

REPORT NUMBER: NCAP-KAR-13-022

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

**GENERAL MOTORS LLC
2013 CADILLAC ATS AWD 4-DOOR SEDAN**

NHTSA NUMBER: MD0108

**PREPARED BY:
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9270 HOLLY ROAD
ADELANTO, CA 92301**



NOVEMBER 20, 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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Date: 


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16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2013 Cadillac ATS AWD 4-door sedan 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 November 6, 2012. The impact velocity of the vehicle was 56.17 km/h and the ambient temperature at the barrier face at the time of impact was 26.9 deg. C. The target vehicle's post-test maximum crush was 405 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>202.2</td> <td>700.0</td> <td>345.9</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-16</td> <td>52</td> <td>-12</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>0.26</td> <td>1</td> <td>0.28</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>726.7</td> <td>2620</td> <td>477.8</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>-114.1</td> <td>2520</td> <td>-515.5</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>-897.8</td> <td>6805</td> <td>-11.2</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>-2736.8</td> <td>6805</td> <td>-165.4</td> </tr> </tbody> </table>						Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC ₁₅)	N/A	700.0	202.2	700.0	345.9	Maximum Chest Compression	mm	63	-16	52	-12	Nij	N/A	1	0.26	1	0.28	Neck Tension	N	4170	726.7	2620	477.8	Neck Compression	N	4000	-114.1	2520	-515.5	Left Femur Force	N	10008	-897.8	6805	-11.2	Right Femur Force	N	10008	-2736.8	6805	-165.4
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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-00259. 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 September 2012.

SUMMARY

A load cell barrier consisting of 36 load cells was impacted by a 2013 Cadillac ATS AWD 4-door sedan at a velocity of 56.17 km/h. The test was performed at KARCO Engineering, LLC. on November 6, 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 placed on the driver and passenger's shoulder belts and lap belts to measure the dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 035) and the right-front passenger (position 2) ATD (Serial No. 635) were calibrated prior to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

The 146 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 405 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 airbag.

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. The left knee contacted the airbag and the glove box. The right knee contacted the glove box.

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)	202.2	78.8	93.8	-16	0.26	726.7	-114.1	-897.8	-2736.8
Passenger (5th)	345.9	65.9	80.9	-12	0.28	477.8	-515.5	-11.2	-165.4

The knee airbags on the 2013 Cadillac ATS are designed to be suppressed when the seat is in the full-forward position.

SECTION 2
DATA SHEETS

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan NHTSA No.: MD0108
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 11/06/12

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: 2013 Cadillac ATS AWD 4-Door Sedan NHTSA No.: MD0108
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 11/06/12

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	MD0108
Model Year	2013
Make	Cadillac
Model	ATS
Body Style	4-Door Sedan
VIN	1G6AJ5S37D0118223
Body Color	Thunder Gray Chromaflair
Odometer Reading (km / mi)	257 / 160
Engine Displacement (L)	3.6
Type / No. of Cylinders	V6
Engine Placement	Longitudinal
Transmission Type	Automatic
Transmission Speeds	6
Overdrive	Yes
Final Drive	AWD
Roof Rack	No
Sunroof / T-Top	Yes
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes
Automatic Door Locks	Yes

Traction Control System	Yes
Power Steering	Yes
Power Window Auto-Reverse	Yes
Driver Frontal Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	Yes
Front Pass. Frontal Airbag	Yes
Front Pass. Curtain Airbag	Yes
Front Pass. Head/Torso Airbag	No
Front Pass. Torso Airbag	No
Front Pass. Torso/Pelvis Airbag	Yes
Front Pass. Pelvis Airbag	No
Front Pass. Knee Airbag	Yes
Driver Seat Belt Pretensioner	Yes
Driver Load Limiter	Yes
Front Pass. Seat Belt Pretensioner	Yes
Front Pass. Load Limiter	Yes
Other	None

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

Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors LLC
Date of Manufacture	Sep-12

GVWR (kg)	2081
GAWR Front (kg)	975
GAWR Rear (kg)	1160

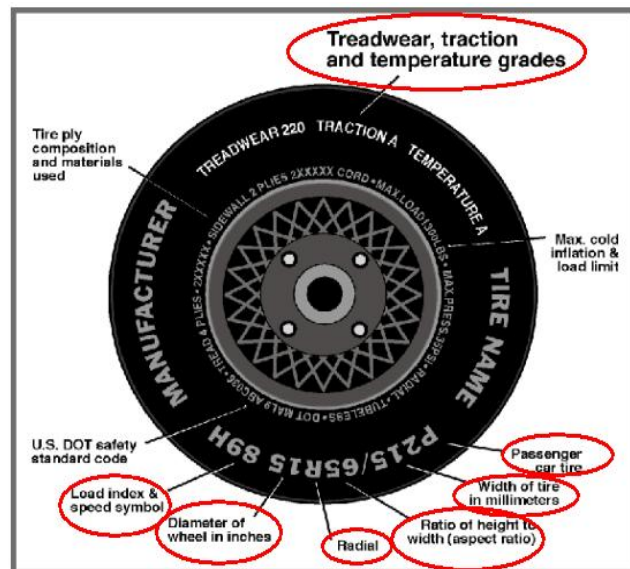
VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Type of Seats	Bucket	Bench			
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				396.0	A
DSC x 68.04 (kg)				340.2	B
Cargo Weight (RCLW) (kg)				55.8	A-B

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2013 Cadillac ATS AWD 4-Door Sedan	NHTSA No.:	MD0108
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	11/06/12



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	220	220
Recommended Tire Size	P225/45R17	P225/45R17
Tire Size on Vehicle	P225/45R17	P225/45R17
Tire Manufacturer	Michelin	Michelin
Tire Model	Primacy MXM4	Primacy MXM4
Treadwear	500	500
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Rayon	2 Rayon
Tire Plies Body	1 Polyamide, 2 Rayon, 2 Steel	1 Polyamide, 2 Rayon, 2 Steel
Load Index / Speed Symbol	90V	90V
Tire Material	Polyamide, Rayon, Steel	Polyamide, Rayon, Steel
DOT Safety Code Left	B98A 023X 3212	B98A 023X 3212
DOT Safety Code Right	B98A 023X 3312	B98A 023X 3212

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

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan NHTSA No.: MD0108
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 11/06/12

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	443.0	392.5		472.0	474.5	
Right	kg	446.5	392.0		459.5	457.0	
Ratio	%	53.1%	46.9%	100.0%	50.0%	50.0%	100.0%
Total	kg	889.5	784.5	1674.0	931.5	931.5	1863.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1674.0	A
Weight of 1 P572E ATD & 1 P572O ATD	kg	141.0	B
Rated Cargo/Luggage Weight (RCLW)	kg	55.8	C
Calculated Vehicle Target Weight (TVTW)	kg	1870.8	A+B+C

TEST VEHICLE ATTITUDES

Condition	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	688	691	677	683	1301
As Tested	mm	682	687	662	672	1388
Post-Test	mm	755	759	666	664	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2776
Total Vehicle Length at Left Side	mm	4053
Total Vehicle Length at Centerline	mm	4630
Total Vehicle Length at Right Side	mm	4060
Weight of Ballast in Cargo Area	kg	95.3
Weight of Vehicle Components Removed	kg	36.5
Amount of Stoddard Solvent in Fuel Tank	L	58.12

VEHICLE COMPONENTS REMOVED TO MEET TEST WEIGHT:

Outboard Mirrors (3.0 kg), Tail Lights (3.0 kg), Rear Carpeting (4.5 kg), Rear Bumper Cover
(7.0 kg), Rear Bumper (5.0 kg), Rear Seat Cushion (5.0 kg), Rear Door Panels (8.0 kg),
Rear Speakers (1.0 kg)

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

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan NHTSA No.: MD0108
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 11/06/12

TARGET VEHICLE STRUCTURAL MEASUREMENTS

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length	4630	4250	-380
2	Total Width	1765	2040	275
3	Bumper Top Height	560	615	55
4	Bumper Bottom Height	450	520	70
5	Longitudinal Member Top Height	530	670	140
6	Distance Between Longitudinal Members	710	820	110
7	Longitudinal Member Width	80	96	16
8	Engine Top Height	910	975	65
9	Engine Bottom Height	206	271	65
10	Engine and Gearbox Width	575	575	0
11	Front Bumper to Engine Distance	605	350	-255
12	Front Shock Absorber Fixing Height	850	927	77
13	Bonnet Leading Edge Height	770	780	10
14	Front Shock Absorber Fixing Width	1090	1115	25
15	Front Bumper to Front Axle Distance	828	495	-333
16	Front Axle to A-Pillar Distance	610	545	-65
17	A-Pillar to B-Pillar Distance	1029	1030	1
18	B-Pillar to Rear Axle Distance	1085	1075	-10
19	B-Pillar to C-Pillar Distance	878	868	-10
20	Roof Sill Bottom Height	1270	1314	44
21	Roof Sill Top Height	1385	1428	43
22	Floor Sill Bottom Height	158	213	55
23	Floor Sill Top Height	340	405	65

All measurements in millimeters.

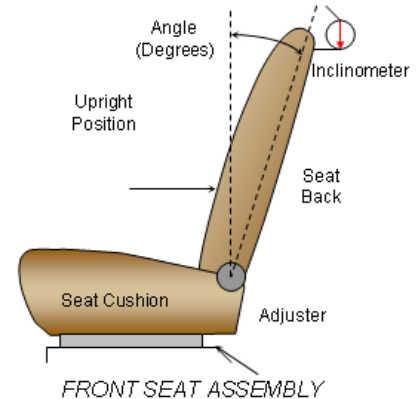
DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan NHTSA No.: MD0108
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 11/06/12

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 headrest post using a digital inclinometer.

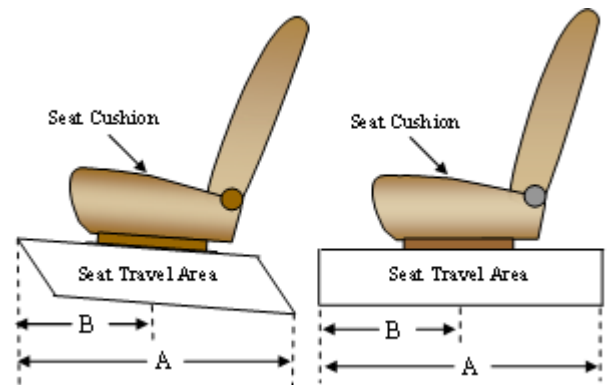


SEAT BACK ANGLE

Seating Position	Degrees
Driver Seat Back Angle	3.4
Passenger Seat Back Angle	2.7

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	317 mm	159 mm
Passenger Seat	242 mm	0 mm

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	Fixed	Fixed
Passenger Seat	Fixed	Fixed

DATA SHEET NO. 2 ... (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan

NHTSA No.: MD0108

Test Program: 56 km/h Frontal Impact NCAP Test

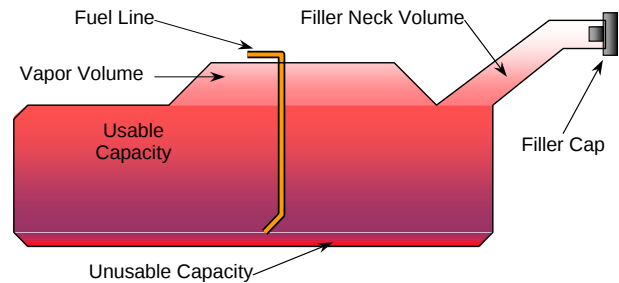
Test Date: 11/06/12

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	62.49
Usable Capacity of "Optional Tank"	
92 - 94% of Usable Capacity	57.49 to 58.74
Actual Amount of Stoddard Solvent Used	58.12
1/3 of Usable Capacity	20.83

FUEL PUMP

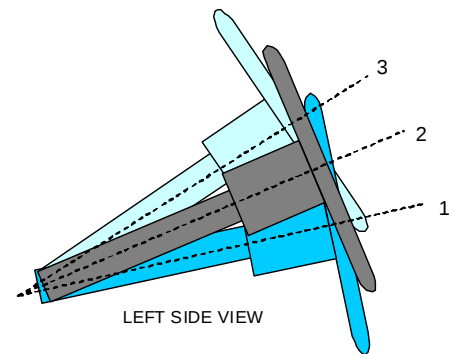
The vehicle is equipped with an electric fuel pump. If the ignition is at the "On" setting and the engine is not running, the fuel pump only operates for a short duration to prime the fuel system. If the engine is running the fuel pump operates continuously.



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	16.8	86
Geometric Center Position, No. 2	19.1	105
Uppermost Position, No. 3	21.4	123
Telescoping Steering Wheel Travel		37
Test Position	19.1	105

DATA SHEET NO. 3

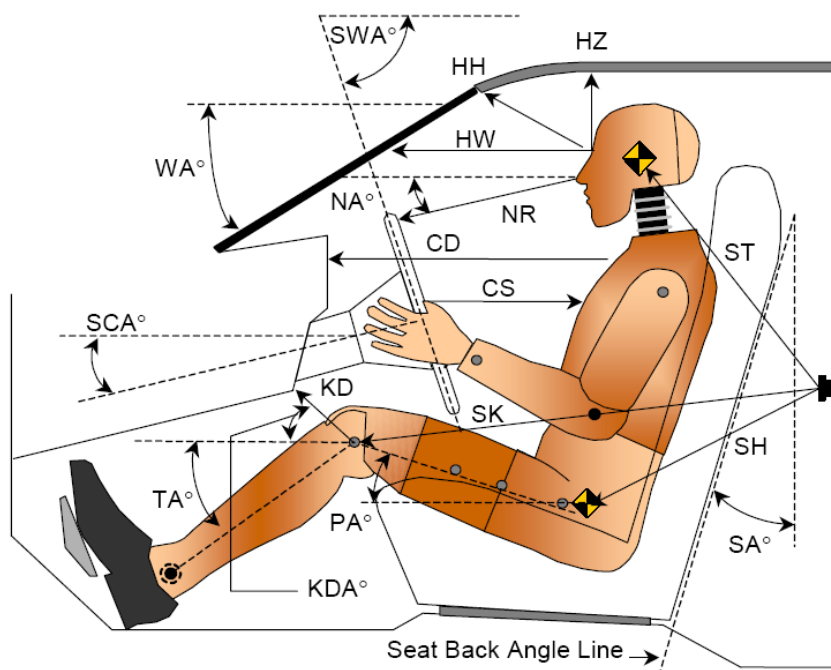
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan

NHTSA No.: MD0108

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 11/06/12



LEFT SIDE VIEW

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		25.7		
SWA°	Steering Wheel Angle		70.9		
SCA°	Steering Column Angle		19.1		
SA°	Seat Back Angle (On Headrest Post)		3.4		2.7
HZ	Head to Roof	187	90.0	236	90.0
HH	Head to Header	365	25.2	298	42.4
HW	Head to Windshield	615	0.0	662	0.0
NR	Nose to Rim	383	4.1	502	14.8
CD	Chest to Dash	521	13.4	444	0.3
CS	Chest to Steering Hub	323	2.5		
RA	Rim to Abdomen	233	0.0		
KDL	Left Knee to Dash	215	33.0	149	59.9
KDR	Right Knee to Dash	200	22.8	156	32.6
PA°	Pelvic Angle		23.8		21.8
TA°	Tibia Angle		36.1		40.0
SK	Striker to Knee	496	7.3	578	8.3
ST	Striker to Head	448	91.6	394	96.6
SH	Striker to H-Point	249	61.2	291	36.9

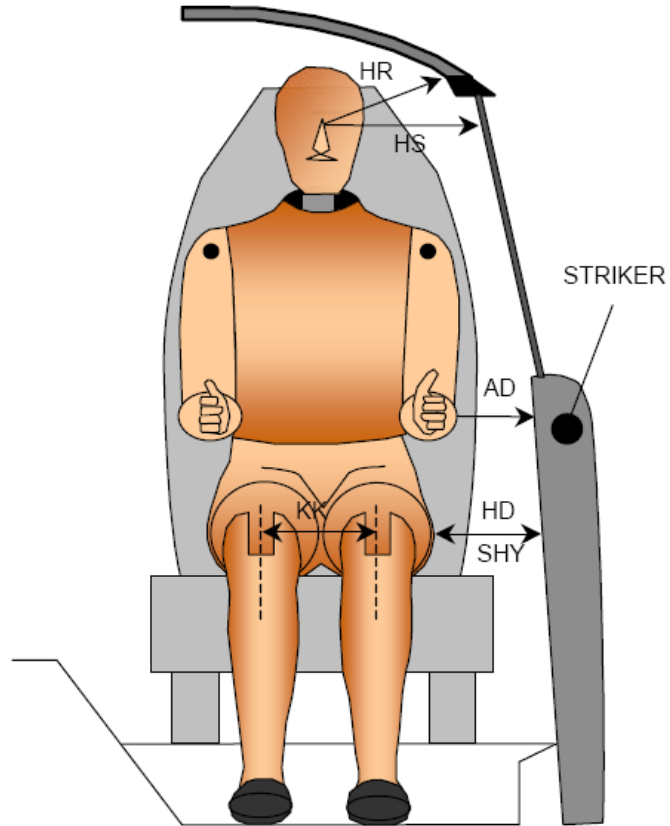
DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan

NHTSA No.: MD0108

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 11/06/12

Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	52	98
HD	H-Point to Door	133	173
HR	Head to Side Header	188	241
HS	Head to Side Window	320	335
KK	Knee to Knee	275	278
SHY	Striker to H-Point (Y-Direction)	195	250
AA	Ankle to Ankle	324	165

DATA SHEET NO. 5

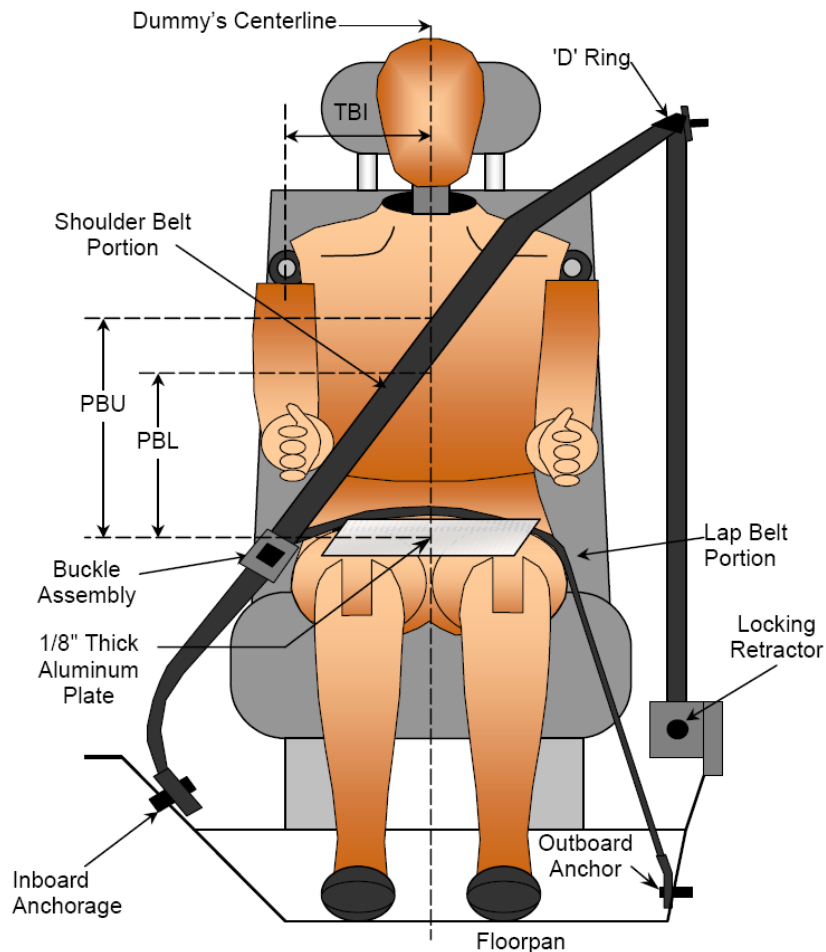
SEAT BELT POSITIONING DATA

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan

NHTSA No.: MD0108

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 11/06/12



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	340	341
PBL	Top Surface of Aluminum Plate to Belt Lower Edge	mm	254	272

BELT LENGTH DATA

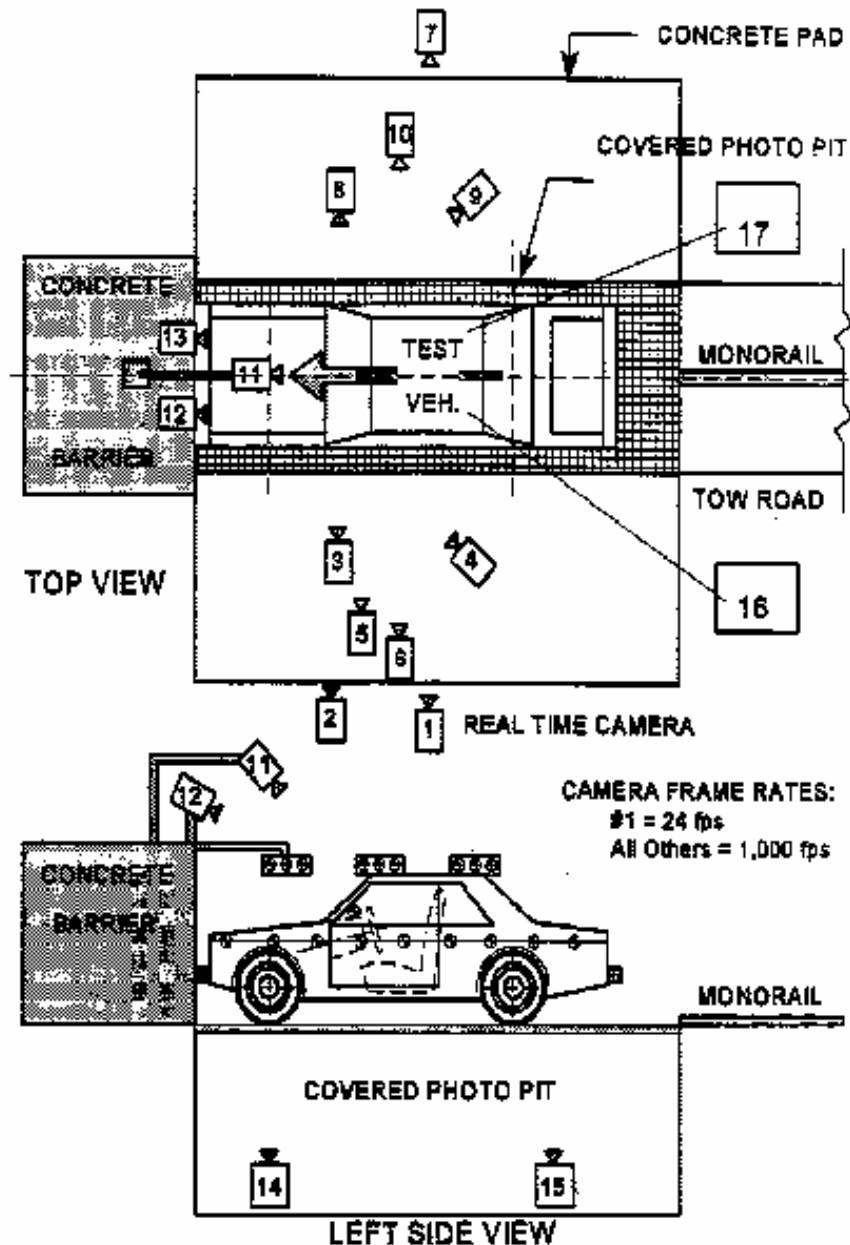
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as Measured on ATD	mm	816	785
Lap Belt Length as Measured on ATD	mm	430	415
Remainder of Belt on Reel	mm	1026	1054
Total Belt Length for Continuous Webbing Systems	mm	2272	2254

DATA SHEET NO. 6

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan NHTSA No.: MD0108
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 11/06/12

CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 6 ... (CONTINUED)

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan NHTSA No.: MD0108
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 11/06/12

CAMERA LOCATIONS

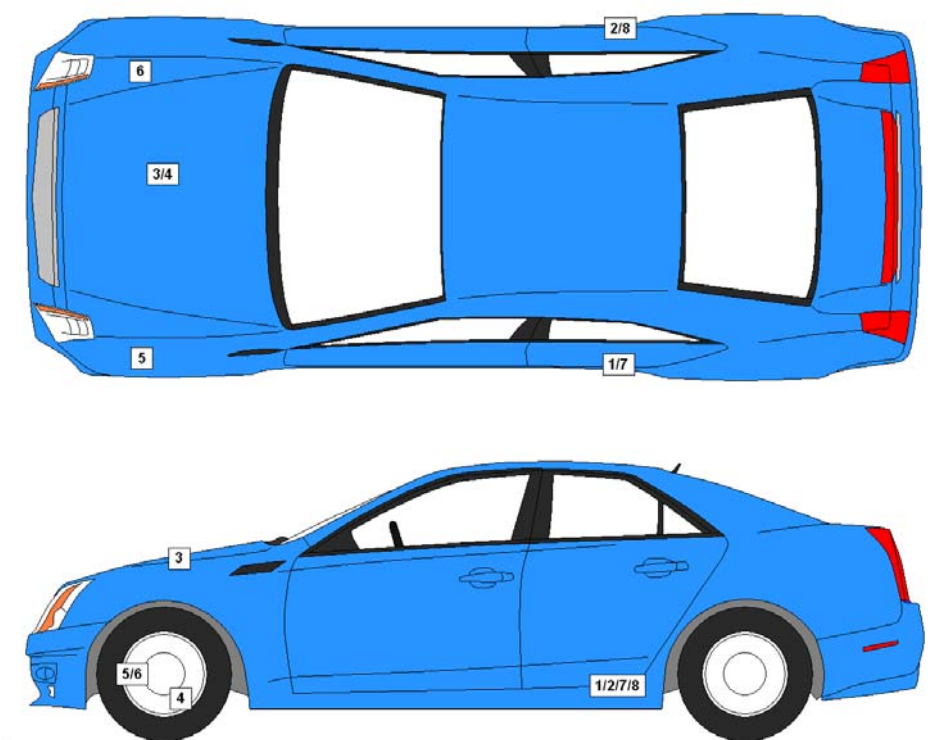
No.	Description	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	-11412	-8150	-1484		30
2	Driver Close-Up	-2590	-7950	-1371	24	1000
3	Left Front Half	-1701	-6197	-1701	50	1000
4	Left Angle	-6696	-10308	-3211	ZOOM	1000
5	Steering Column - Top	-1966	-10412	-3688	50	1000
6	Steering 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 (Optional)	-1460	300	-1300	12	1000
17	Onboard Passenger Airbag (Optional)	-1460	-300	-1300	12	1000
18	Real-Time Left View of Impact					
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: 2013 Cadillac ATS AWD 4-Door Sedan NHTSA No.: MD0108
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 11/06/12



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Description	Location		
		X	Y	Z
1	Left Rear Accelerometer X-Direction	1830	-730	-380
2	Right Rear Accelerometer X-Direction	1830	730	-380
3	Engine Top X	3690	190	-830
4	Engine Bottom X	3700	0	-240
5	Left Rear Accelerometer Z-Direction	1830	-730	-380
6	Right Rear Accelerometer Z-Direction	1830	730	-380

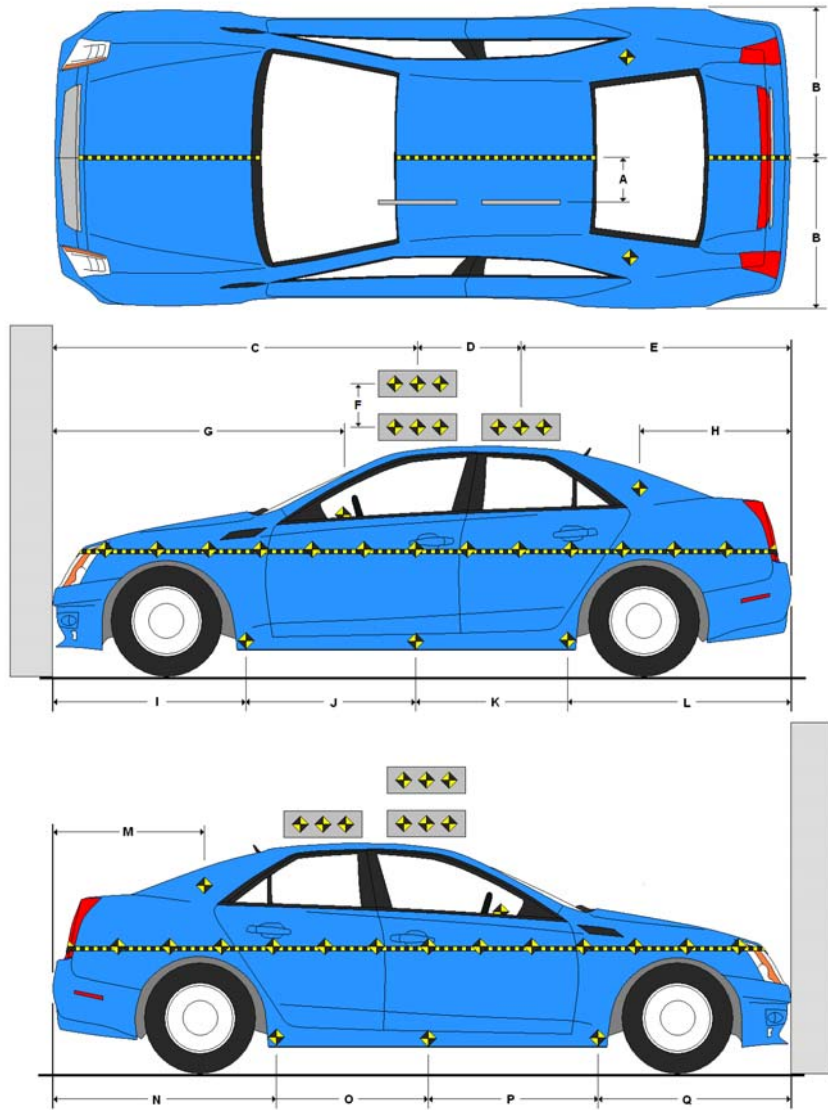
Reference Points: X – Rear Surface of Vehicle (+ forward)
Y – Vehicle Centerline (+ to right)
Z – Ground Plane (+ down)

DATA SHEET NO. 8

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan NHTSA No.: MD0108
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 11/06/12

Item	Value
A	
B	883
C	2308
D	610
E	1720
F	305
G	1830
H	903
I	1255
J	960
K	960
L	1470
M	1912
N	1465
O	961
P	961
Q	1248



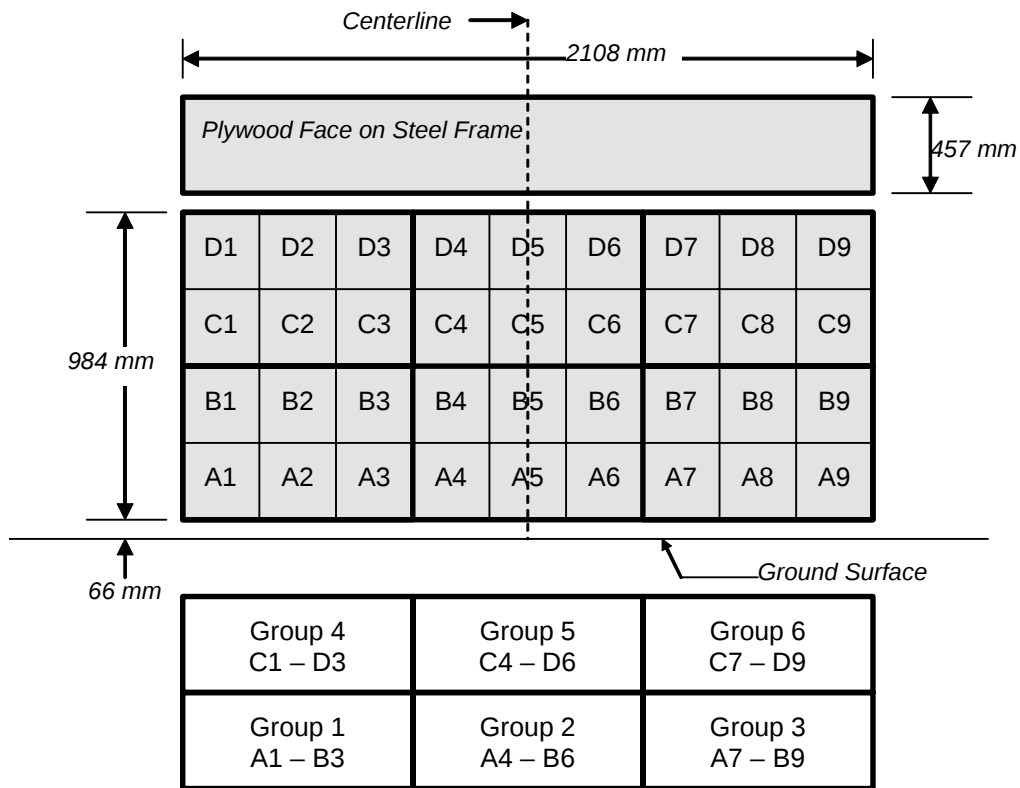
All measurements in millimeters.

DATA SHEET NO. 9

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan NHTSA No.: MD0108
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 11/06/12

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: 2013 Cadillac ATS AWD 4-Door Sedan NHTSA No.: MD0108
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 11/06/12

INSTRUMENTATION

Driver Dummy Accelerometers	50
Passenger Dummy Accelerometers	50
Vehicle Structure Accelerometers	8
Seat Belt Load Cells	2
Load Cell Barrier	36
Total	146

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: 2013 Cadillac ATS AWD 4-Door SedanNHTSA No.: MD0108Test Program: 56 km/h Frontal Impact NCAP TestTest Date: 11/06/12**TEST DUMMY INFORMATION AND CONTACT**

Description	Driver	Passenger
Dummy Type/Serial No.	P572E 50th Percentile Male ATD / 035	P572O 5th Percentile Female ATD / 635
Head Contact	Airbag, Headrest	Airbag, Headrest
Upper Torso Contact	Airbag	Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Airbag	Airbag, Glovebox
Right Knee Contact	Knee Airbag	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)	20	11
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	2070
Center	mm	2170
Right Side	mm	2148
Average	mm	2129

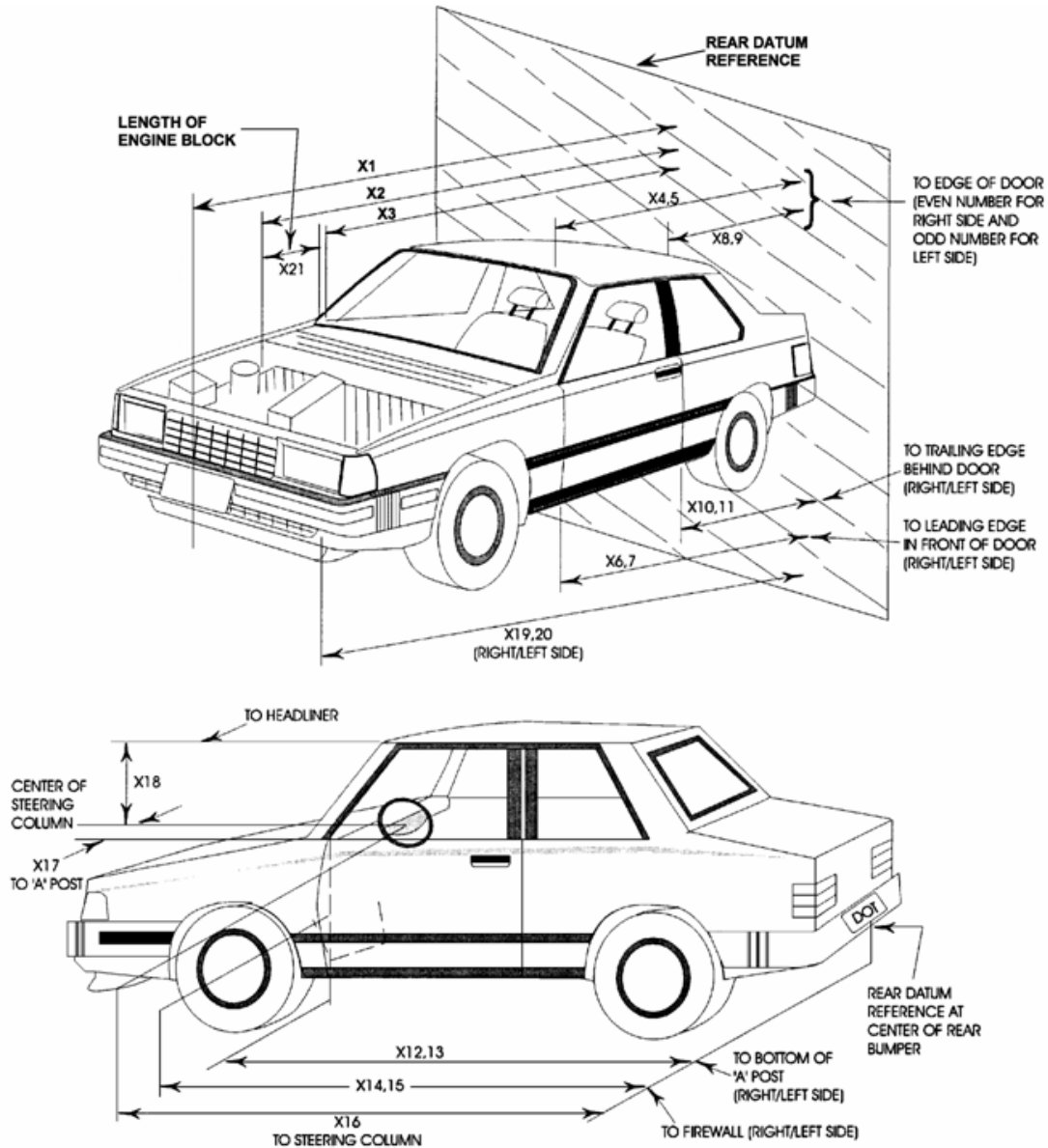
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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/Pelvis)	Yes	No	Yes	No
Knee Airbag	Yes	Yes	Yes	No
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes

The knee airbags on the 2013 Cadillac ATS are designed to be suppressed when the seat is in the full forward position.

DATA SHEET NO. 12
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan NHTSA No.: MD0108
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 11/06/12

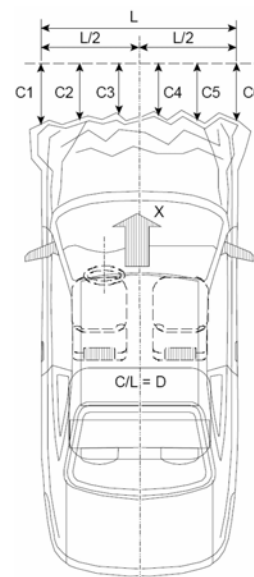


DATA SHEET NO. 12 ... (CONTINUED)**VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan NHTSA No.: MD0108
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 11/06/12

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4630	4265	-365
2	Rear Surface of Vehicle to Front of Engine	4025	3875	-150
3	RSOV to Firewall	3420	3370	-50
4	RSOV to Upper Leading Edge of Right Door	3230	3230	0
5	RSOV to Upper Leading Edge of Left Door	3280	3230	-50
6	RSOV to Lower Leading Edge of Right Door	3200	3192	-8
7	RSOV to Lower Leading Edge of Left Door	3202	3202	0
8	RSOV to Upper Trailing Edge of Right Door	2060	2062	2
9	RSOV to Upper Trailing Edge of Left Door	2056	2062	6
10	RSOV to Lower Trailing Edge of Right Door	2118	2113	-5
11	RSOV to Lower Trailing Edge of Left Door	2117	2117	0
12	RSOV to Bottom of A-Pillar, Right Side	3165	3163	-2
13	RSOV to Bottom of A-Pillar, Left Side	3165	3165	0
14	RSOV to Firewall, Right Side	3430	3400	-30
15	RSOV to Firewall, Left Side	3420	3400	-20
16	RSOV to Steering Column	2620	2740	120
17	Center of Steering Column to A-Pillar	395	370	-25
18	Center of Steering Column to Headliner	380	420	40
19	RSOV to Right Side of Front Bumper	4060	3980	-80
20	RSOV to Left Side of Front Bumper	4053	3911	-142
21	Length of Engine Block	620	620	0
RD	RSOV to Right Side of Dash Panel	2820	2810	-10
CD	RSOV to Center of Dash Panel	2760	2730	-30
LD	RSOV to Left Side of Dash Panel	4810	2795	-2015

All measurements in millimeters.

DATA SHEET NO. 13**ACCIDENT INVESTIGATION DATA**Test Vehicle: 2013 Cadillac ATS AWD 4-Door SedanNHTSA No.: MD0108Test Program: 56 km/h Frontal Impact NCAP TestTest Date: 11/06/12**VEHICLE INFORMATION**VIN: 1G6AJ5S37D0118223Wheelbase (mm): 2776Vehicle Size Category: 4-Door SedanTest Weight (kg): 1863.0**ACCELEROMETER DATA**Accelerometer Locations: Left Rear CrossmemberCal. Procedure/Interval: Drop Test / 6 monthsIntegration Algorithm: NHTSA StandardImpact Velocity (km/h): 56.17Velocity Change (km/h): 64.5Time of Separation (msec): 68.1Linearity: Good**CRUSH PROFILE**Collision Deformation Classification: 12FDEW2Midpoint of Damage: Vehicle CenterlineDamage Region Length (mm): 1481Impact Mode: Full Frontal

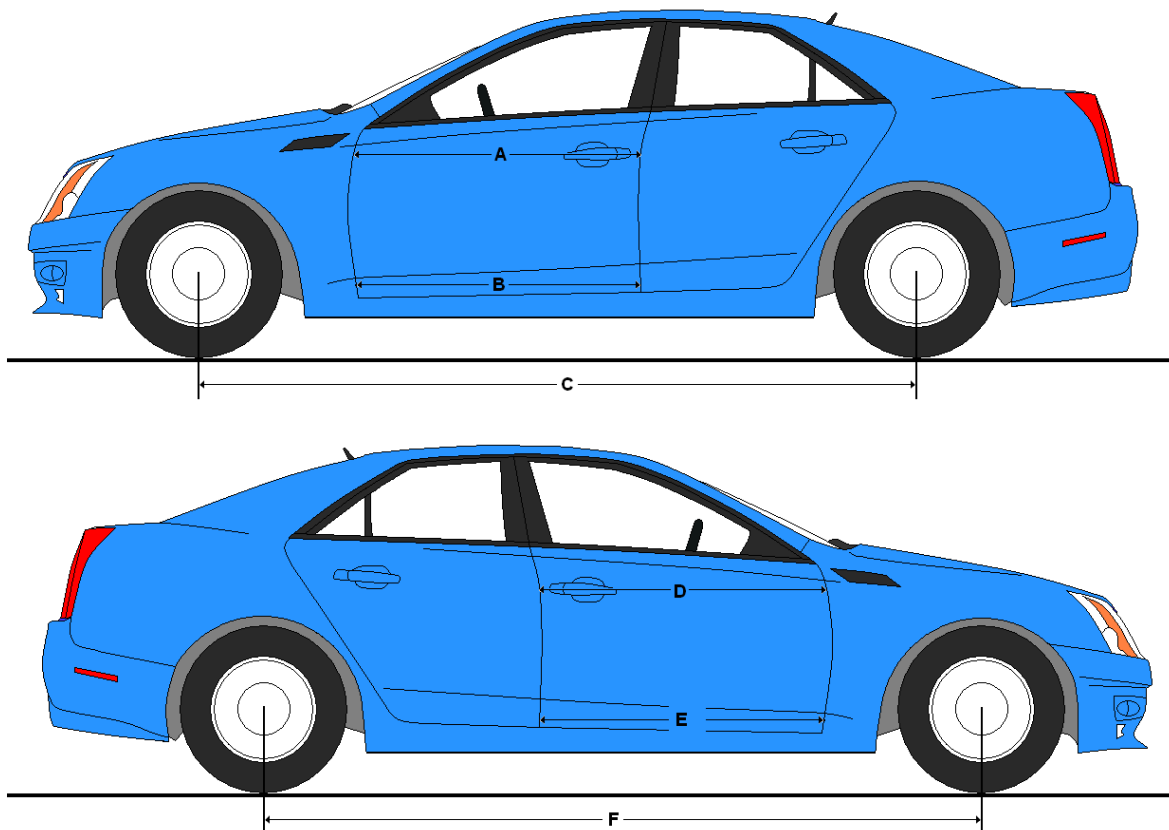
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	323	547	224
C2	Crush Zone 2 at Left Side	mm	120	520	400
C3	Crush Zone 3 at Left Side	mm	55	460	405
C4	Crush Zone 4 at Right Side	mm	55	440	385
C5	Crush Zone 5 at Right Side	mm	120	455	335
C6	Crush Zone 6 at Right Side	mm	323	485	162
L	C1 to C6	mm	1481		

DATA SHEET NO. 14**VEHICLE INTRUSION MEASUREMENTS**Test Vehicle: 2013 Cadillac ATS AWD 4-Door SedanNHTSA No.: MD0108Test Program: 56 km/h Frontal Impact NCAP TestTest Date: 11/06/12**DOOR OPENING WIDTH**

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1028	1033	-5
B	Left Side Lower	mm	890	888	2
D	Right Side Upper	mm	1028	1028	0
E	Right Side Lower	mm	903	903	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2776	2695	81
F	Right Side Wheelbase	mm	2776	2720	56



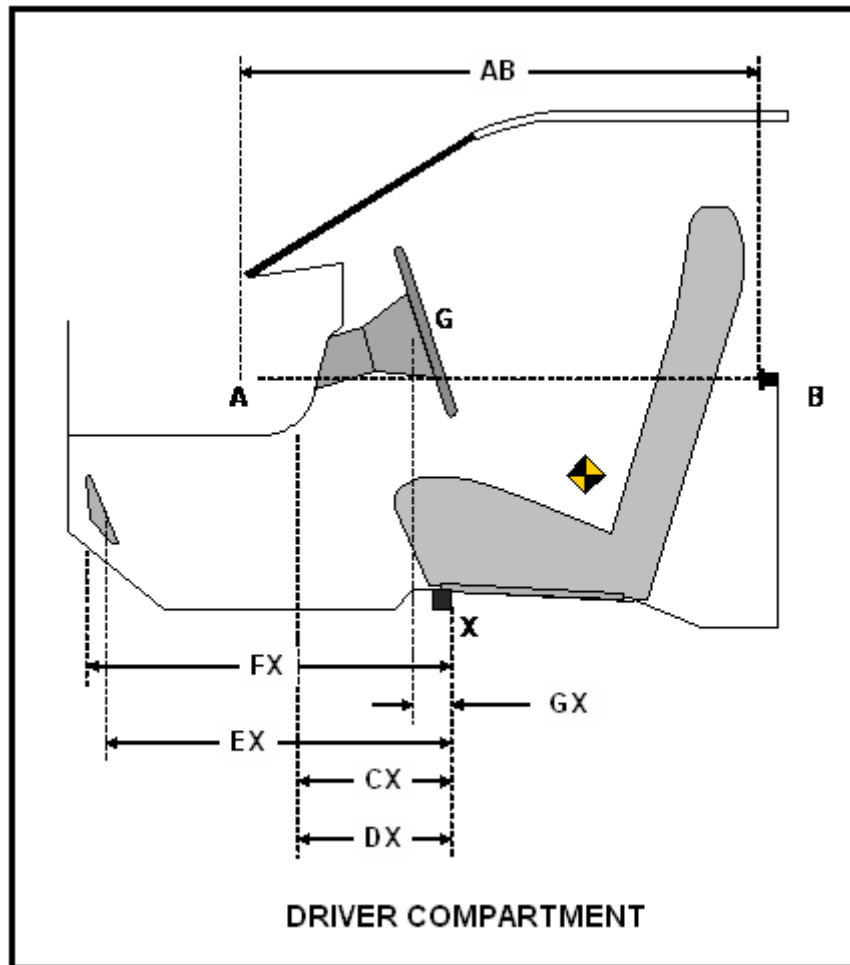
DATA SHEET NO. 14 ... (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan NHTSA No.: MD0108
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 11/06/12

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	853	936	-83
CX	Left Knee Bolster to X	mm	250	240	10
DX	Right Knee Bolster to X	mm	250	220	30
EX	Brake Pedal to X	mm	535	540	-5
FX	Foot Rest to X	mm	580	650	-70
GX	Center of Steering Wheel Hub to X	mm	30	100	-70

X = Front of Seat Track (Stationary)



DATA SHEET NO. 15

SUMMARY OF FMVSS 212 AND 219 (PARTIAL) DATA

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan NHTSA No.: MD0108

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 11/06/12

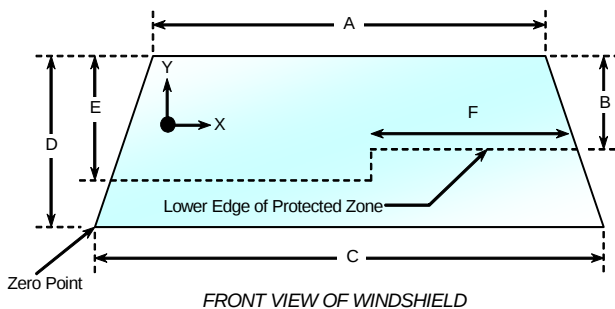
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with rubber cement.

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: 21.0 ° C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2093	2093	100.0%
Right Side	2093	2093	100.0%
Total	4186	4186	100.0%



Item	Units	Value
A	mm	1160
B	mm	332
C	mm	1405
D	mm	810
E	mm	477
F	mm	500

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: 2013 Cadillac ATS AWD 4-Door Sedan NHTSA No.: MD0108
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 11/06/12

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 26.9° C Test Time: 1:40 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

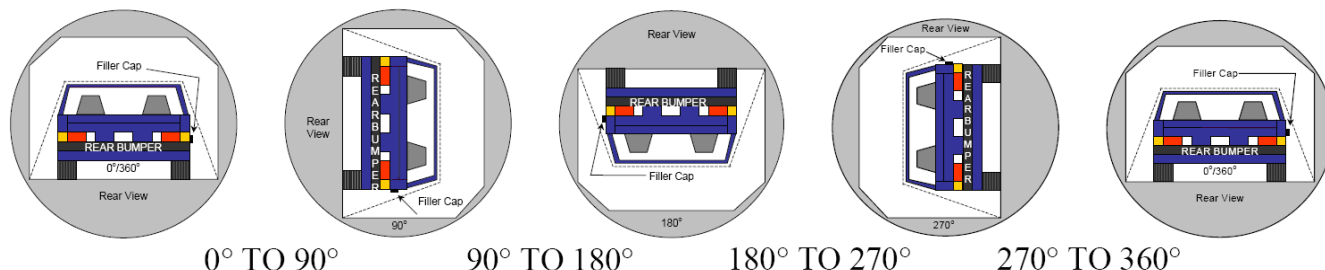
FMVSS 301 STATIC ROLLOVER

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan

NHTSA No.: MD0108

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 11/06/12



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°	82	300	382
180° To 270°	78	300	378
270° To 360°	81	300	381

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			

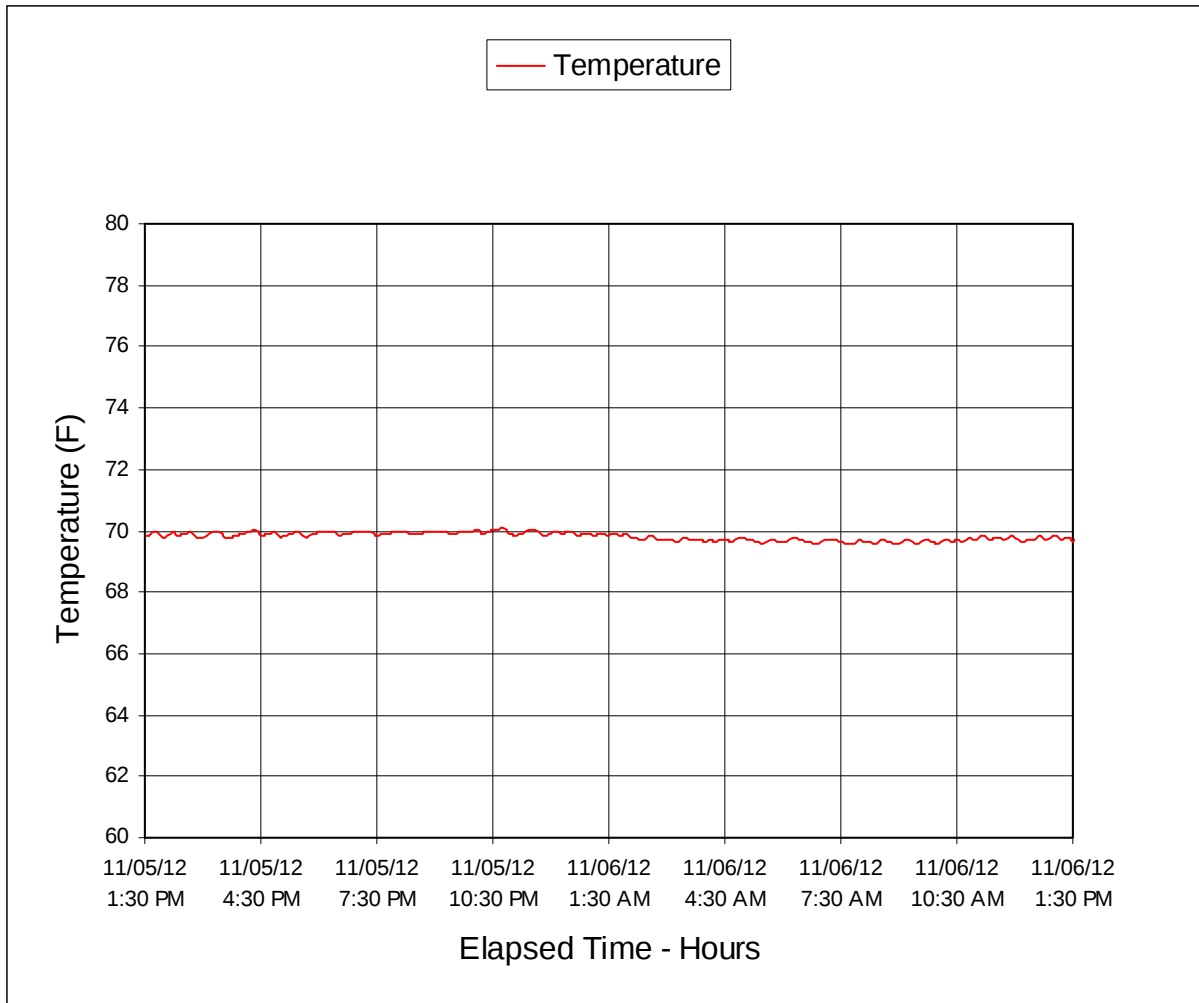
SOLVENT SPILLAGE LOCATION TABLE

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: 2013 Cadillac ATS AWD 4-Door Sedan NHTSA No.: MD0108
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 11/06/12



APPENDIX A
PHOTOGRAPHS

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FIGURE 1. Load Cell Location



FIGURE 2. Load Cell Wall

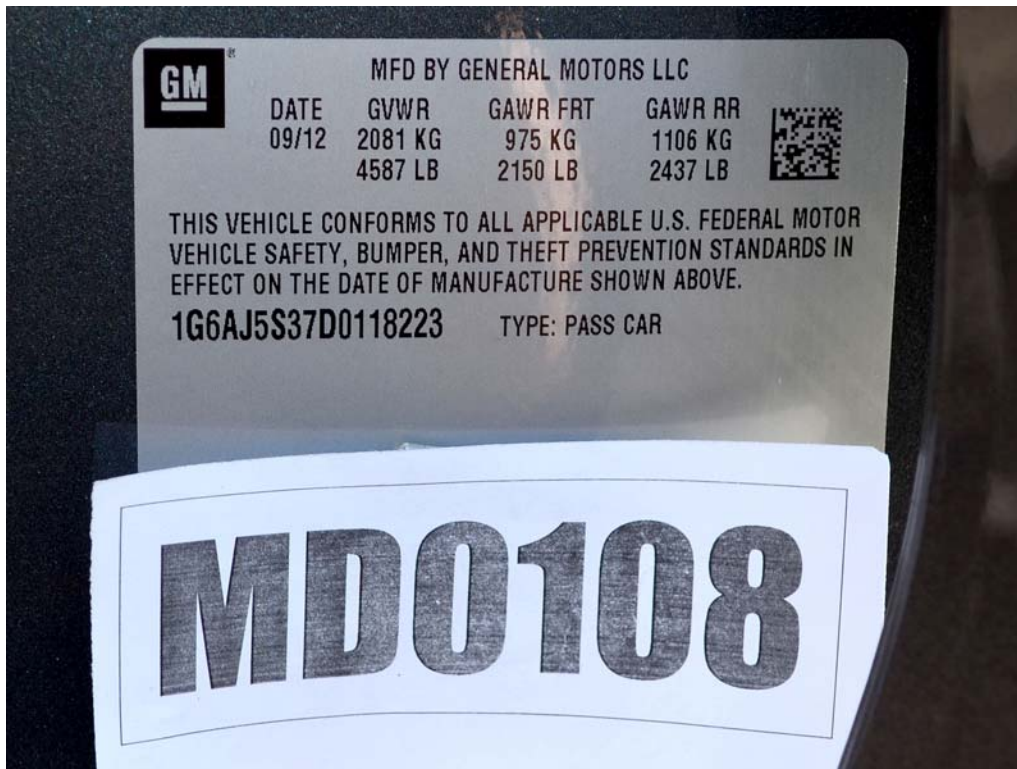


FIGURE 3. Manufacturer's Label

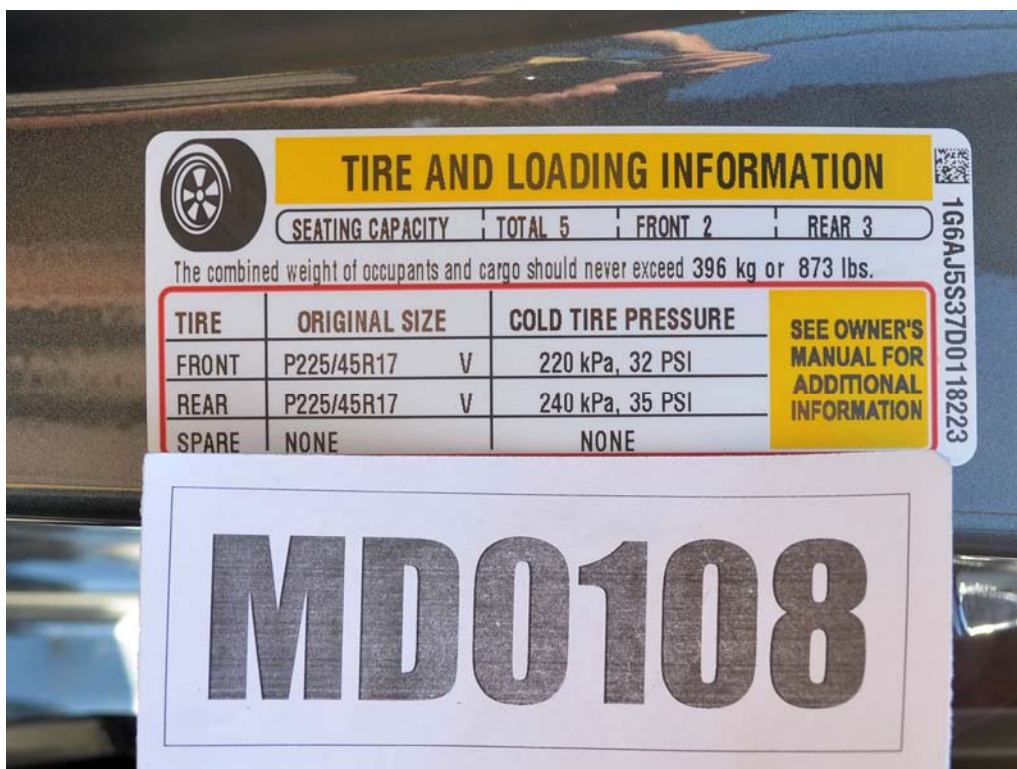


FIGURE 4. Tire Placard



FIGURE 5. 2013 Cadillac ATS AWD Frontal, As Delivered



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



FIGURE 7. Pre-Test Front View of Test Vehicle

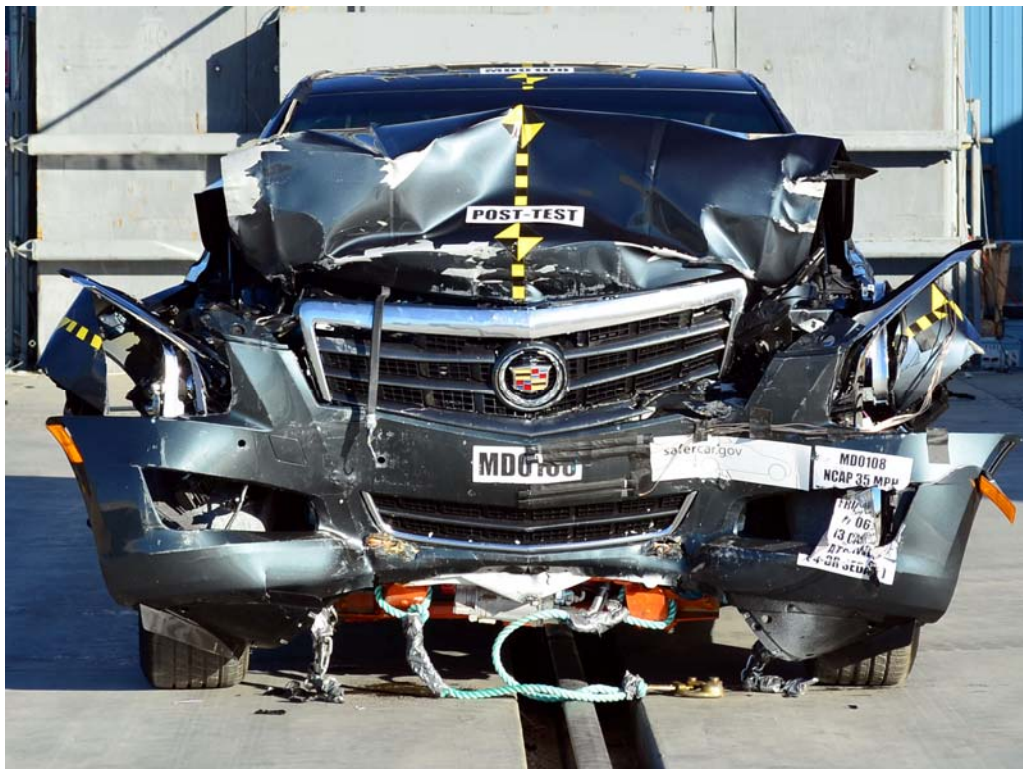


FIGURE 8. Post-Test Front View of Test Vehicle



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

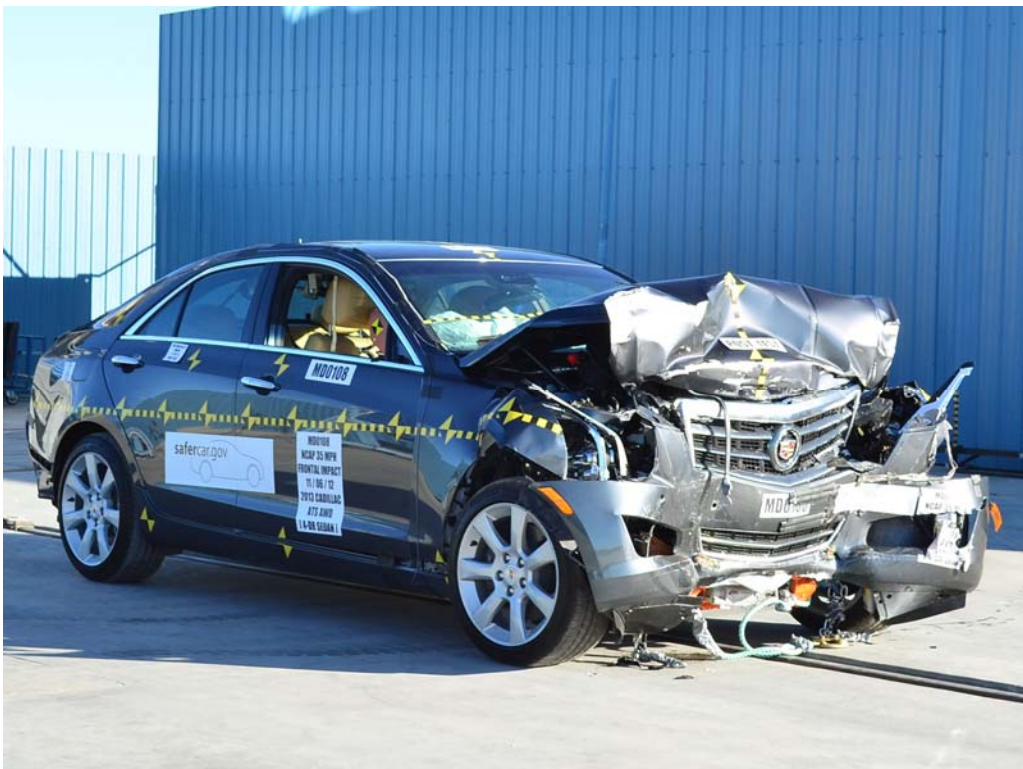


FIGURE 14. Post-Test Right Front $\frac{3}{4}$ View



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



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

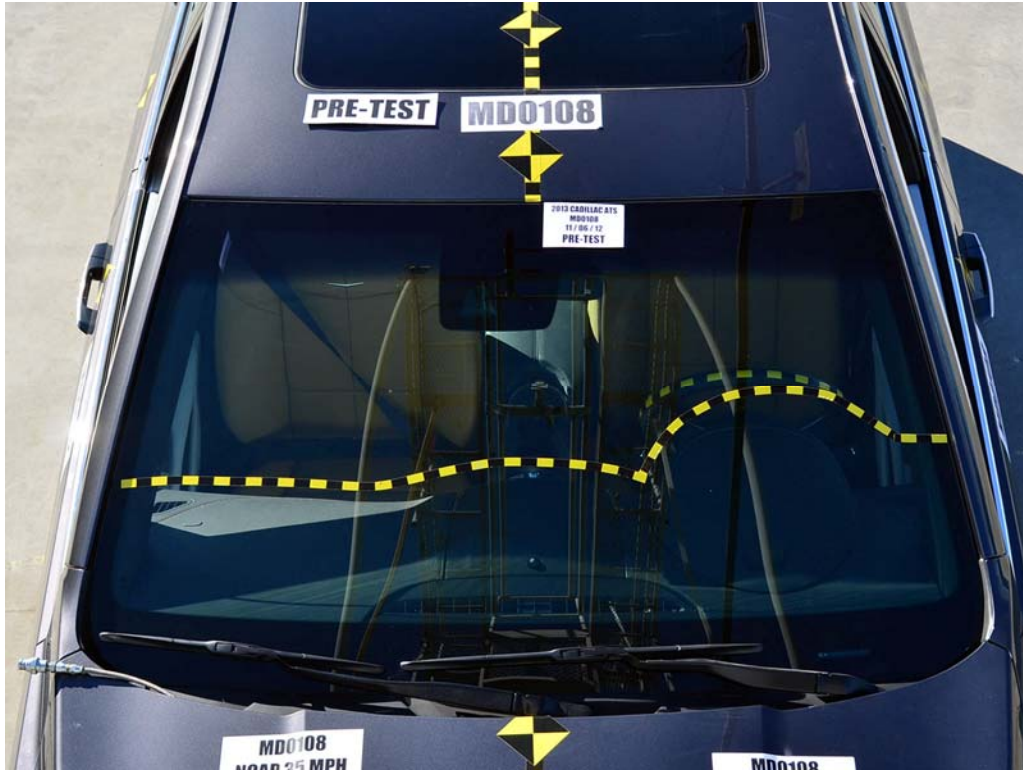


FIGURE 17. Pre-Test Windshield View



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

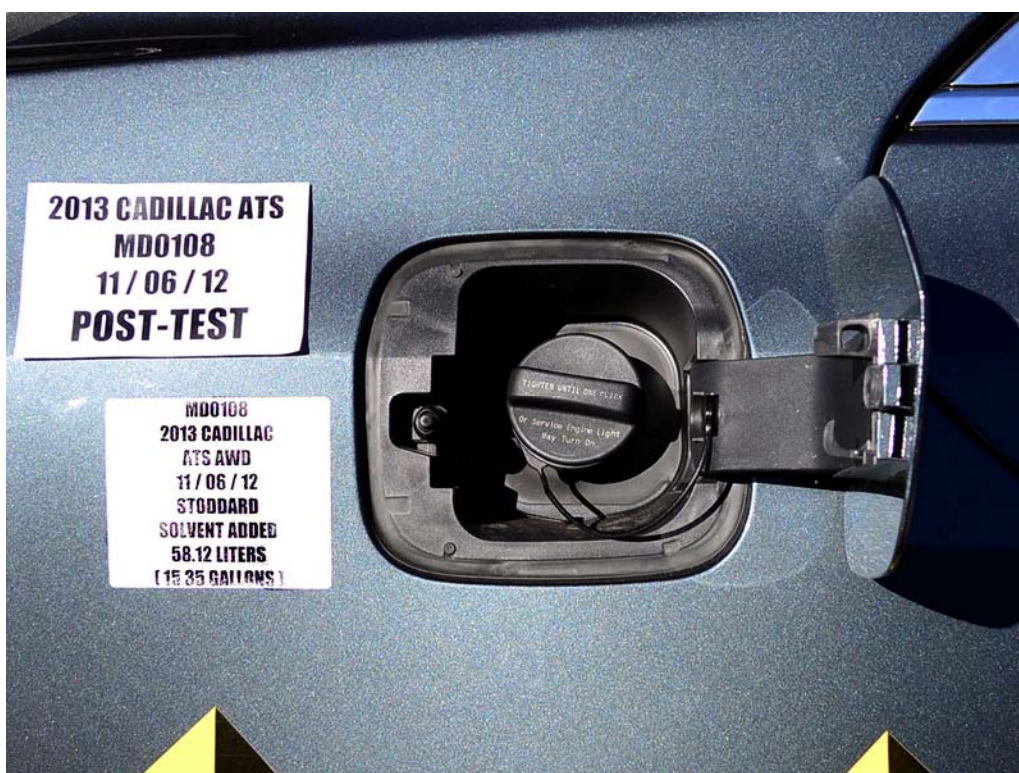


FIGURE 22. Post-Test Fuel Filler Cap View

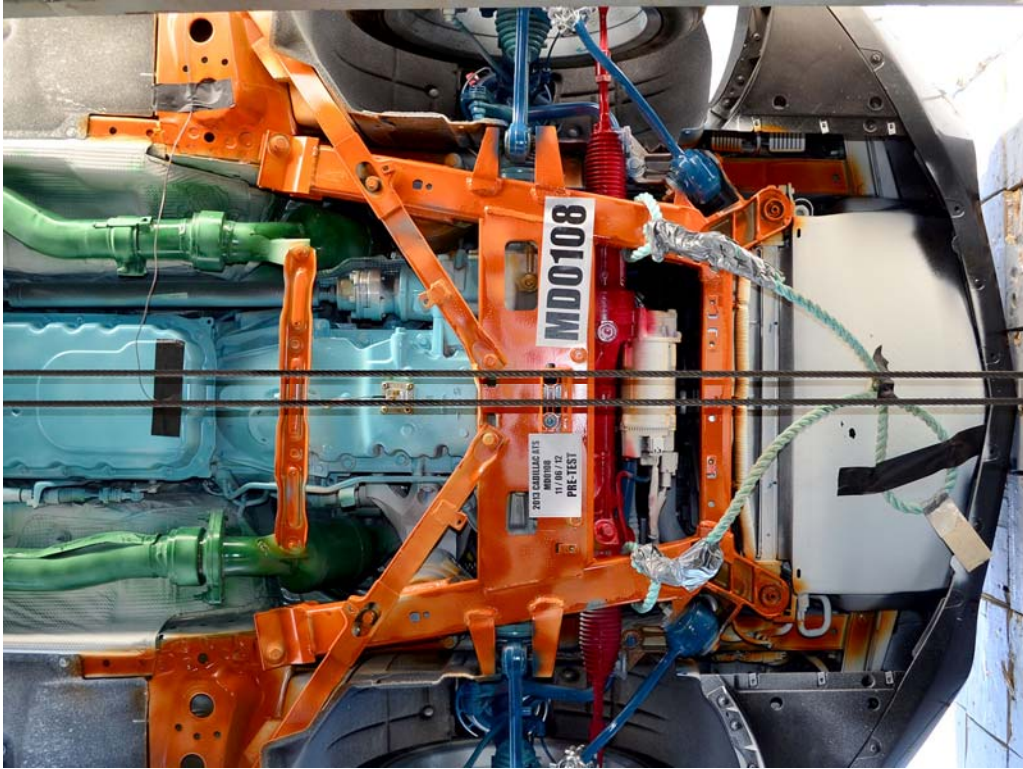


FIGURE 23. Pre-Test Front Underbody View

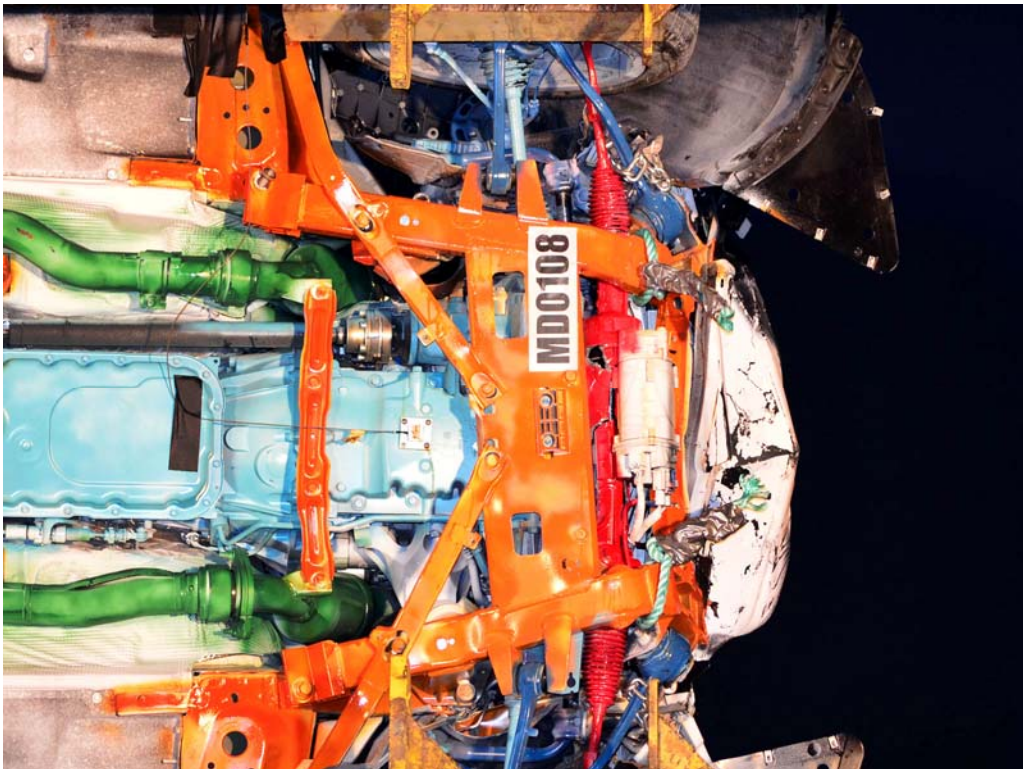


FIGURE 24. Post-Test Front Underbody View

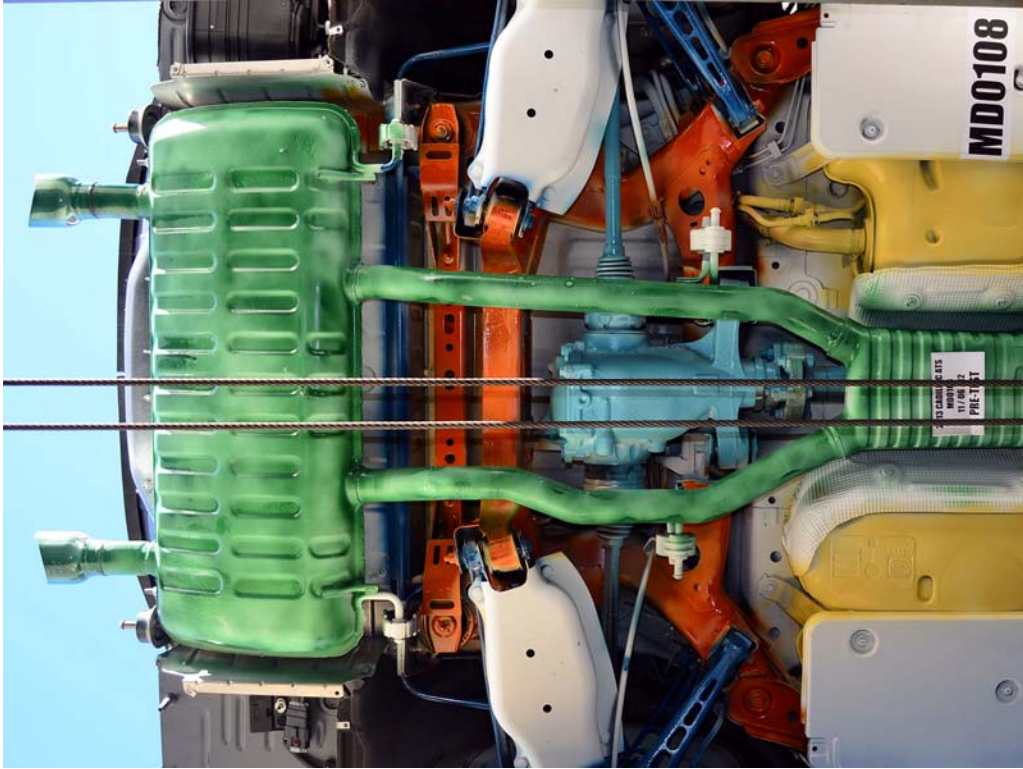


FIGURE 25. Pre-Test Rear Underbody View

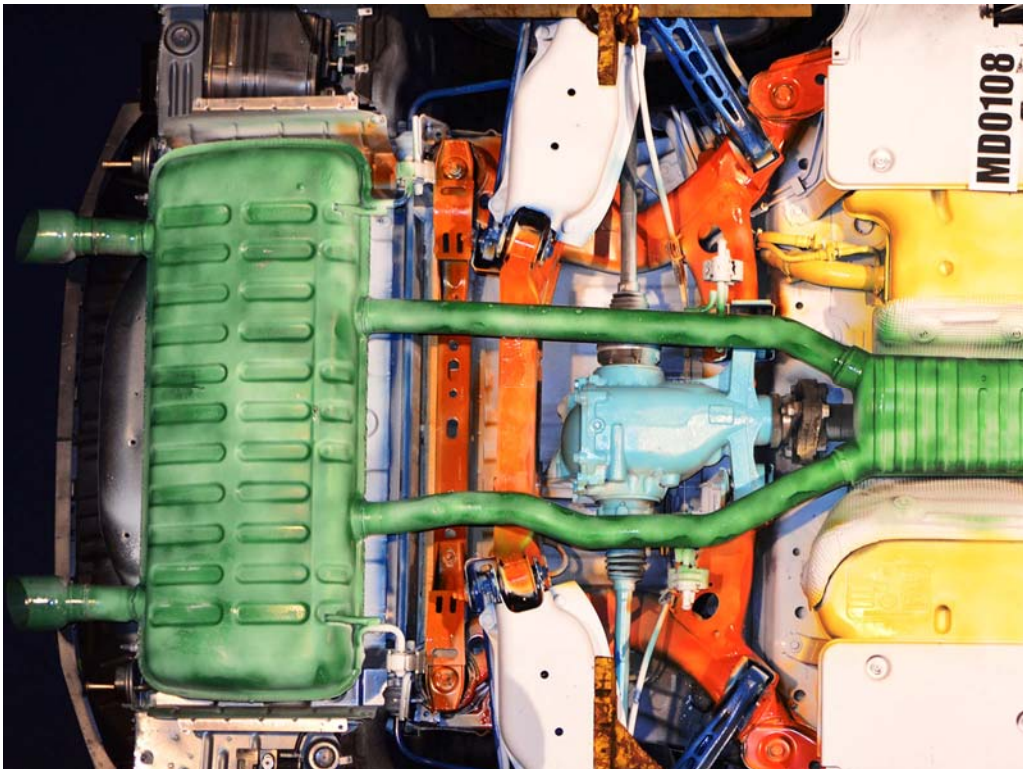


FIGURE 26. Post-Test Rear Underbody View



FIGURE 27. Pre-Test Dummy Cable Routing

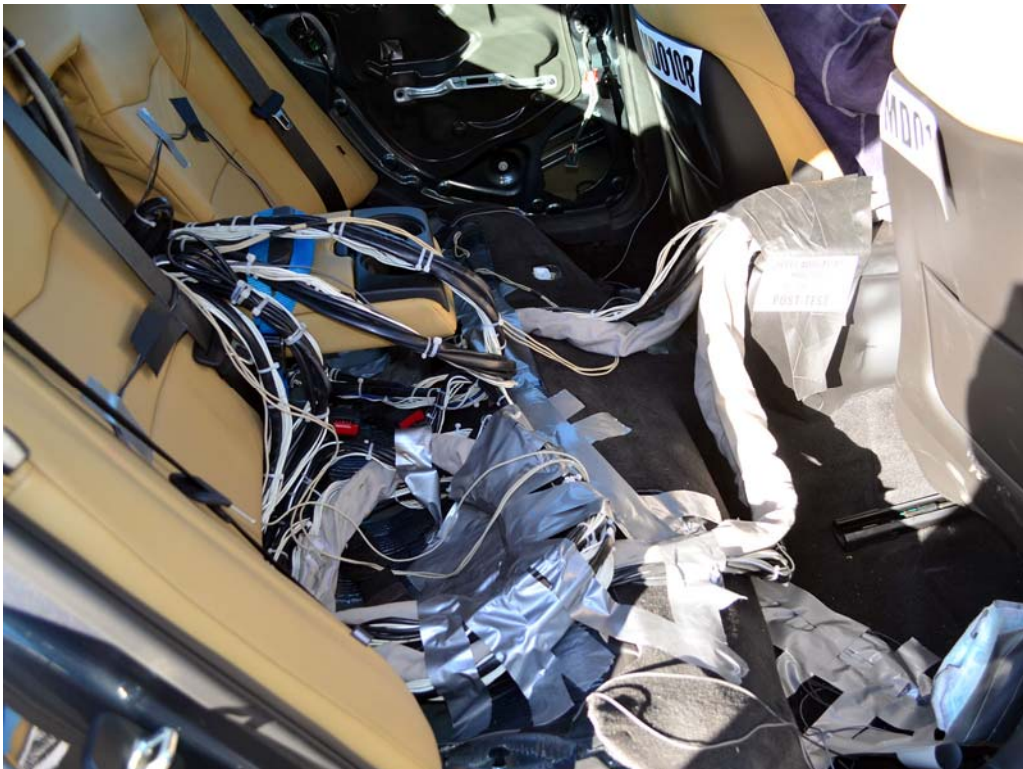


FIGURE 28. Post-Test Dummy Cable Routing



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

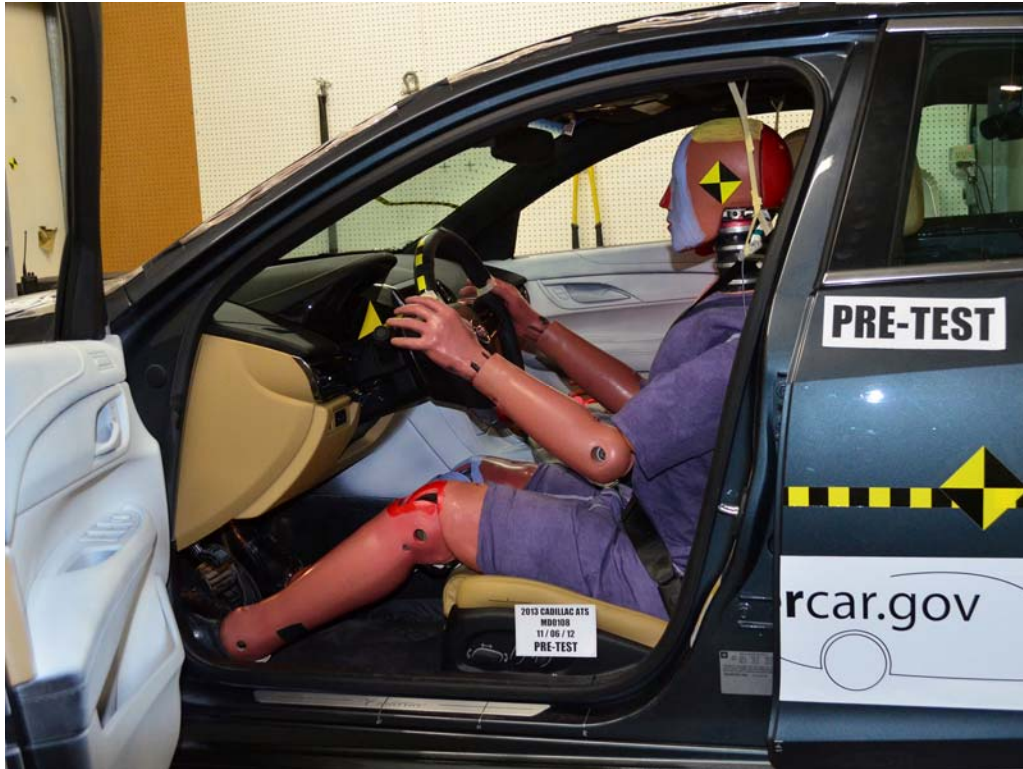


FIGURE 33. Pre-Test Driver Dummy and Vehicle Interior View



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



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

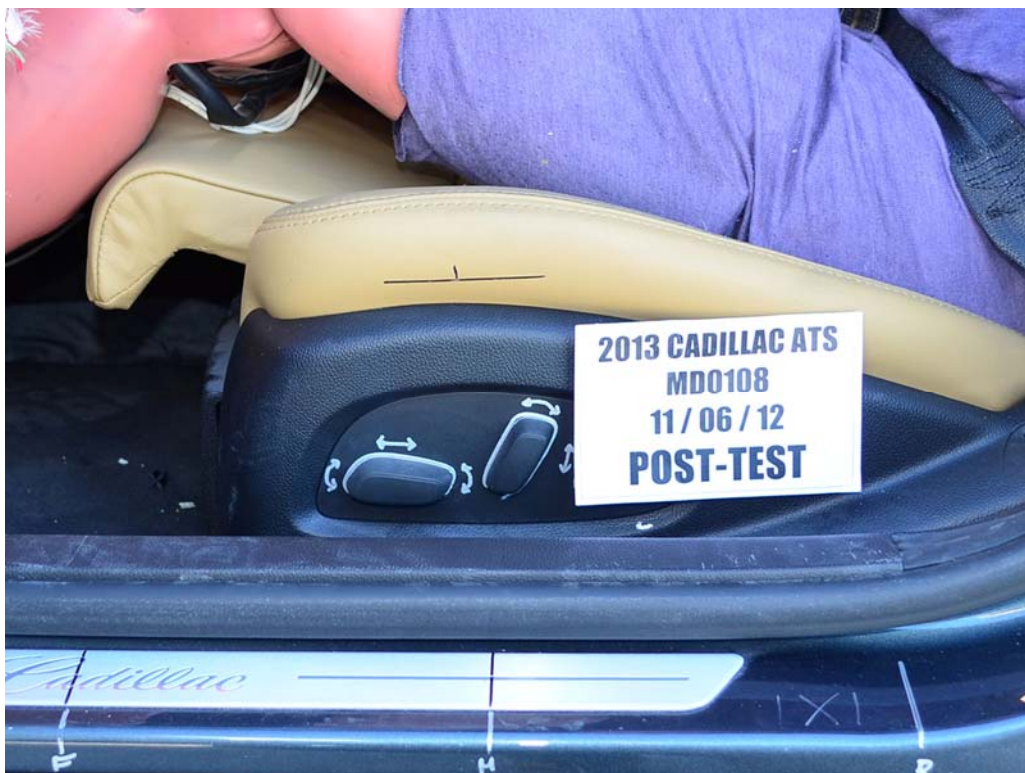


FIGURE 36. Post-Test Driver's Seat Fore-Aft Markings



FIGURE 37. Pre-Test View of Belt Anchorage for Driver Dummy



FIGURE 38. Post-Test View of Belt Anchorage for Driver Dummy



FIGURE 39. Pre-Test Driver Dummy Feet



FIGURE 40. Post-Test Driver Dummy Feet



FIGURE 41. Pre-Test Driver's Side Knee Bolster



FIGURE 42. Post-Test Driver's Side Knee Bolster



FIGURE 43. Pre-Test Driver's Side Floorpan



FIGURE 44. Post-Test Driver's Side Floorpan



FIGURE 45. Post-Test Driver Dummy Face

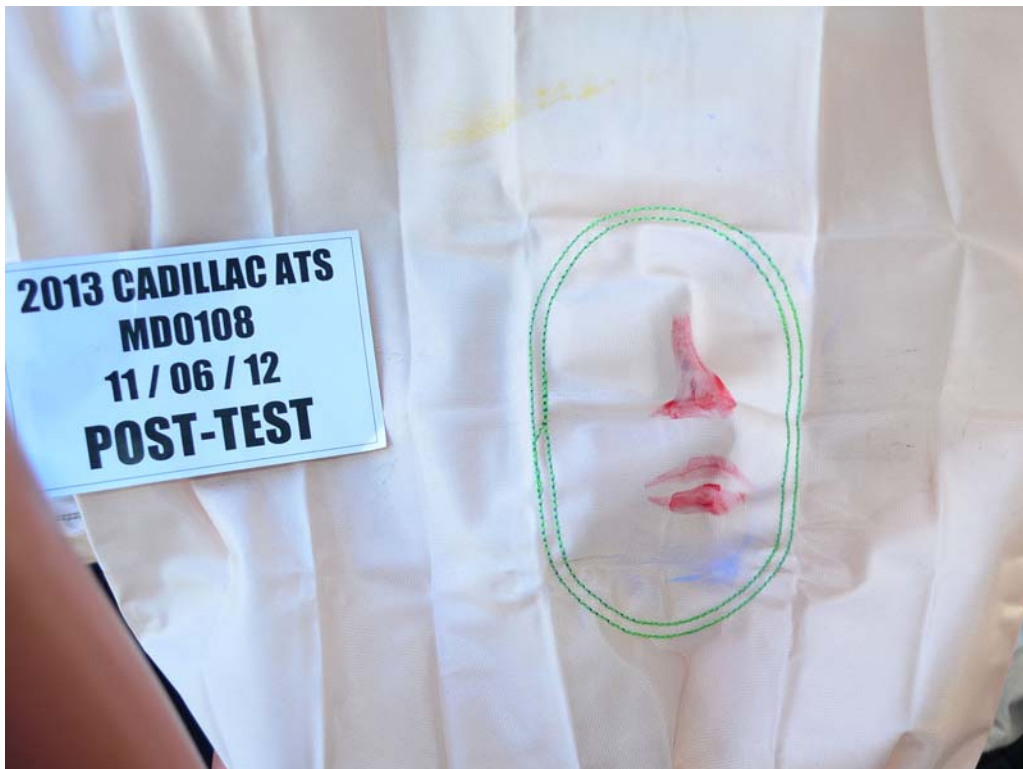


FIGURE 46. Post-Test Driver Dummy Contact With Airbag



FIGURE 47. Post-Test Driver Dummy Contact With Headrest

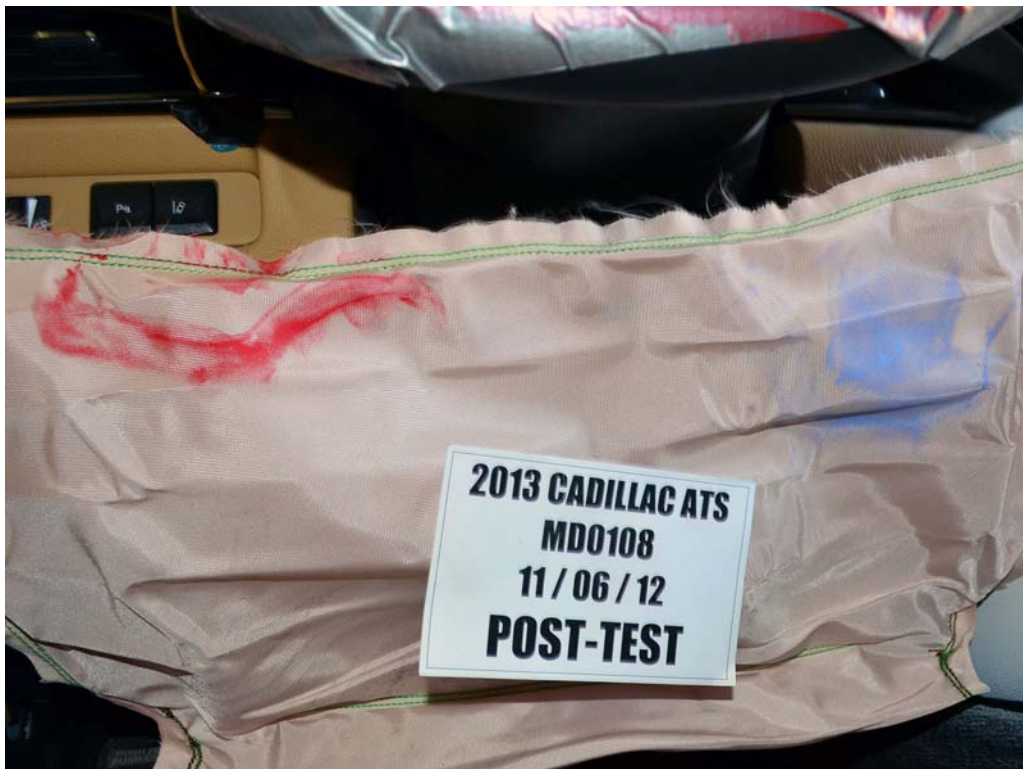


FIGURE 47a. Post-Test Driver Dummy Contact With Knee Airbag



FIGURE 48. Pre-Test View of the Steering Wheel



FIGURE 49. Post-Test View of the Steering Wheel



FIGURE 50. Pre-Test Passenger Dummy Front View

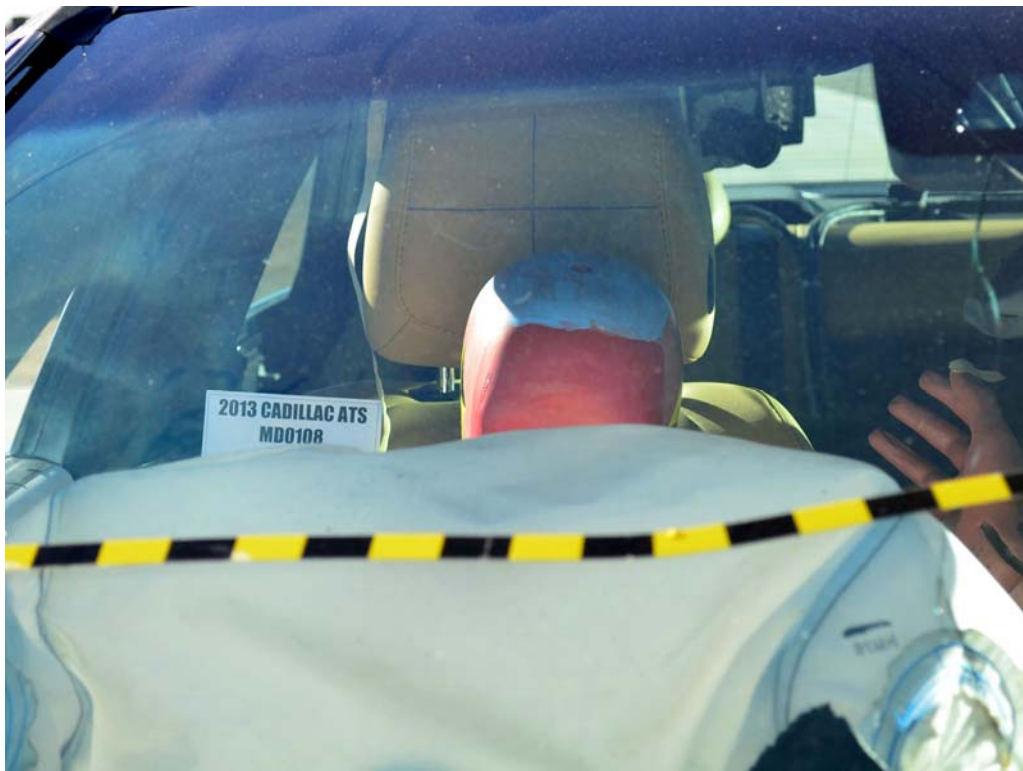


FIGURE 51. Post-Test Passenger Dummy Front View



FIGURE 52. Pre-Test Passenger Dummy Window View



FIGURE 53. Post-Test Passenger Dummy Window View



FIGURE 54. Pre-Test Passenger Dummy and Vehicle Interior View



FIGURE 55. Post-Test Passenger Dummy and Vehicle Interior View



FIGURE 56. Pre-Test Passenger's Seat Fore-Aft Markings



FIGURE 57. Post-Test Passenger's Seat Fore-Aft Markings

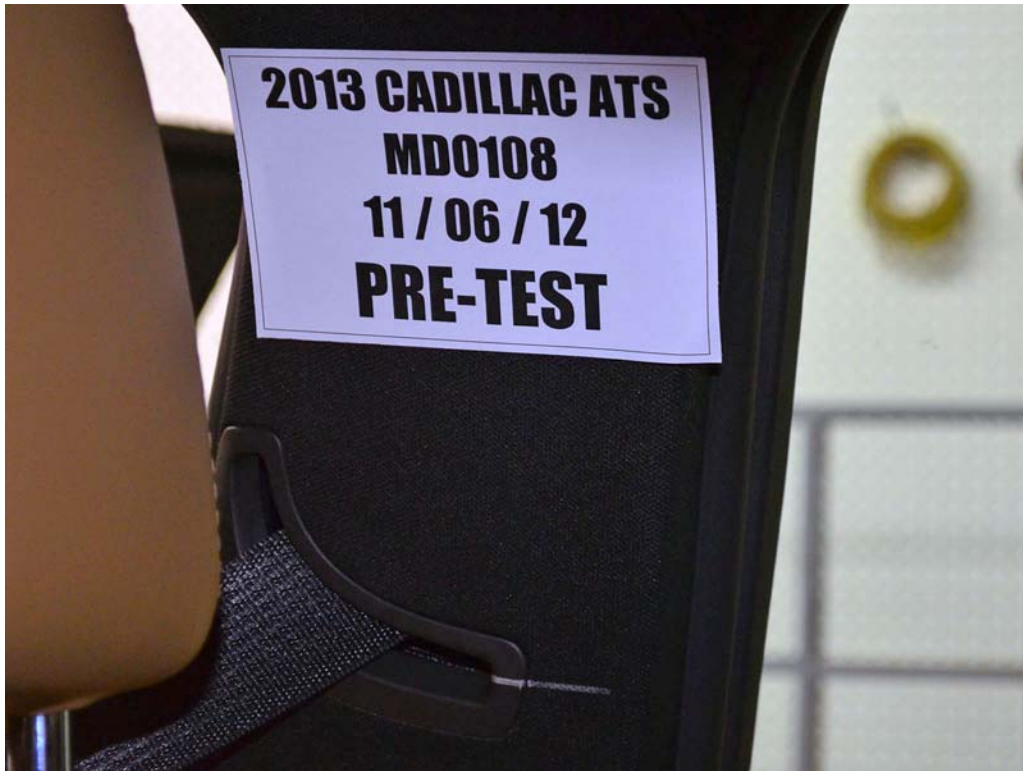


FIGURE 58. Pre-Test View of Belt Anchorage for Passenger Dummy



FIGURE 59. Post-Test View of Belt Anchorage for Passenger Dummy



FIGURE 60. Pre-Test Passenger Dummy Feet



FIGURE 61. Post-Test Passenger Dummy Feet

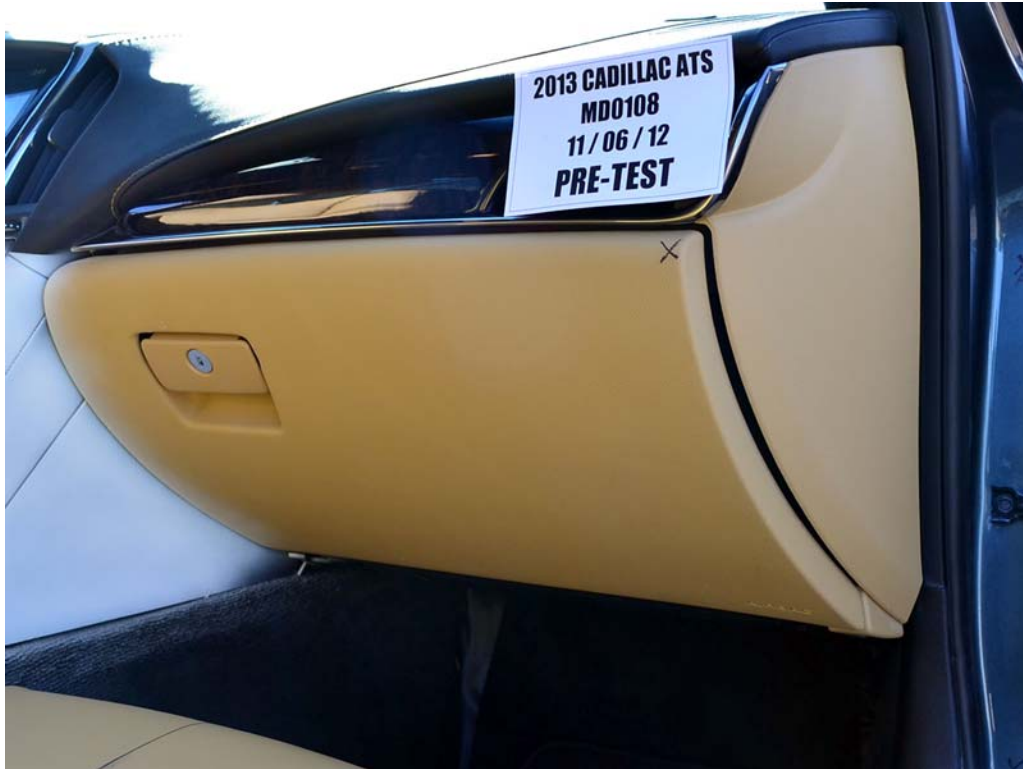


FIGURE 62. Pre-Test Passenger's Side Knee Bolster



FIGURE 63. Post-Test Passenger's Side Knee Bolster



FIGURE 64. Pre-Test Passenger's Side Floorpan



FIGURE 65. Post-Test Passenger's Side Floorpan

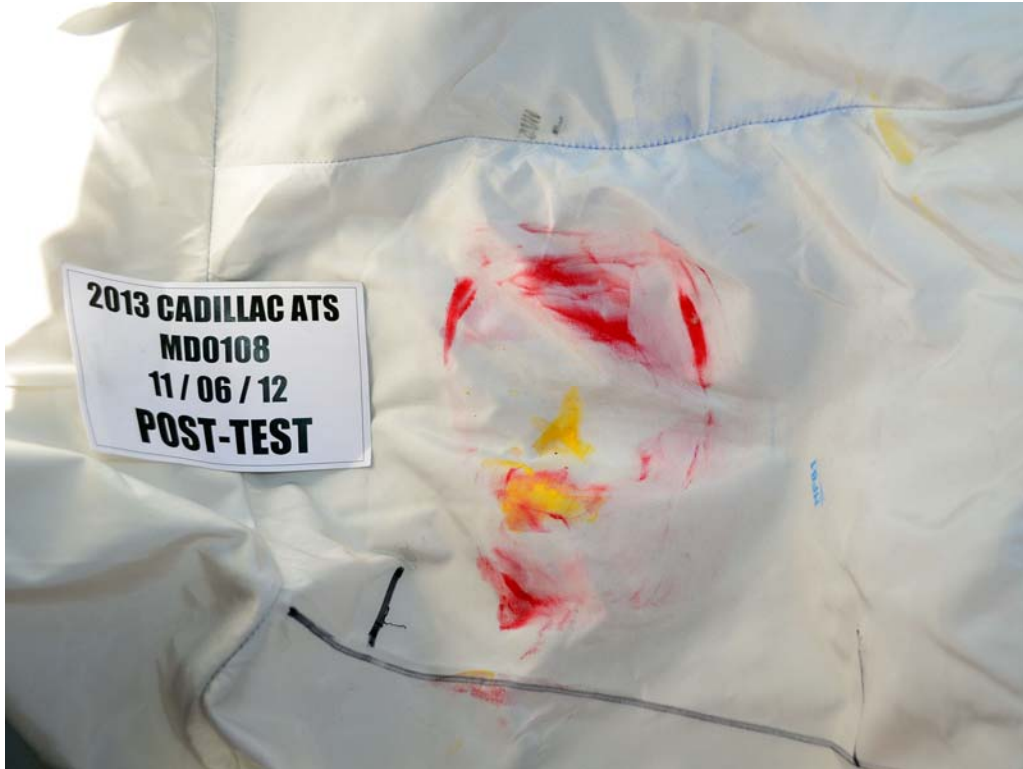


FIGURE 66. Post-Test Passenger Dummy Contact With Airbag



FIGURE 66a. Post-Test Passenger Dummy Contact With Headrest

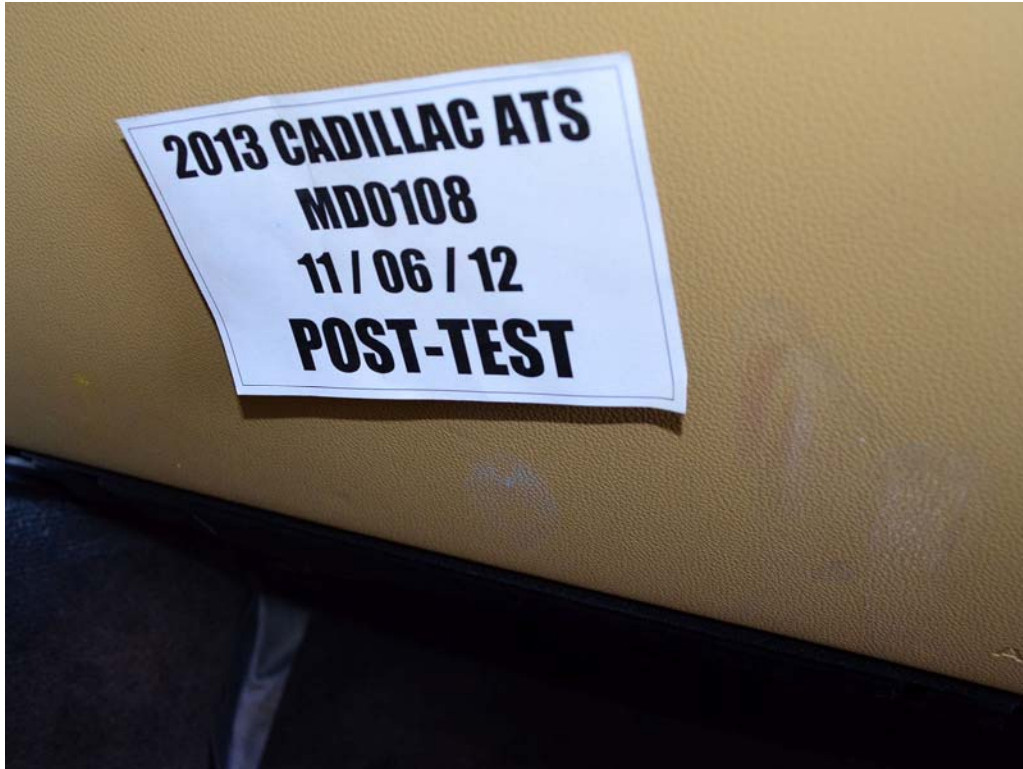


FIGURE 66b. Post-Test Passenger Dummy Contact With Glovebox

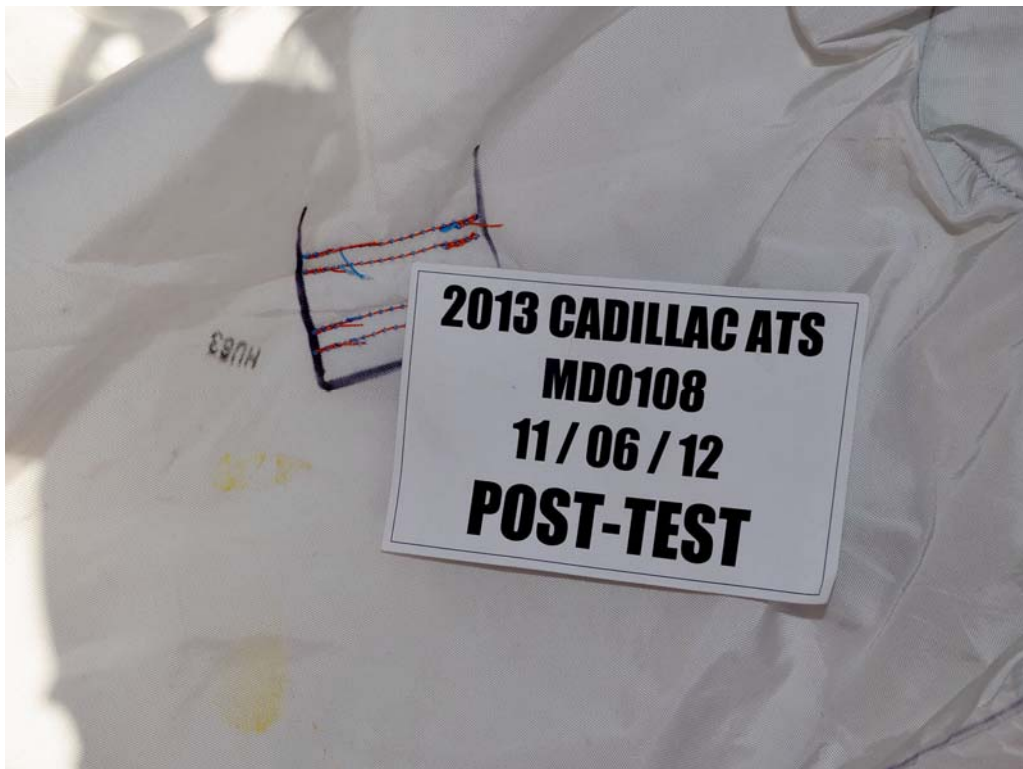


FIGURE 66c. Post-Test Passenger Dummy Knee Contact With Airbag



FIGURE 67. Photograph of Ballast Installed In vehicle

Photograph Not Applicable

No Stoddard
Solvent Leakage

FIGURE 68. Post-Test Stoddard Solvent Spillage Location

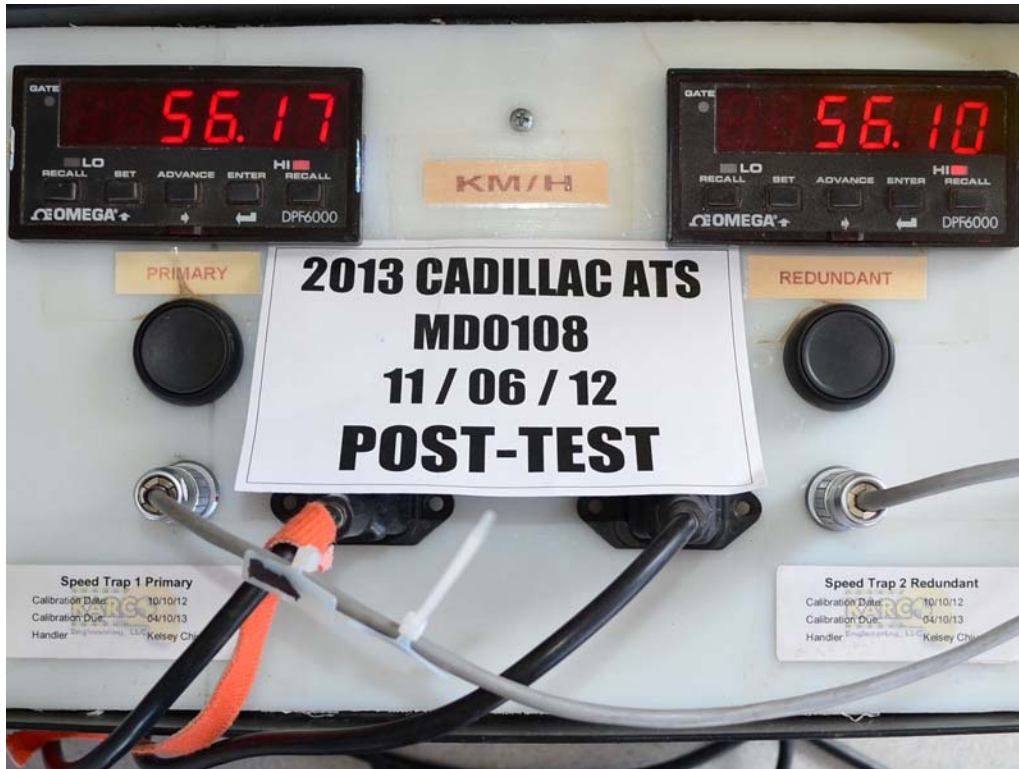


FIGURE 69. Post-Test Speed Trap Read Out

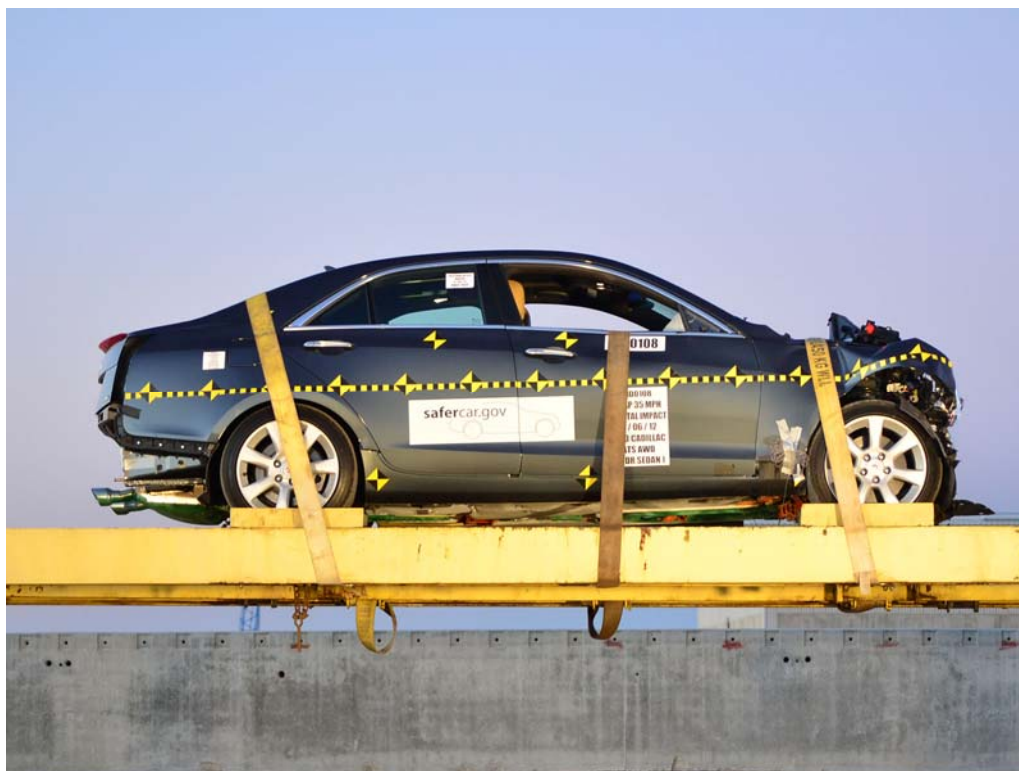


FIGURE 70. Vehicle at 0° on Static Rollover Device



FIGURE 71. Vehicle at 90° on Static Rollover Device



FIGURE 72. Vehicle at 180° on Static Rollover Device

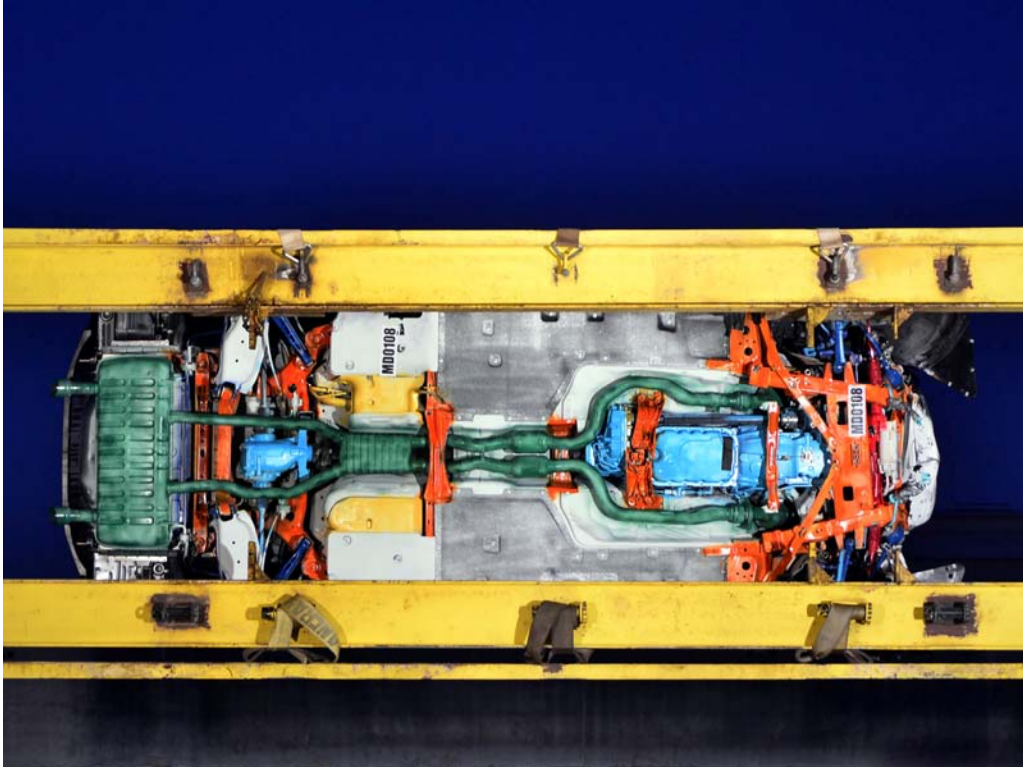


FIGURE 73. Vehicle at 270° on Static Rollover Device

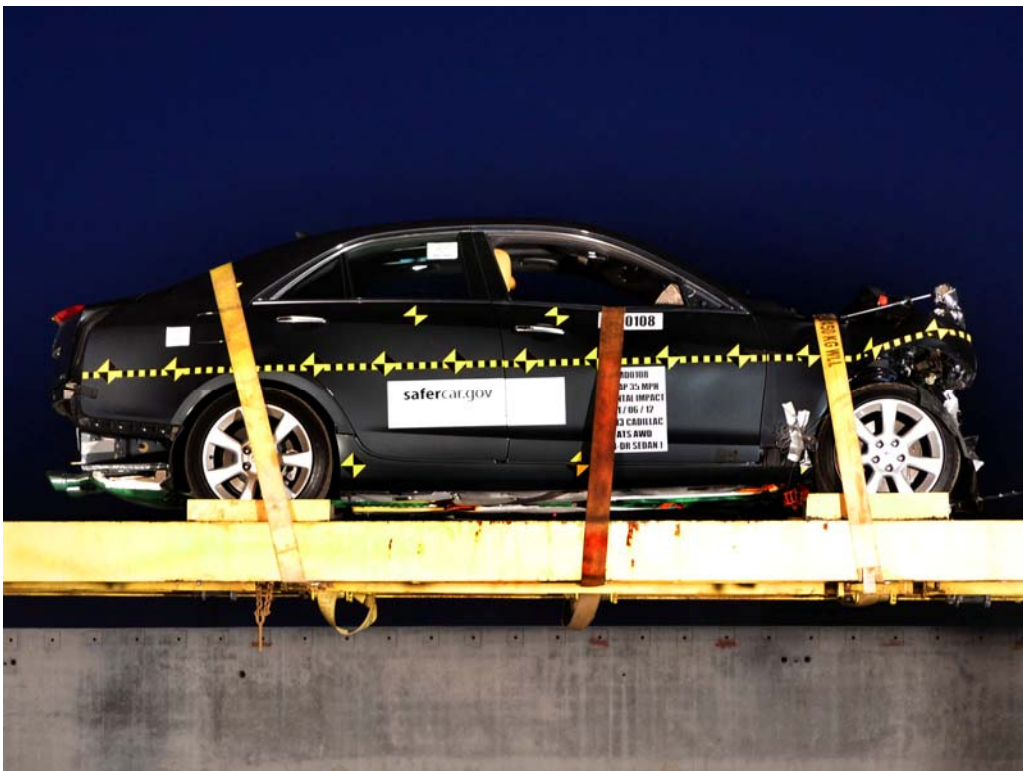


FIGURE 74. Vehicle at 360° on Static Rollover Device



FIGURE 75. 2013 Cadillac ATS AWD Impact Event

2013 ATS AWD 3.6L PERFORMANCE COLLECTION

EXTERIOR: THUNDER GRAY CHROMAFLAIR
INTERIOR: CAMEL W/ JET BLACK ACCENTS

ENGINE: 3.6L V6 321HP
TRANSMISSION: 6 SPD AUTOMATIC

Visit us at www.cadillac.com

STANDARD EQUIPMENT		PERFORMANCE		EXTERIOR		ENGINE	
CADILLAC ATS CADILLAC SHIELD • 4 YEAR / 50,000 MILE* BUMPER-TO-BUMPER WARRANTY • 6 YEAR / 70,000 MILE* POWERTRAIN LIMITED WARRANTY • 4 YEAR / 50,000 MILE* PREMIUM CARE MAINTENANCE • 6 YEAR / 70,000 MILE* COUNTRY TRANSPORTATION • 5 YEAR / 70,000 MILE* ROADSIDE ASSISTANCE • 12 MISC. ON-STAR DIRECTIONS & CONNECTIONS W/ AUTOMATIC CRASH RESPONSE, TURN-BY-TURN NAVIGATION, AND ON-STAR REMOTELOCK (ASK DEALER ABOUT GEOGRAPHIC COVERAGE)		• *WHICHEVER COMES FIRST SEE DEALER FOR DETAILS. PERFORMANCE • ENGINE, 3.6L V6 321HP* WITH DIRECT INJECTION • ALL WHEEL DRIVE • TRANSMISSION, 6 SPD AUTOMATIC • PDRF* ALGORITHM TAPSHIFT • SUSPENSION, SPORT • 27 PREMIUM ELECTRIC VARIABLE STEERING • EXHAUST, DUAL, STAINLESS STEEL WITH BRIGHT POLISHED TIPS • WHEELS, 17" PAINTED ALUMINUM • TIRES, ALL SEASON RUN FLAT • BRAKES, PERFORMANCE PBR BRAKES • STABILITRAC STABILITY CONTROL W/ TRACTION CONTROL • TIRE PRESSURE MONITOR LUXURY/CONVENIENCE • HANDCRAFTED CUT & SEWN INTERIOR • LEATHER SEATING SURFACES • SEATS, PERFORMANCE • DRIVER 12-WAY AND FRONT PASSENGER 10-WAY • LUMBAR PWR DRIVE/PASS PWR • MEMORY SEAT ADJUSTER • SEAT, REAR CENTER ARMREST, PASS THROUGH • 5.7" FULL-COLOR DIC • CADILLAC USER EXPERIENCE (CUE) WITH SURROUND SOUND • 8" FULL-COLOR TOUCH DISPLAY • AM/FM STEREO, CD PLAYER, BOSE • SIRIUSXM AND HD RADIO + SURFACE SUBSCRIPTION SOLD SEPARATELY BY SIRIUSXM AFTER 3 MONTHS • BLUE TOOTH FOR PHONE & AUDIO • LEATHER WRAP STEERING WHEEL • MAGNETIC RIDE SHIFTERS • PEDALS, SPORT ALLOY • DUAL ZONE CLIMATE CONTROL • AIR FILTRATION SYSTEM		• AUTO DIMMING EXTERIOR • WINDSHIELD WIPERS, RANDENSE • MIRRORS, OUTSIDE HEATED & PWR • W/ DRIVER SIDE AUTO DIMMING • LED INTERIOR LIGHTING ACCENTS • UNIVERSAL HEAT REMOTE • HEADLAMPS, HIGH INTENSITY • W/ ADAPTIVE FORWARD LIGHTING • LED VERTICAL ACCENT LIGHTING • DOOR HANDLES, ILLUMINATING • KEYLESS PUSH-BUTTON START • KEYLESS PASSAGE ENTRY SYSTEM • ADAPTIVE REMOTE VEHICLE START • FRONT AND REAR PARKING ASSIST • MOONLIGHT CHROME ACCENT GRILLE SAFETY AND SECURITY • AIRBAGS, DRIVER & PASSENGER • FRONTAL AND KNEE • FETTERING RR - HEAD CURTAIN AND SIDE • 4-WAY ADJUSTABLE FRONT HEAD RESTRAINTS		• DRIVER AWARENESS PACKAGE • REAR VISION CAMERA SYSTEM • BRAKES, ABS W/ AUTO DRY • HILL HOLD & START ASSIST • DAYTIME RUNNING LAMPS • POWER DOOR LOCKS, PROGRAMMABLE • REAR OR LOCKS, CHILD SECURITY • KIDSAFE THEFT DETECTION • W/ VEHICLE IMMOBILIZER • REMOTE KEYLESS ENTRY	

TOTAL VEHICLE & OPTIONS \$48,530.00
DESTINATION CHARGE \$85.00
TOTAL VEHICLE PRICE* \$48,615.00

STANDARD VEHICLE PRICE \$48,615.00

OPTIONS INSTALLED BY THE MANUFACTURER (REPLACE STANDARD EQUIPMENT ITEMS)

POWER SUNROOF 1,050.00
THUNDER GRAY CHROMAFLAIR 995.00
NAVIGATION SYSTEM 795.00
TOTAL OPTIONS \$2,840.00

EPA DOT Fuel Economy and Environment

Fuel Economy
21 18 26
 combined city highway
 4.8 gallons per 100 miles

You spend \$1,150 more in fuel costs over 5 years
 compared to the average new vehicle.

Annual fuel cost \$2,550

Fuel Economy & Greenhouse Gas Rating
 Smog Rating: 5 (1-10 scale)
 Fuel economy: 21 mpg city, 18 mpg highway, 26 mpg combined
 CO2 emissions: 210 g/mi city, 180 g/mi highway, 195 g/mi combined

GOVERNMENT 5-STAR SAFETY RATINGS

This vehicle has not been rated by the government for overall vehicle score, frontal crash, side crash or rollover risk.

Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-800-321-4226

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:
 U.S./CANADIAN PARTS CONTENT: 65%
 MAJOR SOURCES OF FOREIGN PARTS CONTENT: MEXICO 17%

NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

FOR THIS VEHICLE:
 FINAL ASSEMBLY POINT: LANSING, MI U.S.A.
 COUNTRY OF ORIGIN: ENGINE: MEXICO
 TRANSMISSION: UNITED STATES

2013 EPA Greenhouse Gas Rating: 195 g/mi combined
 2013 EPA Fuel Economy: 21 mpg city, 18 mpg highway, 26 mpg combined

DV
 1GA0918771

FIGURE 76. Monroney Label Photograph

APPENDIX B
DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

Plot		Page
1	Driver Head X Acceleration vs. Time Primary	B-1
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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
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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
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25	Passenger Upper Neck Force X 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

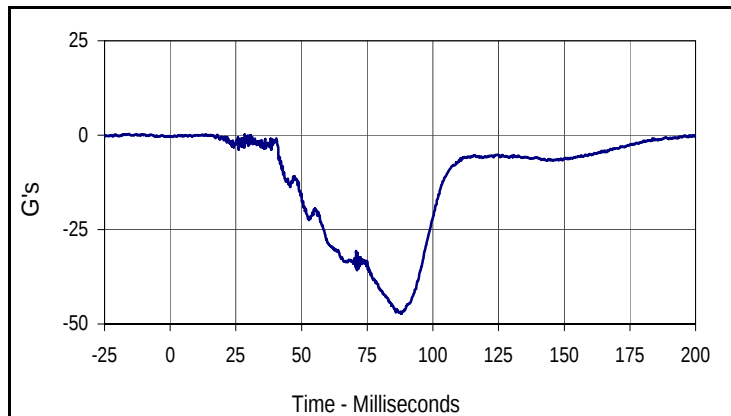
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Driver Head Y Acceleration Redundant
Driver Head Z Acceleration Redundant
Driver Head Front Y Acceleration
Driver Head Front Z Acceleration
Driver Head Top X Acceleration
Driver Head Top Y Acceleration
Driver Head Left X Acceleration
Driver Head Left Z Acceleration
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 Head Front Y Acceleration
Passenger Head Front Z Acceleration
Passenger Head Top X Acceleration
Passenger Head Top Y Acceleration
Passenger Head Left X Acceleration
Passenger Head Left Z Acceleration
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

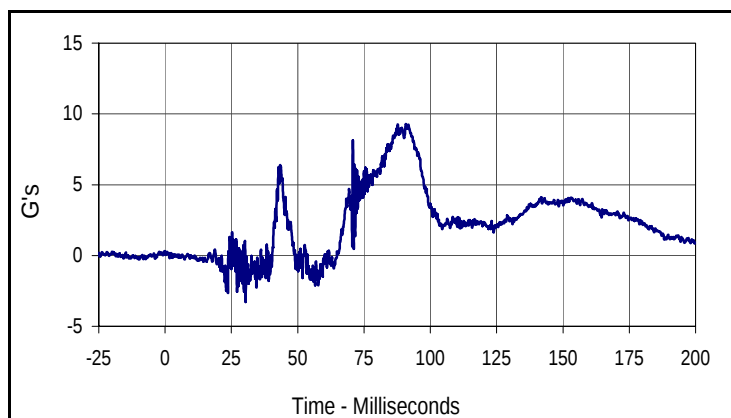
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Fore Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Right Foot Fore Z
Passenger Right 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 Rear Z
Vehicle Right Rear Z
Load Cell Barrier A1-A9
Load Cell Barrier B1-B9
Load Cell Barrier C1-C9
Load Cell Barrier D1-D9

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan
 Test Program: 56 km/h Frontal Impact NCAP Test

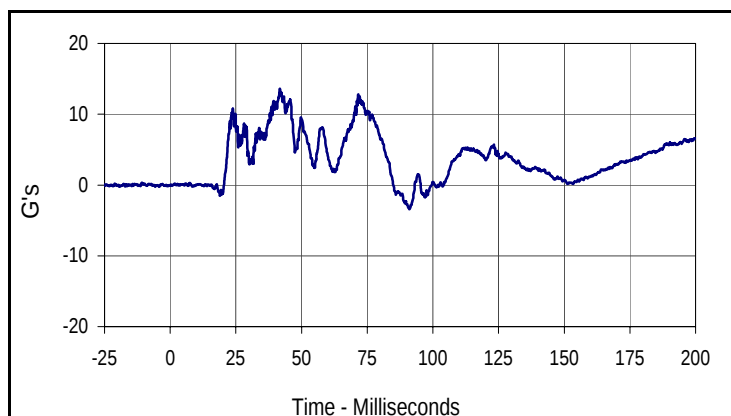
NHTSA No.: MD0108
 Test Date: 11/6/12



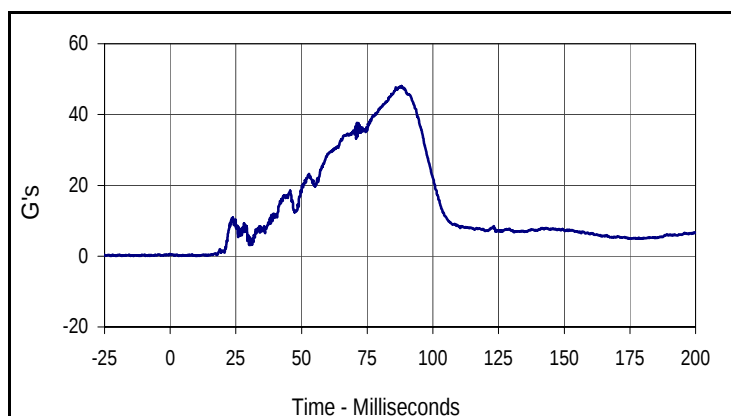
Curve Description			
Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
0.2	13.5	-47.2	88.1



Curve Description			
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Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
9.3	90.8	-3.3	30.4



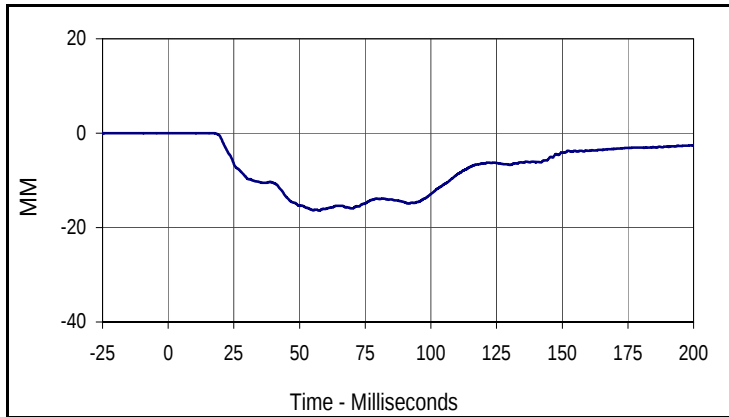
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
13.6	41.8	-3.4	91.1



Curve Description			
Driver Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
48.0	88.1	0.0	9.8

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan
 Test Program: 56 km/h Frontal Impact NCAP Test

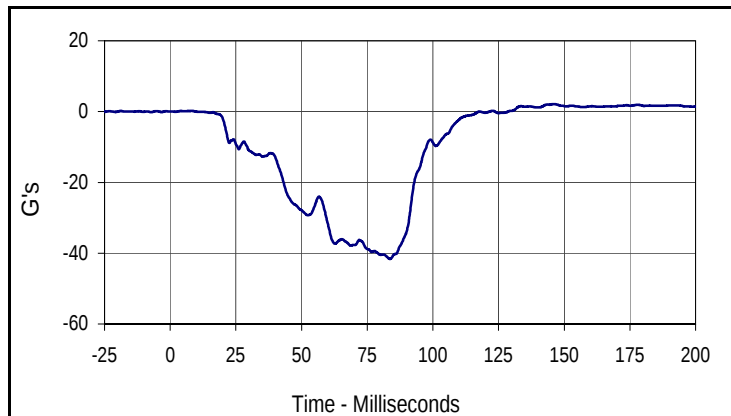
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 Test Date: 11/6/12



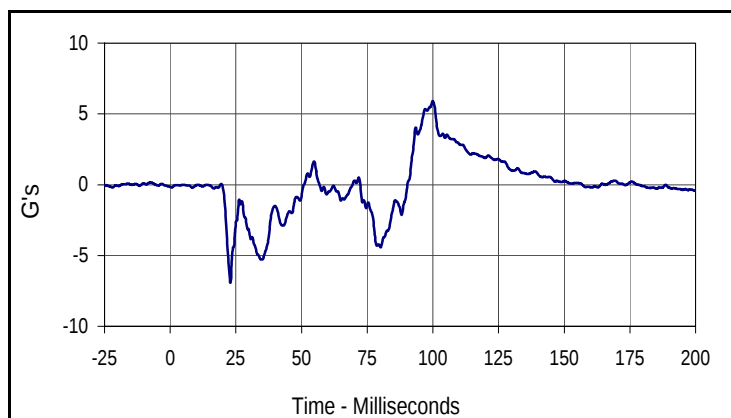
Curve Description			
Driver Chest Deflection			
Plot No.	Type	SAE Class	Units
005	FIL	600	MM
Max	Time	Min	Time
0.0	5.7	-16.4	57.5

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan
 Test Program: 56 km/h Frontal Impact NCAP Test

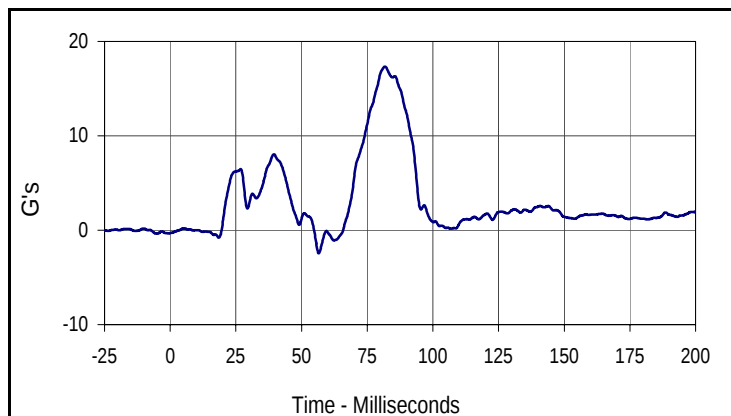
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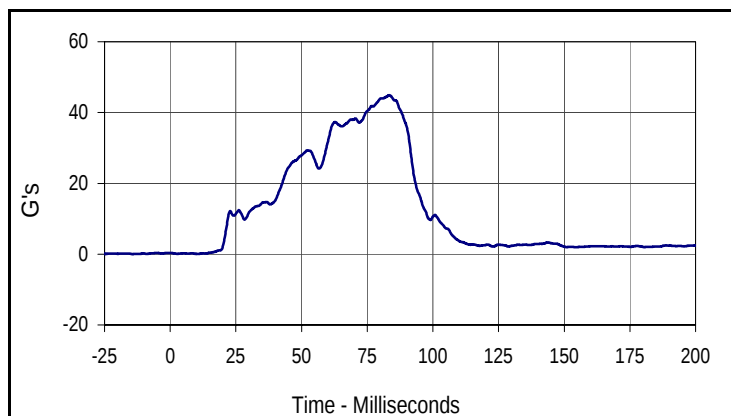
Curve Description			
Driver Chest Acceleration X Primary			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
2.1	146.1	-41.6	83.6



Curve Description			
Driver Chest Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
007	FIL	180	G's
Max	Time	Min	Time
5.9	99.9	-6.9	22.9



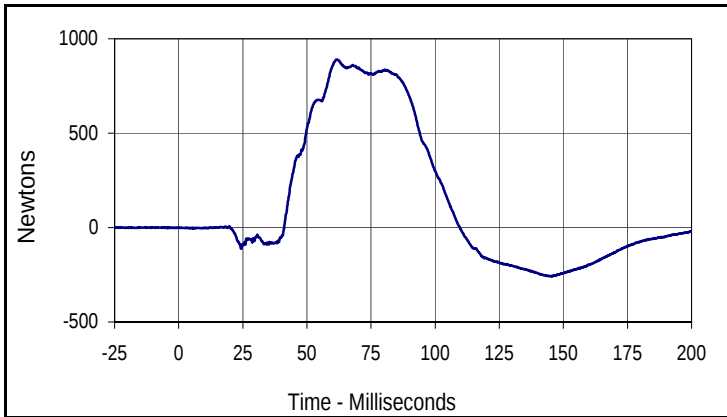
Curve Description			
Driver Chest Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
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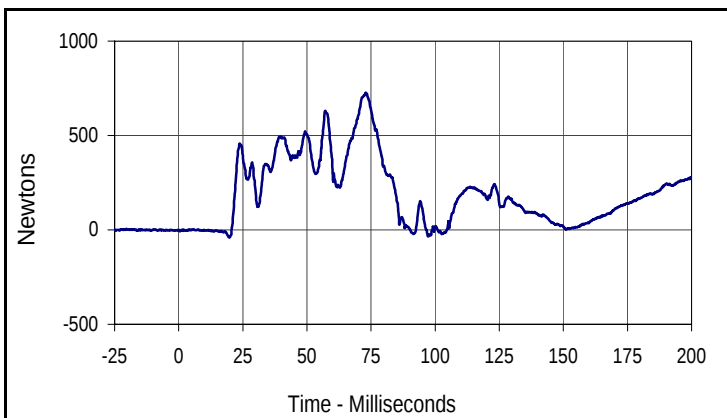
Curve Description			
Driver Chest Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
009	RES	180	G's
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Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan
 Test Program: 56 km/h Frontal Impact NCAP Test

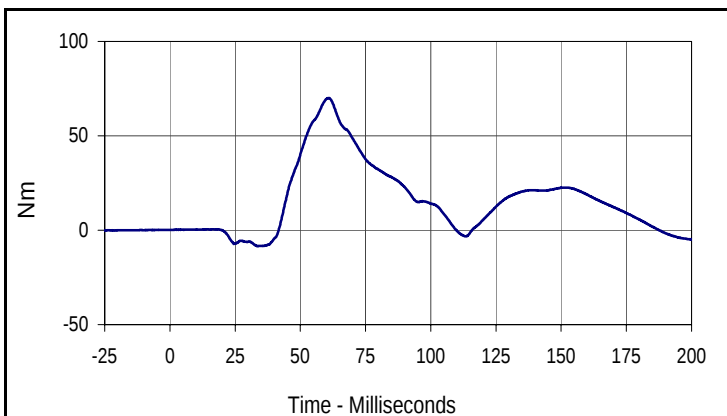
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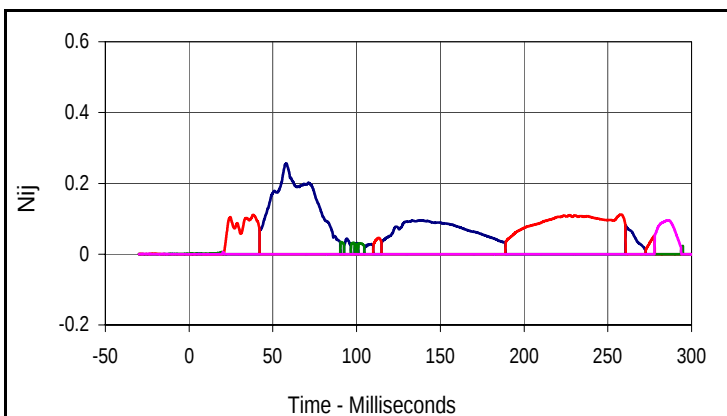
Curve Description			
Driver Upper Neck Force X			
Plot No.	Type	SAE Class	Units
010	FIL	1000	Newtons
Max	Time	Min	Time
889.9	61.5	-258.6	145.6



Curve Description			
Driver Upper Neck Force Z			
Plot No.	Type	SAE Class	Units
011	FIL	1000	Newtons
Max	Time	Min	Time
726.7	72.9	-38.4	19.5



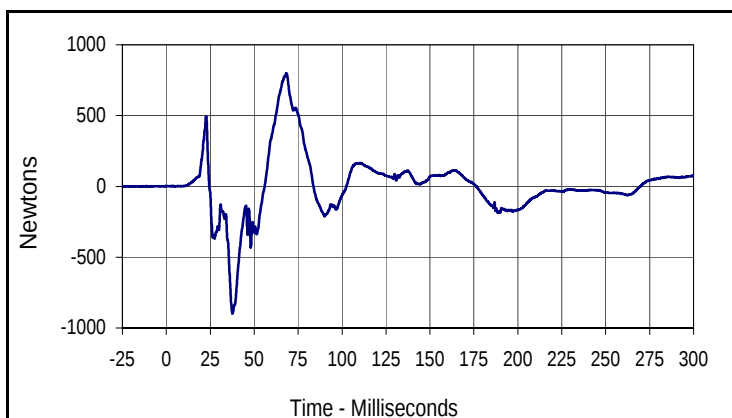
Curve Description			
Driver Upper Neck Moment Y			
Plot No.	Type	SAE Class	Units
012	FIL	600	Nm
Max	Time	Min	Time
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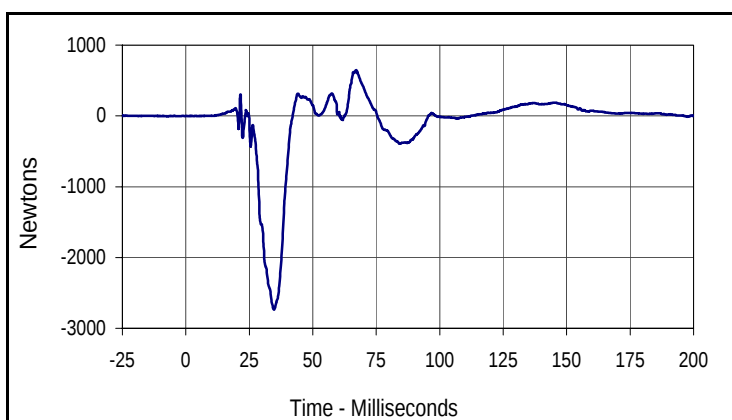
Curve Description			
Driver Nij			
Units	Type	Max	Time
Ntf	FIL	0.26	58.1
Units	Type	Max	Time
Nte	FIL	0.11	257.7
Units	Type	Max	Time
Ncf	FIL	0.03	90.7
Units	Type	Max	Time
Nce	FIL	0.10	285.6

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan
 Test Program: 56 km/h Frontal Impact NCAP Test

NHTSA No.: MD0108
 Test Date: 11/6/12



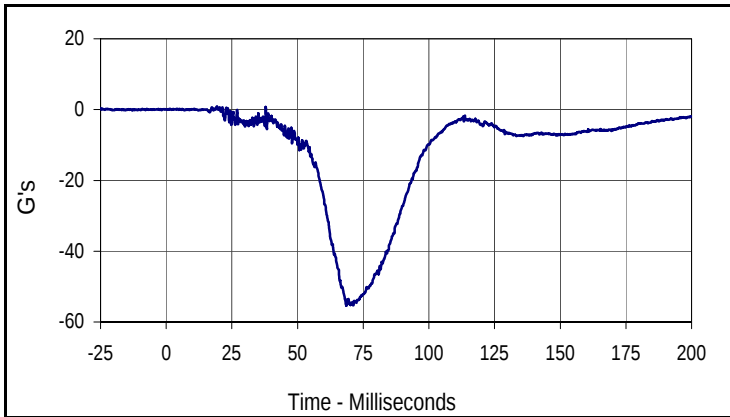
Curve Description			
Driver Left Femur Force Z			
Plot No.	Type	SAE Class	Units
013	FIL	600	Newtons
Max	Time	Min	Time
799.3	68.4	-897.8	37.7



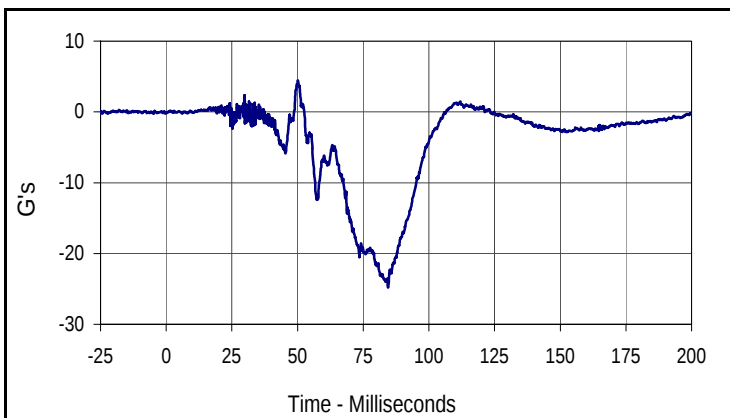
Curve Description			
Driver Right Femur Force Z			
Plot No.	Type	SAE Class	Units
014	FIL	600	Newtons
Max	Time	Min	Time
645.9	67.1	-2736.8	34.7

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan
 Test Program: 56 km/h Frontal Impact NCAP Test

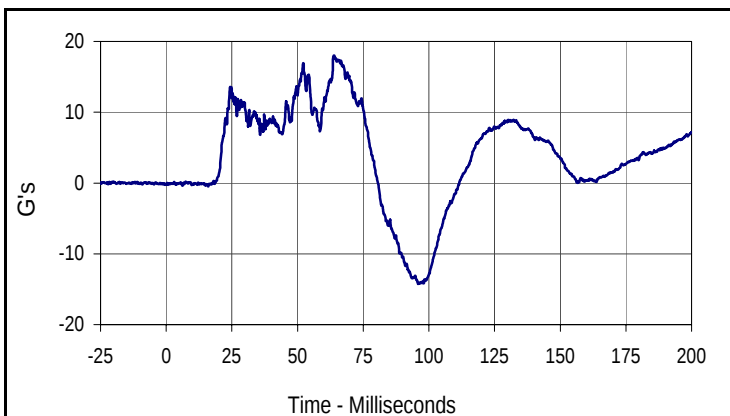
NHTSA No.: MD0108
 Test Date: 11/6/12



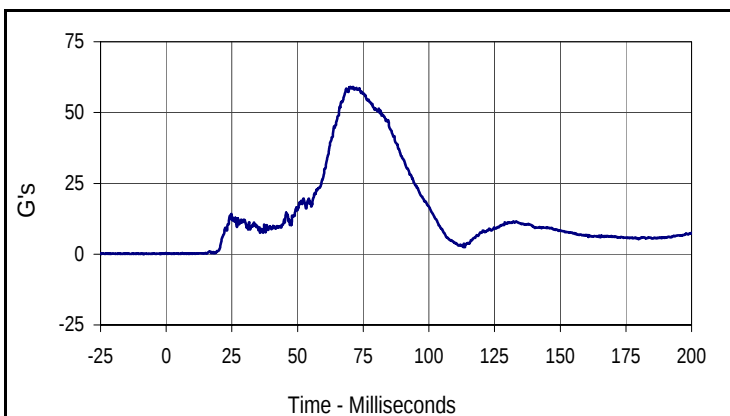
Curve Description			
Passenger Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
015	FIL	1000	G's
Max	Time	Min	Time
0.9	19.3	-55.4	68.5



Curve Description			
Passenger Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
016	FIL	1000	G's
Max	Time	Min	Time
4.4	50.1	-24.8	84.5



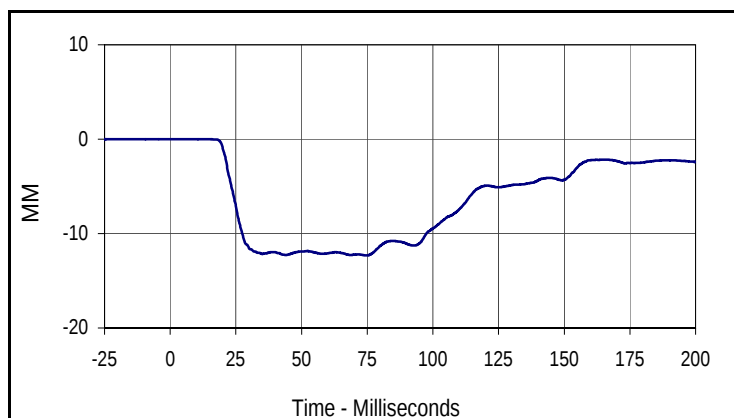
Curve Description			
Passenger Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
017	FIL	1000	G's
Max	Time	Min	Time
18.0	63.8	-14.3	95.9



Curve Description			
Passenger Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
018	RES	1000	G's
Max	Time	Min	Time
59.1	71.1	0.0	9.4

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan
 Test Program: 56 km/h Frontal Impact NCAP Test

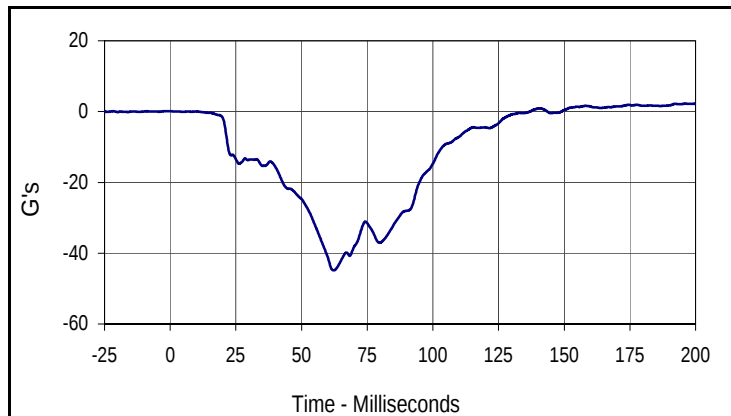
NHTSA No.: MD0108
 Test Date: 11/6/12



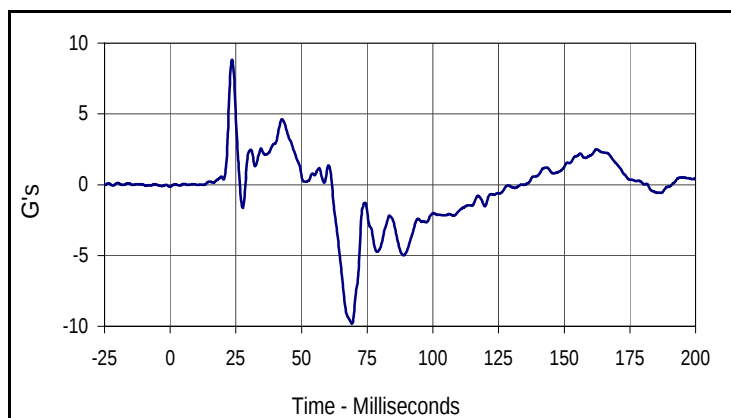
Curve Description			
Passenger Chest Deflection			
Plot No.	Type	SAE Class	Units
019	FIL	600	MM
Max	Time	Min	Time
0.0	5.5	-12.3	74.2

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan
 Test Program: 56 km/h Frontal Impact NCAP Test

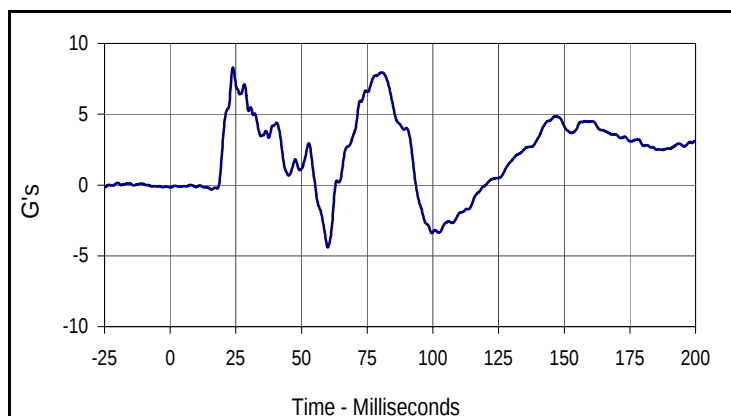
NHTSA No.: MD0108
 Test Date: 11/6/12



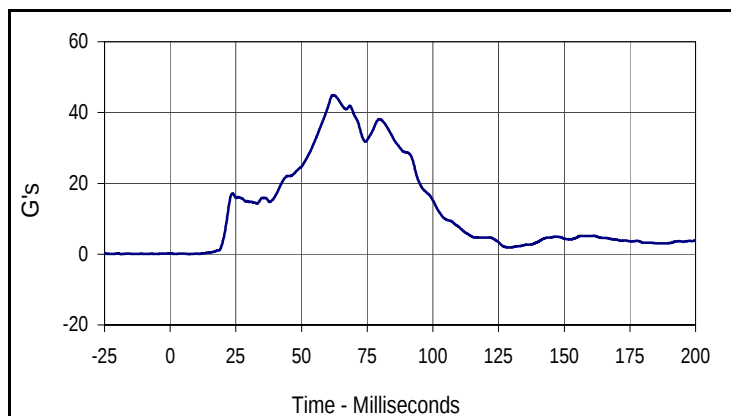
Curve Description			
Passenger Chest Acceleration X Primary			
Plot No.	Type	SAE Class	Units
020	FIL	180	G's
Max	Time	Min	Time
2.3	196.2	-44.8	62.2



Curve Description			
Passenger Chest Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
021	FIL	180	G's
Max	Time	Min	Time
8.8	23.5	-9.8	69.2



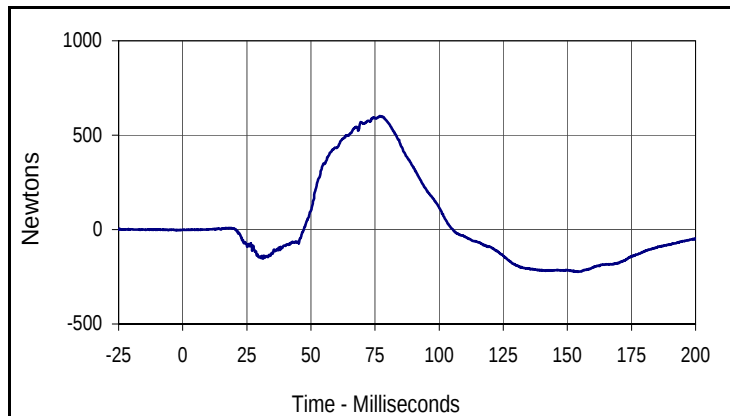
Curve Description			
Passenger Chest Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
022	FIL	180	G's
Max	Time	Min	Time
8.3	23.9	-4.4	60.0



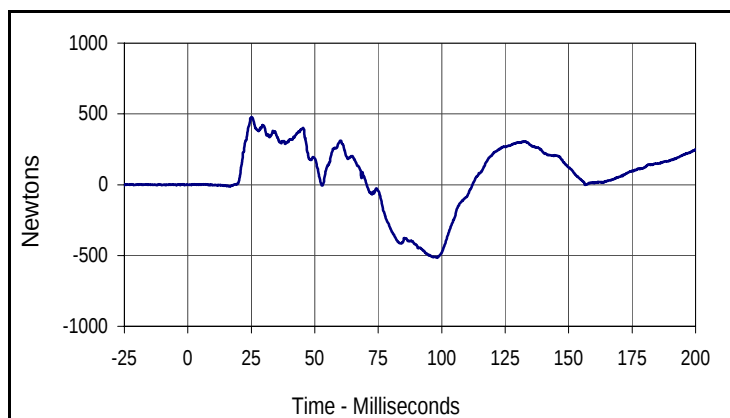
Curve Description			
Passenger Chest Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
023	RES	180	G's
Max	Time	Min	Time
44.9	62.1	0.0	7.3

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan
 Test Program: 56 km/h Frontal Impact NCAP Test

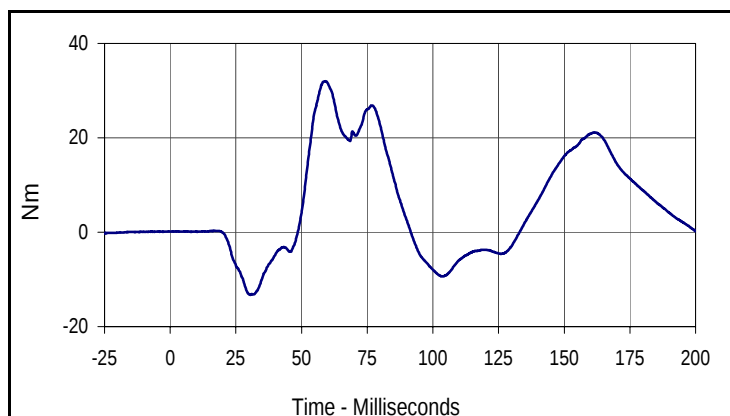
NHTSA No.: MD0108
 Test Date: 11/6/12



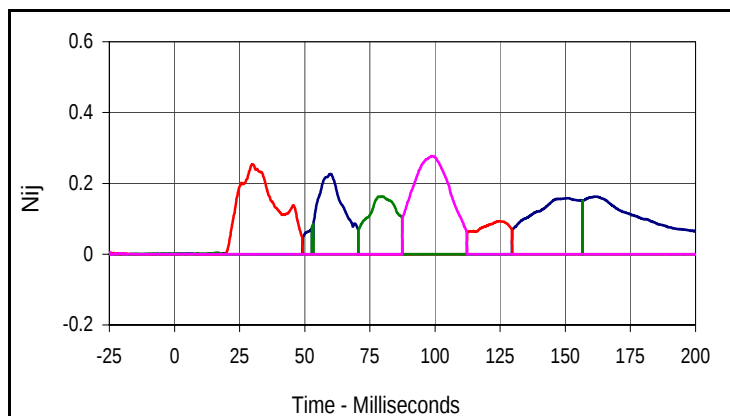
Curve Description			
Passenger Upper Neck Force X			
Plot No.	Type	SAE Class	Units
024	FIL	1000	Newtons
Max	Time	Min	Time
601.3	76.9	-223.7	154.2



Curve Description			
Passenger Upper Neck Force Z			
Plot No.	Type	SAE Class	Units
025	FIL	1000	Newtons
Max	Time	Min	Time
477.8	25.2	-515.5	98.1



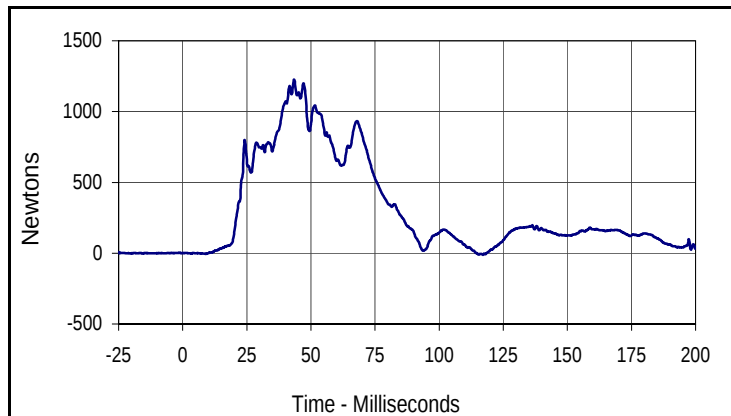
Curve Description			
Passenger Upper Neck Moment Y			
Plot No.	Type	SAE Class	Units
026	FIL	600	Nm
Max	Time	Min	Time
32.0	59.2	-13.3	30.5



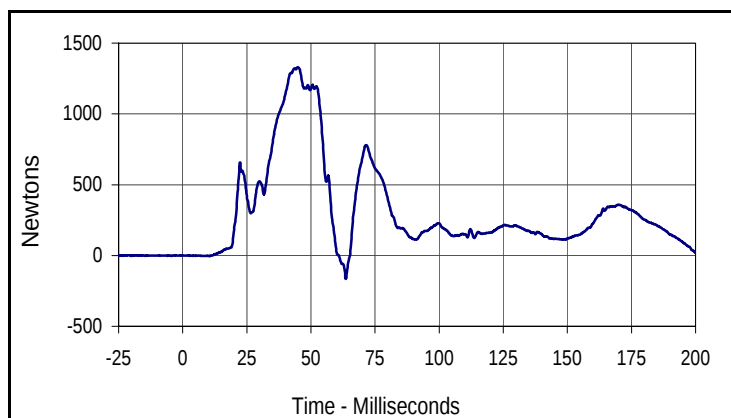
Curve Description			
Passenger Nij			
Units	Type	Max	Time
Ntf	FIL	0.23	60.0
Units	Type	Max	Time
Nte	FIL	0.25	30.1
Units	Type	Max	Time
Ncf	FIL	0.16	79.6
Units	Type	Max	Time
Nce	FIL	0.28	98.7

Test Vehicle: 2013 Cadillac ATS AWD 4-Door Sedan
 Test Program: 56 km/h Frontal Impact NCAP Test

NHTSA No.: MD0108
 Test Date: 11/6/12



Curve Description			
Passenger Left Femur Force Z			
Plot No.	Type	SAE Class	Units
027	FIL	600	Newtons
Max	Time	Min	Time
1226.0	43.4	-11.2	117.1



Curve Description			
Passenger Right Femur Force Z			
Plot No.	Type	SAE Class	Units
028	FIL	600	Newtons
Max	Time	Min	Time
1329.7	44.8	-165.4	63.6

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: 10/25/12



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: 10/25/12

ATD Serial No.: 035

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.26	Pass
Laboratory Relative Humidity	%	10 to 70	22.5	Pass
A - Total sitting height	mm	879 to 889	884	Pass
B - Shoulder pivot height	mm	505 to 521	515	Pass
C - H point height	mm	84 to 89	85	Pass
D - H point location from backline	mm	135 to 140	137	Pass
E - Shoulder pivot from backline	mm	84 to 94	89	Pass
F - Thigh clearance	mm	140 to 155	146	Pass
G - Back of elbow to wrist pivot	mm	290 to 305	298	Pass
H - Head back to backline	mm	41 to 46	43	Pass
I - Shoulder to elbow length	mm	330 to 345	336	Pass
J - Elbow rest height	mm	190 to 211	200	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	491	Pass
N - Buttock popliteal length	mm	452 to 477	472	Pass
O - Chest depth without jacket	mm	213 to 229	225	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	981	Pass
Z - Waist circumference	mm	836 to 866	865	Pass
AA - Location for chest circumference	mm	429 to 434	430	Pass
BB - Location for waist circumference	mm	226 to 231	231	Pass
Overall Test Results			Pass	

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

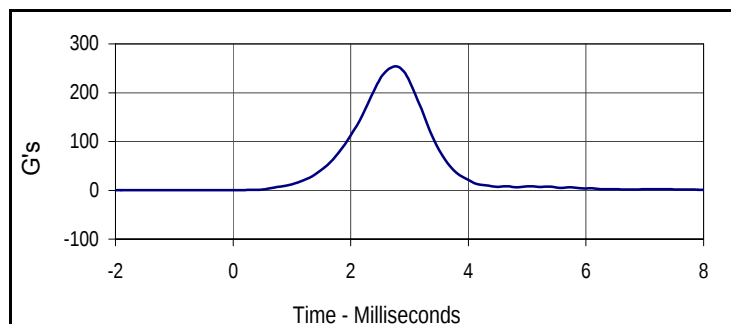
Test Date: 10/25/12



ATD Serial No.: 035

Test I.D.: M035HD048

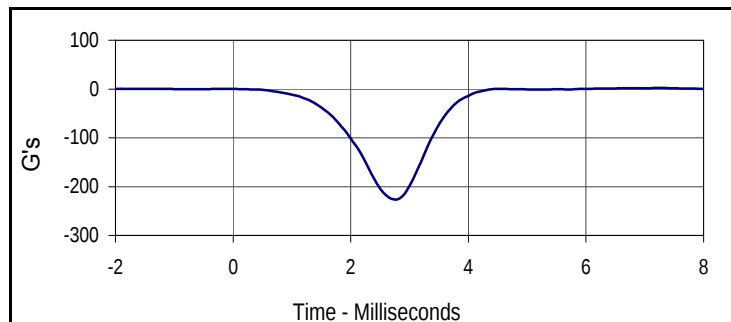
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	247	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	22.3	Pass
Peak Resultant Acceleration		G's	225.0 to 275.0	253.2	Pass
Peak Lateral Acceleration		G's	≤15.0	5.7	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	8.5	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Overall Test Results				Pass	



Curve Description

Head Resultant

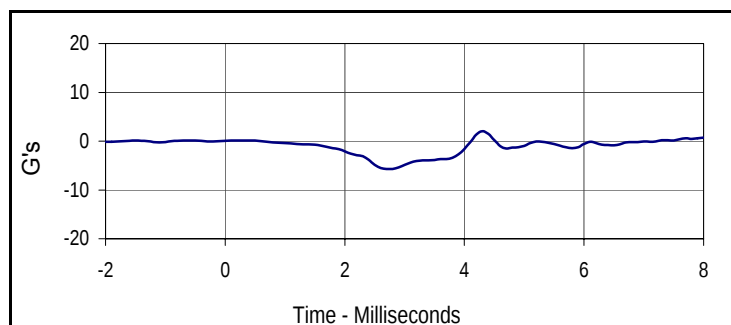
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
253.2	2.8	0.0	-1.7



Curve Description

Head X

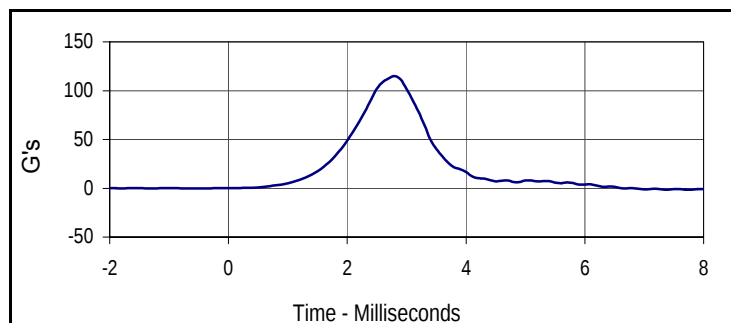
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.6	4.5	-225.6	2.8



Curve Description

Head Y

Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
2.1	4.3	-5.7	2.7



Curve Description

Head Z

Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
114.8	2.8	-0.2	-0.5

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

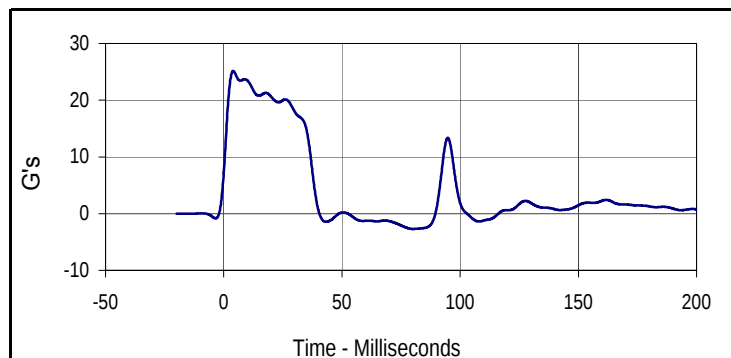
Test Date: 10/25/12



ATD Serial No.: 035

Test I.D.: M035NF048

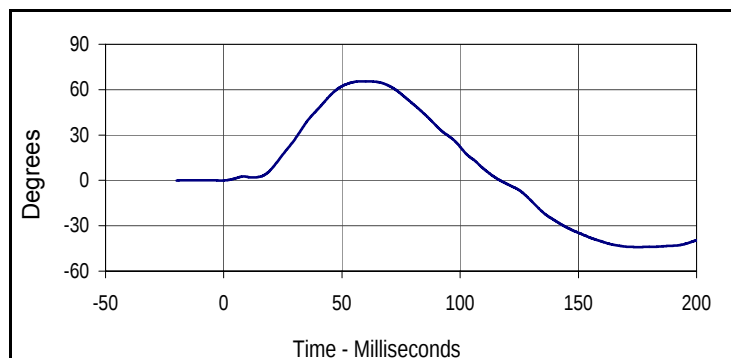
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	292	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	22.3	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.04	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.5	Pass
	20 Msec.	G's	17.6 to 22.6	20.6	Pass
	30 Msec.	G's	12.5 to 18.5	18.0	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	18.0	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	38.3	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	65.5	Pass
	Time	Msec.	57.0 to 64.0	58.8	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	116.9	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	85.9	Pass
	Time	Msec.	47.0 to 58.0	52.1	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	98.4	Pass
Overall Test Results					Pass



Curve Description

Pendulum Deceleration

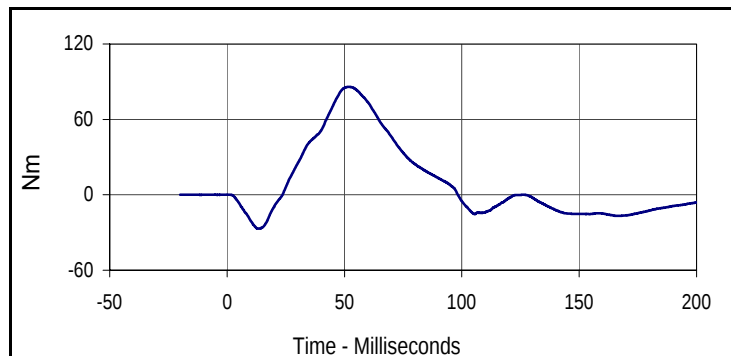
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
25.2	4.0	-2.7	80.1



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
65.5	58.8	-44.1	175.2



Curve Description

Moment About Occipital Condyle

Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
85.9	52.1	-27.0	13.5

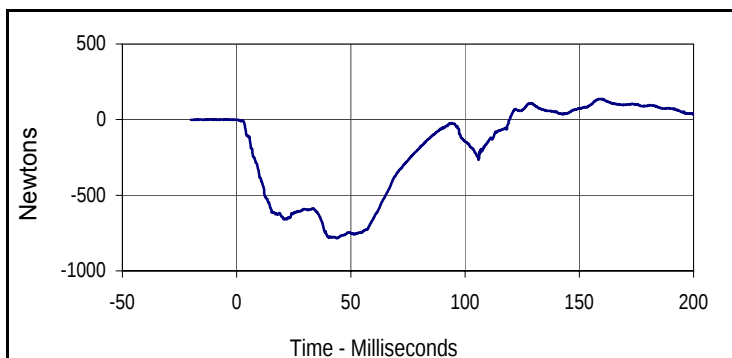
Test Program: Hybrid III 50th Percentile Male Neck Flexion Test

Test Date: 10/25/12



ATD Serial No.: 035

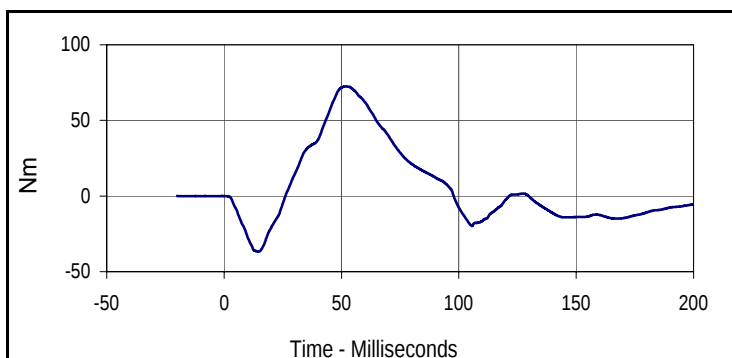
Test I.D.: M035NF048



Curve Description

Neck Force X

Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
137.0	159.6	-784.8	44.1



Curve Description

Neck Moment Y

Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
72.5	52.2	-36.7	14.6

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

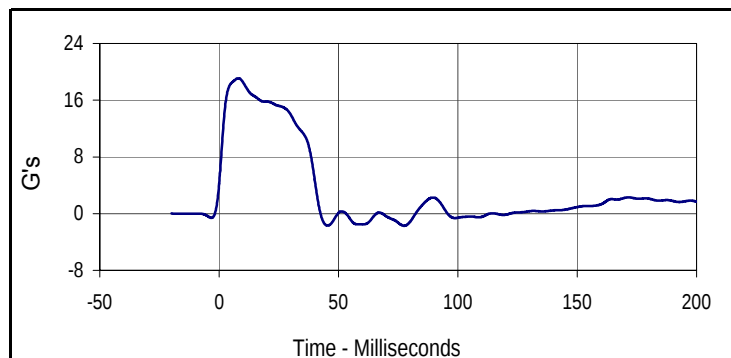
Test Date: 10/25/12



ATD Serial No.: 035

Test I.D.: M035NE048

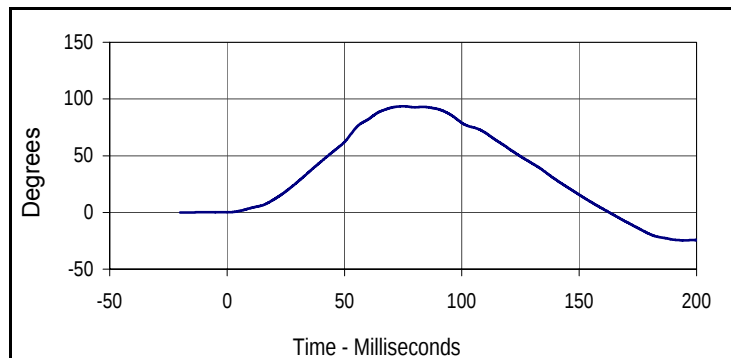
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	327	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.7	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	22.9	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.07	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.5	Pass
	20 Msec.	G's	14.0 to 19.0	15.8	Pass
	30 Msec.	G's	11.0 to 16.0	14.0	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	14.0	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	40.0	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	93.5	Pass
	Time	Msec.	72.0 to 82.0	75.0	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	162.8	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to -79.9	-77.1	Pass
	Time	Msec.	65.0 to 79.0	66.7	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	134.8	Pass
Overall Test Results					Pass



Curve Description

Pendulum Deceleration

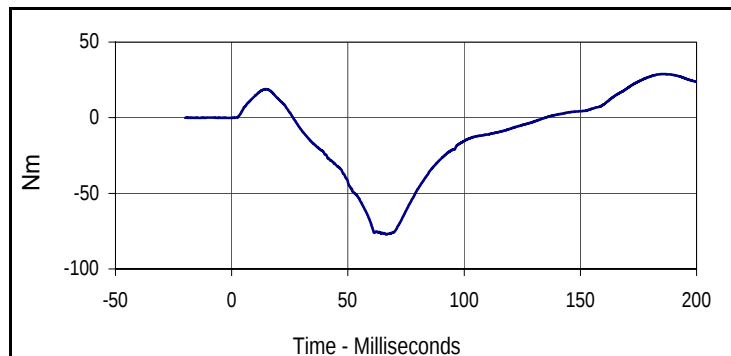
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
19.1	8.0	-1.7	77.5



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
93.5	75.0	-24.5	194.6



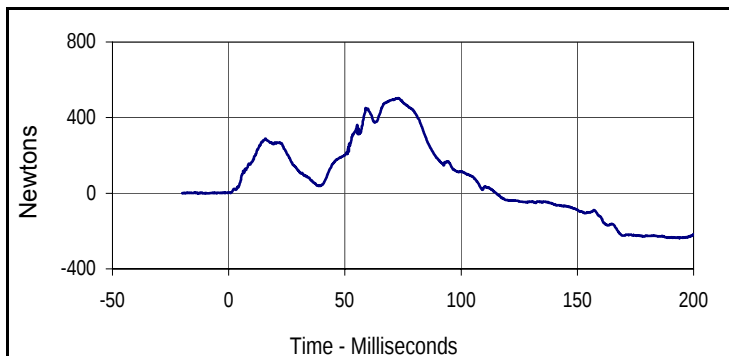
Curve Description

Moment About Occipital Condyle

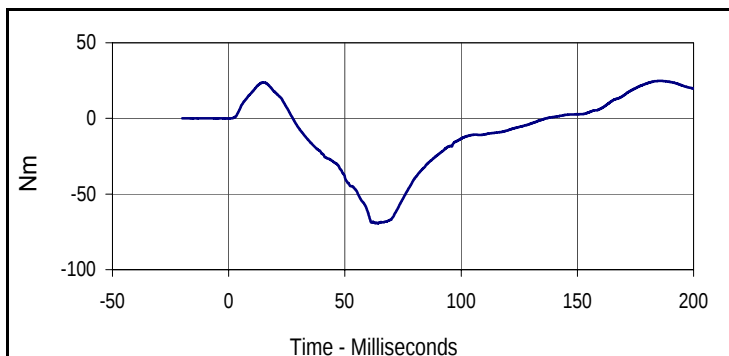
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
28.9	185.8	-77.1	66.7

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

Test Date: 10/25/12
 Test I.D.: M035NE048



Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
503.1	72.9	-236.9	193.9



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
24.8	185.8	-69.5	64.2

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

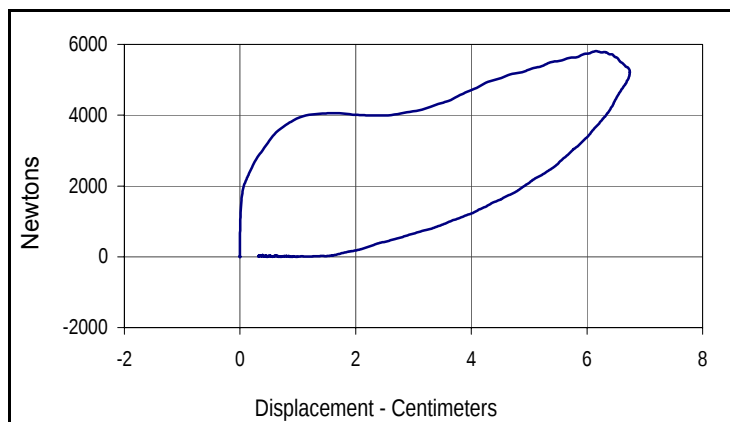
Test Date: 10/25/12



ATD Serial No.: 035

Test I.D.: M035CH048

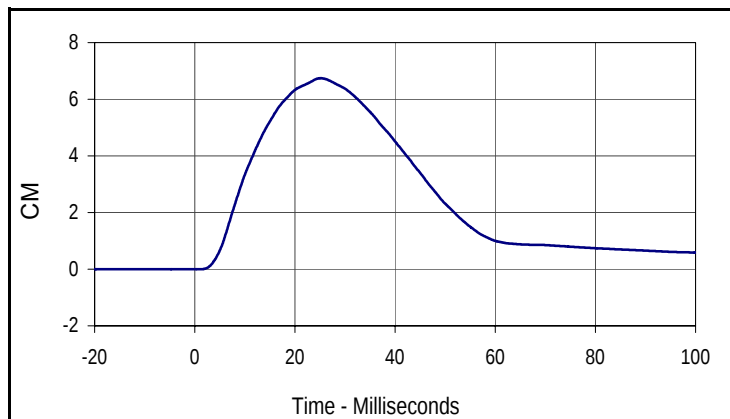
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	377	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	22.7	Pass
Probe Velocity		m/s	6.58 to 6.82	6.78	Pass
Peak Probe Force		Newtons	5159 to 5893	5808	Pass
Peak Sternum Deflection		CM	6.35 to 7.26	6.74	Pass
Internal Hysteresis		%	69 to 85	70.9	Pass
Overall Test Results				Pass	



Curve Description

Probe Force vs. Chest Deflection

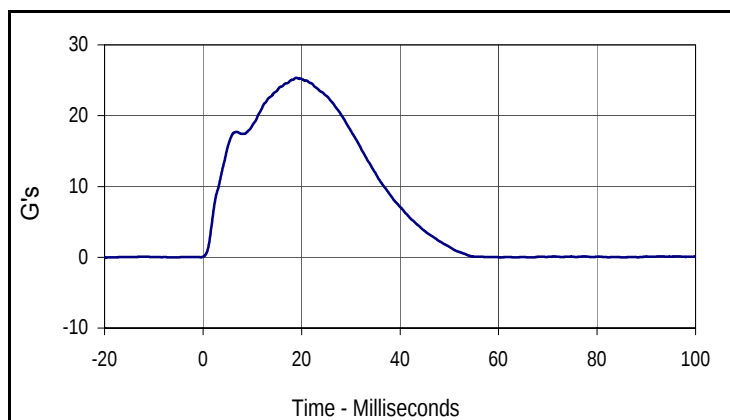
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	70.9
Peak Probe Force		Peak Chest Deflection	
5808		6.74	



Curve Description

Chest Deflection

Plot No.	Type	SAE Class	Units
002	FIL	180	CM
Max	Time	Min	Time
6.7	25.1	0.0	1.0



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
25.4	18.9	0.0	-20.0

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

Test Date: 10/25/12

ATD Serial No.: 035

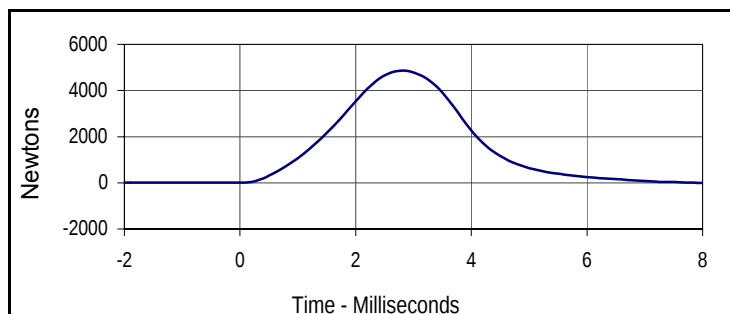
Test I.D.: M035LK048, M035RK048

**Left Knee**

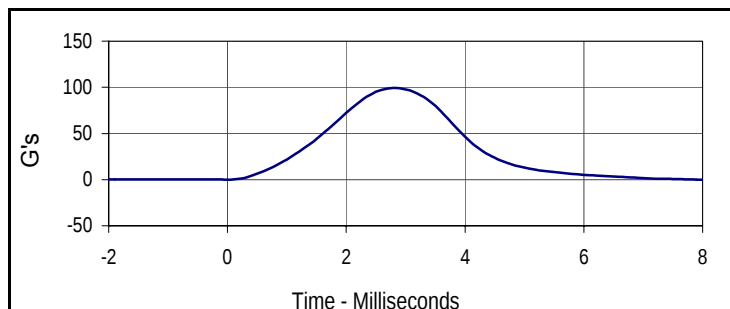
Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	412	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	22.5	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	4715 to 5782	4861	Pass
Overall Test Results				Pass	

Right Knee

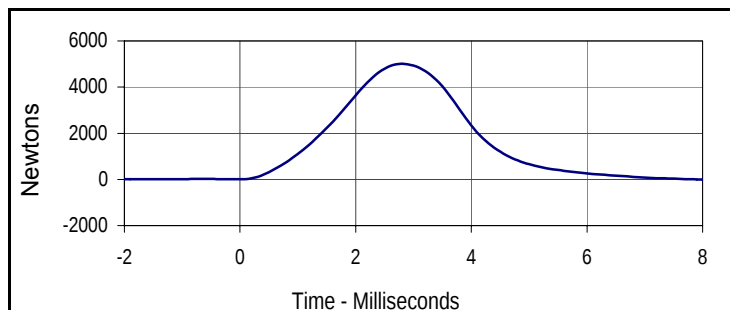
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.11	Pass
Peak Probe Force		Newtons	4715 to 5782	5013	Pass
Overall Test Results				Pass	

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

Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4860.9	2.8	-12.9	8.7

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

Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
99.3	2.8	-0.3	8.7

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

Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
5013.2	2.8	-13.2	8.7

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

Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
102.5	2.8	-0.3	8.7

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

Test Date: 10/25/12

ATD Serial No.: 035

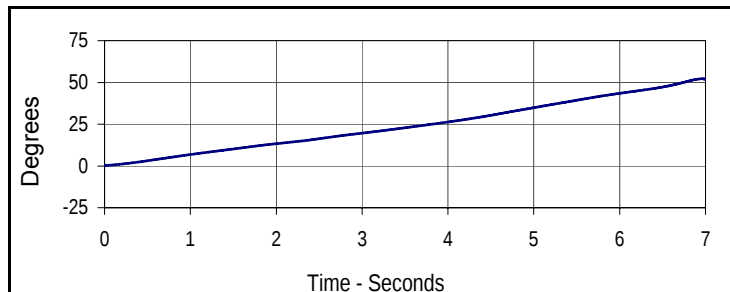
Test I.D.: M035LF048, M035RF048

**Left Hip Joint-Femur Results**

Tested Parameter	Units	Specification	Result	Pass/Fail
Hip Joint-Femur Assembly Soak Time	Minutes	≥240	462	Pass
Temperature During Soak	Max	18.9 to 25.6	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	22.6	Pass
Rotation Rate	deg/sec	5 to 10	7.5	Pass
Femur Torque at 30°	Nm	≤ 95	87.2	Pass
Rotation at 203 Nm	Degrees	40.0 to 50.0	48.9	Pass
Overall Test Results				Pass

Right Hip Joint-Femur Results

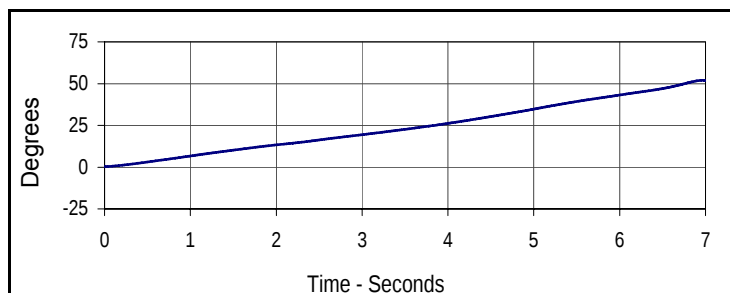
Rotation Rate	deg/sec	5 to 10	7.5	Pass
Femur Torque at 30°	Nm	≤ 95	86.7	Pass
Rotation at 203 Nm	Degrees	40.0 to 50.0	48.7	Pass
Overall Test Results				Pass

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

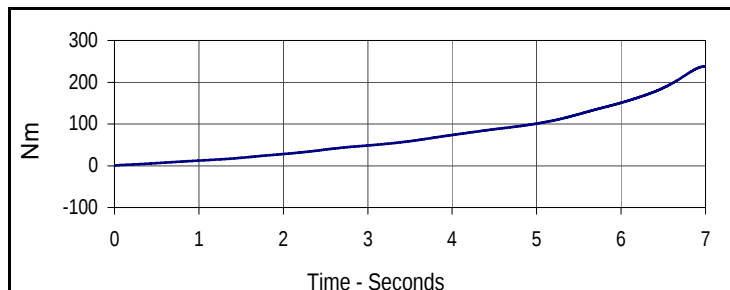
Plot No.	Type	SAE Class	Units
001	FIL	60	Degrees
Max	Time	Min	Time
52.1	7.0	0.2	0.0

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

Plot No.	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
237.6	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
51.9	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
237.8	7.0	1.1	0.0

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

Test Date: 10/26/12



ATD Serial No.: 635

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: 10/26/12

ATD Serial No.: 635

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	20.98	Pass
Laboratory Relative Humidity	%	10 to 70	30.1	Pass
A - Total sitting height	mm	774.7 to 800.1	787	Pass
B - Shoulder pivot height	mm	431.8 to 457.2	450	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	146	Pass
E - Shoulder pivot from backline	mm	68.6 to 83.8	77	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	197	Pass
K - Buttock to knee length	mm	520.7 to 546.1	532	Pass
L - Popliteal length	mm	355.6 to 376.0	371	Pass
M - Knee pivot height	mm	393.7 to 419.1	403	Pass
N - Buttock popliteal length	mm	414.0 to 439.4	420	Pass
O - Chest depth without jacket	mm	175.3 to 190.5	186	Pass
P - Foot length	mm	218.5 to 233.7	221	Pass
R - Buttock to Knee Pivot Length	mm	457.2 to 482.6	473	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	302	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	541	Pass
Y - Chest circumference (with chest jacket)	mm	850.8 to 881.3	864	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

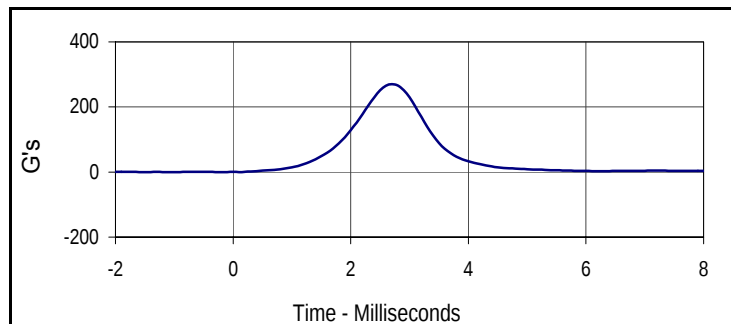
Test Date: 10/26/12



ATD Serial No.: 635

Test I.D.: F635HD033

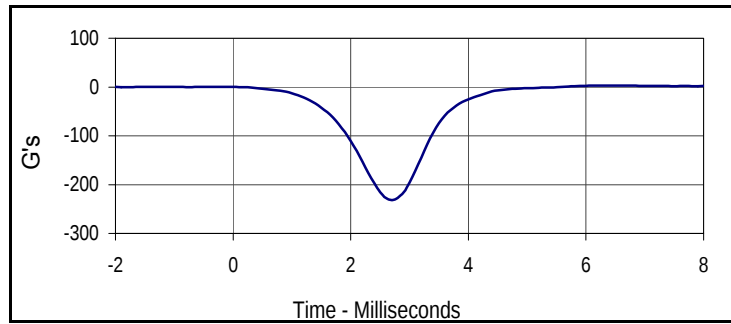
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	295	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.5	Pass
Peak Resultant Acceleration		G's	250.0 to 300.0	270.7	Pass
Peak Lateral Acceleration		G's	≤15.0	4.6	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	1.5	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Overall Test Results				Pass	



Curve Description

Head Resultant

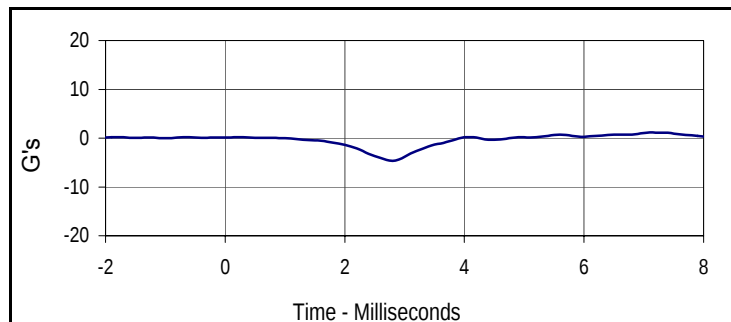
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
270.7	2.7	0.1	-0.9



Curve Description

Head X

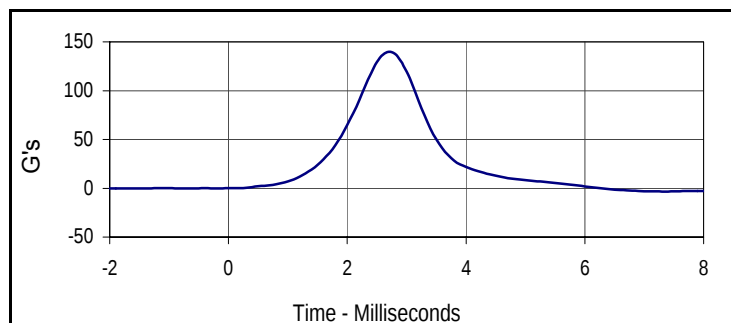
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.5	6.0	-231.7	2.7



Curve Description

Head Y

Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
0.7	5.6	-4.6	2.8



Curve Description

Head Z

Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
139.9	2.7	-0.2	-0.7

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

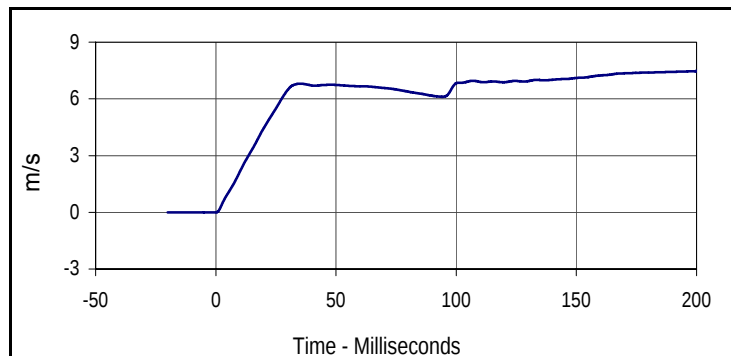
Test Date: 10/26/12



ATD Serial No.: 635

Test I.D.: F635NF033

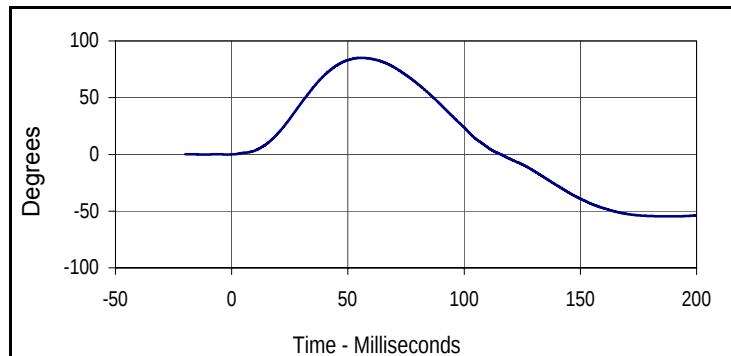
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	340	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.7	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.05	Pass
Pendulum Deceleration	10 Msec.	m/s	2.1 to 2.5	2.1	Pass
	20 Msec.	m/s	4.0 to 5.0	4.5	Pass
	30 Msec.	m/s	5.8 to 7.0	6.5	Pass
"D" Plane Rotation	Max	Degrees	77.0 to 91.0	85.1	Pass
Peak Moment in Rotation	Max	Nm	69.0 to 83.0	75.3	Pass
Positive Moment Decay, Time To 10 Nm		Msec.	80.0 to 100.0	84.3	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Velocity

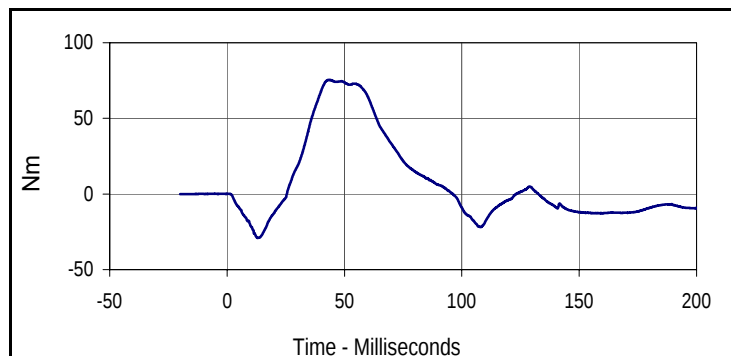
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
7.5	200.0	0.0	-0.2



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
85.1	55.7	-54.6	186.7



Curve Description

Moment About Occipital Condyle

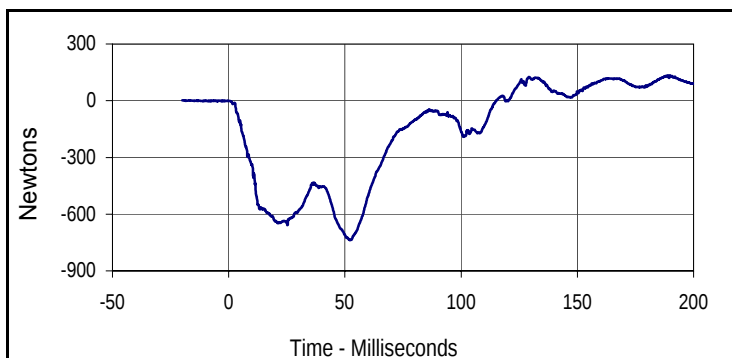
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
75.4	43.0	-29.0	13.0

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

ATD Serial No.: 635

Test Date: 10/26/12

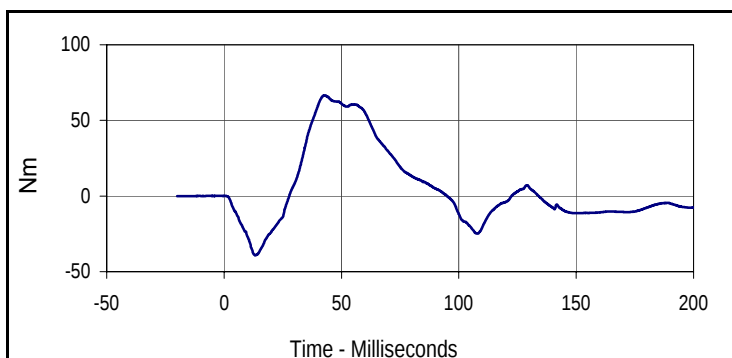
Test I.D.: F635NF033



Curve Description

Upper Neck Force X

Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
134.1	188.9	-736.9	52.3



Curve Description

Neck Moment Y

Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
66.6	42.9	-39.1	13.4

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

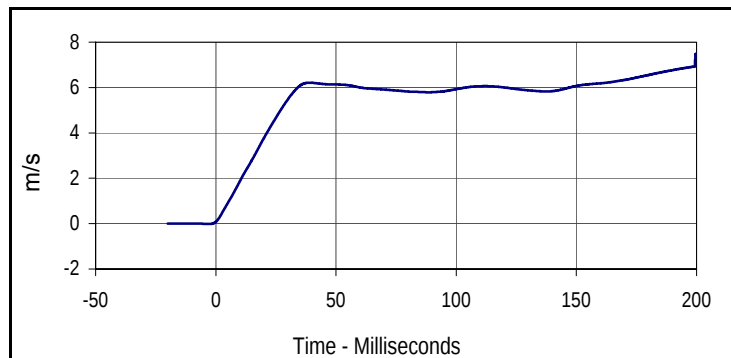
Test Date: 10/26/12



ATD Serial No.: 635

Test I.D.: F635NE033

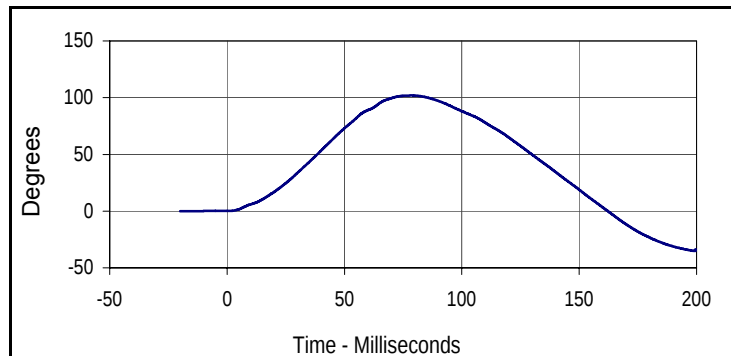
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	375	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.07	Pass
Pendulum Deceleration	10 Msec.	m/s	1.5 to 1.9	1.9	Pass
	20 Msec.	m/s	3.1 to 3.9	3.8	Pass
	30 Msec.	m/s	4.6 to 5.6	5.5	Pass
"D" Plane Rotation	Max	Degrees	99.0 to 114.0	101.9	Pass
Peak Moment in Rotation	Max	Nm	-53.0 to -65.0	-54.4	Pass
Positive Moment Decay, Time To -10 Nm		Msec.	94.0 to 114.0	107.5	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Velocity

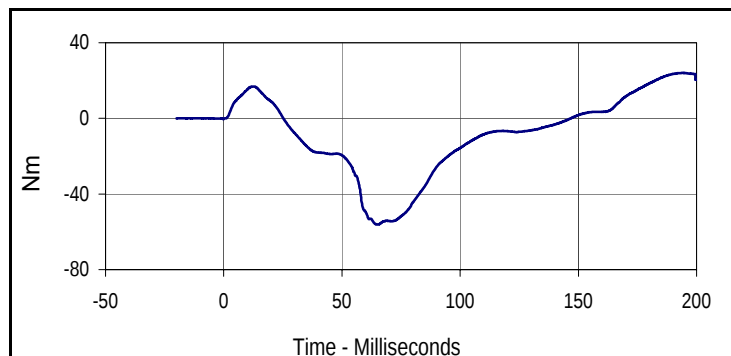
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
7.5	200.0	0.0	-2.8



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
101.9	78.5	-35.1	199.4



Curve Description

Moment About Occipital Condyle

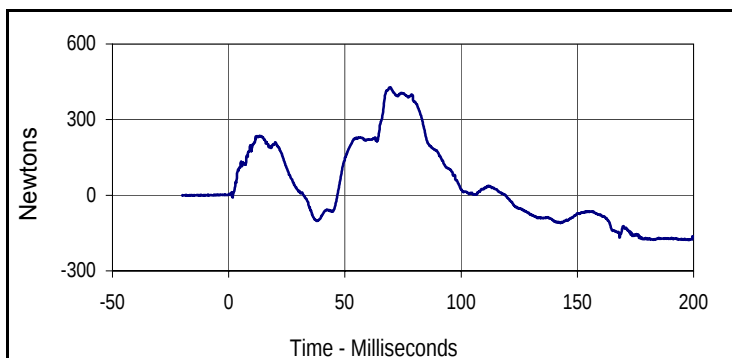
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
24.0	193.8	-56.2	65.0

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

ATD Serial No.: 635

Test Date: 10/26/12

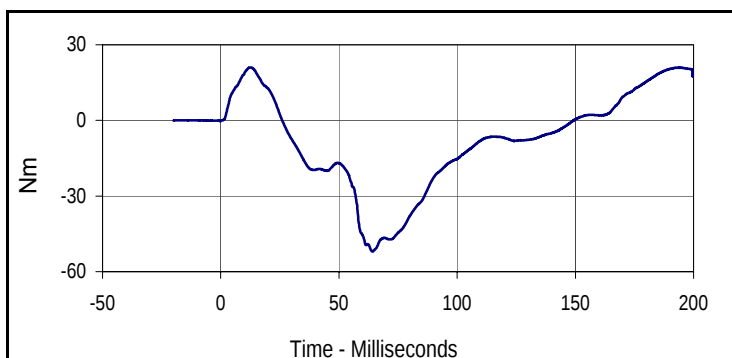
Test I.D.: F635NE033



Curve Description

Upper Neck Force X

Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
427.8	69.2	-177.9	197.9



Curve Description

Neck Moment Y

Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
21.0	12.4	-52.0	64.2

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

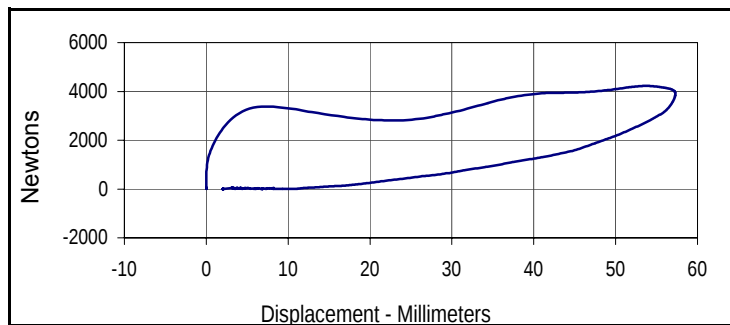
Test Date: 10/26/12



ATD Serial No.: 635

Test I.D.: F635CH033

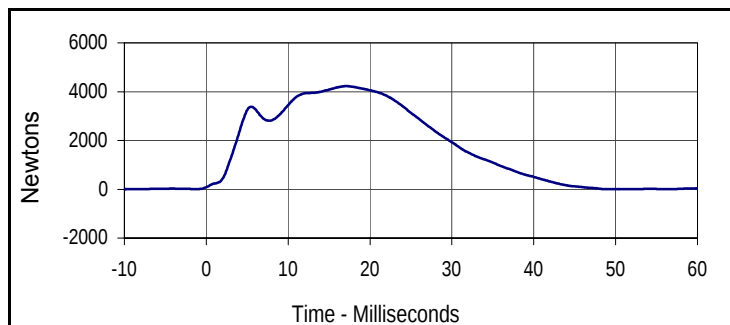
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	425	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.3	Pass
Probe Velocity		m/s	6.59 to 6.83	6.76	Pass
Peak Chest Deflection		mm	50.0 to 58.0	57.3	Pass
Peak Force Between 50 and 58 MM		Newtons	3900 to 4400	4103	Pass
Peak Force Between 18 and 50 MM		Newtons	≤4600	4224	Pass
Internal Hysteresis		%	69 to 85	73.1	Pass
Overall Test Results					Pass



Curve Description

Probe Force vs. Chest Deflection

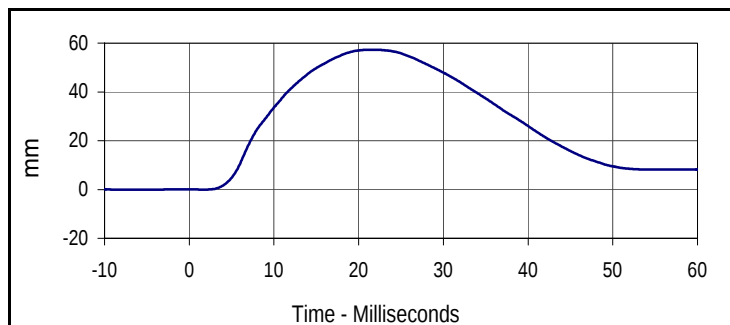
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	73.1
Peak Probe Force		Peak Chest Deflection	
4224.2		57.3	



Curve Description

Probe Force

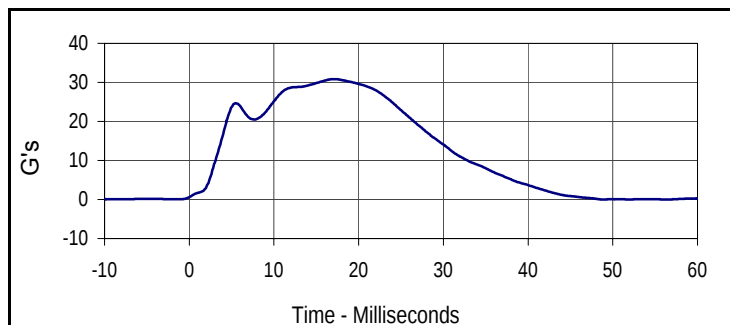
Plot No.	Type	SAE Class	Units
002	FIL	180	Newtons
Max	Time	Min	Time
4224.2	17.1	-10.5	76.1



Curve Description

Chest Deflection

Plot No.	Type	SAE Class	Units
003	FIL	600	mm
Max	Time	Min	Time
57.3	21.6	0.0	1.8



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
30.8	17.1	-0.1	76.1

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

Test Date: 10/26/12

ATD Serial No.: 635

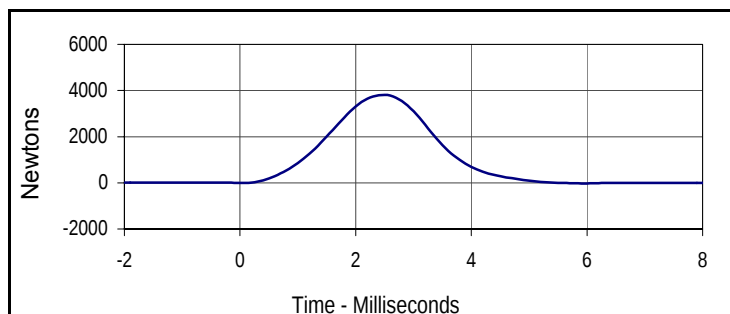
Test I.D.: F635LK033, F635RK033

**Left Knee**

Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	455	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.4	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	3450 to 4060	3808	Pass
Overall Test Results					Pass

Right Knee

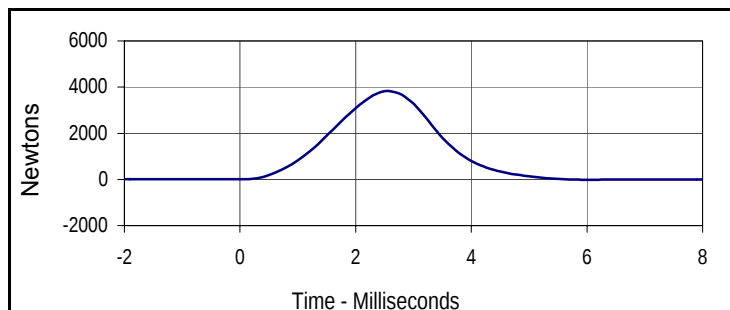
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.12	Pass
Peak Probe Force		Newtons	3450 to 4060	3825	Pass
Overall Test Results					Pass

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

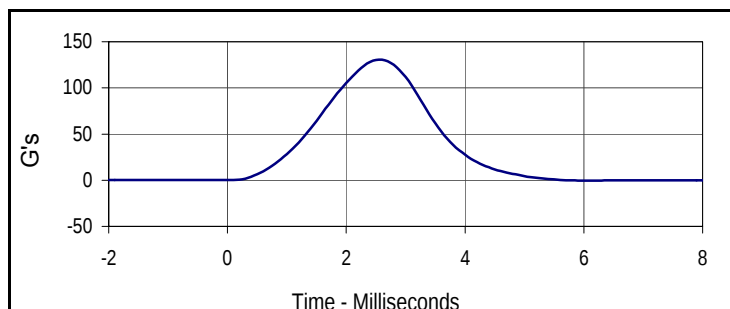
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3807.6	2.5	-25.9	5.9

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

Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
129.9	2.5	-0.9	5.9

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

Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
3825.1	2.6	-16.8	9.3

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

Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
130.5	2.6	-0.6	9.3

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

Test Date: 10/26/12

ATD Serial No.: 635

Test I.D.: F635TF033

**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		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.2	Pass
Initial Reference Plane Angle		Degrees	≤ 20	0.1	Pass
Peak Force at 45° +/-0.5°		Newtons	320.0 to 390.0	352.9	Pass
Torso Rotation Rate		deg/sec	0.5 to 1.5	0.9	Pass
Final Reference Plane Angle		Degrees	+/-8	1.2	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: 11/7/12



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: 11/7/12

ATD Serial No.: 035

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.23	Pass
Laboratory Relative Humidity	%	10 to 70	29.2	Pass
A - Total sitting height	mm	879 to 889	885	Pass
B - Shoulder pivot height	mm	505 to 521	514	Pass
C - H point height	mm	84 to 89	85	Pass
D - H point location from backline	mm	135 to 140	137	Pass
E - Shoulder pivot from backline	mm	84 to 94	89	Pass
F - Thigh clearance	mm	140 to 155	146	Pass
G - Back of elbow to wrist pivot	mm	290 to 305	297	Pass
H - Head back to backline	mm	41 to 46	43	Pass
I - Shoulder to elbow length	mm	330 to 345	336	Pass
J - Elbow rest height	mm	190 to 211	201	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	490	Pass
N - Buttock popliteal length	mm	452 to 477	472	Pass
O - Chest depth without jacket	mm	213 to 229	225	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	981	Pass
Z - Waist circumference	mm	836 to 866	864	Pass
AA - Location for chest circumference	mm	429 to 434	429	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

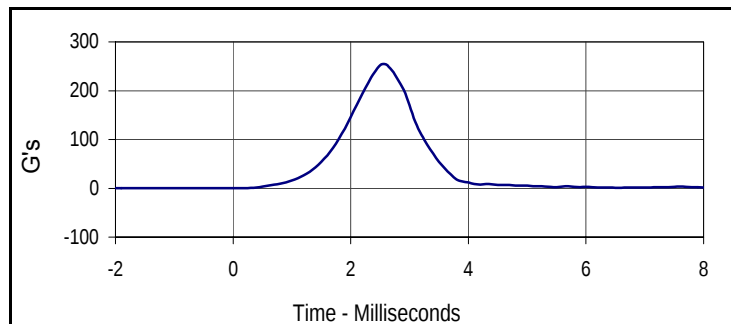
Test Date: 11/7/12



ATD Serial No.: 035

Test I.D.: M035HD049

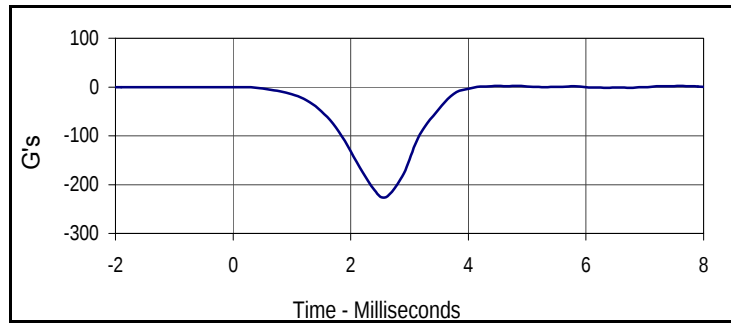
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	250	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.1	Pass
Peak Resultant Acceleration		G's	225.0 to 275.0	253.9	Pass
Peak Lateral Acceleration		G's	≤15.0	6.7	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	4.7	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Overall Test Results				Pass	



Curve Description

Head Resultant

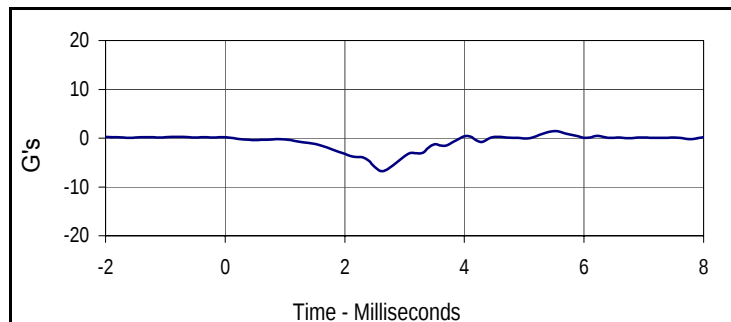
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
253.9	2.6	0.1	-1.6



Curve Description

Head X

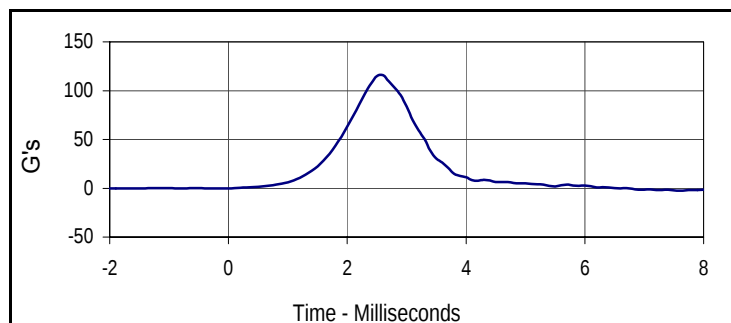
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.3	4.5	-225.8	2.6



Curve Description

Head Y

Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
1.5	5.5	-6.7	2.6



Curve Description

Head Z

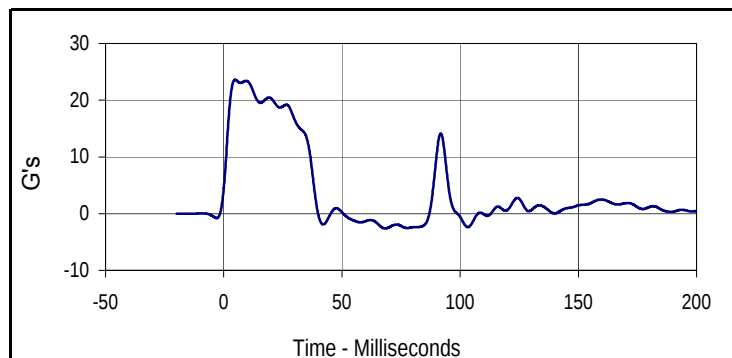
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
115.8	2.6	-0.3	-2.0

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

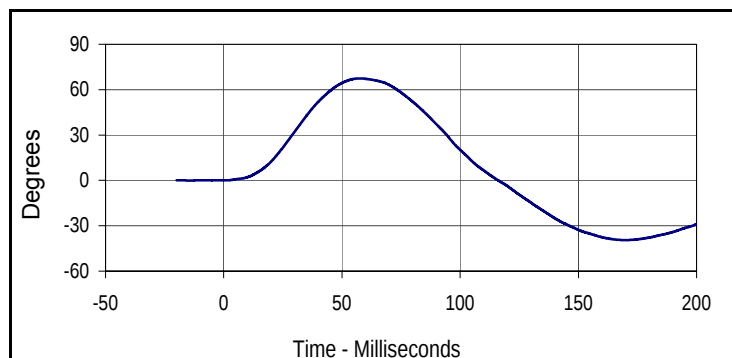
Test Date: 11/7/12
 Test I.D.: M035NF049



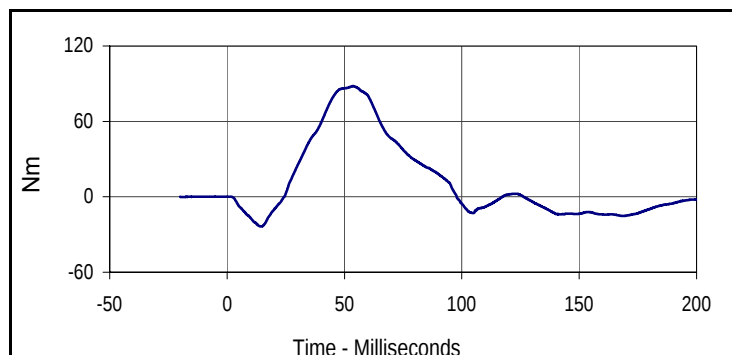
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	295	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.3	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.02	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.4	Pass
	20 Msec.	G's	17.6 to 22.6	20.3	Pass
	30 Msec.	G's	12.5 to 18.5	16.5	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	16.5	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	38.2	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	67.4	Pass
	Time	Msec.	57.0 to 64.0	57.6	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	116.1	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	88.1	Pass
	Time	Msec.	47.0 to 58.0	53.6	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	97.8	Pass
Overall Test Results					Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
23.6	4.8	-2.6	68.3



Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
67.4	57.6	-39.4	169.6



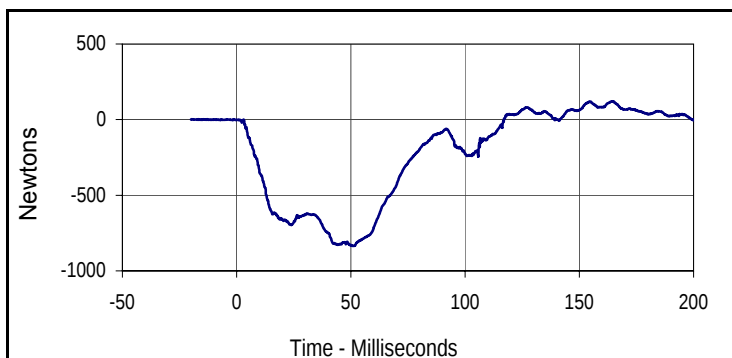
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
88.1	53.6	-23.6	14.7

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

ATD Serial No.: 035

Test Date: 11/7/12

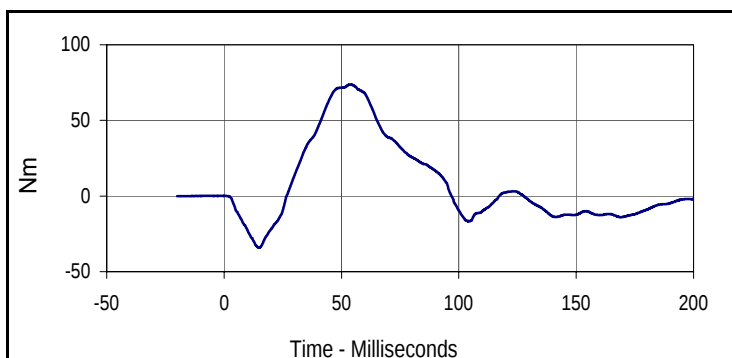
Test I.D.: M035NF049



Curve Description

Neck Force X

Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
120.4	164.5	-835.8	50.9



Curve Description

Neck Moment Y

Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
73.8	53.7	-34.1	14.9

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

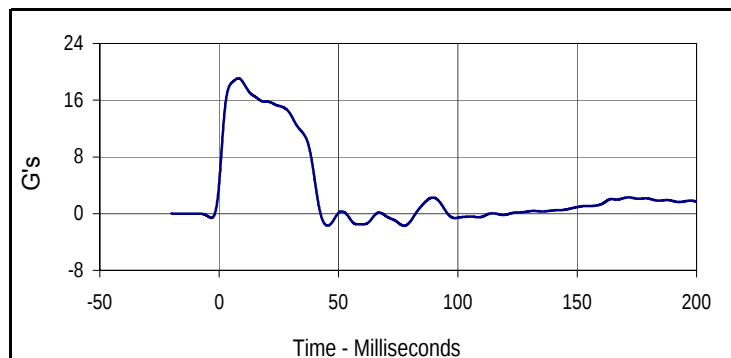
Test Date: 11/7/12

ATD Serial No.: 035

Test I.D.: M035NE049



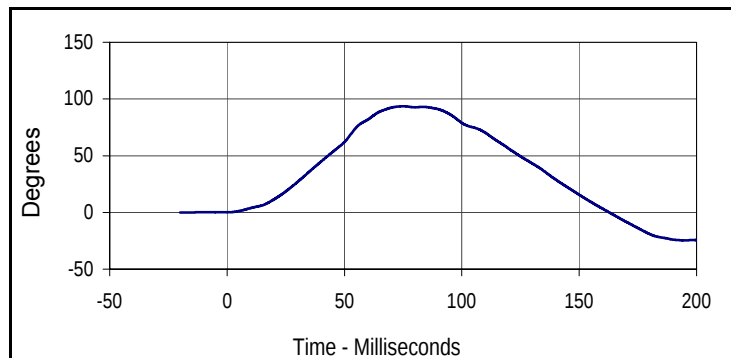
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	330	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.4	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.06	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.5	Pass
	20 Msec.	G's	14.0 to 19.0	15.8	Pass
	30 Msec.	G's	11.0 to 16.0	14.0	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	14.0	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	40.0	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	93.5	Pass
	Time	Msec.	72.0 to 82.0	75.0	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	162.8	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to -79.9	-77.1	Pass
	Time	Msec.	65.0 to 79.0	66.7	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	134.8	Pass
Overall Test Results					Pass



Curve Description

Pendulum Deceleration

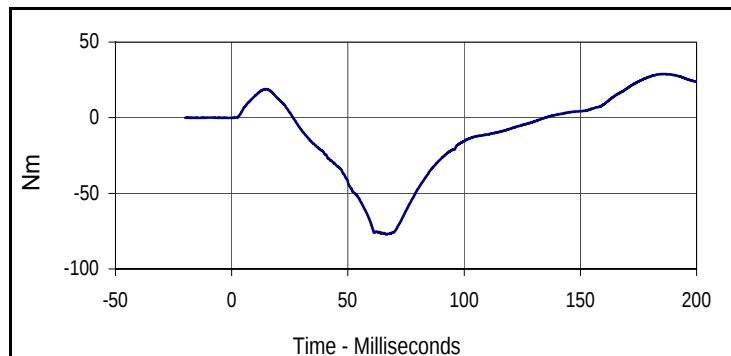
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
19.1	8.0	-1.7	77.5



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
93.5	75.0	-24.5	194.6



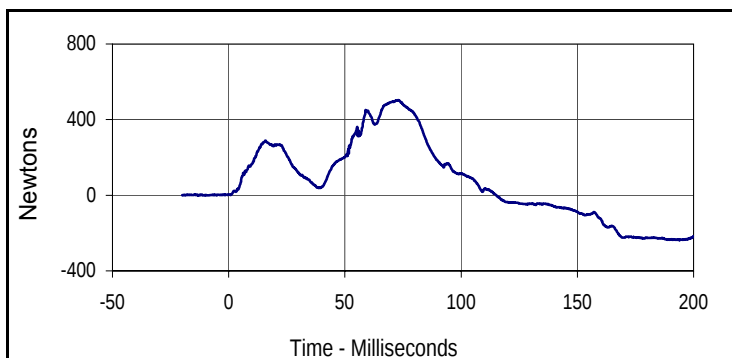
Curve Description

Moment About Occipital Condyle

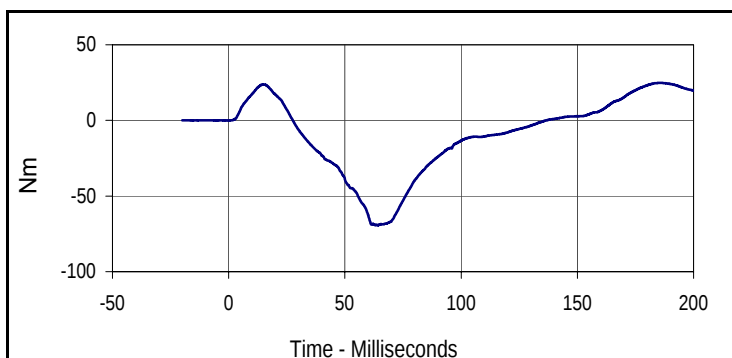
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
28.9	185.8	-77.1	66.7

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

Test Date: 11/7/12
 Test I.D.: M035NE049



Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
503.1	72.9	-236.9	193.9



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
24.8	185.8	-69.5	64.2

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

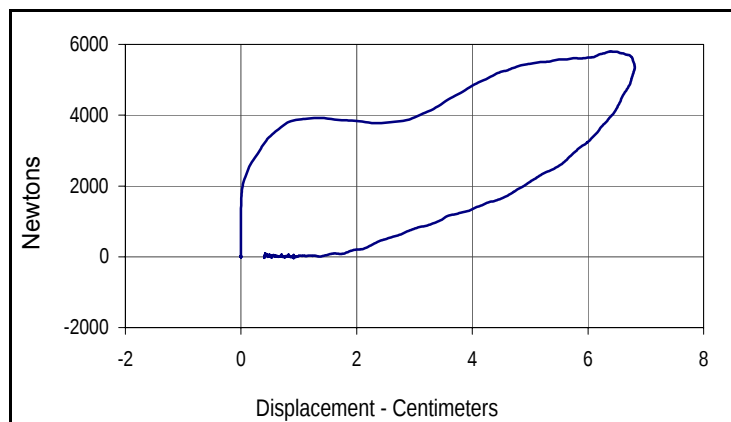
Test Date: 11/7/12



ATD Serial No.: 035

Test I.D.: M035CH049

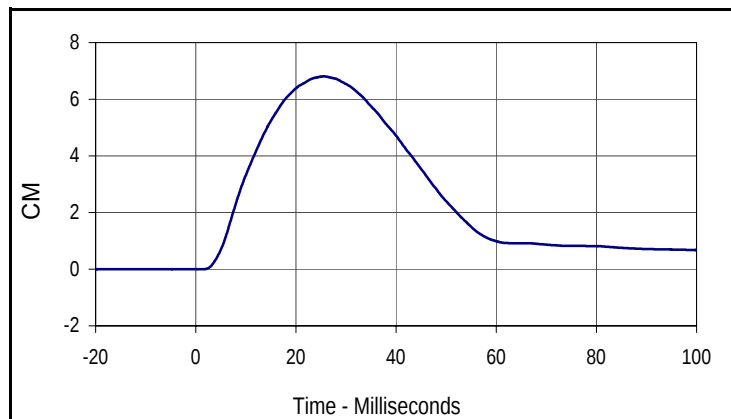
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	380	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.2	Pass
Probe Velocity		m/s	6.58 to 6.82	6.72	Pass
Peak Probe Force		Newtons	5159 to 5893	5798	Pass
Peak Sternum Deflection		CM	6.35 to 7.26	6.81	Pass
Internal Hysteresis		%	69 to 85	69.8	Pass
Overall Test Results				Pass	



Curve Description

Probe Force vs. Chest Deflection

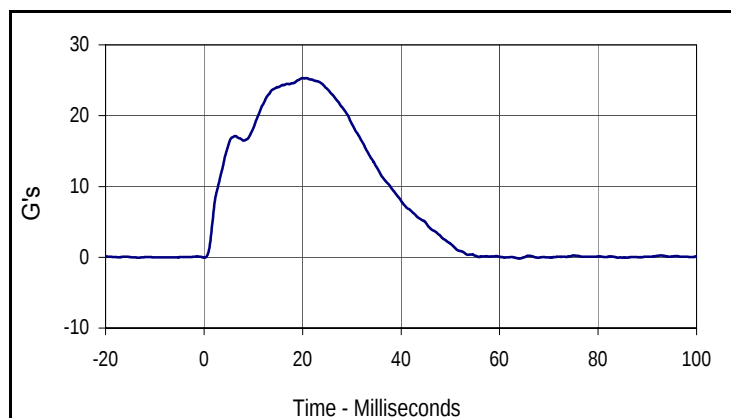
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	69.8
Peak Probe Force		Peak Chest Deflection	
5798		6.81	



Curve Description

Chest Deflection

Plot No.	Type	SAE Class	Units
002	FIL	180	CM
Max	Time	Min	Time
6.8	25.5	0.0	1.3



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
25.3	20.0	-0.2	64.0

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

Test Date: 11/7/12

ATD Serial No.: 035

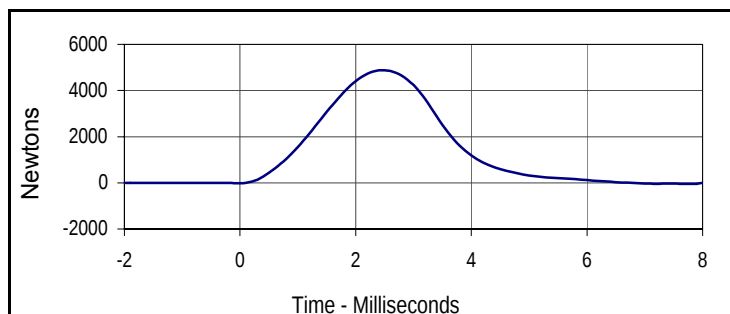
Test I.D.: M035LK049, M035RK049

**Left Knee**

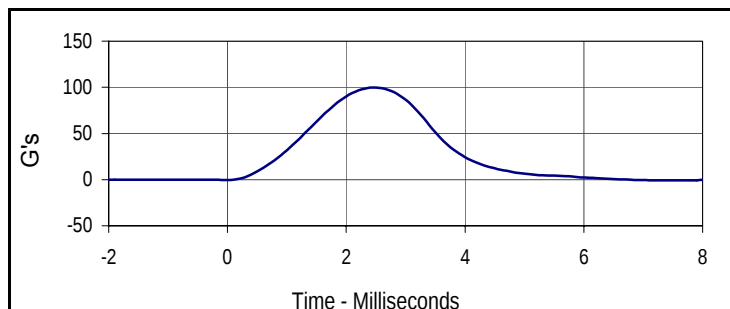
Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	415	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.3	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	4715 to 5782	4884	Pass
Overall Test Results				Pass	

Right Knee

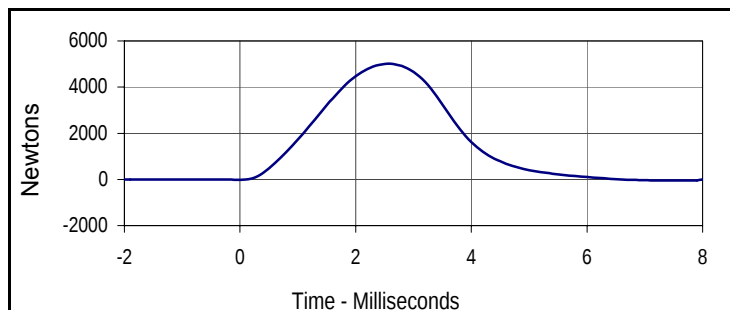
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force		Newtons	4715 to 5782	5009	Pass
Overall Test Results				Pass	

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

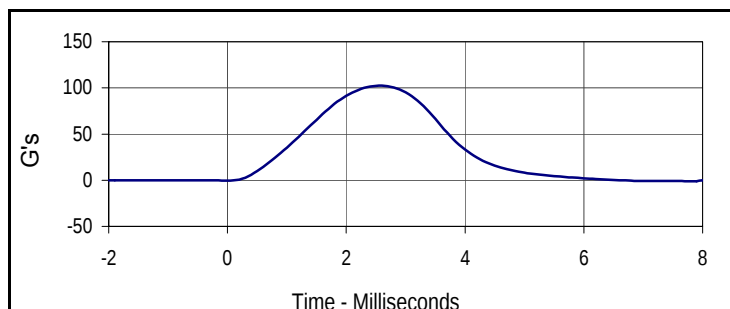
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4883.5	2.5	-46.3	7.9

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

Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
99.8	2.5	-0.9	7.9

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

Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
5008.9	2.6	-48.5	7.8

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

Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
102.4	2.6	-1.0	7.8

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

Test Date: 11/7/12

ATD Serial No.: 035

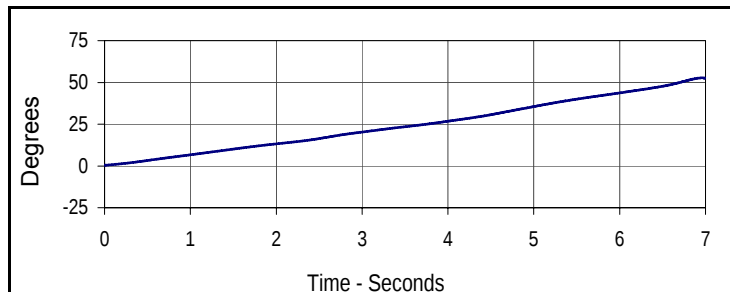
Test I.D.: M035LF049, M035RF049

**Left Hip Joint-Femur Results**

Tested Parameter	Units	Specification	Result	Pass/Fail
Hip Joint-Femur Assembly Soak Time	Minutes	≥240	465	Pass
Temperature During Soak	Max	18.9 to 25.6	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	31.0	Pass
	Min		29.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	29.2	Pass
Rotation Rate	deg/sec	5 to 10	7.6	Pass
Femur Torque at 30°	Nm	≤ 95	87.3	Pass
Rotation at 203 Nm	Degrees	40.0 to 50.0	49.1	Pass
Overall Test Results				Pass

Right Hip Joint-Femur Results

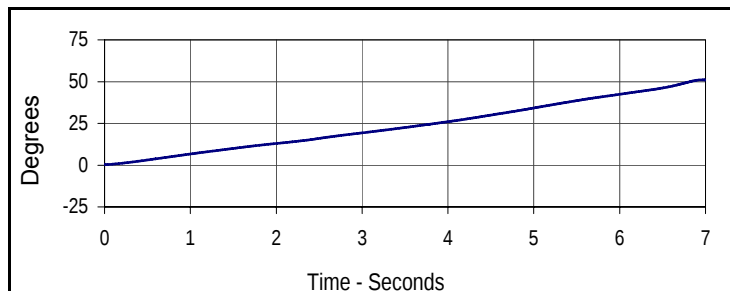
Rotation Rate	deg/sec	5 to 10	7.3	Pass
Femur Torque at 30°	Nm	≤ 95	89.9	Pass
Rotation at 203 Nm	Degrees	40.0 to 50.0	47.8	Pass
Overall Test Results				Pass

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

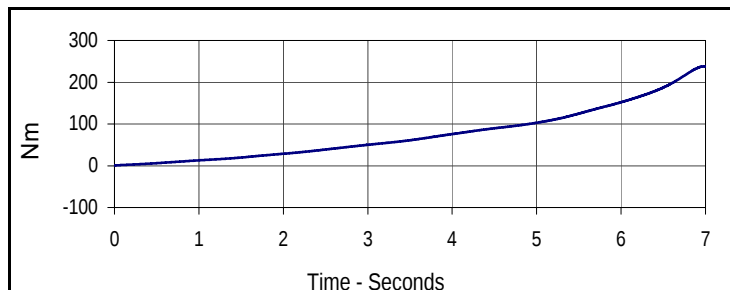
Plot No.	Type	SAE Class	Units
001	FIL	60	Degrees
Max	Time	Min	Time
52.7	7.0	0.4	0.0

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

Plot No.	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
240.2	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
51.1	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
238.3	7.0	1.0	0.0

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

Test Date: 11/8/12



ATD Serial No.: 635

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: 11/8/12

ATD Serial No.: 635

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.25	Pass
Laboratory Relative Humidity	%	10 to 70	29.5	Pass
A - Total sitting height	mm	774.7 to 800.1	786	Pass
B - Shoulder pivot height	mm	431.8 to 457.2	450	Pass
C - H point height	mm	81.3 to 86.3	85	Pass
D - H point location from backline	mm	144.8 to 149.8	146	Pass
E - Shoulder pivot from backline	mm	68.6 to 83.8	77	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	198	Pass
K - Buttock to knee length	mm	520.7 to 546.1	531	Pass
L - Popliteal length	mm	355.6 to 376.0	371	Pass
M - Knee pivot height	mm	393.7 to 419.1	402	Pass
N - Buttock popliteal length	mm	414.0 to 439.4	420	Pass
O - Chest depth without jacket	mm	175.3 to 190.5	186	Pass
P - Foot length	mm	218.5 to 233.7	221	Pass
R - Buttock to Knee Pivot Length	mm	457.2 to 482.6	473	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	302	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	541	Pass
Y - Chest circumference (with chest jacket)	mm	850.8 to 881.3	864	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

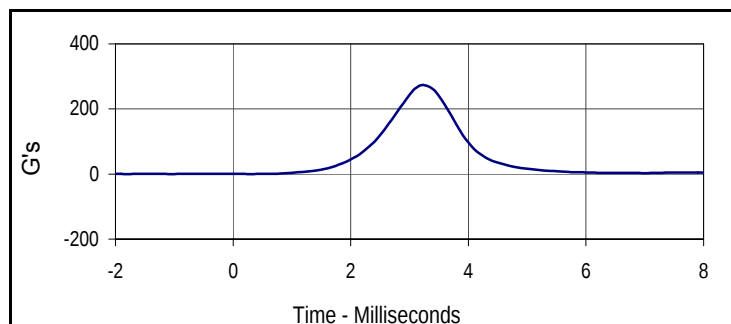
Test Date: 11/8/12

ATD Serial No.: 635

Test I.D.: F635HD034



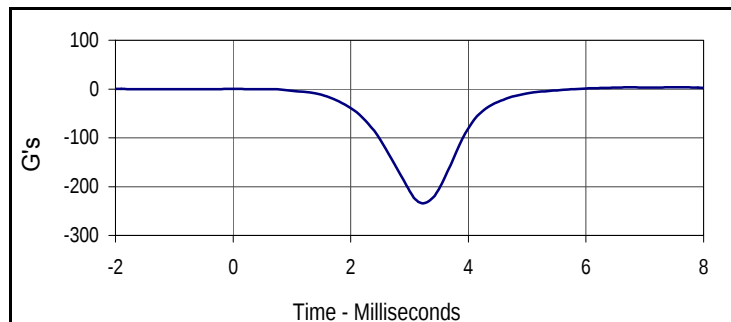
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	245	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.5	Pass
Peak Resultant Acceleration		G's	250.0 to 300.0	273.1	Pass
Peak Lateral Acceleration		G's	≤15.0	4.2	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	1.9	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Overall Test Results				Pass	



Curve Description

Head Resultant

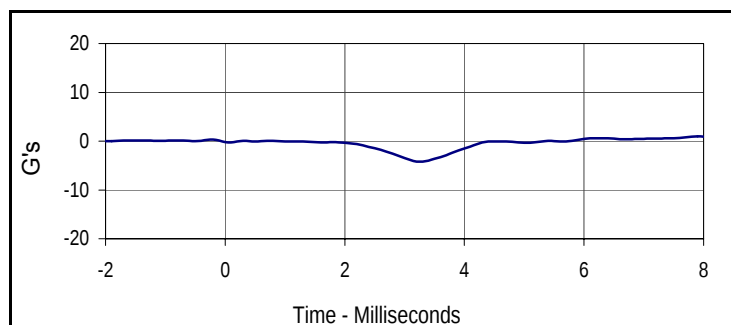
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
273.1	3.2	0.1	-1.8



Curve Description

Head X

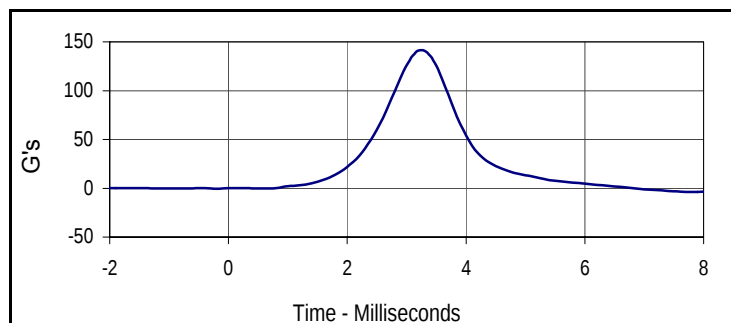
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.7	6.0	-233.8	3.2



Curve Description

Head Y

Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
0.4	6.0	-4.2	3.3



Curve Description

Head Z

Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
141.1	3.2	-0.3	-0.2

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

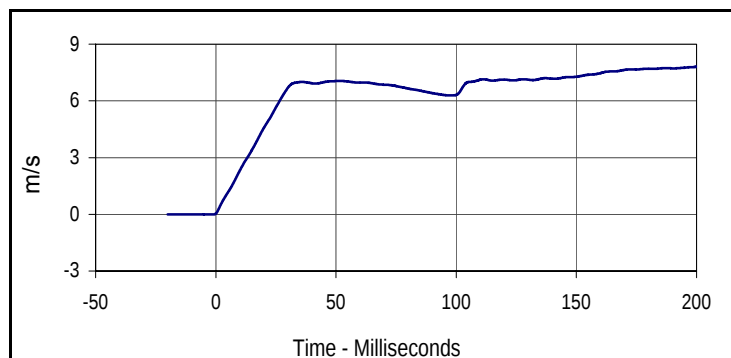
Test Date: 11/8/12

ATD Serial No.: 635

Test I.D.: F635NF034



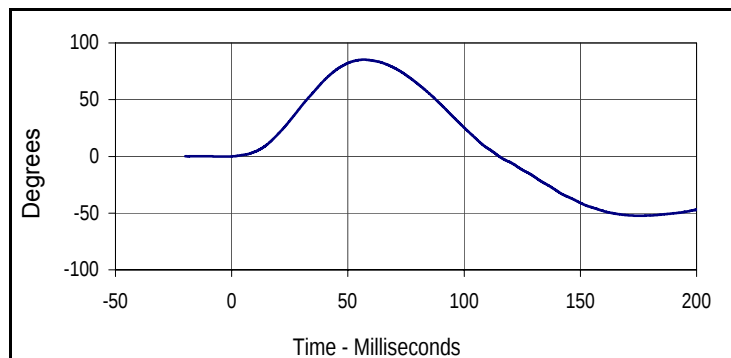
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	290	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.8	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	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	85.3	Pass
Peak Moment in Rotation	Max	Nm	69.0 to 83.0	81.8	Pass
Positive Moment Decay, Time To 10 Nm		Msec.	80.0 to 100.0	87.5	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Velocity

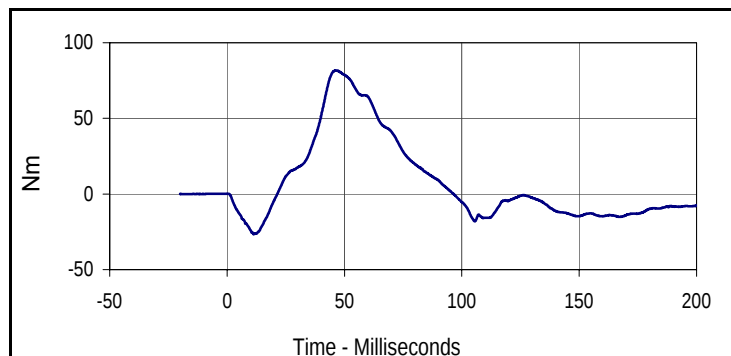
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
7.8	200.0	0.0	-1.0



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
85.3	56.8	-52.3	174.8



Curve Description

Moment About Occipital Condyle

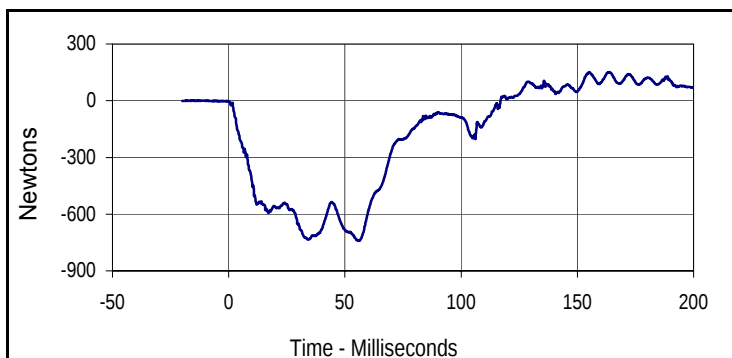
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
81.8	46.1	-26.7	11.3

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

ATD Serial No.: 635

Test Date: 11/8/12

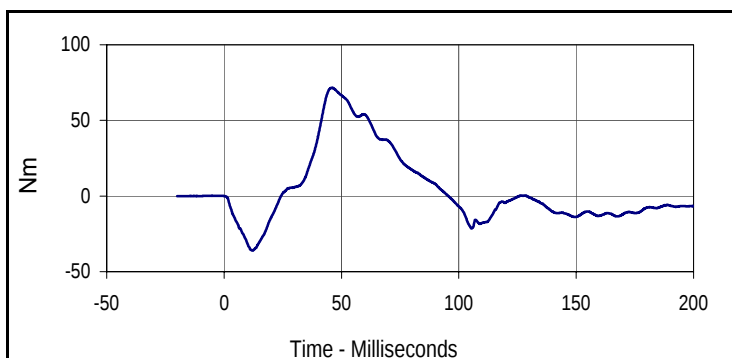
Test I.D.: F635NF034



Curve Description

Upper Neck Force X

Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
151.2	155.2	-741.7	55.8



Curve Description

Neck Moment Y

Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
71.6	46.0	-36.0	12.1

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

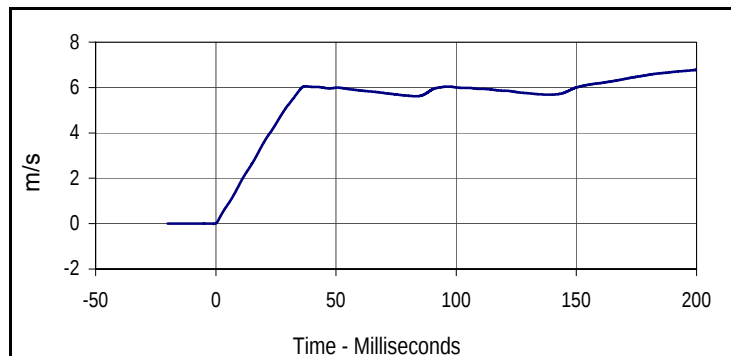
Test Date: 11/8/12



ATD Serial No.: 635

Test I.D.: F635NE034

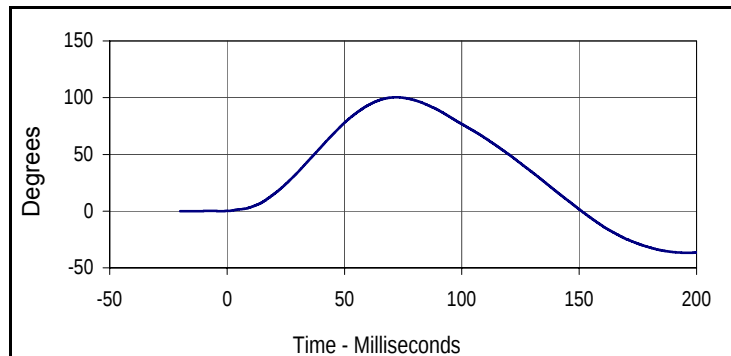
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	325	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.3	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.06	Pass
Pendulum Deceleration	10 Msec.	m/s	1.5 to 1.9	1.8	Pass
	20 Msec.	m/s	3.1 to 3.9	3.6	Pass
	30 Msec.	m/s	4.6 to 5.6	5.2	Pass
"D" Plane Rotation	Max	Degrees	99.0 to 114.0	100.3	Pass
Peak Moment in Rotation	Max	Nm	-53.0 to -65.0	-58.4	Pass
Positive Moment Decay, Time To -10 Nm		Msec.	94.0 to 114.0	95.0	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Velocity

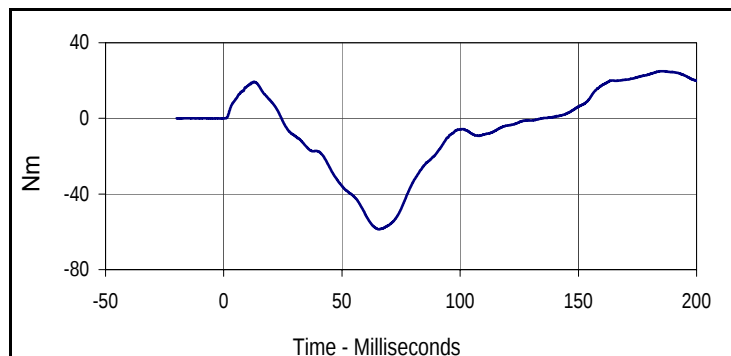
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
6.8	200.0	0.0	-0.8



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
100.3	72.2	-36.7	196.0



Curve Description

Moment About Occipital Condyle

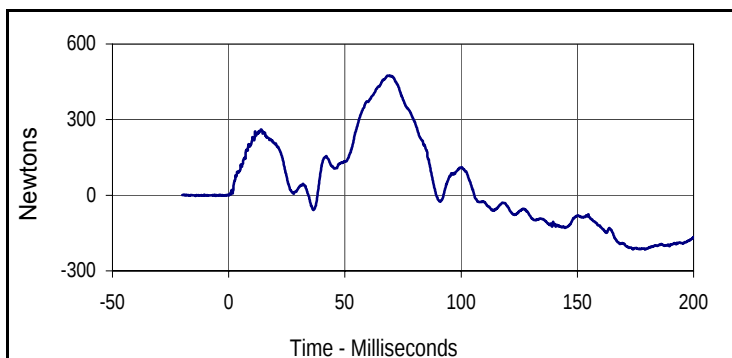
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
25.0	185.0	-58.6	65.6

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

ATD Serial No.: 635

Test Date: 11/8/12

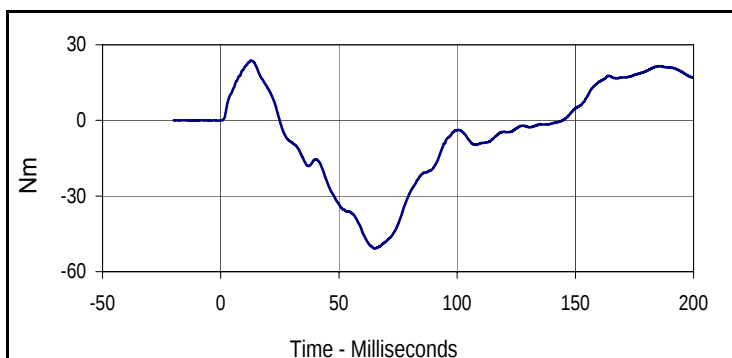
Test I.D.: F635NE034



Curve Description

Upper Neck Force X

Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
474.5	68.7	-214.6	173.9



Curve Description

Neck Moment Y

Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
23.8	12.6	-50.8	65.2

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

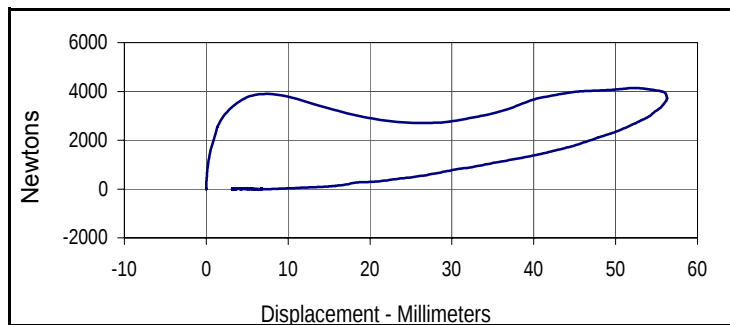
Test Date: 11/8/12



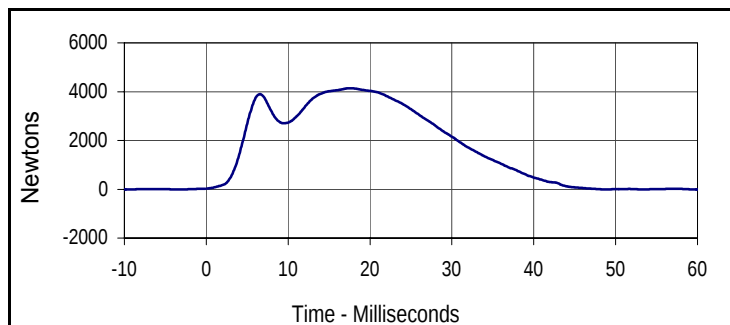
ATD Serial No.: 635

Test I.D.: F635CH034

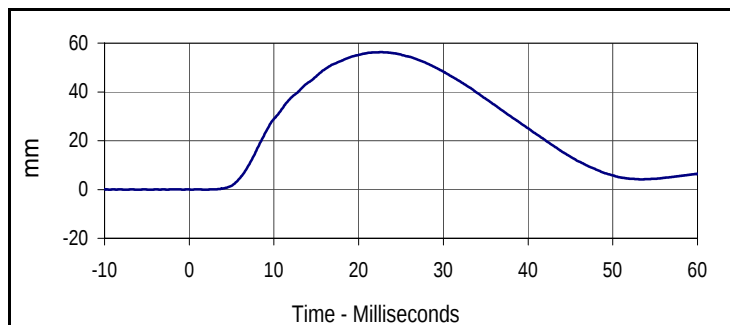
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	375	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.4	Pass
Probe Velocity		m/s	6.59 to 6.83	6.72	Pass
Peak Chest Deflection		mm	50.0 to 58.0	56.3	Pass
Peak Force Between 50 and 58 MM		Newtons	3900 to 4400	4083	Pass
Peak Force Between 18 and 50 MM		Newtons	≤4600	4142	Pass
Internal Hysteresis		%	69 to 85	72.1	Pass
Overall Test Results					Pass



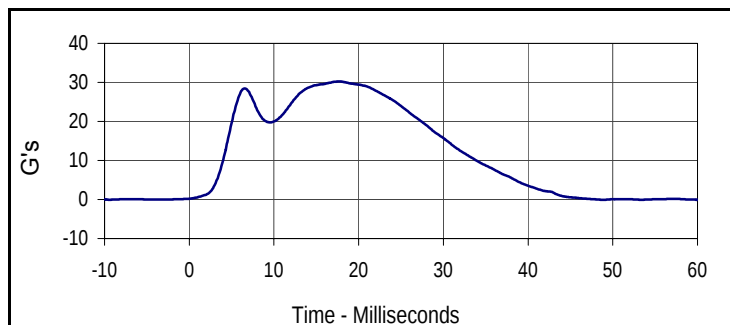
Curve Description			
Probe Force vs. Chest Deflection			
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	72.1
Peak Probe Force		Peak Chest Deflection	
4142.3		56.3	



Curve Description			
Probe Force			
Plot No.	Type	SAE Class	Units
002	FIL	180	Newtons
Max	Time	Min	Time
4142.3	17.7	-37.6	178.1



Curve Description			
Chest Deflection			
Plot No.	Type	SAE Class	Units
003	FIL	600	mm
Max	Time	Min	Time
56.3	22.7	0.0	-7.5



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
30.2	17.7	-0.2	69.7

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

Test Date: 11/8/12

ATD Serial No.: 635

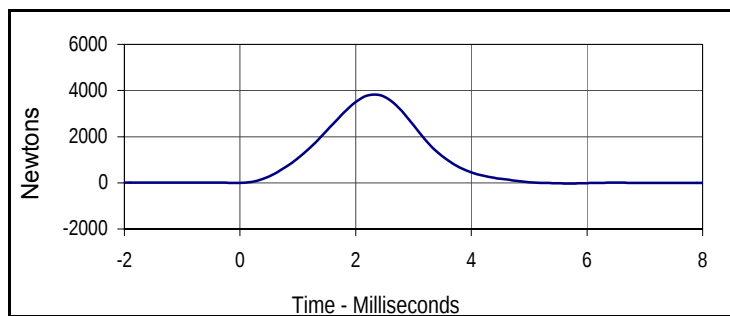
Test I.D.: F635LK034 , F635RK034

**Left Knee**

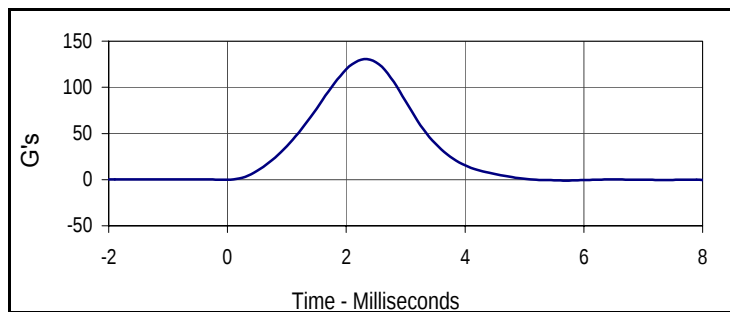
Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	405	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.3	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	3450 to 4060	3828	Pass
Overall Test Results					Pass

Right Knee

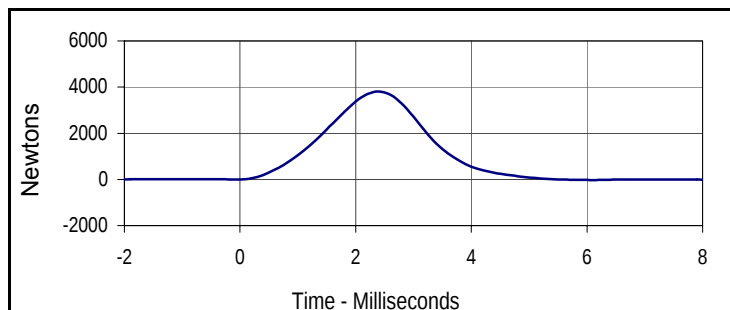
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.08	Pass
Peak Probe Force		Newtons	3450 to 4060	3810	Pass
Overall Test Results					Pass

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

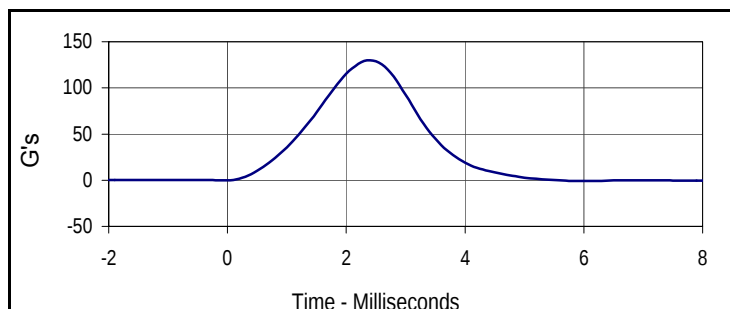
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3828.3	2.3	-28.1	5.7

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

Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
130.6	2.3	-1.0	5.7

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

Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
3809.9	2.4	-25.2	6.1

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

Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
130.0	2.4	-0.9	6.1

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

Test Date: 11/8/12

ATD Serial No.: 635

Test I.D.: F635TF034

**Left Hip Joint-Femur Results**

Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	430	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.3	Pass
Initial Reference Plane Angle		Degrees	≤ 20	0.3	Pass
Peak Force at 45° +/-0.5°		Newtons	320.0 to 390.0	351.2	Pass
Torso Rotation Rate		deg/sec	0.5 to 1.5	0.8	Pass
Final Reference Plane Angle		Degrees	+/-8	1.4	Pass
Overall Test Results					Pass