REPORT NUMBER: SINCAP-KAR-13-010

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

CODA AUTOMOTIVE

2012 CODA 4-DOOR SEDAN

NHTSA No: MC0534

PREPARED BY:

KARCO ENGINEERING, LLC.

9270 HOLLY ROAD

ADELANTO, CA 92301

AUGUST 15, 2012

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

OFFICE OF CRASHWORTHINESS STANDARDS

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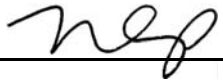
Reviewed By: 

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Approval Date: August 15, 2012

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date:

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

Date:

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Final Report of New Car Assessment Program Side Impact MDB Testing of a 2012 CODA 4-Door Sedan NHTSA No. MC0534	August 15, 2012
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9. Performing Organization Name and Address KARCO Engineering, LLC. 9270 Holly Rd. Adelanto, CA 92301	**10. Work Unit No.**
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15. Supplementary Notes

16. Abstract

A 55/28 km/h 90 deg. Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2012 CODA 4-door sedan in accordance with the specifications of the Office of Crash Worthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. The test was conducted at the KARCO Engineering, LLC. facility in Adelanto, California on August 1, 2012

The impact velocity of the Moving Deformable Barrier was 62.14 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 30.8 deg. C. The target vehicle's maximum post-test static crush was 167 mm located at level 3. The test vehicle's occupant performance data is as follows:

Measurement Description	Driver ATD (ES-2re)		
	Units	IARV	Result
Head Injury Criteria (HIC_{36})		1000	155.8
Maximum Thorax Rib Deflection	mm	44	24
Total Abdominal Force	N	2500	567
Pubic Symphysis Force	N	6000	794

Measurement Description	Passenger ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC_{36})		1000	398.9
Resultant Lower Spine Acceleration	g	82	52
Total Pelvic Force (Sum of Acetubular and Iliac Forces)	N	5525	3276
Maximum Thoracic Rib Deflection	mm	38*	35
Maximum Abdominal Rib Deflection	mm	45*	25

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

** Proposed IARV*

17. Key Words		18. Distribution Statement	
New Car Assessment Program (NCAP) Side Impact Moving Deformable Barrier (MDB) ES-2re SID-IIs		Copies of this report are available from: National Highway Traffic Safety Admin. Technical Information Services Division, NPO-411 1200 New Jersey Ave., SE, Room E12-100 Washington, DC 20590	
19. Security Classification of this report	**20. Security Classification of this page**	**21. No. of Pages**	**22. Price**
UNCLASSIFIED	UNCLASSIFIED	155	

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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 CODA 4-door sedan. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated May 2012.

SECTION 2
SUMMARY OF TEST RESULTS

A 2012 CODA 4-door sedan 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 62.14 km/h (38.61 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 August 1, 2012. 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 May 2012. The side impact event was documented by 11 cameras. Camera locations are included in Data Sheet No. 5 of this report.

The dummies were instrumented in the following manner:

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

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

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

Dummy injury readings were recorded as follows:

Measurement Description	Units	Driver ATD (ES-2re)	
		Threshold	Result
Head Injury Criteria (HIC_{36})		1000	155.8
Maximum Thorax Rib Deflection	mm	44	24
Combined Abdominal Force	N	2500	567
Pubic Symphysis Force	N	6000	794

Measurement Description	Units	Passenger ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC_{36})		1000	398.9
Lower Spine (T12) Resultant Acceleration	g	82	52
Total Pelvic Force (sum of acetabular and iliac forces	N	5525	3276
Maximum Thoracic Rib Deflection	mm	38*	35
Maximum Abdominal Rib Deflection	mm	45*	25

**Proposed IARV*

Supplemental restraint information is given below:

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

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.

During the side MDB test, the side curtain air bag did not fully deploy, causing the rear passenger dummy's head to contact the window. Please refer to NHTSA Campaign Number 12V409000 for further information regarding the air bag deployment issue. These ratings are applicable to vehicles subject to NHTSA Campaign Number 12V409000 that have not been fixed.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12

CONVERSION FACTORS

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

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	MC0534
Model Year	2012
Make	CODA
Model	CODA
Body Style	4-Door Sedan
VIN	53G1U4A45CB000047
Body Color	Perfect Storm
Odometer Reading (km / mi)	11 / 7
Engine Displacement (L)	
Type / No. of Cylinders	Electric
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	
Overdrive	Yes
Final Drive	Front
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
All Wheel Drive (AWD)	No

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks	No
Power Window Auto-Reverse	Yes
Other Optional Feature	None
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	No
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head/Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso/Pelvis Airbag	No
Rear Pass. Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensione	Yes
Driver Load Limiter	Yes
Rear Pass. Load Limiter	Yes
Other Safety Restraint	None

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

DATA FROM CERTIFICATION LABEL

Manufactured By	CODA Automotive
Date of Manufacture	Feb-12
Vehicle Type	Passenger Car

GVWR (kg)	2045
GAWR Front (kg)	995
GAWR Rear (kg)	1050

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				375.0	*A*
DSC x 68.04 (kg)				340.2	*B*
Cargo Weight (RCLW) (kg)				34.8	*A-B*

VEHICLE SEAT TYPE

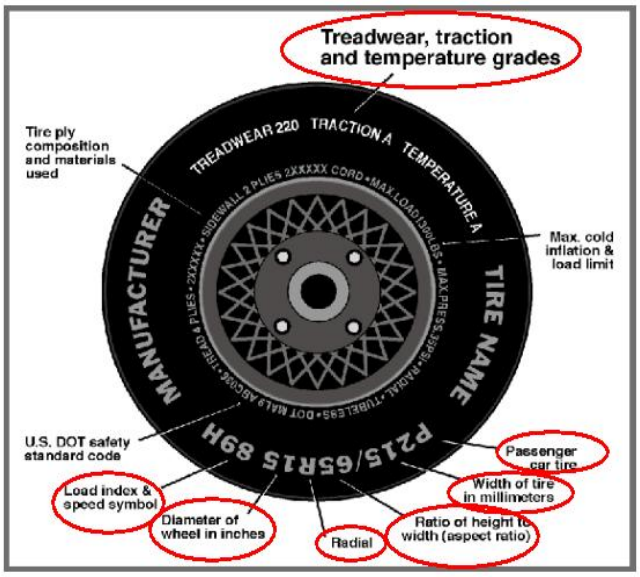
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable w/ Lever	Adjustable w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat		Yes			Yes		
Third Row Seat							

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	290	290
Recommended Tire Size	205/45R17	205/45R17

VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	340	340
Tire Size on Vehicle	205 45R17 88H	205 45R17 88H
Tire Manufacturer	Kumho	Kumho
Tire Name	Ecsta AST	Ecsta AST
Tire Type	Passenger	Passenger
Tire Width	205	205
Aspect Ratio	45	45
Radial	Yes	Yes
Wheel Diameter	17	17
Load Index/Speed Symbol	88H	88H
Treadware	400	400
Traction Grade	A	A
Temperature Grade	A	A
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	290	290	285	290
Tire Placard	kPa	290	290	290	290
Owner's Manual	kPa	290	290	290	290
As Tested	kPa	290	290	290	290

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	446.5	378.5		486.0	455.0		480.0	464.0	
Right	kg	443.0	399.5		453.0	427.0		452.0	431.0	
Ratio	%	53.3%	46.7%	100.0%	51.6%	48.4%	100.0%	51.0%	49.0%	100.0%
Total	kg	889.5	778.0	1667.5	939.0	882.0	1821.0	932.0	895.0	1827.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1667.5	A
Actual Weight of 2 P572 ATDs Used	kg	125.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	34.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1827.3	A+B+C

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

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Non-Struck Outboard Mirror, Doors and Windows	13.0
Rear Bumper Cover	6.0
Tail Lights	2.5
Navigation Unit	2.5
Trunk Lid	10.5
Regulators for Windows	2.5
Rear Speakers	1.0
Ballast / Equipment Added	56.0

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement***
LF	mm	665	664	Yes
RF	mm	676	670	Yes
RR	mm	666	664	Yes
LR	mm	669	671	Yes
Vehicle CG (Aft of Front Axle)	mm	1279	1264	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	25	25	

***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 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12

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	2.6	0.0	1.3
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle	As Tested SCRP Height	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid Fore/Aft	Forwardmost
Driver Seat	1.3	540	Max	536	540	544
			Mid	536	540	544
			Min	536	540	544
Front Passenger Seat	Fixed	542	Max	538	542	546
			Mid	538	542	546
			Min	538	542	546
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed

DATA SHEET NO. 2 … (CONTINUED)

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

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

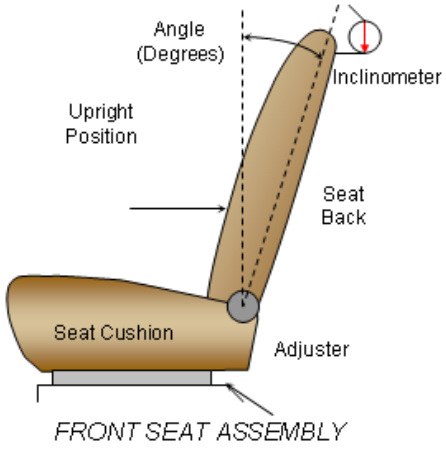
Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12

SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	220	23	110	11
Front Passenger Seat	220	23	110	11
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

SEAT BACK ADJUSTMENT

The driver's seat back is positioned to the manufacturer's designated design angle. The right front passenger's seat back is positioned in a similar manner as the driver's seat back. The struck side rear seat back is positioned such that the dummy's head is level. The rear center and non-struck side rear outboard seat backs are positioned in a similar manner as the struck side rear seat back. Seat back angle is measured at the headrest post.



SEAT BACK POSITION

Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/Seated Dummy	74.3	41	14.7	15
Front Passenger Seat	74.8	41	14.7	15
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

DATA SHEET NO. 2 … (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12

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	5	H
Rear Seat	Fixed	Fixed

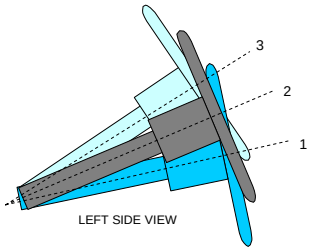
HEAD RESTRAINT ADJUSTMENT

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

	Total No. of Positions	Placed in Position
Driver Seat	5	Full Up
Rear Seat	4	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.



STEERING COLUMN ASSEMBLY

	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	22.8	
Geometric Center - Position 2	24.0	
Uppermost - Position 3	25.2	
Telescoping Steering Wheel Travel		
Test Position	24.0	

DATA SHEET NO. 2 … (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12

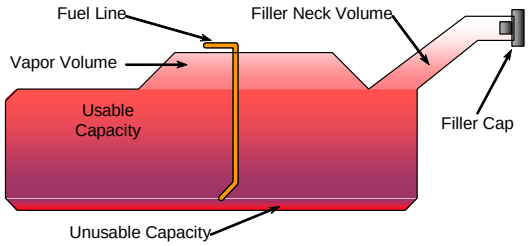
FUEL TANK CAPACITY

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

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

FUEL PUMP

The test vehicle is electric and is not equipped with any liquid fuel system, including a fuel pump or tank. There is no fuel filler door.



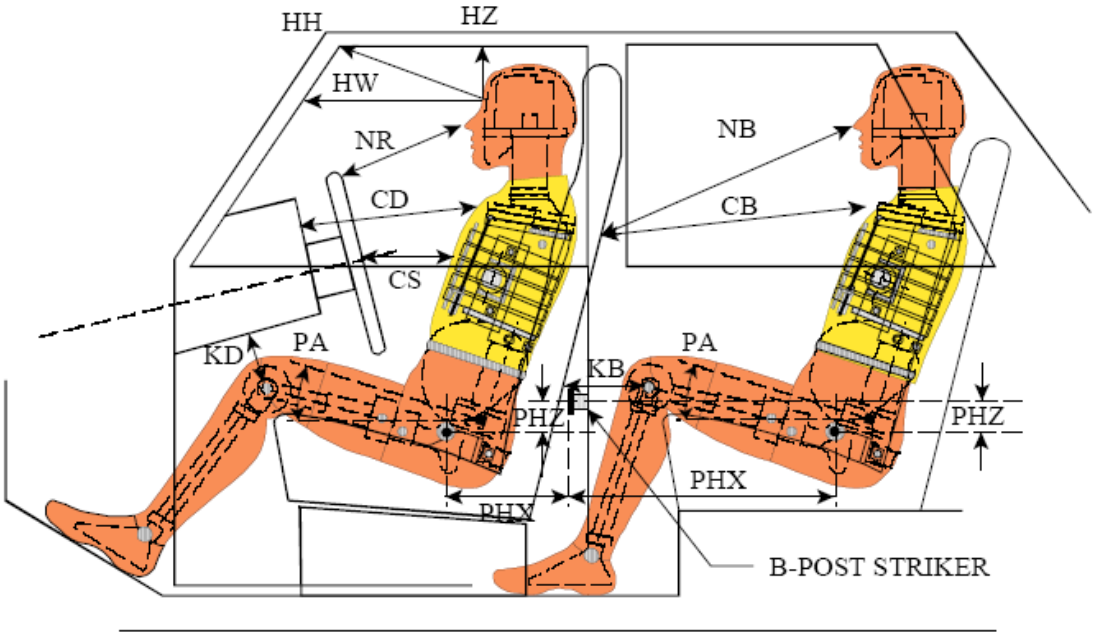
VEHICLE FUEL TANK ASSEMBLY

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12



LEFT SIDE VIEW

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

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

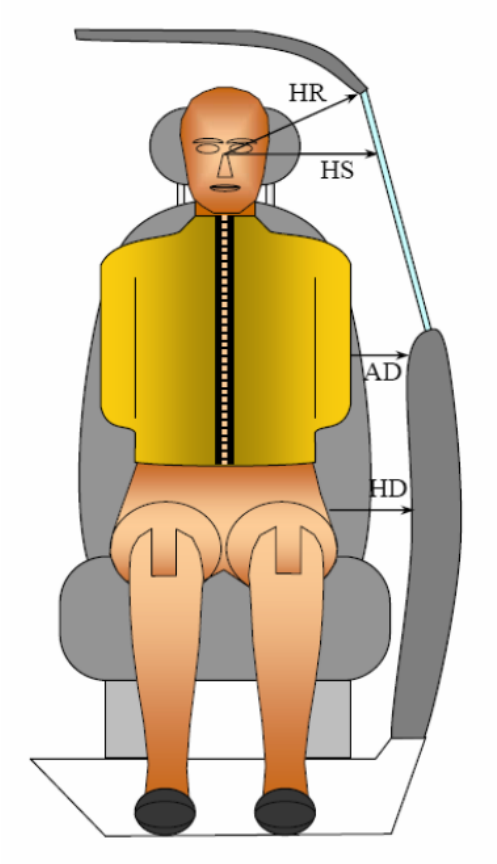
Driver Code	Pass. Code	Description	Driver		Passenger	
			Length (mm)	Angle (º)	Length (mm)	Angle (º)
HH		Head to Header	416			
HW		Head to Windshield	565			
HZ	HZ	Head to Roof	146		243	
NR	NB	Nose to Rim/Seat Back	450		522	
CD	CB	Chest to Dash/Seat Back	566		508	
CS		Chest to Steering Wheel	282			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	115	34.6	277	26.8
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	60	31.8	278	26.1
PAX°	PAX°	Pelvic Tilt Angle X		16.9		21.2
	PAY°	Pelvic Tilt Angle Y				0.4
PHX	PHX	Hip Point to Striker (x-axis)	210		229	
PHZ	PHZ	Hip Point to Striker (z-axis)	135		270	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12



FRONT VIEW OF DUMMY

DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

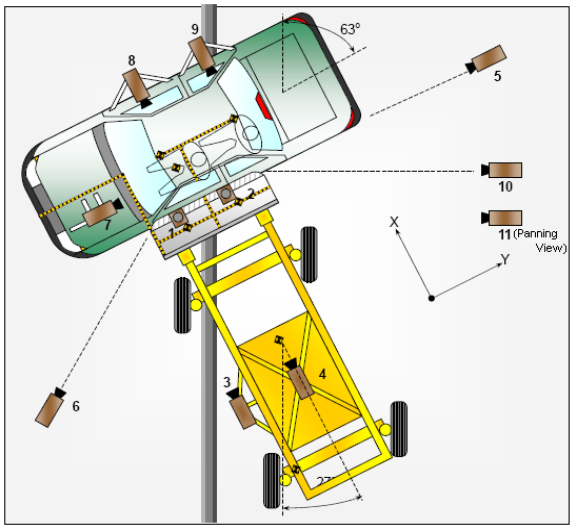
Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	151	232
HS	Head to Side Window	mm	282	336
AD	Arm to Door	mm	95	104
HD	H-Point to Door	mm	157	150

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12



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)	482	-883	-600	35	1000
8	Driver Side (On-Board)	1581	786	-357	14	1000
9	Passenger Side (On-Board)	1526	1674	-458	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

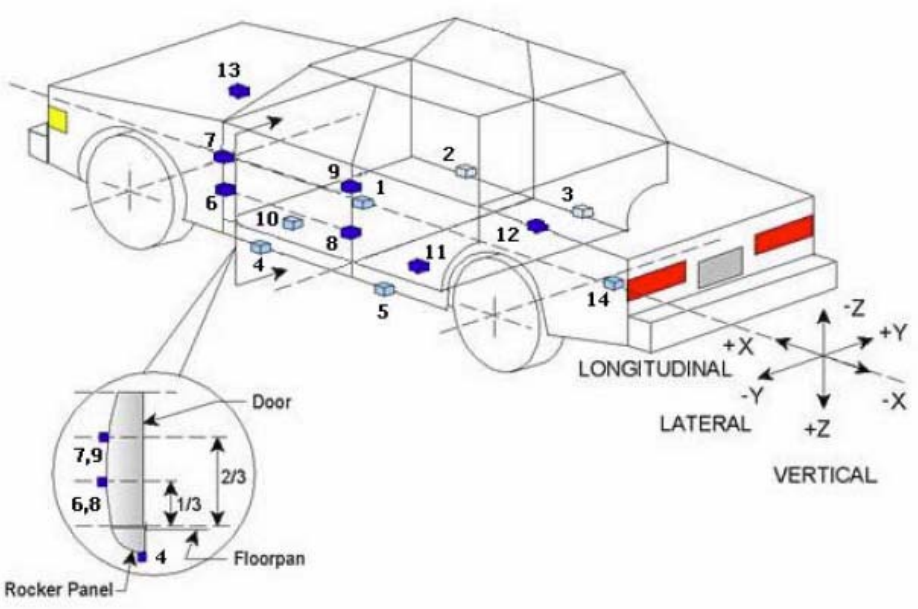
Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	23
MDB Accelerometers	5
Total	60

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2005	0	-377
2	Right Sill at Front Seat	2765	665	-320
3	Right Sill at Rear Seat	1815	658	-330
4	Left Sill at Front Door	3005	-670	-185
5	Left Sill at Rear Door	1745	-655	-188
6	A-Pillar Lower	3179	-725	-540
7	A-Pillar Middle	3179	-725	-765
8	B-Pillar Lower	2140	-697	-455
9	B-Pillar Middle	2140	-697	-760
10	Front Seat Track	2382	-538	-315
11	Rear Seat Structure			
12	Right Rear Occupant Compartment	2095	472	-319
13	Engine Block	3795	45	-782
14	Rear Floorpan Above Axle	942	458	-492

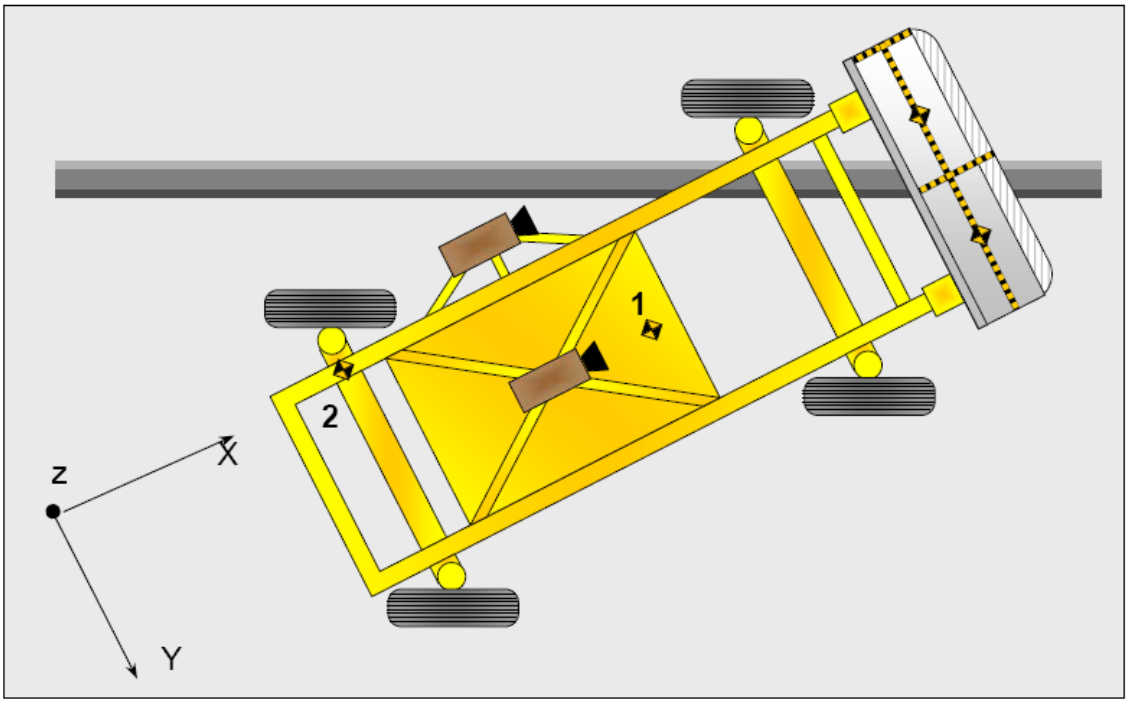
Reference: X – Rear surface of vehicle (+ forward)
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 7

MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12



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 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12

TEST DUMMY INFORMATION AND CONTACT POINTS

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

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/Other Door
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	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)					

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No Separation
Sill Separation	No Separation
Windshield Damage	None
Side Window Damage	Left Rear Window Broken
Other Notable Effects	Rear portion of curtain airbag did not fully inflate

DATA SHEET NO. 8 … (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No	No	
Knee Airbag	No		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				

*NOTE: Rear portion of curtain airbag did not fully inflate.

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2610
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		364
Actual Impact Point (Aft of Front Axle)	mm		358
Horizontal Offset (+ forward / - rearward)	mm	± 50 of Intended Impact Point	6
Vertical Offset (+ down / - up)	mm	± 20 of Intended Impact Point	20

DATA SHEET NO. 9

MDB SUMMARY OF RESULTS

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12

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	1369

SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.14
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.06
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.6
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	62.7
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26.0 to 28.0	27.9

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

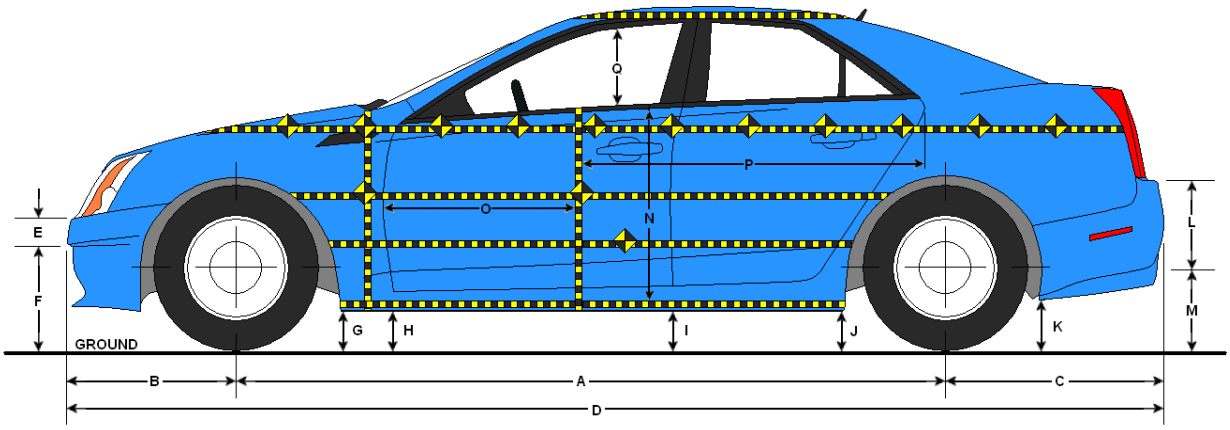
Vertical Location			From Centerline		Max. Crush
Row	Description	Height (mm)	Distance (mm)	Direction	(mm)
A	Center of Bumper	432	600	Left	327
B	Top of Bumper	533	800	Left	207
C	Mid Level	686	800	Left	187
D	Top of Stack	813	800	Left	199

DATA SHEET NO. 10

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2610	2602	-8
B	Front Axle to FSOV	875	881	6
C	Rear Axle to RSOV	994	995	1
D	Total Length at Centerline	4479	4478	-1
E	Front Bumper Thickness	107	107	0
F	Fromt Bumper Bottom to Ground	432	439	7
G	Sill Height at Front Wheel Well	241	248	7
H	Sill Height at Front Door Leading Edge	243	251	8
I	Sill Height at B-Pillar	301	310	9
J1	Sill Height at Rear Wheel Well	281	281	0
J2	Pinch Weld Height at Rear Wheel Well	179	175	-4
K	Sill Height Aft of Rear Wheel Well	498	516	18
L	Rear Bumper Thickness	151	151	0
M	Rear Bumper Bottom to Ground	424	445	21
N	Sill Height to Bottom of Front Window Sill	585	629	44
O	Front Door Leading Edge to Impact CL	743	740	-3
P	Rear Door Trailing Edge to Impact CL	1266	1252	-14
Q	Front Window Opening	460	472	12
R	Right Side Length	3030	3033	3
S	Left Side Length	3027	3008	-19
T	Vehicle Width at B-Pillar	1690	1621	-69

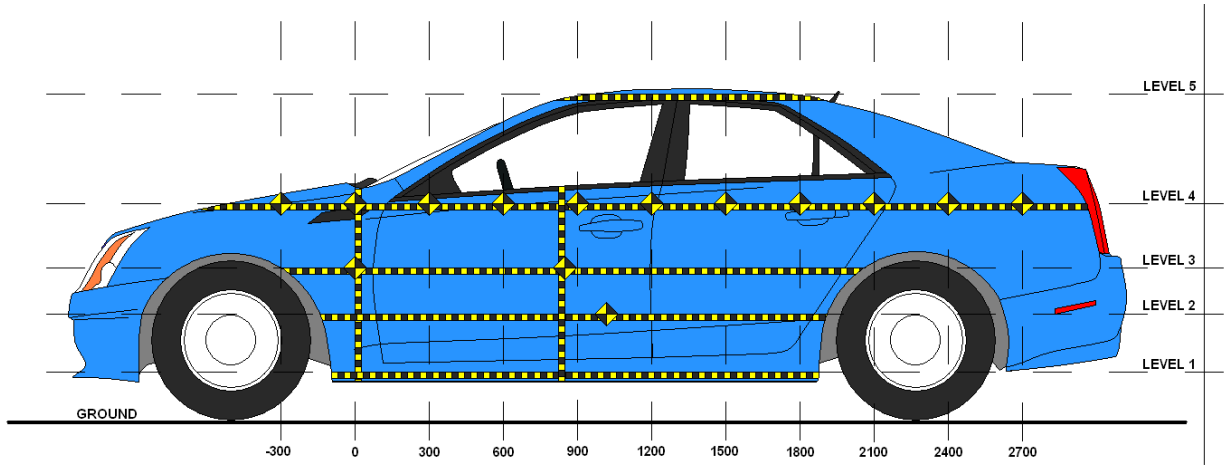
All measurements in mm with tolerance of ± 3mm

DATA SHEET NO. 11

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	276	104	1500
2	Occupant H-Point	576	141	1500
3	Mid-Door	659	167	1650
4	Window Sill	897	102	1350
5	Window Top	1444	25	1950

DATA SHEET NO. 11 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

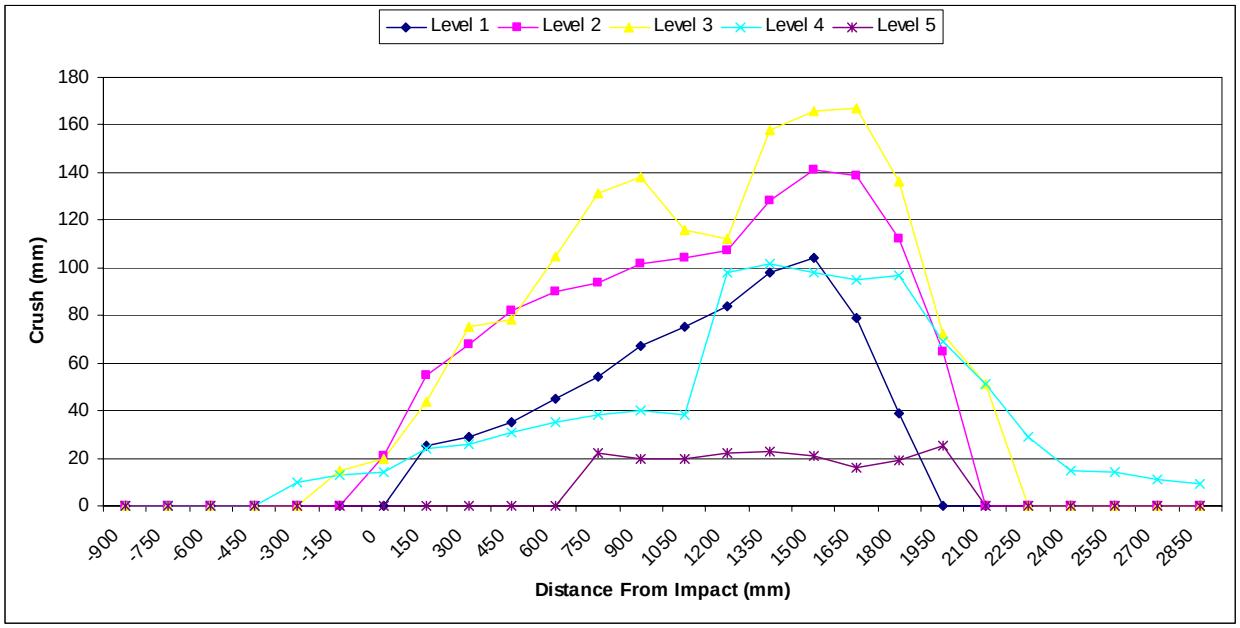
	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300				756					766					10	
-150			644	740				659	753				15	13	
0		648	652	728			669	672	742			21	20	14	
150	679	650	651	712		704	705	695	736		25	55	44	24	
300	679	639	649	702		708	707	724	728		29	68	75	26	
450	679	639	648	693		714	721	726	724		35	82	78	31	
600	679	639	647	685		724	729	752	720		45	90	105	35	
750	681	640	647	681	944	735	734	778	719	966	54	94	131	38	22
900	681	641	648	676	947	748	743	786	716	967	67	102	138	40	20
1050	682	643	648	672	953	757	747	764	710	973	75	104	116	38	20
1200	684	645	651	673	955	768	752	763	771	977	84	107	112	98	22
1350	688	647	652	672	956	786	775	810	774	979	98	128	158	102	23
1500	690	650	655	672	955	794	791	821	770	976	104	141	166	98	21
1650	692	653	657	671	957	771	792	824	766	973	79	139	167	95	16
1800	695	662	660	661	954	734	774	796	758	973	39	112	136	97	19
1950		646	656	653	953		711	728	722	978		65	72	69	25
2100			639	679				690	730				51	51	
2250				683					712					29	
2400				688					703					15	
2550				696					710					14	
2700				712					723					11	
2850				730					739					9	

DATA SHEET NO. 11 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12

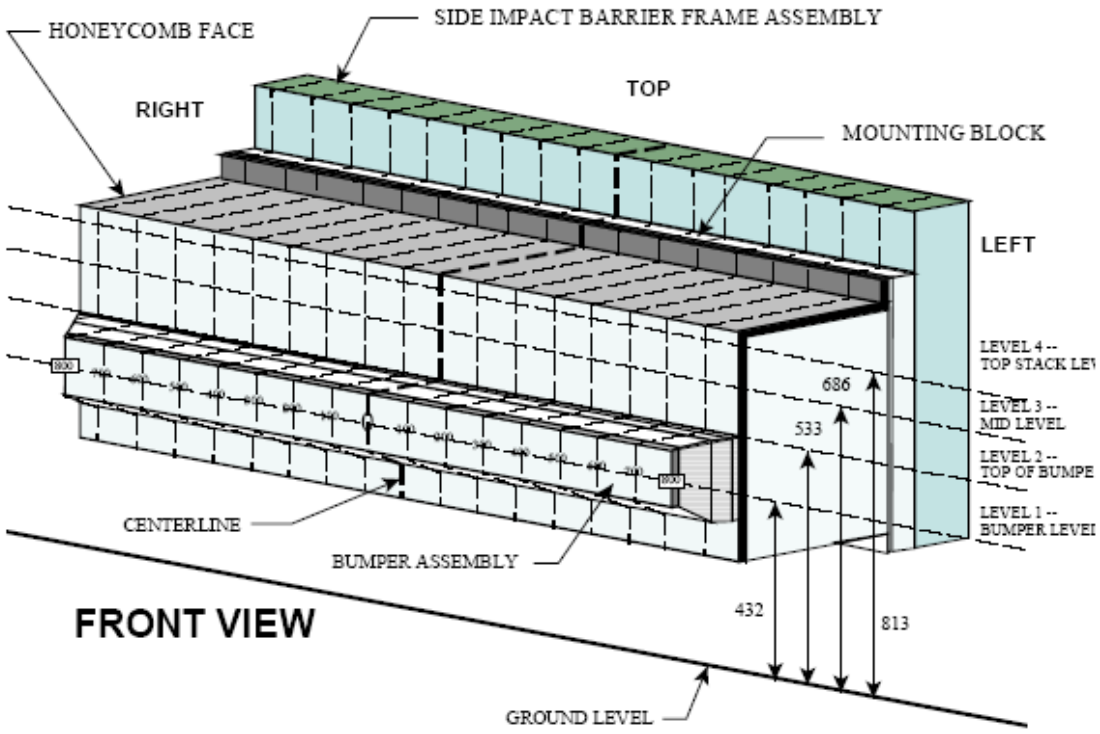


DATA SHEET NO. 12

MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	225	221	225	222	224	229	225	227	225	219	223	227	226	231	327	250	275
2	149	144	142	141	137	133	128	156	147	148	160	167	172	179	186	195	207
3	78	72	66	69	76	100	111	83	67	69	69	83	96	109	125	147	187
4	53	51	49	48	67	105	117	80	65	67	65	73	82	99	131	165	199

All dimensions in millimeters.

DATA SHEET NO. 13

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12

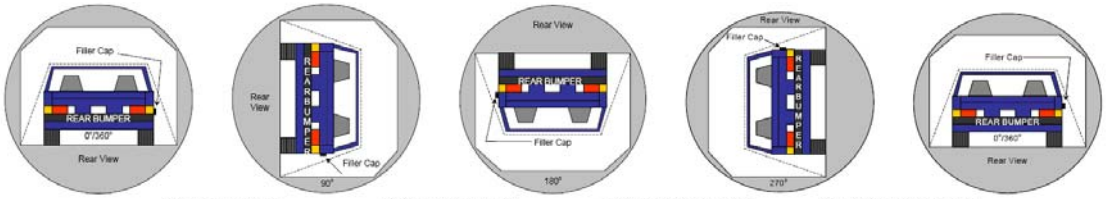
Temperature at Time of Impact: 30.8° C Test Time: 11:20 AM

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

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

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

D. Spillage Details: N/A



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

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	82	300	382
90° To 180°	81	300	381
180° To 270°	79	300	379
270° To 360°	84	300	384

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

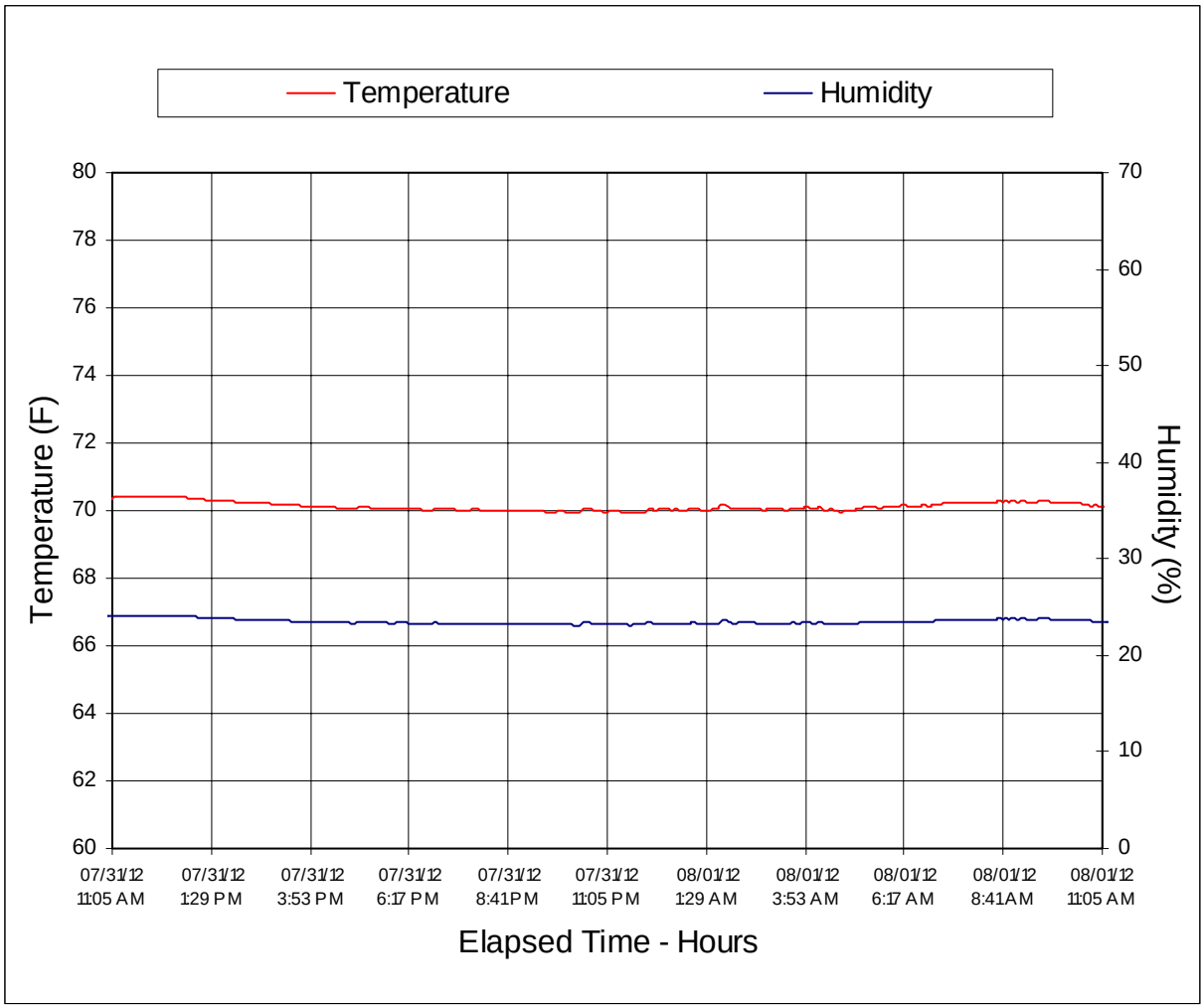
Test Phase	Spillage Location
0° To 90°	
90° To 180°	
180° To 270°	
270° To 360°	

DATA SHEET NO. 14

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2012 CODA 4-Door Sedan NHTSA No. MC0534

Test Program: NCAP MDB Side Impact Test Test Date: 08/01/12



APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS … (CONTINUED)

TABLE OF PHOTOGRAPHS … (CONTINUED)

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

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

FIGURE 3. Pre-Test Frontal View of Test Vehicle

FIGURE 4. Post-Test Frontal View of Test Vehicle

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

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

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

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

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

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

FIGURE 11. Pre-Test Rear View of Test Vehicle

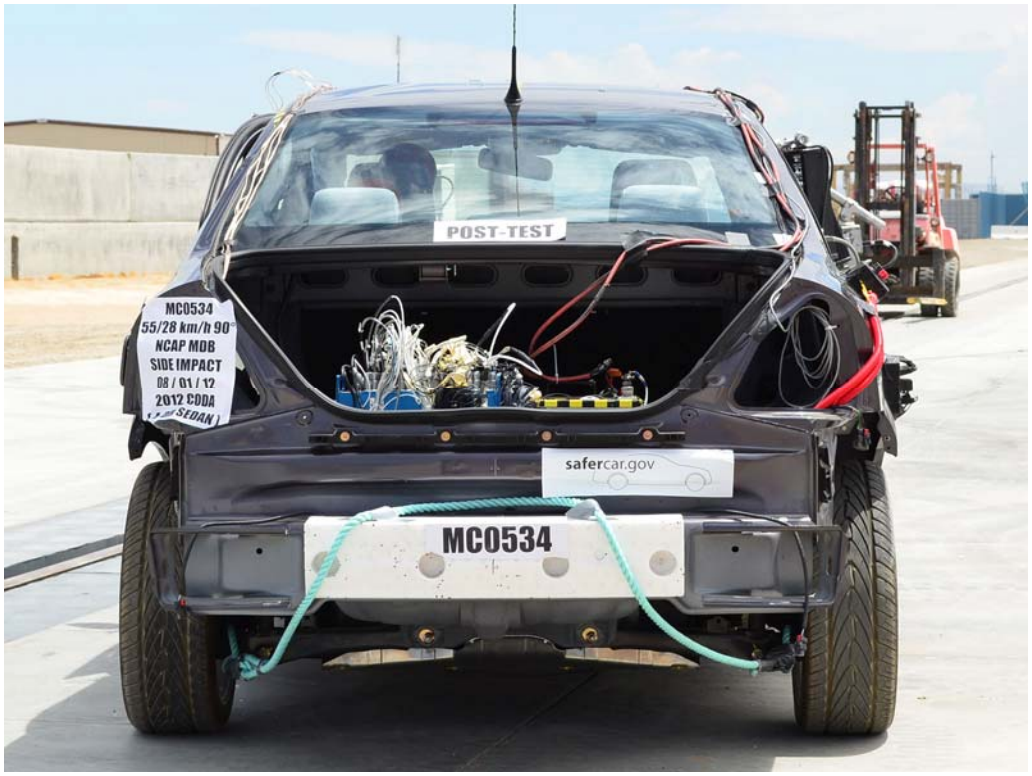


FIGURE 12. Post-Test Rear View of Test Vehicle

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

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

FIGURE 15. Pre-Test Overhead View of Test Area

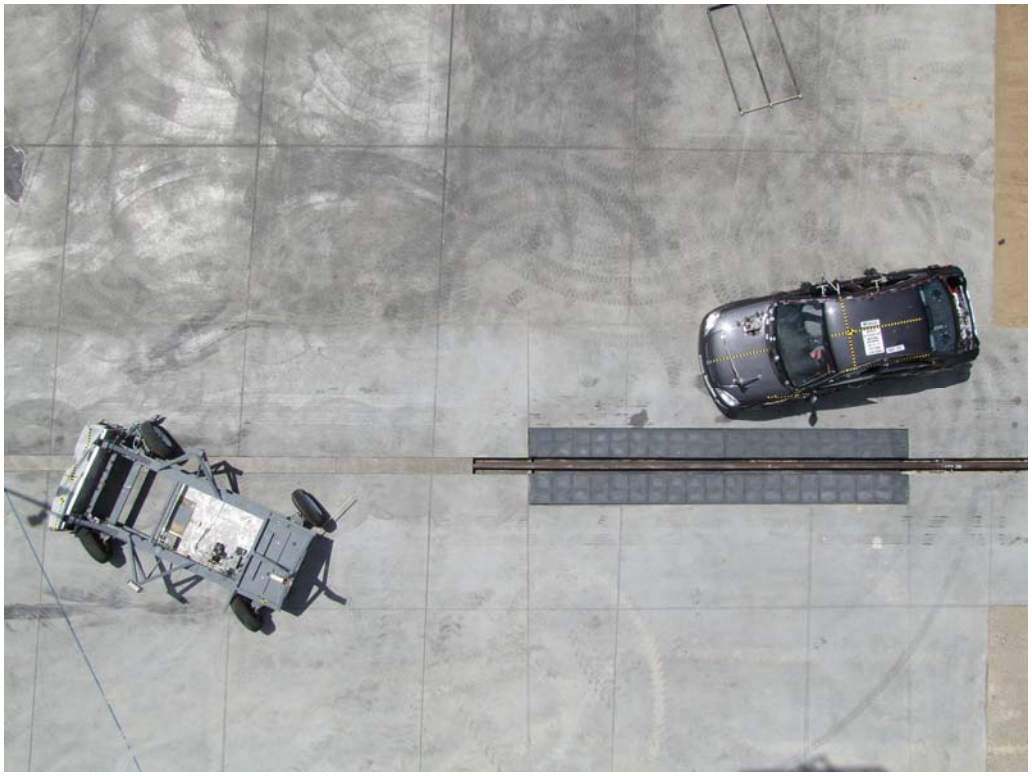


FIGURE 16. Post-Test Overhead View of Test Area

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

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

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

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

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

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

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

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

FIGURE 32. Pre-Test 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

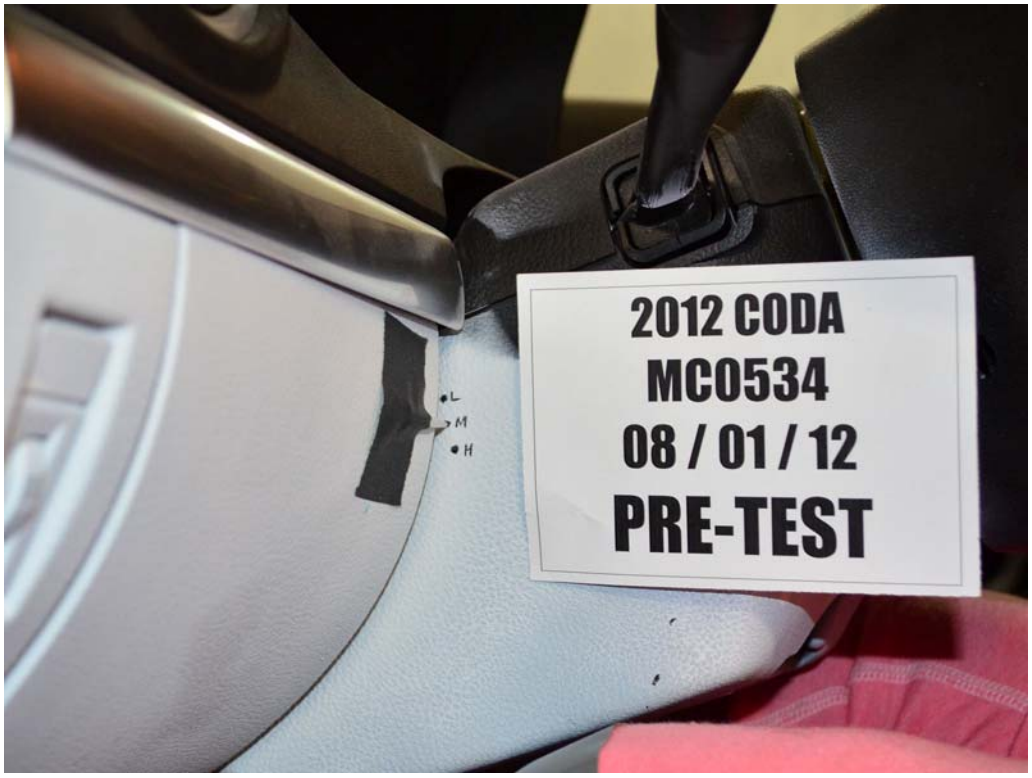


FIGURE 36. Pre-Test Left Side View of Steering Wheel

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

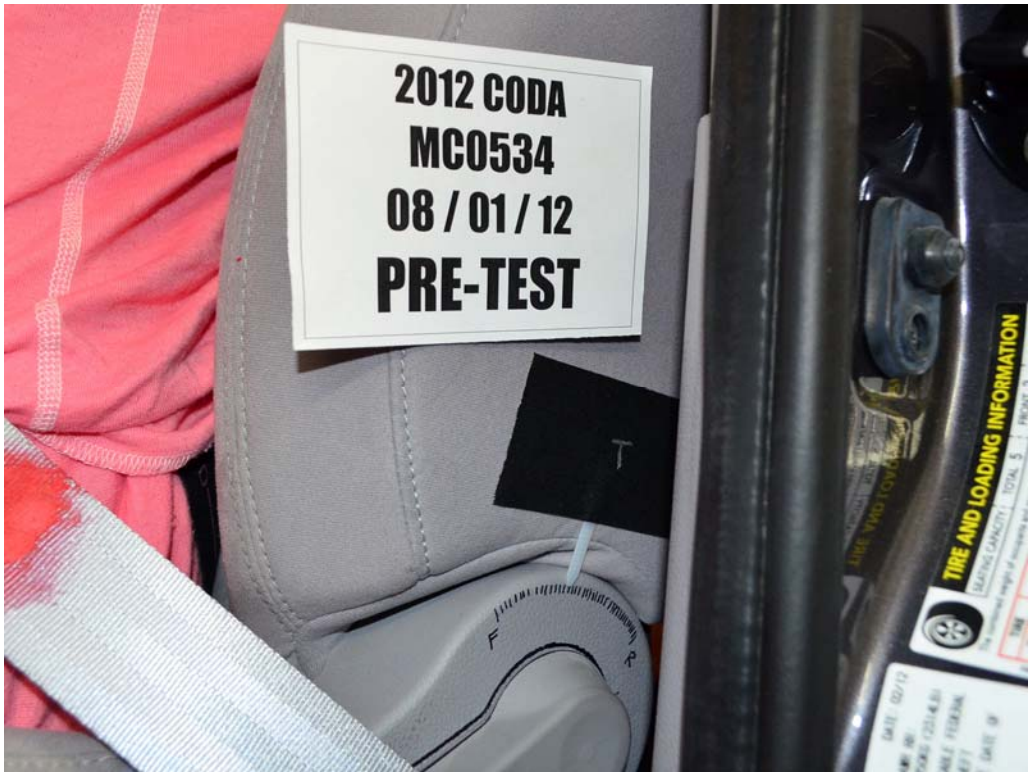


FIGURE 40. Pre-Test Close-Up Left Side View of Driver Seat Back

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
Showing Driver Dummy Contact Locations

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

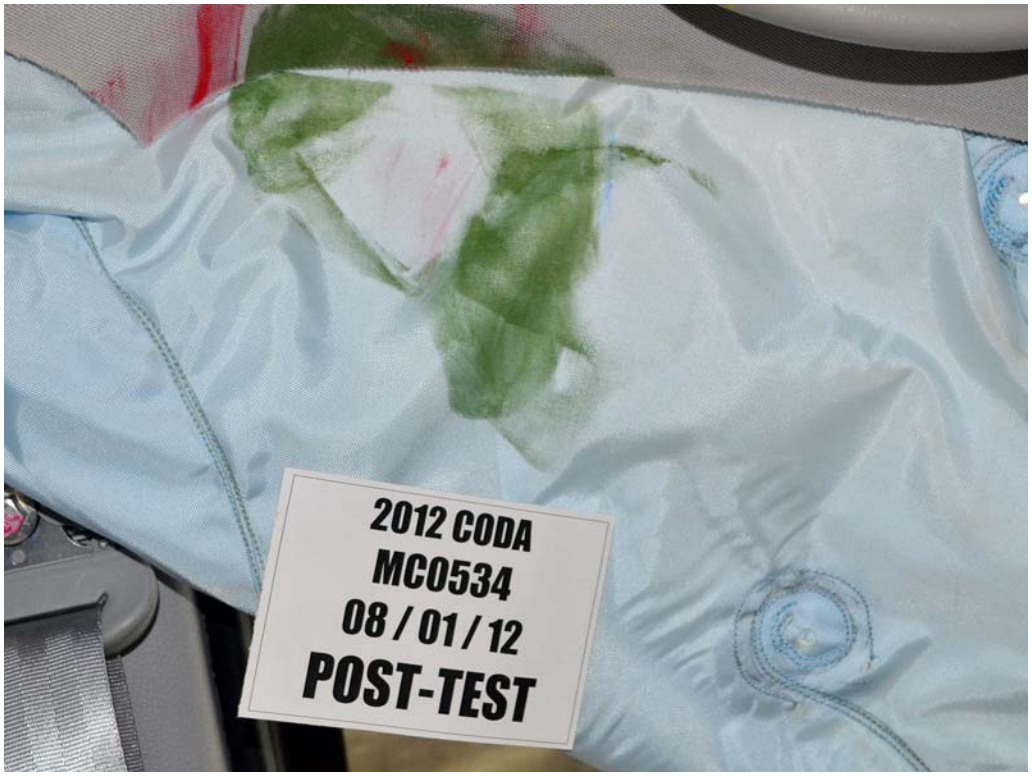


FIGURE 49. Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View

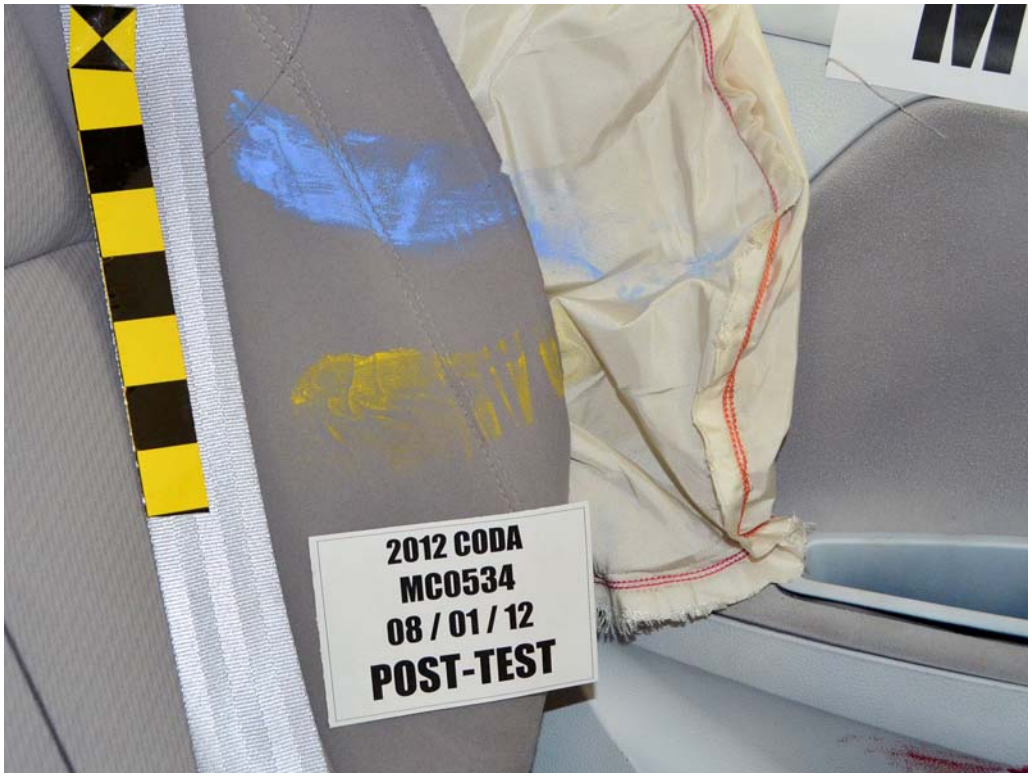


FIGURE 50. Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View

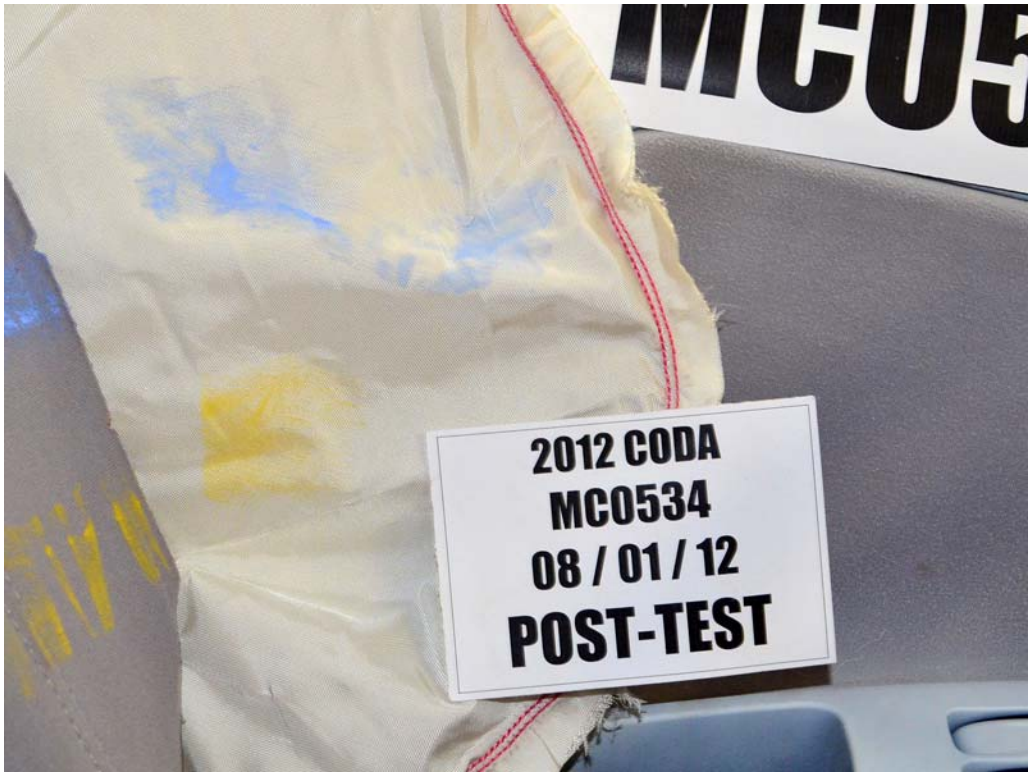


FIGURE 51. Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View

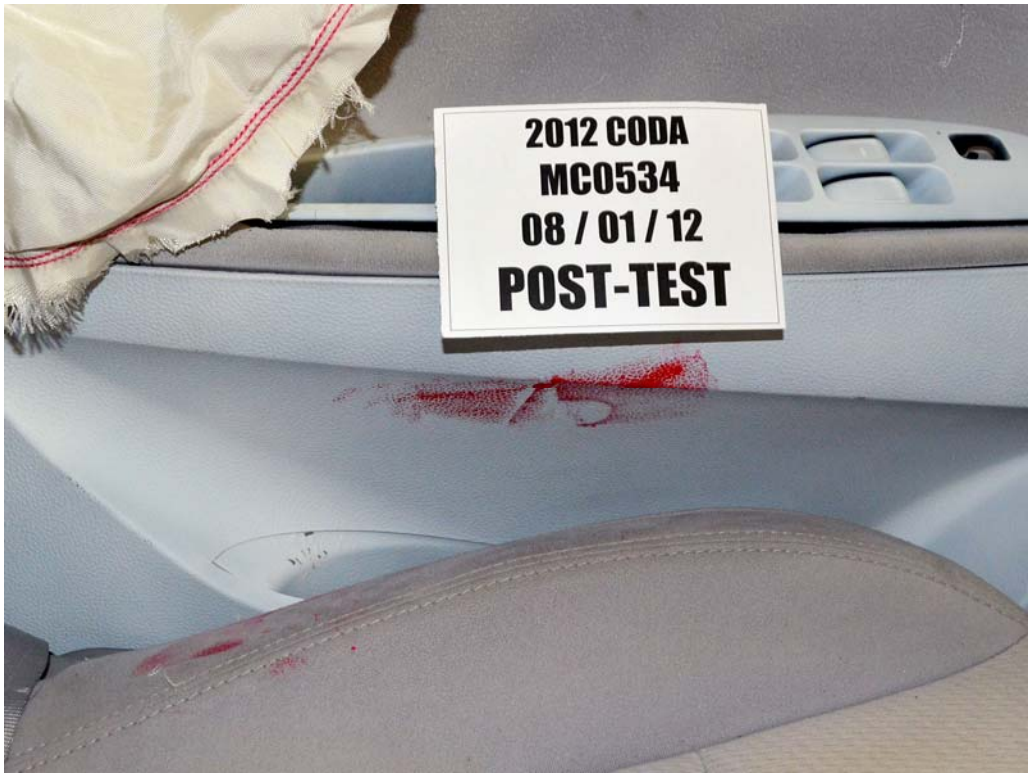


FIGURE 52. Post-Test Driver Dummy Close-Up Pelvis Contact with Vehicle Interior View

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

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

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

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

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

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

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

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

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

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

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

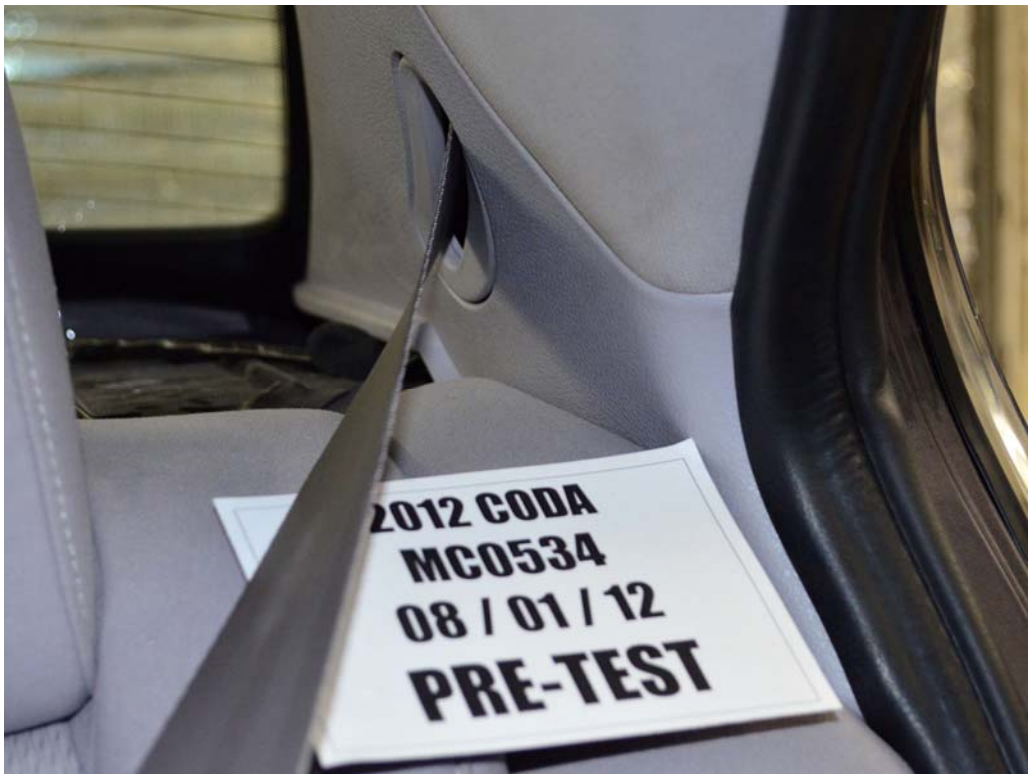


FIGURE 65. Pre-Test View of Belt Anchorage for Rear Passenger Dummy

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

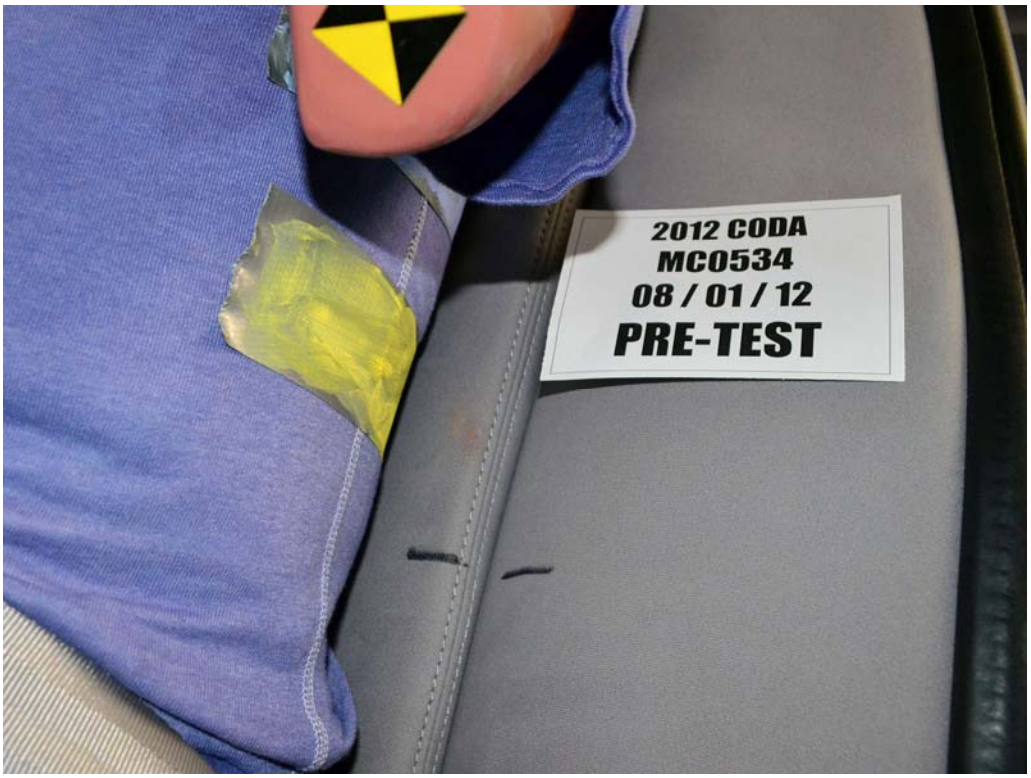


FIGURE 67. Pre-Test Close-Up Left Side View of Rear Passenger Seat Back

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

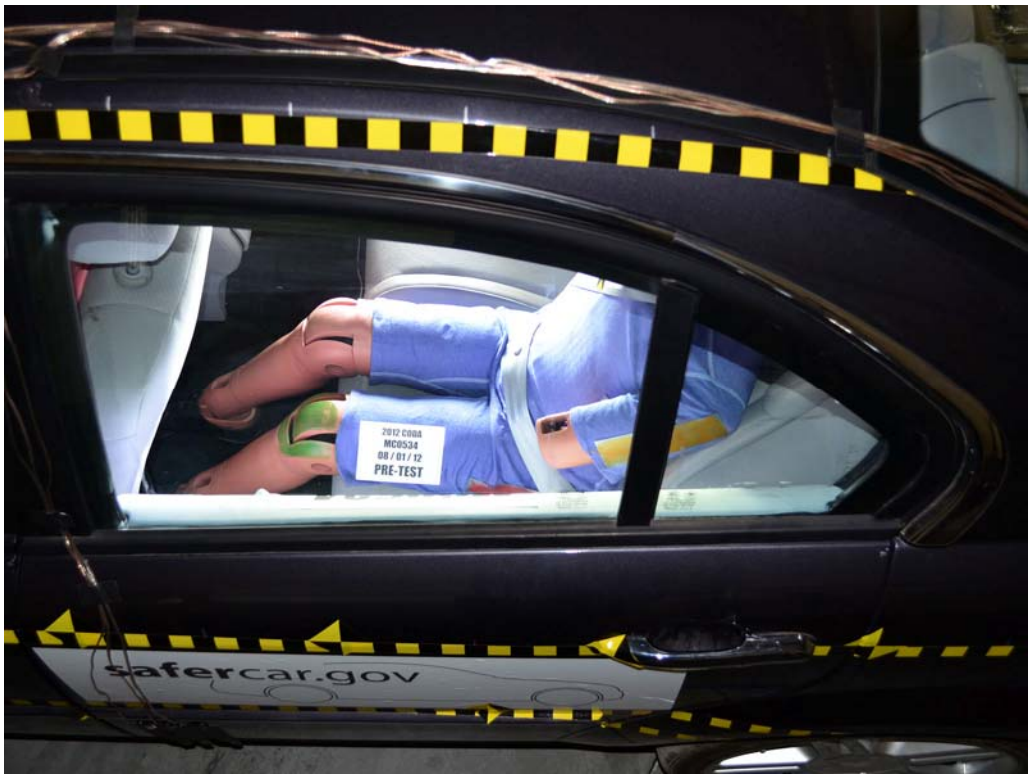


FIGURE 69. Pre-Test Rear Passenger Dummy and Door Clearance View

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

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

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

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

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

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

Photograph Not Applicable

No Passenger Dummy Head Contact With Side Airbag

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

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

Photograph Not Applicable

Vehicle Not Equipped With Rear Passenger Side Airbag

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

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

Photograph Not Applicable

Vehicle Not Equipped With Rear Passenger Side Airbag

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

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

Photo Not Required

FMVSS 305 Performed Instead

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

Photo Not Required

FMVSS 305 Performed Instead

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

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

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

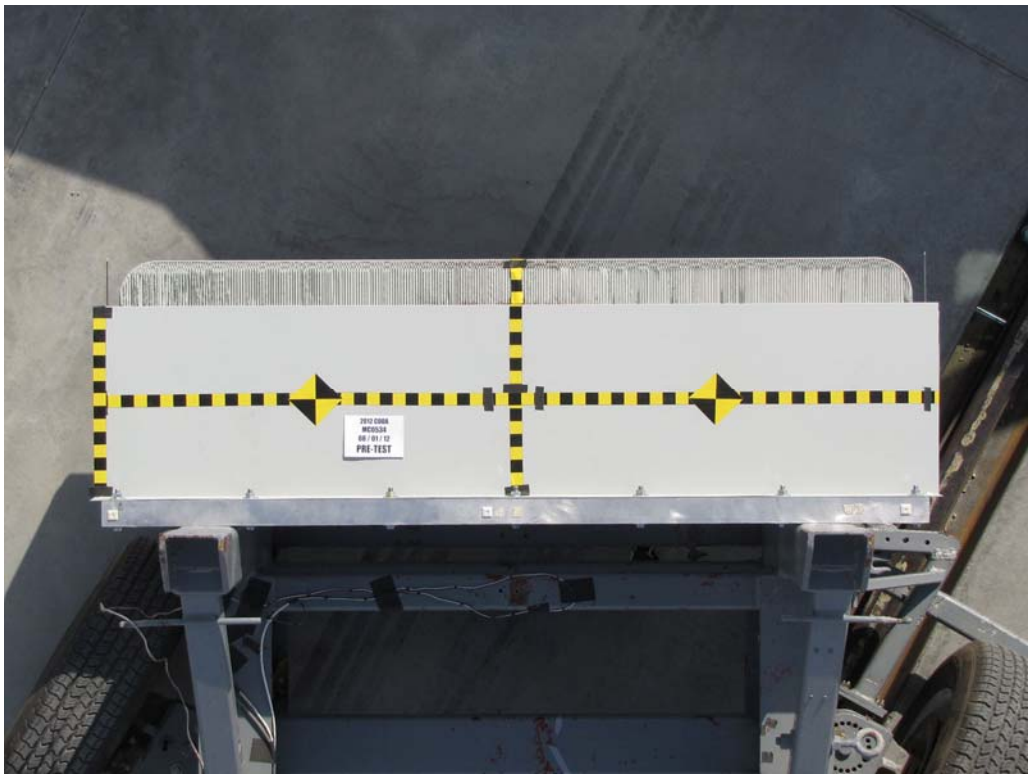


FIGURE 86. Pre-Test Top View of MDB Impactor Face

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

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

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

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

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

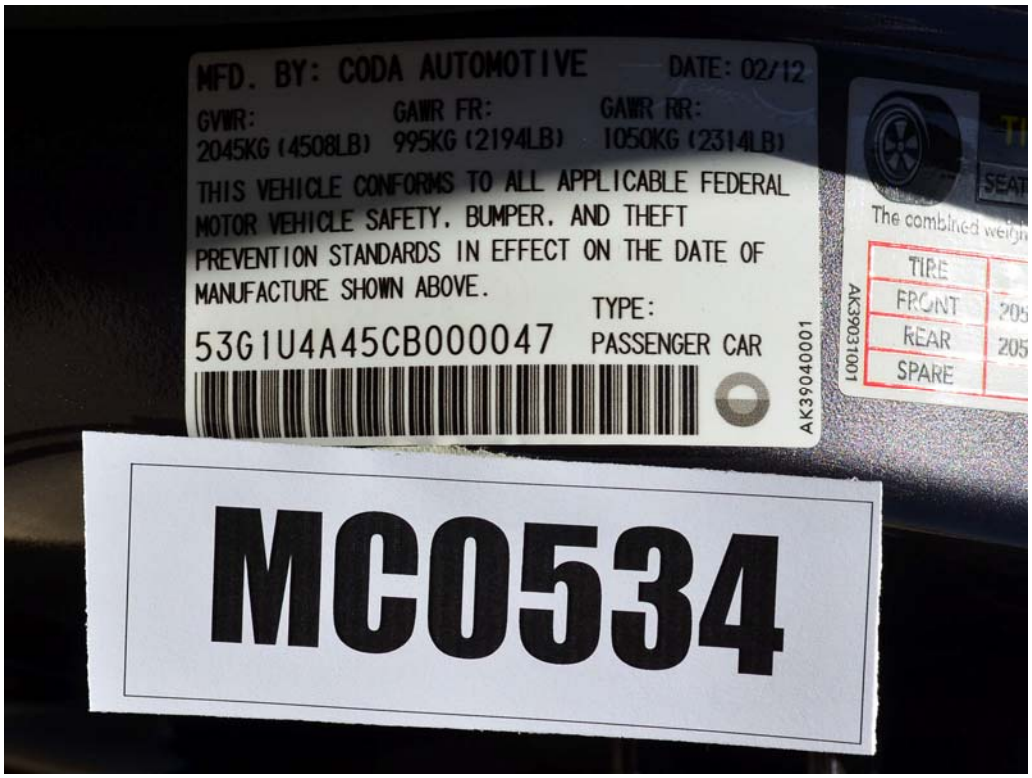


FIGURE 92. Close-Up View of Vehicle's Certification Label

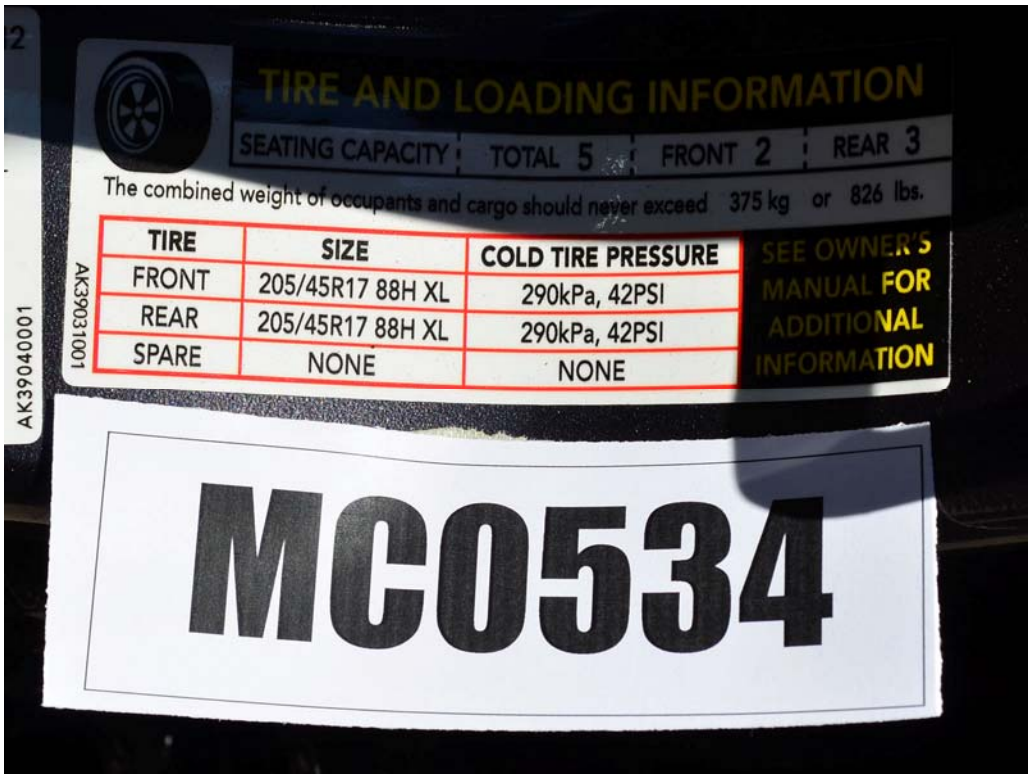


FIGURE 93. Close-Up View of Vehicle's Tire Information Placard or Label

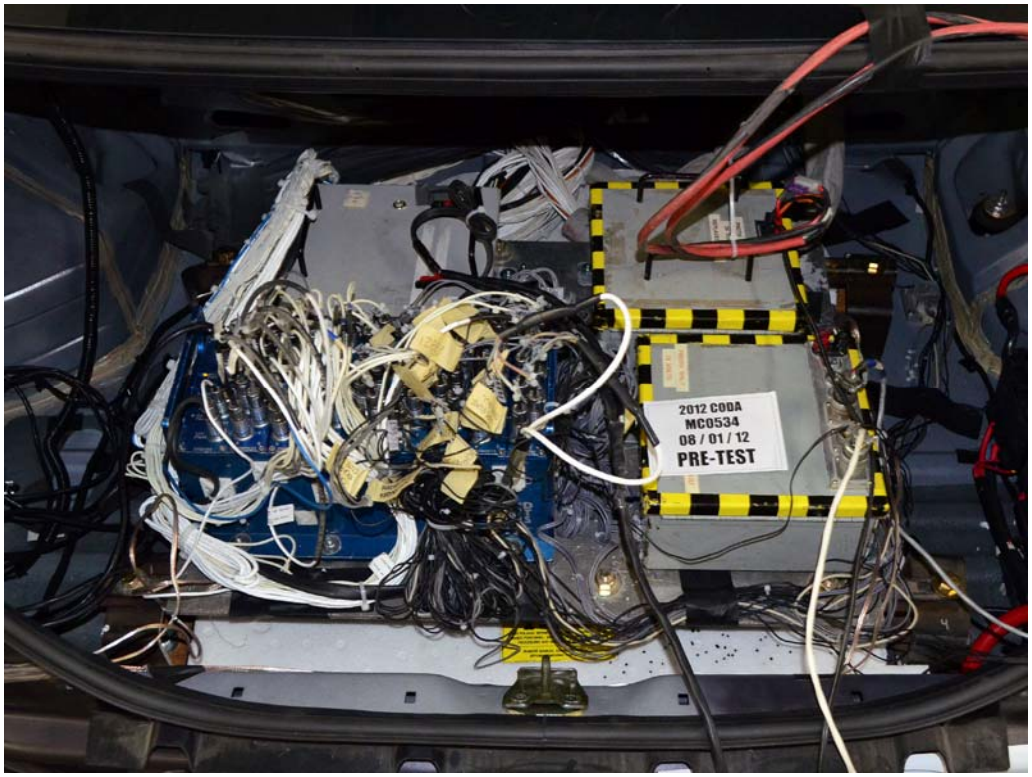


FIGURE 94. Pre-Test Ballast View

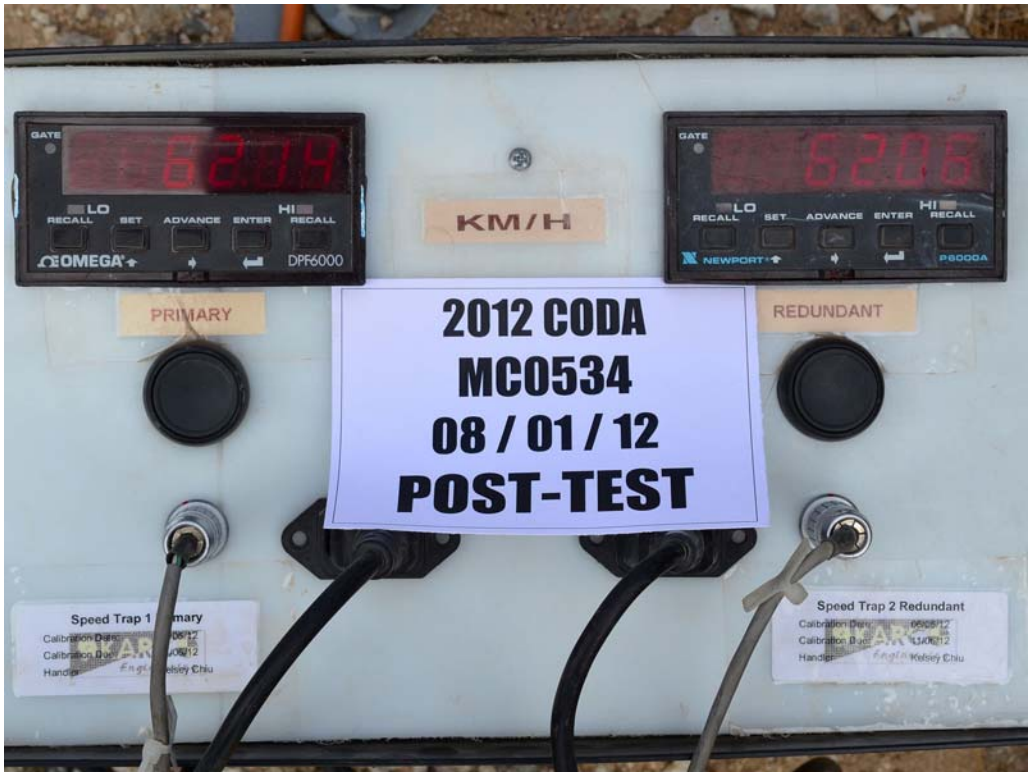


FIGURE 95. Post-Test Primary and Redundant Speed Trap Read-Out

Photo Not Required

FMVSS 305 Performed Instead

FIGURE 96. FMVSS No. 301 Static Rollover 0 Degrees

Photo Not Required

FMVSS 305 Performed Instead

FIGURE 97. FMVSS No. 301 Static Rollover 90 Degrees

Photo Not Required

FMVSS 305 Performed Instead

FIGURE 98. FMVSS No. 301 Static Rollover 180 Degrees

Photo Not Required

FMVSS 305 Performed Instead

FIGURE 99. FMVSS No. 301 Static Rollover 270 Degrees

Photo Not Required

FMVSS 305 Performed Instead

FIGURE 100. FMVSS No. 301 Static Rollover 360 Degrees

FIGURE 101. Impact Event

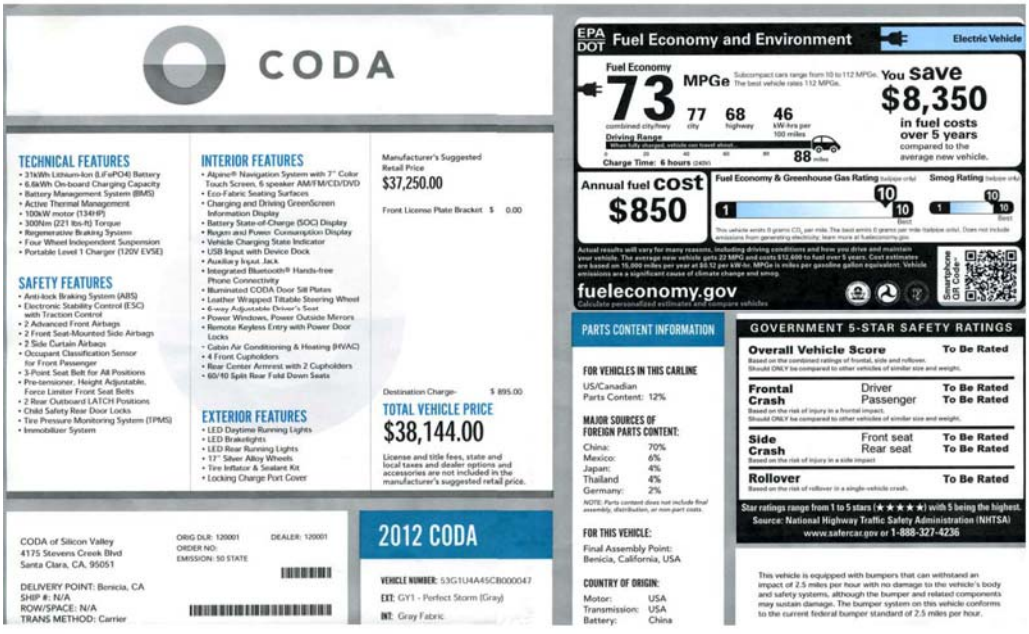


FIGURE 102. Monroney Label

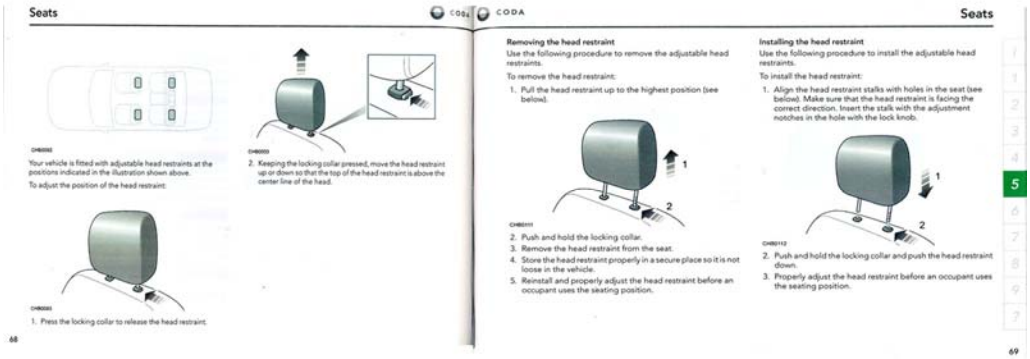


FIGURE 103. Driver Head Restraint Use and Adjustment
Information from Vehicle Owner's Manual

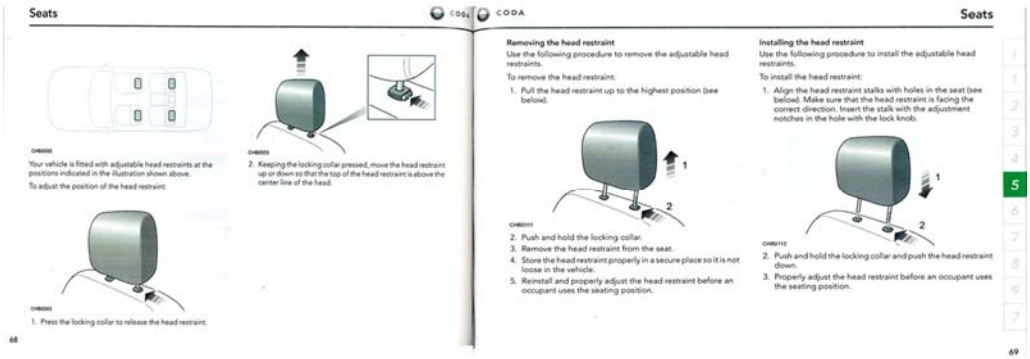


FIGURE 104. Left Rear Passenger Head Restraint
Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B
DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

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

Additional Driver & Passenger Dummy Instrumentation Data

Driver Lower Spine T12 Acceleration (X)

Driver Lower Spine T12 Acceleration (Y)

Driver Lower Spine T12 Acceleration (Z)

Passenger Upper Thorax Rib Deflection (Y)

Passenger Middle Thorax Rib Deflection (Y)

Passenger Lower Thorax Rib Deflection (Y)

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

Vehicle Instrumentation Data

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

MDB Instrumentation Data

MDB Center of Gravity Acceleration (X)

MDB Center of Gravity Acceleration (Y)

MDB Center of Gravity Acceleration (Z)

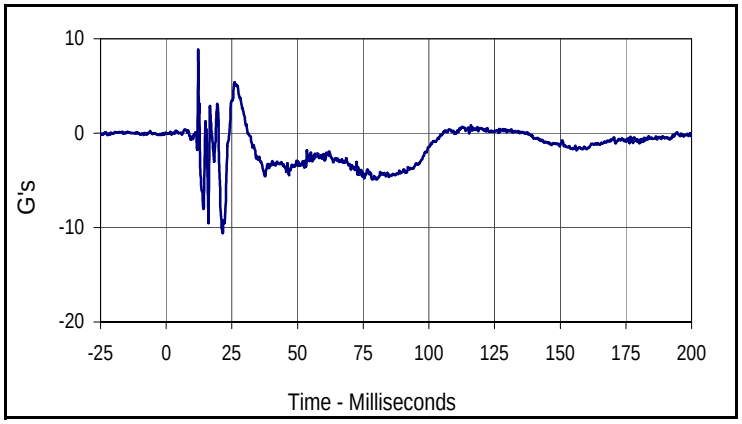
MDB Rear Acceleration (X)

MDB Rear Acceleration (Y)

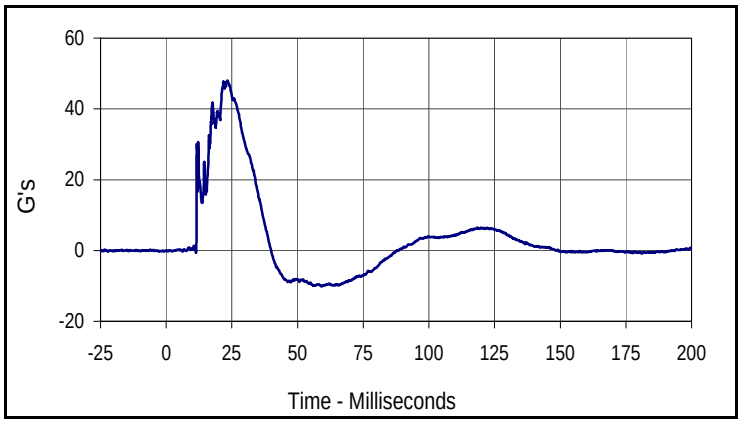
Left MDB Contact Switch

Right MDB Contact Switch

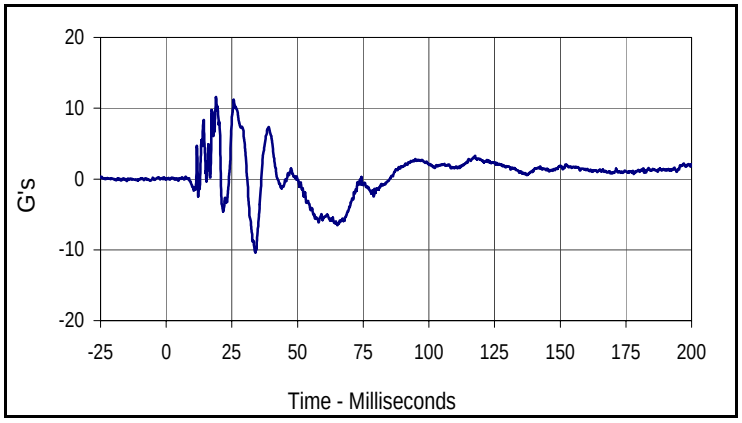
Test Vehicle:	2012 CODA 4-Door Sedan	NHTSA No.:	MC0534
Test Program:	61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test	Test Date:	8/1/12



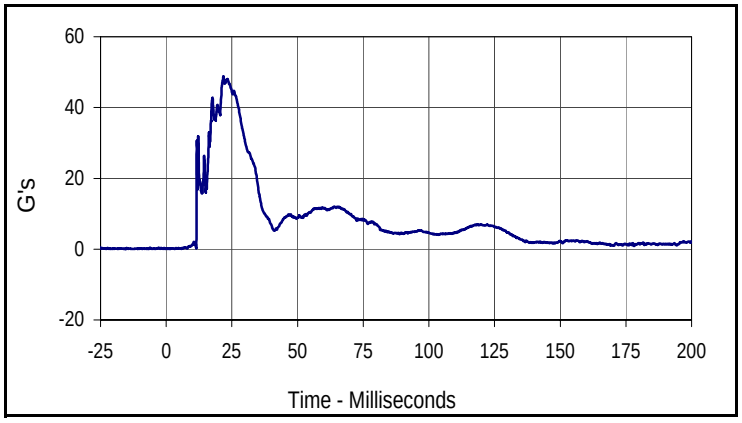
Curve Description			
Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
8.8	12.2	-10.6	21.5



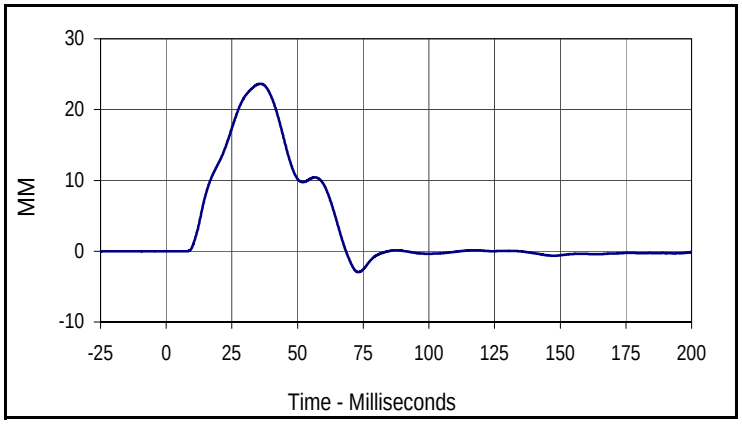
Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
48.0	23.4	-10.1	59.3



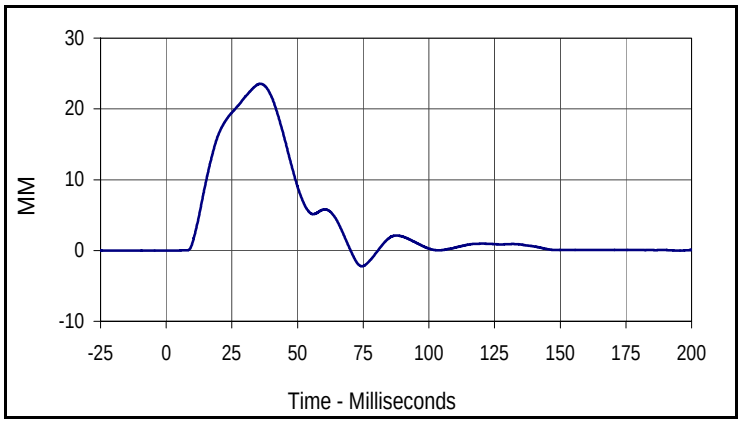
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
11.6	19.0	-10.4	33.9



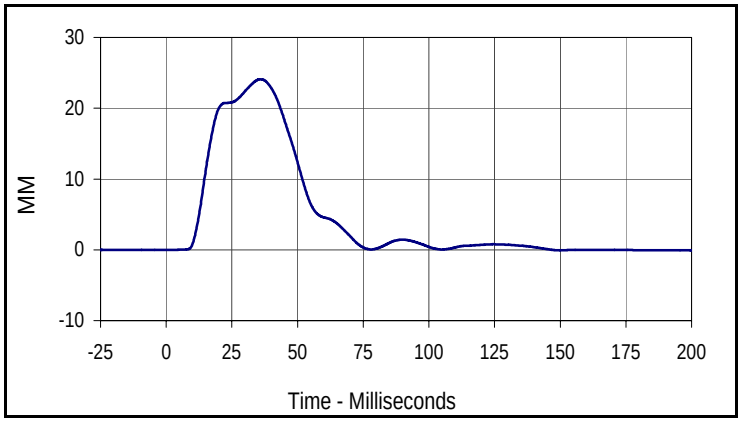
Curve Description			
Driver Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
48.8	21.8	0.0	3.0



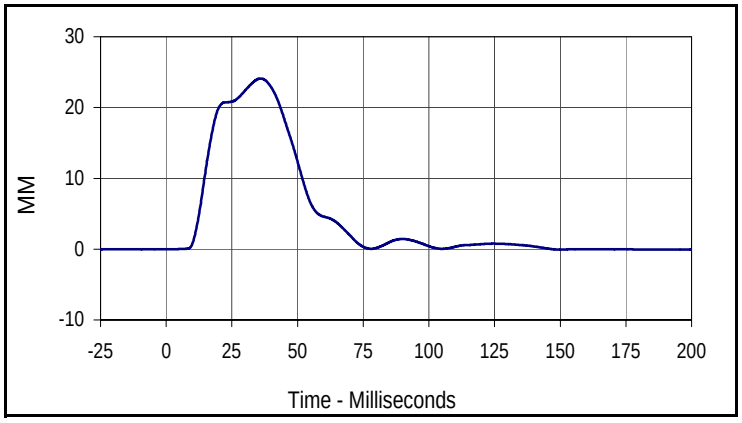
Curve Description			
Driver Upper Thorax Rib Deflection Y			
Plot No.	Type	SAE Class	Units
005	FIL	180	MM
Max	Time	Min	Time
23.6	35.9	-3.0	73.1



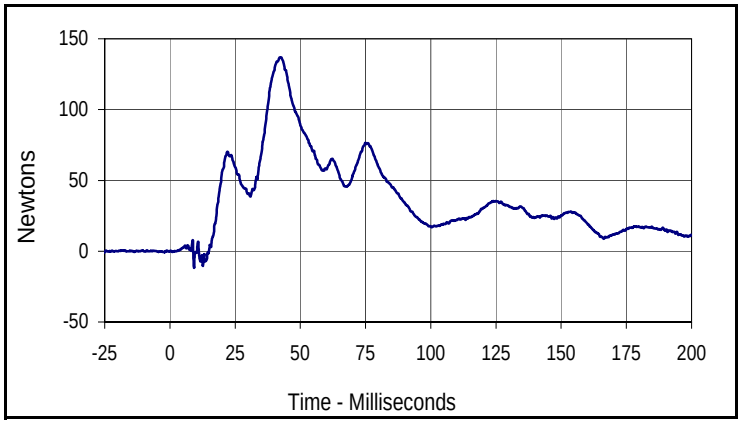
Curve Description			
Driver Middle Thorax Rib Deflection Y			
Plot No.	Type	SAE Class	Units
006	FIL	180	MM
Max	Time	Min	Time
23.5	35.8	-2.2	74.5



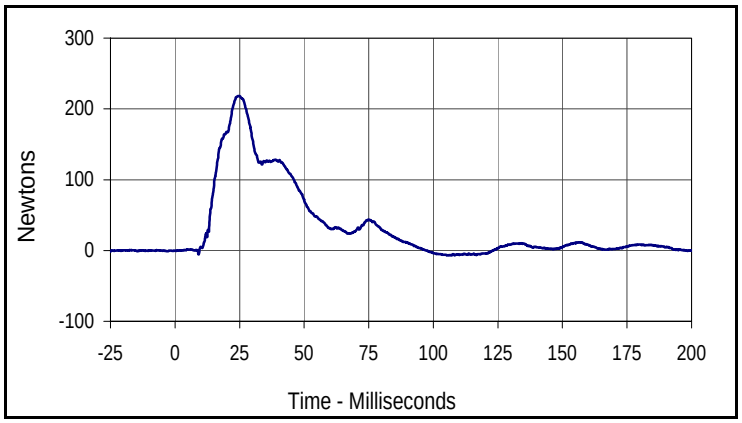
Curve Description			
Driver Lower Thorax Rib Deflection Y			
Plot No.	Type	SAE Class	Units
007	FIL	180	MM
Max	Time	Min	Time
24.1	35.9	-0.1	190.8



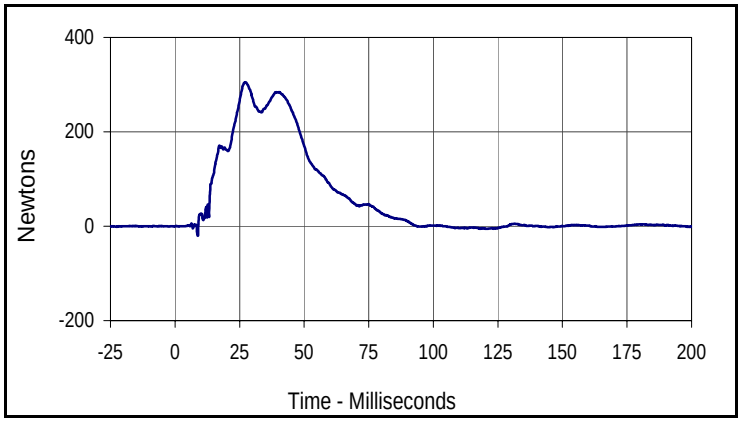
Curve Description			
Driver Thorax Rib Deflection Maximum			
Plot No.	Type	SAE Class	Units
010	FIL	180	MM
Max	Time	Min	Time
24.1	35.9	-0.1	190.8



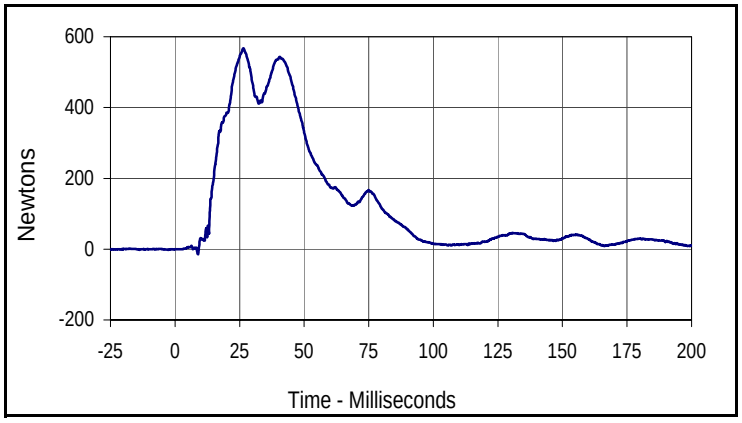
Curve Description			
Driver Anterior Abdominal Force Y			
Plot No.	Type	SAE Class	Units
008	FIL	600	Newtons
Max	Time	Min	Time
137.0	42.2	-11.9	9.2



Curve Description			
Driver Middle Abdominal Force Y			
Plot No.	Type	SAE Class	Units
009	FIL	600	Newtons
Max	Time	Min	Time
218.4	24.9	-7.1	105.7

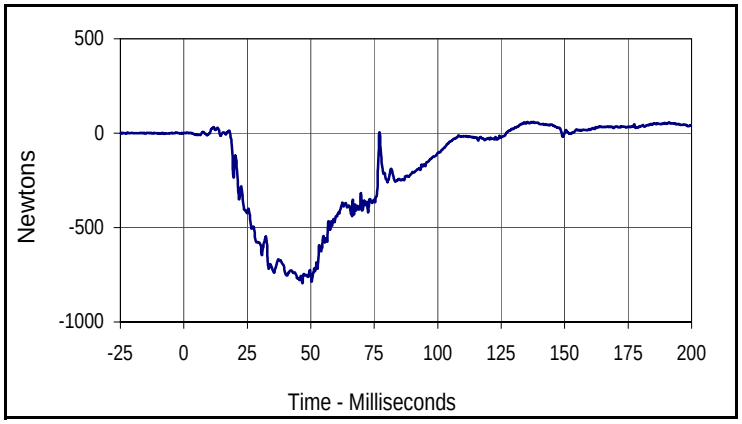


Curve Description			
Driver Posterior Abdominal Force Y			
Plot No.	Type	SAE Class	Units
011	FIL	600	Newtons
Max	Time	Min	Time
305.1	27.4	-20.4	8.8

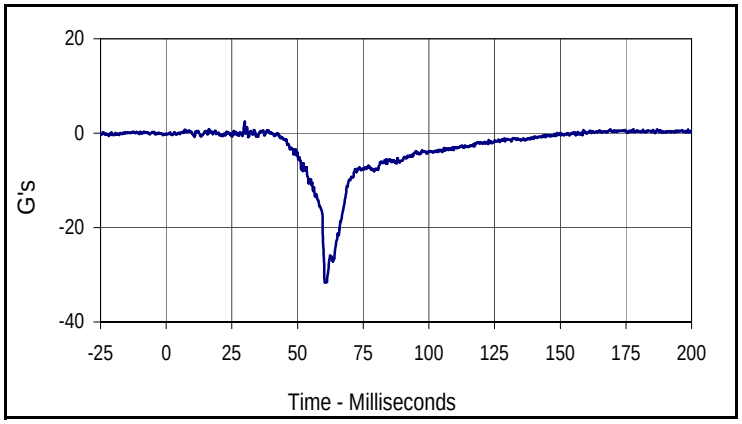


Curve Description			
Driver Total Abdominal Force			
Plot No.	Type	SAE Class	Units
012	SUM	600	Newtons
Max	Time	Min	Time
567.4	26.5	-15.1	8.9

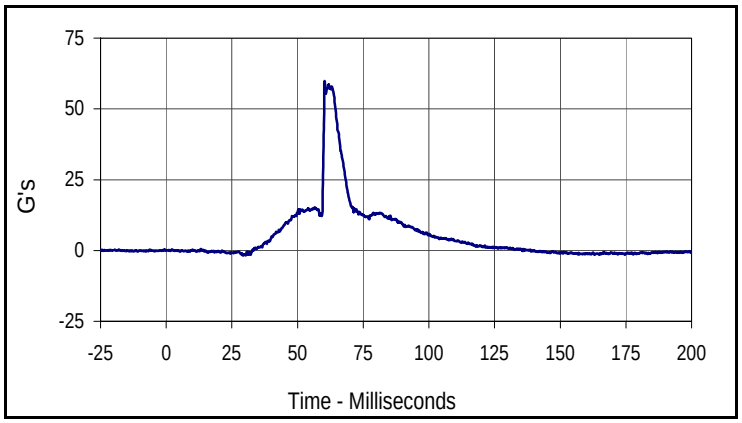
Test Vehicle:	2012 CODA 4-Door Sedan	NHTSA No.:	MC0534
Test Program:	61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test	Test Date:	8/1/12



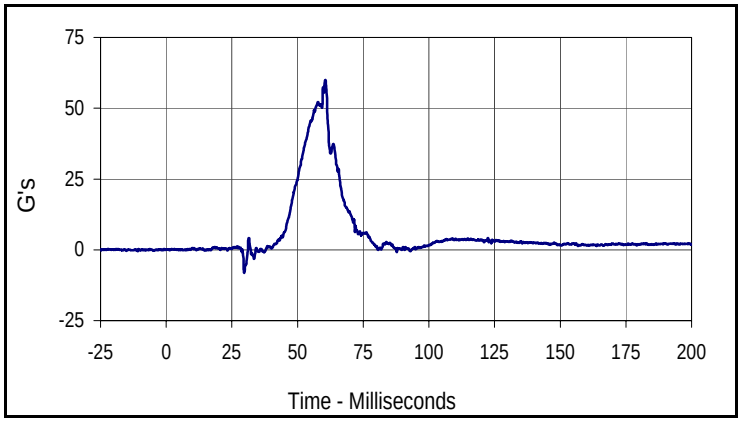
Curve Description			
Driver Pubic Symphysis Force Y			
Plot No.	Type	SAE Class	Units
013	FIL	600	Newtons
Max	Time	Min	Time
59.7	136.8	-794.3	46.7



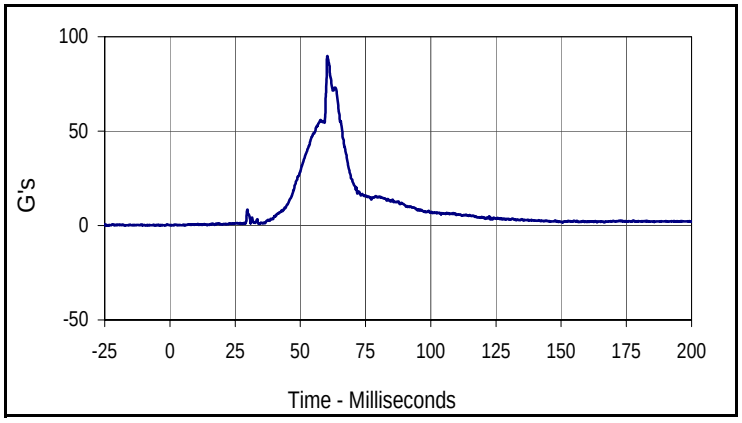
Curve Description			
Passenger Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
014	FIL	1000	G's
Max	Time	Min	Time
2.4	29.9	-31.7	60.5



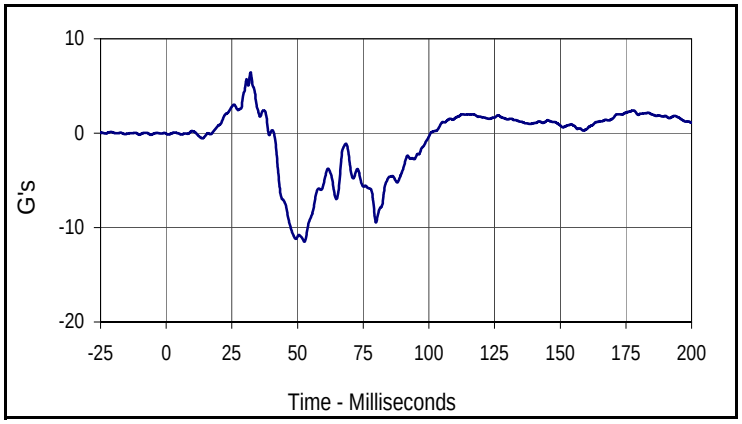
Curve Description			
Passenger Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
015	FIL	1000	G's
Max	Time	Min	Time
59.8	60.3	-1.7	29.2



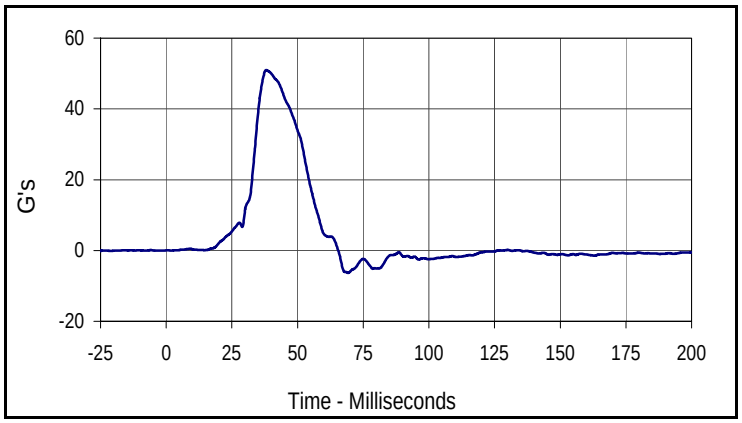
Curve Description			
Passenger Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
016	FIL	1000	G's
Max	Time	Min	Time
60.0	60.6	-8.1	29.7



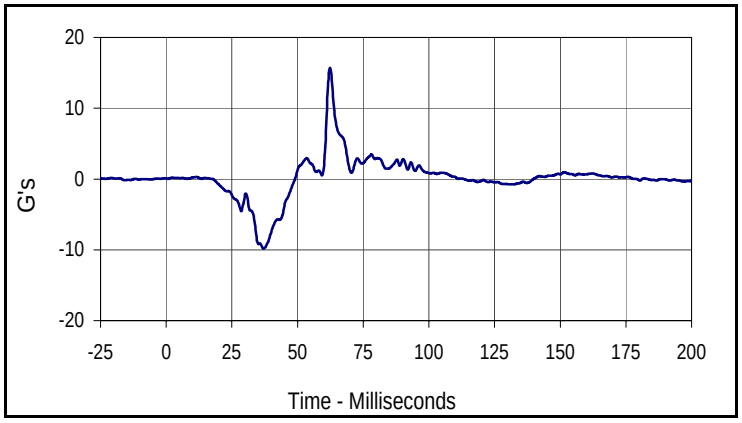
Curve Description			
Passenger Head Acceleration Resultant Primary			
Plot No.	Type	SAE Class	Units
017	RES	1000	G's
Max	Time	Min	Time
89.9	60.4	0.1	5.6



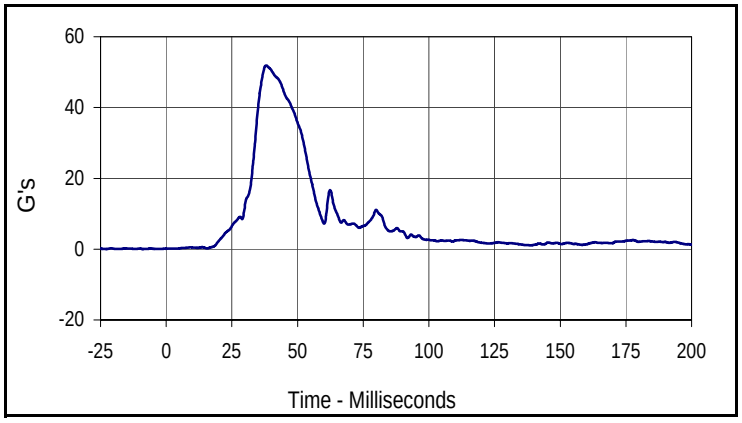
Curve Description			
Passenger Lower Spine T12 Acceleration X			
Plot No.	Type	SAE Class	Units
019	FIL	180	G's
Max	Time	Min	Time
6.4	32.1	-11.5	52.6



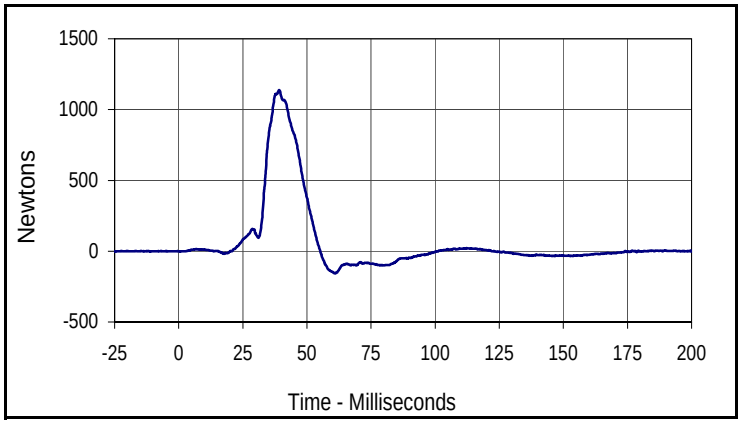
Curve Description			
Passenger Lower Spine T12 Acceleration Y			
Plot No.	Type	SAE Class	Units
020	FIL	180	G's
Max	Time	Min	Time
51.0	38.1	-6.3	69.3



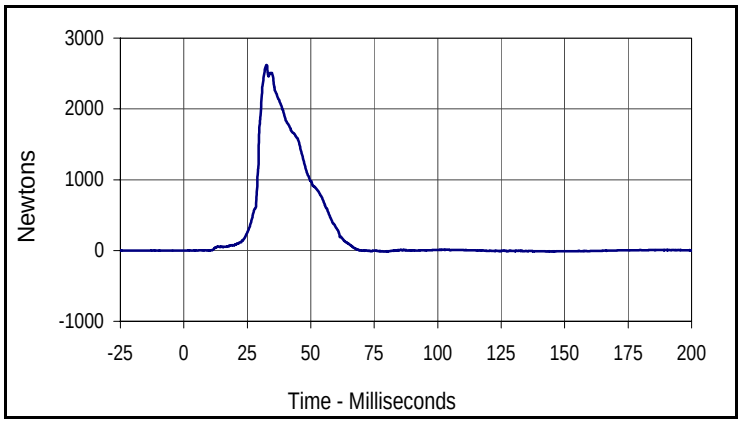
Curve Description			
Passenger Lower Spine T12 Acceleration Z			
Plot No.	Type	SAE Class	Units
021	FIL	180	G's
Max	Time	Min	Time
15.7	62.4	-9.9	37.1



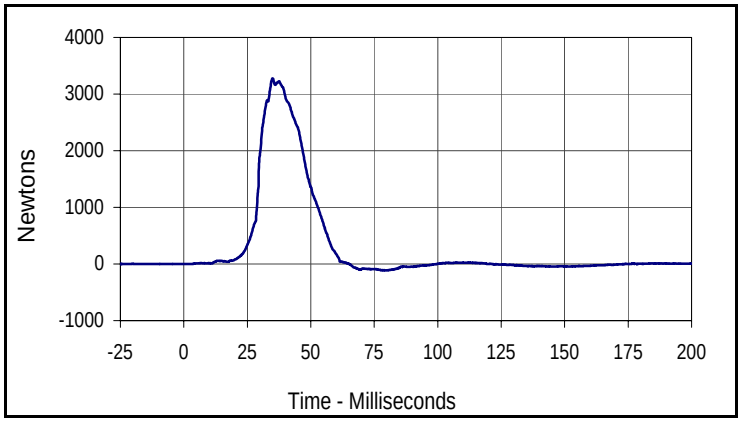
Curve Description			
Passenger Lower Spine T12 Acceleration Res.			
Plot No.	Type	SAE Class	Units
022	RES	180	G's
Max	Time	Min	Time
51.9	38.0	0.1	0.0



Curve Description			
Passenger Iliac Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
023	FIL	600	Newtons
Max	Time	Min	Time
1138.4	39.2	-156.6	60.9



Curve Description			
Passenger Acetabulum Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
024	FIL	600	Newtons
Max	Time	Min	Time
2618.4	32.6	-15.1	79.3



Curve Description			
Passenger Total Pelvic Force			
Plot No.	Type	SAE Class	Units
018	SUM	600	Newtons
Max	Time	Min	Time
3275.5	35.0	-113.7	79.4

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

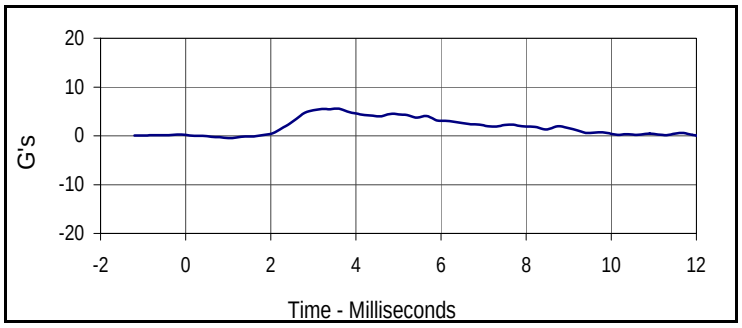
Test Program:	ES2re External Measurements	Test Date:	7/20/12
ATD Serial No.:	F035	Test I.D.:	N/A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	20.8	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
1	Sitting Height	mm	900 - 918	910	Pass
2	Seat to Shoulder Joint	mm	558 - 572	566	Pass
3	Seat to Lower Face of Thoracic Spine Box	mm	346 - 356	351	Pass
4	Seat to Hip Joint (Center of Bolt)	mm	97 - 103	99	Pass
5	Sole to Seat, Sitting	mm	333 - 451	389	Pass
6	Head Width	mm	152 - 158	156	Pass
7	Shoulder / Arm Width	mm	461 - 479	470	Pass
8	Thorax Width	mm	322 - 332	327	Pass
9	Abdomen Width	mm	273 - 287	281	Pass
10	Pelvis Lap Width	mm	359 - 373	363	Pass
11	Head Depth	mm	196 - 206	201	Pass
12	Thorax Depth	mm	262 - 272	270	Pass
13	Abdomen Width	mm	194 - 204	199	Pass
14	Pelvis Depth	mm	235 - 245	240	Pass
15	Back of Buttocks to Hip Joint (Center of Bolt)	mm	150 - 160	155	Pass
16	Back of Buttocks to Front Knee	mm	597 - 615	609	Pass
			Overall Test Results		Pass

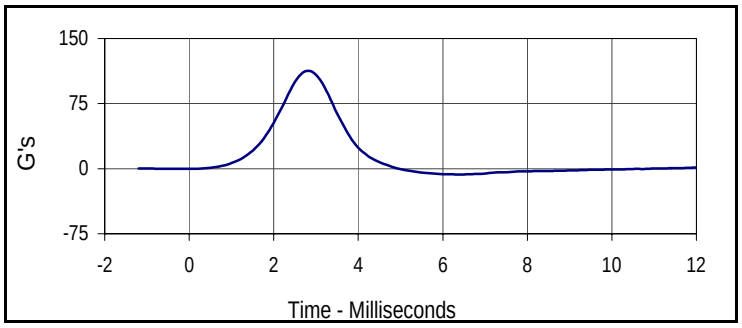
Test Program:	ES2re Head Drop Test	Test Date:	7/20/12
ATD Serial No.:	F035	Test I.D.:	F035HD033

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	240	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	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.0	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.5	Pass
Peak Head Resultant Acceleration		G's	125 to 155	129.2	Pass
Peak Head X Acceleration		G's	≤15	5.6	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	6.0	Pass
			Overall Test Results		Pass

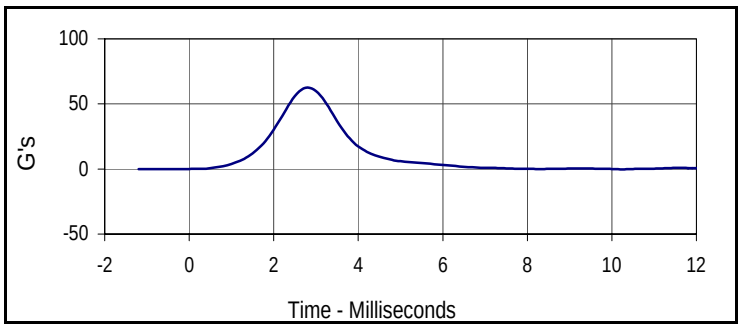
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
129.2	2.8	0.1	-1.0



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.6	3.6	-0.5	1.0



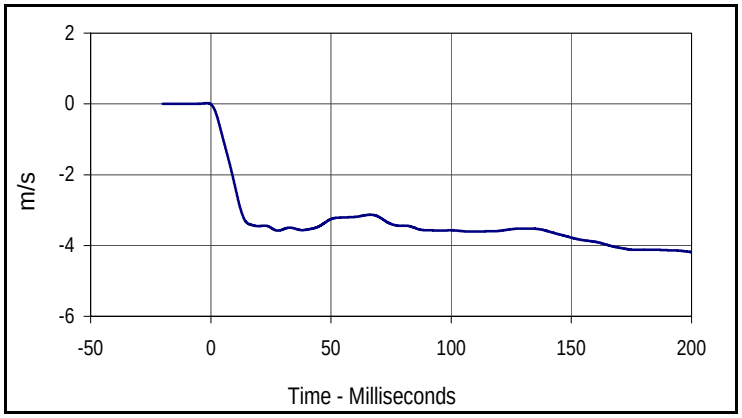
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
112.9	2.8	-6.7	6.4



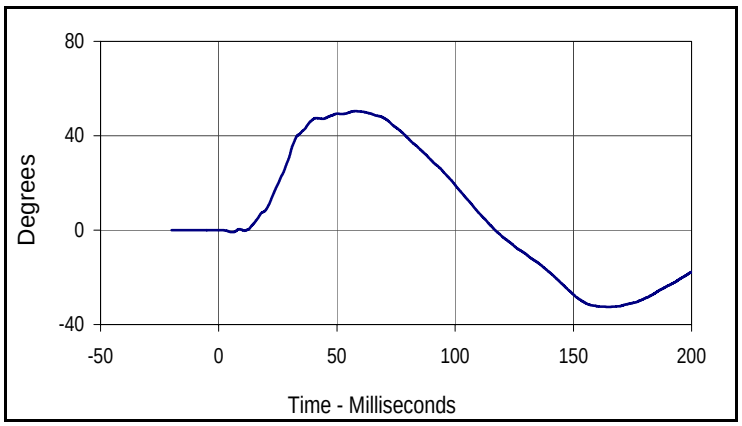
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
62.7	2.8	-0.2	10.2

Test Program:	ES2re Neck Flexion Test	Test Date:	7/20/12
ATD Serial No.:	F035	Test I.D.:	F035NB033

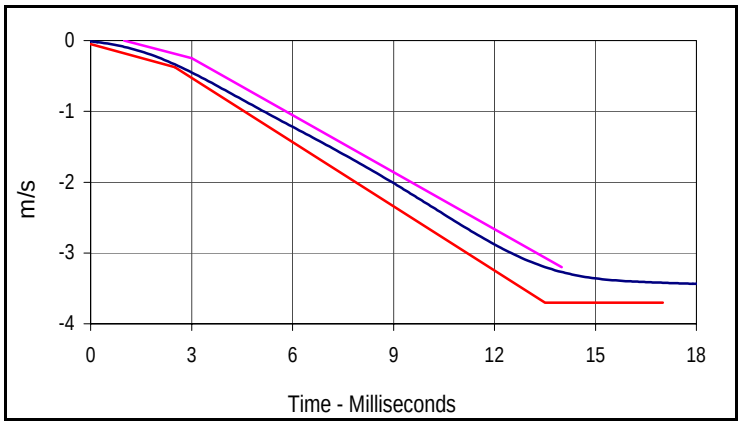
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	265	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	20.9	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.8	Pass
Pendulum Velocity		m/s	3.3 to 3.5	3.39	Pass
Headform Flexion	Max	Degrees	49 to 59	50.4	Pass
	Time	msec	54 to 66	57.8	Pass
Headform Flexion Decay (Peak to Zero)		msec	53 to 88	59.2	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	-4.2	200.0



Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
50.4	57.8	-32.5	164.8

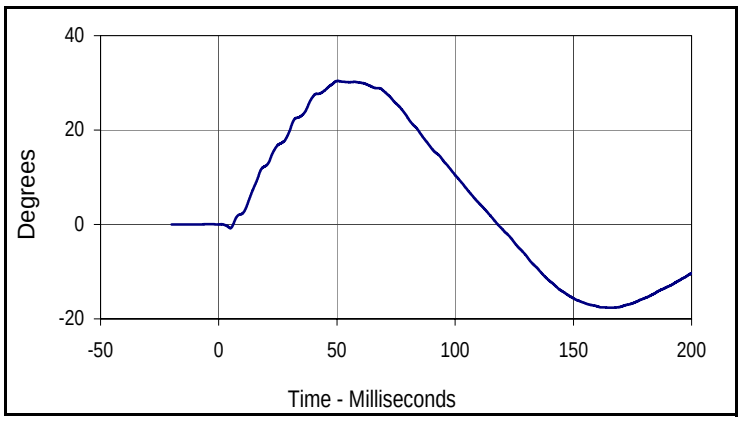


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.6	-4.2	200.0

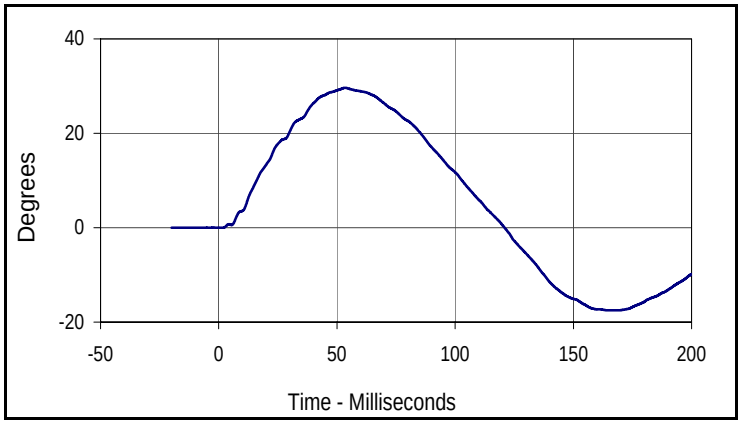
Velocity Corridors

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

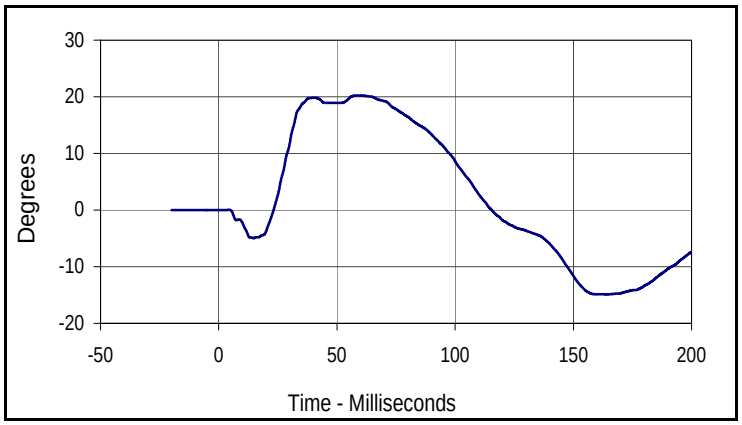
Test Program:	ES2re Neck Flexion Test	Test Date:	7/20/12
ATD Serial No.:	F035	Test I.D.:	F035NB033



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
30.4	50.2	-17.6	166.0



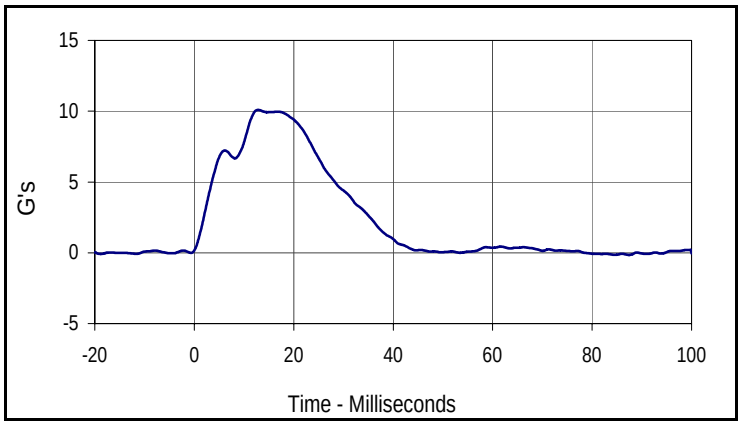
Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
29.6	53.5	-17.5	167.2



Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
20.2	59.0	-14.9	164.3

Test Program:	ES2re Shoulder Impact Test	Test Date:	7/20/12
ATD Serial No.:	F035	Test I.D.:	F035SH033

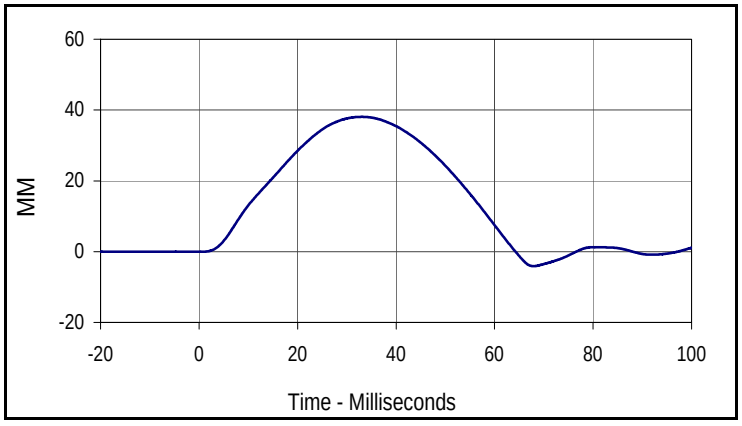
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	290	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Speed		m/s	4.2 to 4.4	4.26	Pass
Peak Impactor Acceleration		G's	7.5 to 10.5	10.1	Pass
			Overall Test Results		Pass



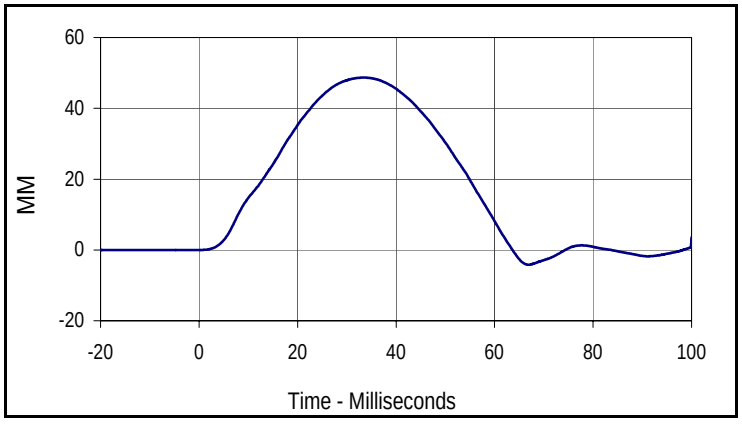
Curve Description			
Probe Impactor Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
10.1	12.9	-0.2	87.4

Test Program:	ES2re Thorax - Rib Drop Test	Test Date:	7/20/12
ATD Serial No.:	F035 Rib #1	Test I.D.:	F035RB1033

Tested Parameter		Units	Specification	Result	Pass/Fail
Rib Module Soak Time		Minutes	≥240	315	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	31.0	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	30.1	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height		mm	36 to 40	38.1	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height		mm	46 to 51	48.7	Pass
			Overall Test Results		Pass



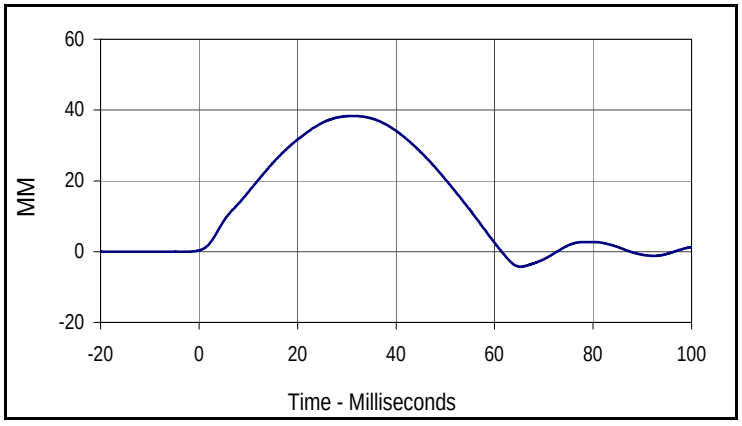
Curve Description			
Upper Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
38.1	33.1	-4.1	67.9



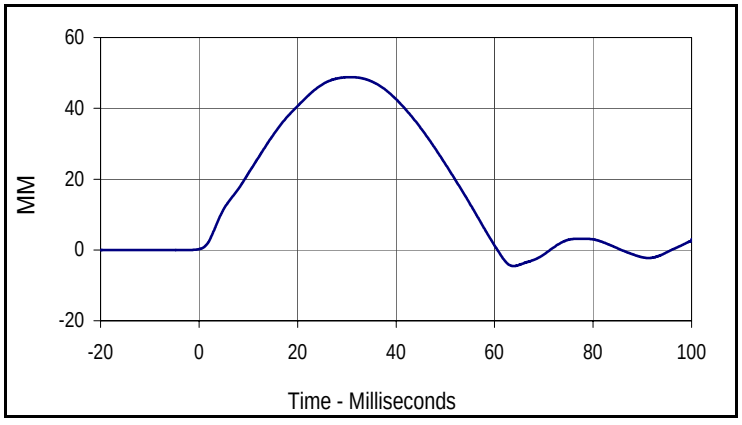
Curve Description			
Upper Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
48.7	33.4	-4.2	66.9

Test Program:	ES2re Thorax - Rib Drop Test	Test Date:	7/20/12
ATD Serial No.:	F035 Rib #2	Test I.D.:	F035RB2033

Tested Parameter		Units	Specification	Result	Pass/Fail
Rib Module Soak Time		Minutes	≥240	330	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	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height		mm	36 to 40	38.3	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height		mm	46 to 51	48.8	Pass
			Overall Test Results		Pass



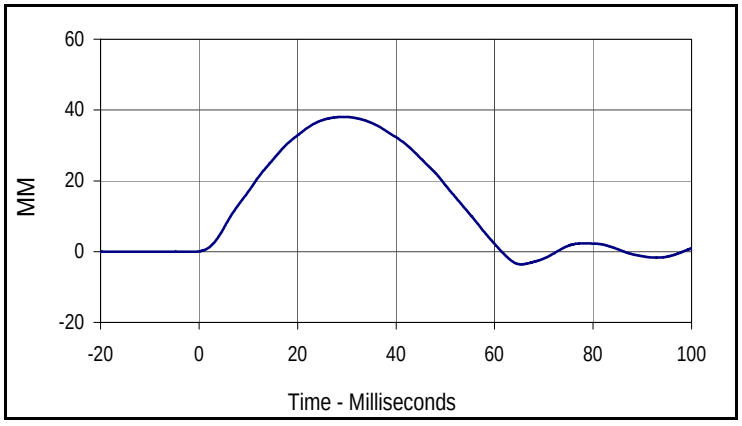
Curve Description			
Middle Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
38.3	31.3	-4.3	65.3



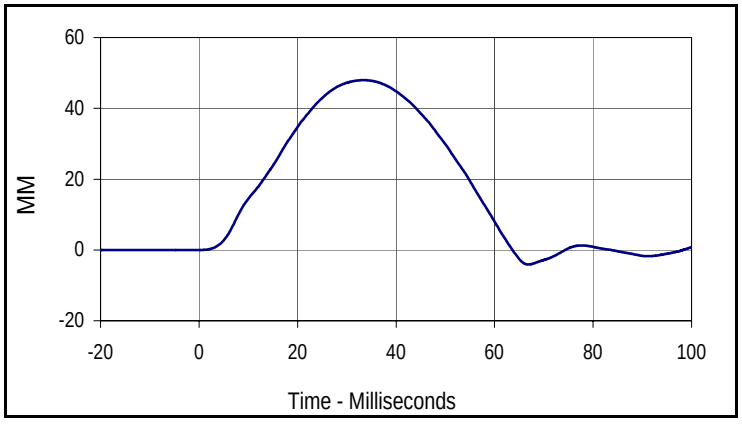
Curve Description			
Middle Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
48.8	30.8	-4.6	63.9

Test Program:	ES2re Thorax - Rib Drop Test	Test Date:	7/20/12
ATD Serial No.:	F035 Rib #3	Test I.D.:	F035RB3033

Tested Parameter		Units	Specification	Result	Pass/Fail
Rib Module Soak Time		Minutes	≥240	350	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	31.0	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	29.5	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height		mm	36 to 40	38.1	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height		mm	46 to 51	48.0	Pass
			Overall Test Results		Pass



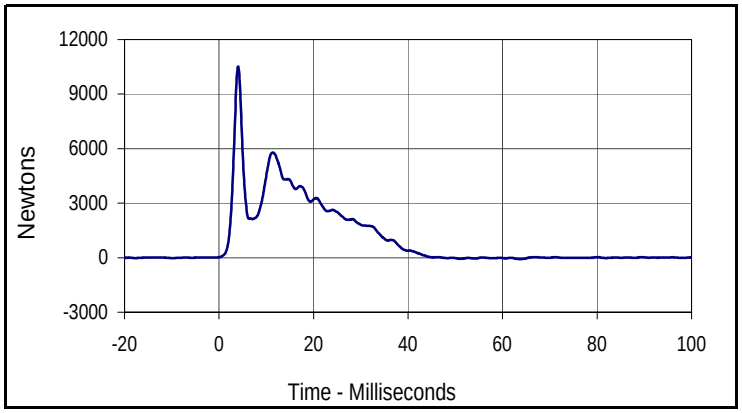
Curve Description			
Lower Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
38.1	29.3	-3.6	65.4



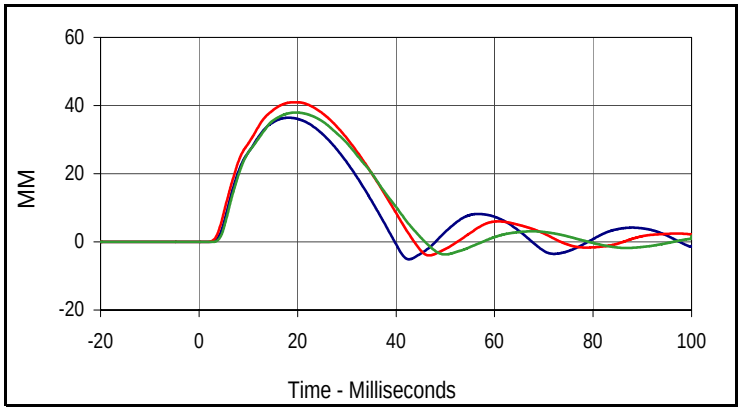
Curve Description			
Lower Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
48.0	33.4	-4.1	66.9

Test Program:	ES2re Thorax - Full Body Impact Test	Test Date:	7/20/12
ATD Serial No.:	F035	Test I.D.:	F035TH033

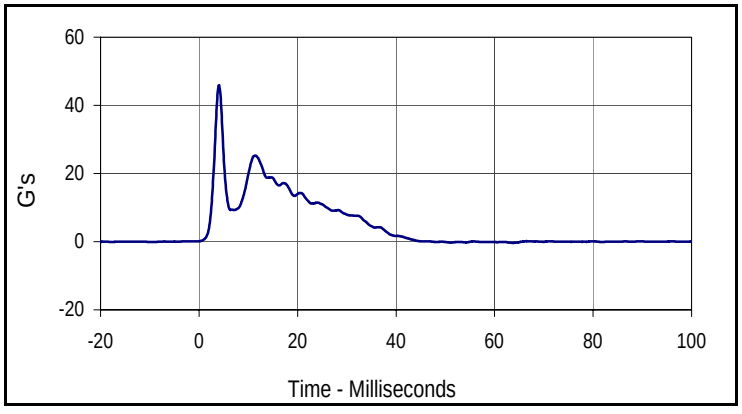
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	370	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.2	Pass
Peak Impactor Velocity		m/s	5.4 to 5.6	5.50	Pass
Peak Impactor Force		N	5100 to 6200	5780.0	Pass
		msec	> 6.0 msec	11.3	Pass
Peak Upper Rib Deflection		mm	34 to 41	36.4	Pass
Peak Middle Rib Deflection		mm	37 to 45	41.0	Pass
Peak Lower Rib Deflection		mm	37 to 44	38.0	Pass
			Overall Test Results		Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
10507.2	4.1	-82.4	63.7



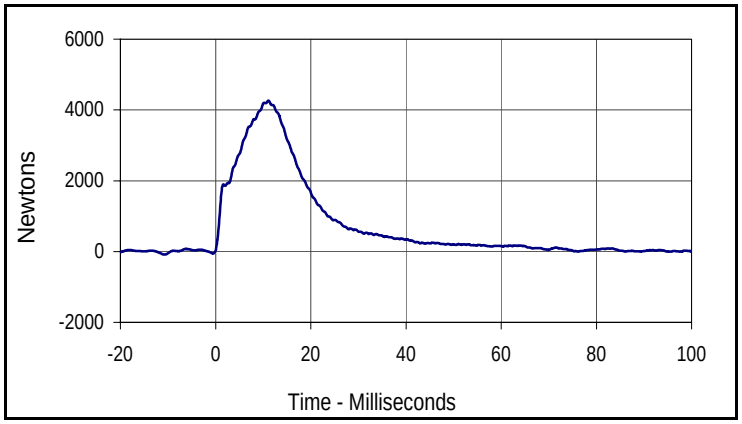
Curve Description			
Upper, Middle, Lower Rib Deflections			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max (Upper)	Time	Min (Upper)	Time
36.4	18.2	-5.1	42.6
Max (Middle)	Time	Min (Middle)	Time
41.0	19.6	-4.0	46.7
Max (Lower)	Time	Min (Lower)	Time
38.0	19.6	-3.7	50.0



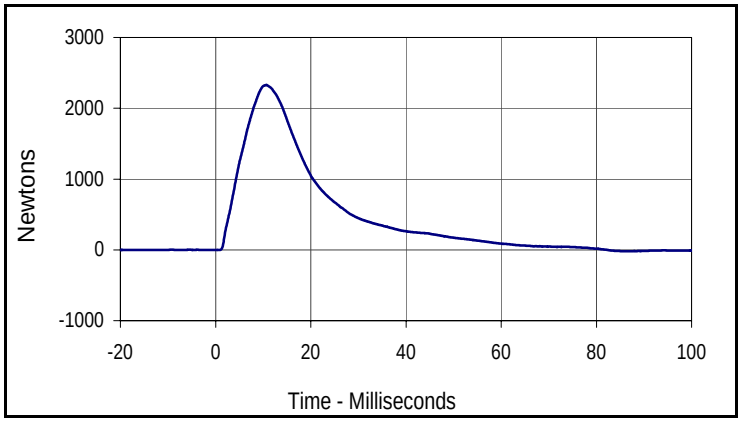
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
45.9	4.1	-0.4	63.7

Test Program:	ES2re Abdomen Impact Test	Test Date:	7/20/12
ATD Serial No.:	F035	Test I.D.:	F035ABD033

Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	400	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	31.0	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	30.2	Pass
Probe Velocity		m/s	3.9 to 4.1	4.0	Pass
Peak Impactor Force		N	4000 to 4800	4265.0	Pass
		msec	10.6 to 13.0	11.1	Pass
Sum of Abdominal Forces		N	2200 to 2700	2329.4	Pass
		msec	10.0 to 12.3	10.7	Pass
			Overall Test Results		Pass

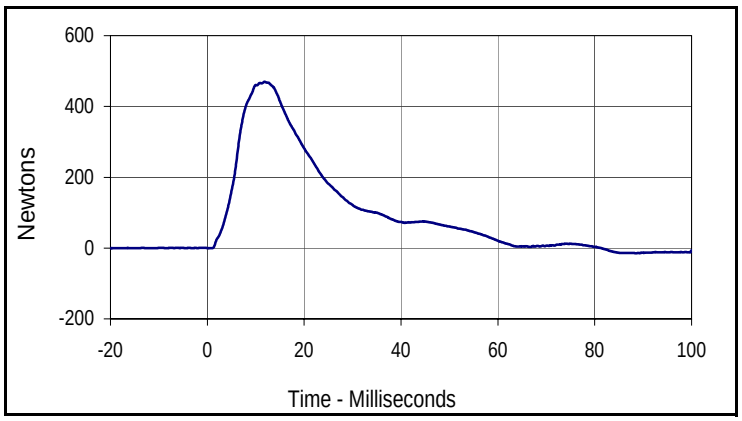


Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4265.0	11.1	-86.2	-10.7

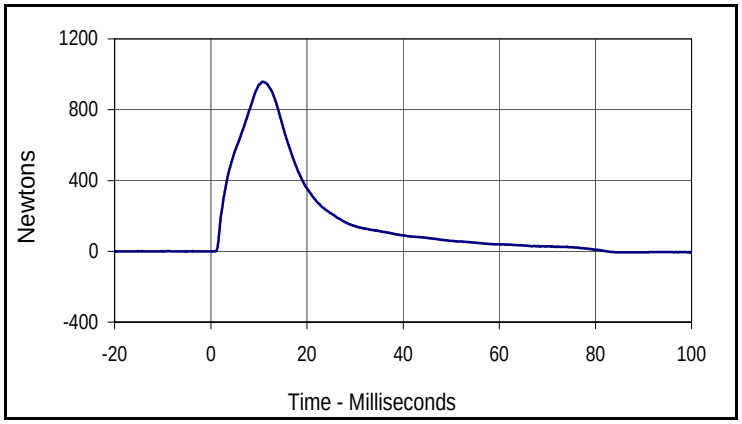


Curve Description			
Abdomen Sum Resultant			
Plot No.	Type	SAE Class	Units
002	RES	600	Newtons
Max	Time	Min	Time
2329.4	10.7	-18.4	85.7

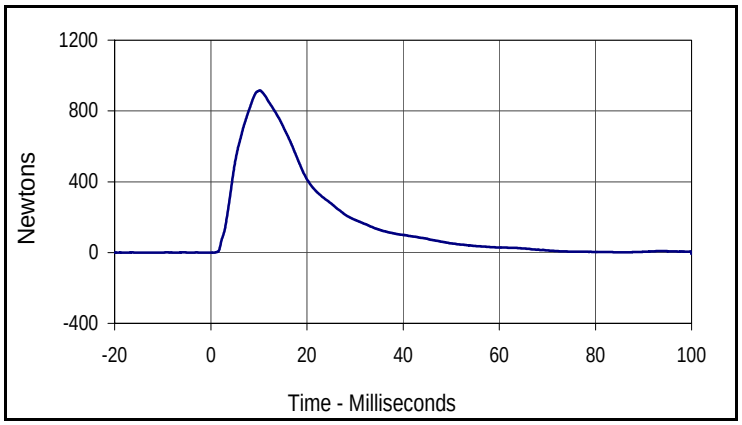
Test Program:	ES2re Abdomen Impact Test	Test Date:	7/20/12
ATD Serial No.:	F035	Test I.D.:	F035ABD033



Curve Description			
Front Abdomen Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
469.9	11.8	-14.6	88.5



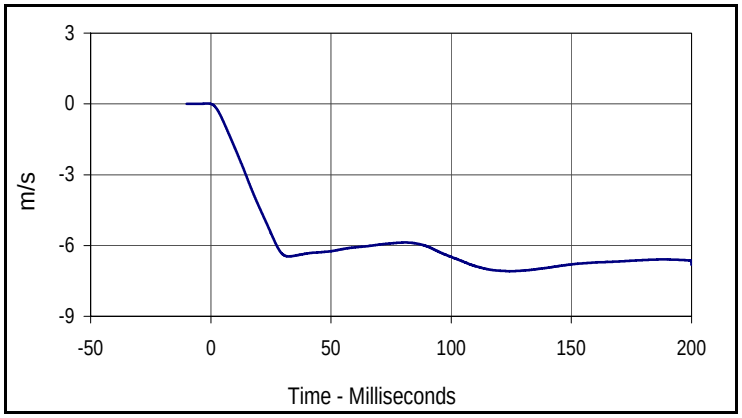
Curve Description			
Middle Abdomen Force			
Plot No.	Type	SAE Class	Units
004	FIL	600	Newtons
Max	Time	Min	Time
958.0	10.8	-8.5	101.2



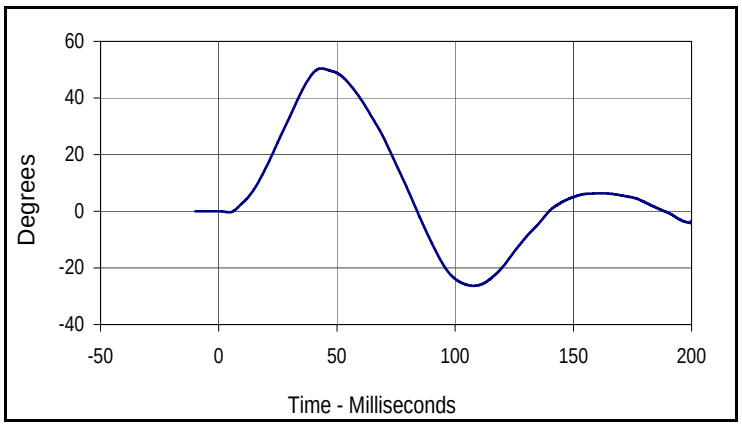
Curve Description			
Rear Abdomen Force			
Plot No.	Type	SAE Class	Units
005	FIL	600	Newtons
Max	Time	Min	Time
916.2	10.2	-8.5	101.2

Test Program:	ES2re Lumbar Flexion Test	Test Date:	7/20/12
ATD Serial No.:	F035	Test I.D.:	F035LB033

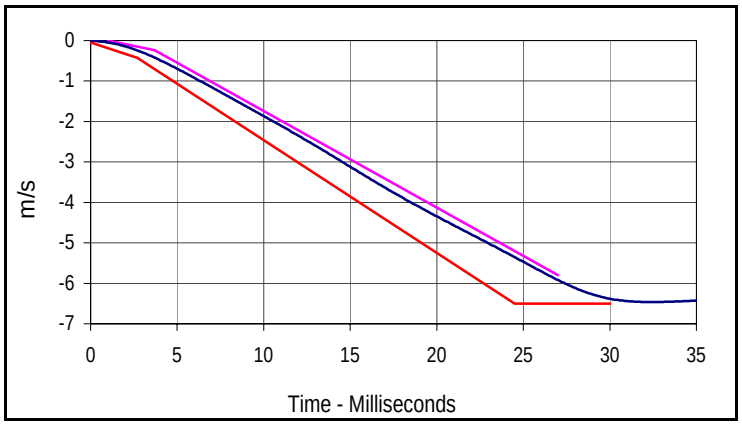
Tested Parameter		Units	Specification	Result	Pass/Fail
Lumbar Spine Assembly Soak Time		Minutes	≥240	425	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.1	Pass
Pendulum Velocity		m/s	5.95 to 6.15	6.01	Pass
Headform Rotation	Max	Degrees	45 to 55	50.4	Pass
	Time	msec	39 to 53	43.3	Pass
Time of Decay to Zero Angle from Peak		msec	37 to 57	40.7	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	-1.3	-7.1	124.8



Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
50.4	43.3	-26.3	107.7

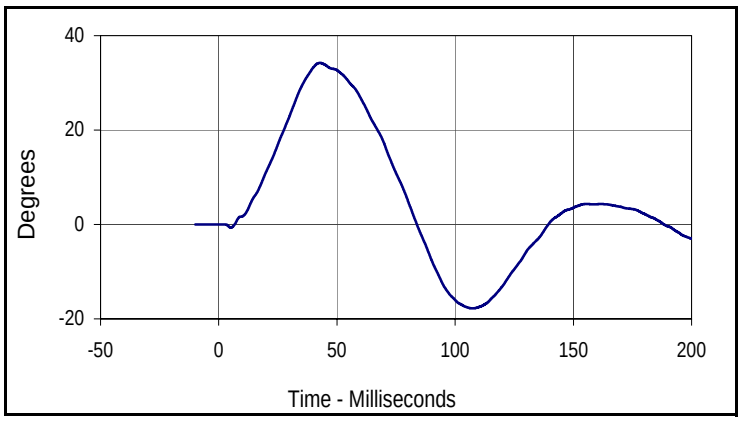


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.3	-7.1	124.8

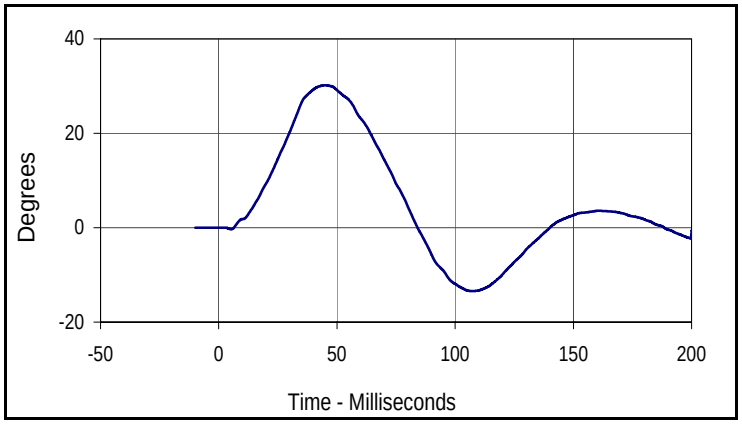
Velocity Corridors

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

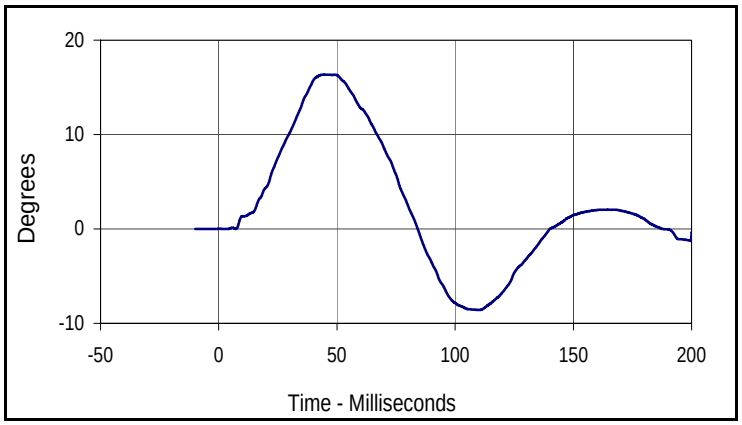
Test Program:	ES2re Lumbar Flexion Test	Test Date:	7/20/12
ATD Serial No.:	F035	Test I.D.:	F035LB033



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
34.2	42.7	-17.8	107.3



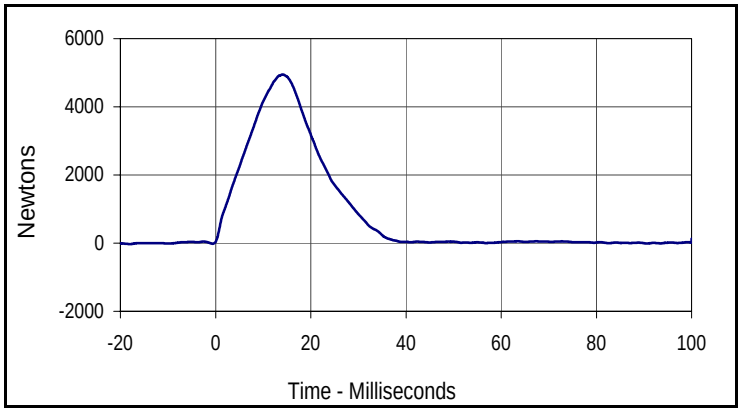
Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
30.2	45.0	-13.4	107.1



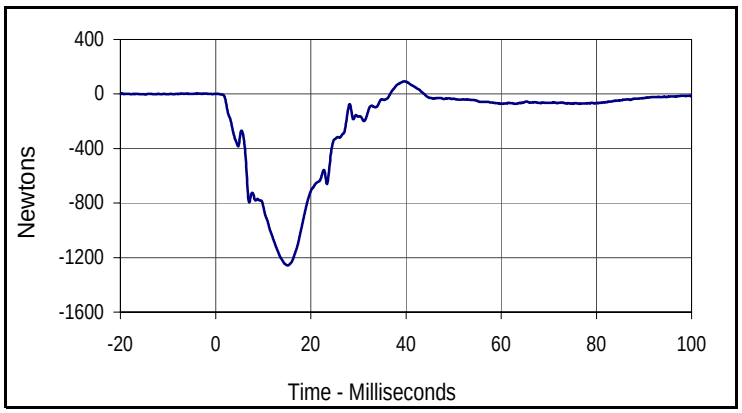
Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
16.4	44.4	-8.6	110.4

Test Program:	ES2re Pelvis Impact Test	Test Date:	7/20/12
ATD Serial No.:	F035	Test I.D.:	F035PL033

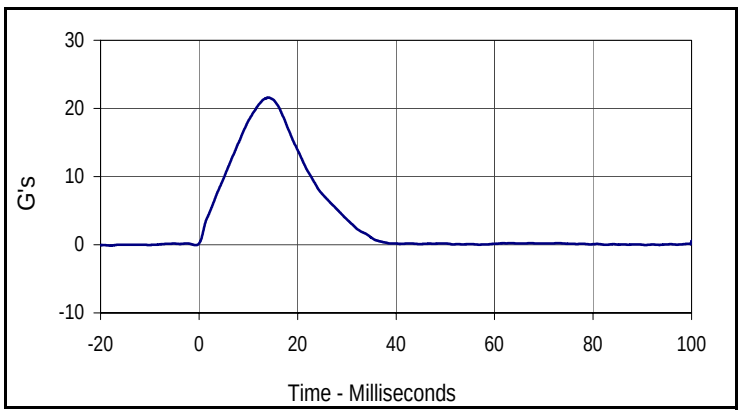
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	440	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.1	Pass
Pendulum Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Impactor Force		N	4700 to 5400	4947.4	Pass
		msec	11.8 to 16.1	14.1	Pass
Peak Pubic Symphysis Load		N	-1230 to -1590	-1258.2	Pass
		msec	12.2 to 17.0	15.1	Pass
			Overall Test Results		Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4947.4	14.1	-28.6	-18.0



Curve Description			
Pubic Symphysis Force Y			
Plot No.	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
92.9	39.6	-1258.2	15.1



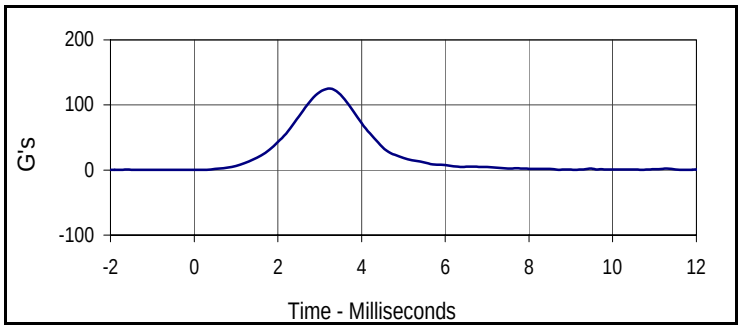
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
21.6	14.1	-0.1	-18.0

Test Program:	SID IIs External Measurements	Test Date:	7/19/12
ATD Serial No.:	307	Test I.D.:	N/A

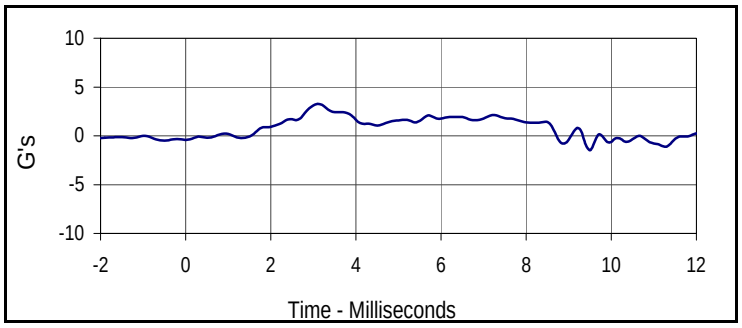
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	29	Pass
A	Sitting Height	mm	772 - 788	780	Pass
B	Shoulder Pivot Height	mm	437 - 453	444	Pass
C	H-Point Height	mm	79 - 89	83	Pass
D	H-Point from Seatback	mm	141 - 151	145	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	102	Pass
F	Thigh Clearance	mm	119 - 135	125	Pass
G	Head Breadth	mm	140 - 148	145	Pass
H	Head Back from Backline	mm	40 - 46	43	Pass
I	Head Depth	mm	178 - 188	183	Pass
J	Head Circumference	mm	541 - 551	546	Pass
K	Buttock to Knee Length	mm	514 - 540	527	Pass
L	Popliteal Height	mm	343 - 369	350	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	318	Pass
R	Arm Length	mm	249 - 259	252	Pass
S	Knee Joint to Seatback	mm	477 - 493	485	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	873	Pass
Z	Waist Circumference	mm	760 - 791	775	Pass
			Overall Test Results		Pass

Test Program:	SID IIs Head Drop Test	Test Date:	7/19/12
ATD Serial No.:	307	Test I.D.:	307HD040

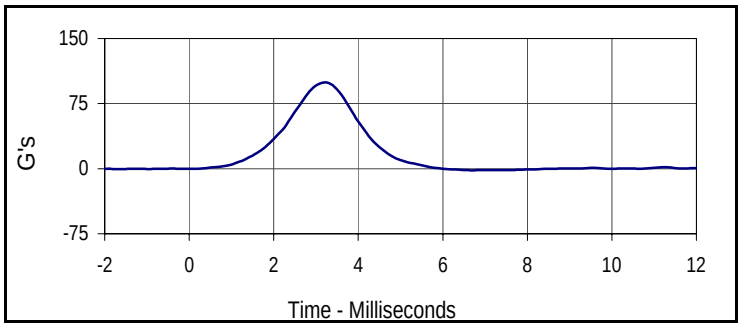
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	250	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.5	Pass
Peak Head Resultant Acceleration		G's	115 to 137	125.1	Pass
Peak Head X Acceleration		G's	<15	3.3	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	3.6	Pass
			Overall Test Results		Pass



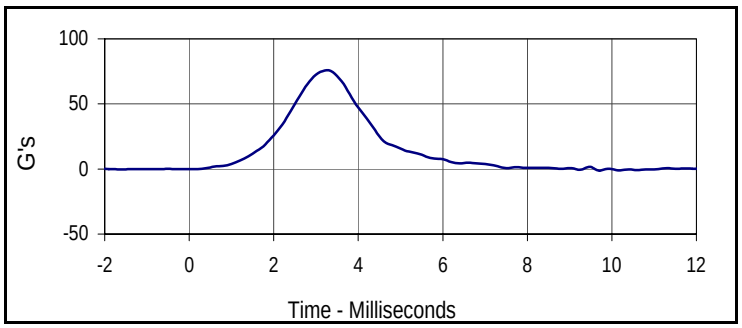
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
125.1	3.2	0.2	0.3



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
3.3	3.1	-0.5	-0.5



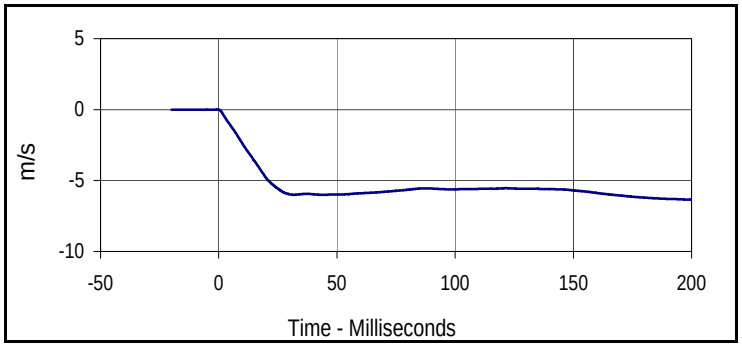
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
99.5	3.2	-1.8	6.7



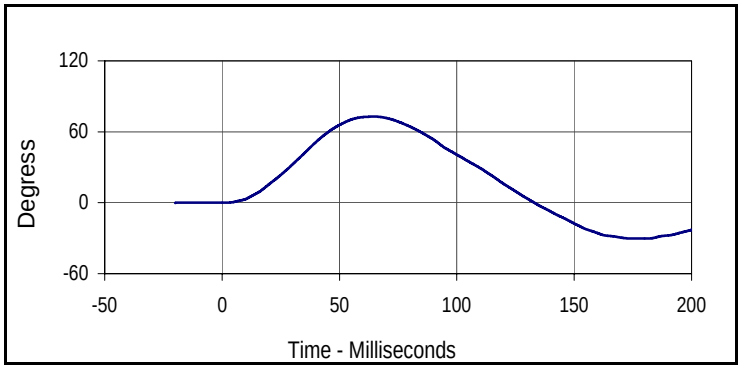
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
75.8	3.3	-1.2	9.7

Test Program:	SID IIs Neck Flexion Test	Test Date:	7/19/12
ATD Serial No.:	307	Test I.D.:	307NB040

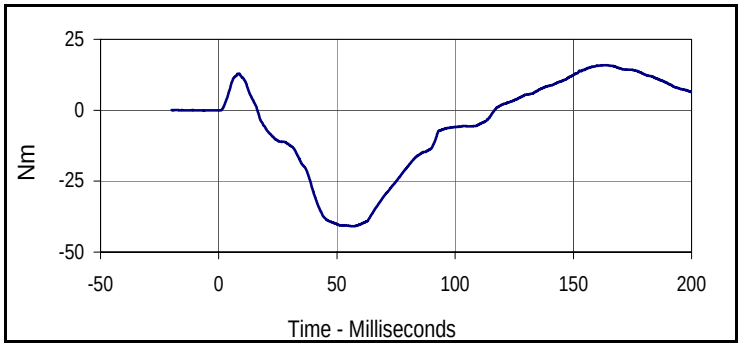
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	285	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.4	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.56	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.39	Pass
	15 msec	m/s	-3.30 to -4.10	-3.59	Pass
	20 msec	m/s	-4.40 to -5.40	-4.81	Pass
	25 msec	m/s	-5.40 to -6.10	-5.57	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.01	Pass
D-Plane Rotation	Max	Degrees	71 to 81	72.9	Pass
	Time	msec	50 to 70	64.8	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-40.9	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	116.7	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.6	-6.3	200.0



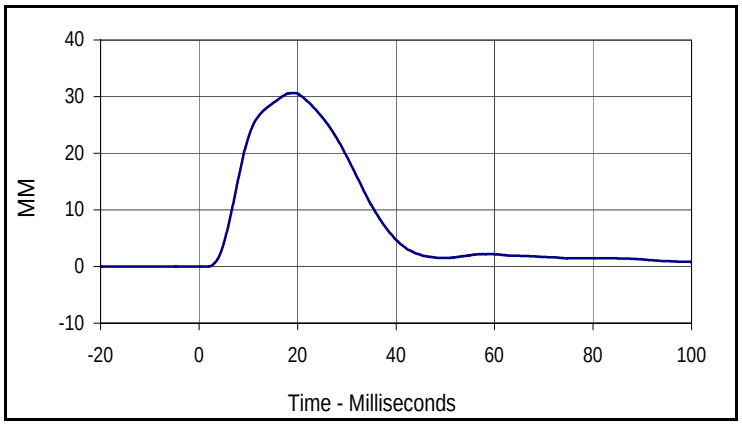
Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
72.9	64.8	-30.3	180.8



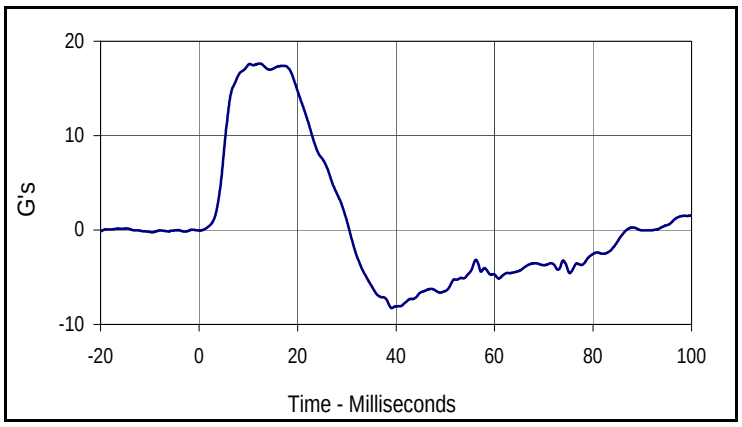
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
15.9	162.4	-40.9	56.8

Test Program:	SID IIs Shoulder Impact Test	Test Date:	7/19/12
ATD Serial No.:	307	Test I.D.:	307SH040

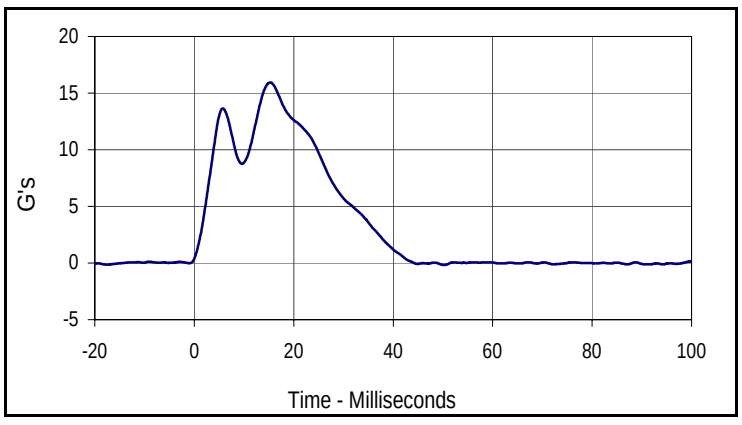
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	310	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.5	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.25	Pass
Peak Shoulder Deflection		mm	28 to 37	30.6	Pass
Peak Lateral Spine Acceleratrion Y		G's	17 to 22	17.6	Pass
Peak Impactor Acceleration		G's	13 to 18	15.9	Pass
			Overall Test Results		Pass



Curve Description			
Shoulder Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
30.6	19.0	0.0	-18.7



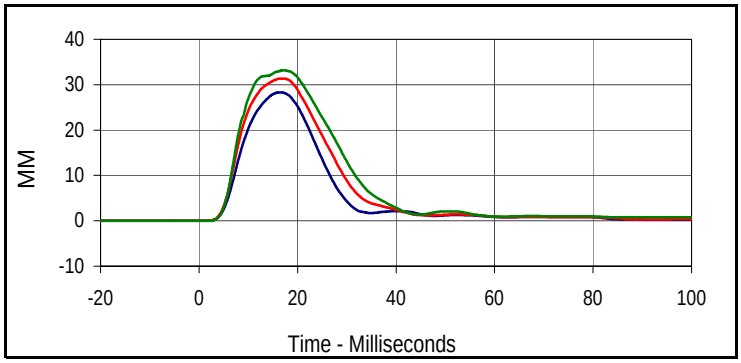
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
17.6	12.3	-8.3	39.1



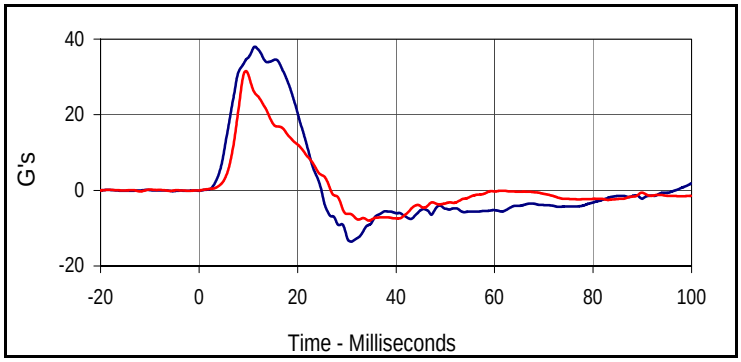
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.9	15.3	-0.2	50.2

Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	7/19/12
ATD Serial No.:	307	Test I.D.:	307TWA040

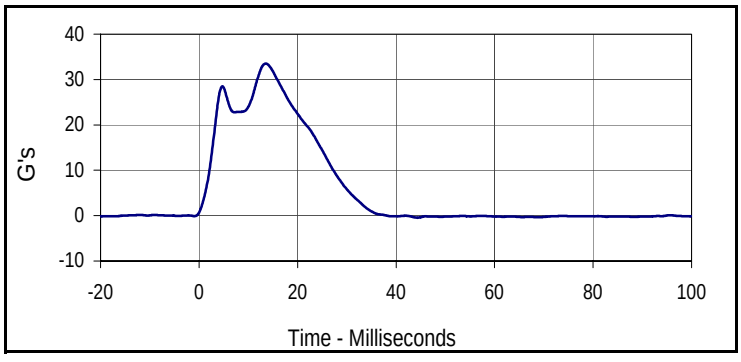
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	330	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.0	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.2	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.7	Pass
Peak Shoulder Deflection		mm	31 to 40	36.1	Pass
Peak Upper Thorax Rib Deflection		mm	25 to 32	28.3	Pass
Peak Middle Thorax Rib Deflection		mm	30 to 36	31.4	Pass
Peak Lower Thorax Rib Deflection		mm	32 to 38	33.2	Pass
Peak Upper Spine Y Acceleration		G's	34 to 43	38.0	Pass
Peak Lower Spine Y Acceleration		G's	29 to 37	31.6	Pass
Peak Impactor Acceleration		G's	30 to 36	33.5	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
28.3	16.4	0.0	-0.9
Middle Thorax Deflection			
Max	Time	Min	Time
31.4	17.0	0.0	0.4
Lower Thorax Deflection			
Max	Time	Min	Time
33.2	17.0	0.0	-19.7

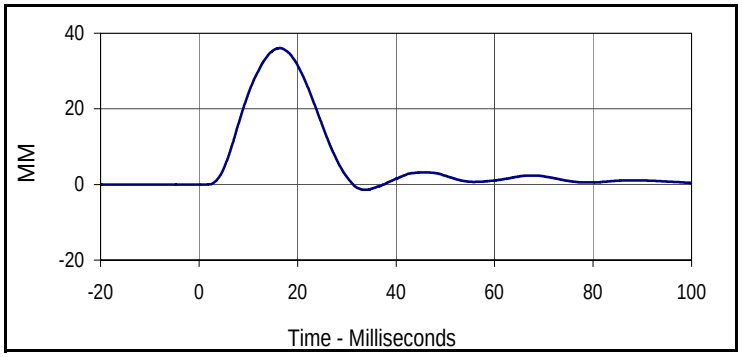


Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
38.0	11.3	-13.6	30.9
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
31.6	9.5	-8.0	34.4



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
33.5	13.5	-0.4	44.3

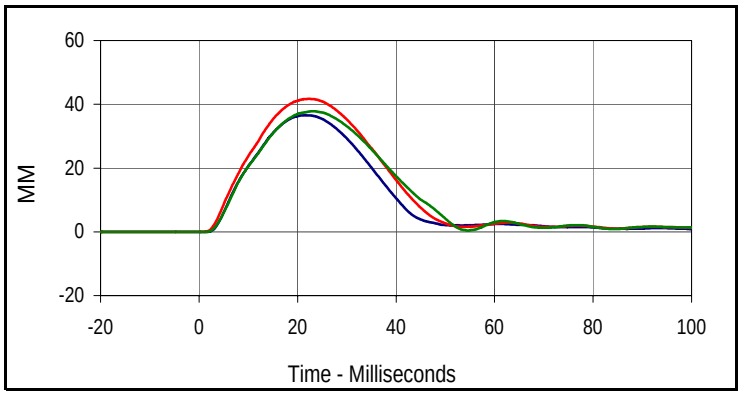
Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	7/19/12
ATD Serial No.:	307	Test I.D.:	307TWA040



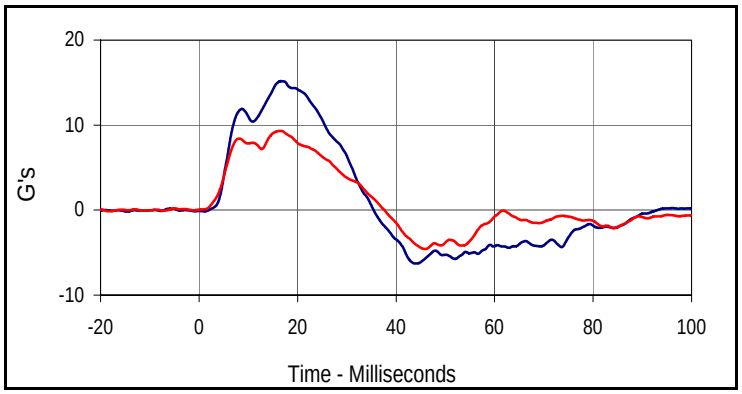
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
36.1	16.4	-1.4	34.0

Test Program:	SID IIs Thorax without Arm Impact Test	Test Date:	7/19/12
ATD Serial No.:	307	Test I.D.:	307TWOA040

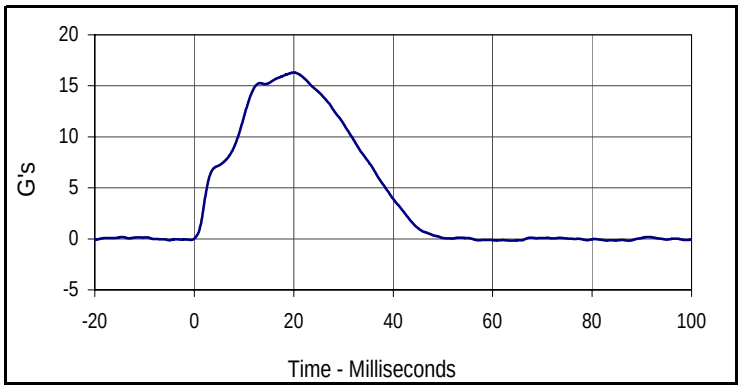
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	360	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	20.8	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	36.6	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	41.7	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	37.9	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	15.2	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	9.3	Pass
Peak Impactor Acceleration		G's	14 to 18	16.3	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
36.6	21.5	0.0	1.5
Middle Thorax Deflection			
Max	Time	Min	Time
41.7	22.4	0.0	-0.9
Lower Thorax Deflection			
Max	Time	Min	Time
37.9	23.1	0.0	-8.9



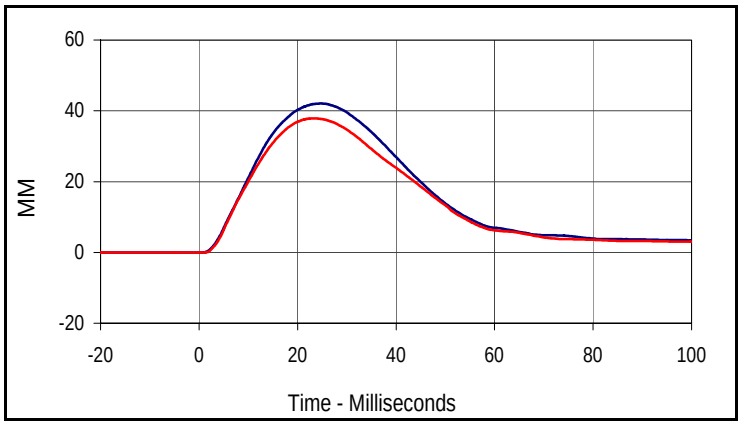
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.2	16.7	-6.3	44.2
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.3	16.5	-4.6	45.9



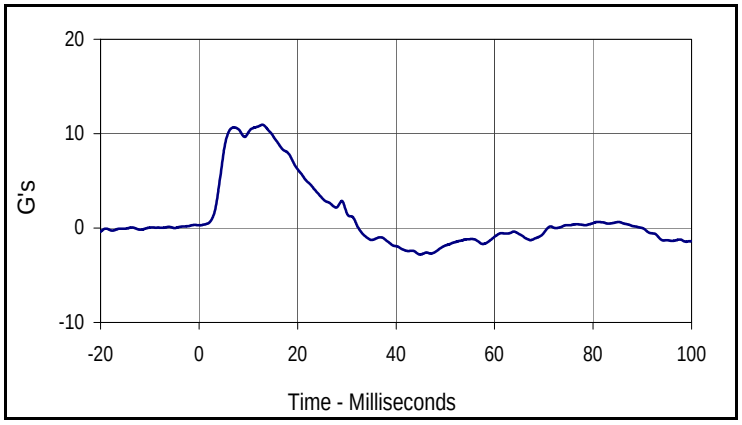
Curve Description			
Impactor Accleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.3	20.0	-0.2	87.4

Test Program:	SID IIs Abdomen Impact Test	Test Date:	7/19/12
ATD Serial No.:	307	Test I.D.:	307ABD040

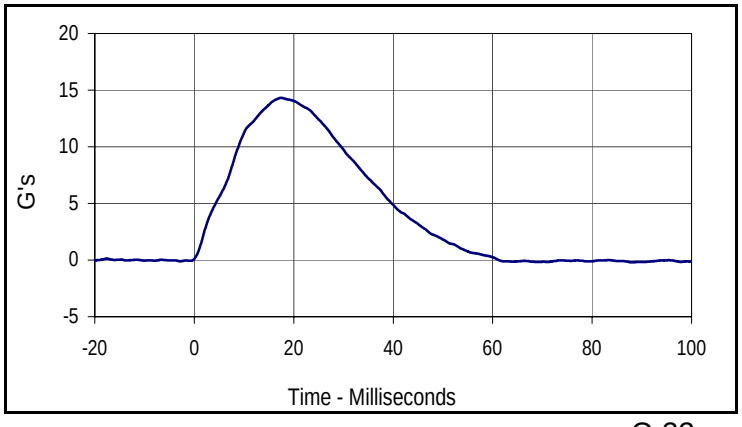
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	380	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Upper Abdominal Rib Deflection		mm	36 to 47	42.1	Pass
Peak Lower Abdominal Rib Deflection		mm	33 to 44	37.9	Pass
Peak Lower Spine Y Acceleration		G's	9 to 14	10.9	Pass
Peak Impactor Acceleration		G's	12 to 16	14.3	Pass
			Overall Test Results		Pass



Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
42.1	24.7	0.0	0.8
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
37.9	23.0	0.0	-1.7



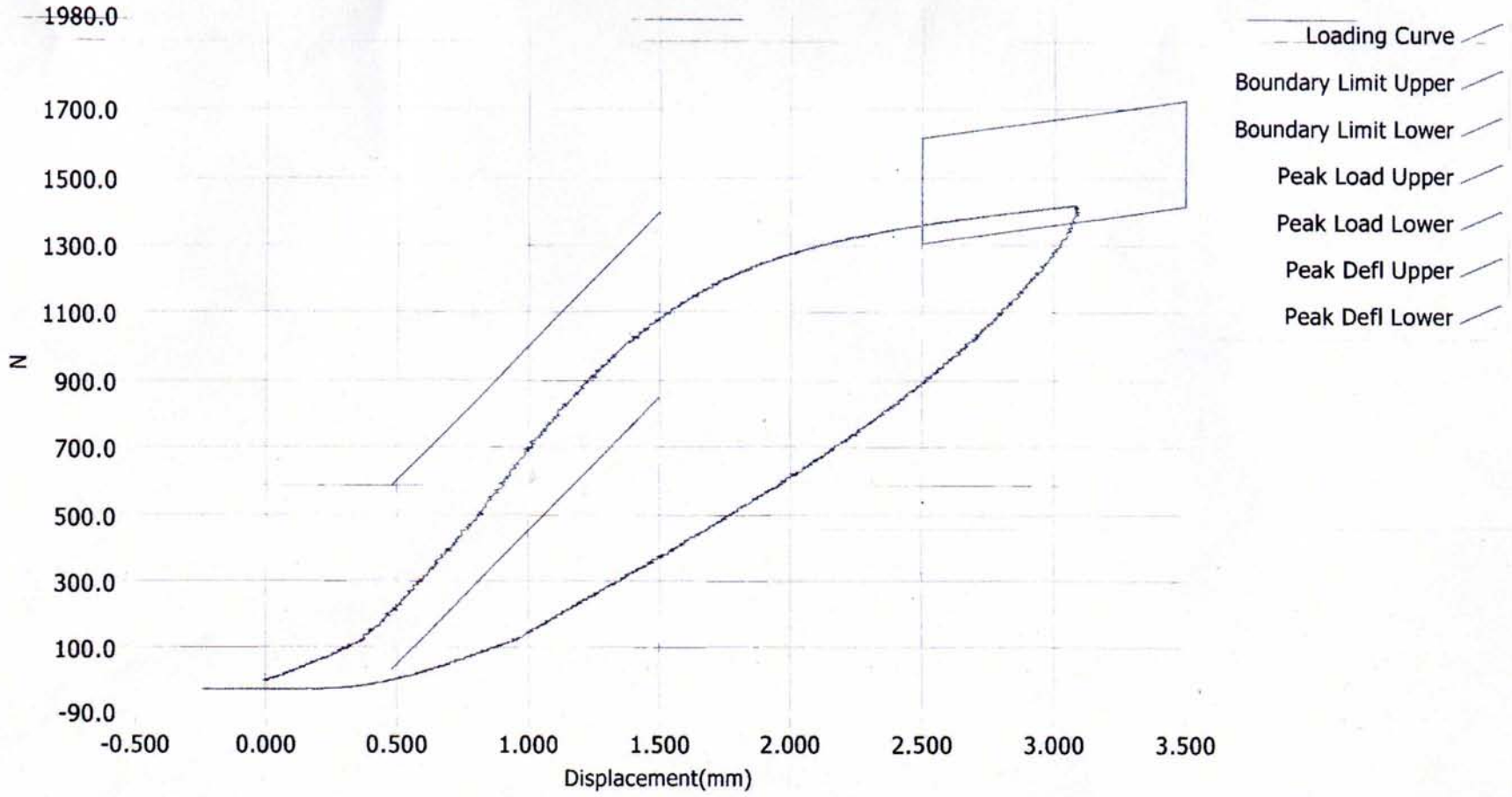
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
10.9	12.9	-2.8	44.9



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.3	17.5	-0.2	87.9

MC0534 PRE TEST

Resultant Data - SIDIIs Plug Compression



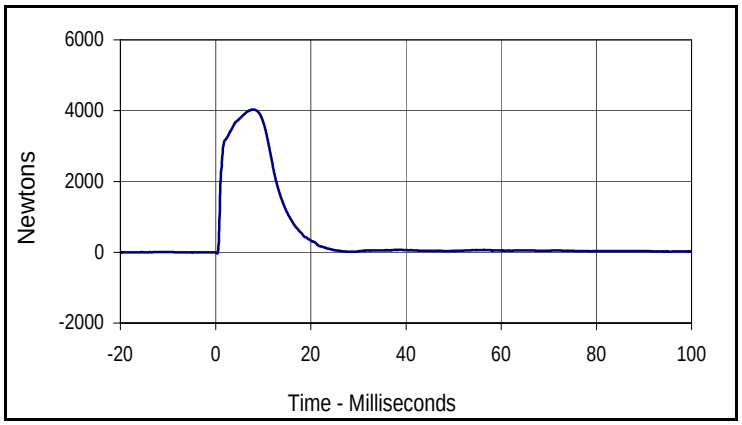
ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	46905	10/6/2011	12:54 AM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

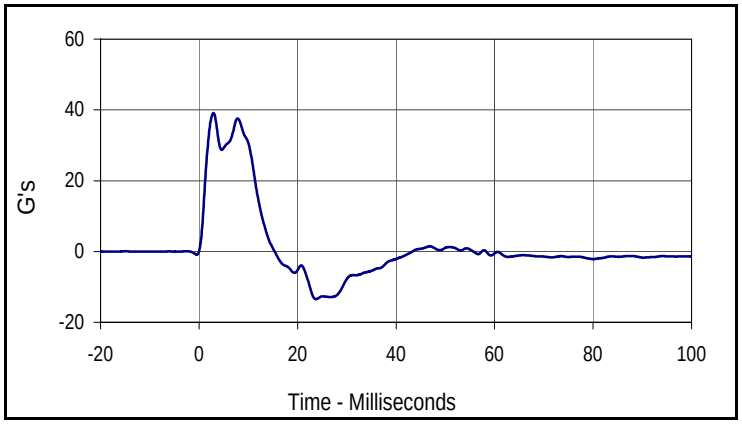
Current Date : 10/6/2011 Current Time : 00:55:21

Test Program:	SID IIs Pelvis Acetabulum Impact Test	Test Date:	7/19/12
ATD Serial No.:	307	Test I.D.:	307ACET040

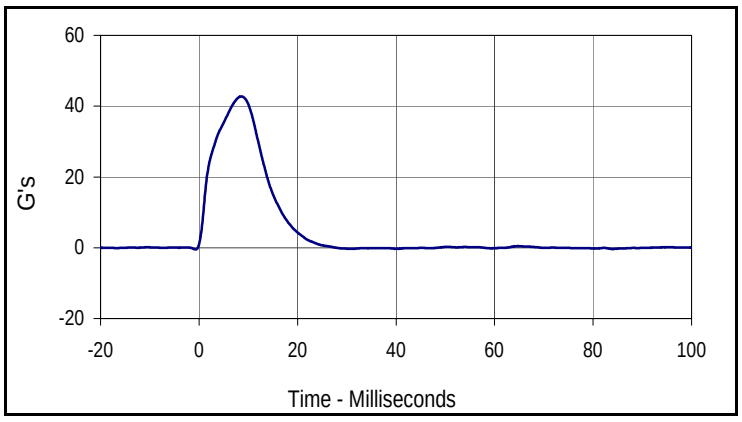
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	400	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.4	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.7	Pass
Peak Acetabulum Force Y		Newtons	3600 to 4300	4032.7	Pass
Peak Pelvis Y Acceleration After 6 msec.		G's	34 to 42	37.6	Pass
Peak Impactor Acceleration		G's	38 to 47	42.7	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4032.7	8.0	-33.7	0.4



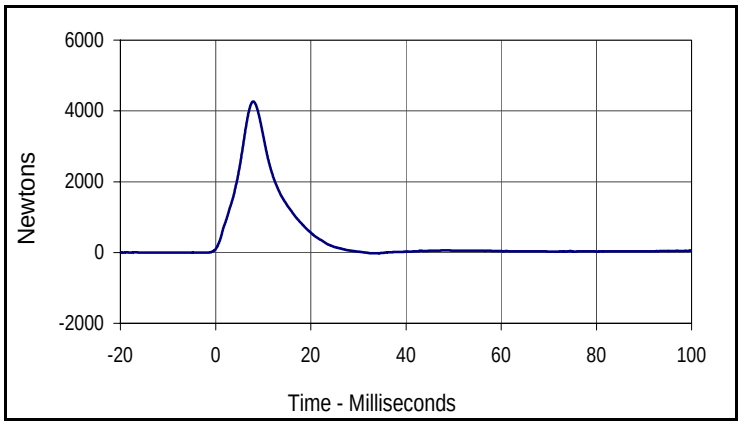
Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
39.1	2.9	-13.5	23.7



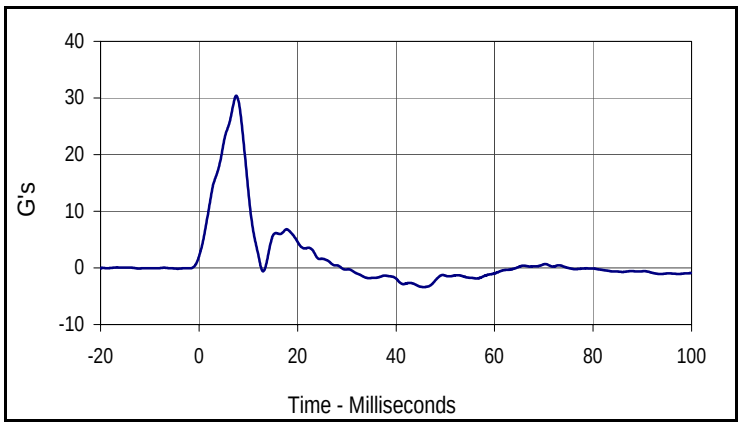
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
42.7	8.6	-0.5	-0.7

Test Program:	SID IIs Pelvis Iliac Calibration	Test Date:	7/19/12
ATD Serial No.:	307	Test I.D.:	307PL040

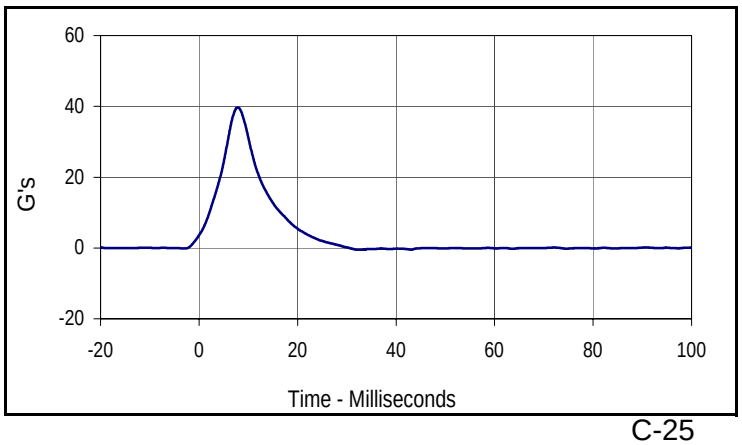
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	415	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.5	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Illiac Force		Newtons	4100 to 5100	4266.8	Pass
Peak Pelvis Y Acceleration		G's	28 to 39	30.4	Pass
Peak Impactor Acceleration		G's	36 to 45	39.7	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4266.8	7.9	-24.1	33.4



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
30.4	7.6	-3.4	45.6



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
39.7	7.9	-0.5	32.6

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

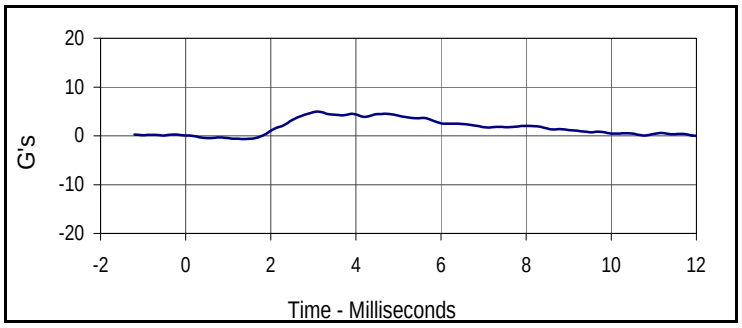
Test Program:	ES2re External Measurements	Test Date:	8/6/12
ATD Serial No.:	F035	Test I.D.:	N/A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
1	Sitting Height	mm	900 - 918	909	Pass
2	Seat to Shoulder Joint	mm	558 - 572	564	Pass
3	Seat to Lower Face of Thoracic Spine Box	mm	346 - 356	350	Pass
4	Seat to Hip Joint (Center of Bolt)	mm	97 - 103	100	Pass
5	Sole to Seat, Sitting	mm	333 - 451	395	Pass
6	Head Width	mm	152 - 158	156	Pass
7	Shoulder / Arm Width	mm	461 - 479	470	Pass
8	Thorax Width	mm	322 - 332	327	Pass
9	Abdomen Width	mm	273 - 287	280	Pass
10	Pelvis Lap Width	mm	359 - 373	363	Pass
11	Head Depth	mm	196 - 206	201	Pass
12	Thorax Depth	mm	262 - 272	270	Pass
13	Abdomen Width	mm	194 - 204	199	Pass
14	Pelvis Depth	mm	235 - 245	240	Pass
15	Back of Buttocks to Hip Joint (Center of Bolt)	mm	150 - 160	155	Pass
16	Back of Buttocks to Front Knee	mm	597 - 615	609	Pass
			Overall Test Results		Pass

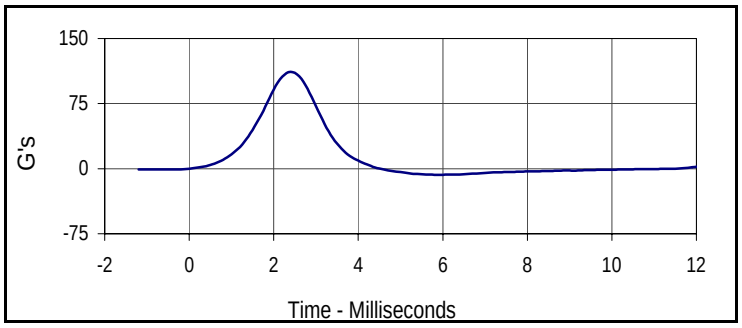
Test Program:	ES2re Head Drop Test	Test Date:	8/6/12
ATD Serial No.:	F035	Test I.D.:	F035HD034

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	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	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.5	Pass
Peak Head Resultant Acceleration		G's	125 to 155	127.9	Pass
Peak Head X Acceleration		G's	≤15	5.0	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	6.5	Pass
			Overall Test Results		Pass

Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
127.9	2.4	0.4	0.0



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.0	3.1	-0.6	1.4

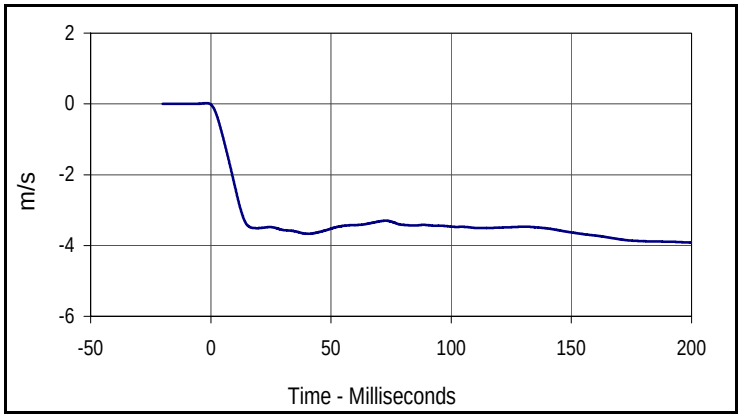


Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
111.8	2.4	-7.1	5.9

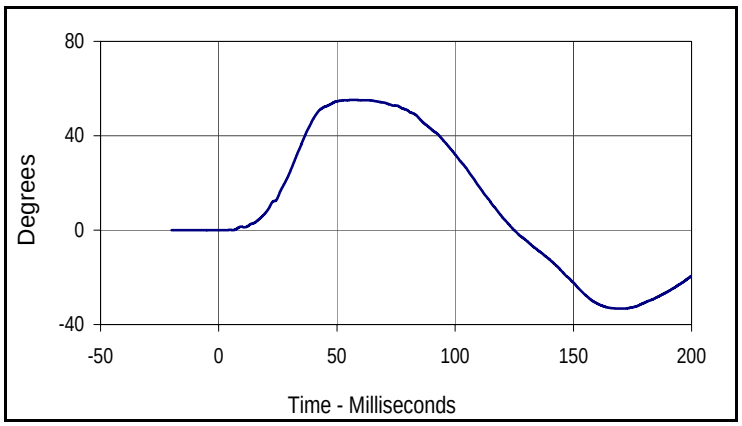
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
62.2	2.4	0.0	-0.3

Test Program:	ES2re Neck Flexion Test	Test Date:	8/6/12
ATD Serial No.:	F035	Test I.D.:	F035NB034

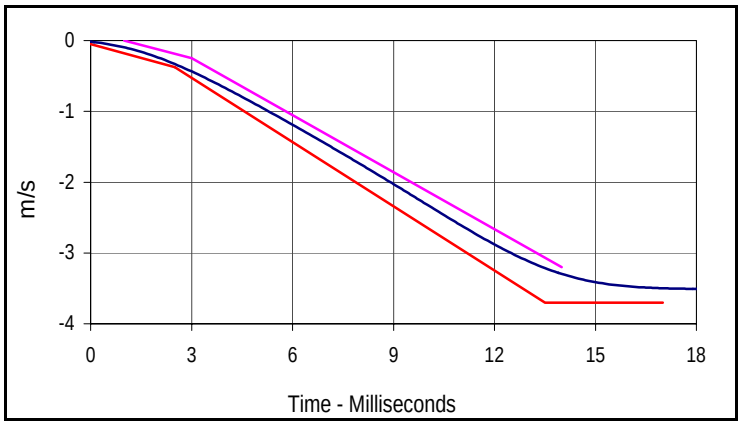
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	290	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.0	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Velocity		m/s	3.3 to 3.5	3.40	Pass
Headform Flexion	Max	Degrees	49 to 59	55.2	Pass
	Time	msec	54 to 66	56.9	Pass
Headform Flexion Decay (Peak to Zero)		msec	53 to 88	68.1	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	-1.8	-3.9	200.0



Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
55.2	56.9	-33.3	170.0

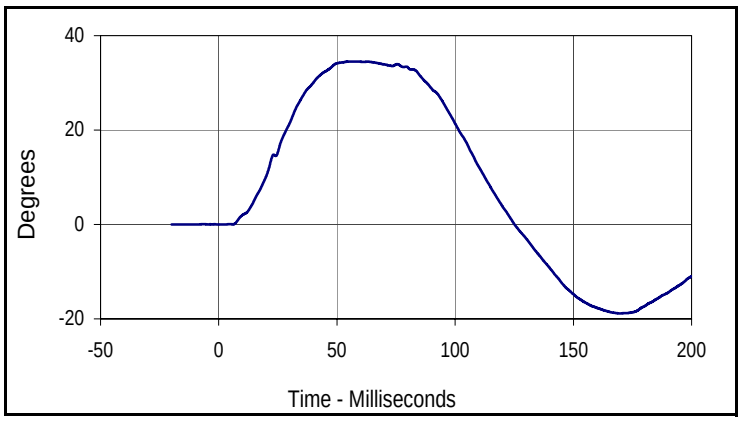


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.8	-3.9	200.0

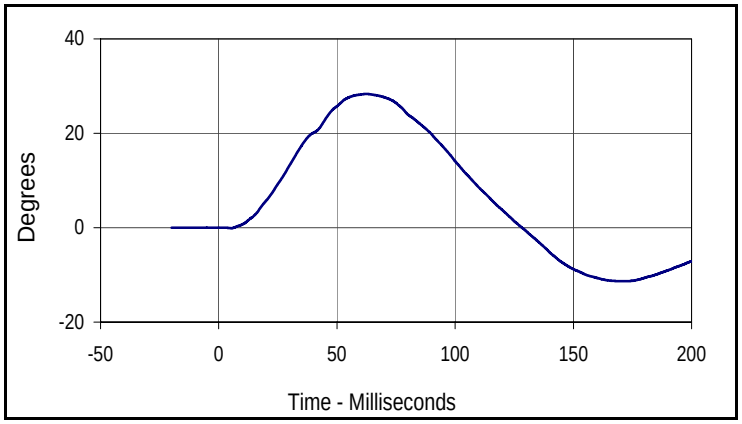
Velocity Corridors

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

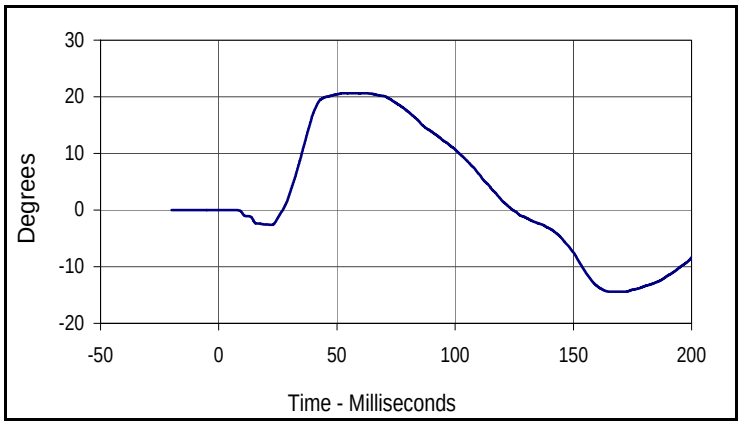
Test Program:	ES2re Neck Flexion Test	Test Date:	8/6/12
ATD Serial No.:	F035	Test I.D.:	F035NB034



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
34.5	56.8	-18.8	169.8



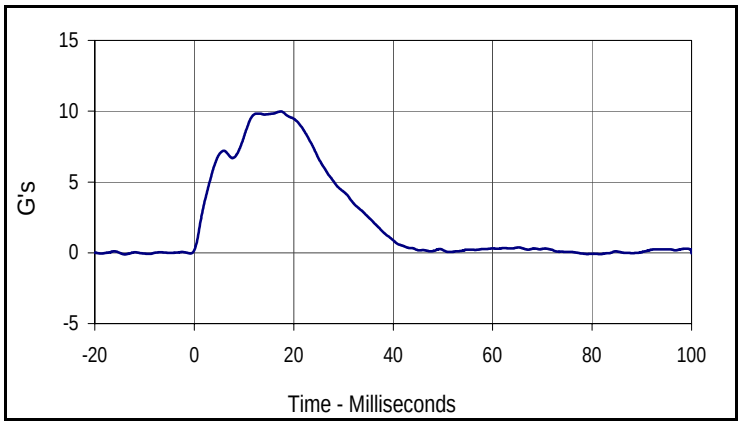
Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
28.3	62.5	-11.3	171.1



Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
20.6	52.7	-14.4	170.7

Test Program:	ES2re Shoulder Impact Test	Test Date:	8/6/12
ATD Serial No.:	F035	Test I.D.:	F035SH034

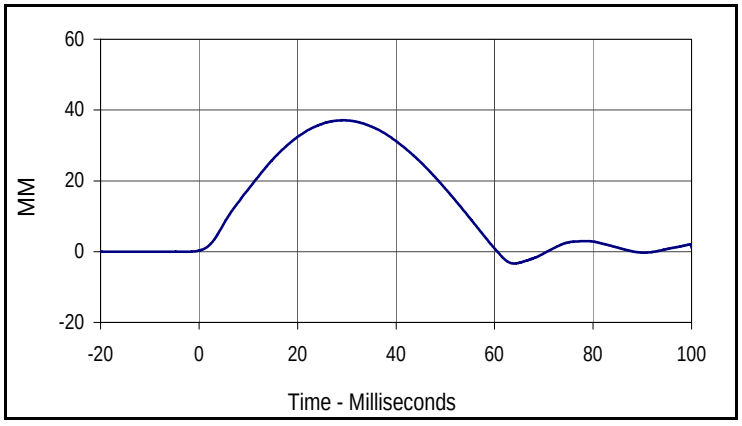
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	315	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.0	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Pendulum Speed		m/s	4.2 to 4.4	4.23	Pass
Peak Impactor Acceleration		G's	7.5 to 10.5	10.0	Pass
			Overall Test Results		Pass



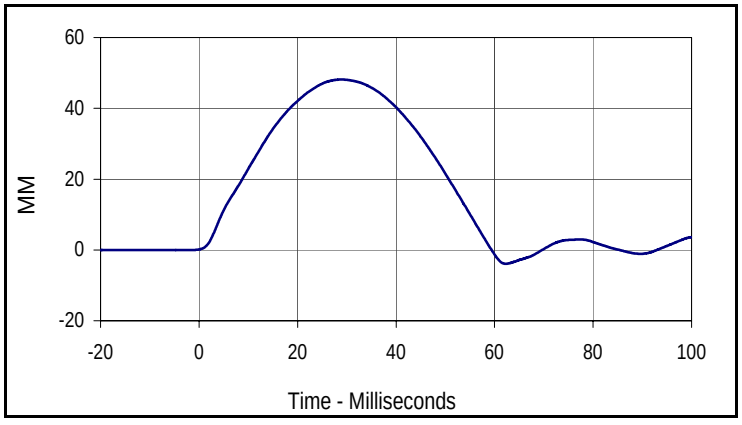
Curve Description			
Probe Impactor Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
10.0	17.4	-0.1	-14.0

Test Program:	ES2re Thorax - Rib Drop Test	Test Date:	8/6/12
ATD Serial No.:	F035 Rib #1	Test I.D.:	F035RB1034

Tested Parameter		Units	Specification	Result	Pass/Fail
Rib Module Soak Time		Minutes	≥240	330	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	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.0	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.7	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height		mm	36 to 40	37.1	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height		mm	46 to 51	48.2	Pass
			Overall Test Results		Pass



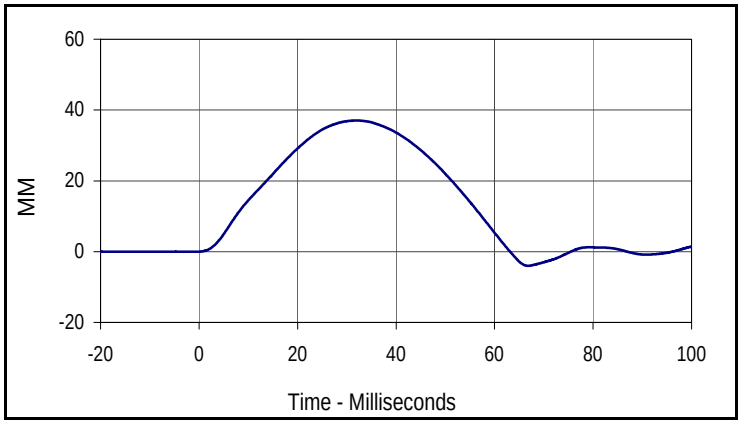
Curve Description			
Upper Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
37.1	29.4	-3.4	64.0



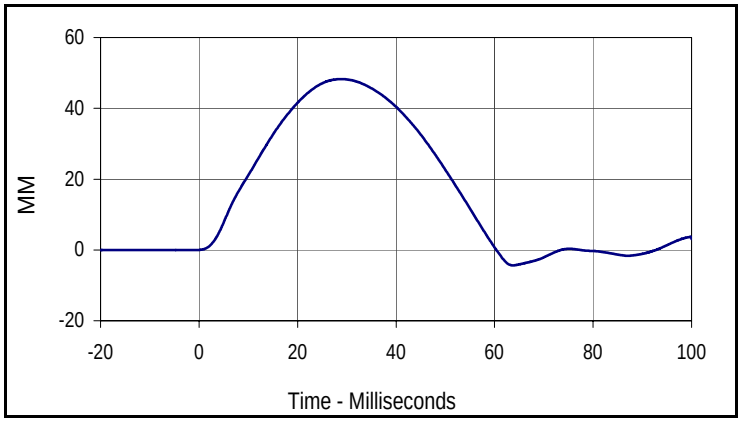
Curve Description			
Upper Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
48.2	28.9	-3.9	62.3

Test Program:	ES2re Thorax - Rib Drop Test	Test Date:	8/6/12
ATD Serial No.:	F035 Rib #2	Test I.D.:	F035RB2034

Tested Parameter		Units	Specification	Result	Pass/Fail
Rib Module Soak Time		Minutes	≥240	340	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	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	20.9	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.8	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height		mm	36 to 40	37.0	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height		mm	46 to 51	48.3	Pass
			Overall Test Results		Pass



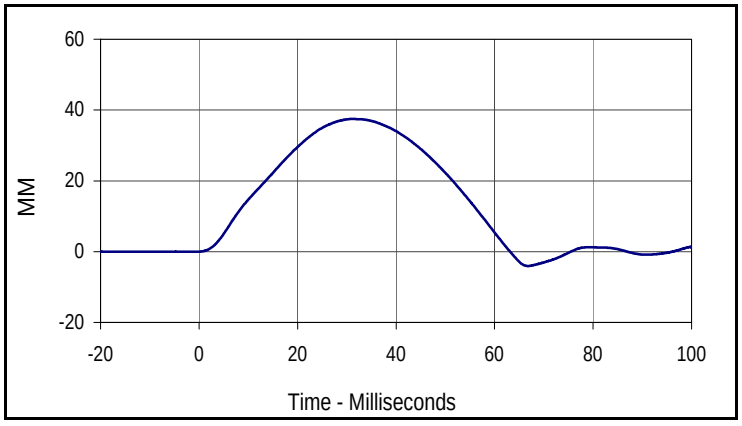
Curve Description			
Middle Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
37.0	32.0	-4.0	66.8



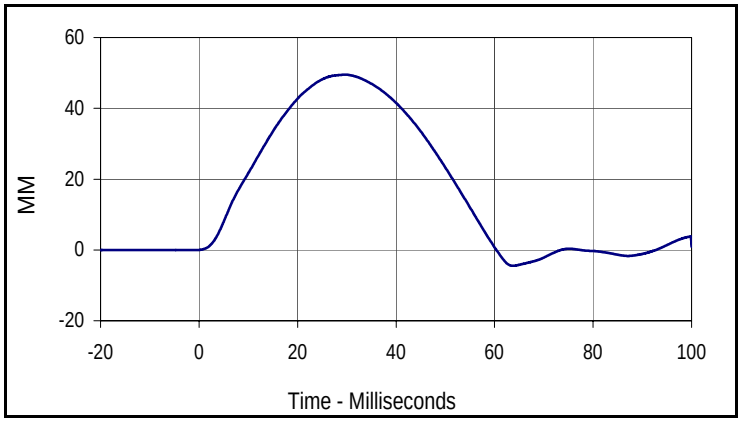
Curve Description			
Middle Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
48.3	28.9	-4.4	63.8

Test Program:	ES2re Thorax - Rib Drop Test	Test Date:	8/6/12
ATD Serial No.:	F035 Rib #3	Test I.D.:	F035RB3034

Tested Parameter		Units	Specification	Result	Pass/Fail
Rib Module Soak Time		Minutes	≥240	350	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	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	20.8	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height		mm	36 to 40	37.5	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height		mm	46 to 51	49.5	Pass
			Overall Test Results		Pass



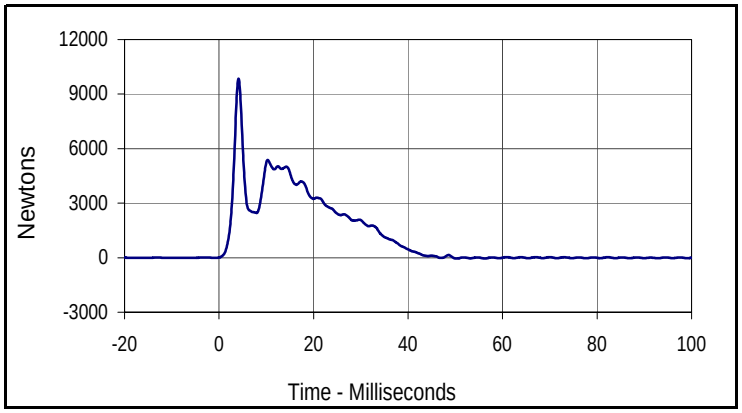
Curve Description			
Lower Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
37.5	31.0	-4.1	66.8



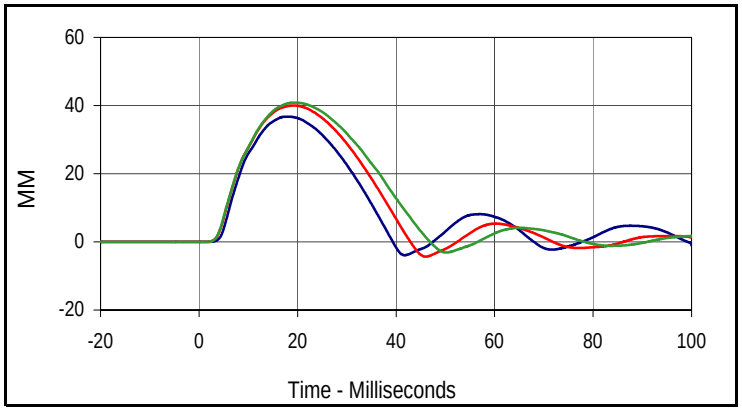
Curve Description			
Lower Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
49.5	29.7	-4.5	63.7

Test Program:	ES2re Thorax - Full Body Impact Test	Test Date:	8/6/12
ATD Serial No.:	F035	Test I.D.:	F035TH034

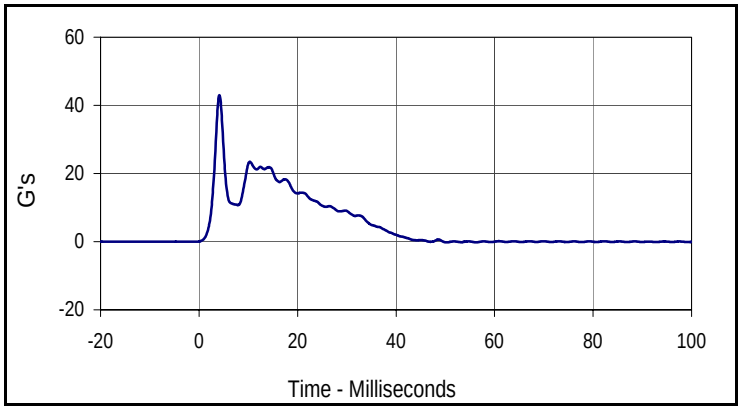
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	380	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.2	Pass
Peak Impactor Velocity		m/s	5.4 to 5.6	5.50	Pass
Peak Impactor Force		N	5100 to 6200	5375.4	Pass
		msec	> 6.0 msec	10.3	Pass
Peak Upper Rib Deflection		mm	34 to 41	36.8	Pass
Peak Middle Rib Deflection		mm	37 to 45	40.0	Pass
Peak Lower Rib Deflection		mm	37 to 44	40.9	Pass
			Overall Test Results		Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
9845.1	4.1	-49.8	50.2



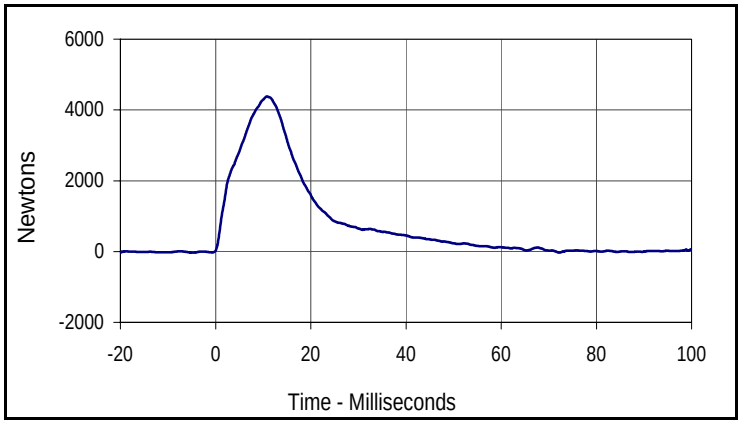
Curve Description			
Upper, Middle, Lower Rib Deflections			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max (Upper)	Time	Min (Upper)	Time
36.8	17.8	-3.9	41.8
Max (Middle)	Time	Min (Middle)	Time
40.0	19.2	-4.3	46.0
Max (Lower)	Time	Min (Lower)	Time
40.9	19.3	-3.1	50.2



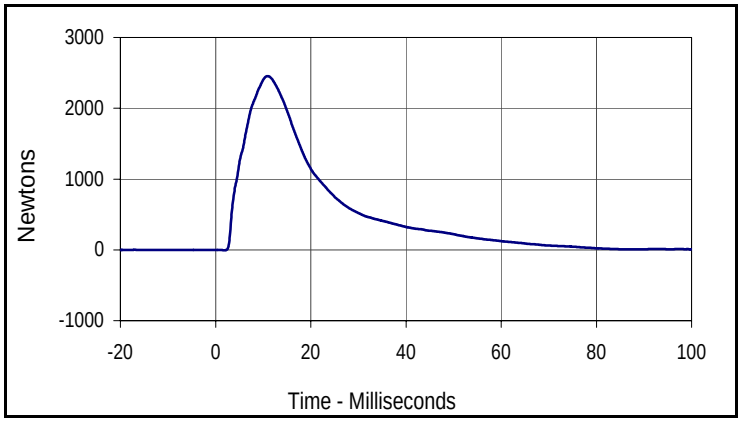
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
43.0	4.1	-0.2	50.2

Test Program:	ES2re Abdomen Impact Test	Test Date:	8/6/12
ATD Serial No.:	F035	Test I.D.:	F035ABD034

Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	410	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	31.0	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	29.9	Pass
Probe Velocity		m/s	3.9 to 4.1	4.0	Pass
Peak Impactor Force		N	4000 to 4800	4381.3	Pass
		msec	10.6 to 13.0	10.8	Pass
Sum of Abdominal Forces		N	2200 to 2700	2452.9	Pass
		msec	10.0 to 12.3	11.0	Pass
			Overall Test Results		Pass

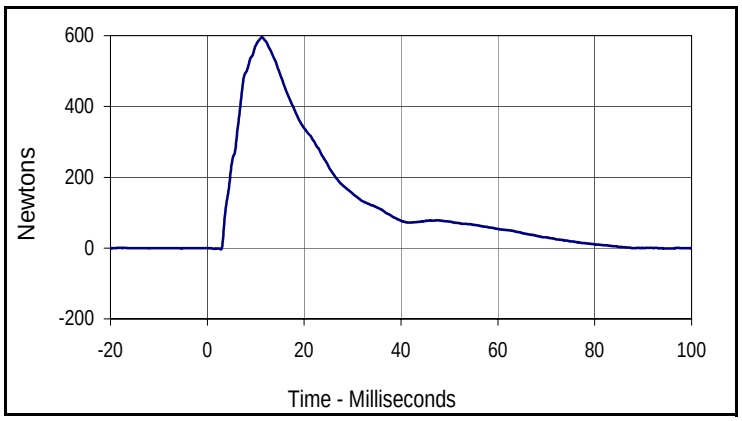


Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4381.3	10.8	-32.3	72.2

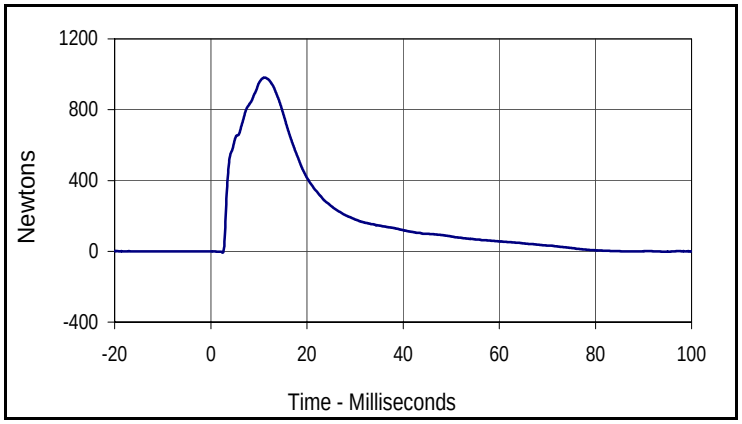


Curve Description			
Abdomen Sum Resultant			
Plot No.	Type	SAE Class	Units
002	RES	600	Newtons
Max	Time	Min	Time
2452.9	11.0	-5.7	1.8

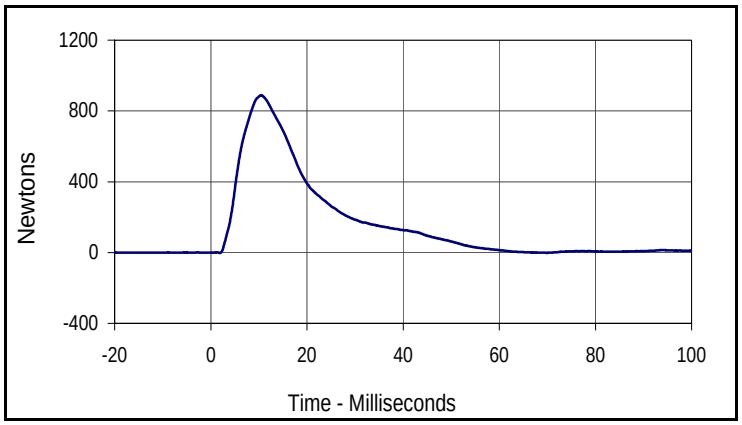
Test Program:	ES2re Abdomen Impact Test	Test Date:	8/6/12
ATD Serial No.:	F035	Test I.D.:	F035ABD034



Curve Description			
Front Abdomen Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
595.3	11.3	-3.5	2.8



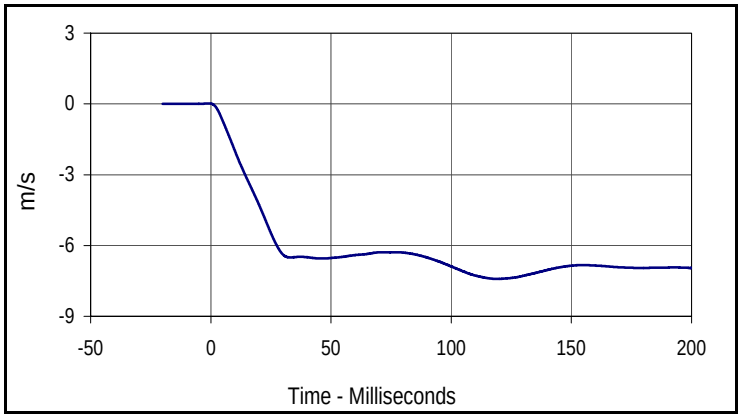
Curve Description			
Middle Abdomen Force			
Plot No.	Type	SAE Class	Units
004	FIL	600	Newtons
Max	Time	Min	Time
981.3	11.2	-7.1	2.5



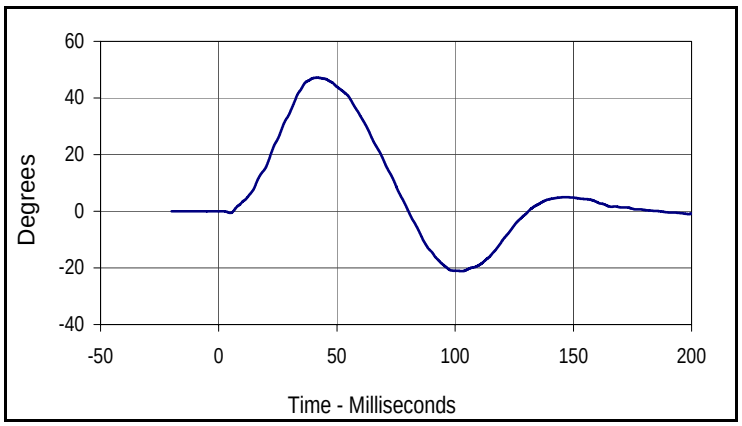
Curve Description			
Rear Abdomen Force			
Plot No.	Type	SAE Class	Units
005	FIL	600	Newtons
Max	Time	Min	Time
888.4	10.5	-2.3	1.9

Test Program:	ES2re Lumbar Flexion Test	Test Date:	8/6/12
ATD Serial No.:	F035	Test I.D.:	F035LB034

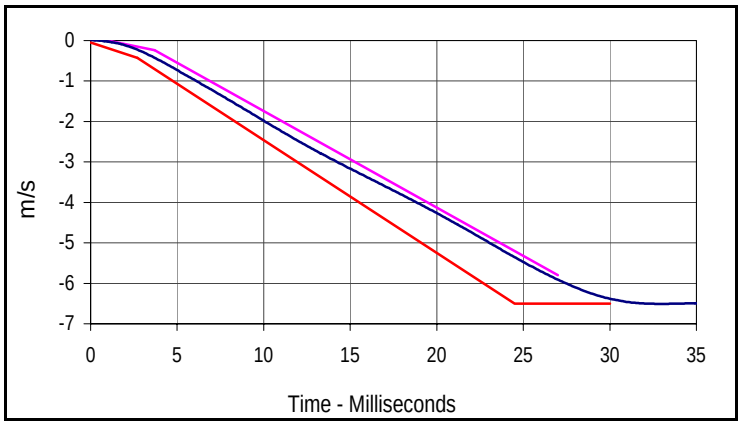
Tested Parameter		Units	Specification	Result	Pass/Fail
Lumbar Spine Assembly Soak Time		Minutes	≥240	440	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Velocity		m/s	5.95 to 6.15	6.06	Pass
Headform Rotation	Max	Degrees	45 to 55	47.2	Pass
	Time	msec	39 to 53	41.7	Pass
Time of Decay to Zero Angle from Peak		msec	37 to 57	38.6	Pass
			Overall Test Results		Pass



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



Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
47.2	41.7	-21.1	102.9

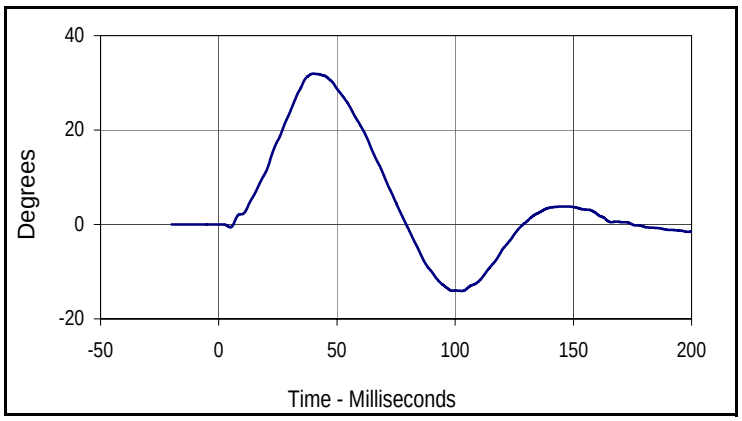


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-0.9	-7.4	119.0

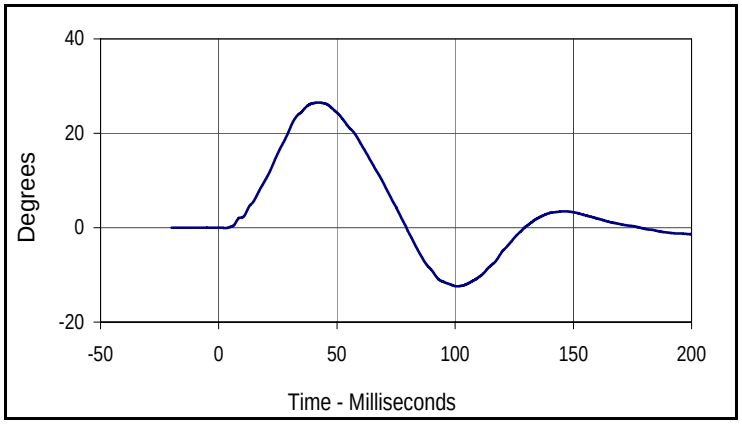
Velocity Corridors

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

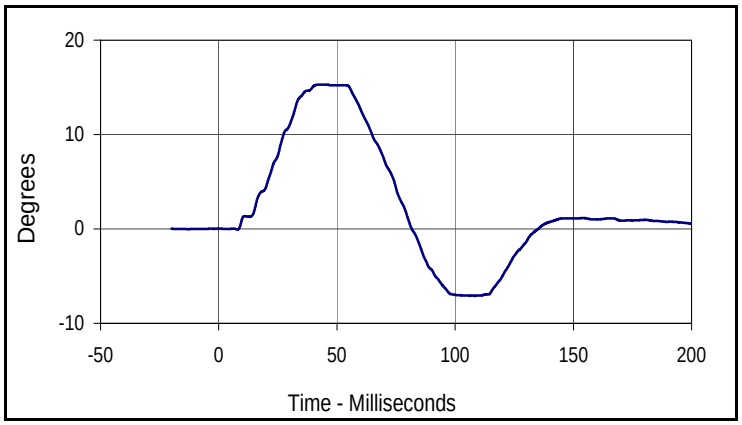
Test Program:	ES2re Lumbar Flexion Test	Test Date:	8/6/12
ATD Serial No.:	F035	Test I.D.:	F035LB034



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
31.9	39.8	-14.1	102.8



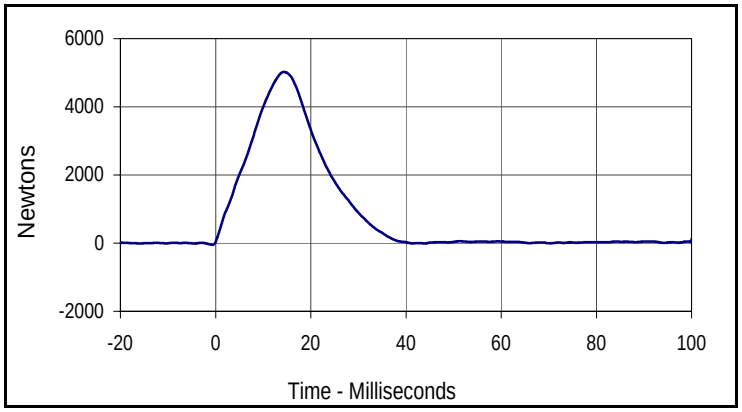
Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
26.5	42.0	-12.4	101.1



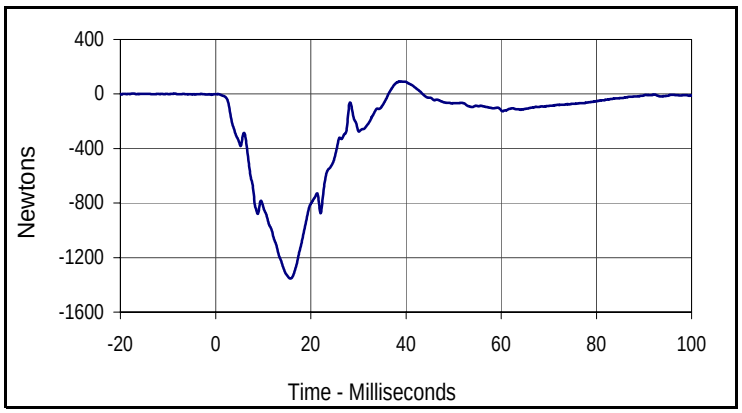
Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
15.3	42.1	-7.1	108.2

Test Program:	ES2re Pelvis Impact Test	Test Date:	8/6/12
ATD Serial No.:	F035	Test I.D.:	F035PL034

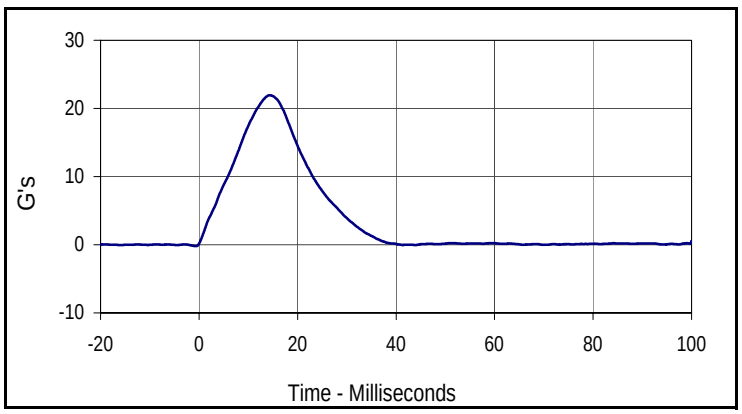
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	480	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.2	Pass
Pendulum Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Impactor Force		N	4700 to 5400	5024.2	Pass
		msec	11.8 to 16.1	14.3	Pass
Peak Pubic Symphysis Load		N	-1230 to -1590	-1354.5	Pass
		msec	12.2 to 17.0	15.7	Pass
			Overall Test Results		Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
5024.2	14.3	-48.1	-0.7



Curve Description			
Pubic Symphysis Force Y			
Plot No.	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
93.1	38.8	-1354.5	15.7



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
21.9	14.3	-0.2	-0.7

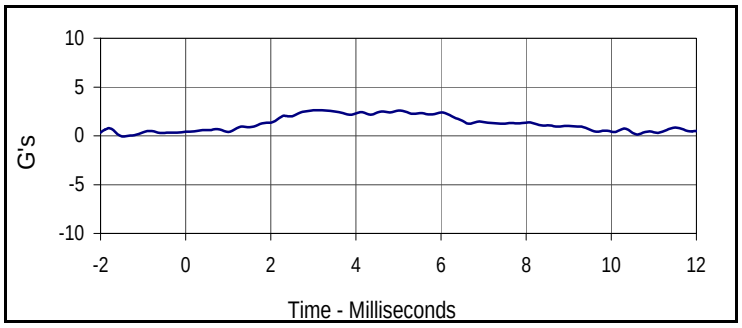
Test Program:	SID IIs External Measurements	Test Date:	8/6/12
ATD Serial No.:	307	Test I.D.:	N/A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
A	Sitting Height	mm	772 - 788	780	Pass
B	Shoulder Pivot Height	mm	437 - 453	445	Pass
C	H-Point Height	mm	79 - 89	84	Pass
D	H-Point from Seatback	mm	141 - 151	145	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	103	Pass
F	Thigh Clearance	mm	119 - 135	126	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	183	Pass
J	Head Circumference	mm	541 - 551	546	Pass
K	Buttock to Knee Length	mm	514 - 540	527	Pass
L	Popliteal Height	mm	343 - 369	350	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	401	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	318	Pass
R	Arm Length	mm	249 - 259	252	Pass
S	Knee Joint to Seatback	mm	477 - 493	483	Pass
V	Shoulder Width	mm	341 - 357	351	Pass
W	Foot Width	mm	78 - 94	89	Pass
Y	Chest Circumference with Jacket	mm	851 - 881	873	Pass
Z	Waist Circumference	mm	760 - 791	775	Pass
			Overall Test Results		Pass

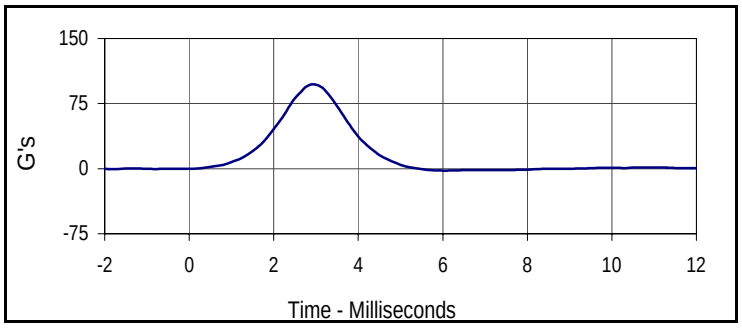
Test Program:	SID IIs Head Drop Test	Test Date:	8/6/12
ATD Serial No.:	307	Test I.D.:	307HD041

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	250	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	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.7	Pass
Peak Head Resultant Acceleration		G's	115 to 137	125.4	Pass
Peak Head X Acceleration		G's	<15	2.6	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	2.8	Pass
			Overall Test Results		Pass

Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
125.4	3.0	0.2	-1.6



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.6	3.1	-0.1	-1.5

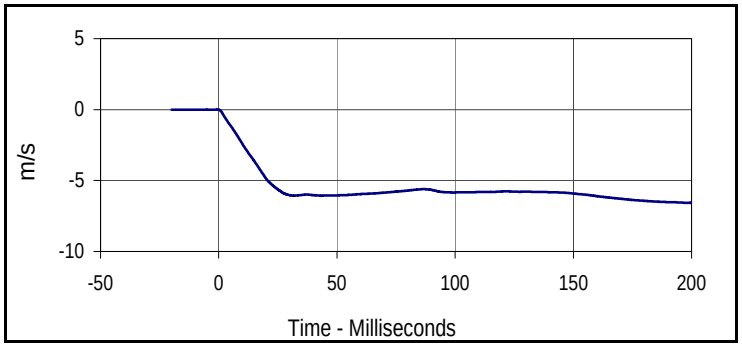


Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
97.3	2.9	-2.2	6.0

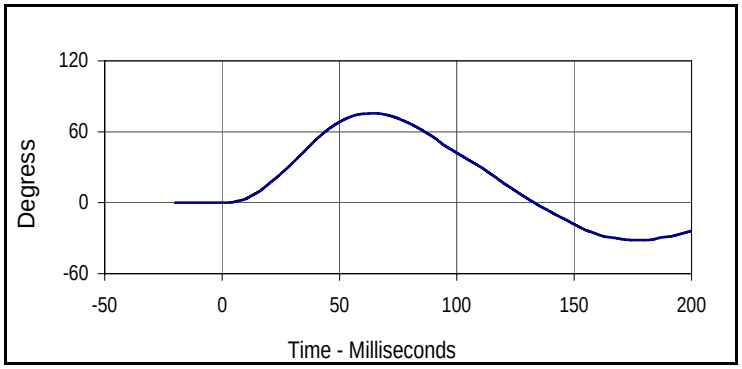
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
79.4	3.0	-0.6	9.0

Test Program:	SID IIs Neck Flexion Test	Test Date:	8/6/12
ATD Serial No.:	307	Test I.D.:	307NB041

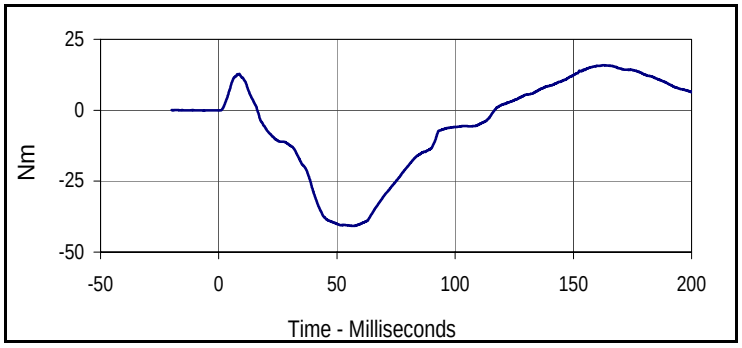
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	285	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.3	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.54	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.42	Pass
	15 msec	m/s	-3.30 to -4.10	-3.62	Pass
	20 msec	m/s	-4.40 to -5.40	-4.86	Pass
	25 msec	m/s	-5.40 to -6.10	-5.63	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.07	Pass
D-Plane Rotation	Max	Degrees	71 to 81	75.6	Pass
	Time	msec	50 to 70	64.8	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-40.8	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	116.7	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.6	-6.6	200.0



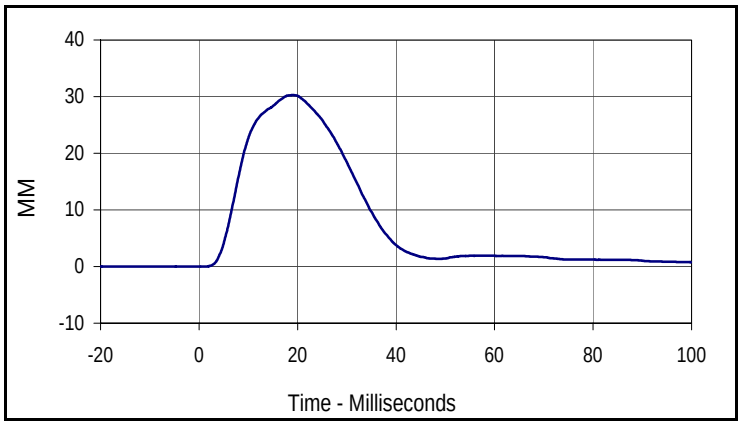
Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
75.6	64.8	-31.5	180.8



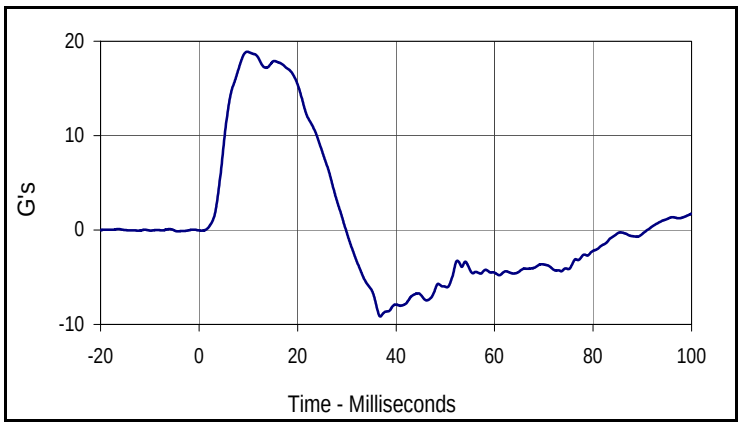
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
15.9	162.4	-40.8	56.8

Test Program:	SID IIs Shoulder Impact Test	Test Date:	8/6/12
ATD Serial No.:	307	Test I.D.:	307SH041

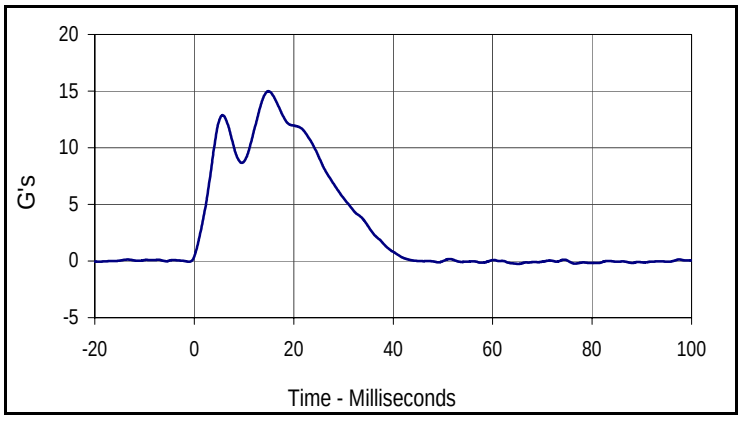
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	310	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.0	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.30	Pass
Peak Shoulder Deflection		mm	28 to 37	30.3	Pass
Peak Lateral Spine Acceleratrion Y		G's	17 to 22	18.9	Pass
Peak Impactor Acceleration		G's	13 to 18	15.0	Pass
			Overall Test Results		Pass



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
30.3	19.1	0.0	-18.4



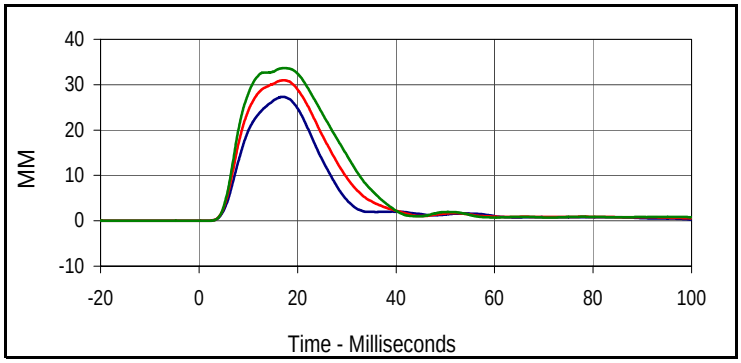
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.9	9.8	-9.2	36.8



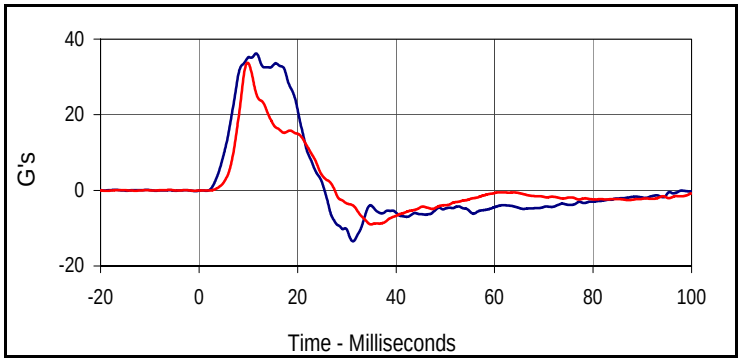
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.0	14.9	-0.3	65.2

Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	8/6/12
ATD Serial No.:	307	Test I.D.:	307TWA041

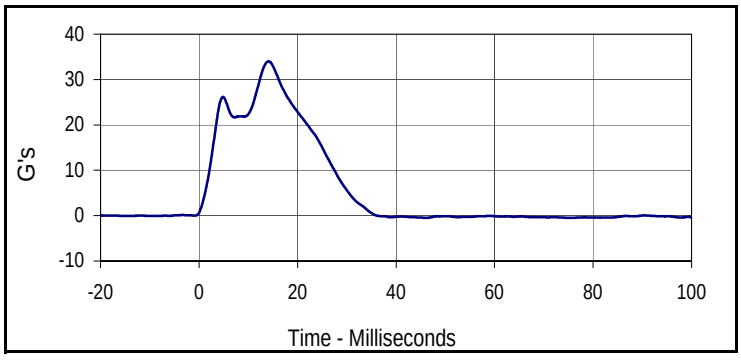
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	330	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.0	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.7	Pass
Peak Shoulder Deflection		mm	31 to 40	35.5	Pass
Peak Upper Thorax Rib Deflection		mm	25 to 32	27.3	Pass
Peak Middle Thorax Rib Deflection		mm	30 to 36	31.0	Pass
Peak Lower Thorax Rib Deflection		mm	32 to 38	33.6	Pass
Peak Upper Spine Y Acceleration		G's	34 to 43	36.2	Pass
Peak Lower Spine Y Acceleration		G's	29 to 37	33.7	Pass
Peak Impactor Acceleration		G's	30 to 36	34.0	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
27.3	17.0	0.0	-11.9
Middle Thorax Deflection			
Max	Time	Min	Time
31.0	17.2	0.0	-5.6
Lower Thorax Deflection			
Max	Time	Min	Time
33.6	17.2	0.0	0.7

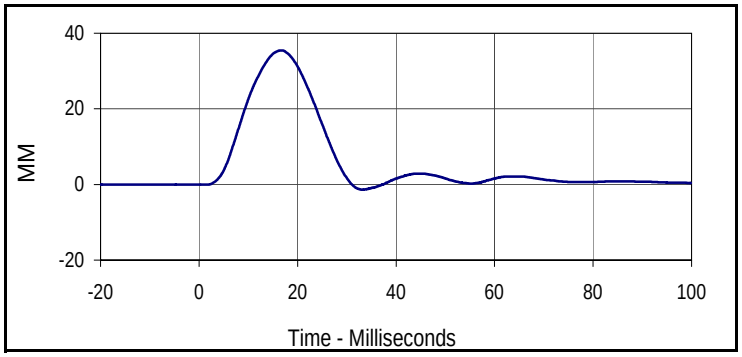


Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
36.2	11.6	-13.5	31.2
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
33.7	9.8	-9.0	34.9



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
34.0	14.1	-0.5	75.6

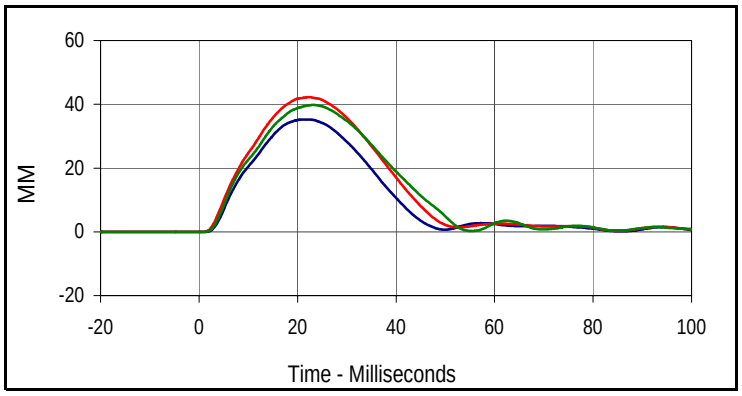
Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	8/6/12
ATD Serial No.:	307	Test I.D.:	307TWA041



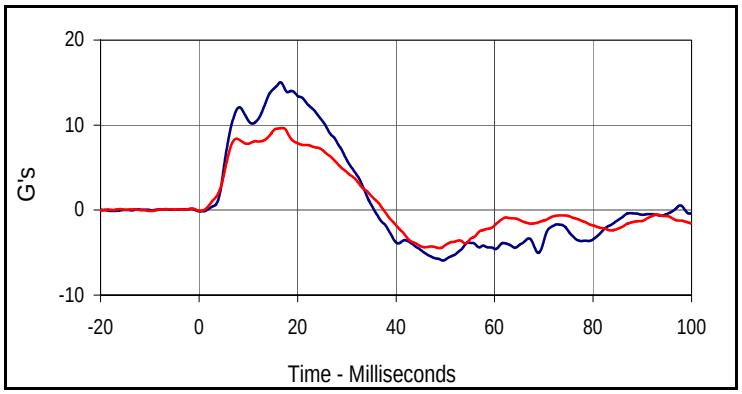
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
35.5	16.7	-1.4	33.2

Test Program:	SID IIs Thorax without Arm Impact Test	Test Date:	8/6/12
ATD Serial No.:	307	Test I.D.:	307TWOA041

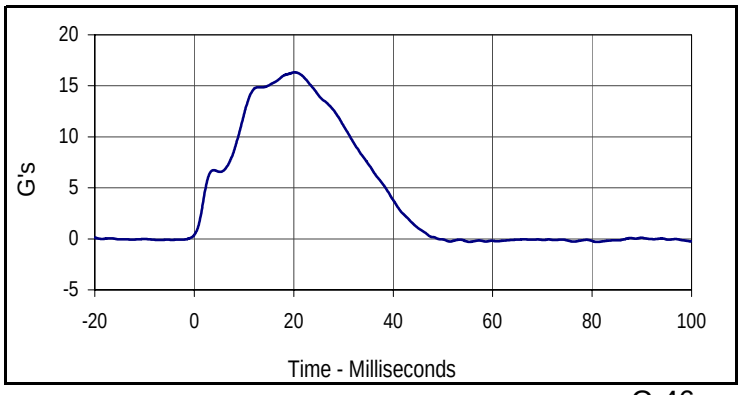
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	350	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	35.3	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	42.2	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	39.8	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	15.0	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	9.6	Pass
Peak Impactor Acceleration		G's	14 to 18	16.3	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
35.3	21.9	0.0	-4.3
Middle Thorax Deflection			
Max	Time	Min	Time
42.2	22.3	0.0	-4.9
Lower Thorax Deflection			
Max	Time	Min	Time
39.8	23.3	0.0	-3.5



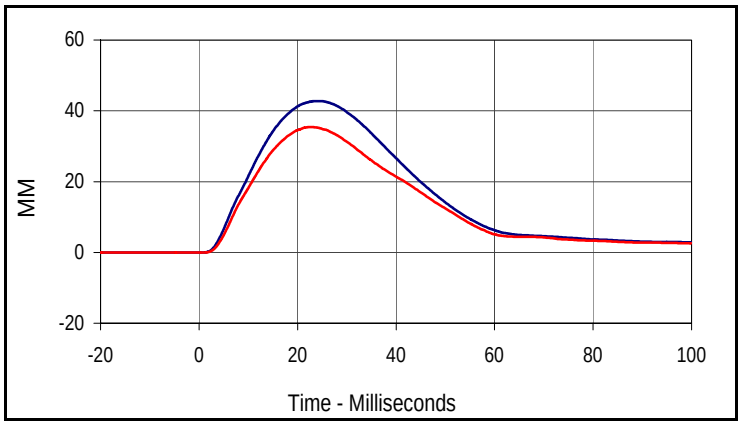
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.0	16.5	-5.9	49.6
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.6	17.0	-4.5	48.9



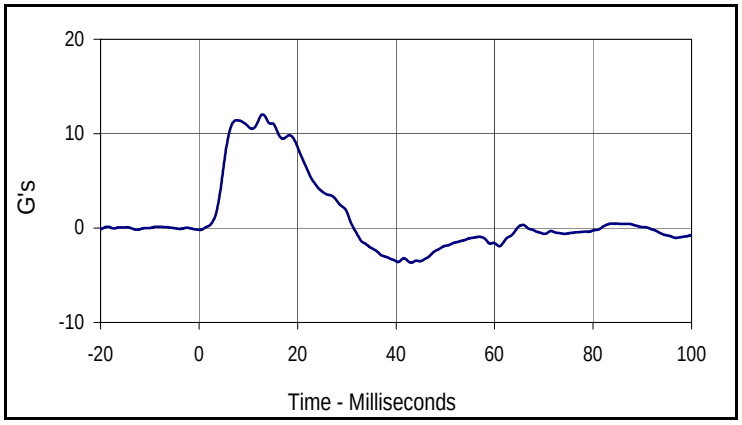
Curve Description			
Impactor Accleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.3	20.2	-0.3	55.4

Test Program:	SID IIs Abdomen Impact Test	Test Date:	8/6/12
ATD Serial No.:	307	Test I.D.:	307ABD041

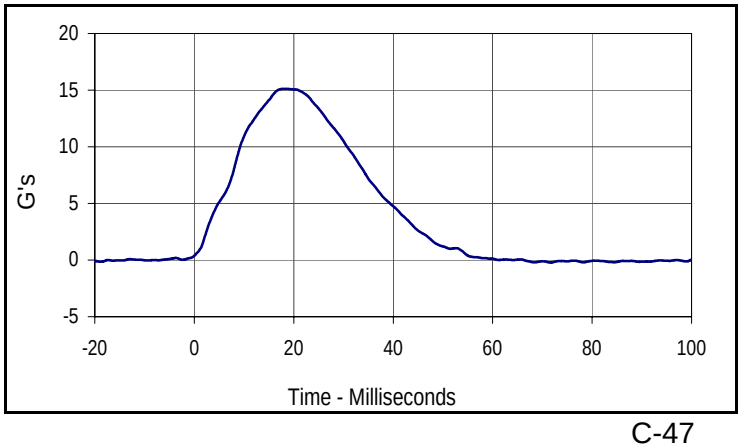
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	380	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Upper Abdominal Rib Deflection		mm	36 to 47	42.8	Pass
Peak Lower Abdominal Rib Deflection		mm	33 to 44	35.4	Pass
Peak Lower Spine Y Acceleration		G's	9 to 14	12.1	Pass
Peak Impactor Acceleration		G's	12 to 16	15.1	Pass
			Overall Test Results		Pass



Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
42.8	24.1	0.0	-10.2
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
35.4	22.4	0.0	-9.3



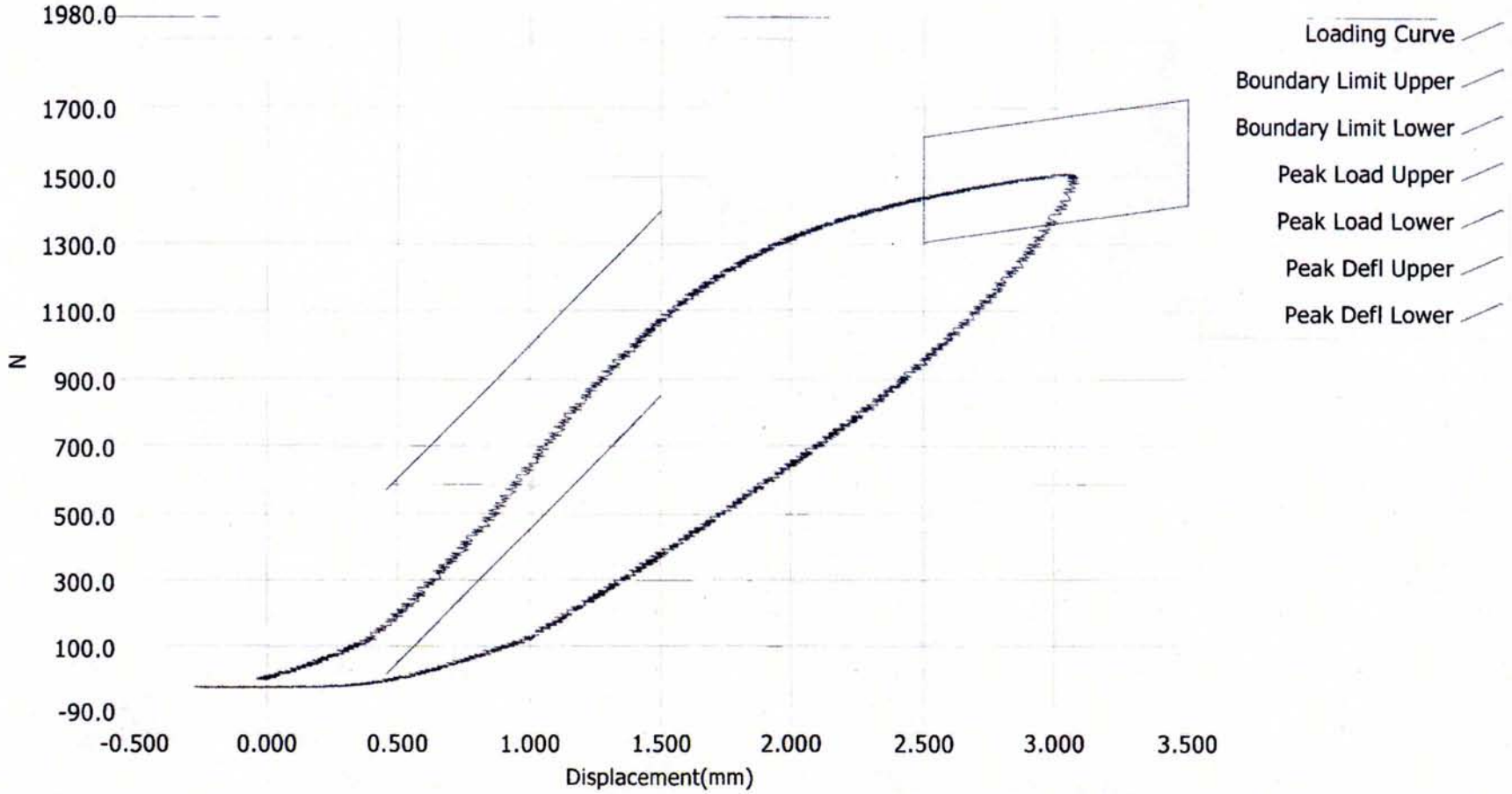
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
12.1	12.9	-3.7	43.0



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.1	18.0	-0.2	71.6

MC0534 POST TEST

Resultant Data - SIDIIs Plug Compression



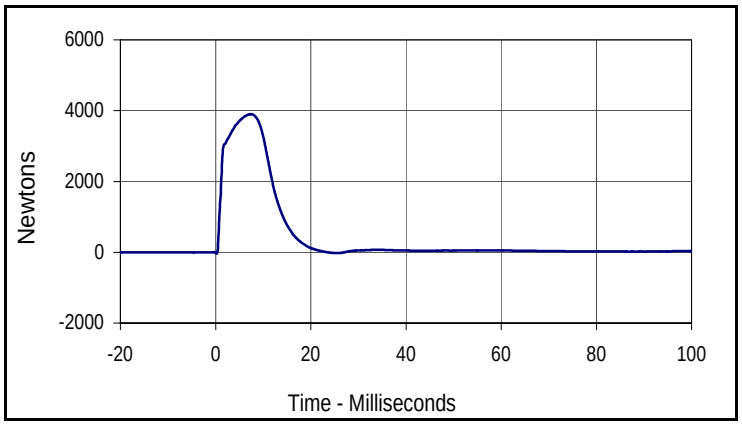
ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	46825	10/4/2011	6:49 PM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

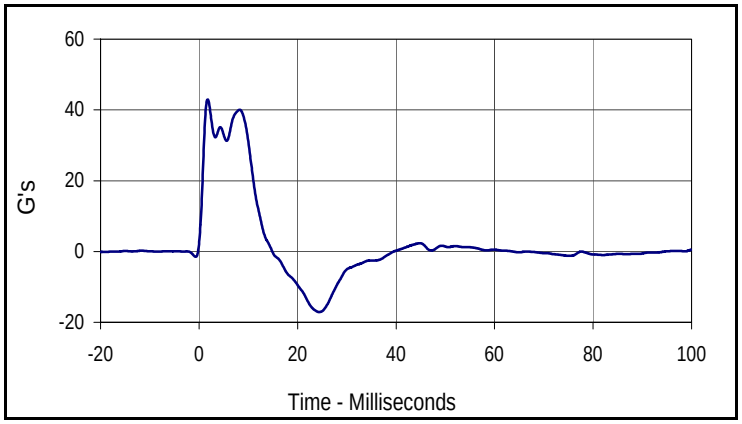
Current Date : 10/4/2011 Current Time : 18:49:47

Test Program:	SID IIs Pelvis Acetabulum Impact Test	Test Date:	8/6/12
ATD Serial No.:	307	Test I.D.:	307ACET041

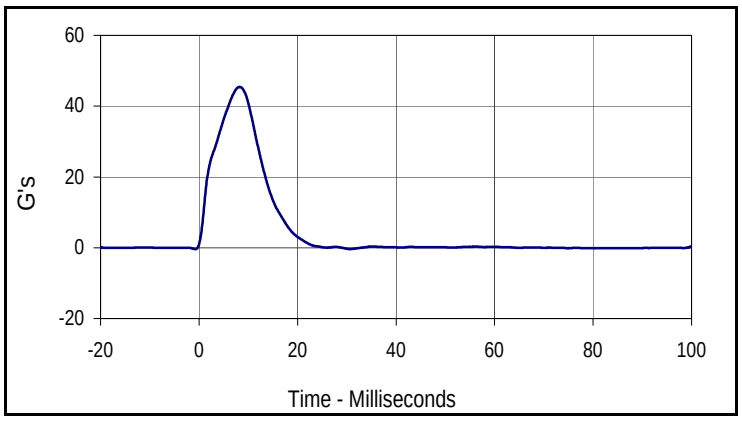
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	415	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.7	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.7	Pass
Peak Acetabulum Force Y		Newtons	3600 to 4300	3899.1	Pass
Peak Pelvis Y Acceleration After 6 msec.		G's	34 to 42	40.0	Pass
Peak Impactor Acceleration		G's	38 to 47	45.4	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3899.1	7.4	-38.0	0.2



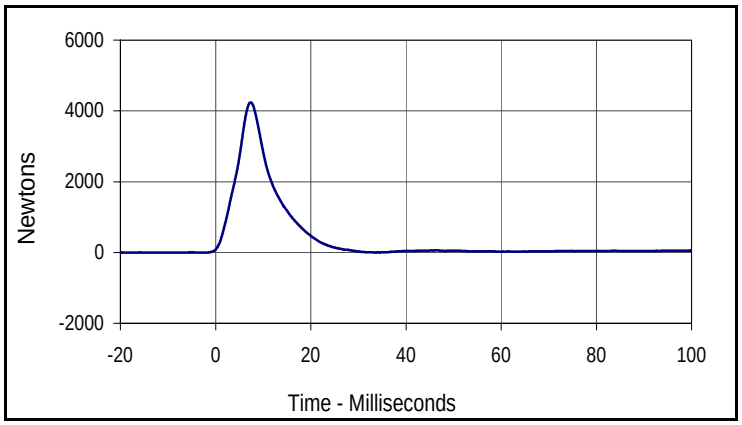
Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
42.9	1.8	-17.1	24.4



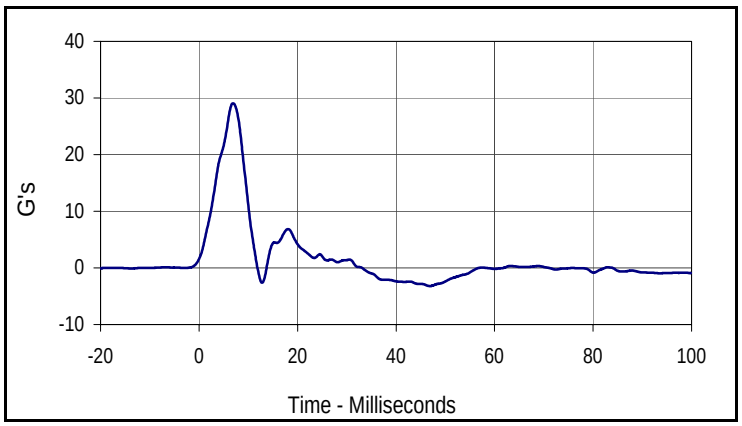
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
45.4	8.2	-0.4	-0.7

Test Program:	SID IIs Pelvis Iliac Calibration	Test Date:	8/6/12
ATD Serial No.:	307	Test I.D.:	307PL041

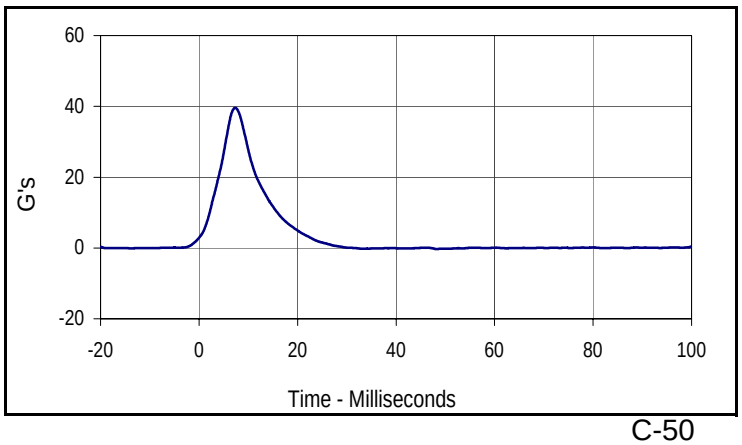
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	450	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Illiac Force		Newtons	4100 to 5100	4240.6	Pass
Peak Pelvis Y Acceleration		G's	28 to 39	29.1	Pass
Peak Impactor Acceleration		G's	36 to 45	39.6	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4240.6	7.4	-2.5	-19.0



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
29.1	6.9	-3.2	46.9



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
39.6	7.3	-0.3	48.3

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	6/21/12
		Y	P58763	Endevco	6/21/12
		Z	P52093	Endevco	6/21/12
Thorax Rib Displacement Potentiometers	Upper	Y	180	FTSS	6/22/12
	Middle	Y	177	FTSS	6/22/12
	Lower	Y	186	FTSS	6/22/12
Abdomen Load Cells	Forward	Y	1514	Denton	6/7/12
	Middle	Y	1510	Denton	6/7/12
	Rear	Y	1515	Denton	6/7/12
Lower Spine Accelerometers (T12)		X	P49165	Endevco	6/21/12
		Y	P49212	Endevco	6/21/12
		Z	P52113	Endevco	6/21/12
Pubic Symphysis Load Cell		Y	506	Denton	6/21/12

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 307		
				Serial Number	Manufacturer	Calibration
Head Accelerometers			X	P58900	Endevco	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)				46813	FTSS	10/4/11
Pelvis Plug (Non-Struck Side)				46909	FTSS	10/6/11

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	13326	ICSensor	6/18/12
	Vehicle Center of Gravity	Y	12862	ICSensor	1/11/12
	Vehicle Center of Gravity	Z	12906	ICSensor	1/11/12
2	Right Sill at Front Seat	X	Ketx11a	ICSensor	7/19/11
	Right Sill at Front Seat	Y	Ketx11b	ICSensor	7/19/11
	Right Sill at Front Seat	Z	Ketx11c	ICSensor	7/19/11
3	Right Sill at Rear Seat	X	Ketx12a	ICSensor	7/20/11
	Right Sill at Rear Seat	Y	Ketx12b	ICSensor	7/20/11
	Right Sill at Rear Seat	Z	Ketx12c	ICSensor	7/20/11
4	Left Sill at Front Door	Y	12885	Endevco	1/11/12
5	Left Sill at Rear Door	Y	13338	Endevco	6/28/12
6	Left A-Post Lower	Y	13317	Endevco	6/18/12
7	Left A-Post Middle	Y	13344	Endevco	6/18/12
8	Left B-Post Lower	Y	13001	Endevco	12/17/11
9	Left B-Post Middle	Y	12882	Endevco	1/11/12
10	Front Seat Track	Y	J23944	Endevco	4/16/12
11	Rear Seat Structure	Y	N/A	N/A	N/A
12	Right Rear Occ. Compartment	Y	Keva004	ICSensor	5/8/11
13	Engine Block	X	12883	Endevco	1/11/12
	Engine Block	Y	12901	Endevco	1/11/12
14	Rear Floorpan Above Axle	X	Ketx202a	ICSensor	11/30/11
	Rear Floorpan Above Axle	Y	Ketx202b	ICSensor	11/30/11
	Rear Floorpan Above Axle	Z	Ketx202c	ICSensor	11/30/11

TABLE 4 – MDB Instrumentation

		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	98H13-F19	Entrans	4/10/12
MDB Center of Gravity	Y	02105-F05	Entrans	9/19/11
MDB Center of Gravity	Z	03E02-N05	Entrans	4/10/11
Left Frame at Rear Axle Centerline	X	02I10-N28	Entrans	3/20/12
Left Frame at Rear Axle Centerline	Y	02A25-N09	Entrans	3/20/12