

REPORT NUMBER: TWG-TRC-13-02

NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE AIRBAG OUT-OF-POSITION INJURY TESTING

GENERAL MOTORS LLC
2013 BUICK VERANO
4-DOOR SEDAN

NHTSA NUMBER: MD0105TWG3
TRC TEST NUMBER: S130212-2

PREPARED BY:
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P.O. BOX B-67
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Test Date: February 12, 2013

FINAL REPORT

Alpha Technology Associate, Inc.
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This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-08-D-00088, Alpha Technology PO 4GT150. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

Prepared By: ILO Projects Operations Group

Approved By: 
Margaret Susan, Project Manager

Approval Date: _____

FINAL REPORT ACCEPTANCE BY:

Accepted By: _____

Acceptance Date: _____

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15. Supplementary Notes						
16. Abstract This side impact Out-Of-Position test was performed in conjunction with a New Car Assessment Program (NCAP). This test was conducted at the T R C Test Facility in East Liberty, O h i o , on February 12, 2013.						
Injury Summary						
HIC15	Maximum Chest Displacement (mm)	Maximum Chest Displacement Rate (m/s)	NIJ(NTF)	NIJ(NTE)	NIJ(NCF)	NIJ(NCE)
503.23	N/A	N/A	0.3356	0.3429	0.1668	0.4576
17. Key Words New Car Assessment Program (NCAP) Side Airbag Out-Of-Position				18. Distribution Statement <u>Copies of this report are available from:</u> Alpha Technology Associate, Inc 2810 Old Lee Hwy, Suite 120 Fairfax,VA 22031 Phone: (703) 876-0010 Fax: (703) 876-0120 Attn: Mai Lan Aram		
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SECTION 1

TEST PURPOSE AND PROCEDURE

1.1 PURPOSE

The purpose of this test was to obtain data from a static out-of-position side impact using a vehicle that had undergone a New Car Assessment Program (NCAP) sponsored test requested by the National Highway Traffic Safety Administration (NHTSA). This test was performed following the technical requirements under NHTSA contract No. DTNH22-08-D-00088 and through Alpha Technology Associate, Inc.

1.2 SUMMARY

The effects of both a seat-mounted side airbag and a curtain airbag deployment in a 2013 Buick Verano 4 door sedan on an out-of-position Hybrid III 3-Year-Old (3YO) child anthropomorphic test device (ATD) were evaluated. The test was performed by TRC on February 12, 2013. Pre- and post-test photographs of the vehicle and ATD can be found in Appendix A.

Two (2) high-speed digital cameras were used to document the side airbag deployment event. Images were recorded at rates of 1000 frames per second. One camera was placed perpendicular to the seat centerline to capture the deployment event from the side. The second camera was positioned to capture a left front $\frac{3}{4}$ view of the right rear passenger seat compartment.

The 3YO ATD was placed in the right rear passenger seat following the ATD placement instructions specified in section 3.3.3.3 of the Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags as prepared by the Side Airbag Out-of-Position Injury Technical Working Group (TWG).

The dummy was instrumented with head x, y and z accelerometers, six upper neck axial force and moment load cell transducers, and six lower neck axial force and moment load cell transducers.

Eighteen (18) channels of data were recorded using an on-board data acquisition system. Appendix A contains photographs. Appendix B contains ATD response data traces. Appendix C contains the test equipment and dummy calibration information.

The 3YO ATD head skin was cleaned with alcohol and dusted with baby powder to achieve acceptable frictional characteristics for test. The skullcap seam was taped with 4 mm wide electrical tape to prevent the airbag from getting caught in the seam.

The dummy was placed on the seat lying on its back with its arms positioned at its sides so that the rearmost arm contacted the seatback. With the back of the head maintaining contact with the armrest, the dummy was bent at the waist and slid to the position where the head CG was aligned with the vertical centerline of the module. This position was maintained with the insertion of a foam wedge wide enough to support the dummy across the full width of its back. The head remained in a neutral position and did not exert a significant downward force ($< 5\text{N}$) on the armrest. The dummy's arm closest to the front edge of the seat was adjusted so that it was parallel to the torso and rested on the foam block with the fingertips just touching the seat cushion. The rearmost upper arm was adjusted to

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an orientation 45 degrees forward of the torso centerline and the forearm to an orientation 90 degrees to the upper arm. This orientation complies with section 3.3.3.3 of the TWG Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags, First Revision dated July, 2003.

SECTION 2

DATA SHEET NO. 1 TEST SUMMARY

TEST CONFIGURATION INFORMATION:

Seating Position:	P3	Right Rear Seating Position
Test:	3.3.3.3	Hybrid III 3-Year-Old Child Dummy Lying on Seat with Head on Armrest
Airbag:	Seat	Seat mounted – outside seam
Airbag:	Side Rail	Side curtain airbag.
Booster Block:	5 Blocks; in 3 Rows	Foam
ATD Type/Serial No.:	040	Hybrid III 3YO child dummy

SEAT POSITION

Measurement	Value
Total Fore/Aft Travel (Detents)	N/A
Placed in Position #	Fixed

Number of Data Channels:	18	
Number of Cameras:	0	<u>Real Time</u>
	2	<u>High Speed Digital</u>

VISIBLE DUMMY CONTACT POINTS

Head Contact:	Seat Airbag, Curtain Airbag, Floorpan
Upper Torso Contact:	None
Lower Torso Contact:	None
Left Knee Contact:	None
Right Knee Contact:	None

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

NHTSA No.	MD0105	Traction Control System (TCS)	Yes
Model Year	2013	Power Steering	Yes
Make	Buick	Power Window Auto-Reverse	Yes
Model	Verano	Driver Front Airbag	Yes
Body Style	4-Door Sedan	Driver Curtain Airbag	Yes
VIN	IG4PP5SK2D4100715	Driver Head/Torso Airbag	No
Body Color	Blue	Driver Torso Airbag	No
Odometer Reading (miles)	9	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	2.4	Driver Pelvis Airbag	No
Number of Cylinders	4	Driver Knee Airbag	Yes
Engine Placement	Transverse	Front Pass. Front Airbag	Yes
Transmission Type	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds	6	Front Pass. Head/Torso Airbag	No
Overdrive	No	Front Pass. Torso Airbag	No
Final Drive	Front	Front Pass. Torso/Pelvis Airbag	Yes
Roof Rack	No	Front Pass. Pelvis Airbag	No
Sunroof / T-Top	No	Front Pass. Knee Airbag	Yes
Running Boards	No	Driver Pretensioner	Yes
Tilt Steering Wheel	Yes	Driver Load Limiter	Yes
Power Seats	No	Front Pass. Pretensioner	No
Anti-Lock Brakes (ABS)	Yes	Front Pass. Load Limiter	No
Automatic Door Locks (ADL)	Yes	Other	No

Does owner's manual provide instructions to turn off automatic door locks?

No

DATA FROM CERTIFICATION LABEL

Manufactured by	General Motors LLC	GVWR (kg)	1978
Date of Manufacture	8/12	GAWR Front (kg)	1061
		GAWR Rear (kg)	917

VEHICLE SEATING AND WEIGHT CAPACITY

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split bench		
Number of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				400
Cargo Wt. (RCLW) (kg)				59.80

DATA SHEET NO. 3
DUMMY INJURY CRITERIA VALUES

Channel	Max	Time (ms)	Min	Time (ms)
Head Ax [g , CFC_1000]	81.032	11.92	-11.272	28.72
Head Ay [g , CFC_1000]	116.138	5.76	-14.326	31.28
Head Az [g , CFC_1000]	105.104	6.16	-23.512	6.48
Upper Neck Fx [N , CFC_1000]	160.663	12.56	-111.365	5.52
Upper Neck Fy [N , CFC_1000]	6.035	61.84	-620.544	15.60
Upper Neck Fz [N , CFC_1000]	720.645	16.32	-719.486	8.88
Upper Neck Mx [N-m , CFC_600]	21.808	12.24	-18.539	28.48
Upper Neck My [N-m , CFC_600]	7.255	40.00	-3.382	8.48
Upper Neck Mz [N-m , CFC_600]	10.595	27.20	-5.111	73.20
Lower Neck Fx [N , CFC_1000]	135.682	24.40	-10.066	5.84
Lower Neck Fy [N , CFC_1000]	577.295	16.40	-19.460	5.52
Lower Neck Fz [N , CFC_1000]	727.489	16.16	-570.900	9.04
Lower Neck Mx [N-m , CFC_600]	3.578	60.72	-49.272	19.04
Lower Neck My [N-m , CFC_600]	16.305	25.60	-0.212	5.60
Lower Neck Mz [N-m , CFC_600]	10.914	24.08	-4.576	77.36
Airbag Event Passenger Side Curtain Voltage [V]	35.470	0.64		
Airbag Event Rear Passenger Seat Voltage [V]	23.580	2.48		
Airbag Event Passenger Side Curtain Current [A]	3.170	7.52		
Airbag Event Rear Passenger Seat Current [A]	3.320	0.48		

HEAD INJURY CRITERIA (HIC)

	HIC(15)	t ₁ (msec)	t ₂ (msec)	HIC(36)	t ₁ (msec)	t ₂ (msec)
Position #2 Right Front	503.23	4.96	17.20	503.23	4.96	17.20

Position 2 Neck Injury Summary (HIII 3-Year-Old)

Nij V10	Nij	Time (ms)
Upper Neck NTF	0.3356	16.08
Upper Neck NTE	0.3429	16.32
Upper Neck NCF	0.1668	11.12
Upper Neck NCE	0.4576	8.56

Peak Tension (CFC1000) 721 N

Peak Compression (CFC1000) -719 N

Critical Values

Nij Intercepts				Peak Limits	
Tension (CVt)	2120 N	Extension (mCVe)	27 N-m	Tension	1130 N
Compression (CVc)	2120 N	Flexion (mCVf)	68 N-m	Compression	1380 N

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APPENDIX A
PHOTOGRAPHS

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Figure A-1 Front ¾ View, as Received



Figure A-2 Vehicle Certification Label



Figure A-3 Pre-Crash Test Images From NCAP Vehicle



Figure A-4 Post-Crash Test Images From NCAP Vehicle



Figure A-5 Pre-Test Right Rear Dummy Position – Side View



Figure A-6 Pre-Test Right Rear Dummy Position – ¾ View



Figure A-7 Pre-Test Right Rear Dummy Position – Full Side View



Figure A-8 Post-Test Right Rear Dummy Position – Side View



Figure A-9 Post-Test Right Rear Dummy Position – Top View



Figure A-10 Post-Test Airbags – Side View



Figure A-11 Pre-Test Overall Testing Area – Side View



Figure A-12 Post-Test Overall Testing Area – Side View



Figure A-13 Post-Test Right Rear Passenger Door-Window

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APPENDIX B

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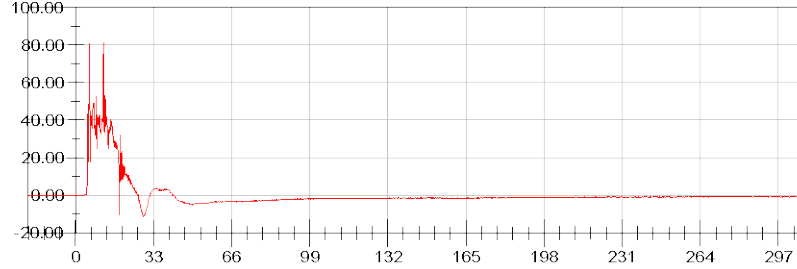
Test Lab: SLED

Test Number: S130212-2 (MD0105TWG3)

Test Date: 02/12/2013

Position #9 Hybrid III 3 year old Dummy (Part 572 P) (40)

Head Accel X (g) vs. Time [ms]



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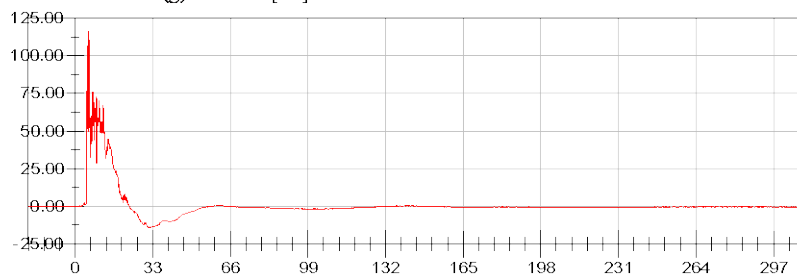
81.03 g at 11.92 ms

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-11.27 g at 28.72 ms

CFC_1000

Head Accel Y (g) vs. Time [ms]



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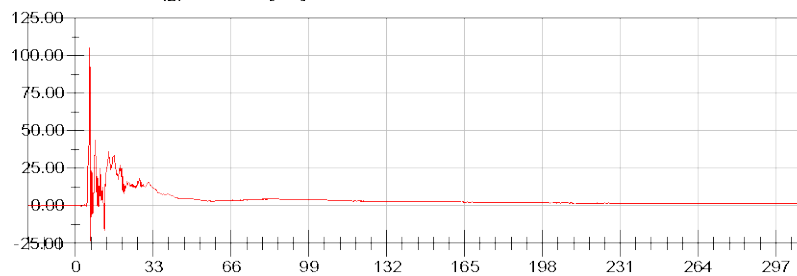
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-14.33 g at 31.28 ms

CFC_1000

Head Accel Z (g) vs. Time [ms]



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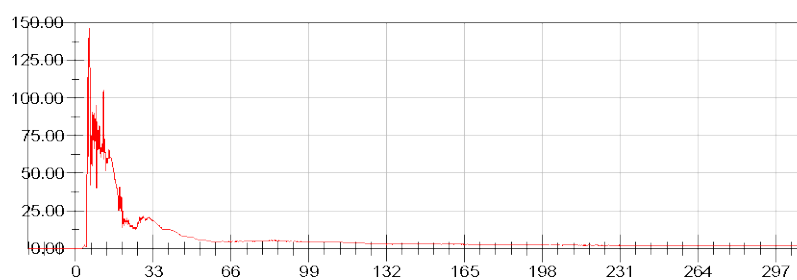
105.10 g at 6.16 ms

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-23.51 g at 6.48 ms

CFC_1000

Head Accel Resultant (g) vs. Time [ms]



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146.50 g at 6.08 ms

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0.04 g at -19.84 ms

CFC_1000



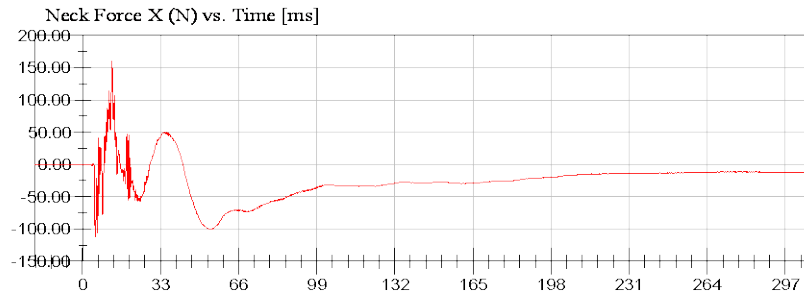
Alpha Technology

Test Lab: SLED

Test Number: S130212-2 (MD0105TWG3)

Test Date: 02/12/2013

Position #9 Hybrid III 3 year old Dummy (Part 572 P) (40)



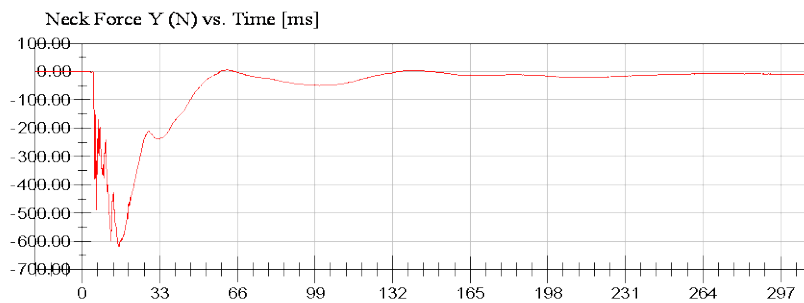
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-111.36 N at 5.52 ms

CFC_1000



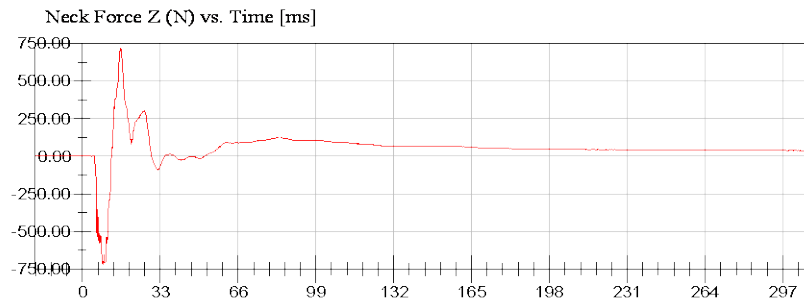
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CFC_1000



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CFC_1000



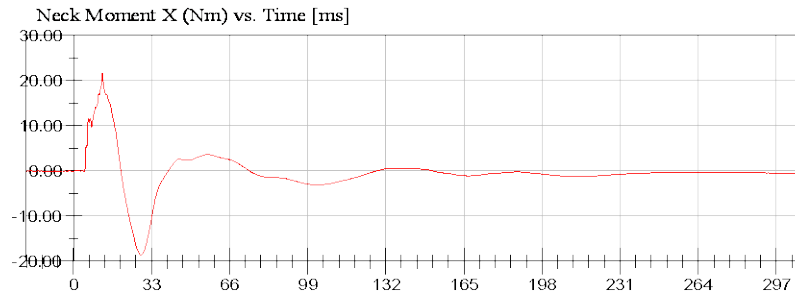
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Test Lab: SLED

Test Number: S130212-2 (MD0105TWG3)

Test Date: 02/12/2013

Position #9 Hybrid III 3 year old Dummy (Part 572 P) (40)



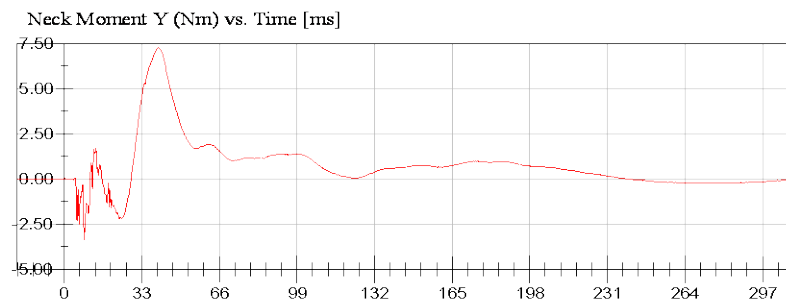
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-18.54 Nm at 28.48 ms

CFC_600



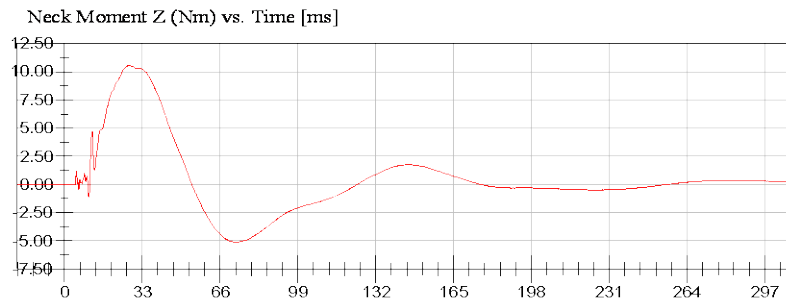
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7.25 Nm at 40.00 ms

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-3.38 Nm at 8.48 ms

CFC_600



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10.59 Nm at 27.20 ms

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-5.11 Nm at 73.20 ms

CFC_600



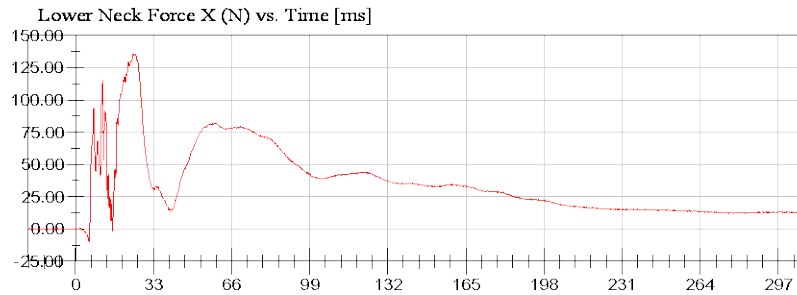
Alpha Technology

Test Lab: SLED

Test Number: S130212-2 (MD0105TWG3)

Test Date: 02/12/2013

Position #9 Hybrid III 3 year old Dummy (Part 572 P) (40)



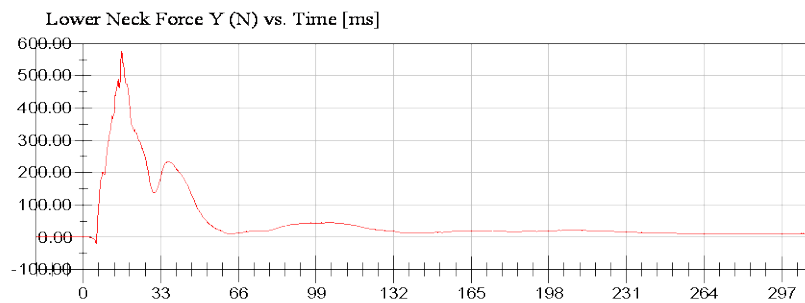
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-10.07 N at 5.84 ms

CFC_1000



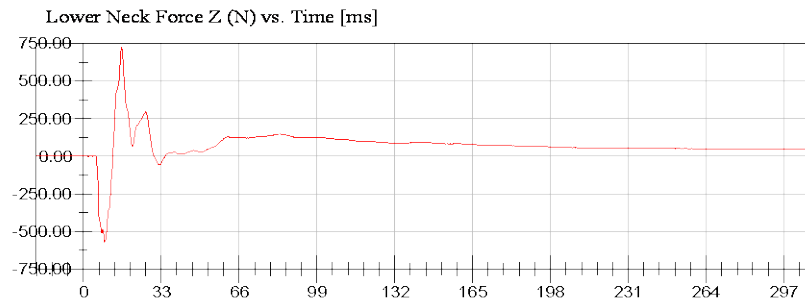
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-19.46 N at 5.52 ms

CFC_1000



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727.49 N at 16.16 ms

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-570.90 N at 9.04 ms

CFC_1000



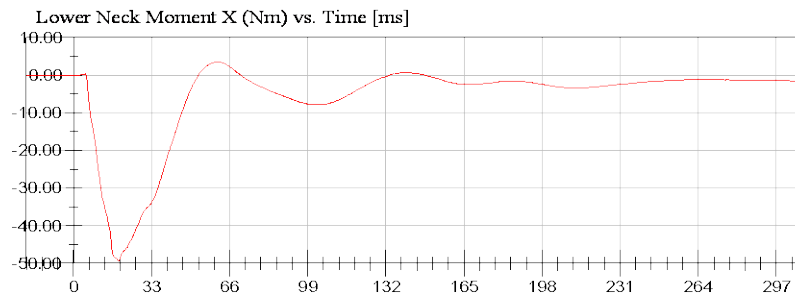
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Test Lab: SLED

Test Number: S130212-2 (MD0105TWG3)

Test Date: 02/12/2013

Position #9 Hybrid III 3 year old Dummy (Part 572 P) (40)



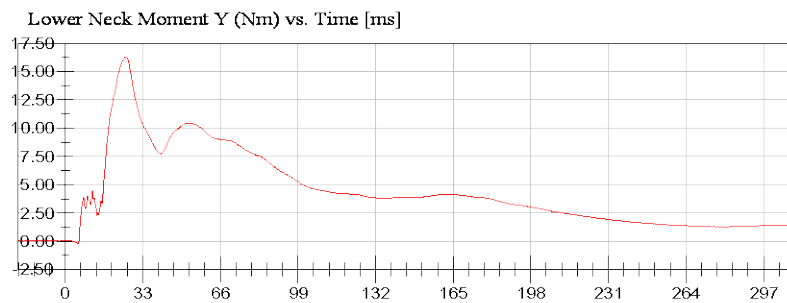
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-49.27 Nm at 19.04 ms

CFC_600



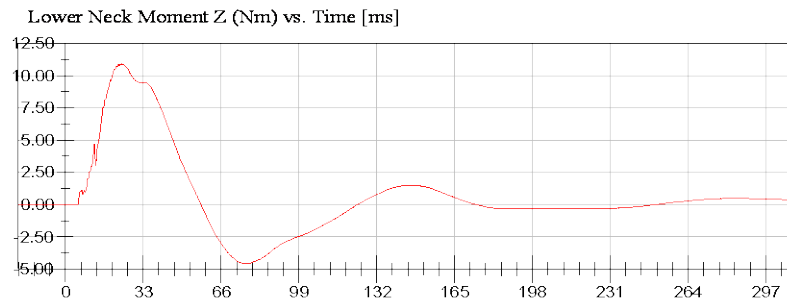
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-0.21 Nm at 5.60 ms

CFC_600



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10.91 Nm at 24.08 ms

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-4.58 Nm at 77.36 ms

CFC_600



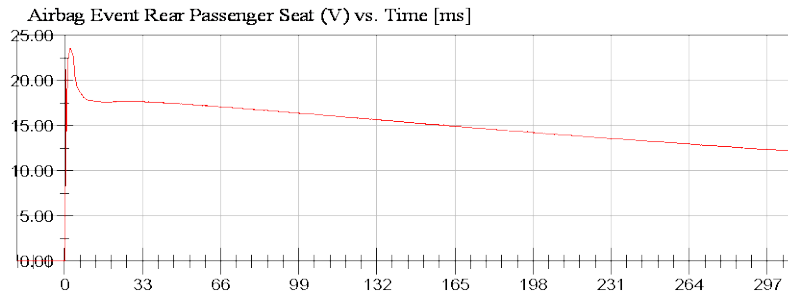
Alpha Technology

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Position #9 Hybrid III 3 year old Dummy (Part 572 P) (40)



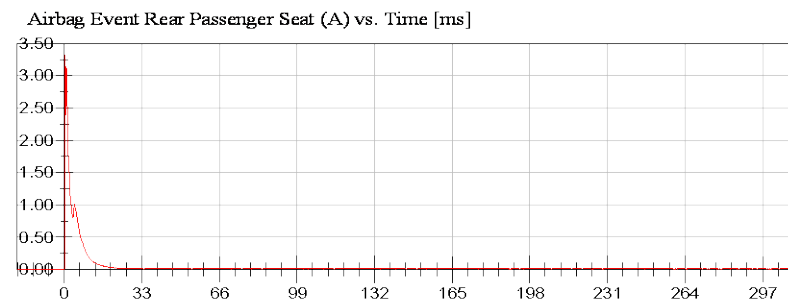
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23.58 V at 2.48 ms

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0.00 V at -20.00 ms

CFC_1000



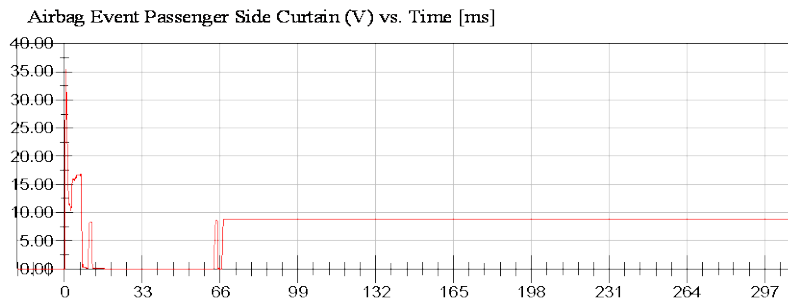
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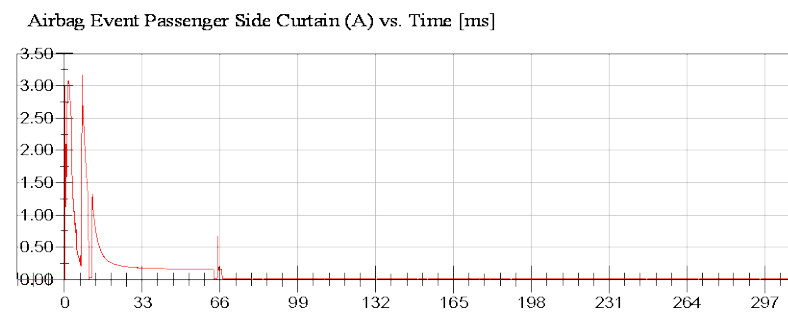
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3.17 A at 7.52 ms

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0.00 A at -20.00 ms

CFC_1000



Test Vehicle: 2013 Buick Verano
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APPENDIX C

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

Test Vehicle: 2013 Buick Verano
 Test Program: Side Airbag O.O.P. Injury Testing

NHTSA No.: MD0105TWG3
 Test Date: 2/12/13

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

P572C INSTRUMENTATION

	POSITION #3 (RIGHT) SERIAL NO.: 040		
	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
Head Accel X	P64095	Endevco	28-Jan-2013
Head Accel Y	P49237	Endevco	28-Jan-2013
Head Accel Z	P58870	Endevco	28-Jan-2013
Upper Neck Force X	3303-214-FX	Denton	29-Jan-2013
Upper Neck Force Y	3303-214-FY	Denton	29-Jan-2013
Upper Neck Force Z	3303-214-FZ	Denton	29-Jan-2013
Upper Neck Moment X	3303-214-MX	Denton	29-Jan-2013
Upper Neck Moment Y	3303-214-MY	Denton	29-Jan-2013
Upper Neck Moment Z	3303-214-MZ	Denton	29-Jan-2013
Lower Neck Force X	3303-210-FX	Denton	29-Jan-2013
Lower Neck Force Y	3303-210-FY	Denton	29-Jan-2013
Lower Neck Force Z	3303-210-FZ	Denton	29-Jan-2013
Lower Neck Moment X	3303-210-MX	Denton	29-Jan-2013
Lower Neck Moment Y	3303-210-MY	Denton	29-Jan-2013
Lower Neck Moment Z	3303-210-MZ	Denton	29-Jan-2013
Airbag Event Rear Passenger Seat	K3789-166	KAYSER-THREDE	12-Feb-2013
Airbag Event Passenger Side Curtain	K3789-166	KAYSER-THREDE	12-Feb-2013
Airbag Event Rear Passenger Seat	K3789-166	KAYSER-THREDE	12-Feb-2013
Airbag Event Passenger Side Curtain	K3789-166	KAYSER-THREDE	12-Feb-2013

Transportation Research Center Inc.

Front Head Drop

HIII 3YO Serial No. 040 Certification No. 5-1

Test Date: 2/6/2013

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Peak Head Resultant Acceleration	250 - 280 g	275.5 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-3.9 g	Yes
Is Acceleration Curve Unimodal?	Yes	Yes	Yes

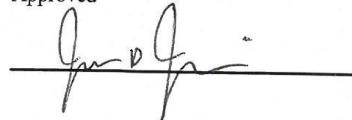
Test meets specifications.

Comments:

Technician



Approved



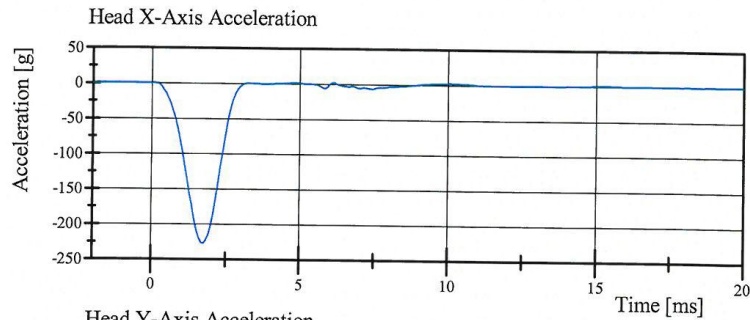
Specification Source: CFR49 Part 572 Subpart P
with Polarity in accordance with J211

02.06.2013 13:02:08 581

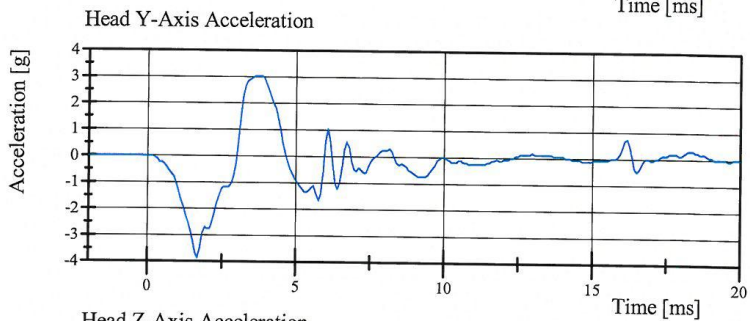


Transportation Research Center Inc.

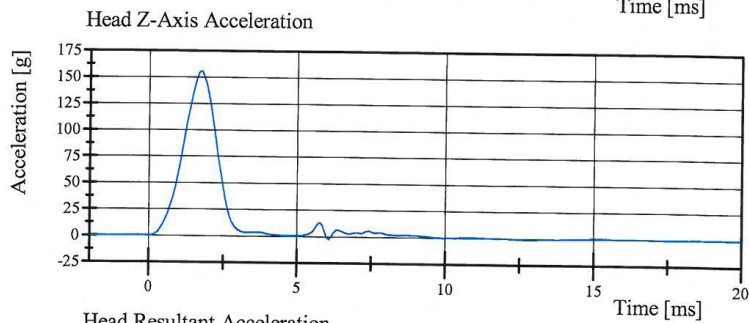
Front Head Drop
HIII 3YO Serial No. 040 Certification No. 5-1
Test Date: 2/6/2013



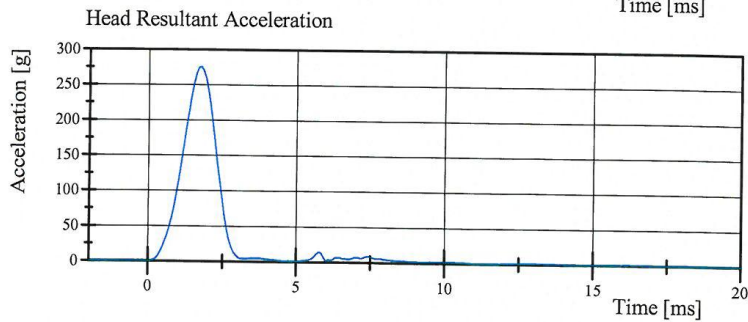
Filter Class: CFC_1000
Max: 2.1 gn at 6.2 ms
Min: -227.6 gn at 1.8 ms



Filter Class: CFC_1000
Max: 3.0 gn at 3.6 ms
Min: -3.9 gn at 1.7 ms



Filter Class: CFC_1000
Max: 155.3 gn at 1.8 ms
Min: -2.7 gn at 6.1 ms



Filter Class: CFC_1000
Max: 275.5 gn at 1.8 ms
Min: 0.0 gn at -2.0 ms

Specification Source: CFR49 Part 572 Subpart P
with Polarity in accordance with J211

02.06.2013 13:02:15 581



Transportation Research Center Inc.

Neck Flexion

HIII 3YO Serial No. 040 Certification No. 5-6

Test Date: 2/7/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	34 %	Yes
Pendulum Impact Velocity	5.40 - 5.60 m/s	5.585 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	(-2.0) - (-2.7) m/s	-2.41 m/s	Yes
Pendulum Integrated Velocity Change at 15 ms	(-3.0) - (-4.0) m/s	-3.54 m/s	Yes
Pendulum Integrated Velocity Change at 20 ms	(-4.0) - (-5.1) m/s	-4.80 m/s	Yes
Total Headform D-Plane Rotation	(-70) - (-82) °	-77.9 °	Yes
Peak Neck Occipital Condyles Moment	42 - 53 Nm	46.7 Nm	Yes
Neck Occipital Condyles Moment Decay to 10 Nm	60 - 80 ms	72.2 ms	Yes

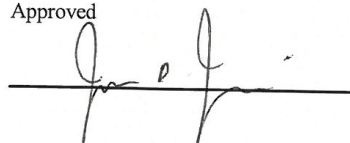
Test meets specifications.

Comments:

Technician



Approved



Specification Source: CFR49 Part 572, Subpart P
with Polarity in accordance with J211

02.07.2013 13:05:12 622

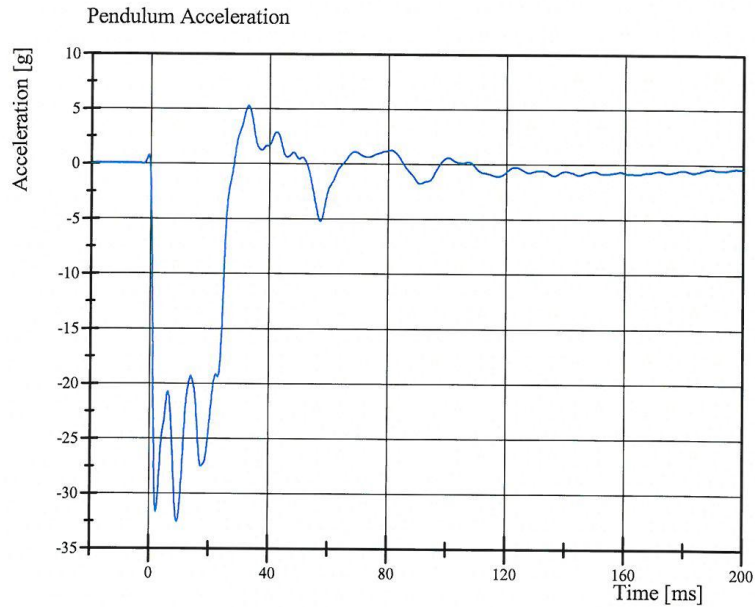


Transportation Research Center Inc.

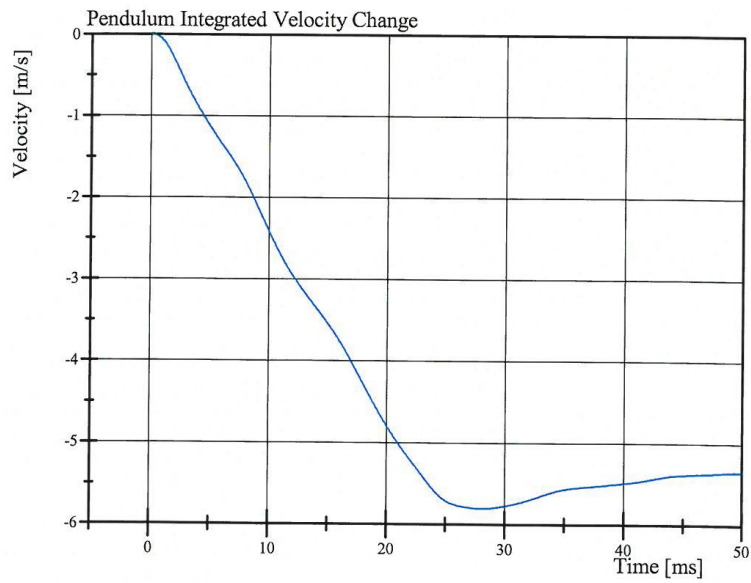
Neck Flexion

HIII 3YO Serial No. 040 Certification No. 5-6

Test Date: 2/7/2013



Filter Class: CFC_180
Max: 5.2 gn at 32.9 ms
Min: -32.6 gn at 9.4 ms



Filter Class: CFC_180
Max: 0.0 m/s at 0.0 ms
Min: -5.8 m/s at 28.1 ms

Specification Source: CFR49 Part 572 Subpart P
with Polarity in accordance with J211

02.07.2013 13:05:18 622



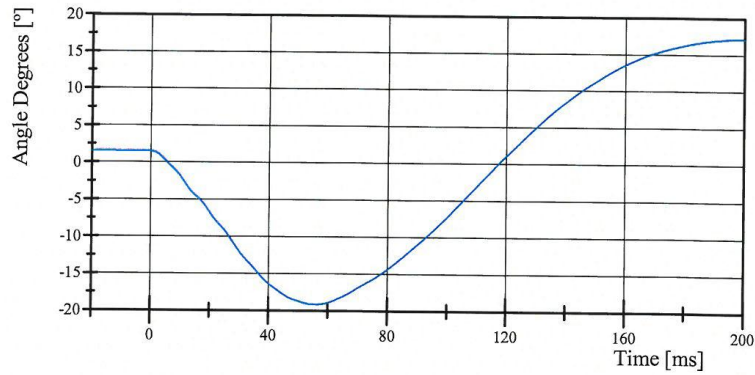
Transportation Research Center Inc.

Neck Flexion

HIII 3YO Serial No. 040 Certification No. 5-6

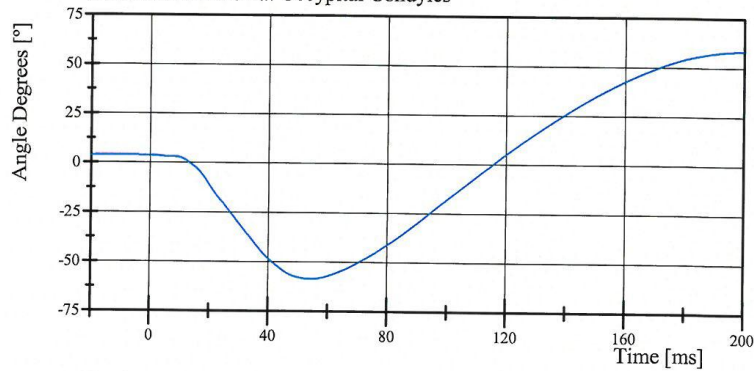
Test Date: 2/7/2013

Pot Rotation at the Base of Neck



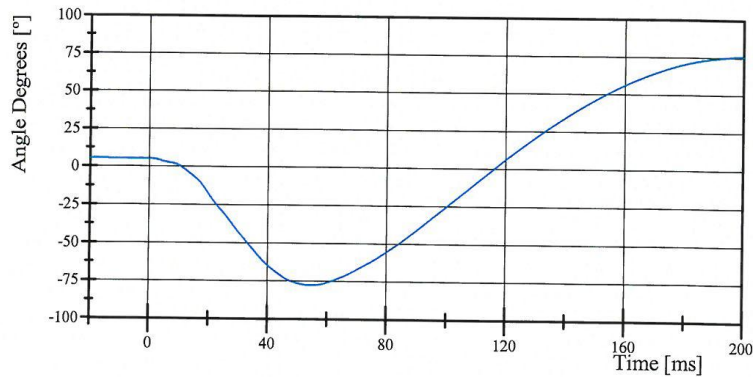
Filter Class: CFC_60
Max: 17.1 ° at 200.0 ms
Min: -19.2 ° at 55.7 ms

Headform Rotation at Occipital Condyles



Filter Class: CFC_60
Max: 58.3 ° at 200.0 ms
Min: -58.8 ° at 54.2 ms

Total Headform D-Plane Rotation



Filter Class: CFC_60
Max: 75.5 ° at 200.0 ms
Min: -77.9 ° at 54.5 ms

Specification Source: CFR49 Part 572 Subpart P
with Polarity in accordance with J211

02.07.2013 13:05:19 622

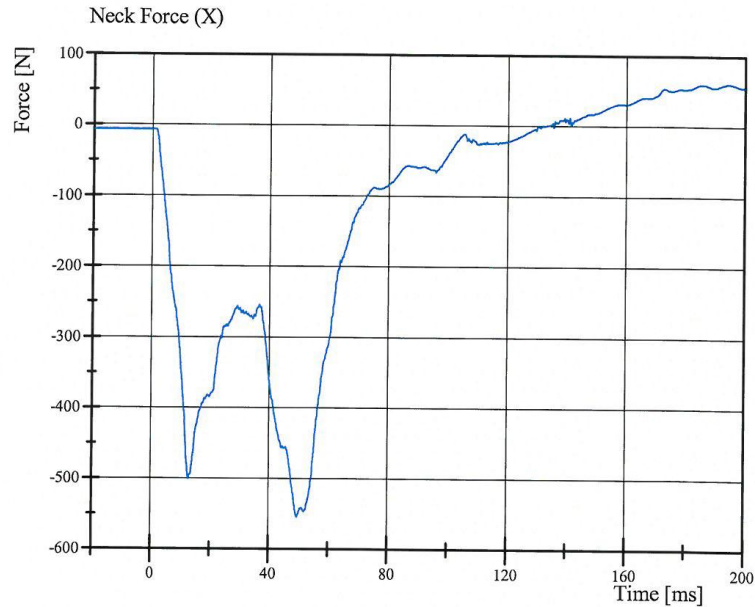


Transportation Research Center Inc.

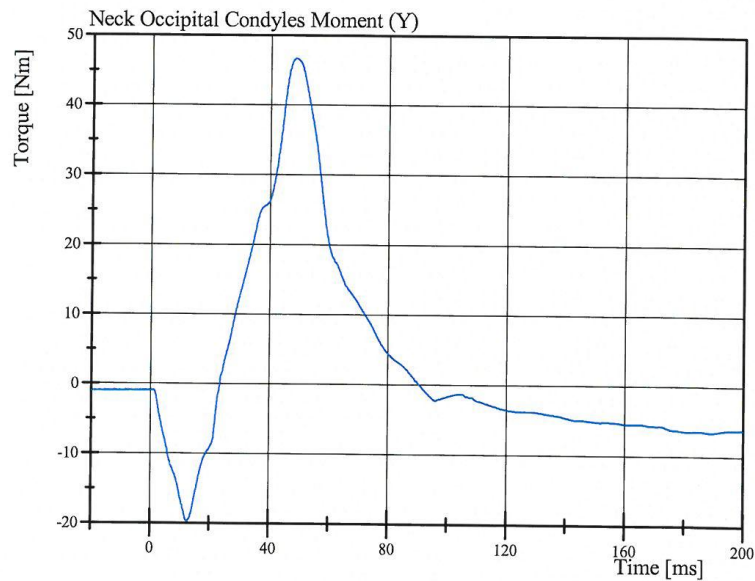
Neck Flexion

HIII 3YO Serial No. 040 Certification No. 5-6

Test Date: 2/7/2013



Filter Class: CFC_1000
Max: 60.2 N at 194.8 ms
Min: -554.5 N at 49.6 ms



Filter Class: CFC_600
Max: 46.7 Nm at 48.5 ms
Min: -19.7 Nm at 12.6 ms

Specification Source: CFR49 Part 572 Subpart P
with Polarity in accordance with J211

02.07.2013 13:05:19 622



Transportation Research Center Inc.

Neck Extension

HIII 3YO Serial No. 040 Certification No. 5-2

Test Date: 2/7/2013

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Pendulum Impact Velocity	(-3.55) - (-3.75) m/s	-3.730 m/s	Yes
Pendulum Integrated Velocity Change at 6 ms	1.0 - 1.4 m/s	1.29 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	1.9 - 2.5 m/s	2.33 m/s	Yes
Pendulum Integrated Velocity Change at 14 ms	2.8 - 3.5 m/s	3.33 m/s	Yes
Total Headform D-Plane Rotation	83 - 93 °	90.7 °	Yes
Peak Neck Occipital Condyles Moment	(-43.7) - (-53.3) Nm	-47.55 Nm	Yes
Neck Occipital Condyles Moment Decay to 10 Nm	60 - 80 ms	69.4 ms	Yes

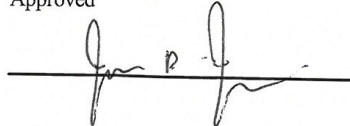
Test meets specifications.

Comments:

Technician



Approved



Specification Source: CFR49 Part 572 Subpart P
with Polarity in accordance with J211

02.07.2013 14:27:38 923

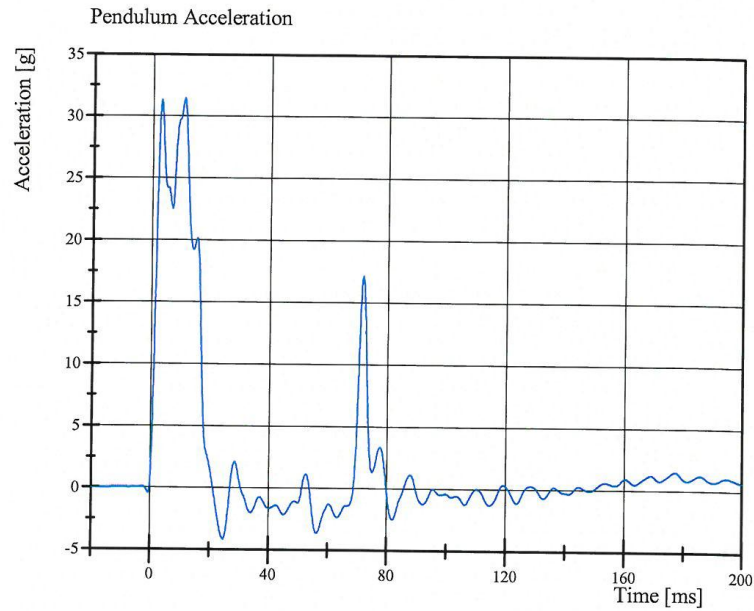


Transportation Research Center Inc.

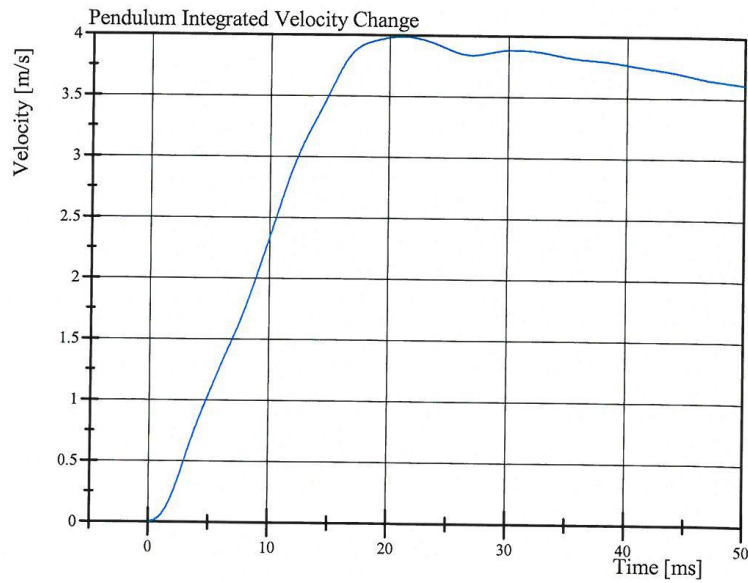
Neck Extension

HIII 3YO Serial No. 040 Certification No. 5-2

Test Date: 2/7/2013



Filter Class: CFC_180
Max: 31.4 gn at 10.6 ms
Min: -4.2 gn at 24.6 ms



Filter Class: CFC_180
Max: 4.0 m/s at 21.0 ms
Min: 0.0 m/s at 0.0 ms

Specification Source: CFR49 Part 572 Subpart P
with Polarity in accordance with J211

02.07.2013 14:27:45 923



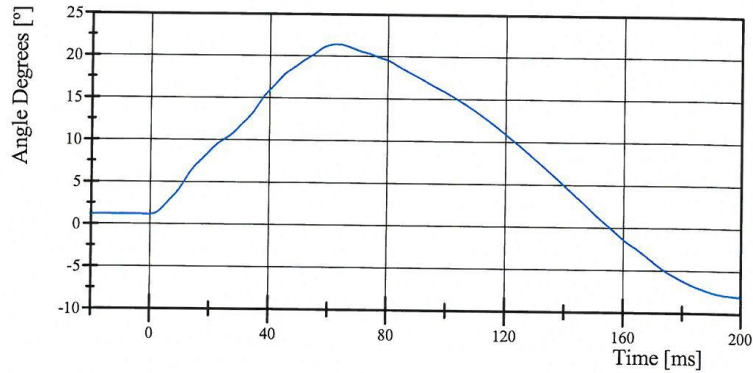
Transportation Research Center Inc.

Neck Extension

HIII 3YO Serial No. 040 Certification No. 5-2

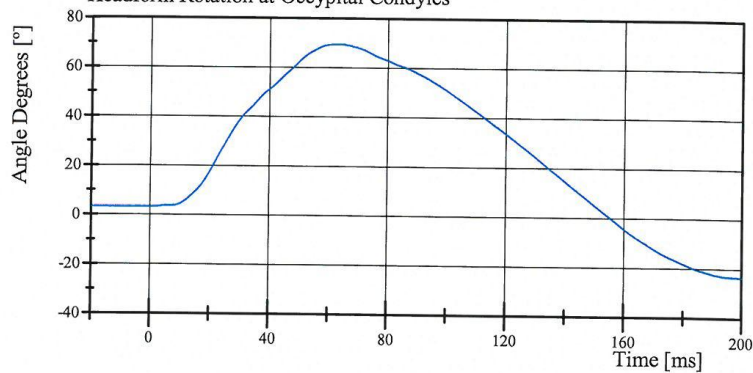
Test Date: 2/7/2013

Pot Rotation at the Base of Neck



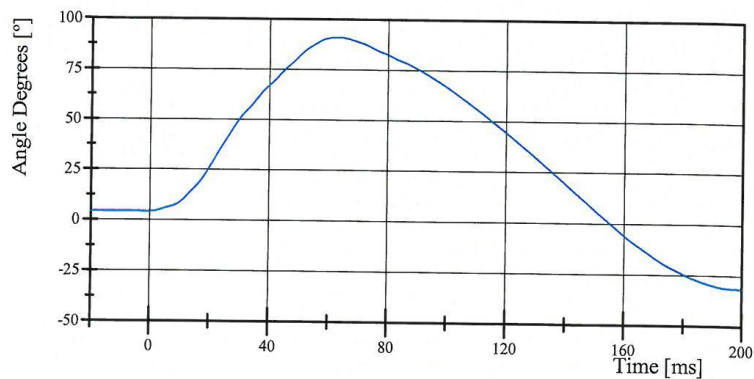
Filter Class: CFC_60
Max: 21.4 ° at 63.0 ms
Min: -8.0 ° at 200.0 ms

Headform Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 69.3 ° at 63.4 ms
Min: -23.5 ° at 200.0 ms

Total Headform D-Plane Rotation



Filter Class: CFC_60
Max: 90.7 ° at 63.2 ms
Min: -31.5 ° at 200.0 ms

Specification Source: CFR49 Part 572 Subpart P
with Polarity in accordance with J211

02.07.2013 14:27:45 923

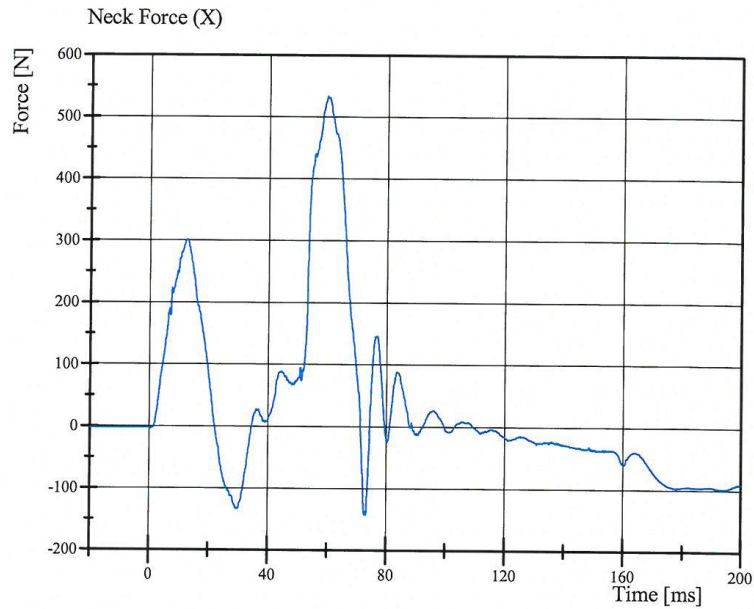


Transportation Research Center Inc.

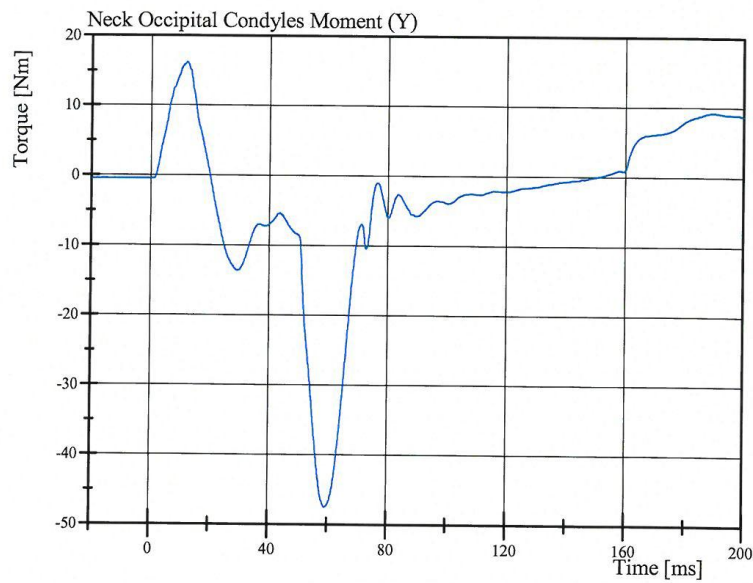
Neck Extension

HIII 3YO Serial No. 040 Certification No. 5-2

Test Date: 2/7/2013



Filter Class: CFC_1000
Max: 532.8 N at 59.5 ms
Min: -143.4 N at 73.2 ms



Filter Class: CFC_600
Max: 16.2 Nm at 12.0 ms
Min: -47.5 Nm at 59.2 ms

Specification Source: CFR49 Part 572 Subpart P
with Polarity in accordance with J211

02.07.2013 14:27:46 923

