REPORT NUMBER: SPNCAP-KAR-12-003

NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST

FORD MOTOR CO.

2012 FORD MUSTANG 2-DOOR COUPE

NHTSA No: MC0212

PREPARED BY:

KARCO ENGINEERING, LLC.

9270 HOLLY ROAD

ADELANTO, CA 92301

OCTOBER 18, 2011

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

OFFICE OF CRASHWORTHINESS STANDARDS

MAIL CODE: NVS-111

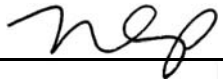
1200 NEW JERSEY AVE, SE, ROOM W43-410

WASHINGTON, D.C. 20590

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared By: 

Mr. Steven D. Matsusaka, Project Engineer
KARCO Engineering, LLC.

Reviewed By: 

Mr. Michael L. Dunlap, Director of Operations
KARCO Engineering, LLC.

Approved By: 

Mr. Frank D. Richardson, Program Manager
KARCO Engineering, LLC.

Approval Date: October 18, 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.
SPNCAP-KAR-12-003		

4. Title and Subtitle	5. Report Date
Final Report of New Car Assessment Program Side Impact Pole Testing of 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212	October 18, 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-P31007-03-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. 4 - Oct. 18, 2011
	14. Sponsoring Agency Code NVS-111

15. Supplementary Notes

16. Abstract

A 32.2 km/h (20 mph) 75 deg. oblique impact Side NCAP Test was conducted on the subject 2012 Ford Mustang 2-Door Coupe in accordance with the specifications of the Office of Crash Worthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. The test was conducted at the KARCO Engineering, LLC facility in Adelanto, California on October 4, 2011.

The impact velocity was 31.6 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 21.1 deg. C. The target vehicle's maximum post-test static crush was 501 mm located at level 3. The test vehicle's occupant performance data is as follows:

Measurement Description	Driver ATD (ES-2re)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})		1000	208.6
Resultant Lower Spine Acceleration	mm	82	57.4
Total Pelvic Force (Sum of Acetubular and Iliac Forces)	N	5525	4820
Maximum Thoracic Rib Deflection	N	38	25
Maximum Abdominal Rib Deflection	mm	45	35

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

17. Key Words	18. Distribution Statement
New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs	Copies of this report are available from: National Highway Traffic Safety Admin. Technical Reference Division 1200 New Jersey Ave., SE Room W43-410 Washington, DC 20590

19. Security Classification of this report	20. Security Classification of this page	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	101	

TABLE OF CONTENTS

SECTION 1
TEST PURPOSE AND PROCEDURE

This 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 Mustang 2-door coupe. 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 rigid pole side impact test was conducted on a 2012 Ford Mustang 2-door coupe. The subject vehicle was towed into the rigid pole at an angle of 75.4° and a velocity of 31.6 km/h. The test was conducted by KARCO Engineering, LLC. in Adelanto, California, on October 4, 2011. Pre- and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

One Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure, dated August 2011. Camera locations and other pertinent camera information are included in this report.

The Part 572V (SID-IIs) was instrumented accordingly:

Head CG tri-axial accelerometers
Thorax upper, middle and lower rib displacement potentiometers
Abdomen upper and lower rib displacement potentiometers
Lower spine (12) tri-axial accelerometers
Iliac load cell
Acetabulum load cell

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

Injury readings for the SID-IIs dummy were recorded as follows:

Measurement Description	Units	Passenger ATD (SID-IIs)	
		IARV	Result
Head Injury Criteria (HIC_{36})		1000	208.6
Lower Spine (T12) Resultant Acceleration	g	82	57
Total Pelvic Force (sum of acetabular and iliac forces	N	5525	4820
Maximum Thoracic Rib Deflection	mm	38*	25
Maximum Abdominal Rib Deflection	mm	45*	35

**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 (Head/Torso)	Yes	Yes	No	
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes	Yes	No	
Other				

GENERAL COMMENTS

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

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11

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 Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	MC0212
Model Year	2012
Make	Ford
Model	Mustang
Body Style	2-Door Coupe
VIN	1ZVBP8AM4C5245599
Body Color	Kona Blue Metallic
Odometer Reading (km / mi)	193 / 120
Engine Displacement (L)	3.7
Type / No. of Cylinders	V6
Engine Placement	Longitudinal
Transmission Type	Manual
Transmission Speeds	6
Overdrive	Yes
Final Drive	Rear
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
All Wheel Drive (AWD)	No

Traction Control System (TCS)	Yes
Auto-Levelling System	No
Automatic Door Locks	Yes
Power Window Auto-Reverse	Yes
Other Optional Feature	None
Driver Front Airbag	Yes
Driver Curtain Airbag	No
Driver Head/Torso Airbag	Yes
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	No
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Rear Pass. Curtain Airbag	No
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)	2041
GAWR Front (kg)	993
GAWR Rear (kg)	1066

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	3		4	
Capacity Weight (VCW) (kg)				317.0	*A*
DSC x 68.04 (kg)				272.2	*B*
Cargo Weight (RCLW) (kg)				44.8	*A-B*

VEHICLE SEAT TYPE

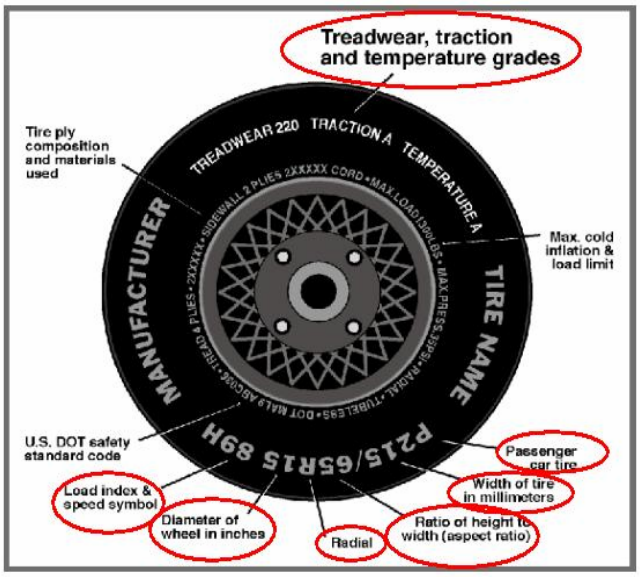
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable w/ Lever	Adjustable w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat				Yes	Yes		
Third Row Seat							

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11



TIRE PLACARD INFORMATION

Measured Parameter	Front	Rear
Recommended Cold Tire Pressure (kPa)	220	220
Recommended Tire Size	P225/60R17	P225/60R17

VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	300	300
Tire Size on Vehicle	P225/60R17	P225/60R17
Tire Manufacturer	BF Goodrich	BF Goodrich
Tire Name	Radial T/A	Radial T/A
Tire Type	Passenger Car	Passenger Car
Tire Width	225	225
Aspect Ratio	60	60
Radial	Yes	Yes
Wheel Diameter	17	17
Load Index/Speed Symbol	98H	98H
Treadware	620	620
Traction Grade	A	A
Temperature Grade	B	B
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	235	230	235	235
Tire Placard	kPa	220	220	220	220
Owner's Manual	kPa	220	220	220	220
As Tested	kPa	220	220	220	220

TEST VEHICLE AXLE WEIGHTS

		As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
	Units	Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	427.5	361.5		447.0	402.0		437.5	412.5	
Right	kg	417.0	361.5		419.5	385.5		417.0	394.0	
Ratio	%	53.9%	46.1%	100.0%	52.4%	47.6%	100.0%	51.4%	48.6%	100.0%
Total	kg	844.5	723.0	1567.5	866.5	787.5	1654.0	854.5	806.5	1661.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1567.5	A
Actual Weight of 1 P572 O ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	44.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1661.3	A+B+C

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

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Non-struck Side Window	5.5
Non-struck Side Outboard Mirror	1.5
Non-struck Side Door Panel	5.0
Speaker	1.0
Window Motor	2.5
Tail Lights	5.0
Trunk Lining	1.5
Rear Bumper Fascia	5.0
Ballast / Equipment Added	73.5

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	°	-1.8	-1.3	-1.3	Yes
Front Passenger Sill Angle (front-to-rear)*	°	-1.6	-1.2	-1.1	Yes
Front Bumper-Line Angle (left-to-right)**	°	0.9	0.4	0.4	Yes
Rear Bumper-Line Angle (left-to-right)**	°	0.1	0.3	0.3	Yes
Vehicle CG (Aft of Front Axle)	mm	1257	1298	1324	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	5	21	19	

*ND=Nose Down (-), NU=Nose Up (+) **LD=Left Down (-), LU=Left Up (+)

***The “As Tested” vehicle attitude angle measurements must be within “As Delivered” and the “Fully Loaded” vehicle attitude measurements at each location. 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 Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11

SEAT POSITIONING

The driver's seat, front center seat (if applicable), and right front passenger's seat should be set to the mid-track, mid-height, 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	0.0	0.4	0.2
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			

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	0.2	546	Max	500	523	558
			Mid	496	517	546
			Min	492	511	534
Front Passenger Seat	Fixed	536	Max	500	518	536
			Mid	500	518	536
			Min	500	518	536
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed

DATA SHEET NO. 2 … (CONTINUED)

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

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

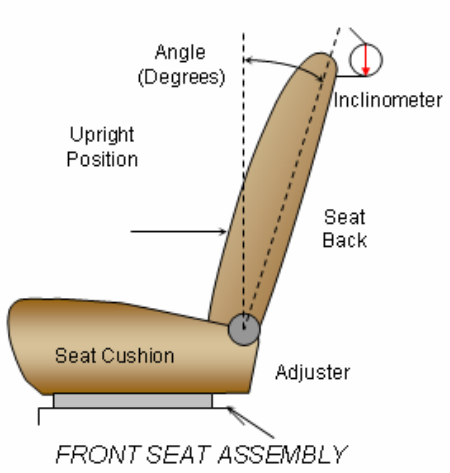
Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11

SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	238	25	0	0
Front Passenger Seat	238	25	0	0
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat				

SEAT BACK ADJUSTMENT

The driver's seat back is positioned such that the dummy's head is level. The right front passenger's seat back and the front center seat back are set to the same angle as the driver's seat back. The struck side-rear passenger's seat back, rear center seat back, and non-struck side rear passenger's seat back are set to the manufacturer's designated design angle.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detent*
Driver Seat w/Seated Dummy	44.5	24	7.2	8
Front Passenger Seat	44.2	24	7.2	8
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				

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1.

	Total No. of Positions	Placed in Position
Driver Seat	1	Fixed

DATA SHEET NO. 2 … (CONTINUED)

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

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11

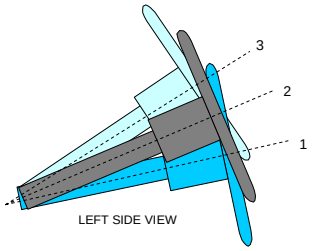
HEAD RESTRAINT ADJUSTMENT

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

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

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.

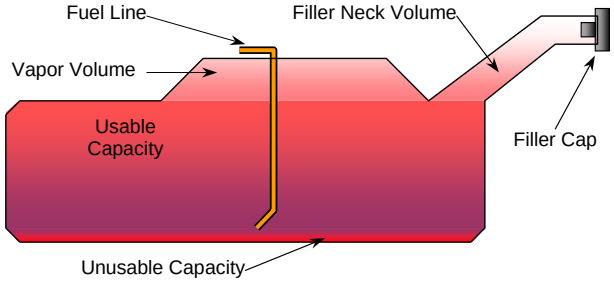


STEERING COLUMN ASSEMBLY

	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	19.7	
Geometric Center - Position 2	21.8	
Uppermost - Position 3	23.9	
Telescoping Steering Wheel Travel		
Test Position	21.8	

FUEL PUMP

The vehicle is equipped with an electric fuel pump. The fuel pump will begin to pump fuel when the ignition key is turned to the "on" position. If the key is not turned to the ignition position, the pump will power down and stop pumping fuel after 2 seconds. If the key is turned to the ignition position, the pump will continue to pump fuel until the key is turned to the "off" position, the restraints module is activated, or power to the pump is otherwise interrupted.



VEHICLE FUEL TANK ASSEMBLY

DATA SHEET NO. 2 … (CONTINUED)

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

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	60.56
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)	60.56
Usable Capacity of "Optional Tank" (see Owner's Manual)	
93% of Usable Capacity	56.32
Actual amount of Solvent Used in Test	56.32
1/3 of Usable Capacity	20.19

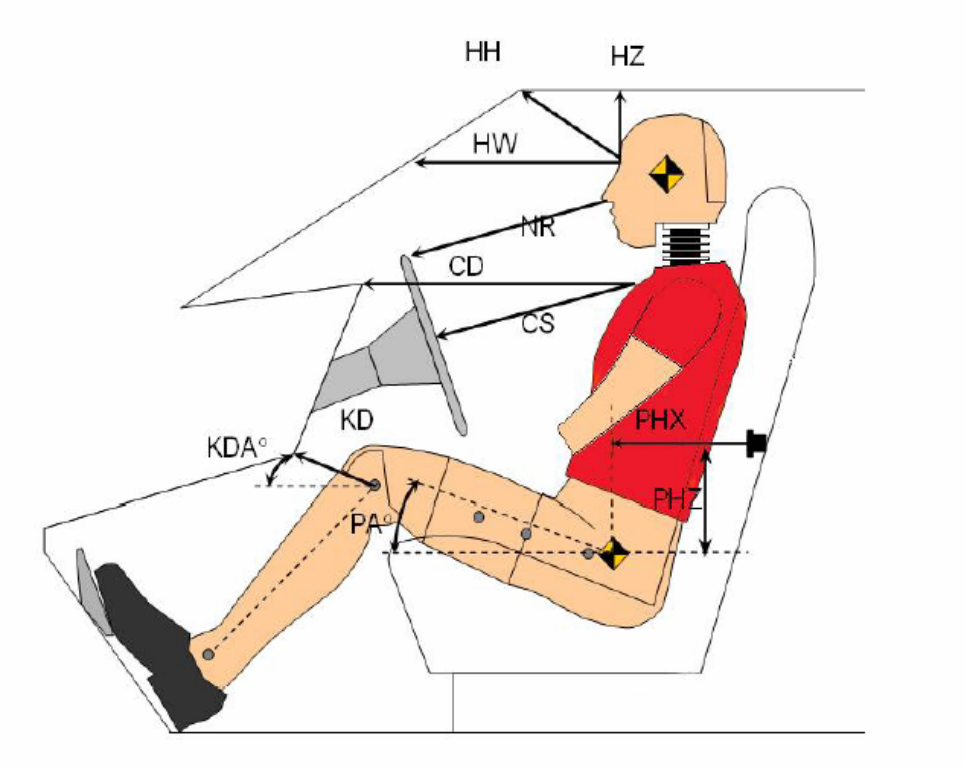
Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in the Form No. 1? ☒ **Yes** ☐ **No**

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11



LEFT SIDE VIEW

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

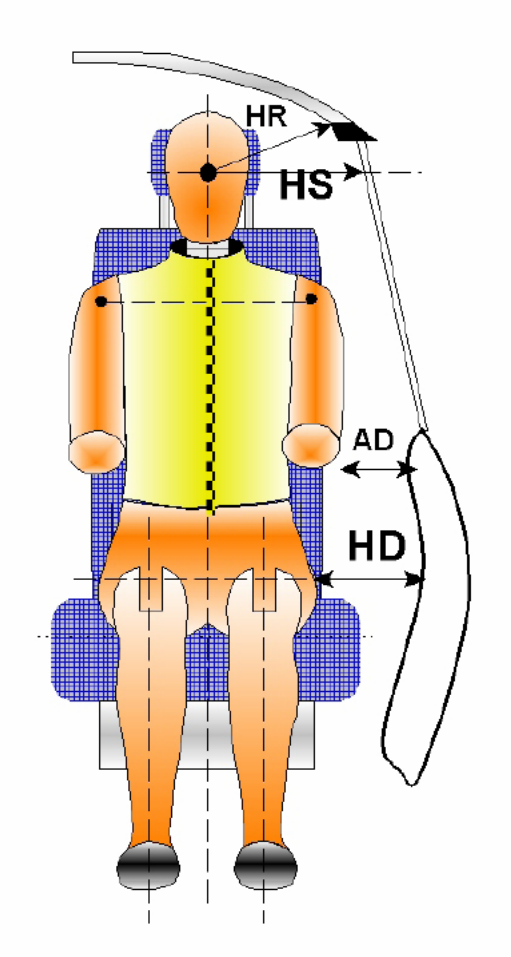
Driver Code	Description	Driver	
		Length (mm)	Angle (º)
HH	Head to Header	251	
HW	Head to Windshield	551	
HZ	Head to Roof	188	
NR	Nose to Rim	264	
CD	Chest to Dash	431	
CS	Chest to Steering Wheel	188	
KD(L)/KDA(L)°	Left Knee to Dash	87	41.5
KD(R)/KDA(R)°	Right Knee to Dash	70	
PAX°	Pelvic Tilt Angle (x-axis)		22.3
PAY°	Pelvic Tilt Angle (y-axis)		0.1
PHX	Hip Point to Striker (x-axis)	621	
PHZ	Hip Point to Striker (z-axis)	211	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11



FRONT VIEW OF DUMMY

DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

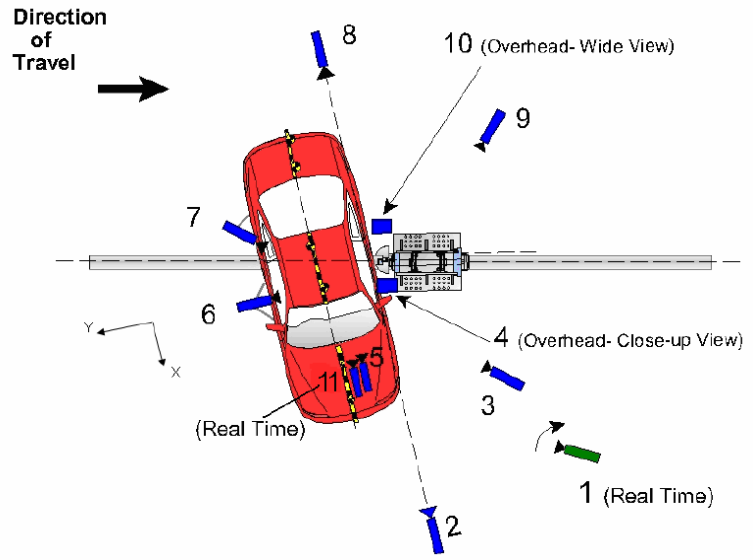
Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	250
HS	Head to Side Window	mm	387
AD	Arm to Door	mm	159
HD	H-Point to Door	mm	165

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11



CAMERA LOCATIONS AND DATA

Camera No.	View	Coordinates (m)			Lens (mm)	Film Speed (fps)
		X*	Y*	Z*		
1	Real Time Pan View of Impact	8.89	46.57	-3.04		30
2	Front Ground Level - Impact View	8.34	-0.05	-0.93	24	1000
3	Impact Side 45° - Forward Pole View	4.10	-2.15	-1.15	8.5	1000
4	Overhead Close-Up View of Impact	0.00	0.00	-5.79	12.5	1000
5	On-Board - Dummy Front View	1.56	0.48	-1.31	35	400
6	On-Board - Dummy Side View	-0.10	1.65	-1.09	14	1000
7	On-Board - Dummy Rear Oblique View	0.36	3.24	-0.85	20	1000
8	Rear Ground Level - Impact View	-6.12	-6.23	-0.96	24	1000
9	Impact Side 45° - Rearward Pole View	-8.02	0.04	-1.01	35	1000
10	Overhead Wide View of Impact	-0.06	0.22	-5.79	14	1000
11	Real Time Dummy Front View	1.65	0.53	-1.31		30

Reference from Point of Impact for X and Y; from Ground for Z):
+X = Forward of Vehicle, +Y = Right of Vehicle, +Z = Down
*All measurements accurate to ±6 mm

INSTRUMENTATION

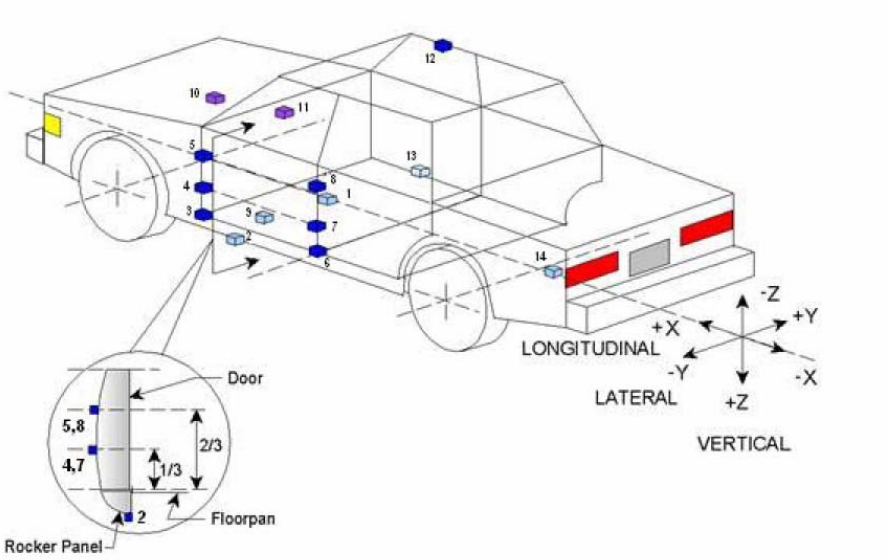
Driver Dummy Channels	16
Vehicle Structure Accelerometers	18
Pole Load Cells	8
Total	42

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1750	0	-425
2	Left Floor Sill	2755	-475	-250
3	A-Pillar Sill	3025	-780	-390
4	A-Pillar Low	3025	-780	-560
5	A-Pillar Mid	3025	-780	-870
6	B-Pillar Sill			
7	B-Pillar Low			
8	B-Pillar Mid			
9	Driver Seat Track	2145	-655	-285
10	Engine Top	3475	-130	-775
11	Firewall	3400	-160	-790
12	Right Roof	1930	505	-1375
13	Right Floor Sill	1740	665	-330
14	Rear Floorpan	1615	420	-550

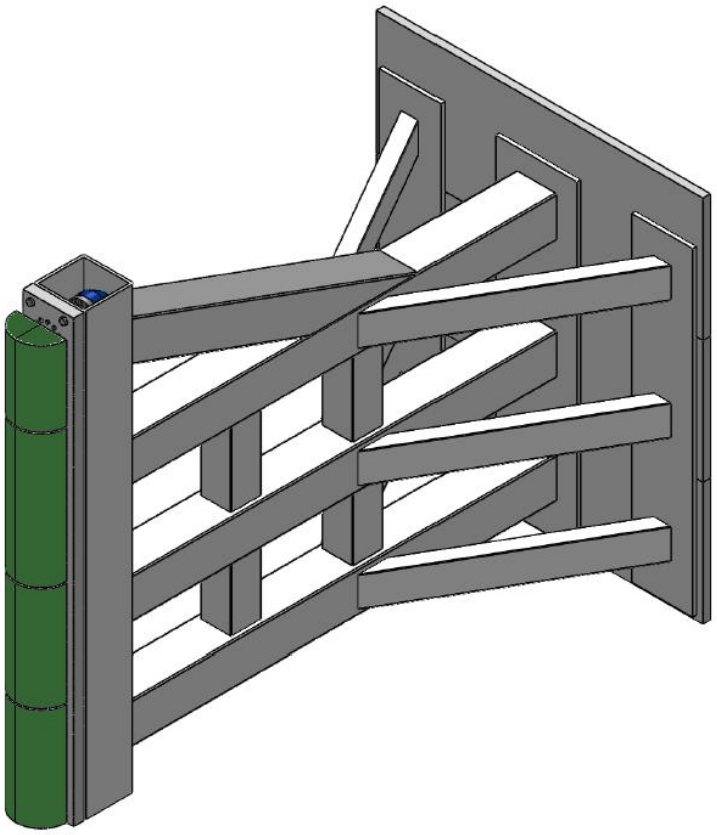
Reference: X – Rear surface of vehicle (+ forward)
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 7

RIGID POLE LOAD CELL DATA

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11



RIGID POLE LOAD CELL LOCATIONS

ID	Units	Height From Ground
1	mm	87
2	mm	468
3	mm	648
4	mm	978
5	mm	1168
6	mm	1651
7	mm	1816
8	mm	2057

DATA SHEET NO. 8

POST-TEST OBSERVATIONS

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver SID-IIs Dummy
Face	Head/Torso Airbag
Top of Head	Head Restraint, Head/Torso Airbag
Left Side of Head	Head/Torso Airbag
Back of Head	Head Restraint
Left Shoulder	Head/Torso Airbag
Upper Torso	Seat, Head/Torso Airbag, Door Panel
Lower Torso	Seat, Door Panel
Left Hip	Seat, Door Panel
Left Knee	Door Panel, Knee Bolster

POST-TEST DOOR PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No separation
Sill Separation	No separation
Windshield Damage	Broken
Side Window Damage	Left front window broken
Other Notable Effects	Rear window broken

DATA SHEET NO. 8 … (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11

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 (Head/Torso)	Yes	Yes	No	
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes	Yes	No	
Other				

IMPACT POINT LOCATION DATA

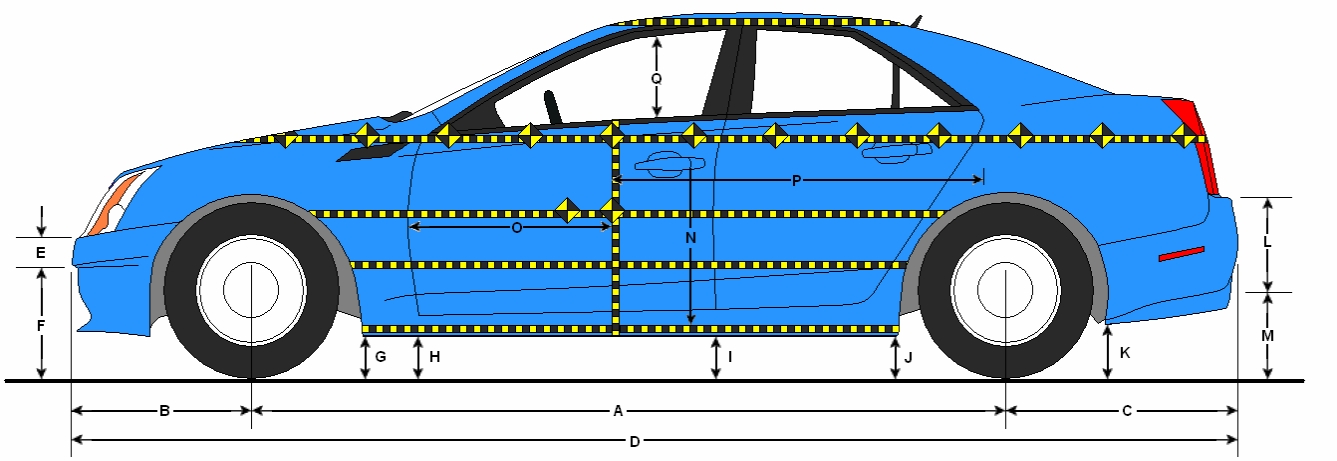
Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		1335
Actual Impact Point (Aft of Front Axle)	mm		1334
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	1
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	75.4
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	31.6
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	31.6

DATA SHEET NO. 9

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2726	2632	-94
B	Front Axle to FSOV	927	941	14
C	Rear Axle to RSOV	1111	1141	30
D	Total Length at Centerline	4559	4714	155
E	Front Bumper Thickness	294	305	11
F	Fromt Bumper Bottom to Ground	222	269	47
G	Sill Height at Front Wheel Well	156	148	-8
H	Sill Height at Front Door Leading Edge	160	148	-12
I	Sill Height at B-Pillar	177	181	4
J1	Sill Height at Rear Wheel Well	181	215	34
J2	Pinch Weld Height at Rear Wheel Well	176	199	23
K	Sill Height Aft of Rear Wheel Well	265	264	-1
L	Rear Bumper Thickness	218	216	-2
M	Rear Bumper Bottom to Ground	322	326	4
N	Sill Height to Bottom of Front Window Sill	604	693	89
O	Front Door Leading Edge to Impact CL	594	471	-123
P	Rear Door Trailing Edge to Impact CL	1096	1005	-91
Q	Front Window Opening	300	277	-23
R	Right Side Length	3348	3363	15
S	Left Side Length	3345	3204	-141
T	Vehicle Width at B-Pillar	1835	1785	-50

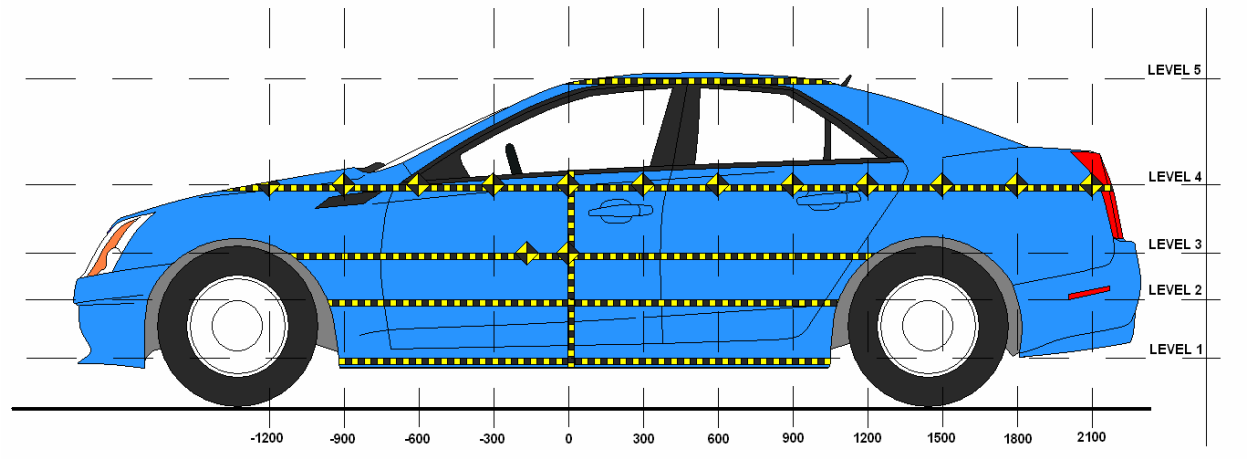
All measurements in mm with tolerance of ± 3mm

DATA SHEET NO. 10

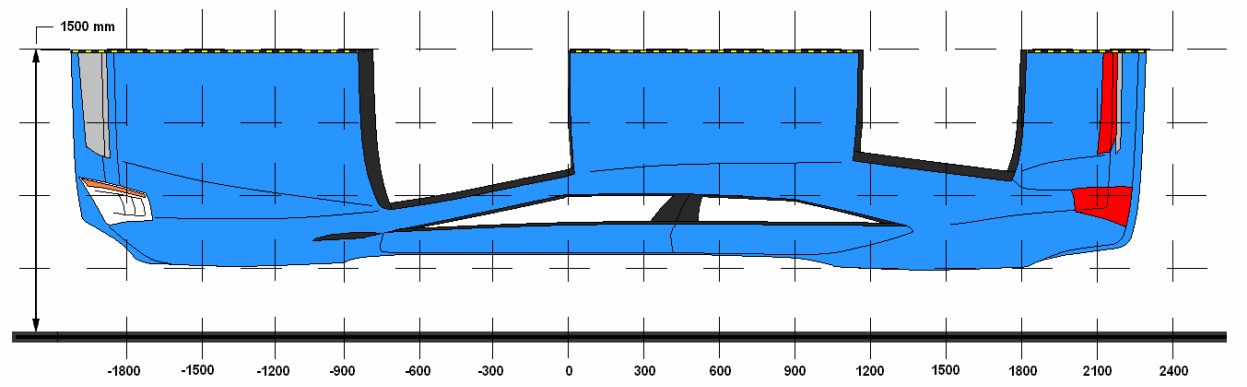
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11



LEFT SIDE VIEW



OVERHEAD VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	223	422	0
2	Occupant H-Point	518	498	0
3	Mid-Door	642	501	0
4	Window Sill	935	429	150
5	Window Top	1341	253	150

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

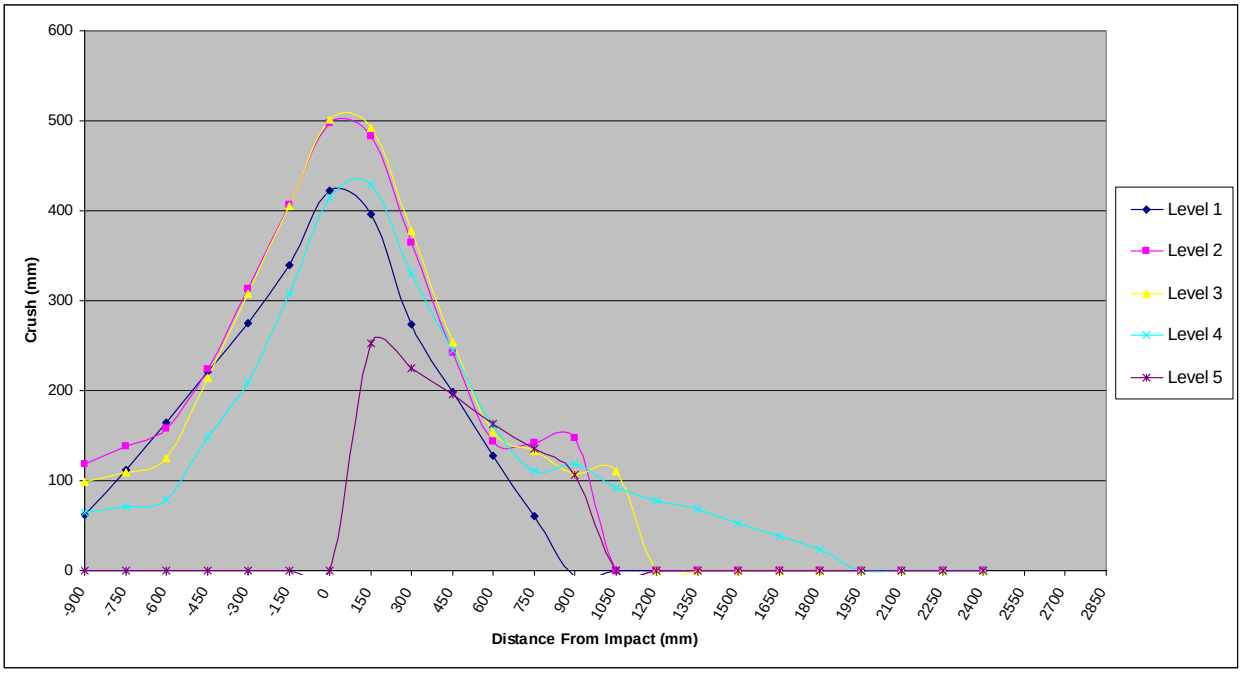
	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	626	581	585	711		688	699	684	775		62	118	99	64	
-750	633	590	586	692		745	728	695	763		112	138	109	71	
-600	634	591	585	679		799	749	710	758		165	158	125	79	
-450	636	590	584	674		857	814	799	823		221	224	215	149	
-300	637	589	583	667		912	902	891	876		275	313	308	209	
-150	639	588	583	663		978	995	988	971		339	407	405	308	
0	642	587	582	656		1064	1085	1083	1071		422	498	501	415	
150	642	587	582	653	882	1038	1070	1074	1082	1135	396	483	492	429	253
300	649	587	582	649	877	923	951	959	979	1102	274	364	377	330	225
450	649	587	583	648	875	848	829	837	893	1071	199	242	254	245	196
600	656	588	585	648	875	783	732	739	808	1038	127	144	154	160	163
750	658	580	585	637	881	718	722	718	747	1017	60	142	133	110	136
900	663	580	576	629	893	656	727	684	748	999	-7	147	108	119	106
1050			565	627				675	719				110	92	
1200				627					704					77	
1350				630					699					69	
1500				636					688					52	
1650				644					682					38	
1800				656					680					24	
1950															
2100															
2250															
2400															
2550															
2700															
2850															

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11



DATA SHEET NO. 11

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11

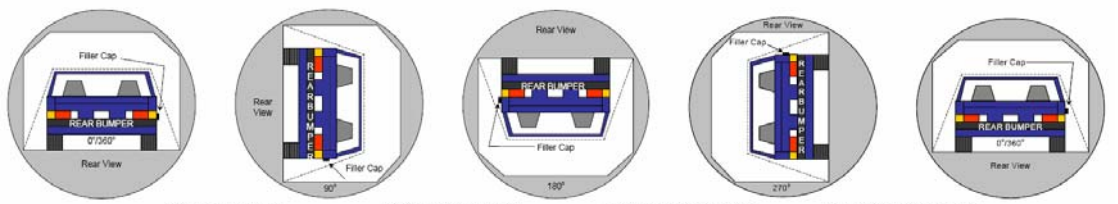
Temperature at Time of Impact: 21.1° C Test Time: 12:24 PM

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

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

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

D. Spillage Details: No spillage occurred



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	86	300	386
90° To 180°	81	305	386
180° To 270°	77	300	377
270° To 360°	77	300	377

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

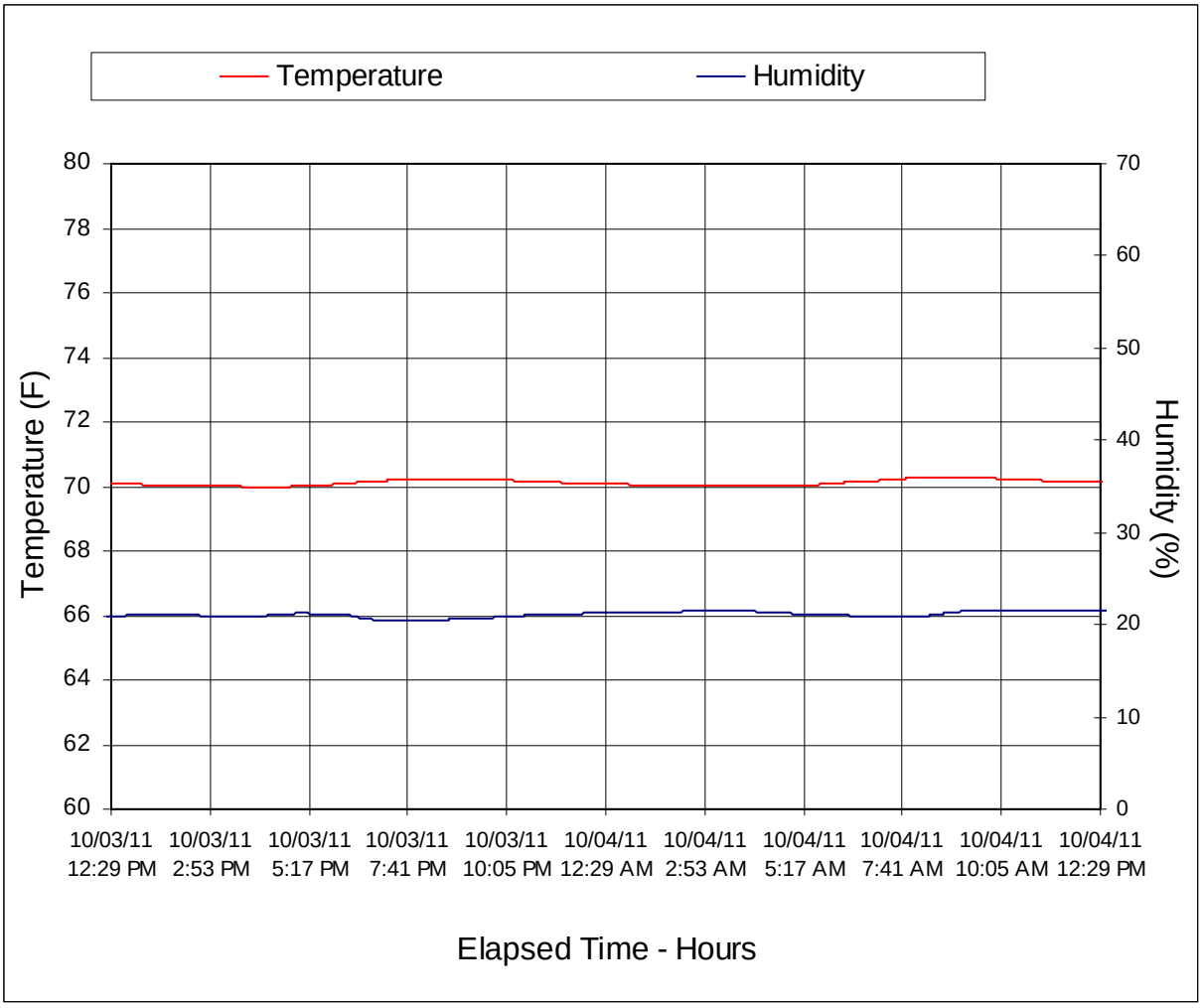
Test Phase	Spillage Location
0° To 90°	No Spillage Occurred
90° To 180°	No Spillage Occurred
180° To 270°	No Spillage Occurred
270° To 360°	No Spillage Occurred

DATA SHEET NO. 14

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2012 Ford Mustang 2-Door Coupe NHTSA No. MC0212

Test Program: NCAP Side Pole Impact Test Test Date: 10/04/11



APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS … (CONTINUED)

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

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

FIGURE 6. Post-Test Left Front Three-Quarter View of Test Vehicle

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

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

FIGURE 9. Pre-Test Left Rear Three-Quarter View of Test Vehicle

FIGURE 10. Post-Test Left Rear Three-Quarter View of Test Vehicle

FIGURE 11. Pre-Test Rear View of Test Vehicle

FIGURE 12. Post-Test Rear View of Test Vehicle

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

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

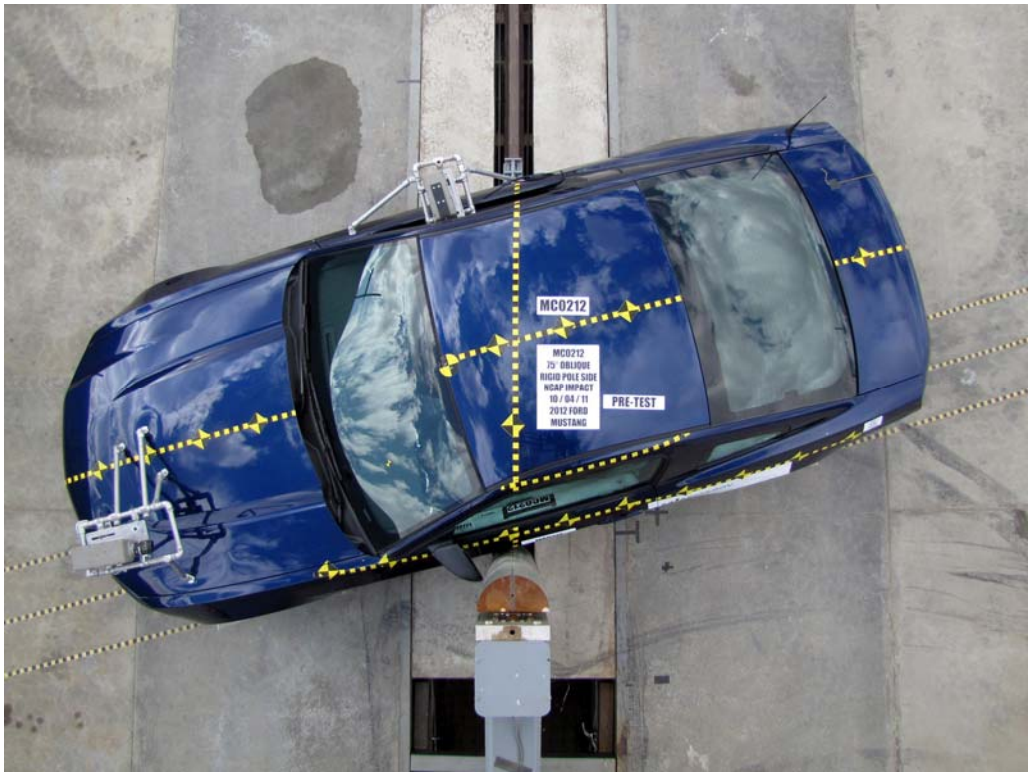


FIGURE 15. Pre-Test Overhead View of Test Vehicle and Pole

FIGURE 16. Post-Test Overhead View of Test Vehicle and Pole

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

FIGURE 18. Pre-Test Right Side View of Pole
Positioned Against Side of 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 Location

FIGURE 21. Pre-Test Front Close-Up View of Dummy

FIGURE 22. Post-Test Front Close-Up View of Dummy

FIGURE 23. Pre-Test Left Side View of Dummy
Showing Belt, Chalking, and Contact Switches

FIGURE 24. Pre-Test Left Side View of Dummy Shoulder and Driver Door Top View

FIGURE 25. Post-Test Left Side View of Dummy Shoulder and Door Top View

FIGURE 26. Pre-Test Frontal View of Seat Back Prior to Dummy Positioning

FIGURE 27. Pre-Test Frontal View of Dummy Head and Shoulders in Relation to Head Restraint

FIGURE 28. Pre-Test Frontal View of Seat Pan Prior to Dummy Positioning

FIGURE 29. Pre-Test Overhead View of Dummy Thighs on Seat Pan

FIGURE 30. Pre-Test View of Dummy's Neck Showing Position of Adjustable Neck Bracket

FIGURE 31. Pre-Test View of Dummy's Head Showing Dummy's Head Is Level

FIGURE 32. Pre-Test Placement of Dummy's Feet

FIGURE 33. Pre-Test View of Belt Anchorage for Dummy

FIGURE 34. Pre-Test Left Side View of Steering Wheel

FIGURE 35. View of Disengaged Parking Brake

FIGURE 36. Pre-Test View of Parking Brake

FIGURE 37. Pre-Test Close-Up Left Side View of Driver Seat Track

FIGURE 38. Pre-Test Close-Up Left Side View of Driver Seat Back

FIGURE 39. Pre-Test Close-Up View of Driver Seat Back or Head Restraint

FIGURE 40. Pre-Test Driver Dummy and Door Clearance

FIGURE 41. Post-Test Driver Dummy and Door Clearance

FIGURE 42. Pre-Test Right Side View of Dummy and Front Seat Occupant Compartment

FIGURE 43. Post-Test Right Side View of Dummy and Front Seat Occupant Compartment

FIGURE 44. Pre-Test Inner Driver Door Panel View

FIGURE 45. Post-Test Inner Driver Door Panel View
Showing Dummy Contact Locations

FIGURE 46. Post-Test Dummy Close-Up Head Contact with Vehicle Interior View

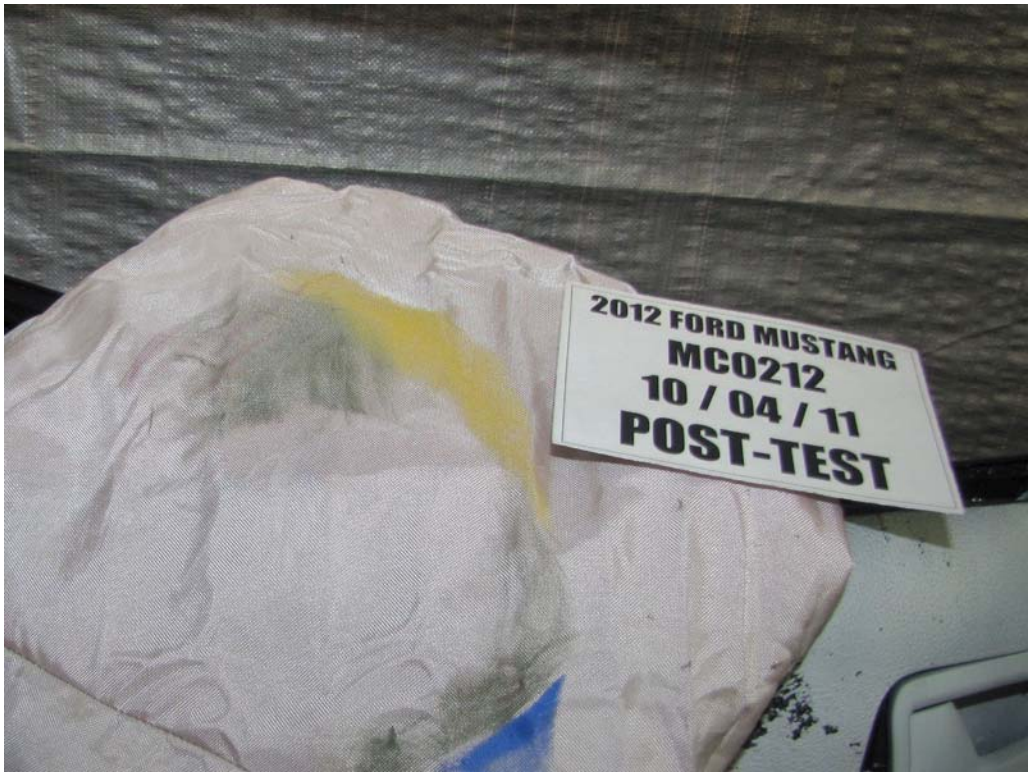


FIGURE 47. Post-Test Dummy Close-Up Head Contact with Side Airbag View

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

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

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

Photograph Not Applicable

No Dummy Pelvis Contact With Side Air Bag

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

FIGURE 52. Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

FIGURE 53. Post-Test View of Fuel Filler Cap or Fuel Filler Neck

FIGURE 54. Close-Up View of Vehicle's Certification Label

FIGURE 55. Close-Up View of Vehicle's Tire Information Placard

FIGURE 56. Pre-Test Pole Barrier Front View

FIGURE 57. Post-Test Pole Barrier Front View

FIGURE 58. Pre-Test Pole Barrier Side View

FIGURE 59. Post-Test Pole Barrier Side View

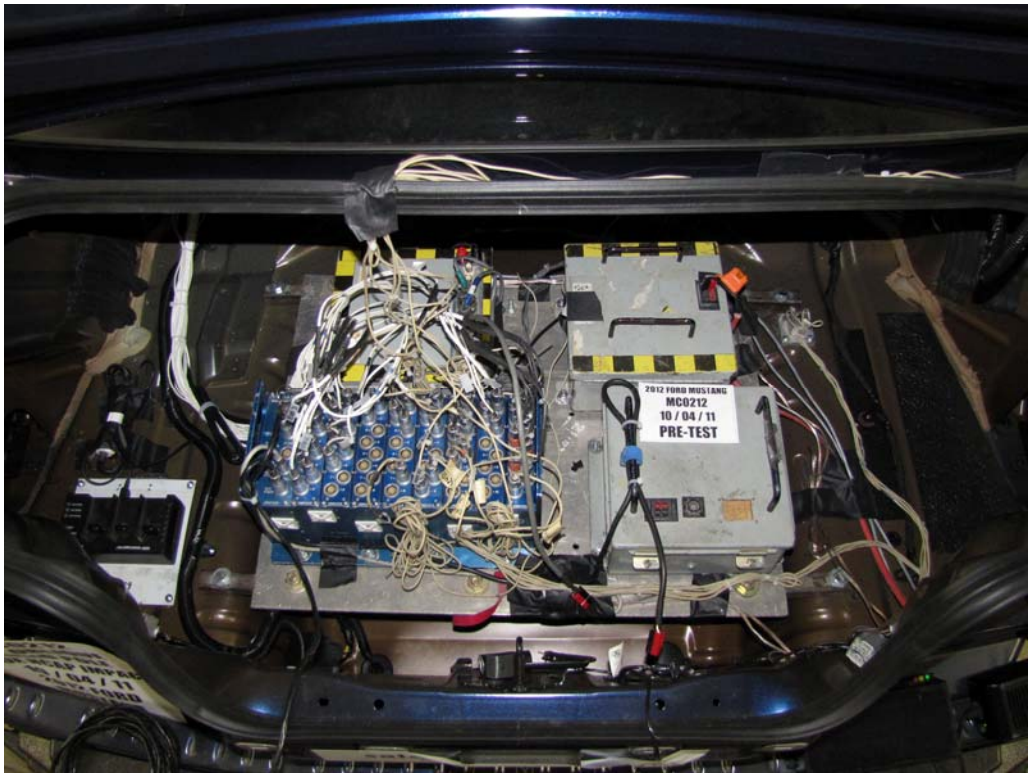


FIGURE 60. Pre-Test Ballast View

FIGURE 61. Post-Test Primary and Redundant Speed Trap Read-Out

FIGURE 62. FMVSS No. 301-305 Rollover 0 Degrees

FIGURE 63. FMVSS No. 301-305 Rollover 90 Degrees

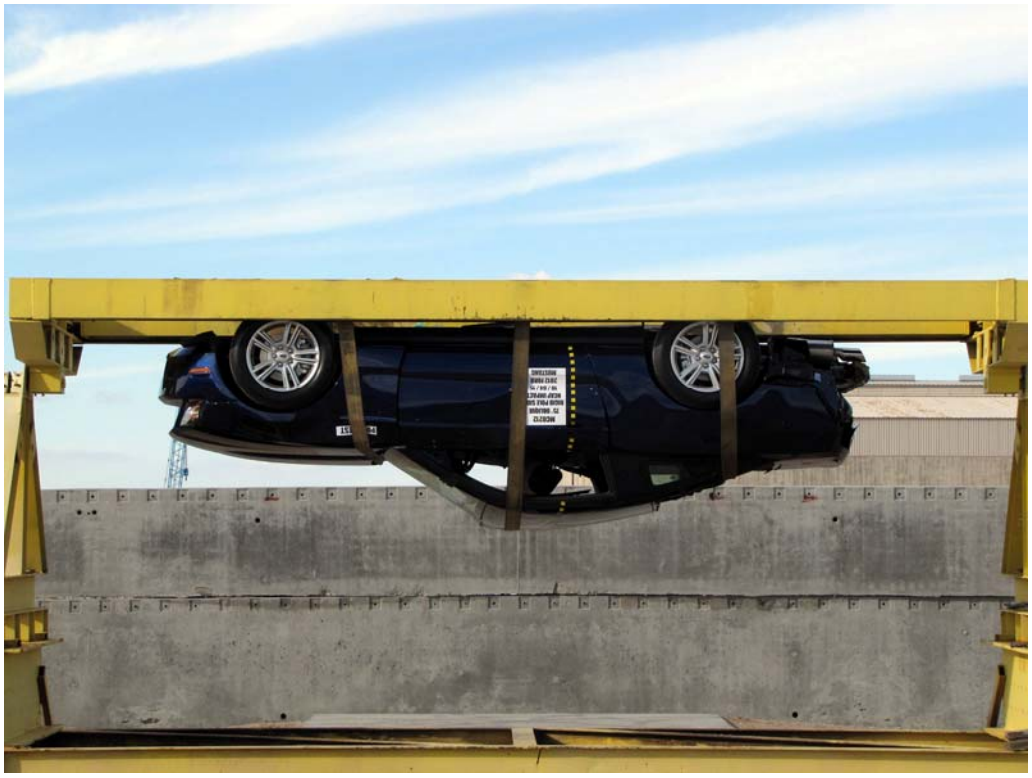


FIGURE 64. FMVSS No. 301-305 Rollover 180 Degrees

FIGURE 65. FMVSS No. 301-305 Rollover 270 Degrees

FIGURE 66. FMVSS No. 301-305 Rollover 360 Degrees

FIGURE 67. Impact Event

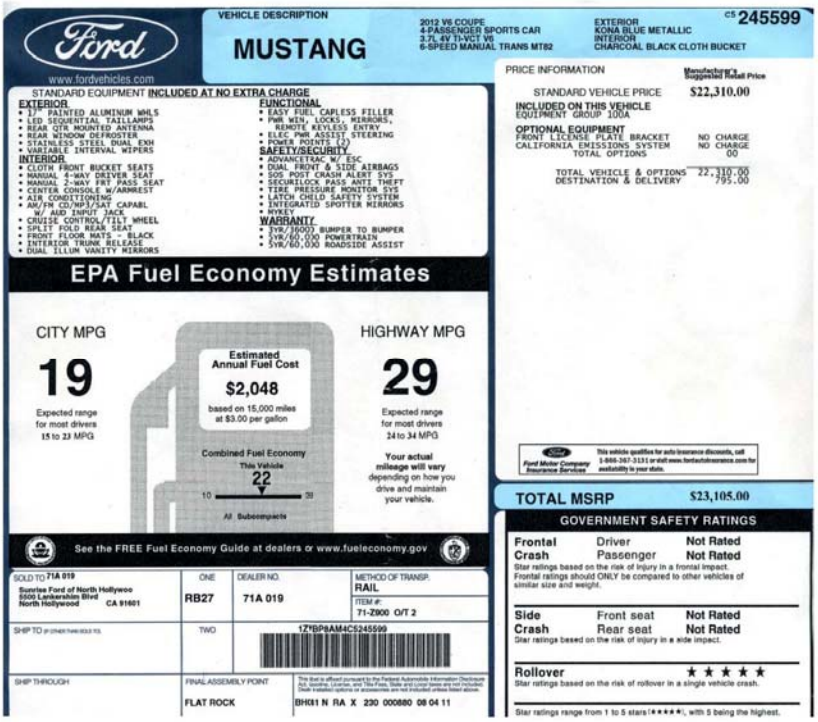
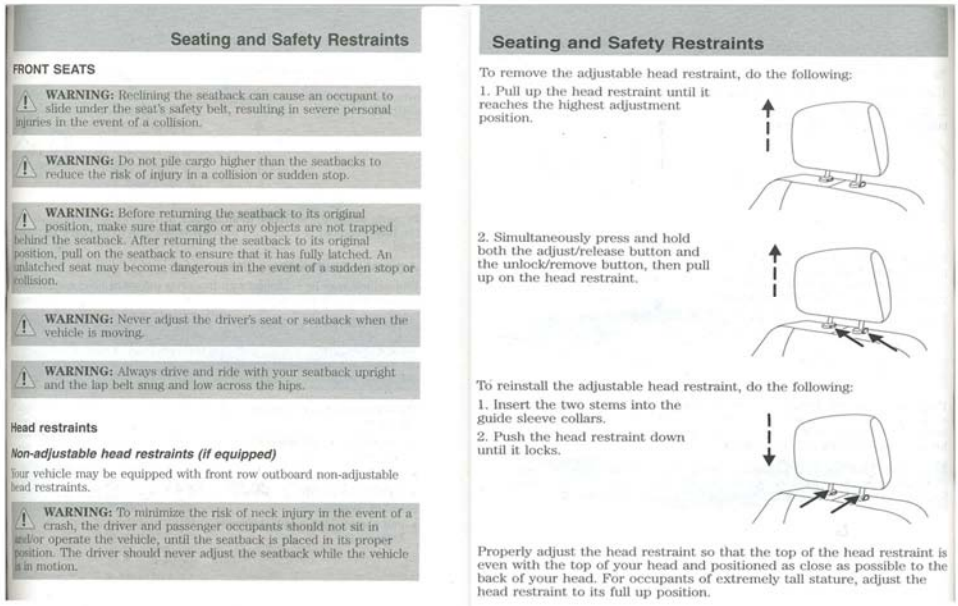


FIGURE 68. Monroney Label



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.

Head restraints

Non-adjustable head restraints (if equipped)

Your vehicle may be equipped with front row outboard non-adjustable 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 seatback is placed in its proper position. The driver should never adjust the seatback while the vehicle is in motion.

Seating and Safety Restraints

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 and the unlock/remove button, 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.

FIGURE 69. Head Restraint Use and Adjustment Information from Vehicle 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. The website can be found at www.NHTSA.dot.gov

Additional Driver Dummy Instrumentation Data

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

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Left Floor Sill Acceleration (Y)
Left A-Pillar Sill Acceleration (Y)
Left Lower A-Pillar Acceleration (Y)
Left Mid A-Pillar Acceleration (Y)

Left B-Pillar Sill Acceleration

Left Lower B-Pillar Acceleration (Y)

Left Mid B-Pillar Acceleration (Y)

Driver Seat Track at Dummy Hip Point Acceleration (Y)

Engine Top Acceleration (X)

Engine Top Acceleration (Y)

Firewall Center Acceleration (Y)

Right Roof at Vertical Impact Reference Line Acceleration (Y)

Right Sill at Vertical Impact Reference Line Acceleration (Y)

Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)

Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)

Pole Instrumentation Data

Load Cell Pole Barrier #1 Force (Y)

Load Cell Pole Barrier #2 Force (Y)

Load Cell Pole Barrier #3 Force (Y)

Load Cell Pole Barrier #4 Force (Y)

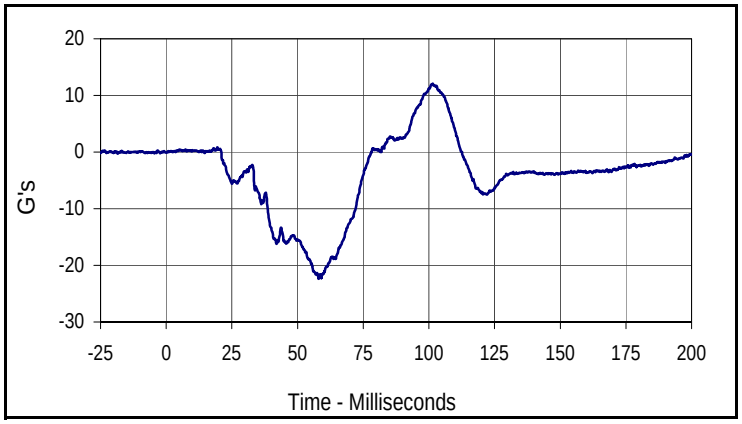
Load Cell Pole Barrier #5 Force (Y)

Load Cell Pole Barrier #6 Force (Y)

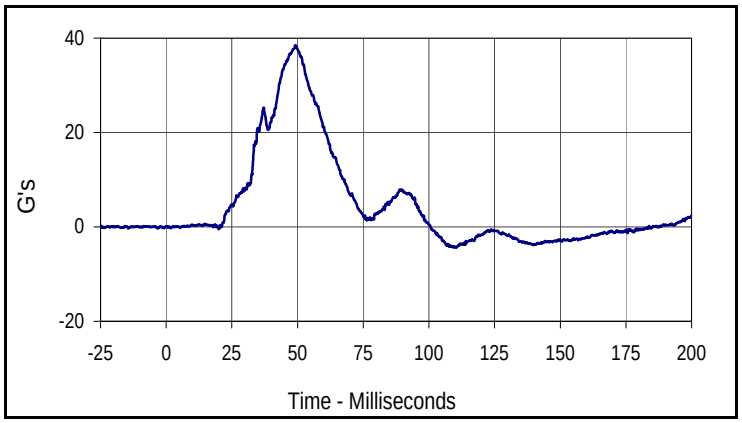
Load Cell Pole Barrier #7 Force (Y)

Load Cell Pole Barrier #8 Force (Y)

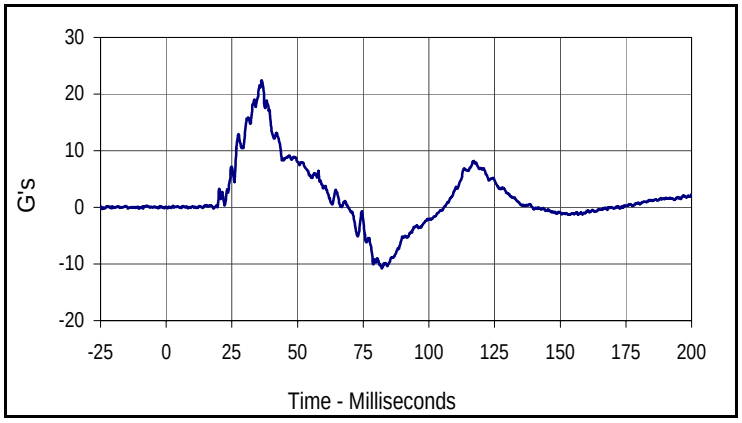
Test Vehicle:	2012 Ford Mustang 2-Door Coupe	Test Date:	10/4/11
Test Program:	32 km/h (20 mph) Side Impact NCAP 75° Rigid Pole Test	NHTSA No.:	MC0212



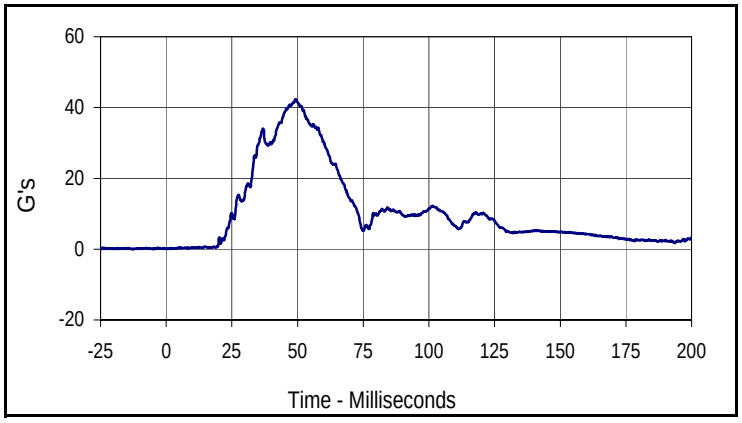
Curve Description			
Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
12.1	101.5	-22.4	58.1



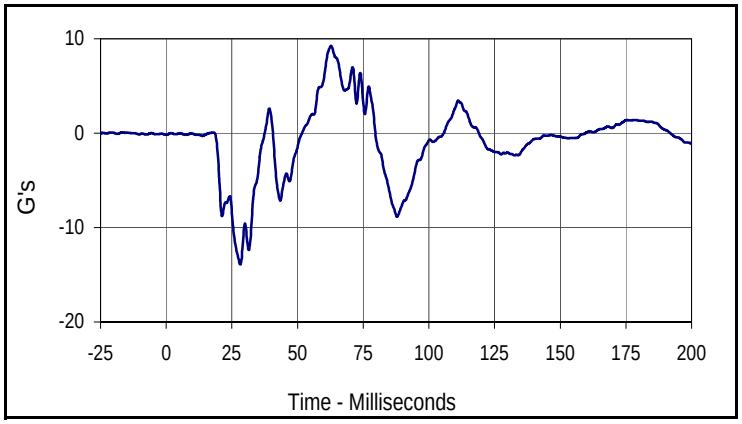
Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
38.5	49.2	-4.4	110.5



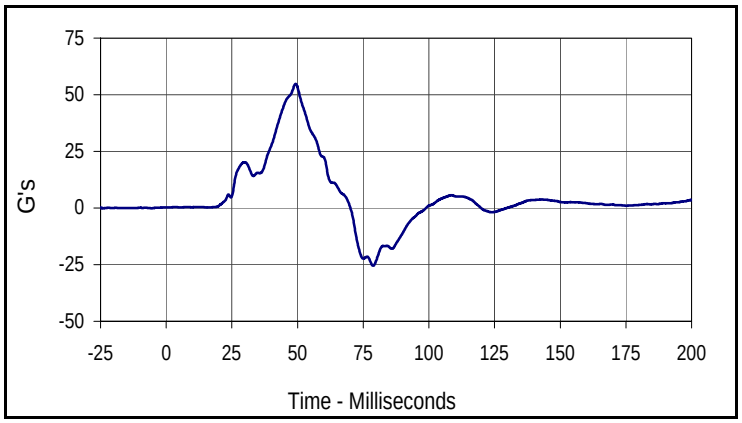
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
22.4	36.3	-10.8	82.1



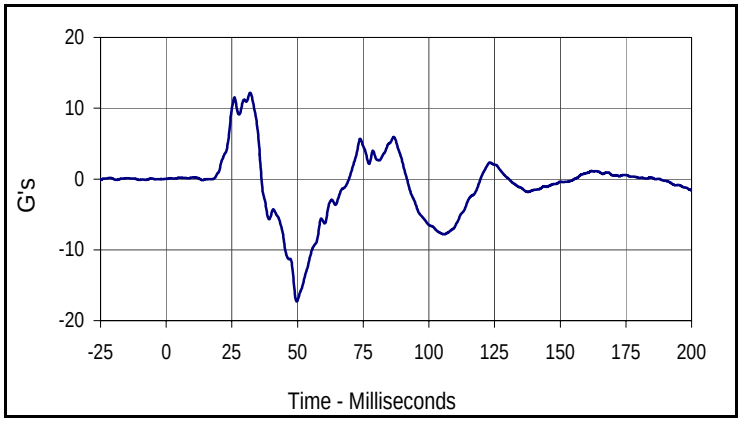
Curve Description			
Driver Head Acceleration Primary Res.			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
42.4	49.2	0.0	1.1



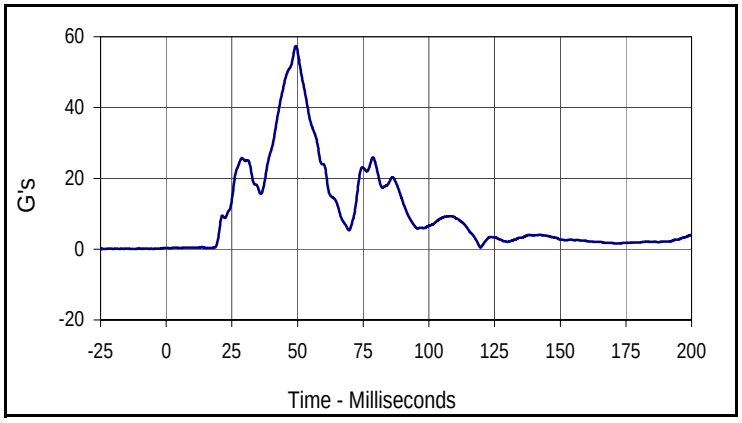
Curve Description			
Driver Lower Spine T12 Acceleration X			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
9.2	62.7	-13.9	28.2



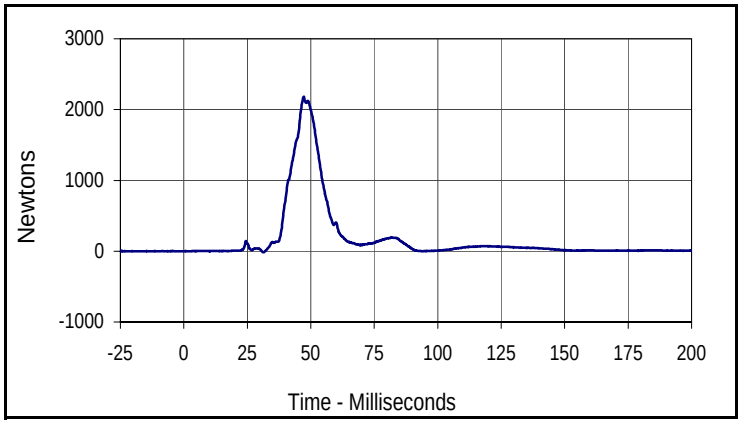
Curve Description			
Driver Lower Spine T12 Acceleration Y			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
54.8	49.3	-25.5	78.7



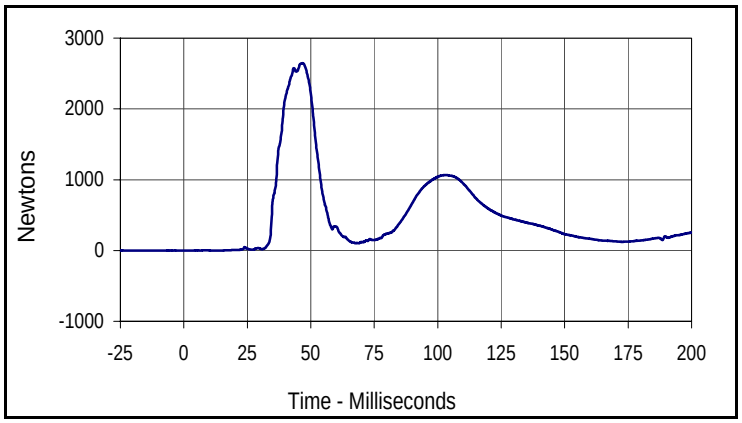
Curve Description			
Driver Lower Spine T12 Acceleration Z			
Plot No.	Type	SAE Class	Units
007	FIL	180	G's
Max	Time	Min	Time
12.2	32.0	-17.3	49.7



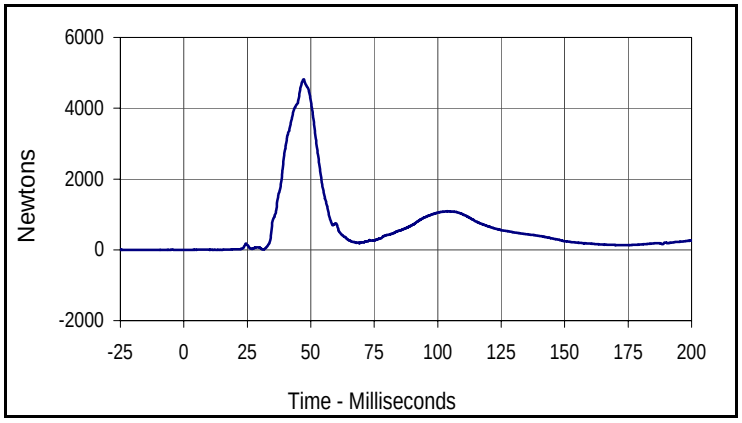
Curve Description			
Driver Lower Spine T12 Acceleration Res.			
Plot No.	Type	SAE Class	Units
008	RES	180	G's
Max	Time	Min	Time
57.4	49.4	0.3	1.4



Curve Description			
Driver Iliac Wing Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
009	FIL	600	Newtons
Max	Time	Min	Time
2183.7	47.3	-15.3	31.3



Curve Description			
Driver Acetabulum Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
010	FIL	600	Newtons
Max	Time	Min	Time
2645.5	46.8	-1.4	12.9



Curve Description			
Driver Total Pelvic Force on Impact Side Y			
Plot No.	Type	SAE Class	Units
011	SUM	600	Newtons
Max	Time	Min	Time
4819.6	47.2	-1.7	1.5

APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

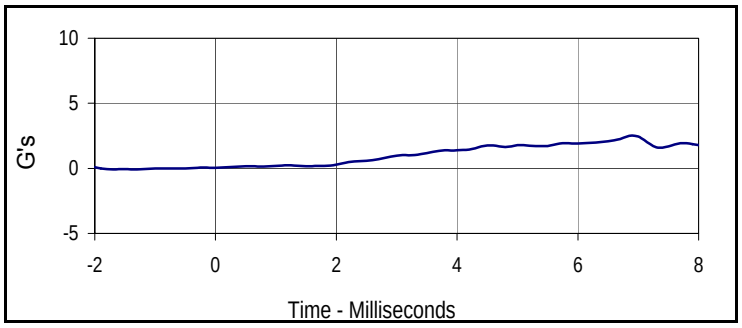
Test Program:	SID IIs External Measurements	Test Date:	10/3/11
ATD Serial No.:	299	Test I.D.:	N/A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.4	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	149	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	145	Pass
H	Head Back from Backline	mm	40 - 46	43	Pass
I	Head Depth	mm	178 - 188	183	Pass
J	Head Circumference	mm	541 - 551	549	Pass
K	Buttock to Knee Length	mm	514 - 540	525	Pass
L	Popliteal Height	mm	343 - 369	351	Pass
M	Knee Pivot to Floor Height	mm	392 - 409	400	Pass
N	Buttock Popliteal Length	mm	416 - 442	430	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	316	Pass
R	Arm Length	mm	249 - 259	256	Pass
S	Knee Joint to Seatback	mm	477 - 493	486	Pass
V	Shoulder Width	mm	341 - 357	351	Pass
W	Foot Width	mm	78 - 94	93	Pass
Y	Chest Circumference with Jacket	mm	851 - 881	880	Pass
Z	Waist Circumference	mm	760 - 791	773	Pass
			Overall Test Results		Pass

Test Program:	SID IIs Head Drop Test	Test Date:	10/3/11
ATD Serial No.:	299	Test I.D.:	299HD018

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		20.8	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
Peak Head Resultant Acceleration		G's	115 to 137	125.0	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
125.0	3.1	0.1	-1.2



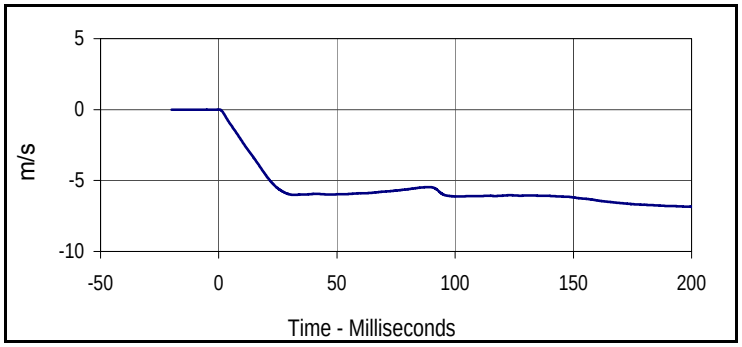
Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.9	5.8	-0.1	-1.7

Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
101.4	3.0	-1.8	6.6

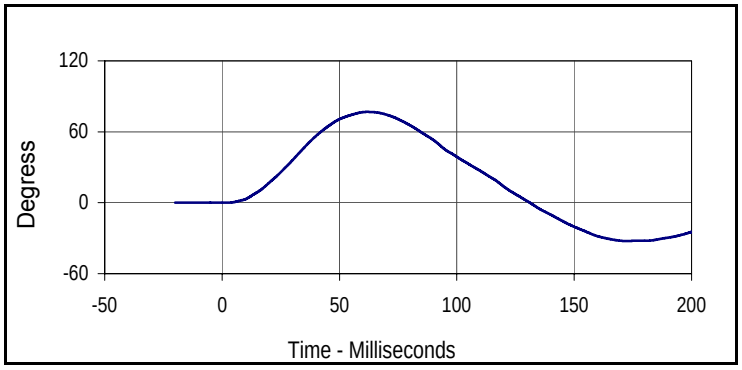
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
73.2	3.1	-0.7	0.0

Test Program:	SID IIs Neck Flexion Test	Test Date:	10/3/11
ATD Serial No.:	299	Test I.D.:	299NB018

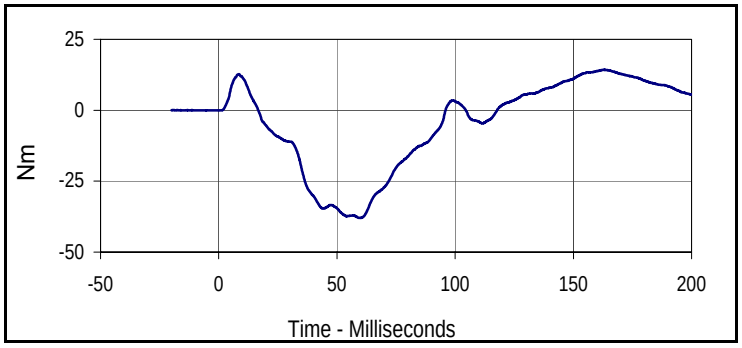
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	290	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Velocity		m/s	5.51 to 5.63	5.54	Pass
Pendulum Deceleration	10 msec	m/s	-2.20 to -2.80	-2.27	Pass
	15 msec	m/s	-3.30 to -4.10	-3.44	Pass
	20 msec	m/s	-4.40 to -5.40	-4.64	Pass
	25 msec	m/s	-5.40 to -6.10	-5.55	Pass
	25-100 msec	m/s	-5.50 to -6.20	-6.12	Pass
D-Plane Rotation	Max	Degrees	71 to 81	76.8	Pass
	Time	msec	50 to 70	61.8	Pass
Peak Occipital Condyle Moment		Nm	-36 to -44	-38.0	Pass
Decaying Moment Time to Cross 0 Nm		msec	102 to 126	117.8	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	-6.9	200.0



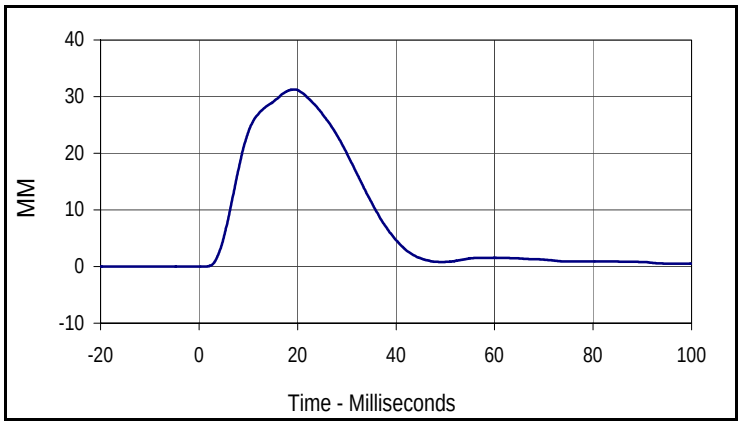
Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
76.8	61.8	-32.4	172.1



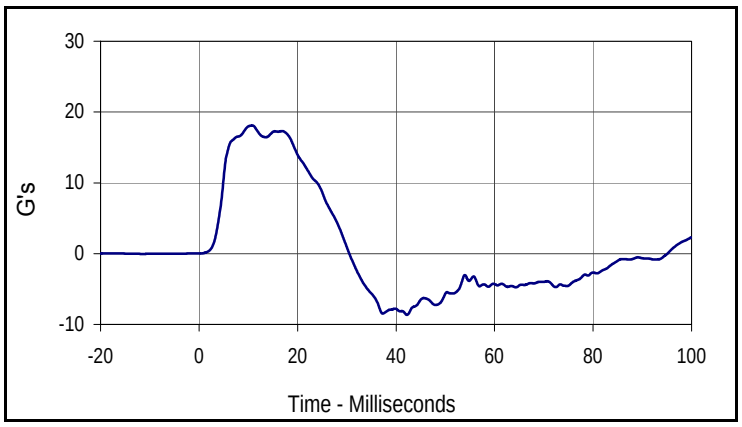
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
14.3	162.8	-38.0	59.6

Test Program:	SID IIs Shoulder Impact Test	Test Date:	10/3/11
ATD Serial No.:	299	Test I.D.:	299SH018

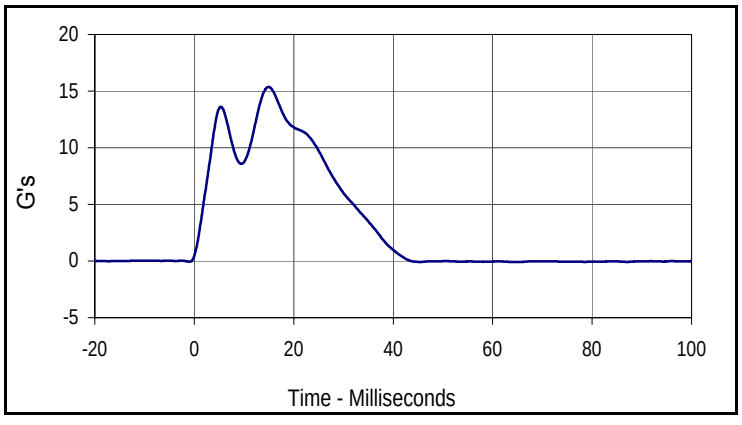
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	335	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Impactor Velocity		m/s	4.20 to 4.40	4.31	Pass
Peak Shoulder Deflection		mm	28 to 37	31.3	Pass
Peak Lateral Spine Acceleratrion Y		G's	17 to 22	18.1	Pass
Peak Impactor Acceleration		G's	13 to 18	15.4	Pass
			Overall Test Results		Pass



Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
31.3	19.2	0.0	-18.7



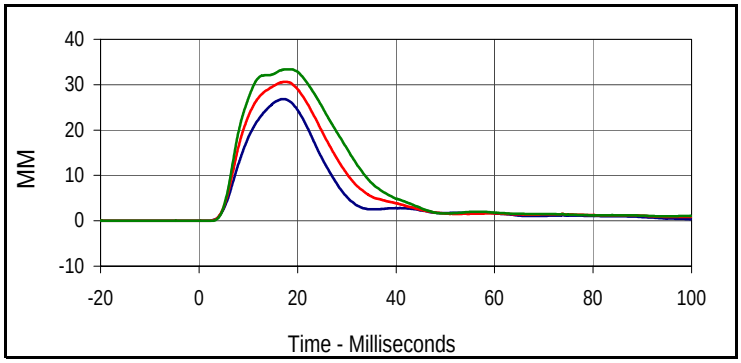
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.1	10.8	-8.7	42.2



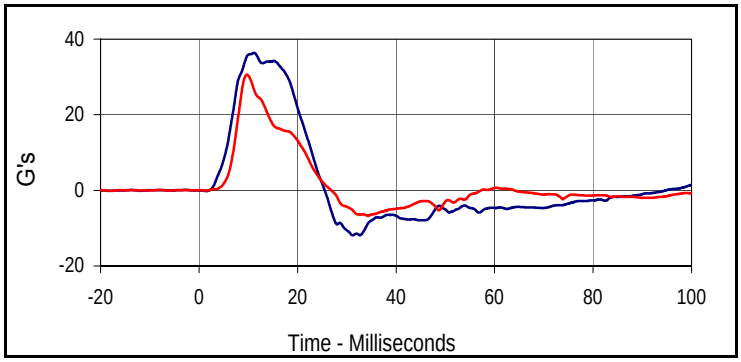
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.4	14.9	-0.1	65.4

Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	10/3/11
ATD Serial No.:	299	Test I.D.:	299TWA018

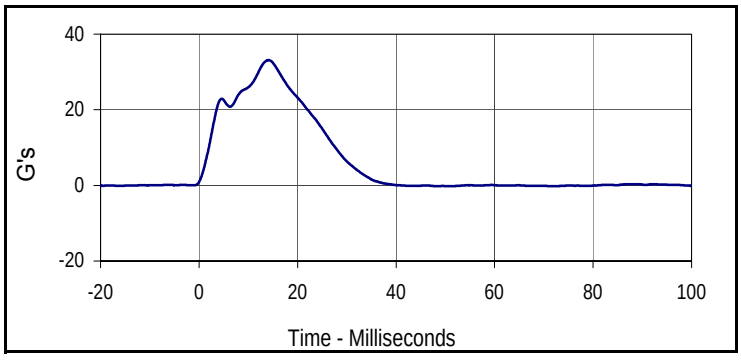
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	360	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.7	Pass
Peak Shoulder Deflection		mm	31 to 40	34.1	Pass
Peak Upper Thorax Rib Deflection		mm	25 to 32	26.8	Pass
Peak Middle Thorax Rib Deflection		mm	30 to 36	30.6	Pass
Peak Lower Thorax Rib Deflection		mm	32 to 38	33.4	Pass
Peak Upper Spine Y Acceleration		G's	34 to 43	36.3	Pass
Peak Lower Spine Y Acceleration		G's	29 to 37	30.6	Pass
Peak Impactor Acceleration		G's	30 to 36	33.1	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
26.8	17.1	0.0	-15.0
Middle Thorax Deflection			
Max	Time	Min	Time
30.6	17.5	0.0	-10.4
Lower Thorax Deflection			
Max	Time	Min	Time
33.4	17.6	0.0	-10.3

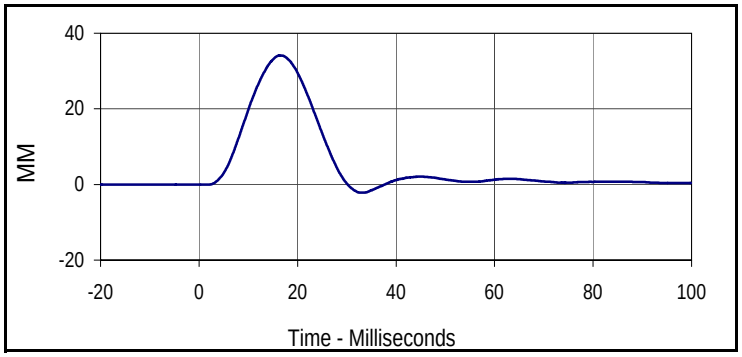


Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
36.3	11.2	-11.9	31.2
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
30.6	9.7	-6.6	34.2



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
33.1	14.1	-0.2	50.7

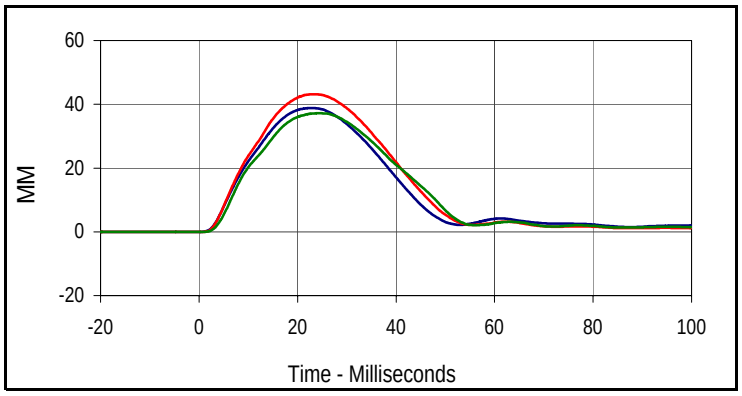
Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	10/3/11
ATD Serial No.:	299	Test I.D.:	299TWA018



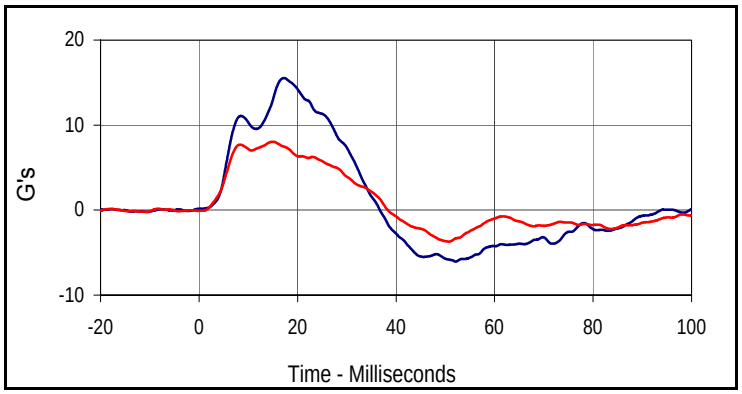
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
34.1	16.5	-2.2	33.0

Test Program:	SID IIs Thorax without Arm Impact Test	Test Date:	10/3/11
ATD Serial No.:	299	Test I.D.:	299TWOA018

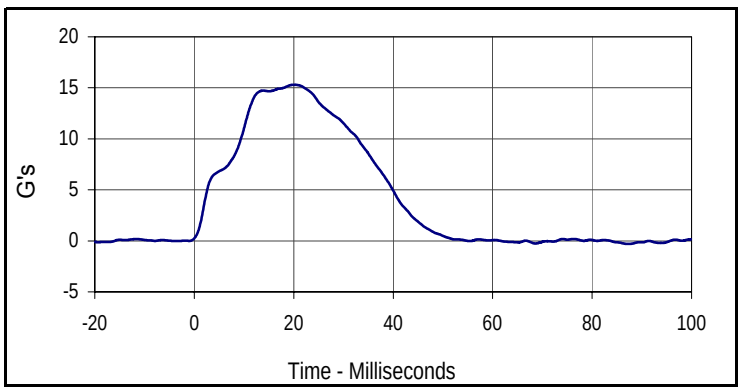
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	390	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Upper Thorax Rib Deflection		mm	32 to 40	38.8	Pass
Peak Middle Thorax Rib Deflection		mm	39 to 45	43.2	Pass
Peak Lower Thorax Rib Deflection		mm	35 to 43	37.2	Pass
Peak Upper Spine Y Acceleration		G's	13 to 17	15.5	Pass
Peak Lower Spine Y Acceleration		G's	7 to 11	8.0	Pass
Peak Impactor Acceleration		G's	14 to 18	15.3	Pass
			Overall Test Results		Pass



Curve Description			
Upper Thorax Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
38.8	22.9	0.0	-5.6
Middle Thorax Deflection			
Max	Time	Min	Time
43.2	23.4	0.0	-3.8
Lower Thorax Deflection			
Max	Time	Min	Time
37.2	24.3	0.0	1.0



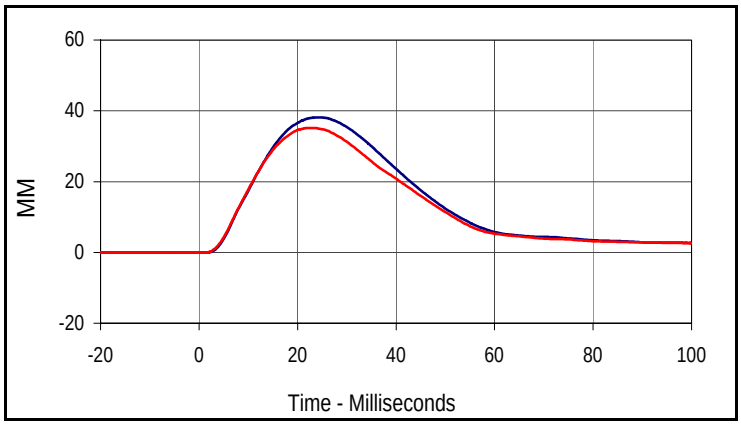
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.5	17.2	-6.1	52.1
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
8.0	15.0	-3.7	50.7



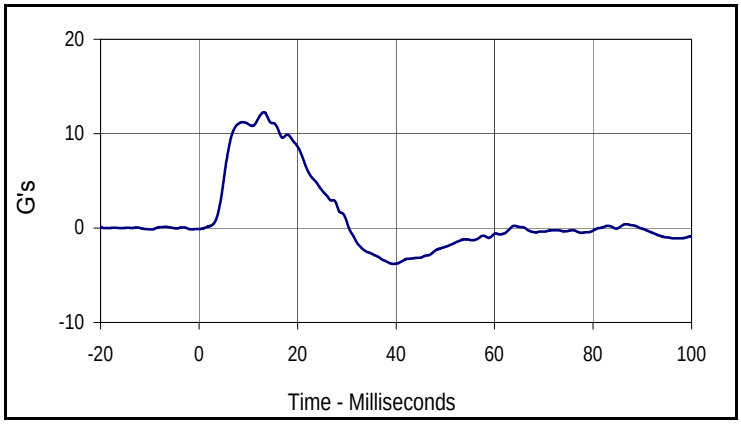
Curve Description			
Impactor Accleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
15.3	20.1	-0.3	87.2

Test Program:	SID IIs Abdomen Impact Test	Test Date:	10/3/11
ATD Serial No.:	299	Test I.D.:	299ABD018

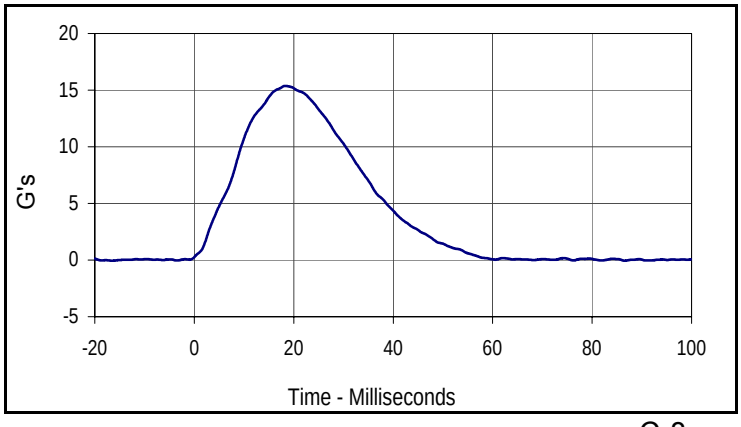
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	420	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.9	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Impactor Velocity		m/s	4.2 to 4.4	4.3	Pass
Peak Upper Abdominal Rib Deflection		mm	36 to 47	38.1	Pass
Peak Lower Abdominal Rib Deflection		mm	33 to 44	35.2	Pass
Peak Lower Spine Y Acceleration		G's	9 to 14	12.3	Pass
Peak Impactor Acceleration		G's	12 to 16	15.4	Pass
			Overall Test Results		Pass



Curve Description			
Upper Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
001	FIL	600	MM
Max	Time	Min	Time
38.1	24.3	0.0	-15.1
Curve Description			
Lower Abdominal Rib Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	600	MM
Max	Time	Min	Time
35.2	22.3	0.0	-17.2

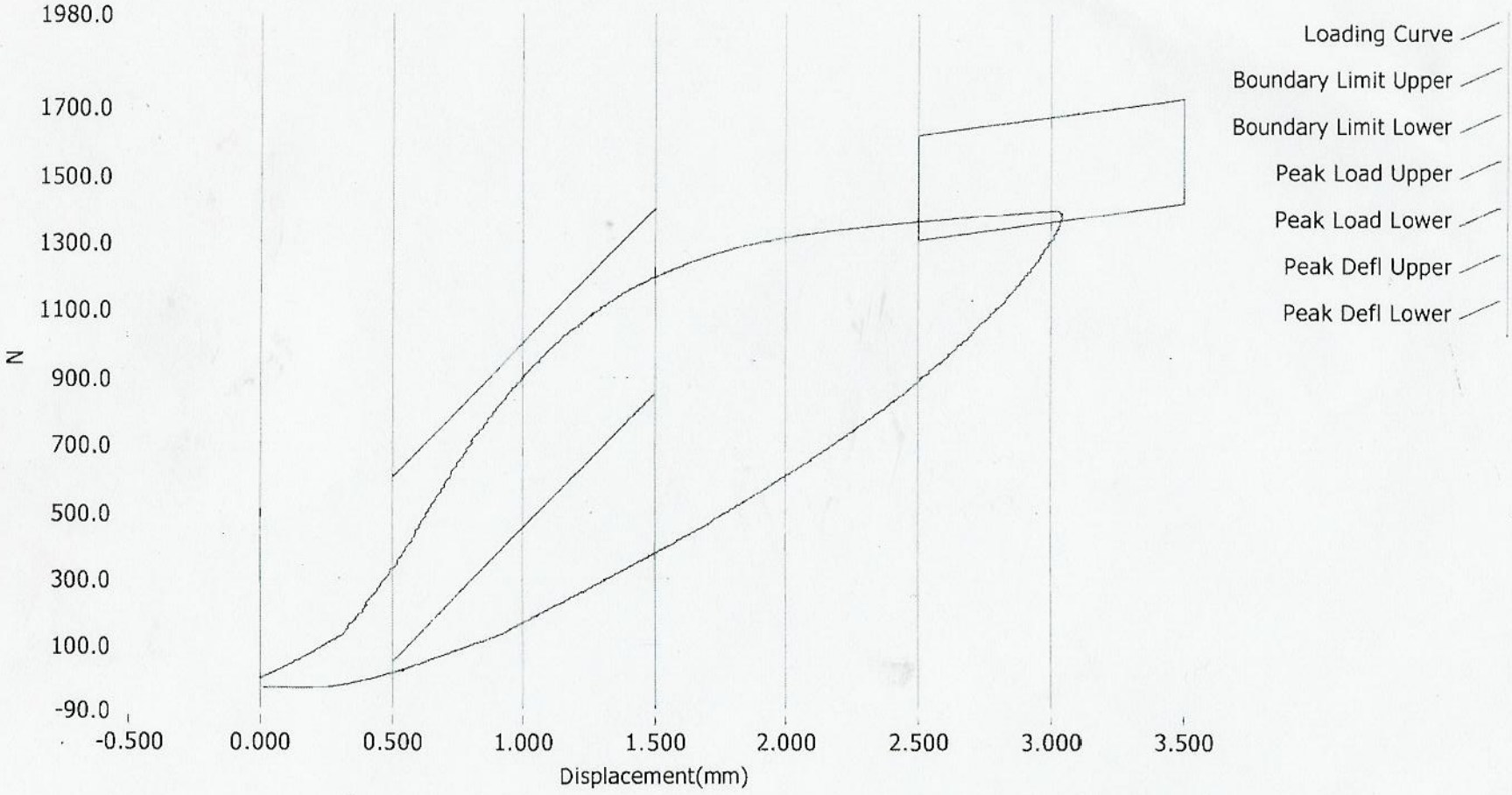


Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
12.3	13.1	-3.8	39.5



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.4	18.3	-0.1	0.0

Resultant Data - SIDIIs Plug Compression



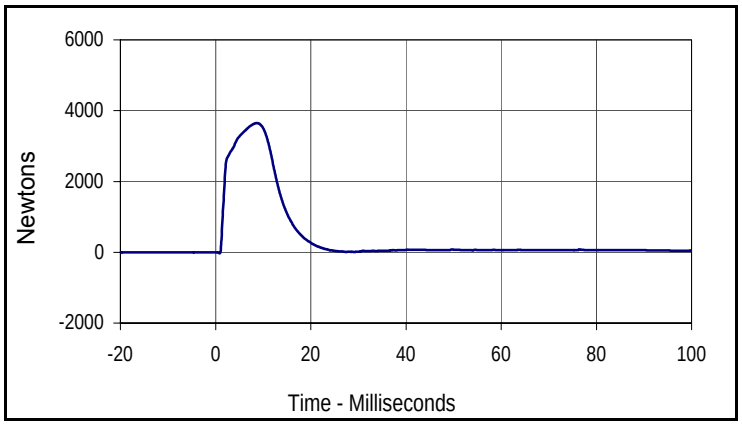
ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
		9/23/2010	12:22 AM
Cert ID	ATD Serial Number	ATD Type	
	36350	SIDIIs	

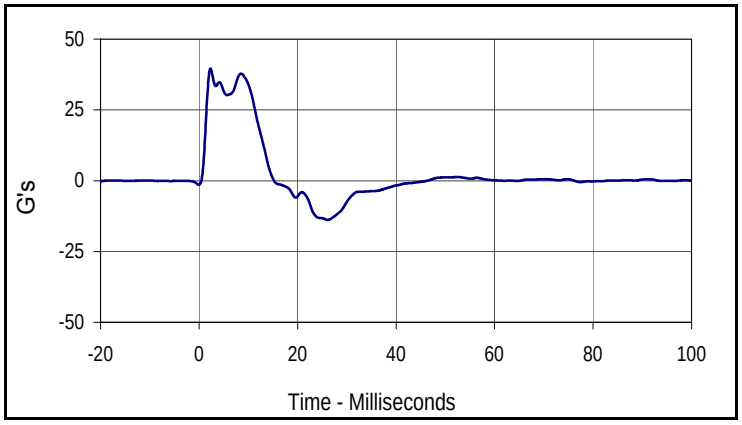
Current Date : 9/23/2010 Current Time : 00:23:57

Test Program:	SID IIs Pelvis Acetabulum Impact Test	Test Date:	10/3/11
ATD Serial No.:	299	Test I.D.:	299ACE018

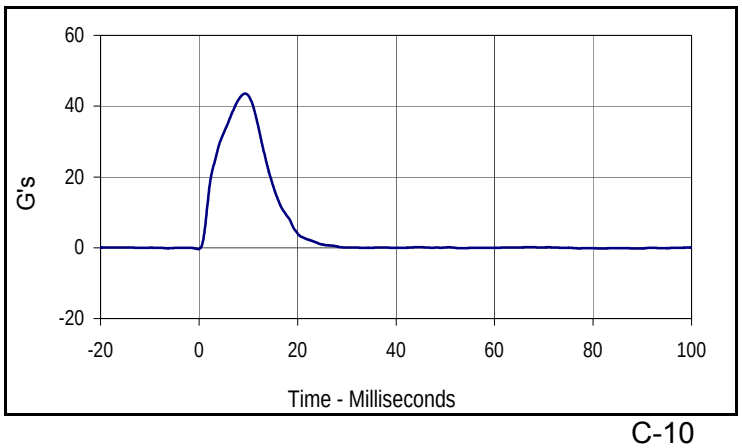
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	455	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Impactor Velocity		m/s	6.6 to 6.8	6.7	Pass
Peak Acetabulum Force Y		Newtons	3400 to 4200	3648.5	Pass
Peak Pelvis Y Acceleration After 6 msec.		G's	34 to 42	37.8	Pass
Peak Impactor Acceleration		G's	38 to 47	43.5	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Acetabulum Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3648.5	8.7	-31.9	0.9



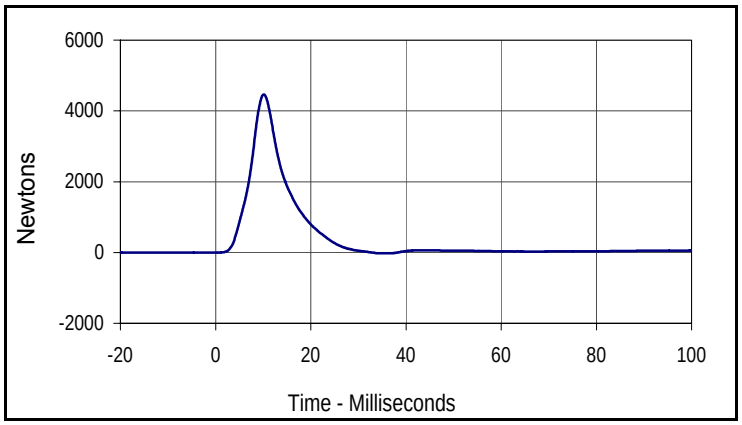
Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
39.6	2.3	-13.9	26.1



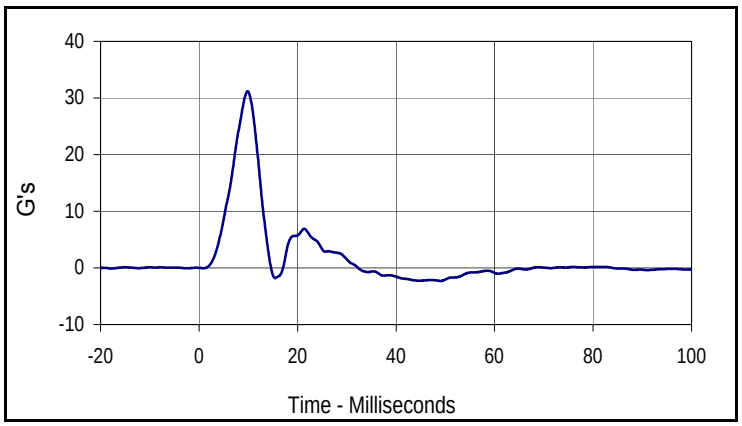
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
43.5	9.4	-0.4	-0.2

Test Program:	SID IIs Pelvis Iliac Calibration	Test Date:	10/3/11
ATD Serial No.:	299	Test I.D.:	299PL018

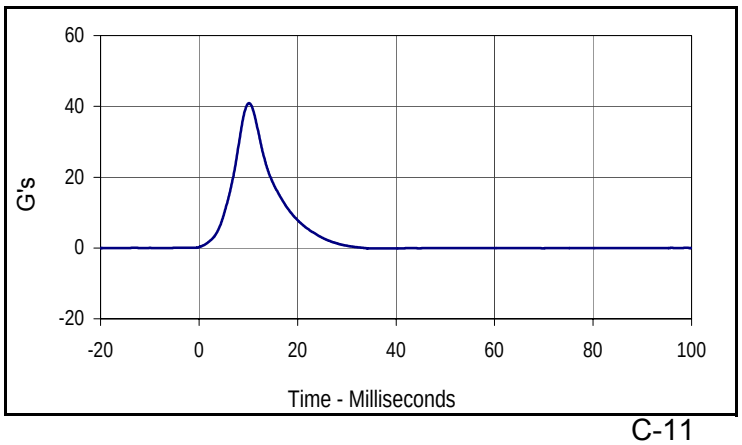
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	485	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.9	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory 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	4462.1	Pass
Peak Pelvis Y Acceleration		G's	28 to 39	31.2	Pass
Peak Impactor Acceleration		G's	36 to 45	40.9	Pass
			Overall Test Results		Pass



Curve Description			
Pelvis Iliac Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4462.1	10.1	-24.7	35.5



Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
31.2	9.9	-2.3	49.1



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
40.9	10.1	-0.1	35.1

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

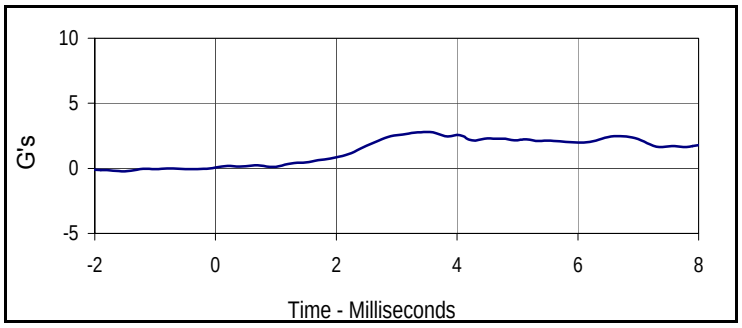
Test Program:	SID IIs External Measurements	Test Date:	10/5/11
ATD Serial No.:	299	Test I.D.:	N/A

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



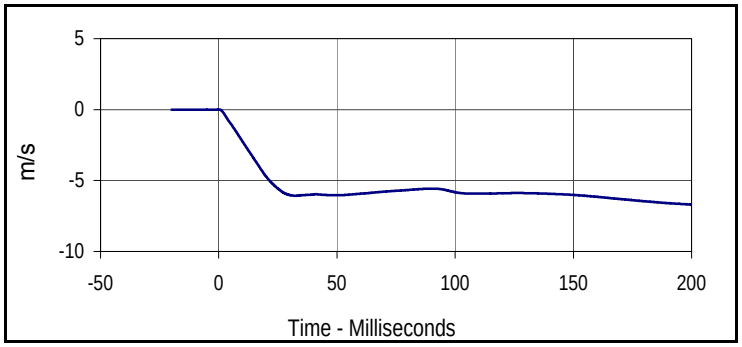
Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.8	3.5	-0.2	-1.5

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

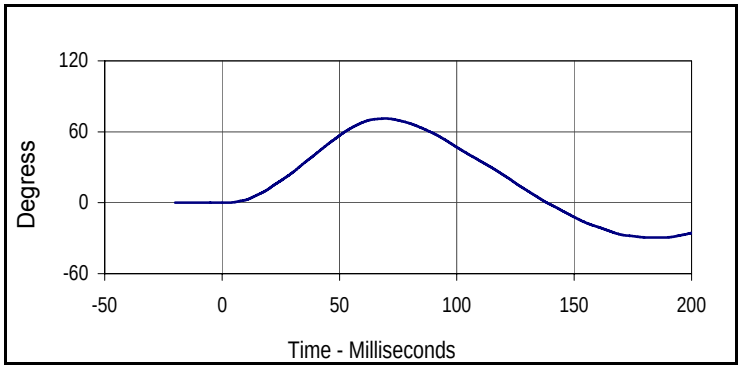
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
71.9	3.0	-0.7	0.0

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

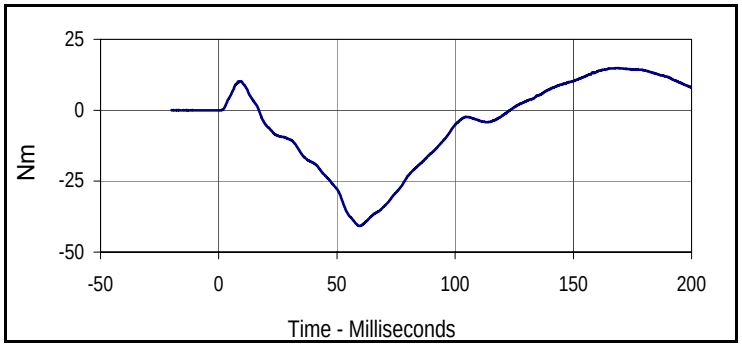
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	295	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
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



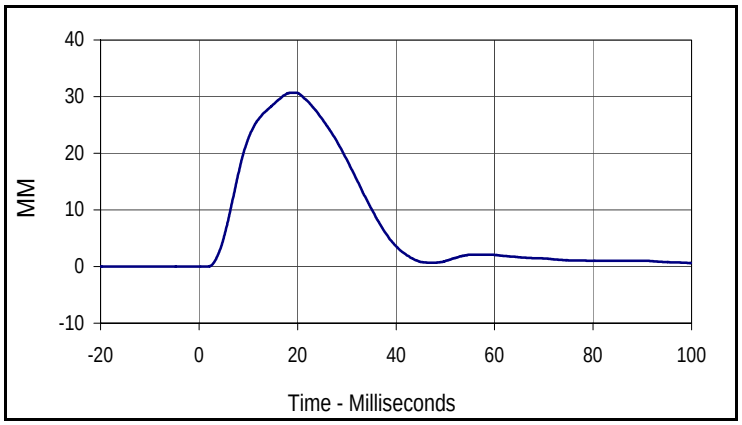
Curve Description			
Maximum Translation Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degress
Max	Time	Min	Time
71.2	69.6	-29.5	182.7



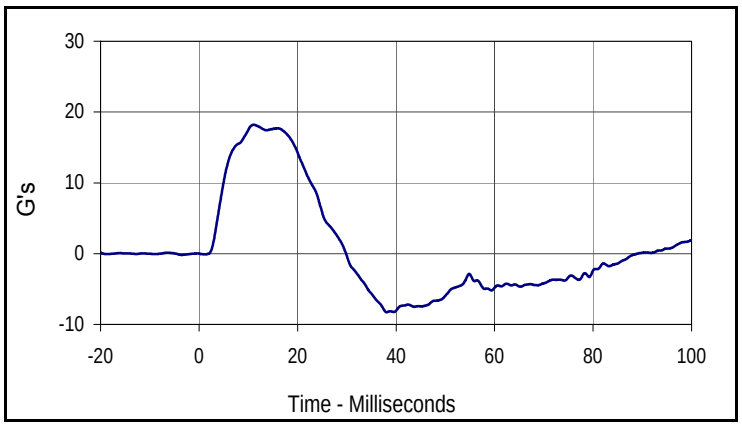
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
14.9	168.3	-40.8	59.8

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

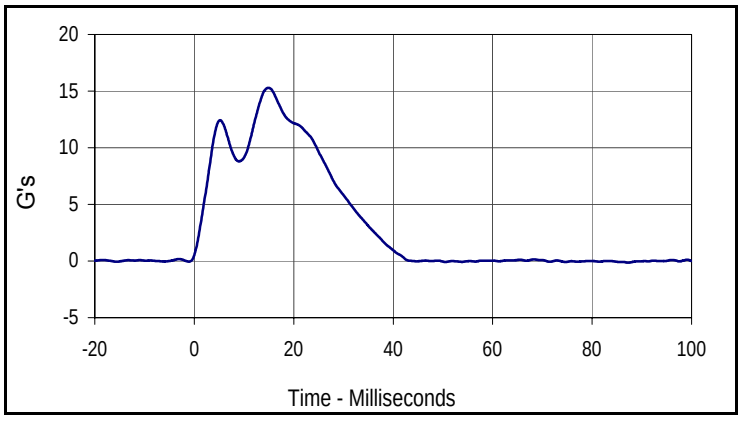
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	335	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory 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



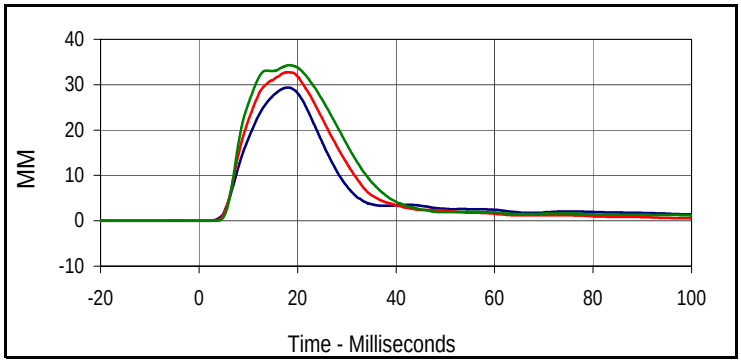
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
18.2	11.0	-8.3	38.1



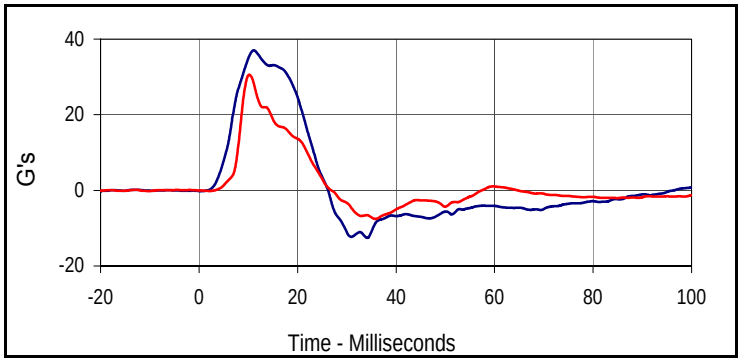
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
15.3	14.9	-0.1	87.2

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

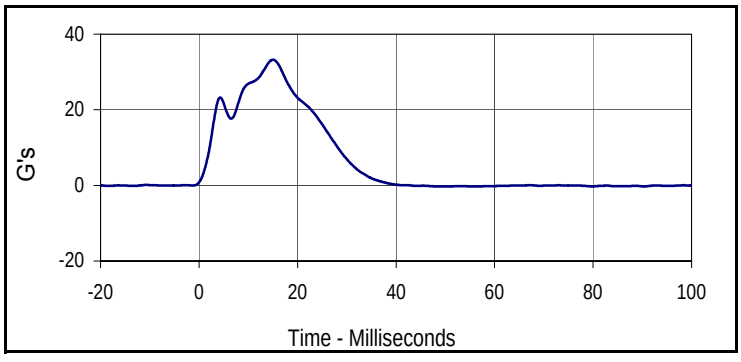
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	395	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory 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

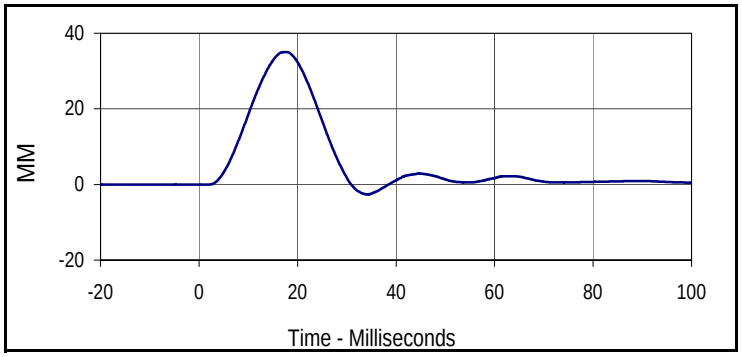


Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
37.1	11.1	-12.6	34.2
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
30.6	10.2	-7.6	35.8



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

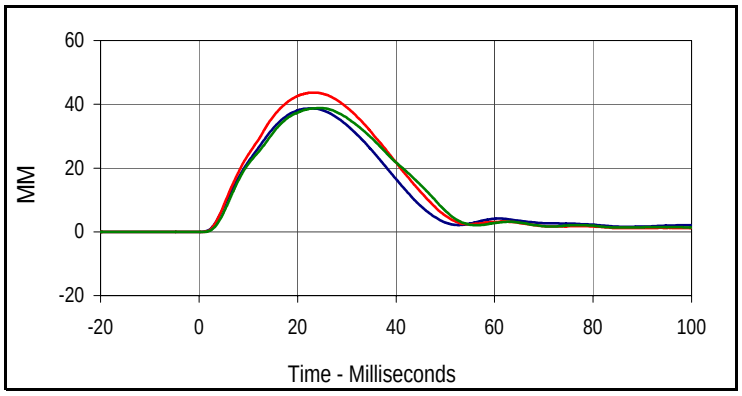
Test Program:	SID IIs Thorax with Arm Impact Test	Test Date:	10/5/11
ATD Serial No.:	299	Test I.D.:	299TWA019



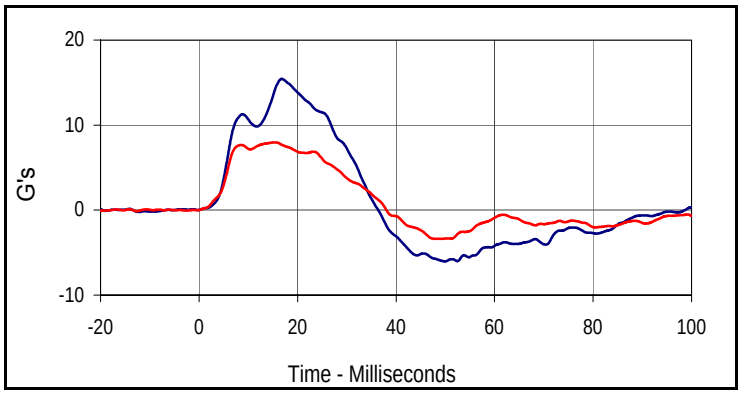
Curve Description			
Shoulder Deflection			
Plot No.	Type	SAE Class	Units
007	FIL	600	MM
Max	Time	Min	Time
35.0	17.8	-2.6	34.1

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

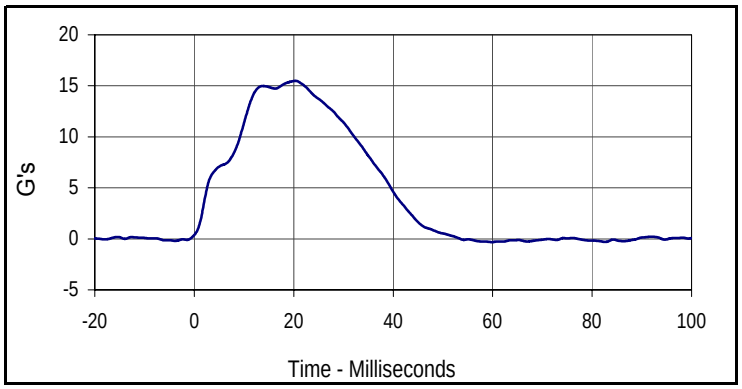
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	420	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory 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



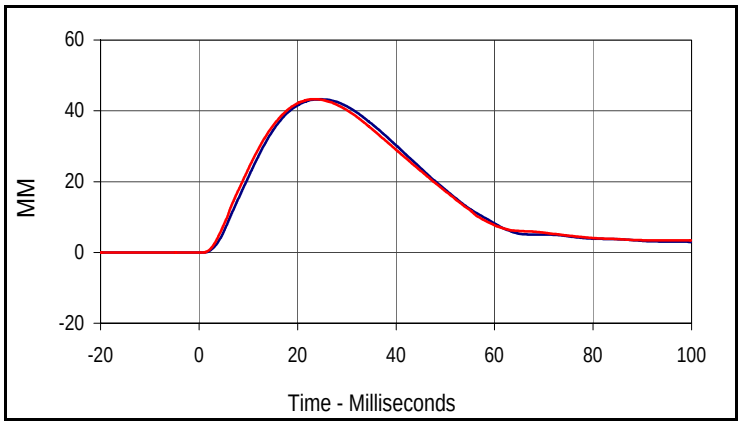
Curve Description			
Upper Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
15.4	16.8	-6.0	49.9
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
005	FIL	180	G's
Max	Time	Min	Time
8.0	15.4	-3.4	48.9



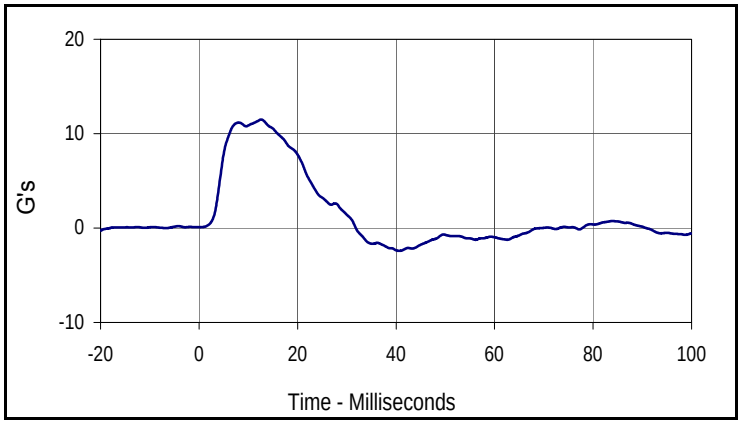
Curve Description			
Impactor Accleration			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
15.5	20.3	-0.3	59.9

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

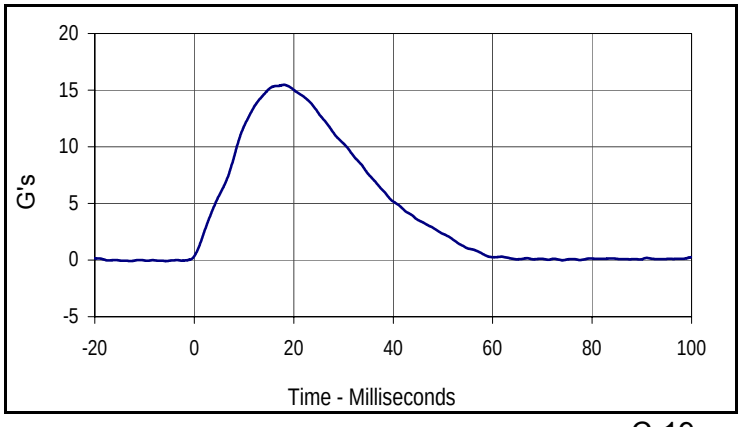
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	445	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.9	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory 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



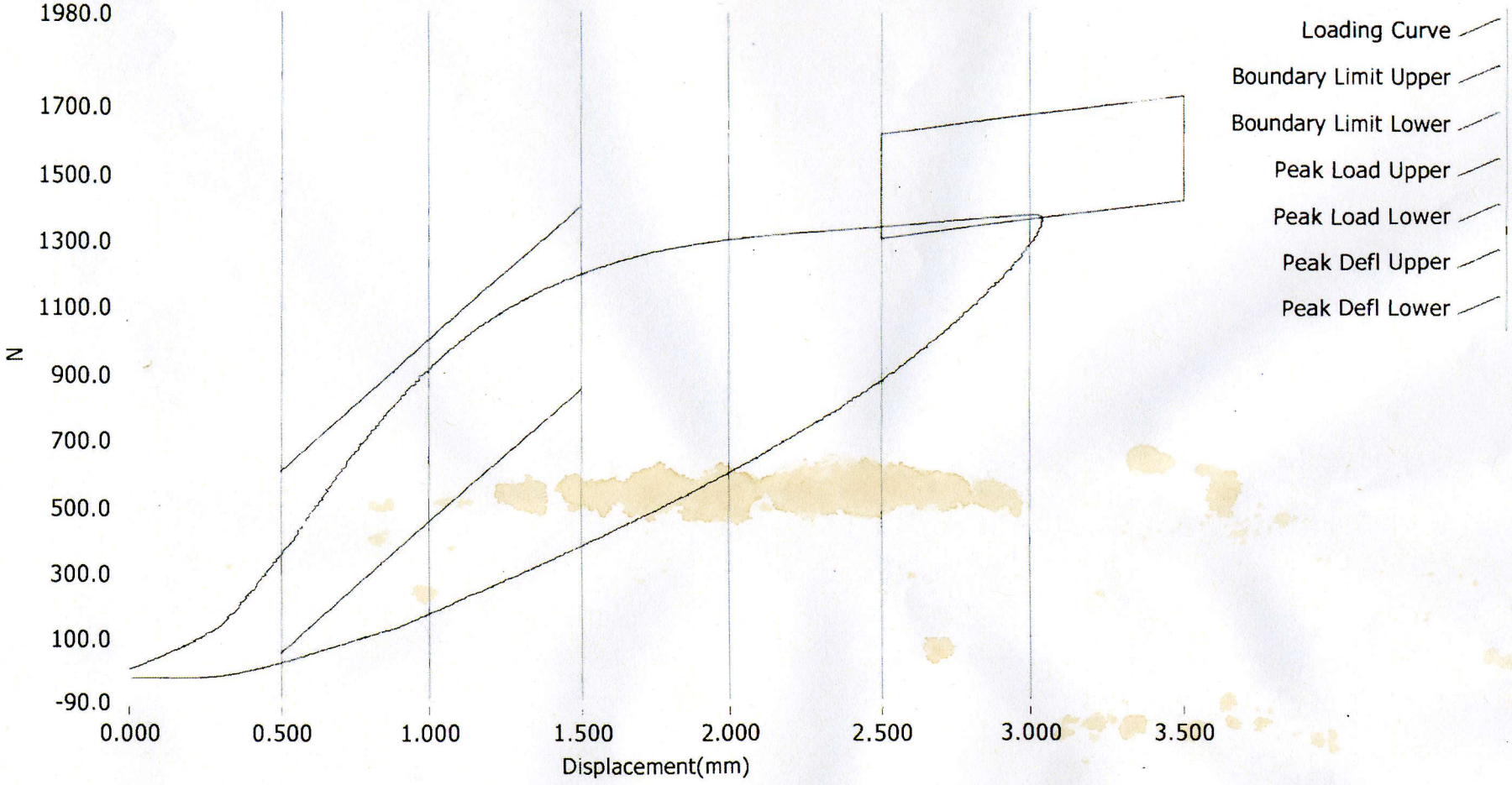
Curve Description			
Lower Spine Y Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
11.5	12.6	-2.4	40.6



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

MC0212 POST TEST CAL

Resultant Data - SIDIIs Plug Compression



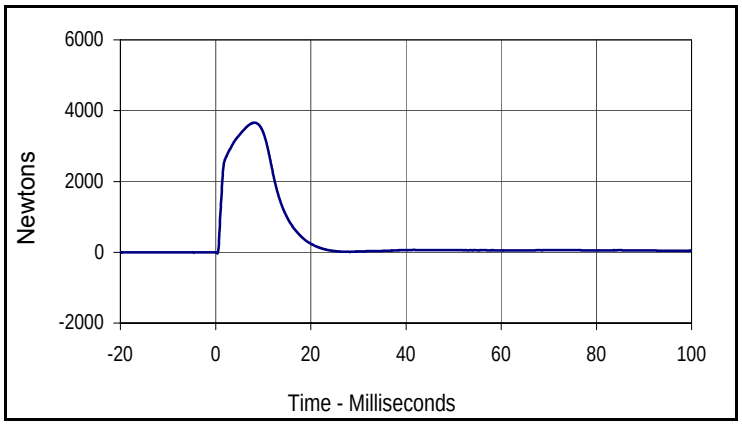
ATD Calibration Lab

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

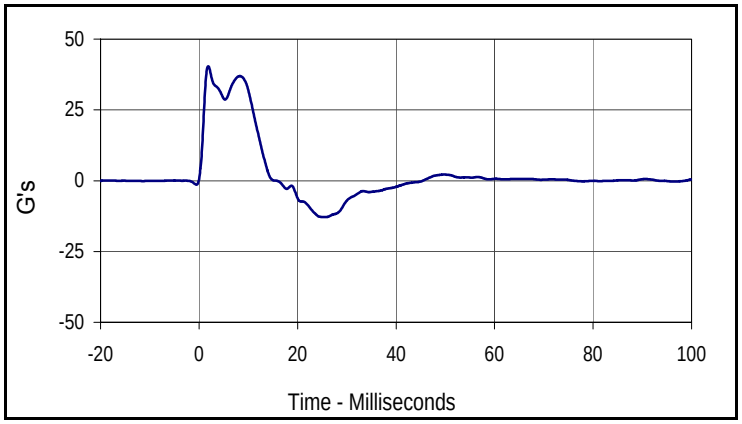
Current Date : 9/23/2010 Current Time : 00:20:05

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

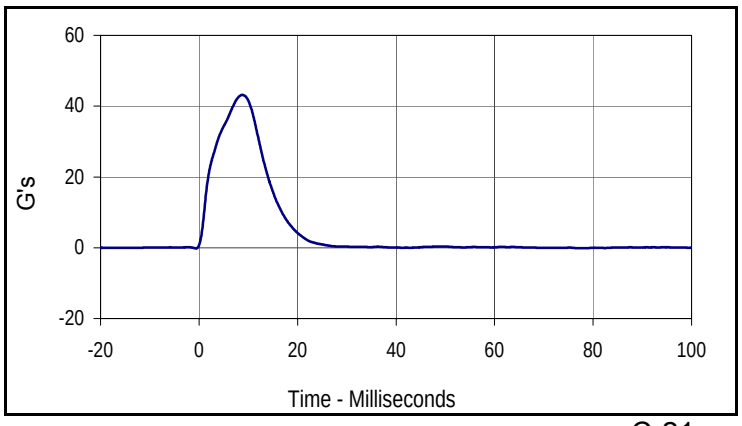
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	485	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory 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



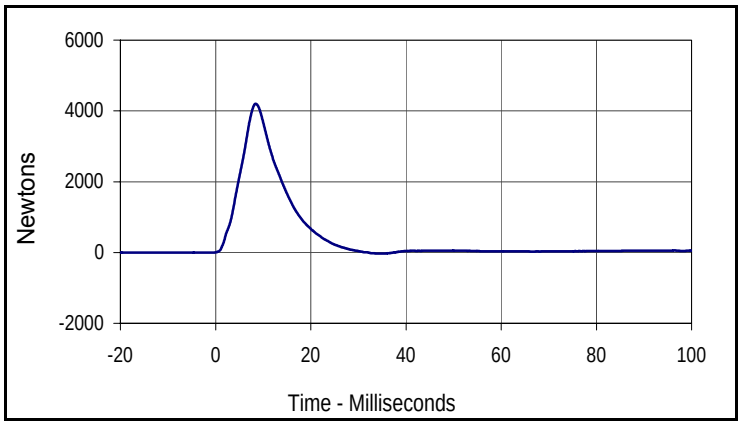
Curve Description			
Pelvis Y Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	180	G's
Max	Time	Min	Time
40.4	1.9	-12.9	25.7



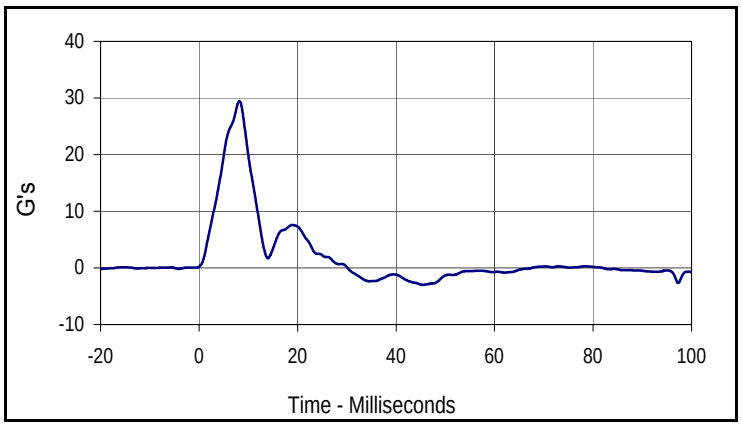
Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
43.2	8.8	-0.2	-0.6

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

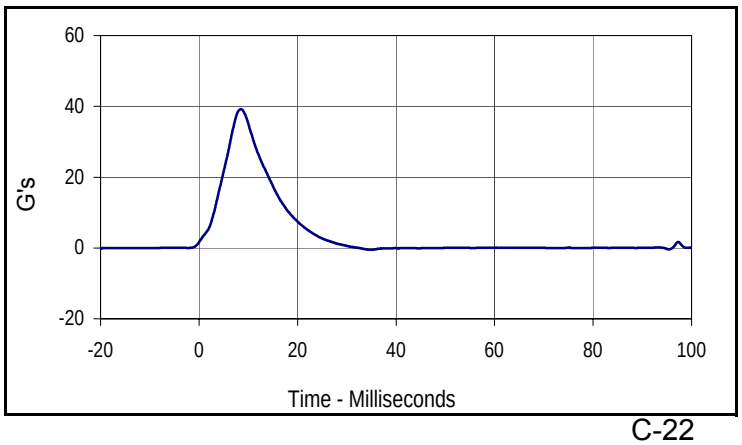
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥180	520	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.9	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	30.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory 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 D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – 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)				36454	FTSS	9/23/11
Pelvis Plug (Non-Struck Side)				36447	FTSS	9/23/11

TABLE 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
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
Left Floor Sill	Y	AJ454	Endevco	4/28/11
A-Pillar Sill	Y	J24583	Endevco	4/1/11
A-Pillar Low	Y	J24288	Endevco	3/22/11
A-Pillar Mid	Y	J27055	Endevco	4/29/11
B-Pillar Sill	Y	BF59J	Endevco	4/29/11
B-Pillar Low	Y	J36724	Endevco	3/30/11
B-Pillar Mid	Y	EK16J	Endevco	2/3/11
Driver Seat	Y	J24533	Endevco	4/1/11
Engine Top	X	BI60H	Endevco	7/22/11
Engine Top	Y	AR17	Endevco	7/22/11
Firewall	Y	BI14H	Endevco	5/30/11
Right Roof	Y	BJ27H	Endevco	5/2/11
Right Floor Sill	Y	BG29H	Endevco	5/6/11
Rear Floorpan	X	J21730	Endevco	8/22/11
Rear Floorpan	Y	DE69J	Endevco	8/5/11

TABLE 3 – Pole Instrumentation

	Serial Number	Manufacturer	Calibration Date
Load Cell 1	131822A	Interface	8/8/11
Load Cell 2	132304A	Interface	8/8/11
Load Cell 3	19477	Interface	8/8/11
Load Cell 4	19325	Interface	8/8/11
Load Cell 5	131827A	Interface	8/8/11
Load Cell 6	132302A	Interface	8/8/11
Load Cell 7	19267	Interface	8/8/11
Load Cell 8	19321	Interface	8/8/11

TABLE 1 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N		
				Serial Number	Manufacturer	Calibration
Head Accelerometers			X			
			Y			
			Z			
Displacement Potentiometers	Shoulder		Y			
	Thoracic Rib	Upper	Y			
		Middle	Y			
		Lower	Y			
	Abdominal Rib	Upper	Y			
		Lower	Y			
Lower Spine Accelerometers (T12)			X			
			Y			
			Z			
Acetabulum Load Cell			Y			
Iliac Wing Load Cell			Y			
Pelvis Plug (Struck Side)						
Pelvis Plug (Non-Struck Side)						

TABLE 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X			
Vehicle Center of Gravity	Y			
Vehicle Center of Gravity	Z			
Left Floor Sill	Y			
A-Pillar Sill	Y			
A-Pillar Low	Y			
A-Pillar Mid	Y			
B-Pillar Sill	Y			
B-Pillar Low	Y			
B-Pillar Mid	Y			
Driver Seat	Y			
Engine Top	X			
Engine Top	Y			
Firewall	Y			
Right Roof	Y			
Right Floor Sill	Y			
Rear Floorpan	X			
Rear Floorpan	Y			

TABLE 3 – Pole Instrumentation

	Serial Number	Manufacturer	Calibration Date
Load Cell 1			
Load Cell 2			
Load Cell 3			
Load Cell 4			
Load Cell 5			
Load Cell 6			
Load Cell 7			
Load Cell 8			