

REPORT NUMBER: SINCAP-KAR-13-044

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

**TOYOTA MOTOR CORPORATION
2013 TOYOTA PRIUS C 5-DOOR HATCHBACK**

NHTSA No: MD5111

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



MARCH 6, 2013

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
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16. Abstract

A 55/28 km/h 90 deg. Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2013 Toyota Prius C 5-door hatchback 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 February 20, 2013.

The impact velocity of the Moving Deformable Barrier was 62.19 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 8.2 deg. C. The target vehicle's maximum post-test static crush was 200 mm located at level 2 and 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	216.4
Maximum Thorax Rib Deflection	mm	44	36
Total Abdominal Force	N	2500	1228
Pubic Symphysis Force	N	6000	1626

Measurement Description	Passenger ATD (SID-Is)		
	Units	IARV	Result
Head Injury Criteria (HIC ₃₆)		1000	373.5
Resultant Lower Spine Acceleration	g	82	90
Total Pelvic Force (Sum of Acetubular and Iliac Forces)	N	5525	4409
Maximum Thoracic Rib Deflection	mm	38*	34
Maximum Abdominal Rib Deflection	mm	45*	53

The door on the struck side of the vehicle did not separate from the body at the hinges or latches, and the opposite side door did not open during the side impact event. The passenger ATD's Resultant Lower Spine Acceleration and Maximum Abdominal Rib Deflection values exceeded their limits.

* Proposed IARV

TR-P32003-18-NC

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SECTION 1

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test is part of the MY 2013 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 2013 Toyota Prius C 5-door hatchback. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated September 2012.

SECTION 2

SUMMARY OF TEST RESULTS

A 2013 Toyota Prius C 5-door hatchback 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 62.19 km/h (38.64 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 February 20, 2013. 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 2012. The side impact event was documented by 11 cameras. Camera locations are included in Data Sheet No. 5 of this report.

The dummies were 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	216.4
Maximum Thorax Rib Deflection	mm	44	36
Combined Abdominal Force	N	2500	1228
Pubic Symphysis Force	N	6000	1626

Measurement Description	Units	Passenger ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	373.5
Lower Spine (T12) Resultant Acceleration	g	82	90
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	4409
Maximum Thoracic Rib Deflection	mm	38*	34
Maximum Abdominal Rib Deflection	mm	45*	53

*Proposed IARV

Supplemental restraint information is given below:

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

GENERAL COMMENTS

The door on the struck side of the vehicle remained closed and latched. There was no separation at the hinges or latches. The door on the non-struck side remained closed and latched. The Passenger ATD's Resultant Lower Spine Acceleration and Maximum Abdominal Rib Deflection values exceeded their limits.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111
Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13

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: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111
 Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	MD5111
Model Year	2013
Make	Toyota
Model	Prius C
Body Style	5-Door Hatchback
VIN	JTDKDTB34D1031757
Body Color	Habanero
Odometer Reading (km / mi)	124 / 77
Engine Displacement (L)	1.5
Type / No. of Cylinders	Inline 4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	1
Overdrive	Yes
Final Drive	Front
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

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

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

Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Toyota Motor Corporation
Date of Manufacture	Dec-12
Vehicle Type	Passenger Car

GVWR (kg)	1576
GAWR Front (kg)	830
GAWR Rear (kg)	830

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				376.0	A
DSC x 68.04 (kg)				340.2	B
Cargo Weight (RCLW) (kg)				35.8	A-B

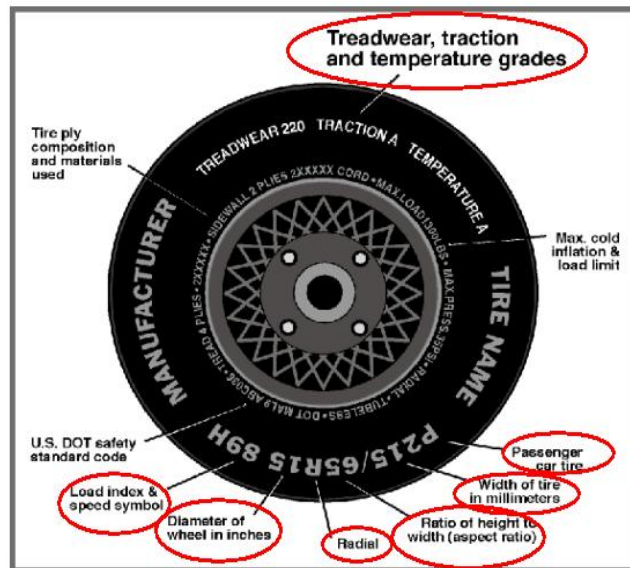
VEHICLE SEAT TYPE

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

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111
 Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	300	300
Cold Pressure (kPa)	240	230
Recommended Tire Size	P175/65 R15	P175/65 R15
Tire Size on Vehicle	P175/65 R15	P175/65 R15
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Turanza EL 400	Turanza EL 400
Treadware	300	300
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 1 Nylon, 2 Steel	1 Polyester, 1 Nylon, 2 Steel
Load Index/Speed Symbol	84H	84H
Tire Material	Polyester, Nylon, Steel	Polyester, Nylon, Steel
DOT Safety Code Left	EL YU DLN5012	EL YU DLN5012
DOT Safety Code Right	EL YU DLN5012	EL YU DLN5012

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111
 Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	265	265	265	265
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	358.5	225.5		398.5	288.5		401.0	295.5	
Right	kg	344.5	212.0		349.0	256.5		348.0	256.5	
Ratio	%	61.6%	38.4%	100.0%	57.8%	42.2%	100.0%	57.6%	42.4%	100.0%
Total	kg	703.0	437.5	1140.5	747.5	545.0	1292.5	749.0	552.0	1301.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1140.5	A
Actual Weight of 2 P572 ATDs Used	kg	125.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	35.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1301.3	A+B+C

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

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement***
LF	mm	639	640	Yes
RF	mm	658	652	Yes
RR	mm	625	624	Yes
LR	mm	638	634	Yes
Vehicle CG (Aft of Front Axle)	mm	1080	1074	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	52	47	

***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: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111

Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Tailights	3.0
Spare Tire	11.0
Tire Tools	4.5
Rear Trim	5.5
Rear Bumper Face	2.5
Rear Bumper Beam	6.5
Non-Struck Side Windows	7.0
Front Bumper Face	6.0
Headlights	5.0
Ballast / Equipment Added	67.2

DATA SHEET NO. 2**SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA**Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13**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 rear-most, lowest, mid-angle position.

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	Fixed	Fixed	Fixed
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	Fixed	522	Max	512	522	532
			Mid	512	522	532
			Min	512	522	532
Front Passenger Seat	Fixed	531	Max	521	531	540
			Mid	521	531	540
			Min	521	531	540
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

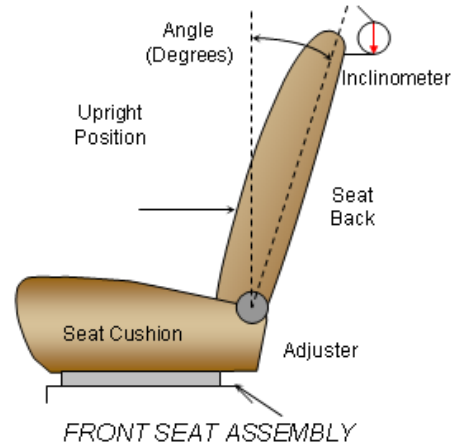
Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111
 Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13

SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	238	25	119	12
Front Passenger Seat	240	25	120	12
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

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.



SEAT BACK POSITION

Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/Seated Dummy	50.5	28	74.6	4
Front Passenger Seat	51.1	28	74.6	4
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

DATA SHEET NO. 2 ... (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111

Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13

SEAT BELT ANCHORAGE ADJUSTMENT

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

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

HEAD RESTRAINT ADJUSTMENT

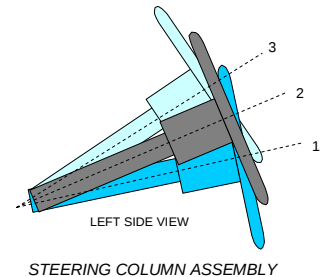
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total No. of Positions	Placed in Position
Driver Seat	Fixed	Fixed
Rear Seat	2	Full Down

STEERING COLUMN ADJUSTMENT

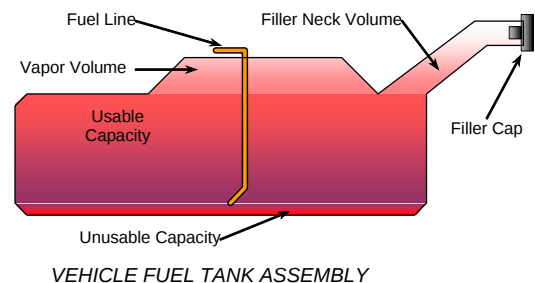
Steering wheel and column adjustments are made so that the steering wheel hub is at the center of the geometric locus it describes when it moves through its full range of motion.

	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	23.1	125
Geometric Center - Position 2	24.5	134
Uppermost - Position 3	25.9	143
Telescoping Steering Wheel Travel		18
Test Position	24.5	134



FUEL PUMP

The vehicle is equipped with an electric fuel pump. The fuel pump is activated when the ignition is turned on.



DATA SHEET NO. 2 ... (CONTINUED)**SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA**Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13**FUEL TANK CAPACITY**

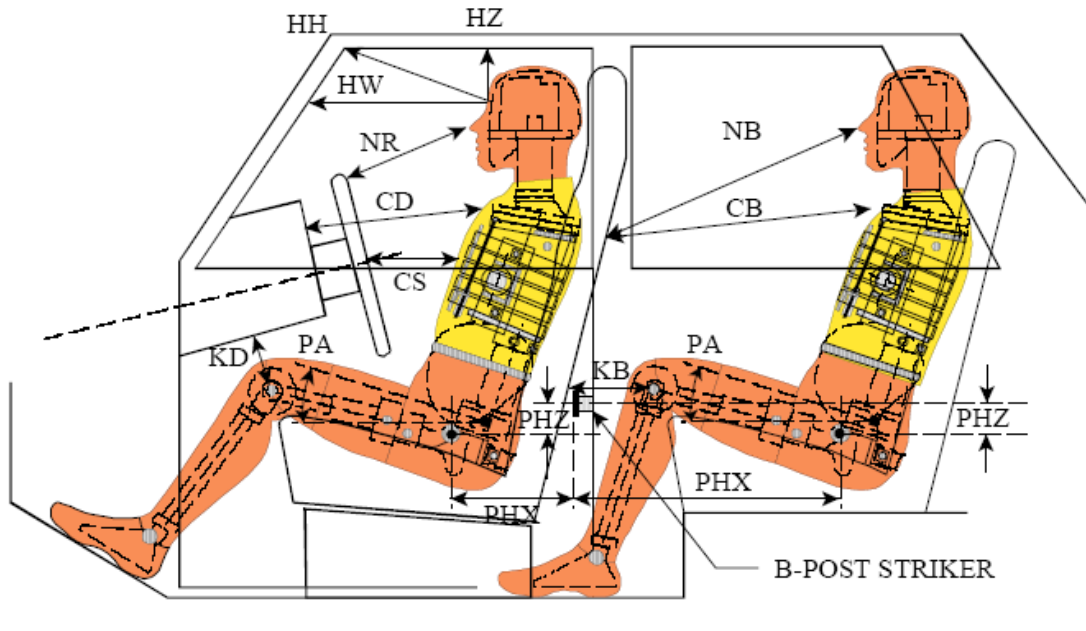
Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	35.96
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)	
Usable Capacity of "Optional Tank" (see Owner's Manual)	
93% of Usable Capacity	33.44
Actual amount of Solvent Used in Test	33.44
1/3 of Usable Capacity	11.99

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: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111
 Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13



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

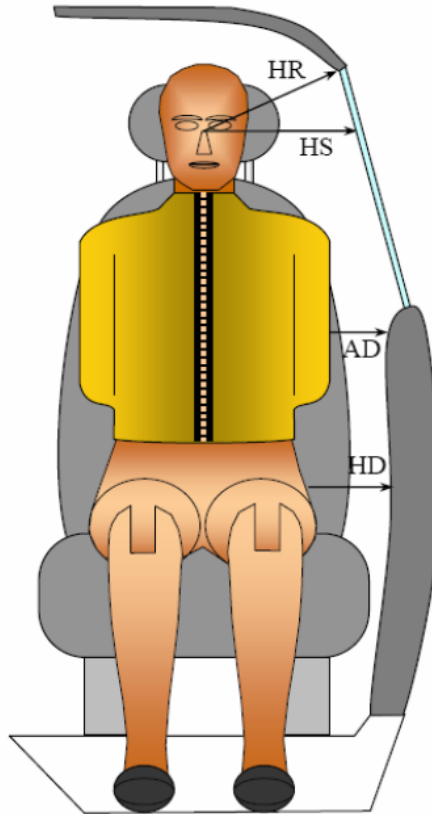
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Description	Driver		Passenger	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Head to Header	339			
HW		Head to Windshield	578			
HZ	HZ	Head to Roof	141		241	
NR	NB	Nose to Rim/Seat Back	446		542	
CD	CB	Chest to Dash/Seat Back	584		521	
CS		Chest to Steering Wheel	305			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	156	37.8	276	20.7
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	180	26.1	284	20.4
PAX°	PAX°	Pelvic Tilt Angle X		15.1		22.5
	PAY°	Pelvic Tilt Angle Y				0.2
PHX	PHX	Hip Point to Striker (x-axis)	194		283	
PHZ	PHZ	Hip Point to Striker (z-axis)	179		310	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111
Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13



FRONT VIEW OF DUMMY

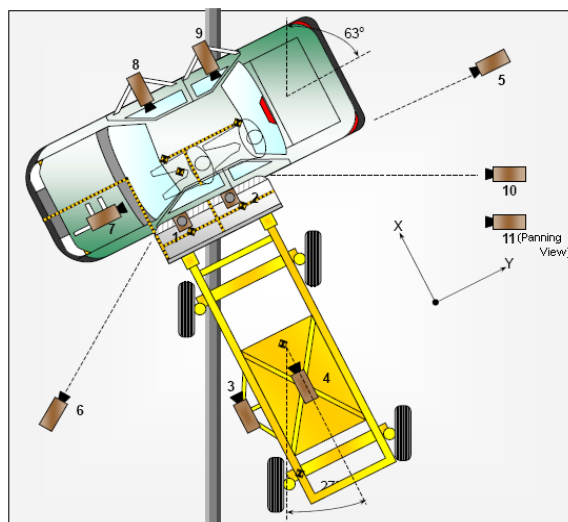
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	169	229
HS	Head to Side Window	mm	272	330
AD	Arm to Door	mm	67	134
HD	H-Point to Door	mm	152	181

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111
 Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13



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)	567	-410	-738	35	1000
8	Driver Side (On-Board)	1553	707	-424	14	1000
9	Passenger Side (On-Board)	1609	1613	-500	14	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

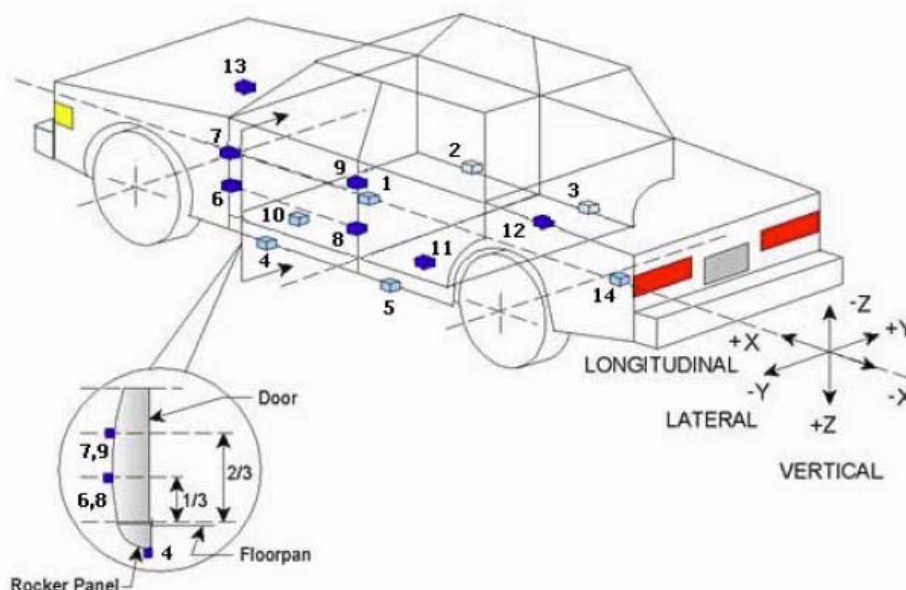
INSTRUMENTATION

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: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111
 Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

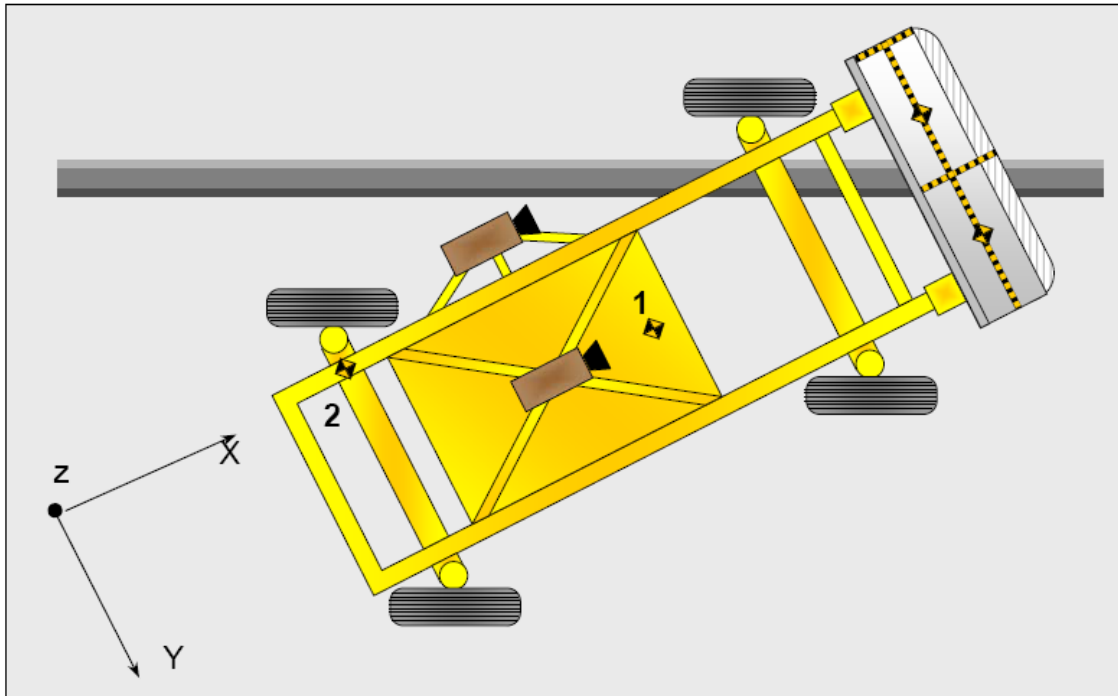
Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1600	80	-245
2	Right Sill at Front Seat	2210	706	-297
3	Right Sill at Rear Seat	1384	704	-229
4	Left Sill at Front Door	1973	-705	-193
5	Left Sill at Rear Door	1233	-708	-197
6	A-Pillar Lower	2842	-773	-532
7	A-Pillar Middle	2845	-775	-842
8	B-Pillar Lower	1716	-697	-475
9	B-Pillar Middle	1719	-698	-837
10	Front Seat Track	2013	-525	-266
11	Rear Seat Structure			
12	Right Rear Occupant Compartment	1745	436	-236
13	Engine Block	3428	380	-756
14	Rear Floorpan Above Axle	825	13	-485

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: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111
Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13



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: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13**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	Side Header, Curtain Airbag
Left Side of Head	Side Header, Curtain Airbag	Curtain Airbag
Back of Head	Side Header, Head Restraint, Curtain Airbag	Curtain Airbag, Side Header, Head Restraint, Center Seat Restraint
Left Shoulder	Torso/Pelvis Airbag	Seat, Door Panel
Upper Torso	Seat, Torso/Pelvis Airbag	Door Panel
Lower Torso	Seat, Torso/Pelvis Airbag	Door Panel
Left Hip	Seat, Torso/Pelvis Airbag	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/Oth
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge System Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)	N/A	N/A	N/A	N/A	N/A

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

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

DATA SHEET NO. 8 ... (CONTINUED)**POST-TEST OBSERVATIONS**Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No	No	
Knee Airbag	Yes	No	No	
Side Airbag 1 (Curtain)	Yes	Yes	Yes	Yes
Side Airbag 2 (Torso/Pelvis)	Yes	Yes	No	
Seat Belt Pretensioner	Yes	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		2546
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		332
Actual Impact Point (Aft of Front Axle)	mm		341
Horizontal Offset (+ forward / - rearward)	mm	± 50 of Intended Impact Point	-9
Vertical Offset (+ down / - up)	mm	± 20 of Intended Impact Point	15

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

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111
 Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13

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	62.19
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.21
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.4
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	62.8
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26.0 to 28.0	27.5

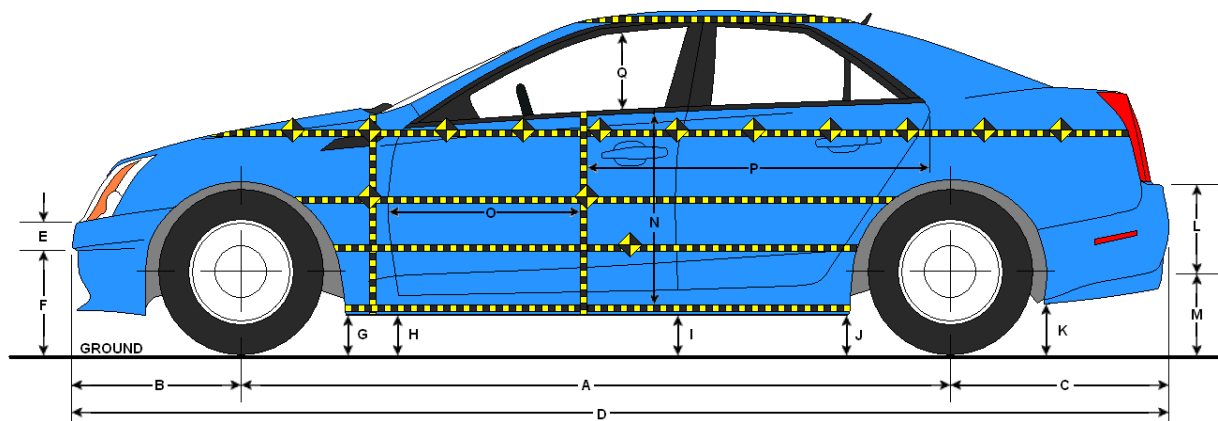
MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

Vertical Location			From Centerline		Max. Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	700	Right	188
B	Top of Bumper	533	700	Right	94
C	Mid Level	686	800	Left	80
D	Top of Stack	813	800	Left	115

DATA SHEET NO. 10

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111
 Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2546	2551	5
B	Front Axle to FSOV	736	738	2
C	Rear Axle to RSOV	580	571	-9
D	Total Length at Centerline	3862	3860	-2
E	Front Bumper Thickness	102	101	-1
F	Front Bumper Bottom to Ground	406	401	-5
G	Sill Height at Front Wheel Well	193	187	-6
H	Sill Height at Front Door Leading Edge	190	182	-8
I	Sill Height at B-Pillar	196	263	67
J1	Sill Height at Rear Wheel Well	187	244	57
J2	Pinch Weld Height at Rear Wheel Well	156	203	47
K	Sill Height Aft of Rear Wheel Well	376	415	39
L	Rear Bumper Thickness	242	243	1
M	Rear Bumper Bottom to Ground	288	316	28
N	Sill Height to Bottom of Front Window Sill	622	540	-82
O	Front Door Leading Edge to Impact CL	795	711	-84
P	Rear Door Trailing Edge to Impact CL	1295	1267	-28
Q	Front Window Opening	476	512	36
R	Right Side Length	2869	2869	0
S	Left Side Length	2872	2859	-13
T	Vehicle Width at B-Pillar	1669	1544	-125

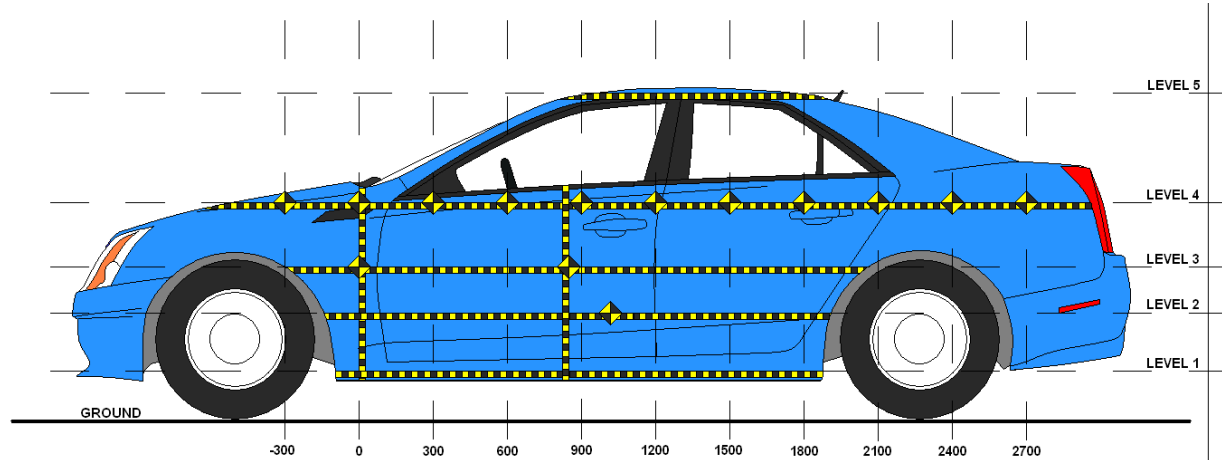
All measurements in mm with tolerance of ± 3 mm

DATA SHEET NO. 11

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111

Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	236	30	600
2	Occupant H-Point	509	200	1200
3	Mid-Door	607	200	1350
4	Window Sill	843	198	1350
5	Window Top	1373	21	1650

DATA SHEET NO. 11 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111

Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

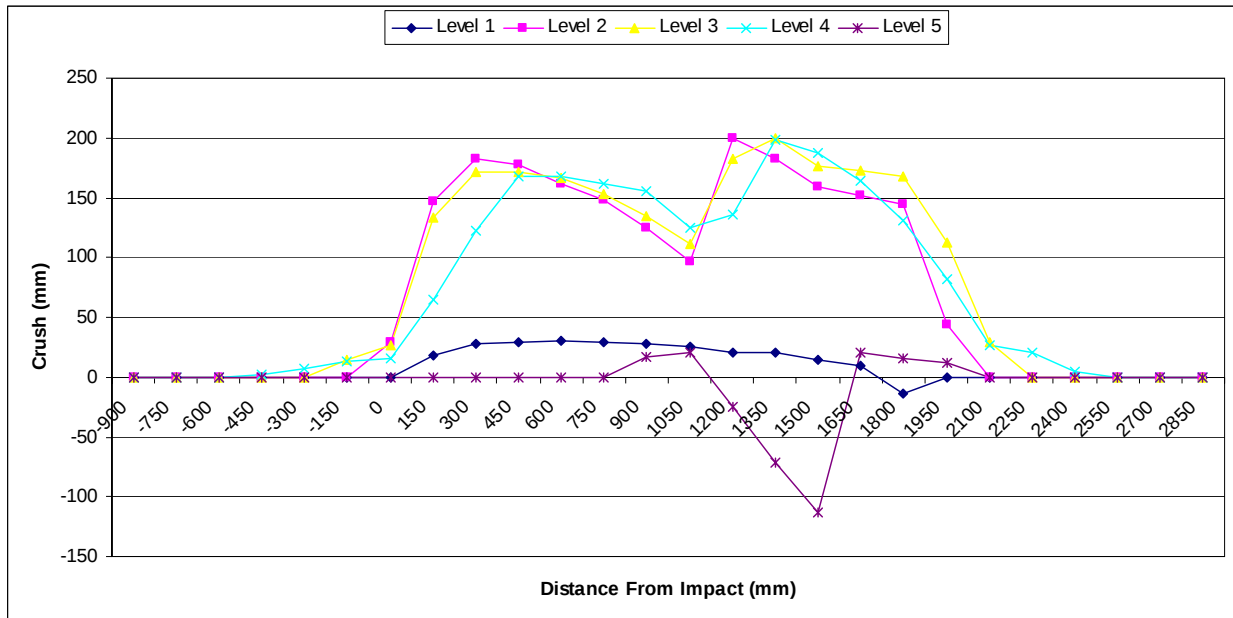
	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450				740					742					2	
-300				731					738					7	
-150			651	725				665	738				14	13	
0		656	656	717			685	683	733			29	27	16	
150	694	658	655	707		712	805	788	772		18	147	133	65	
300	696	658	654	701		724	841	825	823		28	183	171	122	
450	696	659	653	696		725	837	825	864		29	178	172	168	
600	696	660	653	689		726	822	819	857		30	162	166	168	
750	696	662	654	686		725	810	807	848		29	148	153	162	
900	696	666	656	682	969	724	791	791	838	986	28	125	135	156	17
1050	696	669	659	682	961	721	766	770	807	981	25	97	111	125	20
1200	696	676	663	681	959	717	876	846	817	934	21	200	183	136	-25
1350	695	680	669	683	958	715	862	869	881	886	20	182	200	198	-72
1500	695	683	676	683	961	710	842	852	871	848	15	159	176	188	-113
1650	696	682	682	686	970	706	834	855	850	991	10	152	173	164	21
1800	700	674	687	691	979	686	818	855	822	995	-14	144	168	131	16
1950		657	665	712	1005		701	778	794	1017		44	113	82	12
2100			654	706				683	733				29	27	
2250				716					736					20	
2400				728					733					5	
2550															
2700															
2850															

DATA SHEET NO. 11 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111

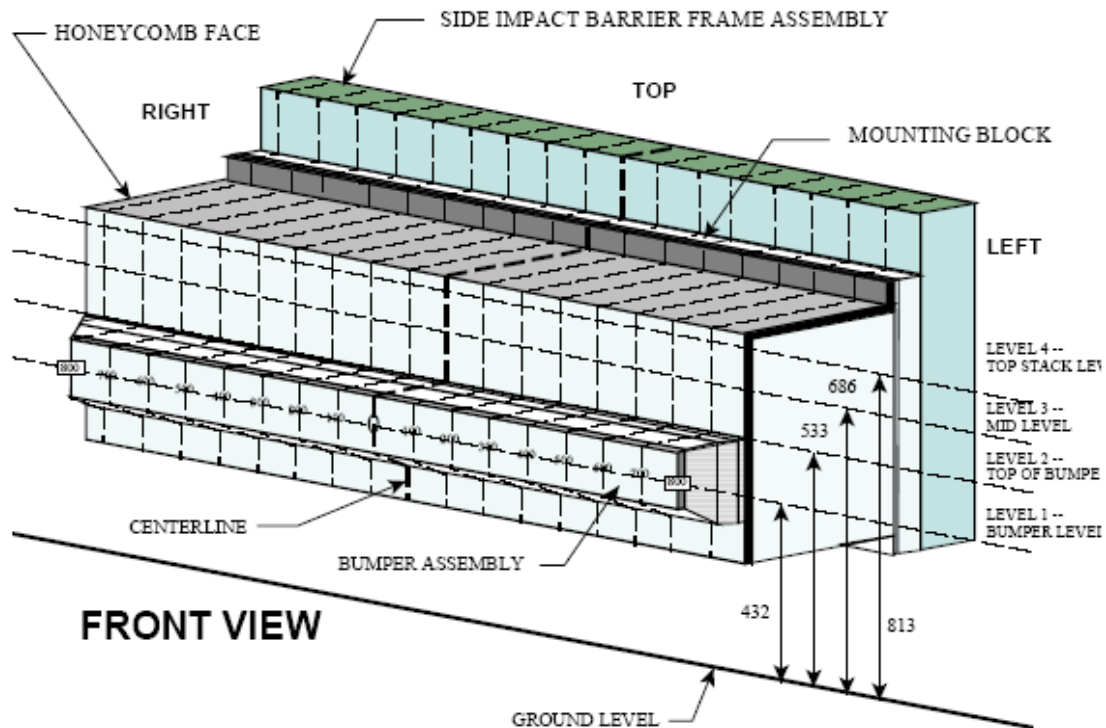
Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13



DATA SHEET NO. 12

MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111
 Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13



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	115	188	182	170	163	157	155	158	142	139	129	123	119	109	112	112	144
2	11	94	80	66	57	50	16	60	56	47	37	29	32	34	32	34	53
3	33	26	23	20	22	24	37	57	34	12	2	3	5	9	17	32	80
4	38	20	5	0	11	32	70	83	60	27	2	3	7	7	21	63	115

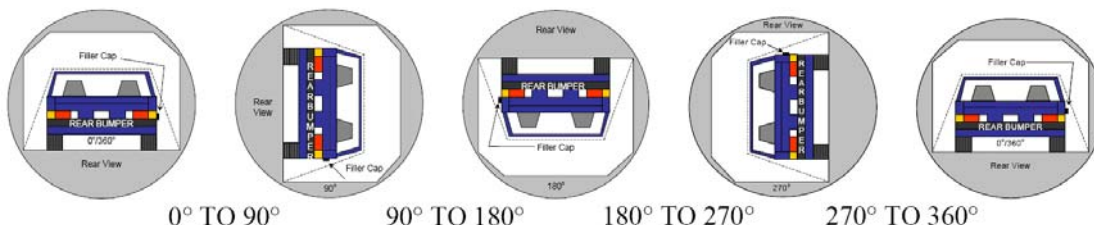
All dimensions in millimeters.

DATA SHEET NO. 13

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111
 Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13
 Temperature at Time of Impact: 8.2° C Test Time: 1:29 PM

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



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	88	300	388
90° To 180°	86	300	386
180° To 270°	83	300	383
270° To 360°	85	300	385

FMVSS 301 SPILLAGE TABLE

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

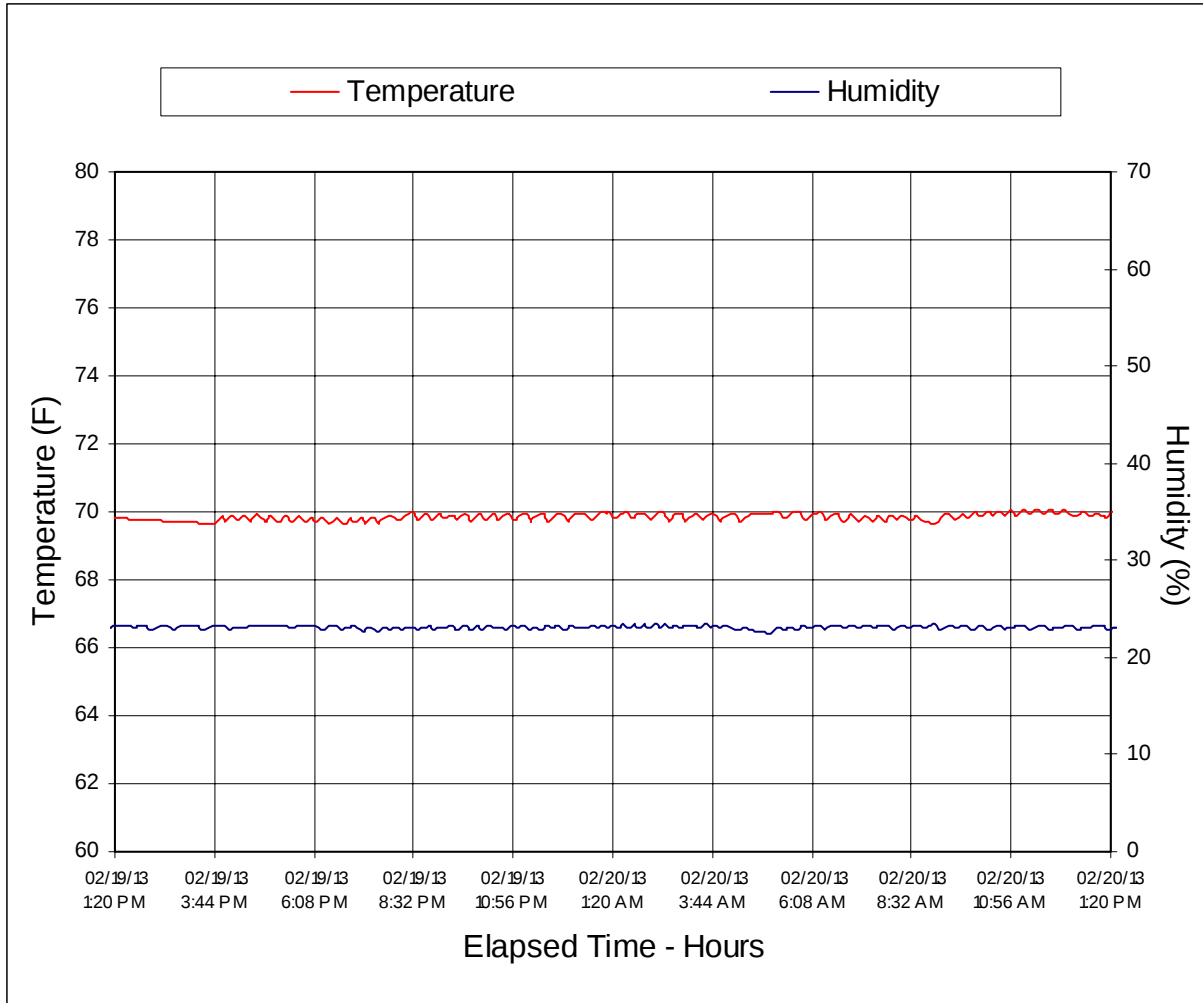
SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 14

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback NHTSA No. MD5111
Test Program: NCAP MDB Side Impact Test Test Date: 02/20/13



APPENDIX A
PHOTOGRAPHS

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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

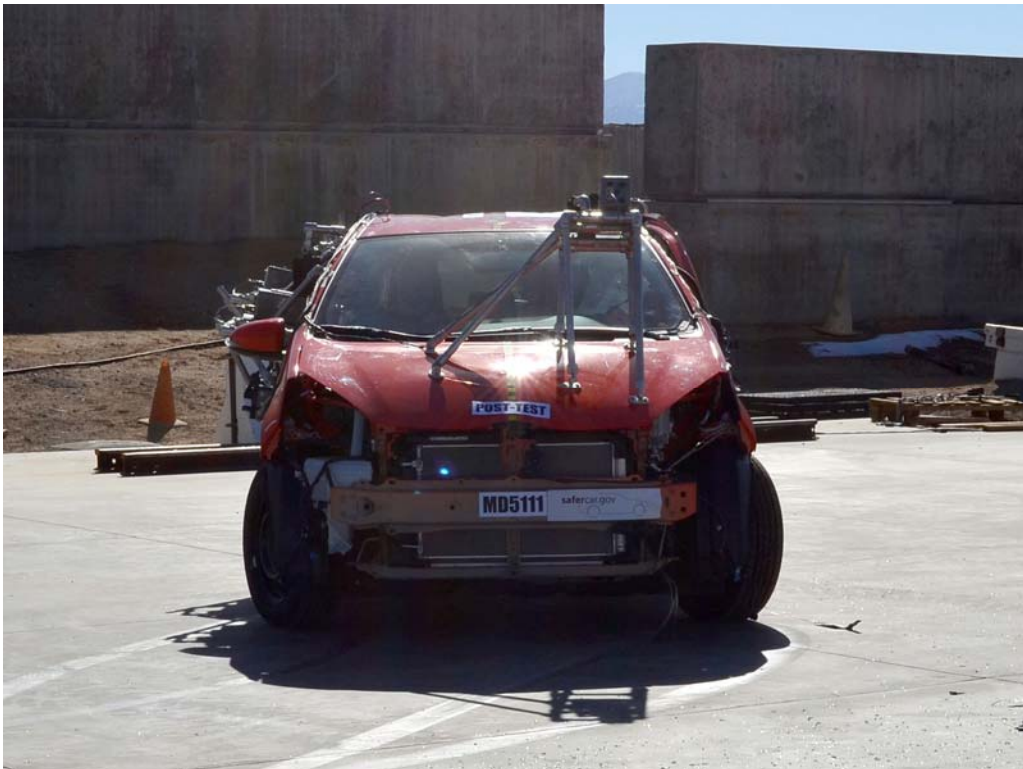


FIGURE 4. Post-Test Frontal View of Test Vehicle



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



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

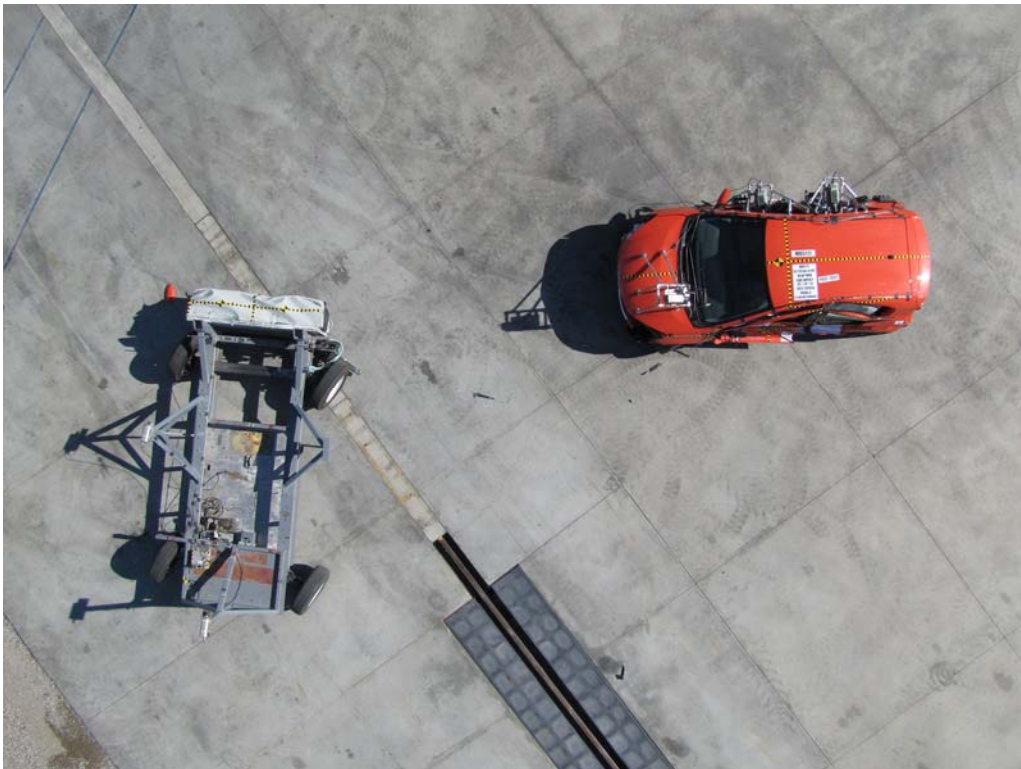


FIGURE 16. Post-Test Overhead View of Test Area



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

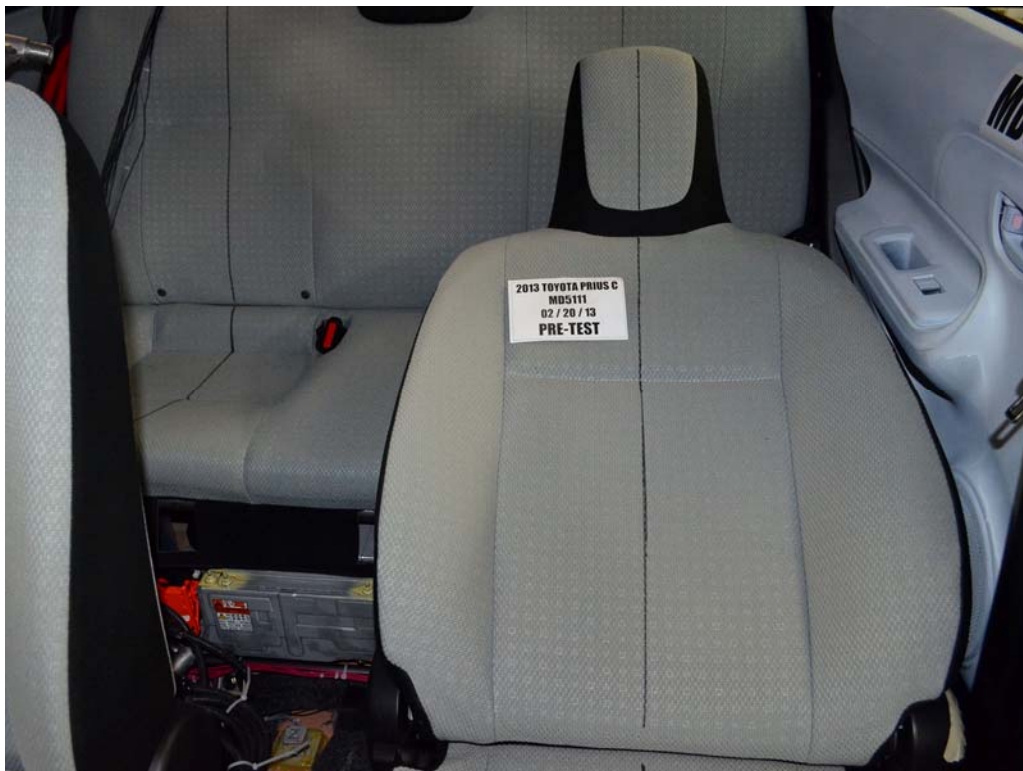


FIGURE 30. Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning



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 of Occupant Compartment



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

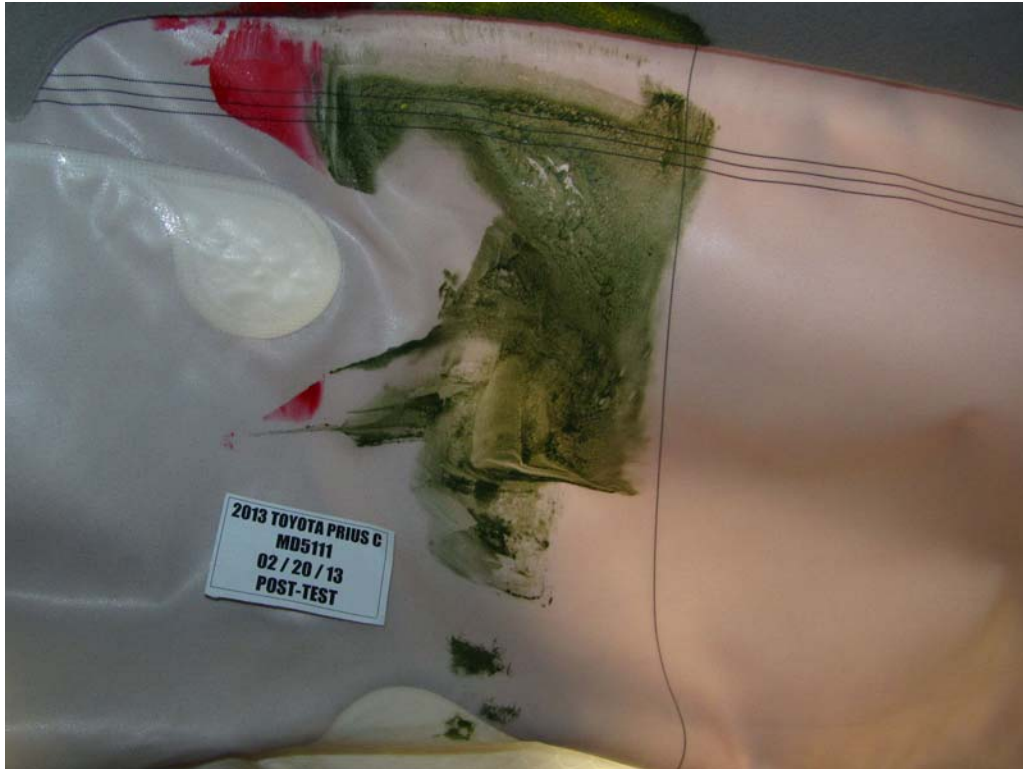


FIGURE 49. Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View



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 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

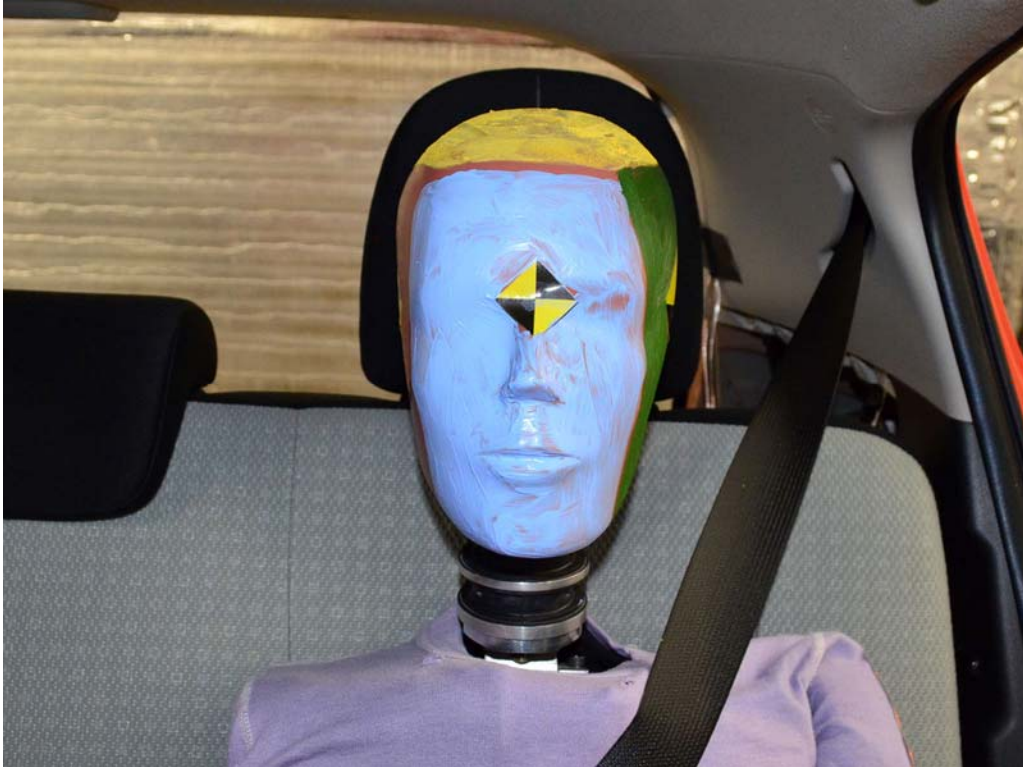


FIGURE 59. Pre-Test Frontal View of Rear Passenger Dummy
Head and Shoulders in Relation to Head Restraint



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 of Occupant Compartment



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

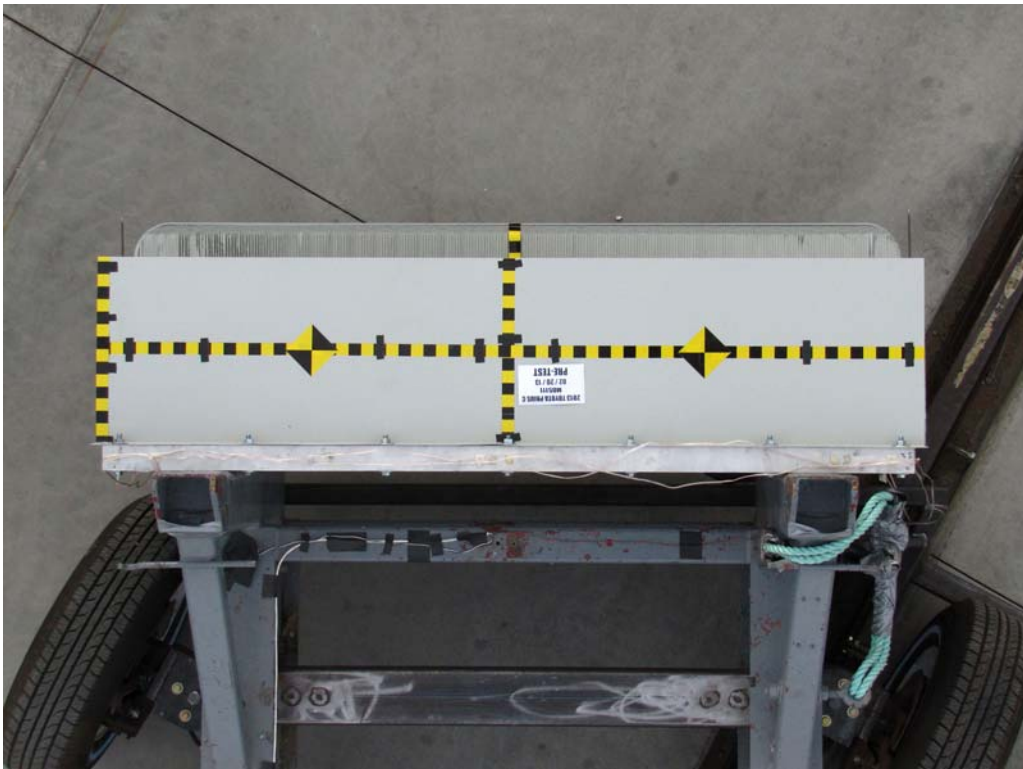


FIGURE 86. Pre-Test Top View of MDB Impactor Face



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 92a. Close-Up View of Vehicle's Reduced Load Carrying Capacity Label

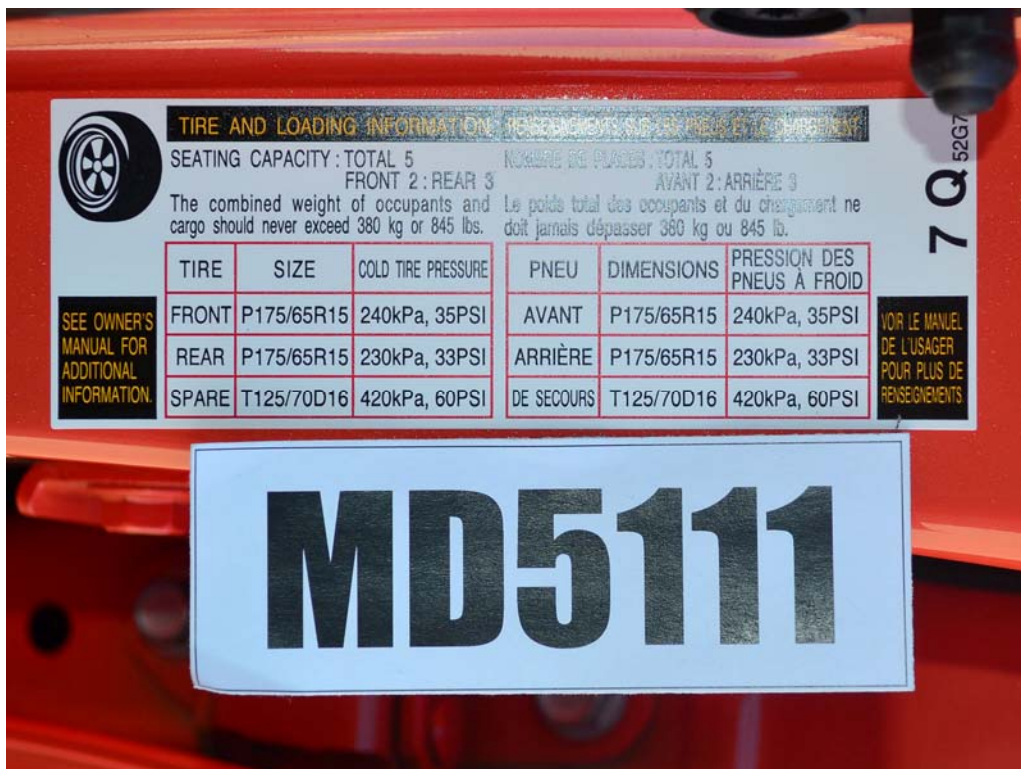


FIGURE 93. Close-Up View of Vehicle's Tire Information Placard or Label

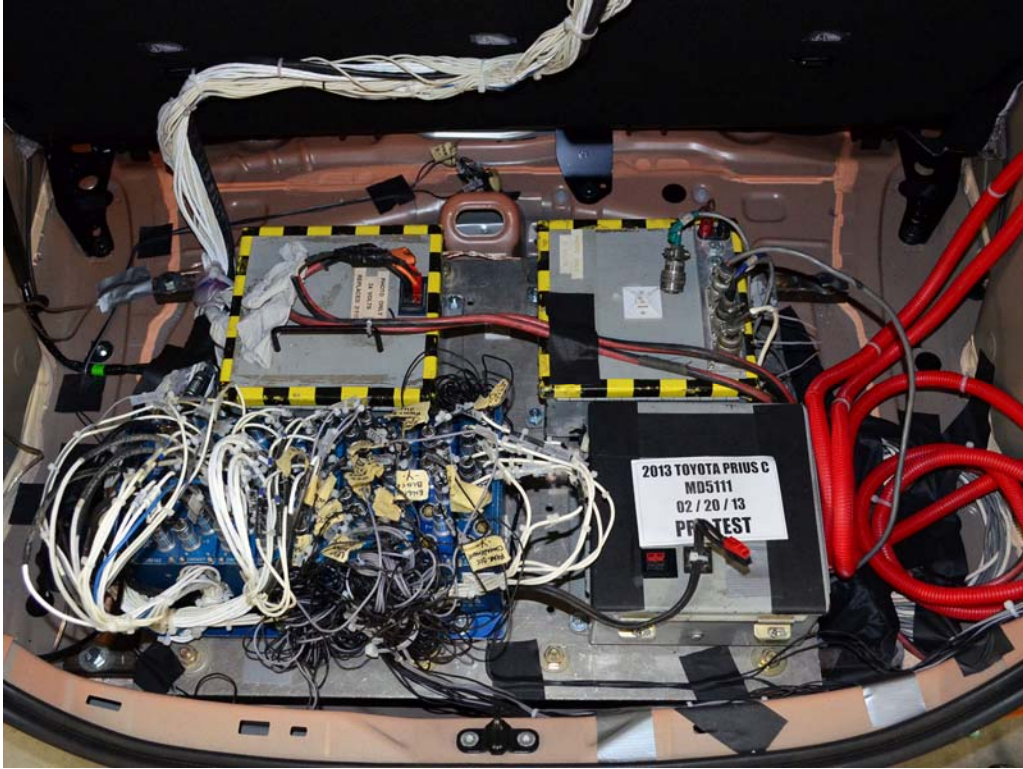


FIGURE 94. Pre-Test Ballast View



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

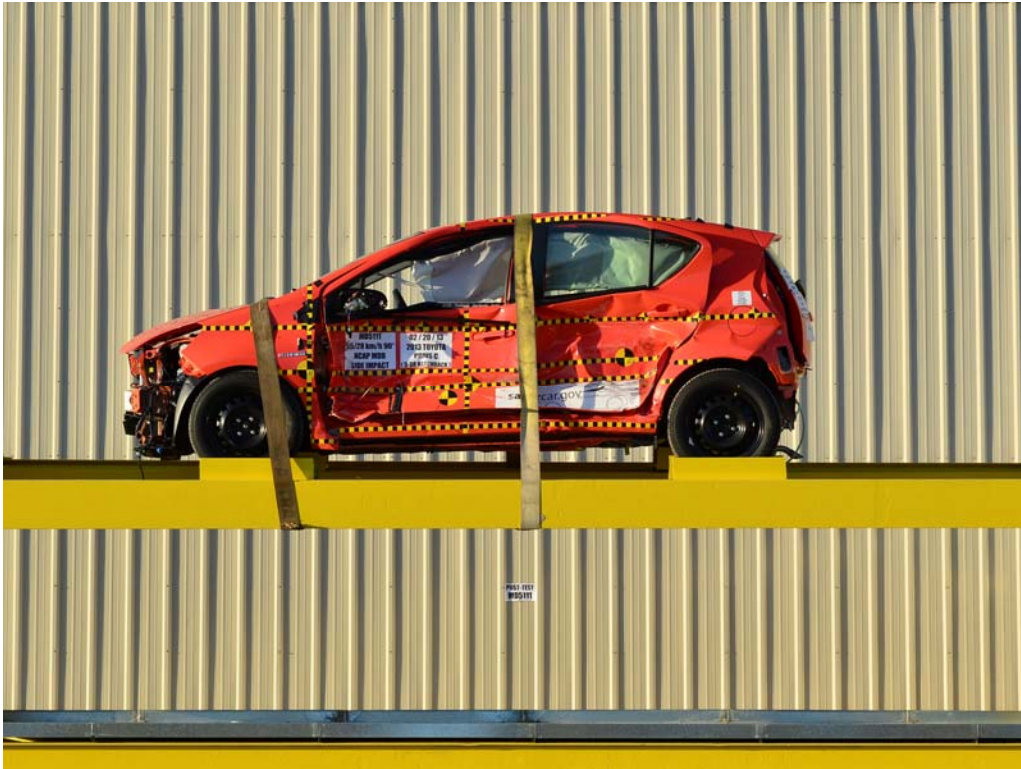


FIGURE 96. FMVSS No. 301 Static Rollover 0 Degrees



FIGURE 97. FMVSS No. 301 Static Rollover 90 Degrees

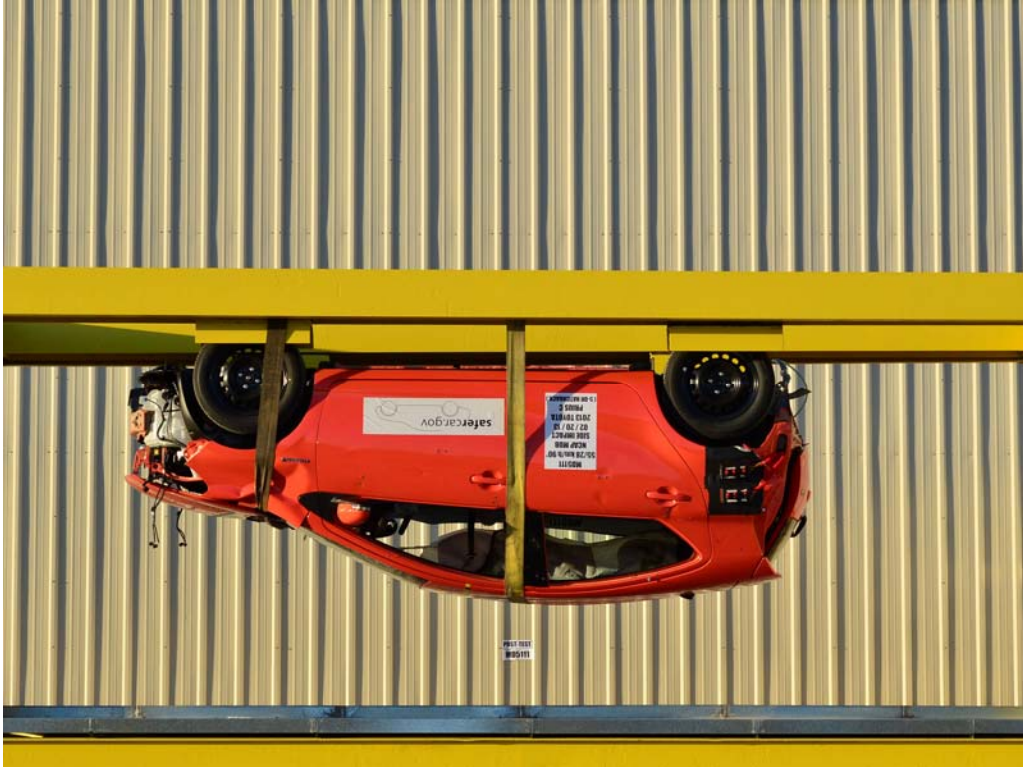


FIGURE 98. FMVSS No. 301 Static Rollover 180 Degrees

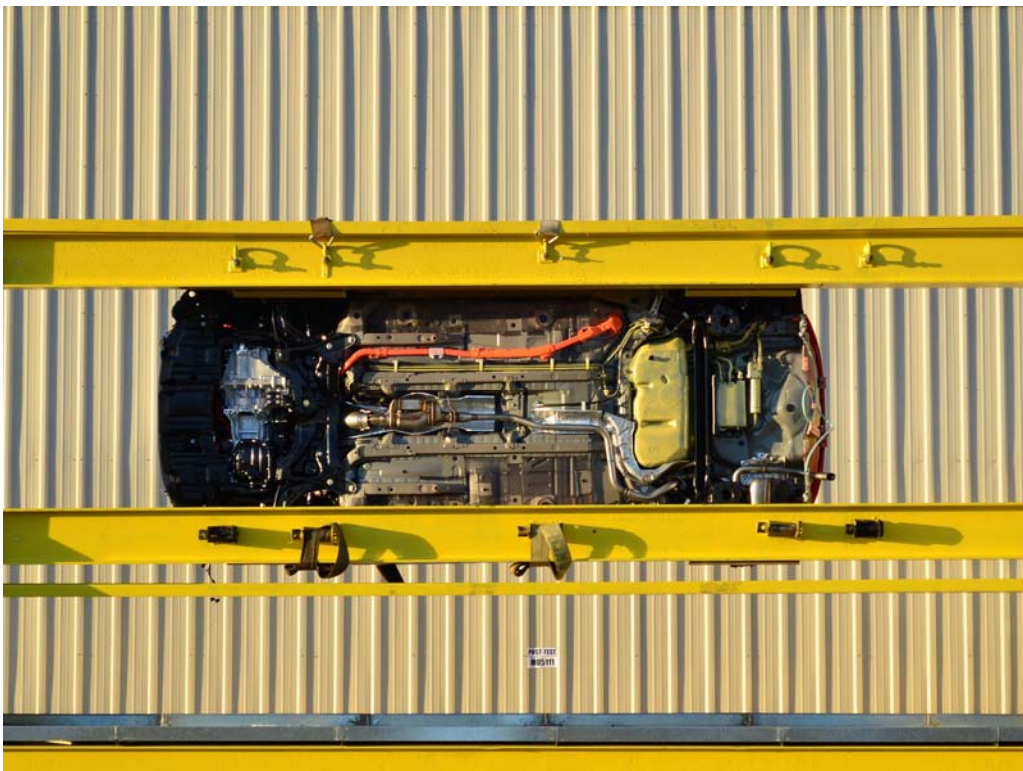


FIGURE 99. FMVSS No. 301 Static Rollover 270 Degrees

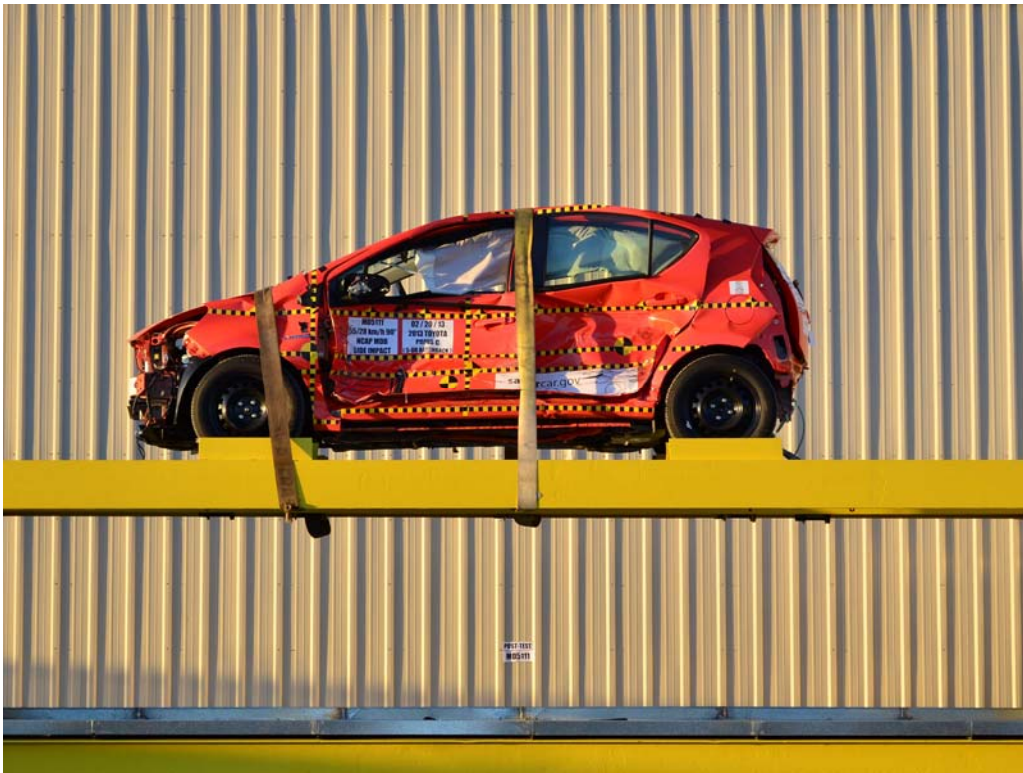


FIGURE 100. FMVSS No. 301 Static Rollover 360 Degrees



FIGURE 101. Impact Event

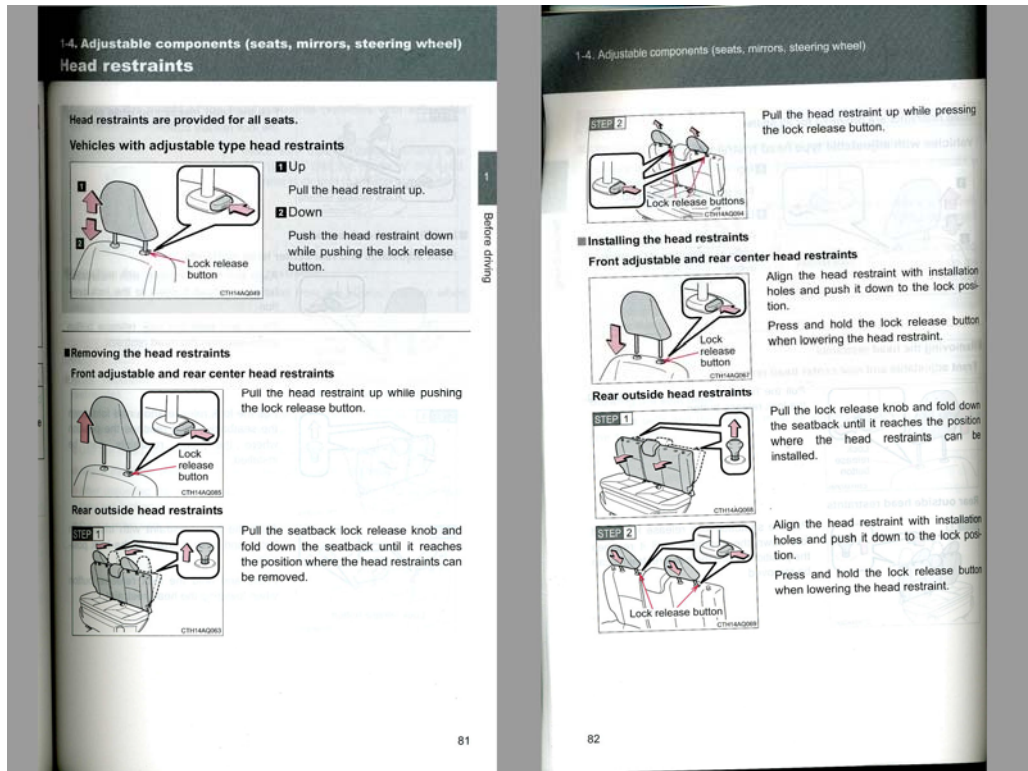


FIGURE 104. Left Rear Passenger Head Restraint
 Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B
DUMMY RESPONSE DATA

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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-4
15	Passenger Head Acceleration (Y) vs. Time Primary	B-4
16	Passenger Head Acceleration (Z) vs. Time Primary	B-4
17	Passenger Head Resultant Acceleration Primary vs. Time	B-5
18	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-5
19	Passenger Lower Spine T12 Acceleration (Y) vs. Time	B-5
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21	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-6
22	Passenger Iliac Force on Impact Side (Y) vs. Time	B-6
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24	Passenger Total Pelvic Force on Impact Side (Y) vs. Time	B-6

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)

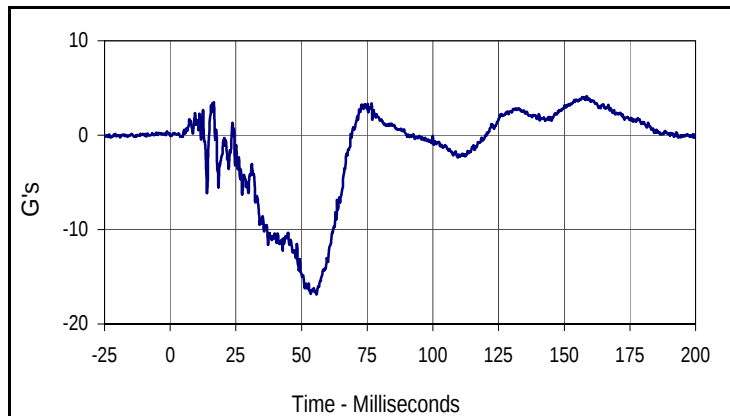
MDB Rear Acceleration (Y)

Left MDB Contact Switch

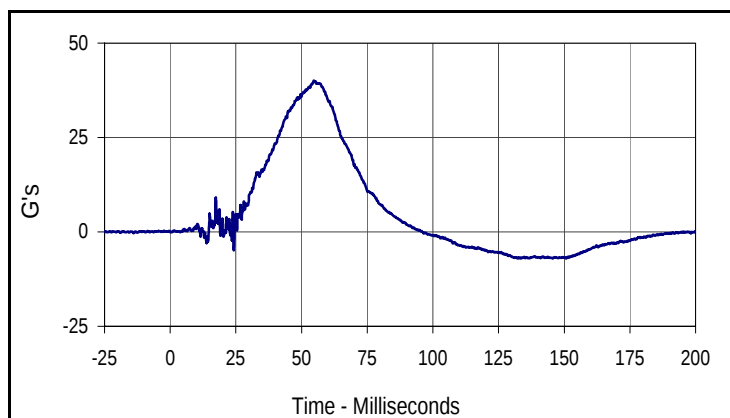
Right MDB Contact Switch

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

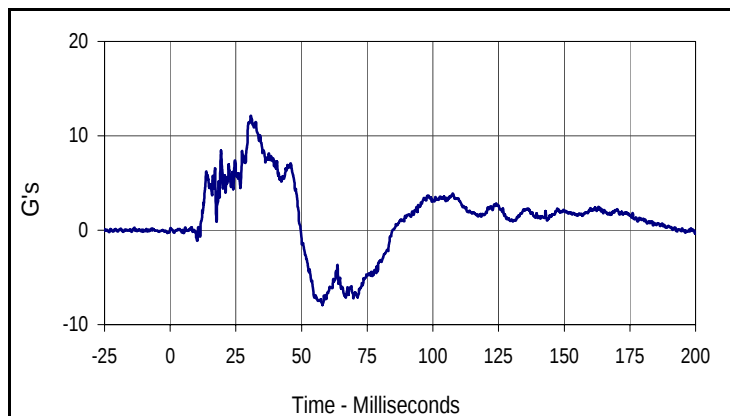
NHTSA No.: MD5111
 Test Date: 2/20/13



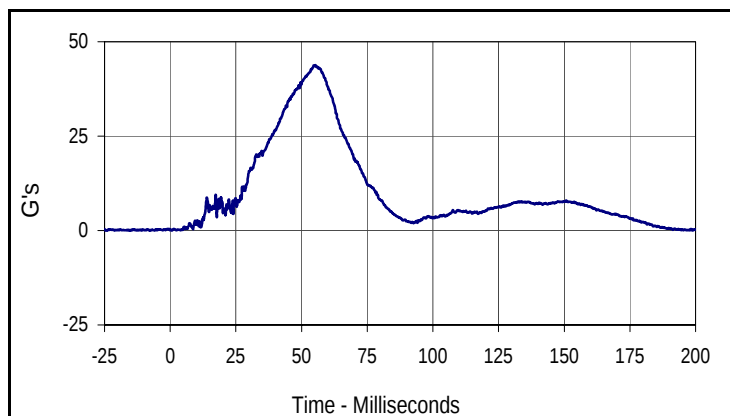
Curve Description			
Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
4.1	158.6	-16.9	55.7



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
40.1	54.7	-7.1	133.5



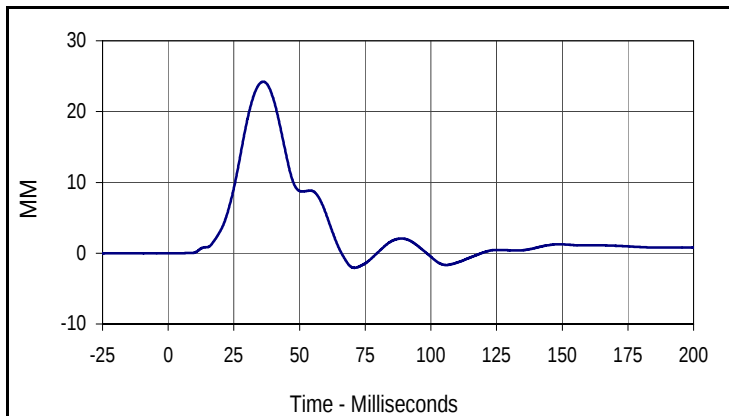
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
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Max	Time	Min	Time
12.1	30.7	-7.9	57.9



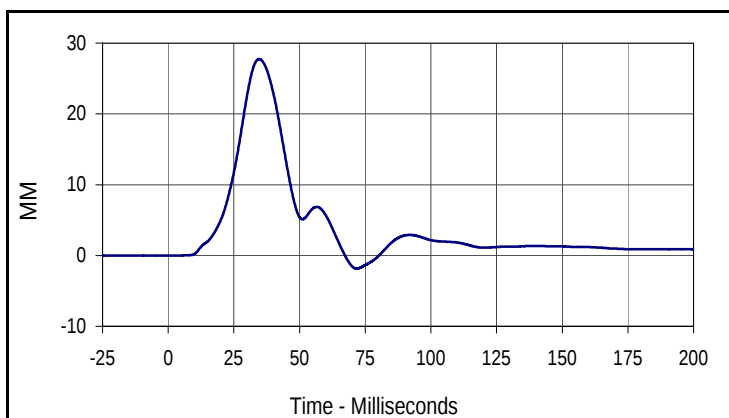
Curve Description			
Driver Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
43.8	55.3	0.0	0.7

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

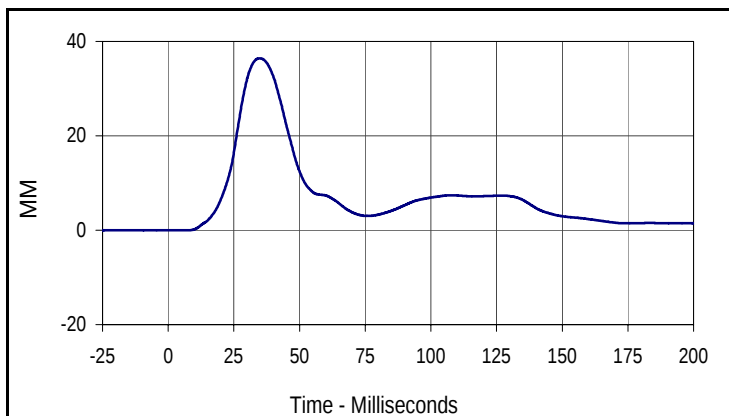
NHTSA No.: MD5111
 Test Date: 2/20/13



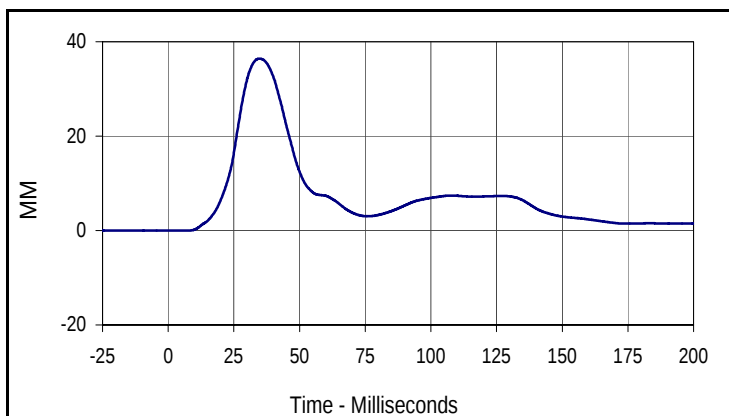
Curve Description			
Driver Upper Thorax Rib Deflection Y			
Plot No.	Type	SAE Class	Units
005	FIL	180	MM
Max	Time	Min	Time
24.2	36.2	-2.1	70.9



Curve Description			
Driver Middle Thorax Rib Deflection Y			
Plot No.	Type	SAE Class	Units
006	FIL	180	MM
Max	Time	Min	Time
27.8	34.6	-1.9	71.8



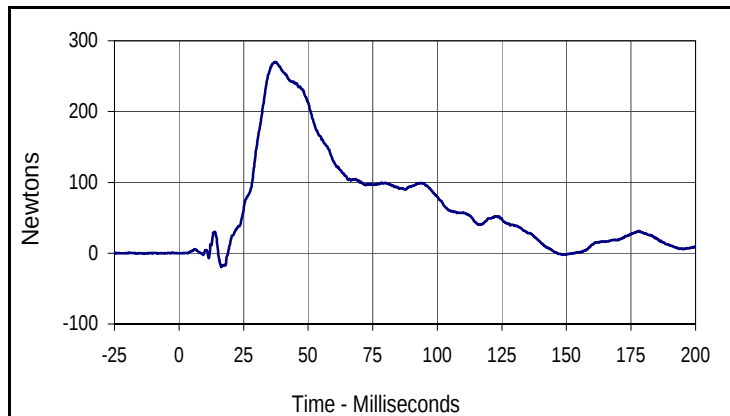
Curve Description			
Driver Lower Thorax Rib Deflection Y			
Plot No.	Type	SAE Class	Units
007	FIL	180	MM
Max	Time	Min	Time
36.4	34.8	0.0	6.7



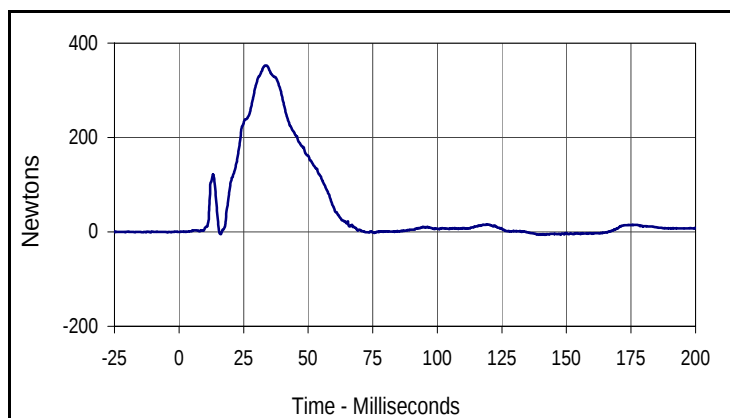
Curve Description			
Driver Thorax Rib Deflection Maximum			
Plot No.	Type	SAE Class	Units
010	FIL	180	MM
Max	Time	Min	Time
36.4	34.8	0.0	6.7

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

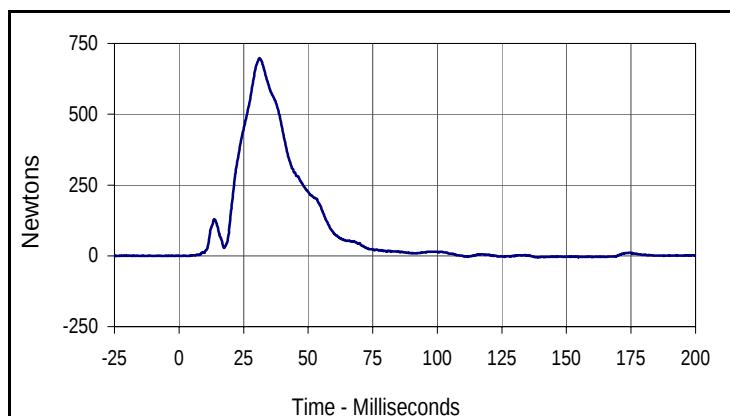
NHTSA No.: MD5111
 Test Date: 2/20/13



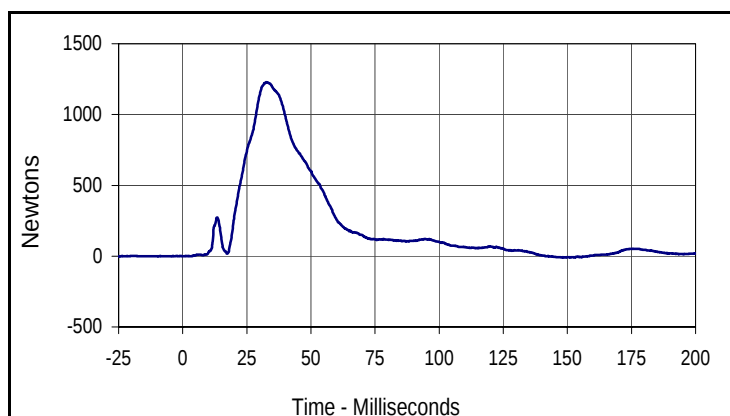
Curve Description			
Driver Anterior Abdominal Force Y			
Plot No.	Type	SAE Class	Units
008	FIL	600	Newtons
Max	Time	Min	Time
270.0	37.2	-19.5	16.4



Curve Description			
Driver Middle Abdominal Force Y			
Plot No.	Type	SAE Class	Units
009	FIL	600	Newtons
Max	Time	Min	Time
352.5	33.3	-5.9	147.7



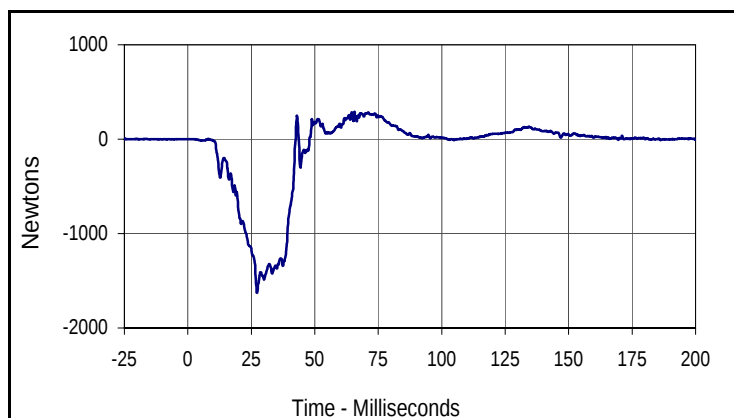
Curve Description			
Driver Posterior Abdominal Force Y			
Plot No.	Type	SAE Class	Units
011	FIL	600	Newtons
Max	Time	Min	Time
697.7	31.1	-5.4	139.1



Curve Description			
Driver Total Abdominal Force			
Plot No.	Type	SAE Class	Units
012	SUM	600	Newtons
Max	Time	Min	Time
1227.7	32.5	-10.2	149.1

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback
Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

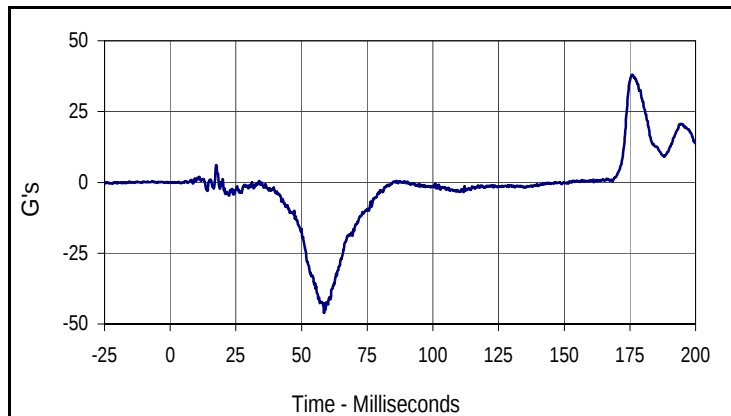
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Test Date: 2/20/13



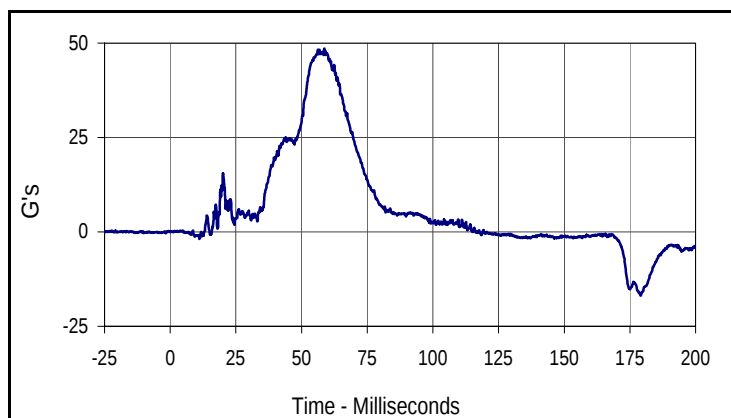
Curve Description			
Driver Pubic Symphysis Force Y			
Plot No.	Type	SAE Class	Units
013	FIL	600	Newtons
Max	Time	Min	Time
290.1	65.6	-1625.9	27.2

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

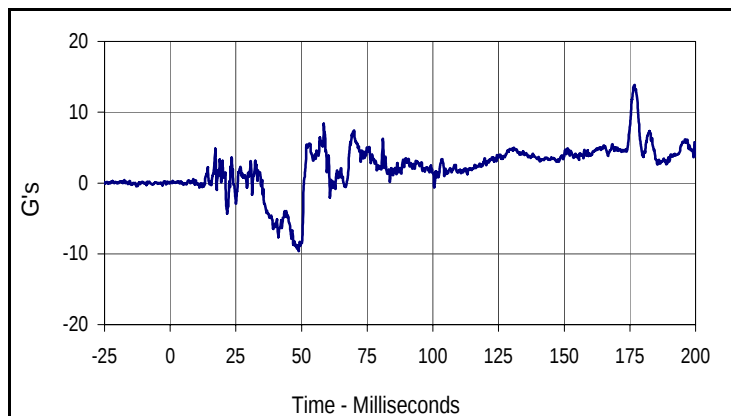
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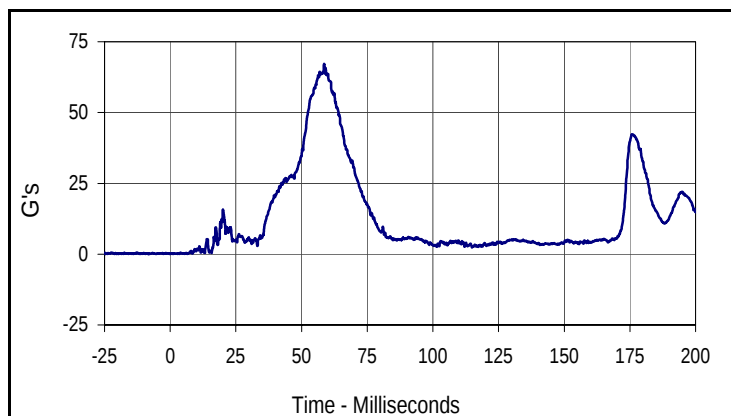
Curve Description			
Passenger Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
014	FIL	1000	G's
Max	Time	Min	Time
38.1	175.8	-46.1	58.6



Curve Description			
Passenger Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
015	FIL	1000	G's
Max	Time	Min	Time
48.6	58.7	-16.9	179.1



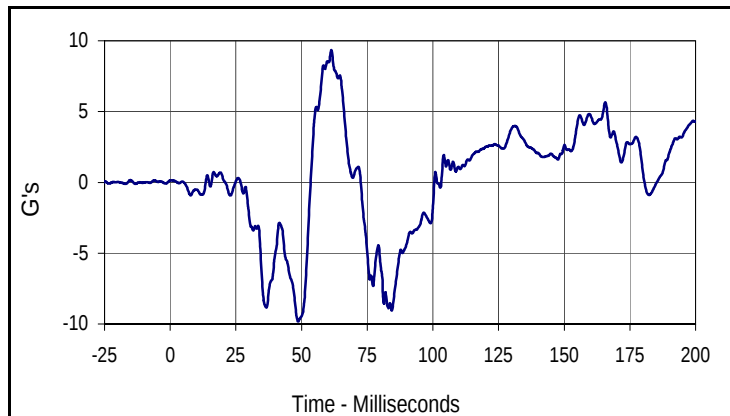
Curve Description			
Passenger Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
016	FIL	1000	G's
Max	Time	Min	Time
13.9	176.7	-9.6	48.9



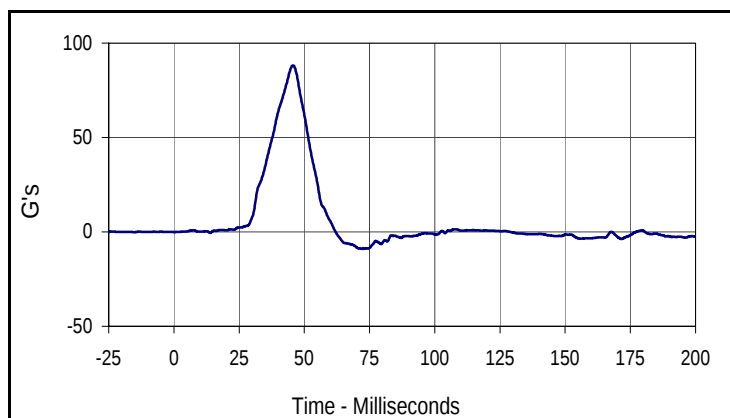
Curve Description			
Passenger Head Acceleration Resultant Primary			
Plot No.	Type	SAE Class	Units
017	RES	1000	G's
Max	Time	Min	Time
67.2	58.6	0.1	0.2

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

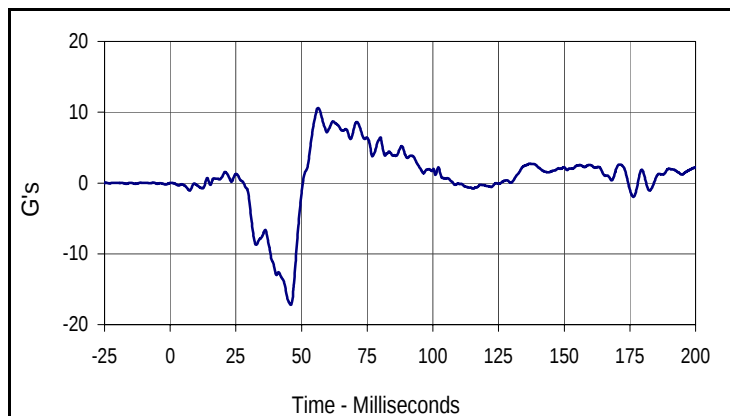
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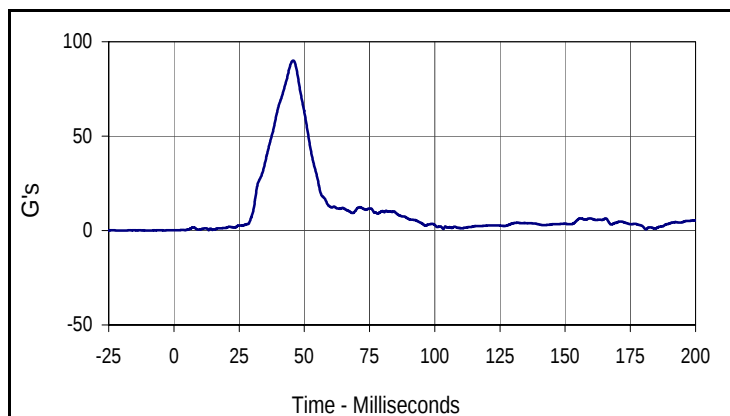
Curve Description			
Passenger Lower Spine T12 Acceleration X			
Plot No.	Type	SAE Class	Units
019	FIL	180	G's
Max	Time	Min	Time
9.3	61.3	-9.8	48.7



Curve Description			
Passenger Lower Spine T12 Acceleration Y			
Plot No.	Type	SAE Class	Units
020	FIL	180	G's
Max	Time	Min	Time
88.2	45.7	-8.9	72.4



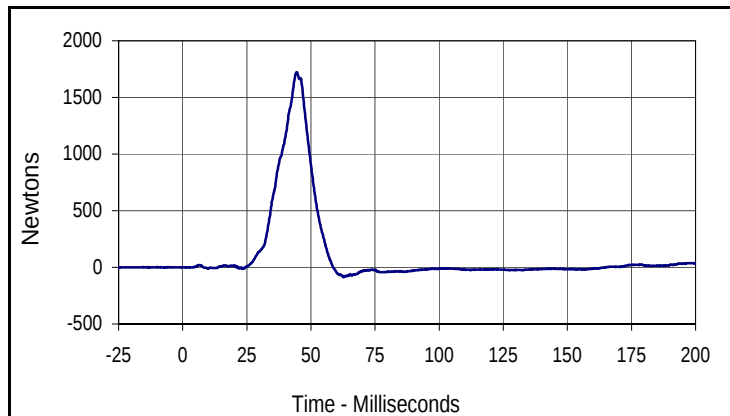
Curve Description			
Passenger Lower Spine T12 Acceleration Z			
Plot No.	Type	SAE Class	Units
021	FIL	180	G's
Max	Time	Min	Time
10.6	56.3	-17.2	45.9



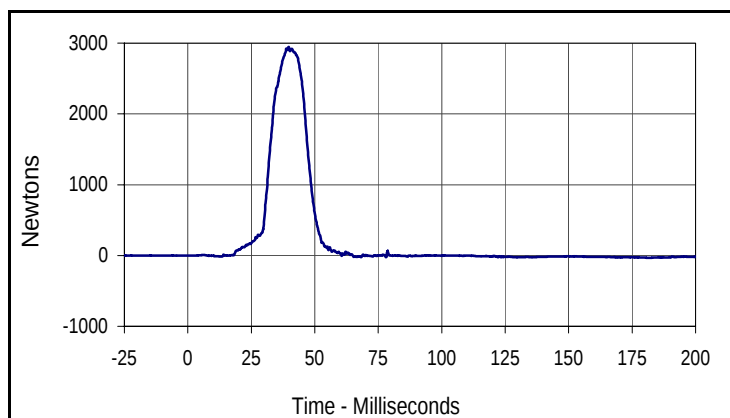
Curve Description			
Passenger Lower Spine T12 Acceleration Res.			
Plot No.	Type	SAE Class	Units
022	RES	180	G's
Max	Time	Min	Time
90.1	45.7	0.1	1.4

Test Vehicle: 2013 Toyota Prius C 5-Door Hatchback
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

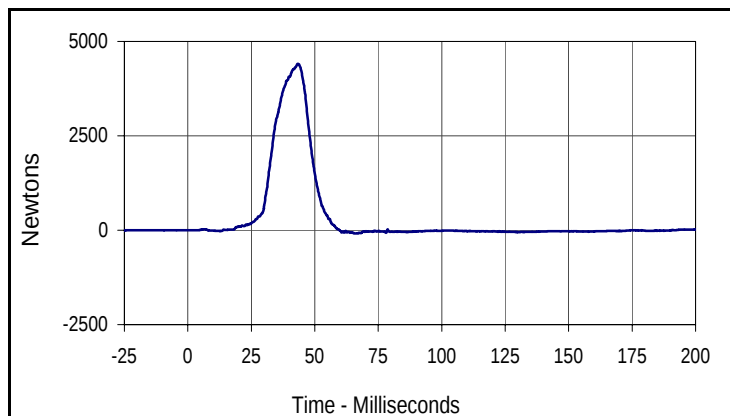
NHTSA No.: MD5111
 Test Date: 2/20/13



Curve Description			
Passenger Iliac Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
023	FIL	600	Newtons
Max	Time	Min	Time
1723.1	44.5	-87.2	62.7



Curve Description			
Passenger Acetabulum Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
024	FIL	600	Newtons
Max	Time	Min	Time
2945.8	39.7	-33.7	182.0



Curve Description			
Passenger Total Pelvic Force			
Plot No.	Type	SAE Class	Units
018	SUM	600	Newtons
Max	Time	Min	Time
4408.8	43.4	-86.5	66.6

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.: F035

Test Date: 1/17/13
 Test I.D.: N/A



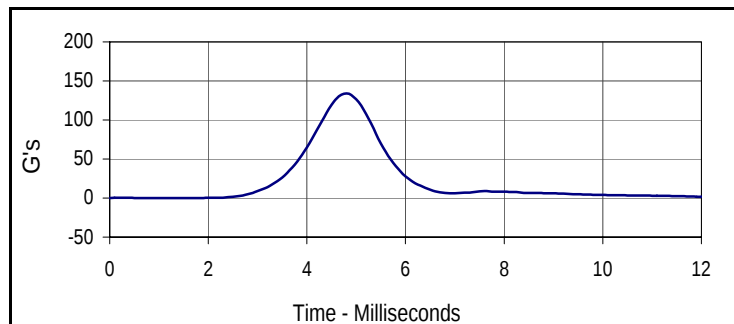
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	30.3	Pass
1	Sitting Height	mm	900 - 918	907	Pass
2	Seat to Shoulder Joint	mm	558 - 572	564	Pass
3	Seat to Lower Face of Thoracic Spine Box	mm	346 - 356	350	Pass
4	Seat to Hip Joint (Center of Bolt)	mm	97 - 103	100	Pass
5	Sole to Seat, Sitting	mm	333 - 451	389	Pass
6	Head Width	mm	152 - 158	155	Pass
7	Shoulder / Arm Width	mm	461 - 479	470	Pass
8	Thorax Width	mm	322 - 332	324	Pass
9	Abdomen Width	mm	273 - 287	280	Pass
10	Pelvis Lap Width	mm	359 - 373	365	Pass
11	Head Depth	mm	196 - 206	202	Pass
12	Thorax Depth	mm	262 - 272	269	Pass
13	Abdomen Width	mm	194 - 204	198	Pass
14	Pelvis Depth	mm	235 - 245	239	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	611	Pass
Overall Test Results					Pass

Test Program: ES2re Head Drop Test
 ATD Serial No.: F035

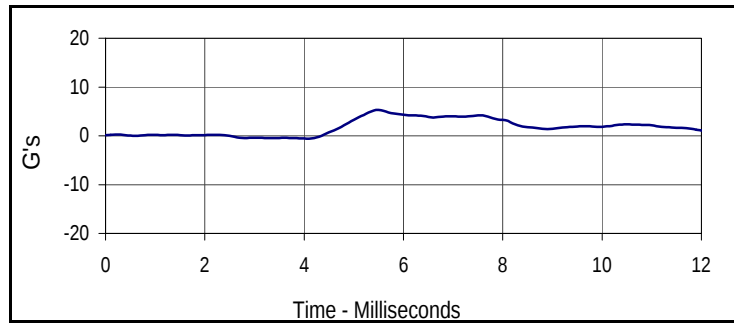
Test Date: 1/17/13
 Test I.D.: F035HD044



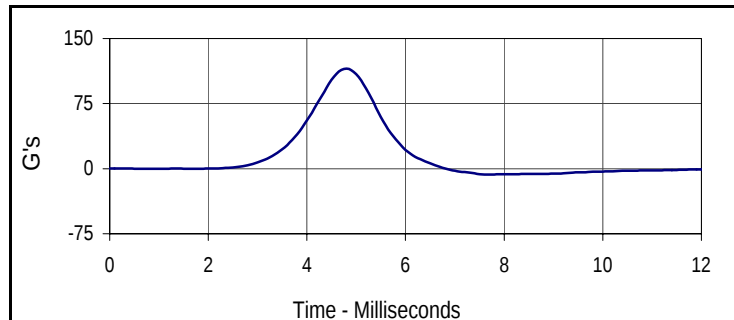
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	375	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.8	Pass
Peak Head Resultant Acceleration	G's	125 to 155	134.0	Pass
Peak Head X Acceleration	G's	≤15	5.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	6.7	Pass
Overall Test Results				Pass



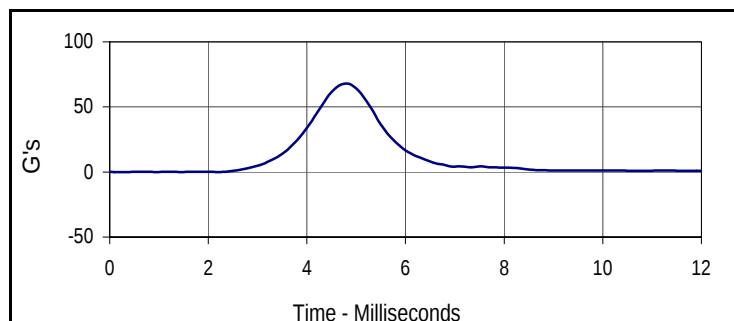
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
134.0	4.8	0.1	1.5



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.3	5.5	-0.6	4.1



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
115.3	4.8	-6.8	7.7



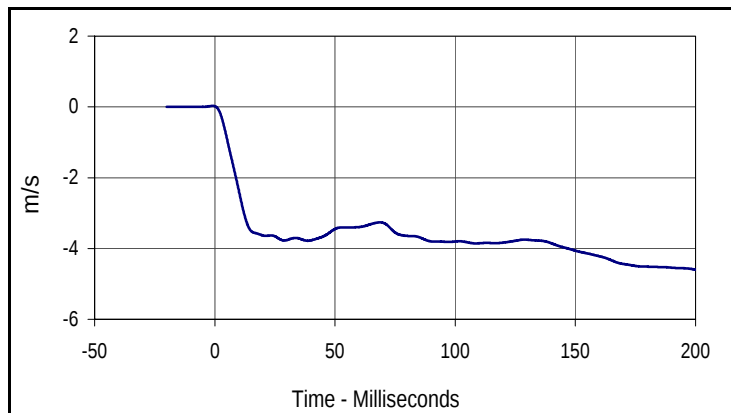
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
68.2	4.8	-0.1	0.3

Test Program: ES2re Neck Flexion Test
 ATD Serial No.: F035

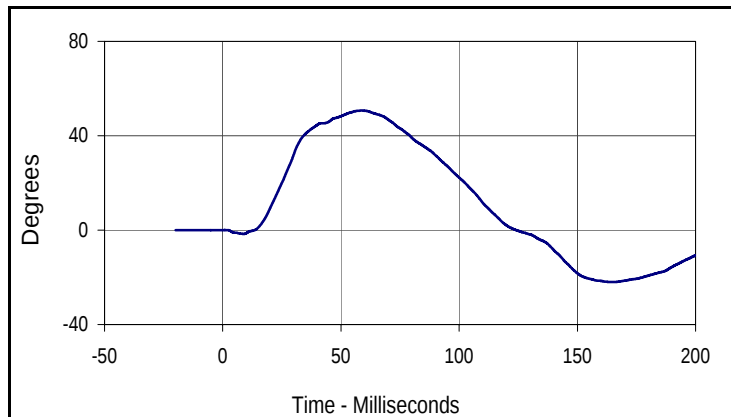
Test Date: 1/17/13
 Test I.D.: F035NB044



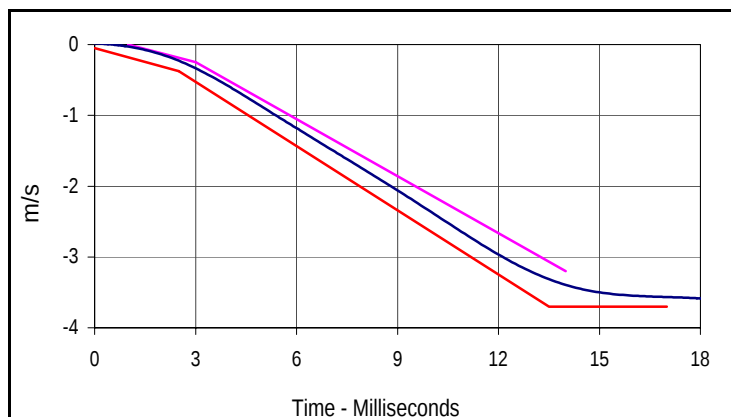
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	415	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Pendulum Velocity	m/s	3.3 to 3.5	3.46	Pass
Headform Flexion	Max	49 to 59	50.7	Pass
	Time	54 to 66	58.8	Pass
Headform Flexion Decay (Peak to Zero)	msec	53 to 88	65.3	Pass
Overall Test Results				Pass



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-0.9	-4.6	200.0



Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
50.7	58.8	-22.0	164.7



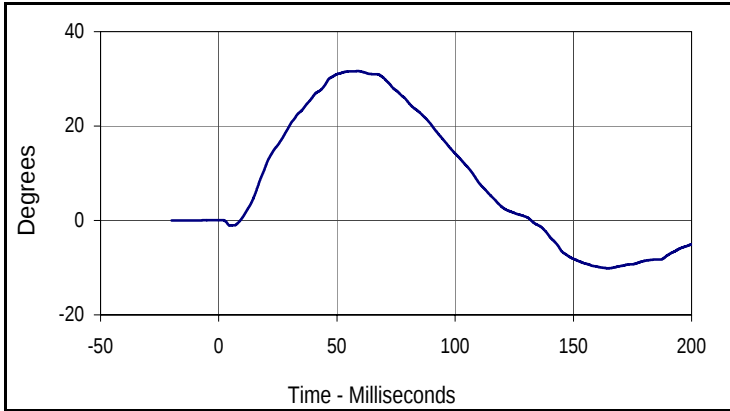
Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-0.9	-4.6	200.0

Velocity Corridors

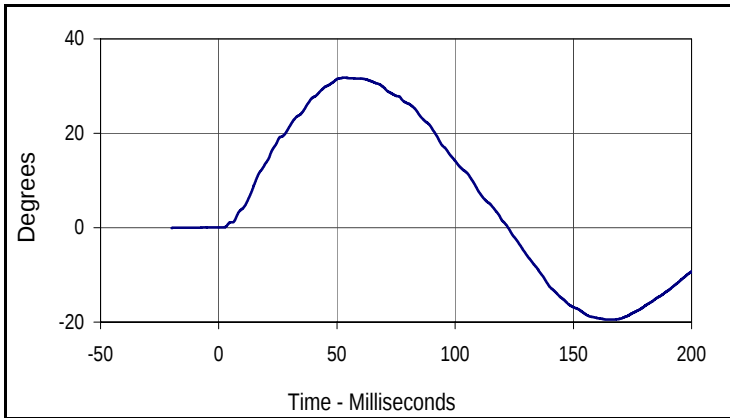
Upper Boundary		Lower Boundary	
Time (msec)	Velocity (m/s)	Time (msec)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.0	-0.03	2.5	-0.375
14.0	-3.20	13.5	-3.70
		17.0	-3.70

Test Program: ES2re Neck Flexion Test
 ATD Serial No.: F035

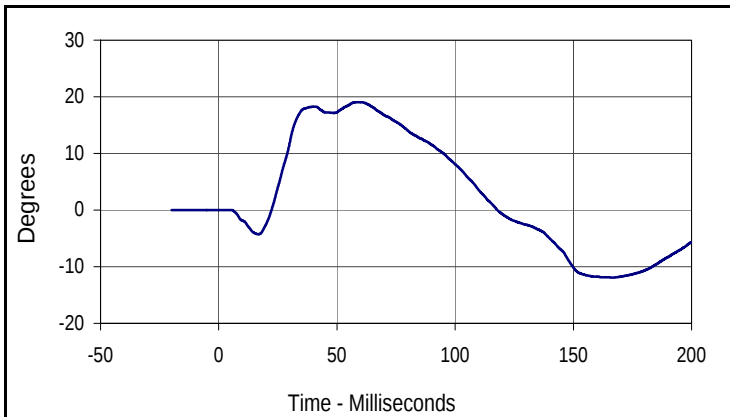
Test Date: 1/17/13
 Test I.D.: F035NB044



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
31.6	58.9	-10.1	164.6



Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
31.8	53.1	-19.5	166.6



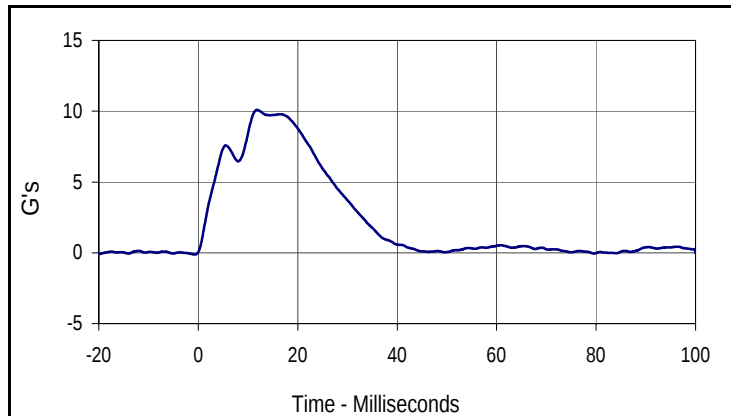
Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
19.0	60.4	-11.9	166.9

Test Program: ES2re Shoulder Impact Test
 ATD Serial No.: F035

Test Date: 1/17/13
 Test I.D.: F035SH044



Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	450	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.6	Pass
Pendulum Speed	m/s	4.2 to 4.4	4.31	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	10.1	Pass
Overall Test Results				Pass



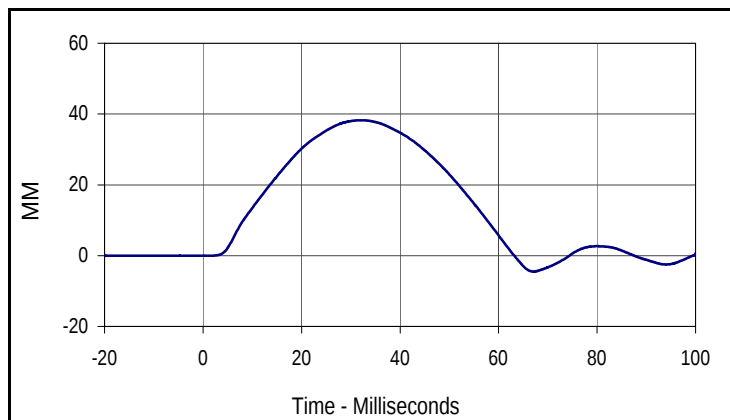
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
10.1	11.8	-0.1	-0.7

Test Program: ES2re Thorax - Rib Drop Test
 ATD Serial No.: F035 Rib # 1

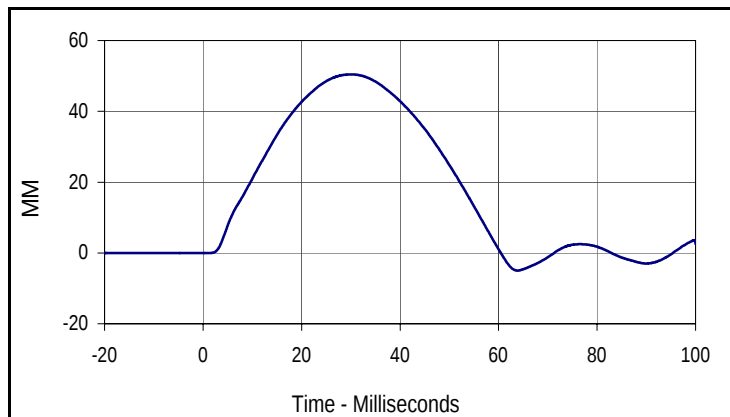
Test Date: 1/17/13
 Test I.D.: F035RB1044



Tested Parameter	Units	Specification	Result	Pass/Fail
Rib Module Soak Time	Minutes	≥240	475	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height	mm	36 to 40	38.3	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height	mm	46 to 51	50.4	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
38.3	32.1	-4.5	67.1



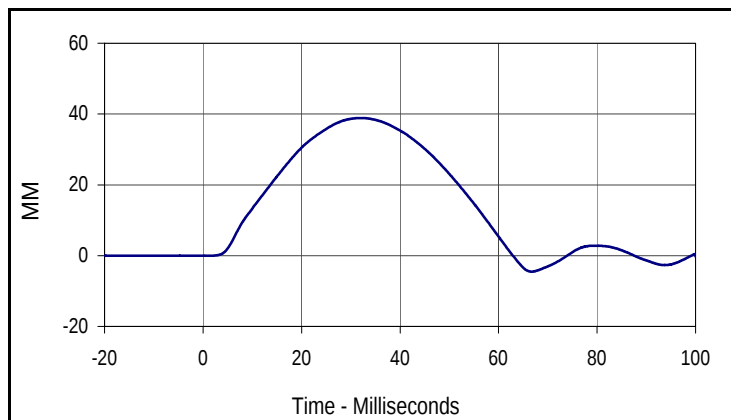
Curve Description			
Upper Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
50.4	30.1	-5.0	63.8

Test Program: ES2re Thorax - Rib Drop Test
 ATD Serial No.: F035 Rib # 2

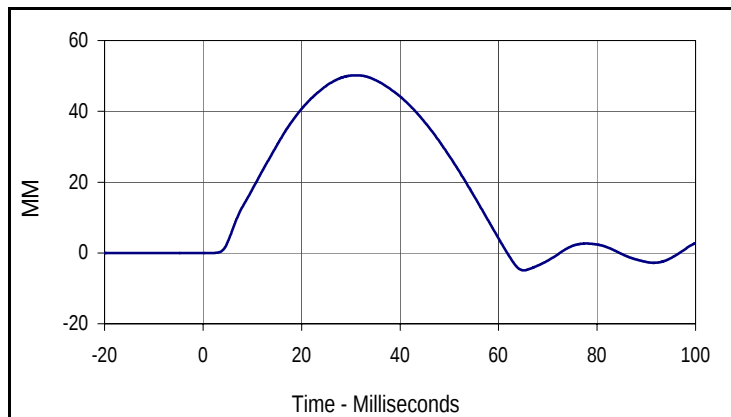
Test Date: 1/17/13
 Test I.D.: F035RB2044



Tested Parameter	Units	Specification	Result	Pass/Fail
Rib Module Soak Time	Minutes	≥240	490	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height	mm	36 to 40	38.9	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height	mm	46 to 51	50.2	Pass
Overall Test Results				Pass



Curve Description			
Middle Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
38.9	32.0	-4.5	66.7



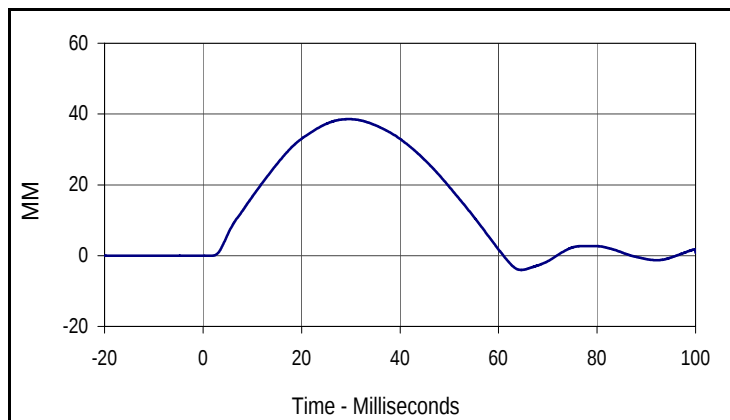
Curve Description			
Middle Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
50.2	31.1	-4.9	65.1

Test Program: ES2re Thorax - Rib Drop Test
 ATD Serial No.: F035 Rib # 3

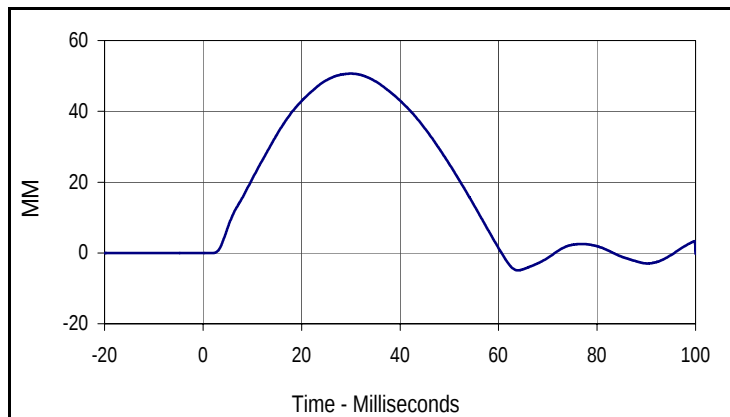
Test Date: 1/17/13
 Test I.D.: F035RB3044



Tested Parameter	Units	Specification	Result	Pass/Fail
Rib Module Soak Time	Minutes	≥240	505	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height	mm	36 to 40	38.6	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height	mm	46 to 51	50.7	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
38.6	29.6	-4.0	64.6



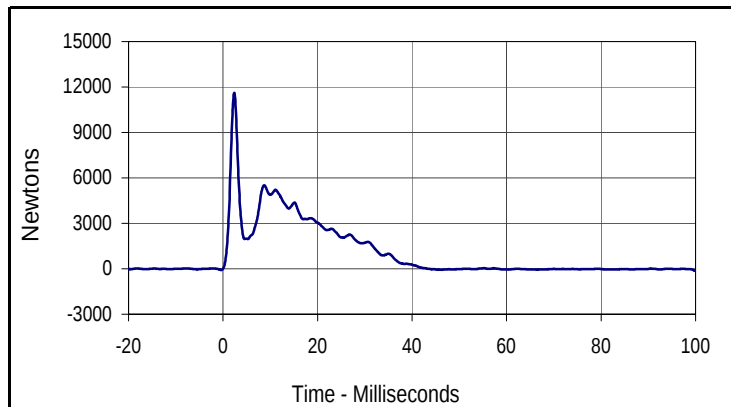
Curve Description			
Lower Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
50.7	30.0	-4.9	63.9

Test Program: ES2re Thorax - Full Body Impact Test
 ATD Serial No.: F035

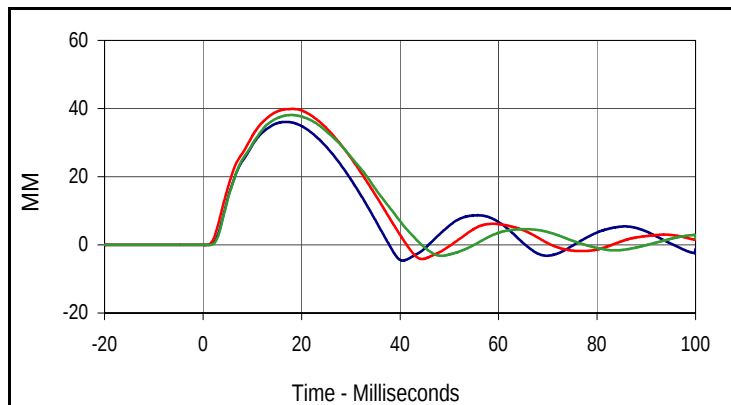
Test Date: 1/17/13
 Test I.D.: F035TH044



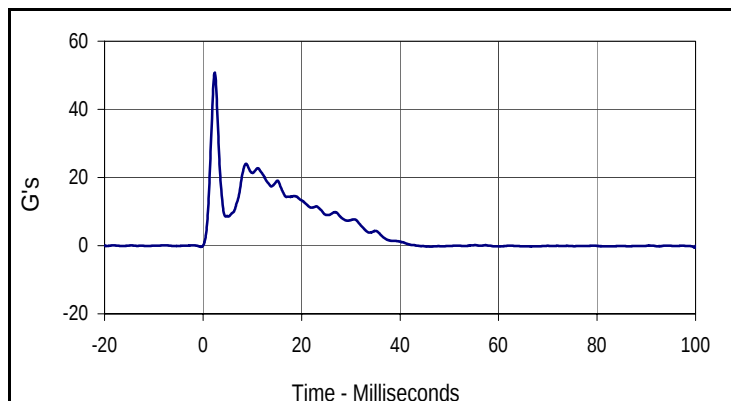
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	545	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.8	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.5	Pass
	Min	%		28.6	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.7	Pass
Peak Impactor Velocity		m/s	5.4 to 5.6	5.51	Pass
Peak Impactor Force	N		5100 to 6200	5505.6	Pass
	msec		> 6.0 msec	8.7	Pass
Peak Upper Rib Deflection		mm	34 to 41	36.1	Pass
Peak Middle Rib Deflection		mm	37 to 45	39.9	Pass
Peak Lower Rib Deflection		mm	37 to 44	38.1	Pass
Overall Test Results					Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
11628.9	2.4	-133.5	99.9



Curve Description			
Upper, Middle, Lower Rib Deflections			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max (Upper)	Time	Min (Upper)	Time
36.1	16.8	-4.6	40.6
Max (Middle)	Time	Min (Middle)	Time
39.9	18.3	-4.2	44.5
Max (Lower)	Time	Min (Lower)	Time
38.1	17.9	-3.2	48.4



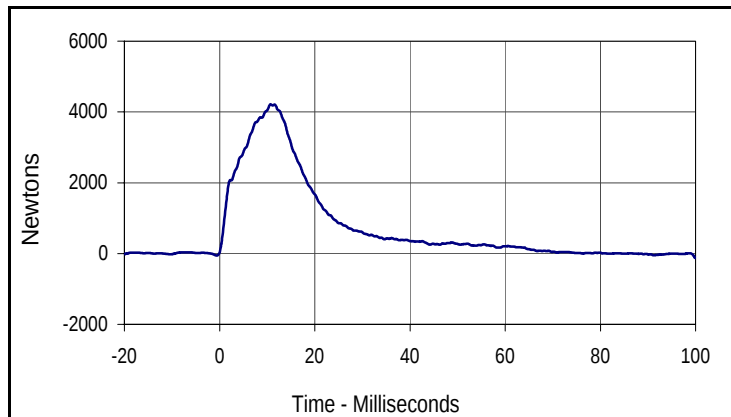
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
50.8	2.4	-0.6	99.9

Test Program: ES2re Abdomen Impact Test
 ATD Serial No.: F035

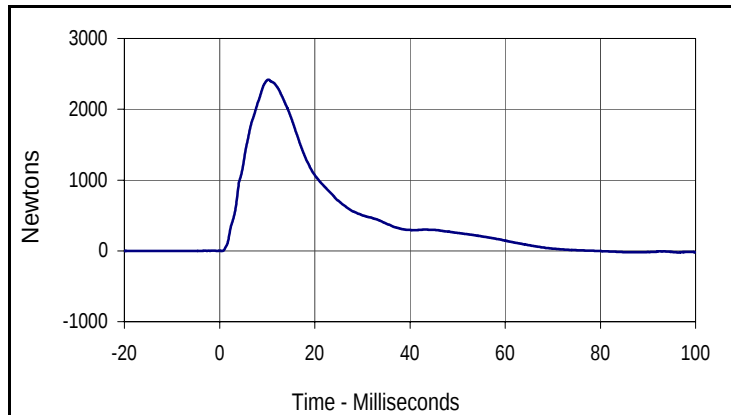
Test Date: 1/17/13
 Test I.D.: F035ABD044



Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	565	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Probe Velocity	m/s	3.9 to 4.1	3.92	Pass
Peak Impactor Force	N	4000 to 4800	4215.3	Pass
	msec	10.6 to 13.0	10.7	Pass
Sum of Abdominal Forces	N	2200 to 2700	2419.2	Pass
	msec	10.0 to 12.3	10.3	Pass
Overall Test Results				Pass



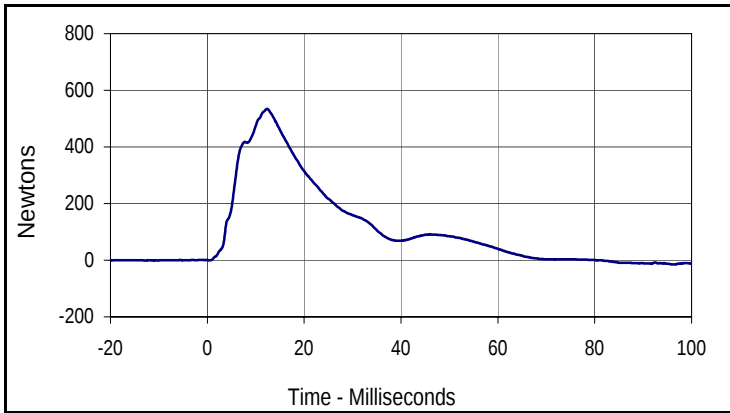
Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4215.3	10.7	-130.5	99.9



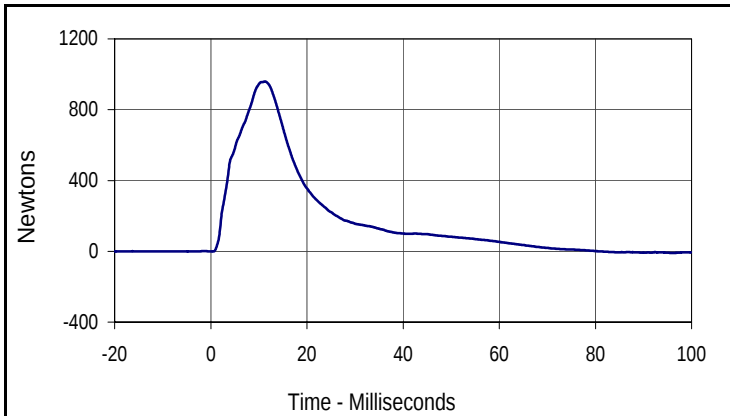
Curve Description			
Abdomen Sum Resultant			
Plot No.	Type	SAE Class	Units
002	RES	600	Newtons
Max	Time	Min	Time
2419.2	10.3	-22.3	96.4

Test Program: ES2re Abdomen Impact Test
 ATD Serial No.: F035

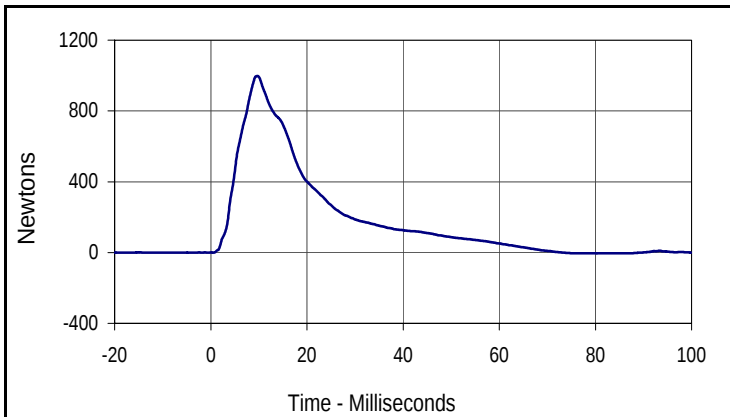
Test Date: 1/17/13
 Test I.D.: F035ABD044



Curve Description			
Front Abdomen Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
534.0	12.3	-14.7	96.5



Curve Description			
Middle Abdomen Force			
Plot No.	Type	SAE Class	Units
004	FIL	600	Newtons
Max	Time	Min	Time
959.9	11.3	-9.7	96.2



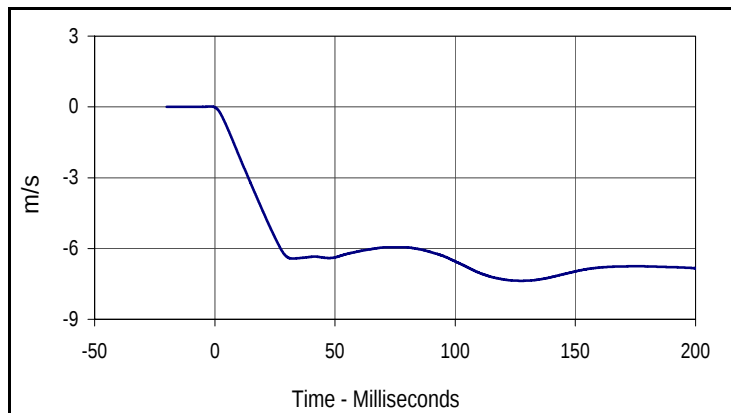
Curve Description			
Rear Abdomen Force			
Plot No.	Type	SAE Class	Units
005	FIL	600	Newtons
Max	Time	Min	Time
998.0	9.7	-4.9	82.7

Test Program: ES2re Lumbar Flexion Test
 ATD Serial No.: F035

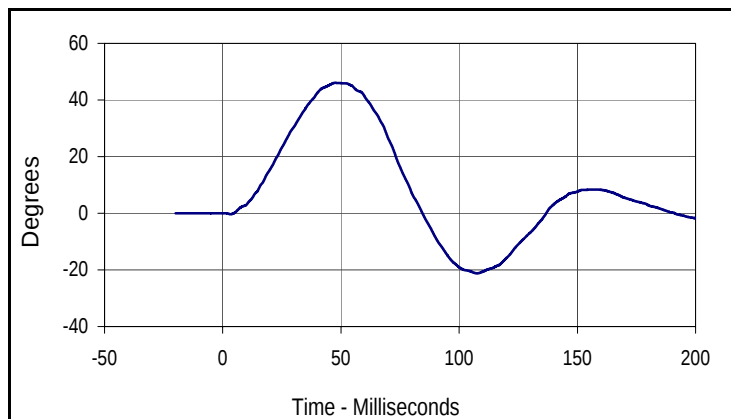
Test Date: 1/17/13
 Test I.D.: F035LB044



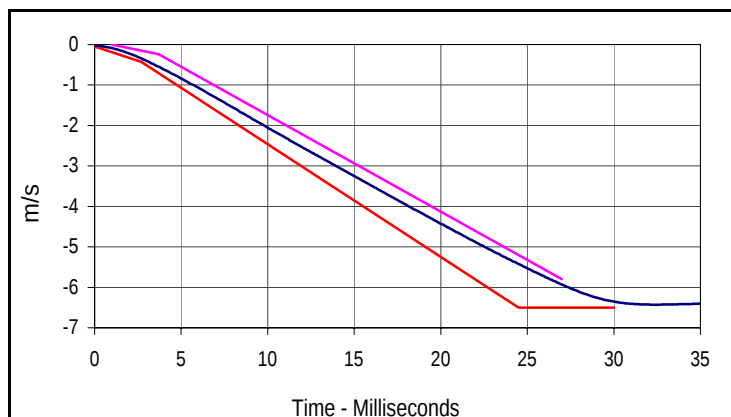
Tested Parameter	Units	Specification	Result	Pass/Fail
Lumbar Spine Assembly Soak Time	Minutes	≥240	620	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Pendulum Velocity	m/s	5.95 to 6.15	6.03	Pass
Headform Rotation	Max	45 to 55	46.1	Pass
	Time	39 to 53	48.2	Pass
Time of Decay to Zero Angle from Peak	msec	37 to 57	38.1	Pass
Overall Test Results				Pass



Curve Description			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.1	-7.4	128.2



Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
46.1	48.2	-21.2	108.2



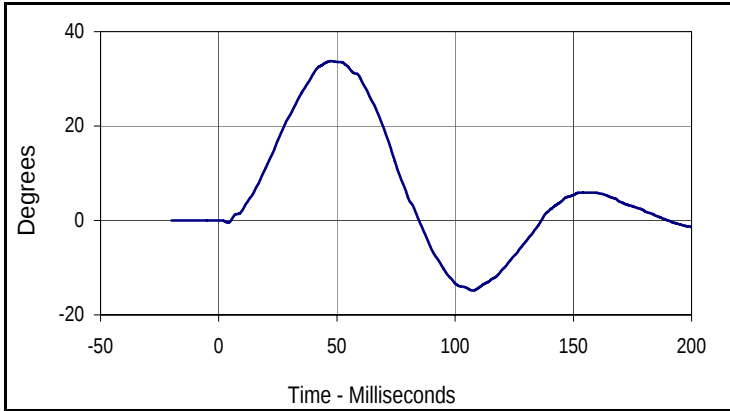
Curve Description			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.1	-7.4	128.2

Velocity Corridors

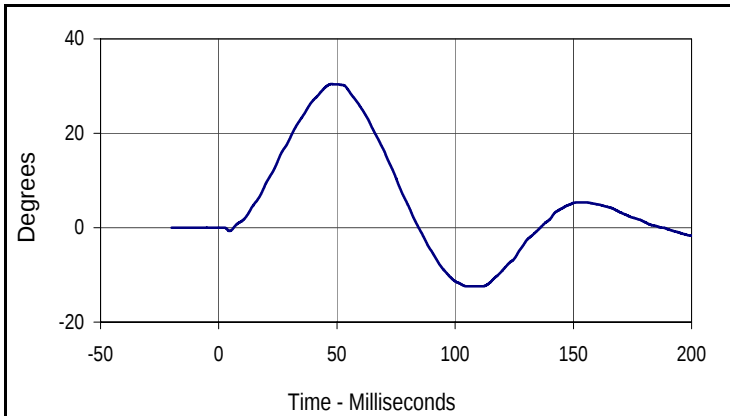
Upper Boundary		Lower Boundary	
Time (msec)	Velocity (m/s)	Time (msec)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.7	-0.24	2.7	-0.425
27.0	-5.80	24.5	-6.50
		30.0	-6.50

Test Program: ES2re Lumbar Flexion Test
 ATD Serial No.: F035

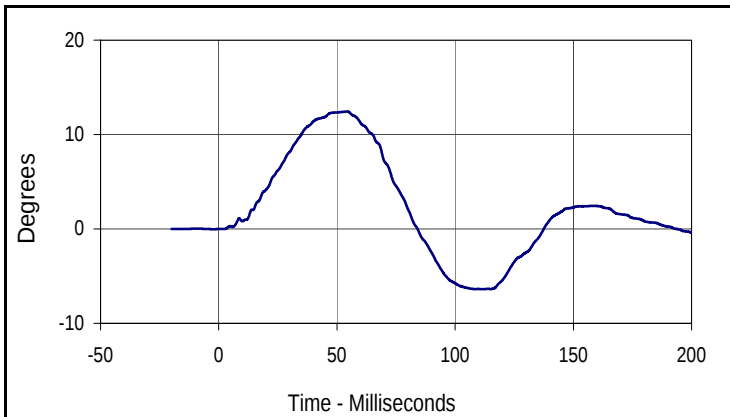
Test Date: 1/17/13
 Test I.D.: F035LB044



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
33.8	48.0	-14.8	108.1



Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
30.4	48.3	-12.4	108.9



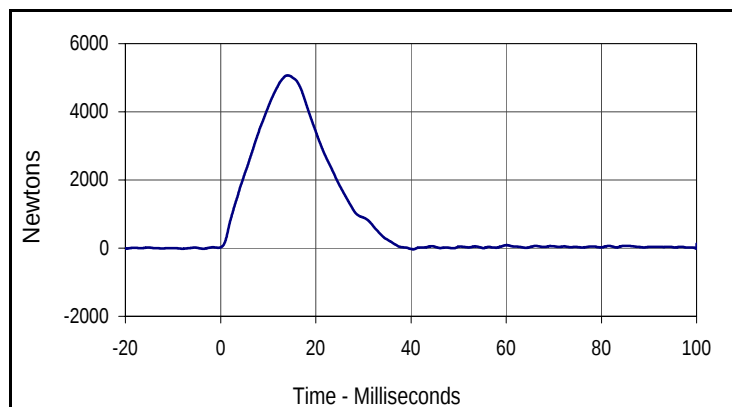
Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
12.4	54.9	-6.4	112.8

Test Program: ES2re Pelvis Impact Test
 ATD Serial No.: F035

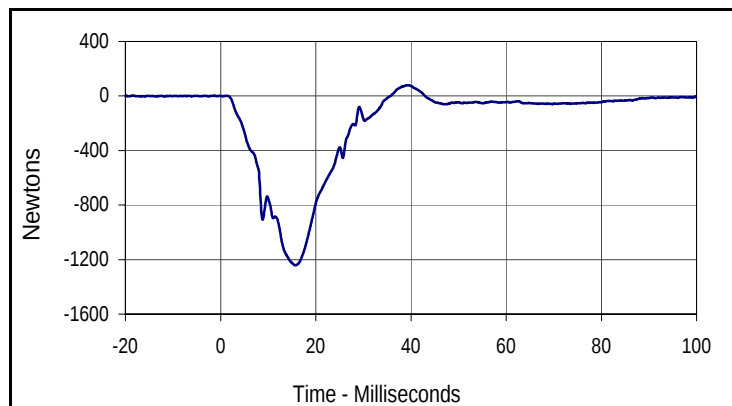
Test Date: 1/17/13
 Test I.D.: F035PL044



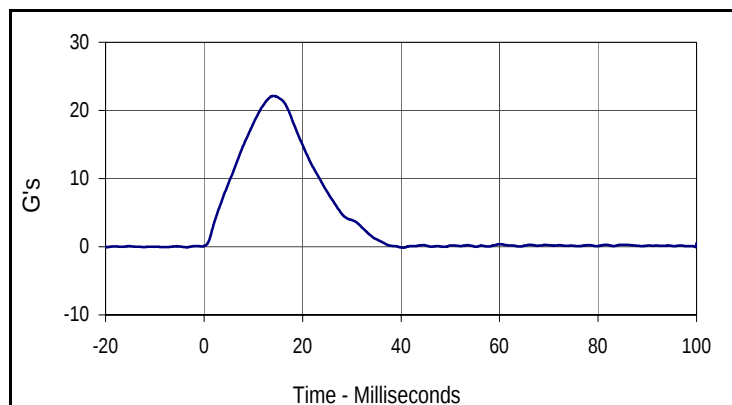
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	680	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Pendulum Velocity	m/s	4.2 to 4.4	4.30	Pass
Peak Impactor Force	N	4700 to 5400	5067.0	Pass
	msec	11.8 to 16.1	14.1	Pass
Peak Pubic Symphysis Load	N	-1230 to -1590	-1241.7	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
5067.0	14.1	-32.9	40.5



Curve Description			
Pubic Symphysis Force Y			
Plot No.	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
78.7	39.4	-1241.7	15.7



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
22.1	14.1	-0.1	40.5

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

Test Date: 1/18/13
 Test I.D.: N/A



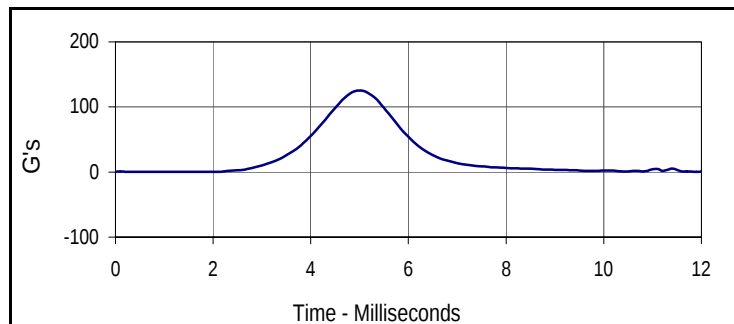
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
A	Sitting Height	mm	772 - 788	778	Pass
B	Shoulder Pivot Height	mm	437 - 453	443	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	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

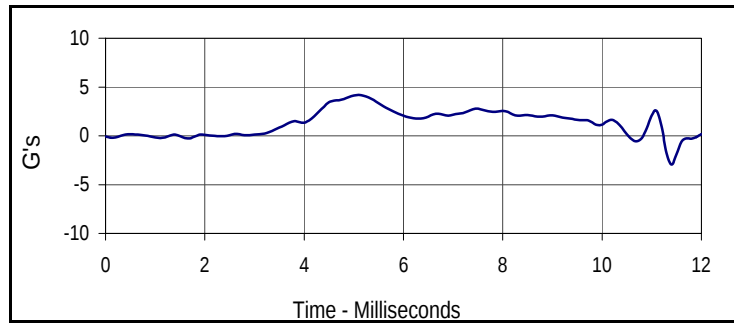
Test Date: 1/18/13
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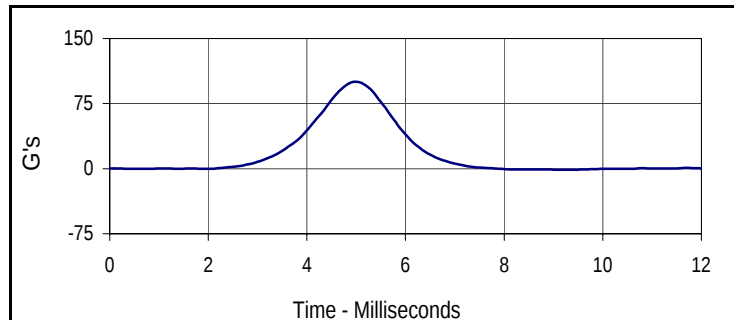
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	300	Pass
Temperature During Soak	Max	18.9 to 25.6	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.6	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.6	Pass
Peak Head Resultant Acceleration	G's	115 to 137	125.4	Pass
Peak Head X Acceleration	G's	<15	4.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	4.4	Pass
Overall Test Results				Pass



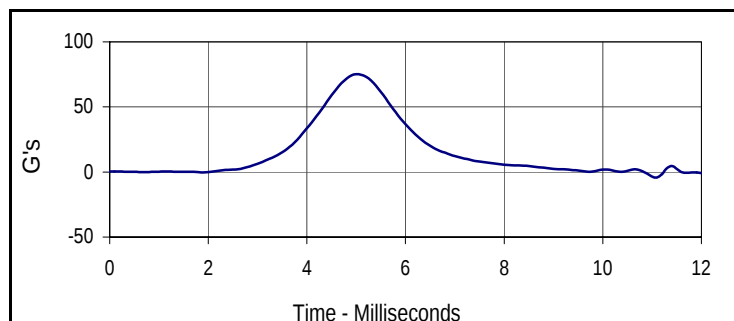
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
125.4	5.0	0.1	1.8



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
4.2	5.1	-0.3	1.7



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
100.3	5.0	-1.3	9.1



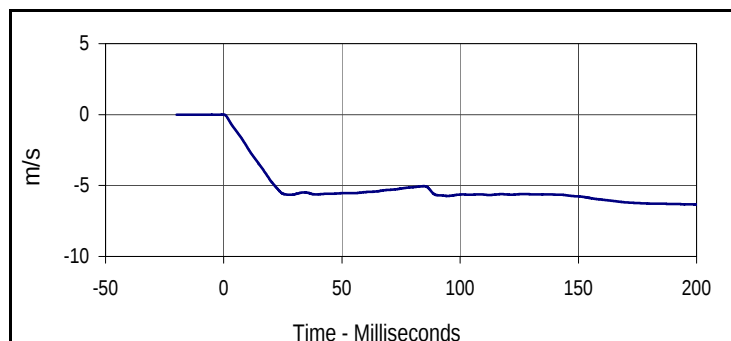
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
75.1	5.0	-4.2	11.1

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

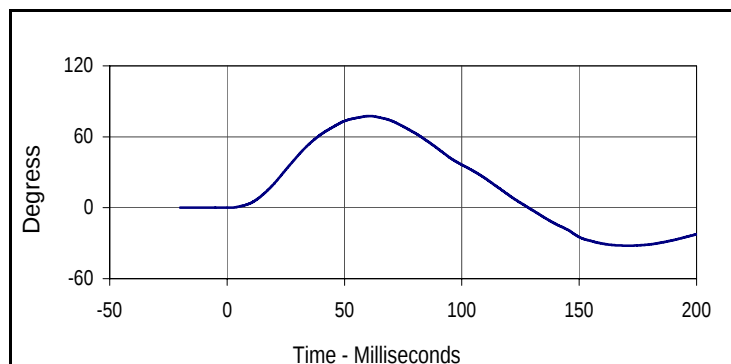
Test Date: 1/18/13
 Test I.D.: 307NB051



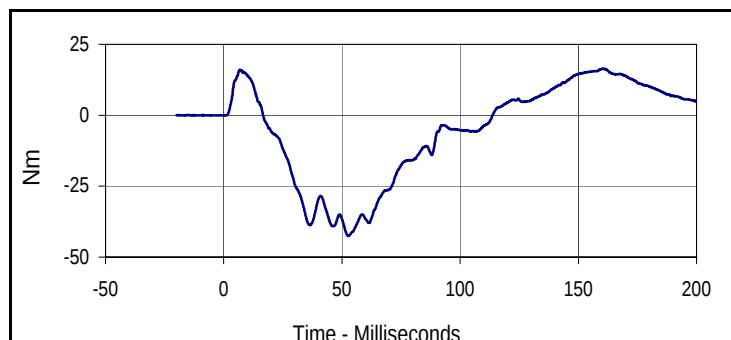
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	355	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.6	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.6	Pass
Pendulum Velocity	m/s	5.51 to 5.63	5.58	Pass
Pendulum Deceleration	10 msec	-2.20 to -2.80	-2.32	Pass
	15 msec	-3.30 to -4.10	-3.50	Pass
	20 msec	-4.40 to -5.40	-4.69	Pass
	25 msec	-5.40 to -6.10	-5.58	Pass
	25-100 msec	-5.50 to -6.20	-5.73	Pass
D-Plane Rotation	Max	71 to 81	77.6	Pass
	Time	50 to 70	60.6	Pass
Peak Occipital Condyle Moment	Nm	-36 to -44	-42.6	Pass
Decaying Moment Time to Cross 0 Nm	msec	102 to 126	113.7	Pass
Overall Test Results			Pass	



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.4	-6.3	200.0



Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
77.6	60.6	-32.1	171.0



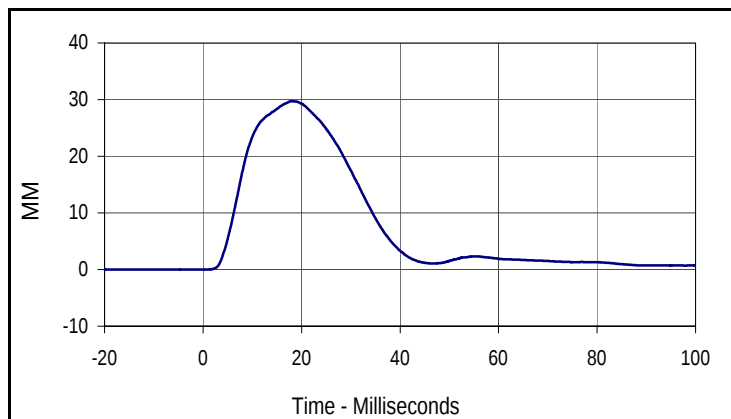
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
16.4	160.4	-42.6	52.5

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

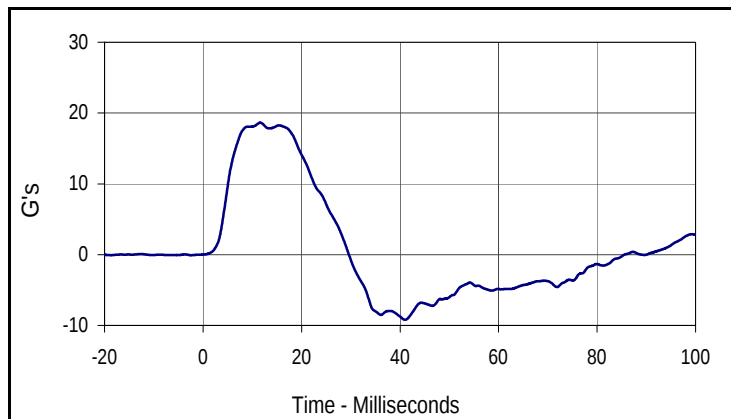
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 Test I.D.: 307SH051



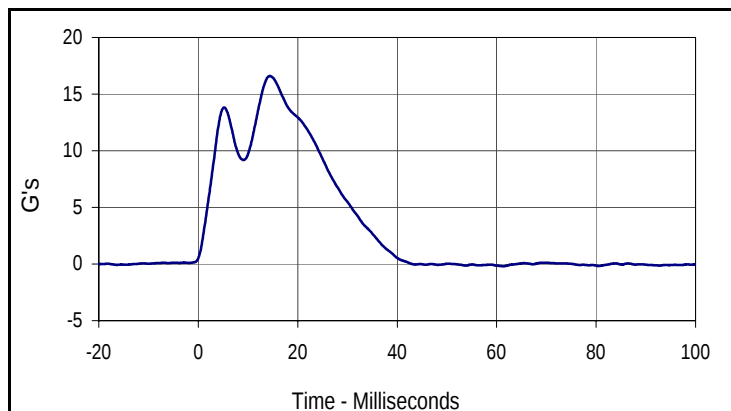
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	390	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.8	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.6	Pass
	Min	%		28.6	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.6	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.31	Pass
Peak Shoulder Deflection		mm	28 to 37	29.7	Pass
Peak Lateral Spine Acceleration Y		G's	17 to 22	18.6	Pass
Peak Impactor Acceleration		G's	13 to 18	16.6	Pass
Overall Test Results				Pass	



Curve Description			
Shoulder Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
29.7	18.0	0.0	-16.5



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.6	11.6	-9.2	41.0



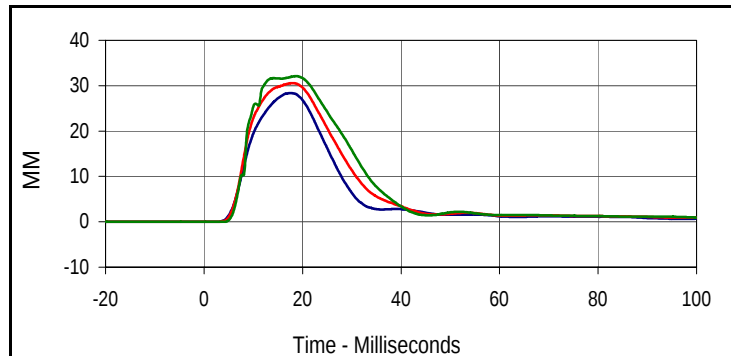
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
16.6	14.4	-0.2	61.3

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

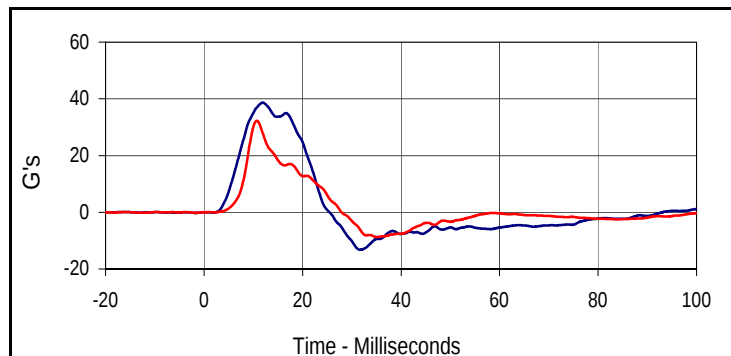
Test Date: 1/18/13
 Test I.D.: 307TWA051



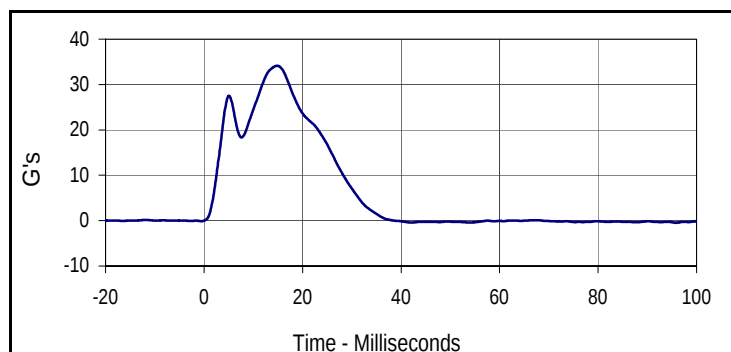
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	410	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.6	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.6	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.70	Pass
Peak Shoulder Deflection	mm	31 to 40	36.2	Pass
Peak Upper Thorax Rib Deflection	mm	25 to 32	28.3	Pass
Peak Middle Thorax Rib Deflection	mm	30 to 36	30.5	Pass
Peak Lower Thorax Rib Deflection	mm	32 to 38	32.1	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	38.7	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	32.3	Pass
Peak Impactor Acceleration	G's	30 to 36	34.1	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
28.3	17.6	0.0	0.1
Middle Thorax Deflection			
Max	Time	Min	Time
30.5	17.9	0.0	0.9
Lower Thorax Deflection			
Max	Time	Min	Time
32.1	18.7	0.0	3.8



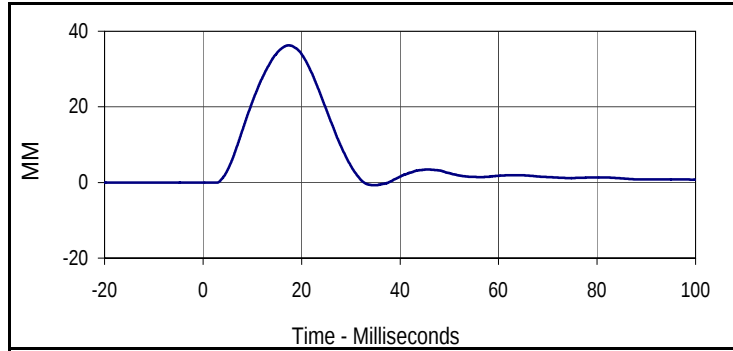
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
38.7	11.9	-13.2	31.7
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
32.3	10.7	-8.8	35.1



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
34.1	14.9	-0.5	95.8

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

Test Date: 1/18/13
 Test I.D.: 307TWA051



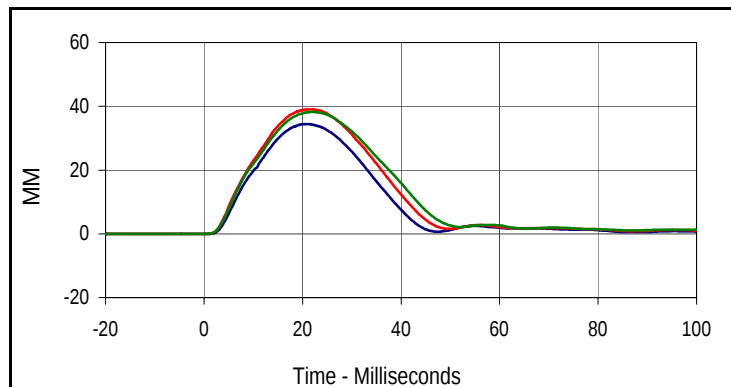
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
36.2	17.5	-0.7	34.8

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

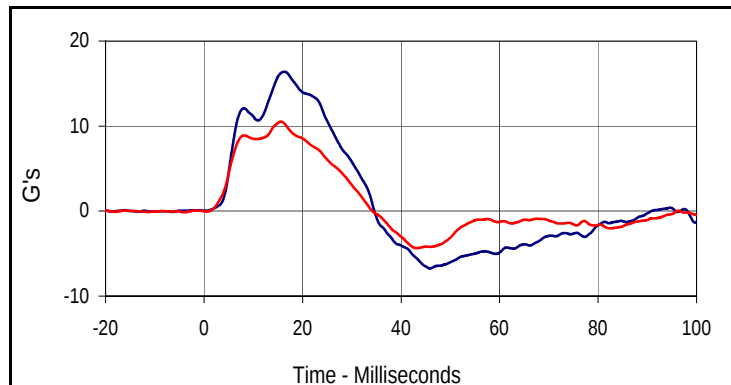
Test Date: 1/18/13
 Test I.D.: 307TWOA051



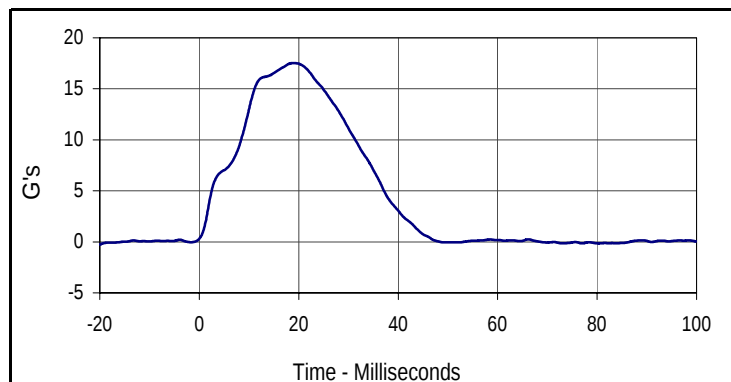
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	435	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.8	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.6	Pass
	Min	%		28.6	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.7	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.33	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	34.4	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	39.0	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	38.3	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	16.4	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	10.5	Pass
Peak Impactor Acceleration		G's	14 to 18	17.5	Pass
Overall Test Results				Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
34.4	20.6	0.0	-18.2
Middle Thorax Deflection			
Max	Time	Min	Time
39.0	21.6	0.0	-17.7
Lower Thorax Deflection			
Max	Time	Min	Time
38.3	22.0	0.0	-18.0



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
16.4	16.3	-6.7	45.9
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
10.5	15.7	-4.4	43.1



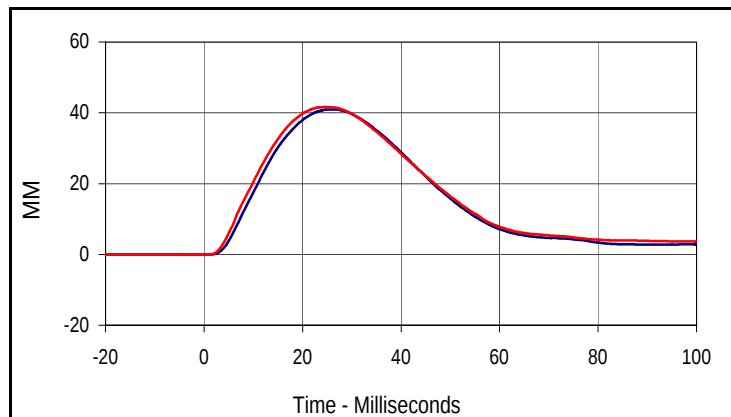
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
17.5	18.9	-0.2	-20.0

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

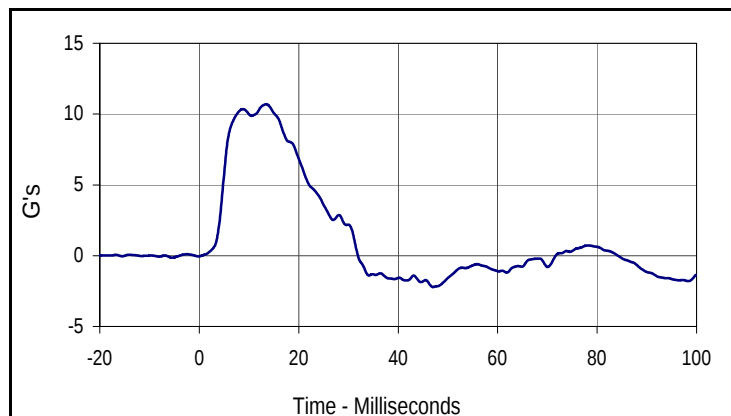
Test Date: 1/18/13
 Test I.D.: 307ABD051



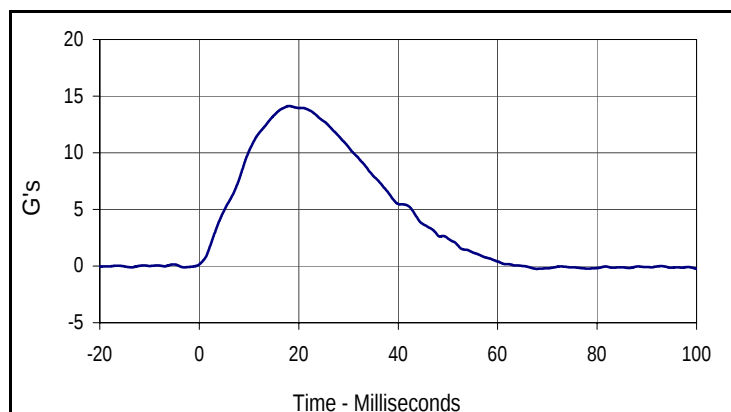
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	455	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.6	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.30	Pass
Peak Upper Abdominal Rib Deflection	mm	36 to 47	41.0	Pass
Peak Lower Abdominal Rib Deflection	mm	33 to 44	41.6	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	10.7	Pass
Peak Impactor Acceleration	G's	12 to 16	14.1	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
41.0	25.9	0.0	-17.1
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
41.6	24.7	0.0	-17.1



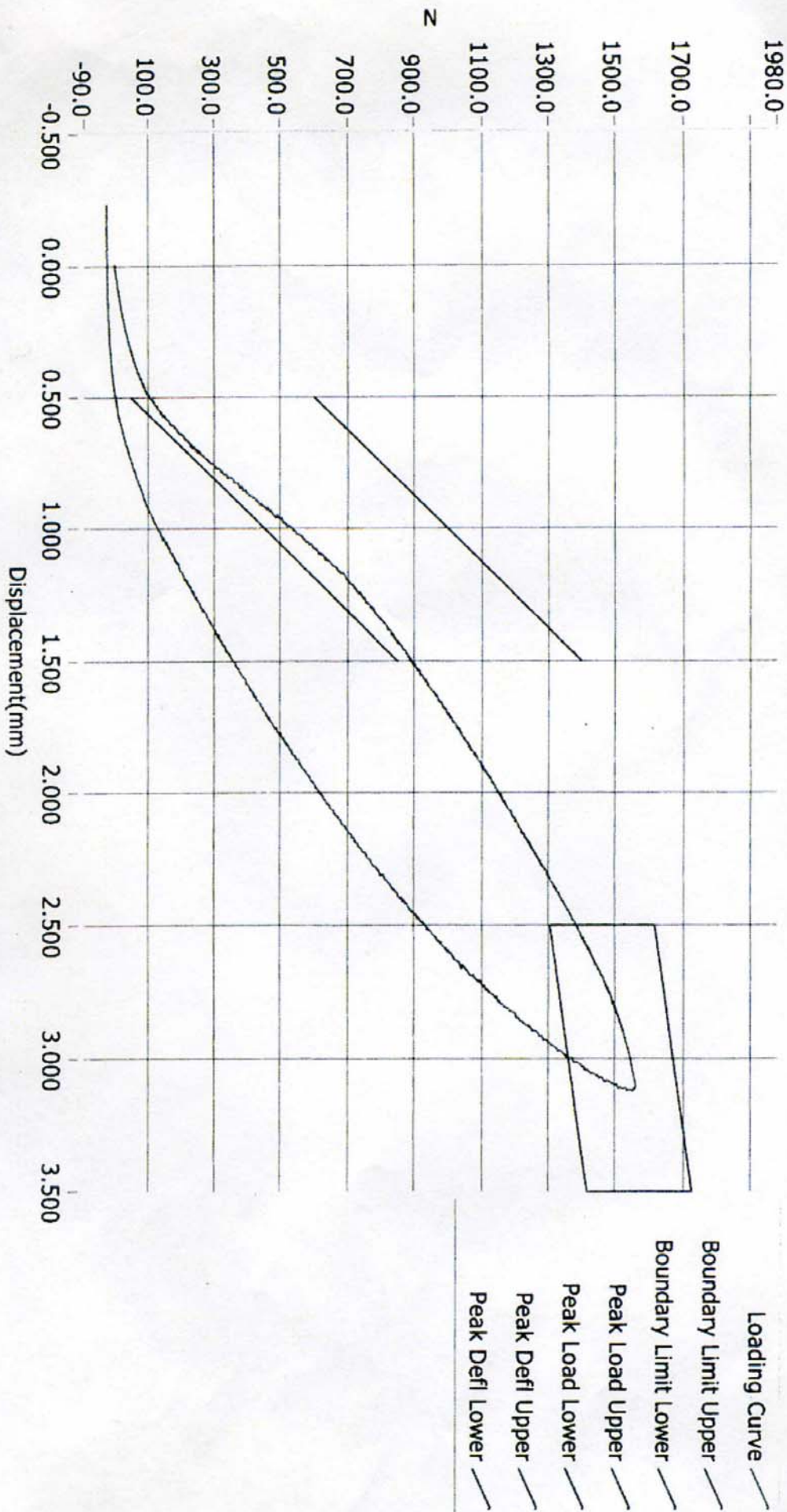
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
10.7	13.5	-2.2	47.0



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.1	18.1	-0.2	67.9

MD5111 PRE TEST

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

49078

12/7/2011

9:15 PM

Cert ID

ATD Serial Number

ATD Type

N/A

SIDIIs

Current Date : 12/7/2011

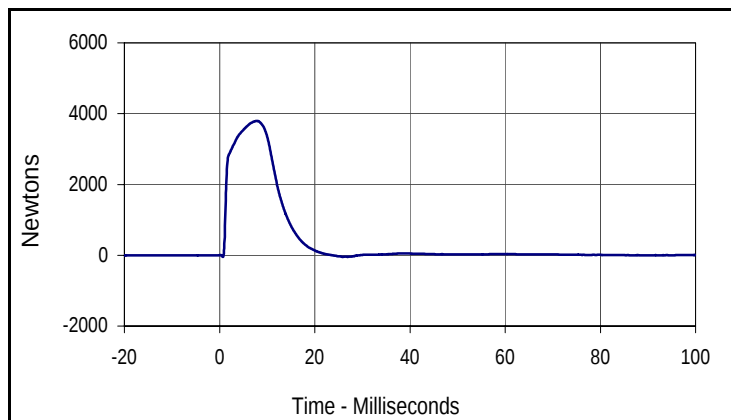
Current Time : 21:16:12

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

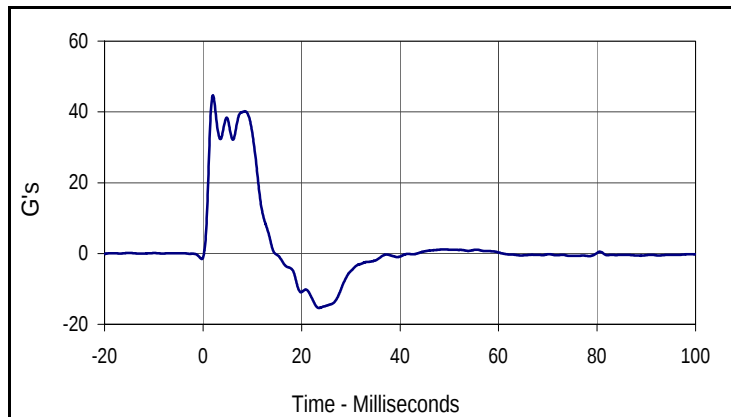
Test Date: 1/18/13
 Test I.D.: 307ACET051



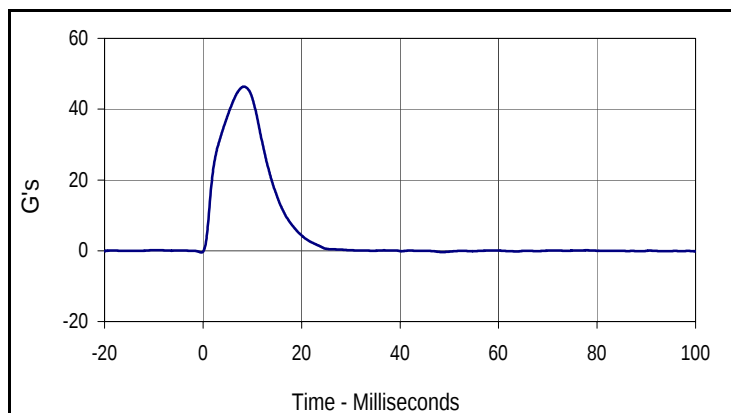
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	490	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.6	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.6	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.65	Pass
Peak Acetabulum Force Y	Newtons	3600 to 4300	3795.4	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	40.2	Pass
Peak Impactor Acceleration	G's	38 to 47	46.3	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3795.4	7.8	-49.9	0.7



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
44.7	2.0	-15.4	23.5



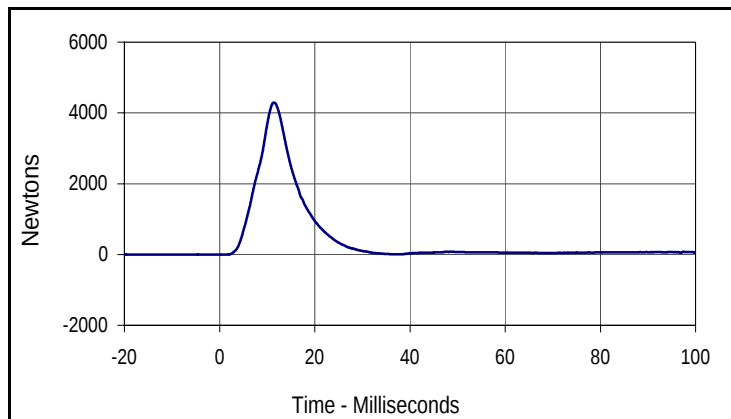
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
46.3	8.4	-0.5	-0.3

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

Test Date: 1/18/13
 Test I.D.: 307PL051



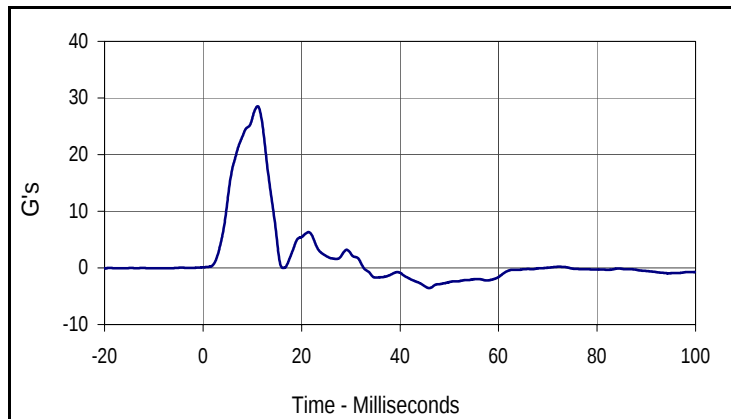
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	545	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.6	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.6	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.23	Pass
Peak Iliac Force	Newtons	4100 to 5100	4294.4	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	28.6	Pass
Peak Impactor Acceleration	G's	36 to 45	38.4	Pass
Overall Test Results			Pass	



Curve Description

Pelvis Iliac Force

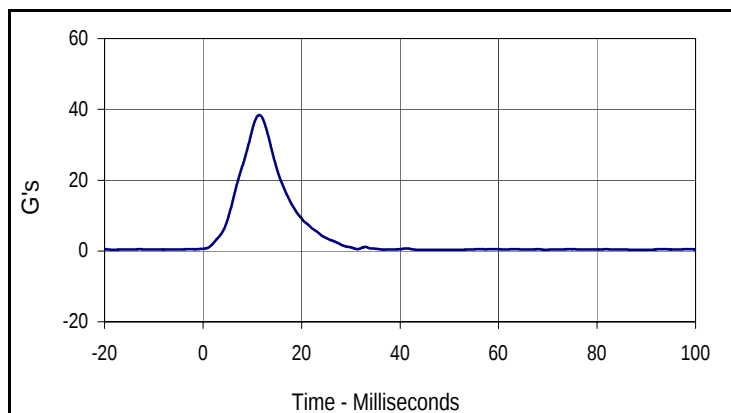
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4294.4	11.4	-3.2	-10.5



Curve Description

Pelvis Y Acceleration

Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
28.6	11.1	-3.6	45.9



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
38.4	11.4	0.1	0.0

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

Test Program: ES2re External Measurements
 ATD Serial No.: F035

Test Date: 2/21/13
 Test I.D.: N/A



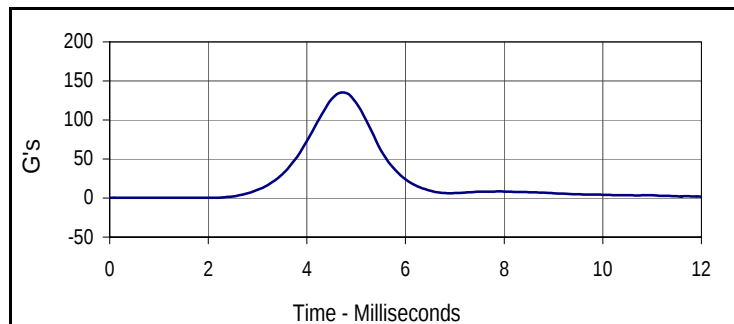
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	30.3	Pass
1	Sitting Height	mm	900 - 918	907	Pass
2	Seat to Shoulder Joint	mm	558 - 572	564	Pass
3	Seat to Lower Face of Thoracic Spine Box	mm	346 - 356	350	Pass
4	Seat to Hip Joint (Center of Bolt)	mm	97 - 103	100	Pass
5	Sole to Seat, Sitting	mm	333 - 451	389	Pass
6	Head Width	mm	152 - 158	155	Pass
7	Shoulder / Arm Width	mm	461 - 479	470	Pass
8	Thorax Width	mm	322 - 332	324	Pass
9	Abdomen Width	mm	273 - 287	280	Pass
10	Pelvis Lap Width	mm	359 - 373	365	Pass
11	Head Depth	mm	196 - 206	202	Pass
12	Thorax Depth	mm	262 - 272	269	Pass
13	Abdomen Width	mm	194 - 204	198	Pass
14	Pelvis Depth	mm	235 - 245	239	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	611	Pass
Overall Test Results					Pass

Test Program: ES2re Head Drop Test
 ATD Serial No.: F035

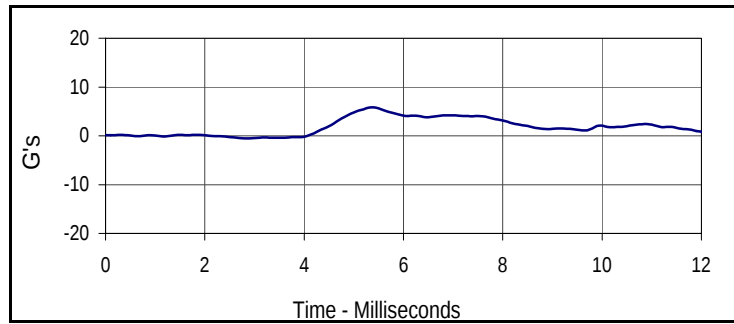
Test Date: 2/21/13
 Test I.D.: F035HD045



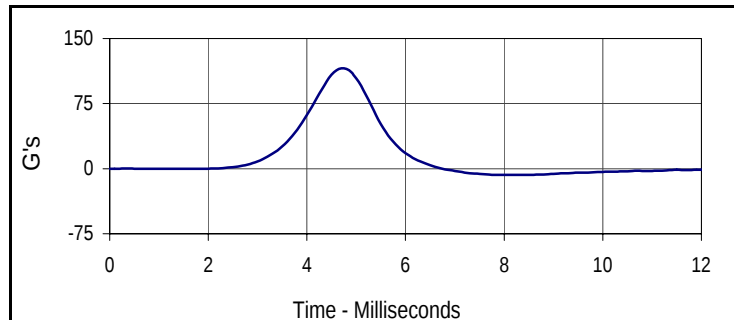
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	325	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Peak Head Resultant Acceleration	G's	125 to 155	135.4	Pass
Peak Head X Acceleration	G's	≤15	5.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	6.2	Pass
Overall Test Results				Pass



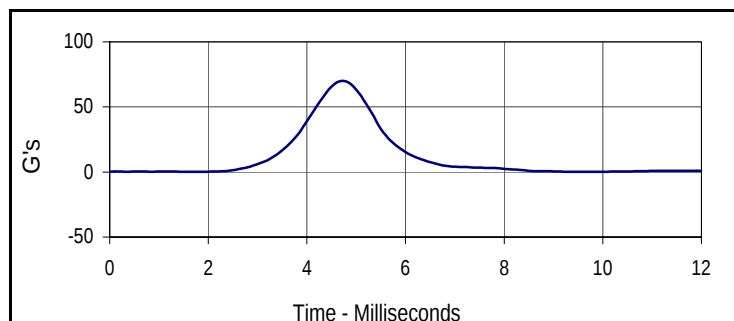
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
135.4	4.7	0.2	1.7



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.8	5.4	-0.5	2.9



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
115.8	4.7	-7.3	8.4



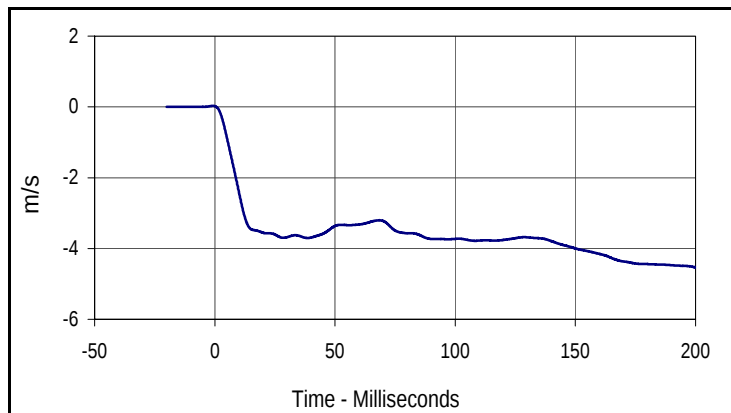
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
70.1	4.7	0.0	9.6

Test Program: ES2re Neck Flexion Test
 ATD Serial No.: F035

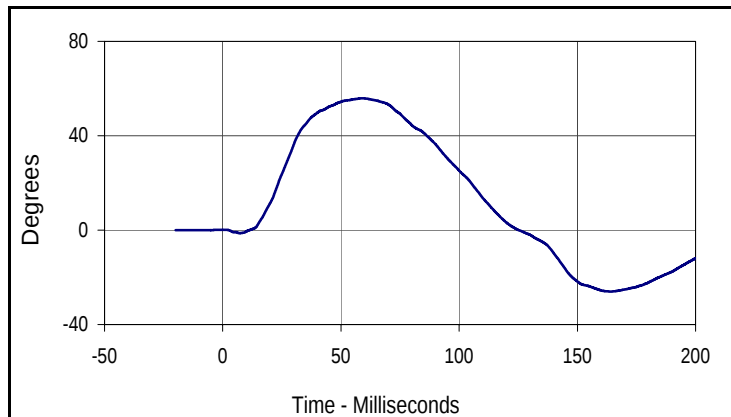
Test Date: 2/21/13
 Test I.D.: F035NB045



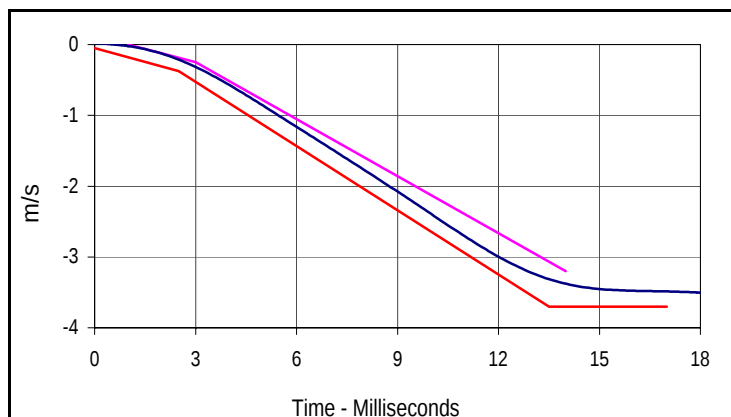
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	365	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Pendulum Velocity	m/s	3.3 to 3.5	3.45	Pass
Headform Flexion	Max	49 to 59	55.9	Pass
	Time	54 to 66	58.6	Pass
Headform Flexion Decay (Peak to Zero)	msec	53 to 88	66.6	Pass
Overall Test Results				Pass



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-0.8	-4.5	200.0



Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
55.9	58.6	-26.0	164.0



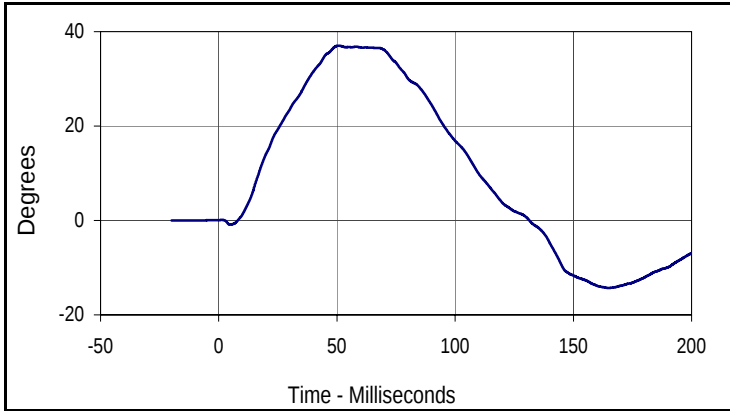
Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-0.8	-4.5	200.0

Velocity Corridors

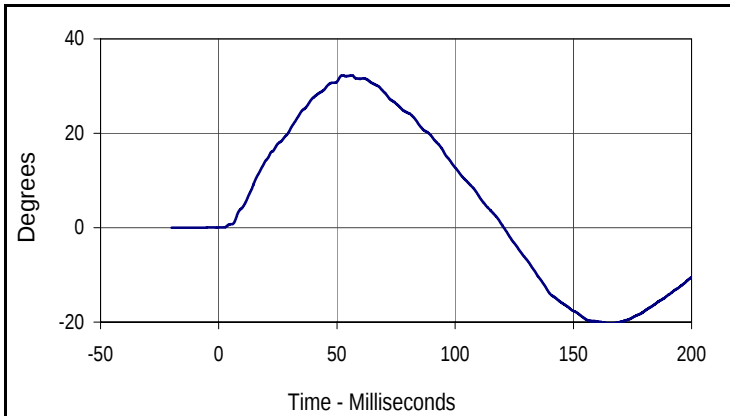
Upper Boundary		Lower Boundary	
Time (msec)	Velocity (m/s)	Time (msec)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.0	-0.03	2.5	-0.375
14.0	-3.20	13.5	-3.70
		17.0	-3.70

Test Program: ES2re Neck Flexion Test
 ATD Serial No.: F035

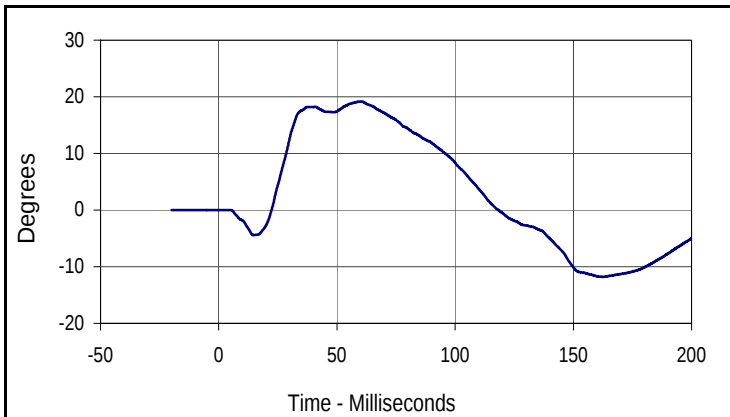
Test Date: 2/21/13
 Test I.D.: F035NB045



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
37.0	50.7	-14.3	164.9



Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
32.3	56.3	-20.3	165.1



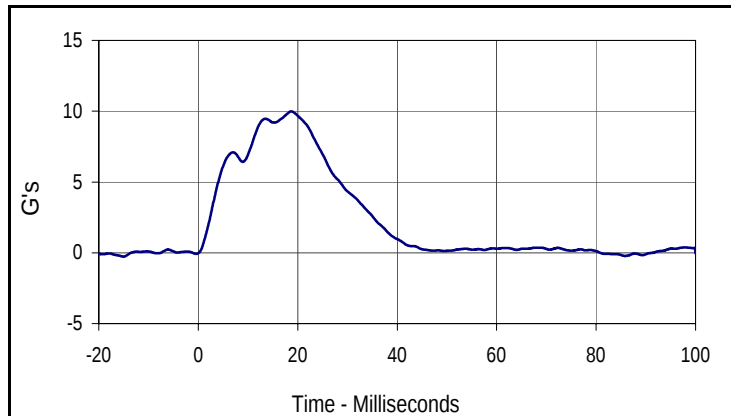
Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
19.2	59.9	-11.8	162.5

Test Program: ES2re Shoulder Impact Test
 ATD Serial No.: F035

Test Date: 2/21/13
 Test I.D.: F035SH045



Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	400	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Pendulum Speed	m/s	4.2 to 4.4	4.31	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	10.0	Pass
Overall Test Results				Pass



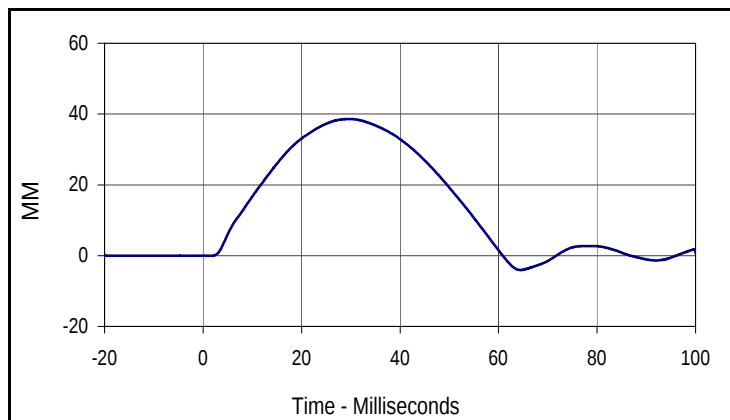
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
10.0	18.7	-0.3	-15.0

Test Program: ES2re Thorax - Rib Drop Test
 ATD Serial No.: F035 Rib # 1

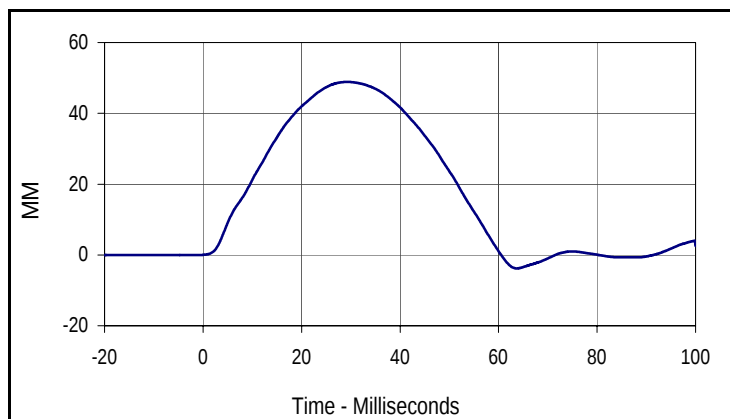
Test Date: 2/21/13
 Test I.D.: F035RB1045



Tested Parameter	Units	Specification	Result	Pass/Fail
Rib Module Soak Time	Minutes	≥240	425	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height	mm	36 to 40	38.6	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height	mm	46 to 51	48.9	Pass
Overall Test Results				Pass



Curve Description			
Upper Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
38.6	29.7	-4.1	64.4



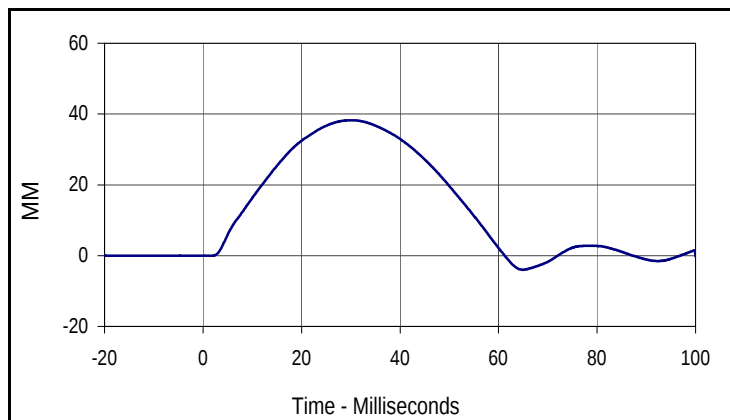
Curve Description			
Upper Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
48.9	29.3	-3.8	63.7

Test Program: ES2re Thorax - Rib Drop Test
 ATD Serial No.: F035 Rib # 2

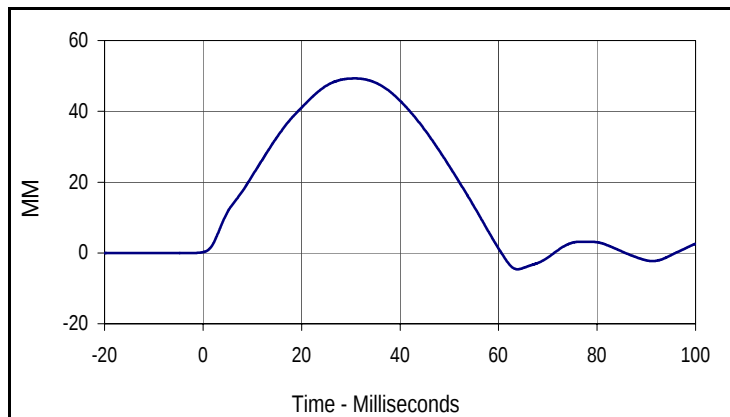
Test Date: 2/21/13
 Test I.D.: F035RB2045



Tested Parameter	Units	Specification	Result	Pass/Fail
Rib Module Soak Time	Minutes	≥240	440	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.6	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	49.3	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	30.2	-4.0	64.9



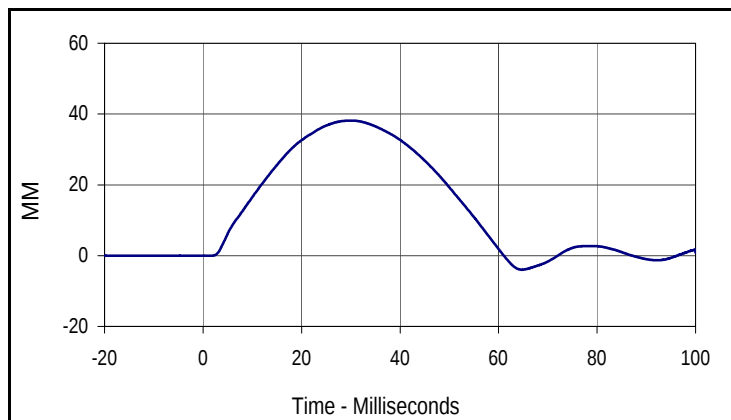
Curve Description			
Middle Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
49.3	30.8	-4.6	63.9

Test Program: ES2re Thorax - Rib Drop Test
 ATD Serial No.: F035 Rib # 3

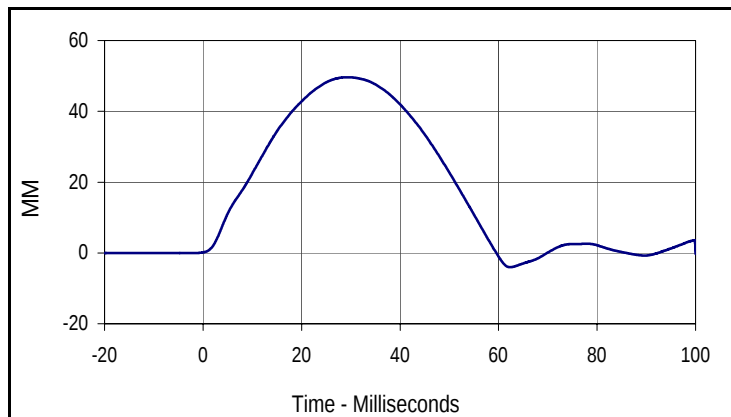
Test Date: 2/21/13
 Test I.D.: F035RB3045



Tested Parameter	Units	Specification	Result	Pass/Fail
Rib Module Soak Time	Minutes	≥240	455	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.6	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	49.6	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
38.1	30.1	-4.0	64.7



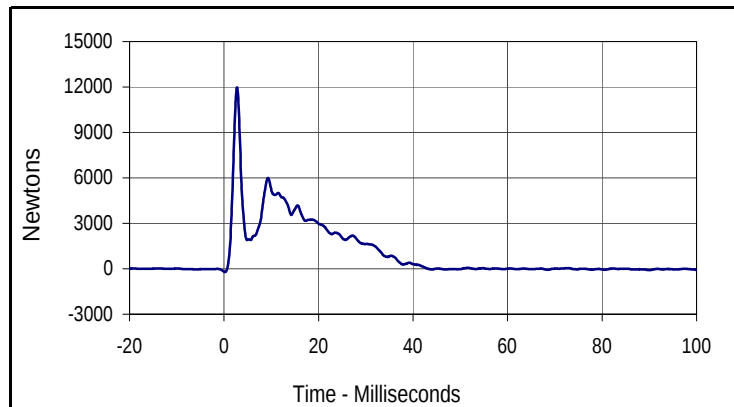
Curve Description			
Lower Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
49.6	29.4	-4.0	62.4

Test Program: ES2re Thorax - Full Body Impact Test
 ATD Serial No.: F035

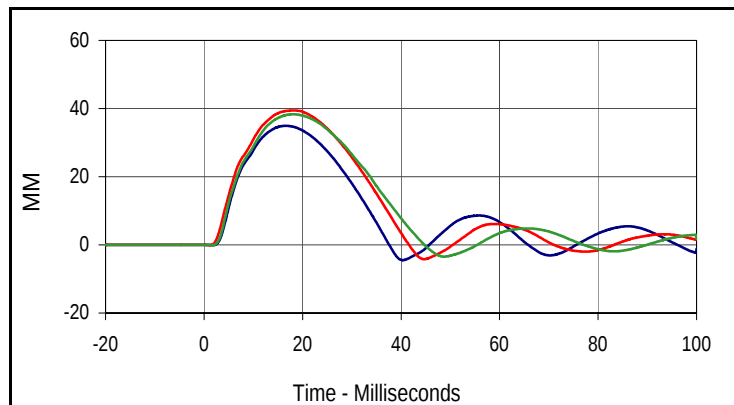
Test Date: 2/21/13
 Test I.D.: F035TH045



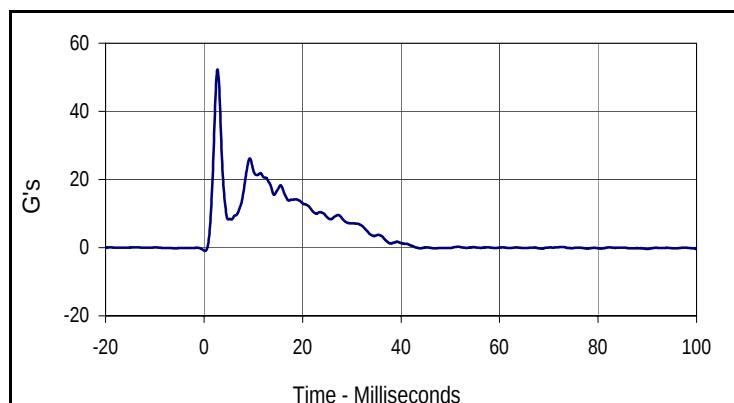
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	495	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Peak Impactor Velocity	m/s	5.4 to 5.6	5.59	Pass
Peak Impactor Force	N	5100 to 6200	5992.5	Pass
	msec	> 6.0 msec	9.3	Pass
Peak Upper Rib Deflection	mm	34 to 41	34.9	Pass
Peak Middle Rib Deflection	mm	37 to 45	39.4	Pass
Peak Lower Rib Deflection	mm	37 to 44	38.3	Pass
Overall Test Results				Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
11960.6	2.7	-212.7	0.2



Curve Description			
Upper, Middle, Lower Rib Deflections			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max (Upper)	Time	Min (Upper)	Time
34.9	16.6	-4.5	40.3
Max (Middle)	Time	Min (Middle)	Time
39.4	18.3	-4.2	44.7
Max (Lower)	Time	Min (Lower)	Time
38.3	18.1	-3.5	48.8



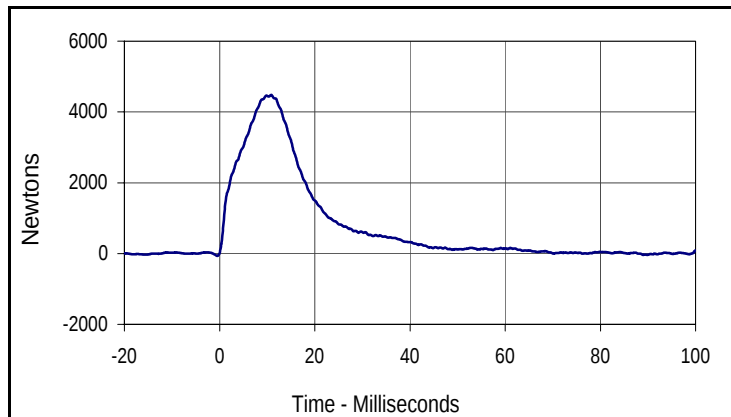
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
52.2	2.7	-0.9	0.2

Test Program: ES2re Abdomen Impact Test
 ATD Serial No.: F035

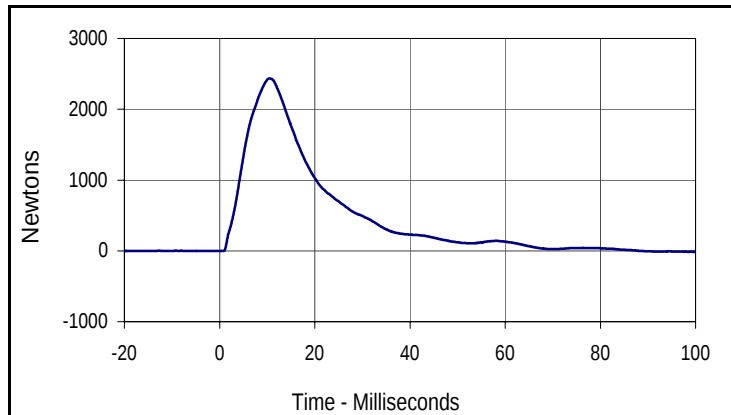
Test Date: 2/21/13
 Test I.D.: F035ABD045



Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	515	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Probe Velocity	m/s	3.9 to 4.1	3.95	Pass
Peak Impactor Force	N	4000 to 4800	4481.7	Pass
	msec	10.6 to 13.0	10.8	Pass
Sum of Abdominal Forces	N	2200 to 2700	2436.9	Pass
	msec	10.0 to 12.3	10.5	Pass
Overall Test Results				Pass



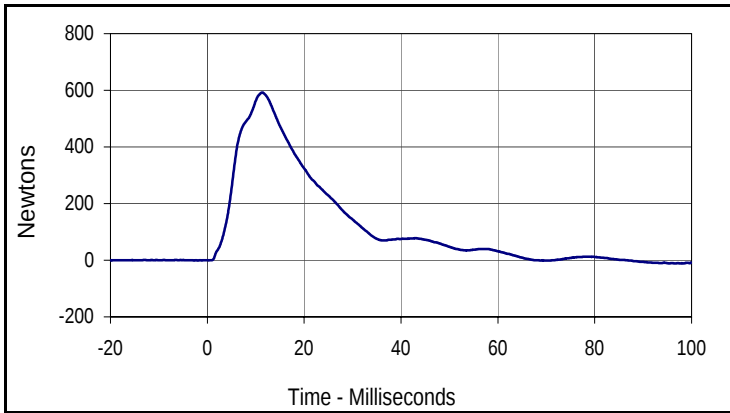
Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4481.7	10.8	-63.2	-0.5



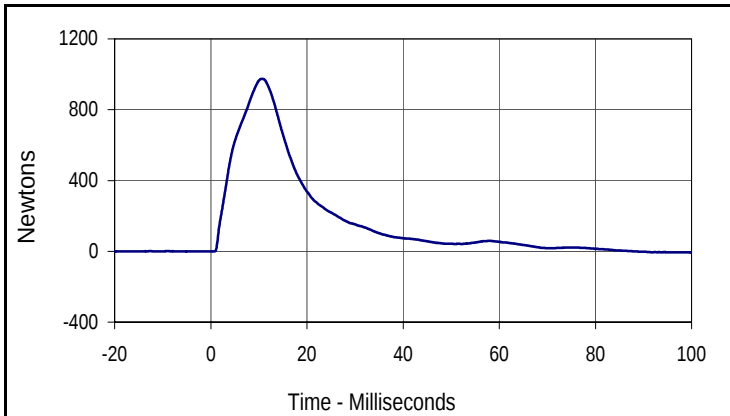
Curve Description			
Abdomen Sum Resultant			
Plot No.	Type	SAE Class	Units
002	RES	600	Newtons
Max	Time	Min	Time
2436.9	10.5	-14.3	98.5

Test Program: ES2re Abdomen Impact Test
 ATD Serial No.: F035

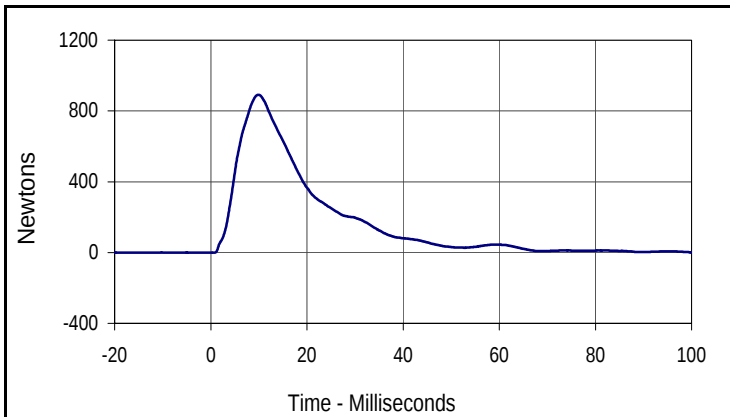
Test Date: 2/21/13
 Test I.D.: F035ABD045



Curve Description			
Front Abdomen Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
592.6	11.3	-11.3	96.6



Curve Description			
Middle Abdomen Force			
Plot No.	Type	SAE Class	Units
004	FIL	600	Newtons
Max	Time	Min	Time
974.9	10.7	-6.4	98.6



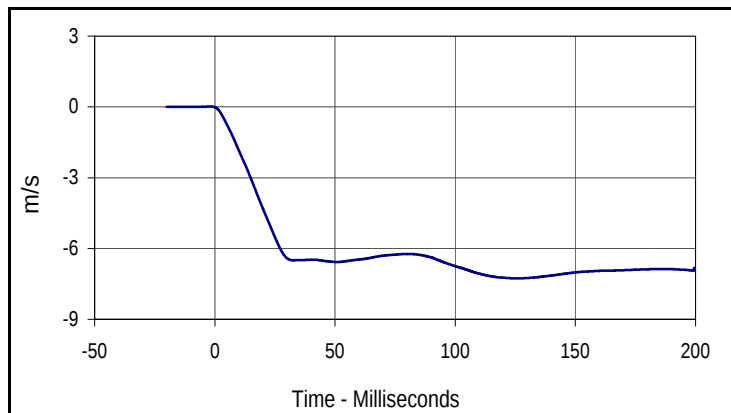
Curve Description			
Rear Abdomen Force			
Plot No.	Type	SAE Class	Units
005	FIL	600	Newtons
Max	Time	Min	Time
891.3	9.9	-0.8	-18.3

Test Program: ES2re Lumbar Flexion Test
 ATD Serial No.: F035

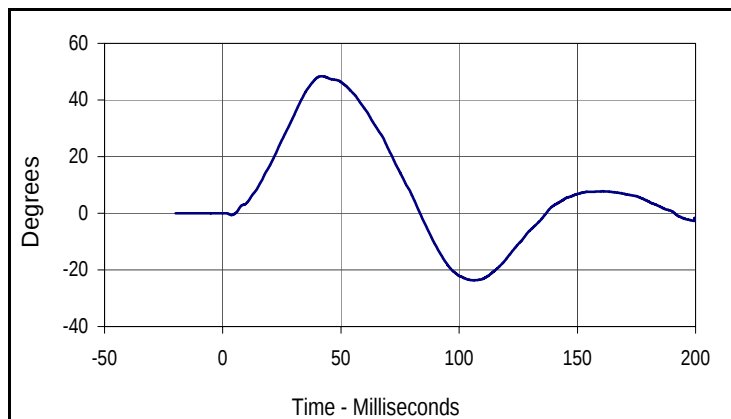
Test Date: 2/21/13
 Test I.D.: F035LB045



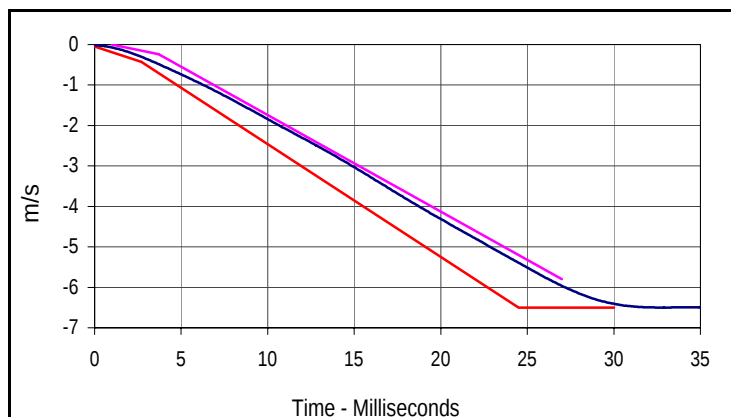
Tested Parameter	Units	Specification	Result	Pass/Fail
Lumbar Spine Assembly Soak Time	Minutes	≥240	570	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.6	Pass
Pendulum Velocity	m/s	5.95 to 6.15	6.05	Pass
Headform Rotation	Max	45 to 55	48.4	Pass
	Time	39 to 53	42.3	Pass
Time of Decay to Zero Angle from Peak	msec	37 to 57	44.0	Pass
Overall Test Results				Pass



Curve Description			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.0	-7.3	126.3



Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
48.4	42.3	-23.7	106.7



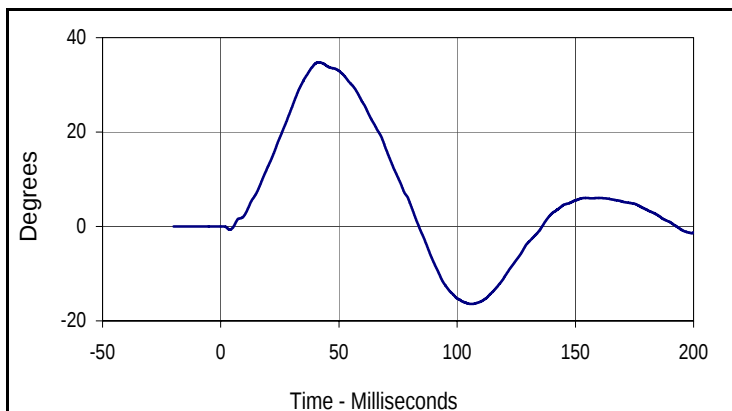
Curve Description			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.0	-7.3	126.3

Velocity Corridors

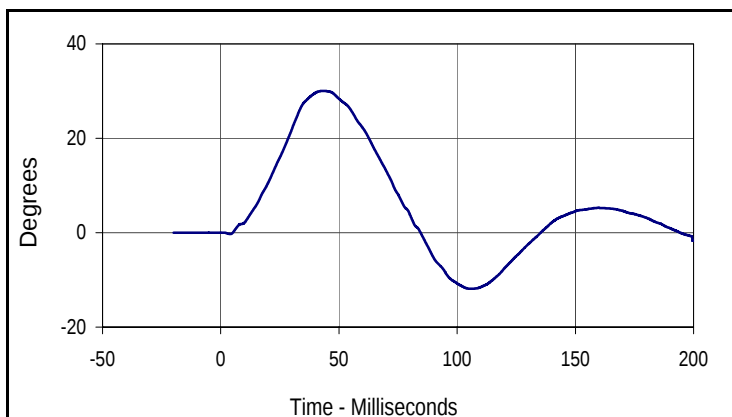
Upper Boundary		Lower Boundary	
Time (msec)	Velocity (m/s)	Time (msec)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.7	-0.24	2.7	-0.425
27.0	-5.80	24.5	-6.50
		30.0	-6.50

Test Program: ES2re Lumbar Flexion Test
 ATD Serial No.: F035

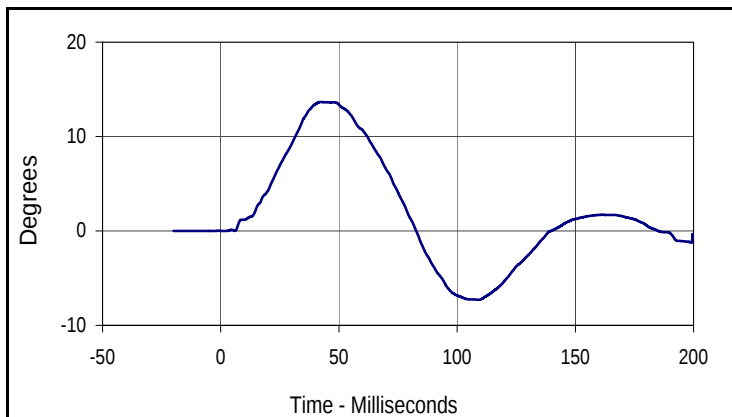
Test Date: 2/21/13
 Test I.D.: F035LB045



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
34.8	42.0	-16.4	106.6



Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
30.0	43.6	-11.9	106.4



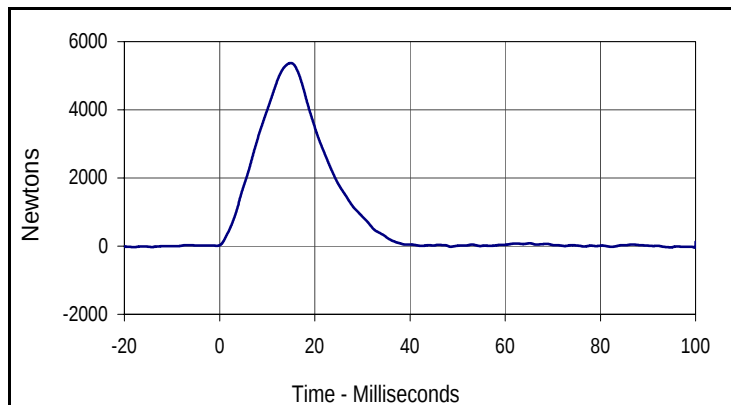
Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
13.7	43.0	-7.3	109.7

Test Program: ES2re Pelvis Impact Test
 ATD Serial No.: F035

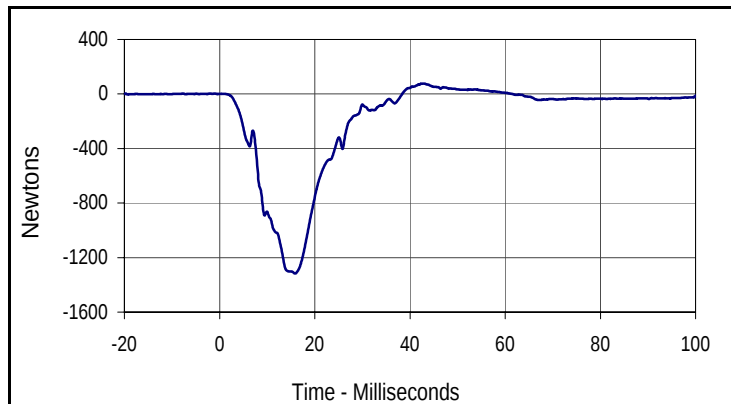
Test Date: 2/21/13
 Test I.D.: F035PL045



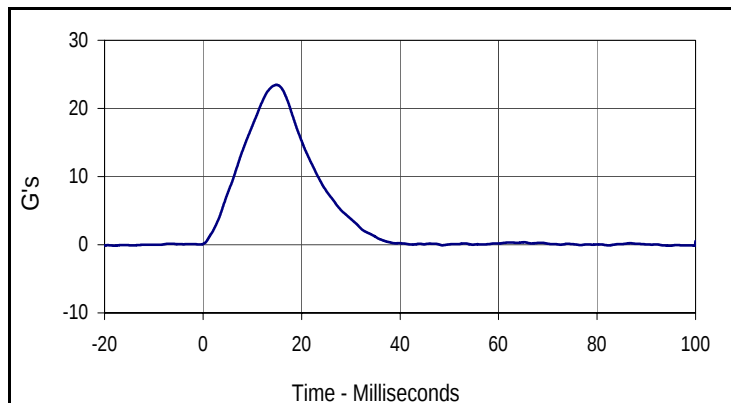
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	630	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.5	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.6	Pass
Pendulum Velocity	m/s	4.2 to 4.4	4.31	Pass
Peak Impactor Force	N	4700 to 5400	5373.5	Pass
	msec	11.8 to 16.1	14.9	Pass
Peak Pubic Symphysis Load	N	-1230 to -1590	-1316.6	Pass
	msec	12.2 to 17.0	15.8	Pass
Overall Test Results				Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
5373.5	14.9	-35.9	94.8



Curve Description			
Pubic Symphysis Force Y			
Plot No.	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
77.1	42.7	-1316.6	15.8



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
23.5	14.9	-0.2	94.8

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

Test Date: 2/22/13
 Test I.D.: N/A



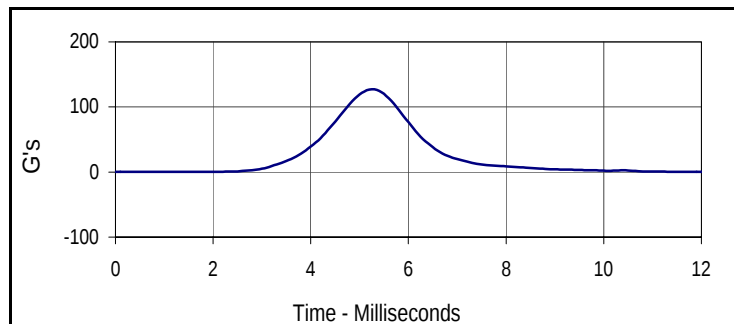
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
A	Sitting Height	mm	772 - 788	778	Pass
B	Shoulder Pivot Height	mm	437 - 453	443	Pass
C	H-Point Height	mm	79 - 89	85	Pass
D	H-Point from Seatback	mm	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

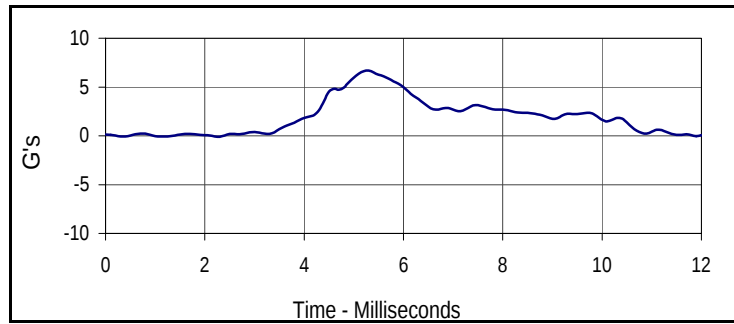
Test Date: 2/22/13
 Test I.D.: 307HD052



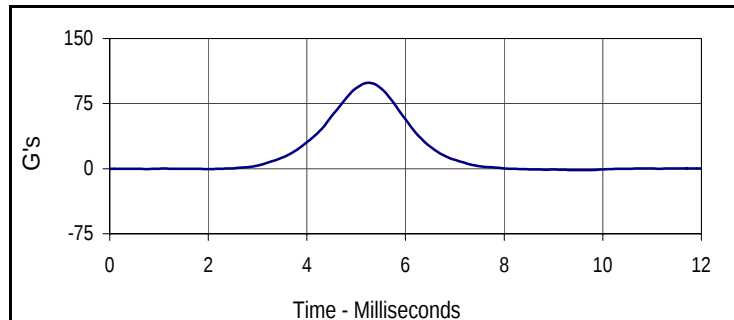
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	365	Pass
Temperature During Soak	Max	18.9 to 25.6	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.6	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.6	Pass
Peak Head Resultant Acceleration	G's	115 to 137	127.0	Pass
Peak Head X Acceleration	G's	<15	6.7	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	3.3	Pass
Overall Test Results				Pass



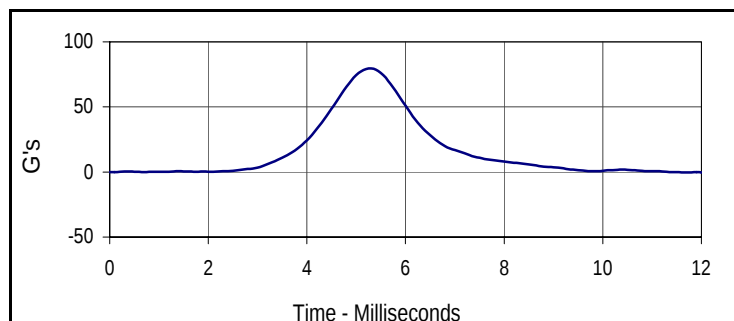
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
127.0	5.3	0.2	1.0



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
6.7	5.3	-0.1	2.3



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
98.8	5.3	-1.7	9.4



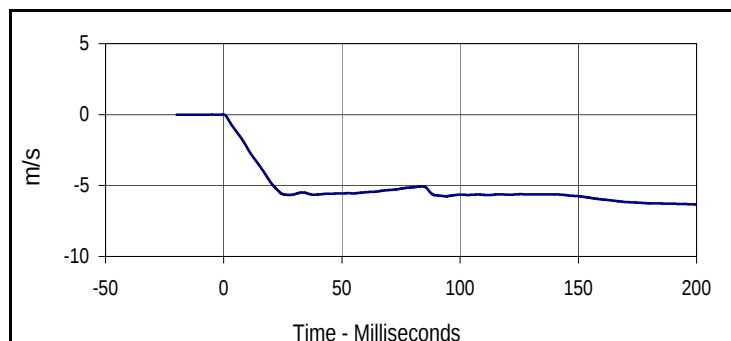
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
79.5	5.3	-0.3	11.7

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

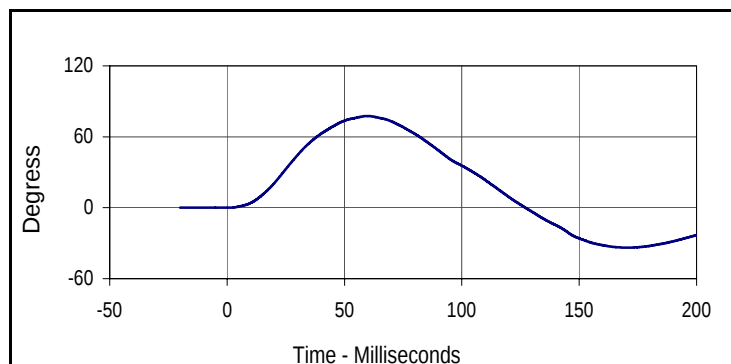
Test Date: 2/22/13
 Test I.D.: 307NB052



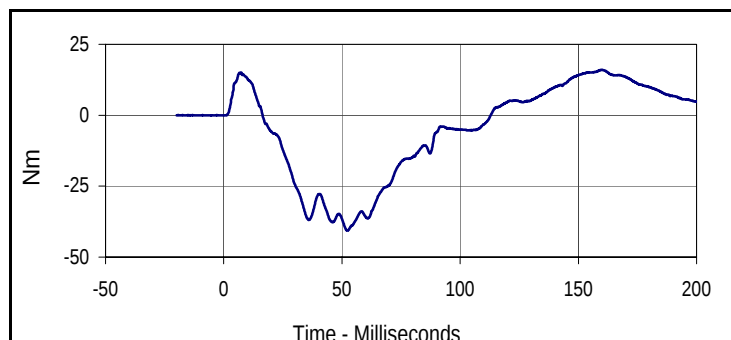
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	420	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.6	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Pendulum Velocity	m/s	5.51 to 5.63	5.54	Pass
Pendulum Deceleration	10 msec	-2.20 to -2.80	-2.36	Pass
	15 msec	-3.30 to -4.10	-3.57	Pass
	20 msec	-4.40 to -5.40	-4.81	Pass
	25 msec	-5.40 to -6.10	-5.61	Pass
	25-100 msec	-5.50 to -6.20	-5.75	Pass
D-Plane Rotation	Max	71 to 81	77.6	Pass
	Time	50 to 70	59.7	Pass
Peak Occipital Condyle Moment	Nm	-36 to -44	-40.6	Pass
Decaying Moment Time to Cross 0 Nm	msec	102 to 126	112.9	Pass
Overall Test Results			Pass	



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.4	-6.3	200.0



Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
77.6	59.7	-33.7	170.7



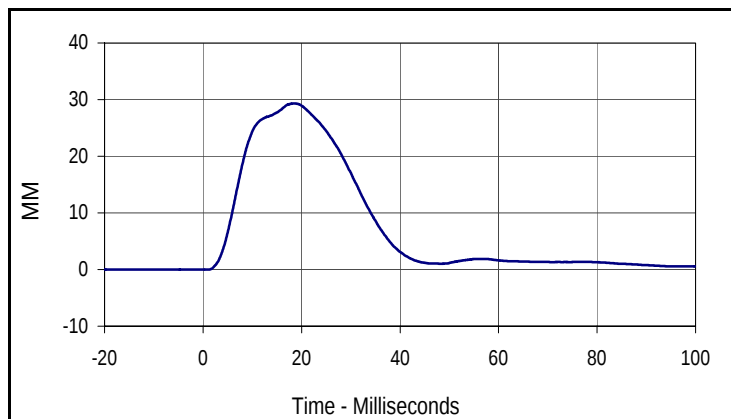
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
16.0	159.8	-40.6	52.4

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

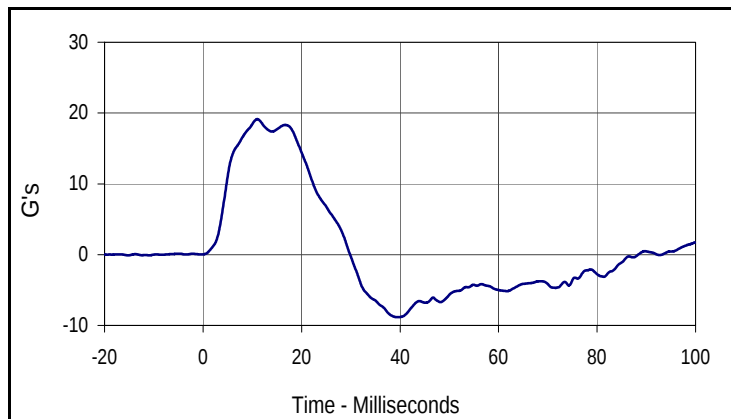
Test Date: 2/22/13
 Test I.D.: 307SH052



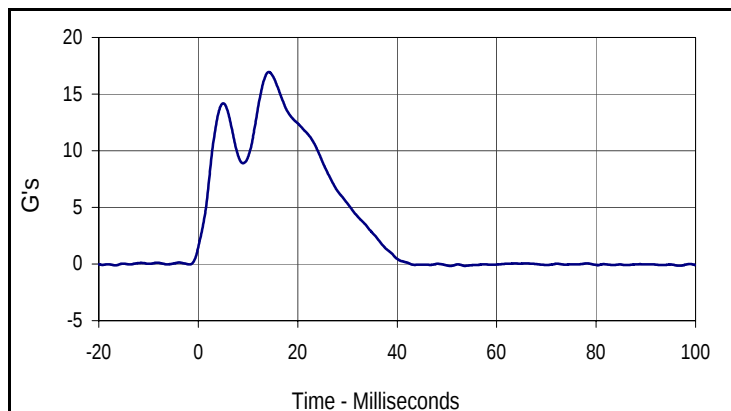
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	455	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.8	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.6	Pass
	Min	%		28.6	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.7	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.34	Pass
Peak Shoulder Deflection		mm	28 to 37	29.3	Pass
Peak Lateral Spine Acceleration Y		G's	17 to 22	19.1	Pass
Peak Impactor Acceleration		G's	13 to 18	17.0	Pass
Overall Test Results				Pass	



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
29.3	18.5	0.0	-20.0



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
19.1	11.0	-8.8	39.5



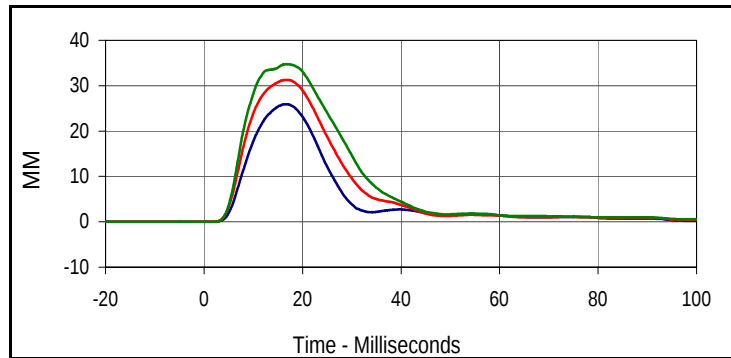
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
17.0	14.2	-0.2	50.7

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

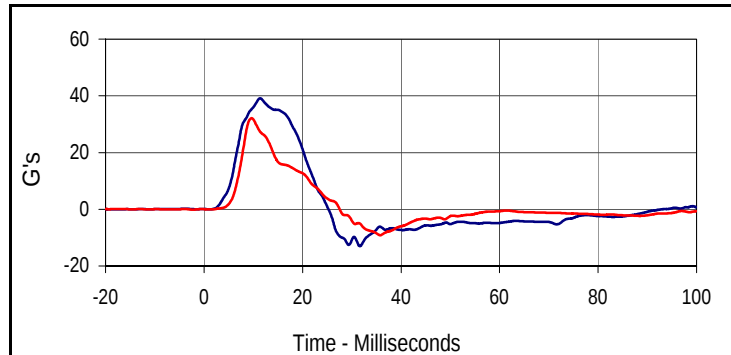
Test Date: 2/22/13
 Test I.D.: 307TWA052



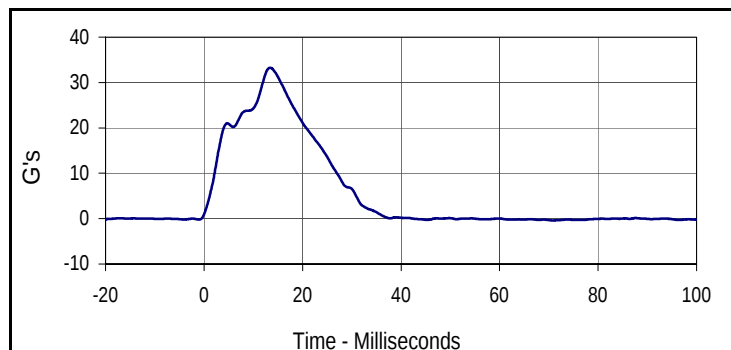
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	475	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.6	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.7	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.71	Pass
Peak Shoulder Deflection	mm	31 to 40	32.4	Pass
Peak Upper Thorax Rib Deflection	mm	25 to 32	25.9	Pass
Peak Middle Thorax Rib Deflection	mm	30 to 36	31.3	Pass
Peak Lower Thorax Rib Deflection	mm	32 to 38	34.7	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	39.1	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	32.1	Pass
Peak Impactor Acceleration	G's	30 to 36	33.3	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
25.9	16.6	0.0	-2.9
Middle Thorax Deflection			
Max	Time	Min	Time
31.3	16.8	0.0	-1.7
Lower Thorax Deflection			
Max	Time	Min	Time
34.7	16.4	0.0	-4.1



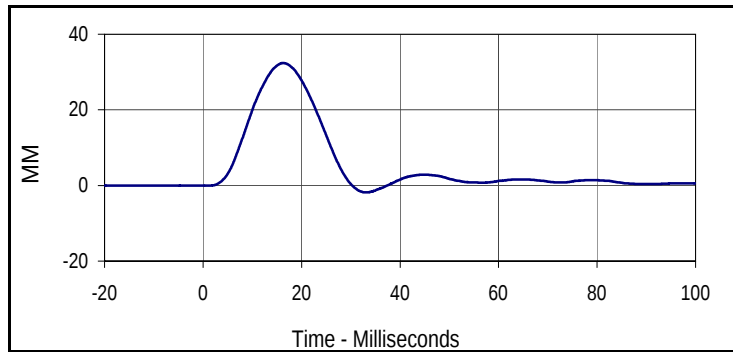
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
39.1	11.4	-13.0	31.6
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
32.1	9.6	-9.1	35.8



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
33.3	13.4	-0.4	70.8

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

Test Date: 2/22/13
Test I.D.: 307TWA052



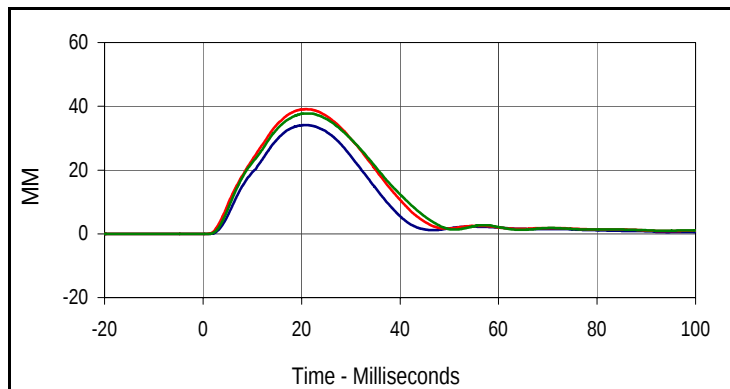
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
32.4	16.3	-1.8	33.0

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

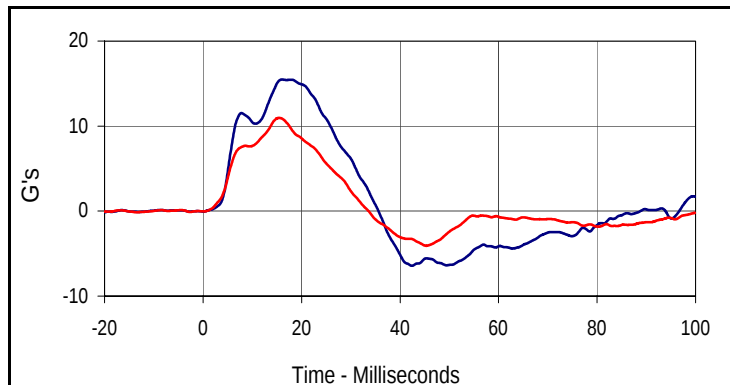
Test Date: 2/22/13
 Test I.D.: 307TWOA052



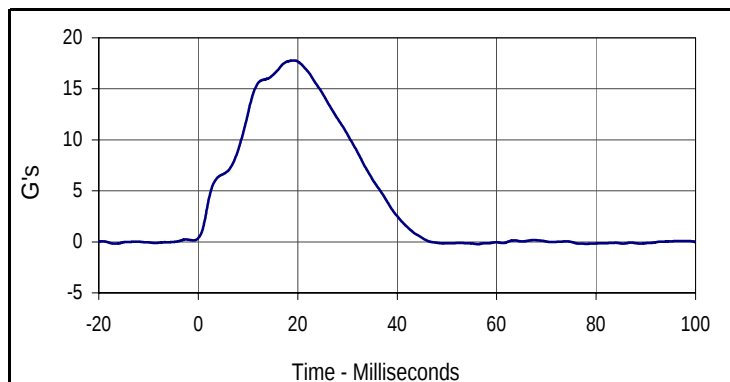
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	500	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.8	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.6	Pass
	Min	%		28.6	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.7	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.35	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	34.1	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	39.1	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	37.8	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	15.5	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	11.0	Pass
Peak Impactor Acceleration		G's	14 to 18	17.8	Pass
Overall Test Results				Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
34.1	20.8	0.0	-17.0
Middle Thorax Deflection			
Max	Time	Min	Time
39.1	20.9	0.0	-9.5
Lower Thorax Deflection			
Max	Time	Min	Time
37.8	21.2	0.0	-5.9



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.5	16.0	-6.4	42.4
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
11.0	15.5	-4.1	45.3



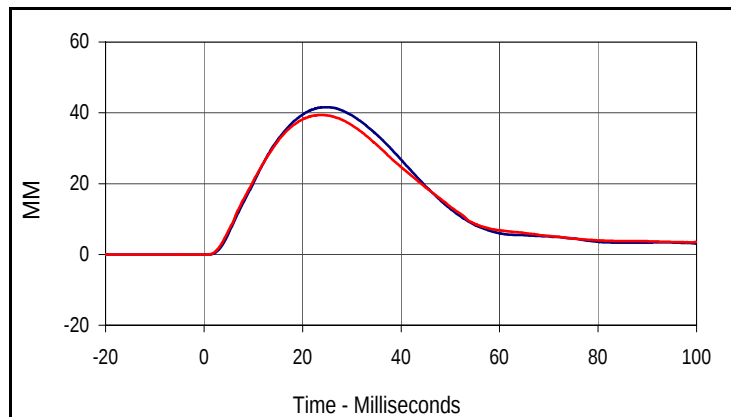
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
17.8	19.2	-0.2	56.3

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

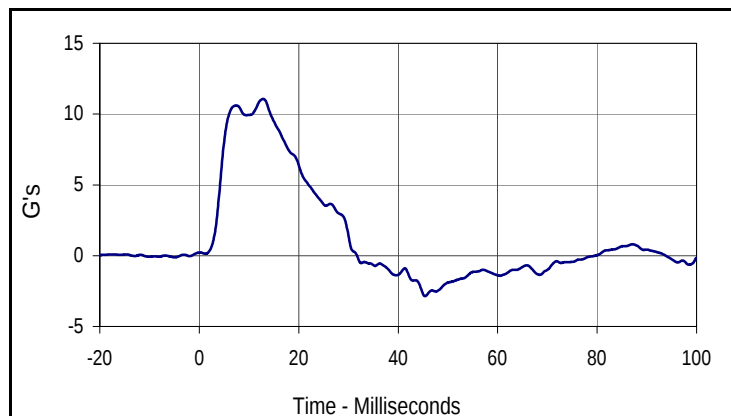
Test Date: 2/22/13
 Test I.D.: 307ABD052



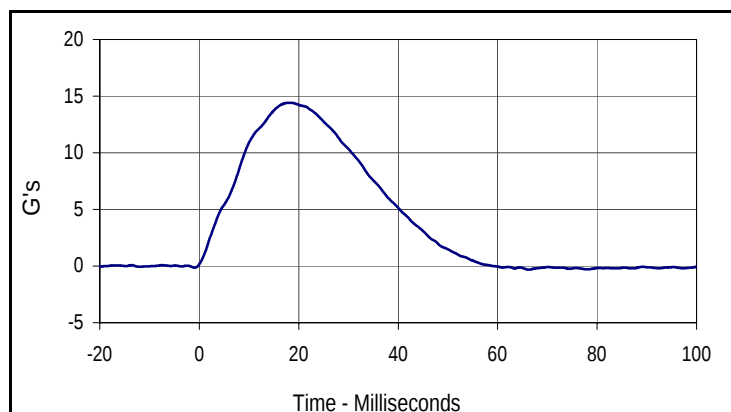
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	520	Pass
Temperature During Soak	Max °C	20.6 to 22.2	21.8	Pass
	Min °C		20.8	Pass
Humidity During Soak	Max %	10.0 to 70.0	30.6	Pass
	Min %		28.6	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.6	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.32	Pass
Peak Upper Abdominal Rib Deflection	mm	36 to 47	41.6	Pass
Peak Lower Abdominal Rib Deflection	mm	33 to 44	39.4	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	11.1	Pass
Peak Impactor Acceleration	G's	12 to 16	14.4	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
41.6	24.7	0.0	-13.6
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
39.4	23.7	0.0	-17.0



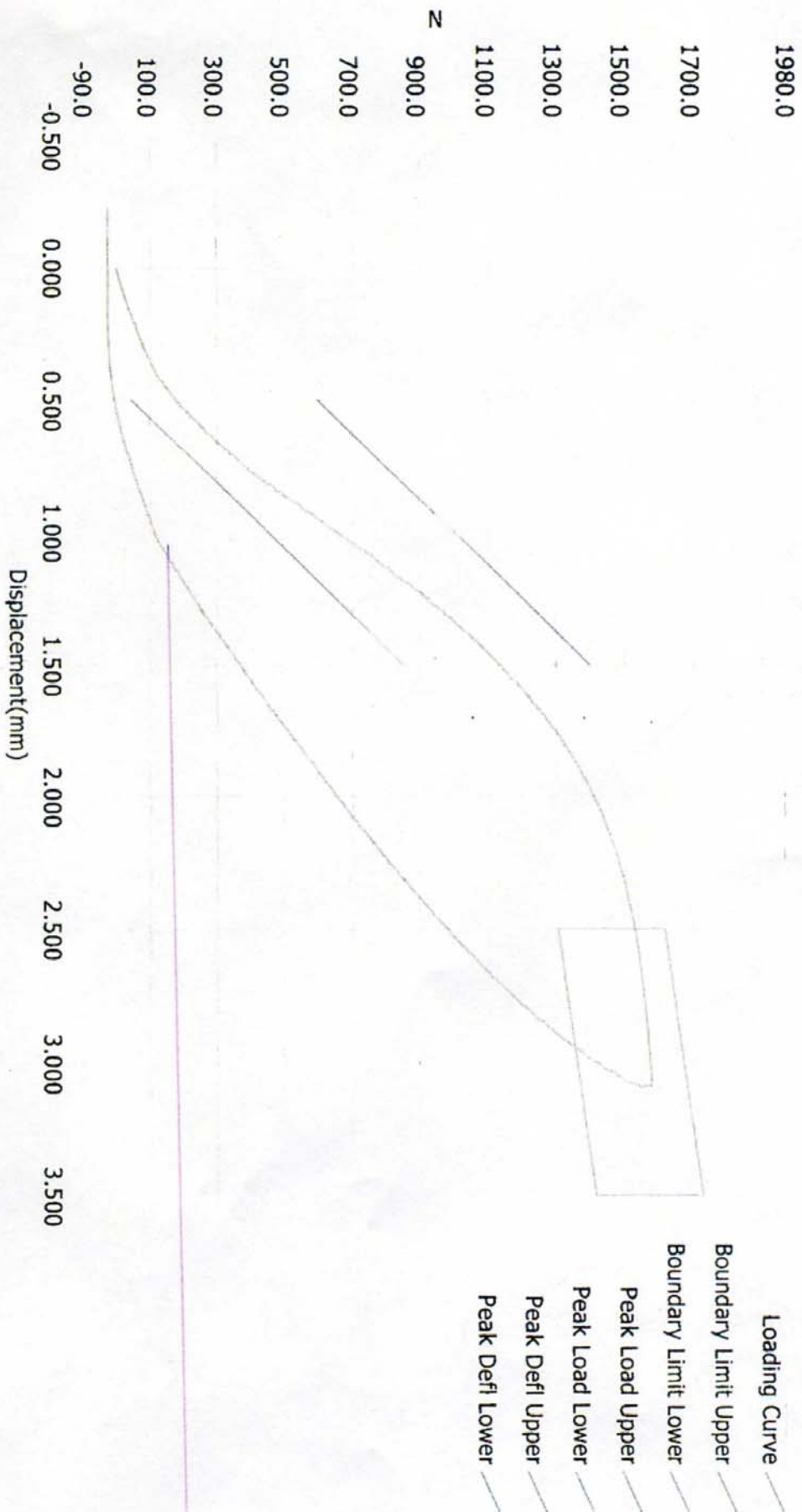
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
11.1	12.8	-2.9	45.4



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.4	18.0	-0.3	66.3

MD5111 POST TEST

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>
	46024	9/20/2011	10:24 PM
<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
	N/A	SIDIIs	

Current Date : 9/20/2011

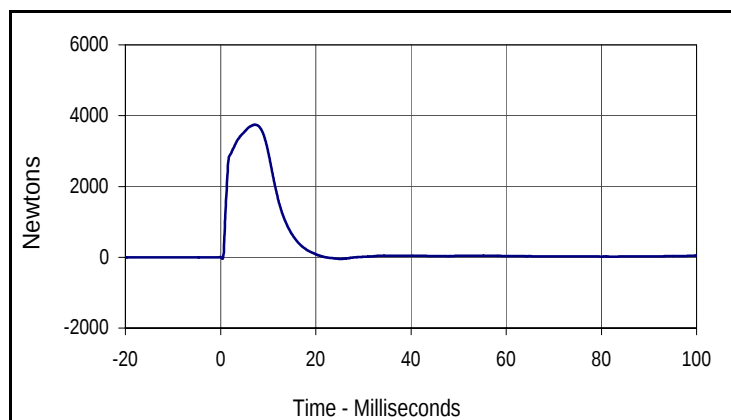
Current Time : 22:25:24

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

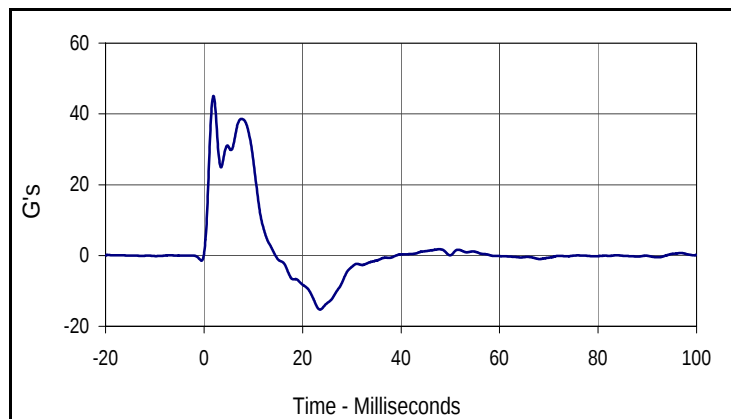
Test Date: 2/22/13
 Test I.D.: 307ACET052



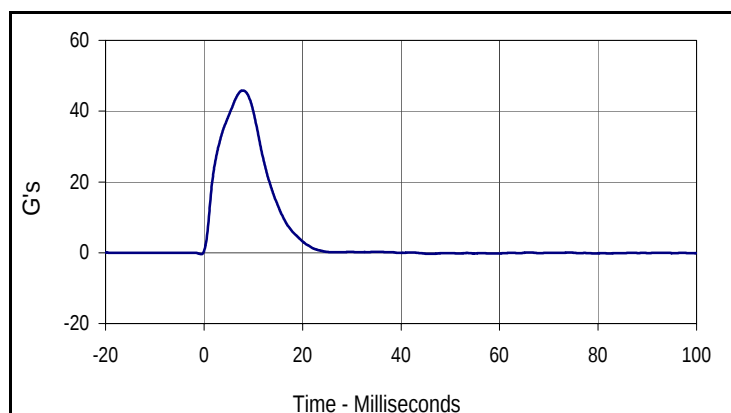
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	555	Pass
Temperature During Soak	Max	20.6 to 22.2	21.8	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	30.6	Pass
	Min		28.6	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.6	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.64	Pass
Peak Acetabulum Force Y	Newtons	3600 to 4300	3744.8	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	38.6	Pass
Peak Impactor Acceleration	G's	38 to 47	45.8	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3744.8	7.2	-45.4	25.2



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
45.1	1.9	-15.3	23.5



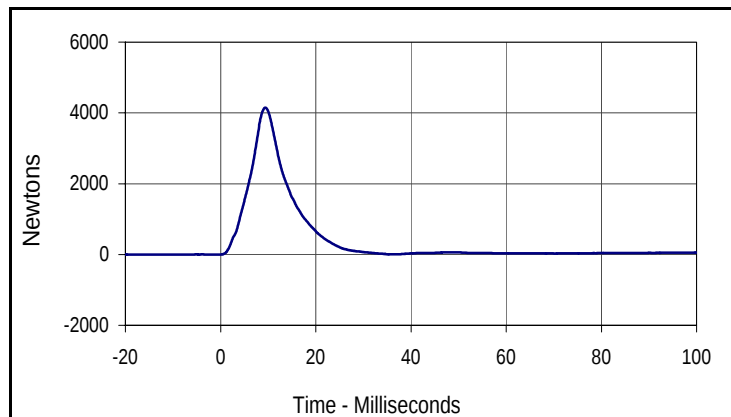
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
45.8	7.8	-0.4	-0.6

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

Test Date: 2/22/13
 Test I.D.: 307PL052



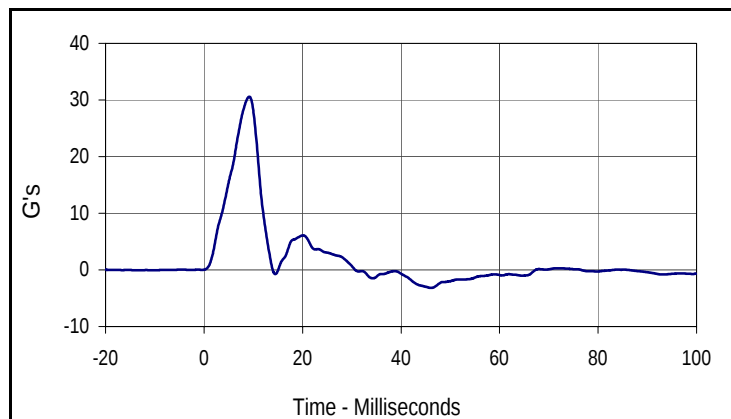
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	610	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.8	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.6	Pass
	Min	%		28.6	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.7	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.27	Pass
Peak Iliac Force		Newtons	4100 to 5100	4150.1	Pass
Peak Pelvis Y Acceleration		G's	28 to 39	30.6	Pass
Peak Impactor Acceleration		G's	36 to 45	39.4	Pass
Overall Test Results				Pass	



Curve Description

Pelvis Iliac Force

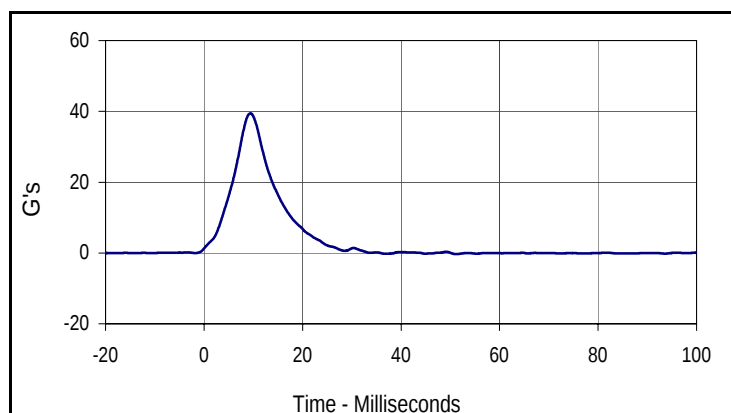
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4150.1	9.4	-2.3	-16.6



Curve Description

Pelvis Y Acceleration

Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
30.6	9.2	-3.2	46.1



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
39.4	9.4	-0.3	51.1

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (ES-2re)

			ES-2re S/N F035		
			Serial Number	Manufacturer	Calibration
Head Accelerometers		X	P58760	Endevco	8/30/12
		Y	P58763	Endevco	8/31/12
		Z	P52093	Endevco	8/31/12
Thorax Rib Displacement Potentiometers	Upper	Y	180	FTSS	6/22/12
	Middle	Y	177	FTSS	6/22/12
	Lower	Y	186	FTSS	6/22/12
Abdomen Load Cells	Forward	Y	1514	Denton	6/7/12
	Middle	Y	1510	Denton	6/7/12
	Rear	Y	1515	Denton	6/7/12
Lower Spine Accelerometers (T12)		X	P49165	Endevco	6/21/12
		Y	P49212	Endevco	6/21/12
		Z	P52113	Endevco	6/21/12
Pubic Symphysis Load Cell		Y	506	Denton	6/21/12

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 307			
				Serial Number	Manufacturer	Calibration	
Head Accelerometers				X	P58900	Endevco	8/15/12
				Y	P58902	Endevco	8/15/12
				Z	P58983	Endevco	8/15/12
Displacement Potentiometers	Shoulder			Y	1244	FTSS	8/17/12
	Thoracic Rib	Upper	Y	1249	FTSS	8/17/12	
		Middle	Y	1265	FTSS	8/17/12	
		Lower	Y	1277	FTSS	8/17/12	
	Abdominal Rib	Upper	Y	1286	FTSS	8/17/12	
		Lower	Y	1290	FTSS	8/17/12	
Lower Spine Accelerometers (T12)				X	P59007	Endevco	8/16/12
				Y	P59015	Endevco	8/16/12
				Z	P59016	Endevco	8/16/12
Acetabulum Load Cell				Y	277	Denton	5/24/12
Iliac Wing Load Cell				Y	289	Denton	5/24/12
Pelvis Plug (Struck Side)					46868	FTSS	10/5/11
Pelvis Plug (Non-Struck Side)					48906	FTSS	12/5/11

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	Ketx12a	ICSensor	7/20/11
	Vehicle Center of Gravity	Y	Ketx12b	ICSensor	7/20/11
	Vehicle Center of Gravity	Z	Ketx12c	ICSensor	7/20/11
2	Right Sill at Front Seat	X	13476	Endevco	8/17/12
	Right Sill at Front Seat	Y	13660	Endevco	1/4/13
	Right Sill at Front Seat	Z	13463	Endevco	8/17/12
3	Right Sill at Rear Seat	X	13378	Endevco	6/26/12
	Right Sill at Rear Seat	Y	12357	Endevco	2/14/12
	Right Sill at Rear Seat	Z	12418	Endevco	2/14/12
4	Left Sill at Front Door	Y	13662	Endevco	1/4/13
5	Left Sill at Rear Door	Y	13713	Endevco	10/22/12
6	Left A-Post Lower	Y	13661	Endevco	1/4/13
7	Left A-Post Middle	Y	13474	Endevco	1/4/13
8	Left B-Post Lower	Y	13475	Endevco	1/4/13
9	Left B-Post Middle	Y	13653	Endevco	1/4/13
10	Front Seat Track	Y	13479	Endevco	8/17/12
11	Rear Seat Structure	Y	13329	Endevco	6/18/12
12	Right Rear Occ. Compartment	Y	13502	Endevco	1/4/13
13	Engine Block	X	13484	Endevco	1/4/13
	Engine Block	Y	13469	Endevco	12/11/12
14	Rear Floorpan Above Axle	X	12903	Endevco	1/11/12
	Rear Floorpan Above Axle	Y	13723	Endevco	10/22/12
	Rear Floorpan Above Axle	Z	13348	Endevco	6/18/12

TABLE 4 – MDB Instrumentation

		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	13682	Endevco	11/14/12
MDB Center of Gravity	Y	13706	Endevco	11/14/12
MDB Center of Gravity	Z	13715	Endevco	11/14/12
Left Frame at Rear Axle Centerline	X	13705	Endevco	11/14/12
Left Frame at Rear Axle Centerline	Y	13711	Endevco	11/14/12