

REPORT NUMBER: SINCAP-KAR-12-028

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

**TOYOTA MOTOR MANUFACTURING, TEXAS, INC.
2012 TOYOTA TUNDRA CREWMAX 4-DOOR TRUCK**

NHTSA No: MC5110

**PREPARED BY:
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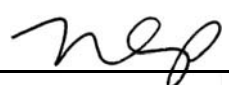
JANUARY 4, 2012

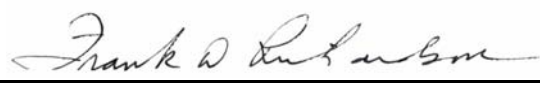
FINAL REPORT

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FINAL REPORT ACCEPTANCE BY OCWS:


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NHTSA, Office of Crashworthiness Standards

Date: 


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

Date: 

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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 2012 Toyota Tundra Crewmax 4-door truck in accordance with the specifications of the Office of Crashworthiness 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 December 21, 2011.

The impact velocity of the Moving Deformable Barrier was 62.1 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 15.6 deg. C. The target vehicle's maximum post-test static crush was 205 mm located at level 2. 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	20.0
Maximum Thorax Rib Deflection	mm	44	11
Total Abdominal Force	N	2500	127
Pubic Symphysis Force	N	6000	512

Measurement Description	Passenger ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC ₃₆)		1000	26.0
Resultant Lower Spine Acceleration	g	82	22
Total Pelvic Force (Sum of Acetubular and Iliac Forces)	N	5525	1256
Maximum Thoracic Rib Deflection	mm	38*	4
Maximum Abdominal Rib Deflection	mm	45*	14

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

* Proposed IARV

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SECTION 1

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test is part of the MY 2012 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 2012 Toyota Tundra Crewmax 4-door truck. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated August 2011.

SECTION 2

SUMMARY OF TEST RESULTS

A 2012 Toyota Tundra Crewmax 4-door truck 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 62.1 km/h (38.6 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 December 21, 2011. 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 August 2011. 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.

Dummy injury readings were recorded as follows:

Measurement Description	Units	Driver ATD (ES-2re)	
		Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	20.0
Maximum Thorax Rib Deflection	mm	44	11
Combined Abdominal Force	N	2500	127
Pubic Symphysis Force	N	6000	512

Measurement Description	Units	Passenger ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	26.0
Lower Spine (T12) Resultant Acceleration	g	82	22
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1256
Maximum Thoracic Rib Deflection	mm	38*	4
Maximum Abdominal Rib Deflection	mm	45*	14

*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	Yes	No	
Knee Airbag	Yes	Yes	No	
Side Airbag 1 (Curtain)	Yes	Yes	Yes	Yes
Side Airbag 2 (Torso)	Yes	Yes	No	
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes	Yes	No	
Other	No		No	

GENERAL COMMENTS

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

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck NHTSA No. MC5110
Test Program: NCAP MDB Side Impact Test Test Date: 12/21/11

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: 2012 Toyota Tundra Crewmax 4-Door Truck

NHTSA No. MC5110

Test Program: NCAP MDB Side Impact Test

Test Date: 12/21/11

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	MC5110
Model Year	2012
Make	Toyota
Model	Tundra Crewmax
Body Style	4-Door Truck
VIN	5TFEM5F15CX036477
Body Color	Silver Sky Metallic
Odometer Reading (km / mi)	278 / 173
Engine Displacement (L)	4.6
Type / No. of Cylinders	V8
Engine Placement	Longitudinal
Transmission Type	Automatic
Transmission Speeds	6
Overdrive	Yes
Final Drive	Rear
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
All Wheel Drive (AWD)	No

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks	Yes
Power Window Auto-Reverse	Yes
Other Optional Feature	n/a
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	Yes
Driver Torso/Pelvis Airbag	No
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	None

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

No

DATA FROM CERTIFICATION LABEL

Manufactured By	Toyota Motor Manufacturing, Texas, Inc.
Date of Manufacture	Sep-11
Vehicle Type	Truck

GVWR (kg)	3080
GAWR Front (kg)	1765
GAWR Rear (kg)	1835

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity	3	3		6
Capacity Weight (VCW) (kg)				597.0
DSC x 68.04 (kg)				408.2
Cargo Weight (RCLW) (kg)				136.0

A

B

A-B

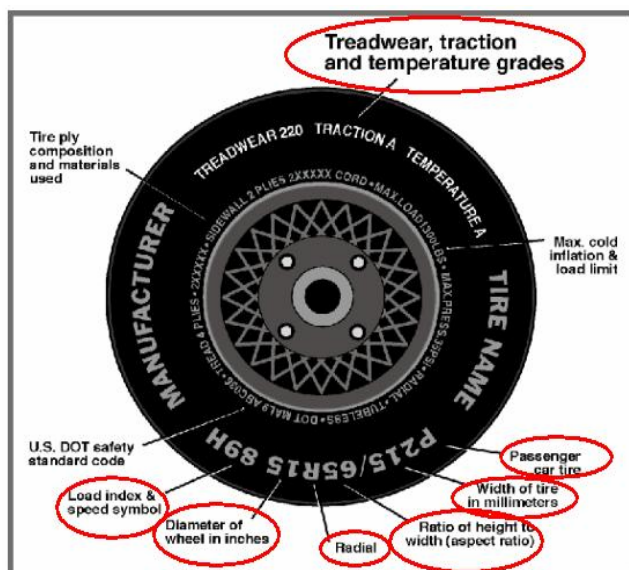
VEHICLE SEAT TYPE

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							

GENERAL TEST AND VEHICLE PARAMETER DATA

NHTSA No. MC5110

Test Date: 12/21/11



Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	210	230
Recommended Tire Size	P255/70R18	P255/70R18

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	300	300
Tire Size on Vehicle	P255/70R18	P255/70R18
Tire Manufacturer	Bridgestone	Bridgestone
Tire Name	Dueller	Dueller
Tire Type	Passenger	Passenger
Tire Width	255	255
Aspect Ratio	70	70
Radial	Yes	Yes
Wheel Diameter	18	18
Load Index/Speed Symbol	112T	112T
Treadware	360	360
Traction Grade	B	B
Temperature Grade	B	B
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck

NHTSA No. MC5110

Test Program: NCAP MDB Side Impact Test

Test Date: 12/21/11

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	210	210	230	230
Tire Placard	kPa	210	210	230	230
Owner's Manual	kPa	210	210	230	230
As Tested	kPa	210	210	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	724.5	542.5		773.5	648.5		792.0	647.0	
Right	kg	654.0	533.0		665.5	622.0		666.5	610.5	
Ratio	%	56.2%	43.8%	100.0%	53.1%	46.9%	100.0%	53.7%	46.3%	100.0%
Total	kg	1378.5	1075.5	2454.0	1439.0	1270.5	2709.5	1458.5	1257.5	2716.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2454.0	A
Actual Weight of 2 P572 ATDs Used	kg	125.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	136.0	C
Calculated Vehicle Target Wt (TVTW)	kg	2715.0	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 kg)? ☒ Yes ☐ No

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Non Struck Side Door Panels	9.0
Spare Tire Tools	4.0
Ballast / Equipment Added	152.5

DATA SHEET NO. 1 ... (CONTINUED)**GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck NHTSA No. MC5110
Test Program: NCAP MDB Side Impact Test Test Date: 12/21/11

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement***
LF	mm	918	915	Yes
RF	mm	941	931	Yes
RR	mm	976	979	Yes
LR	mm	987	987	Yes
Vehicle CG (Aft of Front Axle)	mm	1716	1738	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	52	43	

***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. 2**SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEM DATA**Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door TruckNHTSA No. MC5110Test Program: NCAP MDB Side Impact TestTest Date: 12/21/11**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	9.0	0.0	4.5
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat	Fixed	Fixed	Fixed
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	4.5	872	Max	896	897	897
			Mid	884	884	882
			Min	871	872	872
Front Passenger Seat	Fixed	901	Max	900	901	902
			Mid	900	901	902
			Min	900	901	902
Front Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Struck Side Rear Seat	Fixed	904	Max	904	905	906
			Mid	904	905	906
			Min	904	905	906
Non-Struck Side Rear Seat	Fixed	904	Max	904	905	906
			Mid	904	905	906
			Min	904	905	906
Rear Center Seat	Fixed to LR	Fixed to LR	Max	Fixed to LR	Fixed to LR	Fixed to LR
			Mid	Fixed to LR	Fixed to LR	Fixed to LR
			Min	Fixed to LR	Fixed to LR	Fixed to LR

DATA SHEET NO. 2 ... (CONTINUED)

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

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck

NHTSA No. MC5110

Test Program: NCAP MDB Side Impact Test

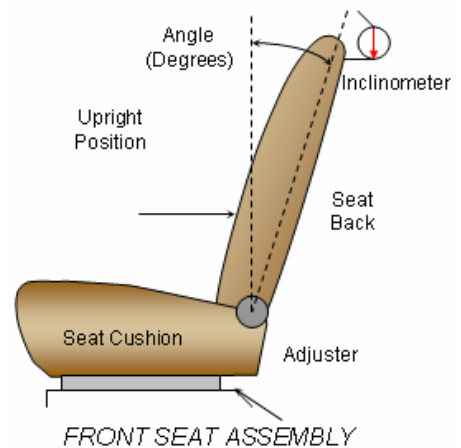
Test Date: 12/21/11

SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	210	15	105	7
Front Passenger Seat	210	15	105	7
Front Center Seat	Fixed	Fixed	Fixed	Fixed
Struck Side Rear Seat	240	17	240	16
Non-Struck Side Rear Seat	240	17	240	16
Rear Center Seat	Fixed to LR	Fixed to LR	Fixed to LR	Fixed to LR

SEAT BACK ADJUSTMENT

The driver's seat back is positioned to the manufacturer's designated design angle. The front center and front passenger's seat backs are 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	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/Seated Dummy	52.0	27	1.0	6
Front Passenger Seat	50.9	27	1.0	6
Front Center Seat	Fixed	Fixed	Fixed	Fixed
Struck Side Rear Seat w/Seated Dummy	30.3	16	4.4	3
Non-Struck Side Rear Seat	30.3	16	4.4	3
Rear Center Seat	Fixed to LR	Fixed to LR	Fixed to LR	Fixed to LR

DATA SHEET NO. 2 ... (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck

NHTSA No. MC5110

Test Program: NCAP MDB Side Impact Test

Test Date: 12/21/11

SEAT BELT ANCHORAGE ADJUSTMENT

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

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

HEAD RESTRAINT ADJUSTMENT

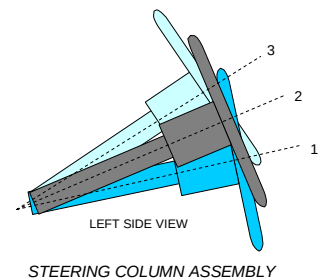
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total No. of Positions	Placed in Position
Driver Seat	8	Full Up
Rear Seat	3	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	23.8	
Geometric Center - Position 2	26.9	
Uppermost - Position 3	29.9	
Telescoping Steering Wheel Travel		
Test Position	26.9	



DATA SHEET NO. 2 ... (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck

NHTSA No. MC5110

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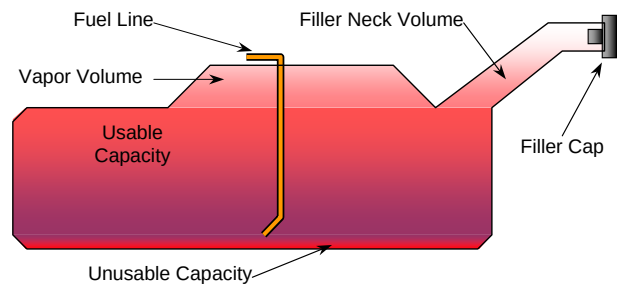
FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	99.92
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	92.93
Actual amount of Solvent Used in Test	92.93
1/3 of Usable Capacity	33.31

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

FUEL PUMP

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



VEHICLE FUEL TANK ASSEMBLY

DATA SHEET NO. 3

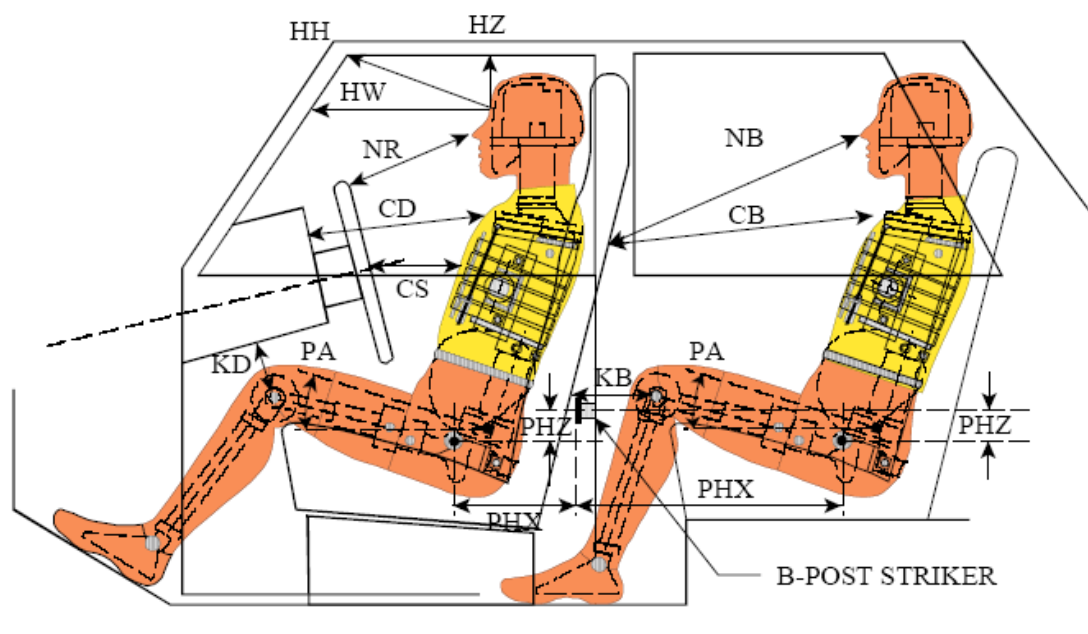
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck

NHTSA No. MC5110

Test Program: NCAP MDB Side Impact Test

Test Date: 12/21/11



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	465			
HW		Head to Windshield	650			
HZ	HZ	Head to Roof	175		300	
NR	NB	Nose to Rim/Seat Back	488		700	
CD	CB	Chest to Dash/Seat Back	395		704	
CS		Chest to Steering Wheel	302			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	171	30.0	445	27.0
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	172	25.7	448	28.9
PAX°	PAX°	Pelvic Tilt Angle X		13.0		20.2
	PAY°	Pelvic Tilt Angle Y				0.2
PHX	PHX	Hip Point to Striker (x-axis)	249		308	
PHZ	PHZ	Hip Point to Striker (z-axis)	135		157	

DATA SHEET NO. 4

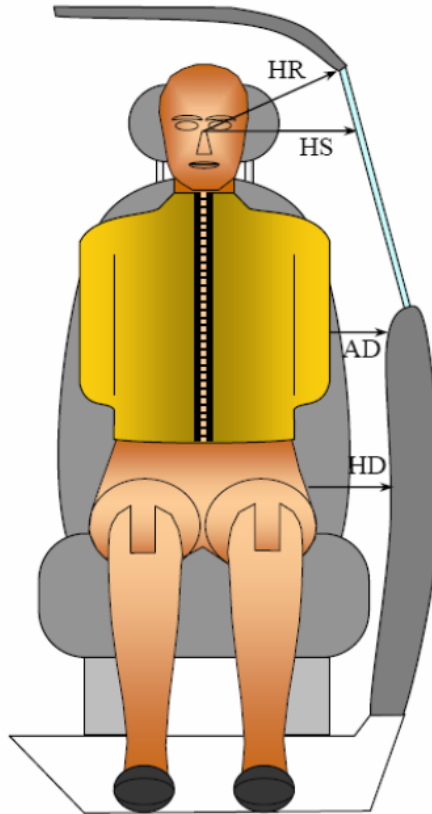
DUMMY LATERAL CLEARANCE DIMENSIONS

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FRONT VIEW OF DUMMY

DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	205	294
HS	Head to Side Window	mm	311	367
AD	Arm to Door	mm	114	161
HD	H-Point to Door	mm	175	179

DATA SHEET NO. 5

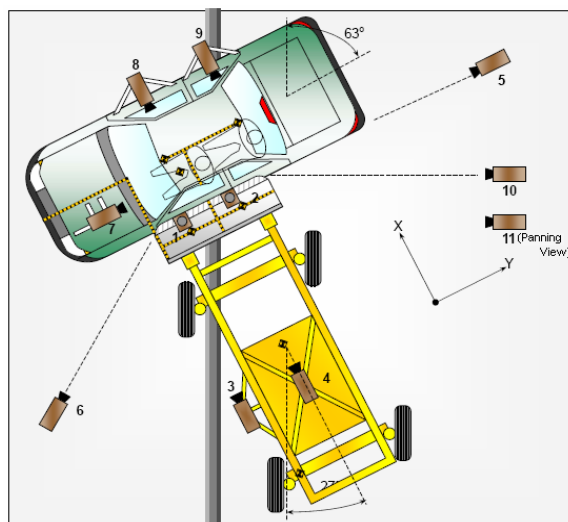
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck

NHTSA No. MC5110

Test Program: NCAP MDB Side Impact Test

Test Date: 12/21/11



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)	505	-730	-1669	35	1000
8	Driver Side (On-Board)	1796	812	-1436	14	1000
9	Passenger Side (On-Board)	1743	1882	-1476	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

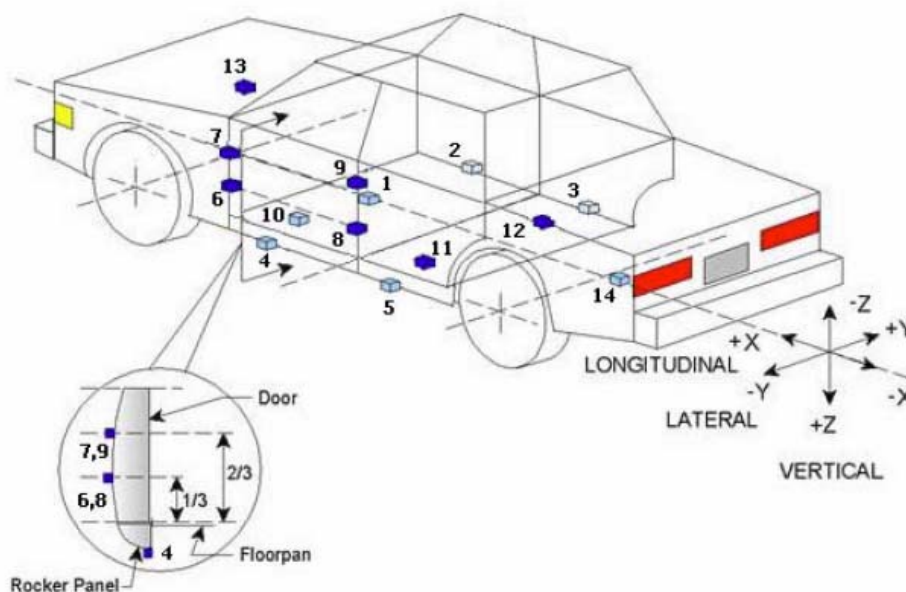
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck

NHTSA No. MC5110

Test Program: NCAP MDB Side Impact Test

Test Date: 12/21/11



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2970	0	-725
2	Right Sill at Front Seat	3950	790	-535
3	Right Sill at Rear Seat	2635	805	-555
4	Left Sill at Front Door	3385	565	-530
5	Left Sill at Rear Door	2625	450	-585
6	A-Pillar Lower	4330	-925	-700
7	A-Pillar Middle	4330	-925	-1080
8	B-Pillar Lower	3195	-815	-895
9	B-Pillar Middle	3195	-815	-1205
10	Front Seat Track	3340	-705	-730
11	Rear Seat Structure	2655	-220	-725
12	Right Rear Occupant Compartment	2980	480	-670
13	Engine Block	5135	0	-1115
14	Rear Floorpan Above Axle	975	330	-835

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

DATA SHEET NO. 7

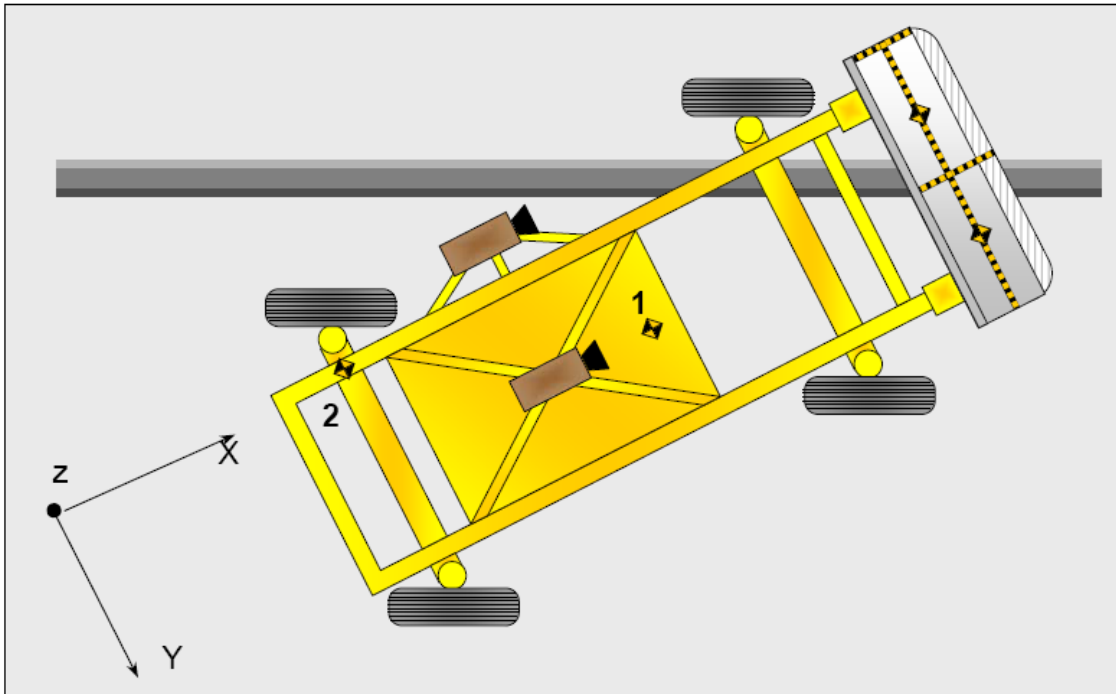
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck

NHTSA No. MC5110

Test Program: NCAP MDB Side Impact Test

Test Date: 12/21/11



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: 2012 Toyota Tundra Crewmax 4-Door TruckNHTSA No. MC5110Test Program: NCAP MDB Side Impact TestTest Date: 12/21/11**TEST DUMMY INFORMATION AND CONTACT POINTS**

Dummy Body Part	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	Side Header	None
Top of Head	Side Header	Curtain Airbag, Side Header
Left Side of Head	Curtain Airbag, Side Header	Curtain Airbag
Back of Head	Side Header, Headrest	Side Header, Headrest
Left Shoulder	Curtain Airbag	Curtain Airbag
Upper Torso	Seat, Torso Airbag	Seat
Lower Torso	Seat, Torso Airbag	Seat, Door Panel
Left Hip	Seat, Door Panel	Seat
Left Knee	Door Panel, Knee Airbag	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	None
Other Notable Effects	None

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

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck NHTSA No. MC5110
Test Program: NCAP MDB Side Impact Test Test Date: 12/21/11

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		3707
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		360
Actual Impact Point (Aft of Front Axle)	mm		368
Horizontal Offset (+ forward / - rearward)	mm	± 50 of Intended Impact Point	-8
Vertical Offset (+ down / - up)	mm	± 20 of Intended Impact Point	-4

DATA SHEET NO. 9**MDB SUMMARY OF RESULTS**Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door TruckNHTSA No. MC5110Test Program: NCAP MDB Side Impact TestTest Date: 12/21/11**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	402	298	700
Right	kg	377	292	669
Ratio	%	56.9%	43.1%	100.0%
Totals	kg	779	590	1368

SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.10
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.05
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.9
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	62.6
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26.0 to 28.0	26.1

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

Vertical Location			From Centerline		Max. Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	800	Right	234
B	Top of Bumper	533	800	Right	210
C	Mid Level	686	800	Left	177
D	Top of Stack	813	800	Left	199

DATA SHEET NO. 10

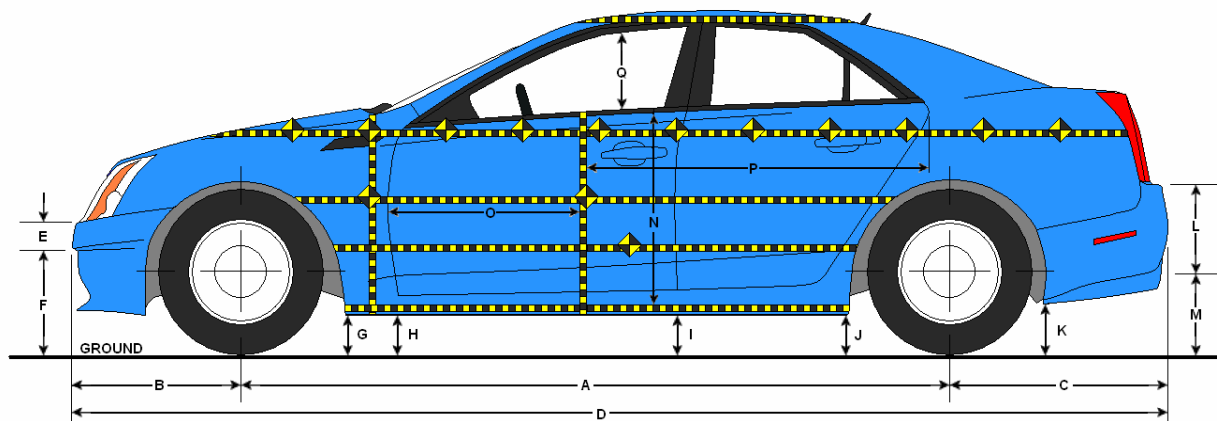
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck

NHTSA No. MC5110

Test Program: NCAP MDB Side Impact Test

Test Date: 12/21/11



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3707	3704	-3
B	Front Axle to FSOV	899	909	10
C	Rear Axle to RSOV	1230	1223	-7
D	Total Length at Centerline	5836	5836	0
E	Front Bumper Thickness	280	279	-1
F	Front Bumper Bottom to Ground	397	397	0
G	Sill Height at Front Wheel Well	381	375	-6
H	Sill Height at Front Door Leading Edge	389	378	-11
I	Sill Height at B-Pillar	424	435	11
J1	Sill Height at Rear Wheel Well	399	393	-6
J2	Pinch Weld Height at Rear Wheel Well	398	394	-4
K	Sill Height Aft of Rear Wheel Well	423	423	0
L	Rear Bumper Thickness	230	231	1
M	Rear Bumper Bottom to Ground	497	480	-17
N	Sill Height to Bottom of Front Window Sill	780	849	69
O	Front Door Leading Edge to Impact CL	805	804	-1
P	Rear Door Trailing Edge to Impact CL	1525	1500	-25
Q	Front Window Opening	513	524	11
R	Right Side Length	4946	4945	-1
S	Left Side Length	4947	4934	-13
T	Vehicle Width at B-Pillar	2028	1951	-77

All measurements in mm with tolerance of ± 3 mm

DATA SHEET NO. 11

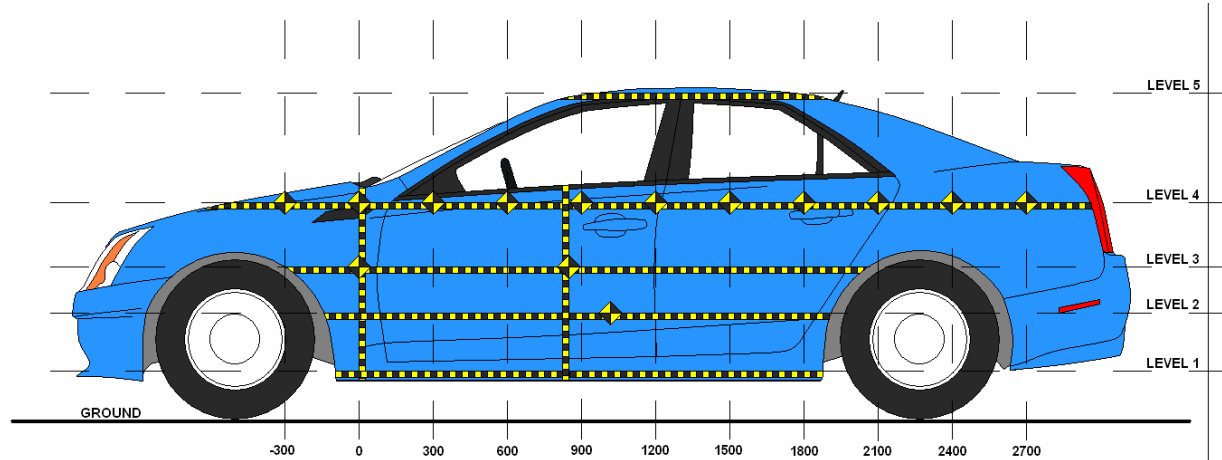
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck

NHTSA No. MC5110

Test Program: NCAP MDB Side Impact Test

Test Date: 12/21/11



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	456	177	1650
2	Occupant H-Point	876	205	1650
3	Mid-Door	936	198	1650
4	Window Sill	1257	71	1200
5	Window Top	1850	35	1650

DATA SHEET NO. 11 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck

NHTSA No. MC5110

Test Program: NCAP MDB Side Impact Test

Test Date: 12/21/11

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300				638					624					-14	
-150		485	485	614			503	504	610			18	19	-4	
0		485	485	597			513	515	596			28	30	-1	
150	537	493	488	581		648	565	560	584		111	72	72	3	
300	560	498	493	571		669	635	623	580		109	137	130	9	
450	558	496	493	564		676	643	621	580		118	147	128	16	
600	557	495	491	560		680	641	615	580		123	146	124	20	
750	557	494	489	554	798	686	642	613	584	816	129	148	124	30	18
900	555	492	488	549	794	691	639	611	588	814	136	147	123	39	20
1050	554	492	486	545	792	695	636	609	594	814	141	144	123	49	22
1200	556	491	485	541	792	709	656	631	612	818	153	165	146	71	26
1350	558	492	485	538	791	728	667	644	599	819	170	175	159	61	28
1500	560	493	485	538	789	734	688	671	592	822	174	195	186	54	33
1650	561	493	486	534	789	738	698	684	595	824	177	205	198	61	35
1800	561	494	486	531	790	708	676	662	577	825	147	182	176	46	35
1950	567	496	488	531	790	662	644	631	563	825	95	148	143	32	35
2100	568	497	489	530	792	637	605	589	559	823	69	108	100	29	31
2250	572	498	490	529	798	616	566	553	555	830	44	68	63	26	32
2400	549	500	491	530		554	543	536	567		5	43	45	37	
2550		501	493	530			509	508	554			8	15	24	
2700			499	542				497	553				-2	11	
2850															

DATA SHEET NO. 11 ... (CONTINUED)

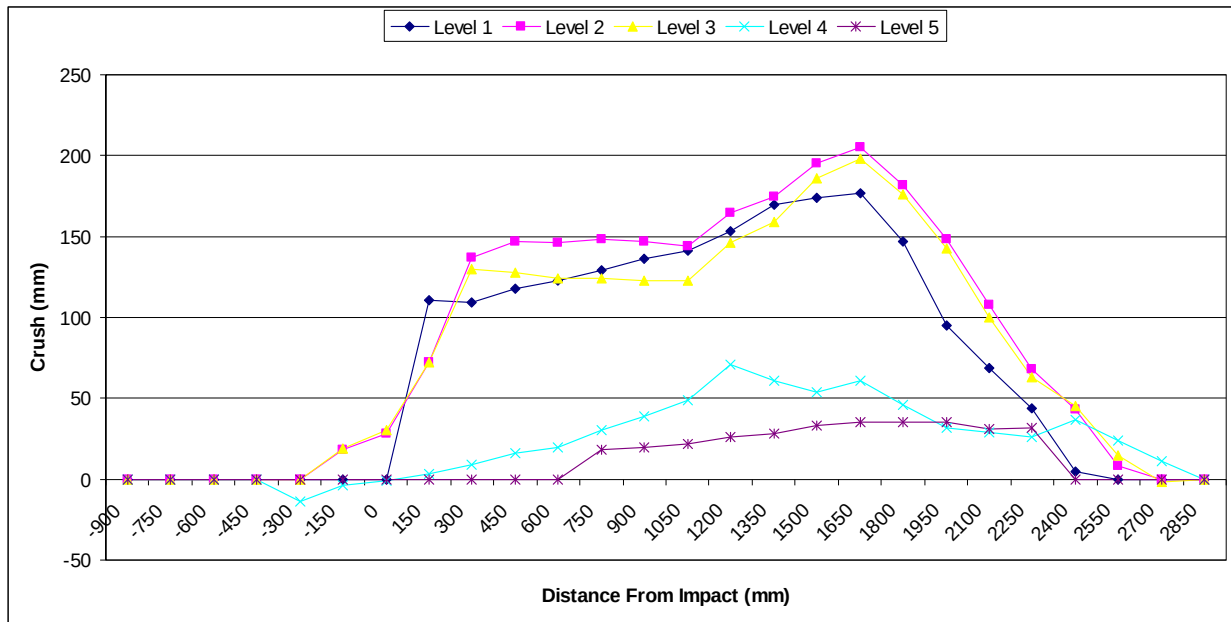
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck

NHTSA No. MC5110

Test Program: NCAP MDB Side Impact Test

Test Date: 12/21/11



DATA SHEET NO. 12

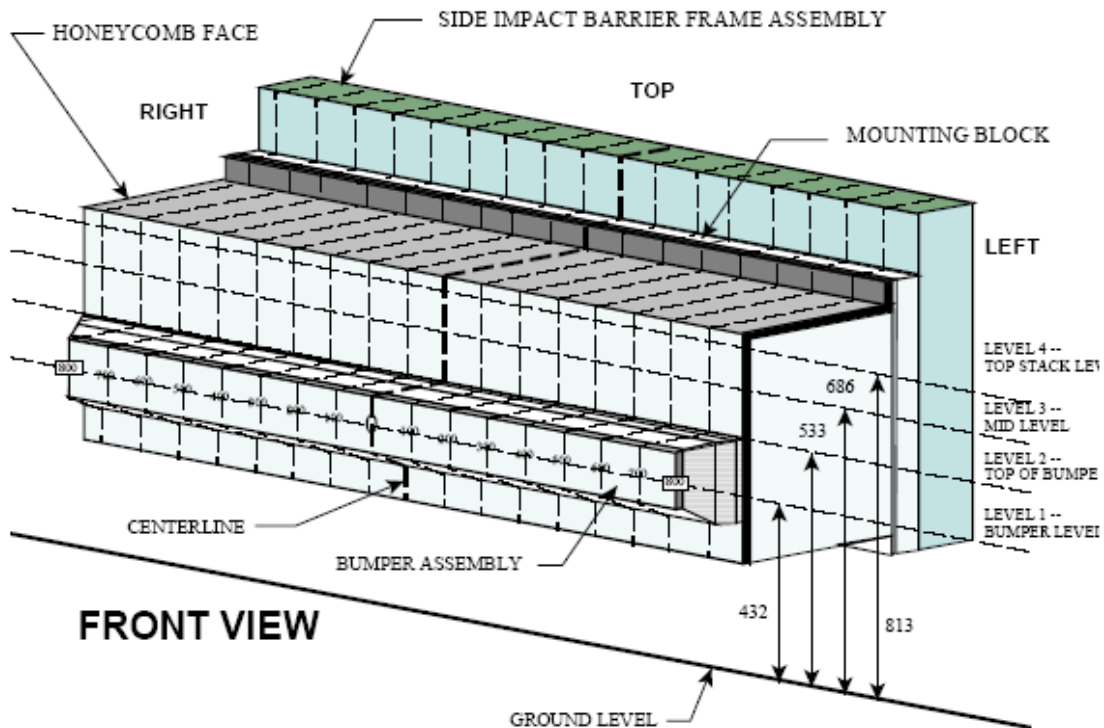
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck

NHTSA No. MC5110

Test Program: NCAP MDB Side Impact Test

Test Date: 12/21/11



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	234	215	214	214	214	215	214	214	214	214	211	211	211	211	211	212	224
2	210	210	205	202	192	182	191	197	200	199	195	197	199	202	202	200	182
3	172	152	132	127	139	154	165	147	130	125	117	117	122	127	134	149	177
4	184	159	135	124	124	145	137	132	119	115	113	115	117	122	142	171	199

All dimensions in millimeters.

DATA SHEET NO. 13

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck

NHTSA No. MC5110

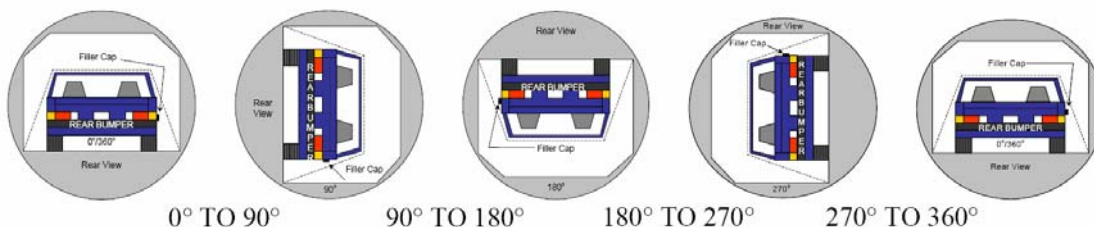
Test Program: NCAP MDB Side Impact Test

Test Date: 12/21/11

Temperature at Time of Impact: 15.6° C

Test Time: 12:48 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°	86	300	386
90° To 180°	83	300	383
180° To 270°	80	300	380
270° To 360°	81	300	381

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

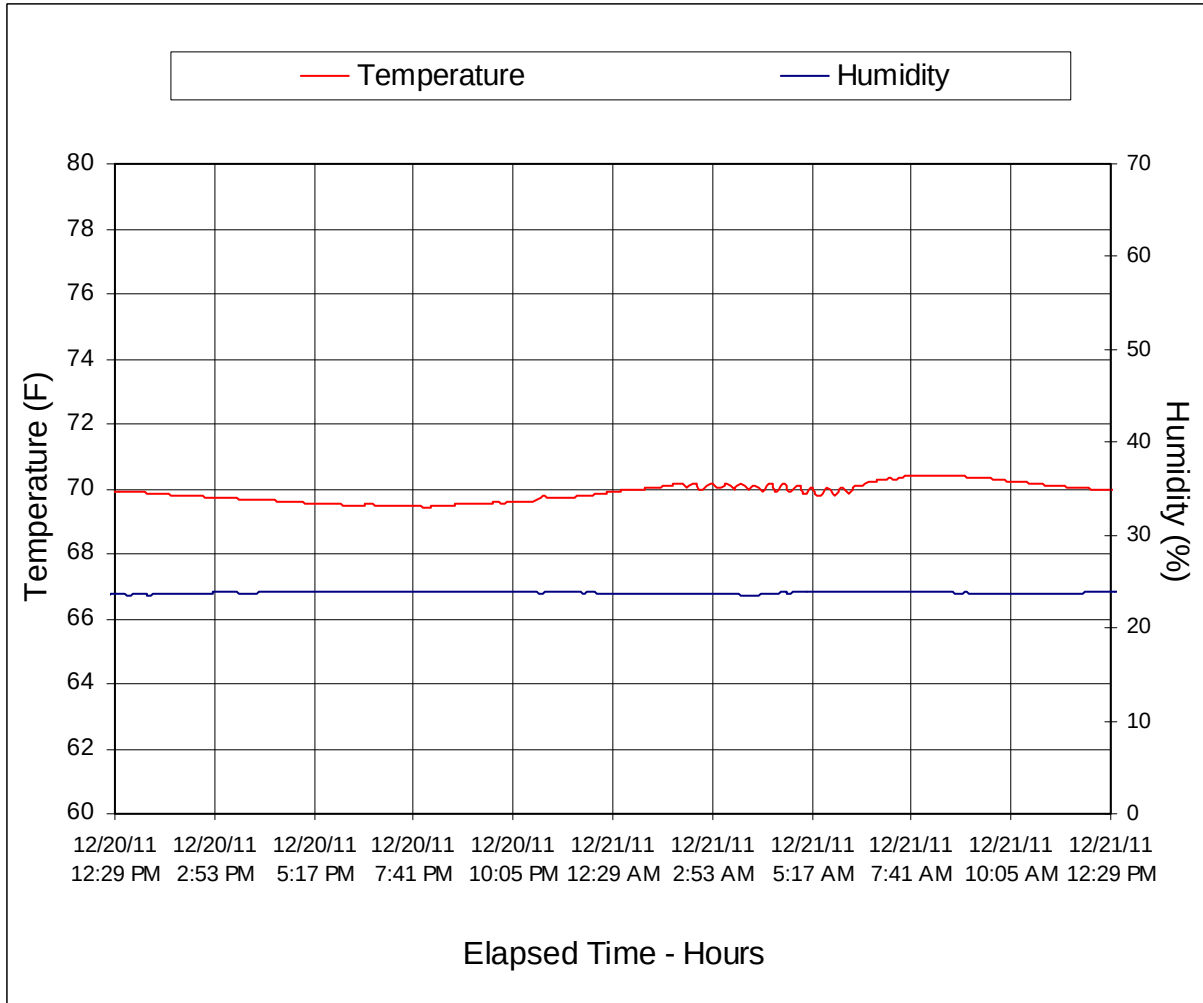
DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck

NHTSA No. MC5110

Test Program: NCAP MDB Side Impact Test

Test Date: 12/21/11



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 Test Vehicle



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



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



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



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



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



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 at Ideal Impact Point



FIGURE 18. Pre-Test Right Side View of MDB Positioned
Against Side of Test Vehicle at Ideal Impact Point



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



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



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, Chalking, and Contact Switches



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 Frontal View of Driver Seat Pan Prior to Dummy Positioning



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



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



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

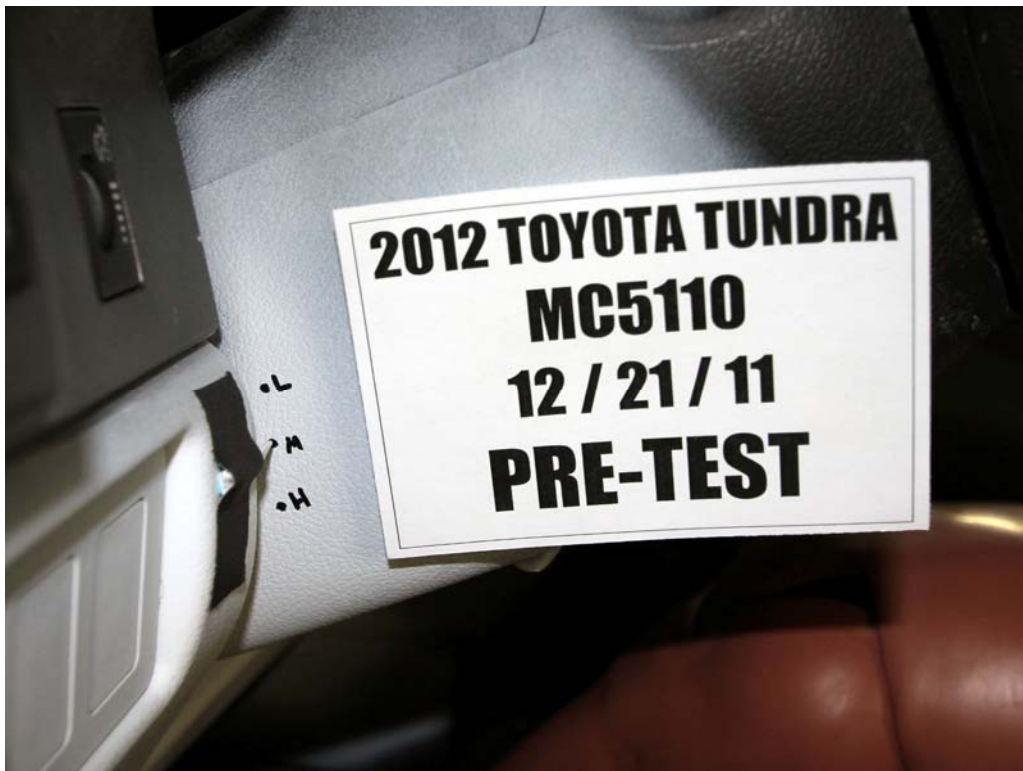


FIGURE 36. Pre-Test Left Side View of Steering Wheel



FIGURE 37. View of Disengaged Parking Brake

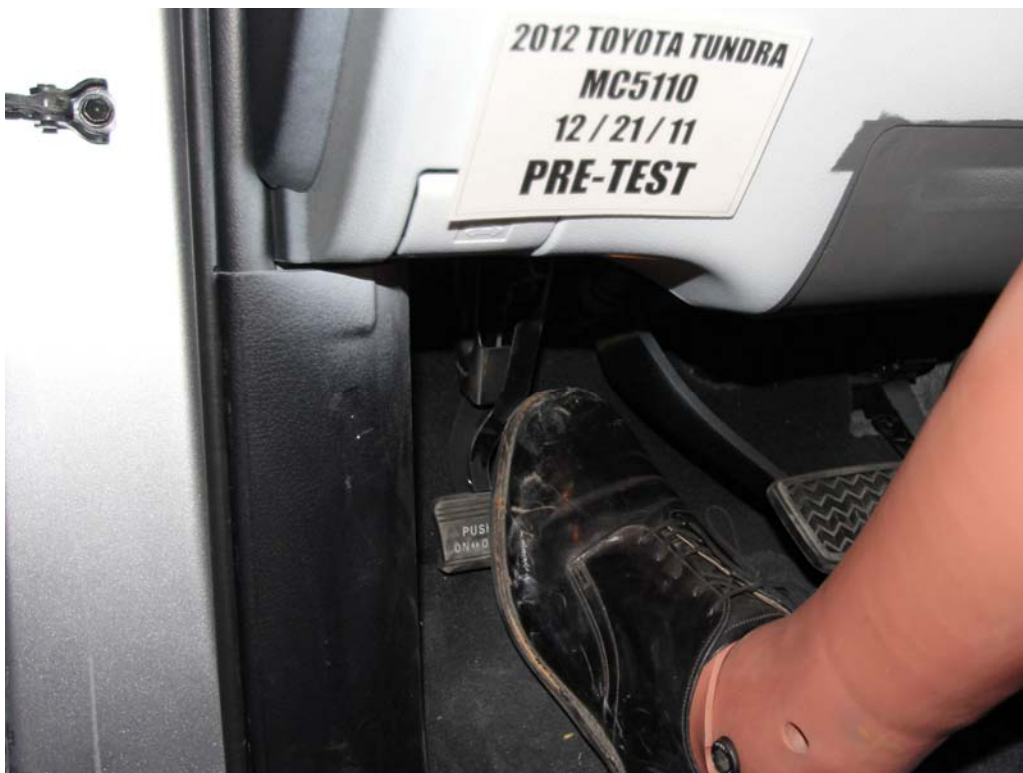


FIGURE 38. Pre-Test View of Parking Brake



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



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



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



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



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



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



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



FIGURE 46. Pre-Test Driver Inner Door Panel View



FIGURE 47. Post-Test Driver Inner Door Panel View



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

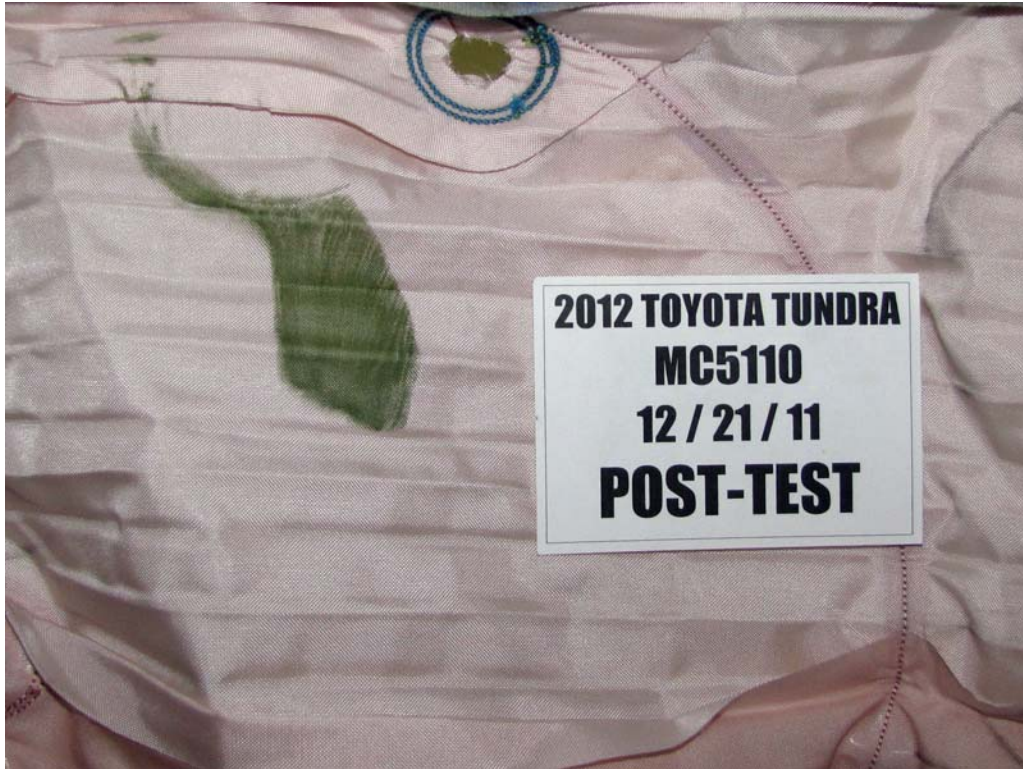


FIGURE 49. Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View



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



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



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

Photograph Not Applicable

No Driver Dummy Pelvis Contact With Side Airbag

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



FIGURE 54. Pre-Test Left Side View of Rear Passenger Dummy
Showing Belt, Chalking, and Contact Switches



FIGURE 55. Pre-Test Left Side View of Rear Passenger Dummy
Shoulder and Door Top View



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



FIGURE 57. Pre-Test Frontal View of Rear Passenger Seat Back
Prior to Dummy Positioning



FIGURE 58. Pre-Test Frontal View of Rear Passenger Dummy
Head and Shoulders in Relation to Head Restraint



FIGURE 59. Pre-Test Overhead View of Rear Passenger
Seat Pan Prior to Dummy Positioning



FIGURE 60. Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan



FIGURE 61. Pre-Test View of Rear Passenger Dummy's Neck
Showing Position of Adjustable Neck Bracket



FIGURE 62. Pre-Test View of Rear Passenger Dummy's Head
Showing Dummy's Head is Level



FIGURE 63. Pre-Test Placement of Rear Passenger Dummy's Feet



FIGURE 64. Pre-Test View of Belt Anchorage for Rear Passenger Dummy



FIGURE 65. Pre-Test Close-Up Left Side View of Rear Passenger Seat Track



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



FIGURE 67. Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint



FIGURE 68. Pre-Test Rear Passenger Dummy and Door Clearance View



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



FIGURE 70. Pre-Test Right Side View of Rear Passenger Dummy
and Rear Seat Occupant Compartment



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



FIGURE 72. Pre-Test Rear Passenger Inner Door Panel View



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



FIGURE 74. Post-Test Rear Passenger Dummy Close-Up
Head Contact with Vehicle Interior View

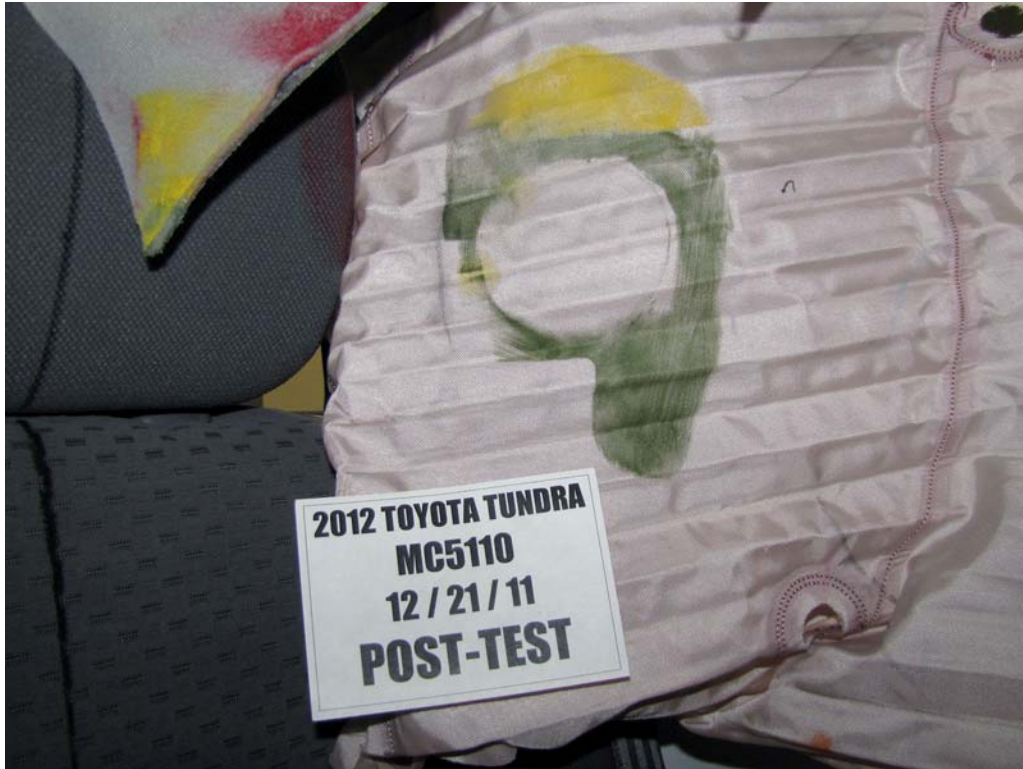


FIGURE 75. Post-Test Rear Passenger Dummy Close-Up
Head Contact with Side Airbag View



FIGURE 76. Post-Test Rear Passenger Dummy Close-Up
Torso Contact with Vehicle Interior View

Photograph Not Applicable

Vehicle Not Equipped With Rear Passenger Side Airbag

FIGURE 77. Post-Test Rear Passenger Dummy Close-Up
Torso Contact with Side Airbag View



FIGURE 78. Post-Test Rear Passenger Dummy Close-Up
Pelvis Contact with Vehicle Interior View

Photograph Not Applicable

Vehicle Not Equipped With
Rear Passenger Side Airbag

FIGURE 79. Post-Test Rear Passenger Dummy Close-Up
Pelvis Contact with Side Airbag View



FIGURE 80. Pre-Test View of Fuel Filler Cap



FIGURE 81. Post-Test View of Fuel Filler Cap



FIGURE 82. Pre-Test Front View of MDB Impactor Face



FIGURE 83. Post-Test Front View of MDB Impactor Face



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



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



FIGURE 86. Pre-Test Left Side View of MDB Impactor Face



FIGURE 87. Post-Test Left Side View of MDB Impactor Face



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



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



FIGURE 90. Close-Up View of Vehicle's Certification Label



FIGURE 91. Close-Up View of Vehicle's Tire Information Placard

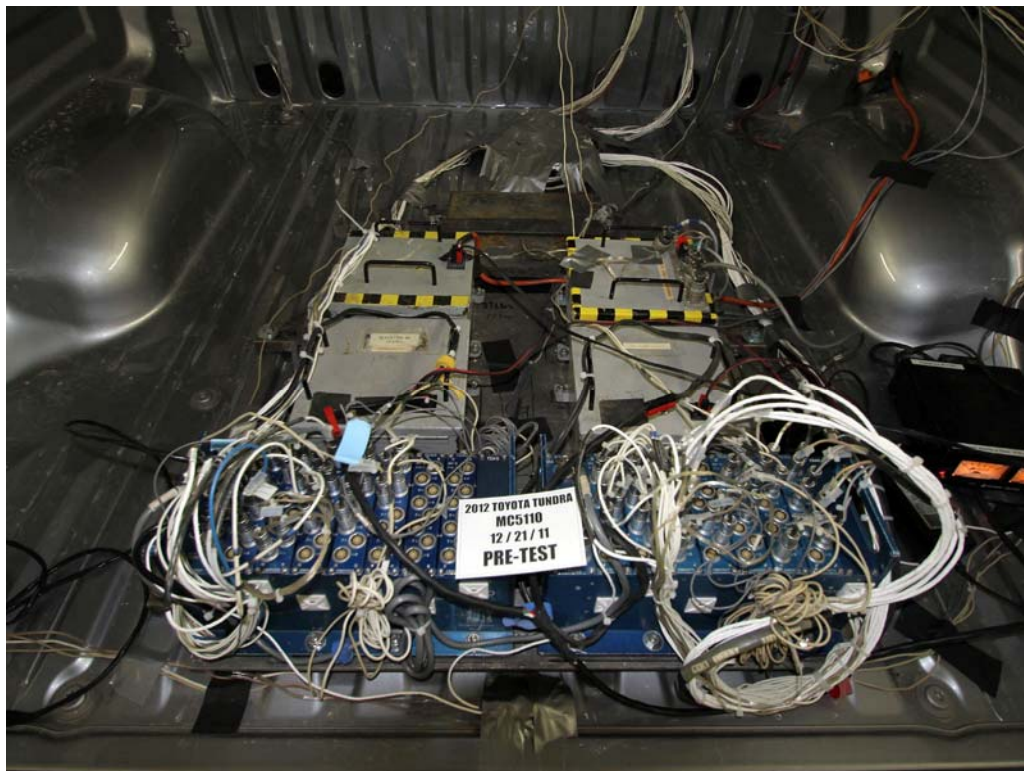


FIGURE 92. Pre-Test Ballast View



FIGURE 93. Post-Test Primary and Redundant Speed Trap Read-Out

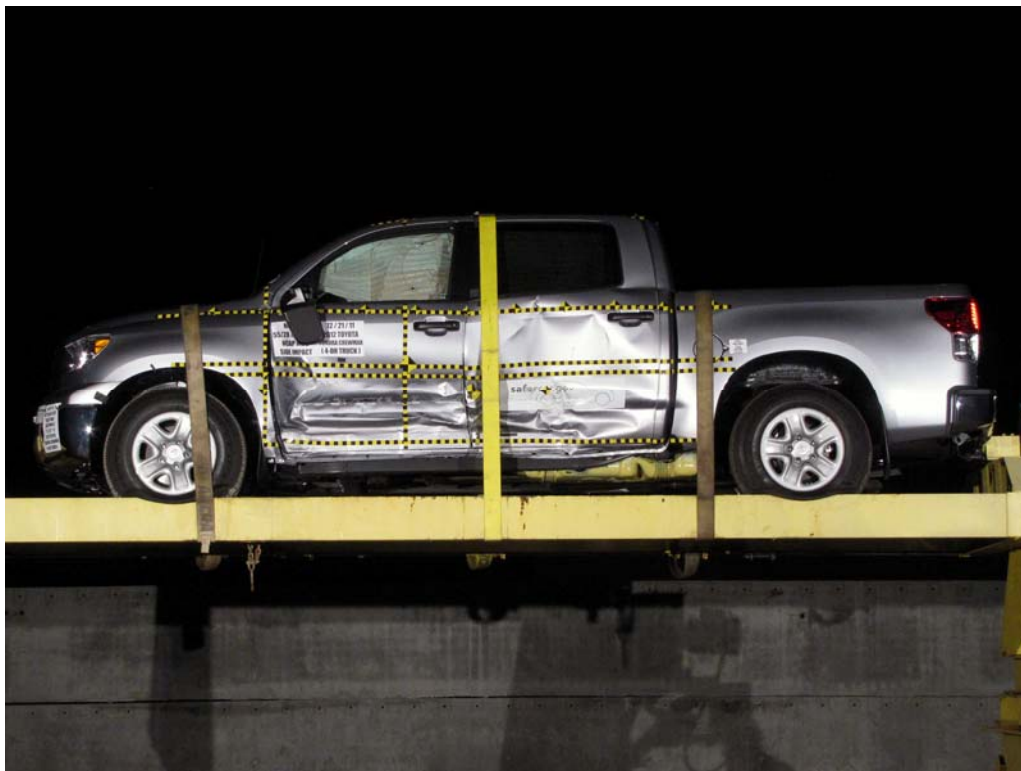


FIGURE 94. FMVSS No. 301 Static Rollover 0 Degrees

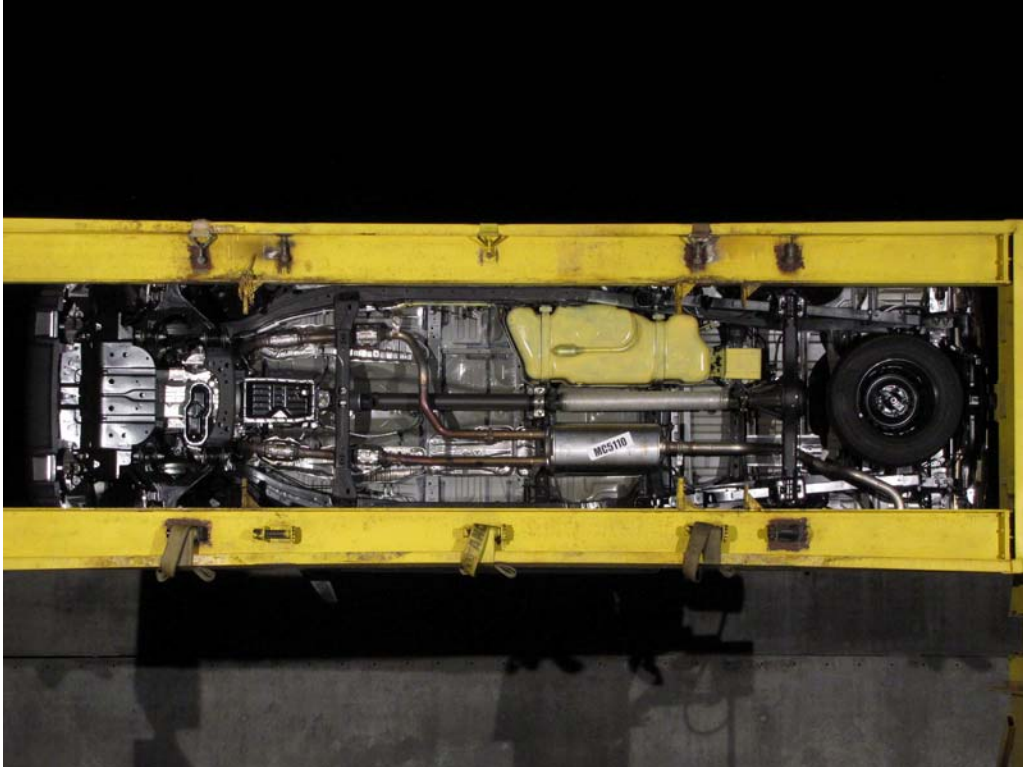


FIGURE 97. FMVSS No. 301 Static Rollover 270 Degrees

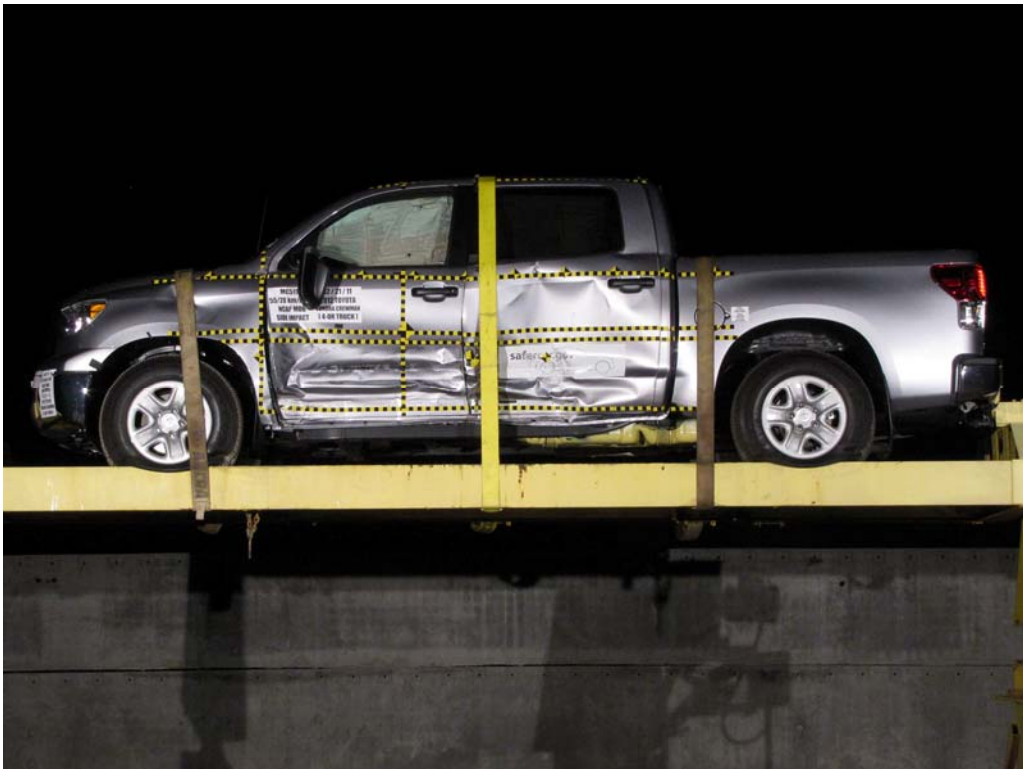


FIGURE 98. FMVSS No. 301 Static Rollover 360 Degrees



FIGURE 99. Impact Event

TOYOTA
moving forward

DESC: **TUNDRA 4X2** CREWMAX 4.6L V8
VIN: **5TFEM5F15CX036477**
YR/MO/L: 2011/02/04
CLR: SILVER SKY METALLIC/PL13 (1D6B13)
PORT/PLANT: San Antonio, TX/TMMTX RAILHEAD

STANDARD EQUIPMENT

MECHANICAL & PERFORMANCE

- 4.6L i-Force V8 302-hp with Dual Independent VVT, 310-hp / 227-tq-ft
- 6-Spd Automatic Transmission w/Overdrive
- TripleTech Frame, Fully-Riveted Fr. Section
- Standard L-Under Cab, 3-Point C-Under Bed
- 3.00 Rear Differential w/ 3.00 Rear Gear
- Automatic Limited-Slip Differential
- Hot Cold-Air High-Mounted Double-Wishbone Front Susp w/ Stabilizer Bar
- Truncated Multi-Leaf Rear Suspension
- w/ Staggered Outboard Mounted Shocks
- Power-Assisted 4-Wheel Disc Brakes
- 11" Dual 20 Whewl w/ P255/70R18 Tires

SAFETY & CONVENIENCE

- 11" Dual 20 Whewl w/ P255/70R18 Tires
- Control Blade System (ABS) w/ Electronic Brake Force Distribution (EBD), Brake Assist (BA), & Smart Trac Technology (STT)
- Trailer Sway Control
- Dr & Fr Park Advanced Airbag System
- Dr & Fr Pass Seat Belts & Buckle-Up Beep
- High-Beam Cut-off Angle Indicator
- 3-Point Seatbelts for All Passengers with Driver (DR) & ALSELA for All Passengers

EXTERIOR

- 4.6L Double-Walled Bed w/ Ball Cape
- Daytime Running Lights (DRL)
- Per Vertical to Window Highway Glass
- Easy Lower and Lift Tailgate

INTERIOR

- 10-Spd 5-Spd Fold-Down 4-Way Driver & 4-Way Passenger Adj Front Bolch Seat
- Fold-Flat Rear Seats
- Dual Zone Air Conditioning
- AM/FM CD w/ MP3/WMA Playback Capability, 6 Speakers, SiriusXM Compatible, Aux Jack
- Power Windows/Door Locks/Heated Mirrors
- Remote Locking, Entry System
- Power Controls, Engine Immobilizer
- Full Tank of Gas

MANUFACTURER'S SUGGESTED RETAIL PRICE \$30,085.00

OPTIONAL EQUIPMENT

- EV 50 Stable Emissions
- AM/FM CD Player
- with MP3/WMA Playback Capability, Six Speakers, SiriusXM Satellite Radio
- Includes 90-Day Trial Subscription to XM Select Package, Auxiliary Audio-Jack, USB Port with iPod Connectivity, and Hands-Free Phone Capability and Music Streaming via Bluetooth Wireless Technology
- Convenience Package
- Includes Fog Lamps and Auto Dimming Rearview Mirror with Compass, and SiriusXM Universal Transceiver
- CP Includes Towing Hitch Receiver, Trailer Brake Controller Pressure, 4-100 Rear Axle Ratio, TOW/Haul, Mode Select, Transmission Fluid Temperature Gauge, Supplemental Transmission Cooler, Heavy-Duty Battery, 170-Amp Alternator and 1-Pin Connector
- DK Preferred Owner's Package
- CF Carpet Floor Mats w/Door Sill Protector

GOVERNMENT SAFETY RATINGS

Frontal	Driver	Not Rated
Crash	Passenger	Not Rated

(Star ratings based on the risk of injury in a frontal impact. Frontal ratings should ONLY be compared to other vehicles of similar size and weight.)

Side	Front	Not Rated
Crash	Rear seat	Not Rated

(Star ratings based on the risk of injury in a side impact.)

Rollover ★★★

(Star ratings based on the risk of rollover in a single vehicle crash.)

Star ratings from 1 to 5 stars (★★★★★) with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA).

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

EPA Fuel Economy Estimates

CITY MPG	Estimated Annual Fuel Cost	HIGHWAY MPG
15	\$3,263	20

Expected range for most drivers: 12 to 18 MPG (City), 16 to 24 MPG (Highway)

Combined Fuel Economy: 17 MPG

based on 15,000 miles at \$3.75 per gallon

17 0 30 All Standard Pickups

Your actual mileage will vary depending on how you drive and maintain your vehicle.

DELIVERY PROCESSING AND HANDLING FEE 985.00

TOTAL \$32,830.00

The New Vehicle Limited Warranty provides 3-year/50,000-mile coverage. A 5-year/100,000-mile powertrain warranty is also available. See dealer for details. All vehicles are covered by a 3-year/50,000-mile bumper-to-bumper warranty. See dealer for details. All vehicles are covered by a 3-year/50,000-mile bumper-to-bumper warranty. See dealer for details.

Dealer Name / Address: 06117
DCH TOYOTA OF SIMI VALLEY
2381 FIRST STREET
SIMI VALLEY, CA 91358

Ship to:

FIGURE 100. Monroney Label

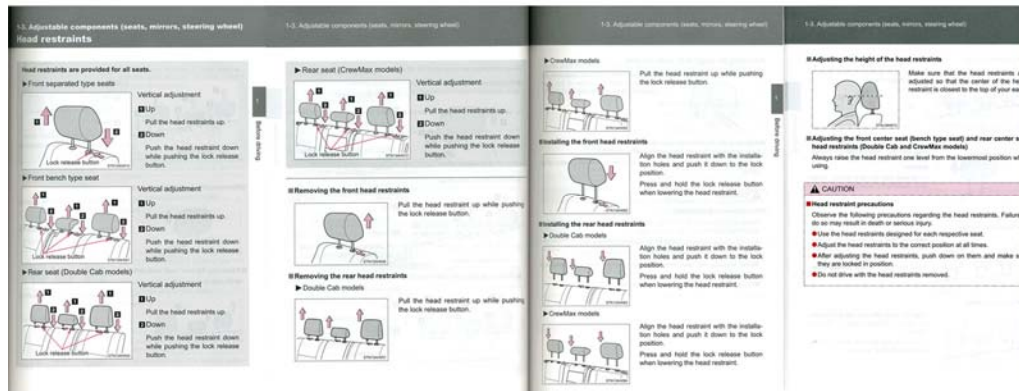


FIGURE 101. Driver Head Restraint Use and Adjustment
Information from Vehicle Owner's Manual

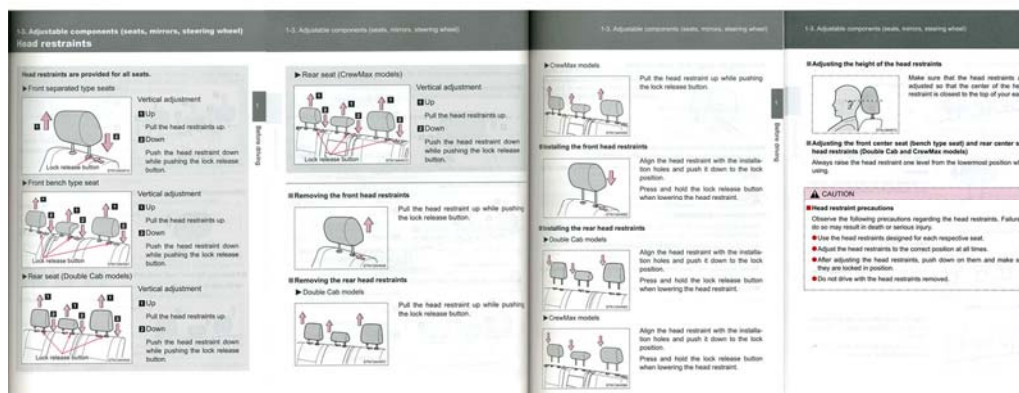


FIGURE 102. Left Rear Passenger Head Restraint
Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B
DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

Plot		Page
1	Driver Head Acceleration (X) Primary vs. Time	B-1
2	Driver Head Acceleration (Y) Primary vs. Time	B-1
3	Driver Head Acceleration (Z) Primary vs. Time	B-1
4	Driver Head Resultant Acceleration Primary vs. Time	B-1
5	Driver Upper Thorax Rib Deflection (Y) vs. Time	B-2
6	Driver Middle Thorax Rib Deflection (Y) vs. Time	B-2
7	Driver Lower Thorax Rib Deflection (Y) vs. Time	B-2
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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
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16	Passenger Head Acceleration (Z) vs. Time Primary	B-5
17	Passenger Head Resultant Acceleration Primary vs. Time	B-5
18	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-6
19	Passenger Lower Spine T12 Acceleration (Y) vs. Time	B-6
20	Passenger Lower Spine T12 Acceleration (Z) vs. Time	B-6
21	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-6
22	Passenger Iliac Force on Impact Side (Y) vs. Time	B-7
23	Passenger Acetabulum Force on Impact Side (Y) vs. Time	B-7
24	Passenger Total Pelvic Force on Impact Side (Y) vs. Time	B-7

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

Additional Driver & Passenger Dummy Instrumentation Data

Driver Lower Spine T12 Acceleration (X)

Driver Lower Spine T12 Acceleration (Y)

Driver Lower Spine T12 Acceleration (Z)

Passenger Upper Thorax Rib Deflection (Y)

Passenger Middle Thorax Rib Deflection (Y)

Passenger Lower Thorax Rib Deflection (Y)

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

Vehicle Instrumentation Data

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

MDB Instrumentation Data

MDB Center of Gravity Acceleration (X)

MDB Center of Gravity Acceleration (Y)

MDB Center of Gravity Acceleration (Z)

MDB Rear Acceleration (X)

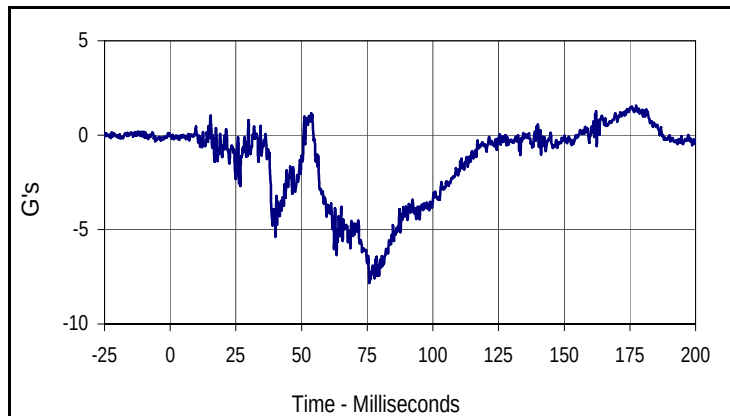
MDB Rear Acceleration (Y)

Left MDB Contact Switch

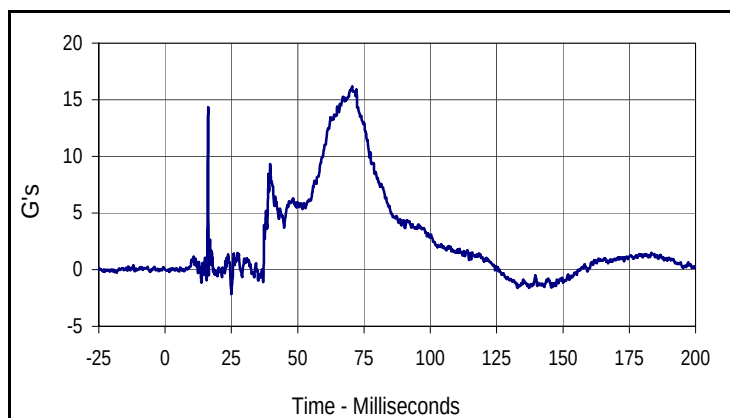
Right MDB Contact Switch

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

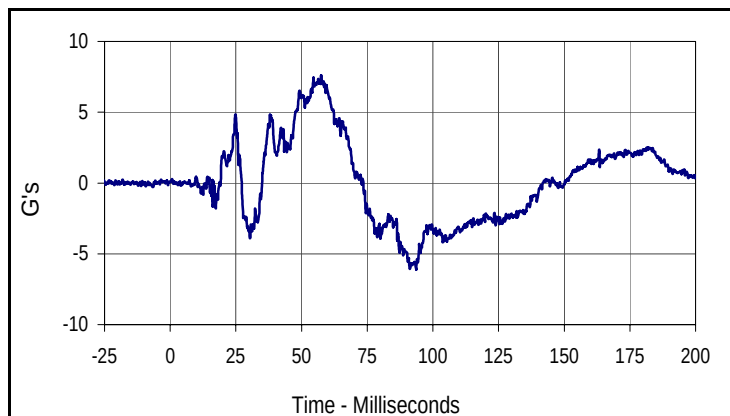
NHTSA No.: MC5110
 Test Date: 12/21/11



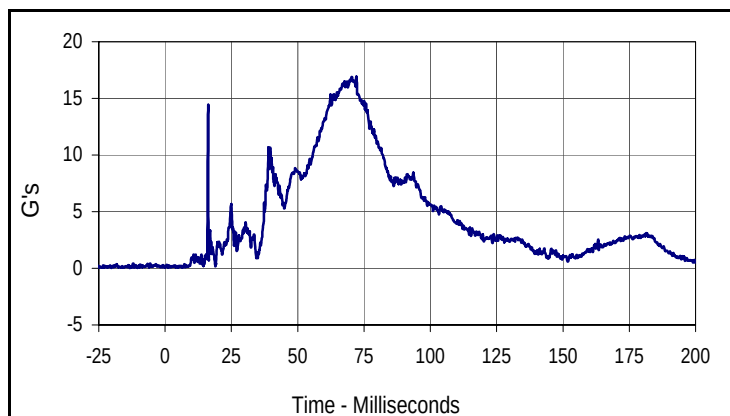
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Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
1.6	177.4	-7.8	75.7



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
16.2	70.5	-2.1	25.0



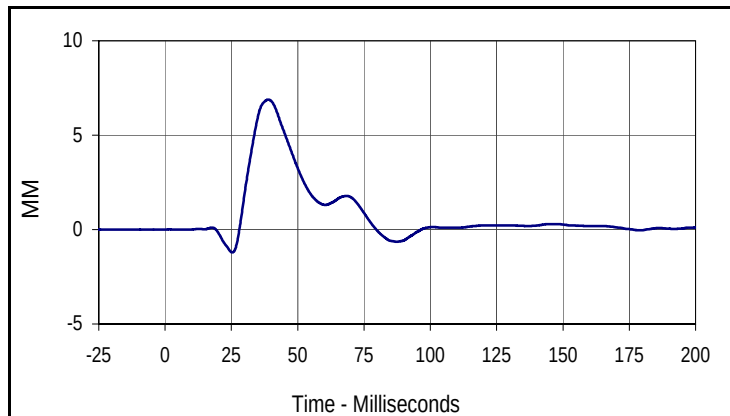
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Driver Head Acceleration Z Primary			
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Max	Time	Min	Time
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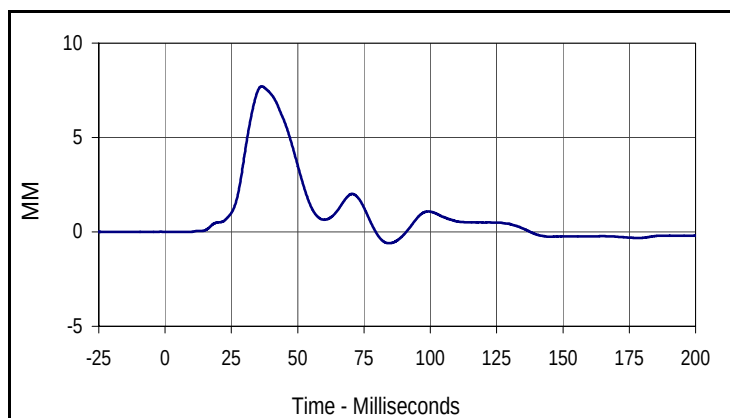
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Driver Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
16.9	72.1	0.0	1.1

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

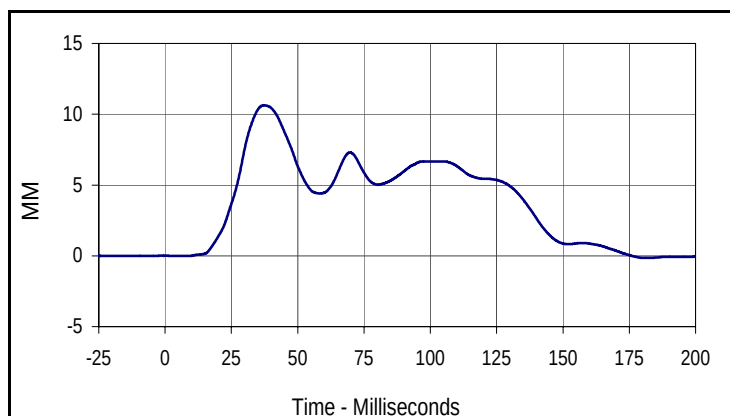
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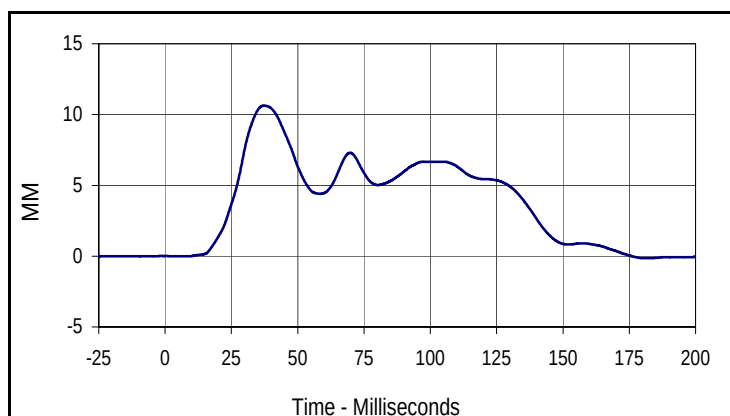
Curve Description			
Driver Upper Thorax Rib Deflection Y			
Plot No.	Type	SAE Class	Units
005	FIL	180	MM
Max	Time	Min	Time
6.9	38.9	-1.2	25.3



Curve Description			
Driver Middle Thorax Rib Deflection Y			
Plot No.	Type	SAE Class	Units
006	FIL	180	MM
Max	Time	Min	Time
7.7	36.4	-0.6	84.4



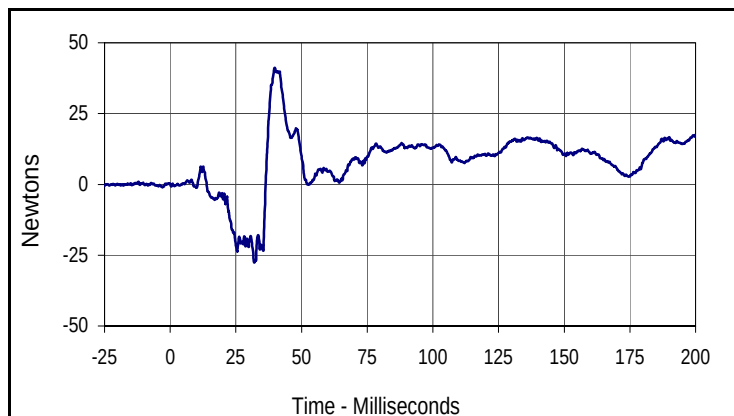
Curve Description			
Driver Lower Thorax Rib Deflection Y			
Plot No.	Type	SAE Class	Units
007	FIL	180	MM
Max	Time	Min	Time
10.6	37.3	-0.2	181.6



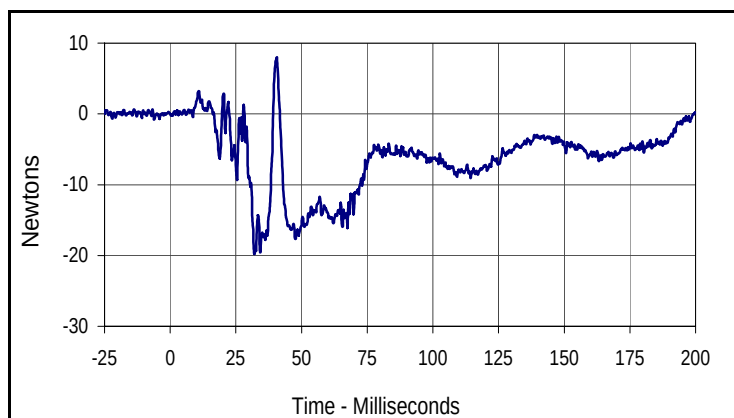
Curve Description			
Driver Thorax Rib Deflection Maximum			
Plot No.	Type	SAE Class	Units
010	FIL	180	MM
Max	Time	Min	Time
10.6	37.3	-0.2	181.6

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

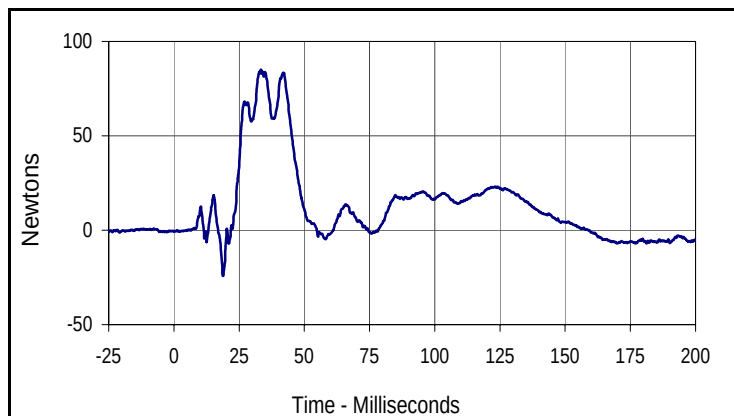
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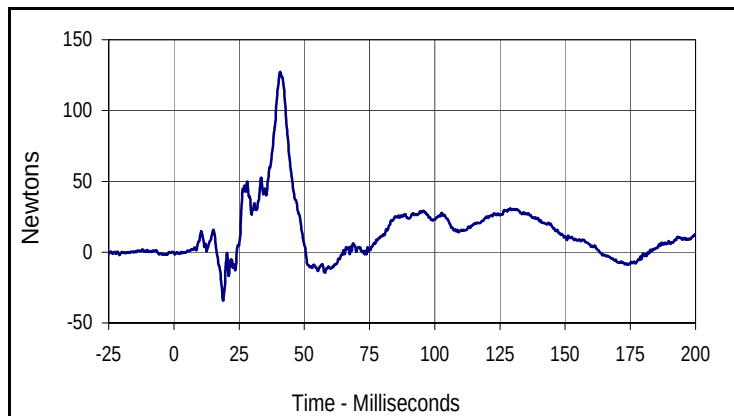
Curve Description			
Driver Anterior Abdominal Force Y			
Plot No.	Type	SAE Class	Units
008	FIL	600	Newtons
Max	Time	Min	Time
41.2	39.8	-27.6	32.0



Curve Description			
Driver Middle Abdominal Force Y			
Plot No.	Type	SAE Class	Units
009	FIL	600	Newtons
Max	Time	Min	Time
8.0	40.6	-19.8	32.0



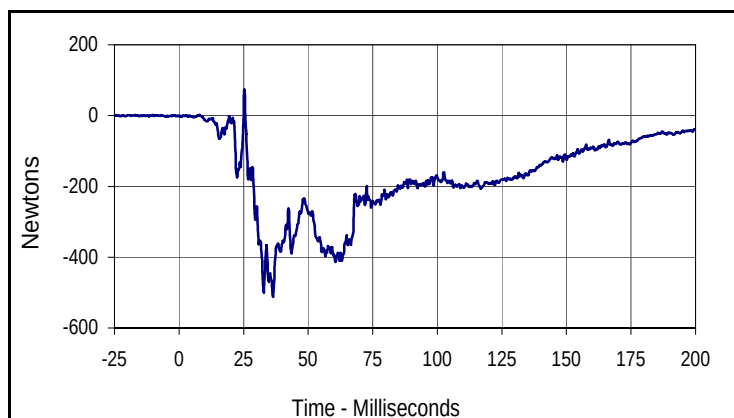
Curve Description			
Driver Posterior Abdominal Force Y			
Plot No.	Type	SAE Class	Units
011	FIL	600	Newtons
Max	Time	Min	Time
85.1	33.4	-24.3	18.8



Curve Description			
Driver Total Abdominal Force			
Plot No.	Type	SAE Class	Units
012	SUM	600	Newtons
Max	Time	Min	Time
127.4	40.7	-34.1	18.9

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck
Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

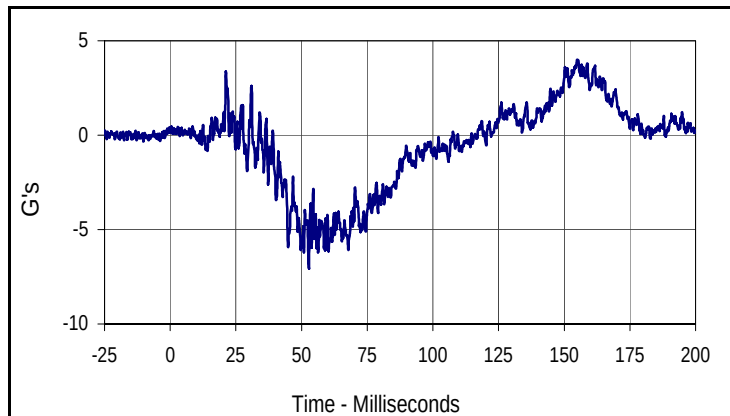
NHTSA No.: MC5110
Test Date: 12/21/11



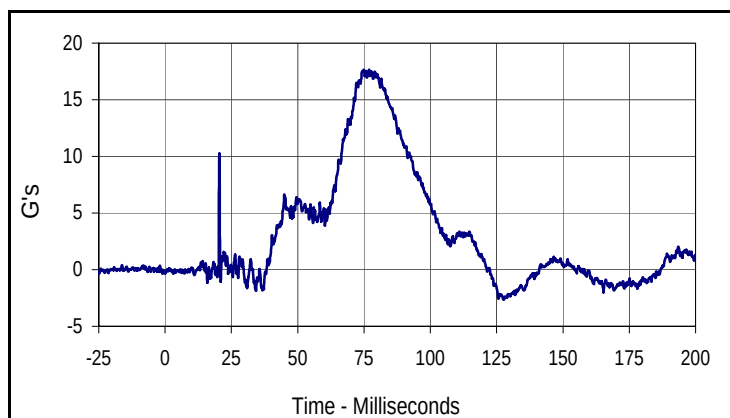
Curve Description			
Driver Pubic Symphysis Force Y			
Plot No.	Type	SAE Class	Units
013	FIL	600	Newtons
Max	Time	Min	Time
73.4	25.3	-511.9	36.4

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

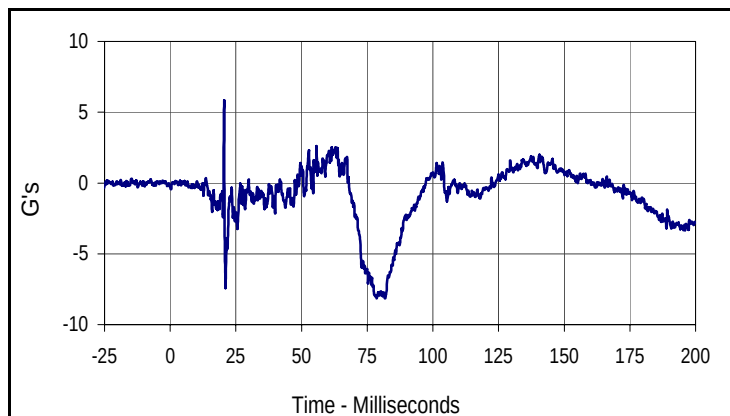
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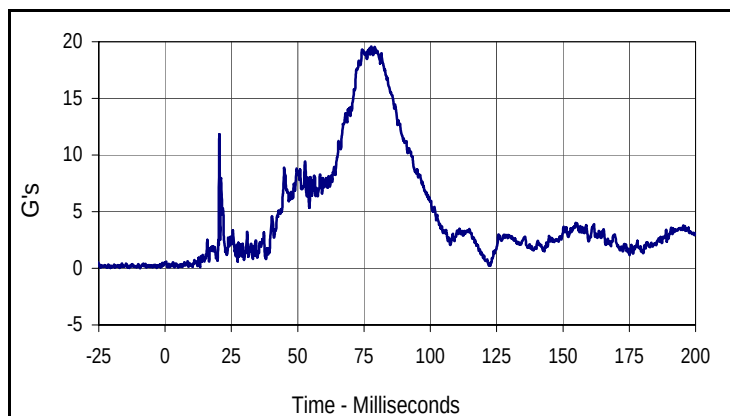
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Plot No.	Type	SAE Class	Units
014	FIL	1000	G's
Max	Time	Min	Time
4.0	154.9	-7.1	52.8



Curve Description			
Passenger Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
015	FIL	1000	G's
Max	Time	Min	Time
17.7	76.9	-2.6	127.8



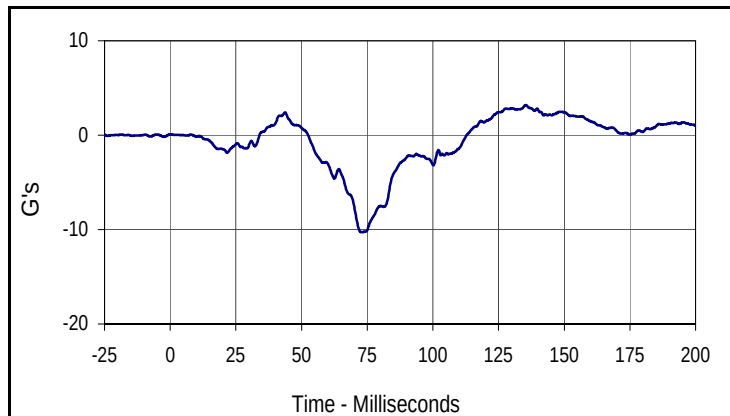
Curve Description			
Passenger Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
016	FIL	1000	G's
Max	Time	Min	Time
5.8	20.5	-8.2	81.7



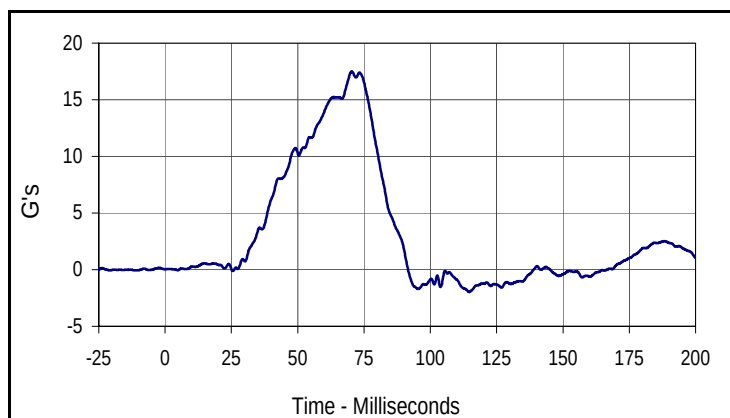
Curve Description			
Passenger Head Acceleration Resultant Primary			
Plot No.	Type	SAE Class	Units
017	RES	1000	G's
Max	Time	Min	Time
19.6	77.7	0.1	4.9

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

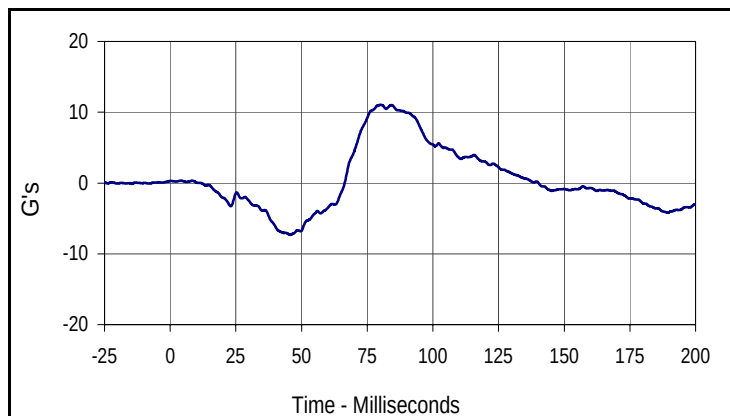
NHTSA No.: MC5110
 Test Date: 12/21/11



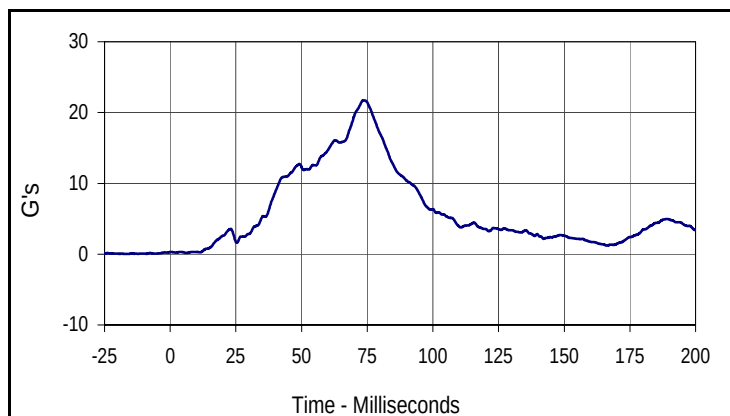
Curve Description			
Passenger Lower Spine T12 Acceleration X			
Plot No.	Type	SAE Class	Units
019	FIL	180	G's
Max	Time	Min	Time
3.2	135.3	-10.3	72.8



Curve Description			
Passenger Lower Spine T12 Acceleration Y			
Plot No.	Type	SAE Class	Units
020	FIL	180	G's
Max	Time	Min	Time
17.5	70.4	-2.0	114.7



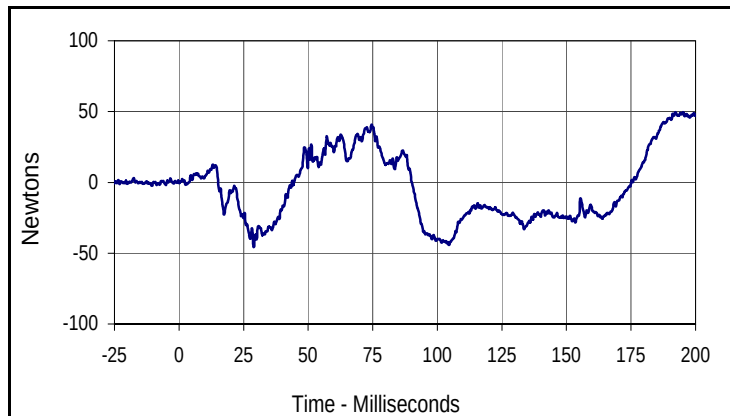
Curve Description			
Passenger Lower Spine T12 Acceleration Z			
Plot No.	Type	SAE Class	Units
021	FIL	180	G's
Max	Time	Min	Time
11.0	80.0	-7.3	45.6



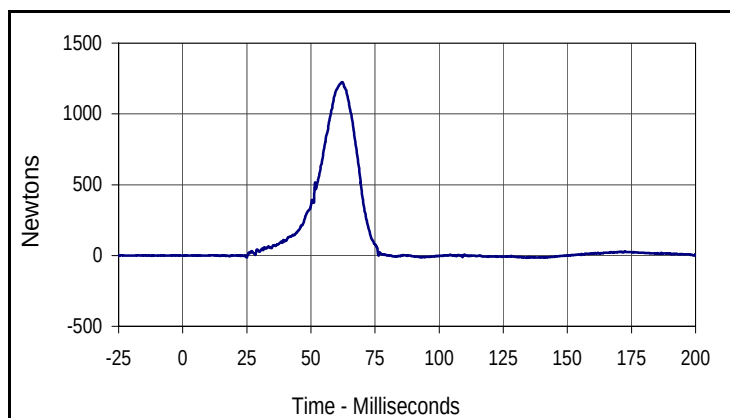
Curve Description			
Passenger Lower Spine T12 Acceleration Res.			
Plot No.	Type	SAE Class	Units
022	RES	180	G's
Max	Time	Min	Time
21.7	73.6	0.2	6.0

Test Vehicle: 2012 Toyota Tundra Crewmax 4-Door Truck
 Test Program: 61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test

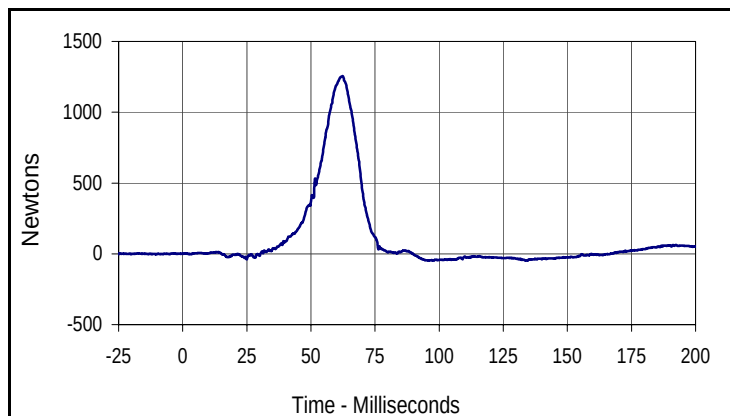
NHTSA No.: MC5110
 Test Date: 12/21/11



Curve Description			
Passenger Iliac Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
023	FIL	600	Newtons
Max	Time	Min	Time
49.7	195.1	-45.7	28.9



Curve Description			
Passenger Acetabulum Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
024	FIL	600	Newtons
Max	Time	Min	Time
1224.3	62.3	-17.2	134.1



Curve Description			
Passenger Total Pelvic Force			
Plot No.	Type	SAE Class	Units
018	SUM	600	Newtons
Max	Time	Min	Time
1255.8	62.4	-48.8	134.1

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: 12/16/11
 Test I.D.: N/A



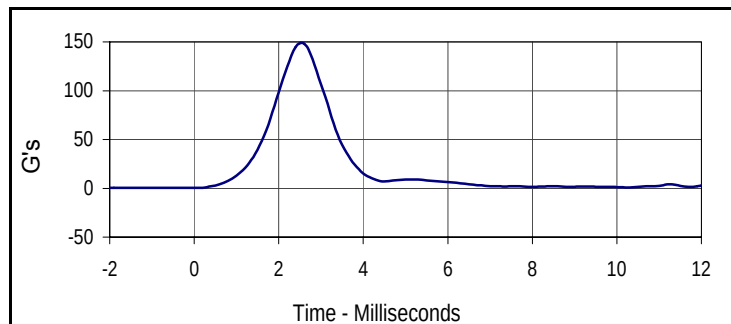
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	32	Pass
1	Sitting Height	mm	900 - 918	910	Pass
2	Seat to Shoulder Joint	mm	558 - 572	563	Pass
3	Seat to Lower Face of Thoracic Spine Box	mm	346 - 356	352	Pass
4	Seat to Hip Joint (Center of Bolt)	mm	97 - 103	100	Pass
5	Sole to Seat, Sitting	mm	333 - 451	379	Pass
6	Head Width	mm	152 - 158	156	Pass
7	Shoulder / Arm Width	mm	461 - 479	472	Pass
8	Thorax Width	mm	322 - 332	328	Pass
9	Abdomen Width	mm	273 - 287	276	Pass
10	Pelvis Lap Width	mm	359 - 373	360	Pass
11	Head Depth	mm	196 - 206	203	Pass
12	Thorax Depth	mm	262 - 272	268	Pass
13	Abdomen Width	mm	194 - 204	199	Pass
14	Pelvis Depth	mm	235 - 245	244	Pass
15	Back of Buttocks to Hip Joint (Center of Bolt)	mm	150 - 160	153	Pass
16	Back of Buttocks to Front Knee	mm	597 - 615	603	Pass
Overall Test Results					Pass

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

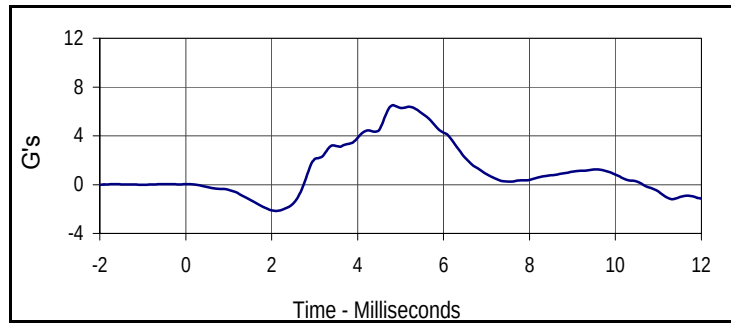
Test Date: 12/16/11
 Test I.D.: F035HD021



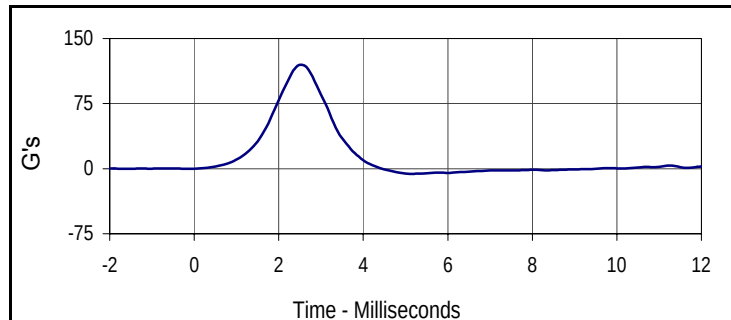
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	250	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	33.2	Pass
Peak Head Resultant Acceleration	G's	125 to 155	148.8	Pass
Peak Head X Acceleration	G's	≤15	6.5	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	6.2	Pass
Overall Test Results				Pass



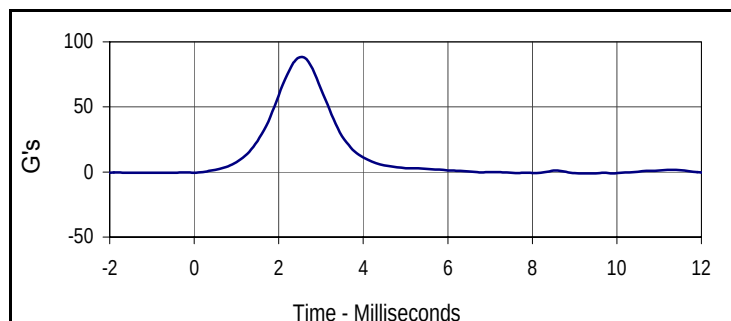
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
148.8	2.5	0.4	-0.2



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
6.5	4.8	-2.2	2.1



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
119.9	2.5	-5.9	5.2



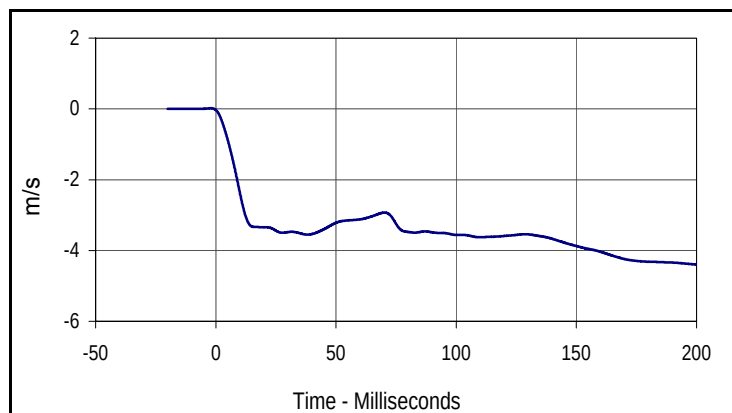
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
88.2	2.5	-1.1	9.4

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

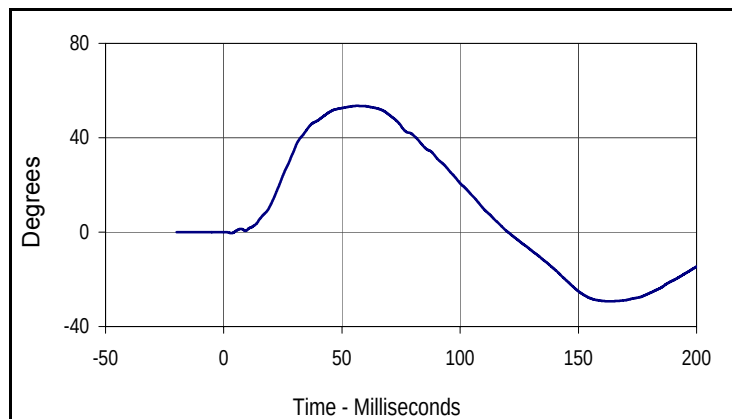
Test Date: 12/16/11
 Test I.D.: F035NB021



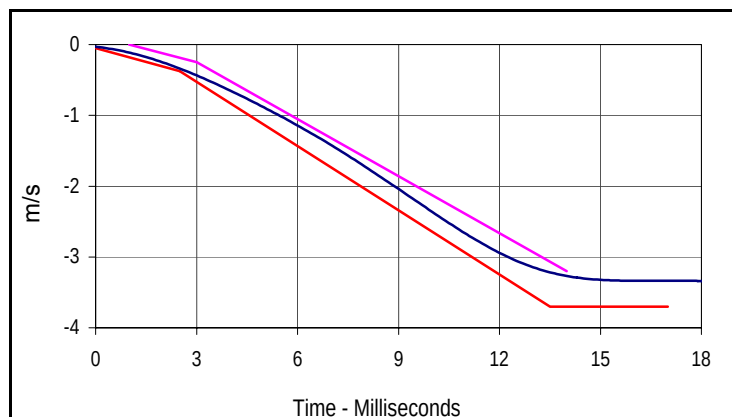
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	290	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	32.8	Pass
Pendulum Velocity	m/s	3.3 to 3.5	3.4	Pass
Headform Flexion	Max	49 to 59	53.5	Pass
	Time	54 to 66	56.5	Pass
Headform Flexion Decay (Peak to Zero)	msec	53 to 88	63.8	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	-2.1	-4.4	200.0



Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
53.5	56.5	-29.2	162.8



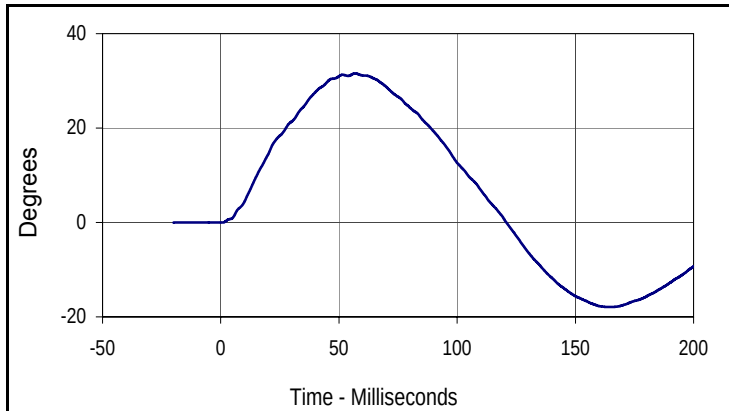
Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-2.1	-4.4	200.0

Velocity Corridors

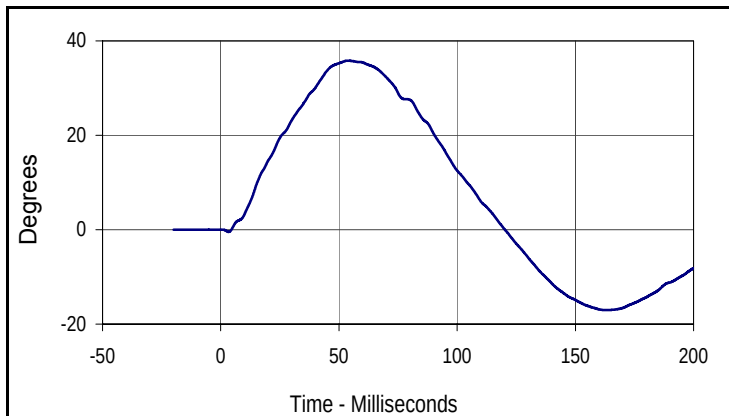
Upper Boundary		Lower Boundary	
Time (msec)	Velocity (m/s)	Time (msec)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.0	-0.03	2.5	-0.375
14.0	-3.20	13.5	-3.70
		17.0	-3.70

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

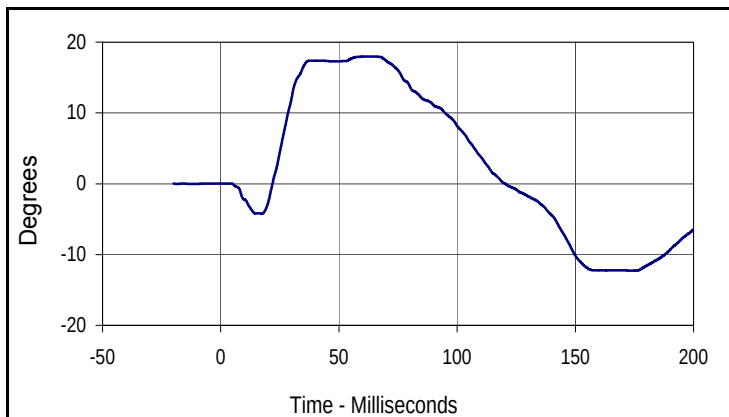
Test Date: 12/16/11
 Test I.D.: F035NB021



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
31.6	56.9	-17.9	165.7



Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
35.8	53.6	-17.0	162.3



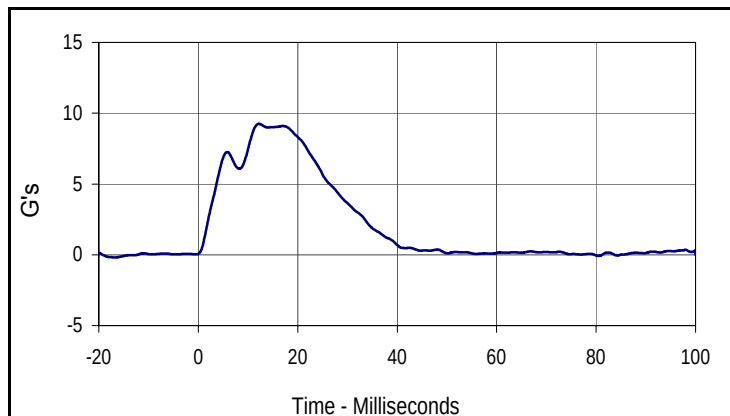
Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
18.0	63.8	-12.3	175.5

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

Test Date: 12/16/11
 Test I.D.: F035SH021



Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	340	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	33.4	Pass
Pendulum Speed	m/s	4.2 to 4.4	4.2	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	9.2	Pass
Overall Test Results			Pass	



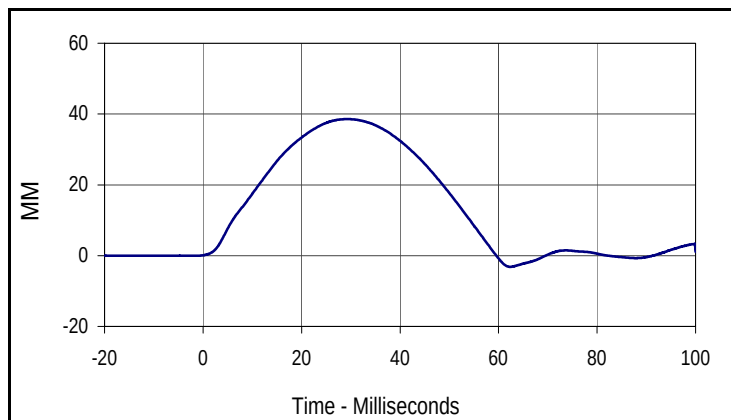
Curve Description			
Probe Impactor Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
9.2	12.2	-0.2	-16.7

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

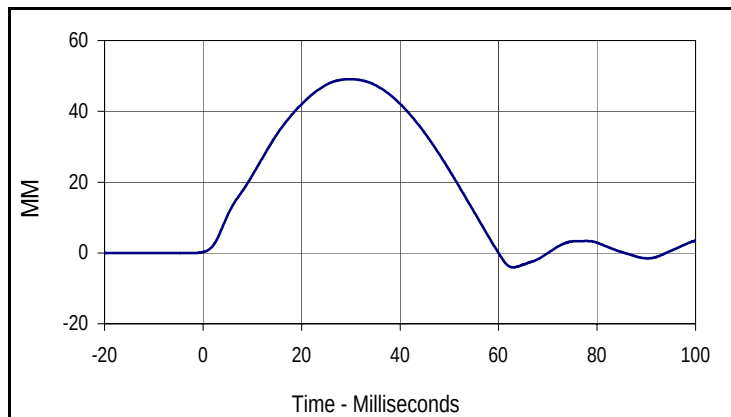
Test Date: 12/16/11
 Test I.D.: F035UR021



Tested Parameter	Units	Specification	Result	Pass/Fail
Rib Module Soak Time	Minutes	≥240	390	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	31.9	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	49.1	Pass
Overall Test Results				Pass



Curve Description			
Upper Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
38.6	29.3	-3.2	62.4



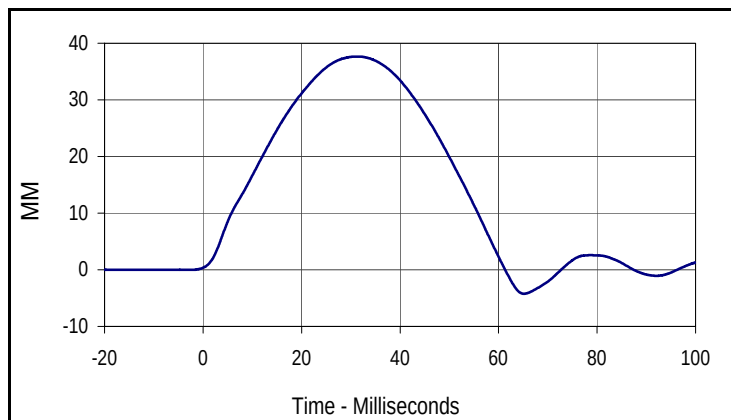
Curve Description			
Upper Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
49.1	29.8	-4.1	62.9

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

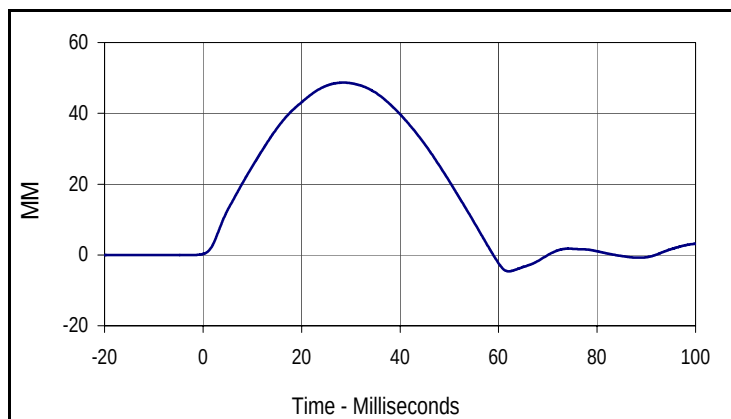
Test Date: 12/16/11
 Test I.D.: F035MR021



Tested Parameter	Units	Specification	Result	Pass/Fail
Rib Module Soak Time	Minutes	≥240	410	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	32.2	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height	mm	36 to 40	37.6	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height	mm	46 to 51	48.7	Pass
Overall Test Results			Pass	



Curve Description			
Middle Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
37.6	31.3	-4.2	65.2



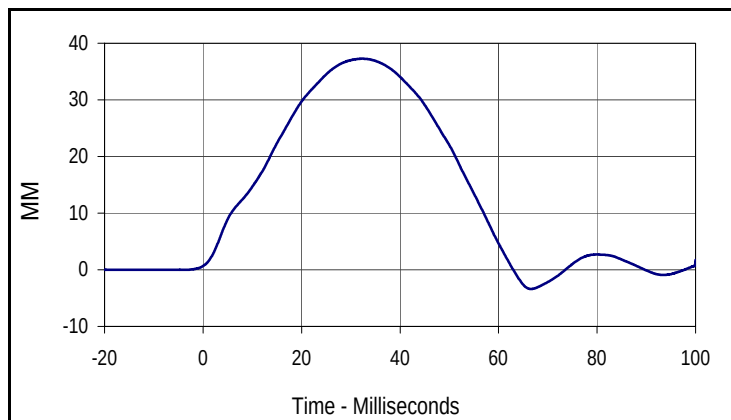
Curve Description			
Middle Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
48.7	28.5	-4.6	62.1

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

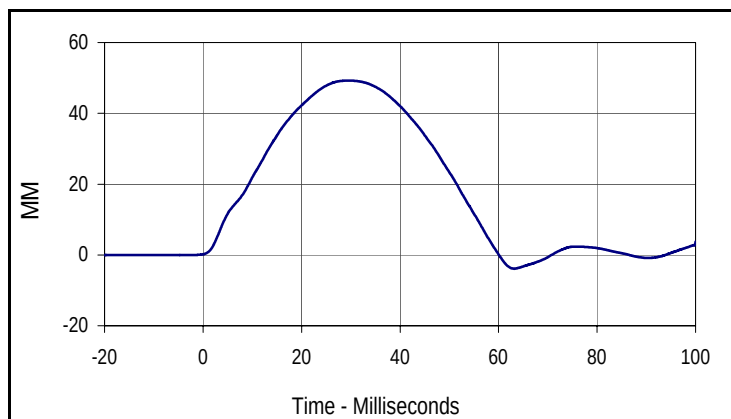
Test Date: 12/16/11
 Test I.D.: F035LR021



Tested Parameter	Units	Specification	Result	Pass/Fail
Rib Module Soak Time	Minutes	≥240	440	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	34.2	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height	mm	36 to 40	37.3	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height	mm	46 to 51	49.3	Pass
Overall Test Results				Pass



Curve Description			
Lower Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
37.3	32.3	-3.4	66.6



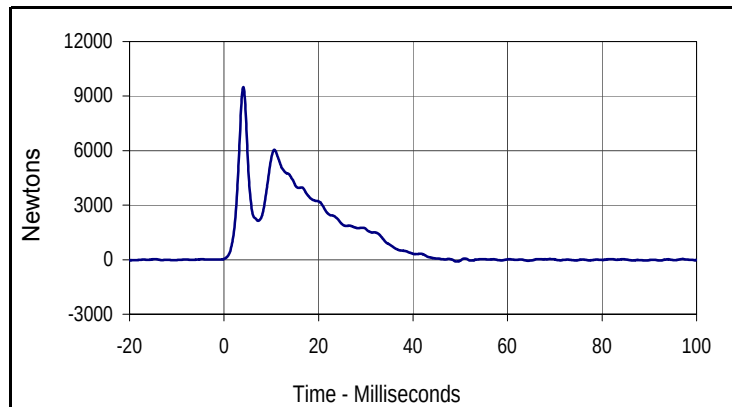
Curve Description			
Lower Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
49.3	29.5	-3.9	63.2

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

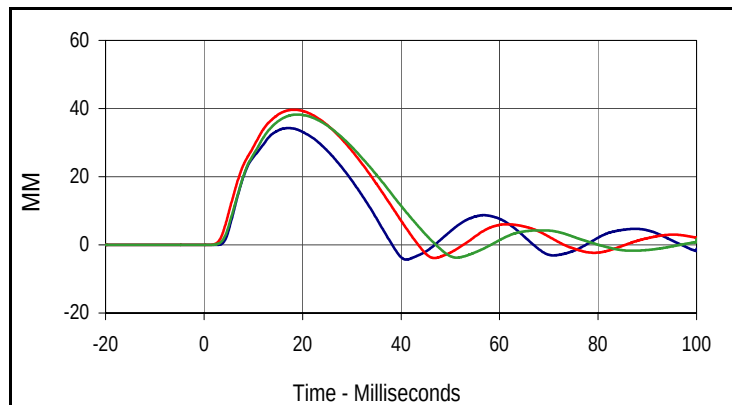
Test Date: 12/16/11
 Test I.D.: F035TH021



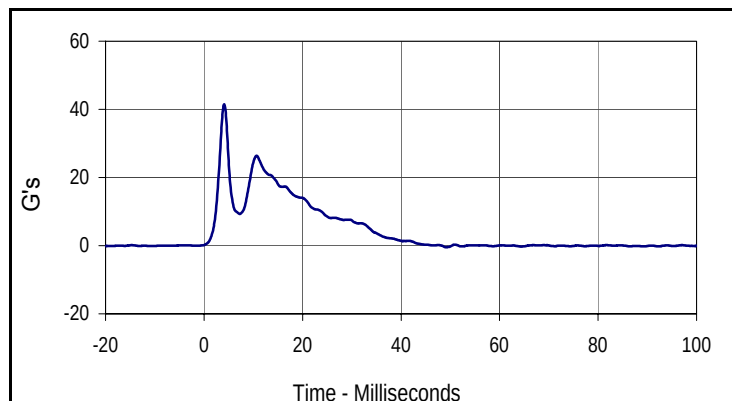
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	470	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	33.9	Pass
Peak Impactor Velocity	m/s	5.4 to 5.6	5.5	Pass
Peak Impactor Force	N	5100 to 6200	6041.9	Pass
	msec	> 6.0 msec	10.7	Pass
Peak Upper Rib Deflection	mm	34 to 41	34.3	Pass
Peak Middle Rib Deflection	mm	37 to 45	39.7	Pass
Peak Lower Rib Deflection	mm	37 to 44	38.2	Pass
Overall Test Results				Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
9503.9	4.1	-102.8	49.1



Curve Description			
Upper, Middle, Lower Rib Deflections			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max (Upper)	Time	Min (Upper)	Time
34.3	17.2	-4.3	41.0
Max (Middle)	Time	Min (Middle)	Time
39.7	18.2	-3.9	46.8
Max (Lower)	Time	Min (Lower)	Time
38.2	18.9	-3.8	51.3



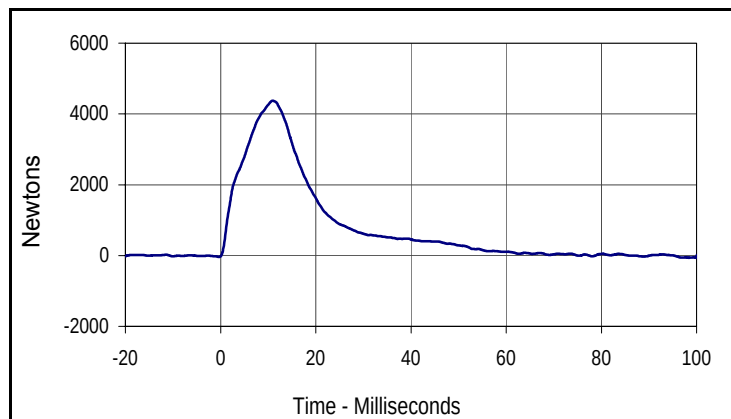
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
41.5	4.1	-0.4	49.1

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

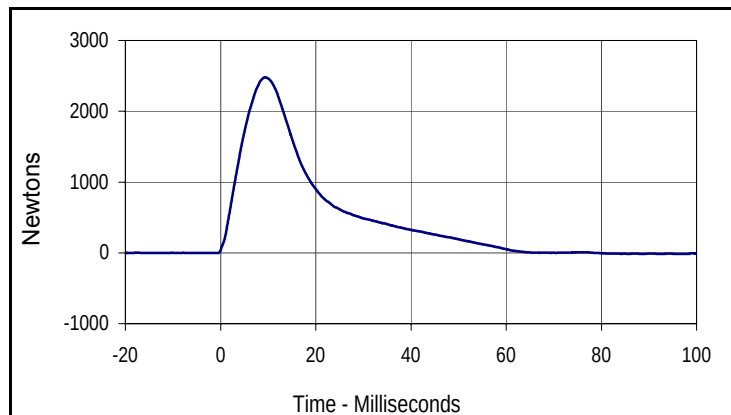
Test Date: 12/16/11
 Test I.D.: F035ABD021



Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	480	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	34.6	Pass
Probe Velocity	m/s	3.9 to 4.1	3.9	Pass
Peak Impactor Force	N	4000 to 4800	4376.9	Pass
	msec	10.6 to 13.0	10.9	Pass
Sum of Abdominal Forces	N	2200 to 2700	2478.5	Pass
	msec	10.0 to 12.3	10.7	Pass
Overall Test Results				Pass



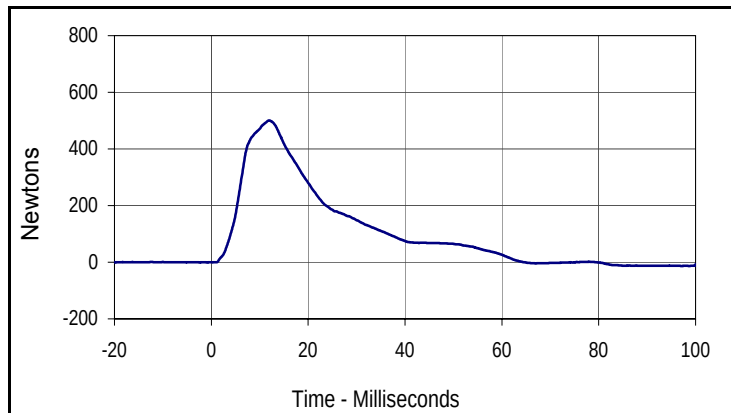
Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4376.9	10.9	-63.9	98.4



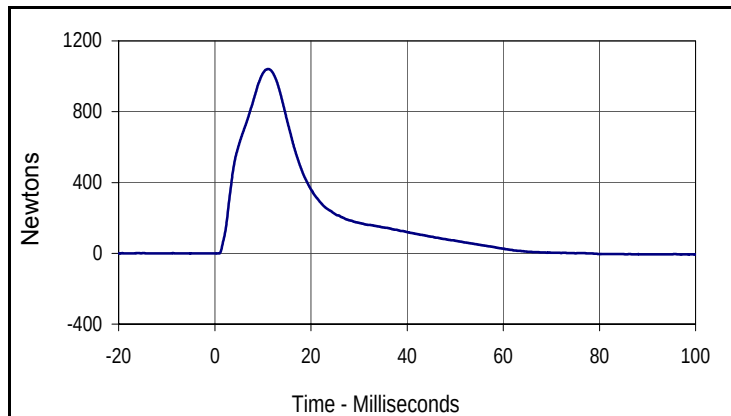
Curve Description			
Abdomen Sum Resultant			
Plot No.	Type	SAE Class	Units
002	RES	600	Newtons
Max	Time	Min	Time
2478.5	10.7	-16.4	97.1

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

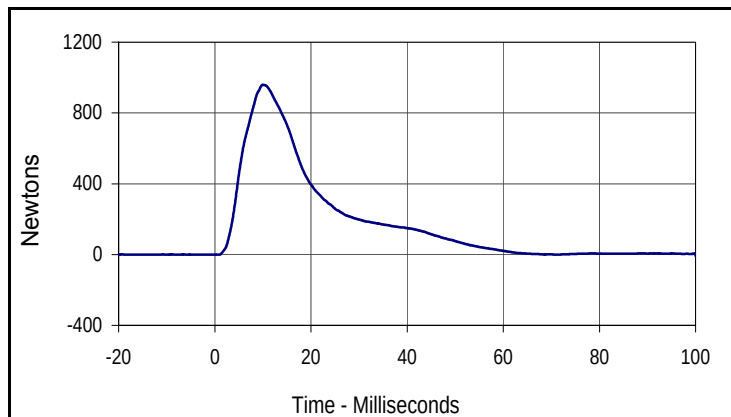
Test Date: 12/16/11
 Test I.D.: F035ABD021



Curve Description			
Front Abdomen Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
500.5	11.9	-13.3	97.0



Curve Description			
Middle Abdomen Force			
Plot No.	Type	SAE Class	Units
004	FIL	600	Newtons
Max	Time	Min	Time
1040.8	11.1	-8.5	0.0



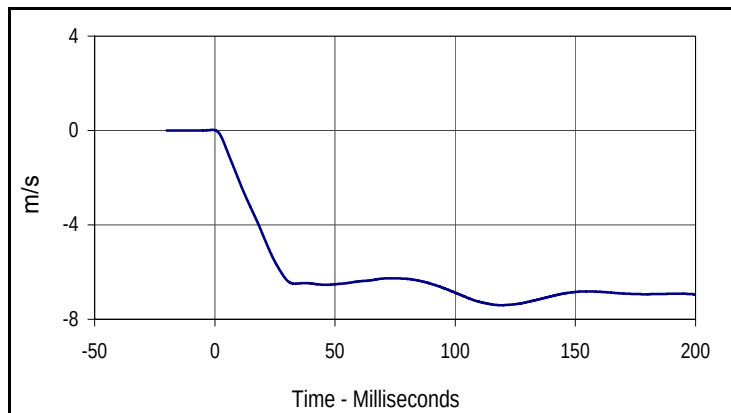
Curve Description			
Rear Abdomen Force			
Plot No.	Type	SAE Class	Units
005	FIL	600	Newtons
Max	Time	Min	Time
958.8	10.0	-8.5	0.0

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

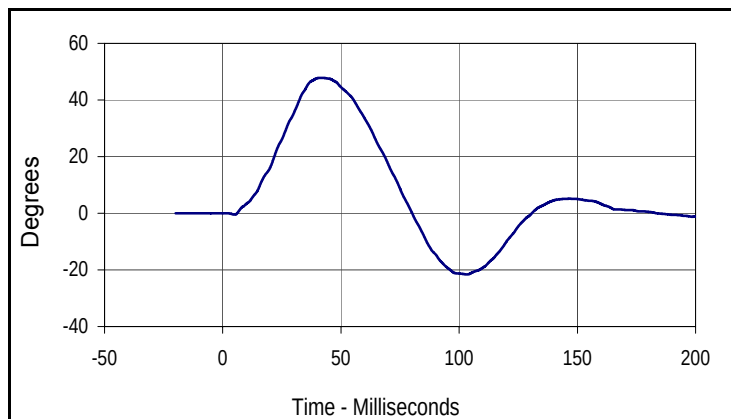
Test Date: 12/16/11
 Test I.D.: F035LB021



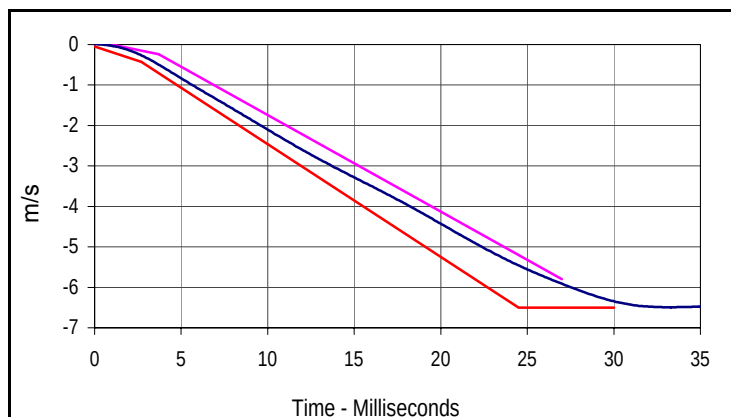
Tested Parameter	Units	Specification	Result	Pass/Fail
Lumbar Spine Assembly Soak Time	Minutes	≥240	540	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	32.9	Pass
Pendulum Velocity	m/s	5.95 to 6.15	6.04	Pass
Headform Rotation	Max	45 to 55	47.9	Pass
	Time	39 to 53	41.8	Pass
Time of Decay to Zero Angle from Peak	msec	37 to 57	38.4	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	-7.4	119.0



Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
47.9	41.8	-21.6	103.2



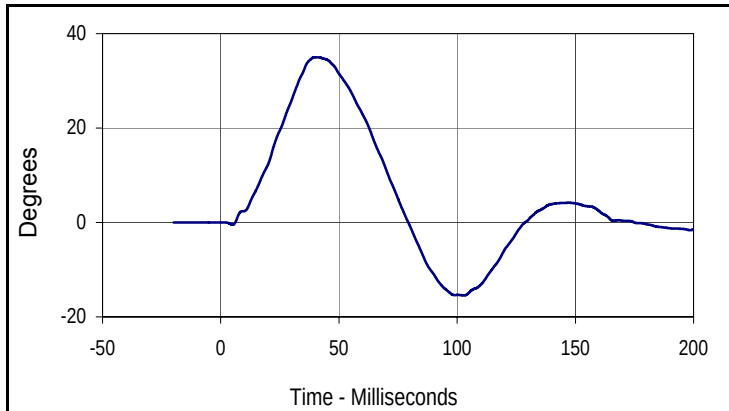
Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-0.9	-7.4	119.0

Velocity Corridors

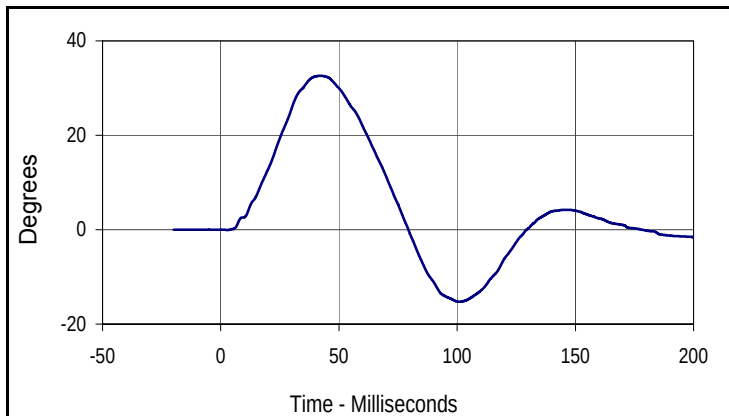
Upper Boundary		Lower Boundary	
Time (msec)	Velocity (m/s)	Time (msec)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.7	-0.24	2.7	-0.425
27.0	-5.80	24.5	-6.50
		30.0	-6.50

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

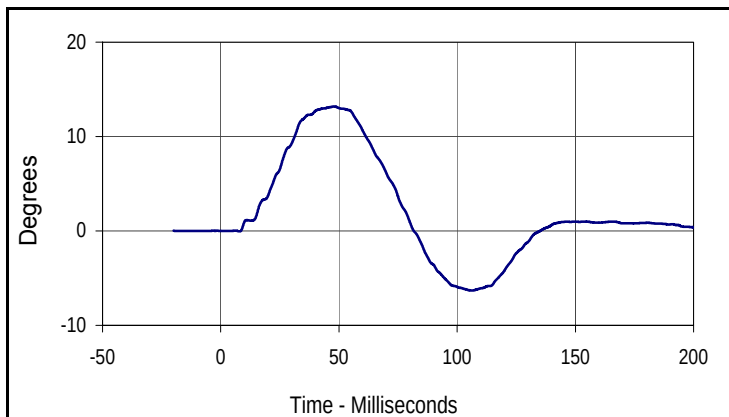
Test Date: 12/16/11
 Test I.D.: F035LB021



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
35.0	39.8	-15.4	102.8



Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
32.6	41.9	-15.3	101.1



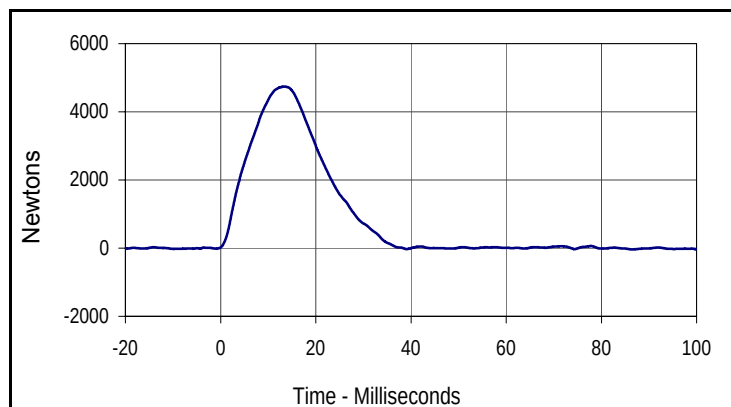
Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
13.2	47.9	-6.3	106.3

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

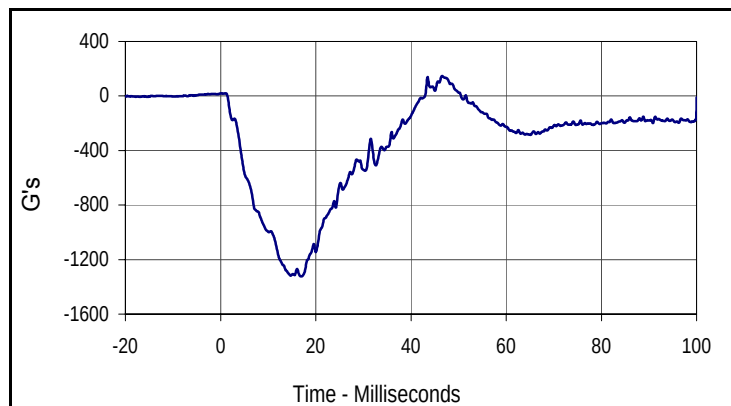
Test Date: 12/16/11
 Test I.D.: F035PL021



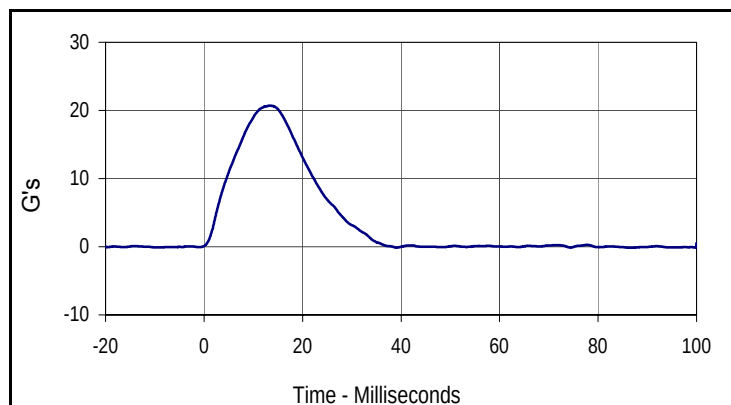
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	580	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	32.5	Pass
Pendulum Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Impactor Force	N	4700 to 5400	4743.7	Pass
	msec	11.8 to 16.1	13.4	Pass
Peak Pubic Symphysis Load	N	-1230 to -1590	-1322.8	Pass
	msec	12.2 to 17.0	17	Pass
Overall Test Results				Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4743.7	13.4	-36.1	86.5



Curve Description			
Pubic Symphysis Force Y			
Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
147.0	46.5	-1322.8	17.0



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
20.7	13.4	-0.2	86.5

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

Test Date: 12/16/11
 Test I.D.: N/A



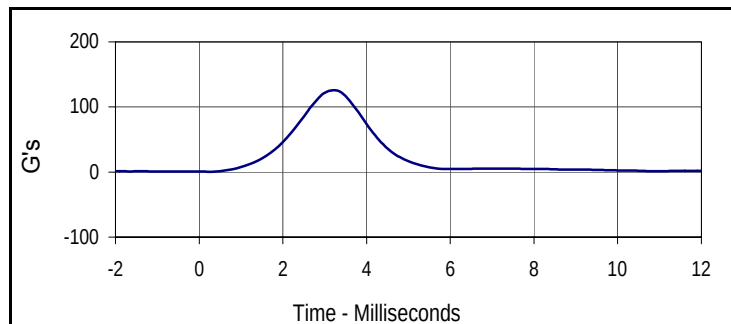
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.3	Pass
Laboratory Relative Humidity		%	10 to 70	32	Pass
A	Sitting Height	mm	772 - 788	778	Pass
B	Shoulder Pivot Height	mm	437 - 453	447	Pass
C	H-Point Height	mm	79 - 89	81	Pass
D	H-Point from Seatback	mm	141 - 151	147	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	103	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	182	Pass
J	Head Circumference	mm	541 - 551	547	Pass
K	Buttock to Knee Length	mm	514 - 540	527	Pass
L	Popliteal Height	mm	343 - 369	348	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	400	Pass
N	Buttock Popliteal Length	mm	416 - 442	430	Pass
O	Chest Depth w/o Jacket	mm	195 - 211	204	Pass
P	Foot Length	mm	216 - 232	221	Pass
Q	Hip Breadth with Pelvic Plug	mm	313 - 323	317	Pass
R	Arm Length	mm	249 - 259	251	Pass
S	Knee Joint to Seatback	mm	477 - 493	480	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	875	Pass
Z	Waist Circumference	mm	760 - 791	773	Pass
Overall Test Results					Pass

Test Program: SID IIs Head Drop Test
 ATD Serial No.: 307

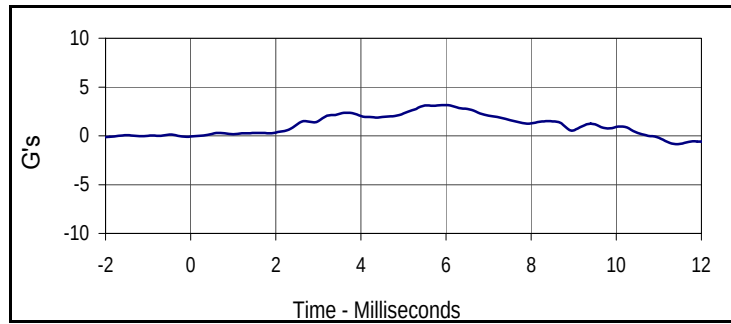
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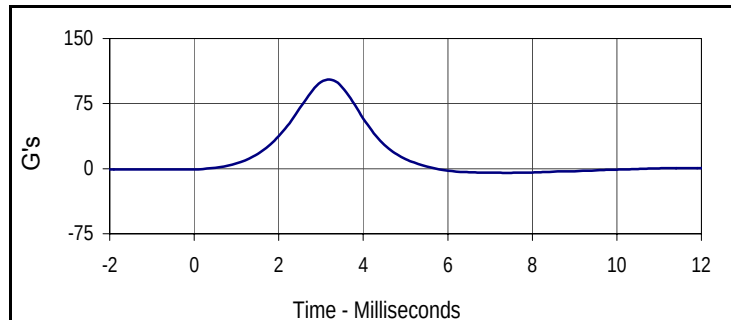
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	250	Pass
Temperature During Soak	Max	18.9 to 25.6	22.2	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	31.7	Pass
Peak Head Resultant Acceleration	G's	115 to 137	125.8	Pass
Peak Head X Acceleration	G's	<15	3.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	13.2	Pass
Overall Test Results				Pass



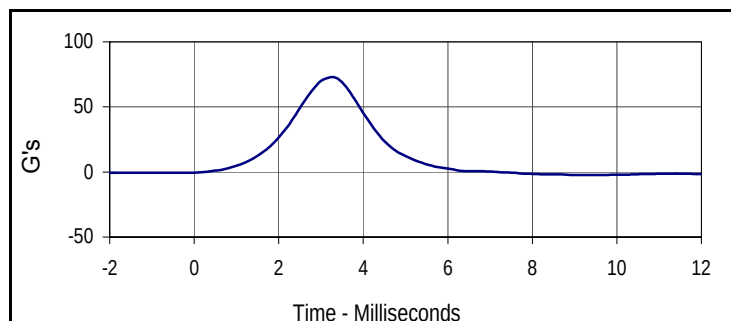
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
125.8	3.2	0.3	0.3



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
3.2	6.0	-0.1	-2.0



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
102.6	3.2	-4.8	7.4



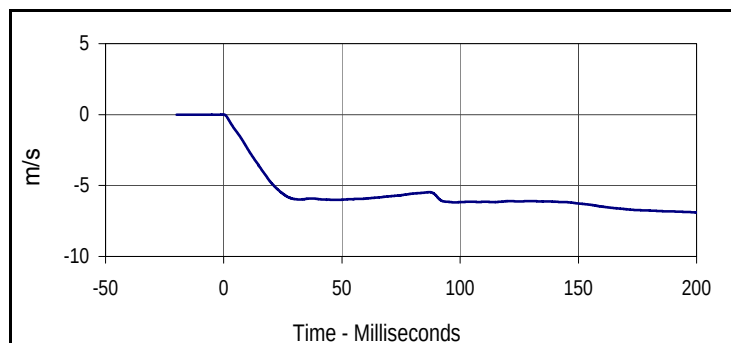
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
72.9	3.3	-2.4	9.0

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

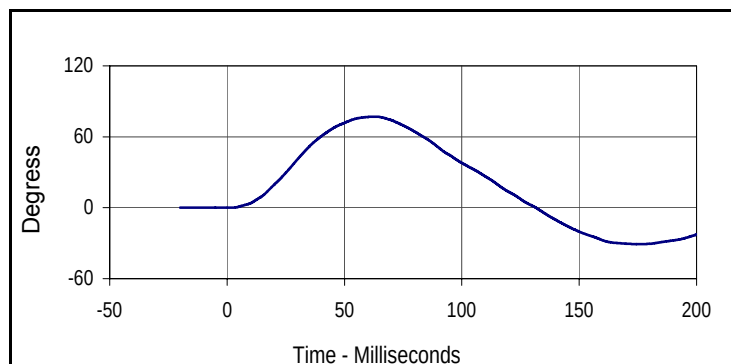
Test Date: 12/16/11
 Test I.D.: 307NB024



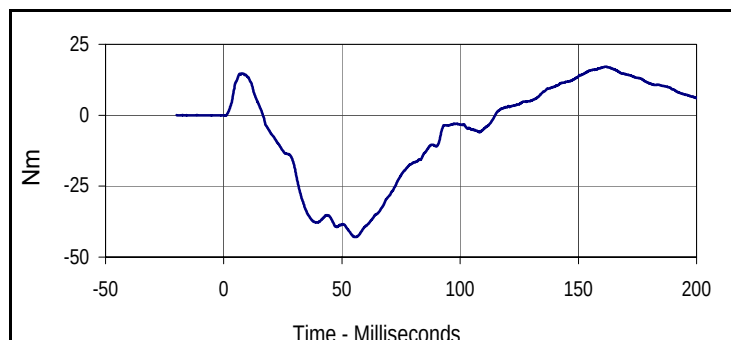
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	250	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	32.3	Pass
Pendulum Velocity	m/s	5.51 to 5.63	5.56	Pass
Pendulum Deceleration	10 msec	-2.20 to -2.80	-2.38	Pass
	15 msec	-3.30 to -4.10	-3.63	Pass
	20 msec	-4.40 to -5.40	-4.79	Pass
	25 msec	-5.40 to -6.10	-5.58	Pass
	25-100 msec	-5.50 to -6.20	-6.18	Pass
D-Plane Rotation	Max	71 to 81	77.1	Pass
	Time	50 to 70	63.1	Pass
Peak Occipital Condyle Moment	Nm	-36 to -44	-43.0	Pass
Decaying Moment Time to Cross 0 Nm	msec	102 to 126	114.9	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	-6.9	200.0



Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
77.1	63.1	-30.9	175.2



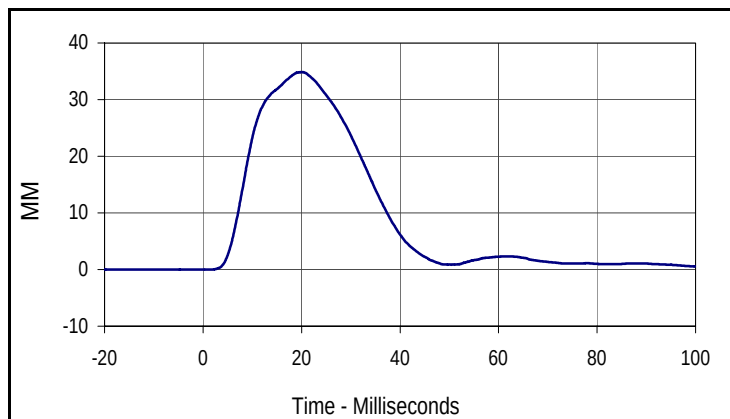
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
17.1	161.7	-43.0	55.5

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

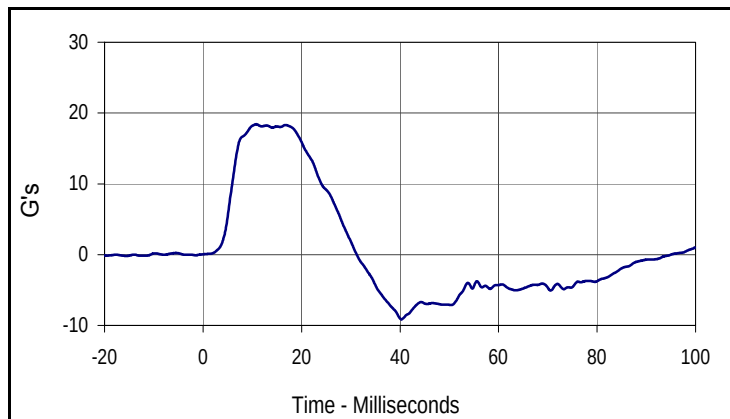
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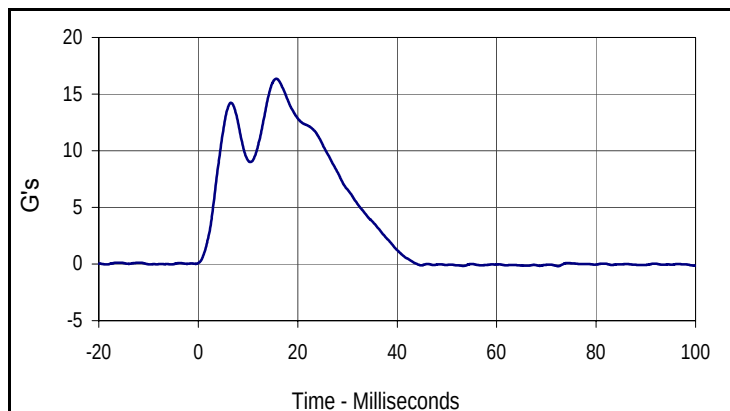
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	260	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	38.0	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	32.9	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.30	Pass
Peak Shoulder Deflection		mm	28 to 37	34.9	Pass
Peak Lateral Spine Acceleration Y		G's	17 to 22	18.4	Pass
Peak Impactor Acceleration		G's	13 to 18	16.4	Pass
Overall Test Results				Pass	



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
34.9	20.1	0.0	-1.7



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.4	10.8	-9.1	40.3



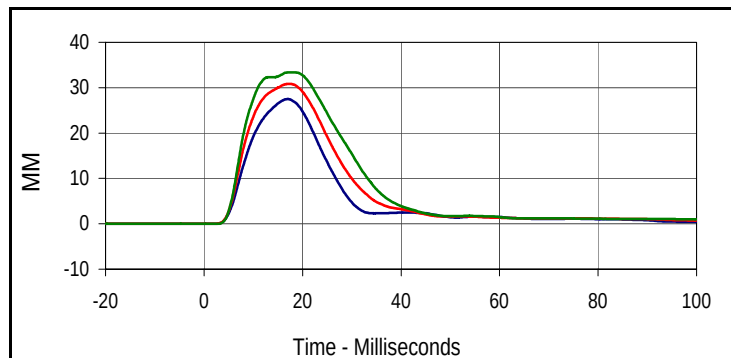
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
16.4	15.7	-0.2	72.3

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

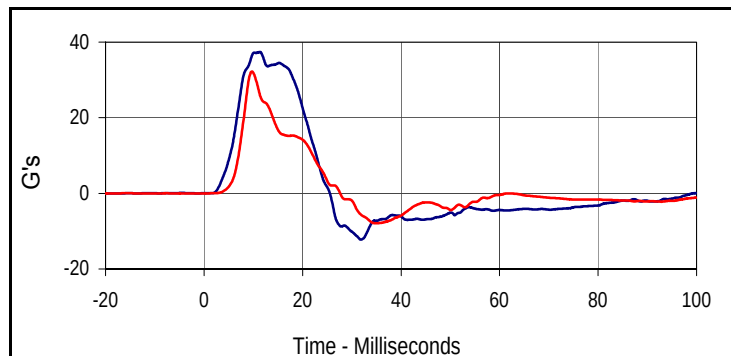
Test Date: 12/16/11
 Test I.D.: 307TWA024



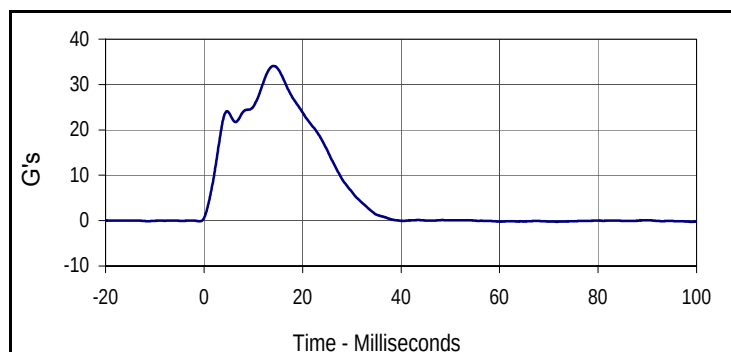
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	290	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	31.5	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.7	Pass
Peak Shoulder Deflection	mm	31 to 40	35.6	Pass
Peak Upper Thorax Rib Deflection	mm	25 to 32	27.5	Pass
Peak Middle Thorax Rib Deflection	mm	30 to 36	30.8	Pass
Peak Lower Thorax Rib Deflection	mm	32 to 38	33.3	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	37.4	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	32.2	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
27.5	17.0	0.0	-9.6
Middle Thorax Deflection			
Max	Time	Min	Time
30.8	17.3	0.0	1.7
Lower Thorax Deflection			
Max	Time	Min	Time
33.3	18.4	0.0	0.2



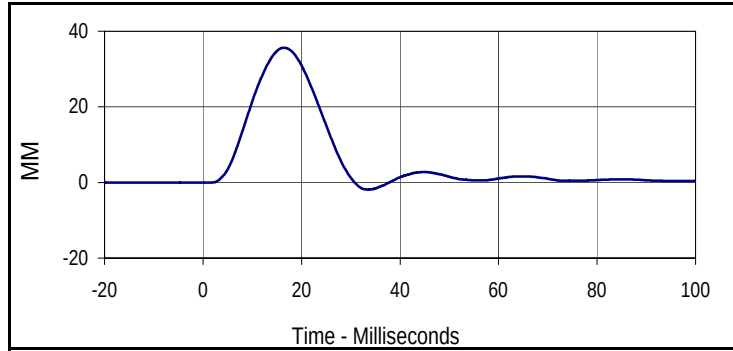
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
37.4	11.4	-12.2	31.8
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
32.2	9.7	-7.9	34.9



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
34.1	14.1	-0.3	98.9

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

Test Date: 12/16/11
 Test I.D.: 307TWA024



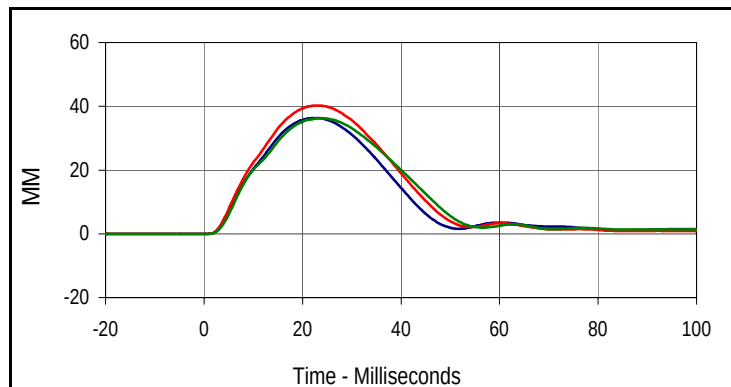
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
35.6	16.4	-1.9	33.5

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

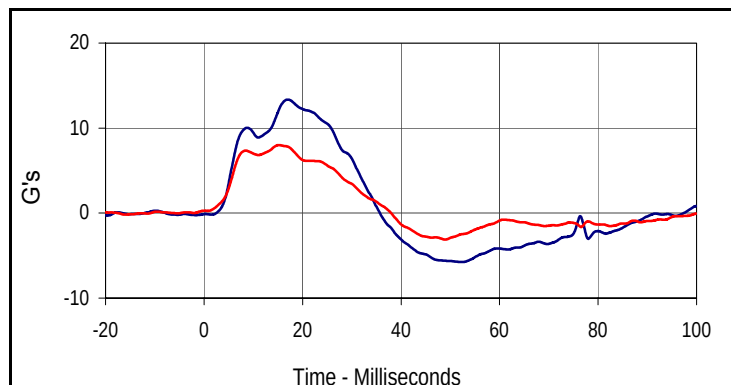
Test Date: 12/16/11
 Test I.D.: 307TWOA024



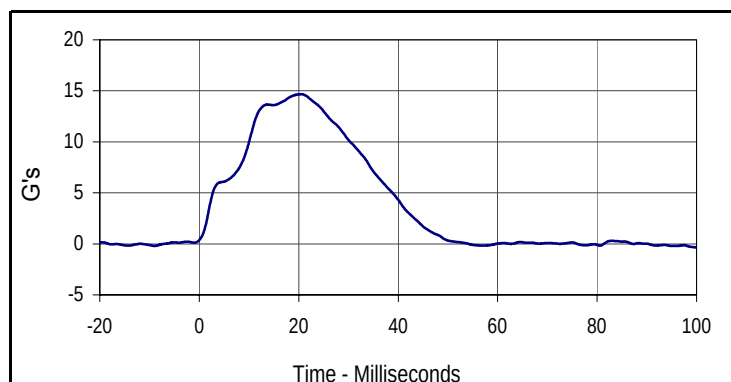
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	310	Pass
Temperature During Soak	Max °C	18.9 to 25.6	21.7	Pass
	Min °C		20.7	Pass
Humidity During Soak	Max %	10.0 to 70.0	38.0	Pass
	Min %		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	32.8	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Upper Thorax Rib Deflection	mm	32 to 40	36.3	Pass
Peak Middle Thorax Rib Deflection	mm	39 to 45	40.3	Pass
Peak Lower Thorax Rib Deflection	mm	35 to 43	36.3	Pass
Peak Upper Spine Y Acceleration	G's	13 to 17	13.3	Pass
Peak Lower Spine Y Acceleration	G's	7 to 11	8.0	Pass
Peak Impactor Acceleration	G's	14 to 18	14.7	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
36.3	22.6	0.0	-8.2
Middle Thorax Deflection			
Max	Time	Min	Time
40.3	23.0	0.0	-9.0
Lower Thorax Deflection			
Max	Time	Min	Time
36.3	23.9	0.0	-7.4



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
13.3	17.0	-5.8	52.0
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
8.0	15.2	-3.1	49.0



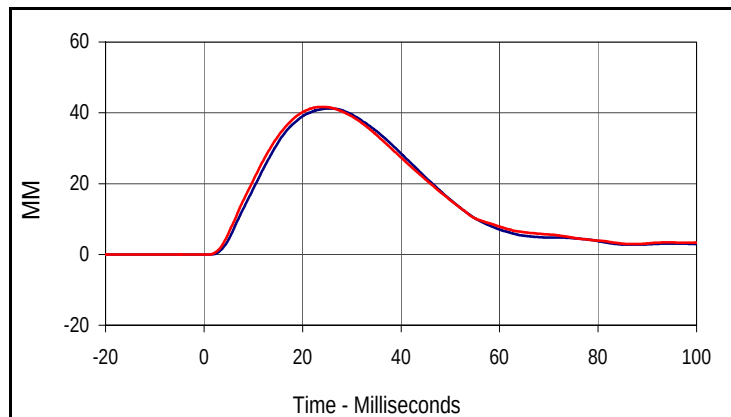
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
14.7	20.5	-0.3	99.9

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

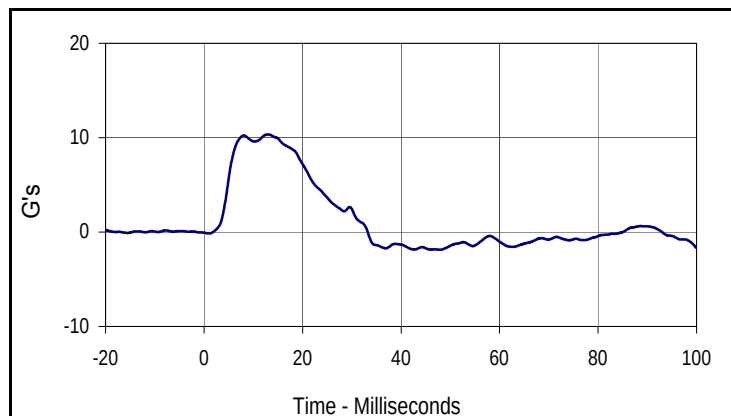
Test Date: 12/16/11
 Test I.D.: 307ABD024



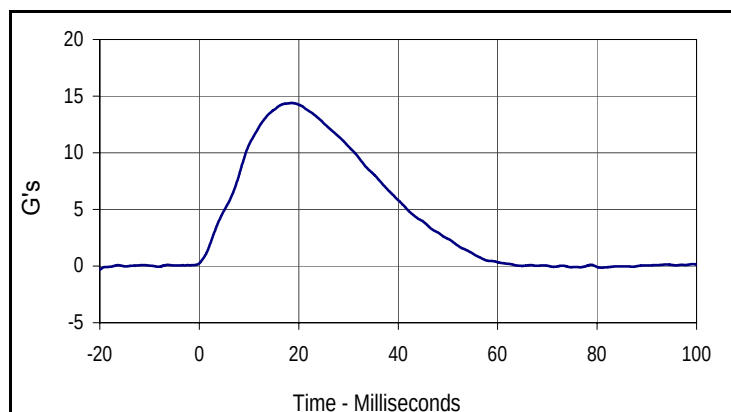
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	320	Pass
Temperature During Soak	Max °C	20.6 to 22.2	21.7	Pass
	Min °C		20.7	Pass
Humidity During Soak	Max %	10.0 to 70.0	38.0	Pass
	Min %		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	32.8	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Upper Abdominal Rib Deflection	mm	36 to 47	41.2	Pass
Peak Lower Abdominal Rib Deflection	mm	33 to 44	41.7	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	10.3	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
41.2	25.5	0.0	-5.3
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
41.7	24.0	0.0	-7.9



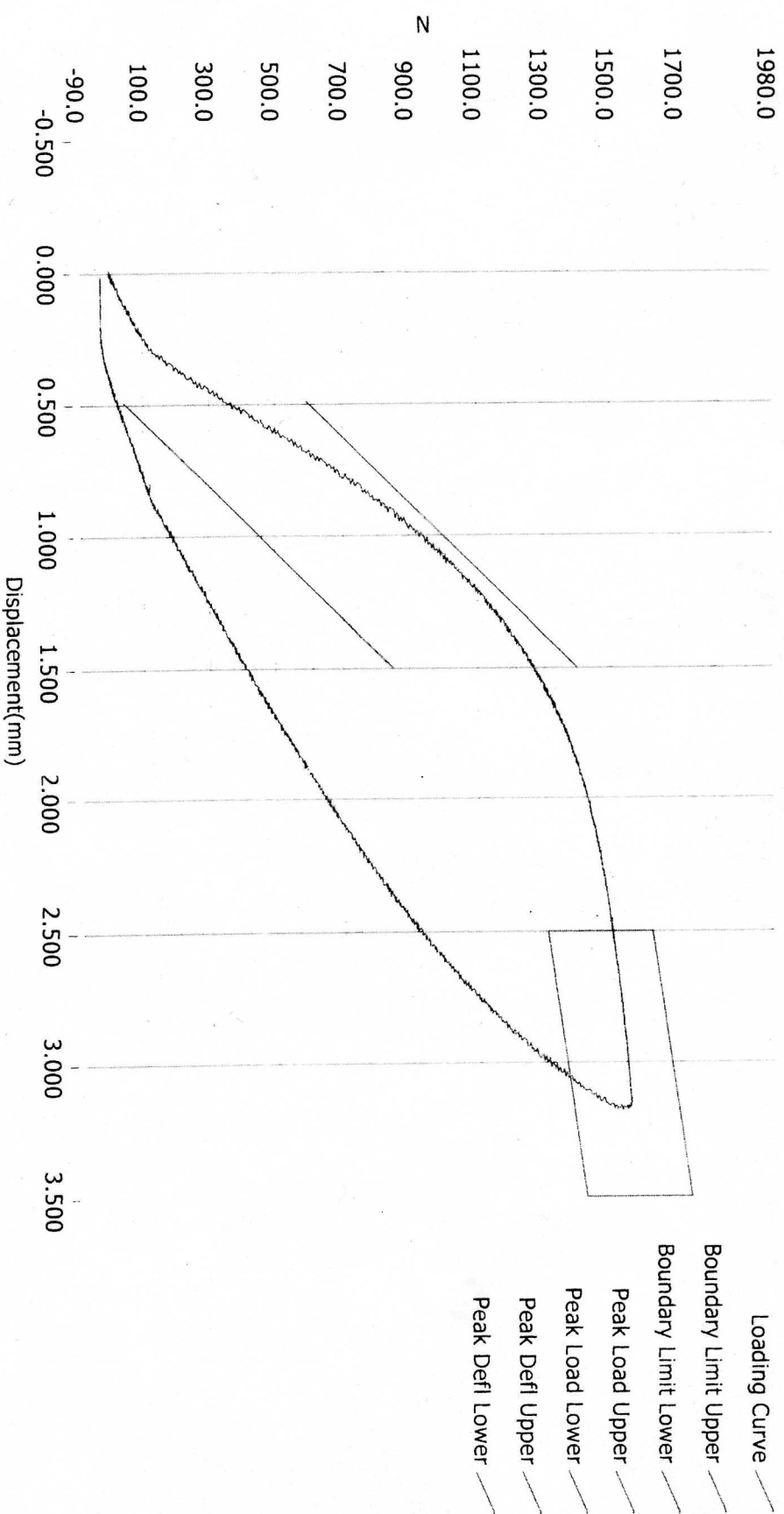
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
10.3	13.0	-1.9	47.9



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.4	18.6	-0.3	-20.0

MC5110 PRE TEST

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

Cert ID

ATD Serial Number

ATD Type

36738

SIDIIs

Current Date : 10/5/2010

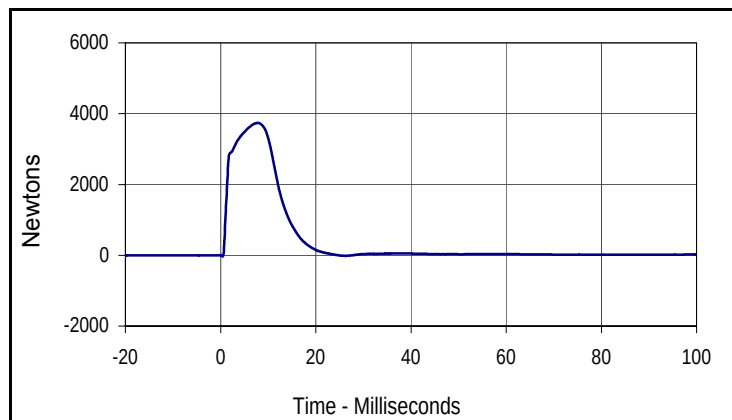
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Test Program: SID IIs Pelvis Acetabulum Impact Test
 ATD Serial No.: 307

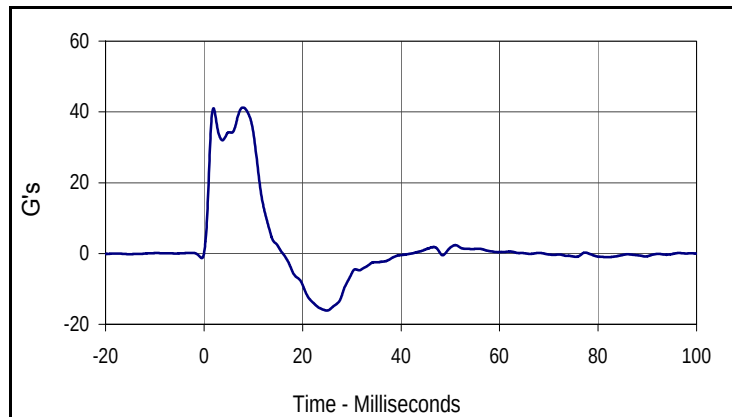
Test Date: 12/16/11
 Test I.D.: 307ACE024



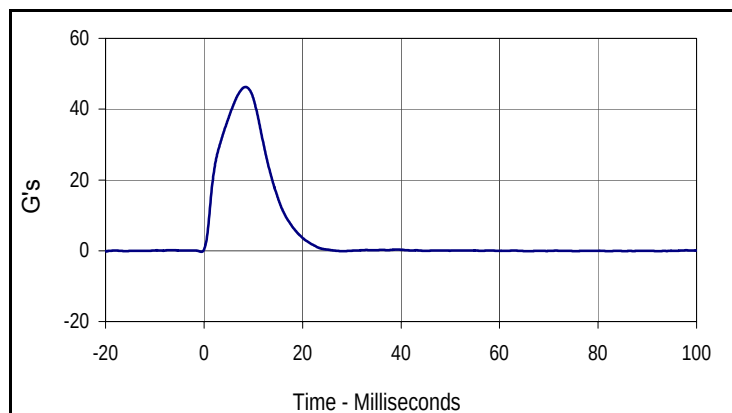
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	340	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	32.9	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.7	Pass
Peak Acetabulum Force Y	Newtons	3600 to 4300	3736.4	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	41.2	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
3736.4	7.8	-30.6	0.4



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
41.2	7.9	-16.1	24.9



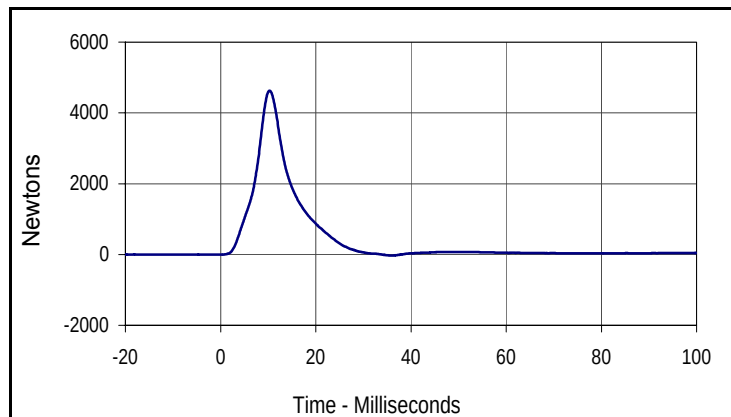
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
46.3	8.4	-0.3	-0.5

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

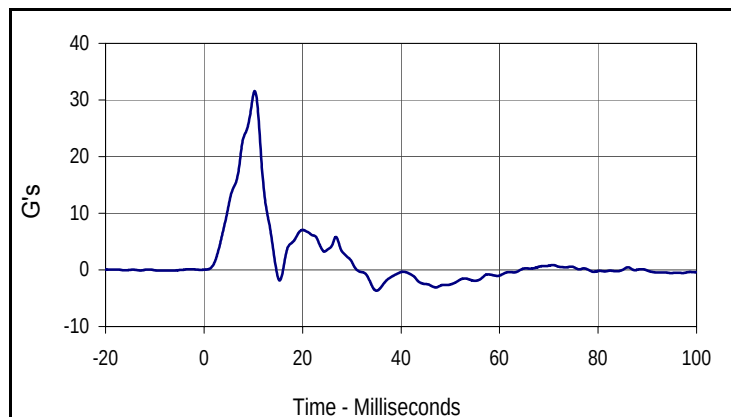
Test Date: 12/16/11
 Test I.D.: 307PL024



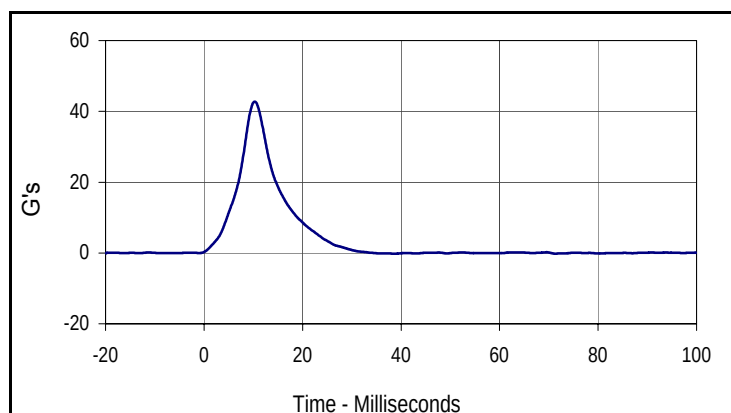
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	380	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	34.0	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Iliac Force	Newtons	4100 to 5100	4628.7	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	31.6	Pass
Peak Impactor Acceleration	G's	36 to 45	42.8	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4628.7	10.3	-29.5	36.1



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
31.6	10.3	-3.7	35.0



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
42.8	10.3	-0.2	71.4

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

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

Test Date: 12/22/11
 Test I.D.: N/A



Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity		%	10 to 70	20	Pass
1	Sitting Height	mm	900 - 918	909	Pass
2	Seat to Shoulder Joint	mm	558 - 572	563	Pass
3	Seat to Lower Face of Thoracic Spine Box	mm	346 - 356	352	Pass
4	Seat to Hip Joint (Center of Bolt)	mm	97 - 103	100	Pass
5	Sole to Seat, Sitting	mm	333 - 451	387	Pass
6	Head Width	mm	152 - 158	156	Pass
7	Shoulder / Arm Width	mm	461 - 479	472	Pass
8	Thorax Width	mm	322 - 332	328	Pass
9	Abdomen Width	mm	273 - 287	275	Pass
10	Pelvis Lap Width	mm	359 - 373	361	Pass
11	Head Depth	mm	196 - 206	203	Pass
12	Thorax Depth	mm	262 - 272	268	Pass
13	Abdomen Width	mm	194 - 204	199	Pass
14	Pelvis Depth	mm	235 - 245	244	Pass
15	Back of Buttocks to Hip Joint (Center of Bolt)	mm	150 - 160	153	Pass
16	Back of Buttocks to Front Knee	mm	597 - 615	603	Pass
Overall Test Results					Pass

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

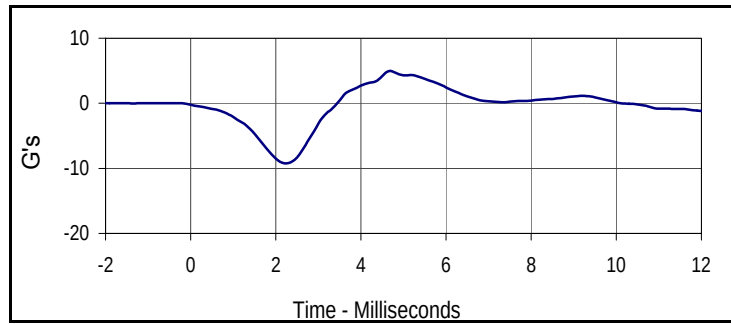
Test Date: 12/23/11
 Test I.D.: F035HD022



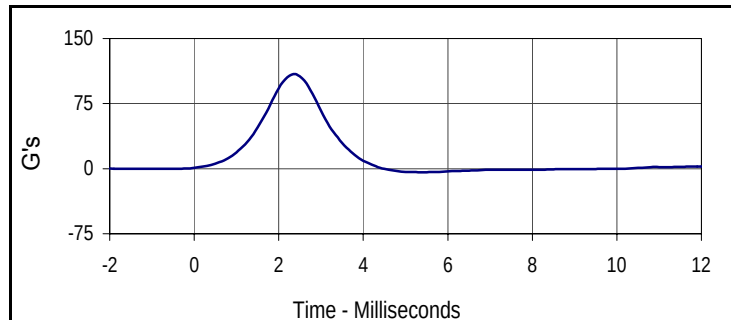
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	240	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	19.6	Pass
Peak Head Resultant Acceleration	G's	125 to 155	132.9	Pass
Peak Head X Acceleration	G's	≤15	9.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	5.9	Pass
Overall Test Results				Pass



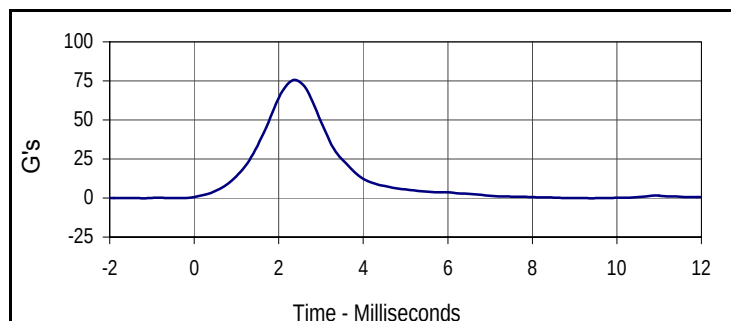
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
132.9	2.4	0.0	-0.5



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.0	4.7	-9.2	2.2



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
109.0	2.4	-4.1	5.4



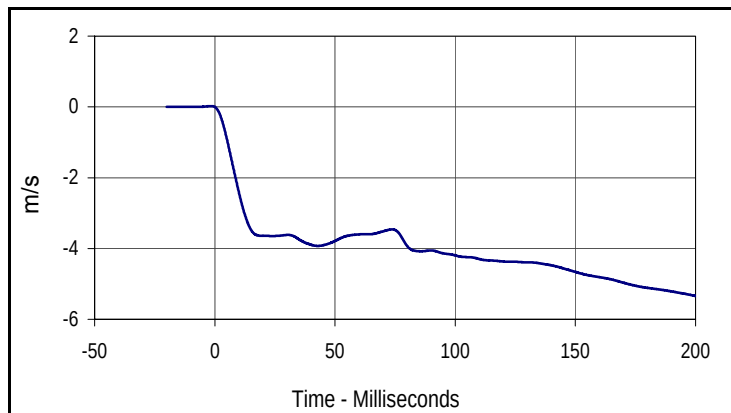
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
75.5	2.4	-0.1	-1.2

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

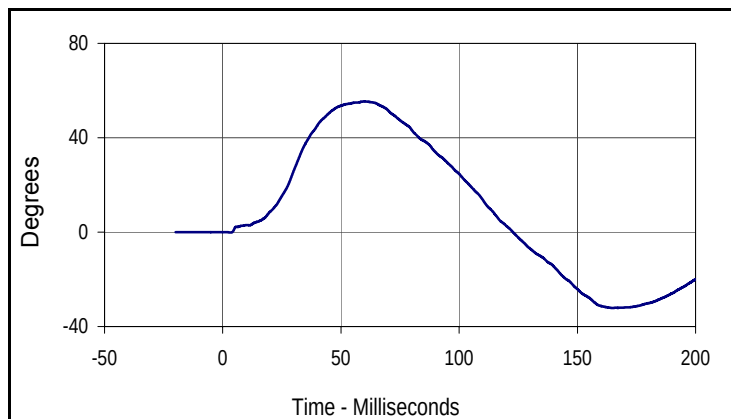
Test Date: 12/23/11
 Test I.D.: F035NB022



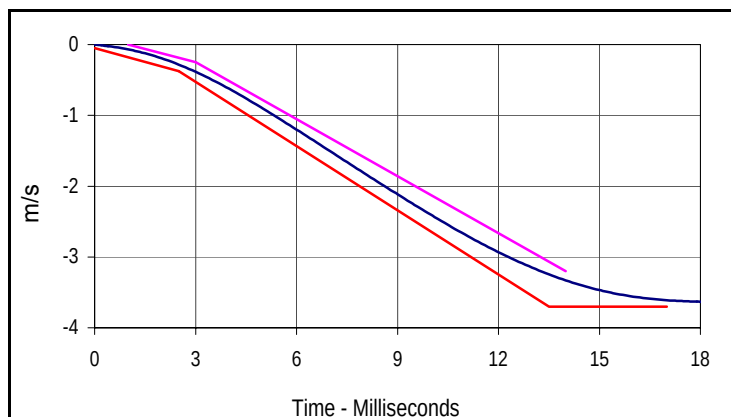
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	630	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	31.0	Pass
Pendulum Velocity	m/s	3.3 to 3.5	3.4	Pass
Headform Flexion	Max	49 to 59	55.4	Pass
	Time	54 to 66	59.8	Pass
Headform Flexion Decay (Peak to Zero)	msec	53 to 88	63.0	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	-1.6	-5.3	200.0



Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
55.4	59.8	-32.1	164.7



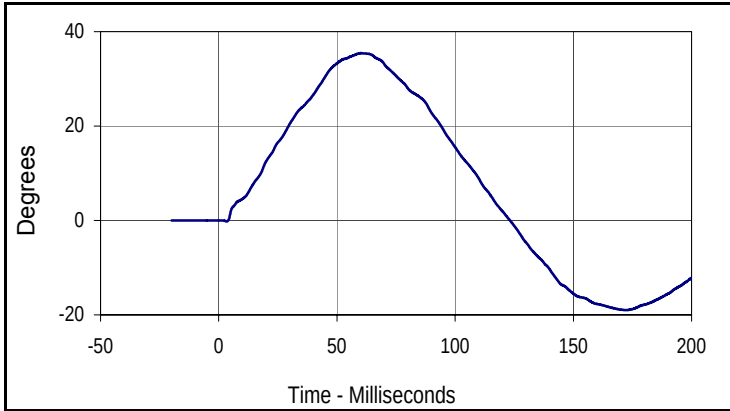
Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.6	-5.3	200.0

Velocity Corridors

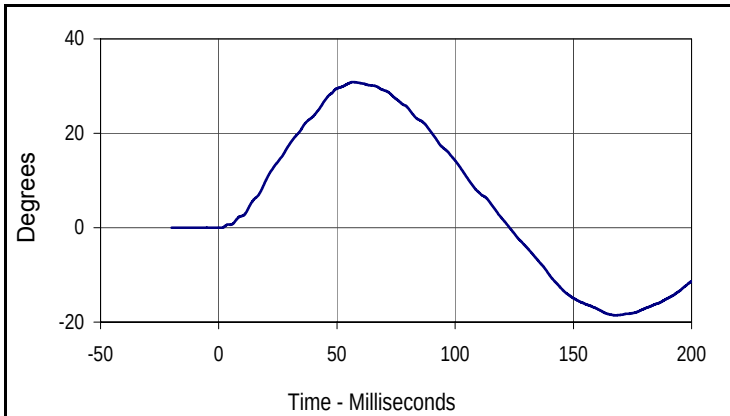
Upper Boundary		Lower Boundary	
Time (msec)	Velocity (m/s)	Time (msec)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.0	-0.03	2.5	-0.375
14.0	-3.20	13.5	-3.70
		17.0	-3.70

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

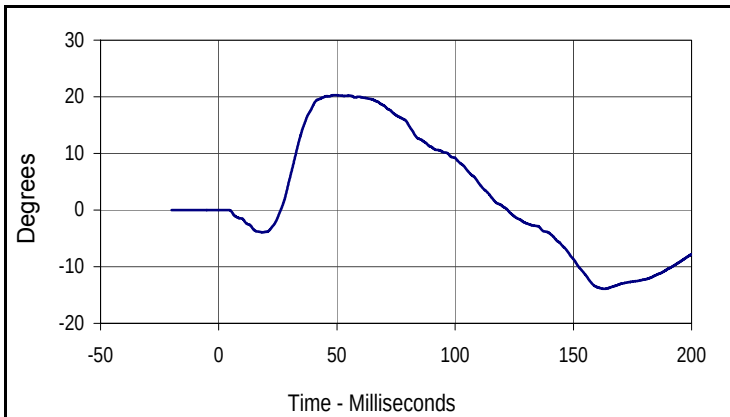
Test Date: 12/23/11
 Test I.D.: F035NB022



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
35.4	60.2	-19.0	172.0



Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
30.9	56.6	-18.6	167.9



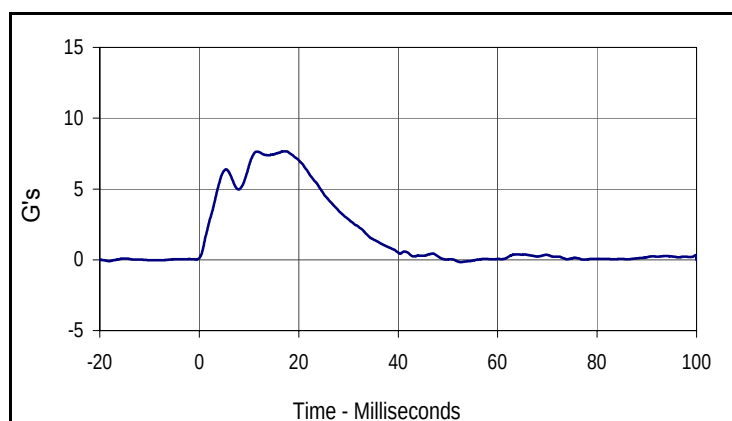
Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
20.3	48.8	-13.9	163.2

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

Test Date: 12/23/11
 Test I.D.: F035SH022



Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	320	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	19.7	Pass
Pendulum Speed	m/s	4.2 to 4.4	4.2	Pass
Peak Impactor Acceleration	G's	7.5 to 10.5	7.7	Pass
Overall Test Results			Pass	



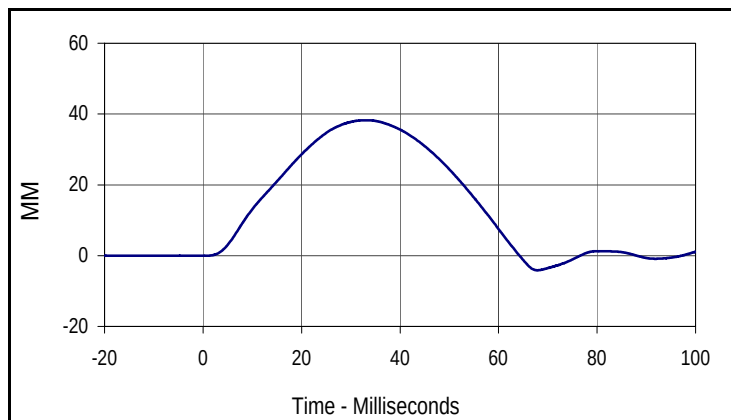
Curve Description			
Probe Impactor Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
7.7	17.5	-0.2	52.6

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

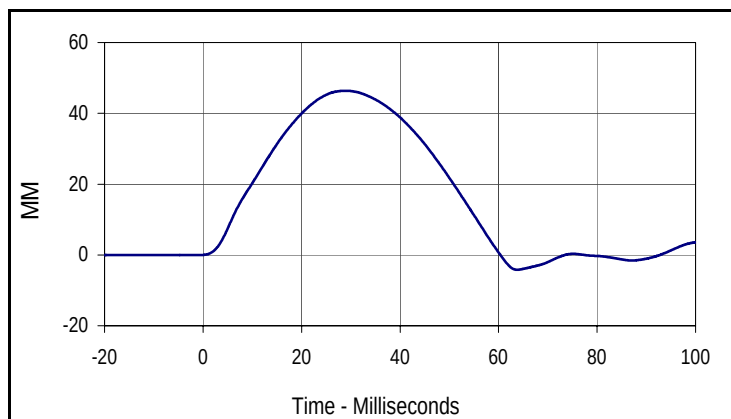
Test Date: 12/23/11
 Test I.D.: F035UR022



Tested Parameter	Units	Specification	Result	Pass/Fail
Rib Module Soak Time	Minutes	≥240	410	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.2	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	46.4	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
38.2	33.1	-4.1	67.9



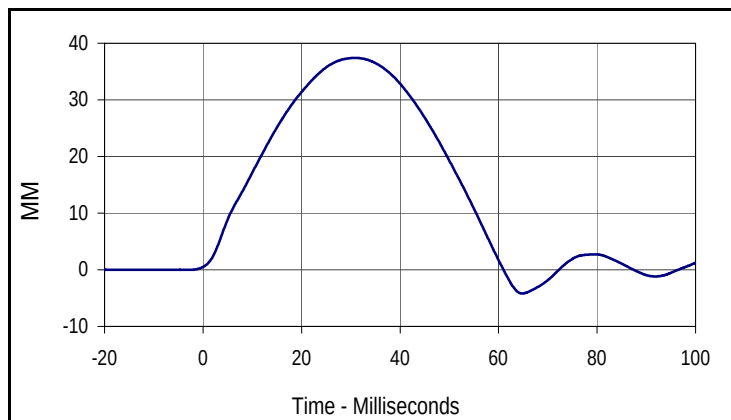
Curve Description			
Upper Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
46.4	28.9	-4.2	63.7

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

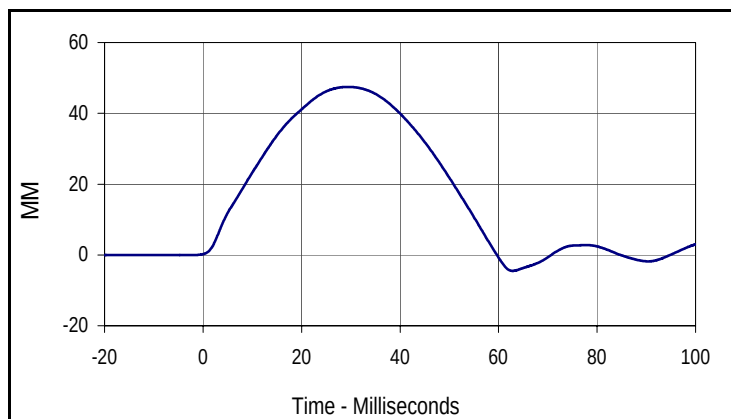
Test Date: 12/23/11
 Test I.D.: F035MR022



Tested Parameter	Units	Specification	Result	Pass/Fail
Rib Module Soak Time	Minutes	≥240	425	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.1	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height	mm	36 to 40	37.4	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height	mm	46 to 51	47.5	Pass
Overall Test Results				Pass



Curve Description			
Middle Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
37.4	30.9	-4.2	64.8



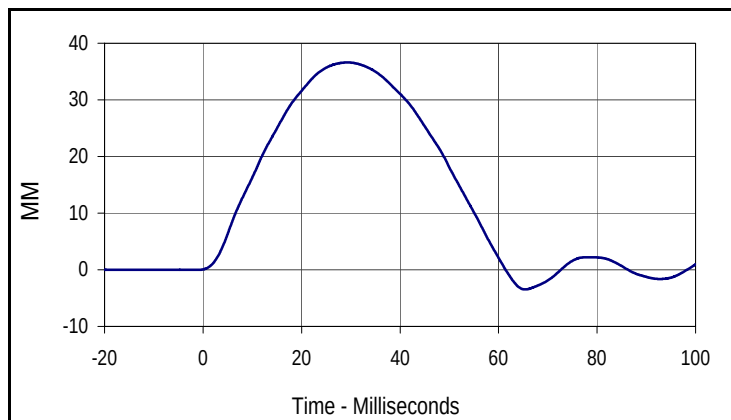
Curve Description			
Middle Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
47.5	29.4	-4.5	62.9

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

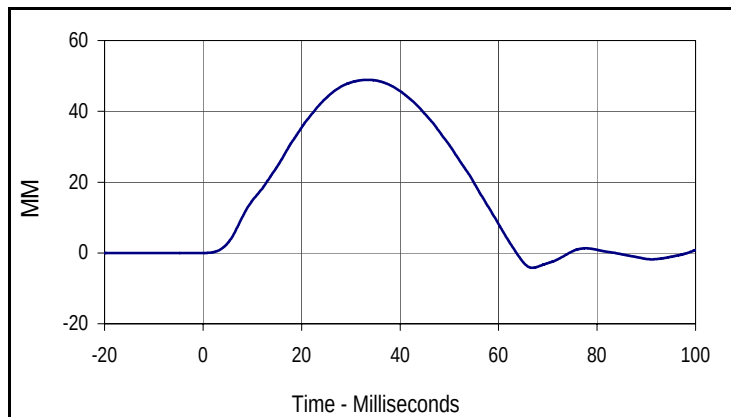
Test Date: 12/23/11
 Test I.D.: F035LR022



Tested Parameter	Units	Specification	Result	Pass/Fail
Rib Module Soak Time	Minutes	≥240	435	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.6	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height	mm	36 to 40	36.6	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height	mm	46 to 51	48.9	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
36.6	29.3	-3.5	65.4



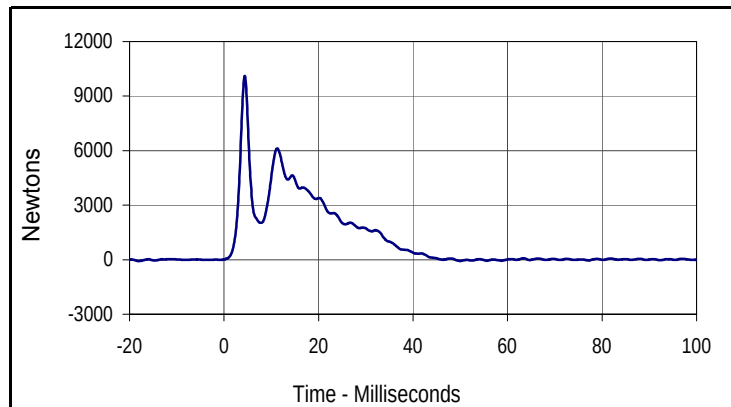
Curve Description			
Lower Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
48.9	33.4	-4.2	66.9

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

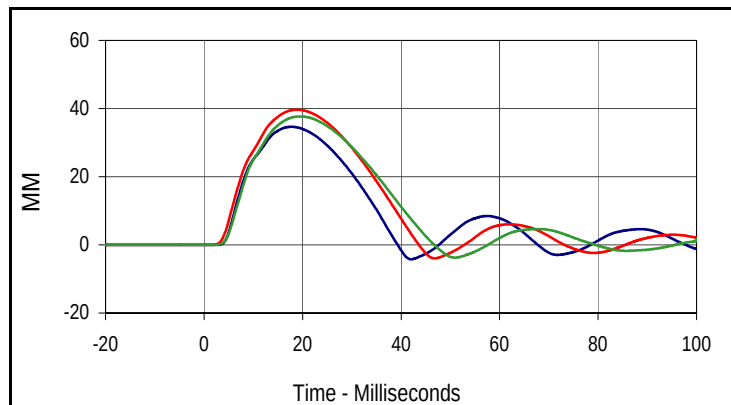
Test Date: 12/23/11
 Test I.D.: F035TH022



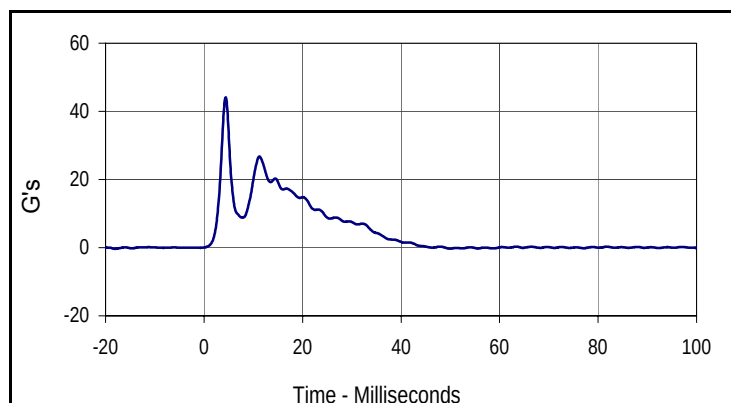
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	480	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.2	Pass
Peak Impactor Velocity	m/s	5.4 to 5.6	5.5	Pass
Peak Impactor Force	N	5100 to 6200	6125.0	Pass
	msec	> 6.0 msec	11.2	Pass
Peak Upper Rib Deflection	mm	34 to 41	34.6	Pass
Peak Middle Rib Deflection	mm	37 to 45	39.7	Pass
Peak Lower Rib Deflection	mm	37 to 44	37.7	Pass
Overall Test Results				Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
10108.6	4.4	-76.7	-18.1



Curve Description			
Upper, Middle, Lower Rib Deflections			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max (Upper)	Time	Min (Upper)	Time
34.6	17.7	-4.2	42.1
Max (Middle)	Time	Min (Middle)	Time
39.7	18.8	-4.0	46.9
Max (Lower)	Time	Min (Lower)	Time
37.7	19.5	-3.7	50.9



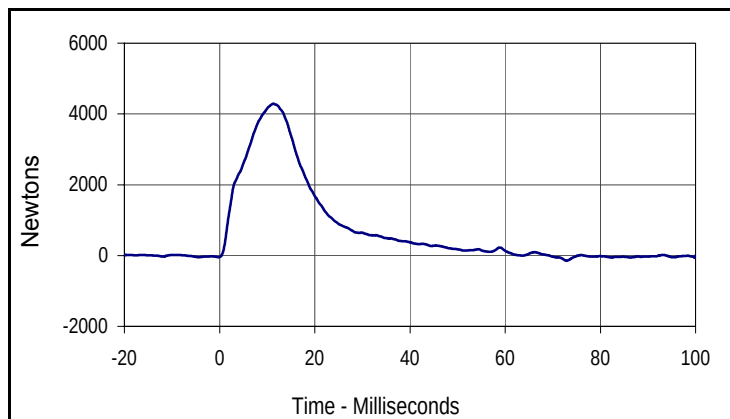
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
44.1	4.4	-0.3	-18.1

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

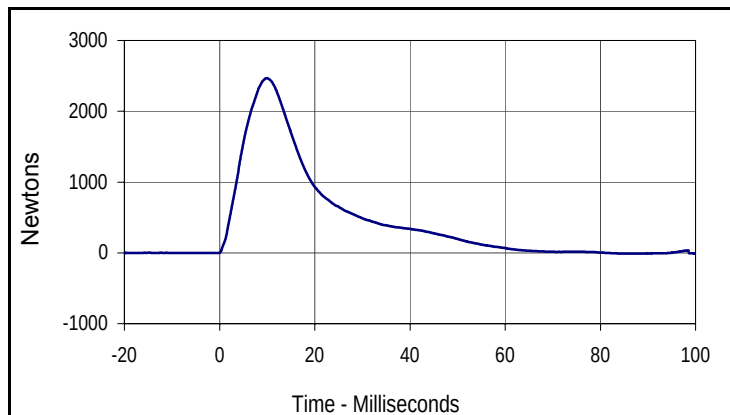
Test Date: 12/23/11
 Test I.D.: F035ABD022



Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	510	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	31.0	Pass
Probe Velocity	m/s	3.9 to 4.1	3.9	Pass
Peak Impactor Force	N	4000 to 4800	4288.9	Pass
	msec	10.6 to 13.0	11.2	Pass
Sum of Abdominal Forces	N	2200 to 2700	2468.6	Pass
	msec	10.0 to 12.3	11.3	Pass
Overall Test Results				Pass



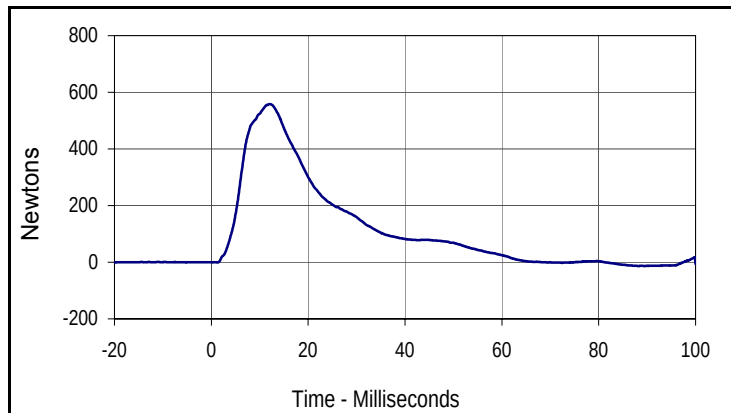
Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4288.9	11.2	-143.4	72.9



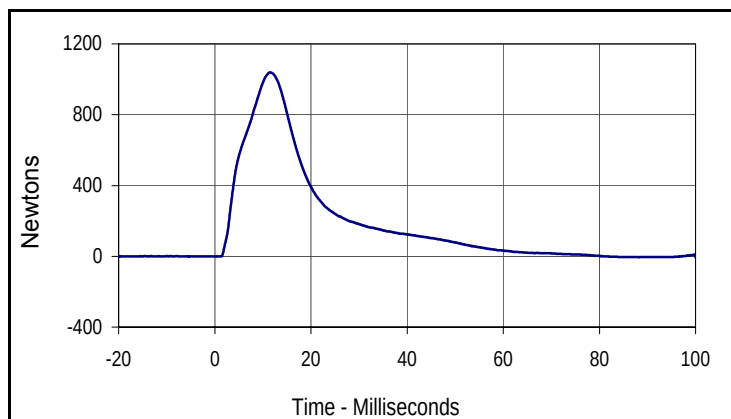
Curve Description			
Abdomen Sum Resultant			
Plot No.	Type	SAE Class	Units
002	RES	600	Newtons
Max	Time	Min	Time
2468.6	11.3	-11.3	88.2

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

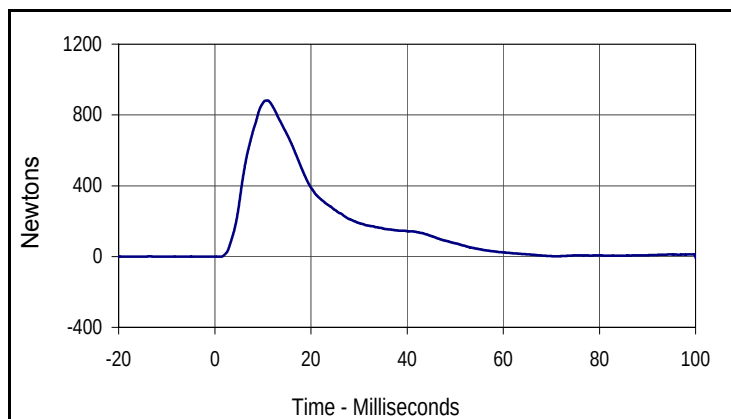
Test Date: 12/23/11
 Test I.D.: F035ABD022



Curve Description			
Front Abdomen Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtontons
Max	Time	Min	Time
558.3	12.1	-13.6	88.2



Curve Description			
Middle Abdomen Force			
Plot No.	Type	SAE Class	Units
004	FIL	600	Newtontons
Max	Time	Min	Time
1038.7	11.5	-8.5	0.0



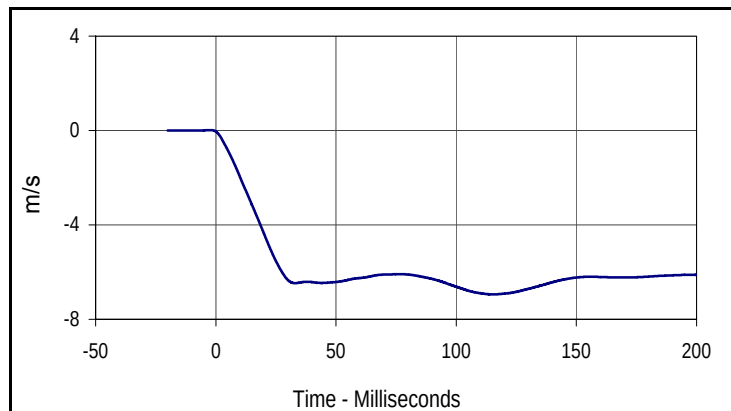
Curve Description			
Rear Abdomen Force			
Plot No.	Type	SAE Class	Units
005	FIL	600	Newtontons
Max	Time	Min	Time
882.3	11.0	-8.5	0.0

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

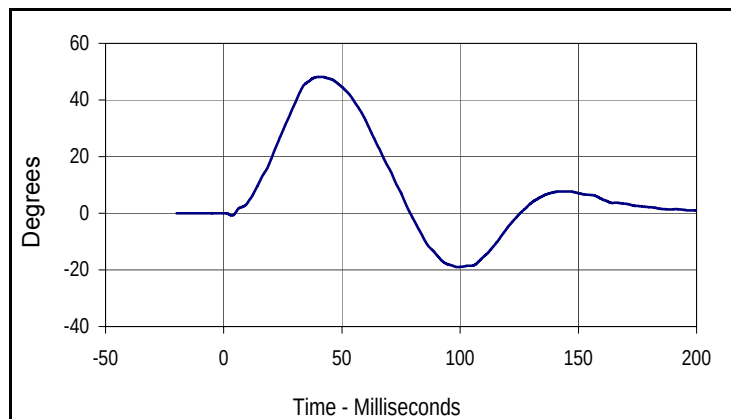
Test Date: 12/23/11
 Test I.D.: F035LB022



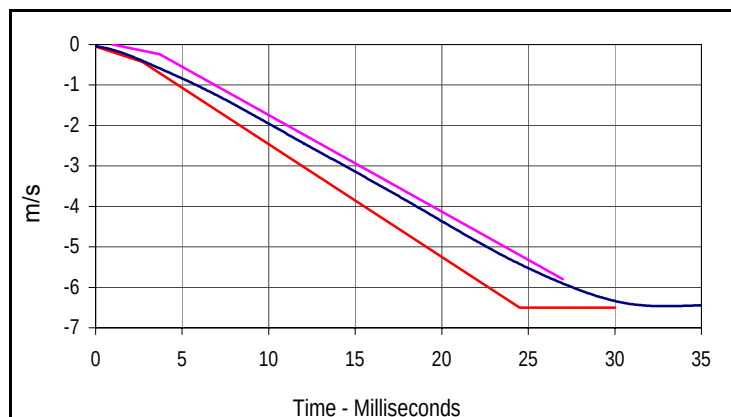
Tested Parameter	Units	Specification	Result	Pass/Fail
Lumbar Spine Assembly Soak Time	Minutes	≥240	590	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.8	Pass
Pendulum Velocity	m/s	5.95 to 6.15	6.08	Pass
Headform Rotation	Max	45 to 55	48.2	Pass
	Time	39 to 53	41.0	Pass
Time of Decay to Zero Angle from Peak	msec	37 to 57	37.9	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	-2.2	-6.9	115.2



Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
48.2	41.0	-19.0	99.0



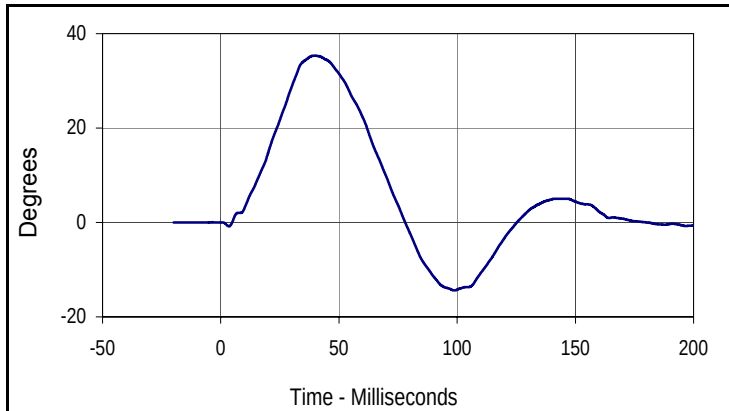
Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-2.2	-6.9	115.2

Velocity Corridors

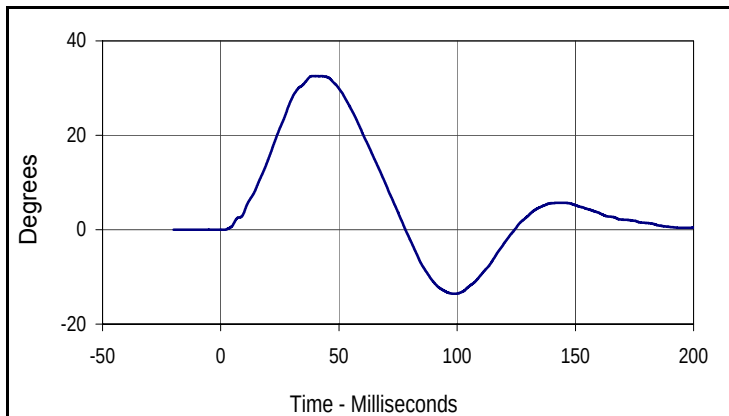
Upper Boundary		Lower Boundary	
Time (msec)	Velocity (m/s)	Time (msec)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.7	-0.24	2.7	-0.425
27.0	-5.80	24.5	-6.50
		30.0	-6.50

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

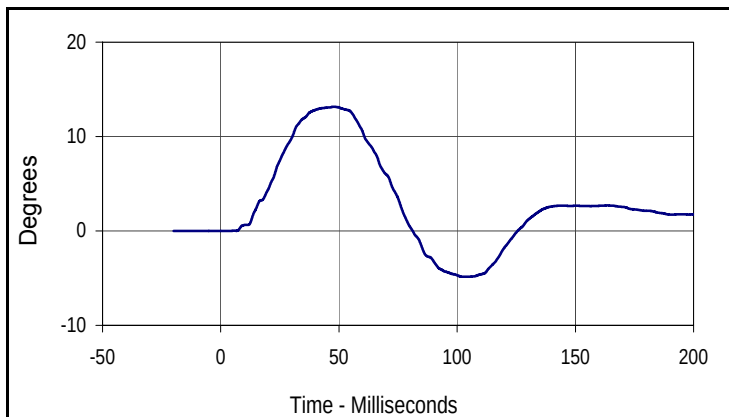
Test Date: 12/23/11
 Test I.D.: F035LB022



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
35.3	39.3	-14.4	98.7



Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
32.6	40.4	-13.6	99.3



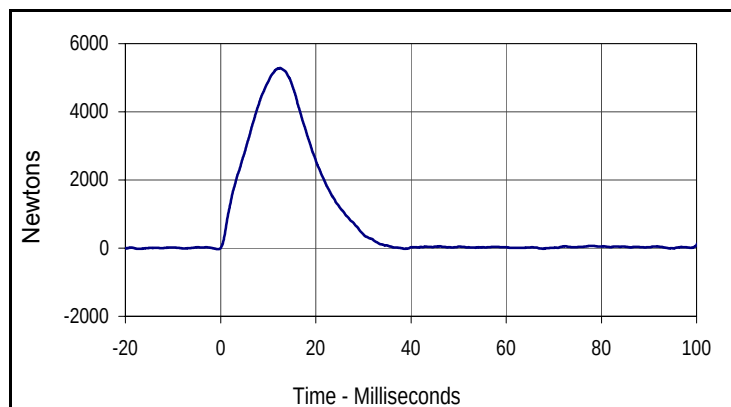
Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
13.2	47.9	-4.9	104.5

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

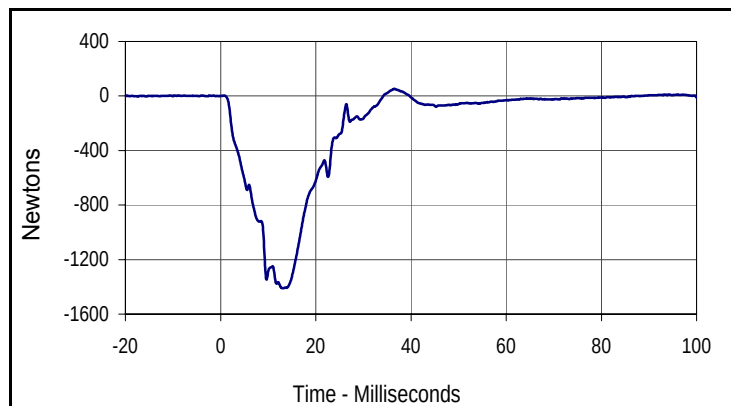
Test Date: 12/23/11
 Test I.D.: F035PL022



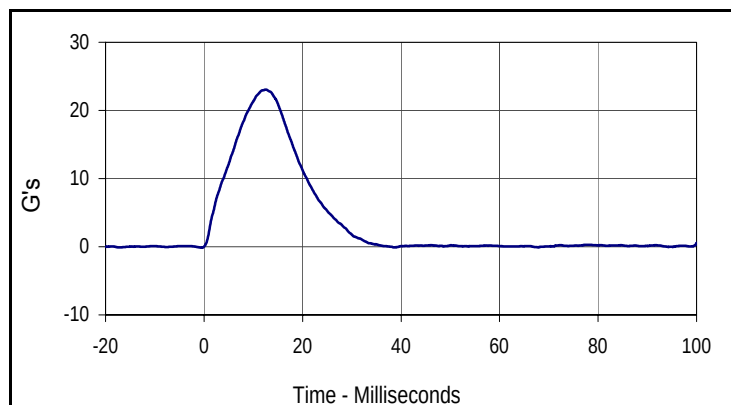
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	515	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.4	Pass
Pendulum Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Impactor Force	N	4700 to 5400	5282.6	Pass
	msec	11.8 to 16.1	12.5	Pass
Peak Pubic Symphysis Load	N	-1230 to -1590	-1410.5	Pass
	msec	12.2 to 17.0	13.1	Pass
Overall Test Results				Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
5282.6	12.5	-29.1	-0.5



Curve Description			
Pubic FY			
Plot No.	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
52.1	36.5	-1410.5	13.1



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
23.1	12.5	-0.1	-0.5

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

Test Date: 12/23/11
 Test I.D.: N/A



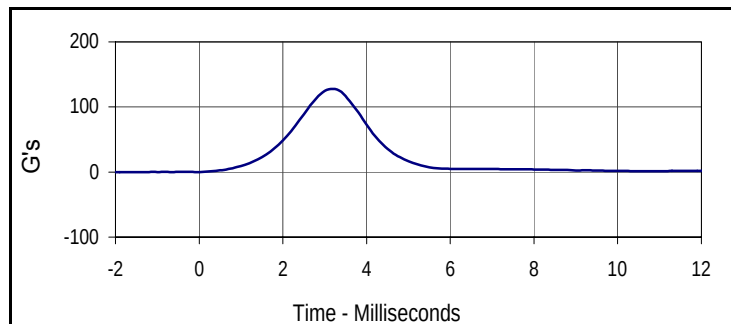
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
A	Sitting Height	mm	772 - 788	777	Pass
B	Shoulder Pivot Height	mm	437 - 453	445	Pass
C	H-Point Height	mm	79 - 89	82	Pass
D	H-Point from Seatback	mm	141 - 151	146	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	103	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	182	Pass
J	Head Circumference	mm	541 - 551	547	Pass
K	Buttock to Knee Length	mm	514 - 540	527	Pass
L	Popliteal Height	mm	343 - 369	348	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	400	Pass
N	Buttock Popliteal Length	mm	416 - 442	430	Pass
O	Chest Depth w/o Jacket	mm	195 - 211	205	Pass
P	Foot Length	mm	216 - 232	221	Pass
Q	Hip Breadth with Pelvic Plug	mm	313 - 323	317	Pass
R	Arm Length	mm	249 - 259	252	Pass
S	Knee Joint to Seatback	mm	477 - 493	480	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	875	Pass
Z	Waist Circumference	mm	760 - 791	774	Pass
Overall Test Results					Pass

Test Program: SID IIs Head Drop Test
 ATD Serial No.: 307

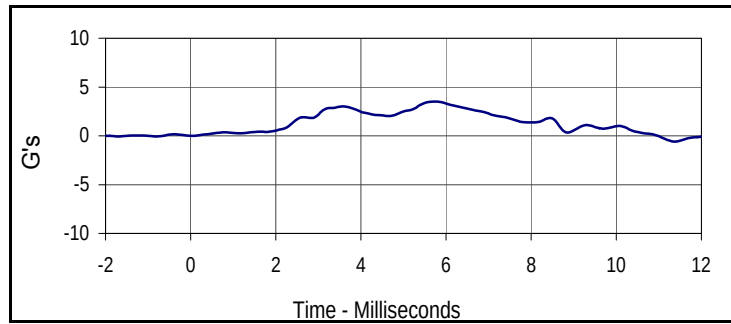
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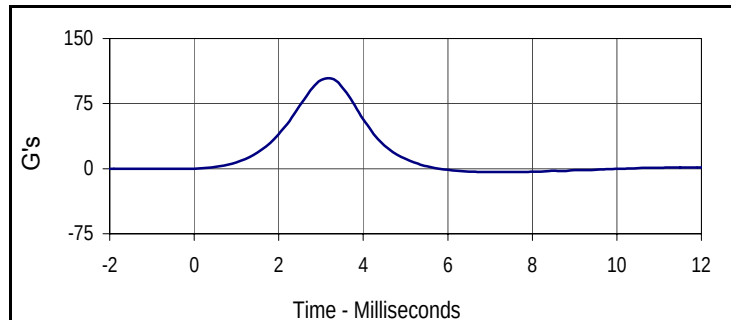
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	260	Pass
Temperature During Soak	Max	18.9 to 25.6	22.2	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.0	Pass
Peak Head Resultant Acceleration	G's	115 to 137	127.9	Pass
Peak Head X Acceleration	G's	<15	3.5	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	13.1	Pass
Overall Test Results				Pass



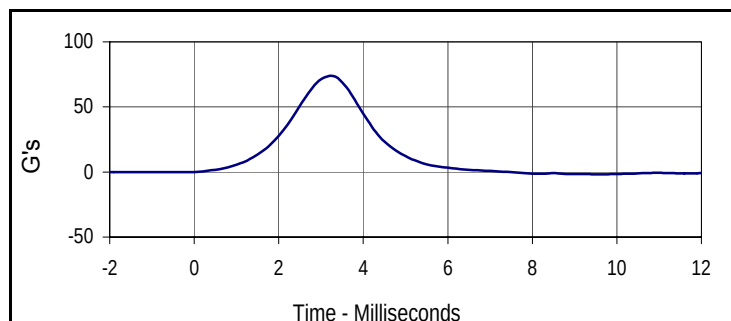
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
127.9	3.2	0.0	-2.0



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
3.5	5.8	-0.1	-0.8



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
104.3	3.2	-4.0	7.4



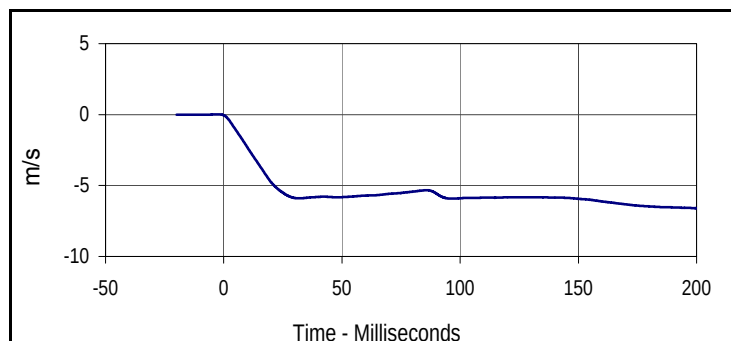
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
73.8	3.2	-1.8	9.6

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

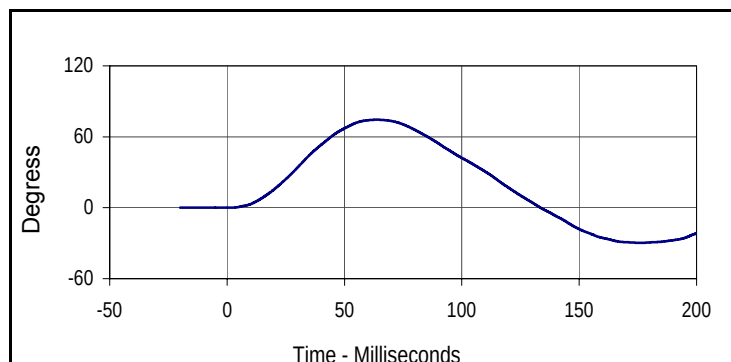
Test Date: 12/23/11
 Test I.D.: 307NB025



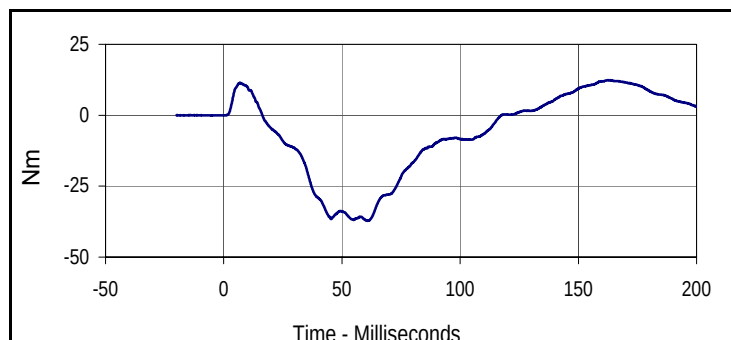
Tested Parameter	Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time	Minutes	≥240	330	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.0	Pass
Pendulum Velocity	m/s	5.51 to 5.63	5.55	Pass
Pendulum Deceleration	10 msec	-2.20 to -2.80	-2.31	Pass
	15 msec	-3.30 to -4.10	-3.55	Pass
	20 msec	-4.40 to -5.40	-4.76	Pass
	25 msec	-5.40 to -6.10	-5.51	Pass
	25-100 msec	-5.50 to -6.20	-5.93	Pass
D-Plane Rotation	Max	71 to 81	74.5	Pass
	Time	50 to 70	63.8	Pass
Peak Occipital Condyle Moment	Nm	-36 to -44	-37.2	Pass
Decaying Moment Time to Cross 0 Nm	msec	102 to 126	117.6	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	-2.2	-6.6	200.0



Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
74.5	63.8	-29.7	176.1



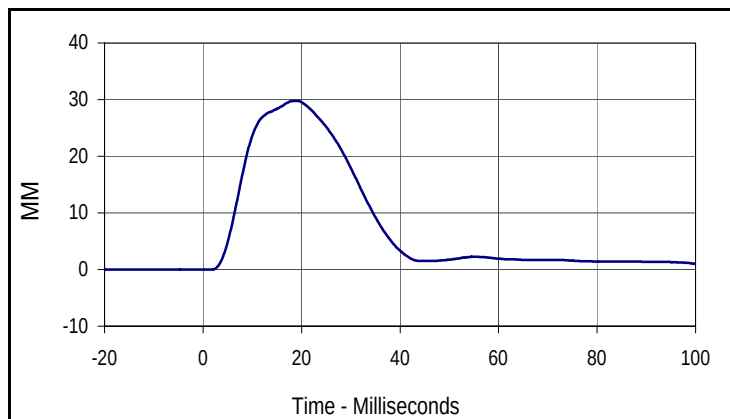
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
12.4	162.7	-37.2	60.8

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

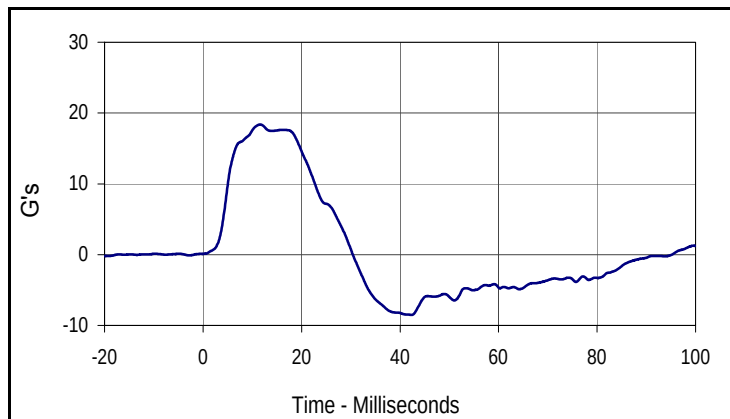
Test Date: 12/23/11
 Test I.D.: 307SH025



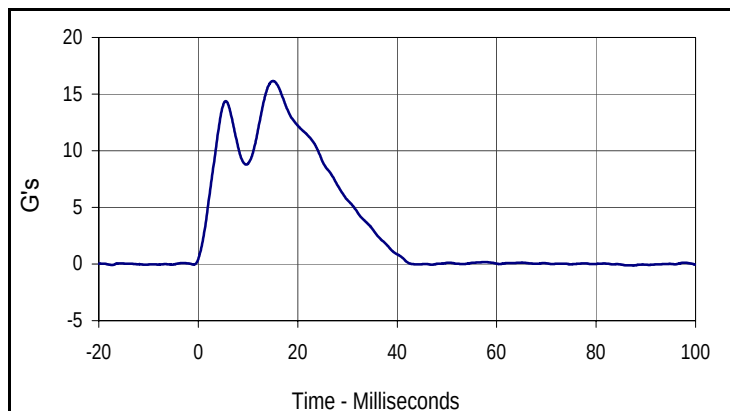
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	350	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	20.3	Pass
Impactor Velocity	m/s	4.20 to 4.40	4.29	Pass
Peak Shoulder Deflection	mm	28 to 37	29.8	Pass
Peak Lateral Spine Acceleration Y	G's	17 to 22	18.4	Pass
Peak Impactor Acceleration	G's	13 to 18	16.1	Pass
Overall Test Results			Pass	



Curve Description			
Shoulder Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
29.8	18.6	0.0	-11.5



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.4	11.6	-8.5	42.3



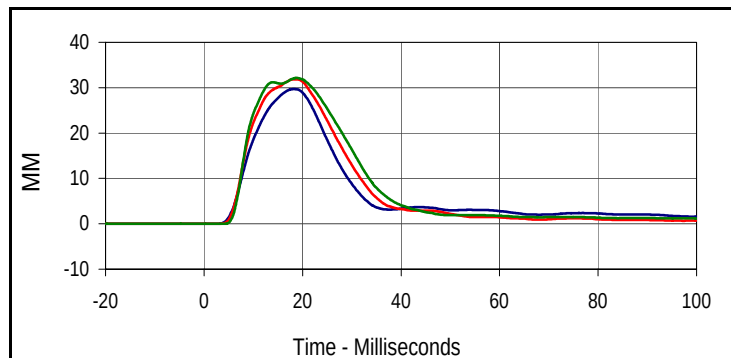
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
16.1	15.1	-0.1	87.5

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

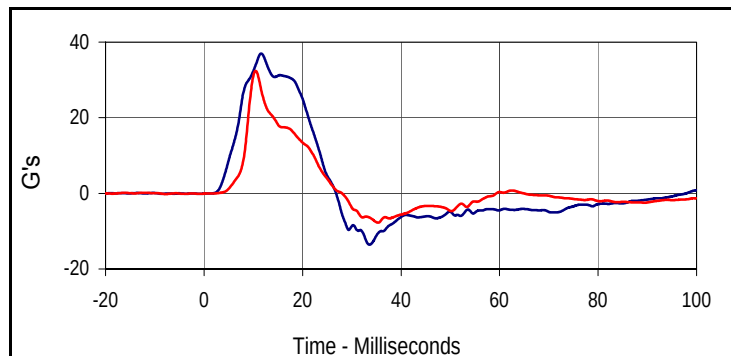
Test Date: 12/23/11
 Test I.D.: 307TWA025



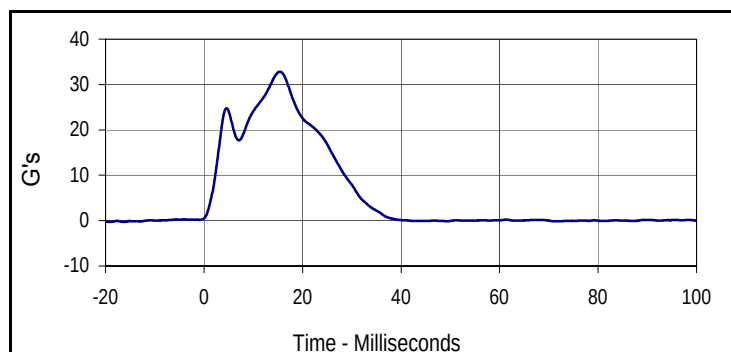
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	370	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.5	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.6	Pass
Peak Shoulder Deflection	mm	31 to 40	37.0	Pass
Peak Upper Thorax Rib Deflection	mm	25 to 32	29.7	Pass
Peak Middle Thorax Rib Deflection	mm	30 to 36	31.8	Pass
Peak Lower Thorax Rib Deflection	mm	32 to 38	32.2	Pass
Peak Upper Spine Y Acceleration	G's	34 to 43	37.0	Pass
Peak Lower Spine Y Acceleration	G's	29 to 37	32.4	Pass
Peak Impactor Acceleration	G's	30 to 36	32.8	Pass
Overall Test Results			Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
29.7	18.3	0.0	-11.2
Middle Thorax Deflection			
Max	Time	Min	Time
31.8	18.2	0.0	-17.8
Lower Thorax Deflection			
Max	Time	Min	Time
32.2	18.8	0.0	-16.1



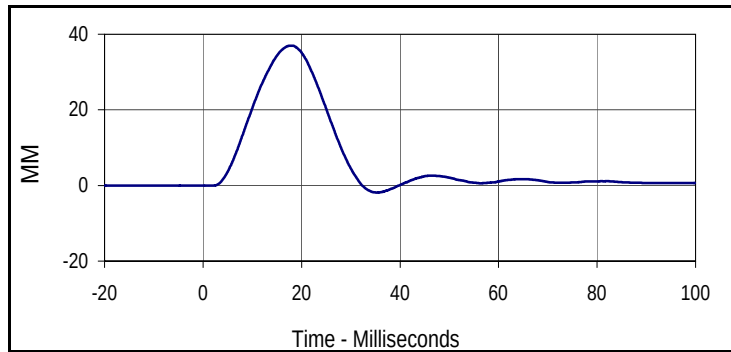
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
37.0	11.6	-13.6	33.6
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
32.4	10.5	-7.8	35.3



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
32.8	15.4	-0.3	-16.3

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

Test Date: 12/23/11
Test I.D.: 307TWA025



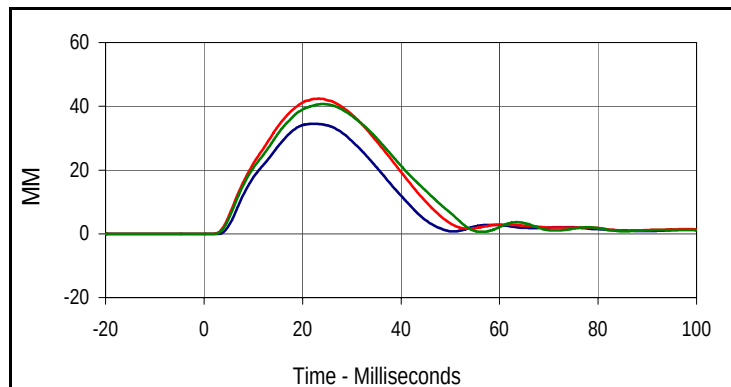
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
37.0	17.9	-1.9	35.3

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

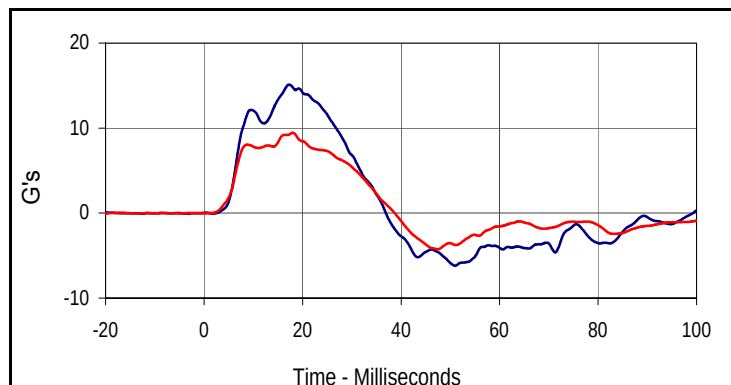
Test Date: 12/23/11
 Test I.D.: 307TWOA025



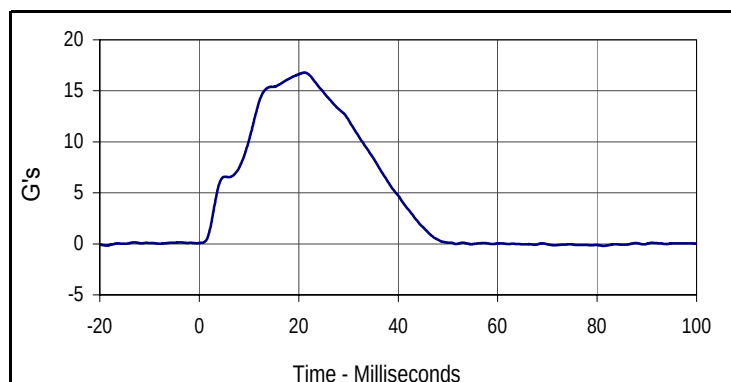
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	390	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	38.0	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.9	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	34.5	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	42.4	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	40.7	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	15.1	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	9.4	Pass
Peak Impactor Acceleration		G's	14 to 18	16.8	Pass
Overall Test Results				Pass	



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
34.5	22.3	0.0	-18.4
Middle Thorax Deflection			
Max	Time	Min	Time
42.4	23.3	0.0	-17.6
Lower Thorax Deflection			
Max	Time	Min	Time
40.7	24.1	0.0	-18.3



Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.1	17.3	-6.2	51.0
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.4	18.0	-4.3	47.4



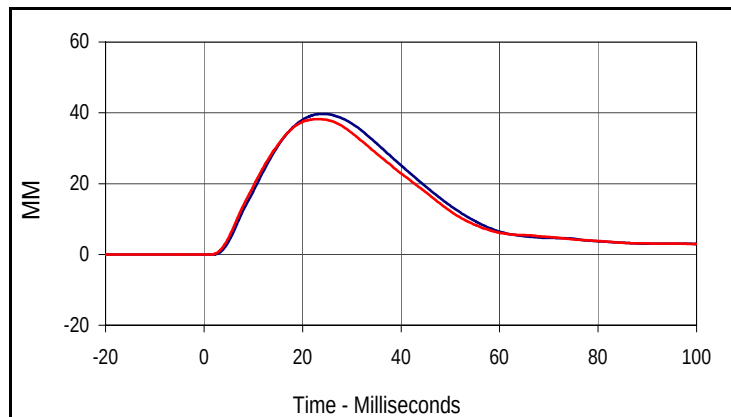
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.8	21.1	-0.2	81.3

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

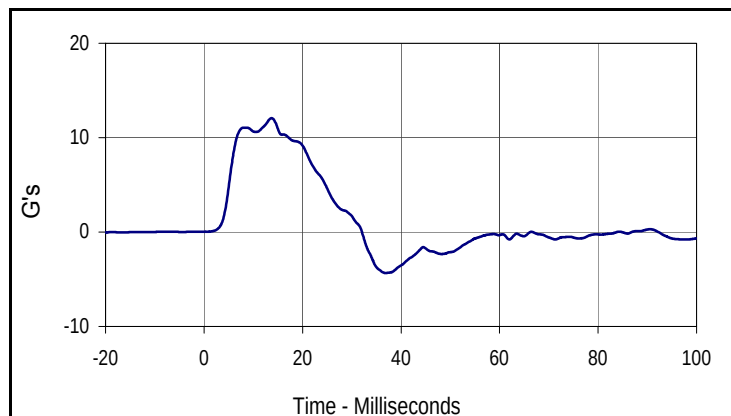
Test Date: 12/23/11
 Test I.D.: 307ABD025



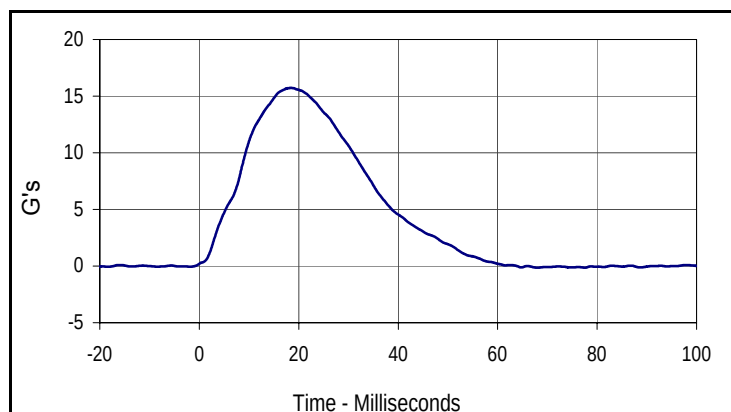
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	450	Pass
Temperature During Soak	Max °C	20.6 to 22.2	21.7	Pass
	Min °C		20.7	Pass
Humidity During Soak	Max %	10.0 to 70.0	38.0	Pass
	Min %		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.5	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.4	Pass
Peak Upper Abdominal Rib Deflection	mm	36 to 47	39.7	Pass
Peak Lower Abdominal Rib Deflection	mm	33 to 44	38.2	Pass
Peak Lower Spine Y Acceleration	G's	9 to 14	12.1	Pass
Peak Impactor Acceleration	G's	12 to 16	15.7	Pass
Overall Test Results			Pass	



Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
39.7	23.9	0.0	0.6
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
38.2	22.8	0.0	-3.5



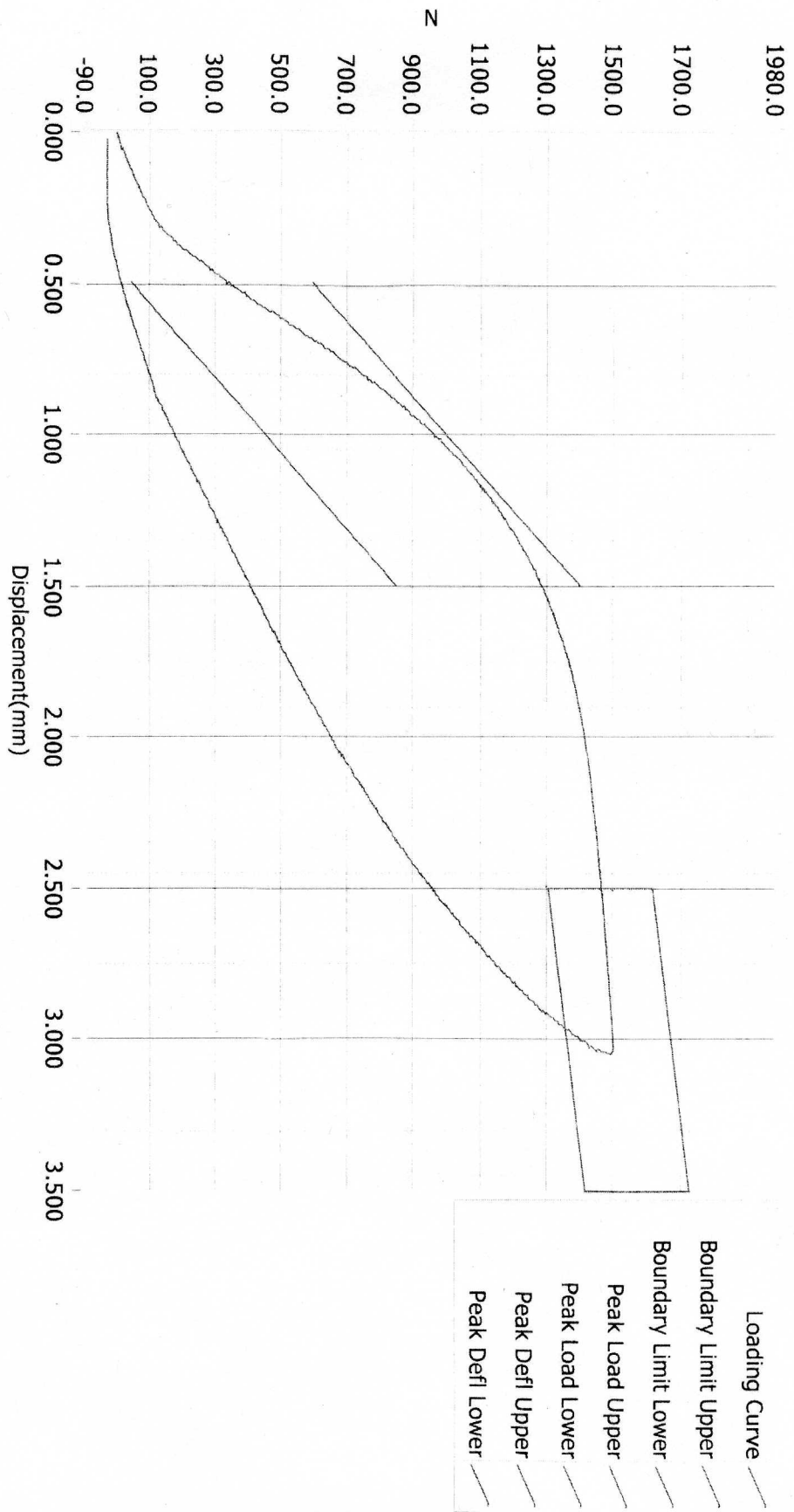
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
12.1	13.7	-4.3	36.8



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.7	18.5	-0.1	68.0

MC5110 POST TEST

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

Cert ID

ATD Serial Number

ATD Type

36387

SIDIIs

Current Date : 9/23/2010

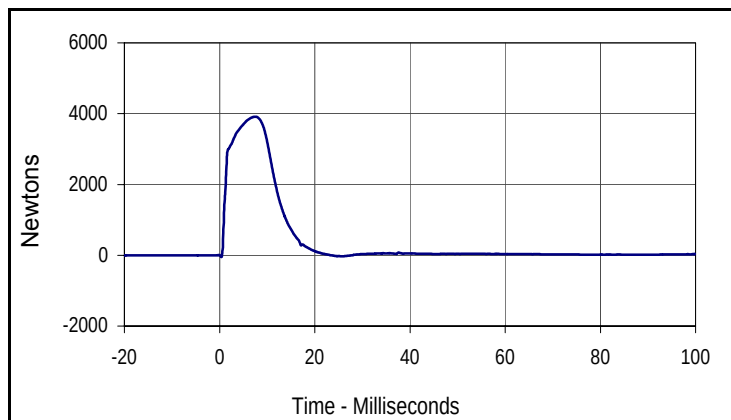
Current Time : 01:44:50

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

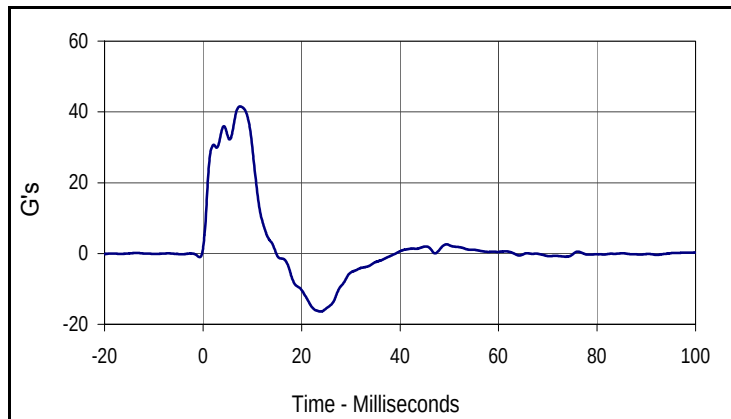
Test Date: 12/23/11
 Test I.D.: 307ACET025



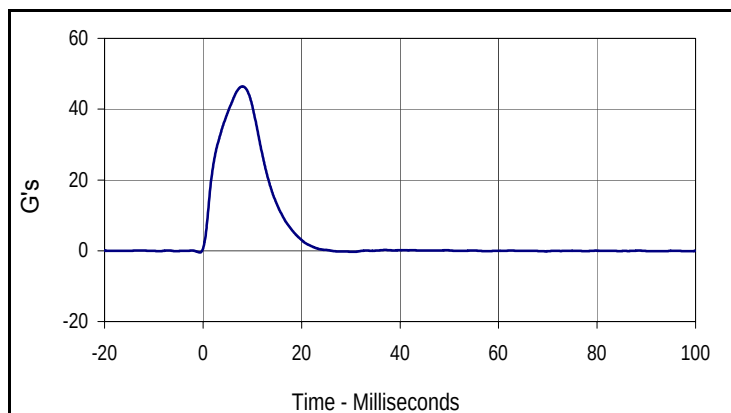
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	525	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.8	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.0	Pass
Impactor Velocity	m/s	6.6 to 6.8	6.6	Pass
Peak Acetabulum Force Y	Newtons	3600 to 4300	3914.7	Pass
Peak Pelvis Y Acceleration After 6 msec.	G's	34 to 42	41.6	Pass
Peak Impactor Acceleration	G's	38 to 47	46.4	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3914.7	7.5	-47.1	0.4



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
41.6	7.5	-16.4	23.9



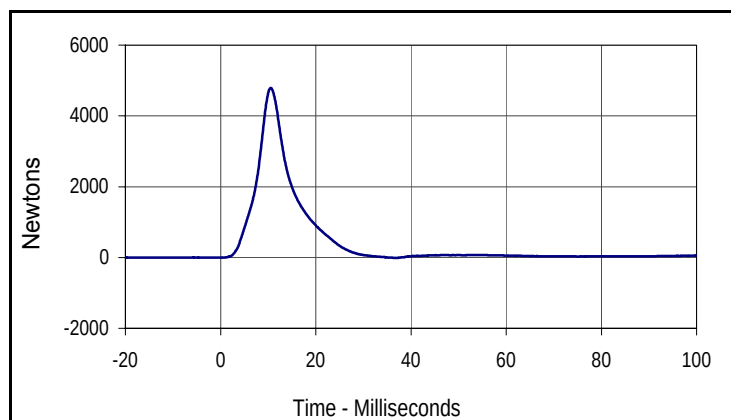
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
46.4	8.0	-0.5	-0.6

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

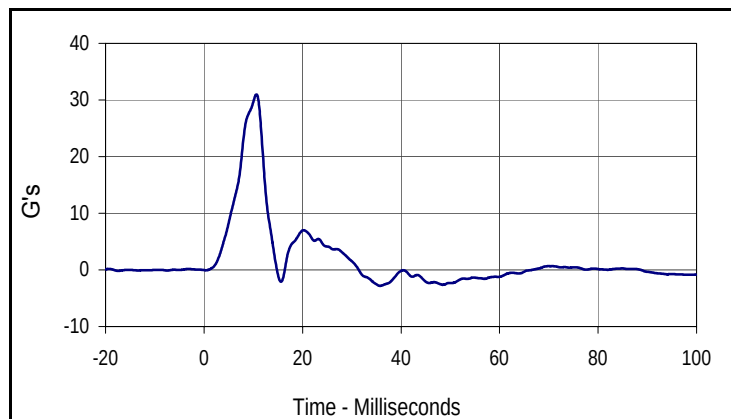
Test Date: 12/23/11
 Test I.D.: 307PL025



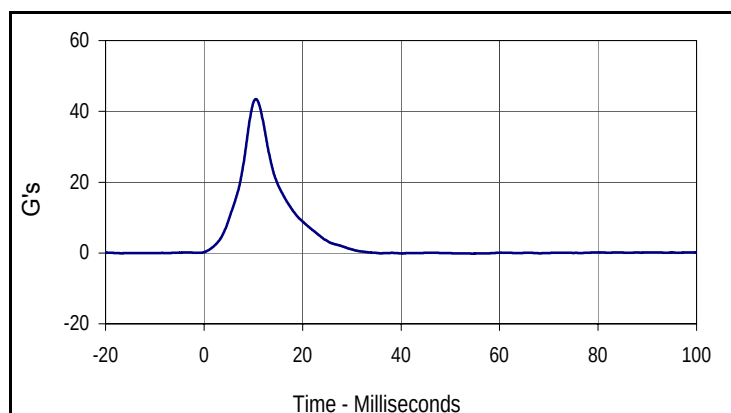
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥180	575	Pass
Temperature During Soak	Max	20.6 to 22.2	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	38.0	Pass
	Min		28.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	30.7	Pass
Impactor Velocity	m/s	4.2 to 4.4	4.3	Pass
Peak Iliac Force	Newtons	4100 to 5100	4788.2	Pass
Peak Pelvis Y Acceleration	G's	28 to 39	31.0	Pass
Peak Impactor Acceleration	G's	36 to 45	43.5	Pass
Overall Test Results			Pass	



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4788.2	10.5	-11.2	37.1



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
31.0	10.6	-2.8	35.8



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
43.5	10.5	-0.2	54.5

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	9/12/11
		Y	P58763	Endevco	9/12/11
		Z	P52093	Endevco	9/9/11
Thorax Rib Displacement Potentiometers	Upper	Y	180	FTSS	7/20/11
	Middle	Y	177	FTSS	7/20/11
	Lower	Y	186	FTSS	7/20/11
Abdomen Load Cells	Forward	Y	1514	Denton	7/22/11
	Middle	Y	1510	Denton	7/22/11
	Rear	Y	1515	Denton	7/22/11
Lower Spine Accelerometers (T12)		X	P49165	Endevco	9/12/11
		Y	P49212	Endevco	9/12/11
		Z	P52113	Endevco	9/12/11
Pubic Symphysis Load Cell		Y	506	Denton	7/22/11

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 307			
				Serial Number	Manufacturer	Calibration	
Head Accelerometers				X	P58900	Endevco	7/5/11
				Y	P58902	Endevco	7/5/11
				Z	P58983	Endevco	7/5/11
Displacement Potentiometers	Shoulder			Y	1244	FTSS	7/1/11
	Thoracic Rib	Upper	Y	1249	FTSS	7/1/11	
		Middle	Y	1265	FTSS	7/1/11	
		Lower	Y	1277	FTSS	7/1/11	
	Abdominal Rib	Upper	Y	1286	FTSS	7/1/11	
		Lower	Y	1290	FTSS	7/1/11	
Lower Spine Accelerometers (T12)				X	P59007	Endevco	7/1/11
				Y	P59015	Endevco	7/1/11
				Z	P59016	Endevco	7/1/11
Acetabulum Load Cell				Y	277	Denton	6/10/11
Iliac Wing Load Cell				Y	289	Denton	6/10/11
Pelvis Plug (Struck Side)					36393	FTSS	9/23/10
Pelvis Plug (Non-Struck Side)					36379	FTSS	9/23/11

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	Ketx5a	ICSensor	6/20/11
	Vehicle Center of Gravity	Y	Ketx5b	ICSensor	6/20/11
	Vehicle Center of Gravity	Z	Ketx5c	ICSensor	6/20/11
2	Right Sill at Front Seat	X	Keva201X	ICSensor	11/28/11
	Right Sill at Front Seat	Y	Keva201Y	ICSensor	11/28/11
	Right Sill at Front Seat	Z	Keva201Z	ICSensor	11/28/11
3	Right Sill at Rear Seat	X	Keva202X	ICSensor	11/28/11
	Right Sill at Rear Seat	Y	Keva202Y	ICSensor	11/28/11
	Right Sill at Rear Seat	Z	Keva202Z	ICSensor	11/28/11
4	Left Sill at Front Door	Y	AJ4F8	Endevco	11/7/11
5	Left Sill at Rear Door	Y	J21776	Endevco	3/22/11
6	Left A-Post Lower	Y	00L20-A20	Entrans	10/28/11
7	Left A-Post Middle	Y	J24288	Endevco	3/22/11
8	Left B-Post Lower	Y	BY98H	Endevco	3/15/11
9	Left B-Post Middle	Y	P12444	Endevco	3/15/11
10	Front Seat Track	Y	J24533	Endevco	4/1/11
11	Rear Seat Structure	Y	J21907	Endevco	3/30/11
12	Right Rear Occ. Compartment	Y	Keva004	ICSensor	5/8/11
13	Engine Block	X	BI60H	Endevco	7/22/11
	Engine Block	Y	AR17	Endevco	7/22/11
14	Rear Floorpan Above Axle	X	Ketx12A	ICSensor	7/20/11
	Rear Floorpan Above Axle	Y	Ketx12Y	ICSensor	7/21/11
	Rear Floorpan Above Axle	Z	Ketx12Z	ICSensor	7/21/11

TABLE 4 – MDB Instrumentation

		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	00L13-F37	Entrans	10/12/11
MDB Center of Gravity	Y	02I10-N16	Entrans	10/14/11
MDB Center of Gravity	Z	03J13_Z09	Entrans	10/14/11
Left Frame at Rear Axle Centerline	X	01J02-F13	Entrans	10/12/11
Left Frame at Rear Axle Centerline	Y	05616-L03	Entrans	10/14/11