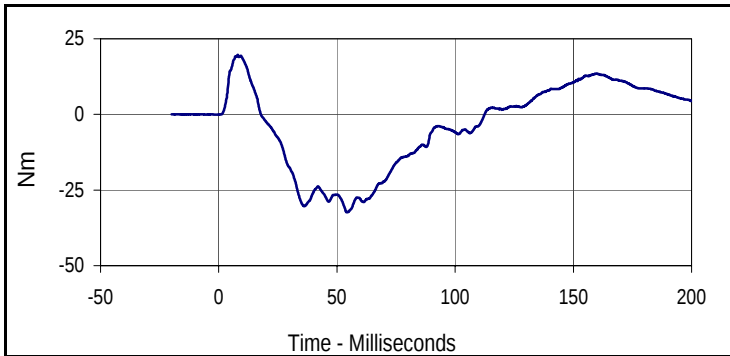
Curve Description			
D-Plane Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degress
Max	Time	Min	Time
73.2	63.0	-30.1	173.4

Test Program: SID IIs Neck Flexion Test
 ATD Serial No.: 307

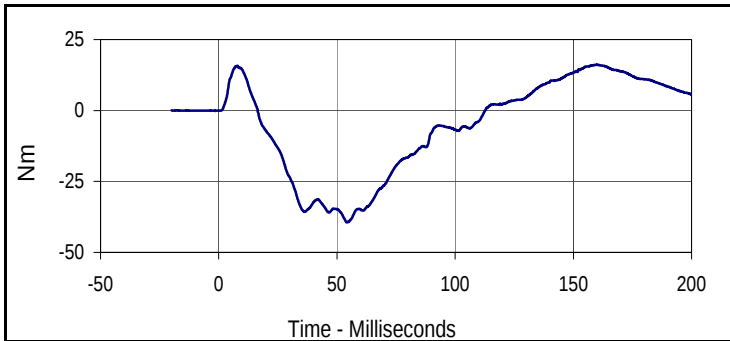
Test Date: 10/24/14
 Test I.D.: 307NB072



Curve Description			
Neck Force Y			
Plot No.	Type	SAE Class	Units
004	FIL	600	Newtons
Max	Time	Min	Time
163.2	166.6	-467.7	50.6



Curve Description			
Neck Moment X			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
19.7	8.0	-32.4	54.2



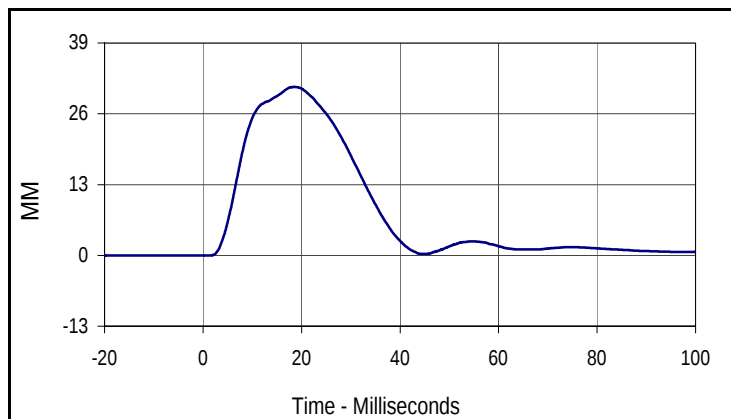
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
006	FIL	600	Nm
Max	Time	Min	Time
16.2	160.0	-39.4	54.2

Test Program: SID IIs Shoulder Impact Test
 ATD Serial No.: 307

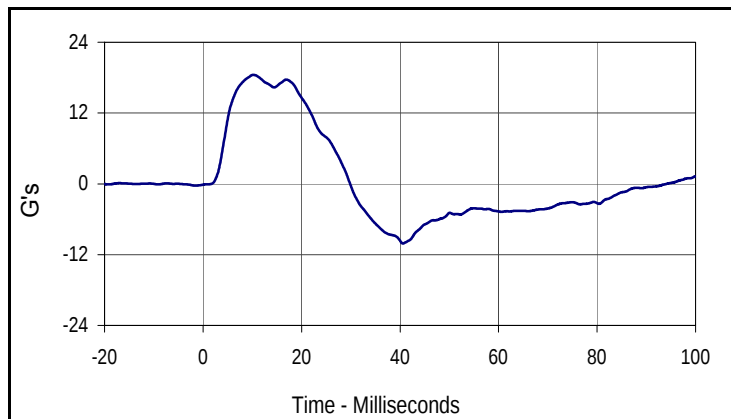
Test Date: 10/24/14
 Test I.D.: 307SH072



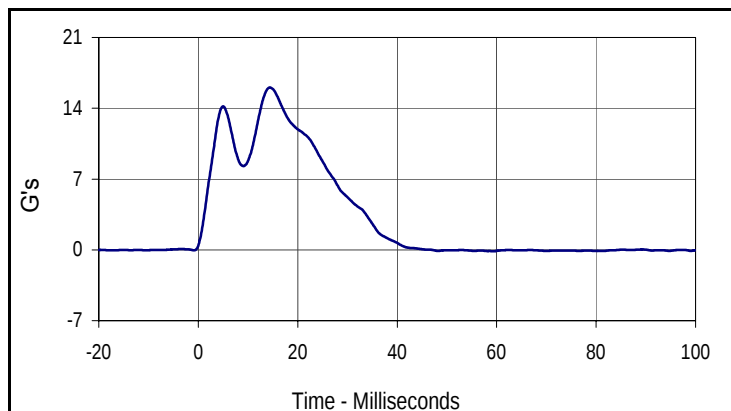
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	430	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.3	Pass
	Min	°C		21.0	Pass
Humidity During Soak	Max	%	10.0 to 70.0	20.4	Pass
	Min	%		20.1	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	20.2	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.27	Pass
Peak Shoulder Deflection		mm	28 to 37	30.9	Pass
Peak Lateral Spine Acceleration Y		G's	17 to 22	18.5	Pass
Peak Impactor Acceleration		G's	13 to 18	16.1	Pass
Overall Test Results				Pass	



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
30.9	18.5	0.0	-16.3



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.5	10.2	-10.1	40.6



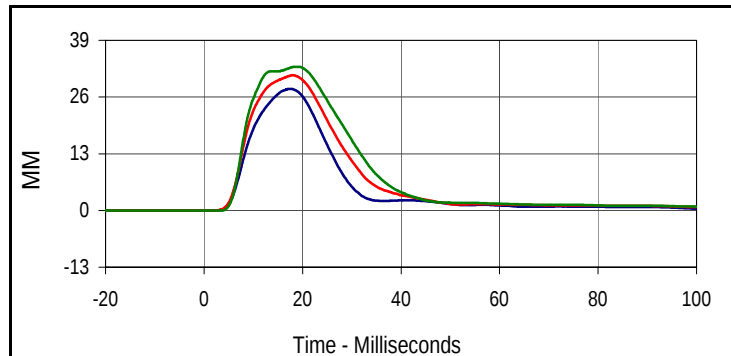
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
16.1	14.4	-0.2	0.0

Test Program: SID IIs Thorax with Arm Impact Test
 ATD Serial No.: 307

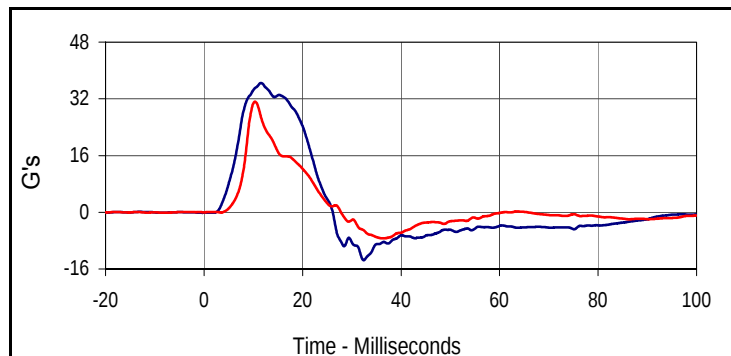
Test Date: 10/24/14
 Test I.D.: 307TWA072



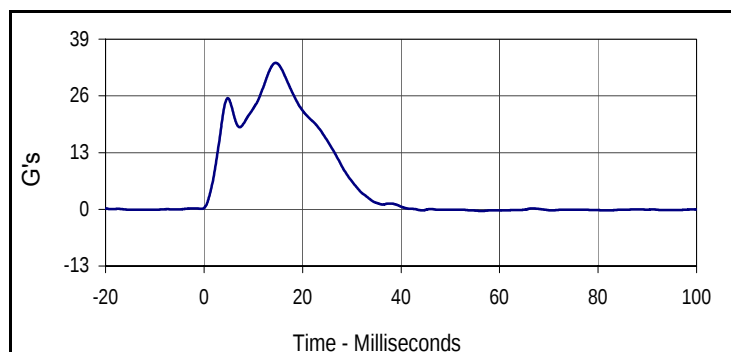
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	475	Pass
Temperature During Soak	Max	20.6 to 22.2	21.3	Pass
	Min		21.0	Pass
Humidity During Soak	Max	10.0 to 70.0	20.4	Pass
	Min		20.1	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	20.1	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.74	Pass
Peak Shoulder Deflection	mm	31 to 40	35.9	Pass
Peak Upper Thorax Rib Deflection	mm	25 to 32	27.9	Pass
Peak Middle Thorax Rib Deflection	mm	30 to 36	31.0	Pass
Peak Lower Thorax Rib Deflection	mm	32 to 38	32.9	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	36.4	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	31.2	Pass
Peak Impactor Acceleration	G's	30 to 36	33.5	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
27.9	17.5	0.0	-13.2
Middle Thorax Deflection			
Max	Time	Min	Time
31.0	18.0	0.0	-14.4
Lower Thorax Deflection			
Max	Time	Min	Time
32.9	18.6	0.0	-4.8



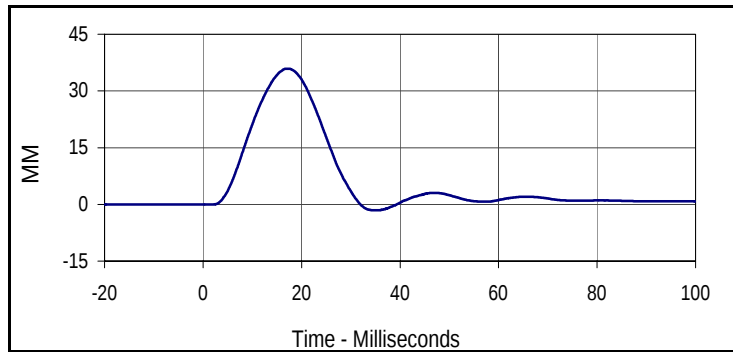
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
36.4	11.6	-13.5	32.4
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
31.2	10.4	-7.3	36.3



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
33.5	14.5	-0.4	56.4

Test Program: SID IIs Thorax with Arm Impact Test
 ATD Serial No.: 307

Test Date: 10/24/14
 Test I.D.: 307TWA072



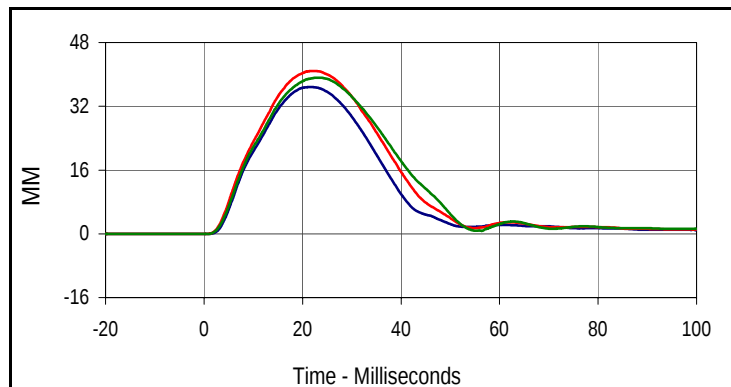
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
35.9	17.1	-1.6	35.0

Test Program: SID IIs Thorax without Arm Impact Test
 ATD Serial No.: 307

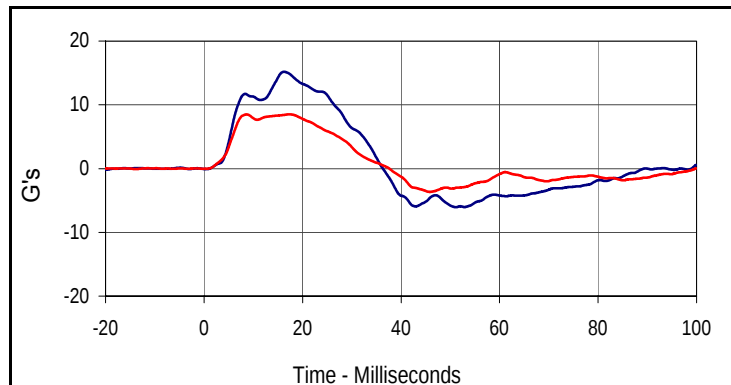
Test Date: 10/24/14
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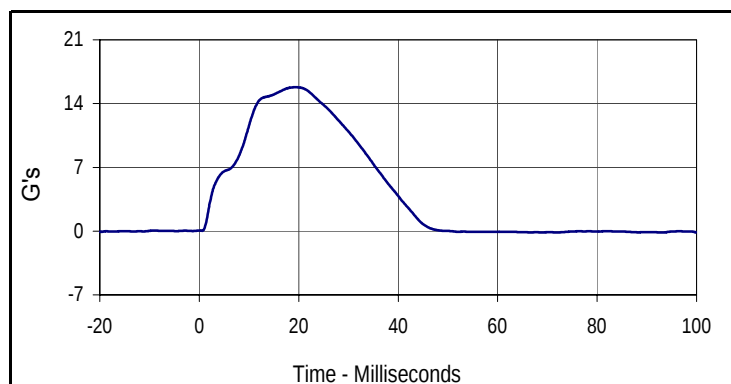
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	525	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.3	Pass
	Min	°C		21.0	Pass
Humidity During Soak	Max	%	10.0 to 70.0	20.4	Pass
	Min	%		20.1	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	20.1	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.34	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	36.8	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	40.9	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	39.2	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	15.2	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	8.5	Pass
Peak Impactor Acceleration		G's	14 to 18	15.8	Pass
Overall Test Results				Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
36.8	21.7	0.0	-13.2
Middle Thorax Deflection			
Max	Time	Min	Time
40.9	22.2	0.0	-19.7
Lower Thorax Deflection			
Max	Time	Min	Time
39.2	23.2	0.0	-11.6



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.2	16.3	-6.1	51.1
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
8.5	17.3	-3.7	45.8



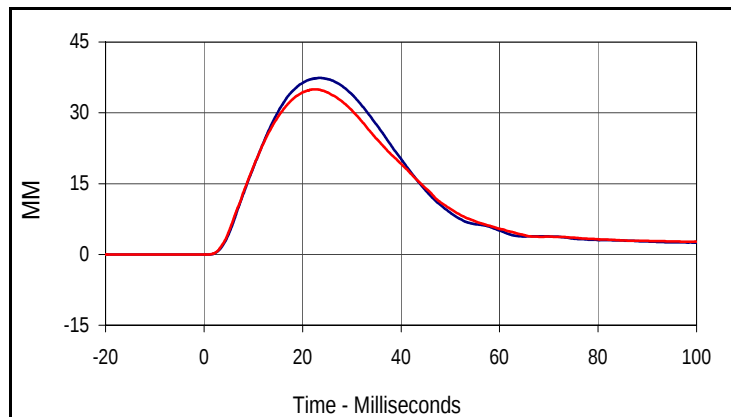
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
15.8	19.3	-0.2	93.3

Test Program: SID IIs Abdomen Impact Test
 ATD Serial No.: 307

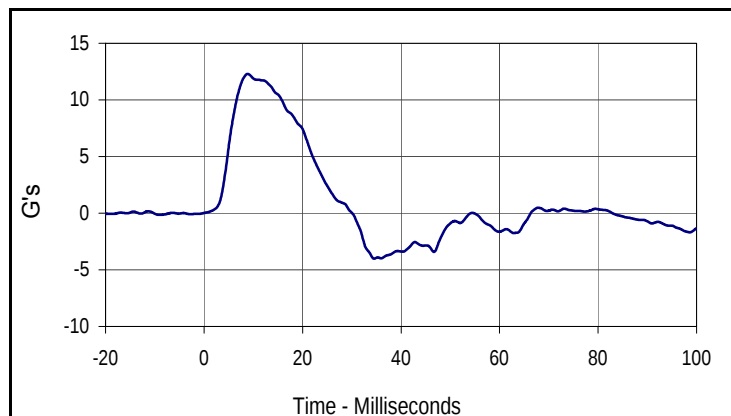
Test Date: 10/24/14
 Test I.D.: 307ABD072



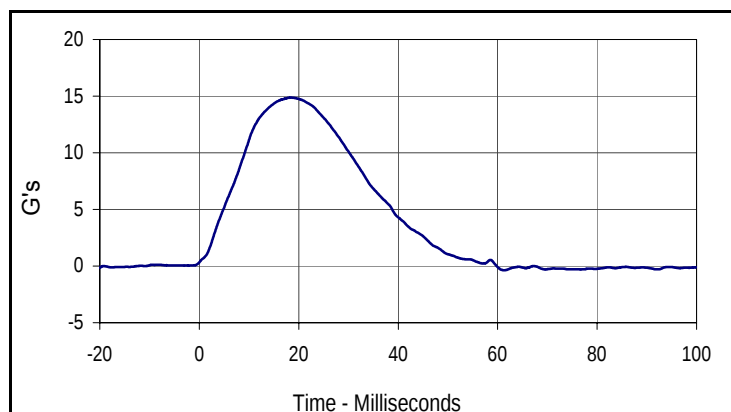
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	560	Pass
Temperature During Soak	Max	20.6 to 22.2	21.3	Pass
	Min		21.0	Pass
Humidity During Soak	Max	10.0 to 70.0	20.4	Pass
	Min		20.1	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	20.2	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.30	Pass
Peak Upper Abdominal Rib Deflection	mm	36 to 47	37.4	Pass
Peak Lower Abdominal Rib Deflection	mm	33 to 44	35.0	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	12.3	Pass
Peak Impactor Acceleration	G's	12 to 16	14.9	Pass
Overall Test Results			Pass	



Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
37.4	23.5	0.0	-18.9
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
35.0	22.6	0.0	-14.5

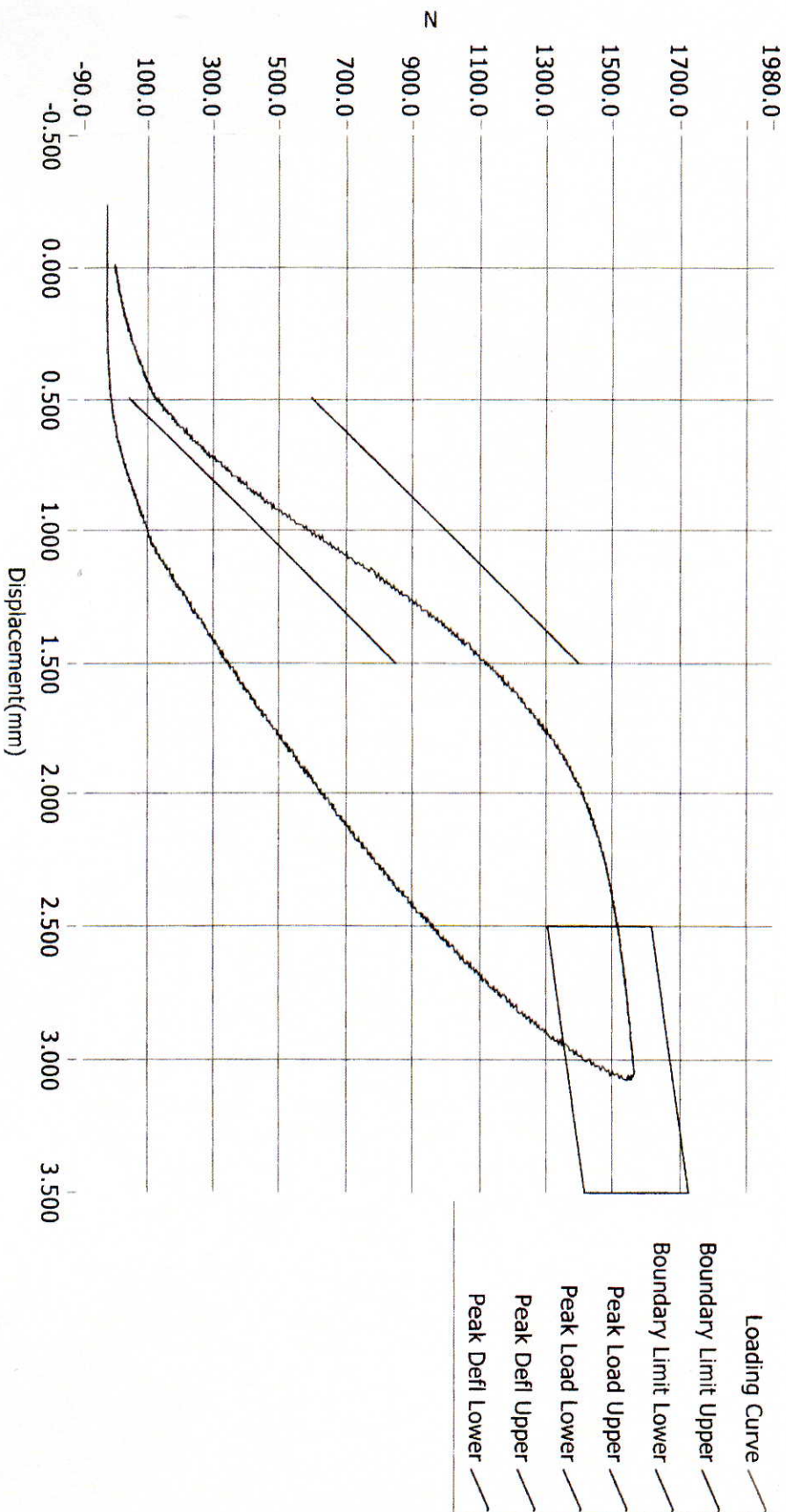


Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
12.3	8.9	-4.0	34.5



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.9	18.4	-0.4	61.3

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

<u>Test ID</u>	<u>Part Serial Number</u>	<u>Test Date</u>	<u>Test Time</u>
	48902	12/5/2011	7:50 PM
<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
	N/A	SIDIIs	

O20155502 POST TEST

Current Date : 12/5/2011

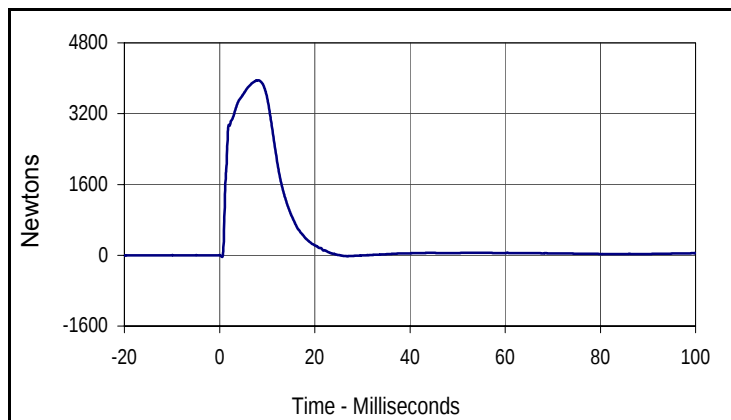
Current Time : 19:51:13

Test Program: SID IIs Pelvis Acetabulum Impact Test
 ATD Serial No.: 307

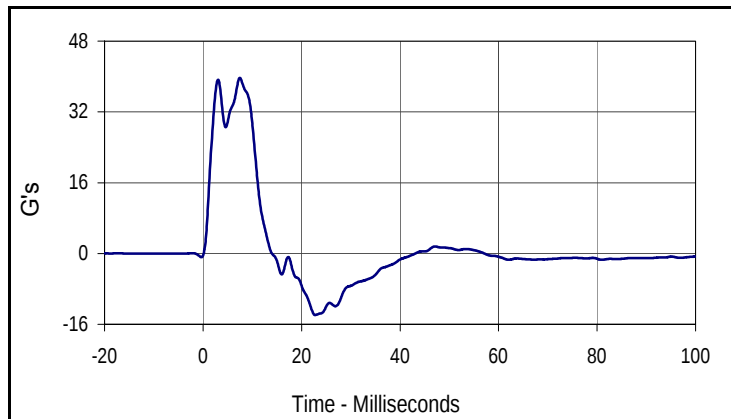
Test Date: 10/24/14
 Test I.D.: 307ACET072



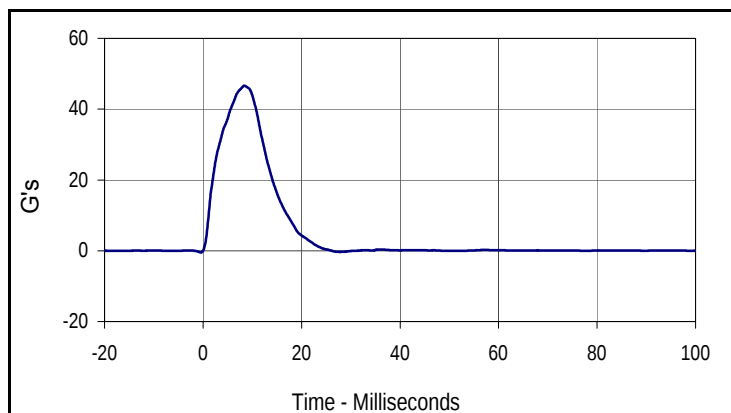
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	605	Pass
Temperature During Soak	Max	20.6 to 22.2	21.3	Pass
	Min		21.0	Pass
Humidity During Soak	Max	10.0 to 70.0	20.4	Pass
	Min		20.1	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	20.2	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.78	Pass
Peak Acetabulum Force Y	Newtons	3600 to 4300	3955.4	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	39.7	Pass
Peak Impactor Acceleration	G's	38 to 47	46.6	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3955.4	8.1	-41.0	0.6



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
39.7	7.5	-13.9	22.8



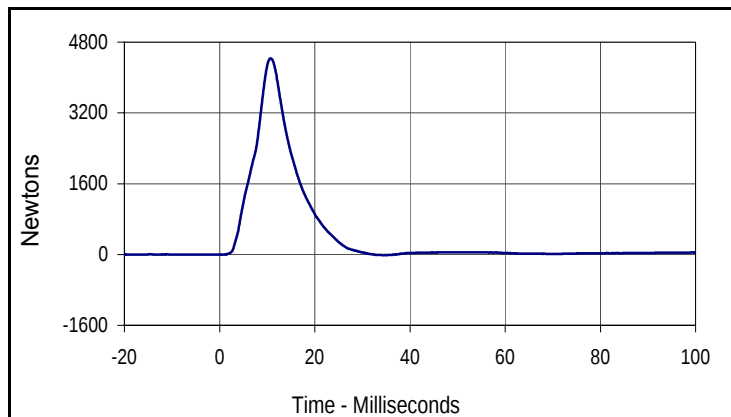
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
46.6	8.4	-0.5	-0.5

Test Program: SID IIs Pelvis Iliac Calibration
 ATD Serial No.: 307

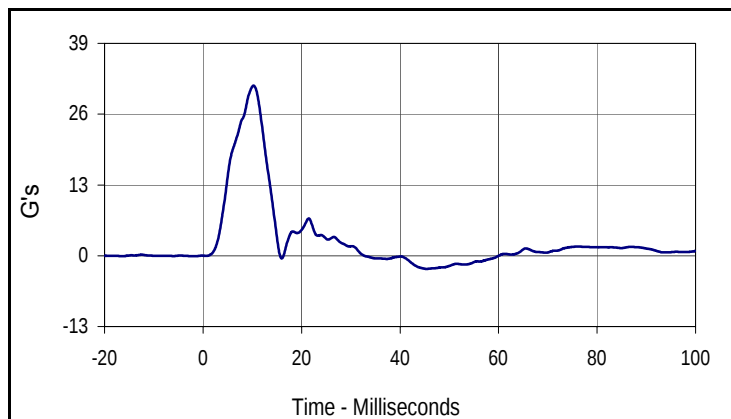
Test Date: 10/24/14
 Test I.D.: 307PL072



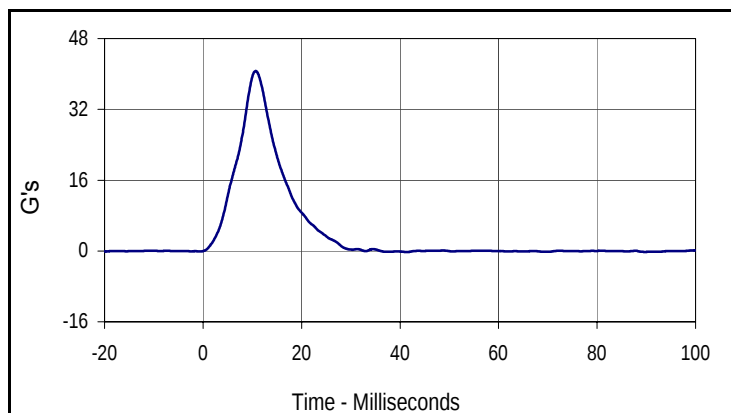
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	675	Pass
Temperature During Soak	Max	20.6 to 22.2	21.3	Pass
	Min		21.0	Pass
Humidity During Soak	Max	10.0 to 70.0	20.4	Pass
	Min		20.1	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.0	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	20.2	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.28	Pass
Peak Iliac Force	Newtons	4100 to 5100	4431.6	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	31.2	Pass
Peak Impactor Acceleration	G's	36 to 45	40.7	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4431.6	10.7	-14.4	34.3



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
31.2	10.3	-2.4	45.4



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
40.7	10.7	-0.3	41.4

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	P58876	Endevco	10/11/14
		Z	P58877	Endevco	10/11/14
Pubic Symphysis Load Cell		Y	DG6834	Denton	5/3/14

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)				72941	FTSS	2/8/14
Pelvis Plug (Non-Struck Side)				48940	FTSS	12/6/11

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	J22040	Endevco	9/26/14
	Vehicle Center of Gravity	Y	AAKE2	Endevco	9/26/14
	Vehicle Center of Gravity	Z	J27513	Endevco	9/10/14
2	Right Sill at Front Seat	X	A145514	MSI	9/23/14
	Right Sill at Front Seat	Y	A145449	MSI	9/23/14
	Right Sill at Front Seat	Z	A145461	MSI	9/23/14
3	Right Sill at Rear Seat	X	A145522	MSI	8/13/14
	Right Sill at Rear Seat	Y	A145526	MSI	8/13/14
	Right Sill at Rear Seat	Z	A145450	MSI	8/13/14
4	Left Sill at Front Door	Y	13474	MSI	9/28/14
5	Left Sill at Rear Door	Y	13722	MSI	9/19/14
6	Left A-Post Lower	Y	A145493	MSI	8/13/14
7	Left A-Post Middle	Y	12276	MSI	8/8/14
8	Left B-Post Lower	Y	12271	MSI	8/8/14
9	Left B-Post Middle	Y	12245	MSI	8/8/14
10	Front Seat Track	Y	A145525	MSI	8/13/14
11	Rear Seat Structure	Y	N/A	N/A	N/A
12	Right Rear Occ. Compartment	Y	A136735	MSI	9/28/14
13	Engine Block	X	A145469	MSI	9/23/14
	Engine Block	Y	A145448	MSI	8/13/14
14	Rear Floorpan Above Axle	X	J24567	MSI	9/26/14
	Rear Floorpan Above Axle	Y	ACCF3	MSI	9/28/14
	Rear Floorpan Above Axle	Z	J36629	Endevco	9/28/14

TABLE 4 – MDB Instrumentation

		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	A124098	MSI	10/3/14
MDB Center of Gravity	Y	A128039	MSI	10/3/14
MDB Center of Gravity	Z	A124104	MSI	10/3/14
Left Frame at Rear Axle Centerline	X	A128036	MSI	10/3/14
Left Frame at Rear Axle Centerline	Y	A127957	MSI	10/3/14