REPORT NUMBER: NCAP-KAR-12-034

NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST

KIA MOTORS CORPORATION

2012 KIA SOUL 5-DOOR MPV

NHTSA NUMBER: MC0515

PREPARED BY:

KARCO ENGINEERING, LLC.

9270 HOLLY ROAD

ADELANTO, CA 92301

JANUARY 23, 2012

FINAL REPORT

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

SAFETY PERFORMANCE STANDARDS

OFFICE OF CRASHWORTHINESS STANDARDS

1200 NEW JERSEY AVE, SE

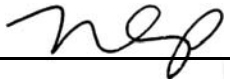
ROOM W43-410

WASHINGTON, DC 20590

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared By: 

Mr. Kelsey A. Chiu, Engineering Department Supervisor
KARCO Engineering, LLC.

Reviewed By: 

Mr. Michael L. Dunlap, Director of Operations
KARCO Engineering, LLC.

Approved By: 

Mr. Frank D. Richardson, Program Manager
KARCO Engineering, LLC.

Approval Date: January 23, 2012

FINAL REPORT ACCEPTANCE BY OCWS:

Division Chief, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

Date:

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

Date:

TECHNICAL REPORT DOCUMENTATON PAGE

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
NCAP-KAR-12-034		

4. Title and Subtitle
Final Report of New Car Assessment Program Testing of a
2012 Kia Soul 5-Door MPV
NHTSA No. MC0515

5. Report Date
January 23, 2012

6. Performing Organization Code
KAR

7. Authors
Mr. Kelsey A. Chiu, Engineering Department Supervisor, KARCO
Mr. Frank Richardson, Program Manager, KARCO

8. Performing Organization Report No.
TR-P31001-01-NC

9. Performing Organization Name and Address
KARCO Engineering, LLC.
9270 Holly Rd.
Adelanto, CA 92301

10. Work Unit No.

11. Contract or Grant No.
DTNH22-06-D-00027

12. Sponsoring Agency Name and Address
U. S. Department of Transportation
National Highway Traffic Safety Administration
Office of Crashworthiness Standards
1200 New Jersey Ave., SE, Room W43-410
Washington, D.C 20590

13. Type of Report and Period Covered
Final Test Report, Jan. 9 - 23, 2012

14. Sponsoring Agency Code
NVS-111

15. Supplementary Notes

16. Abstract

A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2012 Kia Soul 5-door MPV in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The test was conducted at the KARCO Engineering, LLC. facility in Adelanto, California on January 9, 2012.

The impact velocity of the vehicle was 56.38 km/h and the ambient temperature at the barrier face at the time of impact was 15.6 deg. C. The target vehicle's post-test maximum crush was 356 mm at the vehicle's centerline. The test vehicle's performance is as follows:

Measurement Description	Units	Driver ATD		Passenger ATD	
		Threshold	Result	Threshold	Result
Head Injury Criteria (HIC_{15})	N/A	700.0	189.0	700.0	332.5
Maximum Chest Compression	mm	63	-31	52	-13
Nij	N/A	1	0.34	1	0.39
Neck Tension	N	4170	1684.2	2620	1167.4
Neck Compression	N	4000	-106.9	2520	-472.5
Left Femur Force	N	10008	-805.2	6805	-1244.3
Right Femur Force	N	10008	-2066.4	6805	-712.2

17. Key Words
35 mph Frontal Barrier Impact Test
New Car Assessment Program (NCAP)

18. Distribution Statement
Copies of this report are available from:
National Highway Traffic Safety Admin.
Technical Reference Division
1200 New Jersey Ave., SE
Washington, DC 20590

19. Security Classification of this report	20. Security Classification of this page	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	135	

TABLE OF CONTENTS

SECTION 1
PURPOSE AND SUMMARY OF TEST

PURPOSE

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

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

SUMMARY

A load cell barrier consisting of 36 load cells was impacted by a 2012 Kia Soul 5-door MPV at a velocity of 56.38 km/h. The test was performed at KARCO Engineering, LLC. on January 9, 2012. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A of this report.

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

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

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

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

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

The maximum static crush of the test vehicle was 356 mm located at the vehicle's centerline. Both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

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

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

The occupant data is summarized below:

ATD Position	HIC_{15}	T^1	T^2	Chest Disp. (mm)	Nij	Neck Tension (N)	Neck Comp. (N)	Left Femur (N)	Right Femur (N)
Driver (50th)	189.0	59.3	74.3	-31	0.34	1684.2	-106.9	-805.2	-2066.4
Passenger (5th)	332.5	63.0	78.0	-13	0.39	1167.4	-472.5	-1244.3	-712.2

SECTION 2

DATA SHEETS

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

CONVERSION FACTORS

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

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	MC0515
Model Year	2012
Make	Kia
Model	Soul
Body Style	5-Door MPV
VIN	KNDJT2A52C7380584
Body Color	Bright Silver
Odometer Reading (km / mi)	11 / 7
Engine Displacement (L)	1.6
Type / No. of Cylinders	Inline 4
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
All Wheel Drive (AWD)	No
Traction Control System	Yes

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

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Kia Motors Corporation
Date of Manufacture	Sep-11

GVWR (kg)	1685
GAWR Front (kg)	980
GAWR Rear (kg)	950

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

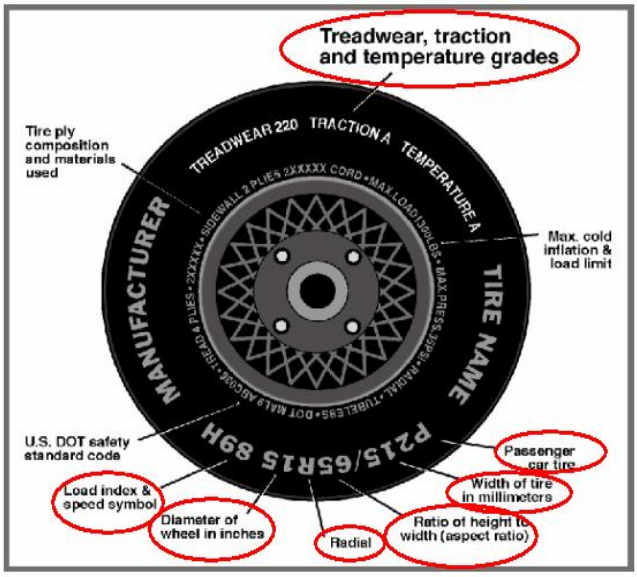
Measured Parameter	Front	Rear	Third	Total	
Type of Seats	Bucket	Bench			
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				385.0	*A*
DSC x 68.04 (kg)				340.2	*B*
Cargo Weight (RCLW) (kg)				44.8	*A-B*

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	230	230
Recommended Tire Size	P195/65R15	P195/65R15
Tire Size on Vehicle	P195/65R15	P195/65R15
Tire Manufacturer	Nexen	Nexen
Tire Model	Classe Premiere	Classe Premiere
Treadwear	440	440
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	2 Steel, 1 Polyester	2 Steel, 1 Polyester
Load Index / Speed Symbol	89S	89S
Tire Material	Steel, Polyester	Steel, Polyester
DOT Safety Code Left	8E9N CBAR 3211	8E9N CBAR 3211
DOT Safety Code Right	8E9N CBAR 3211	8E9N CBAR 3211

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	397.0	256.5		432.5	318.0	
Right	kg	375.0	238.5		401.0	296.0	
Ratio	%	60.9%	39.1%	100.0%	57.6%	42.4%	100.0%
Total	kg	772.0	495.0	1267.0	833.5	614.0	1447.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1267.0	A
Weight of 1 P572E ATD & 1 P572O ATD	kg	141.0	B
Rated Cargo/Luggage Weight (RCLW)	kg	44.8	C
Calculated Vehicle Target Weight (TVTW)	kg	1452.8	A+B+C

TEST VEHICLE ATTITUDES

Condition	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	674	681	705	700	996
As Tested	mm	668	670	675	682	1082
Post-Test	mm	647	640	677	676	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2550
Total Vehicle Length at Left Side	mm	3452
Total Vehicle Length at Centerline	mm	4110
Total Vehicle Length at Right Side	mm	3452
Weight of Ballast in Cargo Area	kg	72.0
Weight of Vehicle Components Removed	kg	35.0
Amount of Stoddard Solvent in Fuel Tank	L	44.63

VEHICLE COMPONENTS REMOVED TO MEET TEST WEIGHT:

Rear Door Panels and Windows (12.0 kg), Rear Speakers (1.0 kg), Rear Seat Cushion (6.0 kg), Outboard Mirrors (3.0 kg), Taillights (5.0 kg), Tire Pump (5.0 kg), Rear Trim Panel (3.0 kg)

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

TARGET VEHICLE STRUCTURAL MEASUREMENTS

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length	4110	3754	-356
2	Total Width	1780	1931	151
3	Bumper Top Height	495	418	-77
4	Bumper Bottom Height	250	165	-85
5	Longitudinal Member Top Height	500	542	42
6	Distance Between Longitudinal Members	935	981	46
7	Longitudinal Member Width	65	93	28
8	Engine Top Height	830	820	-10
9	Engine Bottom Height	183	168	-15
10	Engine and Gearbox Width	430	430	0
11	Front Bumper to Engine Distance	420	110	-310
12	Front Shock Absorber Fixing Height	885	859	-26
13	Bonnet Leading Edge Height	800	936	136
14	Front Shock Absorber Fixing Width	1100	1107	7
15	Front Bumper to Front Axle Distance	843	456	-387
16	Front Axle to A-Pillar Distance	468	402	-66
17	A-Pillar to B-Pillar Distance	945	942	-3
18	B-Pillar to Rear Axle Distance	1060	1060	0
19	B-Pillar to C-Pillar Distance	853	846	-7
20	Roof Sill Bottom Height	1425	1422	-3
21	Roof Sill Top Height	1561	1557	-4
22	Floor Sill Bottom Height	230	206	-24
23	Floor Sill Top Height	360	344	-16

All measurements in millimeters.

DATA SHEET NO. 2

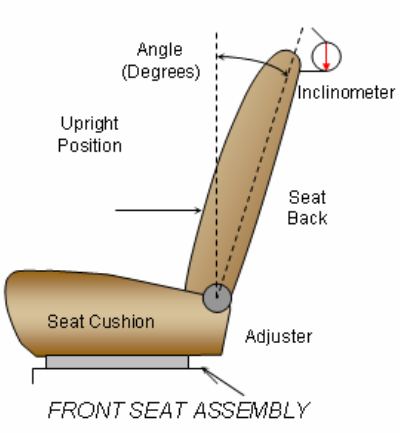
SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

NOMINAL DESIGN RIDING POSITION

The procedure for the driver is as follows: the seat back is set to the manufacturer's designated angle. The procedure for the passenger is as follows: the seat back is set to position the transverse instrumentation platform of the dummy's head at 0° ± 0.5°. Seat back angle is measured at the headrest post using a digital inclinometer.

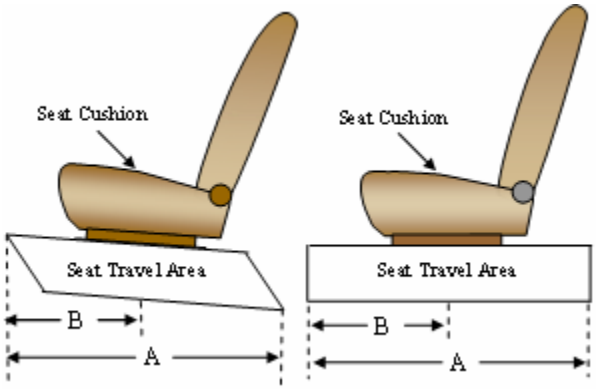


SEAT BACK ANGLE

Seating Position	Degrees
Driver Seat Back Angle	3.1
Passenger Seat Back Angle	0.8

SEAT FORE / AFT POSITIONING

The total seat travel is measured from the forward most possible position to the rear most possible position. The driver's seat is set to the middle of the fore-aft travel. The passenger's seat is set to the forward most position where the ATD will not contact any interior panels.



SEAT FORE/AFT POSITIONS

Seating Position	Total Fore-Aft Travel	Placed in Position
Driver Seat	235 mm (21 detents)	125 mm (9th detent)
Passenger Seat	200 mm (21 detents)	0 mm (1st detent)

SEAT BELT UPPER ANCHORAGE

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

SEAT BELT UPPER ANCHORAGES

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

DATA SHEET NO. 2 … (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

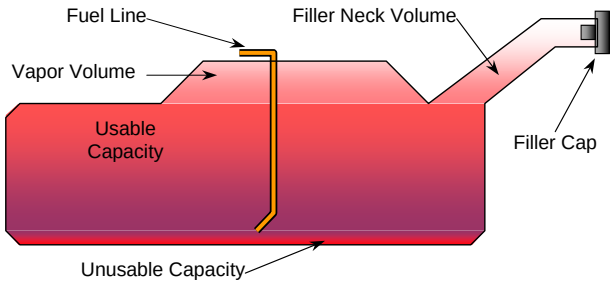
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	47.99
Usable Capacity of "Optional Tank"	
92 - 94% of Usable Capacity	44.15 to 45.11
Actual Amount of Stoddard Solvent Used	44.63
1/3 of Usable Capacity	16.00

FUEL PUMP

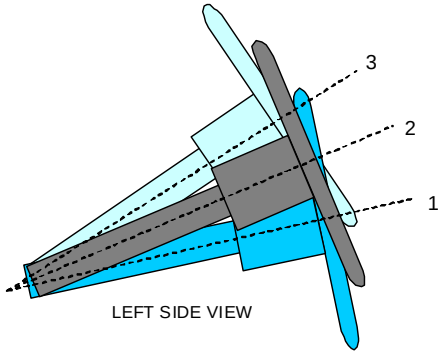
The vehicle is equipped with an electric fuel pump. The fuel pump will operate when the engine is running.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

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



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONING

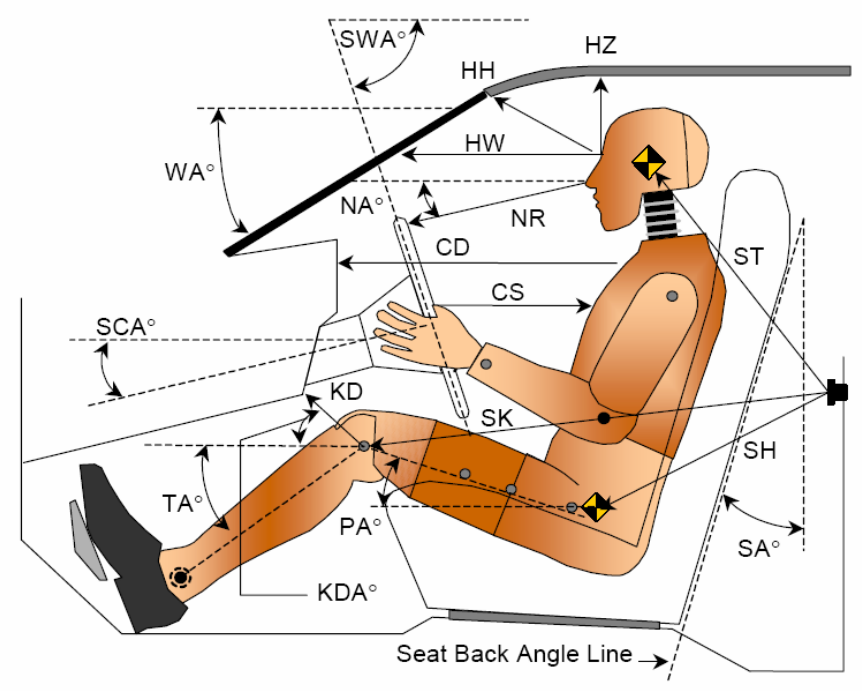
	Degrees	Fore-Aft Position (mm)
Lowermost Position, No. 1	26.2	100
Geometric Center Position, No. 2	28.0	115
Uppermost Position, No. 3	29.9	129
Telescoping Steering Wheel Travel		29
Test Position	28.0	115

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12



LEFT SIDE VIEW

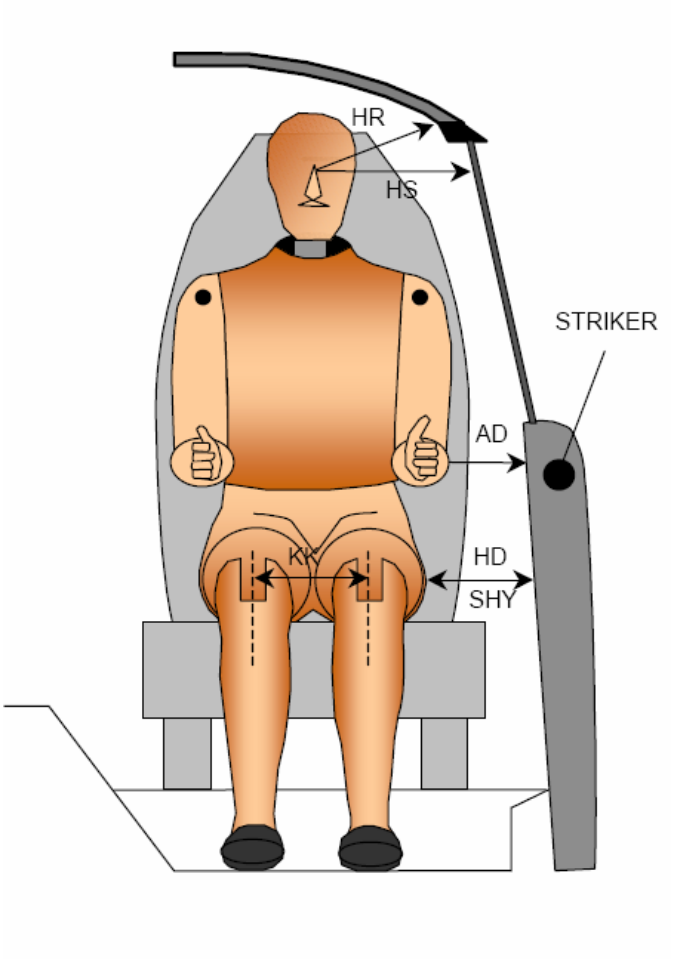
Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		35.9		
SWA°	Steering Wheel Angle		62.0		
SCA°	Steering Column Angle		28.0		
SA°	Seat Back Angle (On Headrest Post)		3.1		0.8
HZ	Head to Roof	253	90.0	279	90.0
HH	Head to Header	451	23.1	391	38.0
HW	Head to Windshield	667	0.0	639	0.0
NR	Nose to Rim	415	10.8	492	26.7
CD	Chest to Dash	542	6.7	445	5.5
CS	Chest to Steering Hub	284	0.0		
RA	Rim to Abdomen	188	0.0		
KDL	Left Knee to Dash	186	23.0	122	27.8
KDR	Right Knee to Dash	175	28.0	131	24.9
PA°	Pelvic Angle		21.5		20.5
TA°	Tibia Angle		58.7		56.3
SK	Striker to Knee	591	4.5	688	7.0
ST	Striker to Head	515	83.9	484	64.4
SH	Striker to H-Point	248	33.3	344	20.6

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12



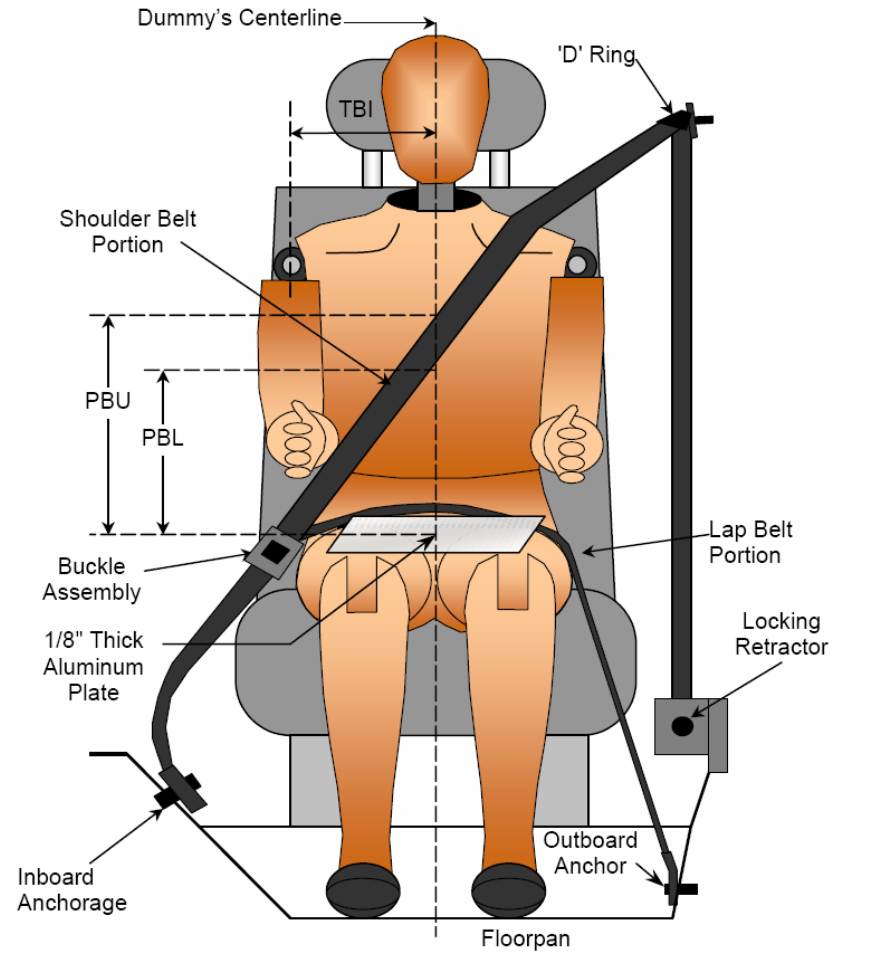
Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	132	96
HD	H-Point to Door	141	189
HR	Head to Side Header	264	306
HS	Head to Side Window	348	367
KK	Knee to Knee	361	324
SHY	Striker to H-Point (Y-Direction)	230	282
AA	Ankle to Ankle	354	150

DATA SHEET NO. 5

SEAT BELT POSITIONING DATA

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12



FRONT VIEW OF DUMMY

SEAT BELT POSITIONING MEASUREMENTS

Code	Measurement Description	Units	Driver	Passenger
PBU	Top Surface of Aluminum Plate to Belt Upper Edge	mm	390	320
PBL	Top Surface of Aluminum Plate to Belt Lower Edge	mm	330	270

BELT LENGTH DATA

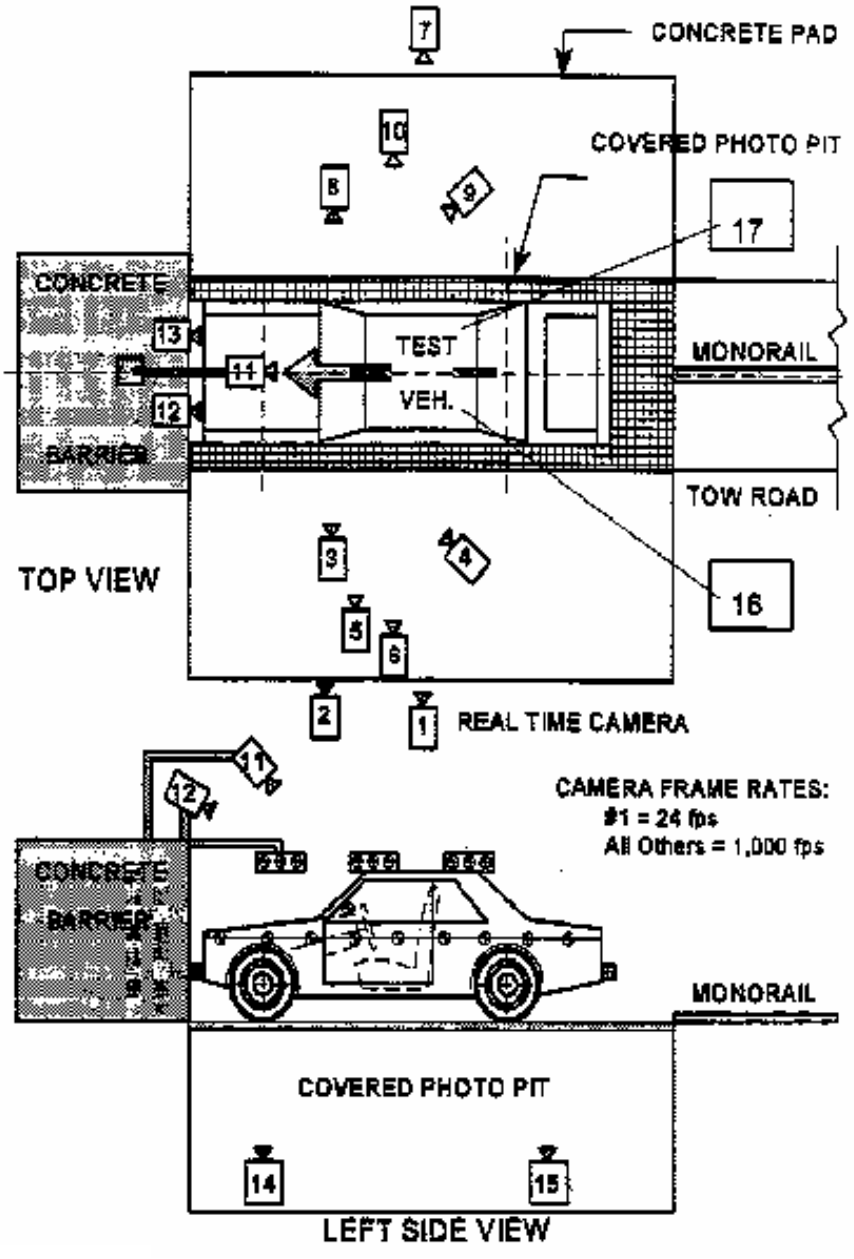
Measurement Description	Units	Driver	Passenger
Shoulder Belt Length as Measured on ATD	mm	886	937
Lap Belt Length as Measured on ATD	mm	621	680
Remainder of Belt on Reel	mm	842	780
Total Belt Length for Continuous Webbing Systems	mm	2349	2397

DATA SHEET NO. 6

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle:	2012 Kia Soul 5-Door MPV	NHTSA No.:	MC0515
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	1/9/12

CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 6 … (CONTINUED)

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

CAMERA LOCATIONS

No.	Description	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	-11412	-8150	-1484		30
2	Driver Close-Up	-2590	-7950	-1371	24	1000
3	Left Front Half	-1701	-6197	-1701	50	1000
4	Left Angle	-6696	-10308	-3211	ZOOM	1000
5	Steering Column - Top	-1966	-10412	-3688	50	1000
6	Steering Column - Bottom	-1972	-10412	-3379	50	1000
7	Right Overall	-2336	7569	-1012	24	1000
8	Passenger Close-Up	-1733	7581	-1408	50	1000
9	Right Front Half	-1600	8214	-1811	ZOOM	1000
10	Right Angle	-6217	9516	-4830	ZOOM	1000
11	Windshield	-354	0	-5749	12	1000
12	Driver Windshield	297	-366	-2460	12	1000
13	Passenger Windshield	297	366	-2460	24	1000
14	Pit Front	-756	0	1495	12	1000
15	Pit Rear	-3398	0	1495	8	1000
16	Onboard Driver Airbag (Optional)	-3100	250	-1510	12	1000
17	Onboard Passenger Airbag (Optional)	-3100	-250	-1510	12	1000
18	Real-Time Left View of Impact					
19	Real-Time Right View of Impact					

Coordinates: +X = forward impact plane

+Y = right of monorail center

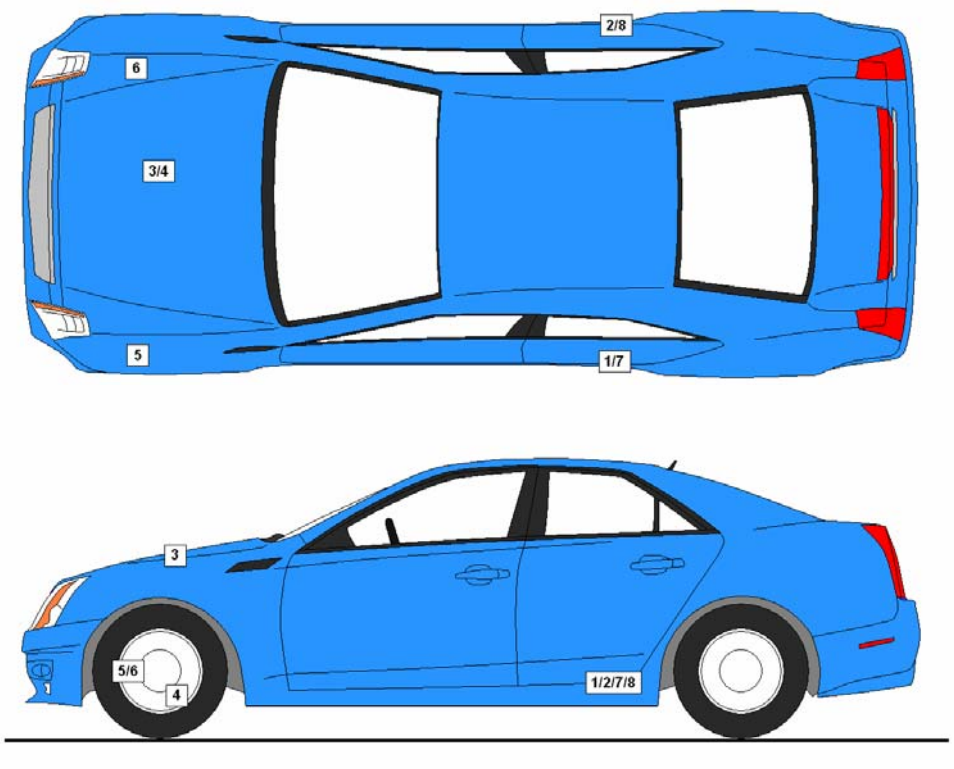
+Z = into ground

DATA SHEET NO. 7

VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Description	Location		
		X	Y	Z
1	Left Rear Accelerometer X-Direction	1491	-689	-376
2	Right Rear Accelerometer X-Direction	1491	689	-376
3	Engine Top X	3315	129	-945
4	Engine Bottom X	3240	254	-171
5	Left Brake Caliper X	3139	-650	-297
6	Right Brake Caliper X	3139	650	-297
7	Left Rear Accelerometer Z-Direction	1491	-689	-376
8	Right Rear Accelerometer Z-Direction	1491	689	-376

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

Y – Vehicle Centerline (+ to right)

Z – Ground Plane (+ down)

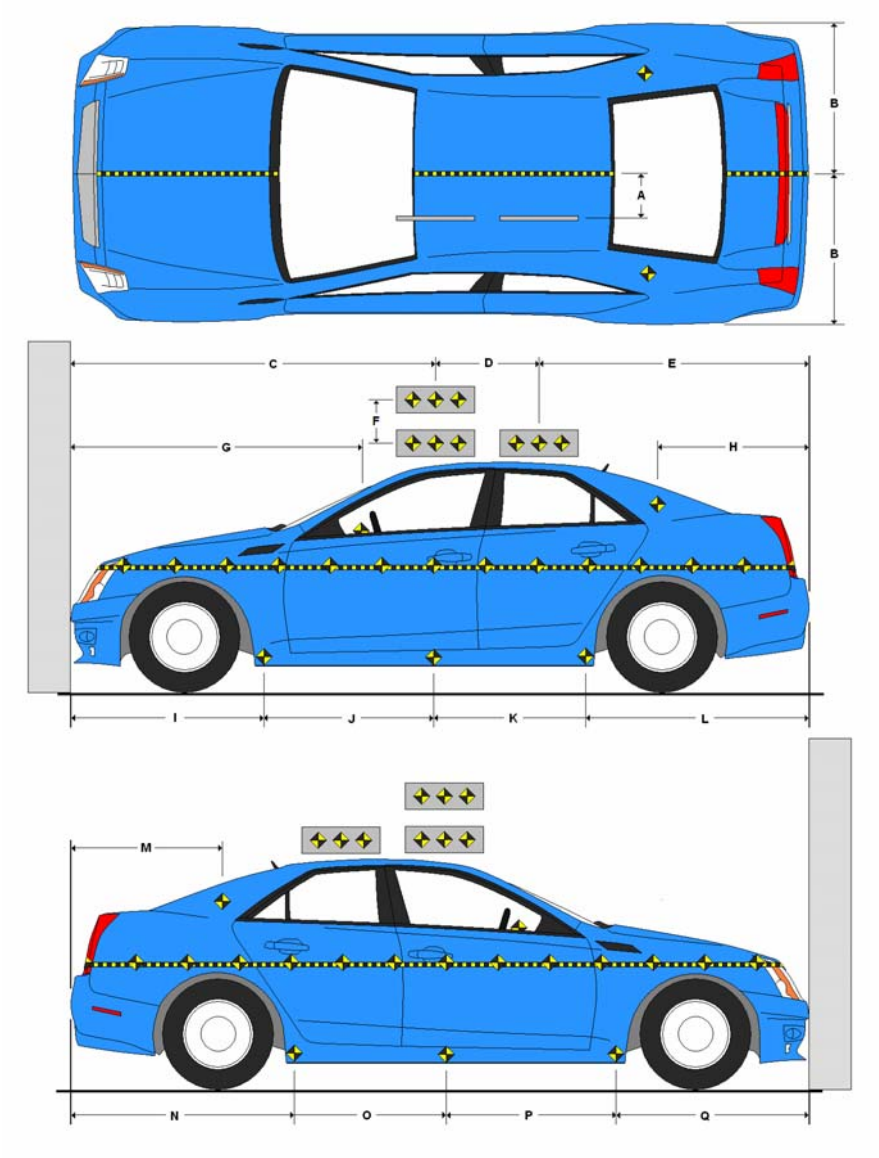
DATA SHEET NO. 8

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

Item	Value
A	420
B	890
C	2160
D	610
E	1357
F	305
G	1605
H	556
I	1285
J	835
K	835
L	1156
M	568
N	1157
O	835
P	835
Q	1287



All measurements in millimeters.

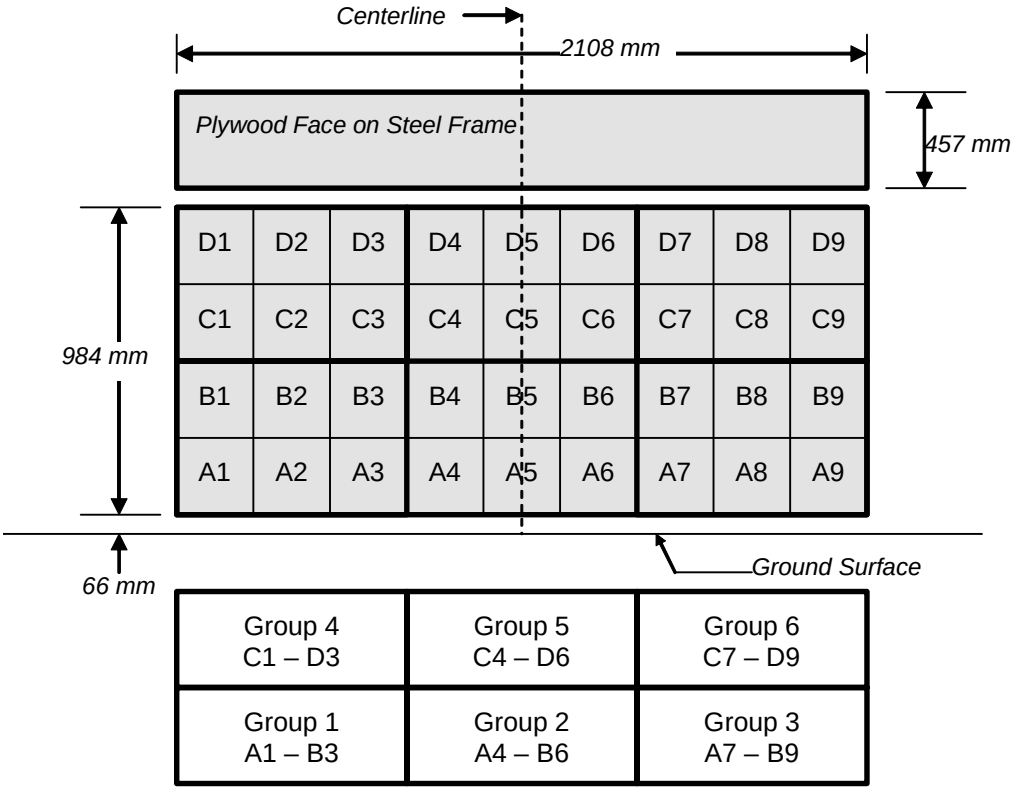
DATA SHEET NO. 9

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

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



6 Groups of 6 Load Cells Each

DATA SHEET NO. 10

TEST VEHICLE CAMERA AND INSTRUMENTATION SUMMARY

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

INSTRUMENTATION

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

CAMERA COVERAGE

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

DATA SHEET NO. 11

POST-TEST OBSERVATIONS

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

TEST DUMMY INFORMATION AND CONTACT

Description	Driver	Passenger
Dummy Type/Serial No.	P572E 50th Percentile Male ATD / 034	P572O 5th Percentile Female ATD / 141
Head Contact	Airbag, Headrest	Airbag, Headrest
Upper Torso Contact	Airbag	Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	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)	-14	-4
Seat Back Failure	None	None
Glazing Damage	None	None

POST TEST STRUCTURAL OBSERVATIONS

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

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	3586
Center	mm	3441
Right Side	mm	3409
Average	mm	3479

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

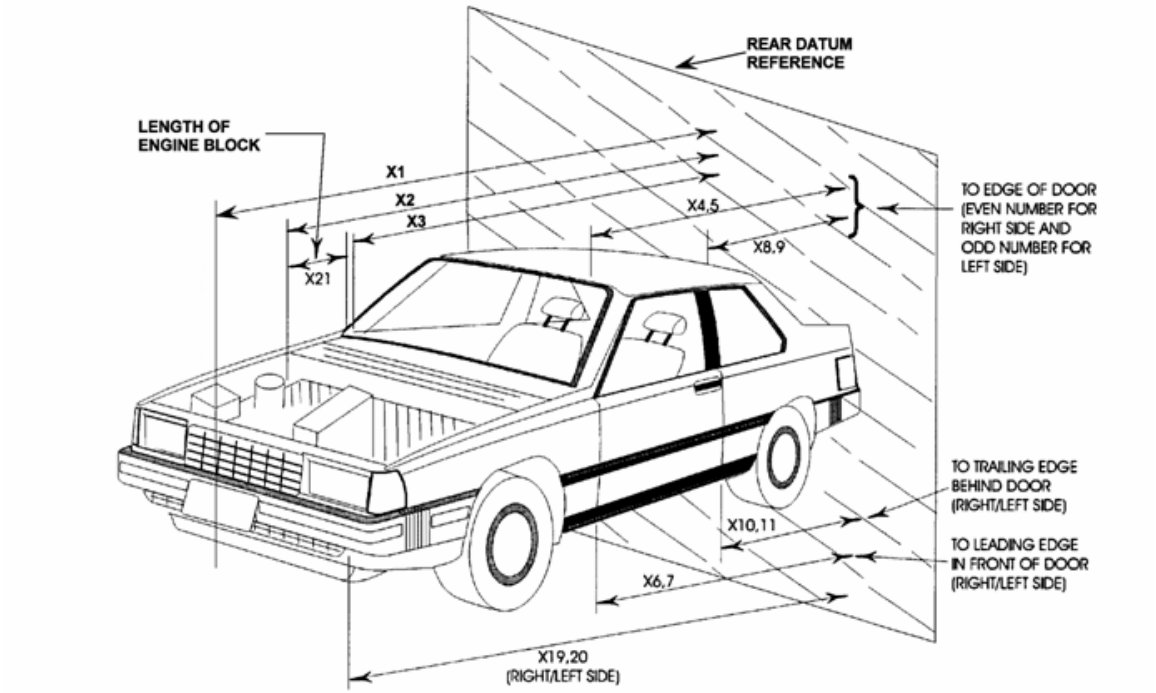
Restraint Type	Driver		Passenger	
	Installed	Operated	Installed	Operated
Front Airbag	Yes	Yes	Yes	Yes
Side Airbag 1 (Curtain)	Yes	No	Yes	No
Side Airbag 2 (Torso/Pelvis)	Yes	No	Yes	No
Knee Airbag	No		No	
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes
Other				

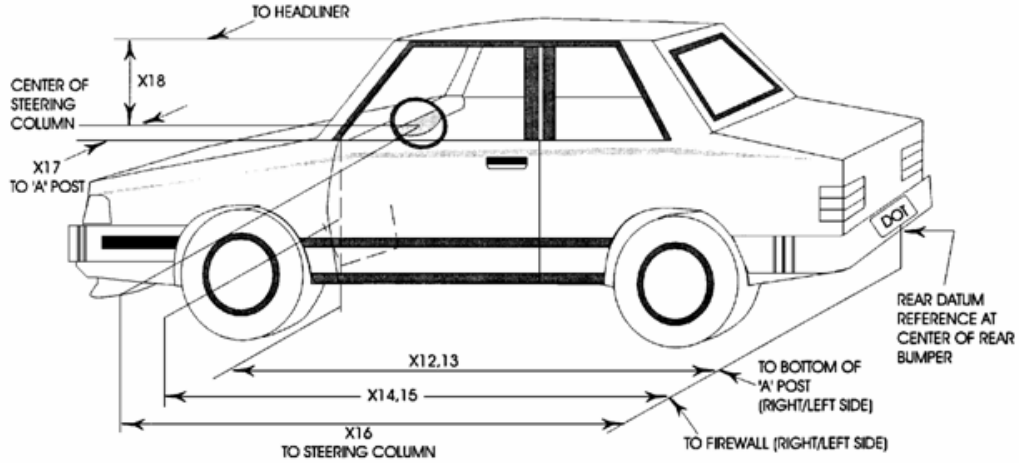
DATA SHEET NO. 12

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12





DATA SHEET NO. 12 … (CONTINUED)

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4110	3754	-356
2	Rear Surface of Vehicle to Front of Engine	3690	3508	-182
3	RSOV to Firewall	3100	2644	-456
4	RSOV to Upper Leading Edge of Right Door	2846	2845	-1
5	RSOV to Upper Leading Edge of Left Door	2841	2839	-2
6	RSOV to Lower Leading Edge of Right Door	2800	2782	-18
7	RSOV to Lower Leading Edge of Left Door	2797	2789	-8
8	RSOV to Upper Trailing Edge of Right Door	1760	1771	11
9	RSOV to Upper Trailing Edge of Left Door	1760	1774	14
10	RSOV to Lower Trailing Edge of Right Door	1787	1765	-22
11	RSOV to Lower Trailing Edge of Left Door	1788	1771	-17
12	RSOV to Bottom of A-Pillar, Right Side	2788	2784	-4
13	RSOV to Bottom of A-Pillar, Left Side	2790	2787	-3
14	RSOV to Firewall, Right Side	3075	2818	-257
15	RSOV to Firewall, Left Side	3065	2780	-285
16	RSOV to Steering Column	2380	2475	95
17	Center of Steering Column to A-Pillar	415	400	-15
18	Center of Steering Column to Headliner	470	521	51
19	RSOV to Right Side of Front Bumper	3452	3345	-107
20	RSOV to Left Side of Front Bumper	3452	3203	-249
21	Length of Engine Block	570	570	0
RD	RSOV to Right Side of Dash Panel	2584	2590	6
CD	RSOV to Center of Dash Panel	2443	2410	-33
LD	RSOV to Left Side of Dash Panel	2594	2595	1

All measurements in millimeters.

DATA SHEET NO. 13

ACCIDENT INVESTIGATION DATA

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

VEHICLE INFORMATION

VIN: KNDJT2A52C7380584 Wheelbase (mm): 2550

Vehicle Size Category: 5-Door MPV Test Weight (kg): 1447.5

ACCELEROMETER DATA

Accelerometer Locations: Left Rear Crossmember

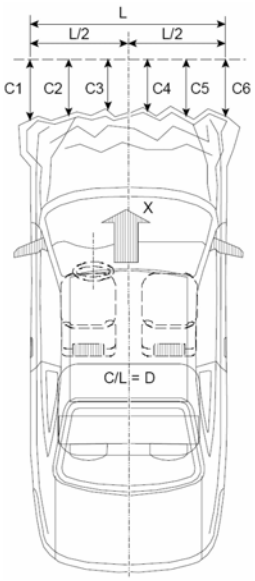
Cal. Procedure/Interval: Drop Test / 6 months

Integration Algorithm: NHTSA Standard Linearity: Good

Impact Velocity (km/h): 56.38

Velocity Change (km/h): 66.0

Time of Separation (msec): 60.2



CRUSH PROFILE

Collision Deformation Classification: 12FDEW2

Midpoint of Damage: Vehicle Centerline

Damage Region Length (mm): 1500

Impact Mode: Full Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	304	583	279
C2	Crush Zone 2 at Left Side	mm	103	422	319
C3	Crush Zone 3 at Left Side	mm	61	403	342
C4	Crush Zone 4 at Right Side	mm	61	412	351
C5	Crush Zone 5 at Right Side	mm	103	436	333
C6	Crush Zone 6 at Right Side	mm	304	451	147
L	C1 to C6	mm	1500		

DATA SHEET NO. 14

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

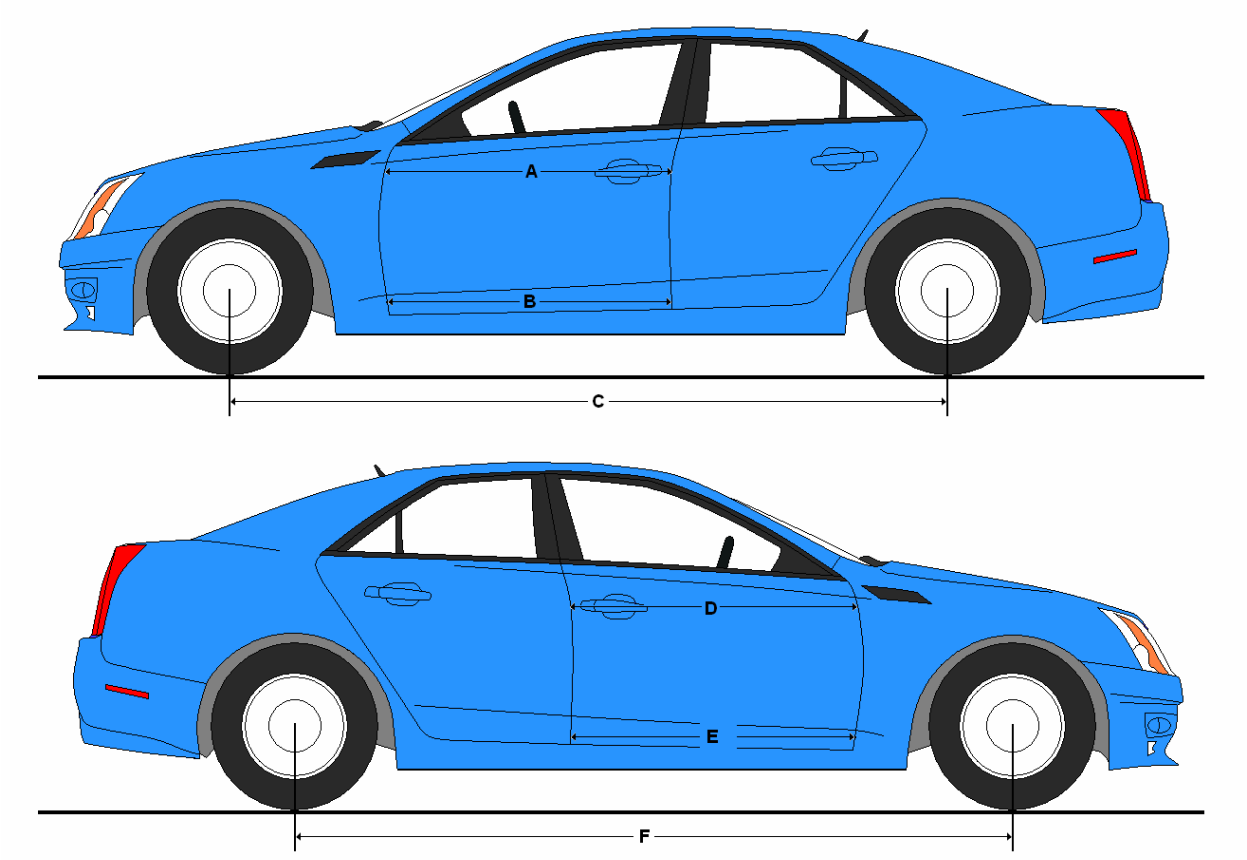
Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	946	935	11
B	Left Side Lower	mm	844	842	2
D	Right Side Upper	mm	953	912	41
E	Right Side Lower	mm	841	833	8

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2550	2474	76
F	Right Side Wheelbase	mm	2550	2532	18



DATA SHEET NO. 14 … (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

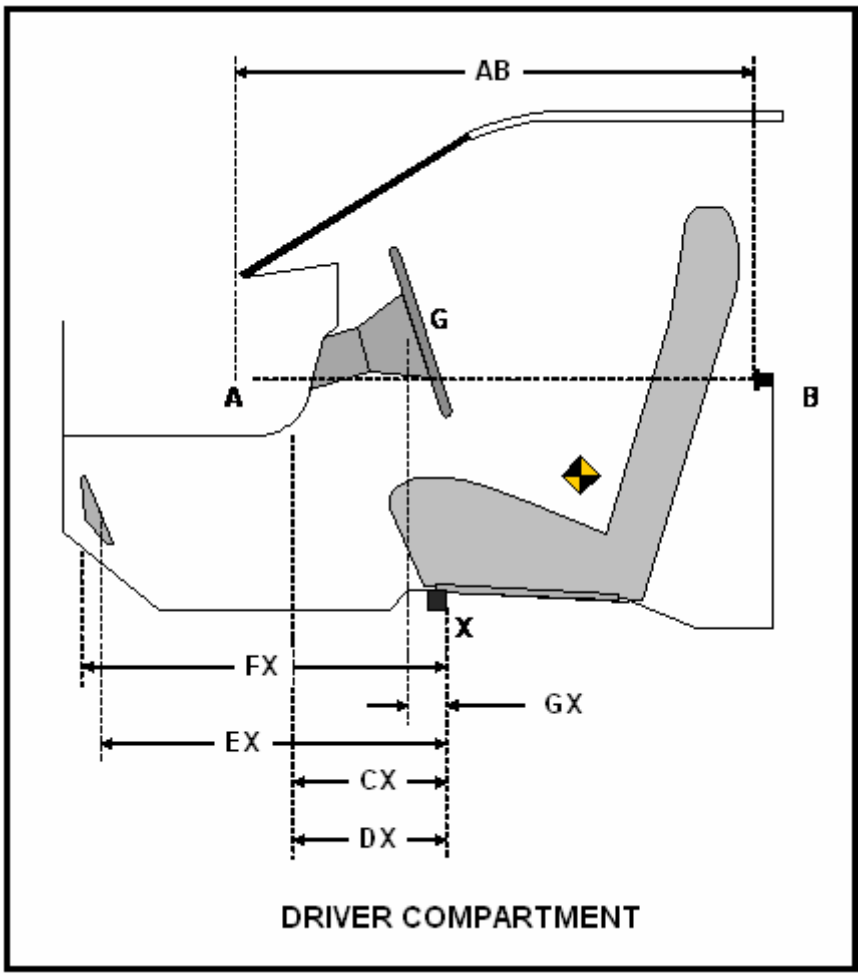
Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	874	869	5
CX	Left Knee Bolster to X	mm	325	341	-16
DX	Right Knee Bolster to X	mm	305	373	-68
EX	Brake Pedal to X	mm	540	482	58
FX	Foot Rest to X	mm	540	525	15
GX	Center of Steering Wheel Hub to X	mm	105	105	0

X = Front of Seat Track (Stationary)

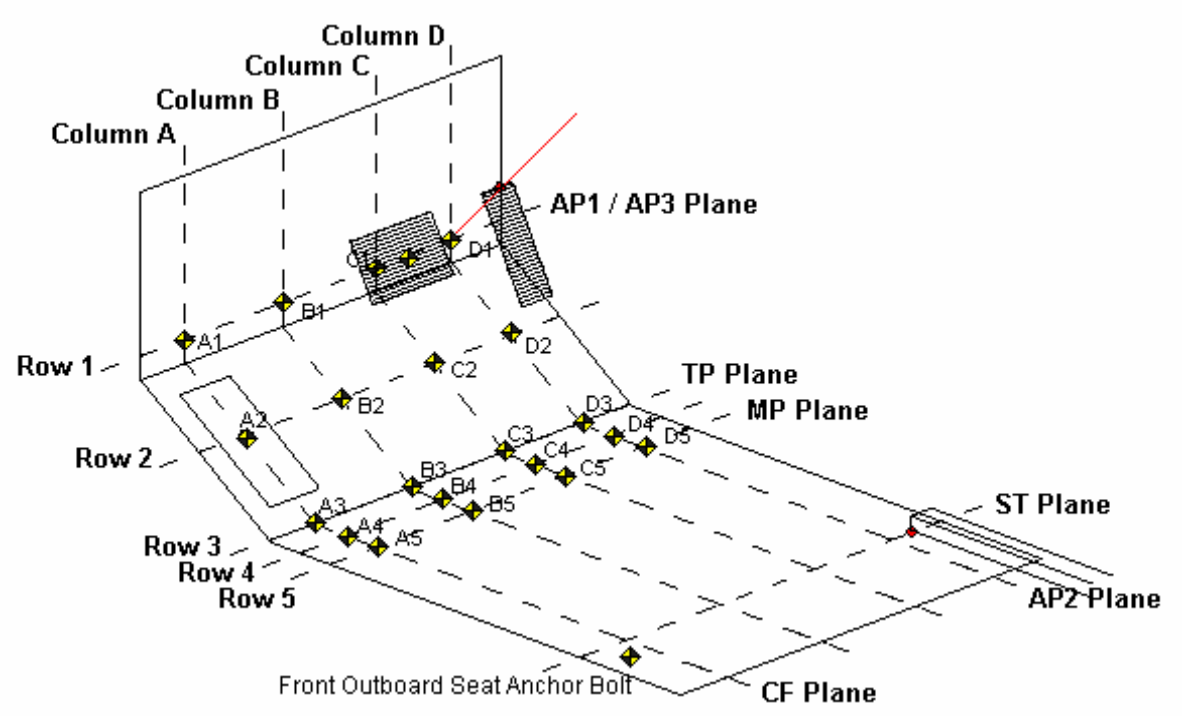


DATA SHEET NO. 14 … (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12



AP1: Y-Z Plane passing through D1

AP2: X-Z Plane passing through D1

AP3: X-Y plane passing through D1

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

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

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

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

Column A: intersection of vehicle and CF plane

Column D: Intersection of vehicle and AP2 plane

Row 1: intersection of the vehicle and the AP3 Plane

Row 3: intersection of the vehicle and TP plane

Row 5: intersection of the vehicle and MP plane

Row 2: evenly spaced between row 1 and 3

Row 4: evenly spaced between row 3 and 5

DATA SHEET NO. 14 … (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

DRIVER FLOORPAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	642	737	745	721	613	683	710	680	29	54	35	41
2	571	654	653	643	553	632	628	621	18	22	25	22
3	506	555	553	548	499	540	532	529	7	15	21	19
4	445	445	445	446	439	430	426	431	6	15	19	15
5	342	342	343	343	335	326	325	335	7	16	18	8

DRIVER FLOORPAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	18	-100	-216	-383	15	-122	-227	-379	3	22	11	-4
2	18	-100	-214	-384	20	-107	-218	-391	-2	7	4	7
3	17	-98	-212	-383	16	-102	-214	-389	1	4	2	6
4	19	-97	-211	-378	20	-98	-211	-375	-1	1	0	-3
5	19	-95	-209	-376	25	-92	-207	-375	-6	-3	-2	-1

DRIVER FLOORPAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	89	-6	-18	1	91	12	-9	-2	-2	-18	-9	3
2	25	-55	-57	-60	23	-54	-59	-76	2	-1	2	16
3	-50	-86	-86	-86	-60	-96	-96	-109	10	10	10	23
4	-107	-98	-96	-101	-113	-113	-112	-126	6	15	16	25
5	-117	-96	-95	-101	-107	-116	-117	-124	-10	20	22	23

All measurements in millimeters

DATA SHEET NO. 14 … (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

PASSENGER FLOORPAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	730	742	723	624	685	711	691	600	45	31	32	24
2	660	650	643	607	633	624	620	588	27	26	23	19
3	551	545	542	538	531	525	523	520	20	20	19	18
4	437	433	433	430	422	415	416	422	15	18	17	8
5	335	331	326	322	323	312	307	317	12	19	19	5

PASSENGER FLOORPAN Y-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	368	195	91	-24	378	202	102	-22	-10	-7	-11	-2
2	382	202	94	-28	387	207	100	-23	-5	-5	-6	-5
3	379	204	94	-27	386	208	98	-23	-7	-4	-4	-4
4	381	211	95	-23	384	213	97	-23	-3	-2	-2	0
5	380	215	96	-20	381	216	95	-22	-1	-1	1	2

PASSENGER FLOORPAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	5	-20	-5	48	13	-10	3	44	-8	-10	-8	4
2	-55	-55	-58	-29	-64	-57	-61	-35	9	2	3	6
3	-85	-88	-89	-93	-106	-102	-104	-105	21	14	15	12
4	-101	-98	-98	-110	-130	-122	-122	-119	29	24	24	9
5	-101	-95	-95	-119	-125	-131	-129	-121	24	36	34	2

All measurements in millimeters

DATA SHEET NO. 15

SUMMARY OF FMVSS 212 AND 219 (PARTIAL) DATA

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

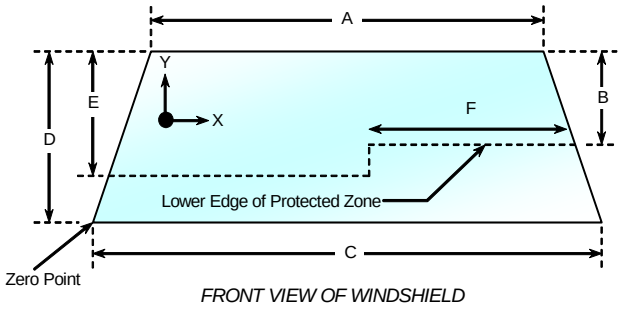
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with rubber molding and rubber cement.

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	2146	2146	100.0%
Right Side	2146	2146	100.0%
Total	4292	4292	100.0%



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1225
B	mm	430
C	mm	1480
D	mm	793
E	mm	490
F	mm	445

AREAS OF PROTECTED ZONE FAILURES

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

X	Y

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

X	Y

DATA SHEET NO. 15 … (CONTINUED)

SUMMARY OF FMVSS 212 AND 219 (PARTIAL) DATA

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 15.6° C Test Time: 1:11 PM

Stoddard Solvent Spillage Measurements

A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable = 1 oz.)

B. For the 5 minute period after motion ceases: 0 oz.
(Maximum allowable = 5 oz.)

C. For the following 25 minutes: 0 oz.
(Maximum allowable = 1 oz./minute)

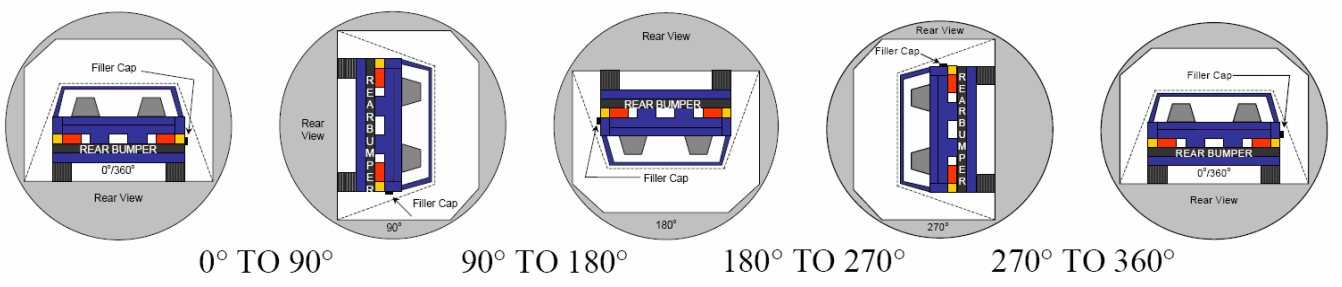
D. Spillage: There was no Stoddard solvent spillage.

DATA SHEET NO. 16

FMVSS 301 STATIC ROLLOVER

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12



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

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

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	84	300	384
90° To 180°	81	300	381
180° To 270°	79	300	379
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

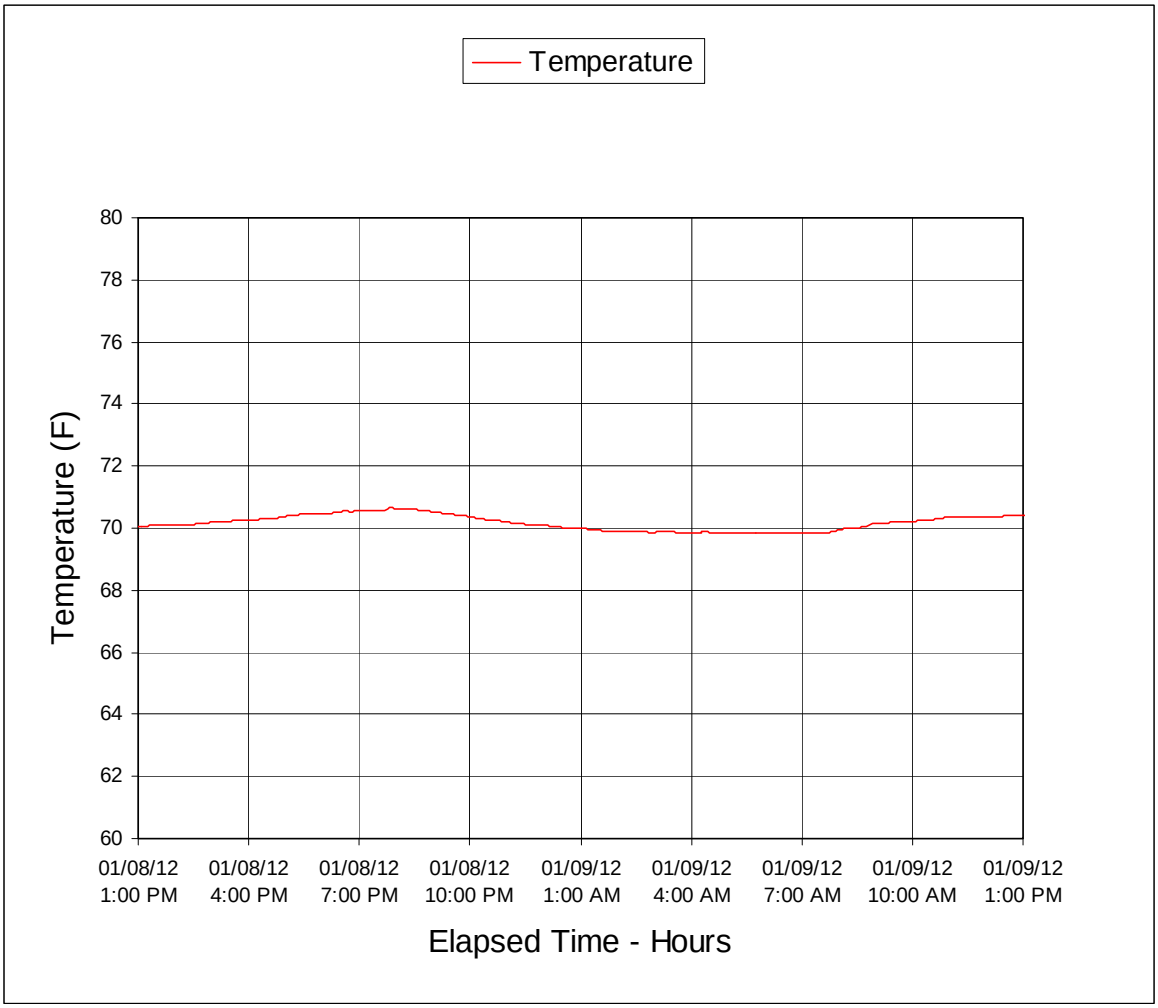
Test Phase	Spillage Location
0° To 90°	
90° To 180°	
180° To 270°	
270° To 360°	

DATA SHEET NO. 17

DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2012 Kia Soul 5-Door MPV NHTSA No.: MC0515

Test Program: 56 km/h Frontal Impact NCAP Test Test Date: 1/9/12



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS … (CONTINUED)

TABLE OF PHOTOGRAPHS … (CONTINUED)

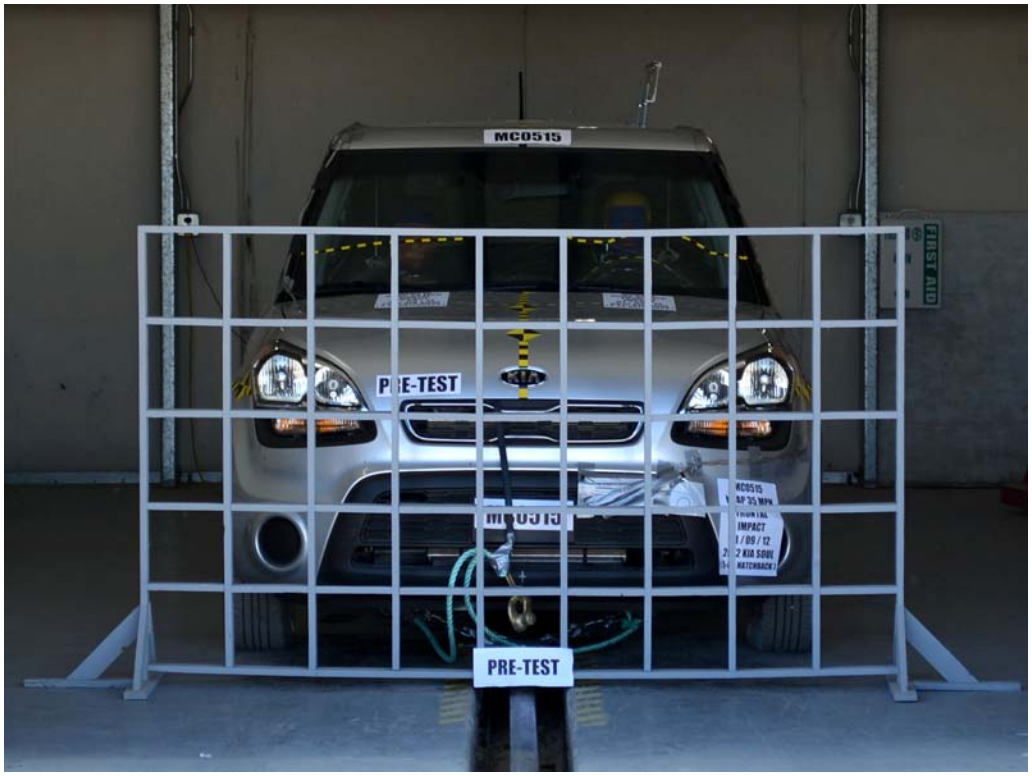


FIGURE 1. Load Cell Location

FIGURE 2. Load Cell Wall

FIGURE 3. Manufacturer's Label

FIGURE 4. Tire Placard

FIGURE 5. 2012 KIA Soul Right Front ¾ View, As Delivered

FIGURE 6. Left Rear ¾ View, As Received

FIGURE 7. Pre-Test Front View of Test Vehicle

FIGURE 8. Post-Test Front View of Test Vehicle

FIGURE 9. Pre-Test Left View of Test Vehicle

FIGURE 10. Post-Test Left View of Test Vehicle

FIGURE 11. Pre-Test Right View of Test Vehicle

FIGURE 12. Post-Test Right View of Test Vehicle

FIGURE 13. Pre-Test Right Front ¾ View

FIGURE 14. Post-Test Right Front ¾ View

FIGURE 15. Pre-Test Left Rear ¾ View

FIGURE 16. Post-Test Left Rear ¾ View

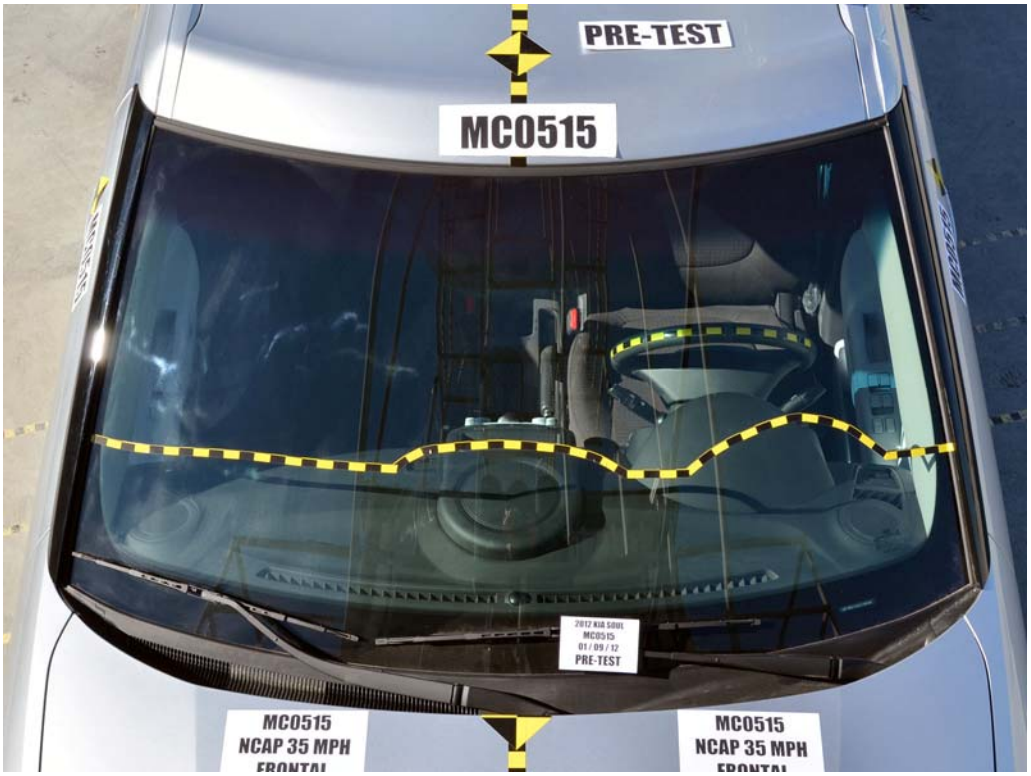


FIGURE 17. Pre-Test Windshield View

FIGURE 18. Post-Test Windshield View

FIGURE 19. Pre-Test Engine Compartment View

FIGURE 20. Post-Test Engine Compartment View

FIGURE 21. Pre-Test Fuel Filler Cap View

FIGURE 22. Post-Test Fuel Filler Cap View

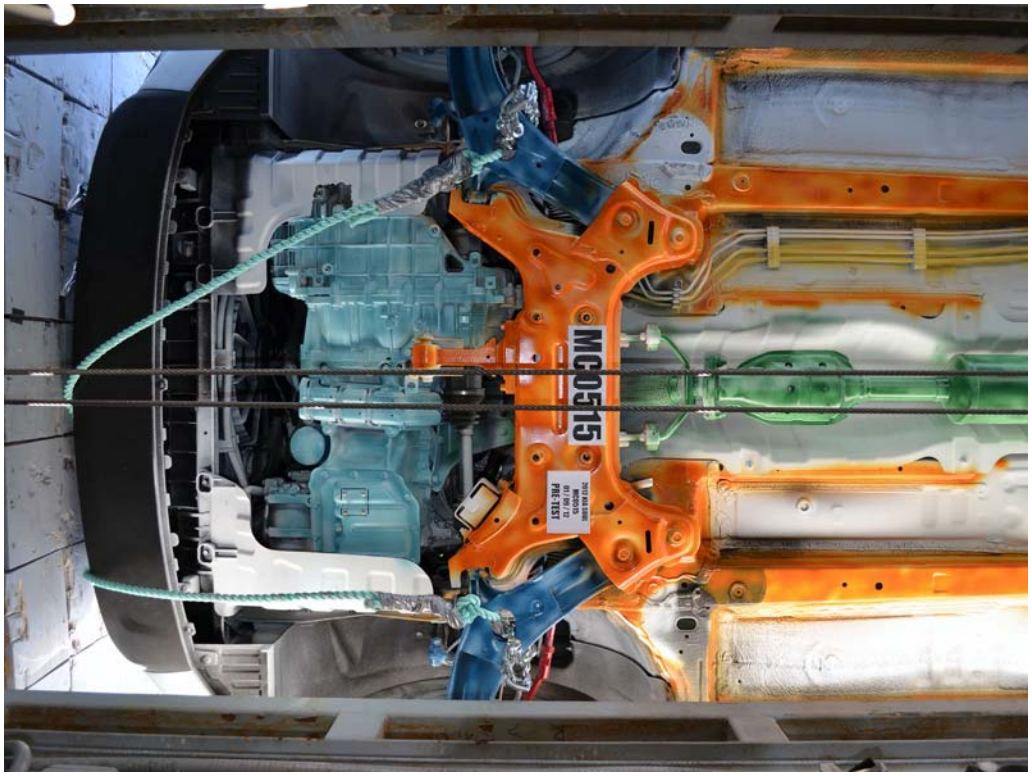


FIGURE 23. Pre-Test Front Underbody View

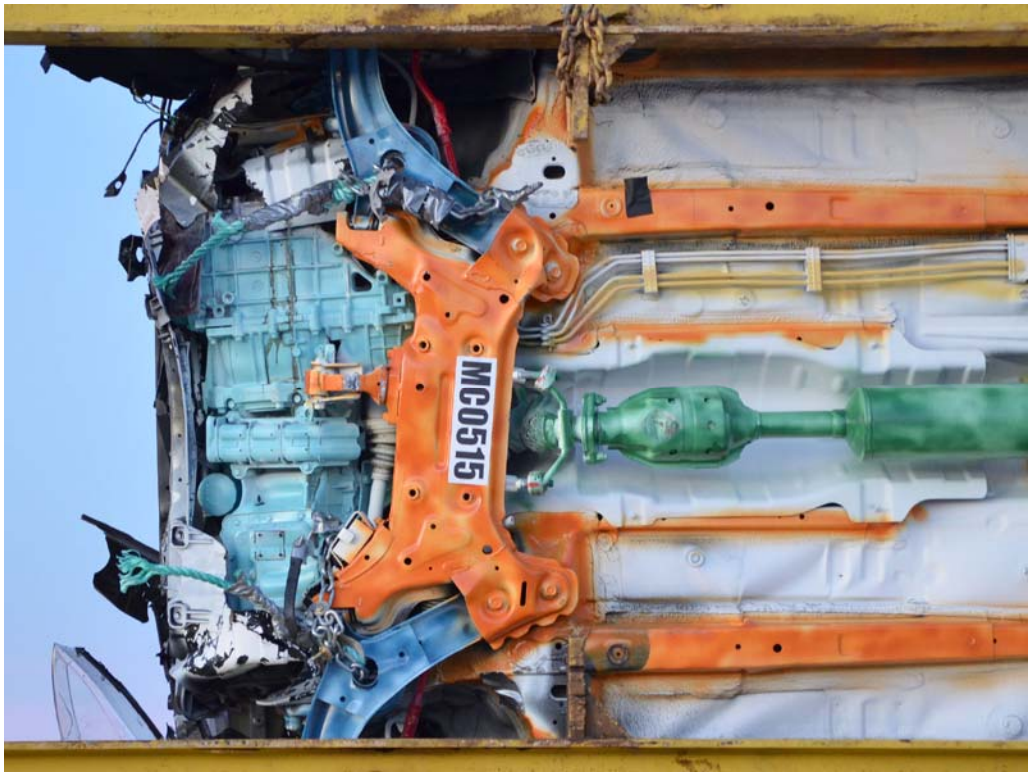


FIGURE 24. Post-Test Front Underbody View

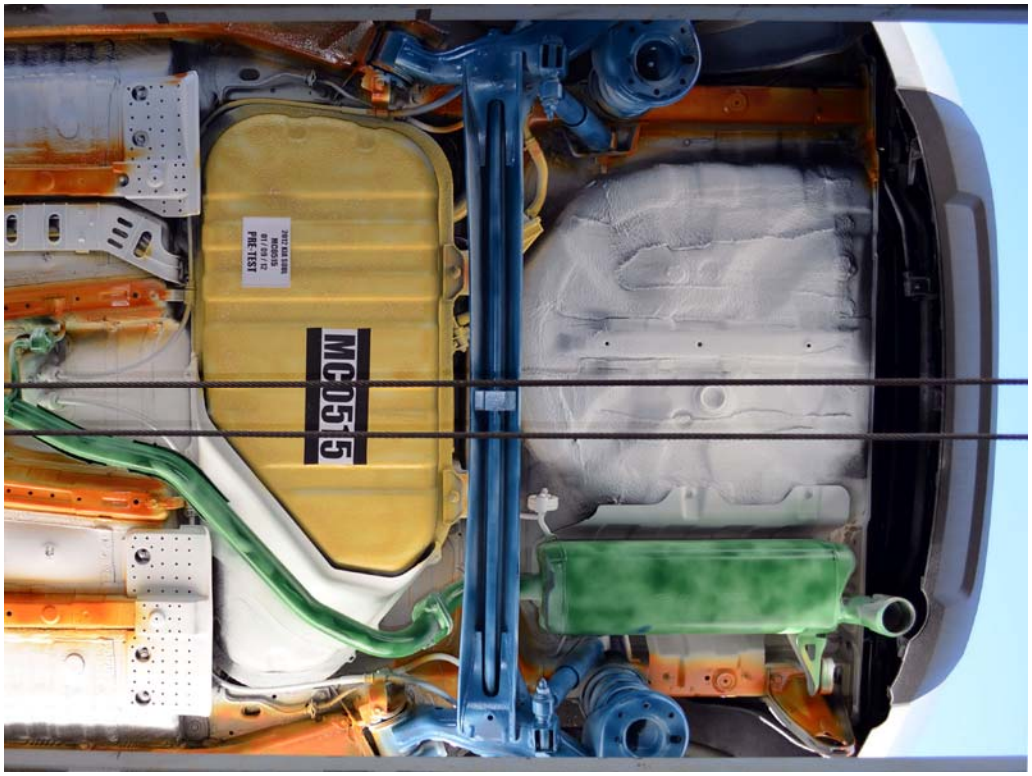


FIGURE 25. Pre-Test Rear Underbody View

FIGURE 26. Post-Test Rear Underbody View

FIGURE 27. Pre-Test Dummy Cable Routing

FIGURE 28. Post-Test Dummy Cable Routing

FIGURE 29. Pre-Test Driver Dummy Front View

FIGURE 30. Post-Test Driver Dummy Front View

FIGURE 31. Pre-Test Driver Dummy Window View

FIGURE 32. Post-Test Driver Dummy Window View

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

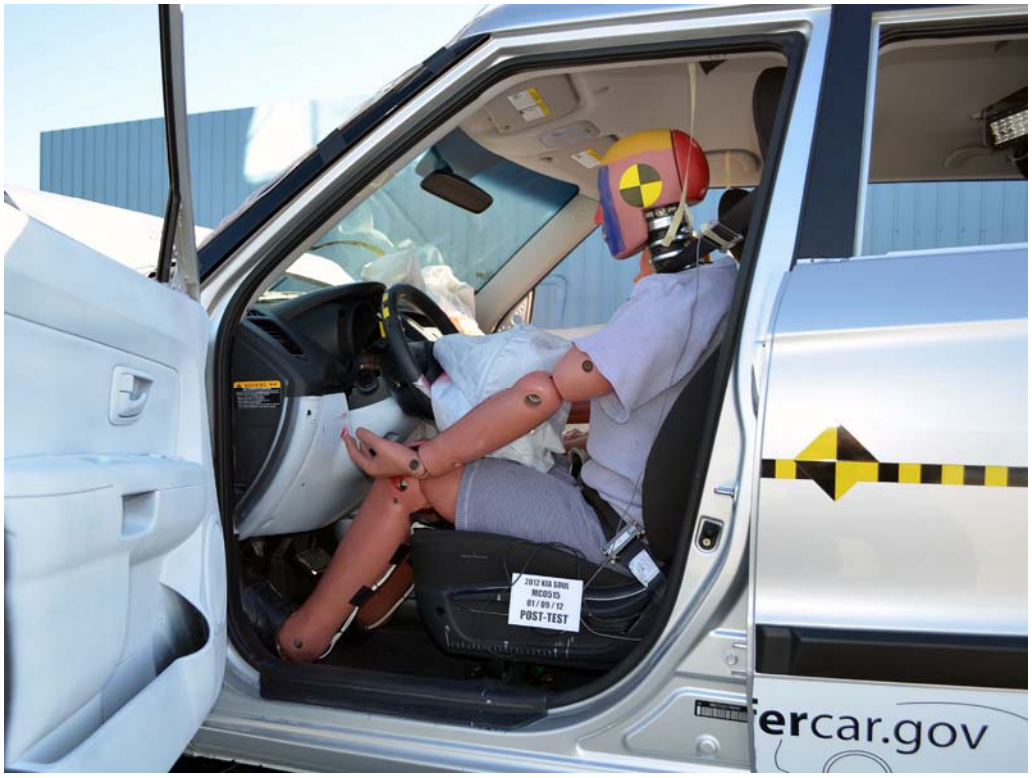


FIGURE 34. Post-Test Driver Dummy and Vehicle Interior View

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

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

FIGURE 37. Pre-Test Driver Dummy Feet

FIGURE 38. Post-Test Driver Dummy Feet

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

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

FIGURE 41. Pre-Test Driver's Side Floorpan

FIGURE 42. Post-Test Driver's Side Floorpan

FIGURE 43. Post-Test Driver Dummy Face

FIGURE 44. Post-Test Driver Dummy Contact With Airbag

FIGURE 45. Post-Test Driver Dummy Contact With Headrest

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

FIGURE 46. Pre-Test View Of Steering Wheel

FIGURE 47. Post-Test View Of Steering Wheel

FIGURE 48. Pre-Test Passenger Dummy Front View

FIGURE 49. Post-Test Passenger Dummy Front View

FIGURE 50. Pre-Test Passenger Dummy Window View

FIGURE 51. Post-Test Passenger Dummy Window View

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

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

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

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

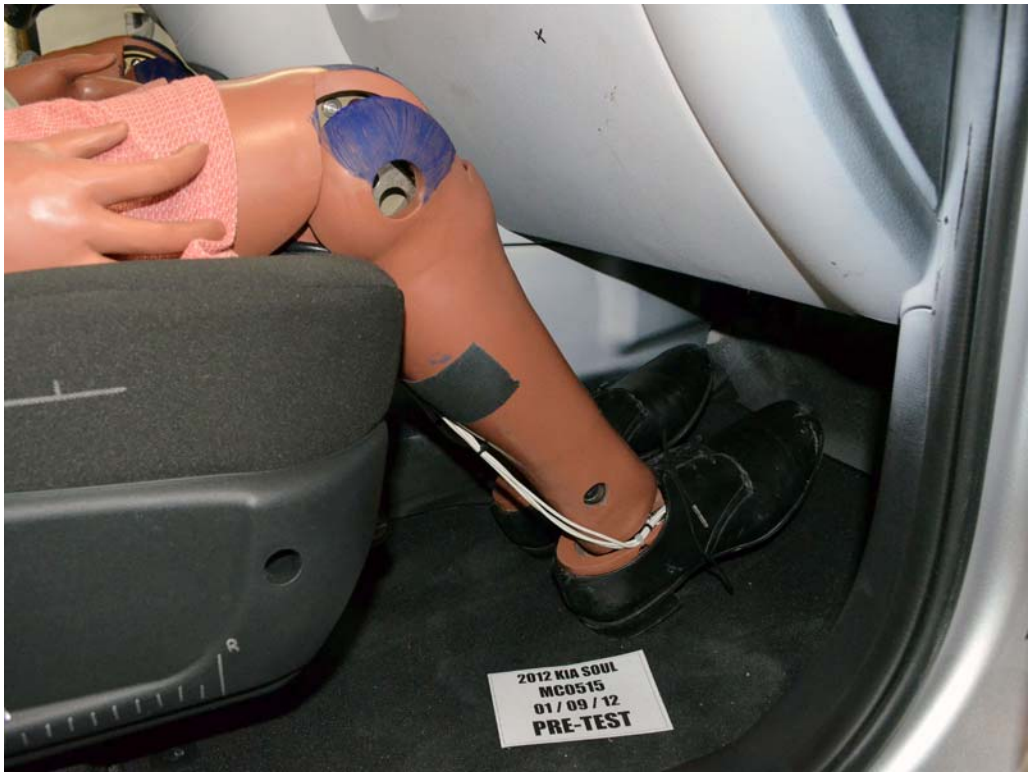


FIGURE 56. Pre-Test Passenger Dummy Feet

FIGURE 57. Post-Test Passenger Dummy Feet

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

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

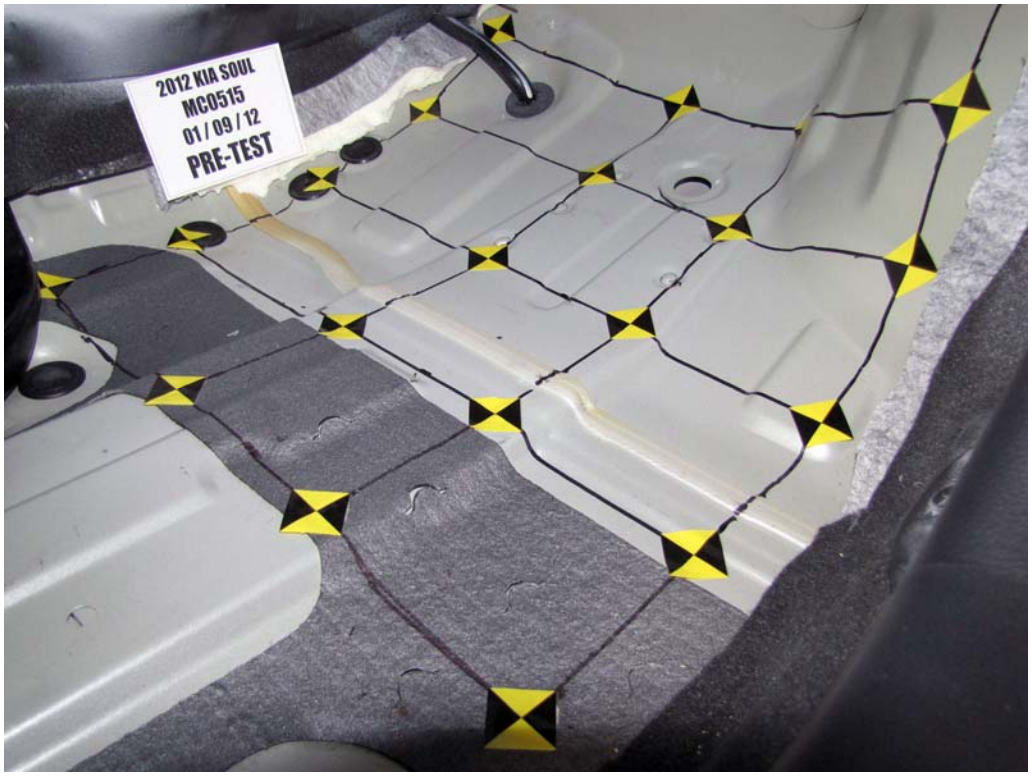


FIGURE 60. Pre-Test Passenger's Side Floorpan

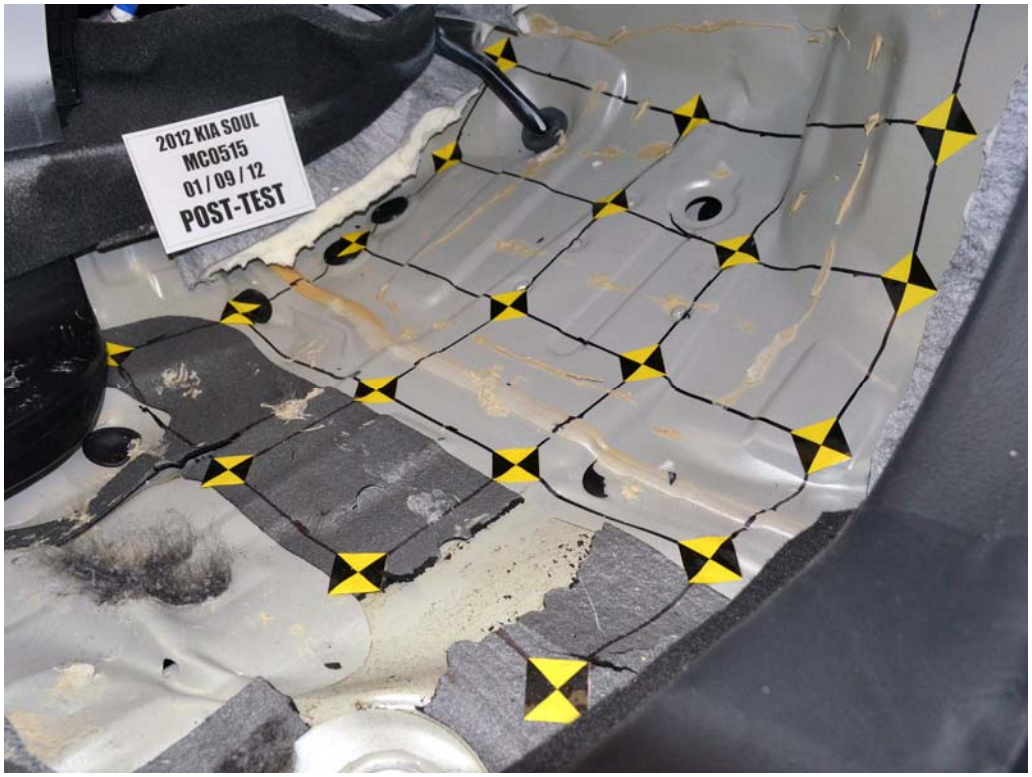


FIGURE 61. Post-Test Passenger's Side Floorpan

FIGURE 62. Post-Test Passenger Dummy Contact With Airbag

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

FIGURE 62b. Post-Test Passenger Dummy Contact With Glovebox

FIGURE 63. Pre-Test of Ballast Installed in Vehicle

Photograph Not Applicable
No Stoddard
Solvent Spillage

FIGURE 64. Post-Test Stoddard Solvent Spillage Location

FIGURE 65. Post-Test Speed Trap Read Out

FIGURE 66. Vehicle at 0°on Static Rollover Device

FIGURE 67. Vehicle at 90°on Static Rollover Device

FIGURE 68. Vehicle at 180°on Static Rollover Device

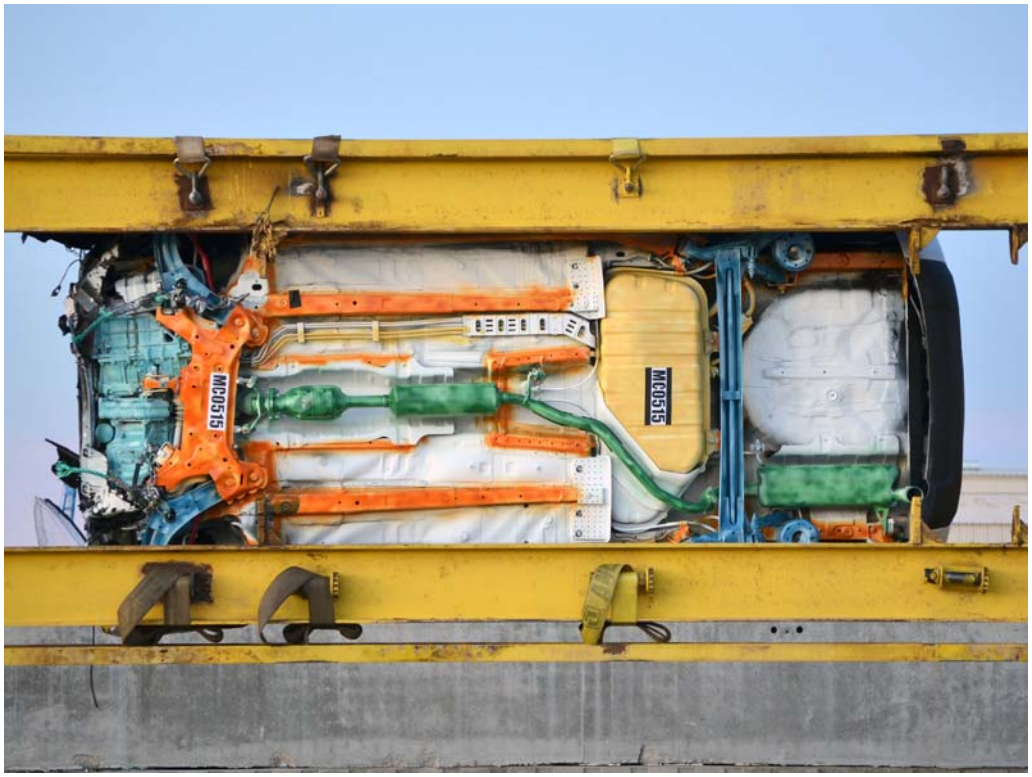


FIGURE 69. Vehicle at 270°on Static Rollover Device

FIGURE 70. Vehicle at 360°on Static Rollover Device

FIGURE 71. 2012 KIA Soul Frontal Impact Event

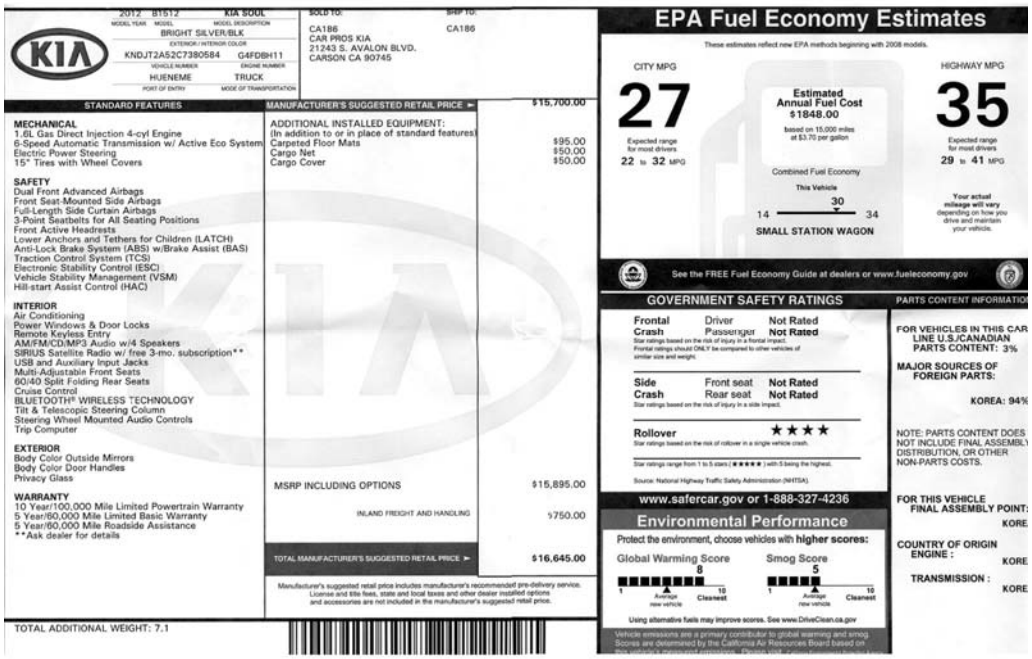


FIGURE 72. Monroney Label Photograph

APPENDIX B
DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

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

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

Vehicle Right Brake Caliper X

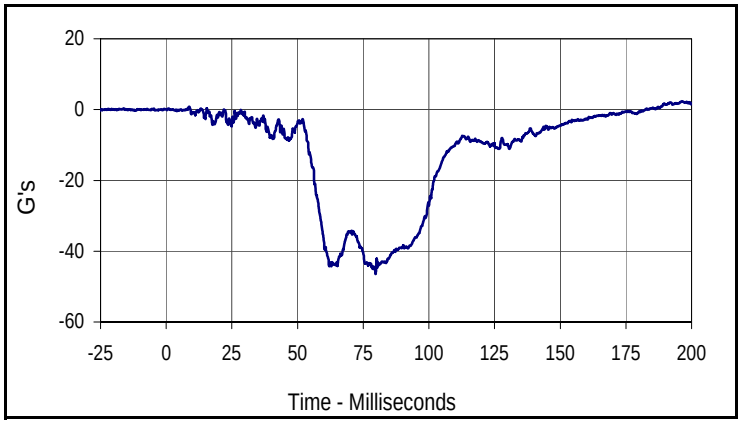
Load Cell Barrier A1-A9

Load Cell Barrier B1-B9

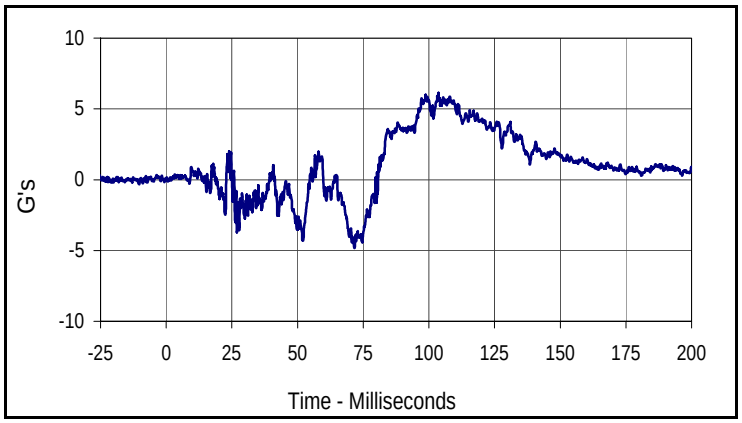
Load Cell Barrier C1-C9

Load Cell Barrier D1-D9

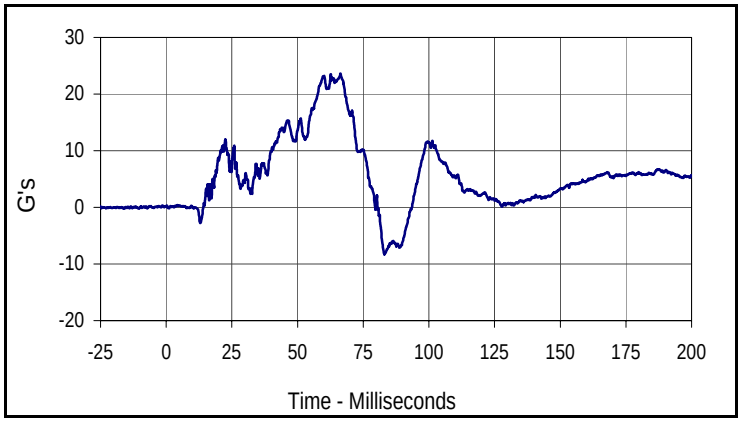
Test Vehicle:	2012 Kia Soul 5-Door MPV	NHTSA No.:	MC0515
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	1/9/12



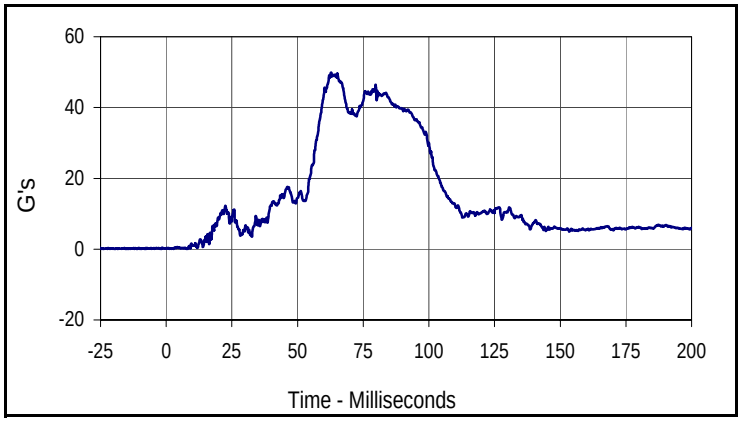
Curve Description			
Driver Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
2.4	196.4	-46.4	79.8



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
6.1	103.6	-4.8	71.7

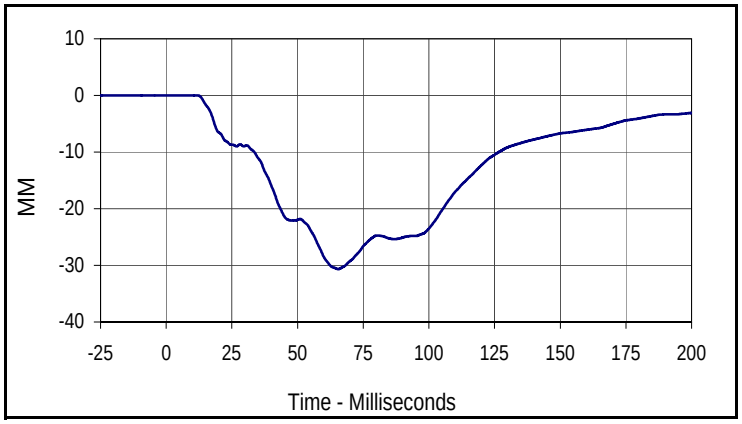


Curve Description			
Driver Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
23.6	66.4	-8.3	83.0



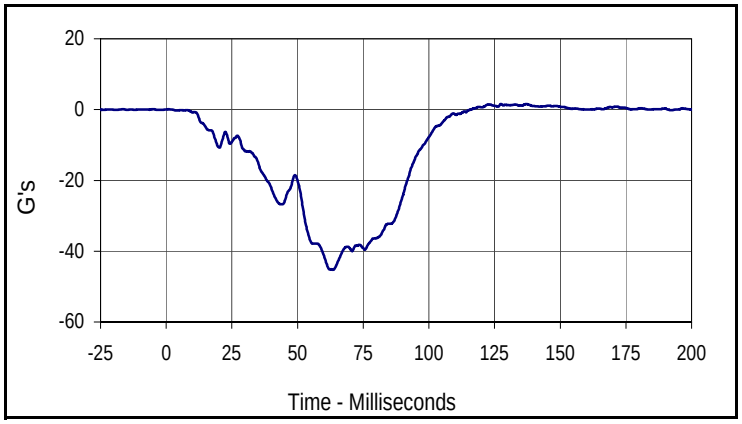
Curve Description			
Driver Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
49.9	62.7	0.0	1.3

Test Vehicle:	2012 Kia Soul 5-Door MPV	NHTSA No.:	MC0515
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	1/9/12

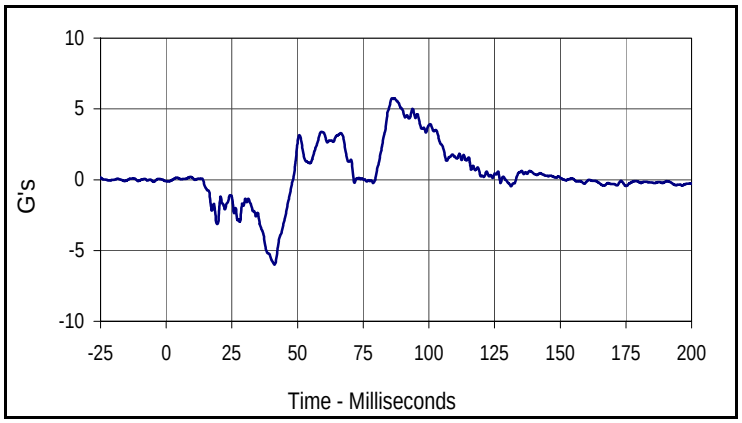


Curve Description			
Driver Chest Deflection			
Plot No.	Type	SAE Class	Units
005	FIL	180	MM
Max	Time	Min	Time
0.0	11.8	-30.7	65.5

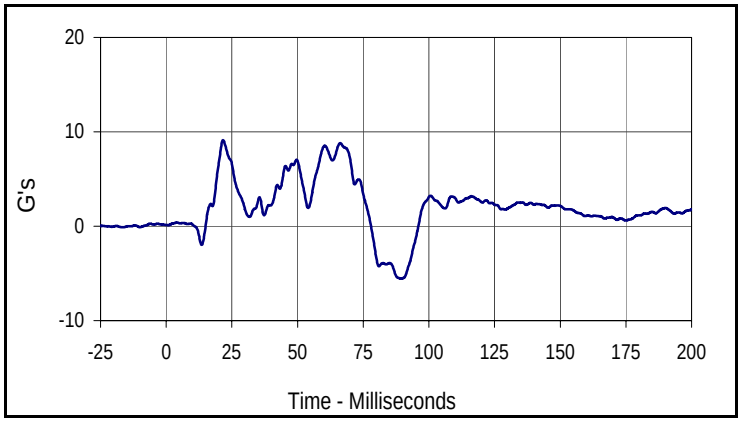
Test Vehicle:	2012 Kia Soul 5-Door MPV	NHTSA No.:	MC0515
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	1/9/12



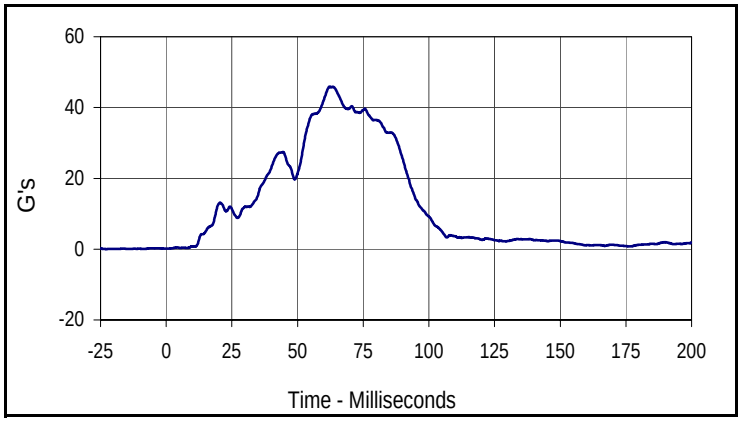
Curve Description			
Driver Chest Acceleration X Primary			
Plot No.	Type	SAE Class	Units
006	FIL	180	G's
Max	Time	Min	Time
1.6	127.4	-45.2	63.5



Curve Description			
Driver Chest Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
007	FIL	180	G's
Max	Time	Min	Time
5.8	85.9	-6.0	41.2

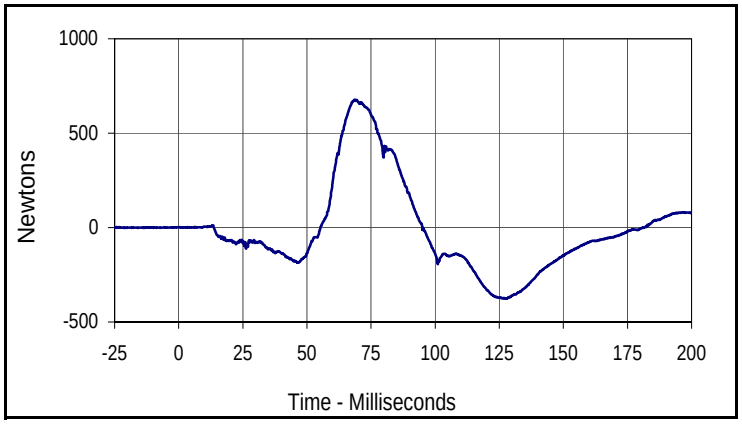


Curve Description			
Driver Chest Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
008	FIL	180	G's
Max	Time	Min	Time
9.1	21.6	-5.5	89.3

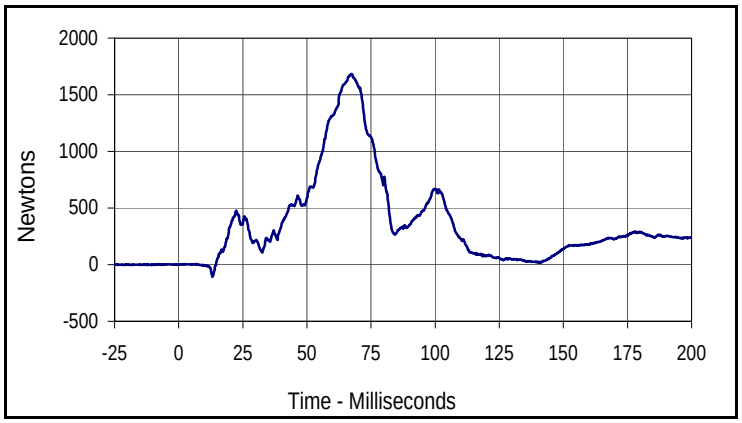


Curve Description			
Driver Chest Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
009	RES	180	G's
Max	Time	Min	Time
45.9	62.2	0.2	0.2

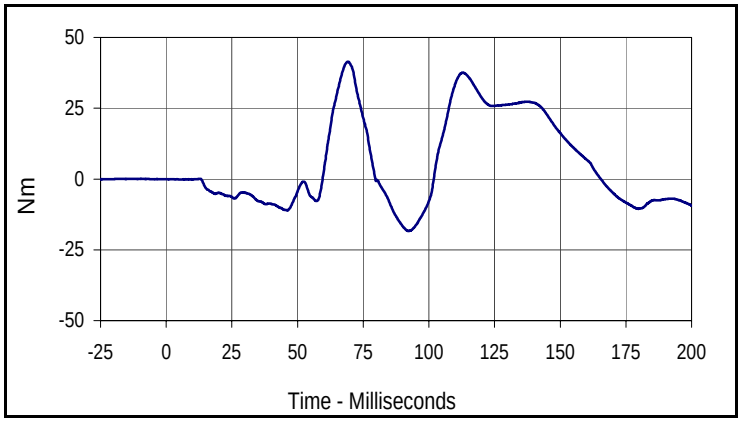
Test Vehicle:	2012 Kia Soul 5-Door MPV	NHTSA No.:	MC0515
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	1/9/12



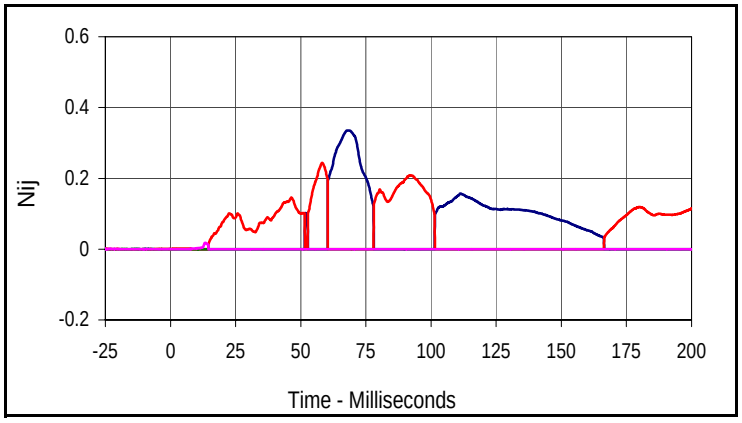
Curve Description			
Driver Upper Neck Force X			
Plot No.	Type	SAE Class	Units
010	FIL	1000	Newtons
Max	Time	Min	Time
678.3	68.6	-376.3	127.8



Curve Description			
Driver Upper Neck Force Z			
Plot No.	Type	SAE Class	Units
011	FIL	1000	Newtons
Max	Time	Min	Time
1684.2	67.5	-106.9	13.1

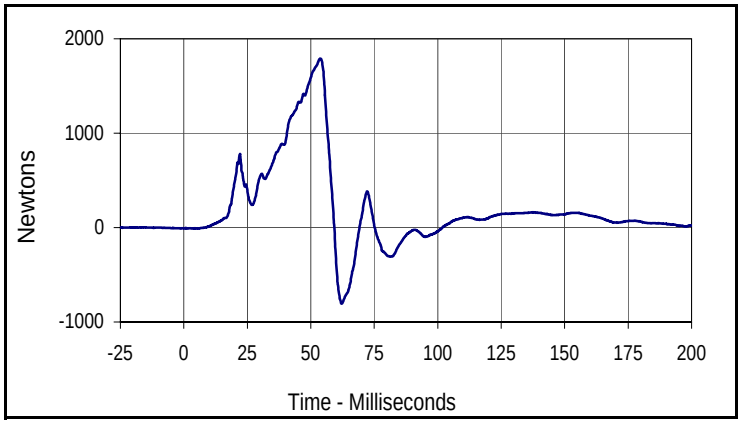


Curve Description			
Driver Upper Neck Moment Y			
Plot No.	Type	SAE Class	Units
012	FIL	600	Nm
Max	Time	Min	Time
41.5	69.1	-18.4	92.3

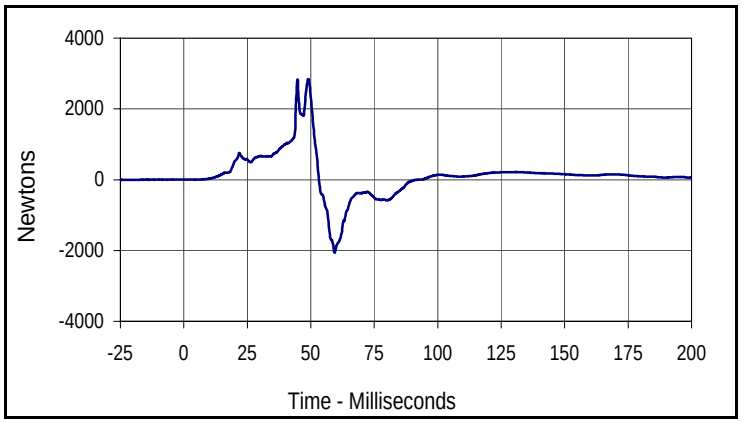


Curve Description			
Driver Nij			
Units	Type	Max	Time
Ntf	FIL	0.34	67.7
Units	Type	Max	Time
Nte	FIL	0.24	58.2
Units	Type	Max	Time
Ncf	FIL	0.02	268.5
Units	Type	Max	Time
Nce	FIL	0.02	13.4

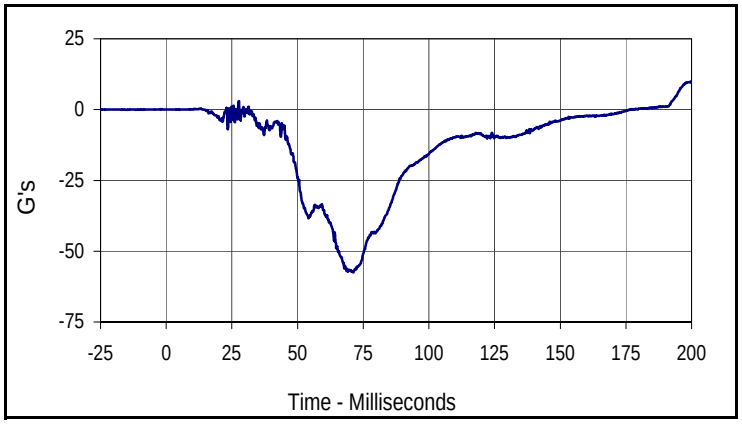
Test Vehicle:	2012 Kia Soul 5-Door MPV	NHTSA No.:	MC0515
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	1/9/12



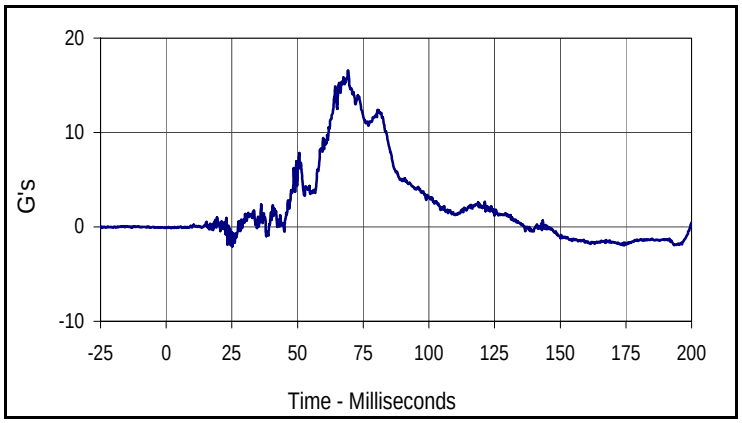
Curve Description			
Driver Left Femur Force Z			
Plot No.	Type	SAE Class	Units
013	FIL	600	Newtons
Max	Time	Min	Time
1791.1	53.8	-805.2	62.1



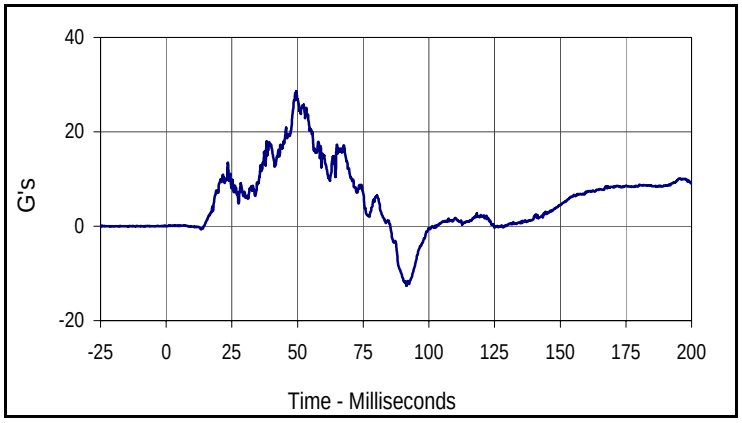
Curve Description			
Driver Right Femur Force Z			
Plot No.	Type	SAE Class	Units
014	FIL	600	Newtons
Max	Time	Min	Time
2845.2	49.0	-2066.4	59.4



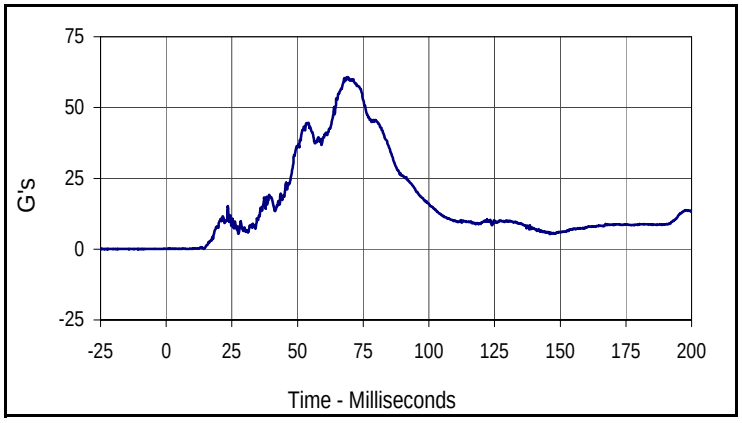
Curve Description			
Passenger Head Acceleration X Primary			
Plot No.	Type	SAE Class	Units
015	FIL	1000	G's
Max	Time	Min	Time
9.9	200.0	-57.5	71.1



Curve Description			
Passenger Head Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
016	FIL	1000	G's
Max	Time	Min	Time
16.6	69.3	-2.1	25.2

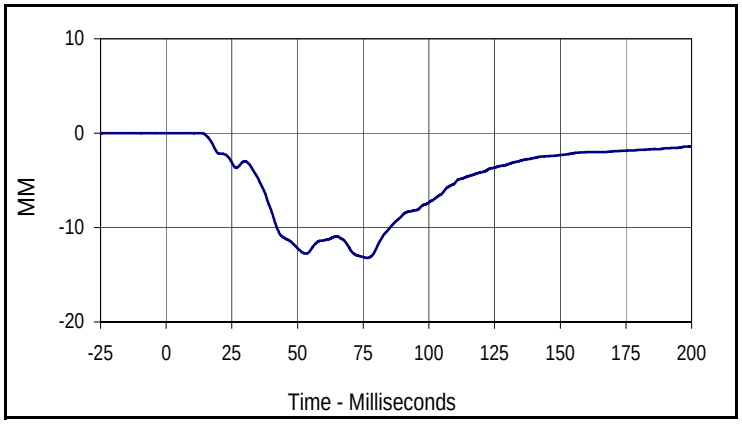


Curve Description			
Passenger Head Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
017	FIL	1000	G's
Max	Time	Min	Time
28.6	49.6	-12.6	91.4

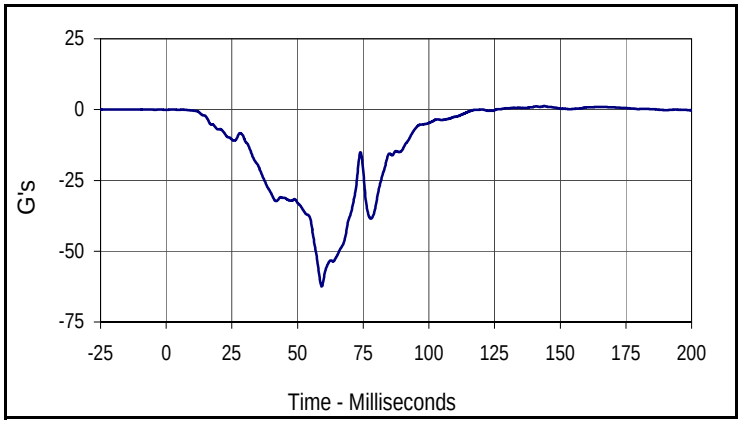


Curve Description			
Passenger Head Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
018	RES	1000	G's
Max	Time	Min	Time
60.8	69.2	0.0	8.4

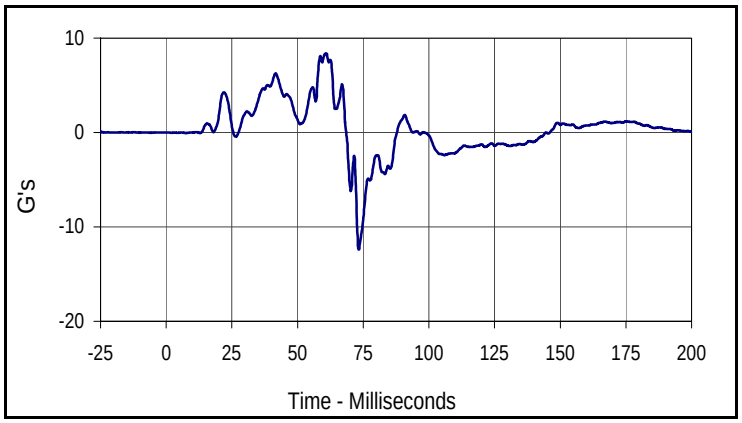
Test Vehicle:	2012 Kia Soul 5-Door MPV	NHTSA No.:	MC0515
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	1/9/12



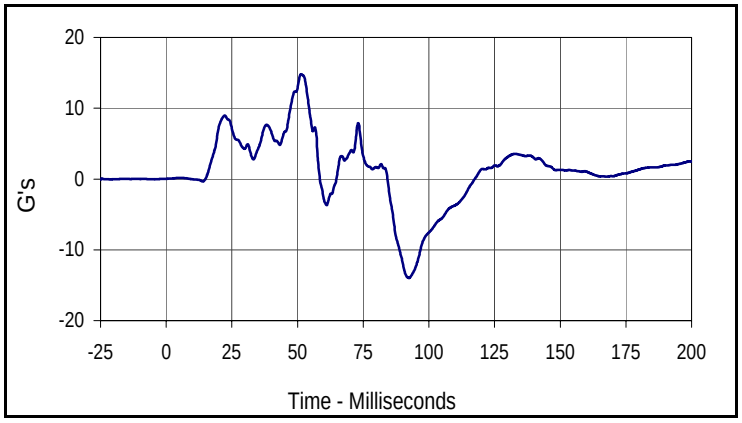
Curve Description			
Passenger Chest Deflection			
Plot No.	Type	SAE Class	Units
019	FIL	180	MM
Max	Time	Min	Time
0.0	13.1	-13.2	76.5



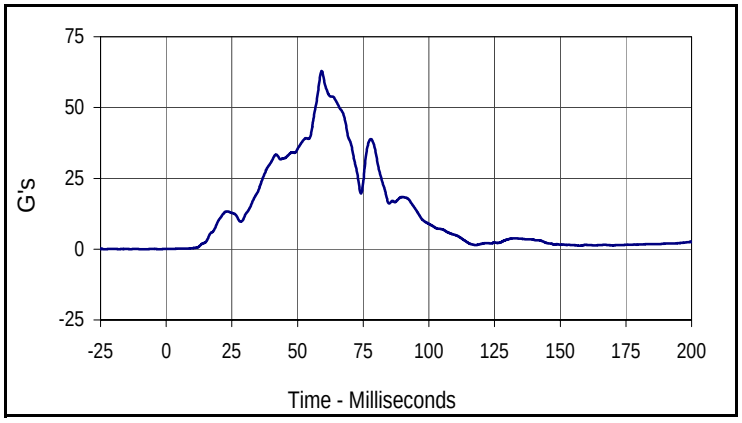
Curve Description			
Passenger Chest Acceleration X Primary			
Plot No.	Type	SAE Class	Units
020	FIL	180	G's
Max	Time	Min	Time
1.2	144.0	-62.4	59.2



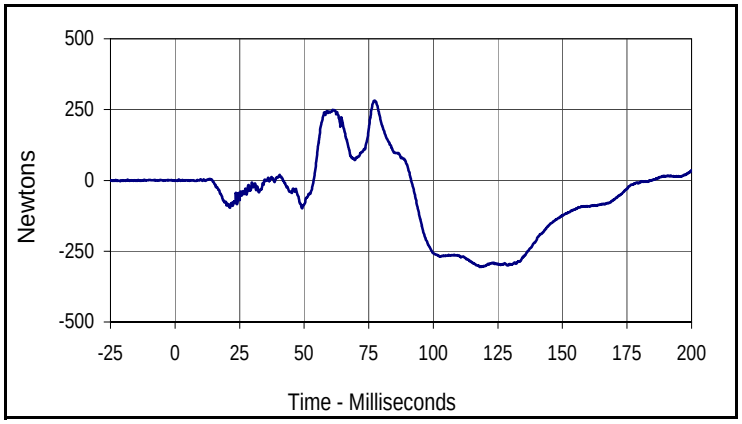
Curve Description			
Passenger Chest Acceleration Y Primary			
Plot No.	Type	SAE Class	Units
021	FIL	180	G's
Max	Time	Min	Time
8.4	60.9	-12.4	73.3



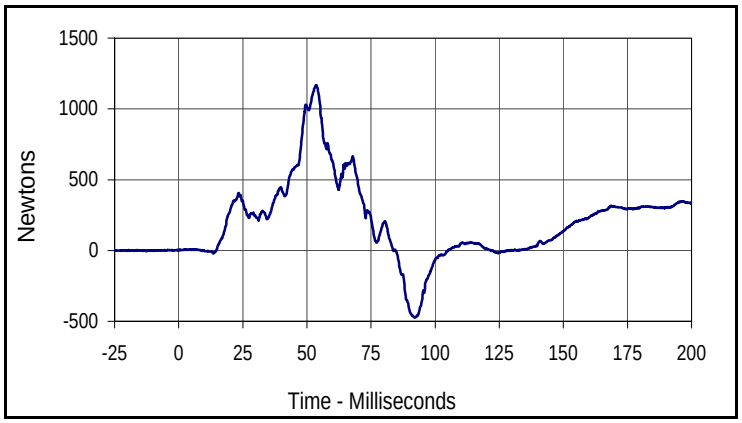
Curve Description			
Passenger Chest Acceleration Z Primary			
Plot No.	Type	SAE Class	Units
022	FIL	180	G's
Max	Time	Min	Time
14.8	51.4	-14.0	92.4



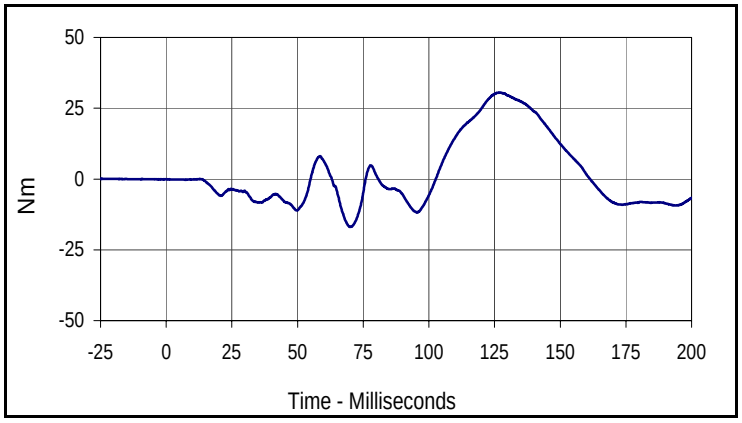
Curve Description			
Passenger Chest Resultant Acceleration Primary			
Plot No.	Type	SAE Class	Units
023	RES	180	G's
Max	Time	Min	Time
62.9	59.2	0.0	0.0



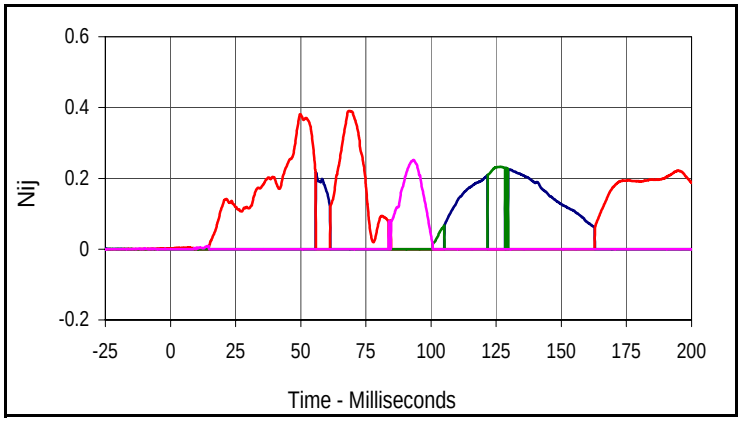
Curve Description			
Passenger Upper Neck Force X			
Plot No.	Type	SAE Class	Units
024	FIL	1000	Newtons
Max	Time	Min	Time
281.9	77.3	-305.6	118.5



Curve Description			
Passenger Upper Neck Force Z			
Plot No.	Type	SAE Class	Units
025	FIL	1000	Newtons
Max	Time	Min	Time
1167.4	53.6	-472.5	92.2

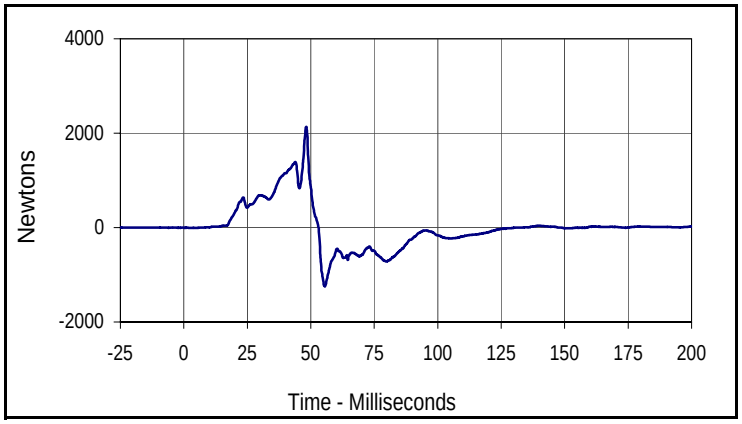


Curve Description			
Passenger Upper Neck Moment Y			
Plot No.	Type	SAE Class	Units
026	FIL	600	Nm
Max	Time	Min	Time
30.5	127.2	-16.9	70.0

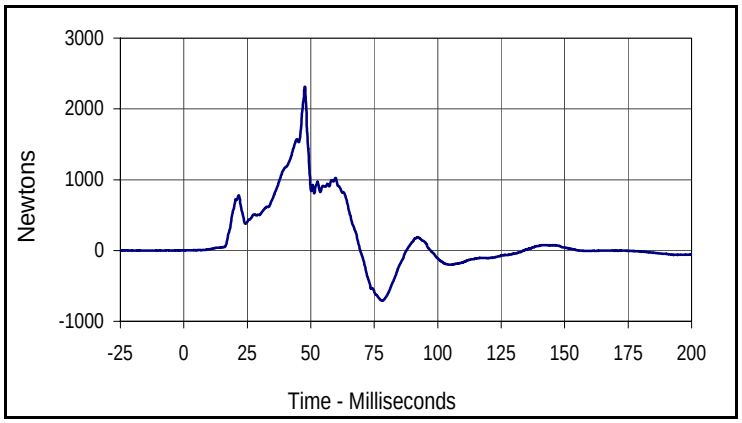


Curve Description			
Passenger Nij			
Units	Type	Max	Time
Ntf	FIL	0.23	128.6
Units	Type	Max	Time
Nte	FIL	0.39	68.5
Units	Type	Max	Time
Ncf	FIL	0.23	126.6
Units	Type	Max	Time
Nce	FIL	0.25	93.3

Test Vehicle:	2012 Kia Soul 5-Door MPV	NHTSA No.:	MC0515
Test Program:	56 km/h Frontal Impact NCAP Test	Test Date:	1/9/12



Curve Description			
Passenger Passenger Left Femur			
Plot No.	Type	SAE Class	Units
027	FIL	600	Newtons
Max	Time	Min	Time
2136.4	48.2	-1244.3	55.5



Curve Description			
Passenger Passenger Right Femur			
Plot No.	Type	SAE Class	Units
028	FIL	600	Newtons
Max	Time	Min	Time
2312.9	47.7	-712.2	78.3

APPENDIX C
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

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

Test Program: Hybrid III 50th Percentile Male Dummy Damage Checklist Test Date: 1/6/12

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

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

Describe the repair on repair or replacement of parts:

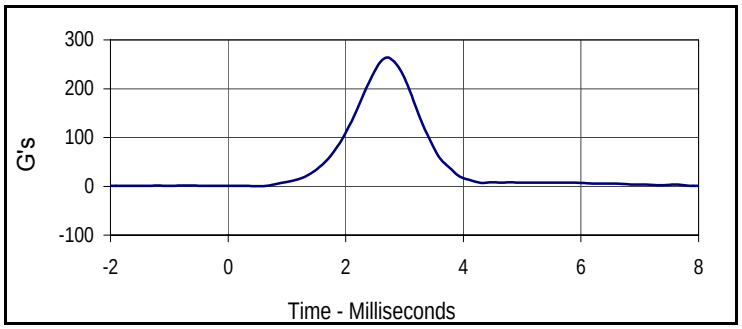
Test Program: Hybrid III 50th Percentile Male External Measurements Test Date: 1/6/12

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

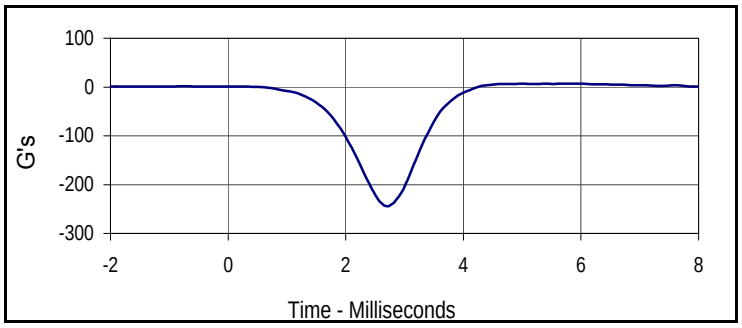
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.11	Pass
Laboratory Relative Humidity	%	10 to 70	27.7	Pass
A - Total sitting height	mm	879 to 889	882	Pass
B - Shoulder pivot height	mm	505 to 521	516	Pass
C - H point height	mm	84 to 89	89	Pass
D - H point location from backline	mm	135 to 140	136	Pass
E - Shoulder pivot from backline	mm	84 to 94	86	Pass
F - Thigh clearance	mm	140 to 155	149	Pass
G - Back of elbow to wrist pivot	mm	290 to 305	300	Pass
H - Head back to backline	mm	41 to 46	44	Pass
I - Shoulder to elbow length	mm	330 to 345	335	Pass
J - Elbow rest height	mm	190 to 211	207	Pass
K - Buttock to knee length	mm	579 to 604	589	Pass
L - Popliteal length	mm	429 to 455	437	Pass
M - Knee pivot height	mm	485 to 500	487	Pass
N - Buttock popliteal length	mm	452 to 477	472	Pass
O - Chest depth without jacket	mm	213 to 229	224	Pass
P - Foot length	mm	251 to 267	260	Pass
V - Shoulder breadth	mm	422 to 437	434	Pass
W - Foot breadth	mm	91 to 107	99	Pass
Y - Chest circumference (with chest jacket)	mm	970 to 1001	985	Pass
Z - Waist circumference	mm	836 to 866	864	Pass
AA - Location for chest circumference	mm	429 to 434	431	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
		Overall Test Results		Pass

Test Program:	Hybrid III 50th Percentile Male Head Drop Test	Test Date:	1/6/12
ATD Serial No.:	034	Test I.D.:	M034HD025

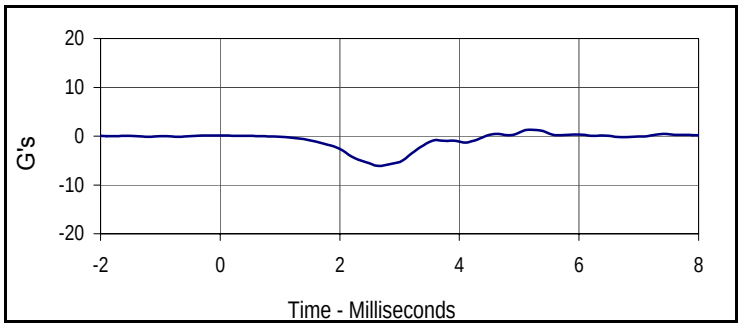
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	245	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	28.7	Pass
Peak Resultant Acceleration		G's	225.0 to 275.0	264.3	Pass
Peak Lateral Acceleration		G's	≤15.0	6.1	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	6.3	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
			Overall Test Results		Pass



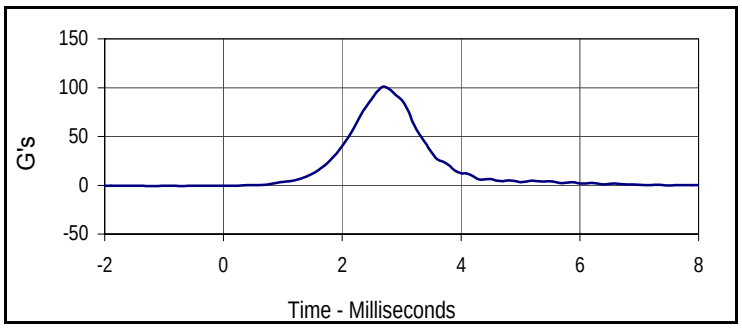
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
264.3	2.7	0.3	0.6



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
7.2	5.7	-244.1	2.7



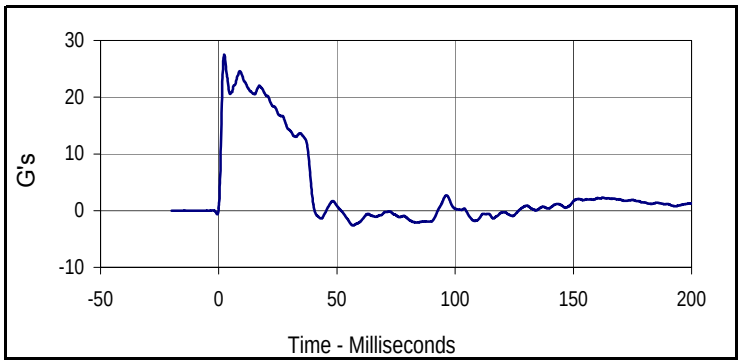
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
1.3	5.2	-6.1	2.7



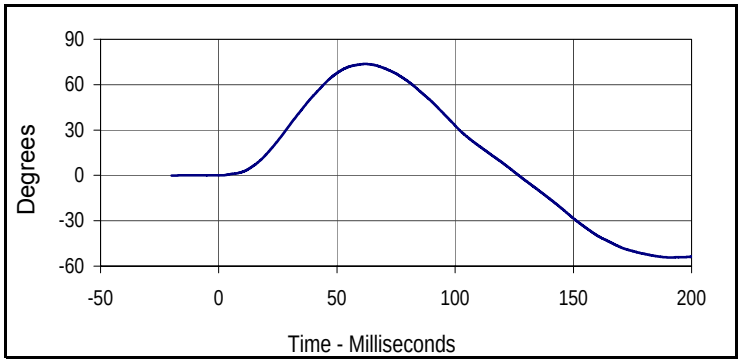
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
101.1	2.7	-0.8	-1.2

Test Program:	Hybrid III 50th Percentile Male Neck Flexion Test	Test Date:	1/6/12
ATD Serial No.:	034	Test I.D.:	M034NF025

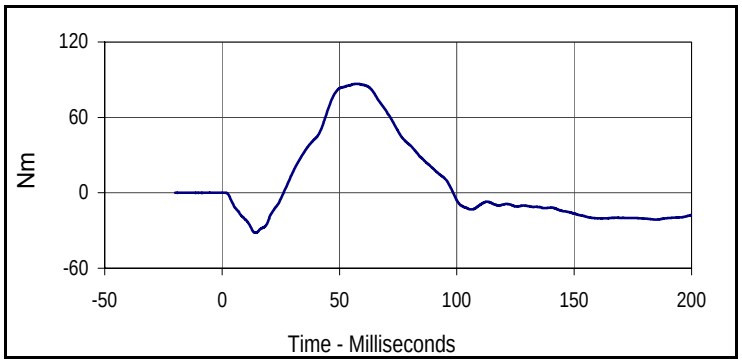
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	280	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	34.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	33.6	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.7	Pass
	20 Msec.	G's	17.6 to 22.6	20.3	Pass
	30 Msec.	G's	12.5 to 18.5	14.2	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	14.2	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	39	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	73.7	Pass
	Time	Msec.	57.0 to 64.0	62.0	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	126.9	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	86.6	Pass
	Time	Msec.	47.0 to 58.0	57.0	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	98.5	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
27.5	2.3	-2.6	56.8

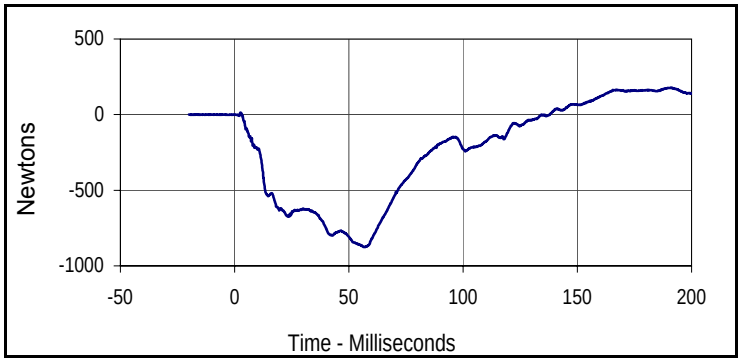


Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
73.7	62.0	-54.2	191.2

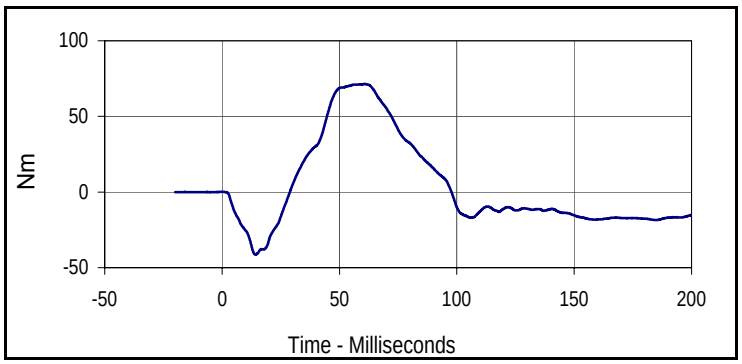


Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
86.6	57.0	-31.8	14.2

Test Program:	Hybrid III 50th Percentile Male Neck Flexion Test	Test Date:	1/6/12
ATD Serial No.:	034	Test I.D.:	M034NF025



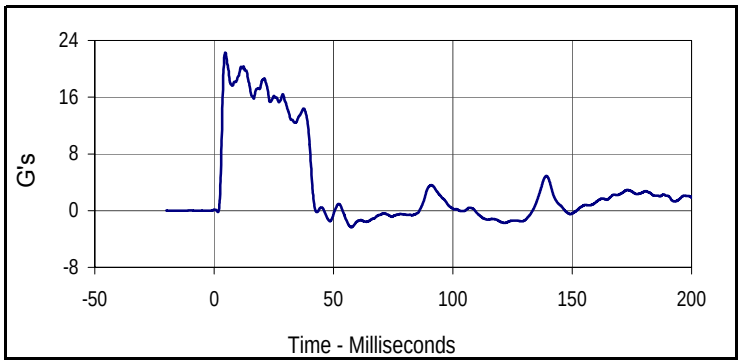
Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
177.8	191.2	-875.7	56.8



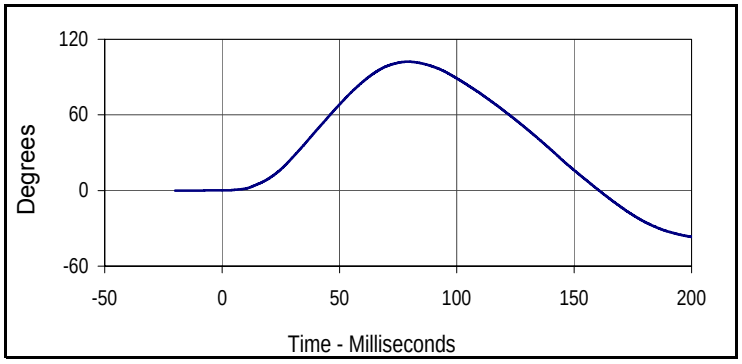
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
71.4	60.6	-41.2	14.3

Test Program:	Hybrid III 50th Percentile Male Neck Extension Test	Test Date:	1/6/12
ATD Serial No.:	034	Test I.D.:	M034NE025

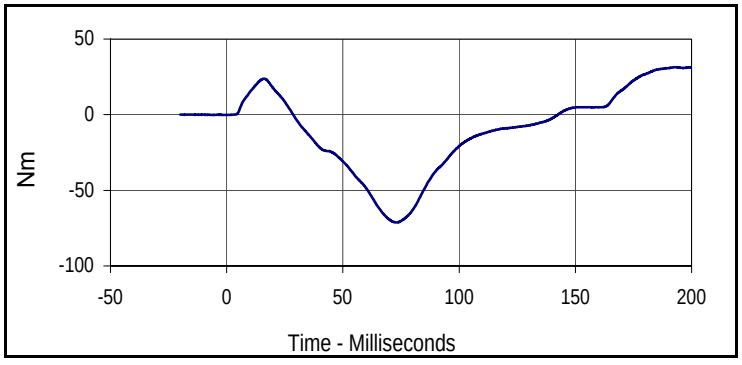
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	320	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	34.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	32.7	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.12	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.9	Pass
	20 Msec.	G's	14.0 to 19.0	18.3	Pass
	30 Msec.	G's	11.0 to 16.0	15.2	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.2	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	40.9	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	102.2	Pass
	Time	Msec.	72.0 to 82.0	79.2	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	160.6	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to -79.9	-71.3	Pass
	Time	Msec.	65.0 to 79.0	73.0	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	142.5	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
22.3	4.7	-2.3	57.5

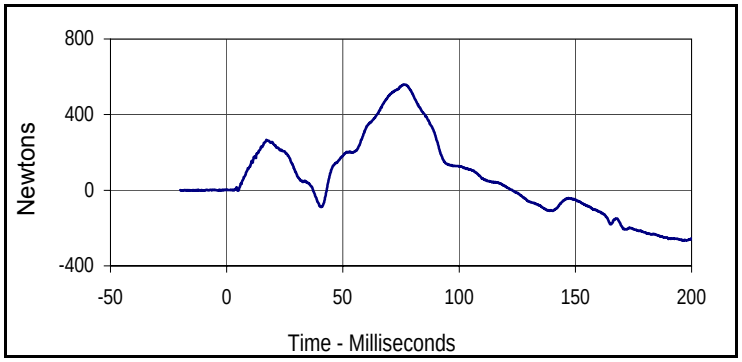


Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
102.2	79.2	-36.8	200.0

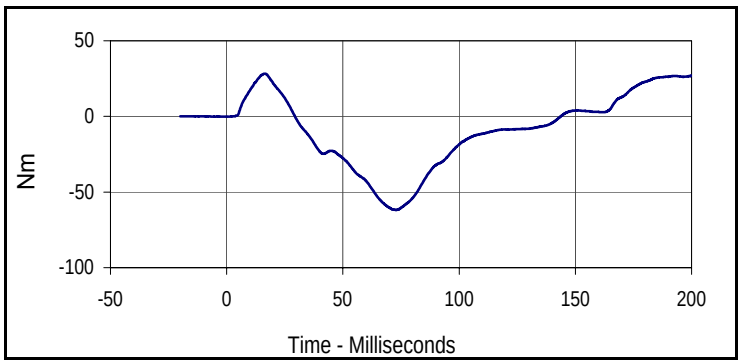


Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
31.4	200.0	-71.3	73.0

Test Program:	Hybrid III 50th Percentile Male Neck Extension Test	Test Date:	1/6/12
ATD Serial No.:	034	Test I.D.:	M034NE025



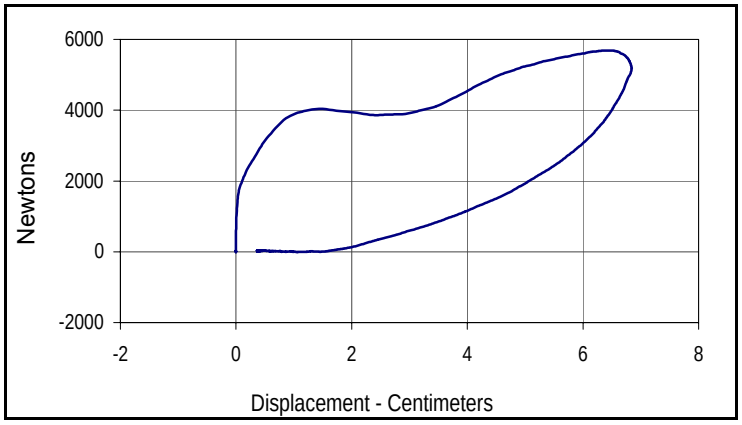
Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
559.6	76.3	-266.1	196.5



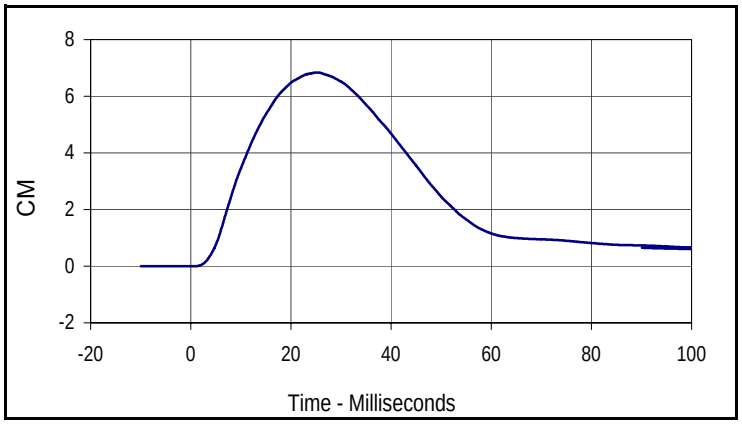
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
28.2	16.2	-61.8	72.8

Test Program:	Hybrid III 50th Percentile Male Thorax Impact Test	Test Date:	1/6/12
ATD Serial No.:	034	Test I.D.:	M034CH025

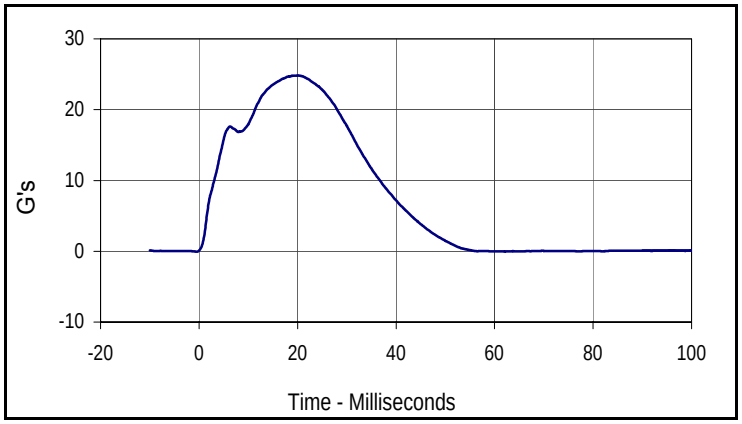
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	360	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	34.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.8	Pass
Probe Velocity		m/s	6.58 to 6.82	6.77	Pass
Peak Probe Force		Newtons	5159 to 5893	5688	Pass
Peak Sternum Deflection		CM	6.35 to 7.26	6.84	Pass
Internal Hysterysis		%	69 to 85	71.7	Pass
			Overall Test Results		Pass



Curve Description			
Probe Force vs. Chest Deflection			
Plot No.	Type	SAE Class	Hysterysis
001	FIL	180	71.7
Peak Probe Force		Peak Chest Deflection	
5688		6.84	



Curve Description			
Chest Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	180	CM
Max	Time	Min	Time
6.8	25.2	0.0	0.7



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
24.8	20.1	-0.1	-0.5

Test Program:	Hybrid III 50th Percentile Male Knee Impact Test	Test Date:	1/6/12
ATD Serial No.:	034	Test I.D.:	M034LK025 , M034RK025

Left Knee

Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	400	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.6	Pass
Humidity During Soak	Max	%	10.0 to 70.0	34.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.7	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.11	Pass
Peak Probe Force		Newtons	4715 to 5782	4906	Pass
			Overall Test Results		Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.08	Pass
Peak Probe Force	Newtons	4715 to 5782	4852	Pass
		Overall Test Results		Pass

Curve Description			
Left Knee Probe Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
4905.8	2.8	-3.1	0.0

Curve Description			
Left Knee Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
100.3	2.8	-0.1	0.0

Curve Description			
Right Knee Probe Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
4851.6	2.7	-44.3	9.0

Curve Description			
Right Knee Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
99.2	2.7	-0.9	9.0

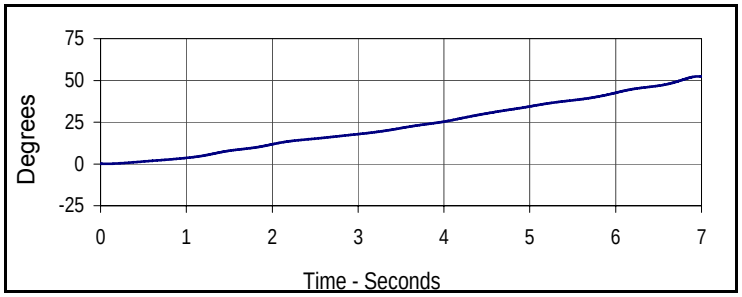
Test Program:	Hybrid III 50th Percentile Male Hip Joint-Femur Flexion Test	Test Date:	1/6/12
ATD Serial No.:	034	Test I.D.:	M034LF025 , M034RF025

Left Hip Joint-Femur Results

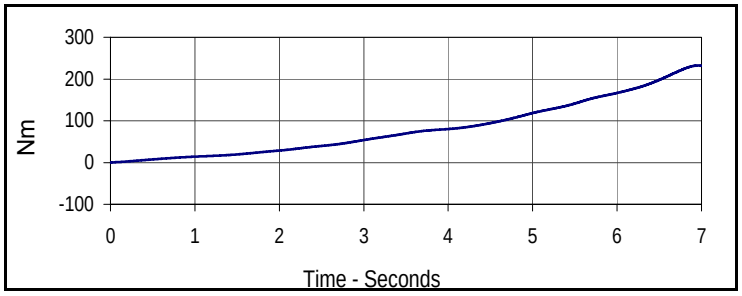
Tested Parameter		Units	Specification	Result	Pass/Fail
Hip Joint-Femur Assembly Soak Time		Minutes	≥240	450	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	34.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	32.7	Pass
Rotation Rate		deg/sec	5 to 10	7.5	Pass
Femur Torque at 30°		Nm	≤ 95	93.4	Pass
Rotation at 203 Nm		Degrees	40.0 to 50.0	47.3	Pass
			Overall Test Results		Pass

Right Hip Joint-Femur Results

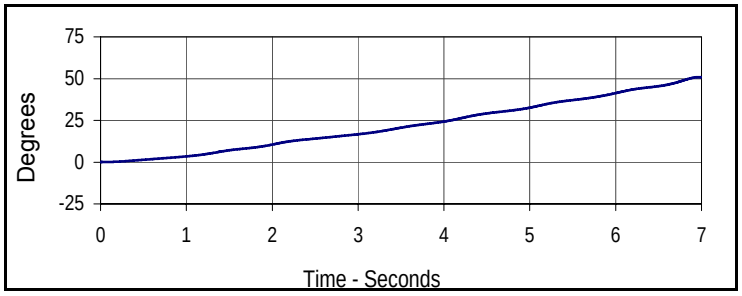
Rotation Rate	deg/sec	5 to 10	7.3	Pass
Femur Torque at 30°	Nm	≤ 95	91.1	Pass
Rotation at 203 Nm	Degrees	40.0 to 50.0	46.1	Pass
		Overall Test Results		Pass



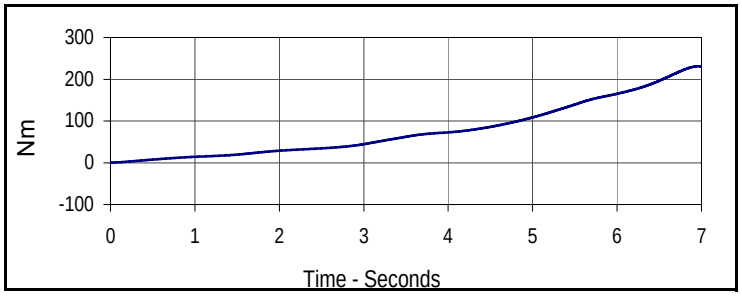
Curve Description			
Left Hip-Femur Rotation			
Plot No.	Type	SAE Class	Units
001	FIL	60	Degrees
Max	Time	Min	Time
52.5	7.0	0.0	0.0



Curve Description			
Left Femur Torque			
Plot No.	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
232.3	7.0	0.3	0.0



Curve Description			
Right Hip-Femur Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
50.9	7.0	0.0	0.0



Curve Description			
Right Femur Torque			
Plot No.	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
230.8	7.0	0.3	0.0

Test Program: Hybrid III 5th Percentile Female Dummy Damage Checklist Test Date: 1/7/12

ATD Serial No.: 141 Test I.D.: N/A

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

Describe the repair on repair or replacement of parts:

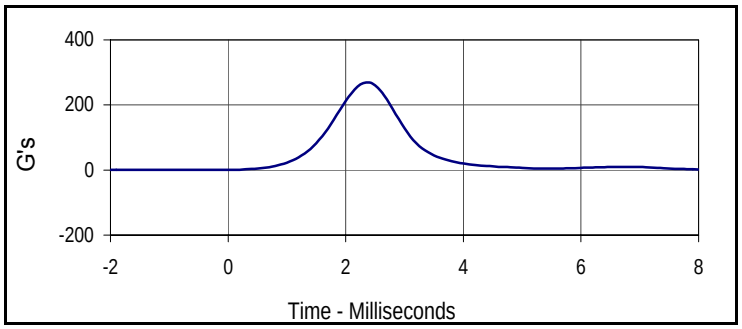
Test Program: Hybrid III 5th Percentile Female External Measurements Test Date: 1/7/12

ATD Serial No.: 141 Test I.D.: N/A

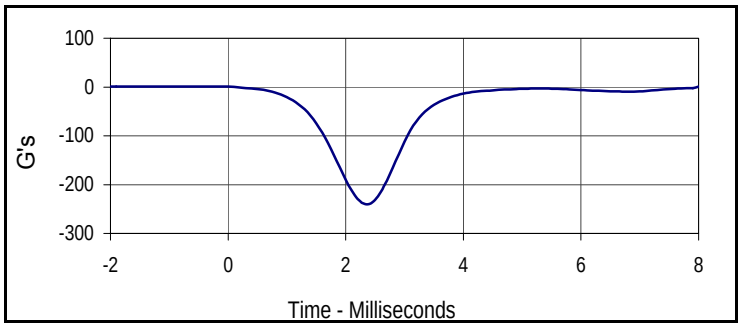
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.46	Pass
Laboratory Relative Humidity	%	10 to 70	33.2	Pass
A - Total sitting height	mm	774.7 to 800.1	780	Pass
B - Shoulder pivot height	mm	431.8 to 457.2	451	Pass
C - H point height	mm	81.3 to 86.3	84	Pass
D - H point location from backline	mm	144.8 to 149.8	146	Pass
E - Shoulder pivot from backline	mm	68.6 to 83.8	79	Pass
F - Thigh clearance	mm	119.4 to 134.6	125	Pass
G - Back of elbow to wrist pivot	mm	243.9 to 259.1	250	Pass
H - Head back to backline	mm	40.7 to 45.7	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	200	Pass
K - Buttock to knee length	mm	520.7 to 546.1	530	Pass
L - Popliteal length	mm	355.6 to 376.0	374	Pass
M - Knee pivot height	mm	393.7 to 419.1	401	Pass
N - Buttock popliteal length	mm	414.0 to 439.4	420	Pass
O - Chest depth without jacket	mm	175.3 to 190.5	187	Pass
P - Foot length	mm	218.5 to 233.7	221	Pass
R - Buttock to Knee Pivot Length	mm	457.2 to 482.6	475	Pass
S - Head Breadth	mm	137.1 to 147.3	144	Pass
T - Head Depth	mm	177.8 to 188.0	180	Pass
U - Hip Breadth	mm	299.7 to 314.9	300	Pass
V - Shoulder breadth	mm	350.5 to 365.7	359	Pass
W - Foot breadth	mm	78.8 to 94.0	90	Pass
X - Head circumference	mm	528.3 to 548.7	541	Pass
Y - Chest circumference (with chest jacket)	mm	850.8 to 881.3	860	Pass
Z - Waist circumference	mm	759.5 to 789.9	766	Pass
AA - Location for chest circumference	mm	299.7 to 309.9	300	Pass
BB - Location for waist circumference	mm	160.1 to 170.2	164	Pass
		Overall Test Results		Pass

Test Program:	Hybrid III 5th Percentile Female Head Drop Test	Test Date:	1/7/12
ATD Serial No.:	141	Test I.D.:	F141HD028

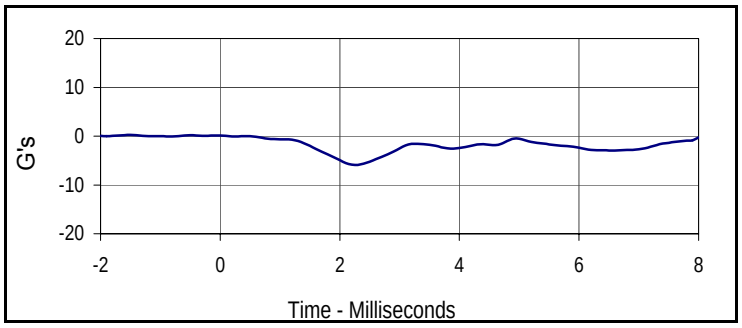
Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	420	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.8	Pass
Peak Resultant Acceleration		G's	250.0 to 300.0	268.9	Pass
Peak Lateral Acceleration		G's	≤15.0	5.9	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	3.7	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
			Overall Test Results		Pass



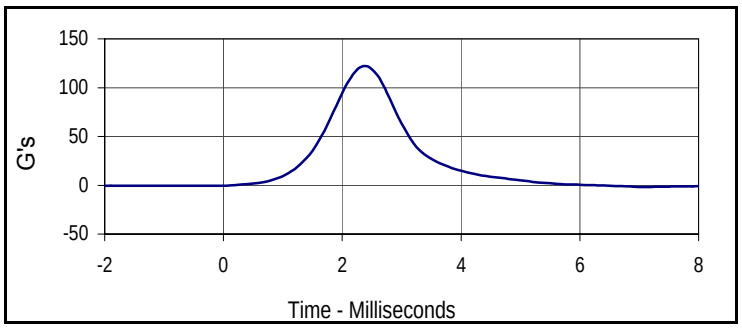
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
268.9	2.4	0.3	0.1



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
1.0	-1.5	-239.6	2.4



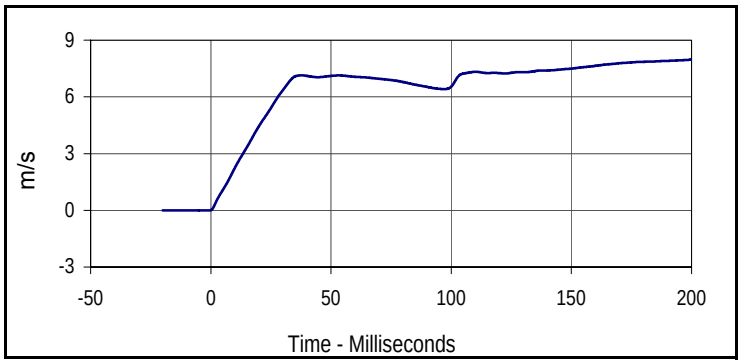
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
0.2	-1.5	-5.9	2.3



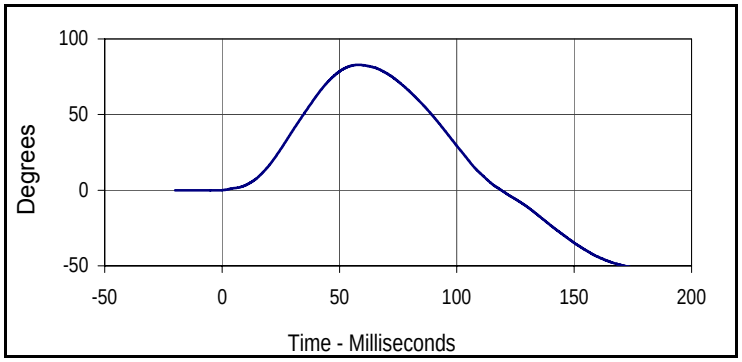
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
122.0	2.4	-0.6	-2.0

Test Program:	Hybrid III 5th Percentile Female Neck Flexion Test	Test Date:	1/7/12
ATD Serial No.:	141	Test I.D.:	F141NF028

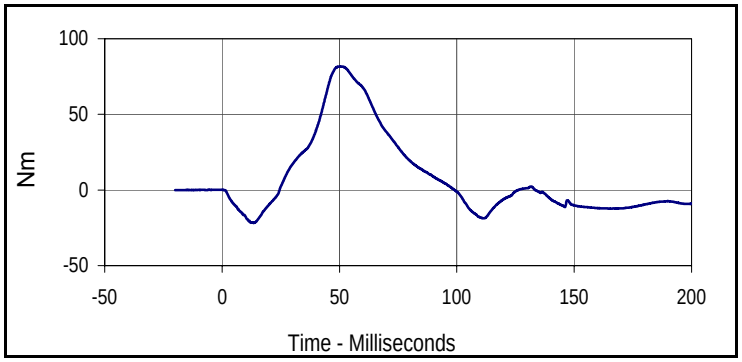
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	450	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	32.1	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.04	Pass
Pendulum Deceleration	10 Msec.	m/s	2.1 to 2.5	2.2	Pass
	20 Msec.	m/s	4.0 to 5.0	4.4	Pass
	30 Msec.	m/s	5.8 to 7.0	6.4	Pass
"D" Plane Rotation	Max	Degrees	77.0 to 91.0	82.9	Pass
Peak Moment in Rotation	Max	Nm	69.0 to 83.0	81.7	Pass
Positive Moment Decay, Time To 10 Nm		Msec.	80.0 to 100.0	87.7	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
8.0	200.0	0.0	-0.6

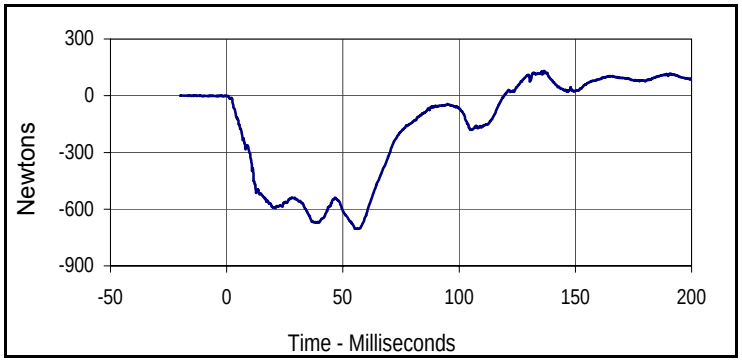


Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
82.9	58.1	-53.3	191.5

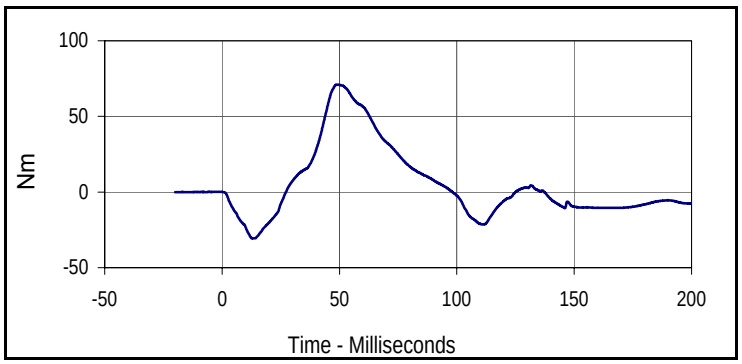


Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
81.7	50.5	-21.8	13.5

Test Program:	Hybrid III 5th Percentile Female Neck Flexion Test	Test Date:	1/7/12
ATD Serial No.:	141	Test I.D.:	F141NF028



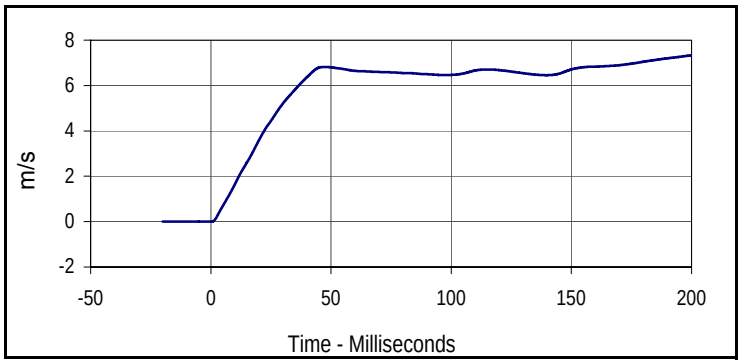
Curve Description			
Upper Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
131.2	136.5	-704.1	55.2



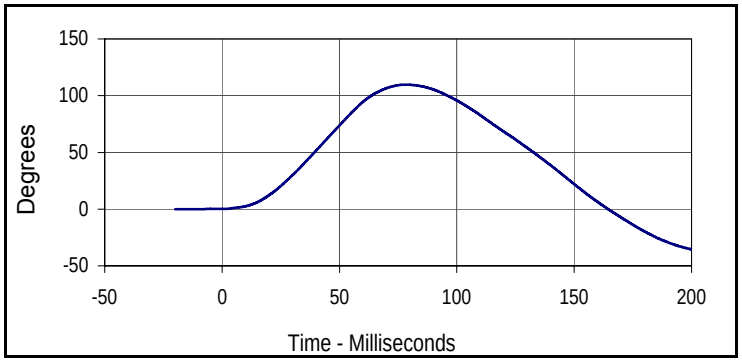
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
71.0	49.2	-30.7	12.8

Test Program:	Hybrid III 5th Percentile Female Neck Extension Test	Test Date:	1/7/12
ATD Serial No.:	141	Test I.D.:	F141NE028

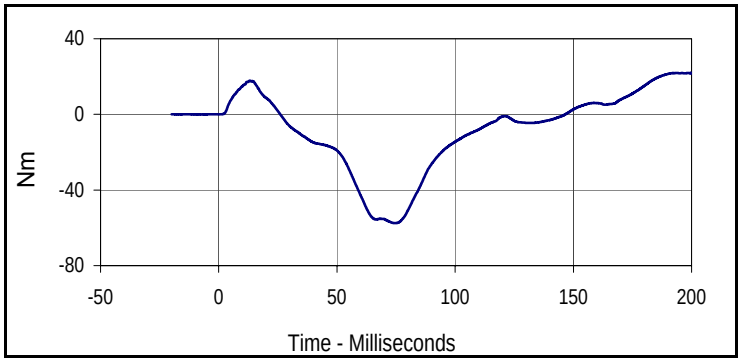
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	250	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	32.4	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.11	Pass
Pendulum Deceleration	10 Msec.	m/s	1.5 to 1.9	1.6	Pass
	20 Msec.	m/s	3.1 to 3.9	3.6	Pass
	30 Msec.	m/s	4.6 to 5.6	5.2	Pass
"D" Plane Rotation	Max	Degrees	99.0 to 114.0	109.7	Pass
Peak Moment in Rotation	Max	Nm	-53.0 to -65.0	-57.5	Pass
Positive Moment Decay, Time To -10 Nm		Msec.	94.0 to 114.0	106.5	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
7.3	200.0	0.0	0.0

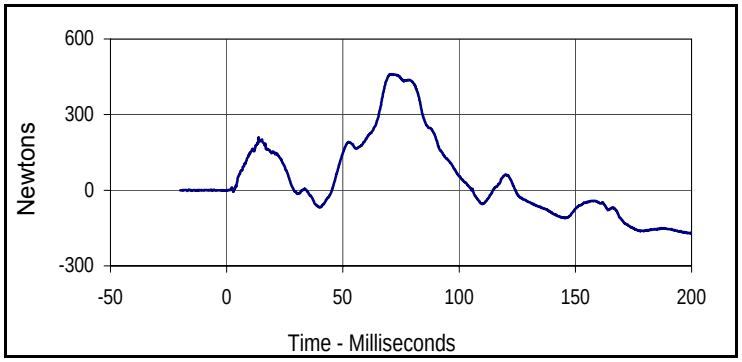


Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
109.7	78.1	-35.5	200.0

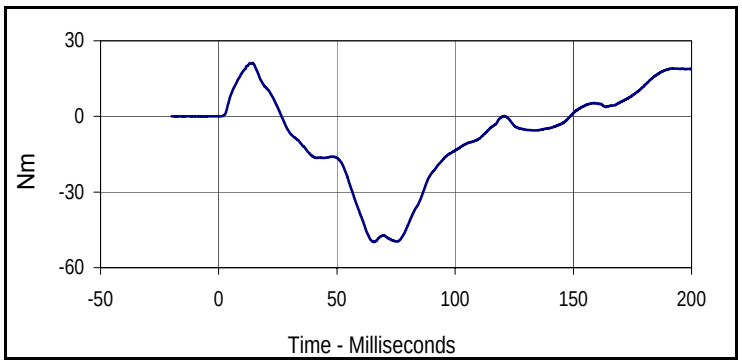


Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
21.9	196.2	-57.5	74.7

Test Program:	Hybrid III 5th Percentile Female Neck Extension Test	Test Date:	1/7/12
ATD Serial No.:	141	Test I.D.:	F141NE028



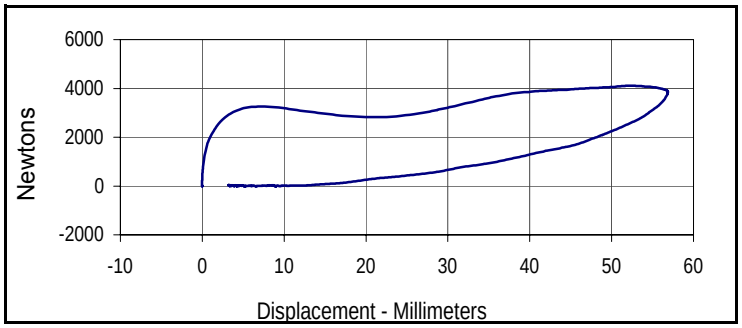
Curve Description			
Upper Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
460.4	71.1	-170.9	199.4



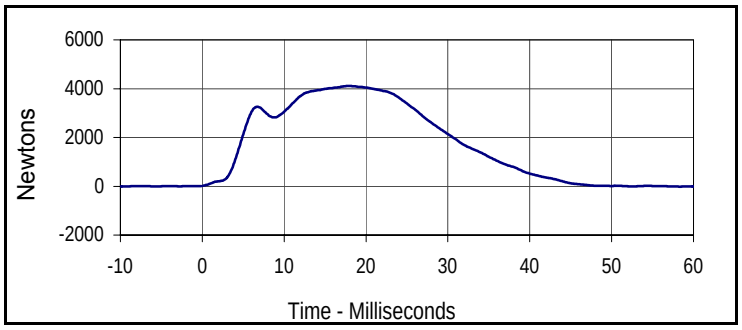
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
21.2	14.1	-49.8	65.6

Test Program:	Hybrid III 5th Percentile Female Thorax Impact Test	Test Date:	1/7/12
ATD Serial No.:	141	Test I.D.:	F141CH028

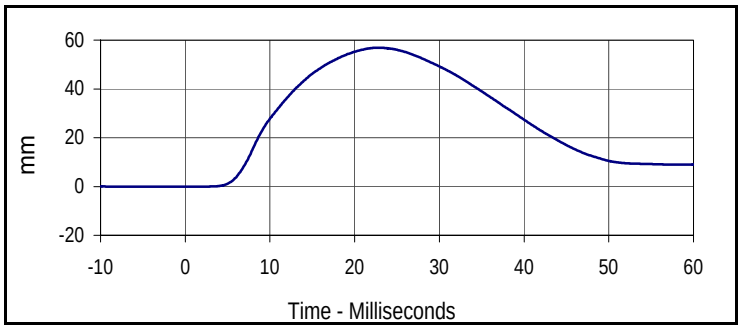
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	350	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	34.6	Pass
Probe Velocity		m/s	6.59 to 6.83	6.78	Pass
Peak Chest Deflection		mm	50.0 to 58.0	56.9	Pass
Peak Force Between 50 and 58 MM		Newtons	3900 to 4400	4059	Pass
Peak Force Between 18 and 50 MM		Newtons	≤4600	4115	Pass
Internal Hysterysis		%	69 to 85	73.1	Pass
			Overall Test Results		Pass



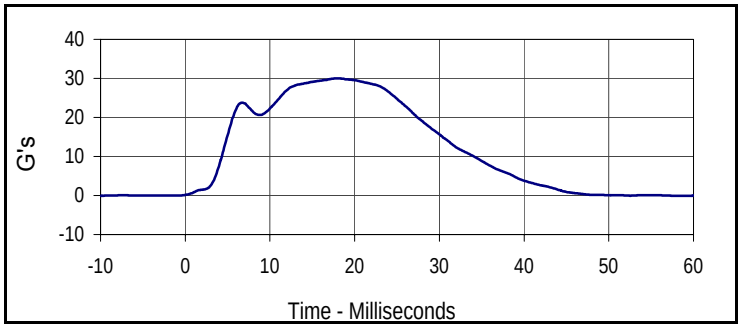
Curve Description			
Probe Force vs. Chest Deflection			
Plot No.	Type	SAE Class	Hysterysis
001	FIL	180	73.1
Peak Probe Force		Peak Chest Deflection	
4115.5		56.9	



Curve Description			
Probe Force			
Plot No.	Type	SAE Class	Units
002	FIL	180	Newtons
Max	Time	Min	Time
4115.5	17.9	-15.2	81.1



Curve Description			
Chest Deflection			
Plot No.	Type	SAE Class	Units
003	FIL	600	mm
Max	Time	Min	Time
56.9	22.8	0.0	1.6



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
30.0	17.9	-0.1	81.1

Test Program:	Hybrid III 5th Percentile Female Knee Impact Test	Test Date:	1/7/12
ATD Serial No.:	141	Test I.D.:	F141LK028 , F141LK028

Left Knee

Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	420	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	33.9	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	3450 to 4060	3796	Pass
			Overall Test Results		Pass

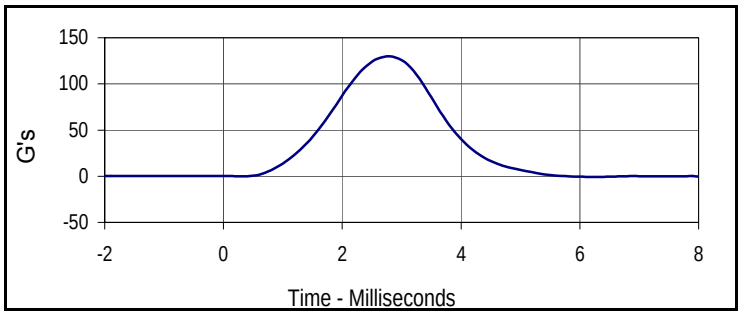
Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	3450 to 4060	3804	Pass
		Overall Test Results		Pass

Curve Description			
Left Knee Probe Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3796.4	2.8	-17.0	8.3

Curve Description			
Left Knee Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
129.5	2.8	-0.6	8.3

Curve Description			
Right Knee Probe Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
3804.0	2.8	-25.9	6.2



Curve Description			
Right Knee Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
129.8	2.8	-0.9	6.2

Test Program:	Hybrid III 5th Percentile Female Torso Flexion Test		Test Date:	1/7/12	
ATD Serial No.:	141		Test I.D.:	F141TF028	

Left Hip Joint-Femur Results

Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	430	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	33.6	Pass
Initial Reference Plane Angle		Degrees	≤ 20	9.7	Pass
Peak Force at 45° +/-0.5°		Newtons	320.0 to 390.0	359.2	Pass
Torso Rotation Rate		deg/sec	0.5 to 1.5	1.2	Pass
Final Reference Plane Angle		Degrees	+/-8	5.1	Pass
			Overall Test Results		Pass

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

Test Program: Hybrid III 50th Percentile Male Dummy Damage Checklist Test Date: 1/10/12

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

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

Describe the repair on repair or replacement of parts:

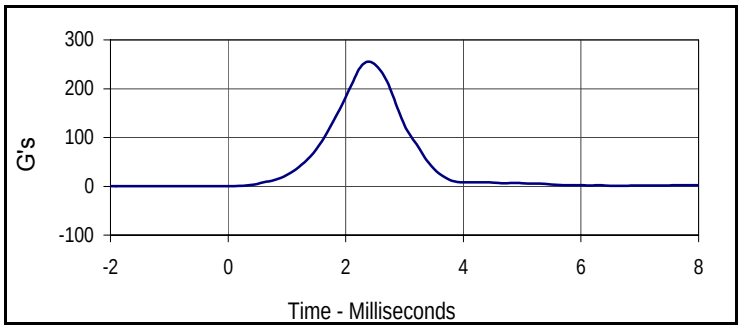
Test Program: Hybrid III 50th Percentile Male External Measurements Test Date: 1/10/12

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

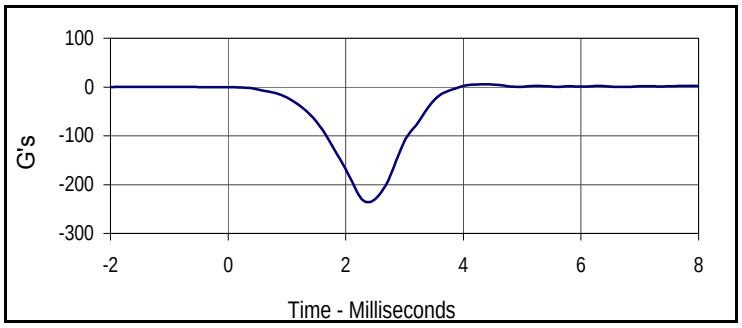
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.56	Pass
Laboratory Relative Humidity	%	10 to 70	27.3	Pass
A - Total sitting height	mm	879 to 889	883	Pass
B - Shoulder pivot height	mm	505 to 521	515	Pass
C - H point height	mm	84 to 89	88	Pass
D - H point location from backline	mm	135 to 140	136	Pass
E - Shoulder pivot from backline	mm	84 to 94	86	Pass
F - Thigh clearance	mm	140 to 155	149	Pass
G - Back of elbow to wrist pivot	mm	290 to 305	300	Pass
H - Head back to backline	mm	41 to 46	43	Pass
I - Shoulder to elbow length	mm	330 to 345	335	Pass
J - Elbow rest height	mm	190 to 211	205	Pass
K - Buttock to knee length	mm	579 to 604	589	Pass
L - Popliteal length	mm	429 to 455	436	Pass
M - Knee pivot height	mm	485 to 500	488	Pass
N - Buttock popliteal length	mm	452 to 477	472	Pass
O - Chest depth without jacket	mm	213 to 229	224	Pass
P - Foot length	mm	251 to 267	260	Pass
V - Shoulder breadth	mm	422 to 437	434	Pass
W - Foot breadth	mm	91 to 107	99	Pass
Y - Chest circumference (with chest jacket)	mm	970 to 1001	983	Pass
Z - Waist circumference	mm	836 to 866	864	Pass
AA - Location for chest circumference	mm	429 to 434	431	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
		Overall Test Results		Pass

Test Program:	Hybrid III 50th Percentile Male Head Drop Test	Test Date:	1/10/12
ATD Serial No.:	034	Test I.D.:	M034HD026

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	255	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	40.0	Pass
	Min	%		28.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	27.2	Pass
Peak Resultant Acceleration		G's	225.0 to 275.0	255.1	Pass
Peak Lateral Acceleration		G's	≤15.0	4.4	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	3.3	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
			Overall Test Results		Pass

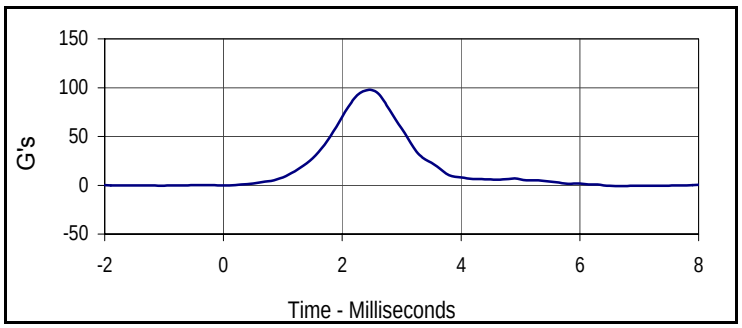


Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
255.1	2.4	0.1	-0.6



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
5.4	4.3	-235.8	2.4

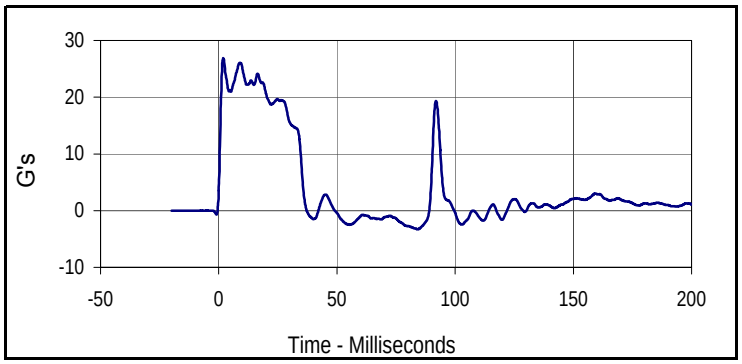
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
1.5	4.0	-4.4	2.3



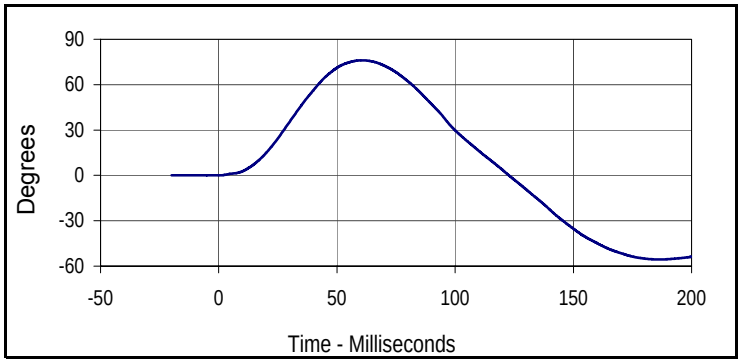
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
97.5	2.5	-0.4	-1.0

Test Program:	Hybrid III 50th Percentile Male Neck Flexion Test	Test Date:	1/10/12
ATD Serial No.:	034	Test I.D.:	M034NF026

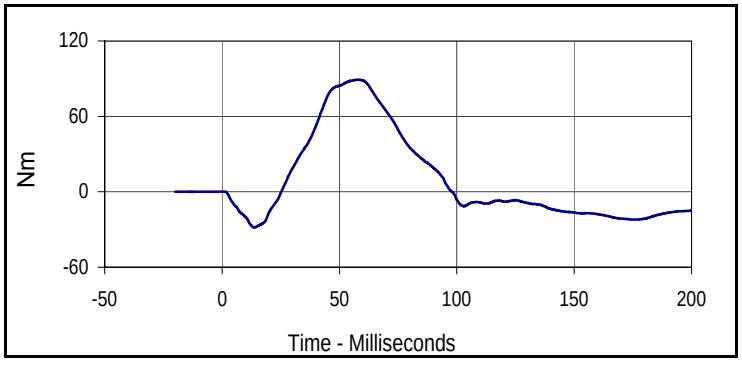
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	275	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	34.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.6	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	29.9	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.04	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	25.1	Pass
	20 Msec.	G's	17.6 to 22.6	20.6	Pass
	30 Msec.	G's	12.5 to 18.5	15.6	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	19.4	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	35.6	Pass
Maximum "D" Plane Rotation	Max	Degrees	64.0 to 78.0	76.1	Pass
	Time	Msec.	57.0 to 64.0	60.5	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	122.8	Pass
Moment About Occ. Condyle	Max	Nm	84.1 to 108.5	89.1	Pass
	Time	Msec.	47.0 to 58.0	57.8	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	98.0	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
26.9	1.9	-3.3	84.2

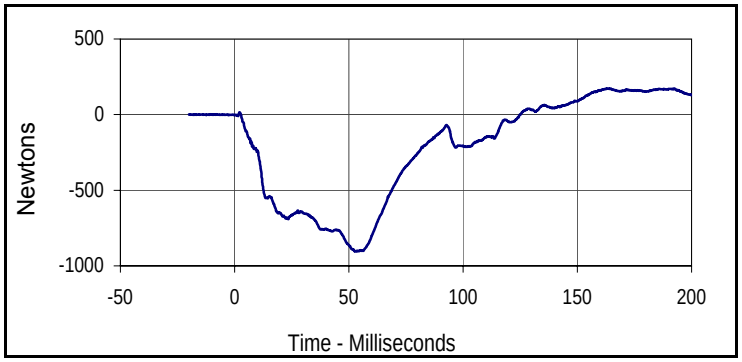


Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
76.1	60.5	-55.6	186.6

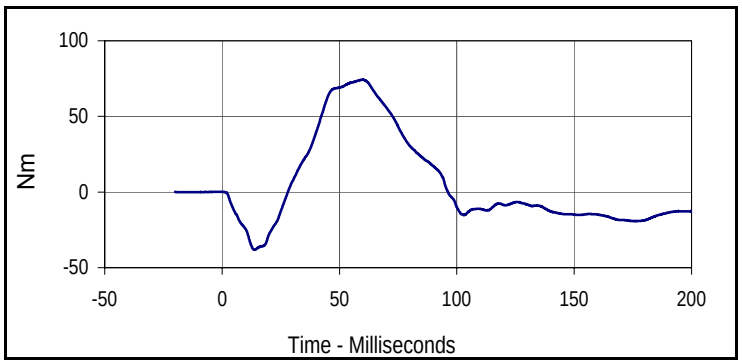


Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
89.1	57.8	-28.4	13.8

Test Program:	Hybrid III 50th Percentile Male Neck Flexion Test	Test Date:	1/10/12
ATD Serial No.:	034	Test I.D.:	M034NF026



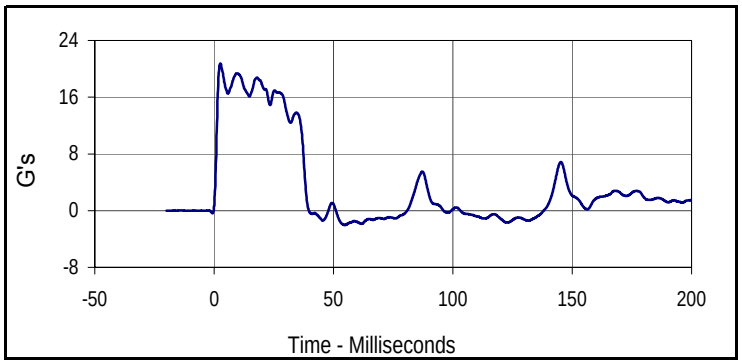
Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
172.5	163.6	-904.4	53.1



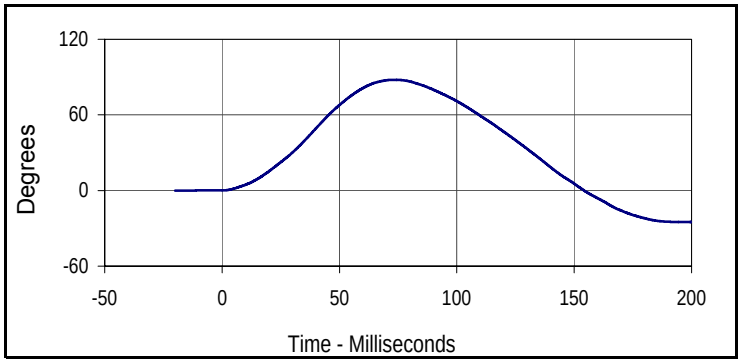
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
74.4	59.9	-38.2	13.8

Test Program:	Hybrid III 50th Percentile Male Neck Extension Test	Test Date:	1/10/12
ATD Serial No.:	034	Test I.D.:	M034NE026

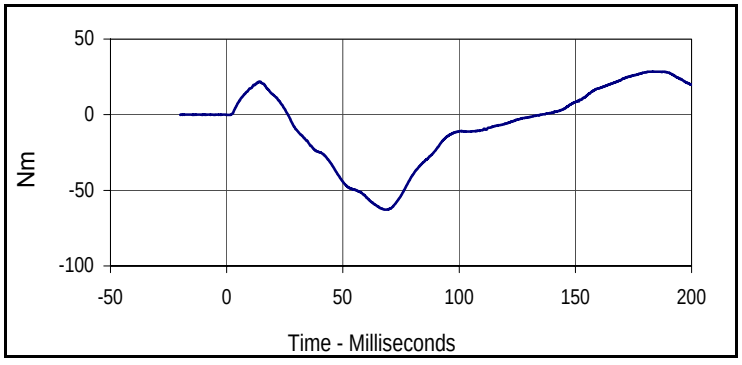
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	310	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	34.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.5	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.10	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	19.3	Pass
	20 Msec.	G's	14.0 to 19.0	17.8	Pass
	30 Msec.	G's	11.0 to 16.0	14.4	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	14.4	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	38.0	Pass
Maximum "D" Plane Rotation	Max	Degrees	81.0 to 106.0	87.9	Pass
	Time	Msec.	72.0 to 82.0	73.5	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	154.2	Pass
Moment About Occ. Condyle	Max	Nm	-52.9 to -79.9	-62.8	Pass
	Time	Msec.	65.0 to 79.0	69.0	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	135.4	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Deceleration			
Plot No.	Type	SAE Class	Units
001	FIL	60	G's
Max	Time	Min	Time
20.8	2.6	-2.0	54.7

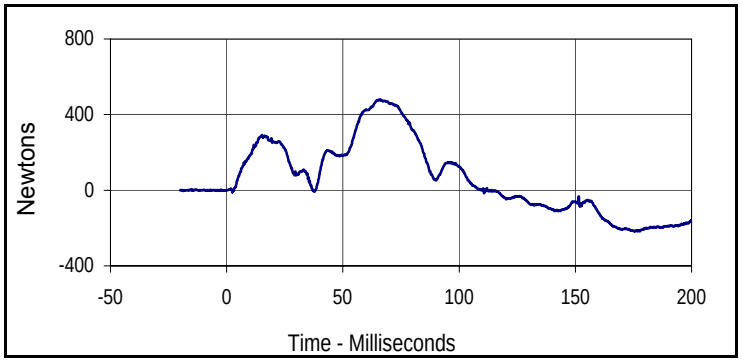


Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
87.9	73.5	-25.1	197.1

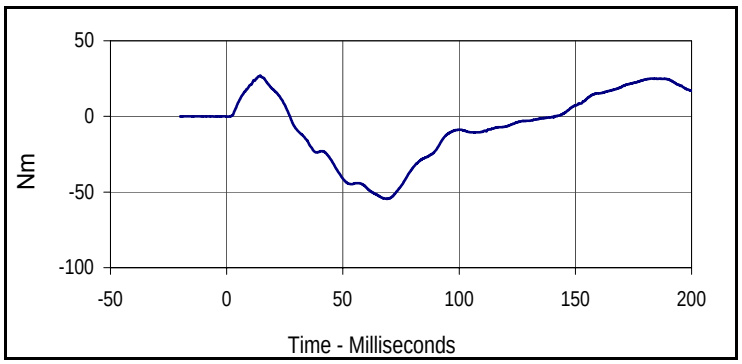


Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
28.5	183.5	-62.8	69.0

Test Program:	Hybrid III 50th Percentile Male Neck Extension Test	Test Date:	1/10/12
ATD Serial No.:	034	Test I.D.:	M034NE026



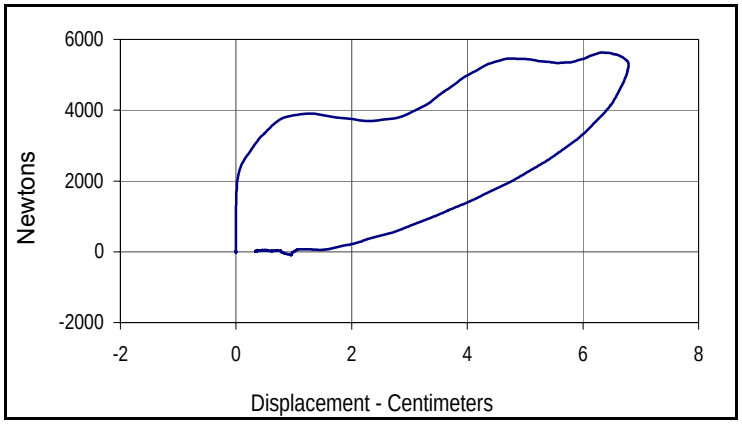
Curve Description			
Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
478.8	66.3	-217.3	176.6



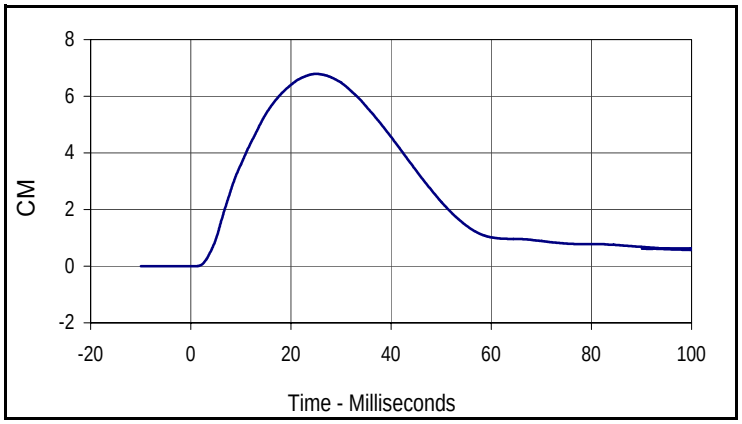
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
26.9	14.4	-54.4	69.1

Test Program:	Hybrid III 50th Percentile Male Thorax Impact Test	Test Date:	1/10/12
ATD Serial No.:	034	Test I.D.:	M034CH026

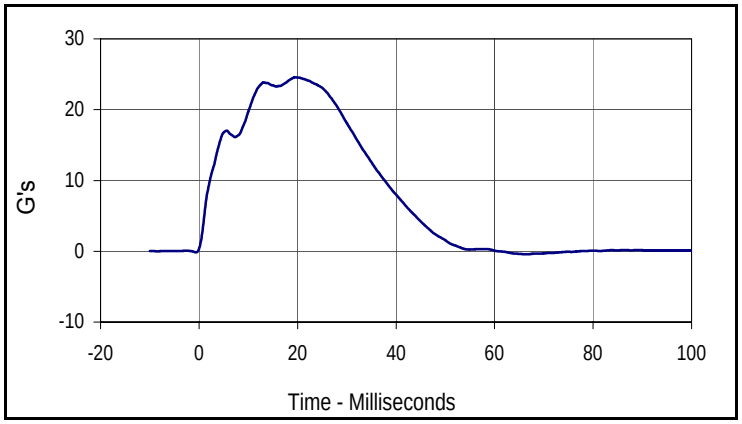
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	355	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	34.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.1	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	31.0	Pass
Probe Velocity		m/s	6.58 to 6.82	6.76	Pass
Peak Probe Force		Newtons	5159 to 5893	5628	Pass
Peak Sternum Deflection		CM	6.35 to 7.26	6.79	Pass
Internal Hysterysis		%	69 to 85	69.2	Pass
			Overall Test Results		Pass



Curve Description			
Probe Force vs. Chest Deflection			
Plot No.	Type	SAE Class	Hysterysis
001	FIL	180	69.2
Peak Probe Force		Peak Chest Deflection	
5628		6.79	



Curve Description			
Chest Deflection			
Plot No.	Type	SAE Class	Units
002	FIL	180	CM
Max	Time	Min	Time
6.8	25.0	0.0	0.7



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
003	FIL	180	G's
Max	Time	Min	Time
24.6	19.5	-0.4	66.6

Test Program:	Hybrid III 50th Percentile Male Knee Impact Test	Test Date:	1/10/12
ATD Serial No.:	034	Test I.D.:	M034LK026 , M034RK025

Left Knee

Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	240	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.6	Pass
Humidity During Soak	Max	%	10.0 to 70.0	34.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.6	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force		Newtons	4715 to 5782	5064	Pass
			Overall Test Results		Pass

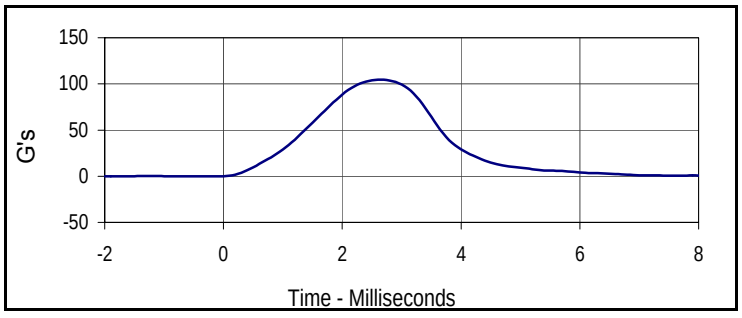
Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5112	Pass
		Overall Test Results		Pass

Curve Description			
Left Knee Probe Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
5064.2	2.7	-62.3	9.0

Curve Description			
Left Knee Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
103.5	2.7	-1.3	9.0

Curve Description			
Right Knee Probe Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
5111.5	2.6	-19.9	10.0



Curve Description			
Right Knee Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
104.5	2.6	-0.4	10.0

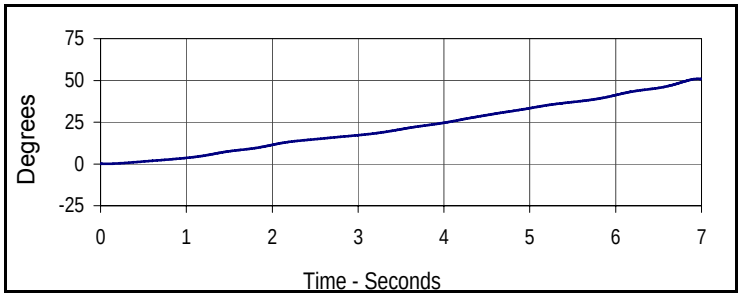
Test Program:	Hybrid III 50th Percentile Male Hip Joint-Femur Flexion Test	Test Date:	1/10/12
ATD Serial No.:	034	Test I.D.:	M034LF026 , M034RF026

Left Hip Joint-Femur Results

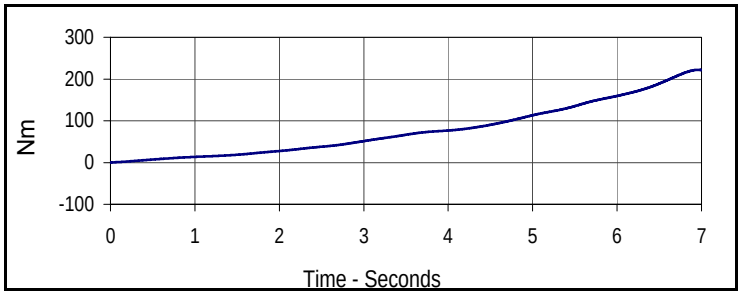
Tested Parameter		Units	Specification	Result	Pass/Fail
Hip Joint-Femur Assembly Soak Time		Minutes	≥240	450	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		20.7	Pass
Humidity During Soak	Max	%	10.0 to 70.0	34.0	Pass
	Min	%		29.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.4	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	32.1	Pass
Rotation Rate		deg/sec	5 to 10	7.3	Pass
Femur Torque at 30°		Nm	≤ 95	93.8	Pass
Rotation at 203 Nm		Degrees	40.0 to 50.0	47.3	Pass
			Overall Test Results		Pass

Right Hip Joint-Femur Results

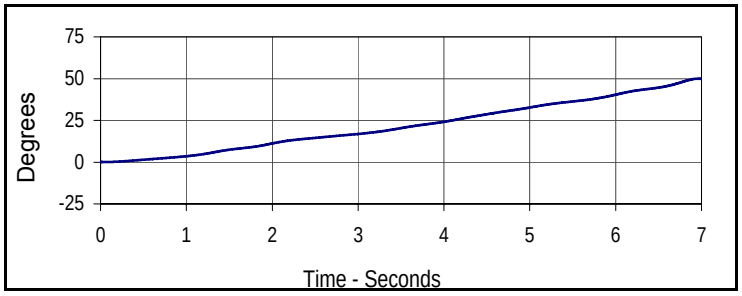
Rotation Rate	deg/sec	5 to 10	7.2	Pass
Femur Torque at 30°	Nm	≤ 95	92.2	Pass
Rotation at 203 Nm	Degrees	40.0 to 50.0	48.1	Pass
		Overall Test Results		Pass



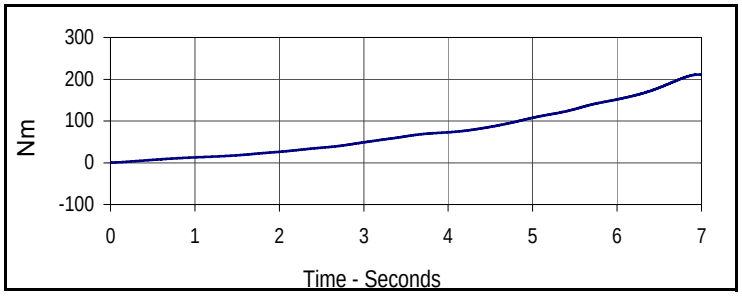
Curve Description			
Left Hip-Femur Rotation			
Plot No.	Type	SAE Class	Units
001	FIL	60	Degrees
Max	Time	Min	Time
51.0	7.0	0.0	0.0



Curve Description			
Left Femur Torque			
Plot No.	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
222.0	7.0	0.3	0.0



Curve Description			
Right Hip-Femur Rotation			
Plot No.	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
50.0	7.0	0.0	0.0



Curve Description			
Right Femur Torque			
Plot No.	Type	SAE Class	Units
004	FIL	600	Nm
Max	Time	Min	Time
211.2	7.0	0.3	0.0

Test Program:	Hybrid III 5th Percentile Female Dummy Damage Checklist	Test Date:	1/10/12
ATD Serial No.:	141	Test I.D.:	N/A

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

Describe the repair on repair or replacement of parts:

Test Program: Hybrid III 5th Percentile Female External Measurements Test Date: 1/10/12

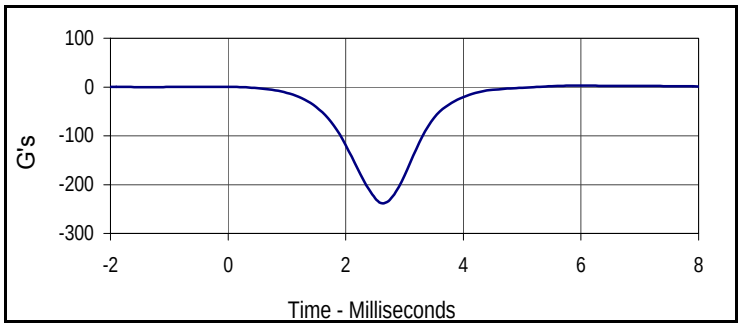
ATD Serial No.: 141 Test I.D.: N/A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.16	Pass
Laboratory Relative Humidity	%	10 to 70	30.3	Pass
A - Total sitting height	mm	774.7 to 800.1	780	Pass
B - Shoulder pivot height	mm	431.8 to 457.2	452	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	79	Pass
F - Thigh clearance	mm	119.4 to 134.6	125	Pass
G - Back of elbow to wrist pivot	mm	243.9 to 259.1	250	Pass
H - Head back to backline	mm	40.7 to 45.7	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	199	Pass
K - Buttock to knee length	mm	520.7 to 546.1	530	Pass
L - Popliteal length	mm	355.6 to 376.0	374	Pass
M - Knee pivot height	mm	393.7 to 419.1	400	Pass
N - Buttock popliteal length	mm	414.0 to 439.4	420	Pass
O - Chest depth without jacket	mm	175.3 to 190.5	187	Pass
P - Foot length	mm	218.5 to 233.7	221	Pass
R - Buttock to Knee Pivot Length	mm	457.2 to 482.6	475	Pass
S - Head Breadth	mm	137.1 to 147.3	144	Pass
T - Head Depth	mm	177.8 to 188.0	180	Pass
U - Hip Breadth	mm	299.7 to 314.9	300	Pass
V - Shoulder breadth	mm	350.5 to 365.7	359	Pass
W - Foot breadth	mm	78.8 to 94.0	90	Pass
X - Head circumference	mm	528.3 to 548.7	541	Pass
Y - Chest circumference (with chest jacket)	mm	850.8 to 881.3	860	Pass
Z - Waist circumference	mm	759.5 to 789.9	766	Pass
AA - Location for chest circumference	mm	299.7 to 309.9	300	Pass
BB - Location for waist circumference	mm	160.1 to 170.2	164	Pass
		Overall Test Results		Pass

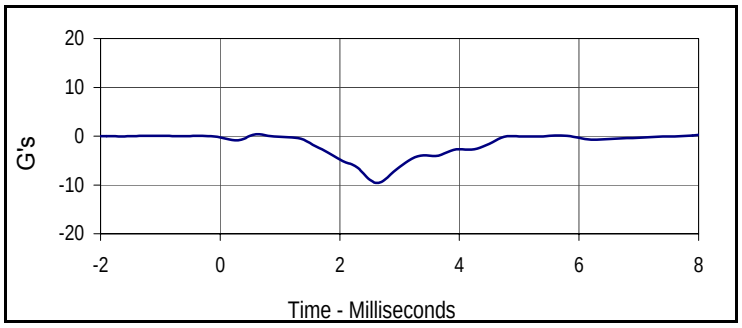
Test Program:	Hybrid III 5th Percentile Female Head Drop Test	Test Date:	1/10/12
ATD Serial No.:	141	Test I.D.:	F141HD029

Tested Parameter		Units	Specification	Result	Pass/Fail
Head Assembly Soak Time		Minutes	≥240	290	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.3	Pass
Peak Resultant Acceleration		G's	250.0 to 300.0	270.7	Pass
Peak Lateral Acceleration		G's	≤15.0	9.6	Pass
Oscillations After Main Pulse		%	<10% of peak Res. Acceleration	1.4	Pass
Is Acceleration Unimodal?		Yes/No	Yes	Yes	Pass
			Overall Test Results		Pass

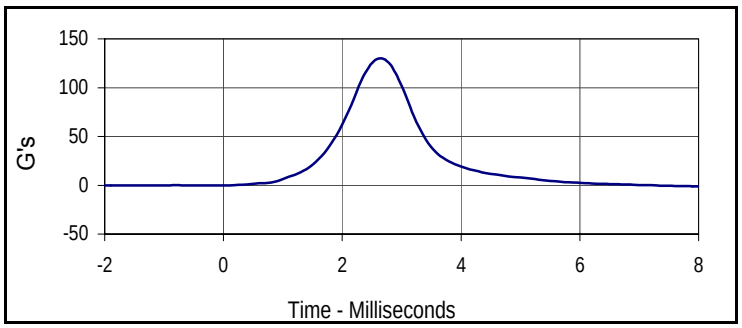
Curve Description			
Head Resultant			
Plot No.	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
270.7	2.6	0.0	-2.0



Curve Description			
Head X			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.9	6.0	-237.4	2.6



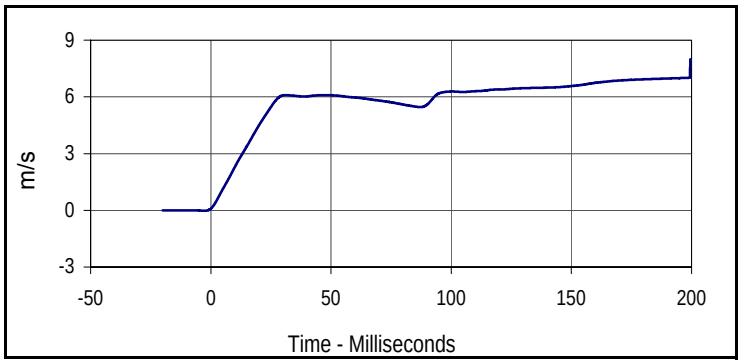
Curve Description			
Head Y			
Plot No.	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
0.4	0.6	-9.6	2.6



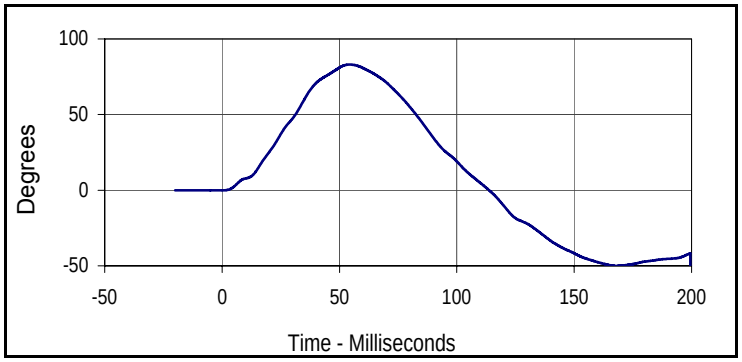
Curve Description			
Head Z			
Plot No.	Type	SAE Class	Units
004	FIL	1000	G's
Max	Time	Min	Time
129.7	2.6	-0.1	-0.1

Test Program:	Hybrid III 5th Percentile Female Neck Flexion Test	Test Date:	1/10/12
ATD Serial No.:	141	Test I.D.:	F141NF029

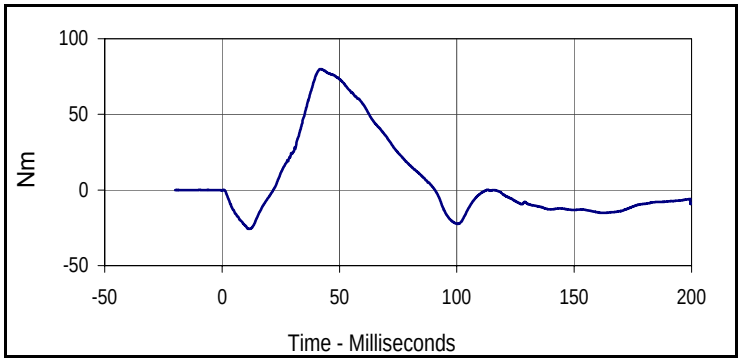
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	325	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	36.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.5	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.4	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.04	Pass
Pendulum Deceleration	10 Msec.	m/s	2.1 to 2.5	2.3	Pass
	20 Msec.	m/s	4.0 to 5.0	4.5	Pass
	30 Msec.	m/s	5.8 to 7.0	6.1	Pass
"D" Plane Rotation	Max	Degrees	77.0 to 91.0	83.1	Pass
Peak Moment in Rotation	Max	Nm	69.0 to 83.0	76.7	Pass
Positive Moment Decay, Time To 10 Nm		Msec.	80.0 to 100.0	83.7	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
8.0	200.0	0.0	-2.6

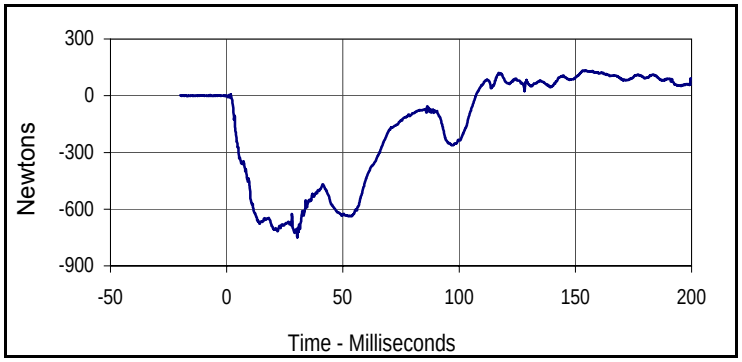


Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
83.1	54.3	-52.8	199.5

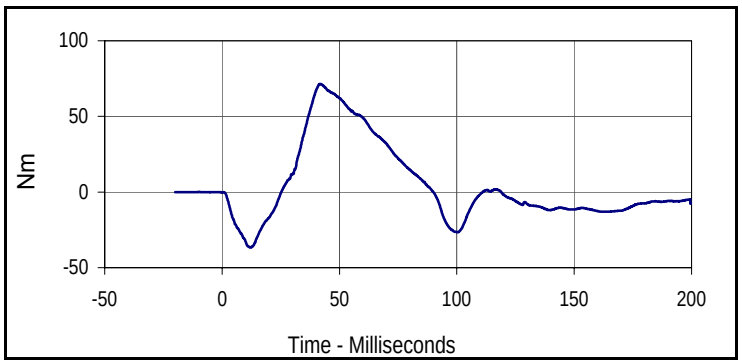


Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
80.0	42.2	-25.8	11.1

Test Program:	Hybrid III 5th Percentile Female Neck Flexion Test	Test Date:	1/10/12
ATD Serial No.:	141	Test I.D.:	F141NF029



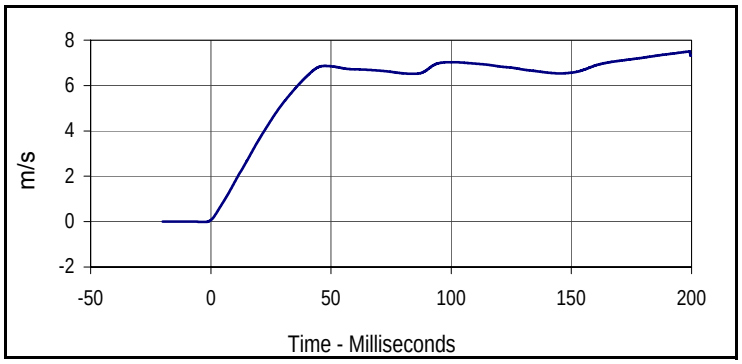
Curve Description			
Upper Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
133.1	154.2	-749.2	30.4



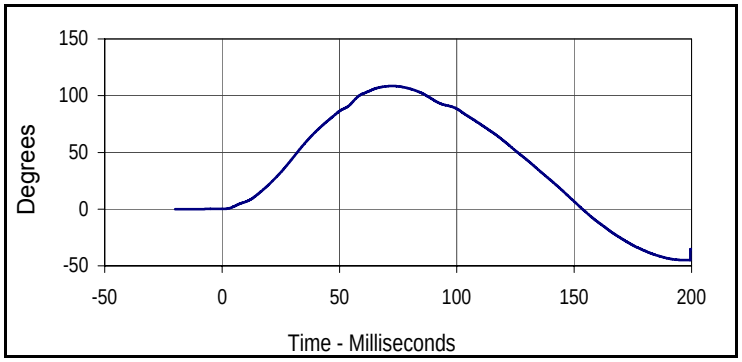
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
71.4	41.7	-36.6	12.0

Test Program:	Hybrid III 5th Percentile Female Neck Extension Test	Test Date:	1/10/12
ATD Serial No.:	141	Test I.D.:	F141NE029

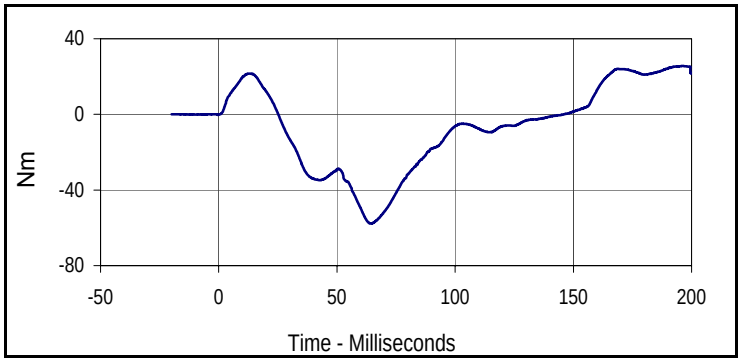
Tested Parameter		Units	Specification	Result	Pass/Fail
Neck Assembly Soak Time		Minutes	≥240	350	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.4	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.11	Pass
Pendulum Deceleration	10 Msec.	m/s	1.5 to 1.9	1.8	Pass
	20 Msec.	m/s	3.1 to 3.9	3.6	Pass
	30 Msec.	m/s	4.6 to 5.6	5.2	Pass
"D" Plane Rotation	Max	Degrees	99.0 to 114.0	108.5	Pass
Peak Moment in Rotation	Max	Nm	-53.0 to -65.0	-57.8	Pass
Positive Moment Decay, Time To -10 Nm		Msec.	94.0 to 114.0	97.0	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
Plot No.	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
7.5	199.4	0.0	-2.7

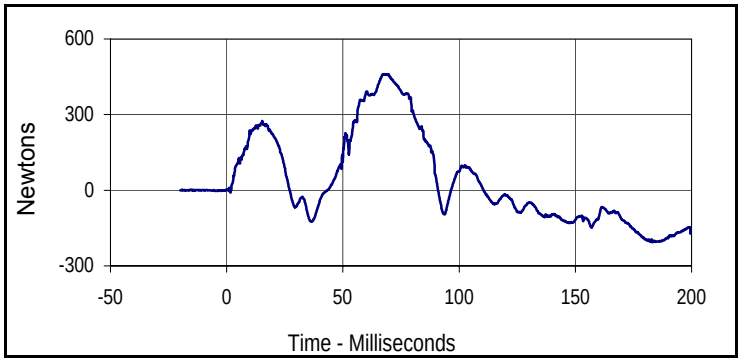


Curve Description			
"D" Plane Rotation			
Plot No.	Type	SAE Class	Units
002	FIL	60	Degrees
Max	Time	Min	Time
108.5	72.6	-44.9	196.6

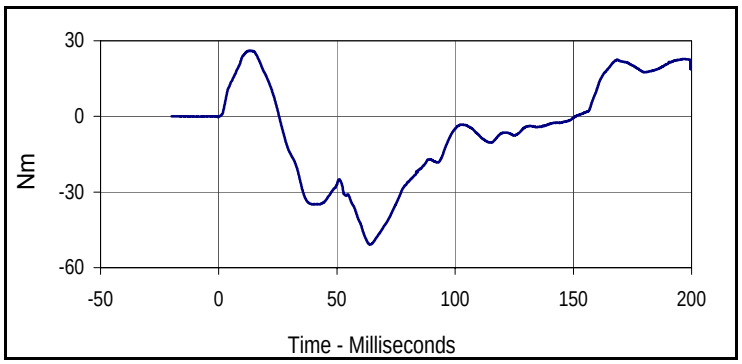


Curve Description			
Moment About Occipital Condyle			
Plot No.	Type	SAE Class	Units
003	FIL	600	Nm
Max	Time	Min	Time
25.6	196.4	-57.8	64.7

Test Program:	Hybrid III 5th Percentile Female Neck Extension Test	Test Date:	1/10/12
ATD Serial No.:	141	Test I.D.:	F141NE029



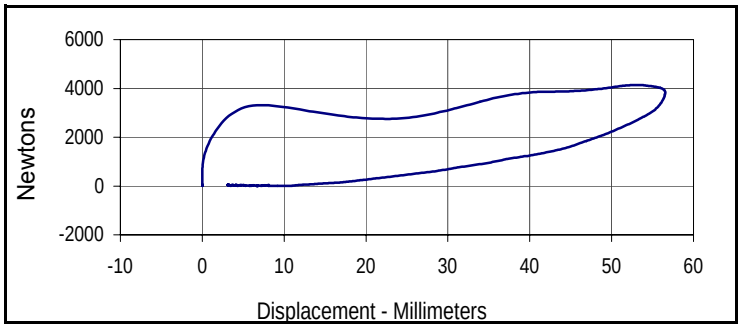
Curve Description			
Upper Neck Force X			
Plot No.	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
460.5	67.9	-206.0	183.2



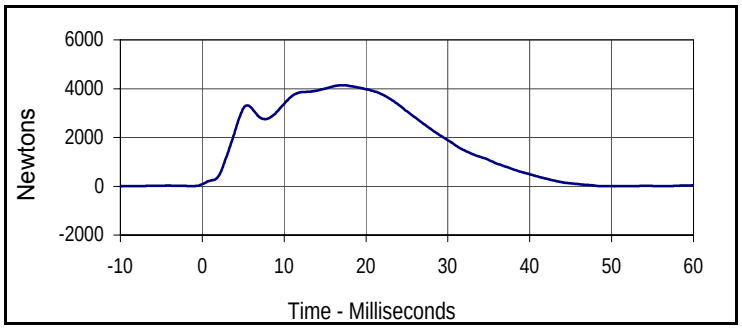
Curve Description			
Neck Moment Y			
Plot No.	Type	SAE Class	Units
005	FIL	600	Nm
Max	Time	Min	Time
26.1	13.7	-50.8	64.0

Test Program:	Hybrid III 5th Percentile Female Thorax Impact Test	Test Date:	1/10/12
ATD Serial No.:	141	Test I.D.:	F141CH029

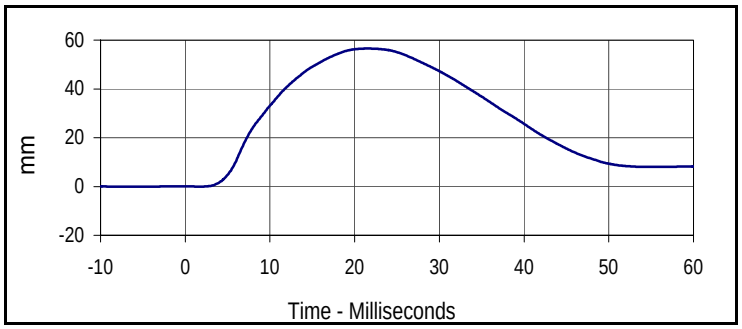
Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	395	Pass
Temperature During Soak	Max	°C	20.6 to 22.2	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	20.6 to 22.2	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.3	Pass
Probe Velocity		m/s	6.59 to 6.83	6.77	Pass
Peak Chest Deflection		mm	50.0 to 58.0	56.5	Pass
Peak Force Between 50 and 58 MM		Newtons	3900 to 4400	4047	Pass
Peak Force Between 18 and 50 MM		Newtons	≤4600	4141	Pass
Internal Hysterysis		%	69 to 85	73.1	Pass
			Overall Test Results		Pass



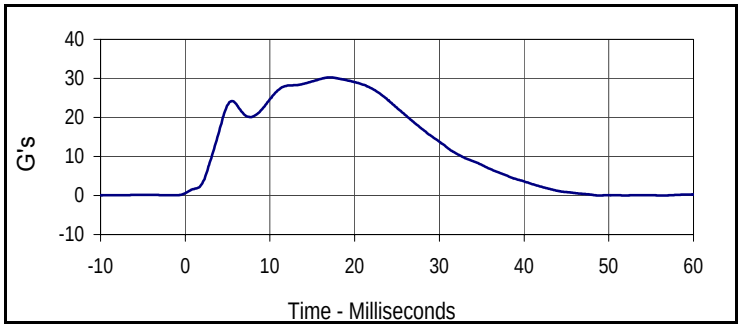
Curve Description			
Probe Force vs. Chest Deflection			
Plot No.	Type	SAE Class	Hysterysis
001	FIL	180	73.1
Peak Probe Force		Peak Chest Deflection	
4140.7		56.5	



Curve Description			
Probe Force			
Plot No.	Type	SAE Class	Units
002	FIL	180	Newtons
Max	Time	Min	Time
4140.7	17.1	-10.5	76.1



Curve Description			
Chest Deflection			
Plot No.	Type	SAE Class	Units
003	FIL	600	mm
Max	Time	Min	Time
56.5	21.5	0.0	1.9



Curve Description			
Impactor Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	180	G's
Max	Time	Min	Time
30.2	17.1	-0.1	76.1

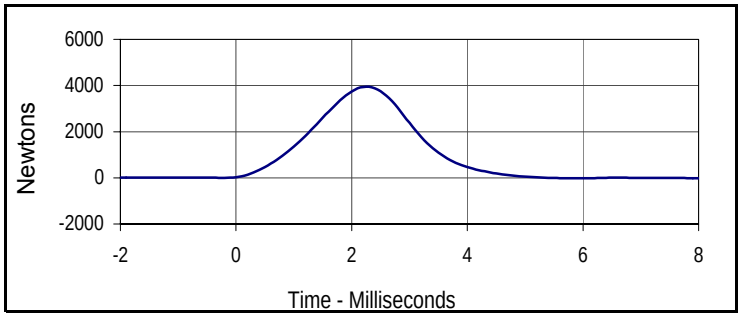
Test Program:	Hybrid III 5th Percentile Female Knee Impact Test	Test Date:	1/10/12
ATD Serial No.:	141	Test I.D.:	F141LK029 , F141LK029

Left Knee

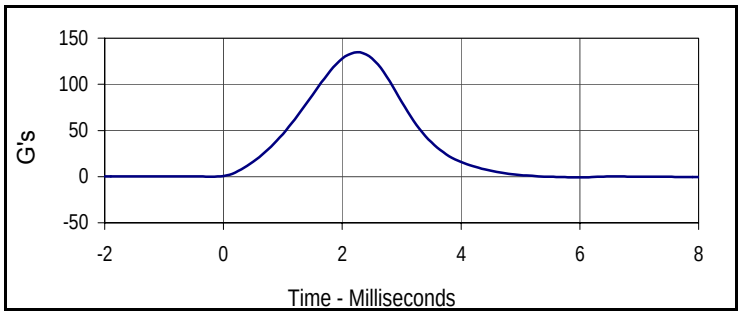
Tested Parameter		Units	Specification	Result	Pass/Fail
Knee Assembly Soak Time		Minutes	≥240	300	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.2	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.0	Pass
Pendulum Velocity at T=0		m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force		Newtons	3450 to 4060	3945	Pass
			Overall Test Results		Pass

Right Knee

Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	3450 to 4060	3878	Pass
		Overall Test Results		Pass

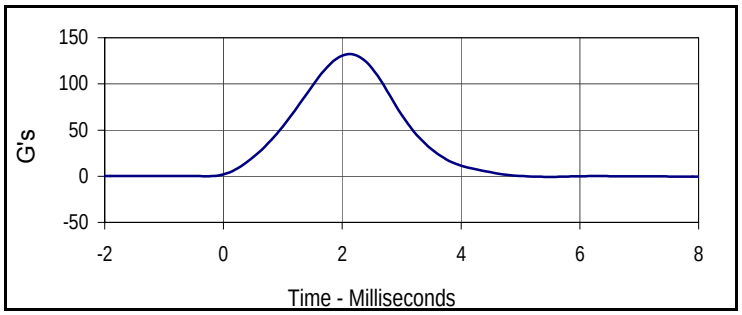


Curve Description			
Left Knee Probe Force			
Plot No.	Type	SAE Class	Units
001	FIL	600	Newtons
Max	Time	Min	Time
3945.2	2.3	-22.3	6.0



Curve Description			
Left Knee Acceleration			
Plot No.	Type	SAE Class	Units
002	FIL	600	G's
Max	Time	Min	Time
134.6	2.3	-0.8	6.0

Curve Description			
Right Knee Probe Force			
Plot No.	Type	SAE Class	Units
003	FIL	600	Newtons
Max	Time	Min	Time
3878.5	2.1	-21.6	5.5



Curve Description			
Right Knee Acceleration			
Plot No.	Type	SAE Class	Units
004	FIL	600	G's
Max	Time	Min	Time
132.3	2.1	-0.7	5.5

Test Program:	Hybrid III 5th Percentile Female Torso Flexion Test	Test Date:	1/10/12
ATD Serial No.:	141	Test I.D.:	F141TF029

Left Hip Joint-Femur Results

Tested Parameter		Units	Specification	Result	Pass/Fail
Dummy Soak Time		Minutes	≥240	445	Pass
Temperature During Soak	Max	°C	18.9 to 25.6	21.7	Pass
	Min	°C		21.1	Pass
Humidity During Soak	Max	%	10.0 to 70.0	35.0	Pass
	Min	%		30.0	Pass
Laboratory Temperature During Test		°C	18.9 to 25.6	21.3	Pass
Laboratory Humidity During Test		%	10.0 to 70.0	30.5	Pass
Initial Reference Plane Angle		Degrees	≤ 20	9.2	Pass
Peak Force at 45° +/-0.5°		Newtons	320.0 to 390.0	347.6	Pass
Torso Rotation Rate		deg/sec	0.5 to 1.5	1.2	Pass
Final Reference Plane Angle		Degrees	+/-8	4.7	Pass
			Overall Test Results		Pass