REPORT NUMBER TR-P33007-08-NC

SIDE AIRBAG OCCUPANT RISK PROGRAM
OCCUPANT OUT-OF-POSITION TESTS

FORD MOTOR CO.
2013 FORD FOCUS ELECTRIC
5-DOOR HATCHBACK

NHTSA NUMBER: MD0214TWG2

PREPARED BY:
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APRIL 29, 2013

FINAL REPORT

PREPARED FOR:

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This final test report was prepared for the U.S. Department of Transportation, Alpha Technology Associate, Inc., in response to Contract Number DTNH22-12-D-00259.

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Date of Acceptance

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SECTION 1

PURPOSE AND SUMMARY OF TEST MD0214TWG2

1.1 PURPOSE

This occupant out-of-position static side airbag deployment test is part of the Technical Working Group Occupant Injury Risk from Deploying Side Airbags Testing Program sponsored by Alpha Technology Associate, Inc. under Contract No. DTNH22-12-D-00259. The purpose of this test was to obtain occupant injury data for a side airbag deployment.

The occupant out-of-position side airbag test was conducted in accordance with the Technical Working Group Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags.

1.2 SUMMARY

The effects of a roof mounted curtain airbag and a torso/pelvis airbag deployment in a 2013 Ford Focus Electric 5-door hatchback with an out-of-position 6 year old dummy were evaluated. The test was performed at KARCO Engineering, LLC. on April 15, 2013. Pre- and post-test photographs of the vehicle and dummy can be found in Appendix A.

Three (3) high-speed digital cameras and one (1) real time camera were used to document the airbag deployment. Camera locations and other pertinent camera information can be found on Data Sheet No.1 and Data Sheet No.6.

A 6 year old anthropomorphic test device (ATD) was placed in the right front passenger seating position facing inboard according to the dummy placement instructions (3.3.5.1) in the July 2003 Revision of the Technical Working Group's 'Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags'.

The 6 year old ATD was instrumented with head tri-axial accelerometers, and upper and lower neck force transducers.

Fifteen (15) channels of data were recorded using an on-board data acquisition system. Appendix B contains dummy response data traces. Appendix C contains the instrumentation data channel assignments. Appendix D contains ATD calibration sheets.

The front passenger side door remained closed during the deployment and was operable after the test.

The 6 year old dummy's visible contact points were as follows: The curtain airbag contacted the ATD’s head and the torso/pelvis airbag contacted the ATD’s back and pelvis.

OUT OF POSITION OCCUPANT DATA SUMMARY

ATD Position	HIC_{15}
Passenger	118.9

Orientation of the 6 year old dummy was in the inboard facing position leaning back against the door panel. The dummy's upper spine was aligned with the deploying trajectory of the airbag. This orientation complies with section 3.3.5.1 of the Technical Working Group (TWG) recommendation in the Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags.

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SECTION 2

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2013 Ford Focus Electric 5-Door Hatchback NHTSA No.: MD0214TWG2
Test Program: TWG 3.3.5.1 Test Date: 04/15/13

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

TEST SUMMARY

Test Vehicle: 2013 Ford Focus Electric 5-Door Hatchback NHTSA No.: MD0214TWG2

Test Program: TWG 3.3.5.1 Test Date: 04/15/13

TEST DUMMY INFORMATION

Description	Passenger Seat Forward Facing
Dummy Type / Serial No.	6 year old / 186
Head Contact	Yes
Chest Contact	No
Abdomen Contact	No
Pelvis	Yes
Left Knee Contact	No
Right Knee Contact	No

VIDEO COVERAGE

High Speed Digital	3
Real Time	1
Total	4

DATA CHANNELS

6 year old ATD Sensors	15
Belt Assessment Sensors	0
Vehicle Structure Accelerometers	0
Total	15

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2013 Ford Focus Electric 5-Door Hatchback NHTSA No.: MD0214TWG2

Test Program: TWG 3.3.5.1 Test Date: 04/15/13

TEST VEHICLE INFORMATION

Make	Ford
Model	Focus Electric
Body Style	5-Door Hatchback
NHTSA No.	MD0214TWG2
VIN	1FADP3R41DL139889
Color	Blue Candy Metallic
Delivery Date	November 19, 2012
Odometer (km./mi.)	23 / 14
Dealer	Hansel Ford
Transmission	Automatic
Final Drive	Front
Type/Number Cylinders	Electric
Engine Displacement (L)	N/A
Engine Placement	Transverse

TEST VEHICLE OPTIONS

Driver Front Airbag	Yes
Driver Side Airbag	Yes
Driver Side Curtain Airbag	Yes
Pass. Front Airbag	Yes
Pass. Side Airbag	Yes
Pass. Curtain Airbag	Yes
Power Brakes	Yes
Power Steering	Yes
Disc Brakes, Front	Yes
Disc Brakes, Rear	Yes
Anti-lock Brakes	Yes
Tilt Steering Wheel	Yes
Power Windows	Yes
Power Seats	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Co.
Date of Manufacture	September-12

GVWR (kg)	2085
GAWR Front (kg)	934
GAWR Rear (kg)	1200

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	260	260
Recommend Tire Size	P225/50R17	P225/50R17
Tire Size on Vehicle	P225/50R17	P225/50R17
Tire Manufacturer	Michelin	Michelin

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				375

* Vehicle underwent New Car Assessment Program Frontal Impact Testing on December 18, 2012.

DATA SHEET NO. 3

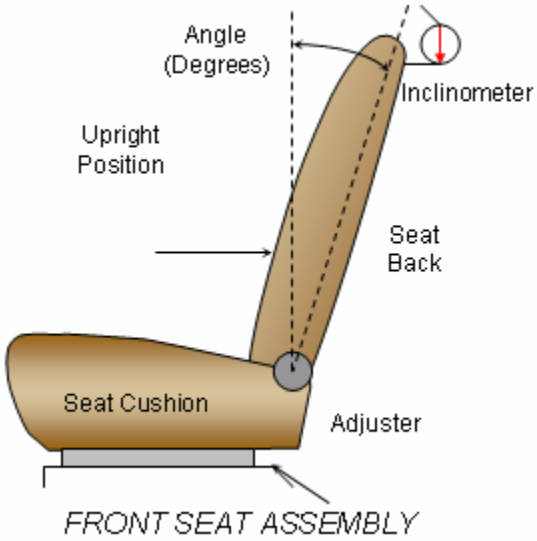
TEST VEHICLE INFORMATION

Test Vehicle: 2013 Ford Focus Electric 5-Door Hatchback NHTSA No.: MD0214TWG2

Test Program: TWG 3.3.5.1 Test Date: 04/15/13

NOMINAL DESIGN RIDING POSITION

The passenger seat back is positioned per section 3.3.5.1 of the TWG recommendation in the Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags. Seat back angle is measured at the headrest post.



SEAT BACK ANGLES

Position	Deg.
Passenger w/ Dummy	7.2

SEAT FORE/AFT POSITIONS

The passenger seat track travel is set per section 3.3.5.1 of the TWG recommendation in the Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags. The first or forward most position is counted as number zero (0).

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Passenger Seat	248 mm (25 detents)	0 mm (0 detent)

DATA SHEET NO. 4

DUMMY POSITIONING INFORMATION

Test Vehicle: 2013 Ford Focus Electric 5-Door Hatchback NHTSA No.: MD0214TWG2

Test Program: TWG 3.3.5.1 Test Date: 04/15/13

TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Hybrid III 6 YO	
		Length (mm)	Angle (°)
SA	Seat Back Angle		7.2
AMW	Side Airbag Module Diameter (Torso / Curtain)	30 / 40	
ABW	Side Airbag Width (Torso / Curtain)	660 / 480	
AML	Side Airbag Module Length (Torso / Curtain)	125 / 315	
ABL	Side Airbag Length (Torso / Curtain)	380 / 1630	
AN	Top of Airbag Module to Head/Neck Junction	234	
HD	Head CG to Door Panel/ Window	142	
HSC	Head to Seat Back Centerline	371	
HB	Head to B-Pillar (first contact)	323	
HZ	Head to Roof (Z)	232	
HHD	Head to Header	283	62.2
ND	Nose to Dash	445	15.5
NS	Nose to Seat Back	340	
NR	Nose to Header	285	62.3
CD	Chest to Dash	349	0.0
CS	Chest to Seat Back	268	
RACL	Right Arm to Seat Back Centerline	299	
LACL	Left Arm to Seat Back Centerline	285	
RA	Right Arm to Door Panel	0	
LA	Left Arm to Door Panel	36	
KK	Knee to Knee	135	
TT	Toe to Toe	92	
KSCR	Right Knee to Seat Cushion Centerline	58	
KSCL	Left Knee to Seat Cushion Centerline	52	
	Head Level (X Direction)		1.0
	Head Level (Y Direction)		2.1

DATA SHEET NO. 5

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2013 Ford Focus Electric 5-Door Hatchback NHTSA No.: MD0214TWG2

Test Program: TWG 3.3.5.1 Test Date: 04/15/13

HEAD PEAK ACCELERATIONS

Location	Axis	Units	Pass. 6 YO			
			Max	Time	Min	Time
Head CG	X	G's	12.6	11.7	-25.0	10.8
Head CG	Y	G's	147.3	10.8	-96.0	11.1
Head CG	Z	G's	115.6	11.0	-21.7	14.3
Head CG Resultant	N/A	G's	183.8	10.8		

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Pass. 6 YO			
			Max	Time	Min	Time
Neck Force	X	Newtons	42.8	272.1	-141.6	11.4
Neck Force	Y	Newtons	84.5	109.7	-249.7	10.8
Neck Force	Z	Newtons	249.8	21.6	-1074.1	13.5
Neck Force Resultant	N/A	Newtons	1077.1	13.5		
Neck Moment	X	Nm	8.6	104.4	-4.2	23.7
Neck Moment	Y	Nm	18.8	39.1	-5.9	11.4
Neck Moment	Z	Nm	2.8	110.2	-2.7	33.9
Neck Moment Resultant	N/A	Nm	19.5	39.1		

LOWER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Pass. 6 YO			
			Max	Time	Min	Time
Neck Force	X	Newtons	35.9	237.8	-165.1	10.8
Neck Force	Y	Newtons	250.0	7.9	-40.2	260.6
Neck Force	Z	Newtons	321.6	21.4	-1124.6	13.8
Neck Force Resultant	N/A	Newtons	1125.1	13.8		
Neck Moment	X	Nm	18.6	106.7	-5.2	256.2
Neck Moment	Y	Nm	46.6	13.7	-7.8	276.1
Neck Moment	Z	Nm	5.9	7.9	-2.2	255.6
Neck Moment Resultant	N/A	Nm	46.6	13.7		

HEAD INJURY CRITERIA (HIC 15)

Location	Pass. 6 YO			
	HIC15	T^1	T^2	Avg G
Head CG	118.9	10.6	11.2	121.7

UPPER NECK NIJ VALUES

Location	Pass. 6 YO			
	Ntf	Nte	Ncf	Nce
Upper Neck	0.20	0.11	0.39	0.41

DATA SHEET NO. 6

CAMERA LOCATIONS

Test Vehicle: 2013 Ford Focus Electric 5-Door Hatchback NHTSA No.: MD0214TWG2

Test Program: TWG 3.3.5.1 Test Date: 04/15/13

No.	Camera View	Location (mm)			Angle (Deg.)	Lens (mm)	Speed (fps)
		X	Y	Z			
1	High Speed Front View	1471	-87	-1355	-9.3	35	1000
2	High Speed 3/4 View	1436	-1624	-1395	-6.6	35	1000
3	High Speed Side View	140	-2738	-866	-0.4	24	1000
4	Real Time	50	-2738	-870	0.0	N/A	30

Coordinates: +X = forward of vehicle relative to dummy's head CG

+Y = right of vehicle relative to dummy's head CG

+Z = into ground

APPENDIX A

PHOTOGRAPHS

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FIGURE 6. Post-Test Right Side View of NCAP Frontal Impact Test

FIGURE 7. Pre-Test Dummy Position, Left Side View

FIGURE 8. Post-Test Dummy Position, Left Side View

FIGURE 9. Pre-Test Dummy Position, ¾ View

FIGURE 10. Post-Test Dummy Position, ¾ View

FIGURE 11. Pre-Test Dummy Position, Front View

FIGURE 12. Post-Test Dummy Position, Front View

FIGURE 13. Post-Test Airbags, Left Side View

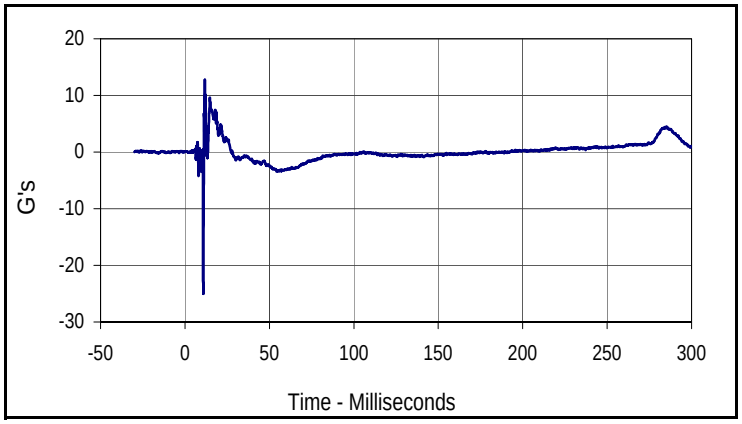
FIGURE 14. Post-Test Airbags, Left Front ¾ View

APPENDIX B

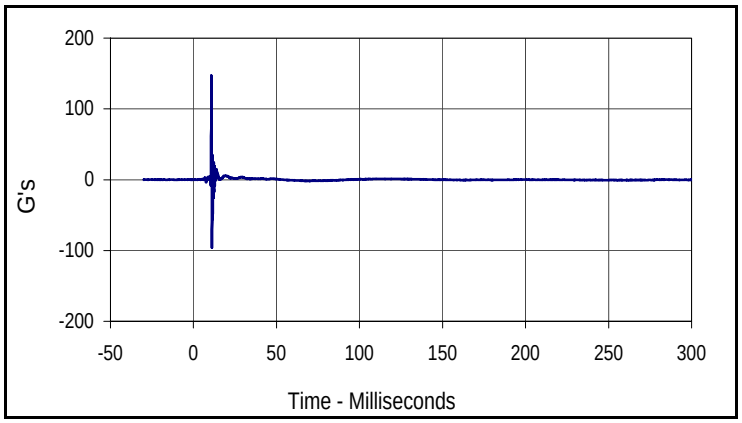
DATA PLOTS

TABLE OF DATAPLOTS

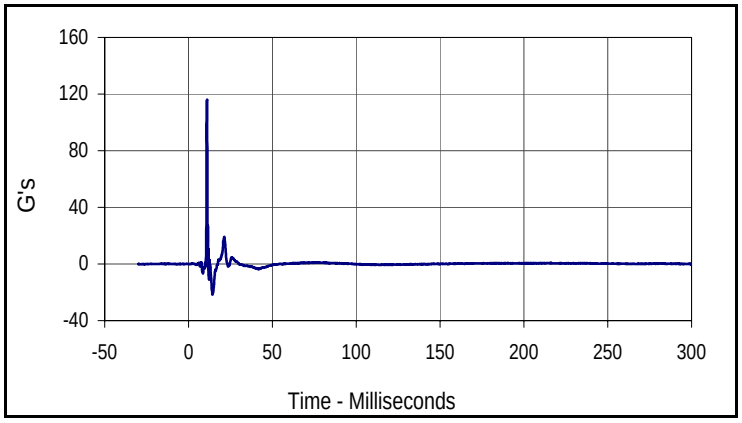
Test Vehicle:	2013 Ford Focus Electric 5-Door Hatchback	Test Date:	4/15/13
Test Program:	TWG 3.3.5.1	NHTSA No.:	MD0214TWG2



Curve Description			
6 Yr. Old Head X			
Plot No.	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
12.6	11.7	-25.0	10.8



Curve Description			
6 Yr. Old Head Y			
Plot No.	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
147.3	10.8	-96.0	11.1



Curve Description			
6 Yr. Old Head Z			
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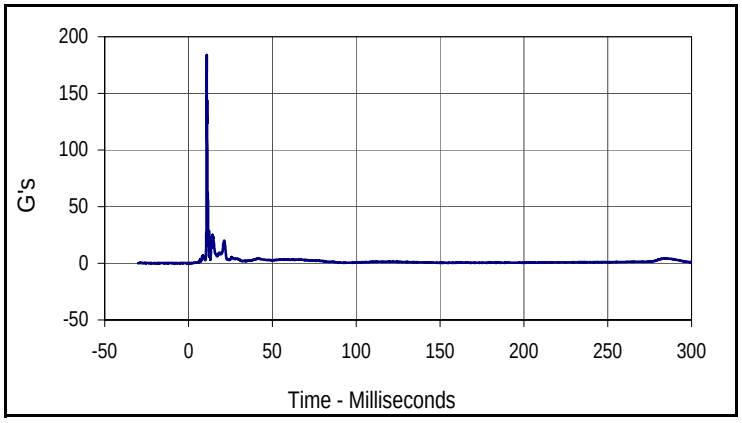
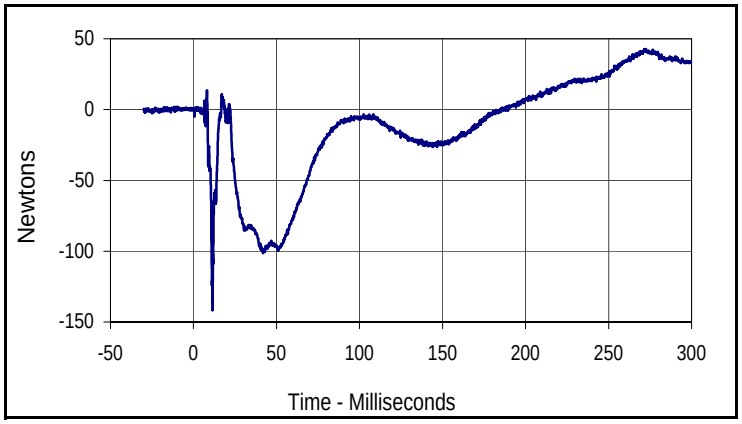
003	FIL	1000	G's
Max	Time	Min	Time
115.6	11.0	-21.7	14.3

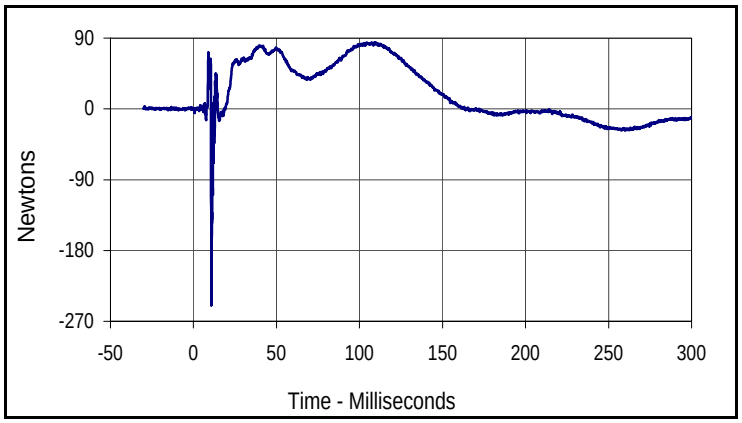


Curve Description			
6 Yr. Old Head Resultant			
Plot No.	Type	SAE Class	Units
004	RES	1000	G's
Max	Time	Min	Time
183.8	10.8	0.1	1.2

Test Vehicle:	2013 Ford Focus Electric 5-Door Hatchback	Test Date:	4/15/13
Test Program:	TWG 3.3.5.1	NHTSA No.:	MD0214TWG2



Curve Description			
6 Yr. Old Upper Neck Force X			
Plot No.	Type	SAE Class	Units
005	FIL	1000	Newtons
Max	Time	Min	Time
42.8	272.1	-141.6	11.4



Curve Description			
6 Yr. Old Upper Neck Force Y			
Plot No.	Type	SAE Class	Units
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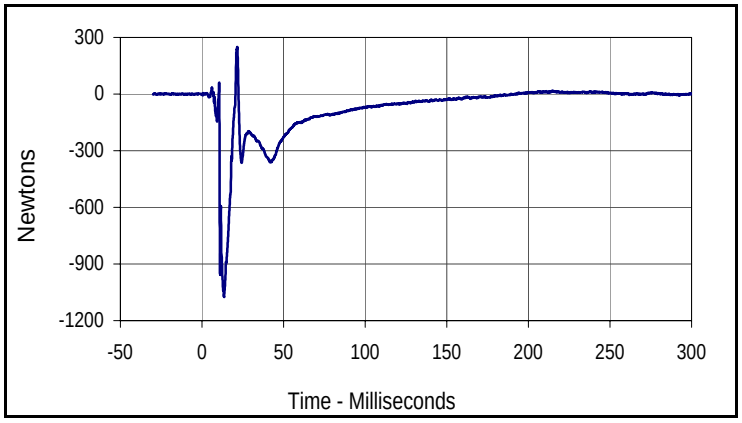
Max	Time	Min	Time
84.5	109.7	-249.7	10.8



Curve Description			
6 Yr. Old Upper Neck Force Z			
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Max	Time	Min	Time
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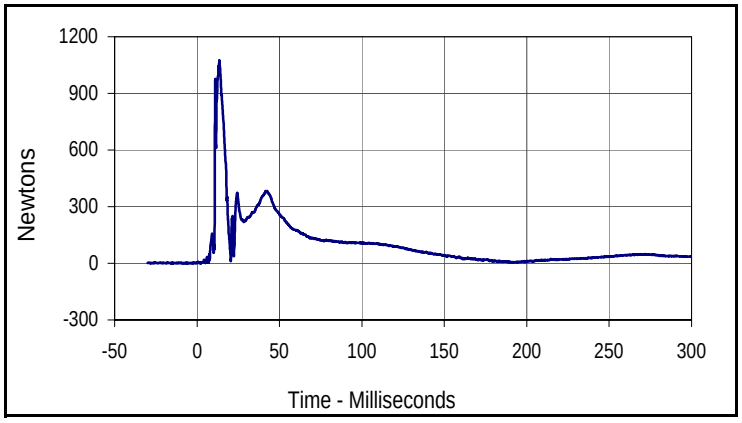


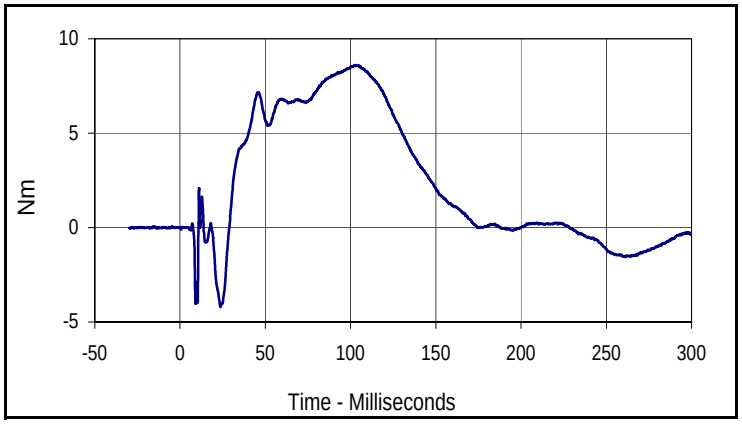
Curve Description			
6 Yr. Old Upper Neck Force Resultant			
Plot No.	Type	SAE Class	Units
008	RES	1000	Newtons
Max	Time	Min	Time
1077.1	13.5	0.5	2.1

Test Vehicle: 2013 Ford Focus Electric 5-Door Hatchback

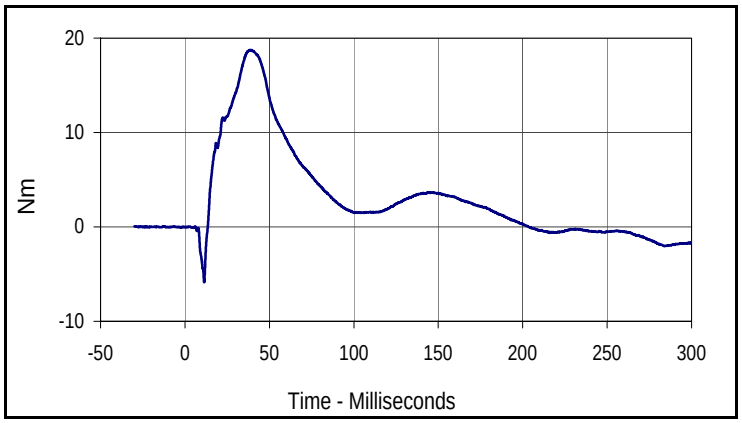
Test Program: TWG 3.3.5.1

Test Date: 4/15/13

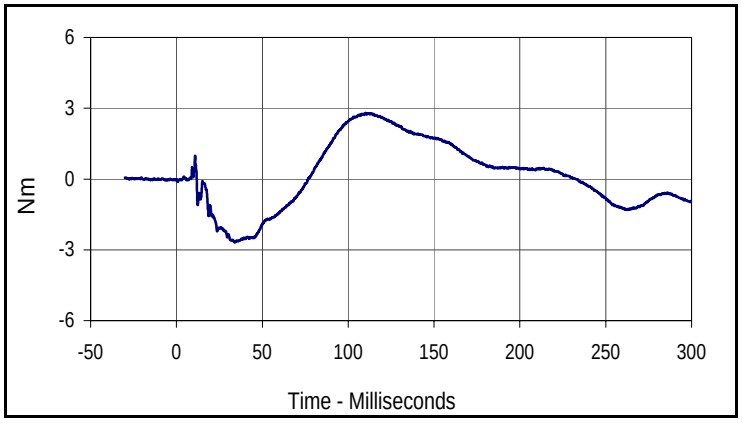
NHTSA No.: MD0214TWG2



Curve Description			
6 Yr. Old Upper Neck Moment X			
Plot No.	Type	SAE Class	Units
009	FIL	600	Nm
Max	Time	Min	Time
8.6	104.4	-4.2	23.7



Curve Description			
6 Yr. Old Upper Neck Moment Y			
Plot No.	Type	SAE Class	Units
010	FIL	600	Nm
Max	Time	Min	Time
18.8	39.1	-5.9	11.4



Curve Description			
6 Yr. Old Upper Neck Moment Z			
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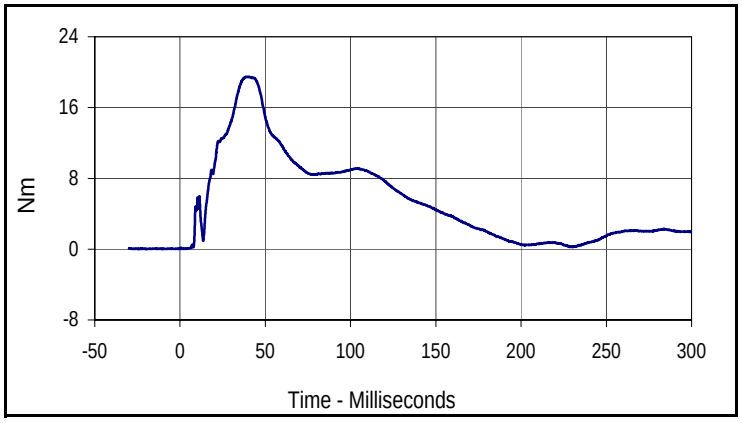
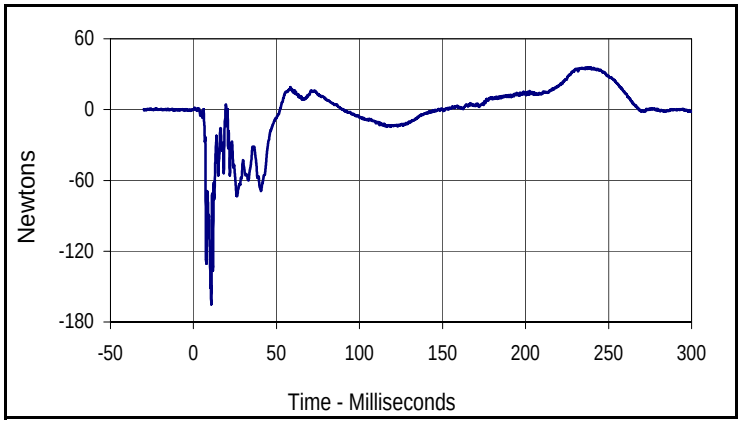
011	FIL	600	Nm
Max	Time	Min	Time
2.8	110.2	-2.7	33.9

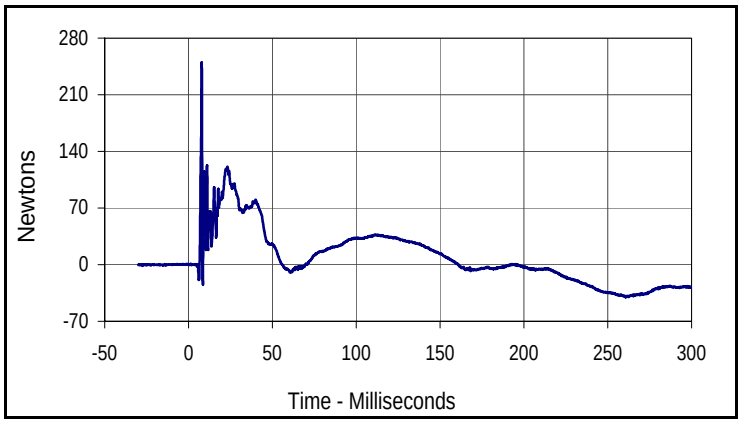


Curve Description			
6 Yr. Old Upper Neck Moment Resultant			
Plot No.	Type	SAE Class	Units
012	RES	600	Nm
Max	Time	Min	Time
19.5	39.1	0.0	3.5

Test Vehicle:	2013 Ford Focus Electric 5-Door Hatchback	Test Date:	4/15/13
Test Program:	TWG 3.3.5.1	NHTSA No.:	MD0214TWG2



Curve Description			
6 Yr. Old Lower Neck Force X			
Plot No.	Type	SAE Class	Units
013	FIL	1000	Newtons
Max	Time	Min	Time
35.9	237.8	-165.1	10.8



Curve Description			
6 Yr. Old Lower Neck Force Y			
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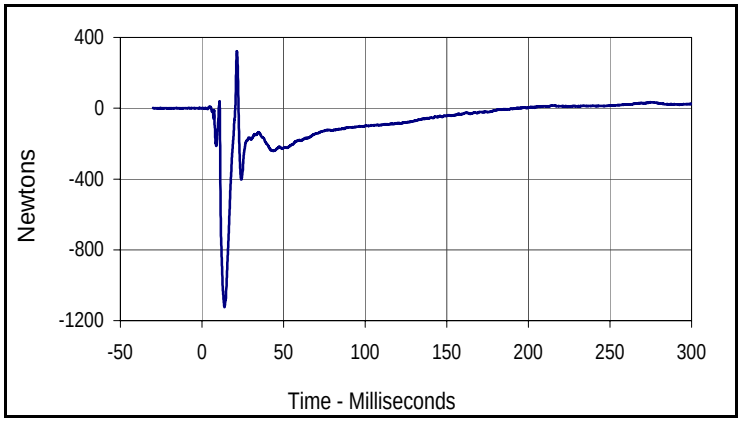
014	FIL	1000	Newtons
Max	Time	Min	Time
250.0	7.9	-40.2	260.6



Curve Description			
6 Yr. Old Lower Neck Force Z			
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015	FIL	1000	Newtons
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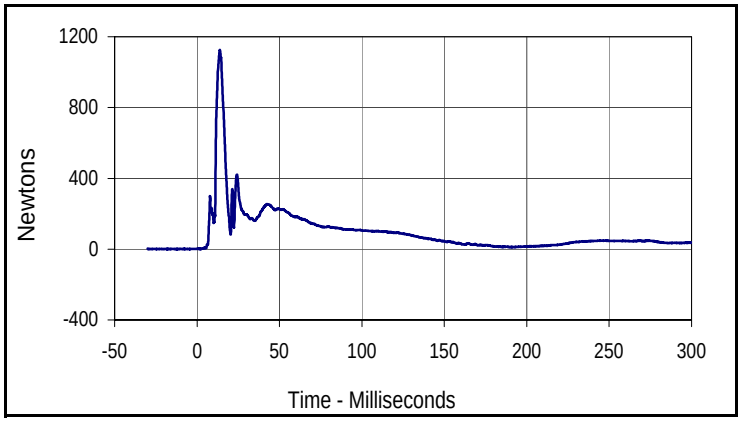


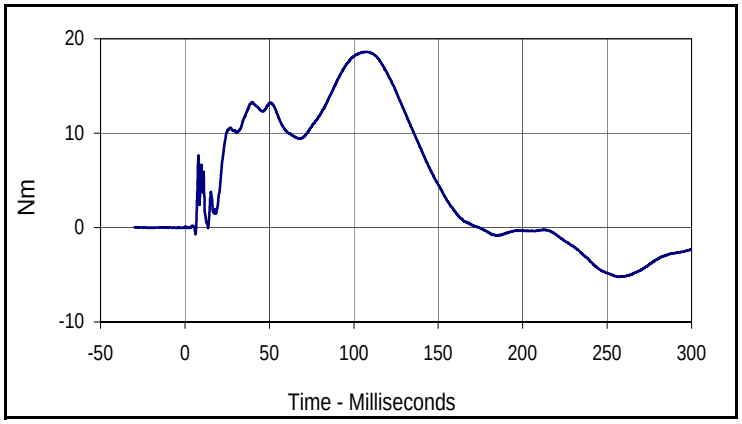
Curve Description			
6 Yr. Old Lower Neck Force Resultant			
Plot No.	Type	SAE Class	Units
016	RES	1000	Newtons
Max	Time	Min	Time
1125.1	13.8	0.3	2.4

Test Vehicle: 2013 Ford Focus Electric 5-Door Hatchback

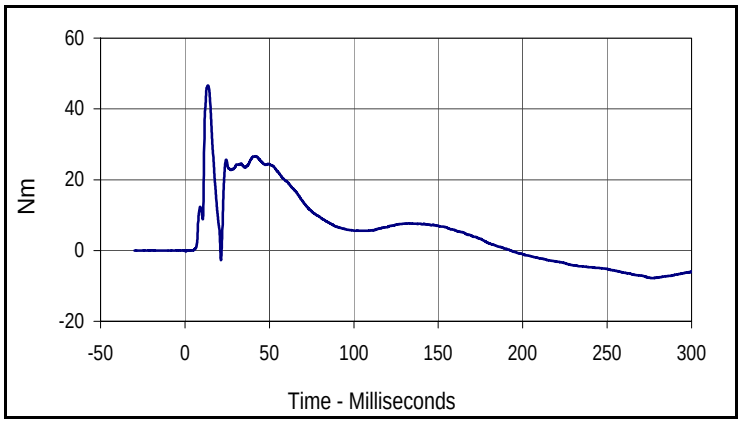
Test Program: TWG 3.3.5.1

Test Date: 4/15/13

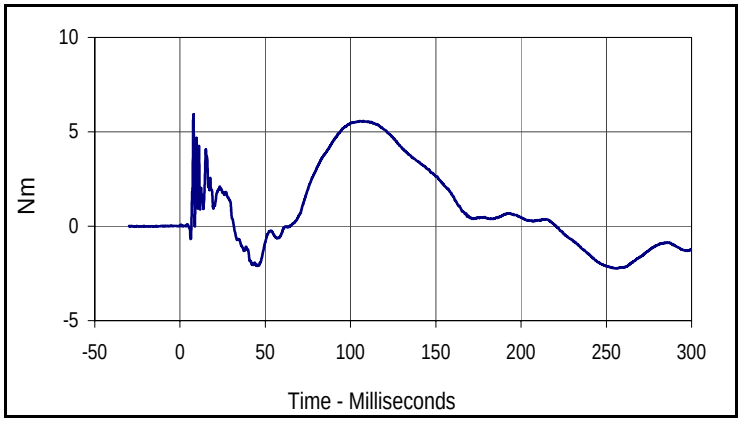
NHTSA No.: MD0214TWG2



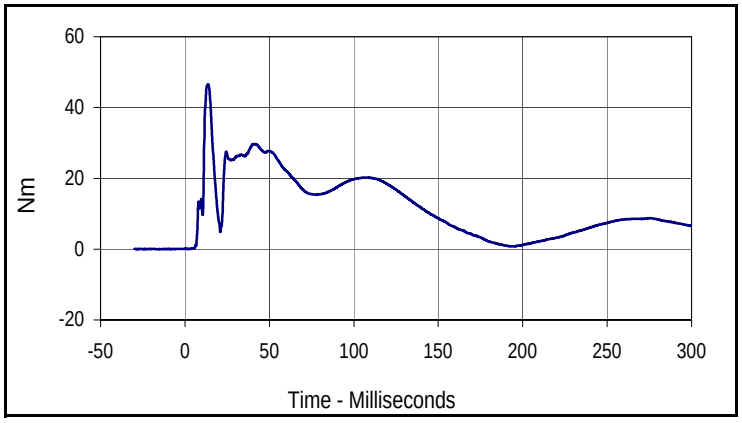
Curve Description			
6 Yr. Old Lower Neck Moment X			
Plot No.	Type	SAE Class	Units
017	FIL	600	Nm
Max	Time	Min	Time
18.6	106.7	-5.2	256.2



Curve Description			
6 Yr. Old Lower Neck Moment Y			
Plot No.	Type	SAE Class	Units
018	FIL	600	Nm
Max	Time	Min	Time
46.6	13.7	-7.8	276.1



Curve Description			
6 Yr. Old Lower Neck Moment Z			
Plot No.	Type	SAE Class	Units
019	FIL	600	Nm
Max	Time	Min	Time
5.9	7.9	-2.2	255.6



Curve Description			
6 Yr. Old Lower Neck Moment Resultant			
Plot No.	Type	SAE Class	Units
020	RES	600	Nm
Max	Time	Min	Time
46.6	13.7	0.0	1.8

APPENDIX C

INSTRUMENTATION DATA CHANNEL ASSIGNMENTS

TWG 3.3.5.1
Instrumentation Data Channel Assignments
A.T.D. Serial Number 186
4/15/13
2013 Ford Focus Electric 5-Door Hatchback

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
1	HEAD	X	J34330	Accel.,full bridge	Endevco	7264-2000	G
2	HEAD	Y	P15334	Accel.,full bridge	Endevco	7264C-2000	G
3	HEAD	Z	ACCW9	Accel.,full bridge	Endevco	7264-2000	G
4	UPPER NECK FORCE	X	1646	Load cell, six axis neck	R. A. Denton	1716A	N
5	UPPER NECK FORCE	Y	1646	Load cell, six axis neck	R. A. Denton	1716A	N
6	UPPER NECK FORCE	Z	1646	Load cell, six axis neck	R. A. Denton	1716A	N
7	UPPER NECK MOMENT	X	1646	Load cell, six axis neck	R. A. Denton	1716A	Nm
8	UPPER NECK MOMENT	Y	1646	Load cell, six axis neck	R. A. Denton	1716A	Nm
9	UPPER NECK MOMENT	Z	1646	Load cell, six axis neck	R. A. Denton	1716A	Nm
10	LOWER NECK FORCE	X	139	Load cell, six axis neck	R. A. Denton	2430	N
11	LOWER NECK FORCE	Y	139	Load cell, six axis neck	R. A. Denton	2430	N
12	LOWER NECK FORCE	Z	139	Load cell, six axis neck	R. A. Denton	2430	N
13	LOWER NECK MOMENT	X	139	Load cell, six axis neck	R. A. Denton	2430	Nm
14	LOWER NECK MOMENT	Y	139	Load cell, six axis neck	R. A. Denton	2430	Nm
15	LOWER NECK MOMENT	Z	139	Load cell, six axis neck	R. A. Denton	2430	Nm

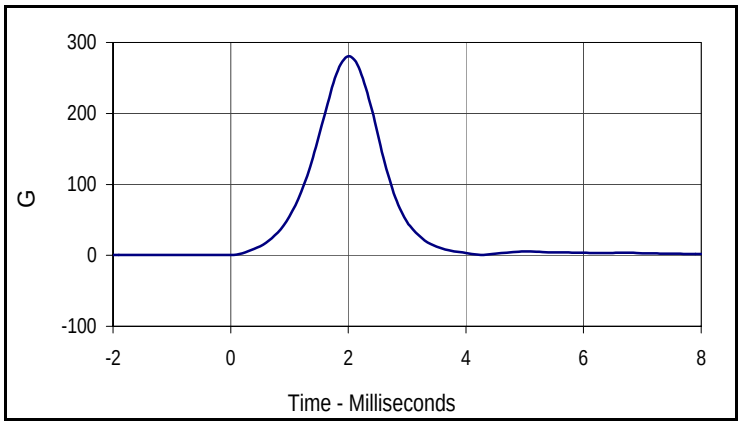
APPENDIX D

PRE-TEST AND POST-TEST HYBRID III CONFIGURATION AND PERFORMANCE VERIFICATION DATA

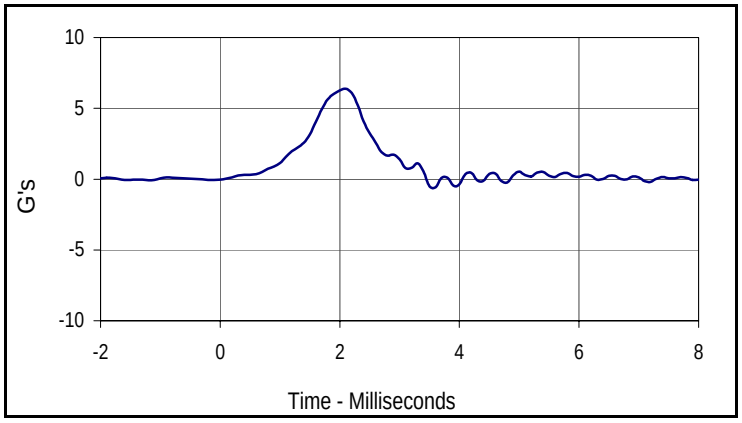
APPENDIX D
PRE-TEST / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program:	Hybrid III 6 Yr Old Head Drop Test	Test Date:	4/11/13
ATD Serial No.:	186	Test I.D.:	186HD025

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	245.0 to 300.0	280.5	Pass
Peak Lateral Acceleration	G's	≤15.0	6.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass



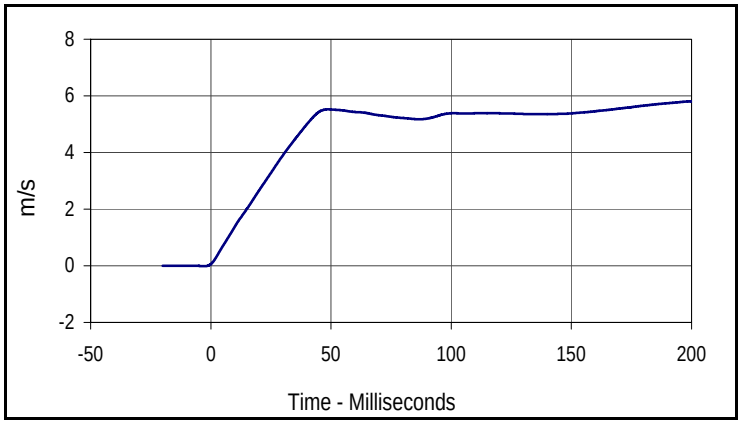
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G
Max	Time	Min	Time
280.5	2.0	0.5	-1.1



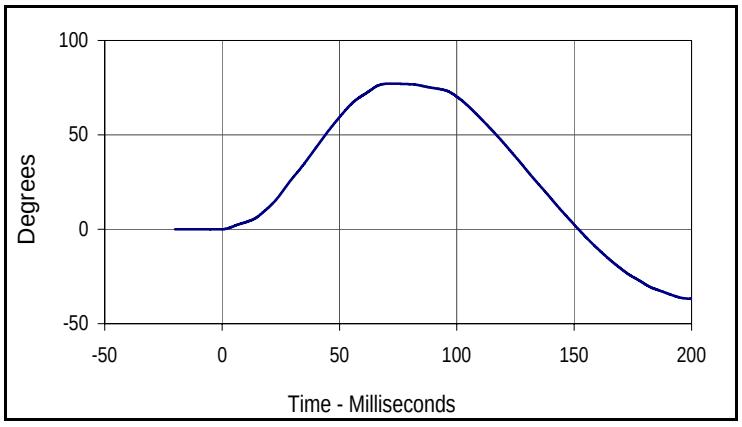
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
6.4	2.1	-0.6	3.6

Test Program:	Hybrid III 6 Yr Old Neck Flexion Test	Test Date:	4/11/13
ATD Serial No.:	186	Test I.D.:	186NF025

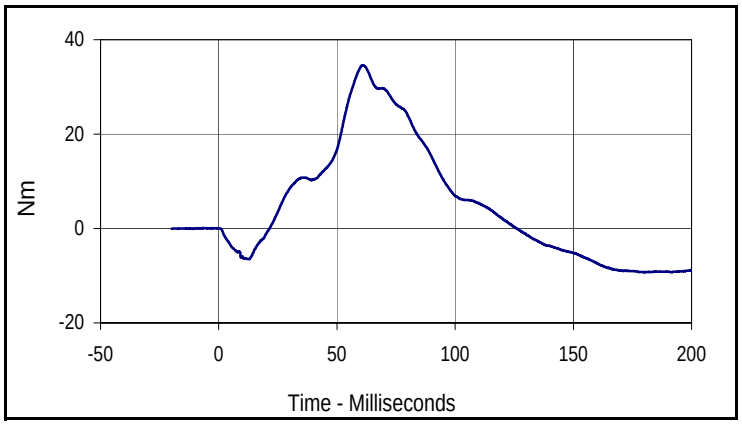
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	20.8	Pass
Laboratory Relative Humidity		%	10 to 70	26	Pass
Pendulum Velocity		m/s	4.83 to 5.07	4.95	Pass
Pendulum Deceleration	10 Msec.	m/s	1.2 to 1.6	1.4	Pass
	20 Msec.	m/s	2.4 to 3.4	2.7	Pass
	30 Msec.	m/s	3.8 to 5.0	3.9	Pass
"D" Plane Rotation	Max	Degrees	74.0 to 92.0	77.2	Pass
Peak Moment in Rotation	Max	Nm	27.0 to 33.0	32.7	Pass
Positive Moment Decay, Time To 5 Nm		Msec.	103.0 to 123.0	111.3	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
5.8	200.0	0.0	-2.8



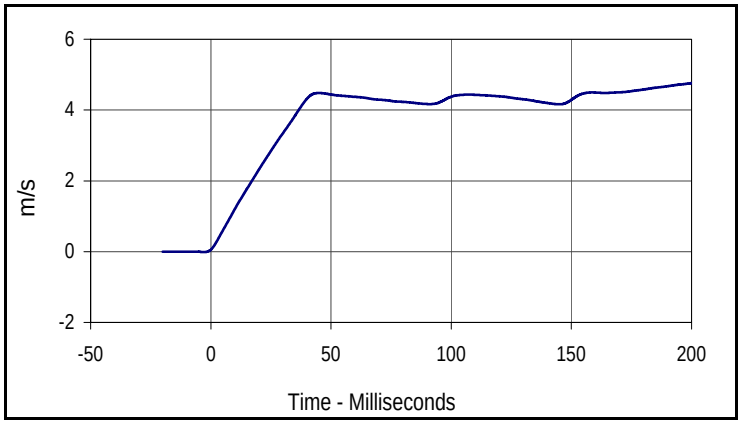
Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
77.2	72.0	-36.9	200.0



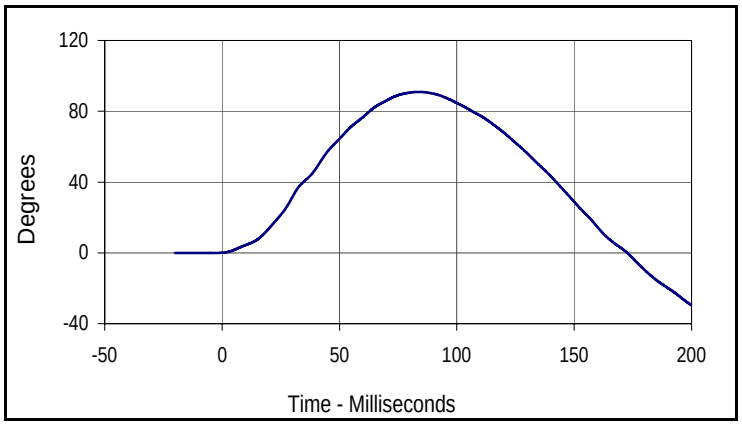
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
34.6	61.2	-9.3	191.6

Test Program:	Hybrid III 6 Yr Old Neck Extension Test	Test Date:	4/11/13
ATD Serial No.:	186	Test I.D.:	186NE025

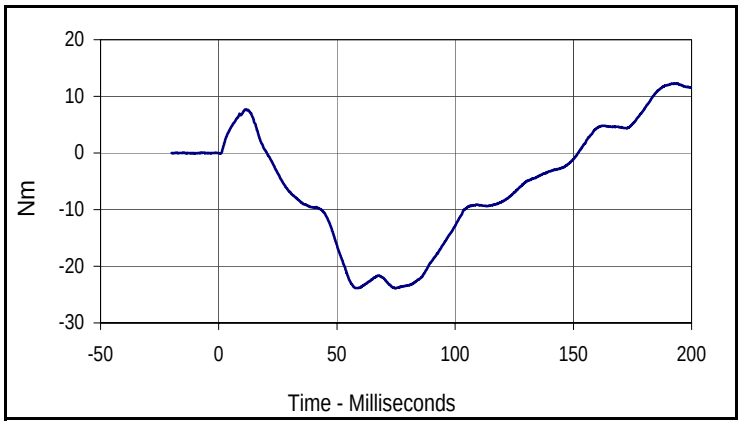
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	20.8	Pass
Laboratory Relative Humidity		%	10 to 70	26	Pass
Pendulum Velocity		m/s	4.18 to 4.42	4.25	Pass
Pendulum Deceleration	10 Msec.	m/s	1.0 to 1.4	1.2	Pass
	20 Msec.	m/s	2.2 to 3.0	2.3	Pass
	30 Msec.	m/s	3.2 to 4.2	3.3	Pass
"D" Plane Rotation	Max	Degrees	85.0 to 103.0	90.9	Pass
Peak Moment in Rotation	Max	Nm	-24.0 to -19.0	-23.9	Pass
Positive Moment Decay, Time To -5 Nm		Msec.	123.0 to 147.0	127.1	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
4.8	200.0	0.0	-2.8



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
90.9	83.8	-29.5	200.0



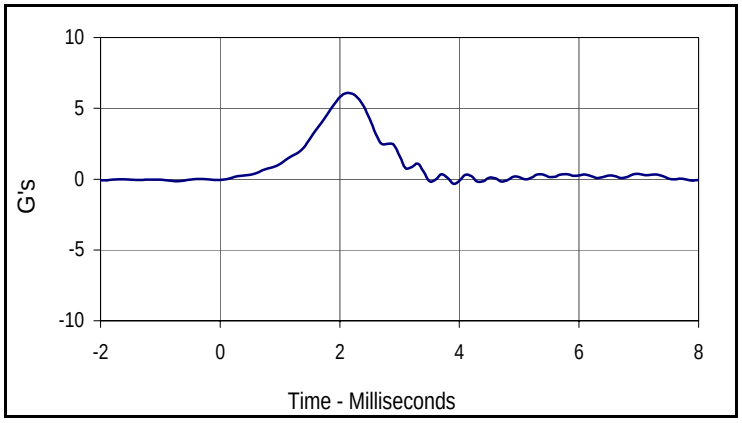
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
12.3	193.4	-23.9	74.8

APPENDIX D
POST-TEST / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program:	Hybrid III 6 Yr Old Head Drop Test	Test Date:	4/17/13
ATD Serial No.:	186	Test I.D.:	186HD026

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Peak Resultant Acceleration	G's	245.0 to 300.0	274.5	Pass
Peak Lateral Acceleration	G's	≤15.0	6.1	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass

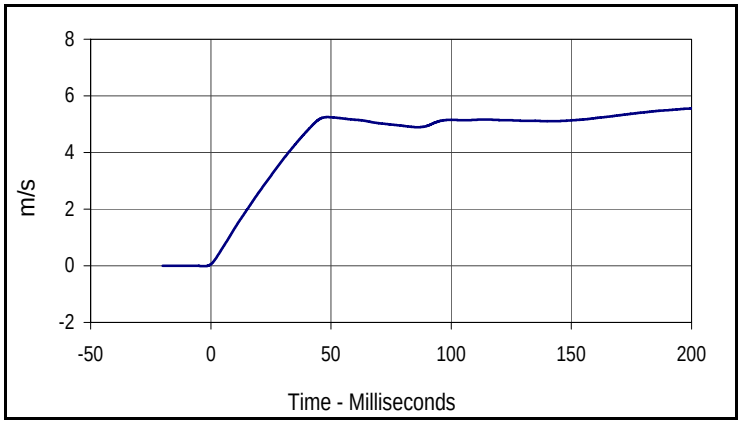
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G
Max	Time	Min	Time
274.5	2.1	0.0	-1.6



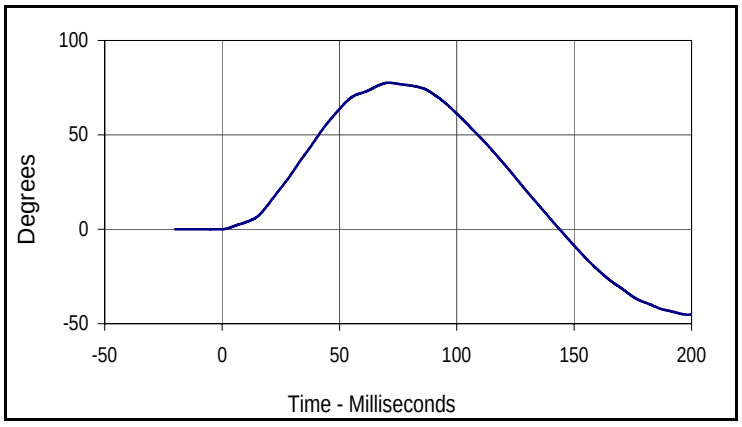
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
6.1	2.1	-0.3	3.9

Test Program:	Hybrid III 6 Yr Old Neck Flexion Test	Test Date:	4/17/13
ATD Serial No.:	186	Test I.D.:	186NF025

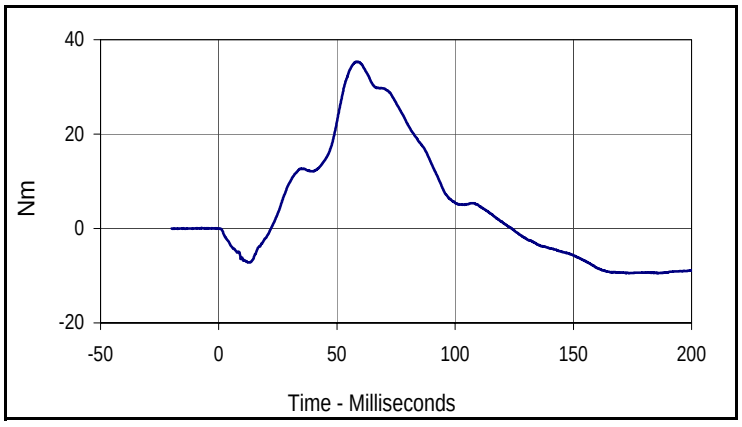
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	4.83 to 5.07	5.03	Pass
Pendulum Deceleration	10 Msec.	m/s	1.2 to 1.6	1.3	Pass
	20 Msec.	m/s	2.4 to 3.4	2.6	Pass
	30 Msec.	m/s	3.8 to 5.0	3.8	Pass
"D" Plane Rotation	Max	Degrees	74.0 to 92.0	77.6	Pass
Peak Moment in Rotation	Max	Nm	27.0 to 33.0	32.4	Pass
Positive Moment Decay, Time To 5 Nm		Msec.	103.0 to 123.0	109.8	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
5.6	200.0	0.0	-2.7



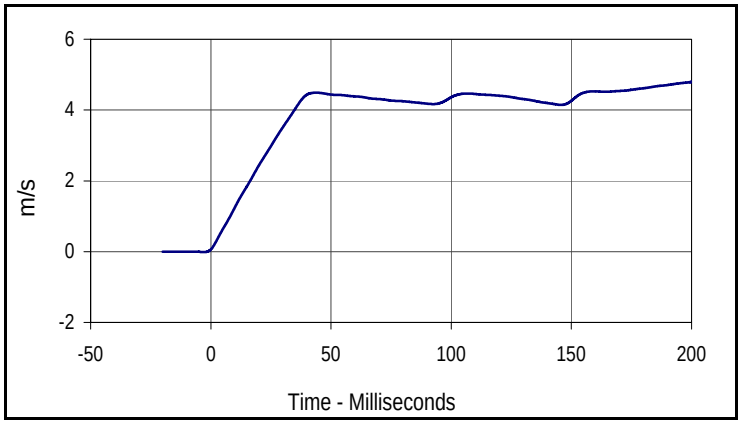
Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
77.6	71.0	-45.3	200.0



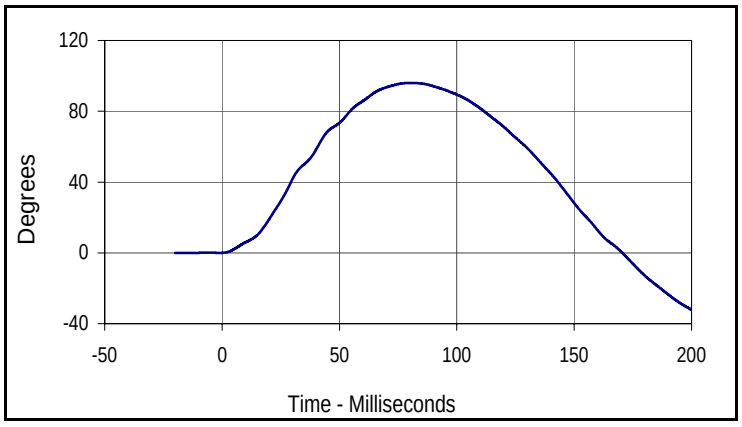
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
35.3	58.1	-9.5	185.8

Test Program:	Hybrid III 6 Yr Old Neck Extension Test	Test Date:	4/17/13
ATD Serial No.:	186	Test I.D.:	186NE026

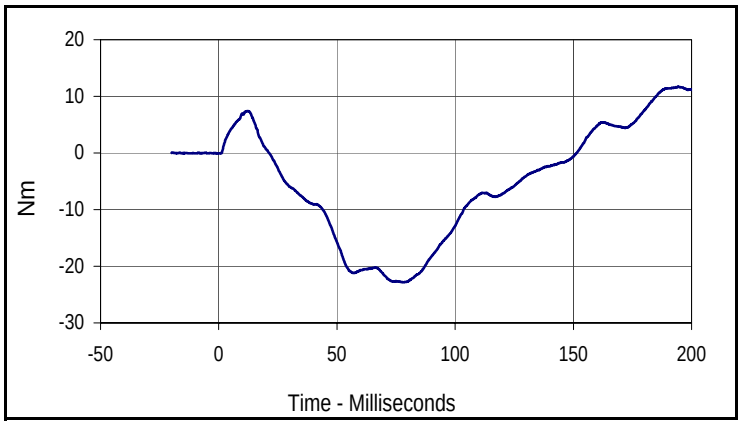
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	4.18 to 4.42	4.31	Pass
Pendulum Deceleration	10 Msec.	m/s	1.0 to 1.4	1.2	Pass
	20 Msec.	m/s	2.2 to 3.0	2.4	Pass
	30 Msec.	m/s	3.2 to 4.2	3.5	Pass
"D" Plane Rotation	Max	Degrees	85.0 to 103.0	96.0	Pass
Peak Moment in Rotation	Max	Nm	-24.0 to -19.0	-22.8	Pass
Positive Moment Decay, Time To -5 Nm		Msec.	123.0 to 147.0	127.2	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
4.8	200.0	0.0	-2.8



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
96.0	80.6	-32.2	200.0



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
11.7	194.4	-22.8	78.2