REPORT NUMBER: NCAP-KAR-14-016

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

AUDI AG
2014 AUDI Q5 2.0T QUATTRO 5-DOOR MPV

NHTSA NUMBER: M20145800

PREPARED BY:
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FEBRUARY 19, 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
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Approval Date: February 19, 2014

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NHTSA, Office of Crashworthiness Standards

Date: _____

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COTR, New Car Assessment Program
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Date: _____

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15. Supplementary Notes

16. Abstract

A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2014 Audi Q5 2.0T Quattro 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 February 5, 2014.

The impact velocity of the vehicle was 55.98 km/h and the ambient temperature at the barrier face at the time of impact was 16.7° C. The target vehicle's post-test maximum crush was 332 mm at DPD 2 to the left of the vehicle's centerline. The test vehicle's performance is as follows:

Measurement Description	Units	Driver ATD		Passenger ATD	
		Threshold	Result	Threshold	Result
Head Injury Criteria (HIC_{15})	N/A	700.0	218.5	700.0	175.1
Maximum Chest Compression	mm	63	-31	52	-16
Nij	N/A	1	0.30	1	0.32
Neck Tension	N	4170	1038.8	2620	819.4
Neck Compression	N	4000	-57.0	2520	-184.0
Left Femur Force	N	10008	-4511.5	6805	-2439.0
Right Femur Force	N	10008	-3270.0	6805	-1694.6

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TABLE OF CONTENTS

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 August 2013.

SUMMARY

A load cell barrier consisting of 176 load cells was impacted by a 2014 Audi Q5 2.0T Quattro 5-door MPV at a velocity of 55.98 km/h. The test was performed at KARCO Engineering, LLC. on February 5, 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 and the passenger's shoulder and lap belts 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 112 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 332 mm located at DPD 2 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 bolster and steering column.

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)	218.5	63.9	78.9	-31	0.30	1038.8	-57.0	-4511.5	-3270.0
Passenger (5th)	175.1	62.1	77.1	-16	0.32	819.4	-184.0	-2439.0	-1694.6

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14

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	^oF	^oC	=(Tf -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 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20145800
Model Year	2014
Make	Audi
Model	Q5 2.0T Quattro
Body Style	5-Door MPV
VIN	WA1LFBFP3EA044520
Body Color	Monsoon Gray Metallic
Odometer Reading (km / mi)	66 / 41
Engine Displacement (L)	2.0
Type / No. of Cylinders	Inline 4
Engine Placement	Longitudinal
Transmission Type	Automatic
Transmission Speeds	8
Overdrive	Yes
Final Drive	AWD
Roof Rack	Yes
Sunroof / T-Top	Yes
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes
Automatic Door Locks (ADLs)	Yes

Traction Control System	Yes
Power Steering	Yes
Power Window Auto-Reverse	Yes
Driver Frontal Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
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	Rear Side Airbags

Does Owner's Manual provide instructions to turn off automatic door locks? No

DATA FROM CERTIFICATION LABEL

Manufactured By	Audi AG
Date of Manufacture	Oct-13

GVWR (kg)	2435
GAWR Front (kg)	1180
GAWR Rear (kg)	1350

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

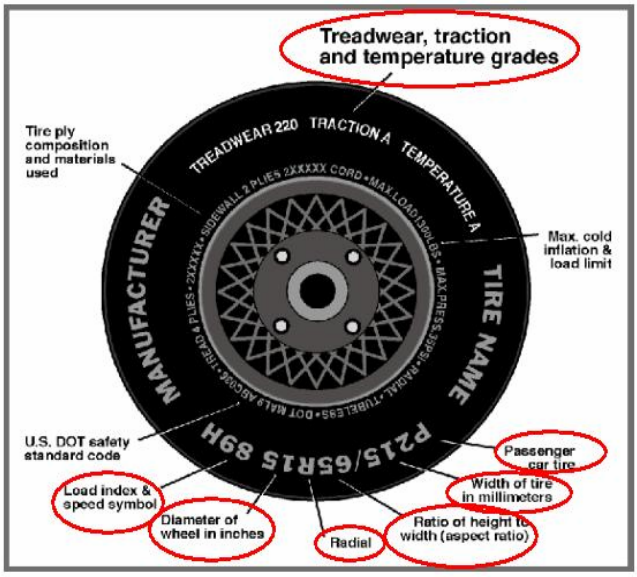
Measured Parameter	Front	Rear	Third	Total	
Type of Seats	Bucket	Split Bench			
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				475.0	*A*
DSC x 68.04 (kg)				340.2	*B*
Cargo Weight (RCLW) (kg)				134.8	*A-B*

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	220	220
Recommended Tire Size	P235/60R18	P235/60R18
Tire Size on Vehicle	P235/60R18	P235/60R18
Tire Manufacturer	Continental	Continental
Tire Model	Cross Contact	Cross Contact
Treadwear	480	480
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Rayon	2 Rayon
Tire Plies Body	2 Rayon, 2 Steel, 1 Polyamide	2 Rayon, 2 Steel, 1 Polyamide
Load Index / Speed Symbol	103H	103H
Tire Material	Rayon, Steel, Polyamide	Rayon, Steel, Polyamide
DOT Safety Code Left	AF45 PXX4 3713	AF45 PXX4 3713
DOT Safety Code Right	AF45 PXX4 3713	AF45 PXX4 3713

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	493.5	451.5		521.5	572.0	
Right	kg	506.0	453.0		524.5	553.5	
Ratio	%	52.5%	47.5%	100.0%	48.2%	51.8%	100.0%
Total	kg	999.5	904.5	1904.0	1046.0	1125.5	2171.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1904.0	A
Weight of 1 P572E ATD & 1 P572O ATD	kg	141.0	B
Rated Cargo/Luggage Weight (RCLW)	kg	134.8	C
Calculated Vehicle Target Weight (TVTW)	kg	2179.8	A+B+C

TEST VEHICLE ATTITUDES

Condition	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	840	832	840	835	1335
As Tested	mm	822	825	799	800	1456
Post-Test	mm	838	824	800	793	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2810
Total Vehicle Length at Left Side	mm	4042
Total Vehicle Length at Centerline	mm	4638
Total Vehicle Length at Right Side	mm	4045
Weight of Ballast in Cargo Area	kg	166.5
Weight of Vehicle Components Removed	kg	45.0
Amount of Stoddard Solvent in Fuel Tank	L	69.72

VEHICLE COMPONENTS REMOVED TO MEET TEST WEIGHT:

Trunk soft trim (12.0 kg), Spare tire and tools (27.5 kg), Roof rail attachments (5.5 kg)

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14

TARGET VEHICLE STRUCTURAL MEASUREMENTS

No.	Description	Pre-Test
1	Total Length	4638
2	Total Width	1888
3	Bumper Top Height	655
4	Bumper Bottom Height	409
5	Longitudinal Member Top Height	595
6	Distance Between Longitudinal Members	795
7	Longitudinal Member Width	80
8	Engine Top Height	910
9	Engine Bottom Height	282
10	Engine and Gearbox Width	500
11	Front Bumper to Engine Distance	480
12	Front Shock Absorber Fixing Height	955
13	Bonnet Leading Edge Height	898
14	Front Shock Absorber Fixing Width	1190
15	Front Bumper to Front Axle Distance	895
16	Front Axle to A-Pillar Distance	575
17	A-Pillar to B-Pillar Distance	921
18	B-Pillar to Rear Axle Distance	1163
19	B-Pillar to C-Pillar Distance	861
20	Roof Sill Bottom Height	1490
21	Roof Sill Top Height	1590
22	Floor Sill Bottom Height	310
23	Floor Sill Top Height	420

All measurements in millimeters.

DATA SHEET NO. 2

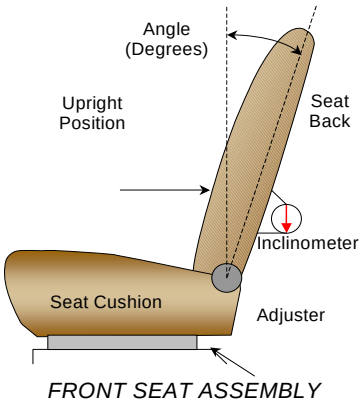
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14

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° ± 0.5°. Seat back angle is measured at the seat back.



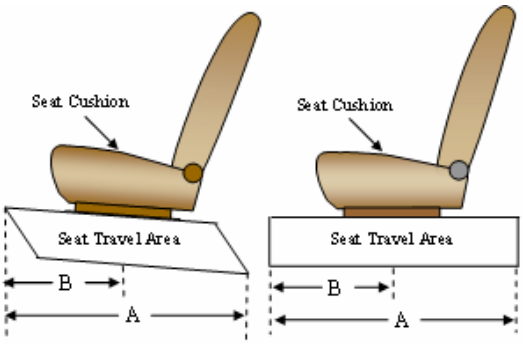
FRONT SEAT ASSEMBLY

SEAT BACK ANGLE

Seating Position	Degrees
Driver Seat Back Angle	21.3
Passenger Seat Back Angle	19.1

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	326 mm	163 mm
Passenger Seat	254 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	5	H
Passenger Seat	5	M1

DATA SHEET NO. 2 … (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

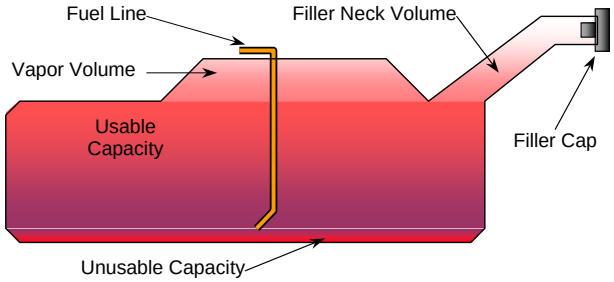
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	74.98
Usable Capacity of "Optional Tank"	
92 - 94% of Usable Capacity	68.98 to 70.48
Actual Amount of Stoddard Solvent Used	69.72
1/3 of Usable Capacity	24.99

FUEL PUMP

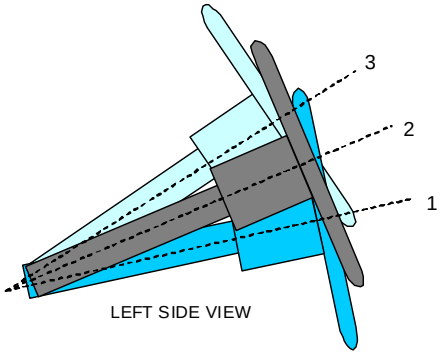
The vehicle is equipped with an electric fuel pump.



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

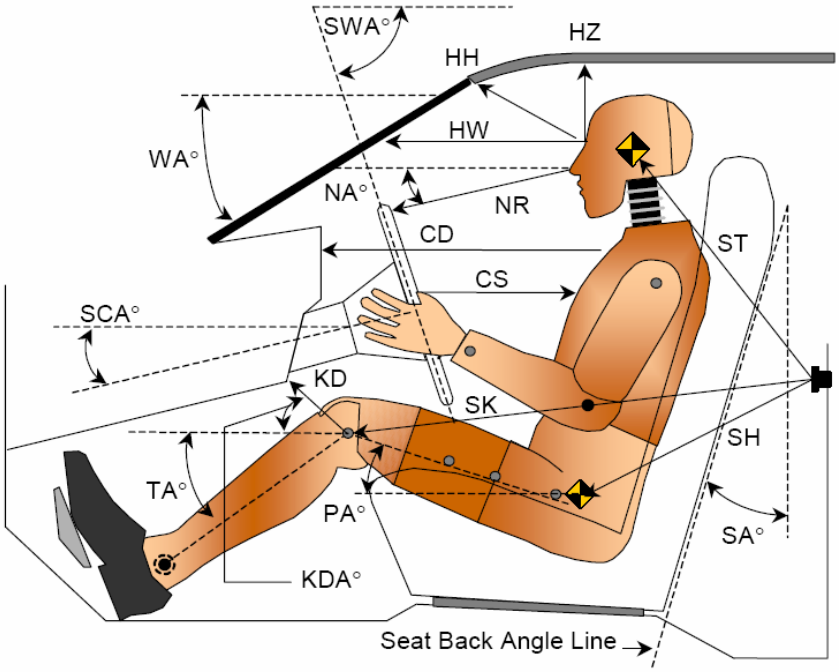
	Degrees	Fore-Aft Position (mm)
Lowermost Position, No. 1	22.8	56
Geometric Center Position, No. 2	25.2	81
Uppermost Position, No. 3	27.6	105
Telescoping Steering Wheel Travel		49
Test Position	25.2	81

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14



LEFT SIDE VIEW

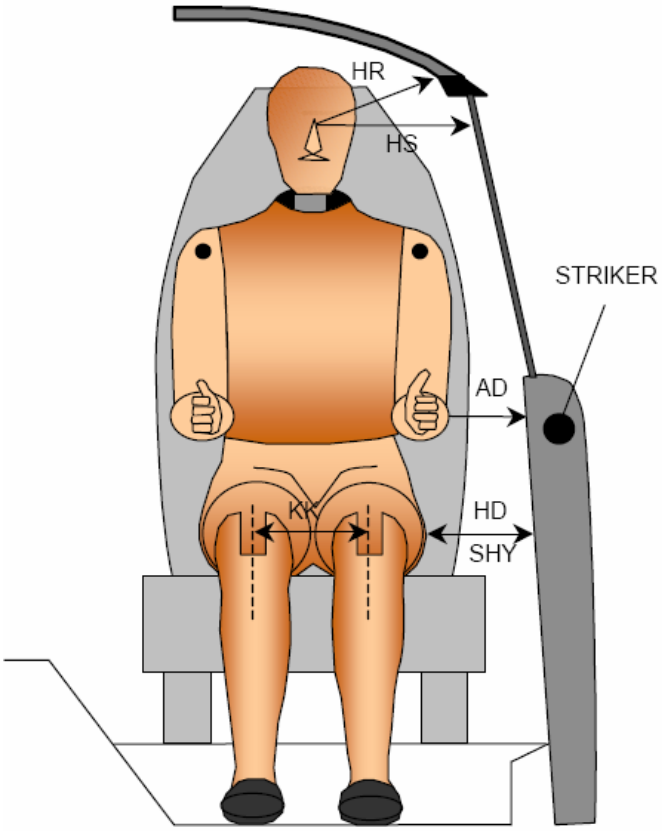
Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		28.0		
SWA°	Steering Wheel Angle		64.8		
SCA°	Steering Column Angle		25.2		
SA°	Seat Back Angle (On Headrest Post)		21.3		19.1
HZ	Head to Roof	246	90.0	224	90.0
HH	Head to Header	426	28.2	320	51.0
HW	Head to Windshield	736	0.0	605	0.0
NR	Nose to Rim	417	9.6	415	31.3
CD	Chest to Dash	541	13.0	349	6.0
CS	Chest to Steering Hub	322	0.0		
RA	Rim to Abdomen	208	0.0		
KDL	Left Knee to Dash	186	35.8	83	36.6
KDR	Right Knee to Dash	170	29.4	81	37.7
PA°	Pelvic Angle		24.8		21.6
TA°	Tibia Angle		37.2		51.6
SK	Striker to Knee	569	8.9	667	3.5
ST	Striker to Head	457	86.5	462	63.1
SH	Striker to H-Point	265	44.2	358	22.7

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14



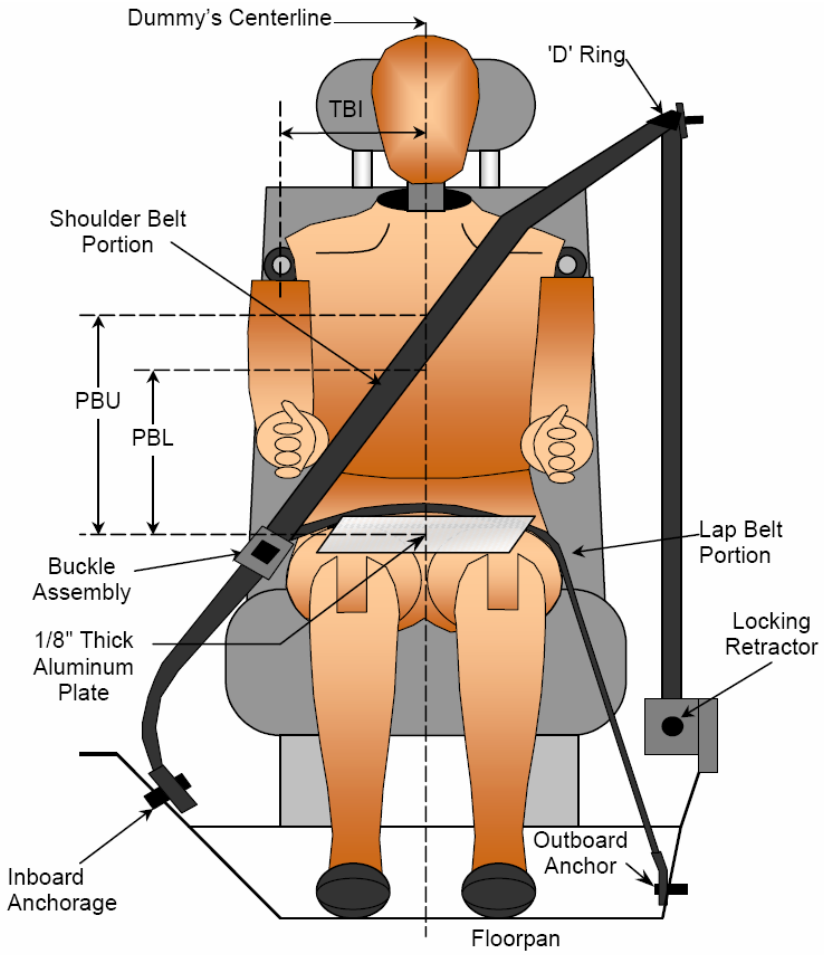
Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	147	97
HD	H-Point to Door	152	262
HR	Head to Side Header	262	260
HS	Head to Side Window	358	353
KK	Knee to Knee	321	220
SHY	Striker to H-Point (Y-Direction)	250	285
AA	Ankle to Ankle	317	150

DATA SHEET NO. 5

SEAT BELT POSITIONING DATA

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14



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	383	315
PBL	Top Surface of Aluminum Plate to Belt Lower Edge	mm	291	225

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as Measured on ATD	mm	824	916
Lap Belt Length as Measured on ATD	mm	698	812
Remainder of Belt on Reel	mm	1140	992
Total Belt Length for Continuous Webbing Systems	mm	2662	2720

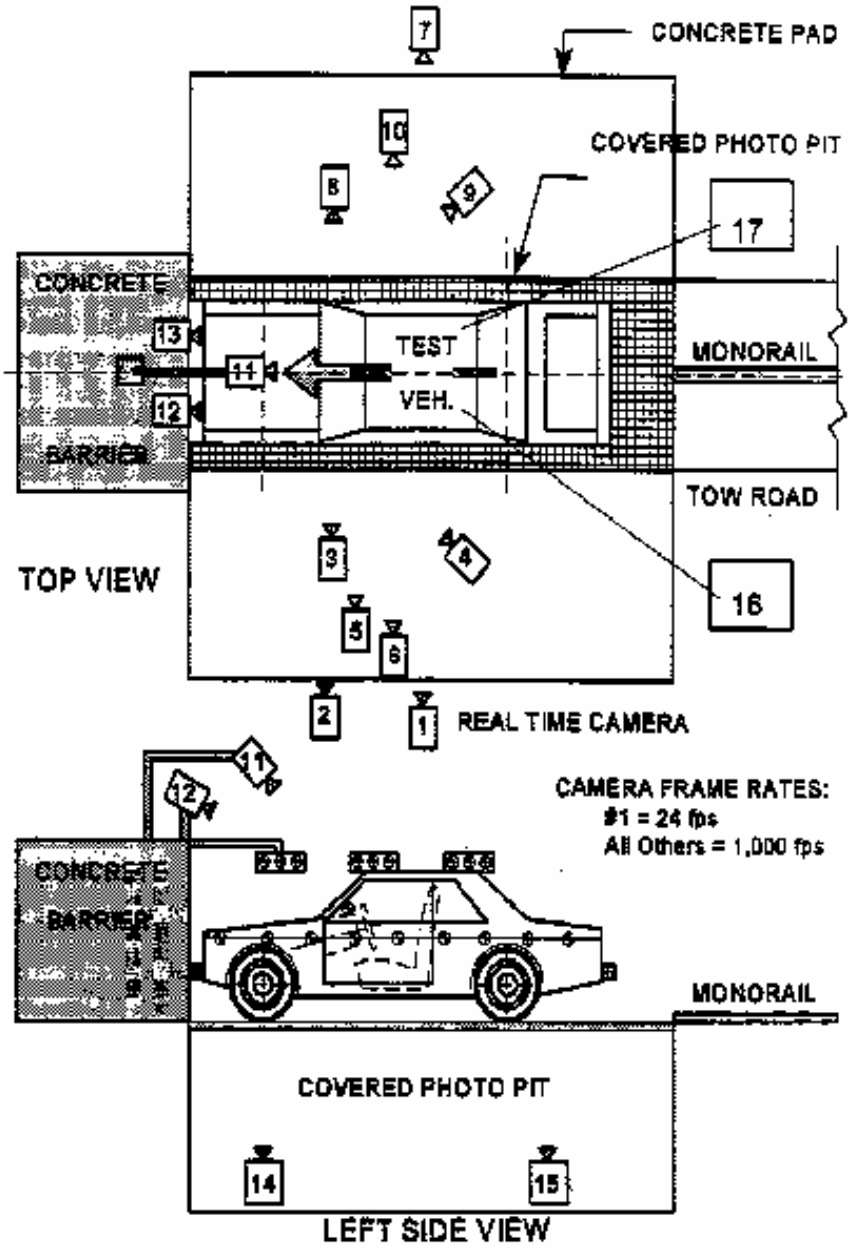
DATA SHEET NO. 6

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14

CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 6 … (CONTINUED)

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14

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	20	1000
15	Pit Rear	-3398	0	1495	20	1000
16	Onboard Driver Airbag (Optional)	-900	200	-1450	13	1000
17	Onboard Passenger Airbag (Optional)	-900	-200	-1450	13	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

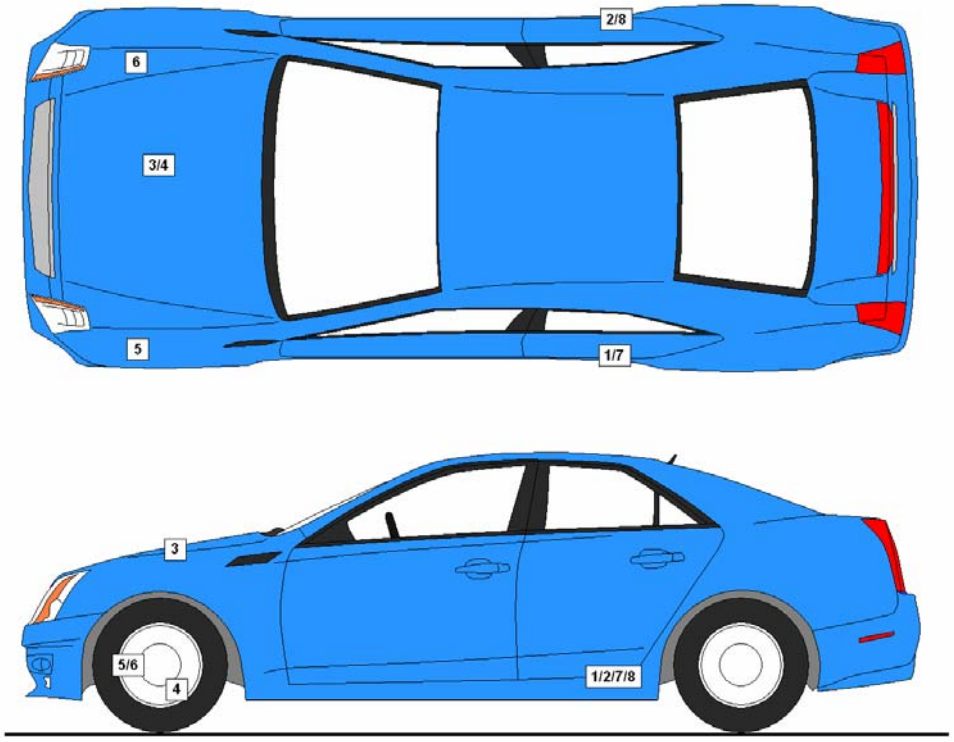
+Z = into ground

DATA SHEET NO. 7

VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Description	Location		
		X	Y	Z
1	Left Rear Accelerometer X-Direction	1789	-714	-407
2	Right Rear Accelerometer X-Direction	1789	714	-407
3	Engine Top X	4135	-140	-843
4	Engine Bottom X	4106	-115	-242
5	Left Rear Accelerometer Z-Direction	1789	-714	-407
6	Right Rear Accelerometer Z-Direction	1789	714	-407
7	Left Rear Accelerometer X-Direction Redundant	1764	-714	-407
8	Right Rear Accelerometer X-Direction Redundant	1764	714	-407

Reference Points: X – Rear Surface of Vehicle (+ forward)

Y – Vehicle Centerline (+ to right)

Z – Ground Plane (+ down)

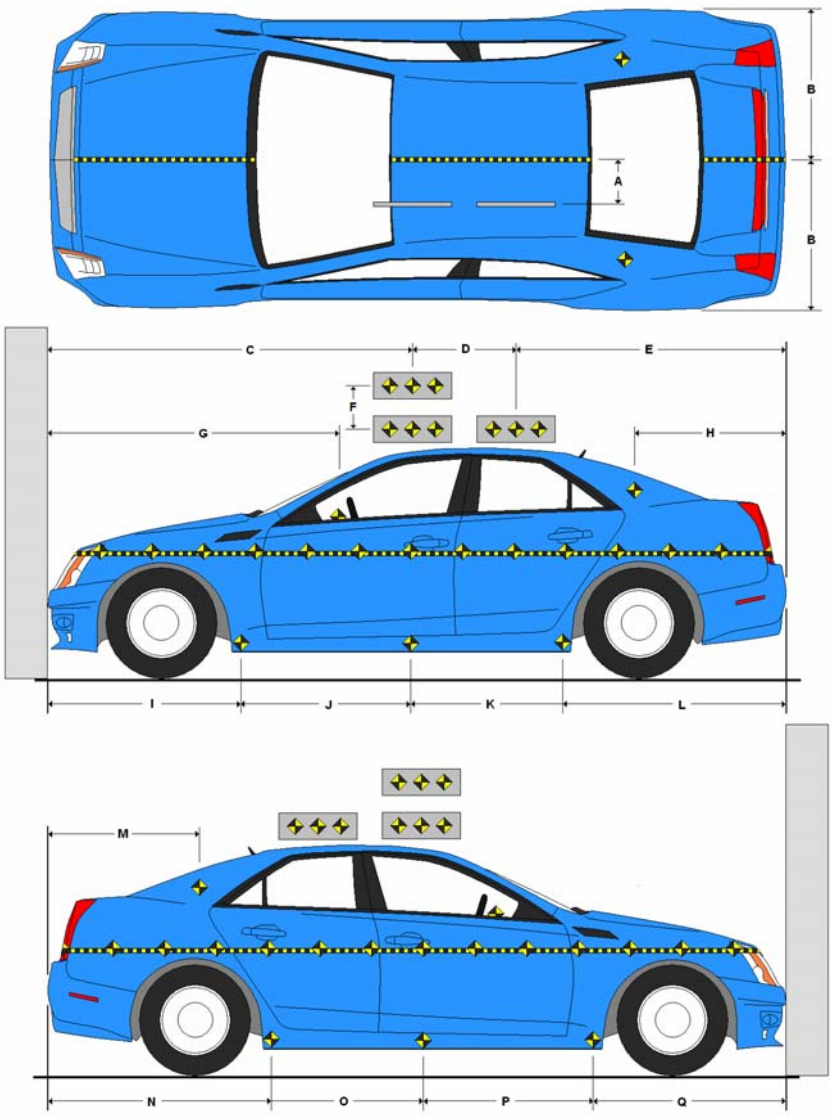
DATA SHEET NO. 8

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14

Item	Value
A	
B	944
C	2309
D	610
E	1715
F	305
G	1920
H	581
I	1400
J	900
K	900
L	1427
M	594
N	1425
O	898
P	898
Q	1403



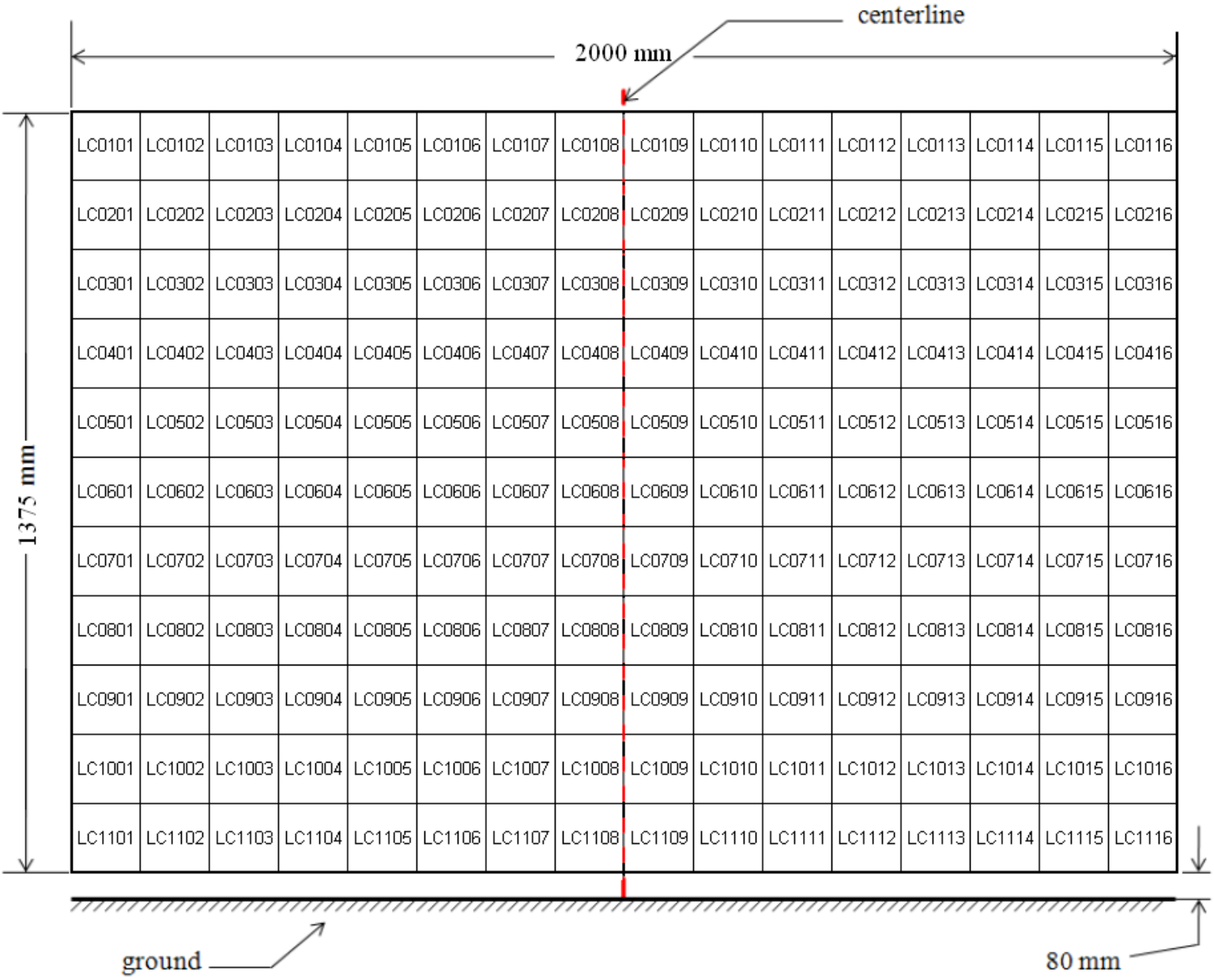
All measurements in millimeters.

DATA SHEET NO. 9

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14



DATA SHEET NO. 10

TEST VEHICLE CAMERA AND INSTRUMENTATION SUMMARY

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14

INSTRUMENTATION

Driver Dummy Accelerometers	50
Passenger Dummy Accelerometers	50
Vehicle Structure Accelerometers	8
Seat Belt Load Cells	4
Load Cell Barrier	528
Total	640

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 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14

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 Bolster, Steering Column	Glovebox
Right Knee Contact	Knee Bolster, Steering Column	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	0
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	765
Center	mm	668
Right Side	mm	779
Average	mm	737

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

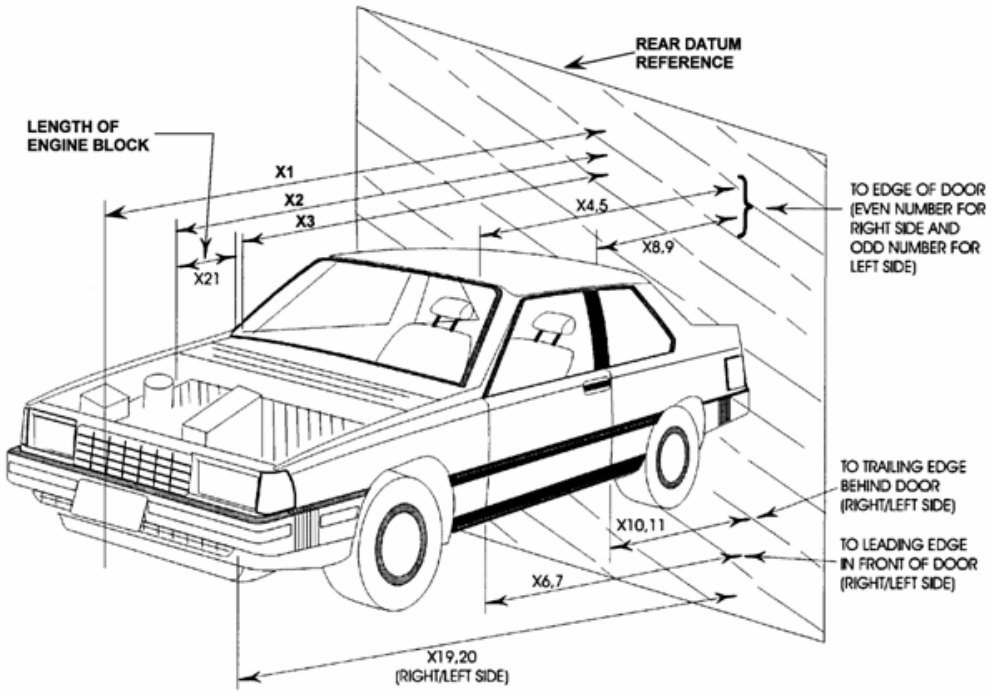
Restraint Type	Driver		Passenger	
	Installed	Operated	Installed	Operated
Front Airbag	Yes	Yes	Yes	Yes
Side Airbag 1 (Curtain)	Yes	No	Yes	No
Side Airbag 2 (Torso/Pelvis)	Yes	No	Yes	No
Knee Airbag	No		No	
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes
Other	No		No	

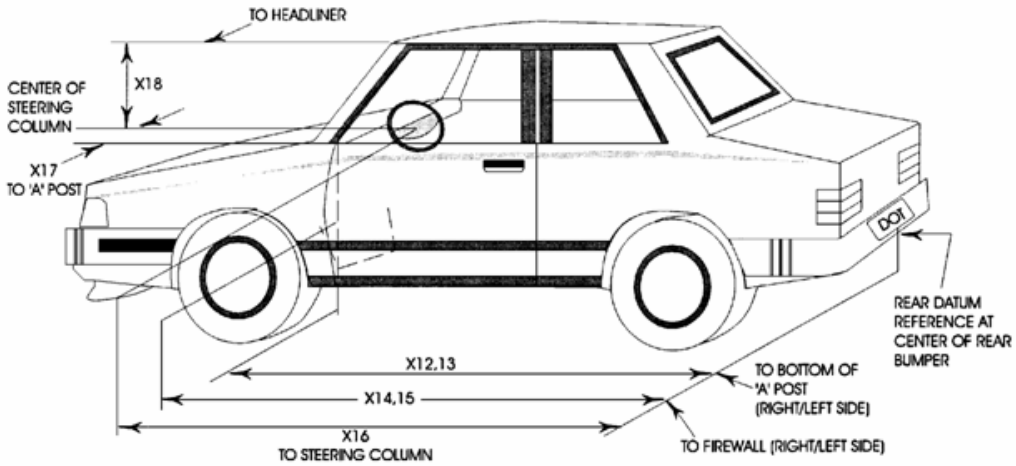
DATA SHEET NO. 12

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14





DATA SHEET NO. 12 … (CONTINUED)

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4638	4520	-118
2	Rear Surface of Vehicle to Front of Engine	4158	3898	-260
3	RSOV to Firewall	3528	3443	-85
4	RSOV to Upper Leading Edge of Right Door	3155	3165	10
5	RSOV to Upper Leading Edge of Left Door	3153	3157	4
6	RSOV to Lower Leading Edge of Right Door	3158	3160	2
7	RSOV to Lower Leading Edge of Left Door	3160	3153	-7
8	RSOV to Upper Trailing Edge of Right Door	2035	2045	10
9	RSOV to Upper Trailing Edge of Left Door	2029	2033	4
10	RSOV to Lower Trailing Edge of Right Door	2092	2092	0
11	RSOV to Lower Trailing Edge of Left Door	2098	2091	-7
12	RSOV to Bottom of A-Pillar, Right Side	3026	3036	10
13	RSOV to Bottom of A-Pillar, Left Side	3036	3035	-1
14	RSOV to Firewall, Right Side	3618	3573	-45
15	RSOV to Firewall, Left Side	3608	3571	-37
16	RSOV to Steering Column	2600	2670	70
17	Center of Steering Column to A-Pillar	445	420	-25
18	Center of Steering Column to Headliner	445	425	-20
19	RSOV to Right Side of Front Bumper	4045	3955	-90
20	RSOV to Left Side of Front Bumper	4042	3940	-102
21	Length of Engine Block	530	530	0
RD	RSOV to Right Side of Dash Panel	2805	2800	-5
CD	RSOV to Center of Dash Panel	2750	2750	0
LD	RSOV to Left Side of Dash Panel	2780	2858	78

All measurements in millimeters.

DATA SHEET NO. 13

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14

VEHICLE INFORMATION

VIN: WA1LFBFP3EA044520 Wheelbase (mm): 2810

Vehicle Size Category: 5-Door MPV Test Weight (kg): 2171.5

ACCELEROMETER DATA

Accelerometer Locations: Left Rear Crossmember

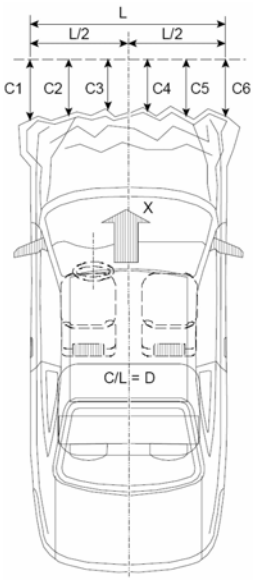
Cal. Procedure/Interval: Drop Test / 6 months

Integration Algorithm: NHTSA Standard Linearity: Good

Impact Velocity (km/h): 55.98

Velocity Change (km/h): 70.2

Time of Separation (msec): 64.4



CRUSH PROFILE

Collision Deformation Classification: 12FDEW2

Midpoint of Damage: Vehicle Centerline

Damage Region Length (mm): 1312

Impact Mode: Full Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	153	391	238
C2	Crush Zone 2 at Left Side	mm	40	372	332
C3	Crush Zone 3 at Left Side	mm	10	334	324
C4	Crush Zone 4 at Right Side	mm	10	319	309
C5	Crush Zone 5 at Right Side	mm	40	356	316
C6	Crush Zone 6 at Right Side	mm	153	389	236
L	C1 to C6	mm	1312		

DATA SHEET NO. 14

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

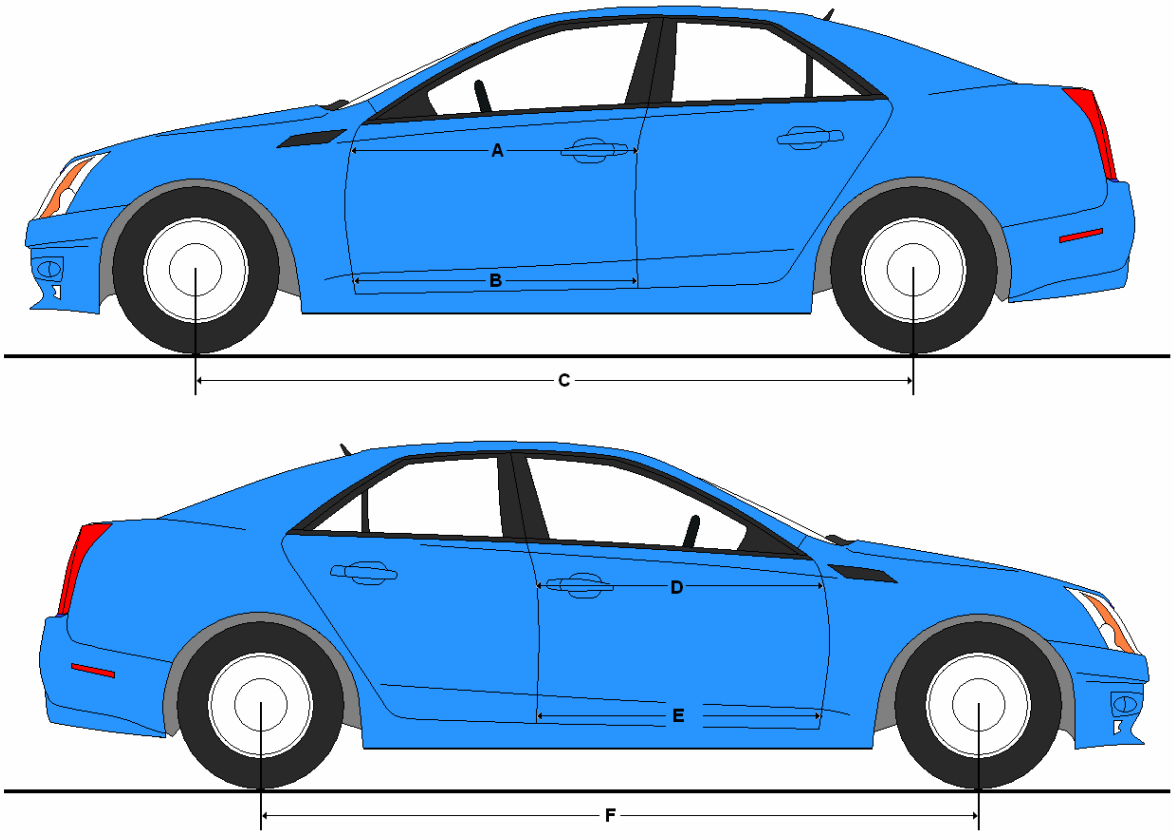
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	917	918	-1
B	Left Side Lower	mm	873	873	0
D	Right Side Upper	mm	906	913	-7
E	Right Side Lower	mm	866	868	-2

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2810	2765	45
F	Right Side Wheelbase	mm	2810	2773	37



DATA SHEET NO. 14 … (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

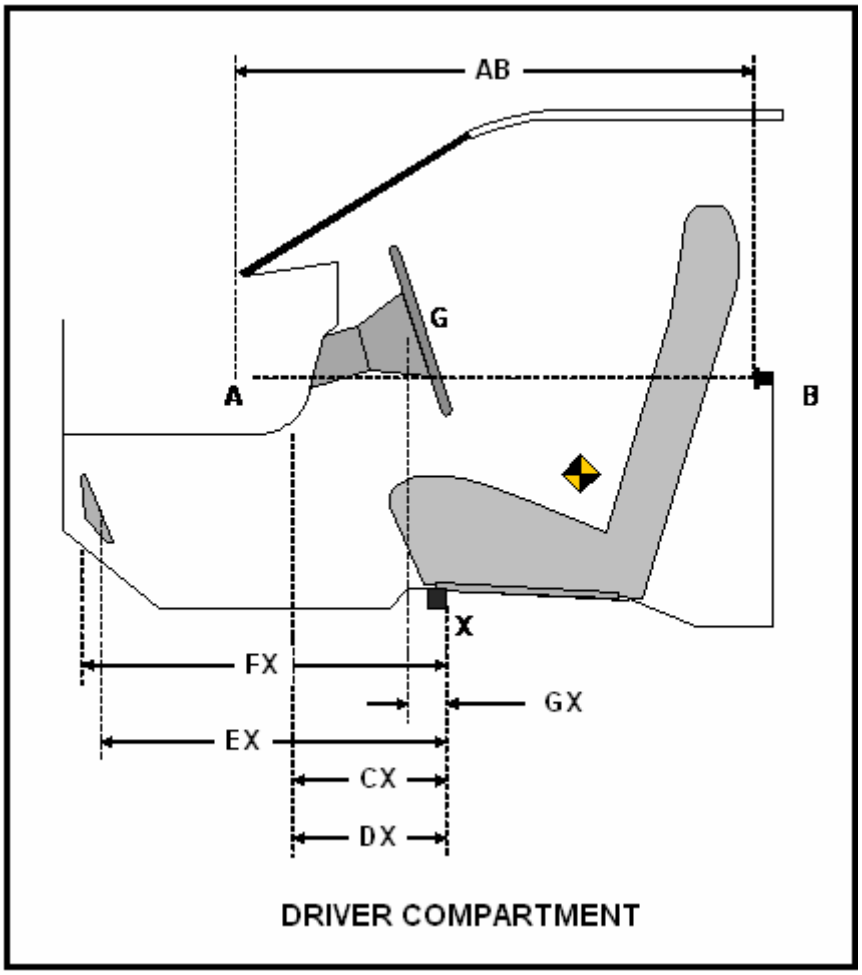
Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	825	824	1
CX	Left Knee Bolster to X	mm	280	255	25
DX	Right Knee Bolster to X	mm	310	275	35
EX	Brake Pedal to X	mm	540	540	0
FX	Foot Rest to X	mm	577	680	-103
GX	Center of Steering Wheel Hub to X	mm	105	70	35

X = Front of Seat Track (Stationary)



DRIVER COMPARTMENT

DATA SHEET NO. 15

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

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14

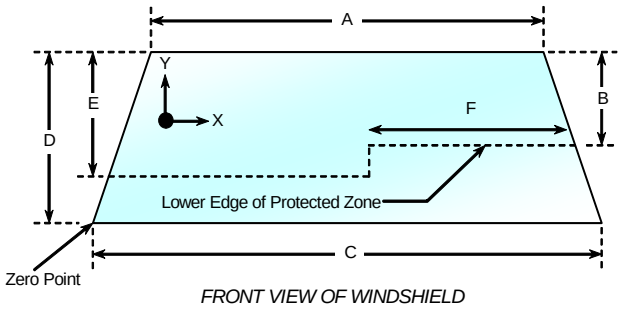
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with plastic molding and rubber cement.

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: 21.1 ° C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2136	2136	100.0%
Right Side	2136	2136	100.0%
Total	4272	4272	100.0%



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1228
B	mm	365
C	mm	1482
D	mm	781
E	mm	497
F	mm	510

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 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 16.7° C Test Time: 1:32 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)

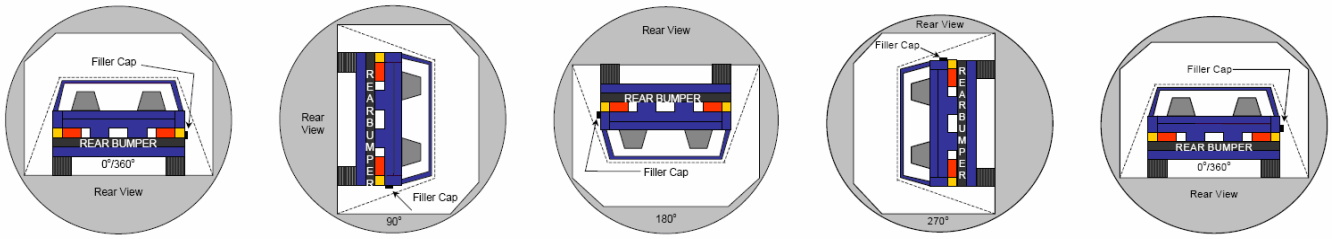
D. Spillage: There was no Stoddard solvent spillage.

DATA SHEET NO. 16

FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14



0° TO 90° 90° TO 180° 180° TO 270° 270° TO 360°

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

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	83	300	383
90° To 180°	82	300	382
180° To 270°	78	300	378
270° To 360°	84	300	384

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

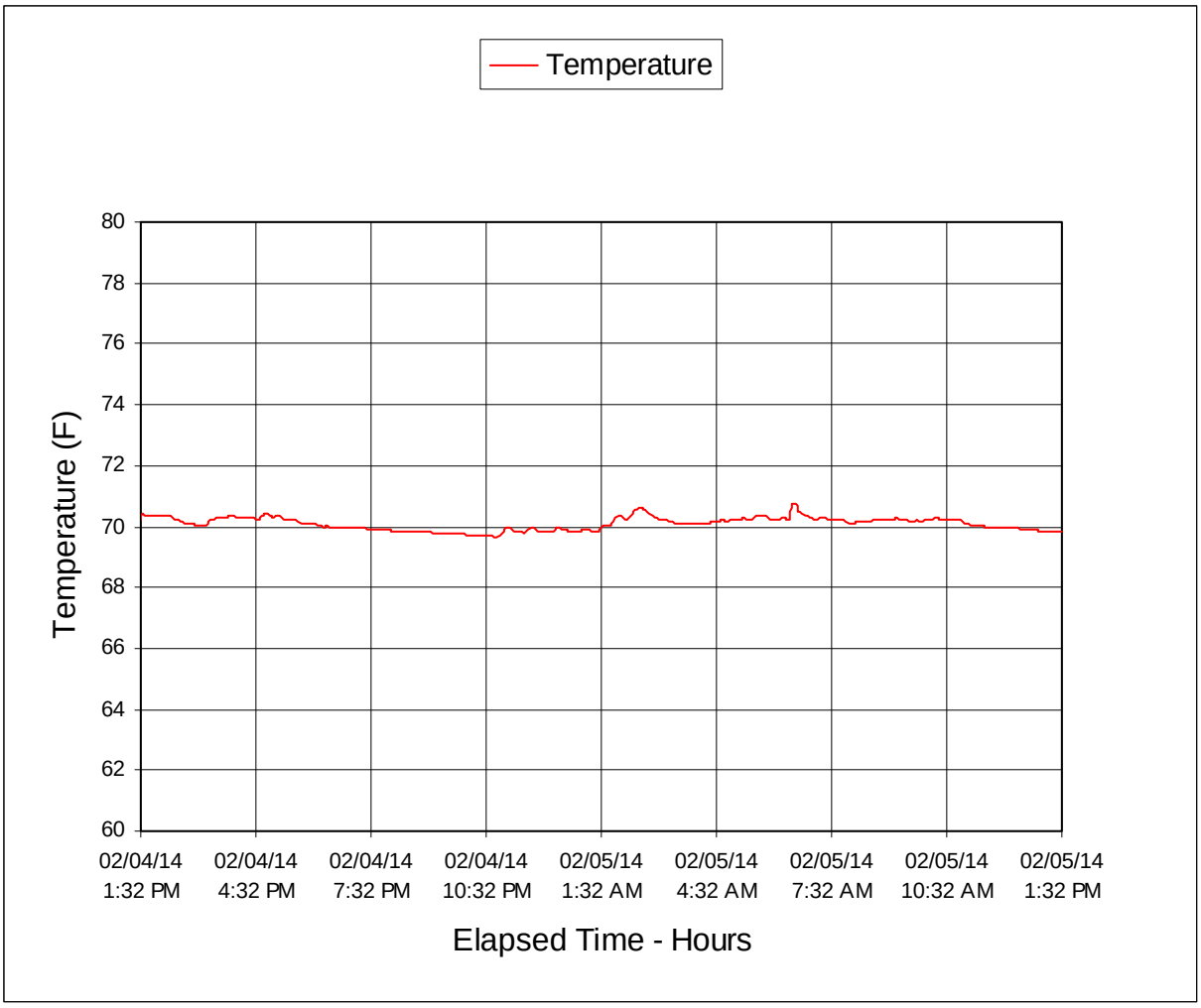
Test Phase	Spillage Location
0° To 90°	
90° To 180°	
180° To 270°	
270° To 360°	

DATA SHEET NO. 17

DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2014 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No.: M20145800

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 02/05/14



APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS … (CONTINUED)

TABLE OF PHOTOGRAPHS … (CONTINUED)

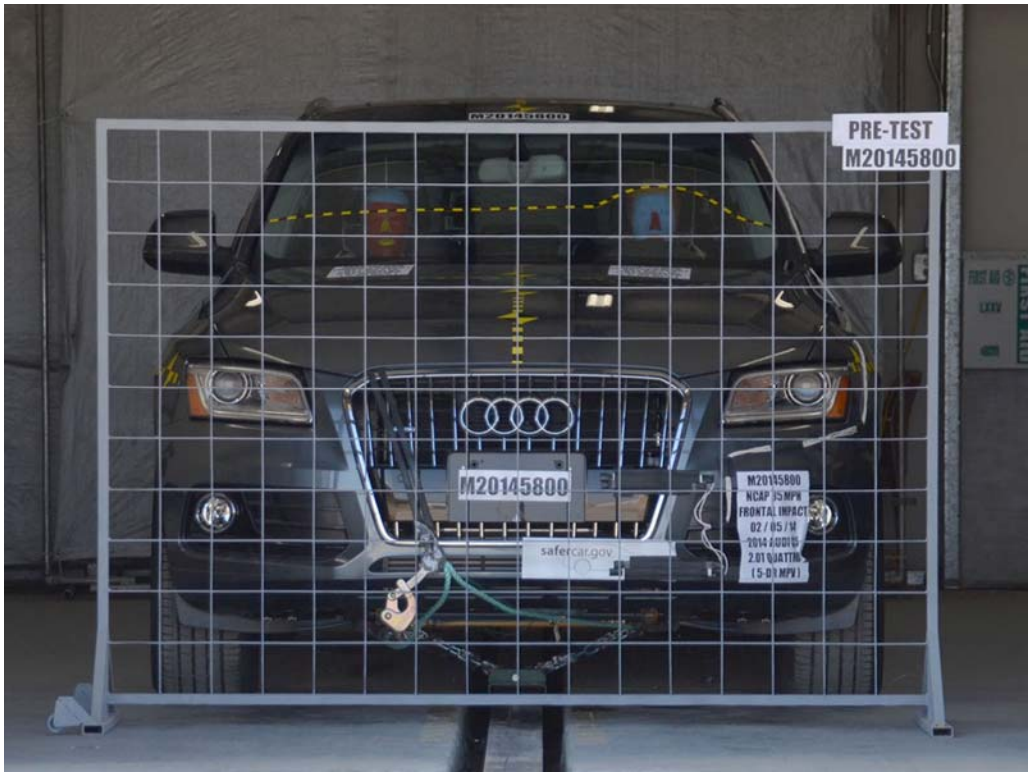


FIGURE 1. Load Cell Location

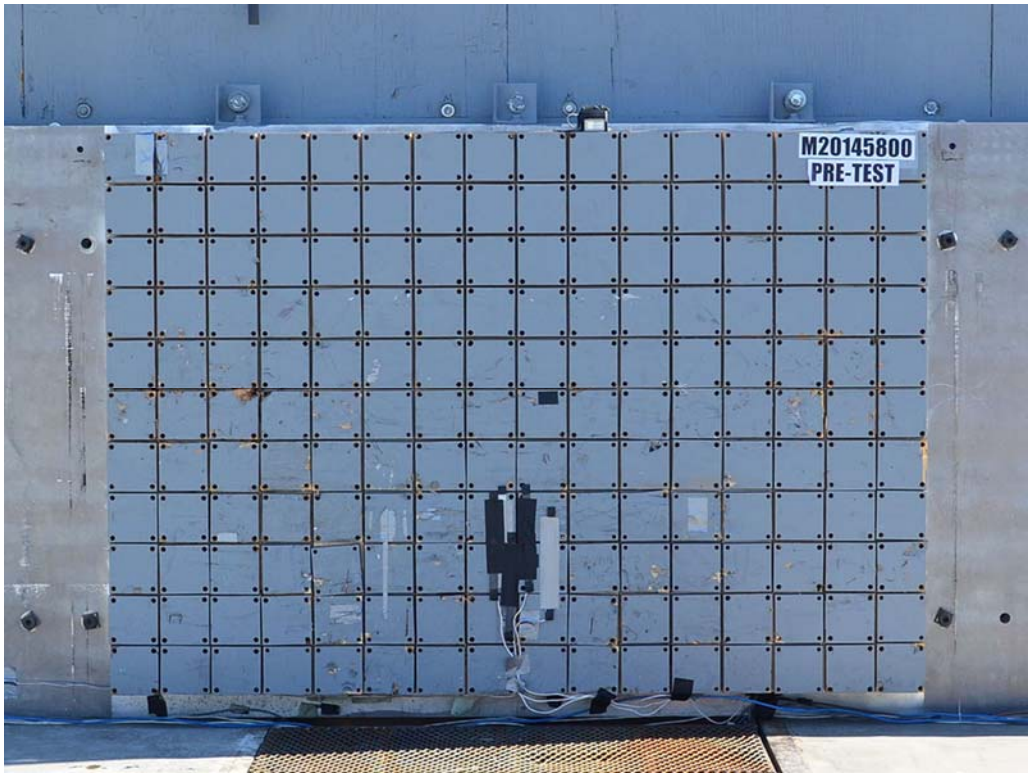


FIGURE 2. Load Cell Wall

FIGURE 3. Manufacturer's Label

FIGURE 4. Tire Placard

FIGURE 5. 2014 Audi Q5 Frontal as Delivered

FIGURE 6. Left Rear ¾ View, as Received

FIGURE 7. Pre-Test Front View of Test Vehicle

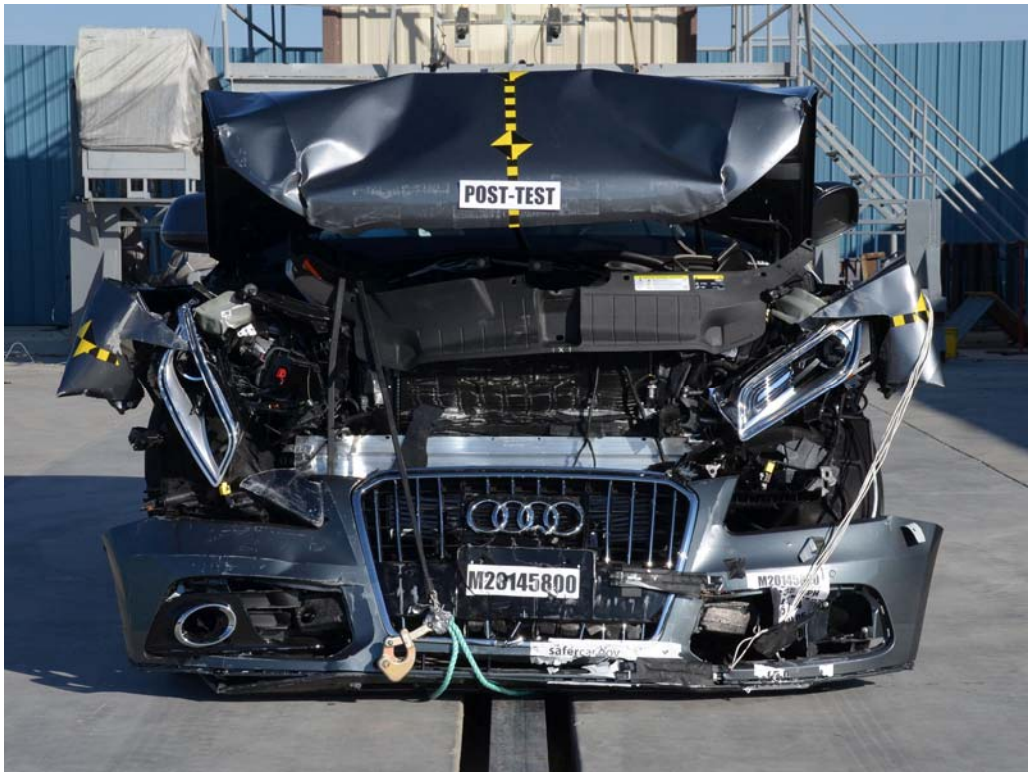


FIGURE 8. Post-Test Front View of Test Vehicle

FIGURE 9. Pre-Test Left View of Test Vehicle

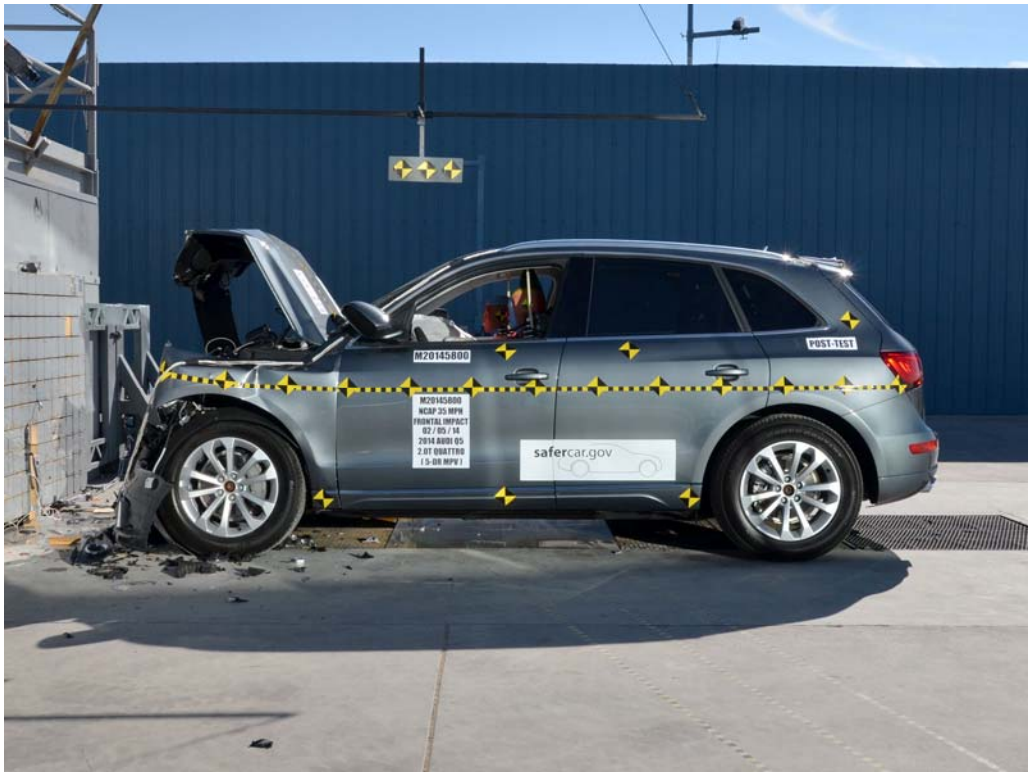


FIGURE 10. Post-Test Left View of Test Vehicle

FIGURE 11. Pre-Test Right View of Test Vehicle

FIGURE 12. Post-Test Right View of Test Vehicle

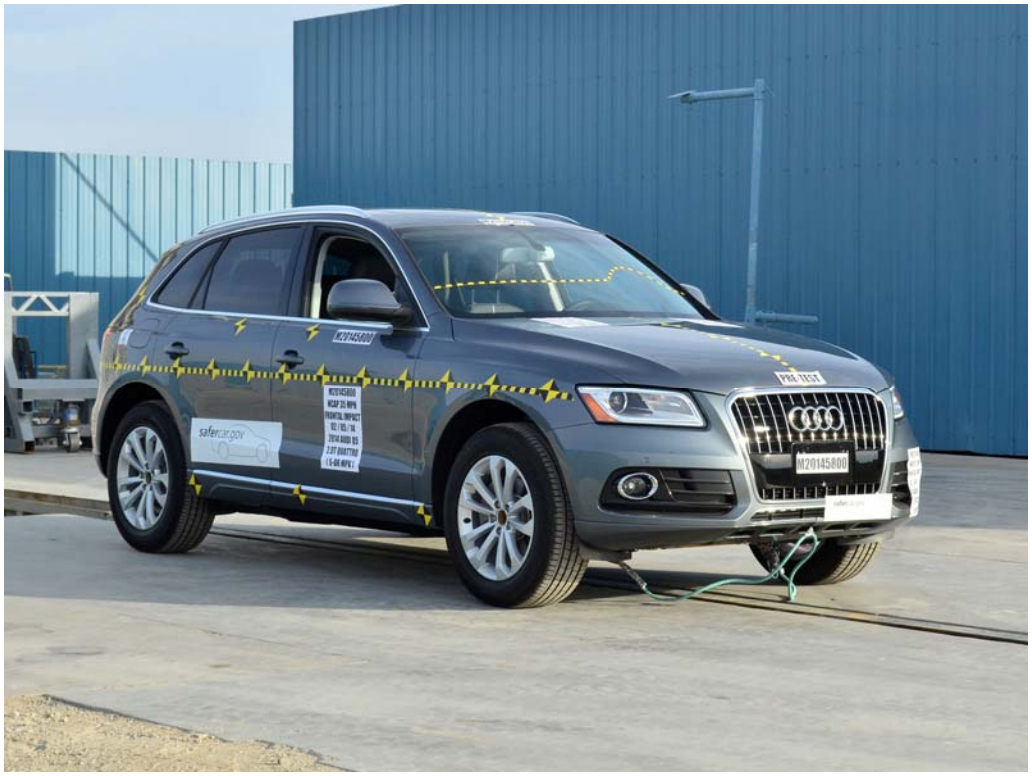


FIGURE 13. Pre-Test Right Front ¾ View

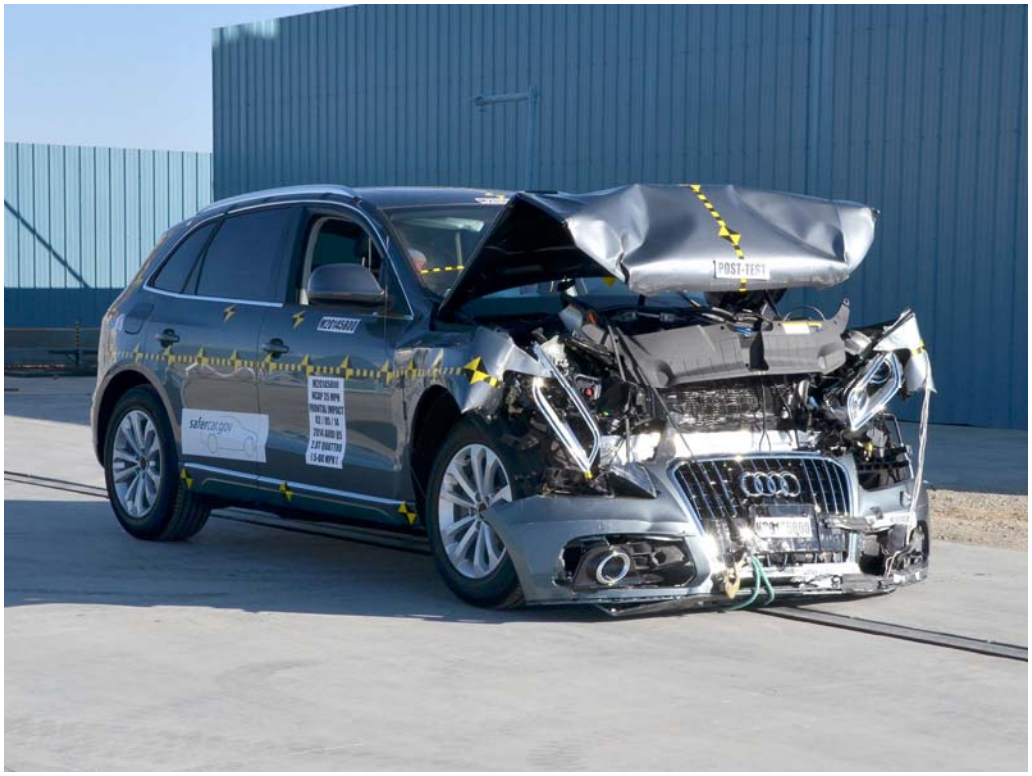


FIGURE 14. Post-Test Right Front ¾ View

FIGURE 15. Pre-Test Left Rear ¾ View

FIGURE 16. Post-Test Left Rear ¾ View

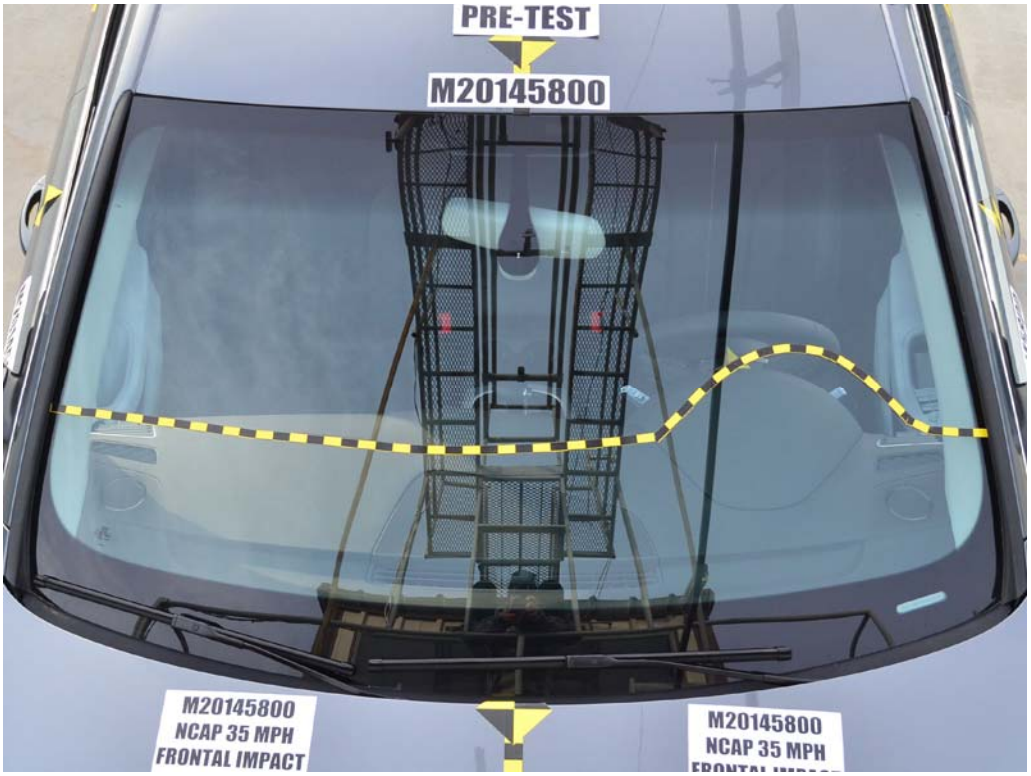


FIGURE 17. Pre-Test Windshield View

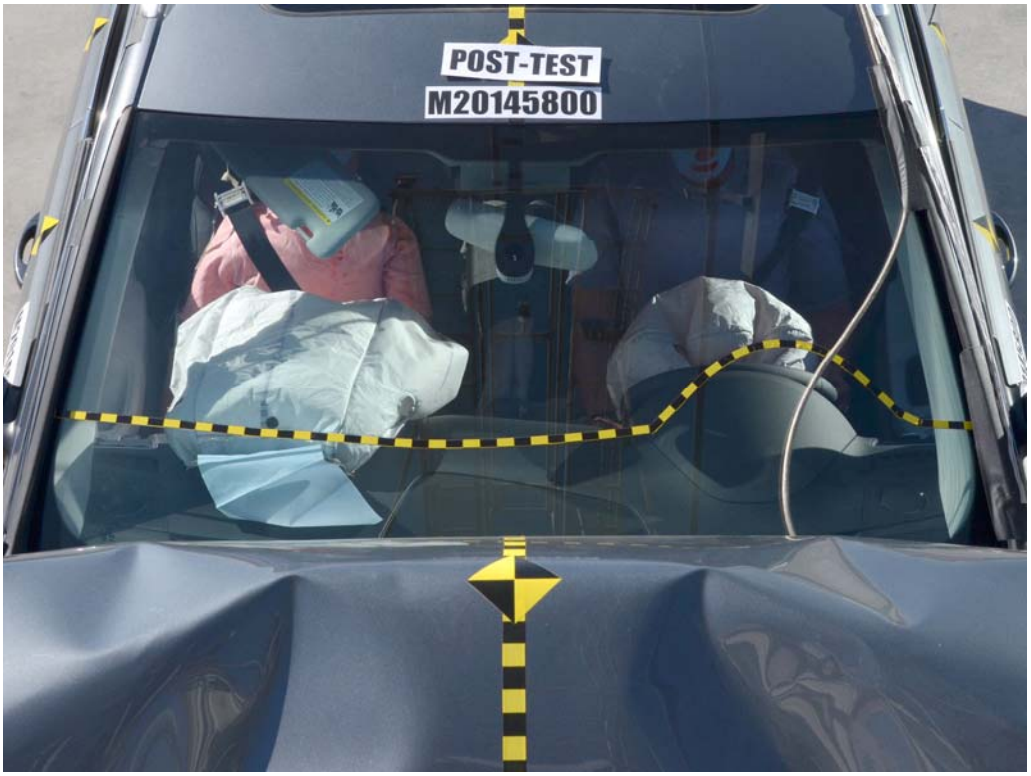


FIGURE 18. Post-Test Windshield View

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

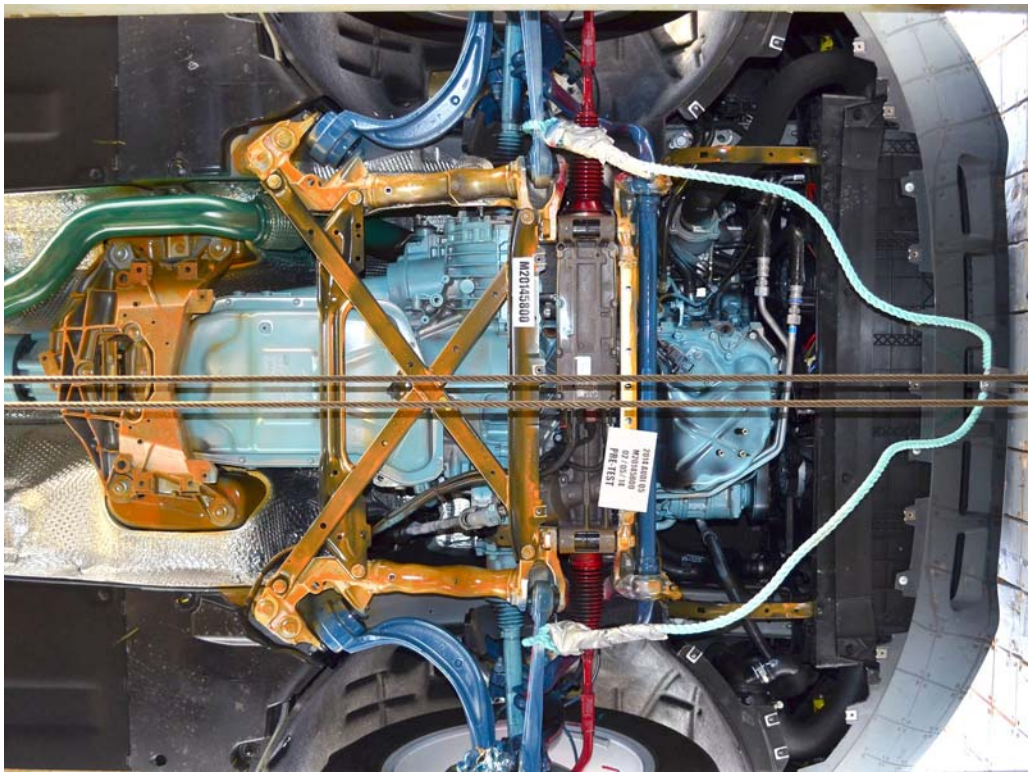


FIGURE 23. Pre-Test Front Underbody View

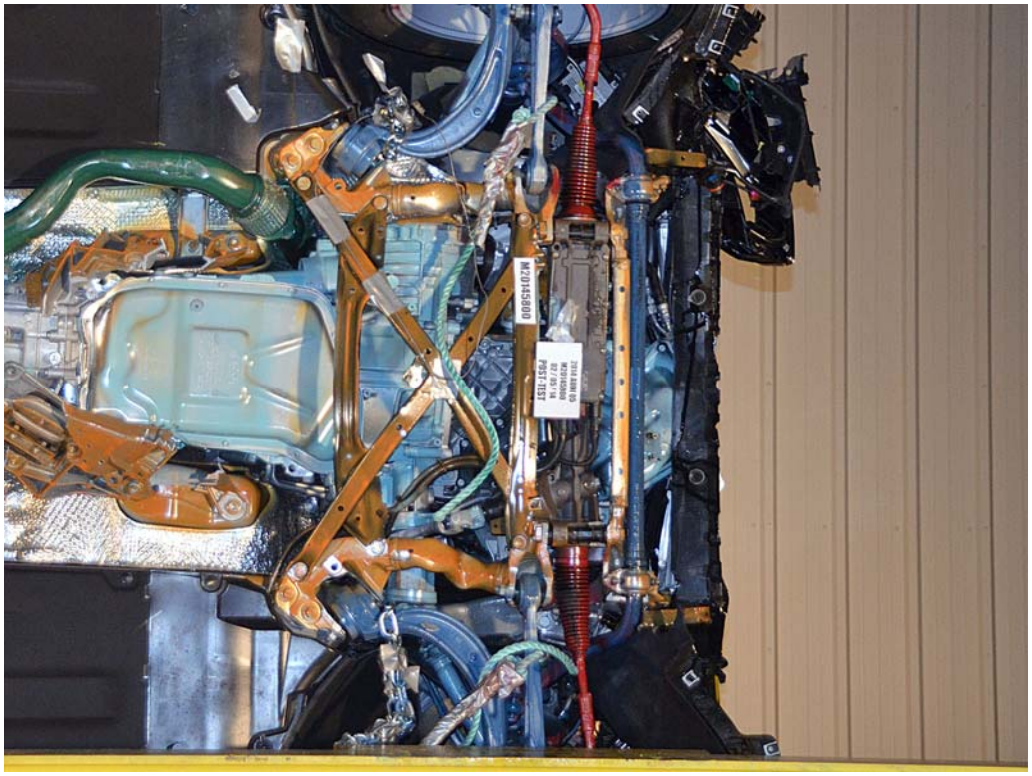


FIGURE 24. Post-Test Front Underbody View

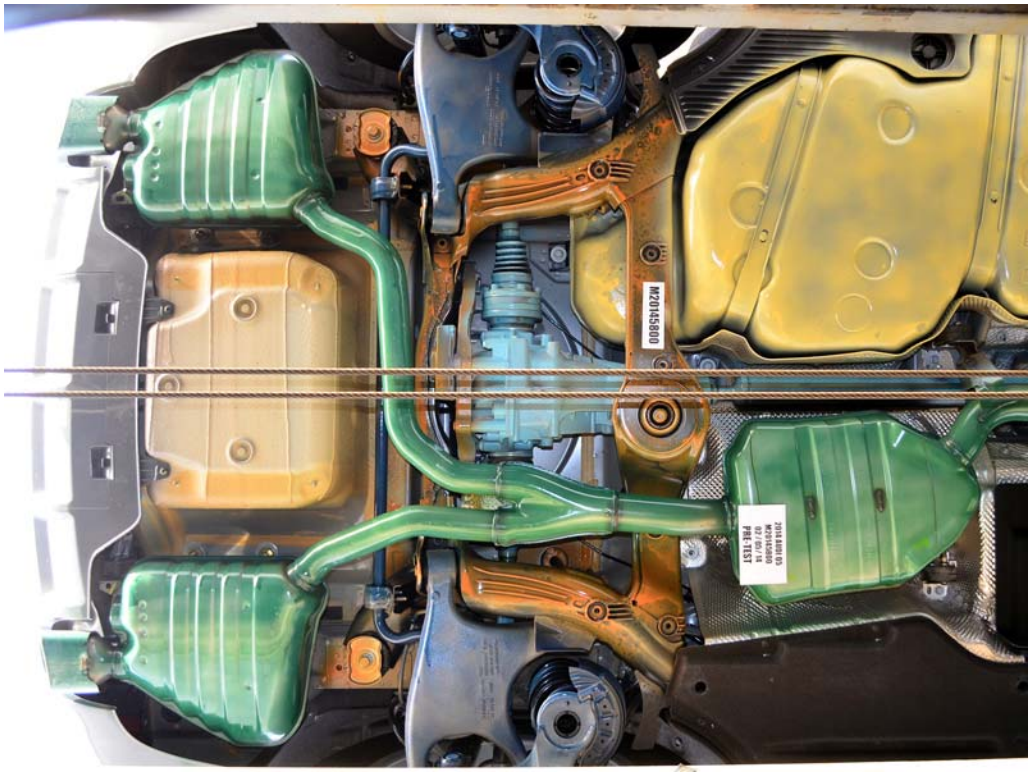


FIGURE 25. Pre-Test Rear Underbody View

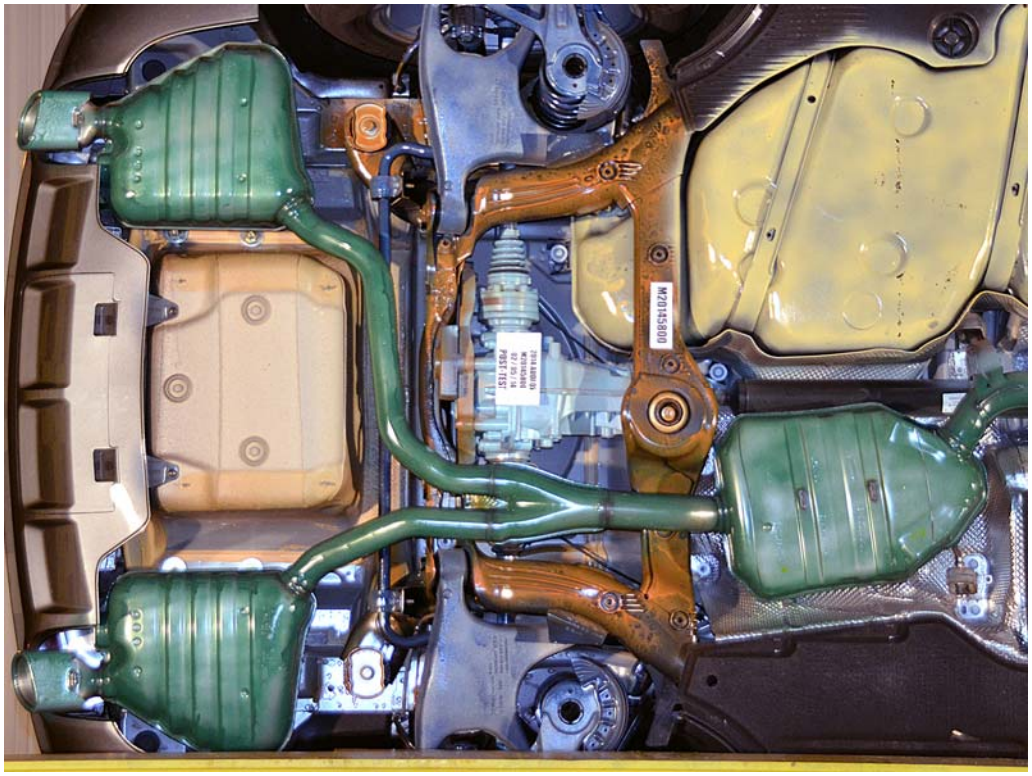


FIGURE 26. Post-Test Rear Underbody View

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

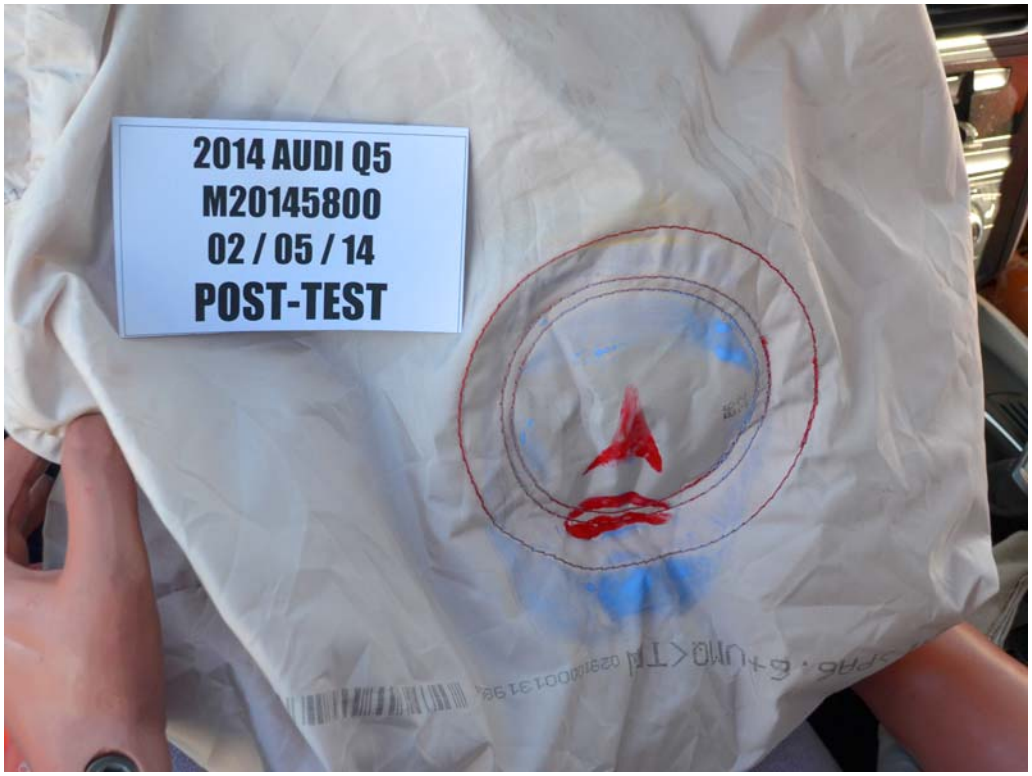


FIGURE 46. Post-Test Driver Dummy Contact with Airbag

FIGURE 47. Post-Test Driver Dummy Contact with Headrest

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

FIGURE 47b. Post-Test Driver Dummy Contact with Steering Column

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 Face

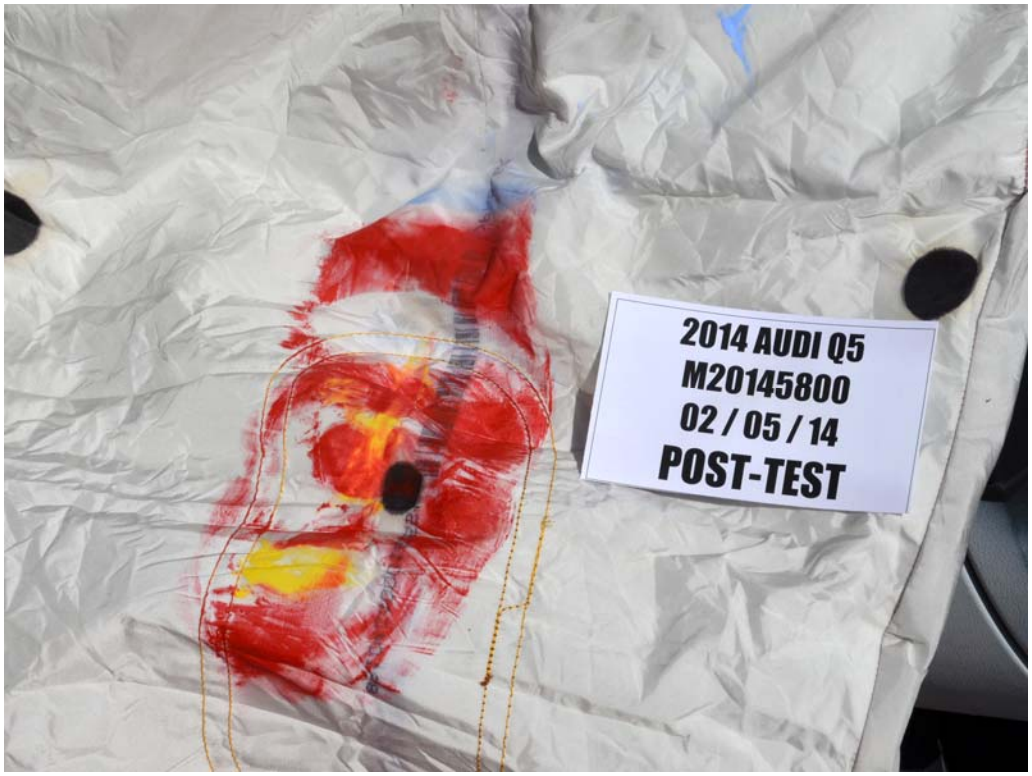


FIGURE 67. Post-Test Passenger Dummy Contact with Airbag

FIGURE 68. Post-Test Passenger Dummy Contact with Headrest

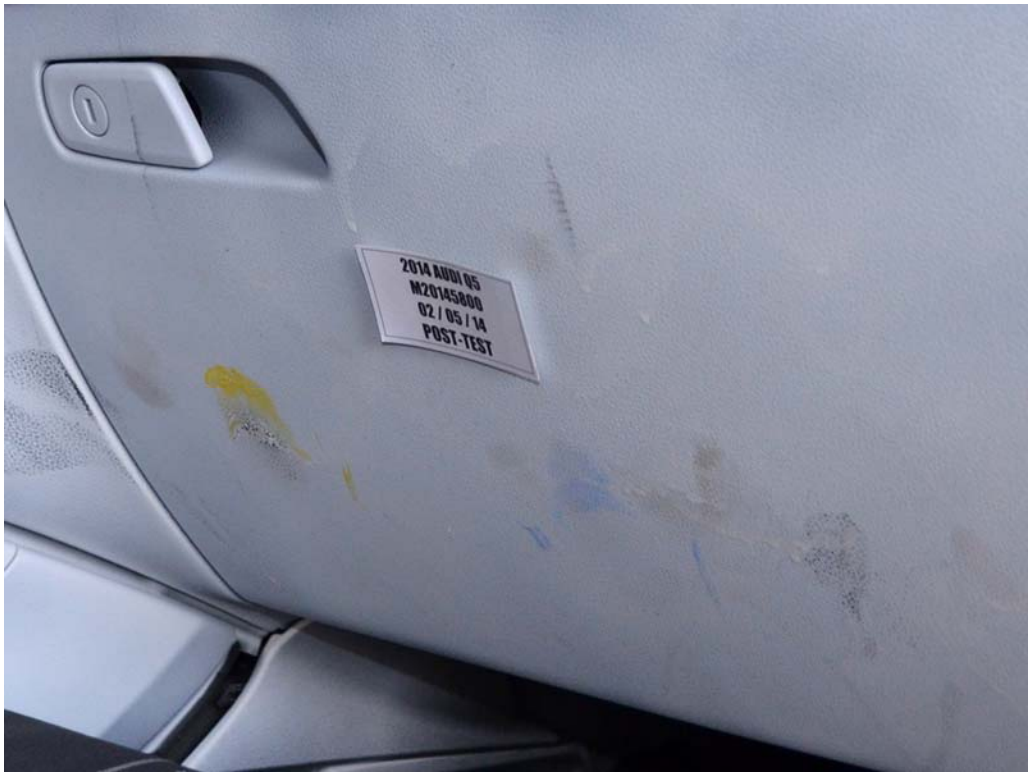


FIGURE 68a. Post-Test Passenger Dummy Contact with Glovebox

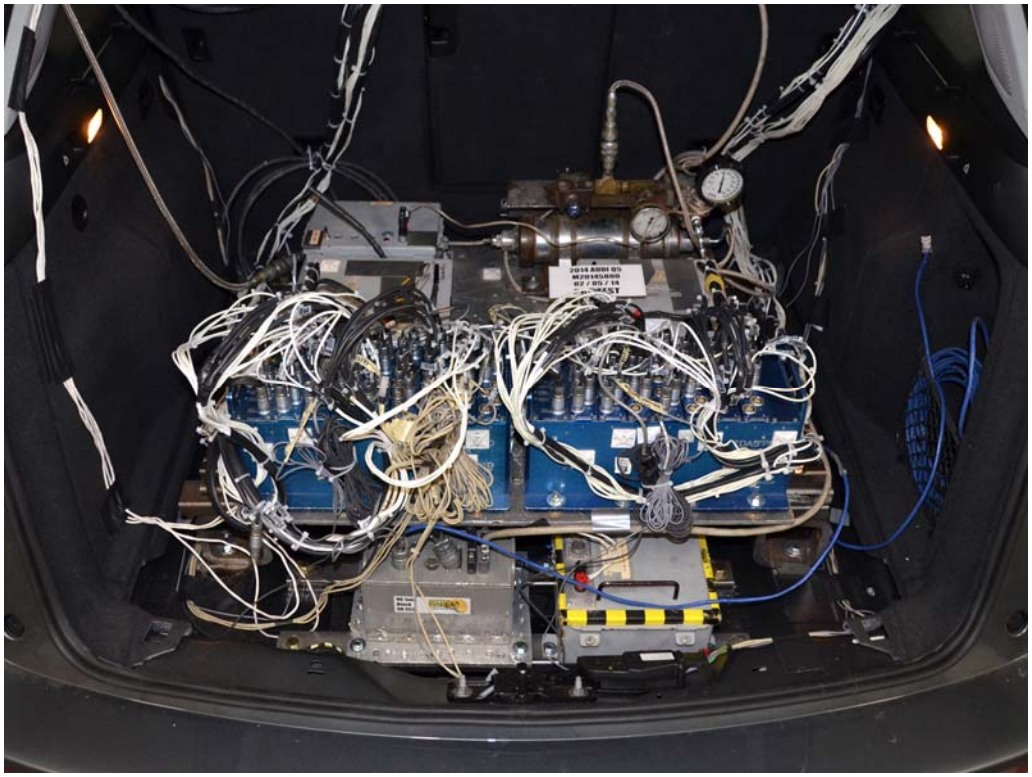


FIGURE 69. Photograph of Ballast Installed in Vehicle

Photograph Not Applicable

No Stoddard
Solvent Spillage

FIGURE 70. Post-Test Stoddard Solvent Spillage Location View

FIGURE 71. Post-Test Speed Trap Read-Out

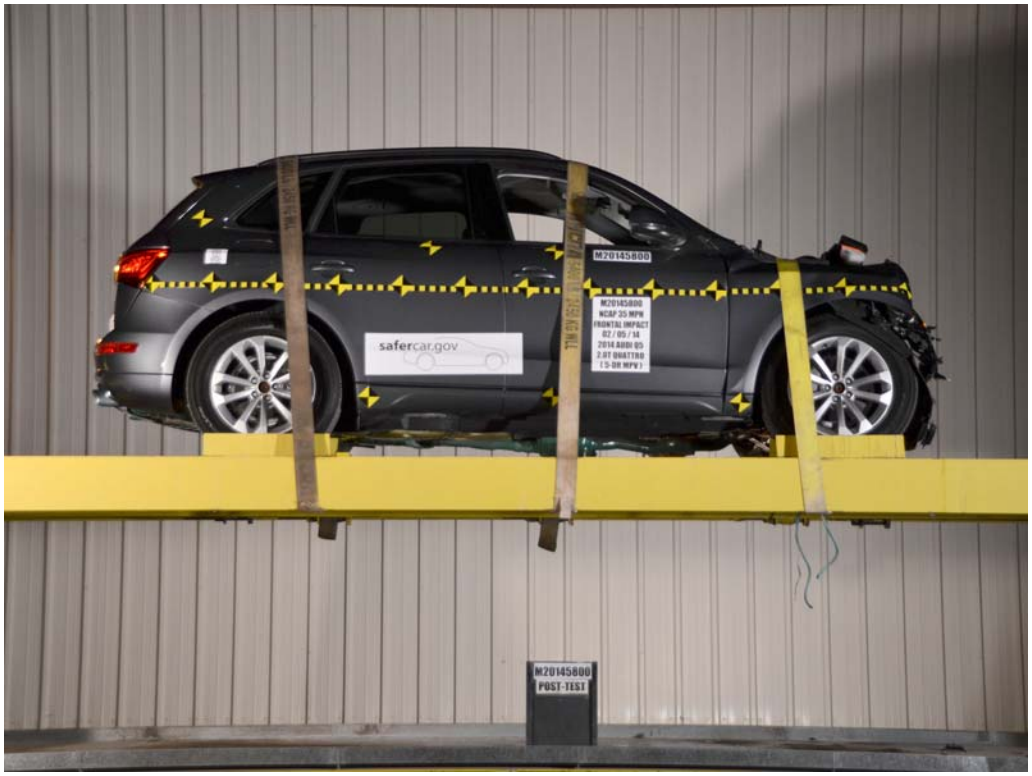


FIGURE 72. Vehicle at 0° on Static Rollover Device

FIGURE 73. Vehicle at 90° on Static Rollover Device

FIGURE 74. Vehicle at 180° on Static Rollover Device

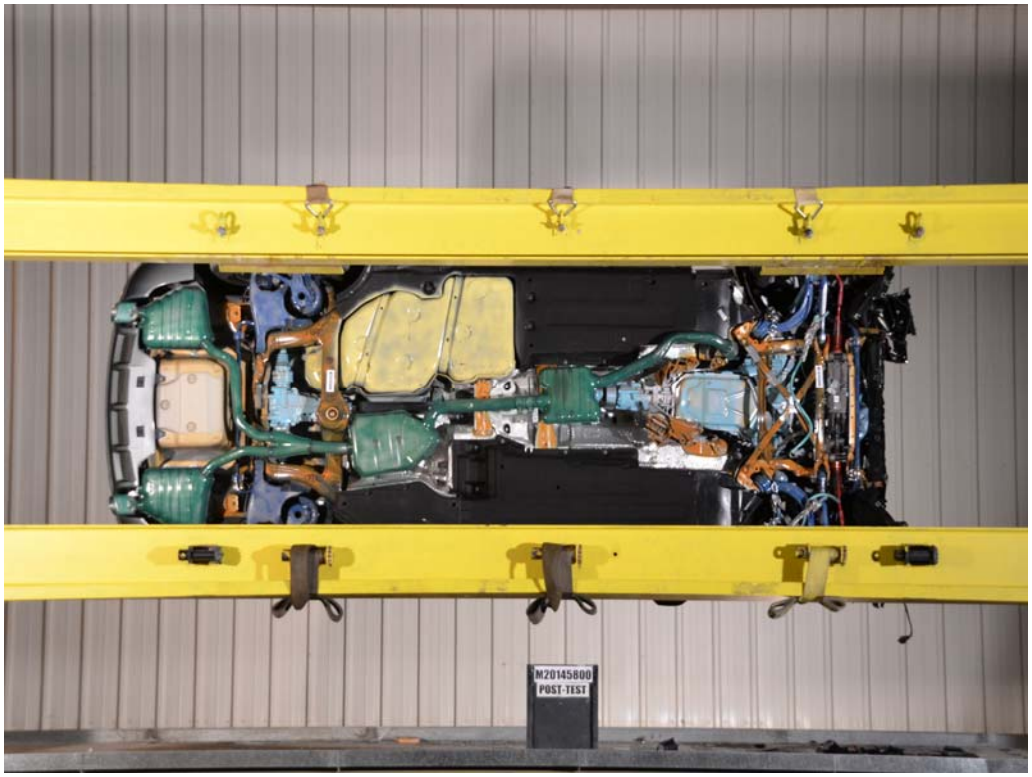


FIGURE 75. Vehicle at 270° on Static Rollover Device

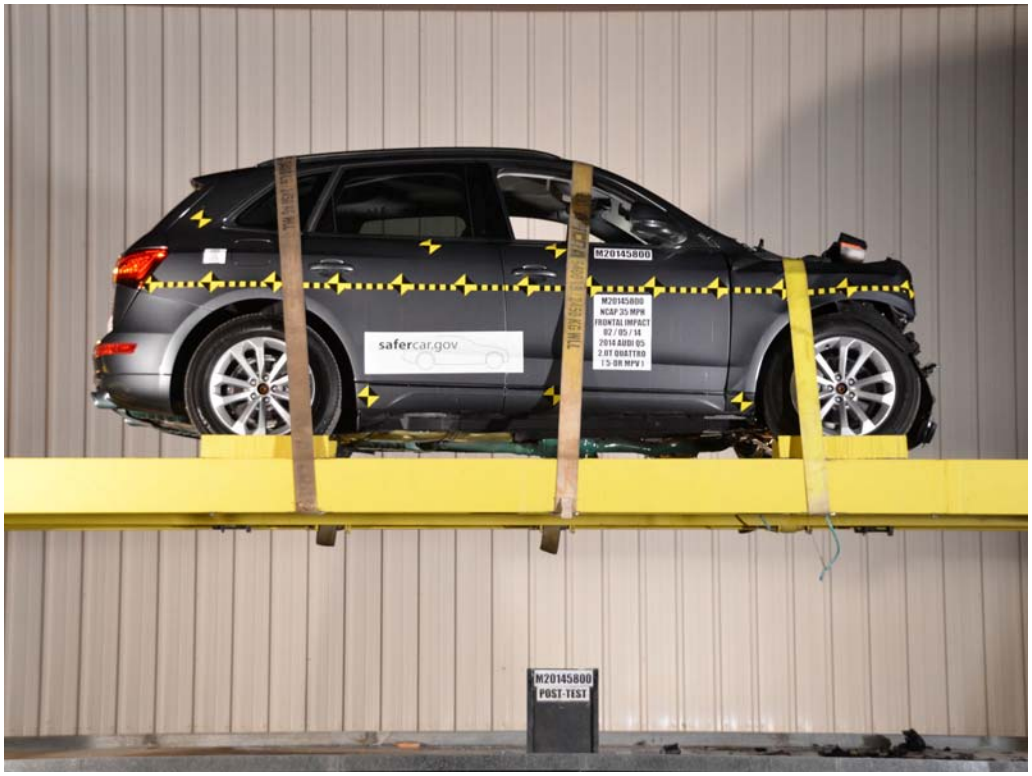


FIGURE 76. Vehicle at 360° on Static Rollover Device

FIGURE 77. 2014 Audi Q5 Frontal Impact Event

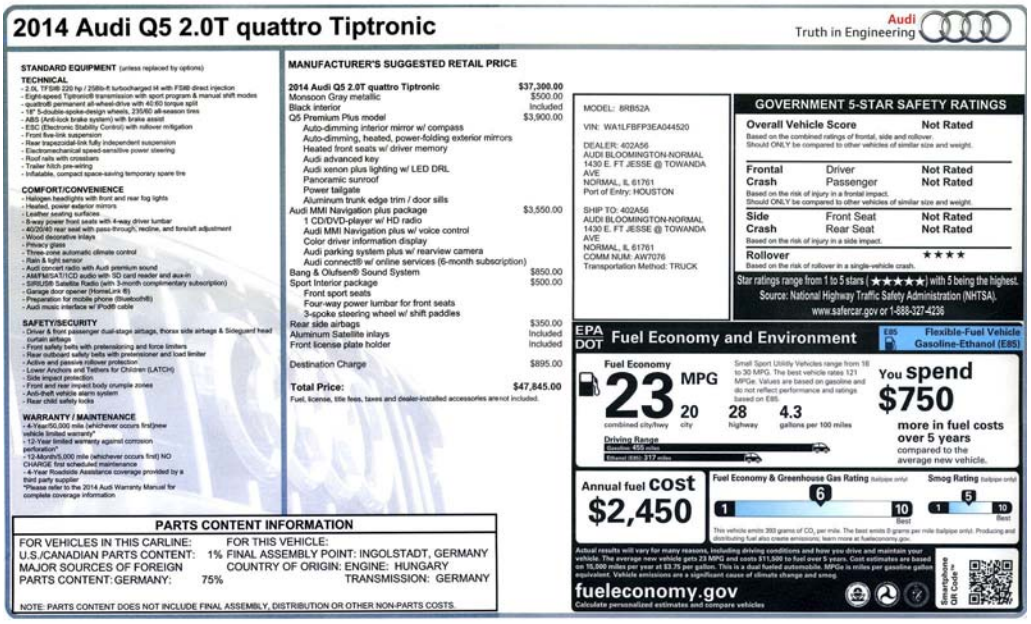


FIGURE 78. Monroney Label Photograph

APPENDIX B
DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

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

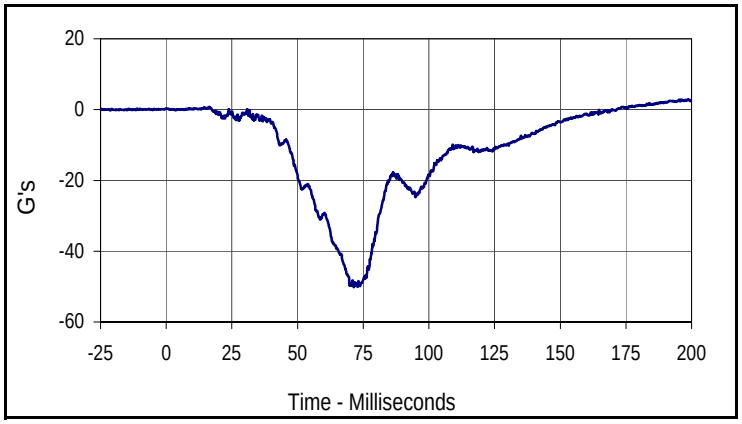
Vehicle Engine Bottom X

Vehicle Left Rear Z

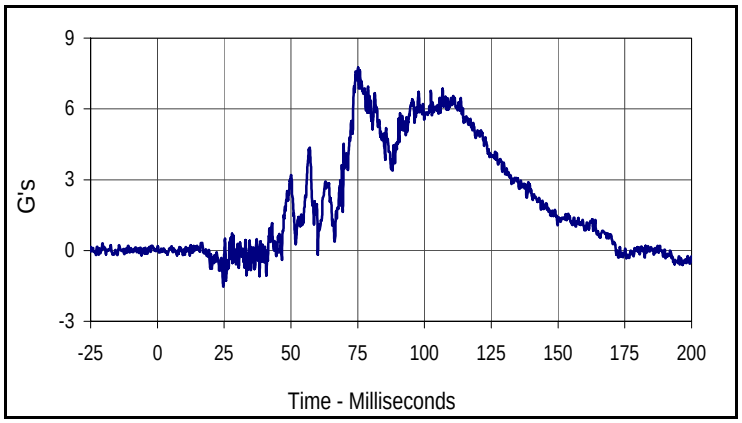
Vehicle Right Rear Z

Load Cell Barrier LC0101 – LC 1116

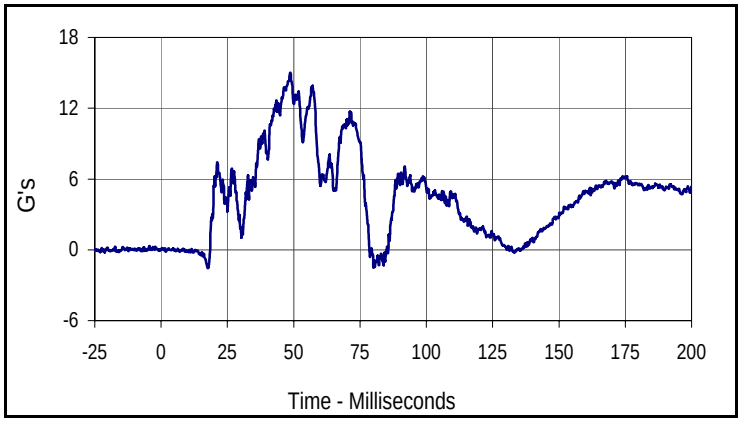
Test Vehicle:	2014 Audi Q5 2.0T Quattro 5-Door MPV	NHTSA No.:	M20145800
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	2/5/14



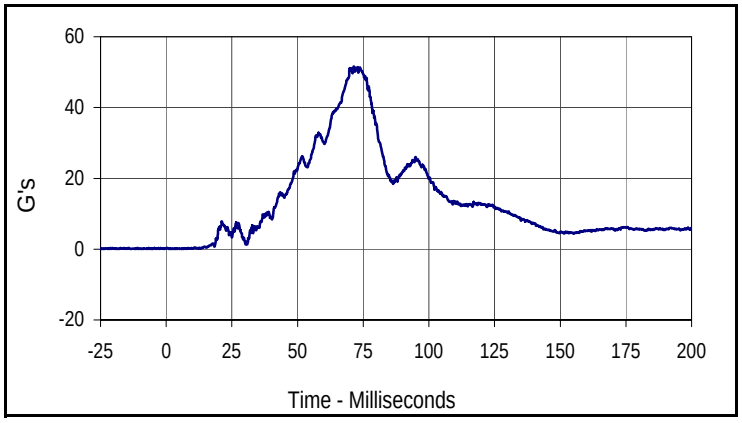
Curve Description			
Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
2.9	198.5	-50.2	71.4



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
7.7	75.1	-1.5	24.7

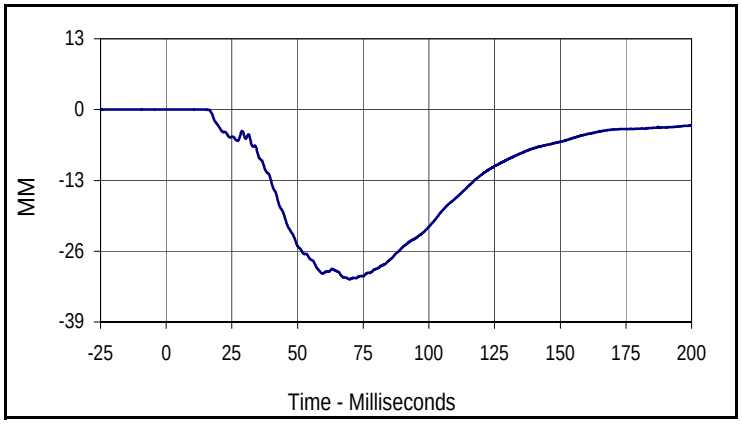


Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
15.0	48.7	-1.6	17.7



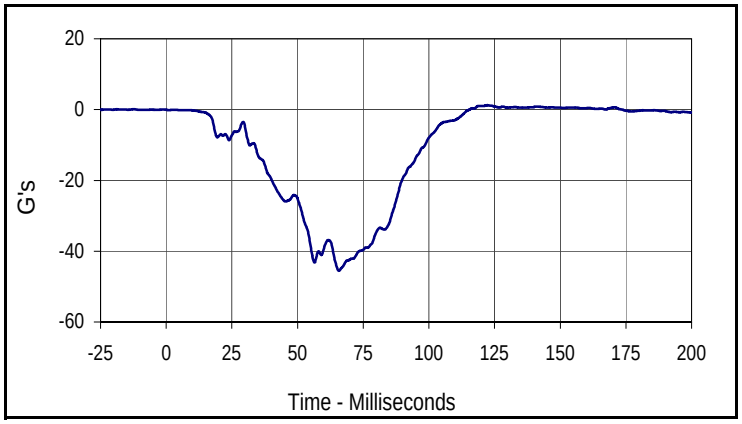
Curve Description			
Driver Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
51.6	71.5	0.0	3.2

Test Vehicle:	2014 Audi Q5 2.0T Quattro 5-Door MPV	NHTSA No.:	M20145800
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	2/5/14

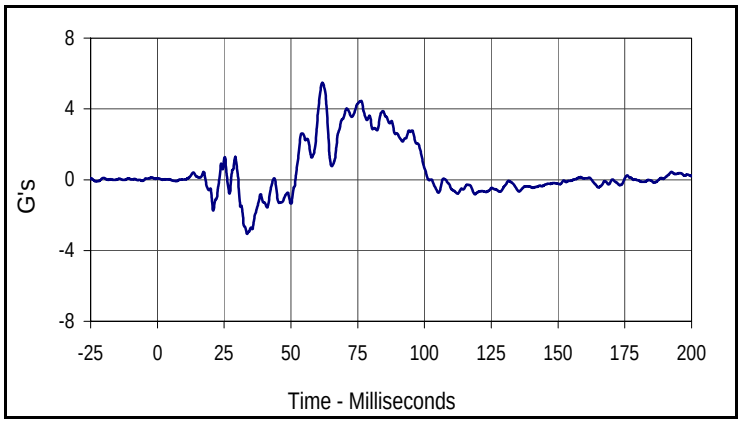


Curve Description			
Driver Chest Deflection			
Plot No.	Type	SAE Class	Units
005	FIL	600	MM
Max	Time	Min	Time
0.0	5.9	-31.2	69.9

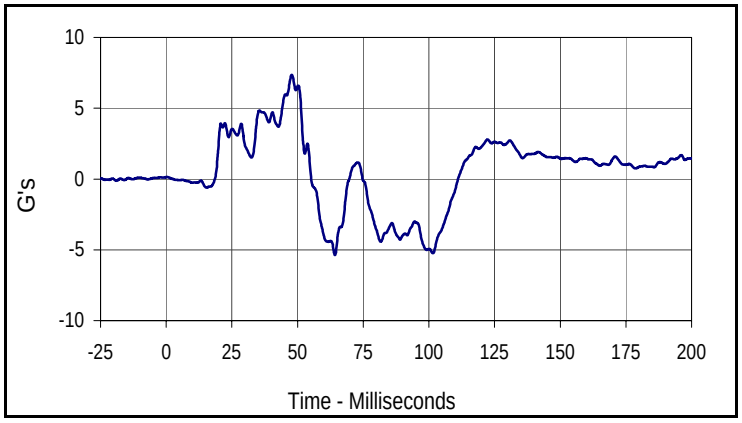
Test Vehicle:	2014 Audi Q5 2.0T Quattro 5-Door MPV	NHTSA No.:	M20145800
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	2/5/14



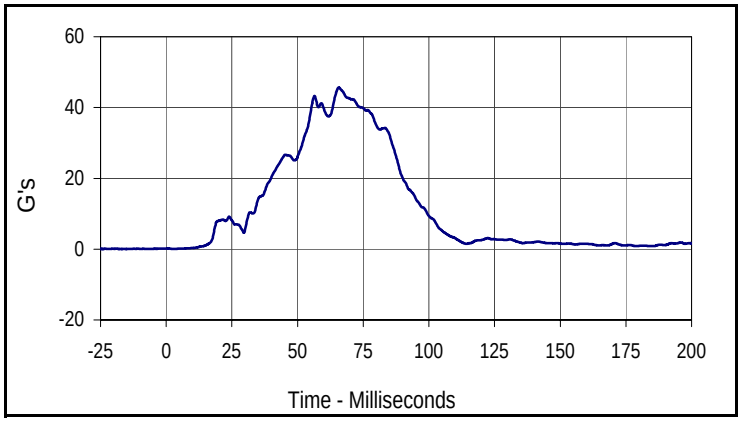
Curve Description			
Driver Chest Acceleration X Primary			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
1.2	122.2	-45.5	65.7



Curve Description			
Driver Chest Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
007	FIL	180	G's
Max	Time	Min	Time
5.5	61.8	-3.1	33.6

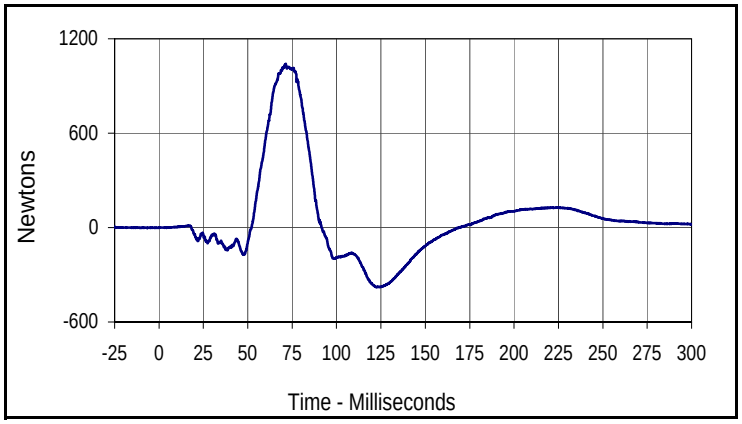


Curve Description			
Driver Chest Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
008	FIL	180	G's
Max	Time	Min	Time
7.4	47.8	-5.4	64.2

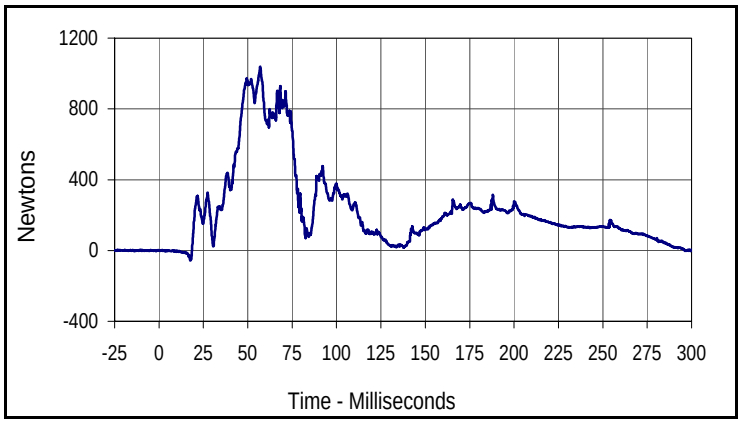


Curve Description			
Driver Chest Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
009	RES	180	G's
Max	Time	Min	Time
45.7	65.7	0.1	2.5

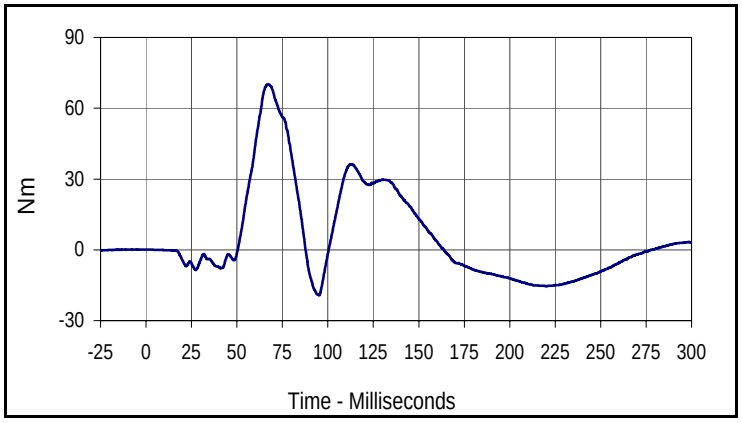
Test Vehicle:	2014 Audi Q5 2.0T Quattro 5-Door MPV	NHTSA No.:	M20145800
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	2/5/14



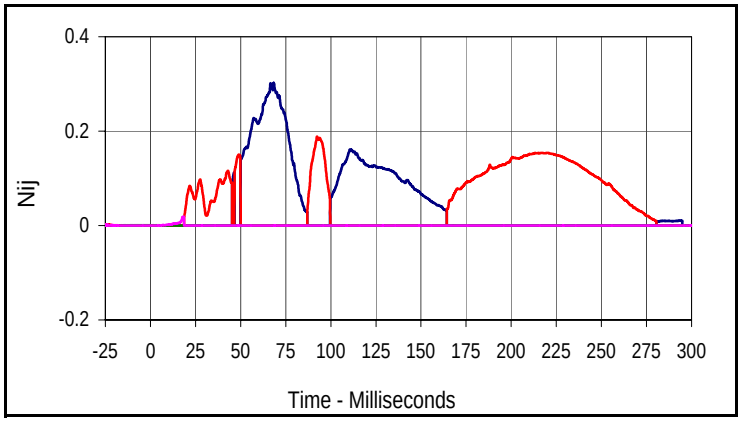
Curve Description			
Driver Upper Neck Force X			
Plot No.	Type	SAE Class	Units
010	FIL	1000	Newtons
Max	Time	Min	Time
1041.4	71.4	-381.1	122.6



Curve Description			
Driver Upper Neck Force Z			
Plot No.	Type	SAE Class	Units
011	FIL	1000	Newtons
Max	Time	Min	Time
1038.8	57.0	-57.0	17.7

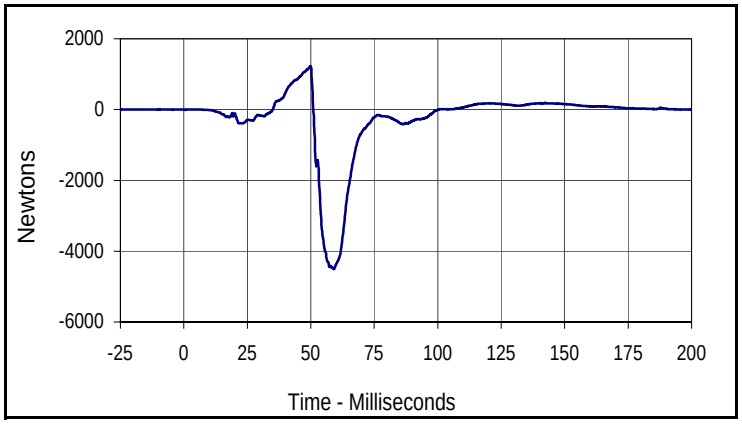


Curve Description			
Driver Upper Neck Moment Y			
Plot No.	Type	SAE Class	Units
012	FIL	600	Nm
Max	Time	Min	Time
70.1	66.6	-19.2	95.2

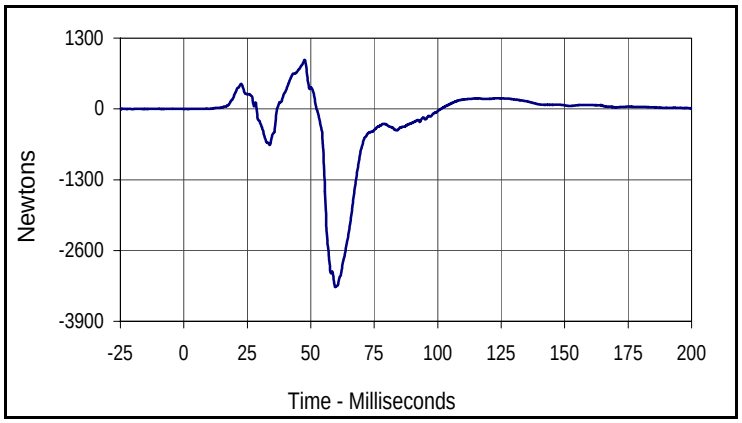


Curve Description			
Driver Nij			
Units	Type	Max	Time
Ntf	FIL	0.30	68.4
Units	Type	Max	Time
Nte	FIL	0.19	92.4
Units	Type	Max	Time
Ncf	FIL	0.00	-1.5
Units	Type	Max	Time
Nce	FIL	0.02	18.2

Test Vehicle:	2014 Audi Q5 2.0T Quattro 5-Door MPV	NHTSA No.:	M20145800
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	2/5/14

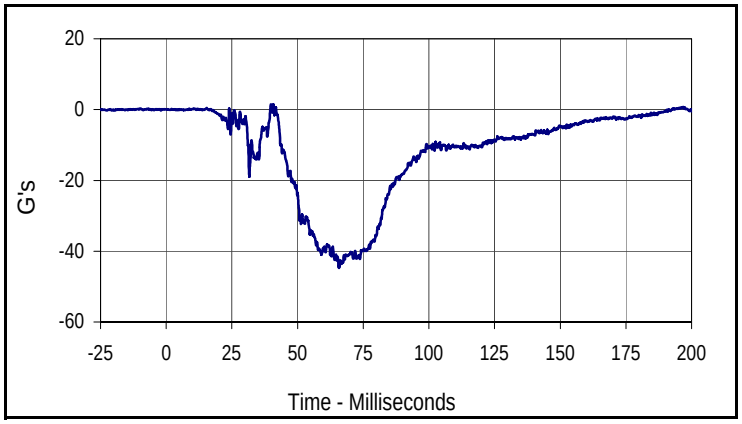


Curve Description			
Driver Left Femur Force Z			
Plot No.	Type	SAE Class	Units
013	FIL	600	Newtons
Max	Time	Min	Time
1229.5	49.9	-4511.5	59.0

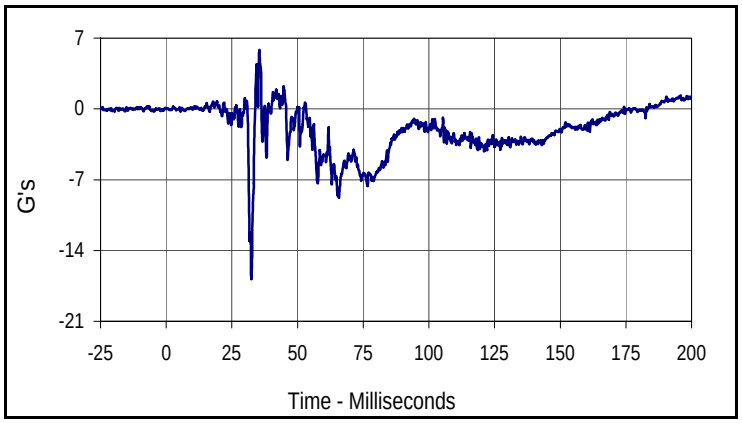


Curve Description			
Driver Right Femur Force Z			
Plot No.	Type	SAE Class	Units
014	FIL	600	Newtons
Max	Time	Min	Time
902.1	47.6	-3270.0	59.7

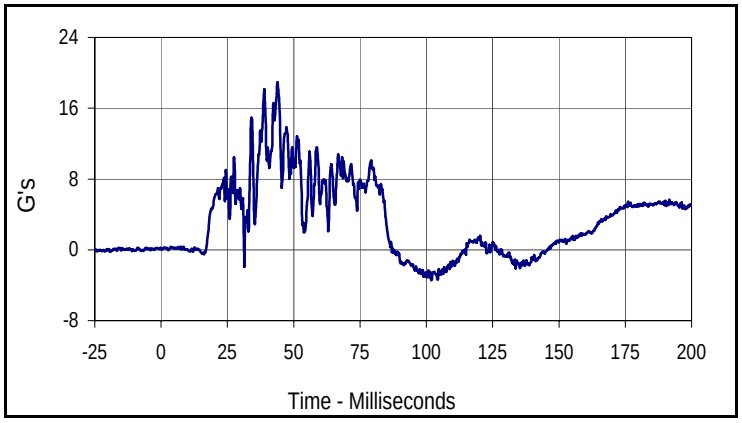
Test Vehicle:	2014 Audi Q5 2.0T Quattro 5-Door MPV	NHTSA No.:	M20145800
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	2/5/14



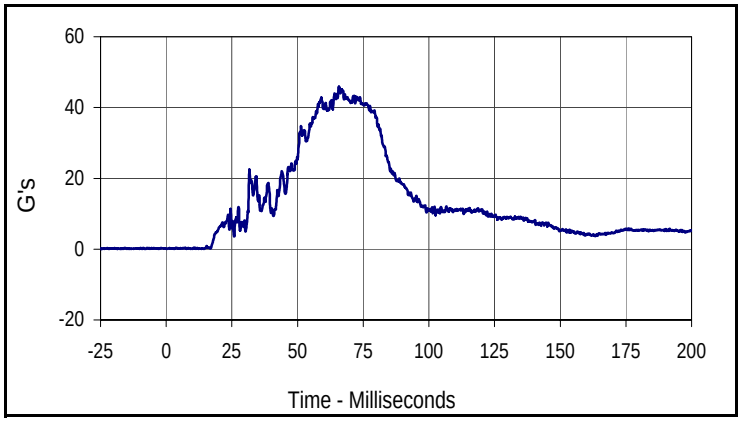
Curve Description			
Passenger Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
015	FIL	1000	G's
Max	Time	Min	Time
1.5	39.9	-44.7	65.7



Curve Description			
Passenger Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
016	FIL	1000	G's
Max	Time	Min	Time
5.8	35.5	-16.8	32.4

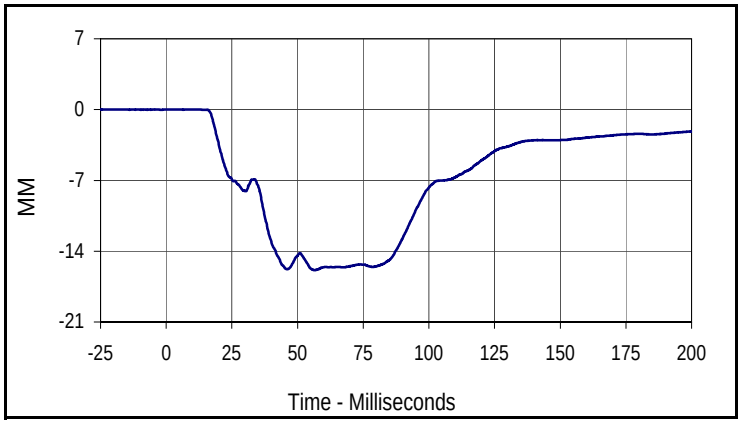


Curve Description			
Passenger Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
017	FIL	1000	G's
Max	Time	Min	Time
18.9	43.9	-3.4	101.9



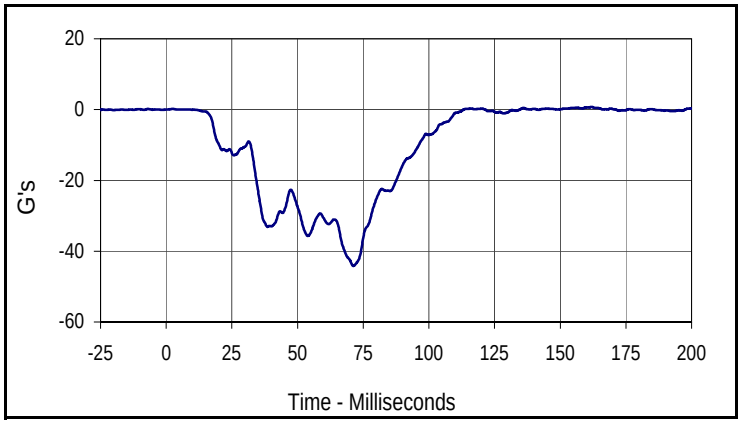
Curve Description			
Passenger Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
018	RES	1000	G's
Max	Time	Min	Time
45.9	65.7	0.0	14.4

Test Vehicle:	2014 Audi Q5 2.0T Quattro 5-Door MPV	NHTSA No.:	M20145800
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	2/5/14

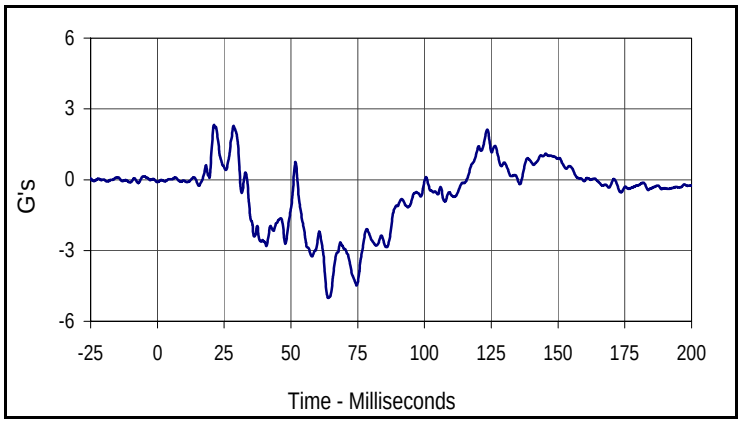


Curve Description			
Passenger Chest Deflection			
Plot No.	Type	SAE Class	Units
019	FIL	600	MM
Max	Time	Min	Time
0.0	8.5	-15.9	56.4

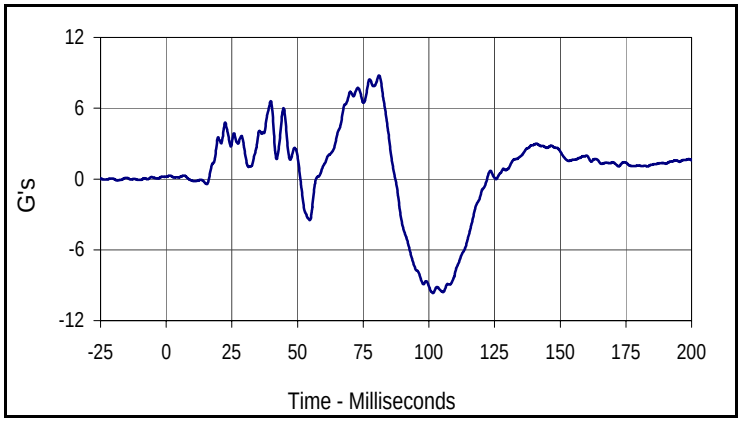
Test Vehicle:	2014 Audi Q5 2.0T Quattro 5-Door MPV	NHTSA No.:	M20145800
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	2/5/14



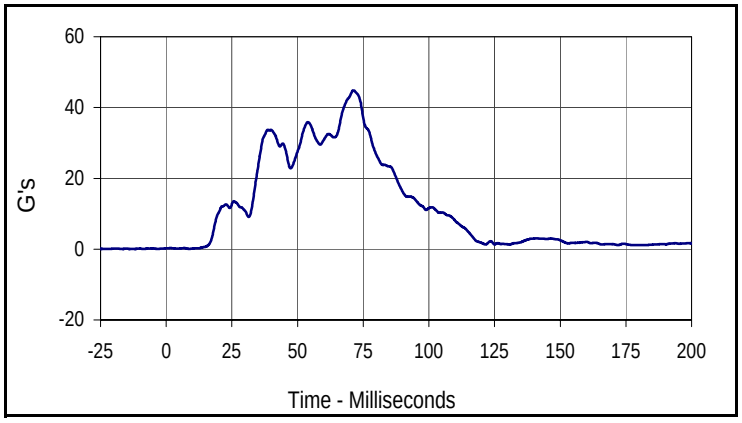
Curve Description			
Passenger Chest Acceleration X Primary			
Plot No.	Type	SAE Class	Units
020	FIL	180	G's
Max	Time	Min	Time
0.8	161.9	-44.2	71.3



Curve Description			
Passenger Chest Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
021	FIL	180	G's
Max	Time	Min	Time
2.3	21.2	-5.0	64.0

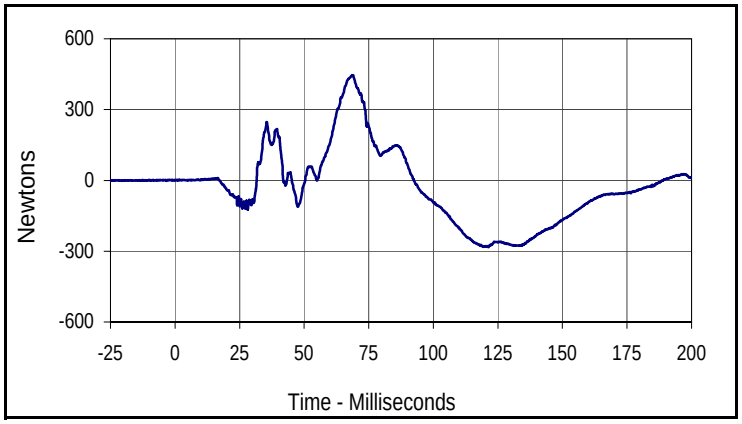


Curve Description			
Passenger Chest Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
022	FIL	180	G's
Max	Time	Min	Time
8.8	81.0	-9.7	101.6

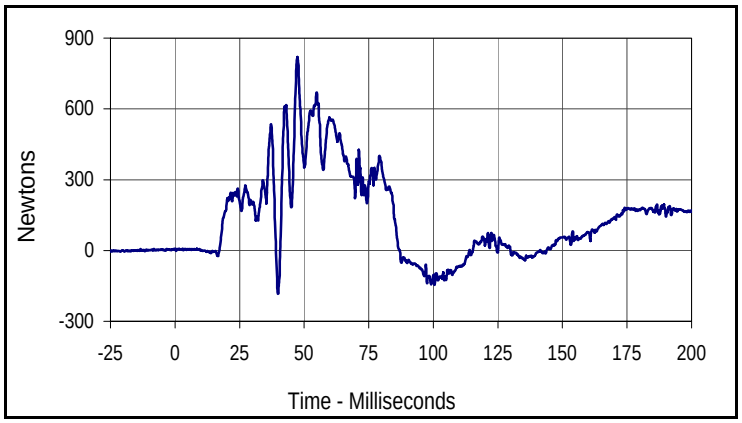


Curve Description			
Passenger Chest Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
023	RES	180	G's
Max	Time	Min	Time
44.8	71.3	0.1	8.5

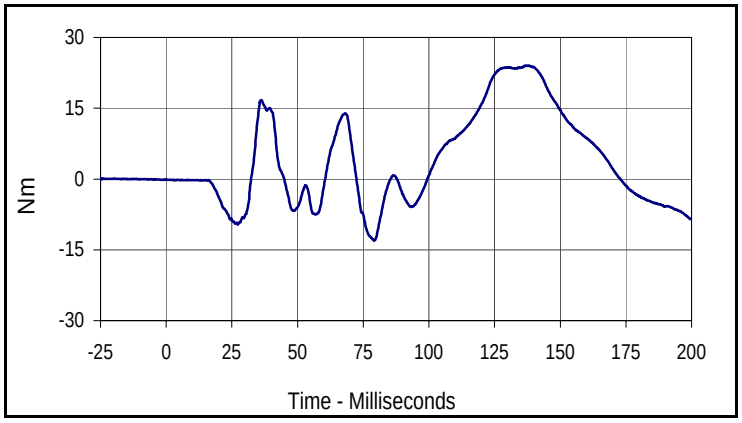
Test Vehicle:	2014 Audi Q5 2.0T Quattro 5-Door MPV	NHTSA No.:	M20145800
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	2/5/14



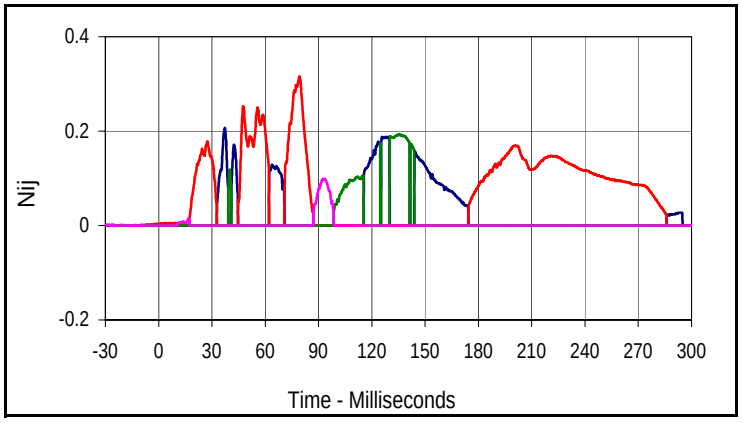
Curve Description			
Passenger Upper Neck Force X			
Plot No.	Type	SAE Class	Units
024	FIL	1000	Newtons
Max	Time	Min	Time
446.0	68.9	-283.3	121.3



Curve Description			
Passenger Upper Neck Force Z			
Plot No.	Type	SAE Class	Units
025	FIL	1000	Newtons
Max	Time	Min	Time
819.4	47.4	-184.0	39.9

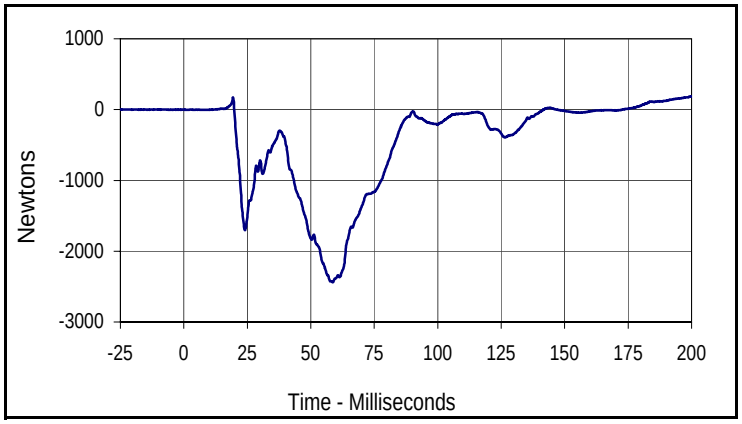


Curve Description			
Passenger Upper Neck Moment Y			
Plot No.	Type	SAE Class	Units
026	FIL	600	Nm
Max	Time	Min	Time
24.0	137.0	-13.0	79.3

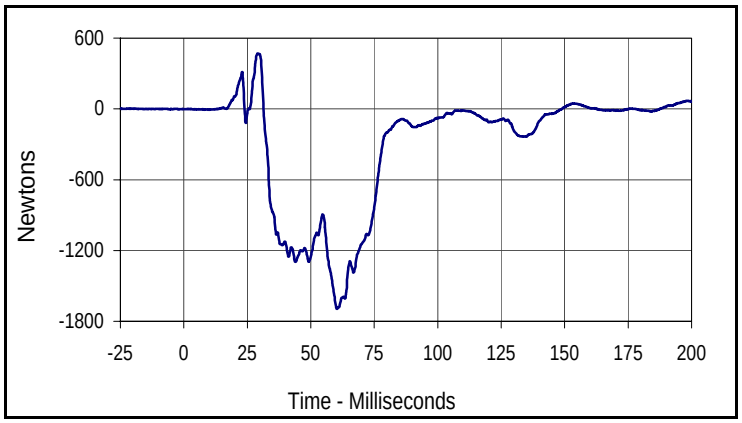


Curve Description			
Passenger Nij			
Units	Type	Max	Time
Ntf	FIL	0.21	37.3
Units	Type	Max	Time
Nte	FIL	0.32	79.3
Units	Type	Max	Time
Ncf	FIL	0.19	135.5
Units	Type	Max	Time
Nce	FIL	0.10	93.5

Test Vehicle:	2014 Audi Q5 2.0T Quattro 5-Door MPV	NHTSA No.:	M20145800
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	2/5/14



Curve Description			
Passenger Left Femur Force Z			
Plot No.	Type	SAE Class	Units
027	FIL	600	Newtons
Max	Time	Min	Time
185.0	200.0	-2439.0	58.7



Curve Description			
Passenger Right Femur Force Z			
Plot No.	Type	SAE Class	Units
028	FIL	600	Newtons
Max	Time	Min	Time
468.6	29.1	-1694.6	60.3

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: 1/29/14

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

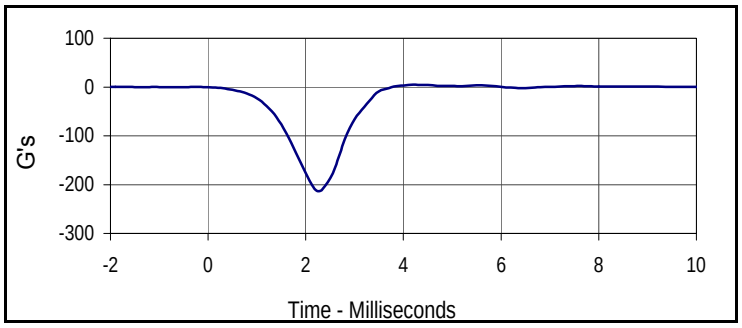
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	29.5	Pass
A - Total sitting height	mm	879 to 889	884	Pass
B - Shoulder pivot height	mm	505 to 521	512	Pass
C - H point height	mm	84 to 89	85	Pass
D - H point 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

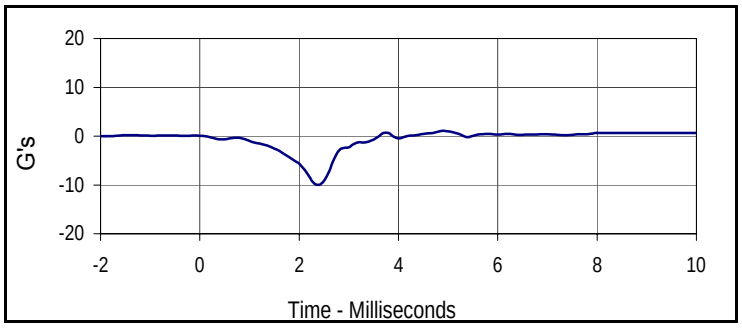
ATD Serial No.: 034 | Test I.D.: M034HD048

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

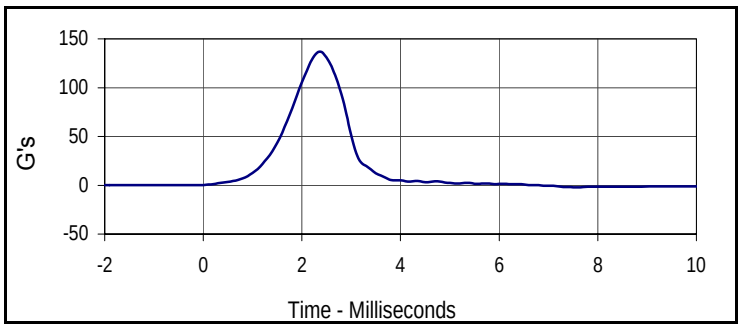
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
252.6	2.3	0.1	-0.2



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



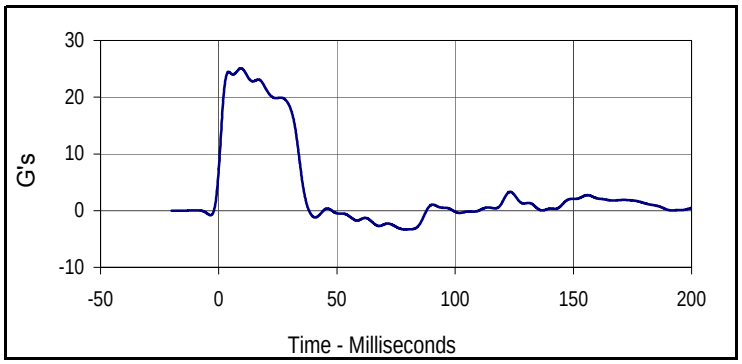
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
1.1	4.9	-10.0	2.4



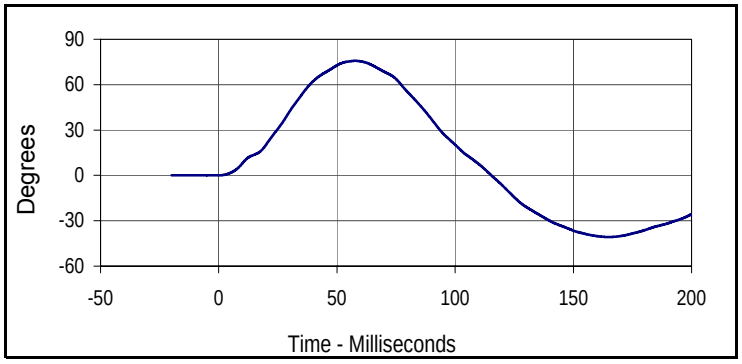
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
136.4	2.4	0.0	-1.4

Test Program:	Hybrid III 50th Percentile Male Neck Flexion Test	Test Date:	1/29/14
ATD Serial No.:	034	Test I.D.:	M034NF048

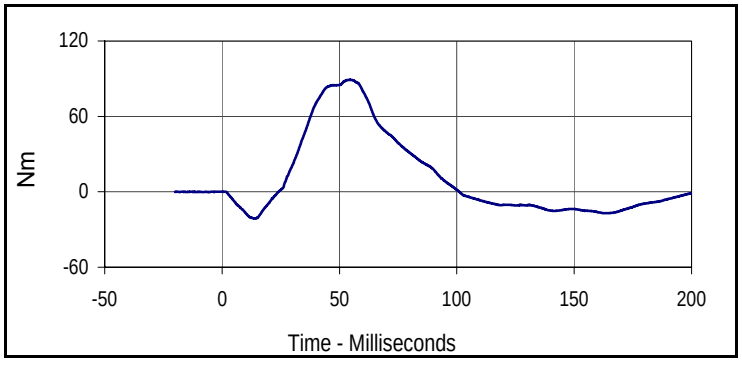
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	550	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.5	Pass
	Min	%		18.3	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
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

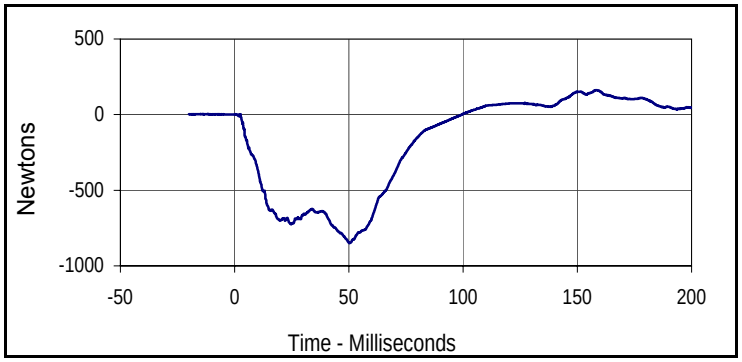


Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
75.8	57.7	-40.7	164.8

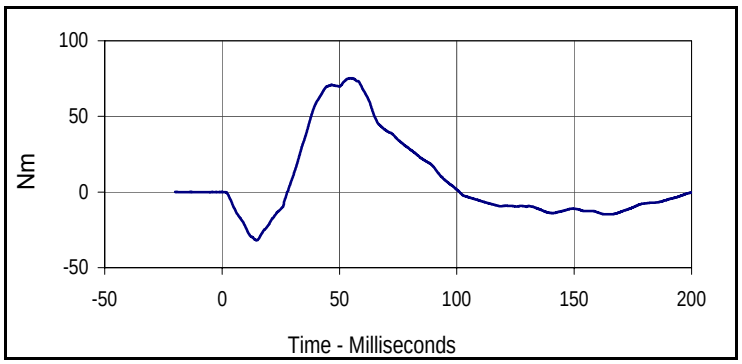


Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
89.1	54.5	-21.3	13.8

Test Program:	Hybrid III 50th Percentile Male Neck Flexion Test	Test Date:	1/29/14
ATD Serial No.:	034	Test I.D.:	M034NF048



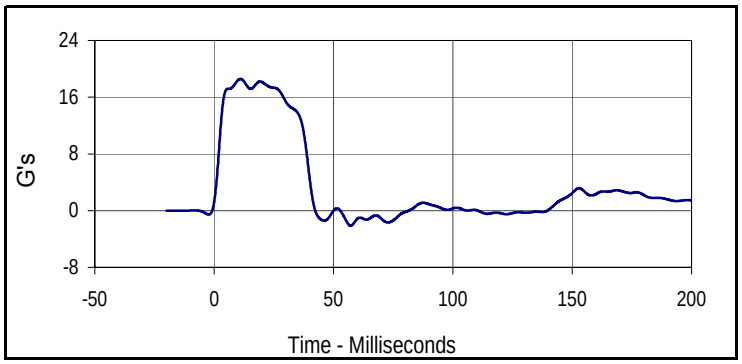
Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
162.5	158.4	-849.9	50.2



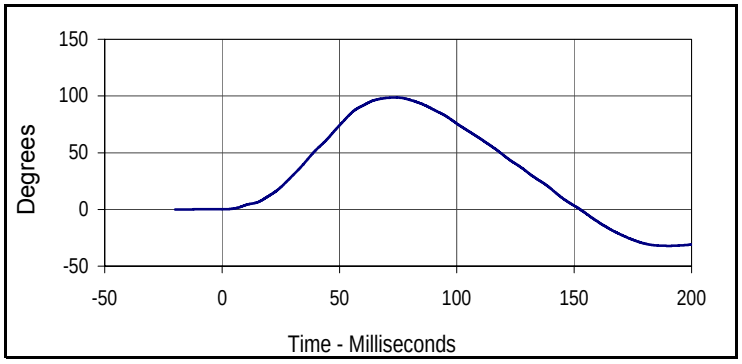
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
75.3	55.4	-31.9	14.9

Test Program:	Hybrid III 50th Percentile Male Neck Extension Test	Test Date:	1/29/14
ATD Serial No.:	034	Test I.D.:	M034NE048

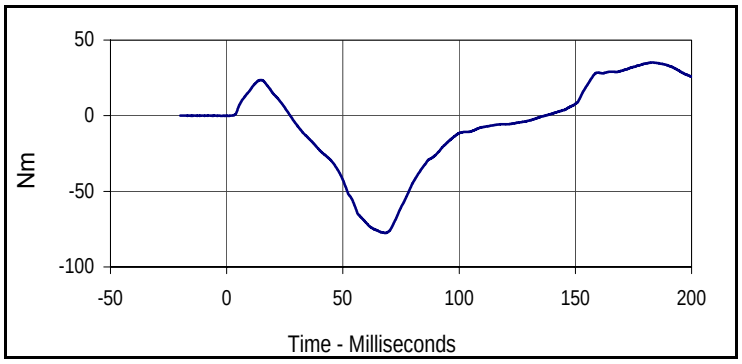
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	585	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.5	Pass
	Min	%		18.3	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
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

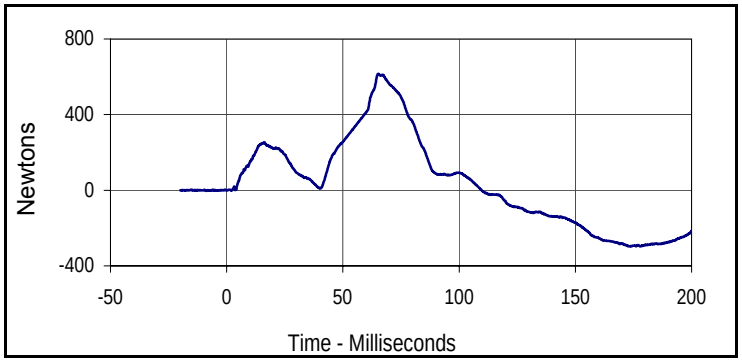


Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
98.6	73.9	-32.1	190.4

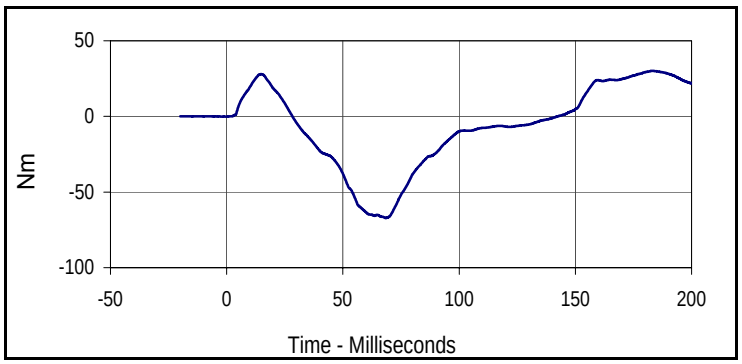


Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
35.2	183.3	-77.6	68.4

Test Program:	Hybrid III 50th Percentile Male Neck Extension Test	Test Date:	1/29/14
ATD Serial No.:	034	Test I.D.:	M034NE048



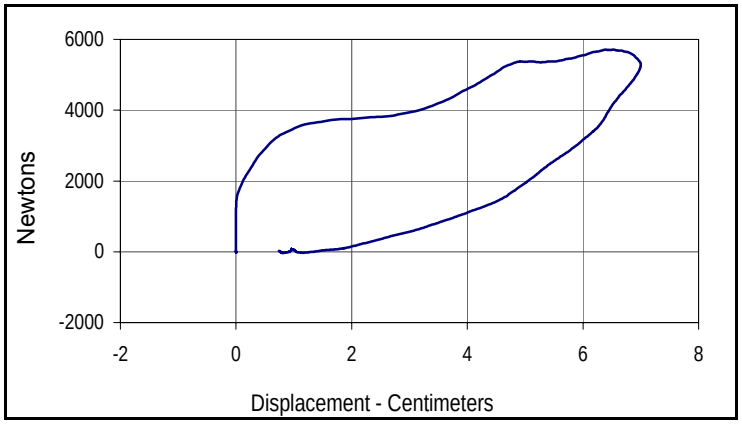
Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
615.2	65.2	-297.5	174.0



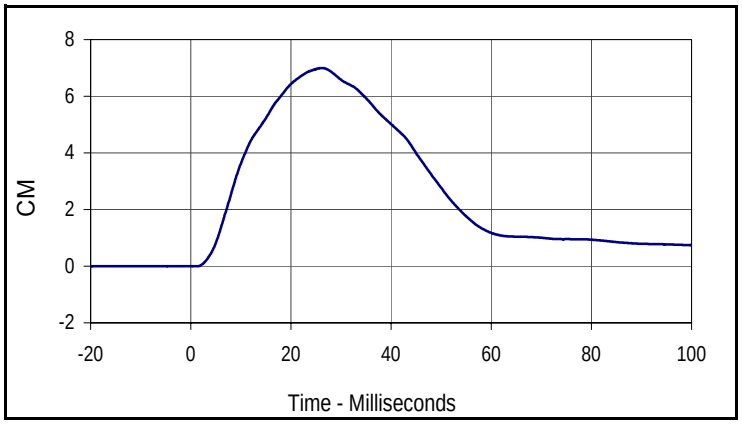
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
30.2	183.3	-67.2	68.5

Test Program:	Hybrid III 50th Percentile Male Thorax Impact Test	Test Date:	1/29/14
ATD Serial No.:	034	Test I.D.:	M034CH048

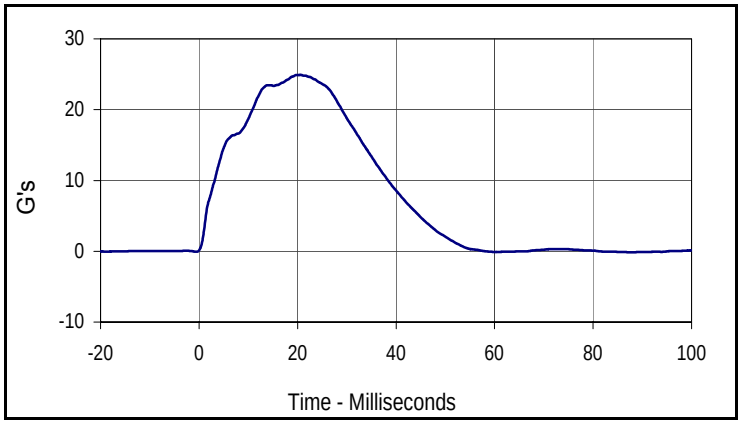
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	635	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.5	Pass
	Min	%		18.3	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory 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 Hysterysis		%	69 to 85	69.5	Pass
			Overall Test Results		Pass



Curve Description			
Probe Force vs. Chest Deflection			
Plot No.	Type	SAE Class	Hysterysis
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

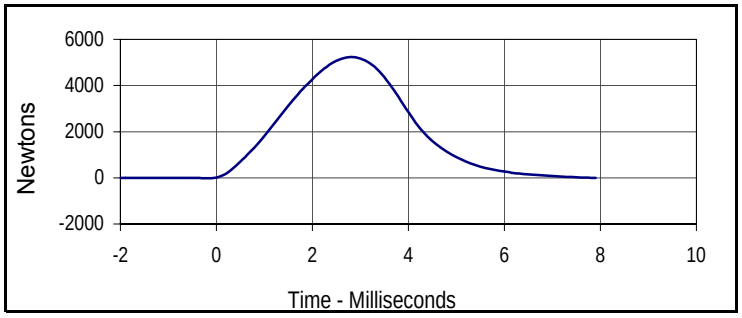
Test Program:	Hybrid III 50th Percentile Male Knee Impact Test	Test Date:	1/29/14
ATD Serial No.:	034	Test I.D.:	M034LK048 , M034RK048

Left Knee

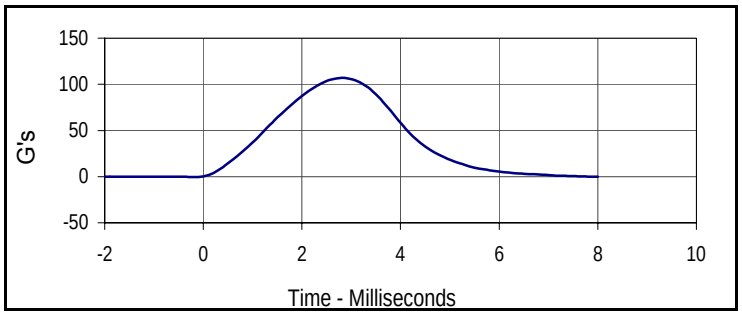
Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	670	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.5	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.5	Pass
	Min	%		18.3	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
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

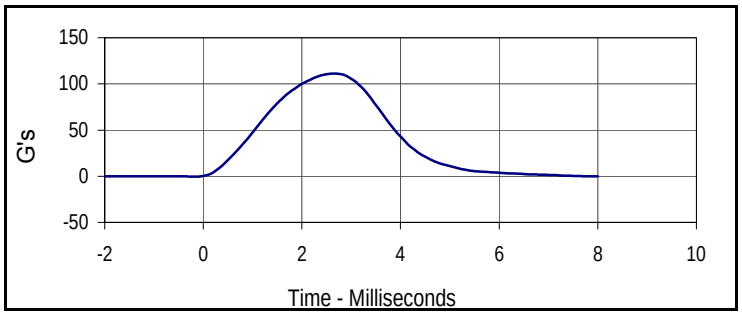


Curve Description			
Left Knee Probe Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5233.2	2.8	-20.1	-0.2



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

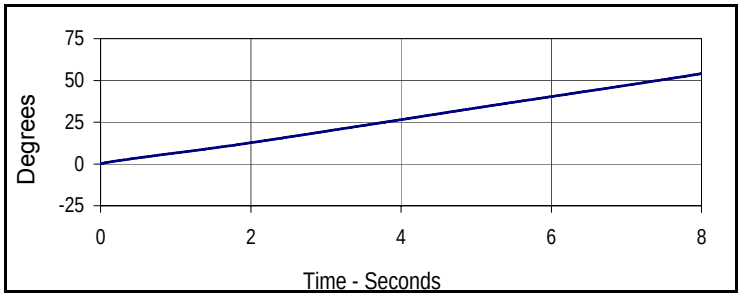
Test Program:	Hybrid III 50th Percentile Male Hip Joint-Femur Flexion Test	Test Date:	1/29/14
ATD Serial No.:	034	Test I.D.:	M034LF048 , M034RF048

Left Hip Joint-Femur Results

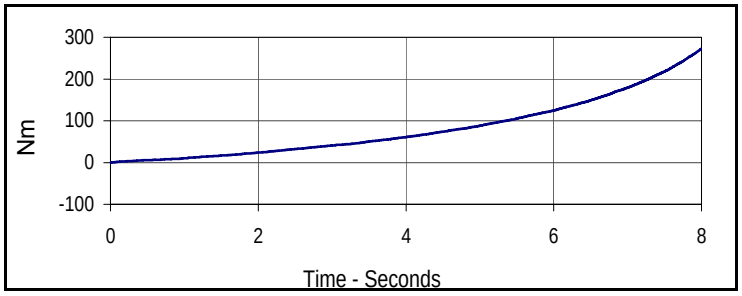
Tested Parameter		Units	Specification	Result	Pass/Fail
Hip Joint-Femur Assembly Soak Time		Minutes	≥240	720	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.5	Pass
	Min	°C		21.4	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.5	Pass
	Min	%		18.3	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	18.5	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

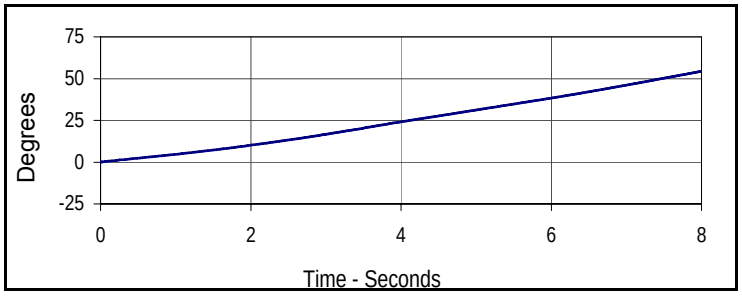
Rotation Rate	deg/sec	5 to 10	6.8	Pass
Femur Torque at 30°	Nm	≤ 95	92.5	Pass
Rotation at 203 Nm	Degrees	40.0 to 50.0	49.2	Pass
		Overall Test Results		Pass



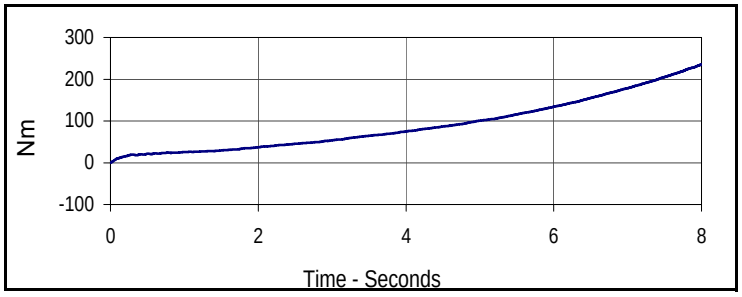
Curve Description			
Left Hip-Femur Rotation			
Plot No.	Type	SAE Class	Units
001	FIL	60	Degrees
Max	Time	Min	Time
54.1	8.0	0.1	0.0



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 Test Date: 1/30/14

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:

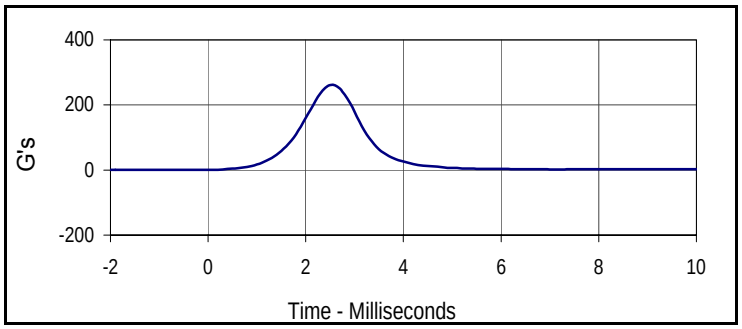
Test Program: Hybrid III 5th Percentile Female External Measurements Test Date: 1/30/14

ATD Serial No.: 635 Test I.D.: N/A

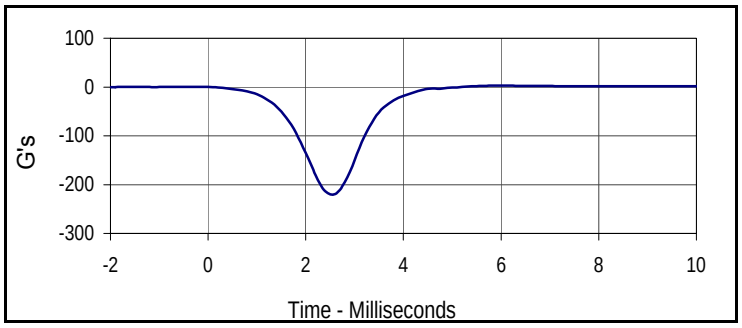
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.57	Pass
Laboratory Relative Humidity	%	10 to 70	18.6	Pass
A - Total sitting height	mm	774.7 to 800.1	786	Pass
B - Shoulder pivot height	mm	431.8 to 457.2	450	Pass
C - H point height	mm	81.3 to 86.3	85	Pass
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

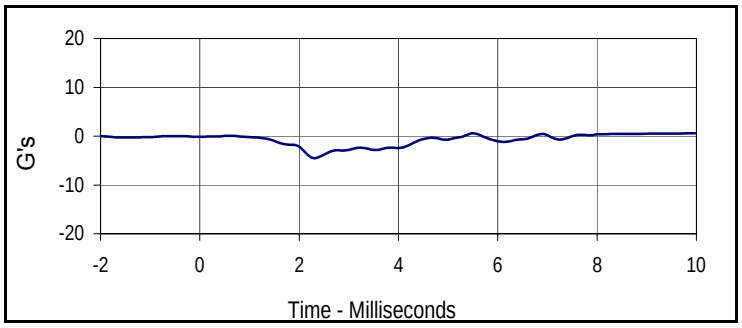
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	550	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.6	Pass
	Min	°C		21.5	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.6	Pass
	Min	%		18.5	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
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



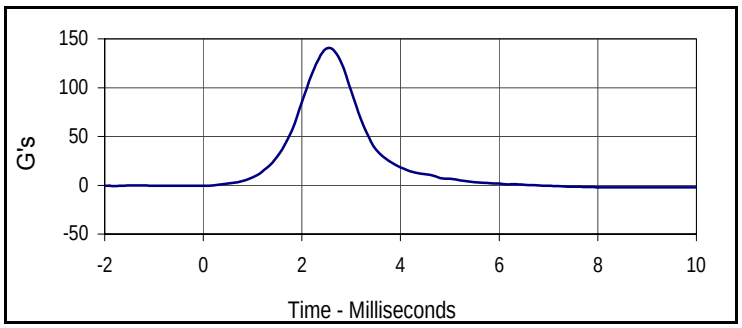
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
261.0	2.5	0.4	-1.3



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



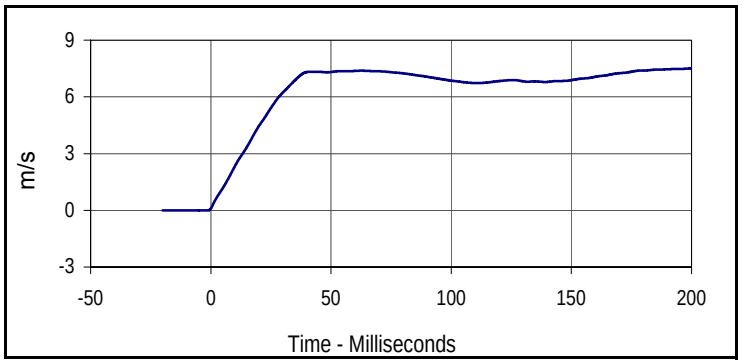
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
0.6	5.5	-4.5	2.3



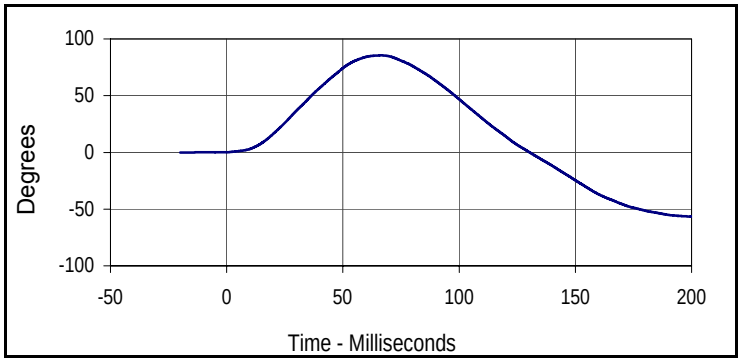
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
140.1	2.6	-0.7	-1.8

Test Program:	Hybrid III 5th Percentile Female Neck Flexion Test	Test Date:	1/30/14
ATD Serial No.:	635	Test I.D.:	F635NF044

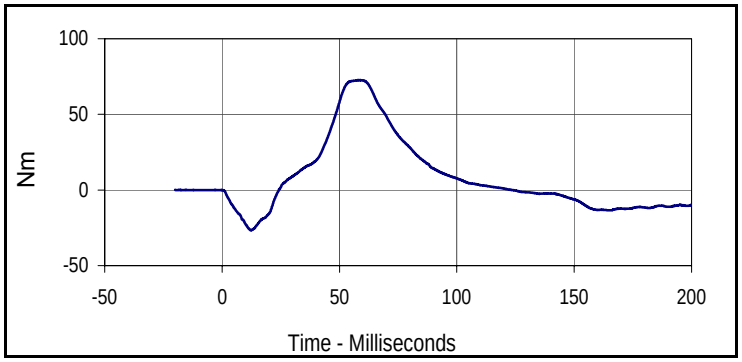
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	605	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.5	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.6	Pass
	Min	%		18.5	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
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

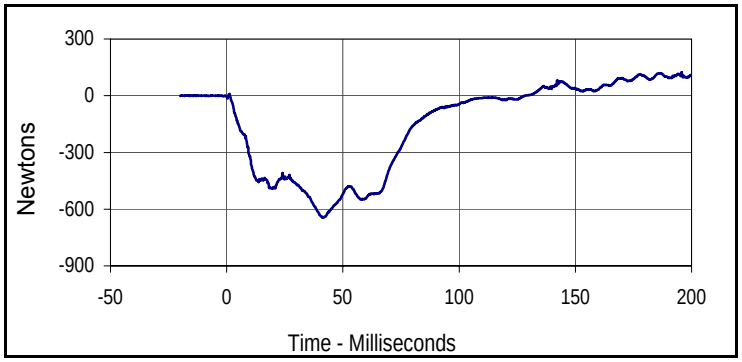


Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
85.5	66.5	-56.6	200.0

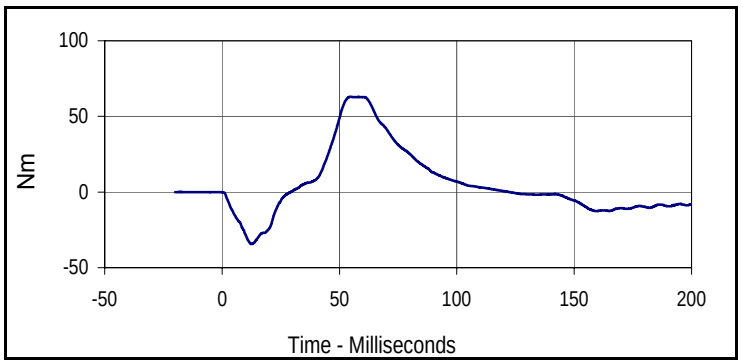


Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
72.6	57.9	-26.7	12.2

Test Program:	Hybrid III 5th Percentile Female Neck Flexion Test	Test Date:	1/30/14
ATD Serial No.:	635	Test I.D.:	F635NF044



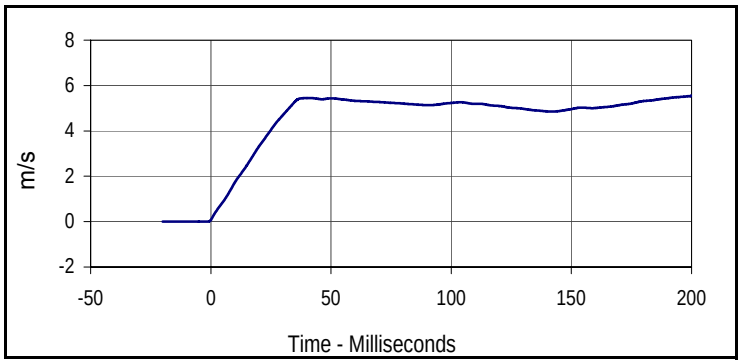
Curve Description			
Upper Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
123.3	195.7	-645.3	41.5



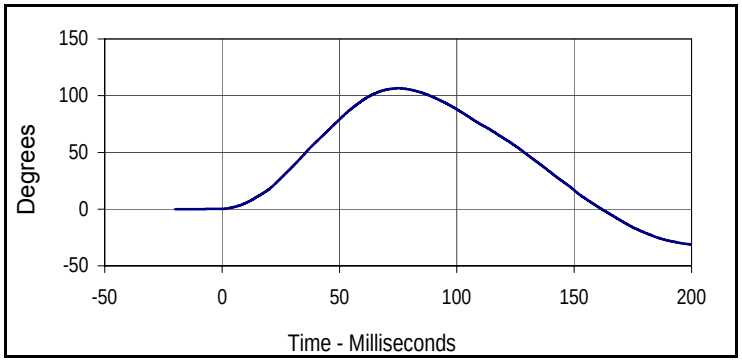
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
63.0	54.6	-34.4	12.6

Test Program:	Hybrid III 5th Percentile Female Neck Extension Test	Test Date:	1/30/14
ATD Serial No.:	635	Test I.D.:	F635NE044

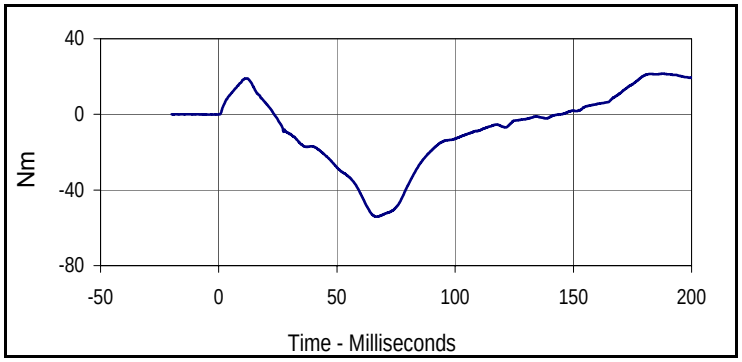
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	640	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.5	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.6	Pass
	Min	%		18.5	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
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

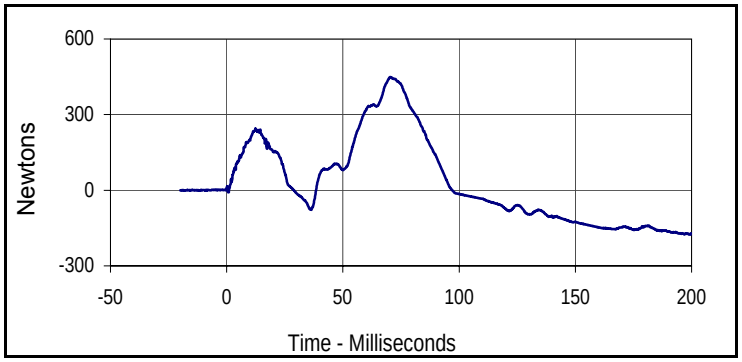


Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
106.5	75.2	-31.1	200.0

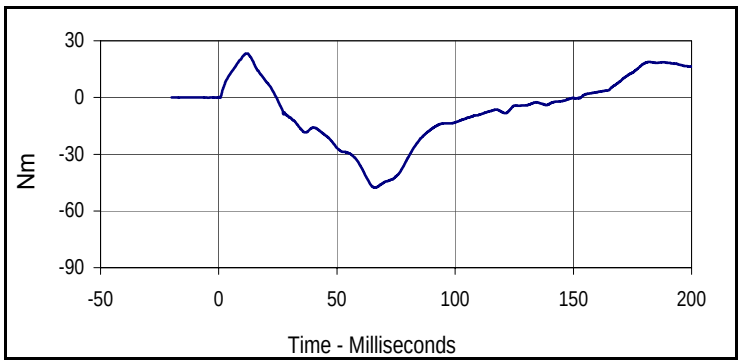


Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
21.5	187.6	-54.2	66.4

Test Program:	Hybrid III 5th Percentile Female Neck Extension Test	Test Date:	1/30/14
ATD Serial No.:	635	Test I.D.:	F635NE044



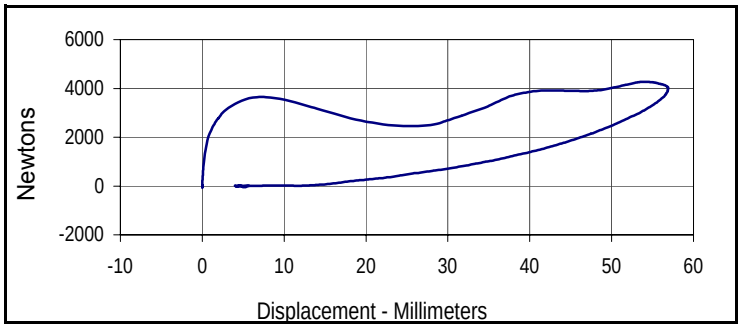
Curve Description			
Upper Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
448.7	70.5	-175.8	196.9



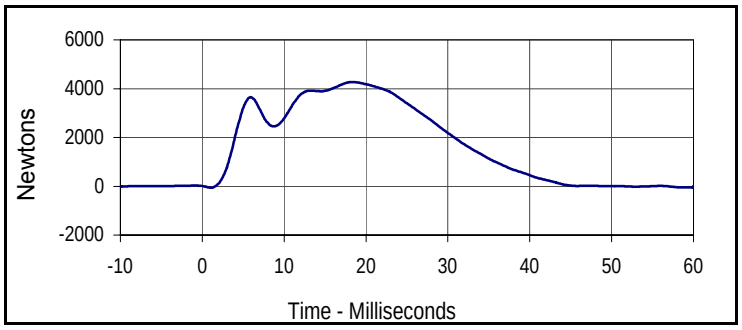
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
23.3	11.8	-47.7	66.3

Test Program:	Hybrid III 5th Percentile Female Thorax Impact Test	Test Date:	1/30/14
ATD Serial No.:	635	Test I.D.:	F635CH044

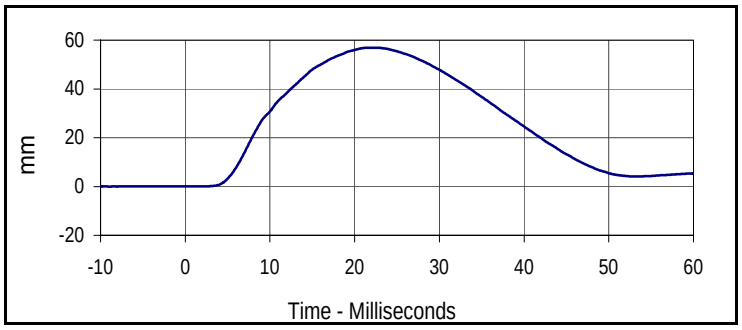
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	690	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.6	Pass
	Min	°C		21.5	Pass
Humidity During Soak	Max	%	10.0 to 70.0	18.6	Pass
	Min	%		18.5	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory 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 Hysterysis		%	69 to 85	70.3	Pass
			Overall Test Results		Pass



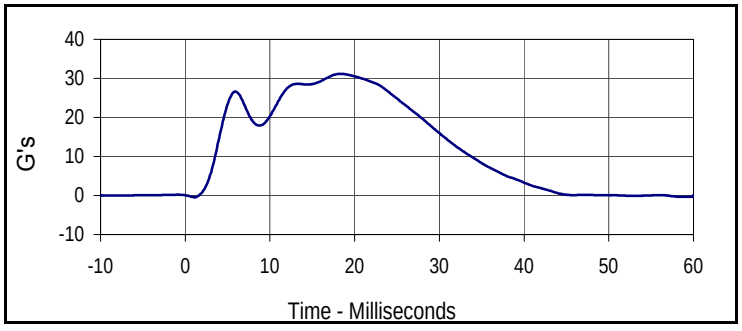
Curve Description			
Probe Force vs. Chest Deflection			
Plot No.	Type	SAE Class	Hysterysis
001	FIL	180	70.3
Peak Probe Force		Peak Chest Deflection	
4270.4		56.9	



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

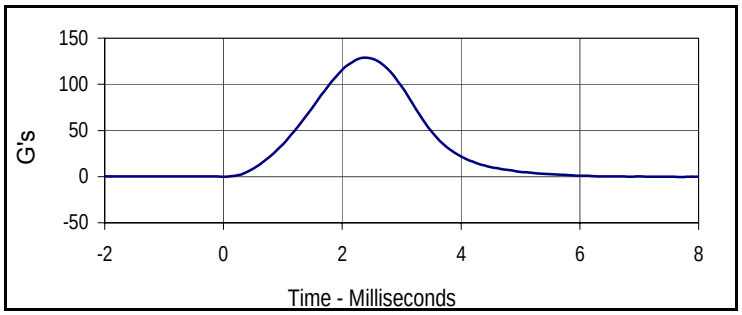
Left Knee

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

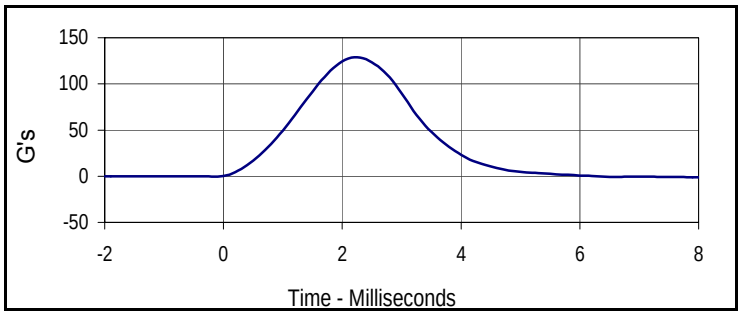
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.11	Pass
Peak Probe Force	Newtons	3450 to 4060	3773	Pass
		Overall Test Results		Pass

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

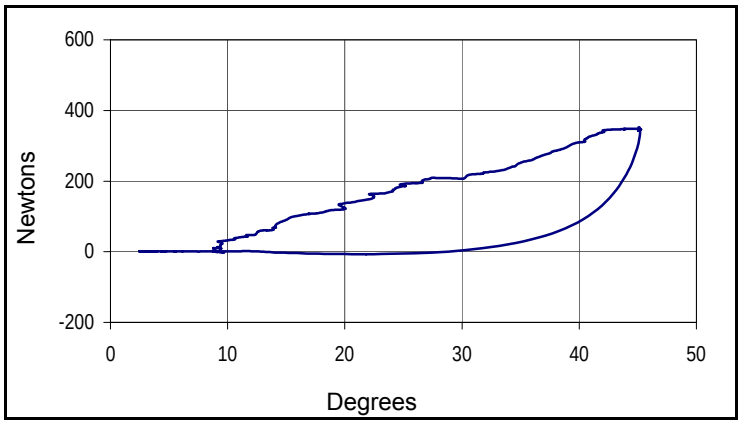
Curve Description			
Right Knee Probe Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
3772.7	2.2	-32.1	7.9



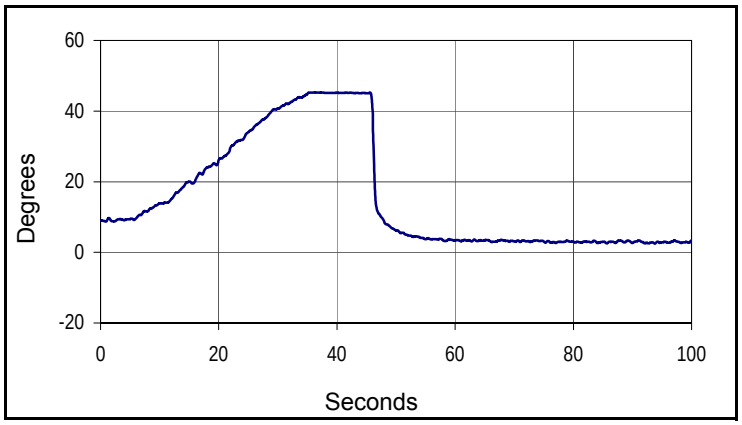
Curve Description			
Right Knee Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
128.7	2.2	-1.3	9.9

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

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

Test Program: Hybrid III 50th Percentile Male Dummy Damage Checklist Test Date: 2/11/14

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:

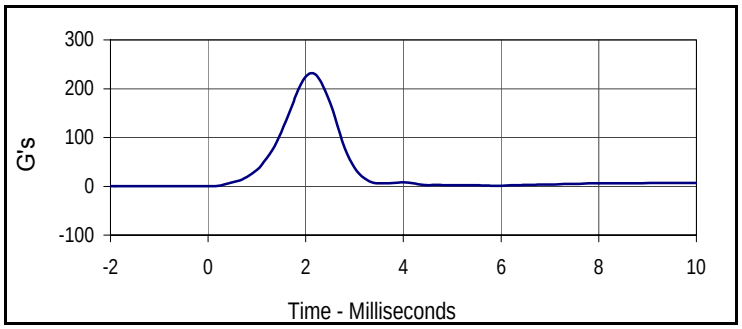
Test Program: Hybrid III 50th Percentile Male External Measurements Test Date: 2/11/14

ATD Serial No.: 034 Test I.D.: N/A

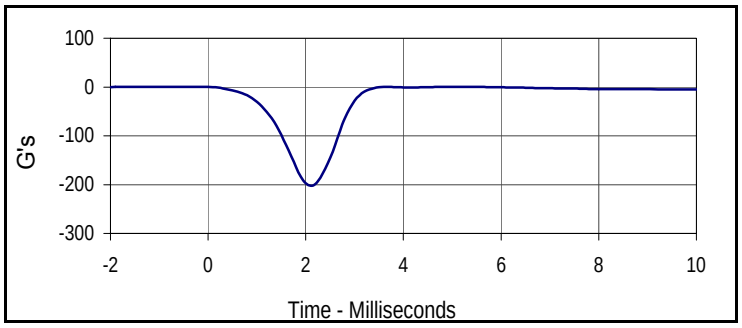
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	29.5	Pass
A - Total sitting height	mm	879 to 889	884	Pass
B - Shoulder pivot height	mm	505 to 521	512	Pass
C - H point height	mm	84 to 89	85	Pass
D - H point 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:	2/11/14
ATD Serial No.:	034	Test I.D.:	M034HD049

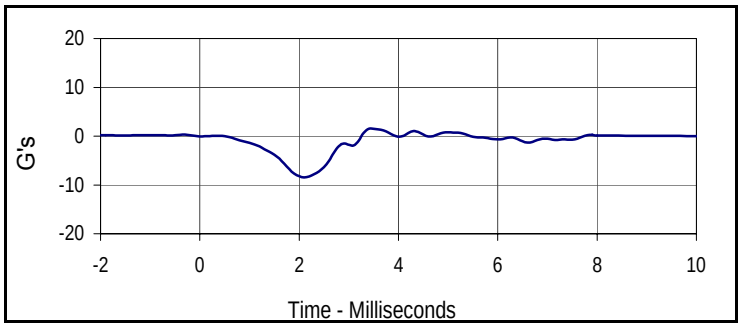
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	550	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.5	Pass
	Min	°C		21.0	Pass
Humidity During Soak	Max	%	10.0 to 70.0	23.5	Pass
	Min	%		22.5	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	23.5	Pass
Peak Resultant Acceleration		G's	225.0 to 275.0	232.1	Pass
Peak Lateral Acceleration		G's	≤15.0	8.4	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	3.4	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
			Overall Test Results		Pass



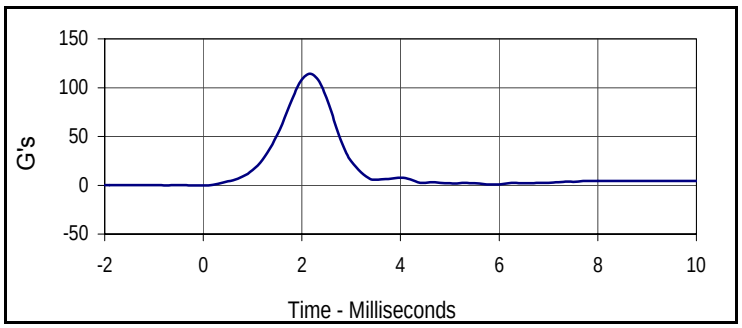
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
232.1	2.1	0.0	0.1



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.6	4.9	-202.3	2.1



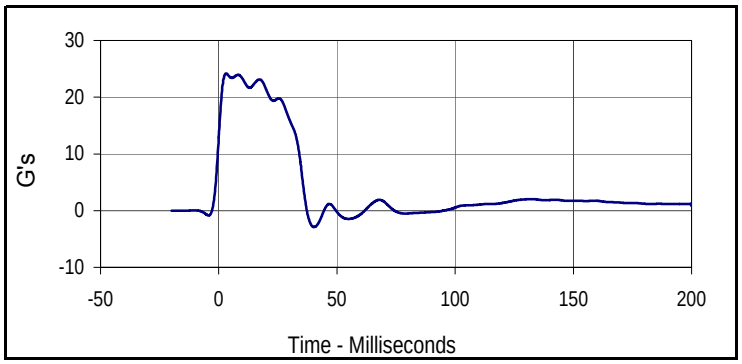
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
1.5	3.4	-8.4	2.1



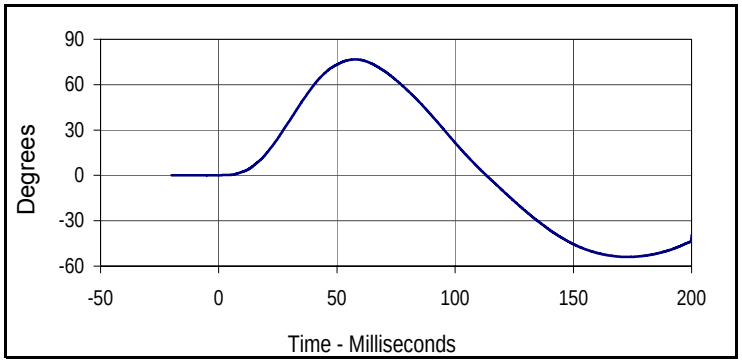
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
114.0	2.2	-0.1	-0.1

Test Program:	Hybrid III 50th Percentile Male Neck Flexion Test	Test Date:	2/11/14
ATD Serial No.:	034	Test I.D.:	M034NF049

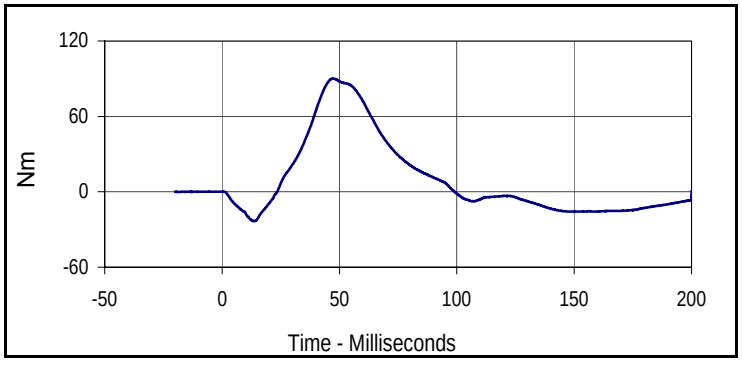
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	600	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.0	Pass
Humidity During Soak	Max	%	10.0 to 70.0	23.5	Pass
	Min	%		22.5	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	23.3	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.03	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.3	Pass
	20 Msec.	G's	17.6 to 22.6	21.4	Pass
	30 Msec.	G's	12.5 to 18.5	15.9	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	15.9	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	35.6	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	76.7	Pass
	Time	Msec.	57.0 to 64.0	57.8	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	113.2	Pass
Moment About Occ. Condyle	Max	Nm	88.1 to 108.5	90.1	Pass
	Time	Msec.	47.0 to 58.0	47.4	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	99.1	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
24.2	3.1	-2.9	40.3

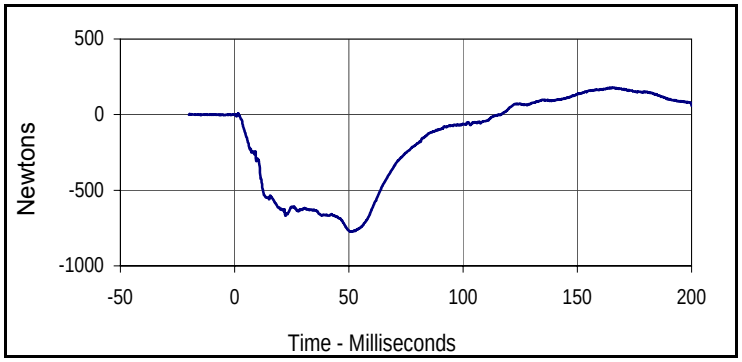


Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
76.7	57.8	-54.0	172.8

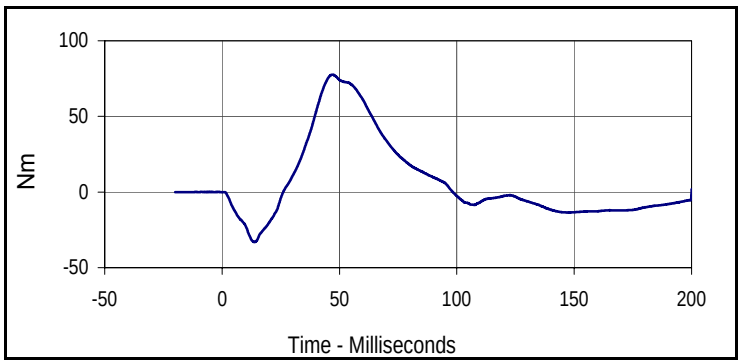


Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
90.1	47.4	-23.3	13.6

Test Program:	Hybrid III 50th Percentile Male Neck Flexion Test	Test Date:	2/11/14
ATD Serial No.:	034	Test I.D.:	M034NF049



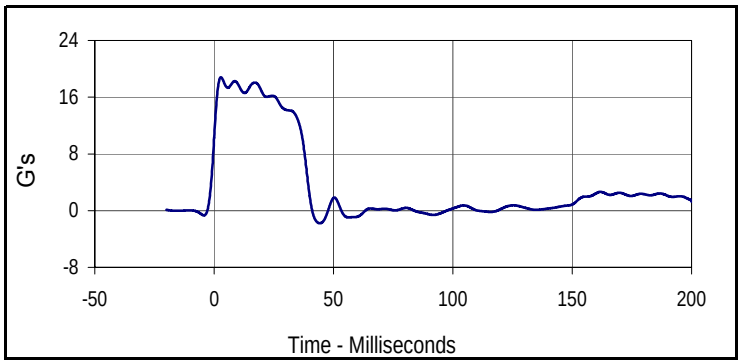
Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
179.2	165.8	-773.3	51.3



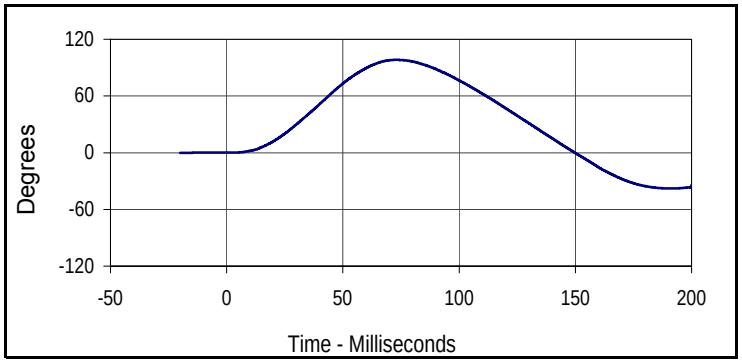
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
77.6	47.0	-33.1	13.7

Test Program:	Hybrid III 50th Percentile Male Neck Extension Test	Test Date:	2/11/14
ATD Serial No.:	034	Test I.D.:	M034NE049

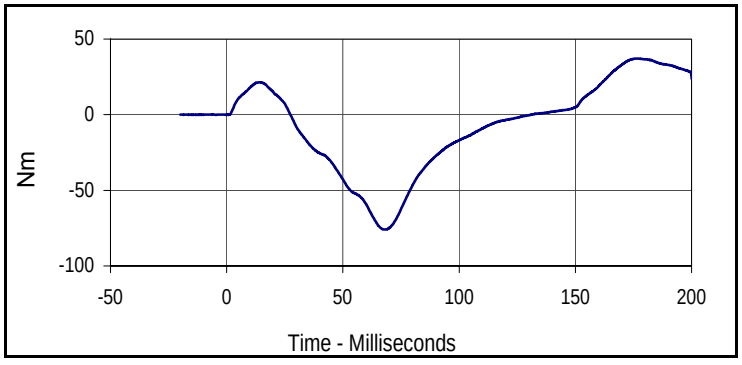
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	635	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.0	Pass
Humidity During Soak	Max	%	10.0 to 70.0	23.5	Pass
	Min	%		22.5	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	23.3	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.14	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	17.8	Pass
	20 Msec.	G's	14.0 to 19.0	16.8	Pass
	30 Msec.	G's	11.0 to 16.0	14.2	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	14.2	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	39.0	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	98.2	Pass
	Time	Msec.	72.0 to 82.0	72.9	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	149.8	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to -79.9	-76.0	Pass
	Time	Msec.	65.0 to 79.0	67.8	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	131.1	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
18.8	2.8	-1.8	44.2

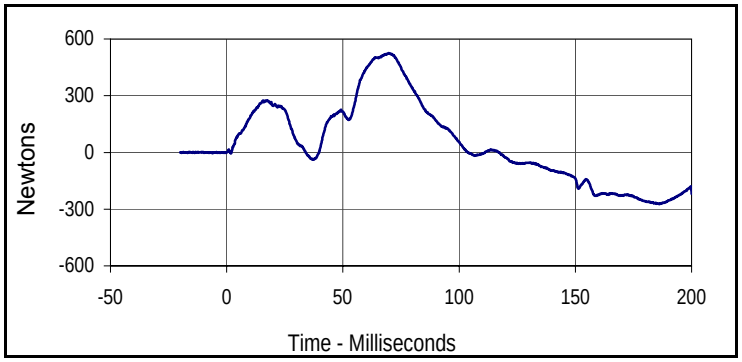


Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
98.2	72.9	-37.9	191.4

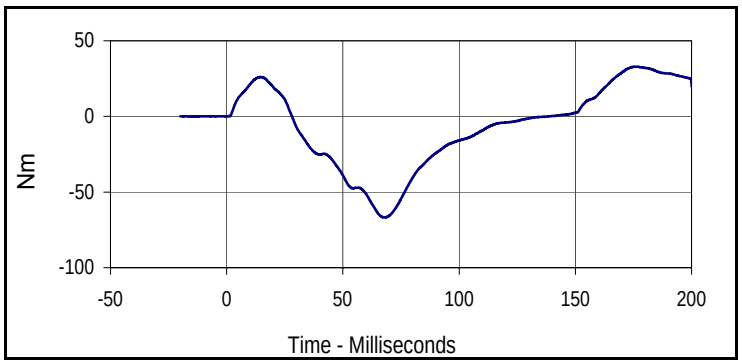


Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
37.2	177.0	-76.0	67.8

Test Program:	Hybrid III 50th Percentile Male Neck Extension Test	Test Date:	2/11/14
ATD Serial No.:	034	Test I.D.:	M034NE049



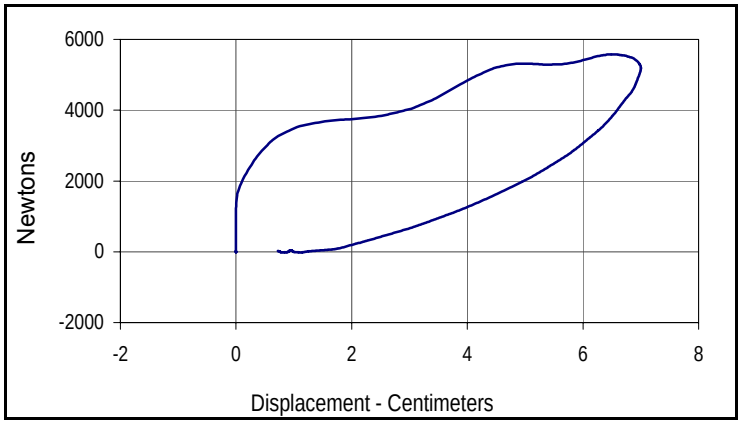
Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
525.3	69.7	-273.7	186.1



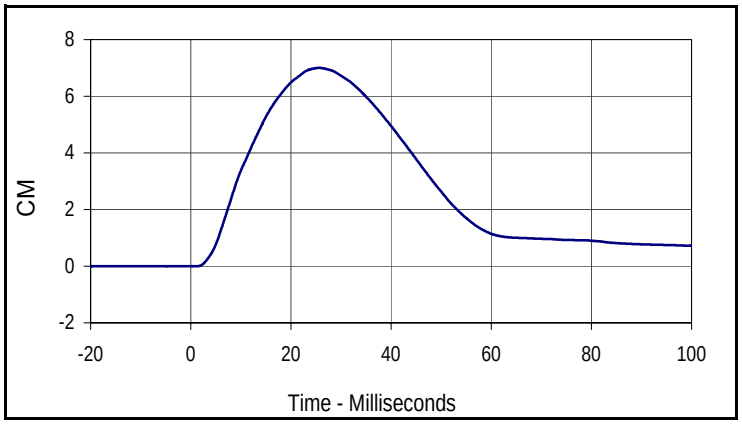
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
32.9	175.8	-66.8	67.6

Test Program:	Hybrid III 50th Percentile Male Thorax Impact Test	Test Date:	2/11/14
ATD Serial No.:	034	Test I.D.:	M034CH049

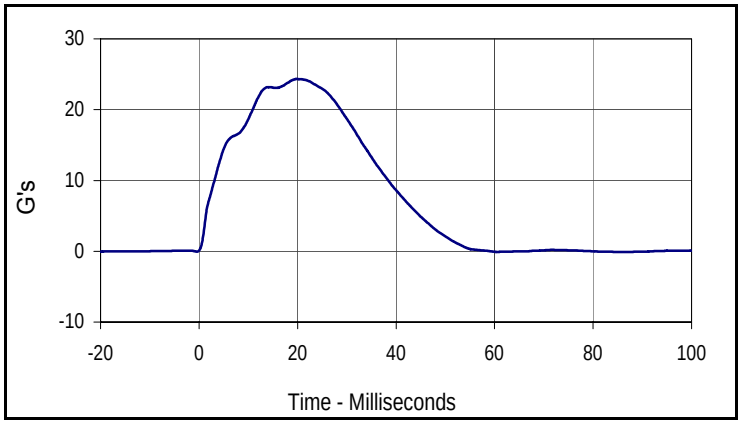
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	685	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.0	Pass
Humidity During Soak	Max	%	10.0 to 70.0	23.5	Pass
	Min	%		22.5	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	23.5	Pass
Probe Velocity		m/s	6.58 to 6.82	6.69	Pass
Peak Probe Force		Newtons	5159 to 5893	5575	Pass
Peak Sternum Deflection		CM	6.35 to 7.26	7.00	Pass
Internal Hysterysis		%	69 to 85	69.1	Pass
			Overall Test Results		Pass



Curve Description			
Probe Force vs. Chest Deflection			
Plot No.	Type	SAE Class	Hysterysis
001	FIL	180	69.1
Peak Probe Force		Peak Chest Deflection	
5575		7.00	



Curve Description			
Chest Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	180	CM
Max	Time	Min	Time
7.0	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
24.3	19.8	-0.1	85.0

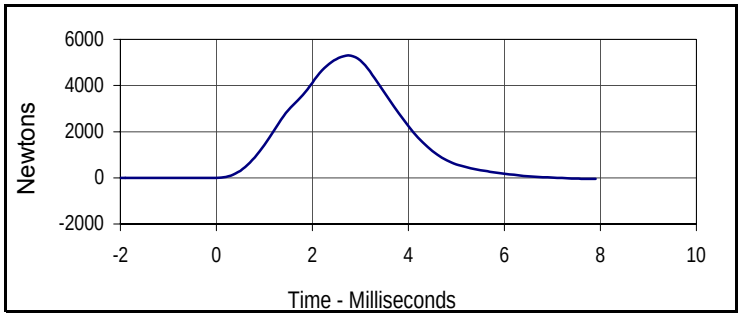
Test Program:	Hybrid III 50th Percentile Male Knee Impact Test	Test Date:	2/11/14
ATD Serial No.:	034	Test I.D.:	M034LK049 , M034RK049

Left Knee

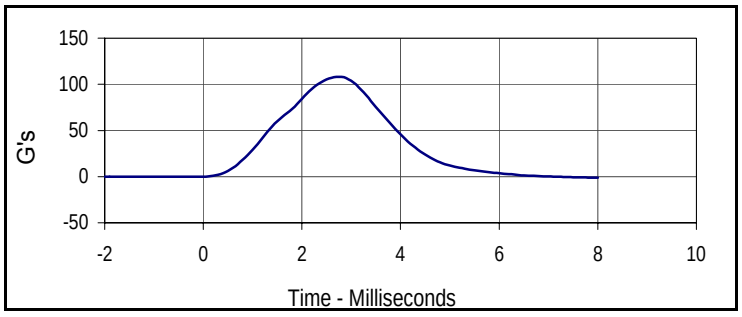
Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	720	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.5	Pass
	Min	°C		21.0	Pass
Humidity During Soak	Max	%	10.0 to 70.0	23.5	Pass
	Min	%		22.5	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.0	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	22.5	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	4715 to 5782	5290	Pass
			Overall Test Results		Pass

Right Knee

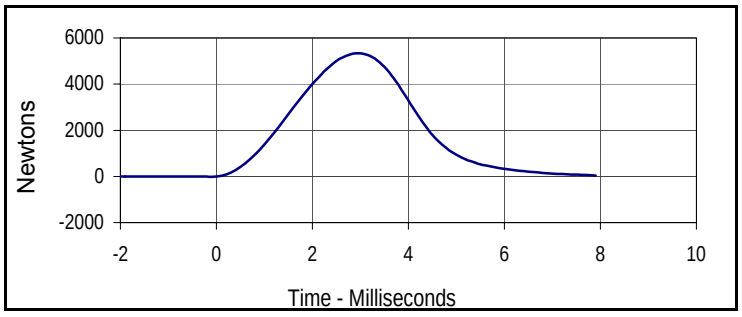
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.11	Pass
Peak Probe Force	Newtons	4715 to 5782	5331	Pass
		Overall Test Results		Pass



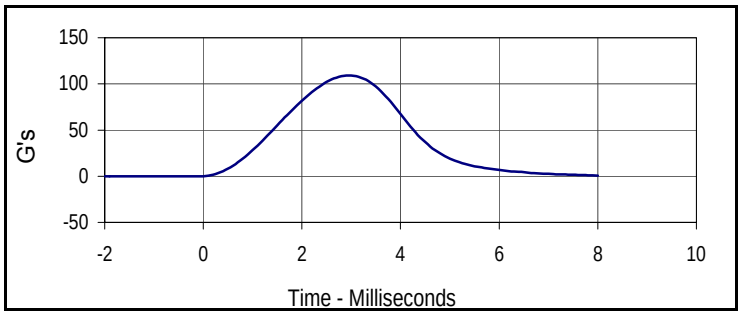
Curve Description			
Left Knee Probe Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5289.7	2.7	-50.7	7.9



Curve Description			
Left Knee Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
108.1	2.7	-1.1	0.0



Curve Description			
Right Knee Probe Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
5331.3	3.0	-11.3	-0.1



Curve Description			
Right Knee Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
109.0	3.0	-1.3	0.0

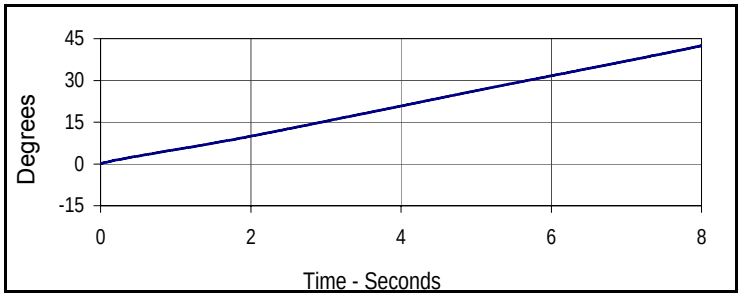
Test Program:	Hybrid III 50th Percentile Male Hip Joint-Femur Flexion Test	Test Date:	2/11/14
ATD Serial No.:	034	Test I.D.:	M034LF049 , M034RF049

Left Hip Joint-Femur Results

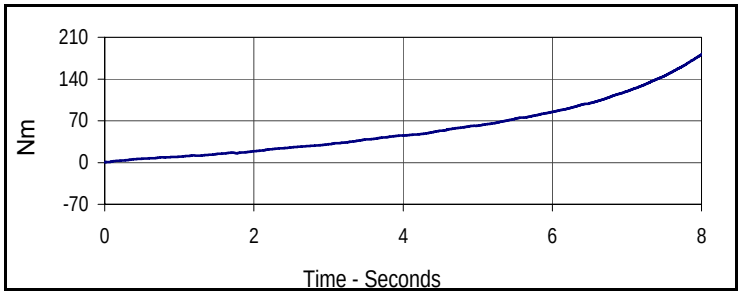
Tested Parameter		Units	Specification	Result	Pass/Fail
Hip Joint-Femur Assembly Soak Time		Minutes	≥240	770	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.5	Pass
	Min	°C		21.0	Pass
Humidity During Soak	Max	%	10.0 to 70.0	23.5	Pass
	Min	%		22.5	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	22.5	Pass
Rotation Rate		deg/sec	5 to 10	5.3	Pass
Femur Torque at 30°		Nm	≤ 95	75.3	Pass
Rotation at 203 Nm		Degrees	40.0 to 50.0	42.0	Pass
			Overall Test Results		Pass

Right Hip Joint-Femur Results

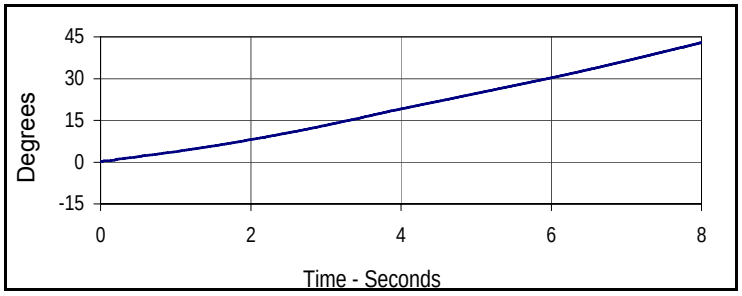
Rotation Rate	deg/sec	5 to 10	5.4	Pass
Femur Torque at 30°	Nm	≤ 95	89.2	Pass
Rotation at 203 Nm	Degrees	40.0 to 50.0	42.4	Pass
		Overall Test Results		Pass



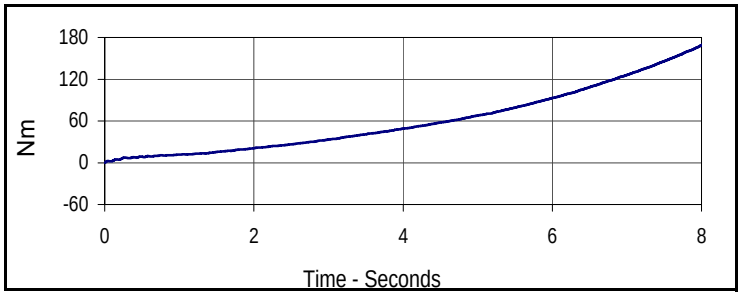
Curve Description			
Left Hip-Femur Rotation			
Plot No.	Type	SAE Class	Units
001	FIL	60	Degrees
Max	Time	Min	Time
42.4	8.0	0.1	0.0



Curve Description			
Left Femur Torque			
Plot No.	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
180.7	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
42.9	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
168.7	8.0	0.1	0.0

Test Program: Hybrid III 5th Percentile Female Dummy Damage Checklist Test Date: 2/10/14

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:

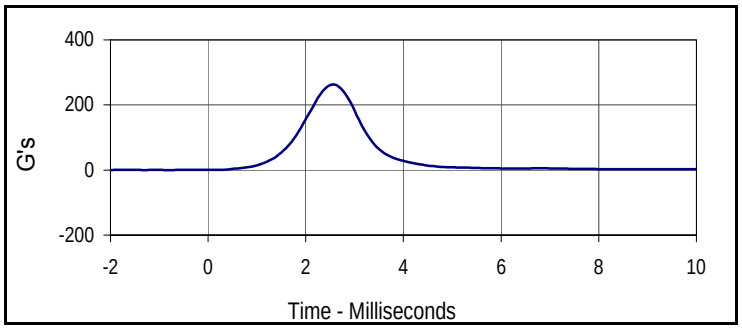
Test Program: Hybrid III 5th Percentile Female External Measurements Test Date: 2/10/14

ATD Serial No.: 635 Test I.D.: N/A

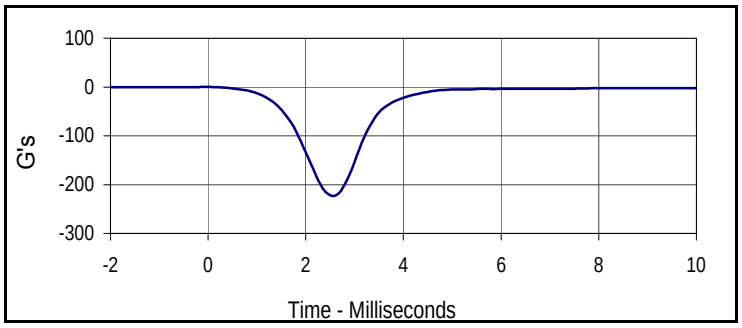
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.49	Pass
Laboratory Relative Humidity	%	10 to 70	23.8	Pass
A - Total sitting height	mm	774.7 to 800.1	786	Pass
B - Shoulder pivot height	mm	431.8 to 457.2	450	Pass
C - H point height	mm	81.3 to 86.3	85	Pass
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:	2/10/14
ATD Serial No.:	635	Test I.D.:	F635HD045

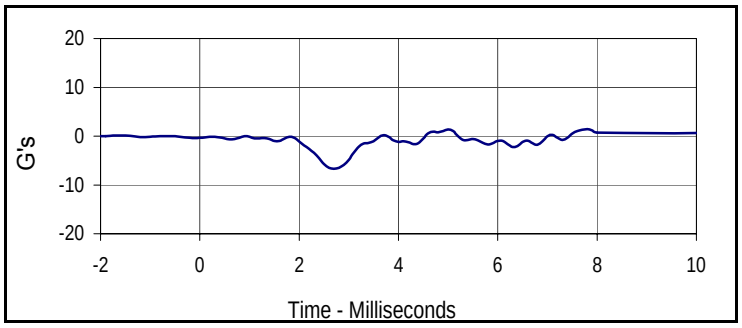
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	500	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	24.0	Pass
	Min	%		22.9	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	22.9	Pass
Peak Resultant Acceleration		G's	250.0 to 300.0	262.2	Pass
Peak Lateral Acceleration		G's	≤15.0	6.7	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	2.2	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
			Overall Test Results		Pass



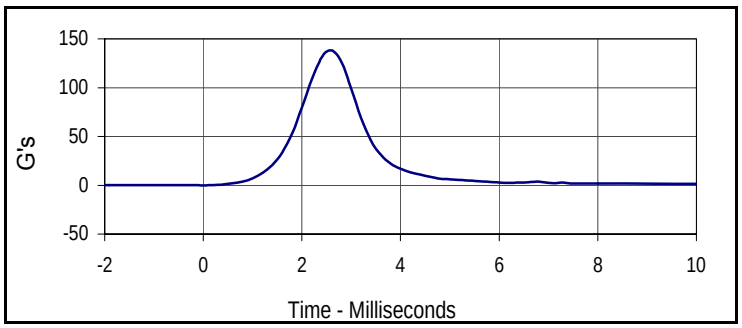
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
262.2	2.6	0.1	-0.8



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.0	-0.1	-222.8	2.6



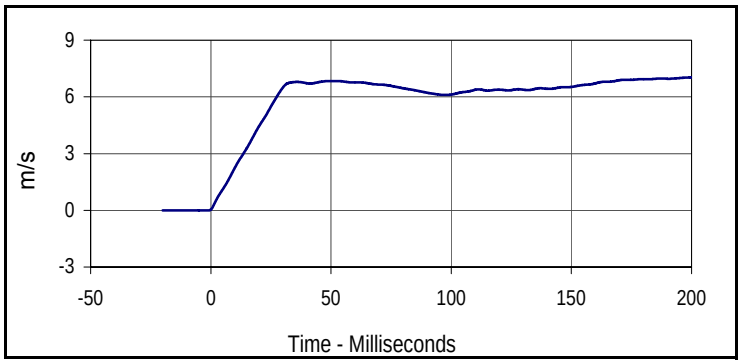
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
1.4	5.0	-6.7	2.7



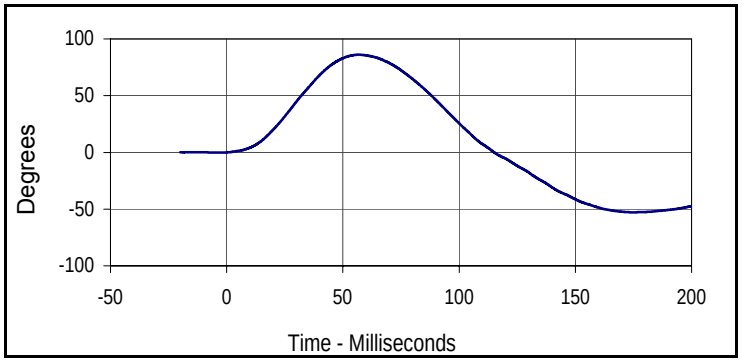
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
138.1	2.6	0.0	0.0

Test Program:	Hybrid III 5th Percentile Female Neck Flexion Test	Test Date:	2/10/14
ATD Serial No.:	635	Test I.D.:	F635NF045

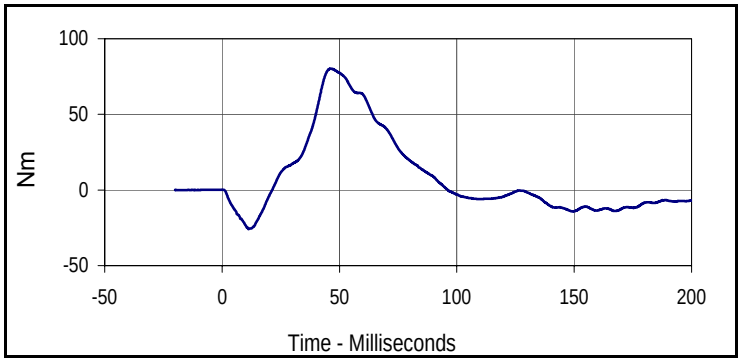
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	555	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	24.0	Pass
	Min	%		22.9	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	23.5	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.02	Pass
Pendulum Deceleration	10 Msec.	m/s	2.1 to 2.5	2.2	Pass
	20 Msec.	m/s	4.0 to 5.0	4.4	Pass
	30 Msec.	m/s	5.8 to 7.0	6.5	Pass
"D" Plane Rotation	Max	Degrees	77.0 to 91.0	86.1	Pass
Peak Moment in Rotation	Max	Nm	69.0 to 83.0	80.4	Pass
Positive Moment Decay, Time To 10 Nm		Msec.	80.0 to 100.0	87.3	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
7.0	200.0	0.0	-1.0

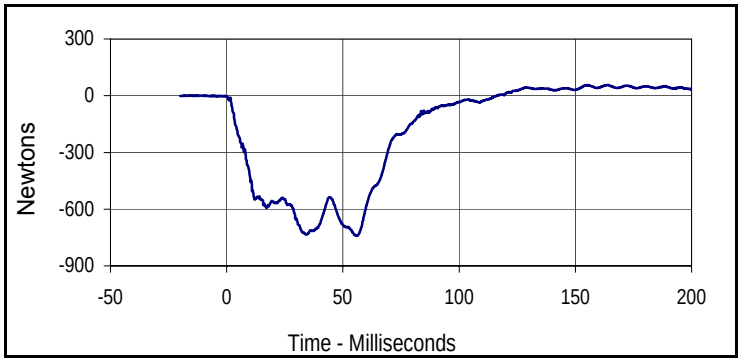


Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
86.1	56.8	-52.8	174.8

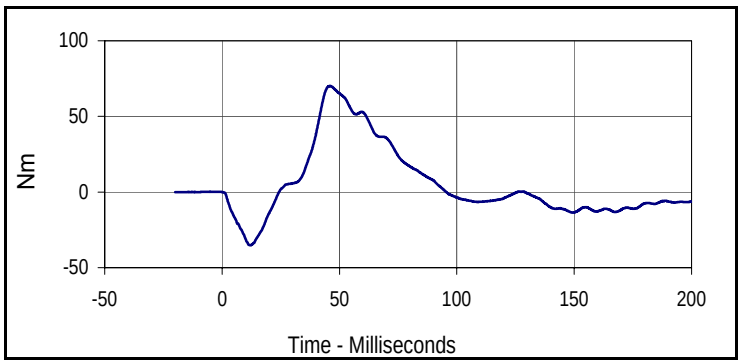


Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
80.4	46.1	-26.0	11.3

Test Program:	Hybrid III 5th Percentile Female Neck Flexion Test	Test Date:	2/10/14
ATD Serial No.:	635	Test I.D.:	F635NF045



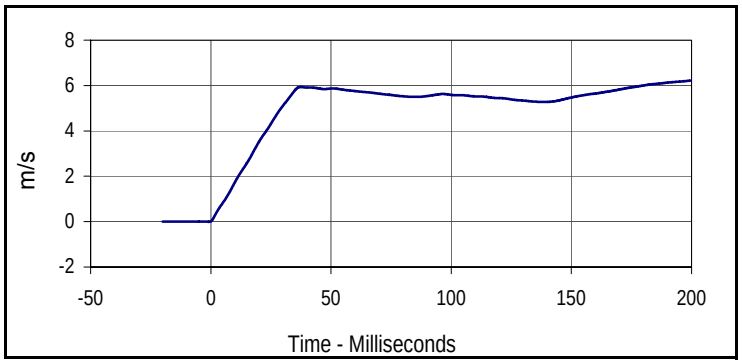
Curve Description			
Upper Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
56.5	155.2	-741.7	55.8



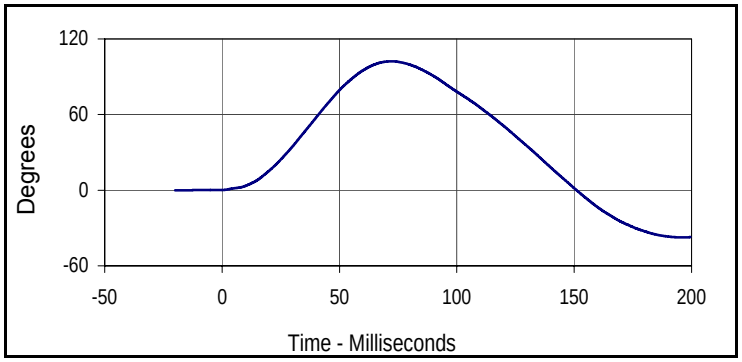
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
70.2	46.0	-35.3	12.1

Test Program:	Hybrid III 5th Percentile Female Neck Extension Test	Test Date:	2/10/14
ATD Serial No.:	635	Test I.D.:	F635NE045

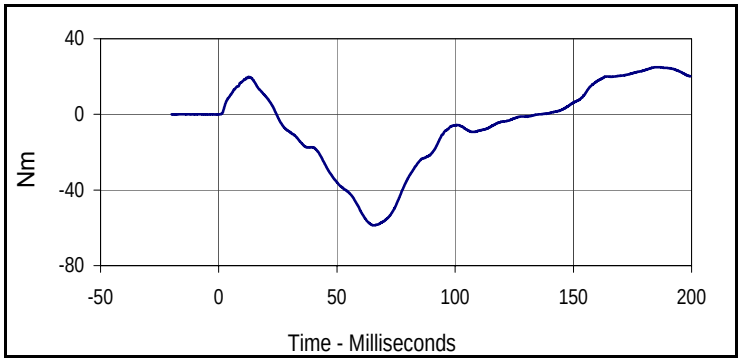
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	590	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	24.0	Pass
	Min	%		22.9	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	22.9	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.06	Pass
Pendulum Deceleration	10 Msec.	m/s	1.5 to 1.9	1.7	Pass
	20 Msec.	m/s	3.1 to 3.9	3.5	Pass
	30 Msec.	m/s	4.6 to 5.6	5.1	Pass
"D" Plane Rotation	Max	Degrees	99.0 to 114.0	102.3	Pass
Peak Moment in Rotation	Max	Nm	-53.0 to -65.0	-58.7	Pass
Positive Moment Decay, Time To -10 Nm		Msec.	94.0 to 114.0	95.1	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
6.2	0.0	0.0	-0.8

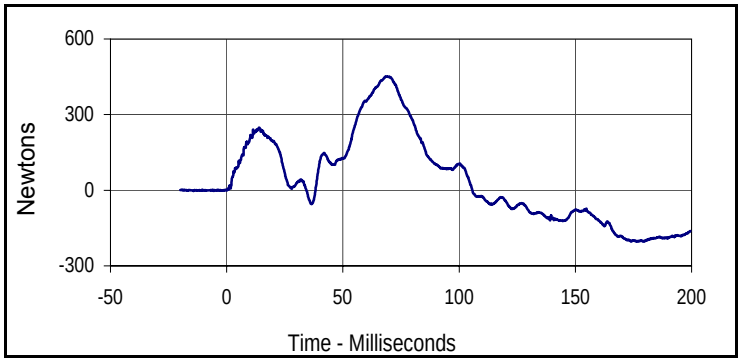


Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
102.3	72.2	-37.4	196.0

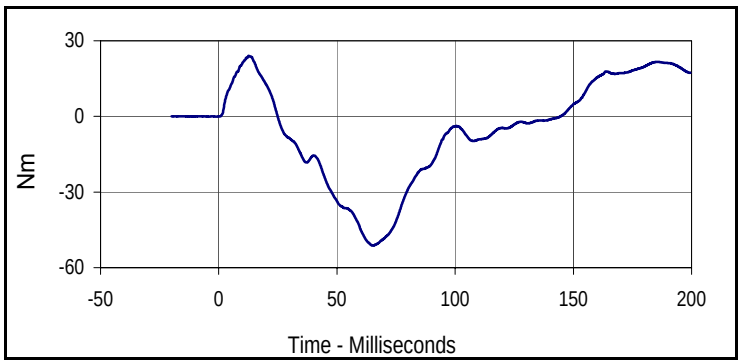


Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
25.0	185.0	-58.7	65.6

Test Program:	Hybrid III 5th Percentile Female Neck Extension Test	Test Date:	2/10/14
ATD Serial No.:	635	Test I.D.:	F635NE045



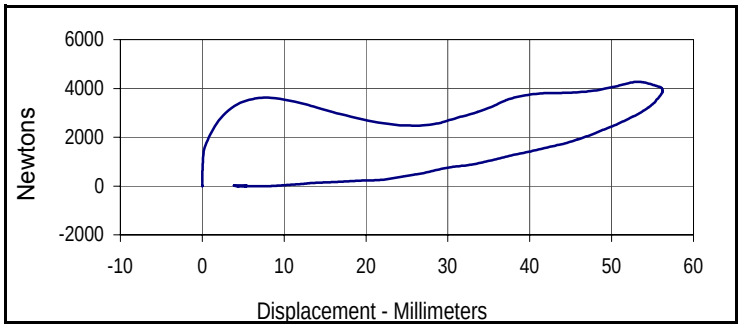
Curve Description			
Upper Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
451.4	68.7	-204.0	173.9



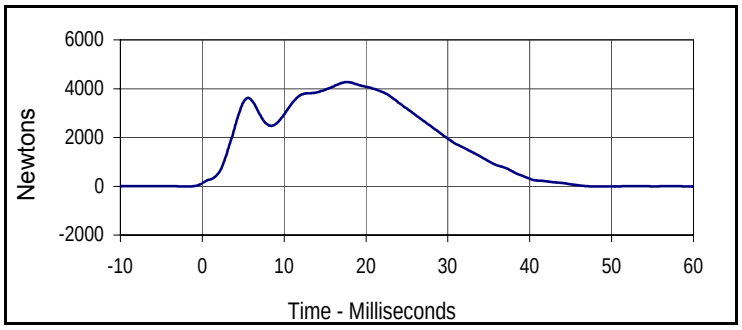
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
24.0	12.6	-51.3	65.2

Test Program:	Hybrid III 5th Percentile Female Thorax Impact Test	Test Date:	2/10/14
ATD Serial No.:	635	Test I.D.:	F635CH045

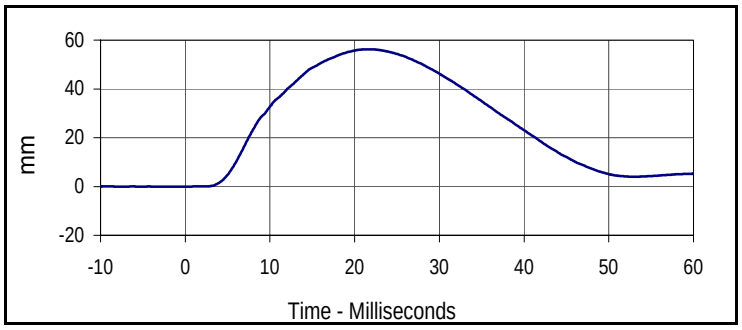
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	640	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	24.0	Pass
	Min	%		22.9	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	24.0	Pass
Probe Velocity		m/s	6.59 to 6.83	6.74	Pass
Peak Chest Deflection		mm	50.0 to 58.0	56.2	Pass
Peak Force Between 50 and 58 MM		Newtons	3900 to 4400	4062	Pass
Peak Force Between 18 and 50 MM		Newtons	≤4600	4267	Pass
Internal Hysterysis		%	69 to 85	71.0	Pass
			Overall Test Results		Pass



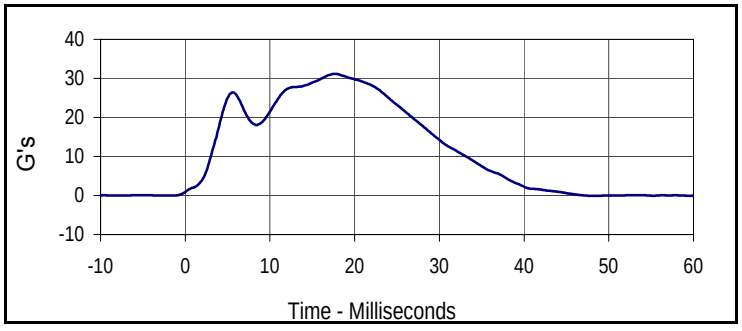
Curve Description			
Probe Force vs. Chest Deflection			
Plot No.	Type	SAE Class	Hysterysis
001	FIL	180	71.0
Peak Probe Force		Peak Chest Deflection	
4267.5		56.2	



Curve Description			
Probe Force			
Plot No.	Type	SAE Class	Units
002	FIL	180	Newtons
Max	Time	Min	Time
4267.5	17.6	-12.9	59.9



Curve Description			
Chest Deflection			
Plot No.	Type	SAE Class	Units
003	FIL	600	mm
Max	Time	Min	Time
56.2	21.7	0.0	-7.9



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
31.1	17.6	-0.1	59.9

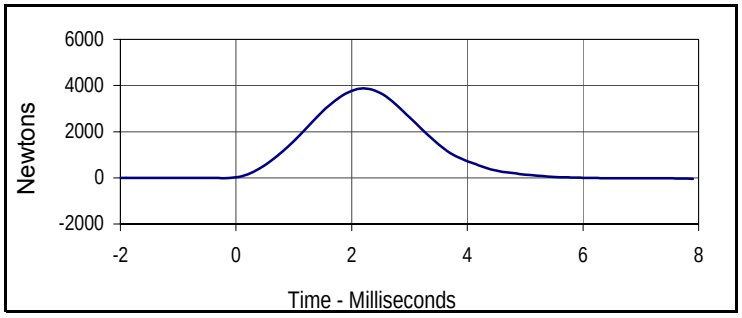
Test Program:	Hybrid III 5th Percentile Female Knee Impact Test	Test Date:	2/10/14
ATD Serial No.:	635	Test I.D.:	F635LK045 , F635RK045

Left Knee

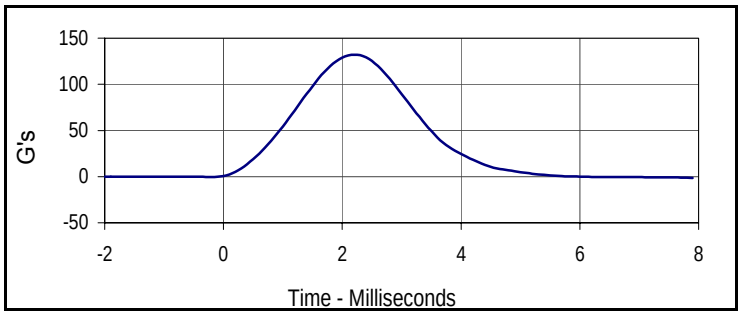
Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	670	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.5	Pass
	Min	°C		21.3	Pass
Humidity During Soak	Max	%	10.0 to 70.0	24.0	Pass
	Min	%		22.9	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	23.0	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	3450 to 4060	3873	Pass
			Overall Test Results		Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	3450 to 4060	3797	Pass
		Overall Test Results		Pass

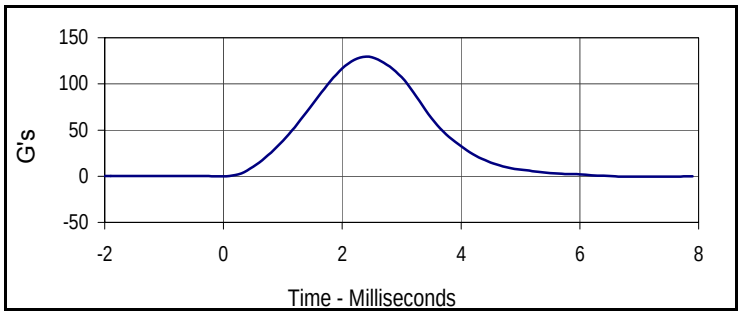


Curve Description			
Left Knee Probe Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3872.6	2.2	-40.9	7.9



Curve Description			
Left Knee Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
132.1	2.2	-1.4	7.9

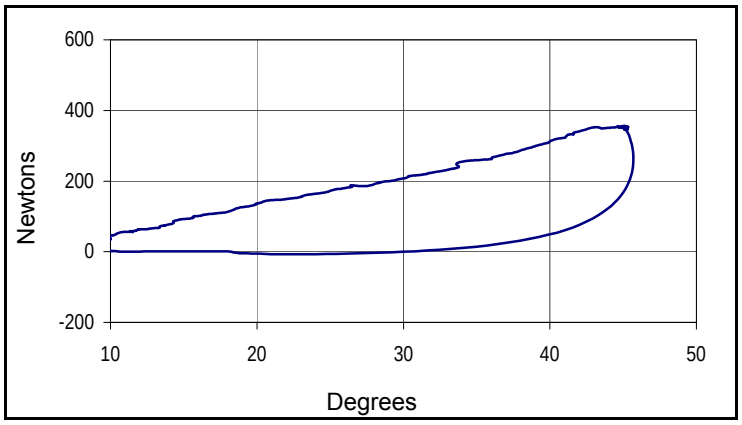
Curve Description			
Right Knee Probe Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
3797.3	2.4	-15.6	7.0



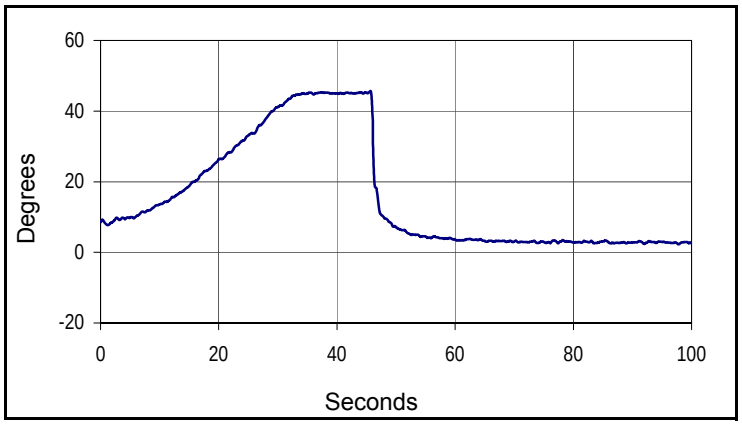
Curve Description			
Right Knee Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
129.5	2.4	-0.5	7.0

Test Program:	Hybrid III 5th Percentile Female Torso Flexion Test	Test Date:	2/10/14
ATD Serial No.:	635	Test I.D.:	TF045

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	24.0	Pass
	Min	%		22.9	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	23.0	Pass
Initial Reference Plane Angle		Degrees	≤ 20	8.6	Pass
Peak Force at 45° +/-0.5°		Newtons	320.0 to 390.0	355.8	Pass
Torso Rotation Rate		deg/sec	0.5 to 1.5	1.0	Pass
Final Reference Plane Angle		Degrees	+/-8	2.5	Pass
			Overall Test Results		Pass



Curve Description		
Force vs Torso Rotation		
Plot No.	Type	Filter Freq
001	FIL	1 Hz
Peak Force		Peak Rotation
355.8		45.7



Curve Description			
Torso Rotation			
Plot No.	Type	Filter Freq	Units
002	FIL	1 Hz	Degrees
Max	Time	Min	Time
45.7	45.7	2.3	97.9