REPORT NUMBER TR-P32011-03-NC

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

GENERAL MOTORS LLC
2012 FIAT 500 POP
3-DOOR HATCHBACK

NHTSA NUMBER: MC0326TWG2

PREPARED BY:
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JANUARY 3, 2012

DRAFT REPORT

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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 DTNH22-06-D-00027.

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Engineer, Alpha Technology Associate, Inc.

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Date of Acceptance

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SECTION 1

PURPOSE AND SUMMARY OF TEST MC0326TWG2

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. DTNH22-06-D-00027. 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 airbag deployment in a 2012 Fiat 500 Pop 3-Door Hatchback with an out-of-position 6 year old dummy were evaluated. The test was performed at KARCO Engineering LLC on January 3, 2011. Pre- and post-test photographs of the vehicle and dummy can be found in Appendix A.

Three high-speed digital cameras and one 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 pld ATD was instrumented with head tri-axial accelerometers, and upper neck transducers.

Fifteen (15) channels of data were recorded using an on-board data acquisition system. Appendix A contains Photographs. Appendix B contains dummy response data traces. Appendix C contains the Instrumentation Data Channel assignments. Appendix D contains Sid IIs calibration sheets.

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

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

OUT OF POSITION OCCUPANT DATA SUMMARY

ATD Position	HIC_{15}
Passenger	31.5

Orientation of the 6 year old dummy was in the Inboard facing position leaning back against the front passenger door. The dummy's head centerline was aligned with the deploying trajectory of the curtain 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: 2012 Fiat 500 Pop 3-Door Hatchback NHTSA No.: MC0326TWG2
Test Program: TWG 3.3.5.1 Test Date: 01/03/12

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

TEST SUMMARY

Test Vehicle: 2012 Fiat 500 Pop 3-Door Hatchback NHTSA No.: MC0326TWG2

Test Program: TWG 3.3.5.1 Test Date: 01/03/12

TEST DUMMY INFORMATION

Description	Passenger Seat Inboard Facing
Dummy Type / Serial No.	6 year old / 186
Head Contact	Yes
Chest Contact	None
Abdomen Contact	Yes
Pelvis	Yes
Left Knee Contact	None
Right Knee Contact	None

MOVIE COVERAGE

High Speed Digital	3
Real Time	1
Total	4

DATA CHANNELS

SID IIs 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: 2012 Fiat 500 Pop 3-Door Hatchback NHTSA No.: MC0326TWG2

Test Program: TWG 3.3.5.1 Test Date: 01/03/12

TEST VEHICLE INFORMATION

Make	Fiat
Model	Pop
Body Style	3-Door Hatchback
NHTSA No.	MC0326TWG2
VIN	3C3CFFAR9CT114196
Color	Grigio
Delivery Date	October 20, 2011
Odometer (km./mi.)	61 / 38
Dealer	Power Fiat of South Bay
Transmission	Manual
Final Drive	Front
Type/Number Cylinders	Inline-4
Engine Displacement (L)	1.4
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	No
Power Seats	No

DATA FROM CERTIFICATION LABEL

Manufactured By	Chrysler Group LLC
Date of Manufacture	April-11

GVWR (kg)	1497
GAWR Front (kg)	850
GAWR Rear (kg)	810

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	230	230
Cold Pressure (kPa)	230	210
Recommend Tire Size	185/55 R15	185/55 R15
Tire Size on Vehicle	185/55 R15	185/55 R15
Tire Manufacturer	Firestone	Firestone

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number of Occupants	2	2		4
Capacity Wt. (VCW) (kg)				340

* Vehicle had undergone New Car Assessment Program Side Impact Testing on November 9, 2011

DATA SHEET NO. 3

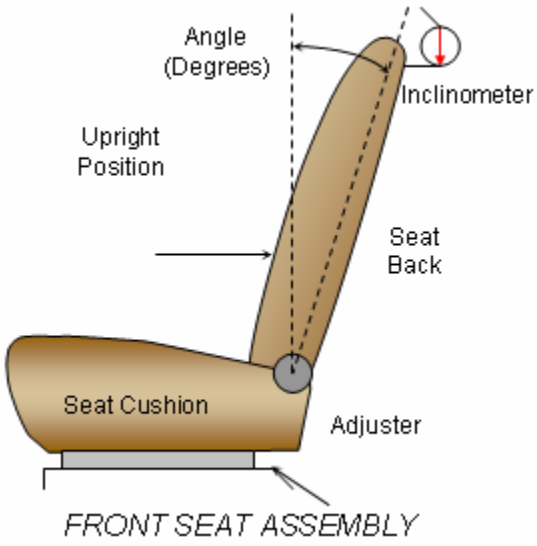
TEST VEHICLE INFORMATION

Test Vehicle: 2012 Fiat 500 Pop 3-Door Hatchback NHTSA No.: MC0326TWG2

Test Program: TWG 3.3.5.1 Test Date: 01/03/12

NOMINAL DESIGN RIDING POSITION

The passenger seat back is positioned to 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	12.2

SEAT FORE/AFT POSITIONS

The first or forward most position is counted as number one (1). The fore/aft position is set aft of the middle position for the passenger seat.

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Passenger Seat	23 detents	2

DATA SHEET NO. 4

DUMMY POSITIONING INFORMATION

Test Vehicle: 2012 Fiat 500 Pop 3-Door Hatchback NHTSA No.: MC0326TWG2

Test Program: TWG 3.3.5.1 Test Date: 01/03/12

TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	SID IIs 5th percentile female	
		Length (mm)	Angle (°)
SA	Seat Back Angle		12.2
AMW	Side Airbag Module Width (Torso / Curtain)	25 / 35	
ABW	Side Airbag Width (Torso / Curtain)	645 / 480	
AML	Side Airbag Module Length (Torso / Curtain)	35	
ABL	Side Airbag Length (Torso / Curtain)	370 / 1320	
AN	Top of Airbag Module to Head/Neck Junction	242	
HD	Head CG to Door Panel/ Window	167	
HSC	Head to Seat Back Centerline	245	
HB	Head to B-Pillar (first contact)	384	
HZ	Head to Roof (Z)	220	
HHD	Head to Header	358	
ND	Nose to Dash	551	
NS	Nose to Seat Back	200	
NR	Nose to Header	447	
CD	Chest to Dash	516	
CS	Chest to Seat Back	183	
RACL	Right Arm to Seat Back Centerline	189	
LACL	Left Arm to Seat Back Centerline	115	
RA	Right Arm to Door Panel	85	
LA	Left Arm to Door Panel	95	
KK	Knee to Knee	6	
TT	Toe to Toe	90	
KSCR	Right Knee to Seat Cushion Centerline	88	
KSCL	Left Knee to Seat Cushion Centerline	206	
	Head Level (X Direction)		5.9
	Head Level (Y Direction)		4.2

DATA SHEET NO. 5

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2012 Fiat 500 Pop 3-Door Hatchback NHTSA No.: MC0326TWG2

Test Program: TWG 3.3.5.1 Test Date: 01/03/12

HEAD PEAK ACCELERATIONS

Location	Axis	Units	Pass. SID IIs			
			Max	Time	Min	Time
Head CG	X	G's	27.2	15.0	-7.4	213.1
Head CG	Y	G's	17.5	22.6	-13.1	212.8
Head CG	Z	G's	31.6	10.3	-14.2	15.9
Head CG Resultant	N/A	G's	36.0	10.3		

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Pass. SID IIs			
			Max	Time	Min	Time
Neck Force	X	Newtons	253.3	17.8	-148.6	32.7
Neck Force	Y	Newtons	229.7	219.3	-97.3	299.9
Neck Force	Z	Newtons	329.1	108.2	-832.7	15.1
Neck Force Resultant	N/A	Newtons	879.4	15.1		
Neck Moment	X	Nm	17.8	21.8	-12.6	220.7
Neck Moment	Y	Nm	34.0	16.0	-33.8	33.7
Neck Moment	Z	Nm	11.2	22.8	-8.7	63.9
Neck Moment Resultant	N/A	Nm	37.7	33.2		

LOWER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Pass. SID IIs			
			Max	Time	Min	Time
Neck Force	X	Newtons	378.9	9.8	-285.8	36.8
Neck Force	Y	Newtons	245.3	9.7	-85.2	19.4
Neck Force	Z	Newtons	341.3	108.2	-708.8	16.0
Neck Force Resultant	N/A	Newtons	784.9	16.0		
Neck Moment	X	Nm	39.1	25.2	-13.3	297.8
Neck Moment	Y	Nm	26.4	220.8	-24.0	20.2
Neck Moment	Z	Nm	25.0	11.4	-12.0	53.1
Neck Moment Resultant	N/A	Nm	44.9	21.3		

HEAD INJURY CRITERIA (HIC 15)

Location	Pass. SID IIs			
	HIC15	T^1	T^2	Avg G
Head CG	31.5	10.1	25.1	21.3

UPPER NECK NIJ VALUES

Location	Pass. SID IIs			
	Ntf	Nte	Ncf	Nce
Upper Neck	0.14	0.40	0.61	0.90

DATA SHEET NO. 6

CAMERA LOCATIONS

Test Vehicle: 2012 Fiat 500 Pop 3-Door Hatchback NHTSA No.: MC0326TWG2

Test Program: TWG 3.3.5.1 Test Date: 01/03/12

No.	Camera View	Location (mm)			Angle (Deg.)	Lens (mm)	Speed (fps)
		X	Y	Z			
1	Real Time	0	-2060	-1065	0.0	N/A	30
2	High Speed Side View	0	-2035	-1030	0.1	24	1000
3	High Speed 3/4 View	-1320	-1265	-1390	5.7	50	1000
4	High Speed Front View	-1855	-75	-1380	6.3	50	1000

* All measurements are taken relative to CG of dummy's head.

APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

FIGURE 1. Right Front ¾ View, As Received

FIGURE 2. Vehicle Certification Label

FIGURE 3. Post-Test Front View of NCAP Side Impact Test

FIGURE 4. Post-Test Left Front ¾ View of NCAP Side Impact Test

FIGURE 5. Post-Test Right Front ¾ View of NCAP Side Impact Test

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

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

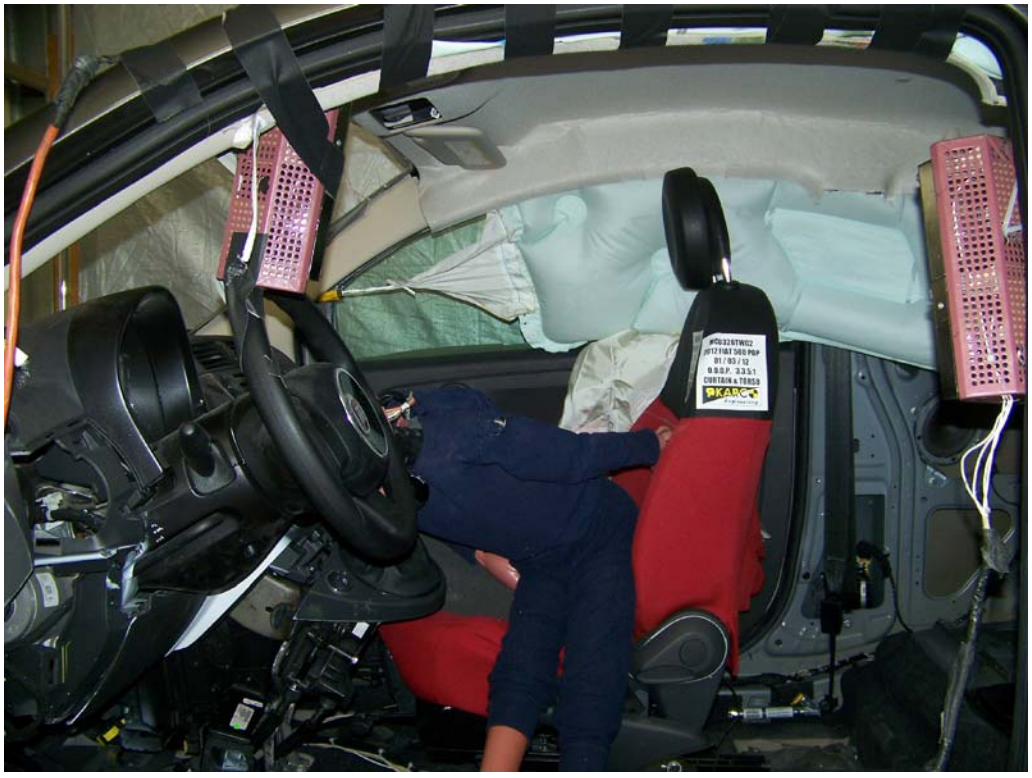


FIGURE 8. Post-Test Dummy Position, Left Side View

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

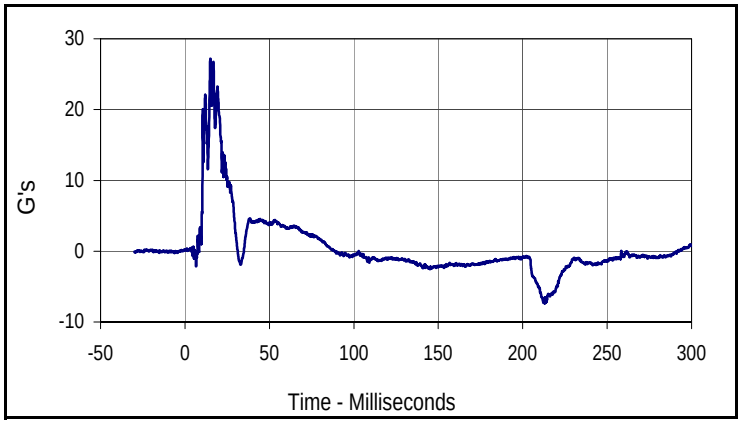
FIGURE 14. Post-Test Airbags, Left Front ¾ View

APPENDIX B

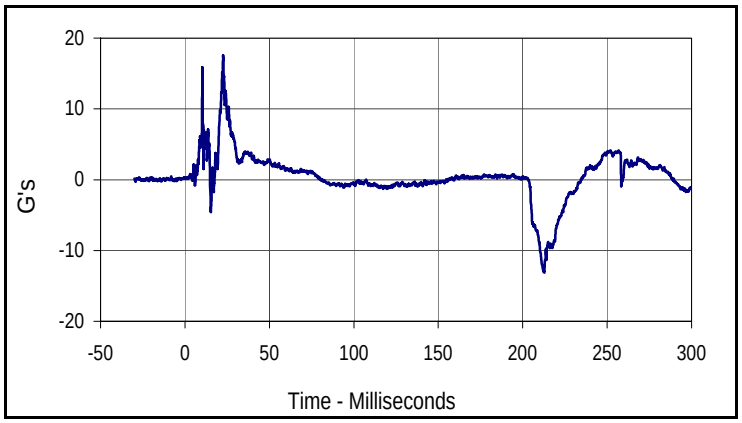
DATA PLOTS

TABLE OF DATAPLOTS

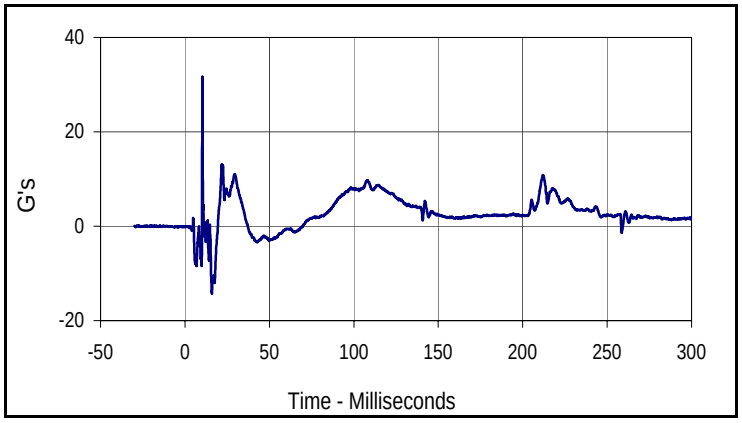
Test Vehicle:	2012 Fiat 500 3-Door Hatchback	Test Date:	1/3/12
Test Program:	TWG 3.3.5.1	NHTSA No.:	MC0326TWG2



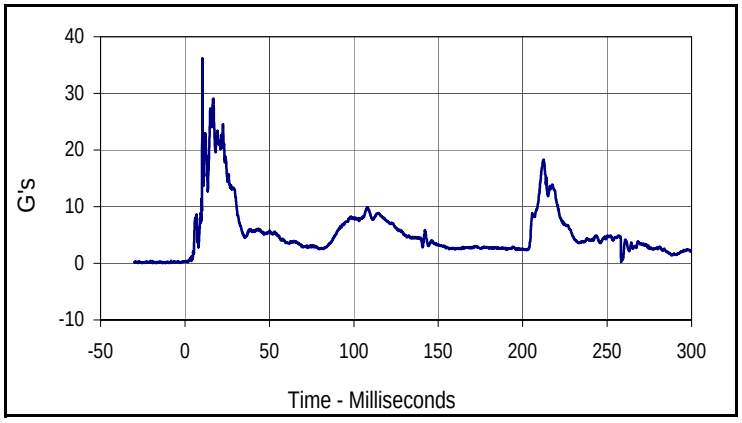
Curve Description			
6 Yr. Old Head X			
CURNO	Type	SAE Class	Units
001	FIL	1000	G's
Max	Time	Min	Time
27.2	15.0	-7.4	213.1



Curve Description			
6 Yr. Old Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
17.5	22.6	-13.1	212.8

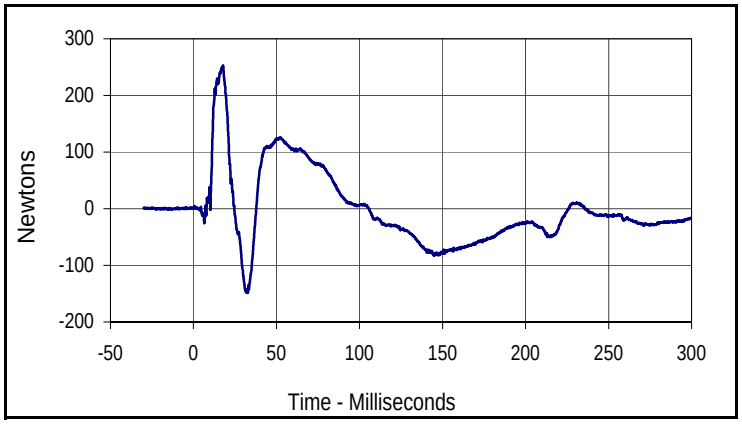


Curve Description			
6 Yr. Old Head Z			
CURNO	Type	SAE Class	Units
003	FIL	1000	G's
Max	Time	Min	Time
31.6	10.3	-14.2	15.9

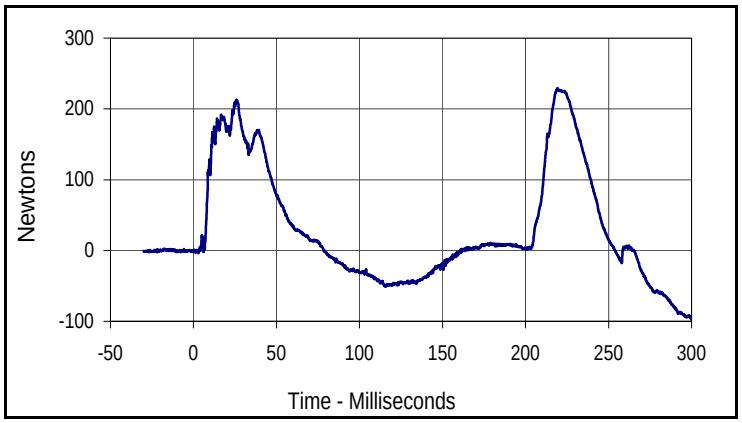


Curve Description			
6 Yr. Old Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
36.0	10.3	0.2	1.5

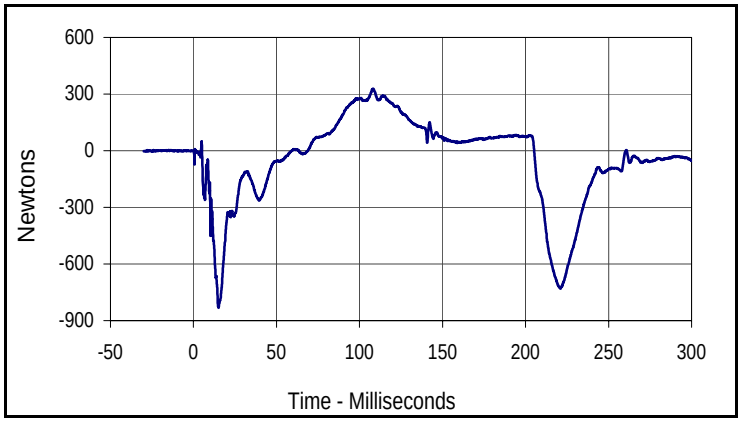
Test Vehicle:	2012 Fiat 500 3-Door Hatchback	Test Date:	1/3/12
Test Program:	TWG 3.3.5.1	NHTSA No.:	MC0326TWG2



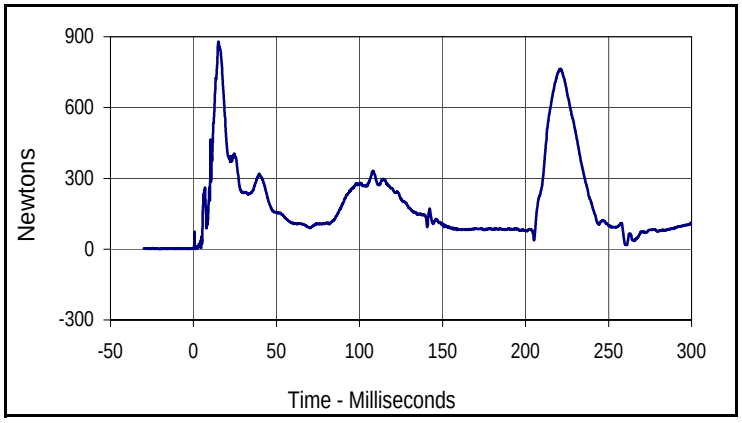
Curve Description			
6 Yr. Old Upper Neck Force X			
CURNO	Type	SAE Class	Units
004	FIL	1000	Newtons
Max	Time	Min	Time
253.3	17.8	-148.6	32.7



Curve Description			
6 Yr. Old Upper Neck Force Y			
CURNO	Type	SAE Class	Units
005	FIL	1000	Newtons
Max	Time	Min	Time
229.7	219.3	-97.3	299.9

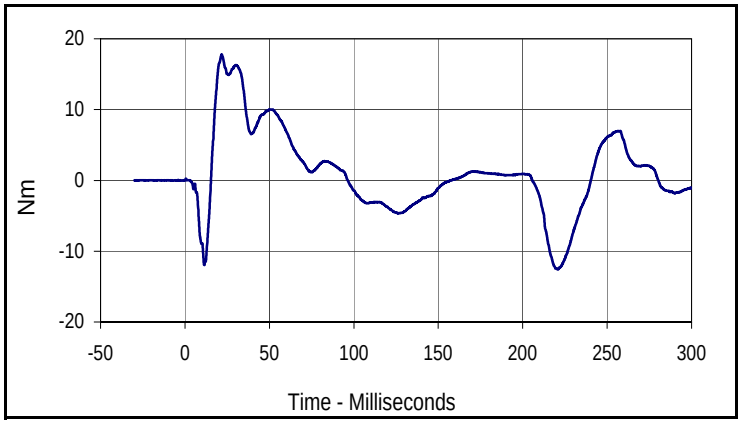


Curve Description			
6 Yr. Old Upper Neck Force Z			
CURNO	Type	SAE Class	Units
006	FIL	1000	Newtons
Max	Time	Min	Time
329.1	108.2	-832.7	15.1

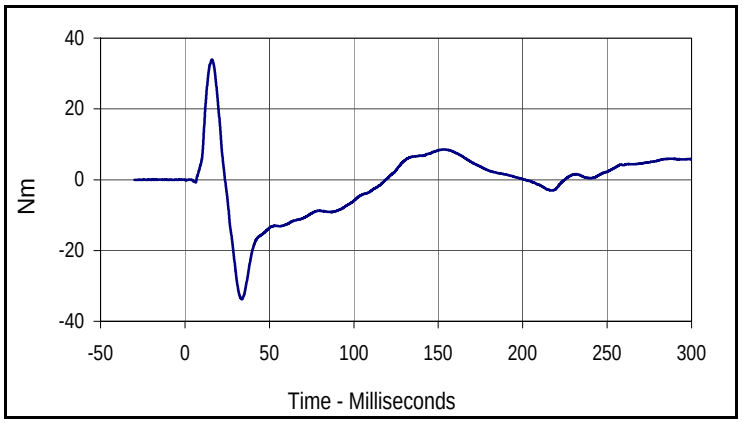


Curve Description			
6 Yr. Old Upper Neck Force Resultant			
CURNO	Type	SAE Class	Units
004	RES	1000	Newtons
Max	Time	Min	Time
879.4	15.1	1.5	1.0

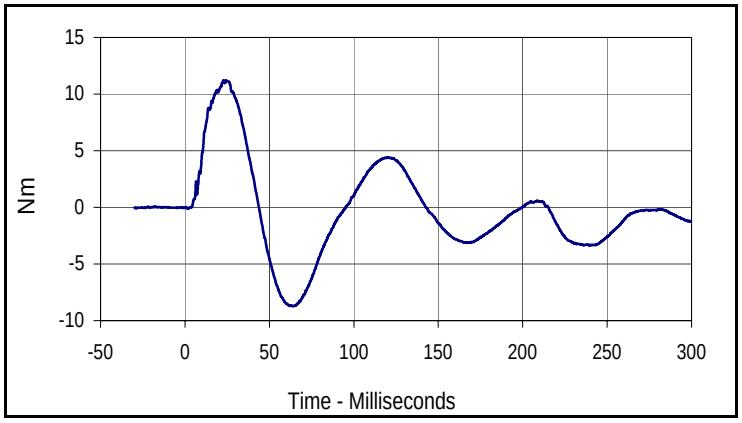
Test Vehicle:	2012 Fiat 500 3-Door Hatchback	Test Date:	1/3/12
Test Program:	TWG 3.3.5.1	NHTSA No.:	MC0326TWG2



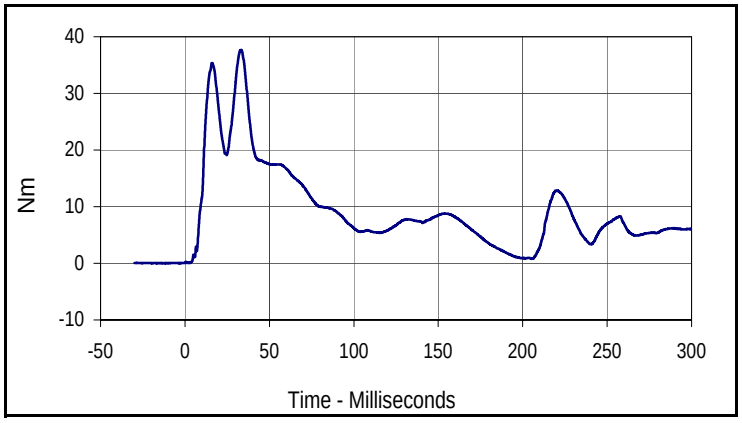
Curve Description			
6 Yr. Old Upper Neck Moment X			
CURNO	Type	SAE Class	Units
007	FIL	600	Nm
Max	Time	Min	Time
17.8	21.8	-12.6	220.7



Curve Description			
6 Yr. Old Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
008	FIL	600	Nm
Max	Time	Min	Time
34.0	16.0	-33.8	33.7

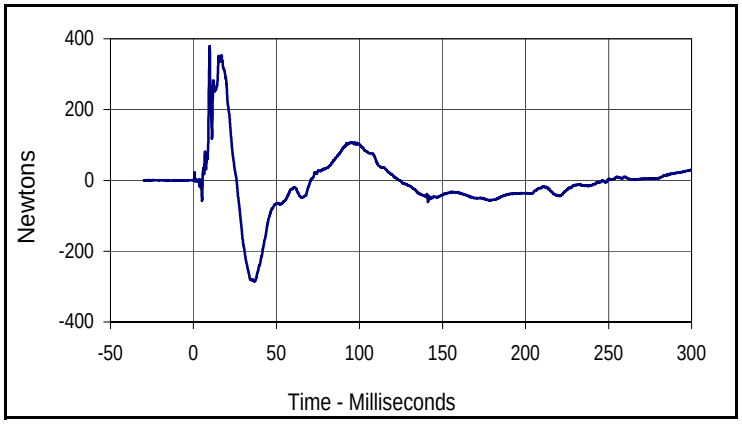


Curve Description			
6 Yr. Old Upper Neck Moment Z			
CURNO	Type	SAE Class	Units
009	FIL	600	Nm
Max	Time	Min	Time
11.2	22.8	-8.7	63.9

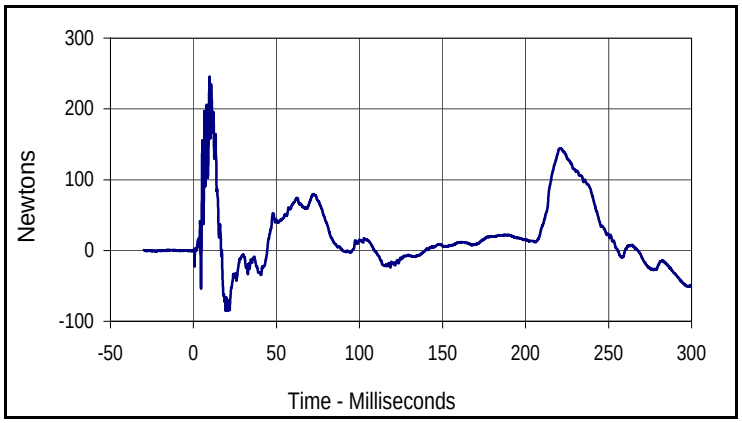


Curve Description			
6 Yr. Old Upper Neck Moment Resultant			
CURNO	Type	SAE Class	Units
007	RES	600	Nm
Max	Time	Min	Time
37.7	33.2	0.0	3.1

Test Vehicle:	2012 Fiat 500 3-Door Hatchback	Test Date:	1/3/12
Test Program:	TWG 3.3.5.1	NHTSA No.:	MC0326TWG2



Curve Description			
6 Yr. Old Lower Neck Force X			
CURNO	Type	SAE Class	Units
010	FIL	1000	Newtons
Max	Time	Min	Time
378.9	9.8	-285.8	36.8



Curve Description			
6 Yr. Old Lower Neck Force Y			
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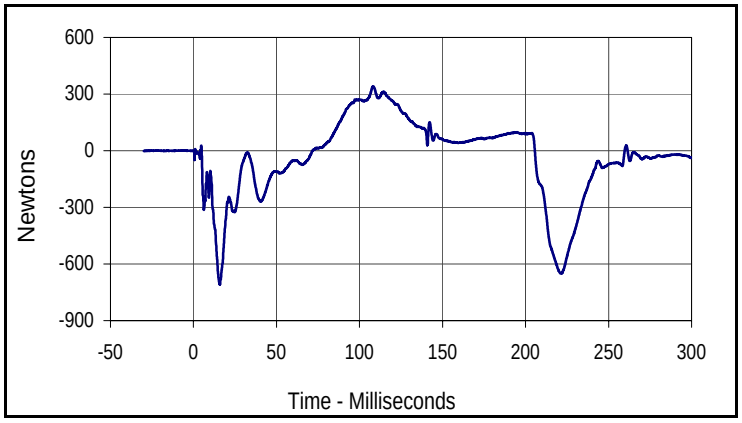
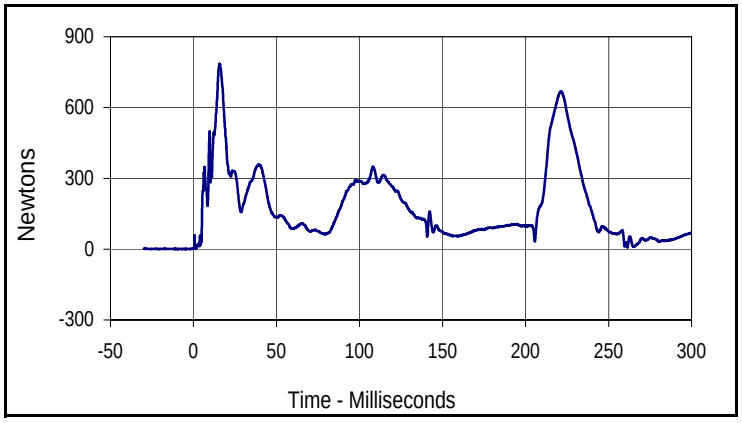
011	FIL	1000	Newtons
Max	Time	Min	Time
245.3	9.7	-85.2	19.4

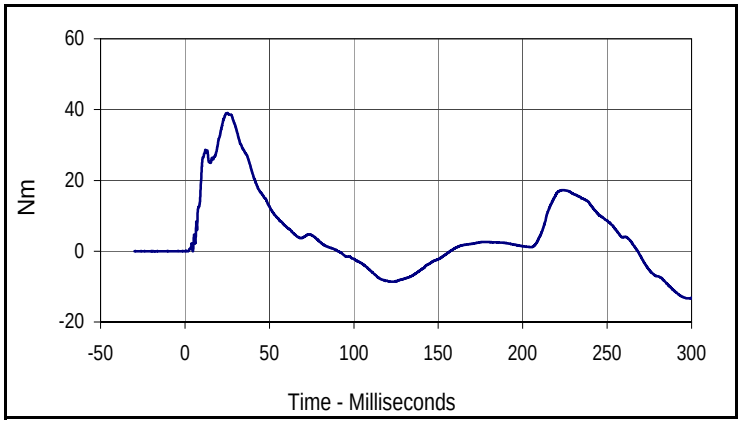


Curve Description			
6 Yr. Old Lower Neck Force Z			
CURNO	Type	SAE Class	Units
012	FIL	1000	Newtons
Max	Time	Min	Time
341.3	108.2	-708.8	16.0

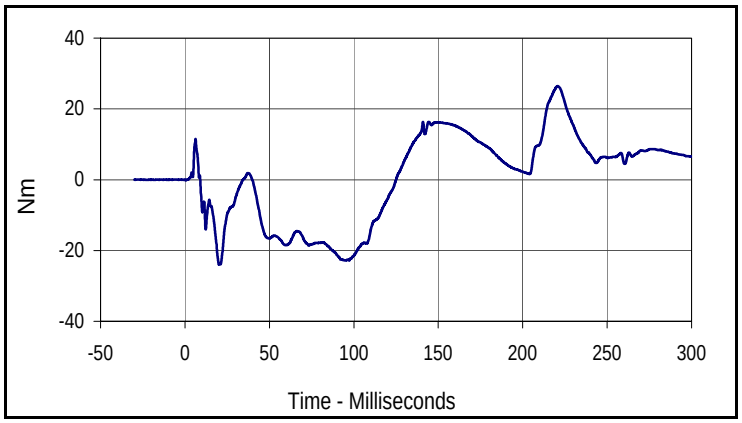


Curve Description			
6 Yr. Old Lower Neck Force Resultant			
CURNO	Type	SAE Class	Units
010	RES	1000	Newtons
Max	Time	Min	Time
784.9	16.0	0.8	1.3

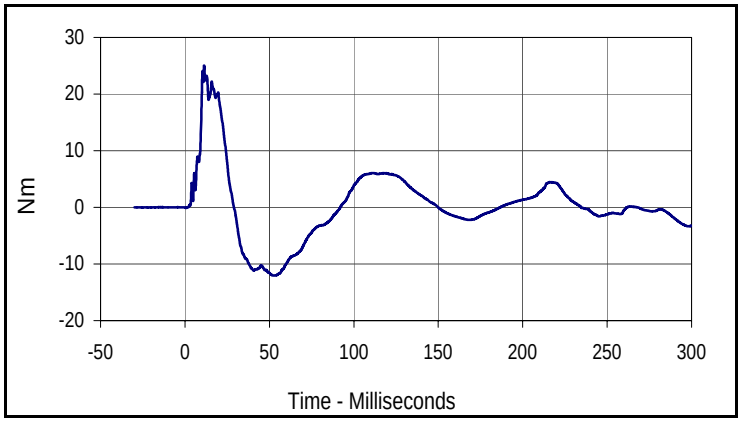
Test Vehicle:	2012 Fiat 500 3-Door Hatchback	Test Date:	1/3/12
Test Program:	TWG 3.3.5.1	NHTSA No.:	MC0326TWG2



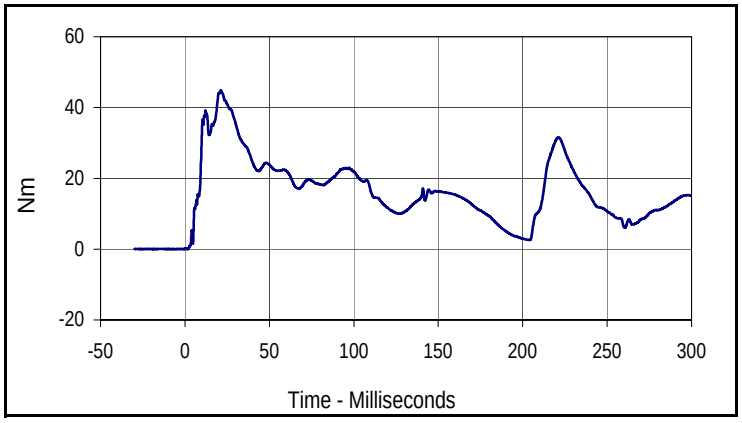
Curve Description			
6 Yr. Old Lower Neck Moment X			
CURNO	Type	SAE Class	Units
013	FIL	600	Nm
Max	Time	Min	Time
39.1	25.2	-13.3	297.8



Curve Description			
6 Yr. Old Lower Neck Moment Y			
CURNO	Type	SAE Class	Units
014	FIL	600	Nm
Max	Time	Min	Time
26.4	220.8	-24.0	20.2



Curve Description			
6 Yr. Old Lower Neck Moment Z			
CURNO	Type	SAE Class	Units
015	FIL	600	Nm
Max	Time	Min	Time
25.0	11.4	-12.0	53.1



Curve Description			
6 Yr. Old Lower Neck Moment Resultant			
CURNO	Type	SAE Class	Units
013	RES	600	Nm
Max	Time	Min	Time
44.9	21.3	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
1/3/12
2012 Fiat 500 3-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 SID IIS CONFIGURATION AND PERFORMANCE VERIFICATION DATA

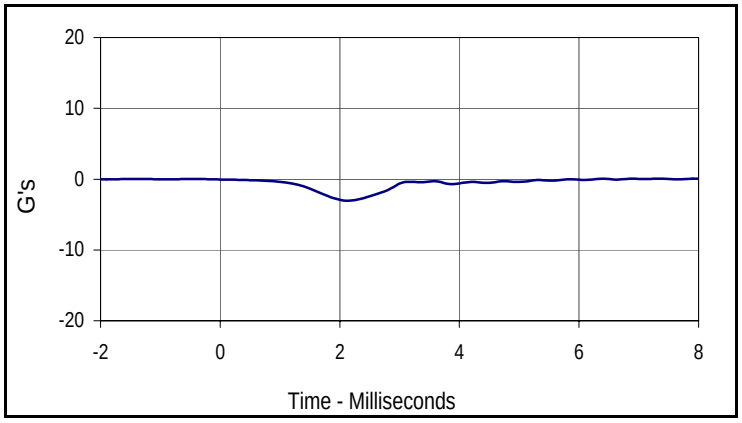
APPENDIX C

PRE-TEST / HIII 6 YEAR OLD CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program:	Hybrid III 6 Yr Old Head Drop Test	Test Date:	12/28/11
ATD Serial No.:	186	Test I.D.:	186HD017

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	245.0 to 300.0	272.9	Pass
Peak Lateral Acceleration	G's	≤15.0	3.0	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass

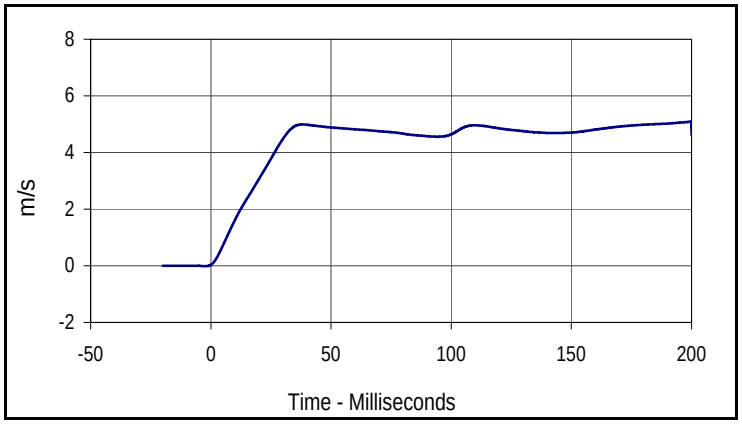
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
272.9	2.2	0.0	-2.0



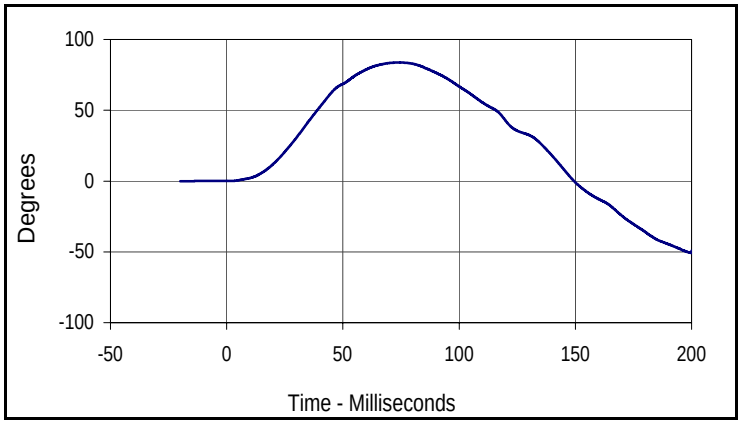
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.0	-0.3	-3.0	2.1

Test Program:	Hybrid III 6 Yr Old Neck Flexion Test	Test Date:	12/28/11
ATD Serial No.:	186	Test I.D.:	186NF017

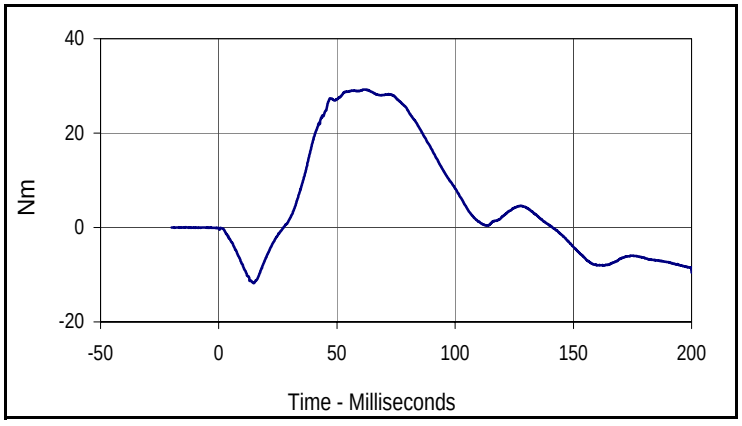
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	31	Pass
Pendulum Velocity		m/s	4.83 to 5.07	4.85	Pass
Pendulum Deceleration	10 Msec.	m/s	1.2 to 1.6	1.6	Pass
	20 Msec.	m/s	2.4 to 3.4	3.1	Pass
	30 Msec.	m/s	3.8 to 5.0	4.5	Pass
"D" Plane Rotation	Max	Degrees	74.0 to 92.0	83.7	Pass
Peak Moment in Rotation	Max	Nm	27.0 to 33.0	29.2	Pass
Positive Moment Decay, Time To 5 Nm		Msec.	103.0 to 123.0	103.9	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
5.1	199.9	0.0	-2.3



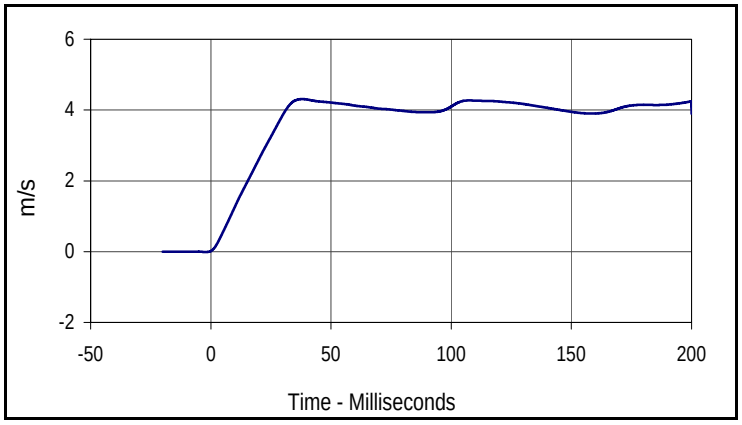
Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
83.7	74.2	-50.7	199.9



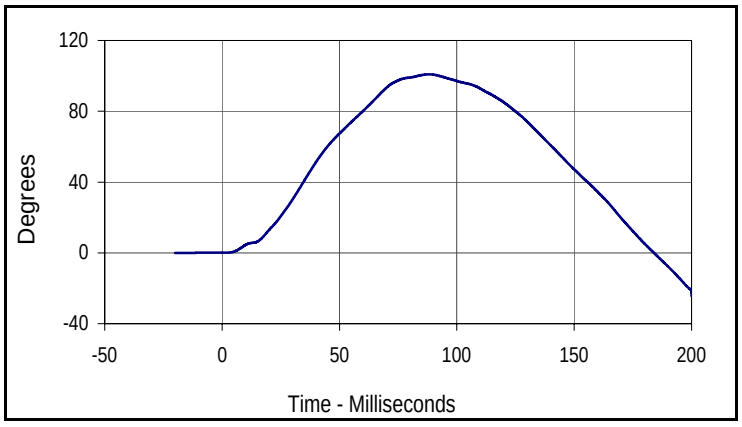
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
29.2	61.9	-11.8	14.8

Test Program:	Hybrid III 6 Yr Old Neck Extension Test	Test Date:	12/28/11
ATD Serial No.:	186	Test I.D.:	186NE017

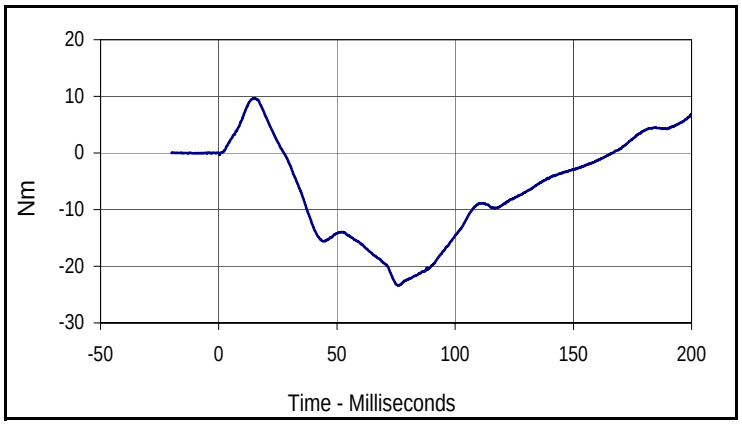
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	4.18 to 4.42	4.20	Pass
Pendulum Deceleration	10 Msec.	m/s	1.0 to 1.4	1.3	Pass
	20 Msec.	m/s	2.2 to 3.0	2.6	Pass
	30 Msec.	m/s	3.2 to 4.2	3.9	Pass
"D" Plane Rotation	Max	Degrees	85.0 to 103.0	100.9	Pass
Peak Moment in Rotation	Max	Nm	-24.0 to -19.0	-23.4	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
4.3	38.0	0.0	-2.0



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
100.9	88.2	-24.4	200.0



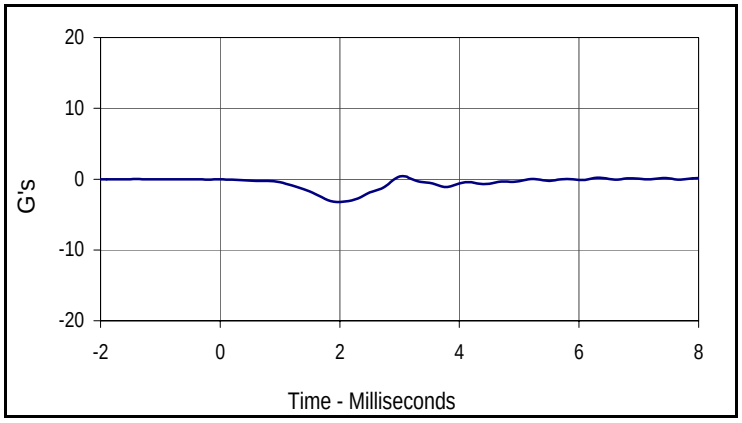
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
9.7	14.7	-23.4	75.9

APPENDIX C
POST-TEST / HIII 6 YEAR OLD CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program:	Hybrid III 6 Yr Old Head Drop Test	Test Date:	1/6/12
ATD Serial No.:	186	Test I.D.:	186HD018

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	245.0 to 300.0	288.1	Pass
Peak Lateral Acceleration	G's	≤15.0	3.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
		Overall Test Results		Pass

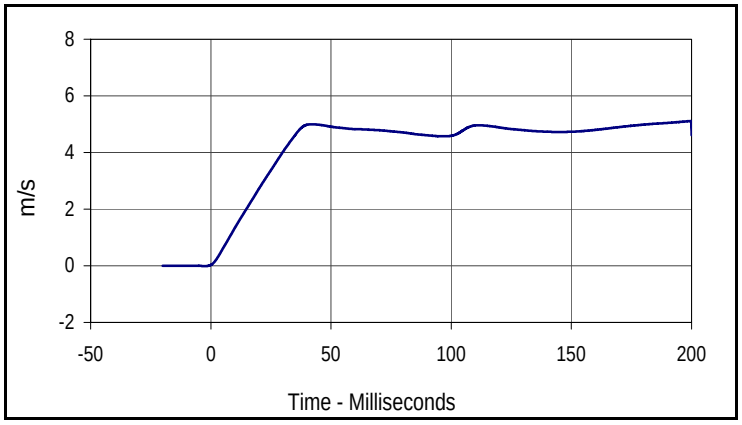
Curve Description			
Head Resultant			
CURNO	Type	SAE Class	Units
001	RES	1000	G's
Max	Time	Min	Time
288.1	2.1	0.2	-1.3



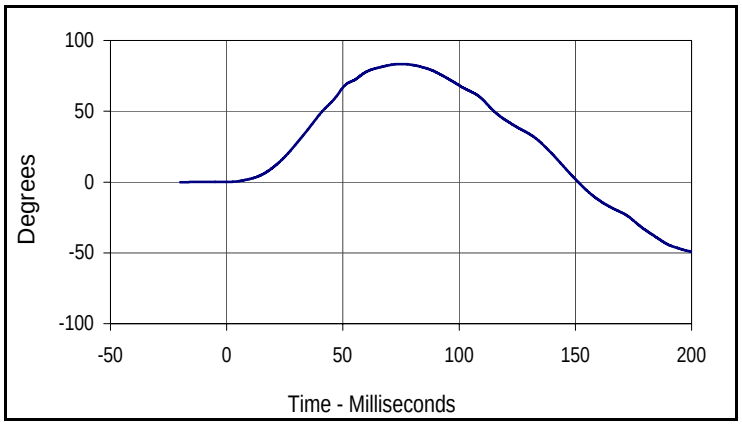
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.4	3.0	-3.2	2.0

Test Program:	Hybrid III 6 Yr Old Neck Flexion Test	Test Date:	1/6/12
ATD Serial No.:	186	Test I.D.:	186NF018

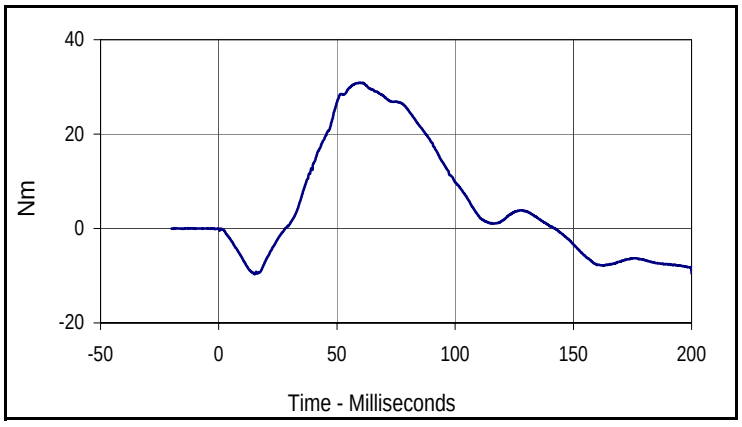
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	4.83 to 5.07	4.88	Pass
Pendulum Deceleration	10 Msec.	m/s	1.2 to 1.6	1.3	Pass
	20 Msec.	m/s	2.4 to 3.4	2.7	Pass
	30 Msec.	m/s	3.8 to 5.0	4.0	Pass
"D" Plane Rotation	Max	Degrees	74.0 to 92.0	83.4	Pass
Peak Moment in Rotation	Max	Nm	27.0 to 33.0	30.9	Pass
Positive Moment Decay, Time To 5 Nm		Msec.	103.0 to 123.0	106.8	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
5.1	199.9	0.0	-2.3



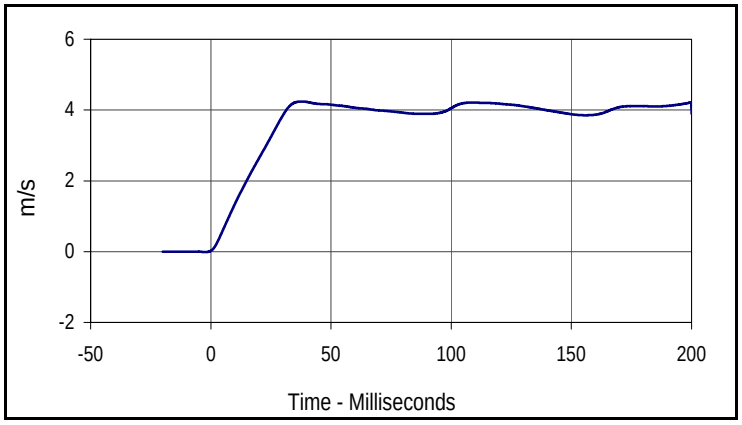
Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
83.4	75.1	-49.1	200.0



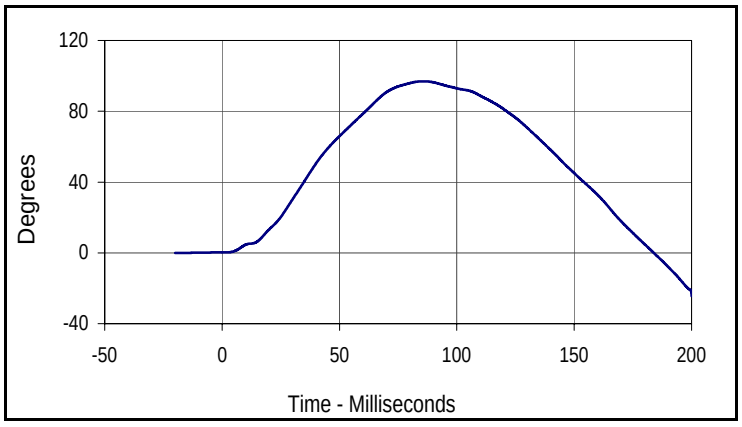
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
30.9	59.7	-9.7	15.2

Test Program:	Hybrid III 6 Yr Old Neck Extension Test	Test Date:	1/6/12
ATD Serial No.:	186	Test I.D.:	186NE018

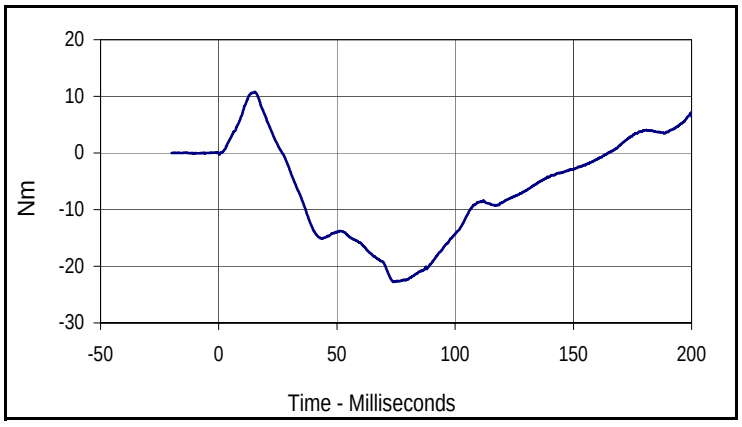
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	4.18 to 4.42	4.24	Pass
Pendulum Deceleration	10 Msec.	m/s	1.0 to 1.4	1.3	Pass
	20 Msec.	m/s	2.2 to 3.0	2.6	Pass
	30 Msec.	m/s	3.2 to 4.2	3.9	Pass
"D" Plane Rotation	Max	Degrees	85.0 to 103.0	96.9	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	127.1	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
4.2	37.8	0.0	-2.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
96.9	85.8	-24.4	200.0



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
10.8	15.3	-22.8	73.8