

**REPORT NUMBER: NCAP-KAR-14-027**

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

**KIA MOTORS CORPORATION  
2015 KIA SEDONA L 5-DOOR MPV**

**NHTSA NUMBER: M20154200**

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



**MARCH 23, 2015**

**FINAL REPORT**

**U.S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
SAFETY PERFORMANCE STANDARDS  
OFFICE OF CRASHWORTHINESS STANDARDS  
1200 NEW JERSEY AVE, SE  
ROOM W43-410  
WASHINGTON, DC 20590**



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		<b>15. Supplementary Notes</b>																																																					
<b>16. Abstract</b> A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2015 Kia Sedona L 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 March 9, 2015.  The impact velocity of the vehicle was 56.48 km/h and the ambient temperature at the barrier face at the time of impact was 24.4° C. The target vehicle's post-test maximum crush was 478 mm at DPD 4 to the right of the vehicle's centerline. The test vehicle's performance is as follows:																																																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Driver ATD</th> <th colspan="2">Passenger ATD</th> </tr> <tr> <th>Threshold</th> <th>Result</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC<sub>15</sub>)</td> <td>N/A</td> <td>700.0</td> <td>236.1</td> <td>700.0</td> <td>207.2</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-22</td> <td>52</td> <td>-8</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>0.23</td> <td>1</td> <td>0.39</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>873.7</td> <td>2620</td> <td>872.9</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>-231.5</td> <td>2520</td> <td>-268.3</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>-78.1</td> <td>6805</td> <td>-2061.9</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>-3897.1</td> <td>6805</td> <td>-457.3</td> </tr> </tbody> </table>				Measurement Description	Units	Driver ATD		Passenger ATD		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC <sub>15</sub> )	N/A	700.0	236.1	700.0	207.2	Maximum Chest Compression	mm	63	-22	52	-8	Nij	N/A	1	0.23	1	0.39	Neck Tension	N	4170	873.7	2620	872.9	Neck Compression	N	4000	-231.5	2520	-268.3	Left Femur Force	N	10008	-78.1	6805	-2061.9	Right Femur Force	N	10008	-3897.1	6805	-457.3
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<b>17. Key Words</b> 35 mph Frontal Barrier Impact Test New Car Assessment Program (NCAP)		<b>18. Distribution Statement</b> Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave., SE Washington, DC 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833																																																					
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## **SECTION 1**

### **PURPOSE AND SUMMARY OF TEST**

#### **PURPOSE**

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

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

#### **SUMMARY**

A load cell barrier consisting of 176 load cells was impacted by a 2015 Kia Sedona L 5-door MPV at a velocity of 56.48 km/h. The test was performed at KARCO Engineering, LLC. on March 9, 2015. 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 50<sup>th</sup> percentile male anthropomorphic test device (ATD) was placed in the driver seating position and one Part 572O 5<sup>th</sup> 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. 360) and the right-front passenger (position 2) ATD (Serial No. 141) were calibrated prior to this test. Certification details, along with instrumentation calibration data, are found in Appendix C of this report.

The 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 478 mm located at DPD 4 to the right of the vehicle's centerline. Both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

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

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 <sub>15</sub>	T <sup>1</sup>	T <sup>2</sup>	Chest Disp. (mm)	Nij	Neck Tension (N)	Neck Comp. (N)	Left Femur (N)	Right Femur (N)
Driver (50th)	236.1	78.4	93.4	-22	0.23	873.7	-231.5	-78.1	-3897.1
Passenger (5th)	207.2	56.6	71.6	-8	0.39	872.9	-268.3	-2061.9	-457.3

## SECTION 2

### OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15

#### 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 <sup>2</sup>	kPa	6.895
Temperature	General Use	°F	°C	$=(T_f - 32)/1.8$
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf-ft	N•m	1.355

**DATA SHEET NO. 1**

**GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15

**TEST VEHICLE INFORMATION AND OPTIONS**

NHTSA Number	M20154200
Model Year	2015
Make	Kia
Model	Sedona L
Body Style	5-Door MPV
VIN	KNDMA5C14F6025750
Body Color	Bright Silver
Odometer Reading (km / mi)	235 /146
Engine Displacement (L)	3.3
Type / No. of Cylinders	V6
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	6
Overdrive	Yes
Final Drive	Front
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
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	None

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

**DATA FROM CERTIFICATION LABEL**

Manufactured By	Kia Motors Corporation
Date of Manufacture	Sep-15

GVWR (kg)	2760
GAWR Front (kg)	1390
GAWR Rear (kg)	1390

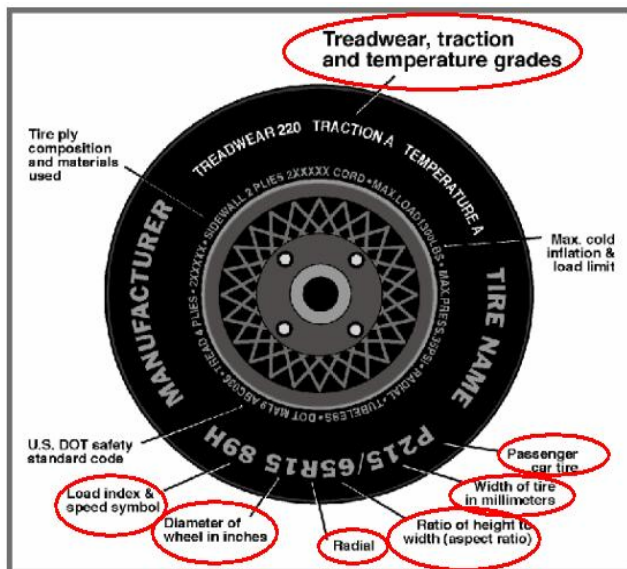
**VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION**

Measured Parameter	Front	Rear	Third	Total	
Type of Seats	Bucket	Bucket	Bench		
Designated Seating Capacity	2	2	3	7	
Capacity Weight (VCW) (kg)				525.0	A
DSC x 68.04 (kg)				476.3	B
Cargo Weight (RCLW) (kg)				48.7	A-B

## DATA SHEET NO. 1 ... (CONTINUED)

### GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
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### VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	235/65R17	235/65R17
Tire Size on Vehicle	235/65R17	235/65R17
Tire Manufacturer	Kumho	Kumho
Tire Model	Crugen	Crugen
Treadwear	440	440
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Steel, 2 Polyester, 1 Nylon	2 Steel, 2 Polyester, 1 Nylon
Load Index / Speed Symbol	104H	104H
Tire Material	Steel, Polyester, Nylon	Steel, Polyester, Nylon
DOT Safety Code Left	H25A YANH	H25A YANH
DOT Safety Code Right	H25A YANH	H25A YANH

**DATA SHEET NO. 1 ... (CONTINUED)**

**GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15

**TEST VEHICLE WEIGHTS**

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	578.0	425.0		619.0	484.0	
Right	kg	571.0	437.5		593.5	498.5	
Ratio	%	57.1%	42.9%	100.0%	55.2%	44.8%	100.0%
Total	kg	1149.0	862.5	2011.5	1212.5	982.5	2195.0

**TARGET TEST WEIGHT CALCULATION**

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2011.5	A
Weight of 1 P572E ATD & 1 P572O ATD	kg	141.0	B
Rated Cargo/Luggage Weight (RCLW)	kg	48.7	C
Calculated Vehicle Target Weight (TVTW)	kg	2201.2	A+B+C

**TEST VEHICLE ATTITUDES**

Condition	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	787	790	785	791	1312
As Tested	mm	775	780	768	778	1370
Post-Test	mm	743	783	759	782	

**GENERAL TEST VEHICLE DATA**

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3060
Total Vehicle Length at Left Side	mm	4446
Total Vehicle Length at Centerline	mm	5140
Total Vehicle Length at Right Side	mm	4444
Weight of Ballast in Cargo Area	kg	67.5
Weight of Vehicle Components Removed	kg	52.0
Amount of Stoddard Solvent in Fuel Tank	L	79.37

**VEHICLE COMPONENTS REMOVED TO MEET TEST WEIGHT:**

Spare tire and tools (21.0 kg), outboard mirrors (5.0 kg), tail lights (6.0 kg), rear bumper fascia (7.0 kg), rear bumper (7.0 kg), rear trim (6.0 kg)

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

Test Vehicle: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15

**TARGET VEHICLE STRUCTURAL MEASUREMENTS**

No.	Description	Pre-Test
1	Total Length	5140
2	Total Width	1985
3	Bumper Top Height	735
4	Bumper Bottom Height	590
5	Longitudinal Member Top Height	575
6	Distance Between Longitudinal Members	900
7	Longitudinal Member Width	50
8	Engine Top Height	922
9	Engine Bottom Height	210
10	Engine and Gearbox Width	620
11	Front Bumper to Engine Distance	742
12	Front Shock Absorber Fixing Height	1010
13	Bonnet Leading Edge Height	962
14	Front Shock Absorber Fixing Width	1300
15	Front Bumper to Front Axle Distance	960
16	Front Axle to A-Pillar Distance	525
17	A-Pillar to B-Pillar Distance	926
18	B-Pillar to Rear Axle Distance	1495
19	B-Pillar to C-Pillar Distance	970
20	Roof Sill Bottom Height	1563
21	Roof Sill Top Height	1695
22	Floor Sill Bottom Height	241
23	Floor Sill Top Height	422

All measurements in millimeters.

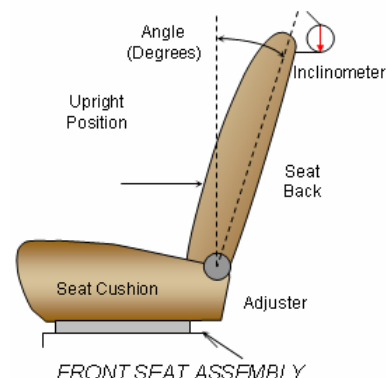
## DATA SHEET NO. 2

### SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15

#### NOMINAL DESIGN RIDING POSITION

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

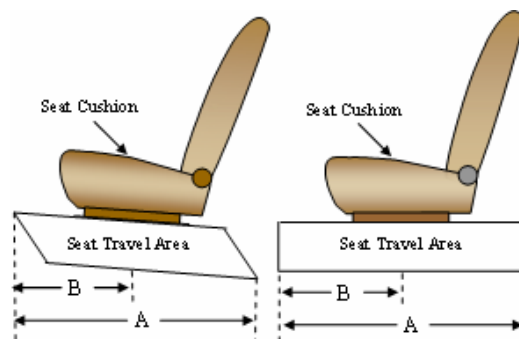


#### SEAT BACK ANGLE

Seating Position	Degrees
Driver Seat Back Angle	0.2
Passenger Seat Back Angle	5.4

#### 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	292 mm	149 mm
Passenger Seat	219 mm	0 mm

#### SEAT BELT UPPER ANCHORAGE

The seat belt upper anchorage is positioned to the manufacturer’s design position for a 50<sup>th</sup> percentile adult male ATD for the driver, and a 5<sup>th</sup> 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	3	H
Passenger Seat	3	H

## DATA SHEET NO. 2 ... (CONTINUED)

### SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

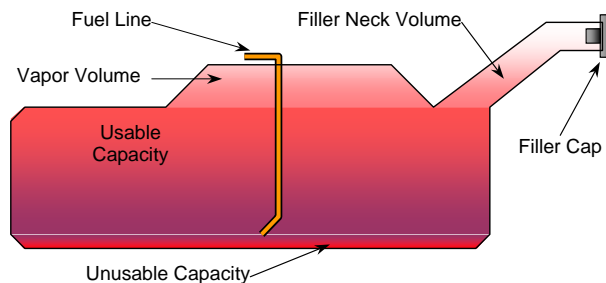
Test Vehicle: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15

#### FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	74.37
Usable Capacity of "Optional Tank"	
92 - 94% of Usable Capacity	68.42 to 69.91
Actual Amount of Stoddard Solvent Used	74.37
1/3 of Usable Capacity	24.79

#### FUEL PUMP

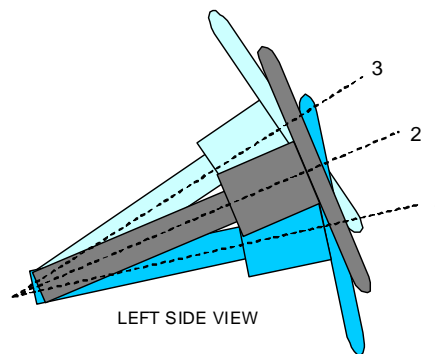
The vehicle is equipped with an electric fuel pump. The fuel pump is activated when the key is turned to the "ON" position.



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	24.5	112
Geometric Center Position, No. 2	27.2	137
Uppermost Position, No. 3	29.9	162
Telescoping Steering Wheel Travel		50
Test Position	27.2	137

### DATA SHEET NO. 3

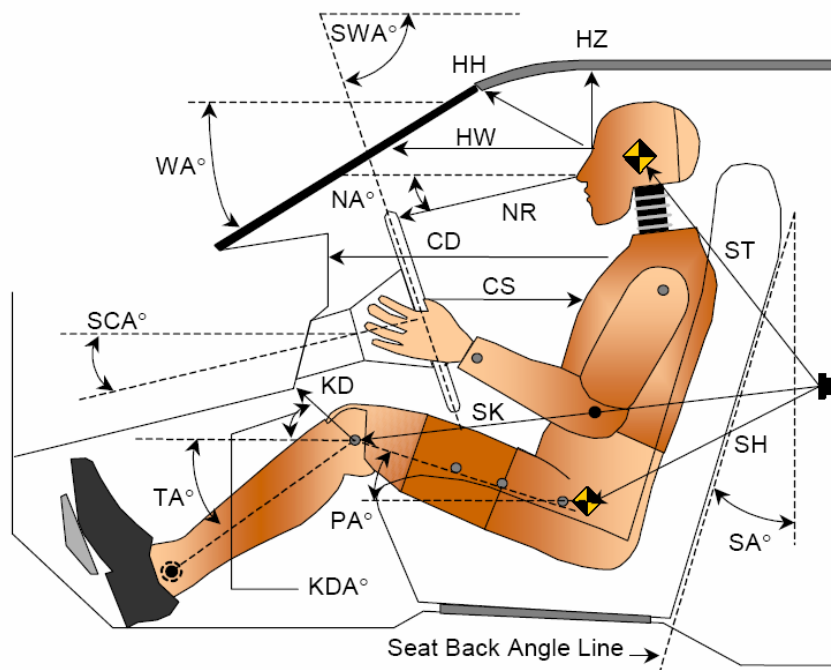
### DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Kia Sedona L 5-Door MPV

NHTSA No.: M20154200

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 03/09/15



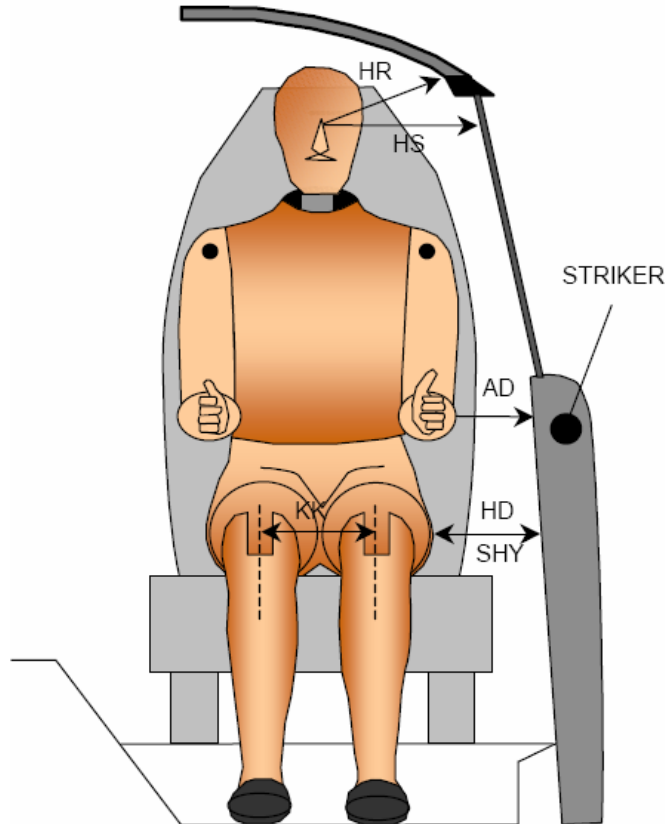
**LEFT SIDE VIEW**

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		25.6		
SWA°	Steering Wheel Angle		62.8		
SCA°	Steering Column Angle		27.2		
SA°	Seat Back Angle (On Headrest Post)		0.2		5.4
HZ	Head to Roof	251	90.0	290	90.0
HH	Head to Header	425	26.0	407	41.8
HW	Head to Windshield	775	0.0	766	0.0
NR	Nose to Rim	402	8.8	490	31.8
CD	Chest to Dash	569	14.1	426	3.8
CS	Chest to Steering Hub	289	0.0		
RA	Rim to Abdomen	198	0.0		
KDL	Left Knee to Dash	197	15.3	90	29.8
KDR	Right Knee to Dash	159	26.0	98	36.2
PA°	Pelvic Angle		24.8		19.7
TA°	Tibia Angle		49.6		58.8
SK	Striker to Knee	475	1.1	681	10.3
ST	Striker to Head	500	80.0	447	63.7
SH	Striker to H-Point	270	41.8	380	26.4

## DATA SHEET NO. 4

### DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15

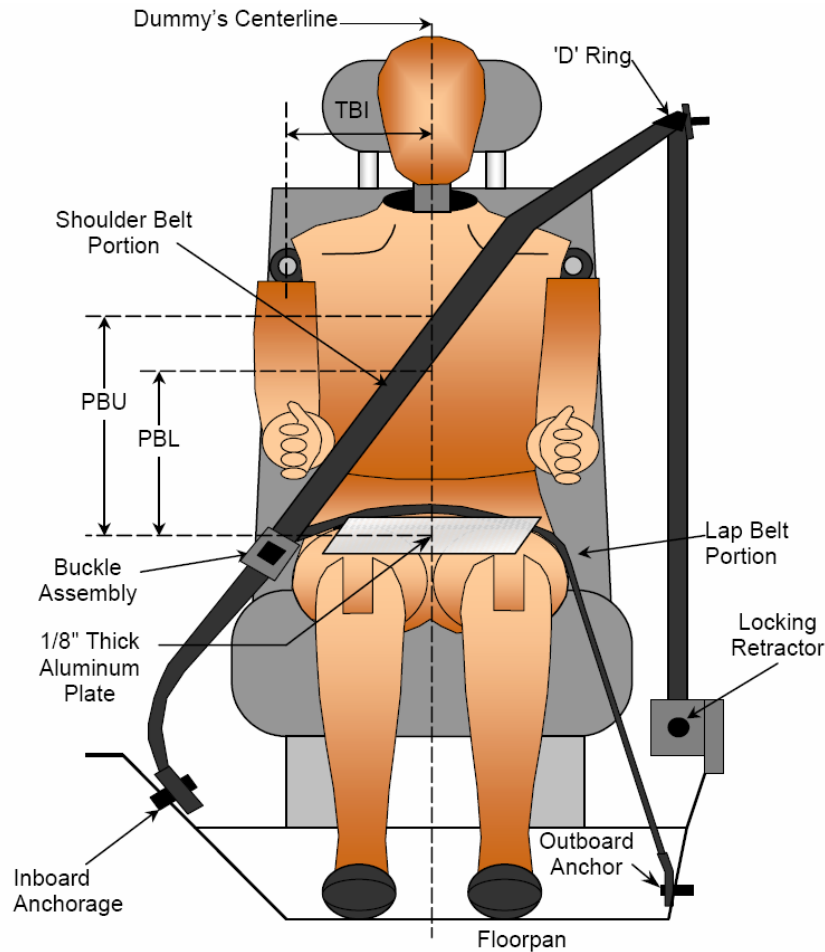


Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	142	102
HD	H-Point to Door	199	208
HR	Head to Side Header	249	292
HS	Head to Side Window	373	400
KK	Knee to Knee	327	222
SHY	Striker to H-Point (Y-Direction)	290	310
AA	Ankle to Ankle	322	170

**DATA SHEET NO. 5**  
**SEAT BELT POSITIONING DATA**

Test Vehicle: 2015 Kia Sedona L 5-Door MPV  
Test Program: 56 km/h Frontal Impact NCAP Test

NHTSA No.: M20154200  
Test Date: 03/09/15



**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	375	290
PBL	Top Surface of Aluminum Plate to Belt Lower Edge	mm	289	210

**BELT LENGTH DATA**

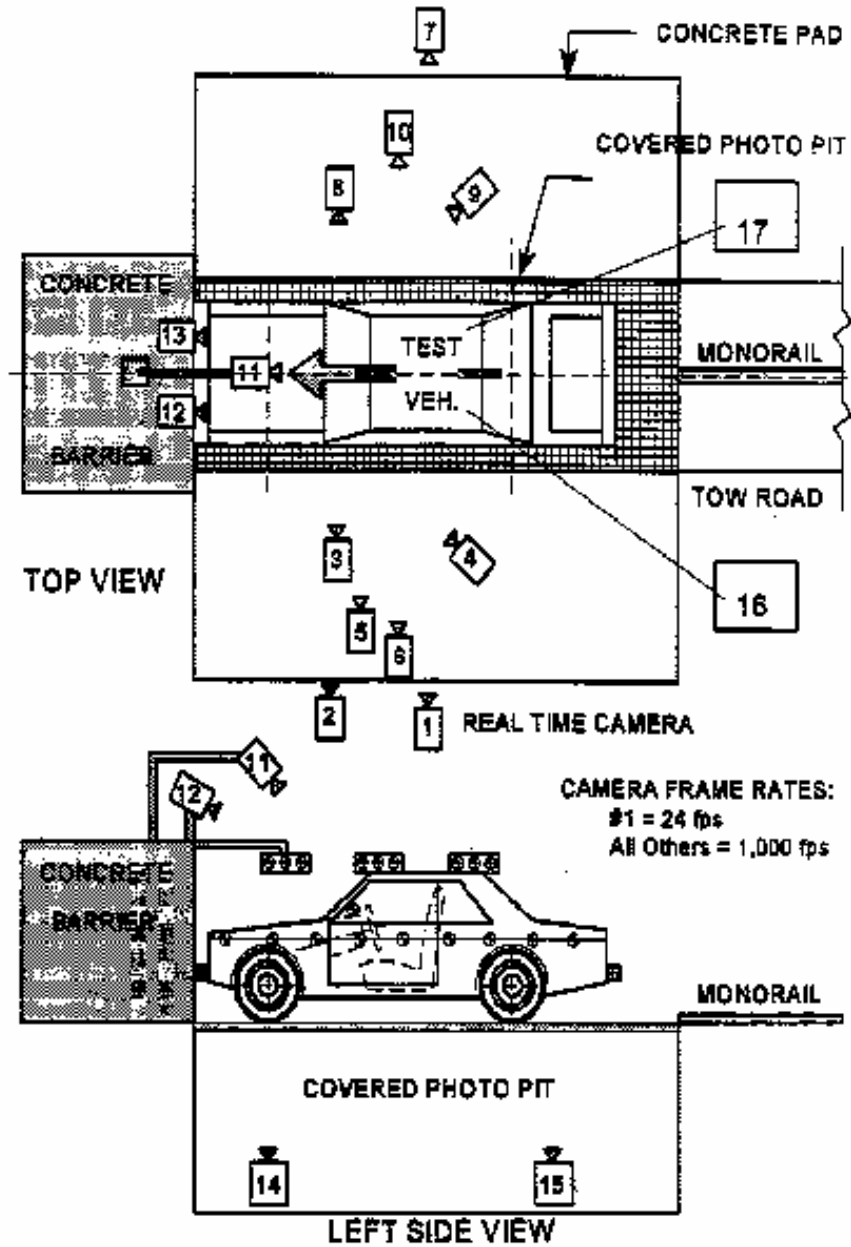
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as Measured on ATD	mm	893	920
Lap Belt Length as Measured on ATD	mm	603	665
Remainder of Belt on Reel	mm	847	710
Total Belt Length for Continuous Webbing Systems	mm	2343	2295

DATA SHEET NO. 6

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15

CAMERA POSITIONS FOR FRONTAL IMPACTS



**DATA SHEET NO. 6 ... (CONTINUED)**

**HIGH-SPEED CAMERA LOCATIONS AND DATA**

Test Vehicle: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15

**CAMERA LOCATIONS**

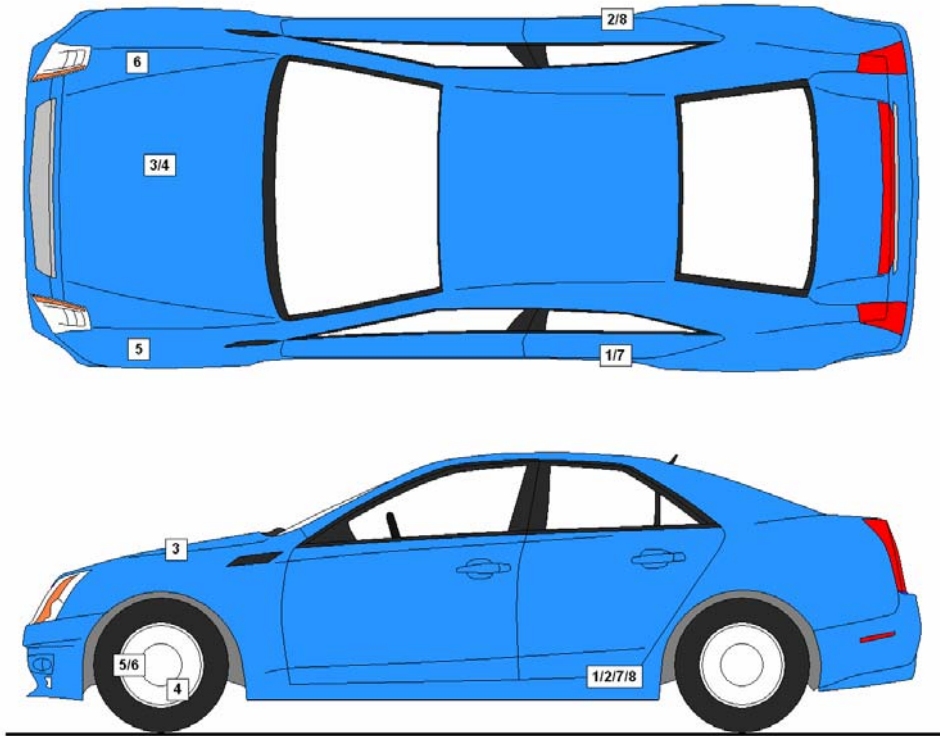
No.	Description	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	-11412	-8150	-1484		30
2	Driver Close-Up	-2590	-7950	-1371	24	1000
3	Left Front Half	-1701	-6197	-1701	50	1000
4	Left Angle	-6696	-10308	-3211	ZOOM	1000
5	Steering Column - Top	-1966	-10412	-3688	50	1000
6	Steering 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)	-950	300	-1650	13	1000
17	Onboard Passenger Airbag (Optional)	-950	-300	-1650	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: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15



**VEHICLE ACCELEROMETER PRE-TEST LOCATIONS**

No.	Description	Location		
		X	Y	Z
1	Left Rear Accelerometer X-Direction	2019	-836	-450
2	Right Rear Accelerometer X-Direction	2019	825	-450
3	Engine Top X	4180	246	-945
4	Engine Bottom X	4172	281	-209
5	Left Rear Accelerometer Z-Direction	2019	-836	-450
6	Right Rear Accelerometer Z-Direction	2019	825	-450
7	Left Rear Accelerometer X-Direction Redundant	1994	-836	-450
8	Right Rear Accelerometer X-Direction Redundant	1994	825	-450

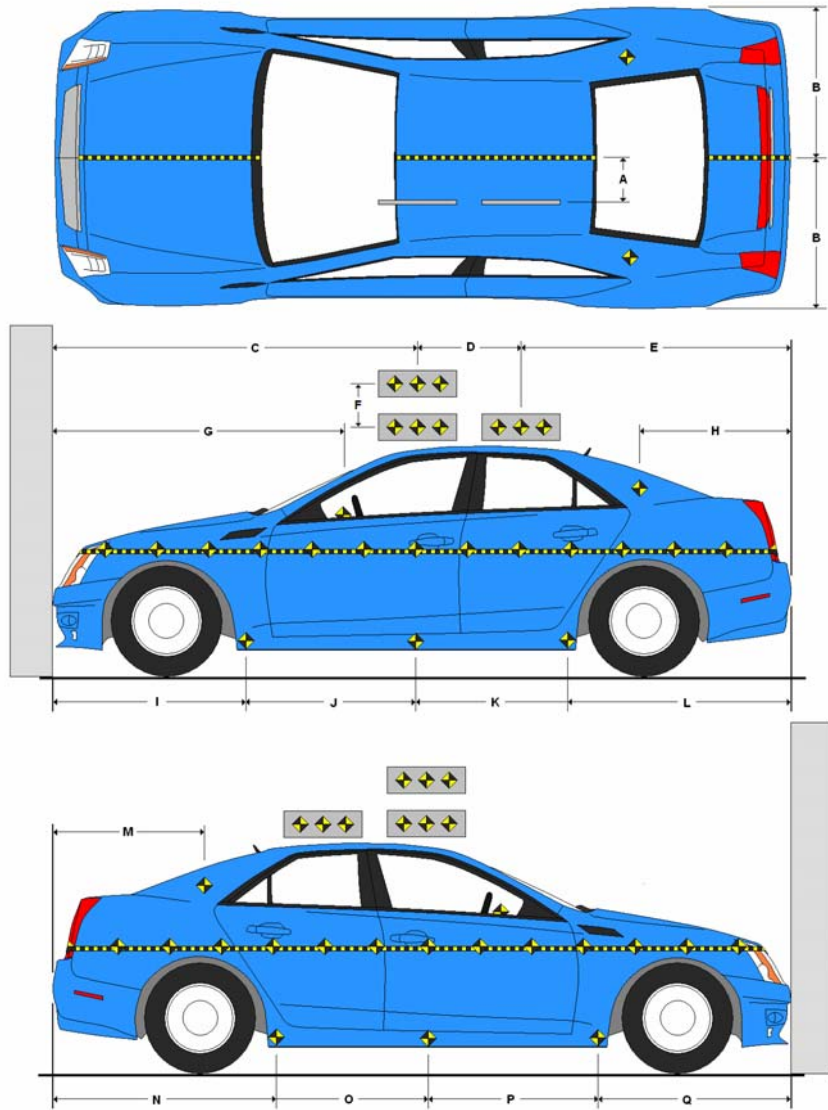
Reference Points: X – Rear Surface of Vehicle (+ forward)  
 Y – Vehicle Centerline (+ to right)  
 Z – Ground Plane (+ down)

**DATA SHEET NO. 8**

**PHOTOGRAPHIC REFERENCE TARGET LOCATIONS**

Test Vehicle: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15

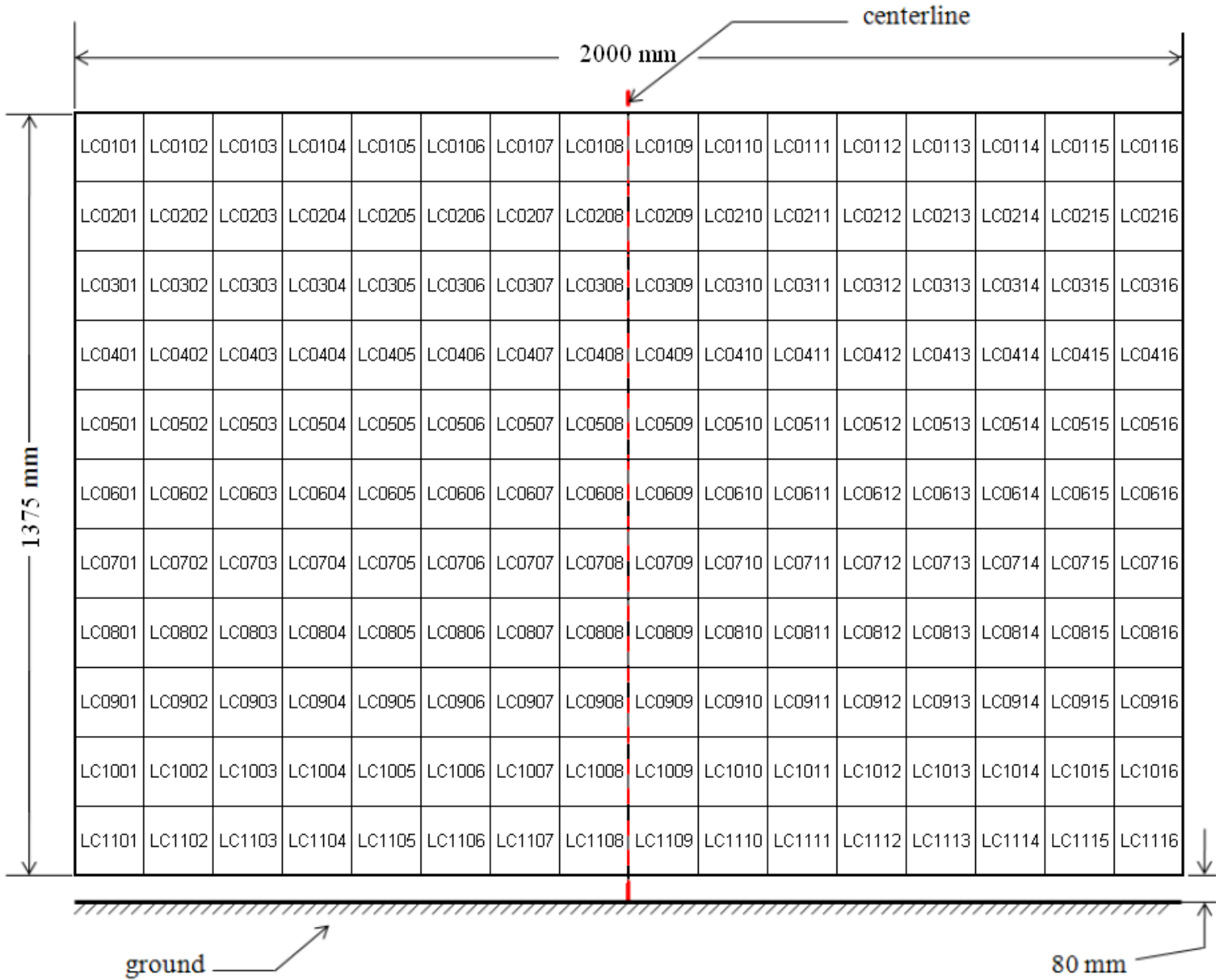
Item	Value
A	450
B	993
C	2240
D	610
E	2275
F	305
G	1760
H	660
I	1485
J	1023
K	1023
L	1609
M	670
N	1591
O	1021
P	1021
Q	1507



All measurements in millimeters.

**DATA SHEET NO. 9**  
**LOAD CELL LOCATIONS ON FIXED BARRIER**

Test Vehicle: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15



**DATA SHEET NO. 10**

**TEST VEHICLE CAMERA AND INSTRUMENTATION SUMMARY**

Test Vehicle: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15

**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: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15

**TEST DUMMY INFORMATION AND CONTACT**

Description	Driver	Passenger
Dummy Type/Serial No.	P572E 50th Percentile Male ATD / 360	P572O 5th Percentile Female ATD / 141
Head Contact	Airbag, Headrest	Airbag, Headrest
Upper Torso Contact	Airbag	Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster, Steering Column	Glovebox
Right Knee Contact	Knee Bolster	Glovebox

**DOOR OPENING AND SEAT TRACK INFORMATION**

Description	Driver	Passenger
Locked / Unlocked Doors	Unlocked	Unlocked
Front Door Opening	Remained closed and latched, operational	Remained closed and latched, operational
Rear Door Opening	Remained closed and latched, operational	Remained closed and latched, operational
Seat Track Shift (mm)	0	0
Seat Back Failure	None	None
Glazing Damage	None	None

**POST TEST STRUCTURAL OBSERVATIONS**

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

**VEHICLE REBOUND FROM BARRIER**

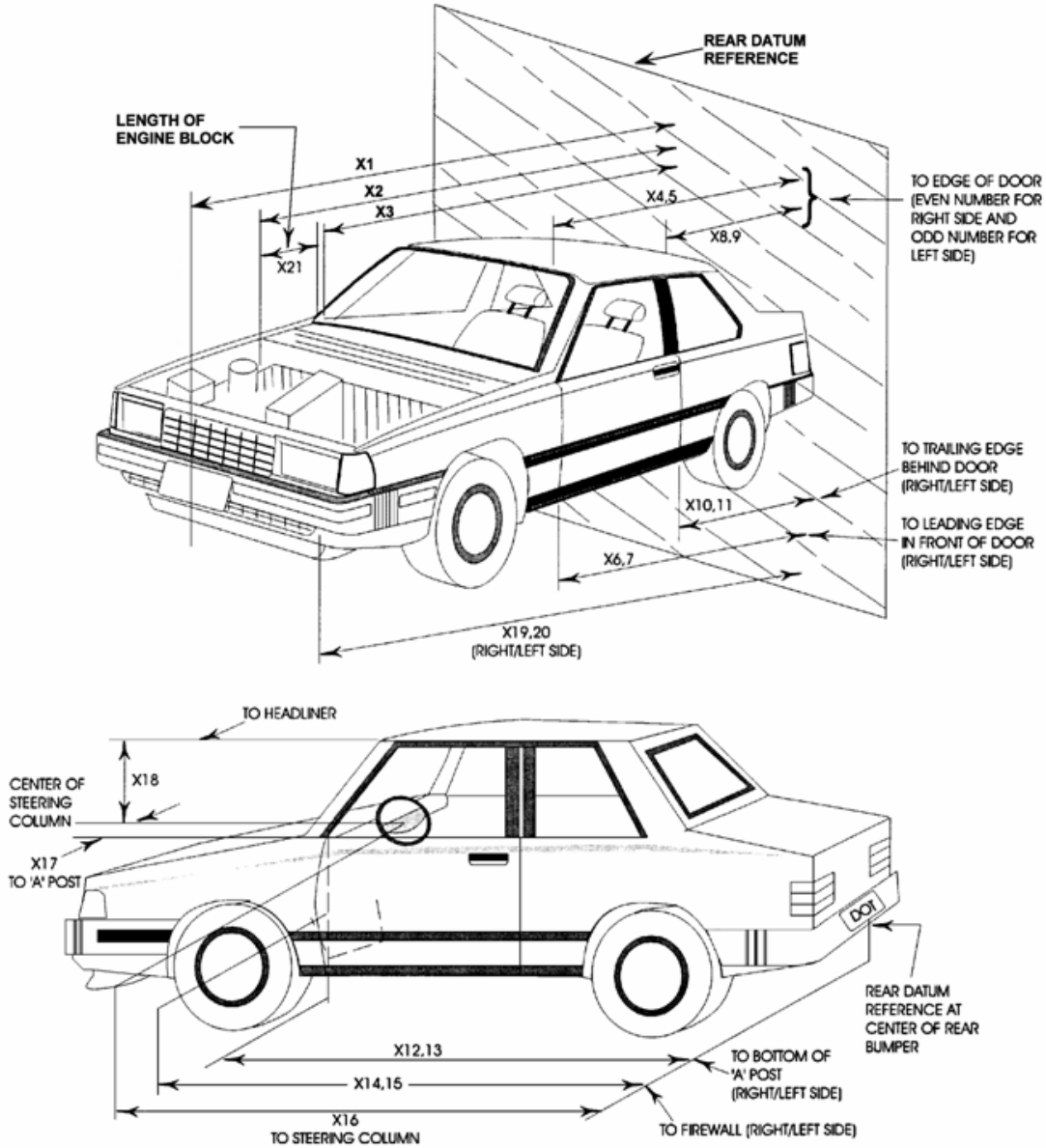
Measured Parameter	Units	Value
Left Side	mm	5565
Center	mm	5559
Right Side	mm	5468
Average	mm	5531

**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: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15



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

Test Vehicle: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	5140	4730	-410
2	Rear Surface of Vehicle to Front of Engine	4398	4275	-123
3	RSOV to Firewall	4235	4000	-235
4	RSOV to Upper Leading Edge of Right Door	3681	3697	16
5	RSOV to Upper Leading Edge of Left Door	3676	3684	8
6	RSOV to Lower Leading Edge of Right Door	3628	3628	0
7	RSOV to Lower Leading Edge of Left Door	3633	3628	-5
8	RSOV to Upper Trailing Edge of Right Door	2615	2629	14
9	RSOV to Upper Trailing Edge of Left Door	2607	2617	10
10	RSOV to Lower Trailing Edge of Right Door	2599	2594	-5
11	RSOV to Lower Trailing Edge of Left Door	2609	2597	-12
12	RSOV to Bottom of A-Pillar, Right Side	3642	3660	18
13	RSOV to Bottom of A-Pillar, Left Side	3631	3644	13
14	RSOV to Firewall, Right Side	4220	4185	-35
15	RSOV to Firewall, Left Side	4220	4195	-25
16	RSOV to Steering Column	3185	3220	35
17	Center of Steering Column to A-Pillar	430	435	5
18	Center of Steering Column to Headliner	646	475	-171
19	RSOV to Right Side of Front Bumper	4444	4220	-224
20	RSOV to Left Side of Front Bumper	4446	4280	-166
21	Length of Engine Block	560	560	0
RD	RSOV to Right Side of Dash Panel	3475	3460	-15
CD	RSOV to Center of Dash Panel	3360	3305	-55
LD	RSOV to Left Side of Dash Panel	3476	3470	-6

All measurements in millimeters.

**DATA SHEET NO. 13**

**ACCIDENT INVESTIGATION DIVISION DATA**

Test Vehicle: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15

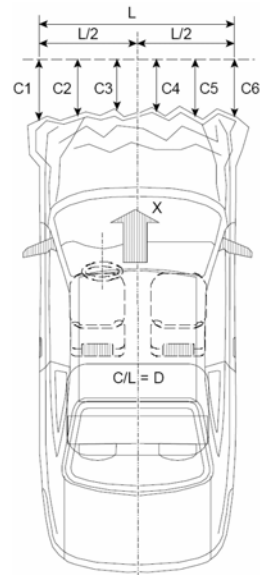
**VEHICLE INFORMATION**

VIN: KNDMA5C14F6025750 Wheelbase (mm): 3060  
 Vehicle Size Category: 5-Door MPV Test Weight (kg): 2195.0

**ACCELEROMETER DATA**

Accelerometer Locations: Left Rear Crossmember  
 Cal. Procedure/Interval: Drop Test / 6 months  
 Integration Algorithm: NHTSA Standard  
 Impact Velocity (km/h): 56.48  
 Velocity Change (km/h): 65.0  
 Time of Separation (msec): 75.8

Linearity: Good



**CRUSH PROFILE**

Collision Deformation Classification: 12FDEW2  
 Midpoint of Damage: Vehicle Centerline  
 Damage Region Length (mm): 1592  
 Impact Mode: Full Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	268	520	252
C2	Crush Zone 2 at Left Side	mm	78	510	432
C3	Crush Zone 3 at Left Side	mm	19	490	471
C4	Crush Zone 4 at Right Side	mm	19	497	478
C5	Crush Zone 5 at Right Side	mm	78	520	442
C6	Crush Zone 6 at Right Side	mm	268	505	237
L	C1 to C6	mm	1592		

**DATA SHEET NO. 14**

**VEHICLE INTRUSION MEASUREMENTS**

Test Vehicle: 2015 Kia Sedona L 5-Door MPV

NHTSA No.: M20154200

Test Program: 56 km/h Frontal Impact NCAP Test

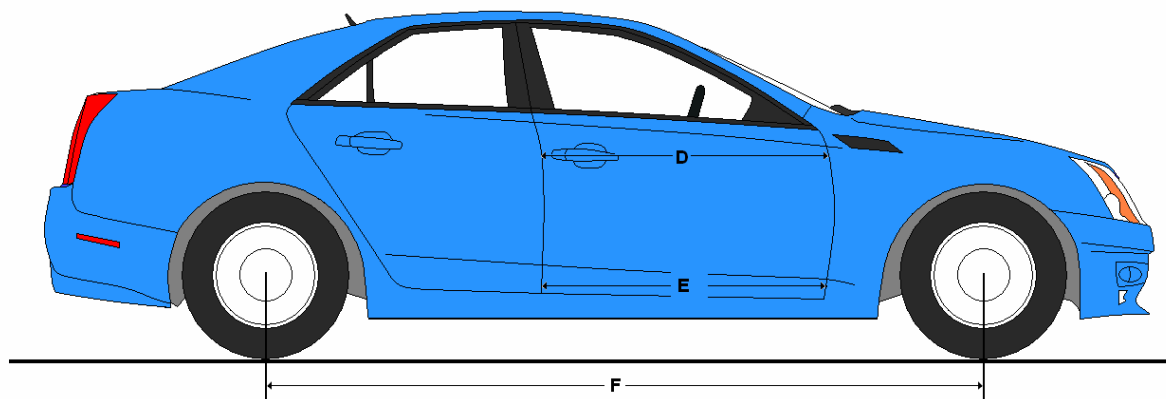
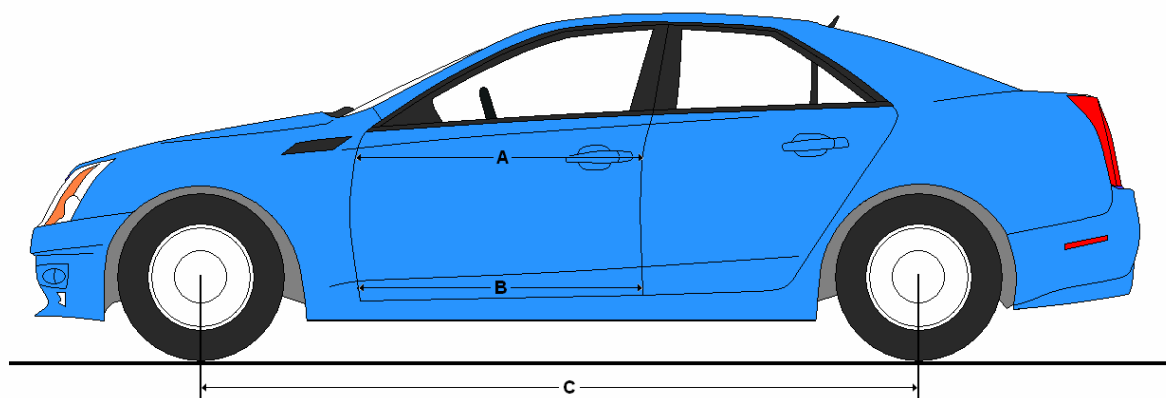
Test Date: 03/09/15

**DOOR OPENING WIDTH**

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	976	972	4
B	Left Side Lower	mm	849	843	6
D	Right Side Upper	mm	973	971	2
E	Right Side Lower	mm	854	850	4

**WHEELBASE MEASUREMENTS**

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3060	2995	65
F	Right Side Wheelbase	mm	3061	2995	66



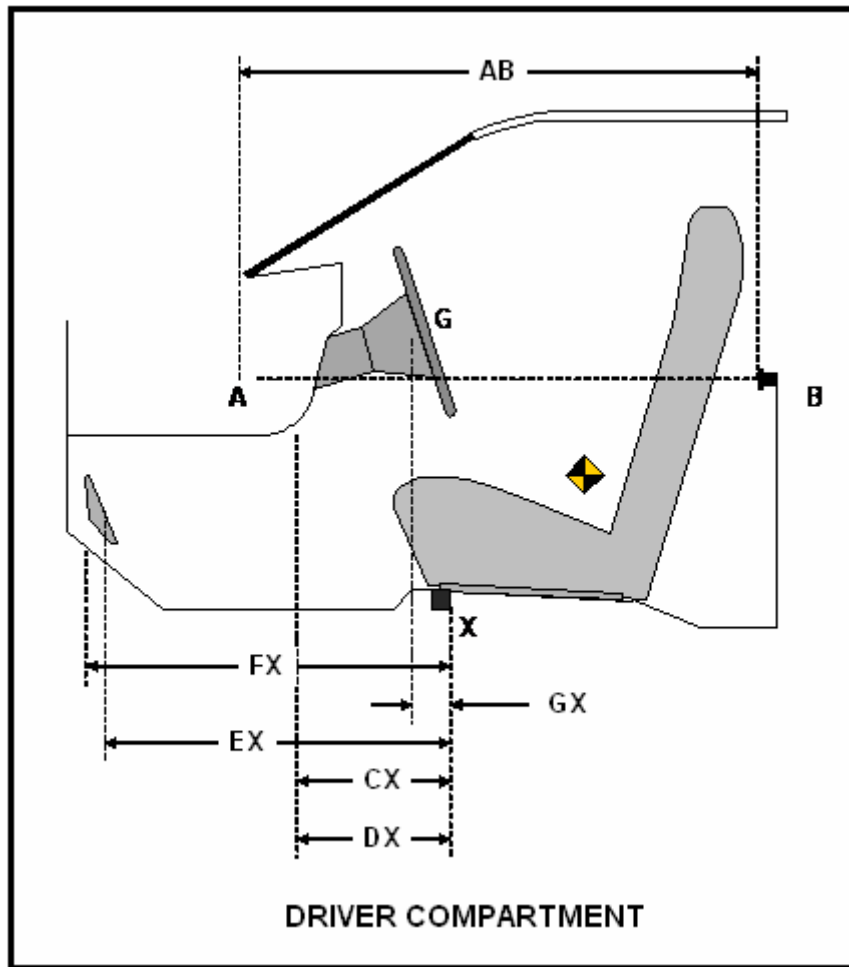
**DATA SHEET NO. 14 ... (CONTINUED)**  
**VEHICLE INTRUSION MEASUREMENTS**

Test Vehicle: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15

**DRIVER COMPARTMENT INTRUSION**

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	860	855	5
CX	Left Knee Bolster to X	mm	270	300	-30
DX	Right Knee Bolster to X	mm	270	260	10
EX	Brake Pedal to X	mm	484	400	84
FX	Foot Rest to X	mm	430	450	-20
GX	Center of Steering Wheel Hub to X	mm	15	60	-45

X = Front of Seat Track (Stationary)



**DATA SHEET NO. 15**

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

Test Vehicle: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15

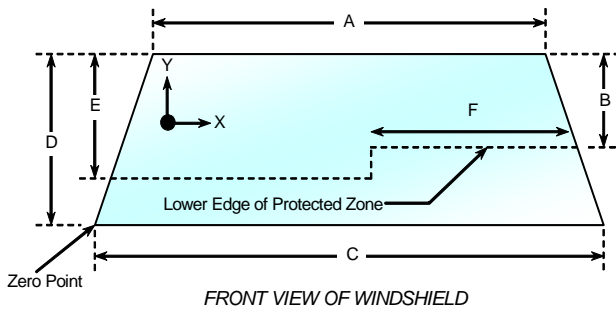
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with plastic molding and rubber cement.

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	2445	2445	100.0%
Right Side	2445	2445	100.0%
Total	4890	4890	100.0%



Item	Units	Value
A	mm	1390
B	mm	520
C	mm	1600
D	mm	950
E	mm	605
F	mm	465

**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: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15

**FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA**

Temperature at Time of Impact: 24.4° C Test Time: 1:30 PM

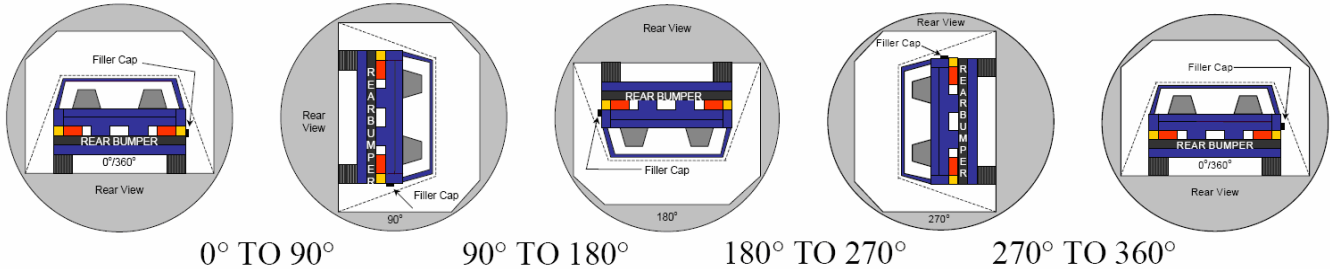
**Stoddard Solvent Spillage Measurements**

- 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: 2015 Kia Sedona L 5-Door MPV NHTSA No.: M20154200  
 Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 03/09/15



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°	84	300	384
90° To 180°	81	300	381
180° To 270°	78	300	378
270° To 360°	80	300	380

**FMVSS 301 SPILLAGE TABLE**

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

**SOLVENT SPILLAGE LOCATION TABLE**

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

**DATA SHEET NO. 17**

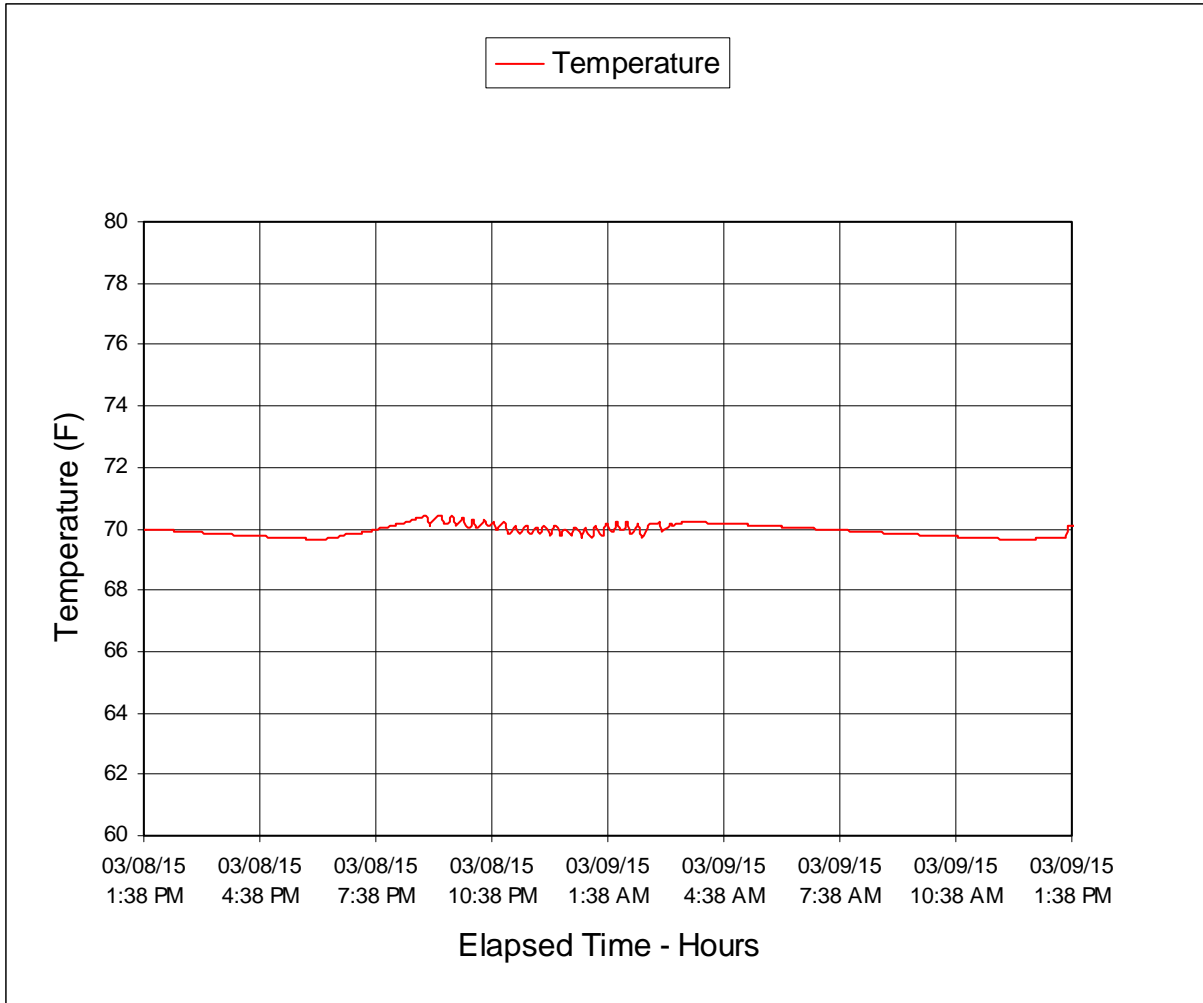
**DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART**

Test Vehicle: 2015 Kia Sedona L 5-Door MPV

NHTSA No.: M20154200

Test Program: 56 km/h Frontal Impact NCAP Test

Test Date: 03/09/15



**APPENDIX A  
PHOTOGRAPHS**

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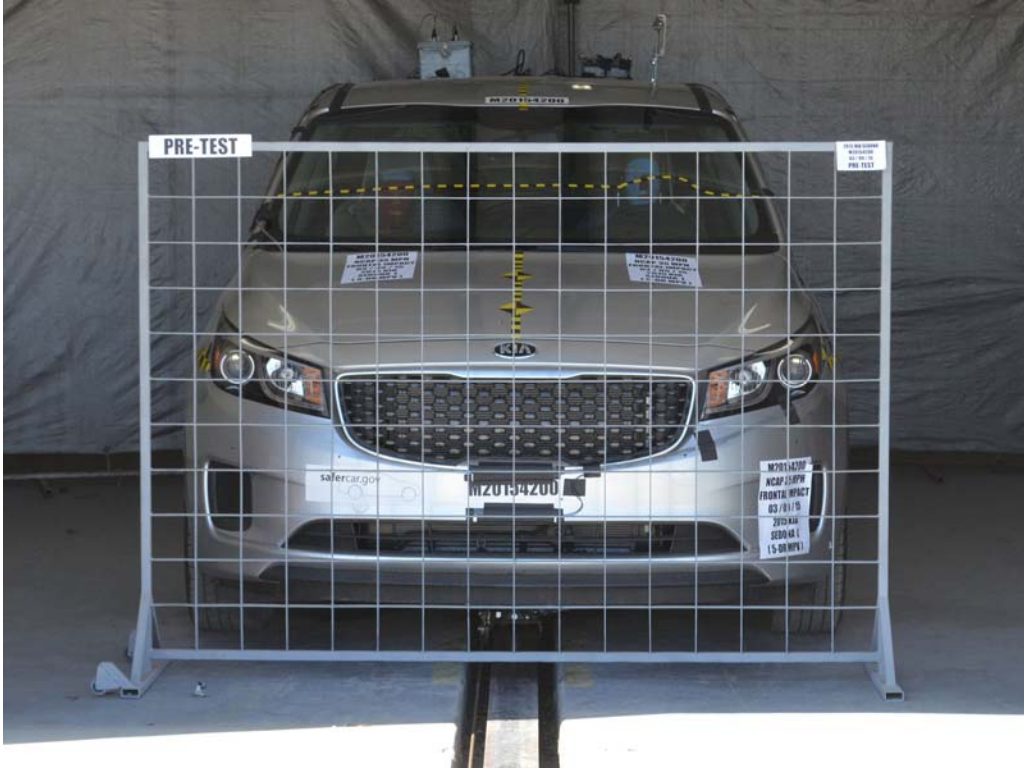


FIGURE 1. Load Cell Location



FIGURE 2. Load Cell Wall



FIGURE 3. Manufacturer's Label



FIGURE 4. Tire Placard



FIGURE 5. 2015 Kia Sedona Frontal as Delivered

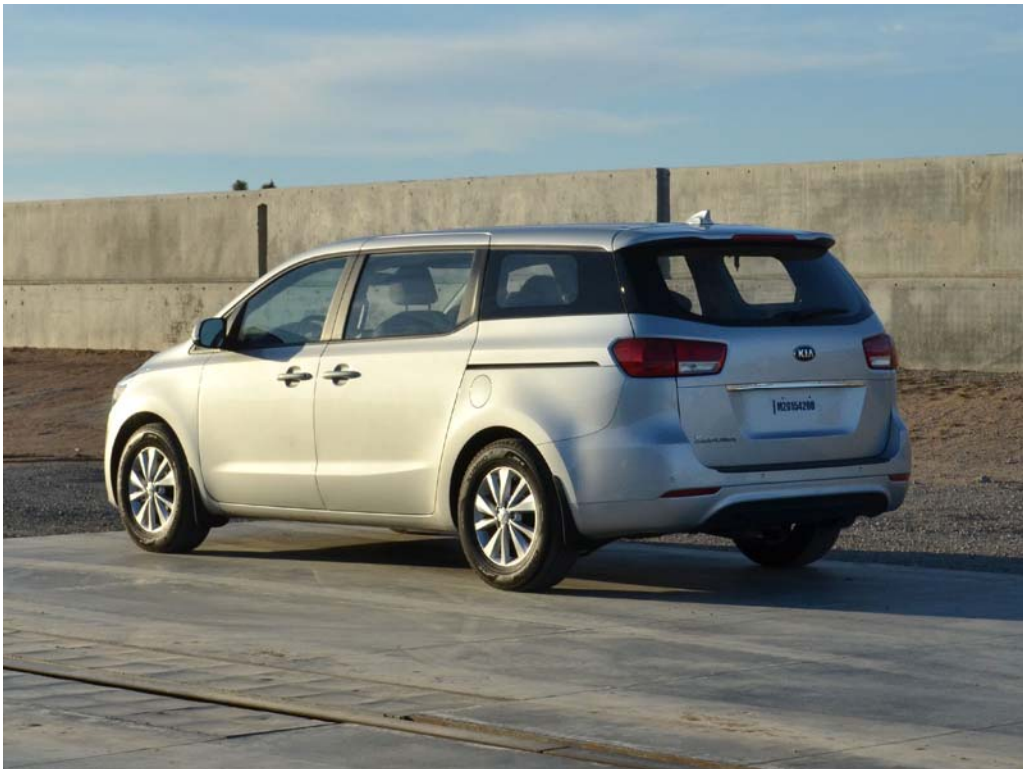


FIGURE 6. Left Rear  $\frac{3}{4}$  View, as Received



FIGURE 7. Pre-Test Front View of Test Vehicle

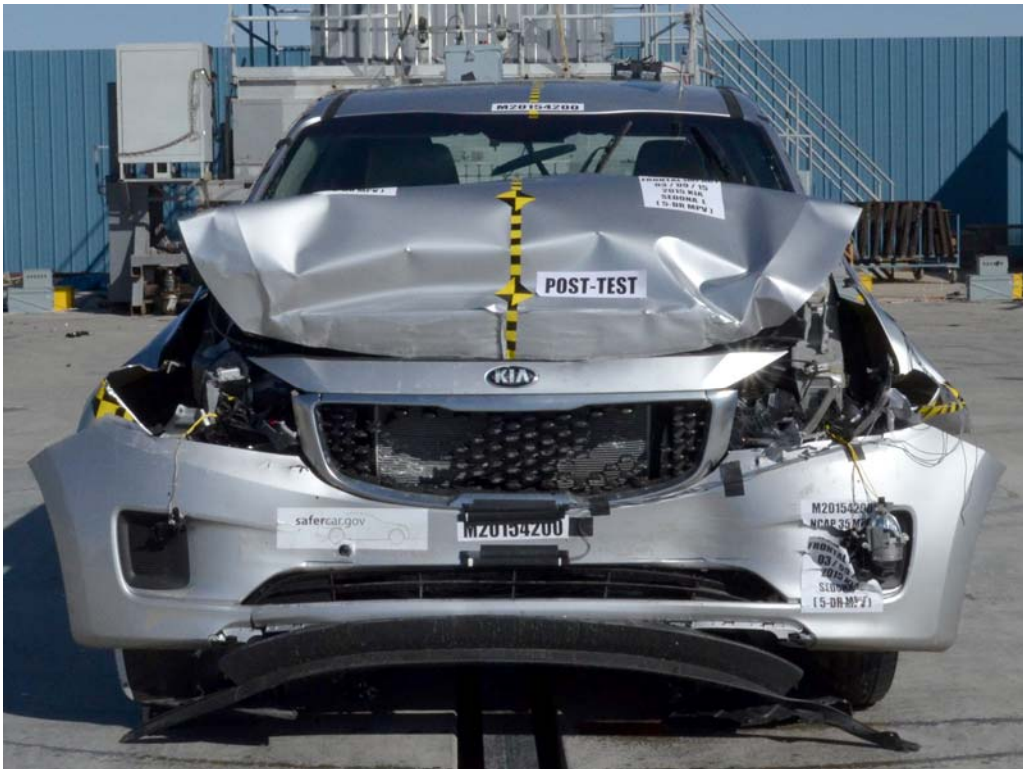


FIGURE 8. Post-Test Front View of Test Vehicle



FIGURE 9. Pre-Test Left View of Test Vehicle



FIGURE 10. Post-Test Left View of Test Vehicle



FIGURE 11. Pre-Test Right View of Test Vehicle



FIGURE 12. Post-Test Right View of Test Vehicle



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



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



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



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

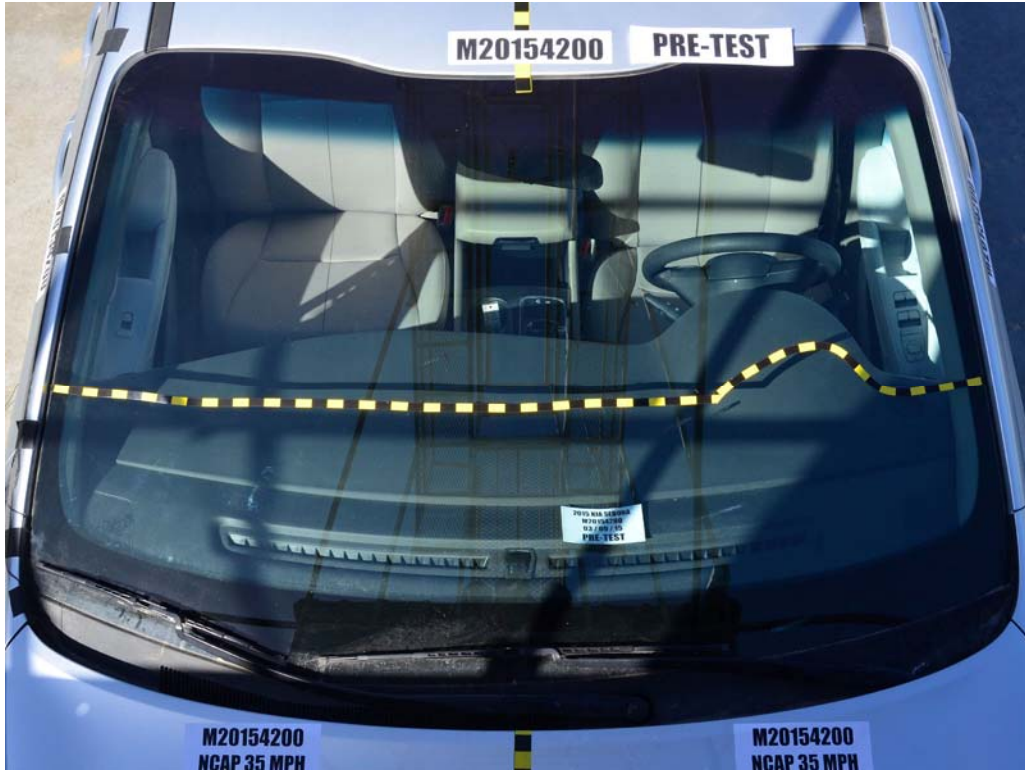


FIGURE 17. Pre-Test Windshield View



FIGURE 18. Post-Test Windshield View



FIGURE 19. Pre-Test Engine Compartment View

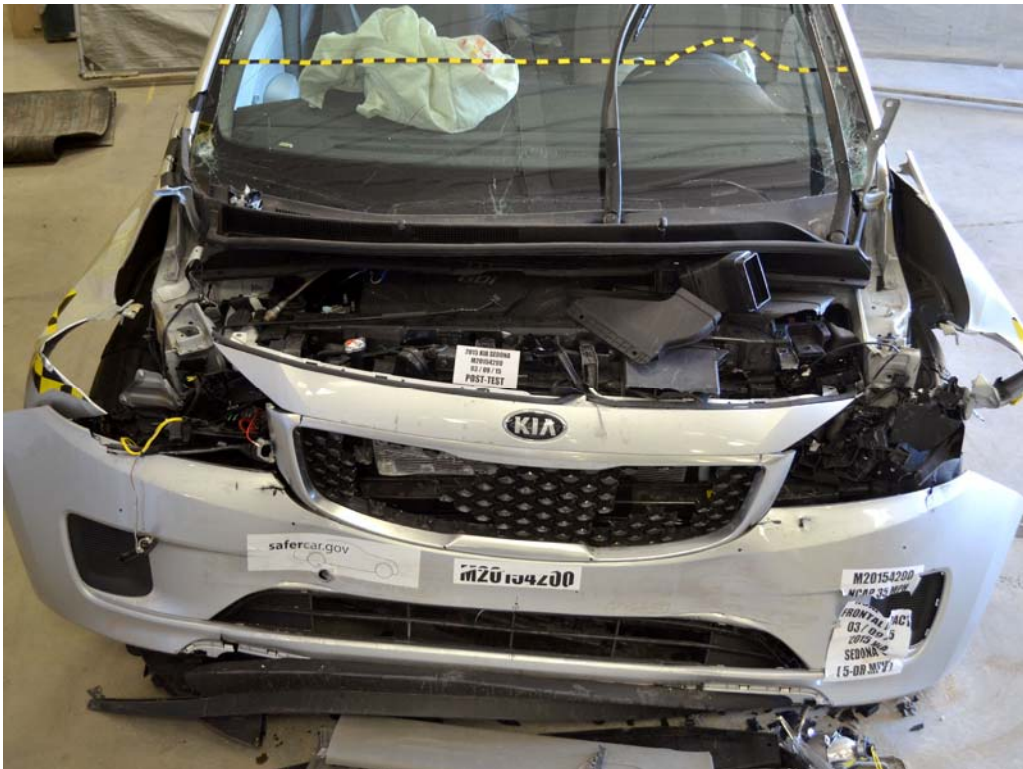


FIGURE 20. Post-Test Engine Compartment View



FIGURE 21. Pre-Test Fuel Filler Cap View



FIGURE 22. Post-Test Fuel Filler Cap View

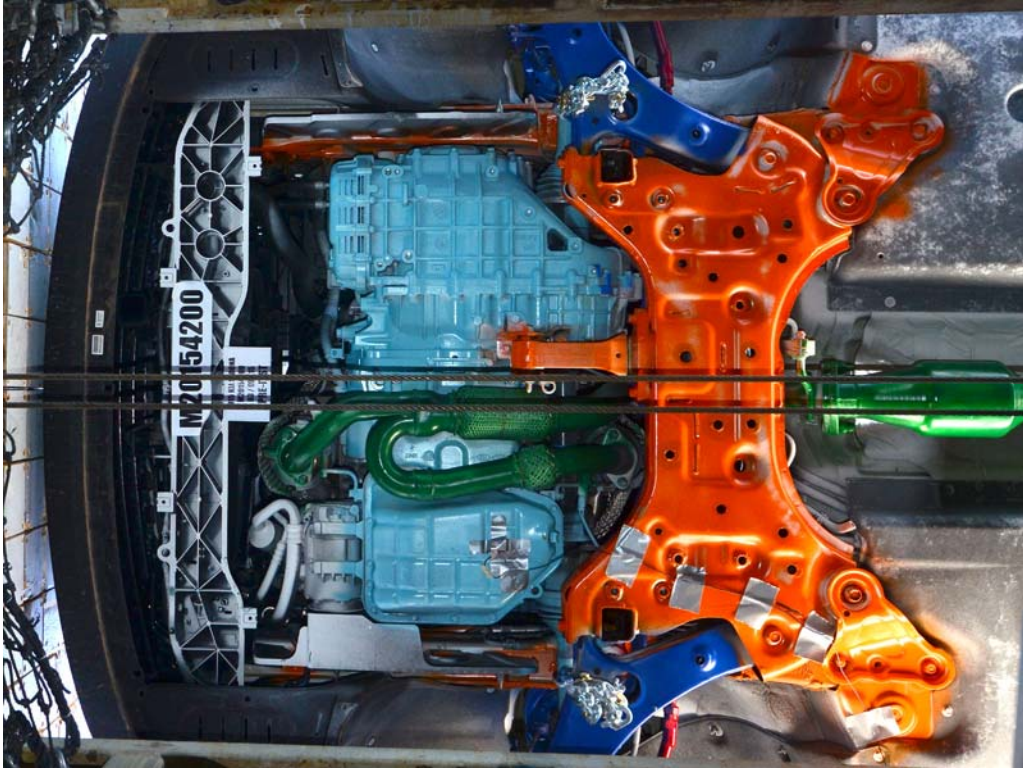


FIGURE 23. Pre-Test Front Underbody View

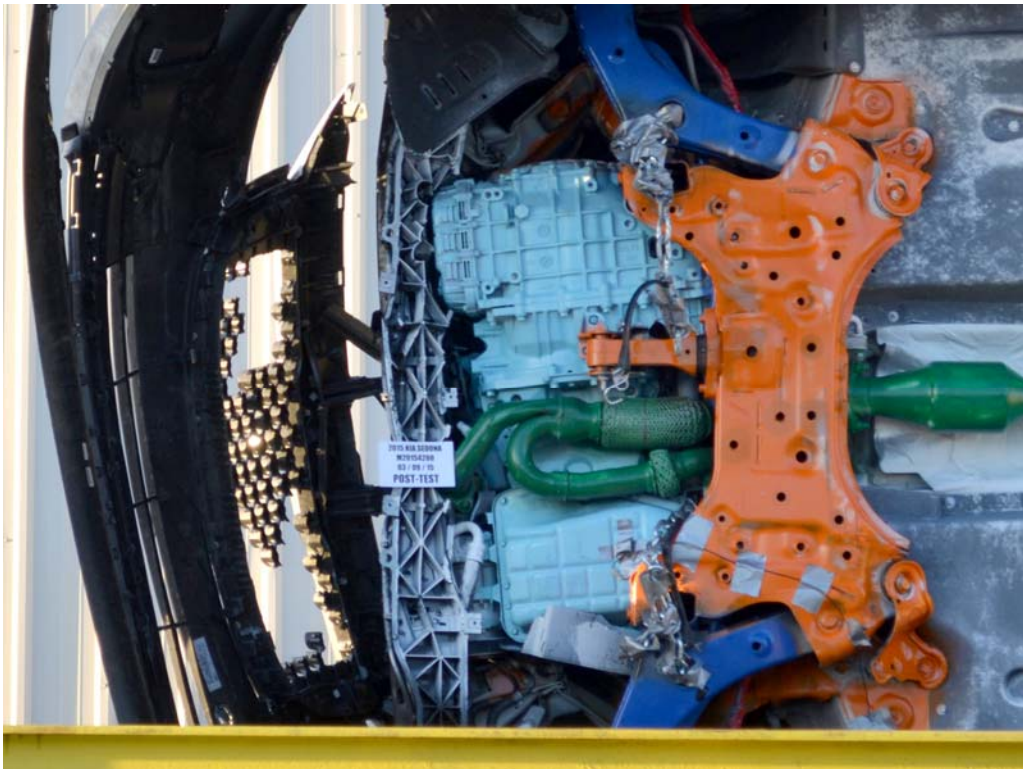


FIGURE 24. Post-Test Front Underbody View

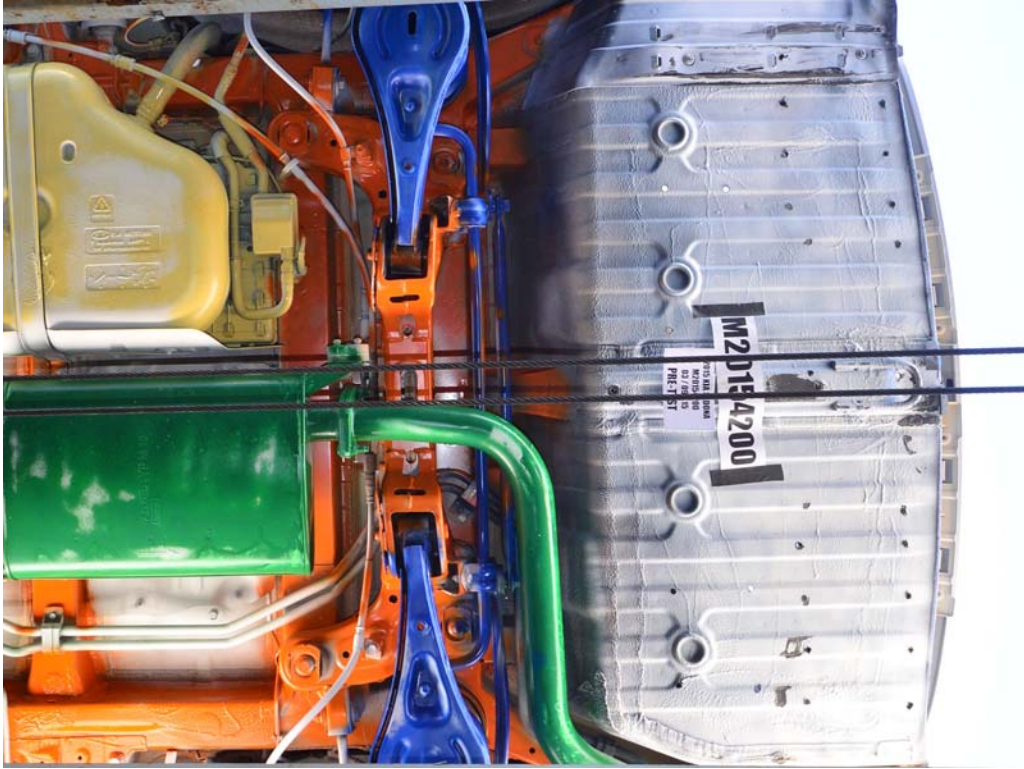


FIGURE 25. Pre-Test Rear Underbody View



FIGURE 26. Post-Test Rear Underbody View



FIGURE 27. Pre-Test Dummy Cable Routing



FIGURE 28. Post-Test Dummy Cable Routing



FIGURE 29. Pre-Test Driver Dummy Front View



FIGURE 30. Post-Test Driver Dummy Front View



FIGURE 31. Pre-Test Driver Dummy Window View



FIGURE 32. Post-Test Driver Dummy Window View



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



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



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



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



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



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



FIGURE 39. Pre-Test Driver Dummy Feet



FIGURE 40. Post-Test Driver Dummy Feet



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



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



FIGURE 43. Pre-Test Driver's Side Floorpan



FIGURE 44. Post-Test Driver's Side Floorpan



FIGURE 45. Post-Test Driver Dummy Face

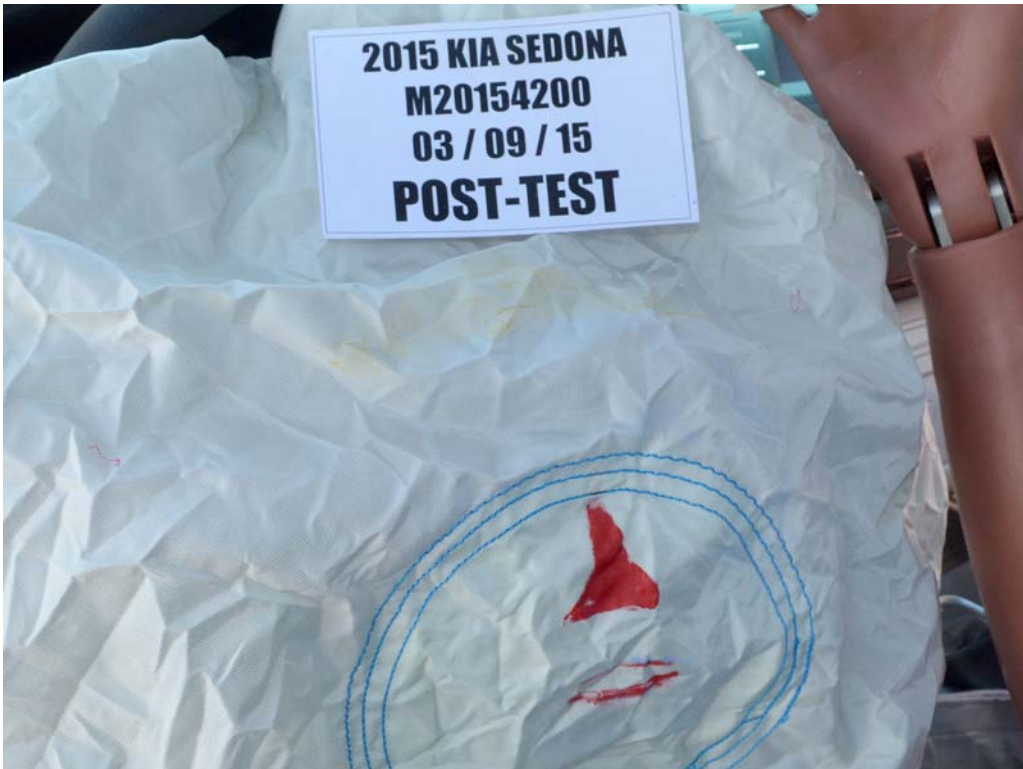


FIGURE 46. Post-Test Driver Dummy Contact with Airbag



FIGURE 47. Post-Test Driver Dummy Contact with Headrest

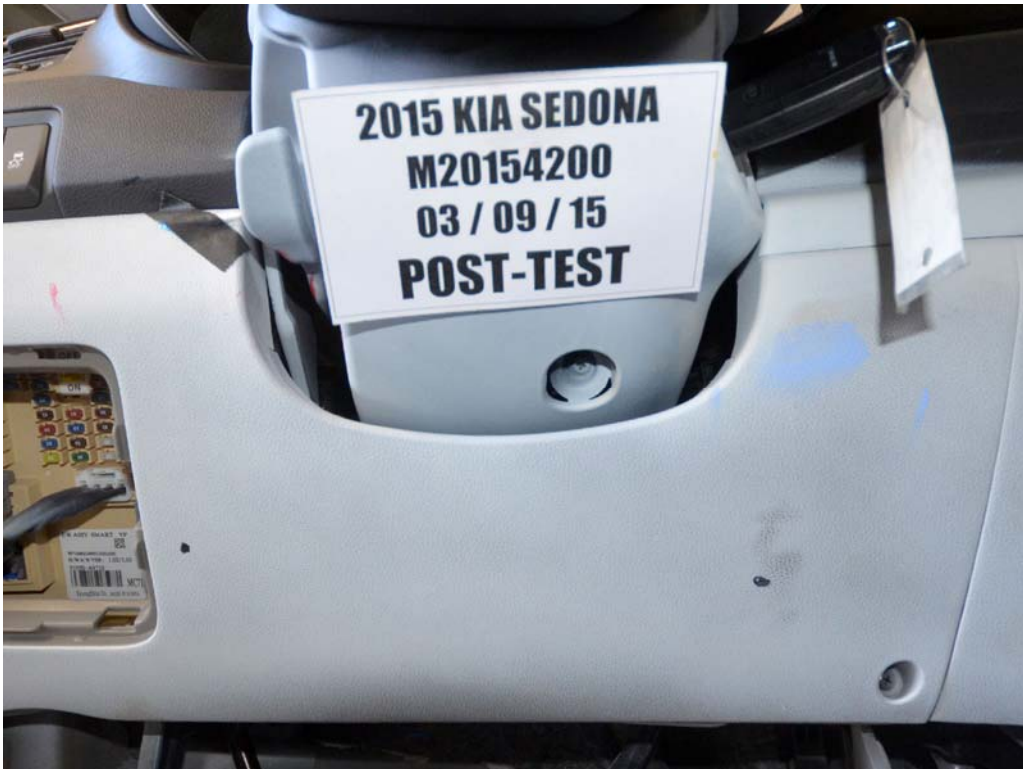


FIGURE 47a. Post-Test Driver Dummy Contact with Knee Bolster



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

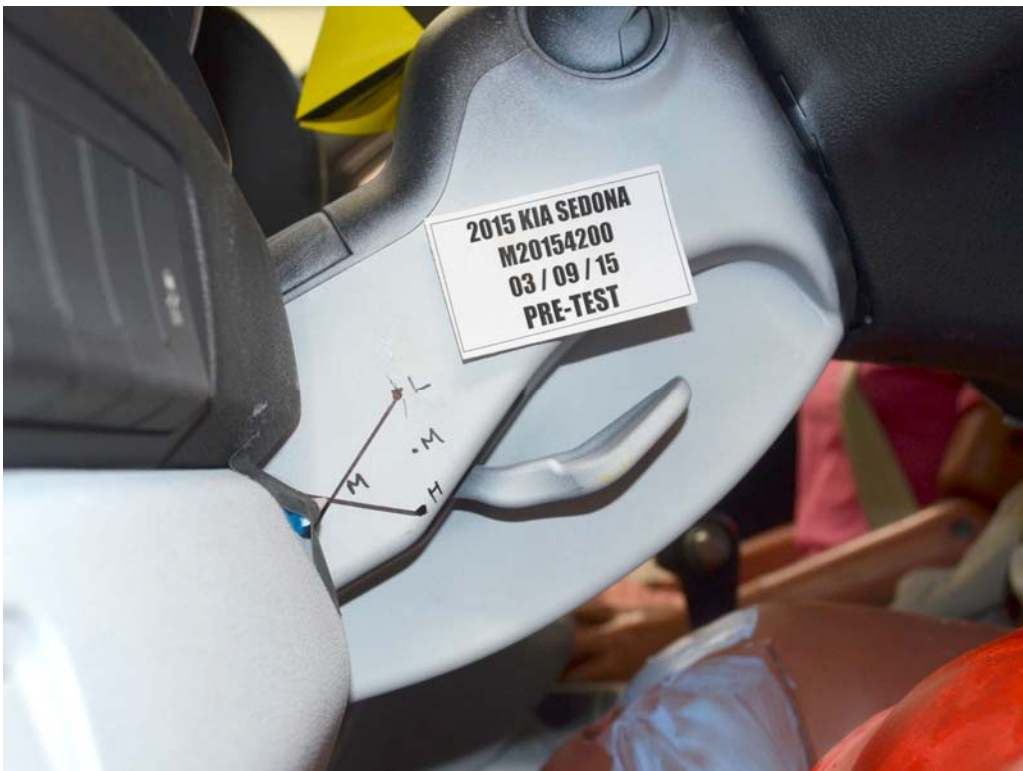


FIGURE 48. Pre-Test View of the Steering Wheel



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

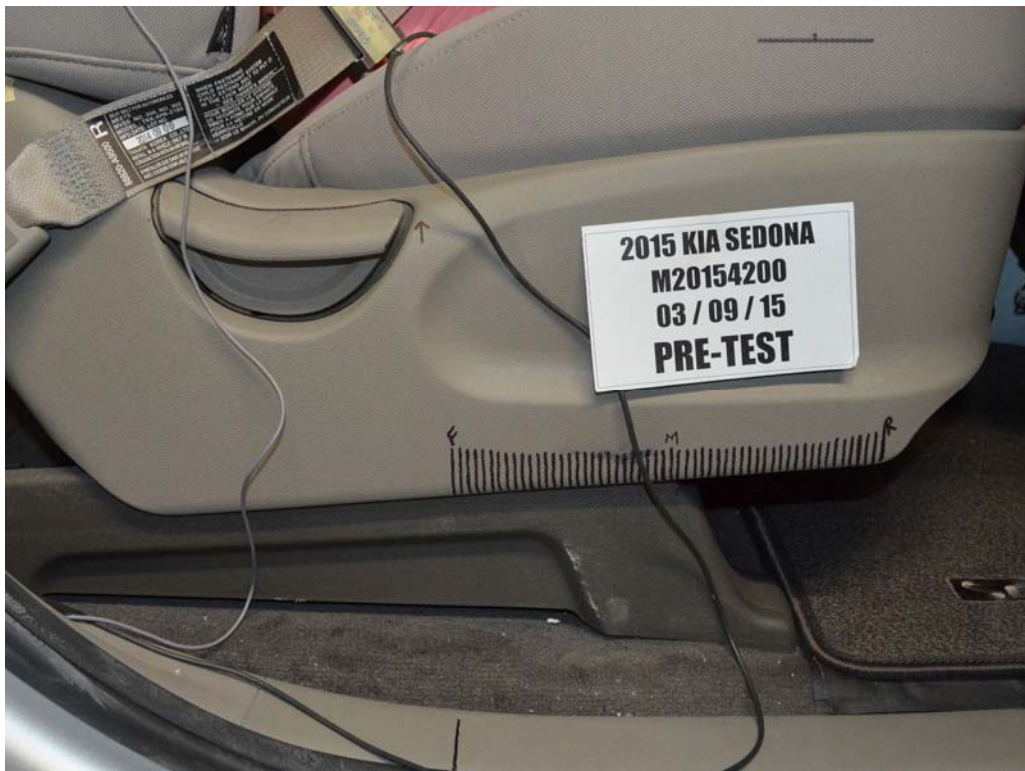


FIGURE 56. Pre-Test Passenger's Seat Fore-Aft Markings



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

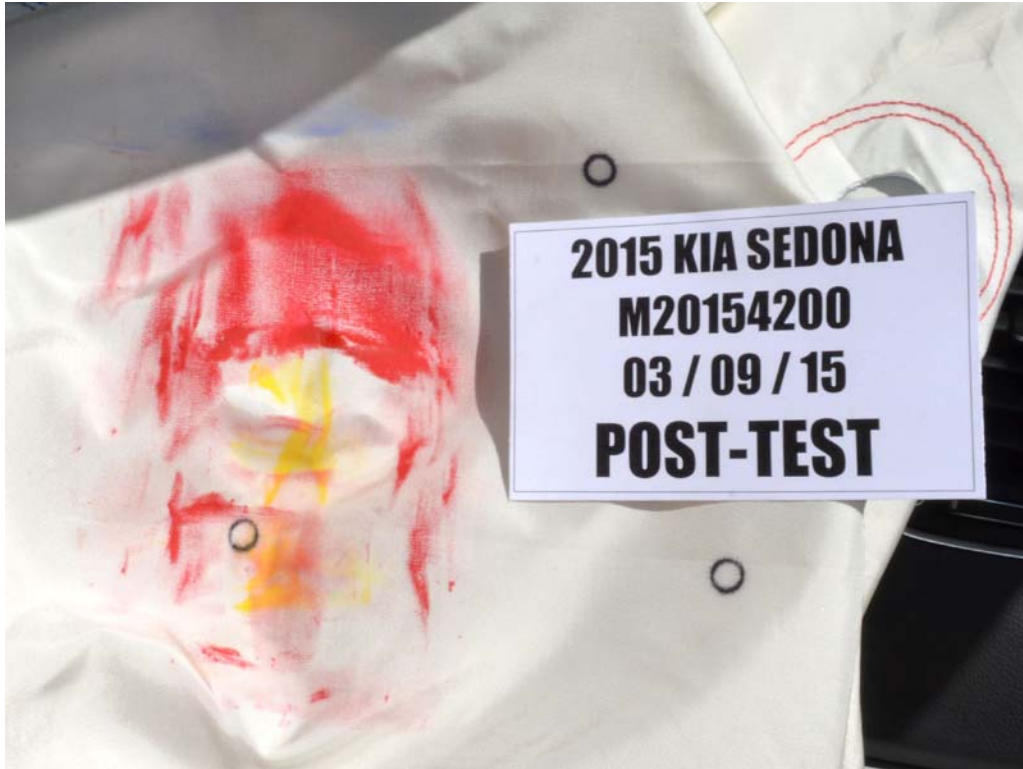


FIGURE 67. Post-Test Passenger Dummy Contact with Airbag



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



FIGURE 68b. 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 74. Vehicle at 180° on Static Rollover Device



FIGURE 75. Vehicle at 270° on Static Rollover Device

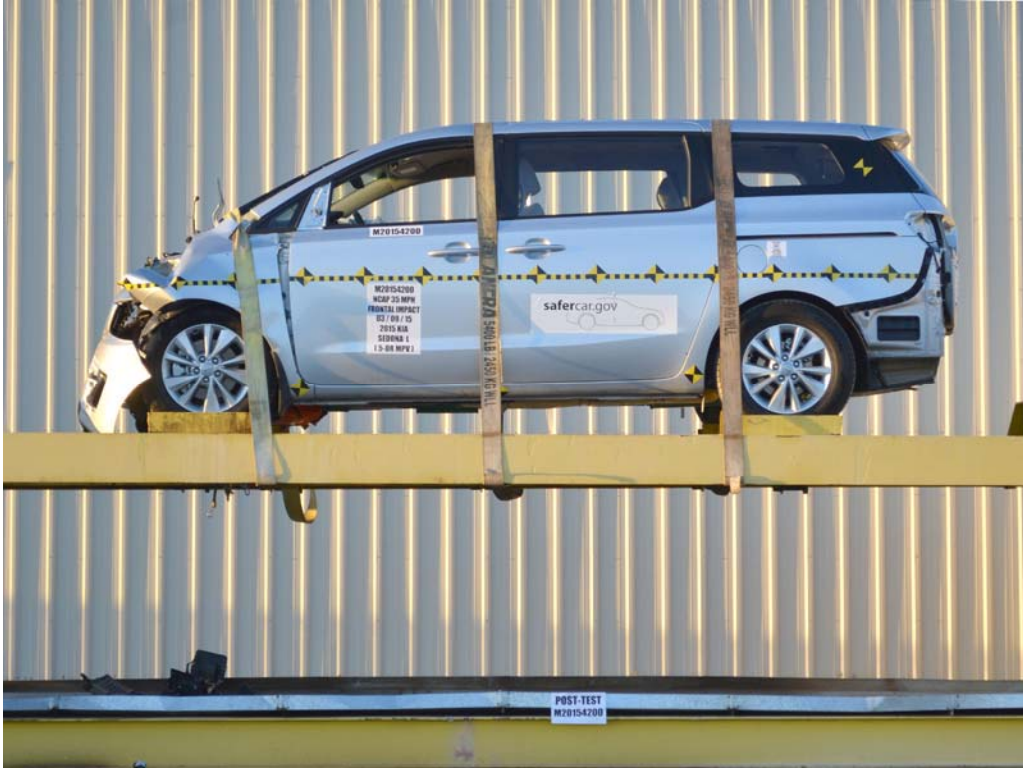


FIGURE 76. Vehicle at 360° on Static Rollover Device



FIGURE 77. 2015 Kia Sedona Frontal Impact Event





<b>2015 KIA SEDONA L</b> MODEL / OPTION CODE: 64212 / 010 EXTERIOR / INTERIOR: BRIGHT SILVER/GRAY VEHICLE ID NUMBER: KNDMASC14F6025750 ENGINE NUMBER: G6DHES20 PORT OF ENTRY: TACOMA MODE OF TRANSPORT: RAIL		SOLD TO: W022 BUYER: RUSS DARROW KIA OF WAUWATOSA ADDRESS: 1901 N. MAYFAIR ROAD WAUWATOSA WI 53226		SHIP TO: W022 BUYER: RUSS DARROW KIA OF WAUWATOSA ADDRESS: 1901 N. MAYFAIR ROAD WAUWATOSA WI 53226		kia.com 											
<b>STANDARD FEATURES</b> <b>MECHANICAL</b> 3.3L DOHC GDI CVT V6 Engine 6-Speed Automatic Transmission w/ Sportmatic 17" Alloy Wheels <b>SAFETY</b> Dual Front Advanced Airbags Front Seat-Mounted Side Airbags Full-Length Side Curtain Airbags for All 3 Rows Lower Anchors and Tethers for Children (LATCH) Anti-Lock Braking System (ABS) Brake Assist System (BAS) Traction Control System (TCS) Electronic Stability Control (ESC) Tire Pressure Monitoring System (TPMS) <b>INTERIOR, COMFORT &amp; CONVENIENCE</b> Front and Rear Air Conditioning Power Windows and Door Locks AM/FM/CD/MP3 Player SIRIUSXM® Satellite Radio w/free 3-mo. subscription* USB/Auxiliary Input Jacks YES Essentials Anti-Spill Seat Fabric 2nd Row Side-N-Snow Seats Remote Keyless Entry System Cruise Control Steering Wheel Mounted Controls (Audio & Cruise) Eco Drive Mode <b>EXTERIOR</b> Outside Mirrors w/ Turn Signal Indicators Back-Up Warning System <b>WARRANTY</b> 10 Year/100,000 Mile Limited Powertrain Warranty 5 Year/60,000 Mile Limited Basic Warranty 5 Year/60,000 Mile Roadside Assistance * Ask dealer for details		<b>MANUFACTURER'S SUGGESTED RETAIL PRICE</b> ▶ \$25,500.00 <b>ADDITIONAL INSTALLED EQUIPMENT:</b> (In addition to or in place of standard features) Carpeted Floor Mats \$195.00 Mud Guards \$95.00		<b>EPA DOT Fuel Economy and Environment</b> Gasoline Vehicle <b>Fuel Economy</b>  <b>You spend \$2000 more in fuel costs over 5 years</b> compared to the average new vehicle. <b>Annual fuel cost \$2600</b> <b>Fuel Economy &amp; Greenhouse Gas Rating</b> (Gasoline only) Smog Rating (Gasoline only)  <small>Annual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average gas mileage is 24 MPG and costs \$11,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.50 per gallon. MPG is miles per gallon. Fuel economy, mileage, and emissions are a significant cause of climate change and smog.</small> <b>fuel economy.gov</b> <small>Calculate personalized estimates for your vehicle.</small>													
<b>MSRP INCLUDING OPTIONS</b> \$26,190.00 INLAND FREIGHT AND HANDLING \$895.00 <b>TOTAL MANUFACTURER'S SUGGESTED RETAIL PRICE</b> ▶ \$27,085.00		<b>GOVERNMENT 5-STAR SAFETY RATINGS</b> <b>Overall Vehicle Score Not Rated</b> <small>Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.</small> <table border="1"> <tr> <td>Frontal Crash</td> <td>Driver Passenger</td> <td>Not Rated</td> </tr> <tr> <td>Side Crash</td> <td>Front seat</td> <td>Not Rated</td> </tr> <tr> <td></td> <td>Rear seat</td> <td>Not Rated</td> </tr> <tr> <td>Rollover</td> <td></td> <td>Not Rated</td> </tr> </table> <small>Star ratings based on the risk of injury in a single-vehicle crash.</small>		Frontal Crash	Driver Passenger	Not Rated	Side Crash	Front seat	Not Rated		Rear seat	Not Rated	Rollover		Not Rated	<b>PARTS CONTENT INFORMATION</b> <b>FOR VEHICLES IN THIS CAR LINE U.S./CANADIAN PARTS CONTENT: 3%</b> <b>MAJOR SOURCES OF FOREIGN PARTS: KOREA: 86%</b> <small>NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.</small> <b>FOR THIS VEHICLE FINAL ASSEMBLY POINT: KOREA</b> <b>COUNTRY OF ORIGIN ENGINE: KOREA</b> <b>TRANSMISSION: KOREA</b>	
Frontal Crash	Driver Passenger	Not Rated															
Side Crash	Front seat	Not Rated															
	Rear seat	Not Rated															
Rollover		Not Rated															
TOTAL ADDITIONAL WEIGHT: 8.6 		<small>Star ratings range from 1 to 5 stars (***** with 5 being the highest). Source: National Highway Traffic Safety Administration (NHTSA) www.safercar.gov or 1-888-327-4236</small> <small>Manufacturer's suggested retail price includes manufacturer's recommended pre-delivery service, license and title fees, dealer fees, state and other taxes, required options, and accessories not included in the manufacturer's suggested retail price.</small>															

FIGURE 78. Monroney label Photograph

**APPENDIX B**  
**DUMMY RESPONSE DATA TRACES**

## TABLE OF DATA PLOTS

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

The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at [www.nhtsa.dot.gov](http://www.nhtsa.dot.gov)

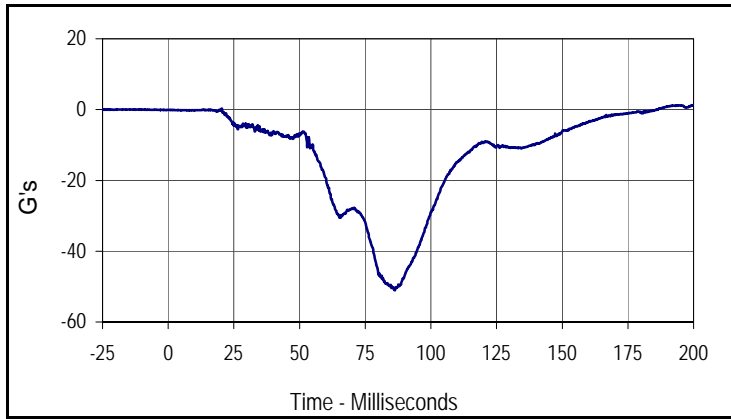
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Driver Head Y Acceleration Redundant  
Driver Head Z Acceleration Redundant  
Driver Head Front Y Acceleration  
Driver Head Front Z Acceleration  
Driver Head Top X Acceleration  
Driver Head Top Y Acceleration  
Driver Head Left X Acceleration  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

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

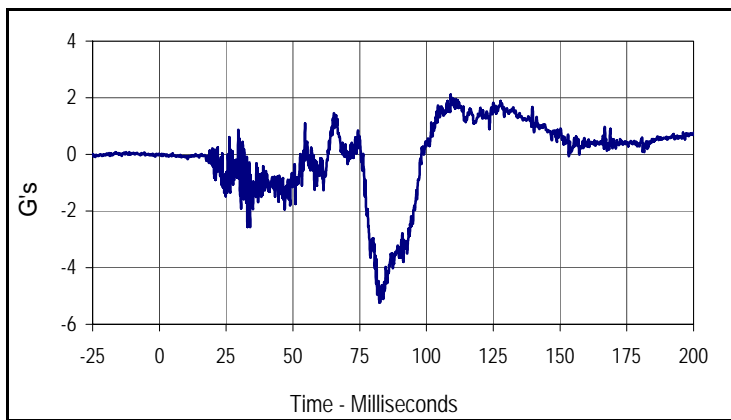
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Passenger Right Upper Tibia Force Z  
Passenger Right Lower Tibia Moment X  
Passenger Right Lower Tibia Moment Y  
Passenger Right Lower Tibia Force Z  
Passenger Left Foot Fore Z  
Passenger Left Foot Aft X  
Passenger Left Foot Aft Z  
Passenger 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: 2015 Kia Sedona L 5-Door MPV  
 Test Program: 56 km/h Frontal Impact NCAP Test

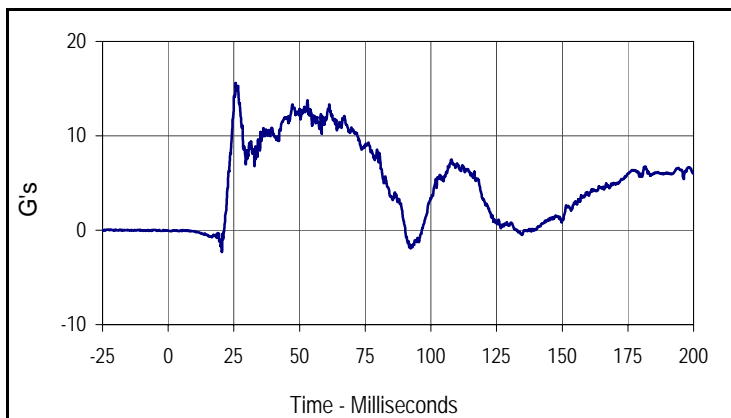
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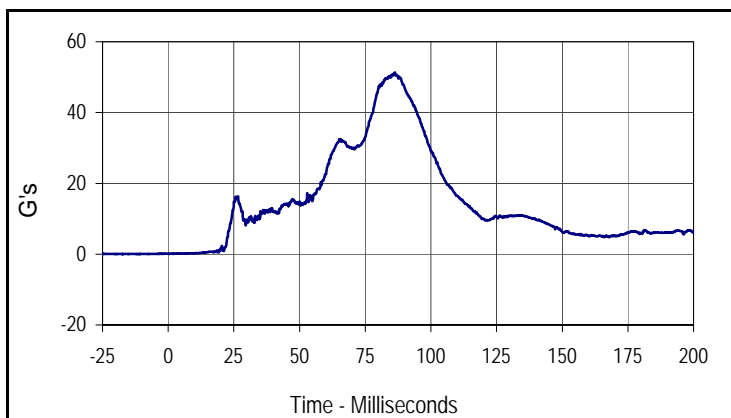
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Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
11.6	246.1	-51.0	86.2



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.1	109.1	-5.2	82.3



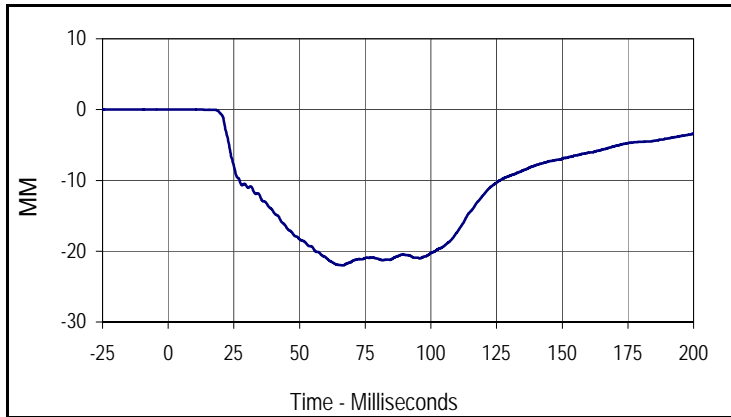
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
15.6	25.7	-2.3	20.4



Curve Description			
Driver Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
51.3	86.2	0.1	0.3

Test Vehicle: 2015 Kia Sedona L 5-Door MPV  
 Test Program: 56 km/h Frontal Impact NCAP Test

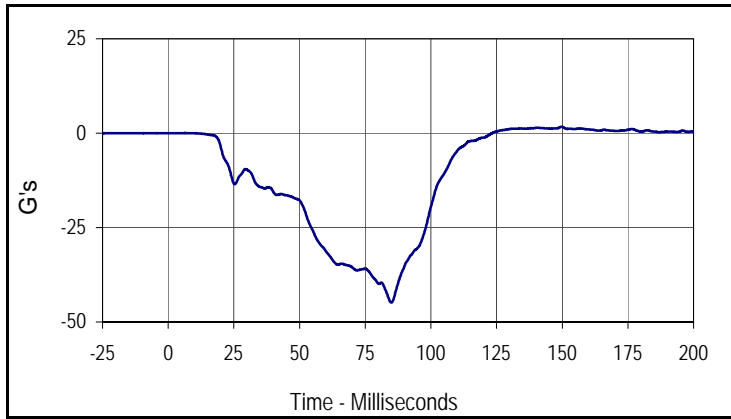
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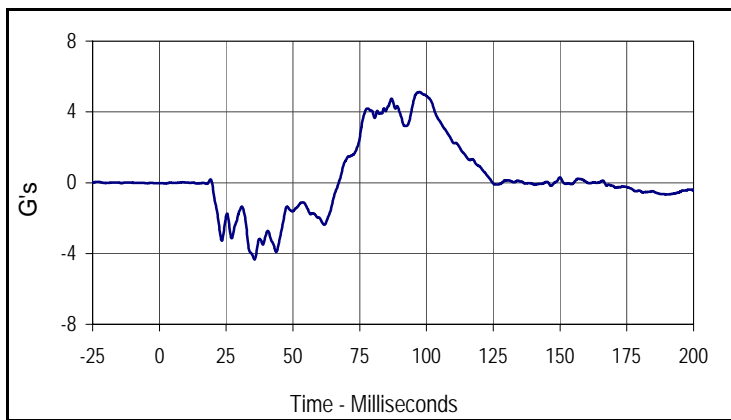
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Test Vehicle: 2015 Kia Sedona L 5-Door MPV  
 Test Program: 56 km/h Frontal Impact NCAP Test

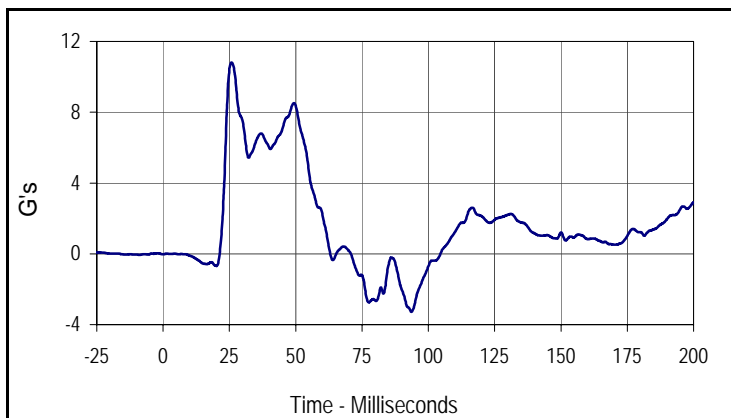
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 Test Date: 3/9/15



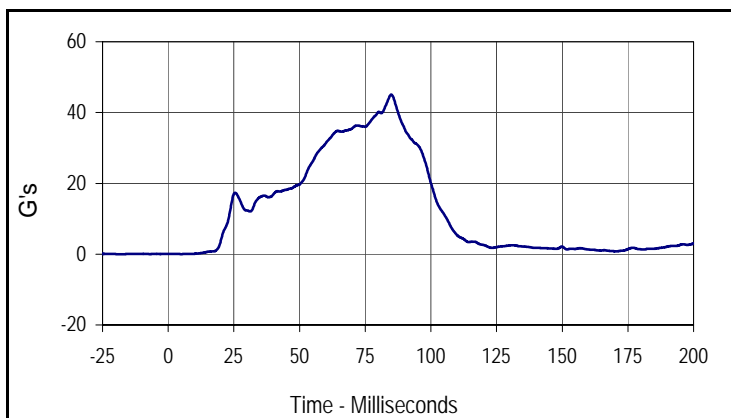
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Driver Chest Acceleration X Primary			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
5.1	274.8	-44.9	84.9



Curve Description			
Driver Chest Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
007	FIL	180	G's
Max	Time	Min	Time
5.1	97.4	-4.3	35.6



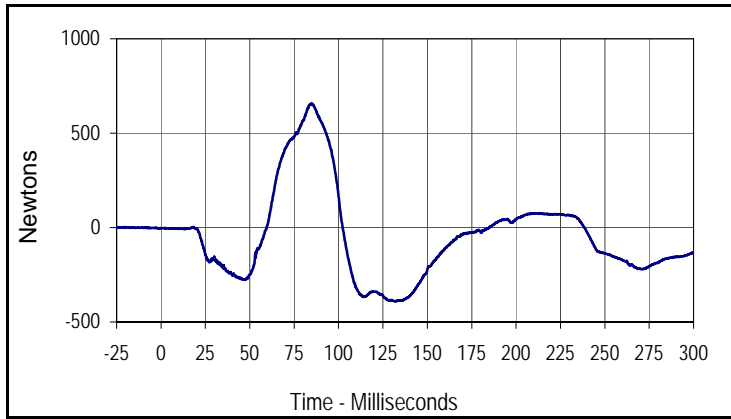
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Driver Chest Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
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Max	Time	Min	Time
10.8	25.8	-3.3	93.6



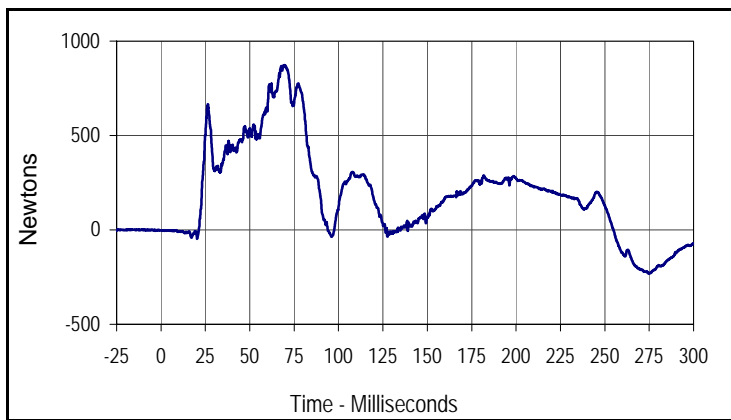
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Driver Chest Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
009	RES	180	G's
Max	Time	Min	Time
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Test Vehicle: 2015 Kia Sedona L 5-Door MPV  
 Test Program: 56 km/h Frontal Impact NCAP Test

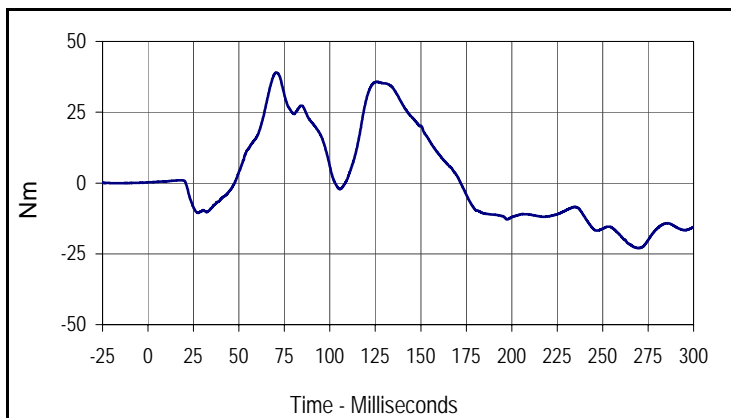
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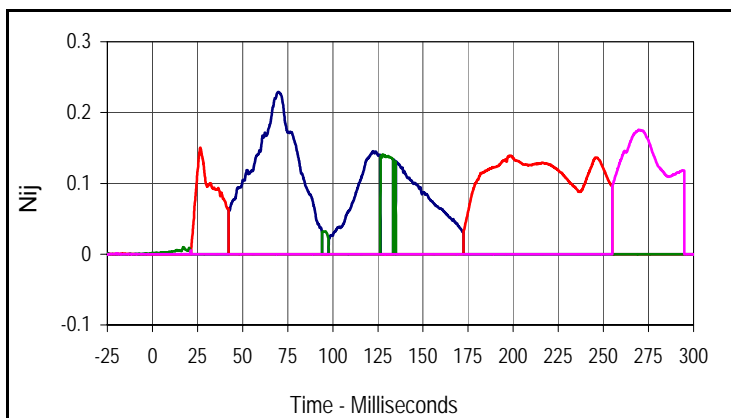
Curve Description			
Driver Upper Neck Force X			
Plot No.	Type	SAE Class	Units
010	FIL	1000	Newtons
Max	Time	Min	Time
658.1	84.9	-391.0	132.1



Curve Description			
Driver Upper Neck Force Z			
Plot No.	Type	SAE Class	Units
011	FIL	1000	Newtons
Max	Time	Min	Time
873.7	69.4	-231.5	274.6



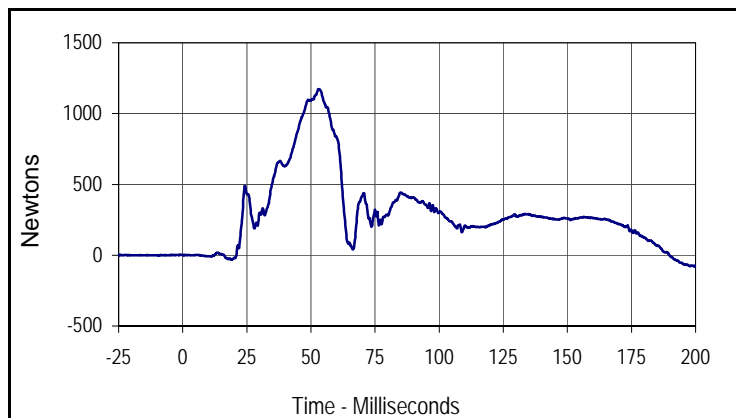
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Driver Upper Neck Moment Y			
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012	FIL	600	Nm
Max	Time	Min	Time
39.0	70.6	-23.0	269.4



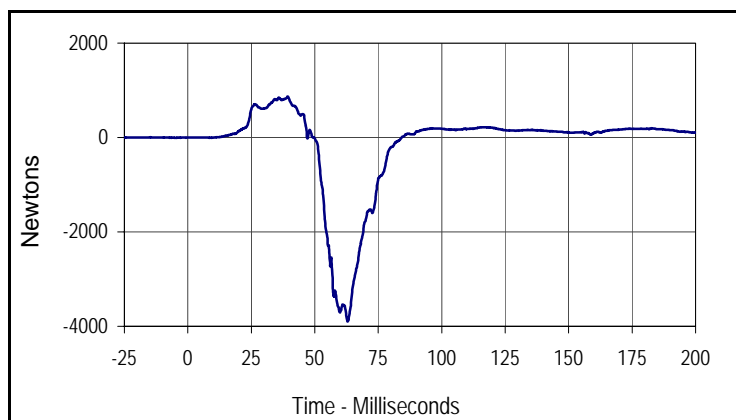
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Driver Nij			
Units	Type	Max	Time
Ntf	FIL	0.23	70.0
Units	Type	Max	Time
Nte	FIL	0.15	26.5
Units	Type	Max	Time
Ncf	FIL	0.14	127.7
Units	Type	Max	Time
Nce	FIL	0.18	269.5

Test Vehicle: 2015 Kia Sedona L 5-Door MPV  
 Test Program: 56 km/h Frontal Impact NCAP Test

NHTSA No.: M20154200  
 Test Date: 3/9/15



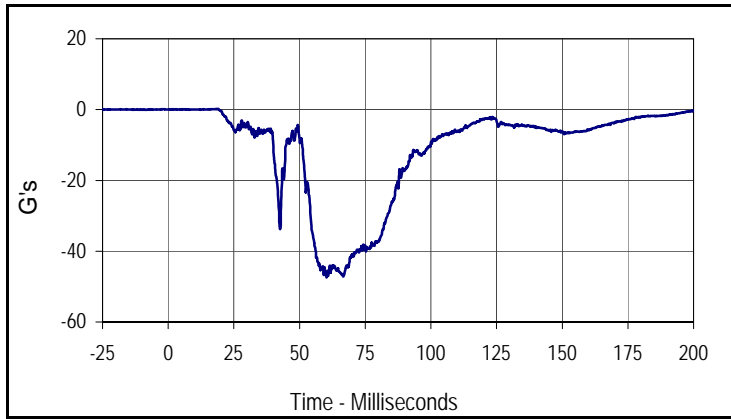
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Driver Left Femur Force Z			
Plot No.	Type	SAE Class	Units
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Max	Time	Min	Time
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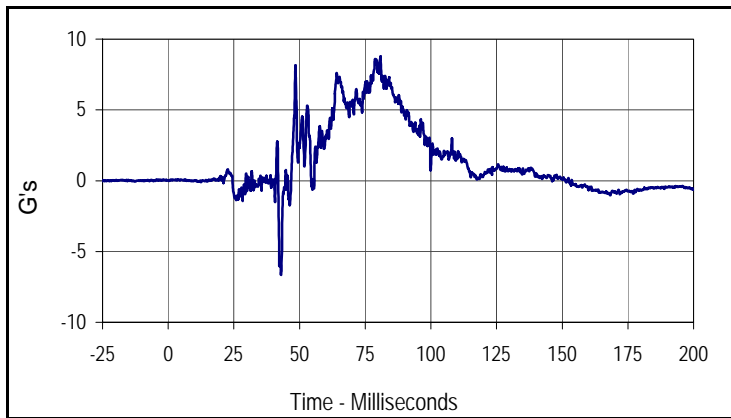
Curve Description			
Driver Right Femur Force Z			
Plot No.	Type	SAE Class	Units
014	FIL	600	Newtons
Max	Time	Min	Time
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Test Vehicle: 2015 Kia Sedona L 5-Door MPV  
 Test Program: 56 km/h Frontal Impact NCAP Test

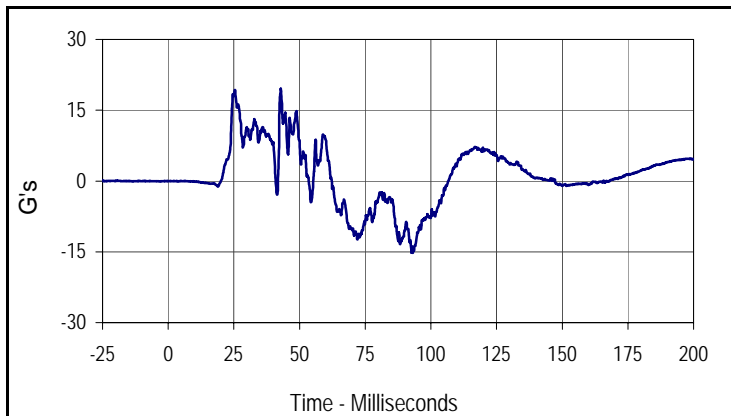
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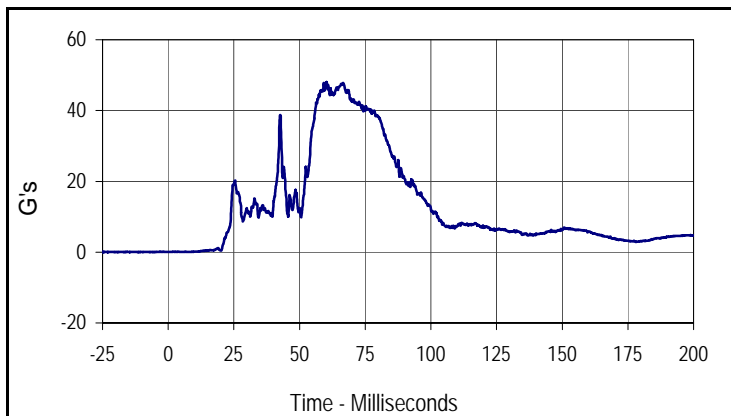
Curve Description			
Passenger Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
015	FIL	1000	G's
Max	Time	Min	Time
21.3	226.2	-47.4	60.3



Curve Description			
Passenger Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
016	FIL	1000	G's
Max	Time	Min	Time
8.8	80.8	-6.6	43.0



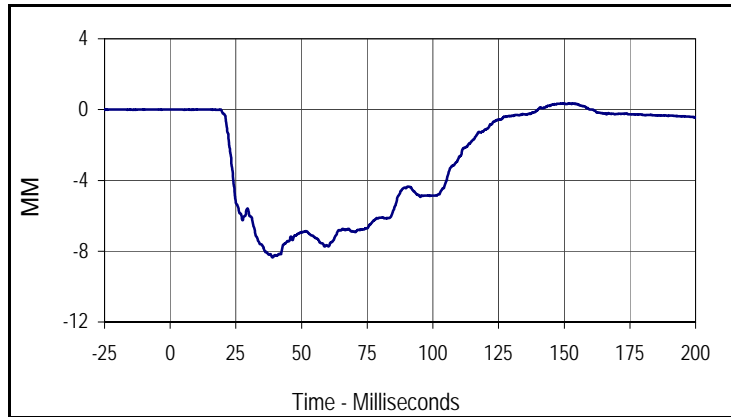
Curve Description			
Passenger Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
017	FIL	1000	G's
Max	Time	Min	Time
19.5	42.9	-15.2	93.2



Curve Description			
Passenger Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
018	RES	1000	G's
Max	Time	Min	Time
48.1	60.3	0.0	0.2

Test Vehicle: 2015 Kia Sedona L 5-Door MPV  
 Test Program: 56 km/h Frontal Impact NCAP Test

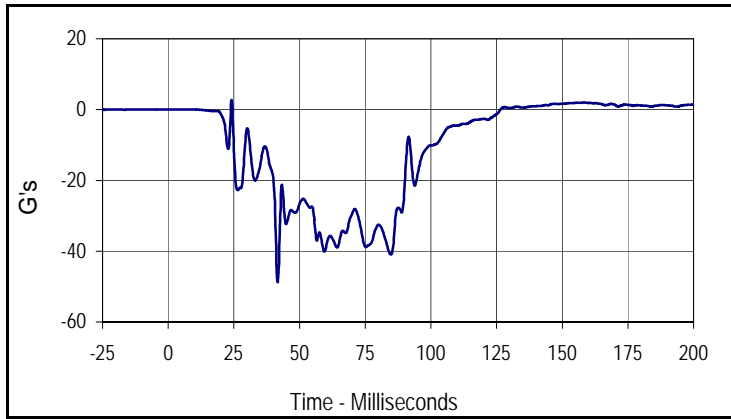
NHTSA No.: M20154200  
 Test Date: 3/9/15



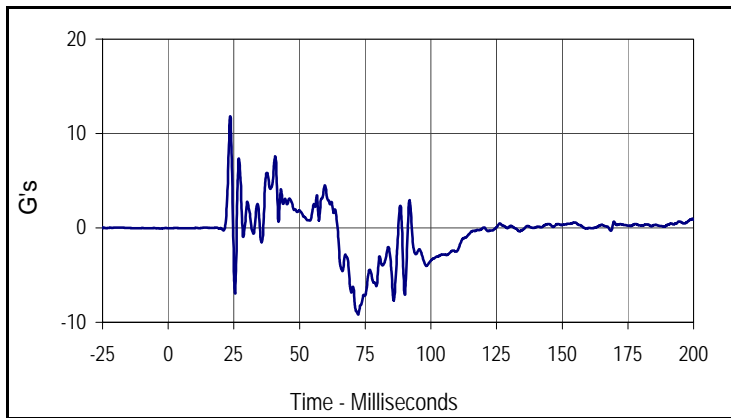
Curve Description			
Passenger Chest Deflection			
Plot No.	Type	SAE Class	Units
019	FIL	600	MM
Max	Time	Min	Time
0.4	152.2	-8.3	38.9

Test Vehicle: 2015 Kia Sedona L 5-Door MPV  
 Test Program: 56 km/h Frontal Impact NCAP Test

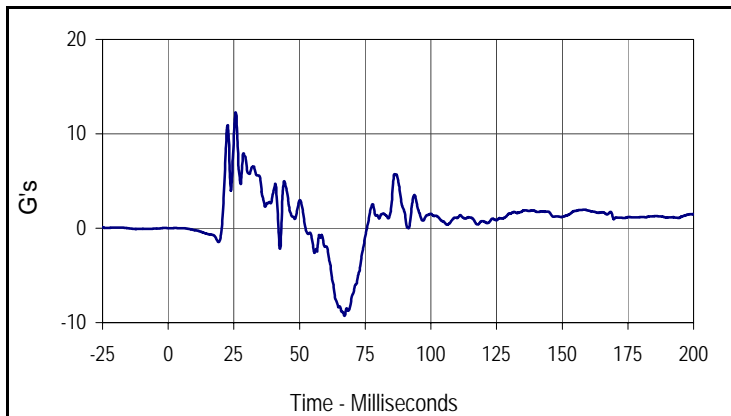
NHTSA No.: M20154200  
 Test Date: 3/9/15



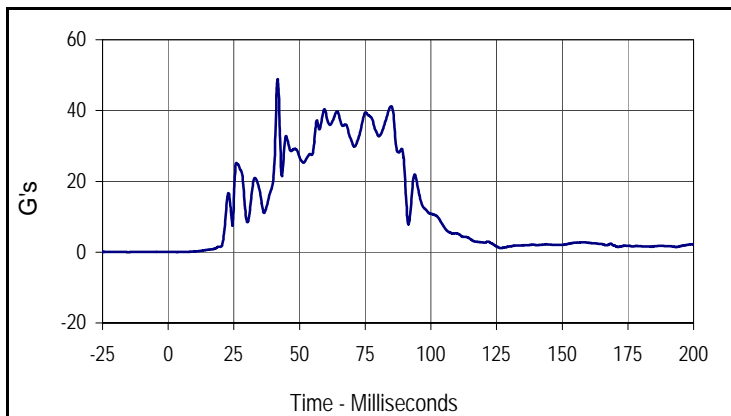
Curve Description			
Passenger Chest Acceleration X Primary			
Plot No.	Type	SAE Class	Units
020	FIL	180	G's
Max	Time	Min	Time
6.4	254.4	-48.8	41.7



Curve Description			
Passenger Chest Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
021	FIL	180	G's
Max	Time	Min	Time
11.8	23.6	-9.2	72.3



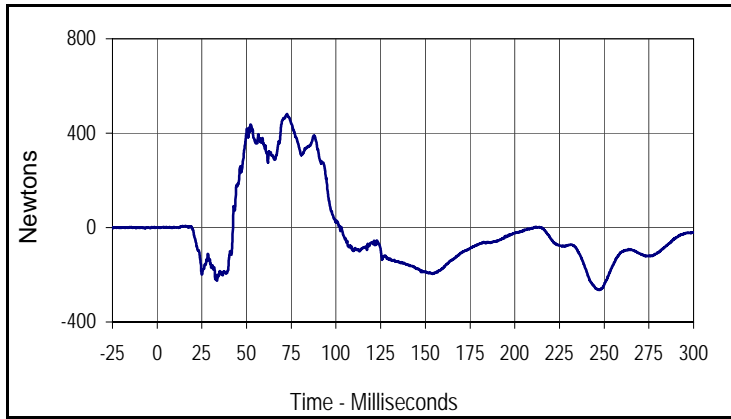
Curve Description			
Passenger Chest Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
022	FIL	180	G's
Max	Time	Min	Time
12.3	25.7	-9.3	67.1



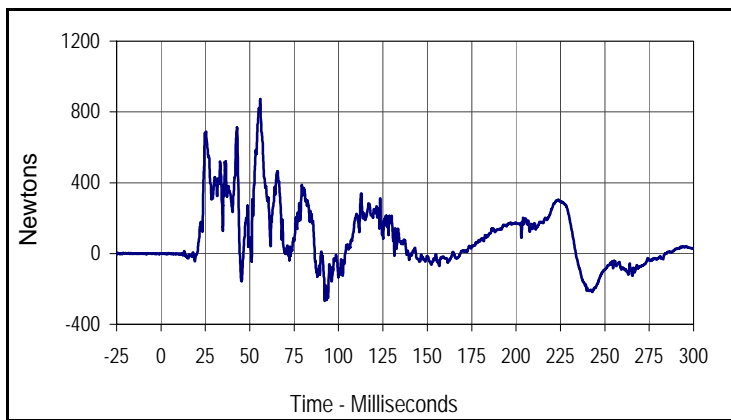
Curve Description			
Passenger Chest Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
023	RES	180	G's
Max	Time	Min	Time
48.9	41.7	0.0	3.4

Test Vehicle: 2015 Kia Sedona L 5-Door MPV  
 Test Program: 56 km/h Frontal Impact NCAP Test

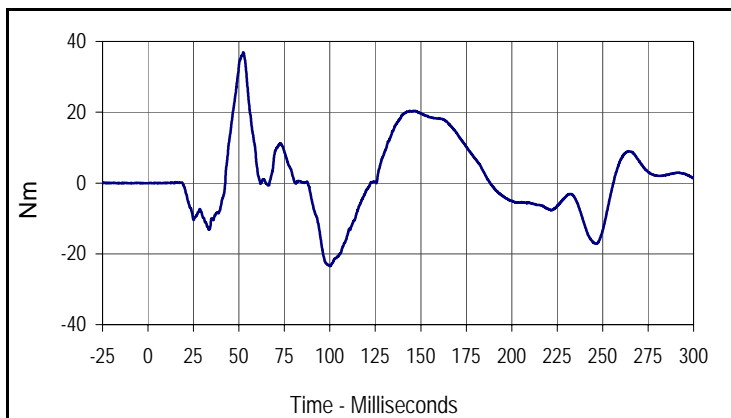
NHTSA No.: M20154200  
 Test Date: 3/9/15



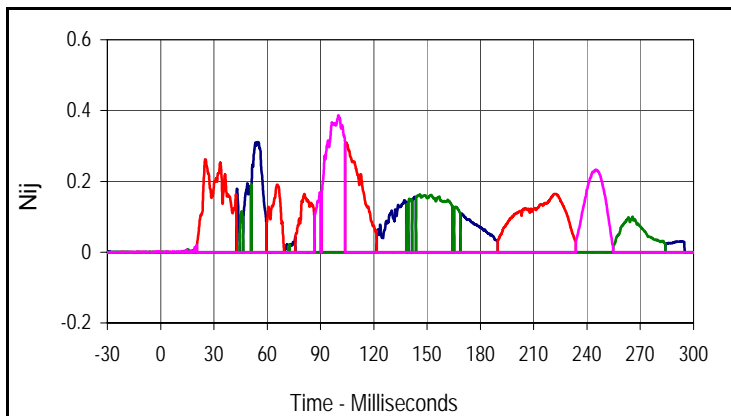
Curve Description			
Passenger Upper Neck Force X			
Plot No.	Type	SAE Class	Units
024	FIL	1000	Newtons
Max	Time	Min	Time
480.9	72.6	-264.3	246.7



Curve Description			
Passenger Upper Neck Force Z			
Plot No.	Type	SAE Class	Units
025	FIL	1000	Newtons
Max	Time	Min	Time
872.9	55.9	-268.3	92.2



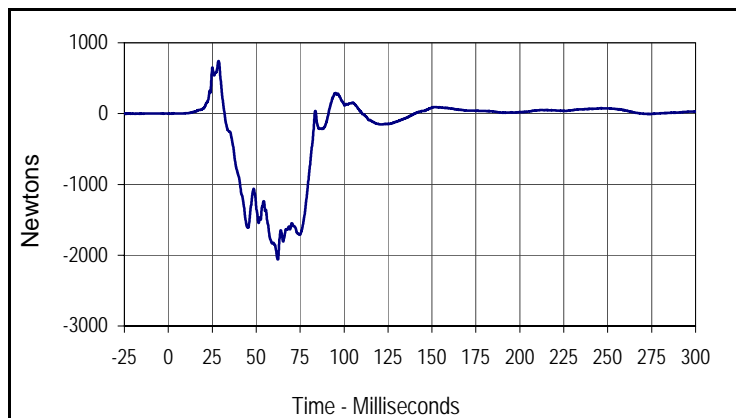
Curve Description			
Passenger Upper Neck Moment Y			
Plot No.	Type	SAE Class	Units
026	FIL	600	Nm
Max	Time	Min	Time
36.9	52.4	-23.5	100.3



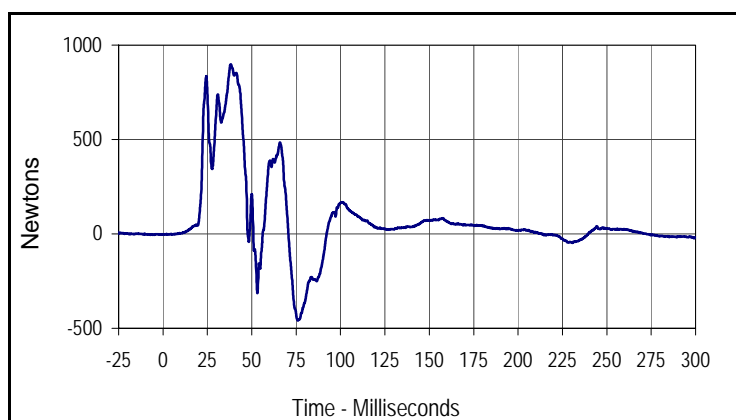
Curve Description			
Passenger Nij			
Units	Type	Max	Time
Ntf	FIL	0.31	55.0
Units	Type	Max	Time
Nte	FIL	0.31	104.5
Units	Type	Max	Time
Ncf	FIL	0.19	51.1
Units	Type	Max	Time
Nce	FIL	0.39	100.1

Test Vehicle: 2015 Kia Sedona L 5-Door MPV  
 Test Program: 56 km/h Frontal Impact NCAP Test

NHTSA No.: M20154200  
 Test Date: 3/9/15



Curve Description			
Passenger Left Femur Force Z			
Plot No.	Type	SAE Class	Units
027	FIL	600	Newtons
Max	Time	Min	Time
744.5	28.6	-2061.9	62.3



Curve Description			
Passenger Right Femur Force Z			
Plot No.	Type	SAE Class	Units
028	FIL	600	Newtons
Max	Time	Min	Time
898.1	38.1	-457.3	75.9

**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: 3/2/15



ATD Serial No.: 360

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 or replacement of parts:

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Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 3/2/15

ATD Serial No.: 360

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	886	Pass
B - Shoulder pivot height	mm	505 to 521	510	Pass
C - H point height	mm	84 to 89	86	Pass
D - H point location from backline	mm	135 to 140	139	Pass
E - Shoulder pivot from backline	mm	84 to 94	91	Pass
F - Thigh clearance	mm	140 to 155	147	Pass
G - Back of elbow to wrist pivot	mm	290 to 305	298	Pass
H - Head back to backline	mm	41 to 46	44	Pass
I - Shoulder to elbow length	mm	330 to 345	337	Pass
J - Elbow rest height	mm	190 to 211	205	Pass
K - Buttock to knee length	mm	579 to 604	587	Pass
L - Popliteal length	mm	429 to 455	437	Pass
M - Knee pivot height	mm	485 to 500	495	Pass
N - Buttock popliteal length	mm	452 to 477	473	Pass
O - Chest depth without jacket	mm	213 to 229	227	Pass
P - Foot length	mm	251 to 267	263	Pass
V - Shoulder breadth	mm	422 to 437	436	Pass
W - Foot breadth	mm	91 to 107	99	Pass
Y - Chest circumference (with chest jacket)	mm	970 to 1001	982	Pass
Z - Waist circumference	mm	836 to 866	865	Pass
AA - Location for chest circumference	mm	429 to 434	431	Pass
BB - Location for waist circumference	mm	226 to 231	231	Pass
Overall Test Results			Pass	

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

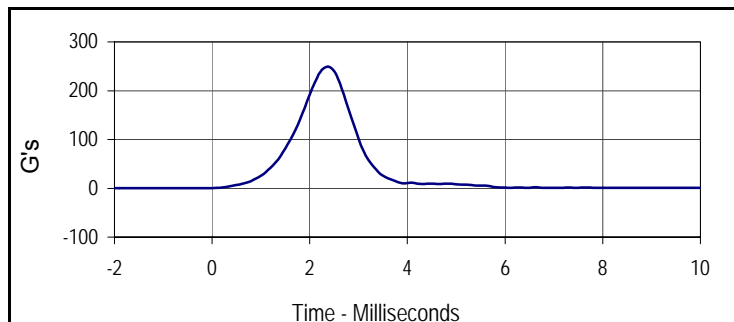
Test Date: 3/2/15



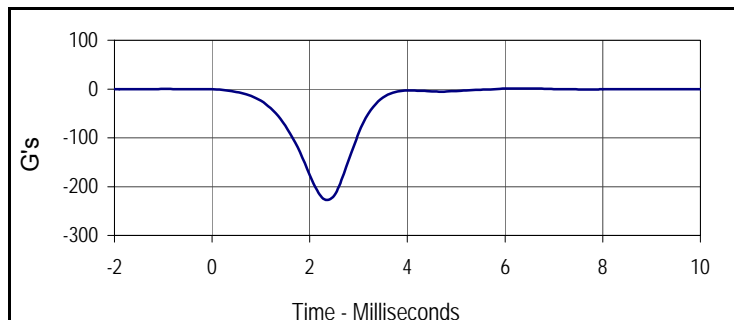
ATD Serial No.: 360

Test I.D.: M360HD007

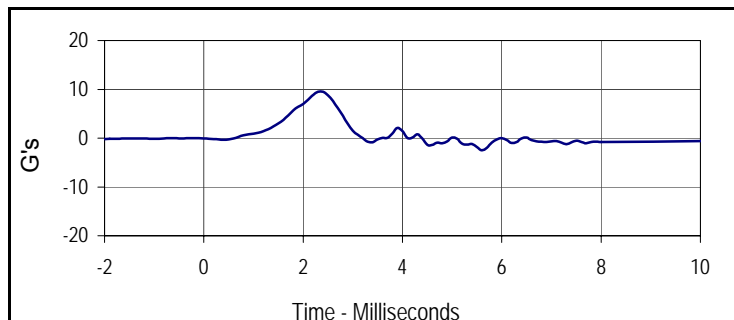
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	285	Pass
Temperature During Soak	Max	18.9 to 25.6	21.6	Pass
	Min		21.5	Pass
Humidity During Soak	Max	10.0 to 70.0	28.3	Pass
	Min		28.1	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	28.2	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	248.6	Pass
Peak Lateral Acceleration	G's	≤15.0	9.5	Pass
Oscillations After Main Pulse	%	<10% of peak Res. Acceleration	4.5	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass



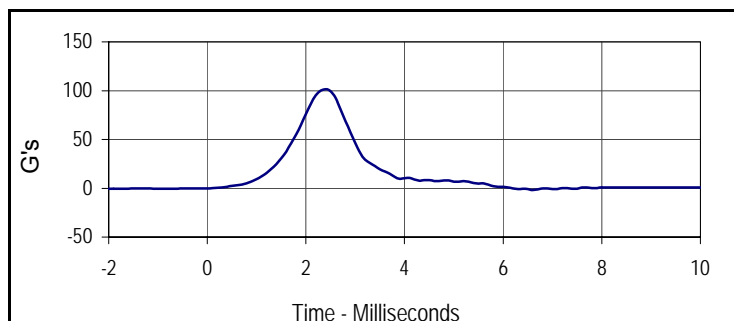
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
248.6	2.4	0.2	-0.3



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.7	6.0	-226.7	2.4



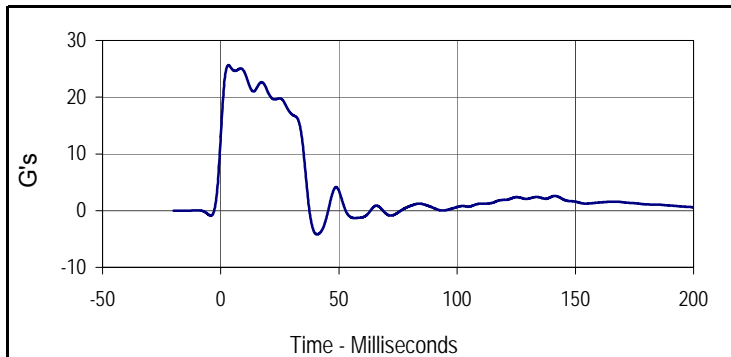
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
9.5	2.3	-2.5	5.6



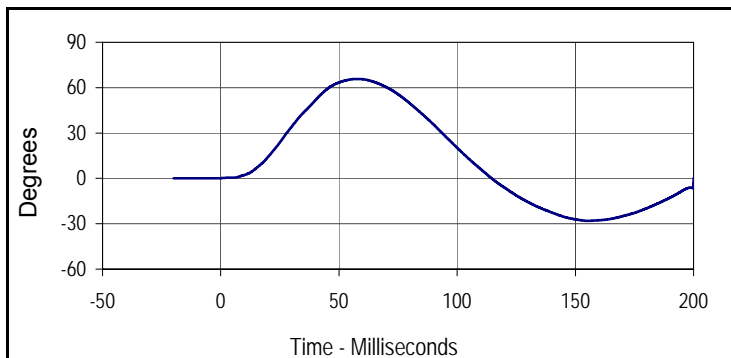
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
101.5	2.4	-0.5	-1.7



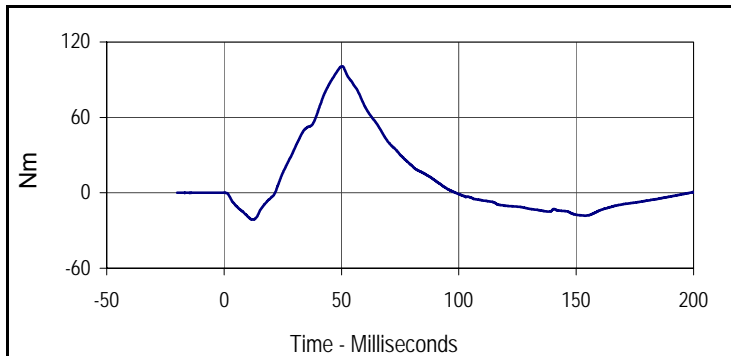
Tested Parameter	Units	Specification	Result	Pass/Fail	
Neck Assembly Soak Time	Minutes	≥240	350	Pass	
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass	
	Min		21.5	Pass	
Humidity During Soak	Max	10.0 to 70.0	28.3	Pass	
	Min		28.1	Pass	
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass	
Laboratory Humidity During Test	%	10.0 to 70.0	28.1	Pass	
Pendulum Velocity	m/s	6.89 to 7.13	6.91	Pass	
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	24.4	Pass
	20 Msec.	G's	17.6 to 22.6	20.9	Pass
	30 Msec.	G's	12.5 to 18.5	17.0	Pass
Peak Pendulum Decel. after 30 Msec.	G's	≤ 29.0	17.0	Pass	
Deceleration Decay, Time to Cross 5 G's	Msec.	34.0 to 42.0	36.3	Pass	
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	65.7	Pass
	Time	Msec.	57.0 to 64.0	57.6	Pass
"D" Plane Rotation Decay, Time To Zero Crossing	Msec.	113.0 to 128.0	114.6	Pass	
Moment About Occ. Condyle	Max	Nm	88.1 to 108.5	100.6	Pass
	Time	Msec.	47.0 to 58.0	50.3	Pass
Positive Moment Decay, Time To Zero Crossing	Msec.	97.0 to 107.0	98.7	Pass	
<b>Overall Test Results</b>				<b>Pass</b>	



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
25.6	3.2	-4.2	40.8



Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
65.7	57.6	-28.0	155.5



Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
100.6	50.3	-21.4	12.0

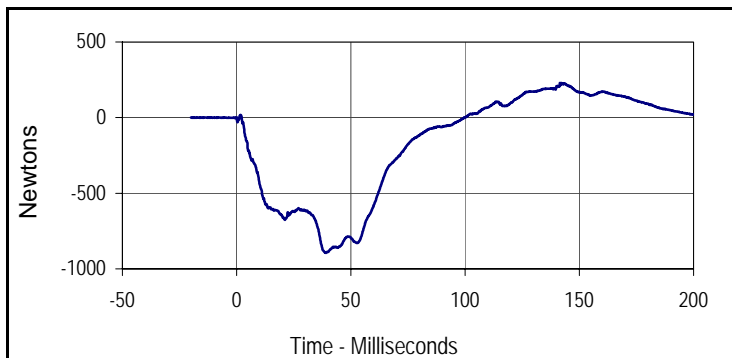
Test Program: Hybrid III 50th Percentile Male Neck Flexion Test

Test Date: 3/2/15

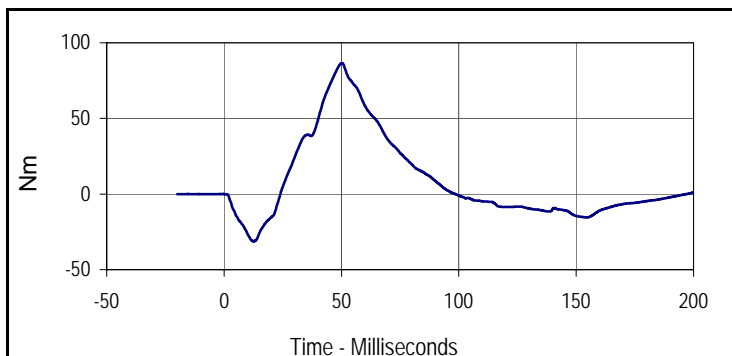


ATD Serial No.: 360

Test I.D.: M360NF007



Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
229.8	141.5	-894.4	39.2



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
86.4	50.2	-31.4	12.8

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

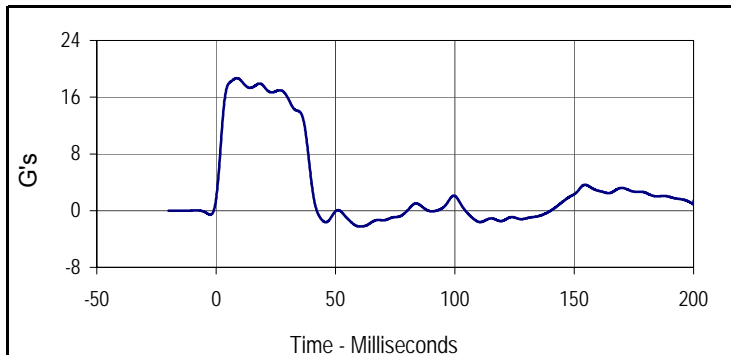
Test Date: 3/2/15



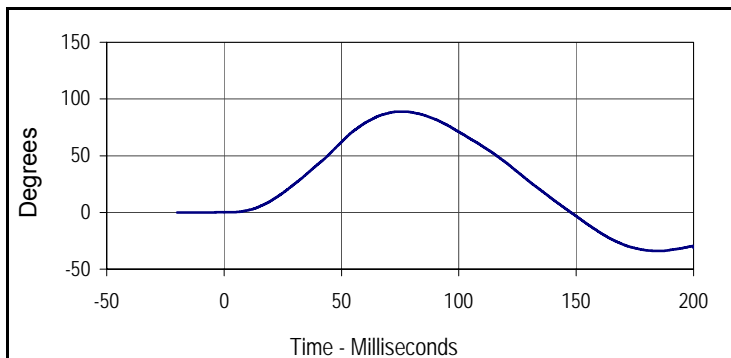
ATD Serial No.: 360

Test I.D.: M360NE007

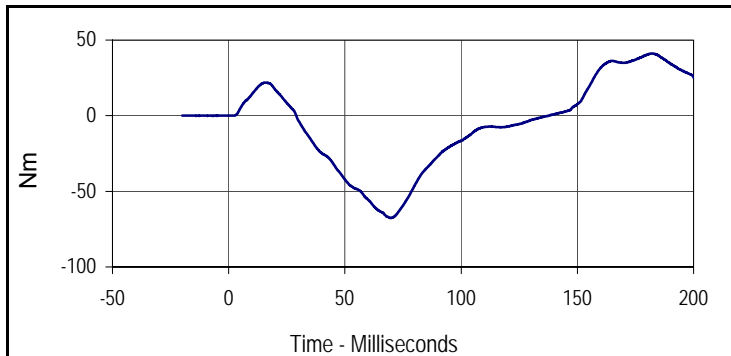
Tested Parameter	Units	Specification	Result	Pass/Fail	
Neck Assembly Soak Time	Minutes	≥240	395	Pass	
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass	
	Min		21.5	Pass	
Humidity During Soak	Max	10.0 to 70.0	28.3	Pass	
	Min		28.1	Pass	
Laboratory Temperature During Test	°C	20.6 to 22.2	21.6	Pass	
Laboratory Humidity During Test	%	10.0 to 70.0	28.2	Pass	
Pendulum Velocity	m/s	5.94 to 6.19	5.98	Pass	
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.5	Pass
	20 Msec.	G's	14.0 to 19.0	17.5	Pass
	30 Msec.	G's	11.0 to 16.0	15.9	Pass
Peak Pendulum Decel. after 30 Msec.	G's	≤ 22.0	15.9	Pass	
Deceleration Decay, Time to Cross 5 G's	Msec.	38.0 to 46.0	39.6	Pass	
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	88.8	Pass
	Time	Msec.	72.0 to 82.0	76.9	Pass
"D" Plane Rotation Decay, Time To Zero Crossing	Msec.	147.0 to 174.0	147.8	Pass	
Moment About Occ. Condyle	Max	Nm	-52.9 to -79.9	-67.6	Pass
	Time	Msec.	65.0 to 79.0	69.9	Pass
Positive Moment Decay, Time To Zero Crossing	Msec.	120.0 to 148.0	137.6	Pass	
<b>Overall Test Results</b>				<b>Pass</b>	



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
18.7	8.7	-2.2	60.2



Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
88.8	76.9	-34.0	185.1



Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
41.0	181.8	-67.6	69.9

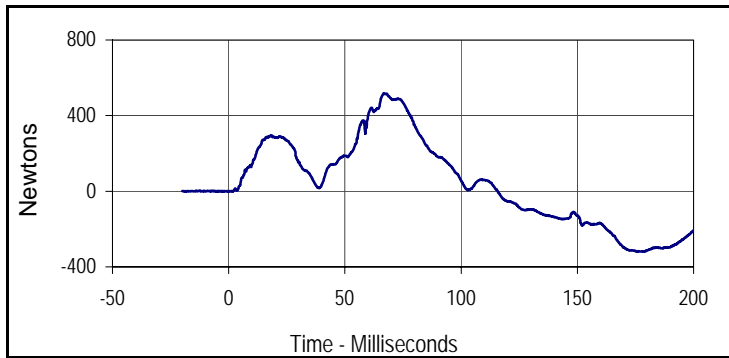
Test Program: Hybrid III 50th Percentile Male Neck Extension Test

Test Date: 3/2/15

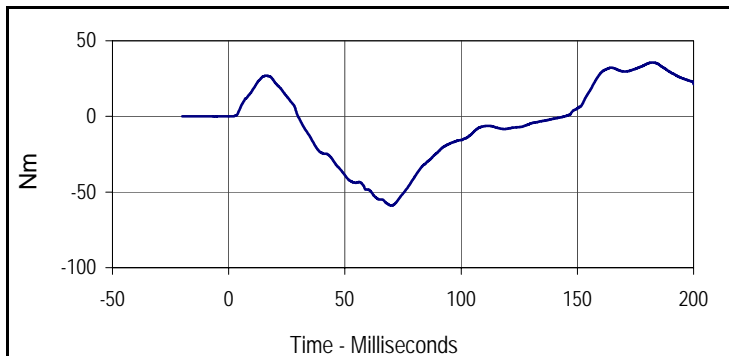


ATD Serial No.: 360

Test I.D.: M360NE007



Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
519.0	66.7	-319.8	175.8



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
35.7	182.6	-58.9	70.0

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

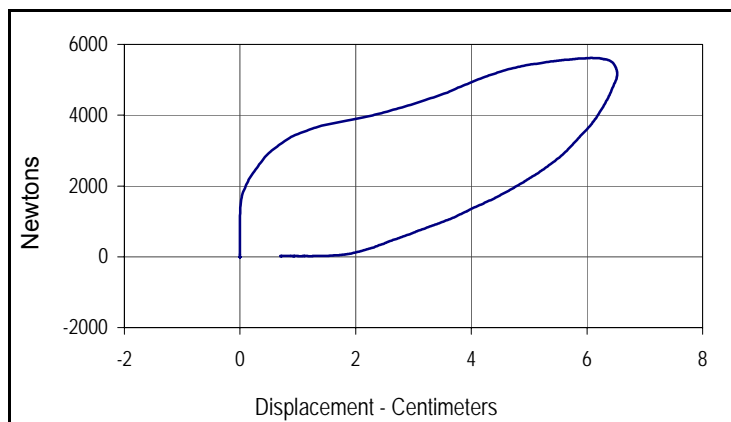
Test Date: 3/2/15



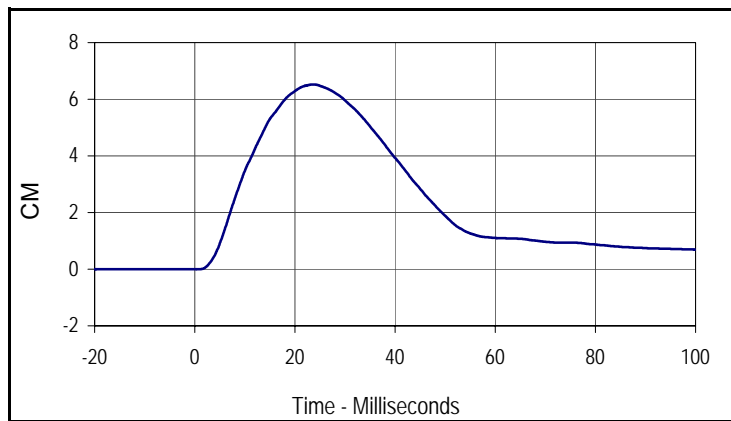
ATD Serial No.: 360

Test I.D.: M360CH007

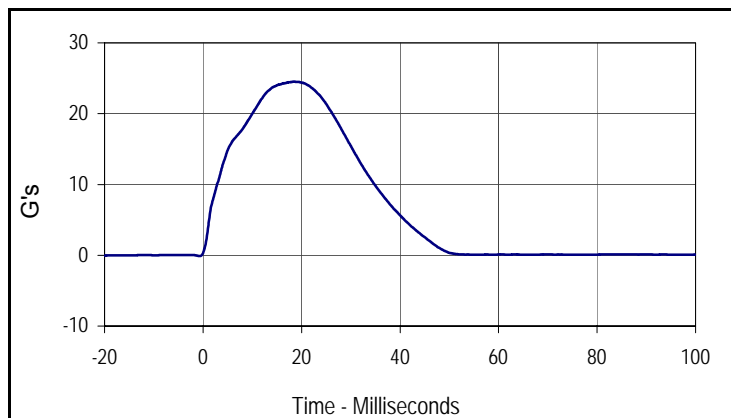
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	470	Pass
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass
	Min		21.5	Pass
Humidity During Soak	Max	10.0 to 70.0	28.3	Pass
	Min		28.1	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	28.3	Pass
Probe Velocity	m/s	6.58 to 6.82	6.75	Pass
Peak Probe Force	Newtons	5159 to 5893	5616	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.52	Pass
Internal Hysteresis	%	69 to 85	71.5	Pass
Overall Test Results				Pass



Curve Description			
Probe Force vs. Chest Deflection			
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	71.5
Peak Probe Force		Peak Chest Deflection	
5616		6.52	



Curve Description			
Chest Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	180	CM
Max	Time	Min	Time
6.5	23.7	0.0	0.7



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
24.5	18.4	-0.1	-0.7

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

Test Date: 3/2/15



ATD Serial No.: 360

Test I.D.: M360LK007, M360RK007

**Left Knee**

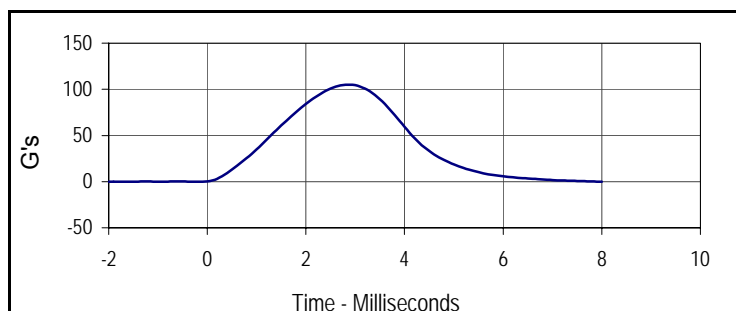
Tested Parameter	Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time	Minutes	≥240	525	Pass
Temperature During Soak	Max	18.9 to 25.6	21.6	Pass
	Min		21.5	Pass
Humidity During Soak	Max	10.0 to 70.0	28.3	Pass
	Min		28.1	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	28.3	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5142	Pass
<b>Overall Test Results</b>				<b>Pass</b>

**Right Knee**

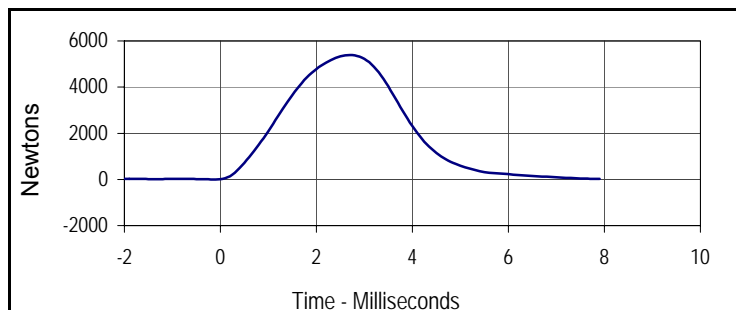
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5394	Pass
<b>Overall Test Results</b>				<b>Pass</b>



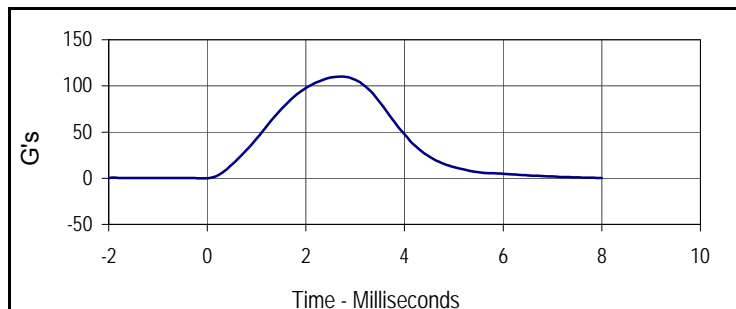
Curve Description			
Left Knee Probe Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5141.8	2.9	-12.3	-0.1



Curve Description			
Left Knee Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
105.1	2.9	-1.3	0.0



Curve Description			
Right Knee Probe Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
5394.2	2.7	-5.1	-0.1



Curve Description			
Right Knee Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
110.2	2.7	-0.4	0.0

Test Program: Hybrid III 50th Percentile Male Hip Joint-Femur Flexion Test  
 ATD Serial No.: 360

Test Date: 3/2/15  
 Test I.D.: M360LF007, M360RF007

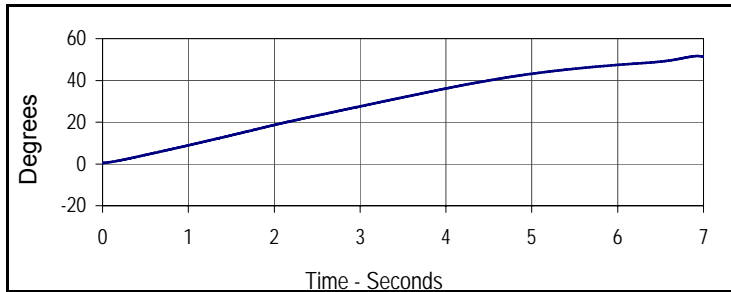


**Left Hip Joint-Femur Results**

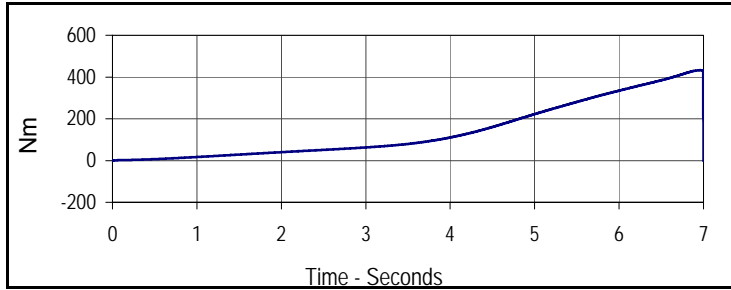
Tested Parameter	Units	Specification	Result	Pass/Fail
Hip Joint-Femur Assembly Soak Time	Minutes	≥240	600	Pass
Temperature During Soak	Max	18.9 to 25.6	21.6	Pass
	Min		21.5	Pass
Humidity During Soak	Max	10.0 to 70.0	28.3	Pass
	Min		28.1	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	28.3	Pass
Rotation Rate	deg/sec	5 to 10	7.5	Pass
Femur Torque at 30°	Nm	≤ 95	68.5	Pass
Rotation at 203 Nm	Degrees	40.0 to 50.0	41.8	Pass
<b>Overall Test Results</b>				<b>Pass</b>

**Right Hip Joint-Femur Results**

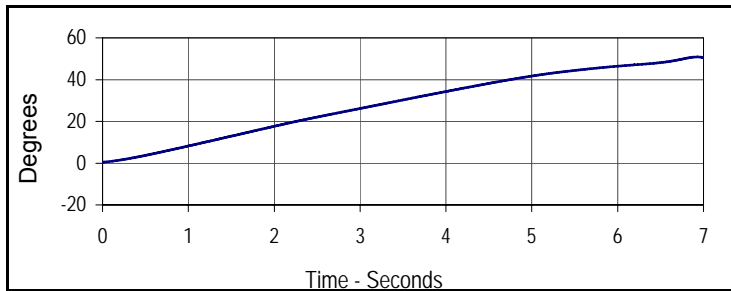
Rotation Rate	deg/sec	5 to 10	7.3	Pass
Femur Torque at 30°	Nm	≤ 95	80.7	Pass
Rotation at 203 Nm	Degrees	40.0 to 50.0	41.8	Pass
<b>Overall Test Results</b>				<b>Pass</b>



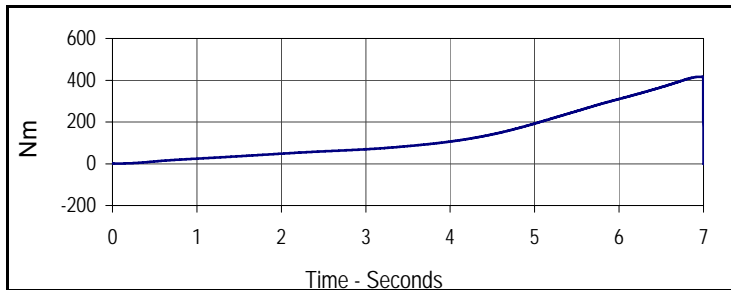
Curve Description			
Left Hip-Femur Rotation			
Plot No.	Type	SAE Class	Units
001	FIL	60	Degrees
Max	Time	Min	Time
51.7	6.9	0.4	0.0



Curve Description			
Left Femur Torque			
Plot No.	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
432.3	7.0	0.4	0.0



Curve Description			
Right Hip-Femur Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
50.9	6.9	0.4	0.0



Curve Description			
Right Femur Torque			
Plot No.	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
416.5	7.0	0.4	0.0

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

Test Date: 3/3/15



ATD Serial No.: 141

Test I.D.: N/A

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

Describe the repair on or replacement of parts:

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Test Program: Hybrid III 5th Percentile Female External Measurements

Test Date: 3/3/15



ATD Serial No.: 141

Test I.D.: N/A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.24	Pass
Laboratory Relative Humidity	%	10 to 70	28.7	Pass
A - Total sitting height	mm	774.7 to 800.1	786	Pass
B - Shoulder pivot height	mm	431.8 to 457.2	450	Pass
C - H point height	mm	81.3 to 86.3	85	Pass
D - H point location from backline	mm	144.8 to 149.8	146	Pass
E - Shoulder pivot from backline	mm	68.6 to 83.8	77	Pass
F - Thigh clearance	mm	119.4 to 134.6	126	Pass
G - Back of elbow to wrist pivot	mm	243.9 to 259.1	250	Pass
H - Head back to backline	mm	40.7 to 45.7	44	Pass
I - Shoulder to elbow length	mm	276.8 to 297.2	285	Pass
J - Elbow rest height	mm	182.8 to 203.2	198	Pass
K - Buttock to knee length	mm	520.7 to 546.1	531	Pass
L - Popliteal length	mm	355.6 to 376.0	371	Pass
M - Knee pivot height	mm	393.7 to 419.1	402	Pass
N - Buttock popliteal length	mm	414.0 to 439.4	420	Pass
O - Chest depth without jacket	mm	175.3 to 190.5	186	Pass
P - Foot length	mm	218.5 to 233.7	221	Pass
R - Buttock to Knee Pivot Length	mm	457.2 to 482.6	473	Pass
S - Head Breadth	mm	137.1 to 147.3	144	Pass
T - Head Depth	mm	177.8 to 188.0	180	Pass
U - Hip Breadth	mm	299.7 to 314.9	302	Pass
V - Shoulder breadth	mm	350.5 to 365.7	359	Pass
W - Foot breadth	mm	78.8 to 94.0	90	Pass
X - Head circumference	mm	528.3 to 548.7	541	Pass
Y - Chest circumference (with chest jacket)	mm	850.8 to 881.3	864	Pass
Z - Waist circumference	mm	759.5 to 789.9	766	Pass
AA - Location for chest circumference	mm	299.7 to 309.9	300	Pass
BB - Location for waist circumference	mm	160.1 to 170.2	164	Pass
Overall Test Results				Pass

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

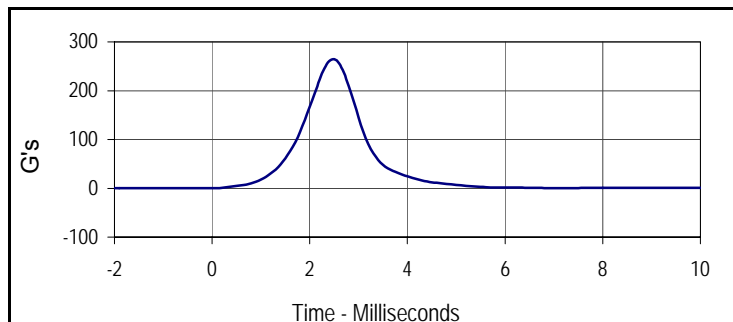
Test Date: 3/3/15



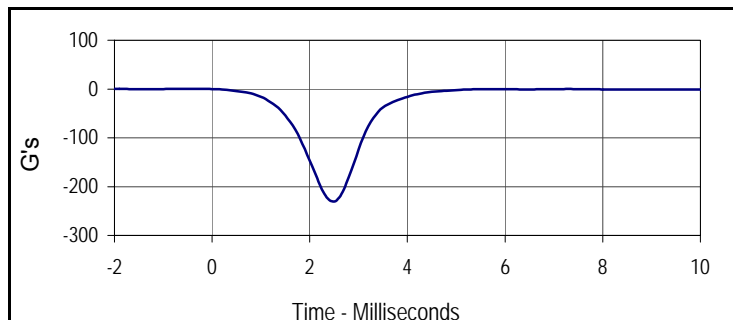
ATD Serial No.: 141

Test I.D.: F141HD066

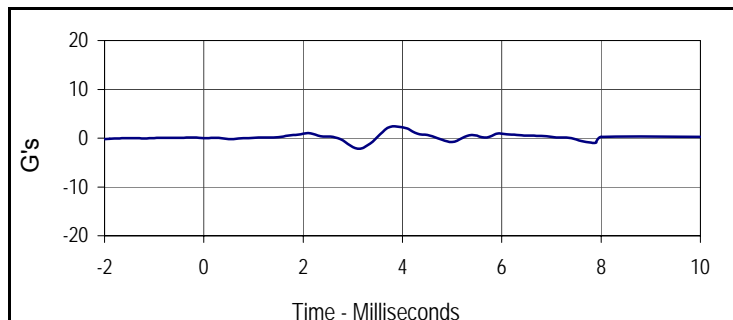
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	268	Pass
Temperature During Soak	Max	18.9 to 25.6	21.3	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	28.8	Pass
	Min		28.7	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	28.7	Pass
Peak Resultant Acceleration	G's	250.0 to 300.0	264.3	Pass
Peak Lateral Acceleration	G's	≤15.0	2.4	Pass
Oscillations After Main Pulse	%	<10% of peak Res. Acceleration	0.7	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
<b>Overall Test Results</b>				<b>Pass</b>



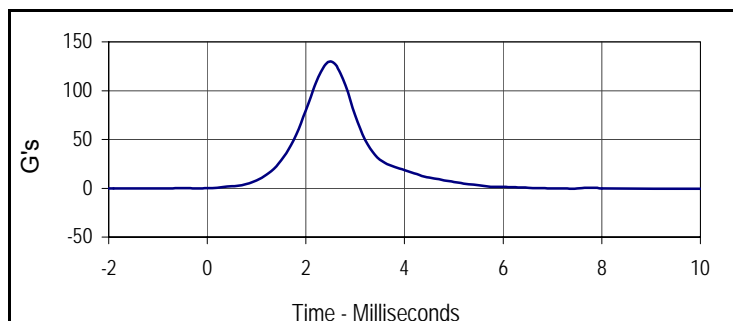
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
264.3	2.5	0.0	0.0



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.1	-2.0	-230.3	2.5



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
2.4	3.8	-2.2	3.1



Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
129.8	2.5	-0.3	-2.0

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

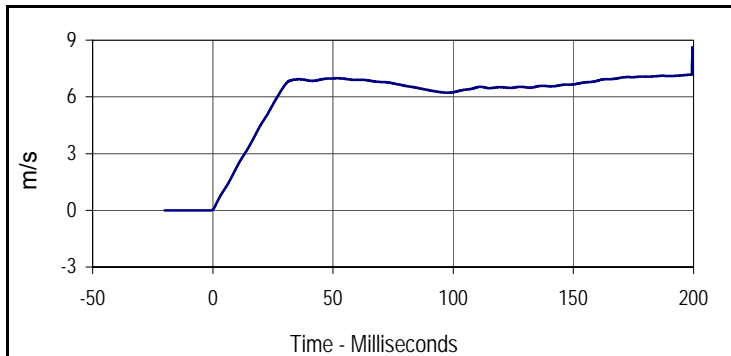
Test Date: 3/3/15



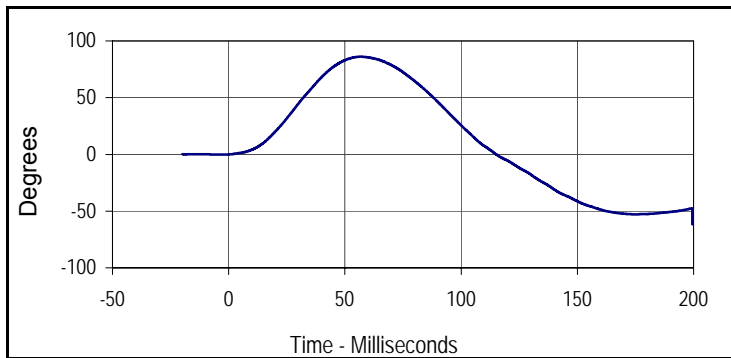
ATD Serial No.: 141

Test I.D.: F141NF066

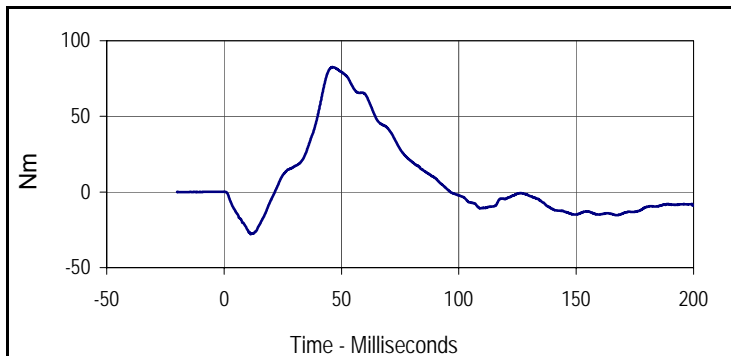
Tested Parameter	Units	Specification	Result	Pass/Fail	
Neck Assembly Soak Time	Minutes	≥240	333	Pass	
Temperature During Soak	Max	20.6 to 22.2	21.3	Pass	
	Min		21.1	Pass	
Humidity During Soak	Max	10.0 to 70.0	28.8	Pass	
	Min		28.7	Pass	
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass	
Laboratory Humidity During Test	%	10.0 to 70.0	28.7	Pass	
Pendulum Velocity	m/s	6.89 to 7.13	6.91	Pass	
Pendulum Deceleration	10 Msec.	m/s	2.1 to 2.5	2.3	Pass
	20 Msec.	m/s	4.0 to 5.0	4.5	Pass
	30 Msec.	m/s	5.8 to 7.0	6.6	Pass
"D" Plane Rotation	Max	Degrees	77.0 to 91.0	86.1	Pass
Peak Moment in Rotation	Max	Nm	69.0 to 83.0	82.7	Pass
Positive Moment Decay, Time To 10 Nm	Msec.	80.0 to 100.0	87.8	Pass	
Overall Test Results				Pass	



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
8.6	199.5	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	-61.3	199.5



Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
82.7	46.1	-27.9	11.3

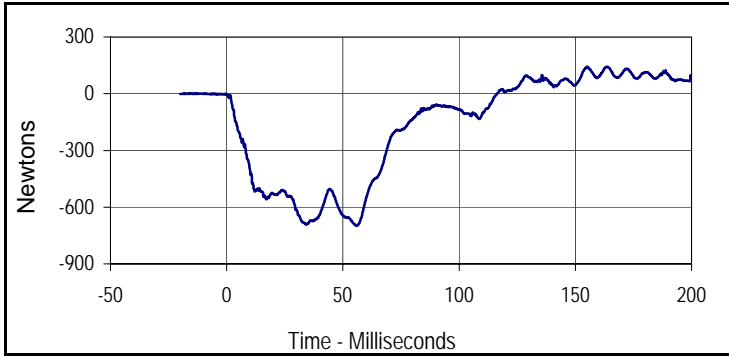
Test Program: Hybrid III 5th Percentile Female Neck Flexion Test

Test Date: 3/3/15

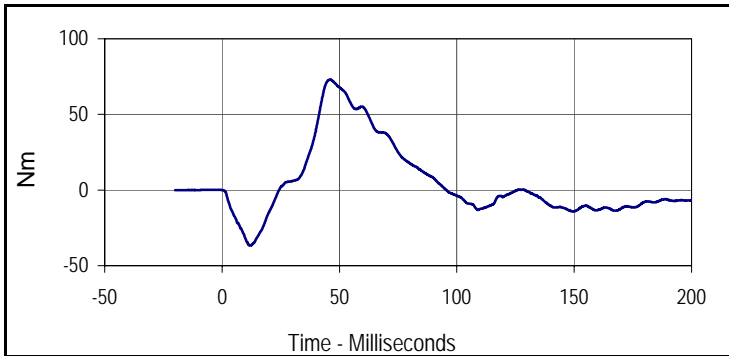


ATD Serial No.: 141

Test I.D.: F141NF066



Curve Description			
Upper Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
142.5	155.2	-698.0	55.8



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
73.1	46.0	-36.7	12.1

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

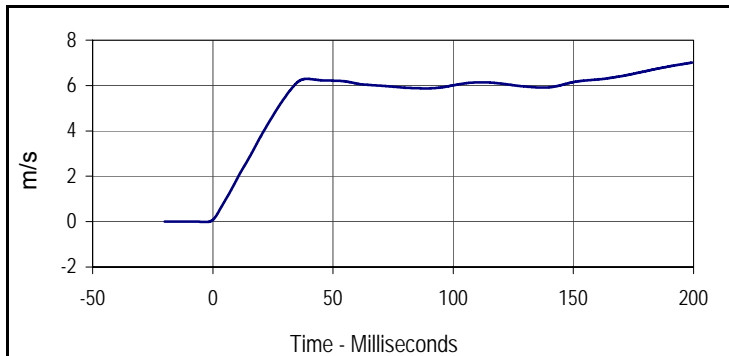
Test Date: 3/3/15



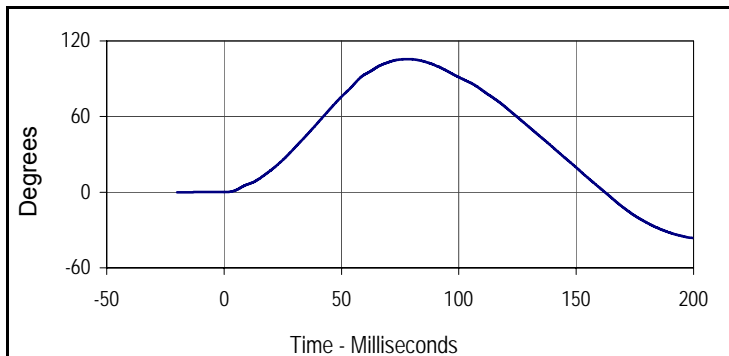
ATD Serial No.: 141

Test I.D.: F141NE066

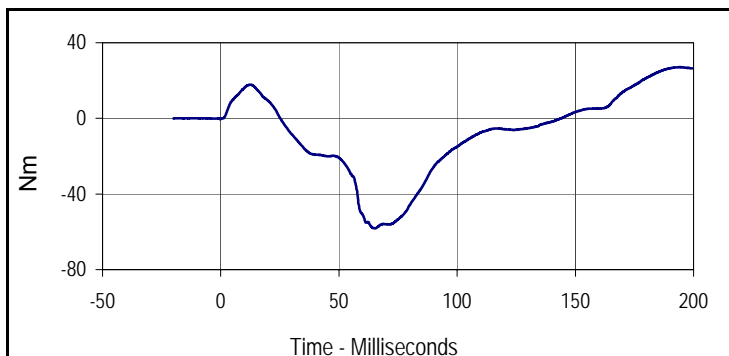
Tested Parameter	Units	Specification	Result	Pass/Fail	
Neck Assembly Soak Time	Minutes	≥240	398	Pass	
Temperature During Soak	Max	20.6 to 22.2	21.3	Pass	
	Min		21.1	Pass	
Humidity During Soak	Max	10.0 to 70.0	28.8	Pass	
	Min		28.7	Pass	
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass	
Laboratory Humidity During Test	%	10.0 to 70.0	28.7	Pass	
Pendulum Velocity	m/s	5.95 to 6.19	6.06	Pass	
Pendulum Deceleration	10 Msec.	m/s	1.5 to 1.9	1.9	Pass
	20 Msec.	m/s	3.1 to 3.9	3.8	Pass
	30 Msec.	m/s	4.6 to 5.6	5.5	Pass
"D" Plane Rotation	Max	Degrees	99.0 to 114.0	105.5	Pass
Peak Moment in Rotation	Max	Nm	-53.0 to -65.0	-58.1	Pass
Positive Moment Decay, Time To -10 Nm	Msec.	94.0 to 114.0	106.2	Pass	
Overall Test Results				Pass	



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
7.0	199.4	0.0	-2.8



Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
105.5	78.5	-36.3	199.4



Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
27.1	193.8	-58.1	65.4

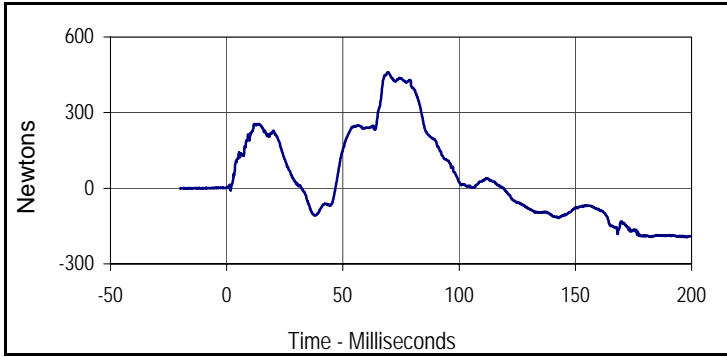
Test Program: Hybrid III 5th Percentile Female Neck Extension Test

Test Date: 3/3/15

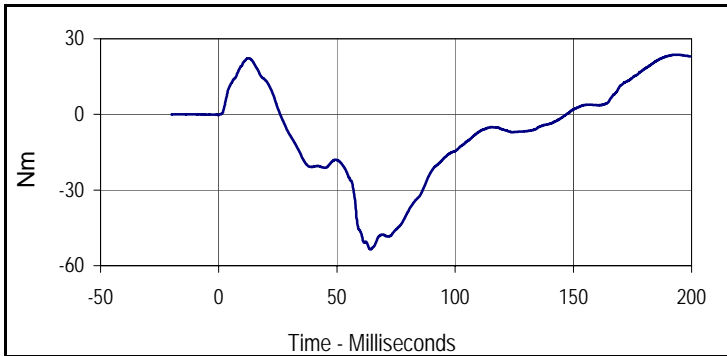


ATD Serial No.: 141

Test I.D.: F141NE066



Curve Description			
Upper Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
460.3	69.2	-194.4	197.9



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
23.7	192.6	-53.6	64.2

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

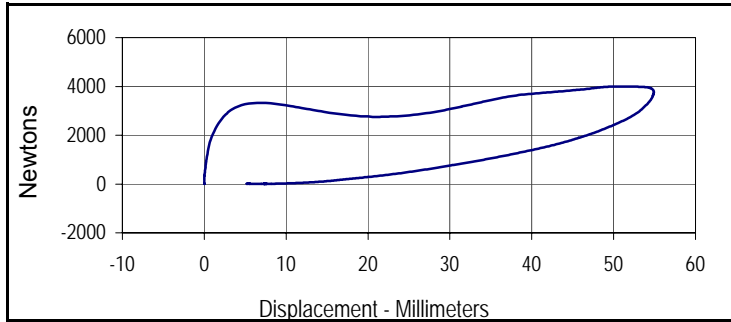
Test Date: 3/3/15



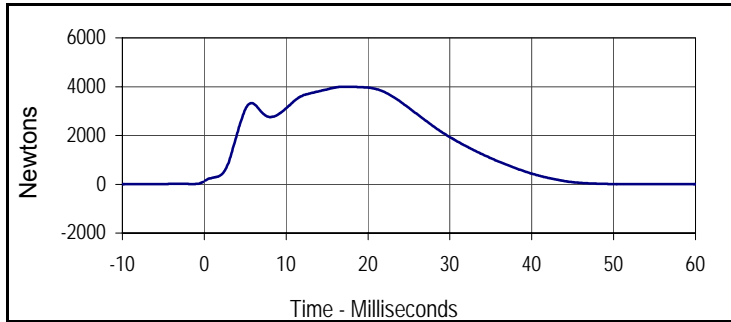
ATD Serial No.: 141

Test I.D.: F141CH066

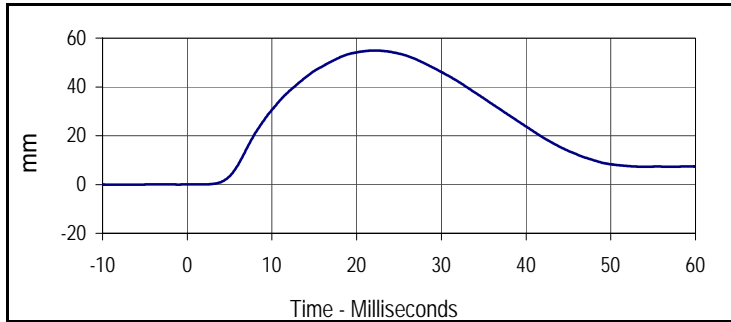
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	443	Pass
Temperature During Soak	Max	20.6 to 22.2	21.3	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	28.8	Pass
	Min		28.7	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	28.8	Pass
Probe Velocity	m/s	6.59 to 6.83	6.71	Pass
Peak Chest Deflection	mm	50.0 to 58.0	54.9	Pass
Peak Force Between 50 and 58 MM	Newtons	3900 to 4400	3996	Pass
Peak Force Between 18 and 50 MM	Newtons	≤4600	3998	Pass
Internal Hysteresis	%	69 to 85	72.4	Pass
Overall Test Results				Pass



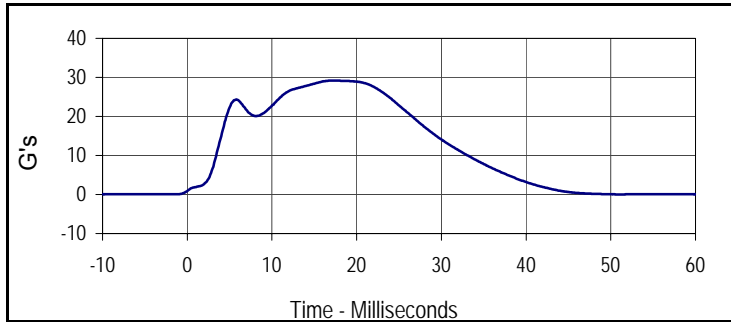
Curve Description			
Probe Force vs. Chest Deflection			
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	72.4
Peak Probe Force		Peak Chest Deflection	
3997.8		54.9	



Curve Description			
Probe Force			
Plot No.	Type	SAE Class	Units
002	FIL	180	Newtons
Max	Time	Min	Time
3997.8	17.0	4.9	50.8



Curve Description			
Chest Deflection			
Plot No.	Type	SAE Class	Units
003	FIL	180	mm
Max	Time	Min	Time
54.9	22.1	0.0	-7.2



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
29.2	17.0	0.0	0.0

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

Test Date: 3/3/15



ATD Serial No.: 141

Test I.D.: F141LK066, F141RK066

**Left Knee**

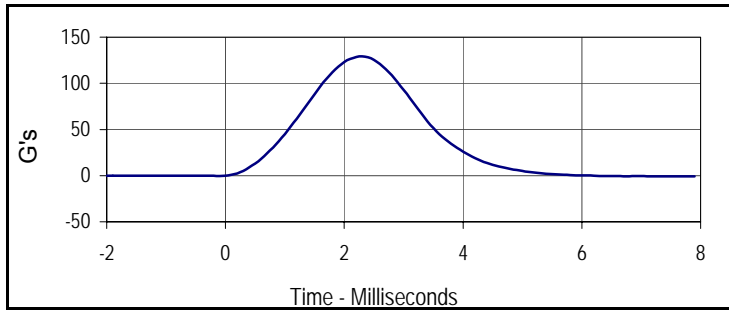
Tested Parameter	Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time	Minutes	≥240	498	Pass
Temperature During Soak	Max	18.9 to 25.6	21.3	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	28.8	Pass
	Min		28.7	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	28.8	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	3450 to 4060	3783	Pass
<b>Overall Test Results</b>				<b>Pass</b>

**Right Knee**

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	3450 to 4060	3786	Pass
<b>Overall Test Results</b>				<b>Pass</b>



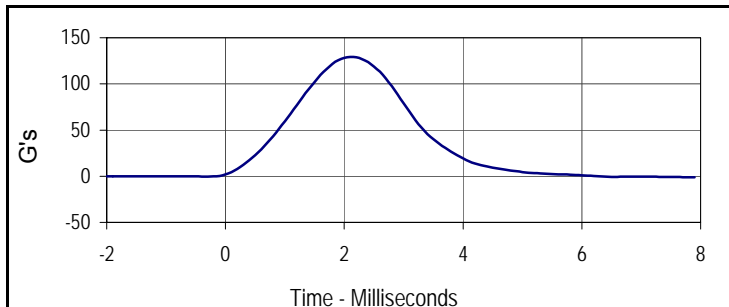
Curve Description			
Left Knee Probe Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3783.2	2.3	-25.2	7.9



Curve Description			
Left Knee Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
129.1	2.3	-1.2	0.0



Curve Description			
Right Knee Probe Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
3786.4	2.1	-31.8	7.9



Curve Description			
Right Knee Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
129.2	2.1	-1.2	0.0

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

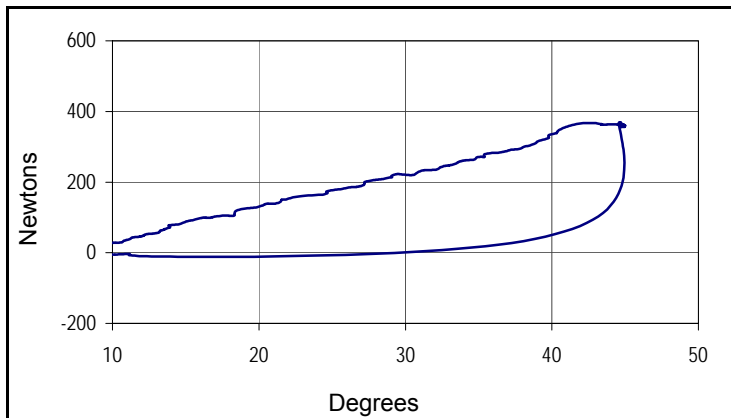
Test Date: 3/3/15



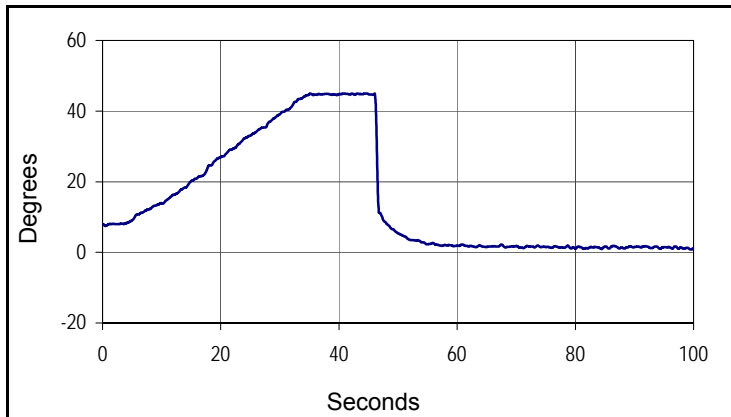
ATD Serial No.: 141

Test I.D.: TF066

Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	563	Pass
Temperature During Soak	Max	18.9 to 25.6	21.3	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	28.8	Pass
	Min		28.7	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	28.8	Pass
Initial Reference Plane Angle	Degrees	≤ 20	7.9	Pass
Peak Force at 45° +/-0.5°	Newtons	320.0 to 390.0	368.7	Pass
Torso Rotation Rate	deg/sec	0.5 to 1.5	1.0	Pass
Final Reference Plane Angle	Degrees	+/-8	1.1	Pass
Overall Test Results				Pass



Curve Description		
Force vs Torso Rotation		
Plot No.	Type	Filter Freq
001	FIL	1 Hz
Peak Force		Peak Rotation
368.7		45.0



Curve Description			
Torso Rotation			
Plot No.	Type	Filter Freq	Units
002	FIL	1 Hz	Degrees
Max	Time	Min	Time
45.0	43.1	0.8	99.5

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

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

Test Date: 3/10/15



ATD Serial No.: 360

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 or replacement of parts:

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Test Program: Hybrid III 50th Percentile Male External Measurements

Test Date: 3/10/15

ATD Serial No.: 360

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	886	Pass
B - Shoulder pivot height	mm	505 to 521	510	Pass
C - H point height	mm	84 to 89	86	Pass
D - H point location from backline	mm	135 to 140	139	Pass
E - Shoulder pivot from backline	mm	84 to 94	91	Pass
F - Thigh clearance	mm	140 to 155	147	Pass
G - Back of elbow to wrist pivot	mm	290 to 305	298	Pass
H - Head back to backline	mm	41 to 46	44	Pass
I - Shoulder to elbow length	mm	330 to 345	337	Pass
J - Elbow rest height	mm	190 to 211	205	Pass
K - Buttock to knee length	mm	579 to 604	587	Pass
L - Popliteal length	mm	429 to 455	437	Pass
M - Knee pivot height	mm	485 to 500	495	Pass
N - Buttock popliteal length	mm	452 to 477	473	Pass
O - Chest depth without jacket	mm	213 to 229	227	Pass
P - Foot length	mm	251 to 267	263	Pass
V - Shoulder breadth	mm	422 to 437	436	Pass
W - Foot breadth	mm	91 to 107	99	Pass
Y - Chest circumference (with chest jacket)	mm	970 to 1001	982	Pass
Z - Waist circumference	mm	836 to 866	865	Pass
AA - Location for chest circumference	mm	429 to 434	431	Pass
BB - Location for waist circumference	mm	226 to 231	231	Pass
Overall Test Results				Pass

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

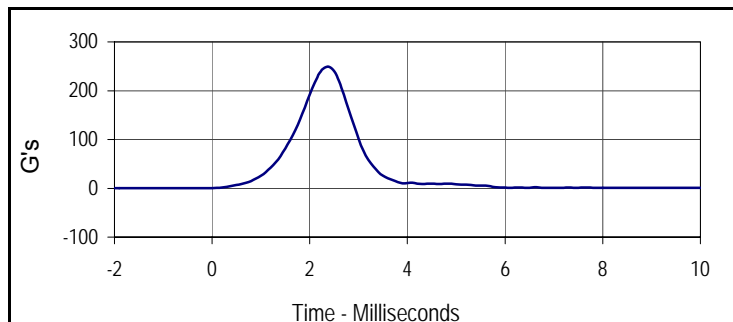
Test Date: 3/10/15



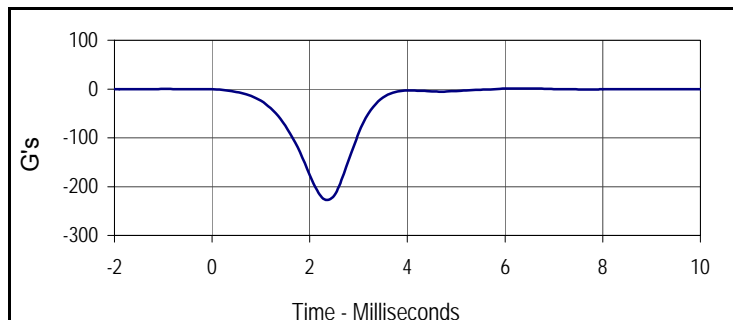
ATD Serial No.: 360

Test I.D.: M360HD008

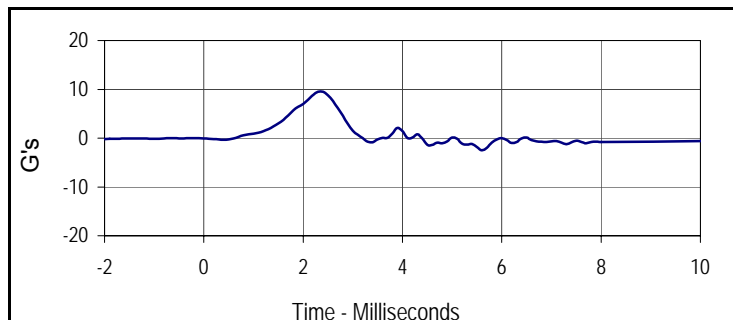
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	266	Pass
Temperature During Soak	Max	18.9 to 25.6	21.6	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	25.8	Pass
	Min		25.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	25.3	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	248.6	Pass
Peak Lateral Acceleration	G's	≤15.0	9.5	Pass
Oscillations After Main Pulse	%	<10% of peak Res. Acceleration	4.5	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
<b>Overall Test Results</b>				<b>Pass</b>



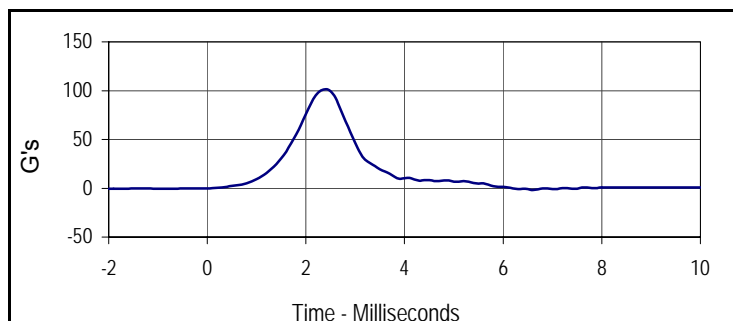
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
248.6	2.4	0.2	-0.3



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.7	6.0	-226.7	2.4



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
9.5	2.3	-2.5	5.6



Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
101.5	2.4	-0.5	-1.7

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

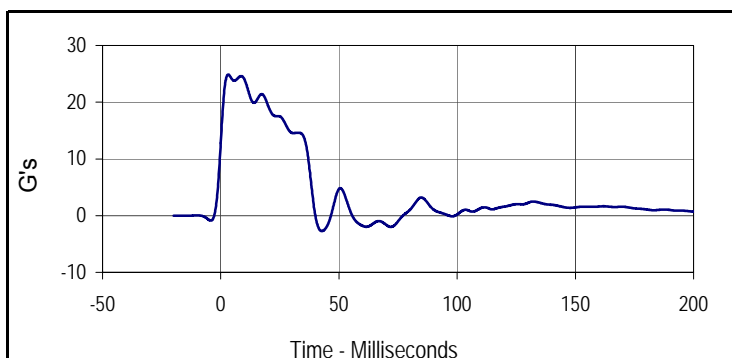
Test Date: 3/10/15



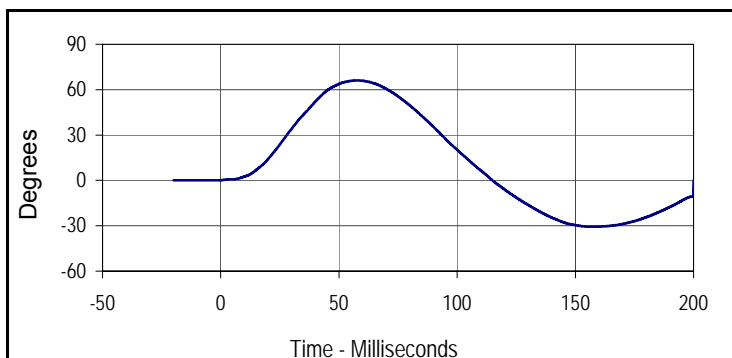
ATD Serial No.: 360

Test I.D.: M360NF008

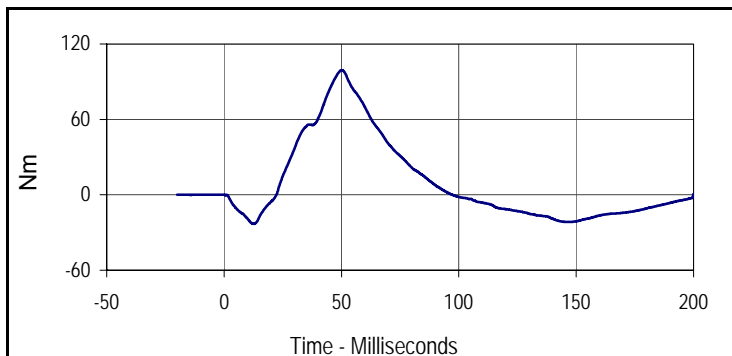
Tested Parameter	Units	Specification	Result	Pass/Fail	
Neck Assembly Soak Time	Minutes	≥240	331	Pass	
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass	
	Min		21.1	Pass	
Humidity During Soak	Max	10.0 to 70.0	25.8	Pass	
	Min		25.0	Pass	
Laboratory Temperature During Test	°C	20.6 to 22.2	21.1	Pass	
Laboratory Humidity During Test	%	10.0 to 70.0	25.1	Pass	
Pendulum Velocity	m/s	6.89 to 7.13	6.89	Pass	
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	24.0	Pass
	20 Msec.	G's	17.6 to 22.6	19.4	Pass
	30 Msec.	G's	12.5 to 18.5	14.6	Pass
Peak Pendulum Decel. after 30 Msec.	G's	≤ 29.0	14.6	Pass	
Deceleration Decay, Time to Cross 5 G's	Msec.	34.0 to 42.0	38.5	Pass	
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	66.1	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	Pass	
Moment About Occ. Condyle	Max	Nm	88.1 to 108.5	99.2	Pass
	Time	Msec.	47.0 to 58.0	50.1	Pass
Positive Moment Decay, Time To Zero Crossing	Msec.	97.0 to 107.0	97.3	Pass	
<b>Overall Test Results</b>				<b>Pass</b>	



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
24.9	3.1	-2.7	42.7



Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
66.1	57.7	-30.7	157.3



Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
99.2	50.1	-23.1	12.8

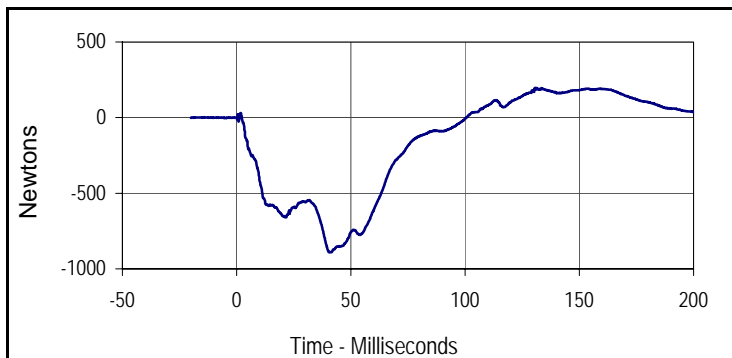
Test Program: Hybrid III 50th Percentile Male Neck Flexion Test

Test Date: 3/10/15

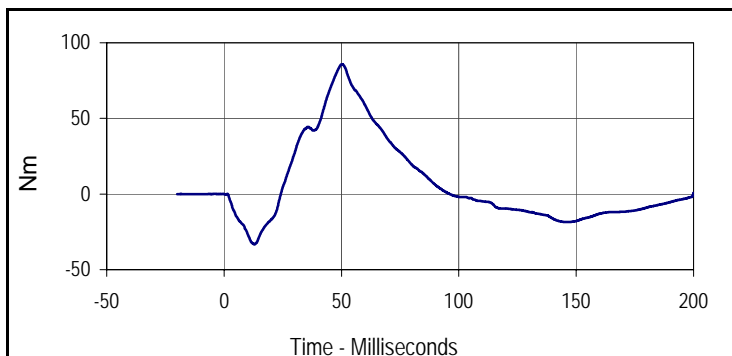


ATD Serial No.: 360

Test I.D.: M360NF008



Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
197.7	131.0	-890.8	41.0



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
85.8	50.2	-33.3	12.9

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

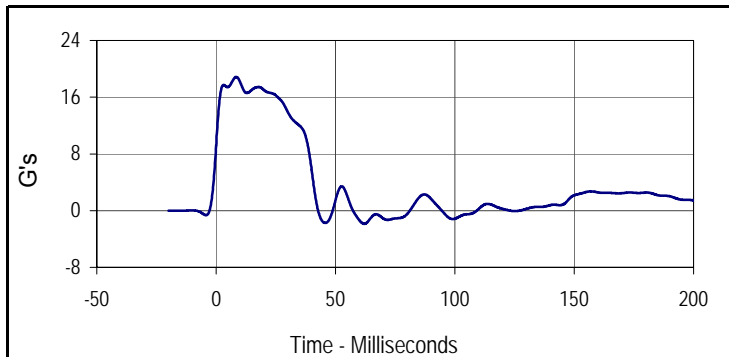
Test Date: 3/10/15



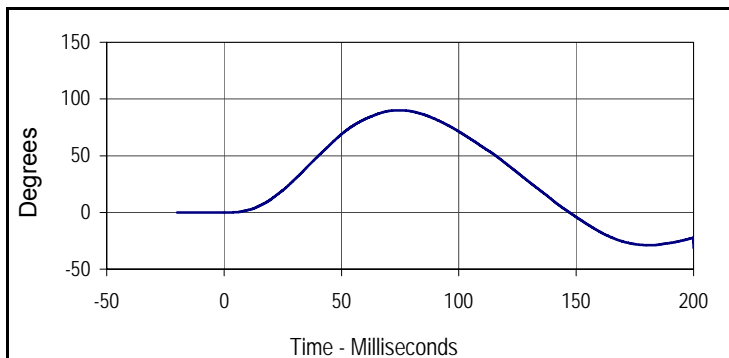
ATD Serial No.: 360

Test I.D.: M360NE008

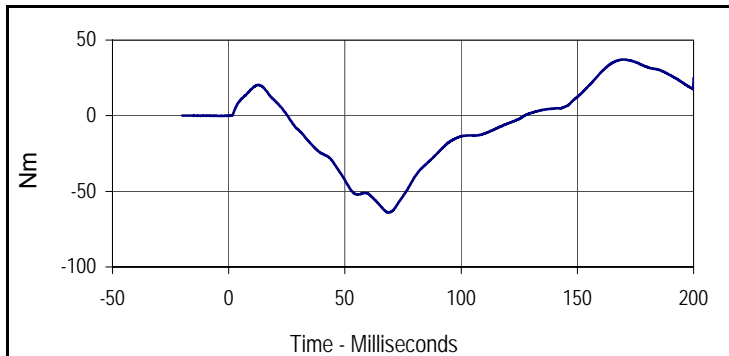
Tested Parameter	Units	Specification	Result	Pass/Fail	
Neck Assembly Soak Time	Minutes	≥240	376	Pass	
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass	
	Min		21.1	Pass	
Humidity During Soak	Max	10.0 to 70.0	25.8	Pass	
	Min		25.0	Pass	
Laboratory Temperature During Test	°C	20.6 to 22.2	21.1	Pass	
Laboratory Humidity During Test	%	10.0 to 70.0	25.4	Pass	
Pendulum Velocity	m/s	5.94 to 6.19	5.95	Pass	
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.2	Pass
	20 Msec.	G's	14.0 to 19.0	17.0	Pass
	30 Msec.	G's	11.0 to 16.0	13.9	Pass
Peak Pendulum Decel. after 30 Msec.	G's	≤ 22.0	13.9	Pass	
Deceleration Decay, Time to Cross 5 G's	Msec.	38.0 to 46.0	40.3	Pass	
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	90.0	Pass
	Time	Msec.	72.0 to 82.0	74.2	Pass
"D" Plane Rotation Decay, Time To Zero Crossing	Msec.	147.0 to 174.0	147.1	Pass	
Moment About Occ. Condyle	Max	Nm	-52.9 to -79.9	-64.0	Pass
	Time	Msec.	65.0 to 79.0	68.9	Pass
Positive Moment Decay, Time To Zero Crossing	Msec.	120.0 to 148.0	127.3	Pass	
<b>Overall Test Results</b>				<b>Pass</b>	



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
18.9	8.4	-1.9	62.1



Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
90.0	74.2	-31.3	200.0



Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
37.2	170.2	-64.0	68.9

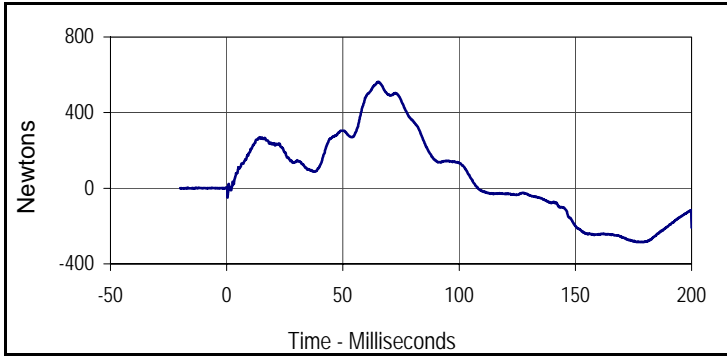
Test Program: Hybrid III 50th Percentile Male Neck Extension Test

Test Date: 3/10/15

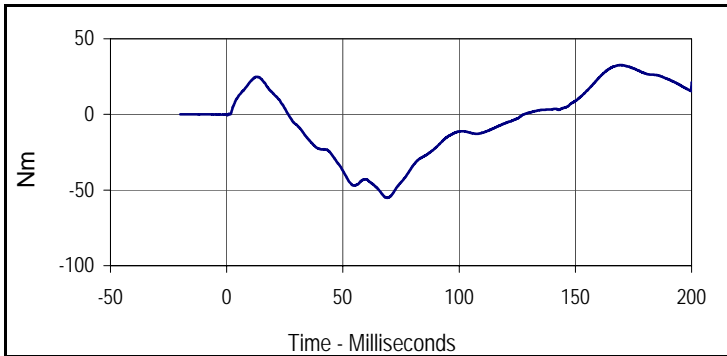


ATD Serial No.: 360

Test I.D.: M360NE008



Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
562.6	65.3	-285.5	179.3



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
32.6	169.2	-55.1	69.1

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

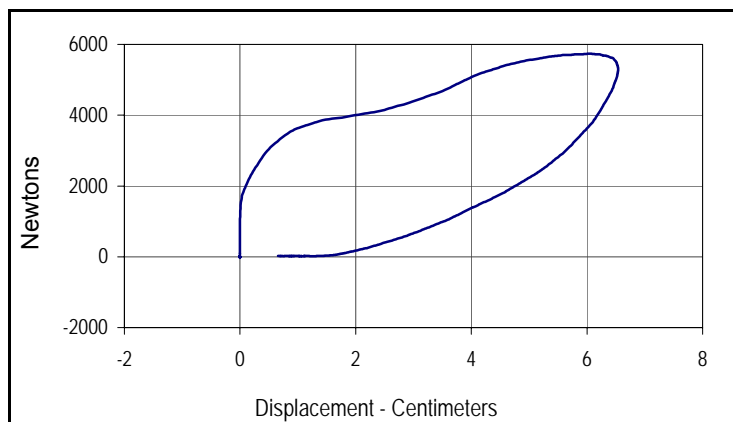
Test Date: 3/10/15



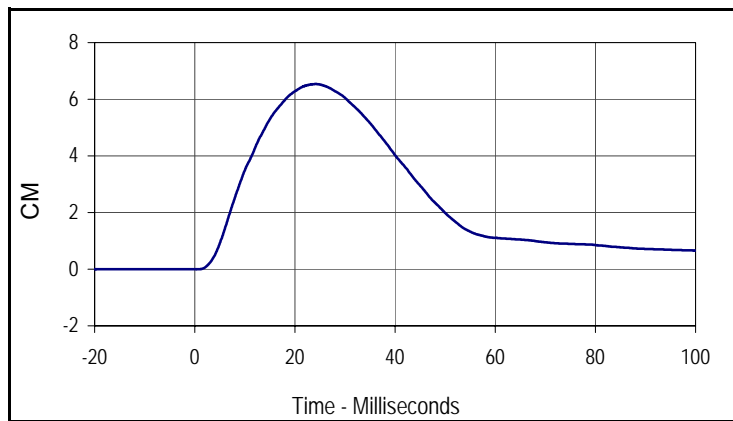
ATD Serial No.: 360

Test I.D.: M360CH008

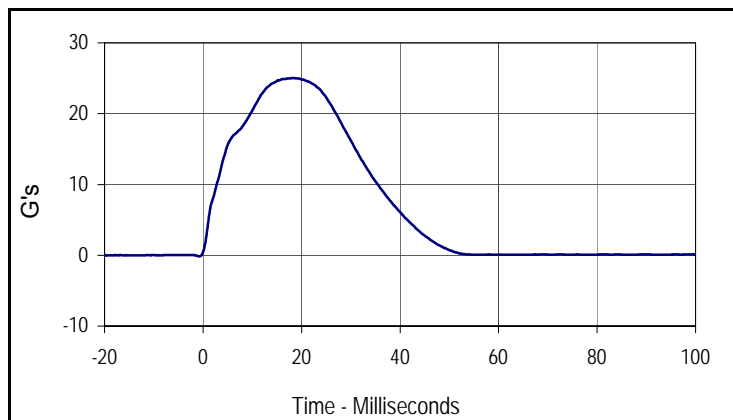
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	451	Pass
Temperature During Soak	Max	20.6 to 22.2	21.6	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	25.8	Pass
	Min		24.9	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	25.3	Pass
Probe Velocity	m/s	6.58 to 6.82	6.75	Pass
Peak Probe Force	Newtons	5159 to 5893	5737	Pass
Peak Sternum Deflection	CM	6.35 to 7.26	6.54	Pass
Internal Hysteresis	%	69 to 85	71.7	Pass
Overall Test Results				Pass



Curve Description			
Probe Force vs. Chest Deflection			
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	71.7
Peak Probe Force		Peak Chest Deflection	
5737		6.54	



Curve Description			
Chest Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	180	CM
Max	Time	Min	Time
6.5	24.1	0.0	0.5



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
25.0	18.3	-0.1	-0.8

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

Test Date: 3/10/15



ATD Serial No.: 360

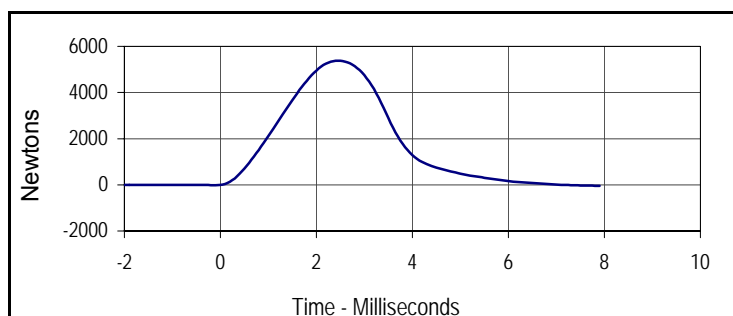
Test I.D.: M360LK008, M360RK008

**Left Knee**

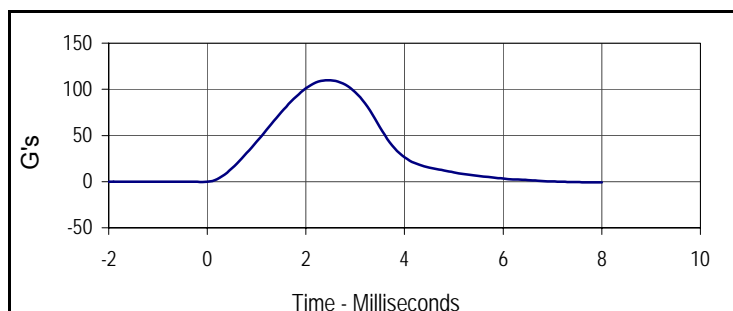
Tested Parameter	Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time	Minutes	≥240	506	Pass
Temperature During Soak	Max	18.9 to 25.6	21.6	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	25.8	Pass
	Min		25.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	25.3	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5378	Pass
<b>Overall Test Results</b>				<b>Pass</b>

**Right Knee**

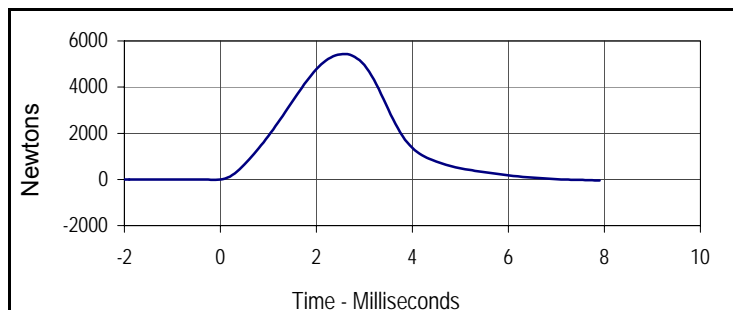
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5431	Pass
<b>Overall Test Results</b>				<b>Pass</b>



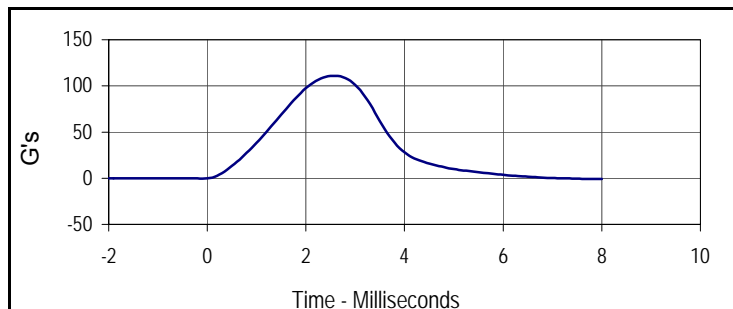
Curve Description			
Left Knee Probe Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5378.0	2.5	-42.4	7.9



Curve Description			
Left Knee Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
109.9	2.5	-1.2	0.0



Curve Description			
Right Knee Probe Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
5430.6	2.6	-44.4	7.9



Curve Description			
Right Knee Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
111.0	2.6	-1.1	0.0

Test Program: Hybrid III 50th Percentile Male Hip Joint-Femur Flexion Test  
 ATD Serial No.: 360

Test Date: 3/10/15  
 Test I.D.: M360LF008\_M360RF008

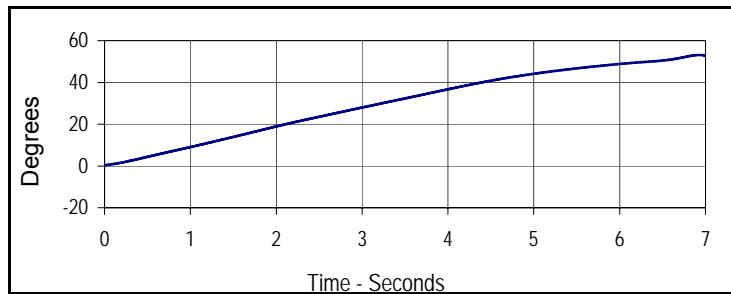


**Left Hip Joint-Femur Results**

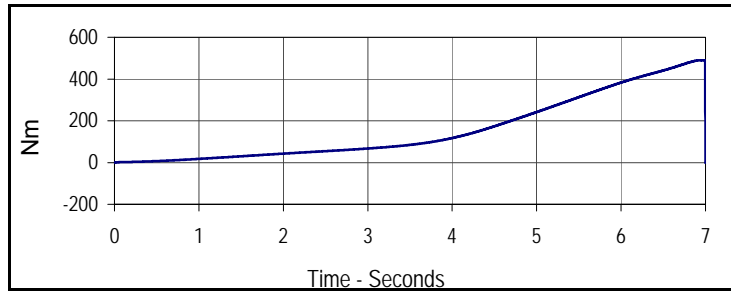
Tested Parameter	Units	Specification	Result	Pass/Fail
Hip Joint-Femur Assembly Soak Time	Minutes	≥240	581	Pass
Temperature During Soak	Max	18.9 to 25.6	21.6	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	25.8	Pass
	Min		25.0	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	25.8	Pass
Rotation Rate	deg/sec	5 to 10	7.7	Pass
Femur Torque at 30°	Nm	≤ 95	71.8	Pass
Rotation at 203 Nm	Degrees	40.0 to 50.0	41.9	Pass
<b>Overall Test Results</b>				<b>Pass</b>

**Right Hip Joint-Femur Results**

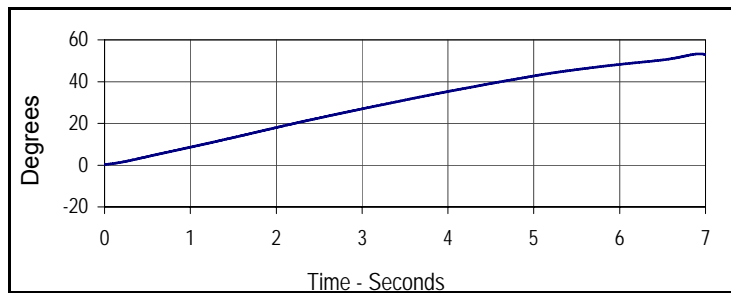
Rotation Rate	deg/sec	5 to 10	7.7	Pass
Femur Torque at 30°	Nm	≤ 95	82.9	Pass
Rotation at 203 Nm	Degrees	40.0 to 50.0	43.6	Pass
<b>Overall Test Results</b>				<b>Pass</b>



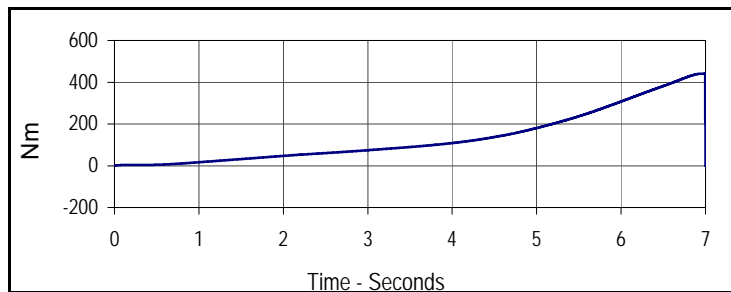
Curve Description			
Left Hip-Femur Rotation			
Plot No.	Type	SAE Class	Units
001	FIL	60	Degrees
Max	Time	Min	Time
53.1	6.9	0.4	0.0



Curve Description			
Left Femur Torque			
Plot No.	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
490.3	6.9	0.4	0.0



Curve Description			
Right Hip-Femur Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
53.3	6.9	0.4	0.0



Curve Description			
Right Femur Torque			
Plot No.	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
441.1	7.0	0.4	0.0

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

Test Date: 3/11/15



ATD Serial No.: 141

Test I.D.: N/A

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

Describe the repair on or replacement of parts:

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Test Program: Hybrid III 5th Percentile Female External Measurements

Test Date: 3/11/15



ATD Serial No.: 141

Test I.D.: N/A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.23	Pass
Laboratory Relative Humidity	%	10 to 70	27.4	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

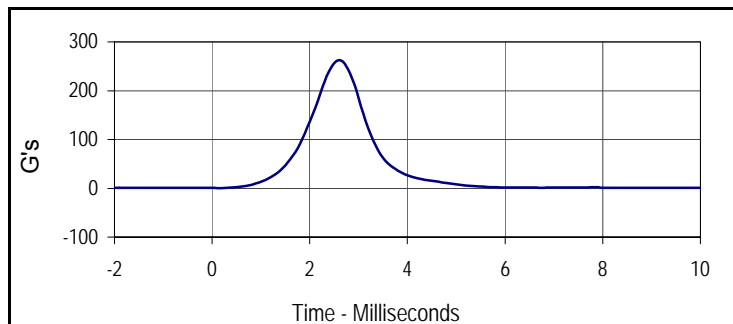
Test Date: 3/11/15



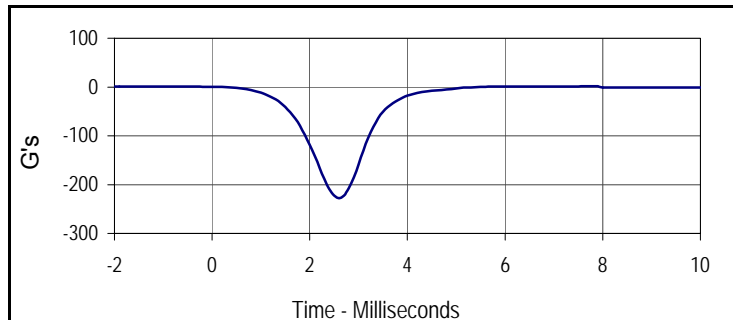
ATD Serial No.: 141

Test I.D.: F141HD067

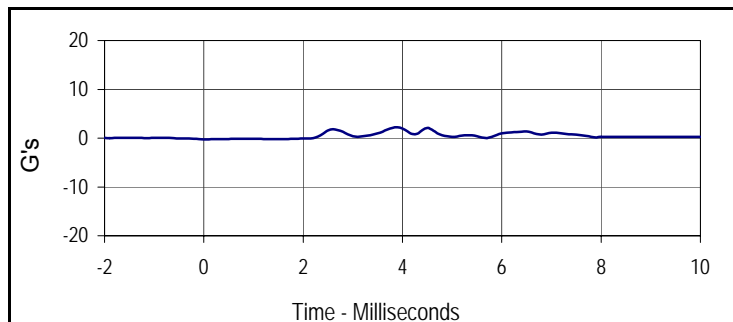
Tested Parameter	Units	Specification	Result	Pass/Fail
Head Assembly Soak Time	Minutes	≥240	275	Pass
Temperature During Soak	Max	18.9 to 25.6	21.2	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	27.8	Pass
	Min		27.3	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	27.3	Pass
Peak Resultant Acceleration	G's	250.0 to 300.0	262.8	Pass
Peak Lateral Acceleration	G's	≤15.0	2.2	Pass
Oscillations After Main Pulse	%	<10% of peak Res. Acceleration	0.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
<b>Overall Test Results</b>				<b>Pass</b>



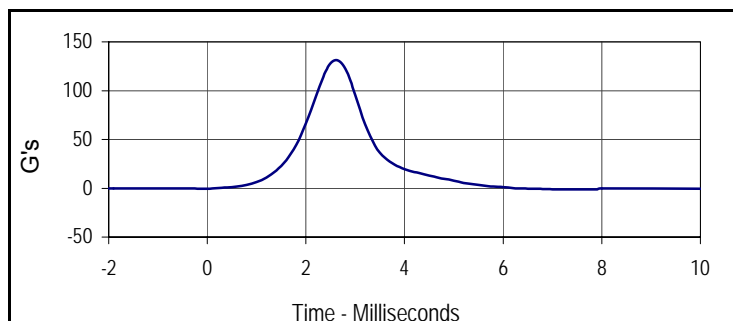
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
262.8	2.6	0.3	0.2



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.0	6.0	-227.6	2.6



Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
2.2	3.9	-0.3	0.0



Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
131.5	2.6	-0.4	-0.1

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

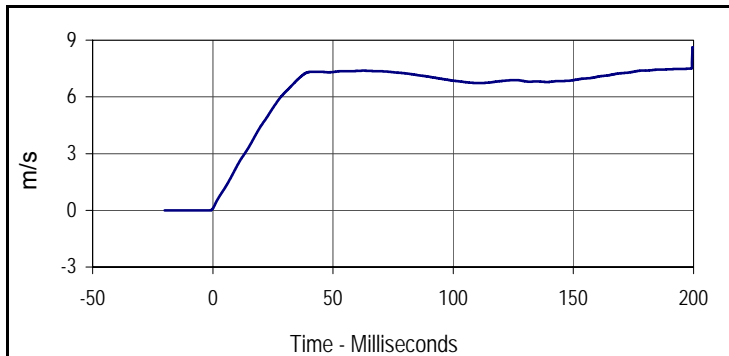
Test Date: 3/11/15



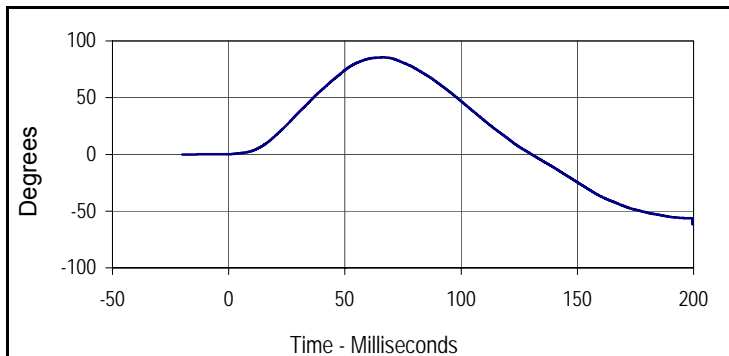
ATD Serial No.: 141

Test I.D.: F141NF067

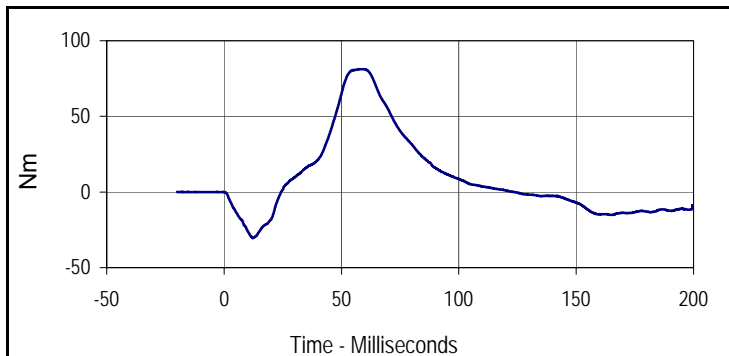
Tested Parameter	Units	Specification	Result	Pass/Fail	
Neck Assembly Soak Time	Minutes	≥240	340	Pass	
Temperature During Soak	Max	20.6 to 22.2	21.2	Pass	
	Min		21.1	Pass	
Humidity During Soak	Max	10.0 to 70.0	27.8	Pass	
	Min		27.3	Pass	
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass	
Laboratory Humidity During Test	%	10.0 to 70.0	27.7	Pass	
Pendulum Velocity	m/s	6.89 to 7.13	6.91	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	81.3	Pass
Positive Moment Decay, Time To 10 Nm	Msec.	80.0 to 100.0	95.9	Pass	
Overall Test Results				Pass	



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
8.6	199.5	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	-61.3	199.5



Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
81.3	57.9	-30.5	12.2

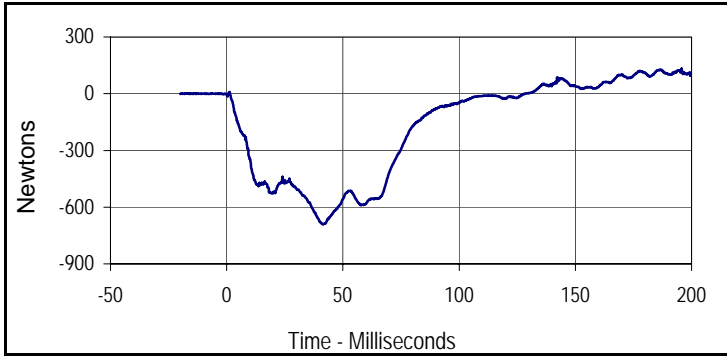
Test Program: Hybrid III 5th Percentile Female Neck Flexion Test

Test Date: 3/11/15

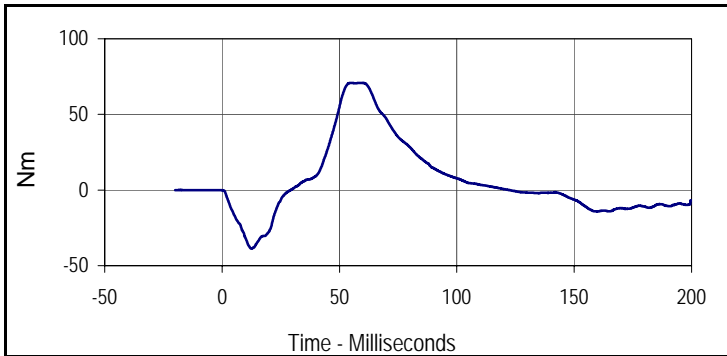


ATD Serial No.: 141

Test I.D.: F141NF067



Curve Description			
Upper Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
132.2	195.7	-691.9	41.5



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
70.9	54.6	-38.7	12.6

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

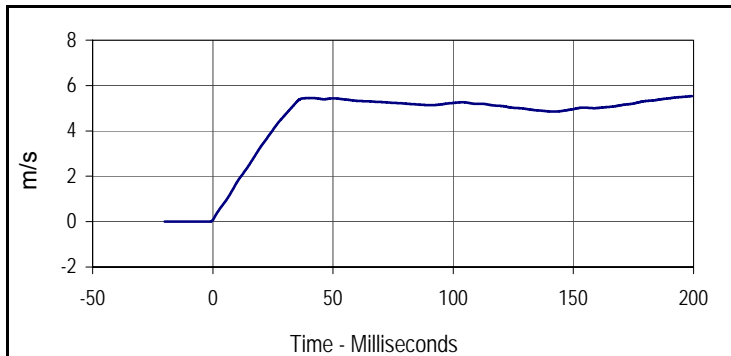
Test Date: 3/11/15



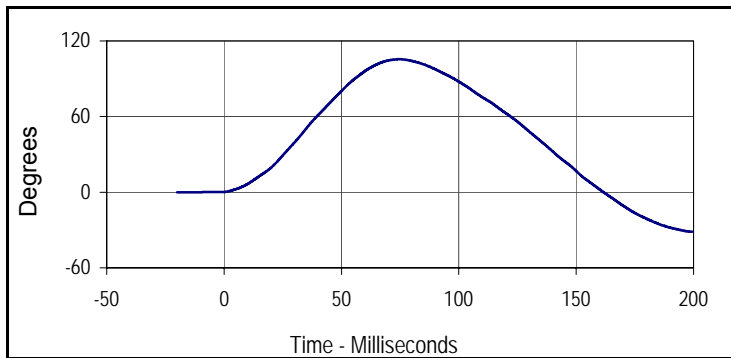
ATD Serial No.: 141

Test I.D.: F141NE067

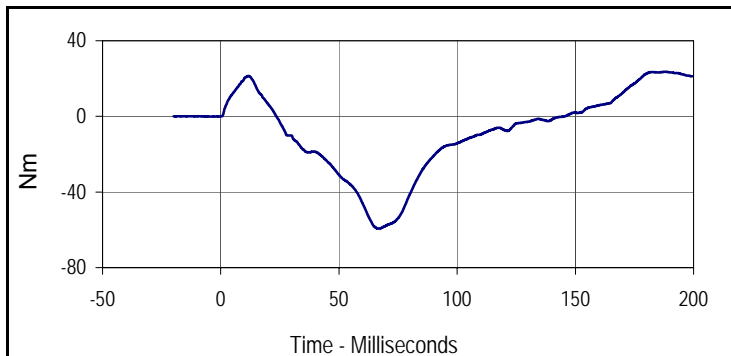
Tested Parameter	Units	Specification	Result	Pass/Fail	
Neck Assembly Soak Time	Minutes	≥240	405	Pass	
Temperature During Soak	Max	20.6 to 22.2	21.2	Pass	
	Min		21.1	Pass	
Humidity During Soak	Max	10.0 to 70.0	27.8	Pass	
	Min		27.3	Pass	
Laboratory Temperature During Test	°C	20.6 to 22.2	21.2	Pass	
Laboratory Humidity During Test	%	10.0 to 70.0	27.8	Pass	
Pendulum Velocity	m/s	5.95 to 6.19	6.03	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	105.5	Pass
Peak Moment in Rotation	Max	Nm	-53.0 to -65.0	-59.4	Pass
Positive Moment Decay, Time To -10 Nm	Msec.	94.0 to 114.0	108.1	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	199.4	0.0	-1.4



Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
105.5	74.7	-31.3	199.4



Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
23.6	187.6	-59.4	66.4

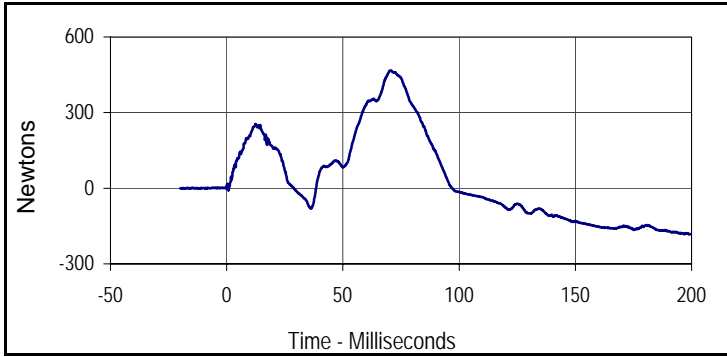
Test Program: Hybrid III 5th Percentile Female Neck Extension Test

Test Date: 3/11/15

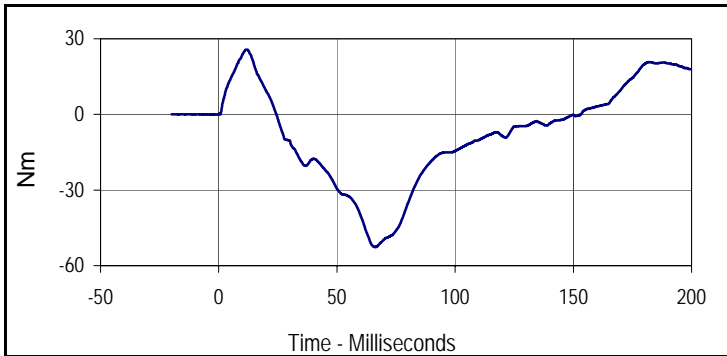


ATD Serial No.: 141

Test I.D.: F141NE067



Curve Description			
Upper Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
467.2	70.2	-182.9	196.9



Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
25.7	11.8	-52.7	66.3

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

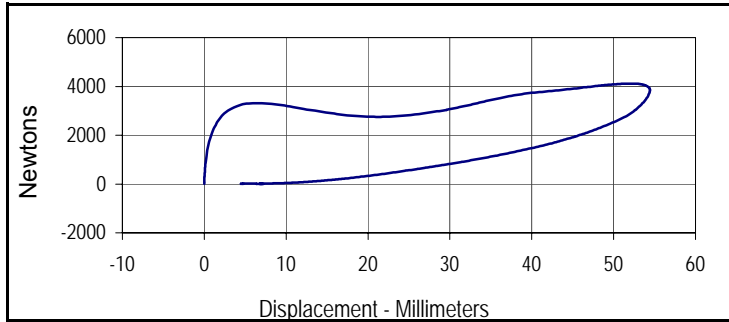
Test Date: 3/11/15



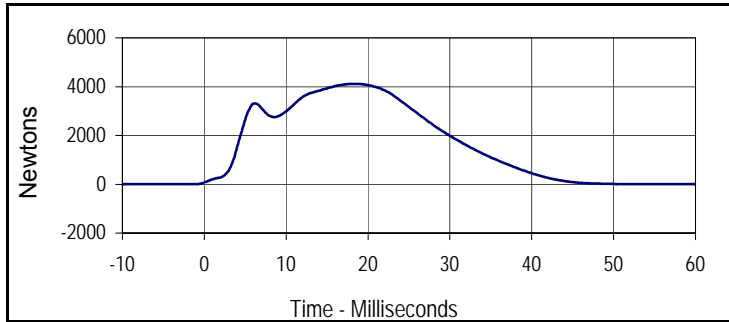
ATD Serial No.: 141

Test I.D.: F141CH067

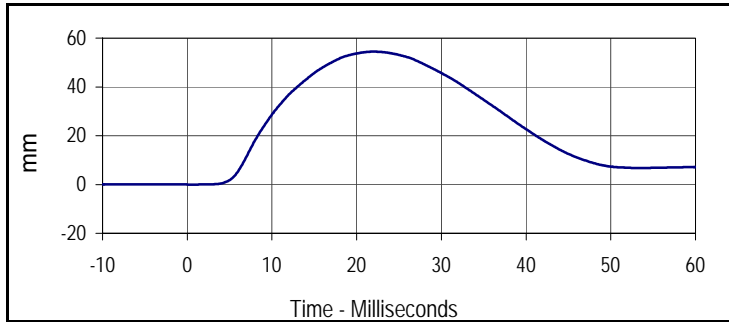
Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	450	Pass
Temperature During Soak	Max	20.6 to 22.2	21.2	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	27.8	Pass
	Min		27.3	Pass
Laboratory Temperature During Test	°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	27.7	Pass
Probe Velocity	m/s	6.59 to 6.83	6.72	Pass
Peak Chest Deflection	mm	50.0 to 58.0	54.4	Pass
Peak Force Between 50 and 58 MM	Newtons	3900 to 4400	4085	Pass
Peak Force Between 18 and 50 MM	Newtons	≤4600	4117	Pass
Internal Hysteresis	%	69 to 85	71.3	Pass
Overall Test Results				Pass



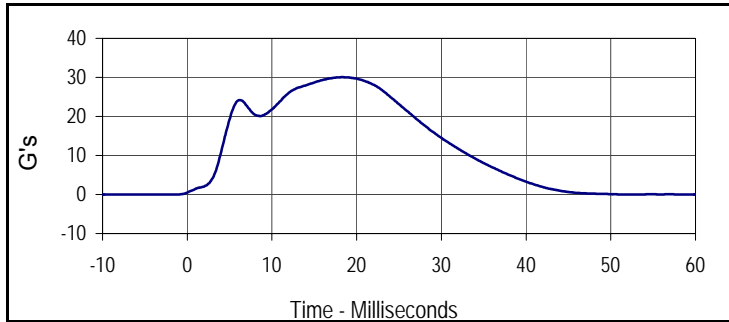
Curve Description			
Probe Force vs. Chest Deflection			
Plot No.	Type	SAE Class	Hysteresis
001	FIL	180	71.3
Peak Probe Force		Peak Chest Deflection	
4117.1		54.4	



Curve Description			
Probe Force			
Plot No.	Type	SAE Class	Units
002	FIL	180	Newtons
Max	Time	Min	Time
4117.1	18.3	0.2	-3.8



Curve Description			
Chest Deflection			
Plot No.	Type	SAE Class	Units
003	FIL	180	mm
Max	Time	Min	Time
54.4	22.0	0.0	0.8



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
30.1	18.3	0.0	-3.8

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

Test Date: 3/11/15



ATD Serial No.: 141

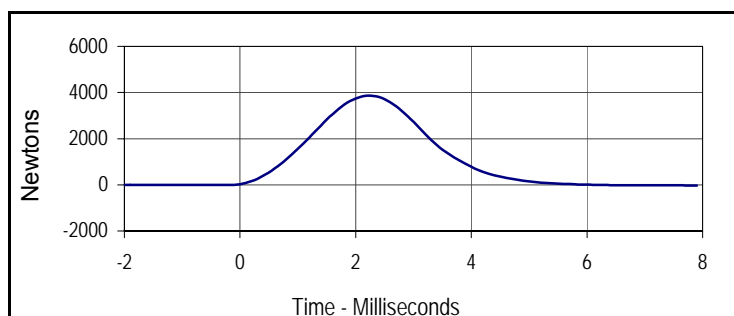
Test I.D.: F141LK067, F141RK067

**Left Knee**

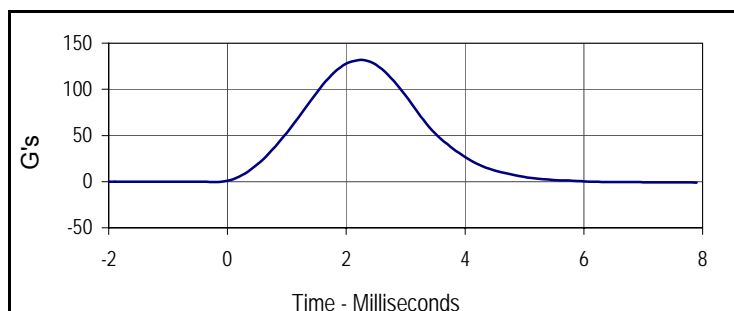
Tested Parameter	Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time	Minutes	≥240	505	Pass
Temperature During Soak	Max	18.9 to 25.6	21.2	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	27.8	Pass
	Min		27.3	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	27.8	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	3450 to 4060	3858	Pass
<b>Overall Test Results</b>				<b>Pass</b>

**Right Knee**

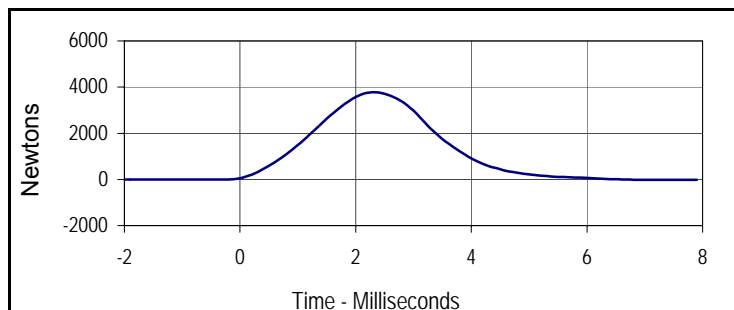
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	3450 to 4060	3779	Pass
<b>Overall Test Results</b>				<b>Pass</b>



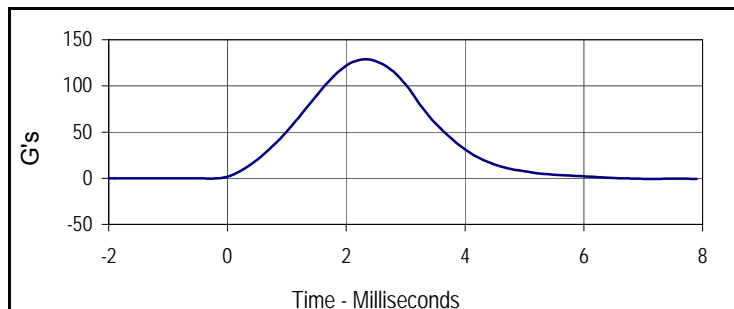
Curve Description			
Left Knee Probe Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3858.1	2.2	-28.1	7.9



Curve Description			
Left Knee Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
131.6	2.2	-1.4	0.0



Curve Description			
Right Knee Probe Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
3778.6	2.3	-23.5	7.9



Curve Description			
Right Knee Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
128.9	2.3	-1.6	0.0

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

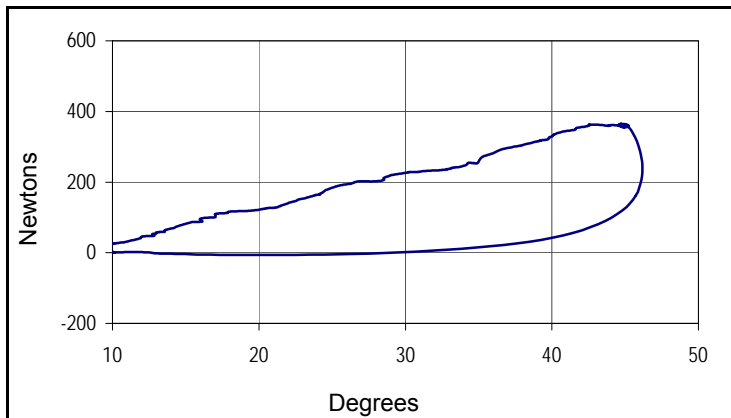
Test Date: 3/11/15



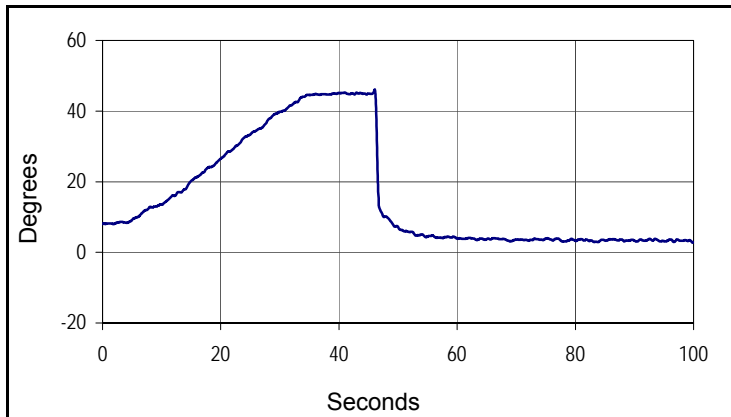
ATD Serial No.: 141

Test I.D.: TF067

Tested Parameter	Units	Specification	Result	Pass/Fail
Dummy Soak Time	Minutes	≥240	570	Pass
Temperature During Soak	Max	18.9 to 25.6	21.2	Pass
	Min		21.1	Pass
Humidity During Soak	Max	10.0 to 70.0	27.8	Pass
	Min		27.3	Pass
Laboratory Temperature During Test	°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test	%	10.0 to 70.0	27.8	Pass
Initial Reference Plane Angle	Degrees	≤ 20	8.0	Pass
Peak Force at 45° +/-0.5°	Newtons	320.0 to 390.0	365.0	Pass
Torso Rotation Rate	deg/sec	0.5 to 1.5	1.0	Pass
Final Reference Plane Angle	Degrees	+/-8	2.9	Pass
Overall Test Results				Pass



Curve Description		
Force vs Torso Rotation		
Plot No.	Type	Filter Freq
001	FIL	1 Hz
Peak Force		Peak Rotation
365.0		46.2



Curve Description			
Torso Rotation			
Plot No.	Type	Filter Freq	Units
002	FIL	1 Hz	Degrees
Max	Time	Min	Time
46.2	46.1	2.8	99.9