

REPORT NUMBER: NCAP-KAR-14-012

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

**FUJI HEAVY INDUSTRIES LTD.
2014 SUBARU XV CROSSTREK 5-DOOR MPV**

NHTSA NUMBER: M20145503

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



FEBRUARY 10, 2014

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: February 10, 2014

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NHTSA, Office of Crashworthiness Standards

Date: 


COTR, New Car Assessment Program
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16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2014 Subaru XV Crosstrek 5-door MPV in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The test was conducted at the KARCO Engineering, LLC. facility in Adelanto, California on January 27, 2014. The impact velocity of the vehicle was 56.11 km/h and the ambient temperature at the barrier face at the time of impact was 22.2 deg. C. The target vehicle's post-test maximum crush was 622 mm at DPD 3 to the left of the vehicle's centerline. The test vehicle's performance is as follows: <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <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>291.4</td> <td>700.0</td> <td>293.7</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-23</td> <td>52</td> <td>-18</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>0.28</td> <td>1</td> <td>0.35</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>1500.5</td> <td>2620</td> <td>1087.1</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>-337.6</td> <td>2520</td> <td>-485.8</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>-1505.2</td> <td>6805</td> <td>-1578.2</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>-3248.9</td> <td>6805</td> <td>-445.9</td> </tr> </tbody> </table>				Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC ₁₅)	N/A	700.0	291.4	700.0	293.7	Maximum Chest Compression	mm	63	-23	52	-18	Nij	N/A	1	0.28	1	0.35	Neck Tension	N	4170	1500.5	2620	1087.1	Neck Compression	N	4000	-337.6	2520	-485.8	Left Femur Force	N	10008	-1505.2	6805	-1578.2	Right Femur Force	N	10008	-3248.9	6805	-445.9
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SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

This 56.3 km/h frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program, sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number DTNH22-12-D-00259. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

The 56.3 km/h frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure, dated September 2013.

SUMMARY

A load cell barrier consisting of 176 load cells was impacted by a 2014 Subaru XV Crosstrek 5-door MPV at a velocity of 56.11 km/h. The test was performed at KARCO Engineering, LLC. on January 27, 2014. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A of this report.

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

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

Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck force transducers, right / left femur load cells, and lower leg instrumentation. Seat belt load cells were placed on the driver's shoulder and lap belt and the passenger's shoulder belt to measure the dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 034) and the right-front passenger (position 2) ATD (Serial No. 635) were calibrated prior to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

The 109 channels of dummy and vehicle response 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.

The maximum static crush of the test vehicle was 622 mm located at DPD 3 to the left of the vehicle's centerline. Both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

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

The occupant data is summarized below:

ATD Position	HIC ₁₅	T ¹	T ²	Chest Disp. (mm)	Nij	Neck Tension (N)	Neck Comp. (N)	Left Femur (N)	Right Femur (N)
Driver (50th)	291.4	68.9	83.9	-23	0.28	1500.5	-337.6	-1505.2	-3248.9
Passenger (5th)	293.7	60.9	75.9	-18	0.35	1087.1	-485.8	-1578.2	-445.9

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV NHTSA No.: M20145503
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 01/27/14

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: 2014 Subaru XV Crosstrek 5-Door MPV NHTSA No.: M20145503
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 01/27/14

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20145503
Model Year	2014
Make	Subaru
Model	XV Crosstrek
Body Style	5-Door MPV
VIN	JF2GPACC5E9214850
Body Color	Dark Gray / Metallic
Odometer Reading (km / mi)	156 / 97
Engine Displacement (L)	2.0
Type / No. of Cylinders	H-4
Engine Placement	Longitudinal
Transmission Type	Manual
Transmission Speeds	5
Overdrive	Yes
Final Drive	AWD
Roof Rack	Yes
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
Automatic Door Locks (ADLs)	No

Traction Control System	Yes
Power Steering	Yes
Power Window Auto-Reverse	No
Driver Frontal Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	Yes
Front Pass. Frontal Airbag	Yes
Front Pass. Curtain Airbag	Yes
Front Pass. Head/Torso Airbag	No
Front Pass. Torso Airbag	No
Front Pass. Torso/Pelvis Airbag	Yes
Front Pass. Pelvis Airbag	No
Front Pass. Knee Airbag	No
Driver Seat Belt Pretensioner	Yes
Driver Load Limiter	Yes
Front Pass. Seat Belt Pretensioner	Yes
Front Pass. Load Limiter	Yes
Other	No

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

N/A

DATA FROM CERTIFICATION LABEL

Manufactured By	Fuji Heavy Industries Ltd.
Date of Manufacture	Sep-13

GVWR (kg)	1970
GAWR Front (kg)	1010
GAWR Rear (kg)	1000

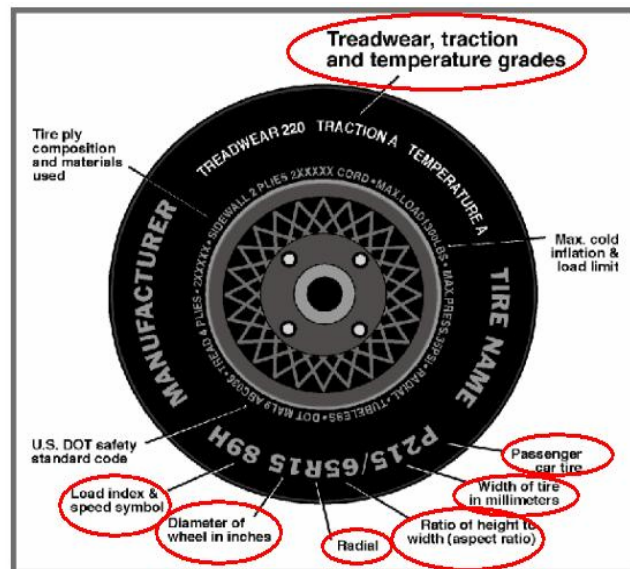
VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Type of Seats	Bucket	Bench			
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				408.0	A
DSC x 68.04 (kg)				340.2	B
Cargo Weight (RCLW) (kg)				67.8	A-B

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2014 Subaru XV Crosstrek 5-Door MPV	NHTSA No.:	M20145503
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	01/27/14



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	220	210
Recommended Tire Size	P225/55R17	P225/55R17
Tire Size on Vehicle	P225/55R17	P225/55R17
Tire Manufacturer	Yokohama	Yokohama
Tire Model	Geolandar G95	Geolandar G95
Treadwear	320	320
Traction	B	B
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Nylon	2 Polyester, 2 Steel, 1 Nylon
Load Index / Speed Symbol	95H	95H
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Left	FDUP N2U3513	FDUP N2U3513
DOT Safety Code Right	FDUP N2U3513	FDUP N2U3513

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

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV NHTSA No.: M20145503
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 01/27/14

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	432.5	296.0		461.5	372.5	
Right	kg	390.0	295.0		417.0	364.5	
Ratio	%	58.2%	41.8%	100.0%	54.4%	45.6%	100.0%
Total	kg	822.5	591.0	1413.5	878.5	737.0	1615.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1413.5	A
Weight of 1 P572E ATD & 1 P572O ATD	kg	141.0	B
Rated Cargo/Luggage Weight (RCLW)	kg	67.8	C
Calculated Vehicle Target Weight (TVTW)	kg	1622.3	A+B+C

TEST VEHICLE ATTITUDES

Condition	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	779	783	778	777	1109
As Tested	mm	770	774	750	752	1210
Post-Test	mm	828	766	756	721	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2652
Total Vehicle Length at Left Side	mm	3809
Total Vehicle Length at Centerline	mm	4455
Total Vehicle Length at Right Side	mm	3806
Weight of Ballast in Cargo Area	kg	64.5
Weight of Vehicle Components Removed	kg	28.5
Amount of Stoddard Solvent in Fuel Tank	L	55.98

VEHICLE COMPONENTS REMOVED TO MEET TEST WEIGHT:

Tail lights (2.0 kg), Rear bumper cover (4.0 kg), Spare tire and tools (15.0 kg), Rear trim (6.0 kg), Bottom front cover (1.5 kg)

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

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV NHTSA No.: M20145503
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 01/27/14

TARGET VEHICLE STRUCTURAL MEASUREMENTS

No.	Description	Pre-Test
1	Total Length	4455
2	Total Width	1776
3	Bumper Top Height	645
4	Bumper Bottom Height	330
5	Longitudinal Member Top Height	570
6	Distance Between Longitudinal Members	840
7	Longitudinal Member Width	50
8	Engine Top Height	897
9	Engine Bottom Height	271
10	Engine and Gearbox Width	700
11	Front Bumper to Engine Distance	486
12	Front Shock Absorber Fixing Height	910
13	Bonnet Leading Edge Height	827
14	Front Shock Absorber Fixing Width	1115
15	Front Bumper to Front Axle Distance	955
16	Front Axle to A-Pillar Distance	495
17	A-Pillar to B-Pillar Distance	1034
18	B-Pillar to Rear Axle Distance	1090
19	B-Pillar to C-Pillar Distance	911
20	Roof Sill Bottom Height	1395
21	Roof Sill Top Height	1519
22	Floor Sill Bottom Height	251
23	Floor Sill Top Height	386

All measurements in millimeters.

DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV

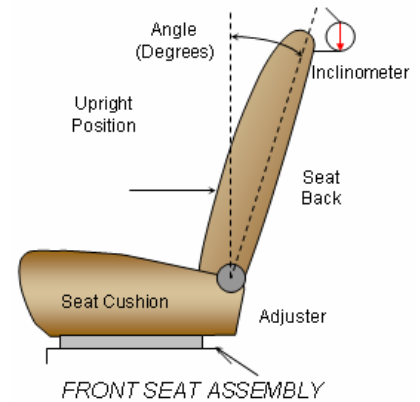
NHTSA No.: M20145503

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 01/27/14

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.

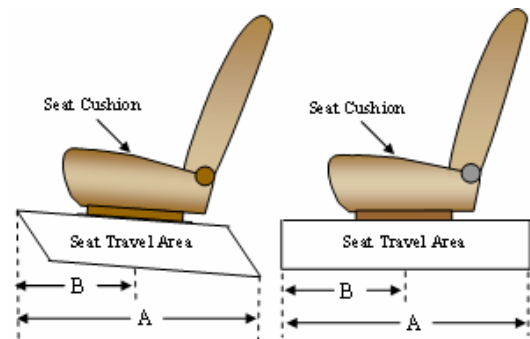


SEAT BACK ANGLE

Seating Position	Degrees
Driver Seat Back Angle	1.2
Passenger Seat Back Angle	3.8

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	278 mm	147 mm
Passenger Seat	240 mm	0 mm

SEAT BELT UPPER ANCHORAGE

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

SEAT BELT UPPER ANCHORAGES

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

DATA SHEET NO. 2 ... (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV

NHTSA No.: M20145503

Test Program: 56 km/h Frontal Impact NCAP Test

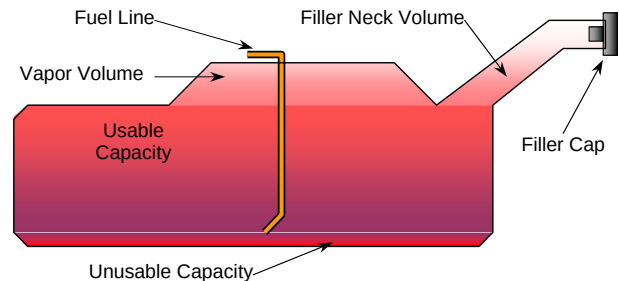
Test Date: 01/27/14

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	60.18
Usable Capacity of "Optional Tank"	
92 - 94% of Usable Capacity	55.37 to 56.57
Actual Amount of Stoddard Solvent Used	55.98
1/3 of Usable Capacity	20.06

FUEL PUMP

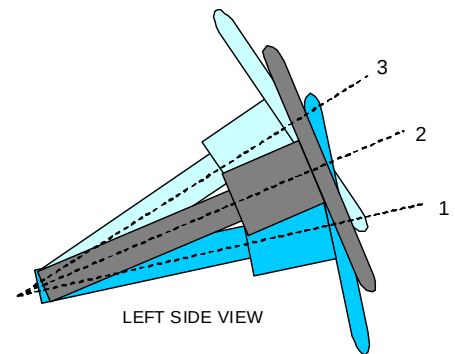
The vehicle is equipped with an electric fuel pump. The fuel pump operates for a few seconds after the ignition switch is turned "ON" and then operates only when the engine is running.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. A digital inclinometer is used to measure a plate which is placed across the rim of the steering wheel for angular measurements. A tape measure is used to measure telescoping steering wheel travel.



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONING

	Degrees	Fore-Aft Position (mm)
Lowermost Position, No. 1	22.0	118
Geometric Center Position, No. 2	23.5	137
Uppermost Position, No. 3	25.0	156
Telescoping Steering Wheel Travel		38
Test Position	23.5	137

DATA SHEET NO. 3

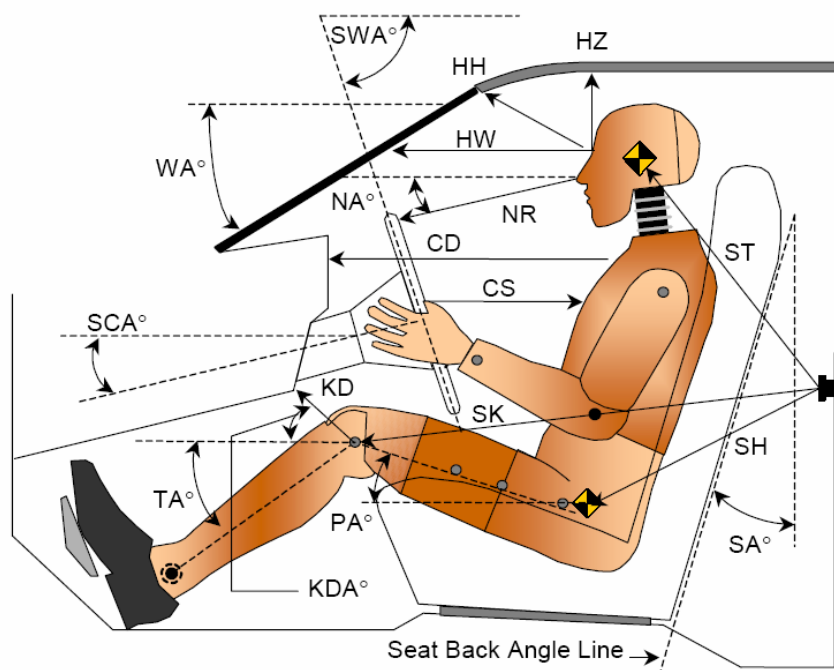
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV

NHTSA No.: M20145503

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 01/27/14



LEFT SIDE VIEW

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		24.5		
SWA°	Steering Wheel Angle		66.5		
SCA°	Steering Column Angle		23.5		
SA°	Seat Back Angle (On Headrest Post)		1.2		3.8
HZ	Head to Roof	225	90.0	228	90.0
HH	Head to Header	344	35.4	302	52.7
HW	Head to Windshield	651	0.0	665	0.0
NR	Nose to Rim	364	6.9	479	30.4
CD	Chest to Dash	522	11.8	415	13.8
CS	Chest to Steering Hub	282	0.0		
RA	Rim to Abdomen	179	0.0		
KDL	Left Knee to Dash	187	31.3	107	32.5
KDR	Right Knee to Dash	170	30.0	115	39.5
PA°	Pelvic Angle		24.7		19.4
TA°	Tibia Angle		40.0		47.0
SK	Striker to Knee	614	9.1	703	8.4
ST	Striker to Head	451	67.5	441	54.7
SH	Striker to H-Point	327	44.1	416	28.1

DATA SHEET NO. 4

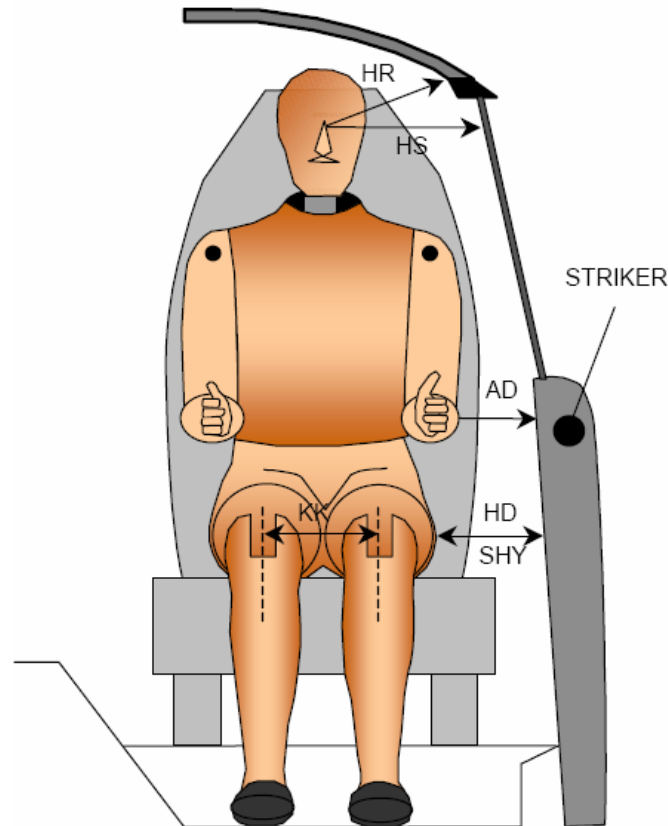
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV

NHTSA No.: M20145503

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 01/27/14



Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	111	92
HD	H-Point to Door	143	176
HR	Head to Side Header	252	276
HS	Head to Side Window	344	350
KK	Knee to Knee	315	225
SHY	Striker to H-Point (Y-Direction)	249	260
AA	Ankle to Ankle	283	160

DATA SHEET NO. 5

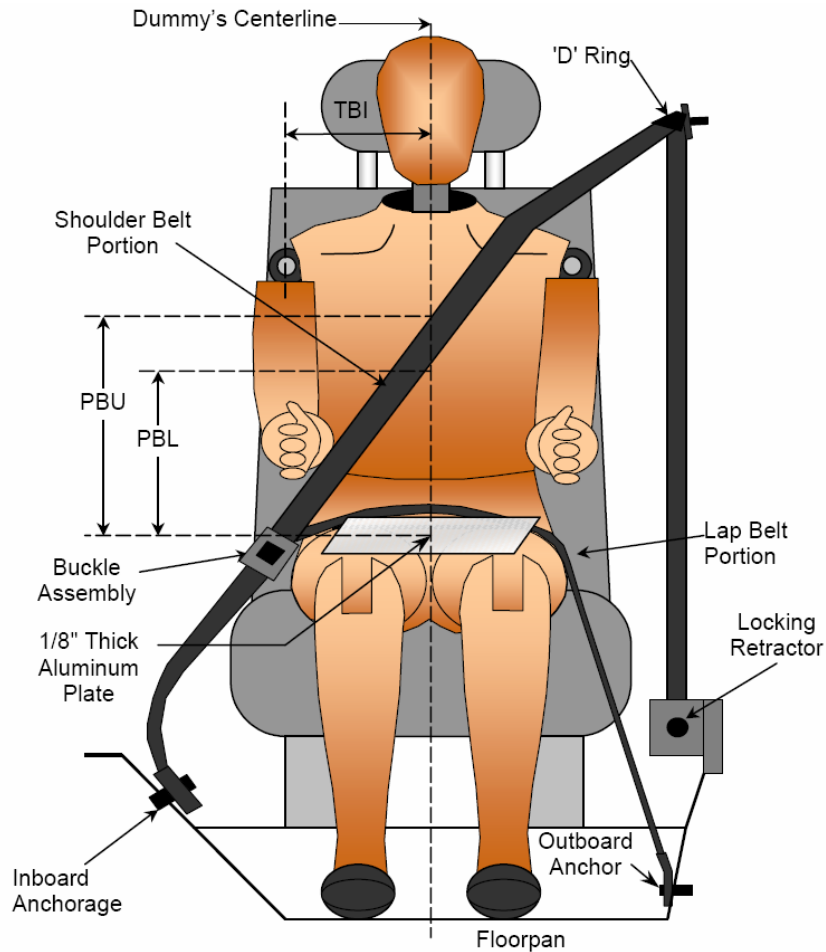
SEAT BELT POSITIONING DATA

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV

NHTSA No.: M20145503

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 01/27/14



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	315
PBL	Top Surface of Aluminum Plate to Belt Lower Edge	mm	275	233

BELT LENGTH DATA

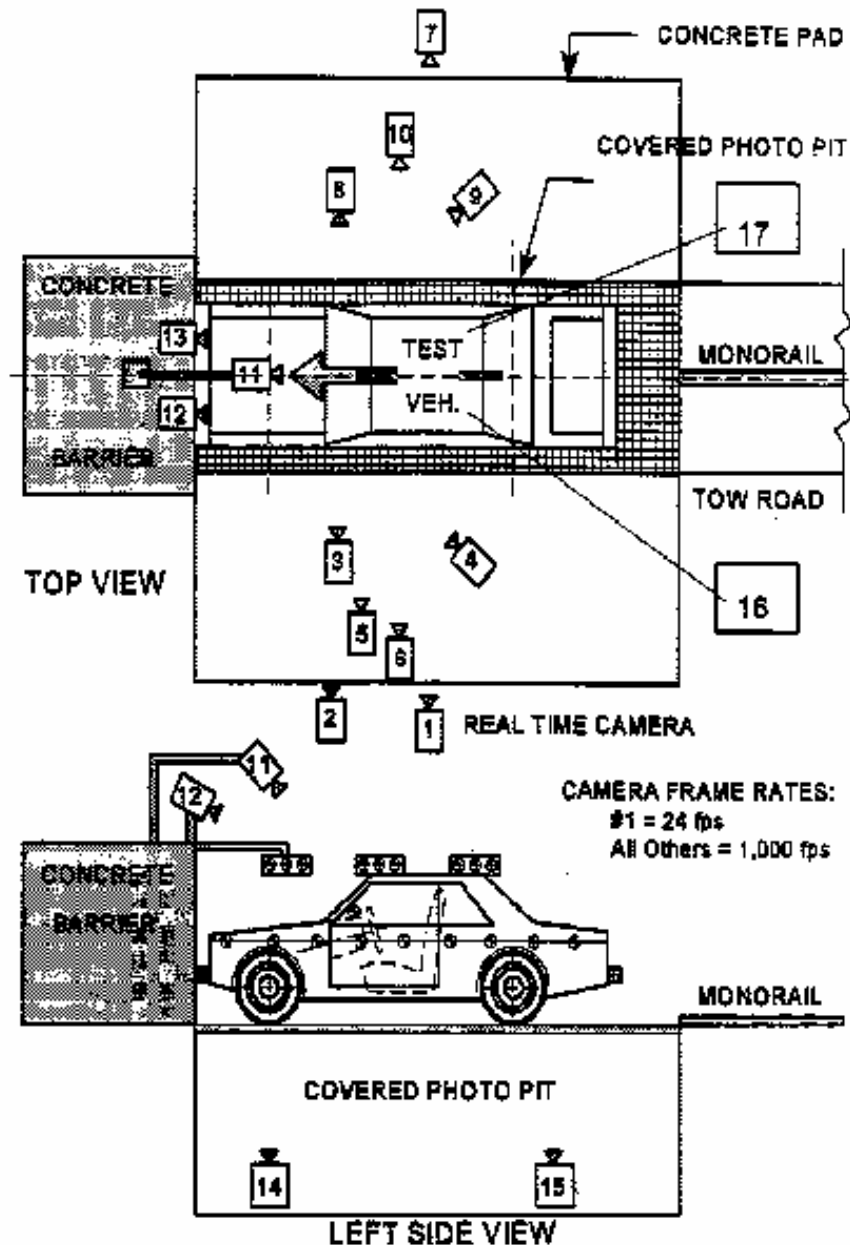
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as Measured on ATD	mm	863	987
Lap Belt Length as Measured on ATD	mm	715	708
Remainder of Belt on Reel	mm	883	647
Total Belt Length for Continuous Webbing Systems	mm	2461	2342

DATA SHEET NO. 6

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle:	2014 Subaru XV Crosstrek 5-Door MPV	NHTSA No.:	M20145503
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	01/27/14

CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 6 ... (CONTINUED)

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV NHTSA No.: M20145503
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 01/27/14

CAMERA LOCATIONS

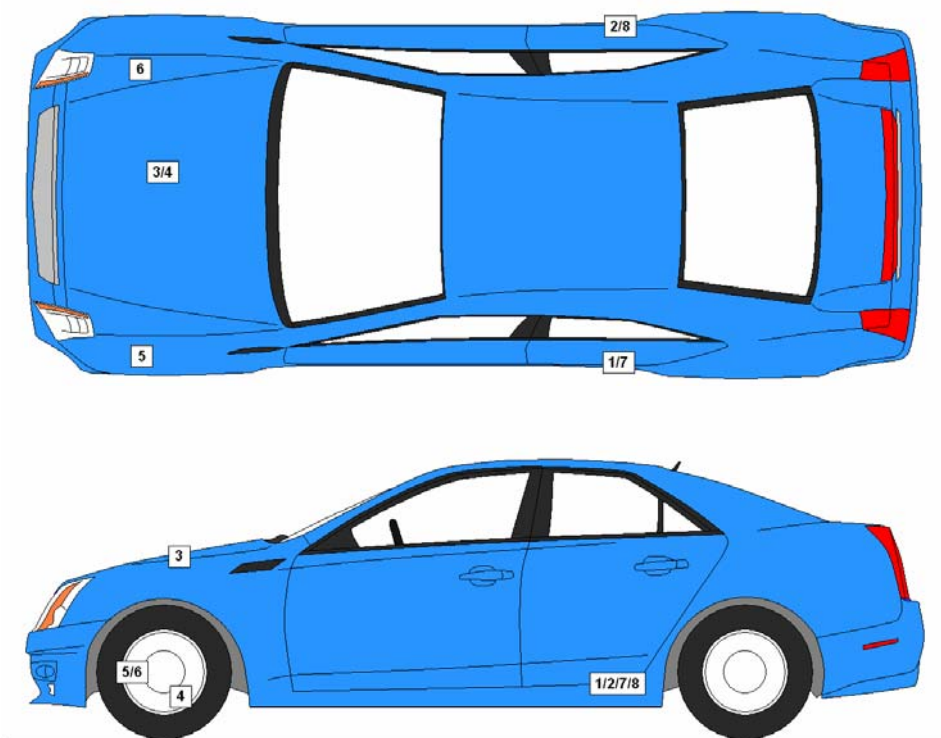
No.	Description	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	-11412	-8150	-1484		30
2	Driver Close-Up	-2590	-7950	-1371	24	1000
3	Left Front Half	-1701	-6197	-1701	50	1000
4	Left Angle	-6696	-10308	-3211	ZOOM	1000
5	Steering Column - Top	-1966	-10412	-3688	50	1000
6	Steering Column - Bottom	-1972	-10412	-3379	50	1000
7	Right Overall	-2336	7569	-1012	24	1000
8	Passenger Close-Up	-1733	7581	-1408	50	1000
9	Right Front Half	-1600	8214	-1811	ZOOM	1000
10	Right Angle	-6217	9516	-4830	ZOOM	1000
11	Windshield	-354	0	-5749	12	1000
12	Driver Windshield	297	-366	-2460	12	1000
13	Passenger Windshield	297	366	-2460	24	1000
14	Pit Front	-756	0	1495	12	1000
15	Pit Rear	-3398	0	1495	8	1000
16	Onboard Driver Airbag (Optional)	-1420	200	-1410	12	1000
17	Onboard Passenger Airbag (Optional)	-1420	-200	-1410	12	1000
18	Real-Time Left View of Impact					
19	Real-Time Right View of Impact					

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

DATA SHEET NO. 7

VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV NHTSA No.: M20145503
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 01/27/14



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Description	Location		
		X	Y	Z
1	Left Rear Accelerometer X-Direction	1773	-703	-433
2	Right Rear Accelerometer X-Direction	1773	703	-433
3	Engine Top X	3887	0	-702
4	Engine Bottom X	3790	0	-258
5	Left Rear Accelerometer Z-Direction	1773	-703	-433
6	Right Rear Accelerometer Z-Direction	1773	703	-433

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

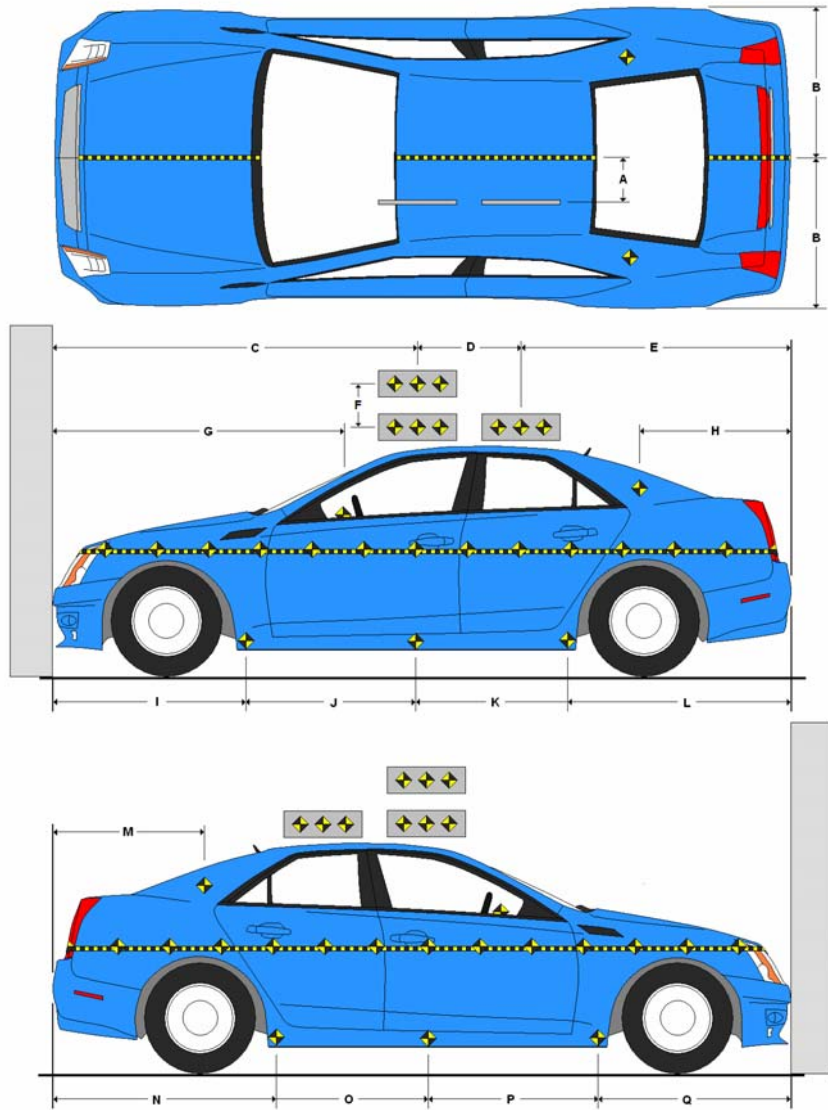
Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV

NHTSA No.: M20145503

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 01/27/14

Item	Value
A	348
B	888
C	2330
D	310
E	1511
F	305
G	1717
H	471
I	1480
J	835
K	835
L	1295
M	497
N	1285
O	836
P	836
Q	1484



All measurements in millimeters.

DATA SHEET NO. 9

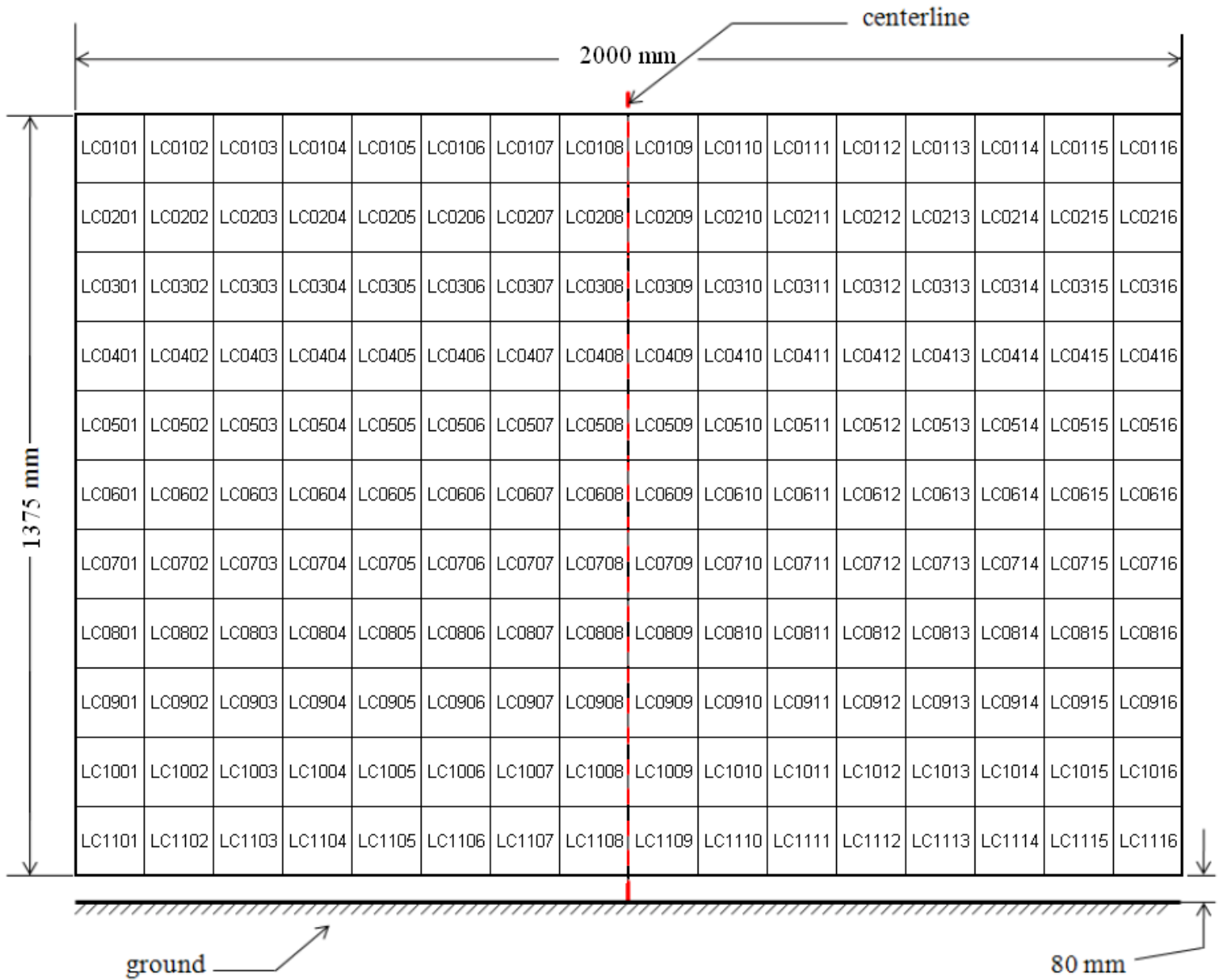
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV

NHTSA No.: M20145503

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 01/27/14



DATA SHEET NO. 10

TEST VEHICLE CAMERA AND INSTRUMENTATION SUMMARY

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV NHTSA No.: M20145503
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 01/27/14

INSTRUMENTATION

Driver Dummy Accelerometers	50
Passenger Dummy Accelerometers	50
Vehicle Structure Accelerometers	6
Seat Belt Load Cells	3
Load Cell Barrier	528
Total	637

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: 2014 Subaru XV Crosstrek 5-Door MPV NHTSA No.: M20145503
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 01/27/14

TEST DUMMY INFORMATION AND CONTACT

Description	Driver	Passenger
Dummy Type/Serial No.	P572E 50th Percentile Male ATD / 034	P572O 5th Percentile Female ATD / 635
Head Contact	Airbag, Headrest	Airbag, Headrest
Upper Torso Contact	Airbag	Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Airbag	Glovebox
Right Knee Contact	Knee Airbag	Glovebox

DOOR OPENING AND SEAT TRACK INFORMATION

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

POST TEST STRUCTURAL OBSERVATIONS

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

VEHICLE REBOUND FROM BARRIER

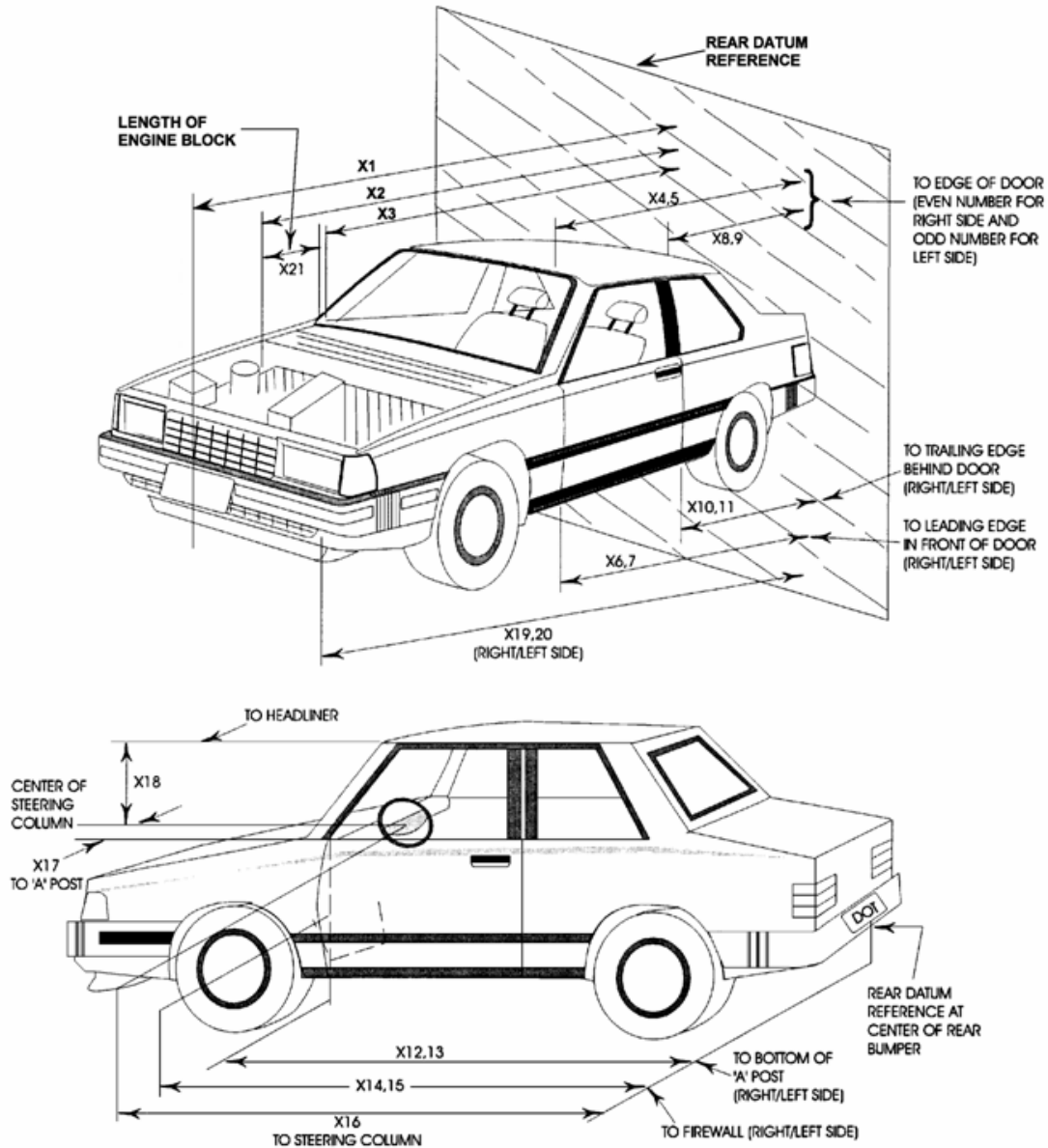
Measured Parameter	Units	Value
Left Side	mm	1743
Center	mm	1803
Right Side	mm	1706
Average	mm	1751

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

DATA SHEET NO. 12
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV NHTSA No.: M20145503
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 01/27/14

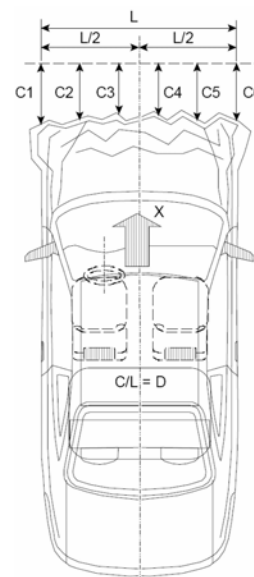


DATA SHEET NO. 12 ... (CONTINUED)**VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV NHTSA No.: M20145503
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 01/27/14

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4455	3910	-545
2	Rear Surface of Vehicle to Front of Engine	3969	3655	-314
3	RSOV to Firewall	3293	3250	-43
4	RSOV to Upper Leading Edge of Right Door	3031	2995	-36
5	RSOV to Upper Leading Edge of Left Door	3025	2978	-47
6	RSOV to Lower Leading Edge of Right Door	2986	2960	-26
7	RSOV to Lower Leading Edge of Left Door	2986	2954	-32
8	RSOV to Upper Trailing Edge of Right Door	1887	1882	-5
9	RSOV to Upper Trailing Edge of Left Door	1883	1878	-5
10	RSOV to Lower Trailing Edge of Right Door	1917	1900	-17
11	RSOV to Lower Trailing Edge of Left Door	1915	1895	-20
12	RSOV to Bottom of A-Pillar, Right Side	2992	2966	-26
13	RSOV to Bottom of A-Pillar, Left Side	2988	2957	-31
14	RSOV to Firewall, Right Side	3237	3215	-22
15	RSOV to Firewall, Left Side	3310	3245	-65
16	RSOV to Steering Column	2490	2560	70
17	Center of Steering Column to A-Pillar	420	430	10
18	Center of Steering Column to Headliner	430	500	70
19	RSOV to Right Side of Front Bumper	3806	3925	119
20	RSOV to Left Side of Front Bumper	3809	3725	-84
21	Length of Engine Block	570	570	0
RD	RSOV to Right Side of Dash Panel	2725	2700	-25
CD	RSOV to Center of Dash Panel	2685	2586	-99
LD	RSOV to Left Side of Dash Panel	2730	2796	66

All measurements in millimeters.

DATA SHEET NO. 13**ACCIDENT INVESTIGATION DATA**Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPVNHTSA No.: M20145503Test Program: 56 km/h Frontal Impact NCAP TestTest Date: 01/27/14**VEHICLE INFORMATION**VIN: JF2GPACC5E9214850Wheelbase (mm): 2652Vehicle Size Category: 5-Door MPVTest Weight (kg): 1615.5**ACCELEROMETER DATA**Accelerometer Locations: Left Rear CrossmemberCal. Procedure/Interval: Drop Test / 6 monthsIntegration Algorithm: NHTSA StandardImpact Velocity (km/h): 56.11Velocity Change (km/h): 63.0Time of Separation (msec): 69.5Linearity: Good**CRUSH PROFILE**Collision Deformation Classification: 12FDEW3Midpoint of Damage: Vehicle CenterlineDamage Region Length (mm): 1445Impact Mode: Full Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	225	560	335
C2	Crush Zone 2 at Left Side	mm	45	597	552
C3	Crush Zone 3 at Left Side	mm	3	625	622
C4	Crush Zone 4 at Right Side	mm	3	590	587
C5	Crush Zone 5 at Right Side	mm	45	595	550
C6	Crush Zone 6 at Right Side	mm	225	483	258
L	C1 to C6	mm	1445		

DATA SHEET NO. 14

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV

NHTSA No.: M20145503

Test Program: 56 km/h Frontal Impact NCAP Test

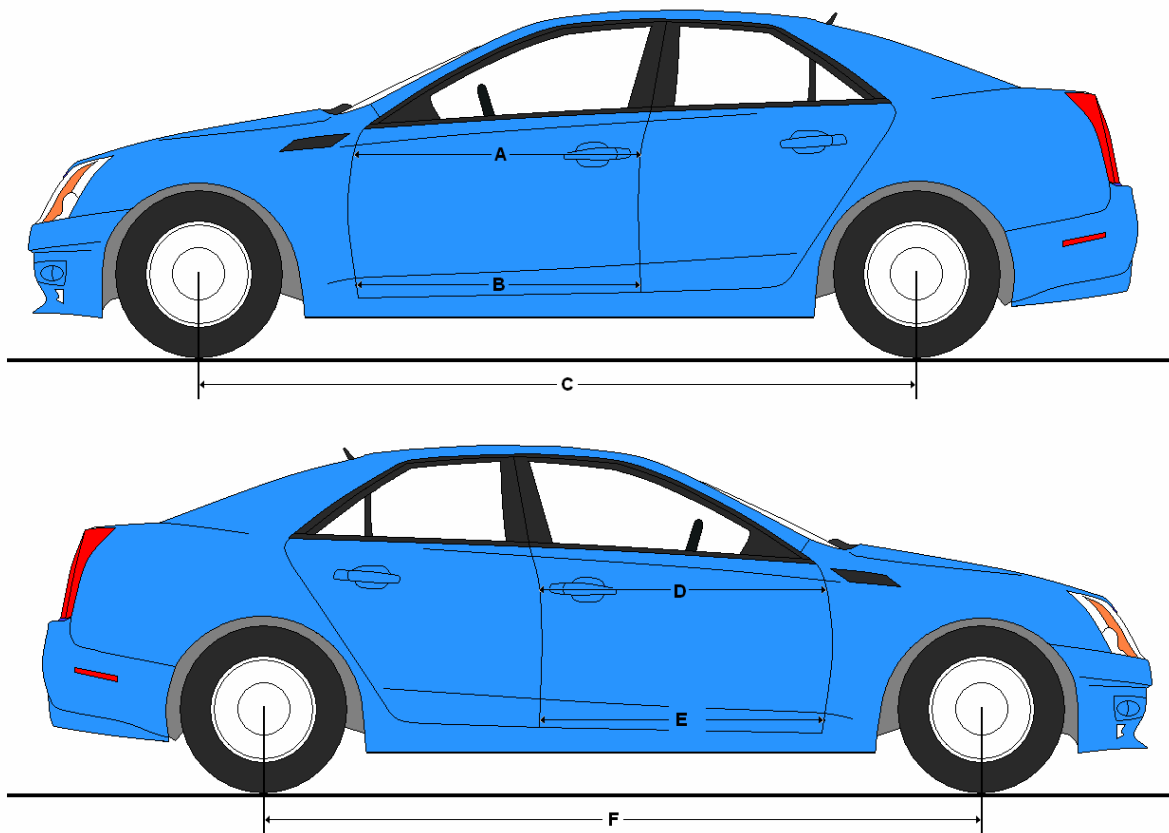
Test Date: 01/27/14

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1034	1031	3
B	Left Side Lower	mm	911	896	15
D	Right Side Upper	mm	1032	1034	-2
E	Right Side Lower	mm	911	902	9

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2652	2620	32
F	Right Side Wheelbase	mm	2652	2630	22



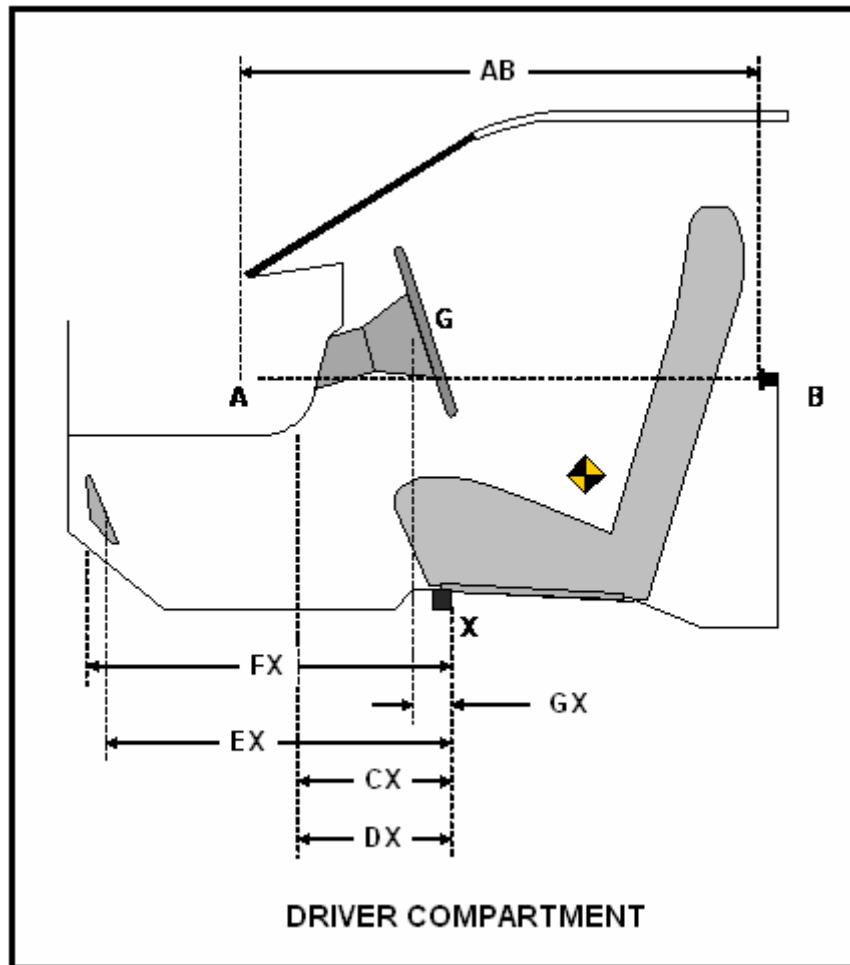
DATA SHEET NO. 14 ... (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV NHTSA No.: M20145503
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 01/27/14

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	986	981	5
CX	Left Knee Bolster to X	mm	300	380	-80
DX	Right Knee Bolster to X	mm	295	365	-70
EX	Brake Pedal to X	mm	560	510	50
FX	Foot Rest to X	mm	570	555	15
GX	Center of Steering Wheel Hub to X	mm	30	130	-100

X = Front of Seat Track (Stationary)



DATA SHEET NO. 15

SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV NHTSA No.: M20145503

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 01/27/14

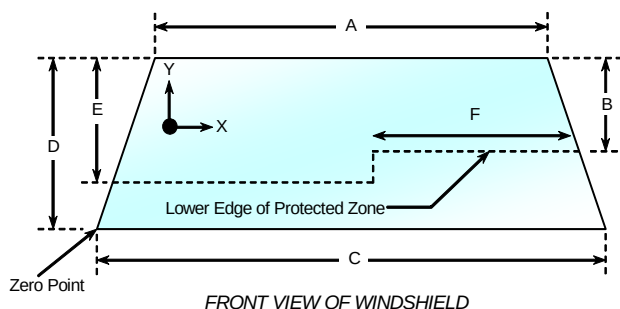
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with plastic molding and rubber cement.

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: 21.2° C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2295	2295	100.0%
Right Side	2295	2295	100.0%
Total	4590	4590	100.0%



Item	Units	Value
A	mm	1214
B	mm	411
C	mm	1417
D	mm	979
E	mm	580
F	mm	380

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, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV NHTSA No.: M20145503
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 01/27/14

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 22.2° C Test Time: 1:08 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

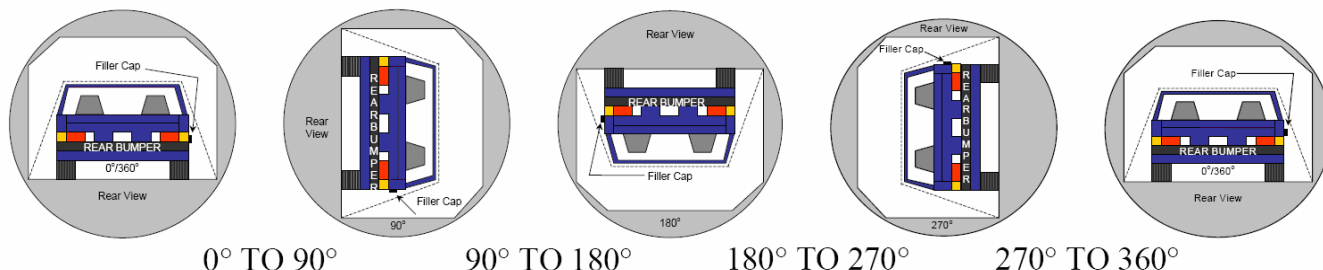
FMVSS 301 STATIC ROLLOVER

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV

NHTSA No.: M20145503

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 01/27/14



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°	85	300	385
90° To 180°	80	300	380
180° To 270°	79	300	379
270° To 360°	83	300	383

FMVSS 301 SPILLAGE TABLE

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

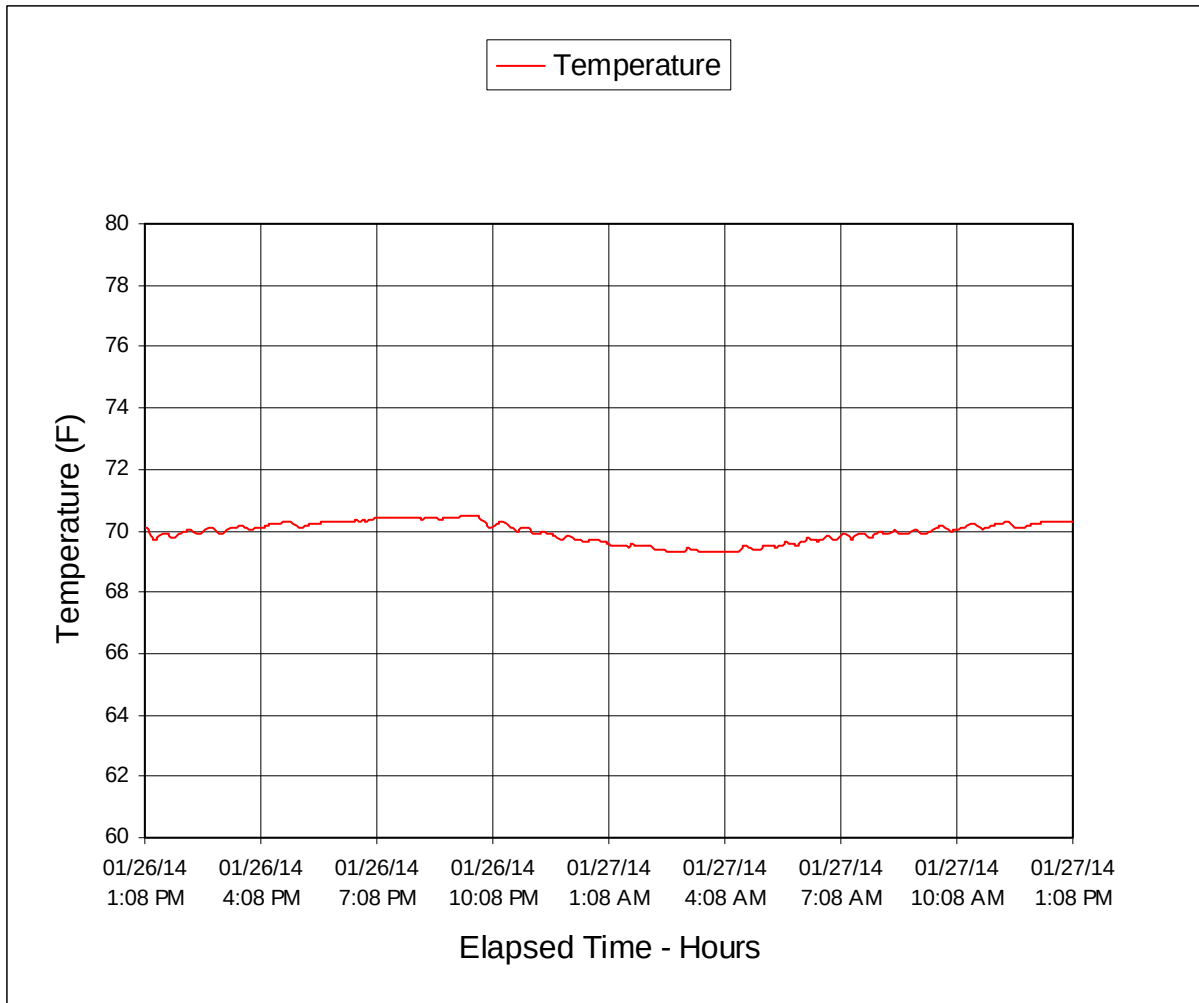
SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 17

DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV NHTSA No.: M20145503
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 01/27/14



APPENDIX A
PHOTOGRAPHS

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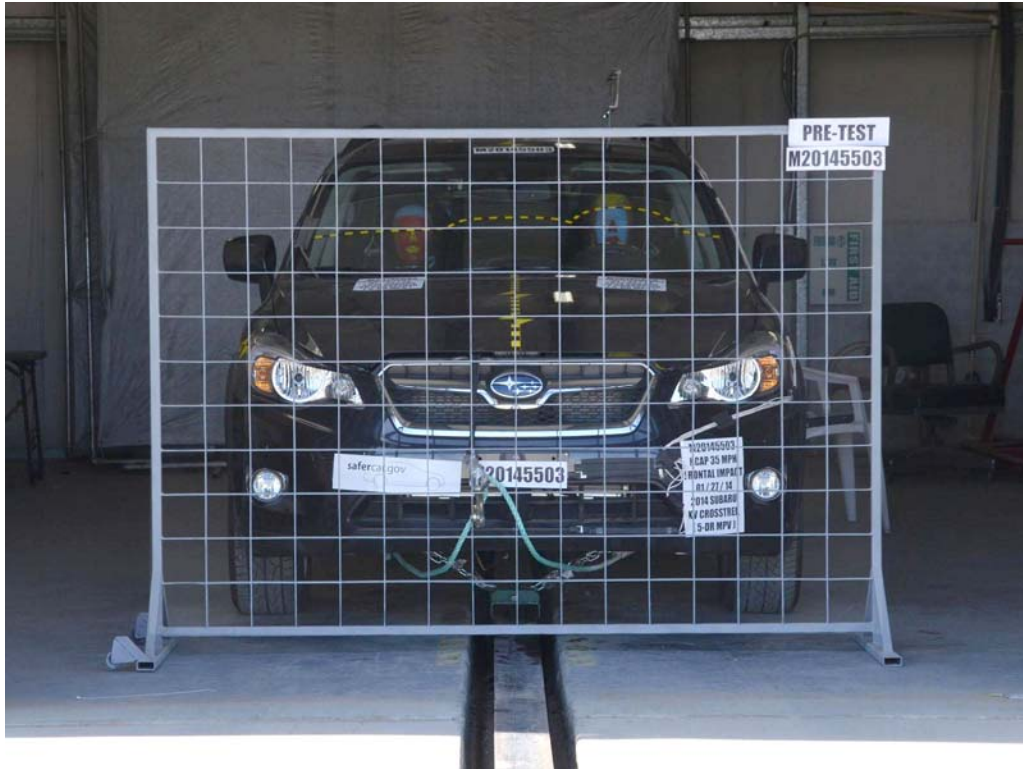


FIGURE 1. Load Cell Location



FIGURE 2. Load Cell Wall



FIGURE 3. Manufacturer's Label



FIGURE 4. Tire Placard



FIGURE 5. 2014 Subaru XV Crosstrek Frontal as Delivered



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



FIGURE 7. Pre-Test Front View of Test Vehicle

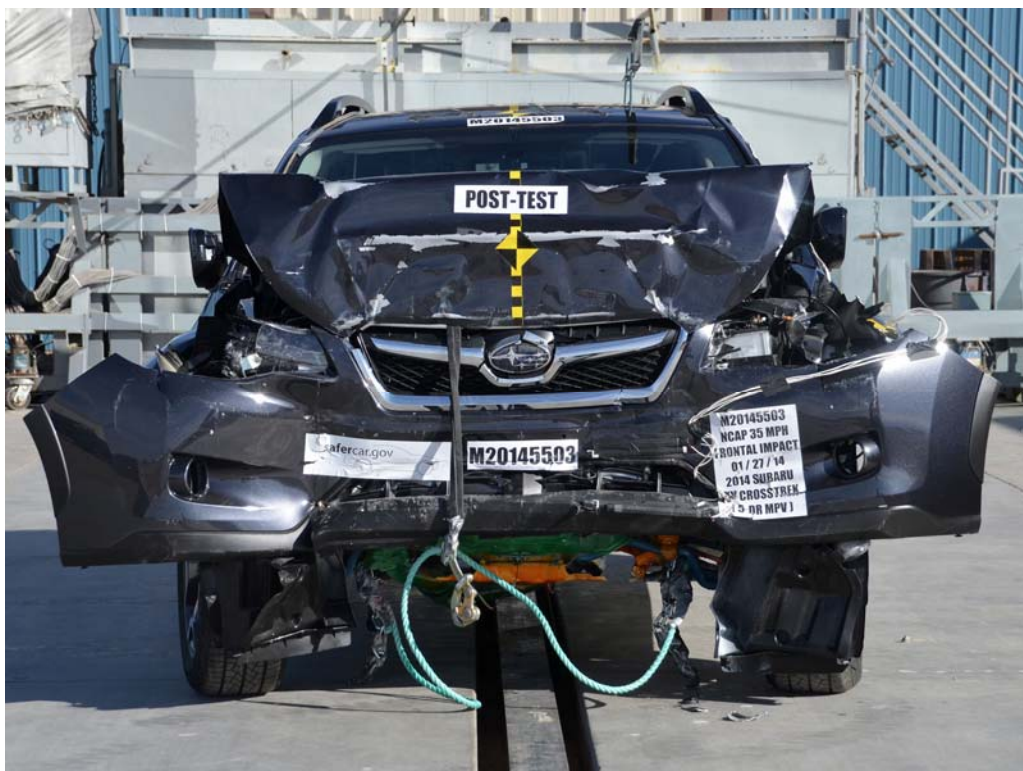


FIGURE 8. Post-Test Front View of Test Vehicle



FIGURE 9. Pre-Test Left View of Test Vehicle



FIGURE 10. Post-Test Left View of Test Vehicle



FIGURE 11. Pre-Test Right View of Test Vehicle

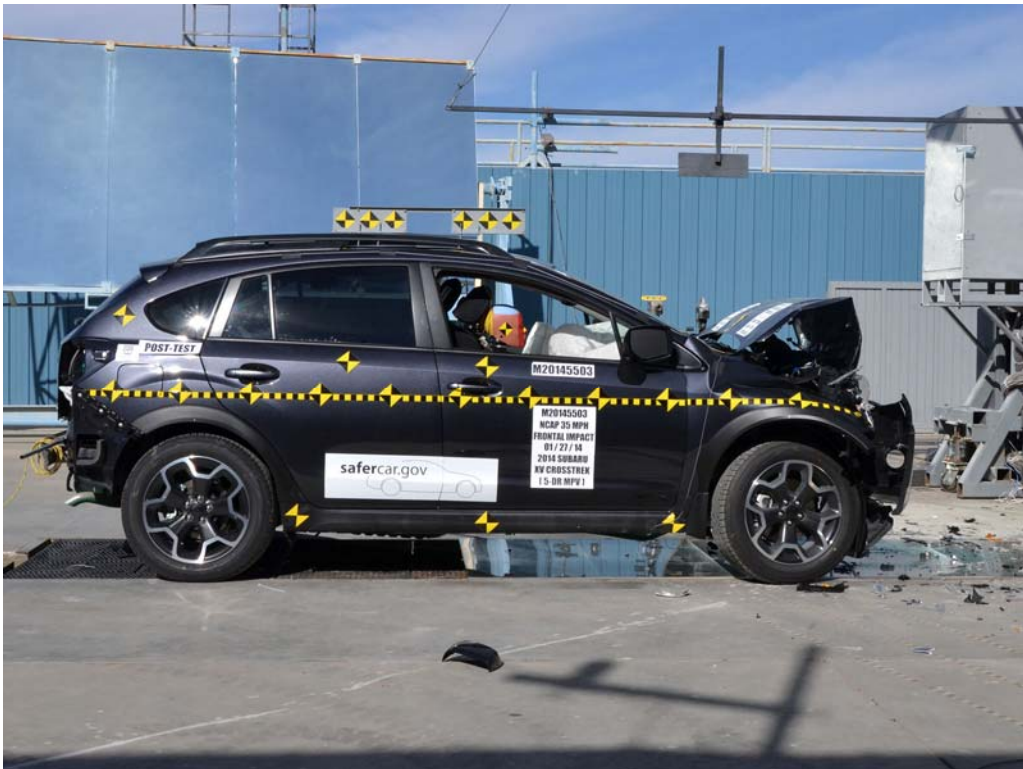


FIGURE 12. Post-Test Right View of Test Vehicle



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



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



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



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

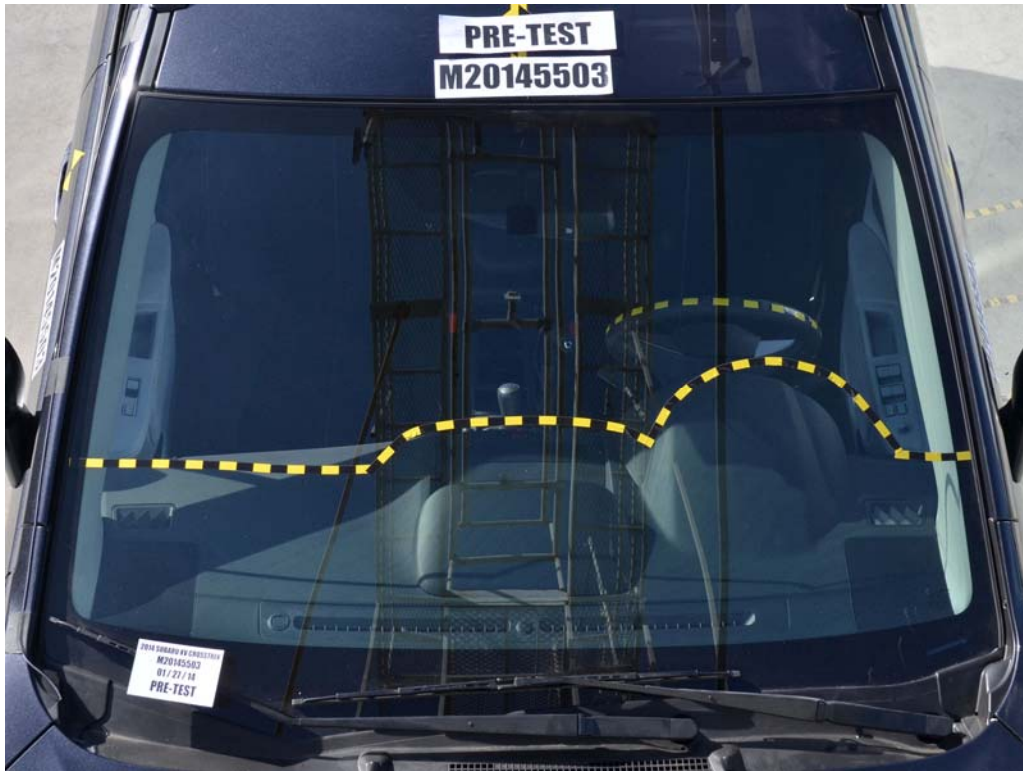


FIGURE 17. Pre-Test Windshield View



FIGURE 18. Post-Test Windshield View



FIGURE 19. Pre-Test Engine Compartment View



FIGURE 20. Post-Test Engine Compartment View



FIGURE 21. Pre-Test Fuel Filler Cap View



FIGURE 22. Post-Test Fuel Filler Cap View

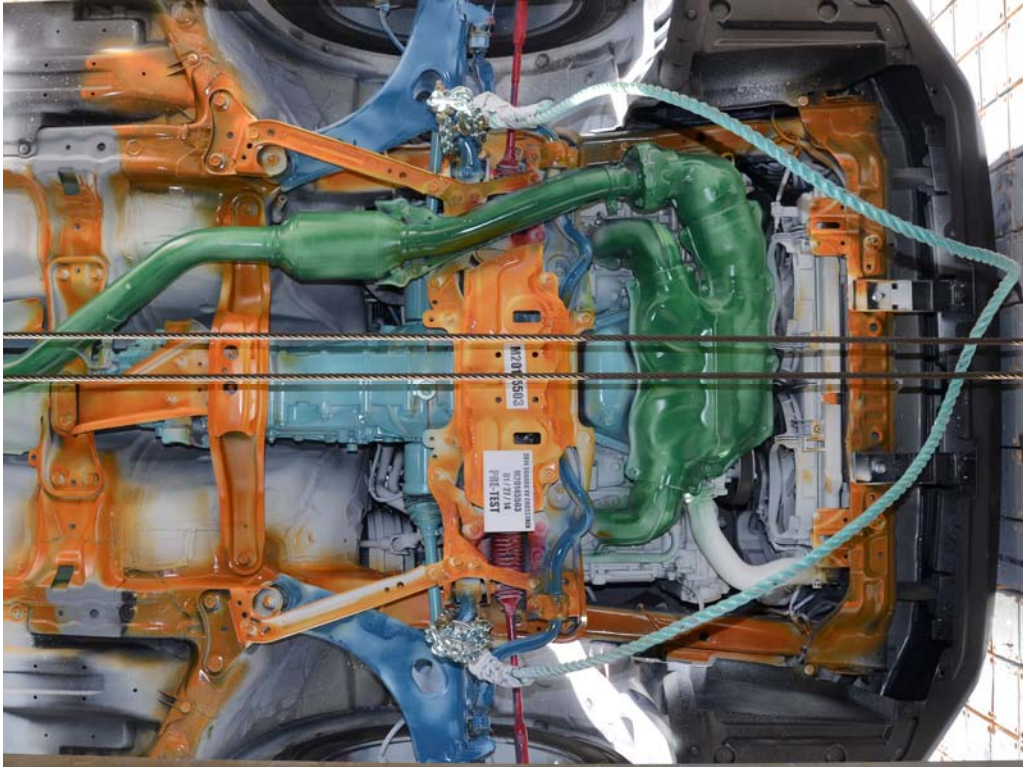


FIGURE 23. Pre-Test Front Underbody View



FIGURE 24. Post-Test Front Underbody View

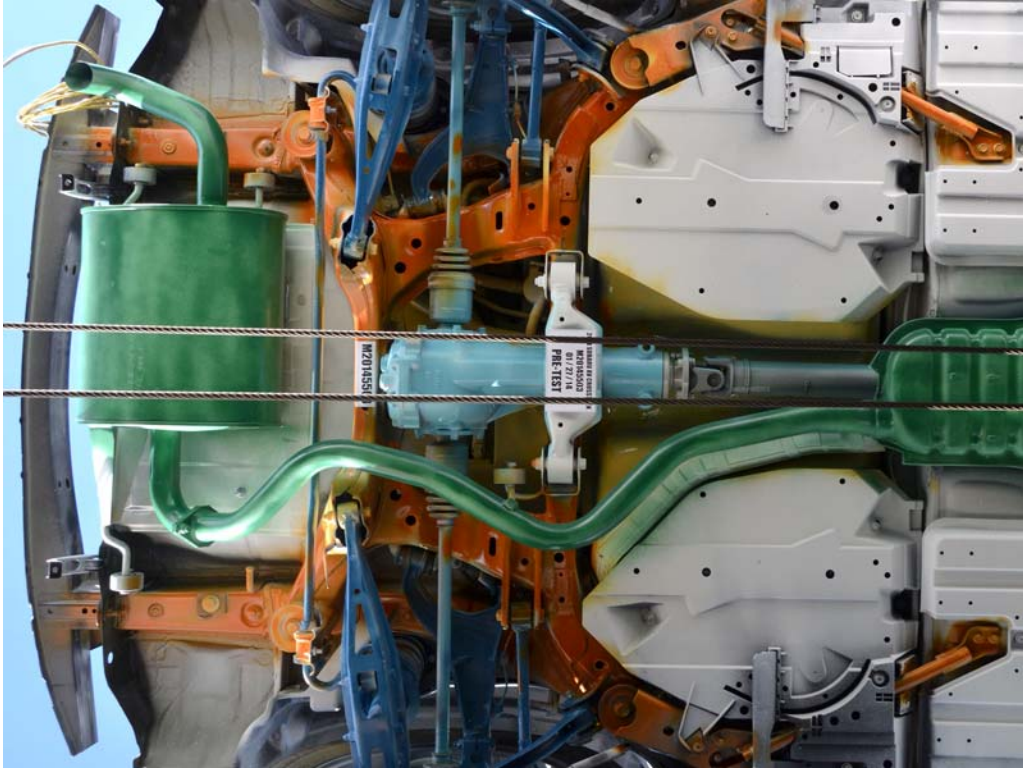


FIGURE 25. Pre-Test Rear Underbody View

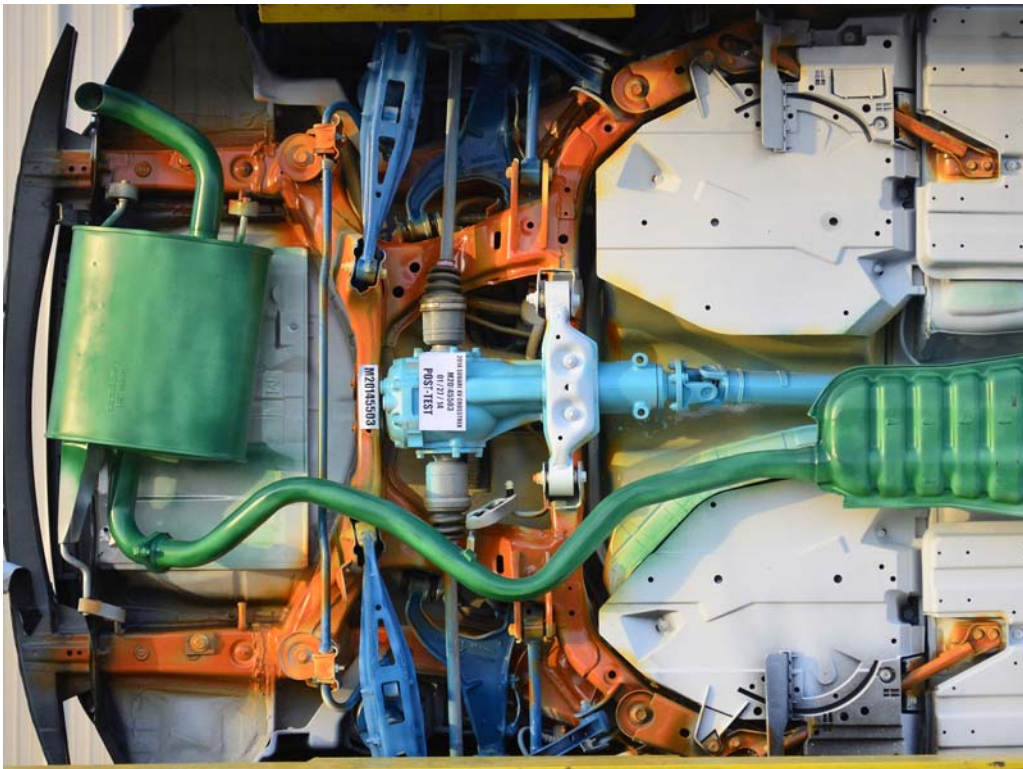


FIGURE 26. Post-Test Rear Underbody View



FIGURE 27. Pre-Test Dummy Cable Routing

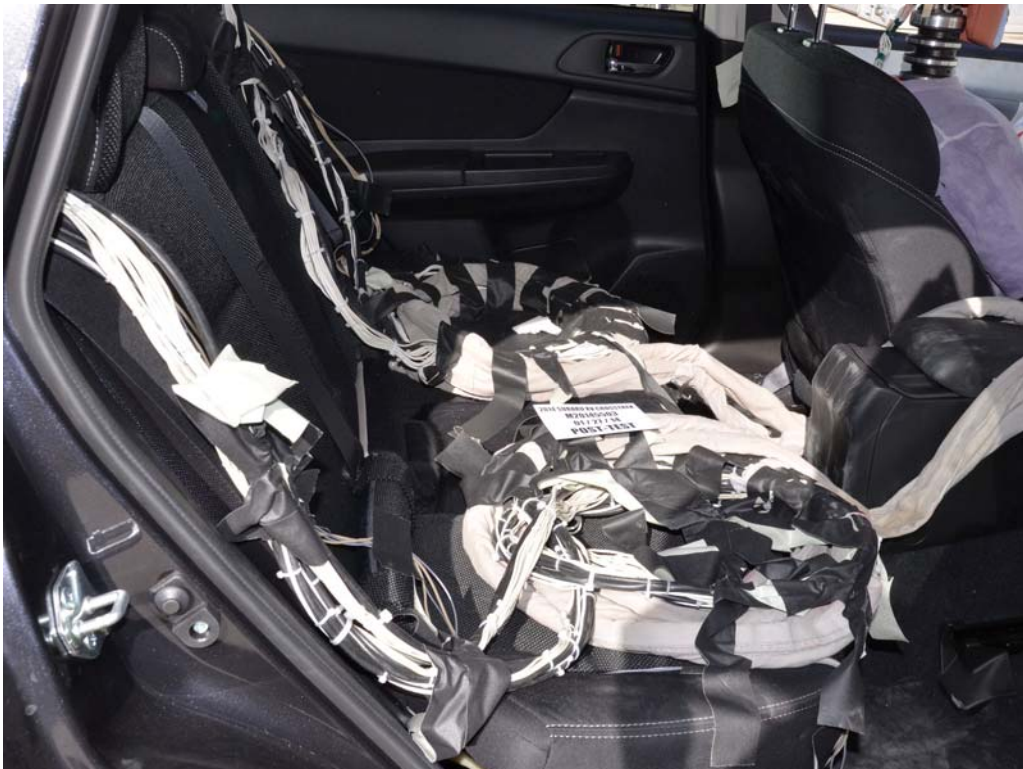


FIGURE 28. Post-Test Dummy Cable Routing

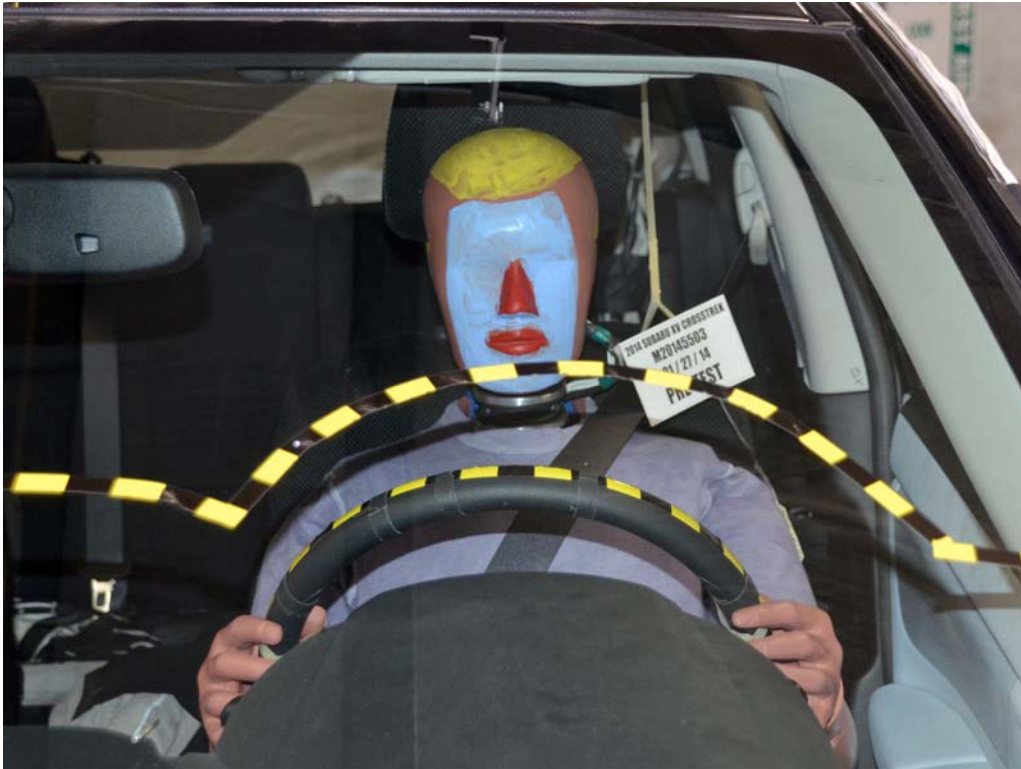


FIGURE 29. Pre-Test Driver Dummy Front View



FIGURE 30. Post-Test Driver Dummy Front View

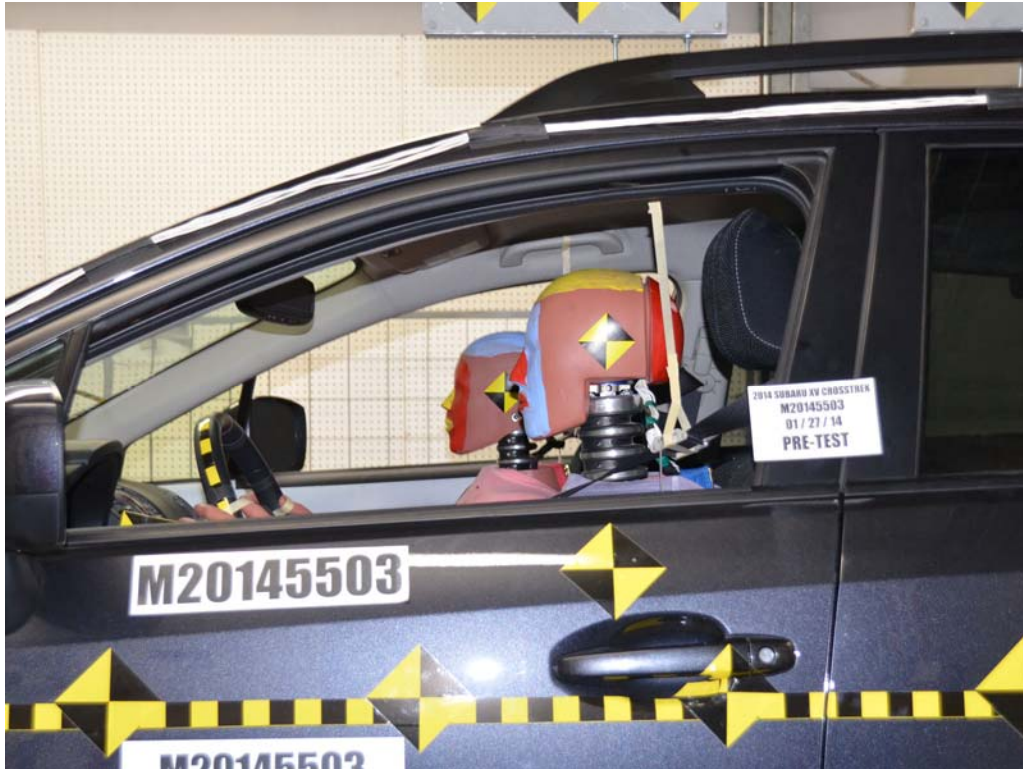


FIGURE 31. Pre-Test Driver Dummy Window View



FIGURE 32. Post-Test Driver Dummy Window View



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



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



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



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



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



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



FIGURE 39. Pre-Test Driver Dummy Feet



FIGURE 40. Post-Test Driver Dummy Feet



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



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



FIGURE 43. Pre-Test Driver's Side Floorpan



FIGURE 44. Post-Test Driver's Side Floorpan



FIGURE 45. Post-Test Driver Dummy Face

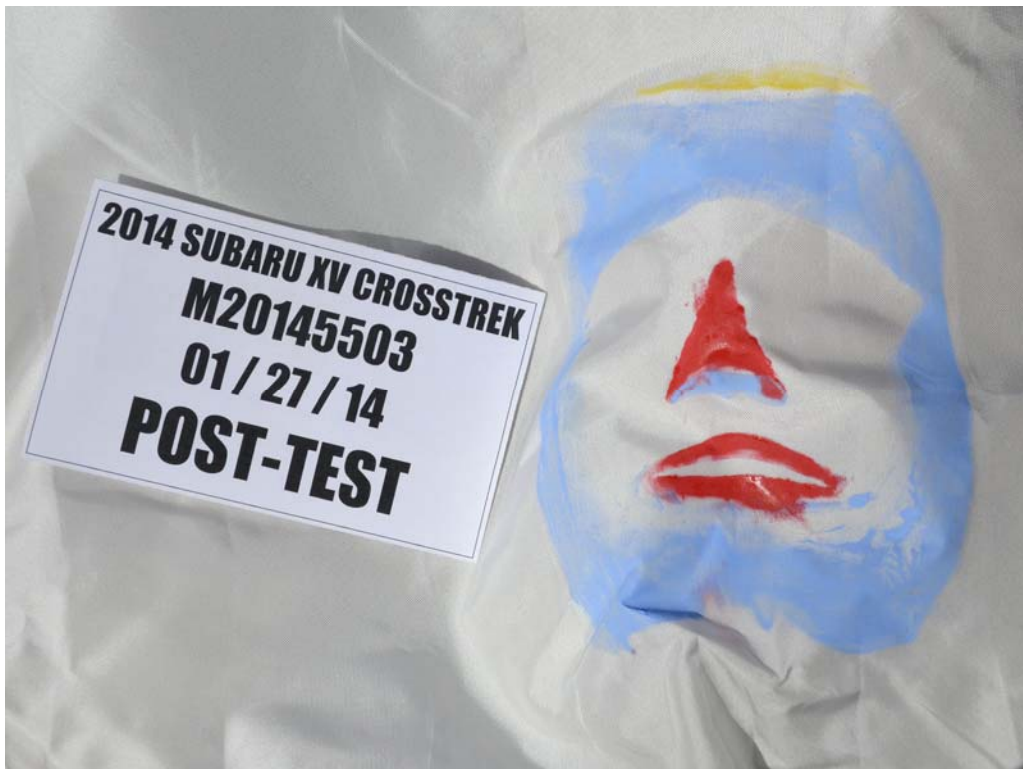


FIGURE 46. Post-Test Driver Dummy Contact with Airbag



FIGURE 47. Post-Test Driver Dummy Contact with Headrest



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



FIGURE 48. Pre-Test View of the Steering Wheel



FIGURE 49. Post-Test View of the Steering Wheel



FIGURE 50. Pre-Test Passenger Dummy Front View



FIGURE 51. Post-Test Passenger Dummy Front View



FIGURE 52. Pre-Test Passenger Dummy Window View



FIGURE 53. Post-Test Passenger Dummy Window View



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



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



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



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



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



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



FIGURE 60. Pre-Test Passenger Dummy Feet



FIGURE 61. Post-Test Passenger Dummy Feet

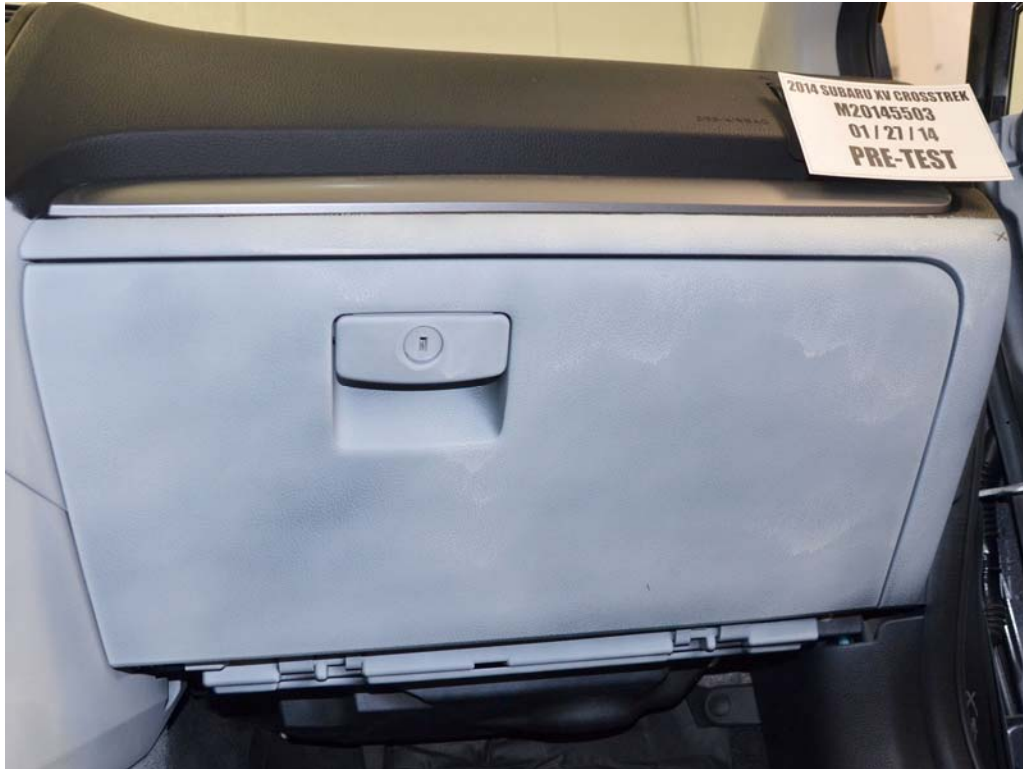


FIGURE 62. Pre-Test Passenger's Side Knee Bolster



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



FIGURE 64. Pre-Test Passenger's Side Floorpan



FIGURE 65. Post-Test Passenger's Side Floorpan



FIGURE 66. Post-Test Passenger Dummy's Face



FIGURE 67. Post-Test Passenger Dummy Contact with Airbag



FIGURE 68. Post-Test Passenger Dummy Contact with Headrest



FIGURE 68a. Post-Test Passenger Dummy Contact with Glovebox



FIGURE 69. Photograph of Ballast Installed in Vehicle

Photograph Not Applicable

No Stoddard
Solvent Spillage

FIGURE 70. Post-Test Stoddard Solvent Spillage Location View



FIGURE 71. Post-Test Speed Trap Read-Out



FIGURE 72. Vehicle at 0° on Static Rollover Device



FIGURE 73. Vehicle at 90° on Static Rollover Device



FIGURE 74. Vehicle at 180° on Static Rollover Device

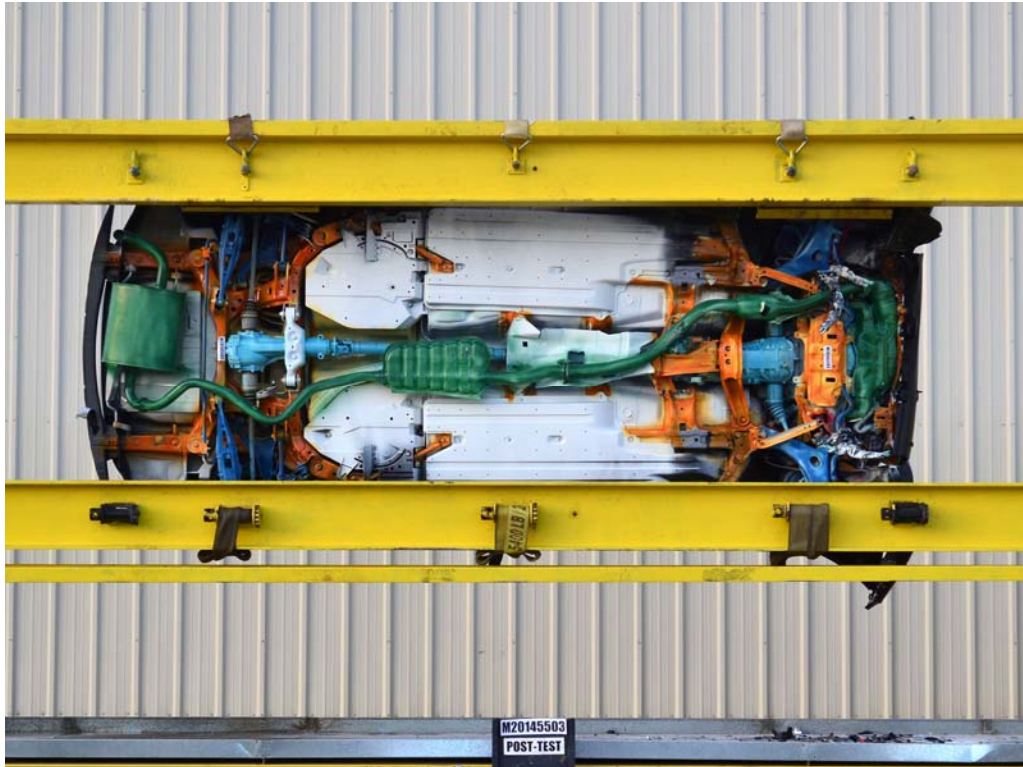


FIGURE 75. Vehicle at 270° on Static Rollover Device

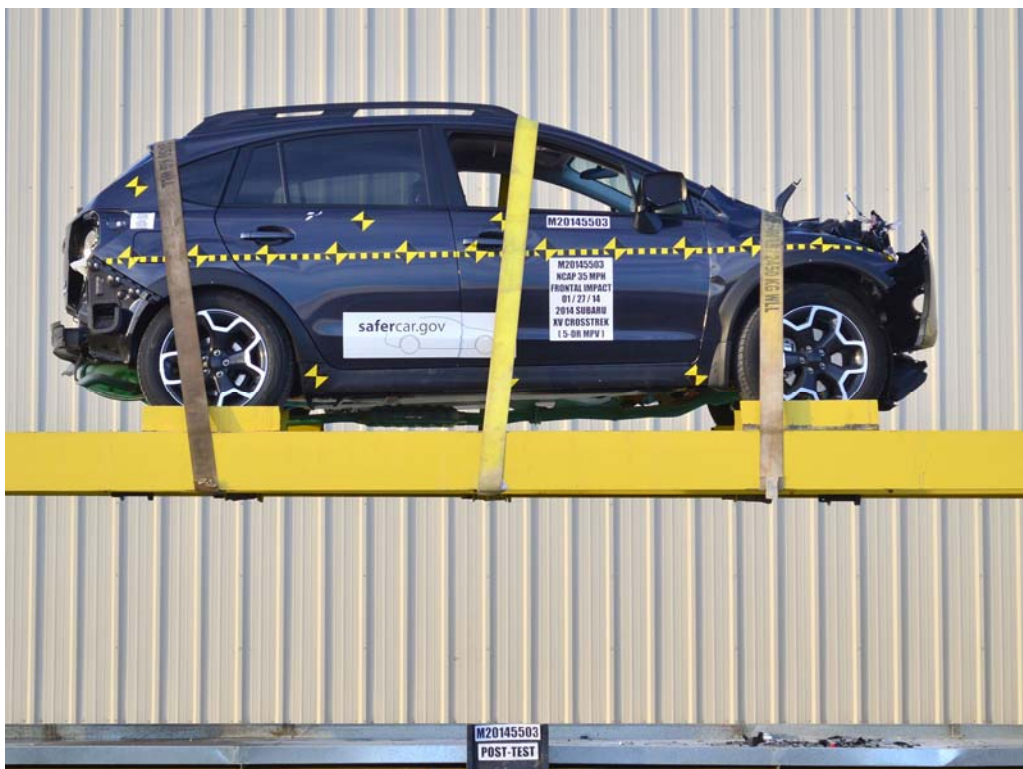


FIGURE 76. Vehicle at 360° on Static Rollover Device



FIGURE 77. 2014 Subaru XV Crosstrek Frontal Impact Event

VIN: JF2GPACCE9214850
Model Code: 2014 Subaru XV Crosstrek 2.0i
Exterior Color: Premium Blue Pearl
Port / Assembly: Richmond
Dealer by / Owner: Truck 403

SHIP TO: 090796
SUBARU OF GLENDALE
1235 S BRAND BLVD
GLENDALE, CA 91204

SOLD TO: 090796
SUBARU OF GLENDALE
1235 S BRAND BLVD
GLENDALE, CA 91204

Confidence in Motion

STANDARD EQUIPMENT

SAFETY
Symmetrical All-Wheel Drive (AWD)
Vehicle Dynamics Control (VDC)
Subaru Advanced Frontal Air Bag System
Front Side-Impact Airbags
Side-Curtain Airbags w/ Roll-over Sensor
Driver's Side Knee Airbag
4-Wheel Disc Brakes w/ Brake Assist
Anti-Lock Braking System (ABS)
Electronic Brake-Force Distribution
Tire Pressure Monitoring System (TPMS)
Anti-Theft Alarm & Immobilizer System
Daytime Running Lights (DRL)

PERFORMANCE AND EXTERIOR
2.0L Horizontally-Opposed DOHC Engine
Fully Independent Raised Suspension
Roof Rails & Front Fog Lights
Wheels: 17-inch Aluminum-Alloy
Privacy Glass
Intermittent Front/Rear Wipers
COMFORT, CONVENIENCE AND INTERIOR
Air Conditioning w/ Air Filtration System
AM/FM/CD Audio System w/ Aux Input Jack
Steering Wheel Mounted Audio Controls

Bluetooth Hands-Free Phone Connectivity
USB Port with iPod Connectivity
Cruise Control, TR TeleSelect Shifting
Power Door Locks & Dual Power Mirrors
Remote Keyless Entry System
Power Windows w/ Driver's Auto Up/Down
Height Adjustable Driver's Seat
TR-Adjustable Front Seat Headrests
Multi-Function Trip Computer
60/40 Split Fold-Down Rear Seatback
All-Weather Package w/ Heated Front Seats

OPTIONAL EQUIPMENT AND OTHER ITEMS

Manufacturer's Suggested Retail Price \$21,995.00
Option Package: 01 - STANDARD PACKAGE
Full Tank of Gas
Popular Package #2
Seat Back Protector
Auto. Dim Mirror/Compass/Homelink
All Weather Floor Mats
Rear Bumper Cover
Splash Guard

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score Not Rated
Based on the combined ratings of frontal, side and rollover.
Should ONLY be compared to other vehicles of similar size and weight.

Frontal	Driver	Not Rated
Crash	Passenger	Not Rated
Side	Front seat	Not Rated
Crash	Rear seat	Not Rated
Rollover		Not Rated

Star ratings range from 1 to 5 stars (★★★★★) with 5 being the highest.
Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

Fuel Economy and Environment

Fuel Economy
26 MPG
combined city/hwy
3.8 gallons per 100 miles

Annual fuel cost
\$2,000

Fuel Economy & Greenhouse Gas Rating
Smog Rating: 7
This vehicle emits 261 grams CO₂ per mile. The best emits 16 grams per mile (city/combined only). Producing and delivering fuel also creates emissions. See EPA.gov for more info.

Actual results may vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 23 MPG and costs \$11,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.50 per gallon. MPGe is miles per gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuel economy.gov
Calculate personalized estimates for multiple vehicles

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score Not Rated
Based on the combined ratings of frontal, side and rollover.
Should ONLY be compared to other vehicles of similar size and weight.

Frontal	Driver	Not Rated
Crash	Passenger	Not Rated
Side	Front seat	Not Rated
Crash	Rear seat	Not Rated
Rollover		Not Rated

Star ratings range from 1 to 5 stars (★★★★★) with 5 being the highest.
Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score Not Rated
Based on the combined ratings of frontal, side and rollover.
Should ONLY be compared to other vehicles of similar size and weight.

Frontal	Driver	Not Rated
Crash	Passenger	Not Rated
Side	Front seat	Not Rated
Crash	Rear seat	Not Rated
Rollover		Not Rated

Star ratings range from 1 to 5 stars (★★★★★) with 5 being the highest.
Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

FIGURE 78. Monroney Label Photograph

APPENDIX B
DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

Plot		Page
1	Driver Head X Acceleration vs. Time Primary	B-1
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
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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

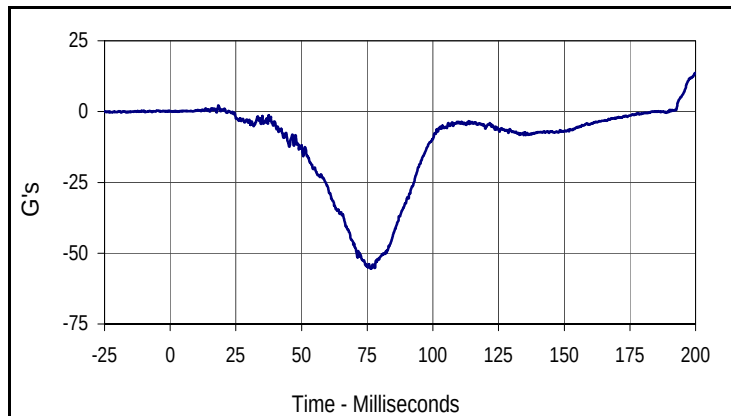
Driver Head X Acceleration Redundant
Driver Head Y Acceleration Redundant
Driver Head Z Acceleration Redundant
Driver Head Front Y Acceleration
Driver Head Front Z Acceleration
Driver Head Top X Acceleration
Driver Head Top Y Acceleration
Driver Head Left X Acceleration
Driver Head Left Z Acceleration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

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

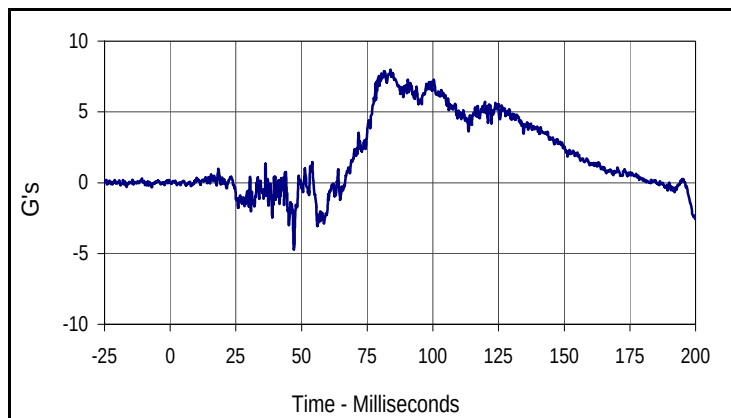
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Fore Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Right Foot Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
Left Rear Seat Crossmember X
Left Rear Seat Crossmember Z
Right Rear Seat Crossmember X
Right Rear Seat Crossmember Z
Vehicle Engine Top X
Vehicle Engine Bottom X
Vehicle Left Rear Z
Vehicle Right Rear Z
Load Cell Barrier LC0101 – LC 1116

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

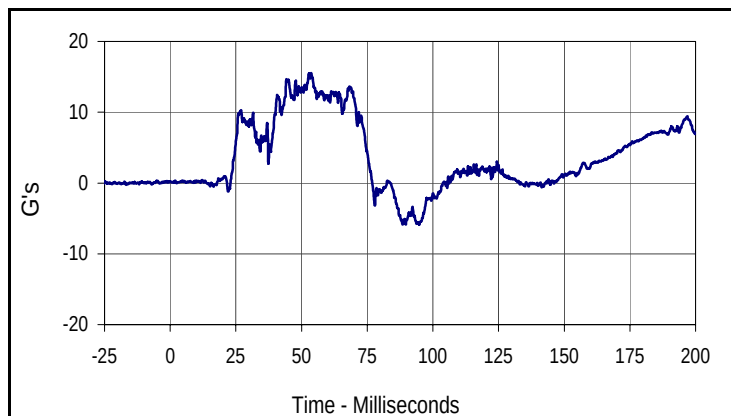
NHTSA No.: M20145503
 Test Date: 1/27/14



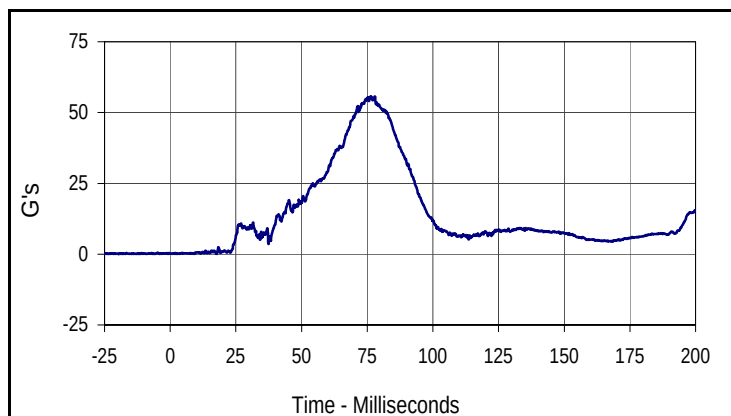
Curve Description			
Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
13.7	200.0	-55.5	76.2



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
8.0	83.9	-4.7	47.1



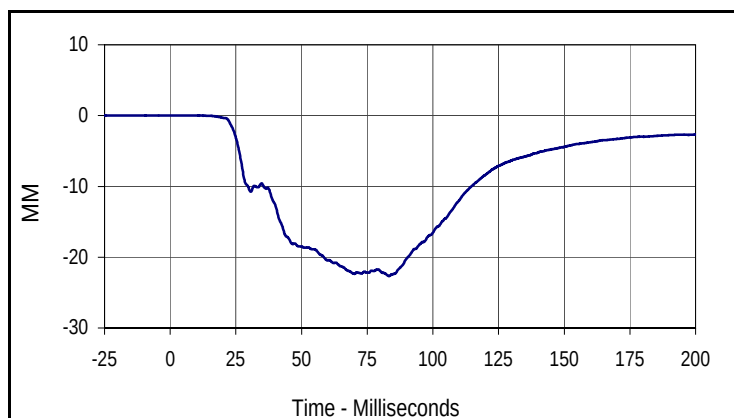
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
15.5	53.7	-5.9	94.7



Curve Description			
Driver Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
55.7	77.9	0.1	0.7

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

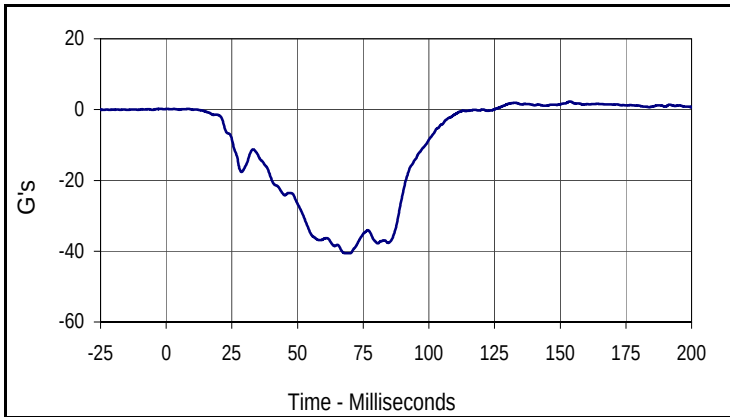
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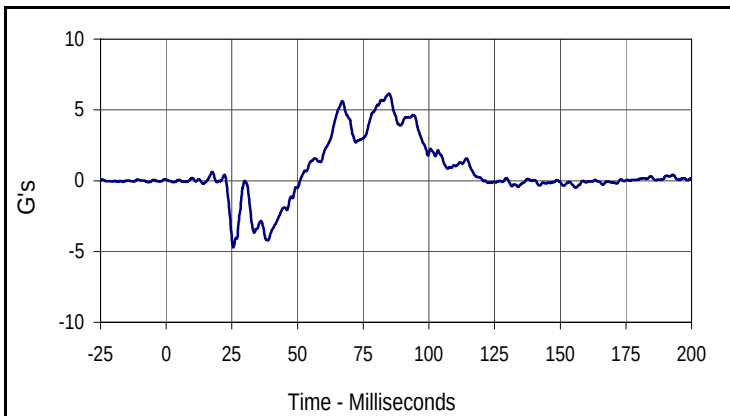
Curve Description			
Driver Chest Deflection			
Plot No.	Type	SAE Class	Units
005	FIL	600	MM
Max	Time	Min	Time
0.0	1.1	-22.7	83.3

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

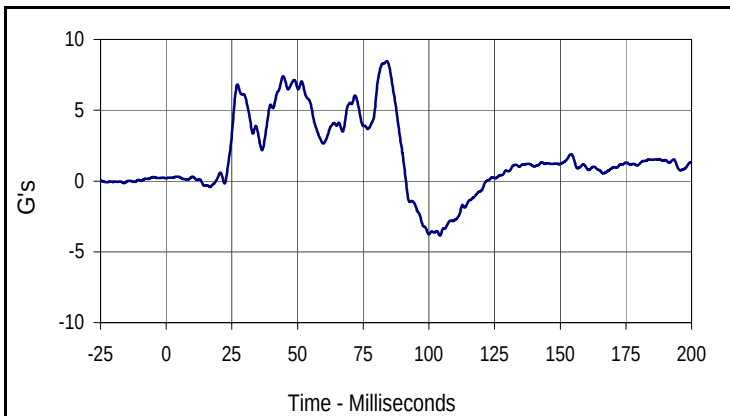
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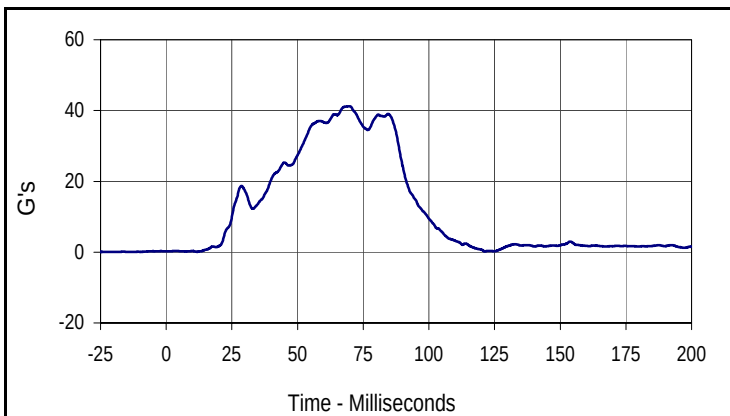
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Driver Chest Acceleration X Primary			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
2.3	153.7	-40.6	70.0



Curve Description			
Driver Chest Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
007	FIL	180	G's
Max	Time	Min	Time
6.2	84.8	-4.7	25.5



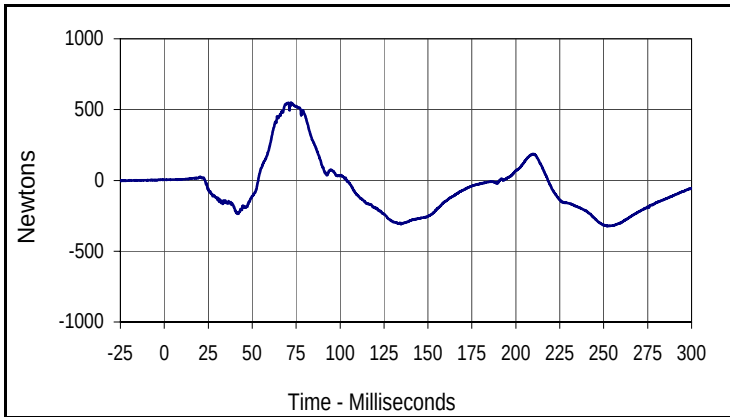
Curve Description			
Driver Chest Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
008	FIL	180	G's
Max	Time	Min	Time
8.5	84.0	-3.9	104.2



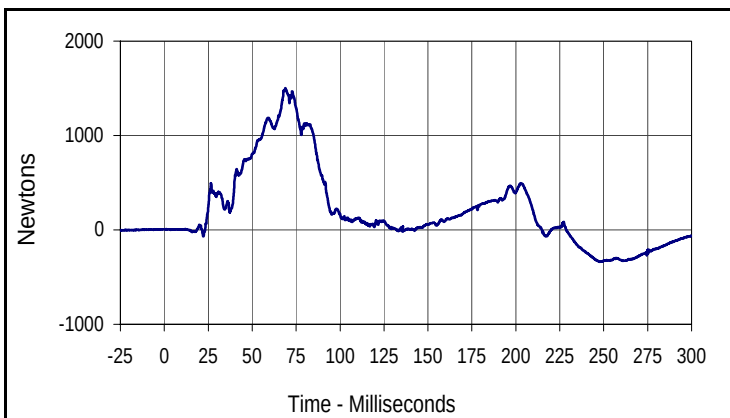
Curve Description			
Driver Chest Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
009	RES	180	G's
Max	Time	Min	Time
41.2	69.9	0.1	11.7

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

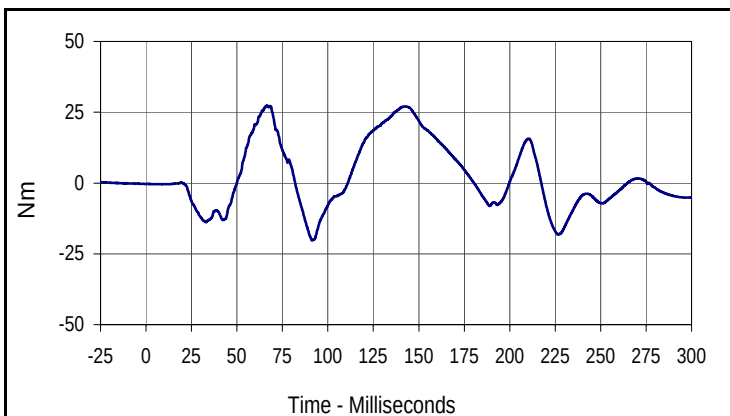
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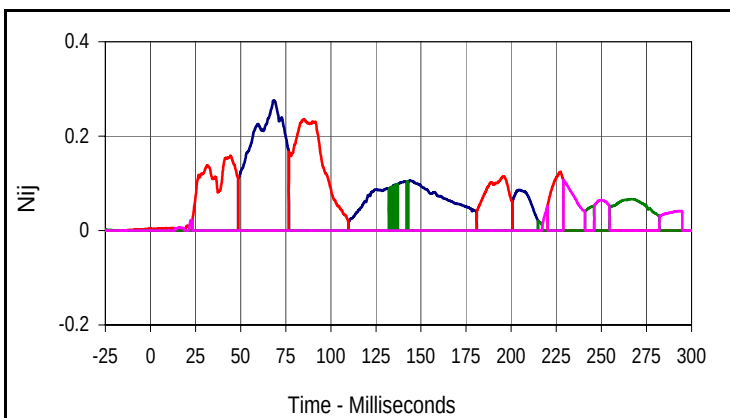
Curve Description			
Driver Upper Neck Force X			
Plot No.	Type	SAE Class	Units
010	FIL	1000	Newtons
Max	Time	Min	Time
550.3	72.1	-323.2	252.0



Curve Description			
Driver Upper Neck Force Z			
Plot No.	Type	SAE Class	Units
011	FIL	1000	Newtons
Max	Time	Min	Time
1500.5	68.9	-337.6	247.8



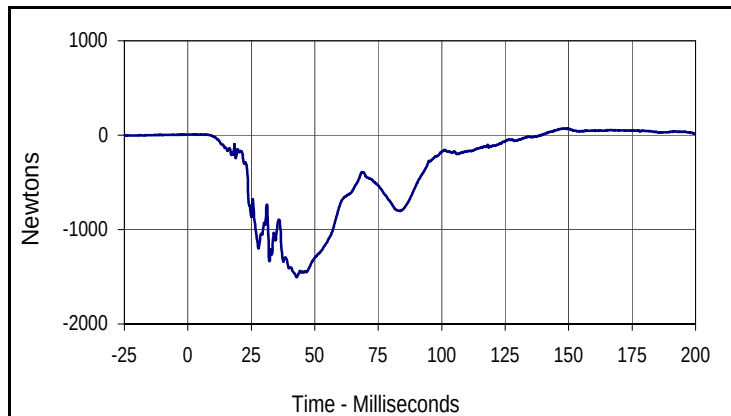
Curve Description			
Driver Upper Neck Moment Y			
Plot No.	Type	SAE Class	Units
012	FIL	600	Nm
Max	Time	Min	Time
27.3	66.7	-20.2	91.3



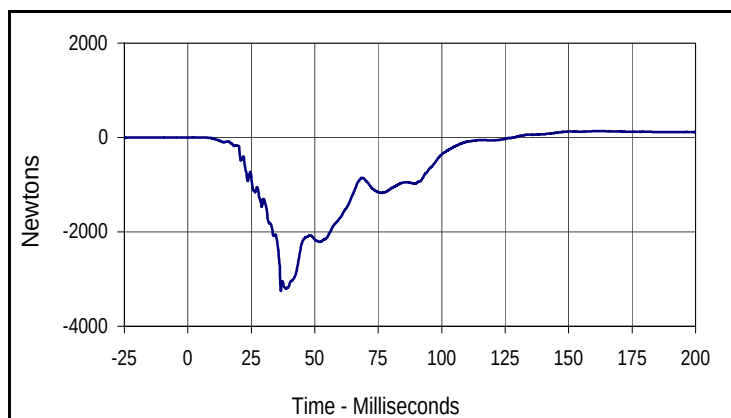
Curve Description			
Driver Nij			
Units	Type	Max	Time
Ntf	FIL	0.28	68.2
Units	Type	Max	Time
Nte	FIL	0.24	85.4
Units	Type	Max	Time
Ncf	FIL	0.10	142.5
Units	Type	Max	Time
Nce	FIL	0.11	228.9

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

NHTSA No.: M20145503
 Test Date: 1/27/14



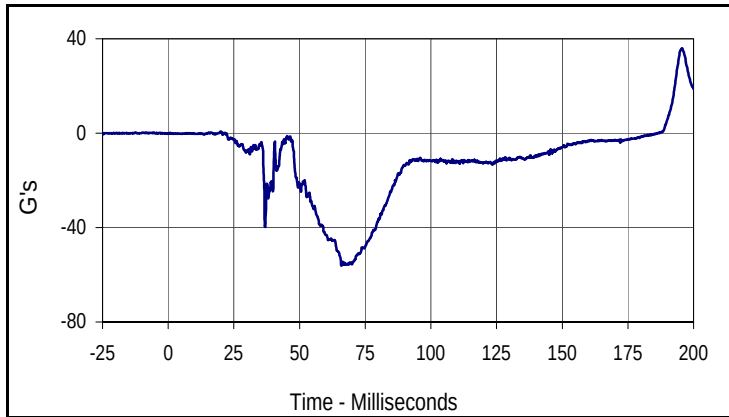
Curve Description			
Driver Left Femur Force Z			
Plot No.	Type	SAE Class	Units
013	FIL	600	Newtons
Max	Time	Min	Time
112.8	227.4	-1505.2	42.9



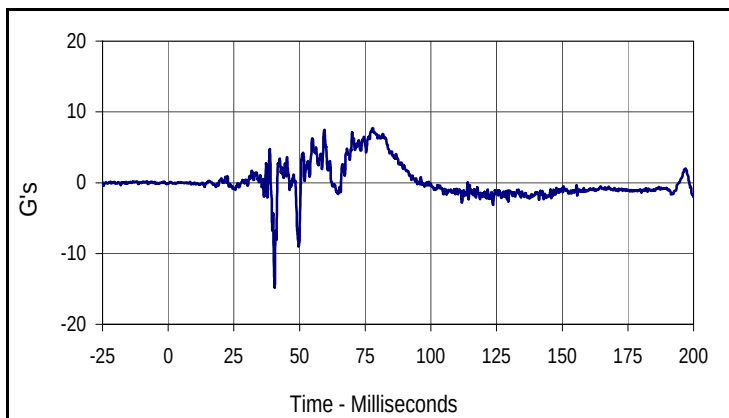
Curve Description			
Driver Right Femur Force Z			
Plot No.	Type	SAE Class	Units
014	FIL	600	Newtons
Max	Time	Min	Time
136.0	162.6	-3248.9	36.7

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

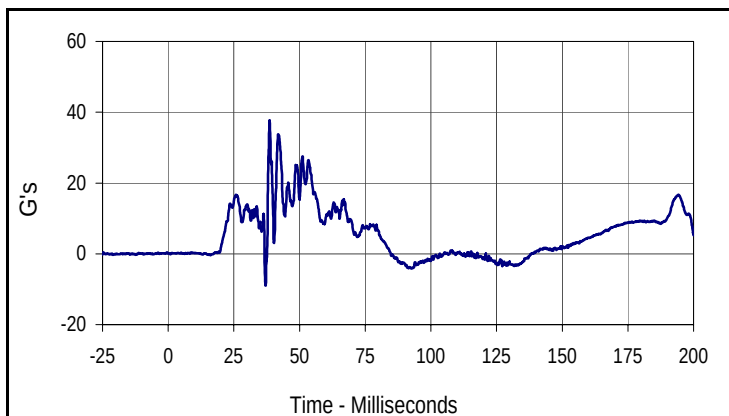
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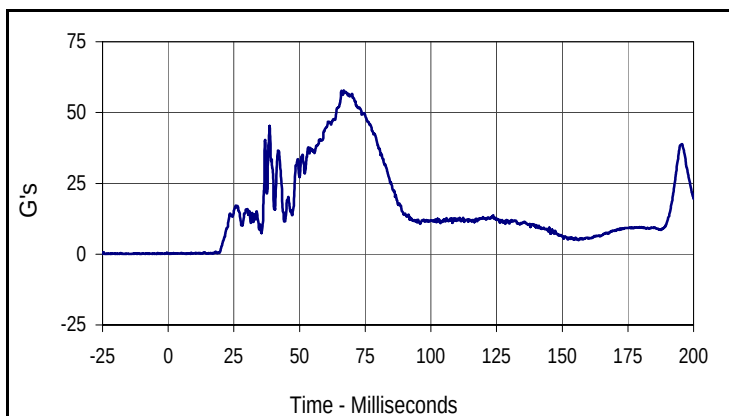
Curve Description			
Passenger Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
015	FIL	1000	G's
Max	Time	Min	Time
35.9	195.6	-56.1	66.0



Curve Description			
Passenger Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
016	FIL	1000	G's
Max	Time	Min	Time
7.7	77.8	-14.8	40.5



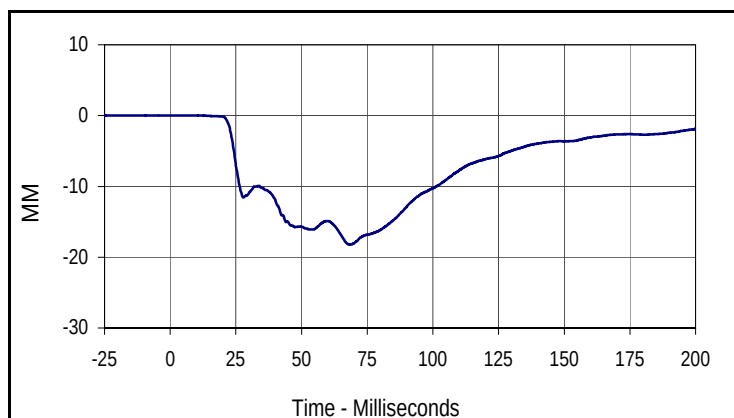
Curve Description			
Passenger Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
017	FIL	1000	G's
Max	Time	Min	Time
37.7	38.6	-9.0	37.1



Curve Description			
Passenger Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
018	RES	1000	G's
Max	Time	Min	Time
57.7	66.0	0.1	1.0

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

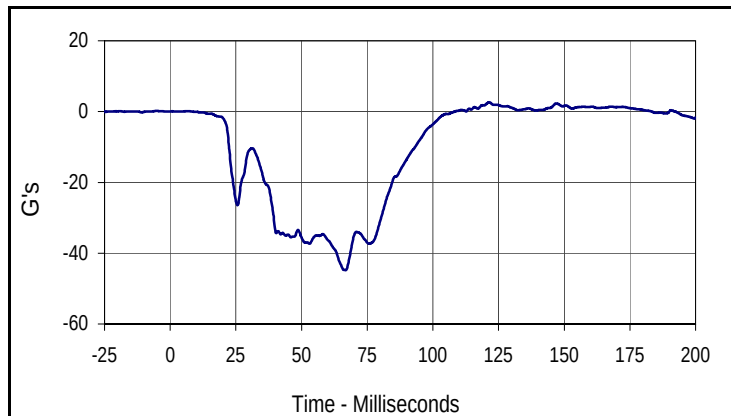
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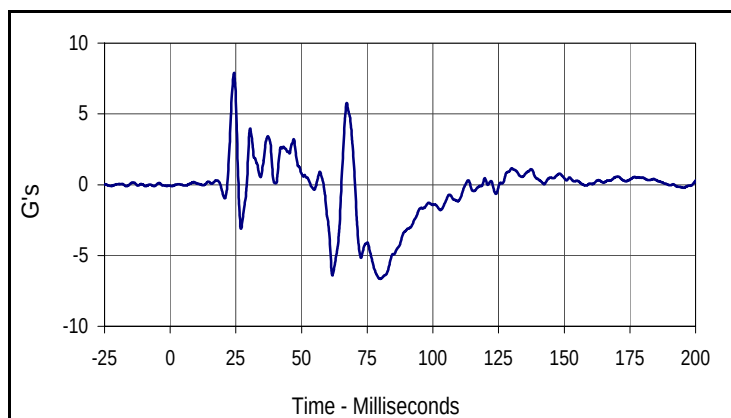
Curve Description			
Passenger Chest Deflection			
Plot No.	Type	SAE Class	Units
019	FIL	600	MM
Max	Time	Min	Time
0.0	9.6	-18.2	68.2

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

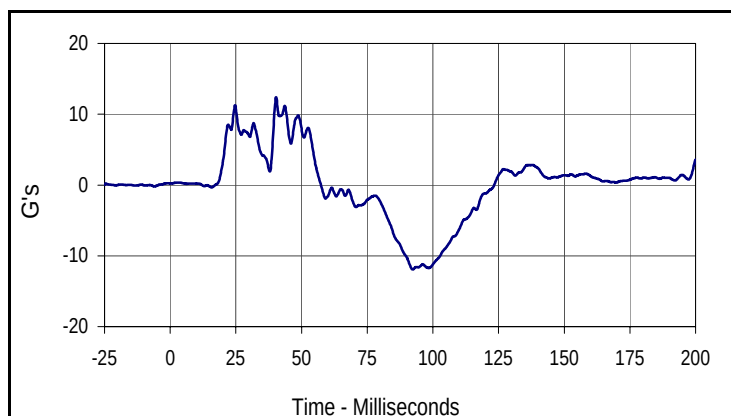
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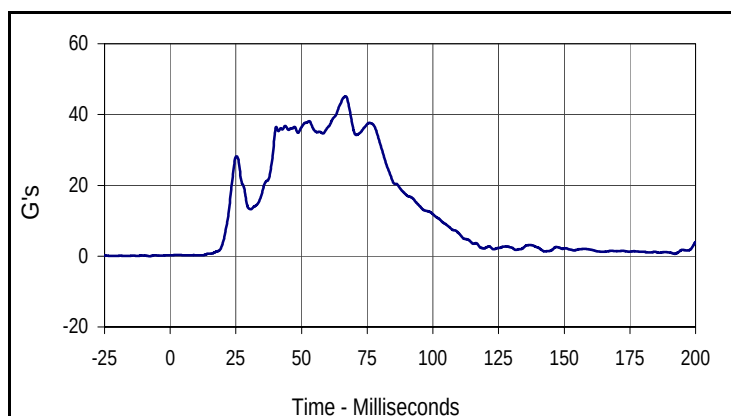
Curve Description			
Passenger Chest Acceleration X Primary			
Plot No.	Type	SAE Class	Units
020	FIL	180	G's
Max	Time	Min	Time
2.6	121.4	-44.8	66.8



Curve Description			
Passenger Chest Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
021	FIL	180	G's
Max	Time	Min	Time
7.9	24.3	-6.6	80.0



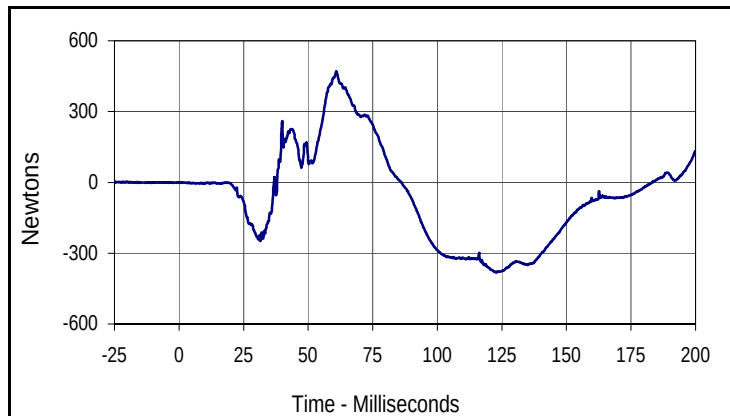
Curve Description			
Passenger Chest Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
022	FIL	180	G's
Max	Time	Min	Time
12.4	40.3	-11.9	92.3



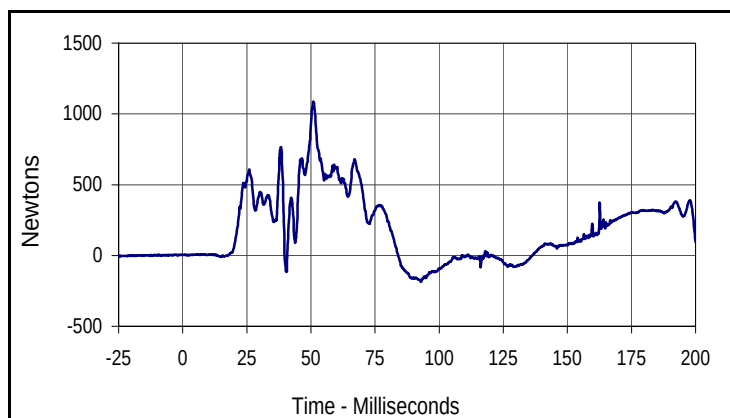
Curve Description			
Passenger Chest Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
023	RES	180	G's
Max	Time	Min	Time
45.1	66.9	0.2	6.5

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

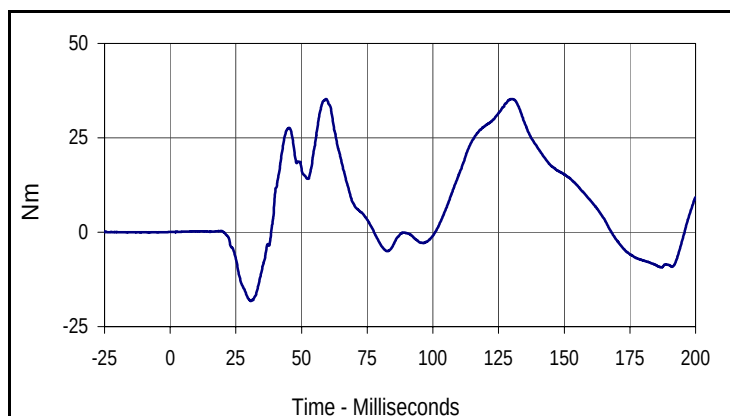
NHTSA No.: M20145503
 Test Date: 1/27/14



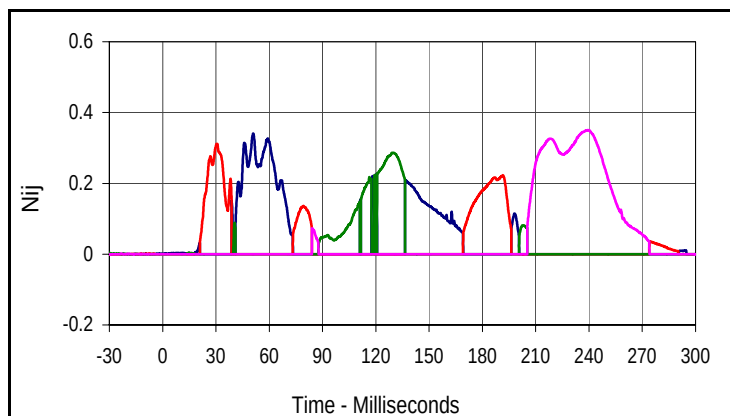
Curve Description			
Passenger Upper Neck Force X			
Plot No.	Type	SAE Class	Units
024	FIL	1000	Newtons
Max	Time	Min	Time
469.4	60.8	-381.7	122.7



Curve Description			
Passenger Upper Neck Force Z			
Plot No.	Type	SAE Class	Units
025	FIL	1000	Newtons
Max	Time	Min	Time
1087.1	50.9	-186.0	92.9



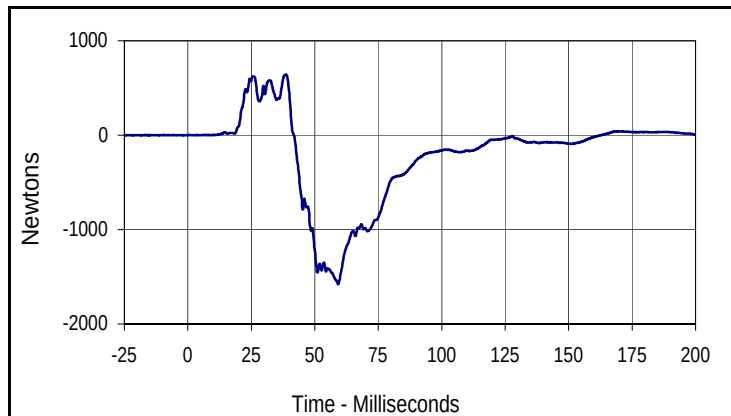
Curve Description			
Passenger Upper Neck Moment Y			
Plot No.	Type	SAE Class	Units
026	FIL	600	Nm
Max	Time	Min	Time
35.3	59.3	-18.2	30.7



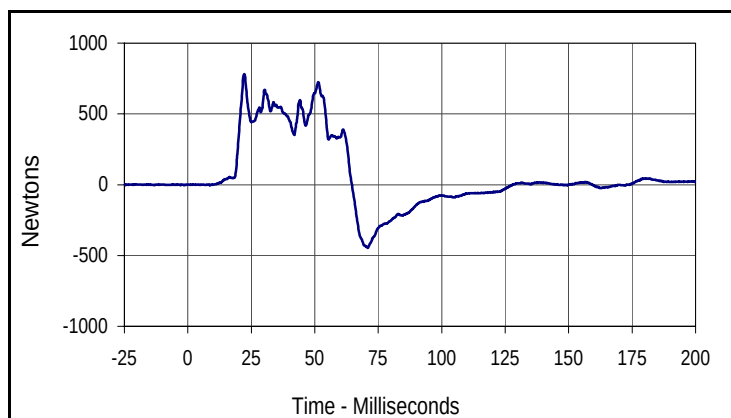
Curve Description			
Passenger Nij			
Units	Type	Max	Time
Ntf	FIL	0.34	51.0
Units	Type	Max	Time
Nte	FIL	0.31	30.5
Units	Type	Max	Time
Ncf	FIL	0.29	129.7
Units	Type	Max	Time
Nce	FIL	0.35	239.4

Test Vehicle: 2014 Subaru XV Crosstrek 5-Door MPV
 Test Program: 56 km/h Frontal Impact NCAP Test

NHTSA No.: M20145503
 Test Date: 1/27/14



Curve Description			
Passenger Left Femur Force Z			
Plot No.	Type	SAE Class	Units
027	FIL	600	Newtons
Max	Time	Min	Time
643.9	38.6	-1578.2	59.2



Curve Description			
Passenger Right Femur Force Z			
Plot No.	Type	SAE Class	Units
028	FIL	600	Newtons
Max	Time	Min	Time
780.4	22.2	-445.9	70.8

APPENDIX C
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

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

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

Test Date: 1/20/14



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: 1/20/14

ATD Serial No.: 034

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	29.5	Pass
A - Total sitting height	mm	879 to 889	884	Pass
B - Shoulder pivot height	mm	505 to 521	512	Pass
C - H point height	mm	84 to 89	85	Pass
D - H point location from backline	mm	135 to 140	137	Pass
E - Shoulder pivot from backline	mm	84 to 94	89	Pass
F - Thigh clearance	mm	140 to 155	146	Pass
G - Back of elbow to wrist pivot	mm	290 to 305	297	Pass
H - Head back to backline	mm	41 to 46	43	Pass
I - Shoulder to elbow length	mm	330 to 345	336	Pass
J - Elbow rest height	mm	190 to 211	201	Pass
K - Buttock to knee length	mm	579 to 604	586	Pass
L - Popliteal length	mm	429 to 455	438	Pass
M - Knee pivot height	mm	485 to 500	493	Pass
N - Buttock popliteal length	mm	452 to 477	472	Pass
O - Chest depth without jacket	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	260	Pass
V - Shoulder breadth	mm	422 to 437	433	Pass
W - Foot breadth	mm	91 to 107	99	Pass
Y - Chest circumference (with chest jacket)	mm	970 to 1001	981	Pass
Z - Waist circumference	mm	836 to 866	864	Pass
AA - Location for chest circumference	mm	429 to 434	429	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
Overall Test Results			Pass	

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

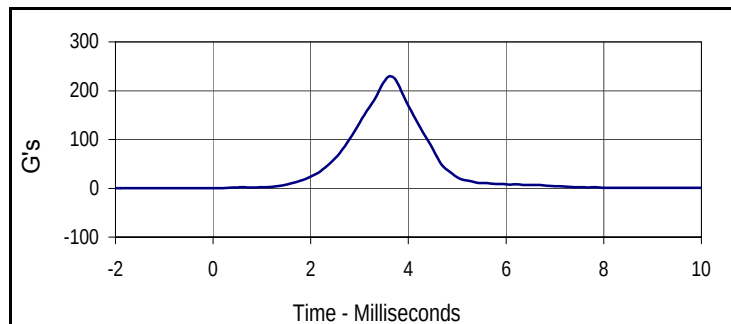
Test Date: 1/20/14



ATD Serial No.: 034

Test I.D.: M034HD047

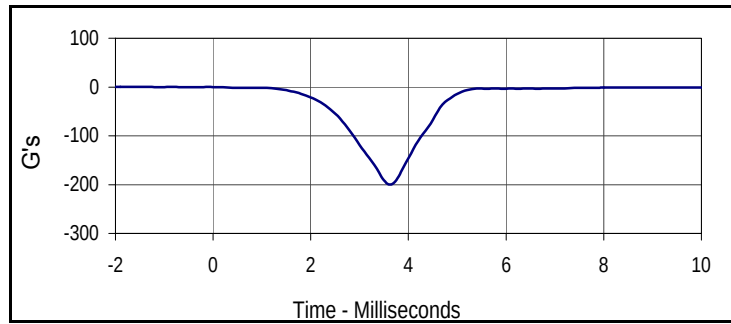
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	550	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.6	Pass
Humidity During Soak	Max	%	10.0 to 70.0	20.5	Pass
	Min	%		20.3	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	20.5	Pass
Peak Resultant Acceleration		G's	225.0 to 275.0	229.1	Pass
Peak Lateral Acceleration		G's	≤15.0	7.3	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	73.5	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Overall Test Results				Pass	



Curve Description

Head Resultant

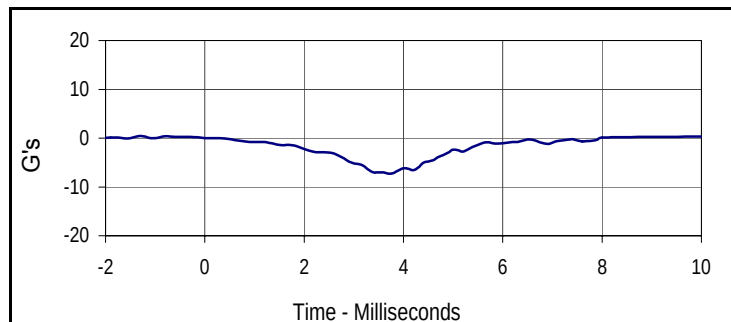
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
229.1	3.6	0.1	0.0



Curve Description

Head X

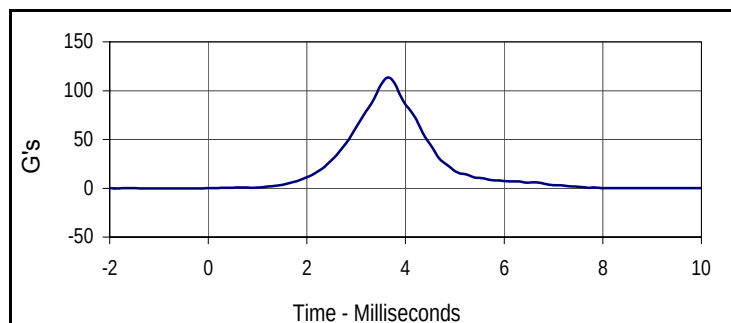
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.4	-1.4	-199.3	3.6



Curve Description

Head Y

Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
0.4	-1.3	-7.3	3.7



Curve Description

Head Z

Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
112.7	3.6	-0.2	-0.9

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

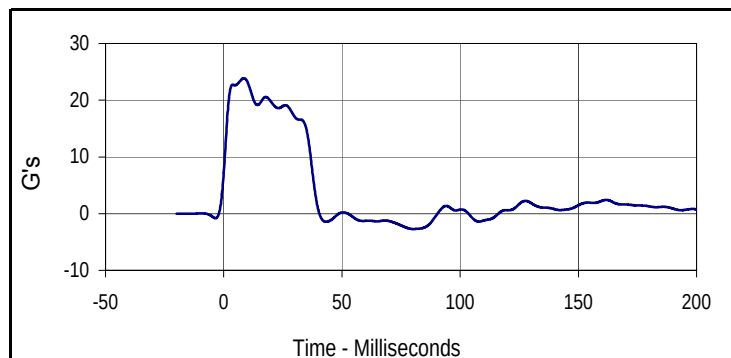
Test Date: 1/20/14



ATD Serial No.: 034

Test I.D.: M034NF047

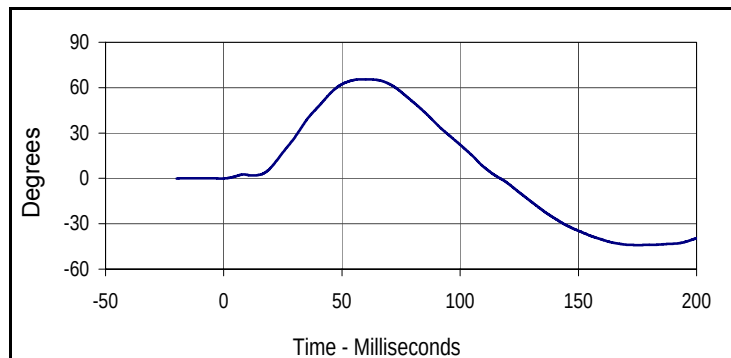
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	600	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.6	Pass
Humidity During Soak	Max	%	10.0 to 70.0	20.5	Pass
	Min	%		20.3	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	20.3	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.01	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.2	Pass
	20 Msec.	G's	17.6 to 22.6	19.7	Pass
	30 Msec.	G's	12.5 to 18.5	17.1	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	17.1	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	38.3	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	65.5	Pass
	Time	Msec.	57.0 to 64.0	58.8	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	116.9	Pass
Moment About Occ. Condyle	Max	Nm	88.1 to 108.5	89.0	Pass
	Time	Msec.	47.0 to 58.0	52.1	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	104.6	Pass
Overall Test Results					Pass



Curve Description

Pendulum Deceleration

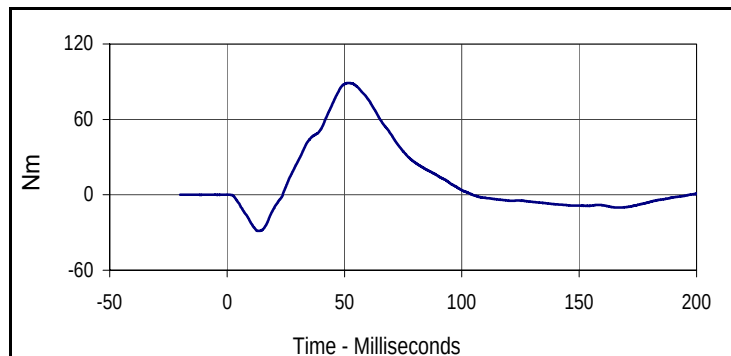
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
23.9	8.5	-2.7	80.2



Curve Description

"D" Plane Rotation

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



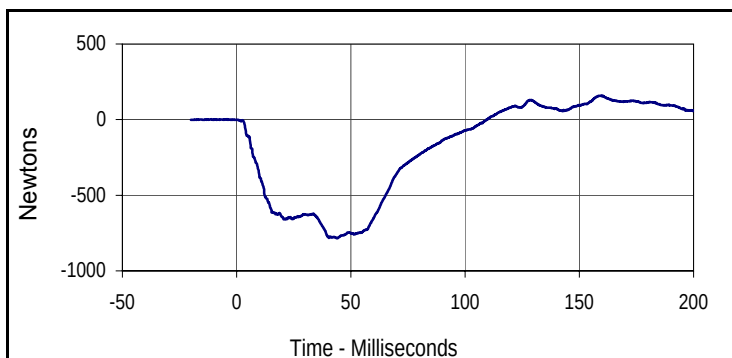
Curve Description

Moment About Occipital Condyle

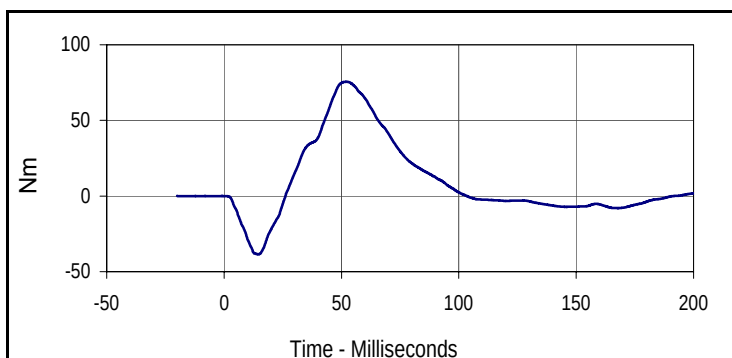
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
89.0	52.1	-28.8	13.5

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

Test Date: 1/20/14
 Test I.D.: M034NF047



Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
158.4	159.6	-784.8	44.1



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
75.6	52.2	-38.5	14.6

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

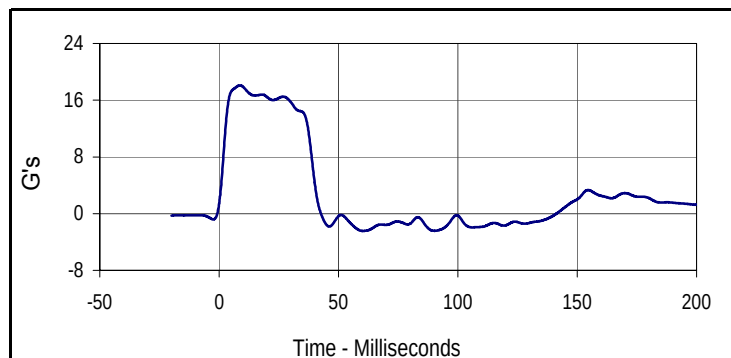
Test Date: 1/20/14

ATD Serial No.: 034

Test I.D.: M034NE047



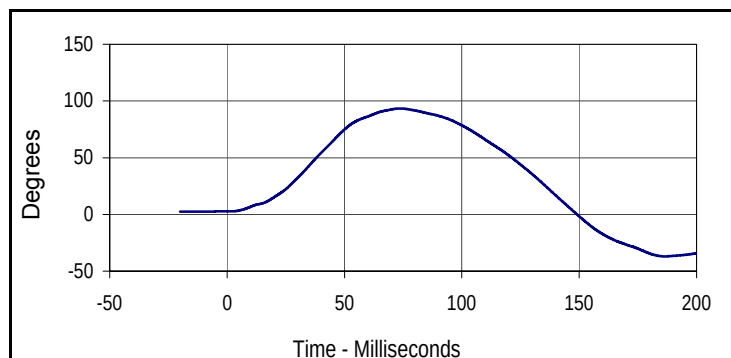
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	635	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.6	Pass
Humidity During Soak	Max	%	10.0 to 70.0	20.5	Pass
	Min	%		20.3	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	20.3	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.07	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.9	Pass
	20 Msec.	G's	14.0 to 19.0	16.5	Pass
	30 Msec.	G's	11.0 to 16.0	15.7	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.7	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	39.8	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	93.4	Pass
	Time	Msec.	72.0 to 82.0	73.7	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	149.1	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to -79.9	-69.0	Pass
	Time	Msec.	65.0 to 79.0	69.9	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	133.6	Pass
Overall Test Results					Pass



Curve Description

Pendulum Deceleration

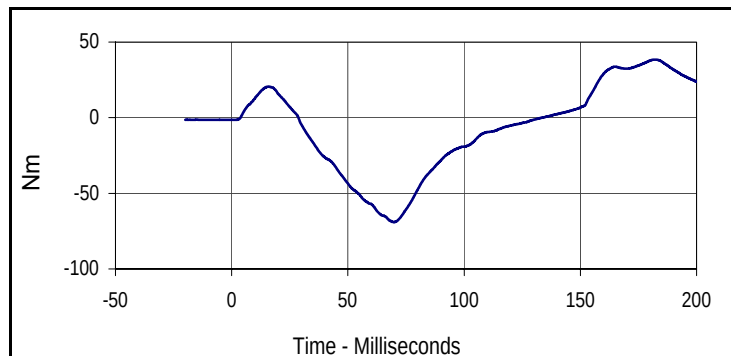
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
18.1	8.7	-2.4	60.1



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
93.4	73.7	-37.0	186.5



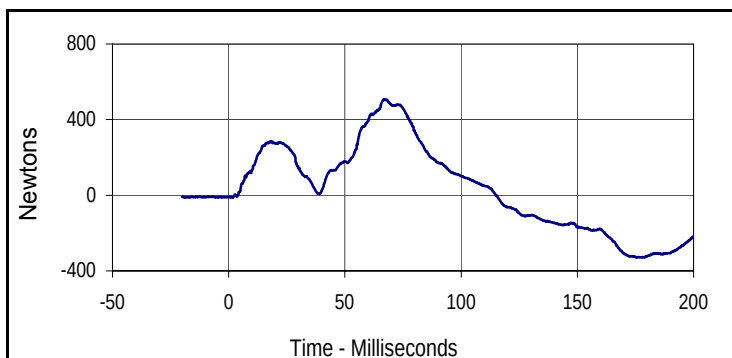
Curve Description

Moment About Occipital Condyle

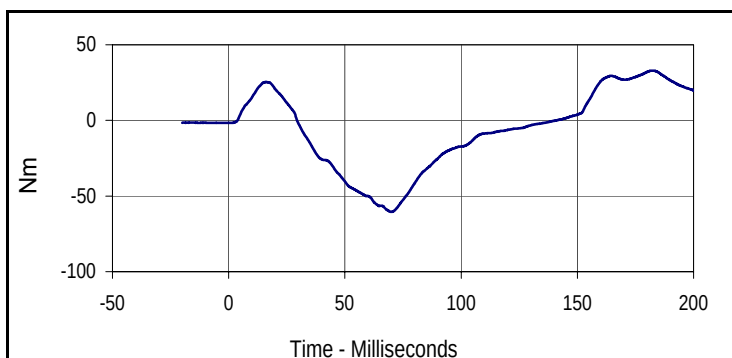
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
38.5	181.8	-69.0	69.9

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

Test Date: 1/20/14
 Test I.D.: M034NE047



Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
509.1	66.7	-329.7	175.8



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
33.0	182.6	-60.5	70.0

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

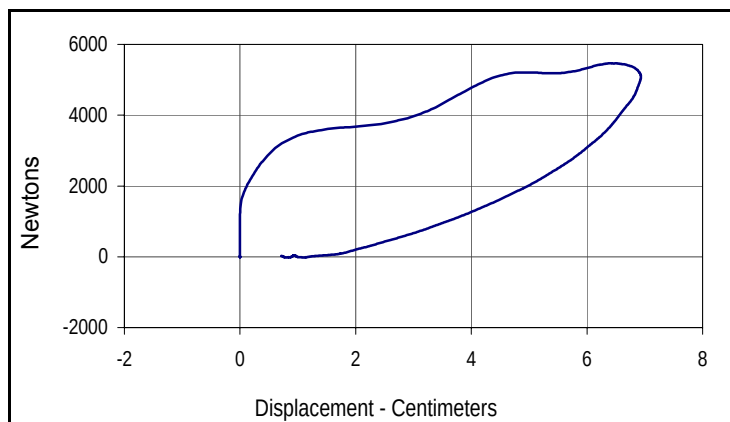
Test Date: 1/20/14



ATD Serial No.: 034

Test I.D.: M034CH047

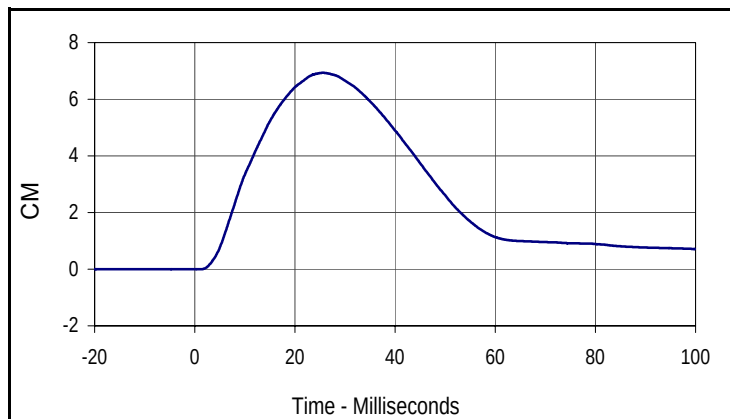
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	685	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.6	Pass
Humidity During Soak	Max	%	10.0 to 70.0	20.3	Pass
	Min	%		20.3	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	20.3	Pass
Probe Velocity		m/s	6.58 to 6.82	6.75	Pass
Peak Probe Force		Newtons	5159 to 5893	5465	Pass
Peak Sternum Deflection		CM	6.35 to 7.26	6.93	Pass
Internal Hysteresis		%	69 to 85	69.1	Pass
Overall Test Results				Pass	



Curve Description

Probe Force vs. Chest Deflection

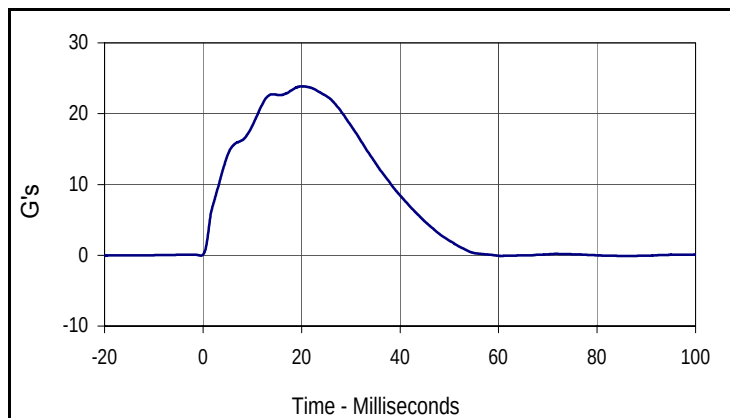
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	69.1
Peak Probe Force		Peak Chest Deflection	
5465		6.93	



Curve Description

Chest Deflection

Plot No.	Type	SAE Class	Units
002	FIL	180	CM
Max	Time	Min	Time
6.9	25.6	0.0	1.0



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
23.9	19.8	-0.1	85.0

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

Test Date: 1/20/14

ATD Serial No.: 034

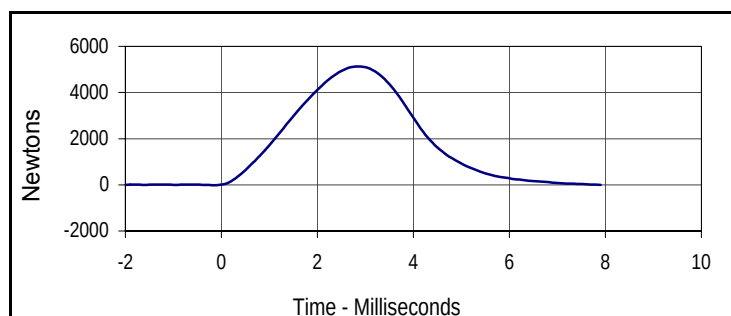
Test I.D.: M034LK047, M034RK047

**Left Knee**

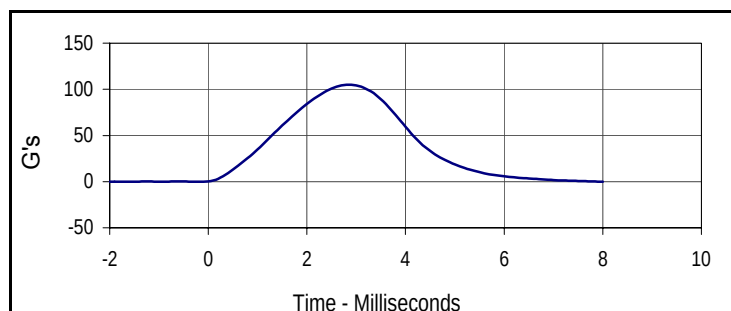
Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	720	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.6	Pass
Humidity During Soak	Max	%	10.0 to 70.0	20.5	Pass
	Min	%		20.3	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	20.3	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	4715 to 5782	5129	Pass
Overall Test Results				Pass	

Right Knee

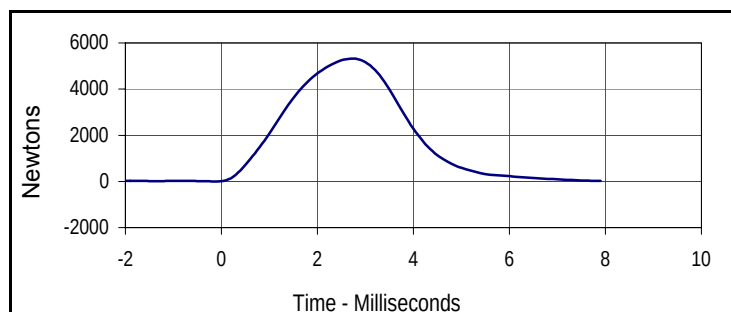
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	4715 to 5782	5324	Pass
Overall Test Results				Pass	

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

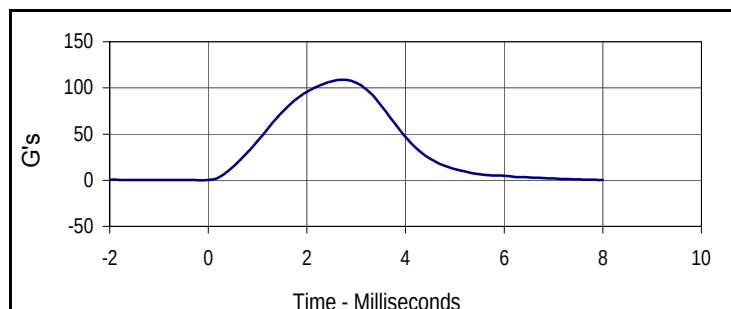
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5129.0	2.9	-12.3	-0.1

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

Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
104.8	2.9	-1.3	0.0

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

Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
5324.1	2.7	-4.9	-0.1

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

Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
108.8	2.7	-1.3	0.0

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

Test Date: 1/20/14

ATD Serial No.: 034

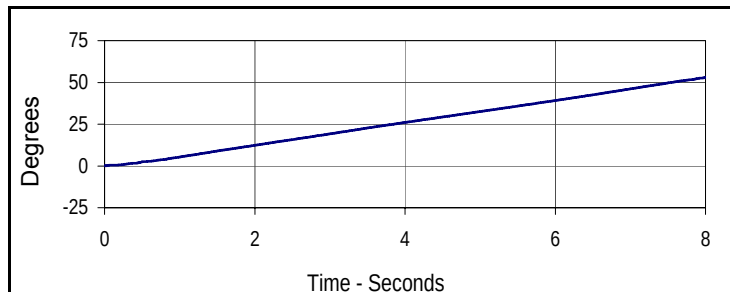
Test I.D.: M034LF047, M034RF047

**Left Hip Joint-Femur Results**

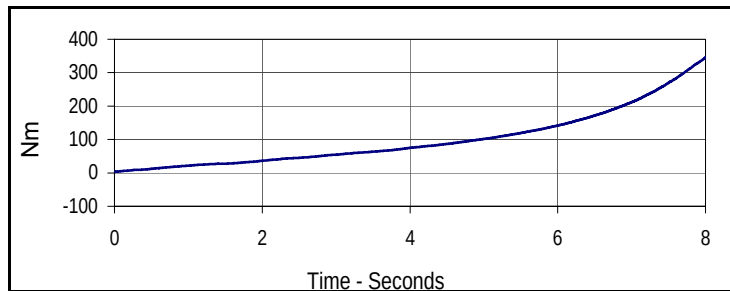
Tested Parameter		Units	Specification	Result	Pass/Fail
Hip Joint-Femur Assembly Soak Time		Minutes	≥240	770	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.6	Pass
Humidity During Soak	Max	%	10.0 to 70.0	20.5	Pass
	Min	%		20.3	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	20.3	Pass
Rotation Rate		deg/sec	5 to 10	6.6	Pass
Femur Torque at 30°		Nm	≤ 95	87.2	Pass
Rotation at 203 Nm		Degrees	40.0 to 50.0	44.9	Pass
Overall Test Results					Pass

Right Hip Joint-Femur Results

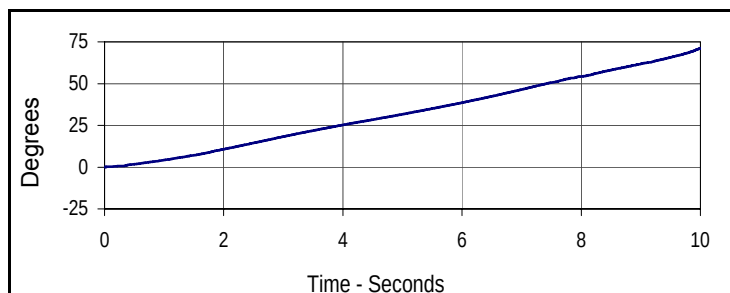
Rotation Rate		deg/sec	5 to 10	6.8	Pass
Femur Torque at 30°		Nm	≤ 95	90.5	Pass
Rotation at 203 Nm		Degrees	40.0 to 50.0	46.8	Pass
Overall Test Results					Pass

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

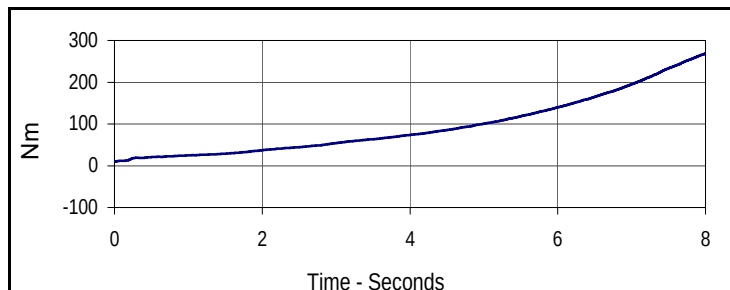
Plot No.	Type	SAE Class	Units
001	FIL	60	Degrees
Max	Time	Min	Time
52.9	8.0	0.0	0.0

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

Plot No.	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
344.7	8.0	0.0	0.0

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

Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
54.2	8.0	0.0	0.0

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

Plot No.	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
268.5	8.0	0.0	0.0

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

Test Date: 1/17/14



ATD Serial No.: 635

Test I.D.: N/A

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

Describe the repair on repair or replacement of parts:

Test Program: Hybrid III 5th Percentile Female External Measurements

Test Date: 1/17/14

ATD Serial No.: 635

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.49	Pass
Laboratory Relative Humidity	%	10 to 70	30.7	Pass
A - Total sitting height	mm	774.7 to 800.1	786	Pass
B - Shoulder pivot height	mm	431.8 to 457.2	450	Pass
C - H point height	mm	81.3 to 86.3	85	Pass
D - H point location from backline	mm	144.8 to 149.8	146	Pass
E - Shoulder pivot from backline	mm	68.6 to 83.8	77	Pass
F - Thigh clearance	mm	119.4 to 134.6	126	Pass
G - Back of elbow to wrist pivot	mm	243.9 to 259.1	250	Pass
H - Head back to backline	mm	40.7 to 45.7	44	Pass
I - Shoulder to elbow length	mm	276.8 to 297.2	285	Pass
J - Elbow rest height	mm	182.8 to 203.2	198	Pass
K - Buttock to knee length	mm	520.7 to 546.1	531	Pass
L - Popliteal length	mm	355.6 to 376.0	371	Pass
M - Knee pivot height	mm	393.7 to 419.1	402	Pass
N - Buttock popliteal length	mm	414.0 to 439.4	420	Pass
O - Chest depth without jacket	mm	175.3 to 190.5	186	Pass
P - Foot length	mm	218.5 to 233.7	221	Pass
R - Buttock to Knee Pivot Length	mm	457.2 to 482.6	473	Pass
S - Head Breadth	mm	137.1 to 147.3	144	Pass
T - Head Depth	mm	177.8 to 188.0	180	Pass
U - Hip Breadth	mm	299.7 to 314.9	302	Pass
V - Shoulder breadth	mm	350.5 to 365.7	359	Pass
W - Foot breadth	mm	78.8 to 94.0	90	Pass
X - Head circumference	mm	528.3 to 548.7	541	Pass
Y - Chest circumference (with chest jacket)	mm	850.8 to 881.3	864	Pass
Z - Waist circumference	mm	759.5 to 789.9	766	Pass
AA - Location for chest circumference	mm	299.7 to 309.9	300	Pass
BB - Location for waist circumference	mm	160.1 to 170.2	164	Pass
Overall Test Results				Pass

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

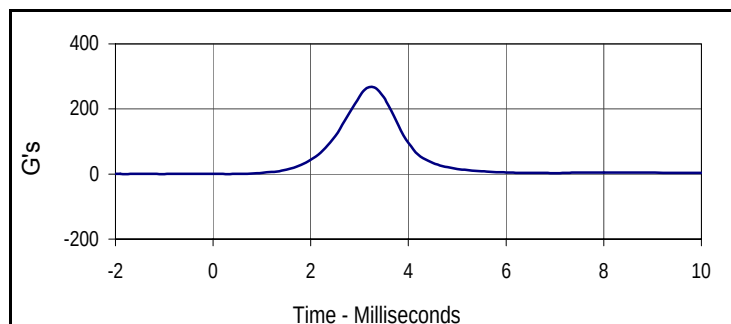
Test Date: 1/17/14

ATD Serial No.: 635

Test I.D.: F635HD043



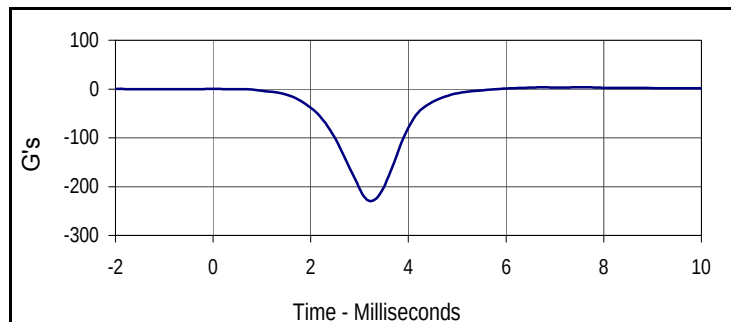
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	500	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.1	Pass
	Min	%		30.5	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.1	Pass
Peak Resultant Acceleration		G's	250.0 to 300.0	267.6	Pass
Peak Lateral Acceleration		G's	≤15.0	4.1	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	1.9	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Overall Test Results				Pass	



Curve Description

Head Resultant

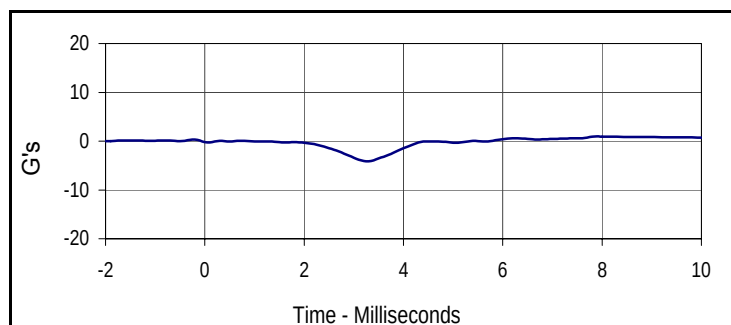
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
267.6	3.2	0.1	-1.8



Curve Description

Head X

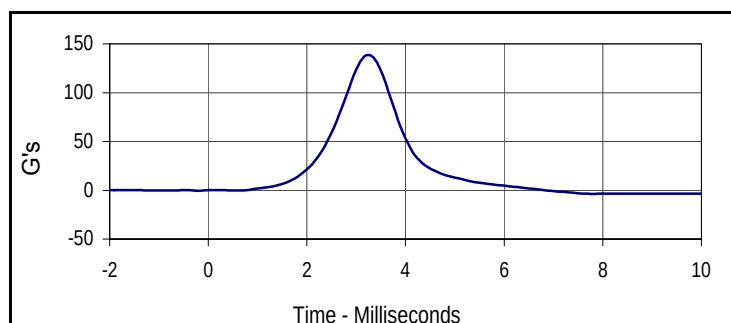
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.7	6.0	-229.1	3.2



Curve Description

Head Y

Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
0.4	6.0	-4.1	3.3



Curve Description

Head Z

Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
138.2	3.2	-0.3	-0.2

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

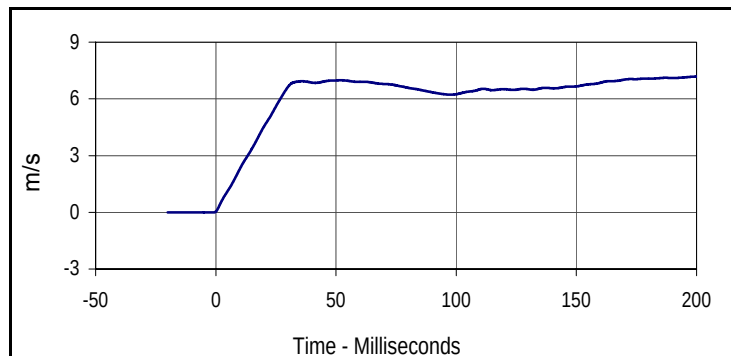
Test Date: 1/17/14



ATD Serial No.: 635

Test I.D.: F635NF043

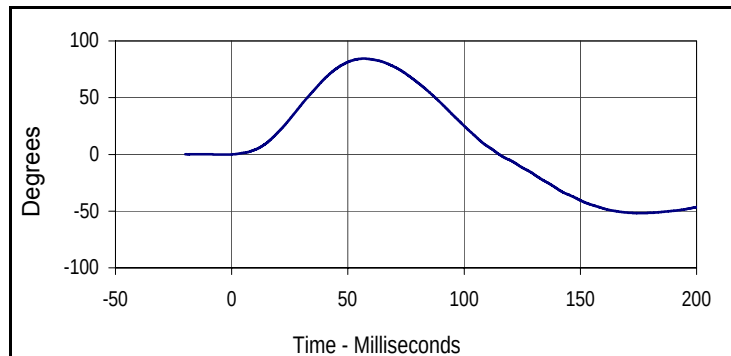
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	555	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.1	Pass
	Min	%		30.5	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.5	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.92	Pass
Pendulum Deceleration	10 Msec.	m/s	2.1 to 2.5	2.3	Pass
	20 Msec.	m/s	4.0 to 5.0	4.5	Pass
	30 Msec.	m/s	5.8 to 7.0	6.6	Pass
"D" Plane Rotation	Max	Degrees	77.0 to 91.0	84.4	Pass
Peak Moment in Rotation	Max	Nm	69.0 to 83.0	81.8	Pass
Positive Moment Decay, Time To 10 Nm		Msec.	80.0 to 100.0	87.5	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Velocity

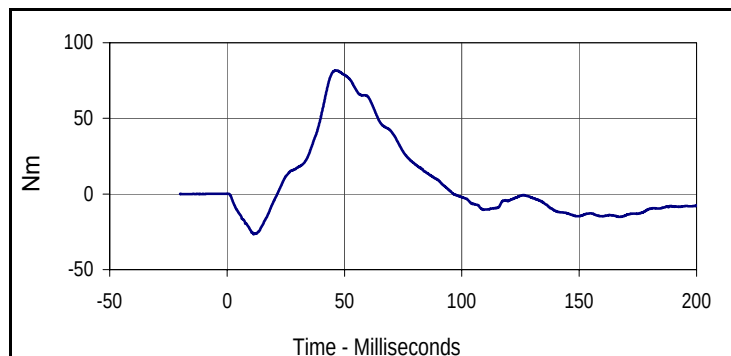
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
7.2	200.0	0.0	-1.0



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
84.4	56.8	-51.8	174.8



Curve Description

Moment About Occipital Condyle

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

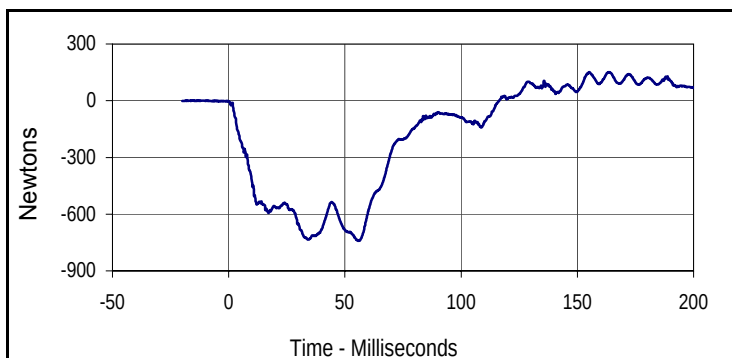
Test Program: Hybrid III 5th Percentile Female Neck Flexion Test

Test Date: 1/17/14

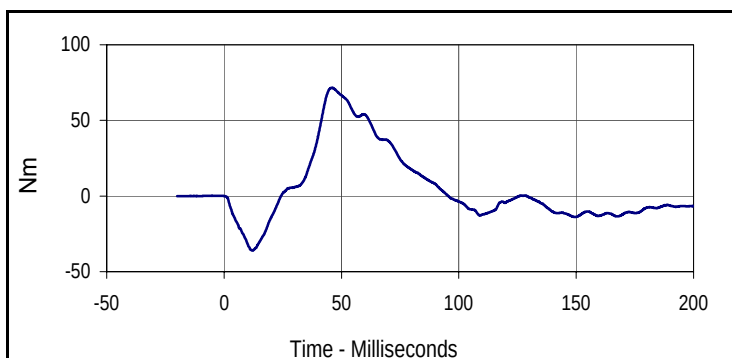


ATD Serial No.: 635

Test I.D.: F635NF043



Curve Description			
Upper Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
151.2	155.2	-741.7	55.8



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
71.6	46.0	-36.0	12.1

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

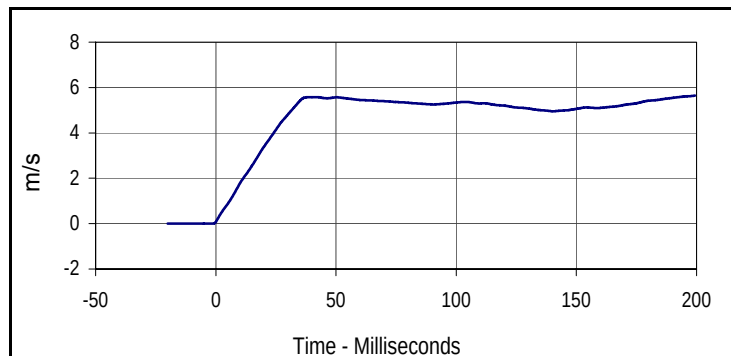
Test Date: 1/17/14



ATD.: 635

Test I.D.: F635NE043

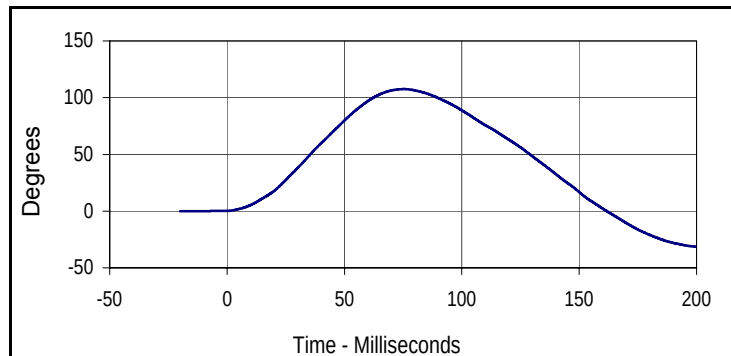
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	590	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.1	Pass
	Min	%		30.5	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.1	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.01	Pass
Pendulum Deceleration	10 Msec.	m/s	1.5 to 1.9	1.8	Pass
	20 Msec.	m/s	3.1 to 3.9	3.4	Pass
	30 Msec.	m/s	4.6 to 5.6	4.8	Pass
"D" Plane Rotation	Max	Degrees	99.0 to 114.0	107.6	Pass
Peak Moment in Rotation	Max	Nm	-53.0 to -65.0	-54.4	Pass
Positive Moment Decay, Time To -10 Nm		Msec.	94.0 to 114.0	102.9	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Velocity

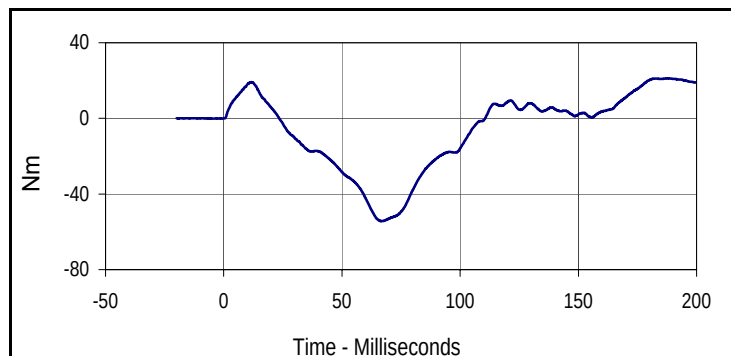
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
5.7	0.0	0.0	-1.4



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
107.6	75.2	-31.3	199.4



Curve Description

Moment About Occipital Condyle

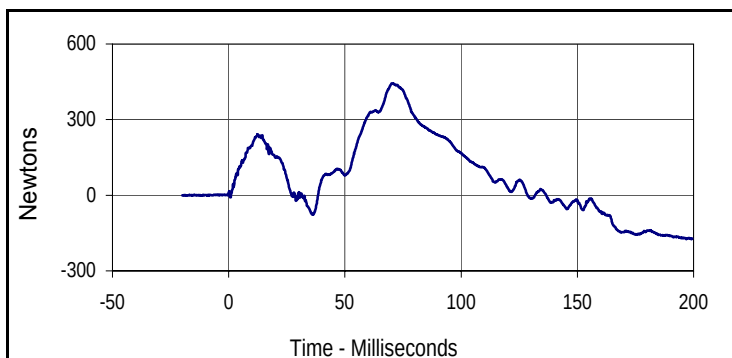
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
21.2	187.6	-54.4	66.4

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

ATD.: 635

Test Date: 1/17/14

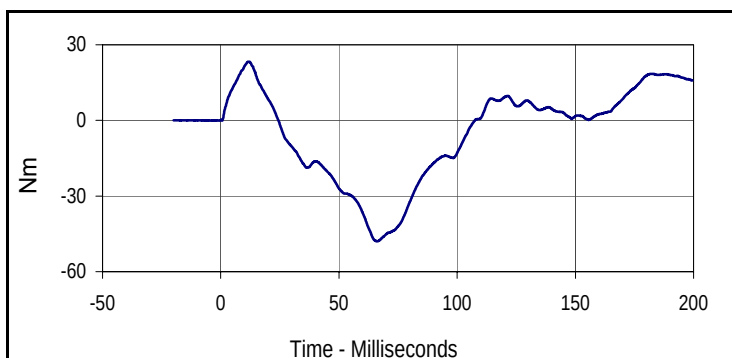
Test I.D.: F635NE043



Curve Description

Upper Neck Force X

Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
444.2	70.5	-174.0	196.9



Curve Description

Neck Moment Y

Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
23.3	11.8	-48.0	66.3

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

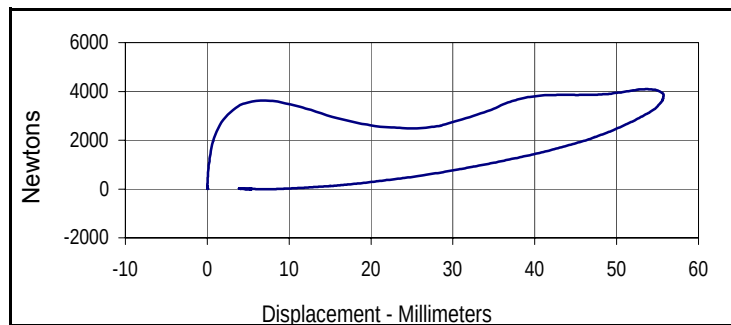
Test Date: 1/17/14



ATD Serial No.: 635

Test I.D.: F635CH043

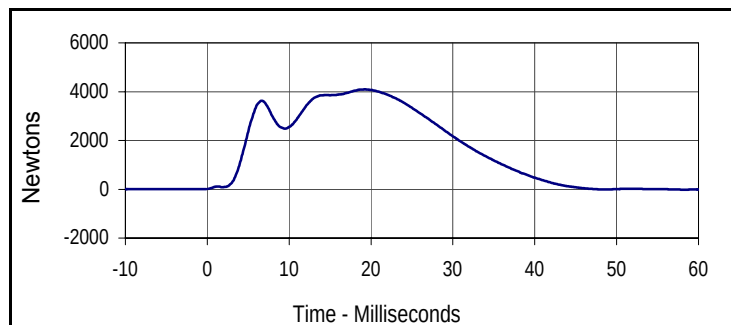
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	640	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.1	Pass
	Min	%		30.5	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.1	Pass
Probe Velocity		m/s	6.59 to 6.83	6.77	Pass
Peak Chest Deflection		mm	50.0 to 58.0	55.7	Pass
Peak Force Between 50 and 58 MM		Newtons	3900 to 4400	3945	Pass
Peak Force Between 18 and 50 MM		Newtons	≤4600	4093	Pass
Internal Hysteresis		%	69 to 85	70.7	Pass
Overall Test Results					Pass



Curve Description

Probe Force vs. Chest Deflection

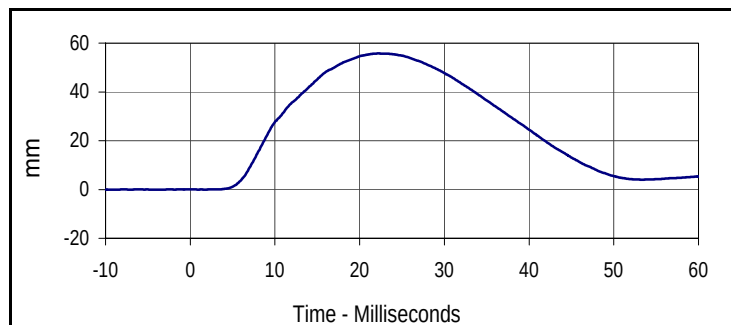
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	70.7
Peak Probe Force		Peak Chest Deflection	
4093.1		55.7	



Curve Description

Probe Force

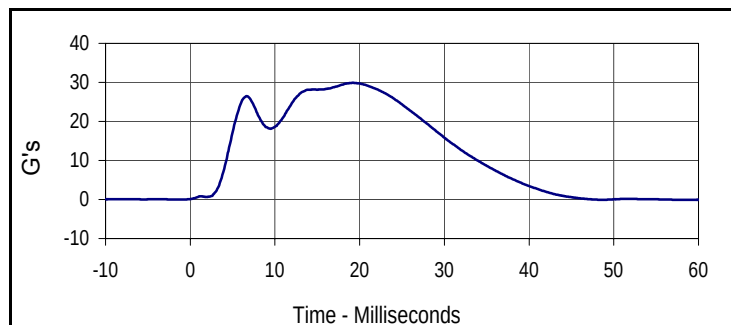
Plot No.	Type	SAE Class	Units
002	FIL	180	Newtons
Max	Time	Min	Time
4093.1	19.2	-14.4	58.5



Curve Description

Chest Deflection

Plot No.	Type	SAE Class	Units
003	FIL	600	mm
Max	Time	Min	Time
55.7	22.2	0.0	-10.0



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
29.9	19.2	-0.1	58.5

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

Test Date: 1/17/14

ATD Serial No.: 635

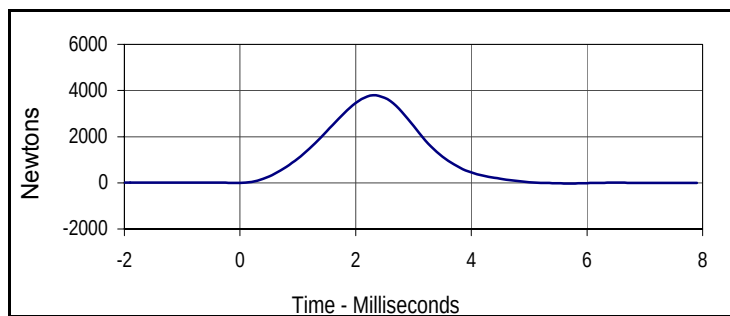
Test I.D.: F635LK043, F635RK043

**Left Knee**

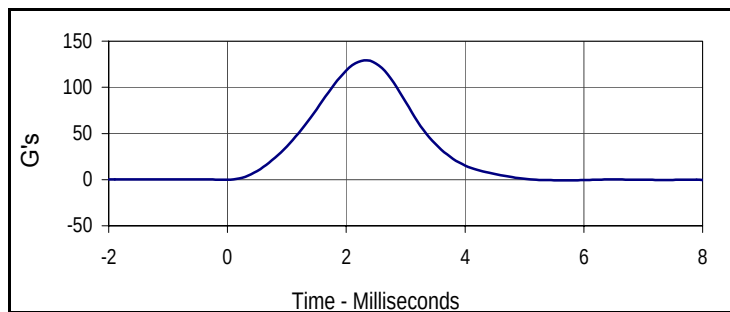
Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	670	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.1	Pass
	Min	%		30.5	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.0	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.11	Pass
Peak Probe Force		Newtons	3450 to 4060	3790	Pass
Overall Test Results				Pass	

Right Knee

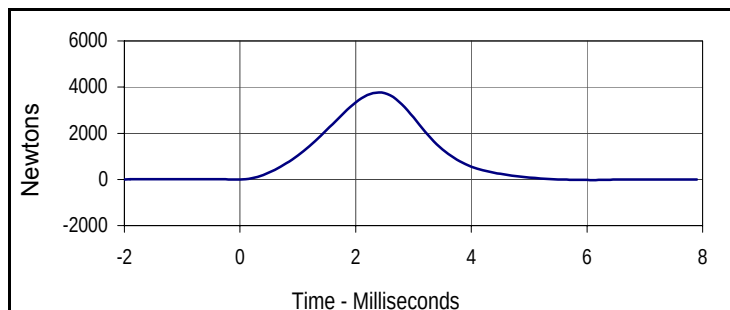
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	3450 to 4060	3772	Pass
Overall Test Results				Pass	

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

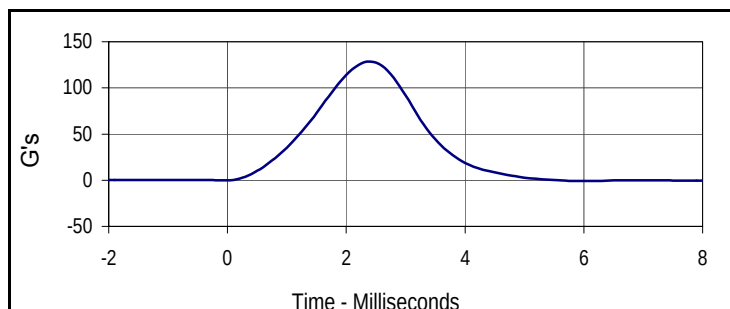
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3790.1	2.3	-27.9	5.7

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

Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
129.3	2.3	-1.0	5.7

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

Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
3771.8	2.4	-25.0	6.1

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

Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
128.7	2.4	-0.9	6.1

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

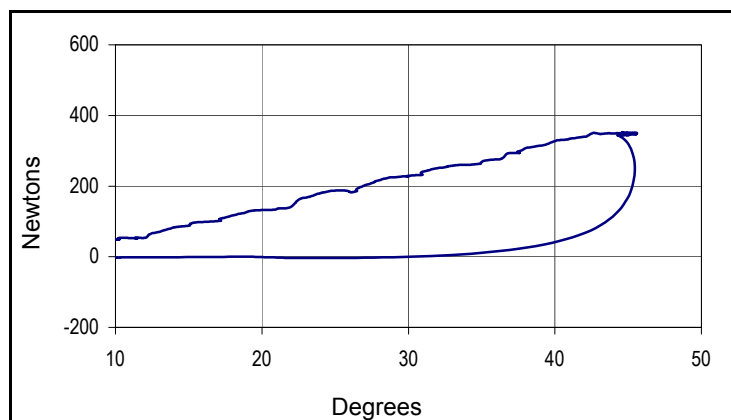
Test Date: 1/17/14

ATD Serial No.: 635

Test I.D.: TF043



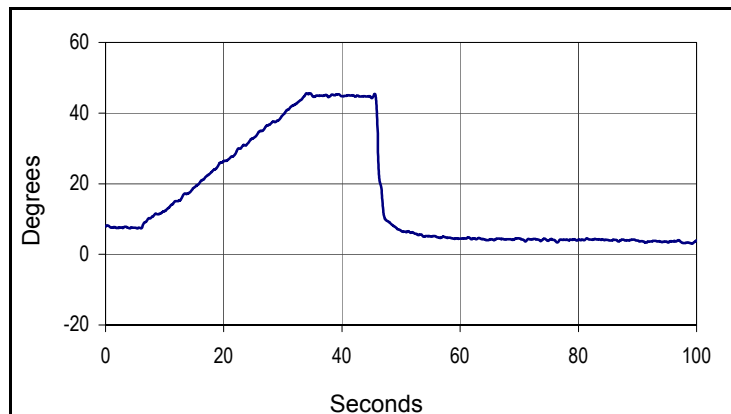
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	695	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	31.1	Pass
	Min	%		30.5	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.0	Pass
Initial Reference Plane Angle		Degrees	≤ 20	8.0	Pass
Peak Force at 45° +/-0.5°		Newtons	320.0 to 390.0	352.8	Pass
Torso Rotation Rate		deg/sec	0.5 to 1.5	1.3	Pass
Final Reference Plane Angle		Degrees	+/-8	3.9	Pass
Overall Test Results				Pass	



Curve Description

Force vs Torso Rotation

Plot No.	Type	Filter Freq
001	FIL	1 Hz
Peak Force		Peak Rotation
352.8		45.6



Curve Description

Torso Rotation

Plot No.	Type	Filter Freq	Units
002	FIL	1 Hz	Degrees
Max	Time	Min	Time
45.6	34.0	3.0	99.2

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

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

Test Date: 1/29/14



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: 1/29/14

ATD Serial No.: 034

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	29.5	Pass
A - Total sitting height	mm	879 to 889	884	Pass
B - Shoulder pivot height	mm	505 to 521	512	Pass
C - H point height	mm	84 to 89	85	Pass
D - H point location from backline	mm	135 to 140	137	Pass
E - Shoulder pivot from backline	mm	84 to 94	89	Pass
F - Thigh clearance	mm	140 to 155	146	Pass
G - Back of elbow to wrist pivot	mm	290 to 305	297	Pass
H - Head back to backline	mm	41 to 46	43	Pass
I - Shoulder to elbow length	mm	330 to 345	336	Pass
J - Elbow rest height	mm	190 to 211	201	Pass
K - Buttock to knee length	mm	579 to 604	586	Pass
L - Popliteal length	mm	429 to 455	438	Pass
M - Knee pivot height	mm	485 to 500	493	Pass
N - Buttock popliteal length	mm	452 to 477	472	Pass
O - Chest depth without jacket	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	260	Pass
V - Shoulder breadth	mm	422 to 437	433	Pass
W - Foot breadth	mm	91 to 107	99	Pass
Y - Chest circumference (with chest jacket)	mm	970 to 1001	981	Pass
Z - Waist circumference	mm	836 to 866	864	Pass
AA - Location for chest circumference	mm	429 to 434	429	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
Overall Test Results			Pass	

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

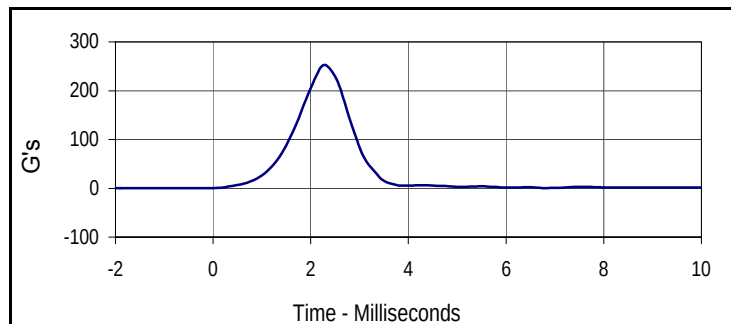
Test Date: 1/29/14



ATD Serial No.: 034

Test I.D.: M034HD048

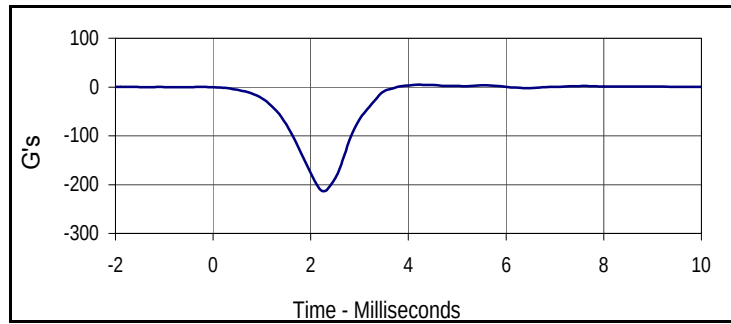
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	500	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.5	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.5	Pass
	Min	%		18.3	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	18.3	Pass
Peak Resultant Acceleration		G's	225.0 to 275.0	252.6	Pass
Peak Lateral Acceleration		G's	≤15.0	10.0	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	2.5	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Overall Test Results				Pass	



Curve Description

Head Resultant

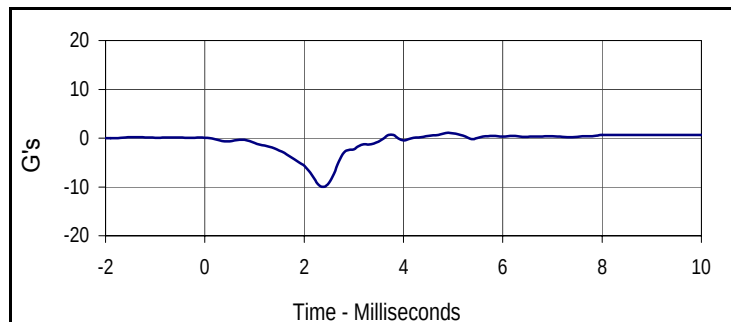
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
252.6	2.3	0.1	-0.2



Curve Description

Head X

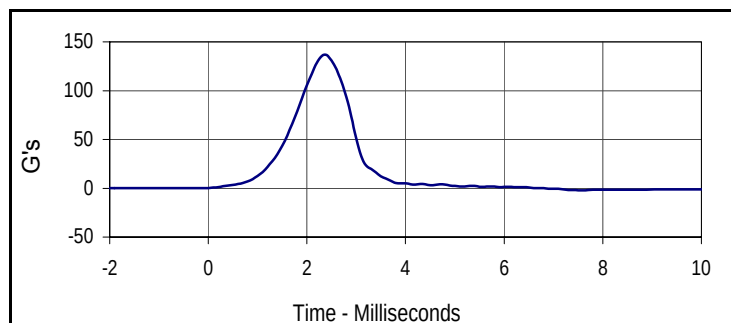
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
4.6	4.2	-212.9	2.3



Curve Description

Head Y

Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
1.1	4.9	-10.0	2.4



Curve Description

Head Z

Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
136.4	2.4	0.0	-1.4

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

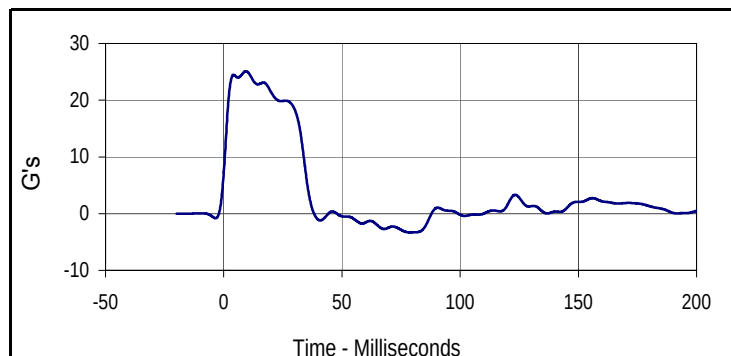
Test Date: 1/29/14



ATD Serial No.: 034

Test I.D.: M034NF048

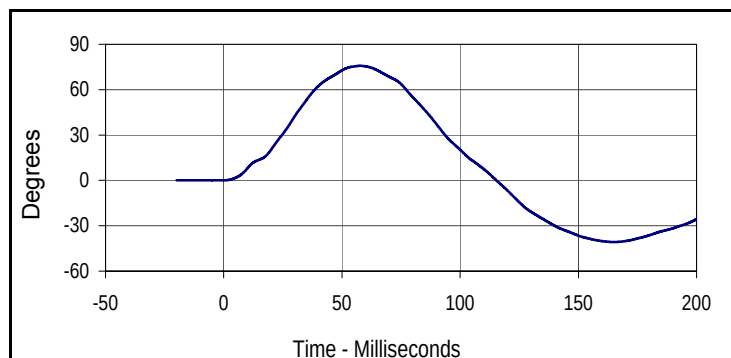
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	550	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.5	Pass
	Min	%		18.3	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	18.5	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.04	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	25.0	Pass
	20 Msec.	G's	17.6 to 22.6	21.4	Pass
	30 Msec.	G's	12.5 to 18.5	18.4	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	18.4	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	35.4	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	75.8	Pass
	Time	Msec.	57.0 to 64.0	57.7	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	115.4	Pass
Moment About Occ. Condyle	Max	Nm	88.1 to 108.5	89.1	Pass
	Time	Msec.	47.0 to 58.0	54.5	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	101.1	Pass
Overall Test Results					Pass



Curve Description

Pendulum Deceleration

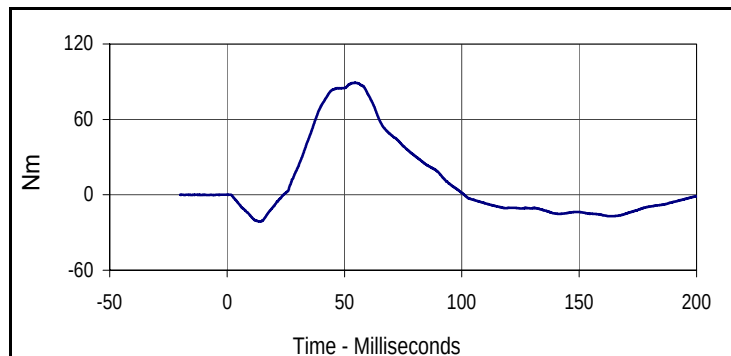
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
25.1	9.4	-3.3	78.8



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
75.8	57.7	-40.7	164.8



Curve Description

Moment About Occipital Condyle

Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
89.1	54.5	-21.3	13.8

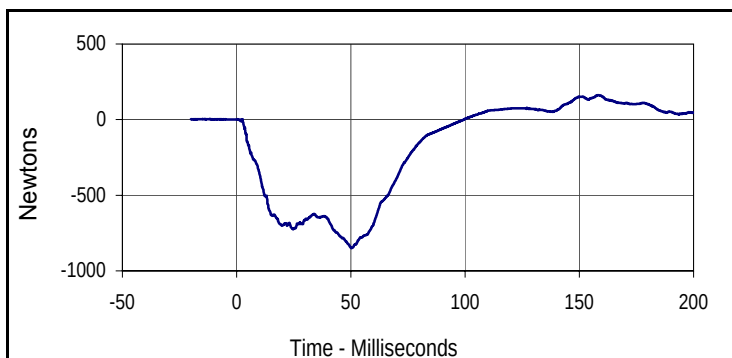
Test Program: Hybrid III 50th Percentile Male Neck Flexion Test

Test Date: 1/29/14

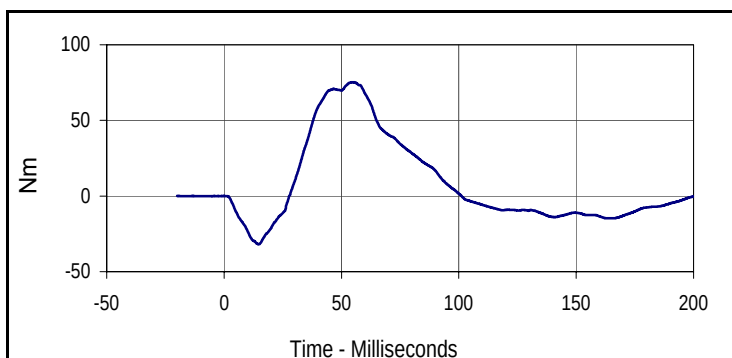


ATD Serial No.: 034

Test I.D.: M034NF048



Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
162.5	158.4	-849.9	50.2



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
75.3	55.4	-31.9	14.9

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

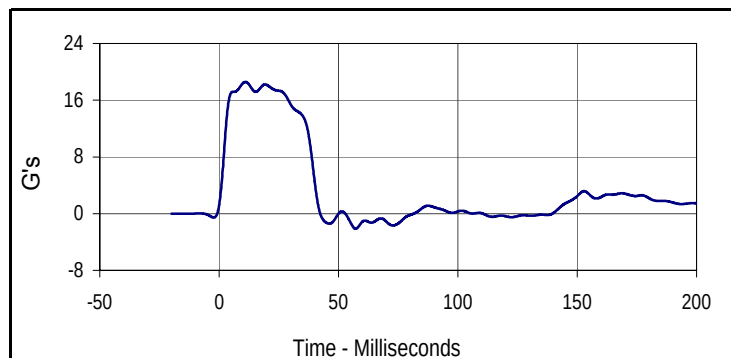
Test Date: 1/29/14



ATD Serial No.: 034

Test I.D.: M034NE048

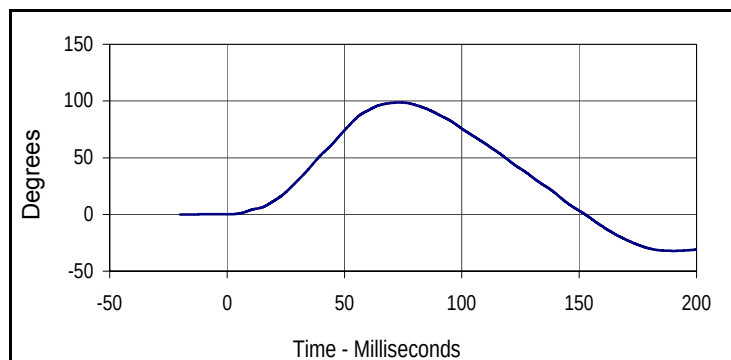
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	585	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.5	Pass
	Min	%		18.3	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	18.3	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.07	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.4	Pass
	20 Msec.	G's	14.0 to 19.0	18.2	Pass
	30 Msec.	G's	11.0 to 16.0	15.4	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.4	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	39.9	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	98.6	Pass
	Time	Msec.	72.0 to 82.0	73.9	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	152.6	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to -79.9	-77.6	Pass
	Time	Msec.	65.0 to 79.0	68.4	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	137.1	Pass
Overall Test Results					Pass



Curve Description

Pendulum Deceleration

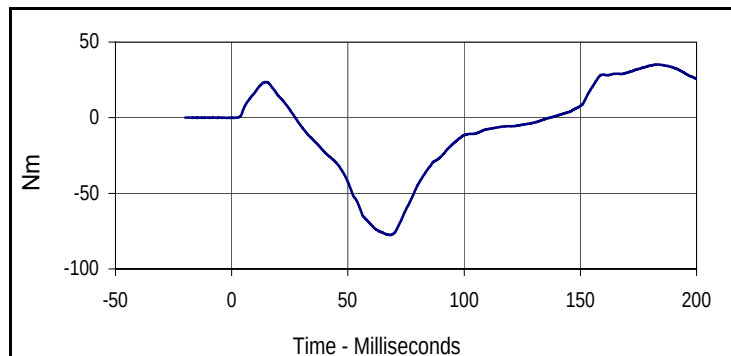
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
18.6	11.0	-2.1	57.2



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
98.6	73.9	-32.1	190.4



Curve Description

Moment About Occipital Condyle

Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
35.2	183.3	-77.6	68.4

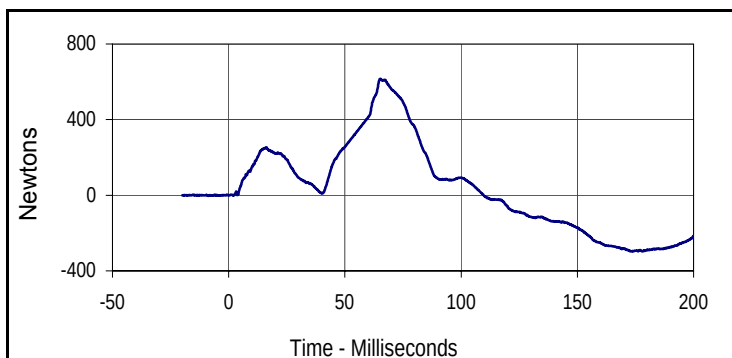
Test Program: Hybrid III 50th Percentile Male Neck Extension Test

Test Date: 1/29/14

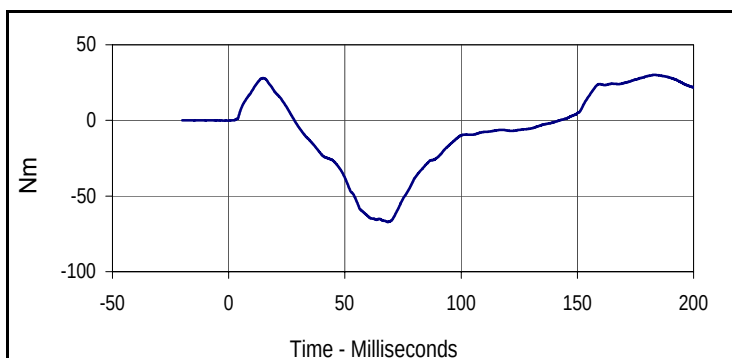


ATD Serial No.: 034

Test I.D.: M034NE048



Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
615.2	65.2	-297.5	174.0



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
30.2	183.3	-67.2	68.5

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

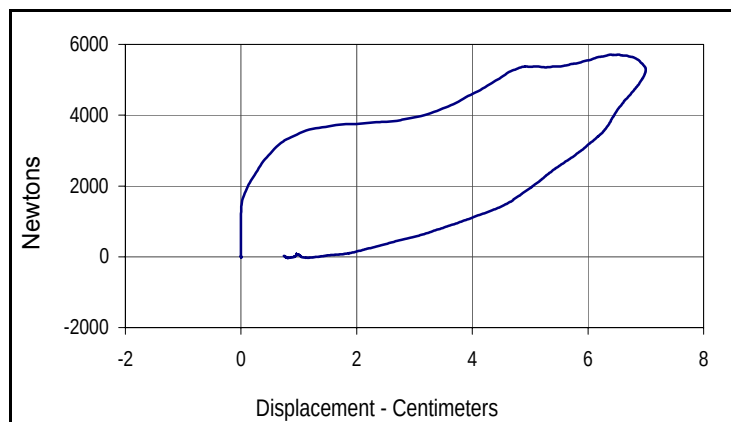
Test Date: 1/29/14



ATD Serial No.: 034

Test I.D.: M034CH048

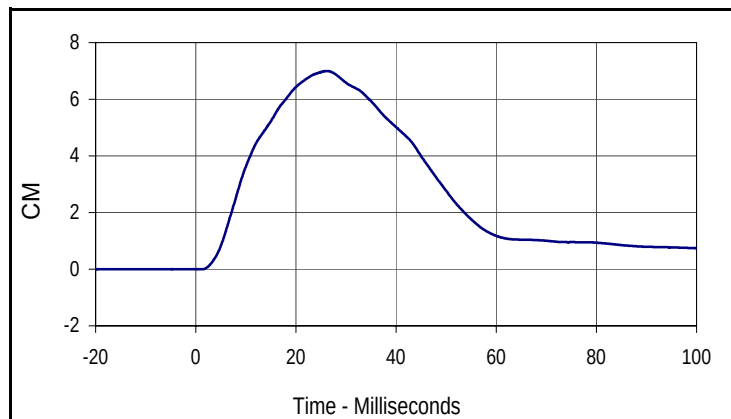
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	635	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.5	Pass
	Min	%		18.2	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	18.4	Pass
Probe Velocity		m/s	6.58 to 6.82	6.73	Pass
Peak Probe Force		Newtons	5159 to 5893	5708	Pass
Peak Sternum Deflection		CM	6.35 to 7.26	7.00	Pass
Internal Hysteresis		%	69 to 85	69.5	Pass
Overall Test Results				Pass	



Curve Description

Probe Force vs. Chest Deflection

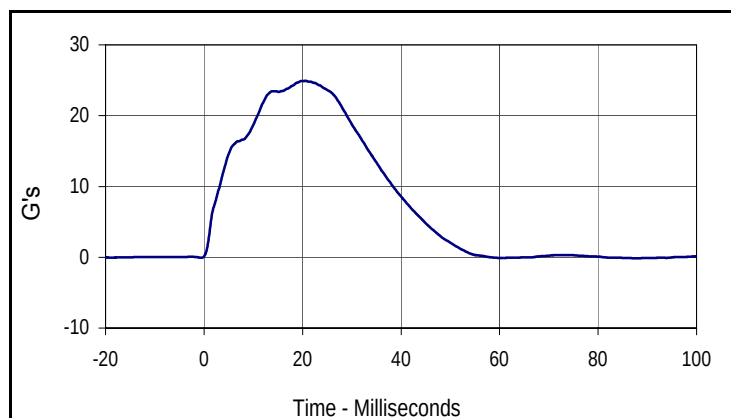
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	69.5
Peak Probe Force		Peak Chest Deflection	
5708		7.00	



Curve Description

Chest Deflection

Plot No.	Type	SAE Class	Units
002	FIL	180	CM
Max	Time	Min	Time
7.0	26.2	0.0	1.1



Curve Description

Impactor Acceleration

Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
24.9	20.6	-0.2	88.0

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

Test Date: 1/29/14

ATD Serial No.: 034

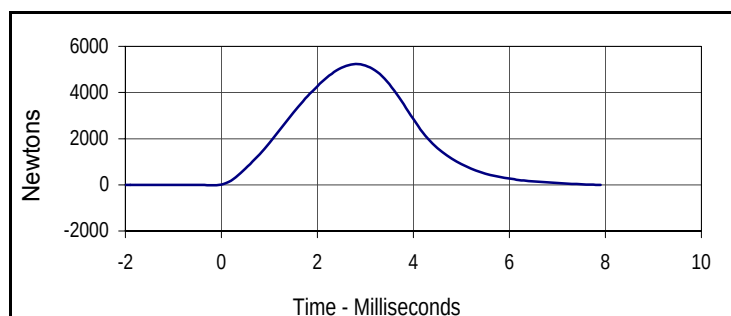
Test I.D.: M034LK048, M034RK048

**Left Knee**

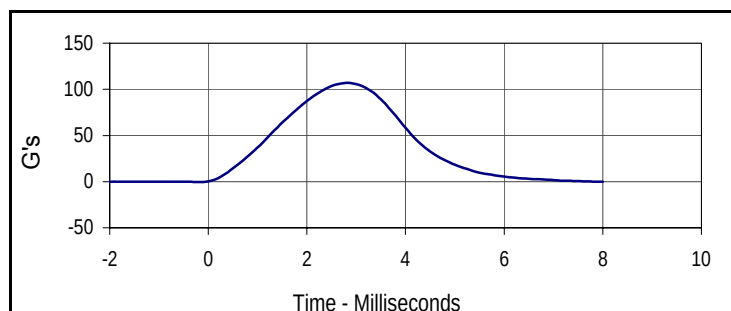
Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	670	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.5	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.5	Pass
	Min	%		18.3	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	18.3	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	4715 to 5782	5233	Pass
Overall Test Results					Pass

Right Knee

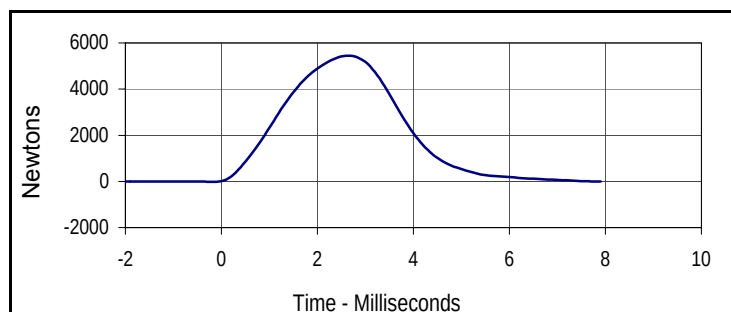
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.11	Pass
Peak Probe Force		Newtons	4715 to 5782	5444	Pass
Overall Test Results					Pass

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

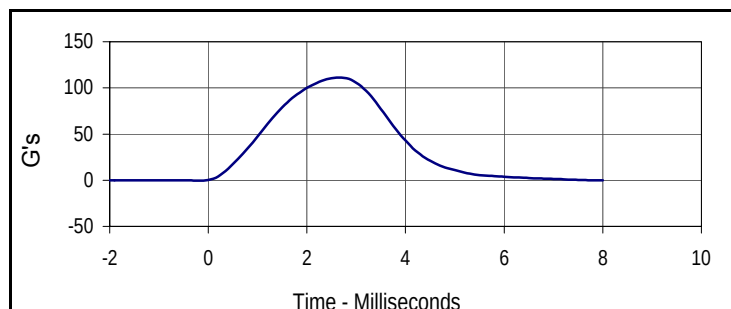
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5233.2	2.8	-20.1	-0.2

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

Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
107.0	2.8	-1.2	0.0

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

Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
5444.3	2.6	-22.2	-0.2

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

Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
111.3	2.6	-0.5	0.0

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

Test Date: 1/29/14

ATD Serial No.: 034

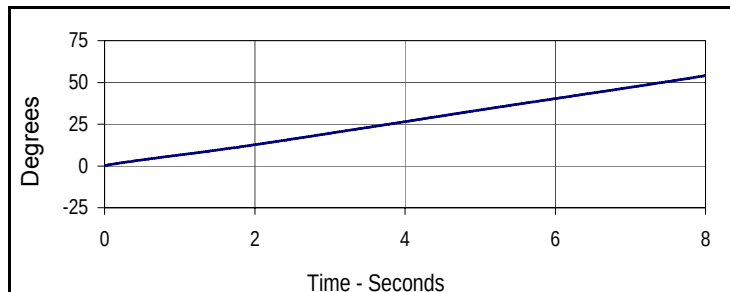
Test I.D.: M034LF048, M034RF048

**Left Hip Joint-Femur Results**

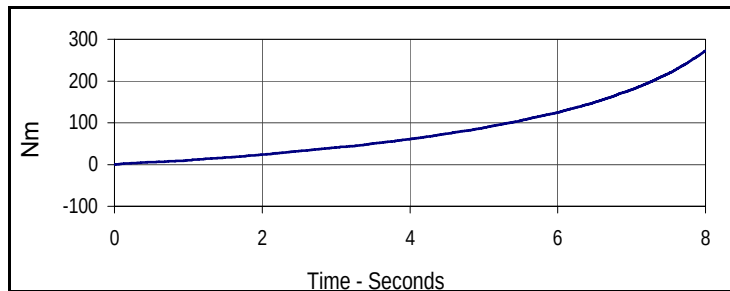
Tested Parameter	Units	Specification	Result	Pass/Fail
Hip Joint-Femur Assembly Soak Time	Minutes	≥240	720	Pass
Temperature During Soak	Max	18.9 to 25.6	21.5	Pass
	Min		21.4	Pass
Humidity During Soak	Max	10.0 to 70.0	18.5	Pass
	Min		18.3	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	18.5	Pass
Rotation Rate	deg/sec	5 to 10	6.8	Pass
Femur Torque at 30°	Nm	≤ 95	71.8	Pass
Rotation at 203 Nm	Degrees	40.0 to 50.0	48.7	Pass
Overall Test Results				Pass

Right Hip Joint-Femur Results

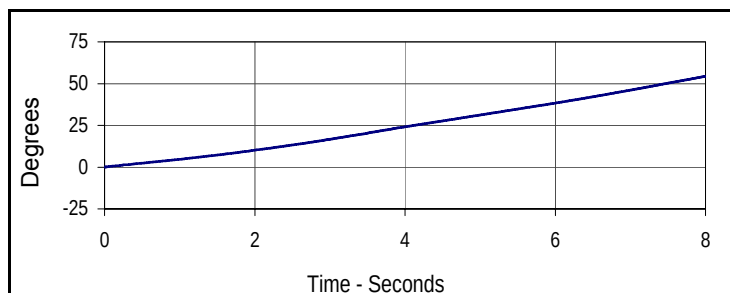
Rotation Rate	deg/sec	5 to 10	6.8	Pass
Femur Torque at 30°	Nm	≤ 95	92.5	Pass
Rotation at 203 Nm	Degrees	40.0 to 50.0	49.2	Pass
Overall Test Results				Pass

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

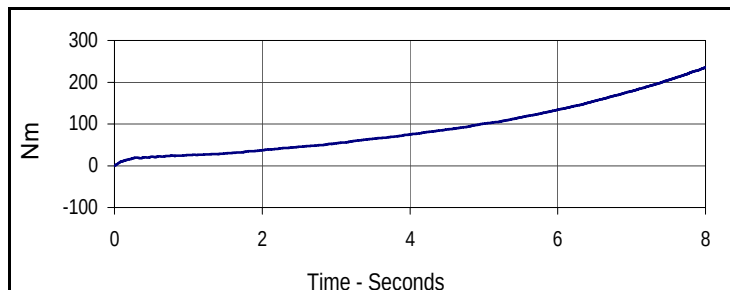
Plot No.	Type	SAE Class	Units
001	FIL	60	Degrees
Max	Time	Min	Time
54.1	8.0	0.1	0.0

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

Plot No.	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
272.1	8.0	0.1	0.0

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

Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
54.4	8.0	0.1	0.0

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

Plot No.	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
235.3	8.0	0.1	0.0

Test Program: Hybrid III 5th Percentile Female Dummy Damage Checklist
 ATD Serial No.: 635

Test Date: 1/30/14
 Test I.D.: N/A



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

Describe the repair on repair or replacement of parts:

Test Program: Hybrid III 5th Percentile Female External Measurements

Test Date: 1/30/14

ATD Serial No.: 635

Test I.D.: N/A



Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.57	Pass
Laboratory Relative Humidity	%	10 to 70	18.6	Pass
A - Total sitting height	mm	774.7 to 800.1	786	Pass
B - Shoulder pivot height	mm	431.8 to 457.2	450	Pass
C - H point height	mm	81.3 to 86.3	85	Pass
D - H point location from backline	mm	144.8 to 149.8	146	Pass
E - Shoulder pivot from backline	mm	68.6 to 83.8	77	Pass
F - Thigh clearance	mm	119.4 to 134.6	126	Pass
G - Back of elbow to wrist pivot	mm	243.9 to 259.1	250	Pass
H - Head back to backline	mm	40.7 to 45.7	44	Pass
I - Shoulder to elbow length	mm	276.8 to 297.2	285	Pass
J - Elbow rest height	mm	182.8 to 203.2	198	Pass
K - Buttock to knee length	mm	520.7 to 546.1	531	Pass
L - Popliteal length	mm	355.6 to 376.0	371	Pass
M - Knee pivot height	mm	393.7 to 419.1	402	Pass
N - Buttock popliteal length	mm	414.0 to 439.4	420	Pass
O - Chest depth without jacket	mm	175.3 to 190.5	186	Pass
P - Foot length	mm	218.5 to 233.7	221	Pass
R - Buttock to Knee Pivot Length	mm	457.2 to 482.6	473	Pass
S - Head Breadth	mm	137.1 to 147.3	144	Pass
T - Head Depth	mm	177.8 to 188.0	180	Pass
U - Hip Breadth	mm	299.7 to 314.9	302	Pass
V - Shoulder breadth	mm	350.5 to 365.7	359	Pass
W - Foot breadth	mm	78.8 to 94.0	90	Pass
X - Head circumference	mm	528.3 to 548.7	541	Pass
Y - Chest circumference (with chest jacket)	mm	850.8 to 881.3	864	Pass
Z - Waist circumference	mm	759.5 to 789.9	766	Pass
AA - Location for chest circumference	mm	299.7 to 309.9	300	Pass
BB - Location for waist circumference	mm	160.1 to 170.2	164	Pass
Overall Test Results				Pass

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

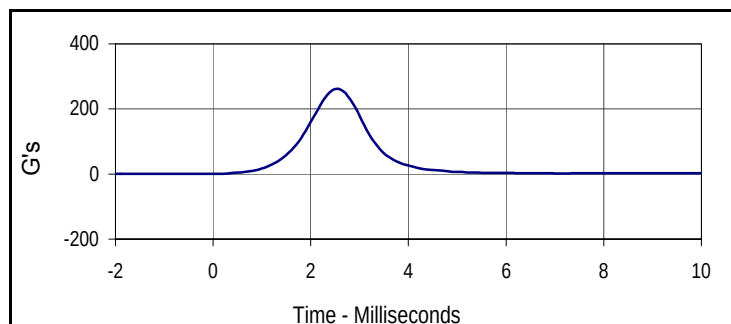
Test Date: 1/30/14

ATD Serial No.: 635

Test I.D.: F635HD044



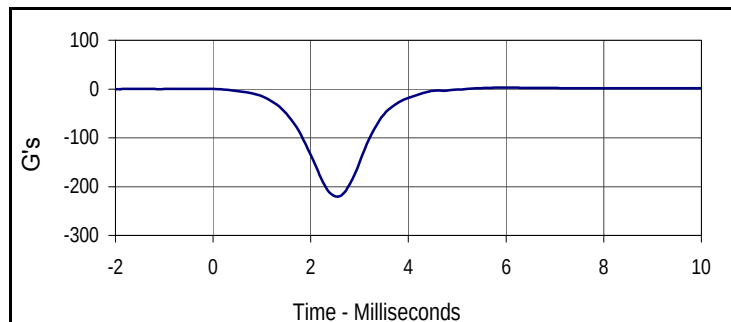
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	550	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.5	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.6	Pass
	Min	%		18.5	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	18.6	Pass
Peak Resultant Acceleration		G's	250.0 to 300.0	261.0	Pass
Peak Lateral Acceleration		G's	≤15.0	4.5	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	1.3	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
Overall Test Results				Pass	



Curve Description

Head Resultant

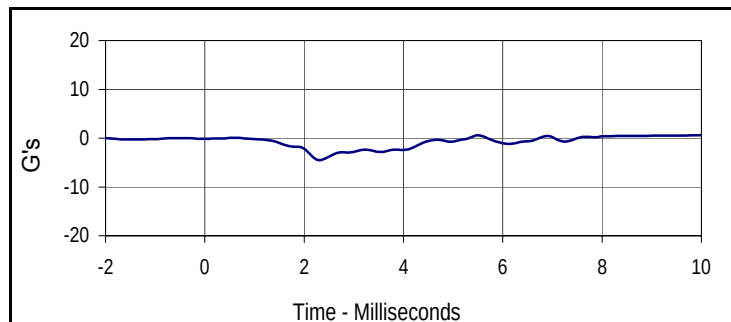
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
261.0	2.5	0.4	-1.3



Curve Description

Head X

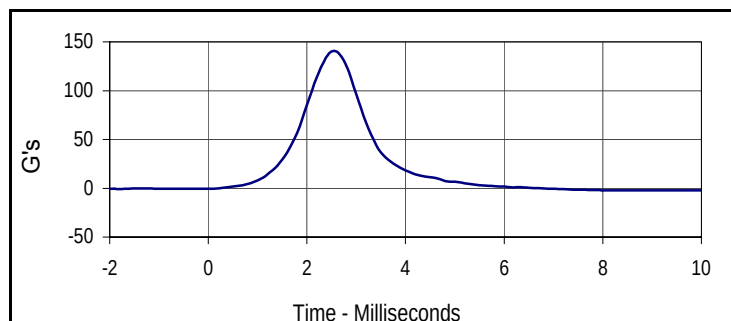
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.9	6.0	-220.2	2.5



Curve Description

Head Y

Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
0.6	5.5	-4.5	2.3



Curve Description

Head Z

Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
140.1	2.6	-0.7	-1.8

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

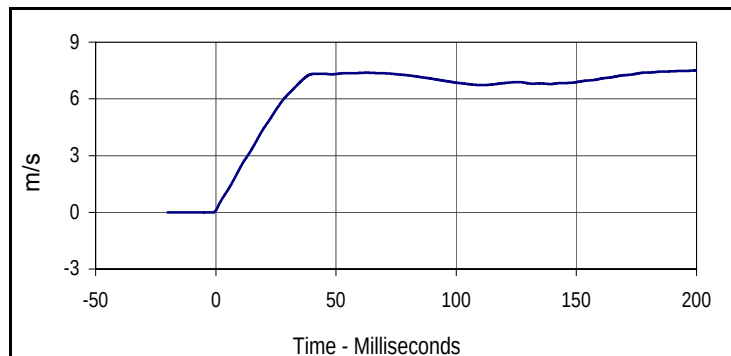
Test Date: 1/30/14

ATD Serial No.: 635

Test I.D.: F635NF044



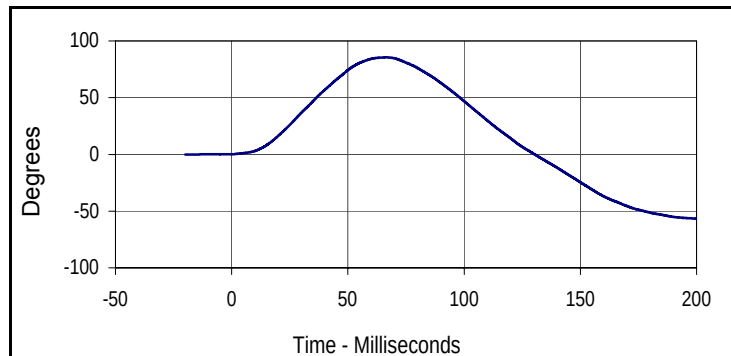
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	605	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.5	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.6	Pass
	Min	%		18.5	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	18.6	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.04	Pass
Pendulum Deceleration	10 Msec.	m/s	2.1 to 2.5	2.3	Pass
	20 Msec.	m/s	4.0 to 5.0	4.5	Pass
	30 Msec.	m/s	5.8 to 7.0	6.2	Pass
"D" Plane Rotation	Max	Degrees	77.0 to 91.0	85.5	Pass
Peak Moment in Rotation	Max	Nm	69.0 to 83.0	72.6	Pass
Positive Moment Decay, Time To 10 Nm		Msec.	80.0 to 100.0	94.0	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Velocity

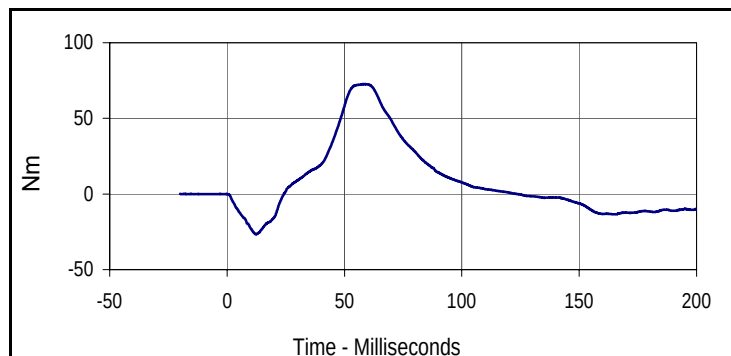
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
7.5	200.0	0.0	-1.3



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
85.5	66.5	-56.6	200.0



Curve Description

Moment About Occipital Condyle

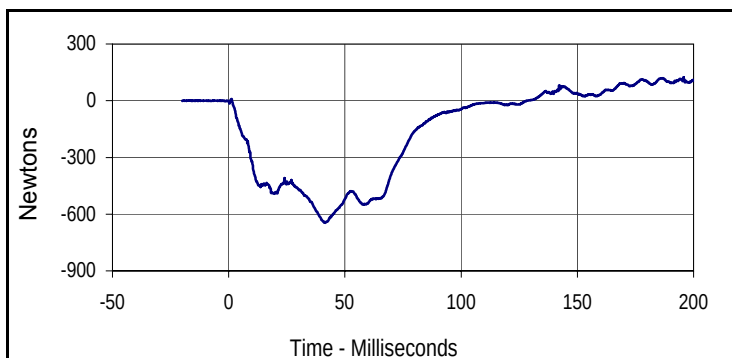
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
72.6	57.9	-26.7	12.2

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

ATD Serial No.: 635

Test Date: 1/30/14

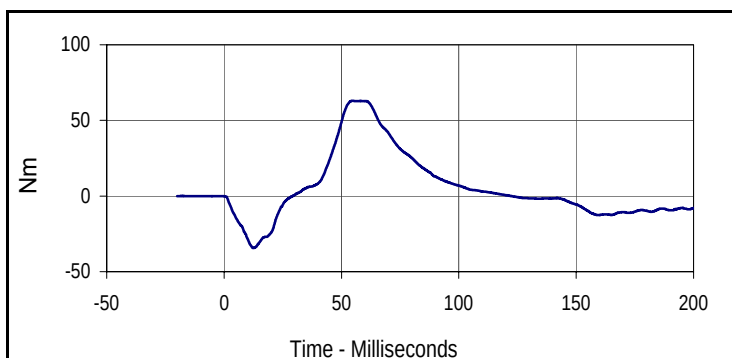
Test I.D.: F635NF044



Curve Description

Upper Neck Force X

Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
123.3	195.7	-645.3	41.5



Curve Description

Neck Moment Y

Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
63.0	54.6	-34.4	12.6

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

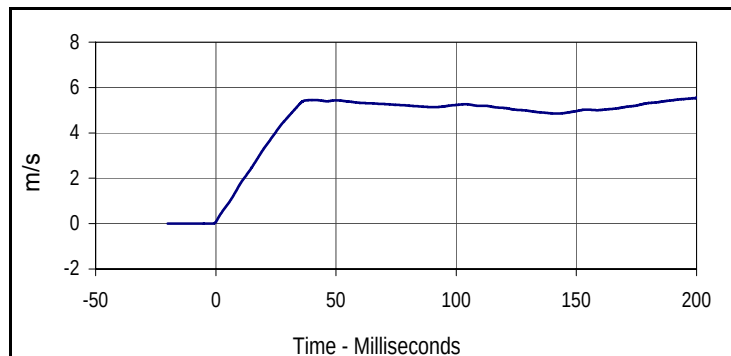
Test Date: 1/30/14



ATD Serial No.: 635

Test I.D.: F635NE044

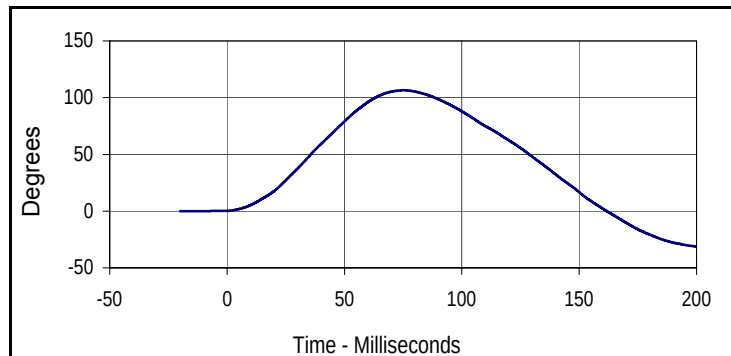
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	640	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.5	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.6	Pass
	Min	%		18.5	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	18.6	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.05	Pass
Pendulum Deceleration	10 Msec.	m/s	1.5 to 1.9	1.7	Pass
	20 Msec.	m/s	3.1 to 3.9	3.3	Pass
	30 Msec.	m/s	4.6 to 5.6	4.7	Pass
"D" Plane Rotation	Max	Degrees	99.0 to 114.0	106.5	Pass
Peak Moment in Rotation	Max	Nm	-53.0 to -65.0	-54.2	Pass
Positive Moment Decay, Time To -10 Nm		Msec.	94.0 to 114.0	106.1	Pass
Overall Test Results				Pass	



Curve Description

Pendulum Velocity

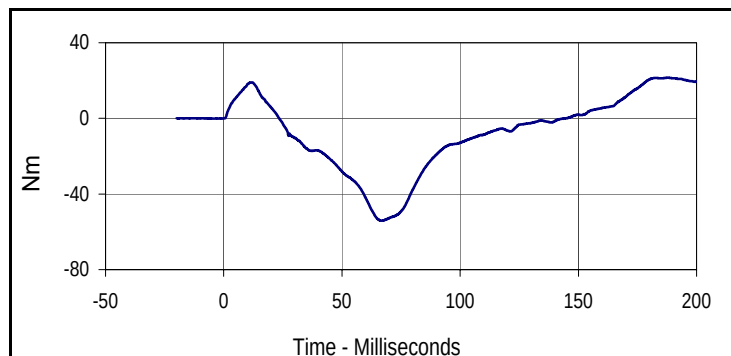
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
5.5	200.0	0.0	-1.4



Curve Description

"D" Plane Rotation

Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
106.5	75.2	-31.1	200.0



Curve Description

Moment About Occipital Condyle

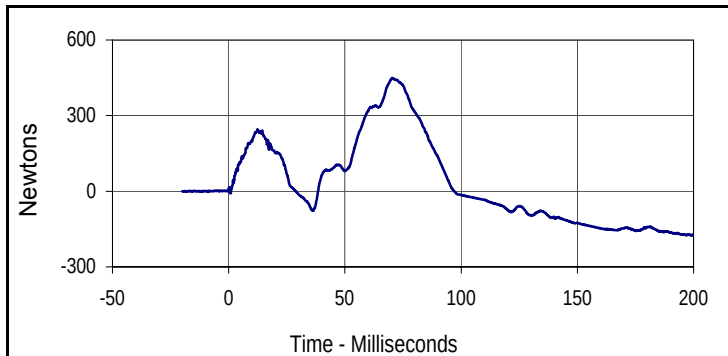
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
21.5	187.6	-54.2	66.4

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

ATD Serial No.: 635

Test Date: 1/30/14

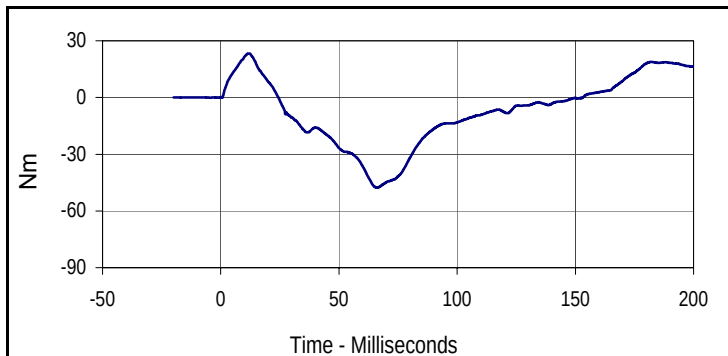
Test I.D.: F635NE044



Curve Description

Upper Neck Force X

Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
448.7	70.5	-175.8	196.9



Curve Description

Neck Moment Y

Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
23.3	11.8	-47.7	66.3

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

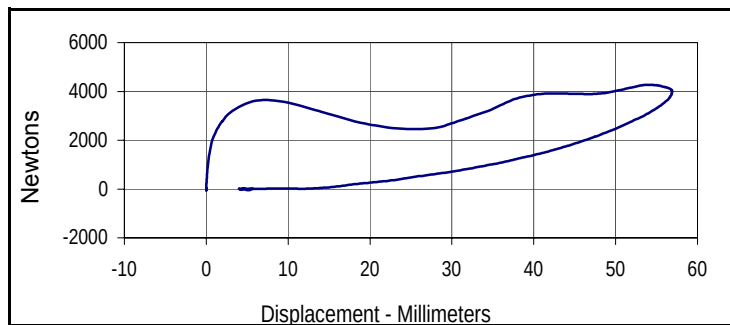
Test Date: 1/30/14



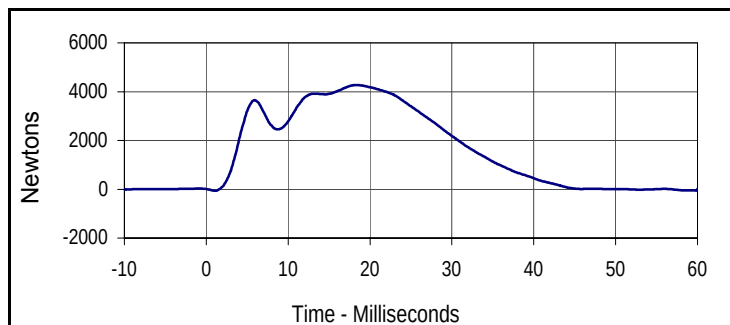
ATD Serial No.: 635

Test I.D.: F635CH044

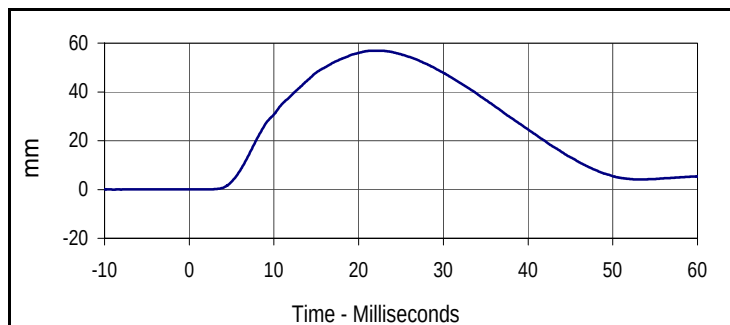
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	690	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.5	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.6	Pass
	Min	%		18.5	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	18.5	Pass
Probe Velocity		m/s	6.59 to 6.83	6.71	Pass
Peak Chest Deflection		mm	50.0 to 58.0	56.9	Pass
Peak Force Between 50 and 58 MM		Newtons	3900 to 4400	4270	Pass
Peak Force Between 18 and 50 MM		Newtons	≤4600	4014	Pass
Internal Hysteresis		%	69 to 85	70.3	Pass
Overall Test Results					Pass



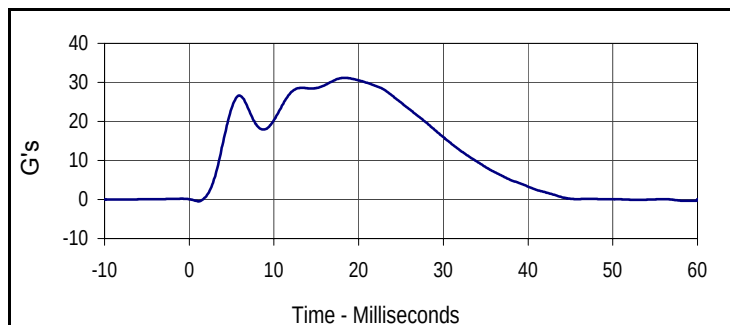
Curve Description			
Probe Force vs. Chest Deflection			
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	70.3
Peak Probe Force		Peak Chest Deflection	
4270.4		56.9	



Curve Description			
Probe Force			
Plot No.	Type	SAE Class	Units
002	FIL	180	Newtons
Max	Time	Min	Time
4270.4	18.3	-63.7	1.1



Curve Description			
Chest Deflection			
Plot No.	Type	SAE Class	Units
003	FIL	600	mm
Max	Time	Min	Time
56.9	21.8	0.0	-9.0



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
31.2	18.3	-0.5	1.1

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

Test Date: 1/30/14

ATD Serial No.: 635

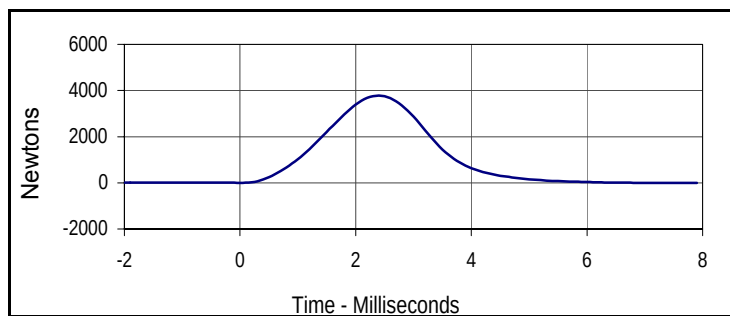
Test I.D.: F635LK044, F635RK044

**Left Knee**

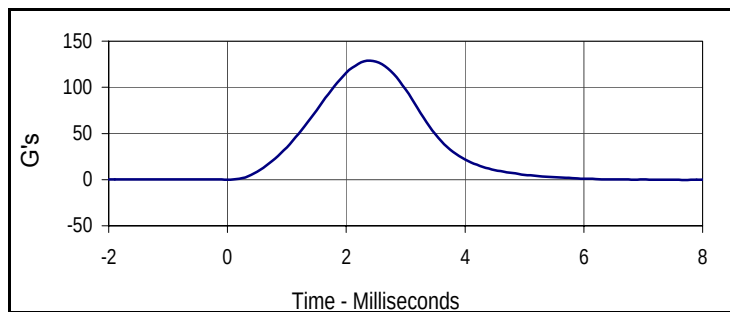
Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	720	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.5	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.6	Pass
	Min	%		18.5	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	18.6	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	3450 to 4060	3778	Pass
Overall Test Results				Pass	

Right Knee

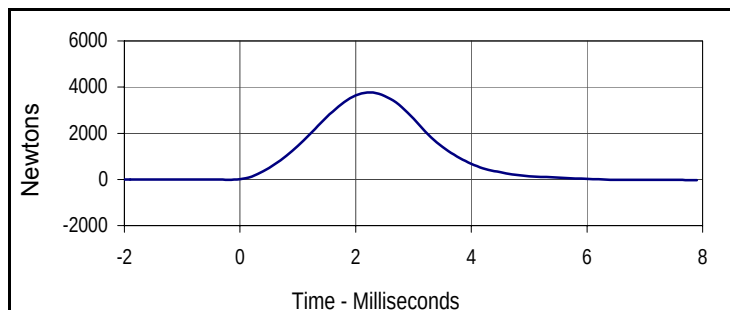
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.11	Pass
Peak Probe Force		Newtons	3450 to 4060	3773	Pass
Overall Test Results				Pass	

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

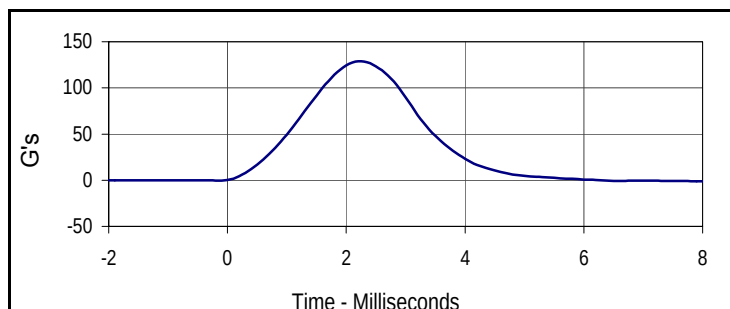
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3777.5	2.4	-8.0	7.7

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

Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
128.9	2.4	-0.7	10.0

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

Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
3772.7	2.2	-32.1	7.9

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

Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
128.7	2.2	-1.3	9.9

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

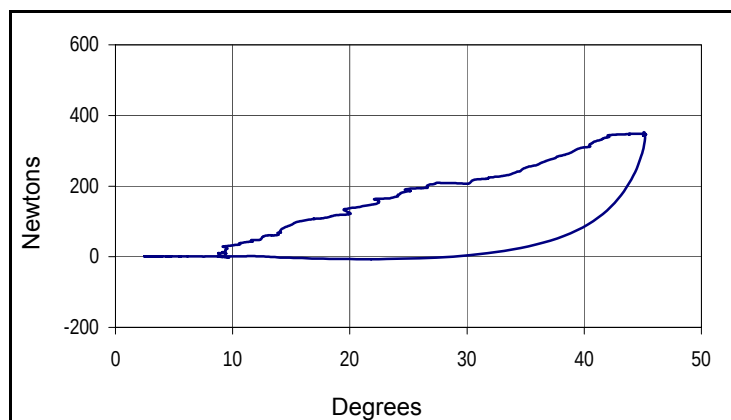
Test Date: 1/30/14

ATD Serial No.: 635

Test I.D.: TF044



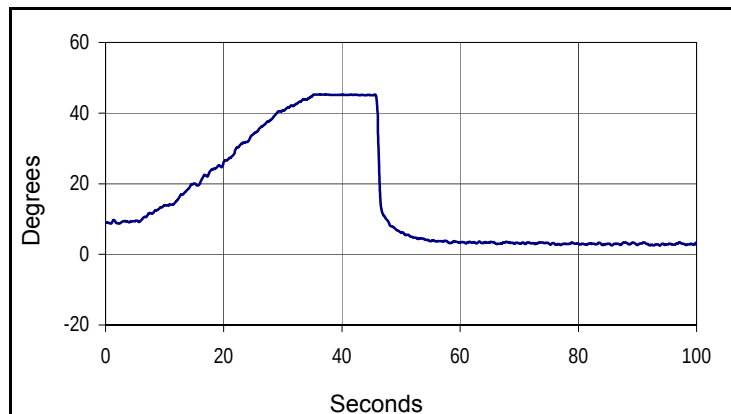
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	745	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.5	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.6	Pass
	Min	%		18.5	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	18.6	Pass
Initial Reference Plane Angle		Degrees	≤ 20	9.1	Pass
Peak Force at 45° +/-0.5°		Newtons	320.0 to 390.0	353.0	Pass
Torso Rotation Rate		deg/sec	0.5 to 1.5	1.2	Pass
Final Reference Plane Angle		Degrees	+/-8	3.3	Pass
Overall Test Results				Pass	



Curve Description

Force vs Torso Rotation

Plot No.	Type	Filter Freq
001	FIL	1 Hz
Peak Force		Peak Rotation
353.0		45.3



Curve Description

Torso Rotation

Plot No.	Type	Filter Freq	Units
002	FIL	1 Hz	Degrees
Max	Time	Min	Time
45.3	36.4	2.5	93.8