REPORT NUMBER: SINCAP-KAR-12-005

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

FORD MOTOR CO.

2012 FORD FOCUS 4-DOOR SEDAN

NHTSA No: MC0201

PREPARED BY:

KARCO ENGINEERING, LLC.

9270 HOLLY ROAD

ADELANTO, CA 92301

OCTOBER 20, 2011

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

OFFICE OF CRASHWORTHINESS STANDARDS

MAIL CODE: NVS-111

1200 NEW JERSEY AVE, SE, ROOM W43-410

WASHINGTON, D.C. 20590

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Approval Date: October 20, 2011

FINAL REPORT ACCEPTANCE BY OCWS:

_____

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

Date: _____

_____

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

Date: _____

TECHNICAL REPORT DOCUMENTATON PAGE

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
SINCAP-KAR-12-005		

4. Title and Subtitle	5. Report Date
Final Report of New Car Assessment Program Side Impact MDB Testing of 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201	October 20, 2011
	6. Performing Organization Code KAR
7. Authors Mr. Steven D. Matsusaka, Project Engineer KARCO Mr. Frank Richardson, Program Manager, KARCO	**8. Performing Organization Report No.** TR-P30003-28-NC
9. Performing Organization Name and Address KARCO Engineering, LLC. 9270 Holly Rd. Adelanto, CA 92301	**10. Work Unit No.**
	11. Contract or Grant No. DTNH22-09-D-00122
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NVS-111) 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C. 20590	**13. Type of Report and Period Covered** Final Test Report, Oct. 6 - Oct. 20, 2011
	14. Sponsoring Agency Code NVS-111

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 Ford Focus 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 October 6, 2011.

The impact velocity of the Moving Deformable Barrier was 62.0 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 18.9 deg. C. The target vehicle's maximum post-test static crush was 236 mm located at level 2. The test vehicle's occupant performance data is as follows:

Measurement Description	Driver ATD (ES-2re)		
	Units	IARV	Result
Head Injury Criteria (HIC_{36})		1000	111.7
Maximum Thorax Rib Deflection	mm	44	35.8
Total Abdominal Force	N	2500	1231
Pubic Symphysis Force	N	6000	1708

Measurement Description	Passenger ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC_{36})		1000	409.5
Resultant Lower Spine Acceleration	g	82	64
Total Pelvic Force (Sum of Acetubular and Iliac Forces)	N	5525	3583
Maximum Thoracic Rib Deflection	mm	38*	33
Maximum Abdominal Rib Deflection	mm	45*	33

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	154	

TABLE OF CONTENTS

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 Ford Focus 4-door sedan. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated August 2011.

SECTION 2
SUMMARY OF TEST RESULTS

A 2012 Ford Focus 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 62.0 km/h (38.5 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by KARCO Engineering, LLC. in Adelanto, California, on October 6, 2011. Pre- and post-test photographs of the test vehicle, the MDB and the dummies (ES-2re and SID-IIs) are included in Appendix A of this report.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated August 2011. The side impact event was documented by 11 cameras. Camera locations are included in Data Sheet No. 5 of this report.

The dummies were instrumented in the following manner:

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

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

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

Dummy injury readings were recorded as follows:

Measurement Description	Units	Driver ATD (ES-2re)	
		Threshold	Result
Head Injury Criteria (HIC_{36})		1000	111.7
Maximum Thorax Rib Deflection	mm	44	35.8
Combined Abdominal Force	N	2500	1231
Pubic Symphysis Force	N	6000	1708

Measurement Description	Units	Passenger ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC_{36})		1000	409.5
Lower Spine (T12) Resultant Acceleration	g	82	64
Total Pelvic Force (sum of acetabular and iliac forces	N	5525	3583
Maximum Thoracic Rib Deflection	mm	38*	33
Maximum Abdominal Rib Deflection	mm	45*	33

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

GENERAL COMMENTS

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

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11

CONVERSION FACTORS

Quantity	Typical Application	Std Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	miles/hr	km/hr	1.609344
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.573
Pressure	Tire Pressures	lbf/in^2	kPa	7.0
Temperature	General Use	^oF	^oC	=(tf -32)/1.8
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf/ft	Nm	1.355

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	MC0201
Model Year	2012
Make	Ford
Model	Focus
Body Style	4-Door Sedan
VIN	1FAHP3E23CL227637
Body Color	Ingot Silver Metallic
Odometer Reading (km / mi)	172 / 107
Engine Displacement (L)	2.0
Type / No. of Cylinders	Inline 4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	6
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	Yes
Power Window Auto-Reverse	Yes
Other Optional Feature	n/a
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head/Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso/Pelvis Airbag	No
Rear Pass. Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensione	No
Driver Load Limiter	Yes
Rear Pass. Load Limiter	No
Other Safety Restraint	None

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Co.
Date of Manufacture	Aug-11
Vehicle Type	Passenger Car

GVWR (kg)	1810
GAWR Front (kg)	972
GAWR Rear (kg)	880

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

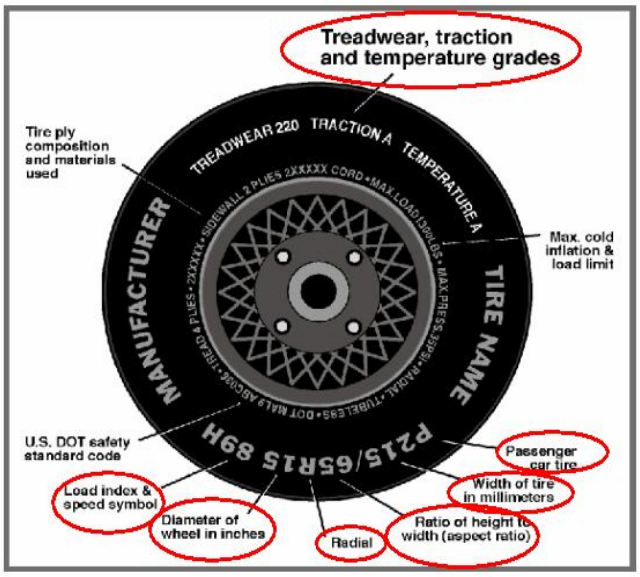
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable w/ Lever	Adjustable w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat		Yes			Yes		
Third Row Seat							

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	240	240
Recommended Tire Size	P195/65R15	P195/65R15

VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	350	350
Tire Size on Vehicle	P195/65R15	P195/65R15
Tire Manufacturer	Continental	Continental
Tire Name	Conti Pro Contact	Conti Pro Contact
Tire Type	Passenger Car	Passenger Car
Tire Width	195	195
Aspect Ratio	65	65
Radial	Yes	Yes
Wheel Diameter	15	15
Load Index/Speed Symbol	91H	91H
Treadware	500	500
Traction Grade	AA	AA
Temperature Grade	A	A
Tire Material	Polyester, Steel, Polyamide	Polyester, Steel, Polyamide

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	250	245	245	245
Tire Placard	kPa	240	240	240	240
Owner's Manual	kPa	240	240	240	240
As Tested	kPa	240	240	240	240

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	409.0	273.0		433.0	354.5		448.0	345.0	
Right	kg	390.5	271.5		387.0	322.0		394.0	316.0	
Ratio	%	59.5%	40.5%	100.0%	54.8%	45.2%	100.0%	56.0%	44.0%	100.0%
Total	kg	799.5	544.5	1344.0	820.0	676.5	1496.5	842.0	661.0	1503.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1344.0	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	1503.8	A+B+C

Does the measured As Tested Vehicle Weight lie within the required weight range (i.e. Calculated Test Vehicle Target Weight -4.5 kg to -9 kg)? ☒ **Yes** ☐ **No**

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Tail Lights	2.0
Bumper Fascia	4.0
Left Front Brake Disc and Caliper	13.0
Right Front Brake Disc and Caliper	12.5
Ballast / Equipment Added	115.0

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement***
LF	mm	656	659	Yes
RF	mm	646	656	Yes
RR	mm	650	640	Yes
LR	mm	654	647	Yes
Vehicle CG (Aft of Front Axle)	mm	1165	1198	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	42	40	

***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 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	4.9	0.0	2.5
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle	As Tested SCRP Height	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid Fore/Aft	Forwardmost
Driver Seat	2.5	527	Max	514	527	539
			Mid	514	527	539
			Min	514	527	539
Front Passenger Seat	Fixed	520	Max	509	520	533
			Mid	509	520	533
			Min	509	520	533
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	530	Max	530	530	530
			Mid	530	530	530
			Min	530	530	530
Non-Struck Side Rear Seat	Fixed	530	Max	530	530	530
			Mid	530	530	530
			Min	530	530	530
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 Ford Focus 4-Door Sedan NHTSA No. MC0201

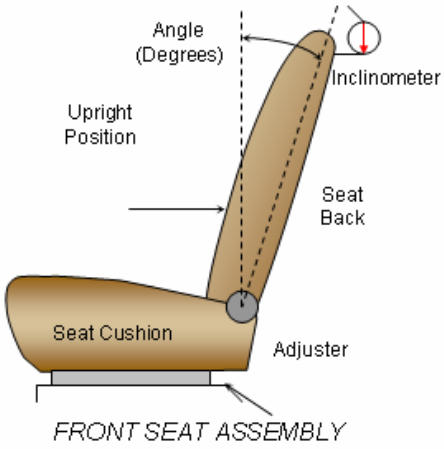
Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11

SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	250	26	130	13
Front Passenger Seat	250	26	130	13
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

SEAT BACK ADJUSTMENT

The driver's seat back is positioned to the manufacturer's designated design angle. The front center and front passenger's seat backs are positioned in a similar manner as the driver's seat back. The rear seat backs are fixed.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/Seated Dummy	86.6	42	11.9	15
Front Passenger Seat	79.5	42	11.9	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 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1. Position "H" is the uppermost position, followed by position "M1". Position "L" is the lowermost position.

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

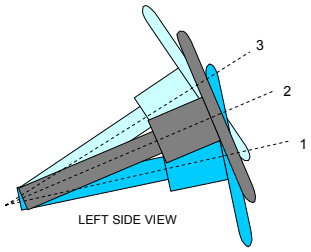
HEAD RESTRAINT ADJUSTMENT

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	3	Full Up
Rear Seat	Fixed	Fixed

STEERING COLUMN ADJUSTMENT

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



STEERING COLUMN ASSEMBLY

	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	20.3	0
Geometric Center - Position 2	23.0	19
Uppermost - Position 3	25.6	37
Telescoping Steering Wheel Travel		37
Test Position	22.9	19

DATA SHEET NO. 2 … (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	46.93
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	43.64
Actual amount of Solvent Used in Test	43.64
1/3 of Usable Capacity	15.64

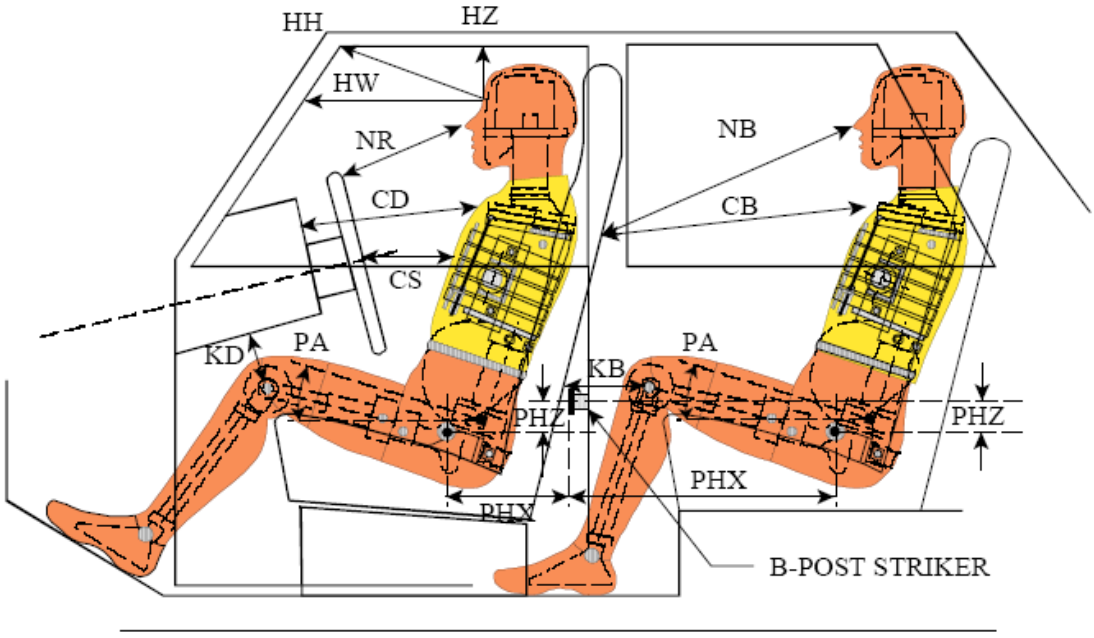
Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in the Form No. 1? ☒ **Yes** ☐ **No**

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11



LEFT SIDE VIEW

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

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

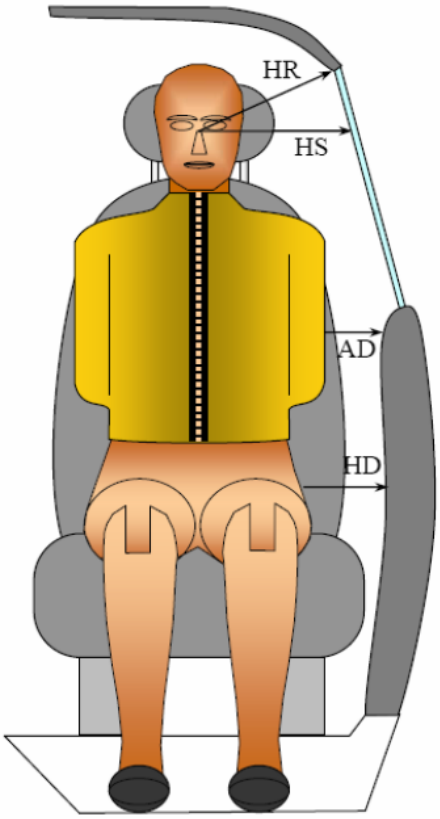
Driver Code	Pass. Code	Description	Driver		Passenger	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Head to Header	399			
HW		Head to Windshield	681			
HZ	HZ	Head to Roof	160		260	
NR	NB	Nose to Rim/Seat Back	486		470	
CD	CB	Chest to Dash/Seat Back	627		462	
CS		Chest to Steering Wheel	330			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	146	42.0	230	23.8
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	141	52.0	230	19.1
PAX°	PAX°	Pelvic Tilt Angle X		18.8		22.3
	PAY°	Pelvic Tilt Angle Y				0.7
PHX	PHX	Hip Point to Striker (x-axis)	162		245	
PHZ	PHZ	Hip Point to Striker (z-axis)	103		292	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11



FRONT VIEW OF DUMMY

DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

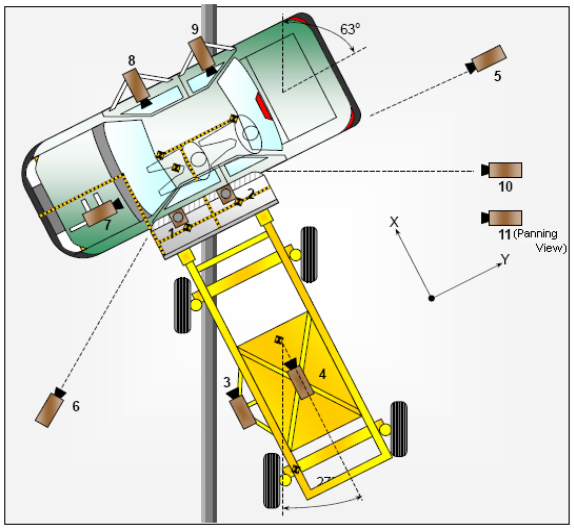
Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	198	245
HS	Head to Side Window	mm	315	377
AD	Arm to Door	mm	99	147
HD	H-Point to Door	mm	153	171

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11



CAMERA LOCATIONS AND DATA

No.	View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	1220	2287	-5486	14	1000
2	Overhead Close-Up	609	2287	-5102	35	1000
3	Left Impact Point (MDB)	-2134	0	-1143	25	1000
4	Side Overall (MDB)	-3912	838	-1829	12.5	1000
5	Rear	-64	2485	-1348	85	1000
6	Left Front	-2266	-3564	-1475	24	1000
7	Driver Front (On-Board)	537	-599	-622	35	1000
8	Driver Side (On-Board)	1586	675	-466	14	1000
9	Passenger Side (On-Board)	1637	1566	-516	20	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

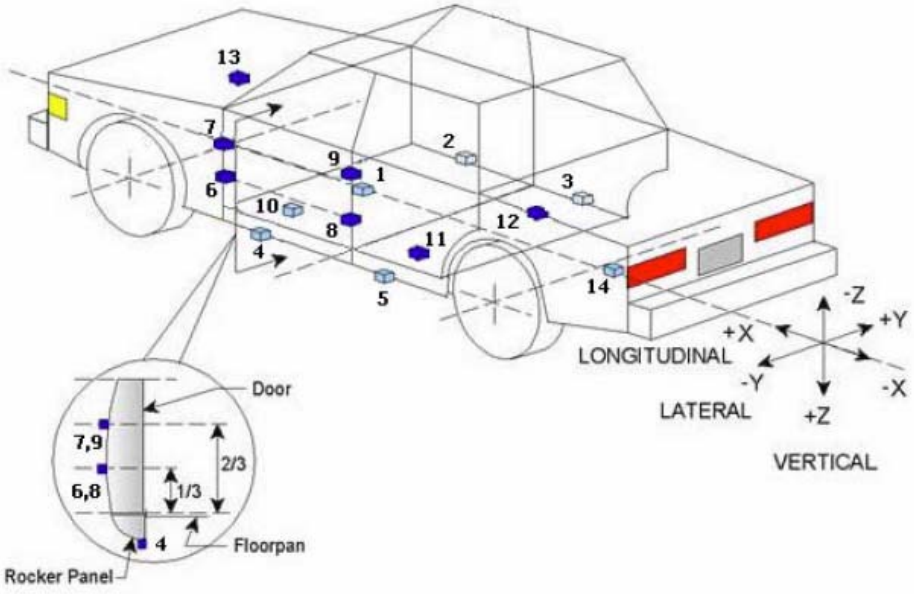
Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	23
MDB Accelerometers	5
Total	60

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1920	0	-285
2	Right Sill at Front Seat	2540	655	-310
3	Right Sill at Rear Seat	1725	655	-310
4	Left Sill at Front Door	3050	-560	-190
5	Left Sill at Rear Door	1750	-560	-190
6	A-Pillar Lower	3095	-790	-505
7	A-Pillar Middle	3095	-790	-815
8	B-Pillar Lower	2075	-740	-690
9	B-Pillar Middle	2075	-740	-980
10	Front Seat Track	2385	-550	-245
11	Rear Seat Structure			
12	Right Rear Occupant Compartment	2010	365	-185
13	Engine Block	3775	85	-685
14	Rear Floorpan Above Axle	765	-345	-505

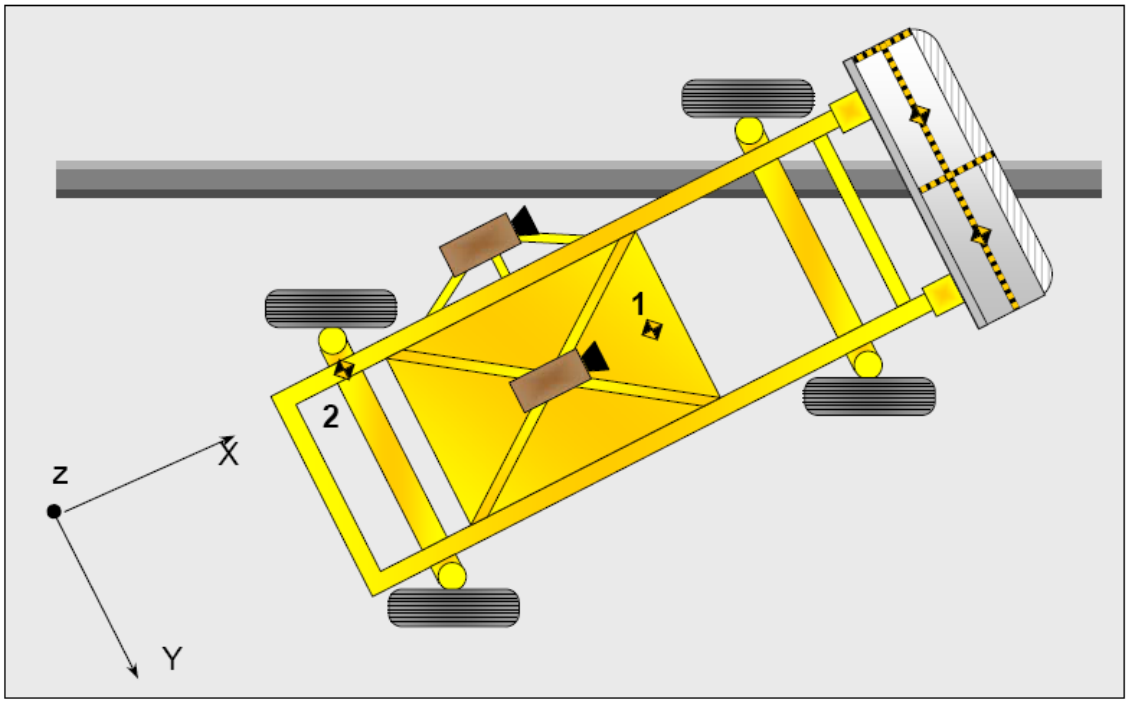
Reference: X – Rear surface of vehicle (+ forward)
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 7

MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11



MDB ACCELEROMETER LOCATIONS

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

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

DATA SHEET NO. 8

POST-TEST OBSERVATIONS

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11

TEST DUMMY INFORMATION AND CONTACT POINTS

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

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/Oth
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge System Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)	n/a	n/a	n/a	n/a	n/a

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

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

DATA SHEET NO. 8 … (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2650
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		385
Actual Impact Point (Aft of Front Axle)	mm		390
Horizontal Offset (+ forward / - rearward)	mm	± 50 of Intended Impact Point	5
Vertical Offset (+ down / - up)	mm	± 20 of Intended Impact Point	2

DATA SHEET NO. 9

MDB SUMMARY OF RESULTS

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11

MDB SPECIFICATIONS

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

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	402	298	700
Right	kg	377	292	669
Ratio	%	56.9%	43.1%	100.0%
Totals	kg	779	590	1368

SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.02
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.96
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.5
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	62.5
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26.0 to 28.0	27.9

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

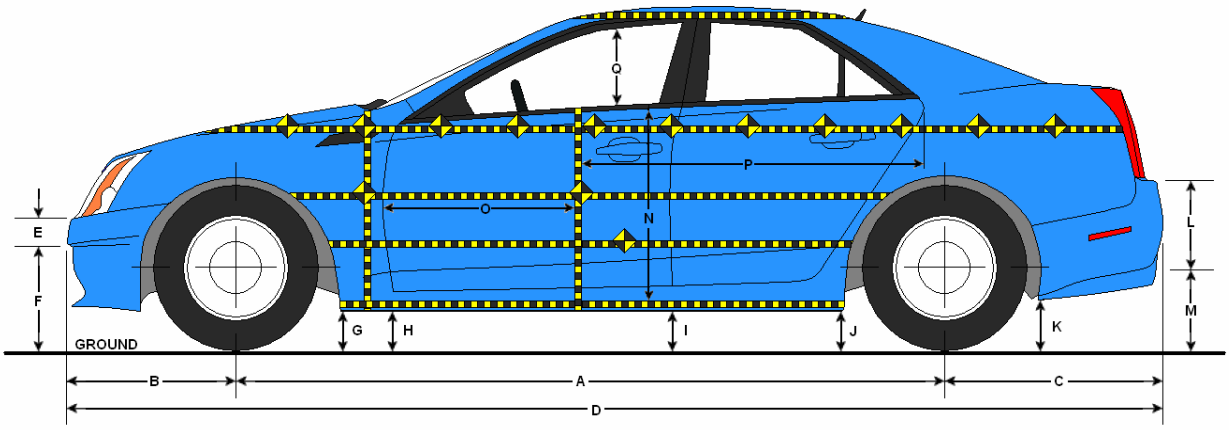
Vertical Location			From Centerline		Max. Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	400	Right	212
B	Top of Bumper	533	800	Right	185
C	Mid Level	686	800	Right	161
D	Top of Stack	813	800	Right	192

DATA SHEET NO. 10

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2650	2618	-32
B	Front Axle to FSOV	885	925	40
C	Rear Axle to RSOV	957	954	-3
D	Total Length at Centerline	4492	4497	5
E	Front Bumper Thickness	359	355	-4
F	Fromt Bumper Bottom to Ground	216	197	-19
G	Sill Height at Front Wheel Well	155	143	-12
H	Sill Height at Front Door Leading Edge	159	150	-9
I	Sill Height at B-Pillar	171	175	4
J1	Sill Height at Rear Wheel Well	161	152	-9
J2	Pinch Weld Height at Rear Wheel Well	159	154	-5
K	Sill Height Aft of Rear Wheel Well	468	458	-10
L	Rear Bumper Thickness	62	78	16
M	Rear Bumper Bottom to Ground	389	356	-33
N	Sill Height to Bottom of Front Window Sill	577	572	-5
O	Front Door Leading Edge to Impact CL	769	729	-40
P	Rear Door Trailing Edge to Impact CL	1294	1272	-22
Q	Front Window Opening	422	464	42
R	Right Side Length	3176	3183	7
S	Left Side Length	3176	3215	39
T	Vehicle Width at B-Pillar	1786	1674	-112

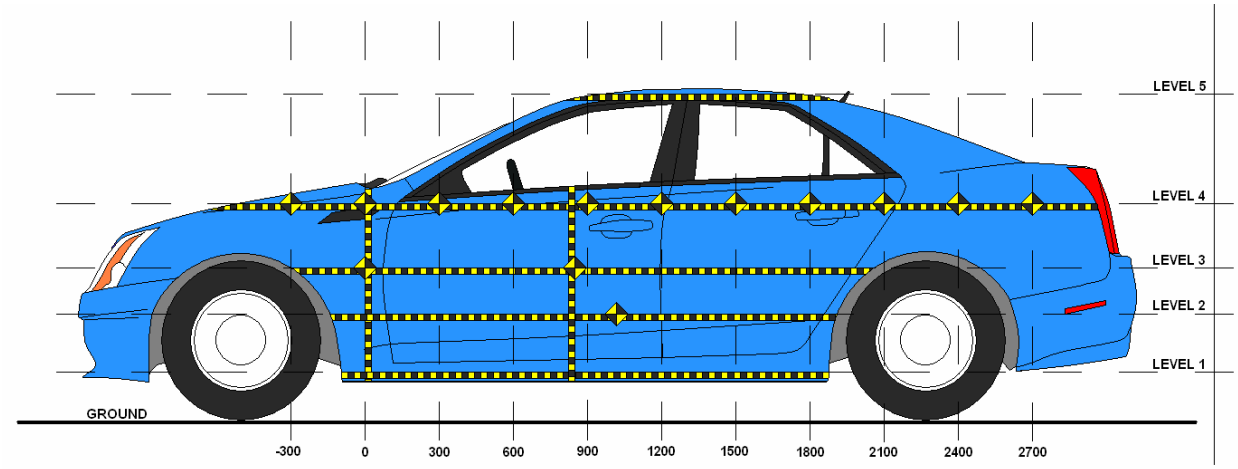
All measurements in mm with tolerance of ± 3mm

DATA SHEET NO. 11

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	215	23	1500
2	Occupant H-Point	511	236	1050
3	Mid-Door	606	215	1350
4	Window Sill	863	181	1650
5	Window Top	1388	23	1200

DATA SHEET NO. 11 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

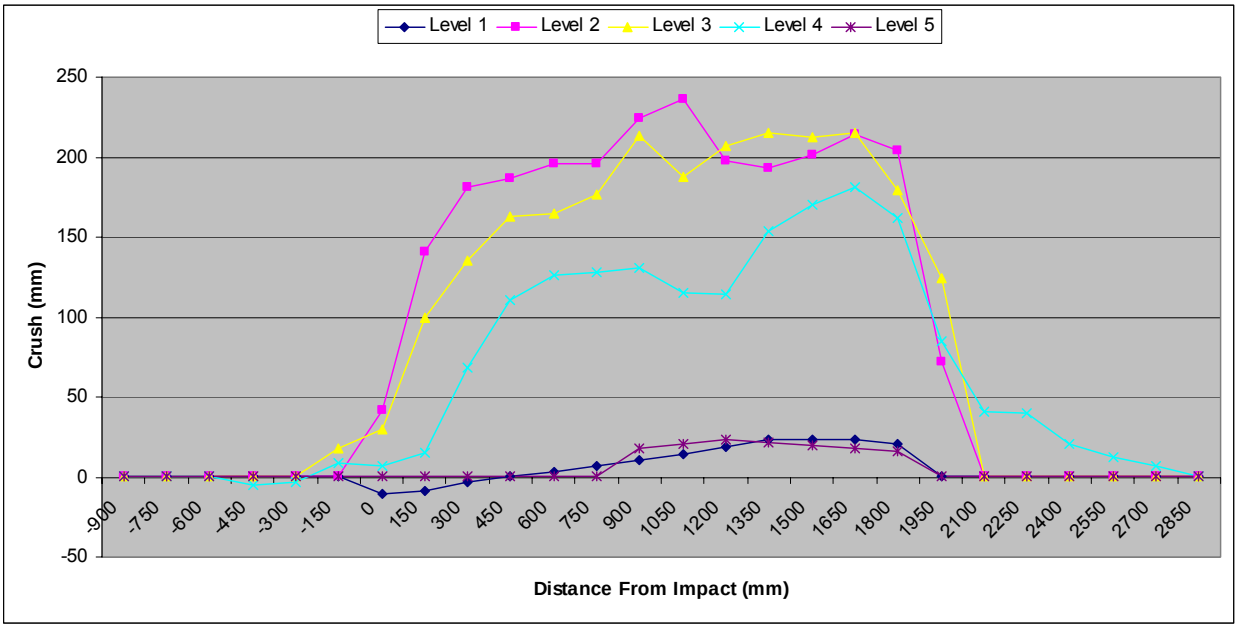
	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450				774					769					-5	
-300				734					731					-3	
-150			596	710				614	719				18	9	
0	640	607	609	693		629	649	639	700		-11	42	30	7	
150	639	617	616	682		630	758	716	697		-9	141	100	15	
300	640	615	613	671		637	796	748	739		-3	181	135	68	
450	642	614	611	662		642	801	774	773		0	187	163	111	
600	643	614	609	653		646	810	774	779		3	196	165	126	
750	646	614	609	646		653	810	786	774		7	196	177	128	
900	649	615	609	639	921	660	839	822	770	939	11	224	213	131	18
1050	655	616	610	637	907	669	852	798	752	928	14	236	188	115	21
1200	657	619	613	635	902	676	817	820	749	925	19	198	207	114	23
1350	662	623	616	634	902	685	816	831	788	924	23	193	215	154	22
1500	663	627	620	635	905	686	828	832	805	925	23	201	212	170	20
1650	663	633	626	637	911	686	847	841	818	929	23	214	215	181	18
1800	665	635	631	625	929	686	839	810	787	945	21	204	179	162	16
1950		627	622	621			699	746	706			72	124	85	
2100				653					694					41	
2250				659					699					40	
2400				666					687					21	
2550				677					689					12	
2700				693					700					7	
2850															

DATA SHEET NO. 11 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11

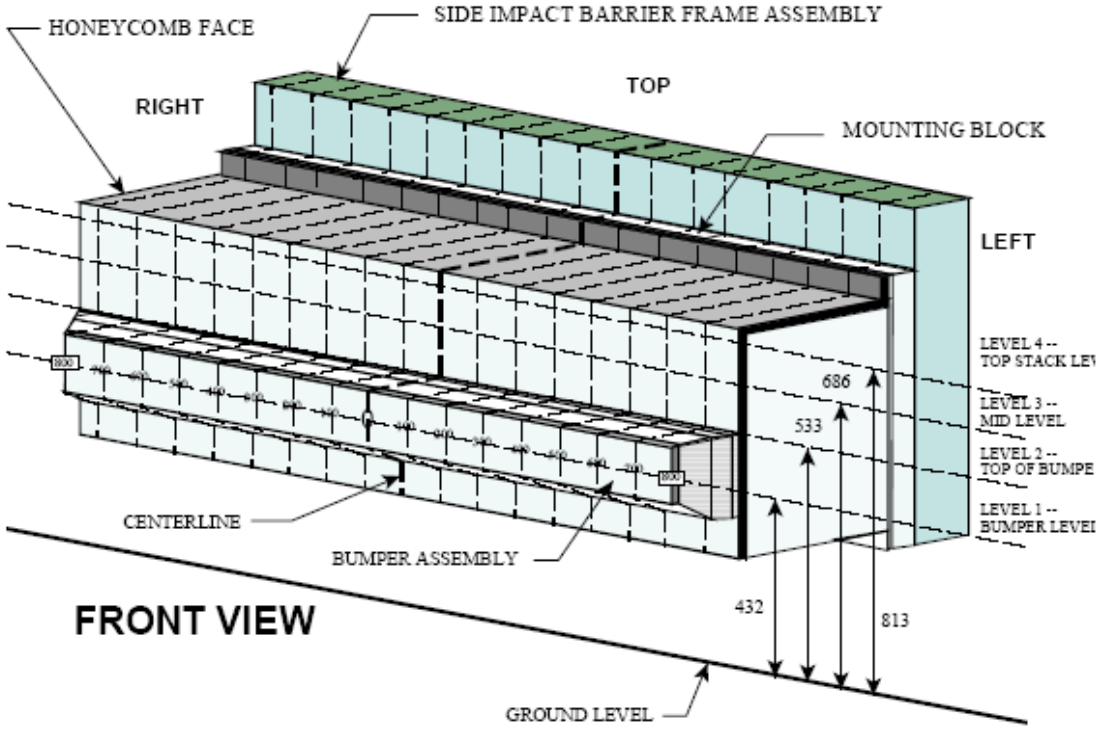


DATA SHEET NO. 12

MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	198	162	155	156	212	145	138	135	131	125	124	122	122	118	114	112	125
2	185	181	170	177	160	163	147	153	147	132	138	139	142	137	135	131	126
3	161	140	114	104	109	114	89	88	85	78	75	75	72	76	83	91	130
4	192	150	123	109	117	132	103	92	82	77	75	76	88	107	119	133	159

All dimensions in millimeters.

DATA SHEET NO. 13

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11

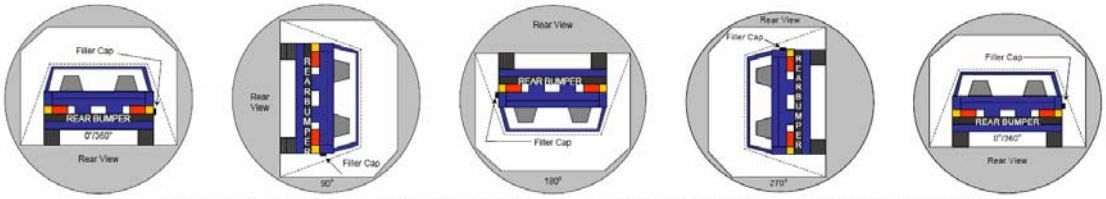
Temperature at Time of Impact: 18.9° C Test Time: 5:20 PM

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

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

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

D. Spillage Details: No spillage occurred



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°	79	300	379
90° To 180°	80	300	380
180° To 270°	77	300	377
270° To 360°	79	300	379

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

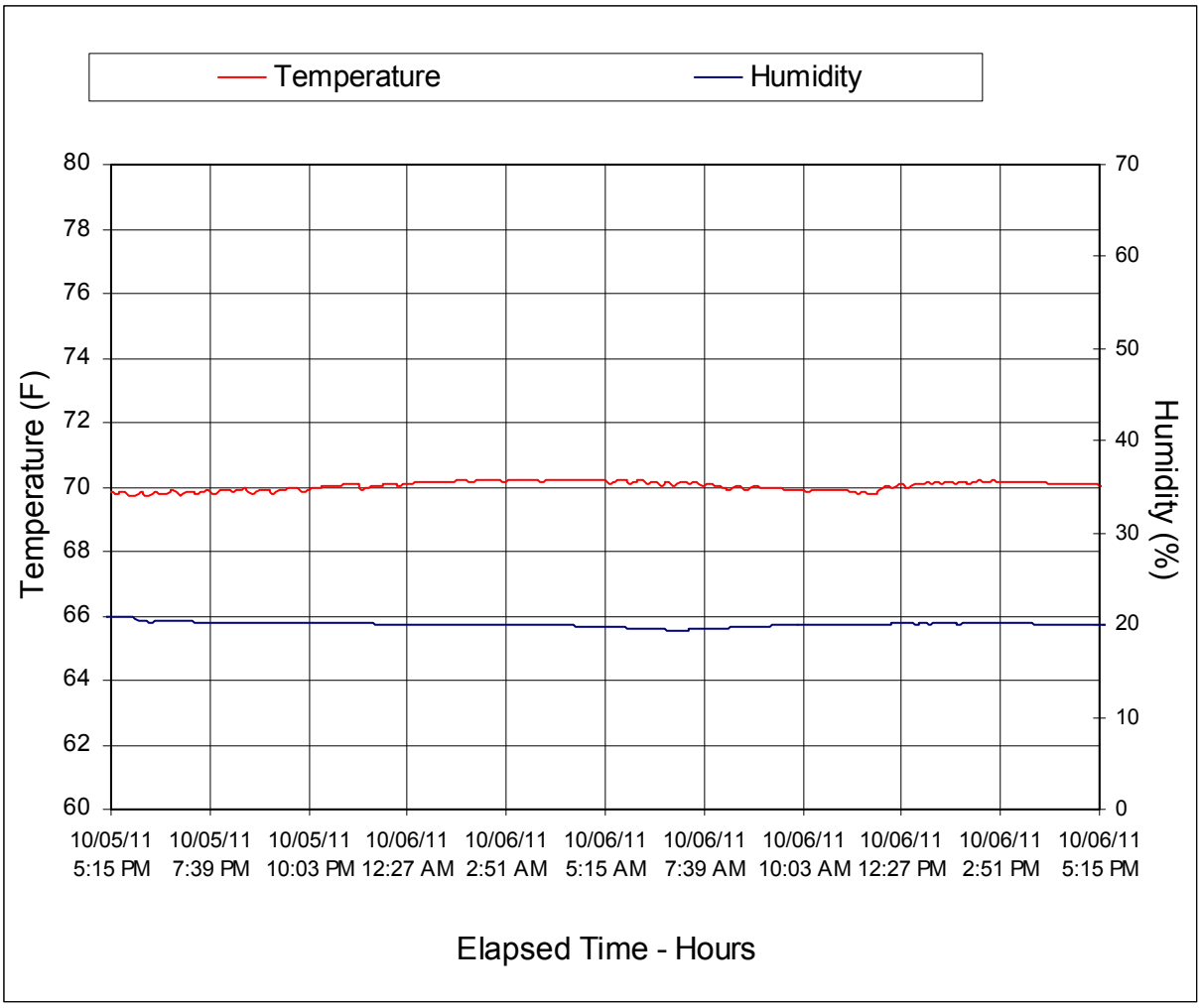
Test Phase	Spillage Location
0° To 90°	No Spillage Occurred
90° To 180°	No Spillage Occurred
180° To 270°	No Spillage Occurred
270° To 360°	No Spillage Occurred

DATA SHEET NO. 14

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2012 Ford Focus 4-Door Sedan NHTSA No. MC0201

Test Program: NCAP MDB Side Impact Test Test Date: 10/06/11



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

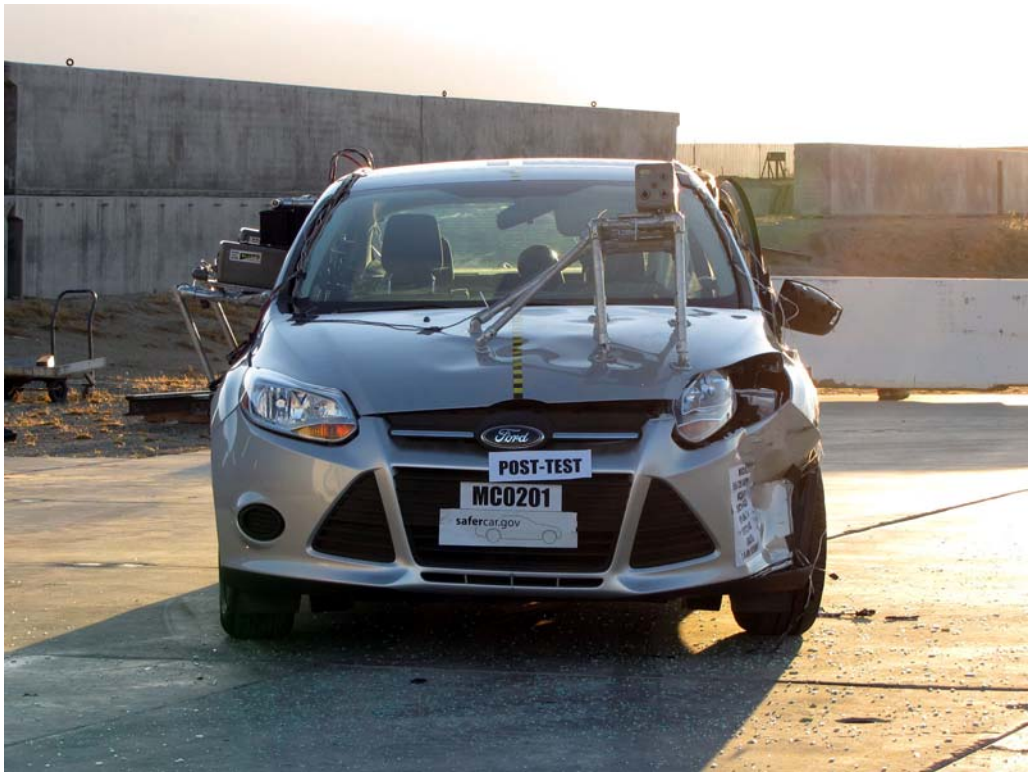


FIGURE 4. Post-Test Frontal View of Test Vehicle

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

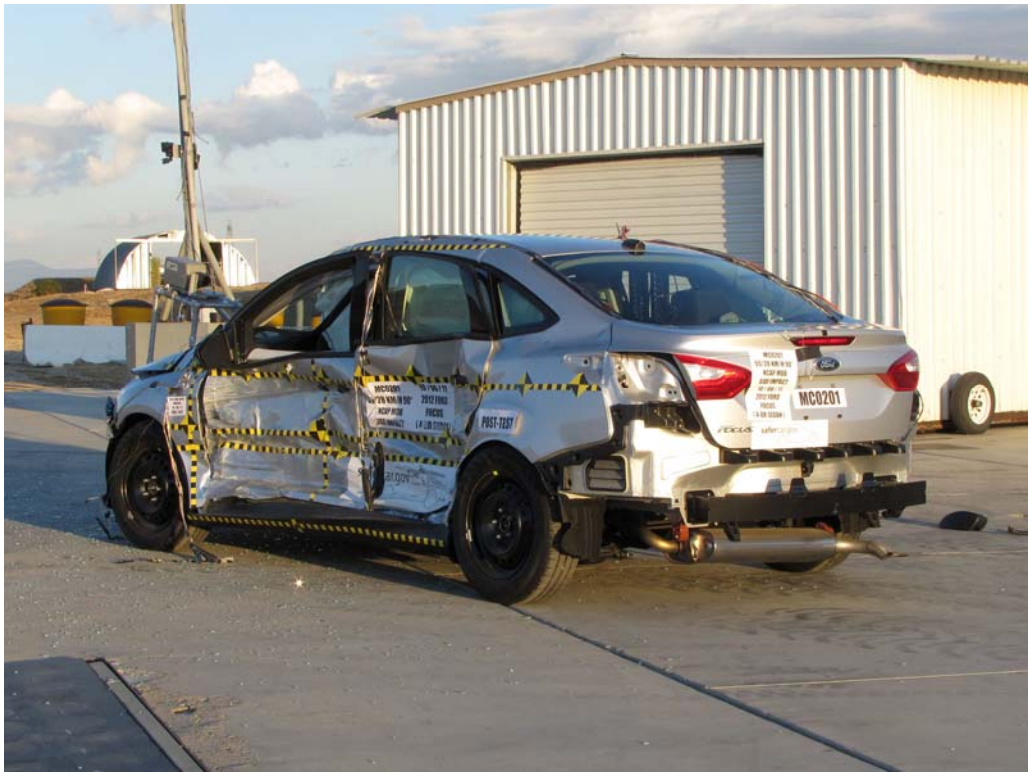


FIGURE 10. Post-Test Left Rear ¾ View of Impact Zone

FIGURE 11. Pre-Test Rear View of Test Vehicle

FIGURE 12. Post-Test Rear View of Test Vehicle

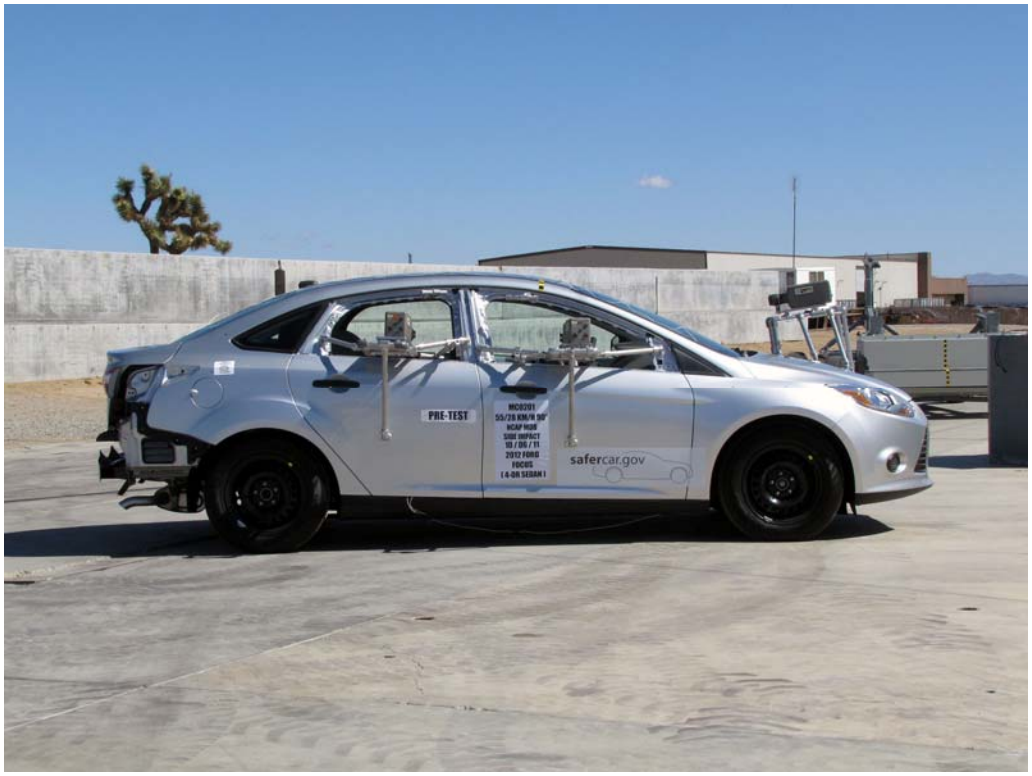


FIGURE 13. Pre-Test Right Side View of Test Vehicle

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

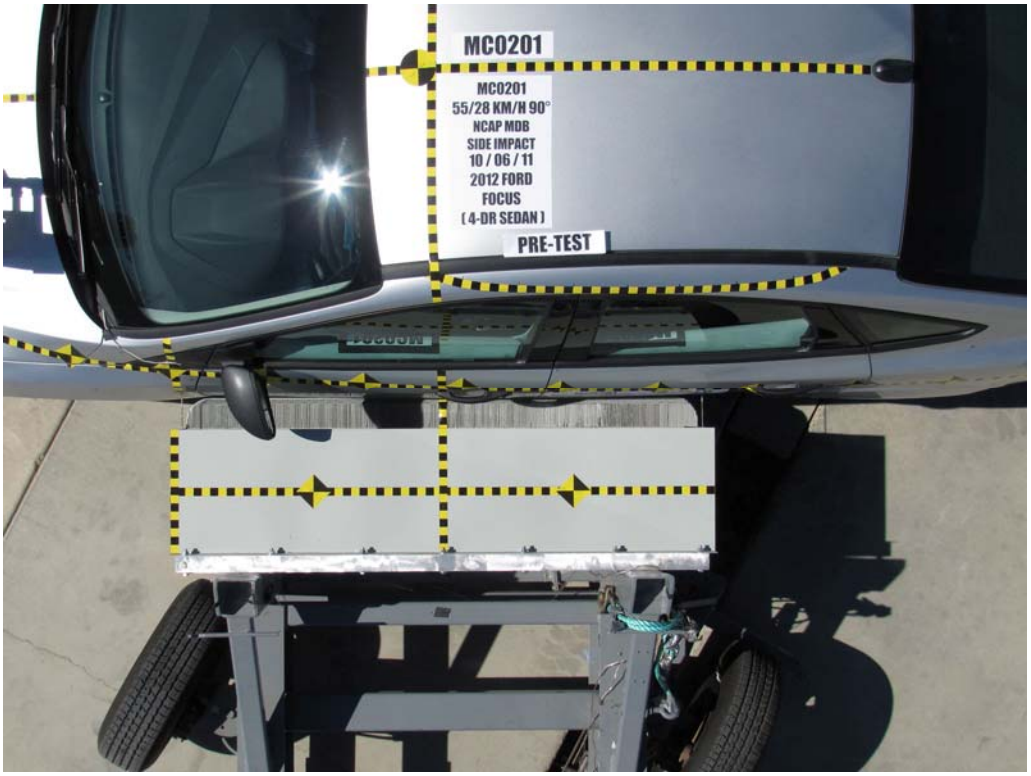


FIGURE 15. Pre-Test Overhead View of Test Area

FIGURE 16. Post-Test Overhead View of Test Area

FIGURE 17. Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle at Ideal Impact Point

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

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

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

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

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

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

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

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

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

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

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

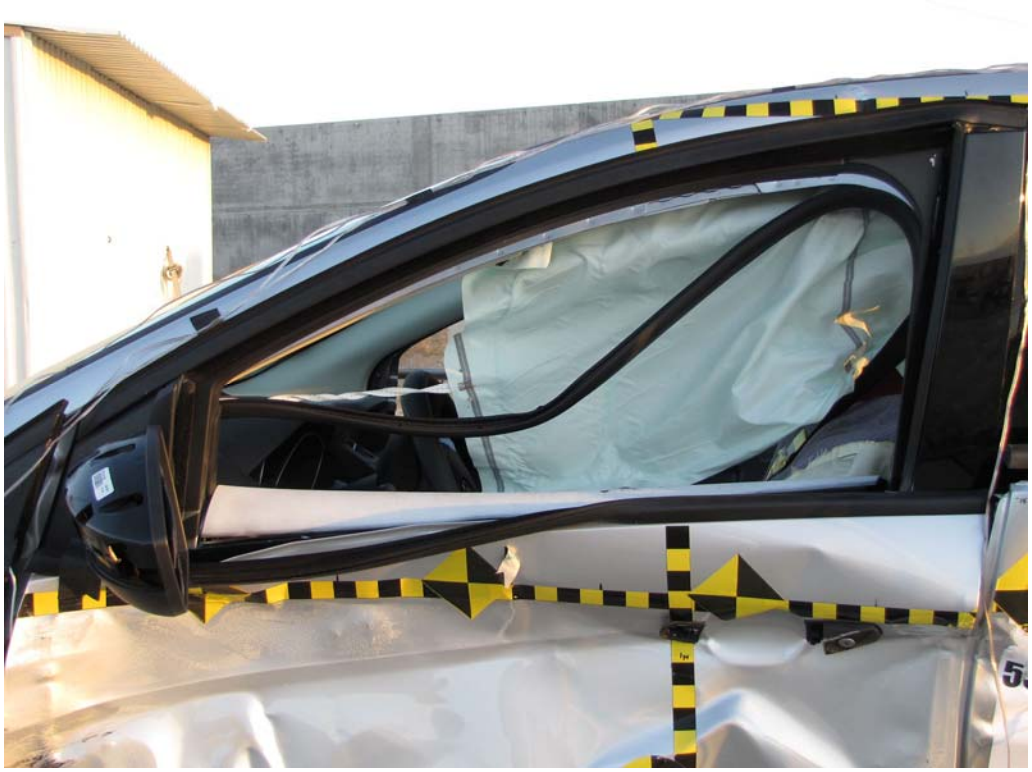


FIGURE 29. Post-Test Left Side View of Driver Dummy Shoulder and Door Top View

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

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

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

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

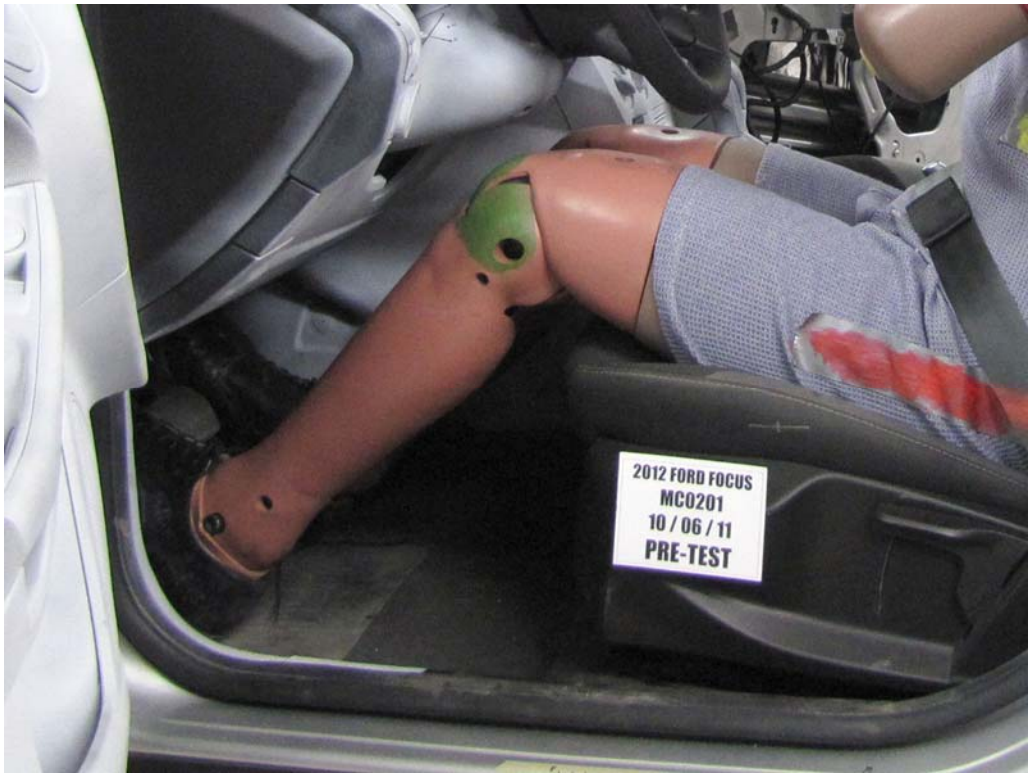


FIGURE 34. Pre-Test Placement of Driver Dummy's Feet

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

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

FIGURE 37. View of Disengaged Parking Brake

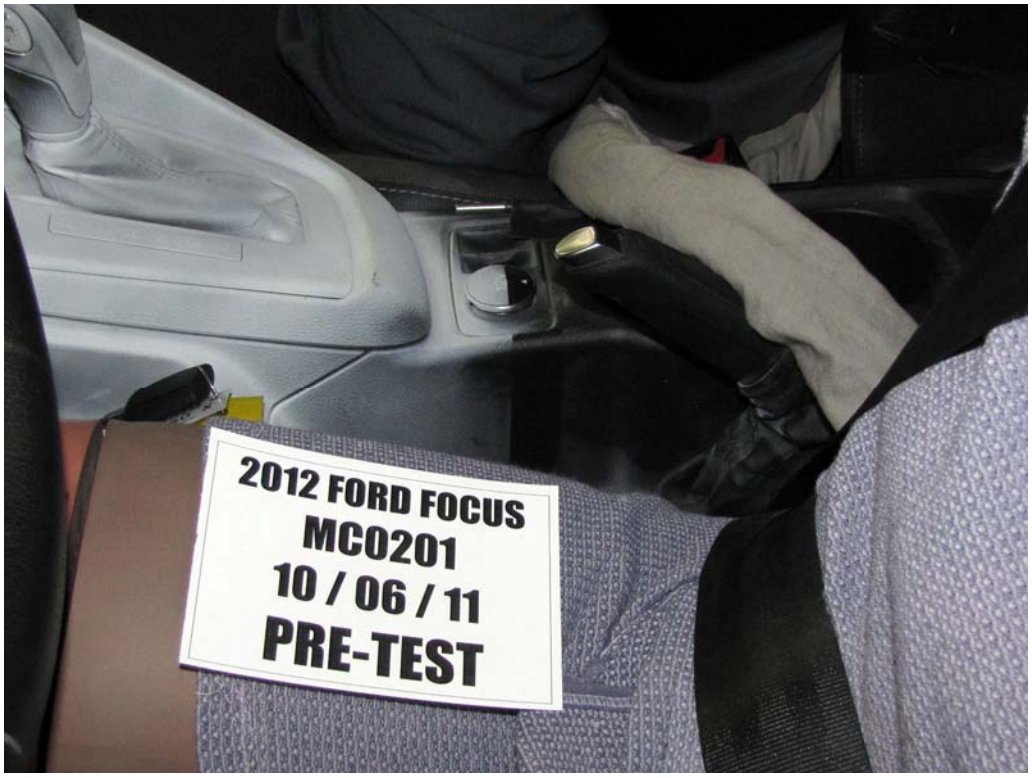


FIGURE 38. Pre-Test View of Parking Brake

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

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

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

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

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

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

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

FIGURE 46. Pre-Test Driver Inner Door Panel View

FIGURE 47. Post-Test Driver Inner Door Panel View

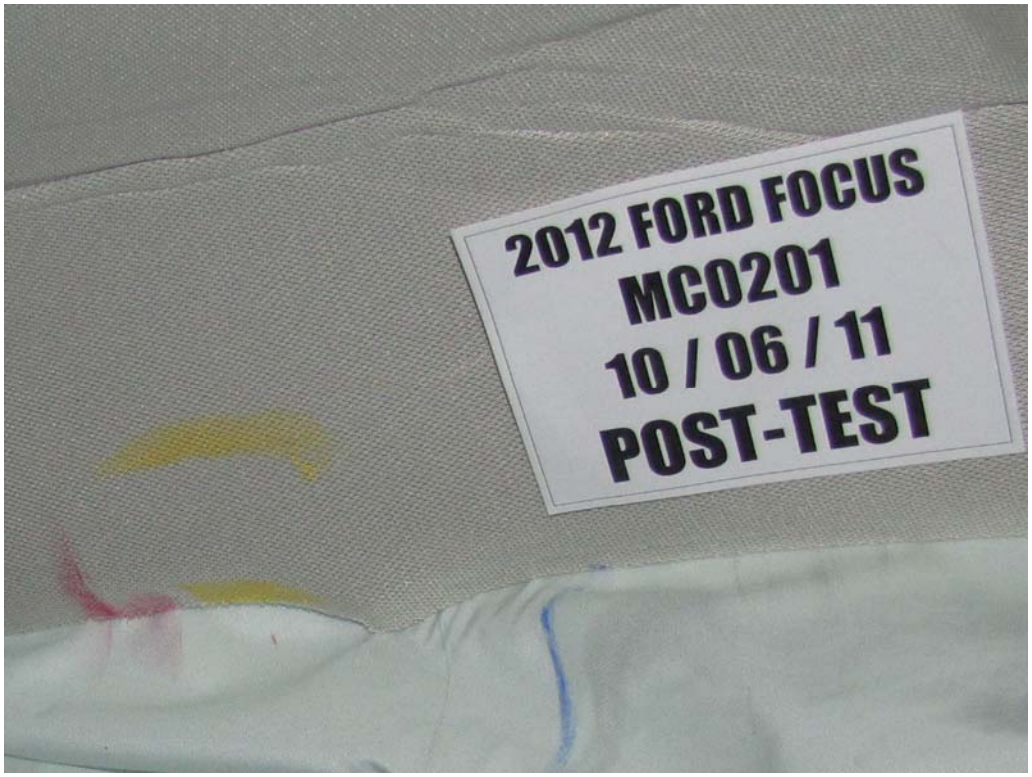


FIGURE 48. Post-Test Driver Dummy Close-Up Head Contact with Vehicle Interior View

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Photograph Not Available

Vehicle Not Equipped with Rear Passenger Side Airbag

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

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

Photograph Not Available

Vehicle Not Equipped with Rear Passenger Side Airbag

FIGURE 79. Post-Test Rear Passenger Dummy Close-Up

Pelvis Contact with Side Airbag View

FIGURE 80. Pre-Test View of Fuel Filler Cap

FIGURE 81. Post-Test View of Fuel Filler Cap

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

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

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

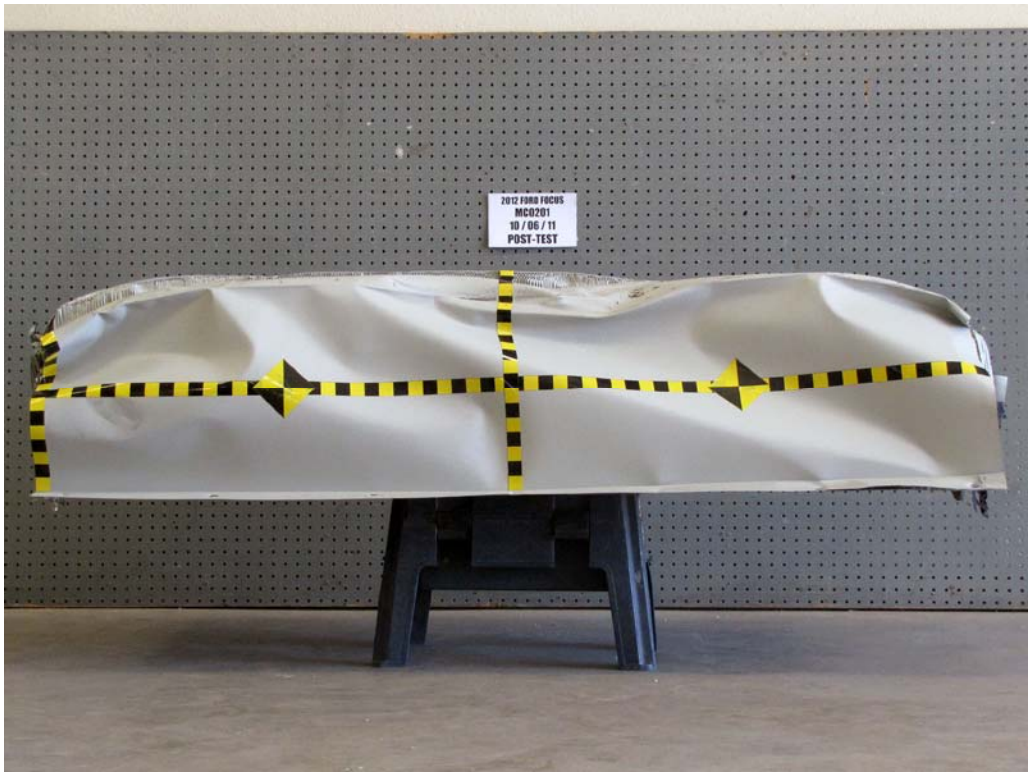


FIGURE 85. Post-Test Top View of MDB Impactor Face

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

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

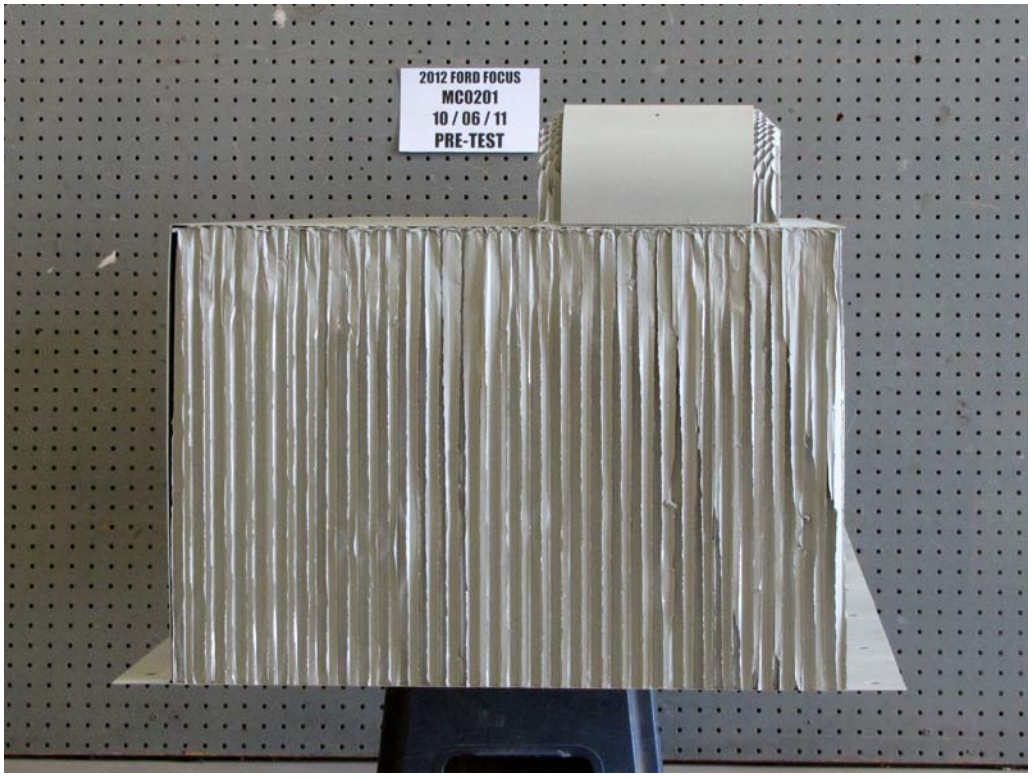


FIGURE 88. Pre-Test Right Side View of MDB Impactor Face

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

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

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

FIGURE 92. Pre-Test Ballast View

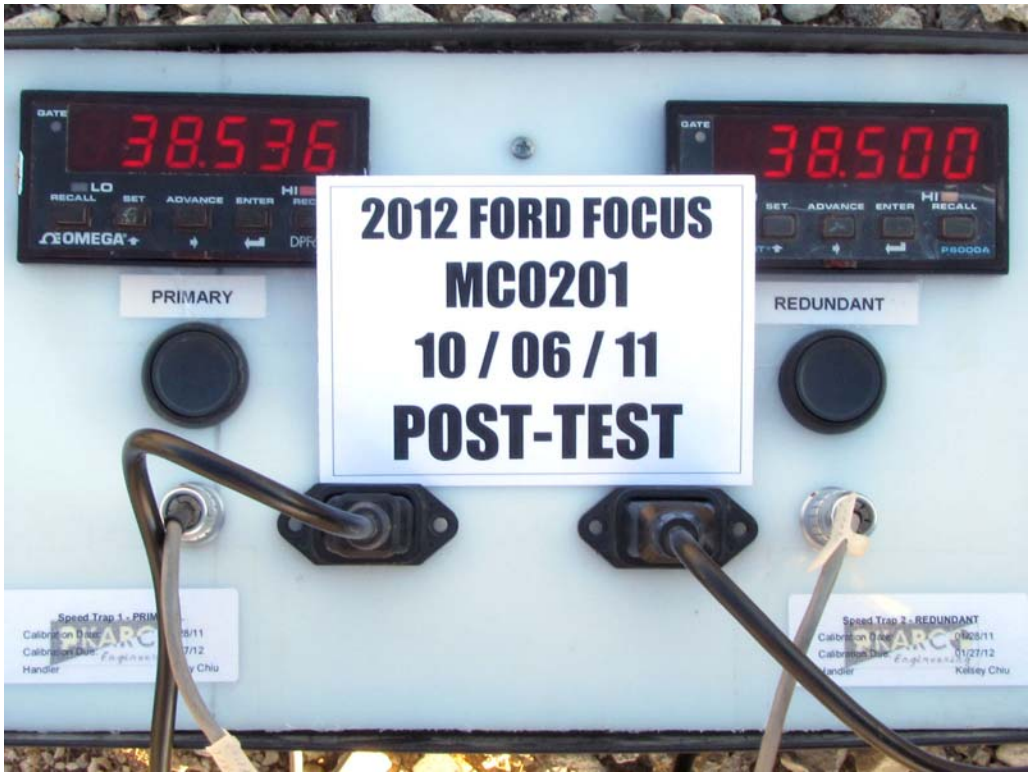


FIGURE 93. Post-Test Primary and Redundant Speed Trap Read-Out

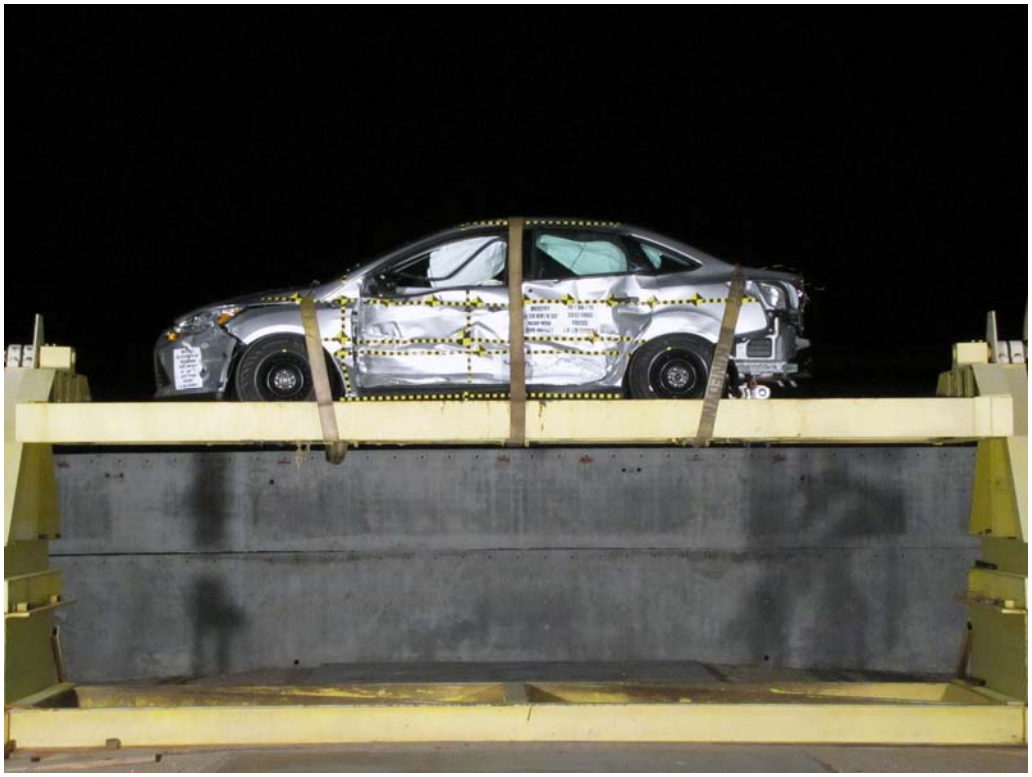


FIGURE 94. FMVSS No. 301 Static Rollover 0 Degrees

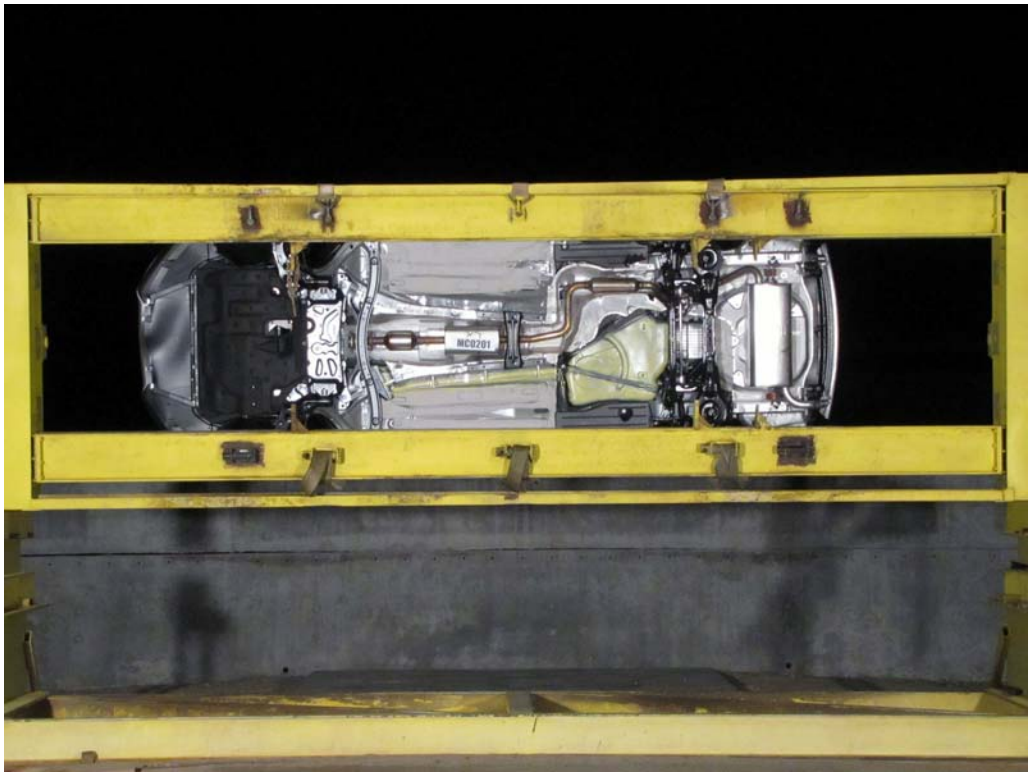


FIGURE 95. FMVSS No. 301 Static Rollover 90 Degrees

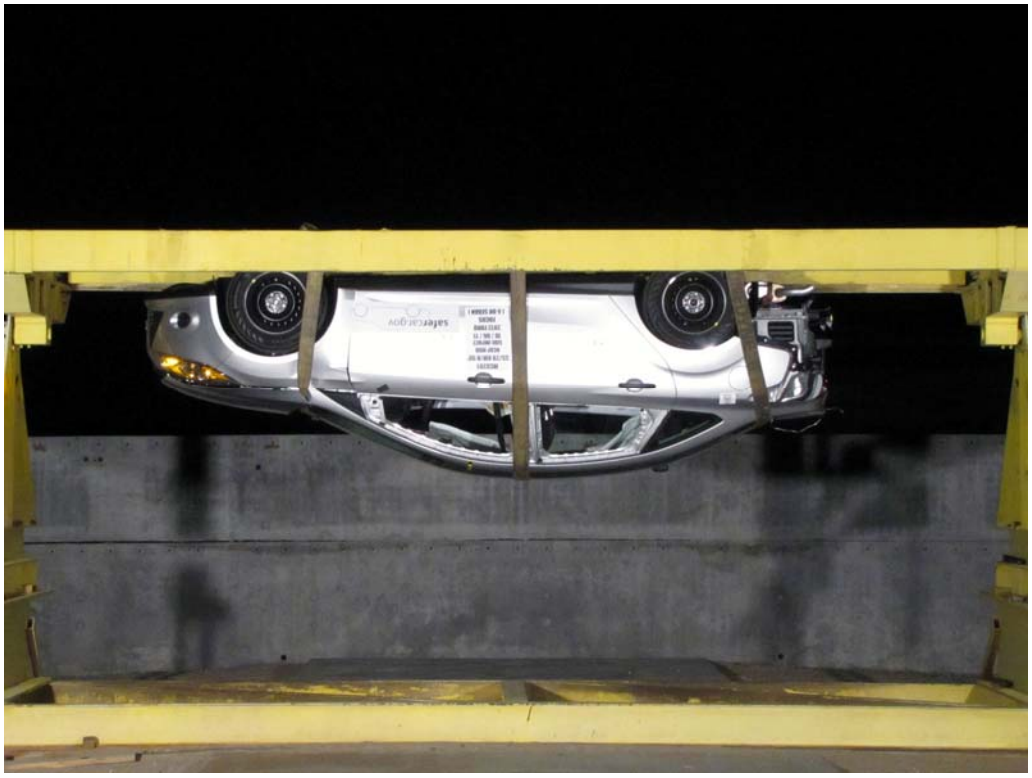


FIGURE 96. FMVSS No. 301 Static Rollover 180 Degrees

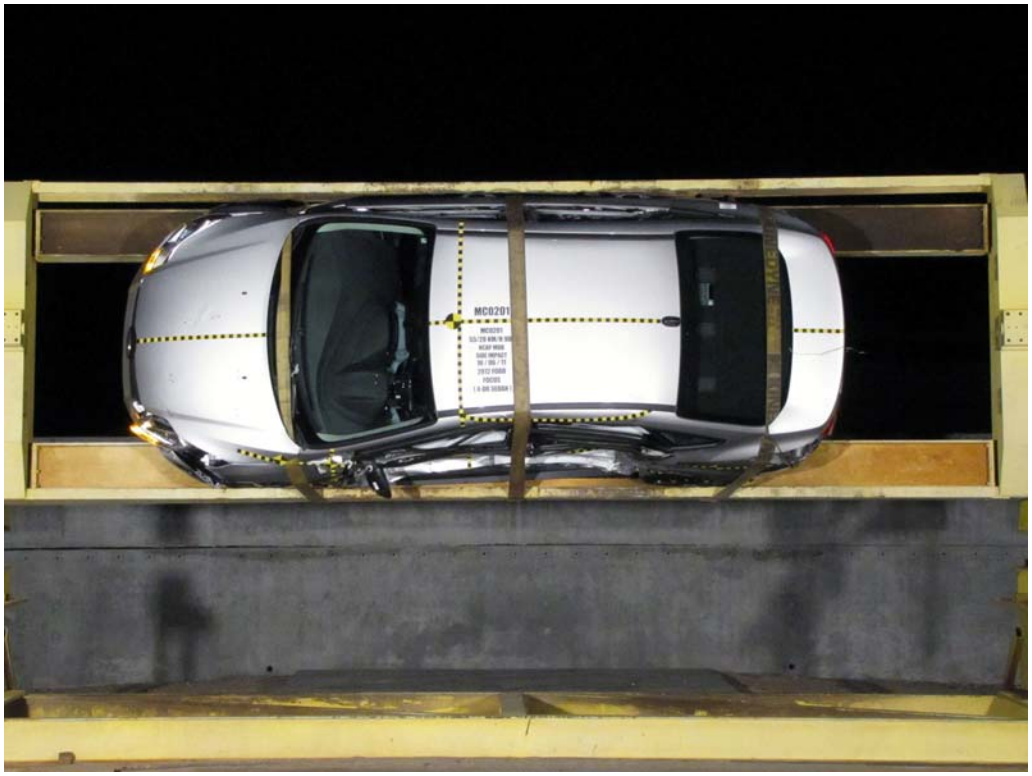


FIGURE 97. FMVSS No. 301 Static Rollover 270 Degrees

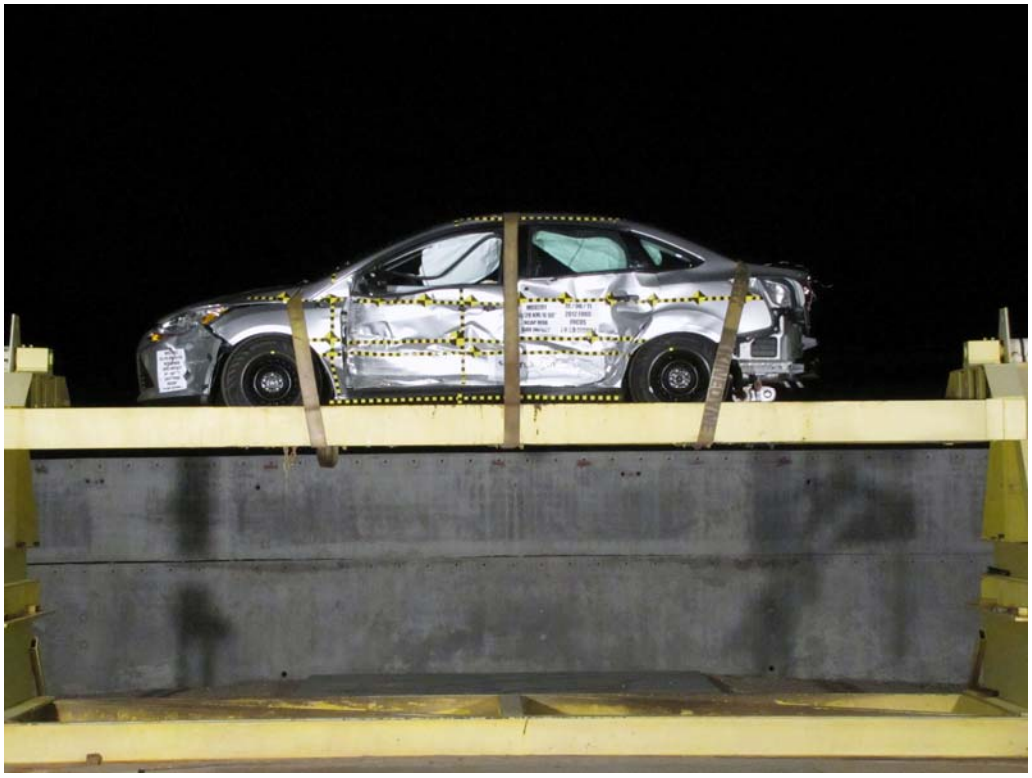


FIGURE 98. FMVSS No. 301 Static Rollover 360 Degrees

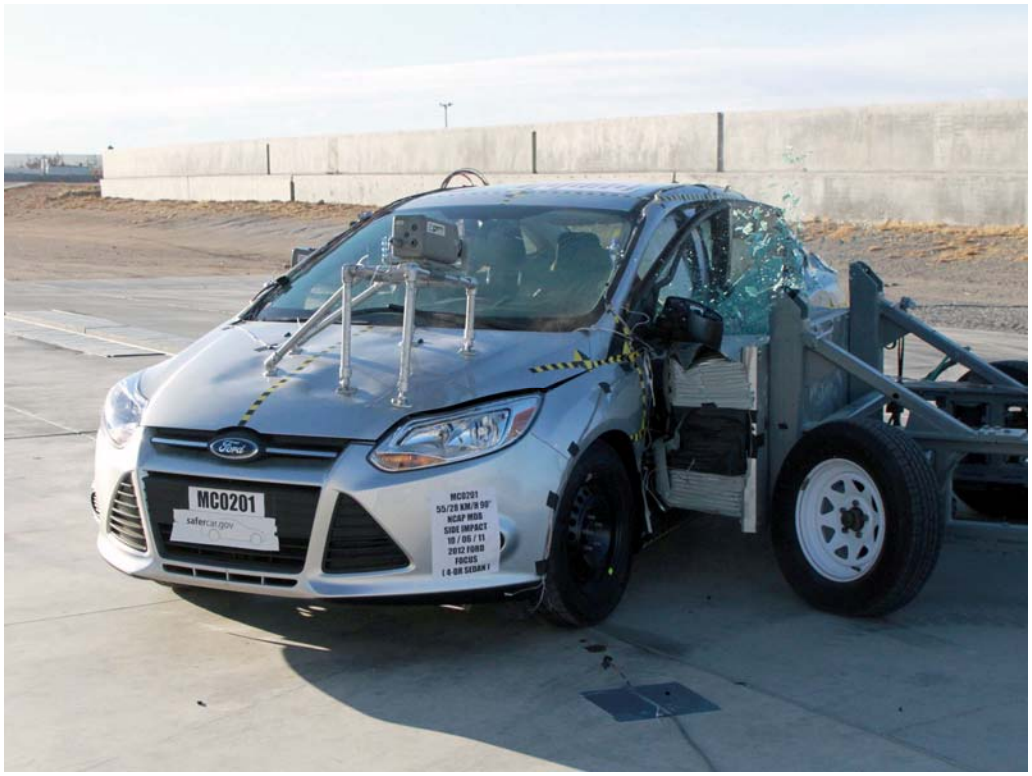


FIGURE 99. Impact Event

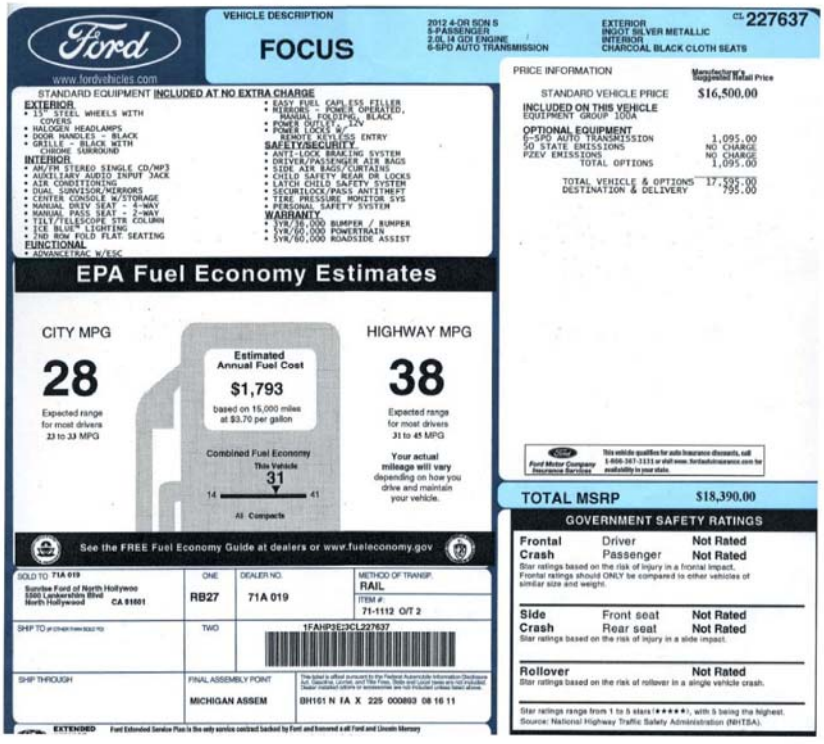
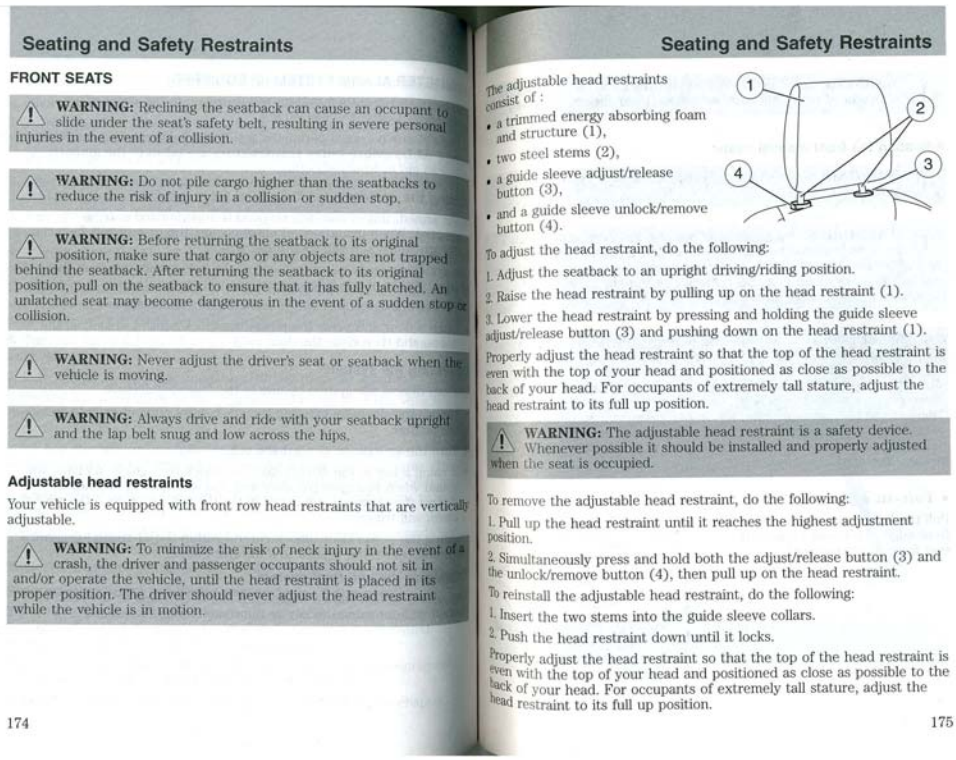


FIGURE 100. Monroney Label



Seating and Safety Restraints

FRONT SEATS

WARNING: Reclining the seatback can cause an occupant to slide under the seat's safety belt, resulting in severe personal injuries in the event of a collision.

WARNING: Do not pile cargo higher than the seatbacks to reduce the risk of injury in a collision or sudden stop.

WARNING: Before returning the seatback to its original position, make sure that cargo or any objects are not trapped behind the seatback. After returning the seatback to its original position, pull on the seatback to ensure that it has fully latched. An unlatched seat may become dangerous in the event of a sudden stop or collision.

WARNING: Never adjust the driver's seat or seatback when the vehicle is moving.

WARNING: Always drive and ride with your seatback upright and the lap belt snug and low across the hips.

Adjustable head restraints

Your vehicle is equipped with front row head restraints that are vertically adjustable.

WARNING: To minimize the risk of neck injury in the event of a crash, the driver and passenger occupants should not sit in and/or operate the vehicle, until the head restraint is placed in its proper position. The driver should never adjust the head restraint while the vehicle is in motion.

174

Seating and Safety Restraints

The adjustable head restraints consist of :

- a trimmed energy absorbing foam and structure (1),
- two steel stems (2),
- a guide sleeve adjust/release button (3),
- and a guide sleeve unlock/remove button (4).

To adjust the head restraint, do the following:

1. Adjust the seatback to an upright driving/riding position.
2. Raise the head restraint by pulling up on the head restraint (1).
3. Lower the head restraint by pressing and holding the guide sleeve adjust/release button (3) and pushing down on the head restraint (1).

Properly adjust the head restraint so that the top of the head restraint is even with the top of your head and positioned as close as possible to the back of your head. For occupants of extremely tall stature, adjust the head restraint to its full up position.

WARNING: The adjustable head restraint is a safety device. Whenever possible it should be installed and properly adjusted when the seat is occupied.

To remove the adjustable head restraint, do the following:

1. Pull up the head restraint until it reaches the highest adjustment position.
2. Simultaneously press and hold both the adjust/release button (3) and the unlock/remove button (4), then pull up on the head restraint.

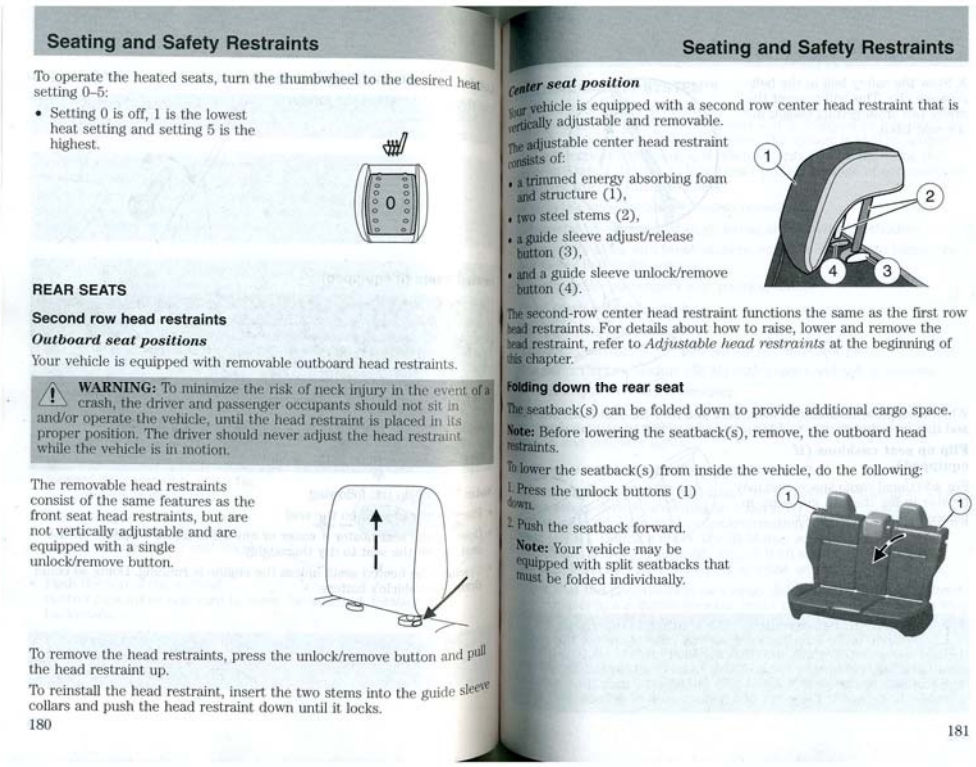
To reinstall the adjustable head restraint, do the following:

1. Insert the two stems into the guide sleeve collars.
2. Push the head restraint down until it locks.

Properly adjust the head restraint so that the top of the head restraint is even with the top of your head and positioned as close as possible to the back of your head. For occupants of extremely tall stature, adjust the head restraint to its full up position.

175

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



Seating and Safety Restraints

To operate the heated seats, turn the thumbwheel to the desired heat setting 0–5:

- Setting 0 is off, 1 is the lowest heat setting and setting 5 is the highest.

REAR SEATS

Second row head restraints

Outboard seat positions

Your vehicle is equipped with removable outboard head restraints.

WARNING: To minimize the risk of neck injury in the event of a crash, the driver and passenger occupants should not sit in and/or operate the vehicle, until the head restraint is placed in its proper position. The driver should never adjust the head restraint while the vehicle is in motion.

The removable head restraints consist of the same features as the front seat head restraints, but are not vertically adjustable and are equipped with a single unlock/remove button.

To remove the head restraints, press the unlock/remove button and pull the head restraint up.

To reinstall the head restraint, insert the two stems into the guide sleeve collars and push the head restraint down until it locks.

180

Seating and Safety Restraints

Center seat position

Your vehicle is equipped with a second row center head restraint that is vertically adjustable and removable.

The adjustable center head restraint consists of:

- a trimmed energy absorbing foam and structure (1),
- two steel stems (2),
- a guide sleeve adjust/release button (3),
- and a guide sleeve unlock/remove button (4).

The second-row center head restraint functions the same as the first row head restraints. For details about how to raise, lower and remove the head restraint, refer to *Adjustable head restraints* at the beginning of this chapter.

Folding down the rear seat

The seatback(s) can be folded down to provide additional cargo space.

Note: Before lowering the seatback(s), remove, the outboard head restraints.

To lower the seatback(s) from inside the vehicle, do the following:

1. Press the unlock buttons (1) down.
2. Push the seatback forward.

Note: Your vehicle may be equipped with split seatbacks that must be folded individually.

181

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

APPENDIX B

DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

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)

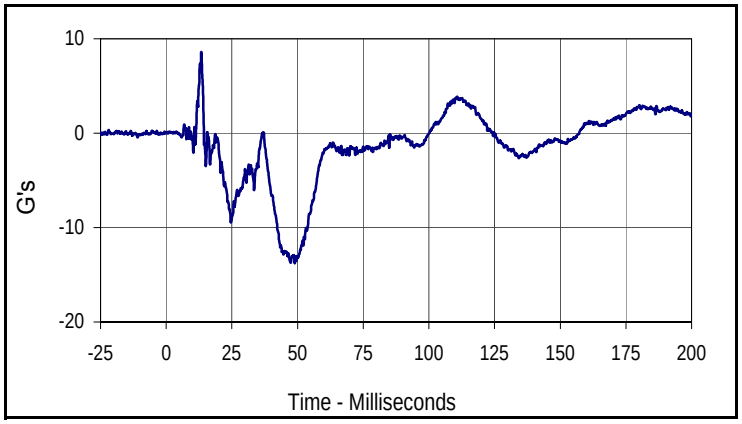
MDB Rear Acceleration (X)

MDB Rear Acceleration (Y)

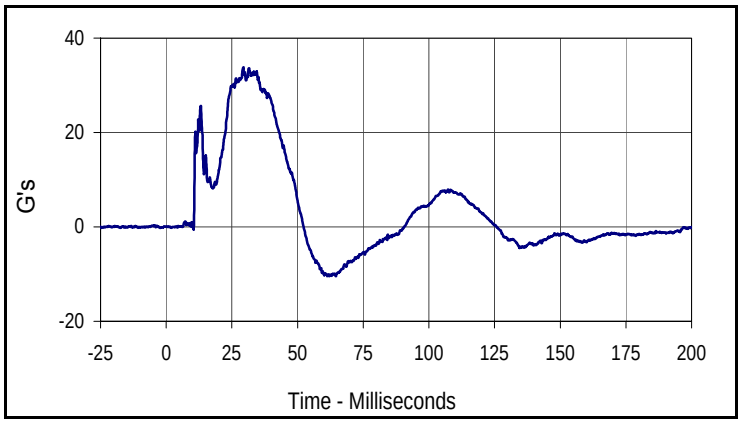
Left MDB Contact Switch

Right MDB Contact Switch

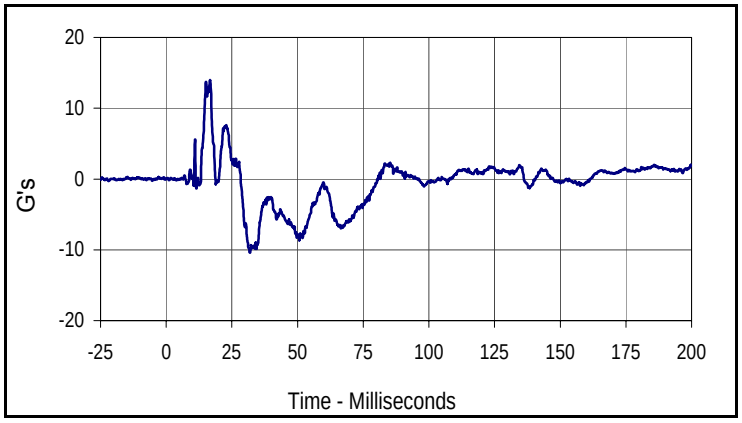
Test Vehicle:	2012 Ford Focus 4-Door Sedan	Test Date:	10/6/11
Test Program:	61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test	NHTSA No.:	MC0201



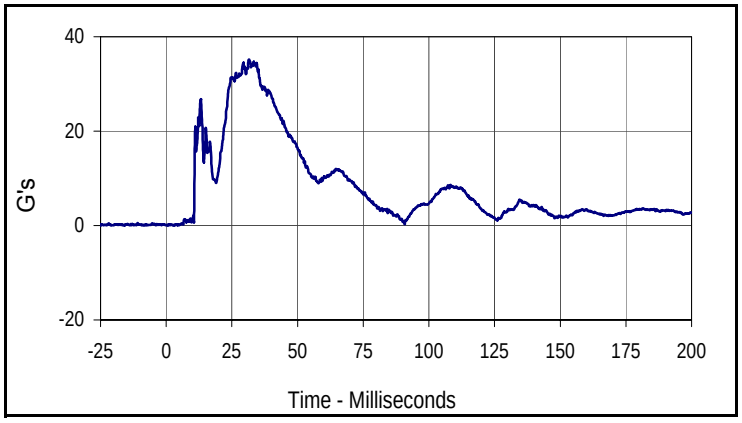
Curve Description			
Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
8.6	13.4	-13.8	48.9



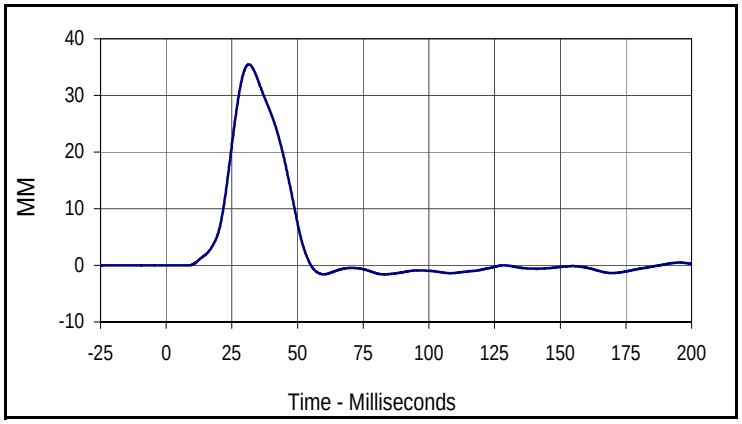
Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
33.8	29.4	-10.5	61.3



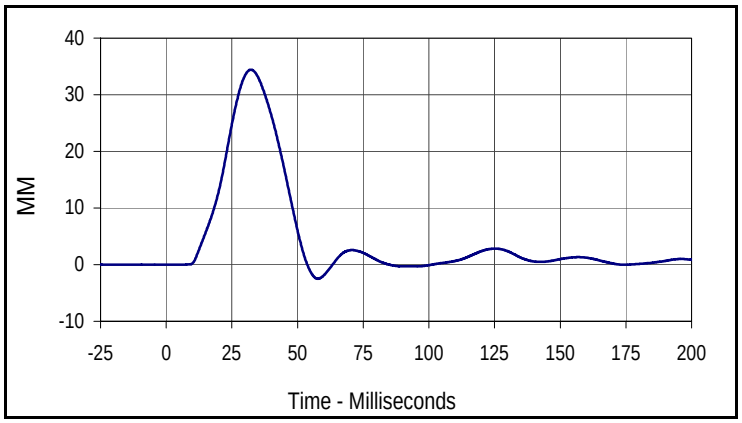
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
14.0	16.7	-10.4	31.9



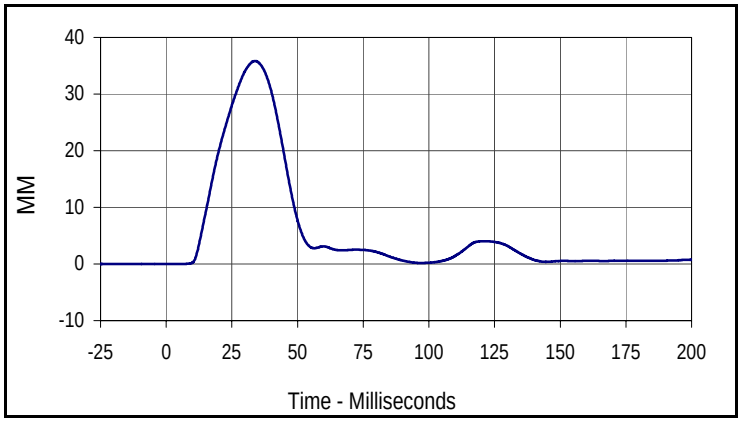
Curve Description			
Driver Head Resultant Accerlation Primary			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
35.2	31.5	0.0	0.8



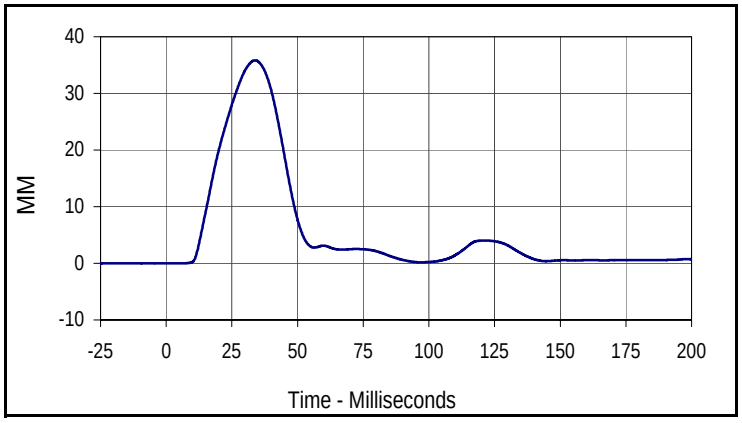
Curve Description			
Driver Upper Thorax Rib Deflection Y			
Plot No.	Type	SAE Class	Units
005	FIL	180	MM
Max	Time	Min	Time
35.5	31.5	-1.6	83.0



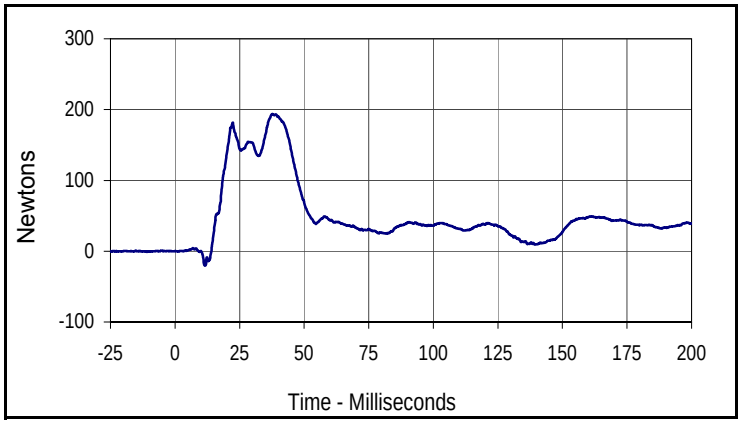
Curve Description			
Driver Middle Thorax Rib Deflection Y			
Plot No.	Type	SAE Class	Units
006	FIL	180	MM
Max	Time	Min	Time
34.4	32.2	-2.5	57.7



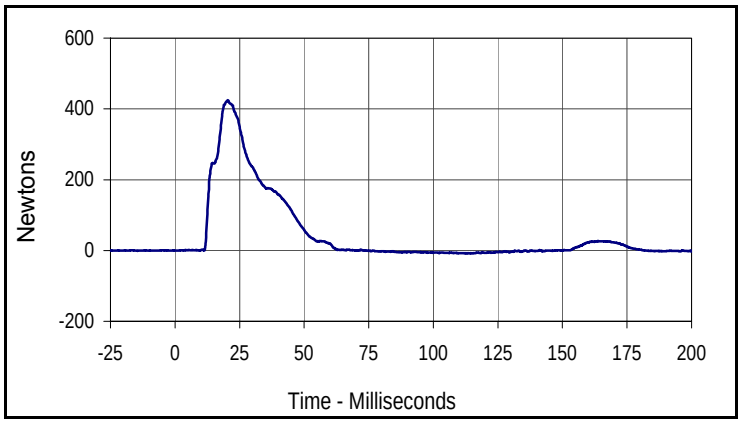
Curve Description			
Driver Lower Thorax Rib Deflection Y			
Plot No.	Type	SAE Class	Units
007	FIL	180	MM
Max	Time	Min	Time
35.8	33.8	0.0	6.2



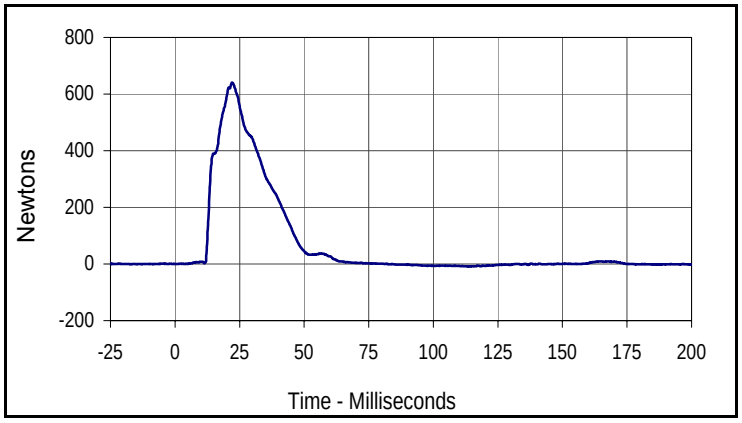
Curve Description			
Driver Thorax Rib Deflection Maximum			
Plot No.	Type	SAE Class	Units
010	FIL	180	MM
Max	Time	Min	Time
35.8	33.8	0.0	6.2



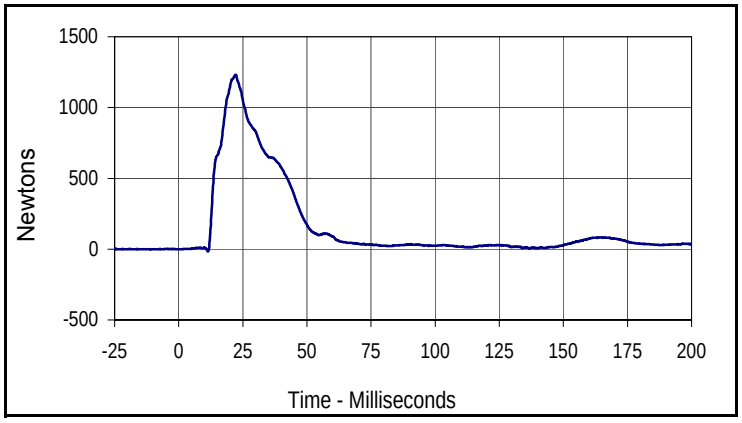
Curve Description			
Driver Anterior Abdominal Force Y			
Plot No.	Type	SAE Class	Units
008	FIL	600	Newtons
Max	Time	Min	Time
193.7	37.7	-20.4	11.7



Curve Description			
Driver Middle Abdominal Force Y			
Plot No.	Type	SAE Class	Units
009	FIL	600	Newtons
Max	Time	Min	Time
424.3	20.5	-8.2	114.1

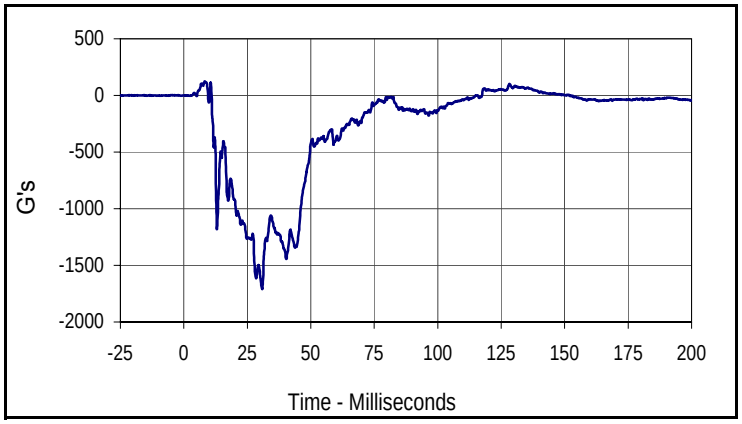


Curve Description			
Driver Posterior Abdominal Force Y			
Plot No.	Type	SAE Class	Units
011	FIL	600	Newtons
Max	Time	Min	Time
640.2	22.1	-8.8	114.0

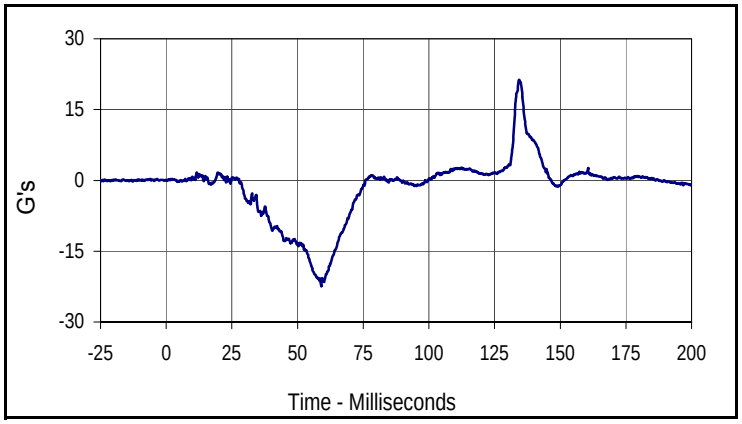


Curve Description			
Driver Total Abdominal Force			
Plot No.	Type	SAE Class	Units
012	SUM	600	Newtons
Max	Time	Min	Time
1230.5	22.2	-16.9	11.4

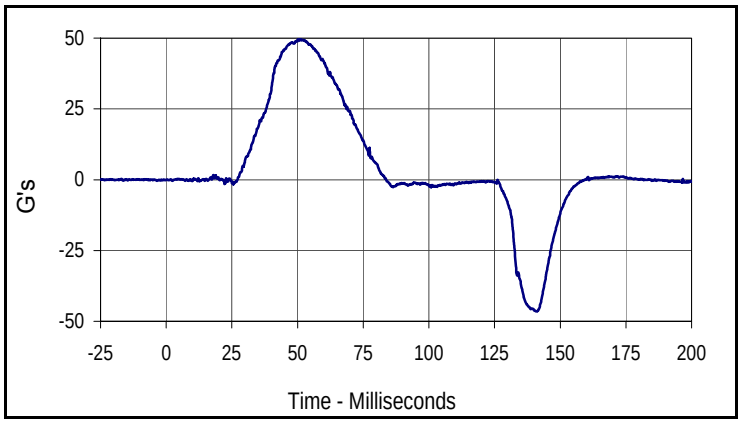
Test Vehicle:	2012 Ford Focus 4-Door Sedan	Test Date:	10/6/11
Test Program:	61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test	NHTSA No.:	MC0201



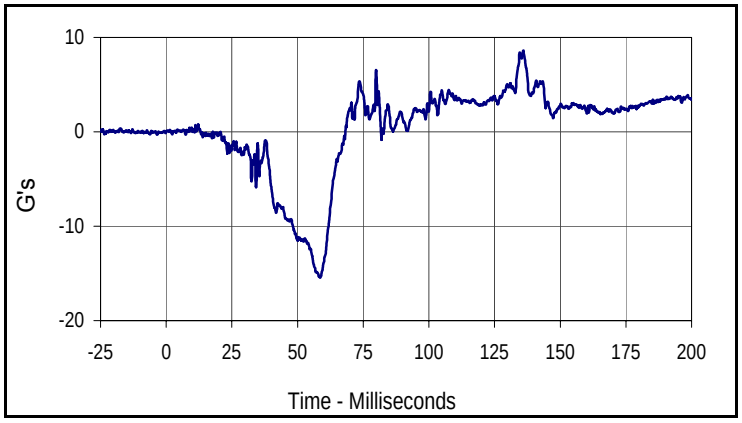
Curve Description			
Driver Pubic Symphysis Force Y			
Plot No.	Type	SAE Class	Units
013	FIL	600	G's
Max	Time	Min	Time
124.4	8.2	-1708.1	30.9



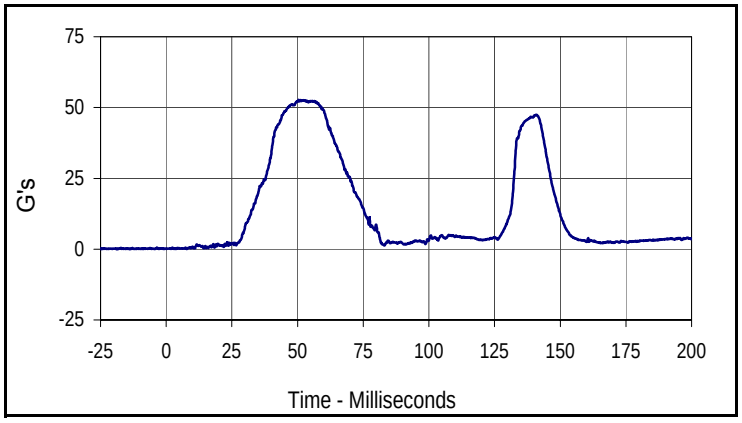
Curve Description			
Passenger Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
014	FIL	1000	G's
Max	Time	Min	Time
21.3	134.4	-22.4	59.0



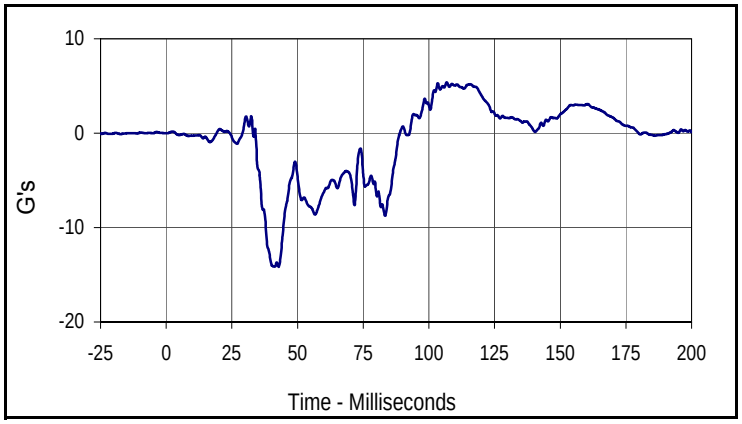
Curve Description			
Passenger Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
015	FIL	1000	G's
Max	Time	Min	Time
49.6	51.2	-46.5	141.0



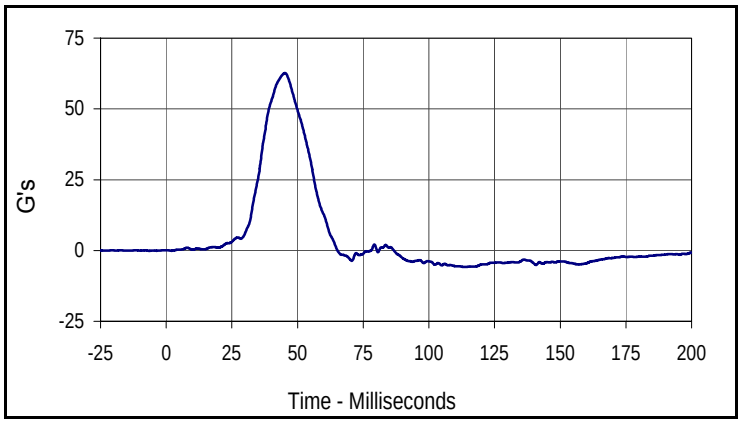
Curve Description			
Passenger Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
016	FIL	1000	G's
Max	Time	Min	Time
8.6	135.9	-15.5	58.6



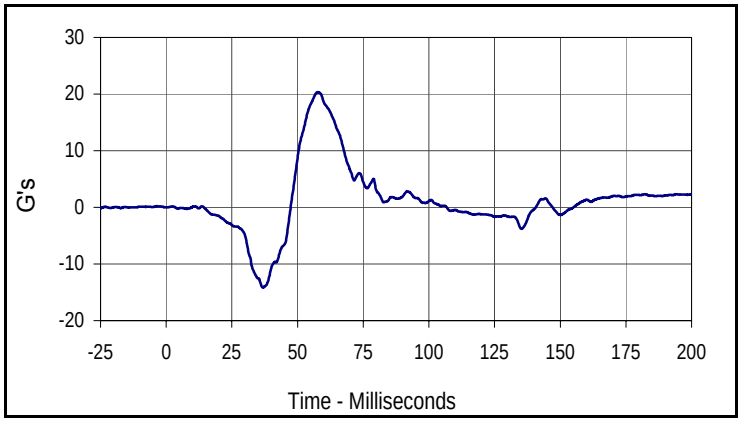
Curve Description			
Passenger Head Acceleration Resultant Primary			
Plot No.	Type	SAE Class	Units
017	RES	1000	G's
Max	Time	Min	Time
52.7	50.4	0.1	8.0



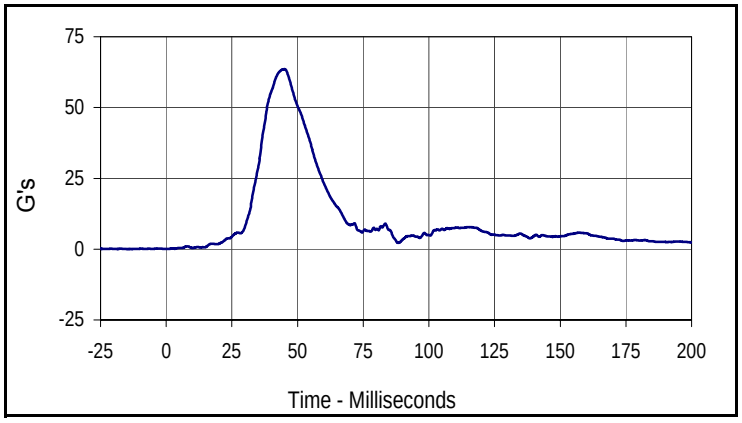
Curve Description			
Passenger Lower Spine T12 Acceleration X			
Plot No.	Type	SAE Class	Units
019	FIL	180	G's
Max	Time	Min	Time
5.4	106.8	-14.2	42.8



Curve Description			
Passenger Lower Spine T12 Acceleration Y			
Plot No.	Type	SAE Class	Units
020	FIL	180	G's
Max	Time	Min	Time
62.7	45.2	-5.8	113.2

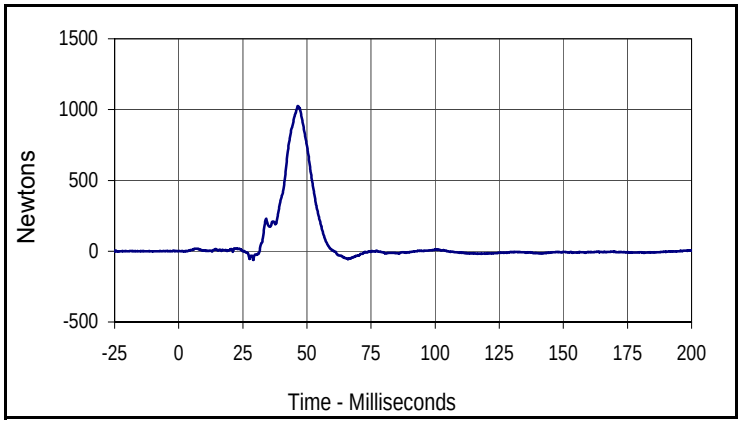


Curve Description			
Passenger Lower Spine T12 Acceleration Z			
Plot No.	Type	SAE Class	Units
021	FIL	180	G's
Max	Time	Min	Time
20.3	57.6	-14.2	36.9

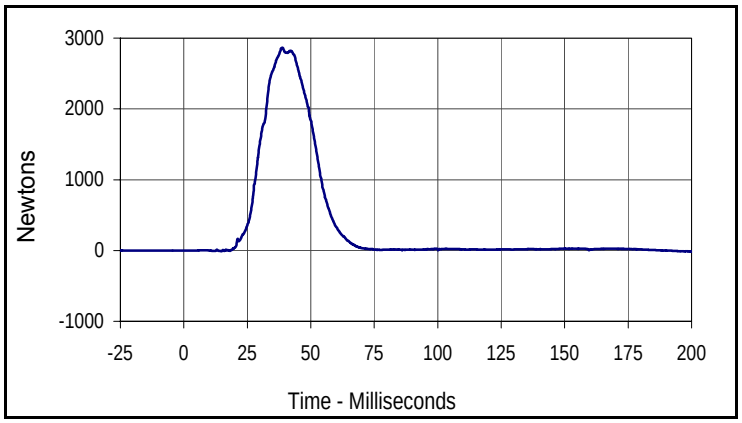


Curve Description			
Passenger Lower Spine T12 Acceleration Res.			
Plot No.	Type	SAE Class	Units
022	RES	180	G's
Max	Time	Min	Time
63.6	45.0	0.1	1.0

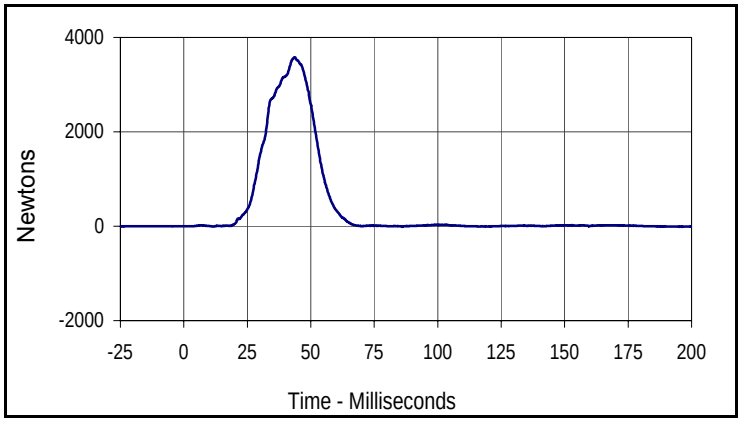
Test Vehicle:	2012 Ford Focus 4-Door Sedan	Test Date:	10/6/11
Test Program:	61 km/h (38 mph) Side Impact NCAP 27° Moving Deformable Barrier Test	NHTSA No.:	MC0201



Curve Description			
Passenger Iliac Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
023	FIL	600	Newtons
Max	Time	Min	Time
1024.4	46.5	-62.3	29.1



Curve Description			
Passenger Acetabulum Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
024	FIL	600	Newtons
Max	Time	Min	Time
2866.4	38.8	-14.0	199.7



Curve Description			
Passenger Total Pelvic Force			
Plot No.	Type	SAE Class	Units
018	SUM	600	Newtons
Max	Time	Min	Time
3582.5	43.7	-12.8	85.9

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

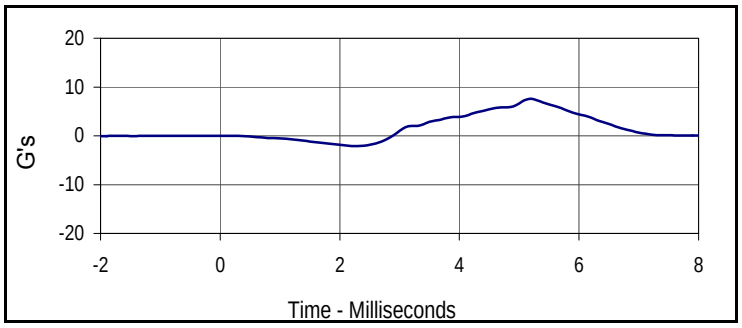
Test Program:	ES2re External Measurements	Test Date:	10/3/11
ATD Serial No.:	F037	Test I.D.:	N/A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
1	Sitting Height	mm	900 - 918	905	Pass
2	Seat to Shoulder Joint	mm	558 - 572	561	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	375	Pass
6	Head Width	mm	152 - 158	156	Pass
7	Shoulder / Arm Width	mm	461 - 479	470	Pass
8	Thorax Width	mm	322 - 332	330	Pass
9	Abdomen Width	mm	273 - 287	280	Pass
10	Pelvis Lap Width	mm	359 - 373	360	Pass
11	Head Depth	mm	196 - 206	201	Pass
12	Thorax Depth	mm	262 - 272	270	Pass
13	Abdomen Width	mm	194 - 204	200	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	610	Pass
			Overall Test Results		Pass

Test Program:	ES2re Head Drop Test	Test Date:	10/3/11
ATD Serial No.:	F037	Test I.D.:	F037HD012

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	250	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	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
Peak Head Resultant Acceleration		G's	125 to 155	144.3	Pass
Peak Head X Acceleration		G's	≤15	7.6	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	7.3	Pass
			Overall Test Results		Pass

Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
144.3	2.7	0.1	-0.5



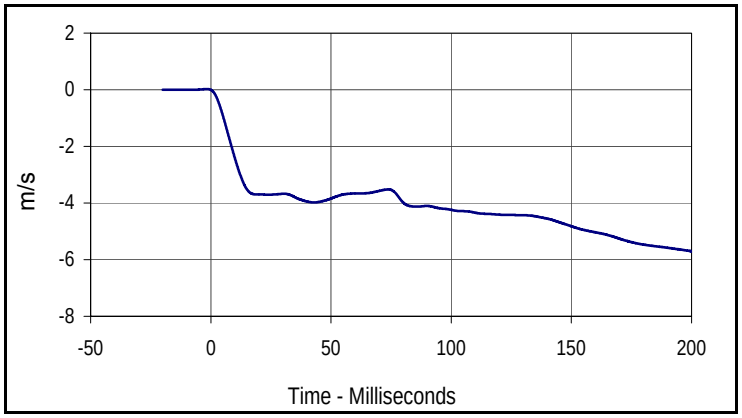
Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
7.6	5.2	-2.1	2.3

Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
121.6	2.7	-4.6	5.3

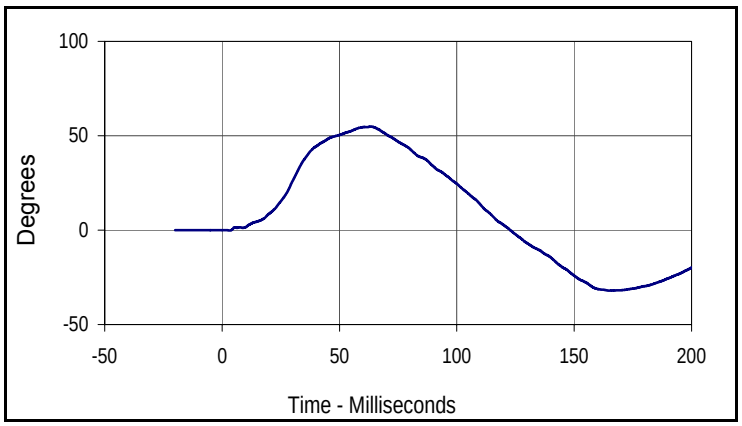
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
77.7	2.7	-0.4	0.0

Test Program:	ES2re Neck Flexion Test	Test Date:	10/3/11
ATD Serial No.:	F037	Test I.D.:	F037NB012

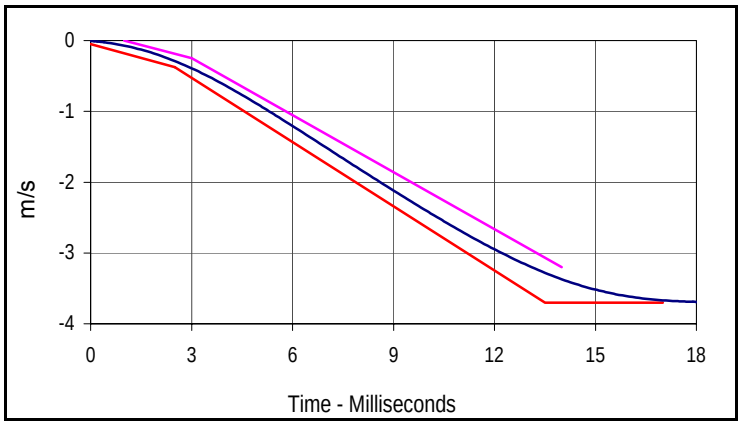
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	310	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Velocity		m/s	3.3 to 3.5	3.3	Pass
Headform Flexion	Max	Degrees	49 to 59	54.9	Pass
	Time	msec	54 to 66	63.3	Pass
Headform Flexion Decay (Peak to Zero)		msec	53 to 88	59.5	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.6	-5.7	200.0



Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
54.9	63.3	-32.0	164.9

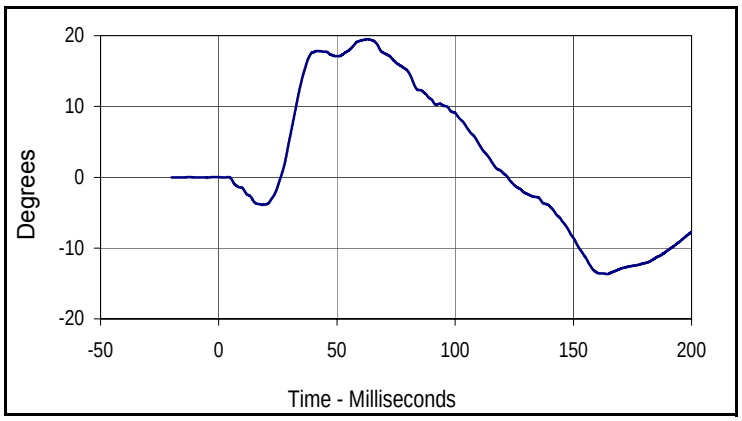


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.6	-5.7	200.0

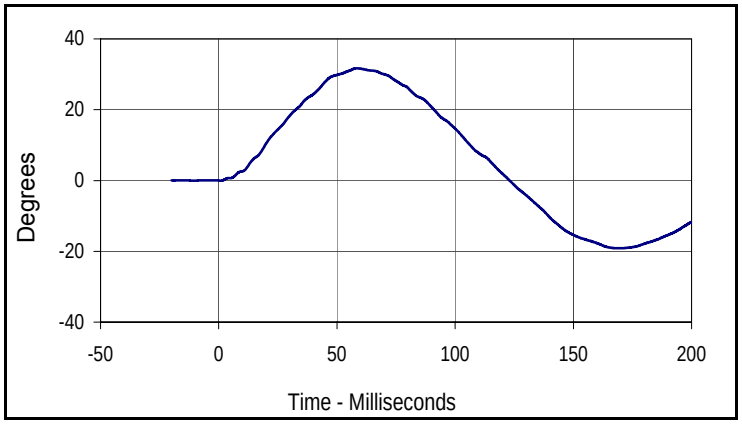
Velocity Corridors

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

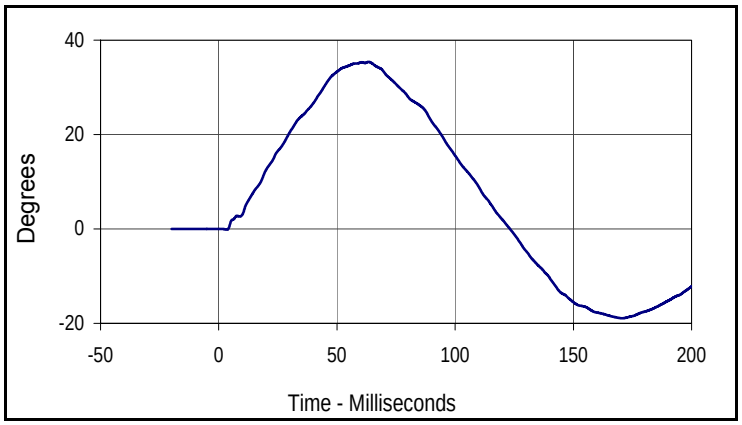
Test Program:	ES2re Neck Flexion Test	Test Date:	10/3/11
ATD Serial No.:	F037	Test I.D.:	F037NB012



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
19.5	63.0	-13.7	164.3



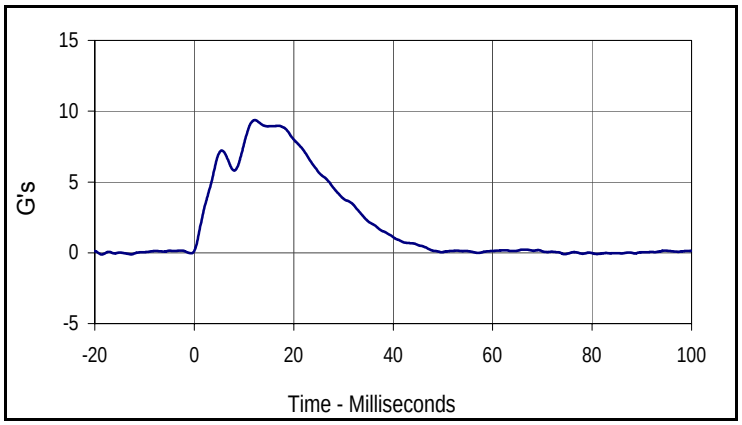
Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
31.7	58.3	-19.1	169.4



Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
35.4	63.4	-18.9	170.7

Test Program:	ES2re Shoulder Impact Test	Test Date:	10/3/11
ATD Serial No.:	F037	Test I.D.:	F037SH012

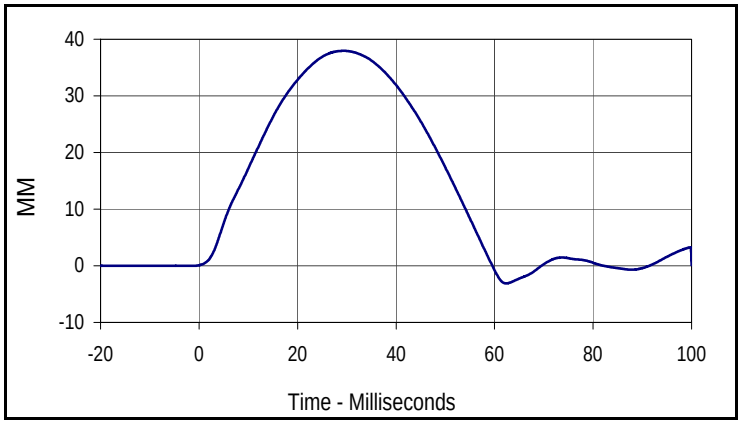
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	260	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Speed		m/s	4.2 to 4.4	4.3	Pass
Peak Impactor Acceleration		G's	7.5 to 10.5	9.4	Pass
			Overall Test Results		Pass



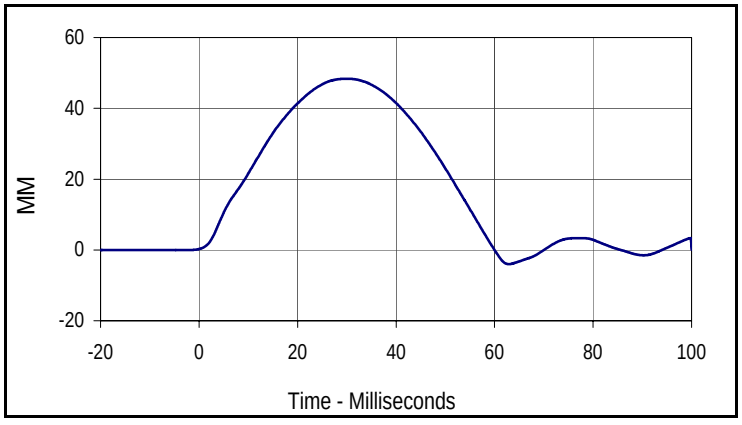
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
9.4	12.2	-0.1	-18.6

Test Program:	ES2re Thorax - Rib Drop Test	Test Date:	10/3/11
ATD Serial No.:	F037 Rib #1	Test I.D.:	F037RB1012

Tested Parameter		Units	Specification	Result	Pass/Fail
Rib Module Soak Time		Minutes	≥240	300	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	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	30.0	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height		mm	36 to 40	37.9	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height		mm	46 to 51	48.4	Pass
			Overall Test Results		Pass



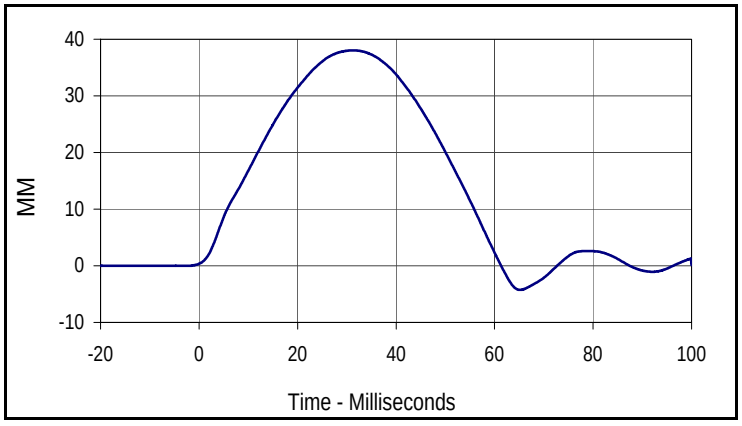
Curve Description			
Upper Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
37.9	29.5	-3.1	62.4



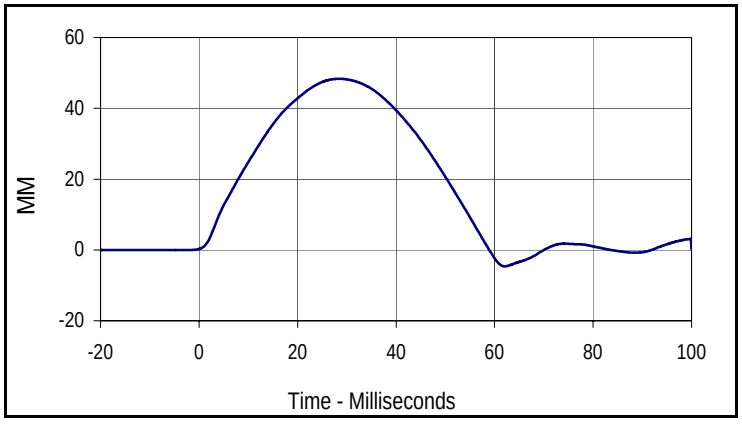
Curve Description			
Upper Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
48.4	30.0	-4.0	62.9

Test Program:	ES2re Thorax - Rib Drop Test	Test Date:	10/3/11
ATD Serial No.:	F037 Rib #2	Test I.D.:	F037RB2012

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		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	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
Peak Rib Deflection at 459 +/- 5 mm Drop Height		mm	36 to 40	38.0	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height		mm	46 to 51	48.3	Pass
			Overall Test Results		Pass



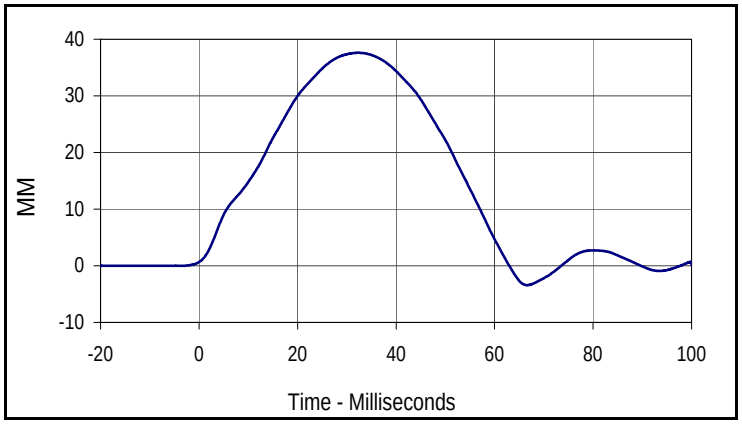
Curve Description			
Middle Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
38.0	31.3	-4.3	65.2



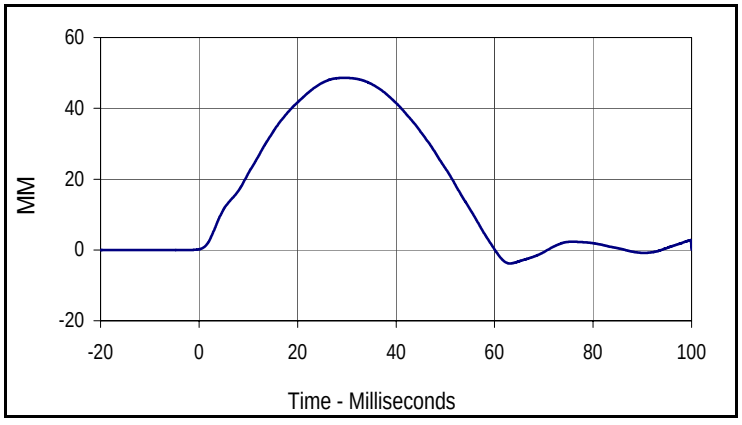
Curve Description			
Middle Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
48.3	28.5	-4.6	62.1

Test Program:	ES2re Thorax - Rib Drop Test	Test Date:	10/3/11
ATD Serial No.:	F037 Rib # 3	Test I.D.:	F037RB3012

Tested Parameter		Units	Specification	Result	Pass/Fail
Rib Module Soak Time		Minutes	≥240	400	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	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	30.0	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height		mm	36 to 40	37.6	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height		mm	46 to 51	48.6	Pass
			Overall Test Results		Pass



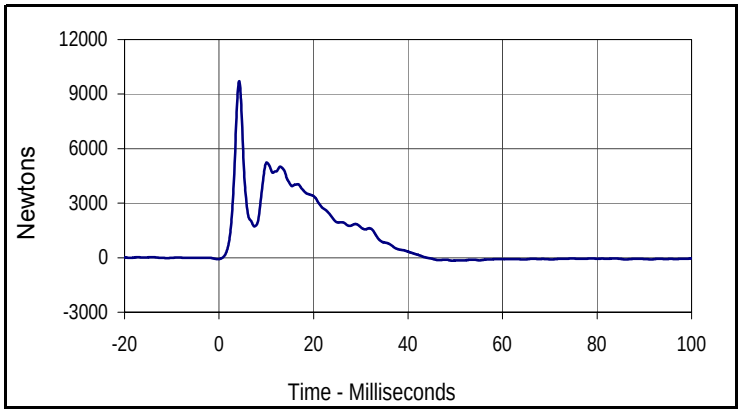
Curve Description			
Lower Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
37.6	32.3	-3.4	66.6



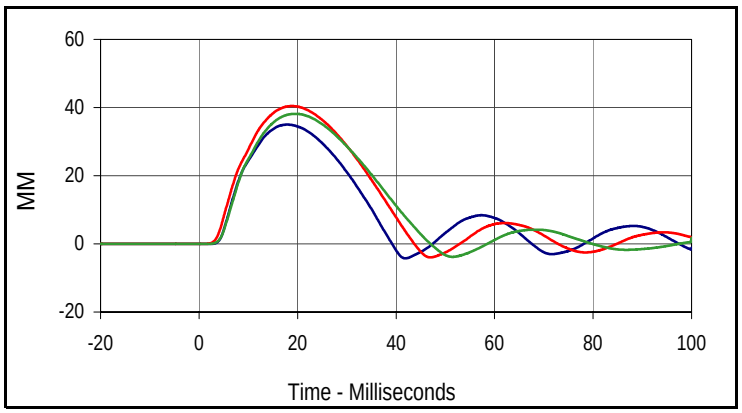
Curve Description			
Lower Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
48.6	29.5	-3.8	63.2

Test Program:	ES2re Thorax - Full Body Impact Test	Test Date:	10/3/11
ATD Serial No.:	F037	Test I.D.:	F035TH012

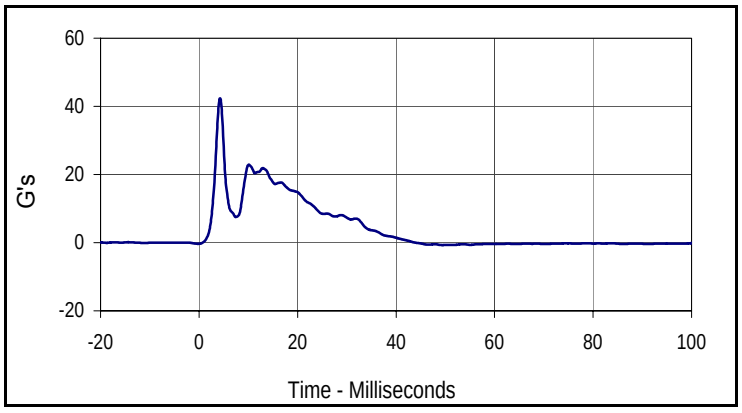
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	460	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Peak Impactor Velocity		m/s	5.4 to 5.6	5.5	Pass
Peak Impactor Force		N	5100 to 6200	5239.7	Pass
		msec	> 6.0 msec	10.1	Pass
Peak Upper Rib Deflection		mm	34 to 41	35.0	Pass
Peak Middle Rib Deflection		mm	37 to 45	40.4	Pass
Peak Lower Rib Deflection		mm	37 to 44	38.2	Pass
			Overall Test Results		Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
9706.6	4.3	-162.4	49.4



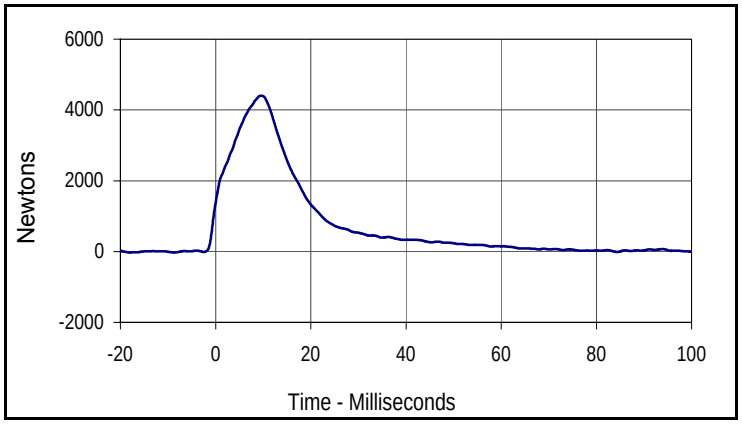
Curve Description			
Upper, Middle, Lower Rib Deflections			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max (Upper)	Time	Min (Upper)	Time
35.0	17.9	-4.3	41.9
Max (Middle)	Time	Min (Middle)	Time
40.4	18.8	-4.0	47.0
Max (Lower)	Time	Min (Lower)	Time
38.2	19.6	-3.8	51.5



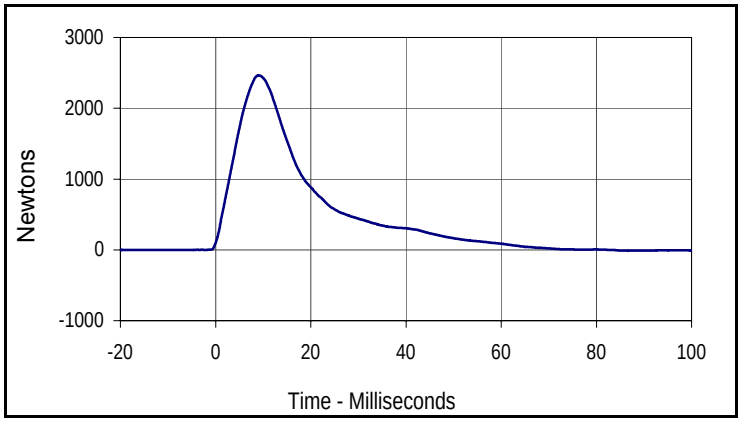
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
42.4	4.3	-0.7	49.4

Test Program:	ES2re Abodomen Impact Test	Test Date:	10/3/11
ATD Serial No.:	F037	Test I.D.:	F037ABD012

Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	490	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	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
Probe Velocity		m/s	3.9 to 4.1	3.9	Pass
Peak Impactor Force		N	4000 to 4800	4403.8	Pass
		msec	10.6 to 13.0	10.8	Pass
Sum of Abdominal Forces		N	2200 to 2700	2464.6	Pass
		msec	10.0 to 12.3	10.4	Pass
			Overall Test Results		Pass

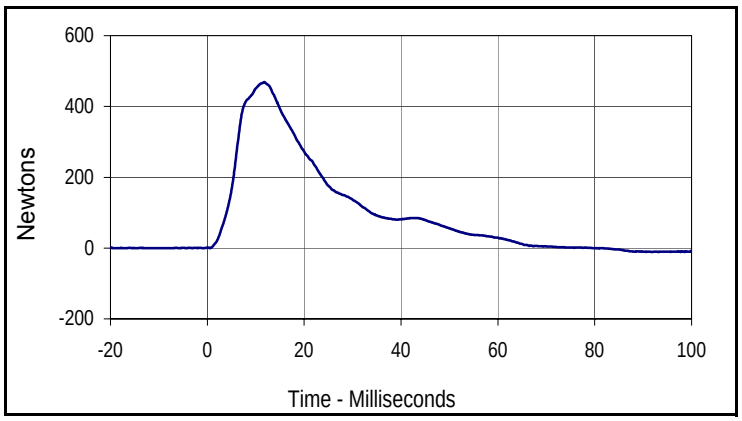


Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4403.8	10.8	-27.3	-16.5

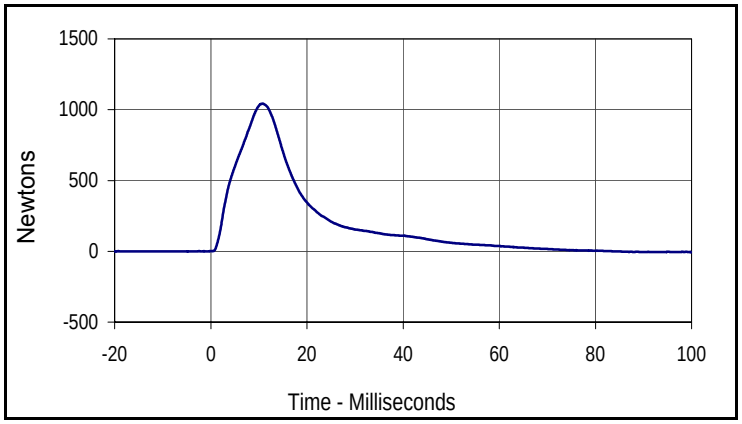


Curve Description			
Abdomen Sum Resultant			
Plot No.	Type	SAE Class	Units
002	RES	600	Newtons
Max	Time	Min	Time
2464.6	10.4	-12.5	88.1

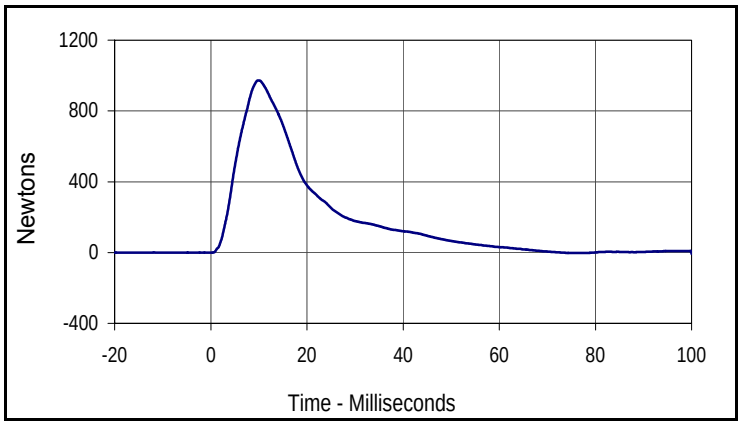
Test Program:	ES2re Abodomen Impact Test	Test Date:	10/3/11
ATD Serial No.:	F037	Test I.D.:	F037ABD012



Curve Description			
Front Abdomen Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
468.6	11.8	-11.1	91.9



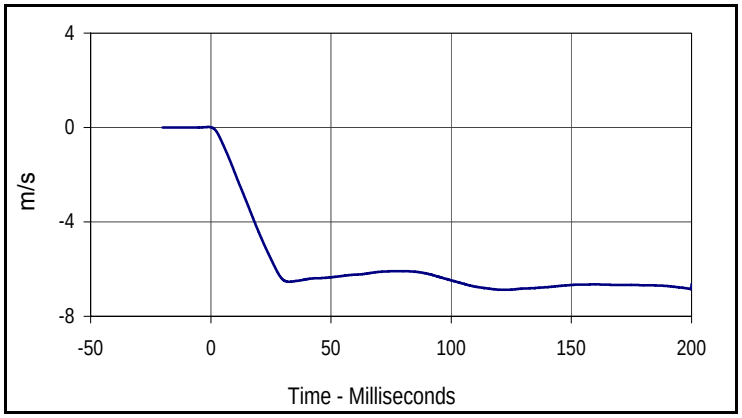
Curve Description			
Middle Abdomen Force			
Plot No.	Type	SAE Class	Units
004	FIL	600	Newtons
Max	Time	Min	Time
1042.6	10.8	-8.5	0.0



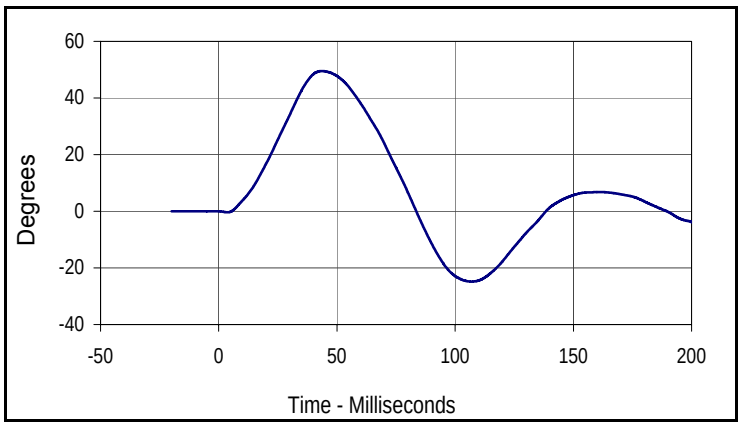
Curve Description			
Rear Abdomen Force			
Plot No.	Type	SAE Class	Units
005	FIL	600	Newtons
Max	Time	Min	Time
972.4	9.9	-8.5	0.0

Test Program:	ES2re Lumbar Flexion Test	Test Date:	10/3/11
ATD Serial No.:	F037	Test I.D.:	F035LB012

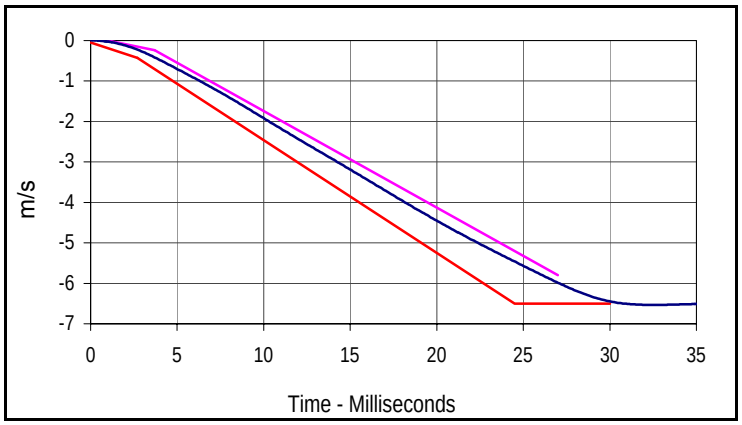
Tested Parameter		Units	Specification	Result	Pass/Fail
Lumbar Spine Assembly Soak Time		Minutes	≥240	370	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Velocity		m/s	5.95 to 6.15	5.98	Pass
Headform Rotation	Max	Degrees	45 to 55	49.5	Pass
	Time	msec	39 to 53	43.7	Pass
Time of Decay to Zero Angle from Peak		msec	37 to 57	39.9	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.0	-6.9	122.2



Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
49.5	43.7	-24.8	107.0

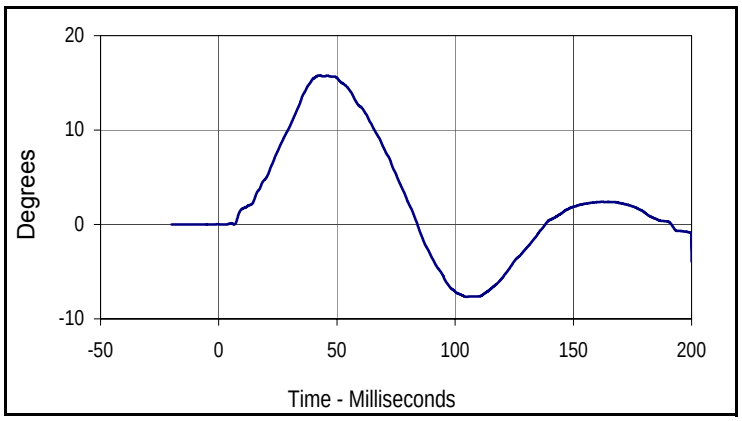


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.0	-6.9	122.2

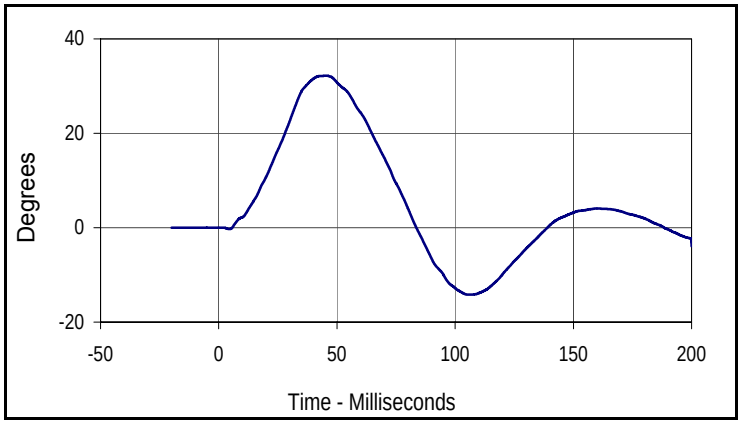
Velocity Corridors

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

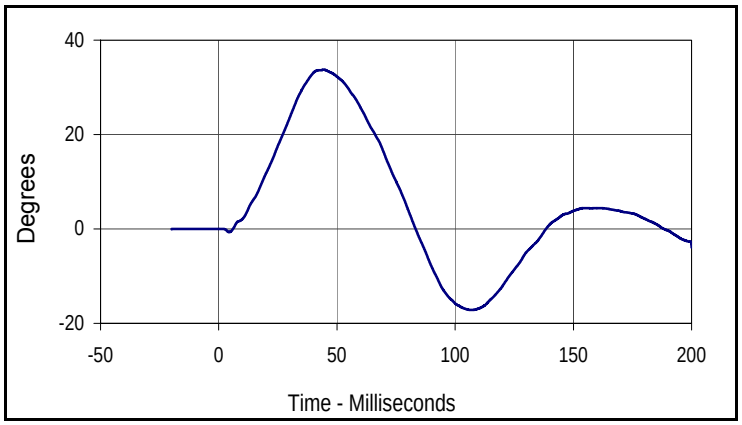
Test Program:	ES2re Lumbar Flexion Test	Test Date:	10/3/11
ATD Serial No.:	F037	Test I.D.:	F035LB012



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
15.8	42.6	-7.7	104.8



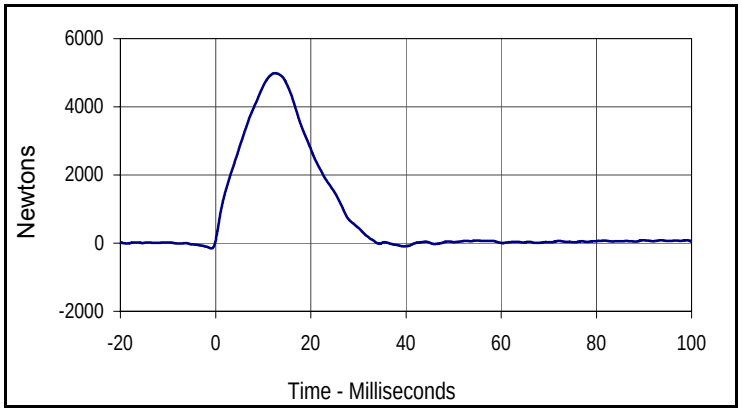
Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
32.2	45.3	-14.2	105.4



Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
33.8	44.4	-17.2	106.7

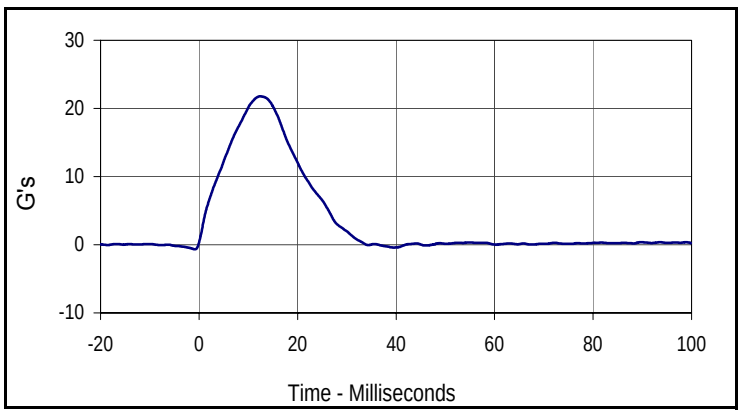
Test Program:	ES2re Pelvis Impact Test	Test Date:	10/3/11
ATD Serial No.:	F037	Test I.D.:	F035PL012

Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	580	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	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 Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Impactor Force		N	4700 to 5400	4989.1	Pass
		msec	11.8 to 16.1	12.4	Pass
Peak Pubic Symphysis Load		N	-1230 to -1590	-1369.0	Pass
		msec	12.2 to 17.0	13.7	Pass
			Overall Test Results		Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4989.1	12.4	-154.3	-0.9

Curve Description			
Pubic Symphysis Force Y			
Plot No.	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
93.6	36.2	-1369.0	13.7



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
21.8	12.4	-0.7	-0.9

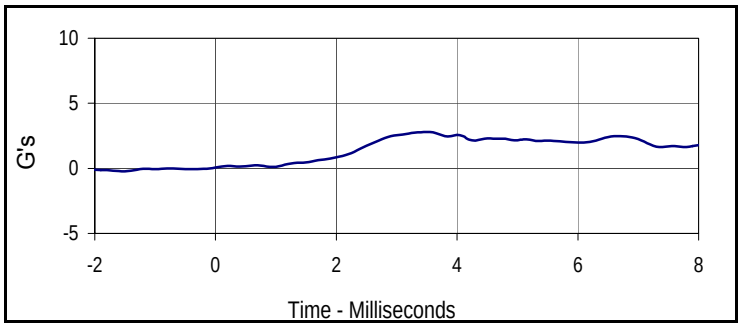
Test Program:	SID IIs External Measurements	Test Date:	10/5/11
ATD Serial No.:	299	Test I.D.:	N/A

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	776	Pass
B	Shoulder Pivot Height	mm	437 - 453	440	Pass
C	H-Point Height	mm	79 - 89	80	Pass
D	H-Point from Seatback	mm	141 - 151	148	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	101	Pass
F	Thigh Clearance	mm	119 - 135	124	Pass
G	Head Breadth	mm	140 - 148	146	Pass
H	Head Back from Backline	mm	40 - 46	45	Pass
I	Head Depth	mm	178 - 188	185	Pass
J	Head Circumference	mm	541 - 551	550	Pass
K	Buttock to Knee Length	mm	514 - 540	526	Pass
L	Popliteal Height	mm	343 - 369	352	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	400	Pass
N	Buttock Popliteal Length	mm	416 - 442	431	Pass
O	Chest Depth w/o Jacket	mm	195 - 211	201	Pass
P	Foot Length	mm	216 - 232	220	Pass
Q	Hip Breadth with Pelvic Plug	mm	313 -323	315	Pass
R	Arm Length	mm	249 - 259	257	Pass
S	Knee Joint to Seatback	mm	477 - 493	485	Pass
V	Shoulder Width	mm	341 - 357	352	Pass
W	Foot Width	mm	78 - 94	93	Pass
Y	Chest Circumference with Jacket	mm	851 - 881	879	Pass
Z	Waist Circumference	mm	760 - 791	773	Pass
			Overall Test Results		Pass

Test Program:	SID IIs Head Drop Test	Test Date:	10/5/11
ATD Serial No.:	299	Test I.D.:	299HD019

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	240	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.6	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	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
Peak Head Resultant Acceleration		G's	115 to 137	126.0	Pass
Peak Head X Acceleration		G's	<15	2.8	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	10.1	Pass
			Overall Test Results		Pass

Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
126.0	3.0	0.0	-0.7



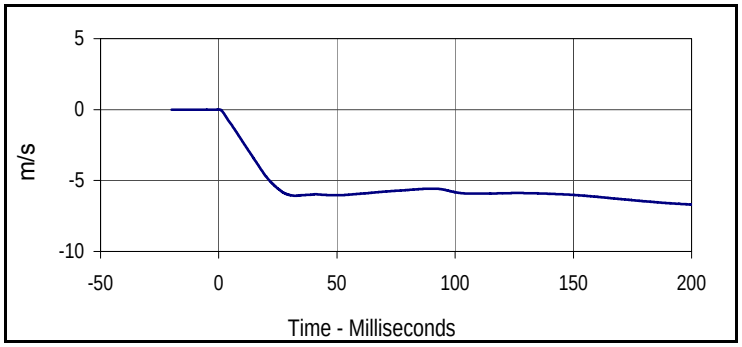
Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.8	3.5	-0.2	-1.5

Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
103.4	3.0	-1.8	0.0

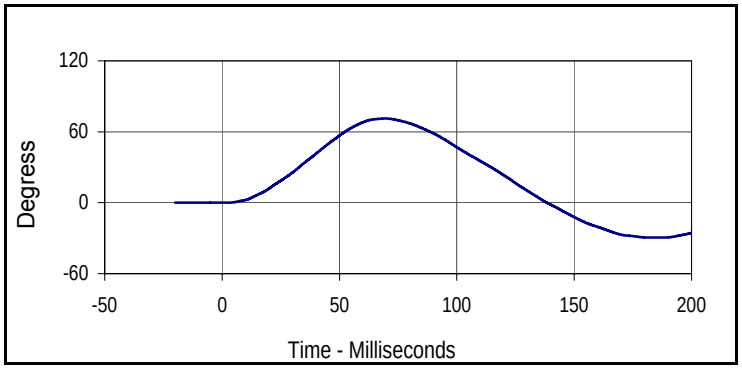
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
71.9	3.0	-0.7	0.0

Test Program:	SID IIs Neck Flexion Test	Test Date:	10/5/11
ATD Serial No.:	299	Test I.D.:	299NB019

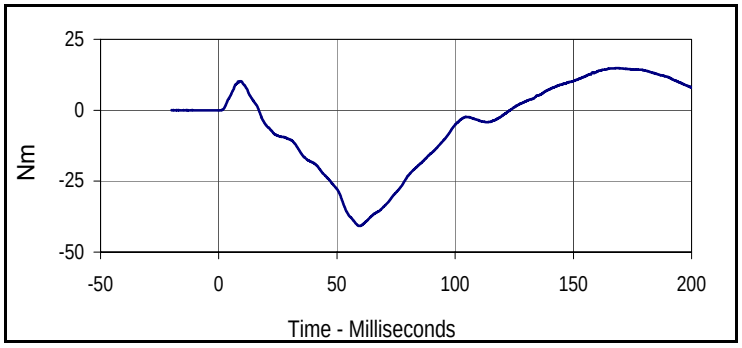
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	295	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.54	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.24	Pass
	15 msec	m/s	-3.30 to -4.10	-3.49	Pass
	20 msec	m/s	-4.40 to -5.40	-4.71	Pass
	25 msec	m/s	-5.40 to -6.10	-5.56	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.07	Pass
D-Plane Rotation	Max	Degrees	71 to 81	71.2	Pass
	Time	msec	50 to 70	69.6	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-40.8	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	123.3	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	-0.2	-6.7	200.0



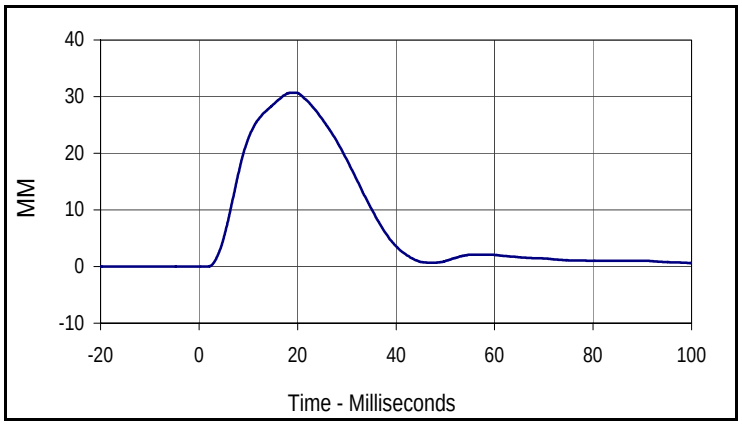
Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
71.2	69.6	-29.5	182.7



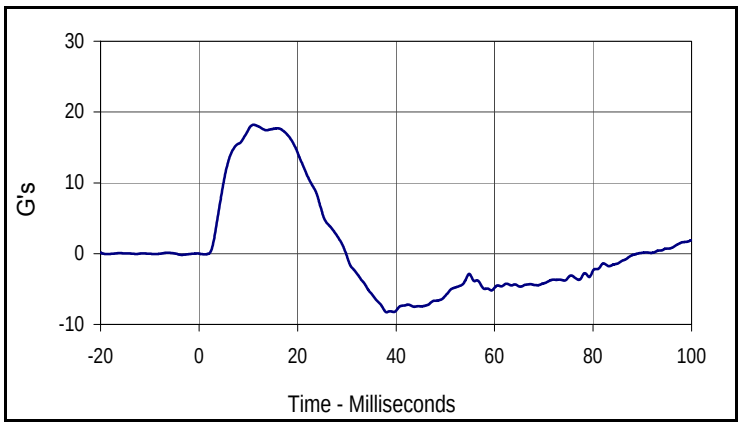
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
14.9	168.3	-40.8	59.8

Test Program:	SID IIs Shoulder Impact Test	Test Date:	10/5/11
ATD Serial No.:	299	Test I.D.:	299SH019

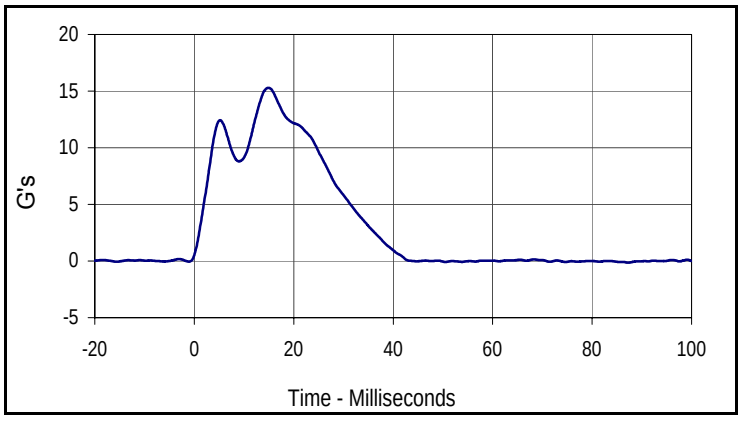
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	335	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.33	Pass
Peak Shoulder Deflection		mm	28 to 37	30.7	Pass
Peak Lateral Spine Acceleratrion Y		G's	17 to 22	18.2	Pass
Peak Impactor Acceleration		G's	13 to 18	15.3	Pass
			Overall Test Results		Pass



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
30.7	19.5	0.0	-16.7



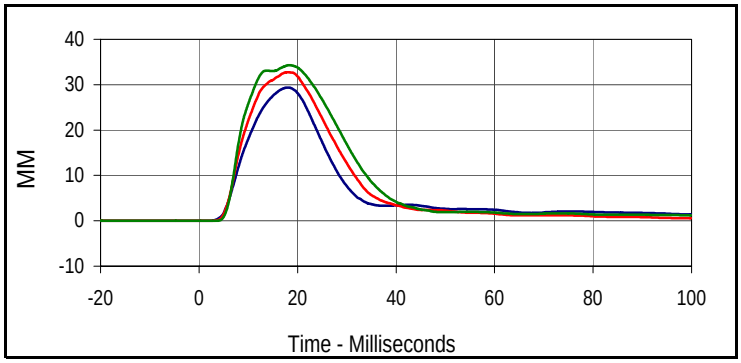
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.2	11.0	-8.3	38.1



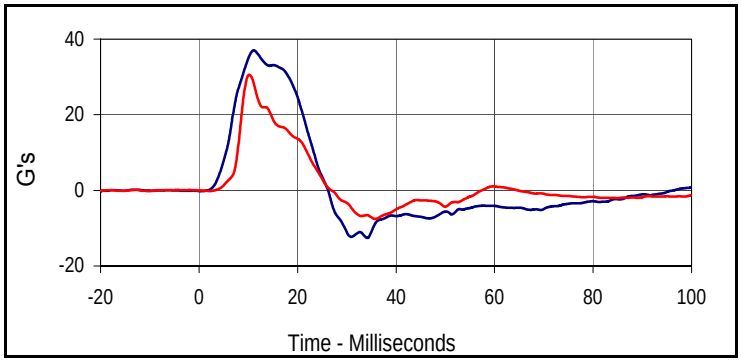
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.3	14.9	-0.1	87.2

Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	10/5/11
ATD Serial No.:	299	Test I.D.:	299TWA019

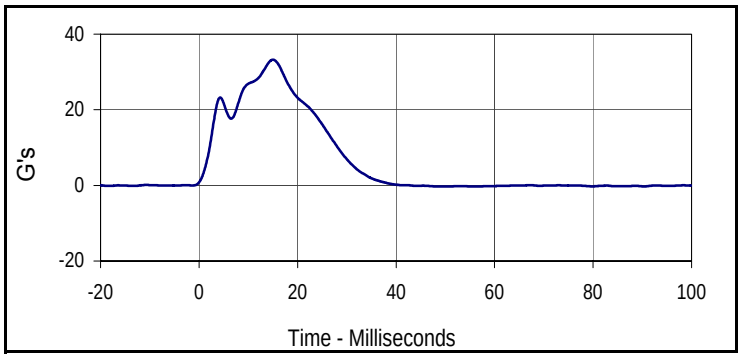
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	395	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.7	Pass
Peak Shoulder Deflection		mm	31 to 40	35.0	Pass
Peak Upper Thorax Rib Deflection		mm	25 to 32	29.3	Pass
Peak Middle Thorax Rib Deflection		mm	30 to 36	32.7	Pass
Peak Lower Thorax Rib Deflection		mm	32 to 38	34.3	Pass
Peak Upper Spine Y Acceleration		G's	34 to 43	37.1	Pass
Peak Lower Spine Y Acceleration		G's	29 to 37	30.6	Pass
Peak Impactor Acceleration		G's	30 to 36	33.2	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
29.3	18.0	0.0	-9.2
Middle Thorax Deflection			
Max	Time	Min	Time
32.7	17.9	0.0	-8.6
Lower Thorax Deflection			
Max	Time	Min	Time
34.3	18.3	0.0	-8.4

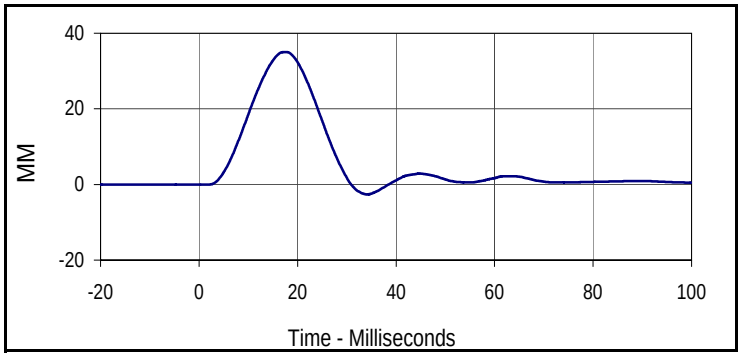


Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
37.1	11.1	-12.6	34.2
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
30.6	10.2	-7.6	35.8



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
33.2	15.0	-0.3	49.8

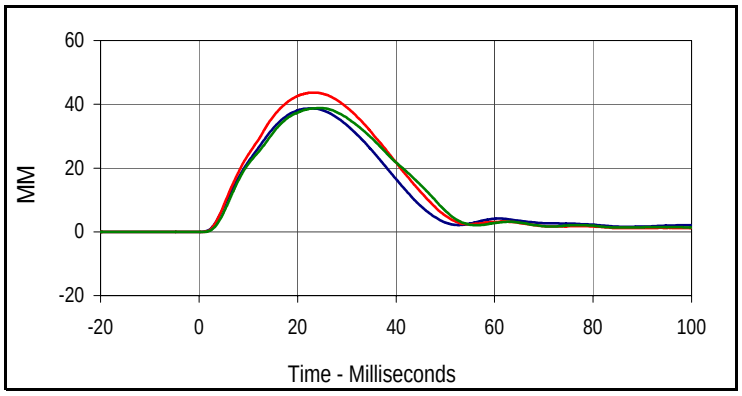
Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	10/5/11
ATD Serial No.:	299	Test I.D.:	299TWA019



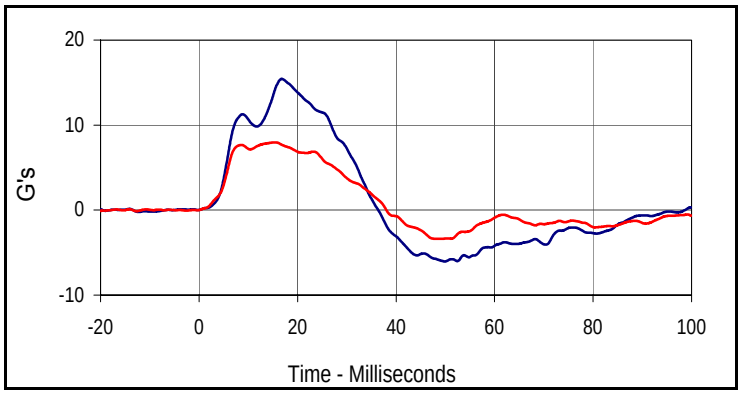
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
35.0	17.8	-2.6	34.1

Test Program:	SID IIs Thorax without Arm Impact Test	Test Date:	10/5/11
ATD Serial No.:	299	Test I.D.:	299TWOA019

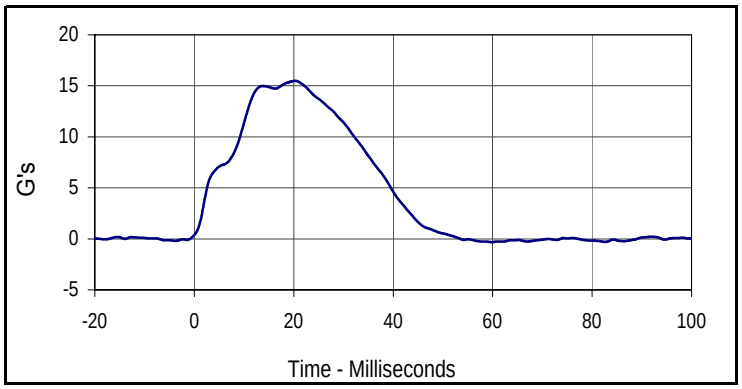
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	420	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	38.7	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	43.7	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	38.8	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	15.4	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	8.0	Pass
Peak Impactor Acceleration		G's	14 to 18	15.5	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
38.7	22.7	0.0	-5.1
Middle Thorax Deflection			
Max	Time	Min	Time
43.7	23.4	0.0	0.5
Lower Thorax Deflection			
Max	Time	Min	Time
38.8	24.6	0.0	-5.4



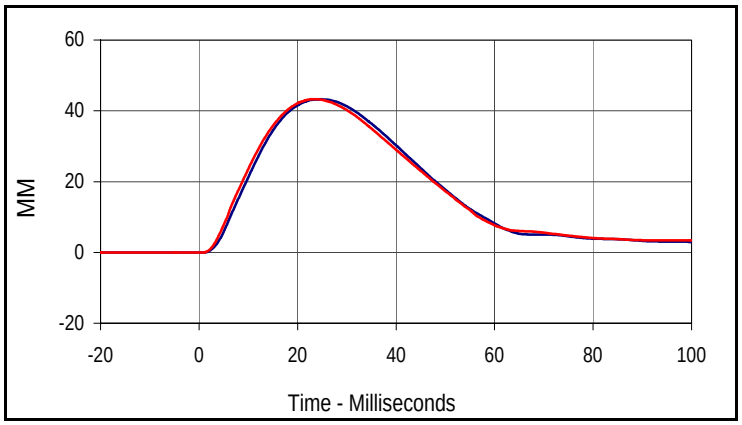
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.4	16.8	-6.0	49.9
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
8.0	15.4	-3.4	48.9



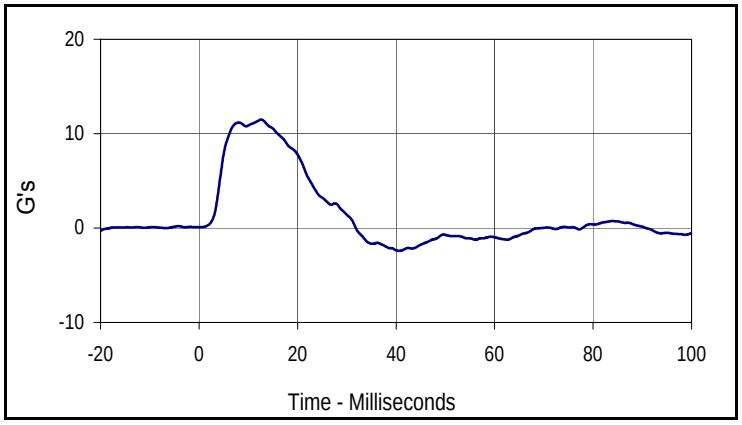
Curve Description			
Impactor Accleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
15.5	20.3	-0.3	59.9

Test Program:	SID IIs Abdomen Impact Test	Test Date:	10/5/11
ATD Serial No.:	299	Test I.D.:	299ABD019

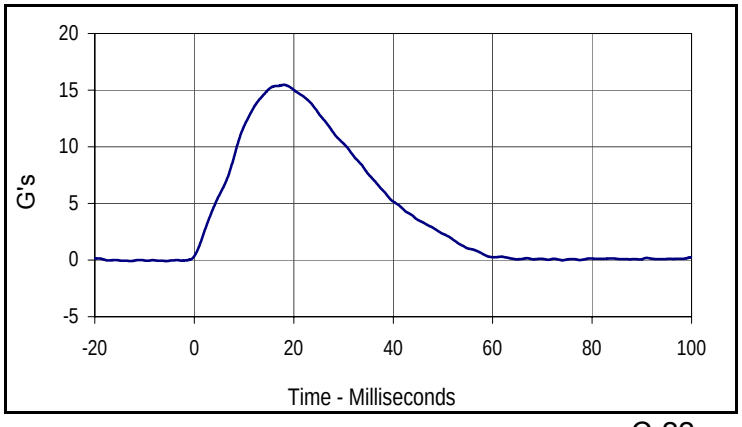
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	445	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.9	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Upper Abdominal Rib Deflection		mm	36 to 47	43.2	Pass
Peak Lower Abdominal Rib Deflection		mm	33 to 44	43.3	Pass
Peak Lower Spine Y Acceleration		G's	9 to 14	11.5	Pass
Peak Impactor Acceleration		G's	12 to 16	15.5	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
43.2	24.6	0.0	-2.8
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
43.3	23.5	0.0	-6.3



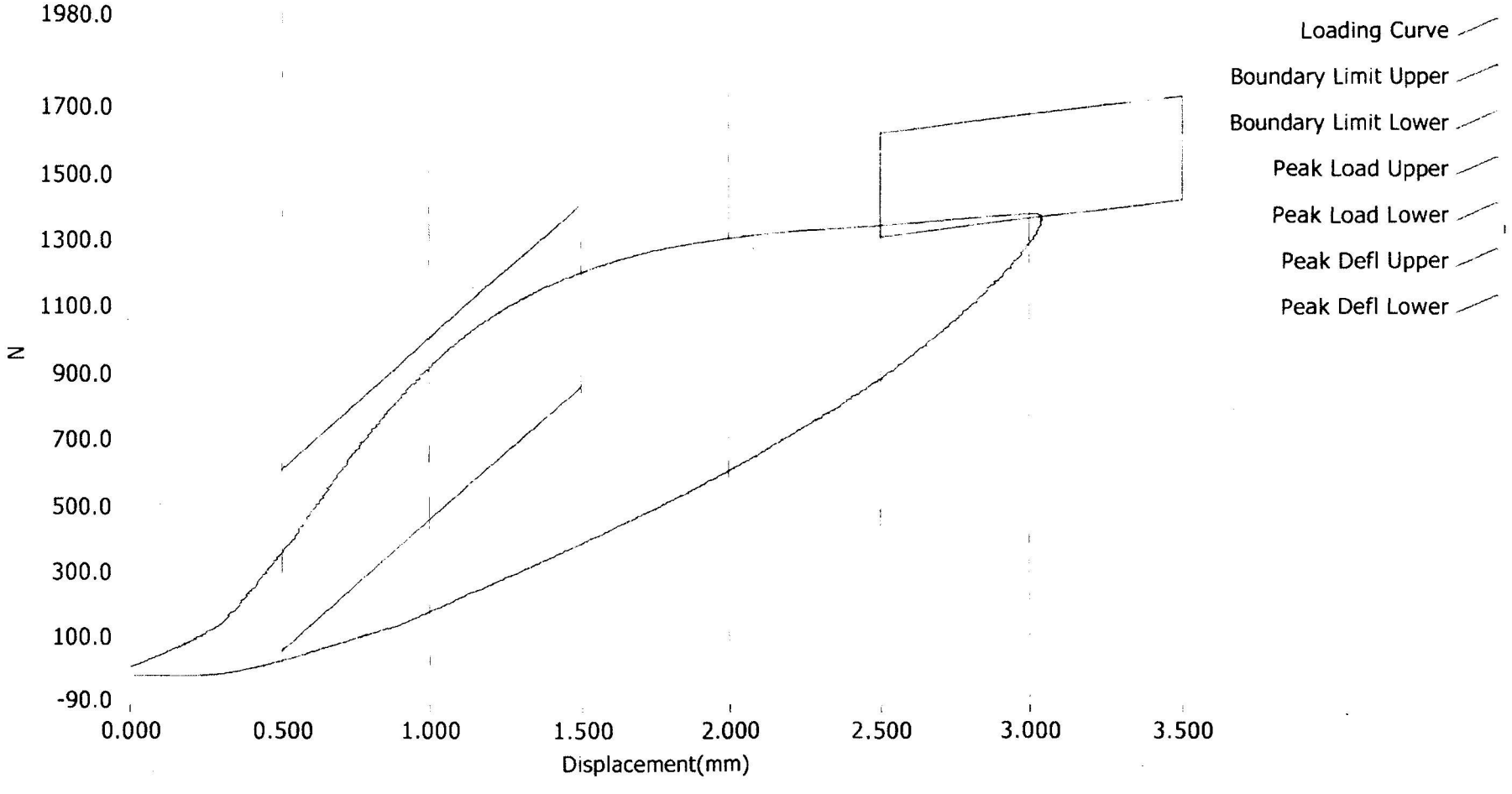
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
11.5	12.6	-2.4	40.6



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.5	18.0	-0.1	-12.7

MC0201 PRE TEST CAL

Resultant Data - SIDIIs Plug Compression



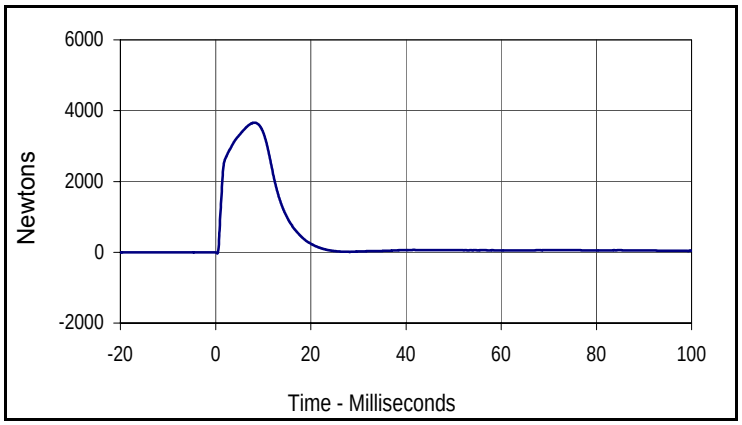
ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
		9/23/2010	12:18 AM
Cert ID	ATD Serial Number	ATD Type	
	36348	SIDIIs	

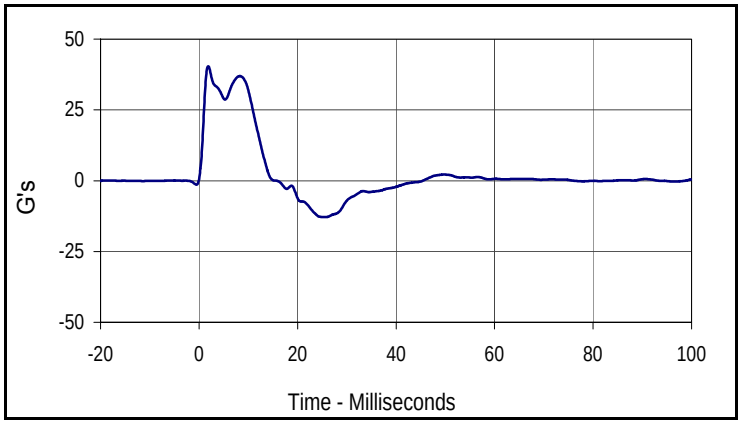
Current Date : 9/23/2010 Current Time : 00:20:05

Test Program:	SID IIs Pelvis Acetabulum Impact Test	Test Date:	10/5/11
ATD Serial No.:	299	Test I.D.:	299ACET019

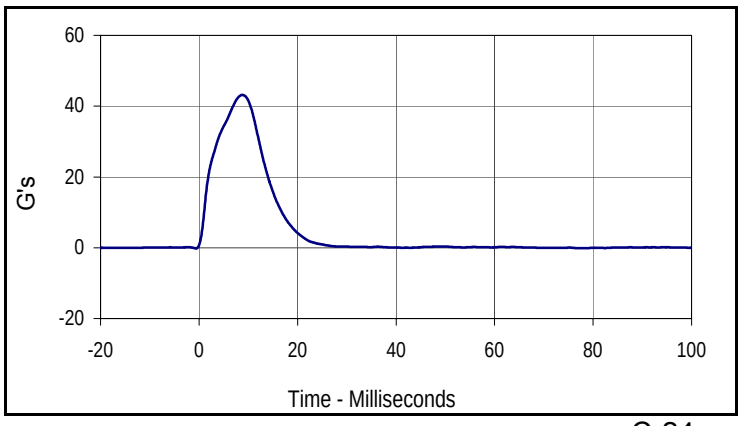
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	485	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.6	Pass
Peak Acetabulum Force Y		Newtons	3400 to 4200	3660.2	Pass
Peak Pelvis Y Acceleration After 6 msec.		G's	34 to 42	37.0	Pass
Peak Impactor Acceleration		G's	38 to 47	43.2	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3660.2	8.2	-32.0	0.4



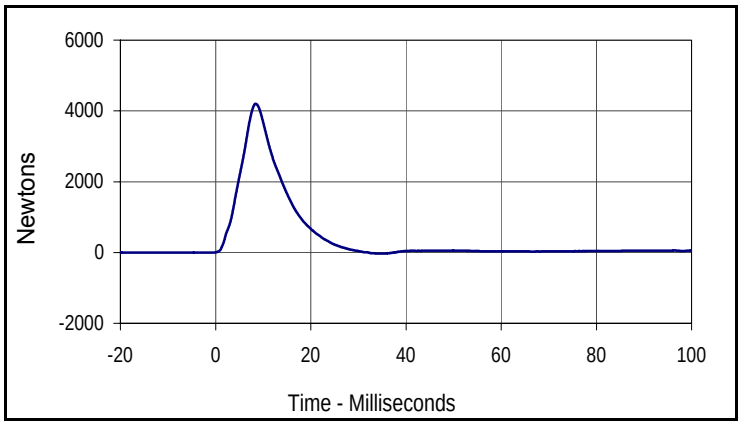
Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
40.4	1.9	-12.9	25.7



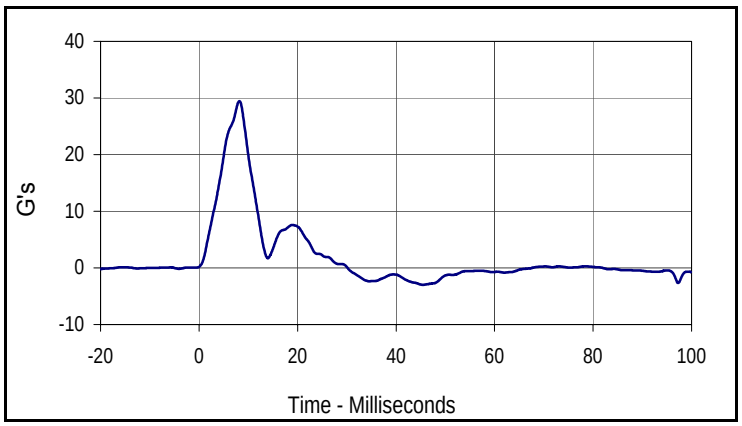
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
43.2	8.8	-0.2	-0.6

Test Program:	SID IIs Pelvis Iliac Calibration	Test Date:	10/5/11
ATD Serial No.:	299	Test I.D.:	299PL019

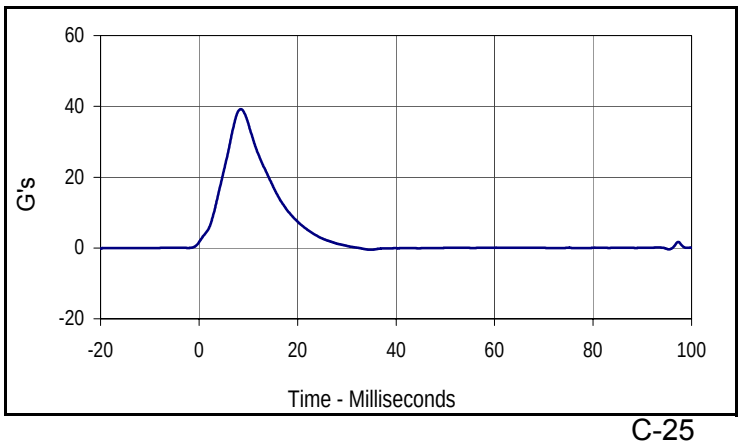
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	520	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.9	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Illiac Force		Newtons	4100 to 5100	4204.7	Pass
Peak Pelvis Y Acceleration		G's	28 to 39	29.5	Pass
Peak Impactor Acceleration		G's	36 to 45	39.2	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4204.7	8.4	-32.7	35.1



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
29.5	8.2	-3.0	45.4



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
39.2	8.5	-0.5	34.9

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

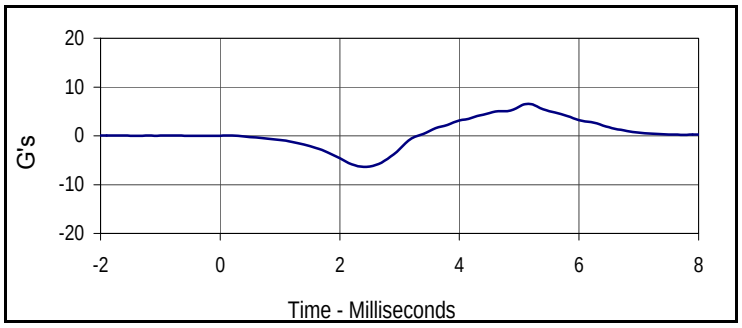
Test Program:	ES2re External Measurements	Test Date:	10/11/11
ATD Serial No.:	F037	Test I.D.:	N/A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
1	Sitting Height	mm	900 - 918	905	Pass
2	Seat to Shoulder Joint	mm	558 - 572	560	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	100	Pass
5	Sole to Seat, Sitting	mm	333 - 451	376	Pass
6	Head Width	mm	152 - 158	156	Pass
7	Shoulder / Arm Width	mm	461 - 479	469	Pass
8	Thorax Width	mm	322 - 332	331	Pass
9	Abdomen Width	mm	273 - 287	279	Pass
10	Pelvis Lap Width	mm	359 - 373	361	Pass
11	Head Depth	mm	196 - 206	202	Pass
12	Thorax Depth	mm	262 - 272	269	Pass
13	Abdomen Width	mm	194 - 204	202	Pass
14	Pelvis Depth	mm	235 - 245	239	Pass
15	Back of Buttocks to Hip Joint (Center of Bolt)	mm	150 - 160	159	Pass
16	Back of Buttocks to Front Knee	mm	597 - 615	612	Pass
			Overall Test Results		Pass

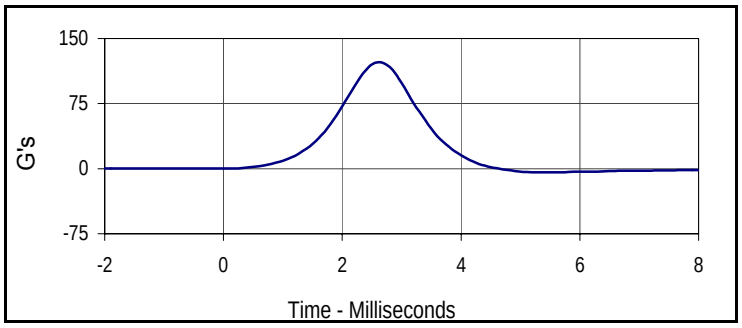
Test Program:	ES2re Head Drop Test	Test Date:	10/11/11
ATD Serial No.:	F037	Test I.D.:	F037HD013

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		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	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
Peak Head Resultant Acceleration		G's	125 to 155	146.2	Pass
Peak Head X Acceleration		G's	≤15	6.5	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	6.7	Pass
			Overall Test Results		Pass

Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
146.2	2.6	0.1	0.1



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
6.5	5.2	-6.3	2.4

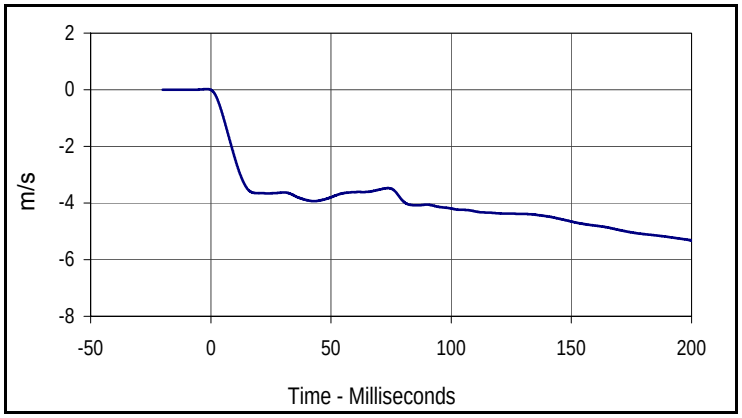


Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
122.6	2.6	-4.4	5.4

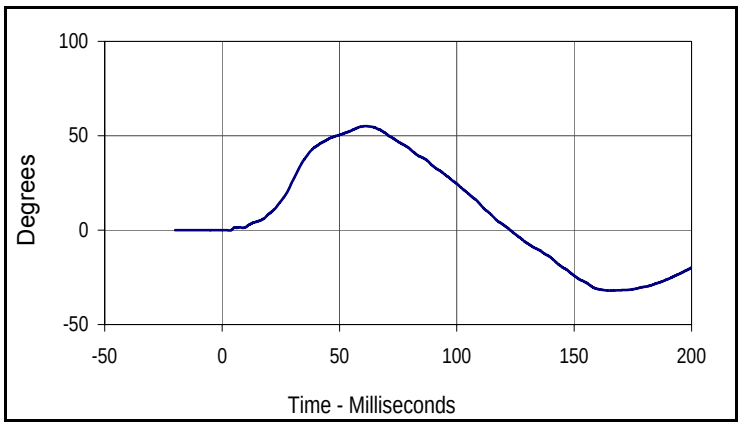
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
79.3	2.6	-0.2	0.0

Test Program:	ES2re Neck Flexion Test	Test Date:	10/11/11
ATD Serial No.:	F037	Test I.D.:	F037NB013

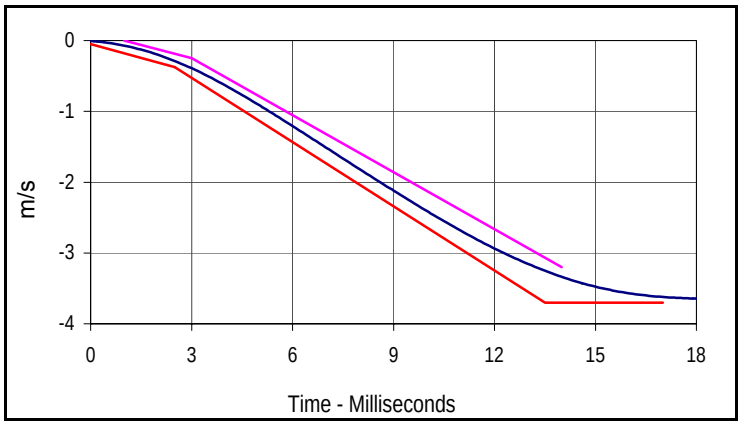
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	310	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Velocity		m/s	3.3 to 3.5	3.3	Pass
Headform Flexion	Max	Degrees	49 to 59	55.1	Pass
	Time	msec	54 to 66	61.4	Pass
Headform Flexion Decay (Peak to Zero)		msec	53 to 88	61.4	Pass
			Overall Test Results		Pass



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



Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
55.1	61.4	-32.0	164.8

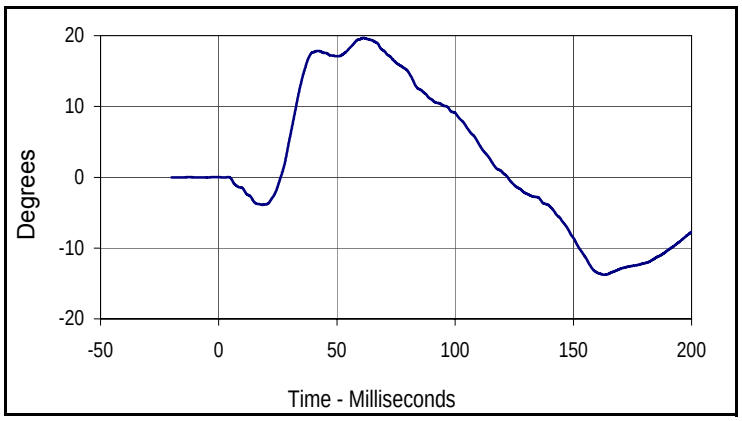


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.6	-5.3	200.0

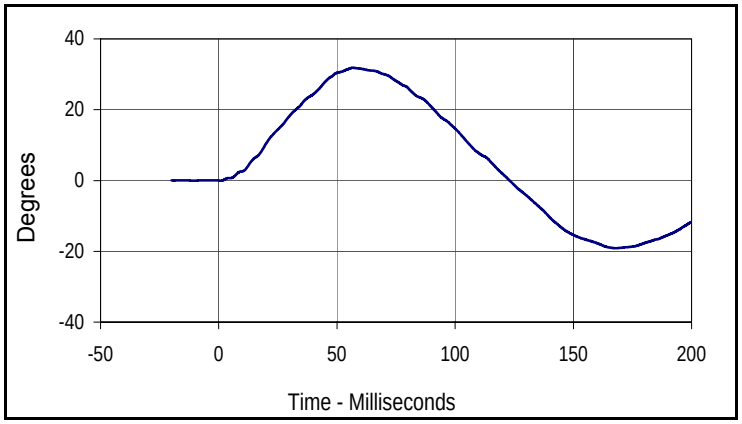
Velocity Corridors

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

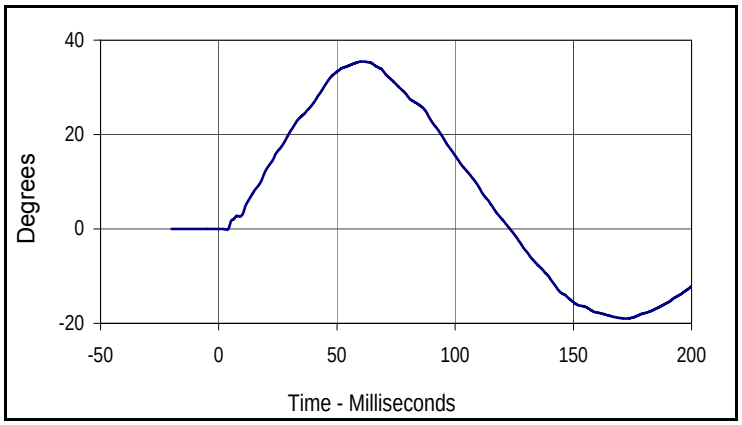
Test Program:	ES2re Neck Flexion Test	Test Date:	10/11/11
ATD Serial No.:	F037	Test I.D.:	F037NB013



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
19.7	61.3	-13.8	163.2



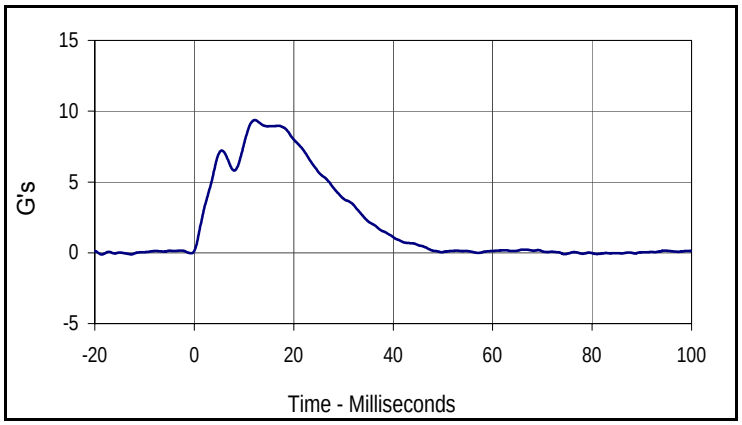
Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
31.8	56.6	-19.1	167.9



Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
35.5	60.2	-19.0	172.0

Test Program:	ES2re Shoulder Impact Test	Test Date:	10/11/11
ATD Serial No.:	F037	Test I.D.:	F037SH013

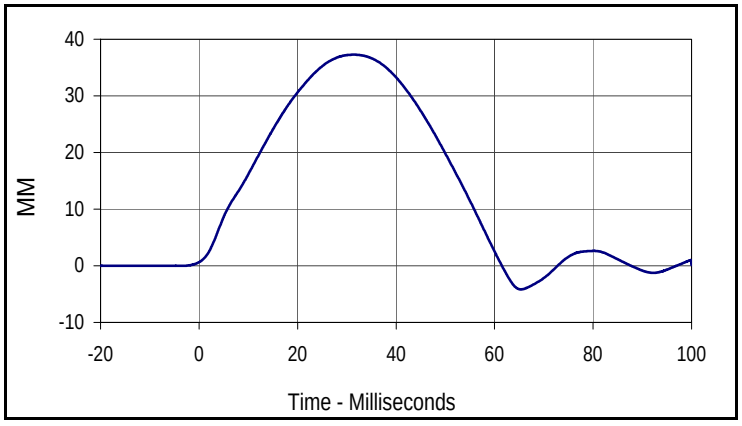
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	275	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	20.8	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Speed		m/s	4.2 to 4.4	4.3	Pass
Peak Impactor Acceleration		G's	7.5 to 10.5	9.4	Pass
			Overall Test Results		Pass



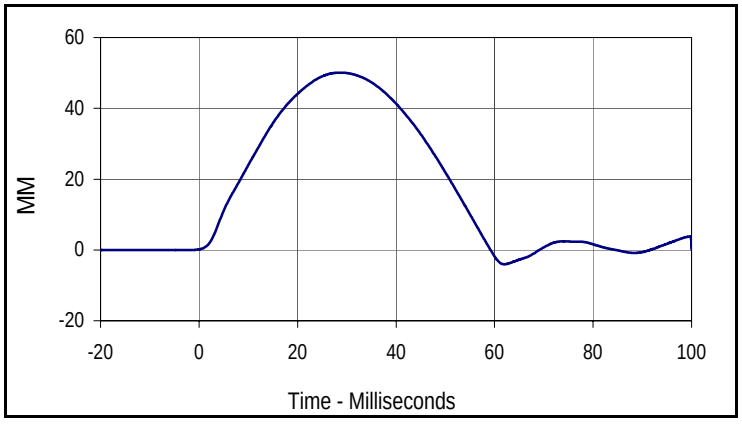
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
001	FIL	180	G's
Max	Time	Min	Time
9.4	12.2	-0.1	-18.6

Test Program:	ES2re Thorax - Rib Drop Test	Test Date:	10/11/11
ATD Serial No.:	F037 Rib #1	Test I.D.:	F037RB1013

Tested Parameter		Units	Specification	Result	Pass/Fail
Rib Module Soak Time		Minutes	≥240	310	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	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	29.8	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height		mm	36 to 40	37.3	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height		mm	46 to 51	50.1	Pass
			Overall Test Results		Pass



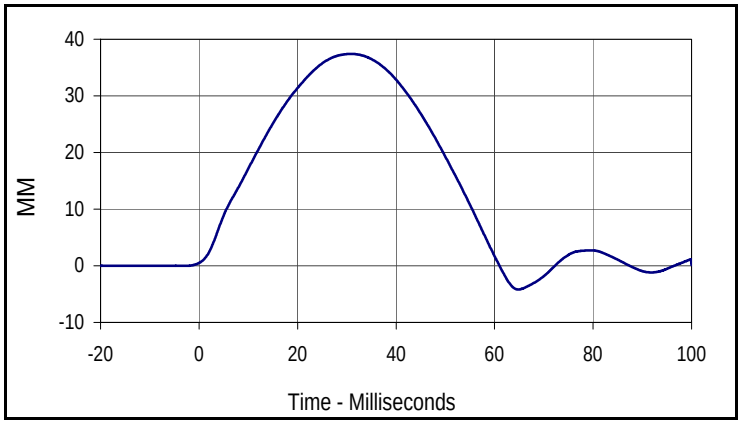
Curve Description			
Upper Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
37.3	31.5	-4.2	65.4



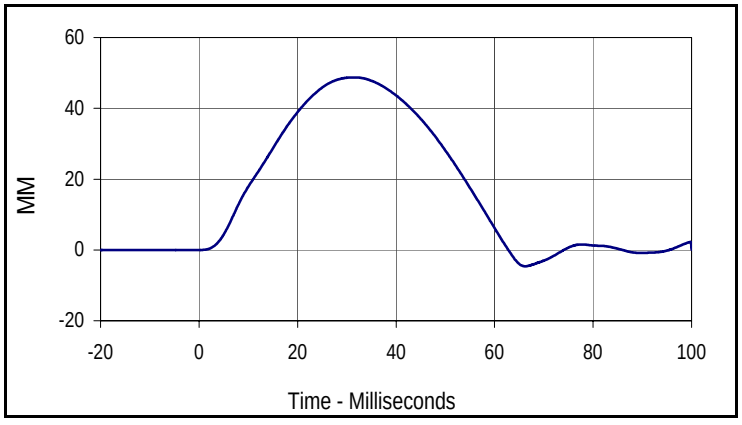
Curve Description			
Upper Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
50.1	28.7	-4.1	62.0

Test Program:	ES2re Thorax - Rib Drop Test	Test Date:	10/11/11
ATD Serial No.:	F037 Rib #2	Test I.D.:	F037RB2013

Tested Parameter		Units	Specification	Result	Pass/Fail
Rib Module Soak Time		Minutes	≥240	335	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	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	30.0	Pass
Peak Rib Deflection at 459 +/- 5 mm Drop Height		mm	36 to 40	37.4	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height		mm	46 to 51	48.7	Pass
			Overall Test Results		Pass



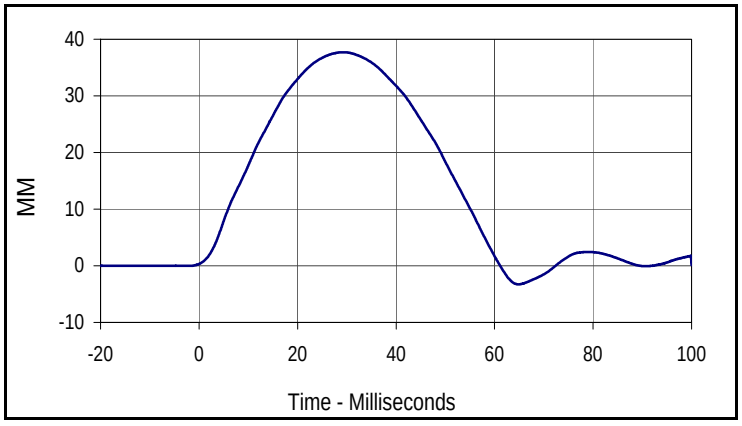
Curve Description			
Middle Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
37.4	30.9	-4.2	64.8



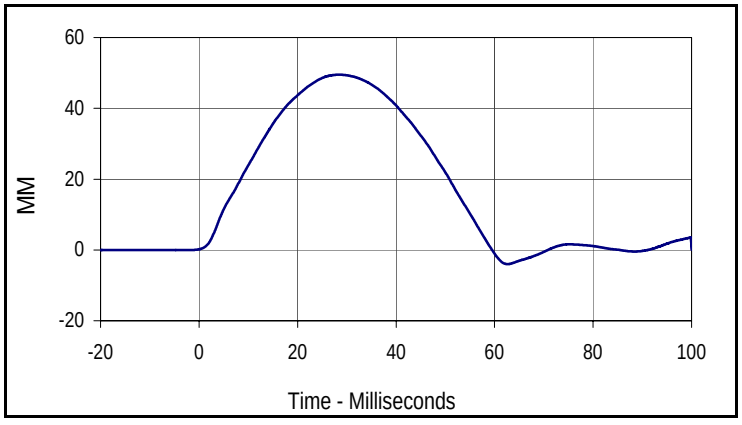
Curve Description			
Middle Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max	Time	Min	Time
48.7	31.5	-4.6	66.2

Test Program:	ES2re Thorax - Rib Drop Test	Test Date:	10/11/11
ATD Serial No.:	F037 Rib # 3	Test I.D.:	F037RB3013

Tested Parameter		Units	Specification	Result	Pass/Fail
Rib Module Soak Time		Minutes	≥240	360	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	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
Peak Rib Deflection at 459 +/- 5 mm Drop Height		mm	36 to 40	37.7	Pass
Peak Rib Deflection at 815 +/- 8 mm Drop Height		mm	46 to 51	49.5	Pass
			Overall Test Results		Pass



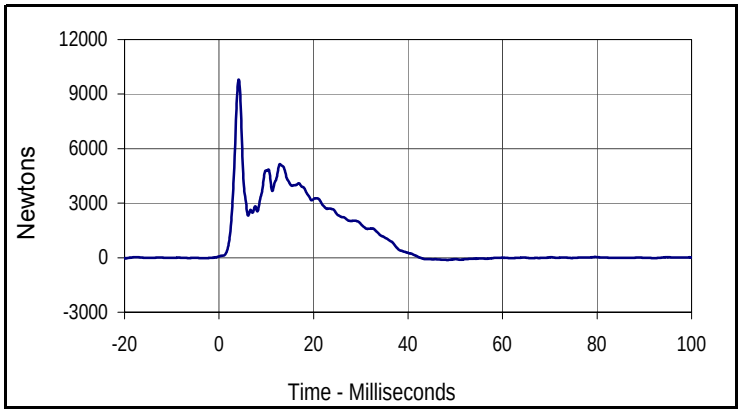
Curve Description			
Lower Rib Deflection (459 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
37.7	29.2	-3.3	64.9



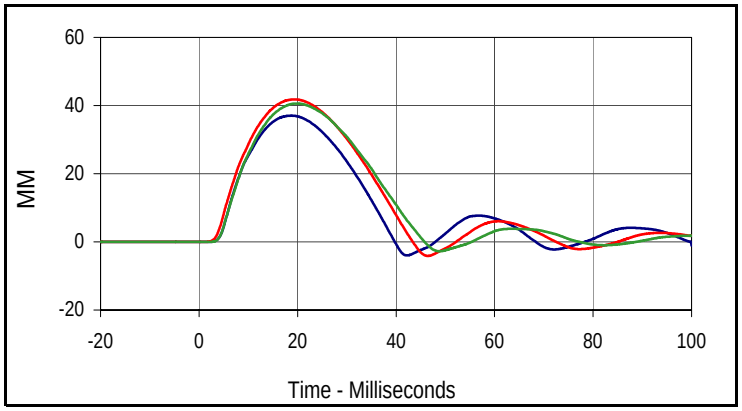
Curve Description			
Lower Rib Deflection (815 mm Drop Height)			
Plot No.	Type	SAE Class	Units
001	FIL	180	MM
Max	Time	Min	Time
49.5	28.4	-4.0	62.6

Test Program:	ES2re Thorax - Full Body Impact Test	Test Date:	10/11/11
ATD Serial No.:	F037	Test I.D.:	F035TH013

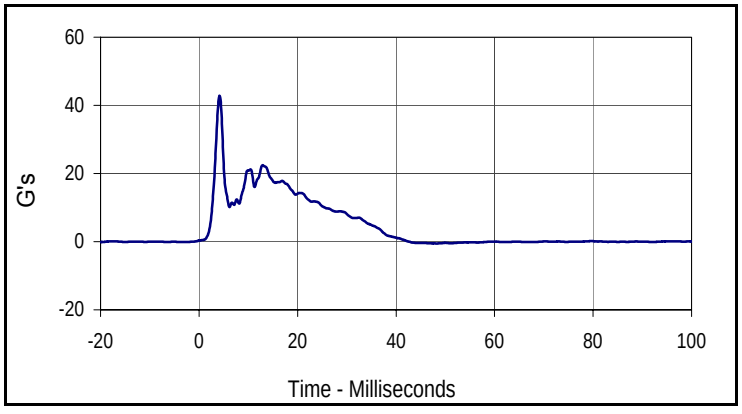
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	405	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.5	Pass
Peak Impactor Velocity		m/s	5.4 to 5.6	5.5	Pass
Peak Impactor Force		N	5100 to 6200	5143.5	Pass
		msec	> 6.0 msec	12.9	Pass
Peak Upper Rib Deflection		mm	34 to 41	37.0	Pass
Peak Middle Rib Deflection		mm	37 to 45	41.8	Pass
Peak Lower Rib Deflection		mm	37 to 44	40.6	Pass
			Overall Test Results		Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
9804.3	4.2	-125.5	48.3



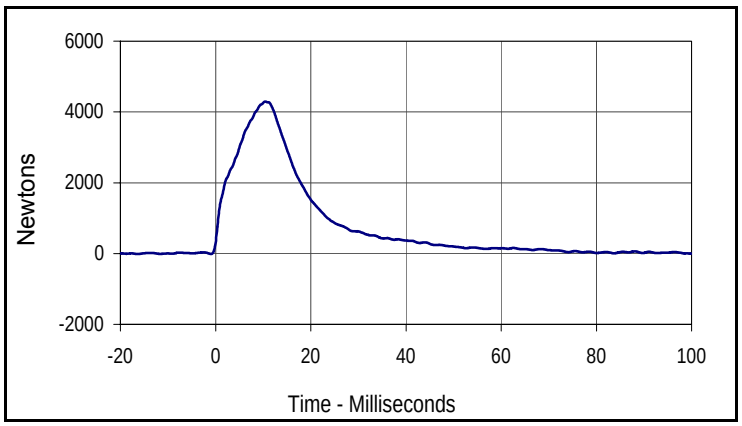
Curve Description			
Upper, Middle, Lower Rib Deflections			
Plot No.	Type	SAE Class	Units
002	FIL	180	MM
Max (Upper)	Time	Min (Upper)	Time
37.0	18.7	-4.0	42.2
Max (Middle)	Time	Min (Middle)	Time
41.8	19.4	-4.1	46.4
Max (Lower)	Time	Min (Lower)	Time
40.6	19.8	-2.8	48.8



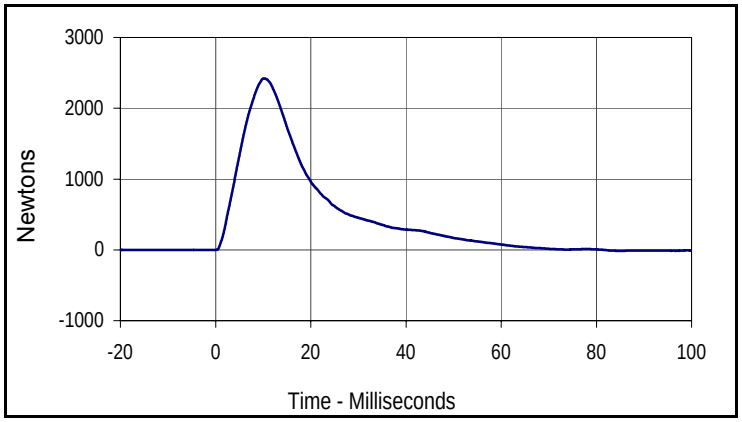
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
42.8	4.2	-0.5	48.3

Test Program:	ES2re Abodomen Impact Test	Test Date:	10/11/11
ATD Serial No.:	F037	Test I.D.:	F037ABD013

Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	430	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	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	4293.2	Pass
		msec	10.6 to 13.0	11.8	Pass
Sum of Abdominal Forces		N	2200 to 2700	2422.6	Pass
		msec	10.0 to 12.3	11.5	Pass
			Overall Test Results		Pass

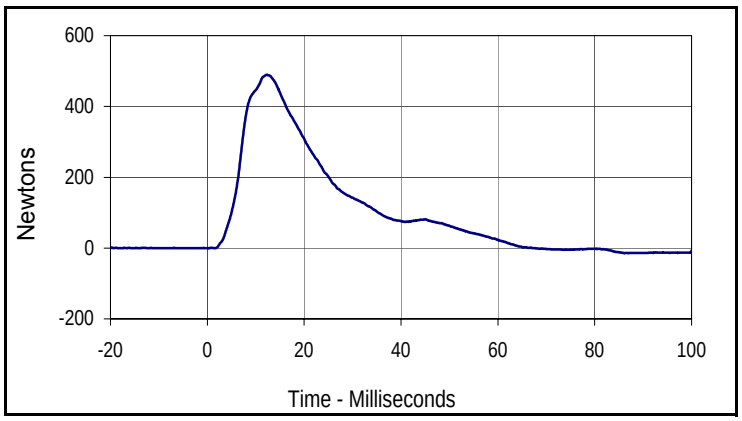


Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4293.2	11.8	-15.4	-15.0

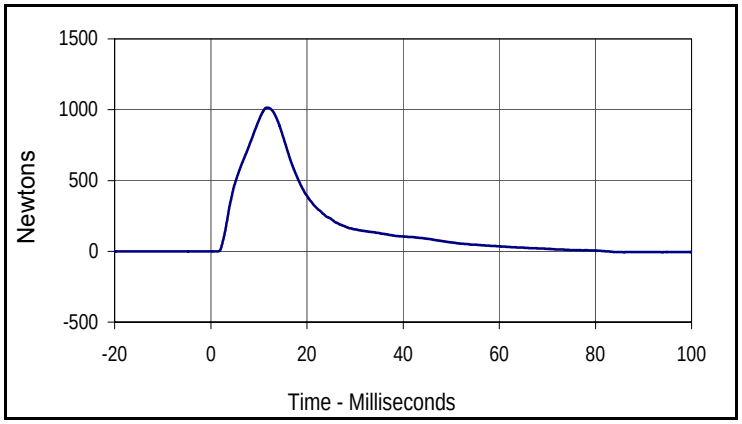


Curve Description			
Abdomen Sum Resultant			
Plot No.	Type	SAE Class	Units
002	RES	600	Newtons
Max	Time	Min	Time
2422.6	11.5	-14.8	86.0

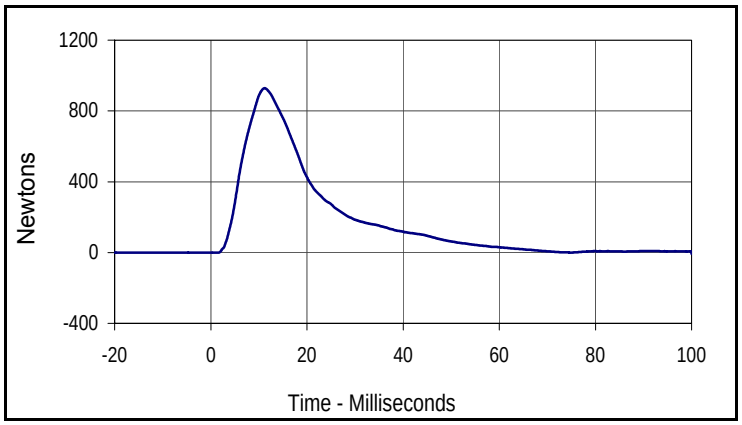
Test Program:	ES2re Abodomen Impact Test	Test Date:	10/11/11
ATD Serial No.:	F037	Test I.D.:	F037ABD013



Curve Description			
Front Abdomen Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
489.3	12.2	-14.3	86.2



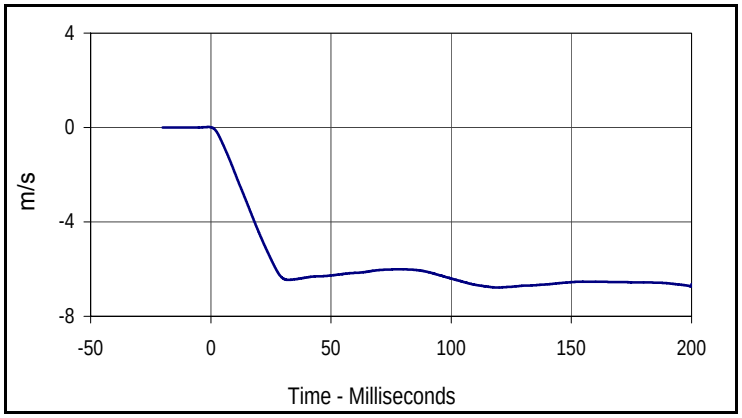
Curve Description			
Middle Abdomen Force			
Plot No.	Type	SAE Class	Units
004	FIL	600	Newtons
Max	Time	Min	Time
1013.9	11.7	-8.5	0.0



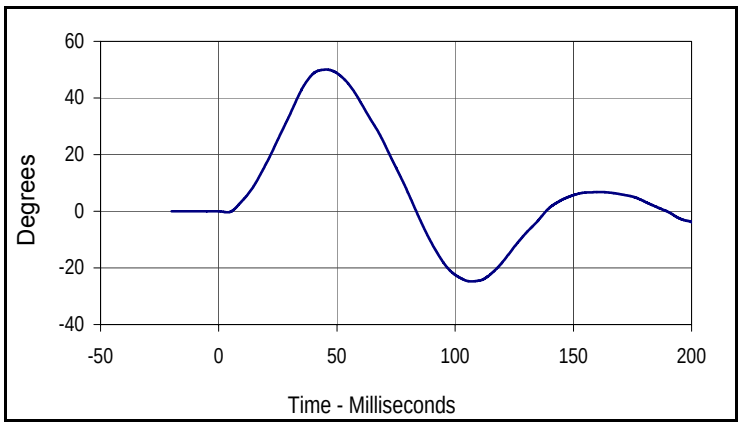
Curve Description			
Rear Abdomen Force			
Plot No.	Type	SAE Class	Units
005	FIL	600	Newtons
Max	Time	Min	Time
928.3	11.2	-8.5	0.0

Test Program:	ES2re Lumbar Flexion Test	Test Date:	10/11/11
ATD Serial No.:	F037	Test I.D.:	F035LB013

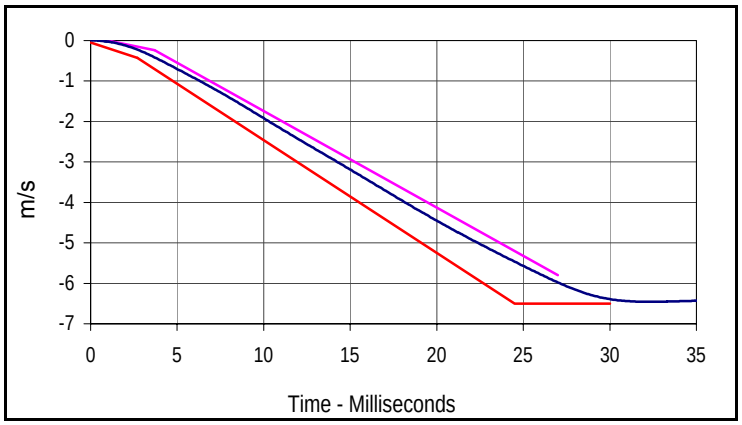
Tested Parameter		Units	Specification	Result	Pass/Fail
Lumbar Spine Assembly Soak Time		Minutes	≥240	510	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Velocity		m/s	5.95 to 6.15	5.97	Pass
Headform Rotation	Max	Degrees	45 to 55	50.0	Pass
	Time	msec	39 to 53	45.4	Pass
Time of Decay to Zero Angle from Peak		msec	37 to 57	38.2	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	-1.0	-6.8	119.2



Curve Description			
Headform Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	180	Degrees
Max	Time	Min	Time
50.0	45.4	-24.8	106.9

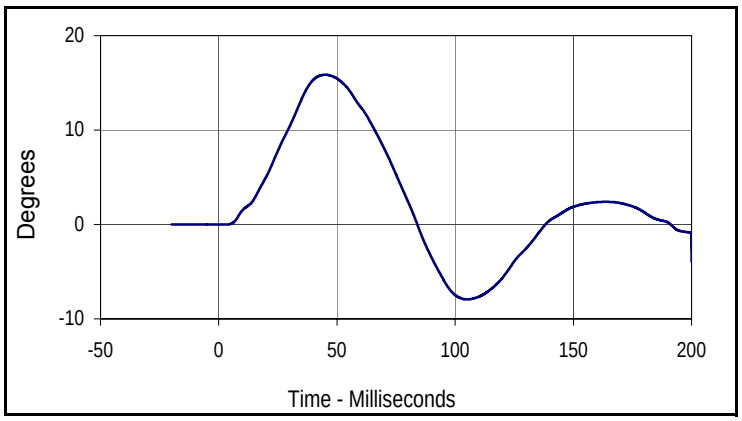


Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	60	m/s
Max	Time	Min	Time
0.0	-1.0	-6.8	119.2

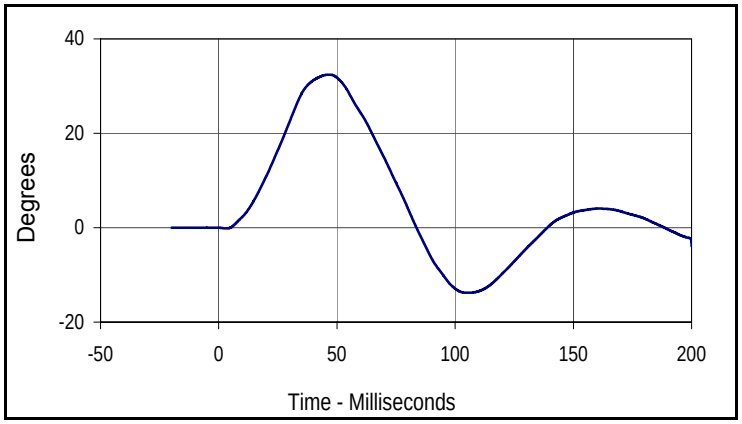
Velocity Corridors

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

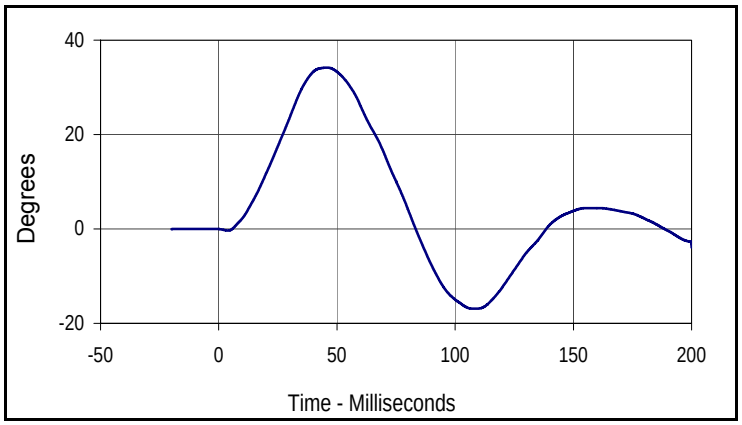
Test Program:	ES2re Lumbar Flexion Test	Test Date:	10/11/11
ATD Serial No.:	F037	Test I.D.:	F035LB013



Curve Description			
Potentiometer A			
Plot No.	Type	SAE Class	Units
003	FIL	180	Degrees
Max	Time	Min	Time
15.9	45.0	-7.9	105.0



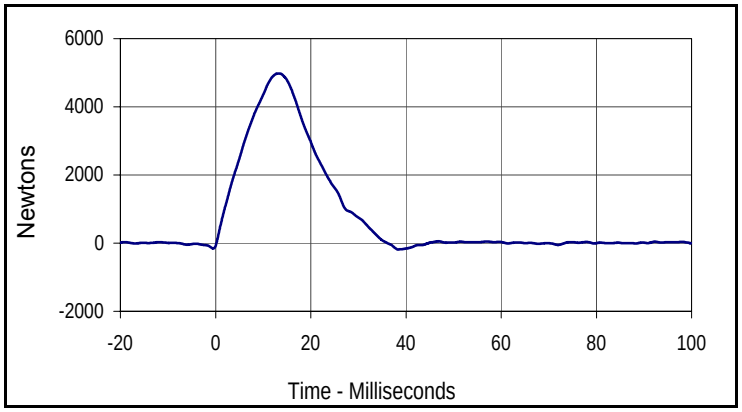
Curve Description			
Potentiometer B			
Plot No.	Type	SAE Class	Units
004	FIL	180	Degrees
Max	Time	Min	Time
32.4	46.8	-13.8	105.2



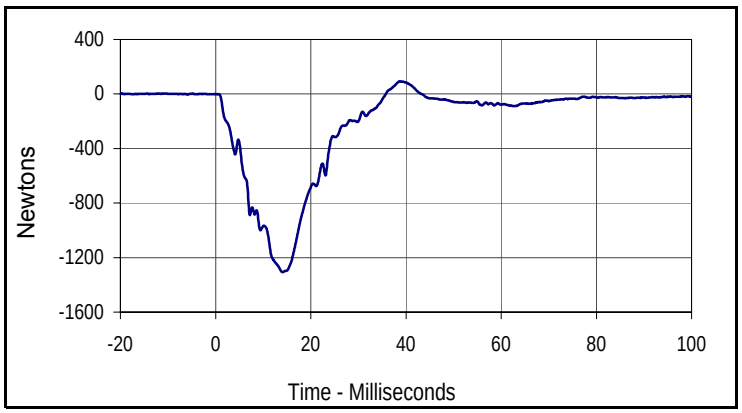
Curve Description			
Potentiometer C			
Plot No.	Type	SAE Class	Units
005	FIL	180	Degrees
Max	Time	Min	Time
34.2	45.8	-16.9	107.8

Test Program:	ES2re Pelvis Impact Test	Test Date:	10/11/11
ATD Serial No.:	F037	Test I.D.:	F035PL013

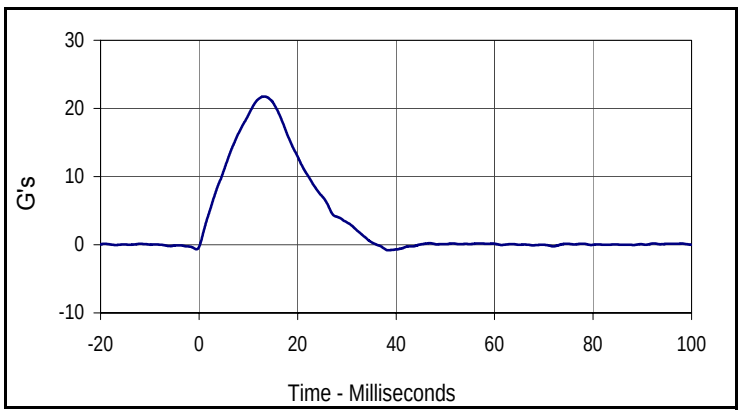
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	455	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Impactor Force		N	4700 to 5400	4978.4	Pass
		msec	11.8 to 16.1	13.1	Pass
Peak Pubic Symphysis Load		N	-1230 to -1590	-1306.2	Pass
		msec	12.2 to 17.0	14.1	Pass
			Overall Test Results		Pass



Curve Description			
Impactor Force			
Plot No.	Type	SAE Class	Units
001	FIL	180	Newtons
Max	Time	Min	Time
4978.4	13.1	-185.8	38.4



Curve Description			
Pubic Symphysis Force Y			
Plot No.	Type	SAE Class	Units
002	FIL	600	Newtons
Max	Time	Min	Time
92.5	38.8	-1306.2	14.1



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
21.7	13.1	-0.8	38.4

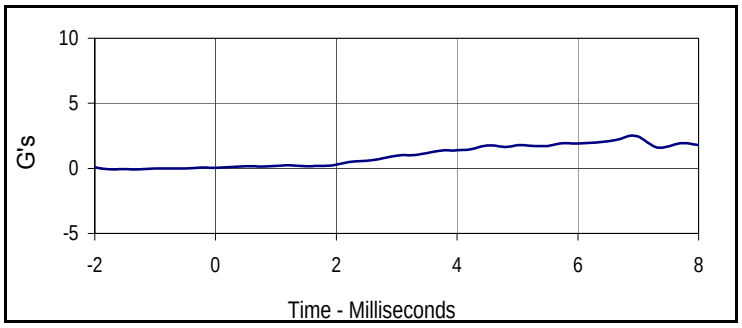
Test Program:	SID IIs External Measurements	Test Date:	10/11/11
ATD Serial No.:	299	Test I.D.:	N/A

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	775	Pass
B	Shoulder Pivot Height	mm	437 - 453	441	Pass
C	H-Point Height	mm	79 - 89	80	Pass
D	H-Point from Seatback	mm	141 - 151	147	Pass
E	Shoulder Pivot from Backline	mm	97 - 107	101	Pass
F	Thigh Clearance	mm	119 - 135	125	Pass
G	Head Breadth	mm	140 - 148	146	Pass
H	Head Back from Backline	mm	40 - 46	45	Pass
I	Head Depth	mm	178 - 188	186	Pass
J	Head Circumference	mm	541 - 551	549	Pass
K	Buttock to Knee Length	mm	514 - 540	527	Pass
L	Popliteal Height	mm	343 - 369	352	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	399	Pass
N	Buttock Popliteal Length	mm	416 - 442	429	Pass
O	Chest Depth w/o Jacket	mm	195 - 211	200	Pass
P	Foot Length	mm	216 - 232	220	Pass
Q	Hip Breadth with Pelvic Plug	mm	313 -323	315	Pass
R	Arm Length	mm	249 - 259	256	Pass
S	Knee Joint to Seatback	mm	477 - 493	485	Pass
V	Shoulder Width	mm	341 - 357	350	Pass
W	Foot Width	mm	78 - 94	92	Pass
Y	Chest Circumference with Jacket	mm	851 - 881	878	Pass
Z	Waist Circumference	mm	760 - 791	773	Pass
			Overall Test Results		Pass

Test Program:	SID IIs Head Drop Test	Test Date:	10/11/11
ATD Serial No.:	299	Test I.D.:	299HD020

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	260	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.6	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	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	30.0	Pass
Peak Head Resultant Acceleration		G's	115 to 137	124.9	Pass
Peak Head X Acceleration		G's	<15	1.9	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse		%	<15	11.4	Pass
			Overall Test Results		Pass

Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
124.9	3.1	0.0	-0.4



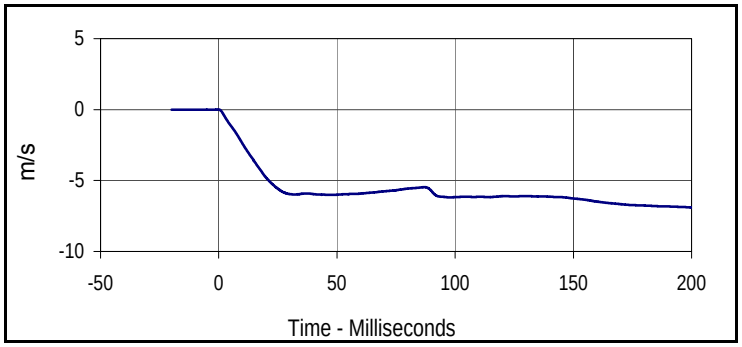
Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.9	5.8	-0.1	-1.7

Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
101.3	3.0	-1.9	6.6

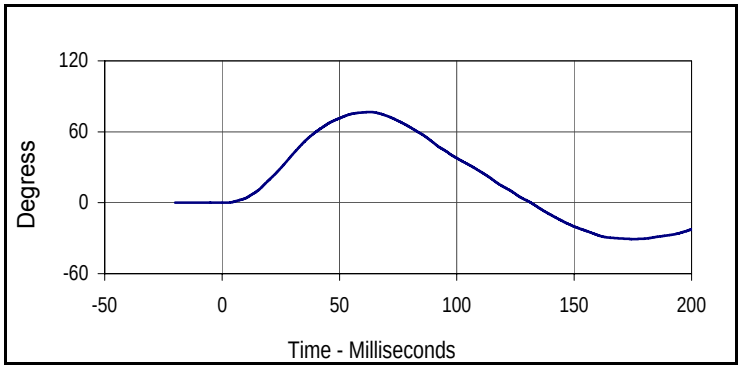
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
73.1	3.1	-0.7	0.0

Test Program:	SID IIs Neck Flexion Test	Test Date:	10/11/11
ATD Serial No.:	299	Test I.D.:	299NB020

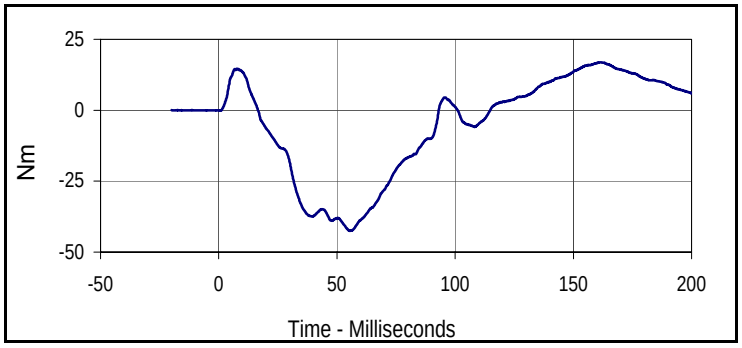
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	345	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.55	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.38	Pass
	15 msec	m/s	-3.30 to -4.10	-3.63	Pass
	20 msec	m/s	-4.40 to -5.40	-4.79	Pass
	25 msec	m/s	-5.40 to -6.10	-5.58	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.18	Pass
D-Plane Rotation	Max	Degrees	71 to 81	76.7	Pass
	Time	msec	50 to 70	63.1	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-42.5	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	114.9	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
0.0	-0.4	-6.9	200.0



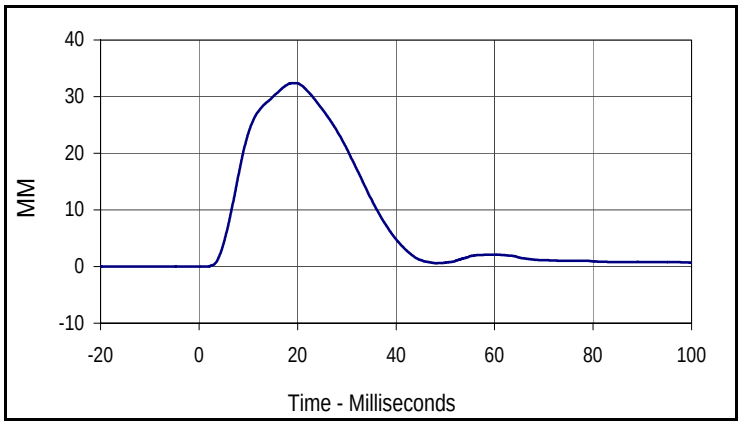
Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
76.7	63.1	-30.7	175.3



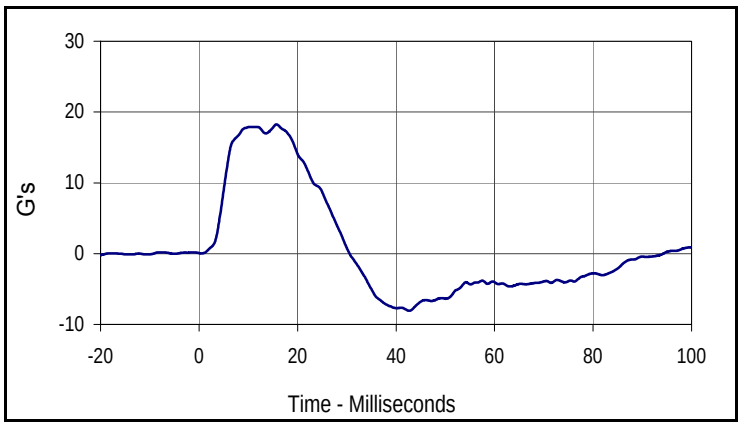
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
16.9	161.7	-42.5	55.5

Test Program:	SID IIs Shoulder Impact Test	Test Date:	10/11/11
ATD Serial No.:	299	Test I.D.:	299SH020

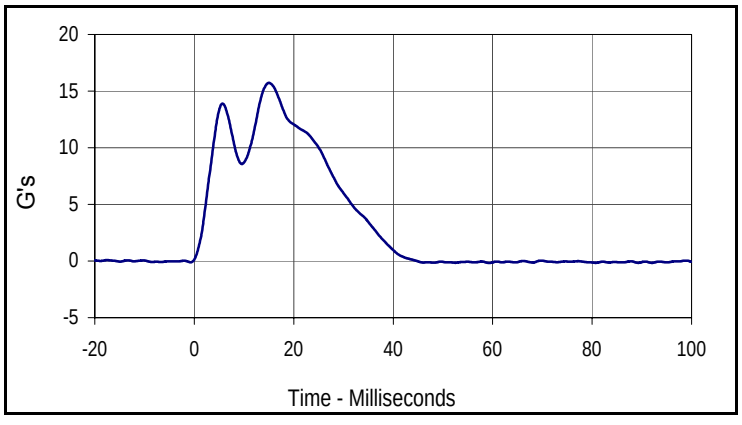
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	375	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.5	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.32	Pass
Peak Shoulder Deflection		mm	28 to 37	32.4	Pass
Peak Lateral Spine Acceleratrion Y		G's	17 to 22	18.2	Pass
Peak Impactor Acceleration		G's	13 to 18	15.7	Pass
			Overall Test Results		Pass



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
32.4	19.1	0.0	-6.3



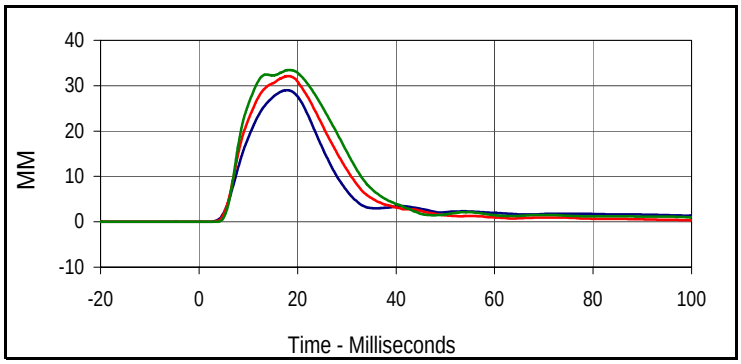
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.2	15.7	-8.1	42.6



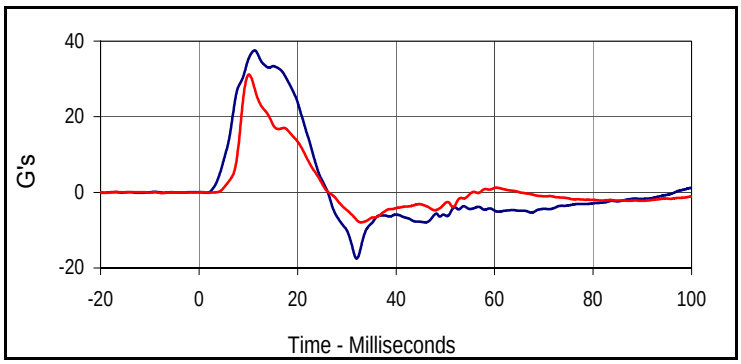
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.7	15.0	-0.2	59.3

Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	10/11/11
ATD Serial No.:	299	Test I.D.:	299TWA020

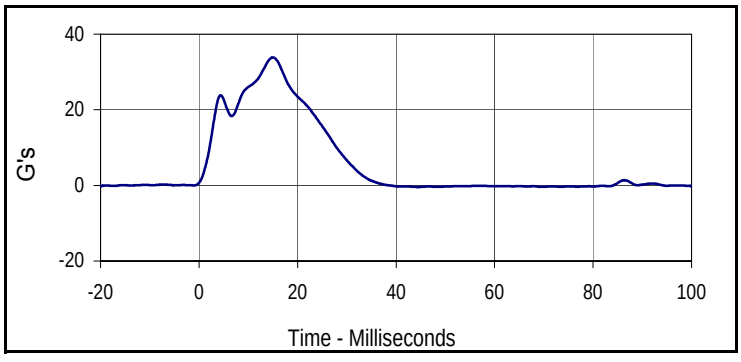
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	400	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.7	Pass
Peak Shoulder Deflection		mm	31 to 40	35.0	Pass
Peak Upper Thorax Rib Deflection		mm	25 to 32	29.0	Pass
Peak Middle Thorax Rib Deflection		mm	30 to 36	32.1	Pass
Peak Lower Thorax Rib Deflection		mm	32 to 38	33.4	Pass
Peak Upper Spine Y Acceleration		G's	34 to 43	37.5	Pass
Peak Lower Spine Y Acceleration		G's	29 to 37	31.2	Pass
Peak Impactor Acceleration		G's	30 to 36	33.9	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
29.0	17.8	0.0	-18.3
Middle Thorax Deflection			
Max	Time	Min	Time
32.1	18.0	0.0	-17.2
Lower Thorax Deflection			
Max	Time	Min	Time
33.4	18.3	0.0	-19.0

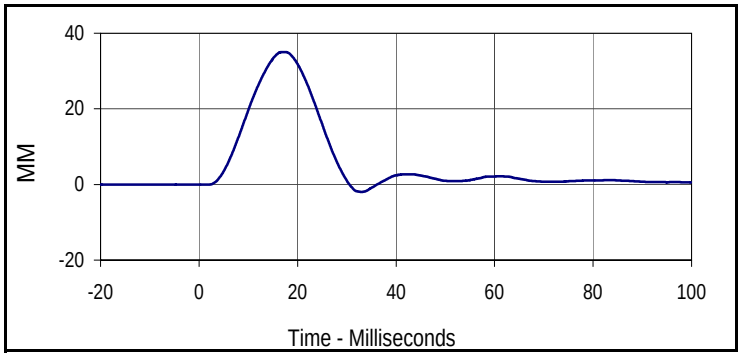


Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
37.5	11.3	-17.5	32.0
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
31.2	10.1	-7.9	32.8



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
33.9	15.0	-0.4	44.5

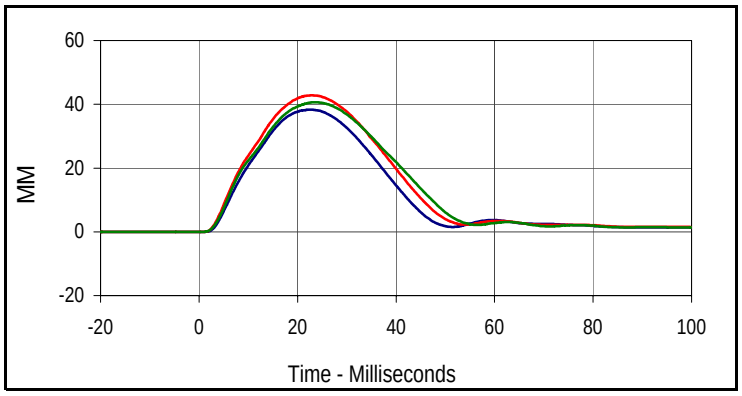
Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	10/11/11
ATD Serial No.:	299	Test I.D.:	299TWA020



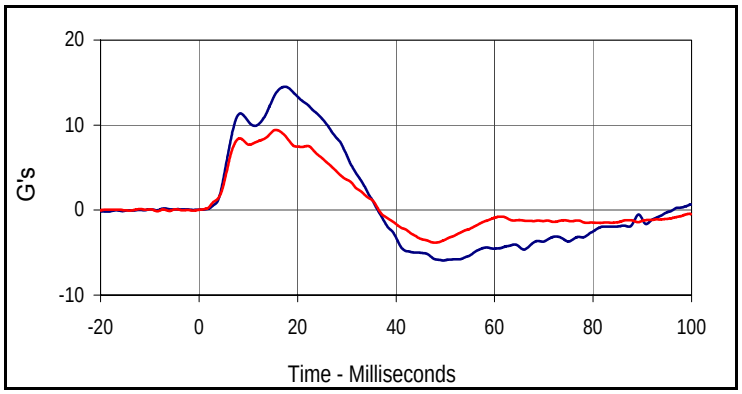
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
35.0	17.3	-2.0	33.0

Test Program:	SID IIs Thorax without Arm Impact Test	Test Date:	10/11/11
ATD Serial No.:	299	Test I.D.:	299TWOA020

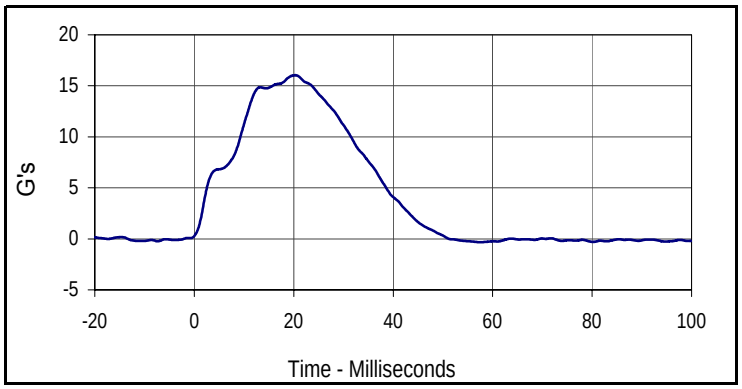
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	435	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.2	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	38.3	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	42.8	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	40.6	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	14.5	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	9.4	Pass
Peak Impactor Acceleration		G's	14 to 18	16.0	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
38.3	22.6	0.0	-8.5
Middle Thorax Deflection			
Max	Time	Min	Time
42.8	22.9	0.0	-8.3
Lower Thorax Deflection			
Max	Time	Min	Time
40.6	23.7	0.0	-10.9



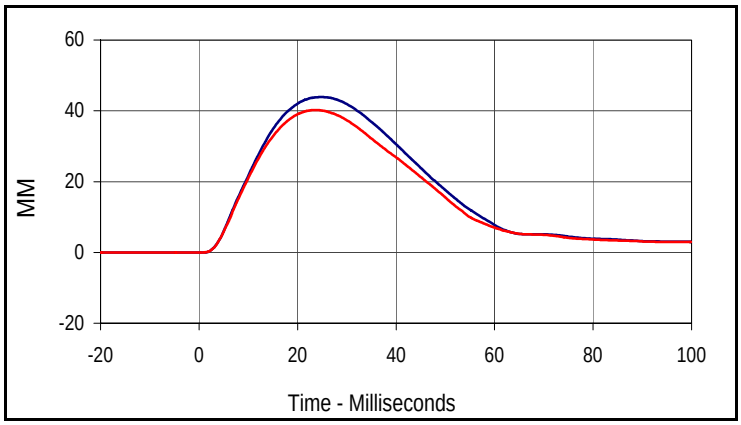
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
14.5	17.5	-5.9	49.6
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.4	15.6	-3.8	47.9



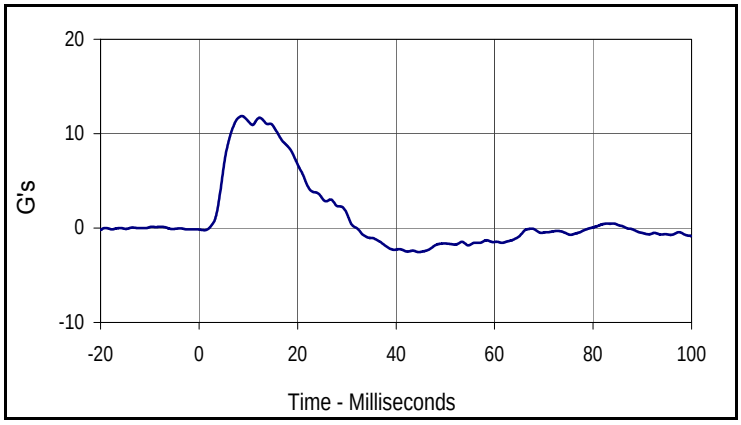
Curve Description			
Impactor Accleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
16.0	20.3	-0.3	57.5

Test Program:	SID IIs Abdomen Impact Test	Test Date:	10/11/11
ATD Serial No.:	299	Test I.D.:	299ABD020

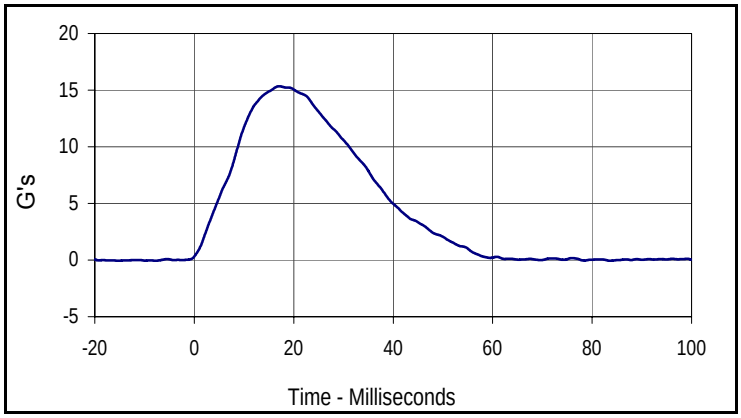
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	470	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.9	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Upper Abdominal Rib Deflection		mm	36 to 47	43.9	Pass
Peak Lower Abdominal Rib Deflection		mm	33 to 44	40.2	Pass
Peak Lower Spine Y Acceleration		G's	9 to 14	11.9	Pass
Peak Impactor Acceleration		G's	12 to 16	15.3	Pass
			Overall Test Results		Pass



Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
43.9	24.7	0.0	-19.7
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
40.2	23.5	0.0	-13.4



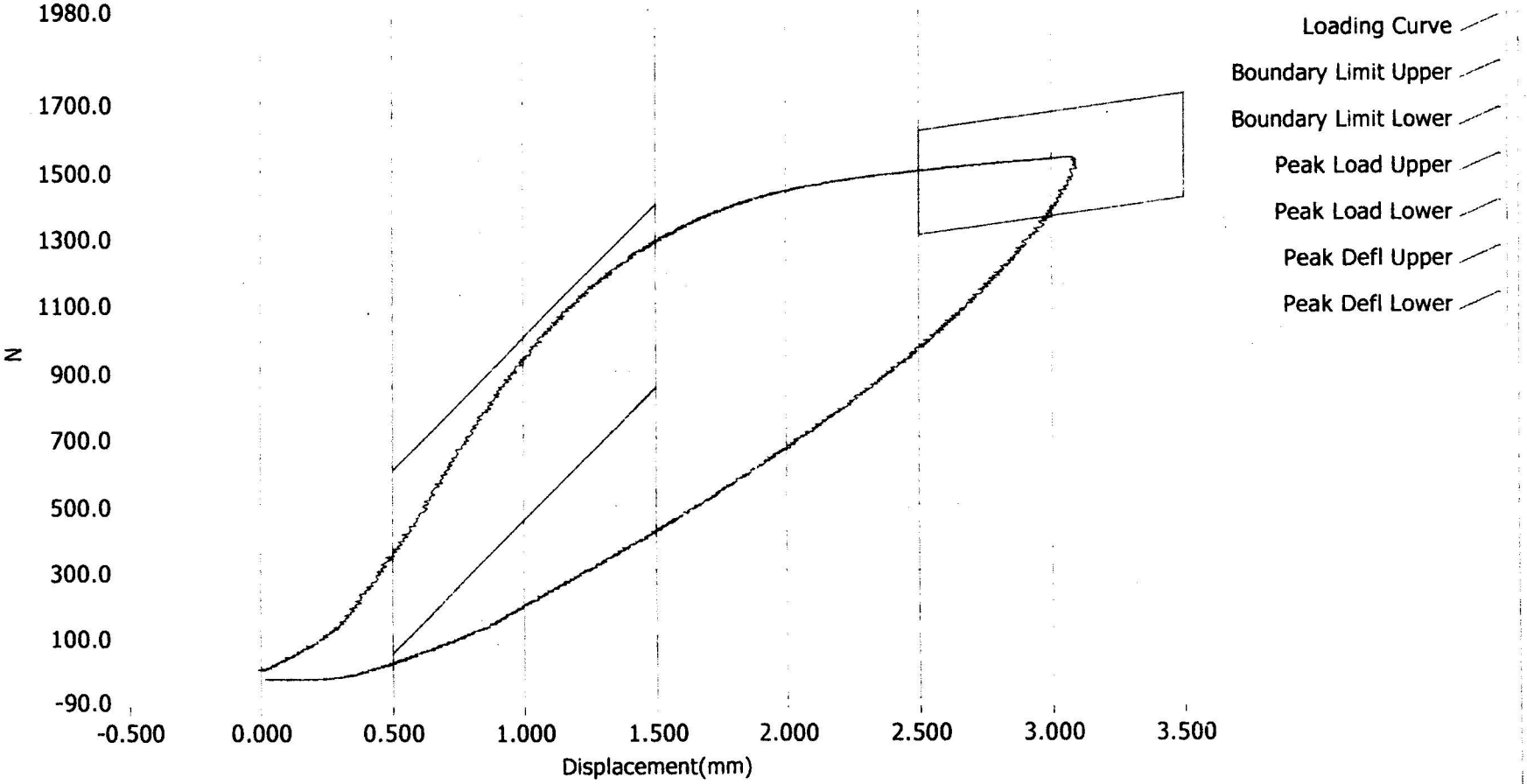
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
11.9	8.7	-2.6	44.6



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.3	17.1	-0.1	0.0

MC0201 POST TEST CAL

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

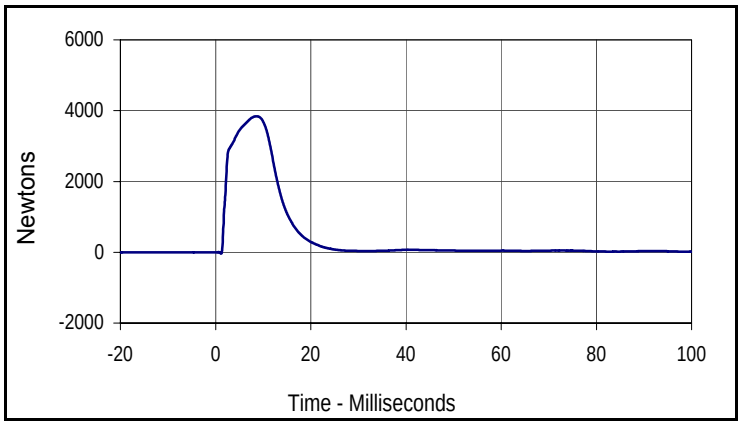
Test ID	Part Serial Number	Test Date	Test Time
		10/5/2010	6:31 AM

Cert ID	ATD Serial Number	ATD Type
	36733	SIDIIs

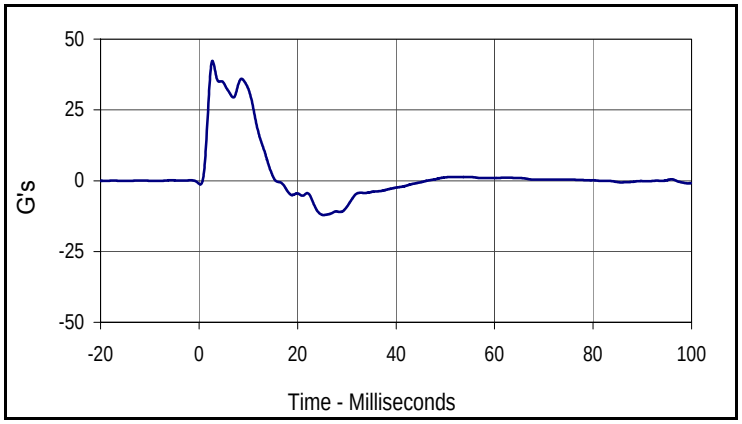
Current Date : 10/5/2010 Current Time : 06:34:52

Test Program:	SID IIs Pelvis Acetabulum Impact Test	Test Date:	10/11/11
ATD Serial No.:	299	Test I.D.:	299ACET020

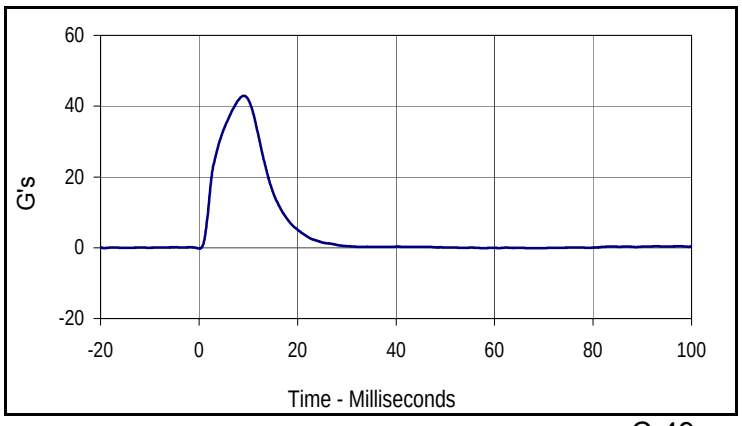
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	495	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.7	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.6	Pass
Peak Acetabulum Force Y		Newtons	3400 to 4200	3842.2	Pass
Peak Pelvis Y Acceleration After 6 msec.		G's	34 to 42	36.0	Pass
Peak Impactor Acceleration		G's	38 to 47	42.9	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3842.2	8.6	-37.4	1.2



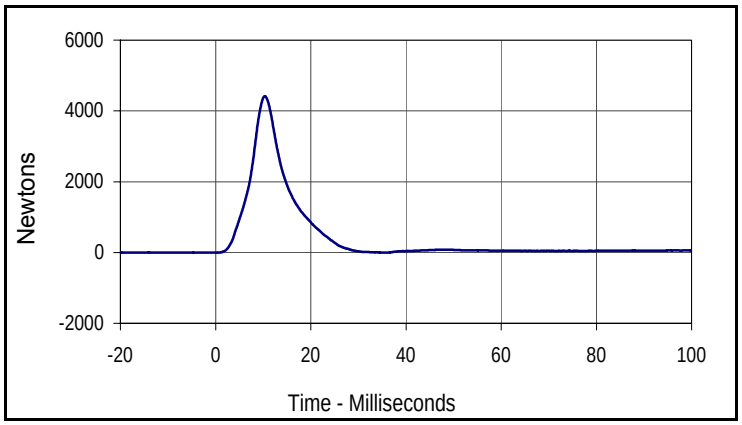
Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
42.3	2.7	-12.1	25.3



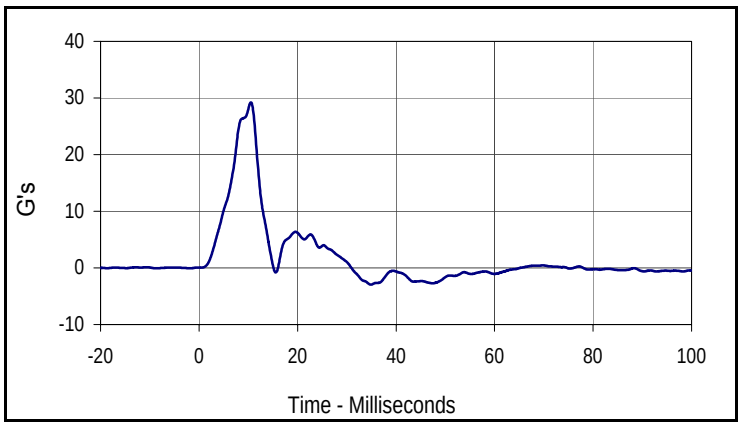
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
42.9	9.1	-0.2	0.1

Test Program:	SID IIs Pelvis Iliac Calibration	Test Date:	10/11/11
ATD Serial No.:	299	Test I.D.:	299PL020

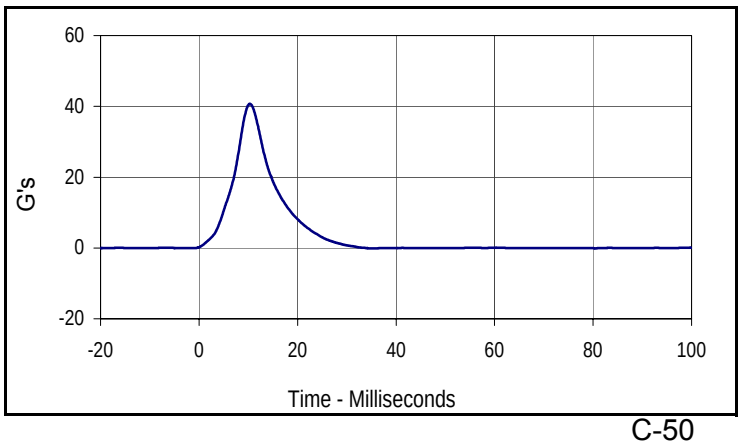
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	525	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.9	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Illiac Force		Newtons	4100 to 5100	4417.5	Pass
Peak Pelvis Y Acceleration		G's	28 to 39	29.2	Pass
Peak Impactor Acceleration		G's	36 to 45	40.7	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4417.5	10.3	-2.8	35.8



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
29.2	10.5	-3.0	34.9



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
40.7	10.3	-0.1	34.9

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (ES-2re)

			ES-2re S/N F037		
			Serial Number	Manufacturer	Calibration
Head Accelerometers		X	P58858	Endevco	5/24/11
		Y	P58865	Endevco	5/24/11
		Z	P58867	Endevco	5/24/11
Thorax Rib Displacement Potentiometers	Upper	Y	209	FTSS	6/2/11
	Middle	Y	210	FTSS	6/2/11
	Lower	Y	207	FTSS	6/2/11
Abdomen Load Cells	Forward	Y	1504	Denton	6/10/11
	Middle	Y	1505	Denton	6/29/11
	Rear	Y	1506	Denton	6/10/11
Lower Spine Accelerometers (T12)		X	04J04107-Z15	Endevco	6/2/11
		Y	P58876	Endevco	6/2/11
		Z	P58877	Endevco	5/31/11
Pubic Symphysis Load Cell		Y	464	Denton	6/9/11

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 299		
				Serial Number	Manufacturer	Calibration
Head Accelerometers			X	P51926	Endevco	8/8/11
			Y	P51929	Endevco	8/8/11
			Z	P51934	Endevco	8/8/11
Displacement Potentiometers	Shoulder		Y	1074	FTSS	8/8/11
	Thoracic Rib	Upper	Y	1143	FTSS	8/8/11
		Middle	Y	1160	FTSS	8/8/11
		Lower	Y	1213	FTSS	8/8/11
	Abdominal Rib	Upper	Y	1218	FTSS	8/8/11
		Lower	Y	1234	FTSS	8/8/11
Lower Spine Accelerometers (T12)			X	P63999	Endevco	8/5/11
			Y	P58872	Endevco	8/4/11
			Z	P58795	Endevco	8/4/11
Acetabulum Load Cell			Y	272	Denton	7/22/11
Iliac Wing Load Cell			Y	284	Denton	7/22/11
Pelvis Plug (Struck Side)				36449	FTSS	9/23/10
Pelvis Plug (Non-Struck Side)				36281	FTSS	9/22/10

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	Ketx5a	ICSensor	6/20/11
	Vehicle Center of Gravity	Y	Ketx5b	ICSensor	6/20/11
	Vehicle Center of Gravity	Z	Ketx5c	ICSensor	6/20/11
2	Right Sill at Front Seat	X	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	AJ454	Endevco	4/28/11
	Right Sill at Rear Seat	Z	ketx12z	ICSensor	7/21/11
4	Left Sill at Front Door	Y	J36641	Endevco	4/4/11
5	Left Sill at Rear Door	Y	J24532	Endevco	6/13/11
6	Left A-Post Lower	Y	BY98H	Endevco	3/15/11
7	Left A-Post Middle	Y	J21735	Endevco	4/1/11
8	Left B-Post Lower	Y	CY06H	Endevco	3/15/11
9	Left B-Post Middle	Y	AK96	Endevco	3/15/11
10	Front Seat Track	Y	J24533	Endevco	4/1/11
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	BI60H	Endevco	7/22/11
	Engine Block	Y	AR17	Endevco	7/22/11
14	Rear Floorpan Above Axle	X	J21730	Endevco	8/22/11
	Rear Floorpan Above Axle	Y	DE69J	Endevco	2/3/11
	Rear Floorpan Above Axle	Z	J28678	Endevco	8/22/11

TABLE 4 – MDB Instrumentation

		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	00L13-F37	Entrans	6/22/11
MDB Center of Gravity	Y	02I10-N16	Entrans	6/22/11
MDB Center of Gravity	Z	03J13_Z09	Entrans	6/22/11
Left Frame at Rear Axle Centerline	X	01J02-F13	Entrans	6/22/11
Left Frame at Rear Axle Centerline	Y	05616-L03	Entrans	6/22/11