

REPORT NUMBER TR-P27188-01-NC

**NEW CAR ASSESMENT PROGRAM
SIDE IMPACT TEST**

**FORD MOTOR COMPANY
2008 FORD EXPEDITION XLT
5-DOOR MPV**

NHTSA NUMBER: F80203

**Prepared By:
KARCO ENGINEERING, LLC
9270 HOLLY ROAD
ADELANTO, CALIFORNIA 92301**



OCTOBER 23, 2007

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
RULEMAKING
MAIL CODE: NVS-111
1200 NEW JERSEY AVE SE, ROOM W43-410
WASHINGTON, D.C. 20590**

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-03-D-32005.

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. Kelsey A. Chiu, Project Engineer
KARCO Engineering, LLC

Date: October 23, 2007



Reviewed by: _____
Mr. Michael L. Dunlap, Director of Operations
KARCO Engineering, LLC

Date: October 23, 2007



Approved by: _____
Mr. Frank D. Richardson, Program Manager
KARCO Engineering, LLC

Date: October 23, 2007

FINAL REPORT ACCEPTED BY:

Manager, Side Impact NCAP

Date of Acceptance

Technical Report Documentation Page

1. Report No. TR-P27188-01	2. Government Accession No.	3. Recipients Catalog No.																			
4. Title and Subtitle Final Report of Side Impact New Car Assessment Program Testing of a 2008 Ford Expedition XLT 5-Door MPV NHTSA No. F80203		5. Report Date October 23, 2007																			
		6. Performing Organization Code KAR																			
7. Authors Mr. Kelsey A. Chiu, Project Engineer, KARCO Mr. Frank Richardson, Program Manager, KARCO		8. Performing Organization Report No. TR-P27188-01																			
9. Performing Organization Name and Address Karco Engineering, LLC 9270 Holly Rd. Adelanto, CA, 92301		10. Work Unit No.																			
		11. Contract or Grant No. DTNH22-03-D-32005																			
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Rulemaking Office of Crashworthiness Standards Mail Code NVS-111 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C 20590		13. Type of Report and Period Covered Final Test Report																			
		14. Sponsoring Agency Code DOT/NHTSA/NRM/OCS																			
15. Supplementary Notes																					
16. Abstract A 55/28 km/h 90 deg. Moving Deformable Barrier Side Impact NCAP Test was conducted on the subject 2008 Ford Expedition XLT 5-Door MPV in accordance with the specifications of the Office of Crashworthiness Standards Test Procedures for the generation of consumer information on vehicle side crash protection. The test was conducted at KARCO Engineering on October 23, 2007. The impact velocity of the Moving Deformable Barrier was 62.19 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 22.8 deg. C. The target vehicle's maximum post-test static crush was 203, located at level 2. The test vehicle's occupant performance data is as follows:																					
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Measurement Description</th> <th style="width: 33%;">Driver SID/HIII</th> <th style="width: 33%;">Pass. SID/HIII</th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) G's</td> <td style="text-align: center;">16.6</td> <td style="text-align: center;">19.9</td> </tr> <tr> <td>Left Lower Rib (LLR) G's</td> <td style="text-align: center;">13.2</td> <td style="text-align: center;">17.4</td> </tr> <tr> <td>Lower Spine (T₁₂) G's</td> <td style="text-align: center;">18.9</td> <td style="text-align: center;">13.9</td> </tr> <tr> <td>Thoracic Trauma Index (TTI) G's</td> <td style="text-align: center;">18.0</td> <td style="text-align: center;">17.0</td> </tr> <tr> <td>Pelvis (PEV) G's</td> <td style="text-align: center;">28.7</td> <td style="text-align: center;">21.9</td> </tr> </tbody> </table>		Measurement Description	Driver SID/HIII	Pass. SID/HIII	Left Upper Rib (LUR) G's	16.6	19.9	Left Lower Rib (LLR) G's	13.2	17.4	Lower Spine (T ₁₂) G's	18.9	13.9	Thoracic Trauma Index (TTI) G's	18.0	17.0	Pelvis (PEV) G's	28.7	21.9		
Measurement Description	Driver SID/HIII	Pass. SID/HIII																			
Left Upper Rib (LUR) G's	16.6	19.9																			
Left Lower Rib (LLR) G's	13.2	17.4																			
Lower Spine (T ₁₂) G's	18.9	13.9																			
Thoracic Trauma Index (TTI) G's	18.0	17.0																			
Pelvis (PEV) G's	28.7	21.9																			
17. Key Words New Car Assessment Program (NCAP) Side Impact Moving Deformable Barrier (MDB) Side Impact Dummy (SID/HIII)																					
18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Admin. NHTSA Technical Reference Division 1200 New Jersey Ave., SE, Room W43-410 Washington, DC 20590		19. Security Classification of this report UNCLASSIFIED																			
20. Security Classification of this page UNCLASSIFIED		21. No. of Pages 178	22. Price TR-P27188-01-NC																		

TABLE OF CONTENTS

Section		Page
1	Purpose and Test Procedure	1
2	Summary of Side Impact Test	2
3	Occupant and Vehicle Information Sheets	4

Data Sheet No.		Page
1	General Test and Vehicle Parameter Data	5
2	Test Vehicle Summary of Results	10
3	Moving Deformable Barrier (MDB) Summary of Results	11
4	Post-Test Observations	12
5	Vehicle Pre-Test and Post-Test Measurements	13
6	SID/HIII Longitudinal Clearance Dimensions	14
7	SID/HIII Lateral Clearance Dimensions	15
8	Vehicle Side Measurements	16
9	Vehicle Exterior Crush Profiles	17
10	Vehicle Damage Profile Distances	19
11	Deformable Barrier Honeycomb Face Static Crush	20
12	Vehicle Accelerometer Locations	21
13	MDB Accelerometer Locations	23
14	High Speed Camera Locations and Data	24
15	FMVSS 301 Fuel System Integrity Post-Impact Data	25
16	FMVSS 301 Static Rollover Data Sheet	26
17	Dummy / Vehicle Temperature Stabilization	28

Appendix		
A	Photographs	A
B	SID/HIII, Vehicle and MDB Response Data	B
C	SID/HIII Configuration and Performance Verification Data	C
D	Child Restraint System	D

SECTION 1

PURPOSE AND TEST PROCEDURE

1.1 PURPOSE

This Side Impact NCAP test is conducted as part of the FY' 2008 test program sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract No. DTNH22-03-D-32005. The purpose of this test is to generate comparative side impact data on a 2008 Ford Expedition XLT 5-Door MPV manufactured by Ford Motor Company.

1.2 TEST PROCEDURE

The side impact test was conducted in accordance with the current National Highway Traffic Safety Administration (NHTSA), Office of Crashworthiness Standards (OCS), laboratory test procedure NCAP Side Impact Testing, dated November 2002. The procedures for receiving, inspection, testing, and reporting of test results are described in the test procedures and are not repeated in this report.

SECTION 2

SUMMARY OF SIDE IMPACT TEST

2.1 SUMMARY OF SIDE IMPACT NCAP TEST

A model year 2008 Ford Expedition XLT 5-Door MPV was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.19 km/h. The specified impact velocity range is from 61.14 to 62.75 km/h. The test (target) vehicle was stationary and positioned 63° to the line of forward motion. The weight of the vehicle as tested was 2827 kg and the test weight of the MDB was 1361 kg. The test was conducted at KARCO Engineering, LLC in Adelanto, California, on October 23, 2007.

Two (2) real-time cameras and ten (10) high-speed video cameras were used to document the impact event. Camera locations and pertinent camera information is documented in the data sheets. Pre- and post-test photographs of the vehicle and SID/HIIIs can be found in Appendix A. Two 50th percentile adult male Side Impact Dummies, Hybrid III (SID/HIIIs) were placed in the driver's and left rear passenger designated seating positions according to the test procedure. Each SID/HIII is instrumented with contact switches on the pelvis, thorax and six-axis neck load cells, and fourteen accelerometers in the following locations:

- Left Upper Rib (LUR) uni-axial accelerometer (Y-axis primary and redundant)
- Left Lower Rib (LLR) uni-axial accelerometer (Y-axis primary and redundant)
- Lower Thoracic Spine (T12) uni-axial accelerometer (Y-axis primary and redundant)
- Pelvic (PEV) section uni-axial accelerometer (Y-axis primary and redundant)
- Head Center of Gravity (CG) tri-axial accelerometers (X, Y, and Z axes primary and redundant)

SUPPLEMENTAL RESTRAINT INFORMATION

Restraint Type	Left Front (Driver)		Left Rear (Passenger)	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	No	No	
Side Torso Airbag	Yes	Yes	No	
Head Airbag	No		No	
Curtain Airbag	Yes	Yes	Yes	Yes

SECTION 2...(CONTINUED)

The test vehicle was instrumented with twenty-one (21) structural accelerometers and the MDB was instrumented with five (5) accelerometers and one (1) contact switch on the right bumper to compare left side to right side bumper impact timing. All data channels were recorded with the fully self contained on-board Data Acquisition System (DAS). The data was digitally sampled at 10,000 samples per second and processed per Appendix V of the Test Procedure.

2.2 GENERAL COMMENTS

The driver and passenger doors remained closed during impact. The test vehicle sustained a maximum static crush of 203 mm at level 2, 1500 mm rearward of the left vertical impact point. The driver SID/Hybrid III, Serial No. 275, and the passenger SID/Hybrid III, Serial No. 274, were calibrated prior to this test. The SID/Hybrid III injury criteria are summarized as follows:

Measurement	Units	Driver	Passenger
Thoracic Trauma Index (TTI)	Gs	18.0	17.0
Peak Pelvis Gs	Gs	28.7	21.9

Tests summaries and post-test observations are presented in Section 3. Appendix A contains the still photograph prints. Appendix B contains the driver and passenger SID/HIIIs, vehicle, and MDB response data traces. Appendix C contains the SID Configuration and performance verification data. Appendix contains the Child Restraint System data.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION SHEETS

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

NHTSA No.: F80203

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 10/23/2007

CONVERSION FACTORS USED IN THIS REPORT*

Quantity	Typical Application	Std Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	mile/h	km/h	1.609
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
Volume	Liquid	gal	liter	3.785
Temperature	General Use	°F	°C	$=(t_f - 32)/1.8$
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf/ft	Nm	1.355

* Based on the Recommended Practice in SAE J916, May 85

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

NHTSA No.: F80203

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 10/23/2007

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	F80203
Make	Ford
Model	Expedition XLT
Body Style	5-Door MPV
VIN No.	1FMFU155X8LA16995
Color	Black
Delivery Date	10/4/2007
Odometer (Miles)	65.6
Dealer	Sunrise Ford
Transmission	6-Speed Automatic
Final Drive	Rear
Type/No. of Cylinders	V8
Engine Displ. (L)	5.4
Engine Placement	Longitudinal
Roof Rack	Yes
Sunroof/T-top	No
Tinted Glass	Yes
Traction Control	Yes
Power Brakes	Yes
Front Disc	Yes
Rear Disc	Yes

Anti-Lock Brakes	Yes
All Wheel Drive	No
Power Steering	Yes
Driver Front Airbag	Yes
Driver Side Torso Airbag	Yes
Driver Side Head Airbag	No
Driver Curtain Airbag	Yes
Rear Pass. Airbag	Yes
Rear Pass. Side Airbag	Yes
Rear Pass. Head Airbag	No
Rear Pass. Curtain Airbag	Yes
Pre-Tensioners	Yes
Load Limiters	Yes
Bucket Seats	Yes
Air Conditioning	Yes
AM/FM CD	Yes
Tilt Steering	Yes
Automatic Door Locks	Yes
Power Windows	Yes
Power Seats	Yes
Other	n/a

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

Yes

DATA FROM CERTIFICATION TABLE

Manufactured By	Ford Motor Company
Date of Manufacture	Aug-07

GWR (kg)	3357
GAWR Front (kg)	1497
GAWR Rear (kg)	1928

VEHICLE SEATING CAPACITY AND WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench		
Number of Occupants	2	3		5
Capacity Weight (VCW) (kg)				777
Cargo Weight (RCLW) (kg)				136

DATA SHEET NO. 1...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

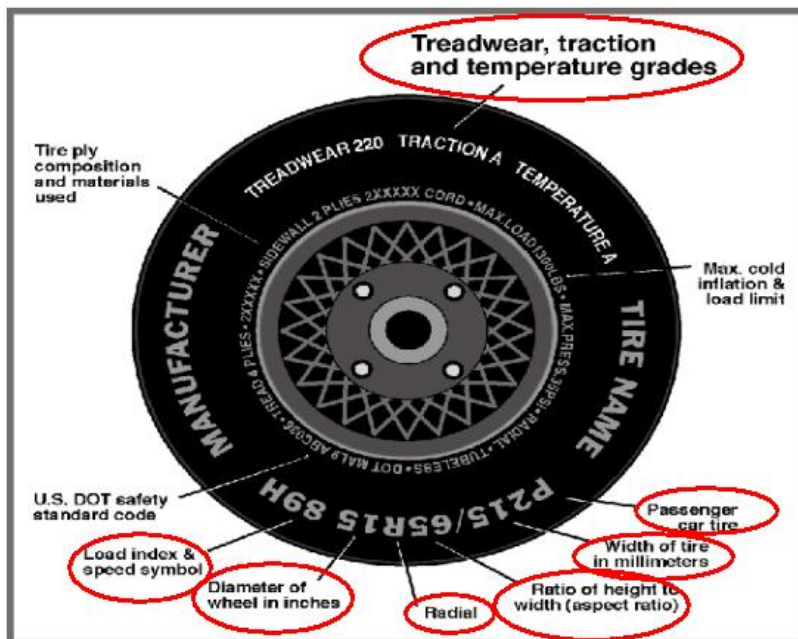
Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

NHTSA No.: F80203

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 10/23/2007

Collect year, make, model, VIN, items circled in red, and tire manufacturer and tire name.



TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Tire Pressure (kPa)	240	240
Recommended Tire Size	P265/70R17	P265/70R17
Tire Size on Vehicle	P265/70R17	P265/70R17
Tire Manufacturer	Continental	Continental
Treadwear	520	520
Traction	A	A
Temperature Grades	B	B
Tire Plies - Sidewall	2 Polyester	2 Polyester
Tire Plies - Body	2 Polyester, 2 Steel	2 Polyester, 2 Steel
Load Index/Speed Symbol	113S	113S
DOT Safety Code Left	A3T6 45PB	A3T6 45PB
DOT Safety Code Right	A3T6 45PB	A3T6 45PB

DATA SHEET NO. 1...(CONTINUED)**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2008 Ford Expedition XLT 5-Door MPVNHTSA No.: F80203Test Program: 55/28 km/h Side Impact NCAPTest Date: 10/23/2007**TEST VEHICLE WEIGHTS**

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	652	629	1281	689	757	1446
Right	kg	630	627	1257	640	741	1381
Ratio	%	50.5	49.5	100.0	47.0	53.0	100.0
Total	kg	1282	1256	2538	1329	1498	2827

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2537
Weight of 2 P572 ATDs	kg	162
Rated Cargo/Luggage Wt (RCLW)	kg	136
Calculated Vehicle Target Wt (TVTW)	kg	2835

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	912	917	908	910	1492
As Tested	mm	903	901	875	882	1597
Fully Loaded	mm	902	900	870	878	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	3014
Total Vehicle Length at Left Side	mm	3637
Total Vehicle Length at Centerline	mm	5224
Total Vehicle Length at Right Side	mm	3637
Weight of Ballast in Cargo Area	kg	118
Amount of Stoddard Solvent Added	L	98.43

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	3014
Target Impact Point Aft of Front Axle	mm	508
Actual Impact Point Aft of Front Axle	mm	497

DATA SHEET NO. 1...(CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

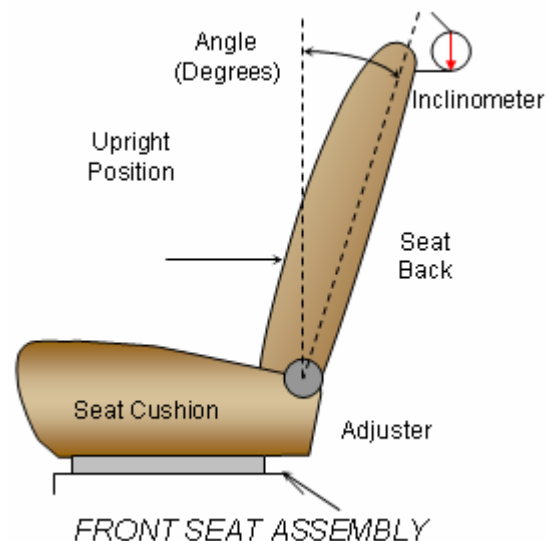
NHTSA No.: F80203

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 10/23/2007

NOMINAL DESIGN RIDING POSITION

The driver and passenger seat backs are positioned to the manufacturer's designated angle. The procedure is as follows: Seat back angle was measured at the headrest using a digital inclinometer.



SEAT BACK ANGLES

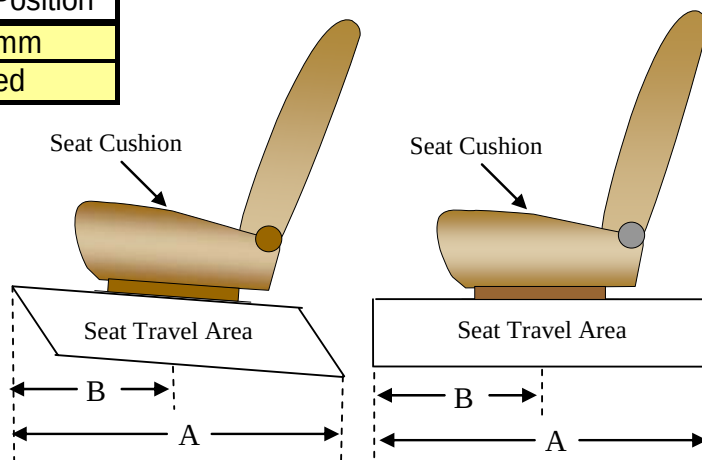
Position	Degrees
Driver w/Seated Dummy	9.3° @ Headrest
Passenger w/Seated Dummy	Fixed

SEAT FORE/AFT POSITIONS

The total seat travel was measured from forward most position to rearmost position. The seat was set at the longitudinal mid position. There were vertical adjustments on the driver seat that was equipped with the vehicle. There were no adjustments on the passenger seat. The driver seat was placed in the lowermost position.

SEAT FORE/AFT POSITIONING

Position	Total Fore/Aft Travel	Placed in Position
Driver Seat	240 mm	120 mm
Passenger Seat	Fixed	Fixed



SEAT BELT ANCHORAGE

Position number one (1) is the uppermost position.

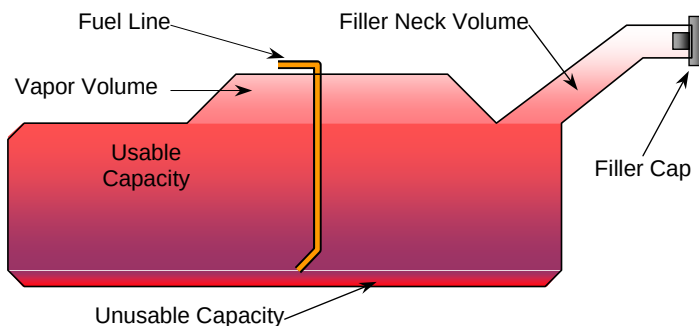
SEAT BELT ANCHORAGE POSITIONING

	Total Number of Positions	Placed in Position
Driver Seat	5	3
Passenger Seat	Fixed	Fixed

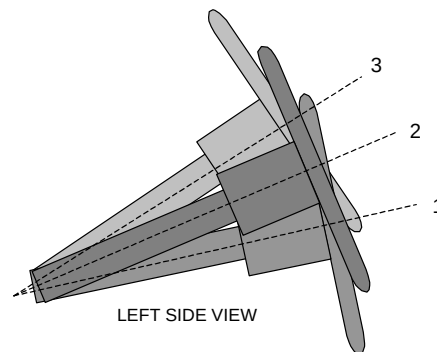
DATA SHEET NO. 1...(CONTINUED)**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2008 Ford Expedition XLT 5-Door MPVNHTSA No.: F80203Test Program: 55/28 km/h Side Impact NCAPTest Date: 10/23/2007**FUEL TANK CAPACITY**

	Liters
Usable Capacity of Standard Tank	100.68
Usable Capacity of Optional Tank	105.98
Usable Capacity Used for FMVSS 301	97.5 to 99.62
Actual Amount of Solvent Used	98.43

The test vehicle is equipped with an electric fuel pump. The fuel pump will operate for approximately two (2) seconds with the ignition in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies the area under the rear seat.

**VEHICLE FUEL TANK ASSEMBLY****STEERING COLUMN ADJUSTMENT**

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, an inclinometer is placed on the plate and the angle is measured.

**STEERING COLUMN ASSEMBLY****STEERING COLUMN POSITIONS**

	Degrees	Fore/Aft Position
Lowermost - Position No. 1	11.8	
Geometric Center - Position No. 2	21.9	
Uppermost - Position No. 3	32.0	

DATA SHEET NO. 2**TEST VEHICLE SUMMARY OF RESULTS**Test Vehicle: 2008 Ford Expedition XLT 5-Door MPVNHTSA No.: F80203Test Program: 55/28 km/h Side Impact NCAPTest Date: 10/23/2007**MAXIMUM EXTERIOR CRUSH**

Level	Measured Parameter	Units	Maximum Crush	Above Ground
1	Sill Top	mm	179	441
2	Occupant H-Point	mm	203	837
3	Mid Door	mm	194	804
4	Window Sill	mm	74	1157
5	Window Top	mm	13	1771
n/a	Maximum Penetration	mm	203	

INSTRUMENTATION

Driver SID/Hybrid III Accelerometers	20
Passenger SID/Hybrid III Accelerometers	20
Vehicle Structure Accelerometers	21
MDB Accelerometers	5
Total Number of Contact Switches	5
Total	71

CAMERA COVERAGE

High Speed, Vehicle On-Board	3
High Speed, Off-Board	4
High Speed, MDB On-Board	3
Real Time, Panning	2
Total	12

DATA SHEET NO. 3**MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS**Test Vehicle: 2008 Ford Expedition XLT 5-Door MPVNHTSA No.: F80203Test Program: 55/28 km/h Side Impact NCAPTest Date: 10/23/2007**MDB SPECIFICATIONS**

Measurement Description	Length
Overall Width of Frame Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheelbase of Frame Carriage	2590
CG Location Aft of Front Axle	1127

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	384	308	
Right	kg	385	284	
Ratio	%	56.5	43.5	100.0
Total	kg	769	592	1361

SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.19
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.18
MDB to Target CL	deg	88.5 to 91.5	89.5

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

Vertical Location		Height	From Centerline		Max Crush
Row	Description		Distance	Direction	
A	Center of Bumper	432	800	Left	298
B	Top of Bumper	533	800	Right	349
C	Mid Level	686	800	Right	284
D	Top of Stack	813	800	Right	300

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	1
High Speed Cameras	2

DATA SHEET NO. 4**POST-TEST OBSERVATIONS**Test Vehicle: 2008 Ford Expedition XLT 5-Door MPVNHTSA No.: F80203Test Program: 55/28 km/h Side Impact NCAPTest Date: 10/23/2007**TEST DUMMY INFORMATION AND CONTACT POINTS**

Description	Front Seat SID/Hybrid III	Rear Seat SID/Hybrid III
Dummy Type/Serial No.	P572F, SID/No. 275	P572F, SID/No. 274
Head Contact	Curtain Airbag, Headrest	Curtain Airbag, Headliner, C-Pillar, Headrest
Upper Torso Contact	Side Airbag, Door Panel	Door Panel
Lower Torso Contact	Door Panel	Door Panel
Left Knee Contact	Door Panel	Door Panel, Right Knee
Right Knee Contact	None	Left Knee

POST-TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Door Opening	Door remained closed and latched, jammed	Door remained closed and latched, jammed
Right Side Door Opening	Door remained closed and latched, opened without tools	Door remained closed and latched, opened without tools
Seat Movement	None	None
Seatback Failure	No	No

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No separation occurred
Sill Separation	No separation occurred
Windshield Damage	Cracked
Window Damage	Both driver and passenger side windows broken
Other Notable Effects	None

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 2	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	No	No	
Side Airbag	Yes	Yes	No	
Head Airbag	No		No	
Curtain Airbag	Yes	Yes	Yes	Yes
Pre-Tensioners	Yes		No	
Load Limiters	Yes		No	

MDB LEFT EDGE IMPACT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	-11 (Left)
Vertical Offset	mm	+/-20	+7 (Above)

DATA SHEET NO. 5

VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

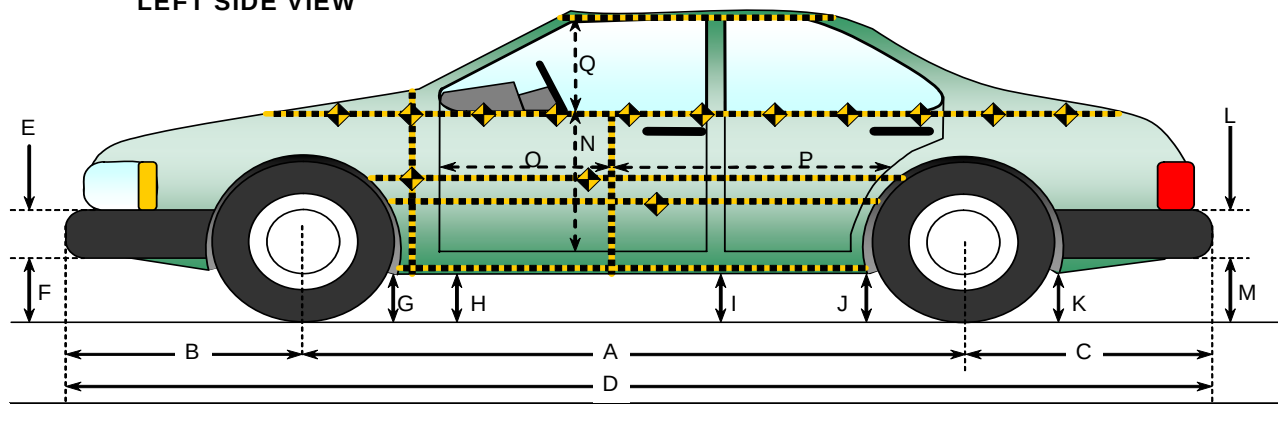
Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

NHTSA No.: F80203

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 10/23/2007

LEFT SIDE VIEW



VEHICLE PRE AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheel base	3014	3015	1
B	Front Surface of Vehicle To Front Axle	994	975	-19
C	Rear Surface of Vehicle to Rear Axle	1215	1226	11
D	Length of Vehicle at Centerline	5224	5216	-8
E	Front Bumper Vertical Dimension	390	390	0
F	Ground Surface to Front Bumper Bottom	388	373	-15
G	Ground Surface to Sill aft of Front Wheel	270	397	127
H	Ground Surface to Sill at Front Door Leading Edge	275	389	114
I	Ground Surface to Sill at Front Door Trailing Edge	296	411	115
J1	Ground Surface to Pinch Weld	278	306	28
J2	Ground Surface to Sill	296	431	135
K	Ground Surface to Sill aft of Rear Wheel	412	450	38
L	Rear Bumper Vertical Dimension	230	230	0
M	Ground Surface to Below Rear Bumper	451	491	40
N	Inside Rocker to Window Bottom (Door Height)	770	750	-20
O	Front Door Leading Edge to Impact Centerline	751	720	-31
P	Rear Door Trailing Edge to Impact Centerline	1451	1235	-216
Q	Window Vertical Height	545	544	-1
R	Right Side Length	3637	3645	8
S	Left Side Length	3637	3605	-32
T	Vehicle Width at "B" Post	1965	1877	-88

DATA SHEET NO. 6

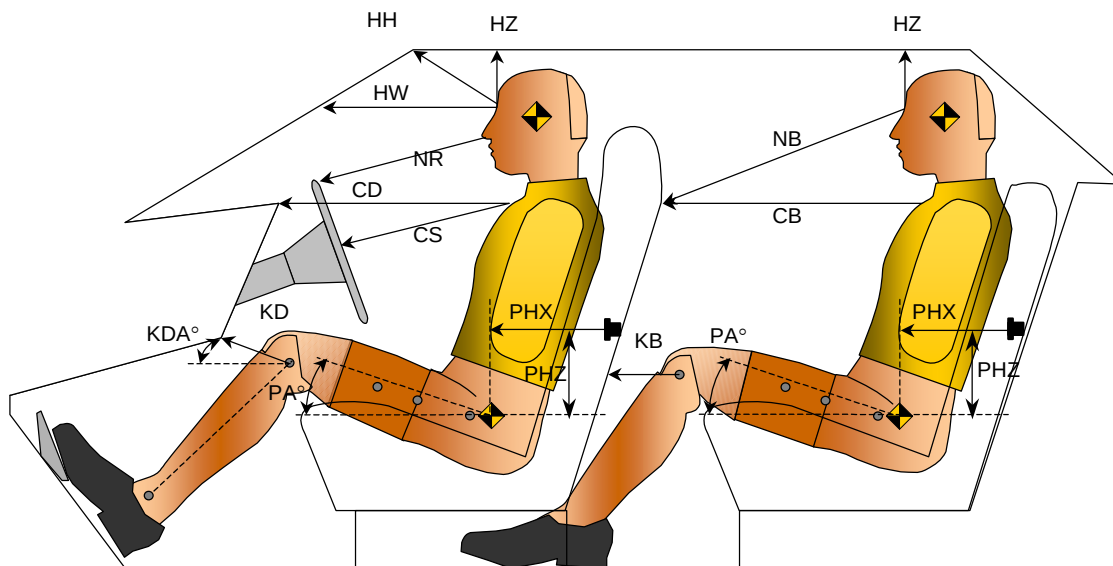
SID/HIII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

NHTSA No.: F80203

Test Program: 55/28 km/h Side Impact NCAP

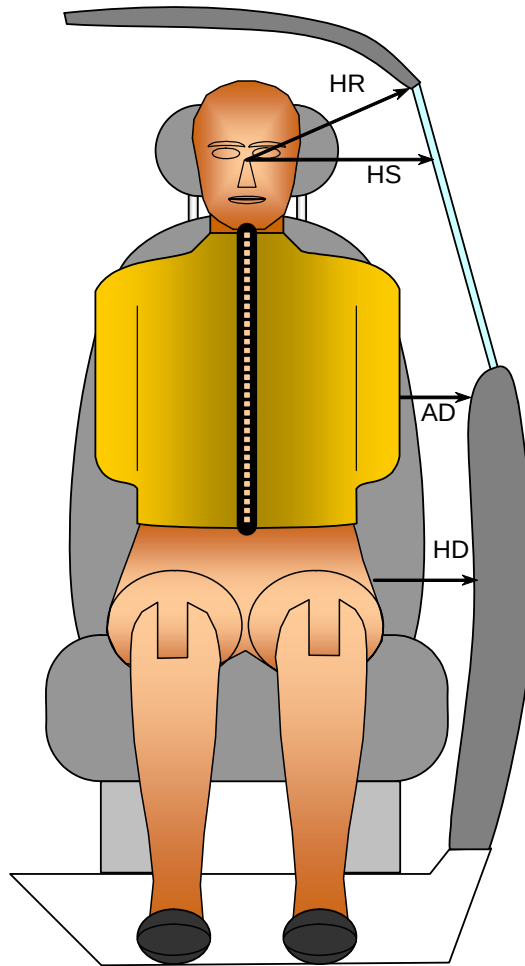
Test Date: 10/23/2007



LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Passenger Code	Measurement	Driver		Passenger	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Head to Header	483	16		
HW		Head to Windshield	667	0		
HZ	HZ	Head to Roof	215	90	220	90
NR	NB	Nose to Rim (Seatback)	491	11.4	90	12.8
CD	CB	Chest to Dash (Seatback)	582	3.4	629	2
CS		Chest to Steering Hub	405	12		
KDL	KBL	Left Knee to Dash (Seatback)	174	26	0	22
KDR	KBR	Right Knee to Dash (Seatback)	160		243	
PA	PA	Pelvic Angle		24.1		23.9
PHX	PHX	Striker to H-Point (X)	217	0	284	0
PHZ	PHZ	Striker to H-Point (Z)	10	0	138	0

All dimensions shown in millimeters (mm).

DATA SHEET NO. 7**SID/HIII LATERAL CLEARANCE DIMENSIONS**Test Vehicle: 2008 Ford Expedition XLT 5-Door MPVNHTSA No.: F80203Test Program: 55/28 km/h Side Impact NCAPTest Date: 10/23/2007*FRONT VIEW OF DUMMY***LATERAL CLEARANCE DIMENSION INFORMATION**

Code	Measurement	Units	Driver	Passenger
HR	Head to Side Header (Y)	mm	216	258
HS	Head to Side Window	mm	290	332
AD	Arm to Door (Y)	mm	79	115
HD	H-Point to Door (Y)	mm	140	180

All dimensions shown in millimeters (mm)

DATA SHEET NO. 8

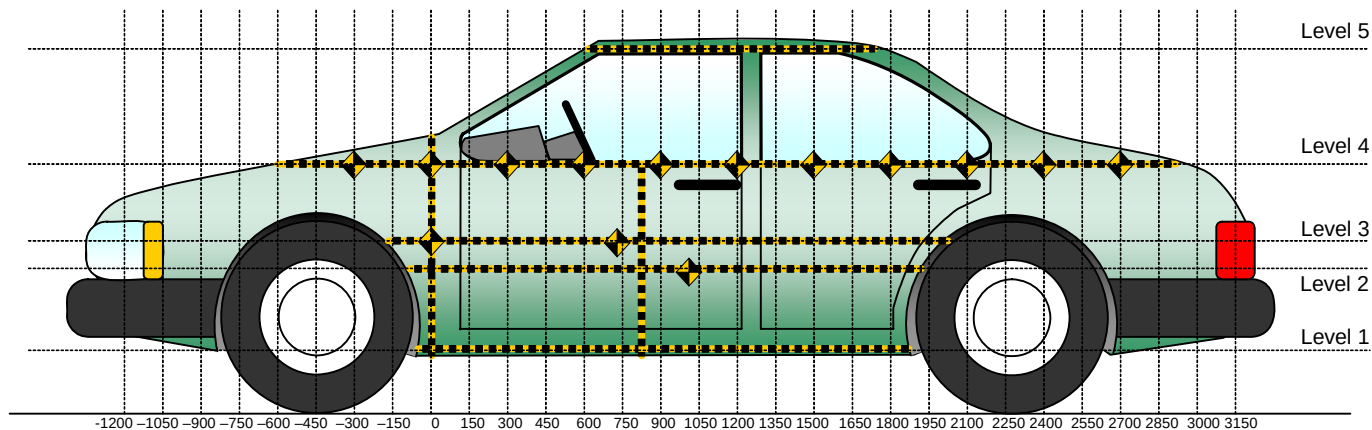
VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

NHTSA No.: F80203

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 10/23/2007



All Measurements Shown in mm

LEFT SIDE VIEW

Measurements are taken with vehicle in the as tested condition.

Measurements taken 900 mm right of impact reference.

All measurements below in mm

Level	Measurement Description	Units	Height Above Ground
1	Sill Top	mm	441
2	Occupant H-Point	mm	837
3	Mid-Door	mm	804
4	Window Sill	mm	1157
5	Window Top	mm	1771

All dimensions shown in millimeters (mm).

DATA SHEET NO. 9

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

NHTSA No.: F80203

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 10/23/2007

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300				596					636					40	
-150		521	508	589			556	556	621			35	48	32	
0	536	530	529	584		636	580	583	610		100	50	54	26	
150	539	530	531	572		681	616	607	602		142	86	76	30	
300	542	528	528	569		706	646	636	601		164	118	108	32	
450	541	525	526	562		706	660	646	601		165	135	120	39	
600	539	521	522	559		699	671	651	601		160	150	129	42	
750	539	518	520	552	803	671	687	666	603	759	132	169	146	51	-44
900	539	517	517	551	813	657	699	680	606	761	118	182	163	55	-52
1050	540	516	516	548	813	661	698	679	610	761	121	182	163	62	-52
1200	541	516	516	546	813	668	679	691	620	768	127	163	175	74	-45
1350	540	516	516	546	813	706	690	708	610	769	166	174	192	64	-44
1500	539	516	516	546	813	718	719	710	600	766	179	203	194	54	-47
1650	540	516	518	546	813	683	686	686	586	736	143	170	168	40	-77
1800	542	519	520	544	813	556	686	662	575	713	14	167	142	31	-100
1950		522	522	544	813		660	656	562	818		138	134	18	5
2100		516	518	548	813		576	611	548	826		60	93	0	13
2250		497	499	549	813		532	531	546	816		35	32	-3	3
2400				547					561					14	
2550															
2700															
2850															
3000															

All dimensions in millimeters (mm)

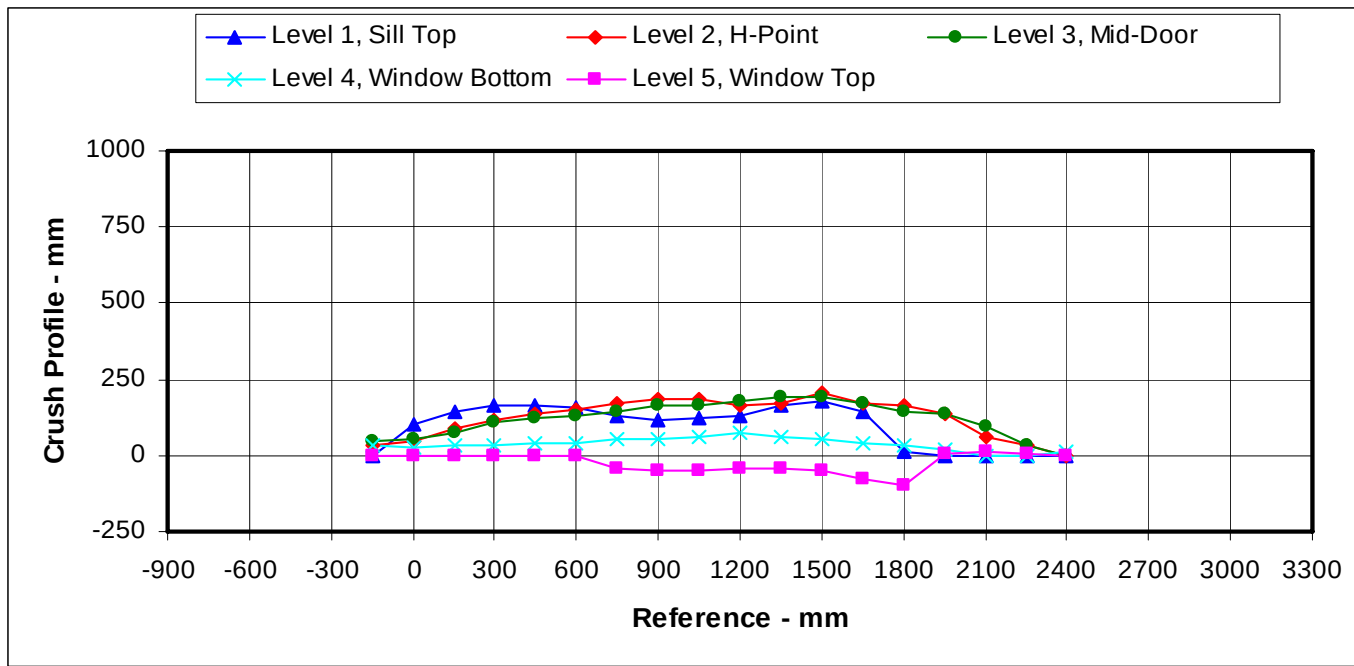
DATA SHEET NO. 9...(CONTINUED)
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

NHTSA No.: F80203

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 10/23/2007



	Units	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush	mm	179	203	194	74	13
Distance From Impact Point	mm	1500	1500	1500	1200	2100

DATA SHEET NO. 10

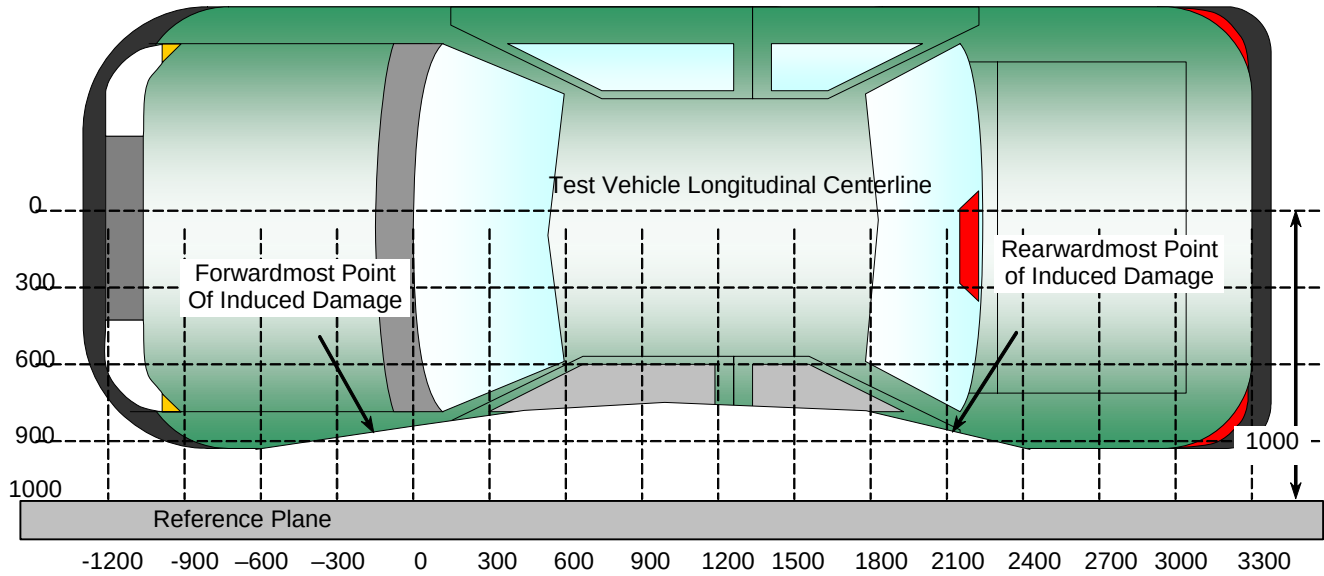
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

NHTSA No.: F80203

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 10/23/2007



All Dimensions Shown in millimeters

TOP VIEW

DPD	Distance From Impact Point	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	1950	2	522	660	138
2	1500	2	516	719	203
3	1050	2	516	698	182
4	600	1	539	699	160
5	150	1	539	681	142
6	-300	4	596	636	40

DATA SHEET NO. 11

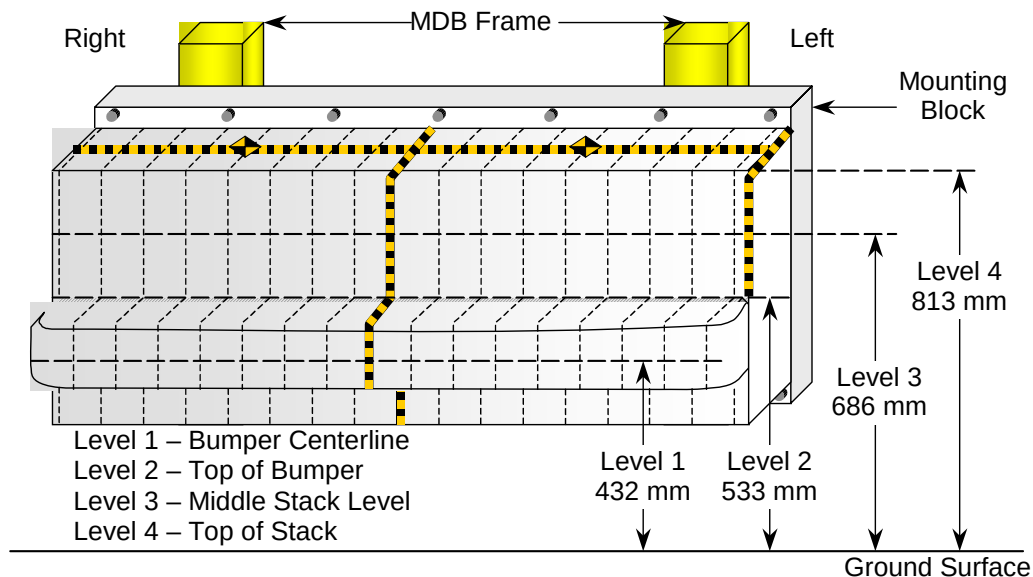
DEFORMABLE BARRIER HONEYCOMBE FACE STATIC CRUSH

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

NHTSA No.: F80203

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 10/23/2007



Stack Level	Right of Center								CL	Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	816	781	756	751	750	751	756	757	759	758	747	731	712	701	695	695	706
2	867	850	845	841	840	839	836	827	839	834	821	812	798	784	778	783	788
3	802	773	759	753	760	776	778	752	740	732	726	721	714	714	720	740	778
4	811	786	771	758	758	789	790	751	731	724	726	732	751	763	778	796	818

All dimensions in millimeters (mm)

DATA SHEET NO. 12

VEHICLE ACCELEROMETER LOCATIONS

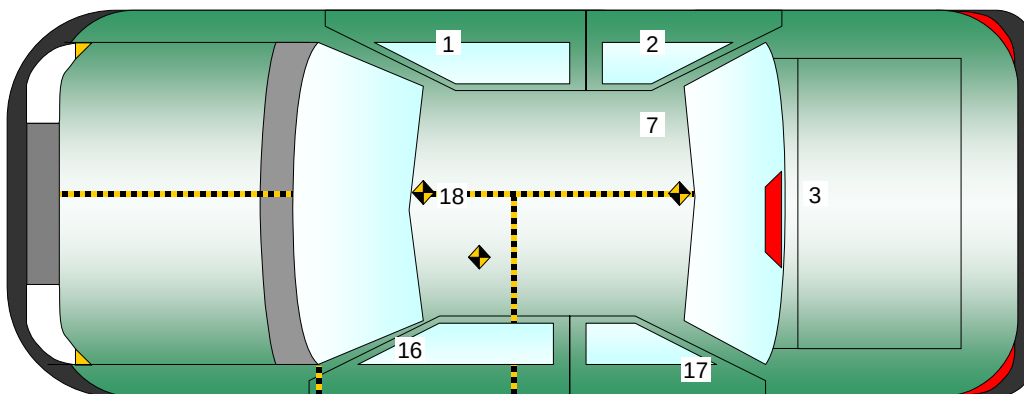
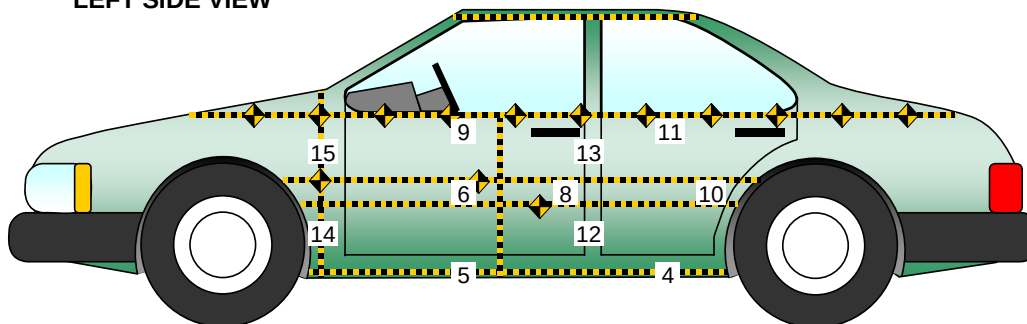
Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

NHTSA No.: F80203

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 10/23/2007

LEFT SIDE VIEW



No.	Location
1	Right Sill at Front Seat
2	Right Sill at Rear Seat
3	Rear Floorpan Above Axle
4	Left Sill at Rear Door
5	Left Sill at Front Door
6	Left Front Door Centerline
7	Right Rear Occupant Compartment
8	Left Front Door Mid-Rear
9	Left Front Door Upper Centerline

No.	Location
10	Left Rear Door Mid-Rear
11	Left Rear Door Upper Centerline
12	Left Lower B-Post
13	Left Middle B-Post
14	Left Lower A-Post
15	Left Middle A-Post
16	Front Seat Track
17	Rear Seat Track or Structure
18	Vehicle CG

DATA SHEET NO. 12...(CONTINUED)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

NHTSA No.: F80203

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 10/23/2007

VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	3165	690	575
2	Right Sill at Rear Seat	2085	770	590
3	Rear Floorpan Above Axle	1145	390	745
4	Left Sill at Rear Door	1875	-545	260
5	Left Sill at Front Door			
6	Front Door Centerline			
7	Rt. Rear Occ. Compartment	2450	325	595
8	Front Door Mid-Rear			
9	Front Door Upper Centerline			
10	Rear Door Mid-Rear			
11	Rear Door Upper Centerline			
12	B-Post Lower	2510	-820	1040
13	B-Post Middle	2510	-820	1205
14	A-Post Lower	3540	900	870
15	A-Post Middle	3540	885	570
16	Front Seat Track	3055	-640	725
17	Rear Seat Structure	1760	-600	780
18	Vehicle CG	3170	260	580

Reference Planes: X = From rear surface of vehicle, Y = Vehicle Centerline, Z = Ground Plane

1.) Not Installed

DATA SHEET NO. 13

MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

NHTSA No.: F80203

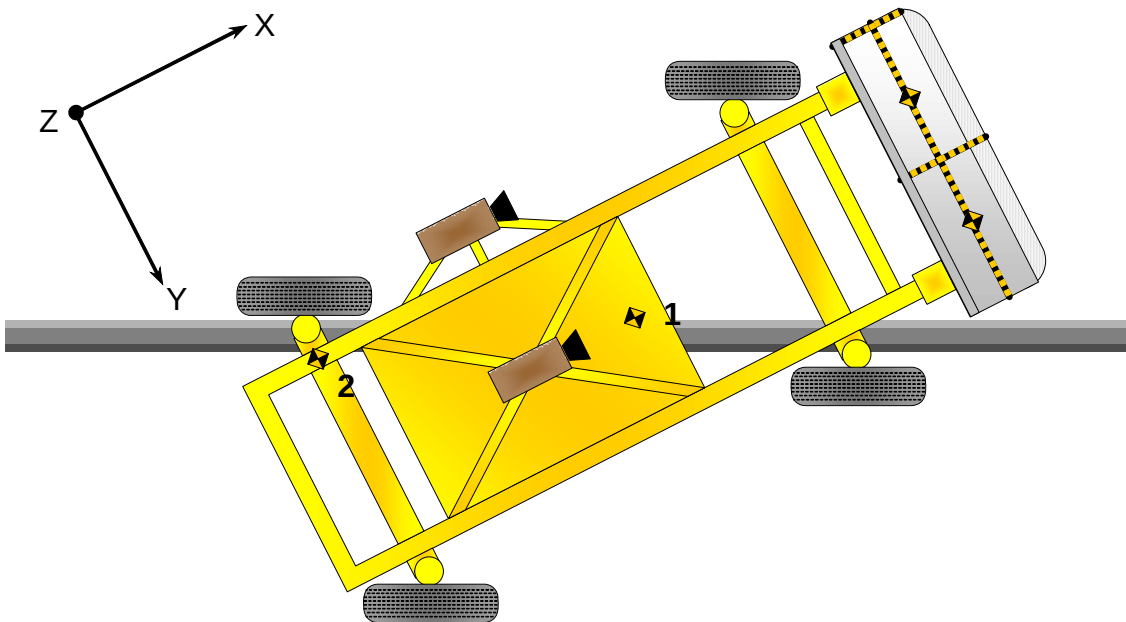
Test Program: 55/28 km/h Side Impact NCAP

Test Date: 10/23/2007

MDB ACCELEROMETER LOCATIONS

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

Reference Points:
X – MDB Front Axle
Y – MDB Centerline
Z – Ground Plane



DATA SHEET NO. 14

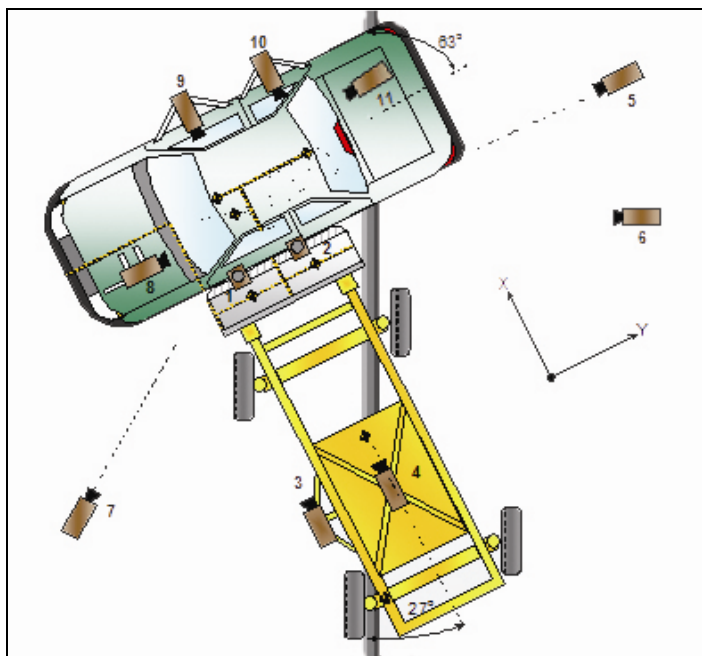
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

NHTSA No.: F80203

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 10/23/2007



No.	Camera View	Location (mm)			Angle (°)	Lens (mm)	Film Speed
		X	Y	Z			
Doc	Real Time Inrun	-2484	-3958	-1506	0		30
Doc	Real Time Left Front	-2266	3549	-1475	-2		30
1	Overhead Overall	1220	2287	-5486	-90	14	1000
2	Overhead Close Up	609	2287	-5102	-90	Zoom	1000
3	Left Impact Point (MDB)	-2134	0	-1143	-2	12	1000
4	Side Overall (MDB)	-3912	838	-1829	-4	12	1000
5	Rear	-64	20485	-1348	0	105	1000
6	Left Rear (MDB)	-2137	-1302	-339	-4	85	1000
7	Left Front	-2266	-3564	-1475	-2	24	1000
8	Driver Front (O.B.)	580	-550	-260	-3	35	1000
9	Driver Side (O.B.)	1795	895	-668	0	20	1000
10	Passenger Side (O.B.)	1795	1640	-668	0	20	1000
11	Passenger CRS (O.B.)	1350	2432	-740	-2	10	1000

DNR = Did Not Run

All measurements are made relative to the point of impact

DATA SHEET NO. 15

FMVSS 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

NHTSA No.: F80203

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 10/23/2007

Test Time: 11:13 AM

Temperature: 22.8 deg. C

STODDARD SOLVENT SPILLAGE MEASUREMENTS

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

DATA SHEET NO. 16

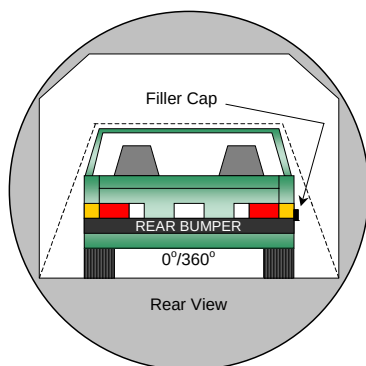
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

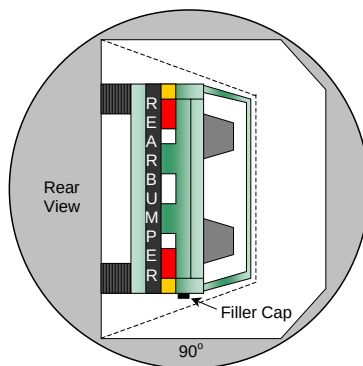
NHTSA No.: F80203

Test Program: 55/28 km/h Side Impact NCAP

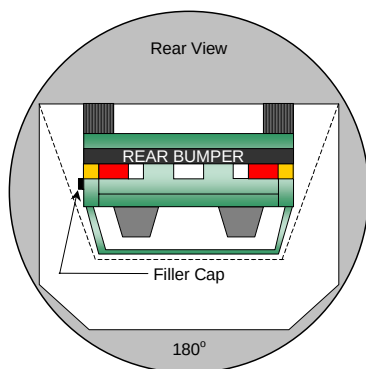
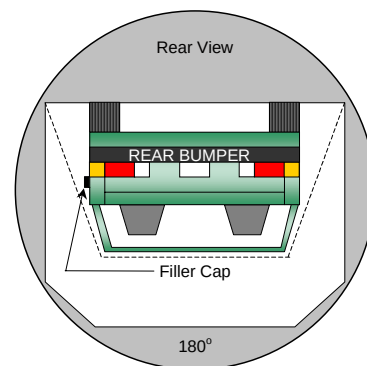
Test Date: 10/23/2007



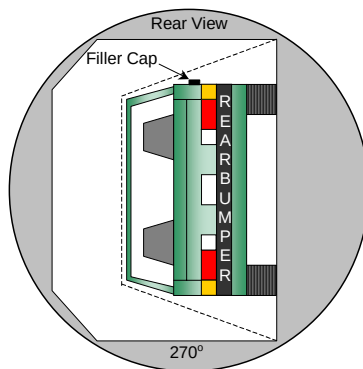
0° to 90°



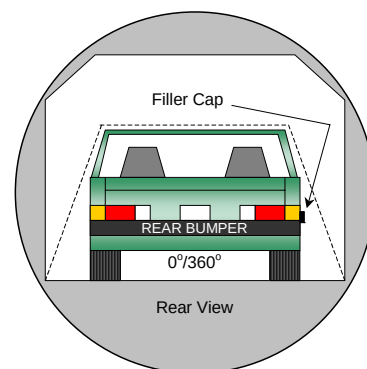
90° to 180°



180° to 270°



270° to 360°



1. The specified fixture rollover rate for each 90° of rotation is 60 to 120 seconds.
 2. The position hold time at each position is 300 seconds (minimum).
 3. Details of Stoddard Solvent spillage locations.
- No solvent leakage occurred during static rollover testing.

DATA SHEET NO. 16...(CONTINUED)**FMVSS 301 STATIC ROLLOVER DATA**Test Vehicle: 2008 Ford Expedition XLT 5-Door MPVNHTSA No.: F80203Test Program: 55/28 km/h Side Impact NCAPTest Date: 10/23/2007**SOLVENT COLLECTION TIME TABLE (SECONDS)**

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	83	313	396
90° to 180°	80	318	398
180° to 270°	81	304	385
270° to 360°	83	304	387

FMVSS 301 SPILLAGE REQUIREMENT TABLE (OZ)

First 5 Minutes	5.0
Sixth Minute	1.0
Seventh Minute	1.0
Eight Minute	1.0

FMVSS 301 SPILLAGE INFORMATION

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

SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	n/a
90° to 180°	n/a
180° to 270°	n/a
270° to 360°	n/a

DATA SHEET NO. 17

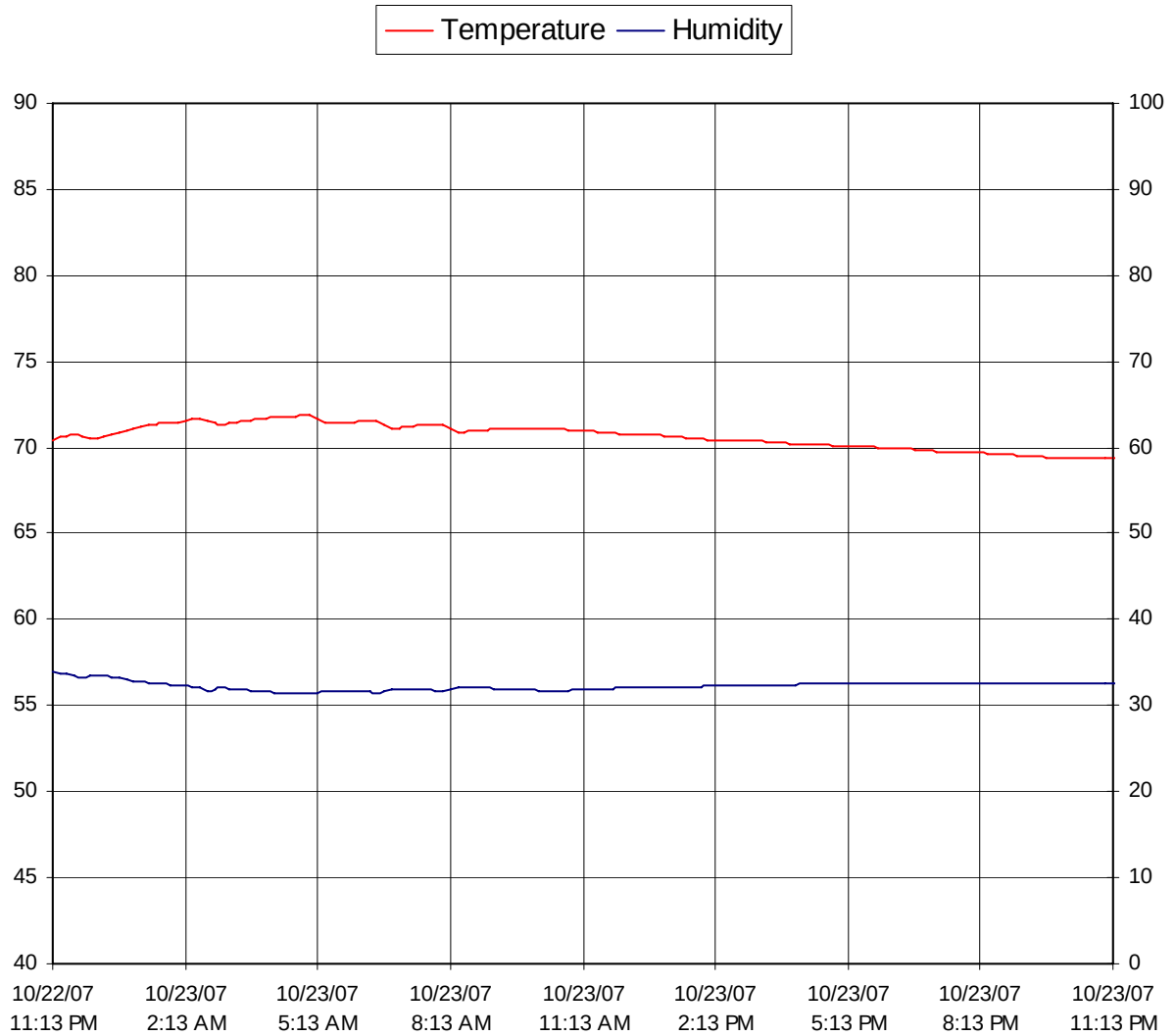
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

NHTSA No.: F80203

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 10/23/2007



APPENDIX A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

Figure		Page
A-1	Left Front $\frac{3}{4}$ View, as Received	A-1
A-2	Right Rear $\frac{3}{4}$ View, as Received	A-2
A-3	Manufacturer's Label	A-3
A-4	Tire Placard	A-4
A-5	Pre-Test Front View	A-5
A-6	Post-Test Front View	A-6
A-7	Pre-Test Left Front $\frac{3}{4}$ View	A-7
A-8	Post-Test Left Front $\frac{3}{4}$ View	A-8
A-9	Pre-Test Left Side View	A-9
A-10	Post-Test Left Side View	A-10
A-11	Pre-Test Left Rear $\frac{3}{4}$ View	A-11
A-12	Post-Test Left Rear $\frac{3}{4}$ View	A-12
A-13	Pre-Test Rear View	A-13
A-14	Post-Test Rear View	A-14
A-15	Pre-Test Right Rear $\frac{3}{4}$ View	A-15
A-16	Post-Test Right Rear $\frac{3}{4}$ View	A-16
A-17	Pre-Test Right Side View	A-17
A-18	Post-Test Right Side View	A-18
A-19	Pre-Test Right Front $\frac{3}{4}$ View	A-19
A-20	Post-Test Right Front $\frac{3}{4}$ View	A-20
A-21	Pre-Test Overhead View	A-21
A-22	Post-Test Overhead View	A-22
A-23	Pre-Test Overhead Close-up View	A-23
A-24	Post-Test Overhead Close-up View	A-24
A-25	Pre-Test Left Impact Point	A-25
A-26	Post-Test Left Impact Point	A-26
A-27	Pre-Test Front $\frac{3}{4}$ View of Left Side Doors	A-27
A-28	Post-Test Front $\frac{3}{4}$ View of Left Side Doors	A-28
A-29	Pre-Test Rear $\frac{3}{4}$ View of Left Side Doors	A-29
A-30	Post-Test Rear $\frac{3}{4}$ View of Left Side Doors	A-30
A-31	Pre-Test Left Front Door	A-31
A-32	Post-Test Left Front Door	A-32
A-33	Pre-Test Left Rear Door	A-33
A-34	Post-Test Left Rear Door	A-34

LIST OF PHOTOGRAPHS...(CONTINUED)

Figure		Page
A-35	Pre-Test Driver Dummy (Door Open)	A-35
A-36	Pre-Test Driver Dummy (Through Window)	A-36
A-37	Post-Test Driver Dummy (Through Window)	A-37
A-38	Pre-Test Driver Dummy Clearance from Door	A-38
A-39	Post-Test Driver Dummy Clearance from Door	A-39
A-40	Pre-Test Driver Dummy Right Side View	A-40
A-41	Post-Test Driver Dummy Right Side View	A-41
A-42	Pre-Test Front Door Panel (Interior)	A-42
A-43	Post-Test Front Door Panel (Interior)	A-43
A-44	Pre-Test Passenger Dummy Left Side (Door Open)	A-44
A-45	Pre-Test Passenger Dummy Left Side (Through Window)	A-45
A-46	Post-Test Passenger Dummy Left Side (Through Window)	A-46
A-47	Pre-Test Passenger Dummy Clearance from Door	A-47
A-48	Post-Test Passenger Dummy Clearance from Door	A-48
A-49	Pre-Test Passenger Dummy Right Side View	A-49
A-50	Post-Test Passenger Dummy Right Side View	A-50
A-51	Pre-Test Rear Door Panel (Interior)	A-51
A-52	Post-Test Rear Door Panel (Interior)	A-52
A-53	Pre-Test Front View of Deformable Barrier	A-53
A-54	Post-Test Front View of Deformable Barrier	A-54
A-55	Pre-Test Top View of Deformable Barrier	A-55
A-56	Post-Test Top View of Deformable Barrier	A-56
A-57	Pre-Test Right Side View of Deformable Barrier	A-57
A-58	Post-Test Right Side View of Deformable Barrier	A-58
A-59	Pre-Test Left Side View of Deformable Barrier	A-59
A-60	Post-Test Left Side View of Deformable Barrier	A-60
A-61	Vehicle on Rollover Device (0°)	A-61
A-62	Vehicle on Rollover Device (90°)	A-62
A-63	Vehicle on Rollover Device (180°)	A-63
A-64	Vehicle on Rollover Device (270°)	A-64
A-65	Vehicle Impact	A-65

**Photograph Not
Available**

Figure A-1: Right Front $\frac{3}{4}$ View, as Received

**Photograph Not
Available**

Figure A-2: Left Rear $\frac{3}{4}$ View, as Received

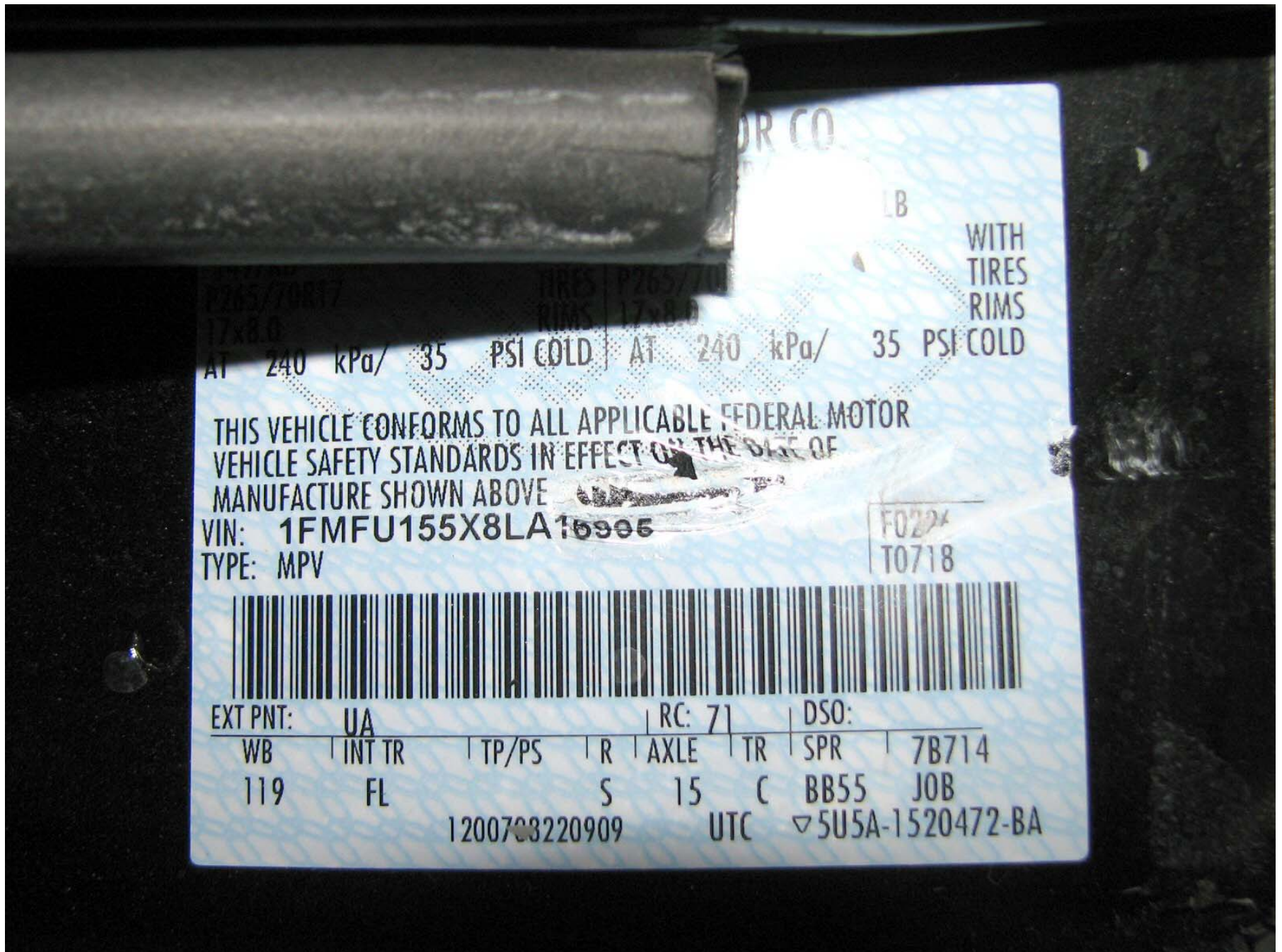


Figure A-3: Manufacturer's Label



TIRE AND LOADING INFORMATION

SEATING CAPACITY TOTAL : 5 FRONT: 2 REAR: 3

The combined weight of occupants and cargo should never exceed : 777 kg or 1714 lbs.

5USA-1532-AA (TLU)

TIRE	SIZE	COLD TIRE PRESSURE
FRONT	P265/70R17	240 KPA, 35 PSI
REAR	P265/70R17	240 KPA, 35 PSI
SPARE	P265/70R17	240 KPA, 35 PSI

SEE OWNERS
MANUAL FOR
ADDITIONAL
INFORMATION

1FMFU155X8LA16995



Figure A-4: Tire Placard



Figure A-5: Pre-Test Front View



Figure A-6: Post-Test Front View



Figure A-7: Pre-Test Left Front 3/4 View



Figure A-8: Post-Test Left Front $\frac{3}{4}$ View



Figure A-9: Pre-Test Left Side View



Figure A-10: Post-Test Left Side View



Figure A-11: Pre-Test Left Rear $\frac{3}{4}$ View



Figure A-12: Post-Test Left Rear $\frac{3}{4}$ View



Figure A-13: Pre-Test Rear View



Figure A-14: Post-Test Rear View



Figure A-15: Pre-Test Right Rear $\frac{3}{4}$ View



Figure A-16: Post-Test Right Rear $\frac{3}{4}$ View



Figure A-17: Pre-Test Right Side View



Figure A-18: Post-Test Right Side View



Figure A-19: Pre-Test Right Front 3/4 View



Figure A-20: Post-Test Right Front $\frac{3}{4}$ View



Figure A-21: Pre-Test Overhead View



Figure A-22: Post-Test Overhead View

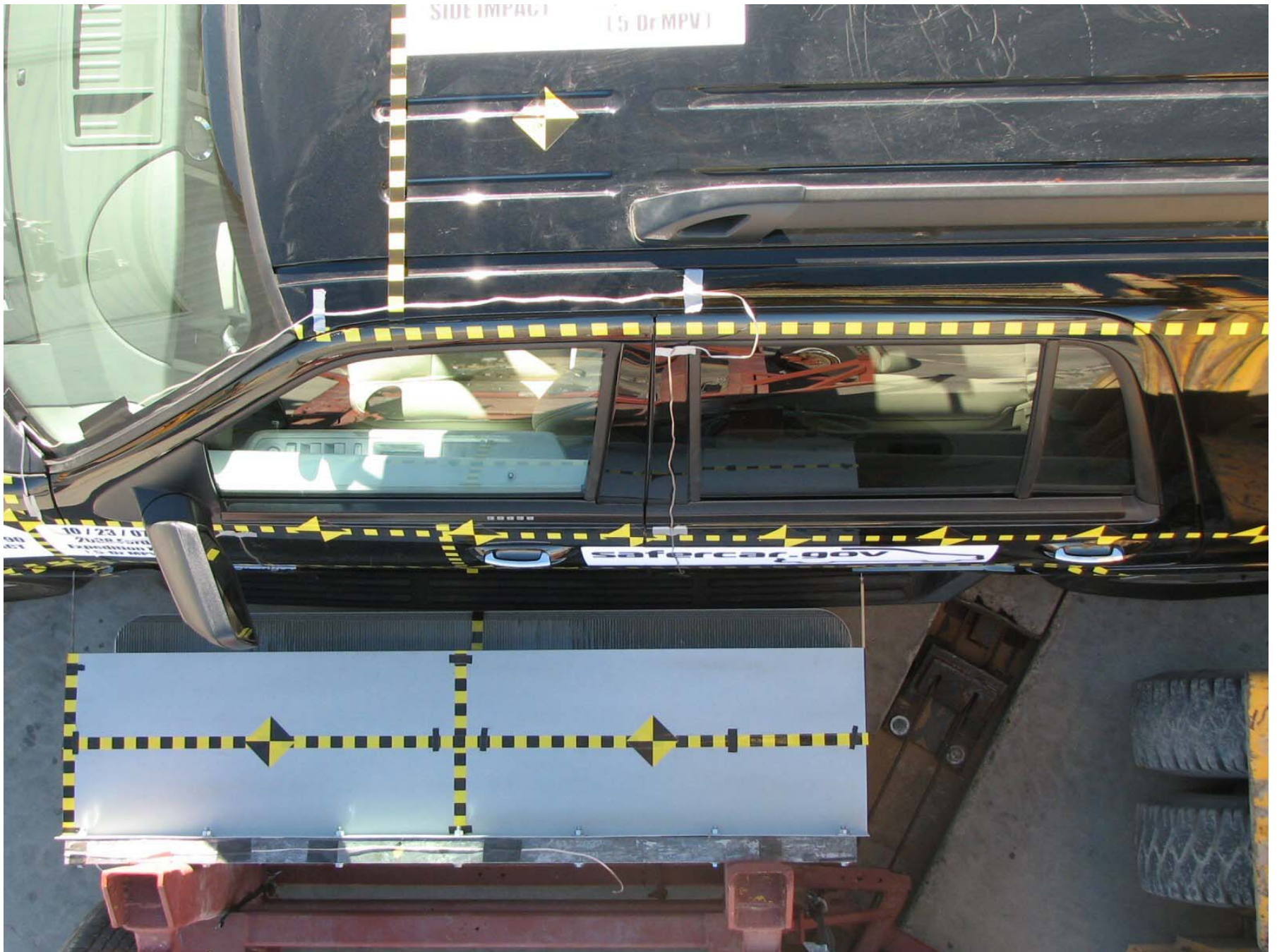


Figure A-23: Pre-Test Overhead Close-up View



Figure A-24: Post-Test Overhead Close-up View

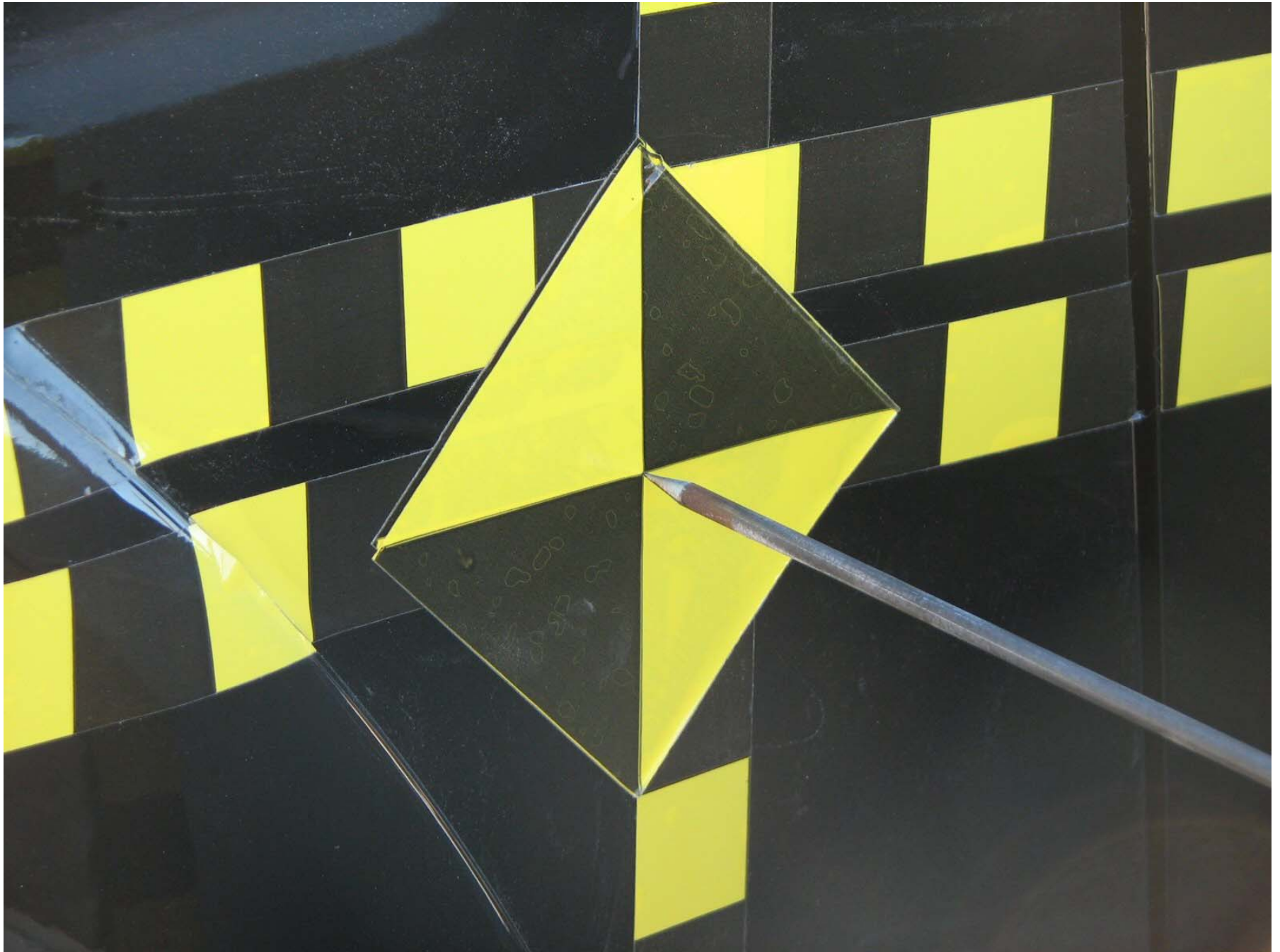


Figure A-25: Pre-Test Left Impact Point

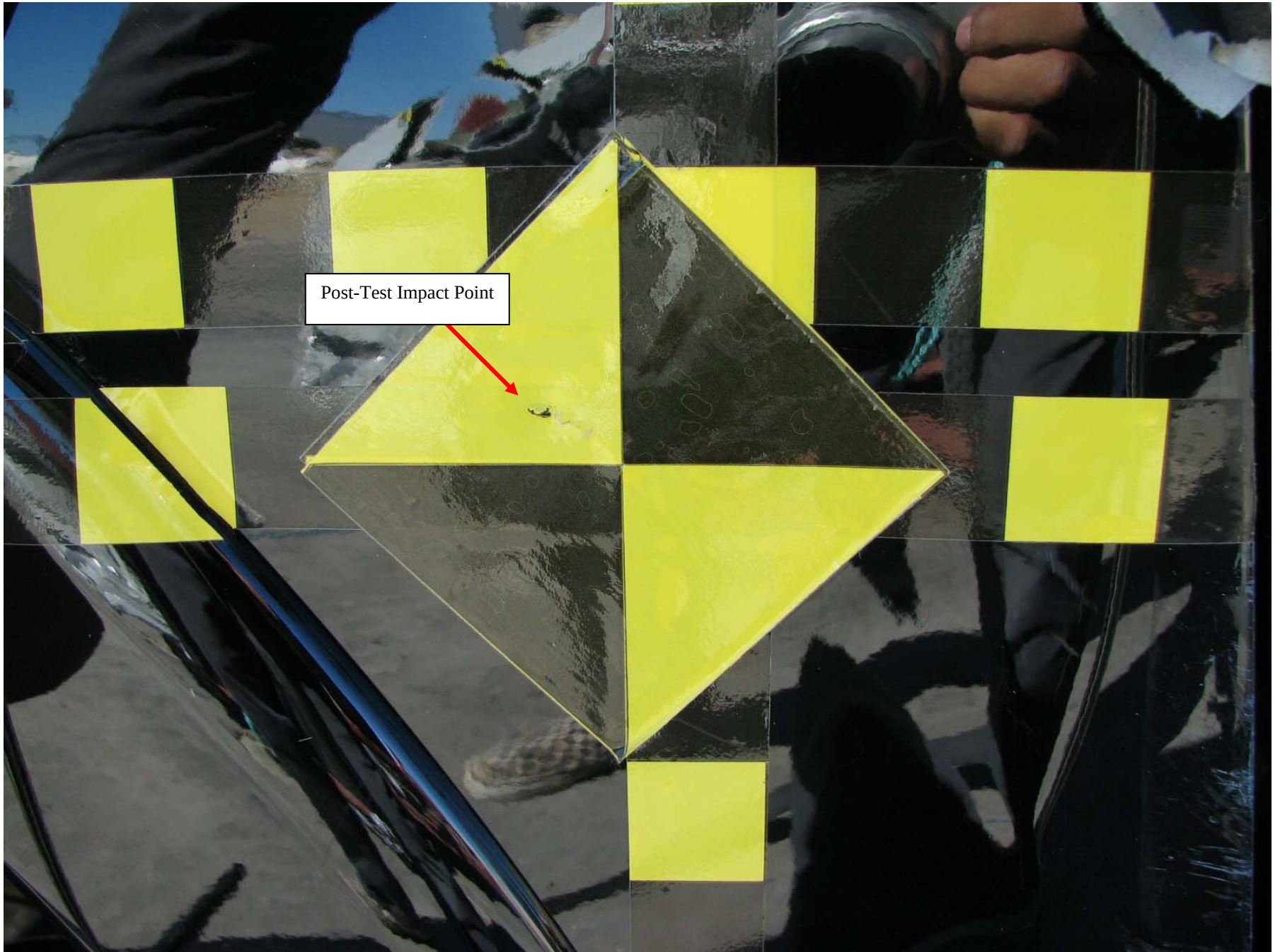


Figure A-26: Post-Test Left Impact Point



Figure A-27: Pre-Test Front $\frac{3}{4}$ View of Left Side Door



Figure A-28: Post-Test Front $\frac{3}{4}$ View of Left Side Door



Figure A-29: Pre-Test Rear $\frac{3}{4}$ View of Left Side Door



Figure A-30: Post-Test Rear $\frac{3}{4}$ View of Left Side Door



Figure A-31: Pre-Test Left Front Door



Figure A-32: Post-Test Left Front Door



Figure A-33: Pre-Test Left Rear Door

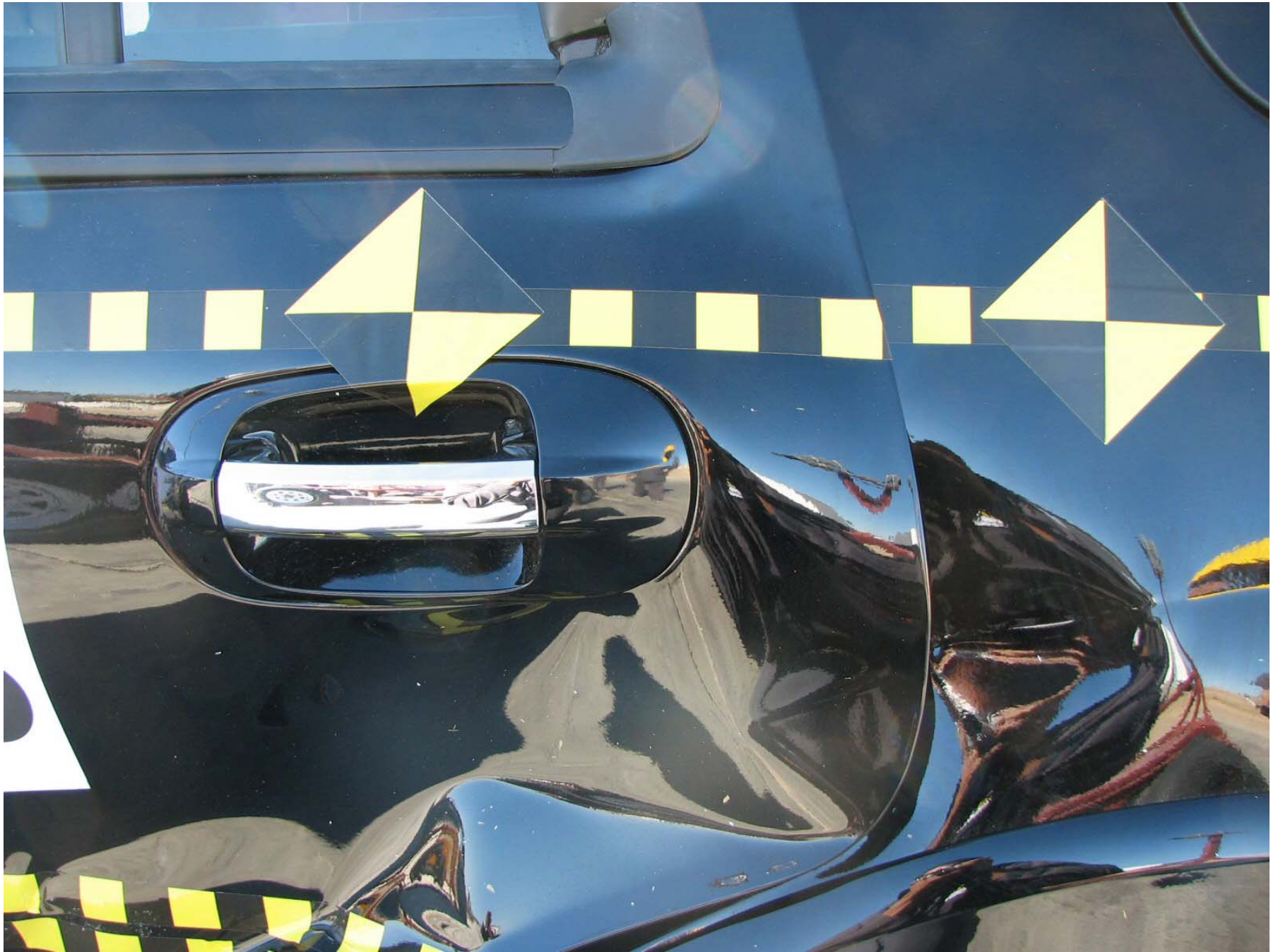


Figure A-34: Post-Test Left Rear Door



Figure A-35: Pre-Test Driver Dummy (Door Open)

This Space Intentionally Left Blank



Figure A-36: Pre-Test Driver Dummy (Through Window)



Figure A-37: Post-Test Driver Dummy (Through Window)

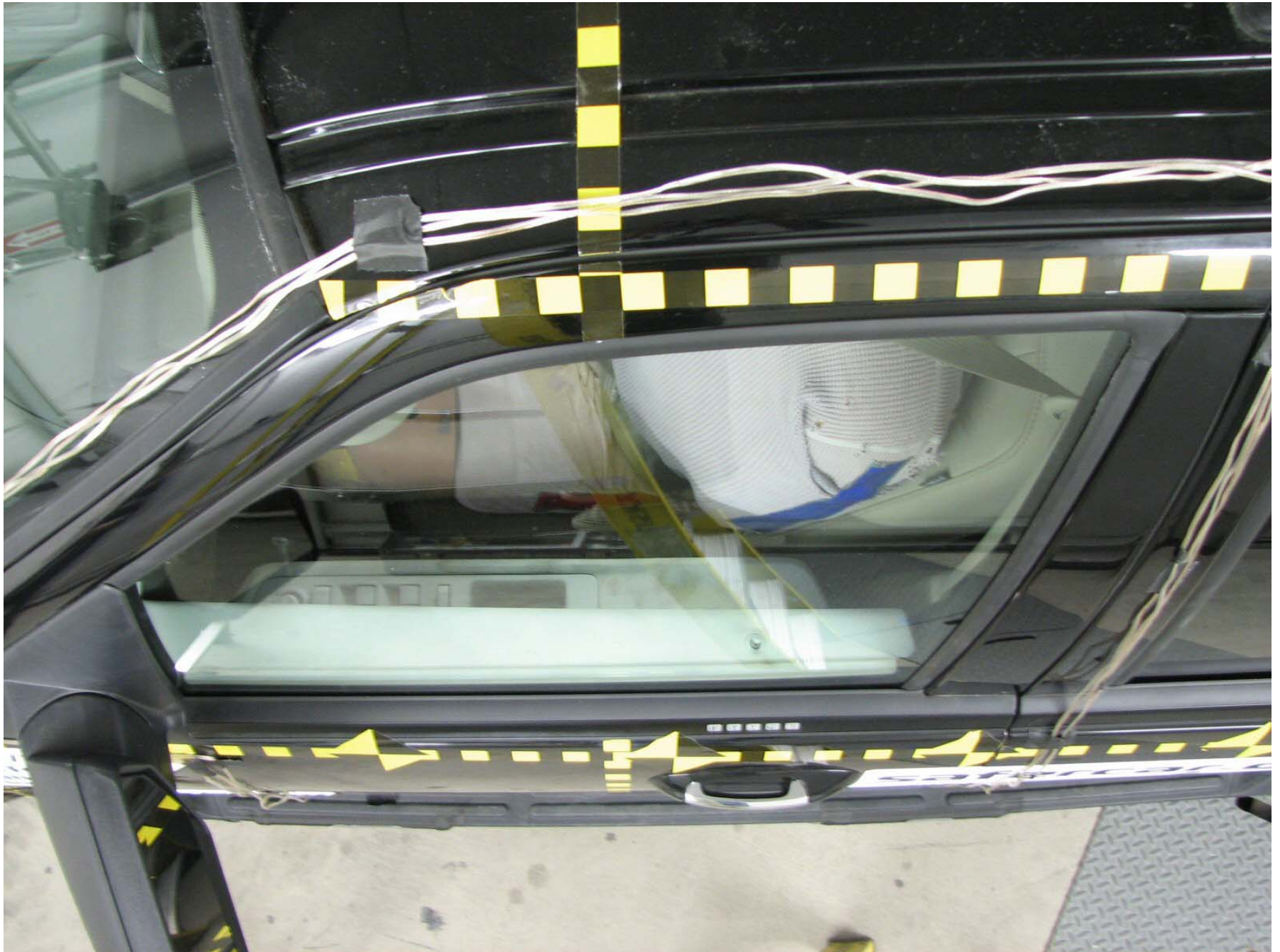


Figure A-38: Pre-Test Driver Dummy Clearance From Door



Figure A-39: Post-Test Driver Dummy Clearance From Door



Figure A-40: Pre-Test Driver Dummy Right Side View



Figure A-41: Post-Test Driver Dummy Right Side View



Figure A-42: Pre-Test Front Door Panel (Interior)

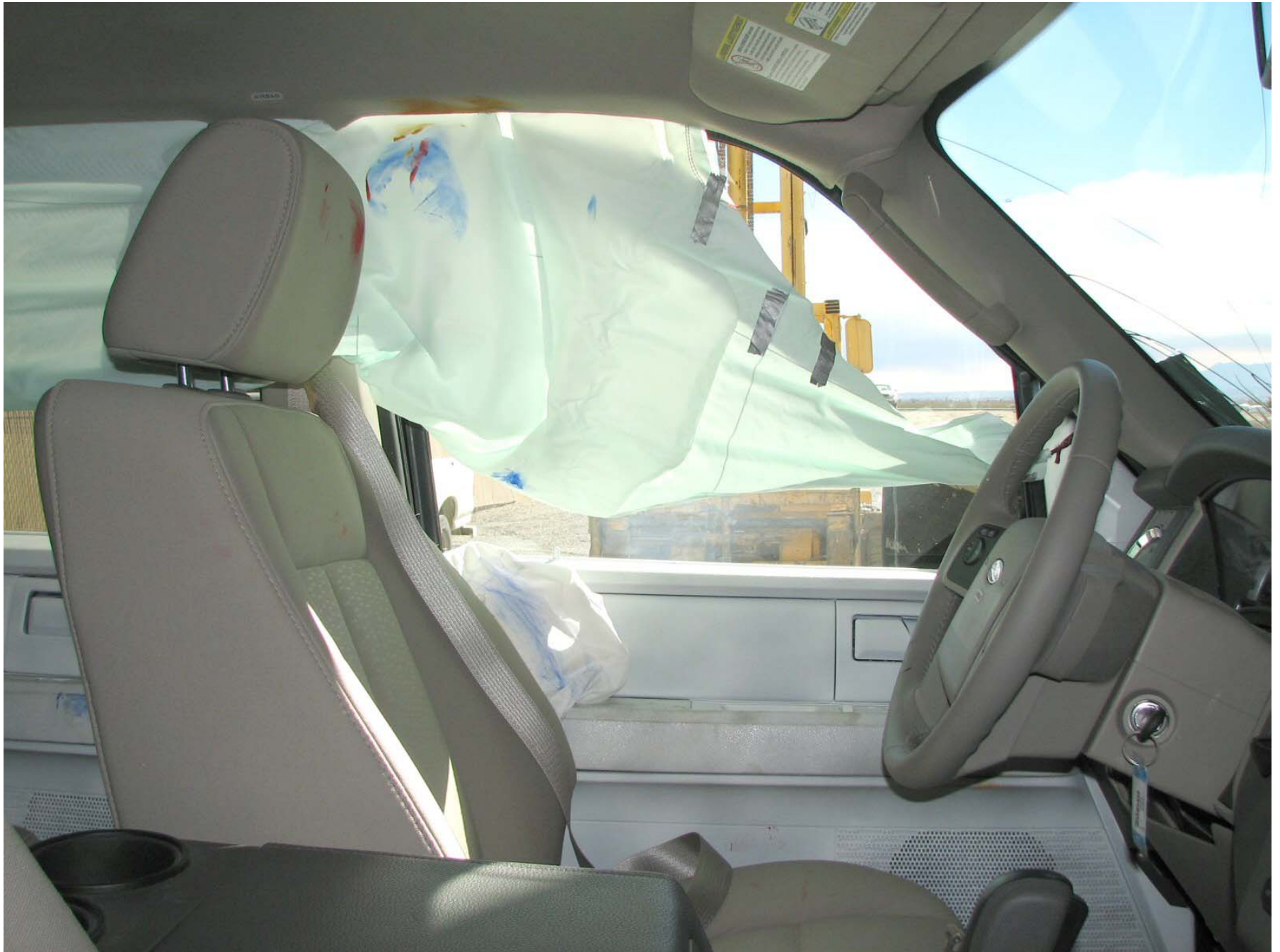


Figure A-43: Post-Test Front Door Panel (Interior)



Figure A-44: Pre-Test Passenger Dummy Left Side (Door Open)

This Space Intentionally Left Blank



Figure A-45: Pre-Test Passenger Dummy Left Side (Through Window)



Figure A-46: Post-Test Passenger Dummy Left Side (Through Window)

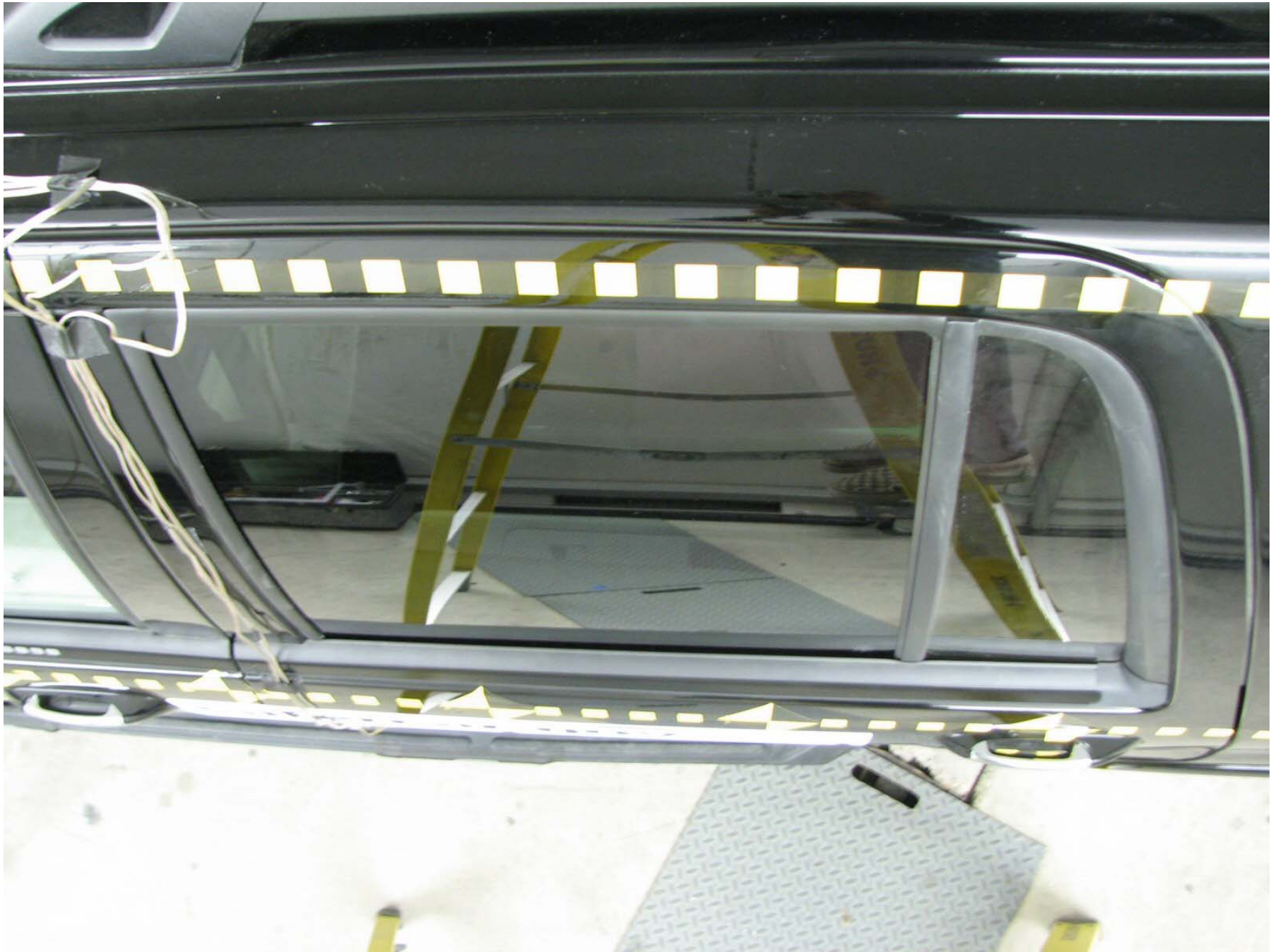


Figure A-47: Pre-Test Passenger Dummy Clearance From Door



Figure A-48: Post-Test Passenger Dummy Clearance From Door



Figure A-49: Pre-Test Passenger Dummy Right Side View



Figure A-50: Post-Test Passenger Dummy Right Side View



Figure A-51: Pre-Test Rear Door Panel (Interior)



Figure A-52: Post-Test Rear Door Panel (Interior)



Figure A-53: Pre-Test Front View of Deformable Barrier



Figure A-54: Post-Test Front View of Deformable Barrier



Figure A-55: Pre-Test Top View of Deformable Barrier

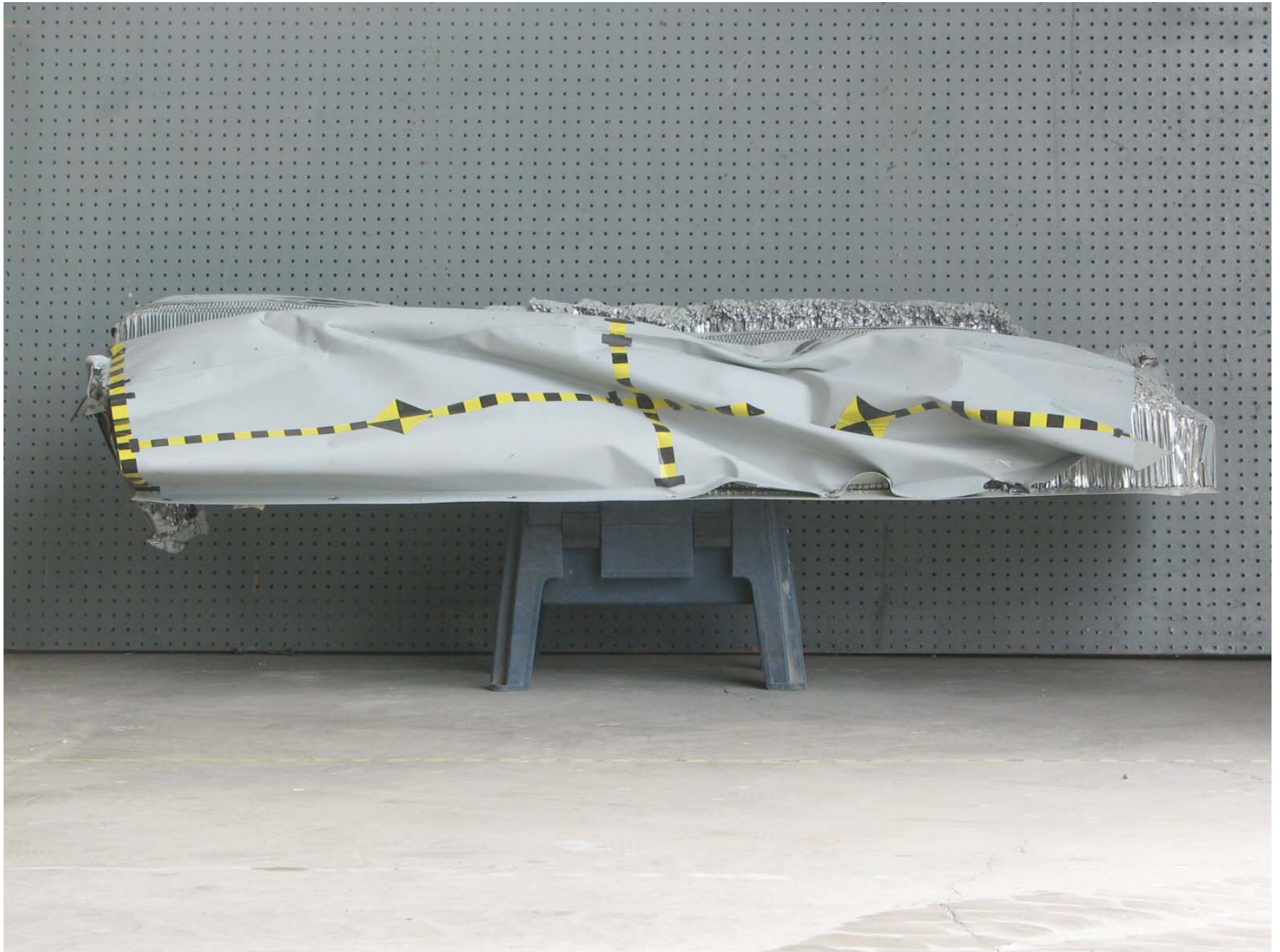


Figure A-56: Post-Test Top View of Deformable Barrier



Figure A-57: Pre-Test Right Side View of Deformable Barrier



Figure A-58: Post-Test Right Side View of Deformable Barrier



Figure A-59: Pre-Test Left Side View of Deformable Barrier



Figure A-60: Post-Test Left Side View of Deformable Barrier



Figure A-61: Vehicle on Rollover Device (0°)



Figure A-62: Vehicle on Rollover Device (90°)

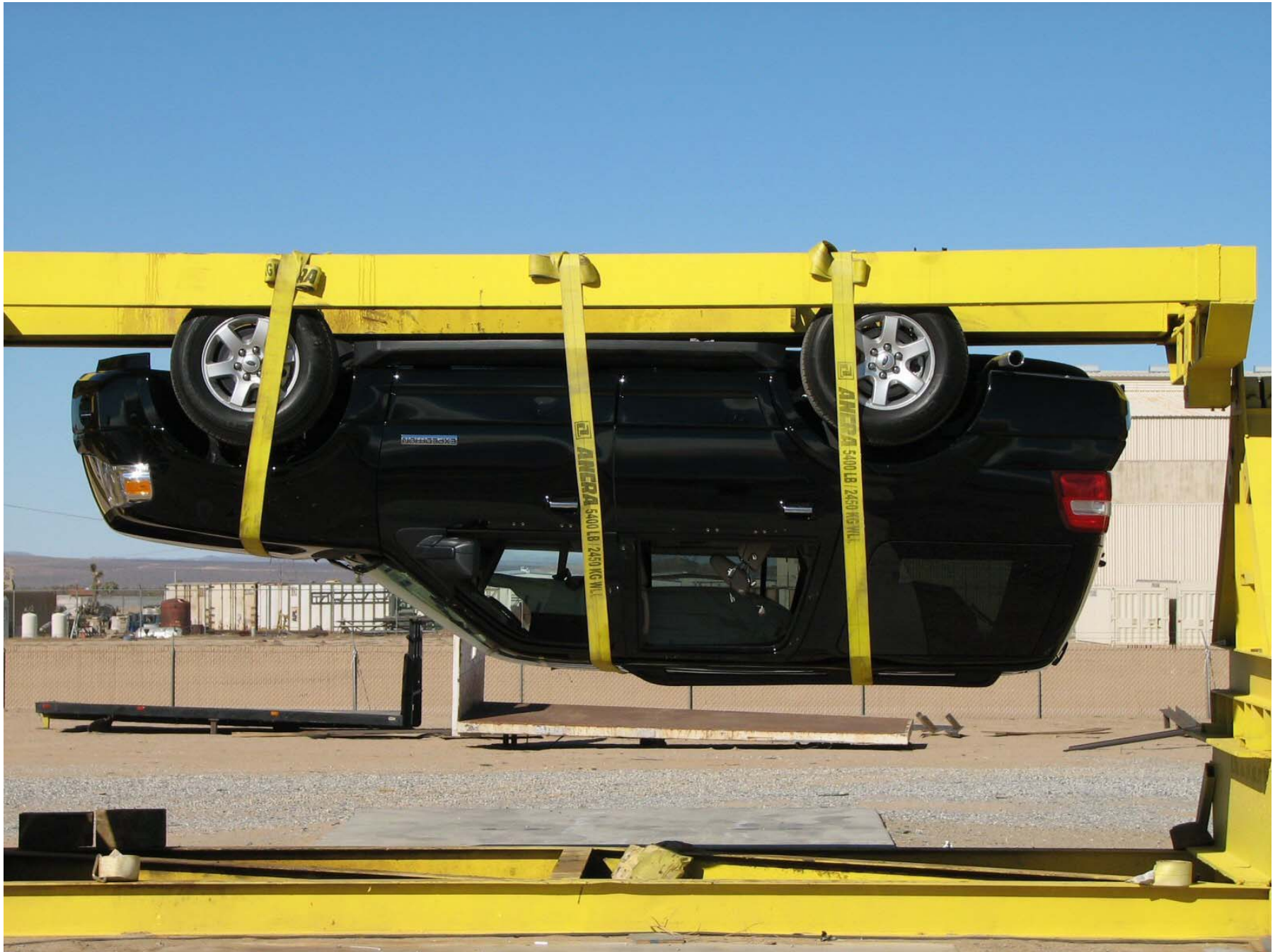


Figure A-63: Vehicle on Rollover Device (180°)

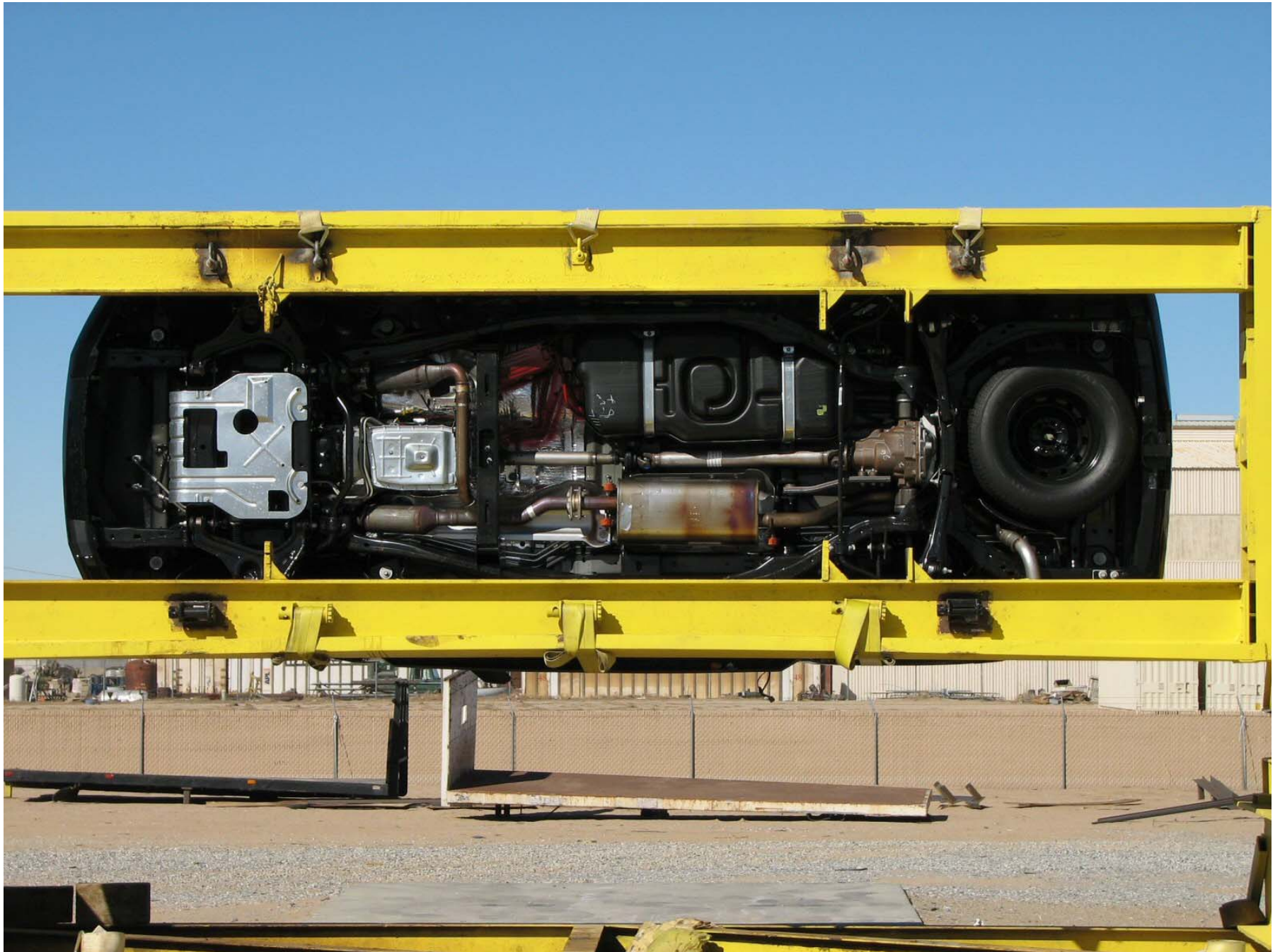


Figure A-64: Vehicle on Rollover Device (270°)



Figure A-65: Vehicle Impact

APPENDIX B
SID/HIII, VEHICLE AND MDB RESPONSE DATA

LIST OF DATA PLOTS

Data Plot	Page
B-1	Driver Upper Rib Primary Y
	Driver Lower Rib Primary Y
	Driver Lower Spine Primary Y
	Driver Pelvis Primary Y
B-2	Passenger Upper Rib Primary Y
	Passenger Lower Rib Primary Y
	Passenger Lower Spine Primary Y
	Passenger Pelvis Primary Y

The following additional data plots 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

LIST OF DATA PLOTS...(CONTINUED)

Driver Head X Primary
Driver Head Y Primary
Driver Head Z Primary
Driver Head Resultant Primary
Driver Head Primary X Velocity
Driver Head Primary Y Velocity
Driver Head Primary Z Velocity
Driver Head X Redundant
Driver Head Y Redundant
Driver Head Z Redundant
Driver Head Resultant Redundant
Driver Head Redundant X Velocity
Driver Head Redundant Y Velocity
Driver Head Redundant Z Velocity
Driver Upper Neck Force X
Driver Upper Neck Force Y
Driver Upper Neck Force Z
Driver Upper Neck Force Resultant
Driver Upper Neck Moment X
Driver Upper Neck Moment Y
Driver Upper Neck Moment Z
Driver Upper Neck Moment Resultant
Driver Upper Rib Primary Y Velocity
Driver Lower Rib Primary Y Velocity
Driver Lower Spine Primary Y Velocity
Driver Pelvis Primary Y Velocity
Driver Upper Rib Redundant Y
Driver Lower Rib Redundant Y
Driver Lower Spine Redundant Y
Driver Pelvis Redundant Y

LIST OF DATA PLOTS...(CONTINUED)

Driver Upper Rib Redundant Y Velocity
Driver Lower Rib Redundant Y Velocity
Driver Lower Spine Redundant Y Velocity
Driver Pelvis Redundant Y Velocity
Driver Thorax Contact
Driver Pelvis Contact
Passenger Head X Primary
Passenger Head Y Primary
Passenger Head Z Primary
Passenger Head Resultant Primary
Passenger Head Primary X Velocity
Passenger Head Primary Y Velocity
Passenger Head Primary Z Velocity
Passenger Head X Redundant
Passenger Head Y Redundant
Passenger Head Z Redundant
Passenger Head Resultant Redundant
Passenger Head Redundant X Velocity
Passenger Head Redundant Y Velocity
Passenger Head Redundant Z Velocity
Passenger Upper Neck Force X
Passenger Upper Neck Force Y
Passenger Upper Neck Force Z
Passenger Upper Neck Force Resultant
Passenger Upper Neck Moment X
Passenger Upper Neck Moment Y
Passenger Upper Neck Moment Z
Passenger Upper Neck Moment Resultant

LIST OF DATA PLOTS...(CONTINUED)

Passenger Upper Rib Primary Y Velocity
Passenger Lower Rib Primary Y Velocity
Passenger Lower Spine Primary Y Velocity
Passenger Pelvis Primary Y Velocity
Passenger Upper Rib Redundant Y
Passenger Lower Rib Redundant Y
Passenger Lower Spine Redundant Y
Passenger Pelvis Redundant Y
Passenger Upper Rib Redundant Y Velocity
Passenger Lower Rib Redundant Y Velocity
Passenger Lower Spine Redundant Y Velocity
Passenger Pelvis Redundant Y Velocity
Passenger Thorax Contact
Passenger Pelvis Contact
Vehicle Right Sill at Front Seat X
Vehicle Right Sill at Front Seat Y
Vehicle Right Sill at Front Seat Z
Vehicle Right Sill Front Seat Resultant
Vehicle Right Sill at Front Seat X Velocity
Vehicle Right Sill at Front Seat Y Velocity
Vehicle Right Sill at Front Seat Z Velocity
Vehicle Right Sill at Rear Seat X
Vehicle Right Sill at Rear Seat Y
Vehicle Right Sill at Rear Seat Z
Vehicle Right Sill Rear Seat Resultant
Vehicle Right Sill at Rear Seat X Velocity
Vehicle Right Sill at Rear Seat Y Velocity
Vehicle Right Sill at Rear Seat Z Velocity
Vehicle Rear Floor Above Axle X
Vehicle Rear Floor Above Axle Y
Vehicle Rear Floor Above Axle Z
Vehicle Rear Floor Above Axle Resultant
Vehicle Rear Floor Above Axle X Velocity
Vehicle Rear Floor Above Axle Y Velocity
Vehicle Rear Floor Above Axle Z Velocity

LIST OF DATA PLOTS...(CONTINUED)

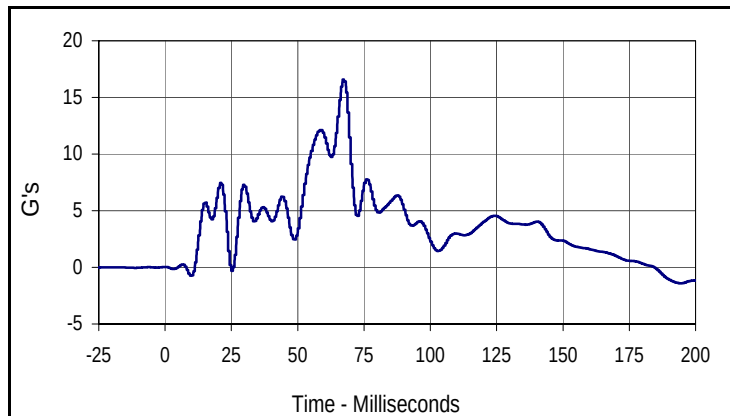
Vehicle Left Sill at Rear Door Y
Vehicle Left Sill at Front Door Y
Vehicle Left Sill at Rear Door Y Velocity
Vehicle Left Sill at Front Door Y Velocity
Vehicle Left Front Door C/L Y
Vehicle Right Rear Occupant Compartment
Vehicle Left Front Door Mid Rear Y
Vehicle Left Front Door Upper CL Y
Vehicle Left Front Door CL Y Velocity
Vehicle Right Rear Occupant Compartment Y Velocity
Vehicle Left Front Door Mid Rear Y Velocity
Vehicle Left Rear Door Upper CL Y Velocity
Vehicle Left Rear Door Mid Rear Y
Vehicle Left Rear Door Upper C/L Y
Vehicle Left Rear Door Mid Rear Y Velocity
Vehicle Left Rear Door Upper CL Y Velocity
Vehicle B-Post Lower Y
Vehicle B-Post Middle Y
Vehicle B-Post Lower Y Velocity
Vehicle B-Post Middle Y Velocity
Vehicle A-Post Lower Y
Vehicle A-Post Middle Y
Vehicle A-Post Lower Y Velocity
Vehicle A-Post Middle Y Velocity
Vehicle Left Front Seat Track
Vehicle Rear Seat Structure
Vehicle Left Front Seat Track Y Velocity
Vehicle Rear Seat Structure Y Velocity
Vehicle CG X
Vehicle CG Y
Vehicle CG Z
Vehicle CG Resultant
Vehicle CG X Velocity
Vehicle CG Y Velocity
Vehicle CG Z Velocity

LIST OF DATA PLOTS...(CONTINUED)

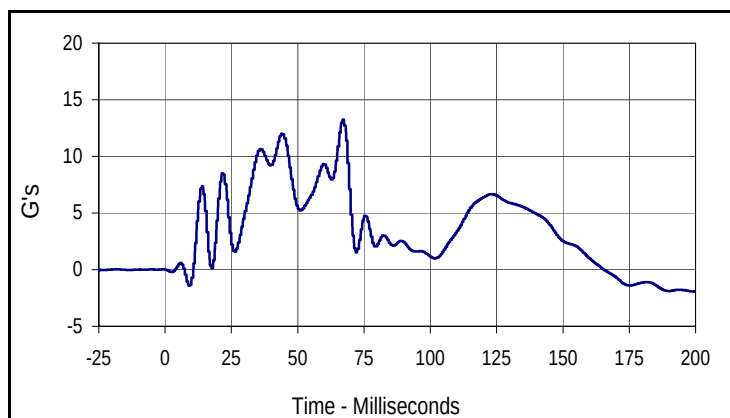
Driver Upper Rib Primary Y
Driver Lower Rib Primary Y
Driver Lower Spine Primary Y
Driver Pelvis Primary Y
Driver Upper Rib Redundant Y
Driver Lower Rib Redundant Y
Driver Lower Spine Redundant Y
Driver Pelvis Redundant Y
Passenger Upper Rib Primary Y
Passenger Lower Rib Primary Y
Passenger Lower Spine Primary Y
Passenger Pelvis Primary Y
Passenger Upper Rib Redundant Y
Passenger Lower Rib Redundant Y
Passenger Lower Spine Redundant Y
Passenger Pelvis Redundant Y
MDB CG X
MDB CG Y
MDB CG Z
MDB CG Resultant
MDB CG X Velocity
MDB CG Y Velocity
MDB CG Z Velocity
MDB Rear X
MDB Rear Y
MDB Rear X Velocity
MDB Rear Y Velocity
MDB Right Bumper Contact

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV
 Test Program: 55/28 km/h Side Impact NCAP

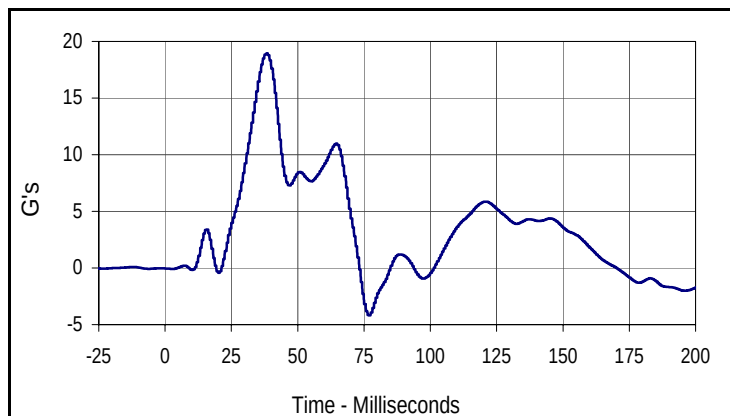
Test Date: 10/23/07
 NHTSA No.: F80203



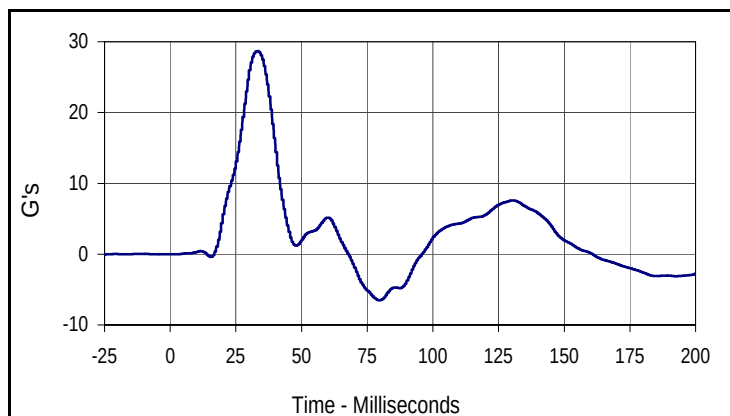
Curve Description			
Driver Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
001	FIR	FIR100	G's
Max	Time	Min	Time
16.6	66.9	-2.2	220.7



Curve Description			
Driver Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIR	FIR100	G's
Max	Time	Min	Time
13.2	66.9	-1.9	198.8



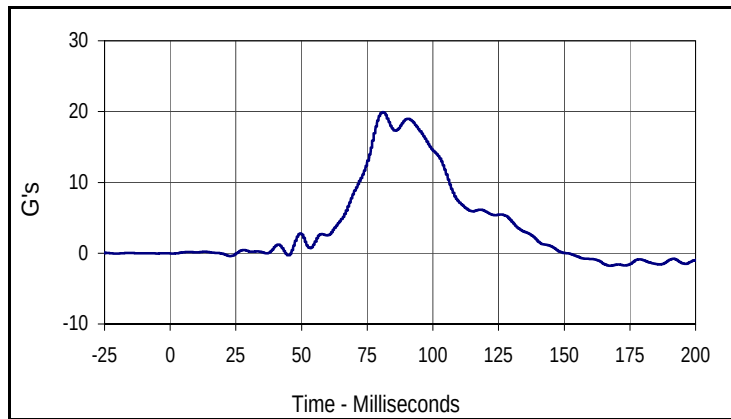
Curve Description			
Driver Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIR	FIR100	G's
Max	Time	Min	Time
18.9	38.2	-4.2	76.9



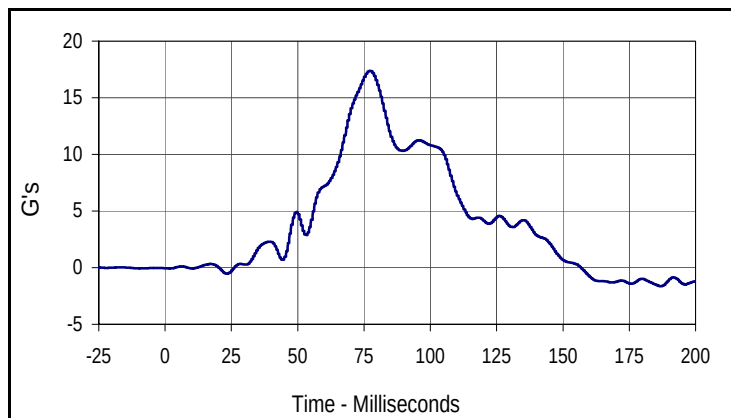
Curve Description			
Driver Pelvis Primary Y			
CURNO	Type	SAE Class	Units
004	FIR	FIR100	G's
Max	Time	Min	Time
28.7	33.2	-6.5	79.4

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV
 Test Program: 55/28 km/h Side Impact NCAP

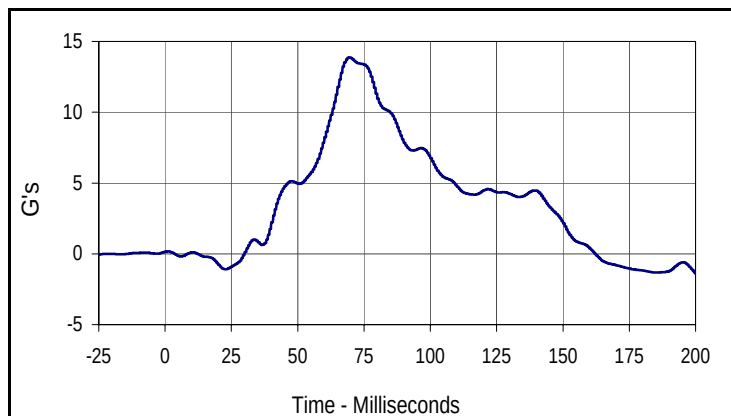
Test Date: 10/23/07
 NHTSA No.: F80203



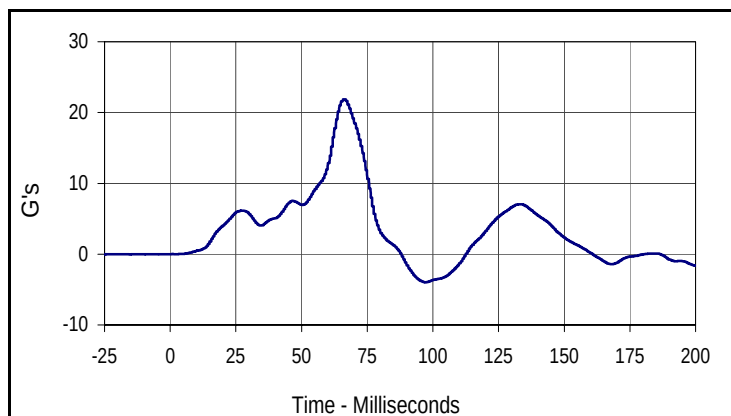
Curve Description			
Passenger Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
005	FIR	FIR100	G's
Max	Time	Min	Time
19.9	80.7	-1.8	166.9



Curve Description			
Passenger Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
006	FIR	FIR100	G's
Max	Time	Min	Time
17.4	76.9	-1.6	210.0



Curve Description			
Passenger Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
007	FIR	FIR100	G's
Max	Time	Min	Time
13.9	69.4	-2.0	206.3



Curve Description			
Passenger Pelvis Y Primary			
CURNO	Type	SAE Class	Units
008	FIR	FIR100	G's
Max	Time	Min	Time
21.9	65.7	-4.0	96.9

APPENDIX C
SID/HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

APPENDIX C
PRE-TEST SID / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program: SID / HIII External Measurements
ATD Serial No.: 275

Test Date: 10/16/07
Test I.D.: N/A



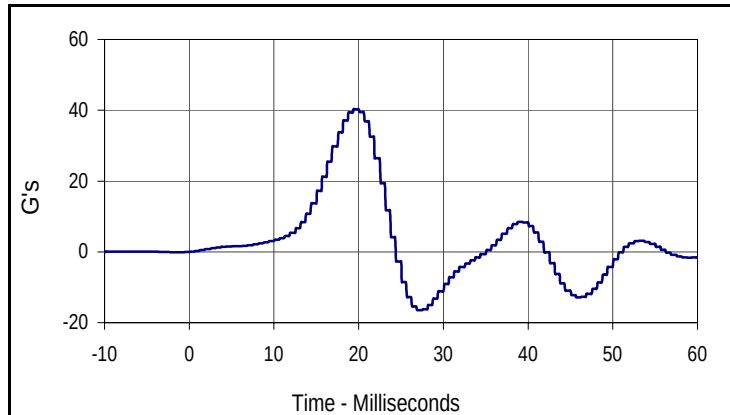
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	898	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	512	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	515	Pass
KV- Knee Pivot From Floor	mm	490 to 505	496	Pass
HW- Hip Width	mm	356 to 391	362	Pass
Overall Test Results				Pass

Test Program: SID / HIII Thorax Lateral Impact
 ATD Serial No.: 275

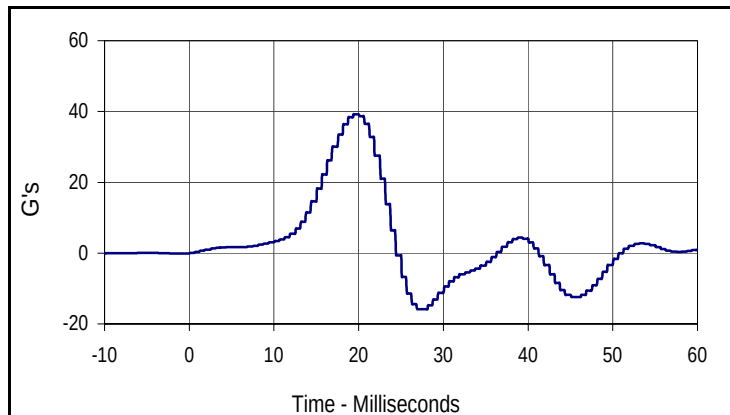
Test Date: 10/16/07
 Test I.D.: TH100



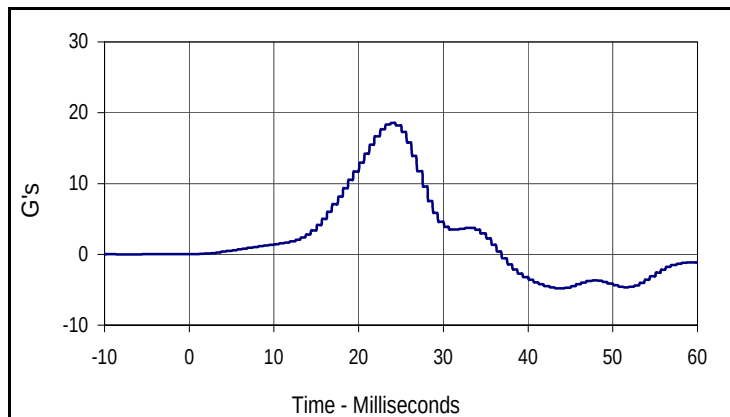
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.30	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	40.3	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	39.2	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	18.5	Pass
Overall Test Results			Pass	



Curve Description			
Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
40.3	19.4	-16.4	26.9



Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
39.2	19.4	-15.8	27.6



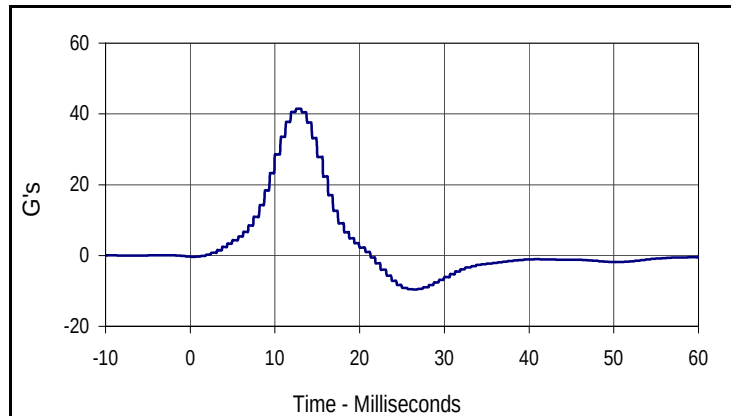
Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
18.5	23.8	-4.8	43.8

Test Program: SID / HIII Pelvis Lateral Impact
 ATD Serial No.: 275

Test Date: 10/16/07
 Test I.D.: PL10N



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.32	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	41.5	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	5.50	Pass
Overall Test Results				Pass



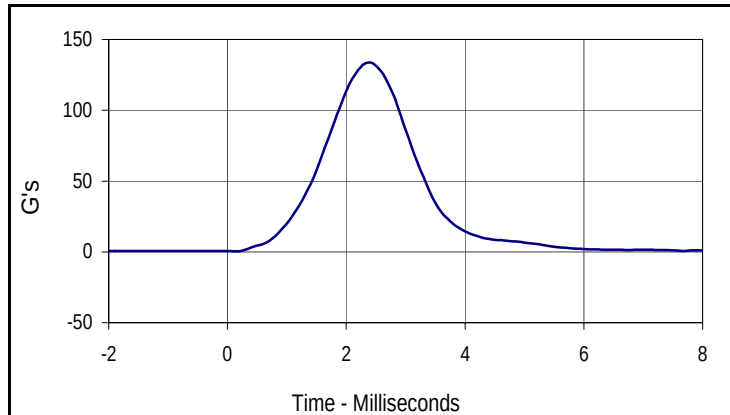
Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
41.5	12.5	-9.6	26.3

Test Program: SID / HIII Head Drop Lateral Impact Test
 ATD Serial No.: 275

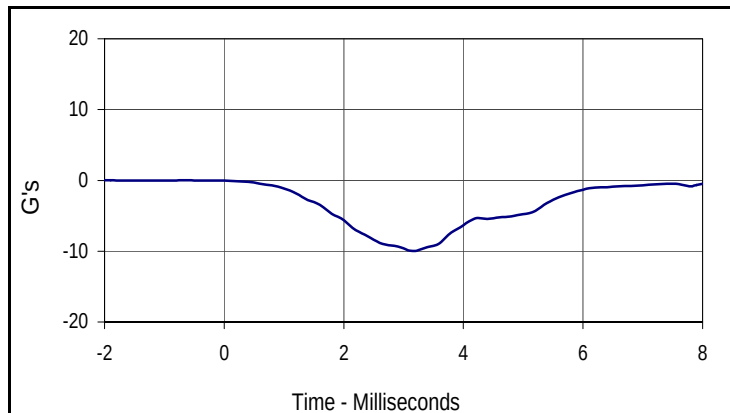
Test Date: 10/16/07
 Test I.D.: HD100



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	120.0 to 150.0	133.6	Pass
Peak Longitudinal Acceleration	G's	≤15.0	9.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	4.9	Pass
Overall Test Results				Pass



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
133.6	2.4	0.5	0.2



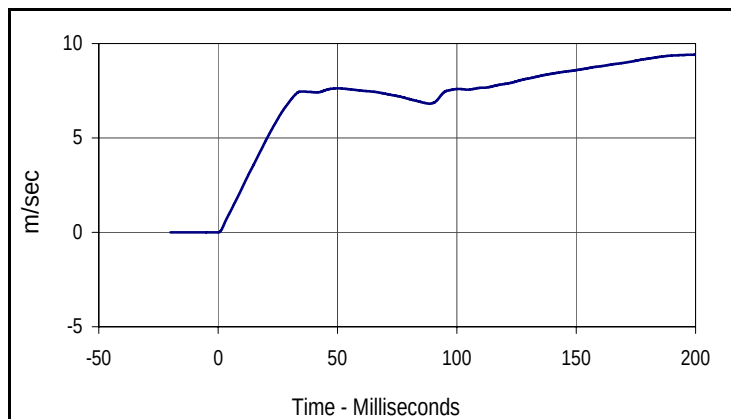
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.0	-2.0	-9.9	3.2

Test Program: SID / HIII Neck Pendulum Lateral Test
 ATD Serial No.: 275

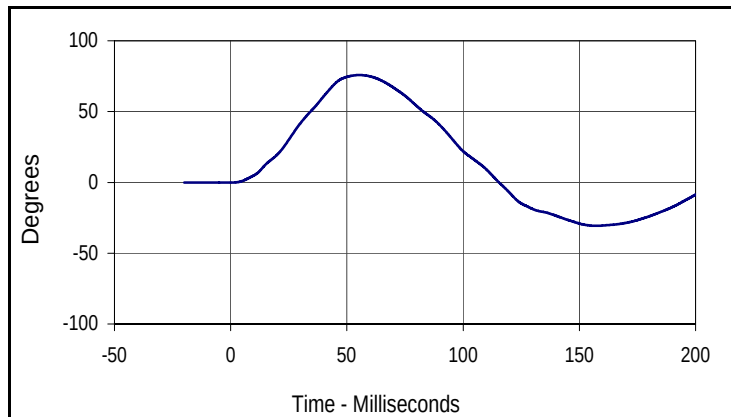
Test Date: 10/16/07
 Test I.D.: NB100



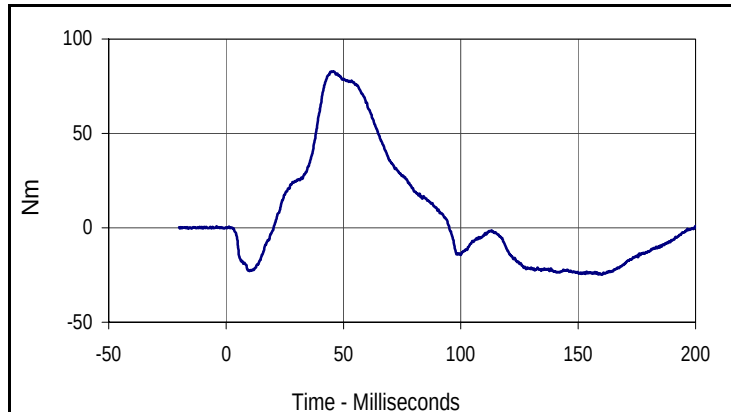
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.03	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.35	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.87	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.95	Pass
	40 to 70	m/sec	6.27 to 7.64	7.62	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	75.8	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	9.8	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	60.1	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	82.8	Pass
Positive Moment Decay, Time To 0 Nm		Msec.	49.0 to 64.0	49.7	Pass
Overall Test Results				Pass	



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/sec
Max	Time	Min	Time
9.4	198.6	0.0	-0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
75.8	55.3	-30.7	157.1



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
82.8	45.5	-24.8	160.2

Test Program: SID / HIII External Measurements
 ATD Serial No.: 274

Test Date: 10/6/07
 Test I.D.: N/A



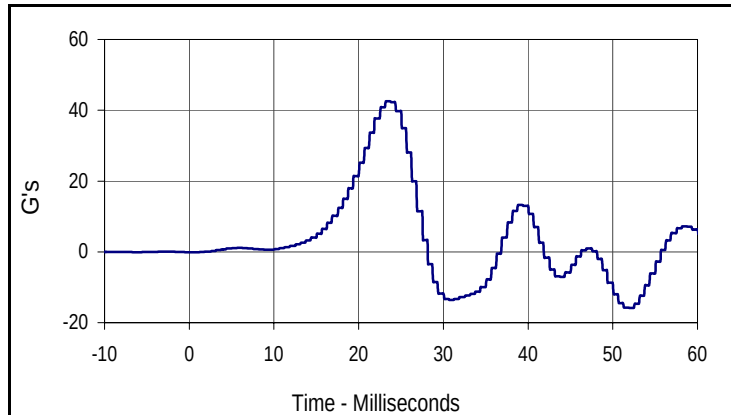
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	898	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	515	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	520	Pass
KV- Knee Pivot From Floor	mm	490 to 505	495	Pass
HW- Hip Width	mm	356 to 391	364	Pass
Overall Test Results				Pass

Test Program: SID / HIII Thorax Lateral Impact
 ATD Serial No.: 274

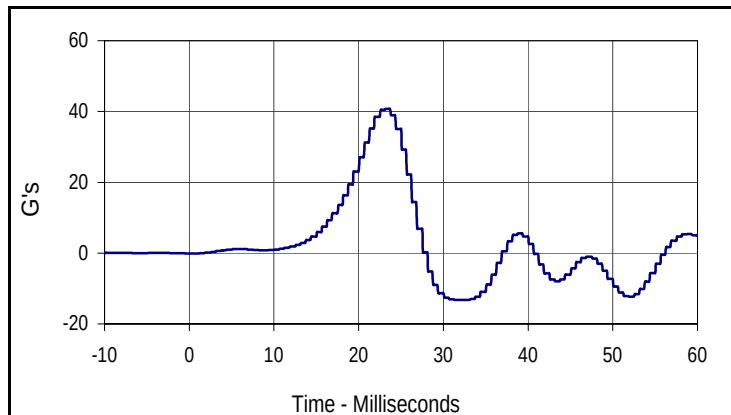
Test Date: 10/16/07
 Test I.D.: TH10N



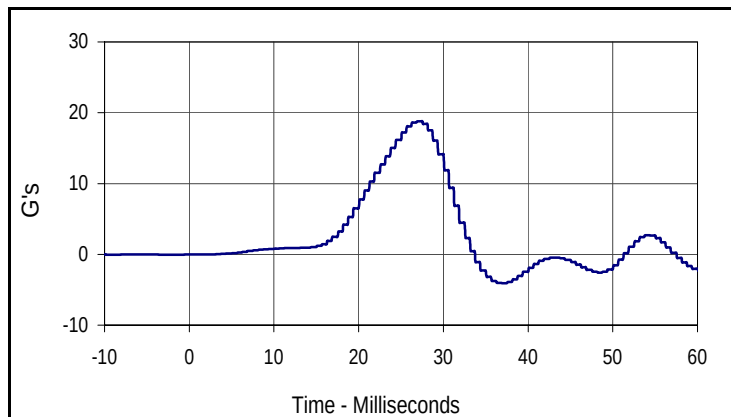
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.31	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	42.6	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	40.8	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	18.8	Pass
Overall Test Results			Pass	



Curve Description			
Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
42.6	23.2	-15.8	51.9



Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
40.8	23.2	-13.2	31.9



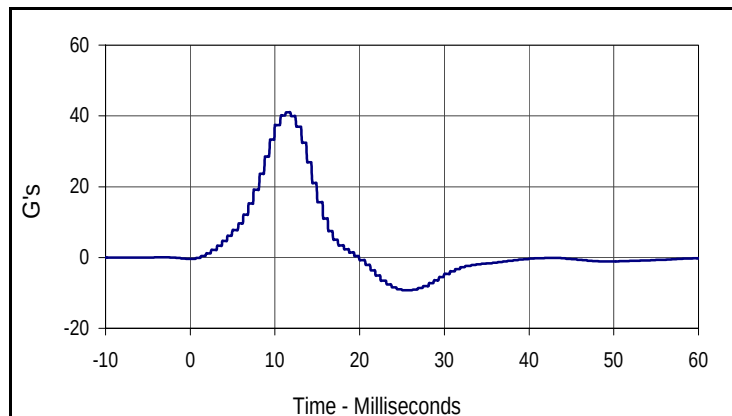
Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
18.8	26.9	-4.1	36.9

Test Program: SID / HIII Pelvis Lateral Impact
 ATD Serial No.: 274

Test Date: 10/16/07
 Test I.D.: PL10N



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.32	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	41.0	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	6.70	Pass
Overall Test Results				Pass



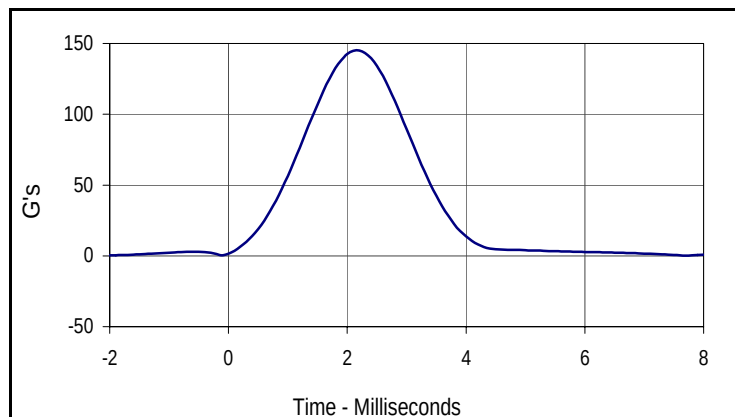
Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
41.0	11.3	-9.3	25.7

Test Program: SID / HIII Head Drop Lateral Impact Test
 ATD Serial No.: 274

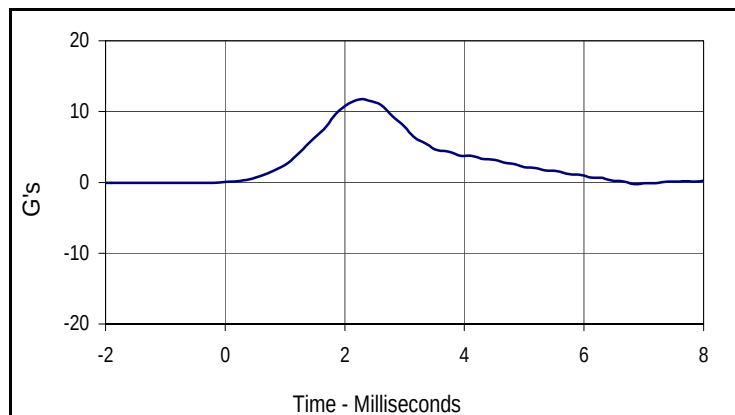
Test Date: 10/16/07
 Test I.D.: HD10N



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	120.0 to 150.0	145.0	Pass
Peak Longitudinal Acceleration	G's	≤15.0	11.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	2.7	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
145.0	2.2	0.4	-2.0



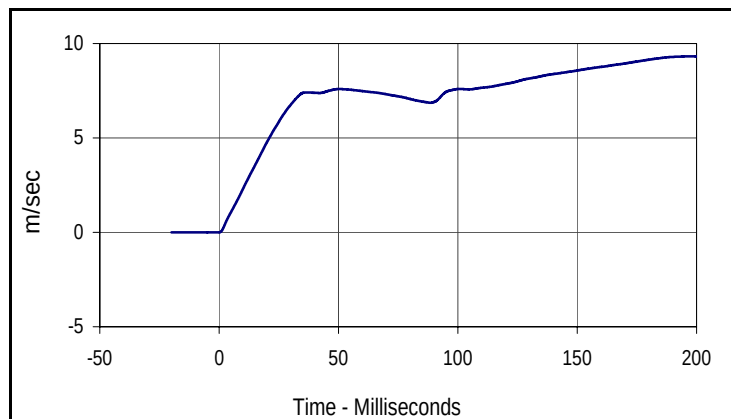
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
11.8	2.3	-0.1	-0.4

Test Program: SID / HIII Neck Pendulum Lateral Test
 ATD Serial No.: 274

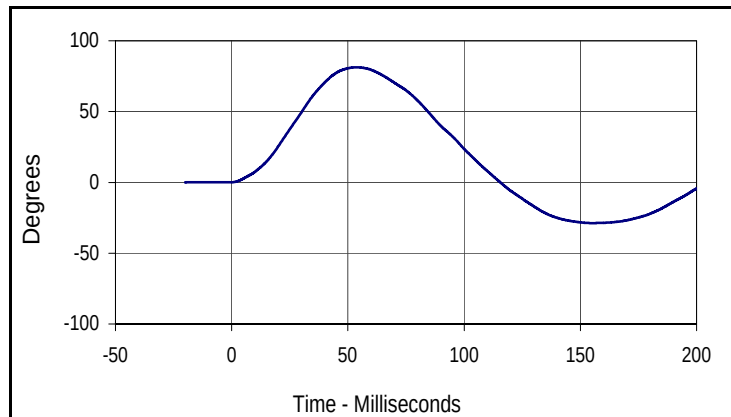
Test Date: 10/16/07
 Test I.D.: NB10N



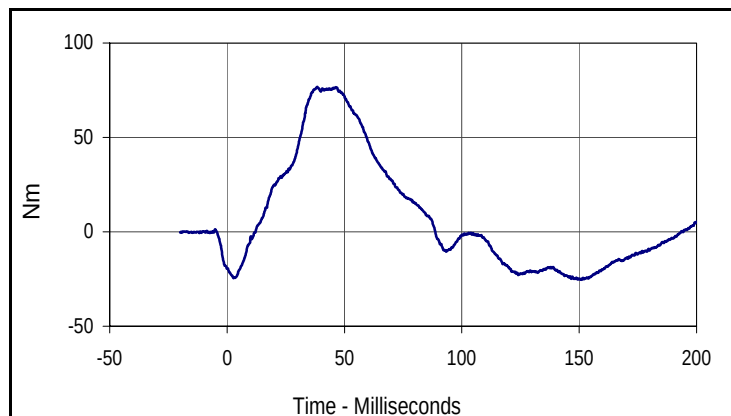
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.31	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.77	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.76	Pass
	40 to 70	m/sec	6.27 to 7.64	7.59	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	81.3	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	15.4	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	61.9	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	76.8	Pass
Positive Moment Decay, Time To 0 Nm		Msec.	49.0 to 64.0	50.4	Pass
Overall Test Results				Pass	



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/sec
Max	Time	Min	Time
9.3	196.6	0.0	-0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
81.3	53.7	-28.8	155.3



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
76.8	38.3	-25.3	151.1

APPENDIX C
POST-TEST SID / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program: SID / HIII External Measurements
 ATD Serial No.: 275

Test Date: 10/24/07
 Test I.D.: N/A



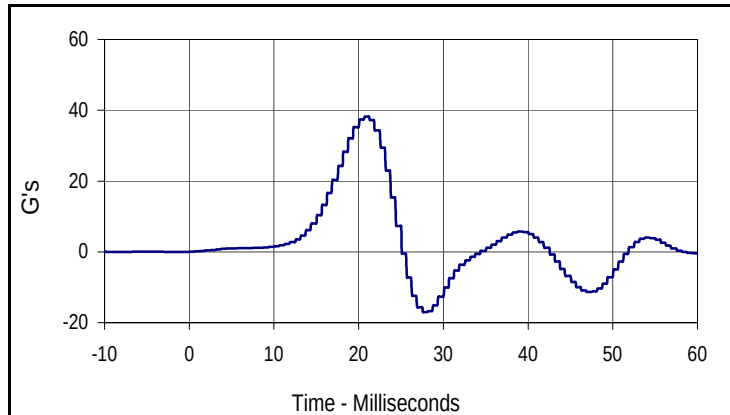
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	897	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	518	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	520	Pass
KV- Knee Pivot From Floor	mm	490 to 505	502	Pass
HW- Hip Width	mm	356 to 391	375	Pass
Overall Test Results				Pass

Test Program: SID / HIII Thorax Lateral Impact
 ATD Serial No.: 275

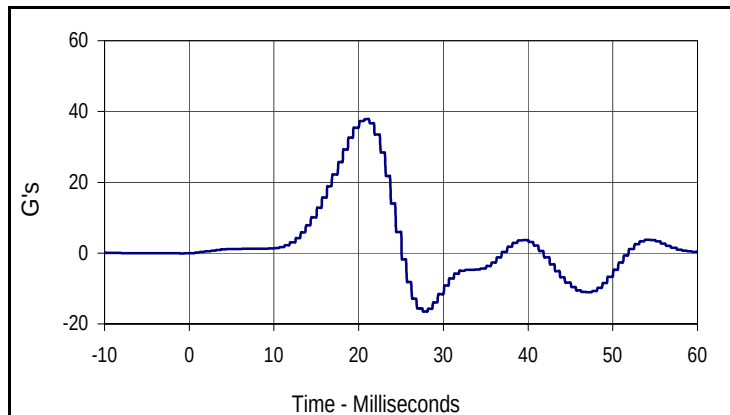
Test Date: 10/24/07
 Test I.D.: TH10P



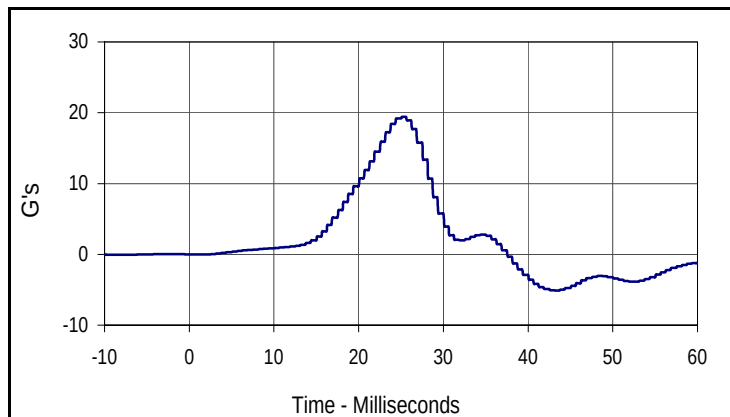
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.30	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	38.2	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	37.9	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	19.4	Pass
Overall Test Results			Pass	



Curve Description			
Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
38.2	20.7	-17.0	27.6



Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
37.9	20.7	-16.5	27.6



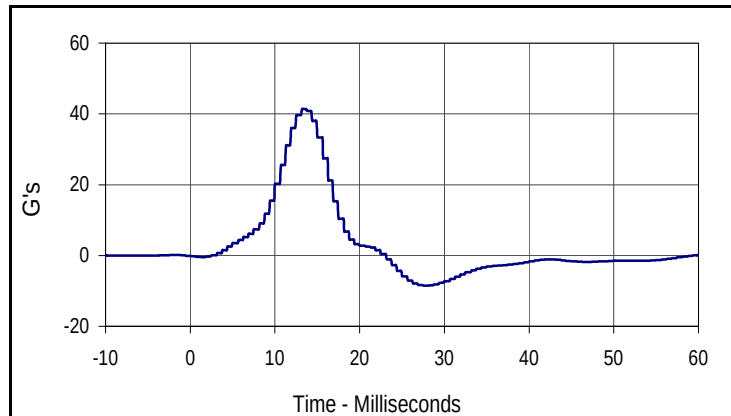
Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
19.4	25.1	-5.1	43.2

Test Program: SID / HIII Pelvis Lateral Impact
 ATD Serial No.: 275

Test Date: 10/24/07
 Test I.D.: PL10P



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.30	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	41.4	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	4.90	Pass
Overall Test Results				Pass



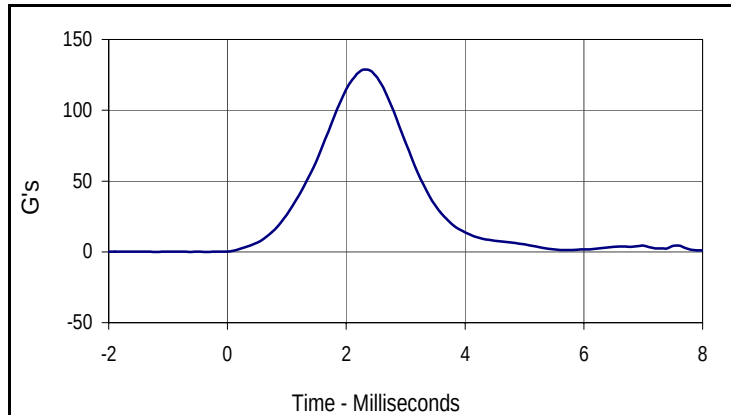
Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
41.4	13.2	-8.5	27.5

Test Program: SID / HIII Head Drop Lateral Impact Test
 ATD Serial No.: 275

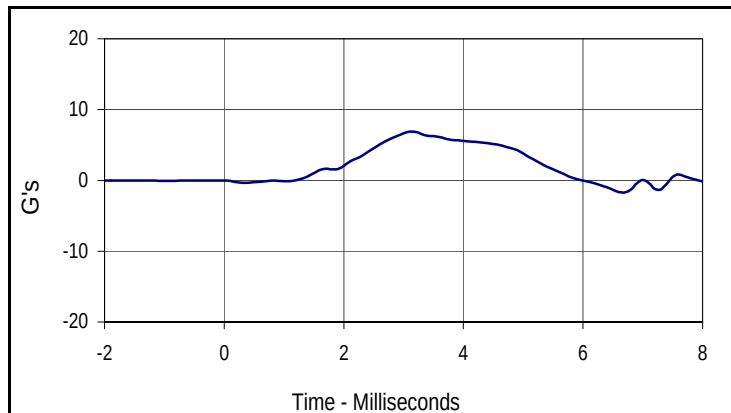
Test Date: 10/24/07
 Test I.D.: HD10P



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	120.0 to 150.0	128.7	Pass
Peak Longitudinal Acceleration	G's	≤15.0	6.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	4.1	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
128.7	2.3	0.0	-0.3



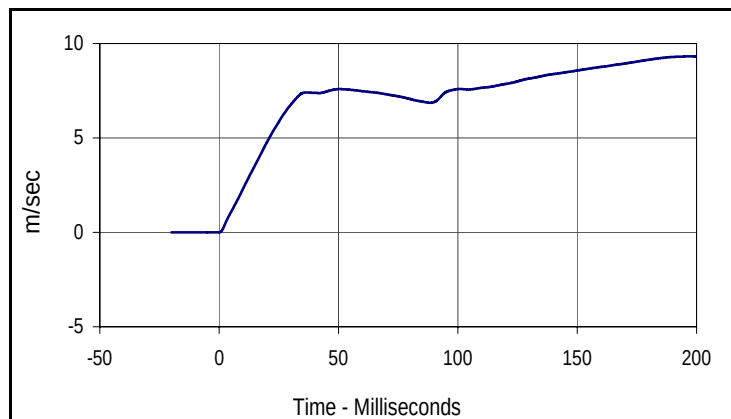
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
6.9	3.1	-0.3	0.3

Test Program: SID / HIII Neck Pendulum Lateral Test
 ATD Serial No.: 275

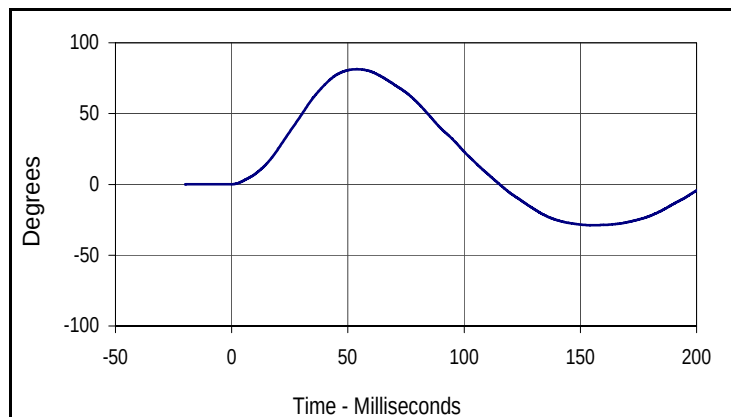
Test Date: 10/24/07
 Test I.D.: NB10P



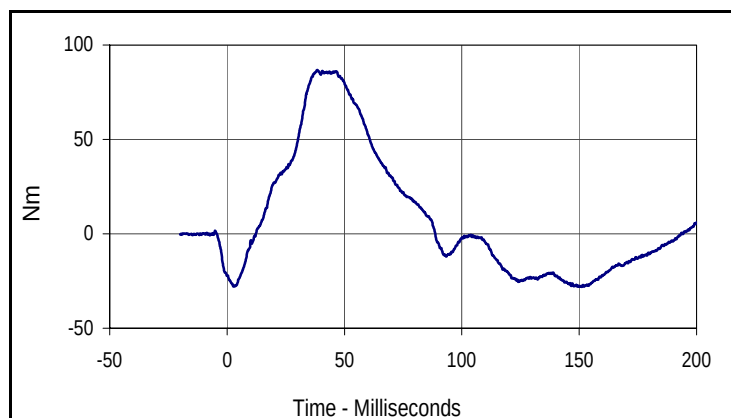
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.05	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.31	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.77	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.76	Pass
	40 to 70	m/sec	6.27 to 7.64	7.59	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	81.4	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	15.5	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	61.5	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	86.8	Pass
Positive Moment Decay, Time To 0 Nm		Msec.	49.0 to 64.0	50.4	Pass
Overall Test Results				Pass	



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/sec
Max	Time	Min	Time
9.3	196.6	0.0	-0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
81.4	53.8	-28.9	155.3



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
86.8	38.3	-28.1	151.0

Test Program: SID / HIII External Measurements
 ATD Serial No.: 274

Test Date: 10/24/07
 Test I.D.: N/A



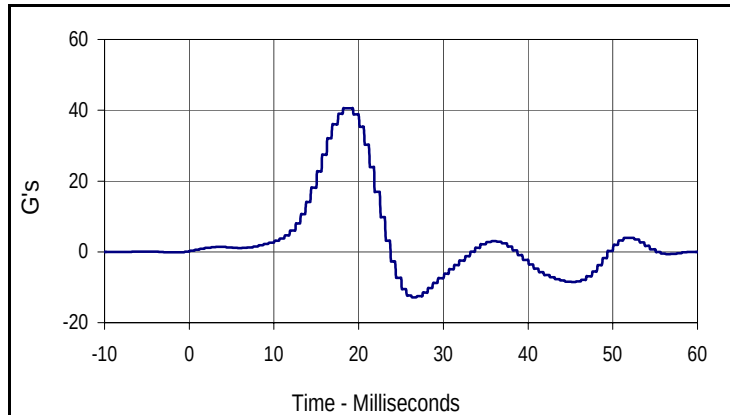
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	897	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	510	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	519	Pass
KV- Knee Pivot From Floor	mm	490 to 505	500	Pass
HW- Hip Width	mm	356 to 391	362	Pass
Overall Test Results				Pass

Test Program: SID / HIII Thorax Lateral Impact
 ATD Serial No.: 274

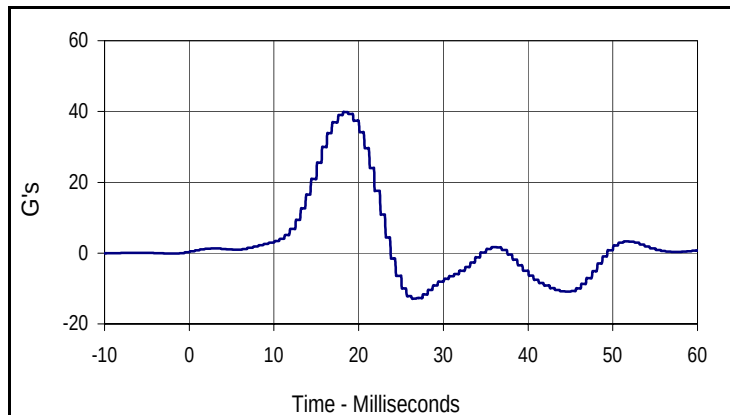
Test Date: 10/24/07
 Test I.D.: TH10Q



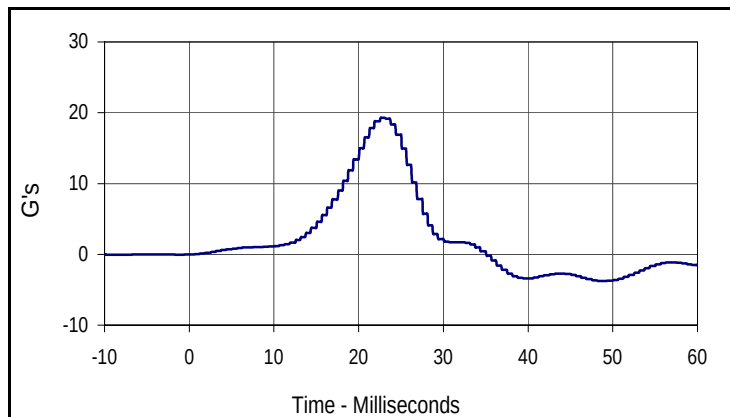
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.29	Pass
Upper Rib Acceleration	G's	37.0 to 46.0	40.6	Pass
Lower Rib Acceleration	G's	37.0 to 46.0	39.8	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	19.3	Pass
Overall Test Results			Pass	



Curve Description			
Upper Rib Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
40.6	18.2	-12.8	26.3



Curve Description			
Lower Rib Y Primary			
CURNO	Type	SAE Class	Units
002	FIL	FIR100	G's
Max	Time	Min	Time
39.8	18.2	-12.9	26.3



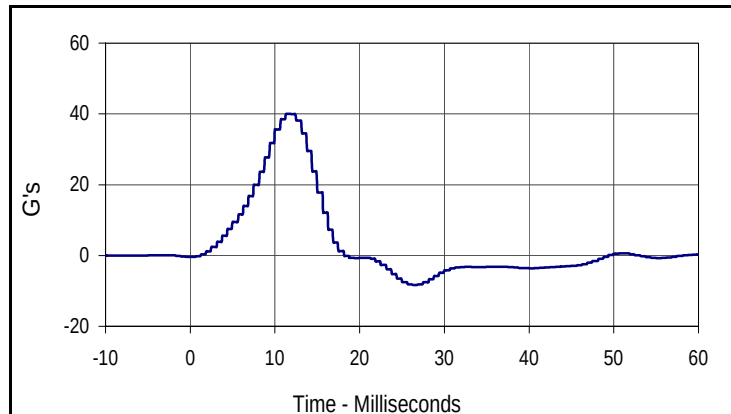
Curve Description			
Lower Spine Y Primary			
CURNO	Type	SAE Class	Units
003	FIL	FIR100	G's
Max	Time	Min	Time
19.3	22.6	-3.8	48.8

Test Program: SID / HIII Pelvis Lateral Impact
 ATD Serial No.: 274

Test Date: 10/24/07
 Test I.D.: PL10Q



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.30	Pass
Peak Pelvis Acceleration	G's	40.0 to 60.0	40.1	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0	6.70	Pass
Overall Test Results				Pass



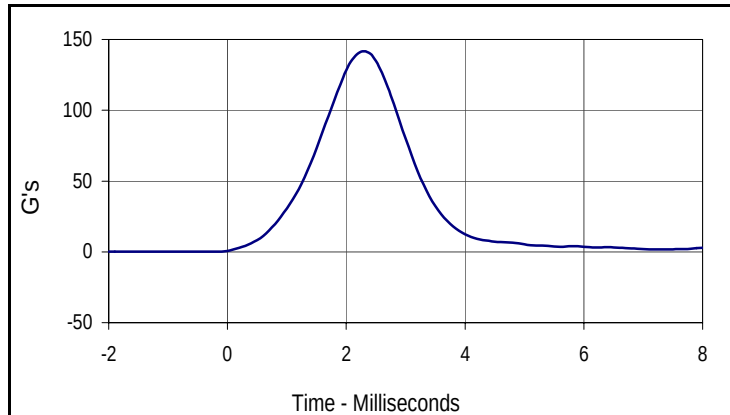
Curve Description			
Pelvis Y Primary			
CURNO	Type	SAE Class	Units
001	FIL	FIR100	G's
Max	Time	Min	Time
40.1	11.3	-8.4	26.3

Test Program: SID / HIII Head Drop Lateral Impact Test
 ATD Serial No.: 274

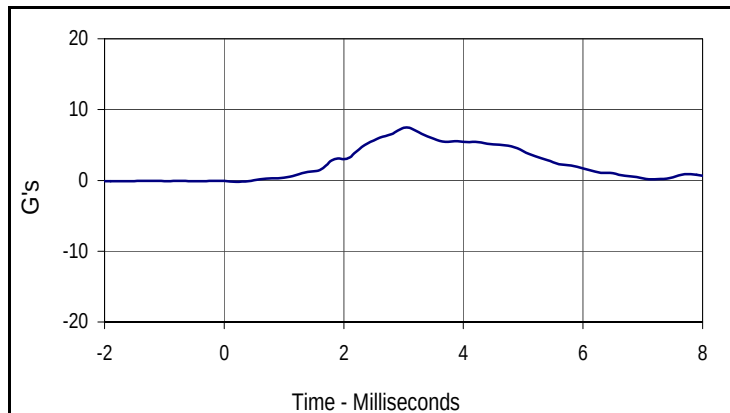
Test Date: 10/24/07
 Test I.D.: HD10Q



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	120.0 to 150.0	141.6	Pass
Peak Longitudinal Acceleration	G's	≤15.0	7.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Oscillations After Main Pulse	%	<15	3.7	Pass
Overall Test Results			Pass	



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
141.6	2.3	0.1	-0.2



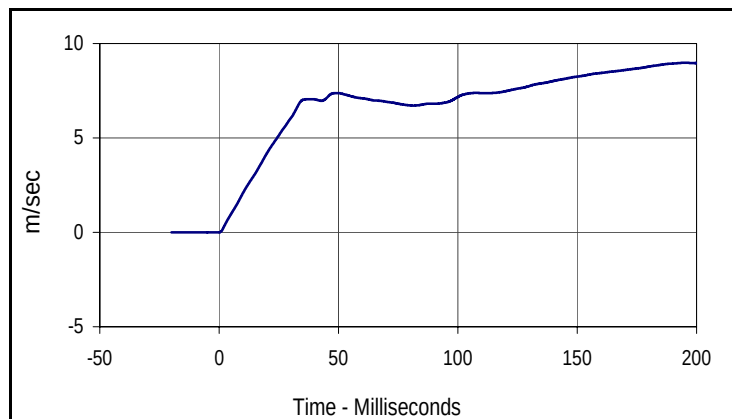
Curve Description			
Head X			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
7.4	3.0	-0.2	0.2

Test Program: SID / HIII Neck Pendulum Lateral Test
 ATD Serial No.: 274

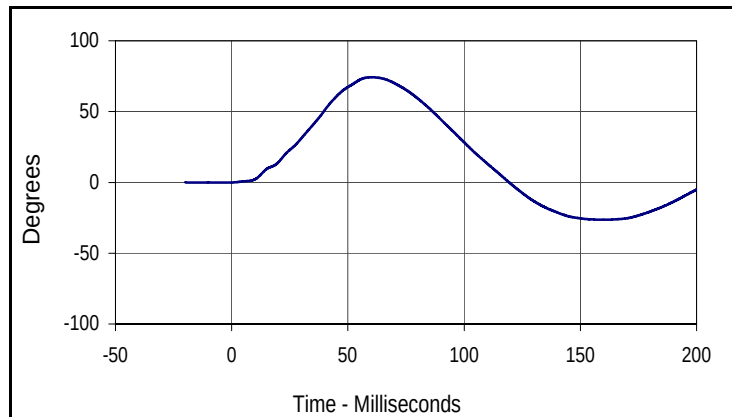
Test Date: 10/24/07
 Test I.D.: NB10Q



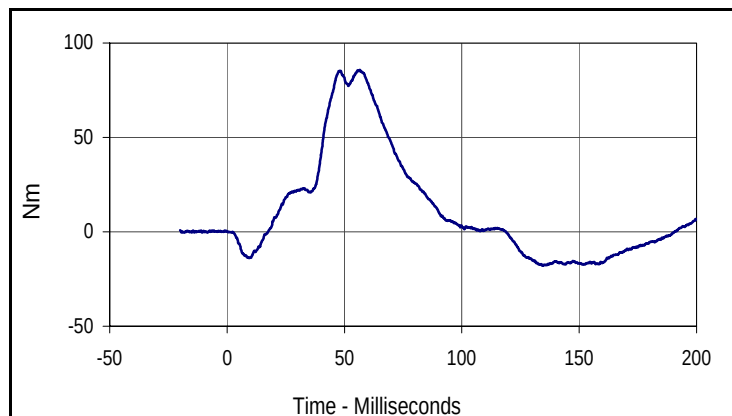
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/sec	6.89 to 7.13	7.09	Pass
Pendulum Deceleration	10 Msec.	m/sec	1.96 to 2.55	2.09	Pass
	20 Msec.	m/sec	4.12 to 5.10	4.19	Pass
	30 Msec.	m/sec	5.73 to 7.01	6.04	Pass
	40 to 70	m/sec	6.27 to 7.64	7.38	Pass
"D" Plane Rotation	Max	Degrees	66.0 to 82.0	74.2	Pass
Max Rotation Time After Peak Moment		Msec.	2.0 to 16.0	3.7	Pass
Rotation Time From Peak to Zero Angle		Msec.	58.0 to 67.0	59.2	Pass
Moment About Occipital Condyle		Nm	73.0 to 88.0	85.8	Pass
Positive Moment Decay, Time To 0 Nm		Msec.	49.0 to 64.0	62.4	Pass
Overall Test Results					Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/sec
Max	Time	Min	Time
9.0	194.7	0.0	-0.3



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
74.2	60.2	-26.3	159.3



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
85.8	56.5	-18.0	134.5

APPENDIX D
CHILD RESTRAINT SYSTEM

REPORT NUMBER TR-P27188-01-NC

**NEW CAR ASSESMENT PROGRAM
SIDE IMPACT TEST**

**FORD MOTOR COMPANY
2008 FORD EXPEDITION XLT
5-DOOR MPV**

NHTSA NUMBER: F80203

**Prepared By:
KARCO ENGINEERING, LLC
9270 HOLLY ROAD
ADELANTO, CALIFORNIA 92301**



OCTOBER 23, 2007

FINAL REPORT

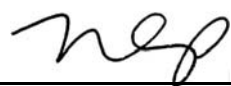
**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
RULEMAKING
MAIL CODE: NVS-111
1200 NEW JERSEY AVE SE, ROOM W43-410
WASHINGTON, D.C. 20590**

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-03-D-32005.

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. Kelsey A. Chiu, Project Engineer
KARCO Engineering, LLC

Date: October 23, 2007

Reviewed by: 
Mr. Michael L. Dunlap, Quality Assurance Manager
KARCO Engineering, LLC

Date: October 23, 2007

Approved by: 
Mr. Frank D. Richardson, Program Manager
KARCO Engineering, LLC

Date: October 23, 2007

FINAL REPORT ACCEPTED BY:

Manager, New Car Assessment Program

Date of Acceptance

COTR, NCAP Frontal Impact Program

Date of Acceptance

Technical Report Documentation Page

1. Report No. TR-P27188-01	2. Government Accession No.	3. Recipients Catalog No.	
4. Title and Subtitle Final report of a Graco Snugride CRS. NHTSA No. F80203		5. Report Date October 23, 2007	
		6. Performing Organization Code KAR	
7. Authors Mr. Kelsey A. Chiu, Project Engineer, KARCO Mr. Frank Richardson, Program Manager, KARCO		8. Performing Organization Report No. TR-P27188-01	
9. Performing Organization Name and Address Karco Engineering, LLC 9270 Holly Rd. Adelanto, CA, 92301		10. Work Unit No.	
		11. Contract or Grant No. DTNH22-03-D-32005	
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Rulemaking Office of Crashworthiness Standards Mail Code NVS-111 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C 20590		13. Type of Report and Period Covered Final Test Report	
		14. Sponsoring Agency Code DOT/NHTSA/NRM/OCS	
15. Supplementary Notes			
16. Abstract A side impact test was conducted on the subject CRS Graco Snugride in conjunction with side impact NCAP testing on a 2008 Ford Expedition XLT 5-Door MPV, and in accordance with the specifications of the Office of Crahsworthiness Standards Test Procedure for the determination of CRS crashworthiness. This test was conducted at KARCO Engineering, LLC, on October 23, 2007.			
Measurement Description	Units	Threshold	Right Rear (P3)
Head Injury Criteria (HIC 15)	N/A	390	11.5
3 msec. Chest Clip	G's	50	20.4
17. Key Words New Car Assessment Program (NCAP) Side Impact Moving Deformable Barrier (MDB) Final report of a Graco Snugride CRS		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Admin. NHTSA Technical Reference Division 1200 New Jersey Ave., SE, Room W43-410 Washington, DC 20590	
19. Security Classification of this report UNCLASSIFIED	20. Security Classification of this page UNCLASSIFIED	21. No. of Pages 111	22. Price

Form DOT F1700.7 (8-72)

TABLE OF CONTENTS

<u>Section</u>	<u>Description</u>	<u>Page</u>
D-1	Purpose and Summary of Test M80501	D1-1 to D1-8
D-2	Photographs	D2-1 to D2-18
D-3	CRABI Response and CRS Data Traces	D3-1 to D3-2
D-4	CRABI Calibration Information	D4-1 to D4-6
<u>Data Sheet</u>	<u>Description</u>	<u>Page</u>
1	Crash Test Summary	D1-2
2	Vehicle Parameter Data	D1-3
3	CRABI Positioning in Vehicle	D1-4
4	CRS Performance Data	D1-6
5	CRS Accelerometer Locations	D1-7
6	CRS Camera Locations and Data	D1-8

SECTION D-1
PURPOSE AND SUMMARY OF TEST M80501

The purpose of this test is to obtain CRS performance data during a 55/28 km/h 90 deg. Moving Deformable Barrier Side Impact NCAP Test

The Side Impact NCAP test was conducted in accordance with the Office of Crashworthiness Standards (OCS) NCAP Laboratory Test Procedure.

SUMMARY

One 12-month old CRABI (P3) was instrumented with head, chest, and six-axis upper neck load cells. A tri-axial accelerometer was installed on the CRS and the CRS base. Seat belt load cells were placed on the inboard and outboard lower tethers.

The right rear (Serial No. 022) CRABI was calibrated prior to this test. CRABI calibration information is found in Section D-4.

CHILD DUMMY VALUES		
Location	HIC 15 Value	3 msec. Chest Clip
CRABI (P3)	11.5	20.4

DATA SHEET NO. 1
CRASH TEST SUMMARY

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

NHTSA No.: F80203

Test Program: 55/28 km/h Side Impact NCAP

Test Date: 10/23/2007

CHILD RESTRAINT INFORMATION

Description	Position #3 CRS
Manufacturer	Graco
Model Name	Snugride
Model No.	8645HEM3
Type	Infant
Forward/Rearward	Rearward

VISIBLE DUMMY CONTACT POINTS

Description	Position #3 CRS
Head Contact	None
Chest Contact	None
Abdomen Contact	None
Left Knee Contact	None
Right Knee Contact	None
Left Toe Contact	Right Toe
Right Toe Contact	Left Toe

POST-TEST DOOR OPENINGS

Description	Position #3 CRS
Right Rear Door	Door remained closed and latched, opened without tools.

CAMERAS

Description	Standard
High Speed	1
Real Time	0
Total	1

DATA CHANNELS

CRABI (P3) Sensors	13
Belt Sensors	2
CRS Sensors	6
Total	21

DATA SHEET NO. 2**VEHICLE PARAMETER DATA**Test Vehicle: 2008 Ford Expedition XLT 5-Door MPVNHTSA No.: F80203Test Program: 55/28 km/h Side Impact NCAPTest Date: 10/23/2007**TEST VEHICLE WEIGHTS**

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	652	629	1281	689	757	1446
Right	kg	630	627	1257	640	741	1381
Ratio	%	50.5	49.5	100.0	47.0	53.0	100.0
Total	kg	1282	1256	2538	1329	1498	2827

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2537
Weight of 2 P572 ATDs	kg	162
Rated Cargo/Luggage Wt (RCLW)	kg	136
Calculated Vehicle Target Wt (TVTW)	kg	2835

DATA SHEET NO. 3

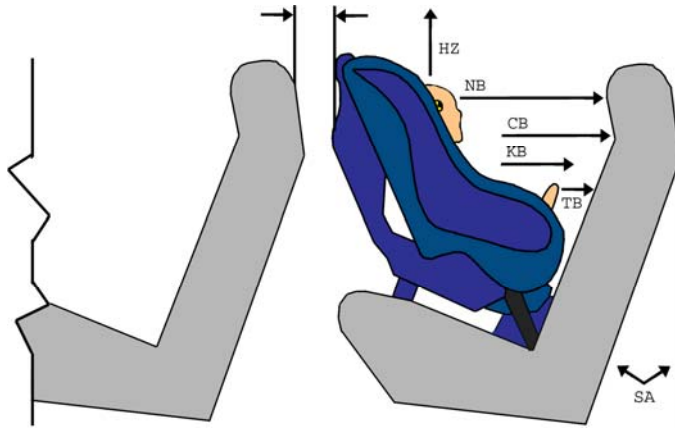
CRABI POSITIONING IN VEHICLE

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV

NHTSA No.: F80203

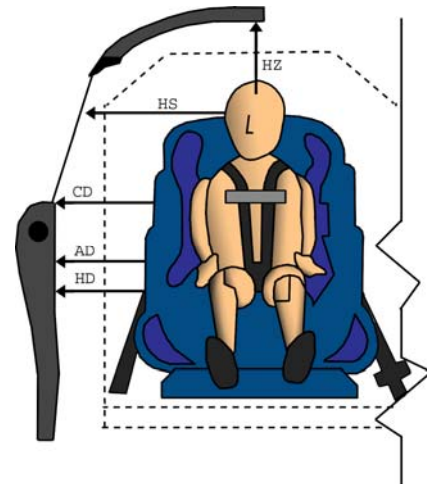
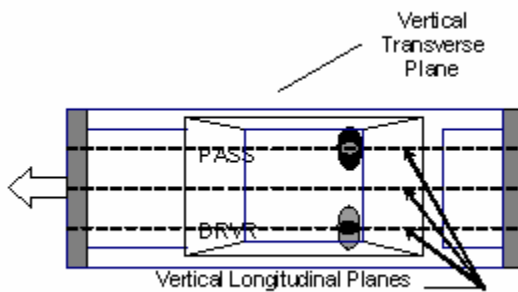
Test Program: 55/28 km/h Side Impact NCAP

Test Date: 10/23/2007



AD	Arm to Door
CD	Chest to Door
HD	H-Point to Door
HS	Head to Side Window
KK	Knee to Knee
TT	Toe to Toe

CB	Chest to Seat Back
HZ	Head to Roof
KB	Knee to Seat Back
NB	Nose to Seat Back
SA	Seat Back Angle
TB	Toe to Seat Back



DUMMY MEASUREMENTS FOR REAR SEAT OCCUPANTS

DATA SHEET NO. 3...(CONTINUED)**CRABI POSITIONING IN VEHICLE**Test Vehicle: 2008 Ford Expedition XLT 5-Door MPVNHTSA No.: F80203Test Program: 55/28 km/h Side Impact NCAPTest Date: 10/23/2007**CRABI POSITION MEASUREMENTS**

Code	Measurement	P3 (Passenger's Side)	
		Length (mm)	Angle (°)
SA	Seatback Angle		18.0
HZ	Head to Roof (Z)	425	
CD	Chest to Door	385	
KK	Knee to Knee (Y)	130	
HS	Head to Side Window	430	
HD	H-Point to Door (Y)	290	
AD	Arm to Door	300	
NB	Nose to Seatback	610	
CB	Chest to Seatback	502	
FF	Foot to Foot	110	
KB-Left	Knee to Seatback	230	
KB-Right	Knee to Seatback	235	
TB-Left	Toe to Seatback	110	
TB-Right	Toe to Seatback	115	

DATA SHEET NO. 4**CRS PERFORMANCE DATA**Test Vehicle: 2008 Ford Expedition XLT 5-Door MPVNHTSA No.: F80203Test Program: 55/28 km/h Side Impact NCAPTest Date: 10/23/2007**CRS PERFORMANCE DATA**

Location	CRS (P3)	
	Damage	Post-Test
Upper Tether Strap		
Upper Tether Buckle		
Upper Tether Hook		
Veh. Upper Tether Anchor		
Lower Anchor Strap	No	None
Lower Anchor Buckle	No	None
Lower Anchor Hooks	No	None
Veh. Lower CRS Anchors	No	None
5-Point Harness Connections	No	None
Cracks on CRS	No	None
Fabric Tears on CRS	No	None
Vehicle Seat Structure	No	None
Vehicle Seat Fabric Tears	No	None

DATA SHEET NO. 5**CRS ACCELEROMETER LOCATIONS**Test Vehicle: 2008 Ford Expedition XLT 5-Door MPVNHTSA No.: F80203Test Program: 55/28 km/h Side Impact NCAPTest Date: 10/23/2007**CRS ACCELEROMETER PRE-TEST LOCATIONS**

Loc No.	Accelerometer Location	Measurements		
		X	Y	Z
1	CRS	2230	580	1185
2	CRS Base	2230	620	1050

Reference Planes: X = From Rear Surface of Vehicle, Y = Vehicle Centerline, Z = Ground Plane

DATA SHEET NO. 6**CRS CAMERA LOCATIONS AND DATA**Test Vehicle: 2008 Ford Expedition XLT 5-Door MPVNHTSA No.: F80203Test Program: 55/28 km/h Side Impact NCAPTest Date: 10/23/2007**CAMERA LOCATIONS**

No.	Camera View	Location (mm)			Angle (°)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Passenger CRS (O.B.)	1350	2432	-740	-2	n/a	10	1000

X = Barrier Face, Y = Monorail, Z = Ground, DNR = Did Not Run, NTM = No Time Marks

SECTION D2

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

Figure		Page
1	Close-up, Position 3 CRS Label	D-1
2	Pre-Test Frontal View of Position 3 CRS	D-2
3	Post-Test Frontal View of Position 3 CRS	D-3
4	Pre-Test Rear View of Position 3 CRS	D-4
5	Post-Test Rear View of Position 3 CRS	D-5
6	Pre-Test Left Side View of Position 3 CRS	D-6
7	Post-Test Left Side View of Position 3 CRS	D-7
8	Pre-Test Right Side View of Position 3 CRS	D-8
9	Post-Test Right Side View of Position 3 CRS	D-9
10	Pre-Test Position 3 Front View (Head and Seat Belt Position)	D-10
11	Post-Test Position 3 Front View (Head and Seat Belt Position)	D-11
12	Pre-Test Position 3 Front View (Seat Belt Position)	D-12
13	Post-Test Position 3 Front View (Seat Belt Position)	D-13
14	Pre-Test Position 3 Right Side View	D-14
15	Post-Test Position 3 Right Side View	D-15
16	Pre-Test Position 3 Left Side View	D-16
17	Post-Test Position 3 Left Side View	D-17
18	Post-Test Position 3 Dummy Legs	D-18

MODEL **8645HEM3**

NAME **SNUGRIDE**

Manufactured in 081607 10

GRACO CHILDREN'S PRODUCTS, INC.

EXTON, PA 19341 1-800-345-4109

Made in U.S.A.

PB-25777

Figure D2-1: Position 3 CRS Label



Figure D2-2: Pre-Test Frontal View of Position 3 CRS



Figure D2-3: Post-Test Frontal View of Position 3 CRS



Figure D2-4: Pre-Test Rear View of Position 3 CRS



Figure D2-5: Post-Test Rear View of Position 3 CRS



Figure D2-6: Pre-Test Left Side View of Position 3 CRS



Figure D2-7: Post-Test Left Side View of Position 3 CRS



Figure D2-8: Pre-Test Right Side View of Position 3 CRS



Figure D2-9: Post-Test Right Side View of Position 3 CRS



Figure D2-10: Pre-Test Position 3 Front View (Head and Seat Belt Position)



Figure D2-11: Post-Test Position 3 Front View (Head and Seat Belt Position)



Figure D2-12: Pre-Test Position 3 Front View (Seat Belt Position)



Figure D2-13: Post-Test Position 3 Front View (Seat Belt Position)



Figure D2-14: Pre-Test Position 3 Right Side View



Figure D2-15: Post-Test Position 3 Right Side View



Figure D2-16: Pre-Test Position 3 Right Side View (Through Window)



Figure D2-17: Post-Test Position 3 Right Side View (Through Window)



Figure D2-18: Post-Test Position 3 Dummy Legs

SECTION D3

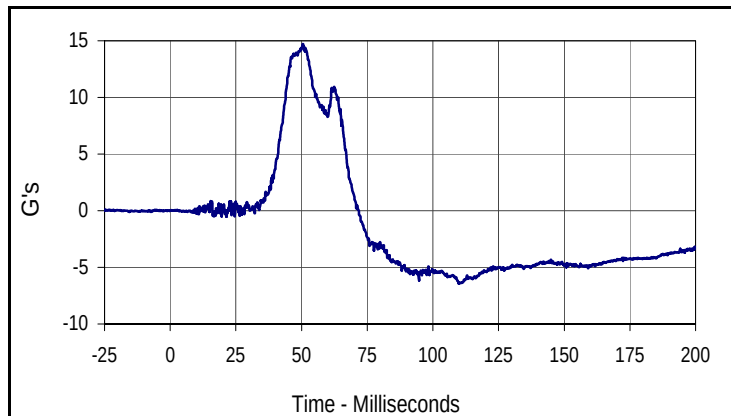
CRABI RESPONSE AND CRS DATA TRACES

LIST OF DATA PLOTS

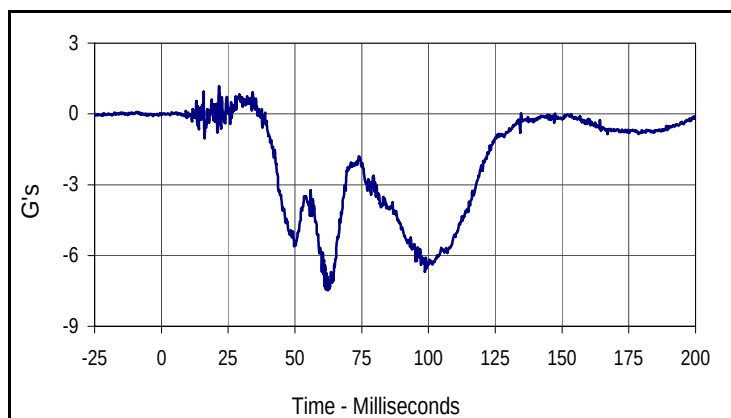
<u>Data Plot</u>	<u>Page</u>
D3-1	Right Rear CRABI Head X
	Right Rear CRABI Head Y
	Right Rear CRABI Head Z
	Right Rear CRABI Head Resultant
D3-2	Right Rear CRABI Chest X
	Right Rear CRABI Chest Y
	Right Rear CRABI Chest Z
	Right Rear CRABI Chest Resultant

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV
 Test Program: 55/28 km/h Side Impact NCAP

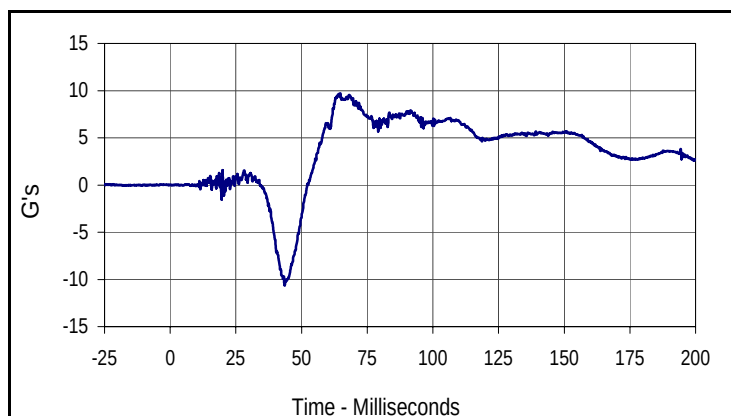
Test Date: 10/23/07
 NHTSA No.: F80203



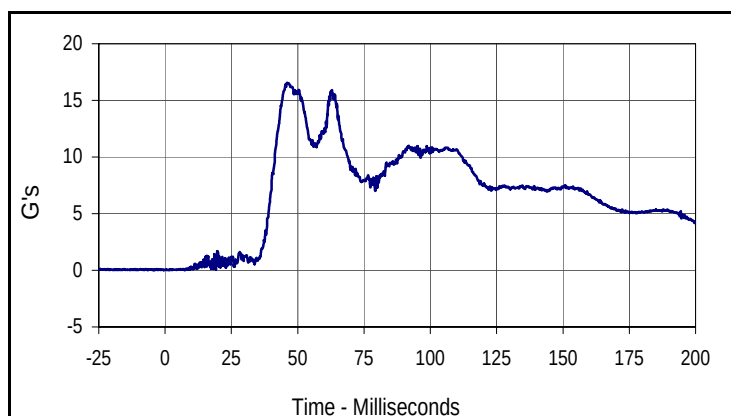
Curve Description			
CRABI Head X (P3)			
CURNO	Type	SAE Class	Units
072	FIL	1000	G's
Max	Time	Min	Time
14.7	50.5	-6.4	109.8



Curve Description			
CRABI Head Y (P3)			
CURNO	Type	SAE Class	Units
073	FIL	1000	G's
Max	Time	Min	Time
1.2	21.6	-7.5	62.4



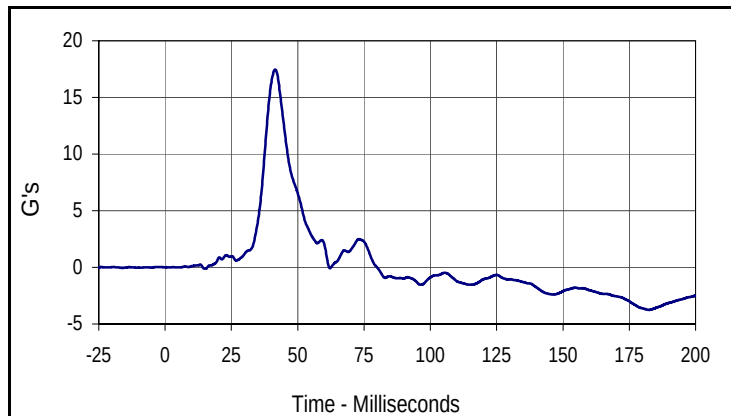
Curve Description			
CRABI Head Z (P3)			
CURNO	Type	SAE Class	Units
074	FIL	1000	G's
Max	Time	Min	Time
9.7	64.8	-10.6	43.6



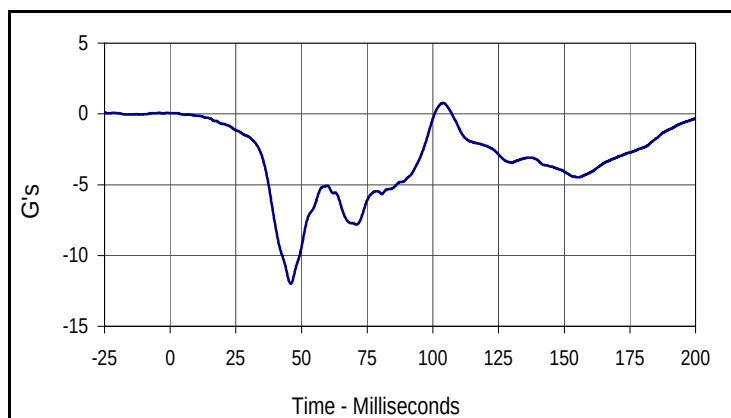
Curve Description			
CRABI Head Resultant (P3)			
CURNO	Type	SAE Class	Units
072	RES	1000	G's
Max	Time	Min	Time
16.5	45.9	0.0	7.4

Test Vehicle: 2008 Ford Expedition XLT 5-Door MPV
 Test Program: 55/28 km/h Side Impact NCAP

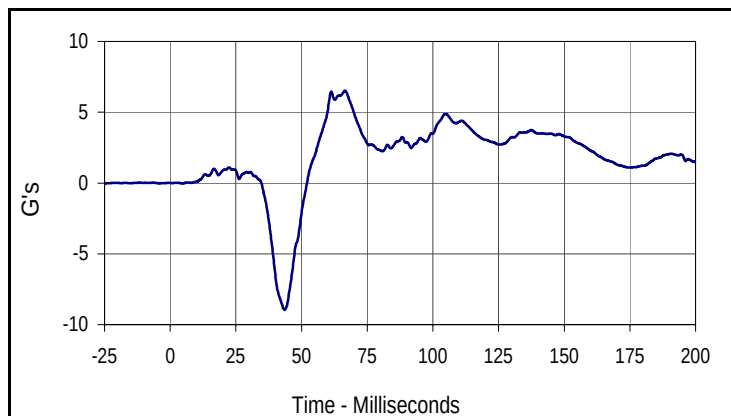
Test Date: 10/23/07
 NHTSA No.: F80203



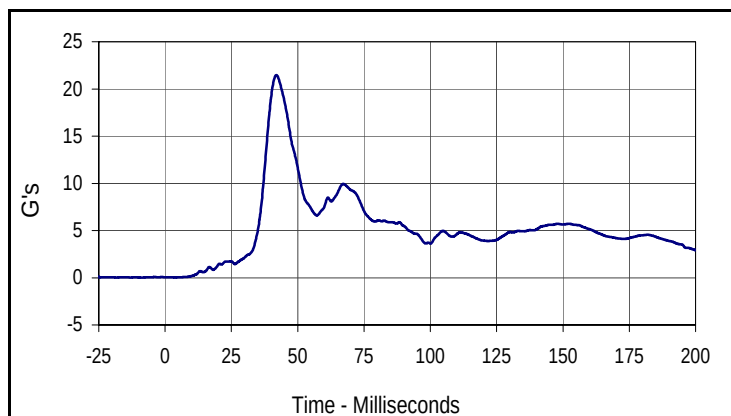
Curve Description			
CRABI Chest X (P3)			
CURNO	Type	SAE Class	Units
082	FIL	180	G's
Max	Time	Min	Time
17.5	41.5	-3.8	182.4



Curve Description			
CRABI Chest Y (P3)			
CURNO	Type	SAE Class	Units
083	FIL	180	G's
Max	Time	Min	Time
0.8	104.0	-12.0	45.9



Curve Description			
CRABI Chest Z (P3)			
CURNO	Type	SAE Class	Units
084	FIL	180	G's
Max	Time	Min	Time
6.5	66.5	-9.0	43.5



Curve Description			
CRABI Chest Resultant (P3)			
CURNO	Type	SAE Class	Units
082	RES	180	G's
Max	Time	Min	Time
21.5	41.9	0.0	3.8

SECTION D4

CRABI CALIBRATION INFORMATION

Test Program: CRABI 12 Month Old Frontal Head Drop Test

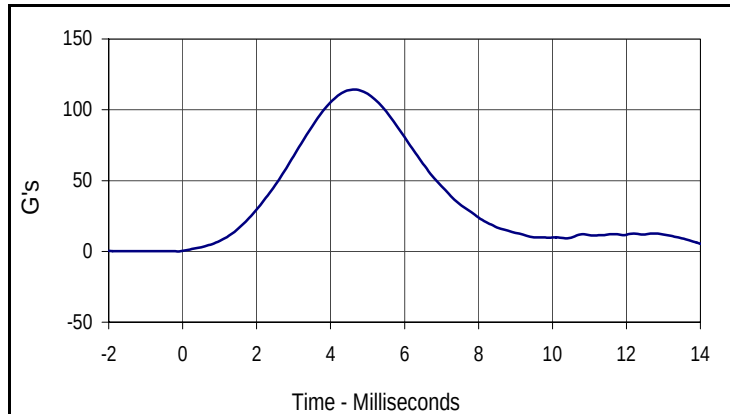
Test Date: 10/22/07

ATD Serial No.: 022

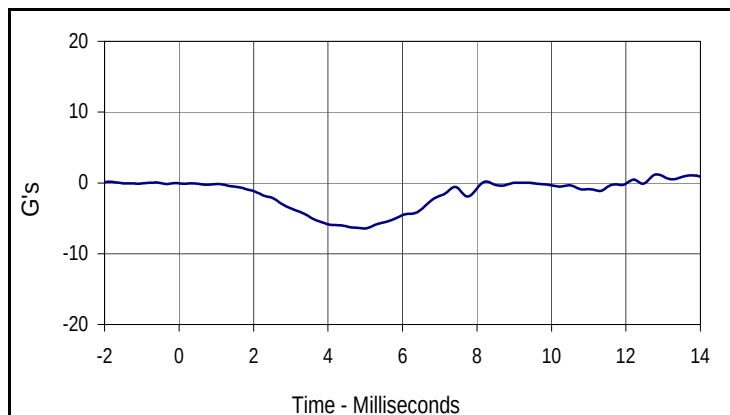
Test I.D.: FHD10R



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	100.0 to 120.0	114.3	Pass
Peak Lateral Acceleration	G's	≤15.0	6.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
114.3	4.6	0.0	-0.1



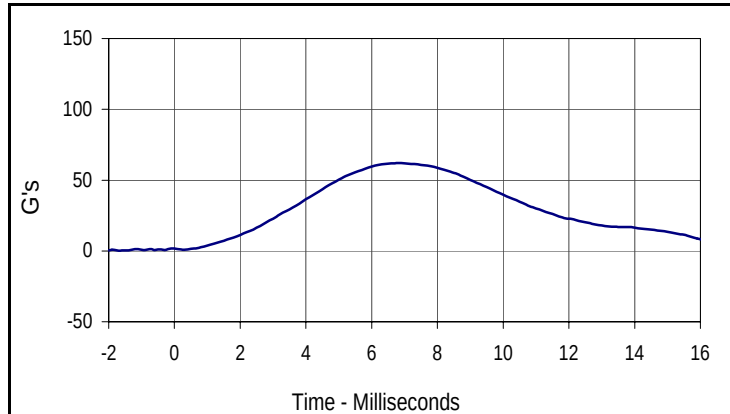
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.1	-1.9	-6.4	5.0

Test Program: CRABI 12 Month Old Rear Head Drop Test
 ATD Serial No.: 022

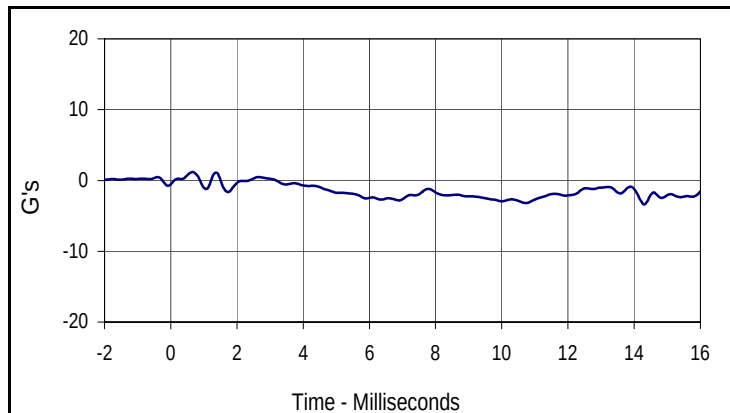
Test Date: 10/22/07
 Test I.D.: RHD10R



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	55.0 to 71.0	59.6	Pass
Peak Lateral Acceleration	G's	≤15.0	2.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass



Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
59.6	6.0	0.3	-1.7



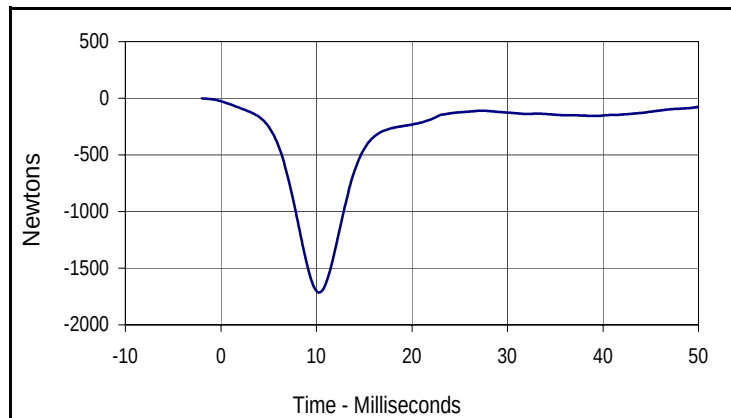
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.1	0.7	-2.6	5.9

Test Program: CRABI 12 Month Old Thorax Impact Test
 ATD Serial No.: 022

Test Date: 10/22/07
 Test I.D.: CH10R



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
Pendulum Velocity at T=0	m/sec	4.90 to 5.10	4.96	Pass
Peak Probe Force	Newtons	-1514 to -1796	-1701	Pass
Overall Test Results				Pass



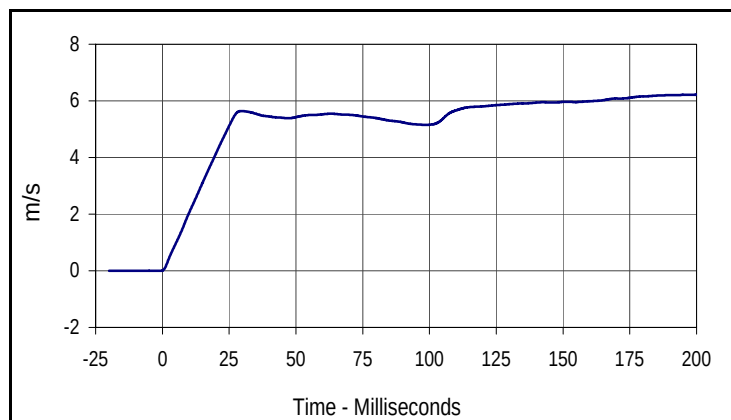
Curve Description			
Probe Force			
CURNO	Type	SAE Class	Units
001	FIL	60	Newtons
Max	Time	Min	Time
-1.2	-2.0	-1700.9	10.0

Test Program: CRABI 12 Month Old Neck Flexion Test
 ATD Serial No.: 022

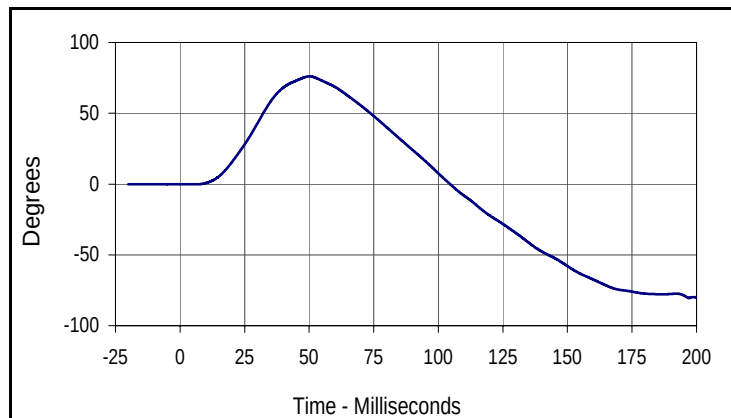
Test Date: 10/22/07
 Test I.D.: NF10R



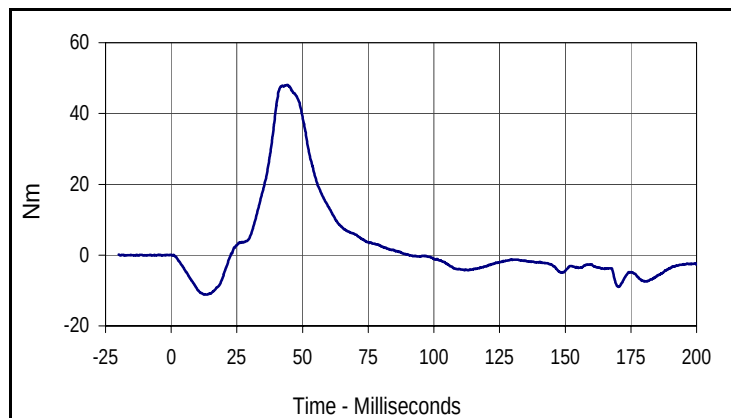
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.10 to 5.30	5.16	Pass
Pendulum Deceleration	10 Msec.	m/s	1.6 to 2.3	2.0	Pass
	20 Msec.	m/s	3.4 to 4.2	4.1	Pass
	25 Msec.	m/s	4.3 to 5.2	5.1	Pass
"D" Plane Rotation	Max	Degrees	75.0 to 86.0	76.1	Pass
Peak Moment in Rotation	Max	Nm	36.0 to 45.0	45.0	Pass
Positive Moment Decay, Time To 5 Nm		Msec.	60.0 to 80.0	71.8	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
6.2	199.3	0.0	-0.7



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
76.1	50.1	-80.5	197.1



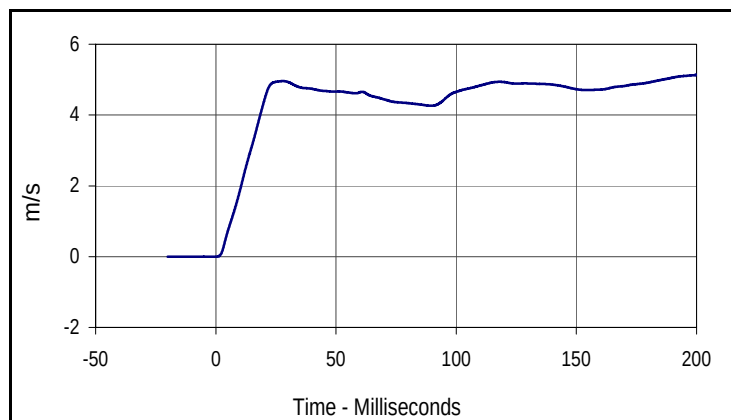
Curve Description			
Upper Neck Force Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
48.1	44.3	-11.2	13.5

Test Program: CRABI 12 Month Old Neck Extension Test
 ATD Serial No.: 022

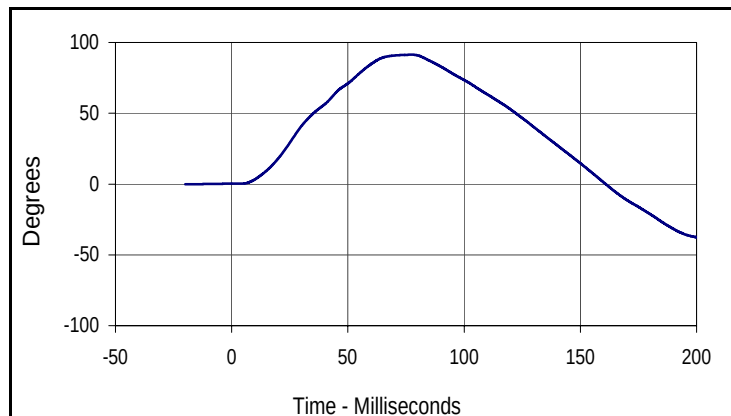
Test Date: 10/22/07
 Test I.D.: NE10R



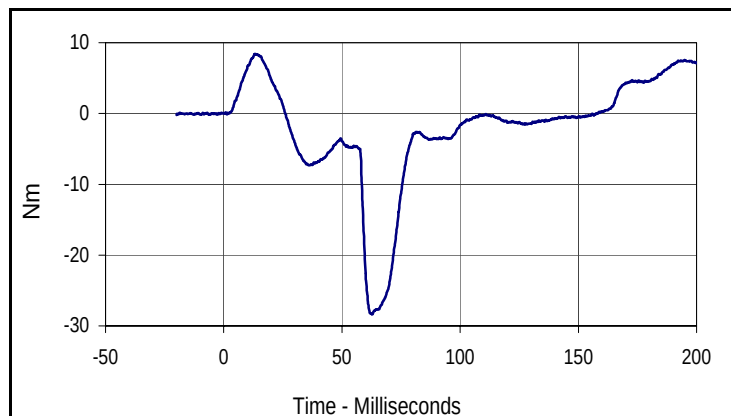
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	2.4 to 2.6	2.41	Pass
Pendulum Deceleration	6 Msec.	m/s	0.8 to 1.2	0.9	Pass
	10 Msec.	m/s	1.5 to 2.1	1.9	Pass
	14 Msec.	m/s	2.2 to 2.9	2.9	Pass
"D" Plane Rotation	Max	Degrees	80.0 to 92.0	91.4	Pass
Peak Moment in Rotation	Max	Nm	-12 to -23	-20.4	Pass
Positive Moment Decay, Time To -5 Nm		Msec.	76.0 to 90.0	78.3	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
5.1	200.0	0.0	0.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
91.4	77.5	-37.6	200.0



Curve Description			
Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
8.4	13.2	-28.4	62.8

Test Program: CRABI 12 Month Old External Dimensions
 ATD Serial No.: 022

Test Date: 10/22/07
 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
A - Total sitting height	mm	456.0 to 471.2	463	Pass
B - Shoulder pivot height	mm	276.6 to 291.8	284	Pass
C - "H" point height	mm	27.9 to 38.1	33	Pass
D - "H" point from backline	mm	40.1 to 50.3	47	Pass
E - Shoulder pivot from back	mm	50.3 to 60.5	56	Pass
F - Thigh clearance	mm	63.0 to 73.2	70	Pass
G - Elbow pivot to fingertip	mm	176.6 to 191.8	185	Pass
I - Shoulder pivot to elbow pivot	mm	99.1 to 114.3	110	Pass
J - Elbow rest height	mm	150.1 to 165.3	160	Pass
K - Buttock to knee length	mm	202.7 to 217.9	210	Pass
L - Popliteal length	mm	138.7 to 153.9	147	Pass
M - Knee pivot height	mm	165.1 to 180.3	169	Pass
N - Buttock popliteal length	mm	144.8 to 160.0	150	Pass
O - Chest depth with jacket	mm	107.5 to 122.7	112	Pass
P - Foot length	mm	92.4 to 102.6	100	Pass
Q- Stature	mm	727.7 to 753.1	N/A	N/A
R - Buttock to knee pivot length	mm	178.5 to 188.7	182	Pass
S - Head Breadth	mm	124.4 to 134.6	129	Pass
T - Head Depth	mm	149.9 to 165.1	150	Pass
U - Hip breadth	mm	158.5 to 173.7	164	Pass
V - Shoulder breadth	mm	200.7 to 215.9	213	Pass
W - Foot breadth	mm	39.1 to 49.3	47	Pass
Y - Chest circumference with jacket	mm	452.4 to 477.8	463	Pass
Z - Waist circumference	mm	447.0 to 472.4	470	Pass
AA - Reference location for dimension Y & O	mm	256.5 to 266.7	263	Pass
BB - Reference Location For dimension Z	mm	106.7 to 116.9	112	Pass
CC - Shoulder Height	mm	299.7 to 314.9	303	Pass
DD - Chin Height	mm	289.6 to 304.8	297	Pass
Overall Test Results				Pass