

REPORT NUMBER: NCAP-KAR-12-027

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

**TOYOTA MOTOR MANUFACTURING, TEXAS, INC.
2012 TOYOTA TUNDRA 4X4 CREWMAX 4-DOOR TRUCK**

NHTSA NUMBER: MC5109

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



JANUARY 3, 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
ROOM W43-410
WASHINGTON, DC 20590**

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Approval Date: January 3, 2012

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NHTSA, Office of Crashworthiness Standards

Date: 


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

Date: 

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16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2012 Toyota Tundra 4x4 Crewmax 4-door truck 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 December 20, 2011. The impact velocity of the vehicle was 56.18 km/h and the ambient temperature at the barrier face at the time of impact was 11.7 deg. C. The target vehicle's post-test maximum crush was 425 mm at DPD 5, to the right 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>232.8</td> <td>700.0</td> <td>317.3</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-27</td> <td>52</td> <td>-15</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>0.49</td> <td>1</td> <td>0.75</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>1837.9</td> <td>2620</td> <td>914.6</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>-436.8</td> <td>2520</td> <td>-437.6</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>-2900.1</td> <td>6805</td> <td>-2301.0</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>-1767.8</td> <td>6805</td> <td>-2164.0</td> </tr> </tbody> </table>						Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC ₁₅)	N/A	700.0	232.8	700.0	317.3	Maximum Chest Compression	mm	63	-27	52	-15	Nij	N/A	1	0.49	1	0.75	Neck Tension	N	4170	1837.9	2620	914.6	Neck Compression	N	4000	-436.8	2520	-437.6	Left Femur Force	N	10008	-2900.1	6805	-2301.0	Right Femur Force	N	10008	-1767.8	6805	-2164.0
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TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	Purpose and Summary of the Test	1
2	Occupant and Vehicle Information / Data Sheets	3
<u>Data Sheet No.</u>		<u>Page No.</u>
1	General Test and Vehicle Parameter Data	4
2	Seat Adjustment, Fuel Systems, and Steering Wheel Data	8
3	Dummy Longitudinal Clearance Dimensions	10
4	Dummy Lateral Clearance Dimensions	11
5	Seat Belt Positioning Data	12
6	High-Speed Camera Locations and Data	13
7	Vehicle Accelerometer Locations	15
8	Photographic Reference Target Locations	16
9	Load Cell Locations on Fixed Barrier	17
10	Test Vehicle Camera and Instrumentation Summary	18
11	Post-Test Observations	19
12	Vehicle Profile Measurements	20
13	Accident Investigation Division Data	22
14	Vehicle Intrusion Measurements	23
15	Summary of FMVSS 212 and FMVSS 219 (Partial) Data	28
16	FMVSS 301 Fuel Static Rollover Data	30
17	Dummy / Vehicle Temperature Stabilization	31
<u>Appendix</u>		<u>Page No.</u>
A	Photographs	A
B	Dummy Response Data Traces	B
C	Dummy Calibration and Performance Verification Data	C

SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

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

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

SUMMARY

A load cell barrier consisting of 36 load cells was impacted by a 2012 Toyota Tundra 4x4 Crewmax 4-door truck at a velocity of 56.18 km/h. The test was performed at KARCO Engineering, LLC. on December 20, 2011. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A of this report.

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

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

Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck force transducers, right / left femur load cells, and lower leg instrumentation. Seat belt load cells were also on the driver's and the passenger's lap belts to measure the dummy pelvic section loading. The driver (position 1) ATD (Serial No. 034) and the right-front passenger (position 2) ATD (Serial No. 141) were calibrated prior to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

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

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

The maximum static crush of the test vehicle was 425 mm located at DPD 5, to the right 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. Both the left and right knees contacted the knee airbag.

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)	232.8	76.3	91.3	-27	0.49	1837.9	-436.8	-2900.1	-1767.8
Passenger (5th)	317.3	67.1	82.1	-15	0.75	914.6	-437.6	-2301.0	-2164.0

SECTION 2
DATA SHEETS

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck

NHTSA No.: MC5109

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 12/20/11

CONVERSION FACTORS

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

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck NHTSA No.: MC5109
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 12/20/11

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	MC5109
Model Year	2012
Make	Toyota
Model	Tundra 4x4 Crewmax
Body Style	4-Door Truck
VIN	5TFDY5F12CX214233
Body Color	Silver Sky Metallic
Odometer Reading (km / mi)	185 / 115
Engine Displacement (L)	5.7
Type / No. of Cylinders	V8
Engine Placement	Longitudinal
Transmission Type	Automatic
Transmission Speeds	6
Overdrive	Yes
Final Drive	4x4
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
All Wheel Drive (AWD)	Yes
Traction Control System	Yes

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

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

No

DATA FROM CERTIFICATION LABEL

Manufactured By	Toyota Motor Manufacturing, Texas, Inc.
Date of Manufacture	Oct-11

GVWR (kg)	3265
GAWR Front (kg)	1810
GAWR Rear (kg)	1880

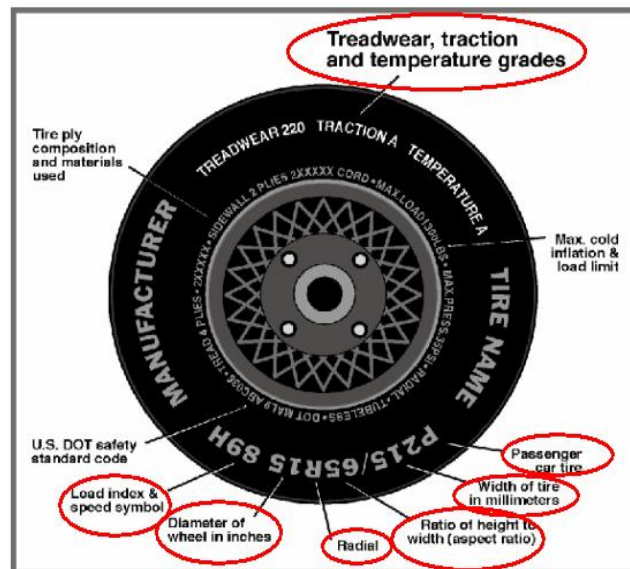
VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Type of Seats	Bucket	Split Bench			
Designated Seating Capacity	3	3		6	
Capacity Weight (VCW) (kg)				616.0	A
DSC x 68.04 (kg)				408.2	B
Cargo Weight (RCLW) (kg)				136.0	A-B

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2012 Toyota Tundra 4x4 Crewmax 4-Door Truck	NHTSA No.:	MC5109
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	12/20/11



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	210	230
Recommended Tire Size	P255/70R18	P255/70R18
Tire Size on Vehicle	P255/70R18	P255/70R18
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Dueler H/T	Dueler H/T
Treadwear	360	360
Traction	B	B
Temperature Grades	B	B
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Steel, 2 Polyester, 1 Nylon	2 Steel, 2 Polyester, 1 Nylon
Load Index / Speed Symbol	112T	112T
Tire Material	Steel, Polyester, Nylon	Steel, Polyester, Nylon
DOT Safety Code Left	7X0P 650 3611	7X0P 650 3611
DOT Safety Code Right	7X0P 650 3611	7X0P 650 3611

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

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck NHTSA No.: MC5109
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 12/20/11

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	790.5	569.0		826.0	678.5	
Right	kg	721.5	547.5		748.5	647.5	
Ratio	%	57.5%	42.5%	100.0%	54.3%	45.7%	100.0%
Total	kg	1512.0	1116.5	2628.5	1574.5	1326.0	2900.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2628.5	A
Weight of 1 P572E ATD & 1 P572O ATD	kg	141.0	B
Rated Cargo/Luggage Weight (RCLW)	kg	136.0	C
Calculated Vehicle Target Weight (TVTW)	kg	2905.5	A+B+C

TEST VEHICLE ATTITUDES

Condition	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	934	947	1014	1006	1574
As Tested	mm	923	934	976	989	1694
Post-Test	mm	949	976	965	960	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3705
Total Vehicle Length at Left Side	mm	5264
Total Vehicle Length at Centerline	mm	5830
Total Vehicle Length at Right Side	mm	5260
Weight of Ballast in Cargo Area	kg	128.3
Weight of Vehicle Components Removed	kg	4.0
Amount of Stoddard Solvent in Fuel Tank	L	92.93

VEHICLE COMPONENTS REMOVED TO MEET TEST WEIGHT:

Spare tire tools (4.0 kg)

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

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck NHTSA No.: MC5109
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 12/20/11

TARGET VEHICLE STRUCTURAL MEASUREMENTS

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length	5830	5468	-362
2	Total Width	2035	2301	266
3	Bumper Top Height	675	763	88
4	Bumper Bottom Height	348	382	34
5	Longitudinal Member Top Height	530	971	441
6	Distance Between Longitudinal Members	800	1590	790
7	Longitudinal Member Width	70	82	12
8	Engine Top Height	1160	1226	66
9	Engine Bottom Height	318	387	69
10	Engine and Gearbox Width	670	670	0
11	Front Bumper to Engine Distance	570	262	-308
12	Front Shock Absorber Fixing Height	790	905	115
13	Bonnet Leading Edge Height	1150	1310	160
14	Front Shock Absorber Fixing Width	1200	880	-320
15	Front Bumper to Front Axle Distance	899	497	-402
16	Front Axle to A-Pillar Distance	595	485	-110
17	A-Pillar to B-Pillar Distance	1069	1076	7
18	B-Pillar to Rear Axle Distance	1983	2054	71
19	B-Pillar to C-Pillar Distance	1068	1069	1
20	Roof Sill Bottom Height	1755	1780	25
21	Roof Sill Top Height	1880	1895	15
22	Floor Sill Bottom Height	423	440	17
23	Floor Sill Top Height	522	543	21

All measurements in millimeters.

DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck

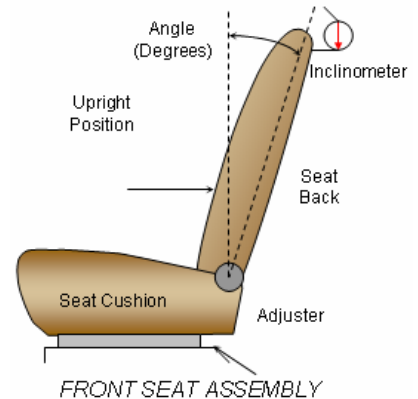
NHTSA No.: MC5109

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 12/20/11

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.

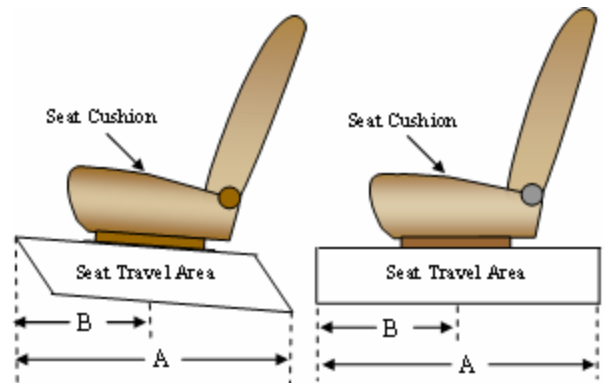


SEAT BACK ANGLE

Seating Position	Degrees
Driver Seat Back Angle	0.9
Passenger Seat Back Angle	-0.8

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	253 mm [15 detents]	129 mm [6th detent]
Passenger Seat	210 mm [15 detents]	0 mm [1st detent]

SEAT BELT UPPER ANCHORAGE

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

SEAT BELT UPPER ANCHORAGES

Seating Position	Total No. of Positions	Placed in Position
Driver Seat	4	M1
Passenger Seat	4	M1

DATA SHEET NO. 2 ... (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck

NHTSA No.: MC5109

Test Program: 56 km/h Frontal Impact NCAP Test

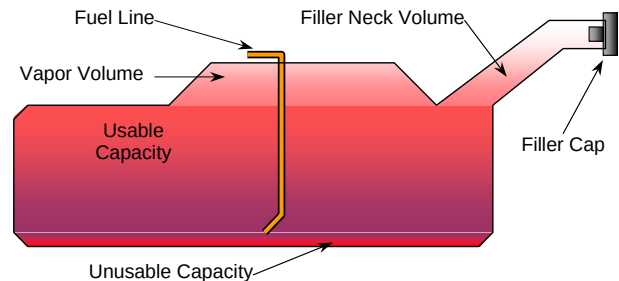
Test Date: 12/20/11

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	99.92
Usable Capacity of "Optional Tank"	
92 - 94% of Usable Capacity	91.93 to 93.93
Actual Amount of Stoddard Solvent Used	92.93
1/3 of Usable Capacity	33.31

FUEL PUMP

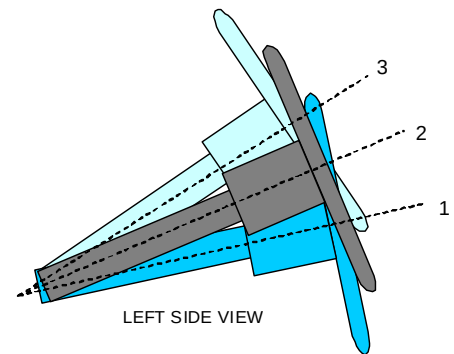
The vehicle is equipped with an electric fuel pump. The fuel pump is activated when the ignition is turned on.



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	23.2	
Geometric Center Position, No. 2	26.7	
Uppermost Position, No. 3	30.2	
Telescoping Steering Wheel Travel		
Test Position	26.7	

DATA SHEET NO. 3

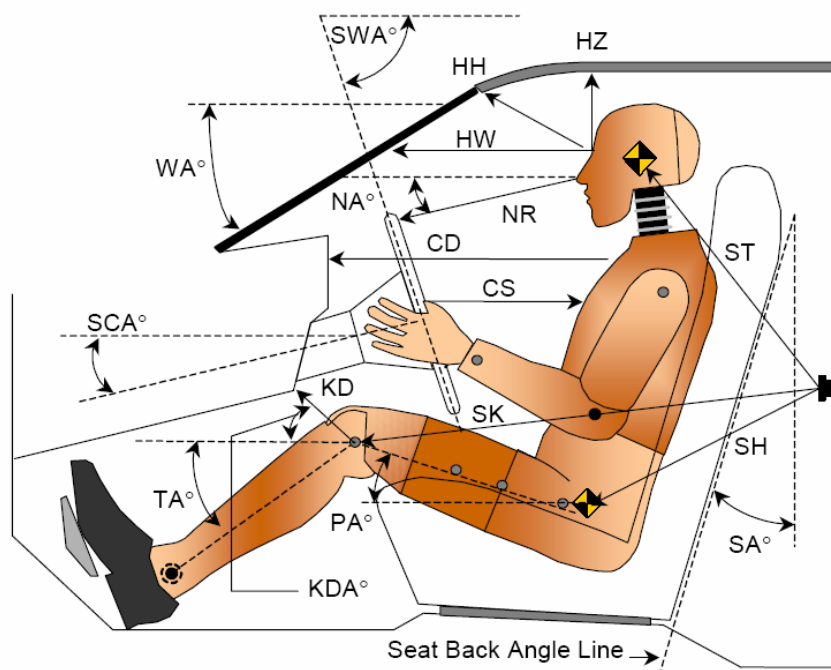
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck

NHTSA No.: MC5109

Test Program: 56 km/h Frontal Impact NCAP Test

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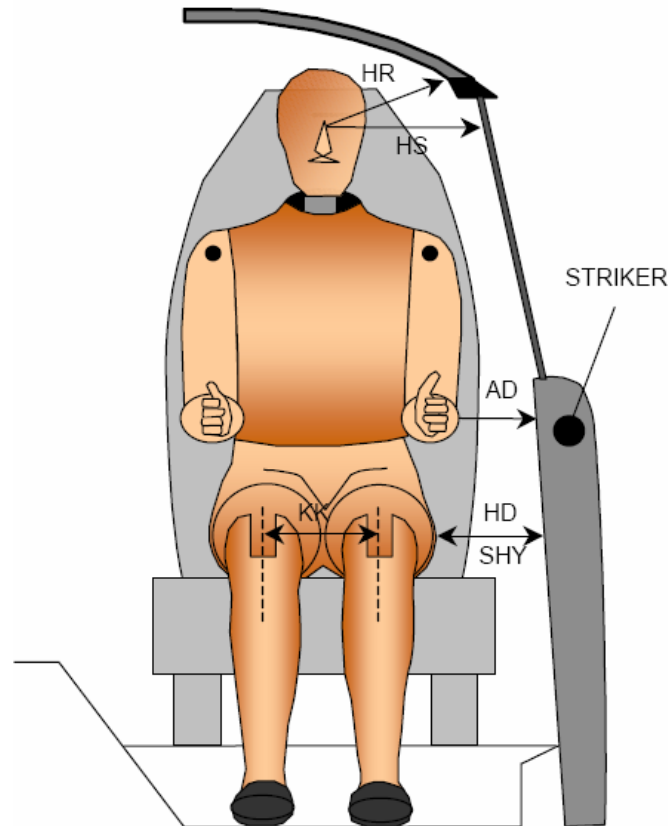
LEFT SIDE VIEW

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		29.7		
SWA°	Steering Wheel Angle		63.3		
SCA°	Steering Column Angle		26.7		
SA°	Seat Back Angle (On Headrest Post)		0.9		-0.8
HZ	Head to Roof	255	90.0	282	90.0
HH	Head to Header	419	25.2	352	39.8
HW	Head to Windshield	749	0.0	714	0.0
NR	Nose to Rim	425	13.0	520	26.8
CD	Chest to Dash	551	14.3	263	12.2
CS	Chest to Steering Hub	300	0.0		
RA	Rim to Abdomen	201	0.0		
KDL	Left Knee to Dash	162	24.5	100	38.4
KDR	Right Knee to Dash	140	29.8	120	36.6
PA°	Pelvic Angle		23.1		22.3
TA°	Tibia Angle		52.4		65.4
SK	Striker to Knee	675	8.3	728	8.4
ST	Striker to Head	527	70.7	482	62.2
SH	Striker to H-Point	233	46.2	396	22.8

DUMMY LATERAL CLEARANCE DIMENSIONS

NHTSA No.: MC5109

Test Date: 12/20/11



Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	145	99
HD	H-Point to Door	175	210
HR	Head to Side Header	260	300
HS	Head to Side Window	347	366
KK	Knee to Knee	345	230
SHY	Striker to H-Point (Y-Direction)	250	290
AA	Ankle to Ankle	320	150

DATA SHEET NO. 5

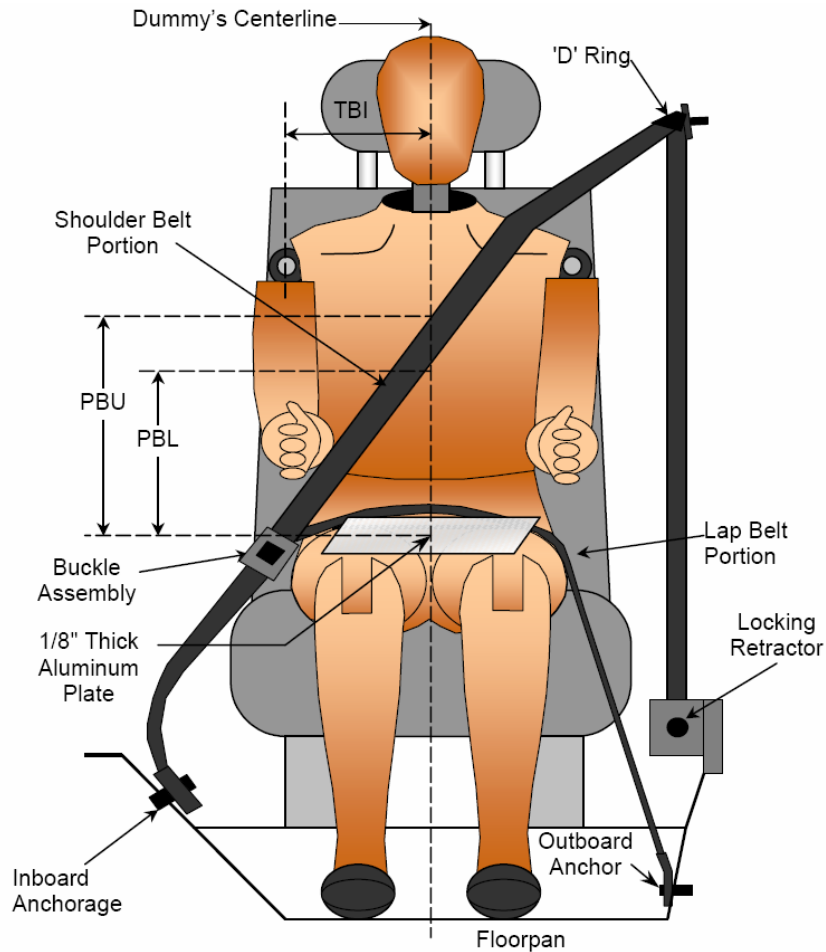
SEAT BELT POSITIONING DATA

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck

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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	365	312
PBL	Top Surface of Aluminum Plate to Belt Lower Edge	mm	290	227

BELT LENGTH DATA

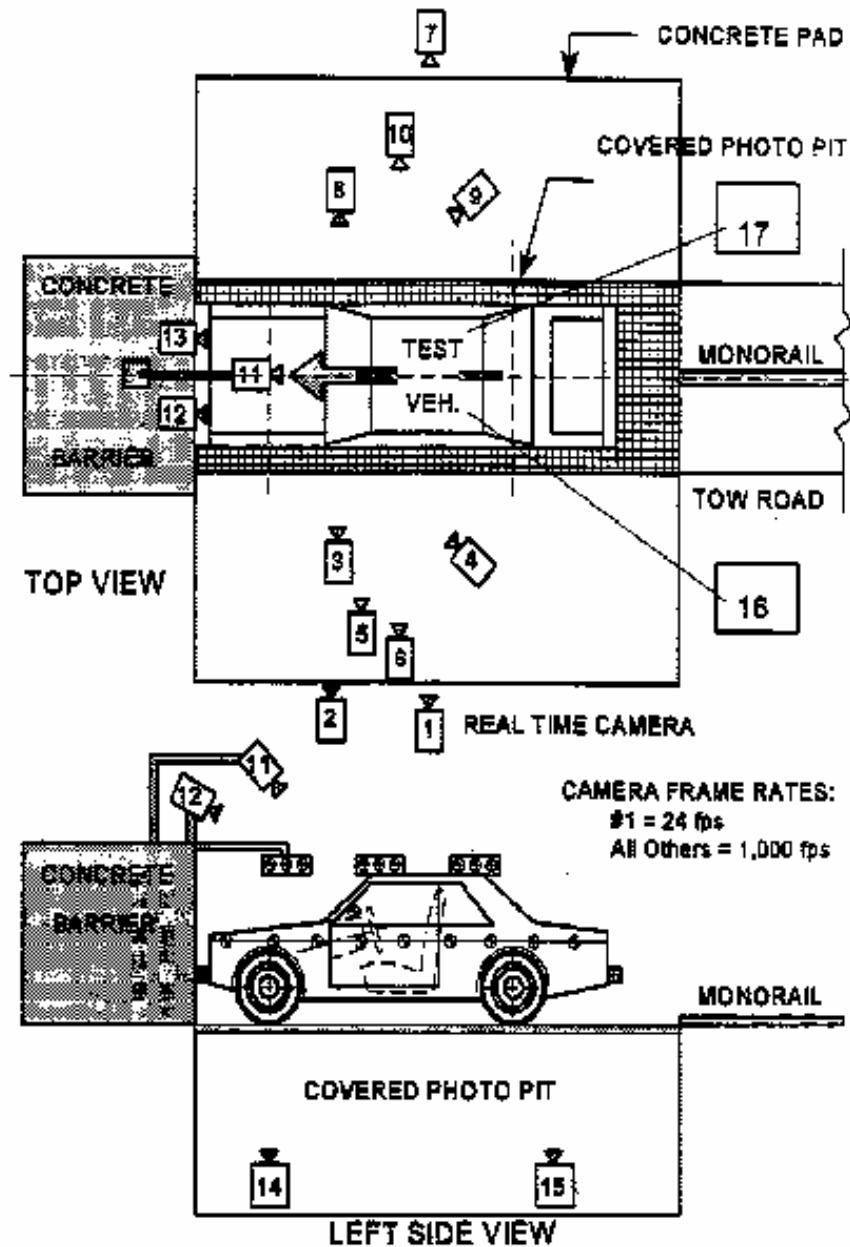
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as Measured on ATD	mm	932	976
Lap Belt Length as Measured on ATD	mm	772	835
Remainder of Belt on Reel	mm	824	721
Total Belt Length for Continuous Webbing Systems	mm	2528	2532

DATA SHEET NO. 6

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck NHTSA No.: MC5109
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 12/20/11

CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 6 ... (CONTINUED)

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck

NHTSA No.: MC5109

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 12/20/11

CAMERA LOCATIONS

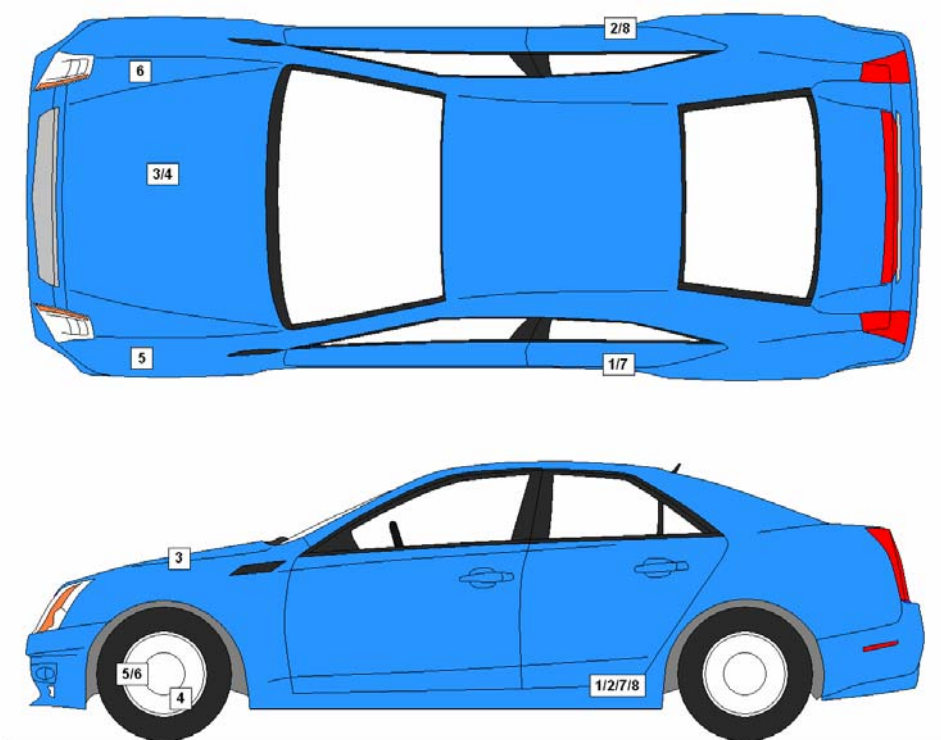
No.	Description	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	-11412	-8150	-1484		30
2	Driver Close-Up	-2590	-7950	-1371	24	1000
3	Left Front Half	-1701	-6197	-1701	50	1000
4	Left Angle	-6696	-10308	-3211	ZOOM	1000
5	Steering Column - Top	-1966	-10412	-3688	50	1000
6	Steering 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	-2500	520	-1820	12	1000
17	Onboard Passenger Airbag (Optional)	-2500	-520	-1820	12	1000
18	Real-Time Left View of Impact (Optional)					
19	Real-Time Right View of Impact					

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

DATA SHEET NO. 7

VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck NHTSA No.: MC5109
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 12/20/11



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Description	Location		
		X	Y	Z
1	Left Rear Accelerometer X-Direction	3150	-805	-530
2	Right Rear Accelerometer X-Direction	3150	805	-530
3	Engine Top X	875	-60	-1125
4	Engine Bottom X	740	145	-310
5	Left Brake Caliper X	1090	-800	-280
6	Right Brake Caliper X	1090	800	-280
7	Left Rear Accelerometer Z-Direction	3150	-805	-530
8	Right Rear Accelerometer Z-Direction	3150	805	-530

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

DATA SHEET NO. 8

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

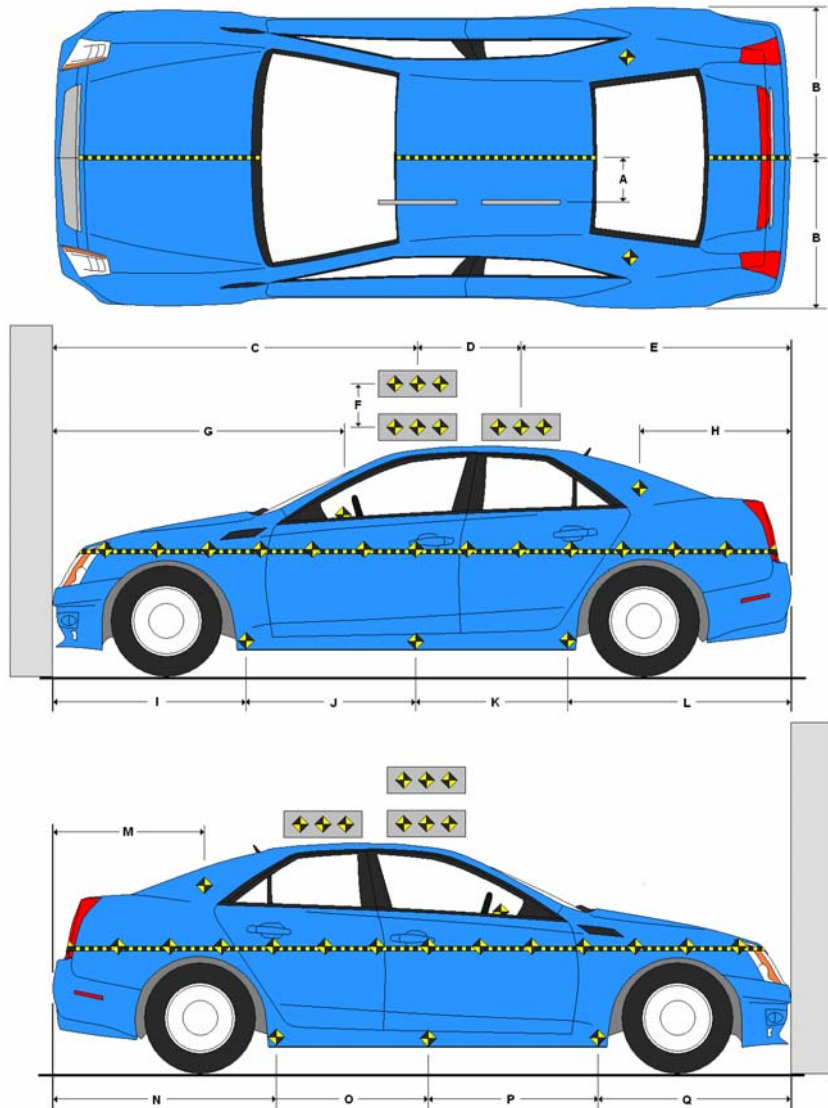
Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck

NHTSA No.: MC5109

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 12/20/11

Item	Value
A	440
B	1018
C	2385
D	610
E	2843
F	305
G	1780
H	2160
I	1450
J	1115
K	1115
L	2153
M	2170
N	2150
O	1113
P	1113
Q	1457



All measurements in millimeters.

DATA SHEET NO. 9

LOAD CELL LOCATIONS ON FIXED BARRIER

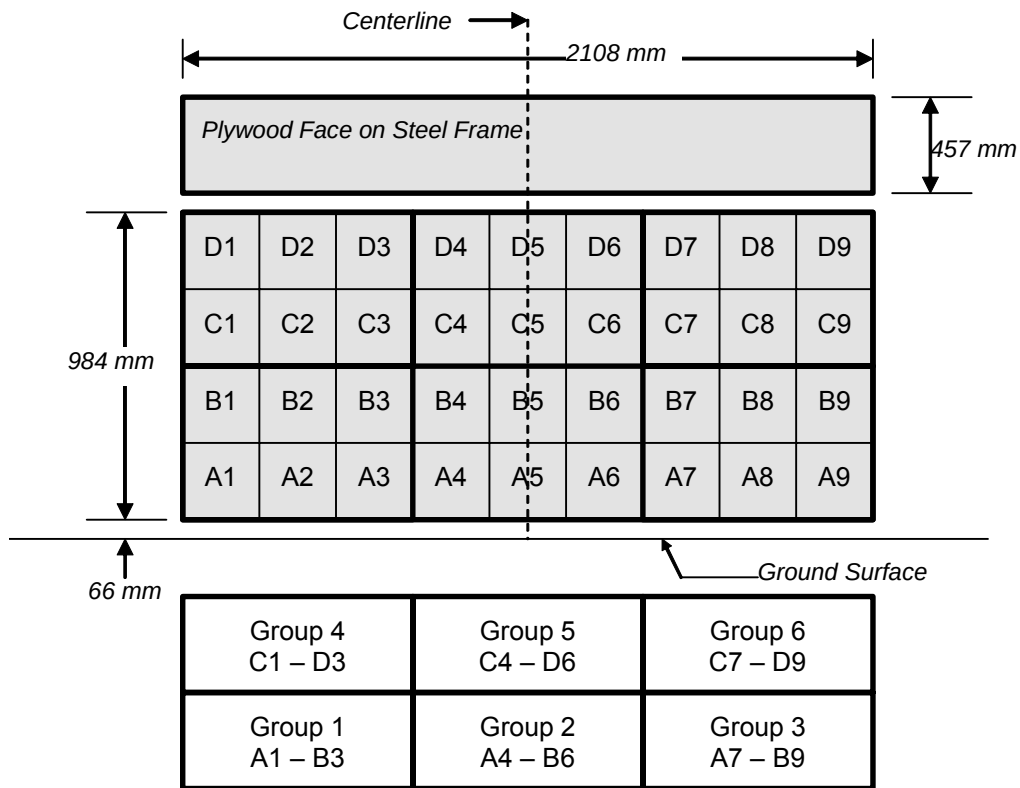
Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck

NHTSA No.: MC5109

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 12/20/11

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



6 Groups of 6 Load Cells Each

DATA SHEET NO. 10

TEST VEHICLE CAMERA AND INSTRUMENTATION SUMMARY

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck NHTSA No.: MC5109
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 12/20/11

INSTRUMENTATION

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

CAMERA COVERAGE

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

DATA SHEET NO. 11

POST-TEST OBSERVATIONS

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck

NHTSA No.: MC5109

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 12/20/11

TEST DUMMY INFORMATION AND CONTACT

Description	Driver	Passenger
Dummy Type/Serial No.	P572E 50th Percentile Male ATD / 034	P572O 5th Percentile Female ATD / 141
Head Contact	Airbag, Headrest	Airbag, Headrest
Upper Torso Contact	Airbag	Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Airbag	Knee Airbag
Right Knee Contact	Knee Airbag	Knee Airbag

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked / Unlocked Doors	Locked	Locked
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)	8	-3
Seat Back Failure	None	None
Glazing Damage	None	None

POST TEST STRUCTURAL OBSERVATIONS

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

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	874
Center	mm	831
Right Side	mm	892
Average	mm	866

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

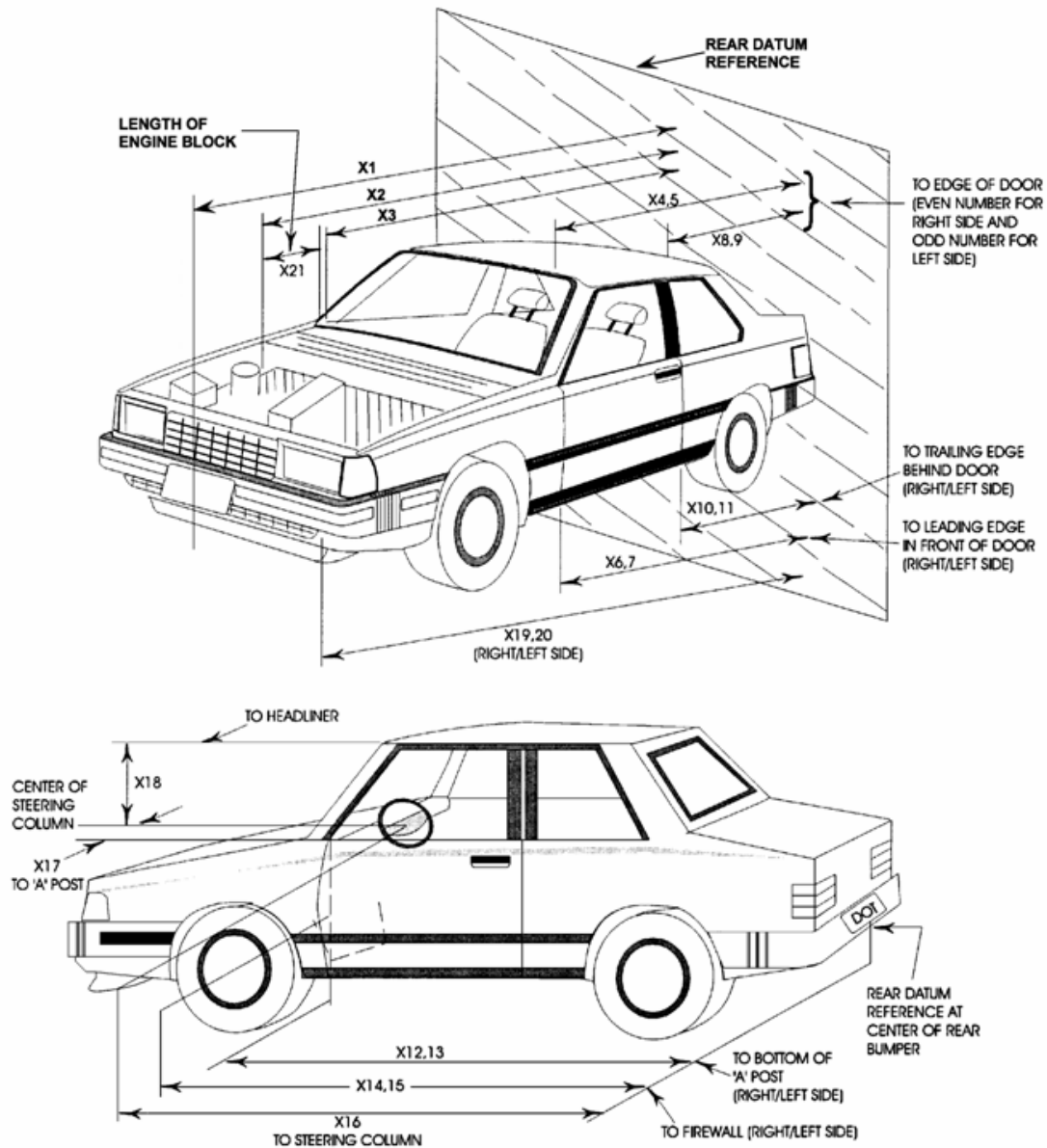
DATA SHEET NO. 12
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck

NHTSA No.: MC5109

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 12/20/11

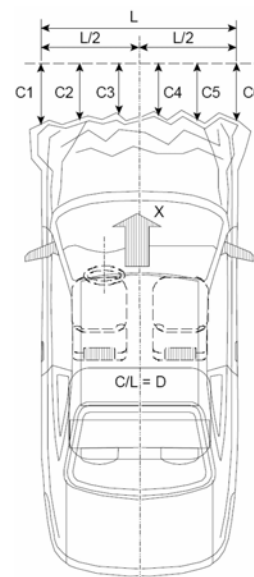


DATA SHEET NO. 12 ... (CONTINUED)**VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck NHTSA No.: MC5109
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 12/20/11

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	5830	5468	-362
2	Rear Surface of Vehicle to Front of Engine	5260	5150	-110
3	RSOV to Firewall	4595	4661	66
4	RSOV to Upper Leading Edge of Right Door	4395	4449	54
5	RSOV to Upper Leading Edge of Left Door	4403	4490	87
6	RSOV to Lower Leading Edge of Right Door	4357	4402	45
7	RSOV to Lower Leading Edge of Left Door	4359	4430	71
8	RSOV to Upper Trailing Edge of Right Door	3221	3275	54
9	RSOV to Upper Trailing Edge of Left Door	3227	3317	90
10	RSOV to Lower Trailing Edge of Right Door	3202	3245	43
11	RSOV to Lower Trailing Edge of Left Door	3205	3275	70
12	RSOV to Bottom of A-Pillar, Right Side	4358	4379	21
13	RSOV to Bottom of A-Pillar, Left Side	4363	4416	53
14	RSOV to Firewall, Right Side	4590	4635	45
15	RSOV to Firewall, Left Side	4590	4635	45
16	RSOV to Steering Column	3855	3976	121
17	Center of Steering Column to A-Pillar	430	383	-47
18	Center of Steering Column to Headliner	450	515	65
19	RSOV to Right Side of Front Bumper	5260	5180	-80
20	RSOV to Left Side of Front Bumper	5264	5200	-64
21	Length of Engine Block	600	600	0
RD	RSOV to Right Side of Dash Panel	4105	4199	94
CD	RSOV to Center of Dash Panel	4070	4141	71
LD	RSOV to Left Side of Dash Panel	4105	4208	103

All measurements in millimeters.

DATA SHEET NO. 13**ACCIDENT INVESTIGATION DATA**Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door TruckNHTSA No.: MC5109Test Program: 56 km/h Frontal Impact NCAP TestTest Date: 12/20/11**VEHICLE INFORMATION**VIN: 5TFDY5F12CX214233
Vehicle Size Category: 4-Door TruckWheelbase (mm): 3705
Test Weight (kg): 2900.5**ACCELEROMETER DATA**Accelerometer Locations: Left Rear Crossmember
Cal. Procedure/Interval: Drop Test / 6 months
Integration Algorithm: NHTSA Standard
Impact Velocity (km/h): 56.18
Velocity Change (km/h): 67.3
Time of Separation (msec): 56.3Linearity: Good**CRUSH PROFILE**Collision Deformation Classification: 12FDEW2
Midpoint of Damage: Vehicle Centerline
Damage Region Length (mm): 1628
Impact Mode: Full Frontal

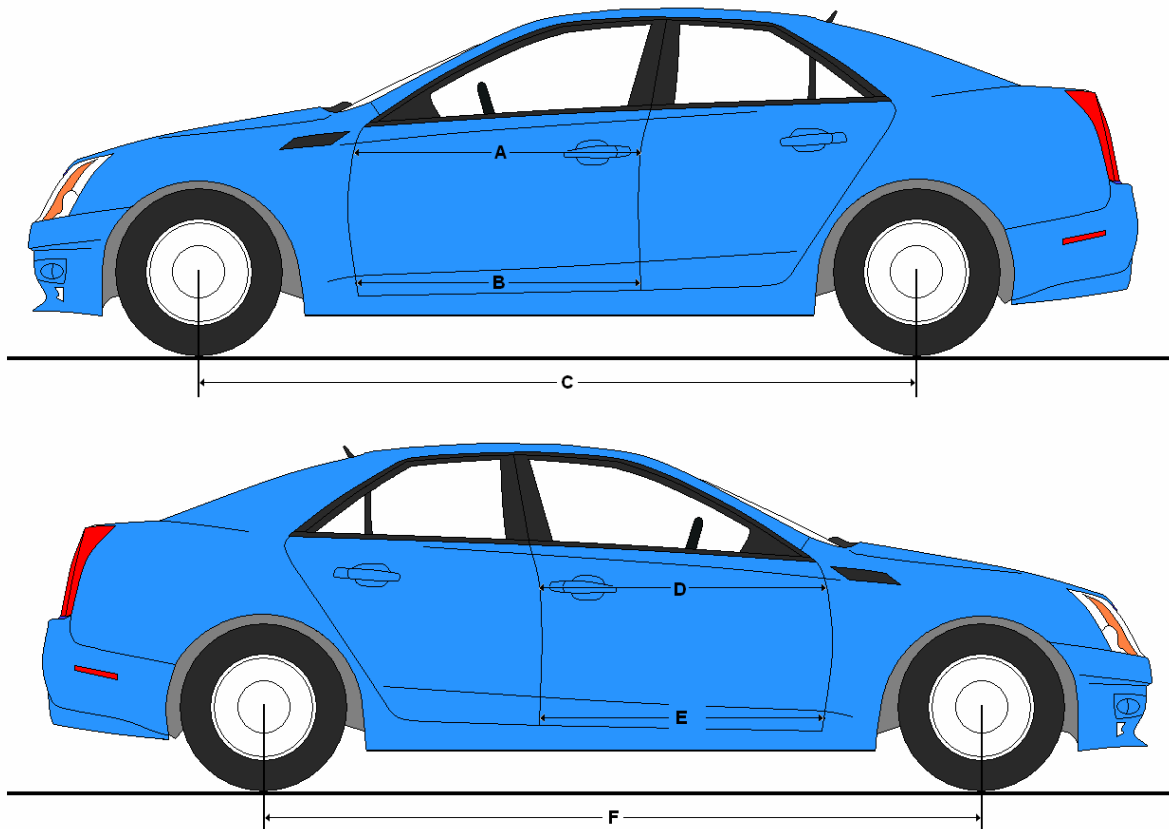
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	147	406	259
C2	Crush Zone 2 at Left Side	mm	35	424	389
C3	Crush Zone 3 at Left Side	mm	15	377	362
C4	Crush Zone 4 at Right Side	mm	15	412	397
C5	Crush Zone 5 at Right Side	mm	35	460	425
C6	Crush Zone 6 at Right Side	mm	147	505	358
L	C1 to C6	mm	1628		

DATA SHEET NO. 14**VEHICLE INTRUSION MEASUREMENTS**Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door TruckNHTSA No.: MC5109Test Program: 56 km/h Frontal Impact NCAP TestTest Date: 12/20/11**DOOR OPENING WIDTH**

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1069	1076	-7
B	Left Side Lower	mm	958	959	-1
D	Right Side Upper	mm	1070	1073	-3
E	Right Side Lower	mm	970	970	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3705	3632	73
F	Right Side Wheelbase	mm	3705	3640	65



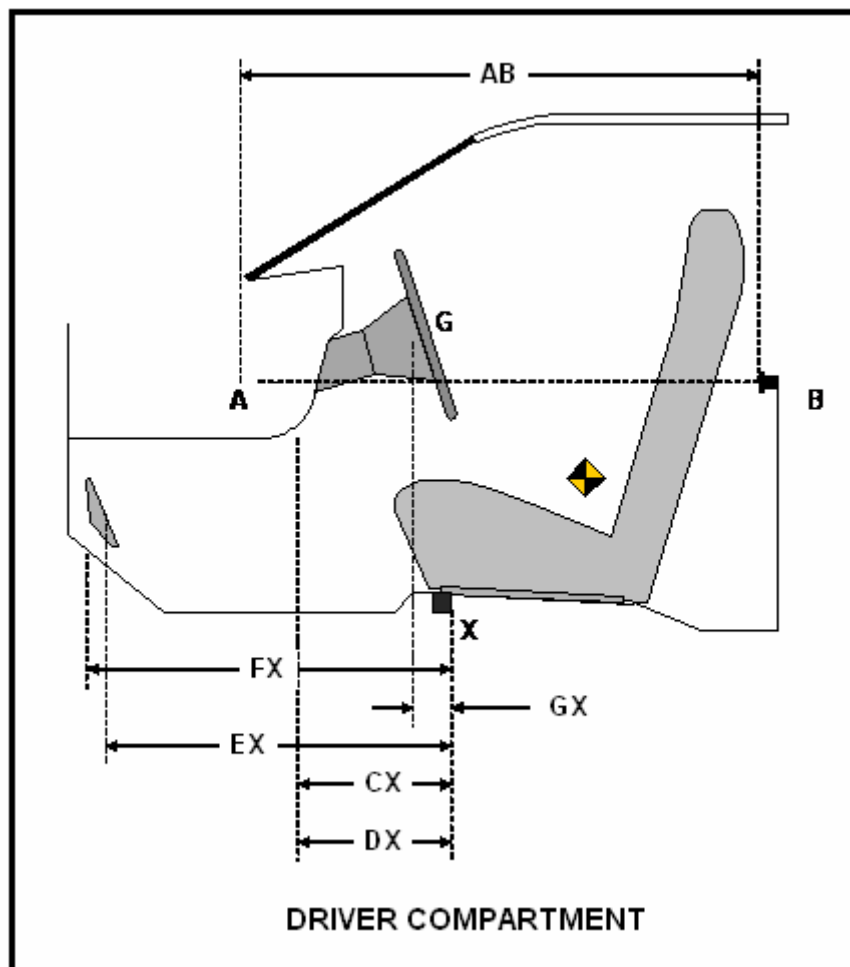
DATA SHEET NO. 14 ... (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck NHTSA No.: MC5109
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 12/20/11

DRIVER COMPARTMENT INTRUSION

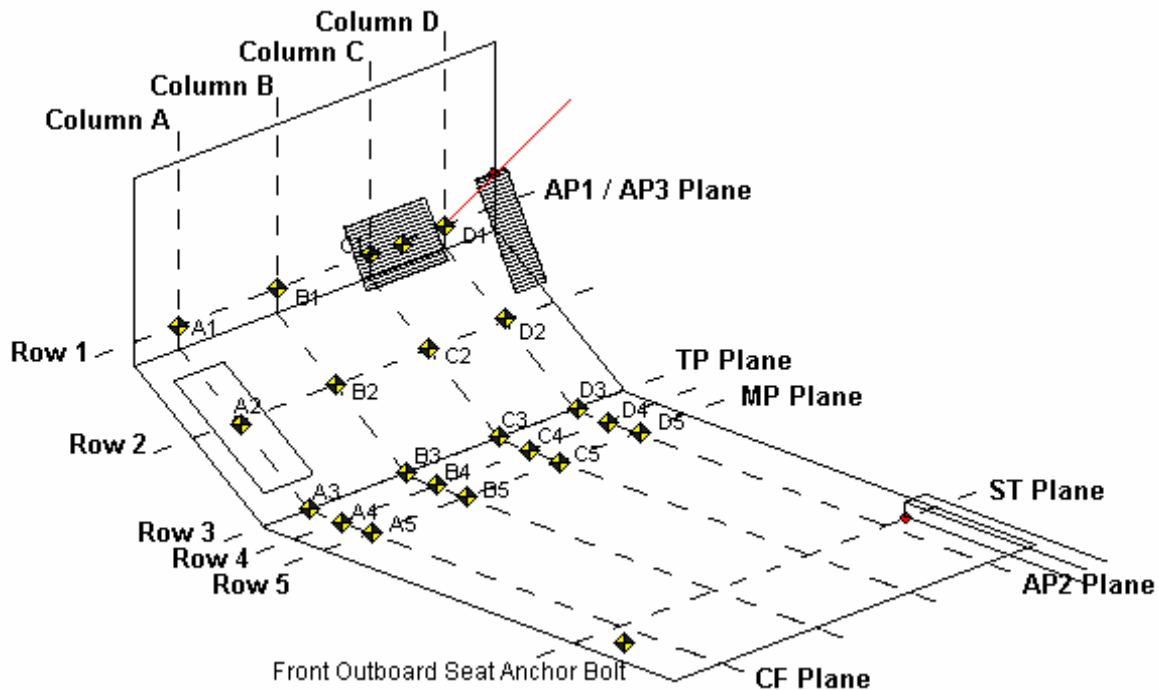
Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	898	898	0
CX	Left Knee Bolster to X	mm	300	337	-37
DX	Right Knee Bolster to X	mm	274	319	-45
EX	Brake Pedal to X	mm	563	555	8
FX	Foot Rest to X	mm	550	510	40
GX	Center of Steering Wheel Hub to X	mm	45	45	0

X = Front of Seat Track (Stationary)



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

Test Vehicle:	<u>2012 Toyota Tundra 4x4 Crewmax 4-Door Truck</u>	NHTSA No.:	<u>MC5109</u>
Test Program:	<u>56 km/h Frontal Impact NCAP Test</u>	Test Date:	<u>12/20/11</u>



AP1: Y-Z Plane passing through D1

AP2: X-Z Plane passing through D1

AP3: X-Y plane passing through D1

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

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

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

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

Column A: intersection of vehicle and CF plane

Column D: Intersection of vehicle and AP2 plane

Row 1: intersection of the vehicle and the AP3 Plane

Row 3: intersection of the vehicle and TP plane

Row 5: intersection of the vehicle and MP plane

Row 2: evenly spaced between row 1 and 3

Row 4: evenly spaced between row 3 and 5

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

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck NHTSA No.: MC5109
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 12/20/11

DRIVER FLOORPAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	665	713	736	694	682	704	703	634	-17	9	33	60
2	597	622	626	632	602	620	609	610	-5	2	17	22
3	498	500	505	514	497	501	505	513	1	-1	0	1
4	397	401	407	411	396	400	407	410	1	1	0	1
5	300	299	302	303	299	299	301	302	1	0	1	1

DRIVER FLOORPAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-30	-133	-249	-377	-32	-149	-263	-375	2	16	14	-2
2	-31	-138	-250	-379	-34	-142	-251	-377	3	4	1	-2
3	-32	-139	-249	-378	-32	-140	-249	-377	0	1	0	-1
4	-33	-143	-248	-373	-32	-144	-249	-374	-1	1	1	1
5	-30	-140	-248	-373	-32	-140	-249	-372	2	0	1	-1

DRIVER FLOORPAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	69	30	10	57	55	33	23	82	14	-3	-13	-25
2	-34	-52	-50	-49	-39	-56	-57	-29	5	4	7	-20
3	-93	-86	-86	-90	-93	-88	-89	-92	0	2	3	2
4	-86	-103	-97	-90	-85	-101	-94	-86	-1	-2	-3	-4
5	-81	-80	-77	-82	-79	-78	-75	-79	-2	-2	-2	-3

All measurements in millimeters

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

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck NHTSA No.: MC5109
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 12/20/11

PASSENGER FLOORPAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	695	740	717	675	636	708	710	676	59	32	7	-1
2	625	624	621	595	598	611	620	598	27	13	1	-3
3	519	513	509	505	518	512	509	506	1	1	0	-1
4	411	410	410	407	411	408	409	406	0	2	1	1
5	305	302	301	300	305	303	300	299	0	-1	1	1

PASSENGER FLOORPAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	375	250	140	37	362	262	148	41	13	-12	-8	-4
2	381	247	135	33	388	245	138	36	-7	2	-3	-3
3	381	248	138	35	383	250	141	39	-2	-2	-3	-4
4	380	251	142	36	383	254	146	40	-3	-3	-4	-4
5	379	250	143	40	382	253	147	43	-3	-3	-4	-3

PASSENGER FLOORPAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	67	20	43	82	100	36	44	74	-33	-16	-1	8
2	-48	-49	-48	-33	-35	-48	-52	-40	-13	-1	4	7
3	-87	-83	-84	-83	-75	-78	-83	-86	-12	-5	-1	3
4	-88	-94	-98	-84	-75	-86	-93	-84	-13	-8	-5	0
5	-81	-75	-76	-78	-67	-66	-71	-77	-14	-9	-5	-1

All measurements in millimeters

DATA SHEET NO. 15

SUMMARY OF FMVSS 212 AND 219 (PARTIAL) DATA

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck NHTSA No.: MC5109

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 12/20/11

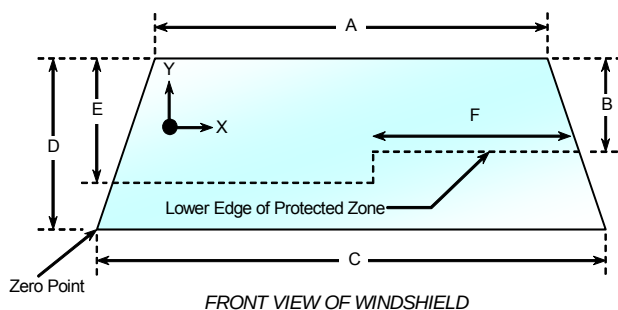
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with plastic molding and rubber cement.

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: 21.3° C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2362	2362	100.0%
Right Side	2362	2362	100.0%
Total	4724	4724	100.0%



Item	Units	Value
A	mm	1390
B	mm	400
C	mm	1665
D	mm	834
E	mm	497
F	mm	620

AREAS OF PROTECTED ZONE FAILURES

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

X	Y

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

X	Y

DATA SHEET NO. 15 ... (CONTINUED)

SUMMARY OF FMVSS 212 AND 219 (PARTIAL) DATA

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck NHTSA No.: MC5109
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 12/20/11

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 11.7° C Test Time: 1:03 PM

Stoddard Solvent Spillage Measurements

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

DATA SHEET NO. 16

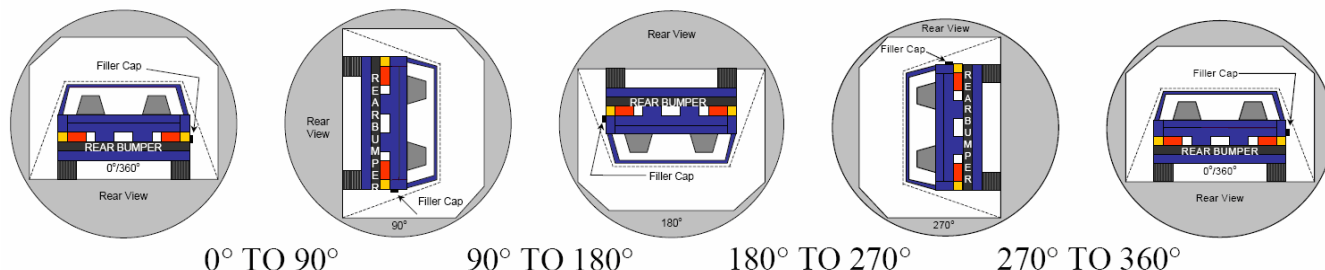
FMVSS 301 STATIC ROLLOVER

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck

NHTSA No.: MC5109

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 12/20/11



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°	77	300	377

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° To 90°	N/A
90° To 180°	N/A
180° To 270°	N/A
270° To 360°	N/A

DATA SHEET NO. 17

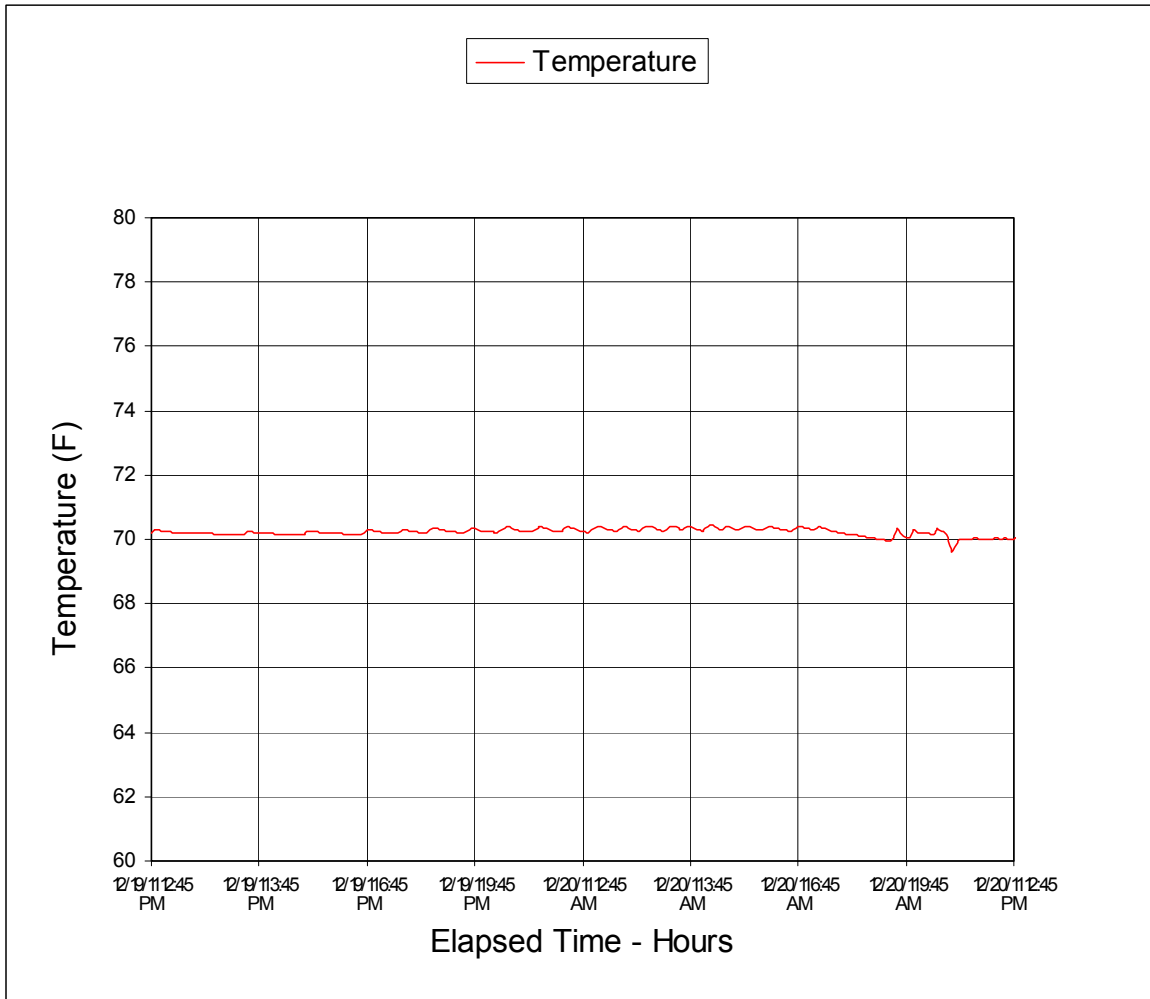
DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2012 Toyota Tundra 4x4 Crewmax 4-Door Truck

NHTSA No.: MC5109

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 12/20/11



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

Figure		Page
1	Load Cell Location	A-1
2	Load Cell Wall	A-1
3	Manufacturer's Label	A-2
4	Tire Placard	A-2
5	2012 Toyota Tundra 4x4 Crewmax Frontal as Delivered	A-3
6	Left Rear 3-4 View, as Received	A-3
7	Pre-Test Front View of Test Vehicle	A-4
8	Post-Test Front View of Test Vehicle	A-4
9	Pre-Test Left View of Test Vehicle	A-5
10	Post-Test Left View of Test Vehicle	A-5
11	Pre-Test Right View of Test Vehicle	A-6
12	Post-Test Right View of Test Vehicle	A-6
13	Pre-Test Right Front 3-4 View	A-7
14	Post-Test Right Front 3-4 View	A-7
15	Pre-Test Left Rear 3-4 View	A-8
16	Post-Test Left Rear 3-4 View	A-8
17	Pre-Test Windshield View	A-9
18	Post-Test Windshield View	A-9
19	Pre-Test Engine Compartment View	A-10
20	Post-Test Engine Compartment View	A-10
21	Pre-Test Fuel Filler Cap View	A-11
22	Post-Test Fuel Filler Cap View	A-11
23	Pre-Test Front Underbody View	A-12
24	Post-Test Front Underbody View	A-12
25	Pre-Test Rear Underbody View	A-13
26	Post-Test Rear Underbody View	A-13
27	Pre-Test Dummy Cable Routing	A-14
28	Post-Test Dummy Cable Routing	A-14
29	Pre-Test Driver Dummy Front View	A-15
30	Post-Test Driver Dummy Front View	A-15
31	Pre-Test Driver Dummy Window View	A-16
32	Post-Test Driver Dummy Window View	A-16
33	Pre-Test Driver Dummy and Vehicle Interior View	A-17
34	Post-Test Driver Dummy and Vehicle Interior View	A-17
35	Pre-Test Driver's Seat Fore-Aft Markings	A-18

TABLE OF PHOTOGRAPHS ... (CONTINUED)

Figure		Page
36	Post-Test Driver's Seat Fore-Aft Markings	A-18
37	Pre-Test Driver Dummy Feet	A-19
38	Post-Test Driver Dummy Feet	A-19
39	Pre-Test Driver's Side Knee Bolster	A-20
40	Post-Test Driver's Side Knee Bolster	A-20
41	Pre-Test Driver's Side Floorpan	A-21
42	Post-Test Driver's Side Floorpan	A-21
43	Post-Test Driver Dummy Face	A-22
44	Post-Test Driver Dummy Contact With Airbag	A-22
45	Post-Test Driver Dummy Contact With Headrest	A-23
45a	Post-Test Driver Dummy Contact With Knee Airbag	A-23
46	Pre-Test View of the Steering Wheel	A-24
47	Post-Test View of the Steering Wheel	A-24
48	Pre-Test Passenger Dummy Front View	A-25
49	Post-Test Passenger Dummy Front View	A-25
50	Pre-Test Passenger Dummy Window View	A-26
51	Post-Test Passenger Dummy Window View	A-26
52	Pre-Test Passenger Dummy and Vehicle Interior View	A-27
53	Post-Test Passenger Dummy and Vehicle Interior View	A-27
54	Pre-Test Passenger's Seat Fore-Aft Markings	A-28
55	Post-Test Passenger's Seat Fore-Aft Markings	A-28
56	Pre-Test Passenger Dummy Feet	A-29
57	Post-Test Passenger Dummy Feet	A-29
58	Pre-Test Passenger's Side Knee Bolster	A-30
59	Post-Test Passenger's Side Knee Bolster	A-30
60	Pre-Test Passenger's Side Floorpan	A-31
61	Post-Test Passenger's Side Floorpan	A-31
62	Post-Test Passenger Dummy Contact With Airbag	A-32
62a	Post-Test Passenger Dummy Contact With Headrest	A-32
62b	Post-Test Passenger Dummy Contact With Knee Airbag	A-33
63	Photograph of Ballast Installed in Vehicle	A-33
64	Post-Test Stoddard Solvent Spillage Location View	A-34
65	Post-Test Speed Trap Read-Out	A-34
66	Vehicle at 0° on Static Rollover Device	A-35
67	Vehicle at 90° on Static Rollover Device	A-35

TABLE OF PHOTOGRAPHS ... (CONTINUED)

Figure		Page
68	Vehicle at 180° on Static Rollover Device	A-36
69	Vehicle at 270° on Static Rollover Device	A-36
70	Vehicle at 360° on Static Rollover Device	A-37
71	2012 Toyota Tundra 4x4 Crewmax Frontal Impact Event	A-37
72	Monroney Label Photograph	A-38



FIGURE 1. Load Cell Location



FIGURE 2. Load Cell Wall



FIGURE 3. Manufacturer's Label

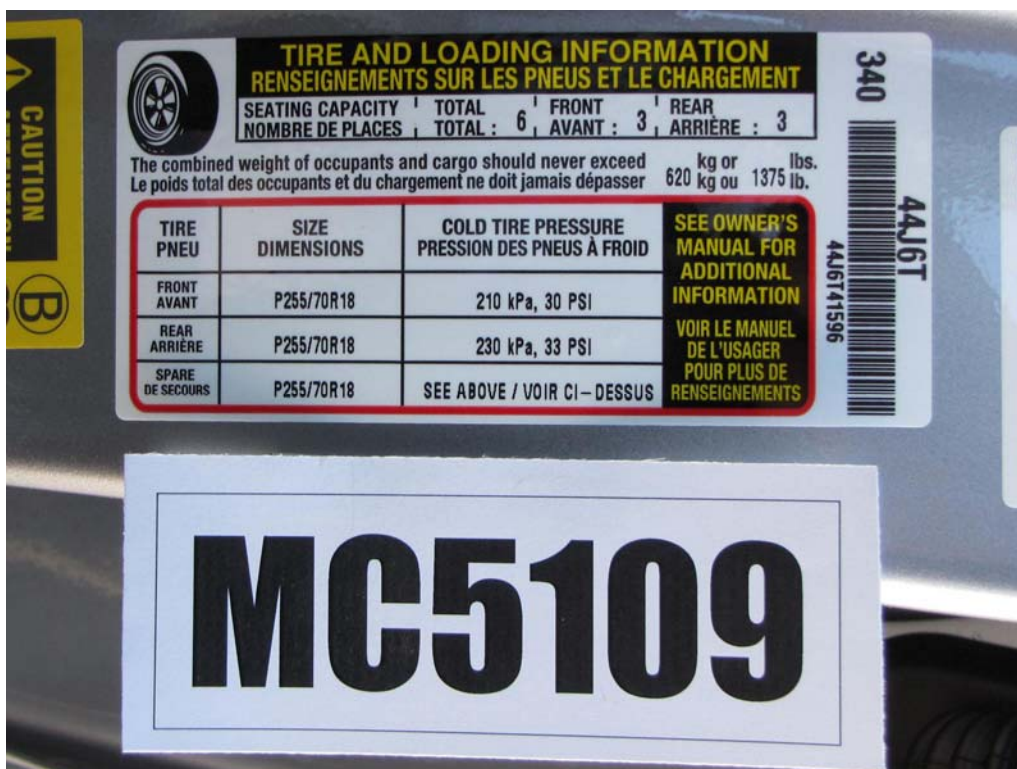


FIGURE 4. Tire Placard



FIGURE 5. 2012 Toyota Tundra 4X4 Crewmax Right Front $\frac{3}{4}$ View, As Delivered



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



FIGURE 7. Pre-Test Front View of Test Vehicle

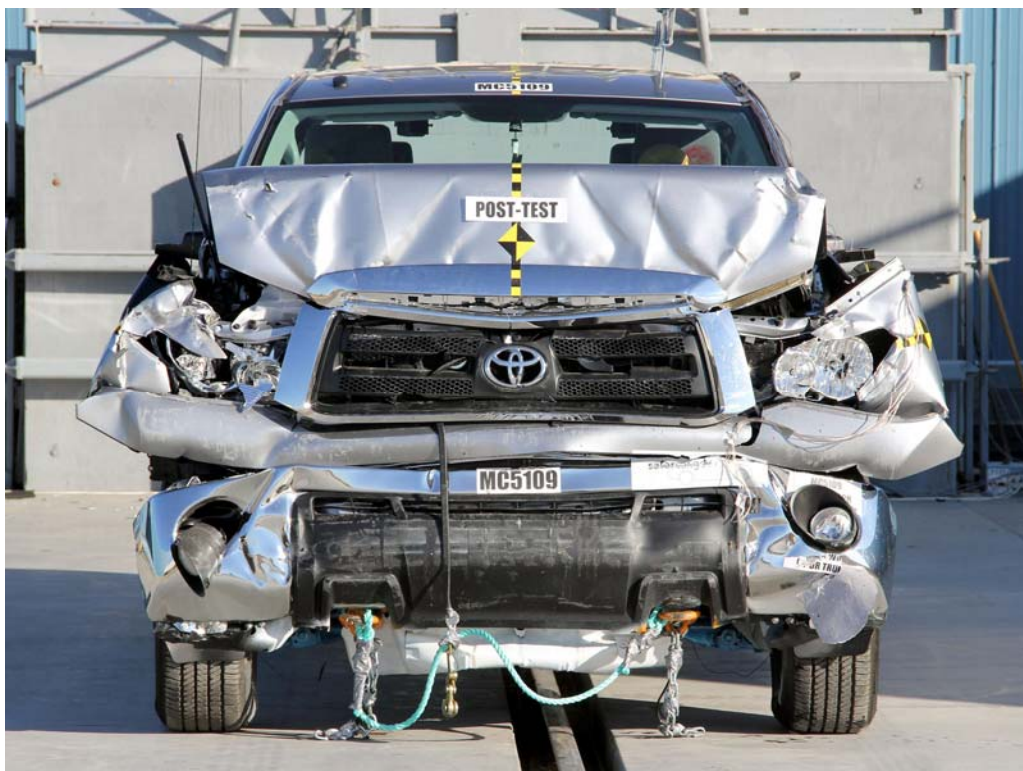


FIGURE 8. Post-Test Front View of Test Vehicle



FIGURE 9. Pre-Test Left View of Test Vehicle



FIGURE 10. Post-Test Left View of Test Vehicle



FIGURE 11. Pre-Test Right View of Test Vehicle



FIGURE 12. Post-Test Right View of Test Vehicle



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

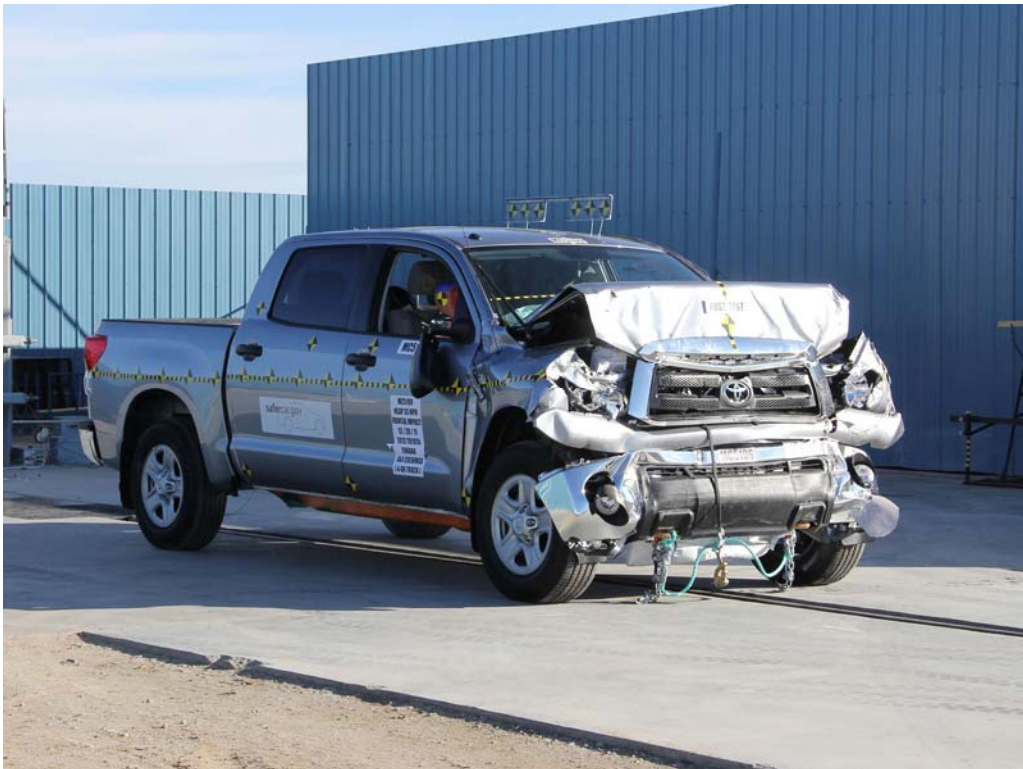


FIGURE 14. Post-Test Right Front $\frac{3}{4}$ View



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



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



FIGURE 17. Pre-Test Windshield View



FIGURE 18. Post-Test Windshield View



FIGURE 19. Pre-Test Engine Compartment View

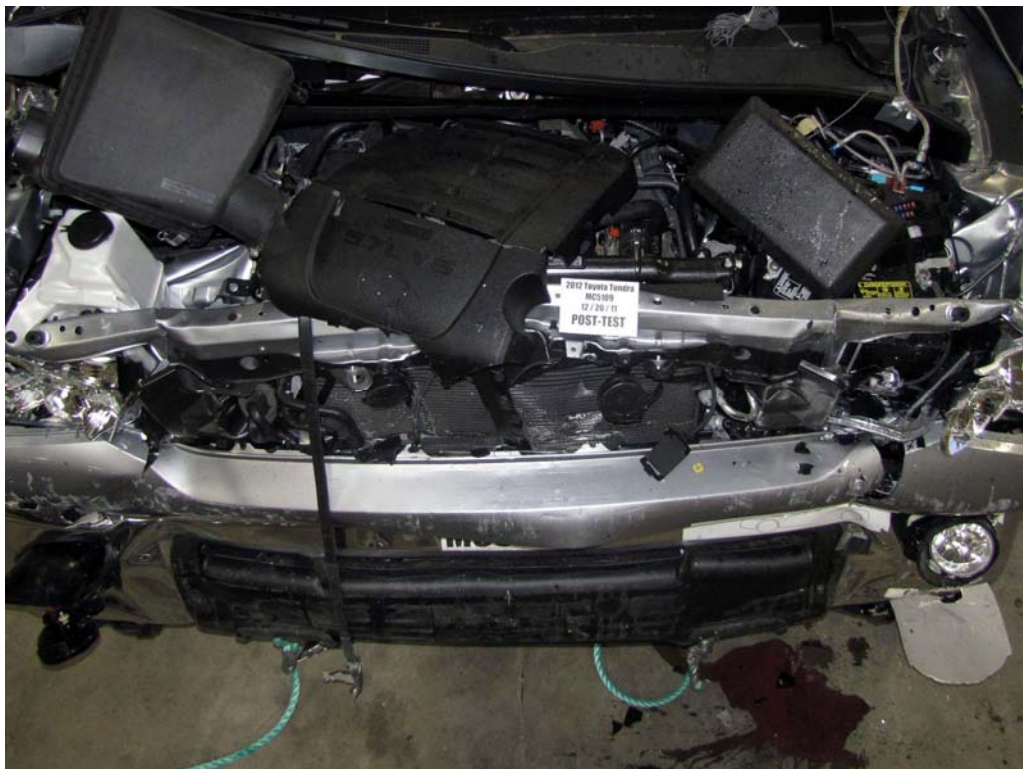


FIGURE 20. Post-Test Engine Compartment View



FIGURE 21. Pre-Test Fuel Filler Cap View



FIGURE 22. Post-Test Fuel Filler Cap View

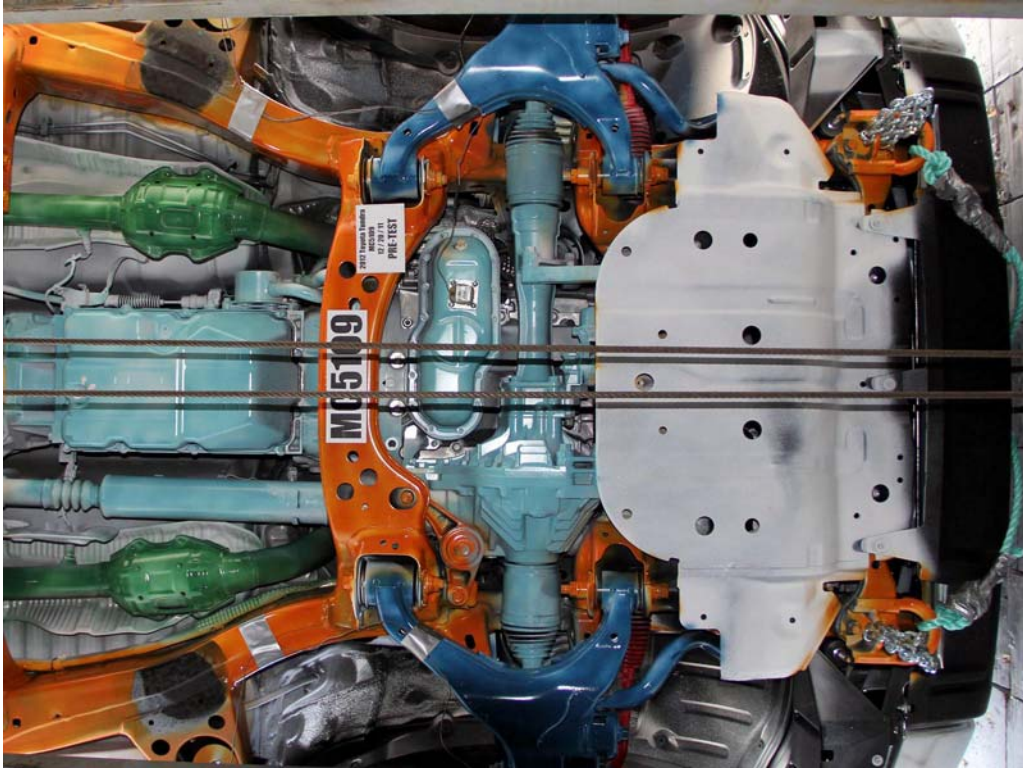


FIGURE 23. Pre-Test Front Underbody View



FIGURE 24. Post-Test Front Underbody View

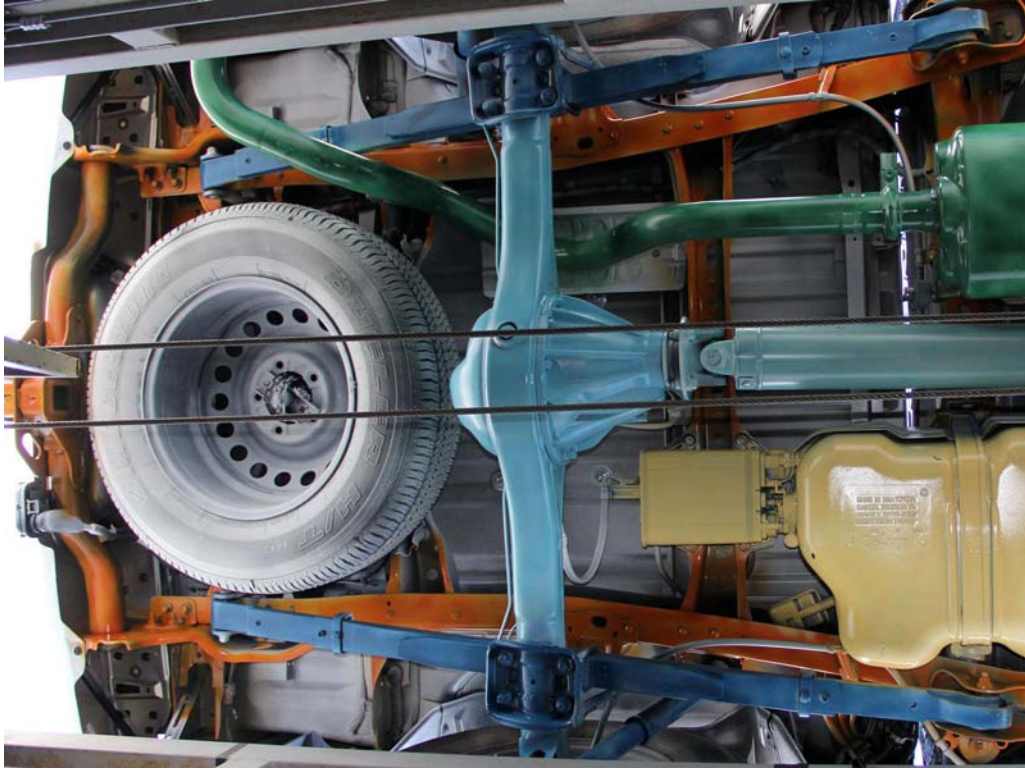


FIGURE 25. Pre-Test Rear Underbody View

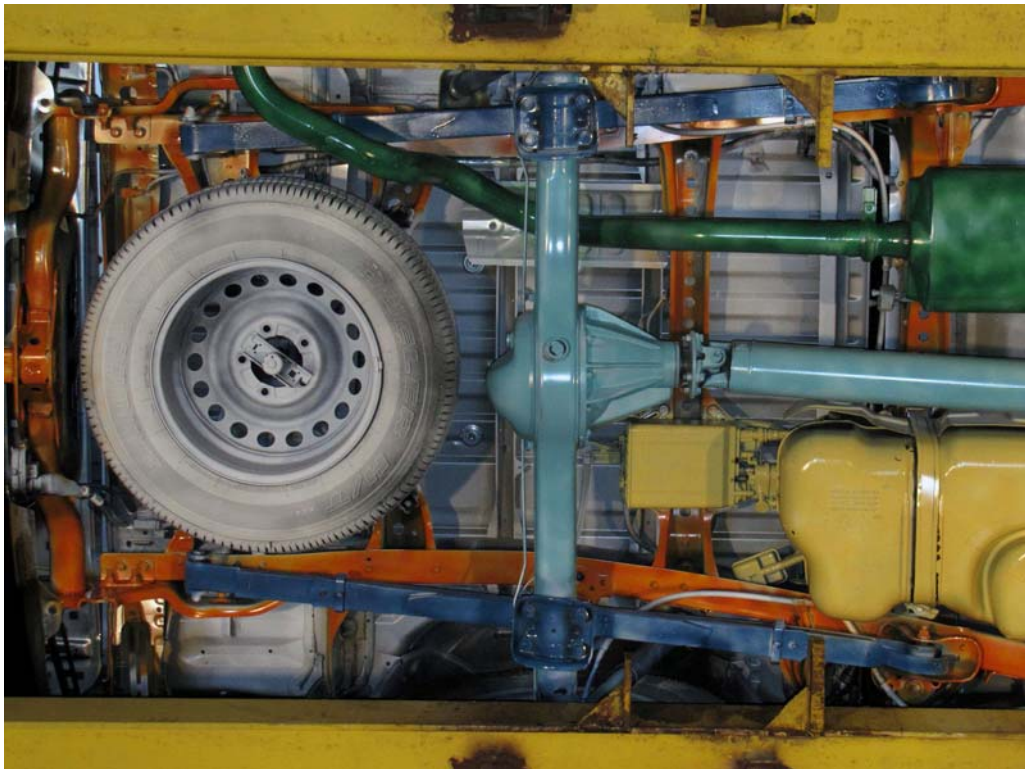


FIGURE 26. Post-Test Rear Underbody View



FIGURE 27. Pre-Test Dummy Cable Routing

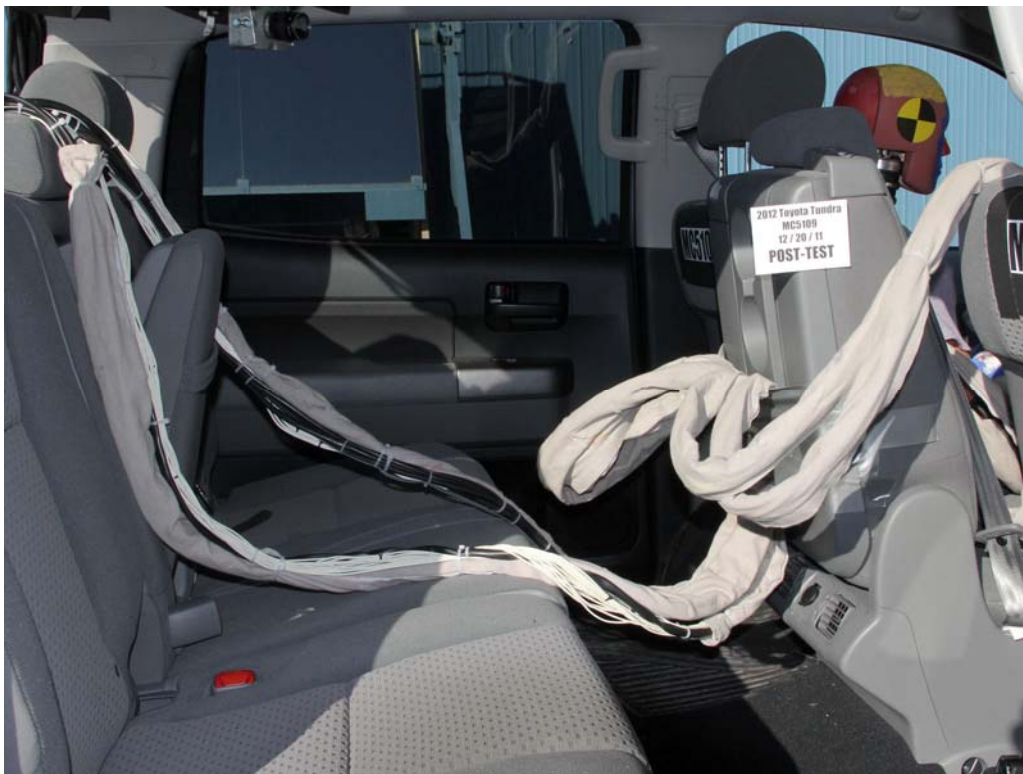


FIGURE 28. Post-Test Dummy Cable Routing



FIGURE 29. Pre-Test Driver Dummy Front View



FIGURE 30. Post-Test Driver Dummy Front View



FIGURE 31. Pre-Test Driver Dummy Window View



FIGURE 32. Post-Test Driver Dummy Window View



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



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



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



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



FIGURE 37. Pre-Test Driver Dummy Feet



FIGURE 38. Post-Test Driver Dummy Feet



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



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



FIGURE 41. Pre-Test Driver's Side Floorpan



FIGURE 42. Post-Test Driver's Side Floorpan



FIGURE 43. Post-Test Driver Dummy Face



FIGURE 44. Post-Test Driver Dummy Contact With Airbag



FIGURE 45. Post-Test Driver Dummy Contact With Headrest



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



FIGURE 46. Pre-Test View Of Steering Wheel



FIGURE 47. Post-Test View Of Steering Wheel



FIGURE 48. Pre-Test Passenger Dummy Front View



FIGURE 49. Post-Test Passenger Dummy Front View



FIGURE 50. Pre-Test Passenger Dummy Window View



FIGURE 51. Post-Test Passenger Dummy Window View



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



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



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



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

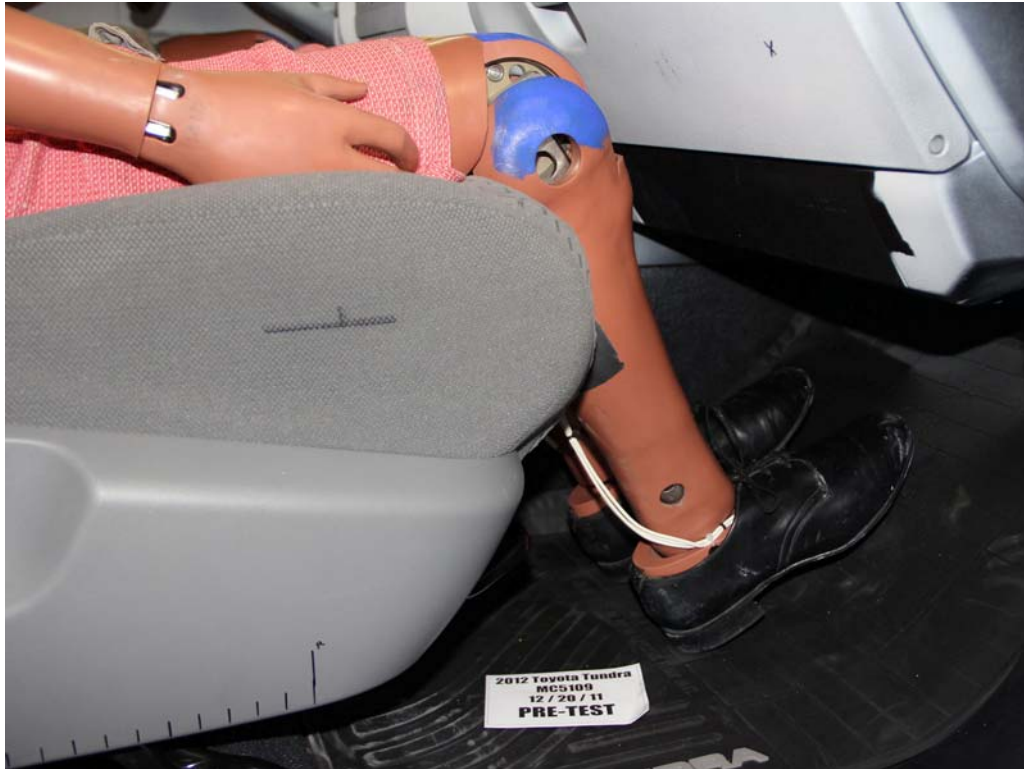


FIGURE 56. Pre-Test Passenger Dummy Feet



FIGURE 57. Post-Test Passenger Dummy Feet



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



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



FIGURE 60. Pre-Test Passenger's Side Floorpan



FIGURE 61. Post-Test Passenger's Side Floorpan

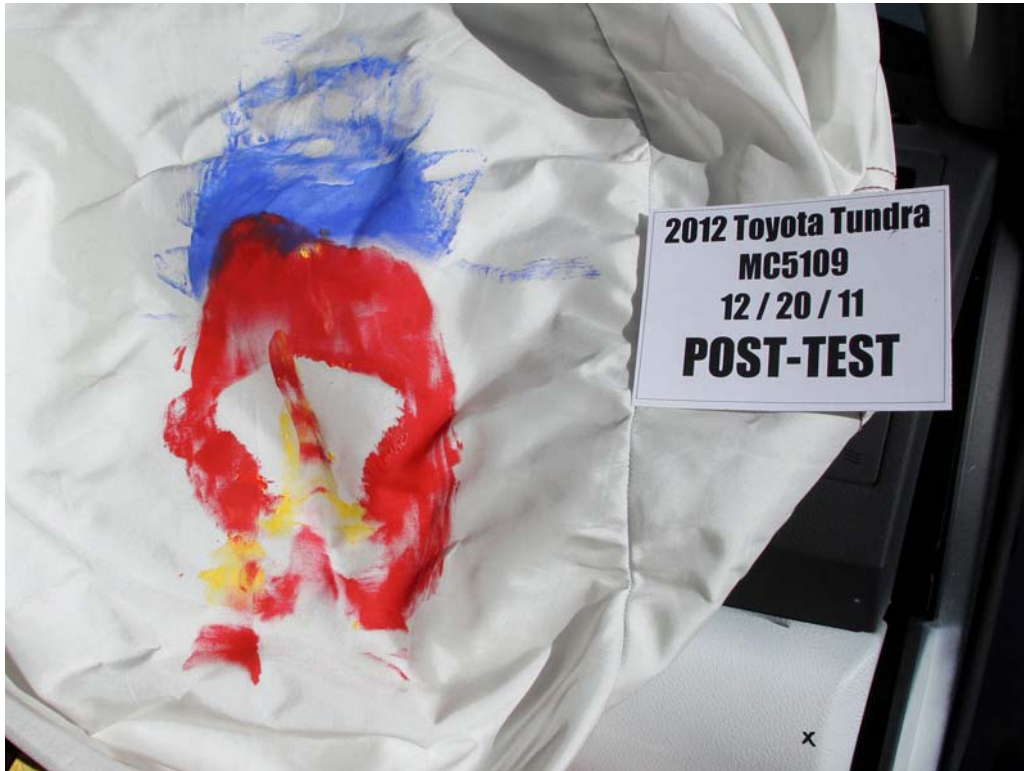


FIGURE 62. Post-Test Passenger Dummy Contact With Airbag



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

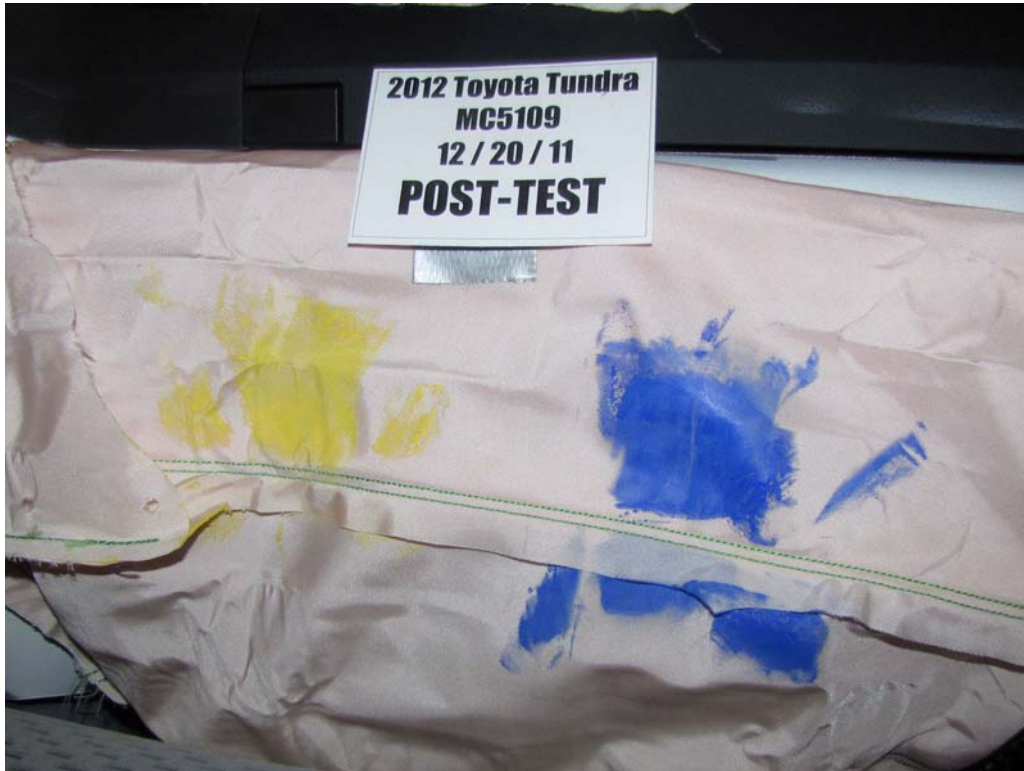


FIGURE 62b. Post-Test Passenger Dummy Contact With Knee Airbag

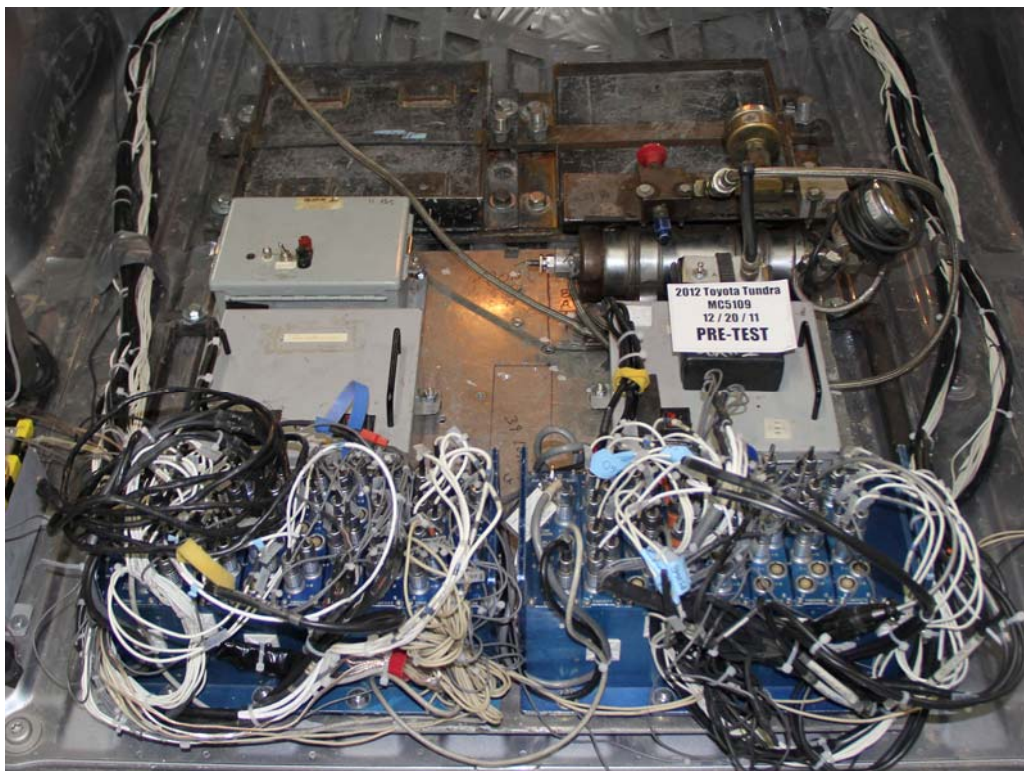


FIGURE 63. Pre-Test of Ballast Installed in Vehicle

Photograph Not Applicable No Stoddard Solvent Spillage

FIGURE 64. Post-Test Stoddard Solvent Spillage Location



FIGURE 65. Post-Test Speed Trap Read Out



FIGURE 66. Vehicle at 0°on Static Rollover Device

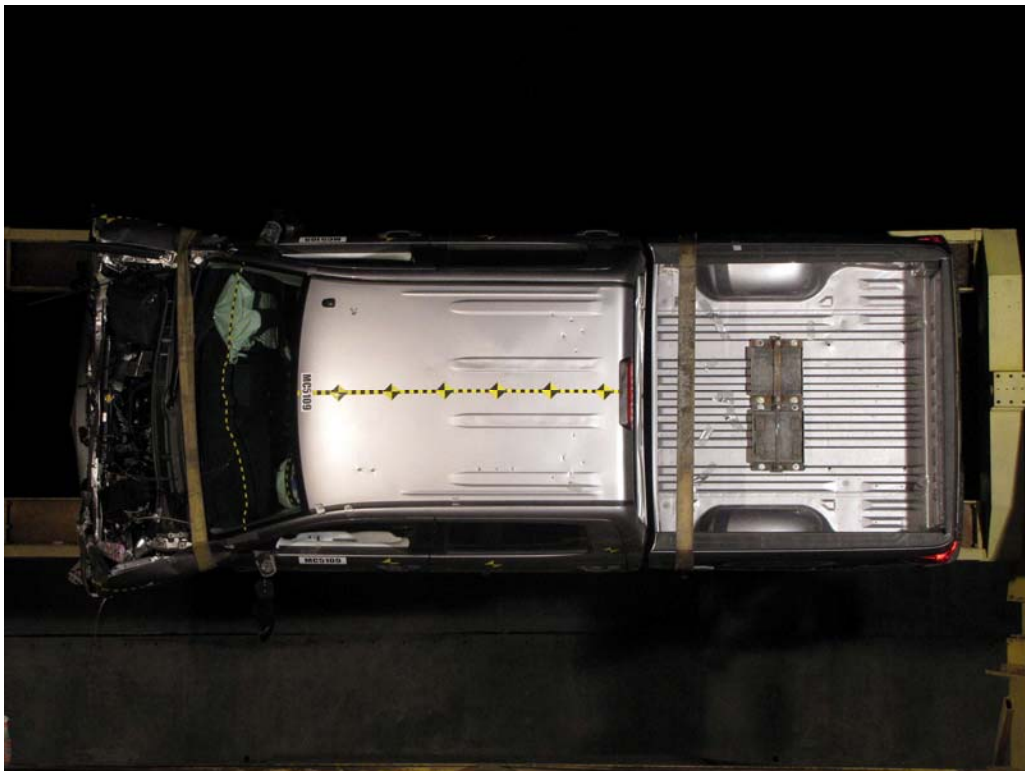


FIGURE 67. Vehicle at 90°on Static Rollover Device

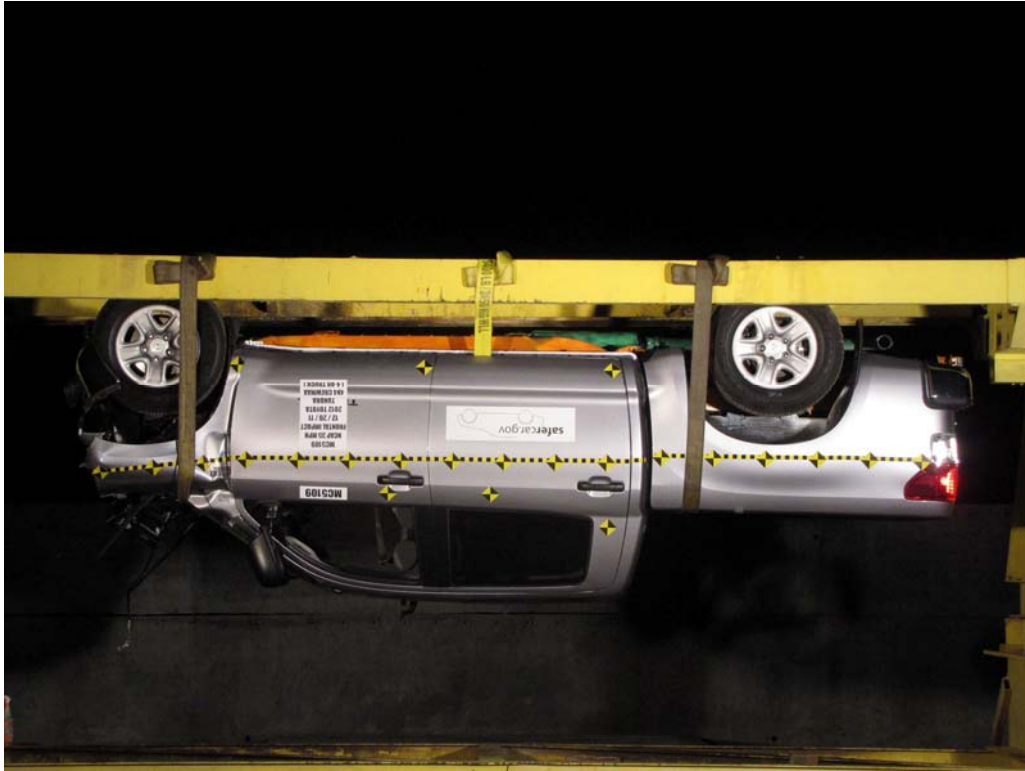


FIGURE 68. Vehicle at 180°on Static Rollover Device

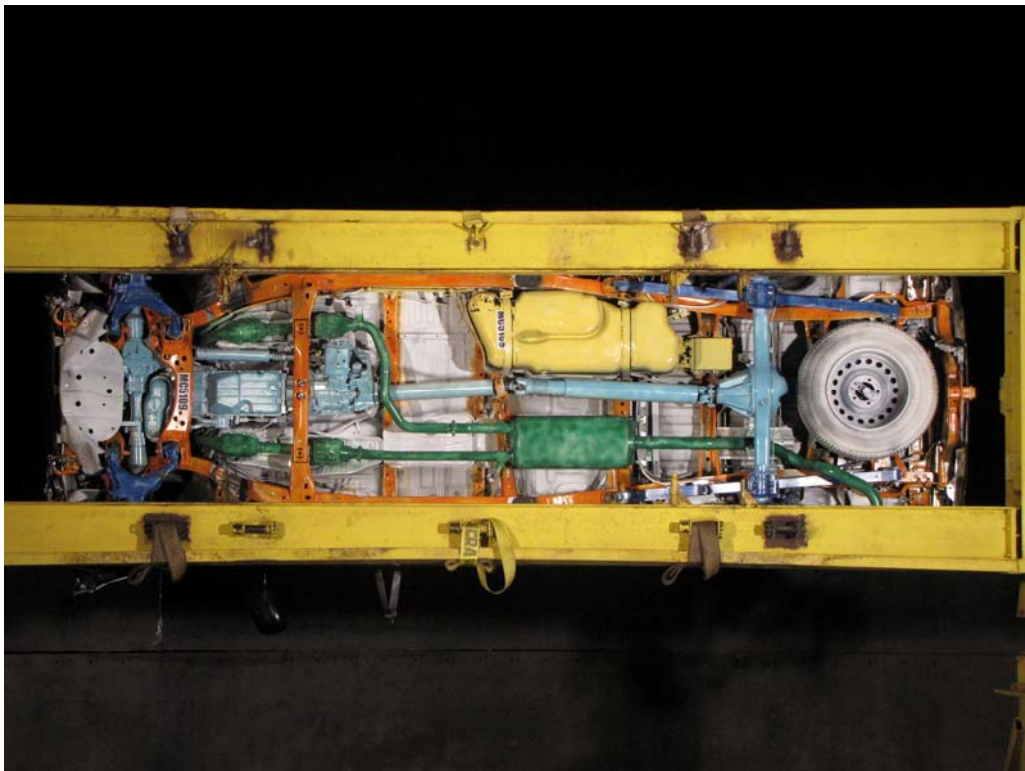


FIGURE 69. Vehicle at 270°on Static Rollover Device



FIGURE 70. Vehicle at 360° on Static Rollover Device



FIGURE 71. 2012 Toyota Tundra 4X4 Crewmax Impact Event

APPENDIX B
DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

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

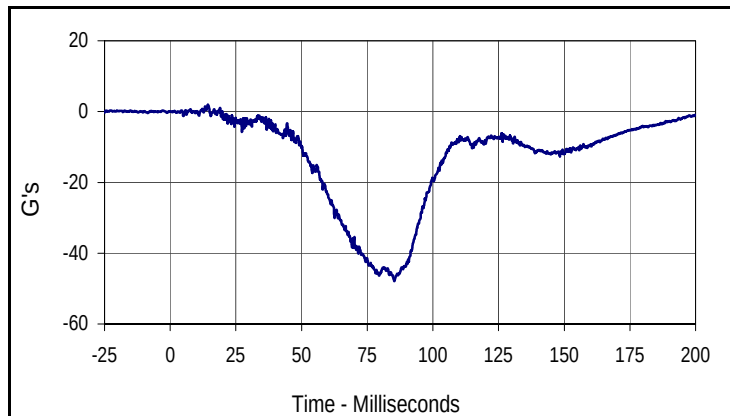
Driver Head X Acceleration Redundant
Driver Head Y Acceleration Redundant
Driver Head Z Acceleration Redundant
Driver Upper Neck Force Y
Driver Upper Neck Moment X
Driver Upper Neck Moment Z
Driver Chest X Acceleration Redundant
Driver Chest Y Acceleration Redundant
Driver Chest Z Acceleration Redundant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

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

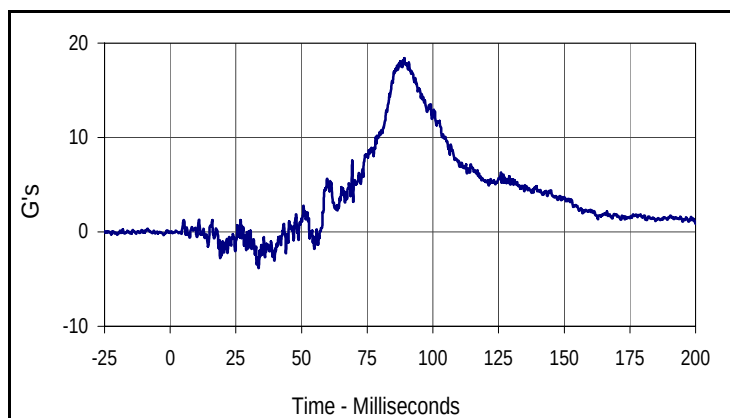
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Right Rear Seat Crossmember X
Right Rear Seat Crossmember Z
Vehicle Engine Top X
Vehicle Engine Bottom X
Vehicle Left Brake Caliper X
Vehicle Right Brake Caliper X
Load Cell Barrier A1-A9
Load Cell Barrier B1-B9
Load Cell Barrier C1-C9
Load Cell Barrier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

Test Vehicle: 2012 Toyota Tundra 4X4 Crewmax 4-Door Truck
 Test Program: 56 km/h Frontal Impact NCAP Test

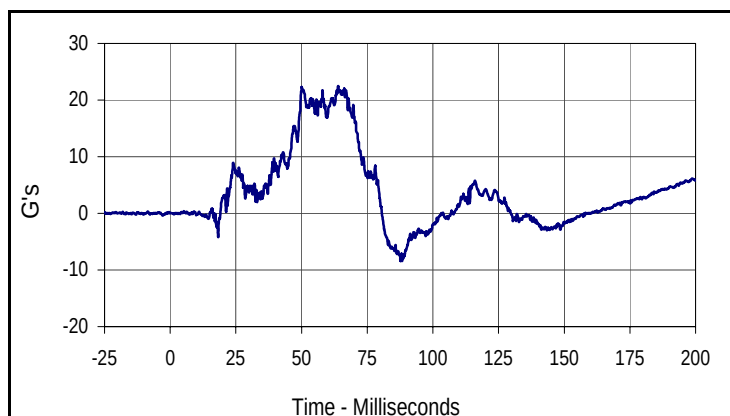
NHTSA No.: MC5109
 Test Date: 12/20/11



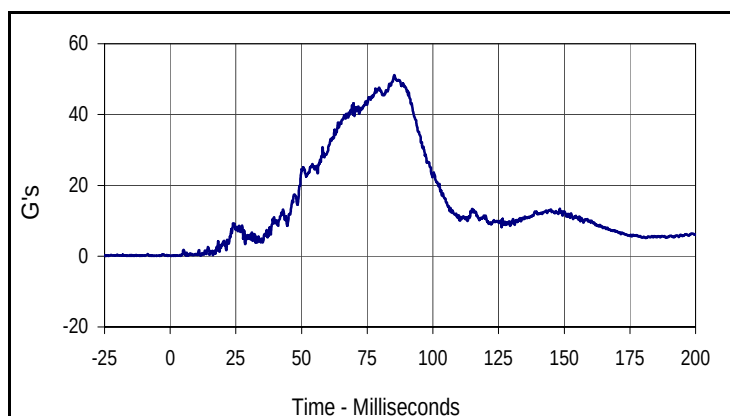
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Driver Head Acceleration X Primary			
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001	FIL	1000	G's
Max	Time	Min	Time
1.9	14.4	-47.9	85.4



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
18.4	89.1	-3.8	33.6



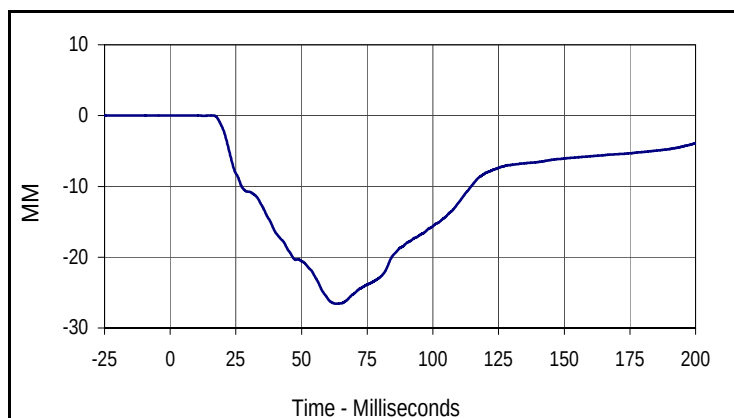
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Plot No.	Type	SAE Class	Units
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Max	Time	Min	Time
22.5	63.9	-8.4	87.7



Curve Description			
Driver Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
51.2	85.4	0.1	0.6

Test Vehicle: 2012 Toyota Tundra 4X4 Crewmax 4-Door Truck
 Test Program: 56 km/h Frontal Impact NCAP Test

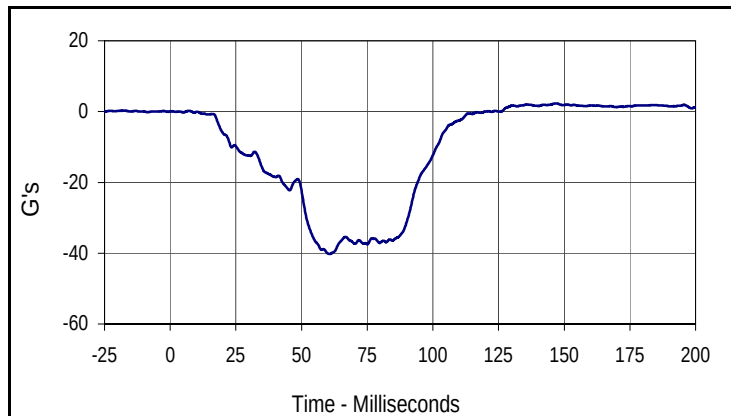
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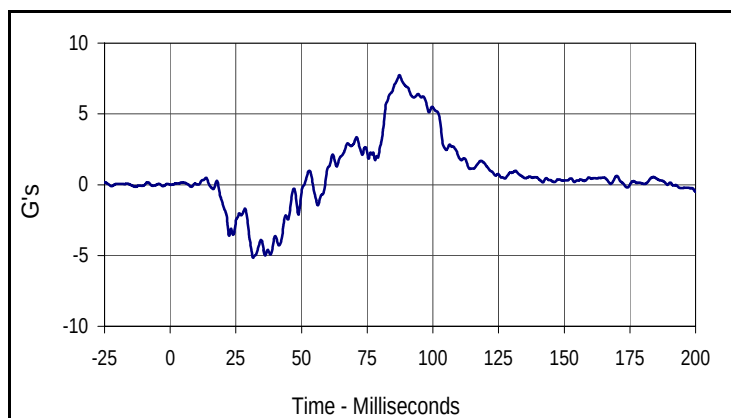
Curve Description			
Driver Chest Deflection			
Plot No.	Type	SAE Class	Units
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Max	Time	Min	Time
0.0	16.3	-26.6	63.2

Test Vehicle: 2012 Toyota Tundra 4X4 Crewmax 4-Door Truck
 Test Program: 56 km/h Frontal Impact NCAP Test

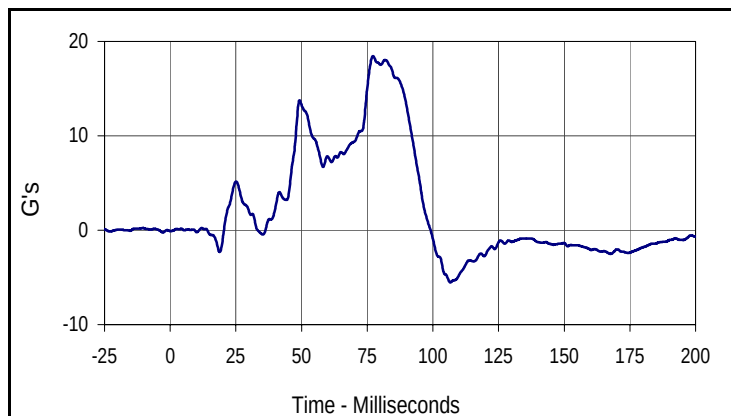
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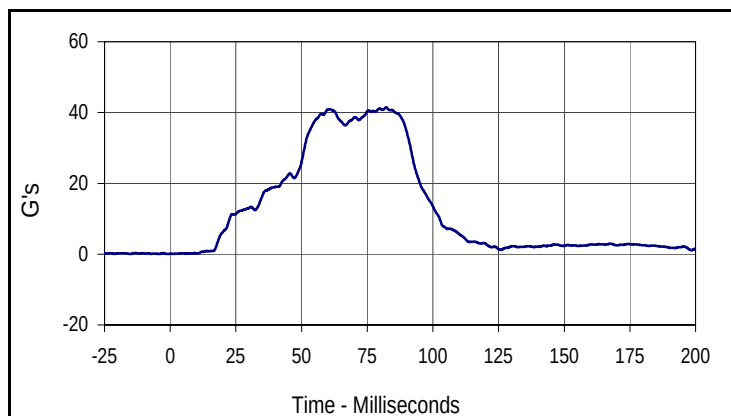
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Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
2.3	146.4	-40.2	60.8



Curve Description			
Driver Chest Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
007	FIL	180	G's
Max	Time	Min	Time
7.7	87.3	-5.2	31.6



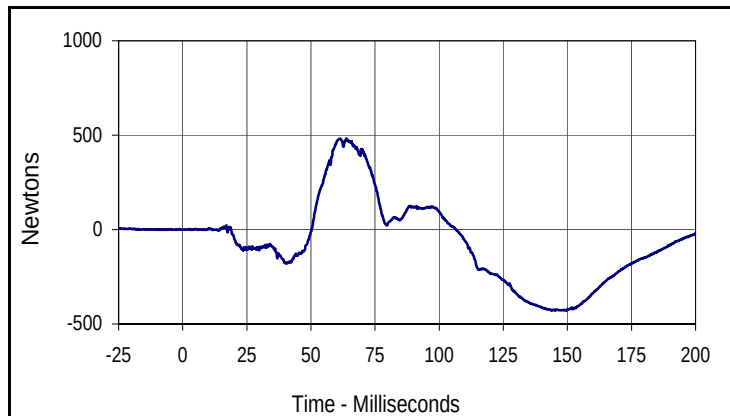
Curve Description			
Driver Chest Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
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Max	Time	Min	Time
18.4	77.2	-5.5	106.6



Curve Description			
Driver Chest Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
009	RES	180	G's
Max	Time	Min	Time
41.5	82.2	0.0	1.4

Test Vehicle: 2012 Toyota Tundra 4X4 Crewmax 4-Door Truck
 Test Program: 56 km/h Frontal Impact NCAP Test

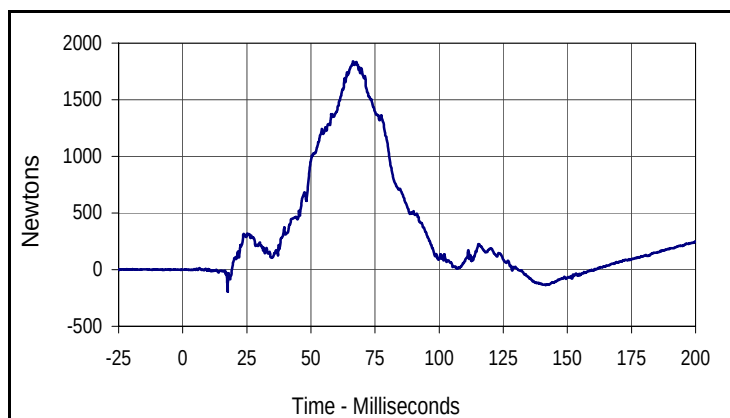
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 Test Date: 12/20/11



Curve Description

Driver Upper Neck Force X

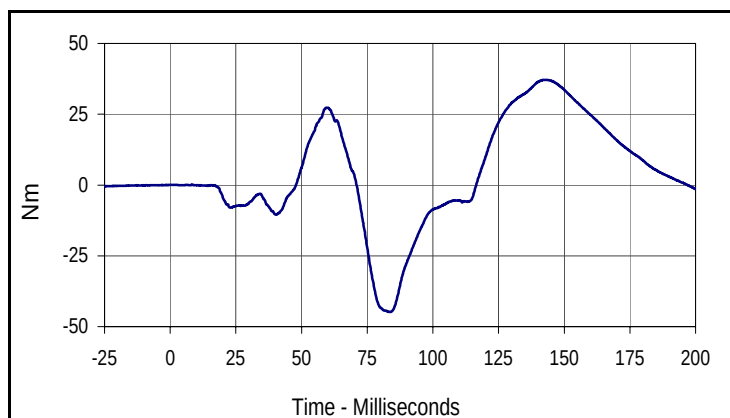
Plot No.	Type	SAE Class	Units
010	FIL	1000	Newtons
Max	Time	Min	Time
482.9	63.8	-429.1	149.3



Curve Description

Driver Upper Neck Force Z

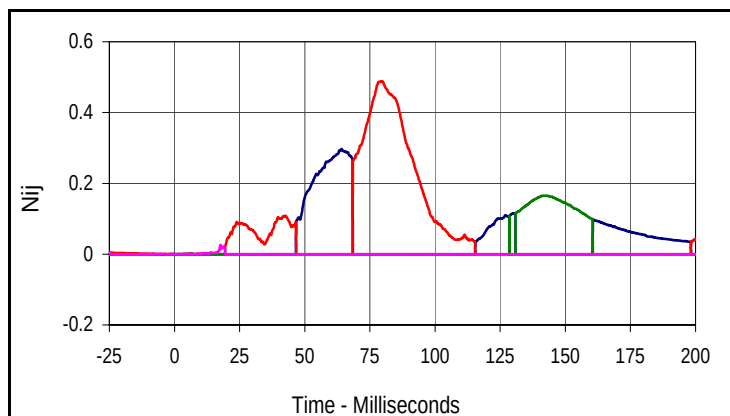
Plot No.	Type	SAE Class	Units
011	FIL	1000	Newtons
Max	Time	Min	Time
1837.9	66.4	-194.7	17.5



Curve Description

Driver Upper Neck Moment Y

Plot No.	Type	SAE Class	Units
012	FIL	600	Nm
Max	Time	Min	Time
37.1	143.3	-44.9	83.6



Curve Description

Driver Nij

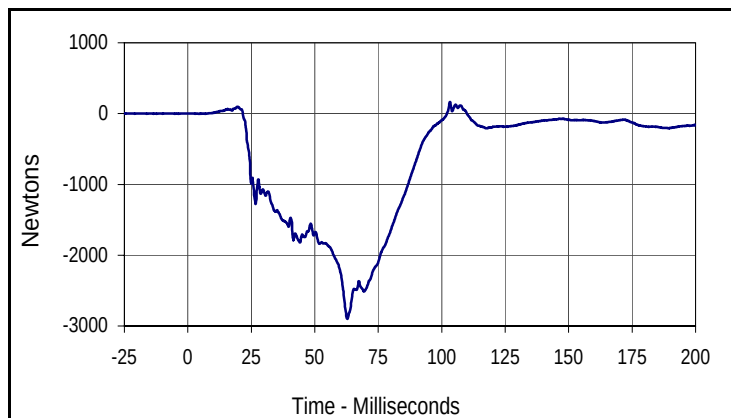
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Units	Type	Max	Time
Nte	FIL	0.49	79.6
Units	Type	Max	Time
Ncf	FIL	0.17	141.8
Units	Type	Max	Time
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Test Vehicle: 2012 Toyota Tundra 4X4 Crewmax 4-Door Truck

NHTSA No.: MC5109

Test Program: 56 km/h Frontal Impact NCAP Test

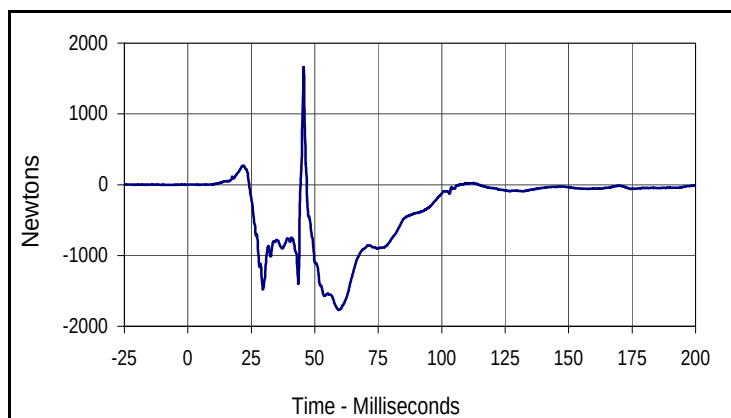
Test Date: 12/20/11



Curve Description

Driver Left Femur Force Z

Plot No.	Type	SAE Class	Units
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Max	Time	Min	Time
165.2	103.2	-2900.1	62.8



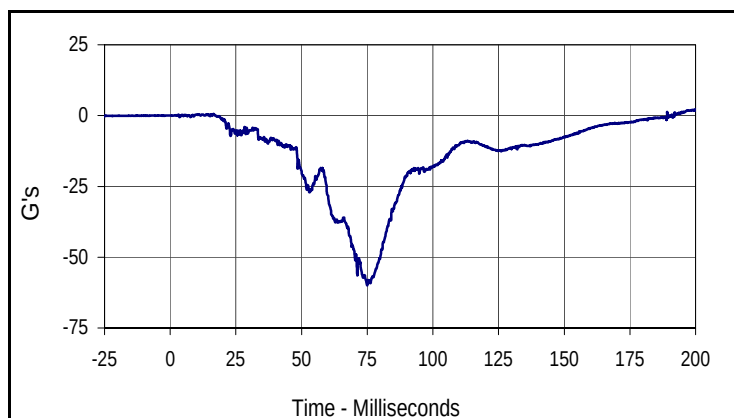
Curve Description

Driver Right Femur Force Z

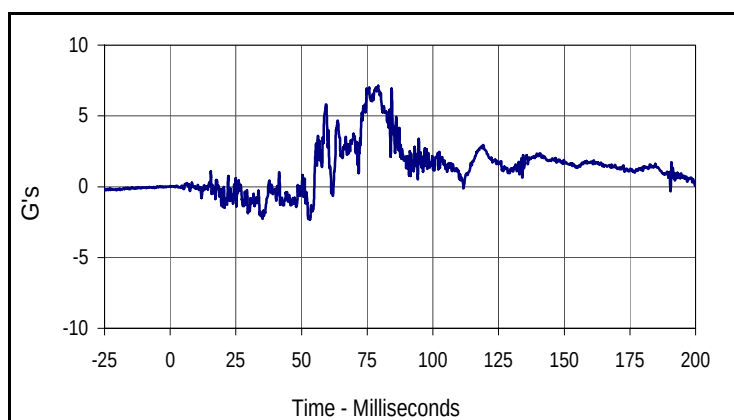
Plot No.	Type	SAE Class	Units
014	FIL	600	Newtons
Max	Time	Min	Time
1662.5	45.6	-1767.8	59.4

Test Vehicle: 2012 Toyota Tundra 4X4 Crewmax 4-Door Truck
 Test Program: 56 km/h Frontal Impact NCAP Test

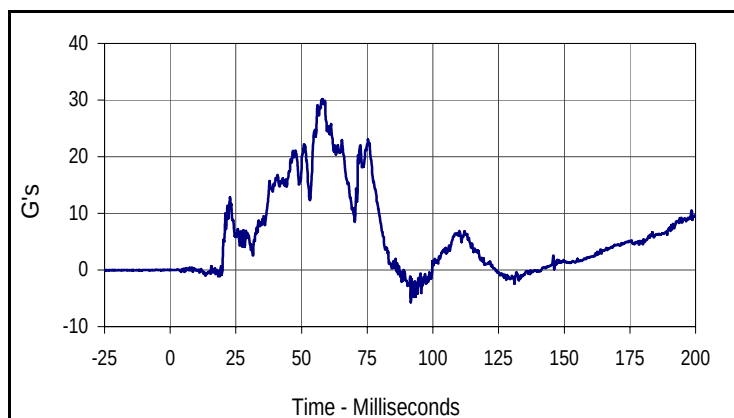
NHTSA No.: MC5109
 Test Date: 12/20/11



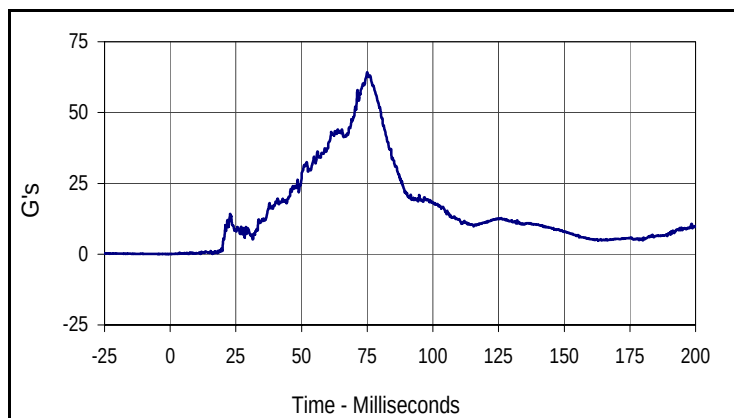
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Passenger Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
015	FIL	1000	G's
Max	Time	Min	Time
2.1	199.9	-59.9	75.0



Curve Description			
Passenger Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
016	FIL	1000	G's
Max	Time	Min	Time
7.1	79.1	-2.3	53.2



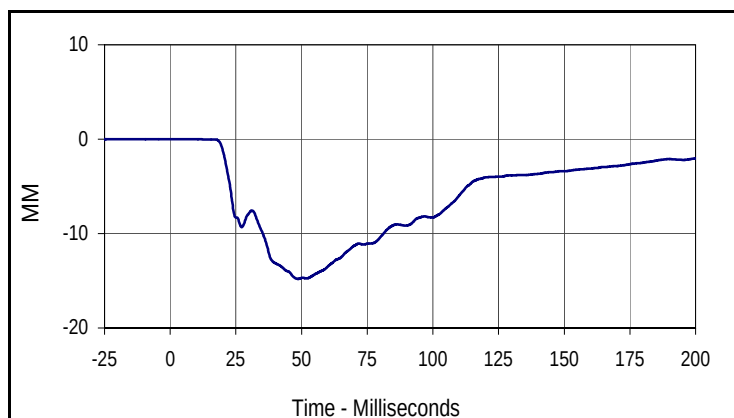
Curve Description			
Passenger Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
017	FIL	1000	G's
Max	Time	Min	Time
30.2	57.9	-5.7	91.6



Curve Description			
Passenger Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
018	RES	1000	G's
Max	Time	Min	Time
64.3	75.0	0.0	0.4

Test Vehicle: 2012 Toyota Tundra 4X4 Crewmax 4-Door Truck
 Test Program: 56 km/h Frontal Impact NCAP Test

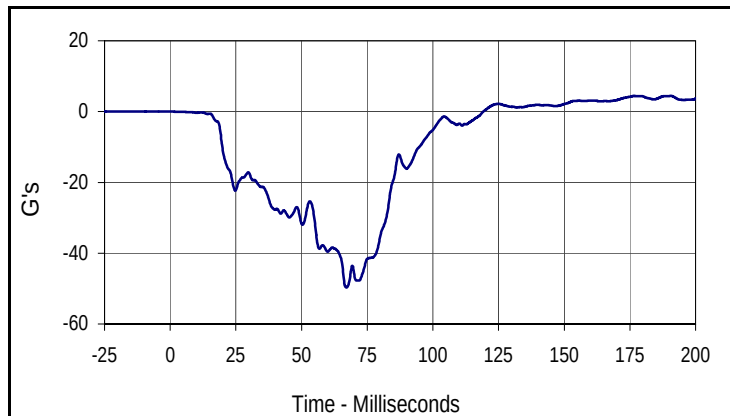
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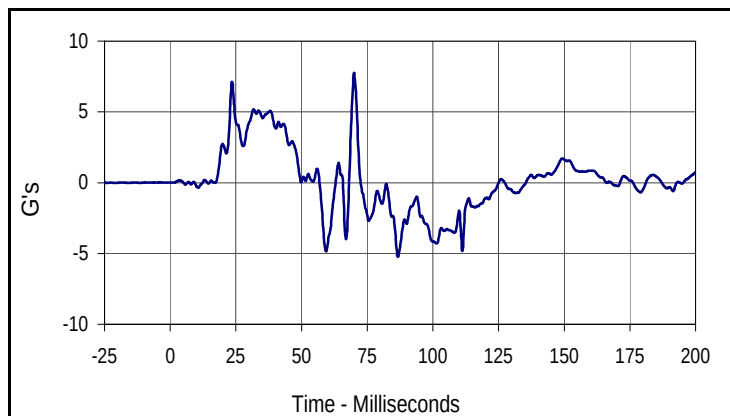
Curve Description			
Passenger Chest Deflection			
Plot No.	Type	SAE Class	Units
019	FIL	180	MM
Max	Time	Min	Time
0.0	5.8	-14.8	48.7

Test Vehicle: 2012 Toyota Tundra 4X4 Crewmax 4-Door Truck
 Test Program: 56 km/h Frontal Impact NCAP Test

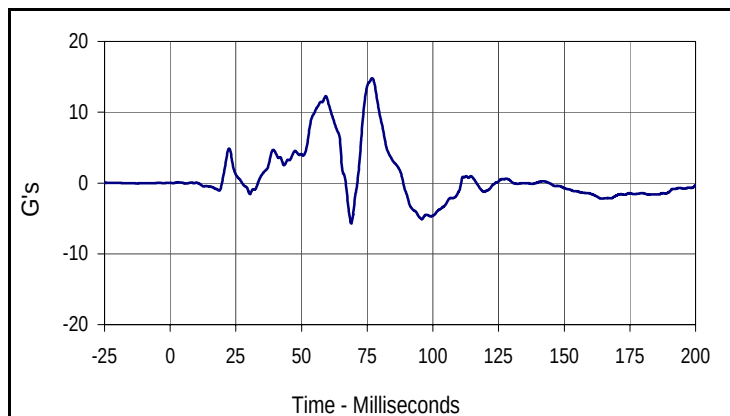
NHTSA No.: MC5109
 Test Date: 12/20/11



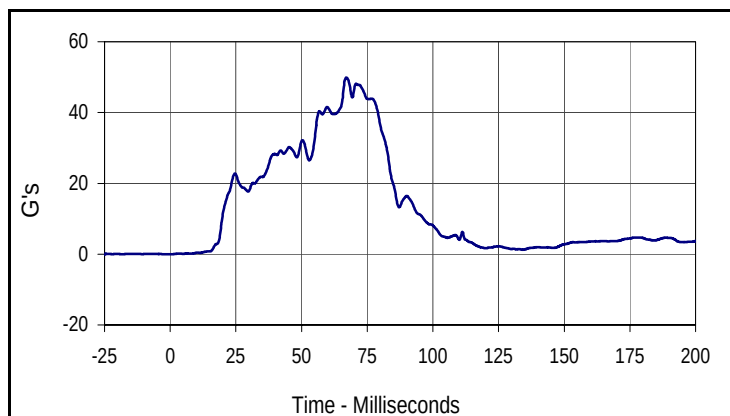
Curve Description			
Passenger Chest Acceleration X Primary			
Plot No.	Type	SAE Class	Units
020	FIL	180	G's
Max	Time	Min	Time
4.4	190.6	-49.7	67.1



Curve Description			
Passenger Chest Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
021	FIL	180	G's
Max	Time	Min	Time
7.8	70.0	-5.2	86.7



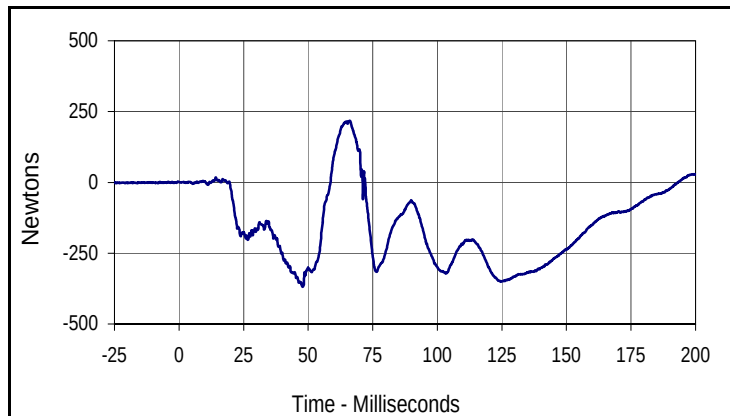
Curve Description			
Passenger Chest Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
022	FIL	180	G's
Max	Time	Min	Time
14.8	76.9	-5.7	68.9



Curve Description			
Passenger Chest Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
023	RES	180	G's
Max	Time	Min	Time
49.8	67.1	0.0	0.3

Test Vehicle: 2012 Toyota Tundra 4X4 Crewmax 4-Door Truck
 Test Program: 56 km/h Frontal Impact NCAP Test

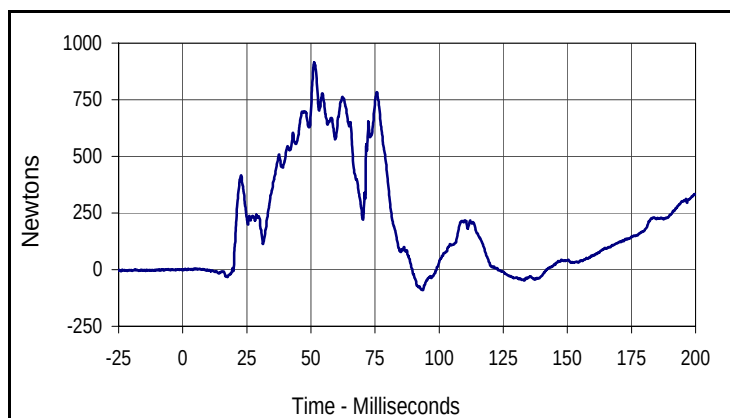
NHTSA No.: MC5109
 Test Date: 12/20/11



Curve Description

Passenger Upper Neck Force X

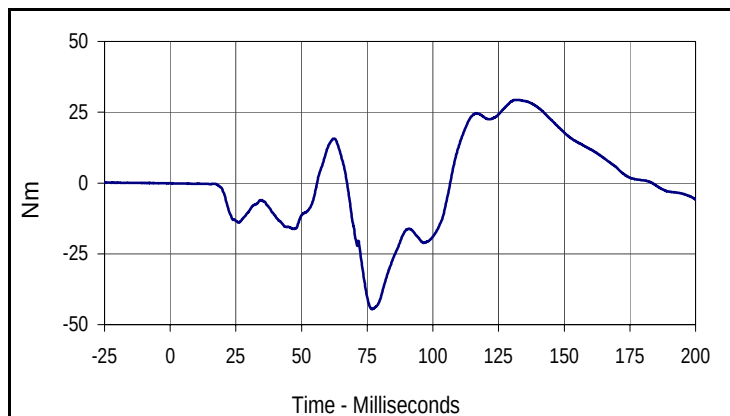
Plot No.	Type	SAE Class	Units
024	FIL	1000	Newtons
Max	Time	Min	Time
217.7	66.2	-368.7	47.9



Curve Description

Passenger Upper Neck Force Z

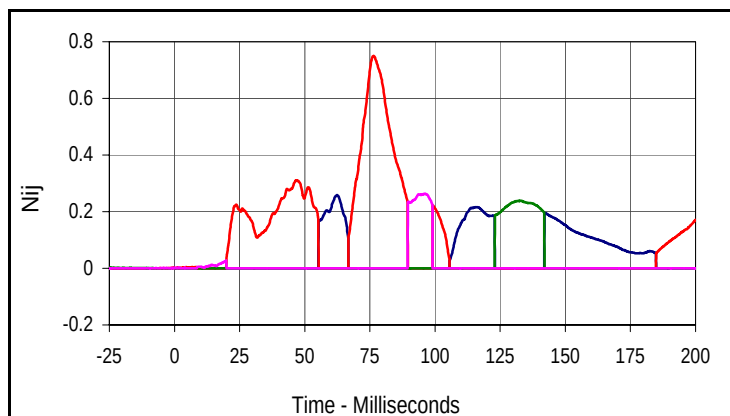
Plot No.	Type	SAE Class	Units
025	FIL	1000	Newtons
Max	Time	Min	Time
914.6	51.2	-90.2	93.7



Curve Description

Passenger Upper Neck Moment Y

Plot No.	Type	SAE Class	Units
026	FIL	600	Nm
Max	Time	Min	Time
29.4	131.8	-44.6	76.8



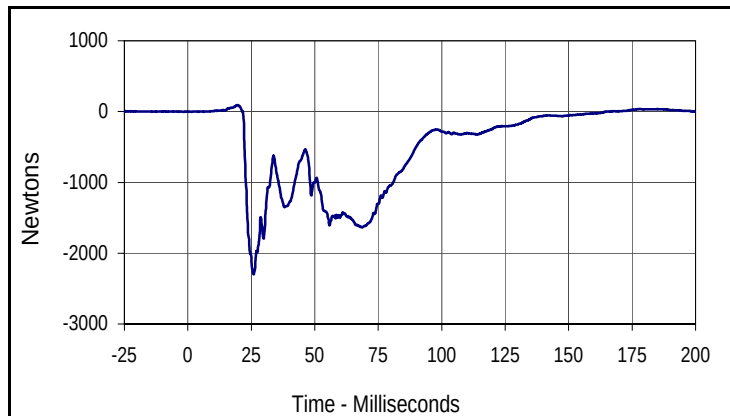
Curve Description

Passenger Nij

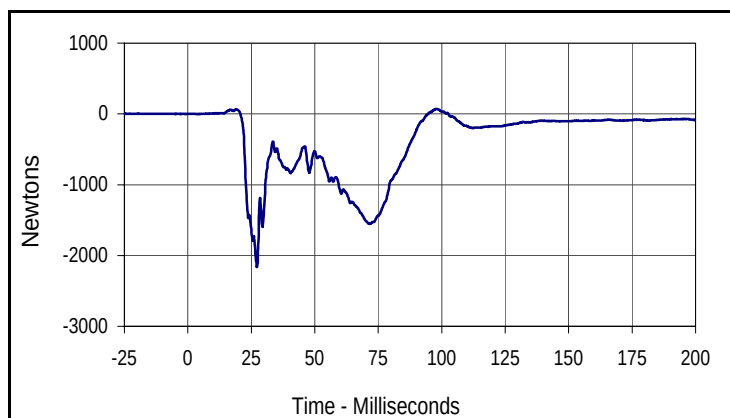
Units	Type	Max	Time
Ntf	FIL	0.26	62.4
Units	Type	Max	Time
Nte	FIL	0.75	76.5
Units	Type	Max	Time
Ncf	FIL	0.24	133.2
Units	Type	Max	Time
Nce	FIL	0.28	237.1

Test Vehicle: 2012 Toyota Tundra 4X4 Crewmax 4-Door Truck
 Test Program: 56 km/h Frontal Impact NCAP Test

NHTSA No.: MC5109
 Test Date: 12/20/11



Curve Description			
Passenger Left Femur Force Z			
Plot No.	Type	SAE Class	Units
027	FIL	600	Newtons
Max	Time	Min	Time
92.3	19.6	-2301.0	25.9



Curve Description			
Passenger Right Femur Force Z			
Plot No.	Type	SAE Class	Units
028	FIL	600	Newtons
Max	Time	Min	Time
70.0	97.8	-2164.0	27.2

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: 12/8/11

ATD Serial No.: 034

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: 12/8/11

ATD Serial No.: 034

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.14	Pass
Laboratory Relative Humidity	%	10 to 70	31.8	Pass
A - Total sitting height	mm	879 to 889	881	Pass
B - Shoulder pivot height	mm	505 to 521	514	Pass
C - H point height	mm	84 to 89	88	Pass
D - H point location from backline	mm	135 to 140	136	Pass
E - Shoulder pivot from backline	mm	84 to 94	86	Pass
F - Thigh clearance	mm	140 to 155	149	Pass
G - Back of elbow to wrist pivot	mm	290 to 305	299	Pass
H - Head back to backline	mm	41 to 46	44	Pass
I - Shoulder to elbow length	mm	330 to 345	334	Pass
J - Elbow rest height	mm	190 to 211	206	Pass
K - Buttock to knee length	mm	579 to 604	589	Pass
L - Popliteal length	mm	429 to 455	437	Pass
M - Knee pivot height	mm	485 to 500	487	Pass
N - Buttock popliteal length	mm	452 to 477	472	Pass
O - Chest depth without jacket	mm	213 to 229	226	Pass
P - Foot length	mm	251 to 267	260	Pass
V - Shoulder breadth	mm	422 to 437	434	Pass
W - Foot breadth	mm	91 to 107	99	Pass
Y - Chest circumference (with chest jacket)	mm	970 to 1001	986	Pass
Z - Waist circumference	mm	836 to 866	864	Pass
AA - Location for chest circumference	mm	429 to 434	431	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
Overall Test Results			Pass	

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

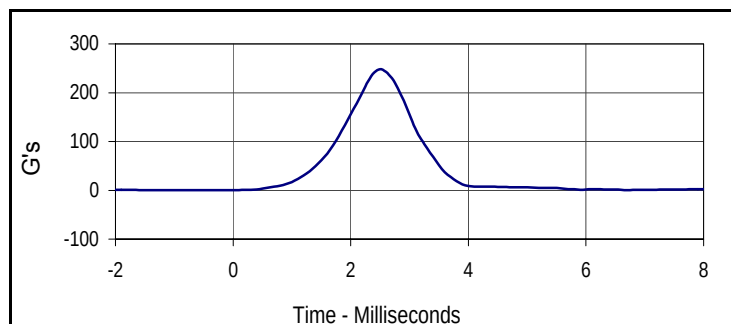
Test Date: 12/8/11

ATD Serial No.: 034

Test I.D.: M034HD023



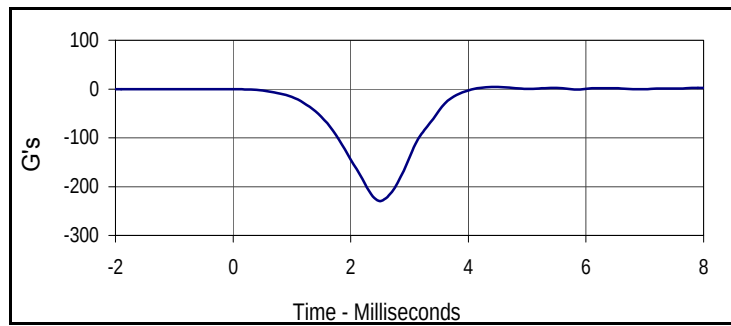
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	247	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.6	Pass
Peak Resultant Acceleration		G's	225.0 to 275.0	248.2	Pass
Peak Lateral Acceleration		G's	≤15.0	3.1	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	3.5	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Overall Test Results				Pass	



Curve Description

Head Resultant

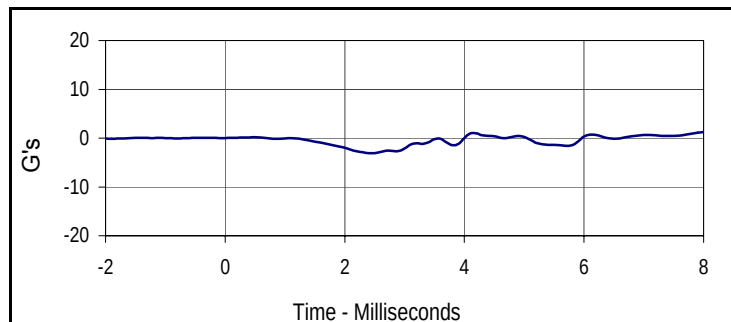
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
248.2	2.5	0.5	-0.6



Curve Description

Head X

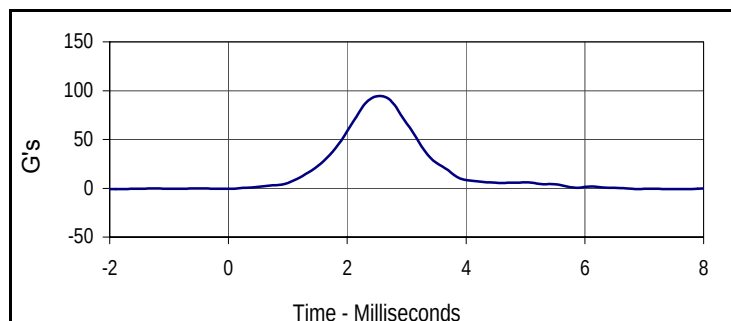
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
4.1	4.5	-229.6	2.5



Curve Description

Head Y

Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
1.0	4.1	-3.1	2.5



Curve Description

Head Z

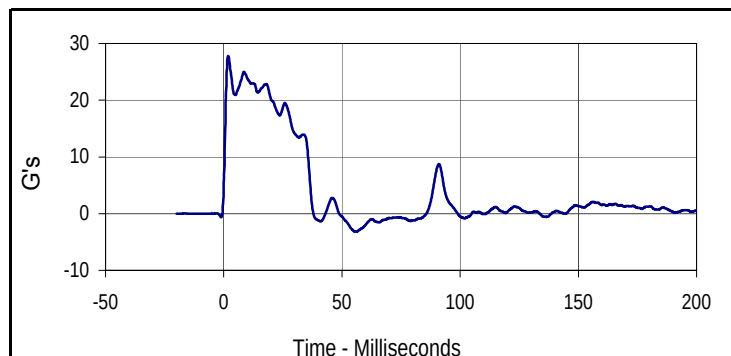
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
94.4	2.5	-0.9	-1.8

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 ATD Serial No.: 034

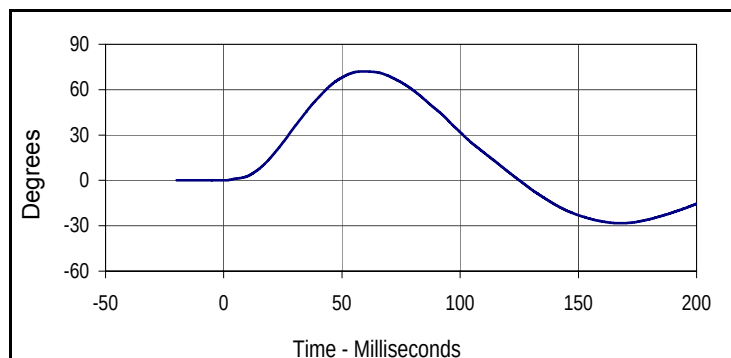
Test Date: 12/8/11
 Test I.D.: M034NF023



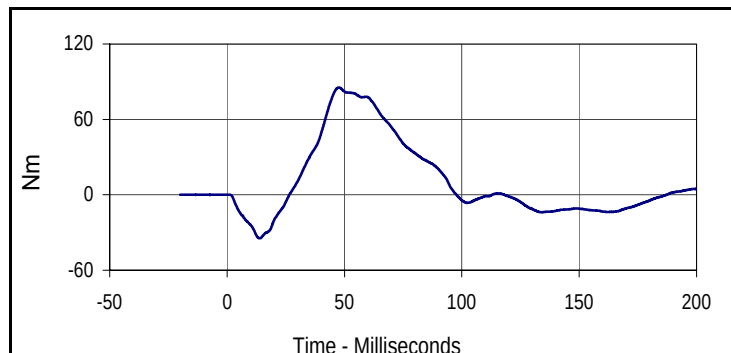
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	292	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	32.6	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.10	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.8	Pass
	20 Msec.	G's	17.6 to 22.6	20.1	Pass
	30 Msec.	G's	12.5 to 18.5	14.1	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	14.1	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	36.6	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	72.0	Pass
	Time	Msec.	57.0 to 64.0	59.0	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	125.1	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	85.3	Pass
	Time	Msec.	47.0 to 58.0	47.5	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
27.8	1.9	-3.2	56.1



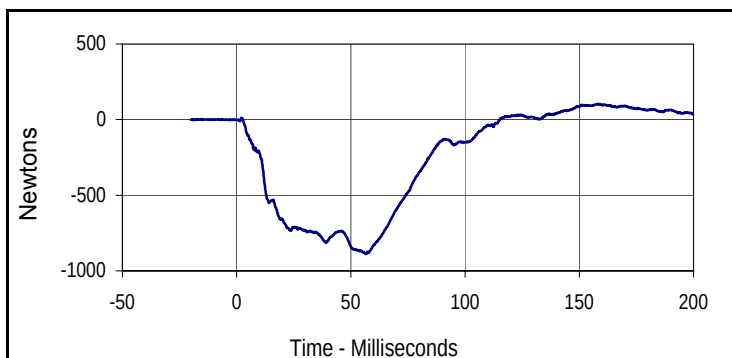
Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
72.0	59.0	-28.3	167.7



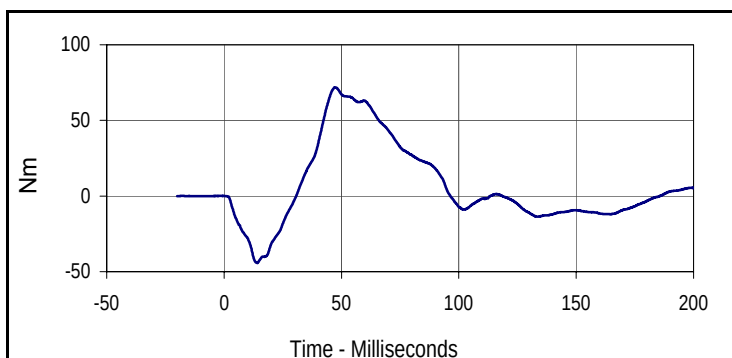
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
85.3	47.5	-34.5	13.6

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 ATD Serial No.: 034

Test Date: 12/8/11
 Test I.D.: M034NF023



Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
103.4	158.2	-887.1	56.6



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
71.8	47.3	-44.3	14.2

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

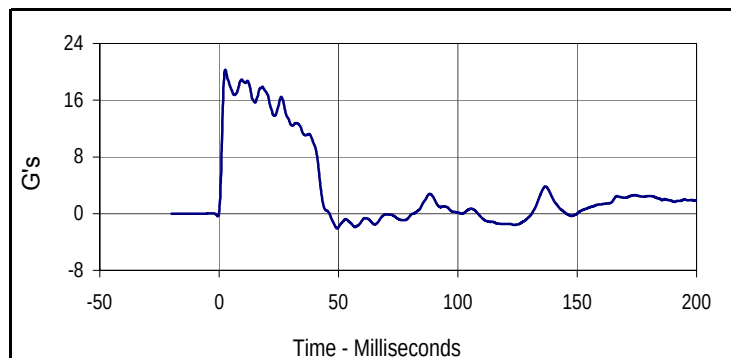
Test Date: 12/8/11

ATD Serial No.: 034

Test I.D.: M034NE023



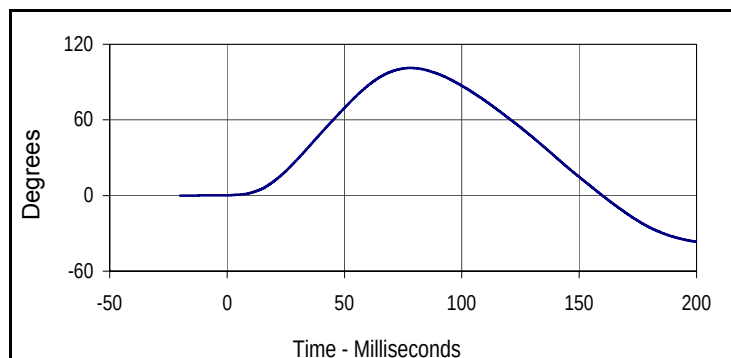
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	312	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.5	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.07	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.7	Pass
	20 Msec.	G's	14.0 to 19.0	16.9	Pass
	30 Msec.	G's	11.0 to 16.0	12.5	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	12.8	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	42.1	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	101.2	Pass
	Time	Msec.	72.0 to 82.0	78.0	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	159.9	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to -79.9	-68.1	Pass
	Time	Msec.	65.0 to 79.0	72.4	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	140.9	Pass
Overall Test Results					Pass



Curve Description

Pendulum Deceleration

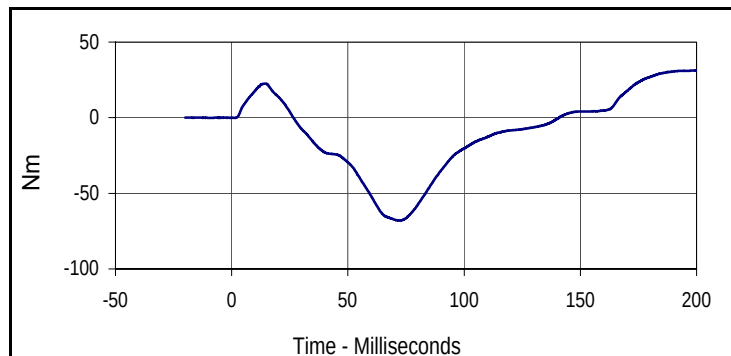
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
20.3	2.6	-2.1	49.4



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
101.2	78.0	-36.7	200.0



Curve Description

Moment About Occipital Condyle

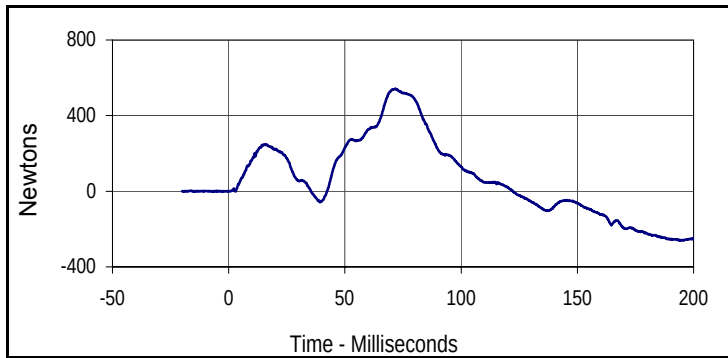
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
31.2	198.7	-68.1	72.4

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

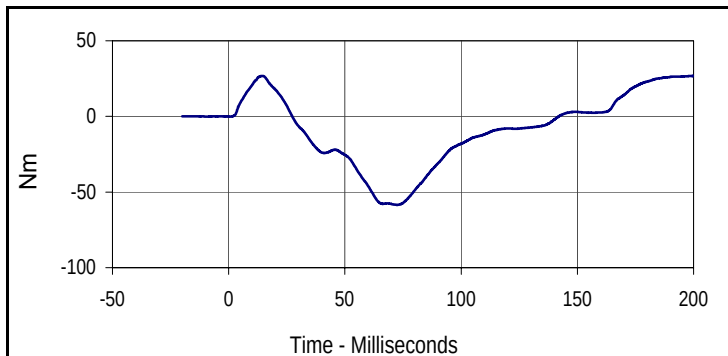
Test Date: 12/8/11

ATD Serial No.: 034

Test I.D.: M034NE023



Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
542.1	71.6	-260.8	195.8



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
26.8	14.2	-58.5	72.4

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

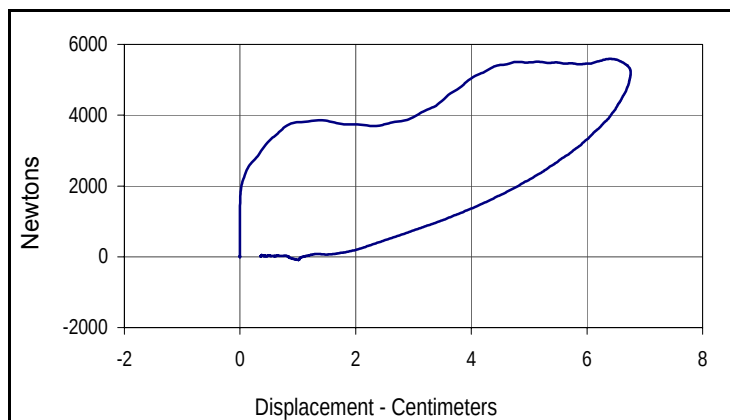
Test Date: 12/8/11

ATD Serial No.: 034

Test I.D.: M034CH023



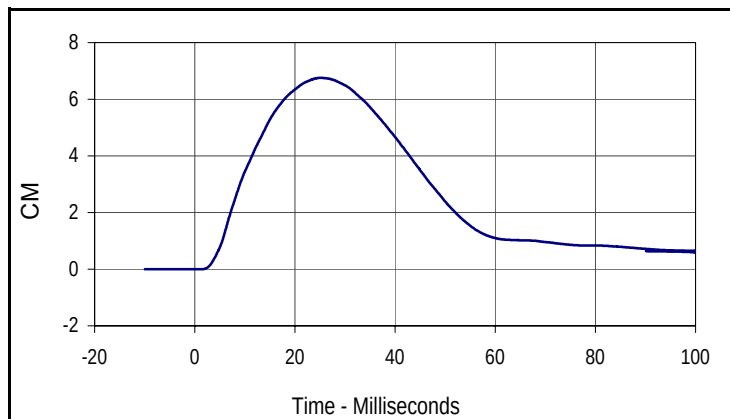
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	352	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	32.4	Pass
Probe Velocity		m/s	6.58 to 6.82	6.60	Pass
Peak Probe Force		Newtons	5159 to 5893	5589	Pass
Peak Sternum Deflection		CM	6.35 to 7.26	6.76	Pass
Internal Hysteresis		%	69 to 85	69.9	Pass
Overall Test Results				Pass	



Curve Description

Probe Force vs. Chest Deflection

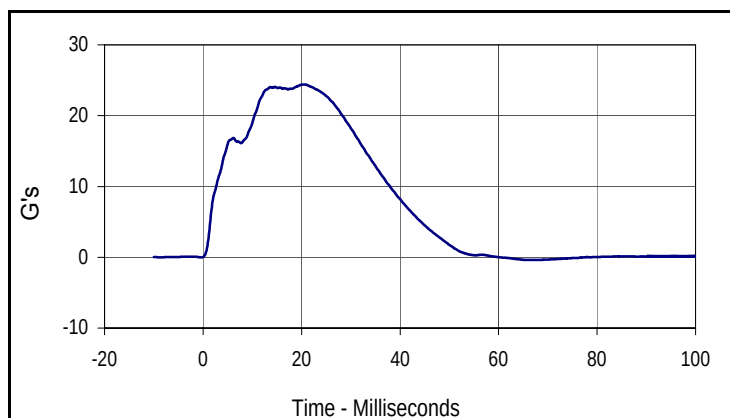
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	69.9
Peak Probe Force		Peak Chest Deflection	
5589		6.76	



Curve Description

Chest Deflection

Plot No.	Type	SAE Class	Units
002	FIL	180	CM
Max	Time	Min	Time
6.8	25.1	0.0	1.2



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
24.4	20.4	-0.4	67.0

Test Program: Hybrid III 50th Percentile Male Knee Impact Test
 ATD Serial No.: 034

Test Date: 12/8/11
 Test I.D.: M034LK023, M034RK023

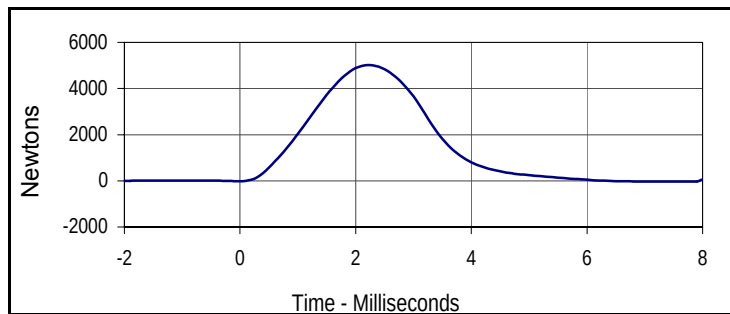


Left Knee

Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	300	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.6	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	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	31.4	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force		Newtons	4715 to 5782	5017	Pass
Overall Test Results				Pass	

Right Knee

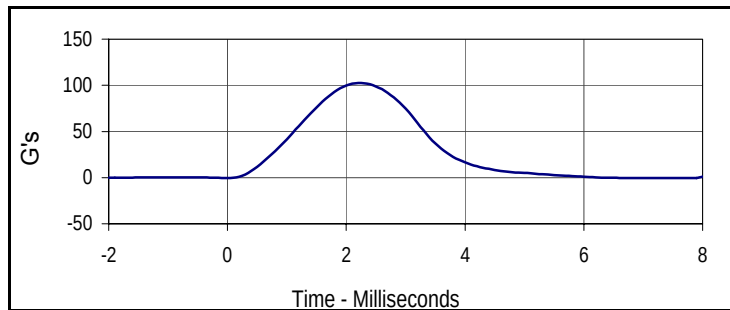
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.08	Pass
Peak Probe Force		Newtons	4715 to 5782	4995	Pass
Overall Test Results				Pass	



Curve Description

Left Knee Probe Force

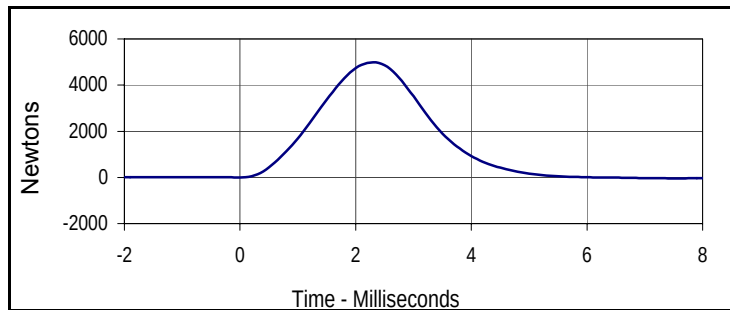
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5017.4	2.2	-27.4	7.4



Curve Description

Left Knee Acceleration

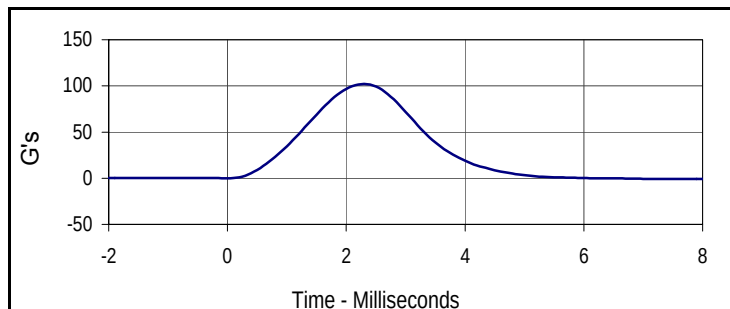
Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
102.5	2.2	-0.6	7.4



Curve Description

Right Knee Probe Force

Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
4994.6	2.3	-39.8	7.5



Curve Description

Right Knee Acceleration

Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
102.1	2.3	-0.8	7.5

Test Program: Hybrid III 50th Percentile Male Hip Joint-Femur Flexion Test
 ATD Serial No.: 034

Test Date: 12/8/11
 Test I.D.: M034LF023, M034RF023

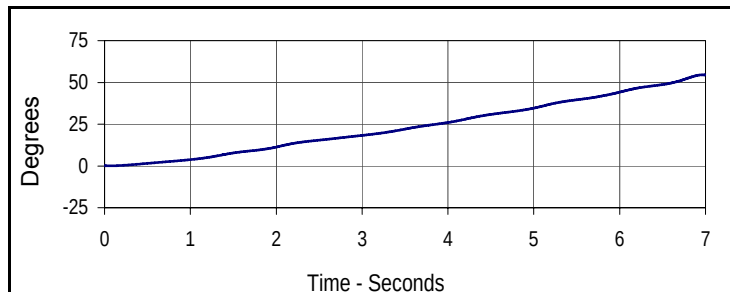


Left Hip Joint-Femur Results

Tested Parameter	Units	Specification	Result	Pass/Fail
Hip Joint-Femur Assembly Soak Time	Minutes	≥240	420	Pass
Temperature During Soak	Max	18.9 to 25.6	21.7	Pass
	Min		20.7	Pass
Humidity During Soak	Max	10.0 to 70.0	40.0	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	34.2	Pass
Rotation Rate	deg/sec	5 to 10	7.8	Pass
Femur Torque at 30°	Nm	≤ 95	91.8	Pass
Rotation at 203 Nm	Degrees	40.0 to 50.0	48.6	Pass
Overall Test Results				Pass

Right Hip Joint-Femur Results

Rotation Rate	deg/sec	5 to 10	7.4	Pass
Femur Torque at 30°	Nm	≤ 95	92.2	Pass
Rotation at 203 Nm	Degrees	40.0 to 50.0	46.3	Pass
Overall Test Results				Pass



Curve Description

Left Hip-Femur Rotation

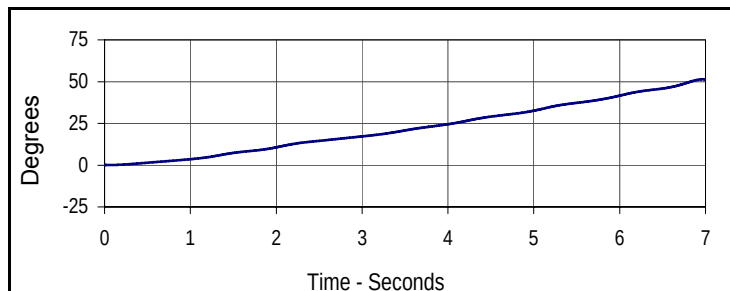
Plot No.	Type	SAE Class	Units
001	FIL	60	Degrees
Max	Time	Min	Time
54.6	7.0	0.0	0.0



Curve Description

Left Femur Torque

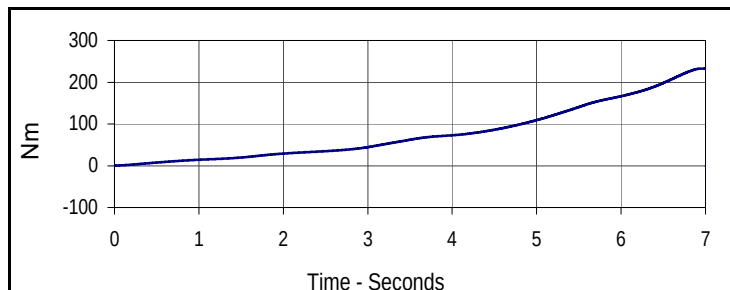
Plot No.	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
240.0	7.0	0.3	0.0



Curve Description

Right Hip-Femur Rotation

Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
51.4	7.0	0.0	0.0



Curve Description

Right Femur Torque

Plot No.	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
232.9	7.0	0.3	0.0

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

Test Date: 12/14/11

ATD Serial No.: 141

Test I.D.: N/A



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

Describe the repair on repair or replacement of parts:

Test Program: Hybrid III 5th Percentile Female External Measurements

Test Date: 12/14/11

ATD Serial No.: 141

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.36	Pass
Laboratory Relative Humidity	%	10 to 70	34.1	Pass
A - Total sitting height	mm	774.7 to 800.1	776	Pass
B - Shoulder pivot height	mm	431.8 to 457.2	452	Pass
C - H point height	mm	81.3 to 86.3	86	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	80	Pass
F - Thigh clearance	mm	119.4 to 134.6	125	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	45	Pass
I - Shoulder to elbow length	mm	276.8 to 297.2	285	Pass
J - Elbow rest height	mm	182.8 to 203.2	201	Pass
K - Buttock to knee length	mm	520.7 to 546.1	529	Pass
L - Popliteal length	mm	355.6 to 376.0	375	Pass
M - Knee pivot height	mm	393.7 to 419.1	400	Pass
N - Buttock popliteal length	mm	414.0 to 439.4	420	Pass
O - Chest depth without jacket	mm	175.3 to 190.5	187	Pass
P - Foot length	mm	218.5 to 233.7	221	Pass
R - Buttock to Knee Pivot Length	mm	457.2 to 482.6	475	Pass
S - Head Breadth	mm	137.1 to 147.3	144	Pass
T - Head Depth	mm	177.8 to 188.0	180	Pass
U - Hip Breadth	mm	299.7 to 314.9	300	Pass
V - Shoulder breadth	mm	350.5 to 365.7	359	Pass
W - Foot breadth	mm	78.8 to 94.0	90	Pass
X - Head circumference	mm	528.3 to 548.7	541	Pass
Y - Chest circumference (with chest jacket)	mm	850.8 to 881.3	860	Pass
Z - Waist circumference	mm	759.5 to 789.9	766	Pass
AA - Location for chest circumference	mm	299.7 to 309.9	300	Pass
BB - Location for waist circumference	mm	160.1 to 170.2	164	Pass
Overall Test Results				Pass

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

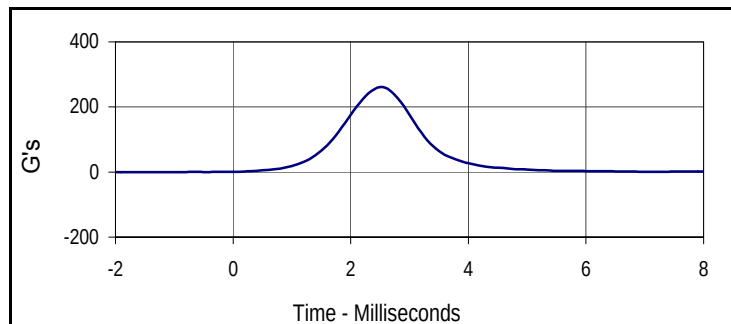
Test Date: 12/14/11

ATD Serial No.: 141

Test I.D.: F141HD025



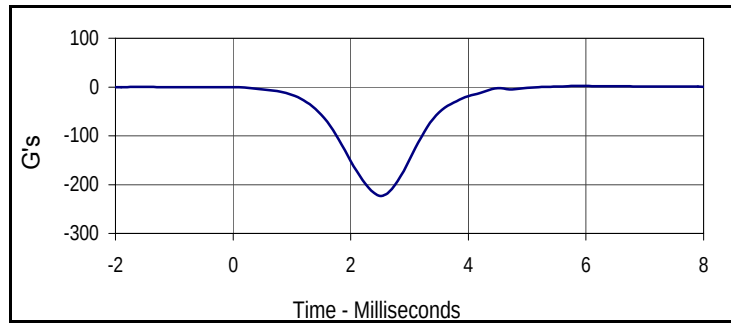
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	265	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.6	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	34.1	Pass
Peak Resultant Acceleration		G's	250.0 to 300.0	261.1	Pass
Peak Lateral Acceleration		G's	≤15.0	3.6	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	1.1	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Overall Test Results				Pass	



Curve Description

Head Resultant

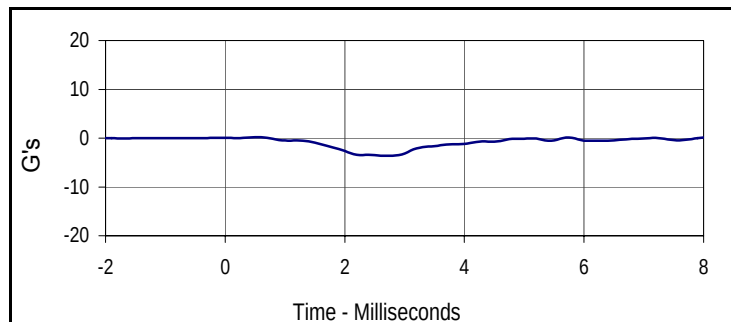
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
261.1	2.5	0.0	-2.0



Curve Description

Head X

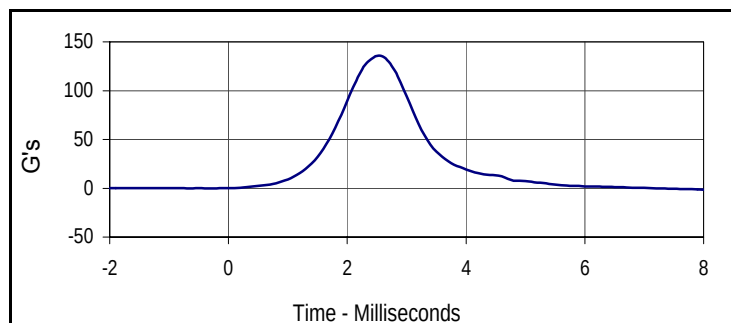
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.2	5.9	-223.2	2.5



Curve Description

Head Y

Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
0.2	0.5	-3.6	2.7



Curve Description

Head Z

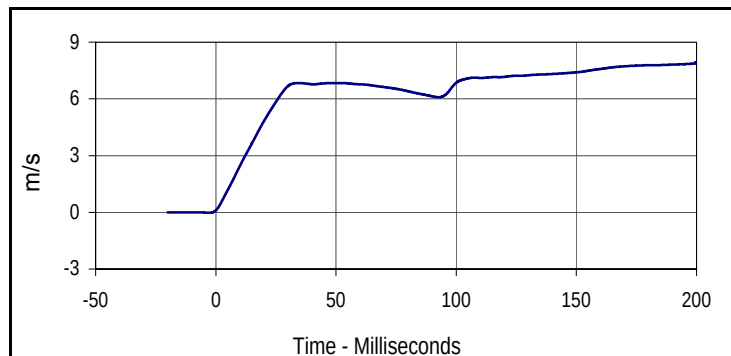
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
135.5	2.5	0.0	-0.7

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

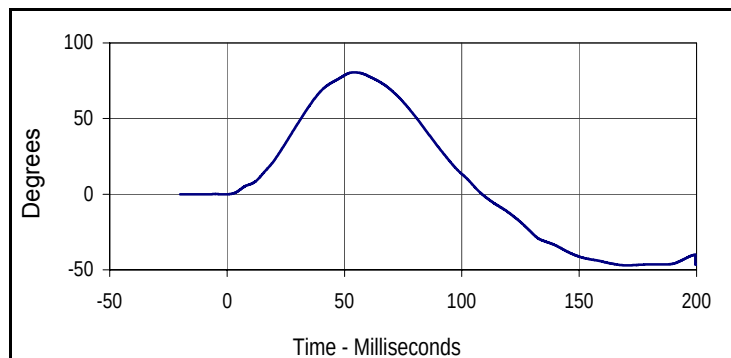
Test Date: 12/14/11
 Test I.D.: F141NF025



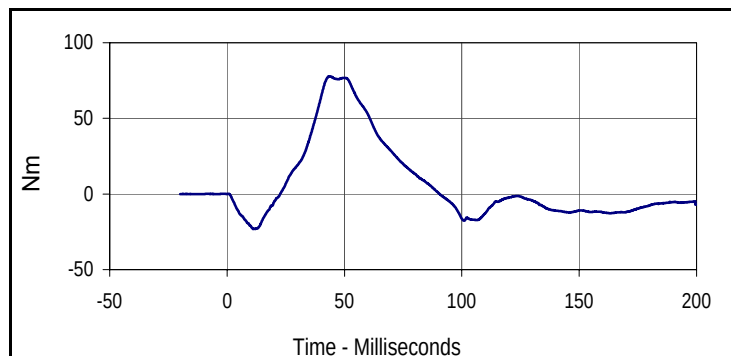
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	315	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	34.0	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.96	Pass
Pendulum Deceleration	10 Msec.	m/s	2.1 to 2.5	2.4	Pass
	20 Msec.	m/s	4.0 to 5.0	4.8	Pass
	30 Msec.	m/s	5.8 to 7.0	6.7	Pass
"D" Plane Rotation	Max	Degrees	77.0 to 91.0	80.6	Pass
Peak Moment in Rotation	Max	Nm	69.0 to 83.0	76.8	Pass
Positive Moment Decay, Time To 10 Nm		Msec.	80.0 to 100.0	81.6	Pass
Overall Test Results					Pass



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
7.9	200.0	0.0	-2.7



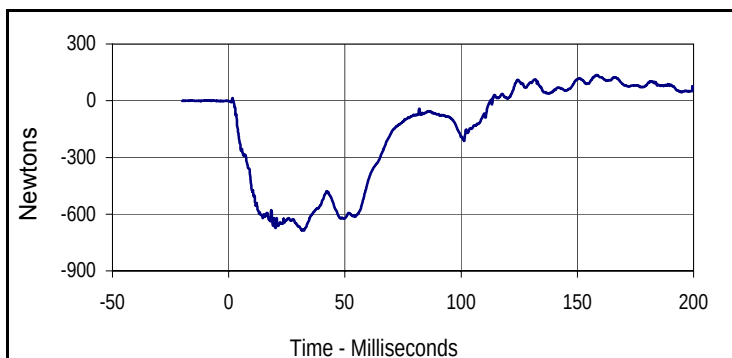
Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
80.6	54.1	-47.0	170.4



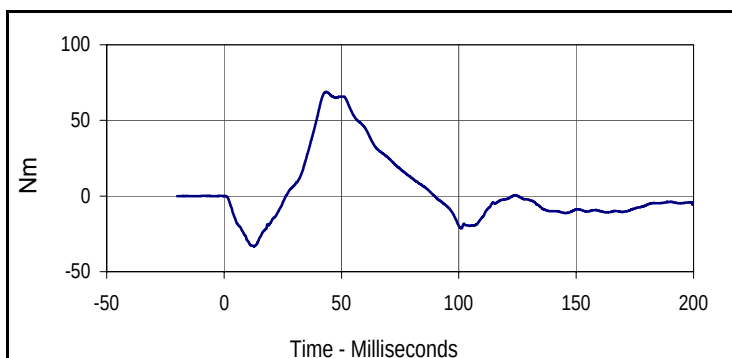
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
77.7	43.4	-23.2	11.1

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

Test Date: 12/14/11
 Test I.D.: F141NF025



Curve Description			
Upper Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
136.6	158.4	-686.6	32.3



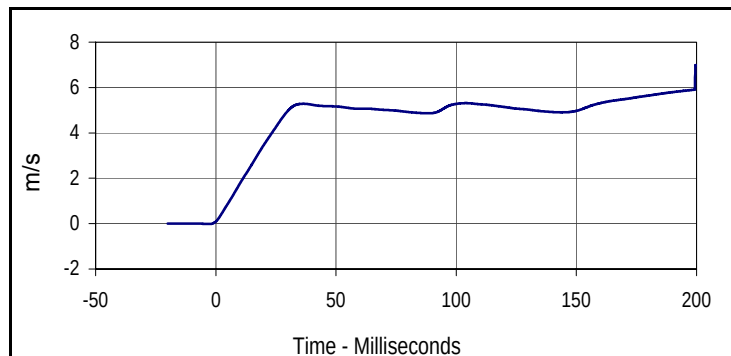
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
68.9	43.3	-33.2	12.8

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

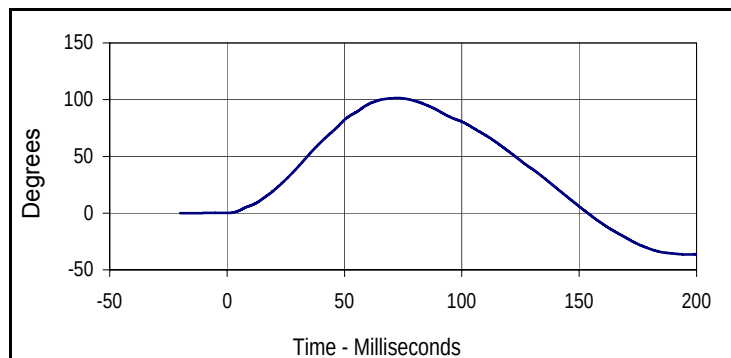
Test Date: 12/14/11
 Test I.D.: F141NE025



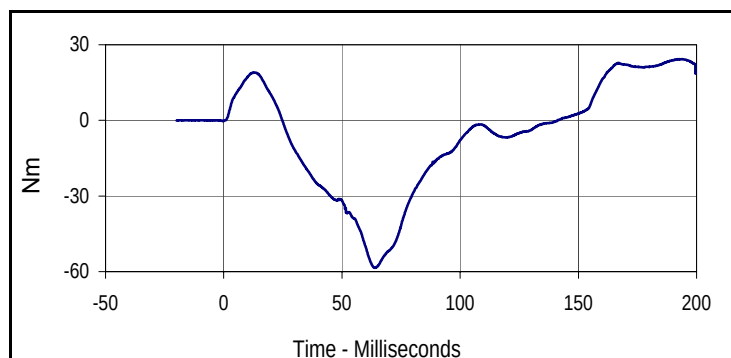
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	340	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	42.5	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	33.9	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.14	Pass
Pendulum Deceleration	10 Msec.	m/s	1.5 to 1.9	1.8	Pass
	20 Msec.	m/s	3.1 to 3.9	3.5	Pass
	30 Msec.	m/s	4.6 to 5.6	5.0	Pass
"D" Plane Rotation	Max	Degrees	99.0 to 114.0	101.5	Pass
Peak Moment in Rotation	Max	Nm	-53.0 to -65.0	-58.5	Pass
Positive Moment Decay, Time To -10 Nm		Msec.	94.0 to 114.0	98.6	Pass
Overall Test Results				Pass	



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
7.0	200.0	0.0	-2.9



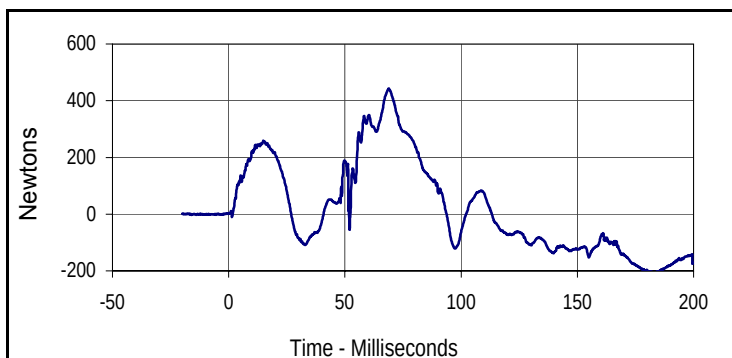
Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
101.5	72.6	-36.6	200.0



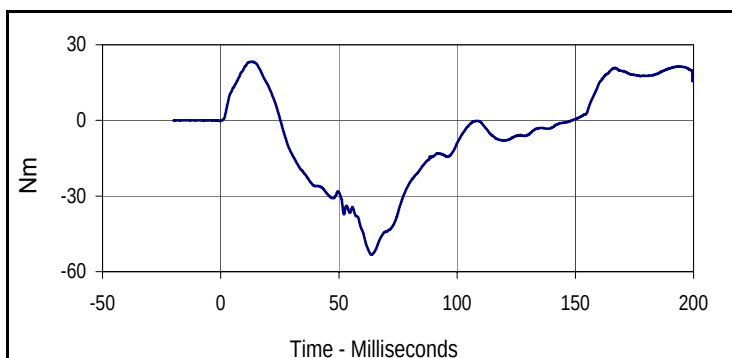
Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
24.3	194.0	-58.5	64.1

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

Test Date: 12/14/11
Test I.D.: F141NE025



Curve Description			
Upper Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
443.0	68.8	-206.8	183.1



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
23.3	12.6	-53.3	63.7

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

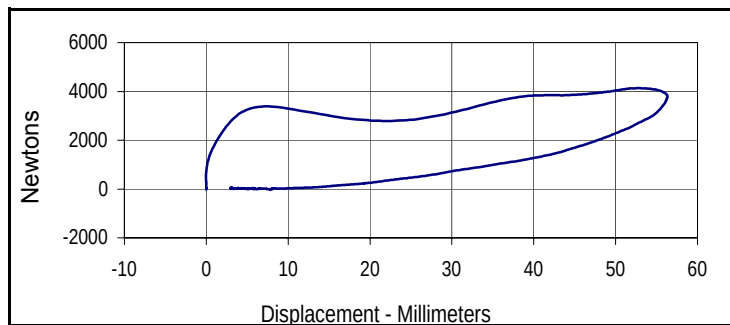
Test Date: 12/14/11

ATD Serial No.: 141

Test I.D.: F141CH025



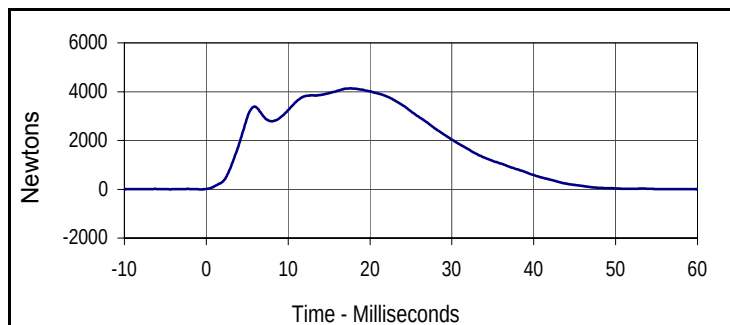
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	380	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	33.7	Pass
Probe Velocity		m/s	6.59 to 6.83	6.64	Pass
Peak Chest Deflection		mm	50.0 to 58.0	56.3	Pass
Peak Force Between 50 and 58 MM		Newtons	3900 to 4400	4042	Pass
Peak Force Between 18 and 50 MM		Newtons	≥4600	4132	Pass
Internal Hysteresis		%	69 to 85	72.9	Pass
Overall Test Results					Pass



Curve Description

Probe Force vs. Chest Deflection

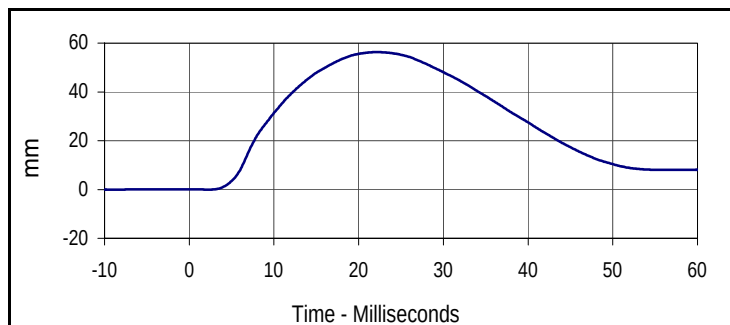
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	72.9
Peak Probe Force		Peak Chest Deflection	
4132.4		56.3	



Curve Description

Probe Force

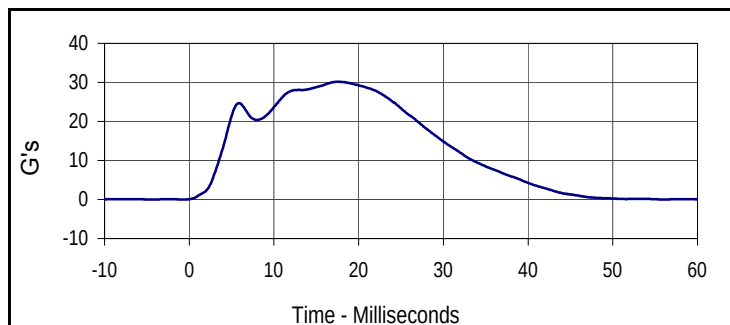
Plot No.	Type	SAE Class	Units
002	FIL	180	Newtons
Max	Time	Min	Time
4132.4	17.6	-13.5	64.2



Curve Description

Chest Deflection

Plot No.	Type	SAE Class	Units
003	FIL	600	mm
Max	Time	Min	Time
56.3	22.1	0.0	2.4



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
30.2	17.6	-0.1	64.2

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

Test Date: 12/14/11

ATD Serial No.: 141

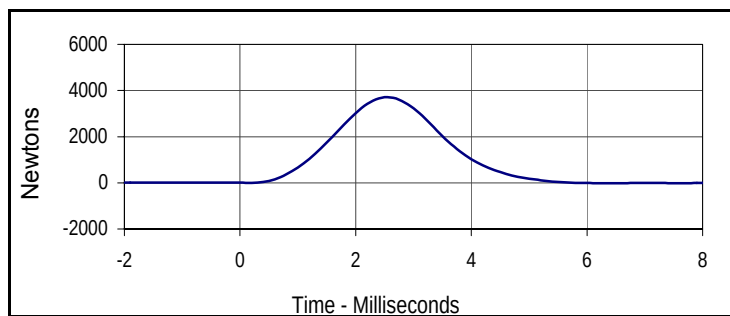
Test I.D.: F141LK025, F141LK025

**Left Knee**

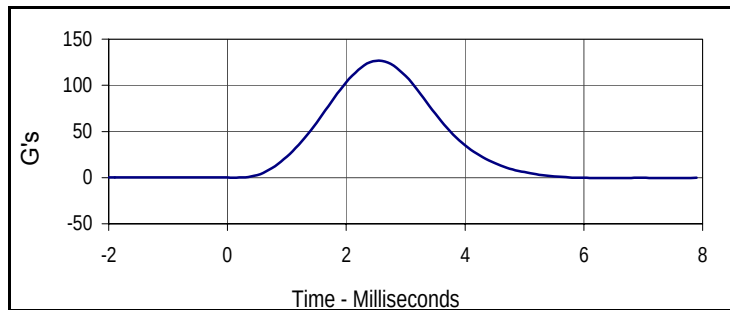
Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	400	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	33.6	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force		Newtons	3450 to 4060	3708	Pass
Overall Test Results					Pass

Right Knee

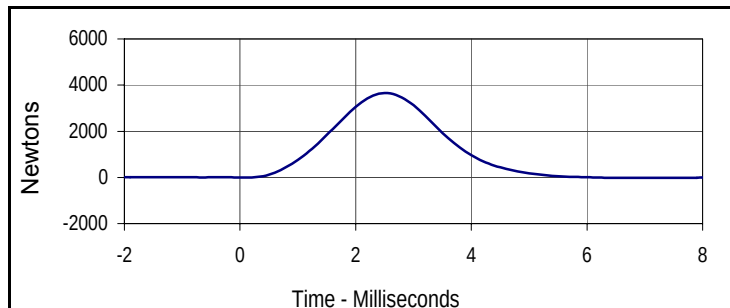
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force		Newtons	3450 to 4060	3659	Pass
Overall Test Results					Pass

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

Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3708.3	2.5	-16.0	7.6

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

Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
126.5	2.5	-0.5	7.6

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

Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
3659.4	2.5	-21.4	6.7

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

Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
124.8	2.5	-0.7	6.7

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

Test Date: 12/14/11

ATD Serial No.: 141

Test I.D.: F141TF025

**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	29.0	Pass
	Min	%		40.3	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	33.4	Pass
Initial Reference Plane Angle		Degrees	≤ 20	9.1	Pass
Peak Force at 45° +/-0.5°		Newtons	320.0 to 390.0	331.9	Pass
Torso Rotation Rate		deg/sec	0.5 to 1.5	1.1	Pass
Final Reference Plane Angle		Degrees	+/-8	4.3	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: 12/21/11

ATD Serial No.: 034

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: 12/21/11

ATD Serial No.: 034

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.03	Pass
Laboratory Relative Humidity	%	10 to 70	38.9	Pass
A - Total sitting height	mm	879 to 889	881	Pass
B - Shoulder pivot height	mm	505 to 521	515	Pass
C - H point height	mm	84 to 89	88	Pass
D - H point location from backline	mm	135 to 140	136	Pass
E - Shoulder pivot from backline	mm	84 to 94	86	Pass
F - Thigh clearance	mm	140 to 155	149	Pass
G - Back of elbow to wrist pivot	mm	290 to 305	299	Pass
H - Head back to backline	mm	41 to 46	44	Pass
I - Shoulder to elbow length	mm	330 to 345	335	Pass
J - Elbow rest height	mm	190 to 211	206	Pass
K - Buttock to knee length	mm	579 to 604	589	Pass
L - Popliteal length	mm	429 to 455	437	Pass
M - Knee pivot height	mm	485 to 500	487	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	434	Pass
W - Foot breadth	mm	91 to 107	99	Pass
Y - Chest circumference (with chest jacket)	mm	970 to 1001	985	Pass
Z - Waist circumference	mm	836 to 866	864	Pass
AA - Location for chest circumference	mm	429 to 434	431	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
Overall Test Results				Pass

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

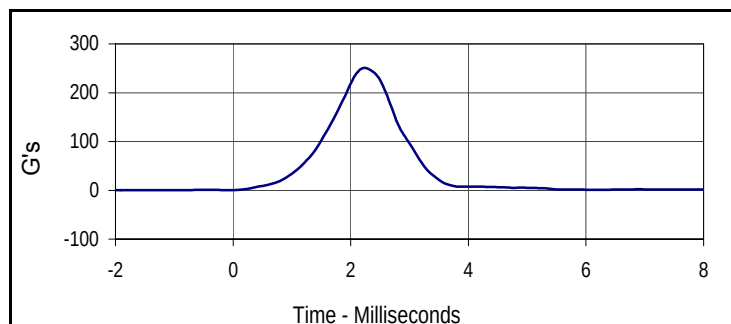
Test Date: 12/21/11

ATD Serial No.: 034

Test I.D.: M034HD024



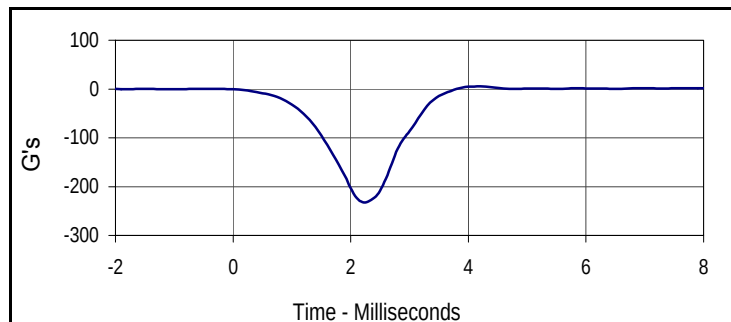
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	250	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	20.9	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	38.9	Pass
Peak Resultant Acceleration		G's	225.0 to 275.0	249.9	Pass
Peak Lateral Acceleration		G's	≤15.0	5.1	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	3.1	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Overall Test Results				Pass	



Curve Description

Head Resultant

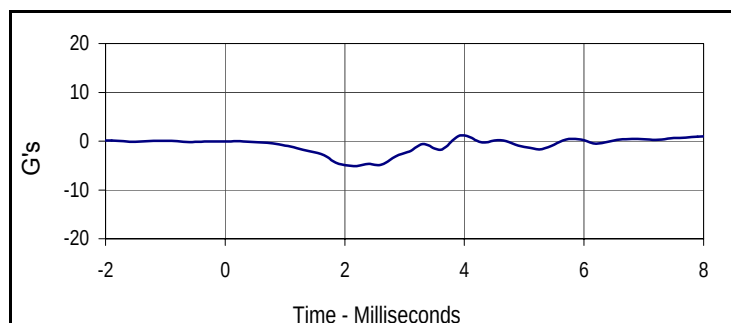
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
249.9	2.2	0.2	-1.9



Curve Description

Head X

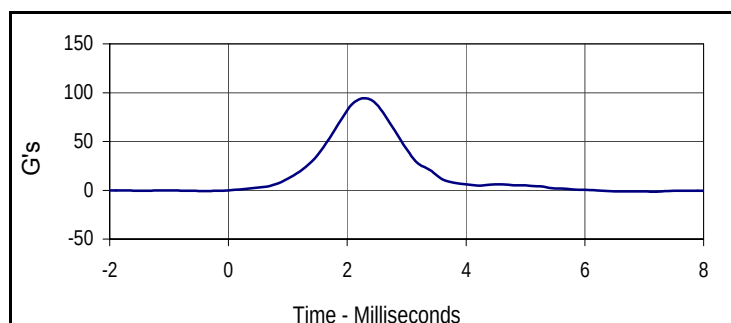
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.4	4.2	-231.8	2.2



Curve Description

Head Y

Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
1.2	4.0	-5.1	2.2



Curve Description

Head Z

Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
94.4	2.3	-0.8	-0.4

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

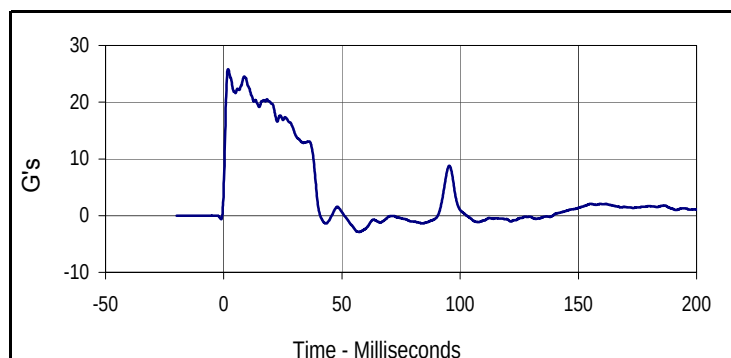
Test Date: 12/21/11

ATD Serial No.: 034

Test I.D.: M034NF024



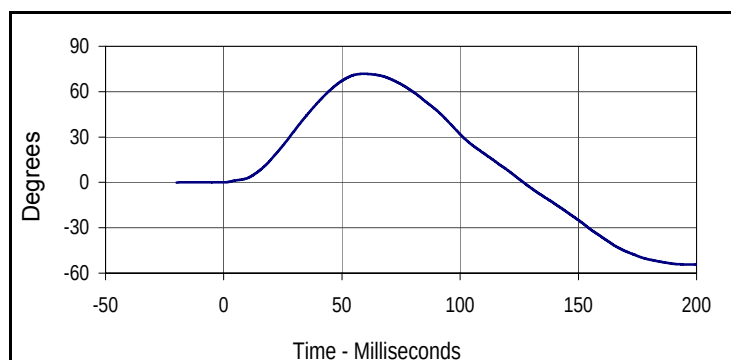
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	280	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	20.9	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	38.9	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.02	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.1	Pass
	20 Msec.	G's	17.6 to 22.6	19.8	Pass
	30 Msec.	G's	12.5 to 18.5	14.6	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	14.6	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	39.1	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	71.8	Pass
	Time	Msec.	57.0 to 64.0	59.3	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	126.8	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	88.1	Pass
	Time	Msec.	47.0 to 58.0	53.1	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	98.0	Pass
Overall Test Results					Pass



Curve Description

Pendulum Deceleration

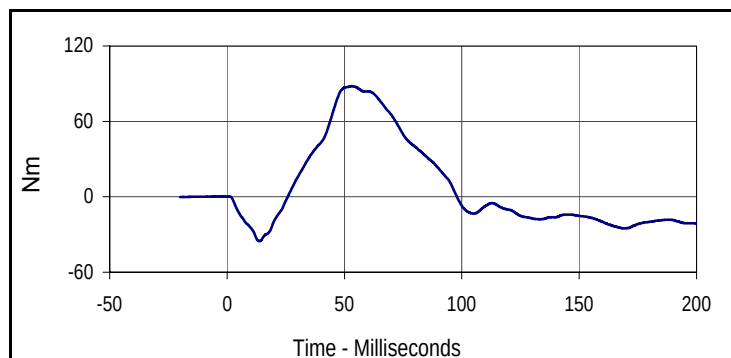
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
25.8	1.8	-2.9	57.4



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
71.8	59.3	-54.4	196.5



Curve Description

Moment About Occipital Condyle

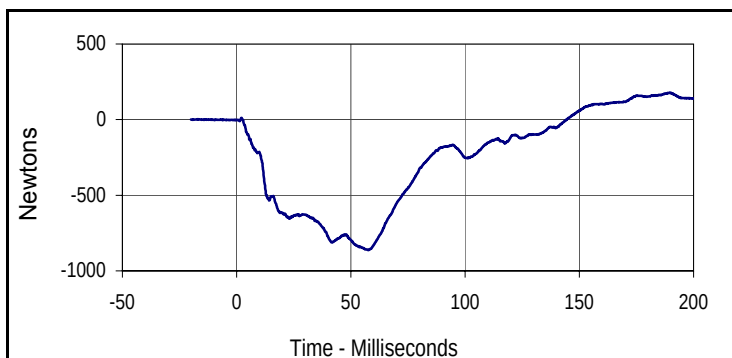
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
88.1	53.1	-35.4	13.8

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

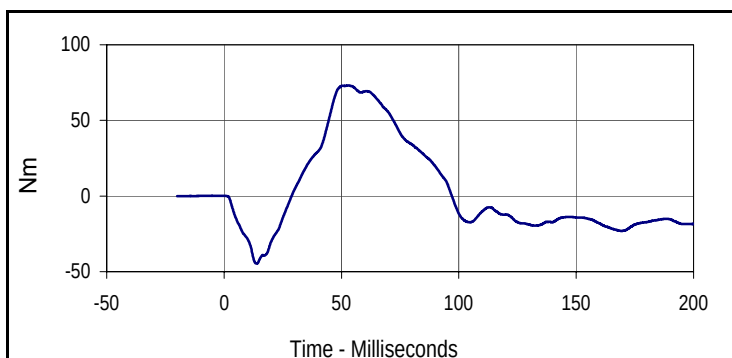
ATD Serial No.: 034

Test Date: 12/21/11

Test I.D.: M034NF024



Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
177.5	189.8	-863.1	57.5



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
73.2	53.1	-44.6	13.9

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

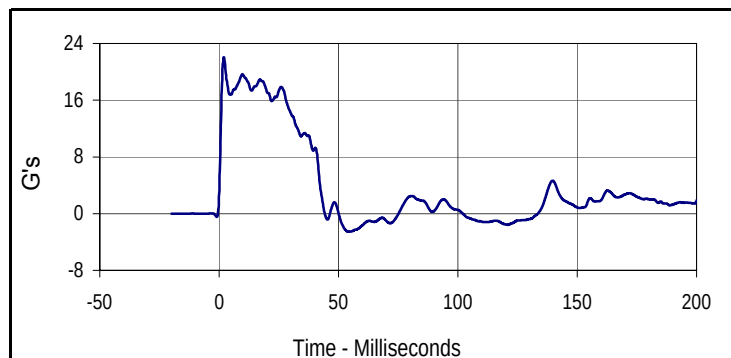
Test Date: 12/21/11

ATD Serial No.: 034

Test I.D.: M034NE024



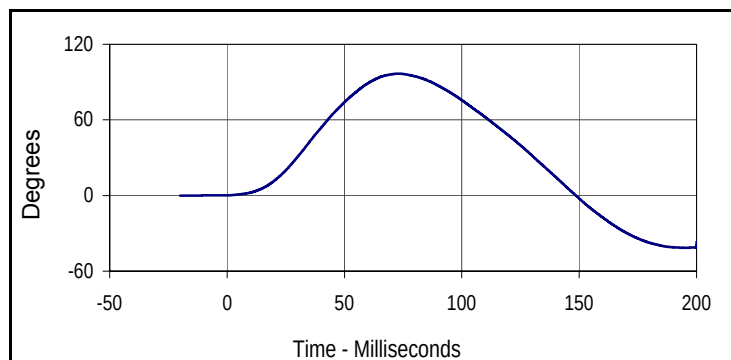
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	320	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	20.7	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	38.9	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.05	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	19.6	Pass
	20 Msec.	G's	14.0 to 19.0	17.2	Pass
	30 Msec.	G's	11.0 to 16.0	14.2	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	14.2	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	42.0	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	96.7	Pass
	Time	Msec.	72.0 to 82.0	73.2	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	148.6	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to -79.9	-72.9	Pass
	Time	Msec.	65.0 to 79.0	66.1	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	138.6	Pass
Overall Test Results					Pass



Curve Description

Pendulum Deceleration

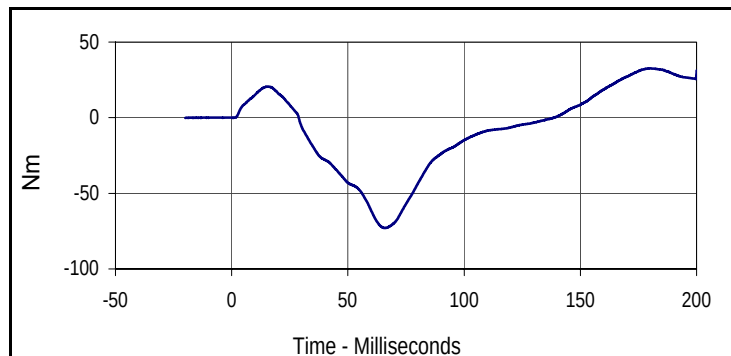
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
22.1	2.0	-2.5	54.9



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
96.7	73.2	-41.4	195.0



Curve Description

Moment About Occipital Condyle

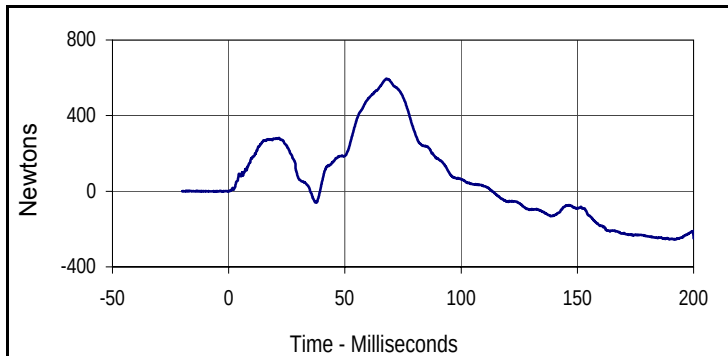
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
32.6	179.6	-72.9	66.1

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

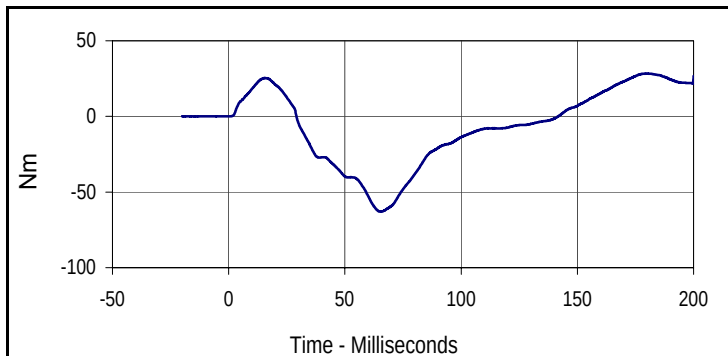
Test Date: 12/21/11

ATD Serial No.: 034

Test I.D.: M034NE024



Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
595.1	67.7	-255.2	191.6



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
28.3	179.8	-62.9	65.5

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

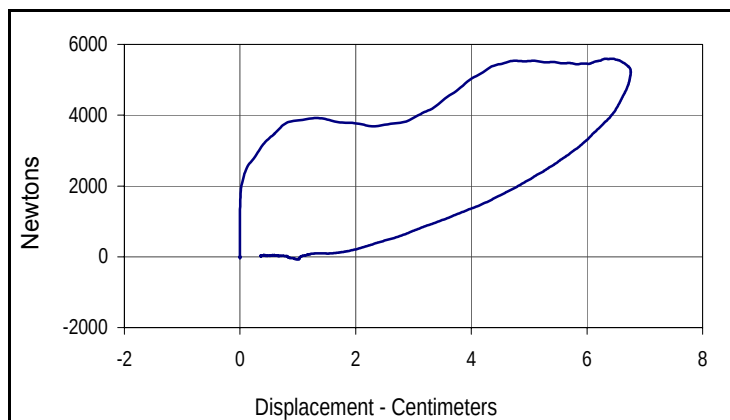
Test Date: 12/21/11

ATD Serial No.: 034

Test I.D.: M034CH024



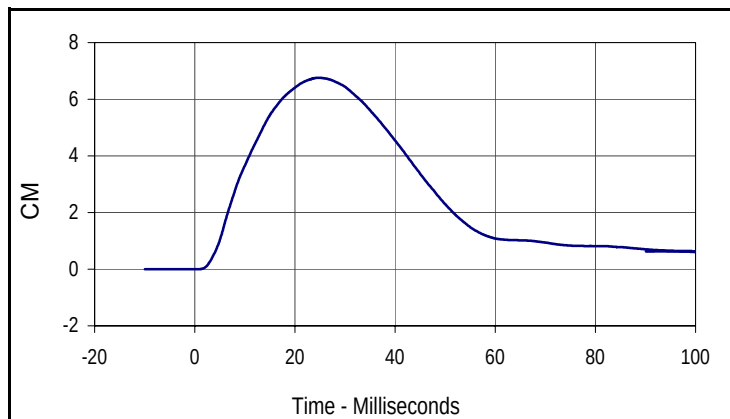
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	360	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	34.9	Pass
Probe Velocity		m/s	6.58 to 6.82	6.59	Pass
Peak Probe Force		Newtons	5159 to 5893	5596	Pass
Peak Sternum Deflection		CM	6.35 to 7.26	6.76	Pass
Internal Hysteresis		%	69 to 85	70.0	Pass
Overall Test Results				Pass	



Curve Description

Probe Force vs. Chest Deflection

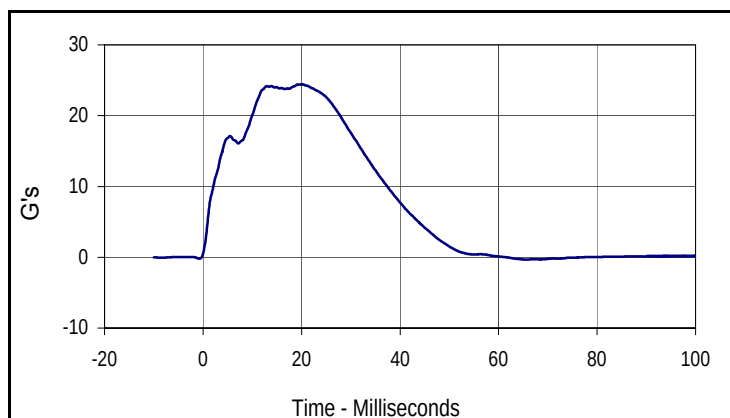
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	70.0
Peak Probe Force		Peak Chest Deflection	
5596		6.76	



Curve Description

Chest Deflection

Plot No.	Type	SAE Class	Units
002	FIL	180	CM
Max	Time	Min	Time
6.8	24.7	0.0	0.6



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
24.4	20.2	-0.3	65.6

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

Test Date: 12/21/11

ATD Serial No.: 034

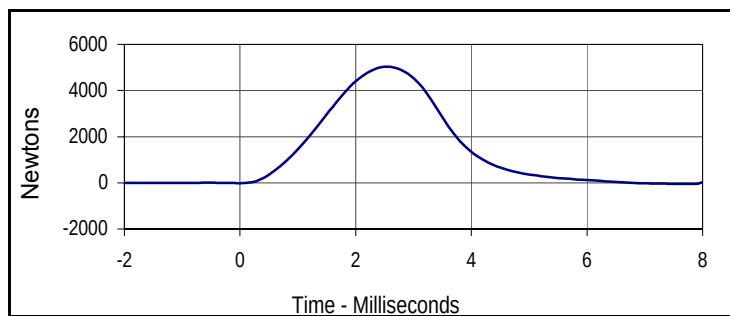
Test I.D.: M034LK024, M034RK024

**Left Knee**

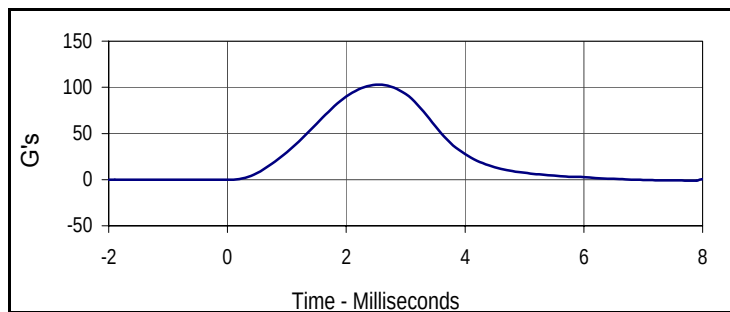
Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	400	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.6	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	34.6	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	4715 to 5782	5029	Pass
Overall Test Results				Pass	

Right Knee

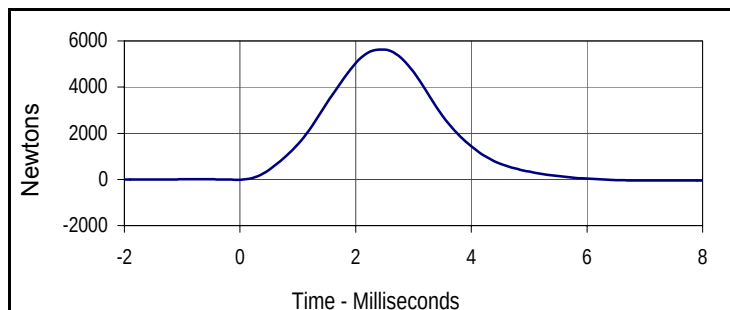
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force		Newtons	4715 to 5782	5632	Pass
Overall Test Results				Pass	

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

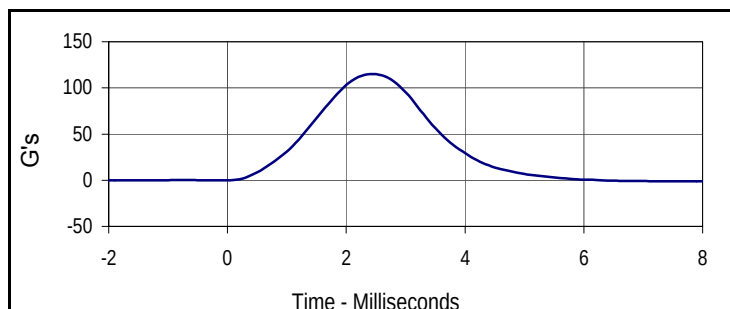
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5028.5	2.5	-50.1	7.9

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

Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
102.8	2.5	-1.0	7.9

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

Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
5632.2	2.4	-51.0	7.7

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

Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
115.1	2.4	-1.0	7.7

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

Test Date: 12/21/11

ATD Serial No.: 034

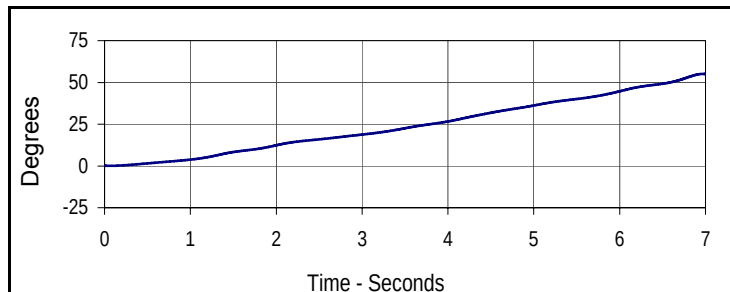
Test I.D.: M034LF024, M034RF024

**Left Hip Joint-Femur Results**

Tested Parameter	Units	Specification	Result	Pass/Fail
Hip Joint-Femur Assembly Soak Time	Minutes	≥240	460	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	40.0	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	33.5	Pass
Rotation Rate	deg/sec	5 to 10	7.9	Pass
Femur Torque at 30°	Nm	≤ 95	91.9	Pass
Rotation at 203 Nm	Degrees	40.0 to 50.0	48.9	Pass
Overall Test Results				Pass

Right Hip Joint-Femur Results

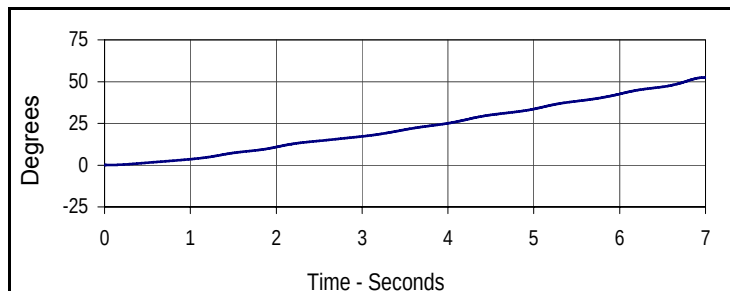
Rotation Rate	deg/sec	5 to 10	7.5	Pass
Femur Torque at 30°	Nm	≤ 95	86.5	Pass
Rotation at 203 Nm	Degrees	40.0 to 50.0	47.3	Pass
Overall Test Results				Pass

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

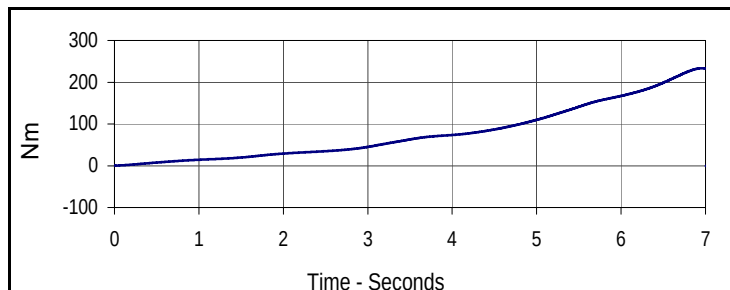
Plot No.	Type	SAE Class	Units
001	FIL	60	Degrees
Max	Time	Min	Time
55.1	7.0	0.0	0.0

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

Plot No.	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
243.0	7.0	0.3	0.0

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

Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
52.4	7.0	0.0	0.0

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

Plot No.	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
233.6	7.0	0.3	0.0

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

Test Date: 12/21/11

ATD Serial No.: 141

Test I.D.: N/A



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

Describe the repair on repair or replacement of parts:

Test Program: Hybrid III 5th Percentile Female External Measurements

Test Date: 12/21/11

ATD Serial No.: 141

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.46	Pass
Laboratory Relative Humidity	%	10 to 70	34.2	Pass
A - Total sitting height	mm	774.7 to 800.1	776	Pass
B - Shoulder pivot height	mm	431.8 to 457.2	452	Pass
C - H point height	mm	81.3 to 86.3	86	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	80	Pass
F - Thigh clearance	mm	119.4 to 134.6	125	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	45	Pass
I - Shoulder to elbow length	mm	276.8 to 297.2	285	Pass
J - Elbow rest height	mm	182.8 to 203.2	201	Pass
K - Buttock to knee length	mm	520.7 to 546.1	529	Pass
L - Popliteal length	mm	355.6 to 376.0	375	Pass
M - Knee pivot height	mm	393.7 to 419.1	400	Pass
N - Buttock popliteal length	mm	414.0 to 439.4	420	Pass
O - Chest depth without jacket	mm	175.3 to 190.5	187	Pass
P - Foot length	mm	218.5 to 233.7	221	Pass
R - Buttock to Knee Pivot Length	mm	457.2 to 482.6	475	Pass
S - Head Breadth	mm	137.1 to 147.3	144	Pass
T - Head Depth	mm	177.8 to 188.0	180	Pass
U - Hip Breadth	mm	299.7 to 314.9	300	Pass
V - Shoulder breadth	mm	350.5 to 365.7	359	Pass
W - Foot breadth	mm	78.8 to 94.0	90	Pass
X - Head circumference	mm	528.3 to 548.7	541	Pass
Y - Chest circumference (with chest jacket)	mm	850.8 to 881.3	860	Pass
Z - Waist circumference	mm	759.5 to 789.9	766	Pass
AA - Location for chest circumference	mm	299.7 to 309.9	300	Pass
BB - Location for waist circumference	mm	160.1 to 170.2	164	Pass
Overall Test Results				Pass

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

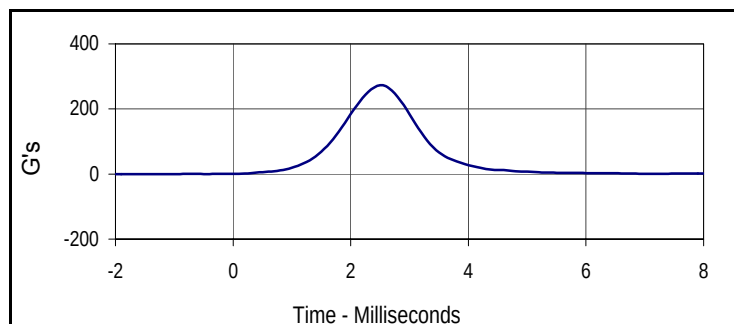
Test Date: 12/21/11

ATD Serial No.: 141

Test I.D.: F141HD026



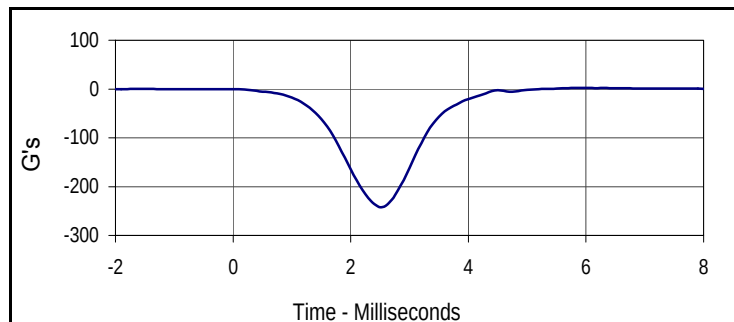
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	430	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.6	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	33.4	Pass
Peak Resultant Acceleration		G's	250.0 to 300.0	273.1	Pass
Peak Lateral Acceleration		G's	≤15.0	7.1	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	1.1	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Overall Test Results				Pass	



Curve Description

Head Resultant

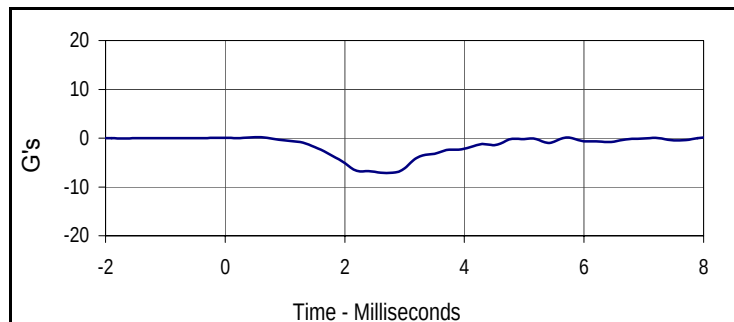
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
273.1	2.5	0.0	-2.0



Curve Description

Head X

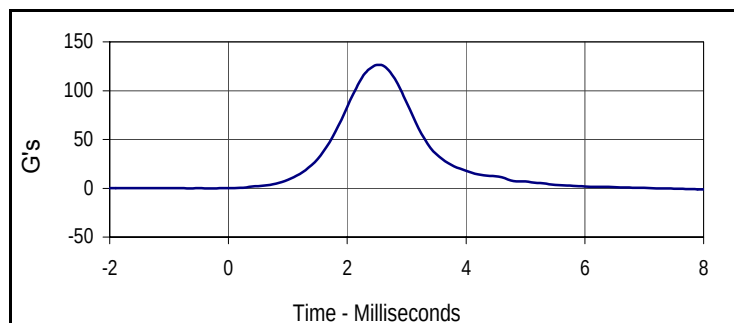
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.4	5.9	-242.1	2.5



Curve Description

Head Y

Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
0.2	0.5	-7.1	2.7



Curve Description

Head Z

Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
126.2	2.5	0.0	-0.7

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

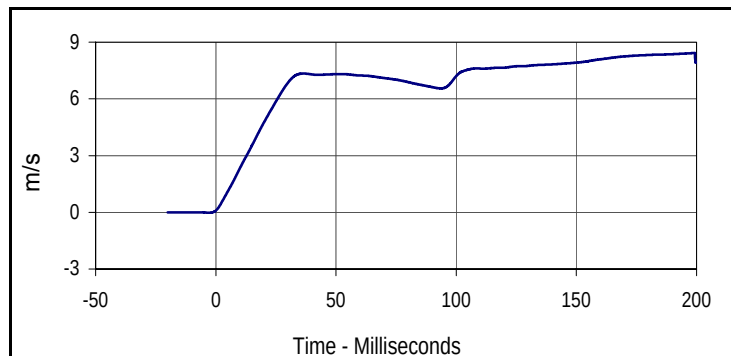
Test Date: 12/21/11

ATD Serial No.: 141

Test I.D.: F141NF026



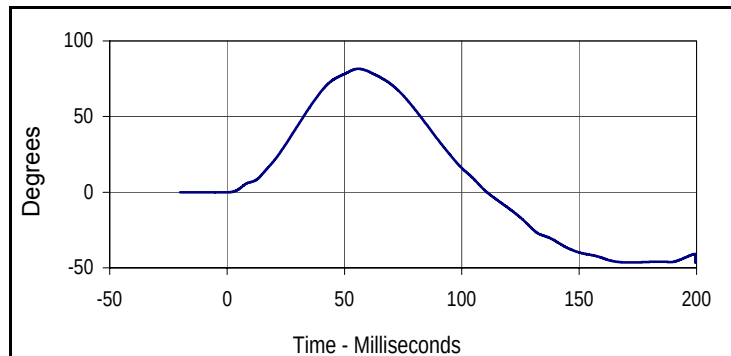
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	450	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.8	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	33.8	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.90	Pass
Pendulum Deceleration	10 Msec.	m/s	2.1 to 2.5	2.3	Pass
	20 Msec.	m/s	4.0 to 5.0	4.8	Pass
	30 Msec.	m/s	5.8 to 7.0	6.9	Pass
"D" Plane Rotation	Max	Degrees	77.0 to 91.0	81.6	Pass
Peak Moment in Rotation	Max	Nm	69.0 to 83.0	77.7	Pass
Positive Moment Decay, Time To 10 Nm		Msec.	80.0 to 100.0	83.4	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Velocity

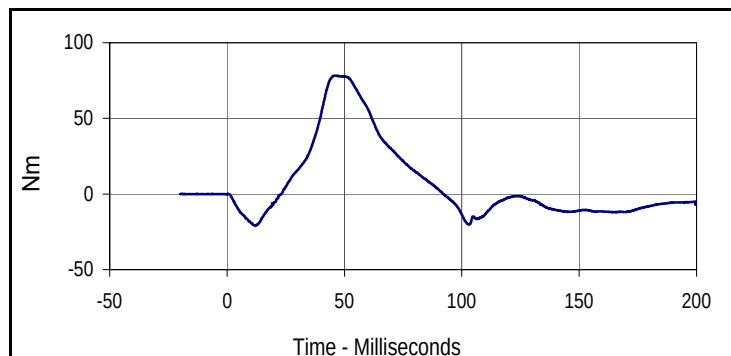
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
8.4	199.4	0.0	-2.7



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
81.6	55.9	-46.5	171.7



Curve Description

Moment About Occipital Condyle

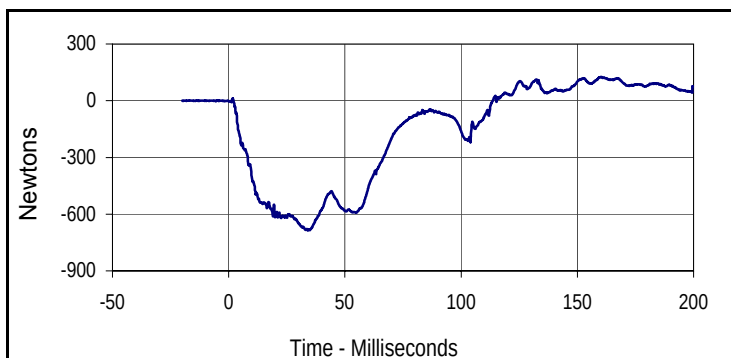
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
78.3	46.3	-21.0	12.2

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

ATD Serial No.: 141

Test Date: 12/21/11

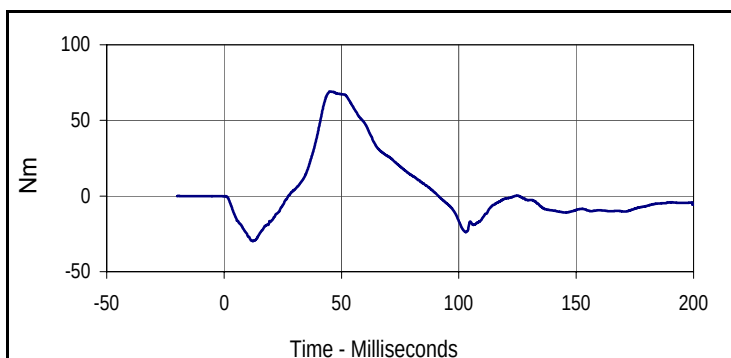
Test I.D.: F141NF026



Curve Description

Upper Neck Force X

Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
125.9	160.1	-686.4	34.1



Curve Description

Neck Moment Y

Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
69.1	45.2	-29.8	12.3

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

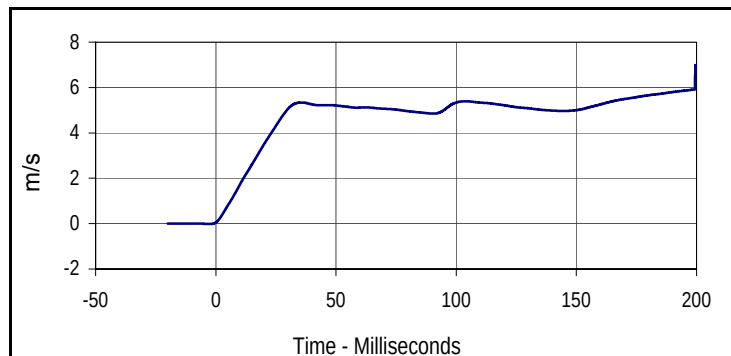
Test Date: 12/22/11

ATD Serial No.: 141

Test I.D.: F141NE026



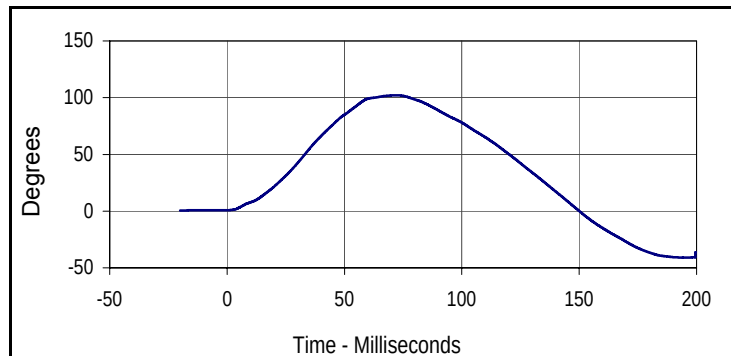
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	250	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	42.5	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.7	Pass
Pendulum Velocity		m/s	5.95 to 6.19	5.99	Pass
Pendulum Deceleration	10 Msec.	m/s	1.5 to 1.9	1.7	Pass
	20 Msec.	m/s	3.1 to 3.9	3.5	Pass
	30 Msec.	m/s	4.6 to 5.6	5.1	Pass
"D" Plane Rotation	Max	Degrees	99.0 to 114.0	102.1	Pass
Peak Moment in Rotation	Max	Nm	-53.0 to -65.0	-58.0	Pass
Positive Moment Decay, Time To -10 Nm		Msec.	94.0 to 114.0	94.6	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Velocity

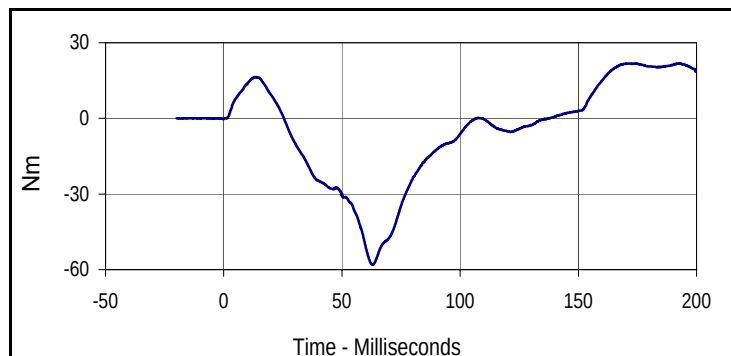
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
7.0	200.0	0.0	-2.4



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
102.1	72.0	-40.9	195.0



Curve Description

Moment About Occipital Condyle

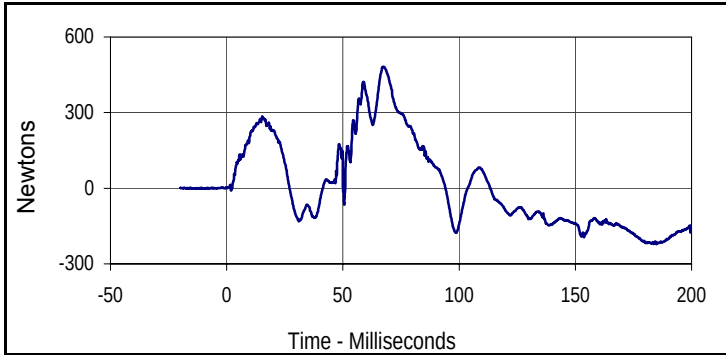
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
21.8	192.8	-58.0	63.0

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

ATD Serial No.: 141

Test Date: 12/22/11

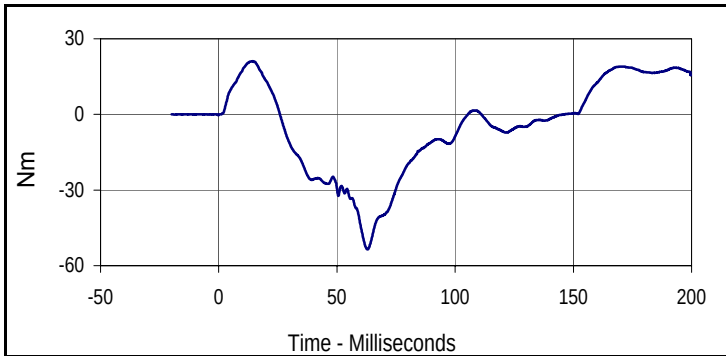
Test I.D.: F141NE026



Curve Description

Upper Neck Force X

Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
482.6	67.5	-221.1	184.8



Curve Description

Neck Moment Y

Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
21.1	14.4	-53.6	62.9

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

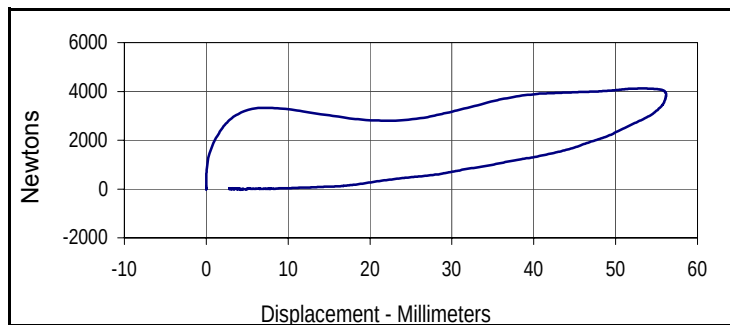
Test Date: 12/22/11

ATD Serial No.: 141

Test I.D.: F141CH026



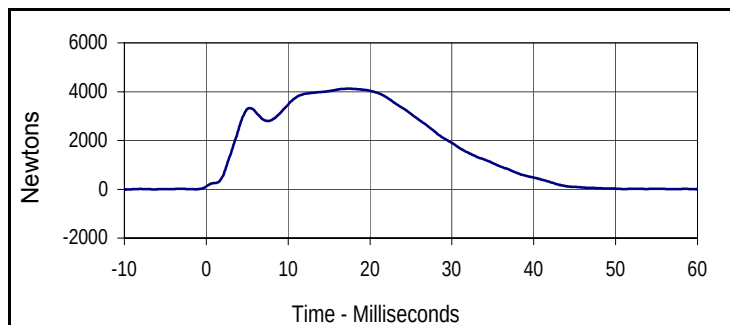
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	350	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	35.0	Pass
Probe Velocity		m/s	6.59 to 6.83	6.65	Pass
Peak Chest Deflection		mm	50.0 to 58.0	56.2	Pass
Peak Force Between 50 and 58 MM		Newtons	3900 to 4400	4057	Pass
Peak Force Between 18 and 50 MM		Newtons	≥4600	4124	Pass
Internal Hysteresis		%	69 to 85	72.9	Pass
Overall Test Results					Pass



Curve Description

Probe Force vs. Chest Deflection

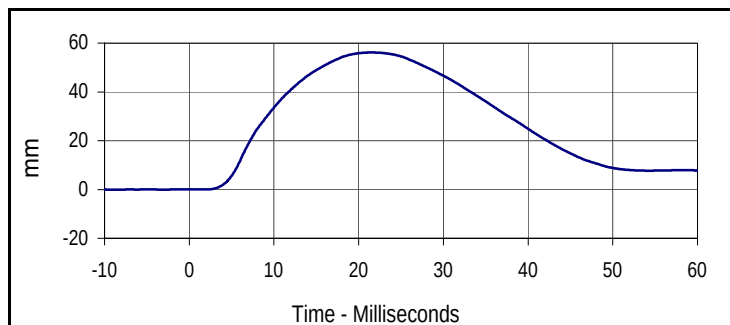
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	72.9
Peak Probe Force		Peak Chest Deflection	
4123.6		56.2	



Curve Description

Probe Force

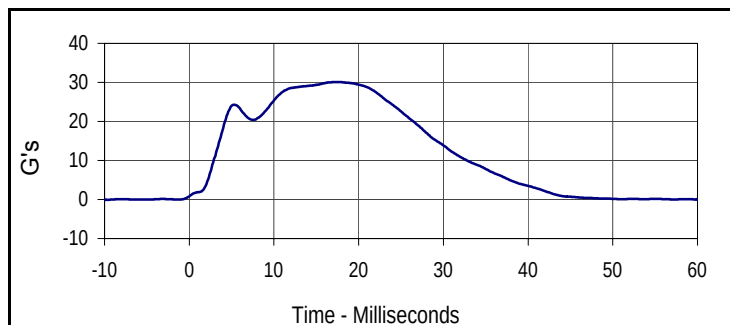
Plot No.	Type	SAE Class	Units
002	FIL	180	Newtons
Max	Time	Min	Time
4123.6	17.3	-27.1	100.7



Curve Description

Chest Deflection

Plot No.	Type	SAE Class	Units
003	FIL	600	mm
Max	Time	Min	Time
56.2	21.5	0.0	-9.1



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
30.1	17.3	-0.1	90.7

Test Program: Hybrid III 5th Percentile Female Knee Impact Test
 ATD Serial No.: 141

Test Date: 12/22/11
 Test I.D.: F141LK026, F141LK026

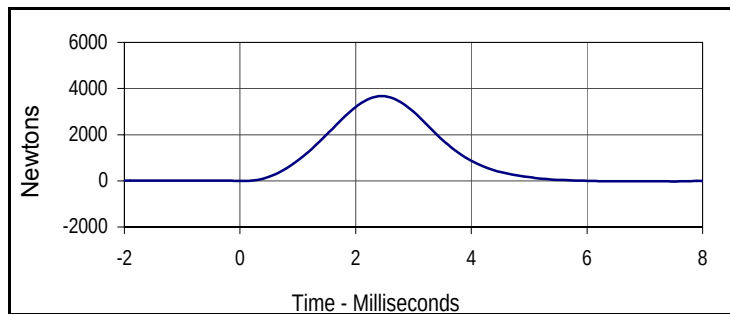


Left Knee

Tested Parameter	Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time	Minutes	≥240	420	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	40.0	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	34.4	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.08	Pass
Peak Probe Force	Newtons	3450 to 4060	3669	Pass
Overall Test Results				Pass

Right Knee

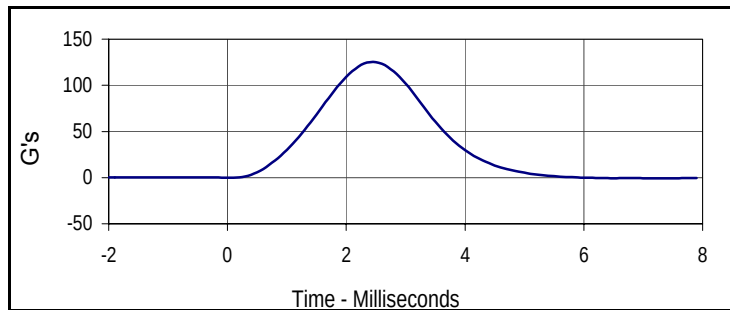
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	3450 to 4060	3663	Pass
Overall Test Results				Pass



Curve Description

Left Knee Probe Force

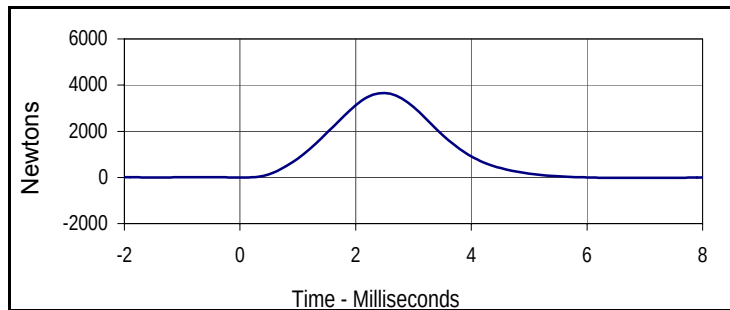
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3668.8	2.4	-24.4	7.5



Curve Description

Left Knee Acceleration

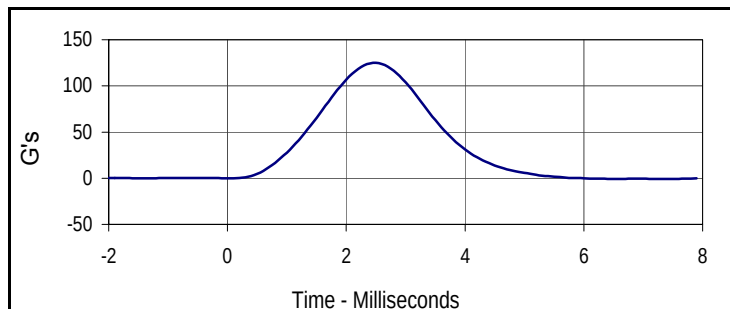
Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
125.2	2.4	-0.8	7.5



Curve Description

Right Knee Probe Force

Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
3663.3	2.5	-20.8	6.6



Curve Description

Right Knee Acceleration

Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
125.0	2.5	-0.7	6.6

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

Test Date: 12/22/11

ATD Serial No.: 141

Test I.D.: F141TF026

**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	29.0	Pass
	Min	%		40.3	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	34.1	Pass
Initial Reference Plane Angle		Degrees	≤ 20	8.9	Pass
Peak Force at 45° +/-0.5°		Newtons	320.0 to 390.0	331.9	Pass
Torso Rotation Rate		deg/sec	0.5 to 1.5	1.0	Pass
Final Reference Plane Angle		Degrees	+/-8	3.9	Pass
Overall Test Results				Pass	