

REPORT NUMBER: NCAP-KAR-12-039

**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

**FORD MOTOR CO.
2012 FORD EXPEDITION 4X4 5-DOOR MPV**

NHTSA NUMBER: MC0213

**PREPARED BY:
KARCO ENGINEERING, LLC.
9270 HOLLY ROAD
ADELANTO, CA 92301**



JANUARY 30, 2012

FINAL REPORT

**U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
SAFETY PERFORMANCE STANDARDS
OFFICE OF CRASHWORTHINESS STANDARDS
1200 NEW JERSEY AVE, SE
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WASHINGTON, DC 20590**

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Approval Date: January 30, 2012

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Date: 


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

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16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2012 Ford Expedition 4x4 5-door MPV in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The test was conducted at the KARCO Engineering, LLC. facility in Adelanto, California on January 14, 2012. The impact velocity of the vehicle was 56.41 km/h and the ambient temperature at the barrier face at the time of impact was 12.2 deg. C. The target vehicle's post-test maximum crush was 522 mm at DPD 3, to the left of the vehicle's centerline. The test vehicle's performance is as follows: <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Driver ATD</th> <th colspan="2">Passenger ATD</th> </tr> <tr> <th>Threshold</th> <th>Result</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>N/A</td> <td>700.0</td> <td>302.5</td> <td>700.0</td> <td>132.1</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-33</td> <td>52</td> <td>-18</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>0.35</td> <td>1</td> <td>0.40</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>1184.9</td> <td>2620</td> <td>1044.0</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>-218.9</td> <td>2520</td> <td>-524.9</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>-3085.0</td> <td>6805</td> <td>-1581.8</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>-1705.0</td> <td>6805</td> <td>-2107.4</td> </tr> </tbody> </table>						Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC ₁₅)	N/A	700.0	302.5	700.0	132.1	Maximum Chest Compression	mm	63	-33	52	-18	Nij	N/A	1	0.35	1	0.40	Neck Tension	N	4170	1184.9	2620	1044.0	Neck Compression	N	4000	-218.9	2520	-524.9	Left Femur Force	N	10008	-3085.0	6805	-1581.8	Right Femur Force	N	10008	-1705.0	6805	-2107.4
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SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

This 56.3 km/h frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program, sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number DTNH22-06-D-00027. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

The 56.3 km/h frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure, dated August, 2011.

SUMMARY

A load cell barrier consisting of 36 load cells was impacted by a 2012 Ford Expedition 4x4 5-door MPV at a velocity of 56.41 km/h. The test was performed at KARCO Engineering, LLC. on January 14, 2012. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A of this report.

Three (3) real-time cameras and sixteen (16) high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in Data Sheet 6 of this report.

One Part 572E 50th percentile male anthropomorphic test device (ATD) was placed in the driver seating position and one Part 572O 5th percentile female ATD was placed in the right-front passenger seating position according to dummy placement instructions specified in the Frontal NCAP Laboratory Test Procedure.

Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck force transducers, right / left femur load cells, and lower leg instrumentation. Seat belt load cells were also on the driver's and the passenger's lap and shoulder belts to measure the dummy pelvic and torso section loading. The driver (position 1) ATD (Serial No. 035) and the right-front passenger (position 2) ATD (Serial No. 141) were calibrated prior to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

The 136 channels of data were recorded on an on-board data acquisition system. Appendix B contains the dummy response data traces.

There was 100% windshield retention and no intrusion into the protected zone of the windshield during the event. There was no Stoddard solvent leakage after the event or during any phase of the static rollover.

The maximum static crush of the test vehicle was 522 mm located at DPD 3, to the left of the vehicle's centerline. Both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were as follows: The driver ATD's head contacted the airbag and the headrest. The upper torso contacted the airbag. Both the left and right knees contacted the knee bolster.

The passenger's visible contact points were as follows: The passenger ATD's head contacted the airbag and the headrest. The upper torso contacted the airbag. Both the left and right knees contacted the glovebox.

The occupant data is summarized below:

ATD Position	HIC ₁₅	T ¹	T ²	Chest Disp. (mm)	Nij	Neck Tension (N)	Neck Comp. (N)	Left Femur (N)	Right Femur (N)
Driver (50th)	302.5	74.7	89.7	-33	0.35	1184.9	-218.9	-3085.0	-1705.0
Passenger (5th)	132.1	70.6	85.6	-18	0.40	1044.0	-524.9	-1581.8	-2107.4

SECTION 2
DATA SHEETS

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12

CONVERSION FACTORS

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

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	MC0213
Model Year	2012
Make	Ford
Model	Expedition
Body Style	5-Door MPV
VIN	1FMJU1G51CEF09033
Body Color	Grey
Odometer Reading (km / mi)	24 / 15
Engine Displacement (L)	5.4
Type / No. of Cylinders	V8
Engine Placement	Longitudinal
Transmission Type	Automatic
Transmission Speeds	6
Overdrive	Yes
Final Drive	4x4
Roof Rack	Yes
Sunroof / T-Top	No
Running Boards	Yes
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes
All Wheel Drive (AWD)	No
Traction Control System	Yes

Auto-Leveling System	No
Automatic Door Locks	Yes
Power Window Auto-Reverse	Yes
Other Optional Feature	None
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	Yes
Driver Torso/Pelvis Airbag	No
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Pass. Front Airbag	Yes
Pass. Curtain Airbag	Yes
Pass. Head/Torso Airbag	No
Pass. Torso Airbag	Yes
Pass. Torso/Pelvis Airbag	No
Pass. Pelvis Airbag	No
Pass. Knee Airbag	No
Driver Seat Belt Pretensioner	Yes
Pass. Seat Belt Pretensioner	Yes
Driver Load Limiter	Yes
Pass. Load Limiter	Yes
Other Safety Restraint	None

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

Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Co.
Date of Manufacture	Oct-11

GVWR (kg)	3402
GAWR Front (kg)	1610
GAWR Rear (kg)	1928

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Type of Seats	Bucket	Bench	Bench		
Designated Seating Capacity	2	3	3	8	
Capacity Weight (VCW) (kg)				726.0	A
DSC x 68.04 (kg)				544.3	B
Cargo Weight (RCLW) (kg)				136.0	A-B

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	694.0	643.5		719.0	766.5	
Right	kg	653.5	663.5		667.0	773.0	
Ratio	%	50.8%	49.2%	100.0%	47.4%	52.6%	100.0%
Total	kg	1347.5	1307.0	2654.5	1386.0	1539.5	2925.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2654.5	A
Weight of 1 P572E ATD & 1 P572O ATD	kg	141.0	B
Rated Cargo/Luggage Weight (RCLW)	kg	136.0	C
Calculated Vehicle Target Weight (TVTW)	kg	2931.5	A+B+C

TEST VEHICLE ATTITUDES

Condition	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	928	931	910	916	1488
As Tested	mm	919	924	886	896	1591
Post-Test	mm	921	957	906	906	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3023
Total Vehicle Length at Left Side	mm	4562
Total Vehicle Length at Centerline	mm	5230
Total Vehicle Length at Right Side	mm	4565
Weight of Ballast in Cargo Area	kg	178.7
Weight of Vehicle Components Removed	kg	31.5
Amount of Stoddard Solvent in Fuel Tank	L	98.56

VEHICLE COMPONENTS REMOVED TO MEET TEST WEIGHT:

Third Row Seat (28.0 kg), Spare Tire Tools (3.5 kg)

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

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12

TARGET VEHICLE STRUCTURAL MEASUREMENTS

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length	5230	4712	-518
2	Total Width	1950	2372	422
3	Bumper Top Height	778	750	-28
4	Bumper Bottom Height	460	425	-35
5	Longitudinal Member Top Height	566	530	-36
6	Distance Between Longitudinal Members	1250	901	-349
7	Longitudinal Member Width	70	83	13
8	Engine Top Height	1160	1135	-25
9	Engine Bottom Height	286	261	-25
10	Engine and Gearbox Width	760	760	0
11	Front Bumper to Engine Distance	790	440	-350
12	Front Shock Absorber Fixing Height	810	840	30
13	Bonnet Leading Edge Height	1100	1125	25
14	Front Shock Absorber Fixing Width	1210	1231	21
15	Front Bumper to Front Axle Distance	973	498	-475
16	Front Axle to A-Pillar Distance	665	550	-115
17	A-Pillar to B-Pillar Distance	889	879	-10
18	B-Pillar to Rear Axle Distance	1272	1283	11
19	B-Pillar to C-Pillar Distance	946	943	-3
20	Roof Sill Bottom Height	1730	1707	-23
21	Roof Sill Top Height	1820	1801	-19
22	Floor Sill Bottom Height	440	400	-40
23	Floor Sill Top Height	502	465	-37

All measurements in millimeters.

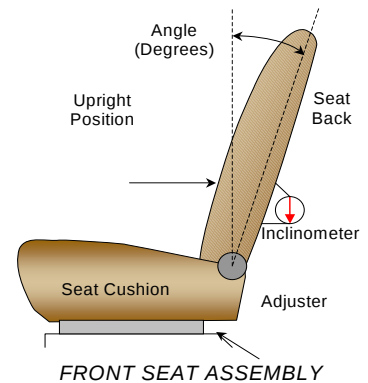
DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12

NOMINAL DESIGN RIDING POSITION

The procedure for the driver is as follows: the seat back is set to the manufacturer's designated angle. The procedure for the passenger is as follows: the seat back is set to position the transverse instrumentation platform of the dummy's head at $0^\circ \pm 0.5^\circ$. Seat back angle is measured at the seat back using a digital inclinometer.

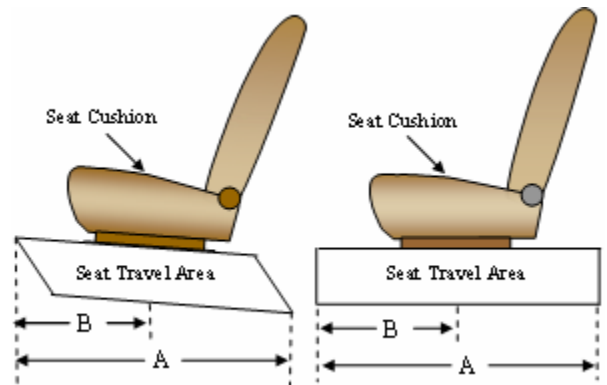


SEAT BACK ANGLE

Seating Position	Degrees
Driver Seat Back Angle	22.1
Passenger Seat Back Angle	21.0

SEAT FORE / AFT POSITIONING

The total seat travel is measured from the forward most possible position to the rear most possible position. The driver's seat is set to the middle of the fore-aft travel. The passenger's seat is set to the forward most position where the ATD will not contact any interior panels.



SEAT FORE/AFT POSITIONS

Seating Position	Total Fore-Aft Travel	Placed in Position
Driver Seat	270 mm	135 mm
Passenger Seat	220 mm [22 Detents]	0 mm [1st detent]

SEAT BELT UPPER ANCHORAGE

The seat belt upper anchorage is positioned to the manufacturer's design position for a 50th percentile adult male ATD for the driver, and a 5th percentile adult female ATD for the passenger. Position "H" is the uppermost position, followed by position "M1". Position "L" is the lowermost position.

SEAT BELT UPPER ANCHORAGES

Seating Position	Total No. of Positions	Placed in Position
Driver Seat	5	M2
Passenger Seat	5	H

DATA SHEET NO. 2 ... (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV

NHTSA No.: MC0213

Test Program: 56 km/h Frontal Impact NCAP Test

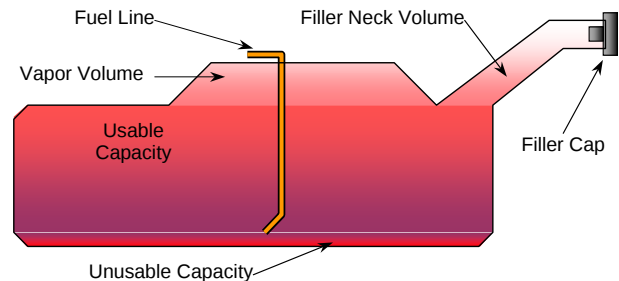
Test Date: 1/14/12

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	105.98
Usable Capacity of "Optional Tank"	
92 - 94% of Usable Capacity	97.5 to 99.62
Actual Amount of Stoddard Solvent Used	98.56
1/3 of Usable Capacity	35.33

FUEL PUMP

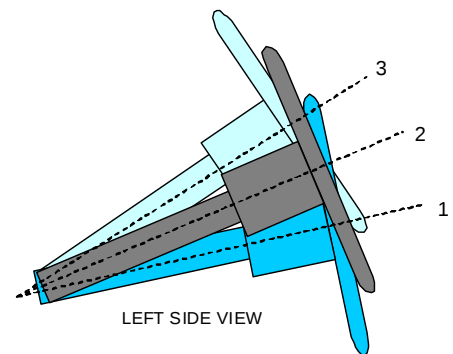
The vehicle is equipped with an electric fuel pump. The fuel pump operates for 3 seconds following the actuation of the ignition. If no attempt has been made to start the engine within 3 seconds the fuel pump will shut off. The fuel pump operates continuously while the engine is running.



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. A digital inclinometer is used to measure a plate which is placed across the rim of the steering wheel for angular measurements. A tape measure is used to measure telescoping steering wheel travel.



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONING

	Degrees	Fore-Aft Position (mm)
Lowermost Position, No. 1	8.2	
Geometric Center Position, No. 2	18.7	
Uppermost Position, No. 3	29.2	
Telescoping Steering Wheel Travel		
Test Position	18.7	

DATA SHEET NO. 3

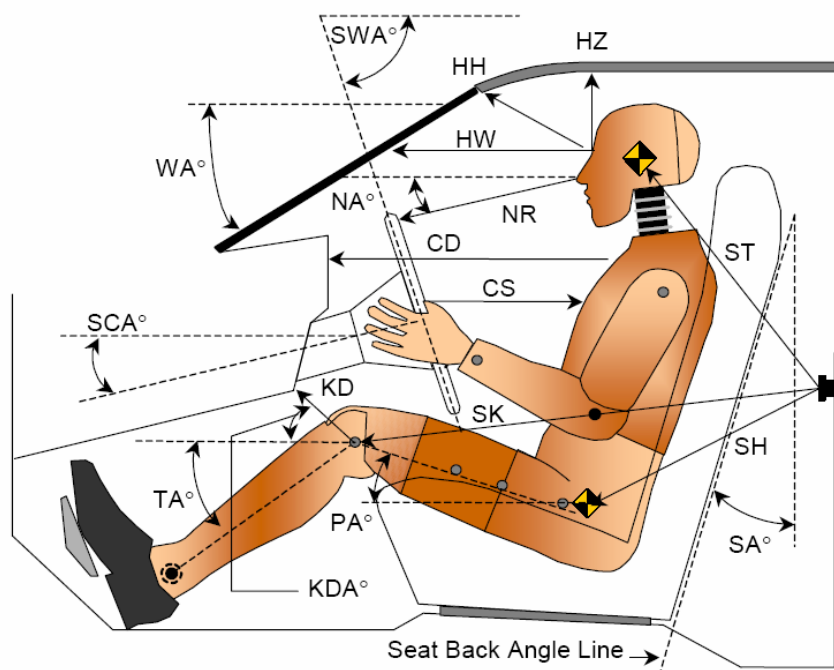
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV

NHTSA No.: MC0213

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 1/14/12



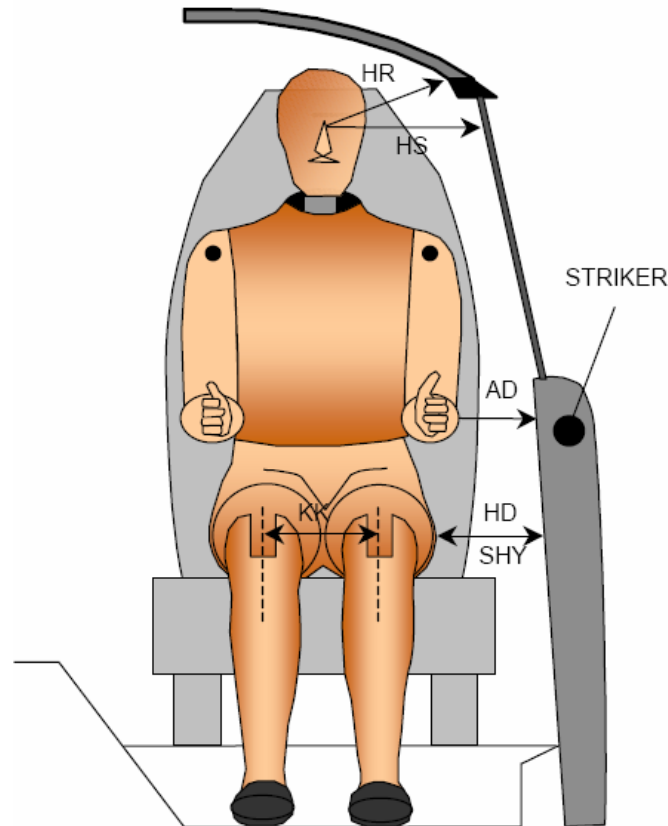
LEFT SIDE VIEW

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		33.6		
SWA°	Steering Wheel Angle		71.3		
SCA°	Steering Column Angle		18.7		
SA°	Seat Back Angle (On Headrest Post)		22.1		21.0
HZ	Head to Roof	236	90.0	278	90.0
HH	Head to Header	438	24.5	368	37.8
HW	Head to Windshield	695	0.0	624	0.0
NR	Nose to Rim	420	10.3	482	13.7
CD	Chest to Dash	572	6.3	445	18.0
CS	Chest to Steering Hub	331	0.0		
RA	Rim to Abdomen	231	0.0		
KDL	Left Knee to Dash	175	23.3	114	21.3
KDR	Right Knee to Dash	169	31.5	114	25.9
PA°	Pelvic Angle		24.4		20.7
TA°	Tibia Angle		47.4		57.8
SK	Striker to Knee	582	8.1	670	5.6
ST	Striker to Head	644	82.3	615	73.8
SH	Striker to H-Point	210	3.0	336	1.4

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle:	2012 Ford Expedition 4x4 5-Door MPV	NHTSA No.:	MC0213
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	1/14/12



Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	112	77
HD	H-Point to Door	149	185
HR	Head to Side Header	239	270
HS	Head to Side Window	332	340
KK	Knee to Knee	358	224
SHY	Striker to H-Point (Y-Direction)	253	295
AA	Ankle to Ankle	329	151

DATA SHEET NO. 5

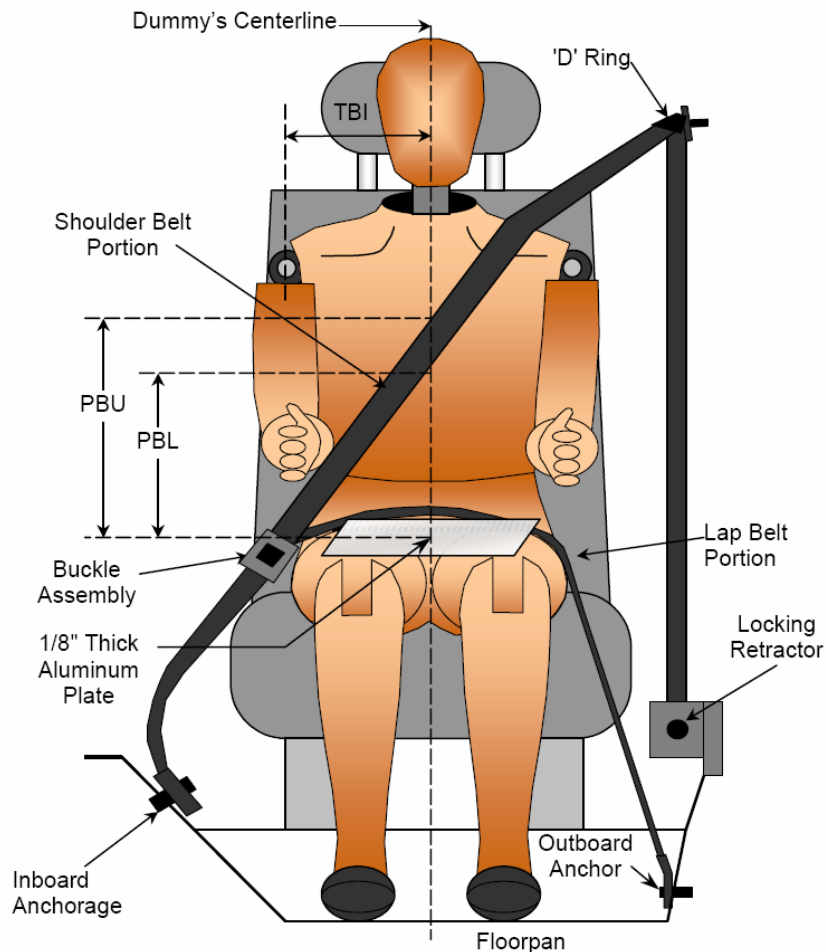
SEAT BELT POSITIONING DATA

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV

NHTSA No.: MC0213

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 1/14/12



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Code	Measurement Description	Units	Driver	Passenger
PBU	Top Surface of Aluminum Plate to Belt Upper Edge	mm	383	341
PBL	Top Surface of Aluminum Plate to Belt Lower Edge	mm	292	238

BELT LENGTH DATA

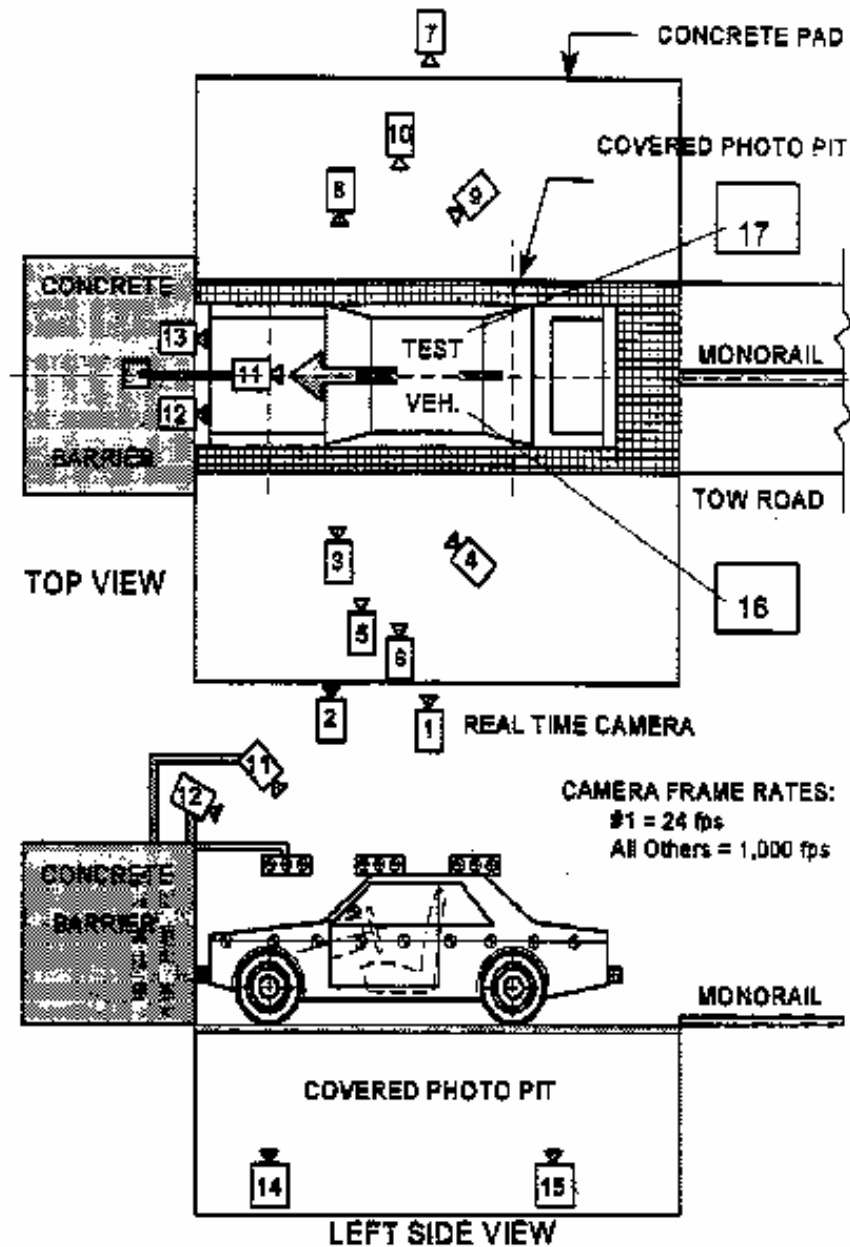
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as Measured on ATD	mm	849	901
Lap Belt Length as Measured on ATD	mm	782	834
Remainder of Belt on Reel	mm	826	695
Total Belt Length for Continuous Webbing Systems	mm	2457	2430

DATA SHEET NO. 6

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12

CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 6 ... (CONTINUED)

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12

CAMERA LOCATIONS

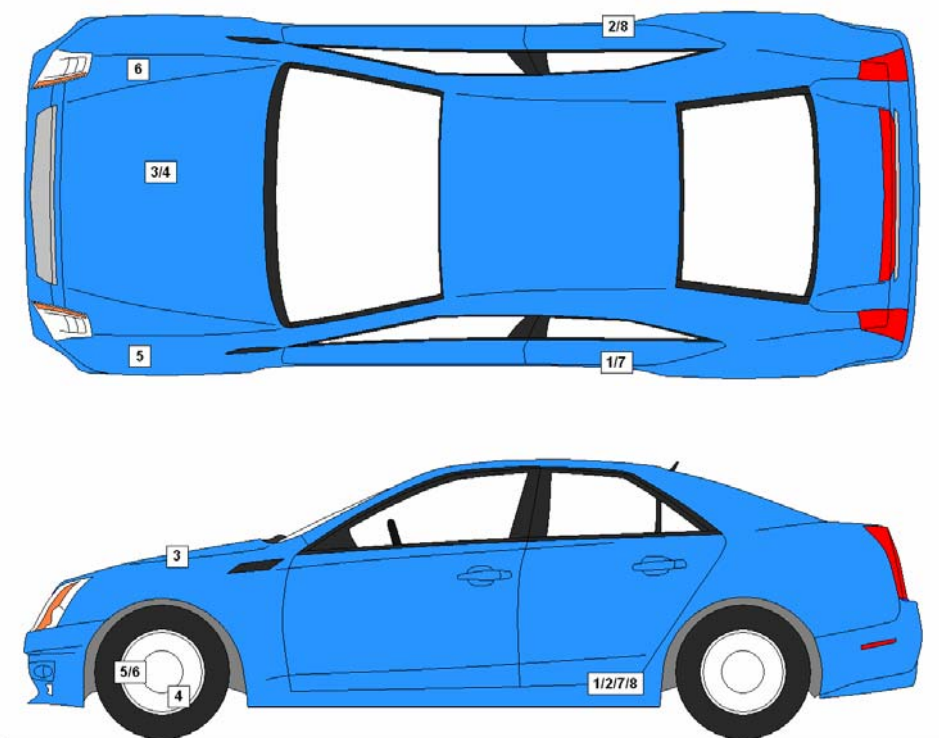
No.	Description	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	-11412	-8150	-1484		30
2	Driver Close-Up	-2590	-7950	-1371	24	1000
3	Left Front Half	-1701	-6197	-1701	50	1000
4	Left Angle	-6696	-10308	-3211	ZOOM	1000
5	Steering Column - Top	-1966	-10412	-3688	50	1000
6	Steering Column - Bottom	-1972	-10412	-3379	50	1000
7	Right Overall	-2336	7569	-1012	24	1000
8	Passenger Close-Up	-1733	7581	-1408	50	1000
9	Right Front Half	-1600	8214	-1811	ZOOM	1000
10	Right Angle	-6217	9516	-4830	ZOOM	1000
11	Windshield	-354	0	-5749	12	1000
12	Driver Windshield	297	-366	-2460	12	1000
13	Passenger Windshield	297	366	-2460	24	1000
14	Pit Front	-756	0	1495	12	1000
15	Pit Rear	-3398	0	1495	8	1000
16	Onboard Driver Airbag	-3530	450	-1770	12	1000
17	Onboard Passenger Airbag (Optional)	-3530	-450	-1770	12	1000
18	Real-Time Left View of Impact (Optional)					
19	Real-Time Right View of Impact					

Coordinates: +X = forward impact plane
 +Y = right of monorail center
 +Z = into ground

DATA SHEET NO. 7

VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Description	Location		
		X	Y	Z
1	Left Rear Accelerometer X-Direction	2115	-794	-509
2	Right Rear Accelerometer X-Direction	2115	794	-509
3	Engine Top X	4286	425	-942
4	Engine Bottom X	4095	224	-382
5	Left Brake Caliper X	4069	-763	-329
6	Right Brake Caliper X	4069	763	329
7	Left Rear Accelerometer Z-Direction	2115	-794	-509
8	Right Rear Accelerometer Z-Direction	2115	794	-509

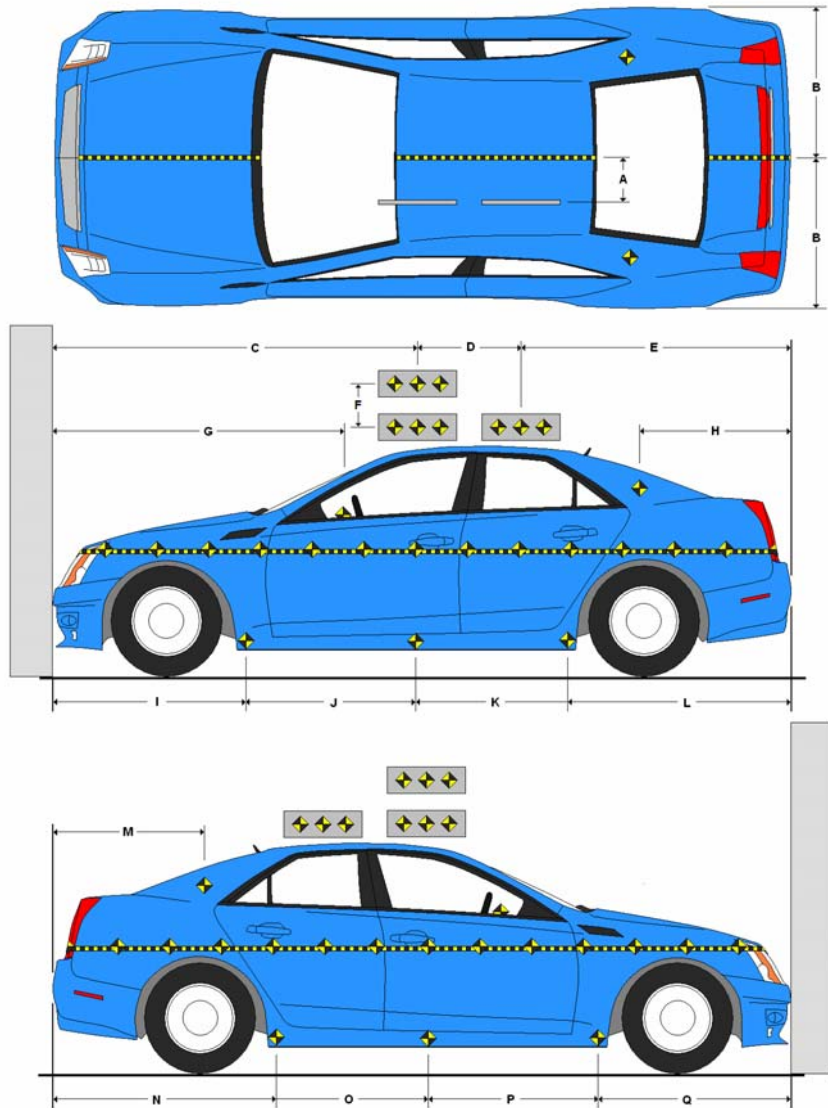
Reference Points:
 X – Rear Surface of Vehicle (+ forward)
 Y – Vehicle Centerline (+ to right)
 Z – Ground Plane (+ down)

DATA SHEET NO. 8

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12

Item	Value
A	445
B	975
C	2450
D	610
E	2163
F	305
G	1903
H	331
I	1507
J	975
K	975
L	1756
M	332
N	1750
O	975
P	975
Q	1513



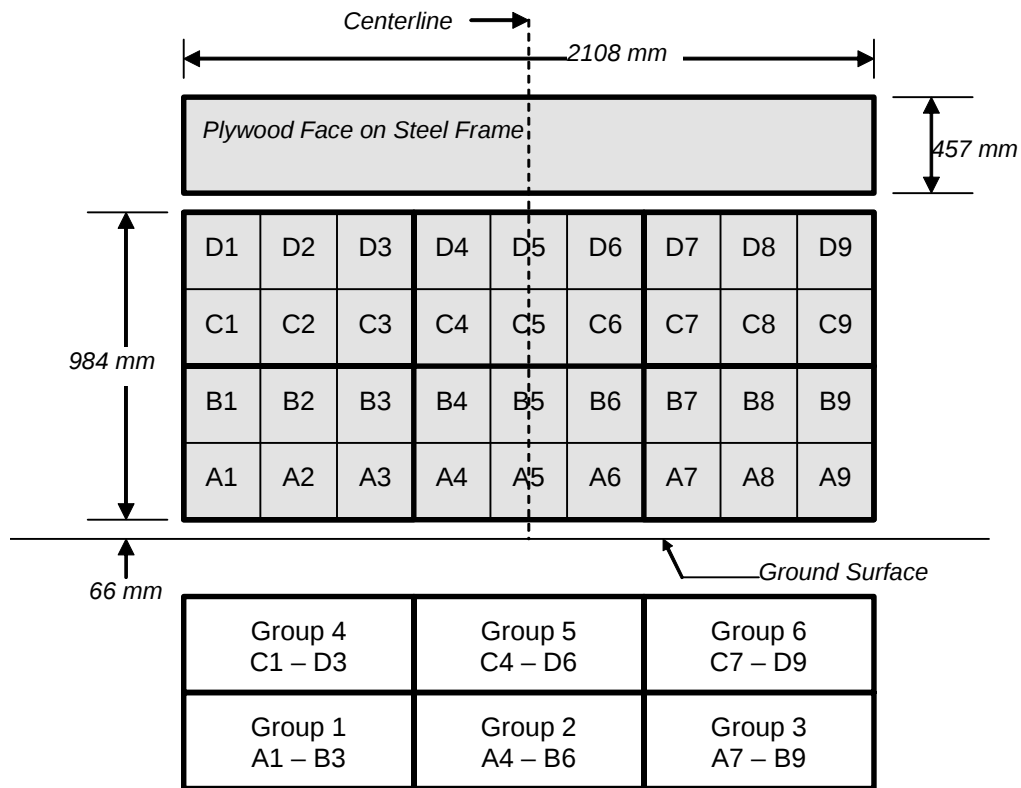
All measurements in millimeters.

DATA SHEET NO. 9

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12

36 Load Cell Rigid Barrier (NHTSA Standard) Load Cell Locations on Fixed Barrier



6 Groups of 6 Load Cells Each

DATA SHEET NO. 10

TEST VEHICLE CAMERA AND INSTRUMENTATION SUMMARY

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12

INSTRUMENTATION

Driver Dummy Accelerometers	44
Passenger Dummy Accelerometers	44
Vehicle Structure Accelerometers	8
Seat Belt Load Cells	4
Load Cell Barrier	36
Total	136

CAMERA COVERAGE

High-Speed Vehicle On Board	2
High-Speed Off board	14
Real Time	3
Total	19

DATA SHEET NO. 11

POST-TEST OBSERVATIONS

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12

TEST DUMMY INFORMATION AND CONTACT

Description	Driver	Passenger
Dummy Type/Serial No.	P572E 50th Percentile Male ATD / 035	P572O 5th Percentile Female ATD / 141
Head Contact	Airbag, Headrest	Airbag, Headrest
Upper Torso Contact	Airbag	Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	Glovebox
Right Knee Contact	Knee Bolster	Glovebox

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked / Unlocked Doors	Unlocked	Unlocked
Front Door Opening	Remained closed and latched, operational	Remained closed and latched, operational
Rear Door Opening	Remained closed and latched, operational	Remained closed and latched, operational
Seat Track Shift (mm)	2	4
Seat Back Failure	None	None
Glazing Damage	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Windshield Damage	Broken
Window Damage	None
Other Notable Effects	None

VEHICLE REBOUND FROM BARRIER

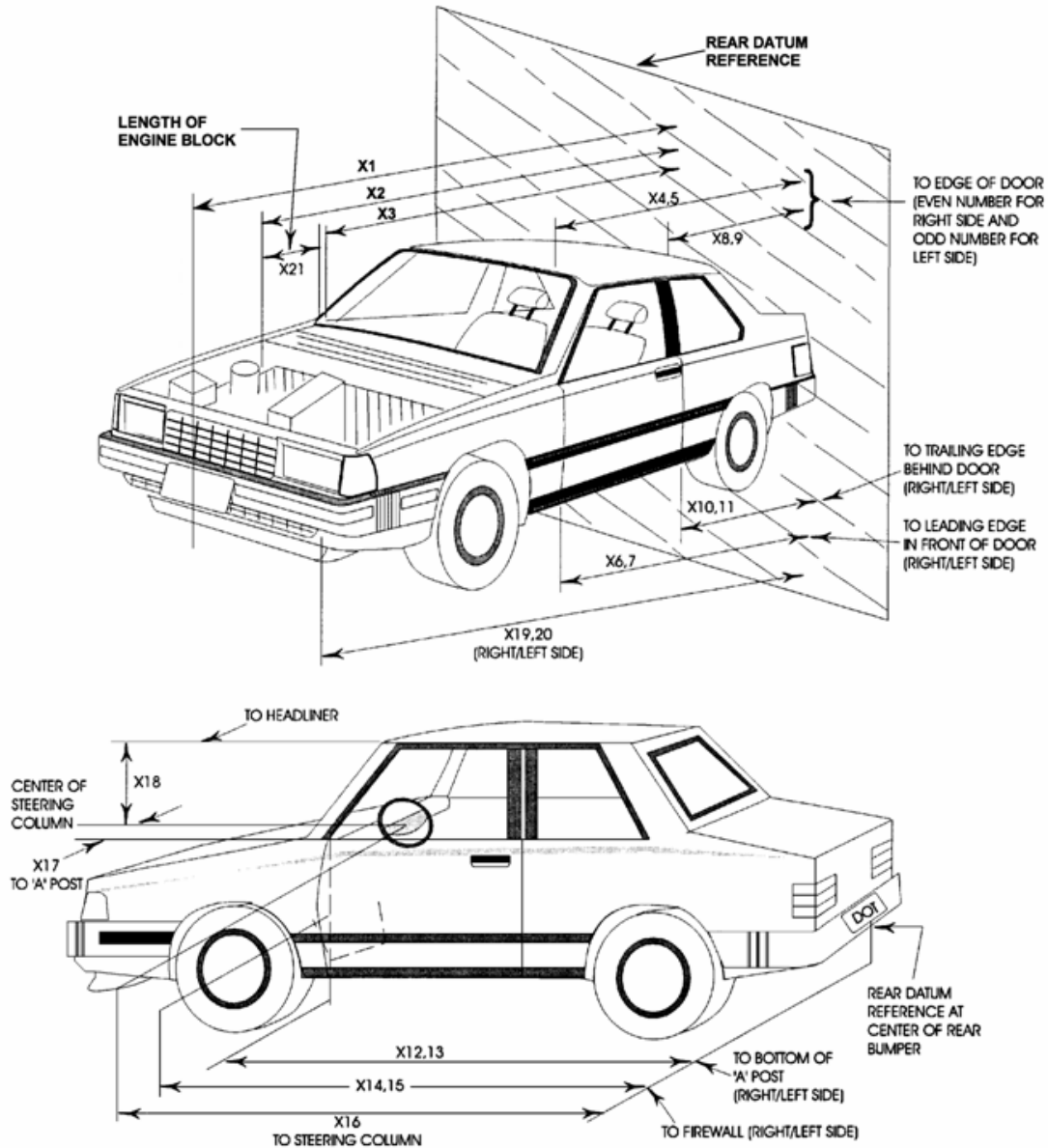
Measured Parameter	Units	Value
Left Side	mm	645
Center	mm	590
Right Side	mm	556
Average	mm	597

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Driver		Passenger	
	Installed	Operated	Installed	Operated
Front Airbag	Yes	Yes	Yes	Yes
Side Airbag 1 (Curtain)	Yes	No	Yes	No
Side Airbag 2 (Torso)	Yes	No	Yes	No
Knee Airbag	No		No	
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes
Other				

DATA SHEET NO. 12
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12

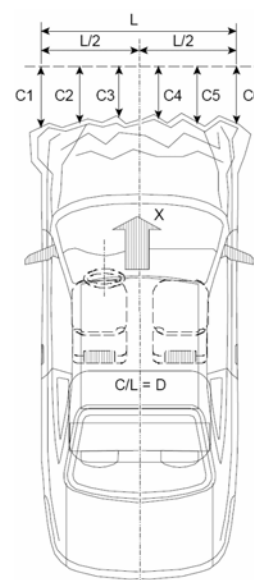


DATA SHEET NO. 12 ... (CONTINUED)**VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	5230	4712	-518
2	Rear Surface of Vehicle to Front of Engine	4440	4272	-168
3	RSOV to Firewall	3820	3823	3
4	RSOV to Upper Leading Edge of Right Door	3651	3675	24
5	RSOV to Upper Leading Edge of Left Door	3642	3682	40
6	RSOV to Lower Leading Edge of Right Door	3553	3563	10
7	RSOV to Lower Leading Edge of Left Door	3565	3570	5
8	RSOV to Upper Trailing Edge of Right Door	2515	2539	24
9	RSOV to Upper Trailing Edge of Left Door	2507	2549	42
10	RSOV to Lower Trailing Edge of Right Door	2493	2502	9
11	RSOV to Lower Trailing Edge of Left Door	2503	2510	7
12	RSOV to Bottom of A-Pillar, Right Side	3496	3523	27
13	RSOV to Bottom of A-Pillar, Left Side	3490	3530	40
14	RSOV to Firewall, Right Side	4015	4011	-4
15	RSOV to Firewall, Left Side	4015	4015	0
16	RSOV to Steering Column	3160	3210	50
17	Center of Steering Column to A-Pillar	445	460	15
18	Center of Steering Column to Headliner	435	460	25
19	RSOV to Right Side of Front Bumper	4565	4345	-220
20	RSOV to Left Side of Front Bumper	4562	4432	-130
21	Length of Engine Block	660	660	0
RD	RSOV to Right Side of Dash Panel	3340	3351	11
CD	RSOV to Center of Dash Panel	3275	3305	30
LD	RSOV to Left Side of Dash Panel	3330	3352	22

All measurements in millimeters.

DATA SHEET NO. 13**ACCIDENT INVESTIGATION DATA**Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPVNHTSA No.: MC0213Test Program: 56 km/h Frontal Impact NCAP TestTest Date: 1/14/12**VEHICLE INFORMATION**VIN: 1FMJU1G51CEF09033Wheelbase (mm): 3023Vehicle Size Category: 5-Door MPVTest Weight (kg): 2925.5**ACCELEROMETER DATA**Accelerometer Locations: Left Rear CrossmemberCal. Procedure/Interval: Drop Test / 6 monthsIntegration Algorithm: NHTSA StandardImpact Velocity (km/h): 56.41Velocity Change (km/h): 67.4Time of Separation (msec): 81.1Linearity: Good**CRUSH PROFILE**Collision Deformation Classification: 12FDEW2Midpoint of Damage: Vehicle CenterlineDamage Region Length (mm): 1683Impact Mode: Full Frontal

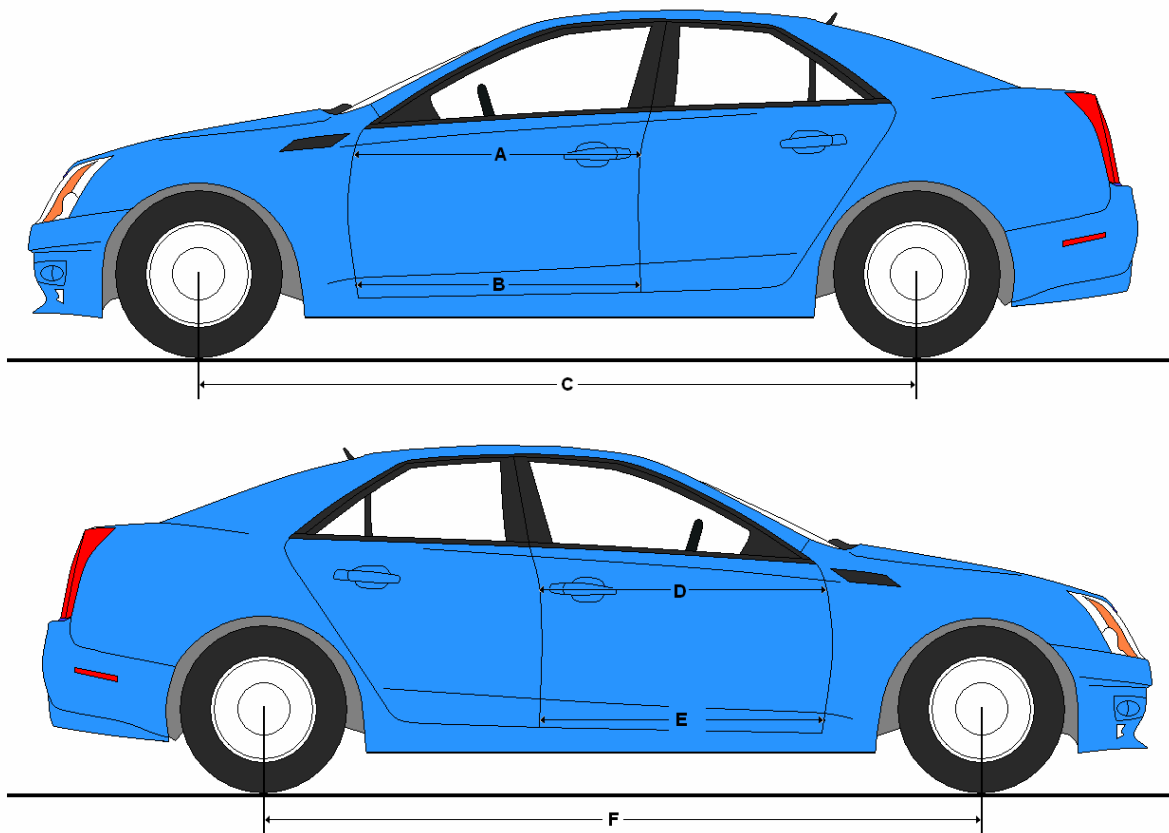
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	241	585	344
C2	Crush Zone 2 at Left Side	mm	80	590	510
C3	Crush Zone 3 at Left Side	mm	30	552	522
C4	Crush Zone 4 at Right Side	mm	30	497	467
C5	Crush Zone 5 at Right Side	mm	80	470	390
C6	Crush Zone 6 at Right Side	mm	241	528	287
L	C1 to C6	mm	1683		

DATA SHEET NO. 14**VEHICLE INTRUSION MEASUREMENTS**Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPVNHTSA No.: MC0213Test Program: 56 km/h Frontal Impact NCAP TestTest Date: 1/14/12**DOOR OPENING WIDTH**

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	889	879	10
B	Left Side Lower	mm	852	846	6
D	Right Side Upper	mm	889	875	14
E	Right Side Lower	mm	853	846	7

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3023	2905	118
F	Right Side Wheelbase	mm	3023	2920	103



DATA SHEET NO. 14 ... (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV

NHTSA No.: MC0213

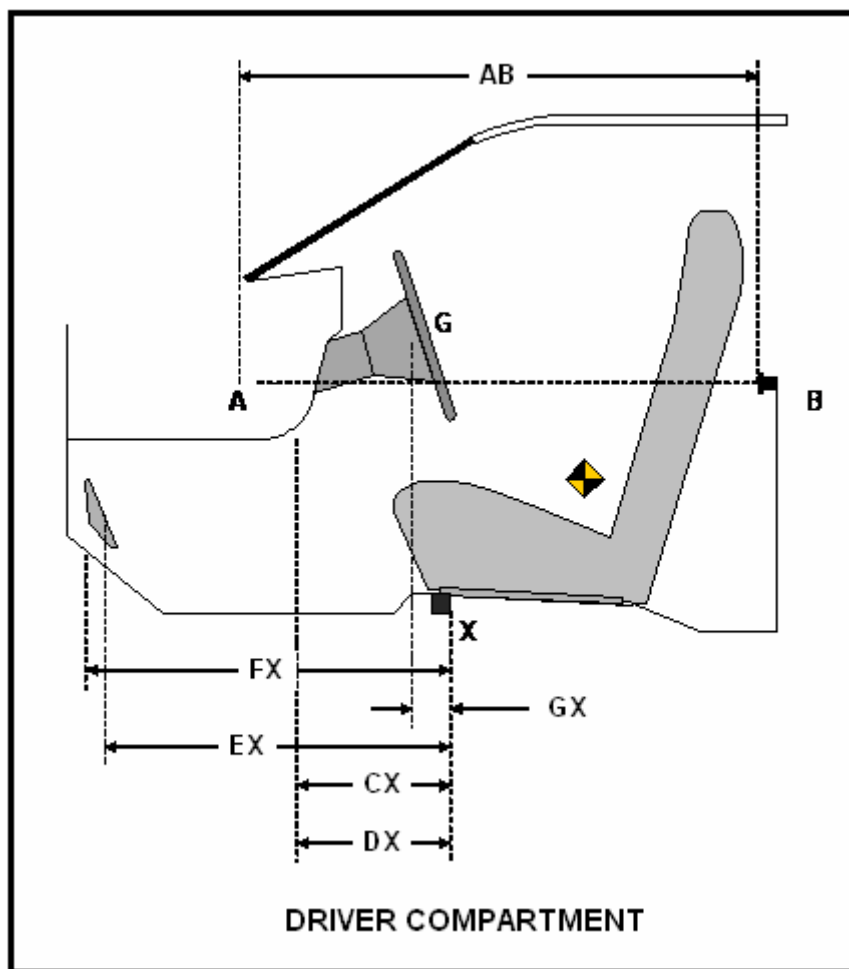
Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 1/14/12

DRIVER COMPARTMENT INTRUSION

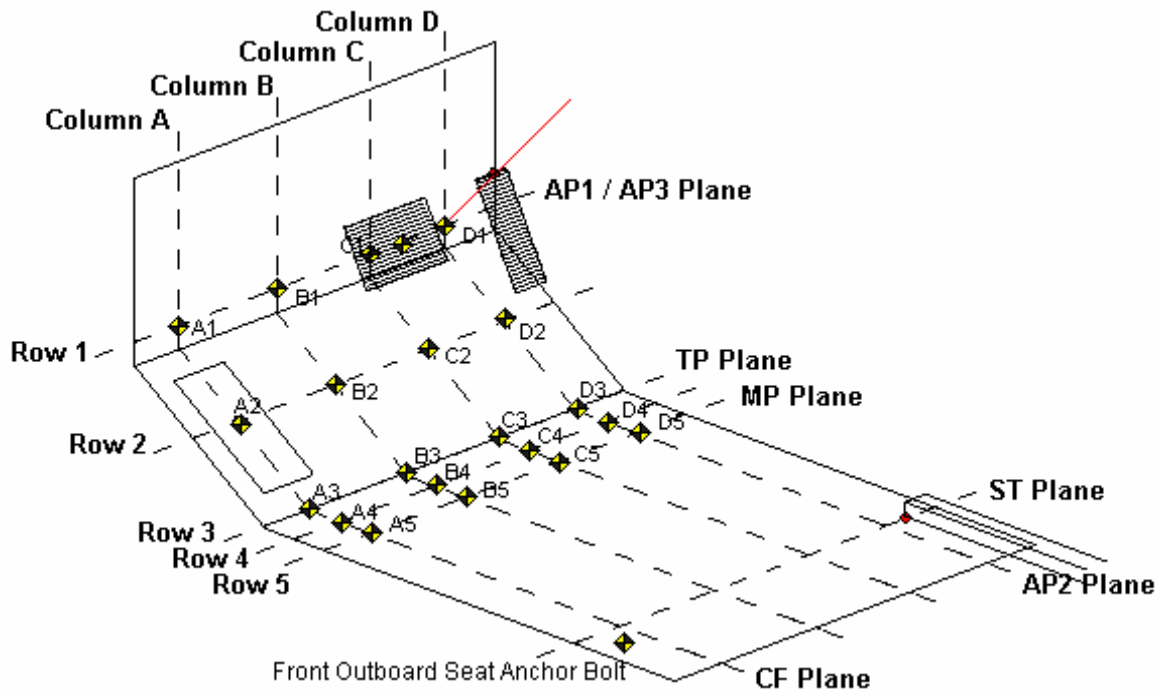
Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	836	821	15
CX	Left Knee Bolster to X	mm	280	240	40
DX	Right Knee Bolster to X	mm	290	276	14
EX	Brake Pedal to X	mm	526	470	56
FX	Foot Rest to X	mm	632	550	82
GX	Center of Steering Wheel Hub to X	mm	100	92	8

X = Front of Seat Track (Stationary)



DATA SHEET NO. 14 ... (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2012 Ford Expedition 4x4 5-Door MPV	NHTSA No.:	MC0213
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	1/14/12



AP1: Y-Z Plane passing through D1

AP2: X-Z Plane passing through D1

AP3: X-Y plane passing through D1

MP: Y-Z plane, halfway between the ST plane and AP1 plane

CF Plane: X-Z plane passes through center of footrest.

BP Plane: X-Z plane passes through center of brake pedal

TP Plane: Y-Z plane, intersection of BP Plane and the intersection of the toe pan and floorboard

Column A: intersection of vehicle and CF plane

Column D: Intersection of vehicle and AP2 plane

Row 1: intersection of the vehicle and the AP3 Plane

Row 3: intersection of the vehicle and TP plane

Row 5: intersection of the vehicle and MP plane

Row 2: evenly spaced between row 1 and 3

Row 4: evenly spaced between row 3 and 5

DATA SHEET NO. 14 ... (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12

DRIVER FLOORPAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	659	656	657	657	641	631	625	617	18	25	32	40
2	578	579	576	574	559	553	544	539	19	26	32	35
3	497	495	492	501	481	474	469	464	16	21	23	37
4	350	348	347	351	341	340	339	340	9	8	8	11
5	204	205	206	208	193	198	198	200	11	7	8	8

DRIVER FLOORPAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-35	-138	-240	-374	-47	-148	-250	-379	12	10	10	5
2	-35	-138	-242	-377	-43	-146	-248	-385	8	8	6	8
3	-37	-141	-246	-377	-41	-143	-249	-381	4	2	3	4
4	-43	-146	-247	-383	-48	-150	-252	-389	5	4	5	6
5	-47	-151	-250	-383	-46	-154	-254	-387	-1	3	4	4

DRIVER FLOORPAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	12	11	11	9	16	19	24	32	-4	-8	-13	-23
2	-25	-28	-25	-28	-18	-19	-13	-13	-7	-9	-12	-15
3	-60	-59	-59	-57	-58	-56	-57	-41	-2	-3	-2	-16
4	-65	-63	-62	-62	-89	-84	-81	-73	24	21	19	11
5	-60	-61	-61	-58	-71	-71	-67	-63	11	10	6	5

All measurements in millimeters

DATA SHEET NO. 14 ... (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12

PASSENGER FLOORPAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	653	666	661	658	613	630	635	638	40	36	26	20
2	603	594	591	590	569	559	566	571	34	35	25	19
3	519	509	505	504	487	480	482	487	32	29	23	17
4	375	364	359	354	363	357	353	349	12	7	6	5
5	223	217	212	208	214	209	207	204	9	8	5	4

PASSENGER FLOORPAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	380	213	123	38	383	222	135	49	-3	-9	-12	-11
2	384	220	125	36	389	223	132	43	-5	-3	-7	-7
3	387	228	130	35	393	232	133	38	-6	-4	-3	-3
4	389	233	132	38	392	236	136	41	-3	-3	-4	-3
5	394	239	140	42	398	242	144	45	-4	-3	-4	-3

PASSENGER FLOORPAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-16	-36	-34	-33	6	-22	-29	-31	-22	-14	-5	-2
2	-63	-65	-64	-63	-44	-46	-62	-61	-19	-19	-2	-2
3	-98	-101	-101	-104	-86	-97	-99	-106	-12	-4	-2	2
4	-118	-116	-114	-113	-132	-139	-132	-130	14	23	18	17
5	-115	-113	-108	-106	-136	-133	-123	-116	21	20	15	10

All measurements in millimeters

DATA SHEET NO. 15

SUMMARY OF FMVSS 212 AND 219 (PARTIAL) DATA

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12

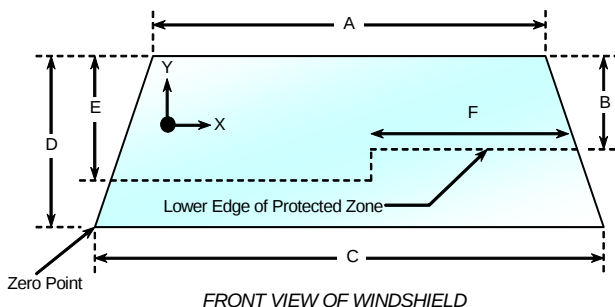
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with rubber cement and rubber molding.

The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicles not equipped with occupant passive restraints and 50% for each side of the windshield for vehicles which are equipped with occupant passive restraints.

Temperature of windshield molding during test: 21.1 ° C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2345	2345	100.0%
Right Side	2345	2345	100.0%
Total	4690	4690	100.0%



Item	Units	Value
A	mm	1355
B	mm	380
C	mm	1675
D	mm	830
E	mm	435
F	mm	480

AREAS OF PROTECTED ZONE FAILURES

- A. Provide Coordinates of the area that the protected zone was penetrated more than 0.25 inches by a vehicle component other than one that is normally in contact with the windshield.

X	Y

- B. Provide coordinates of the area beneath the protected zone that the inner surface of the windshield was penetrated by a vehicle component.

X	Y

DATA SHEET NO. 15 ... (CONTINUED)

SUMMARY OF FMVSS 212 AND 219 (PARTIAL) DATA

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 12.2° C Test Time: 12:29 PM

Stoddard Solvent Spillage Measurements

- A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable = 1 oz.)
- B. For the 5 minute period after motion ceases: 0 oz.
(Maximum allowable = 5 oz.)
- C. For the following 25 minutes: 0 oz.
(Maximum allowable = 1 oz./minute)
- D. Spillage: There was no Stoddard solvent spillage.

DATA SHEET NO. 16

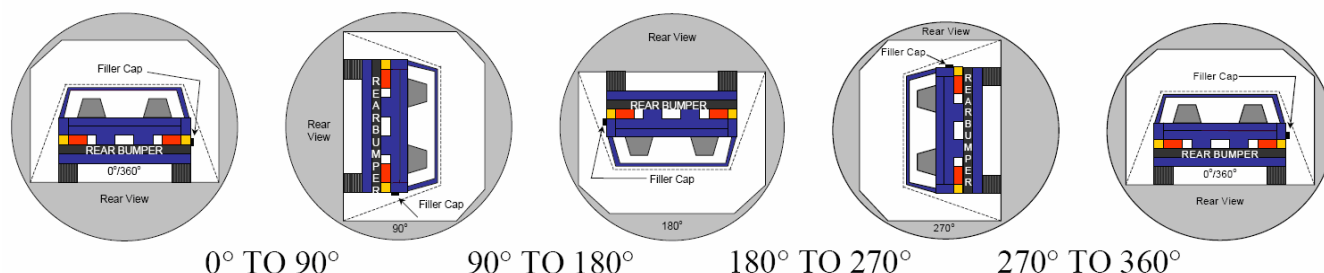
FMVSS 301 STATIC ROLLOVER

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV

NHTSA No.: MC0213

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 1/14/12



1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. Details of Stoddard solvent spillage: There was no Stoddard solvent spillage.

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	83	300	383
90° To 180°	81	300	381
180° To 270°	78	300	378
270° To 360°	80	300	380

FMVSS 301 SPILLAGE TABLE

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

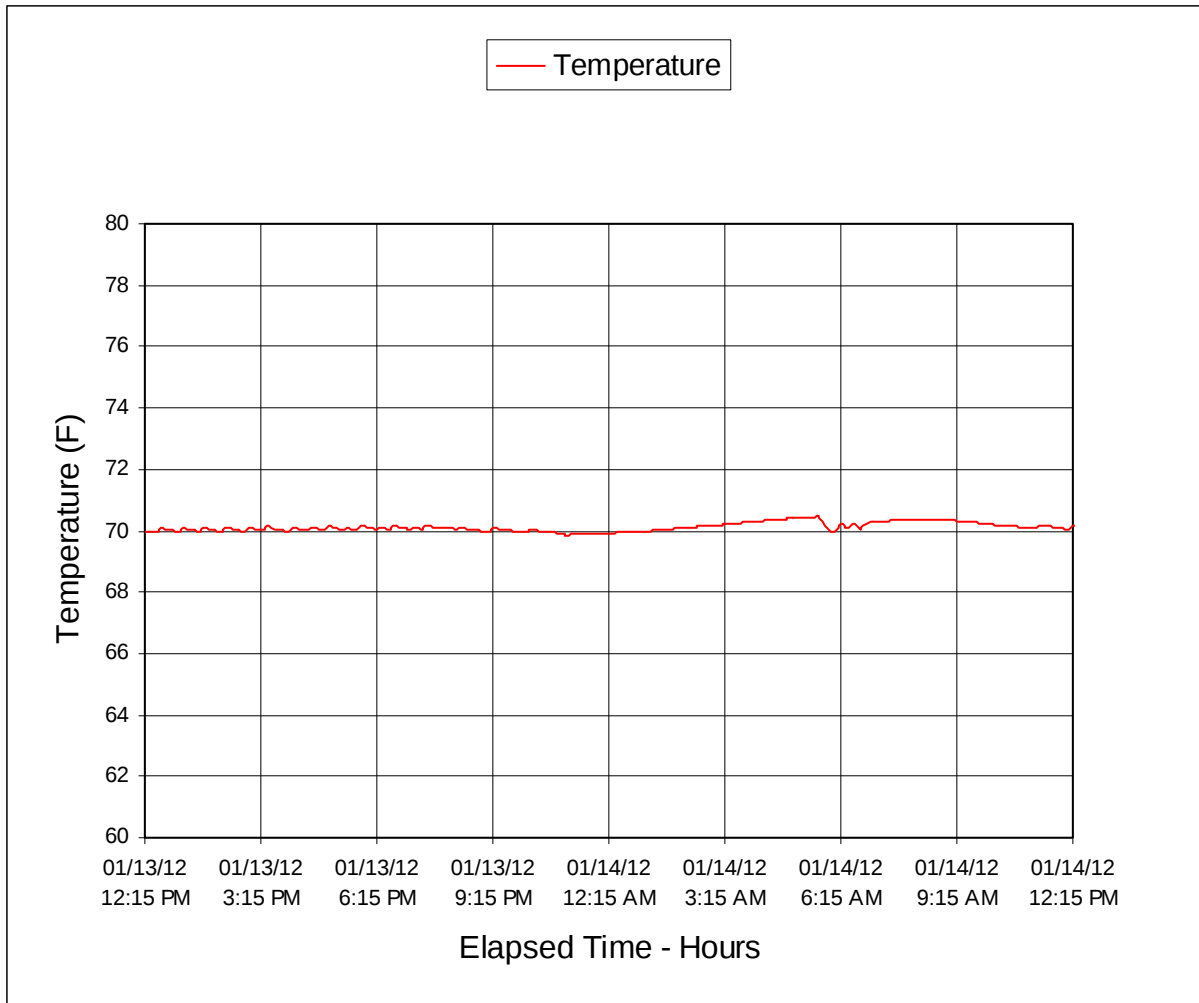
SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 17

DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2012 Ford Expedition 4x4 5-Door MPV NHTSA No.: MC0213
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/14/12



APPENDIX A
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FIGURE 1. Load Cell Location

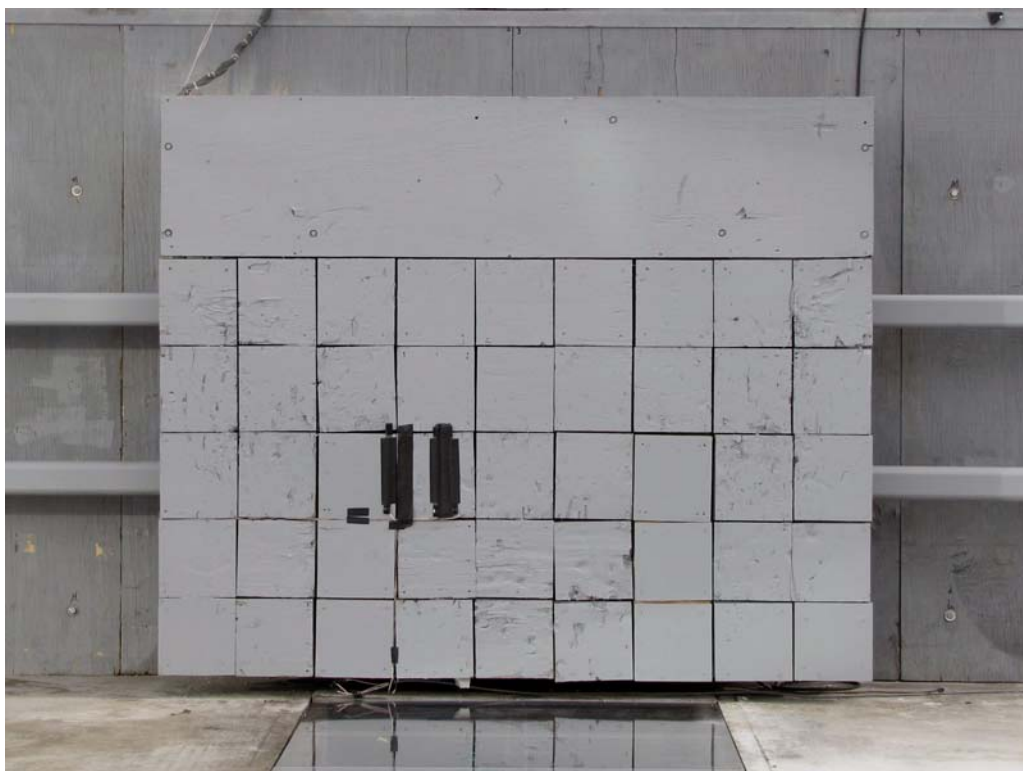


FIGURE 2. Load Cell Wall



FIGURE 3. Manufacturer's Label



FIGURE 4. Tire Placard



FIGURE 5. 2012 Ford Expedition Frontal, As Delivered



FIGURE 6. Left Rear $\frac{3}{4}$ View, As Received



FIGURE 7. Pre-Test Front View of Test Vehicle



FIGURE 8. Post-Test Front View of Test Vehicle



FIGURE 9. Pre-Test Left View of Test Vehicle



FIGURE 10. Post-Test Left View of Test Vehicle



FIGURE 11. Pre-Test Right View of Test Vehicle



FIGURE 12. Post-Test Right View of Test Vehicle



FIGURE 13. Pre-Test Right Front $\frac{3}{4}$ View



FIGURE 14. Post-Test Right Front $\frac{3}{4}$ View



FIGURE 15. Pre-Test Left Rear $\frac{3}{4}$ View



FIGURE 16. Post-Test Left Rear $\frac{3}{4}$ View



FIGURE 17. Pre-Test Windshield View



FIGURE 18. Post-Test Windshield View



FIGURE 19. Pre-Test Engine Compartment View



FIGURE 20. Post-Test Engine Compartment View



FIGURE 21. Pre-Test Fuel Filler Cap View



FIGURE 22. Post-Test Fuel Filler Cap View

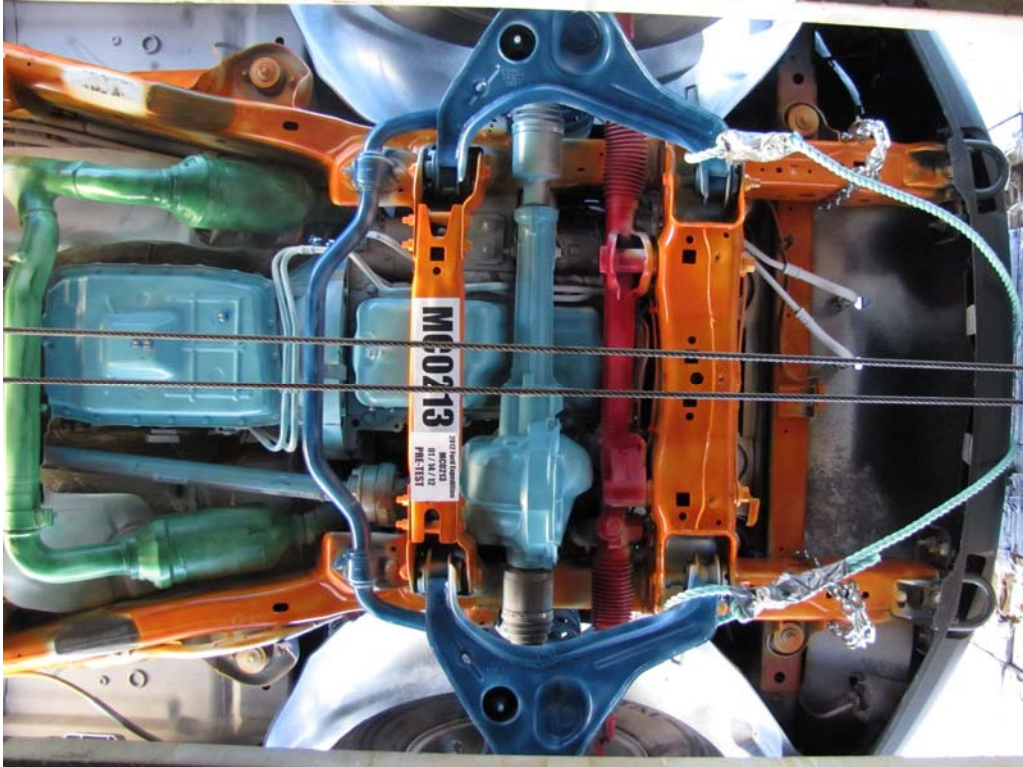


FIGURE 23. Pre-Test Front Underbody View

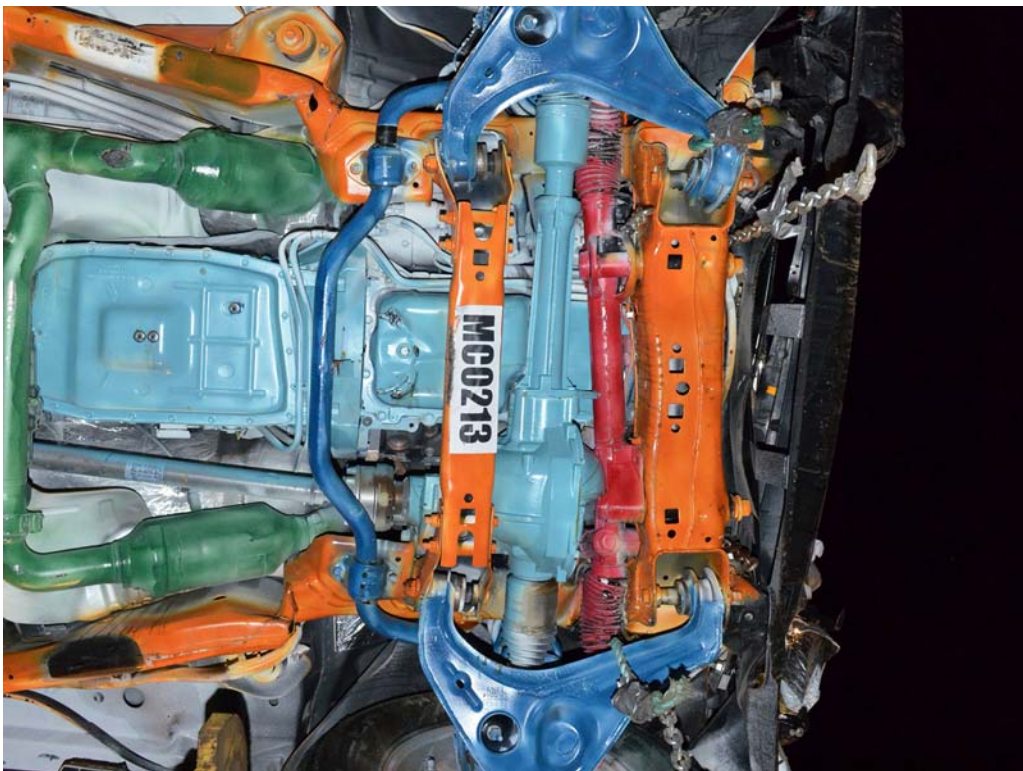


FIGURE 24. Post-Test Front Underbody View

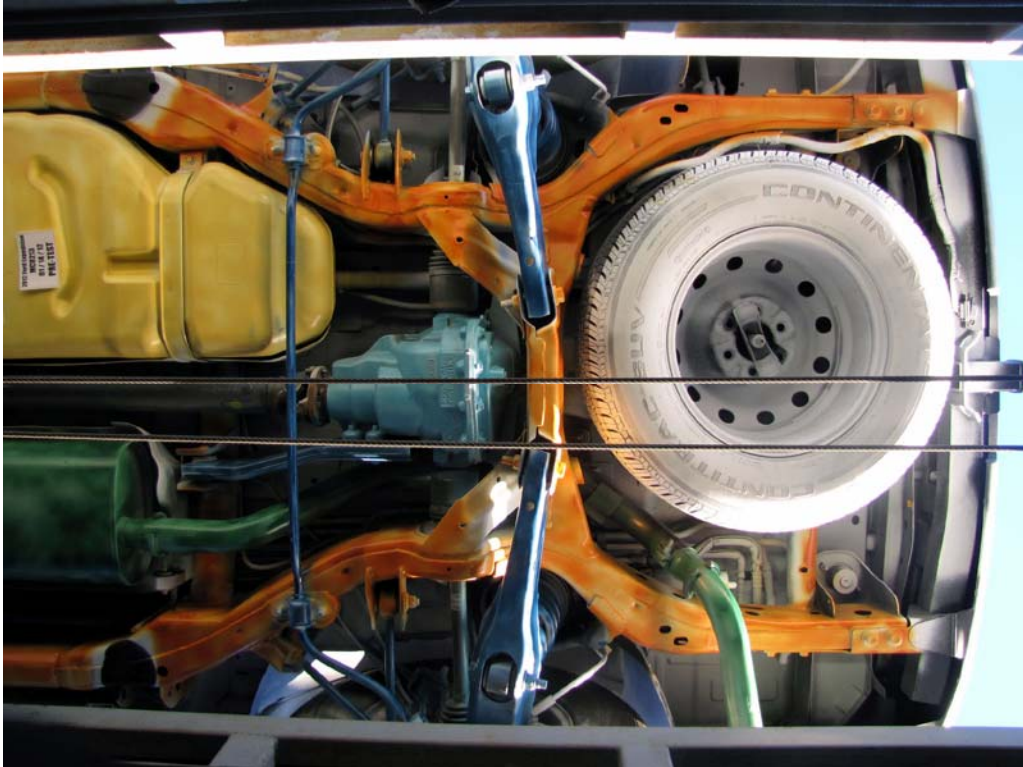


FIGURE 25. Pre-Test Rear Underbody View

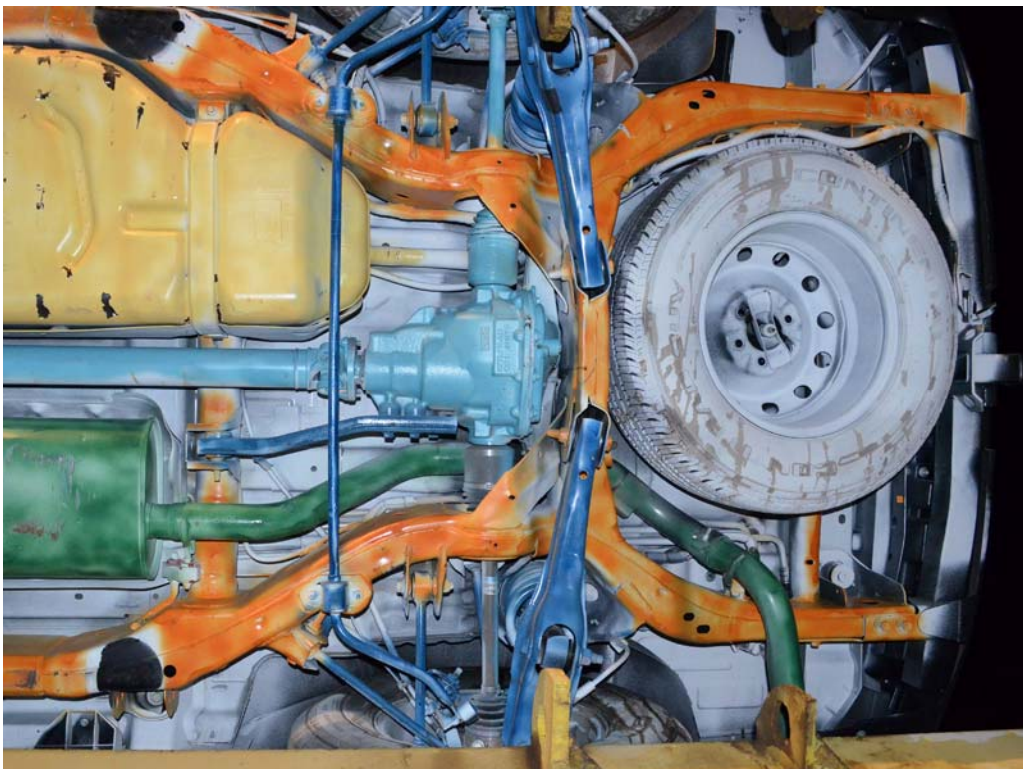


FIGURE 26. Post-Test Rear Underbody View



FIGURE 27. Pre-Test Dummy Cable Routing



FIGURE 28. Post-Test Dummy Cable Routing



FIGURE 29. Pre-Test Driver Dummy Front View



FIGURE 30. Post-Test Driver Dummy Front View



FIGURE 31. Pre-Test Driver Dummy Window View



FIGURE 32. Post-Test Driver Dummy Window View



FIGURE 33. Pre-Test Driver Dummy and Vehicle Interior View



FIGURE 34. Post-Test Driver Dummy and Vehicle Interior View



FIGURE 35. Pre-Test Driver's Seat Fore-Aft Markings



FIGURE 36. Post-Test Driver's Seat Fore-Aft Markings



FIGURE 37. Pre-Test Driver Dummy Feet



FIGURE 38. Post-Test Driver Dummy Feet



FIGURE 39. Pre-Test Driver's Side Knee Bolster



FIGURE 40. Post-Test Driver's Side Knee Bolster



FIGURE 41. Pre-Test Driver's Side Floorpan



FIGURE 42. Post-Test Driver's Side Floorpan



FIGURE 43. Post-Test Driver Dummy Face



FIGURE 44. Post-Test Driver Dummy Contact With Airbag



FIGURE 45. Post-Test Driver Dummy Contact With Headrest

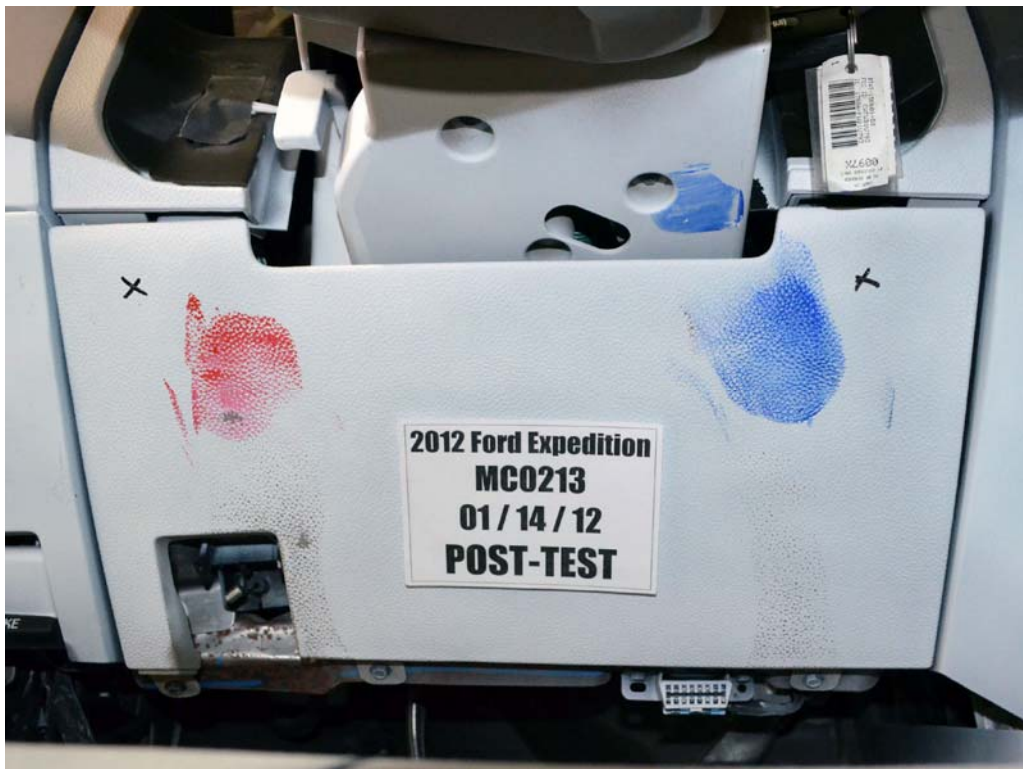


FIGURE 45a. Post-Test Driver Dummy Contact With Knee Bolster



FIGURE 45b. Post-Test Driver Dummy Contact With Steering Column



FIGURE 46. Pre-Test View Of Steering Wheel



FIGURE 47. Post-Test View Of Steering Wheel



FIGURE 48. Pre-Test Passenger Dummy Front View



FIGURE 49. Post-Test Passenger Dummy Front View



FIGURE 50. Pre-Test Passenger Dummy Window View



FIGURE 51. Post-Test Passenger Dummy Window View



FIGURE 52. Pre-Test Passenger Dummy and Vehicle Interior View



FIGURE 53. Post-Test Passenger Dummy and Vehicle Interior View



FIGURE 54. Pre-Test Passenger's Seat Fore-Aft Markings



FIGURE 55. Post-Test Passenger's Seat Fore-Aft Markings



FIGURE 56. Pre-Test Passenger Dummy Feet



FIGURE 57. Post-Test Passenger Dummy Feet



FIGURE 58. Pre-Test Passenger's Side Knee Bolster



FIGURE 59. Post-Test Passenger's Side Knee Bolster



FIGURE 60. Pre-Test Passenger's Side Floorpan



FIGURE 61. Post-Test Passenger's Side Floorpan



FIGURE 62. Post-Test Passenger Dummy Contact With Airbag

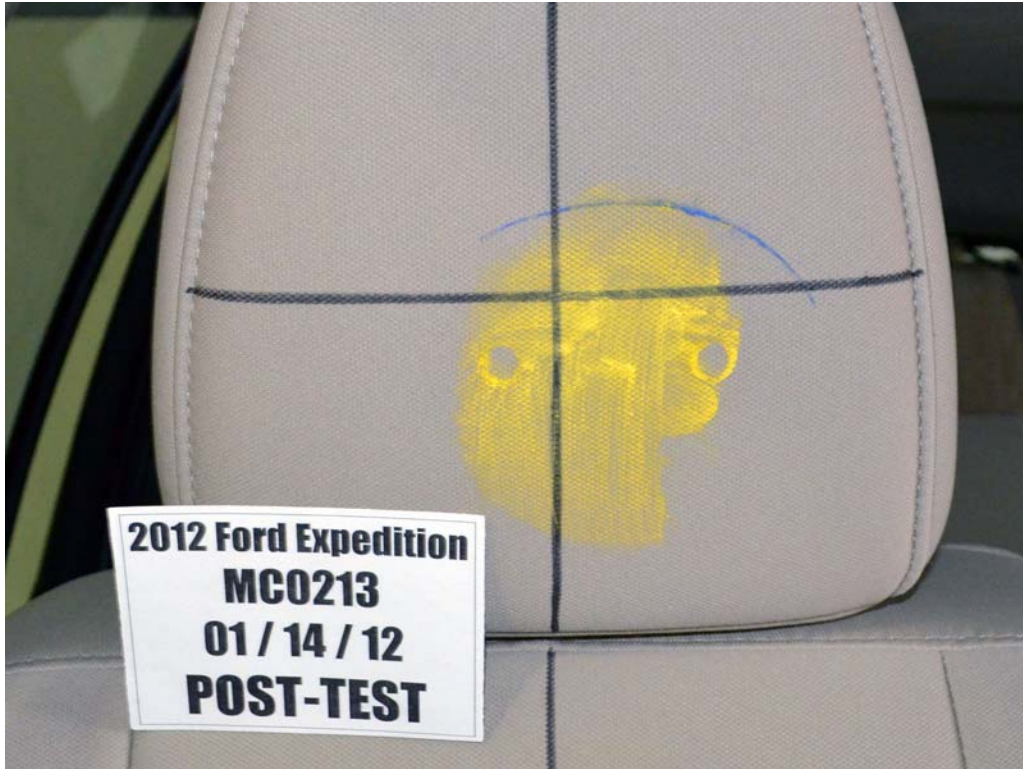


FIGURE 62a. Post-Test Passenger Dummy Contact With Headrest



FIGURE 62b. Post-Test Passenger Dummy Contact With Glovebox

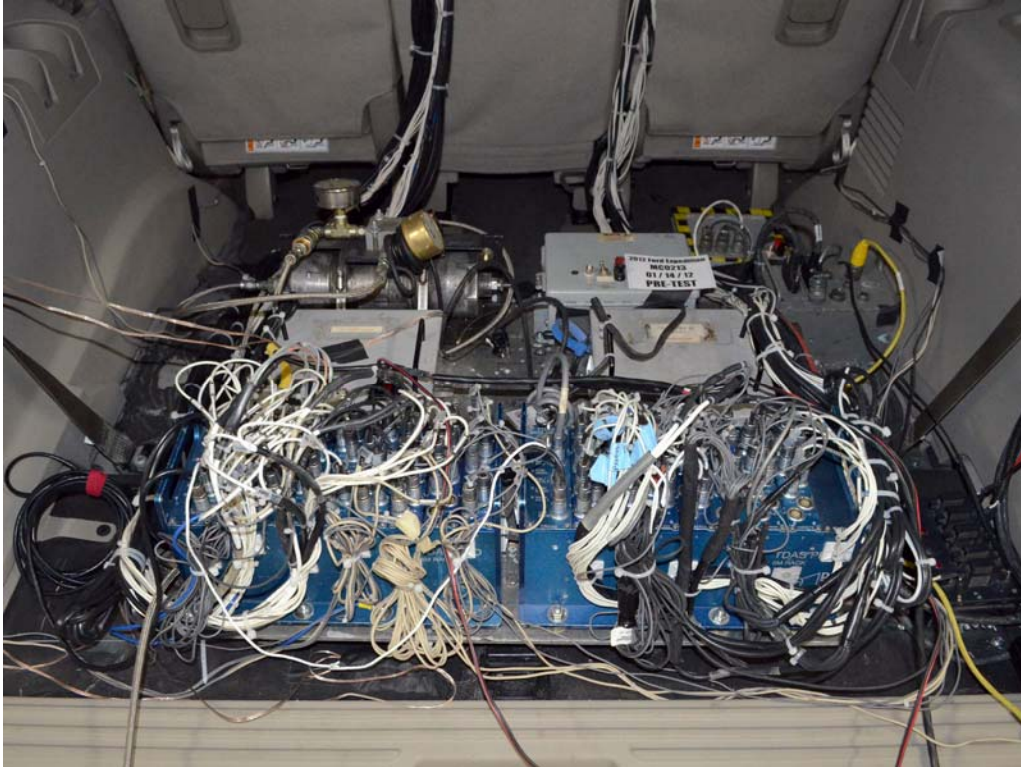


FIGURE 63. Pre-Test of Ballast Installed in Vehicle

Photograph Not Applicable
No Stoddard
Solvent Spillage

FIGURE 64. Post-Test Stoddard Solvent Spillage Location



FIGURE 65. Post-Test Speed Trap Read Out

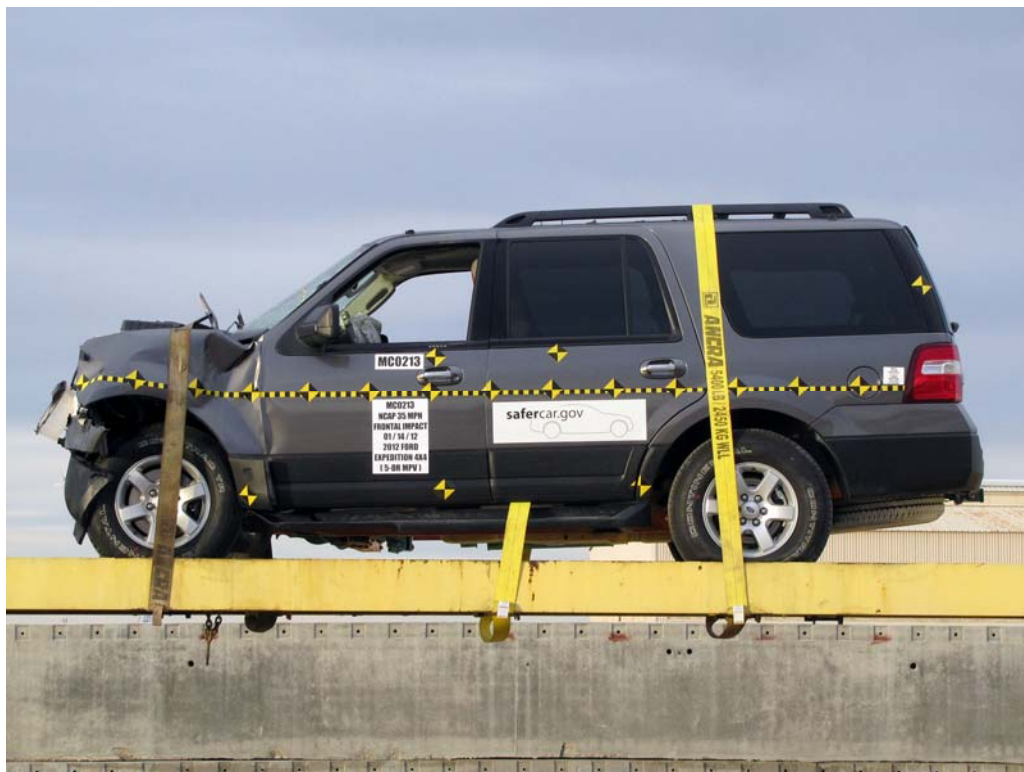


FIGURE 66. Vehicle at 0° on Static Rollover Device



FIGURE 67. Vehicle at 90°on Static Rollover Device

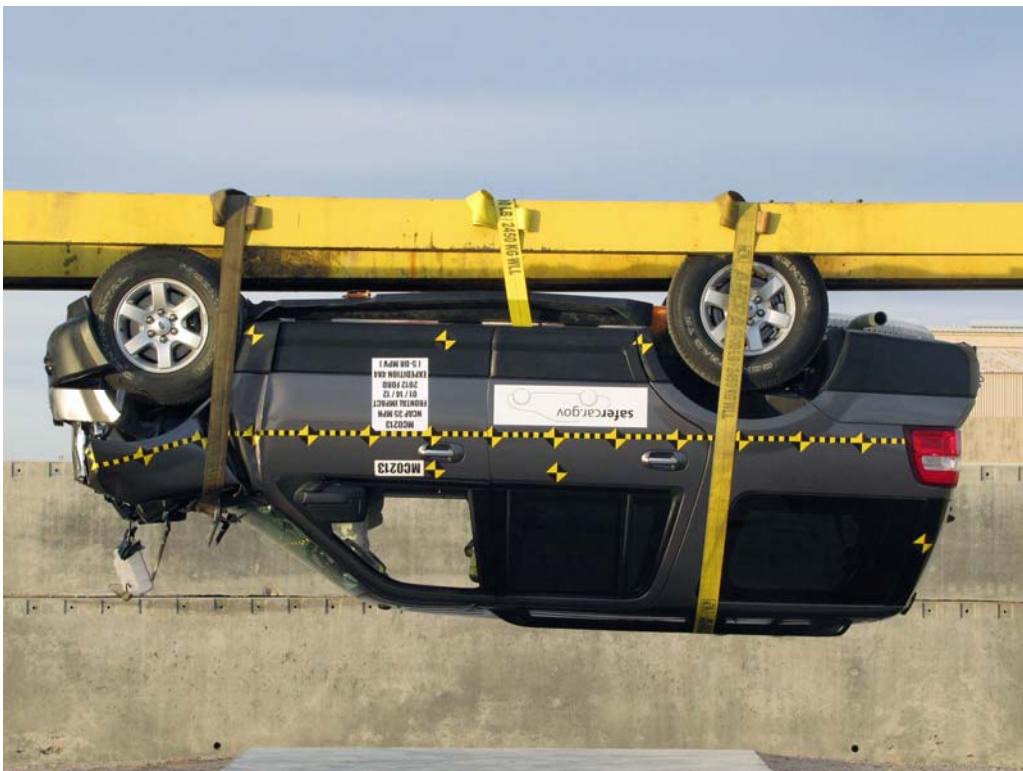


FIGURE 68. Vehicle at 180°on Static Rollover Device



FIGURE 69. Vehicle at 270°on Static Rollover Device

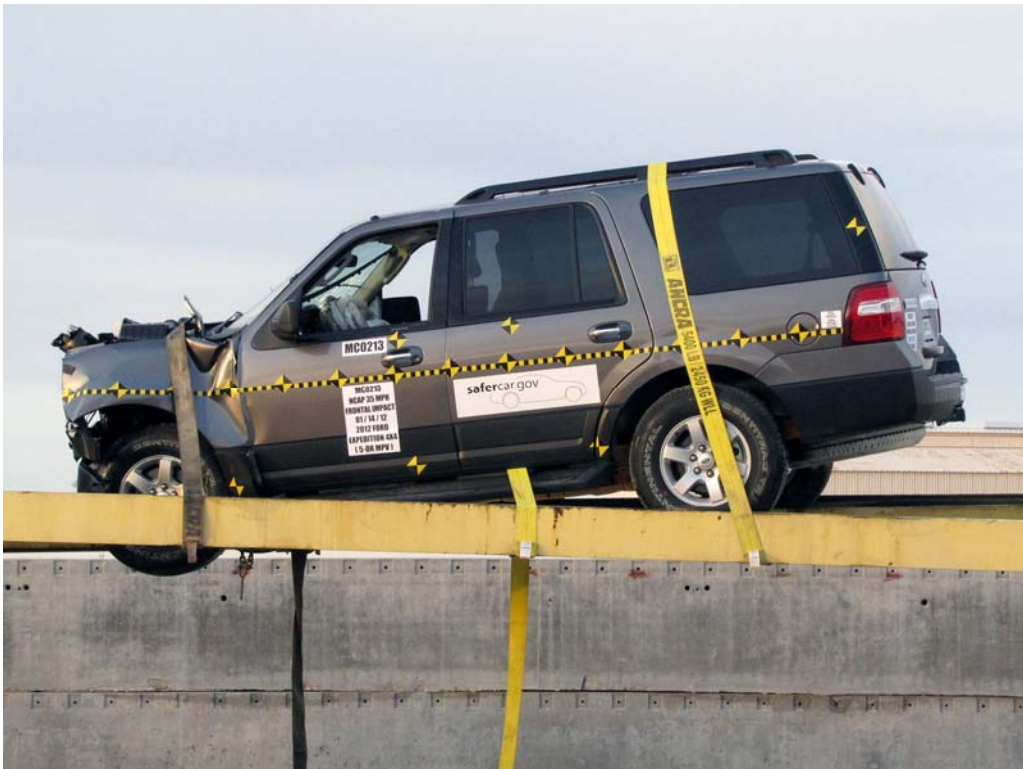


FIGURE 70. Vehicle at 360°on Static Rollover Device



FIGURE 71. 2012 Ford Expedition Frontal Impact Event

		VEHICLE DESCRIPTION EXPEDITION 2012 EXP XL 4X4 XL 8-PASSENGER 5.4L 302HC V8 ENGINE 6-SPEED AUTOMATIC 6D TRANS		EXTERIOR STERLING GRAY METALLIC INTERIOR STONE CLOTH BUCKET SEATS	F09033
STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE					
EXTERIOR • CRUISE: 4-SPEAKER CHROME • BURNING BOARDS • LUGGAGE RACK AND CROSSLAMPS • LEATHER WITH FLIP-UP GLASS • REAR EXT. WIPER/WASH/DEFROST • AUTO-AMP-AUTO ON/OFF HOLDUP INTERIOR • 17" LCD W/MP3/CD/USB/CTL • AUXILIARY AUDIO INPUT JACK • CLOTH BUCKET FRONT SEATS • 2ND ROW BENCH SEAT • FLOORMATS-1ST AND 2ND ROW FUNCTIONAL • 4-SPK PREMIUM SOUND SYS/ • SINGLE CD/MP3 W/SPEAKERS • FRONT/REAR TIRE MONITORING					
WARRANTY • 3YR/50,000 BUMPER-TO-BUMPER • 5YR/100,000 POWERTRAIN • 5YR/60,000 ROADSIDE ASSIST					
EPA Fuel Economy Estimates					
GASOLINE CITY MPG 13 Expected range for most drivers 18 to 16 MPG *Fuel economy when operating on E85 will yield different values than gasoline. See Fuel Economy Guide for more information.	Dual Fuel Vehicle* Gasoline-Ethanol(E85) Estimated Annual Fuel Cost \$3,702 based on 15,000 miles at \$3.70 per gallon of gasoline Combined Gasoline Fuel Economy This Vehicle 15 AT SUVs	GASOLINE HIGHWAY MPG 18 Expected range for most drivers 14 to 22 MPG Your actual mileage will vary depending on how you drive and maintain your vehicle.	PRICE INFORMATION STANDARD VEHICLE PRICE \$39,205.00 INCLUDED ON THIS VEHICLE EQUIPMENT GROUP 101A *HOLD FLAT THIRD ROW SEAT *5-LEIS RATED W/6 PDS SVC OPTIONAL EQUIPMENT FRONT LICENSE PLATE BRACKET CALIFORNIA EMISSIONS SYSTEM SYNC VOICE ACTIVATED COMM SYS TOTAL OPTIONS TOTAL VEHICLE & OPTIONS 40,670.00 DESTINATION & DELIVERY 995.00		
See the FREE Fuel Economy Guide at dealers or www.fueleconomy.gov					
SOLD TO 27B 414 The Frederick Motor Co One Waverly Drive Frederick MD 21702	ONE RA03	DEALER NO. 27B 414	METHOD OF TRANSF. RAIL ITEM #: 2F-5606 Q/T 2	TOTAL MSRP \$41,665.00	
SHIP TO or other new location TWO	FINAL ASSEMBLY POINT KTP LT. TRK.		GOVERNMENT SAFETY RATINGS Frontal Crash Driver Not Rated Passenger Not Rated Star ratings based on the risk of injury in a frontal impact. Frontal ratings should ONLY be compared to other vehicles of similar size and weight. Side Crash Front seat Not Rated Rear seat Not Rated Star ratings based on the risk of injury in a side impact. Rollover *** Star ratings based on the risk of rollover in a single vehicle crash. Star ratings range from 1 to 5 stars (*****), with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA).		
EXTENDED WARRANTY Ford Extended Service Plan is the only service contract backed by Ford and honored at all Ford and Lincoln Mercury dealers.					

FIGURE 72. Monroney Label Photograph

APPENDIX B
DUMMY RESPONSE DATA TRACES

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4	Driver Head Resultant Acceleration vs. Time Primary	B-1
5	Driver Chest X Deflection vs. Time	B-2
6	Driver Chest X Acceleration vs. Time Primary	B-3
7	Driver Chest Y Acceleration vs. Time Primary	B-3
8	Driver Chest Z Acceleration vs. Time Primary	B-3
9	Driver Chest Resultant Acceleration vs. Time Primary	B-3
10	Driver Upper Neck Force X vs. Time Primary	B-4
11	Driver Upper Neck Force Z vs. Time Primary	B-4
12	Driver Upper Neck Moment Y vs. Time Primary	B-4
13	Driver Nij vs. Time Primary	B-4
14	Driver Left Femur Force vs. Time	B-5
15	Driver Right Femur Force vs. Time	B-5
16	Passenger Head X Acceleration vs. Time Primary	B-6
17	Passenger Head Y Acceleration vs. Time Primary	B-6
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19	Passenger Head Resultant Acceleration vs. Time Primary	B-6
20	Passenger Chest X Deflection vs. Time	B-7
21	Passenger Chest X Acceleration vs. Time Primary	B-8
22	Passenger Chest Y Acceleration vs. Time Primary	B-8
23	Passenger Chest Z Acceleration vs. Time Primary	B-8
24	Passenger Chest Resultant Acceleration vs. Time Primary	B-8
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26	Passenger Upper Neck Force Z vs. Time Primary	B-9
27	Passenger Upper Neck Moment Y vs. Time Primary	B-9
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29	Passenger Left Femur Force vs. Time	B-10
30	Passenger Right Femur Force vs. Time	B-10

The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

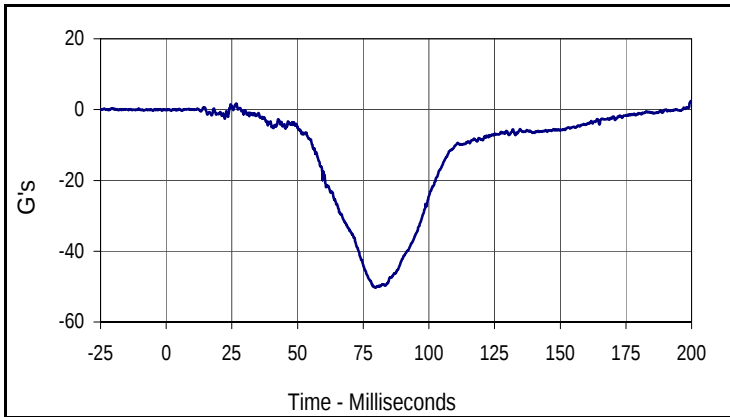
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Driver Head Y Acceleration Redundant
Driver Head Z Acceleration Redundant
Driver Upper Neck Force Y
Driver Upper Neck Moment X
Driver Upper Neck Moment Z
Driver Chest X Acceleration Redundant
Driver Chest Y Acceleration Redundant
Driver Chest Z Acceleration Redundant
Driver Pelvis X
Driver Pelvis Y
Driver Pelvis Z
Driver Left Femur Force Z Redundant
Driver Right Femur Force Z Redundant
Driver Shoulder Belt Force
Driver Lap Belt Force
Driver Left Upper Tibia Moment X
Driver Left Upper Tibia Moment Y
Driver Left Upper Tibia Force Z
Driver Left Lower Tibia Moment X
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver Right Lower Tibia Force Z
Driver Left Foot Fore Z
Driver Left Foot Aft X
Driver Left Foot Aft Z
Driver Right Foot Fore Z
Driver Right Foot Aft X

Driver Right Foot Aft Z
Passenger Head X Acceleration Redundant
Passenger Head Y Acceleration Redundant
Passenger Head Z Acceleration Redundant
Passenger Upper Neck Force X
Passenger Upper Neck Force Z
Passenger Upper Neck Moment Y
Passenger Chest X Acceleration Redundant
Passenger Chest Y Acceleration Redundant
Passenger Chest Z Acceleration Redundant
Passenger Pelvis X
Passenger Pelvis Y
Passenger Pelvis Z
Passenger Left Femur Force Z Redundant
Passenger Right Femur Force Z Redundant
Passenger Shoulder Belt Force
Passenger Lap Belt Force
Passenger Left Upper Tibia Moment X
Passenger Left Upper Tibia Moment Y
Passenger Left Upper Tibia Force Z
Passenger Left Lower Tibia Moment X
Passenger Left Lower Tibia Moment Y
Passenger Left Lower Tibia Force Z
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Fore Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Right Foot Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
Left Rear Seat Crossmember X

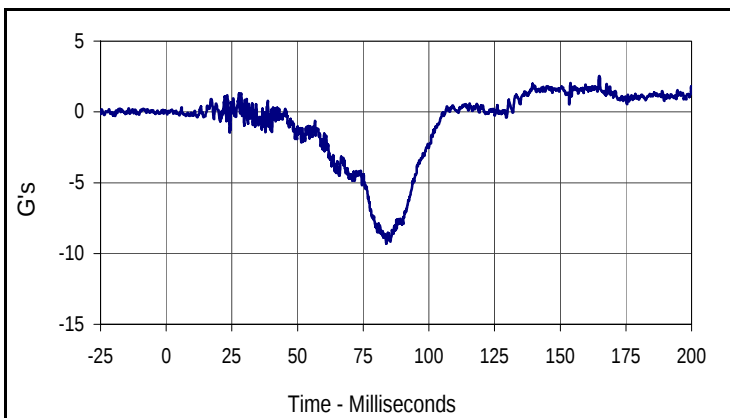
Left Rear Seat Crossmember Z
Right Rear Seat Crossmember X
Right Rear Seat Crossmember Z
Vehicle Engine Top X
Vehicle Engine Bottom X
Vehicle Left Brake Caliper X
Vehicle Right Brake Caliper X
Load Cell Barrier A1-A9
Load Cell Barrier B1-B9
Load Cell Barrier C1-C9
Load Cell Barrier D1-D9

Test Vehicle: 2012 Ford Expedition 4X4 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

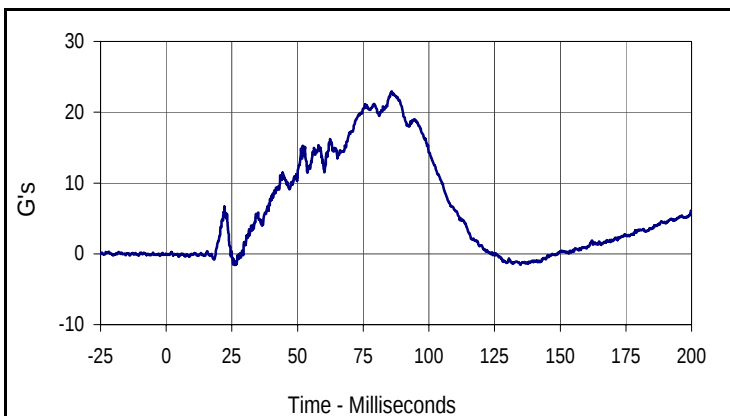
NHTSA No.: MC0213
 Test Date: 1/14/12



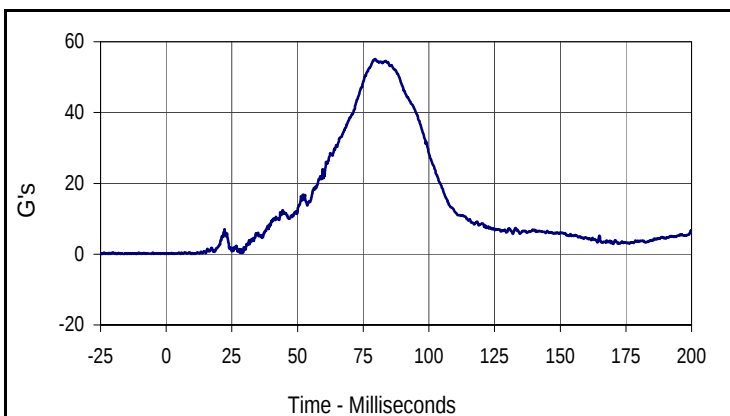
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Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
2.5	200.0	-50.4	79.6



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.5	164.9	-9.3	83.8



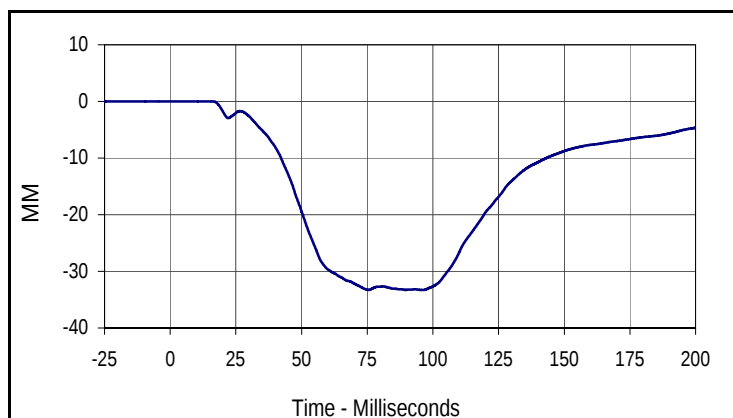
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
22.9	85.8	-1.6	26.2



Curve Description			
Driver Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
55.1	79.6	0.0	3.0

Test Vehicle: 2012 Ford Expedition 4X4 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

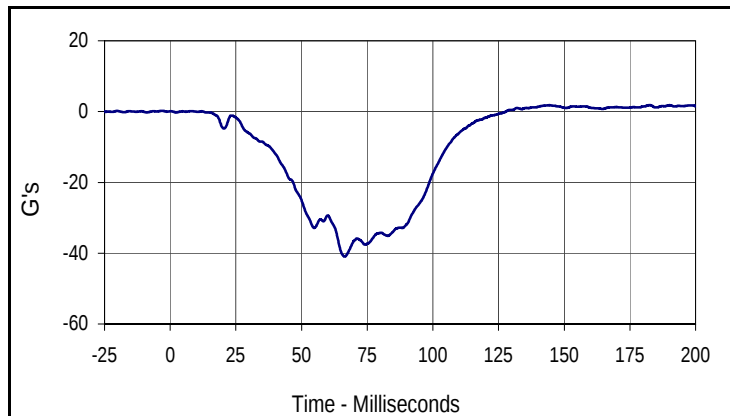
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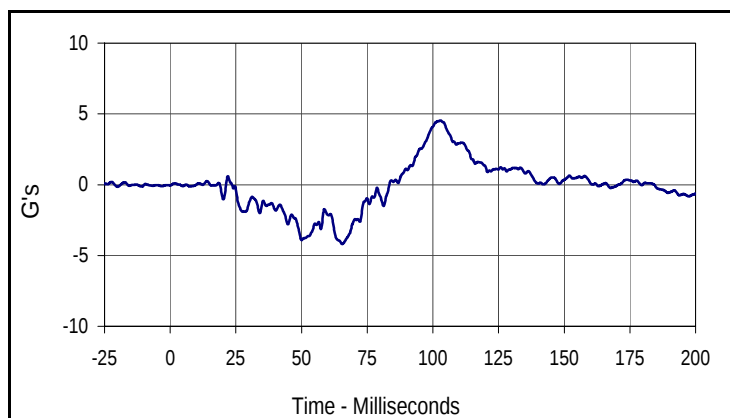
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Driver Chest Deflection			
Plot No.	Type	SAE Class	Units
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Max	Time	Min	Time
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Test Vehicle: 2012 Ford Expedition 4X4 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

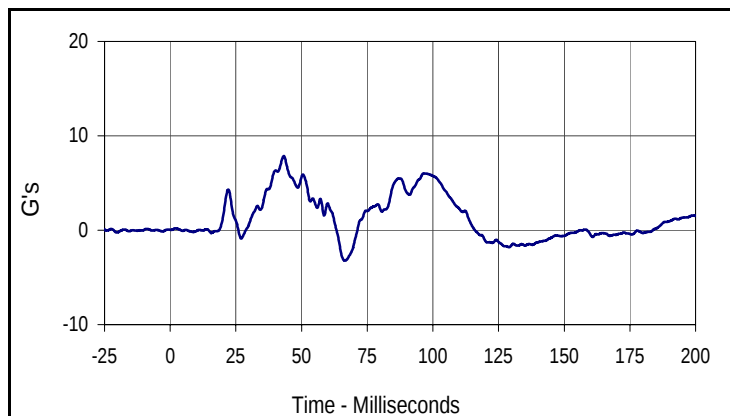
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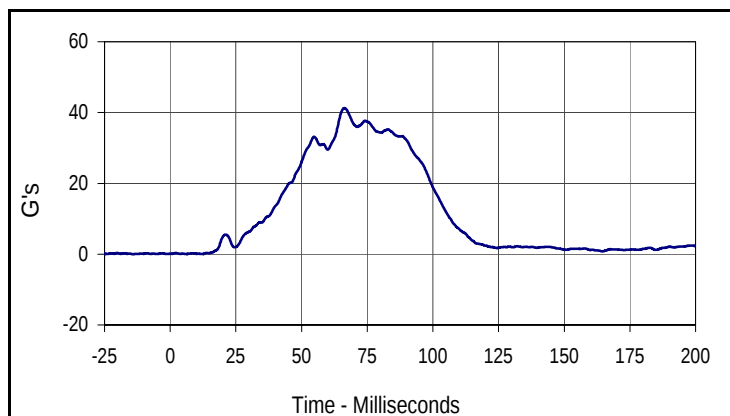
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Plot No.	Type	SAE Class	Units
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Max	Time	Min	Time
1.8	182.5	-40.9	66.4



Curve Description			
Driver Chest Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
007	FIL	180	G's
Max	Time	Min	Time
4.5	102.9	-4.2	65.5



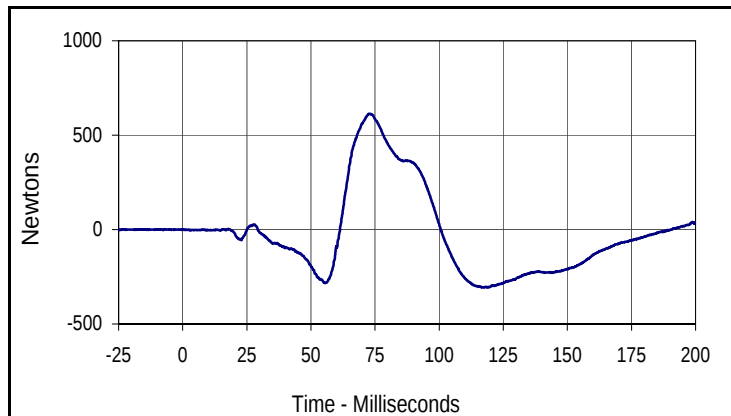
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Driver Chest Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
008	FIL	180	G's
Max	Time	Min	Time
7.9	43.2	-3.2	66.5



Curve Description			
Driver Chest Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
009	RES	180	G's
Max	Time	Min	Time
41.2	66.4	0.0	6.4

Test Vehicle: 2012 Ford Expedition 4X4 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

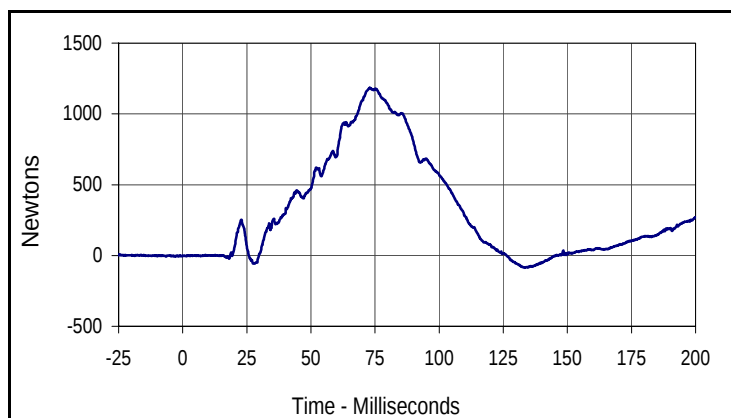
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 Test Date: 1/14/12



Curve Description

Driver Upper Neck Force X

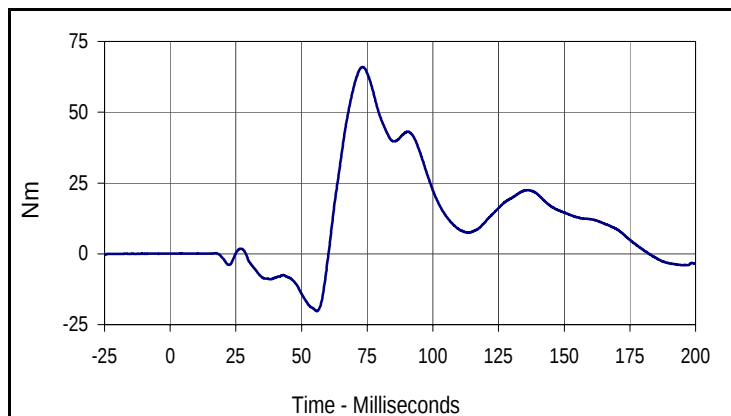
Plot No.	Type	SAE Class	Units
010	FIL	1000	Newtons
Max	Time	Min	Time
613.8	72.8	-307.1	117.6



Curve Description

Driver Upper Neck Force Z

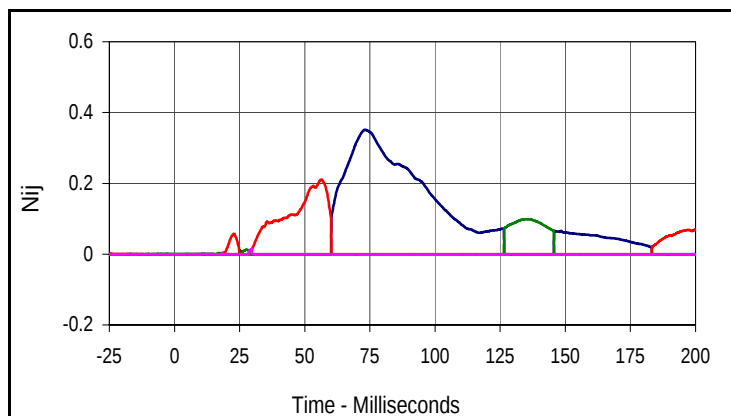
Plot No.	Type	SAE Class	Units
011	FIL	1000	Newtons
Max	Time	Min	Time
1184.9	73.0	-85.9	133.4



Curve Description

Driver Upper Neck Moment Y

Plot No.	Type	SAE Class	Units
012	FIL	600	Nm
Max	Time	Min	Time
66.0	73.2	-20.2	55.9



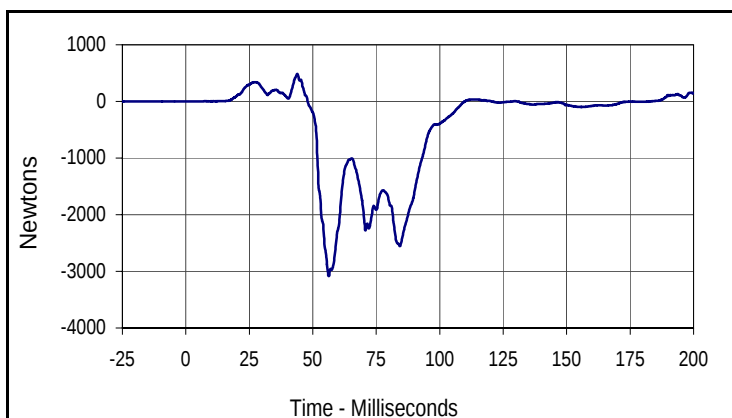
Curve Description

Driver Nij

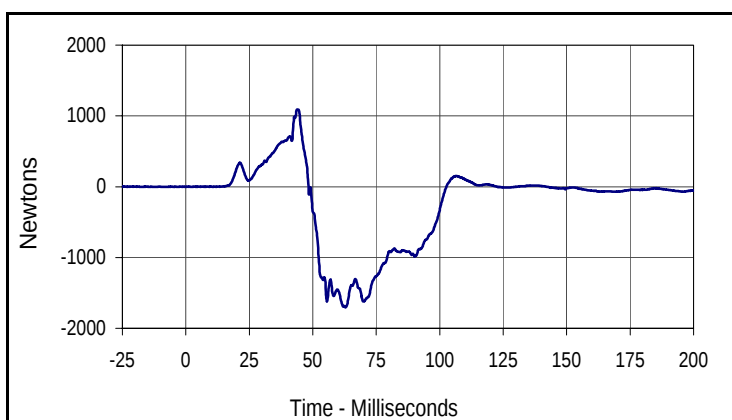
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Units	Type	Max	Time
Nte	FIL	0.21	56.4
Units	Type	Max	Time
Ncf	FIL	0.10	134.9
Units	Type	Max	Time
Nce	FIL	0.08	266.4

Test Vehicle: 2012 Ford Expedition 4X4 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

NHTSA No.: MC0213
 Test Date: 1/14/12



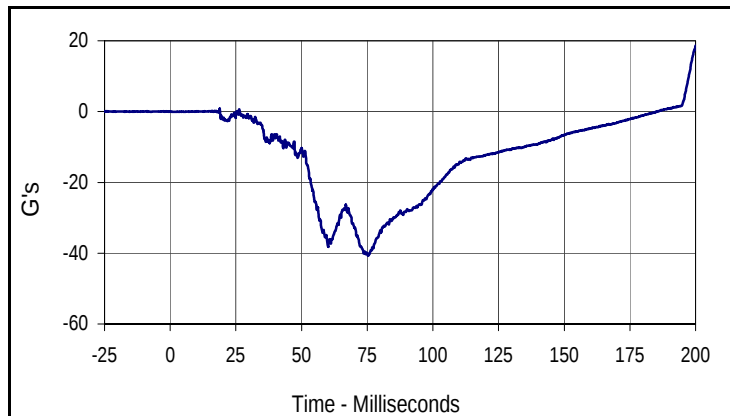
Curve Description			
Driver Left Femur Force Z			
Plot No.	Type	SAE Class	Units
013	FIL	600	Newtons
Max	Time	Min	Time
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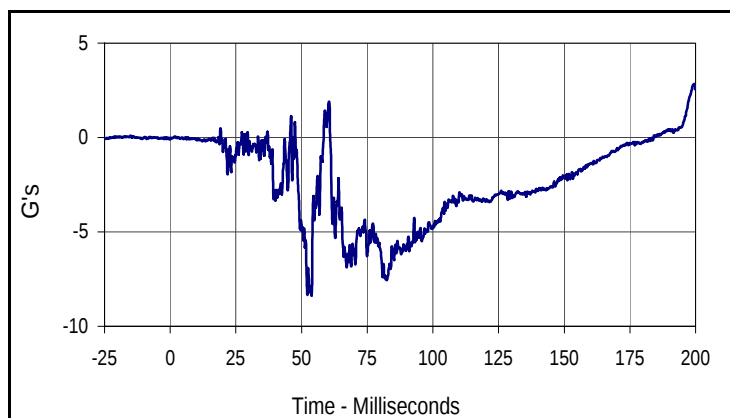
Curve Description			
Driver Right Femur Force Z			
Plot No.	Type	SAE Class	Units
014	FIL	600	Newtons
Max	Time	Min	Time
1093.3	43.9	-1704.9	62.9

Test Vehicle: 2012 Ford Expedition 4X4 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

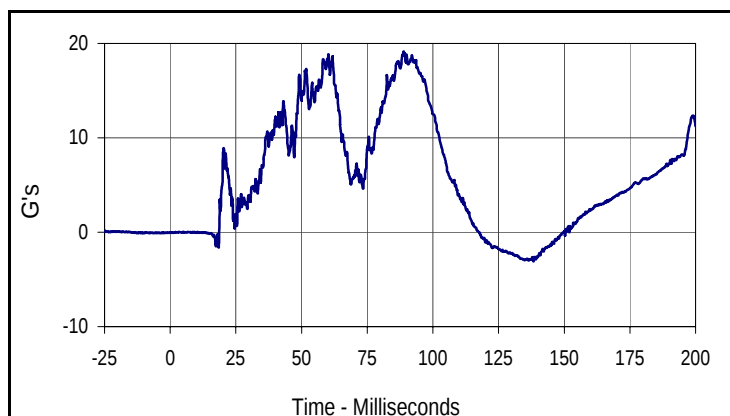
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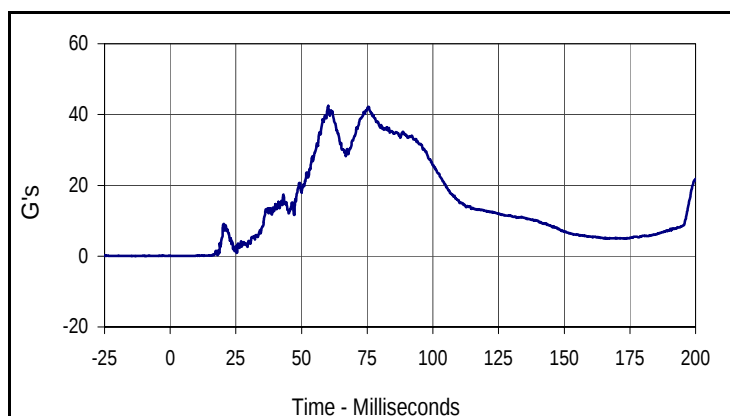
Curve Description			
Passenger Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
015	FIL	1000	G's
Max	Time	Min	Time
18.6	200.0	-40.7	75.3



Curve Description			
Passenger Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
016	FIL	1000	G's
Max	Time	Min	Time
2.8	199.5	-8.4	53.8



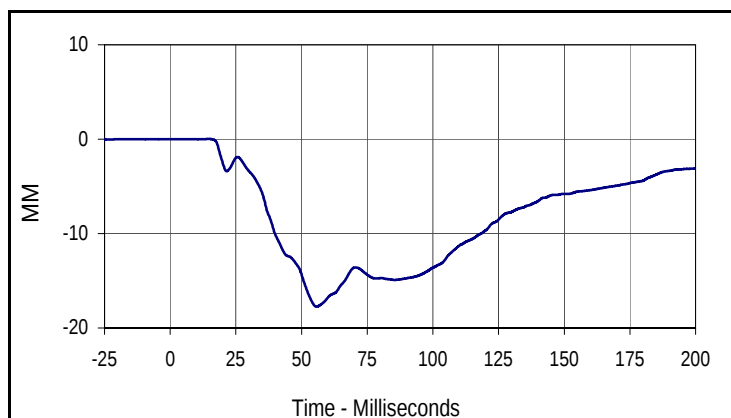
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Passenger Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
017	FIL	1000	G's
Max	Time	Min	Time
19.1	88.9	-3.1	138.2



Curve Description			
Passenger Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
018	RES	1000	G's
Max	Time	Min	Time
42.5	60.1	0.0	4.7

Test Vehicle: 2012 Ford Expedition 4X4 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

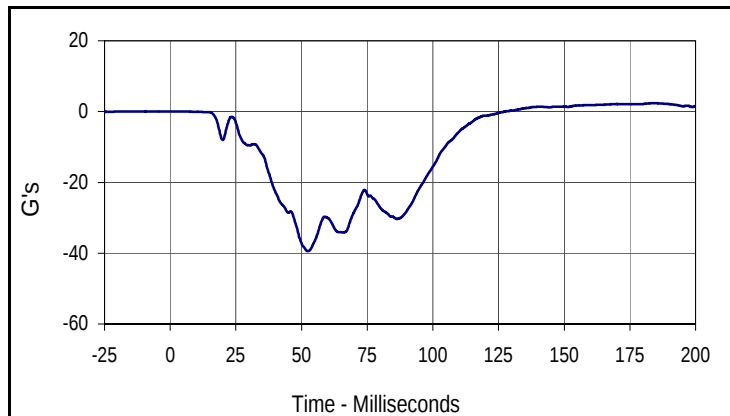
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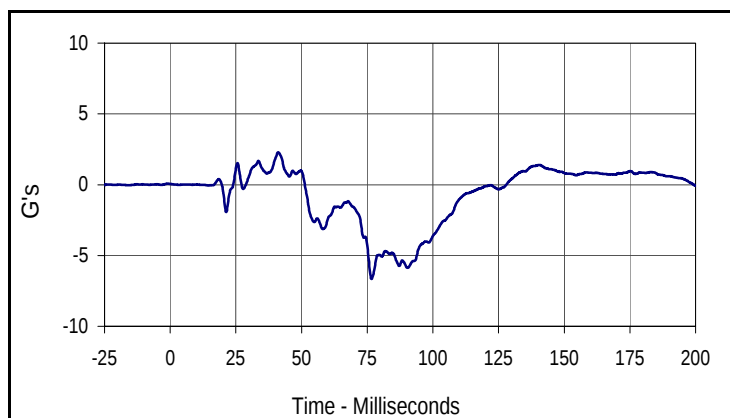
Curve Description			
Passenger Chest Deflection			
Plot No.	Type	SAE Class	Units
019	FIL	180	MM
Max	Time	Min	Time
0.0	14.6	-17.7	55.7

Test Vehicle: 2012 Ford Expedition 4X4 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

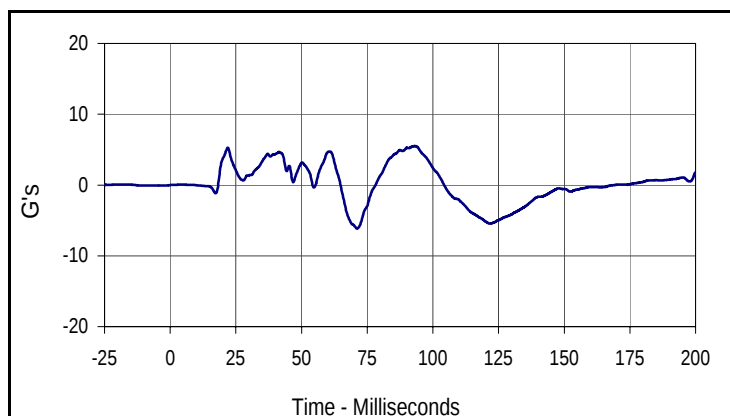
NHTSA No.: MC0213
 Test Date: 1/14/12



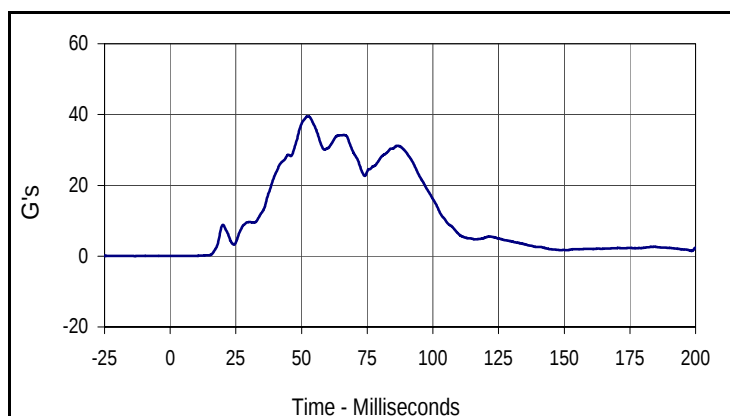
Curve Description			
Passenger Chest Acceleration X Primary			
Plot No.	Type	SAE Class	Units
020	FIL	180	G's
Max	Time	Min	Time
2.4	184.3	-39.4	52.3



Curve Description			
Passenger Chest Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
021	FIL	180	G's
Max	Time	Min	Time
2.3	41.1	-6.7	76.6



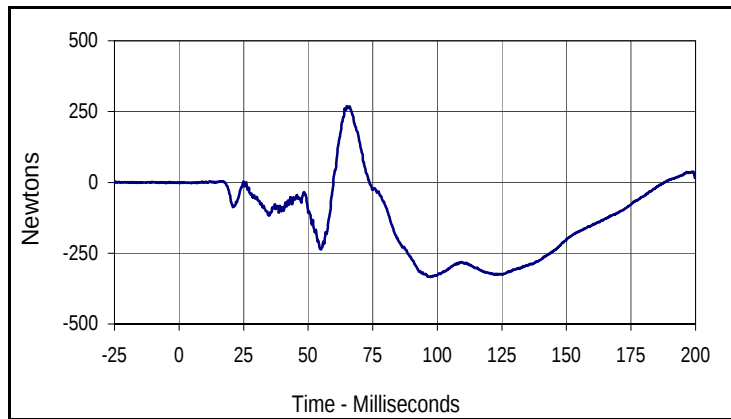
Curve Description			
Passenger Chest Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
022	FIL	180	G's
Max	Time	Min	Time
5.5	93.0	-6.2	71.2



Curve Description			
Passenger Chest Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
023	RES	180	G's
Max	Time	Min	Time
39.5	52.3	0.0	6.8

Test Vehicle: 2012 Ford Expedition 4X4 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

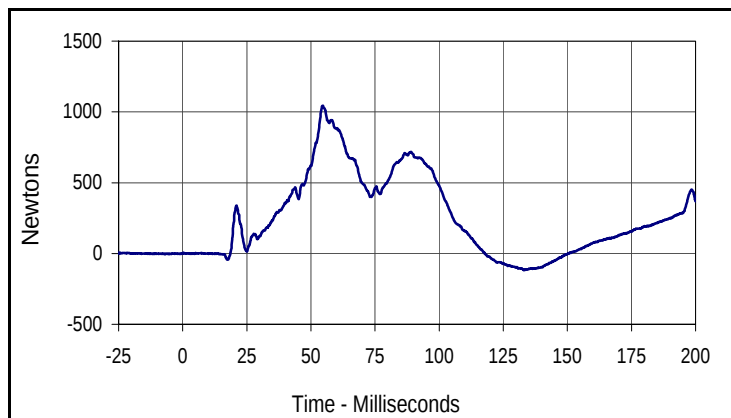
NHTSA No.: MC0213
 Test Date: 1/14/12



Curve Description

Passenger Upper Neck Force X

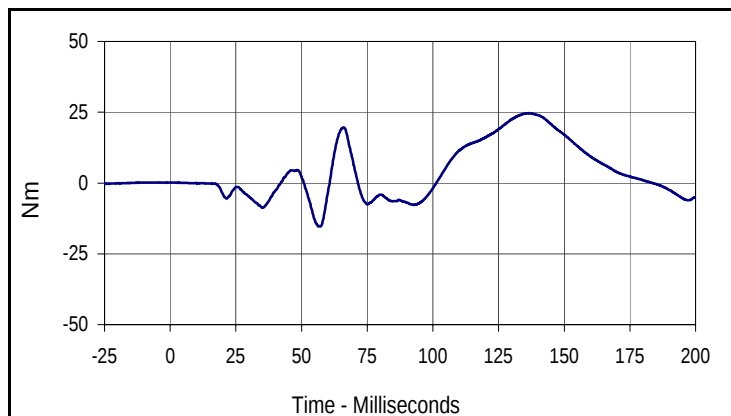
Plot No.	Type	SAE Class	Units
024	FIL	1000	Newtons
Max	Time	Min	Time
270.0	65.0	-334.4	97.3



Curve Description

Passenger Upper Neck Force Z

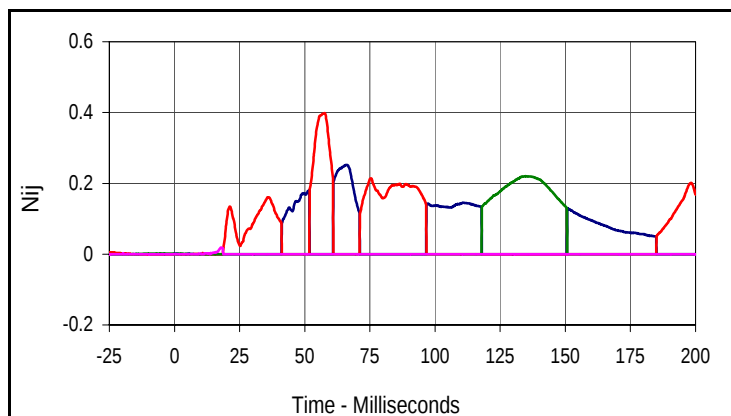
Plot No.	Type	SAE Class	Units
025	FIL	1000	Newtons
Max	Time	Min	Time
1044.0	54.6	-117.0	133.1



Curve Description

Passenger Upper Neck Moment Y

Plot No.	Type	SAE Class	Units
026	FIL	600	Nm
Max	Time	Min	Time
24.6	136.4	-15.4	57.2



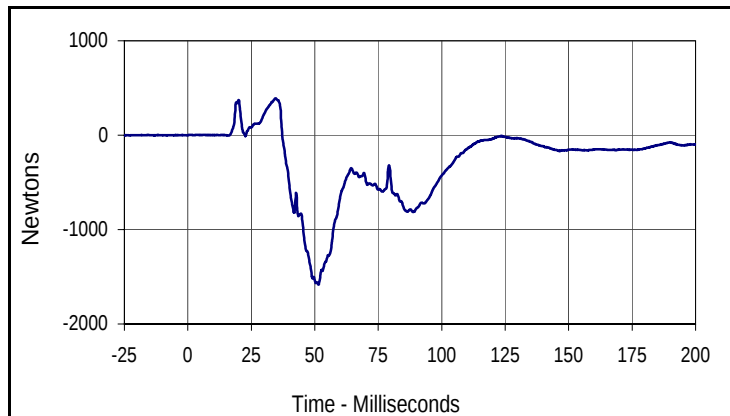
Curve Description

Passenger Nij

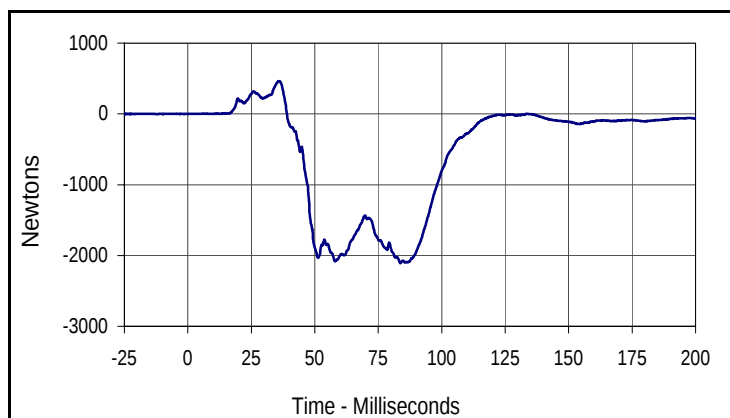
Units	Type	Max	Time
Ntf	FIL	0.25	66.2
Units	Type	Max	Time
Nte	FIL	0.40	57.7
Units	Type	Max	Time
Ncf	FIL	0.22	134.8
Units	Type	Max	Time
Nce	FIL	0.33	247.5

Test Vehicle: 2012 Ford Expedition 4X4 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

NHTSA No.: MC0213
 Test Date: 1/14/12



Curve Description			
Passenger Left Femur Force Z			
Plot No.	Type	SAE Class	Units
027	FIL	600	Newtons
Max	Time	Min	Time
390.5	34.5	-1581.8	51.5



Curve Description			
Passenger Right Femur Force Z			
Plot No.	Type	SAE Class	Units
028	FIL	600	Newtons
Max	Time	Min	Time
462.9	36.0	-2107.4	83.7

APPENDIX C
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

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

Test Program: Hybrid III 50th Percentile Male Dummy Damage Checklist

Test Date: 1/13/12

ATD Serial No.: 035

Test I.D.: N/A



Dummy Item	Inspect for	Comments	Damaged	OK
Entire Dummy	Perform general cleaning			X
Outer Skin	Gashes, rips, cracks			X
Head	Ballast secure			X
	General appearance			X
Neck	Broken or cracked rubber			X
	Upper neck bracket firmly attached to the lower neck bracket			X
	Looseness at the condyle joint			X
	Nodding blocks cracked or out of position			X
Spine	Broken or cracks in rubber			X
Ribs	Broken or bent ribs			X
	Broken or bent rib supports			X
	Damping material separated or cracked			X
	Rubber bumpers in place			X
Chest Displacement Assembly	Bent shaft			X
	Slider arm riding in track			X
Transducer Leads	Torn cables			X
Accelerometer Mountings	Head mounting secure			X
	Chest mounting secure			X
Knees	Skin condition			X
	Insert (do not remove)			X
	Casting			X
Limbs	Normal movement and adjustment			X
Knee Sliders	Wires intact			X
	Rubber returned to "at rest" position			X
Pelvis	Broken			X
Other				X

Describe the repair on repair or replacement of parts:

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 1/13/12

ATD Serial No.: 035

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.05	Pass
Laboratory Relative Humidity	%	10 to 70	30.3	Pass
A - Total sitting height	mm	879 to 889	885	Pass
B - Shoulder pivot height	mm	505 to 521	516	Pass
C - H point height	mm	84 to 89	87	Pass
D - H point location from backline	mm	135 to 140	138	Pass
E - Shoulder pivot from backline	mm	84 to 94	87	Pass
F - Thigh clearance	mm	140 to 155	148	Pass
G - Back of elbow to wrist pivot	mm	290 to 305	298	Pass
H - Head back to backline	mm	41 to 46	44	Pass
I - Shoulder to elbow length	mm	330 to 345	334	Pass
J - Elbow rest height	mm	190 to 211	204	Pass
K - Buttock to knee length	mm	579 to 604	587	Pass
L - Popliteal length	mm	429 to 455	438	Pass
M - Knee pivot height	mm	485 to 500	489	Pass
N - Buttock popliteal length	mm	452 to 477	472	Pass
O - Chest depth without jacket	mm	213 to 229	226	Pass
P - Foot length	mm	251 to 267	260	Pass
V - Shoulder breadth	mm	422 to 437	433	Pass
W - Foot breadth	mm	91 to 107	99	Pass
Y - Chest circumference (with chest jacket)	mm	970 to 1001	987	Pass
Z - Waist circumference	mm	836 to 866	864	Pass
AA - Location for chest circumference	mm	429 to 434	431	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
Overall Test Results			Pass	

Test Program: Hybrid III 50th Percentile Male Head Drop Test

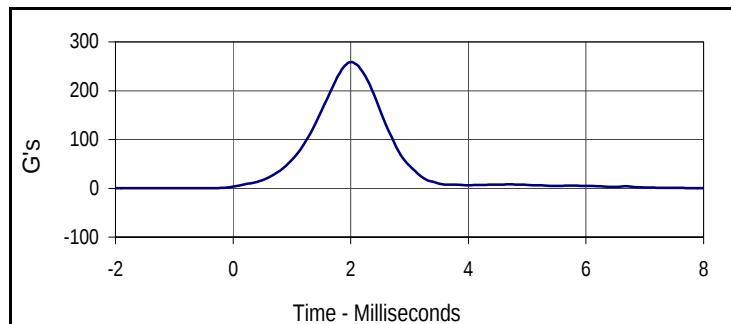
Test Date: 1/13/12

ATD Serial No.: 035

Test I.D.: M035HD030



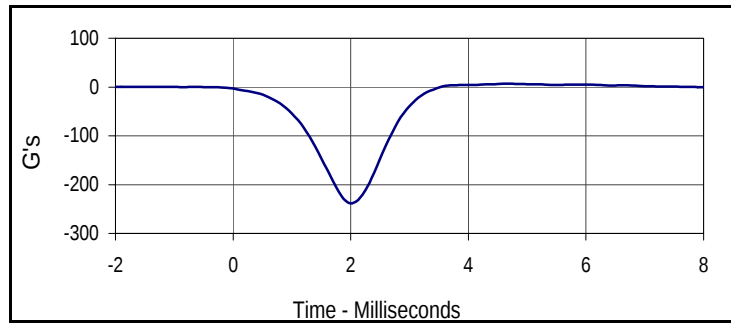
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	240	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Peak Resultant Acceleration		G's	225.0 to 275.0	258.8	Pass
Peak Lateral Acceleration		G's	≤15.0	7.2	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	3.1	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Overall Test Results				Pass	



Curve Description

Head Resultant

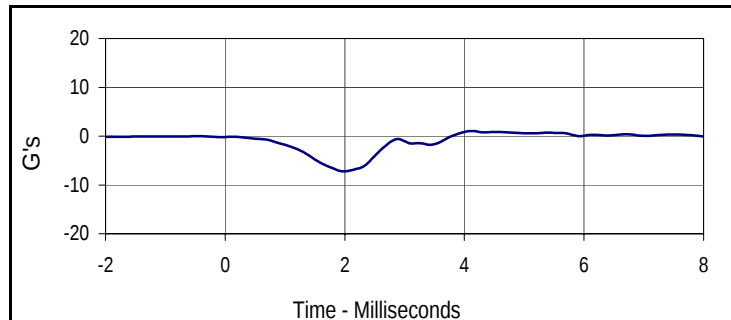
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
258.8	2.0	0.3	-1.9



Curve Description

Head X

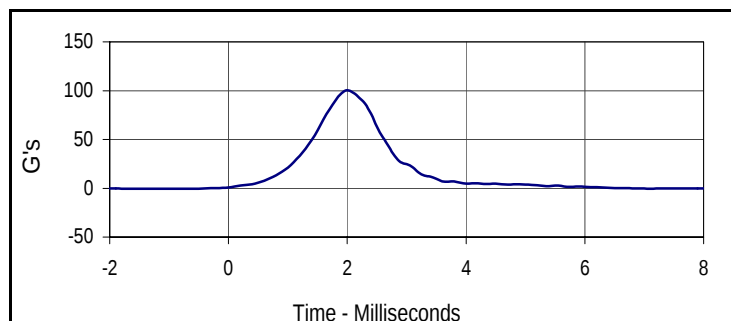
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
6.9	4.7	-238.4	2.0



Curve Description

Head Y

Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
1.0	4.1	-7.2	2.0



Curve Description

Head Z

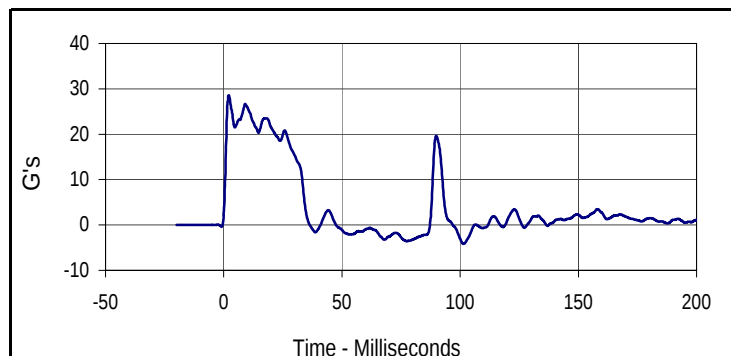
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
100.6	2.0	-0.6	-1.6

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 ATD Serial No.: 035

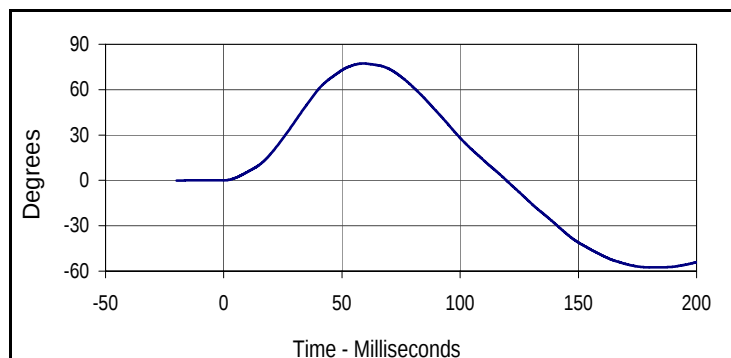
Test Date: 1/13/12
 Test I.D.: M035NF030



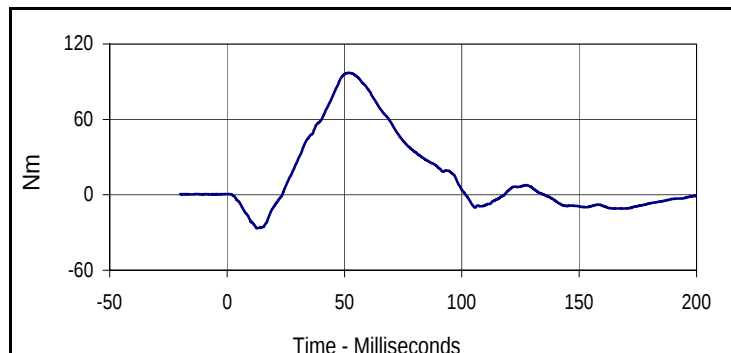
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	280	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.02	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	25.9	Pass
	20 Msec.	G's	17.6 to 22.6	21.6	Pass
	30 Msec.	G's	12.5 to 18.5	15.3	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	19.6	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	34.2	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	77.3	Pass
	Time	Msec.	57.0 to 64.0	59.0	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	119.6	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	97.0	Pass
	Time	Msec.	47.0 to 58.0	51.7	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	101.7	Pass
Overall Test Results					Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
28.6	2.1	-4.2	101.4



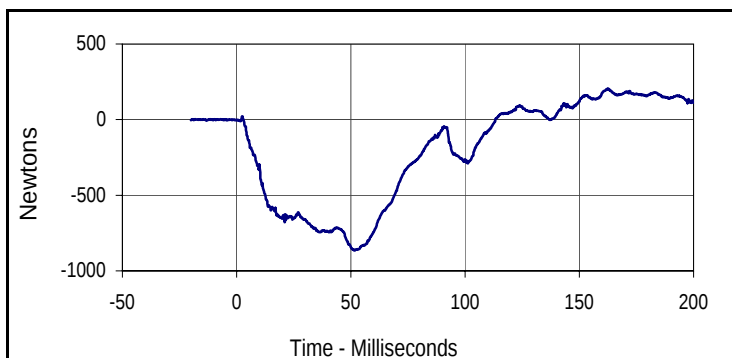
Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
77.3	59.0	-57.5	180.5



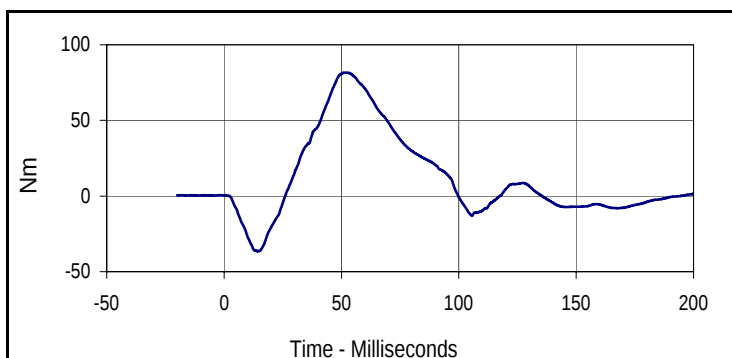
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
97.0	51.7	-26.6	12.6

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 ATD Serial No.: 035

Test Date: 1/13/12
 Test I.D.: M035NF030



Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
204.1	162.7	-863.7	51.7



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
81.7	52.2	-36.5	14.6

Test Program: Hybrid III 50th Percentile Male Neck Extension Test

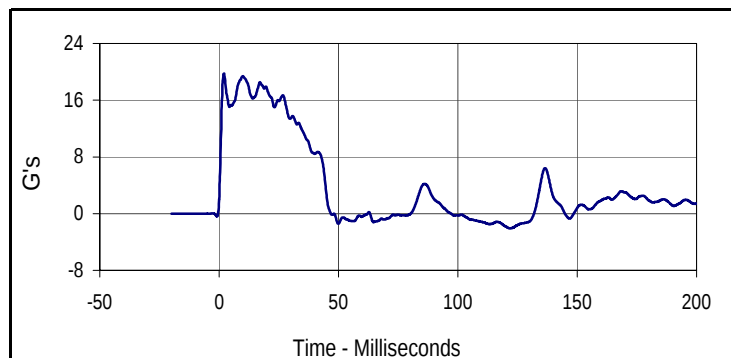
Test Date: 1/13/12

ATD Serial No.: 035

Test I.D.: M035NE030



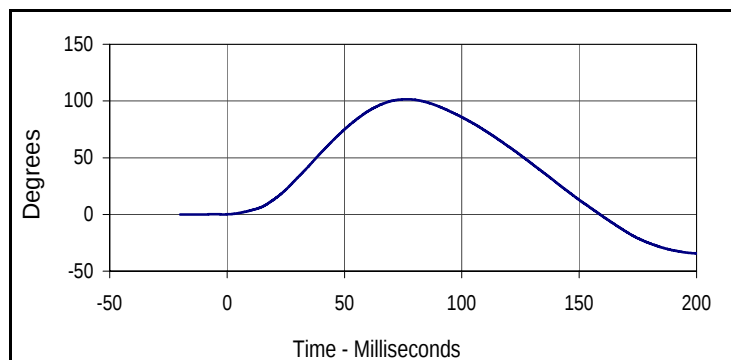
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	325	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.7	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.09	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	19.4	Pass
	20 Msec.	G's	14.0 to 19.0	17.6	Pass
	30 Msec.	G's	11.0 to 16.0	13.4	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	13.8	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	44.3	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	101.5	Pass
	Time	Msec.	72.0 to 82.0	76.7	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	158.9	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to -79.9	-67.7	Pass
	Time	Msec.	65.0 to 79.0	70.3	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	139.0	Pass
Overall Test Results					Pass



Curve Description

Pendulum Deceleration

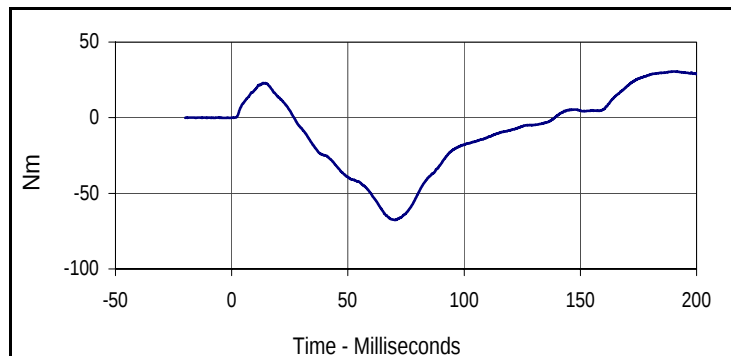
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
19.7	2.0	-2.1	121.8



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
101.5	76.7	-34.3	200.0



Curve Description

Moment About Occipital Condyle

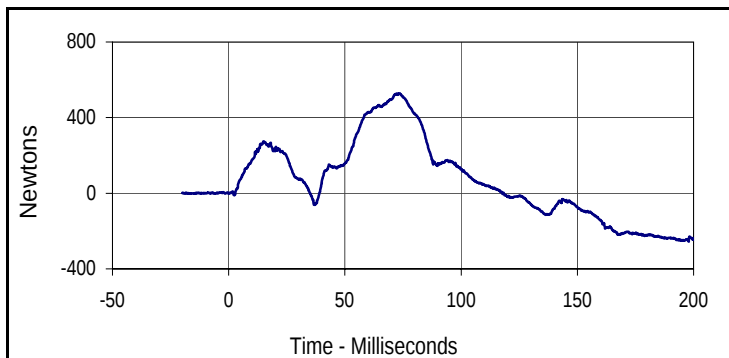
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
30.6	190.5	-67.7	70.3

Test Program: Hybrid III 50th Percentile Male Neck Extension Test

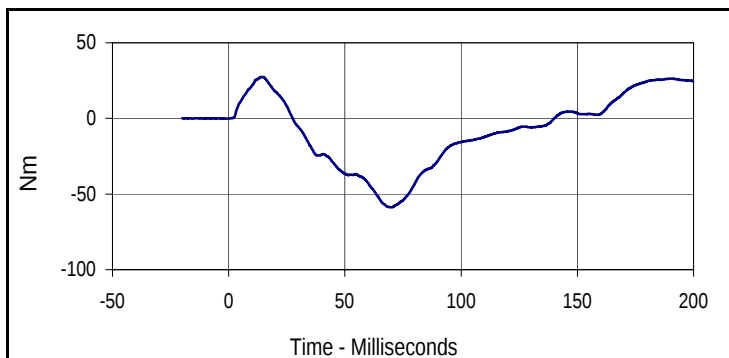
Test Date: 1/13/12

ATD Serial No.: 035

Test I.D.: M035NE030



Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
527.2	72.2	-255.9	197.9



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
27.5	13.6	-58.8	70.3

Test Program: Hybrid III 50th Percentile Male Thorax Impact Test

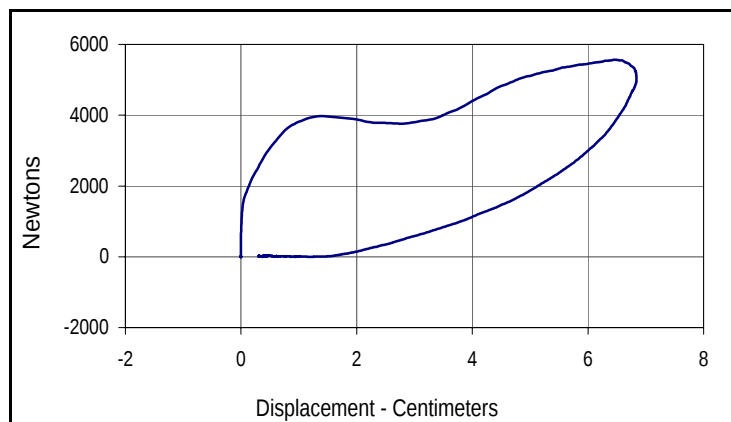
Test Date: 1/13/12

ATD Serial No.: 035

Test I.D.: M035CH030



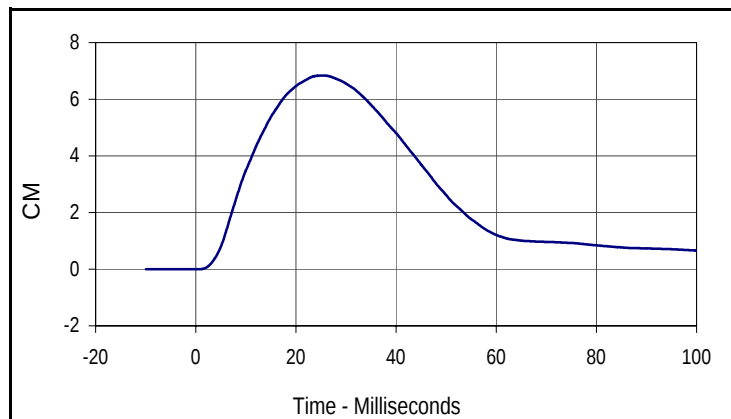
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	370	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Probe Velocity		m/s	6.58 to 6.82	6.74	Pass
Peak Probe Force		Newtons	5159 to 5893	5568	Pass
Peak Sternum Deflection		CM	6.35 to 7.26	6.84	Pass
Internal Hysteresis		%	69 to 85	71.7	Pass
Overall Test Results				Pass	



Curve Description

Probe Force vs. Chest Deflection

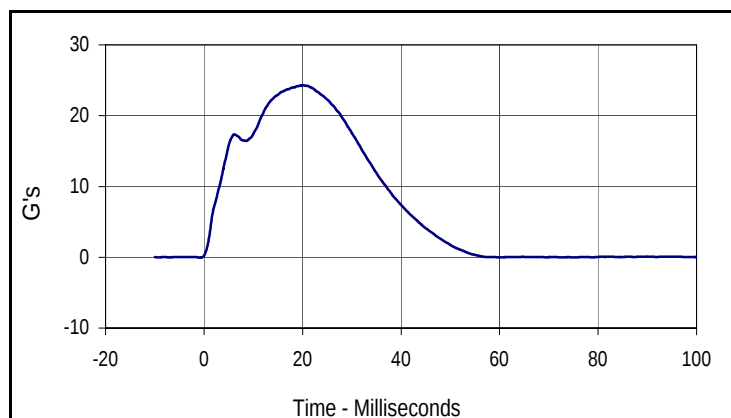
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	71.7
Peak Probe Force		Peak Chest Deflection	
5568		6.84	



Curve Description

Chest Deflection

Plot No.	Type	SAE Class	Units
002	FIL	180	CM
Max	Time	Min	Time
6.8	25.5	0.0	0.5



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
24.3	20.0	-0.1	-0.8

Test Program: Hybrid III 50th Percentile Male Knee Impact Test

Test Date: 1/13/12

ATD Serial No.: 035

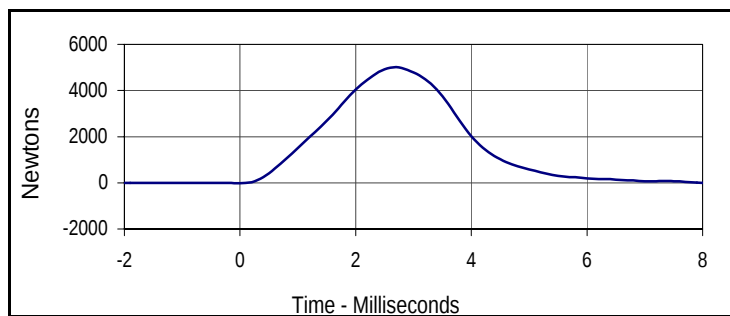
Test I.D.: M035LK030, M035RK030

**Left Knee**

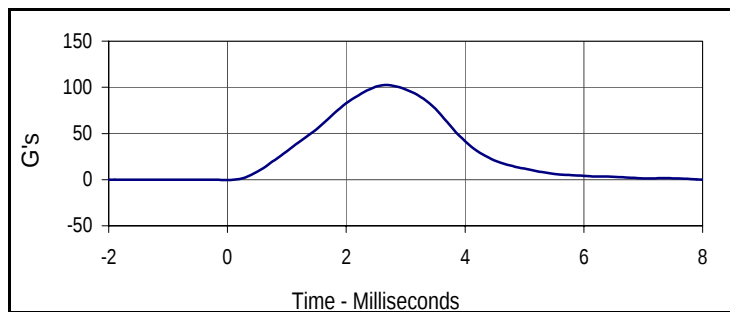
Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	395	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force		Newtons	4715 to 5782	5009	Pass
Overall Test Results					Pass

Right Knee

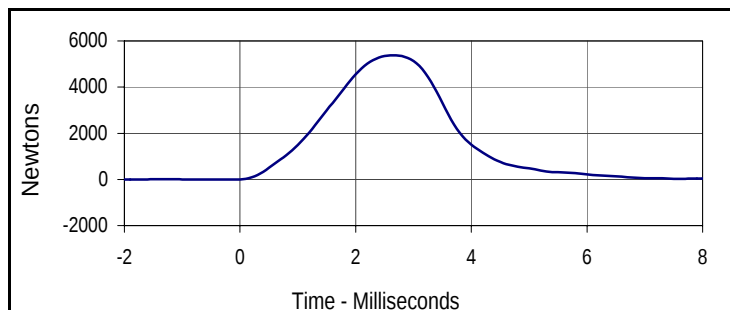
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	4715 to 5782	5381	Pass
Overall Test Results					Pass

**Curve Description****Left Knee Probe Force**

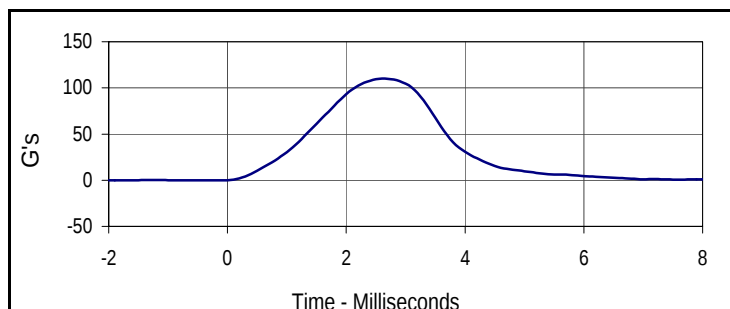
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5009.4	2.7	-61.2	9.0

**Curve Description****Left Knee Acceleration**

Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
102.4	2.7	-1.3	9.0

**Curve Description****Right Knee Probe Force**

Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
5380.7	2.6	-20.9	10.0

**Curve Description****Right Knee Acceleration**

Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
110.0	2.6	-0.4	10.0

Test Program: Hybrid III 50th Percentile Male Hip Joint-Femur Flexion Test

Test Date: 1/13/12

ATD Serial No.: 035

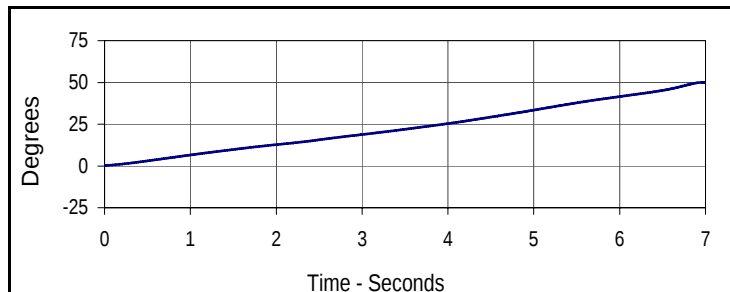
Test I.D.: M035LF030, M035RF030

**Left Hip Joint-Femur Results**

Tested Parameter		Units	Specification	Result	Pass/Fail
Hip Joint-Femur Assembly Soak Time		Minutes	≥240	425	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Rotation Rate		deg/sec	5 to 10	7.2	Pass
Femur Torque at 30°		Nm	≤ 95	88.1	Pass
Rotation at 203 Nm		Degrees	40.0 to 50.0	47.2	Pass
Overall Test Results					Pass

Right Hip Joint-Femur Results

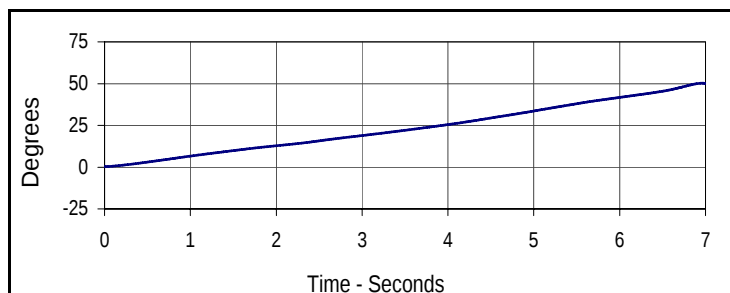
Rotation Rate		deg/sec	5 to 10	7.2	Pass
Femur Torque at 30°		Nm	≤ 95	88.6	Pass
Rotation at 203 Nm		Degrees	40.0 to 50.0	47.1	Pass
Overall Test Results					Pass

**Curve Description****Left Hip-Femur Rotation**

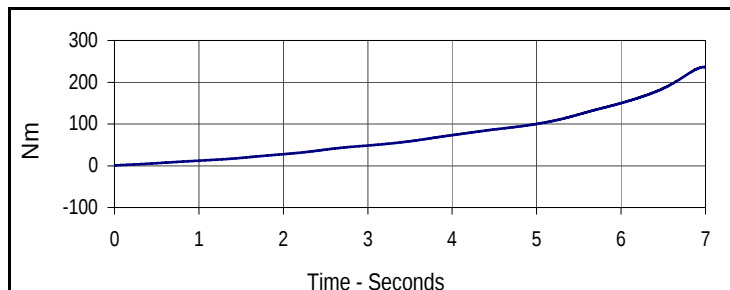
Plot No.	Type	SAE Class	Units
001	FIL	60	Degrees
Max	Time	Min	Time
50.0	7.0	0.2	0.0

**Curve Description****Left Femur Torque**

Plot No.	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
233.4	7.0	1.0	0.0

**Curve Description****Right Hip-Femur Rotation**

Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
50.2	7.0	0.2	0.0

**Curve Description****Right Femur Torque**

Plot No.	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
236.6	7.0	1.0	0.0

Test Program: Hybrid III 5th Percentile Female Dummy Damage Checklist

Test Date: 1/13/12

ATD Serial No.: 141

Test I.D.: N/A



Dummy Item	Inspect for	Comments	Damaged	OK
Entire Dummy	Perform general cleaning			X
Outer Skin	Gashes, rips, cracks			X
Head	Ballast secure			X
	General appearance			X
Neck	Broken or cracked rubber			X
	Upper neck bracket firmly attached to the lower neck bracket			X
	Looseness at the condyle joint			X
	Nodding blocks cracked or out of position			X
Spine	Broken or cracks in rubber			X
Ribs	Broken or bent ribs			X
	Broken or bent rib supports			X
	Damping material separated or cracked			X
	Rubber bumpers in place			X
Chest Displacement Assembly	Bent shaft			X
	Slider arm riding in track			X
Transducer Leads	Torn cables			X
Accelerometer Mountings	Head mounting secure			X
	Chest mounting secure			X
Knees	Skin condition			X
	Insert (do not remove)			X
	Casting			X
Limbs	Normal movement and adjustment			X
Knee Sliders	Wires intact			X
	Rubber returned to "at rest" position			X
Pelvis	Broken			X
Other				X

Describe the repair on repair or replacement of parts:

Test Program: Hybrid III 5th Percentile Female External Measurements

Test Date: 1/13/12

ATD Serial No.: 141

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.34	Pass
Laboratory Relative Humidity	%	10 to 70	31.5	Pass
A - Total sitting height	mm	774.7 to 800.1	782	Pass
B - Shoulder pivot height	mm	431.8 to 457.2	451	Pass
C - H point height	mm	81.3 to 86.3	84	Pass
D - H point location from backline	mm	144.8 to 149.8	145	Pass
E - Shoulder pivot from backline	mm	68.6 to 83.8	79	Pass
F - Thigh clearance	mm	119.4 to 134.6	126	Pass
G - Back of elbow to wrist pivot	mm	243.9 to 259.1	250	Pass
H - Head back to backline	mm	40.7 to 45.7	44	Pass
I - Shoulder to elbow length	mm	276.8 to 297.2	285	Pass
J - Elbow rest height	mm	182.8 to 203.2	196	Pass
K - Buttock to knee length	mm	520.7 to 546.1	529	Pass
L - Popliteal length	mm	355.6 to 376.0	372	Pass
M - Knee pivot height	mm	393.7 to 419.1	399	Pass
N - Buttock popliteal length	mm	414.0 to 439.4	420	Pass
O - Chest depth without jacket	mm	175.3 to 190.5	185	Pass
P - Foot length	mm	218.5 to 233.7	221	Pass
R - Buttock to Knee Pivot Length	mm	457.2 to 482.6	475	Pass
S - Head Breadth	mm	137.1 to 147.3	144	Pass
T - Head Depth	mm	177.8 to 188.0	180	Pass
U - Hip Breadth	mm	299.7 to 314.9	300	Pass
V - Shoulder breadth	mm	350.5 to 365.7	359	Pass
W - Foot breadth	mm	78.8 to 94.0	90	Pass
X - Head circumference	mm	528.3 to 548.7	540	Pass
Y - Chest circumference (with chest jacket)	mm	850.8 to 881.3	860	Pass
Z - Waist circumference	mm	759.5 to 789.9	766	Pass
AA - Location for chest circumference	mm	299.7 to 309.9	300	Pass
BB - Location for waist circumference	mm	160.1 to 170.2	164	Pass
Overall Test Results				Pass

Test Program: Hybrid III 5th Percentile Female Head Drop Test

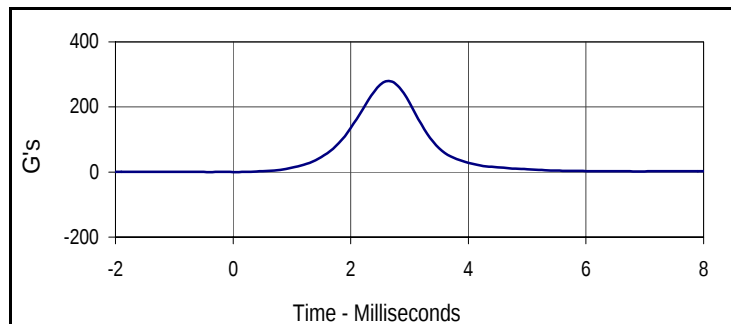
Test Date: 1/13/12

ATD Serial No.: 141

Test I.D.: F141HD032



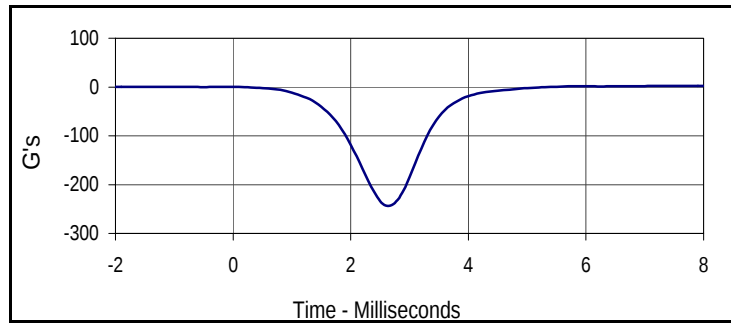
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	300	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.2	Pass
Peak Resultant Acceleration		G's	250.0 to 300.0	278.6	Pass
Peak Lateral Acceleration		G's	≤15.0	4.1	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	1.1	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Overall Test Results				Pass	



Curve Description

Head Resultant

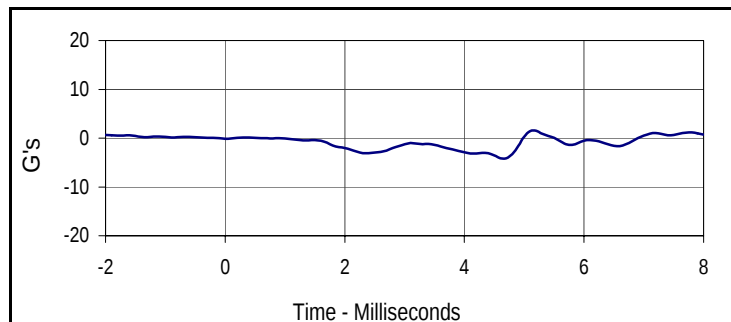
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
278.6	2.6	0.1	0.1



Curve Description

Head X

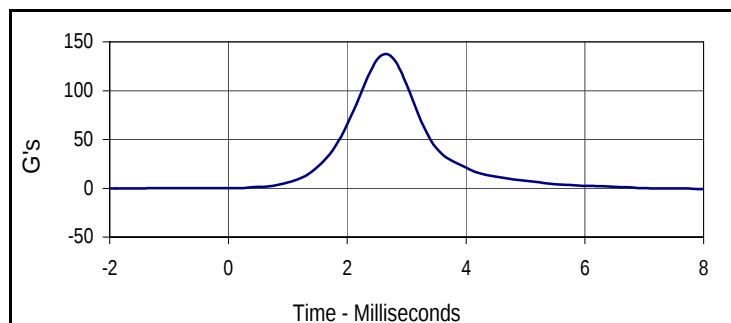
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.6	5.9	-242.7	2.6



Curve Description

Head Y

Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
1.5	5.2	-4.1	4.7



Curve Description

Head Z

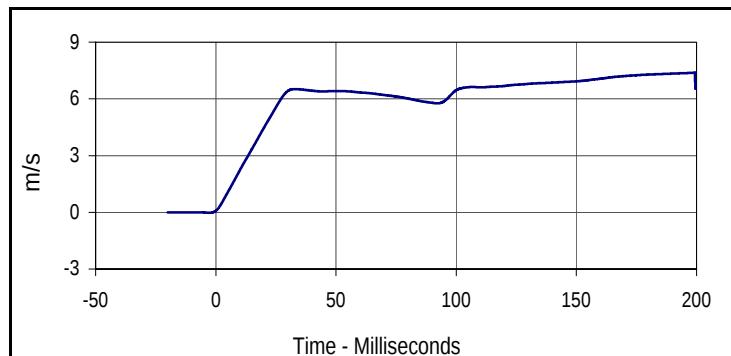
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
136.9	2.6	-0.2	-2.0

Test Program: Hybrid III 5th Percentile Female Neck Flexion Test
 ATD Serial No.: 141

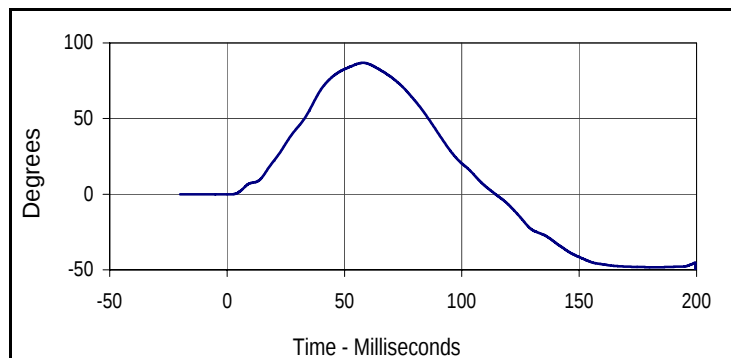
Test Date: 1/13/12
 Test I.D.: F141NF032



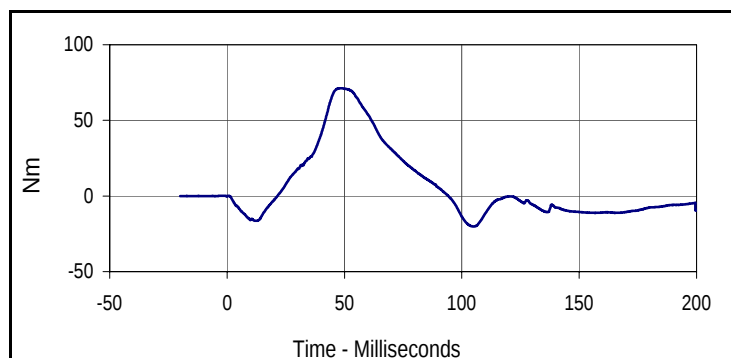
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	335	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.94	Pass
Pendulum Deceleration	10 Msec.	m/s	2.1 to 2.5	2.2	Pass
	20 Msec.	m/s	4.0 to 5.0	4.5	Pass
	30 Msec.	m/s	5.8 to 7.0	6.4	Pass
"D" Plane Rotation	Max	Degrees	77.0 to 91.0	86.9	Pass
Peak Moment in Rotation	Max	Nm	69.0 to 83.0	71.3	Pass
Positive Moment Decay, Time To 10 Nm		Msec.	80.0 to 100.0	85.1	Pass
Overall Test Results				Pass	



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
7.4	199.4	0.0	-2.6



Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
86.9	57.9	-53.8	199.5



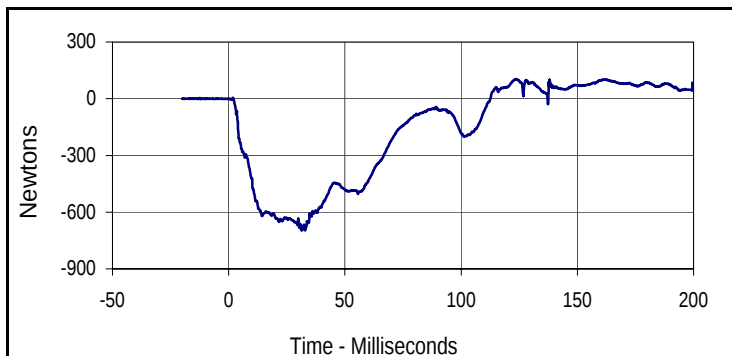
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
71.3	48.4	-20.1	104.9

Test Program: Hybrid III 5th Percentile Female Neck Flexion Test

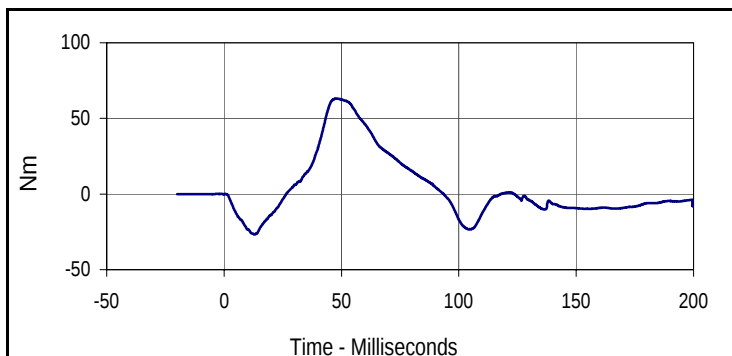
ATD Serial No.: 141

Test Date: 1/13/12

Test I.D.: F141NF032



Curve Description			
Upper Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
103.5	123.6	-696.9	31.5



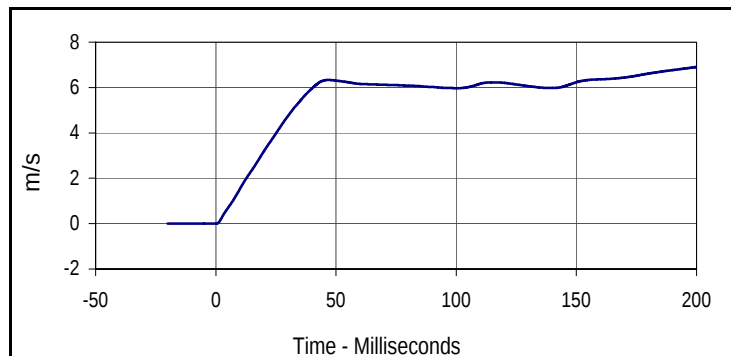
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
63.1	47.9	-26.7	12.9

Test Program: Hybrid III 5th Percentile Female Neck Extension Test
 ATD Serial No.: 141

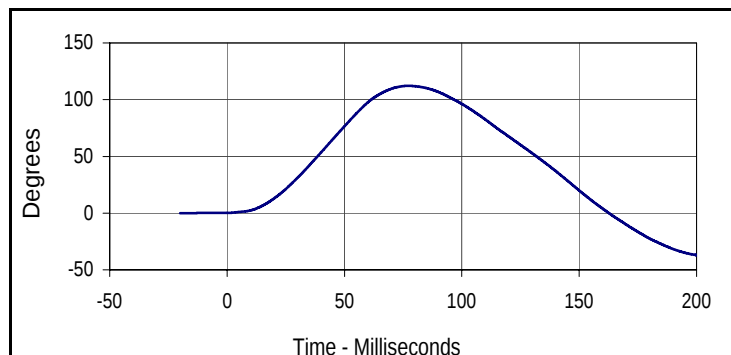
Test Date: 1/13/12
 Test I.D.: F141NE032



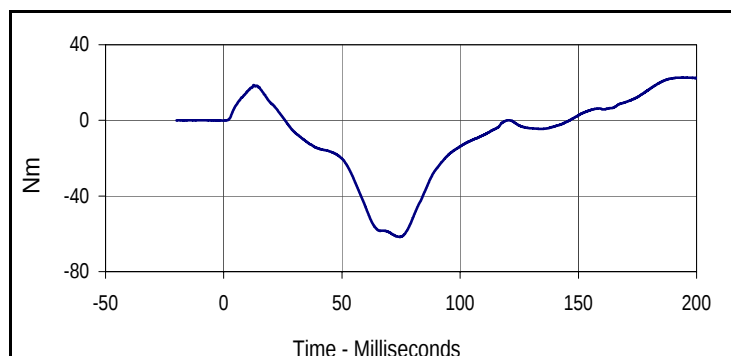
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	365	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 Msec.	m/s	1.5 to 1.9	1.5	Pass
	20 Msec.	m/s	3.1 to 3.9	3.2	Pass
	30 Msec.	m/s	4.6 to 5.6	4.7	Pass
"D" Plane Rotation	Max	Degrees	99.0 to 114.0	112.2	Pass
Peak Moment in Rotation	Max	Nm	-53.0 to -65.0	-61.6	Pass
Positive Moment Decay, Time To -10 Nm		Msec.	94.0 to 114.0	106.0	Pass
Overall Test Results				Pass	



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
6.9	200.0	0.0	-0.3



Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
112.2	77.2	-37.0	200.0



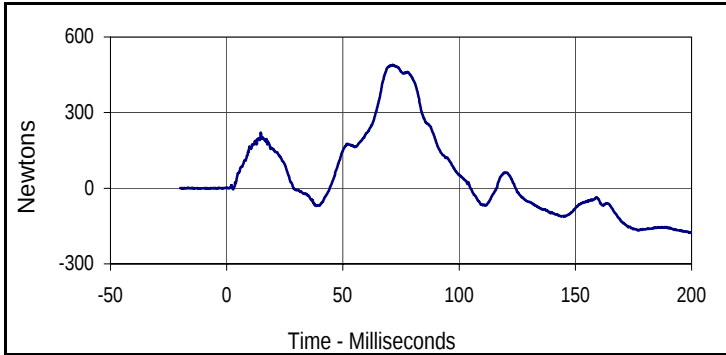
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
22.7	195.8	-61.6	74.5

Test Program: Hybrid III 5th Percentile Female Neck Extension Test

ATD Serial No.: 141

Test Date: 1/13/12

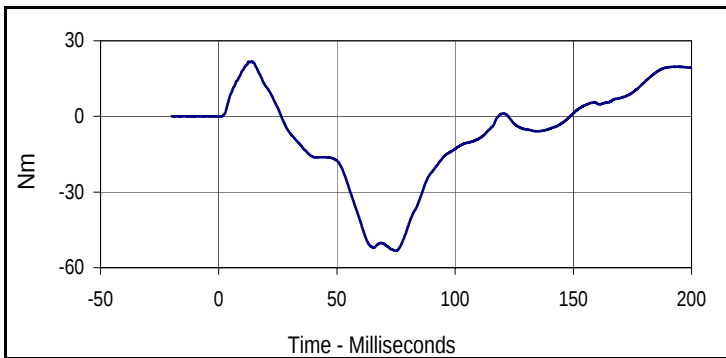
Test I.D.: F141NE032



Curve Description

Upper Neck Force X

Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
490.2	71.4	-176.3	199.4



Curve Description

Neck Moment Y

Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
21.9	14.0	-53.3	74.8

Test Program: Hybrid III 5th Percentile Female Thorax Impact Test

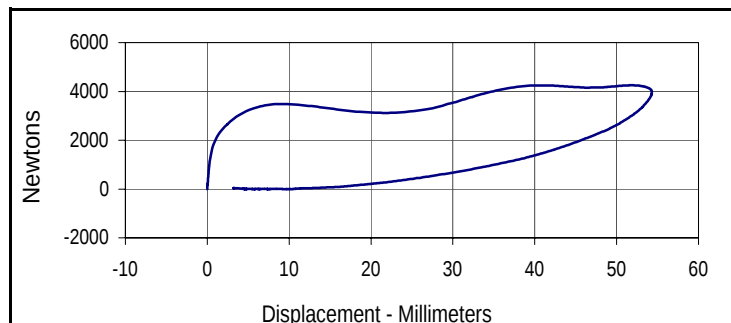
Test Date: 1/13/12

ATD Serial No.: 141

Test I.D.: F141CH032



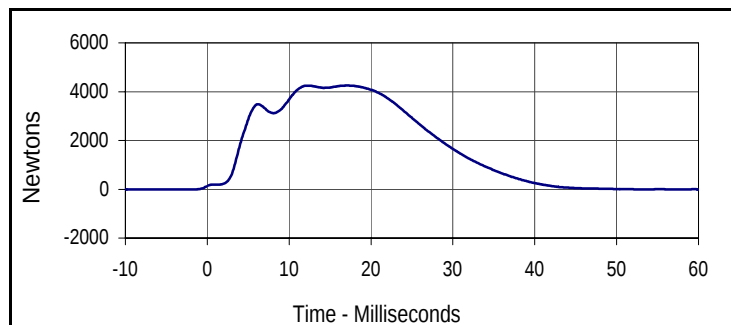
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	405	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Probe Velocity		m/s	6.59 to 6.83	6.73	Pass
Peak Chest Deflection		mm	50.0 to 58.0	54.3	Pass
Peak Force Between 50 and 58 MM		Newtons	3900 to 4400	4248	Pass
Peak Force Between 18 and 50 MM		Newtons	≤4600	4253	Pass
Internal Hysteresis		%	69 to 85	75.3	Pass
Overall Test Results					Pass



Curve Description

Probe Force vs. Chest Deflection

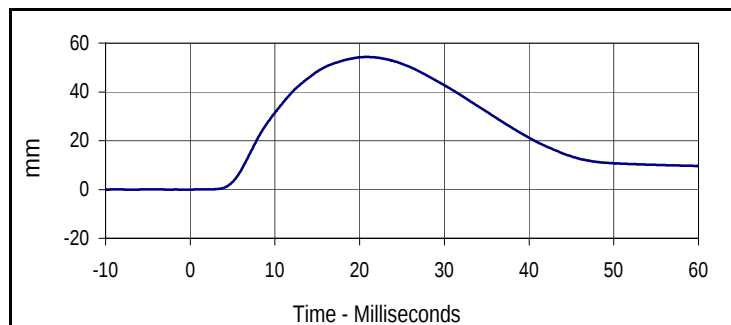
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	75.3
Peak Probe Force		Peak Chest Deflection	
4252.9		54.3	



Curve Description

Probe Force

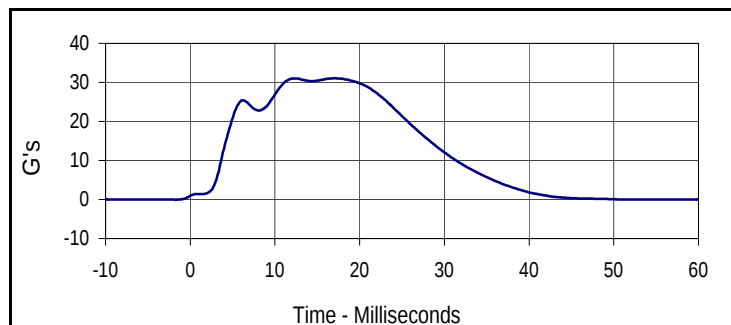
Plot No.	Type	SAE Class	Units
002	FIL	180	Newtons
Max	Time	Min	Time
4252.9	17.1	-7.1	61.1



Curve Description

Chest Deflection

Plot No.	Type	SAE Class	Units
003	FIL	600	mm
Max	Time	Min	Time
54.3	20.8	0.0	-0.1



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
31.0	17.1	-0.1	61.1

Test Program: Hybrid III 5th Percentile Female Knee Impact Test

Test Date: 1/13/12

ATD Serial No.: 141

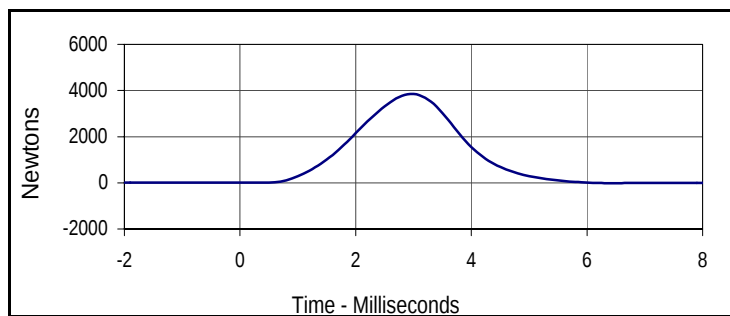
Test I.D.: F141LK032, F141LK032

**Left Knee**

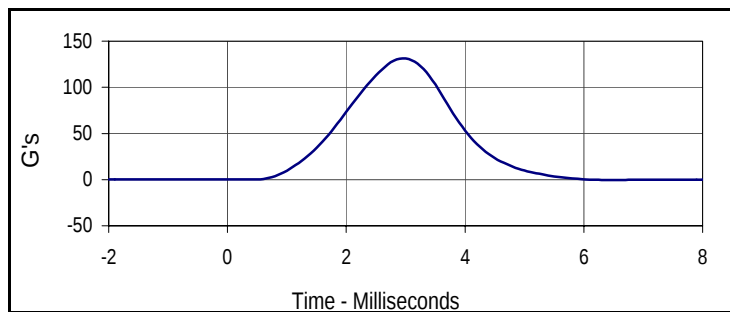
Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	440	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force		Newtons	3450 to 4060	3844	Pass
Overall Test Results				Pass	

Right Knee

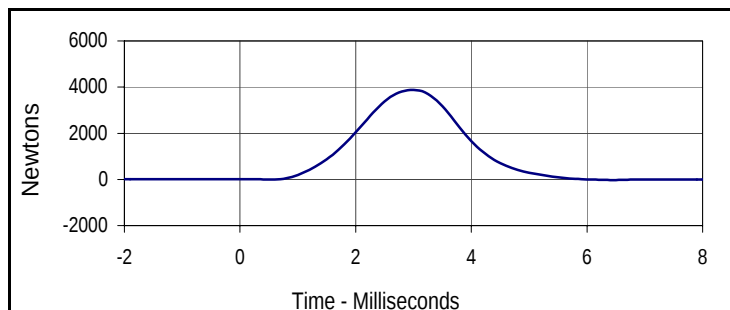
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force		Newtons	3450 to 4060	3884	Pass
Overall Test Results				Pass	

**Curve Description****Left Knee Probe Force**

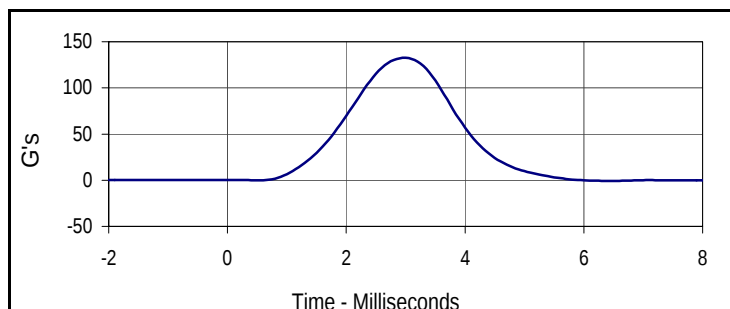
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3844.0	3.0	-16.8	9.7

**Curve Description****Left Knee Acceleration**

Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
131.1	3.0	-0.6	9.7

**Curve Description****Right Knee Probe Force**

Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
3883.8	3.0	-26.3	6.4

**Curve Description****Right Knee Acceleration**

Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
132.5	3.0	-0.9	6.4

Test Program: Hybrid III 5th Percentile Female Torso Flexion Test

Test Date: 1/13/12

ATD Serial No.: 141

Test I.D.: F141TF032

**Left Hip Joint-Femur Results**

Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	480	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Initial Reference Plane Angle		Degrees	≤ 20	8.9	Pass
Peak Force at 45° +/-0.5°		Newtons	320.0 to 390.0	345.2	Pass
Torso Rotation Rate		deg/sec	0.5 to 1.5	1.0	Pass
Final Reference Plane Angle		Degrees	+/-8	3.7	Pass
Overall Test Results					Pass

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

Test Program: Hybrid III 50th Percentile Male Dummy Damage Checklist

Test Date: 1/16/12

ATD Serial No.: 035

Test I.D.: N/A



Dummy Item	Inspect for	Comments	Damaged	OK
Entire Dummy	Perform general cleaning			X
Outer Skin	Gashes, rips, cracks			X
Head	Ballast secure			X
	General appearance			X
Neck	Broken or cracked rubber			X
	Upper neck bracket firmly attached to the lower neck bracket			X
	Looseness at the condyle joint			X
	Nodding blocks cracked or out of position			X
Spine	Broken or cracks in rubber			X
Ribs	Broken or bent ribs			X
	Broken or bent rib supports			X
	Damping material separated or cracked			X
	Rubber bumpers in place			X
Chest Displacement Assembly	Bent shaft			X
	Slider arm riding in track			X
Transducer Leads	Torn cables			X
Accelerometer Mountings	Head mounting secure			X
	Chest mounting secure			X
Knees	Skin condition			X
	Insert (do not remove)			X
	Casting			X
Limbs	Normal movement and adjustment			X
Knee Sliders	Wires intact			X
	Rubber returned to "at rest" position			X
Pelvis	Broken			X
Other				X

Describe the repair on repair or replacement of parts:

Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 1/16/12

ATD Serial No.: 035

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.22	Pass
Laboratory Relative Humidity	%	10 to 70	29.6	Pass
A - Total sitting height	mm	879 to 889	885	Pass
B - Shoulder pivot height	mm	505 to 521	516	Pass
C - H point height	mm	84 to 89	87	Pass
D - H point location from backline	mm	135 to 140	138	Pass
E - Shoulder pivot from backline	mm	84 to 94	87	Pass
F - Thigh clearance	mm	140 to 155	148	Pass
G - Back of elbow to wrist pivot	mm	290 to 305	298	Pass
H - Head back to backline	mm	41 to 46	44	Pass
I - Shoulder to elbow length	mm	330 to 345	335	Pass
J - Elbow rest height	mm	190 to 211	204	Pass
K - Buttock to knee length	mm	579 to 604	586	Pass
L - Popliteal length	mm	429 to 455	438	Pass
M - Knee pivot height	mm	485 to 500	489	Pass
N - Buttock popliteal length	mm	452 to 477	472	Pass
O - Chest depth without jacket	mm	213 to 229	226	Pass
P - Foot length	mm	251 to 267	260	Pass
V - Shoulder breadth	mm	422 to 437	433	Pass
W - Foot breadth	mm	91 to 107	99	Pass
Y - Chest circumference (with chest jacket)	mm	970 to 1001	986	Pass
Z - Waist circumference	mm	836 to 866	864	Pass
AA - Location for chest circumference	mm	429 to 434	431	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
Overall Test Results			Pass	

Test Program: Hybrid III 50th Percentile Male Head Drop Test

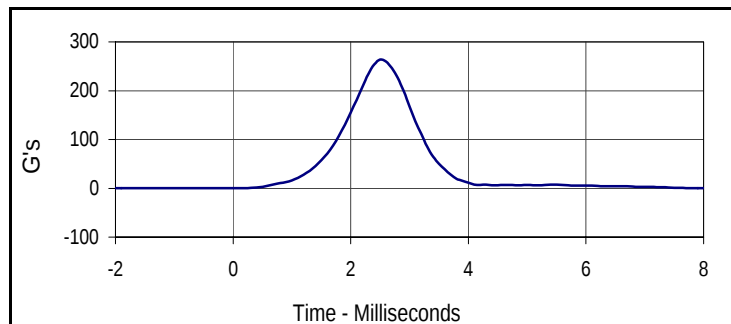
Test Date: 1/16/12

ATD Serial No.: 035

Test I.D.: M035HD031



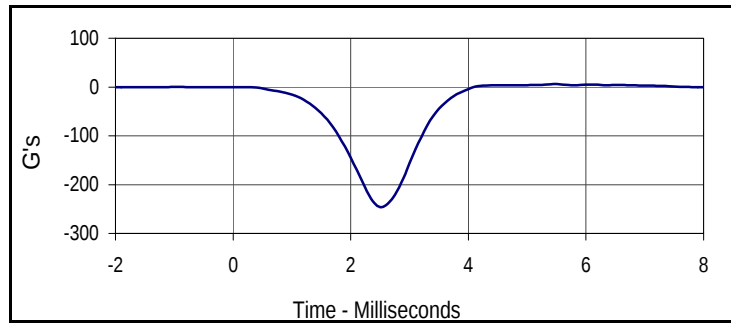
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	245	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Peak Resultant Acceleration		G's	225.0 to 275.0	264.1	Pass
Peak Lateral Acceleration		G's	≤15.0	6.3	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	4.3	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Overall Test Results				Pass	



Curve Description

Head Resultant

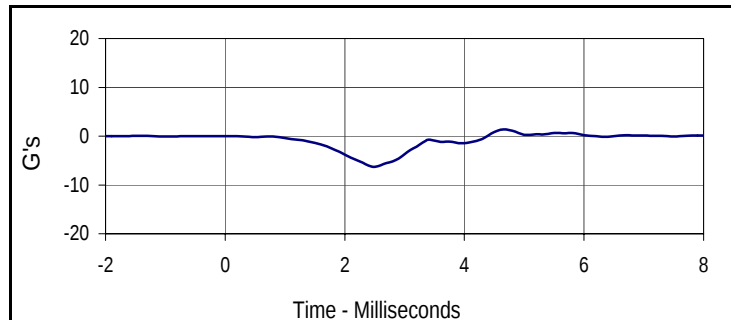
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
264.1	2.5	0.1	-0.1



Curve Description

Head X

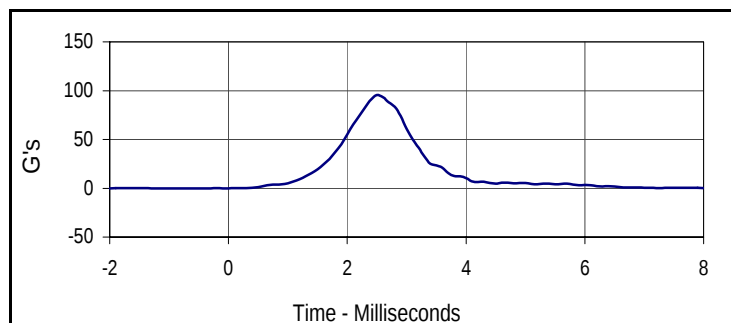
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
6.0	5.5	-246.1	2.5



Curve Description

Head Y

Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
1.4	4.7	-6.3	2.5



Curve Description

Head Z

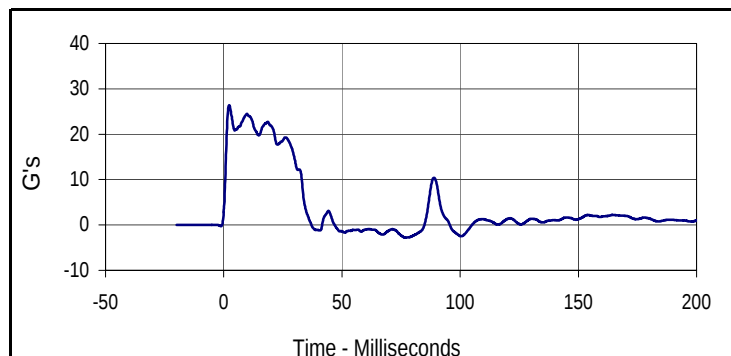
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
95.6	2.5	-0.2	-0.9

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 ATD Serial No.: 035

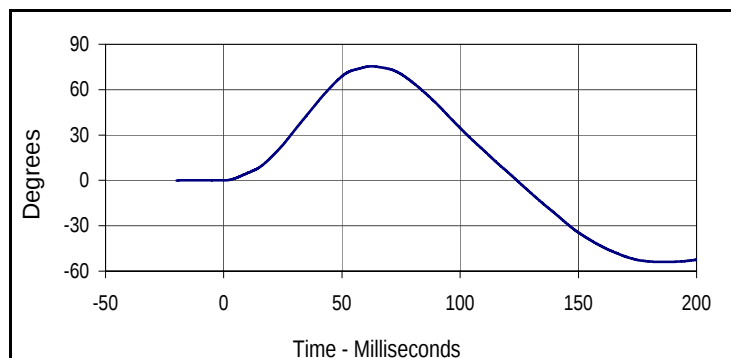
Test Date: 1/16/12
 Test I.D.: M035NF031



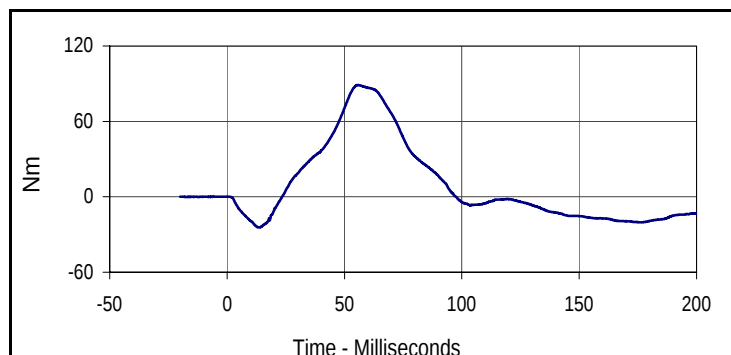
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	285	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.02	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	24.4	Pass
	20 Msec.	G's	17.6 to 22.6	21.8	Pass
	30 Msec.	G's	12.5 to 18.5	14.5	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	14.5	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	34.1	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	75.5	Pass
	Time	Msec.	57.0 to 64.0	62.6	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	124	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	89.0	Pass
	Time	Msec.	47.0 to 58.0	55.9	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	97.6	Pass
Overall Test Results					Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
26.4	2.3	-2.8	76.8



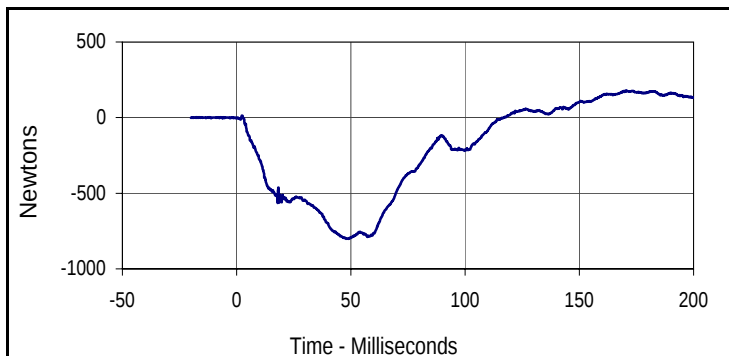
Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
75.5	62.6	-53.9	185.7



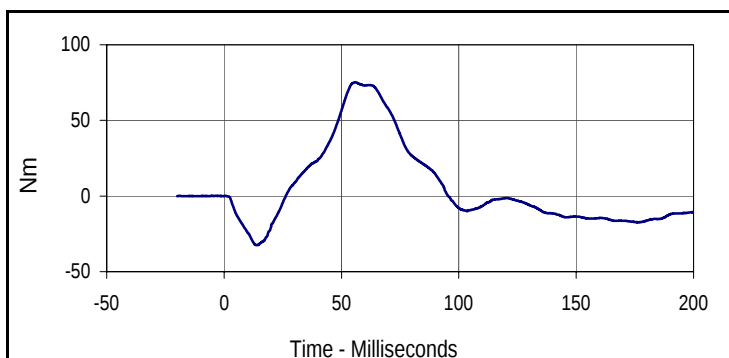
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
89.0	55.9	-24.4	13.4

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 ATD Serial No.: 035

Test Date: 1/16/12
 Test I.D.: M035NF031



Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
180.6	170.6	-801.5	47.8



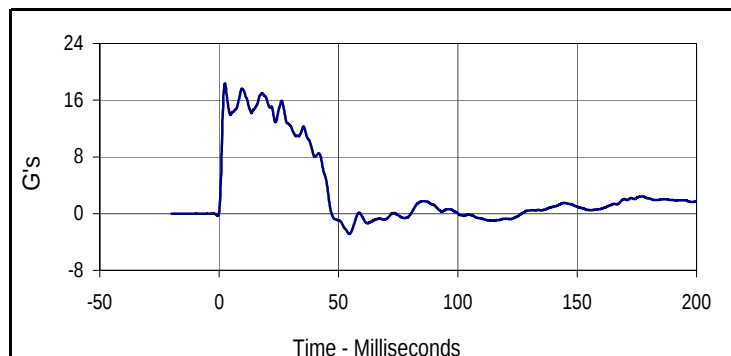
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
75.2	55.9	-32.5	13.9

Test Program: Hybrid III 50th Percentile Male Neck Extension Test
 ATD Serial No.: 035

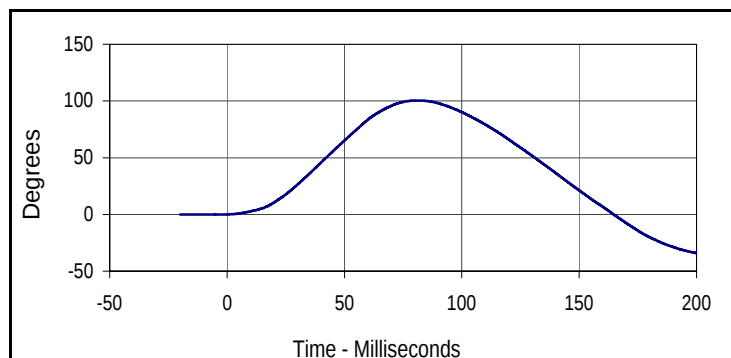
Test Date: 1/16/12
 Test I.D.: M035NE031



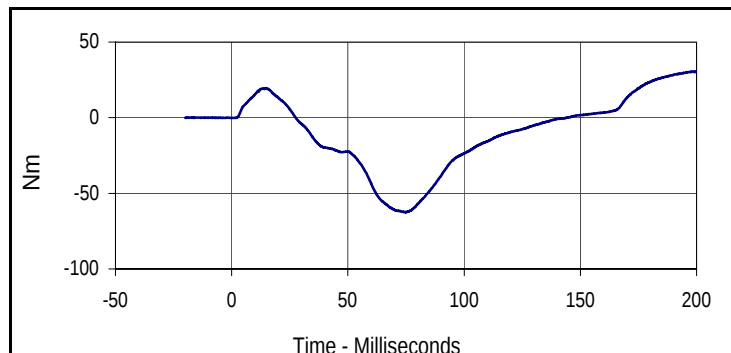
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	305	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Velocity		m/s	5.94 to 6.19	5.96	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.5	Pass
	20 Msec.	G's	14.0 to 19.0	16.0	Pass
	30 Msec.	G's	11.0 to 16.0	12.3	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	12.3	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	44.7	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	100.4	Pass
	Time	Msec.	72.0 to 82.0	80.9	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	164.7	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to -79.9	-62.5	Pass
	Time	Msec.	65.0 to 79.0	74.9	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	144.2	Pass
Overall Test Results					Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
18.4	2.4	-2.8	54.6



Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
100.4	80.9	-34.1	200.0



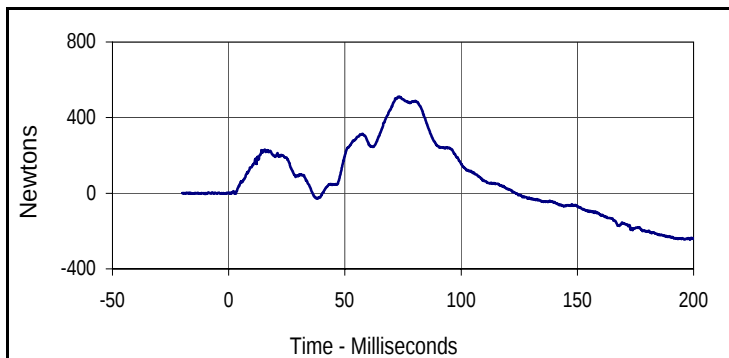
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
30.6	198.4	-62.5	74.9

Test Program: Hybrid III 50th Percentile Male Neck Extension Test

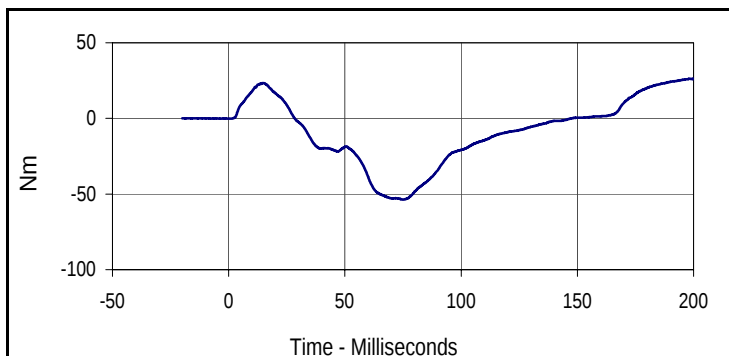
Test Date: 1/16/12

ATD Serial No.: 035

Test I.D.: M035NE031



Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
511.2	73.2	-246.2	198.4



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
26.3	198.3	-53.6	74.9

Test Program: Hybrid III 50th Percentile Male Thorax Impact Test

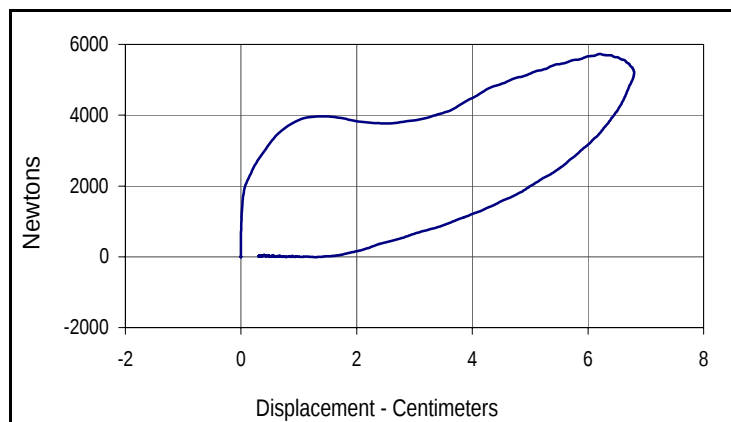
Test Date: 1/16/12

ATD Serial No.: 035

Test I.D.: M035CH031



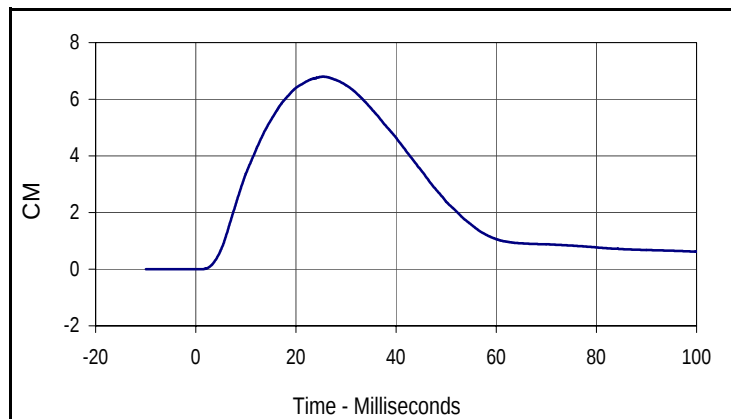
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	345	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Probe Velocity		m/s	6.58 to 6.82	6.73	Pass
Peak Probe Force		Newtons	5159 to 5893	5726	Pass
Peak Sternum Deflection		CM	6.35 to 7.26	6.80	Pass
Internal Hysteresis		%	69 to 85	70.9	Pass
Overall Test Results				Pass	



Curve Description

Probe Force vs. Chest Deflection

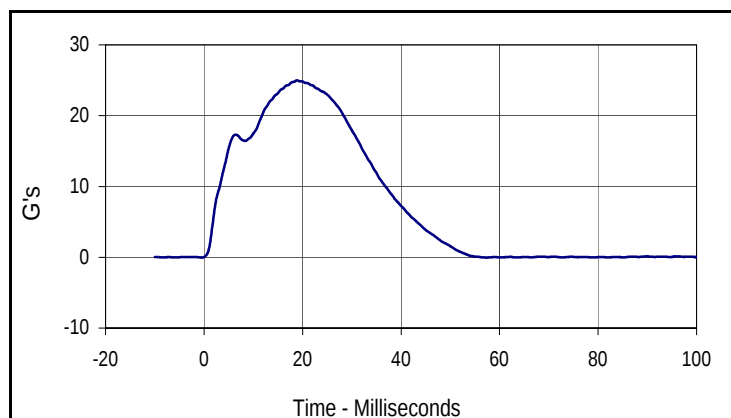
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	70.9
Peak Probe Force		Peak Chest Deflection	
5726		6.80	



Curve Description

Chest Deflection

Plot No.	Type	SAE Class	Units
002	FIL	180	CM
Max	Time	Min	Time
6.8	25.5	0.0	1.0



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
25.0	18.9	0.0	57.3

Test Program: Hybrid III 50th Percentile Male Knee Impact Test
 ATD Serial No.: 035

Test Date: 1/16/12
 Test I.D.: M035LK031, M035RK031

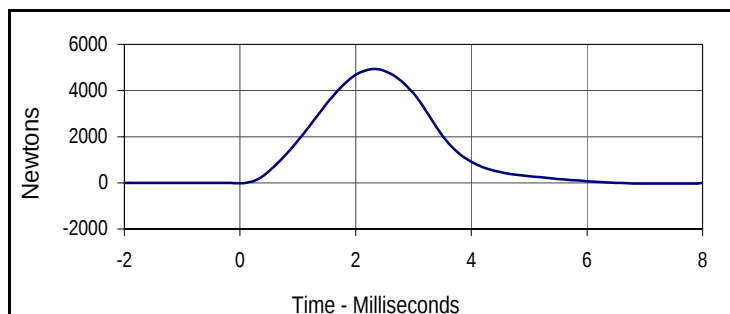


Left Knee

Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	385	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	4715 to 5782	4926	Pass
Overall Test Results					Pass

Right Knee

Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	4715 to 5782	4932	Pass
Overall Test Results					Pass



Curve Description

Left Knee Probe Force

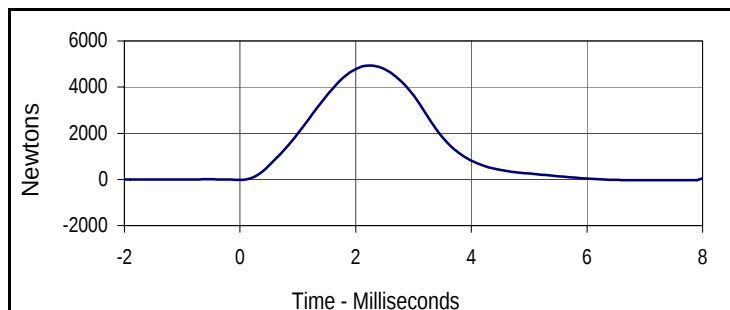
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4925.9	2.3	-61.2	9.0



Curve Description

Left Knee Acceleration

Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
100.7	2.3	-1.3	9.0



Curve Description

Right Knee Probe Force

Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
4932.0	2.2	-35.1	7.8



Curve Description

Right Knee Acceleration

Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
100.8	2.2	-0.7	7.8

Test Program: Hybrid III 50th Percentile Male Hip Joint-Femur Flexion Test

Test Date: 1/16/12

ATD Serial No.: 035

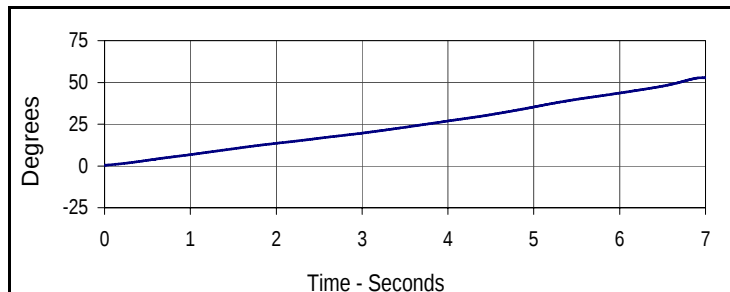
Test I.D.: M035LF031, M035RF031

**Left Hip Joint-Femur Results**

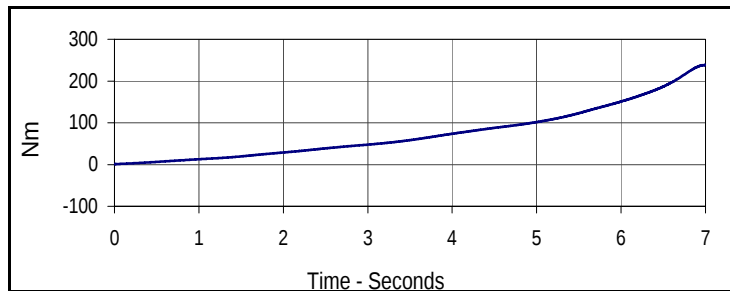
Tested Parameter		Units	Specification	Result	Pass/Fail
Hip Joint-Femur Assembly Soak Time		Minutes	≥240	420	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Rotation Rate		deg/sec	5 to 10	7.6	Pass
Femur Torque at 30°		Nm	≤ 95	85.6	Pass
Rotation at 203 Nm		Degrees	40.0 to 50.0	49.5	Pass
Overall Test Results					Pass

Right Hip Joint-Femur Results

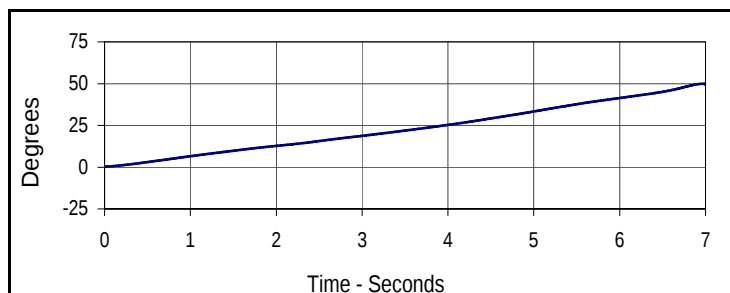
Rotation Rate		deg/sec	5 to 10	7.2	Pass
Femur Torque at 30°		Nm	≤ 95	88.0	Pass
Rotation at 203 Nm		Degrees	40.0 to 50.0	47.2	Pass
Overall Test Results					Pass

**Curve Description****Left Hip-Femur Rotation**

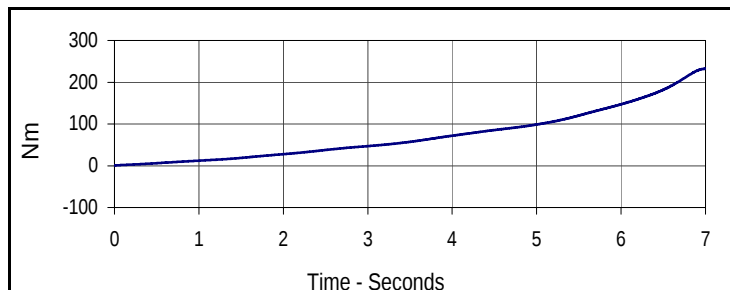
Plot No.	Type	SAE Class	Units
001	FIL	60	Degrees
Max	Time	Min	Time
52.8	7.0	0.4	0.0

**Curve Description****Left Femur Torque**

Plot No.	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
238.3	7.0	1.0	0.0

**Curve Description****Right Hip-Femur Rotation**

Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
49.9	7.0	0.2	0.0

**Curve Description****Right Femur Torque**

Plot No.	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
232.2	7.0	1.0	0.0

Test Program: Hybrid III 5th Percentile Female Dummy Damage Checklist

Test Date: 1/14/12

ATD Serial No.: 141

Test I.D.: N/A



Dummy Item	Inspect for	Comments	Damaged	OK
Entire Dummy	Perform general cleaning			X
Outer Skin	Gashes, rips, cracks			X
Head	Ballast secure			X
	General appearance			X
Neck	Broken or cracked rubber			X
	Upper neck bracket firmly attached to the lower neck bracket			X
	Looseness at the condyle joint			X
	Nodding blocks cracked or out of position			X
Spine	Broken or cracks in rubber			X
Ribs	Broken or bent ribs			X
	Broken or bent rib supports			X
	Damping material separated or cracked			X
	Rubber bumpers in place			X
Chest Displacement Assembly	Bent shaft			X
	Slider arm riding in track			X
Transducer Leads	Torn cables			X
Accelerometer Mountings	Head mounting secure			X
	Chest mounting secure			X
Knees	Skin condition			X
	Insert (do not remove)			X
	Casting			X
Limbs	Normal movement and adjustment			X
Knee Sliders	Wires intact			X
	Rubber returned to "at rest" position			X
Pelvis	Broken			X
Other				X

Describe the repair on repair or replacement of parts:

Test Program: Hybrid III 5th Percentile Female External Measurements

Test Date: 1/14/12

ATD Serial No.: 141

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.18	Pass
Laboratory Relative Humidity	%	10 to 70	30.0	Pass
A - Total sitting height	mm	774.7 to 800.1	782	Pass
B - Shoulder pivot height	mm	431.8 to 457.2	451	Pass
C - H point height	mm	81.3 to 86.3	84	Pass
D - H point location from backline	mm	144.8 to 149.8	145	Pass
E - Shoulder pivot from backline	mm	68.6 to 83.8	79	Pass
F - Thigh clearance	mm	119.4 to 134.6	126	Pass
G - Back of elbow to wrist pivot	mm	243.9 to 259.1	250	Pass
H - Head back to backline	mm	40.7 to 45.7	44	Pass
I - Shoulder to elbow length	mm	276.8 to 297.2	285	Pass
J - Elbow rest height	mm	182.8 to 203.2	196	Pass
K - Buttock to knee length	mm	520.7 to 546.1	529	Pass
L - Popliteal length	mm	355.6 to 376.0	372	Pass
M - Knee pivot height	mm	393.7 to 419.1	399	Pass
N - Buttock popliteal length	mm	414.0 to 439.4	420	Pass
O - Chest depth without jacket	mm	175.3 to 190.5	185	Pass
P - Foot length	mm	218.5 to 233.7	221	Pass
R - Buttock to Knee Pivot Length	mm	457.2 to 482.6	475	Pass
S - Head Breadth	mm	137.1 to 147.3	144	Pass
T - Head Depth	mm	177.8 to 188.0	180	Pass
U - Hip Breadth	mm	299.7 to 314.9	300	Pass
V - Shoulder breadth	mm	350.5 to 365.7	359	Pass
W - Foot breadth	mm	78.8 to 94.0	90	Pass
X - Head circumference	mm	528.3 to 548.7	540	Pass
Y - Chest circumference (with chest jacket)	mm	850.8 to 881.3	860	Pass
Z - Waist circumference	mm	759.5 to 789.9	766	Pass
AA - Location for chest circumference	mm	299.7 to 309.9	300	Pass
BB - Location for waist circumference	mm	160.1 to 170.2	164	Pass
Overall Test Results				Pass

Test Program: Hybrid III 5th Percentile Female Head Drop Test

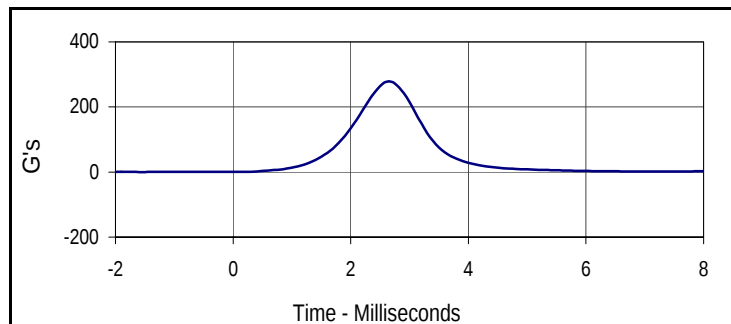
Test Date: 1/14/12

ATD Serial No.: 141

Test I.D.: F141HD033



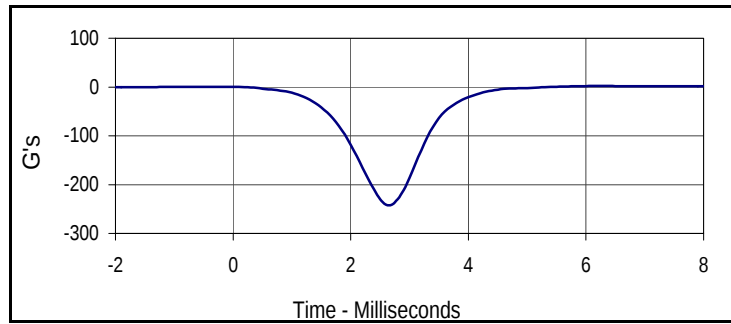
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	330	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.1	Pass
Peak Resultant Acceleration		G's	250.0 to 300.0	277.0	Pass
Peak Lateral Acceleration		G's	≤15.0	2.4	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	1.2	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Overall Test Results				Pass	



Curve Description

Head Resultant

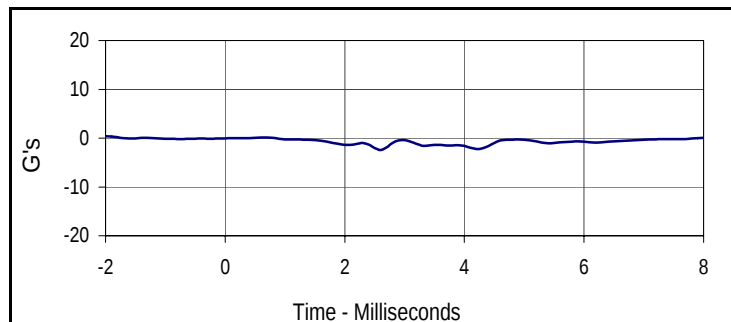
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
277.0	2.6	0.2	-1.6



Curve Description

Head X

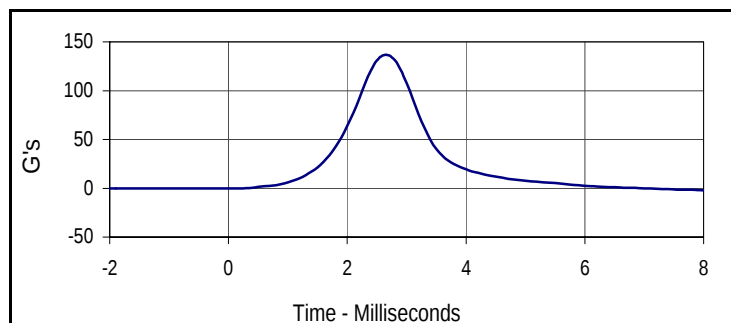
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.9	6.0	-241.1	2.6



Curve Description

Head Y

Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
0.4	-2.0	-2.4	2.6



Curve Description

Head Z

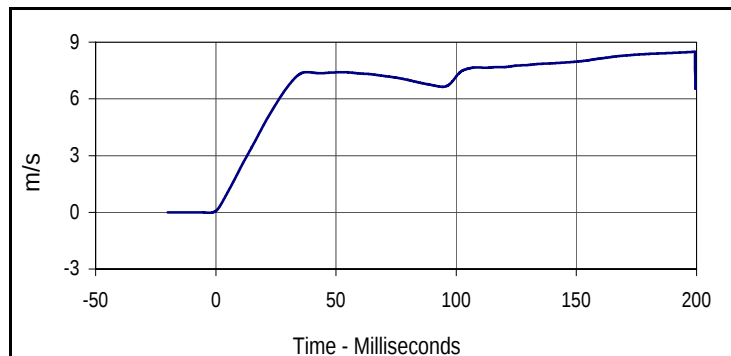
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
136.3	2.7	-0.3	0.0

Test Program: Hybrid III 5th Percentile Female Neck Flexion Test
 ATD Serial No.: 141

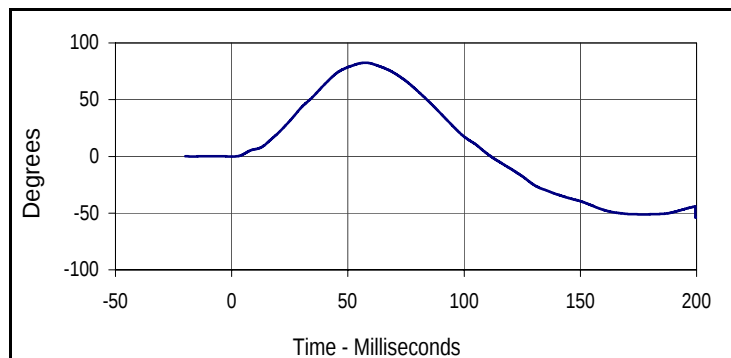
Test Date: 1/14/12
 Test I.D.: F141NF033



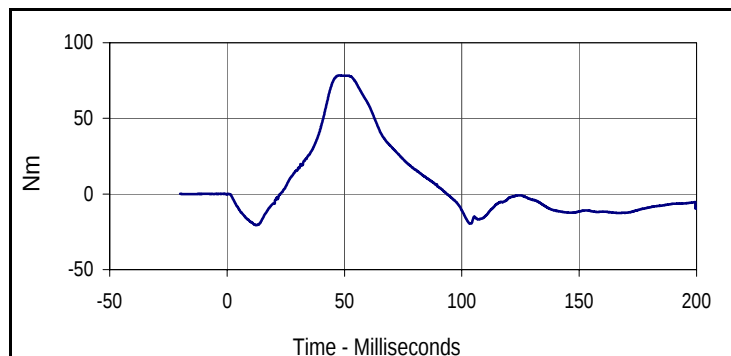
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	335	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.90	Pass
Pendulum Deceleration	10 Msec.	m/s	2.1 to 2.5	2.3	Pass
	20 Msec.	m/s	4.0 to 5.0	4.6	Pass
	30 Msec.	m/s	5.8 to 7.0	6.7	Pass
"D" Plane Rotation	Max	Degrees	77.0 to 91.0	82.6	Pass
Peak Moment in Rotation	Max	Nm	69.0 to 83.0	78.4	Pass
Positive Moment Decay, Time To 10 Nm		Msec.	80.0 to 100.0	84.4	Pass
Overall Test Results				Pass	



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
8.5	199.4	0.0	-2.5



Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
82.6	57.6	-53.8	199.5



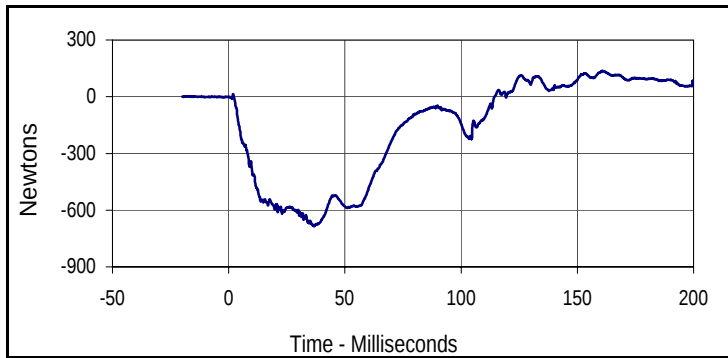
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
78.5	47.7	-20.6	12.6

Test Program: Hybrid III 5th Percentile Female Neck Flexion Test

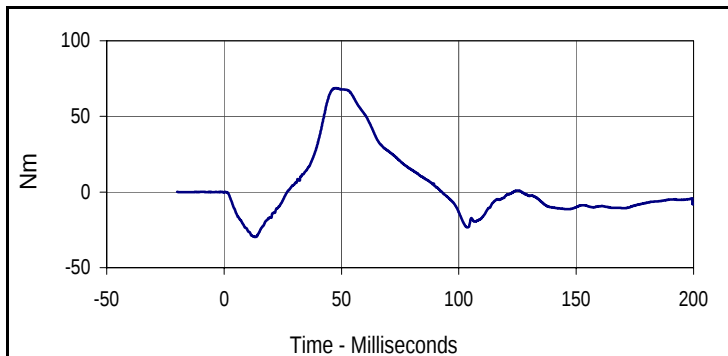
Test Date: 1/14/12

ATD Serial No.: 141

Test I.D.: F141NF033



Curve Description			
Upper Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
136.9	160.8	-685.2	36.8



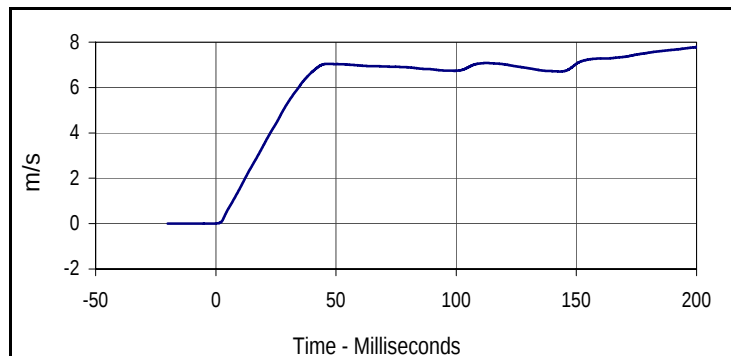
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
68.8	47.6	-29.7	13.2

Test Program: Hybrid III 5th Percentile Female Neck Extension Test
 ATD Serial No.: 141

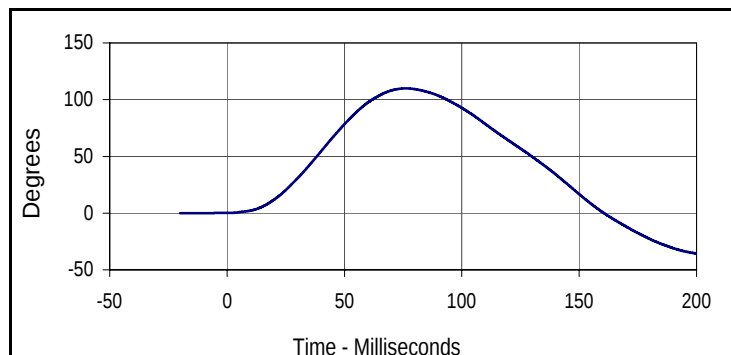
Test Date: 1/14/12
 Test I.D.: F141NE033



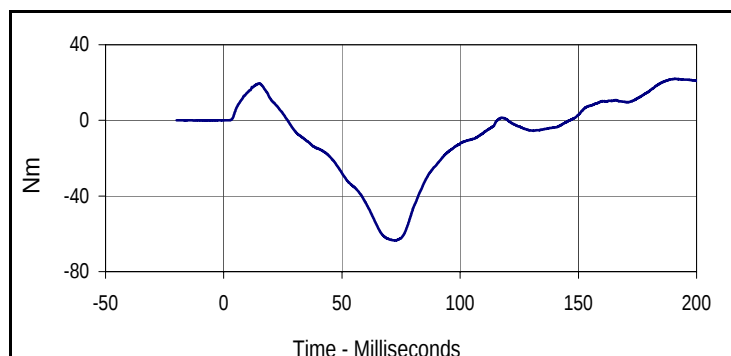
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	385	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.12	Pass
Pendulum Deceleration	10 Msec.	m/s	1.5 to 1.9	1.6	Pass
	20 Msec.	m/s	3.1 to 3.9	3.5	Pass
	30 Msec.	m/s	4.6 to 5.6	5.3	Pass
"D" Plane Rotation	Max	Degrees	99.0 to 114.0	109.9	Pass
Peak Moment in Rotation	Max	Nm	-53.0 to -65.0	-63.6	Pass
Positive Moment Decay, Time To -10 Nm		Msec.	94.0 to 114.0	105.2	Pass
Overall Test Results				Pass	



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
7.8	200.0	0.0	-14.0



Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
109.9	76.2	-35.7	200.0



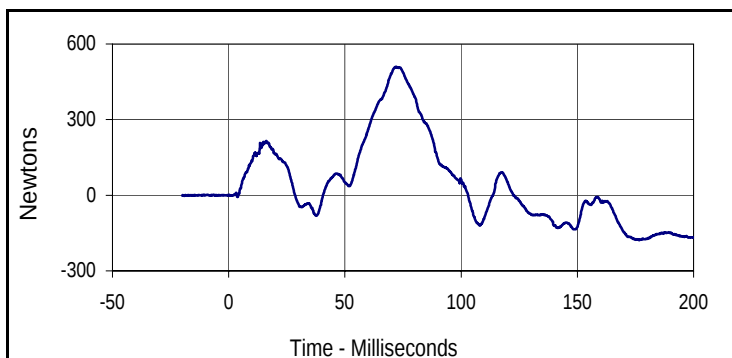
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
22.0	191.0	-63.6	72.6

Test Program: Hybrid III 5th Percentile Female Neck Extension Test

ATD Serial No.: 141

Test Date: 1/14/12

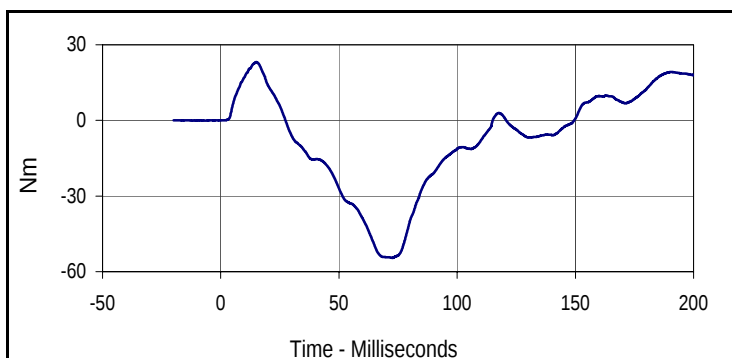
Test I.D.: F141NE033



Curve Description

Upper Neck Force X

Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
509.9	72.0	-177.8	176.6



Curve Description

Neck Moment Y

Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
23.1	15.1	-54.6	72.6

Test Program: Hybrid III 5th Percentile Female Thorax Impact Test

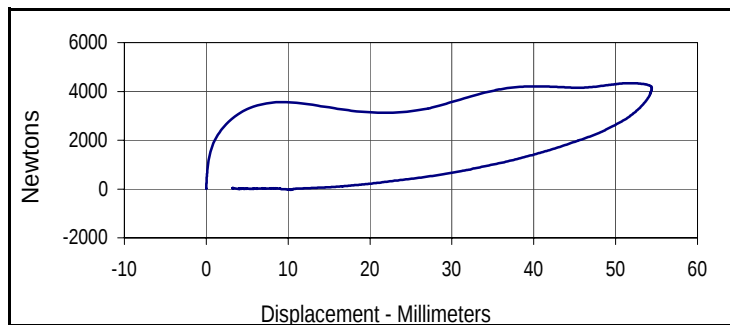
Test Date: 1/14/12

ATD Serial No.: 141

Test I.D.: F141CH033



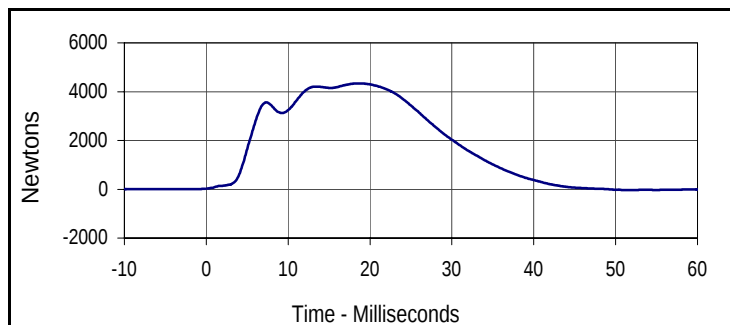
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	425	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Probe Velocity		m/s	6.59 to 6.83	6.73	Pass
Peak Chest Deflection		mm	50.0 to 58.0	54.4	Pass
Peak Force Between 50 and 58 MM		Newtons	3900 to 4400	4301	Pass
Peak Force Between 18 and 50 MM		Newtons	≤4600	4339	Pass
Internal Hysteresis		%	69 to 85	75.1	Pass
Overall Test Results					Pass



Curve Description

Probe Force vs. Chest Deflection

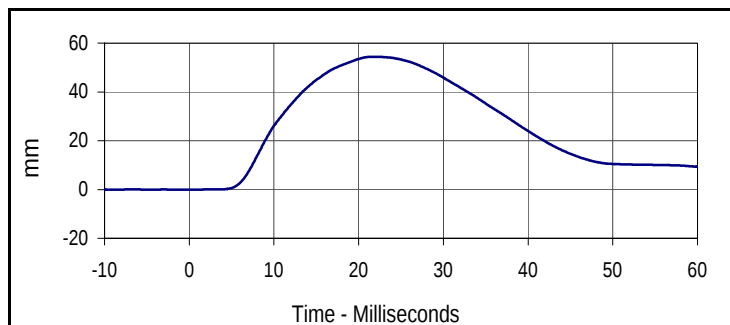
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	75.1
Peak Probe Force		Peak Chest Deflection	
4338.6		54.4	



Curve Description

Probe Force

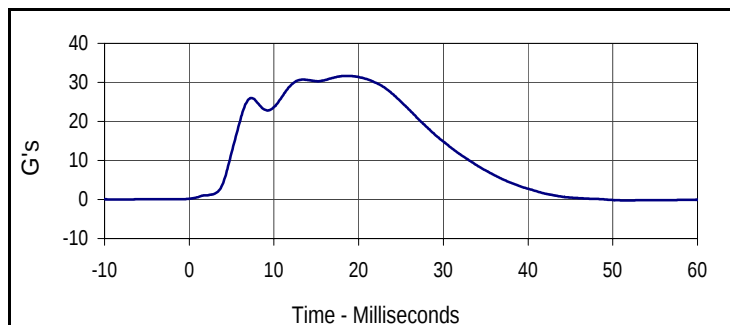
Plot No.	Type	SAE Class	Units
002	FIL	180	Newtons
Max	Time	Min	Time
4338.6	18.4	-32.4	51.7



Curve Description

Chest Deflection

Plot No.	Type	SAE Class	Units
003	FIL	600	mm
Max	Time	Min	Time
54.4	21.7	0.0	-1.2



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
31.7	18.4	-0.2	51.7

Test Program: Hybrid III 5th Percentile Female Knee Impact Test

Test Date: 1/14/12

ATD Serial No.: 141

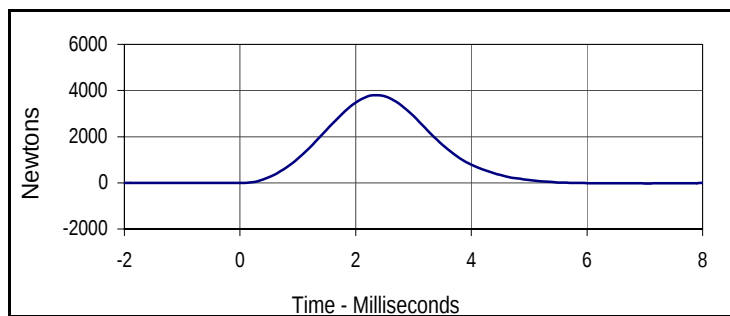
Test I.D.: F141LK033 , F141LK033

**Left Knee**

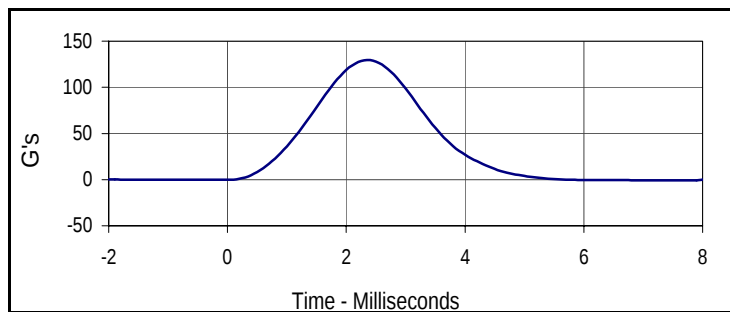
Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	465	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	3450 to 4060	3794	Pass
Overall Test Results				Pass	

Right Knee

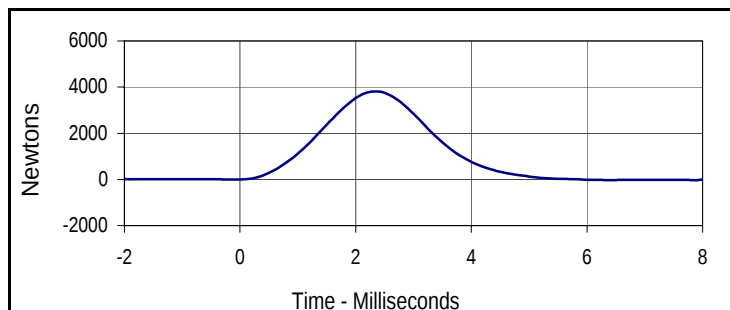
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	3450 to 4060	3816	Pass
Overall Test Results				Pass	

**Curve Description****Left Knee Probe Force**

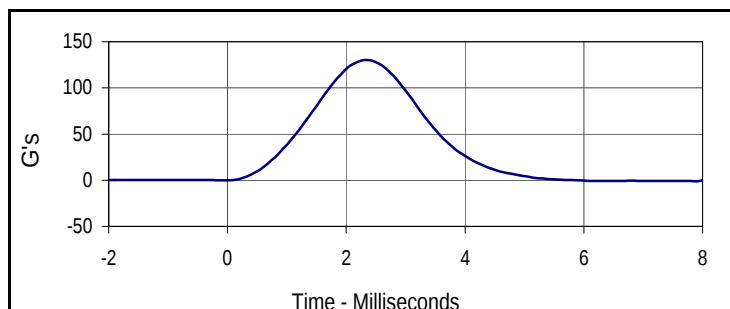
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3794.2	2.4	-24.9	7.0

**Curve Description****Left Knee Acceleration**

Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
129.4	2.4	-0.9	7.0

**Curve Description****Right Knee Probe Force**

Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
3815.9	2.3	-29.4	7.9

**Curve Description****Right Knee Acceleration**

Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
130.2	2.3	-1.0	7.9

Test Program: Hybrid III 5th Percentile Female Torso Flexion Test

Test Date: 1/14/12

ATD Serial No.: 141

Test I.D.: F141TF033

**Left Hip Joint-Femur Results**

Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	505	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.1	Pass
Initial Reference Plane Angle		Degrees	≤ 20	9.0	Pass
Peak Force at 45° +/-0.5°		Newtons	320.0 to 390.0	345.2	Pass
Torso Rotation Rate		deg/sec	0.5 to 1.5	1.2	Pass
Final Reference Plane Angle		Degrees	+/-8	3.4	Pass
Overall Test Results					Pass