

REPORT NUMBER TR-P32011-07-NC

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

**VOLKSWAGEN DE MEXICO S.A. DE C.V.
2012 VOLKSWAGEN BEETLE
2-DOOR COUPE**

NHTSA NUMBER: MC5800TWG2

**PREPARED BY:
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FEBRUARY 25, 2012

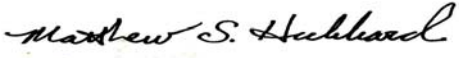
FINAL REPORT

PREPARED FOR:

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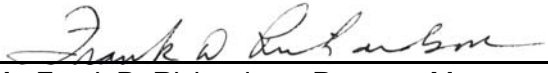
This final test report was prepared for the U.S. Department of Transportation, Alpha Technology Associate, Inc., in response to Contract Number DTNH22-06-D-00027.

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Date of Acceptance _____

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SECTION 1

PURPOSE AND SUMMARY OF TEST MC5800TWG2

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 seat mounted head/torso airbag deployment in a 2012 Volkswagen Beetle 2-Door Coupe with an out-of-position 6 year old dummy were evaluated. The test was performed at KARCO Engineering LLC on February 25, 2012. 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 forward according to the dummy placement instructions (3.3.3.5) 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 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 Hybrid III 6 year old 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 head/torso airbag contacted the ATD's head and back.

OUT OF POSITION OCCUPANT DATA SUMMARY

ATD Position	HIC ₁₅
Passenger	2.7

Orientation of the 6 year old dummy was in the forward facing position leaning back against the seat back. The dummy's spine was aligned with the deploying trajectory of the airbag. This orientation complies with section 3.3.3.5 of the Technical Working Group (TWG) recommendation in the Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags.

SECTION 2

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2012 Volkswagen Beetle 2-Door Coupe NHTSA No.: MC5800TWG2
Test Program: TWG 3.3.3.5 Test Date: 02/25/12

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	°F	°C	$=(t_f - 32)/1.8$
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf-ft	N•m	1.355

DATA SHEET NO. 1

TEST SUMMARY

Test Vehicle: 2012 Volkswagen Beetle 2-Door Coupe NHTSA No.: MC5800TWG2

Test Program: TWG 3.3.3.5 Test Date: 02/25/12

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 Volkswagen Beetle 2-Door Coupe NHTSA No.: MC5800TWG2
 Test Program: TWG 3.3.3.5 Test Date: 02/25/12

TEST VEHICLE INFORMATION

Make	Volkswagen
Model	Beetle
Body Style	2-Door Coupe
NHTSA No.	MC5800TWG2
VIN	3VWJP7AT7CM606377
Color	Platinum Gray Metallic
Delivery Date	December 8, 2011
Odometer (km./mi.)	192 / 119
Dealer	Volkswagen Pasadena
Transmission	Automatic
Final Drive	Front
Type/Number Cylinders	Inline-5
Engine Displacement (L)	2.5
Engine Placement	Transverse

TEST VEHICLE OPTIONS

Driver Front Airbag	Yes
Driver Side Airbag	Yes
Driver Side Curtain Airbag	No
Pass. Front Airbag	Yes
Pass. Side Airbag	Yes
Pass. Curtain Airbag	No
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	No

DATA FROM CERTIFICATION LABEL

Manufactured By	Volkswagen de Mexico S.A. de C.V.	GVWR (kg)	1780
Date of Manufacture	August-11	GAWR Front (kg)	1010
		GAWR Rear (kg)	820

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	200	200
Recommend Tire Size	P215/55 R17	P215/55 R17
Tire Size on Vehicle	P215/55 R17	P215/55 R17
Tire Manufacturer	Hankook	Hankook

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number of Occupants	2	2		4
Capacity Wt. (VCW) (kg)				370

* Vehicle had undergone New Car Assessment Program Testing
 on January 12, 2012

DATA SHEET NO. 3

TEST VEHICLE INFORMATION

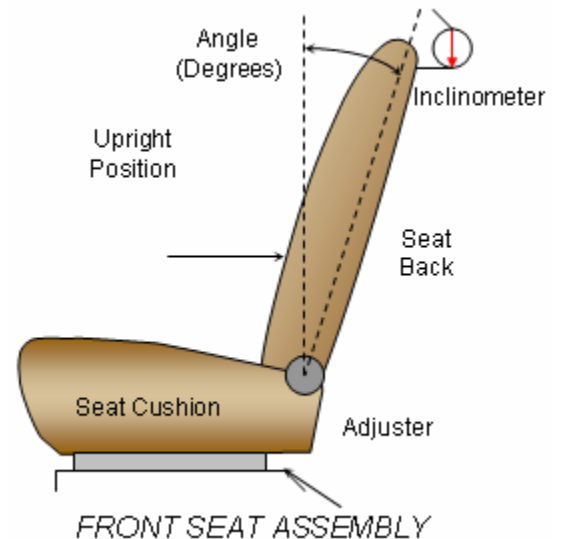
Test Vehicle: 2012 Volkswagen Beetle 2-Door Coupe NHTSA No.: MC5800TWG2
Test Program: TWG 3.3.3.5 Test Date: 02/25/12

NOMINAL DESIGN RIDING POSITION

The passenger seat back is positioned to section 3.3.3.5 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	1.9



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	254mm (37 Detents)	207mm (31 detents)

DATA SHEET NO. 4

DUMMY POSITIONING INFORMATION

Test Vehicle: 2012 Volkswagen Beetle 2-Door Coupe NHTSA No.: MC5800TWG2
 Test Program: TWG 3.3.3.5 Test Date: 02/25/12

TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Hybrid III 6 YO	
		Length (mm)	Angle (°)
SA	Seat Back Angle		1.9
AMW	Side Airbag Module Width	20	
ABW	Side Airbag Width	785	
AML	Side Airbag Module Length	150	
ABL	Side Airbag Length	320	
AN	Top of Airbag Module to Head/Neck Junction	57	
HD	Head CG to Door Panel/ Window	187	
HSC	Head to Seat Back Centerline	180	
HB	Head to B-Pillar (first contact)	295	
HZ	Head to Roof (Z)	215	
HHD	Head to Header	593	
ND	Nose to Dash	728	
NS	Nose to Seat Back	220	
NR	Nose to Header	604	
CD	Chest to Dash	625	
CS	Chest to Seat Back	209	
RACL	Right Arm to Seat Back Centerline	295	
LACL	Left Arm to Seat Back Centerline	56	
RA	Right Arm to Door Panel	60	
LA	Left Arm to Door Panel	298	
KK	Knee to Knee	124	
TT	Toe to Toe	115	
KSCR	Right Knee to Seat Cushion Centerline	63	
KSCL	Left Knee to Seat Cushion Centerline	50	
	Head Level (X Direction)		5.5
	Head Level (Y Direction)		5.9

DATA SHEET NO. 5

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2012 Volkswagen Beetle 2-Door Coupe NHTSA No.: MC5800TWG2
 Test Program: TWG 3.3.3.5 Test Date: 02/25/12

HEAD PEAK ACCELERATIONS

Location	Axis	Units	Pass. 6 YO			
			Max	Time	Min	Time
Head CG	X	G's	8.8	14.7	-1.5	29.5
Head CG	Y	G's	2.1	292.4	-7.8	12.9
Head CG	Z	G's	4.5	27.4	-4.0	6.6
Head CG Resultant	N/A	G's	11.5	14.4		

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Pass. 6 YO			
			Max	Time	Min	Time
Neck Force	X	Newtons	202.6	15.9	-79.3	0.0
Neck Force	Y	Newtons	50.9	299.7	-159.7	14.9
Neck Force	Z	Newtons	150.3	26.6	-212.0	0.0
Neck Force Resultant	N/A	Newtons	257.7	14.9		
Neck Moment	X	Nm	11.6	12.8	-13.9	23.5
Neck Moment	Y	Nm	15.7	14.9	-15.2	31.6
Neck Moment	Z	Nm	1.4	64.0	-3.2	17.2
Neck Moment Resultant	N/A	Nm	18.6	31.6		

LOWER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Pass. 6 YO			
			Max	Time	Min	Time
Neck Force	X	Newtons	234.0	16.1	-76.4	6.2
Neck Force	Y	Newtons	80.9	298.8	-196.0	11.8
Neck Force	Z	Newtons	140.1	9.7	-152.7	41.0
Neck Force Resultant	N/A	Newtons	297.1	13.8		
Neck Moment	X	Nm	10.6	299.9	-31.4	31.2
Neck Moment	Y	Nm	6.3	137.7	-32.1	14.0
Neck Moment	Z	Nm	5.5	41.2	-21.8	12.9
Neck Moment Resultant	N/A	Nm	48.0	13.7		

HEAD INJURY CRITERIA (HIC 15)

Location	Pass. 6 YO			
	HIC15	T ¹	T ²	Avg G
Head CG	2.7	9.2	20.7	8.9

UPPER NECK NIJ VALUES

Location	Pass. 6 YO			
	Ntf	Nte	Ncf	Nce
Upper Neck	0.14	0.44	0.12	0.36

DATA SHEET NO. 6**CAMERA LOCATIONS**Test Vehicle: 2012 Volkswagen Beetle 2-Door Coupe NHTSA No.: MC5800TWG2Test Program: TWG 3.3.3.5 Test Date: 02/25/12

No.	Camera View	Location (mm)			Angle (Deg.)	Lens (mm)	Speed (fps)
		X	Y	Z			
1	Real Time	-24	-3320	-975	0.0	N/A	30
2	High Speed Side View	-68	-3325	-975	-0.6	50	1000
3	High Speed 3/4 View	-1610	-1390	-1385	-9.3	50	1000
4	High Speed Front View	-1905	0	-1310	-7.5	50	1000

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

APPENDIX A

PHOTOGRAPHS

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FIGURE 1. Right Front ¾ View, As Received



FIGURE 2. Vehicle Certification Label

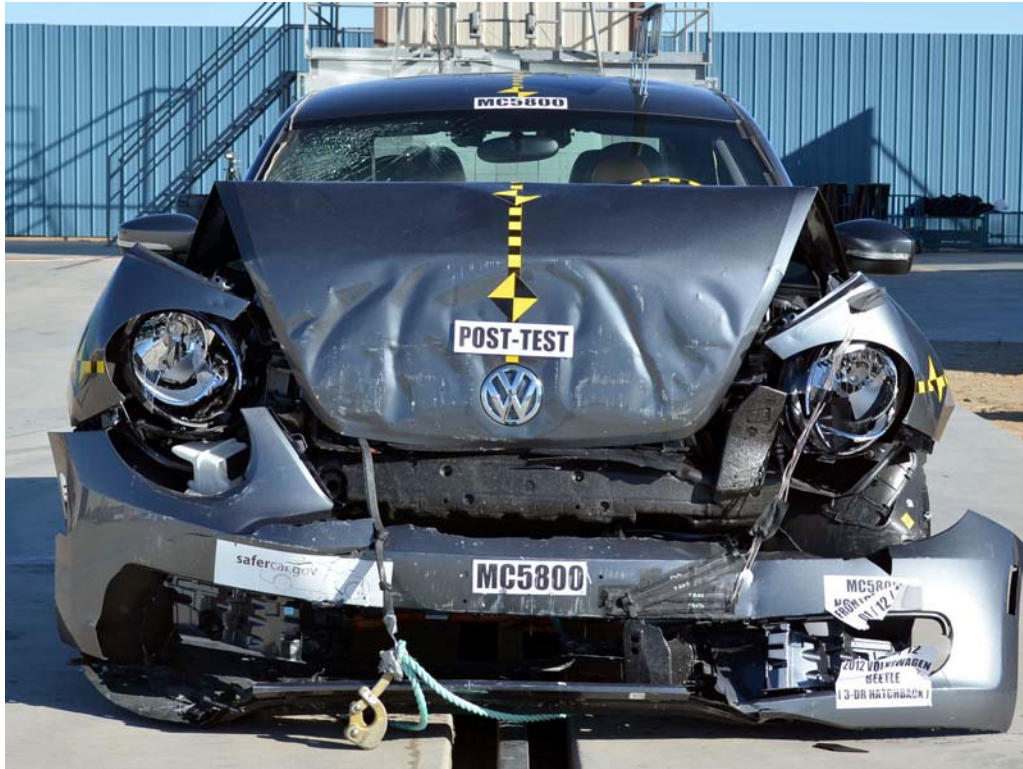


FIGURE 3. Post-Test Front View of NCAP Frontal Impact Test



FIGURE 4. Post-Test Left Front $\frac{3}{4}$ View of NCAP Frontal Impact Test



FIGURE 5. Post-Test Right Front 3/4 View of NCAP Frontal Impact Test

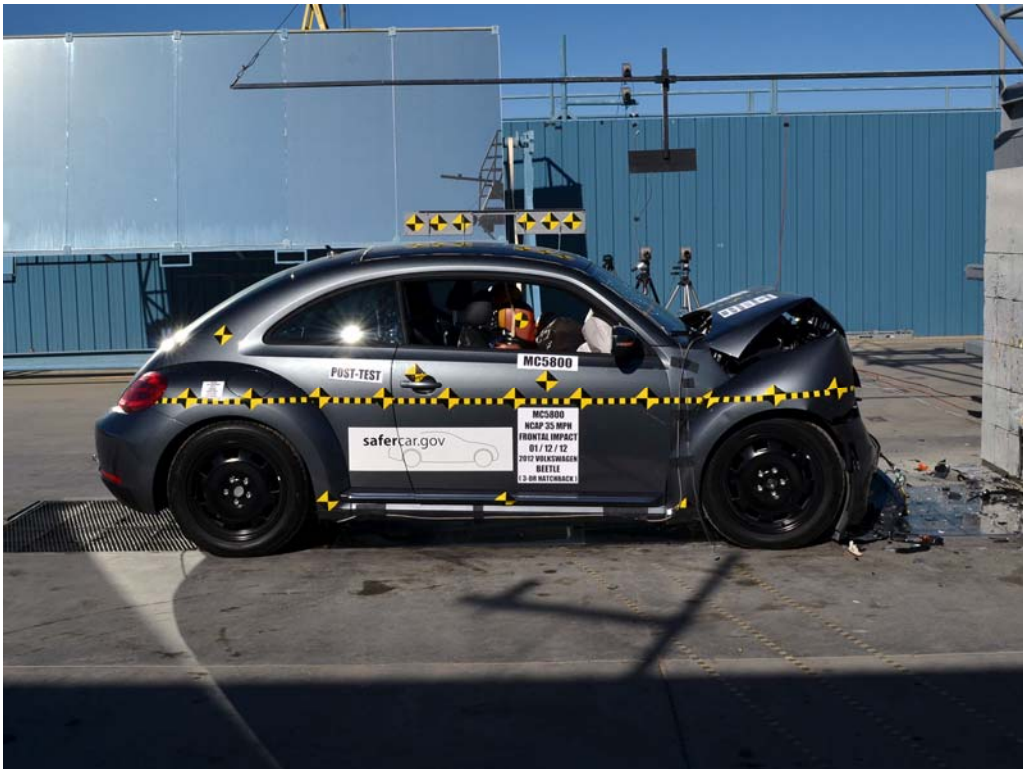


FIGURE 6. Post-Test Right Side View of NCAP Frontal Impact Test



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 $\frac{3}{4}$ View

APPENDIX B

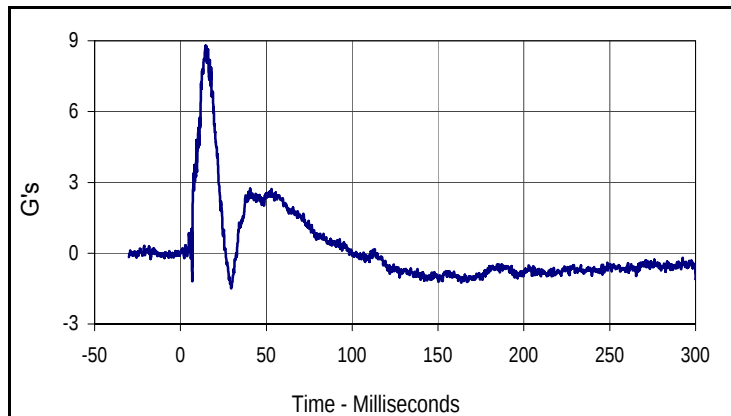
DATA PLOTS

TABLE OF DATAPLOTS

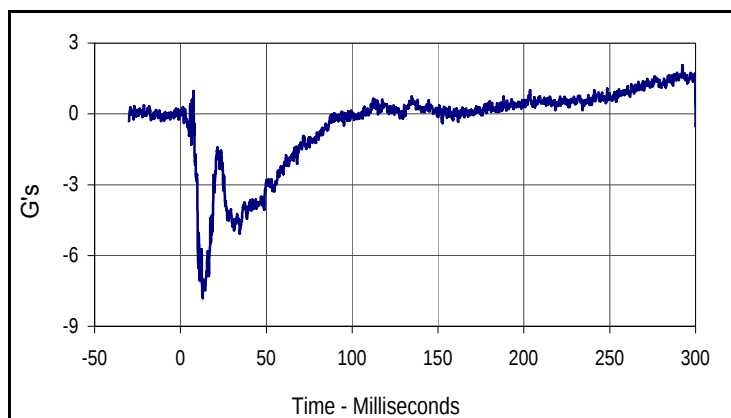
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Test Vehicle: 2012 Volkswagen Beetle 2-Door Coupe
 Test Program: TWG 3.3.3.5

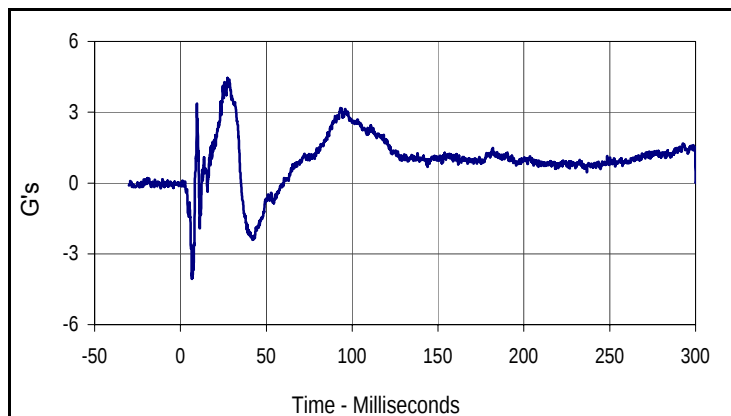
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 NHTSA No.: MC5800TWG2



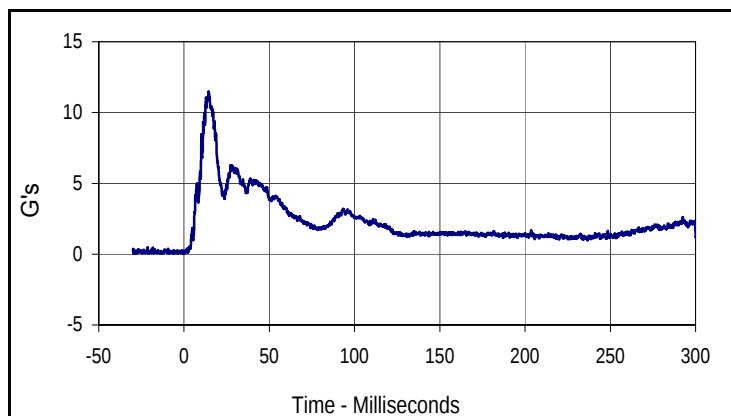
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Max	Time	Min	Time
8.8	14.7	-1.5	29.5



Curve Description			
6 Yr. Old Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
2.1	292.4	-7.8	12.9



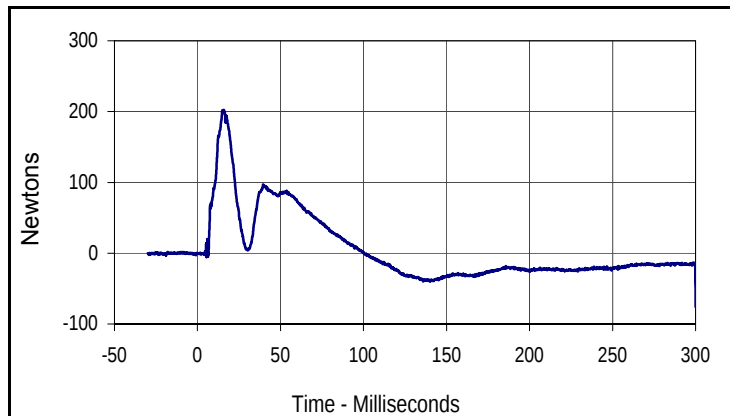
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6 Yr. Old Head Z			
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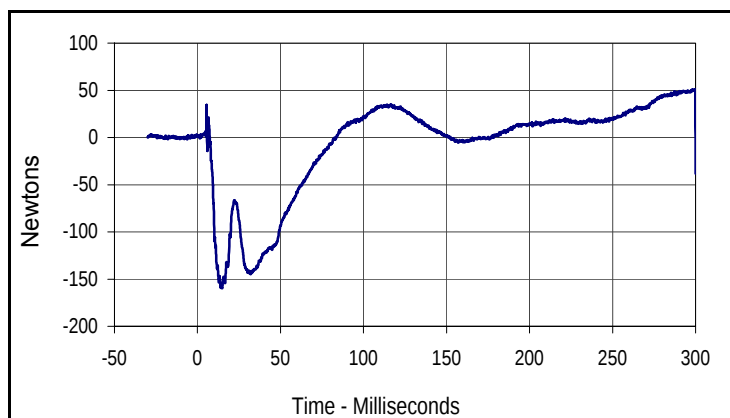
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6 Yr. Old Head Resultant			
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Test Vehicle: 2012 Volkswagen Beetle 2-Door Coupe
 Test Program: TWG 3.3.3.5

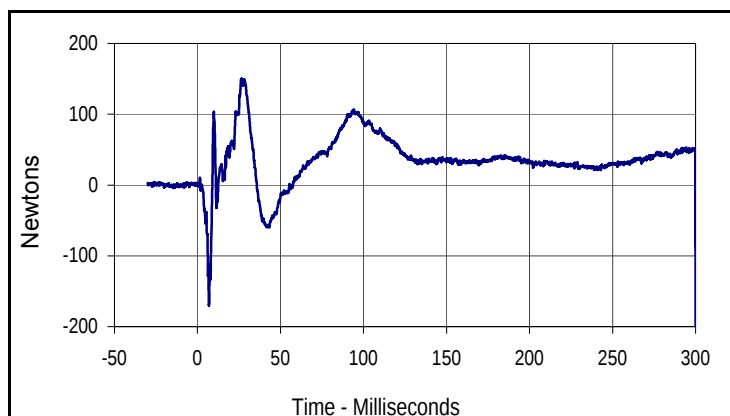
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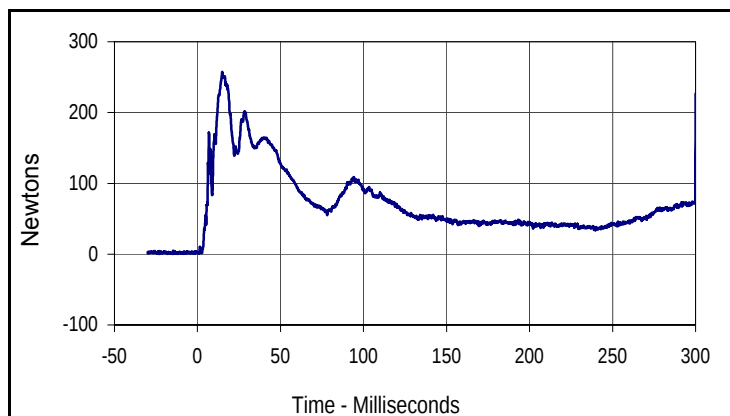
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Max	Time	Min	Time
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Curve Description			
6 Yr. Old Upper Neck Force Y			
CURNO	Type	SAE Class	Units
005	FIL	1000	Newtons
Max	Time	Min	Time
50.9	299.7	-159.7	14.9



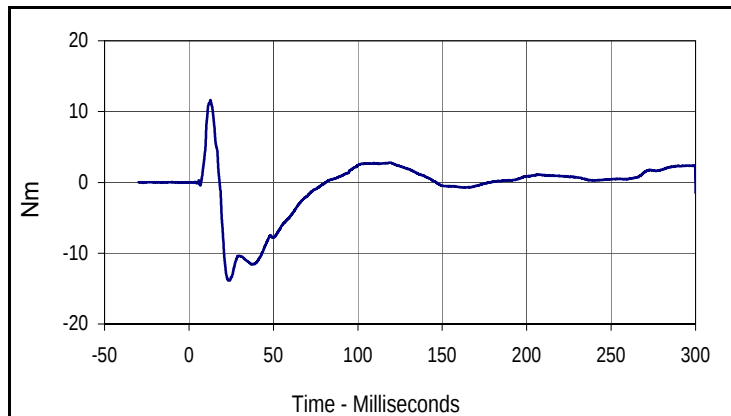
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6 Yr. Old Upper Neck Force Z			
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Max	Time	Min	Time
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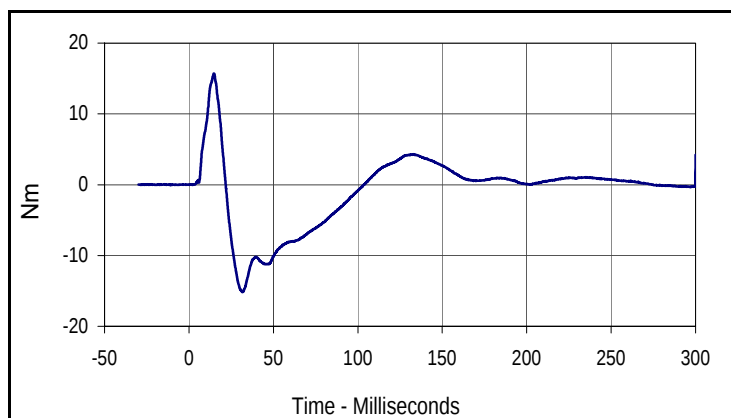
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6 Yr. Old Upper Neck Force Resultant			
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004	RES	1000	Newtons
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Test Vehicle: 2012 Volkswagen Beetle 2-Door Coupe
 Test Program: TWG 3.3.3.5

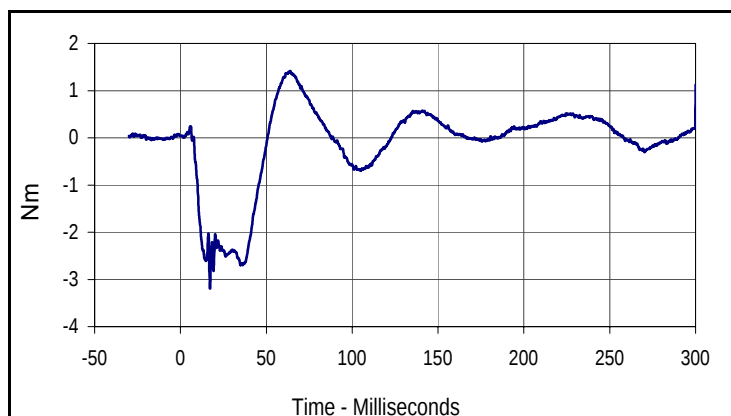
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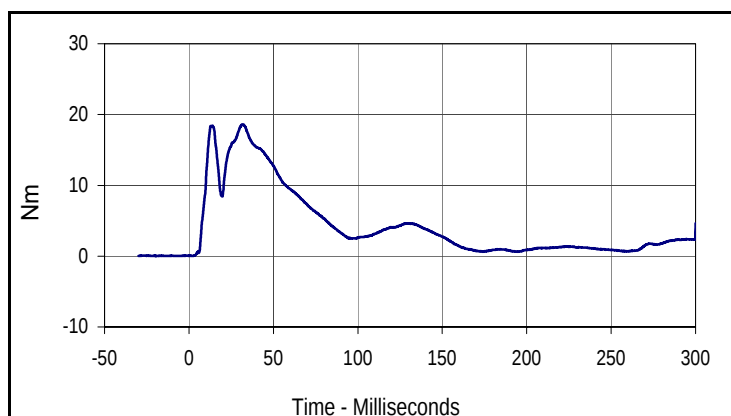
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6 Yr. Old Upper Neck Moment X			
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Max	Time	Min	Time
11.6	12.8	-13.9	23.5



Curve Description			
6 Yr. Old Upper Neck Moment Y			
CURNO	Type	SAE Class	Units
008	FIL	600	Nm
Max	Time	Min	Time
15.7	14.9	-15.2	31.6



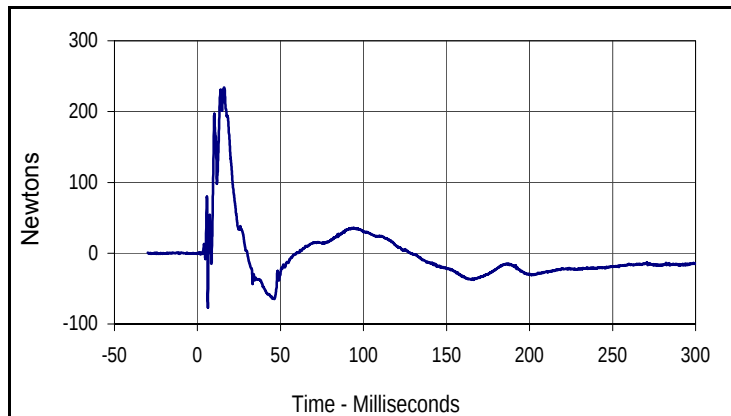
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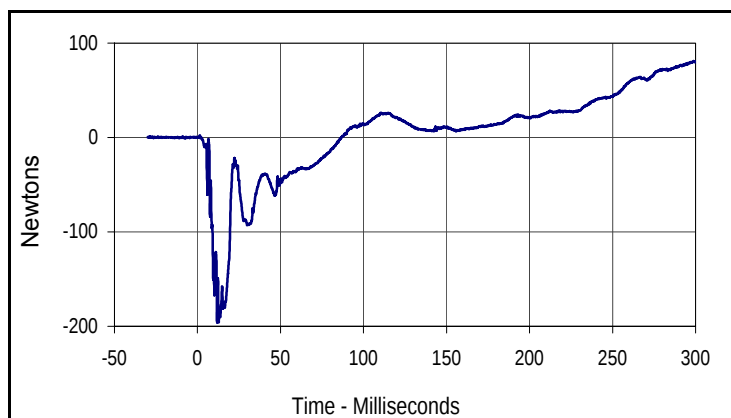
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6 Yr. Old Upper Neck Moment Resultant			
CURNO	Type	SAE Class	Units
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Test Vehicle: 2012 Volkswagen Beetle 2-Door Coupe
 Test Program: TWG 3.3.3.5

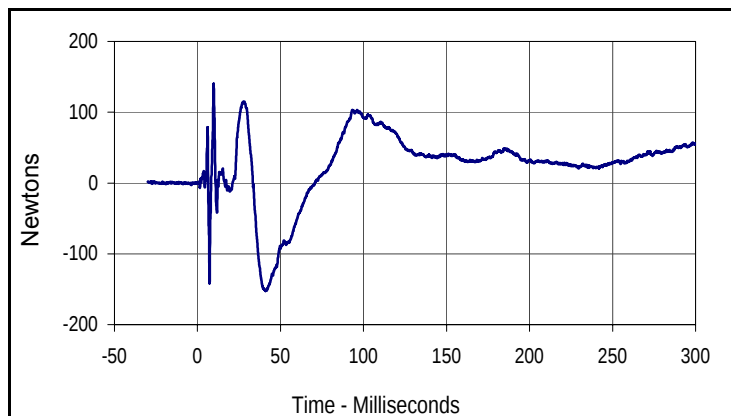
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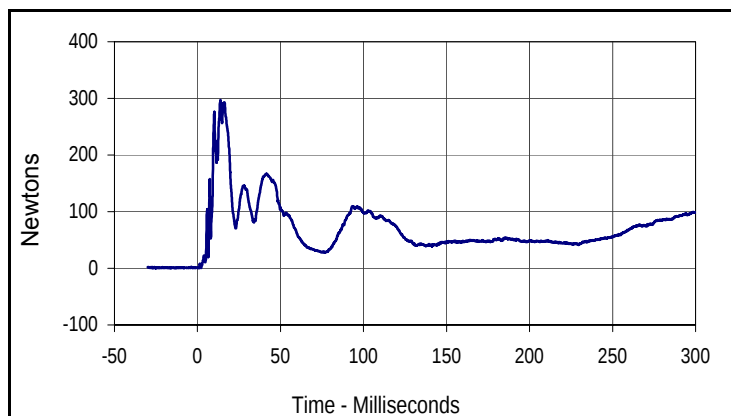
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6 Yr. Old Lower Neck Force X			
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010	FIL	1000	Newtons
Max	Time	Min	Time
234.0	16.1	-76.4	6.2



Curve Description			
6 Yr. Old Lower Neck Force Y			
CURNO	Type	SAE Class	Units
011	FIL	1000	Newtons
Max	Time	Min	Time
80.9	298.8	-196.0	11.8



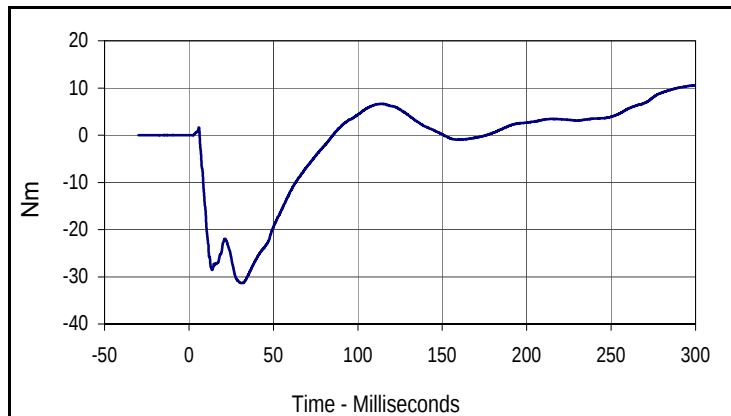
Curve Description			
6 Yr. Old Lower Neck Force Z			
CURNO	Type	SAE Class	Units
012	FIL	1000	Newtons
Max	Time	Min	Time
140.1	9.7	-152.7	41.0



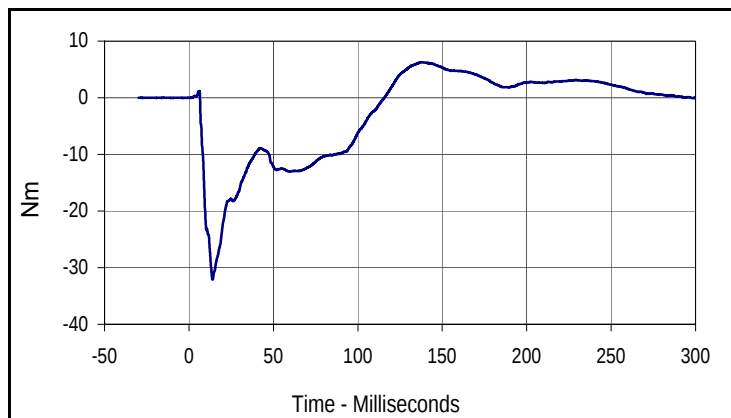
Curve Description			
6 Yr. Old Lower Neck Force Resultant			
CURNO	Type	SAE Class	Units
010	RES	1000	Newtons
Max	Time	Min	Time
297.1	13.8	0.5	0.7

Test Vehicle: 2012 Volkswagen Beetle 2-Door Coupe
 Test Program: TWG 3.3.3.5

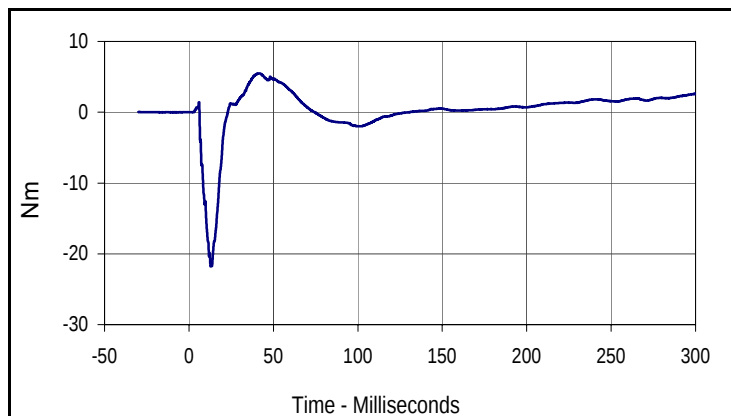
Test Date: 2/25/12
 NHTSA No.: MC5800TWG2



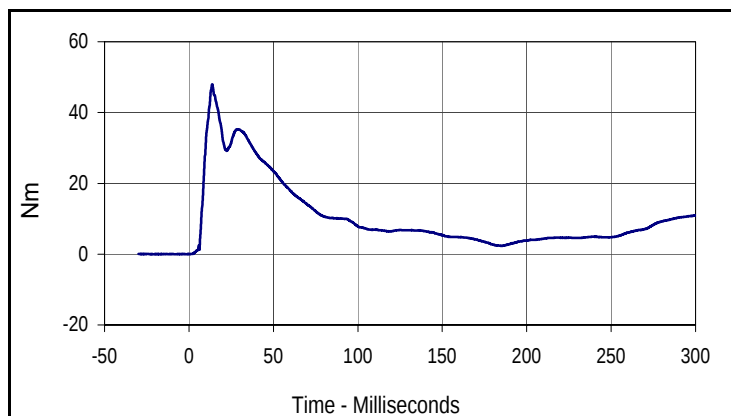
Curve Description			
6 Yr. Old Lower Neck Moment X			
CURNO	Type	SAE Class	Units
013	FIL	600	Nm
Max	Time	Min	Time
10.6	299.9	-31.4	31.2



Curve Description			
6 Yr. Old Lower Neck Moment Y			
CURNO	Type	SAE Class	Units
014	FIL	600	Nm
Max	Time	Min	Time
6.3	137.7	-32.1	14.0



Curve Description			
6 Yr. Old Lower Neck Moment Z			
CURNO	Type	SAE Class	Units
015	FIL	600	Nm
Max	Time	Min	Time
5.5	41.2	-21.8	12.9



Curve Description			
6 Yr. Old Lower Neck Moment Resultant			
CURNO	Type	SAE Class	Units
013	RES	600	Nm
Max	Time	Min	Time
48.0	13.7	0.0	0.5

APPENDIX C

INSTRUMENTATION DATA CHANNEL ASSIGNMENTS

TWG 3.3.3.5
Instrumentation Data Channel Assignments
A.T.D. Serial Number 186
2/25/12
2012 Volkswagen Beetle 2-Door Coupe

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

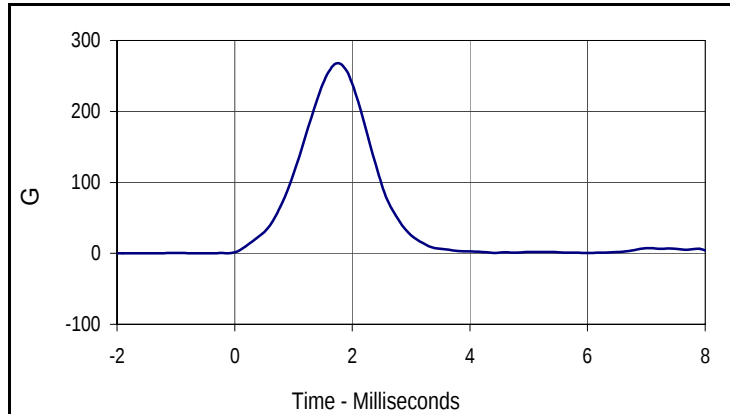
APPENDIX D
PRE-TEST / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program: Hybrid III 6 Yr Old Head Drop Test
 ATD Serial No.: 186

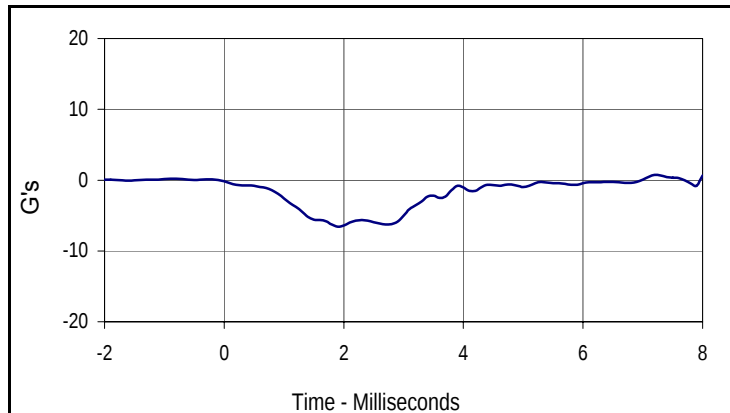
Test Date: 2/16/12
 Test I.D.: 186HD02E



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	267.0	Pass
Peak Lateral Acceleration	G's	≤15.0	6.6	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
267.0	1.8	0.1	-0.5



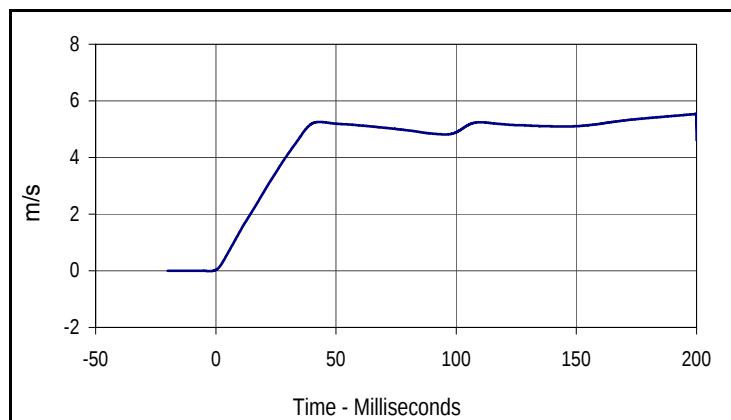
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.2	-0.8	-6.6	1.9

Test Program: Hybrid III 6 Yr Old Neck Flexion Test
 ATD Serial No.: 186

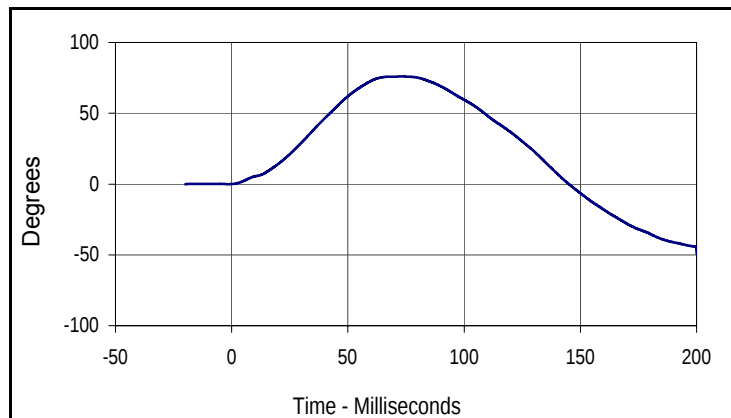
Test Date: 2/16/12
 Test I.D.: 186NF02E



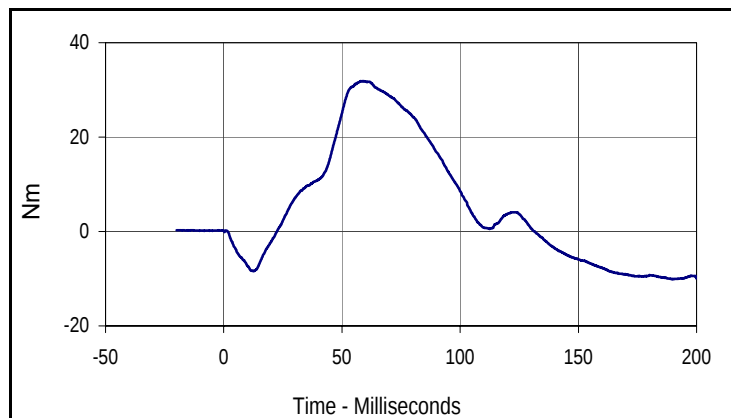
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	4.83 to 5.07	4.88	Pass
Pendulum Deceleration	10 Msec.	m/s	1.2 to 1.6	1.4	Pass
	20 Msec.	m/s	2.4 to 3.4	2.8	Pass
	30 Msec.	m/s	3.8 to 5.0	4.1	Pass
"D" Plane Rotation	Max	Degrees	74.0 to 92.0	76.0	Pass
Peak Moment in Rotation	Max	Nm	27.0 to 33.0	31.8	Pass
Positive Moment Decay, Time To 5 Nm		Msec.	103.0 to 123.0	103.8	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
5.5	199.9	0.0	-2.3



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
76.0	73.3	-49.1	200.0



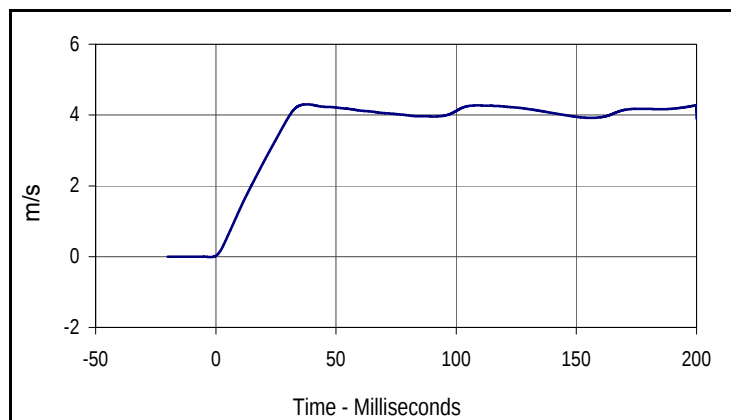
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
31.9	58.9	-10.1	190.2

Test Program: Hybrid III 6 Yr Old Neck Extension Test
 ATD Serial No.: 186

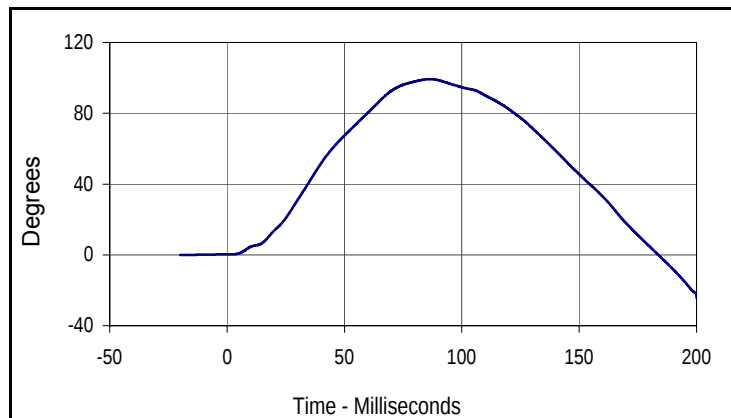
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 Test I.D.: 186NE02E



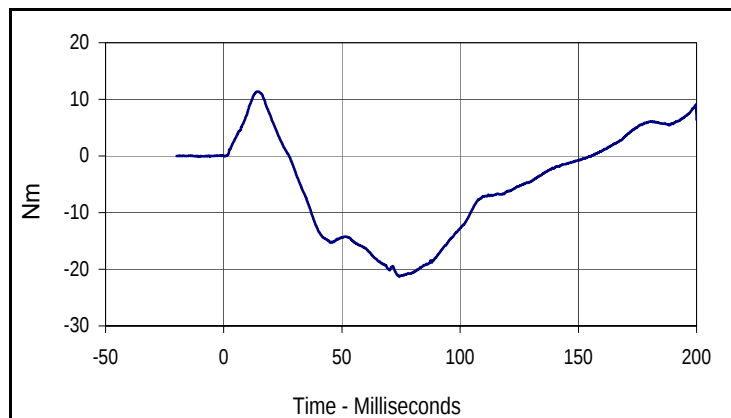
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	4.18 to 4.42	4.42	Pass
Pendulum Deceleration	10 Msec.	m/s	1.0 to 1.4	1.3	Pass
	20 Msec.	m/s	2.2 to 3.0	2.7	Pass
	30 Msec.	m/s	3.2 to 4.2	3.9	Pass
"D" Plane Rotation	Max	Degrees	85.0 to 103.0	99.3	Pass
Peak Moment in Rotation	Max	Nm	-24.0 to -19.0	-21.2	Pass
Positive Moment Decay, Time To -5 Nm		Msec.	123.0 to 147.0	126.7	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	37.8	0.0	-2.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
99.3	86.4	-24.4	200.0



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
11.3	14.1	-21.2	74.3

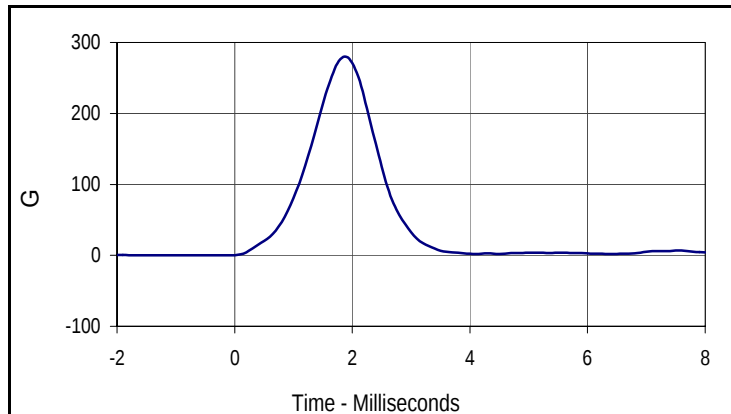
APPENDIX D
POST-TEST / HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Test Program: Hybrid III 6 Yr Old Head Drop Test
 ATD Serial No.: 186

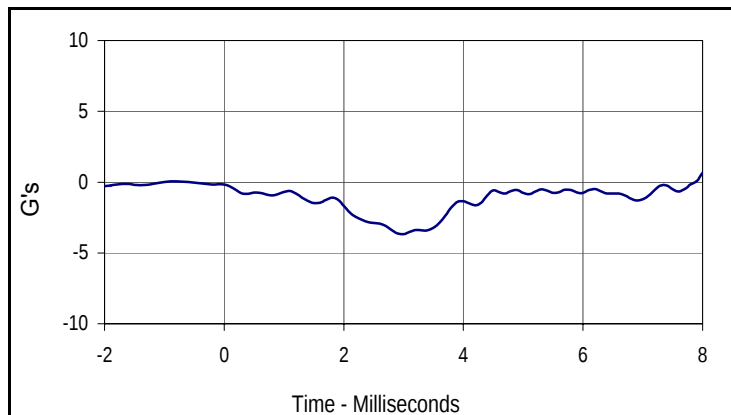
Test Date: 2/27/12
 Test I.D.: 186HD02F



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	279.6	Pass
Peak Lateral Acceleration	G's	≤15.0	3.7	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
279.6	1.9	0.2	-0.8



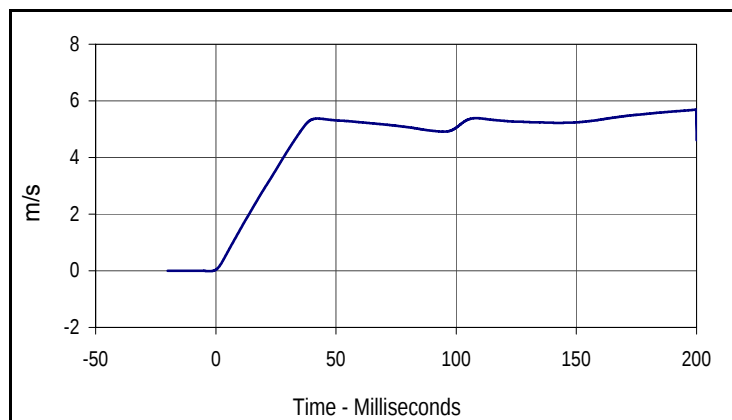
Curve Description			
Head Y			
CURNO	Type	SAE Class	Units
002	FIL	1000	G's
Max	Time	Min	Time
0.1	-0.9	-3.7	3.0

Test Program: Hybrid III 6 Yr Old Neck Flexion Test
 ATD Serial No.: 186

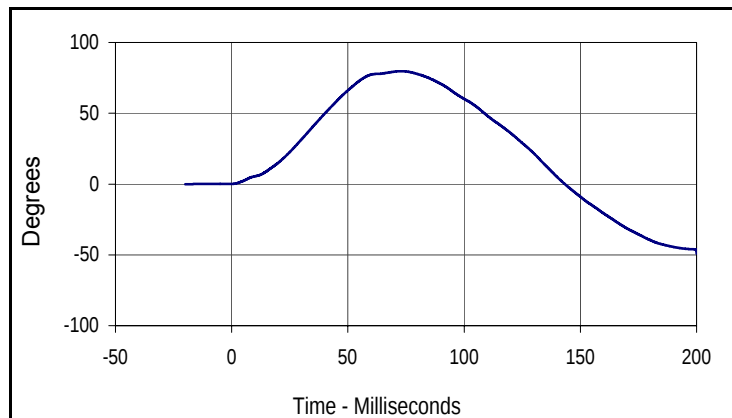
Test Date: 2/27/12
 Test I.D.: 186NF02F



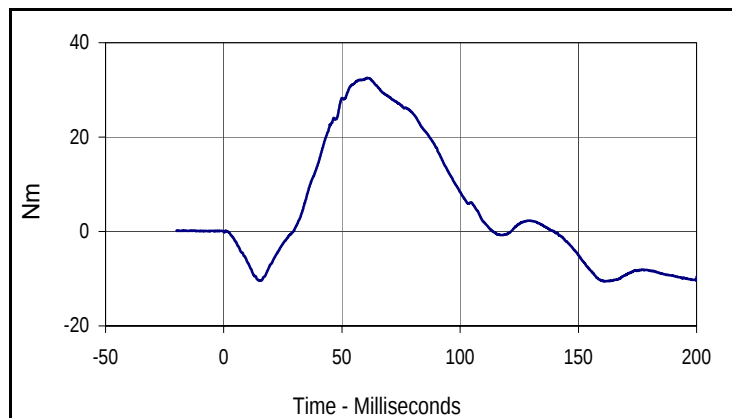
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	4.83 to 5.07	4.91	Pass
Pendulum Deceleration	10 Msec.	m/s	1.2 to 1.6	1.4	Pass
	20 Msec.	m/s	2.4 to 3.4	2.9	Pass
	30 Msec.	m/s	3.8 to 5.0	4.3	Pass
"D" Plane Rotation	Max	Degrees	74.0 to 92.0	79.7	Pass
Peak Moment in Rotation	Max	Nm	27.0 to 33.0	32.6	Pass
Positive Moment Decay, Time To 5 Nm		Msec.	103.0 to 123.0	106.4	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
5.7	199.9	0.0	-2.4



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
79.7	72.9	-49.1	200.0



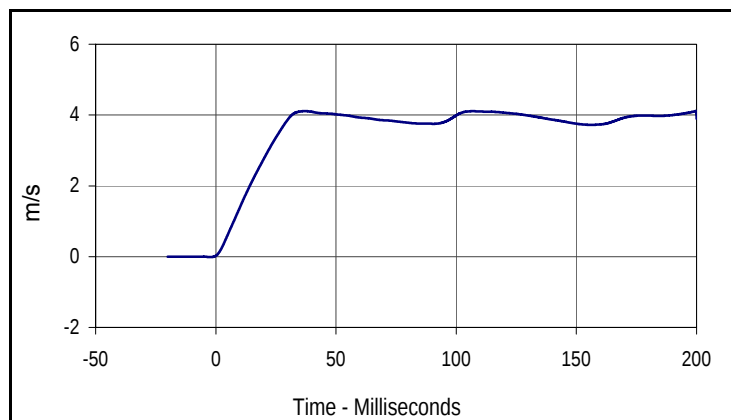
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
32.6	60.7	-10.6	161.0

Test Program: Hybrid III 6 Yr Old Neck Extension Test
 ATD Serial No.: 186

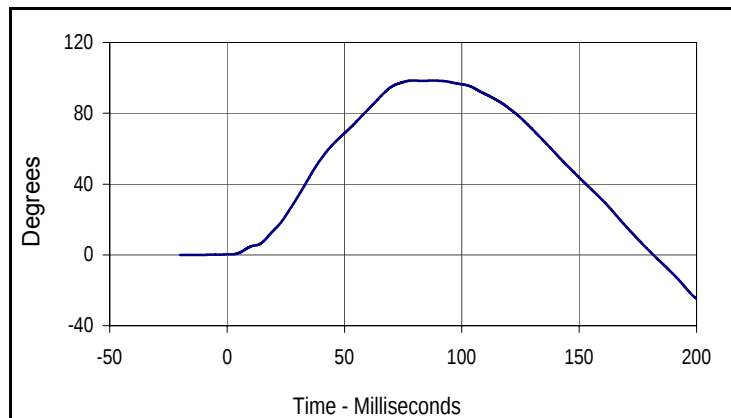
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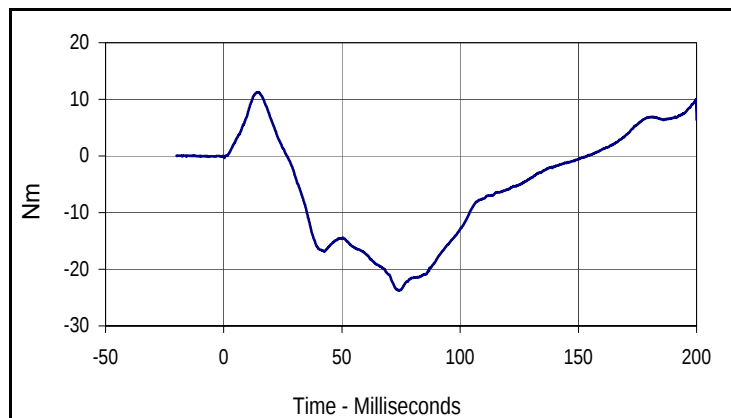
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	4.18 to 4.42	4.25	Pass
Pendulum Deceleration	10 Msec.	m/s	1.0 to 1.4	1.4	Pass
	20 Msec.	m/s	2.2 to 3.0	2.8	Pass
	30 Msec.	m/s	3.2 to 4.2	3.9	Pass
"D" Plane Rotation	Max	Degrees	85.0 to 103.0	98.6	Pass
Peak Moment in Rotation	Max	Nm	-24.0 to -19.0	-23.7	Pass
Positive Moment Decay, Time To -5 Nm		Msec.	123.0 to 147.0	125.5	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
4.1	199.9	0.0	-2.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
98.6	79.2	-24.5	199.9



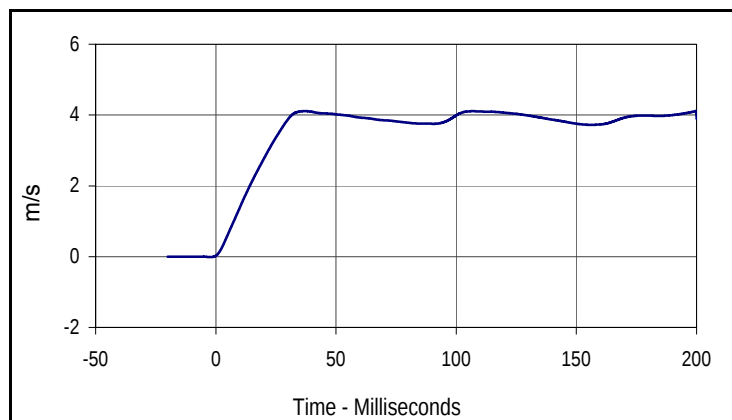
Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
11.3	14.5	-23.7	74.1

Test Program: Hybrid III 6 Yr Old Neck Extension Test
 ATD Serial No.: 186

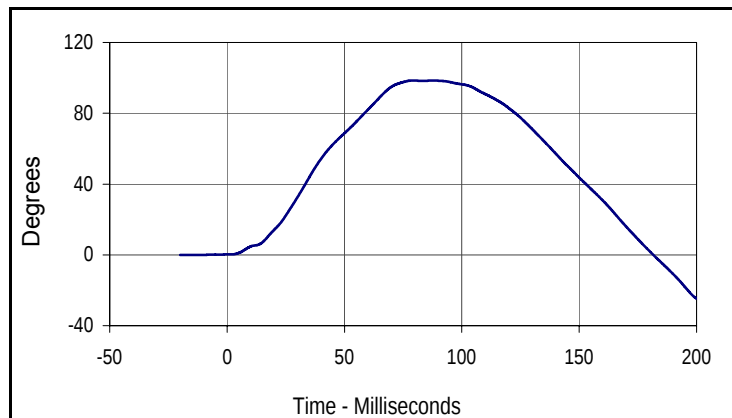
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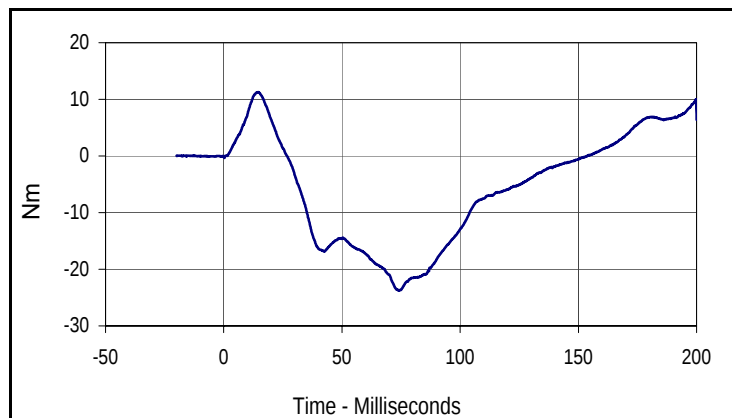
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.2	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	4.18 to 4.42	4.25	Pass
Pendulum Deceleration	10 Msec.	m/s	1.0 to 1.4	1.4	Pass
	20 Msec.	m/s	2.2 to 3.0	2.8	Pass
	30 Msec.	m/s	3.2 to 4.2	3.9	Pass
"D" Plane Rotation	Max	Degrees	85.0 to 103.0	98.6	Pass
Peak Moment in Rotation	Max	Nm	-24.0 to -19.0	-23.7	Pass
Positive Moment Decay, Time To -5 Nm		Msec.	123.0 to 147.0	125.5	Pass
			Overall Test Results		Pass



Curve Description			
Pendulum Velocity			
CURNO	Type	SAE Class	Units
001	FIL	180	m/s
Max	Time	Min	Time
4.1	199.9	0.0	-2.1



Curve Description			
"D" Plane Rotation			
CURNO	Type	SAE Class	Units
003	FIL	60	Degrees
Max	Time	Min	Time
98.6	79.2	-24.5	199.9



Curve Description			
Moment About Occipital Condyle			
CURNO	Type	SAE Class	Units
002	FIL	600	Nm
Max	Time	Min	Time
11.3	14.5	-23.7	74.1