

REPORT NUMBER: NCAPCHILD-MGA-2004-011

**NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST**

**Evenflo Vanguard 5
Britax Wizard**

NHTSA NUMBER: M50100

**PREPARED BY:
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5000 WARREN ROAD
BURLINGTON, WI 53105**



Test Date: April 6, 2004

Report Date: April 16, 2004

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
RULEMAKING
OFFICE OF CRASHWORTHINESS STANDARDS
400 SEVENTH STREET, SW, ROOM 5311
WASHINGTON, D.C. 20590**

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Manager, New Car Assessment Program

Date of Acceptance

COTR, NCAP Frontal Impact Program

Date of Acceptance

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16. Abstract The subjects CRS Evenflo Vanguard 5 and Britax Wizard were tested in conjunction with a Frontal NCAP test in support of research in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the determination of CRS crashworthiness. This test was conducted at MGA Research Corporation in Burlington, Wisconsin on April 6, 2004, in conjunction with frontal NCAP.																					
<table border="1" style="margin: auto; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Measurement Description</th> <th style="text-align: left;">Units</th> <th style="text-align: left;">Pos. 3 ATD</th> <th style="text-align: left;">Pos. 4 ATD</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC36)</td> <td>N/A</td> <td>765.1</td> <td>616.6</td> </tr> <tr> <td>Head Injury Criteria (HIC15)</td> <td>N/A</td> <td>423.9</td> <td>340.9</td> </tr> <tr> <td>Max. Thorax Accel. (3msec Clip)</td> <td>G's</td> <td>42.9</td> <td>39.4</td> </tr> </tbody> </table>						Measurement Description	Units	Pos. 3 ATD	Pos. 4 ATD	Head Injury Criteria (HIC36)	N/A	765.1	616.6	Head Injury Criteria (HIC15)	N/A	423.9	340.9	Max. Thorax Accel. (3msec Clip)	G's	42.9	39.4
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SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

The purpose of this test was to obtain CRS performance data in a frontal impact NCAP condition.

This 56.3 km/h frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number DTNH22-01-D-12005.

SUMMARY

Both child dummies were instrumented with head, chest, and pelvic triaxial accelerometers. In addition, both dummies had six upper axial neck force and moment sensors.

The right rear (Position 3) child dummy (S/N 40) and left rear (Position 4) child dummy (S/N 42) were calibrated previous to this test. Child dummy certification information is found in Appendix C.

The right rear child dummy's HIC36 was 765.1; maximum chest deceleration over 3 msec was 42.9 g's. The left rear child dummy's HIC36 was 616.6. The maximum chest deceleration over 3 msec was 39.4 g's. Position 3 and Position 4 were forward facing and used the vehicle LATCH and top tether for attachments.

TEST NOTES

The data plots have been plotted to 300ms because some activity was noticed on the plots around 200ms.

No valid data was collected for LRP Child Upper Neck Z after 120 msec.

SECTION 2

DATA SHEET NO. 1 CRASH TEST SUMMARY

TEST DUMMY INFORMATION

Description	Position 3 CRS	Position 4 CRS
Dummy Type / Serial No.	HIII 3 Year Old / 40	HIII 3 Year Old / 42
Number of Data Channels	22	22
Restraint System	Evenflo Vanguard 5 (Forward Facing)	Britax Wizard (Forward Facing)

16 MM CAMERA COVERAGE

High Speed	16
Real Time	1
Total	17

POST TEST DOOR OPENING

Description	Driver	Passenger
Locked/Unlocked Doors	Doors were unlocked	Doors were unlocked
Front Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
Rear Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
Seat Track Shift (mm)	0	0
Seat Back Failure	None	None
Glazing Damage	The windshield cracked	

POST TEST SEAT DATA

Location	Seat Movement (mm)	Seat Back Failure
P1 (Left Front)	0	None
P2 (Right Front)	0	None
P3 (Right Rear)	0	None
P4 (Left Rear)	0	None

VISIBLE DUMMY CONTACT POINTS

Description	Position 3 CRS (S/N 40)	Position 4 CRS (S/N 42)
Head Contact	Back of head to CRS	Back of head to CRS
Upper Torso Contact	None	None
Lower Torso Contact	None	None
Left Foot Contact	Passenger seat back	Driver seat back
Right Foot Contact	Passenger seat back	Driver seat back

SECTION 2... (continued)**DATA SHEET NO. 2
CRS PARAMETER DATA**

Child Restraint System (Position 3)	Evenflo Vanguard 5 (Forward Facing)
Child Restraint System (Position 4)	Britax Wizard (Forward Facing)
NHTSA No.	M50100

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1730.5
Weight of 2 P572E ATDs	kg	156.0
Rated Cargo/Luggage Weight (RCLW)	kg	136.1
Calculated Vehicle Target Weight (TVTW)	kg	2022.6

TEST VEHICLE WEIGHTS

	Units	As Tested (ATW) (Axle)		
		Front	Rear	Total
Left	kg	531.2	489.4	
Right	kg	527.1	466.8	
Ratio	%	52.5	47.5	
Totals	kg	1058.3	956.2	2014.5

As tested weight of vehicle includes two 50th percentile ATDs, two 3 year old with CRS, cargo, equipment and instrumentation.

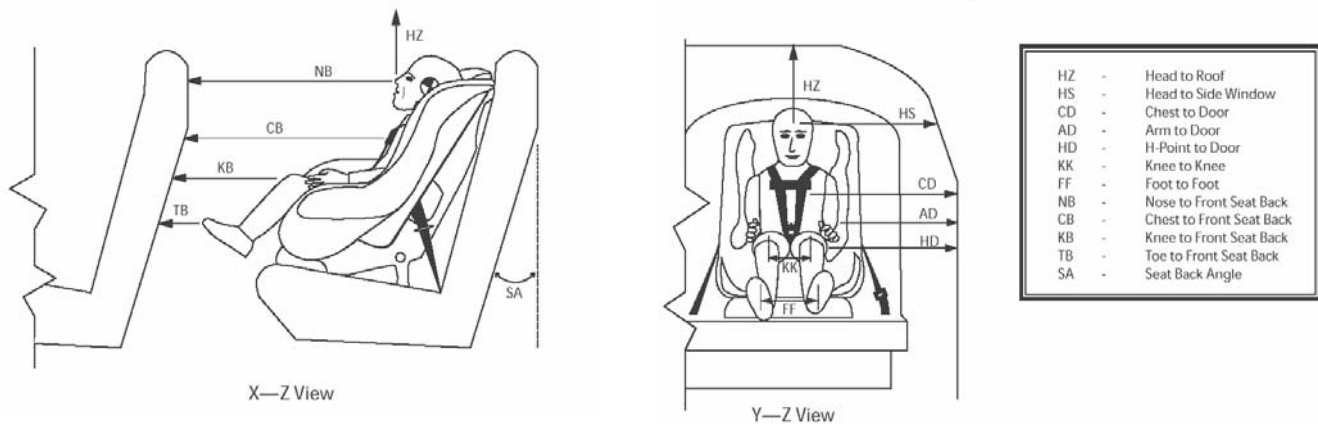
CHEST CLIP DISPLACEMENT

	Units	Left	Right
Right Child Dummy	mm	65	69
Left Child Dummy	mm	81	86

SECTION 2... (continued)
DATA SHEET NO. 3
CHILD DUMMY POSITIONING IN VEHICLE

Child Restraint System (Position 3)	Evenflo Vanguard 5 (Forward Facing)
NHTSA No.	M50100

Dummy Measurements for CRS Passengers



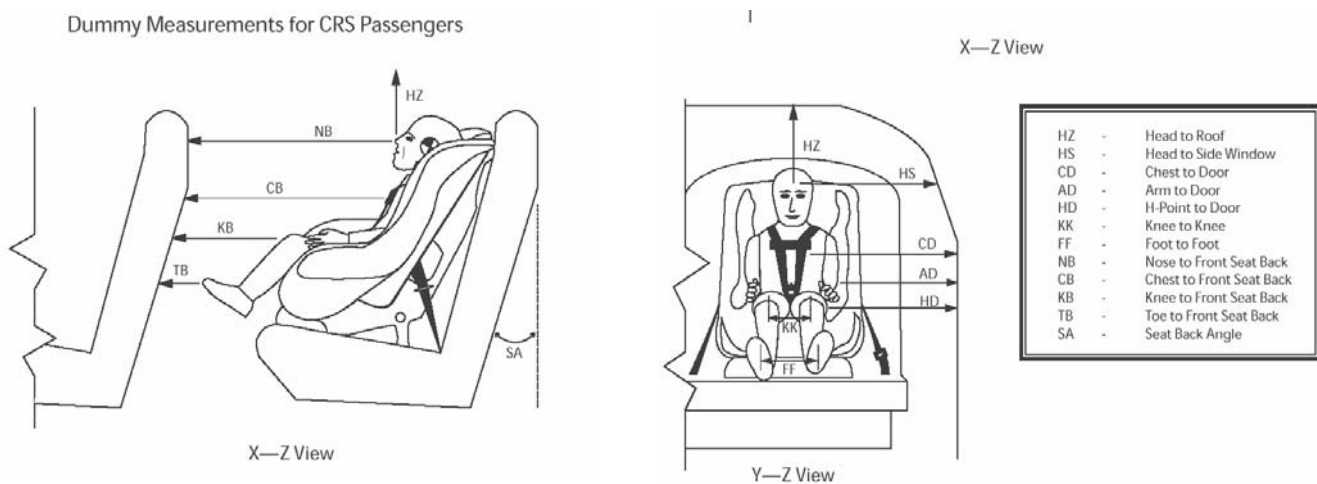
Measurement	Pre-Test (mm)	Post-Test (mm)
	P3 CRS (40)	P3 CRS (40)
SA (deg)	8.1	8.1
HS	386	385
CD	337	357
AD	188	215
HD	244	281
HZ	377	374
NB	697	708
CB	661	678
KK	188	169
FF	172	215
KB - LEFT	437	471
KB - RIGHT	431	436
TB - LEFT	182	222
TB - RIGHT	181	237

All dimensions in mm (unless noted)
P3 – Right Rear Passenger (Forward Facing)

SECTION 2... (continued)
DATA SHEET NO. 3
CHILD DUMMY POSITIONING IN VEHICLE

Child Restraint System (Position 4)	Britax Wizard (Forward Facing)
NHTSA No.	M50100

Dummy Measurements for CRS Passengers



Measurement	Pre-Test (mm)	Post-Test (mm)
	P4 CRS (42)	P4 CRS (42)
SA (deg)	8.1	8.1
HS	386	381
CD	345	355
AD	192	204
HD	248	244
HZ	341	343
NB	860	711
CB	633	694
KK	193	159
FF	192	166
KB - LEFT	384	449
KB - RIGHT	382	447
TB - LEFT	132	194
TB - RIGHT	127	214

All dimensions in mm (unless noted)
P4 – Left Rear Passenger (Forward facing)

DATA SHEET NO. 4
CHILD DUMMY INJURY CRITERIA VALUES

Child Restraint System (Position 3)	Evenflo Vanguard 5
Child Restraint System (Position 4)	Britax Wizard
NHTSA No.	M50100

HEAD PEAK ACCELERATIONS

Location	Axis	Units	Position 3				Position 4			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	50.1	207	-34.2	111	82.1	201	-32.7	122
Head CG	Y	G's	3.5	254	-4.5	85	3.2	183	-4.2	200
Head CG	Z	G's	53.7	107	-3.1	57	53.7	95	-6.8	62
Resultant	N/A	G's	63.1	107			87.4	201		

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Position 3				Position 4			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	N	23	180	-818	111	52	236	-871	125
Neck Force	Y	N	35	139	-126	92	47	257	-127	127
Neck Force	Z	N	1940	107	-214	250	*	*	*	*
Resultant	N/A	N	2103	107			*	*		
Neck Moment	X	N•m	7.7	214	-10.4	99	2.7	263	-5.4	94
Neck Moment	Y	N•m	3.8	158	-14.4	218	3.9	157	-17.5	208
Neck Moment	Z	N•m	4.3	121	-1.8	276	1.7	233	-2.4	49
Resultant	N/A	N•m	15.6	217			17.5	208		

* No valid data collected after 120 ms

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Position 3				Position 4			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	10.8	253	-37.1	79	11.5	213	-34.8	92
Chest CG	Y	G's	3.5	244	-8.4	78	3.5	99	-2.3	125
Chest CG	Z	G's	18.4	210	-25.1	95	32.2	64	-19.1	204
Resultant	N/A	G's	44.5	95			40.1	64		

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Position 3				Position 4			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest	X	mm			-16.3	129			-14.7	131

SECTION 2... (continued)

**DATA SHEET NO. 4... (continued)
CHILD DUMMY INJURY CRITERIA VALUES**

Child Restraint System (Position 3)	Evenflo Vanguard 5
Child Restraint System (Position 4)	Britax Wizard
NHTSA No.	M50100

TETHER FORCE

Location	Axis	Units	Position 3				Position 4			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Tether Force	N/A	N					133	94	-28	279
Right Tether Force	N/A	N	318	124	-41	210	313	66	-38	212

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Position 3				Position 4			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	6.5	131	-58.1	75	8.4	188	-34.7	68
Pelvis	Y	G's	9.6	113	-10.1	75	7.9	201	-8.4	105
Pelvis	Z	G's	18.8	210	-29.3	96	22.9	205	-34.4	66
Resultant	N/A	G's	61.7	75			48.6	66		

HEAD PEAK REDUNDANT ACCELERATIONS

Location	Axis	Units	Position 3				Position 4			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	50.5	207	-34.9	102	83.1	201	-32.8	123
Head CG	Y	G's	3.7	254	-6.1	88	8.0	56	-4.9	86
Head CG	Z	G's	54.3	104	-3.0	56	54.5	95	-3.6	53
Resultant	N/A	G's	64.4	103			88.8	201		

CHEST PEAK REDUNDANT ACCELERATIONS

Location	Axis	Units	Position 3				Position 4			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	10.7	253	-36.3	79	11.6	213	-35.3	90
Chest CG	Y	G's	3.4	340	-8.5	78	3.9	99	-2.9	125
Chest CG	Z	G's	18.3	210	-24.7	95	32.0	65	-19.0	204
Resultant	N/A	G's	43.5	95			40.2	64		

SECTION 2... (continued)**DATA SHEET NO. 4... (continued)
CHILD DUMMY INJURY CRITERIA VALUES**

Child Restraint System (Position 3)	Evenflo Vanguard 5
Child Restraint System (Position 4)	Britax Wizard
NHTSA No.	M50100

HEAD INJURY CRITERIA (HIC36)

Location	HIC	T ¹ (msec)	T ² (msec)	Average Acceleration (G's)
Position 3 - Right	765.1	85.1	121.1	53.8
Position 4 – Left	616.6	75.4	111.4	49.4

HIC is as defined in FMVSS 208. The maximum time interval from t1 to t2 is 36 milliseconds.

HEAD INJURY CRITERIA (HIC15)

Location	HIC	T ¹ (msec)	T ² (msec)	Average Acceleration (G's)
Position 3 - Right	423.9	94.9	109.9	60.3
Position 4 – Left	340.9	86.8	101.8	55.3

HIC is as defined in FMVSS 208. The maximum time interval from t1 to t2 is 15 milliseconds.

CLIP SUMMARY

Location	CLIP	T ¹ (msec)	T ² (msec)
Position 3 - Right	42.9	93.7	96.7
Position 4 – Left	39.4	62.2	65.2

The maximum chest resultant acceleration is defined as the maximum acceleration, which exceeds 0.003 seconds in duration.

SECTION 2... (continued)

**DATA SHEET NO. 5
CRS PERFORMANCE DATA**

Child Restraint System (Position 3)	Evenflo Vanguard 5 (Forward Facing)
Child Restraint System (Position 4)	Britax Wizard(Forward Facing)
NHTSA No.	M50100

POSITION 3 CRS POST-TEST INSPECTION

Location	Damage	Remarks
Upper Tether Strap	None	
Upper Tether Buckle	None	
Upper Tether Hook	None	
Vehicle Upper Tether Anchor	None	
Lower Anchor Strap	None	
Lower Anchor Buckle	None	
Lower Anchor Hooks	None	
Vehicle Lower CRS Anchors	None	
Five Point Harness Connections	None	
Cracks on CRS	None	
Fabric Tears on CRS	None	
Vehicle Seat Structure	None	
Vehicle Seat Fabric Tears	None	
Child Dummy	None	

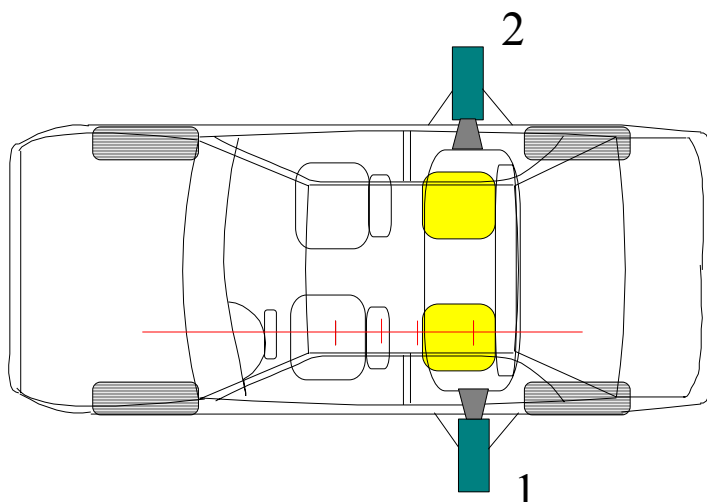
POSITION 4 CRS POST-TEST INSPECTION

Location	Damage	Remarks
Upper Tether Strap	None	
Upper Tether Buckle	None	
Upper Tether Hook	None	
Vehicle Upper Tether Anchor	None	
Lower Anchor Strap	None	
Lower Anchor Buckle	None	
Lower Anchor Hooks	None	
Vehicle Lower CRS Anchors	None	
Five Point Harness Connections	None	
Cracks on CRS	None	
Fabric Tears on CRS	None	
Vehicle Seat Structure	None	
Vehicle Seat Fabric Tears	None	
Child Dummy	None	

SECTION 2... (continued)

DATA SHEET NO. 6 CRS CAMERA DATA

Child Restraint System (Position 3)	Evenflo Vanguard 5 (Forward Facing)
Child Restraint System (Position 4)	Britax Wizard (Forward Facing)
NHTSA No.	M50100



No.	Camera View	Location (mm) *			Angle (deg)	Lens (mm)	Speed (fps)
		X	Y	Z			
1	Left Side CRS Lateral View					13	518
2	Right Side CRS Lateral View					13	505

*COORDINATES:

+X = film plane rearward of barrier

+Y = film plane to right of monorail centerline

+Z = film plane above ground level

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PHOTOGRAPHS

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ddressed and we've paid the postage

Tear off and mail this part

addressee

Tear off and mail this part

st fill in your name and address. PLEASE PRINT

address

State

Zip Code

you may register your
it system via the Internet
www.evenflo.com.

ed the model number and
nufacture (both of which
the card below).

25804620 5/03

Manufactured in 01DEC03
Model # 3691261 P1

Close-up View of Position 3 CRS Label

A-2.



Pre-Test Front View of Position 3 CRS



Post-Test Front View of Position 3 CRS



Pre-Test Rear View of Position 3 CRS



Post-Test Rear View of Position 3 CRS



Pre-Test Left Side View of Position 3 CRS



Post-Test Left Side View of Position 3 CRS

A-8.



Pre-Test Right Side View of Position 3 CRS

A-9.



Post-Test Right Side View of Position 3 CRS

Street Address: _____

_____ State: _____ Zip Code: _____



CHILD RESTRAINT REGISTRATION CARD

RESTRAINT MODEL: E9L0762
SERIAL NUMBER: E9L07623527
MANUFACTURED IN: Dec 04, 2003
BATCH NUMBER: 504764

Check

☐

I have been trained by the store in the
installation of this restraint.

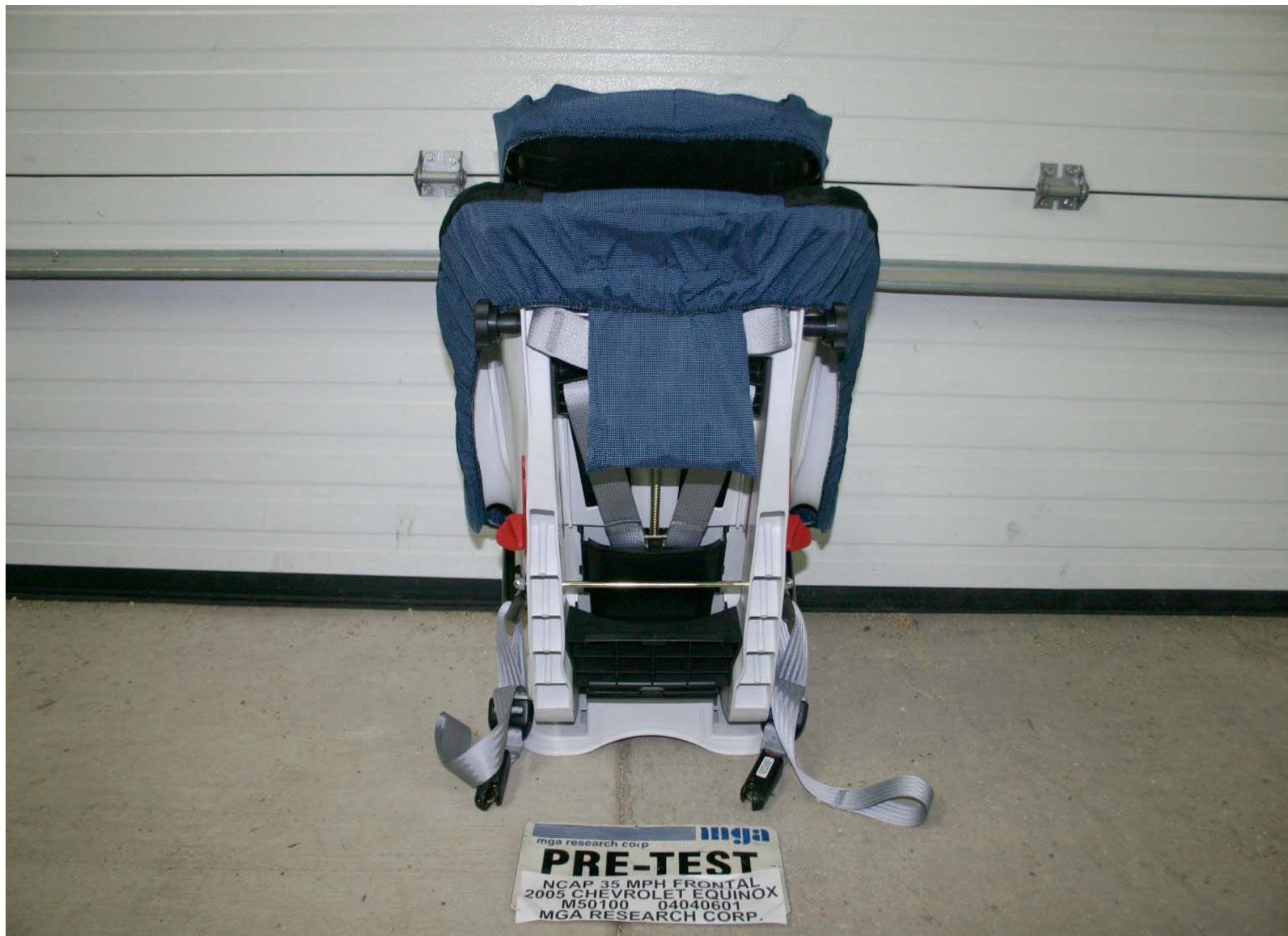
A-11.



Pre-Test Front View of Position 4 CRS



Post-Test Front View of Position 4 CRS



Pre-Test Rear View of Position 4 CRS



Post-Test Rear View of Position 4 CRS



Pre-Test Left Side View of Position 4 CRS



Post-Test Left Side View of Position 4 CRS



Pre-Test Right Side View of Position 4 CRS



Post-Test Right Side View of Position 4 CRS



Pre-Test Position 3 Left Side View



Post-Test Position 3 Left Side View



Pre-Test Position 4 Left Side View



Post-Test Position 4 Left Side View



Pre-Test Position 3 Right Side View



Post-Test Position 3 Right Side View



Pre-Test Position 4 Right Side View



Post-Test Position 4 Right Side View



Post-Test Position 3 Front $\frac{3}{4}$ View



Post-Test Position 4 Front $\frac{3}{4}$ View



Post-Test Position 3 Foot Contact View

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CHILD DUMMY RESPONSE DATA TRACES

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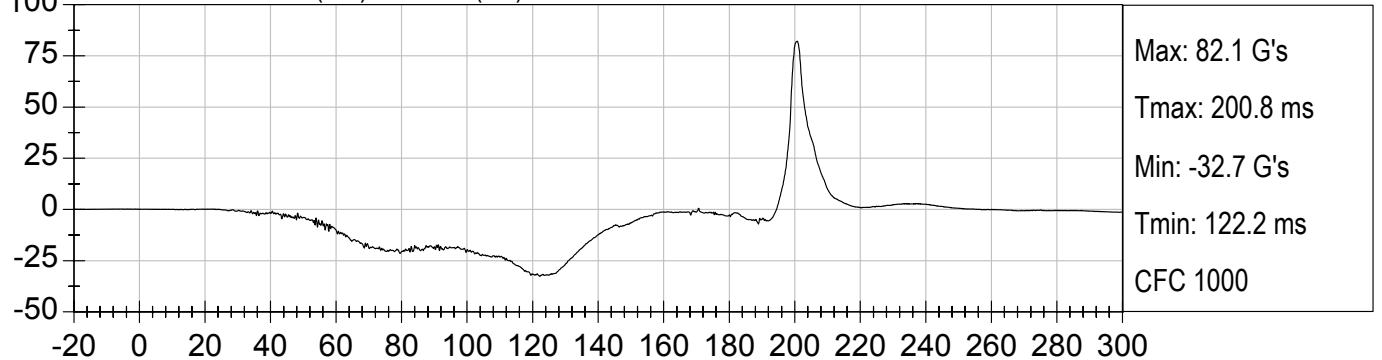
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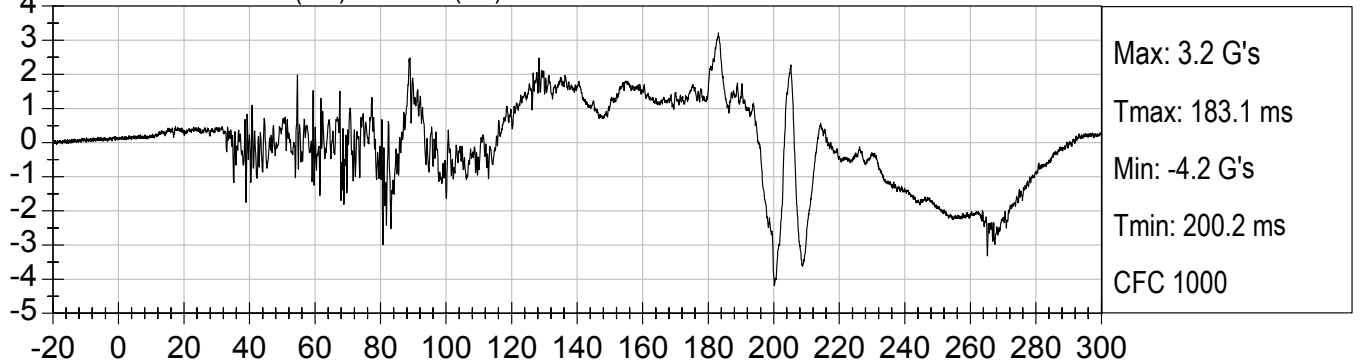
35MPH FRONTAL IMPACT
2005 CHEVROLET EQUINOX (M50100)

Test Date: 4/6/2004
Speed: 35.0 mph (56.3 km/h)

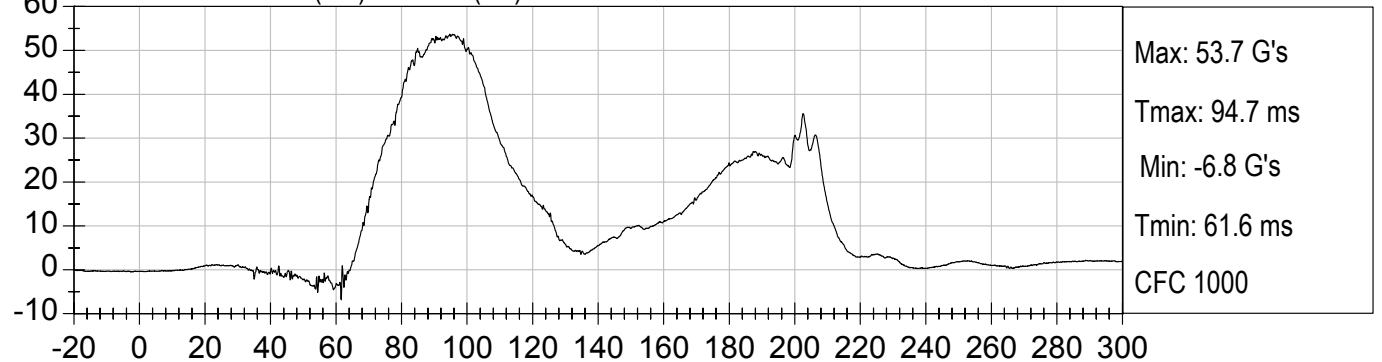
LRP CHILD HEAD X (G's) vs TIME (ms)



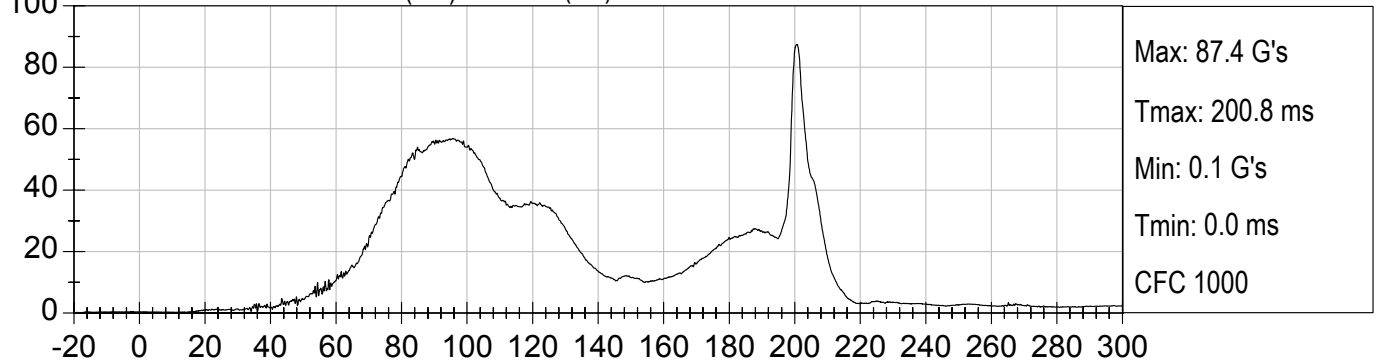
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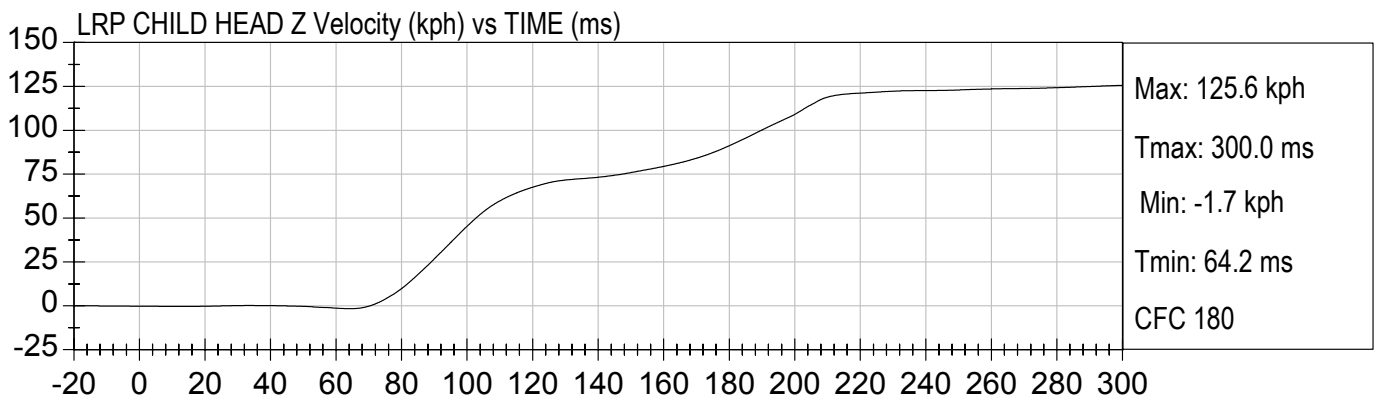
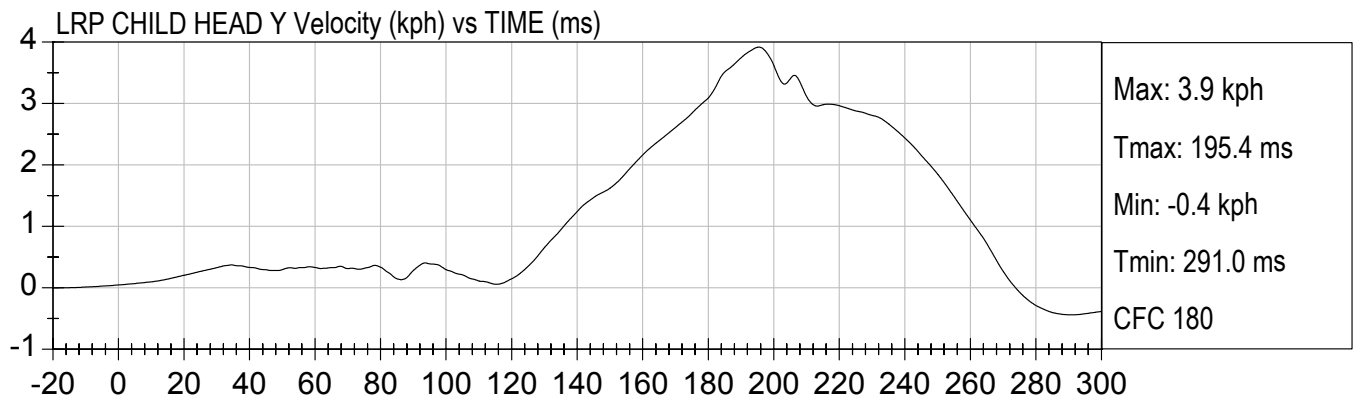
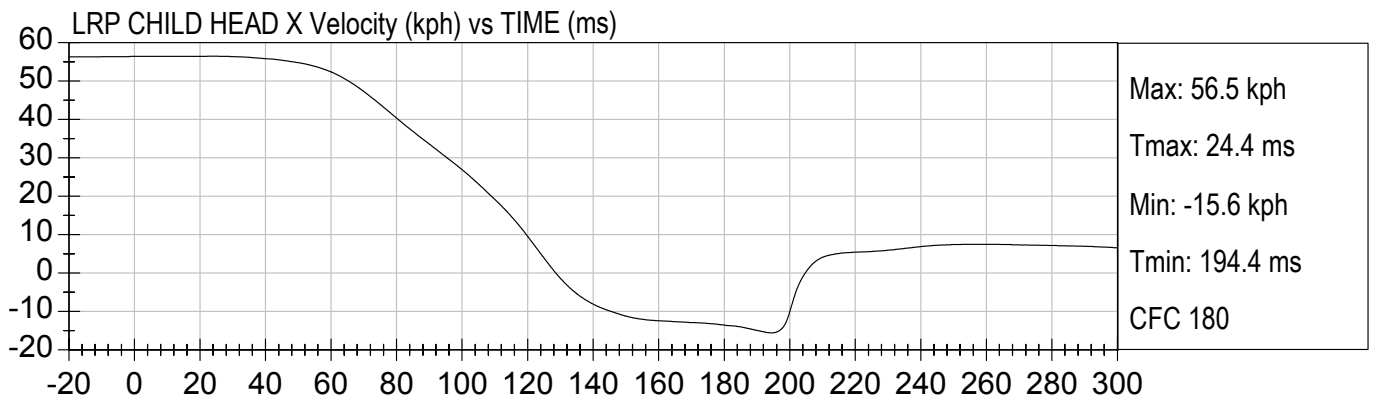


LRP CHILD HEAD Z (G's) vs TIME (ms)



LRP CHILD HEAD Resultant (G's) vs TIME (ms)



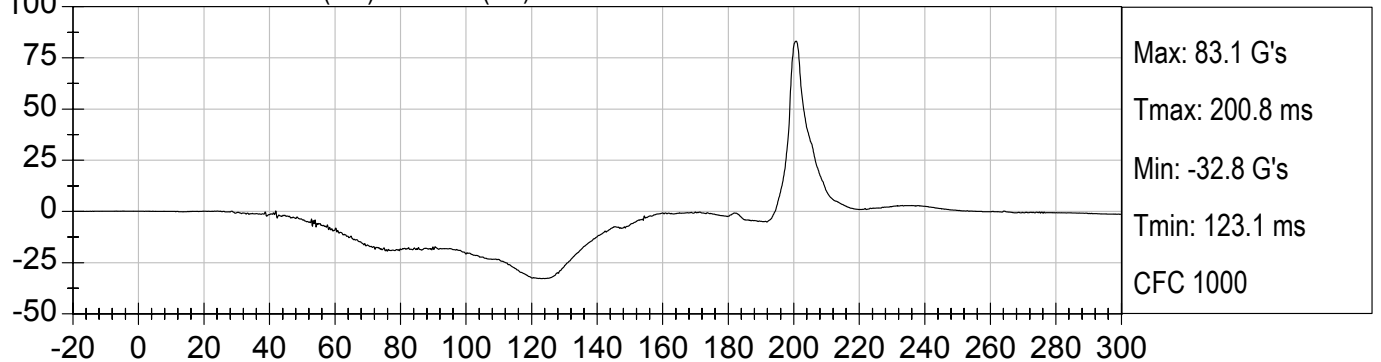




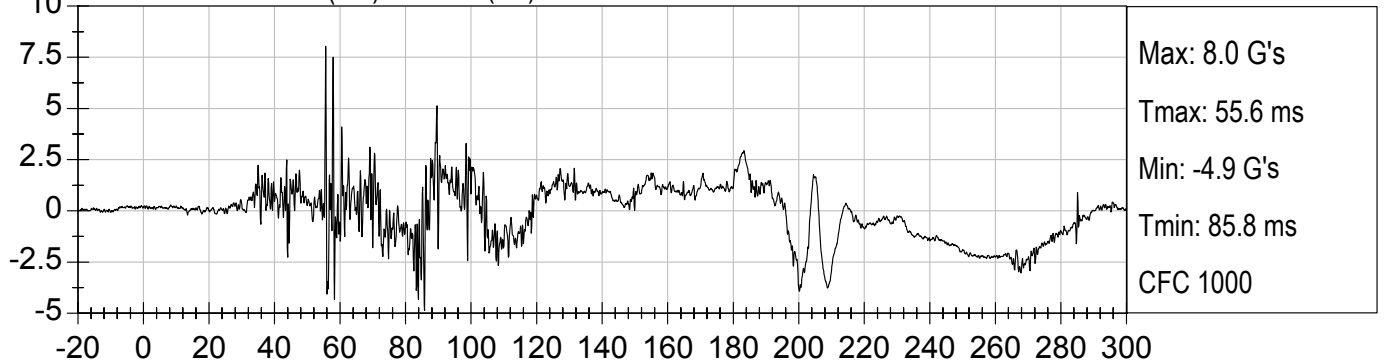
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2005 CHEVROLET EQUINOX (M50100)

Test Date: 4/6/2004
Speed: 35.0 mph (56.3 km/h)

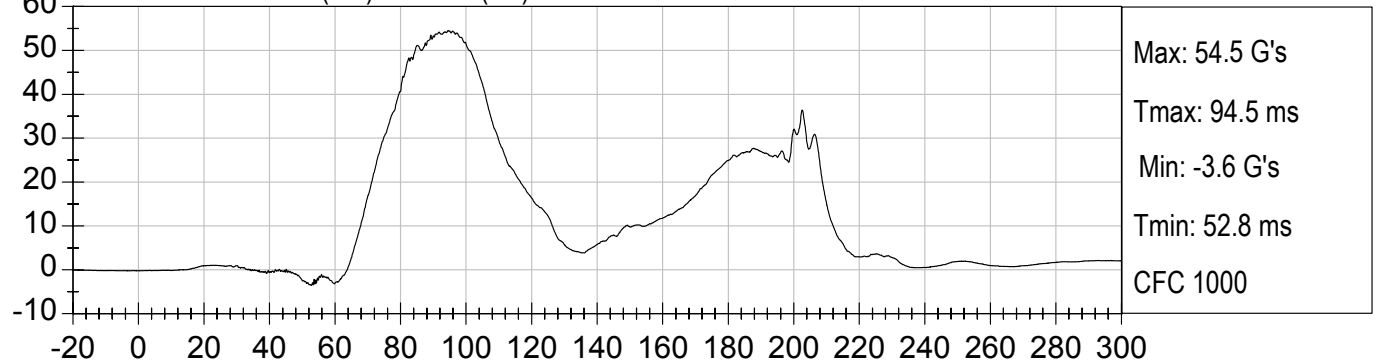
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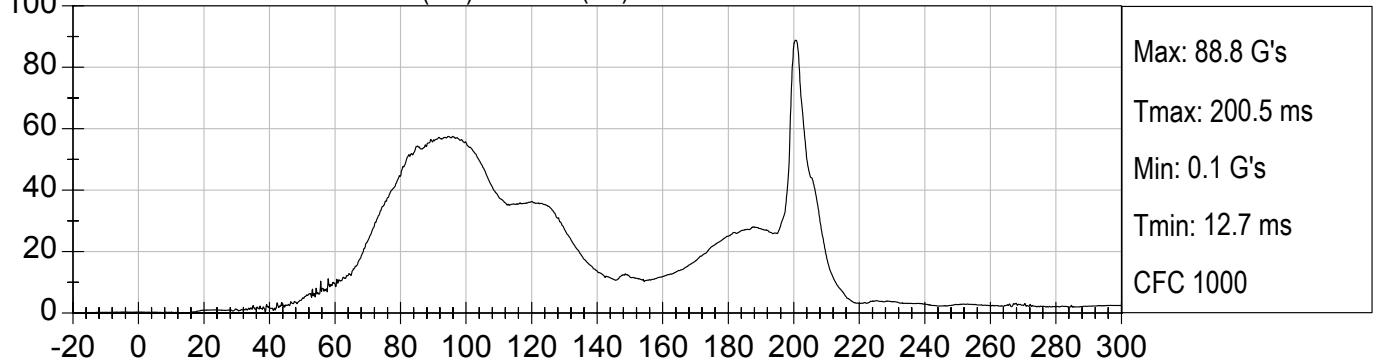
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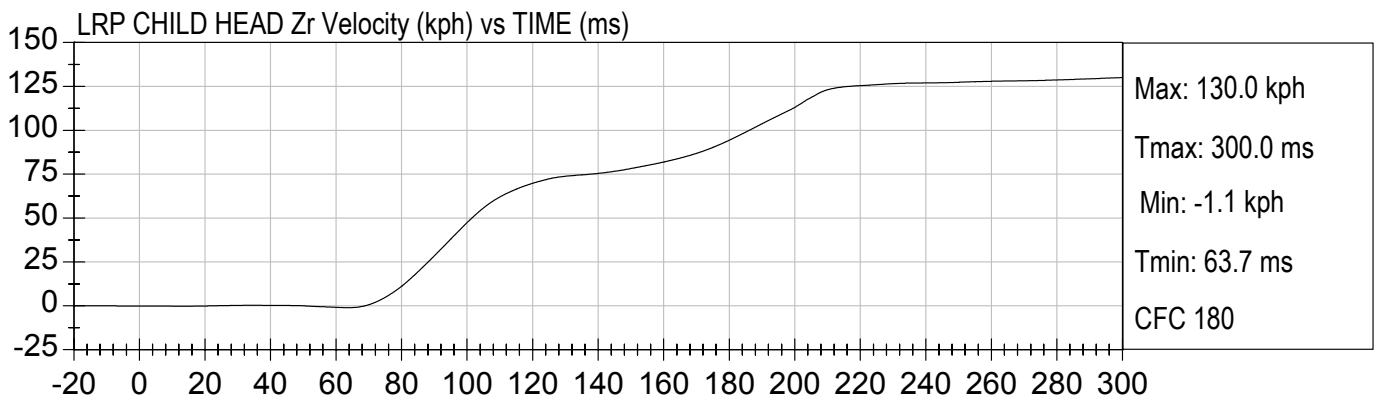
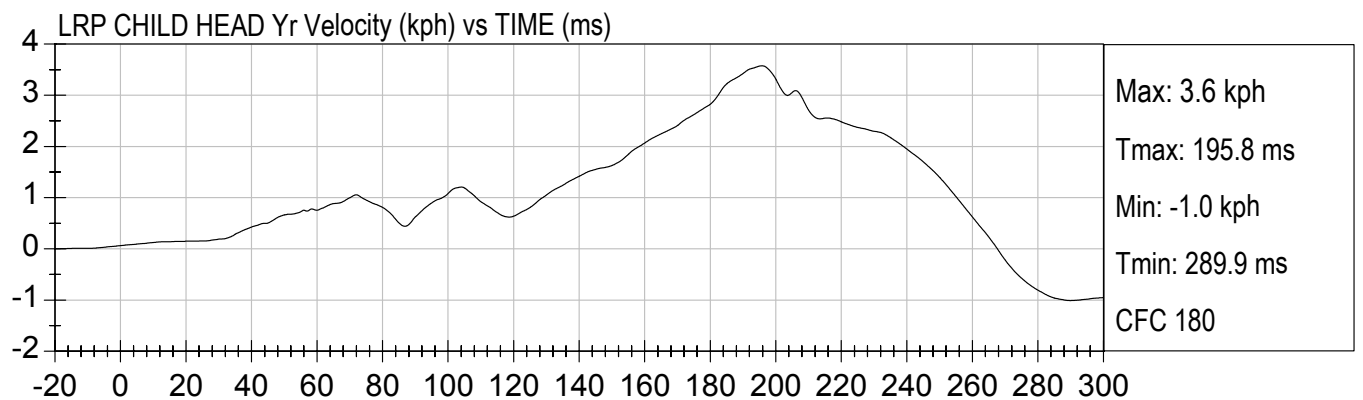
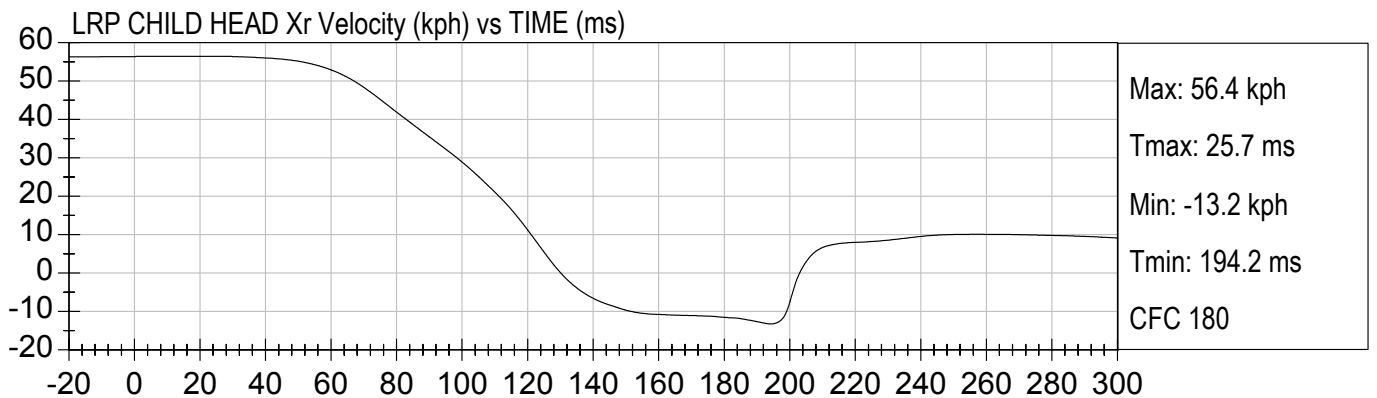


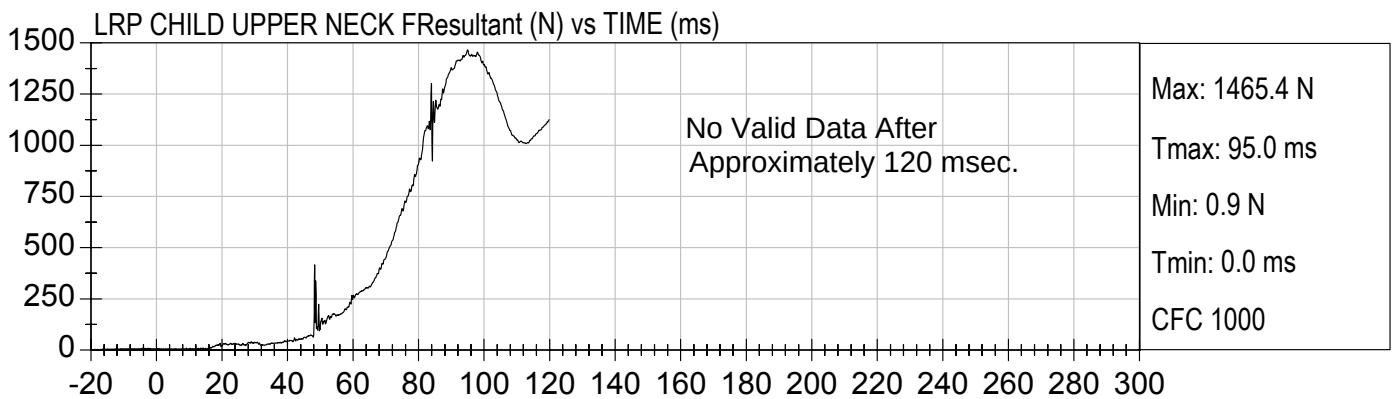
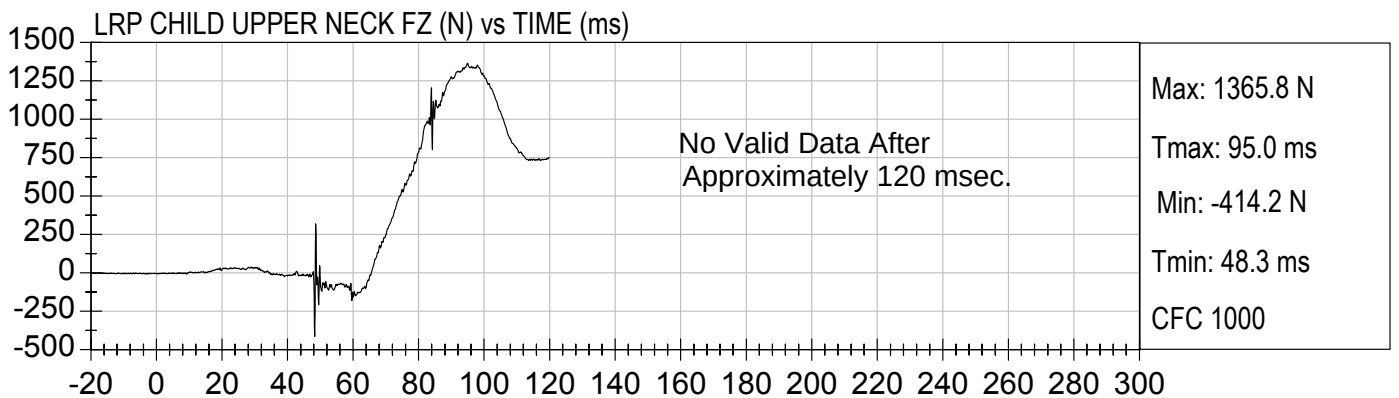
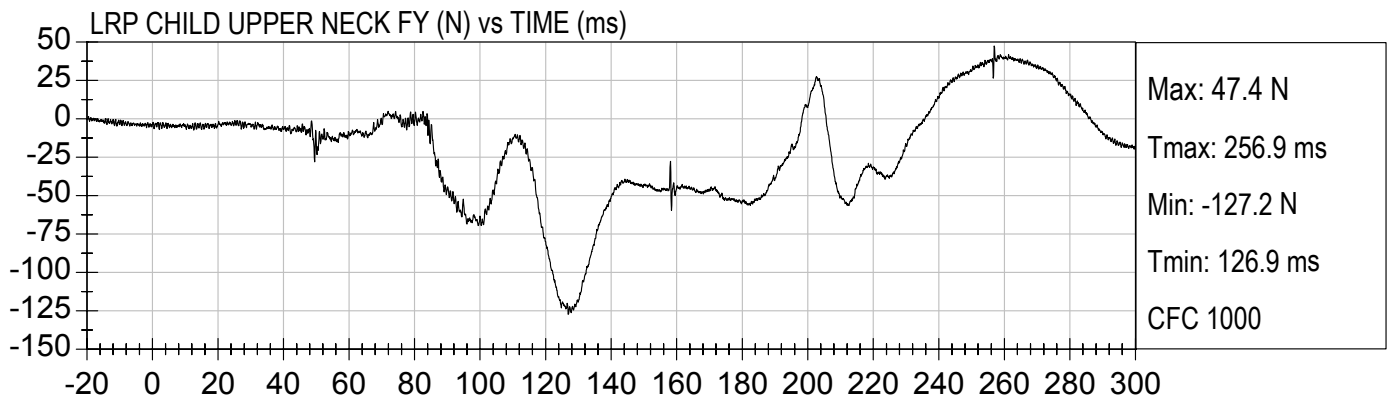
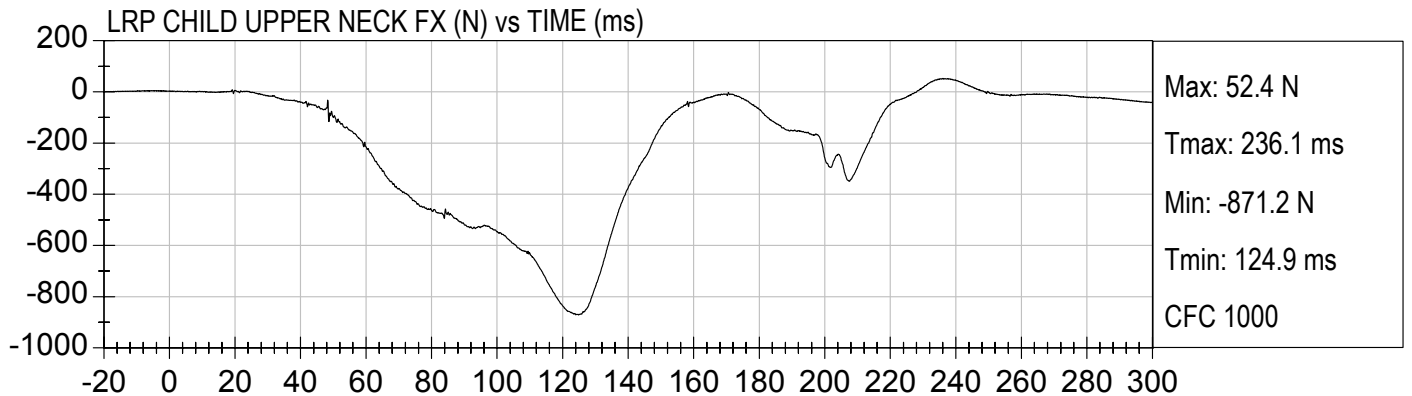
LRP CHILD HEAD Zr (G's) vs TIME (ms)



LRP CHILD HEAD ResultantR (G's) vs TIME (ms)



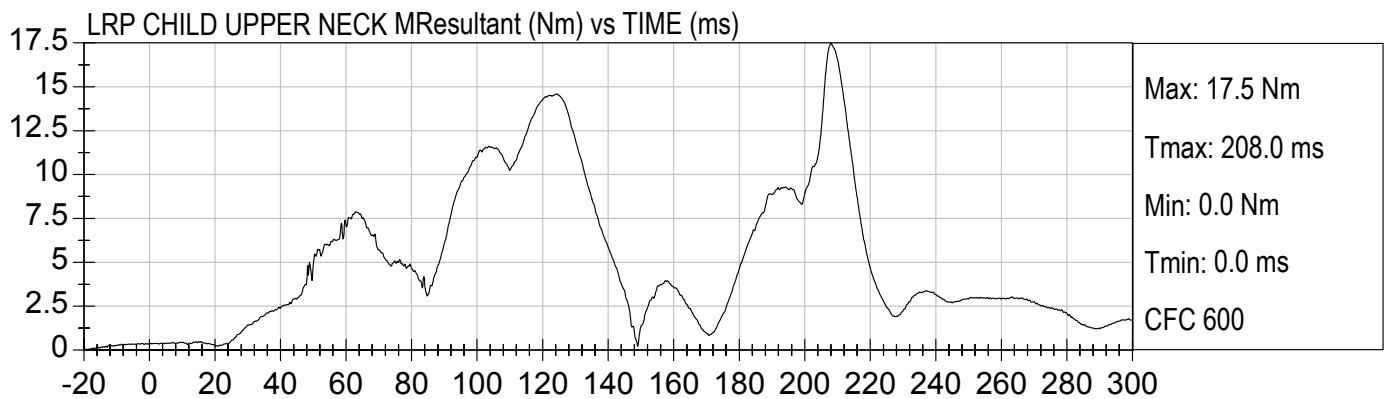
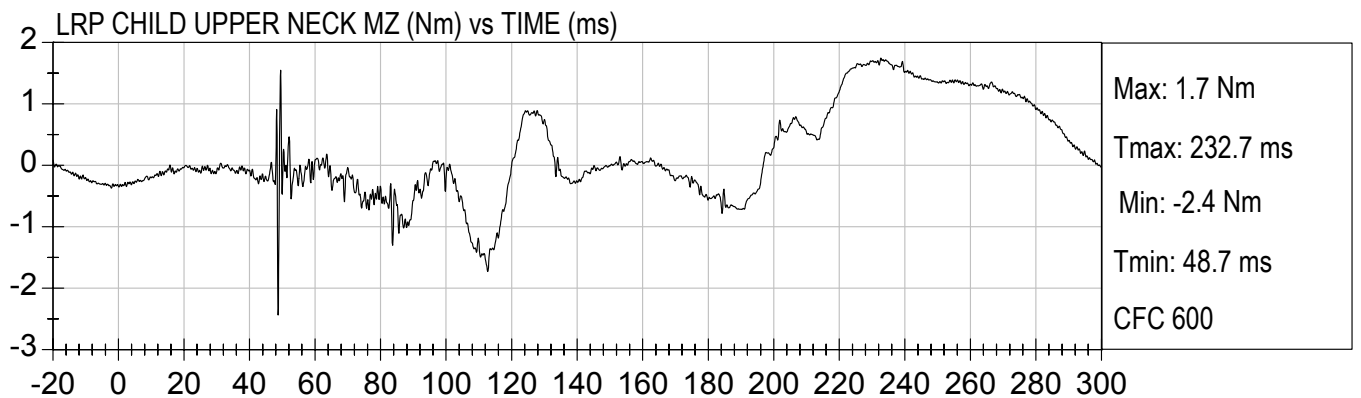
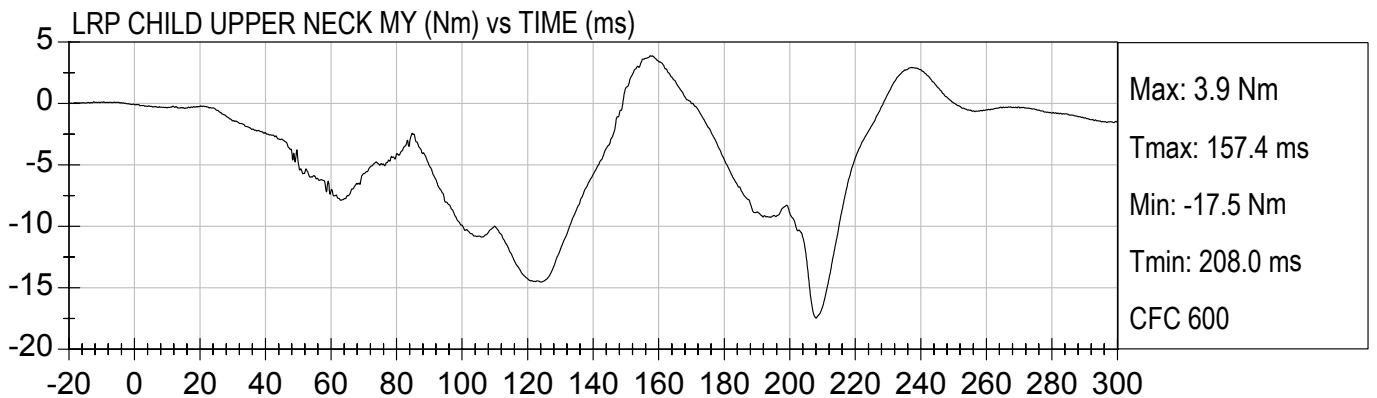
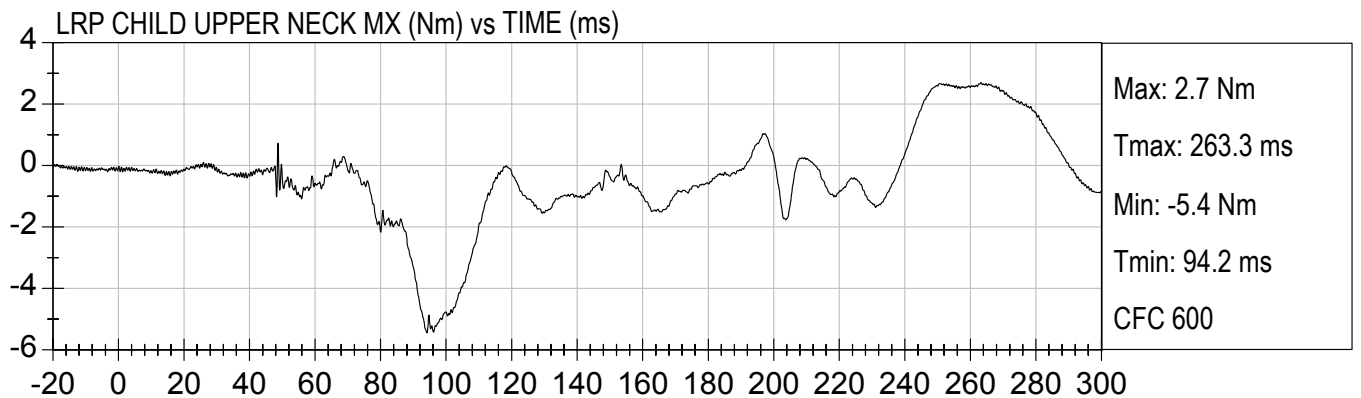






35MPH FRONTAL IMPACT
2005 CHEVROLET EQUINOX (M50100)

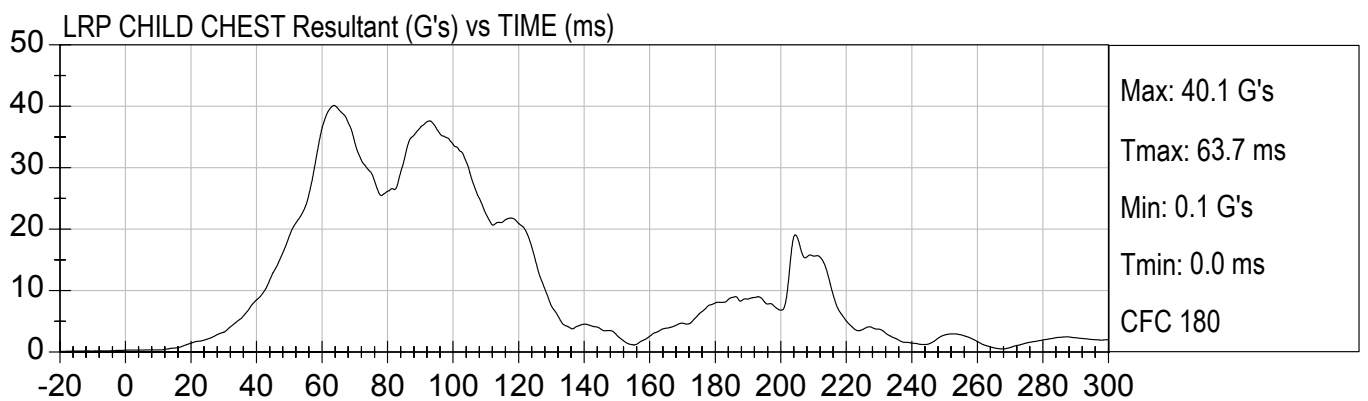
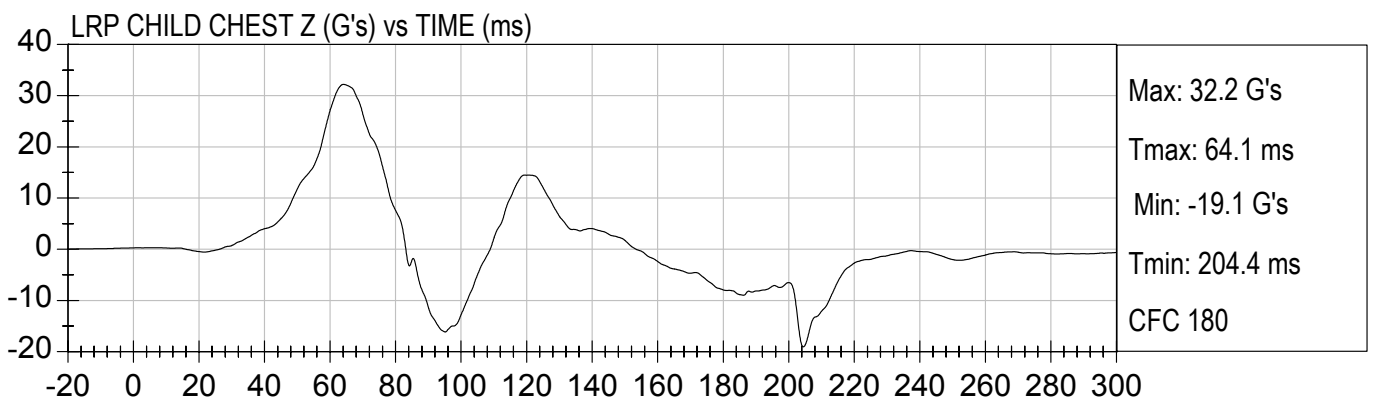
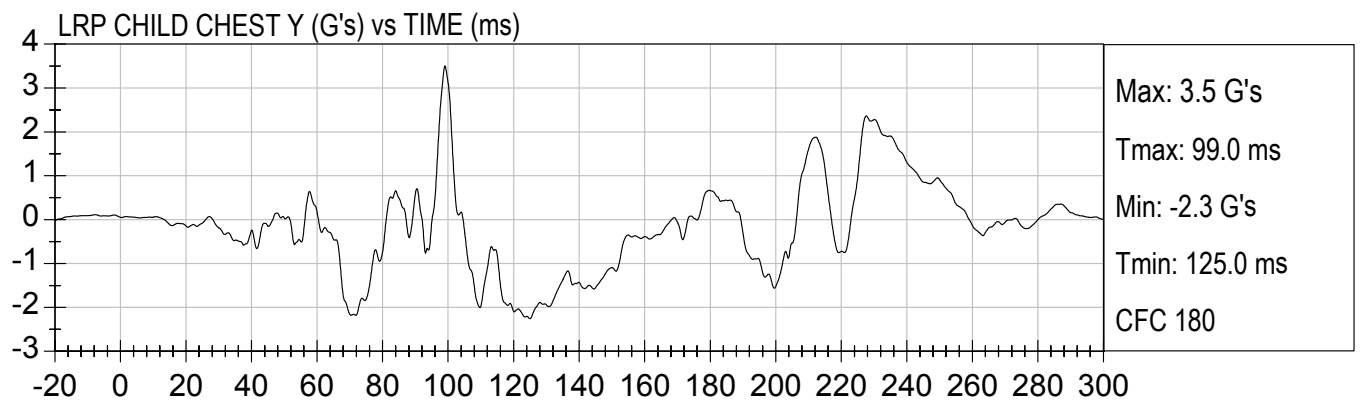
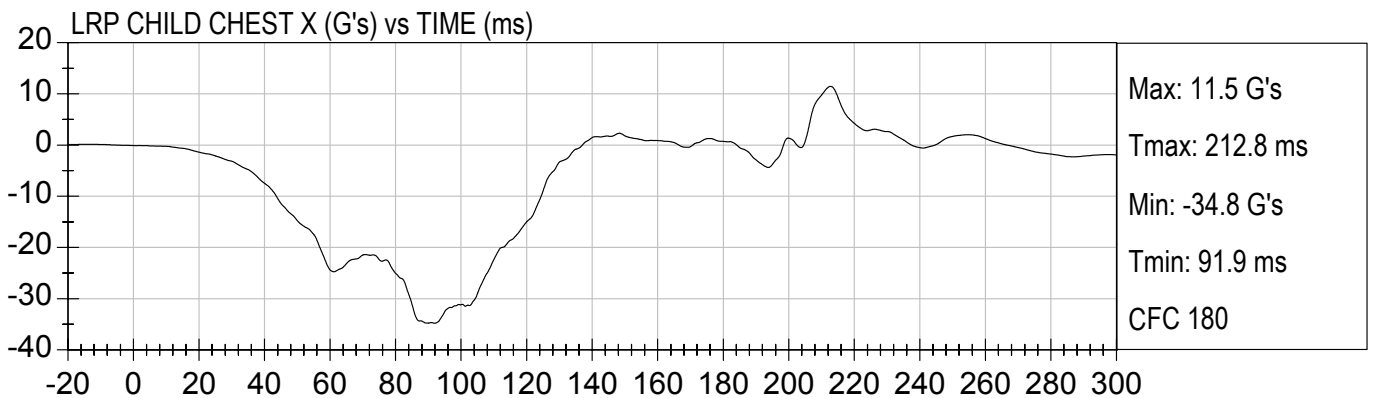
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Speed: 35.0 mph (56.3 km/h)





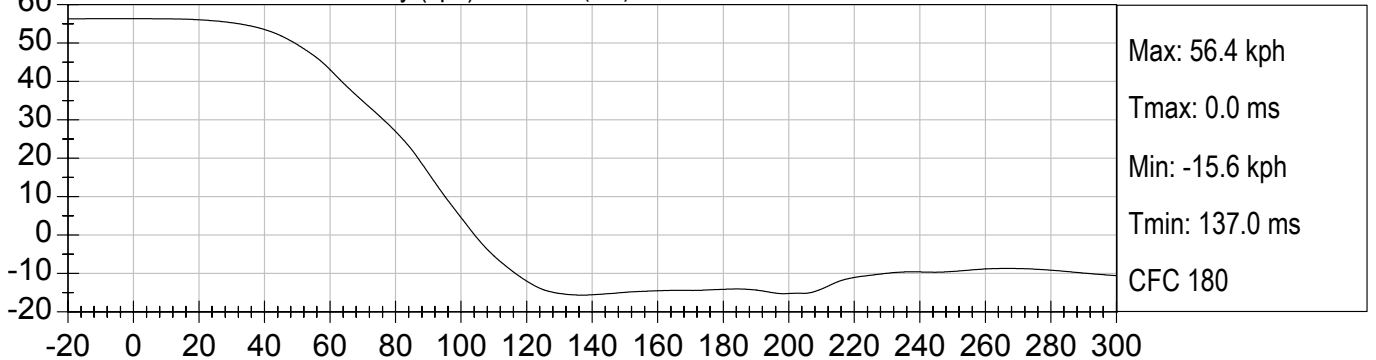
35MPH FRONTAL IMPACT
2005 CHEVROLET EQUINOX (M50100)

Test Date: 4/6/2004
Speed: 35.0 mph (56.3 km/h)

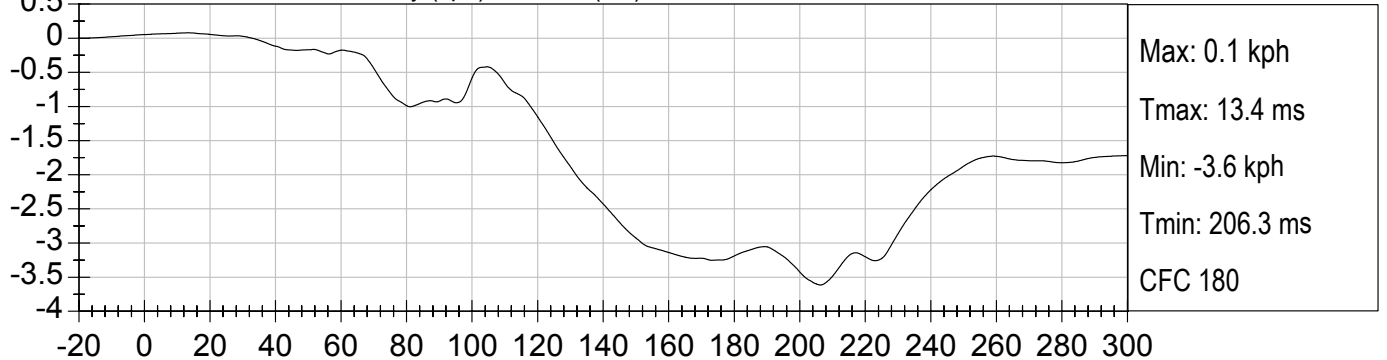




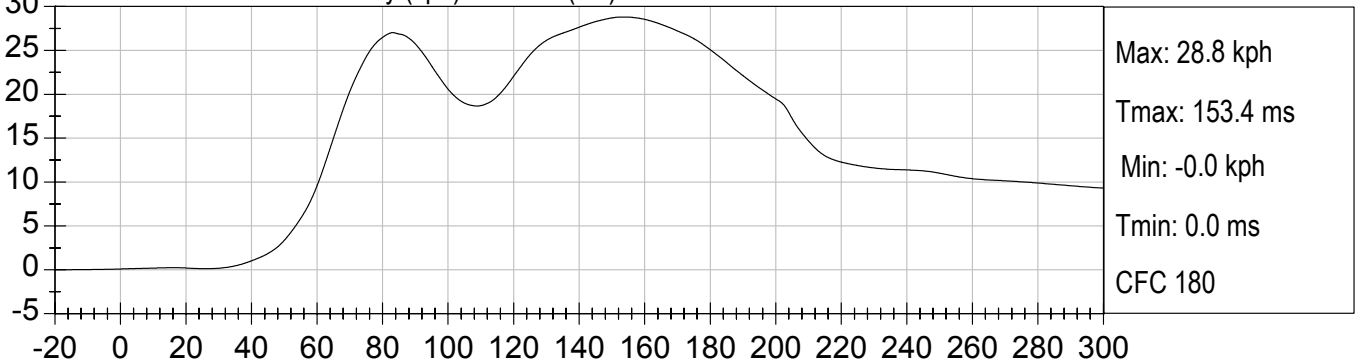
LRP CHILD CHEST X Velocity (kph) vs TIME (ms)



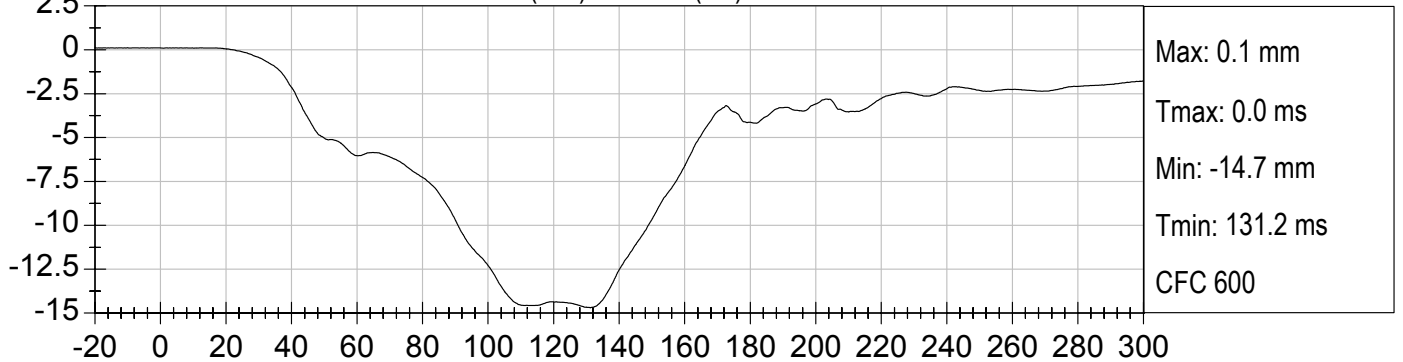
LRP CHILD CHEST Y Velocity (kph) vs TIME (ms)



LRP CHILD CHEST Z Velocity (kph) vs TIME (ms)



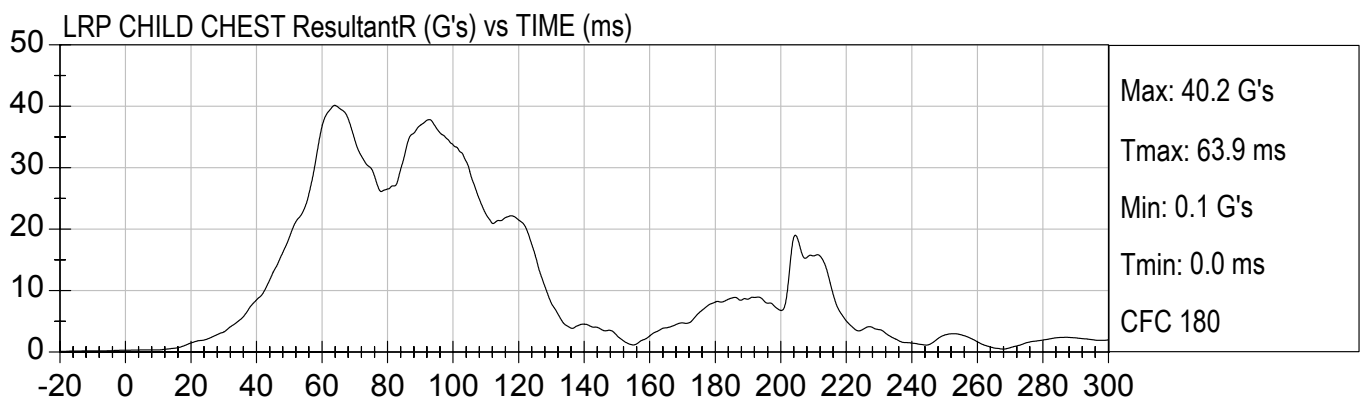
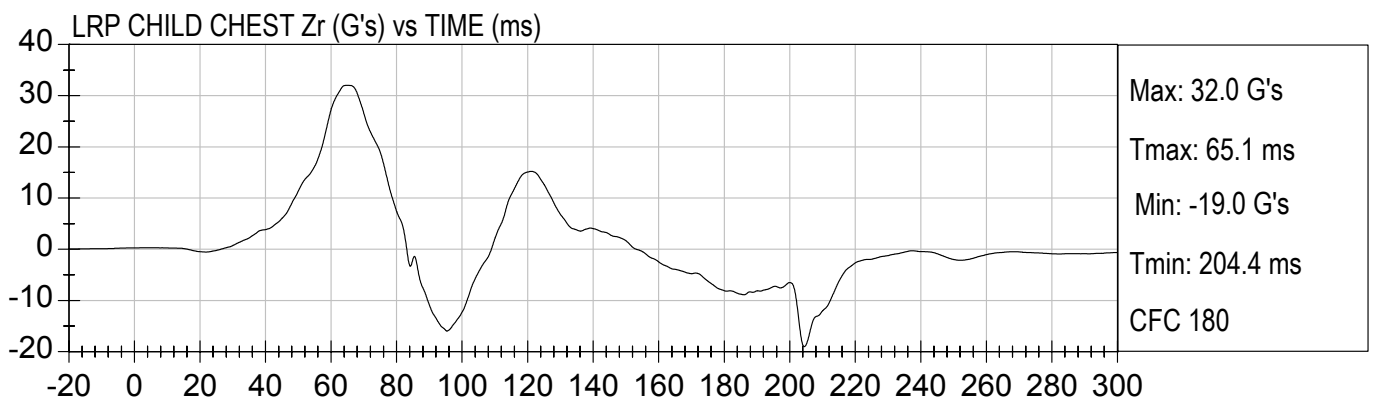
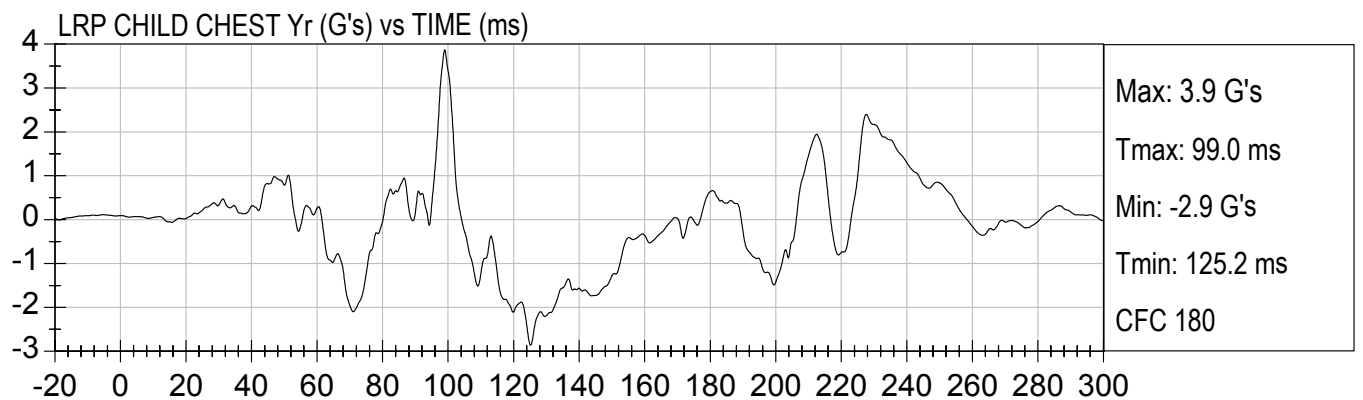
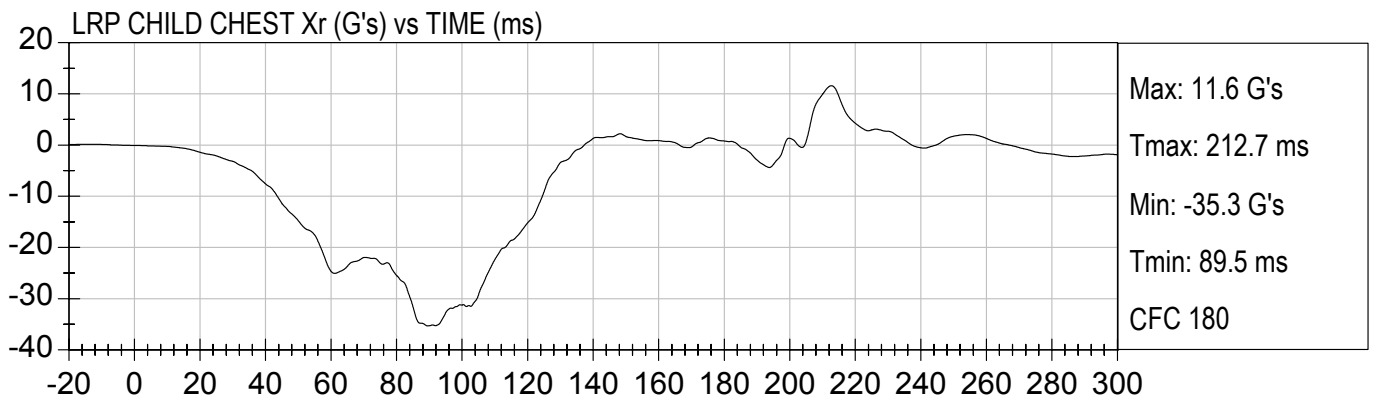
LRP CHILD CHEST DISPLACEMENT (mm) vs TIME (ms)

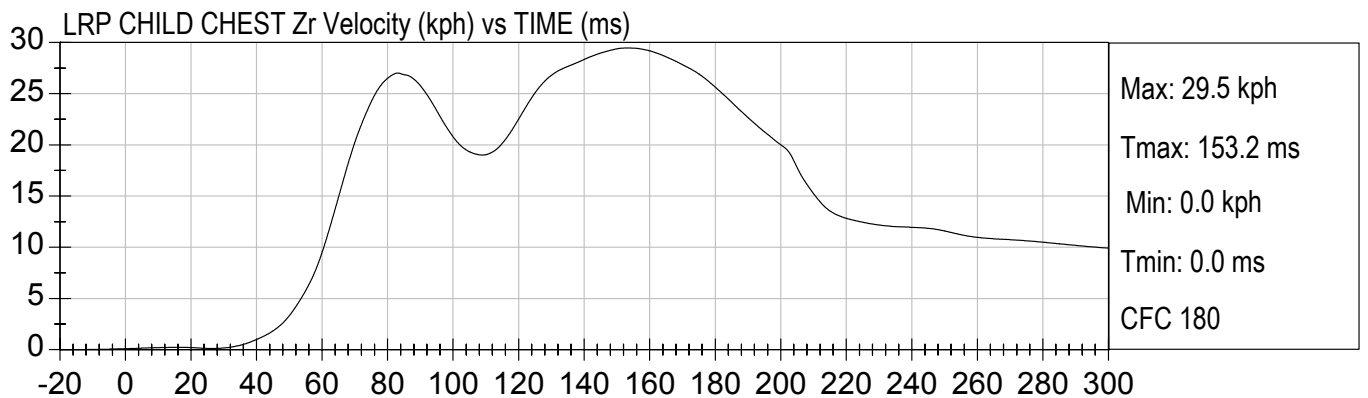
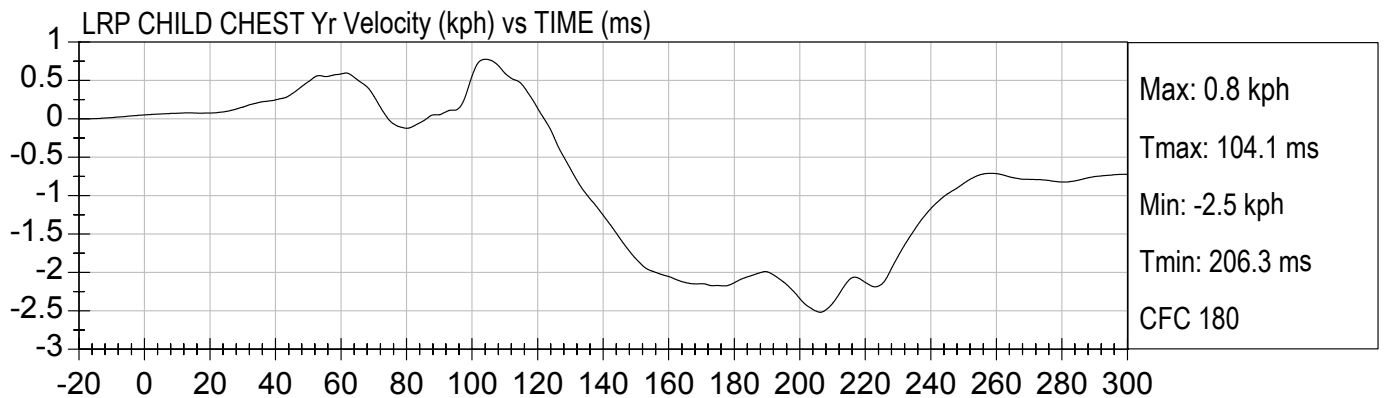
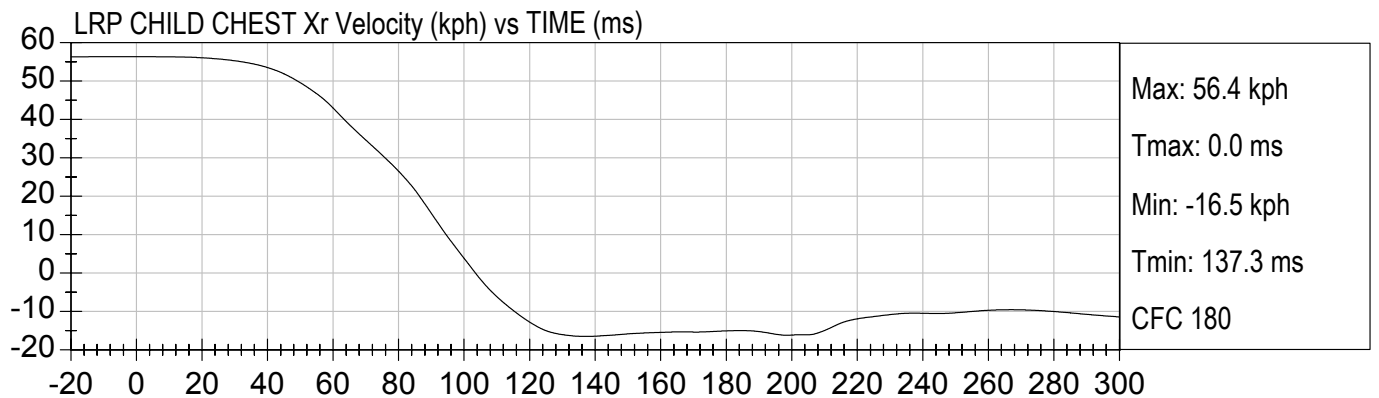


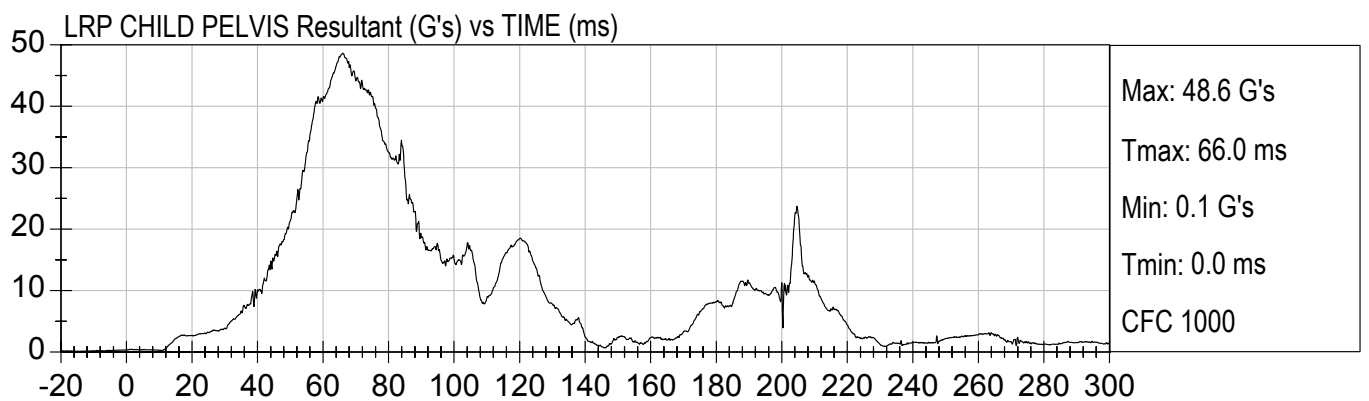
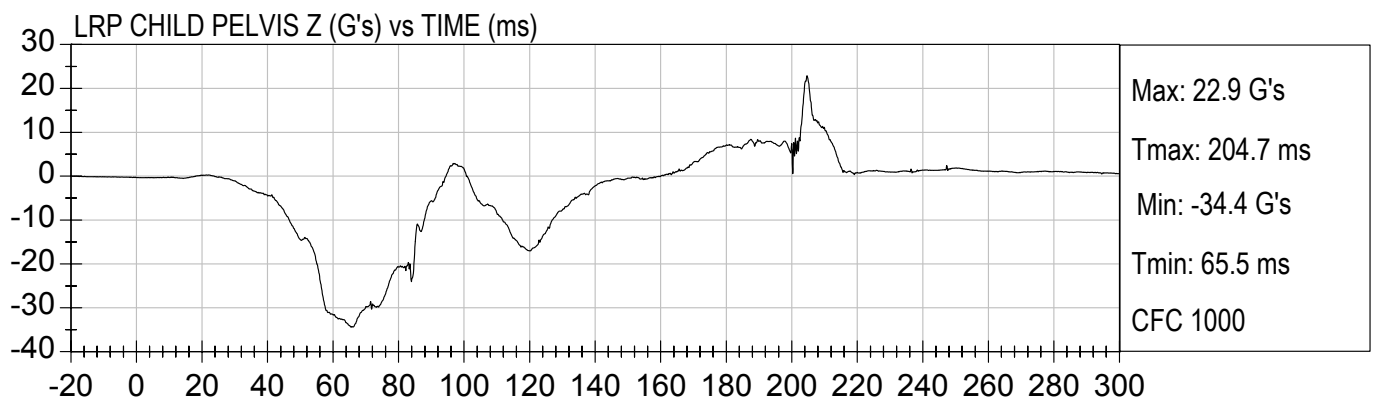
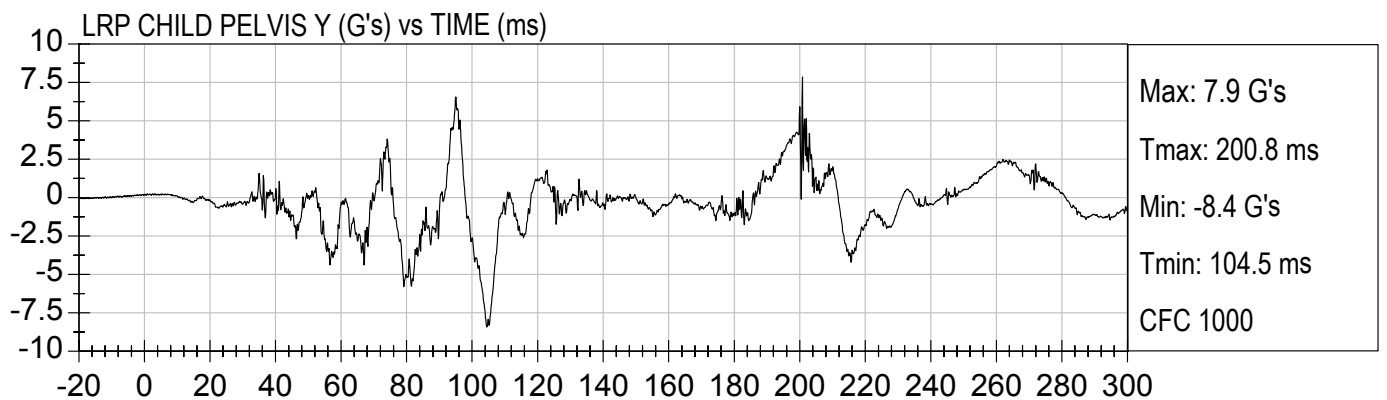
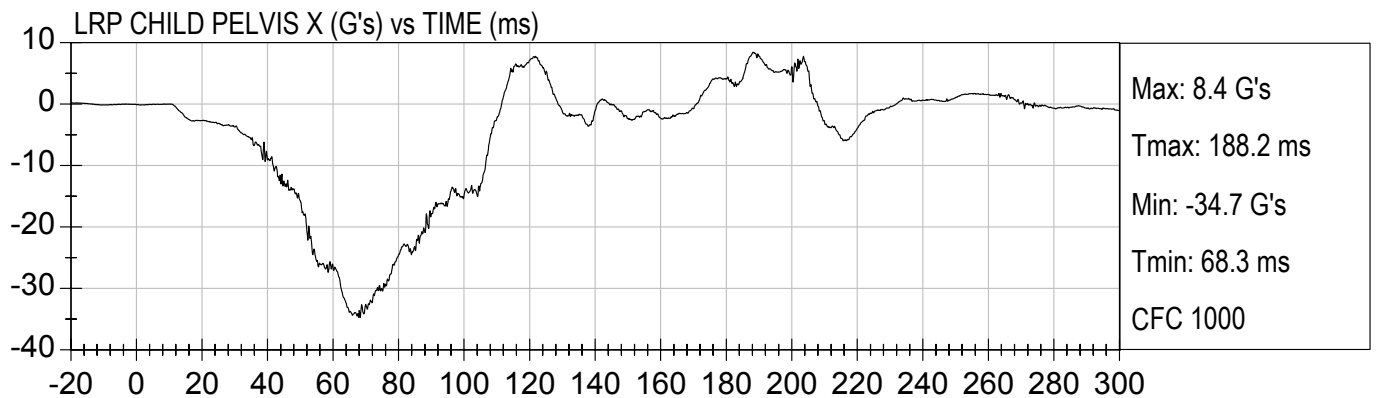


35MPH FRONTAL IMPACT
2005 CHEVROLET EQUINOX (M50100)

Test Date: 4/6/2004
Speed: 35.0 mph (56.3 km/h)

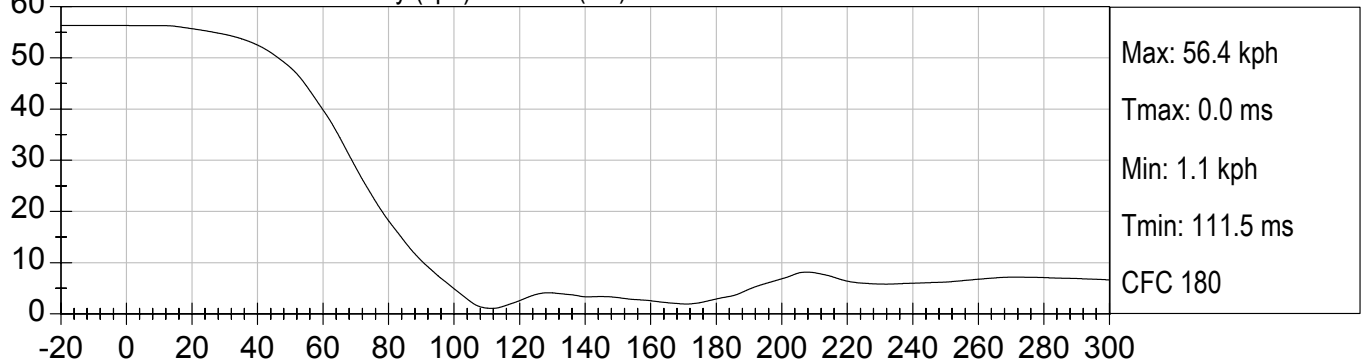




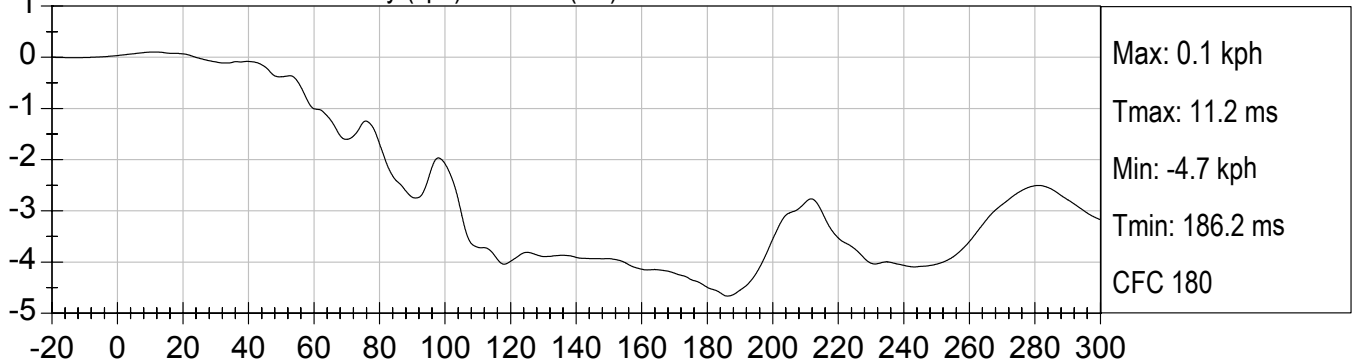




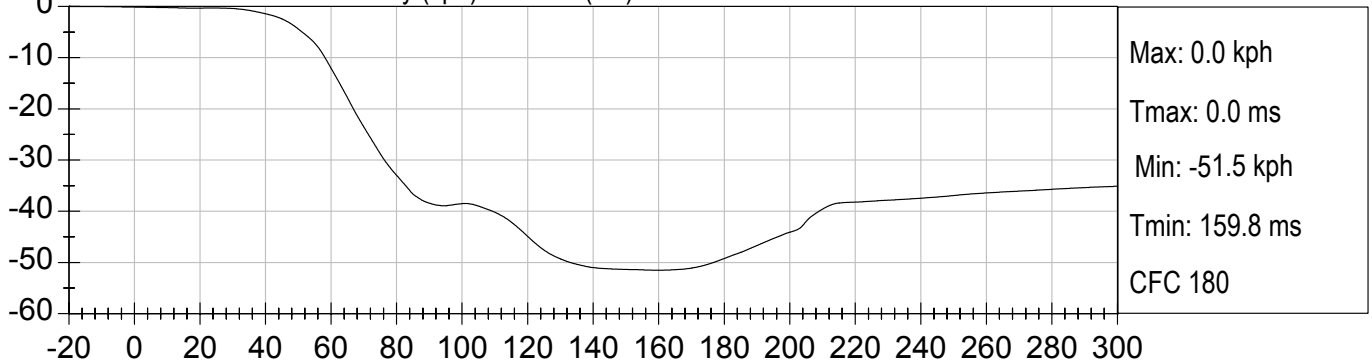
LRP CHILD PELVIS X Velocity (kph) vs TIME (ms)



LRP CHILD PELVIS Y Velocity (kph) vs TIME (ms)



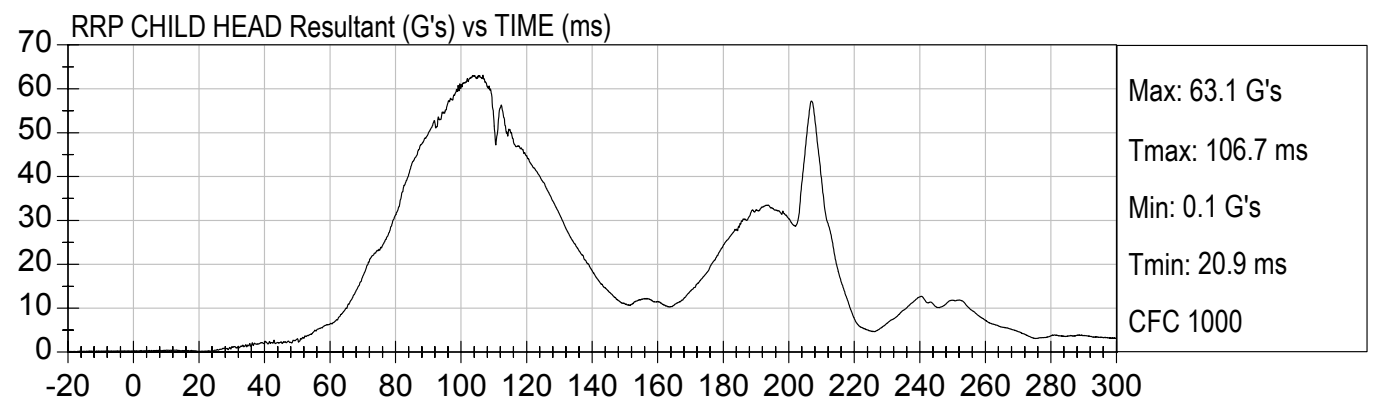
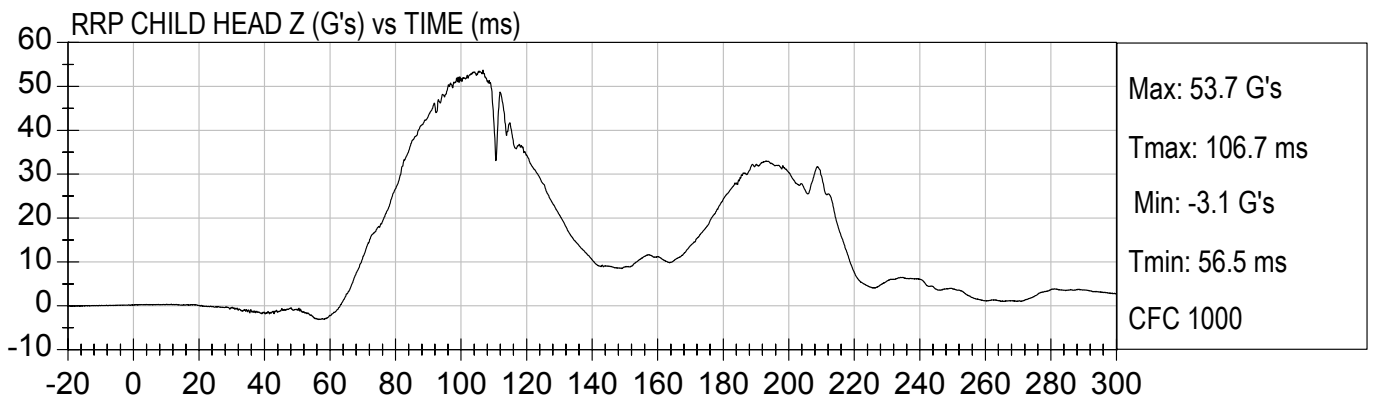
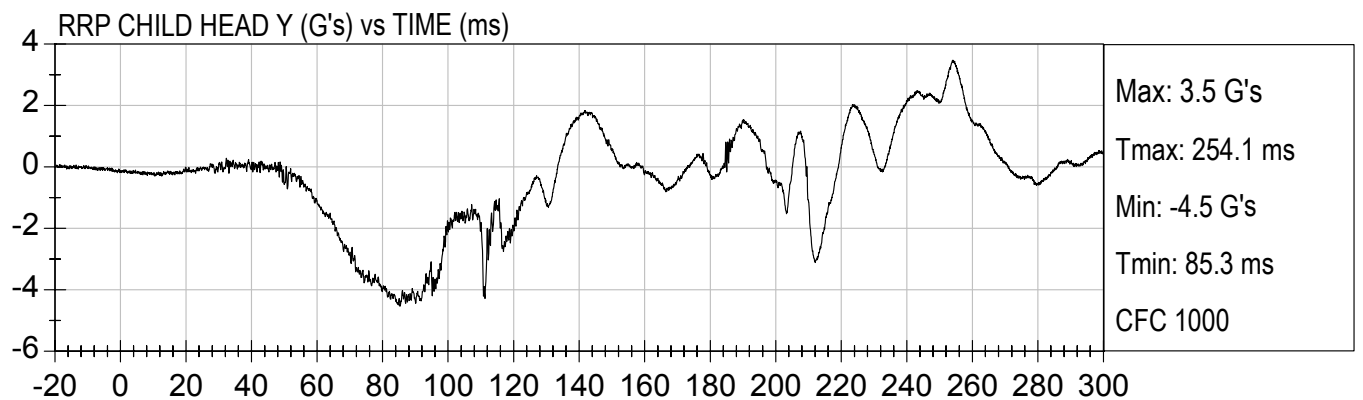
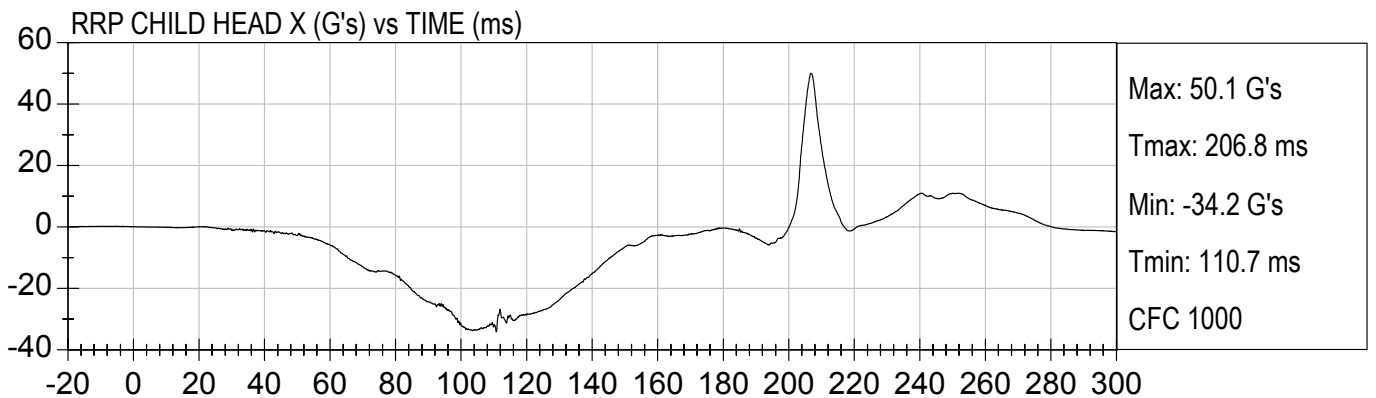
LRP CHILD PELVIS Z Velocity (kph) vs TIME (ms)

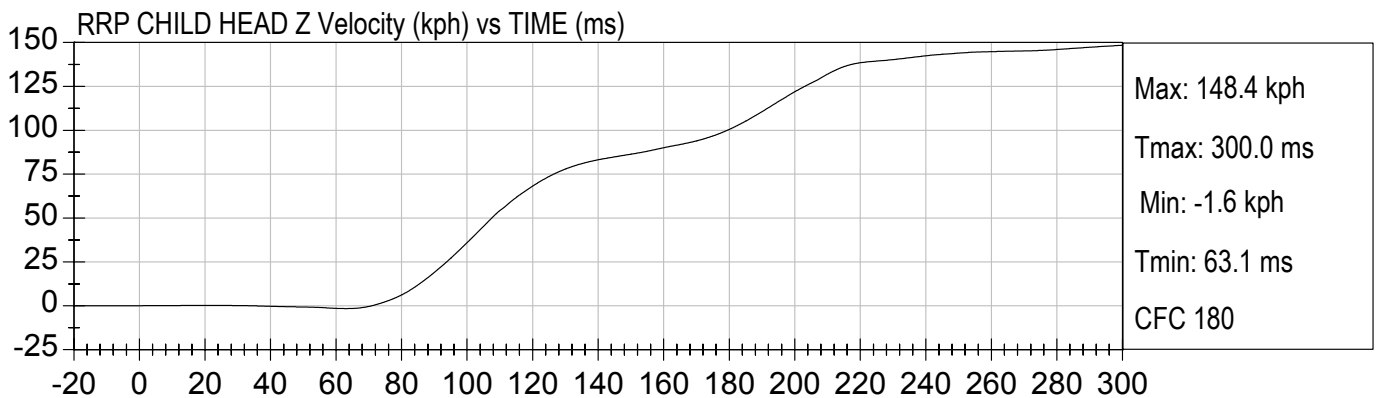
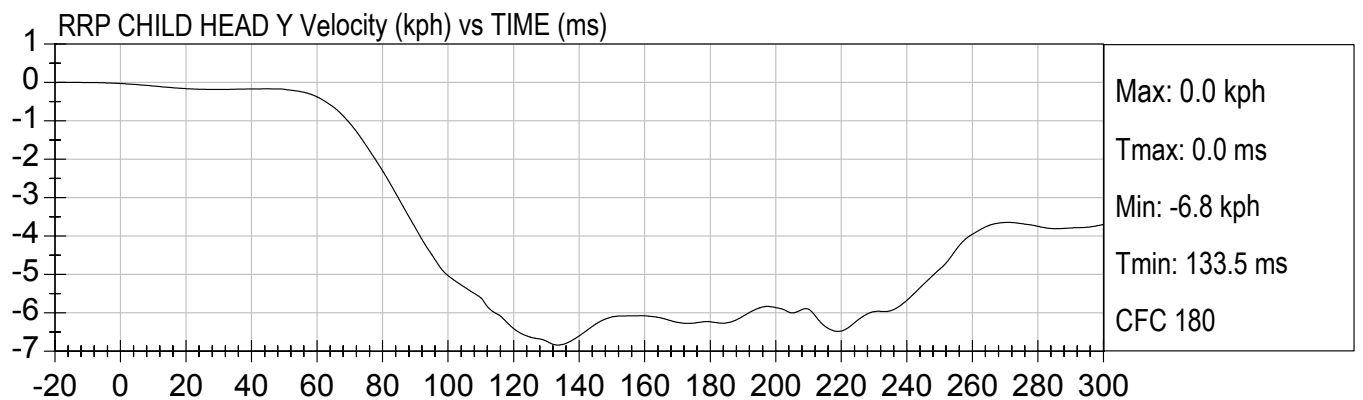
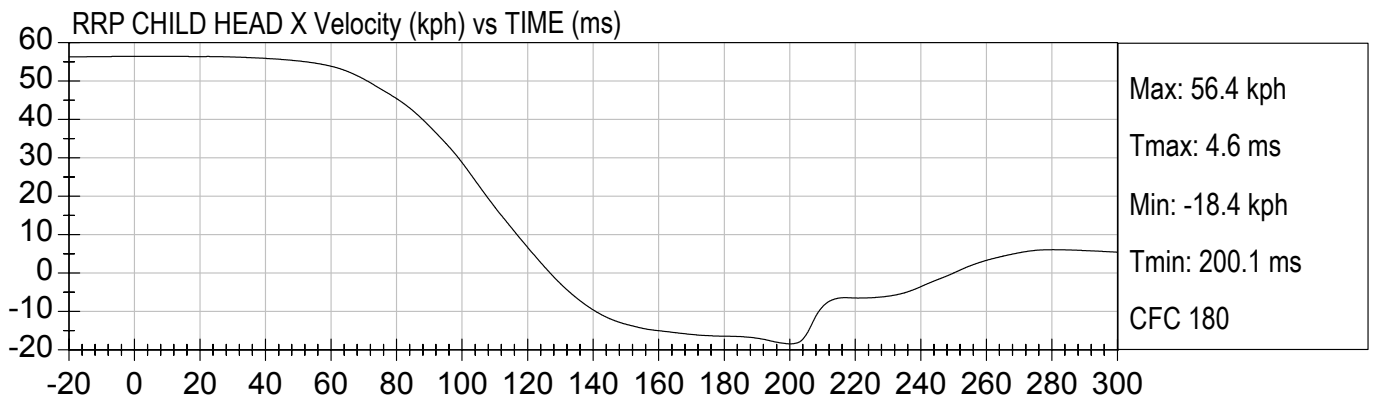




35MPH FRONTAL IMPACT
2005 CHEVROLET EQUINOX (M50100)

Test Date: 4/6/2004
Speed: 35.0 mph (56.3 km/h)

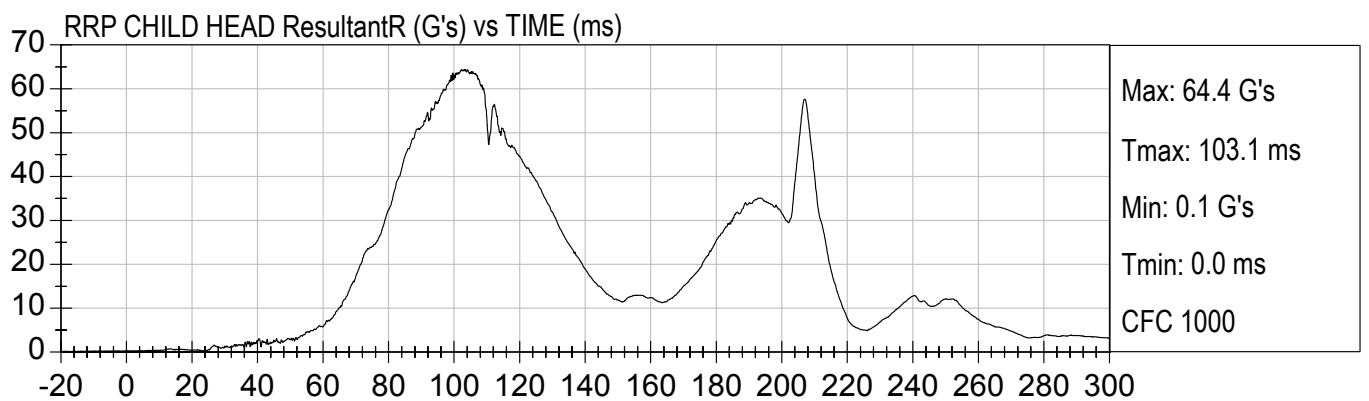
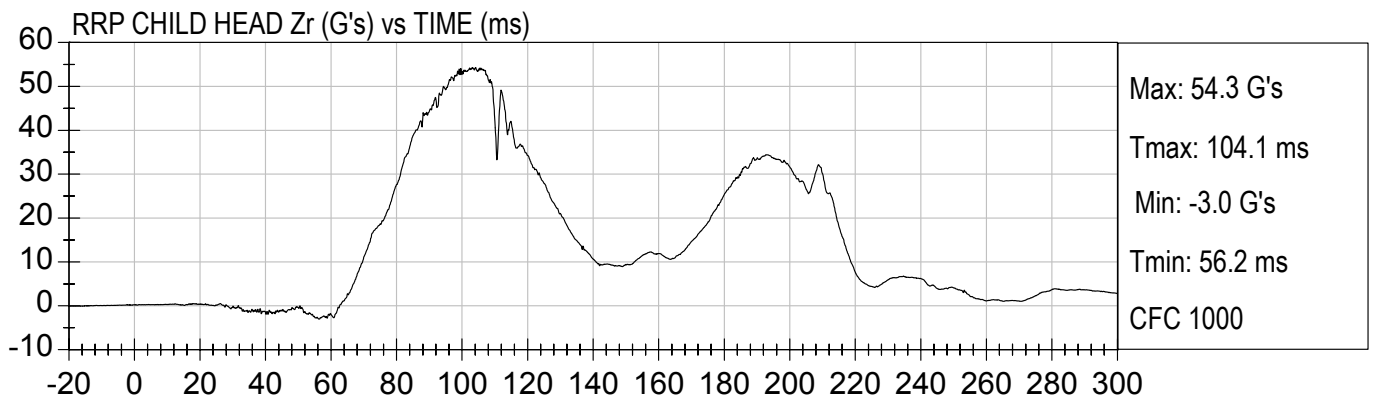
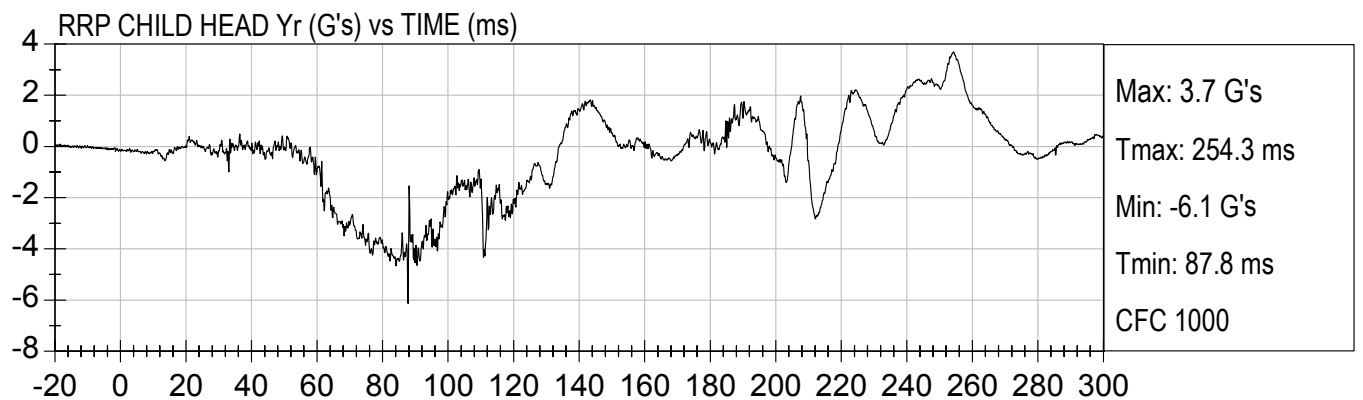
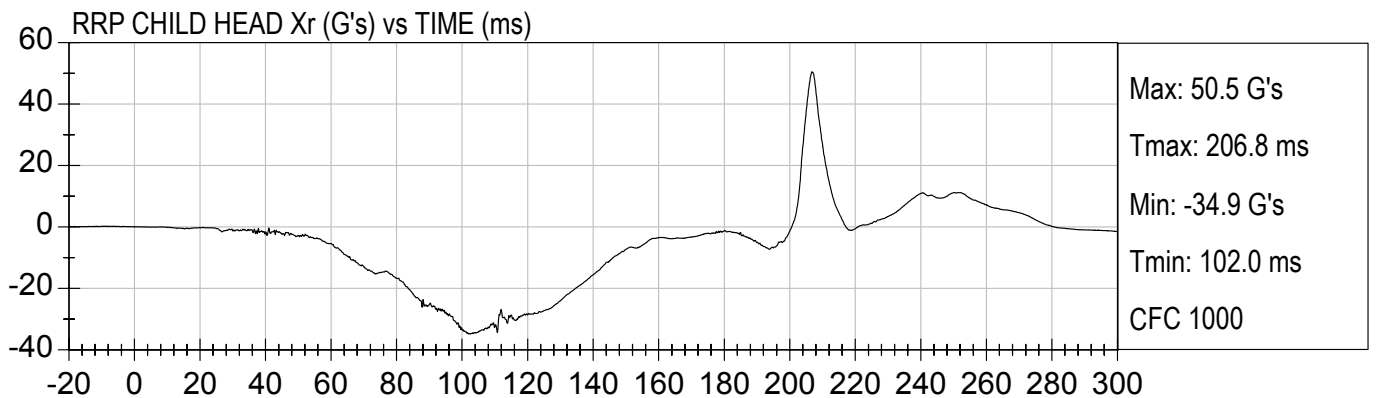


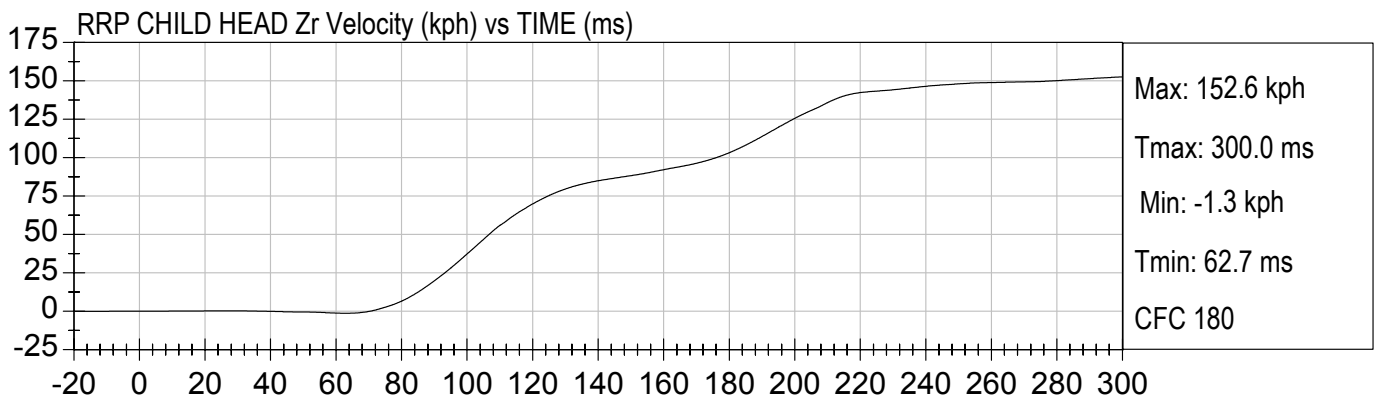
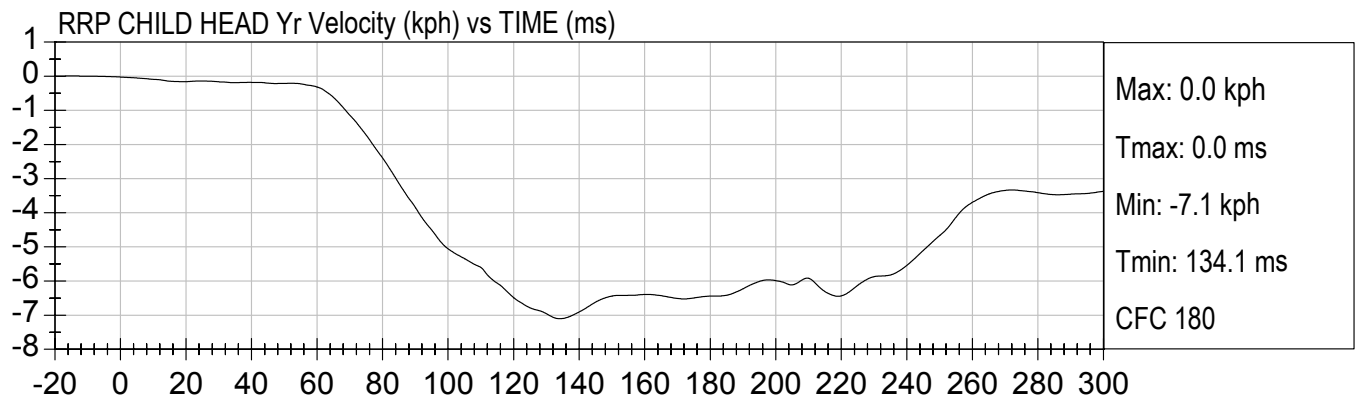
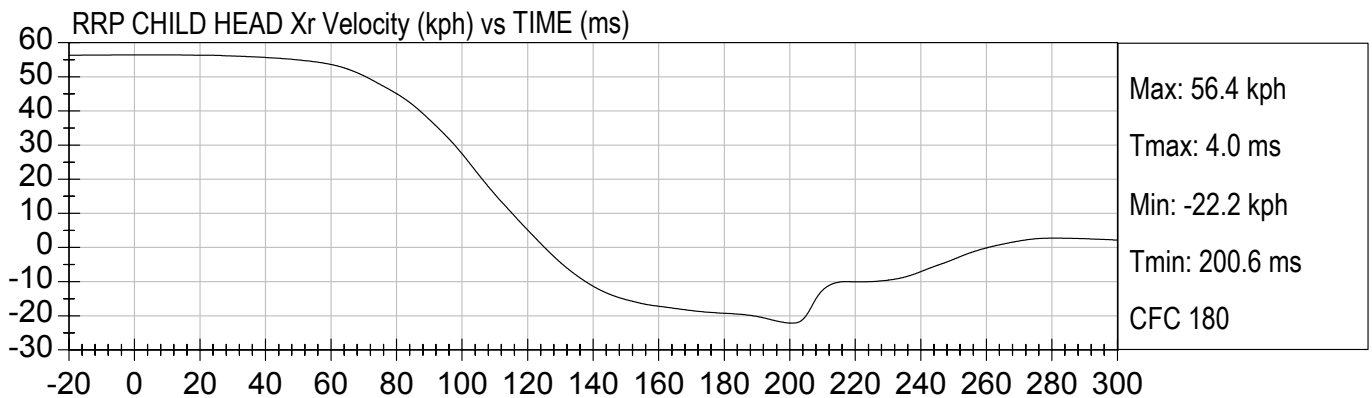




35MPH FRONTAL IMPACT
2005 CHEVROLET EQUINOX (M50100)

Test Date: 4/6/2004
Speed: 35.0 mph (56.3 km/h)

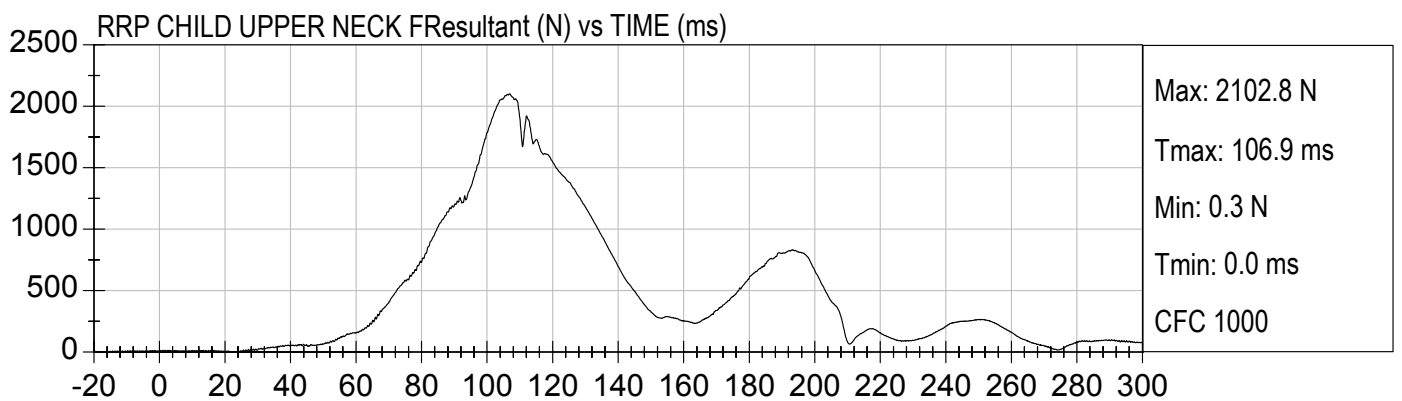
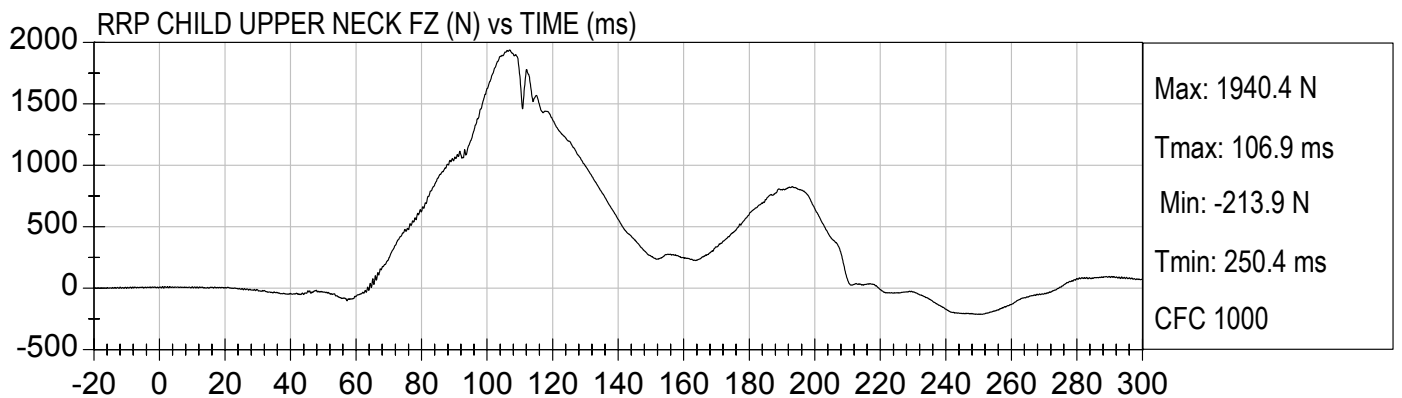
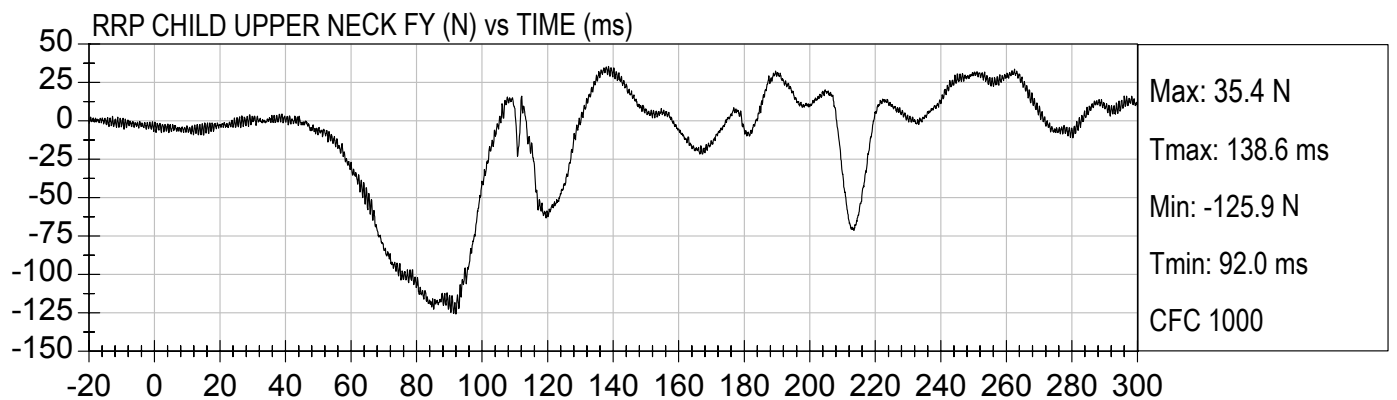
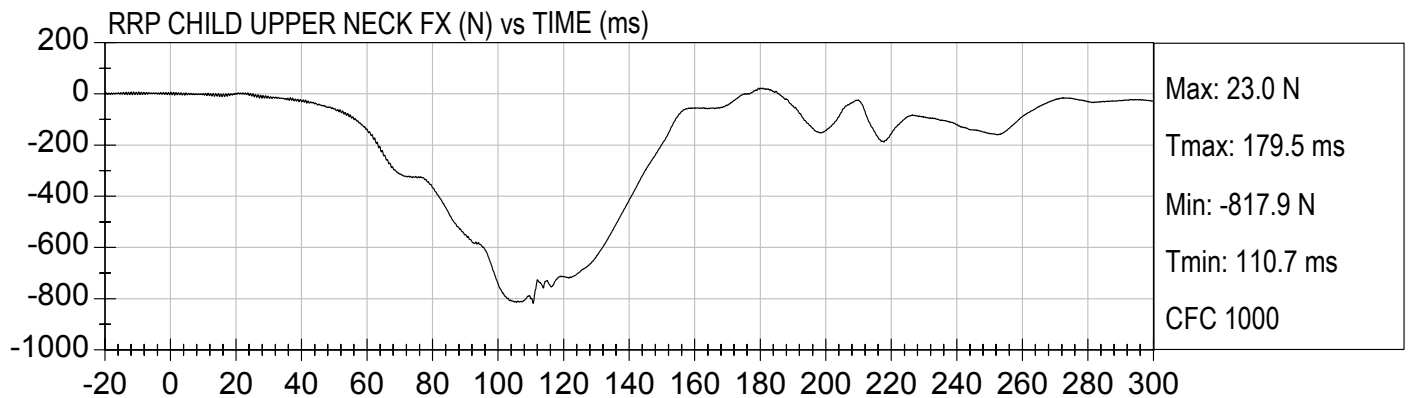






35MPH FRONTAL IMPACT
2005 CHEVROLET EQUINOX (M50100)

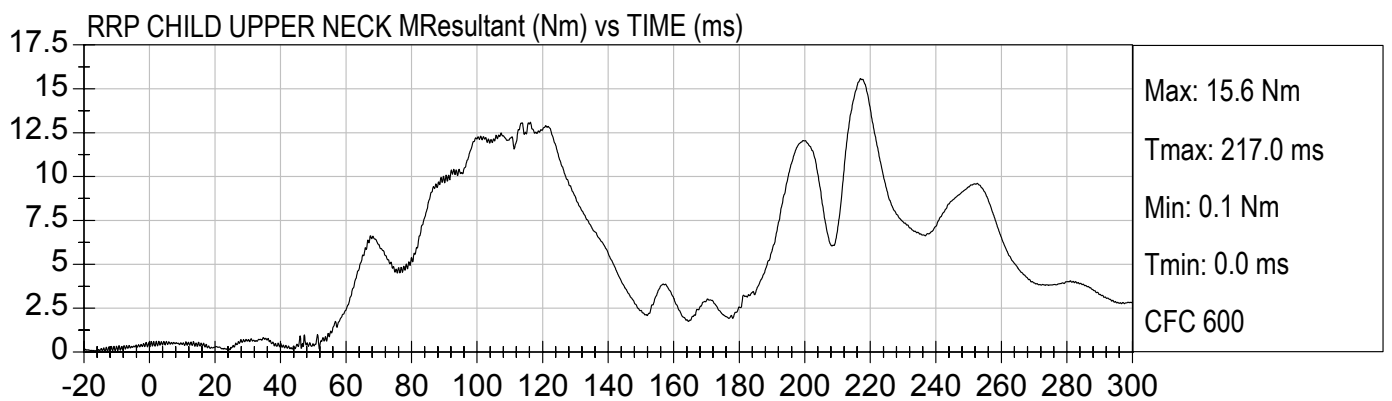
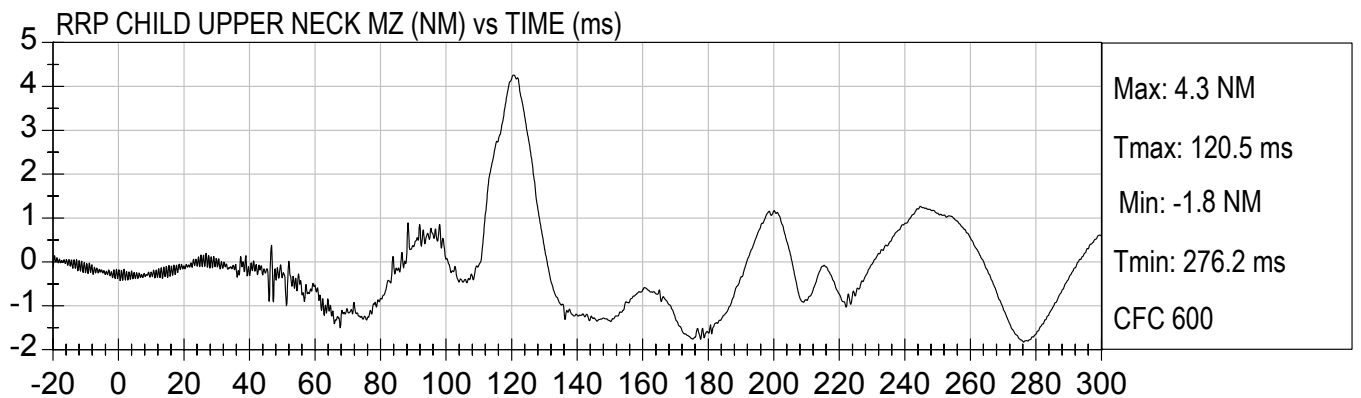
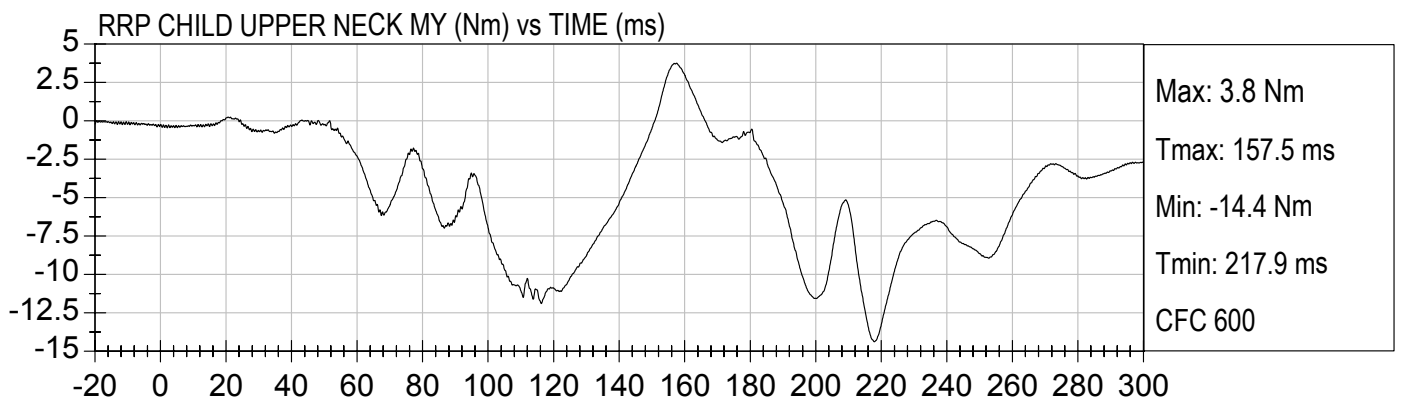
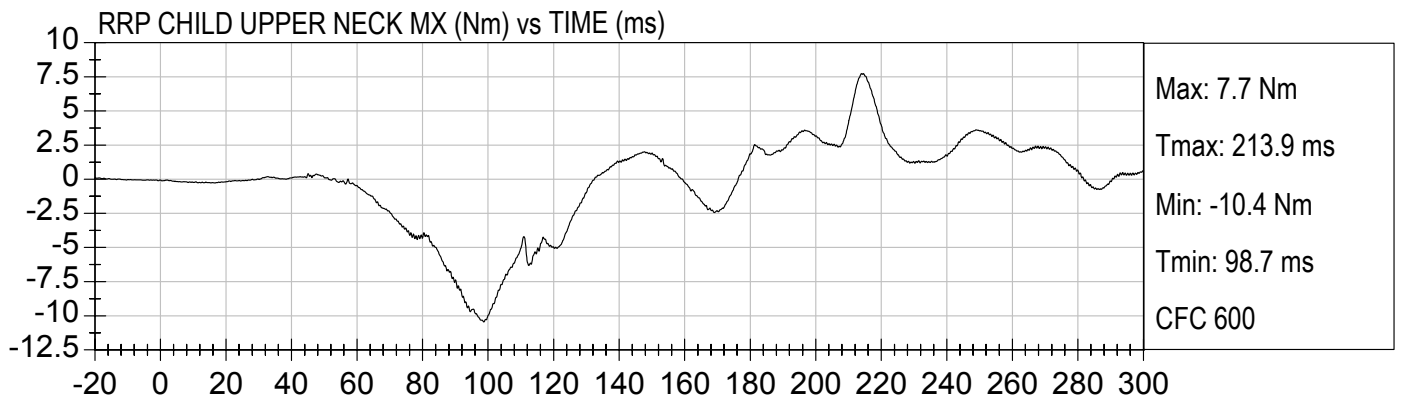
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Speed: 35.0 mph (56.3 km/h)





35MPH FRONTAL IMPACT
2005 CHEVROLET EQUINOX (M50100)

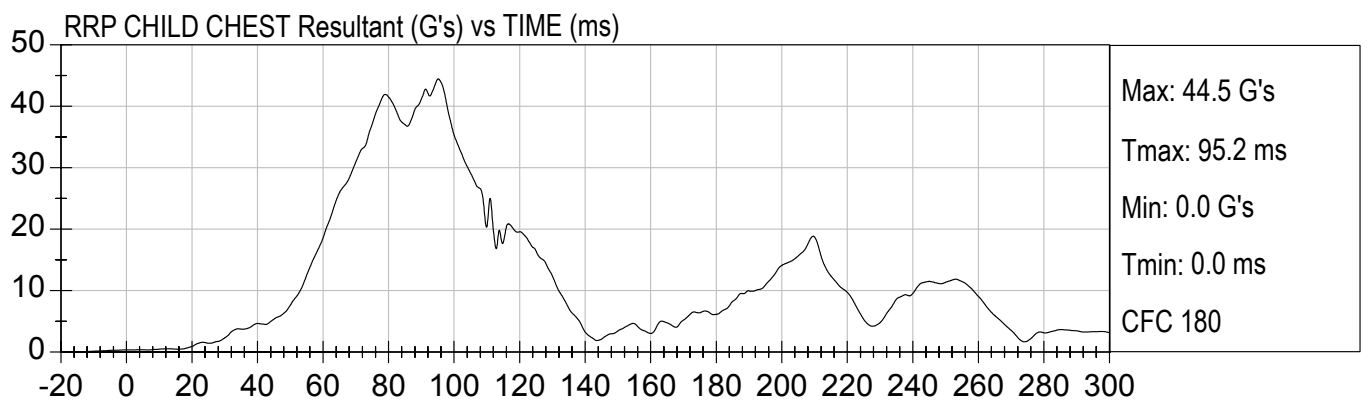
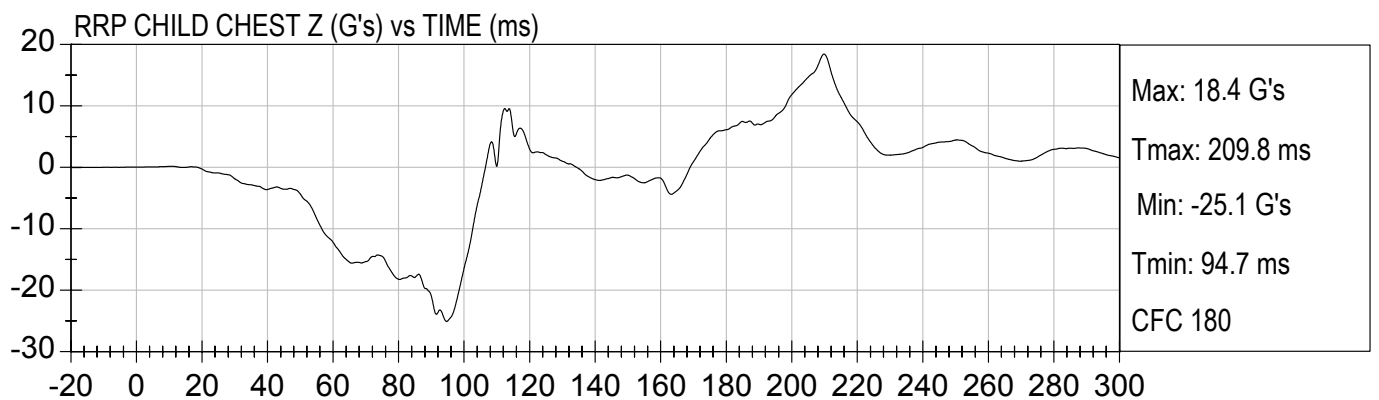
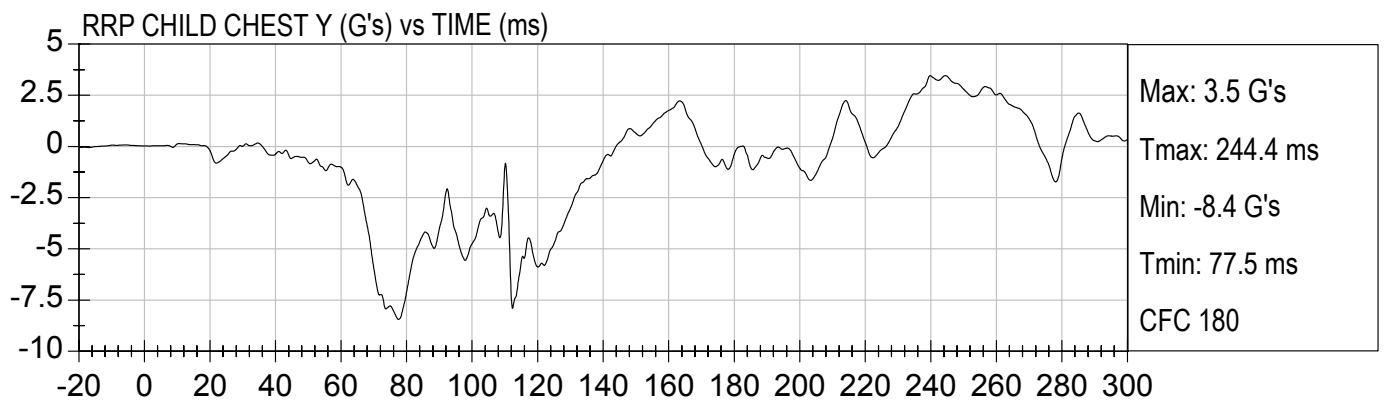
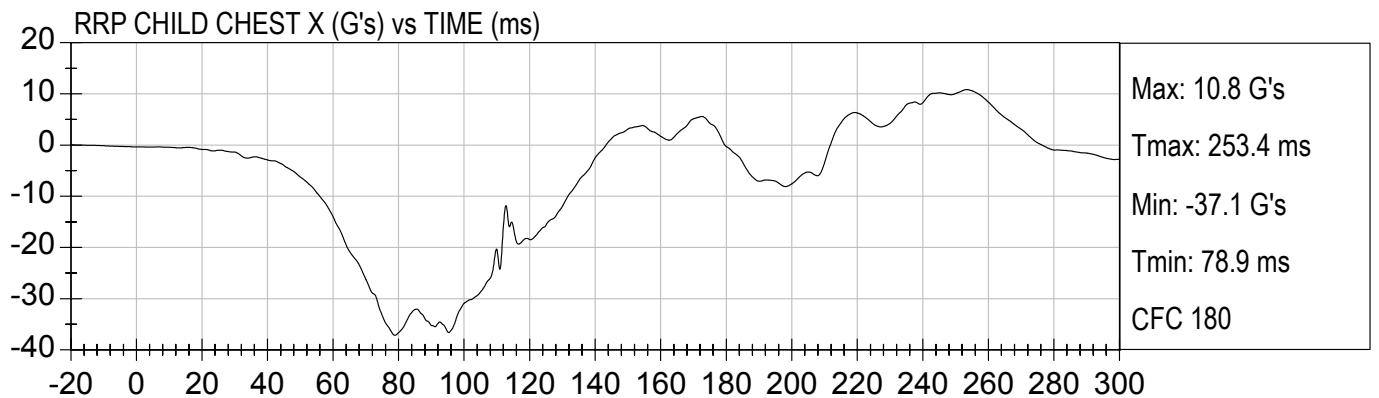
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Speed: 35.0 mph (56.3 km/h)





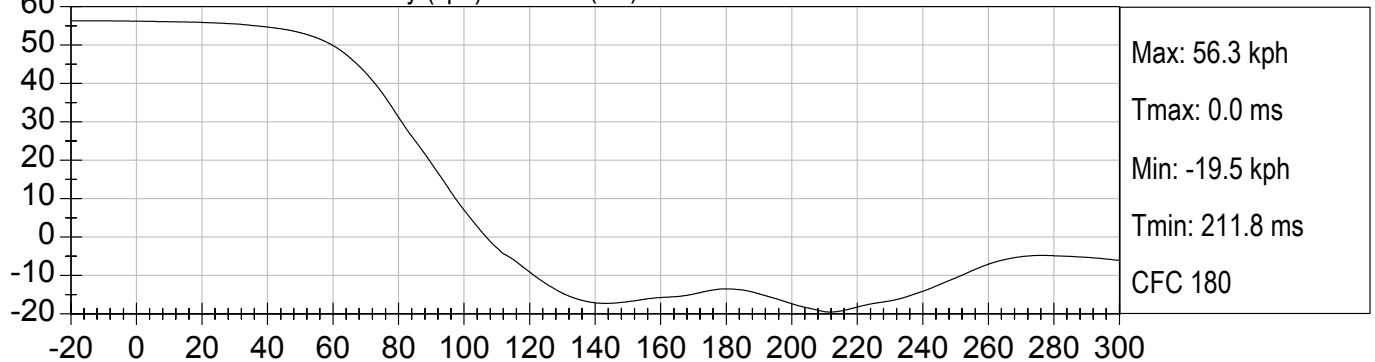
35MPH FRONTAL IMPACT
2005 CHEVROLET EQUINOX (M50100)

Test Date: 4/6/2004
Speed: 35.0 mph (56.3 km/h)

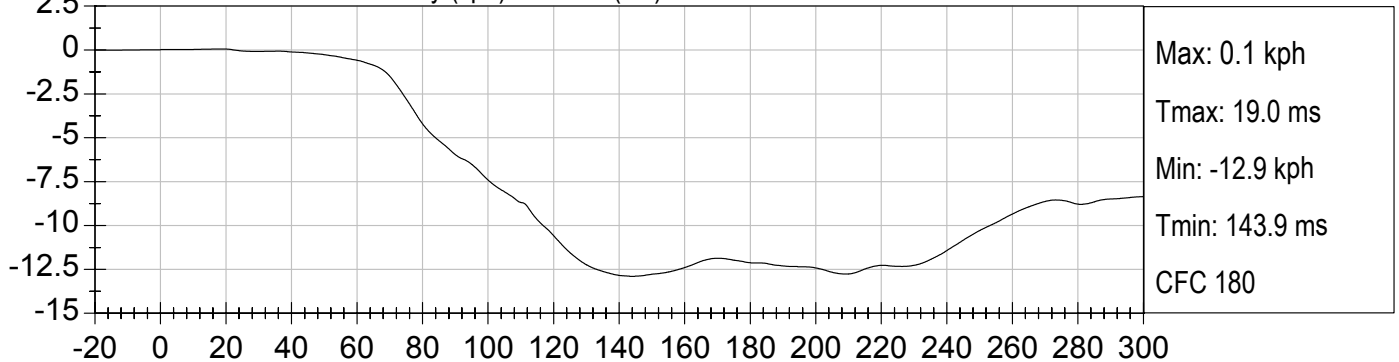




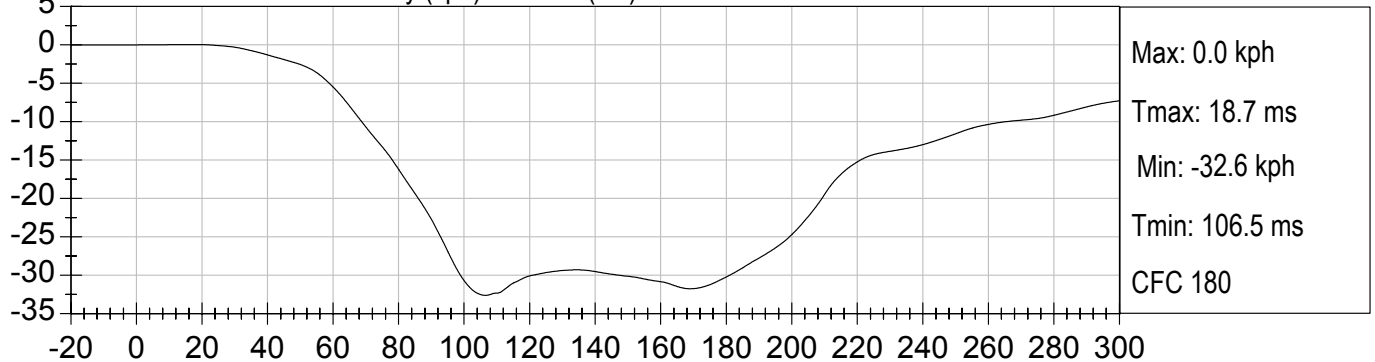
RRP CHILD CHEST X Velocity (kph) vs TIME (ms)



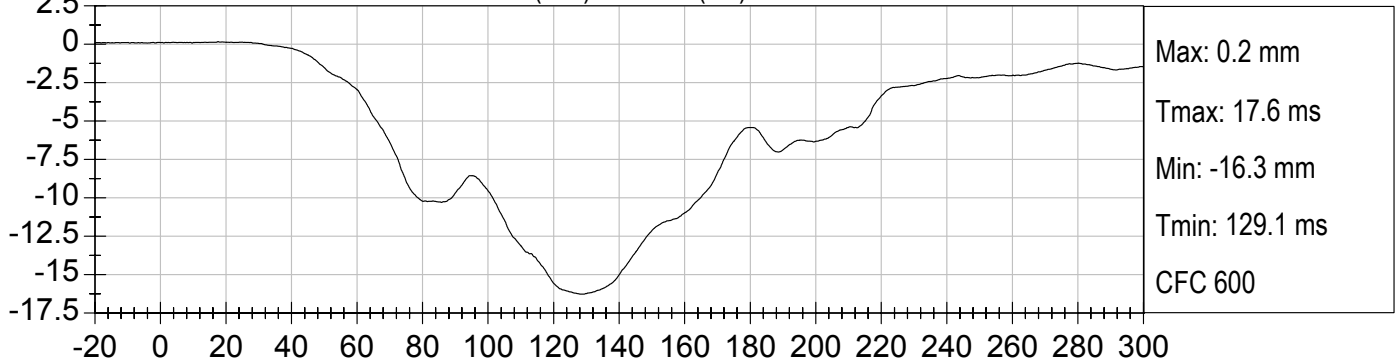
RRP CHILD CHEST Y Velocity (kph) vs TIME (ms)



RRP CHILD CHEST Z Velocity (kph) vs TIME (ms)



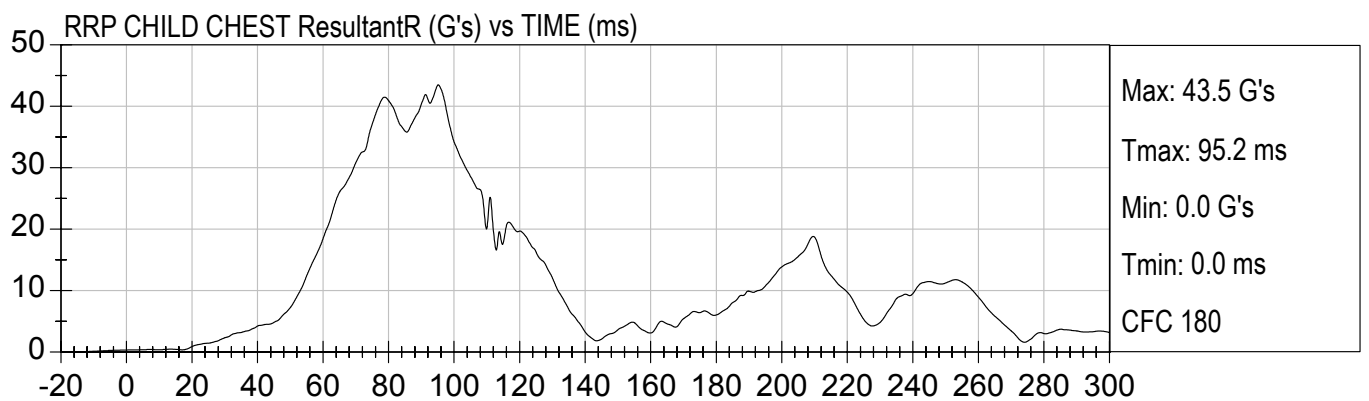
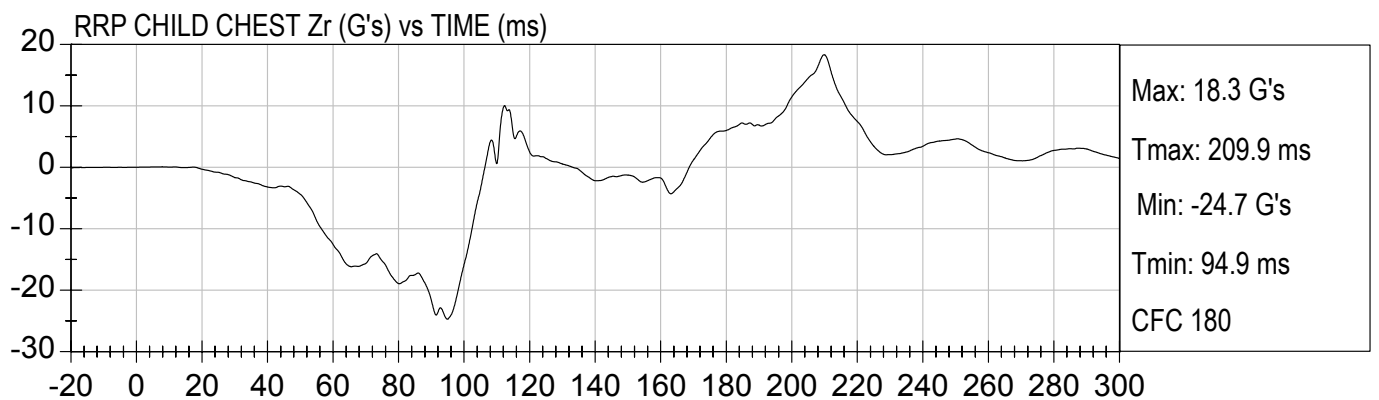
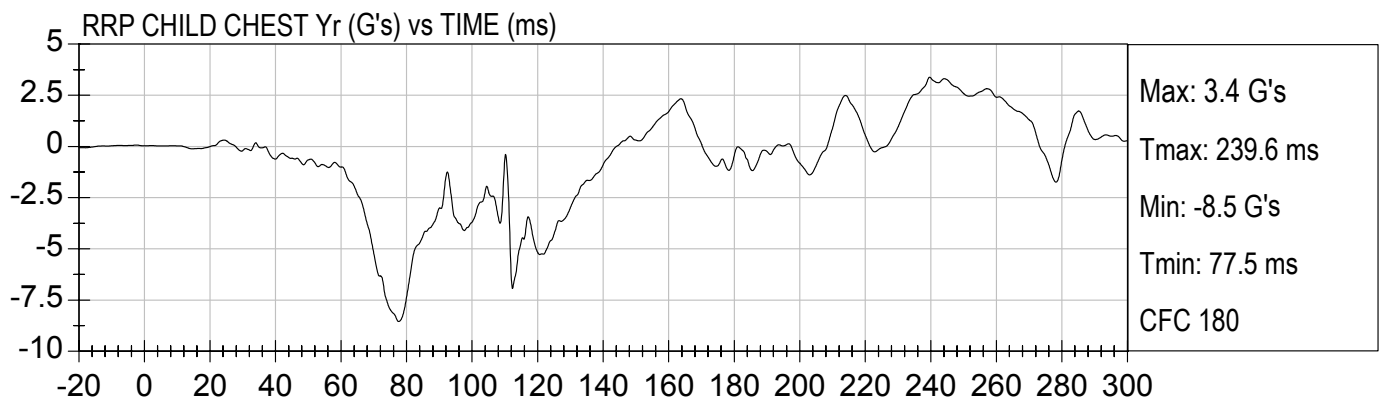
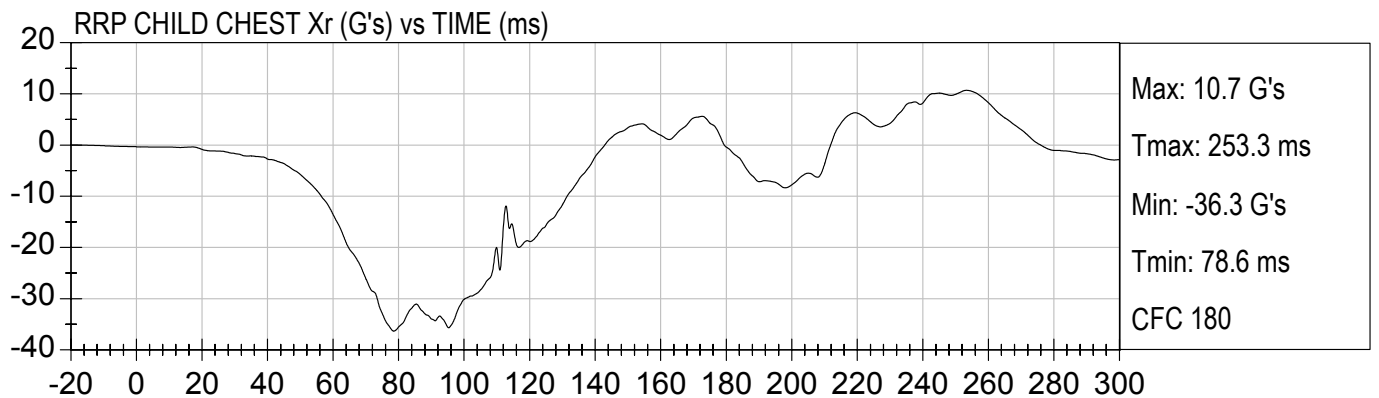
RRP CHILD CHEST DISPLACEMENT (mm) vs TIME (ms)





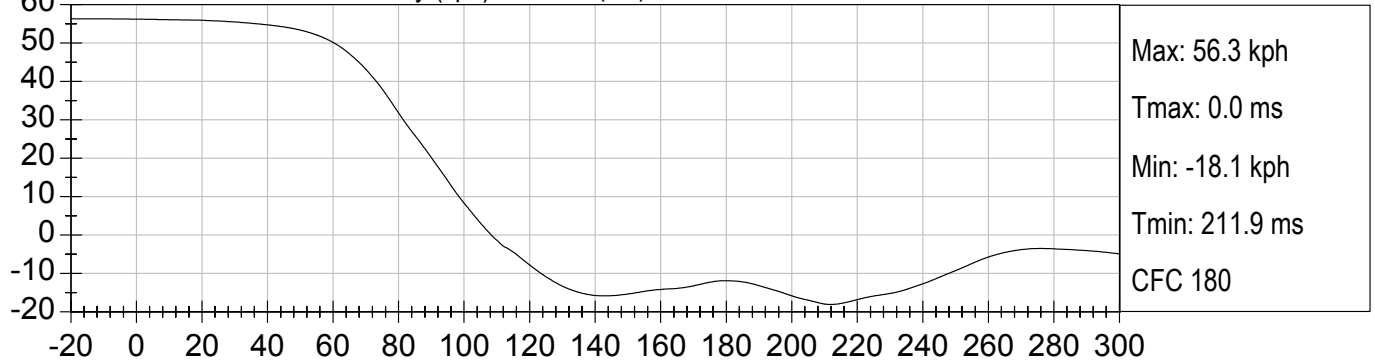
35MPH FRONTAL IMPACT
2005 CHEVROLET EQUINOX (M50100)

Test Date: 4/6/2004
Speed: 35.0 mph (56.3 km/h)

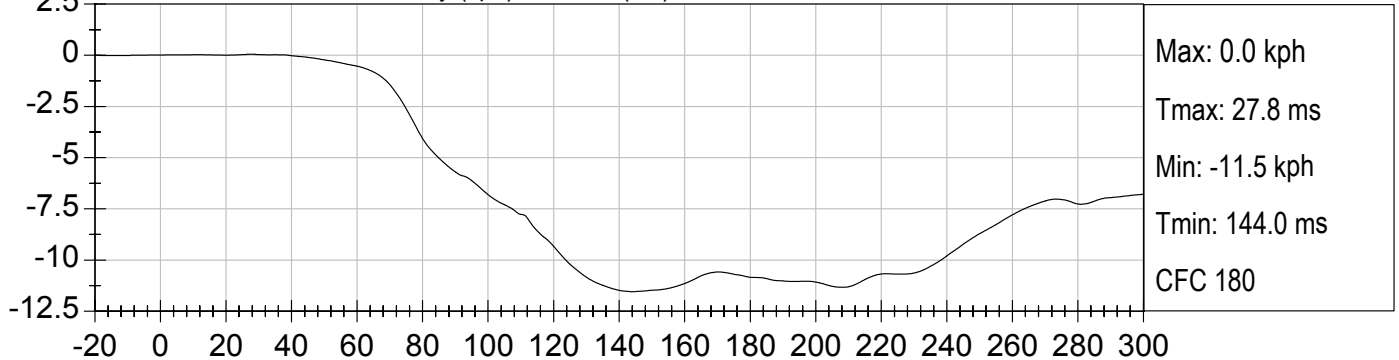




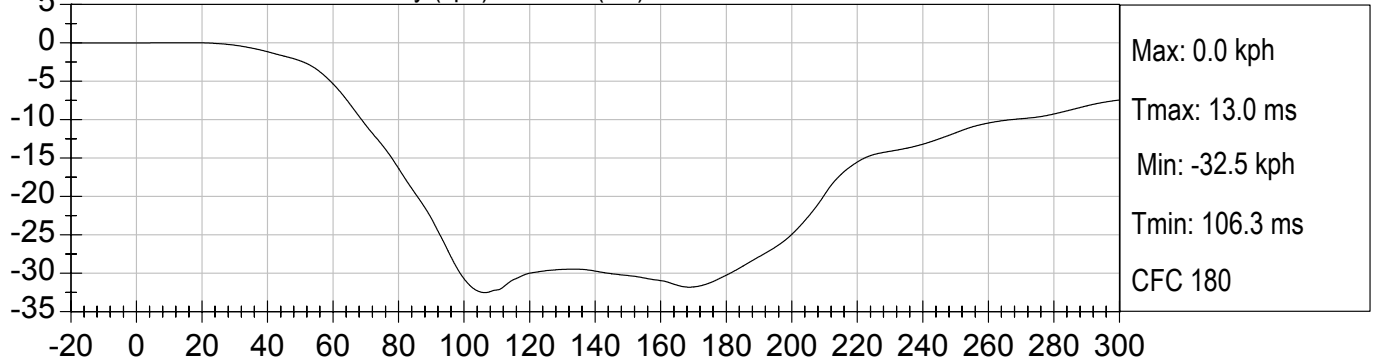
RRP CHILD CHEST Xr Velocity (kph) vs TIME (ms)



RRP CHILD CHEST Yr Velocity (kph) vs TIME (ms)



RRP CHILD CHEST Zr Velocity (kph) vs TIME (ms)

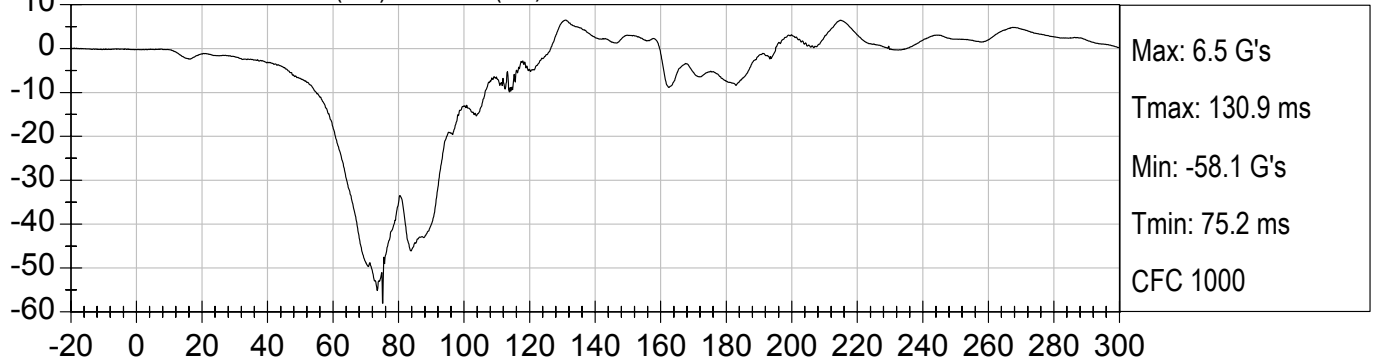




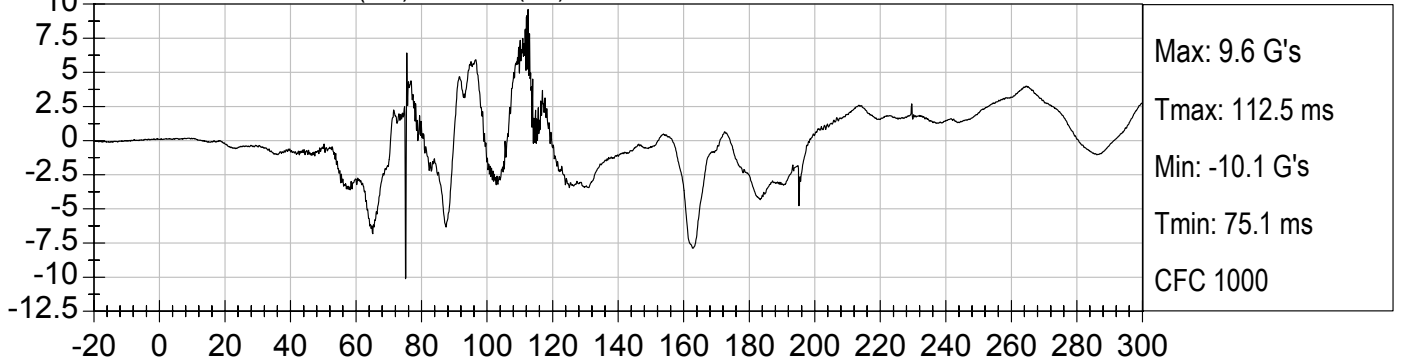
35MPH FRONTAL IMPACT
2005 CHEVROLET EQUINOX (M50100)

Test Date: 4/6/2004
Speed: 35.0 mph (56.3 km/h)

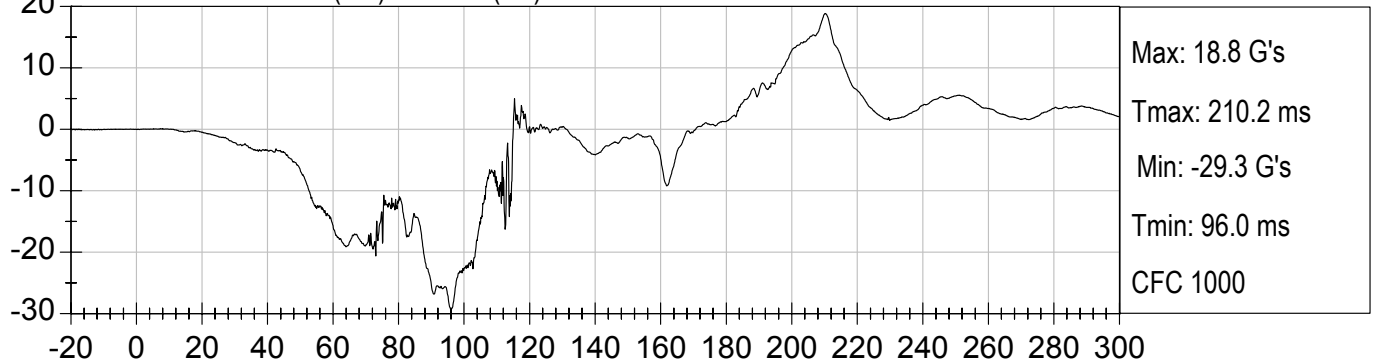
RRP CHILD PELVIS X (G's) vs TIME (ms)



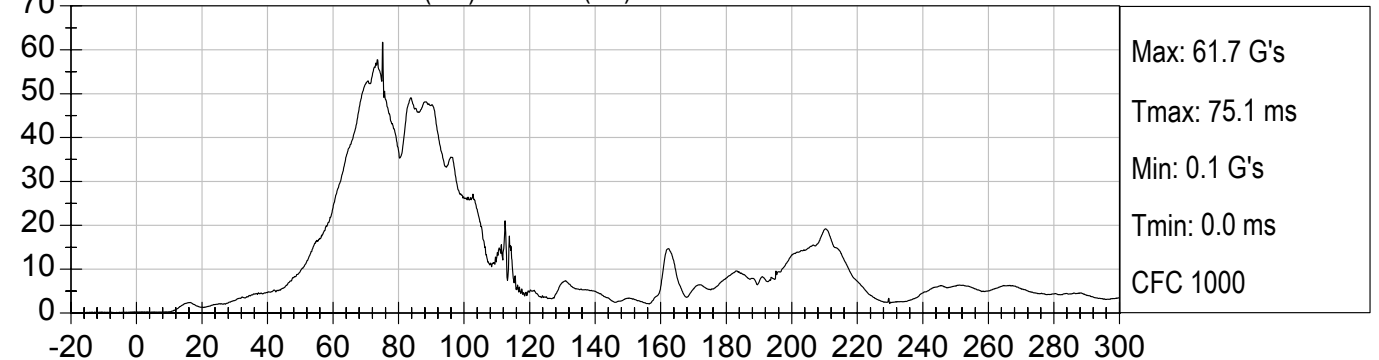
RRP CHILD PELVIS Y (G's) vs TIME (ms)

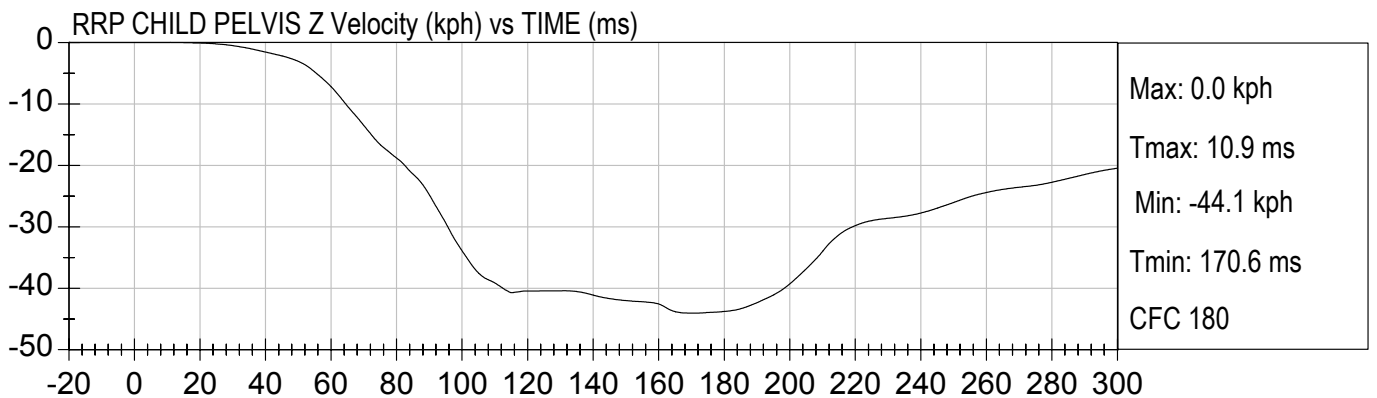
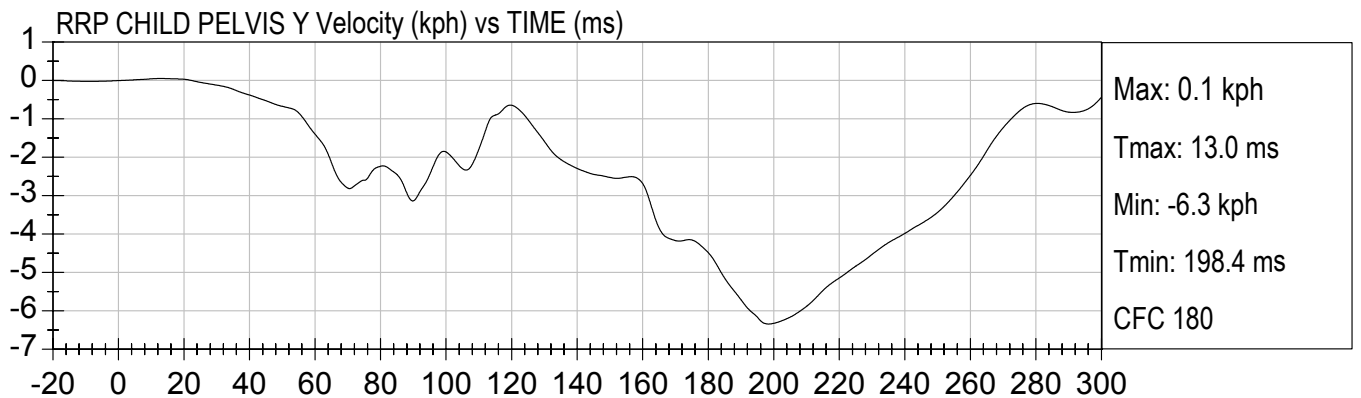
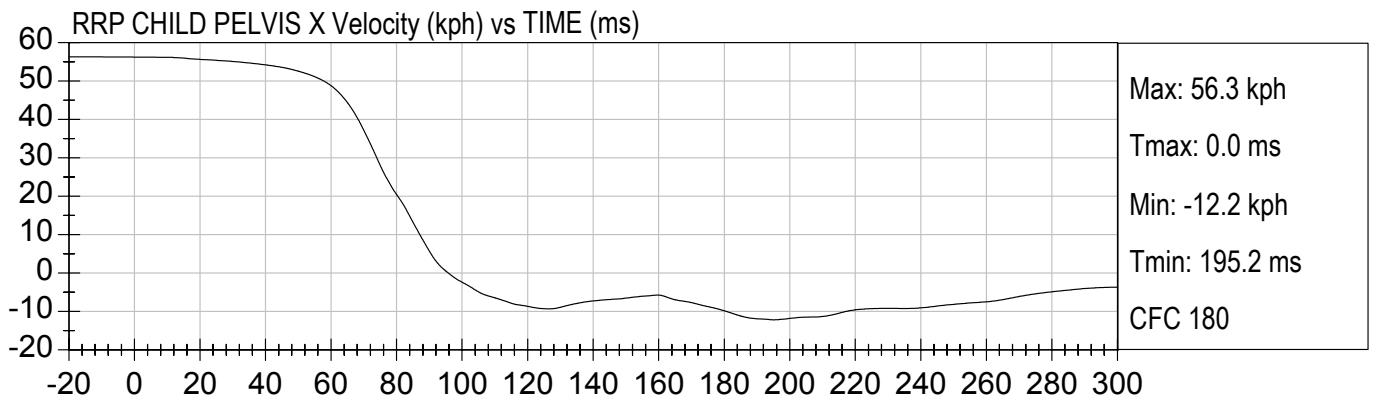


RRP CHILD PELVIS Z (G's) vs TIME (ms)



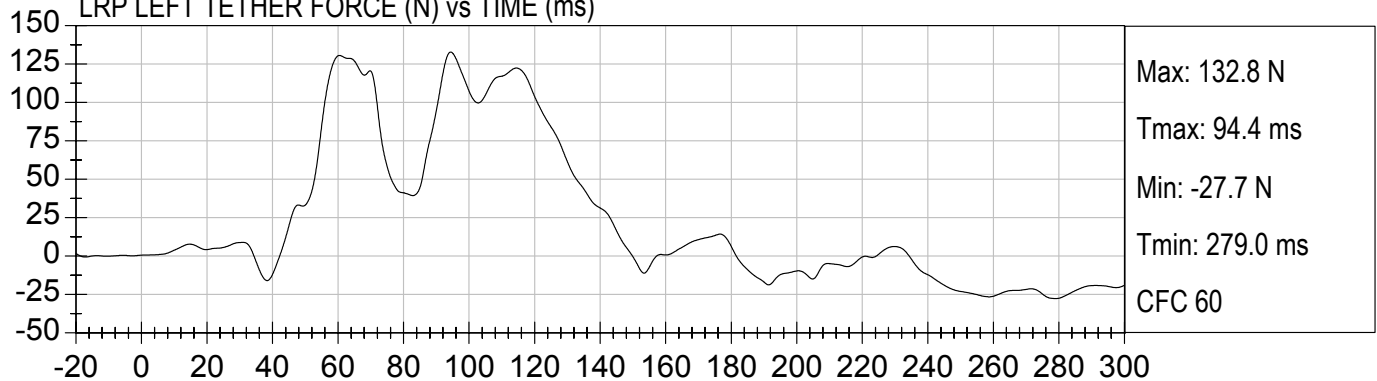
RRP CHILD PELVIS Resultant (G's) vs TIME (ms)



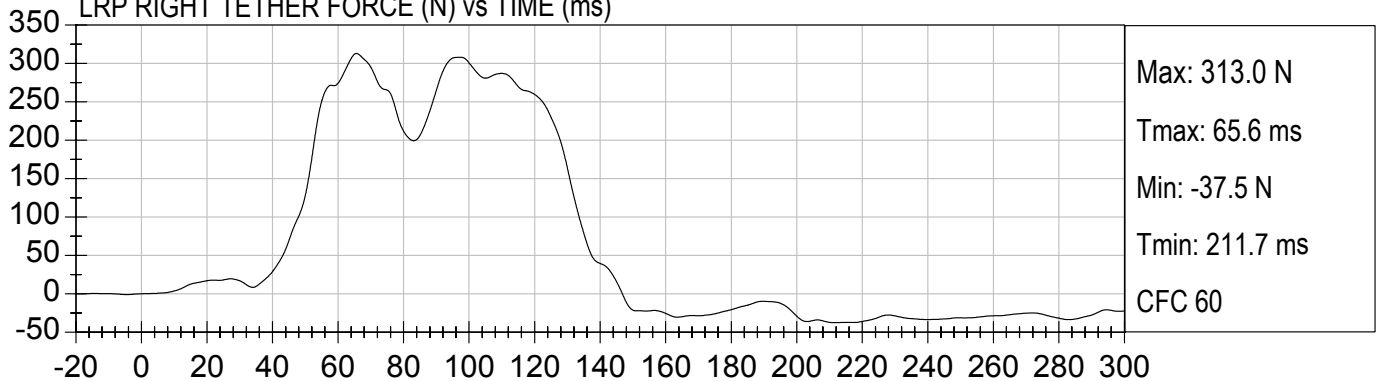




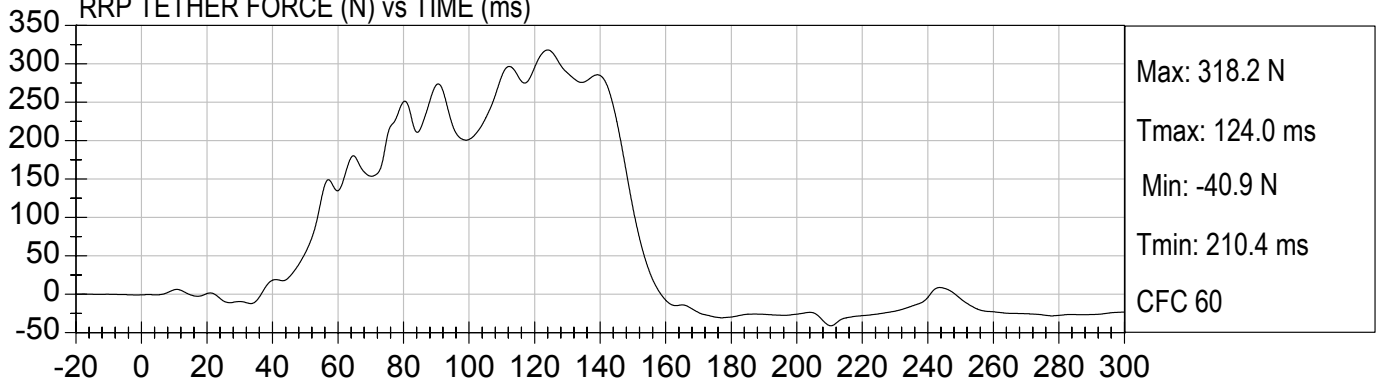
LRP LEFT TETHER FORCE (N) vs TIME (ms)



LRP RIGHT TETHER FORCE (N) vs TIME (ms)



RRP TETHER FORCE (N) vs TIME (ms)



APPENDIX C
CHILD DUMMY CALIBRATION INFORMATION

**Transportation Research Center
Inc.**

ATD Calibration Report

for

VRTC

**HIII 3 Year Old Serial No. 042
Calibration No. 02**



Transportation Research Center Inc.
P.O. Box B-67
10820 St. Rt. 347
East Liberty, OH 43319-0367

Transportation Research Center Inc.
572P HIII 3 Year Old Dummy
External Dimensions
Serial No. 042 Calibration No. 02

Test Parameter	Dimension	Specification	Results	Pass
Total Sitting Height	A	538.5 - 553.7 mm	546 mm	Yes
Shoulder Pivot Height	B	307.3 - 322.6 mm	313 mm	Yes
Hip Pivot Height	C	33.0 - 43.2 mm	37 mm	Yes
Hip Pivot from Backline	D	56.9 - 67.1 mm	59 mm	Yes
Shoulder Pivot from Backline	E	58.4 - 68.6 mm	63 mm	Yes
Thigh Clearance	F	81.0 - 91.2 mm	87 mm	Yes
Back of Elbow to Wrist Pivot	G	247.4 - 262.6 mm	253 mm	Yes
Head Back to Backline	H	48.3 - 58.4 mm	49 mm	Yes
Shoulder to Elbow Length	I	185.0 - 200.7 mm	193 mm	Yes
Elbow Rest Height	J	133.6 - 148.8 mm	136 mm	Yes
Buttock to Knee Length	K	287.3 - 302.5 mm	293 mm	Yes
Popliteal Height	L	221.0 - 236.2 mm	228 mm	Yes
Knee to Floor Height	M	241.6 - 256.8 mm	249 mm	Yes
Buttock Popliteal Height	N	217.9 - 233.2 mm	229 mm	Yes
Chest Depth without Jacket	O	134.6 - 149.9 mm	137 mm	Yes
Foot Length	P	137.7 - 147.8 mm	141 mm	Yes
Stature	Q	932.2 - 957.6 mm	936 mm	Yes
Buttock to Knee Pivot Length	R	251.5 - 261.6 mm	258 mm	Yes
Head Breadth	S	128.3 - 143.5 mm	136 mm	Yes
Head Depth	T	167.4 - 182.6 mm	176 mm	Yes
Hip Breadth	U	200.7 - 215.9 mm	209 mm	Yes
Shoulder Breadth	V	236.5 - 251.7 mm	243 mm	Yes
Foot Breadth	W	53.6 - 63.8 mm	57 mm	Yes
Head Circumference	X	500.4 - 515.6 mm	510 mm	Yes
Chest Circumference with Jacket	Y	527.1 - 552.5 mm	536 mm	Yes
Waist Circumference	Z	527.1 - 552.5 mm	543 mm	Yes
Reference Location for Chest Circumference	AA	248.9 - 259.1 mm	254 mm	Yes
Reference Location for Waist Circumference	BB	160.0 - 170.2 mm	165 mm	Yes

Technician



Approved




Transportation Research Center Inc.

572P Head Drop Test

HIII 3 Year Old Serial No. 042 Calibration No. 02 - 1

Test Date 10/15/2003

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Peak Resultant Acceleration	250 - 280 g	259.5 g	Yes
Peak Lateral Acceleration	15 g Max	-8.0 g	Yes
Is Acceleration Curve Unimodal?	Yes	Yes	Yes

Comments:

Technician



Approved



10.15.2003 14:25:05 611

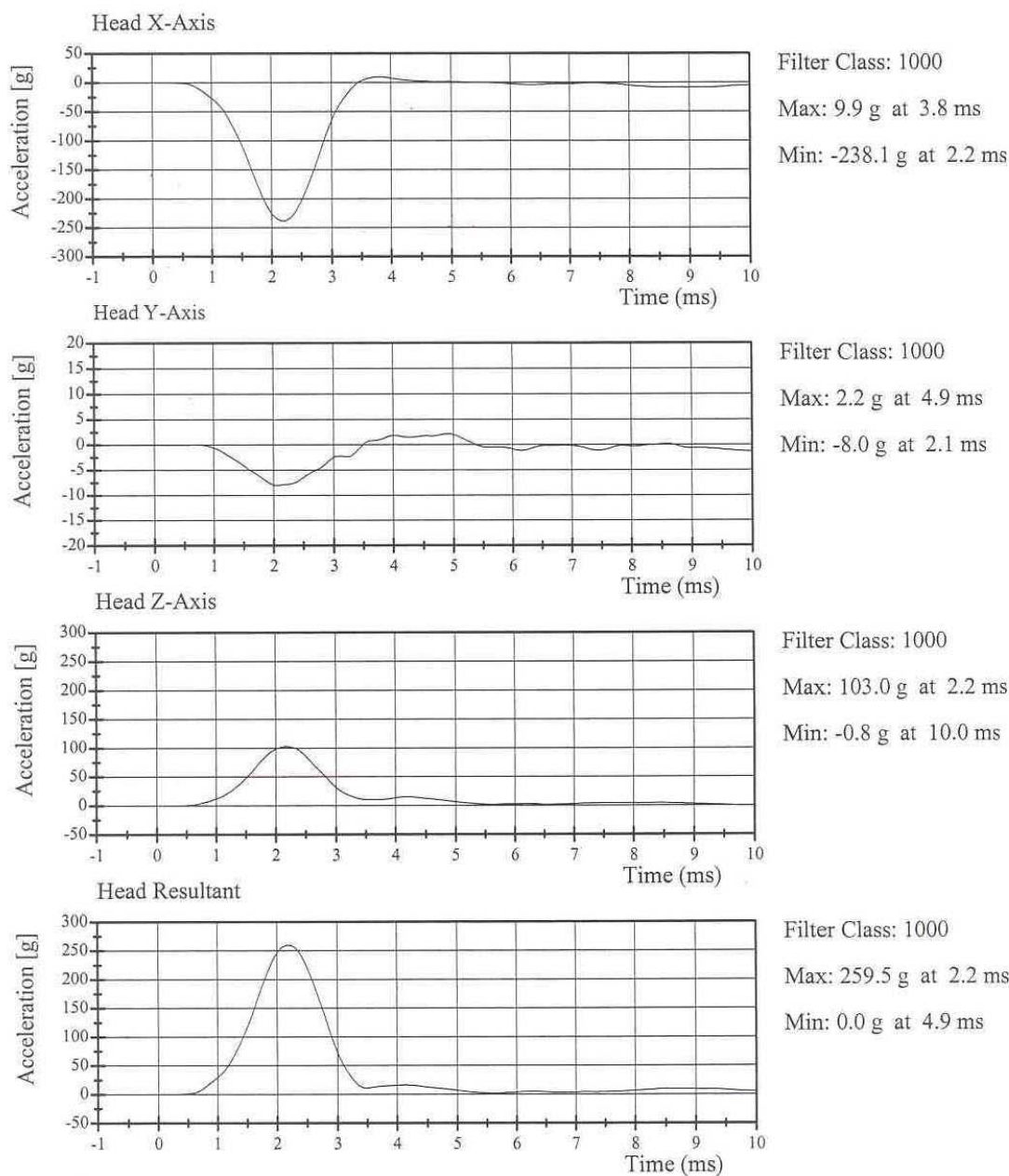


Transportation Research Center Inc.

572P Head Drop Test

HIII 3 Year Old Serial No. 042 Calibration No. 02 - 1

Test Date 10/15/2003



10.15.2003 14:25:05 611



Transportation Research Center Inc.

572P Neck Flexion Test - 6 Channel Transducer

HIII 3 Year Old Serial No. 042 Calibration No. 02 - 2

Test Date 10/15/2003

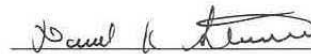
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Impact Velocity	5.40 - 5.60 m/s	5.47 m/s	Yes
Integrated Pendulum Velocity			
10 ms	2.00 - 2.70 m/s	2.36 m/s	Yes
15 ms	3.00 - 4.00 m/s	3.41 m/s	Yes
20 ms	4.00 - 5.10 m/s	4.62 m/s	Yes
Peak D Plane Rotation	70 - 82 °	73.7 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	42.0 - 53.0 N·m	42.46 N·m	Yes
Positive Moment Decay Time To 10 N·m	60 - 80 ms	71.36 ms	Yes

Comments:

Technician



Approved



10.15.2003 15:21:00 640

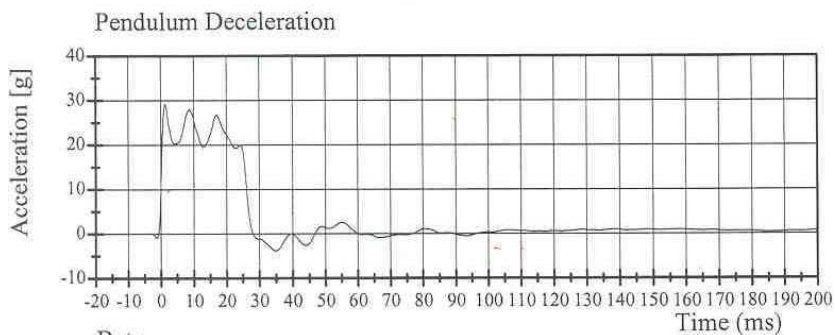


Transportation Research Center Inc.

572P Neck Flexion Test

HIII 3 Year Old Serial No. 042 Calibration No. 02 - 2

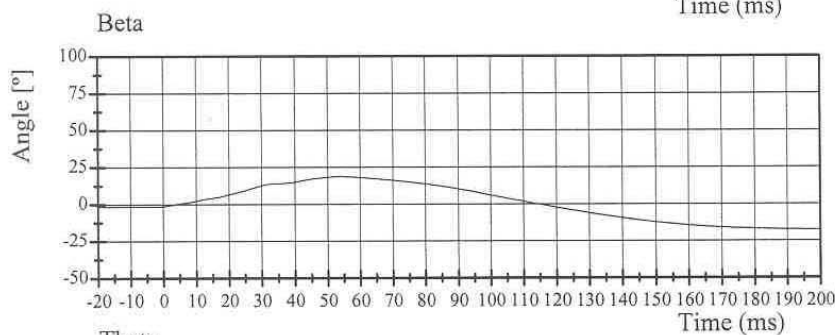
Test Date 10/15/2003



Filter Class: 180

Max: 29.2 g at 1.4 ms

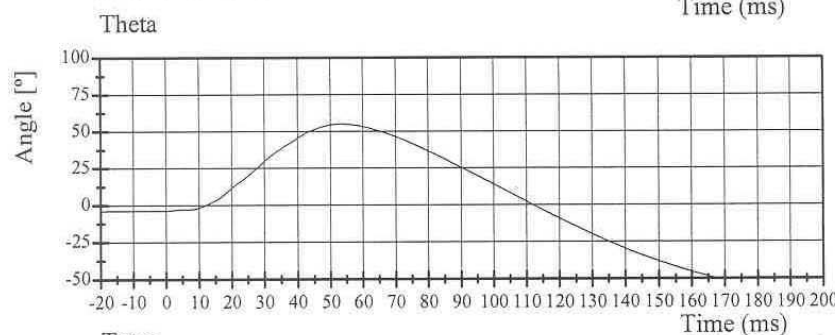
Min: -3.8 g at 35.0 ms



Filter Class: 60

Max: 18.7 ° at 53.9 ms

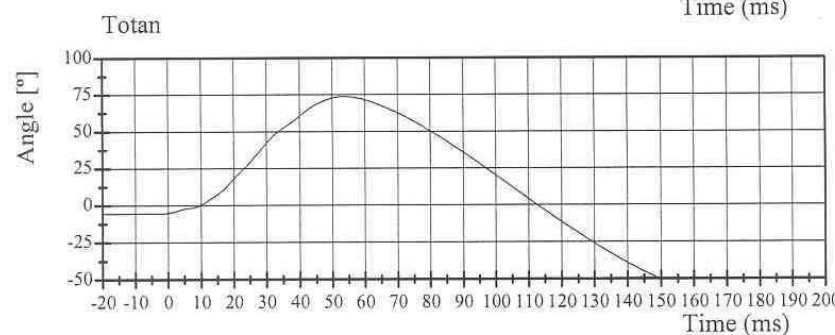
Min: -17.6 ° at 214.3 ms



Filter Class: 60

Max: 55.0 ° at 53.4 ms

Min: -56.8 ° at 200.0 ms



Filter Class: 60

Max: 73.7 ° at 53.6 ms

Min: -74.4 ° at 201.8 ms

10.15.2003 15:21:01 640

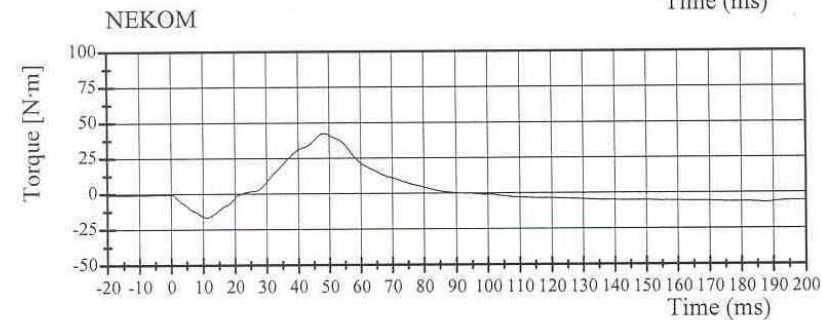
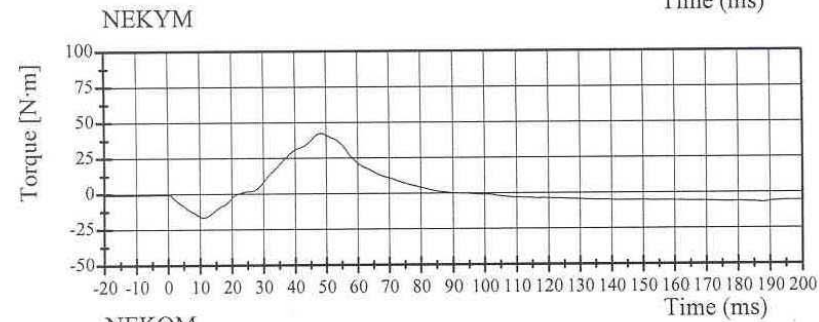
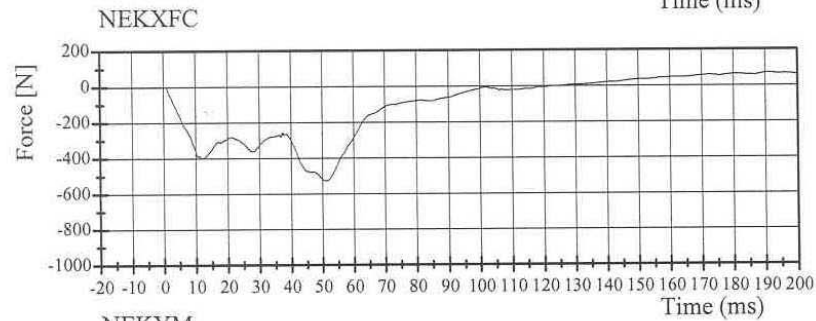
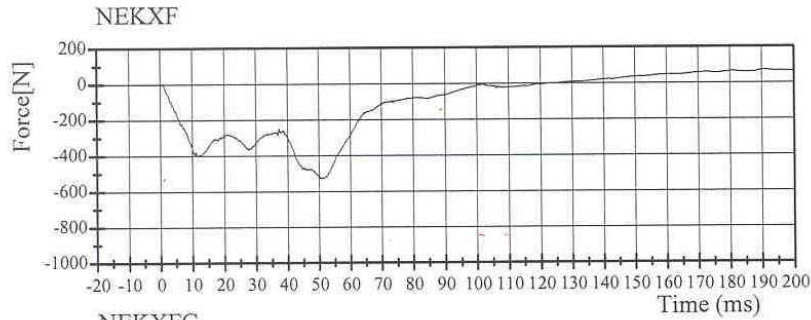


Transportation Research Center Inc.

572P Neck Flexion Test

HIII 3 Year Old Serial No. 042 Calibration No. 02 - 2

Test Date 10/15/2003



10.15.2003 15:21:02 640



Transportation Research Center Inc.

572P Neck Extension Test - 6 Channel Transducer

HIII 3 Year Old Serial No. 042 Calibration No. 02 - 3

Test Date 10/16/2003

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Impact Velocity	3.55 - 3.75 m/s	3.72 m/s	Yes
Integrated Pendulum Velocity			
10 ms	1.00 - 1.40 m/s	1.37 m/s	Yes
15 ms	1.90 - 2.50 m/s	2.44 m/s	Yes
20 ms	2.80 - 3.50 m/s	3.29 m/s	Yes
Peak D Plane Rotation	83 - 93 °	87.0 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	-53.3 - (-43.7) N·m	-47.07 N·m	Yes
Positive Moment Decay Time To -10 N·m	60 - 80 ms	72.08 ms	Yes

Comments:

Technician



Approved



10.16.2003 08:30:06 942



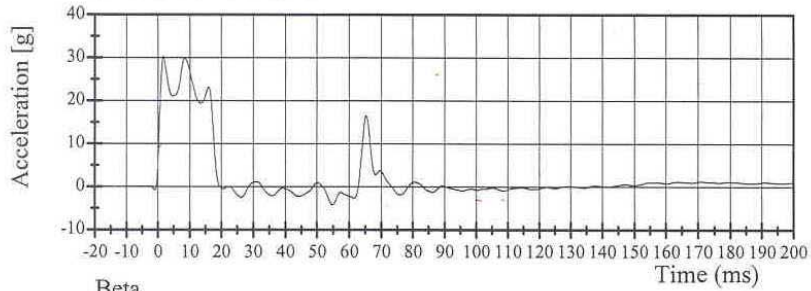
Transportation Research Center Inc.

572P Neck Extension Test

HIII 3 Year Old Serial No. 042 Calibration No. 02 - 3

Test Date 10/16/2003

Pendulum Deceleration

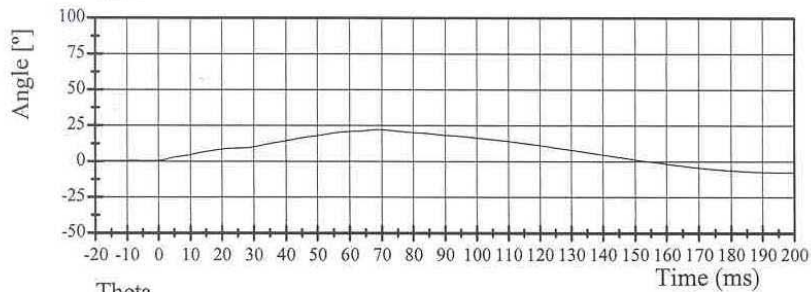


Filter Class: 180

Max: 30.4 g at 1.7 ms

Min: -4.2 g at 54.8 ms

Beta

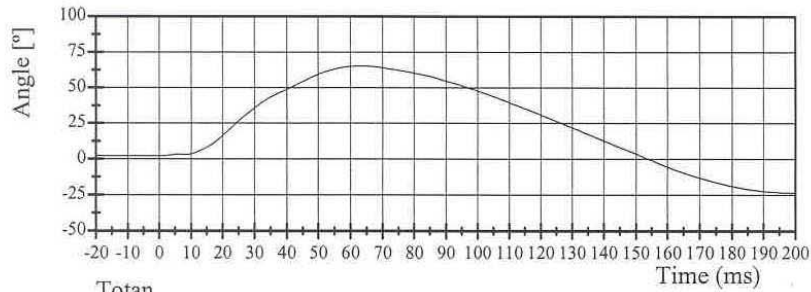


Filter Class: 60

Max: 22.2 ° at 68.8 ms

Min: -7.6 ° at 200.0 ms

Theta

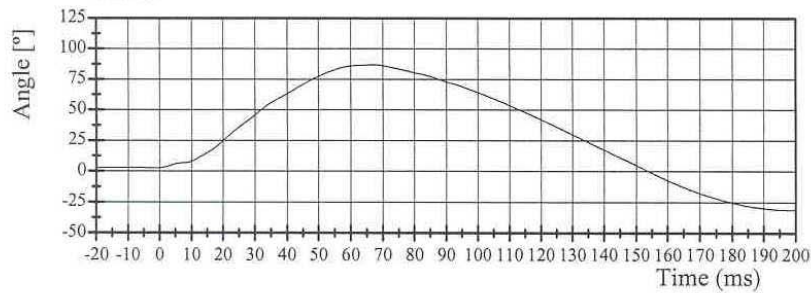


Filter Class: 60

Max: 65.3 ° at 63.4 ms

Min: -23.5 ° at 199.6 ms

Totan



Filter Class: 60

Max: 87.0 ° at 67.0 ms

Min: -31.1 ° at 199.6 ms

10.16.2003 08:30:07 942

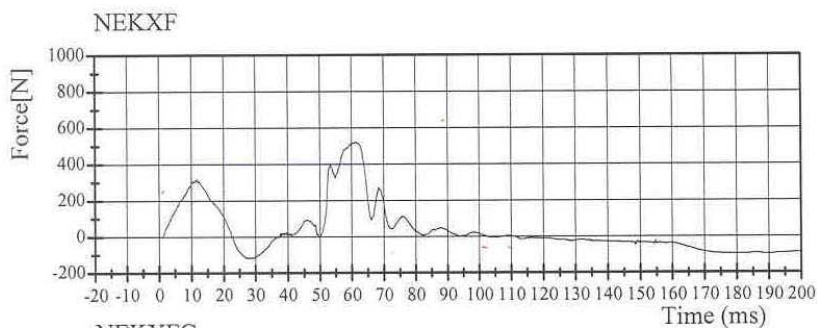


Transportation Research Center Inc.

572P Neck Extension Test

HIII 3 Year Old Serial No. 042 Calibration No. 02 - 3

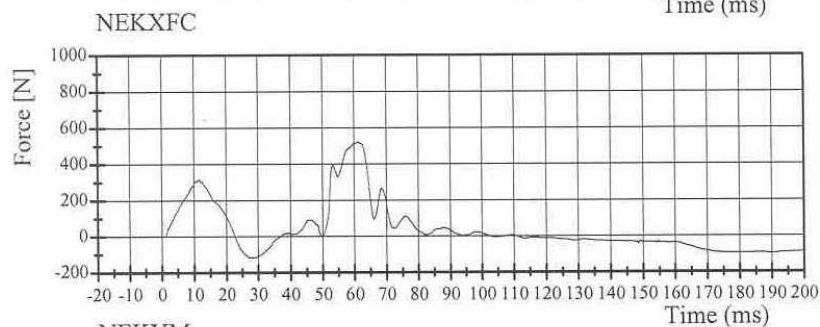
Test Date 10/16/2003



Filter Class: 1000

Max: 521.6 N at 61.4 ms

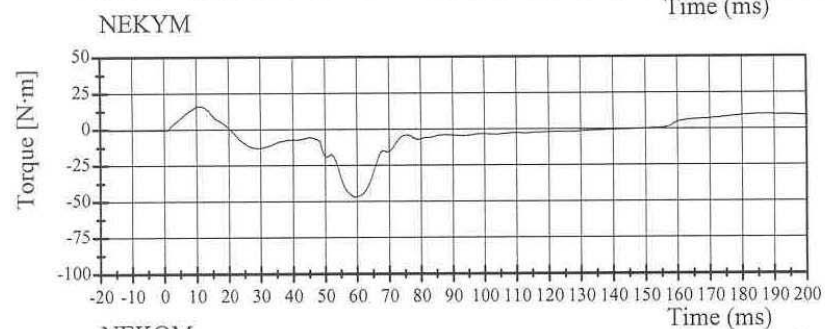
Min: -119.7 N at 28.4 ms



Filter Class: 600

Max: 520.8 N at 61.3 ms

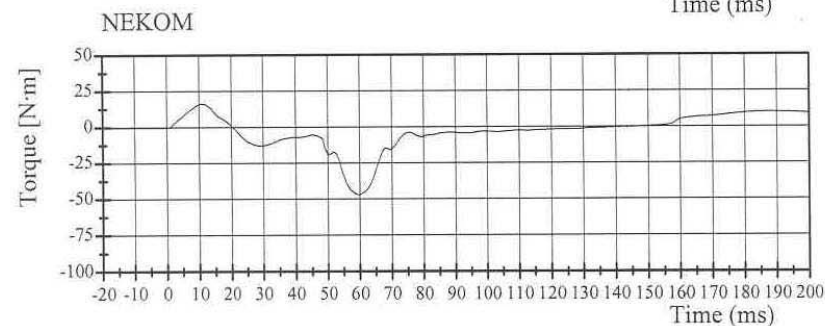
Min: -119.0 N at 28.3 ms



Filter Class: 600

Max: 16.2 N·m at 11.3 ms

Min: -47.1 N·m at 59.7 ms



Filter Class: 600

Max: 16.2 N·m at 11.3 ms

Min: -47.1 N·m at 59.7 ms

10.16.2003 08:30:08 942



Transportation Research Center Inc.

572P Thorax Test

HIII 3 Year Old Serial No. 042 Calibration No. 02 - 1

Test Date 10/17/2003

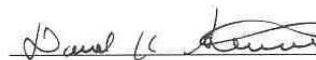
Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Pendulum Velocity	5.90 - 6.10 m/s	6.05 m/s	Yes
Maximum Chest Deflection	-38.0 - (-32.0) mm	-35.0 mm	Yes
Peak Impact Probe Force Within Compression Corridor	680 - 810 N	746 N	Yes
Internal Hysteresis	65 - 85 %	71 %	Yes
Maximum Force Between 12.5 mm & 32 mm Of Deflection	<= 910	795	Yes

Comments:

Technician



Approved



10.17.2003 13:12:32 991



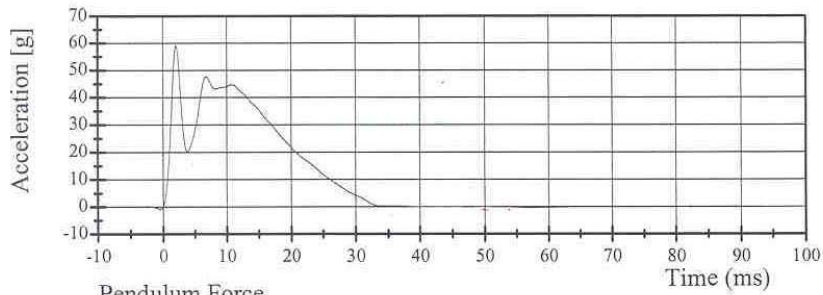
Transportation Research Center Inc.

572P Thorax Test

HIII 3 Year Old Serial No. 042 Calibration No. 02 - 1

Test Date 10/17/2003

Pendulum Deceleration

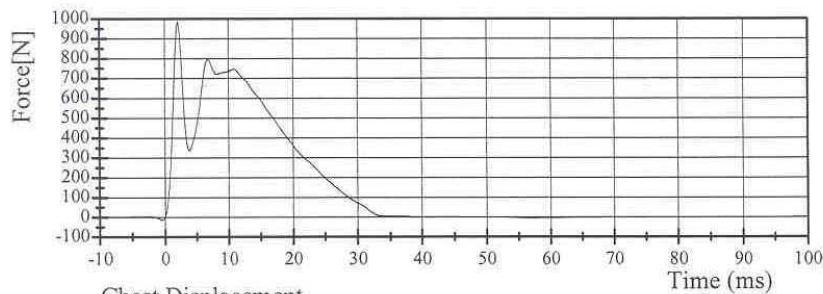


Filter Class: 180

Max: 59.1 g at 2.1 ms

Min: -0.9 g at -0.4 ms

Pendulum Force

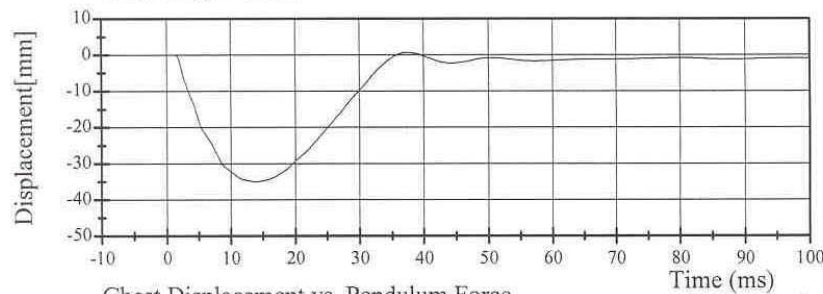


Filter Class: 180

Max: 984.8 N at 2.1 ms

Min: -15.2 N at -0.4 ms

Chest Displacement

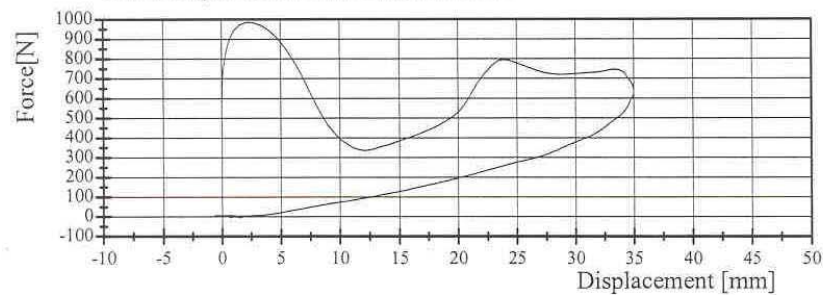


Filter Class: 600

Max: 0.7 mm at 37.3 ms

Min: -35.0 mm at 14.0 ms

Chest Displacement vs. Pendulum Force



10.17.2003 13:12:33 991



TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

HYBRID III THREE-YEAR-OLD

CAL DATE: 16-Oct-03

TRC, INC. TEST NO: 042C02TF1 572 P SN 042 TORSO FLEX CAL 02

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 – 70 %	36 %
INITIAL ANGLE OF UNSUPPORTTED DUMMY	<= 15 DEG. REFERENCED TO VERTICAL	4.9 DEG.
MAXIMUM FORCE AT 45 DEG. DURING 10 SECOND PERIOD	130 – 180 N	179.8 N
RETURN ANGLE		2.5 DEG.
DIFFERENCE BETWEEN RETURN ANGLE & INTIAL ANGLE	+/- 10° OF INTIAL ANGLE	7.4 °
RATE	0.5° - 1.5°/sec	1.0 °/sec

TEST MEETS SPECIFICATIONS

TECHNICIAN 

**Transportation Research Center
Inc.**

ATD Calibration Report

for

VRTC

**HIII 3 Year Old Serial No. 040
Calibration No. 02**



Transportation Research Center Inc.
P.O. Box B-67
10820 St. Rt. 347
East Liberty, OH 43319-0367

Transportation Research Center Inc.
572P HIII 3 Year Old Dummy
External Dimensions
Serial No. 040 Calibration No. 02

Test Parameter	Dimension	Specification	Results	Pass
Total Sitting Height	A	538.5 - 553.7 mm	550 mm	Yes
Shoulder Pivot Height	B	307.3 - 322.6 mm	315 mm	Yes
Hip Pivot Height	C	33.0 - 43.2 mm	40 mm	Yes
Hip Pivot from Backline	D	56.9 - 67.1 mm	60 mm	Yes
Shoulder Pivot from Backline	E	58.4 - 68.6 mm	64 mm	Yes
Thigh Clearance	F	81.0 - 91.2 mm	86 mm	Yes
Back of Elbow to Wrist Pivot	G	247.4 - 262.6 mm	251 mm	Yes
Head Back to Backline	H	48.3 - 58.4 mm	55 mm	Yes
Shoulder to Elbow Length	I	185.0 - 200.7 mm	196 mm	Yes
Elbow Rest Height	J	133.6 - 148.8 mm	139 mm	Yes
Buttock to Knee Length	K	287.3 - 302.5 mm	297 mm	Yes
Popliteal Height	L	221.0 - 236.2 mm	229 mm	Yes
Knee to Floor Height	M	241.6 - 256.8 mm	254 mm	Yes
Buttock Popliteal Height	N	217.9 - 233.2 mm	225 mm	Yes
Chest Depth without Jacket	O	134.6 - 149.9 mm	145 mm	Yes
Foot Length	P	137.7 - 147.8 mm	140 mm	Yes
Stature	Q	932.2 - 957.6 mm	950 mm	Yes
Buttock to Knee Pivot Length	R	251.5 - 261.6 mm	254 mm	Yes
Head Breadth	S	128.3 - 143.5 mm	138 mm	Yes
Head Depth	T	167.4 - 182.6 mm	178 mm	Yes
Hip Breadth	U	200.7 - 215.9 mm	204 mm	Yes
Shoulder Breadth	V	236.5 - 251.7 mm	239 mm	Yes
Foot Breadth	W	53.6 - 63.8 mm	57 mm	Yes
Head Circumference	X	500.4 - 515.6 mm	503 mm	Yes
Chest Circumference with Jacket	Y	527.1 - 552.5 mm	531 mm	Yes
Waist Circumference	Z	527.1 - 552.5 mm	540 mm	Yes
Reference Location for Chest Circumference	AA	248.9 - 259.1 mm	254 mm	Yes
Reference Location for Waist Circumference	BB	160.0 - 170.2 mm	165 mm	Yes

Technician



Approved




Transportation Research Center Inc.

572P Head Drop Test

HIII 3 Year Old Serial No. 040 Calibration No. 02 - 1

Test Date 10/09/2003

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	47 %	Yes
Peak Resultant Acceleration	250 - 280 g	262.1 g	Yes
Peak Lateral Acceleration	15 g Max	-4.5 g	Yes
Is Acceleration Curve Unimodal?	Yes	Yes	Yes

Comments:

Technician



Approved



10.09.2003 09:57:28 607

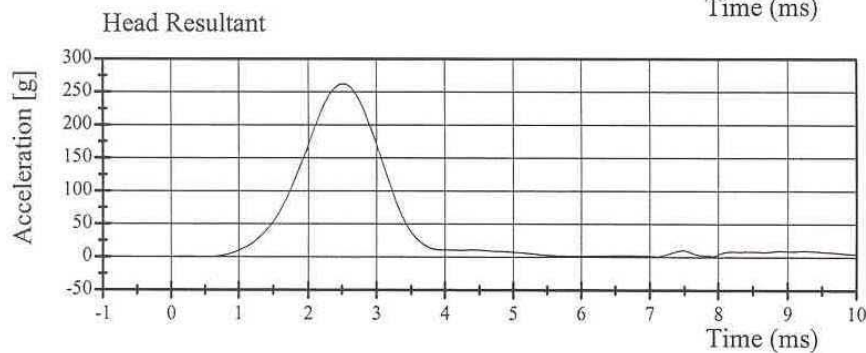
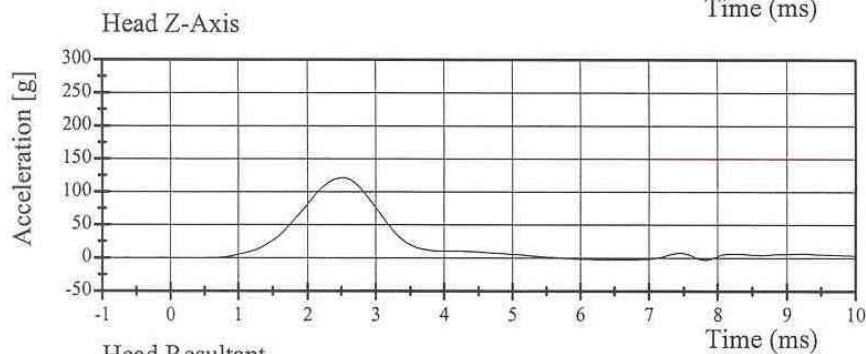
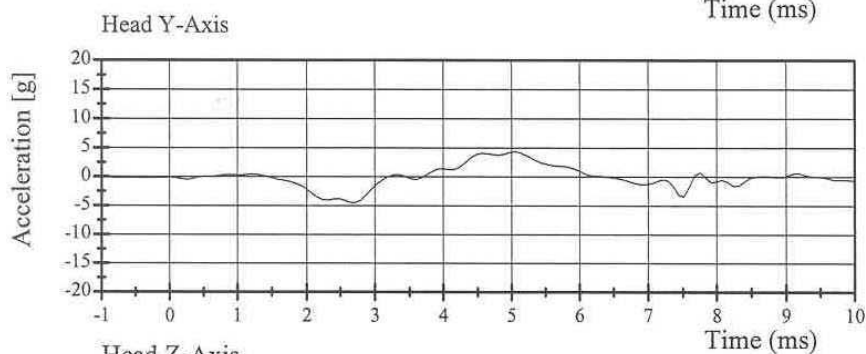
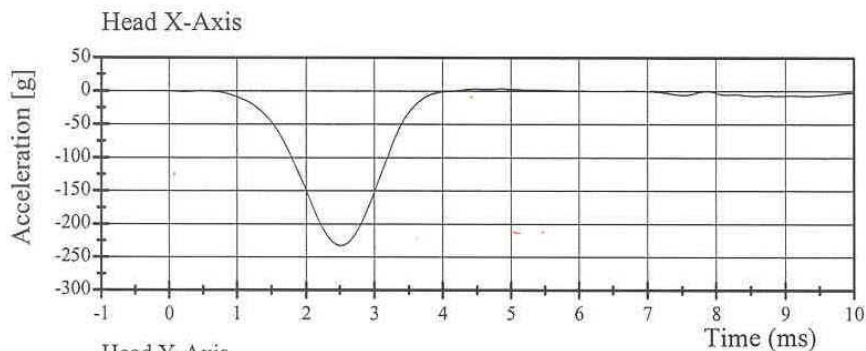


Transportation Research Center Inc.

572P Head Drop Test

HIII 3 Year Old Serial No. 040 Calibration No. 02 - 1

Test Date 10/09/2003



10.09.2003 09:57:30 607



Transportation Research Center Inc.

572P Neck Flexion Test - 6 Channel Transducer

HIII 3 Year Old Serial No. 040 Calibration No. 02 - 3

Test Date 10/09/2003

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Impact Velocity	5.40 - 5.60 m/s	5.58 m/s	Yes
Integrated Pendulum Velocity			
10 ms	2.00 - 2.70 m/s	2.60 m/s	Yes
15 ms	3.00 - 4.00 m/s	3.71 m/s	Yes
20 ms	4.00 - 5.10 m/s	5.03 m/s	Yes
Peak D Plane Rotation	70 - 82 °	71.8 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	42.0 - 53.0 N·m	46.29 N·m	Yes
Positive Moment Decay Time To 10 N·m	60 - 80 ms	69.12 ms	Yes

Comments:

Technician



Approved



10.09.2003 08:57:58 637



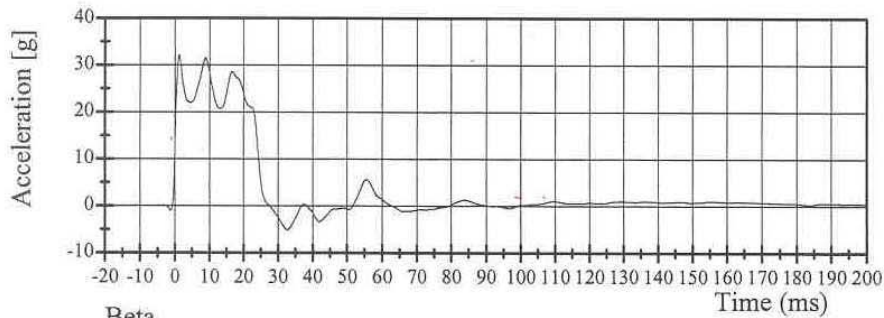
Transportation Research Center Inc.

572P Neck Flexion Test

HIII 3 Year Old Serial No. 040 Calibration No. 02 - 3

Test Date 10/09/2003

Pendulum Deceleration

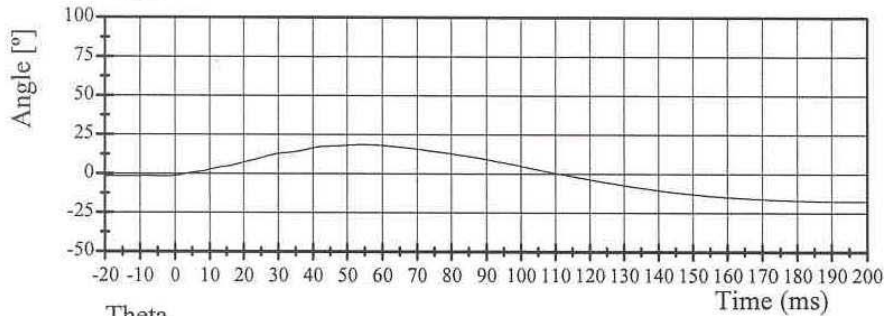


Filter Class: 180

Max: 32.1 g at 1.3 ms

Min: -5.1 g at 32.7 ms

Beta

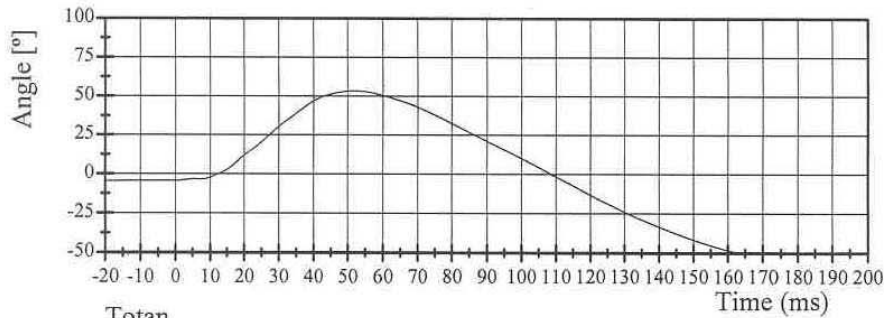


Filter Class: 60

Max: 18.5 ° at 55.1 ms

Min: -17.6 ° at 201.9 ms

Theta

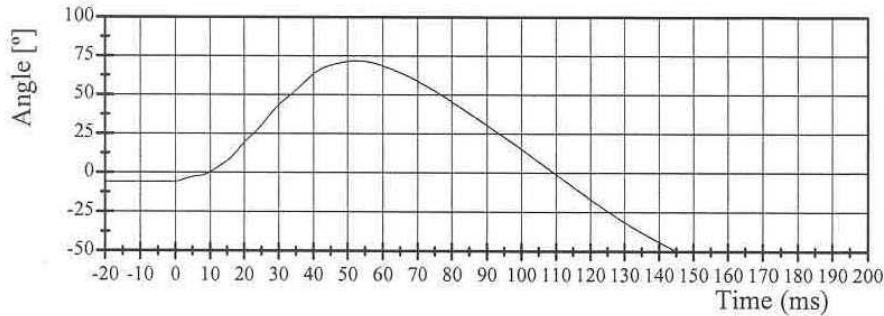


Filter Class: 60

Max: 53.4 ° at 51.7 ms

Min: -57.3 ° at 192.6 ms

Totan



Filter Class: 60

Max: 71.8 ° at 52.6 ms

Min: -74.9 ° at 192.9 ms

10.09.2003 08:57:59 637

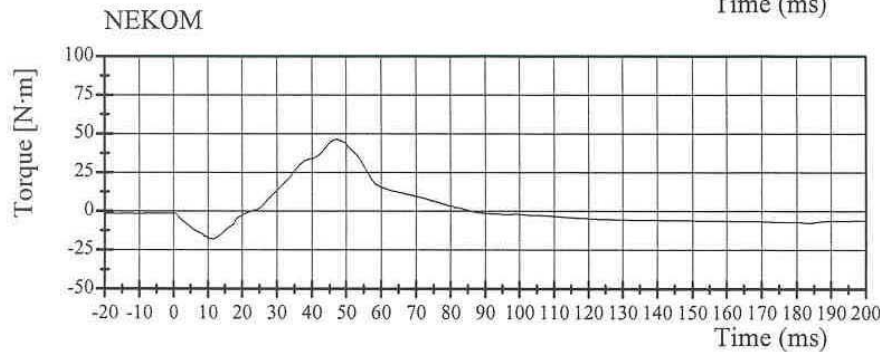
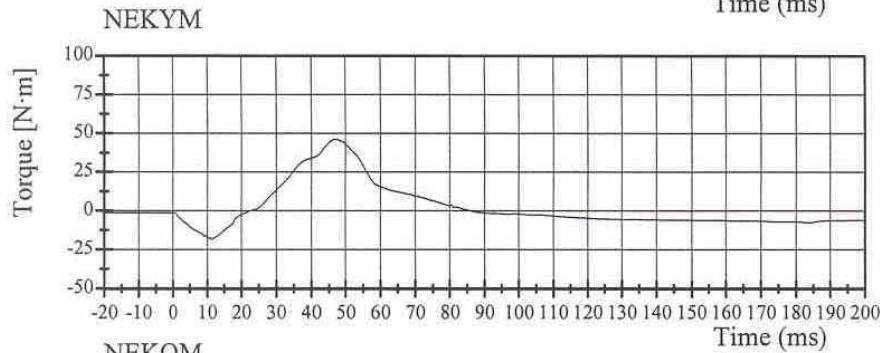
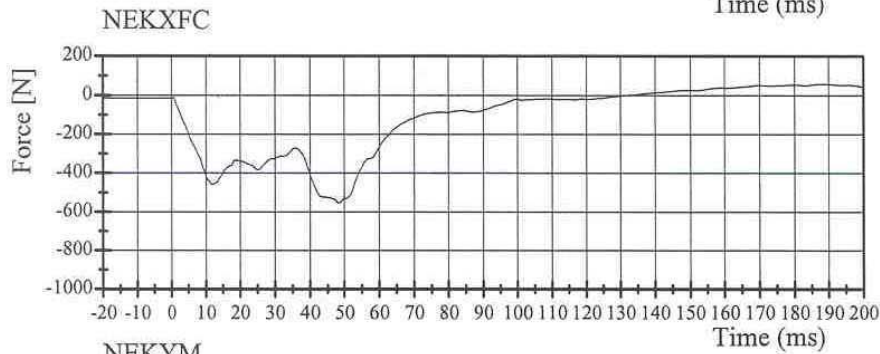
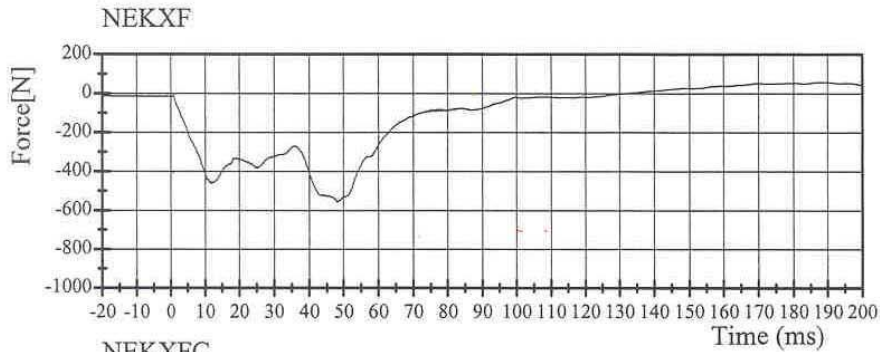


Transportation Research Center Inc.

572P Neck Flexion Test

HIII 3 Year Old Serial No. 040 Calibration No. 02 - 3

Test Date 10/09/2003



10.09.2003 08:58:00 637



Transportation Research Center Inc.

572P Neck Extension Test - 6 Channel Transducer

HIII 3 Year Old Serial No. 040 Calibration No. 02 - 2

Test Date 10/09/2003

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	47 %	Yes
Impact Velocity	3.55 - 3.75 m/s	3.71 m/s	Yes
Integrated Pendulum Velocity			
10 ms	1.00 - 1.40 m/s	1.38 m/s	Yes
15 ms	1.90 - 2.50 m/s	2.44 m/s	Yes
20 ms	2.80 - 3.50 m/s	3.32 m/s	Yes
Peak D Plane Rotation	83 - 93 °	86.8 °	Yes
Peak Moment About Occipital Condyles (During time interval rotation is within specified corridors)	-53.3 - (-43.7) N·m	-46.33 N·m	Yes
Positive Moment Decay Time To -10 N·m	60 - 80 ms	66.16 ms	Yes

Comments:

Technician



Approved



10.09.2003 09:53:50 953



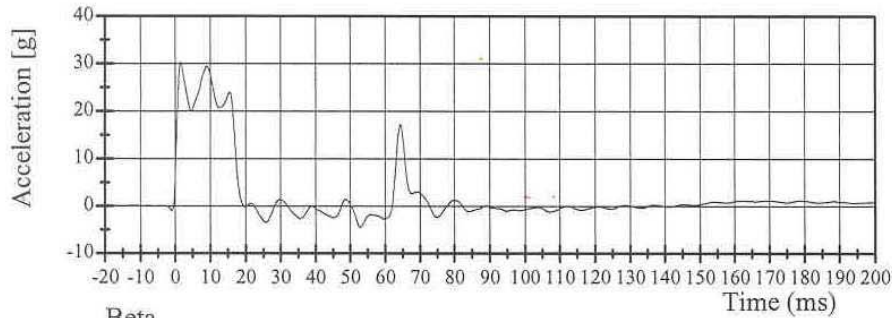
Transportation Research Center Inc.

572P Neck Extension Test

HIII 3 Year Old Serial No. 040 Calibration No. 02 - 2

Test Date 10/09/2003

Pendulum Deceleration

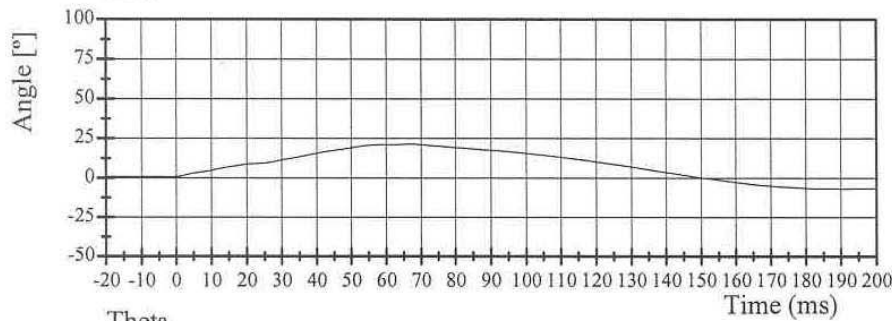


Filter Class: 180

Max: 30.2 g at 1.7 ms

Min: -4.5 g at 52.8 ms

Beta

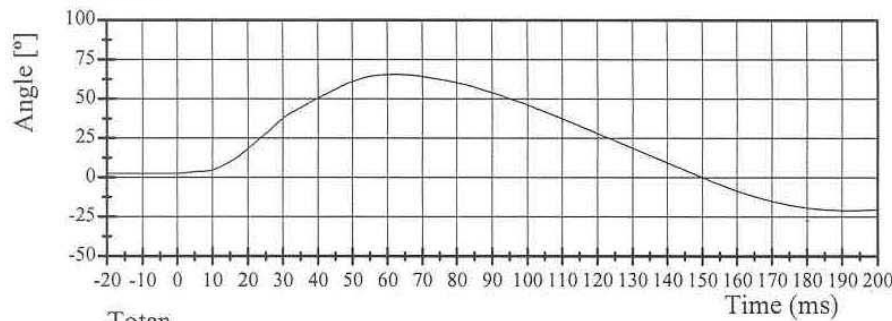


Filter Class: 60

Max: 21.4 ° at 67.0 ms

Min: -6.8 ° at 190.8 ms

Theta

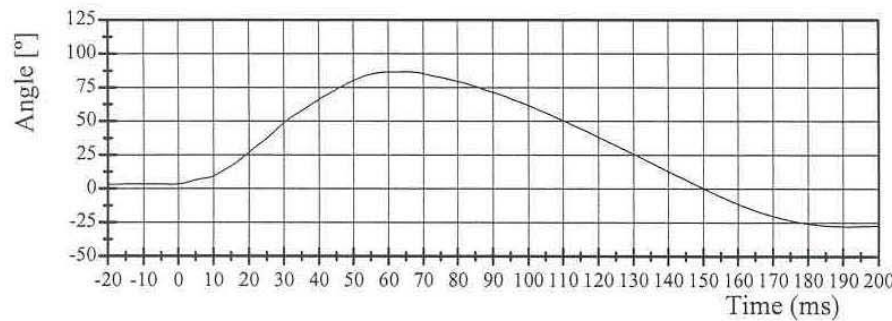


Filter Class: 60

Max: 65.5 ° at 62.4 ms

Min: -20.9 ° at 191.8 ms

Totan



Filter Class: 60

Max: 86.8 ° at 65.4 ms

Min: -27.8 ° at 191.6 ms

10.09.2003 09:53:51 953

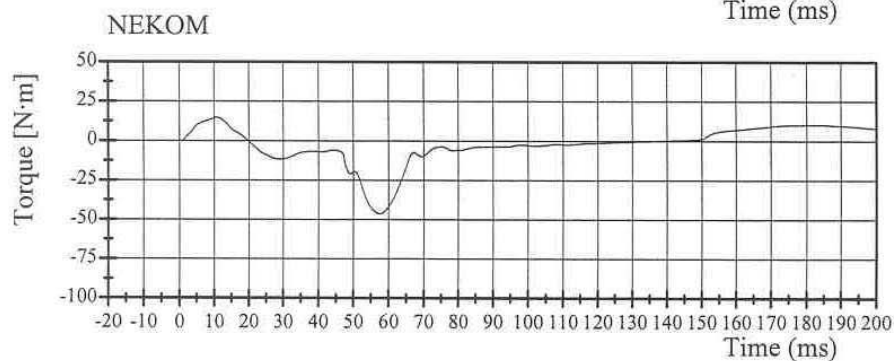
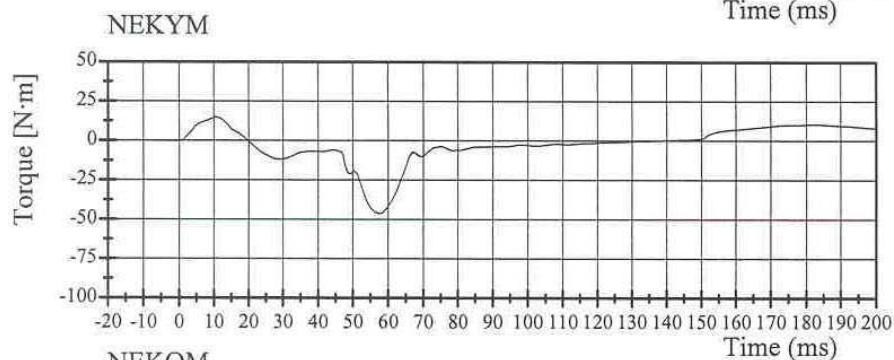
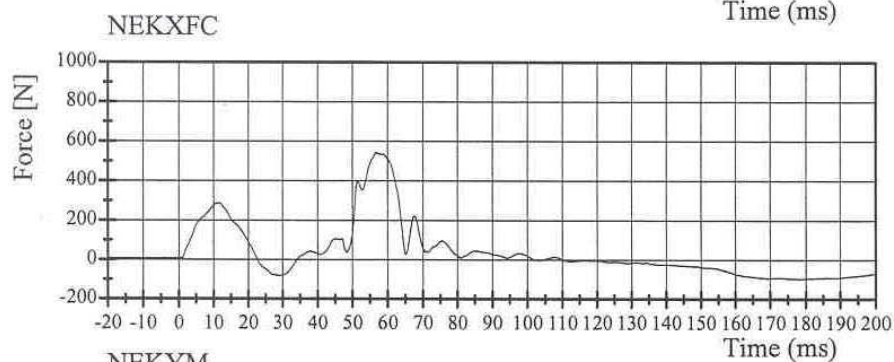
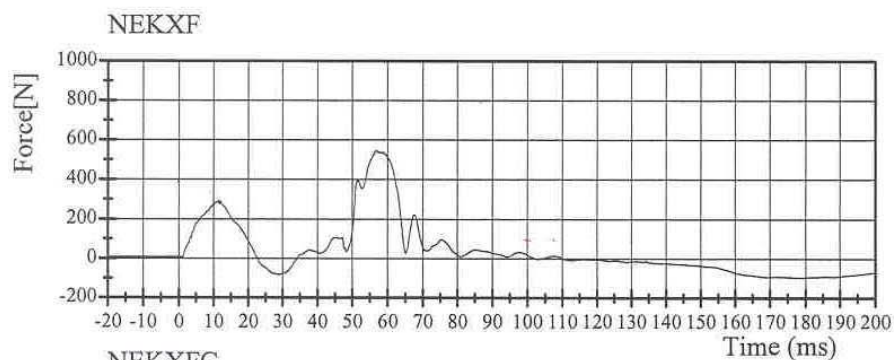


Transportation Research Center Inc.

572P Neck Extension Test

HIII 3 Year Old Serial No. 040 Calibration No. 02 - 2

Test Date 10/09/2003



10.09.2003 09:53:52 953



Transportation Research Center Inc.

572P Thorax Test

HIII 3 Year Old Serial No. 040 Calibration No. 02 - 3

Test Date 10/10/2003

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	62 %	Yes
Pendulum Velocity	5.90 - 6.10 m/s	6.05 m/s	Yes
Maximum Chest Deflection	-38.0 - (-32.0) mm	-32.5 mm	Yes
Peak Impact Probe Force Within Compression Corridor	680 - 810 N	715 N	Yes
Internal Hysteresis	65 - 85 %	71 %	Yes
Maximum Force Between 12.5 mm & 32 mm Of Deflection	<= 910	778	Yes

Comments:

Technician



Approved



10.10.2003 09:47:24 998



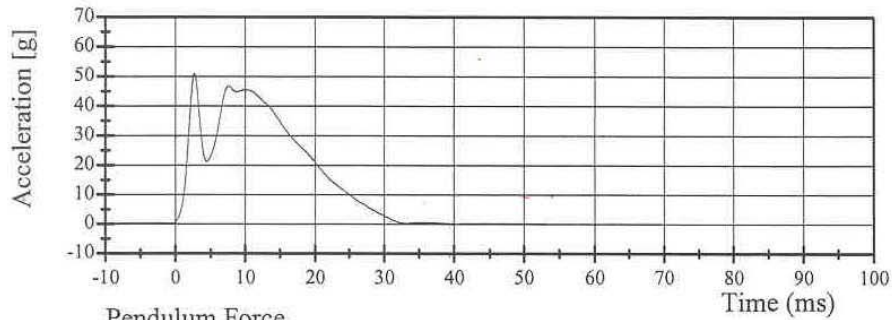
Transportation Research Center Inc.

572P Thorax Test

HIII 3 Year Old Serial No. 040 Calibration No. 02 - 3

Test Date 10/10/2003

Pendulum Deceleration

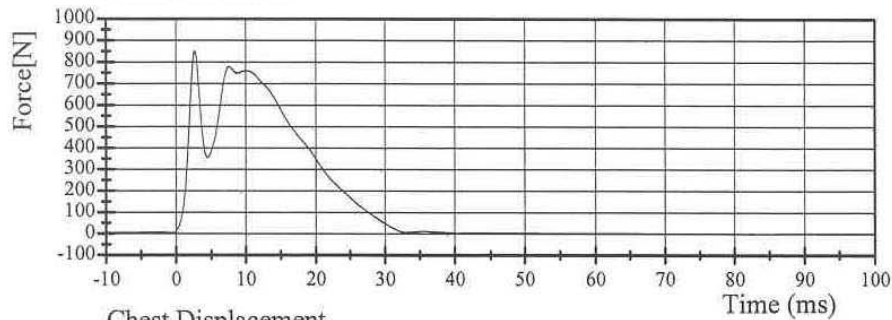


Filter Class: 180

Max: 51.0 g at 2.6 ms

Min: -0.4 g at 433.0 ms

Pendulum Force

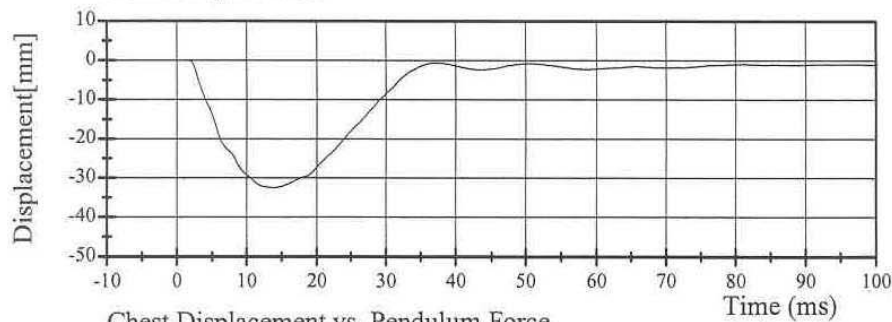


Filter Class: 180

Max: 850.3 N at 2.6 ms

Min: -7.0 N at 433.0 ms

Chest Displacement

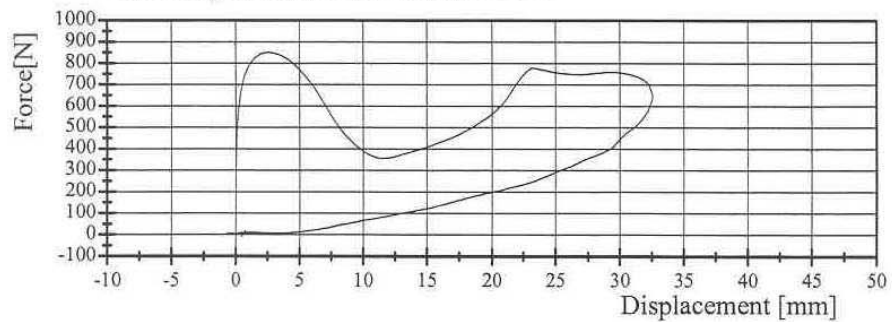


Filter Class: 600

Max: 0.7 mm at 725.3 ms

Min: -32.5 mm at 13.9 ms

Chest Displacement vs. Pendulum Force



10.10.2003 09:47:25 998



TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

HYBRID III THREE-YEAR-OLD

CAL DATE: 09-Oct-03

TRC, INC. TEST NO: 040C02TF1 572 P SN 040 TORSO FLEX CAL 02

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 – 70 %	44 %
INITIAL ANGLE OF UNSUPPORTRED DUMMY	<= 15 DEG. REFERENCED TO VERTICAL	9.2 DEG.
MAXIMUM FORCE AT 45 DEG. DURING 10 SECOND PERIOD	130 – 180 N	152.6 N
RETURN ANGLE		14.8 °
DIFFERENCE BETWEEN RETURN ANGLE & INTIAL ANGLE	+/- 8 ° OF INTIAL ANGLE	5.6 °
RATE	0.5° - 1.5°/sec	1.0 °/sec

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPENDIX D

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

INSTRUMENTS FOR LRP CHILD DUMMY S/N: 042

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	J13884	Entran	1/13/04
Head Y	AKAF3	Entran	1/13/04
Head Z	AHWP2	Endevco	1/13/04
Head X Redundant	J14027	Endevco	1/13/04
Head Y Redundant	AMP95	Endevco	1/13/04
Head Z Redundant	AHY98	Endevco	1/13/04
Upper Neck Load Cell	94	FTSS	3/08/04
Chest X	P22150	Endevco	2/02/04
Chest Y	AJ417	Endevco	2/02/04
Chest Z	P22652	Endevco	2/02/04
Chest X Redundant	P24265	Endevco	2/03/04
Chest Y Redundant	AJ9D2	Endevco	1/14/04
Chest Z Redundant	P22086	Endevco	1/14/04
Chest Displacement	042	Servo	10/23/03
Pelvis X	AGTT2	Endevco	11/10/03
Pelvis Y	AJ4J0	Endevco	11/10/03
Pelvis Z	AJ9C2	Endevco	11/10/03
Left Tether Force	198	Denton	12/09/03
Right Tether Force	158	Denton	8/21/03

INSTRUMENTS FOR RRP CHILD DUMMY S/N: 040

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	A05-A22	Entran	2/10/04
Head Y	L30-Z18	Entran	2/10/04
Head Z	A12-A11	Entran	2/10/04
Head X Redundant	J14120	Endevco	4/02/04
Head Y Redundant	J23774	Endevco	4/02/04
Head Z Redundant	APYY3	Endevco	4/02/04
Upper Neck Load Cell	210	Denton	3/09/04
Chest X	J18736	Endevco	4/02/04
Chest Y	J23946	Endevco	4/02/04
Chest Z	J27513	Endevco	4/02/04
Chest X Redundant	P22180	Endevco	4/02/04
Chest Y Redundant	P22805	Endevco	4/02/04
Chest Z Redundant	P22190	Endevco	4/02/04
Chest Displacement	040	Servo	10/14/03
Pelvis X	A05-A21	Entran	2/10/04
Pelvis Y	A05-A20	Entran	2/10/04
Pelvis Z	A07-J01	Entran	2/10/04
Tether Force	104	FTSS	11/04/03