

REPORT NUMBER: TO1-MGA-2004-019

**OBLIQUE RIGID SIDE POLE IMPACT
SIDIIsD DRIVER POSITION, Q6 LEFT REAR POSITION
TEST DATE: June 27, 2005
Task Order #T0001 / RFP #0004**

**2005 FORD FIVE HUNDRED
NHTSA NUMBER: R50616**

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**FINAL REPORT SUBMITTED:
April 12, 2006**

**PREPARED FOR:
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This final test report was prepared for the U.S. Department of Transportation, Volpe National Transportation System Center, in response to Contract Number DTRS57-04-D-30001.

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SECTION 1
PURPOSE AND TEST PROCEDURE

This Side Impact test is conducted as part of Contract No. DTRS57-04-D-30001, RFP 4, Task Order 1, sponsored by the U.S. Department of Transportation, Volpe National Transportation System Center. The purpose of this test is to evaluate the responses of the SIDIIIsD and the Q6 in a 2005 Ford Five Hundred, when subjected to a rigid pole side impact at 285 degrees.

MGA does not endorse or certify products. The manufacturer's name appears solely for identification purposes.

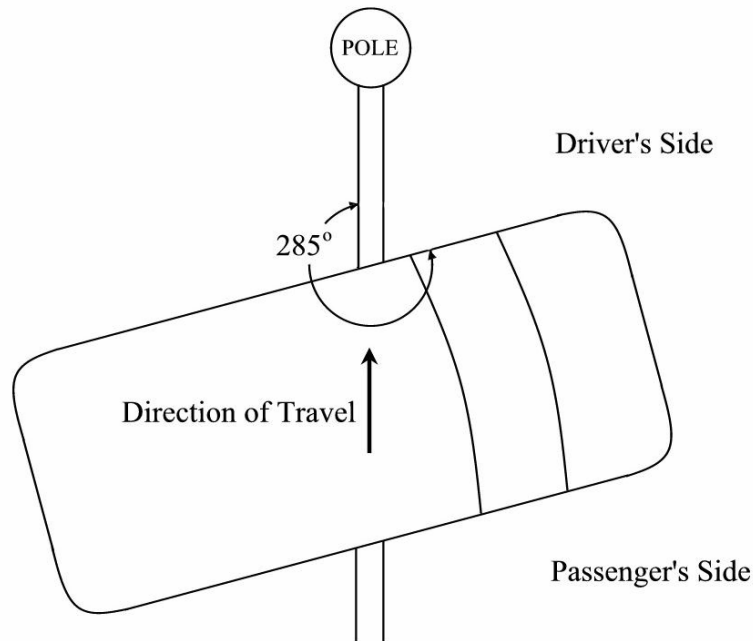
SECTION 2

SUMMARY OF SIDE IMPACT TEST

A rigid pole side impact test at 285 degrees was performed on a 2005 Ford Five Hundred. The subject vehicle was towed into a rigid pole at a velocity of 32.3 km/h. The weight of the vehicle as tested was 1812.7 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on June 27, 2005. Pre- and post-test photographs of the test vehicle and the dummies are included in Appendix A.

One SIDIIIsD side impact dummy was placed in the left front designated seating position according to instructions specified in TP-214P-00 dated May 21, 2004. A Q6 dummy was placed in the left rear seating position in a Graco Turbo Booster with the back of the booster seat removed. The side impact event was documented by twelve high speed cameras and one real time camera. Camera locations and other pertinent camera information can be found in this report.

Appendix B contains the vehicle and dummy response data traces. A summary of the dummy configuration and performance verification test data is shown in Appendix C. Dummy and vehicle calibration data can be found in Appendix D of this report.



SECTION 2...continued

SUMMARY OF SIDE IMPACT TEST

The following tables summarize the results of the Left Side Impact Test:

Rib Deflection (mm) CFC 180	
Upper Thorax Rib	-36.7
Mid Thorax Rib	-31.2
Lower Thorax Rib	-32.2
Upper Abdominal Rib	-56.6
Lower Abdominal Rib	-45.4

Abdominal Forces (N) CFC 600	
Left Acetabulum Force	2805
Left Ilium Crest Force	4075
Sum of Left Acetabulum and Left Ilium	6542

Lower Spine (CFC180)	
Lower Spine Resultant	92.4

HIC 15 & HIC 36		Left Front
	T1 (msec)	58.2
	T2 (msec)	59.2
	T2 – T1 (msec)	1.0
	HIC	7016.6

<i>Injury Criteria</i>		Left Rear Passenger
HIC 36		276
	T1	89.6
	T2	103.7
N _{te}		0.3
N _{tf}		0.1
N _{ce}		0.4
N _{cf}		0.1
Clip (g)		29

TEST NOTES

Driver Left Ilium Crest FY – no valid data after 120 msec

Floorpan @ Rear Axle Y – no valid data collected

Left Mid A-Post Y – no valid data after 100 msec

Note: The curtain airbag deployed after the occupant hit the pole. The head hit the pole at approximately 60 msec after time 0. The curtain airbag deployed approximately 85 msec after time 0. The side thorax airbag did not deploy.

SECTION 3
SIDE IMPACT DUMMY (SIDII_sD) AND TEST VEHICLE DATA

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2005 Ford Five Hundred

Test Date: June 27, 2005

TEST VEHICLE INFORMATION

Make	Ford
Model	Five hundred
Body Style	Passenger Car
VIN	1FAHP23155G149300
Color	Titanium Green
Odometer Reading (mile)	38.5
Transmission	Automatic
Final Drive	Front
Number of Cylinders	6
Engine Displacement (L)	3.0
Engine Placement	Lateral

TEST VEHICLE OPTIONS

Front Airbag	Yes
Side Airbags	Curtain
Power Windows	Yes
Power Steering	Yes
Power Door Locks	Yes
Tilt Wheel	Yes
Air Conditioning	Yes
Power Brakes	Yes
Anti-lock Brakes	Yes
AM/FM/CD	Yes
Cruise Control	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company	GVWR (kg)	2177
Date of Manufacture	01/05	GAWR Front (kg)	1145
		GAWR Rear (kg)	1065

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Cold Pressure (kPa)	220	220
Recommended Tire Size	P215/60R17	P215/60R17
Tire Size on Vehicle	P215/60R17	P215/60R17
Tire Manufacturer	Continental	Continental

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number Of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				430
Cargo Wt. (RCLW) (kg)				90.7

DATA SHEET NO. 1... (continued)**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2005 Ford Five HundredTest Date: June 27, 2005**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	515.3	323.9		517.6	390.1	
Right	kg	492.6	342.9		499.9	405.1	
Ratio	%	60.2	39.8		56.1	43.9	
Totals	kg	1007.9	666.8	1674.7	1017.5	795.2	1812.7

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1674.7
Weight of SID/ISD Side Impact Dummy	kg	54.4
Rated Cargo/Luggage Weight (RCLW)	kg	90.7
Calculated Vehicle Target Weight (TVTW)	kg	1819.8

TEST VEHICLE ATTITUDES

	Unit	As Delivered	Fully Loaded	Ready for Test
Right Door Sill Angle	Deg	0.8 ND	0.1 ND	0.1 ND
Left Door Sill Angle	Deg	0.8 ND	0.2 ND	0.2 ND
Front Bumper Angle	Deg	0.3 LD	0.0	0.2 LD
Rear Bumper Angle	Deg	0.0	0.2 LD	0.1 LD

ND=Nose down, BD = Back Down, LD = Left Down, RD = Right Down

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2865
Total Vehicle Length at Centerline	mm	5108
Total Vehicle Width	mm	1893
Weight of Ballast in Cargo Area	kg	11.3
Amount of Water in Fuel Tank	liters	71.9

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Impact Reference Line From Front Axle	mm	1126
Impact Point	mm	3 mm forward
Impact Angle Difference	deg	1°

DATA SHEET NO. 1... (continued)

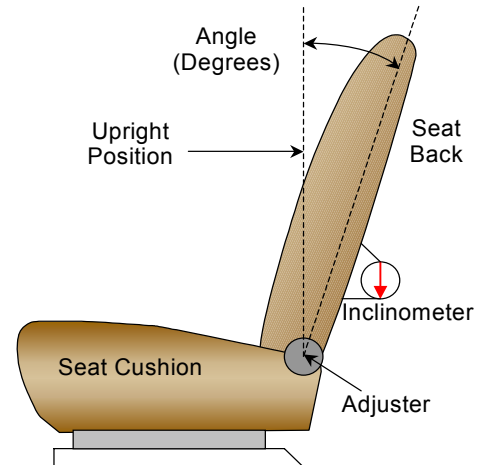
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2005 Ford Five Hundred

Test Date: June 27, 2005

SEAT RIDING POSITION

Driver seat back angle: 5.3° forward on head rest post



FRONT SEAT ASSEMBLY

SEAT FORE/AFT POSITIONS

Driver seat fore/aft total travel: 245 mm

Driver seat fore/aft position: Full forward

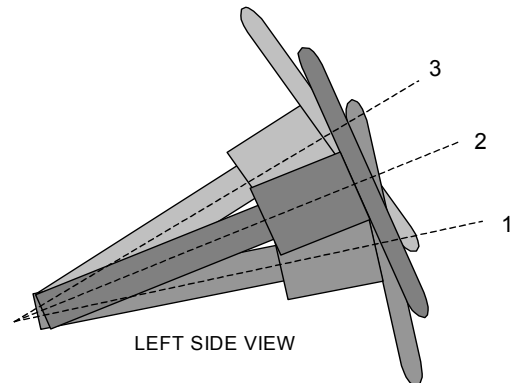
SEAT BELT UPPER ANCHORAGE

The test vehicle "D" ring anchorage for the driver's seat position was placed in the first position up from the lowest position.

STEERING COLUMN ADJUSTMENT

The steering column was placed in the mid position of travel.

Steering column position: 24.3°



STEERING COLUMN ASSEMBLY

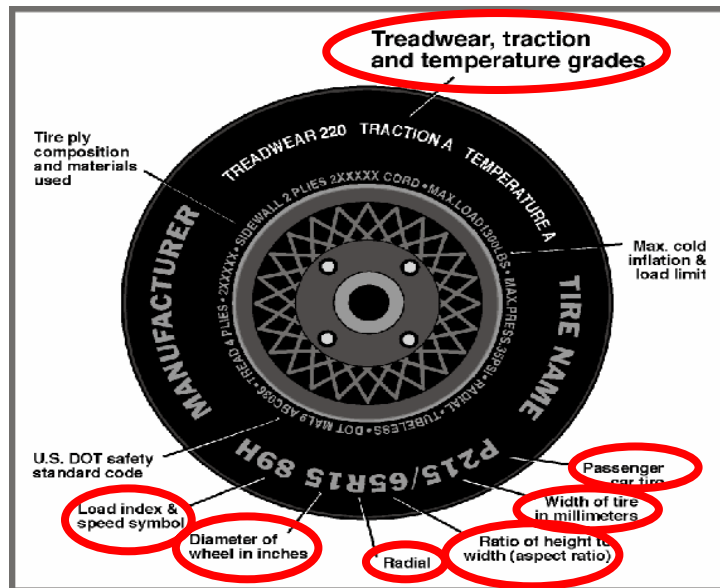
DATA SHEET NO. 2

TEST VEHICLE TIRE INFORMATION

Test Vehicle: 2005 Ford Five Hundred

Test Date: June 27, 2005

Vehicle Year	2005	Vehicle Make	Ford
VIN	1FAHP23155G149300	Vehicle Model	Five hundred



	Front	Rear
Tire Manufacturer	Continental	Continental
Tire Name	Contouring Contact	Contouring Contact
Tire Type	M+S	M+S
Tire Width (mm)	215	215
Ratio of Height to Width (aspect ratio)	60	60
Radial	R	R
Wheel Diameter	17	17
Load Index & Speed Symbol	95T	95T
Treadwear	360	360
Traction Grade	A	A
Temperature Grade	A	A

DATA SHEET NO. 3
POST TEST OBSERVATIONS

Test Vehicle: 2005 Ford Five Hundred

Test Date: June 27, 2005

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Left Front	Left Rear
Dummy Type	SIDIIsD	Q6
Head Contact	Curtain, Pole, Headrest	Curtain, Seatback
Upper Torso Contact	Door Panel	
Lower Torso Contact	Door Panel	
Left Knee Contact	Door Panel	Door Panel
Right Knee Contact	Right Knee	Left Knee

POST TEST DOOR OPENING

Description	Left Front	Left Rear
Left Side Door Opening	Remained latched and closed	Remained latched and closed
Right Side Door Opening	Remained latched and closed	Remained latched and closed

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No failures
Sill Separation	None
Windshield Damage	Windshield broke
Window Damage	Left side windows up for test, left front broke
Other Notable Effects	Left top corner of windshield lost retention (see Appendix A, photograph A-37)

AIRBAG DEPLOYMENT

	Driver	Passenger
Front	No	No
Side	No	No
Curtain	Yes	Yes

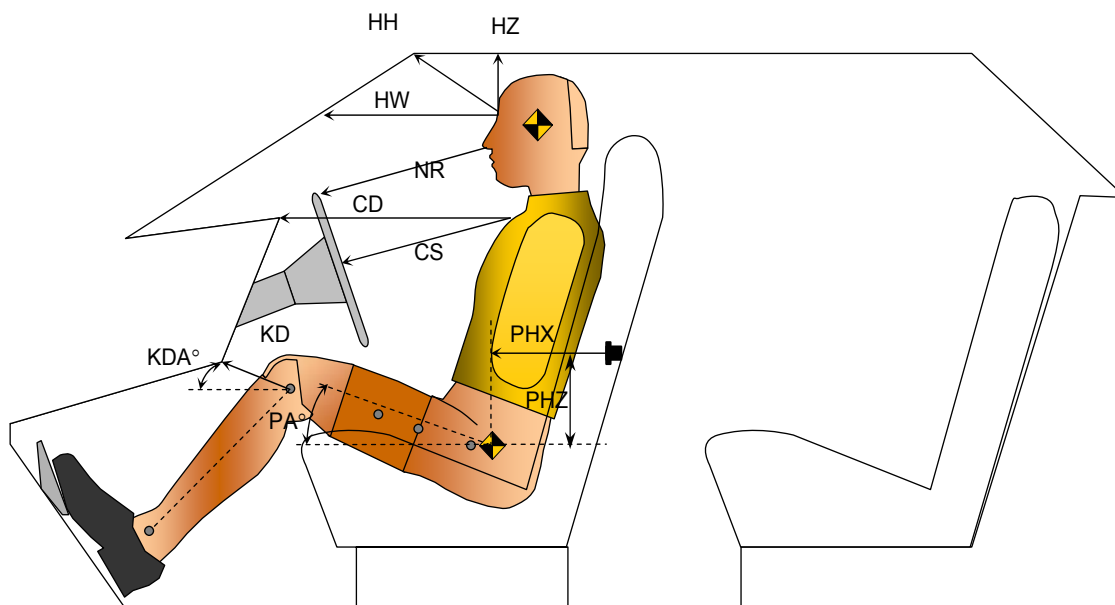
SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 4

SIDIIsD CLEARANCE DIMENSIONS

Test Vehicle: 2005 Ford Five Hundred

Test Date: June 27, 2005

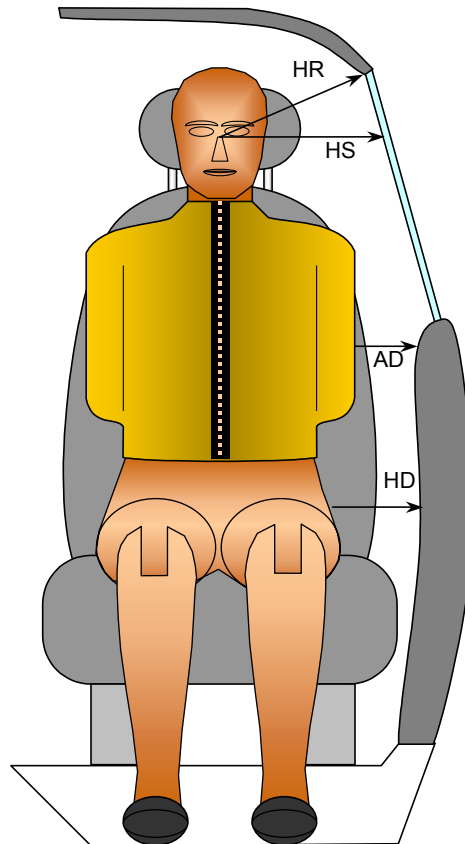


Driver Code	Measurement Description	Left Front	
		Length(mm)	Angle(°)
HH	Head to Header	224	
HW	Head to Windshield	514	
HZ	Head to Roof	186	
NR	Nose to Rim	194	
CD	Chest to Dash (Top of Rib)	407	
CS	Chest to Steering Wheel (Top of Rib)	146	
KDL	Left Knee to Dash	97	41.2
KDR	Right Knee to Dash	106	37.2
PA	Pelvic Angle (Longitudinal)		19.5
PHX	H-Point to Striker (X-Axis)	364	
PHZ	H-Point to Striker (Z-Axis)	153	

DATA SHEET NO. 4 (continued...)
SIDIIsD CLEARANCE DIMENSIONS

Test Vehicle: 2005 Ford Five Hundred

Test Date: June 27, 2005



FRONT VIEW OF DUMMY

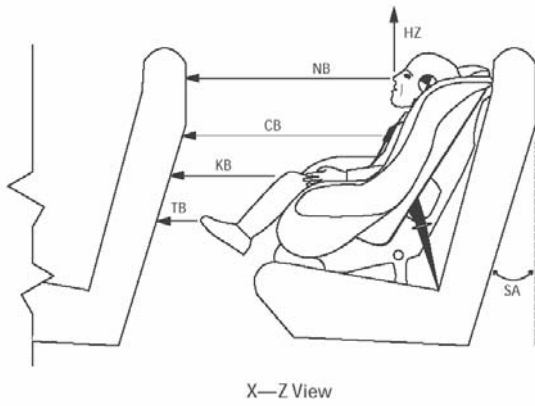
Code	Measurement Description	Units	Left Front
HR	Head to Side Header	mm	236
HS	Head to Side Window	mm	379
AD	Arm to Door	mm	148
HD	H-Point to Door	mm	214

DATA SHEET NO. 5
CHILD DUMMY POSITIONING IN VEHICLE

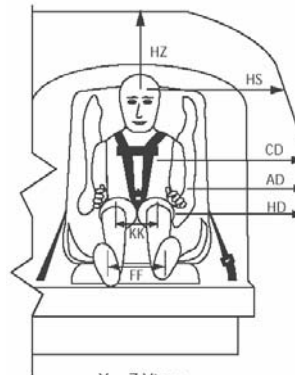
Child Restraint System

Graco Turbo Booster (Forward Facing) With Back Removed

Dummy Measurements for CRS Passengers



X—Z View



Y—Z View

X—Z View

HZ	-	Head to Roof
HS	-	Head to Side Window
CD	-	Chest to Door
AD	-	Arm to Door
HD	-	H-Point to Door
KK	-	Knee to Knee
FF	-	Foot to Foot
NB	-	Nose to Front Seat Back
CB	-	Chest to Front Seat Back
KB	-	Knee to Front Seat Back
TB	-	Toe to Front Seat Back
SA	-	Seat Back Angle

Measurement	Pre-Test (mm)
	CRS (001)
SA (deg)	31.5
HS	362
CD	331
AD	176
HD	164
HZ	348
NB	997
CB	998
KK	176
FF	180
KB - LEFT	664
KB - RIGHT	657
TB - LEFT	337
TB - RIGHT	332
Top of Head to Window Sill (Z)	121
Shoulder to Window Sill (Z)	97
Top of vehicle armrest to top of booster armrest (Z)	28

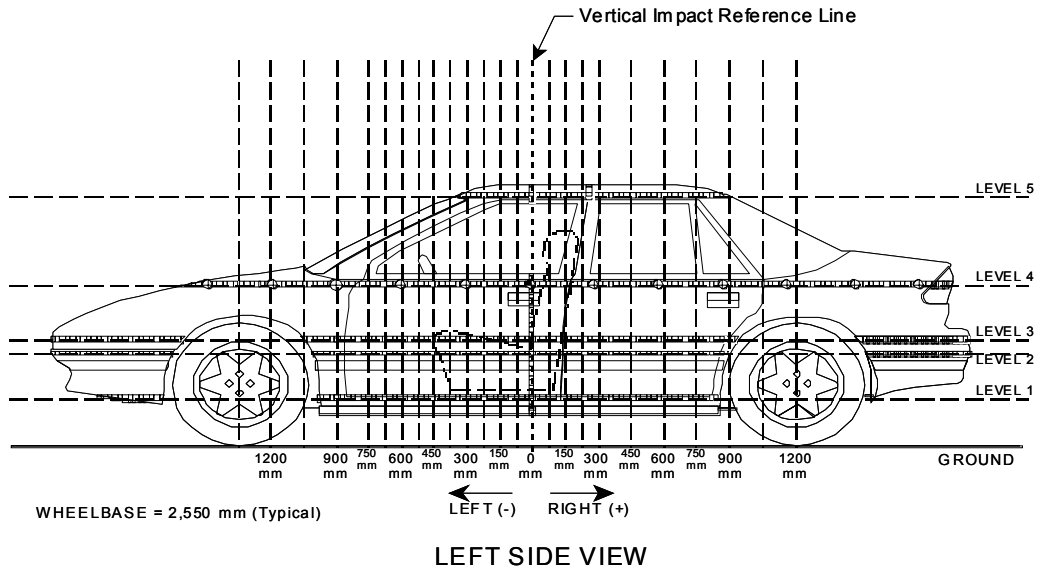
All dimensions in mm (unless noted)
Left Rear Passenger (Forward facing)

DATA SHEET NO. 6 **VEHICLE SIDE MEASUREMENTS**

Test Vehicle: 2005 Ford Five Hundred

Test Date: June 27, 2005

PRETEST AND POST TEST EXTERIOR PROFILE MEASUREMENTS



Measurements are taken with vehicle in the as tested condition.
Measurements along the vertical 0 mm.
All measurements below in mm.

Level	Measurement Description	Height Above Ground
5	Window	1545
4	Window Sill	1060
3	Mid Door	750
2	Occupant H-Point	630
1	Sill Top	330

DATA SHEET NO. 7
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2005 Ford Five Hundred

Test Date: June 27, 2005

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1575				290					294					4	
-1425				278					278					0	
-1275				270					271					1	
-1125				260					267					7	
-975				253					263					10	
-825				250					261					11	
-750		163	163	250			191	192	261			28	29	11	
-675	222	165	170	244		253	194	198	259		31	29	28	15	
-600	237	172		244		262	195		259		25	23		15	
-525	239	171	170	245		282	216	221	270		43	45	51	25	
-450	238	169	169	244		320	264	265	308		82	95	96	64	
-375	237	168	168	239		358	313	313	345		121	145	145	106	
-300	235	167	166	238		393	369	367	386		158	202	201	148	
-225	235	165	165	238		428	322	319	430		193	157	154	192	
-150	234	165	164	238		471	374	470	476		237	209	306	238	
-75	233	164	164	237		525	525	525	526		292	361	361	289	
0	233	164	163	235		565	567	571	565		332	403	408	330	
75	233	163	163	236	480	570	576	573	571	598	337	413	410	335	118
150	233	163	163	236	474	543	544	543	545	608	310	381	380	309	134
225	234	163	162	235	472	494	490	492	491	586	260	327	330	256	114
300	234	163	162	237	470	445	430	429	431	555	211	267	267	194	85
375	234	163	162	237	470	403	369	364	374	536	169	206	202	137	66
450	235	162	162	236	471	371	311	301	326	521	136	149	139	90	50
525	238	164	162	237	472	350	269	260	319	505	112	105	98	82	33
600	237	165	162	238	475	338	260	252	307	497	101	95	90	69	22
675	239	165	165	240	480	327	253	244	302	494	88	88	79	62	14
825	240	167	168	245		296	232	223	284		56	65	55	39	
975	241	170	171	249		267	208	200	264		26	38	29	15	
1125	244	173	174	253		240	184	178	246		-4	11	4	-7	
1275	235	176	178	260		204	160	158	231		-31	-16	-20	-29	
1425		167	172	263			160	128	214			-7	-44	-49	
1575			160	268				158	264				-2	-4	
1725			159	275				157	271				-2	-4	
1875			160	285				161	278				1	-7	
2025			180	291				179	286				-1	-5	
2175			205	305				205	299				0	-6	
2325			220	319				221	317				-1	-2	

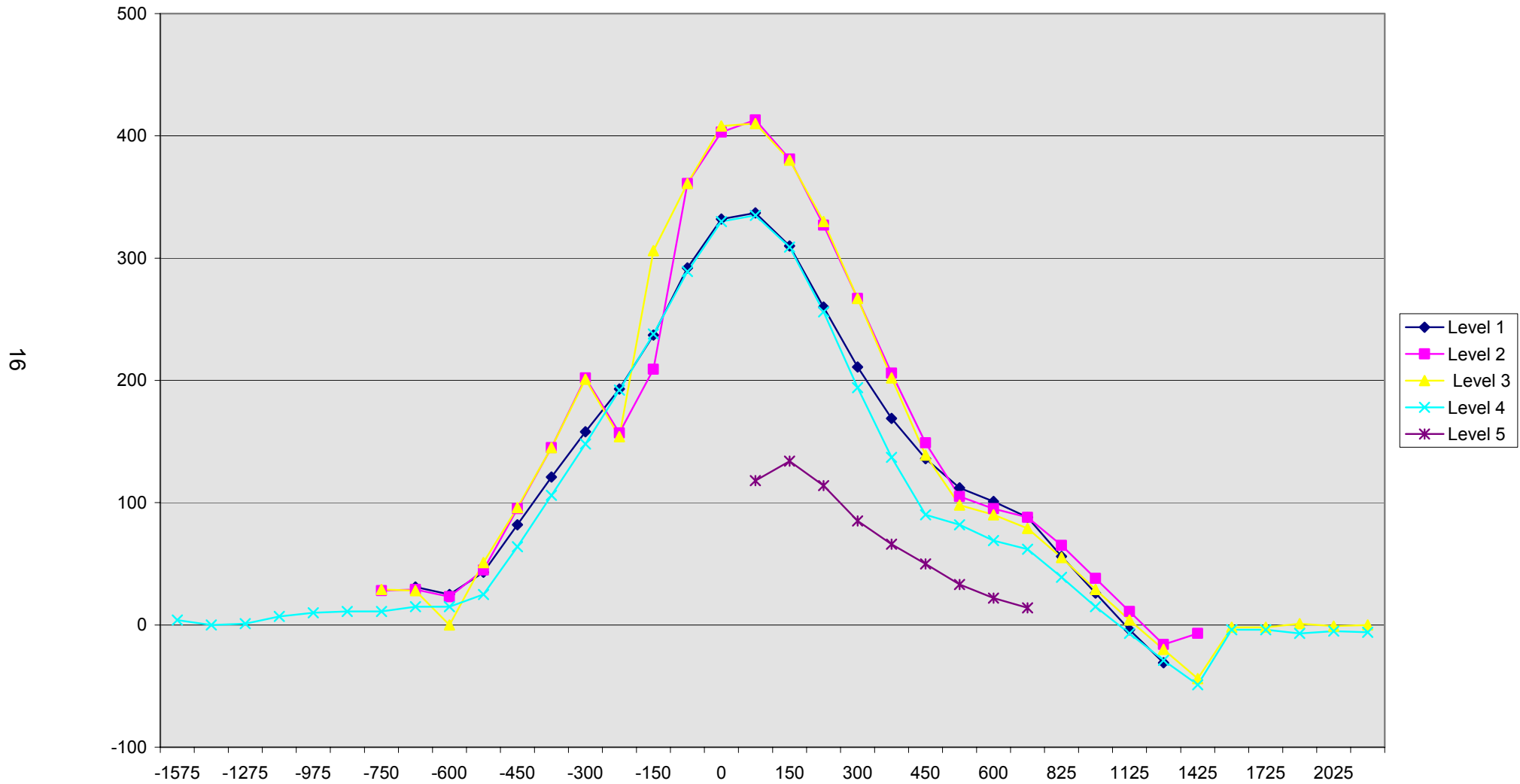
Reference plane is parallel to test vehicle longitudinal centerline.

Given dimensions = Reference plane to car body. Measurements are in mm.

DATA SHEET NO. 7... (continued)
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2005 Ford Five Hundred

Test Date: June 27, 2005

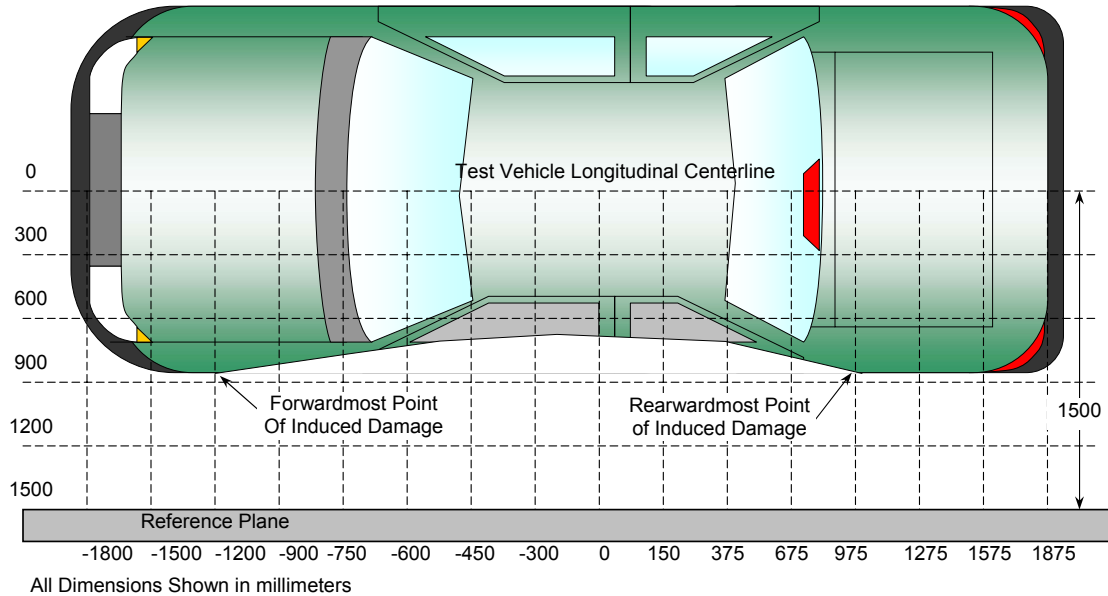


Measurement in mm.

DATA SHEET NO. 8
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2005 Ford Five Hundred

Test Date: June 27, 2005



TOP VIEW

Damage Profile Distances

DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	2325 mm	4	319	317	-2
2	1590 mm	3	160	158	-2
3	898 mm	2	169	220	51
4	-15 mm	3	163	571	408
5	-825 mm	4	250	261	11
6	-1575 mm	4	290	294	4

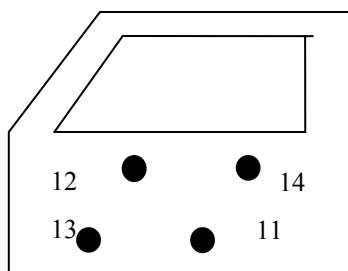
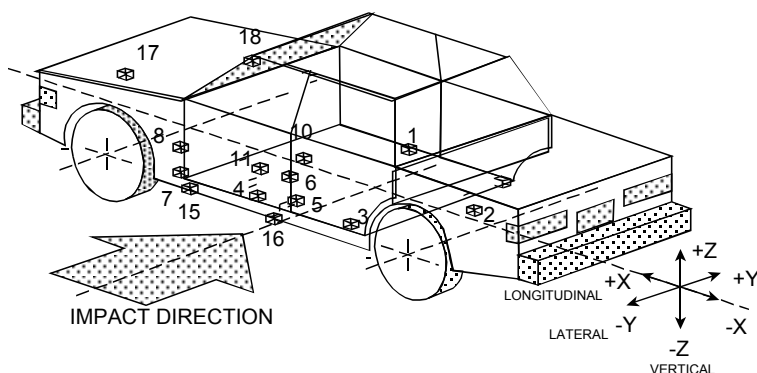
Reference plane is parallel to test vehicle longitudinal centerline.

Given dimensions = Reference plane to car body.

DATA SHEET NO. 9 **VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY**

Test Vehicle: 2005 Ford Five Hundred

Test Date: June 27, 2005



No.	Location
1	Right Side Sill at Front Seat
2	Rear Floorpan Above Axle
3	Left Side Sill at Rear Door
4	Left Side Sill at Front Door
5	Left Lower B-Post
6	Left Mid B-Post
7	Left Lower A-Post
8	Left Mid A-Post
9	Driver Seat Track
10	Vehicle CG
11	Left Front Door @ Pelvis

No.	Location
12	Left Front Door @ Arm
13	Left Front Door @ Knee
14	Left Front Door @ Mid Rib
15	Left A-Post @ Sill
16	Left B-Post @ Sill
17	Upper Engine
18	Firewall

DATA SHEET NO. 9... (continued)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2005 Ford Five Hundred

Test Date: June 27, 2005

VEHICLE ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Long (X) Maximums (g's) (CFC 60)		Lat. (Y) Maximums (g's) (CFC 60)		Vert. (Z) Maximums (g's) (CFC 60)		Resultant (g's) (CFC 60)
		Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Max.
1	Right Side Sill at Front Seat	2.3	-4.6	20.6	-1.5	9.4	-8.2	20.8
2	Rear Floorpan Above Axle	1.4	-5.5	*	*	4.3	-5.7	*
3	Left Side Sill at Rear Door			22.6	-5.5			
4	Left Side Sill at Front Door			58.0	-5.2			
5	Left Lower B-Post			48.0	-18.2			
6	Left Mid B-Post			39.5	-8.2			
7	Left Lower A-Post			57.5	-3.7			
8	Left Mid A-Post			**	**			
9	Driver Left Seat Track			60.2	-8.8			
10	Vehicle CG	8.0	-11.8	31.2	-4.7	30.7	-52.9	55.3
11	Left Front Door at Pelvis			123.8	-36.4			
12	Left Front Door at Arm			62.8	-16.2			
13	Left Front Door at Knee			50.0	-52.1			
14	Left Front Door at Rib			73.5	-18.4			
15	Left A-post @ Sill			28.9	-7.3			
16	Left B-post @ Sill			37.7	-0.9			
17	Upper Engine	4.9	-15.5	17.6	-2.7			
18	Firewall			14.2	-0.7			

*No valid data collected

**No valid data collected after 100 msec

Sign Convention X - + forward
 Y - + to right
 Z - + down

DATA SHEET NO. 9... (continued)**VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY**Test Vehicle: 2005 Ford Five HundredTest Date: June 27, 2005**VEHICLE ACCELEROMETER COORDINATES**

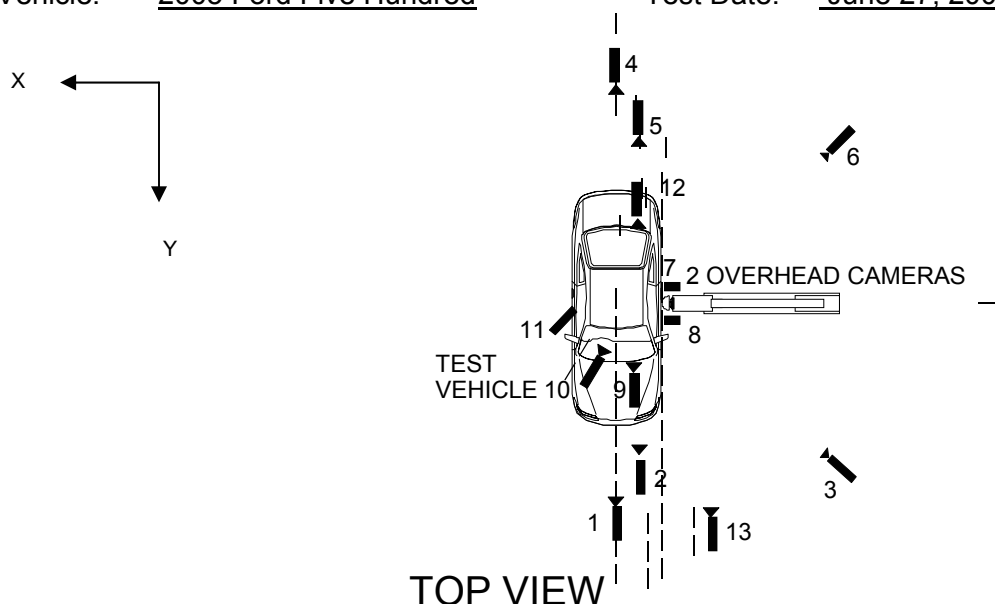
Loc. No.	Description	Coordinates (mm)		
		X	Y	Z
1	Right Side Sill at Front Seat	3039	752	204
2	Rear Floorpan Above Axle	1160	0	580
3	Left Side Sill at Rear Door	2057	-764	213
4	Left Side Sill at Front Door	3041	-760	196
5	Left Lower B-Post	2440	-735	497
6	Left Mid B-Post	2428	-740	938
7	Left Lower A-Post	3513	-862	578
8	Left Mid A-Post	3530	-865	805
9	Driver Left Seat Track	2176	-562	465**
10	Vehicle CG	2924	0	271
11	Left Door @ Pelvis	2851	-800	674
12	Left Door @ Arm	2906	-791	878
13	Left Door @ Knee	3218	-792	717
14	Left Door @ Rib	2742	-802	923
15	Left A Pillar Sill	3336	-791	193
16	Left B Pillar Sill	2432	-762	203
17	Engine	4131	60	992
18	Firewall	3923	-585	904

Sign Convention X – Rear Bumper (+ forward)
 Y – Vehicle Centerline (+ to right)
 Z – Ground Plane (+ up)

DATA SHEET NO. 10
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2005 Ford Five Hundred

Test Date: June 27, 2005



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Front Overall	-495	5470	1385	24	1000
2	Front Close Up	-1340	7275	1525	35	1000
3	Front Angle	-2425	2865	1460	24	1000
4	Rear Overall	3630	-9580	1400	24	1000
5	Rear Close Up	2580	-8295	1345	35	1000
6	Rear Angle	-2050	-2640	1460	24	1000
7	Overhead View	510	-1110	5725	14	1000
8	Overhead Close Up	-10	0	5050	19	1000
9	Onboard Driver Front				13	500
10	Onboard Driver Hip				13	500
11	Onboard Driver Side				8	500
12	Onboard Rear Passenger				10	500
13	Real Time				13	24

Reference Points X - + Forward of Impact
 Y - + Right of Impact
 Z - + Up from Ground

APPENDIX A
PHOTOGRAPHS

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A-1.



Pre-Test Front View of Test Vehicle



Post-Test Front View of Test Vehicle



Pre-Test Rear View of Test Vehicle



Post-Test Rear View of Test Vehicle

A-5.



Pre-Test Left Side View of Test Vehicle

Post-Test Left Side View of Test Vehicle



Post-Test Left Side View of Test Vehicle (Close Up)



Pre-Test Left $\frac{3}{4}$ Front View of Test Vehicle



Post-Test Left $\frac{3}{4}$ Front View of Test Vehicle



Pre-Test Left $\frac{3}{4}$ Rear View of Test Vehicle



Post-Test Left $\frac{3}{4}$ Rear View of Test Vehicle



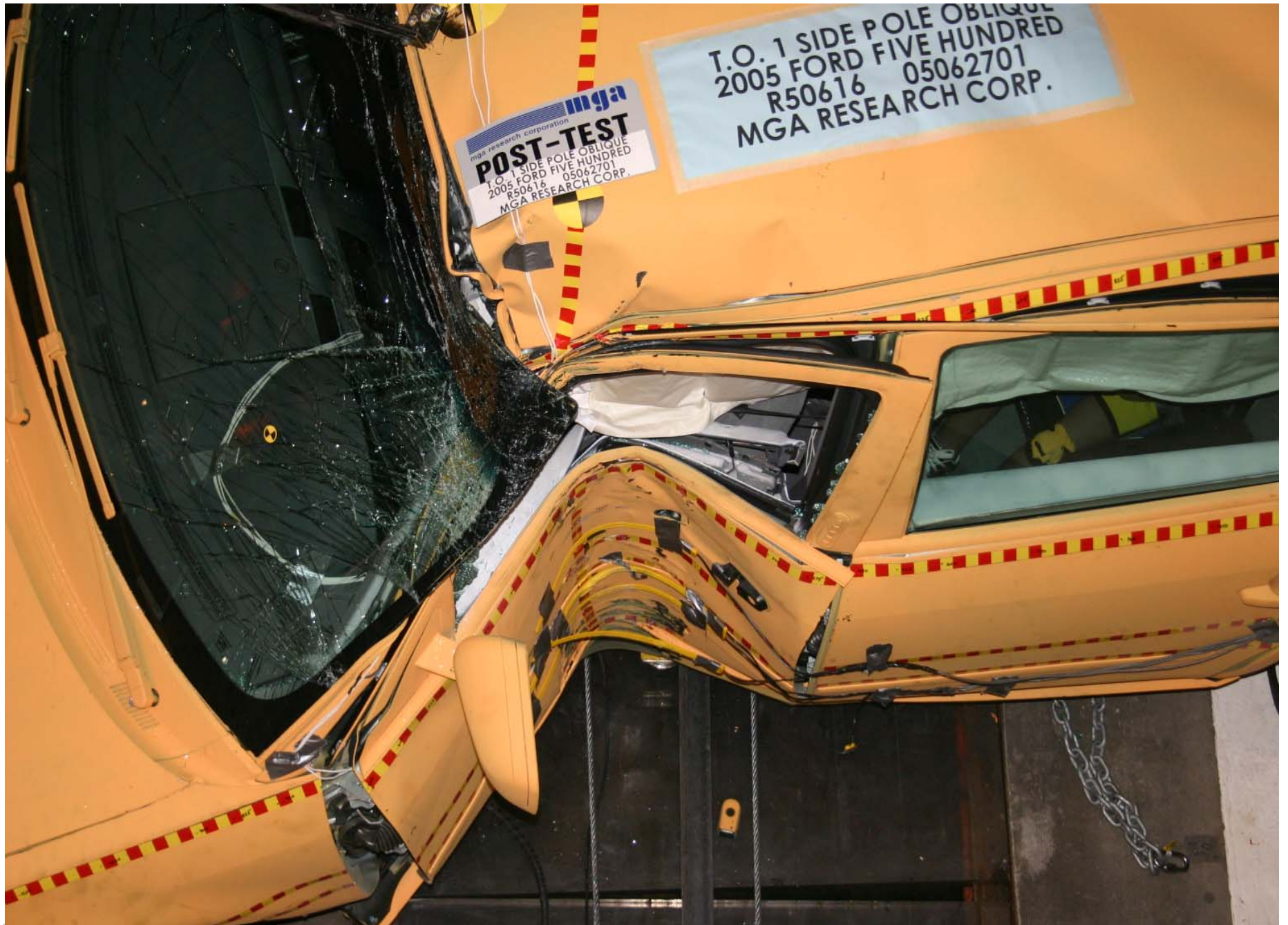
Pre-Test Vehicle Overhead View Positioned Against Pole



Post-Test Vehicle Overhead View



Pre-Test Vehicle Overhead View Positioned Against Pole (Close Up)



Post-Test Vehicle Overhead View (Close Up)



Pre-Test Driver Seat Position



Pre-Test Driver Dummy Left Side View (Door open)



Pre-Test Driver Dummy Left Side View



Post-Test Driver Dummy Left Side View



Pre-Test Driver Dummy Right Side View



Post-Test Driver Dummy Right Side View



Pre-Test Driver Shoulder and Door Top View



Post-Test Driver Dummy Head Contact



Post-Test Driver Dummy Contact



Pre-Test LRP Child Dummy Left Side View (Door open)



Pre-Test LRP Child Dummy Left Side View

A-27.



Post-Test LRP Child Dummy Left Side View



Pre-Test LRP Child Dummy Right Side View



Post-Test LRP Child Dummy Right Side View



Pre-Test LRP Child Dummy Front Facing View



Post-Test LRP Child Dummy Front Facing View



Pre-Test LRP Child Dummy Shoulder and Door Top View

A-33.



Post-Test LRP Child Dummy Contact



Post-Test LRP Child Dummy Head Contact



Post-Test Impact Point on Vehicle



Post-Test Right Side Curtain Airbag View



Post-Test Windshield Retention

MFD. BY FORD MOTOR CO.

DATE: 01/05

GVWR: 2177KG /4800LB

FRONT GAWR: 1145KG/2525LB

REAR GAWR: 1065KG /2350LB

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR
VEHICLE SAFETY, BUMPER, AND THEFT PREVENTION STANDARDS
IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

VIN: 1FAHP23155G149300 TYPE: PASSENGER CAR

MAXIMUM LOAD = OCCUPANTS + LUGGAGE = 430KG/0950LB

OCCUPANTS = 05 TOTAL; 2 FRONT, 03 REAR

TIRE (FR): P215/60R17

RIMS (FR): 17X7.0J

(RR): P215/60R17

(RR): 17X7.0J

PRESSURE (FR): 220 kPa/32

PSI COLD

(RR): 220

kPa/32

PSI COLD



1FAHP23155G149300

TRAILER TOWING - SEE OWNER GUIDE

EXT PNT: DV

IRC: 41

LDSO:

F004B

R0091

INT TR

TP/PS

R

AXLE

TR

SPR

SPGIF

B

BB33

805

CT

2

1A

B

CMC

2U5A5420472-AA

1200501145841

TIRE AND LOAD INFORMATION
SEE OWNERS MANUAL FOR ADDITIONAL INFORMATION

The combined weight of occupants and cargo should never exceed 430 kg or 0950 lbs.

SEATING CAPACITY TOTAL : 05 FRONT: 2 REAR: 03

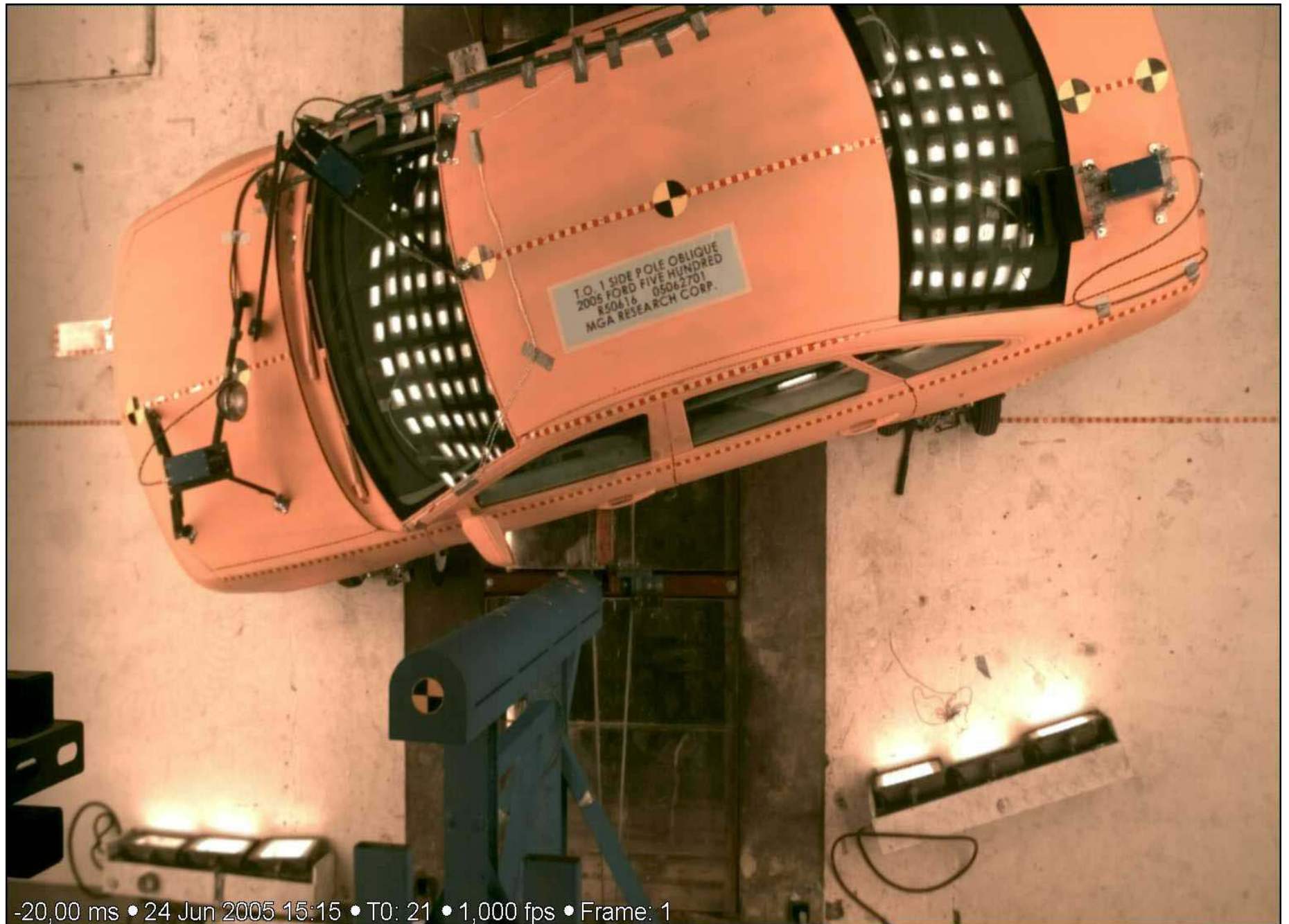
ORIGINAL TIRE SIZE		COLD TIRE INFLATION PRESSURE	
FRONT	P215/60R17	FRONT	220 KPA, 32 PSI
REAR	P215/60R17	REAR	220 KPA, 32 PSI
SPARE TIRE SIZE		COLD TIRE INFLATION PRESSURE	
T135/90D17		415 KPA, 60 PSI	

4U5A-1532-AA (TLU)

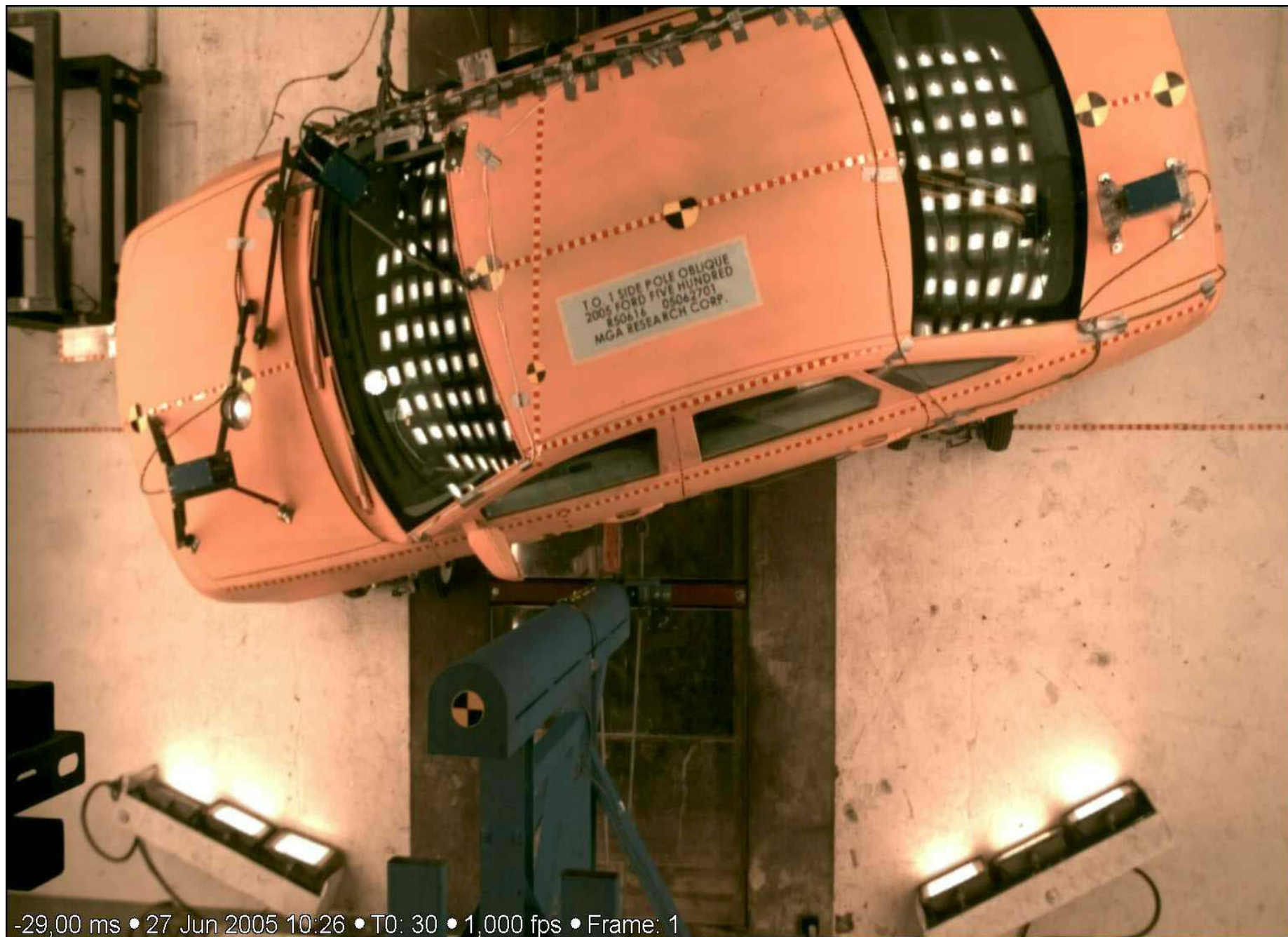
1FAHP23155G149300

Tire Placard

A-40.



Pre-Test Point of Impact View



Post-Test Point of Impact View



46,00 ms • 27 Jun 2005 10:26 • T0: 1 • 1,000 fps • Frame: 47

Impact

APPENDIX B

VEHICLE AND DUMMY RESPONSE DATA TRACES

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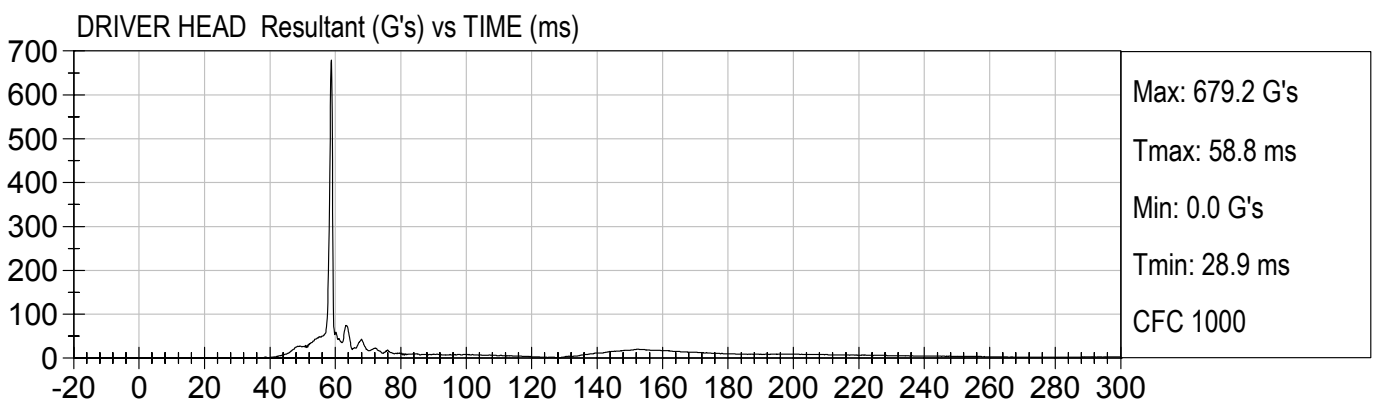
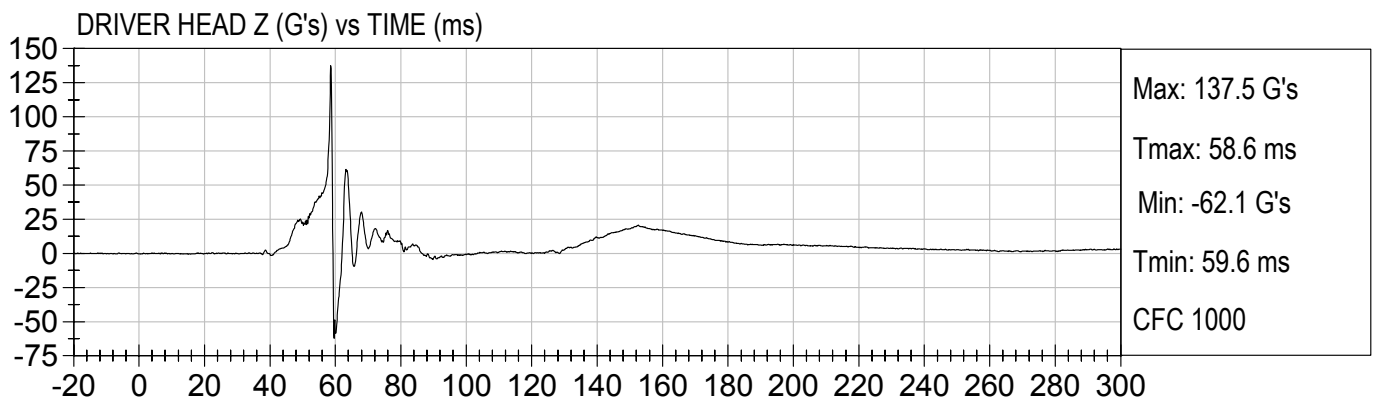
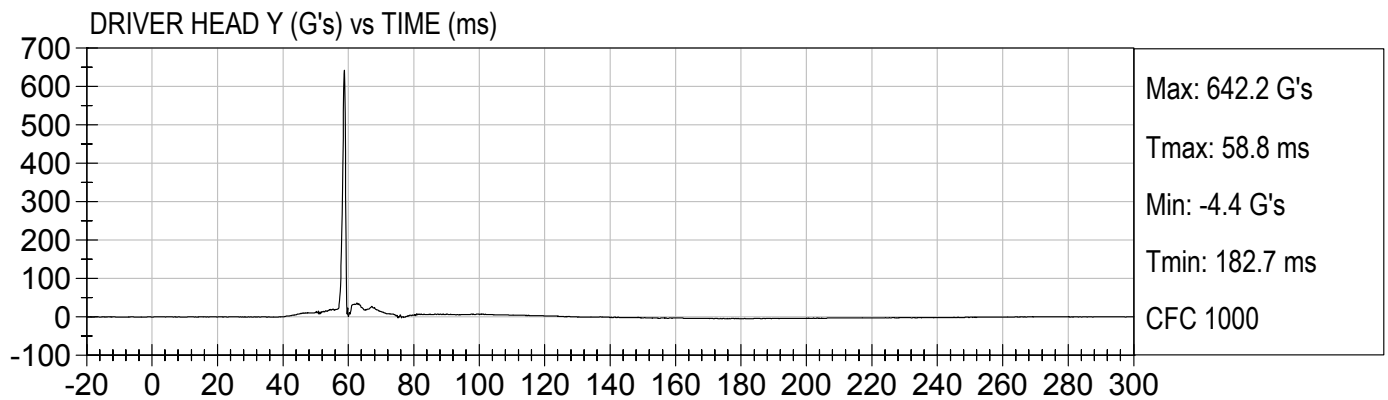
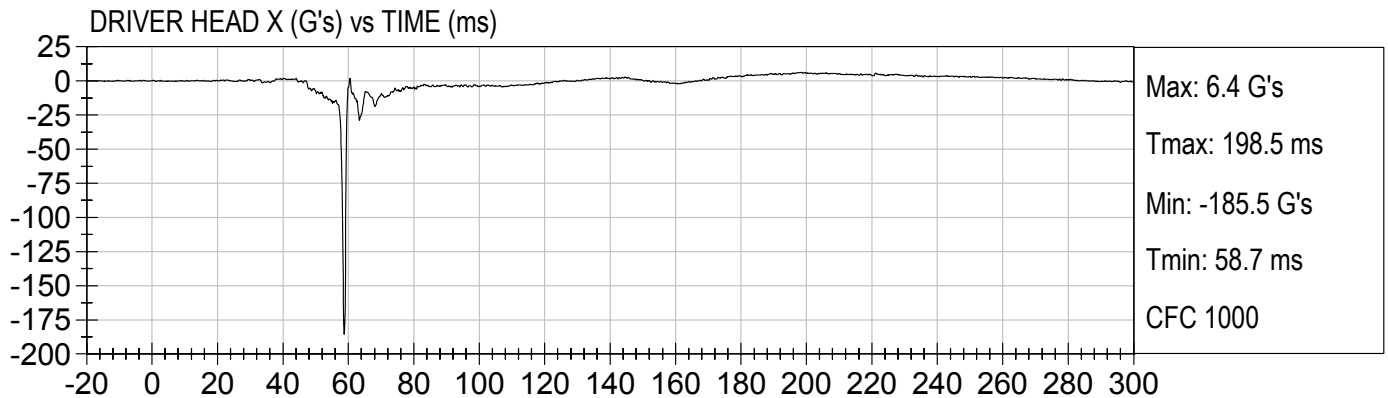
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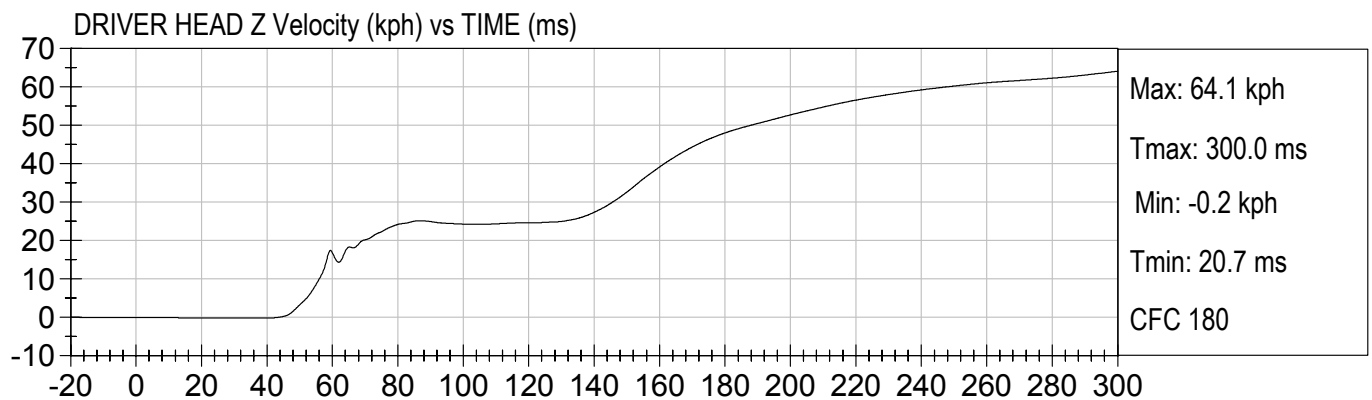
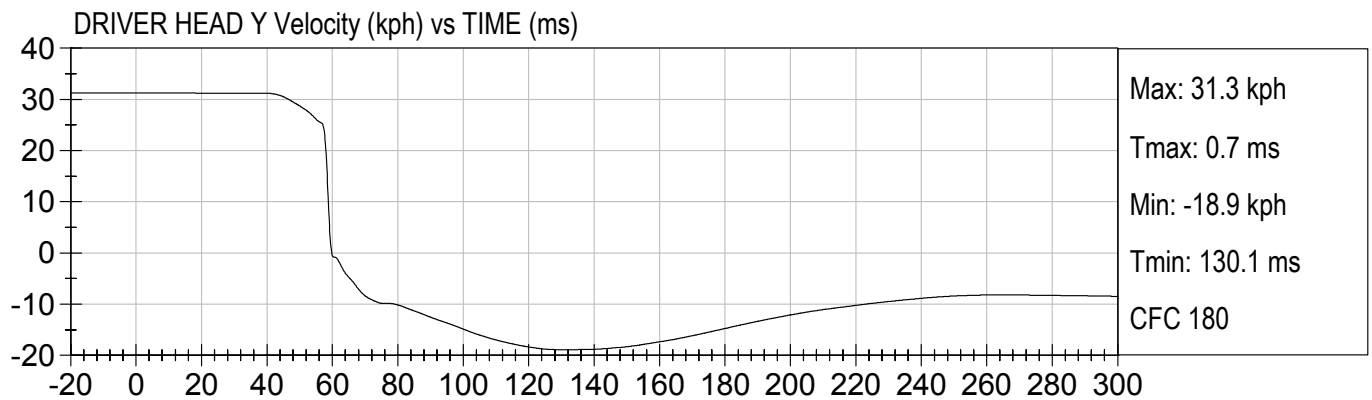
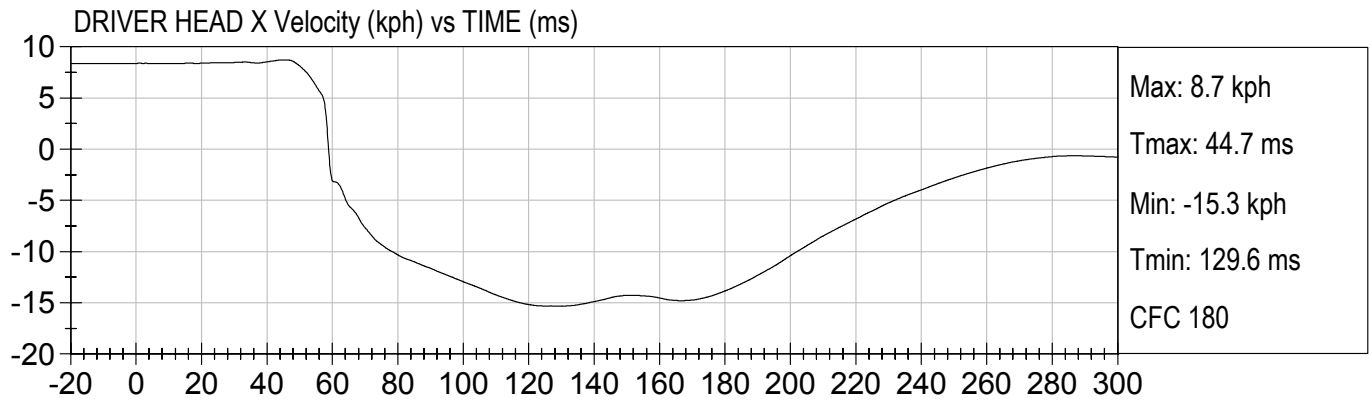
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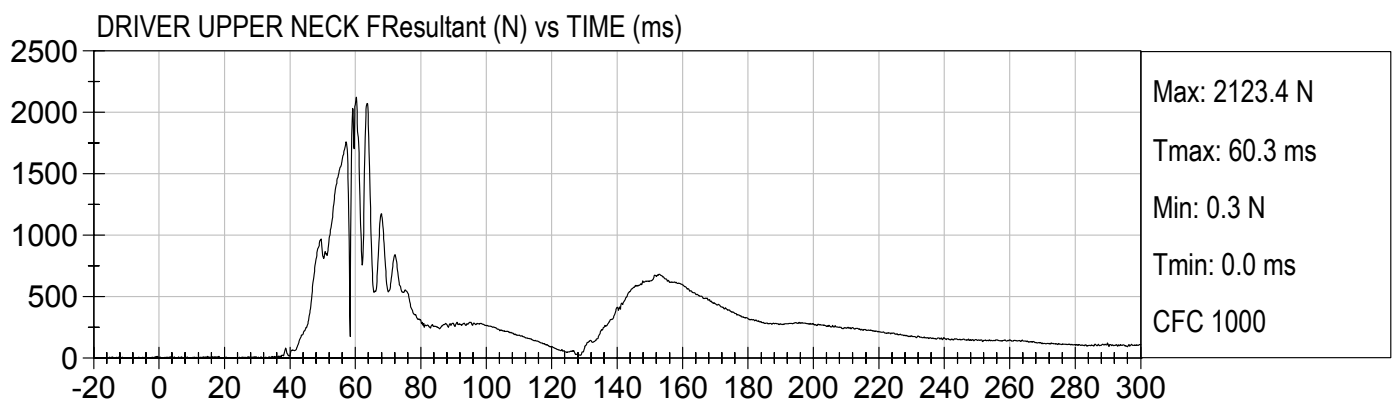
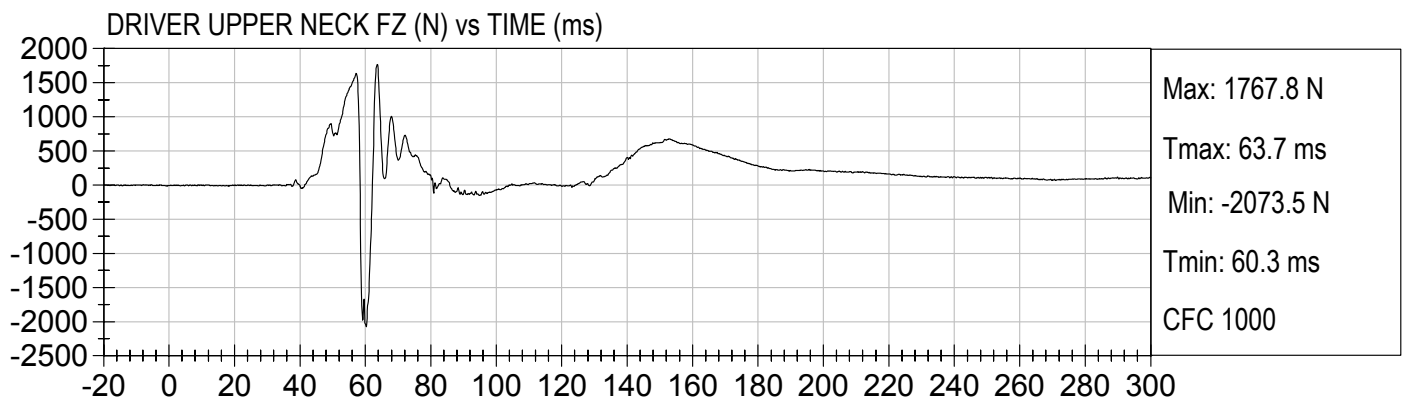
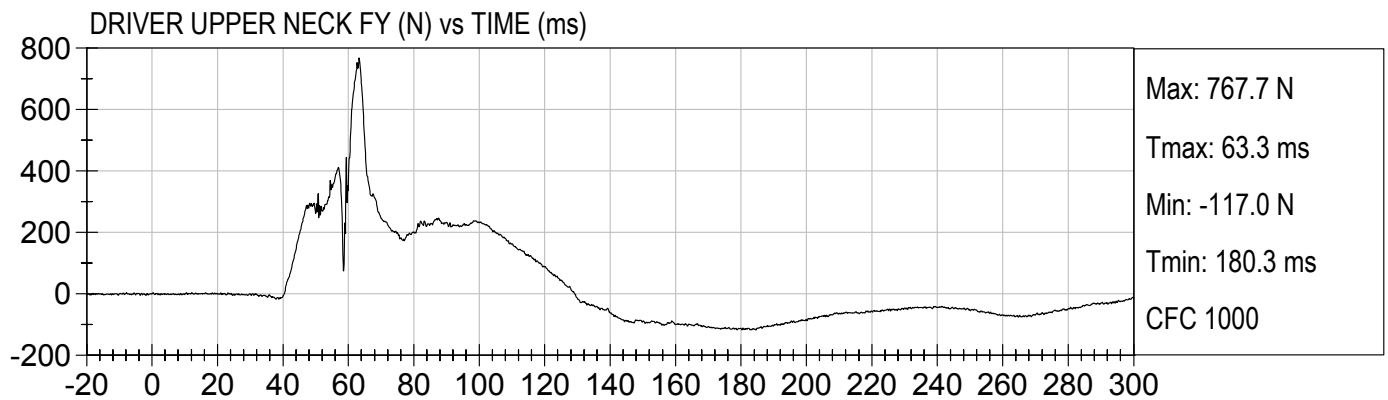
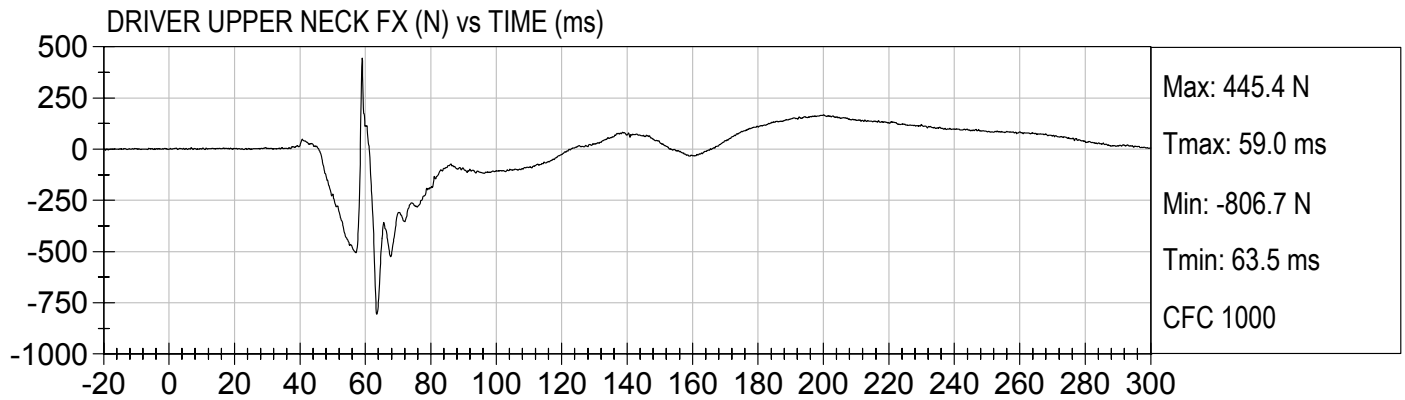
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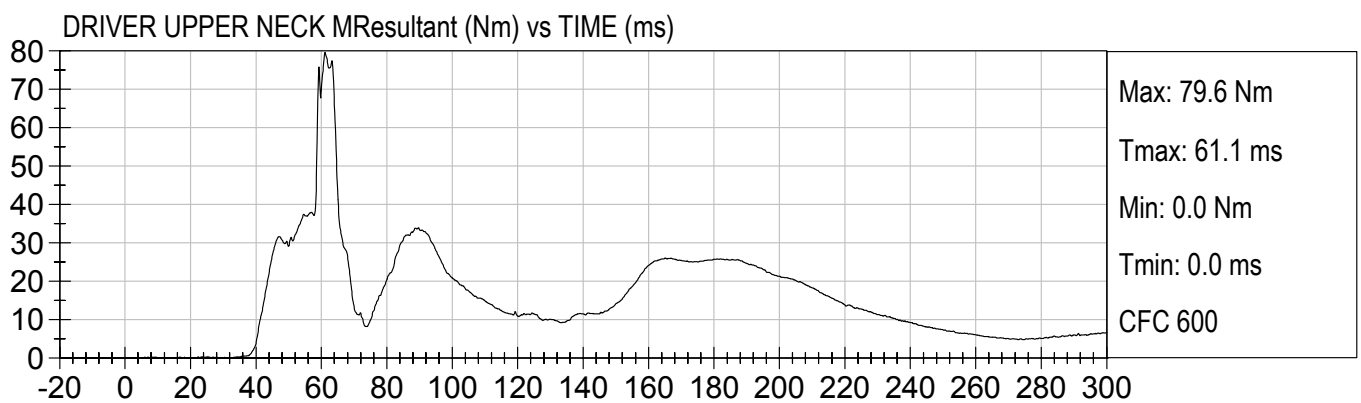
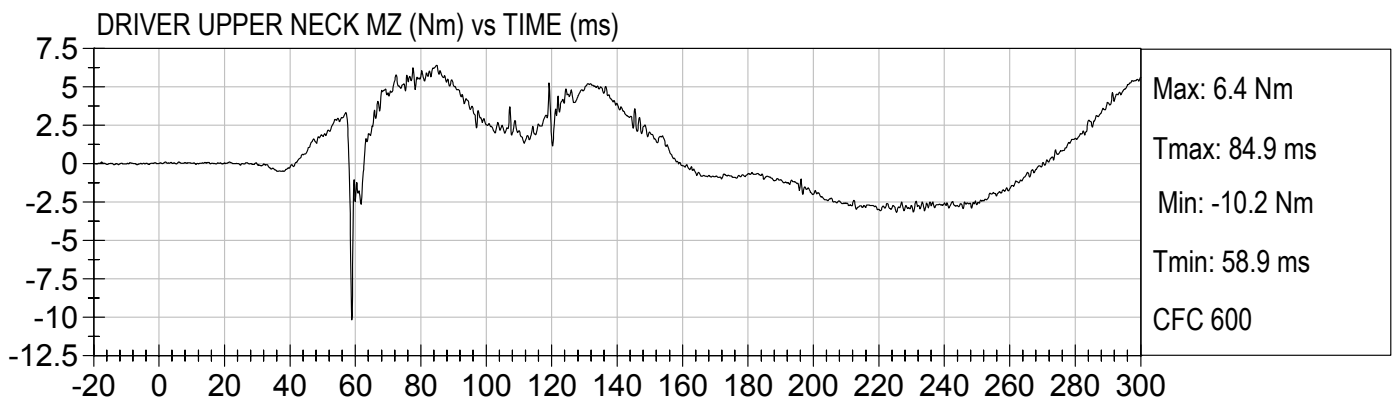
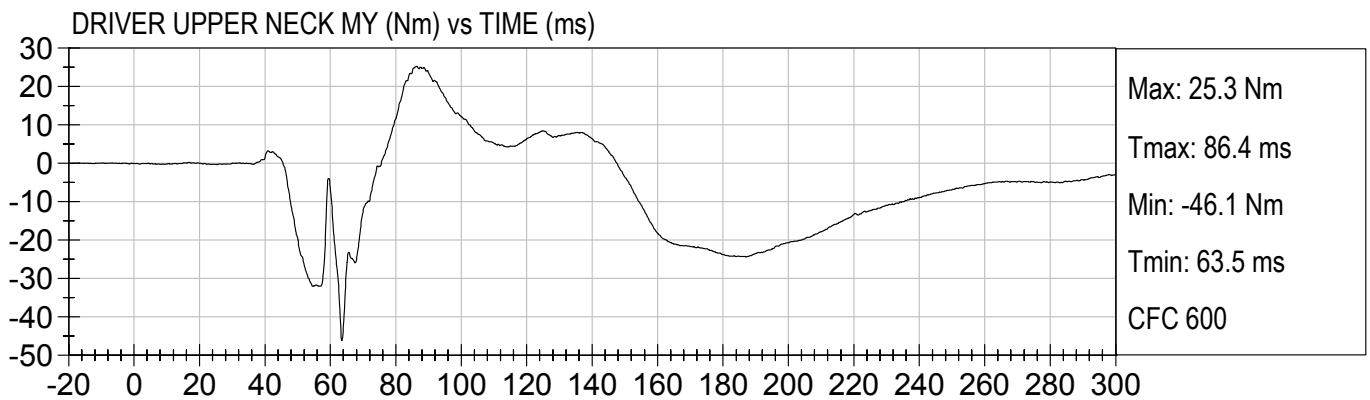
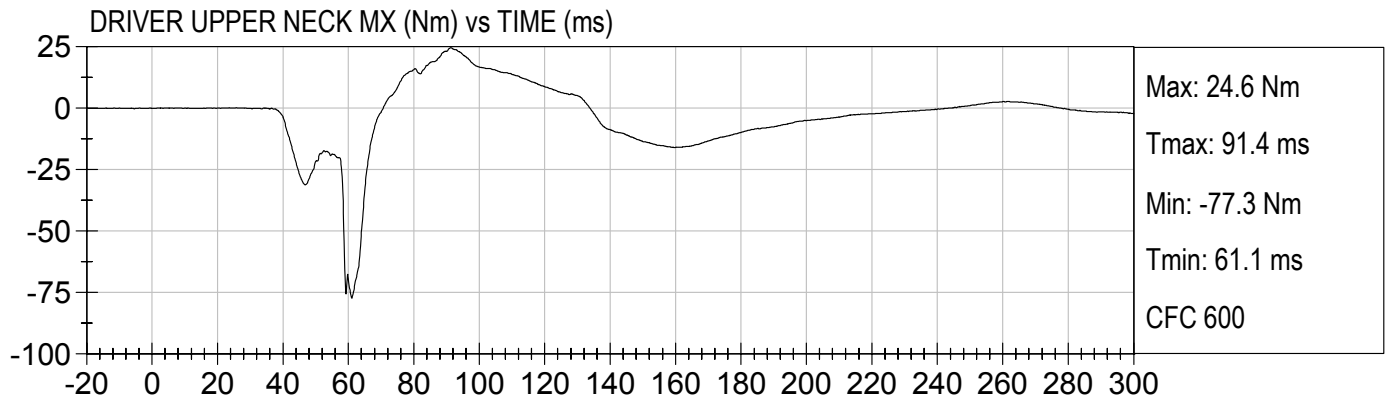
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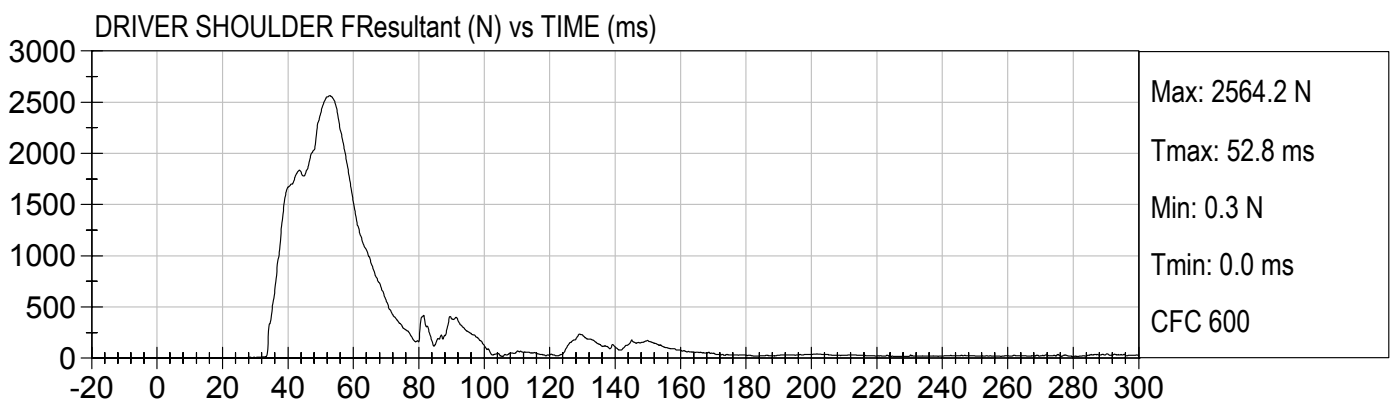
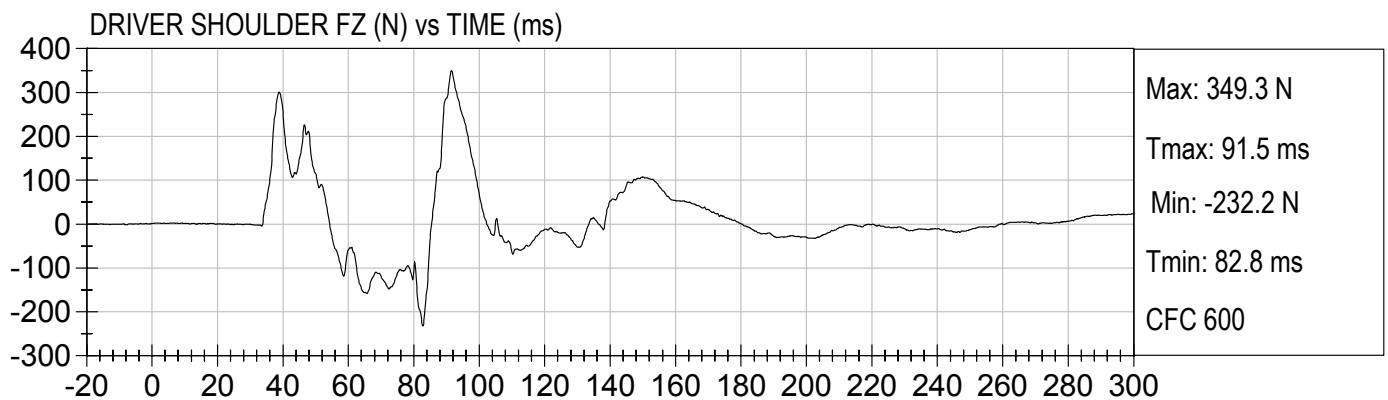
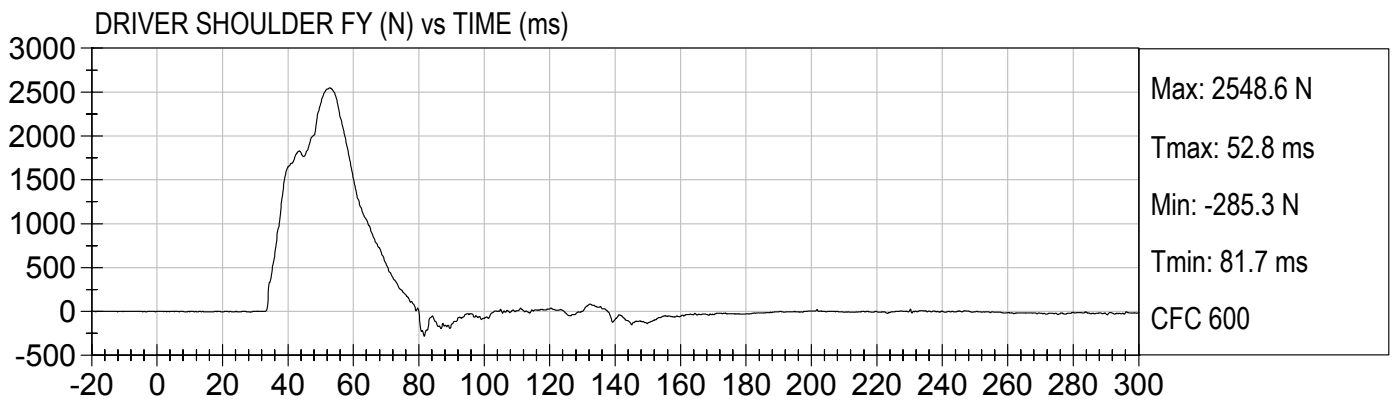
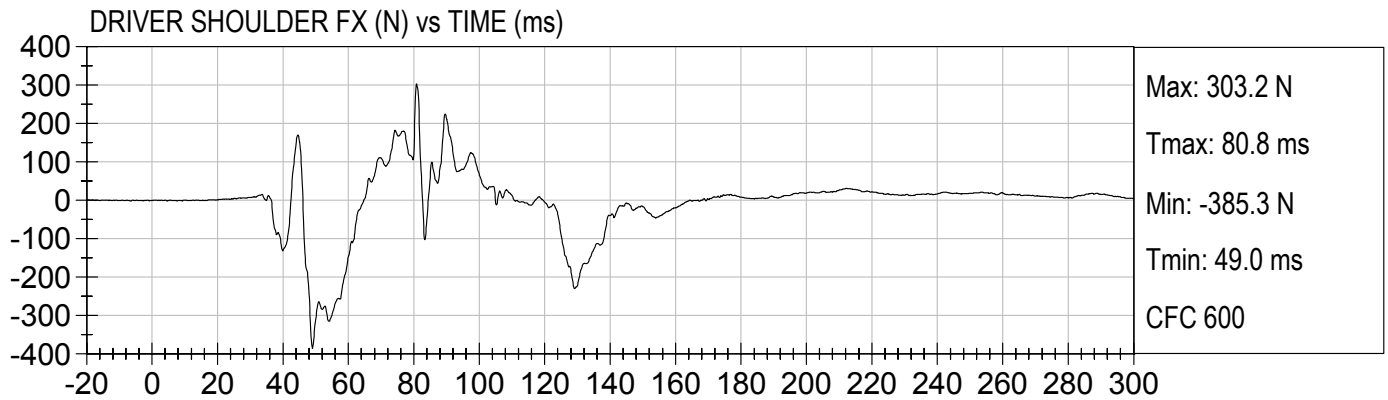
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Figure No. 171.	Driver Arm Contact vs. Time	B-47
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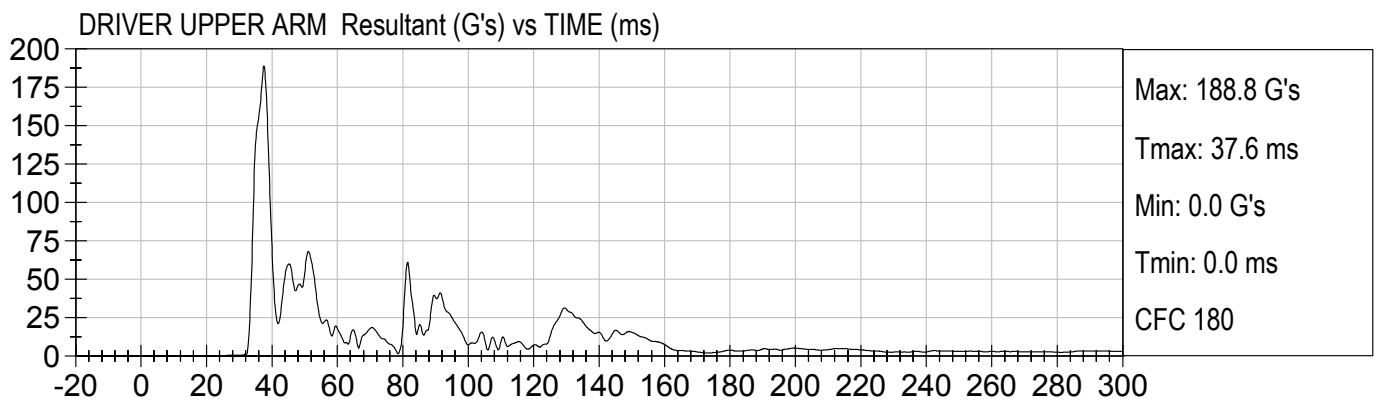
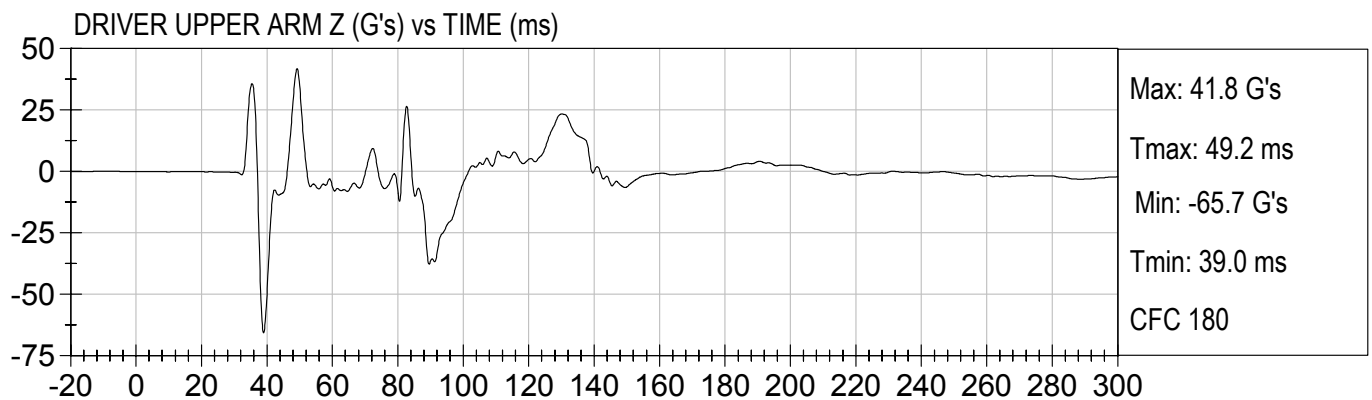
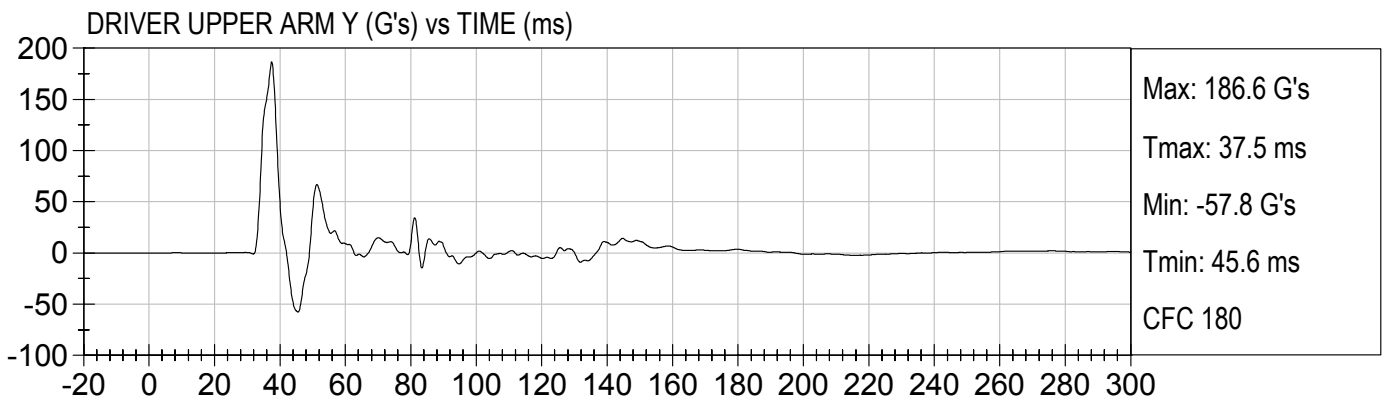
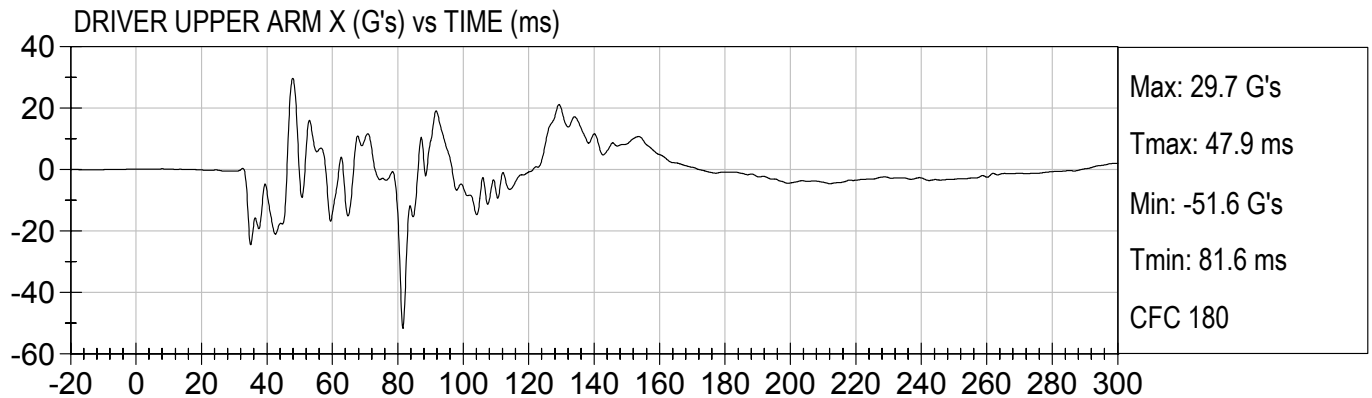


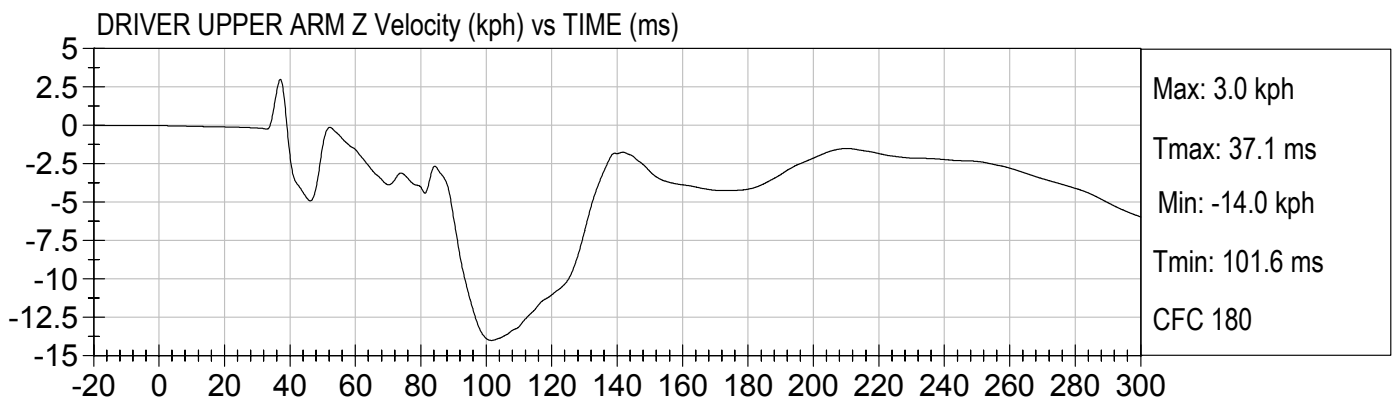
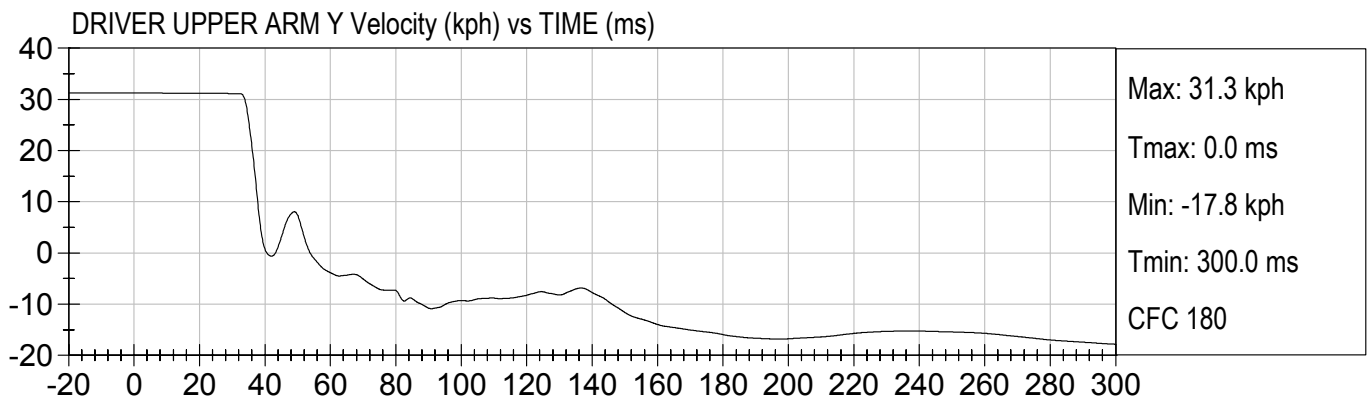
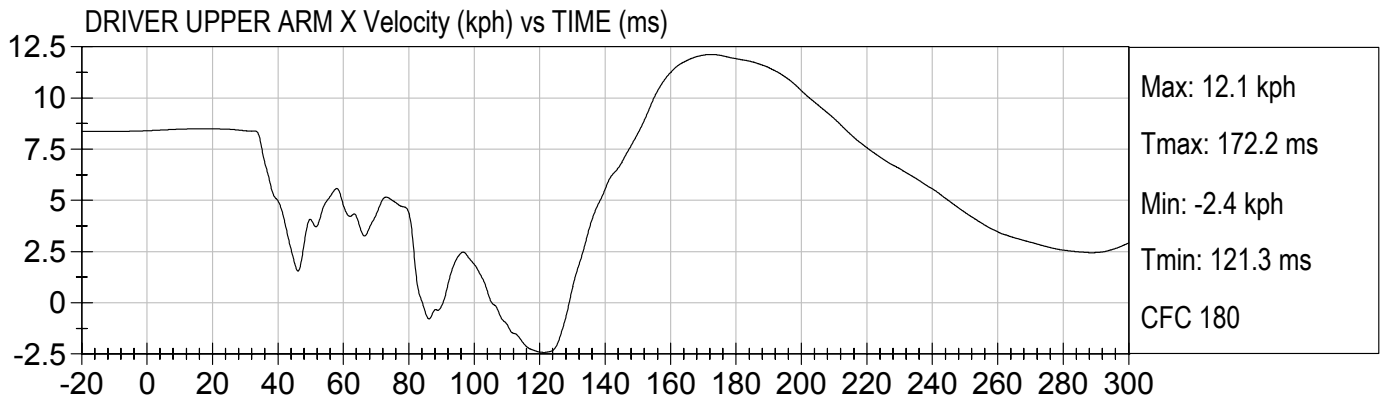


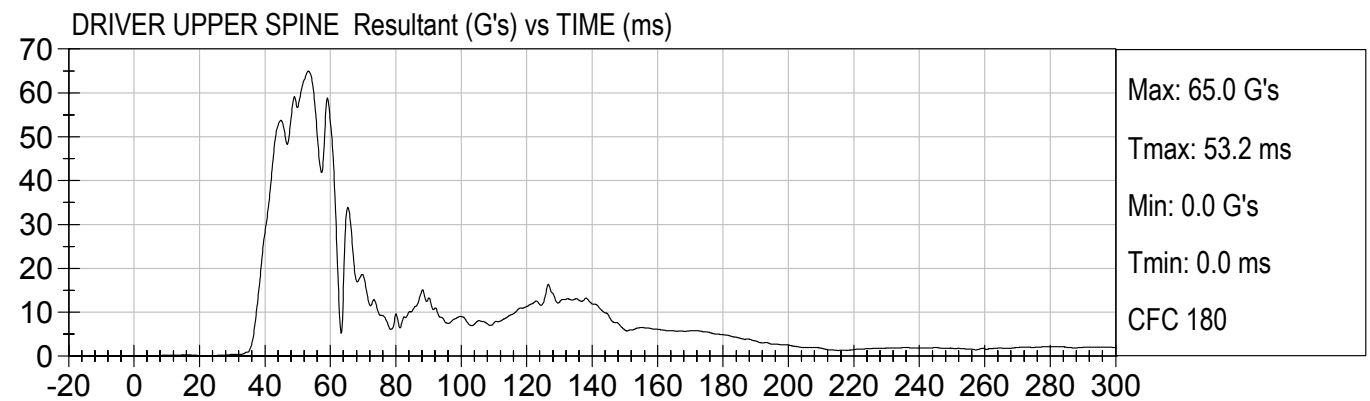
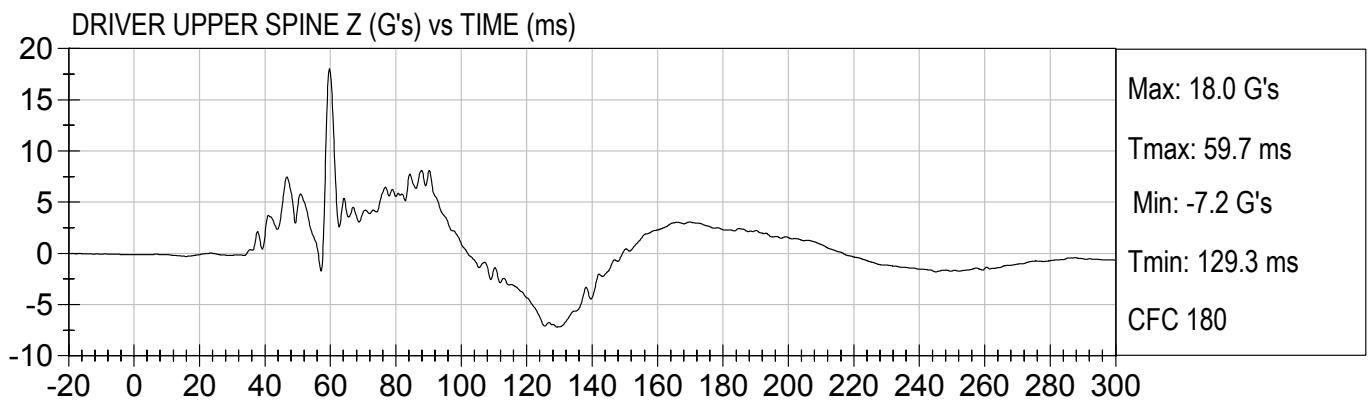
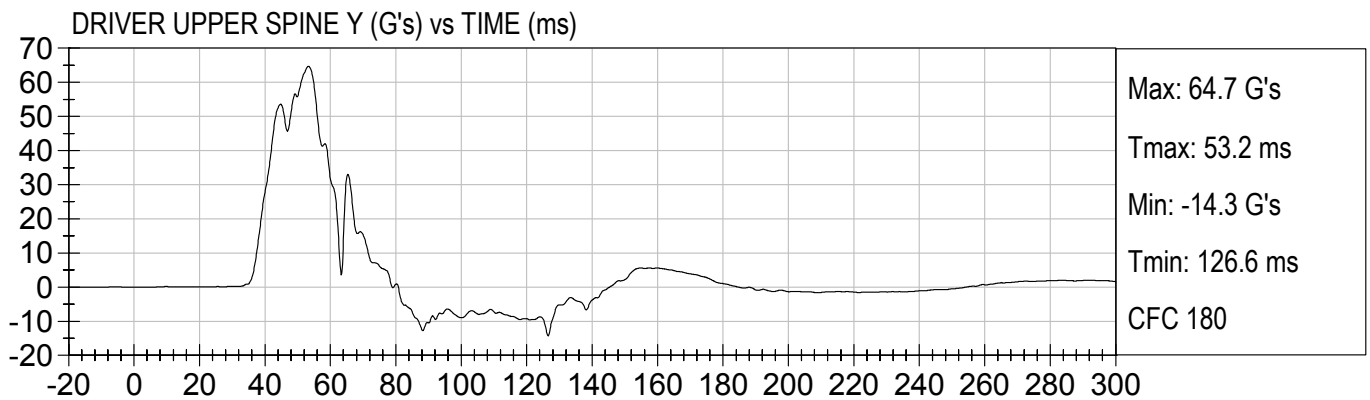
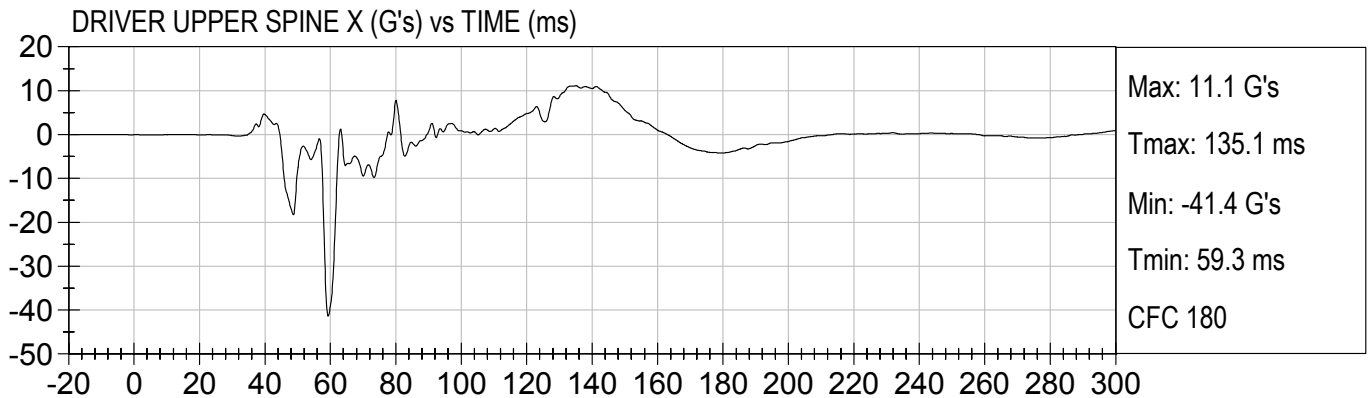


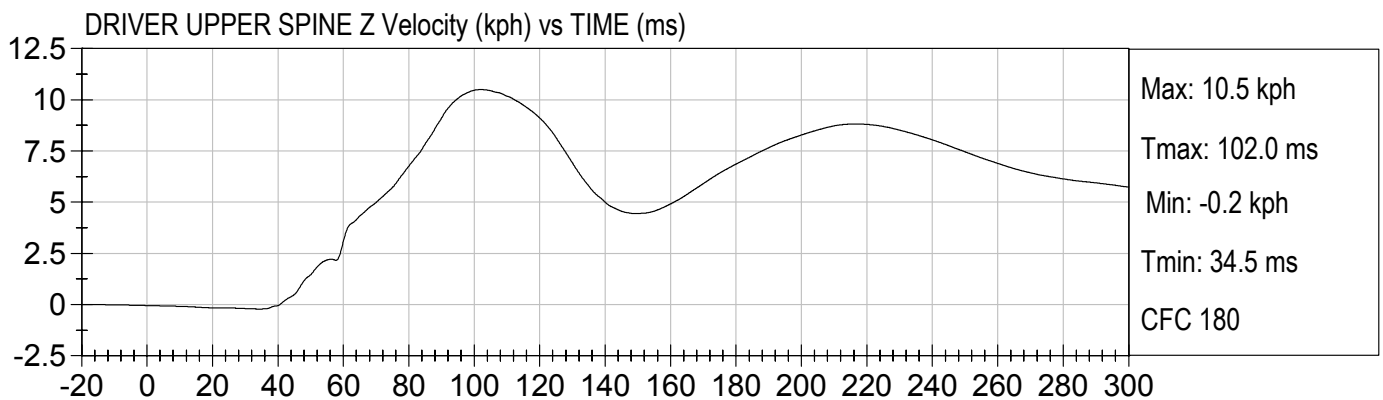
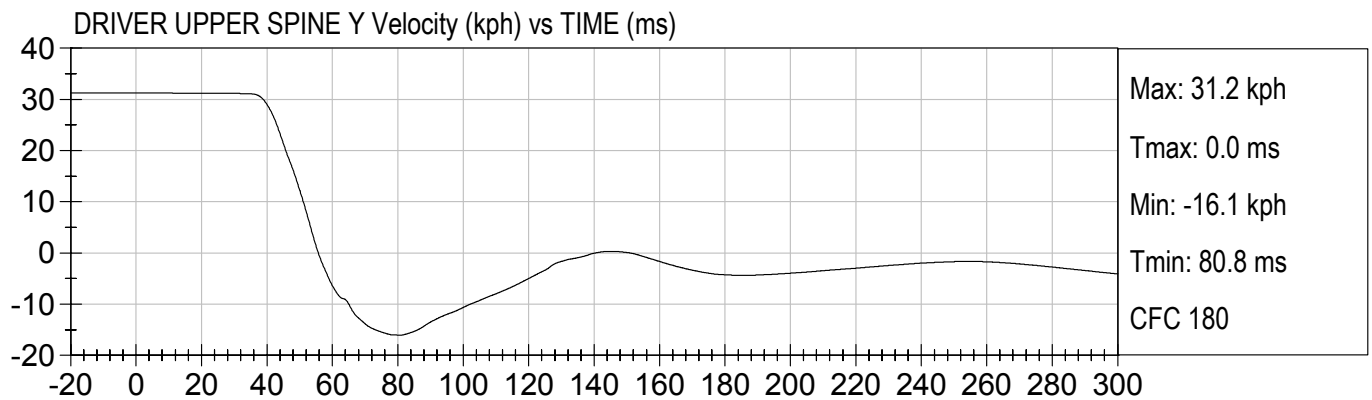
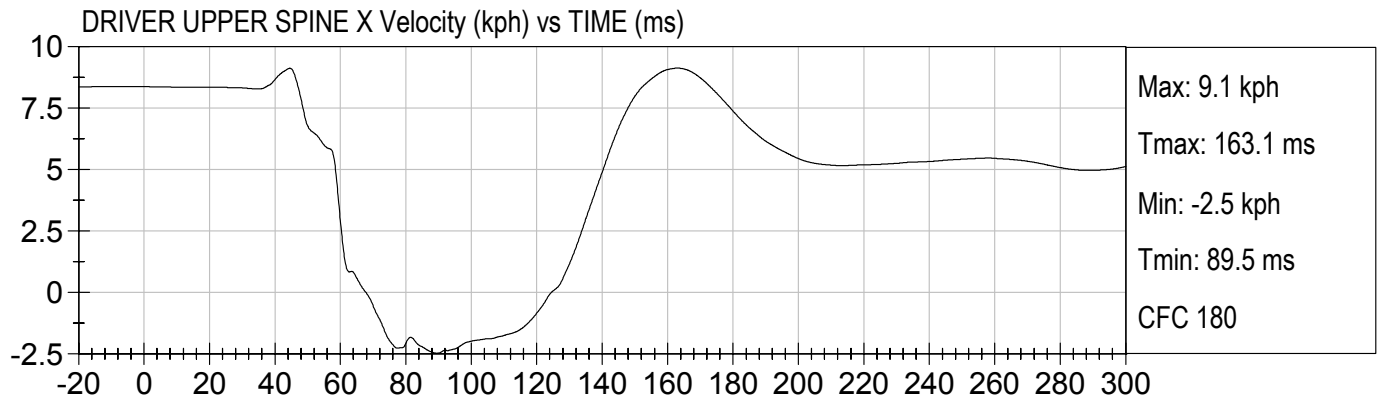


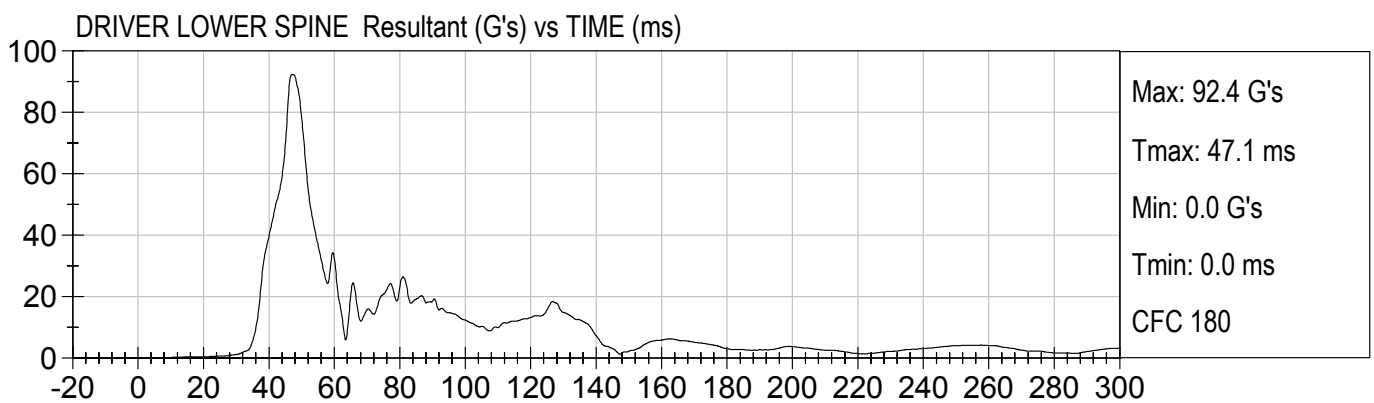
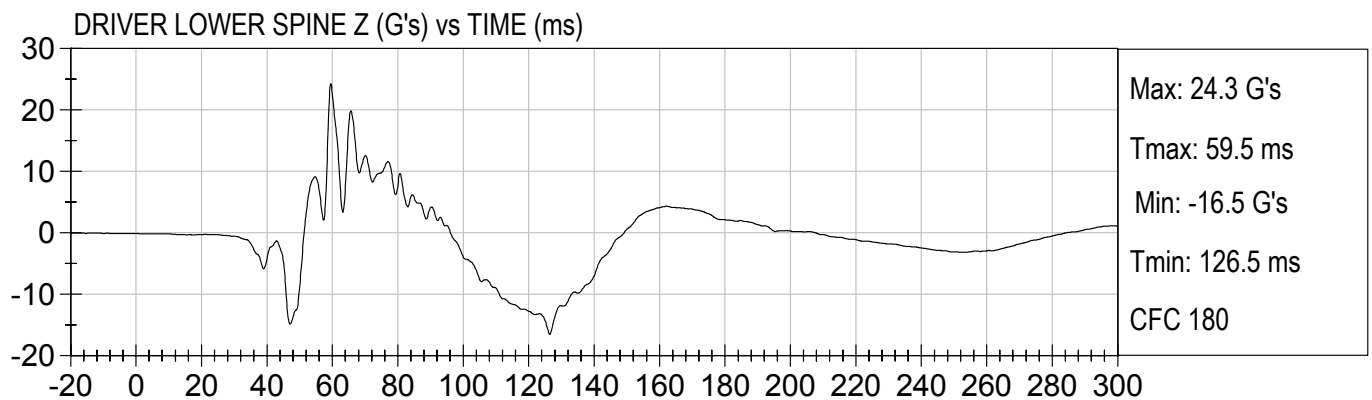
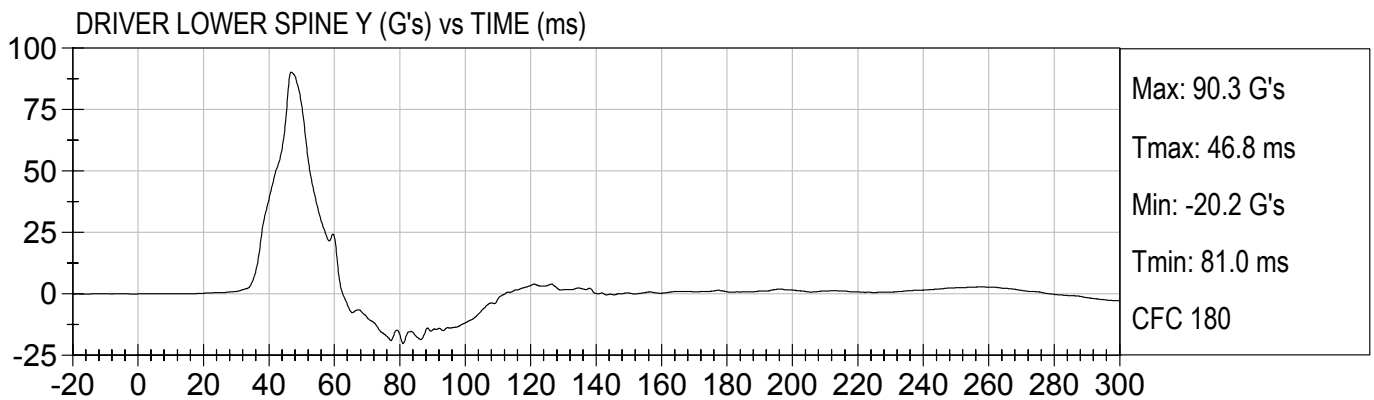
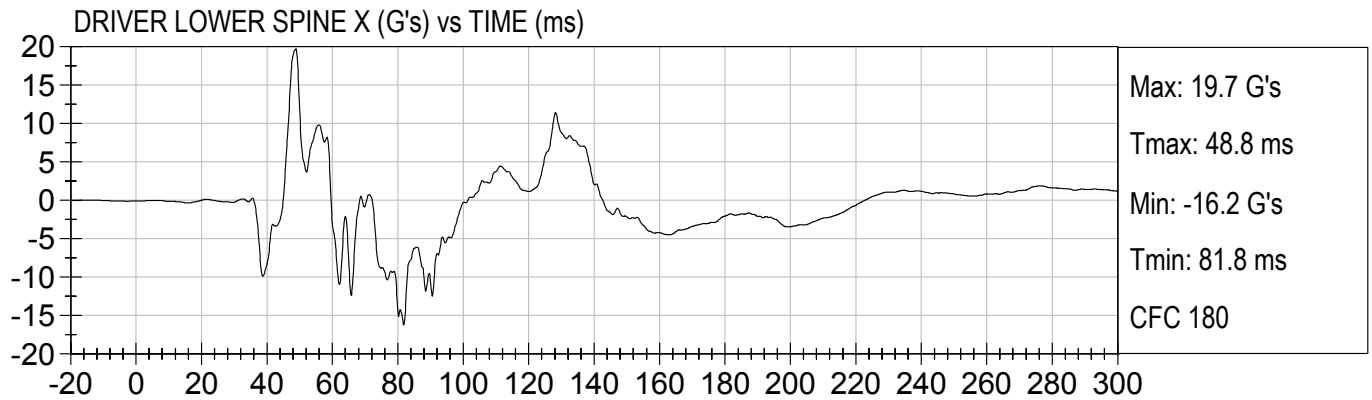






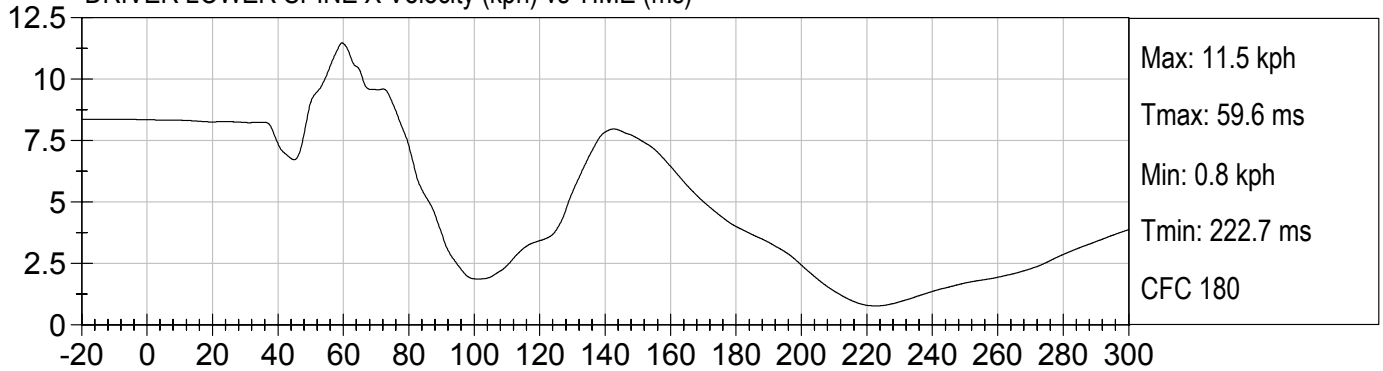




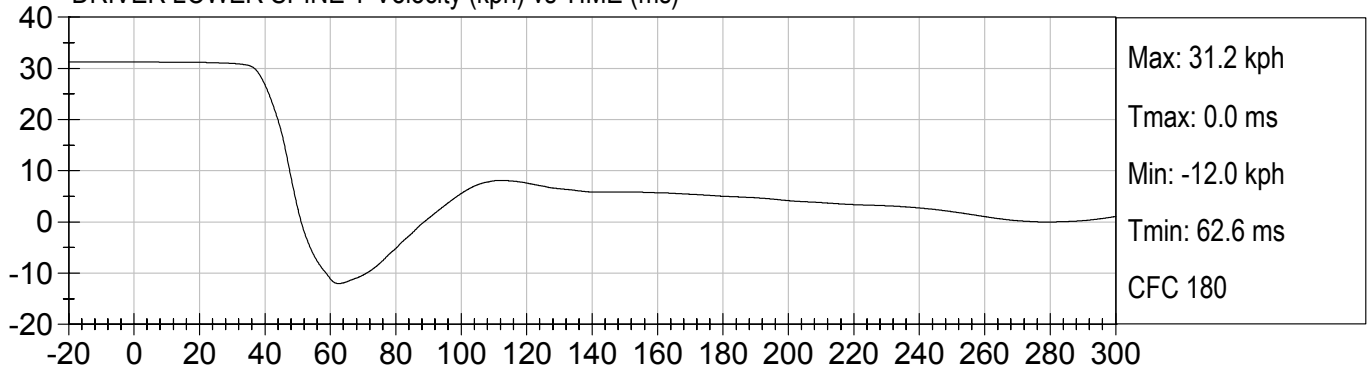




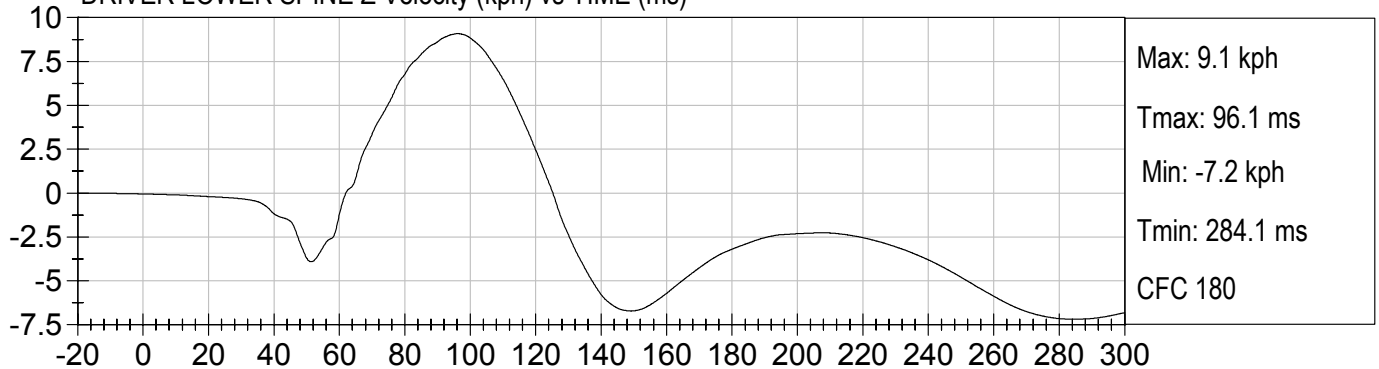
DRIVER LOWER SPINE X Velocity (kph) vs TIME (ms)

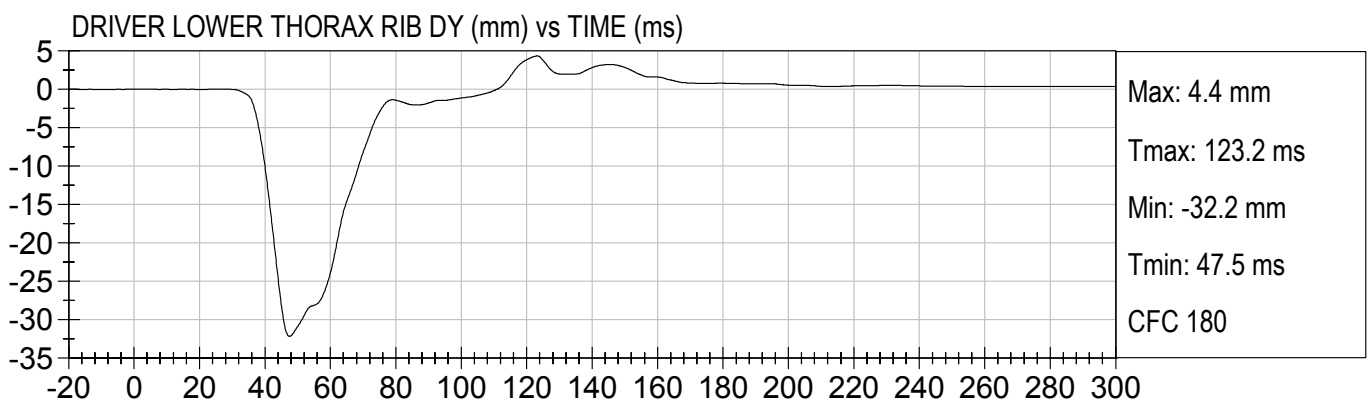
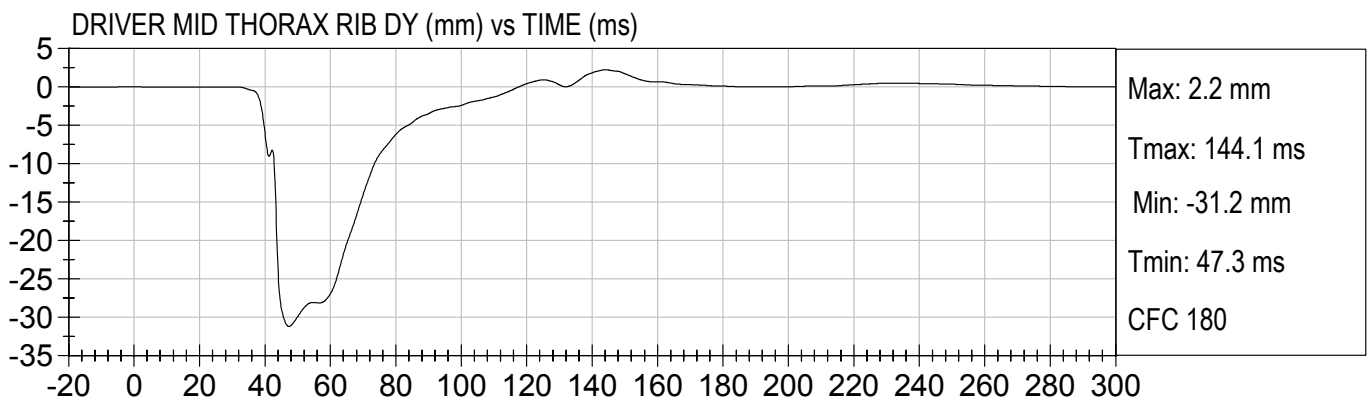
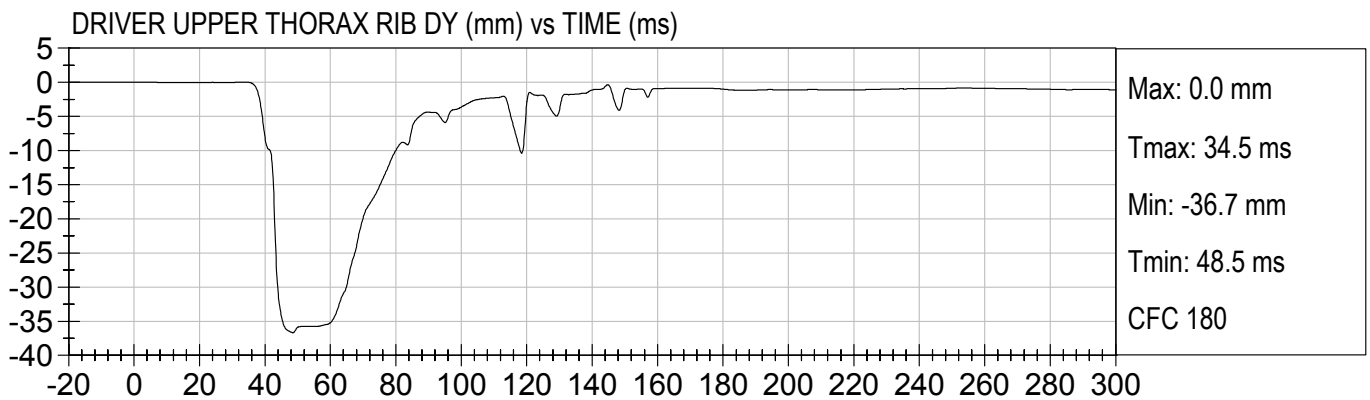
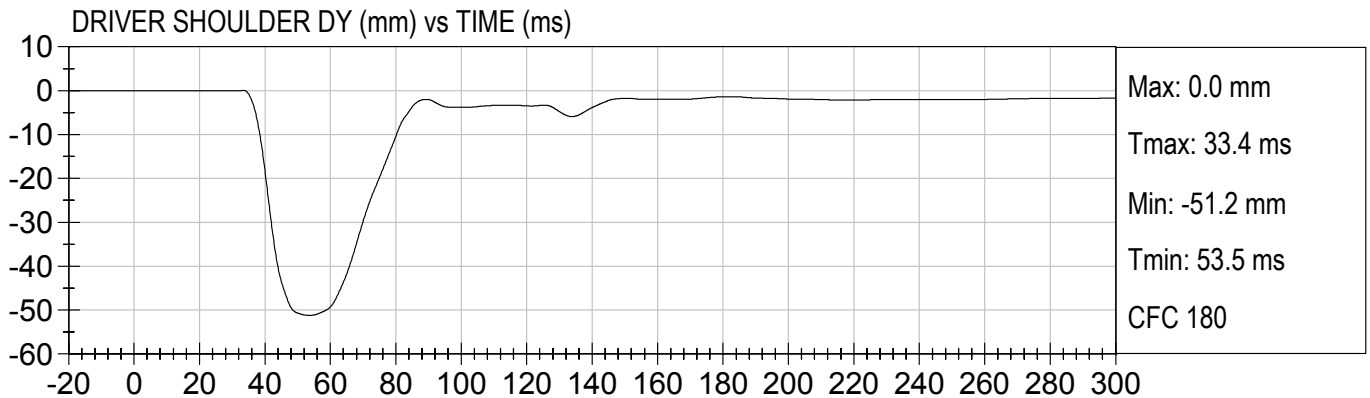


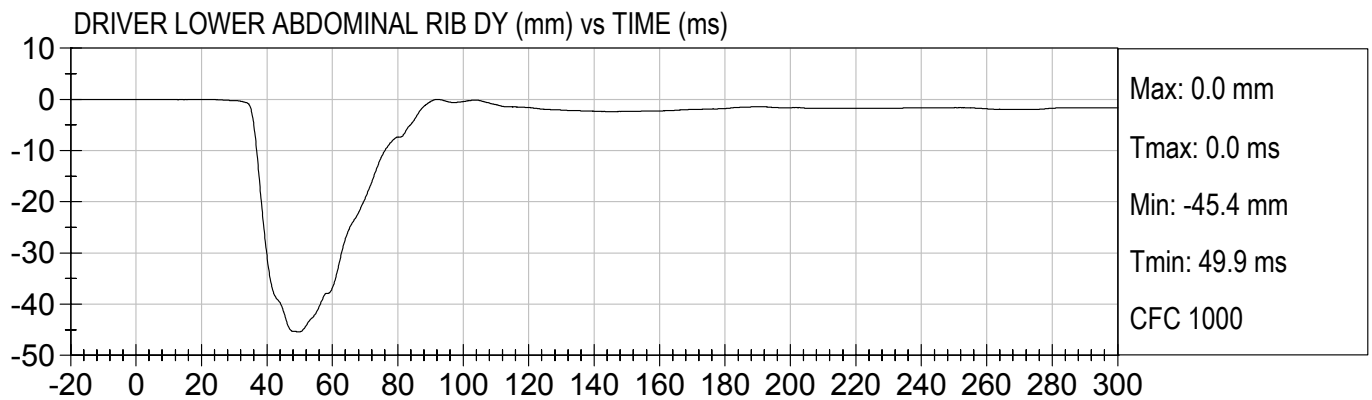
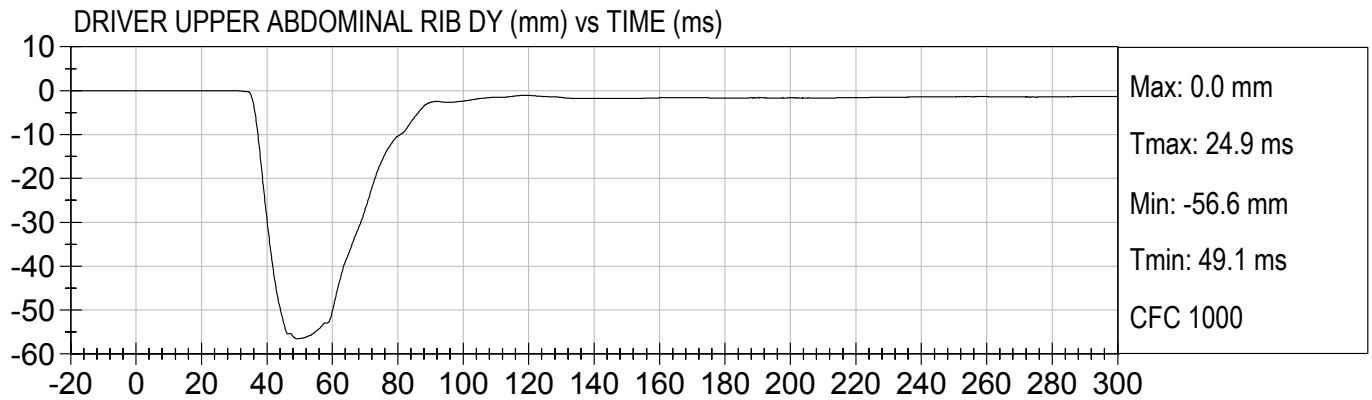
DRIVER LOWER SPINE Y Velocity (kph) vs TIME (ms)

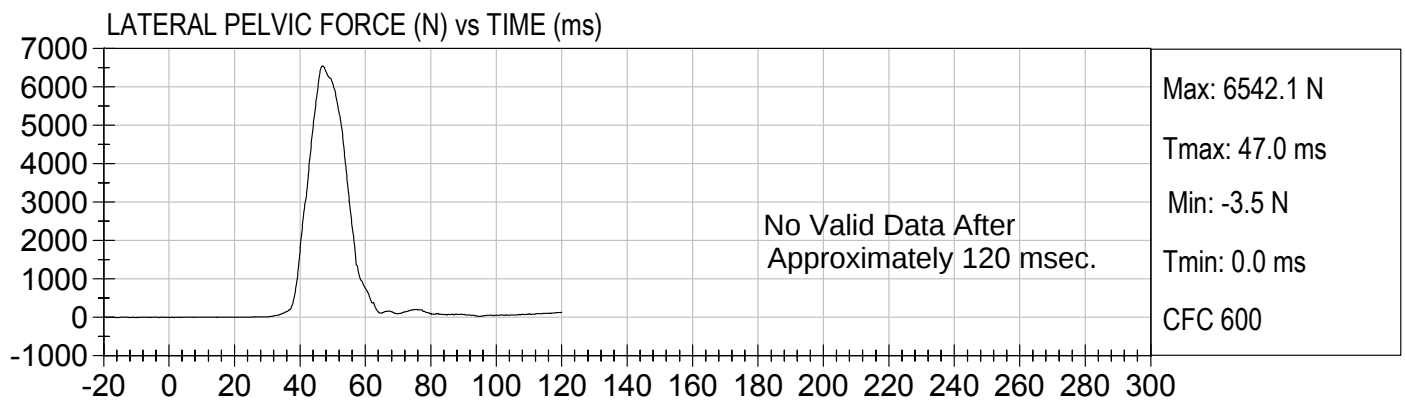
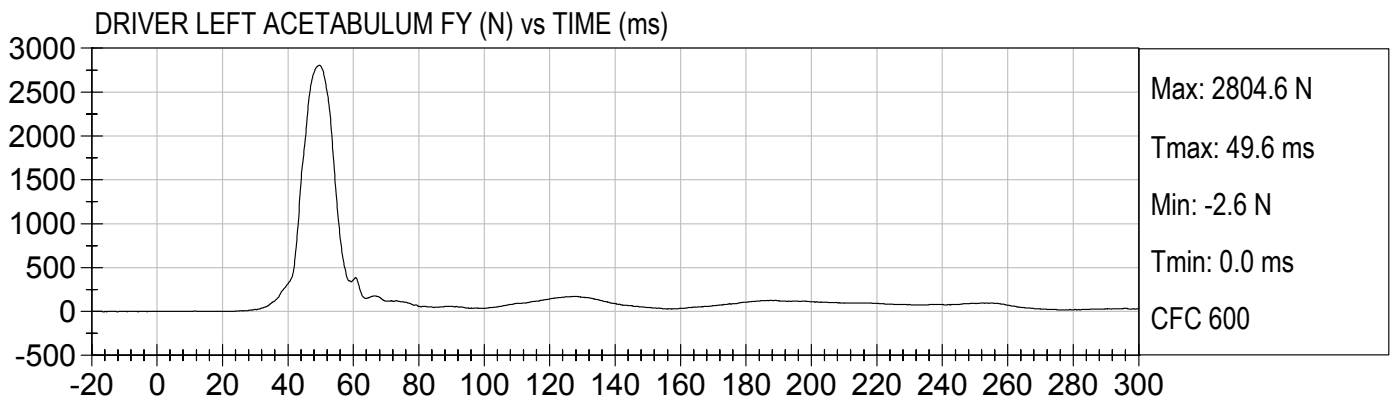
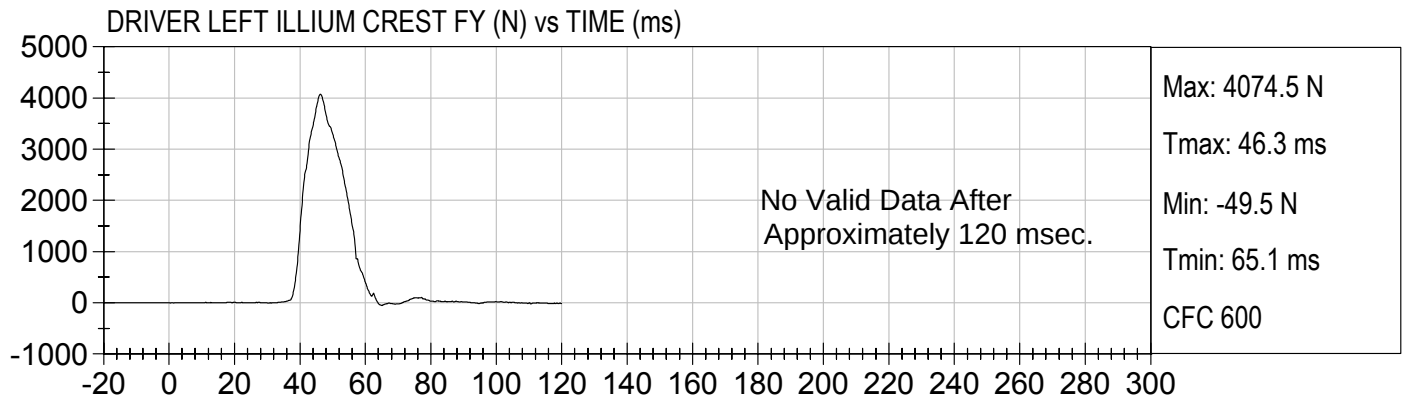


DRIVER LOWER SPINE Z Velocity (kph) vs TIME (ms)



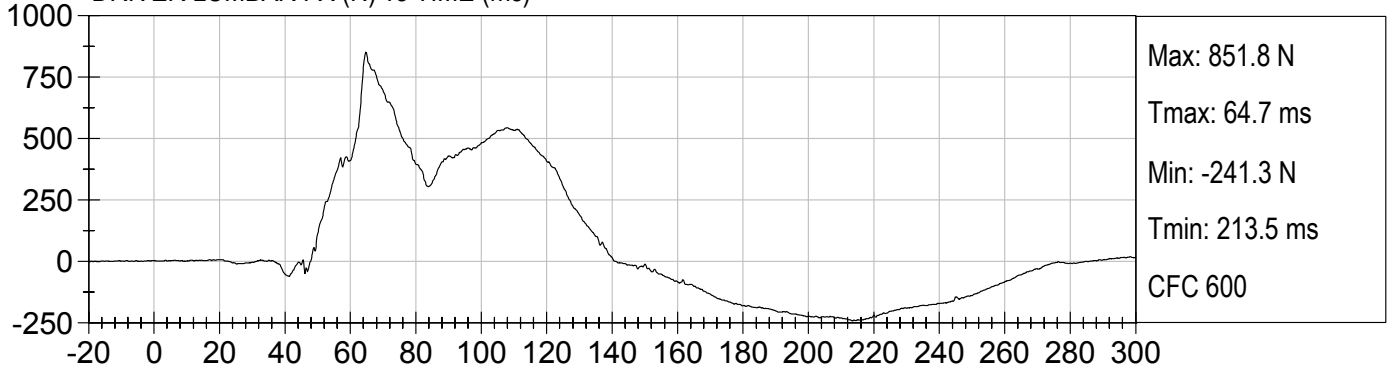




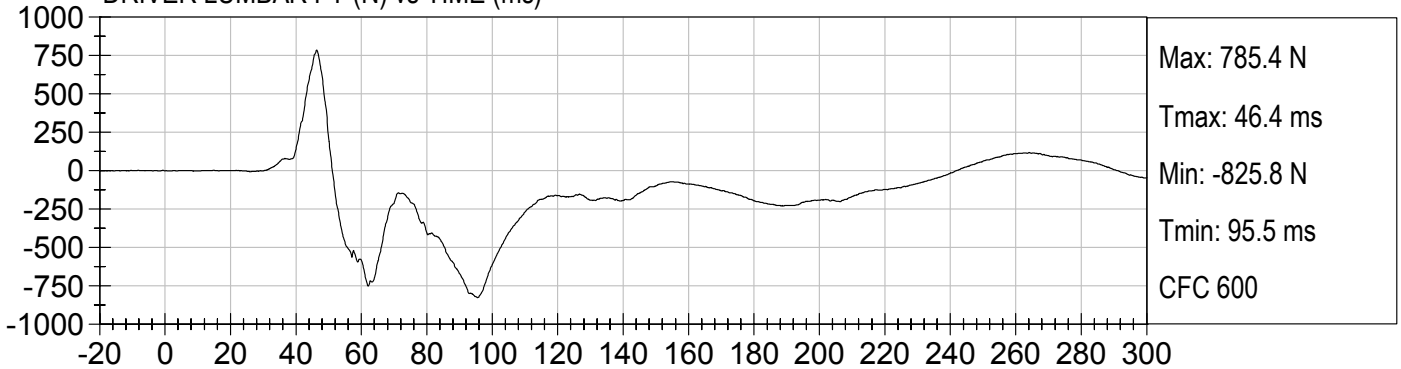




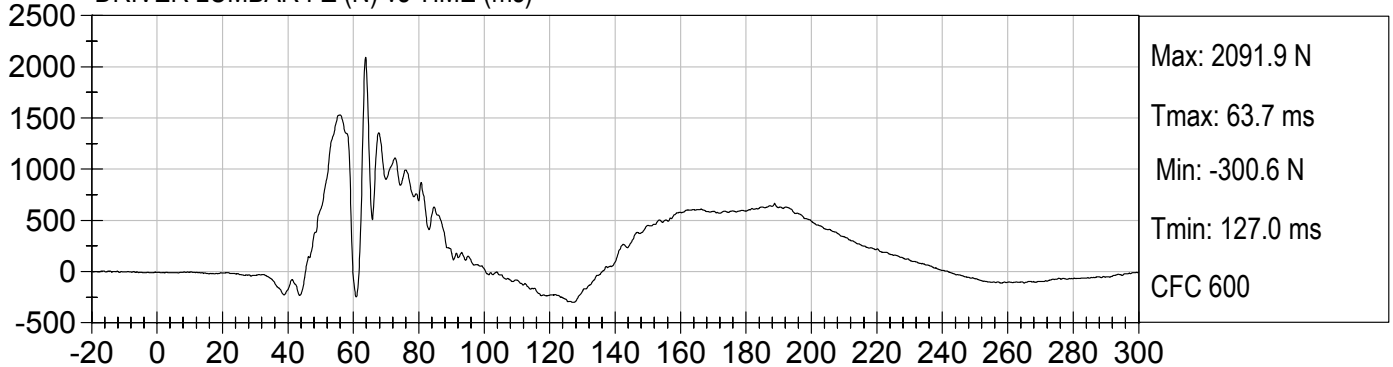
DRIVER LUMBAR FX (N) vs TIME (ms)



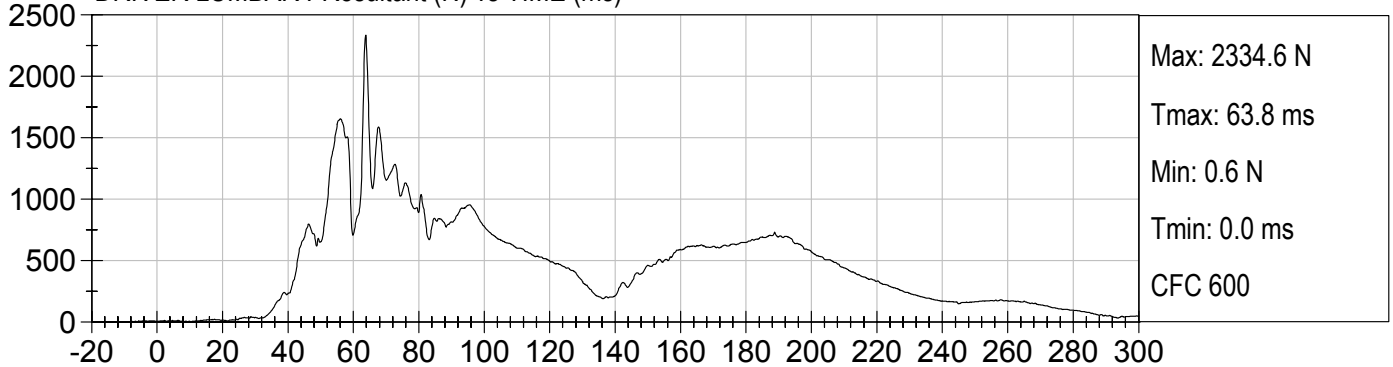
DRIVER LUMBAR FY (N) vs TIME (ms)

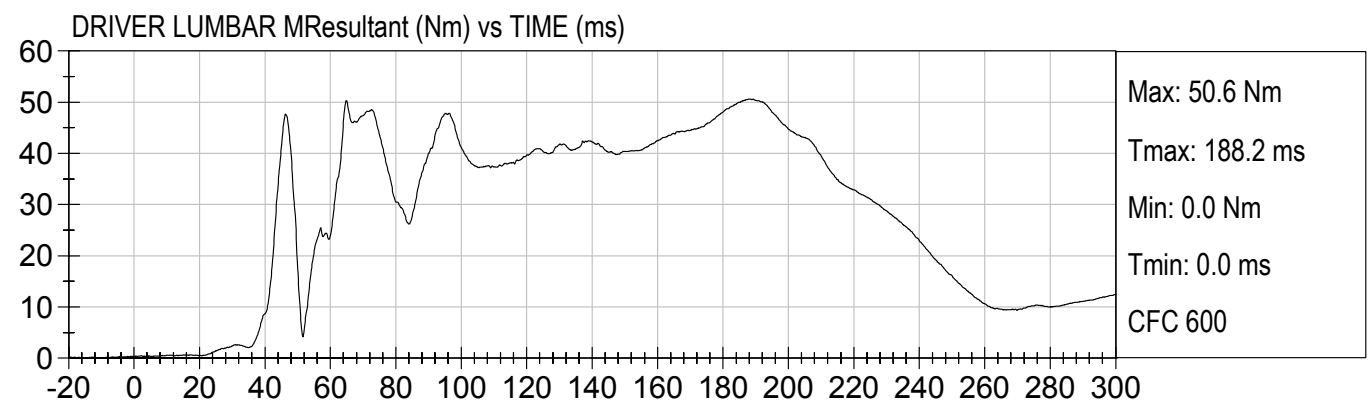
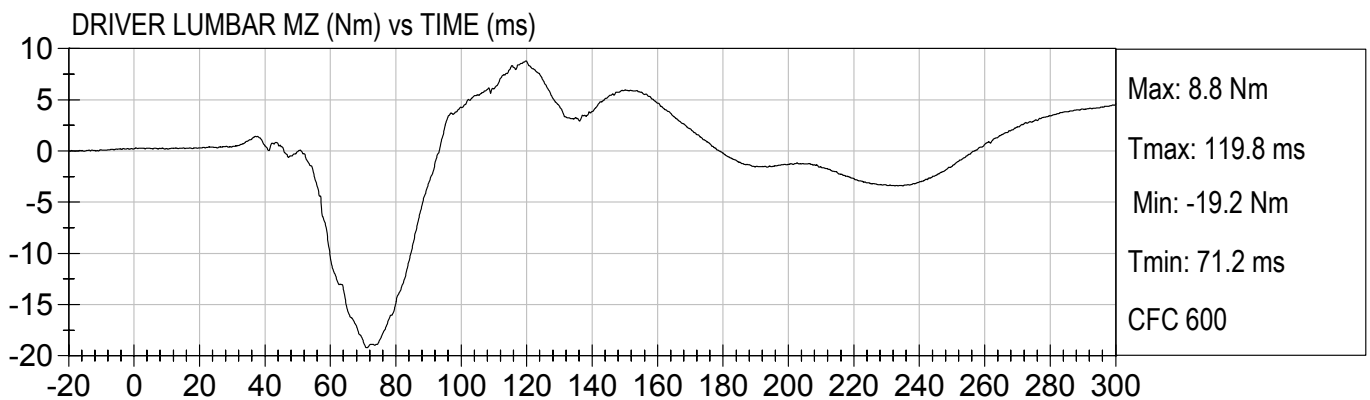
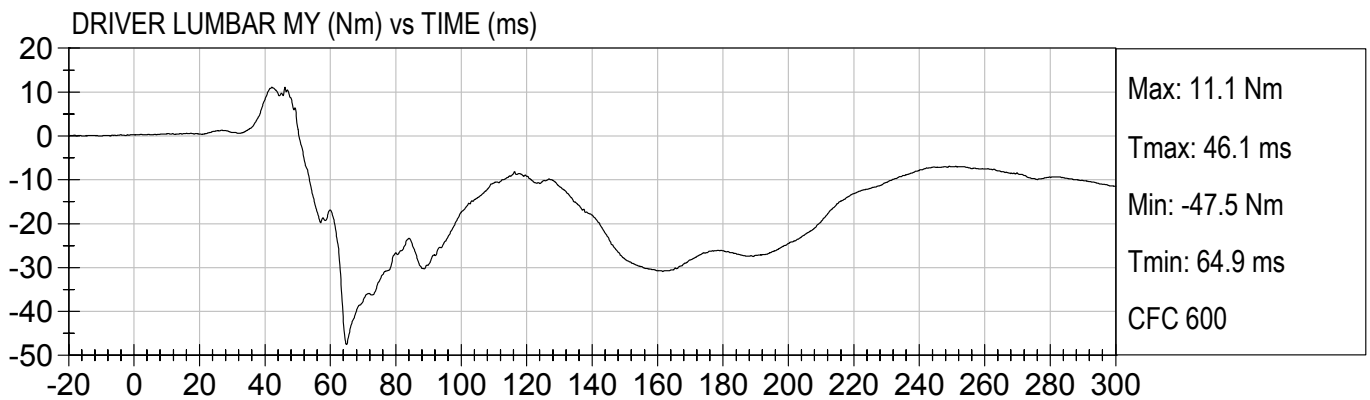
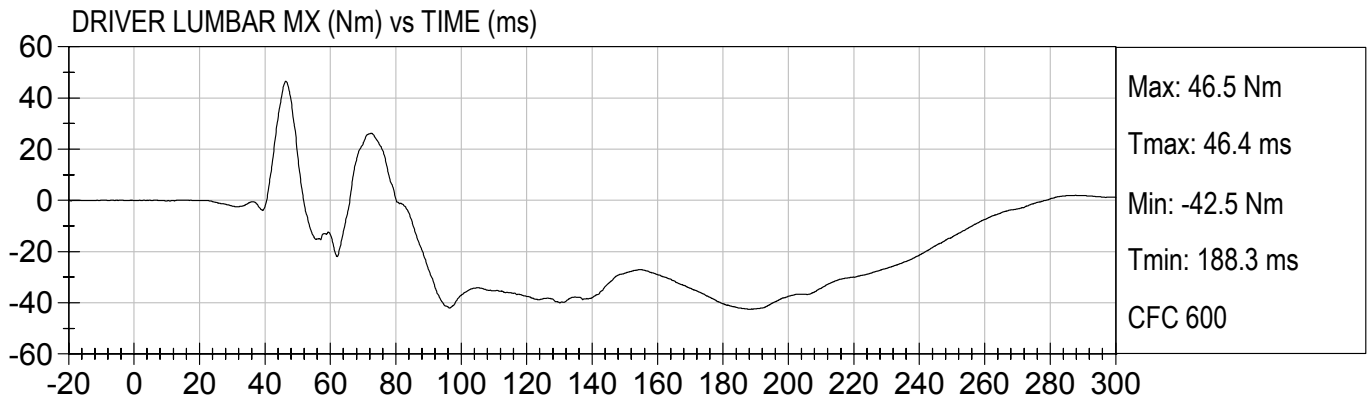


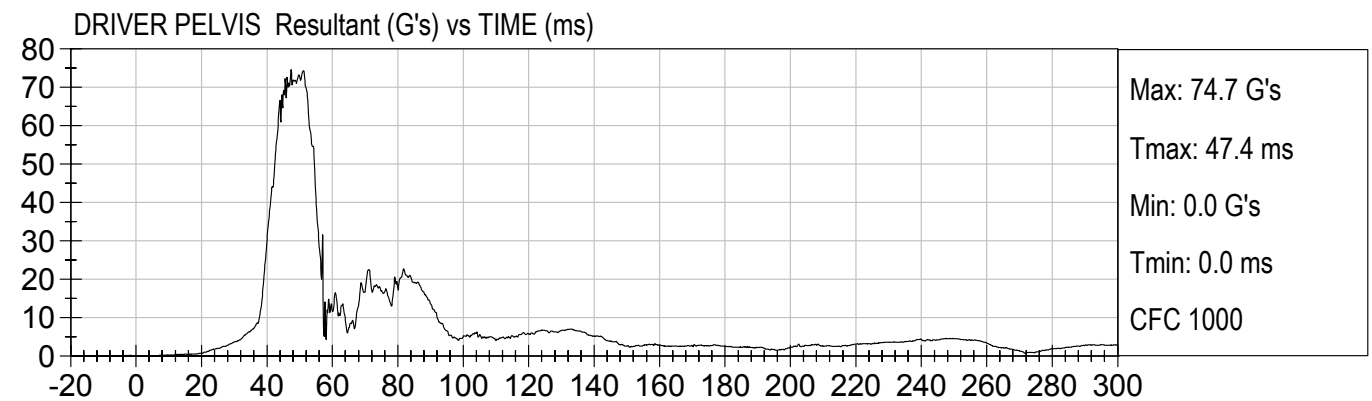
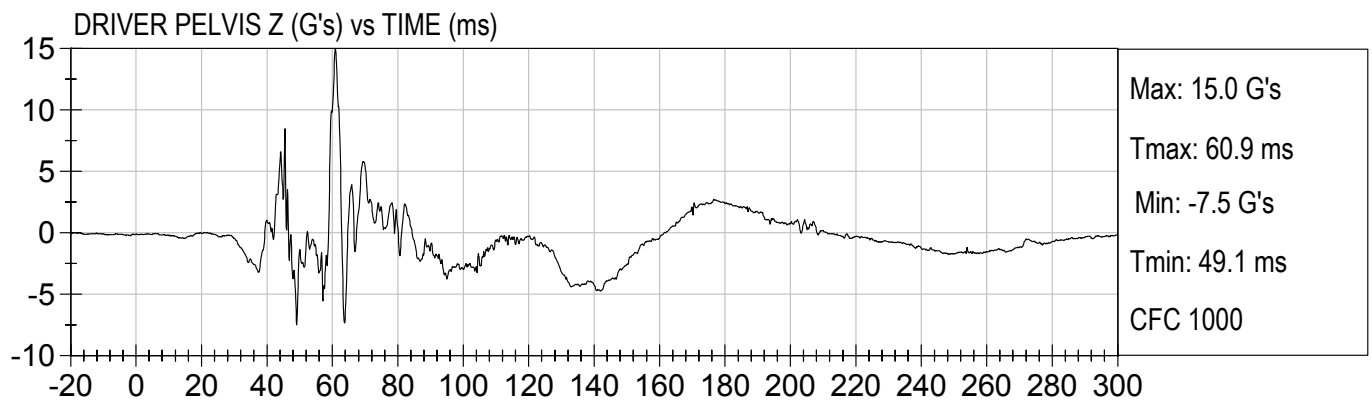
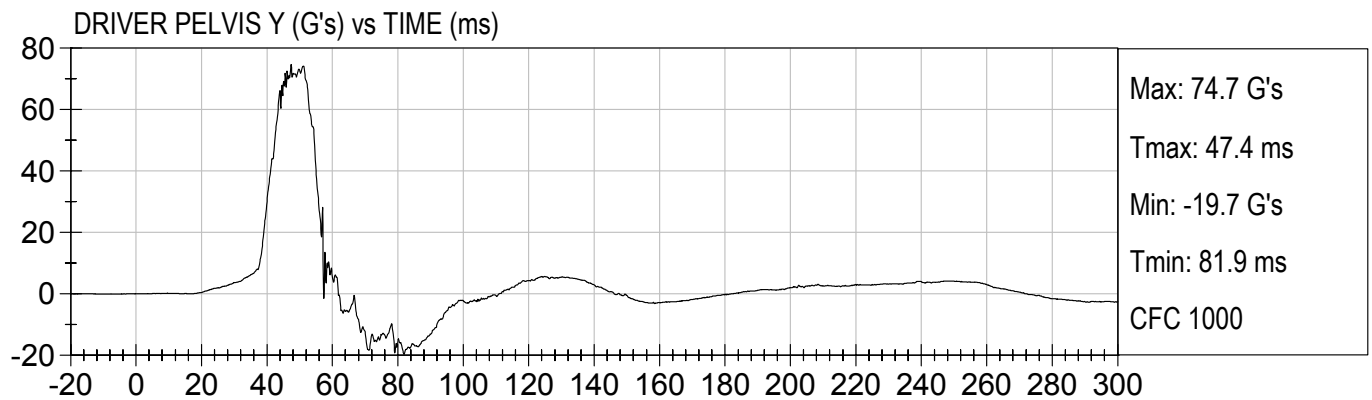
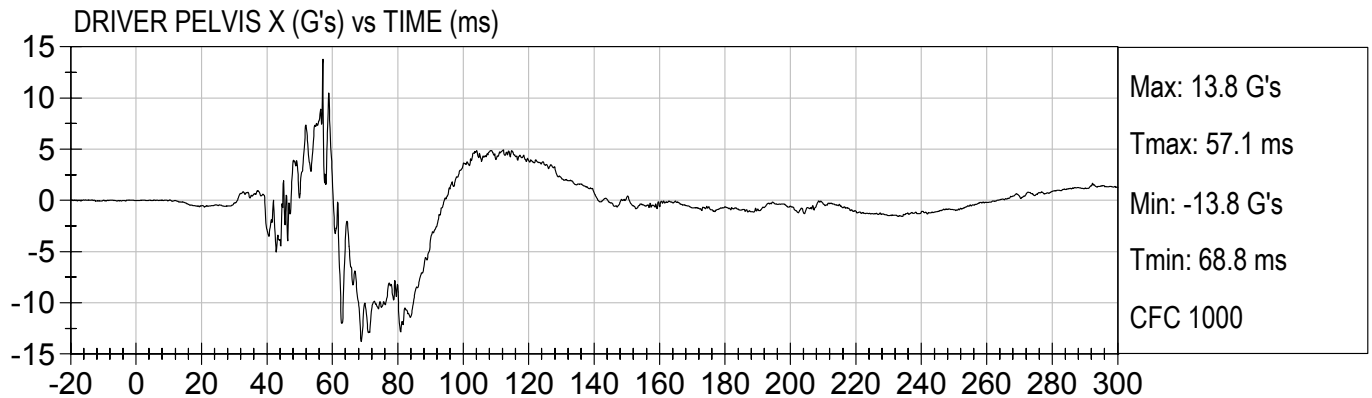
DRIVER LUMBAR FZ (N) vs TIME (ms)



DRIVER LUMBAR FResultant (N) vs TIME (ms)

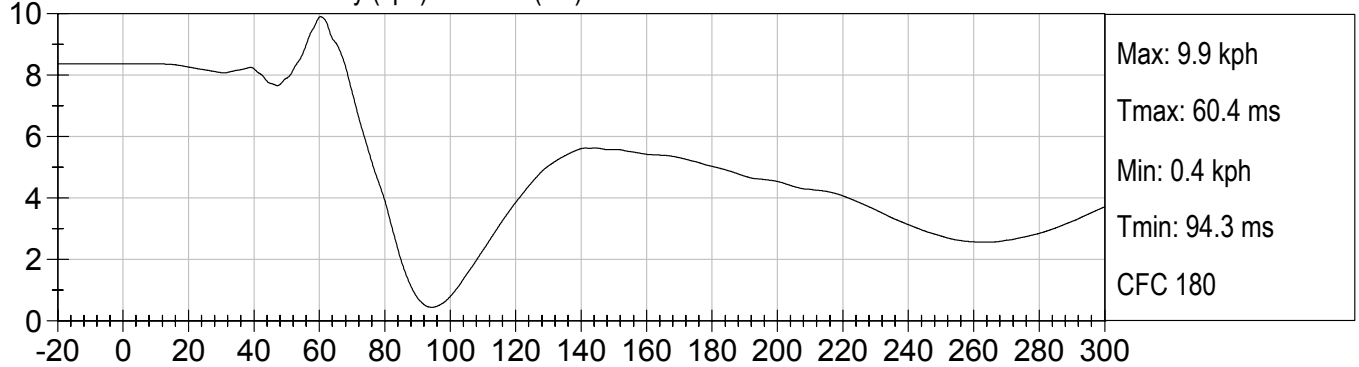




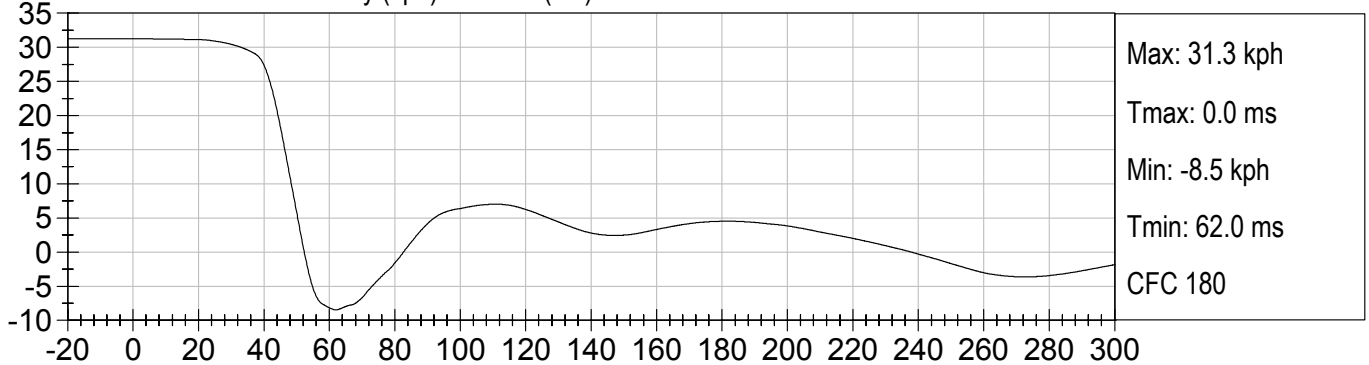




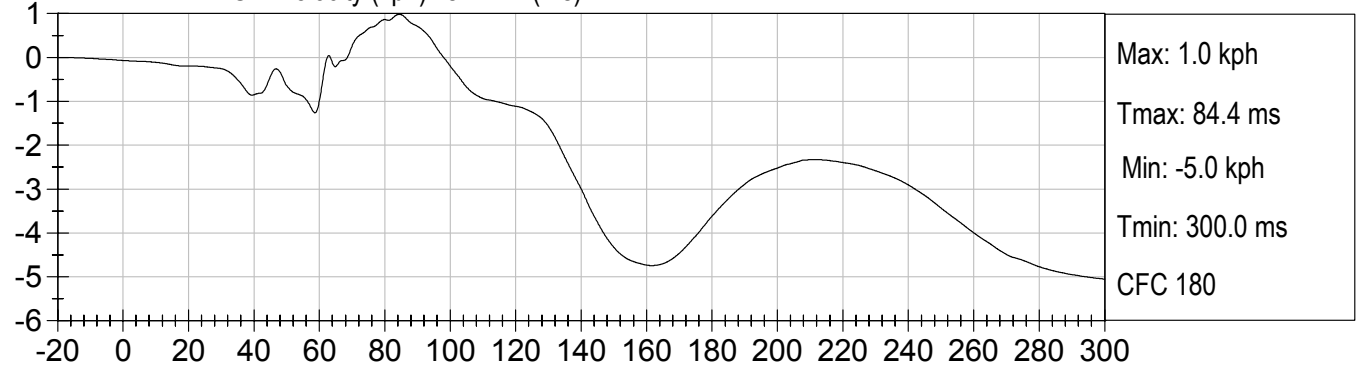
DRIVER PELVIS X Velocity (kph) vs TIME (ms)

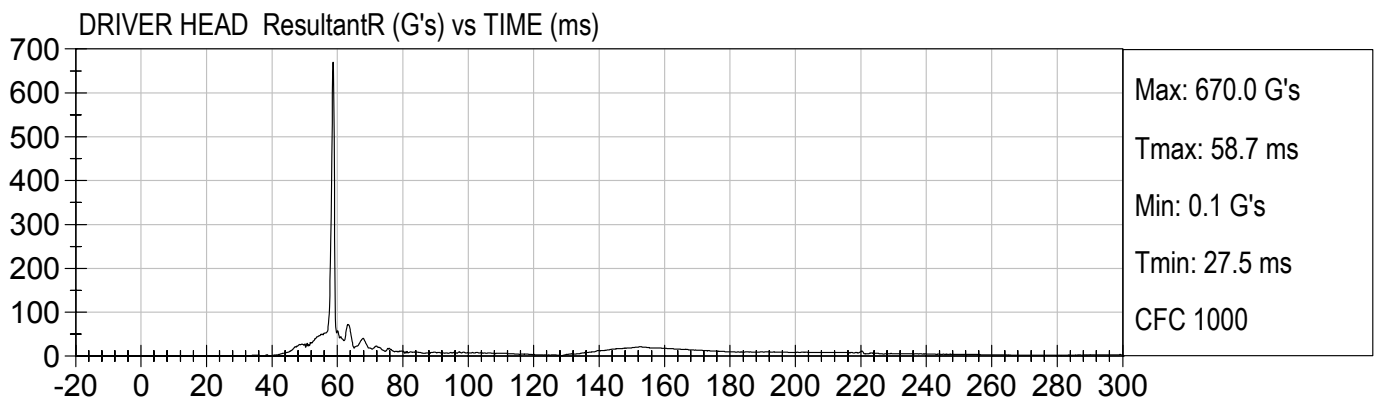
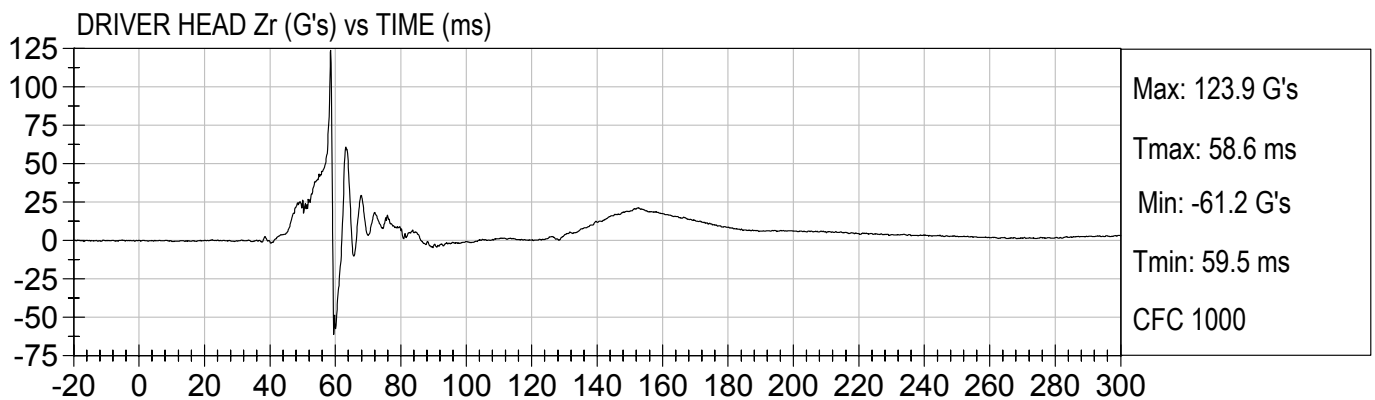
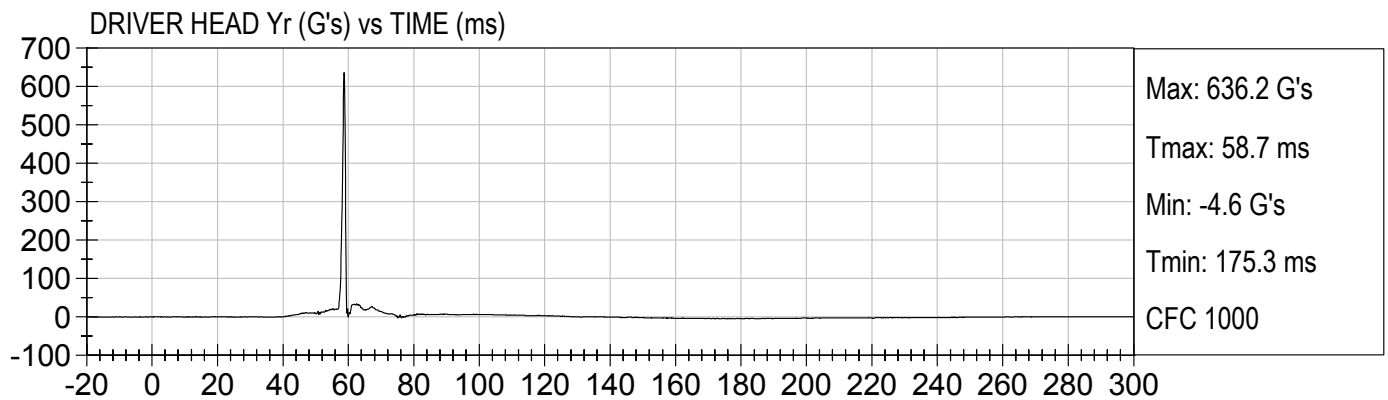
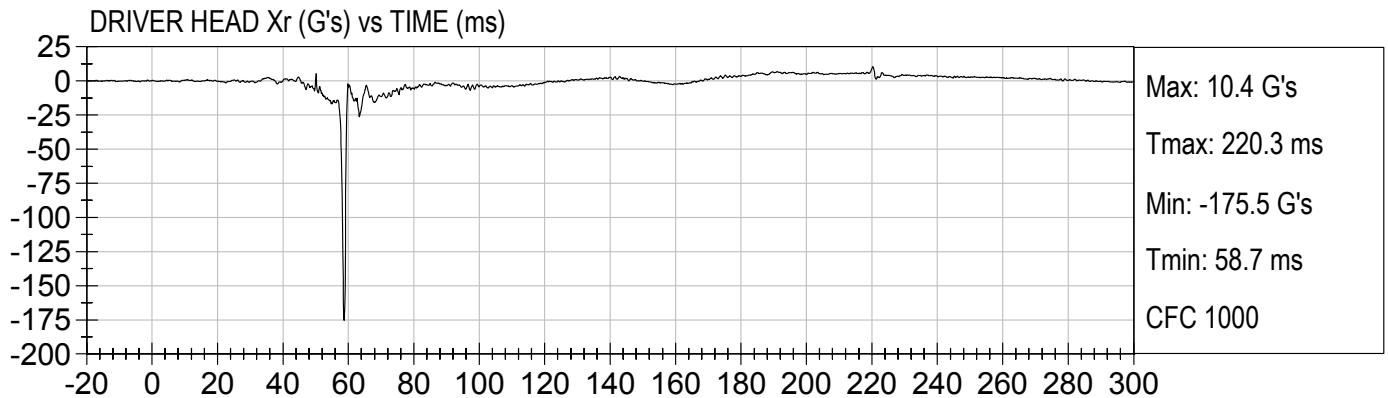


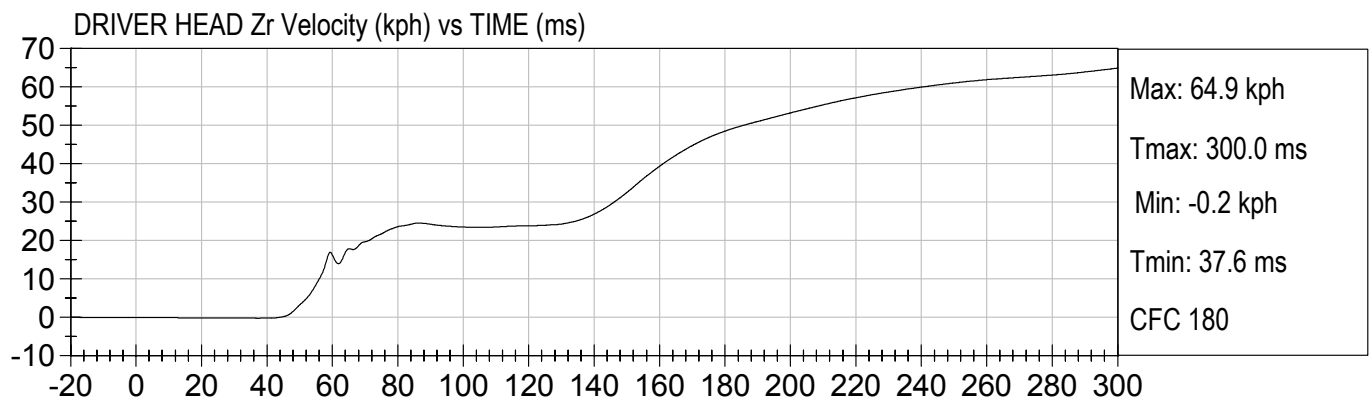
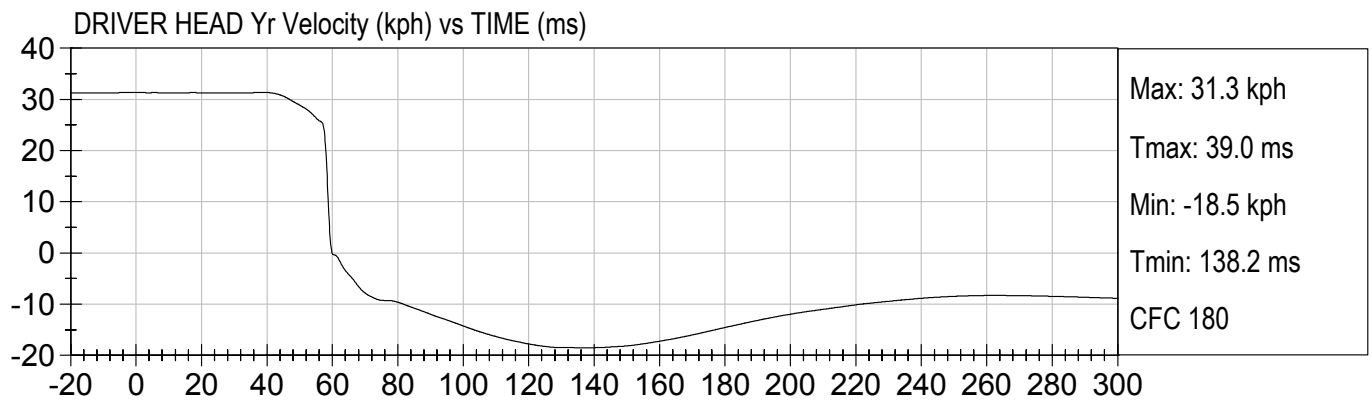
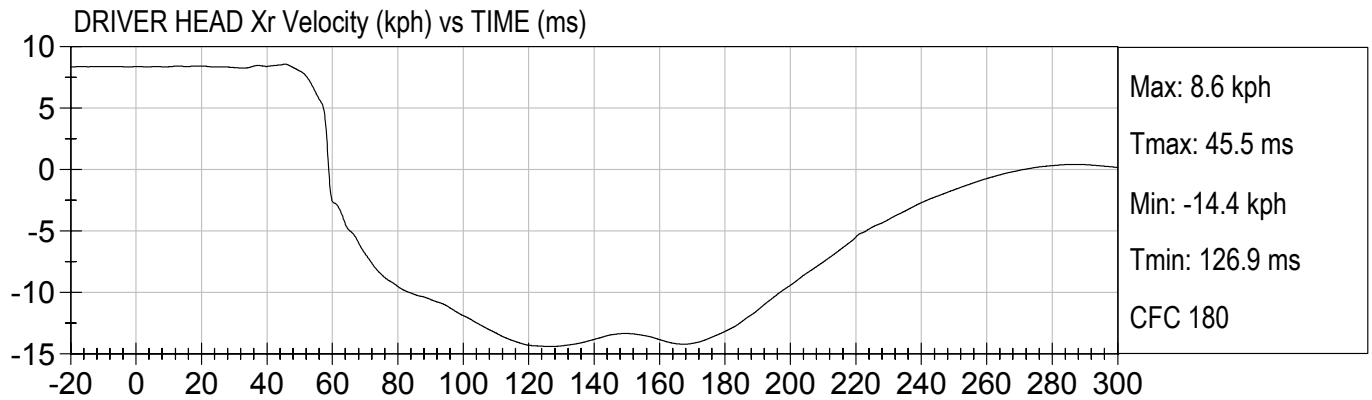
DRIVER PELVIS Y Velocity (kph) vs TIME (ms)

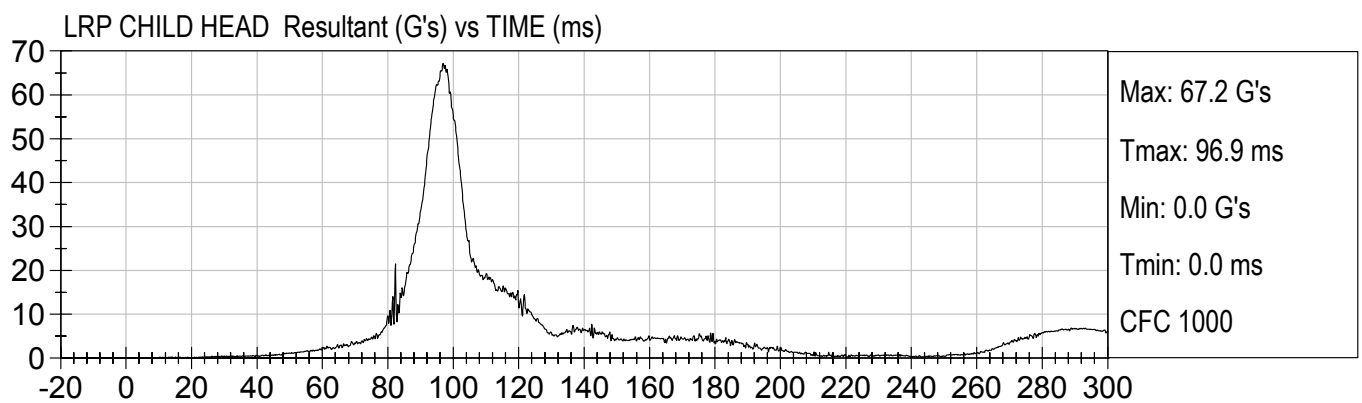
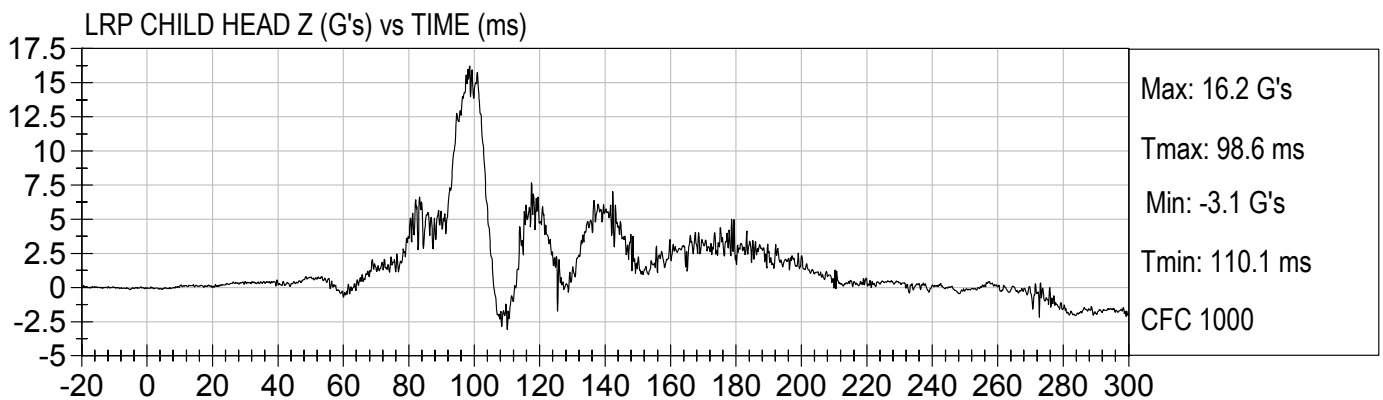
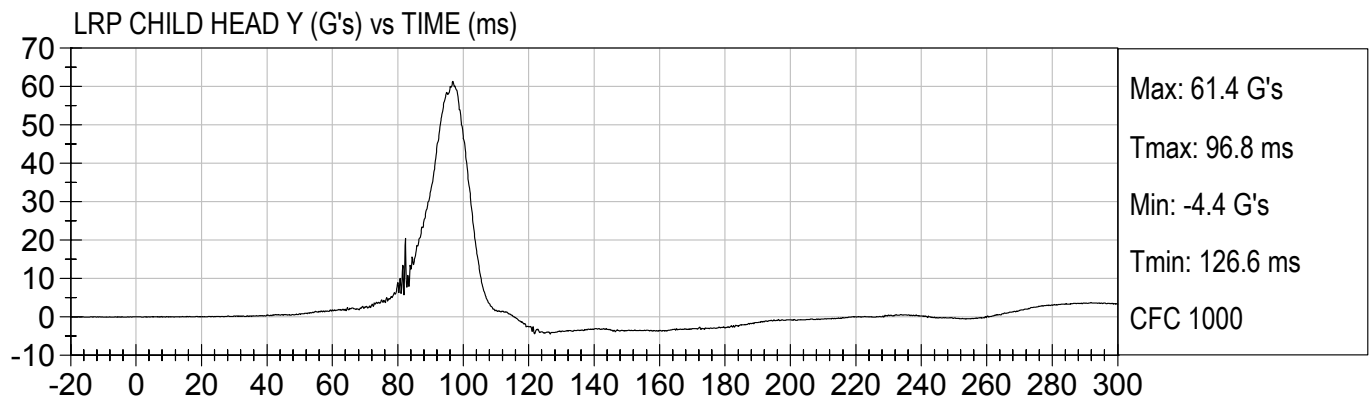
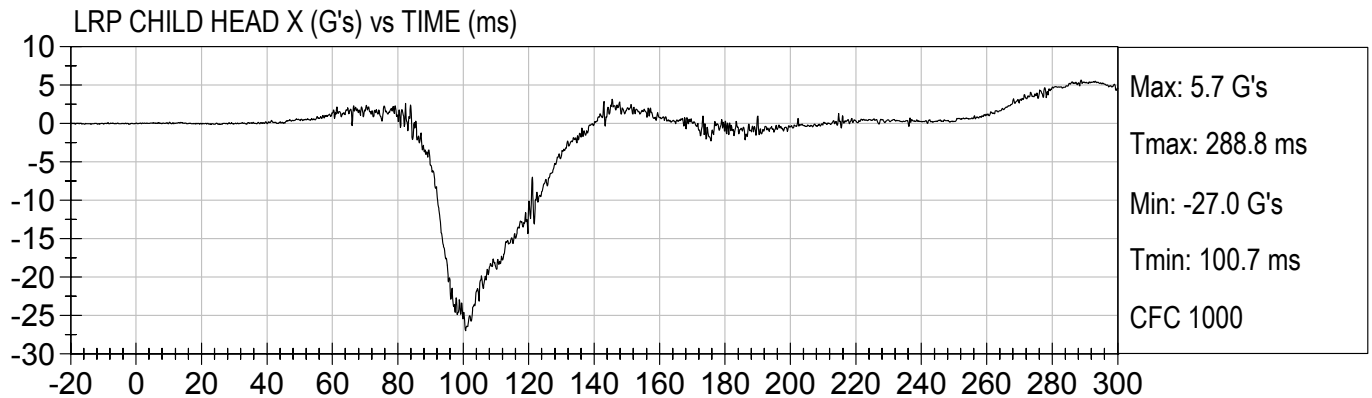


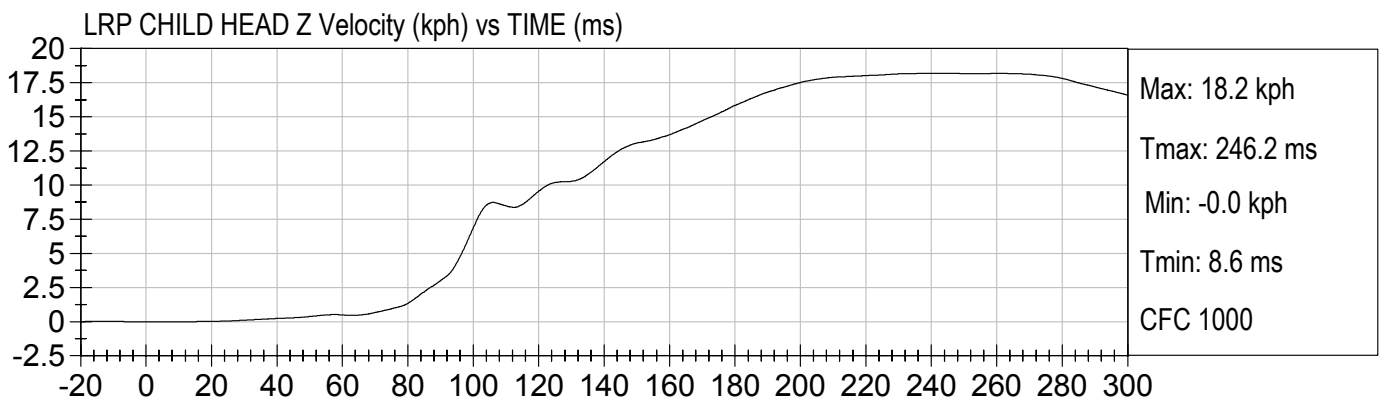
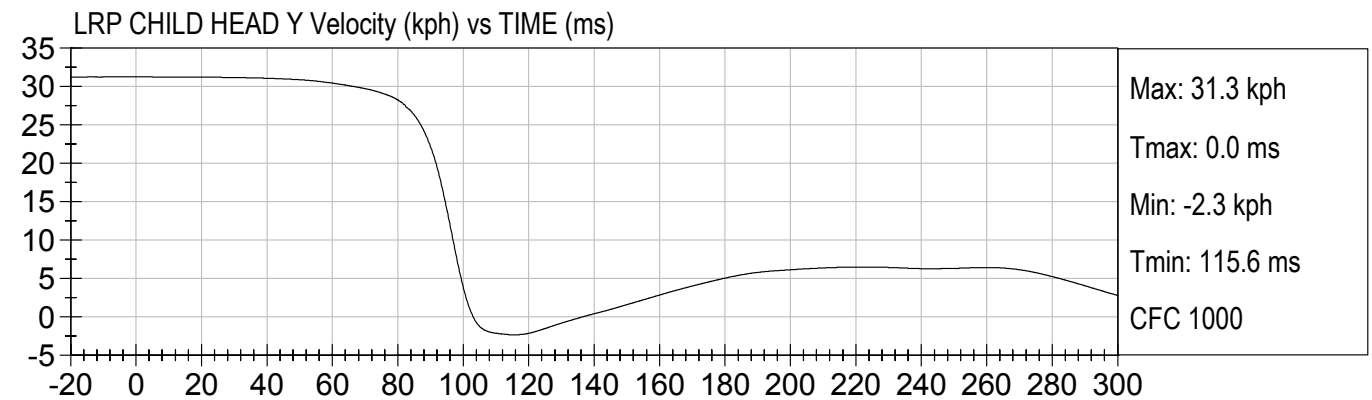
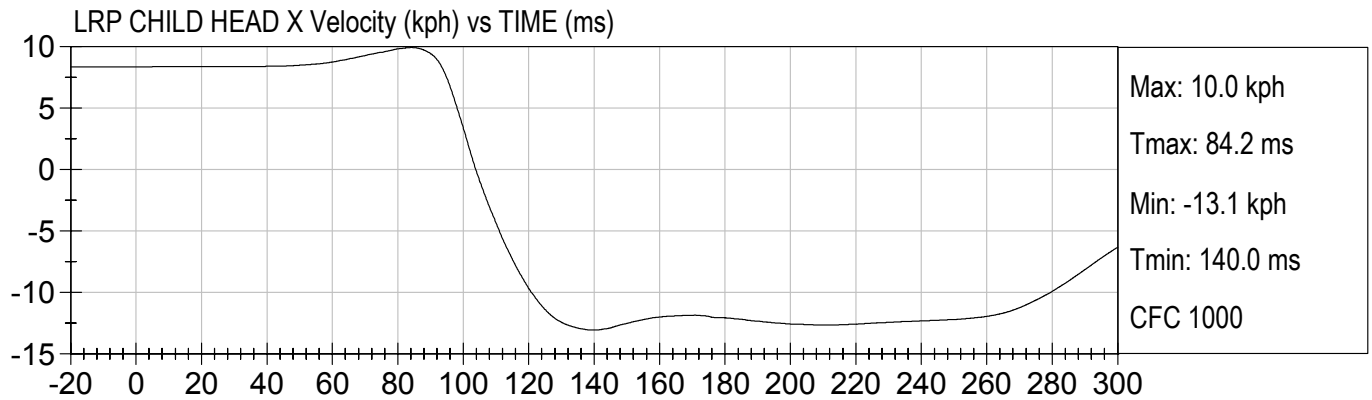
DRIVER PELVIS Z Velocity (kph) vs TIME (ms)

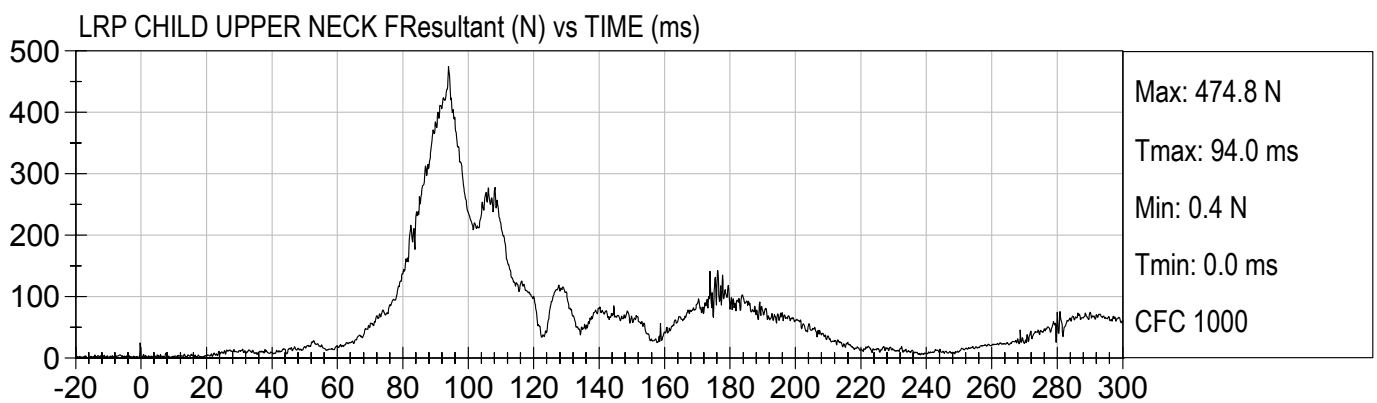
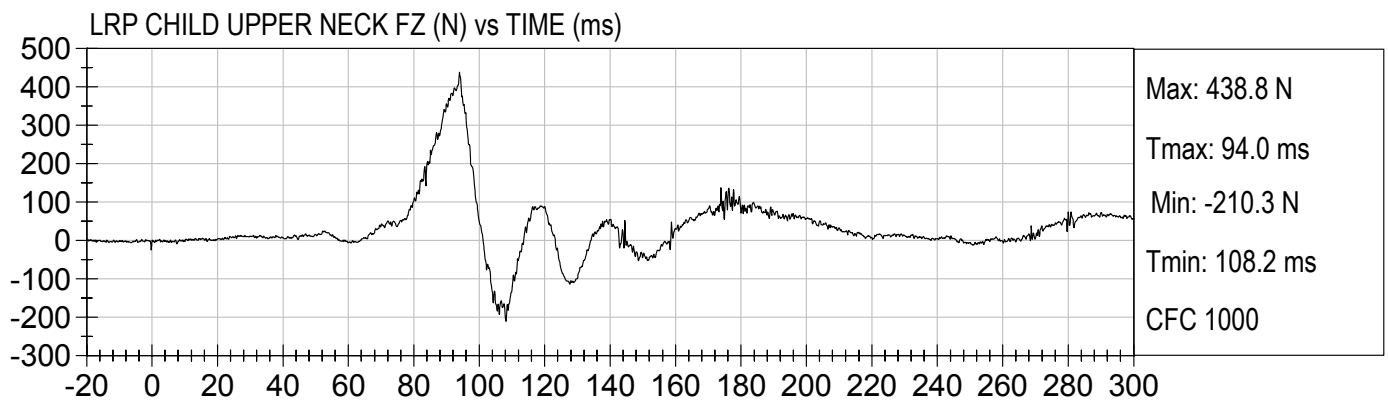
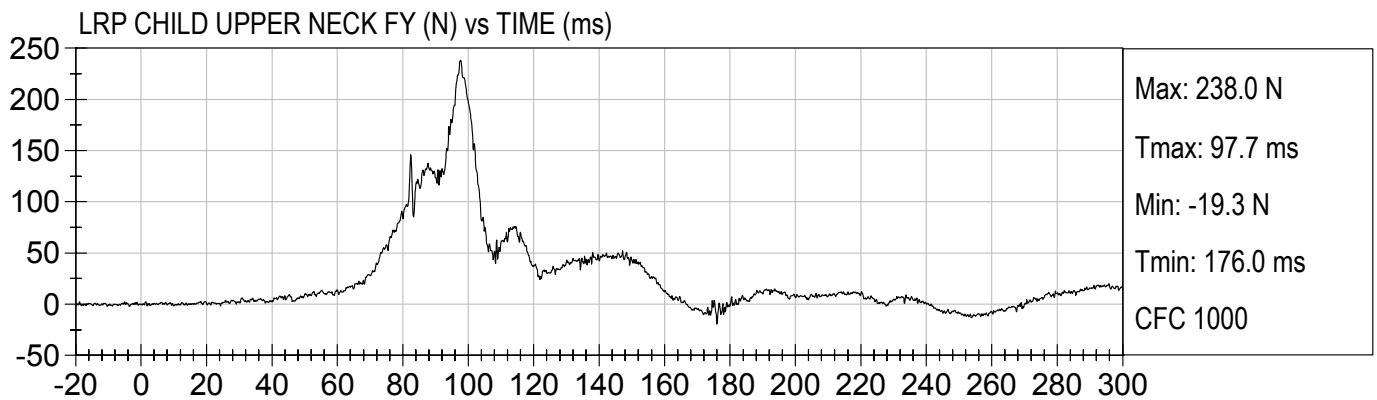
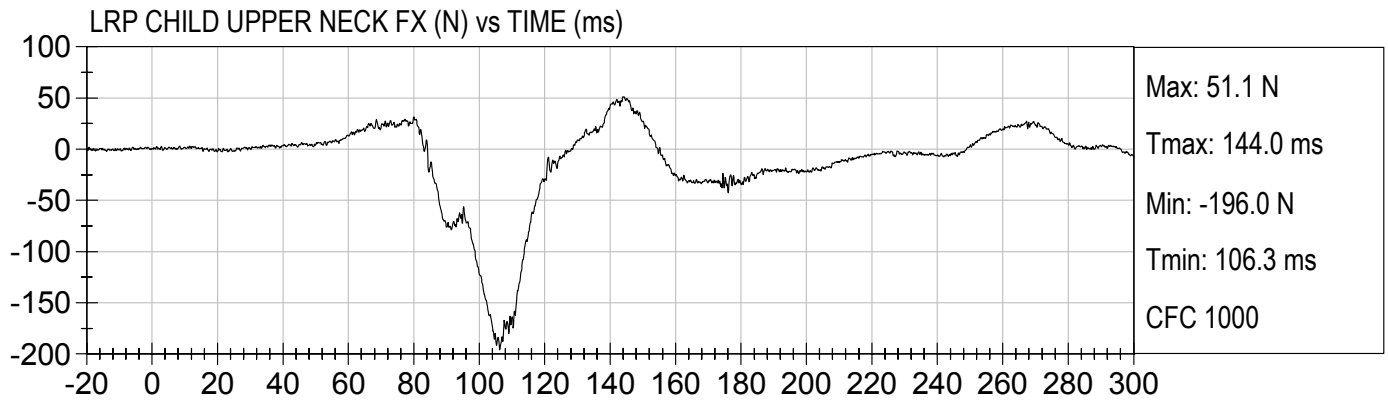


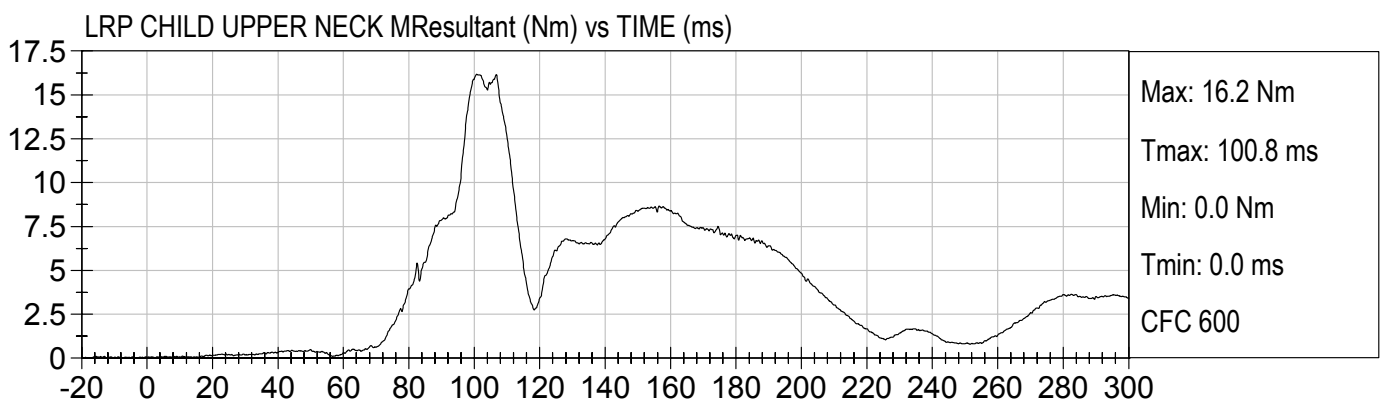
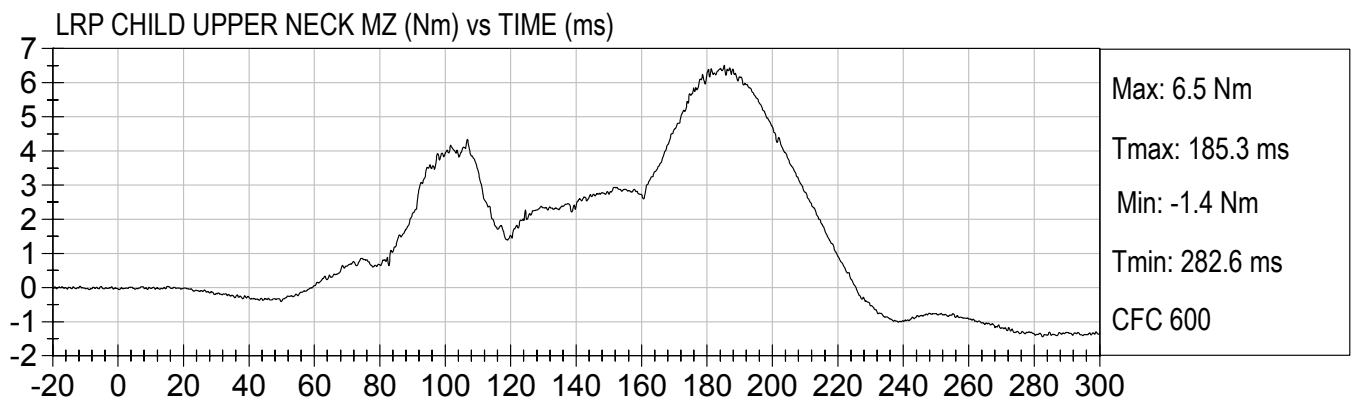
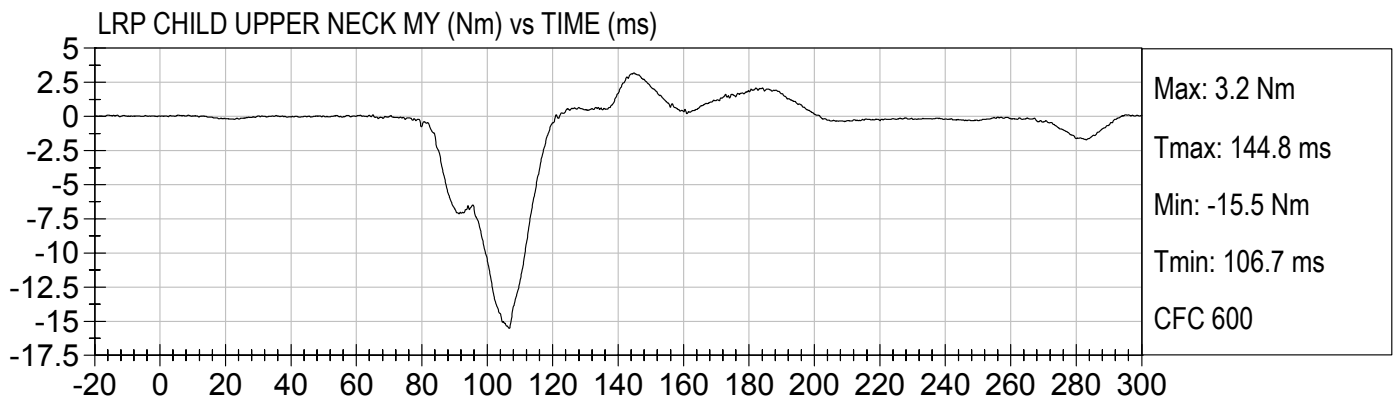
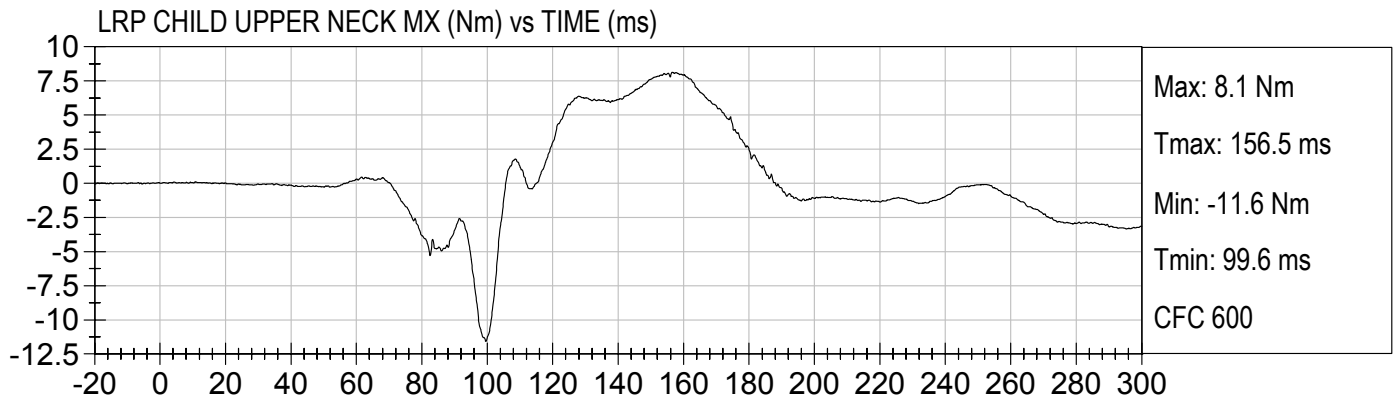


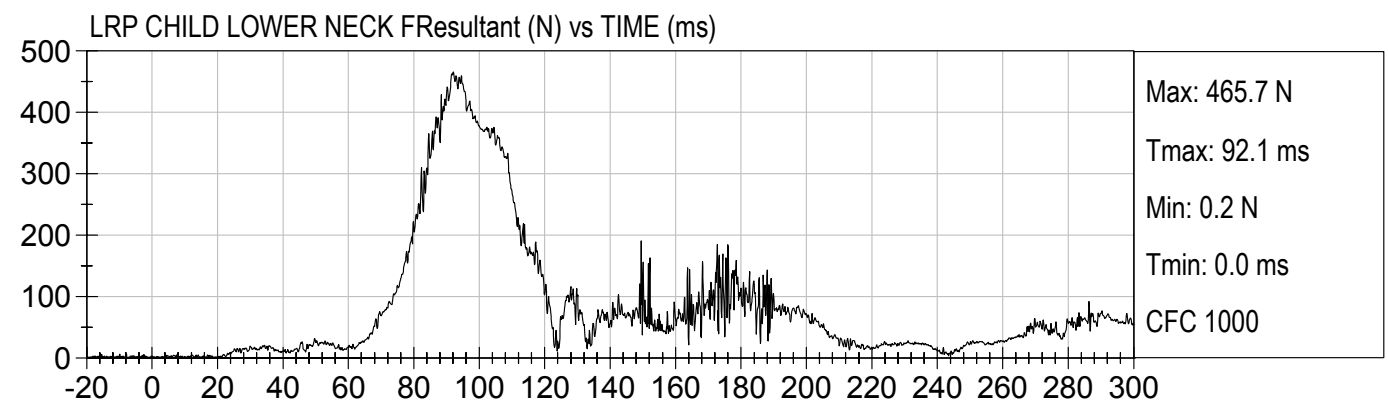
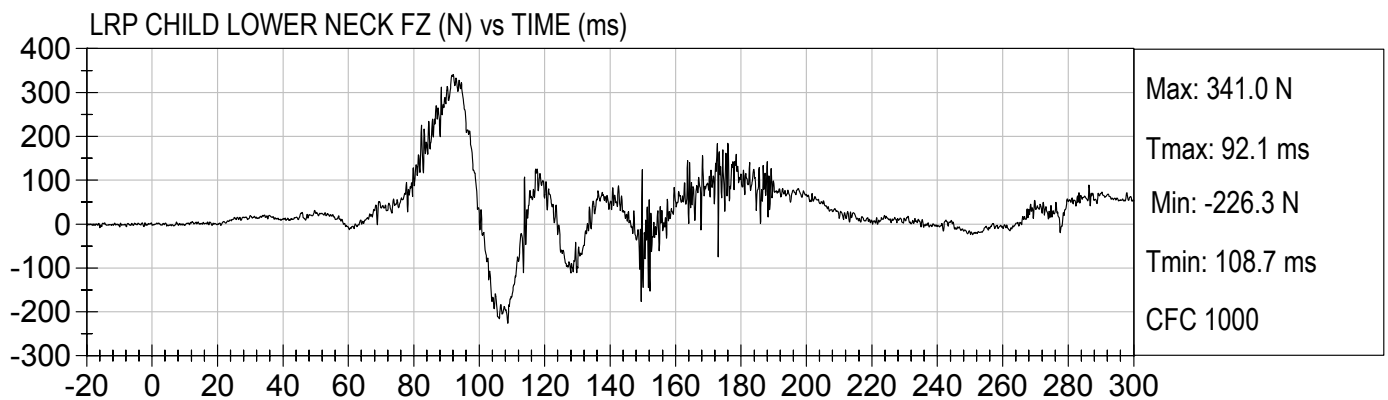
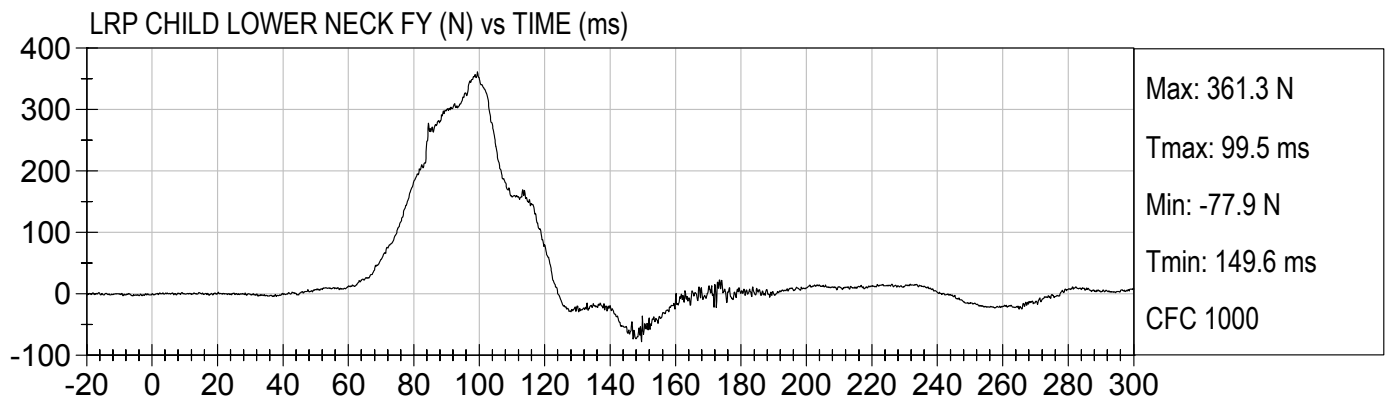
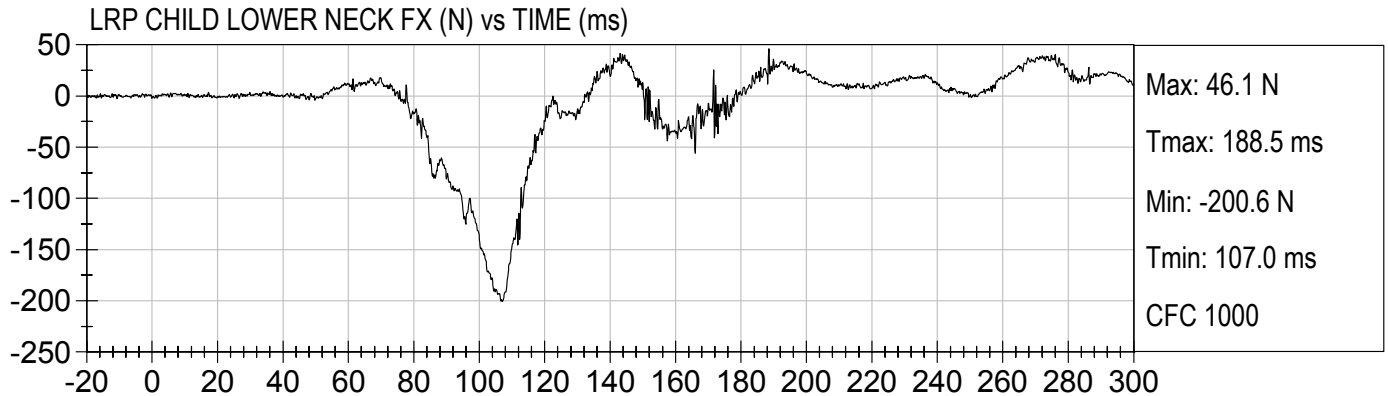






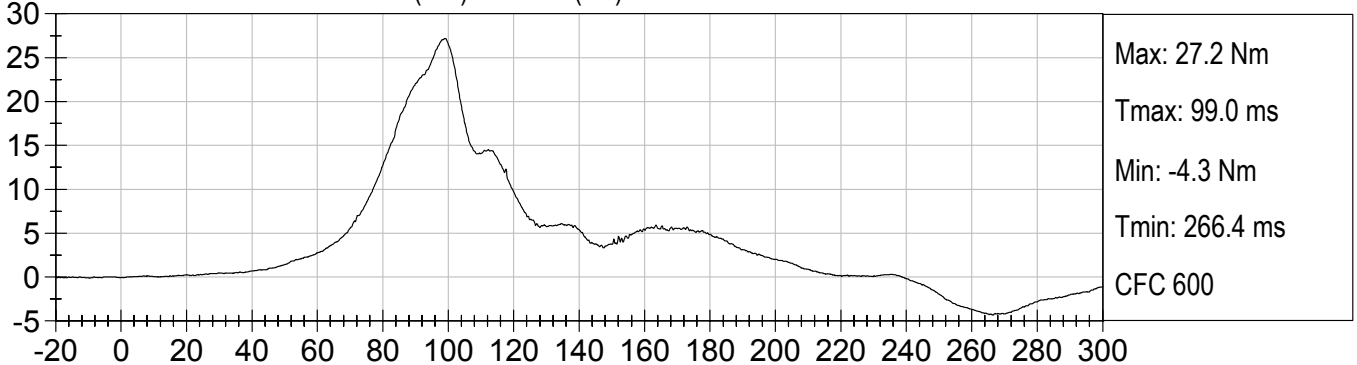




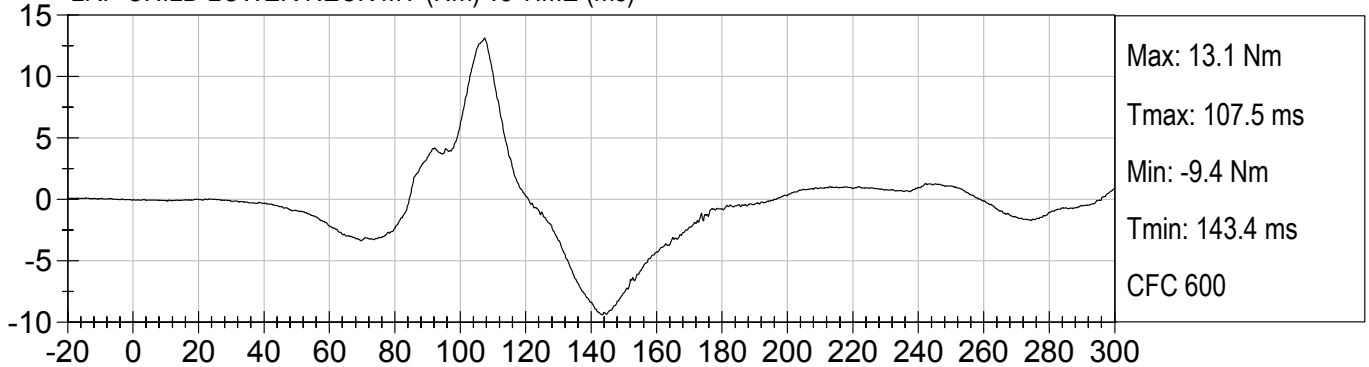




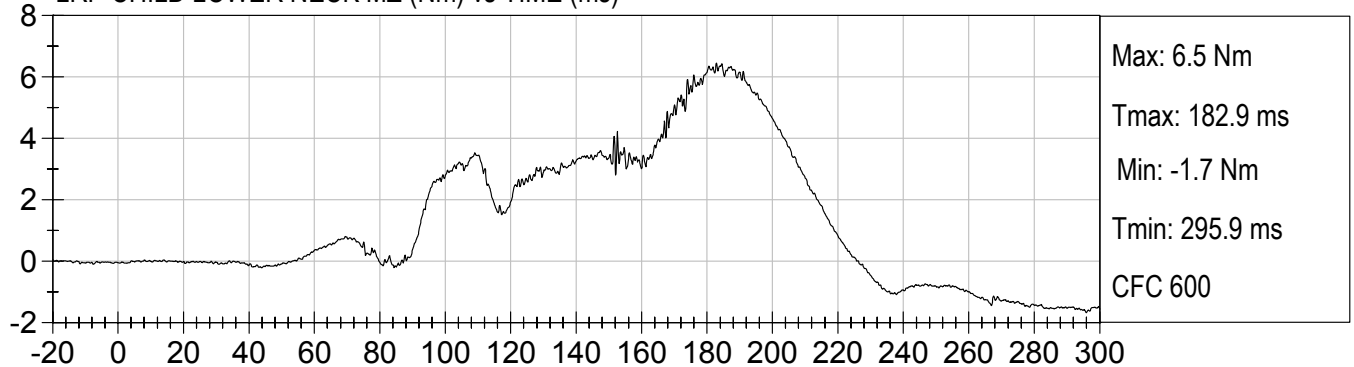
LRP CHILD LOWER NECK MX (Nm) vs TIME (ms)



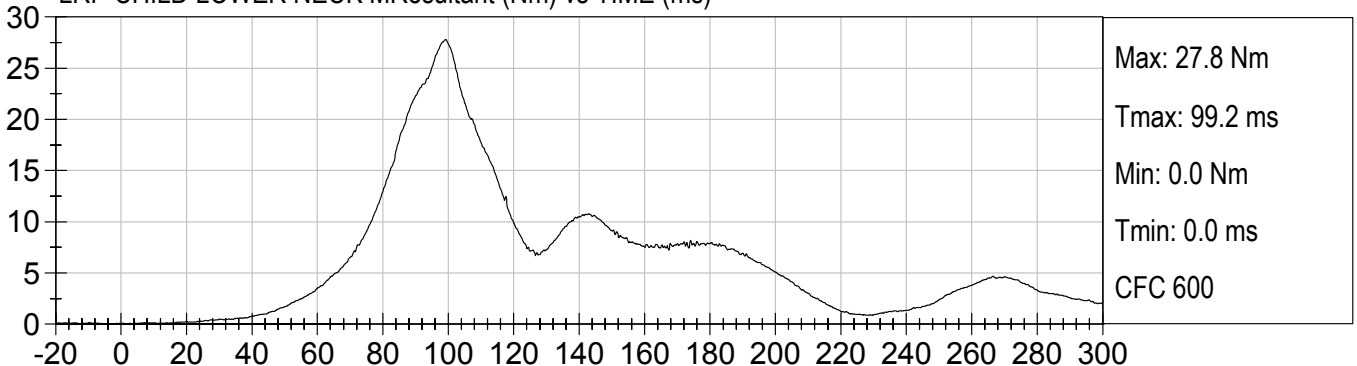
LRP CHILD LOWER NECK MY (Nm) vs TIME (ms)

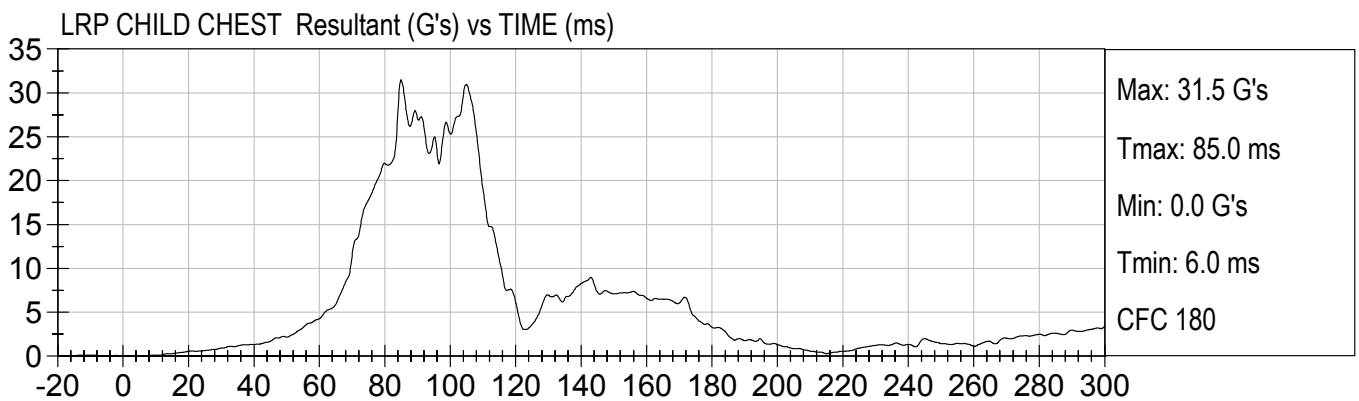
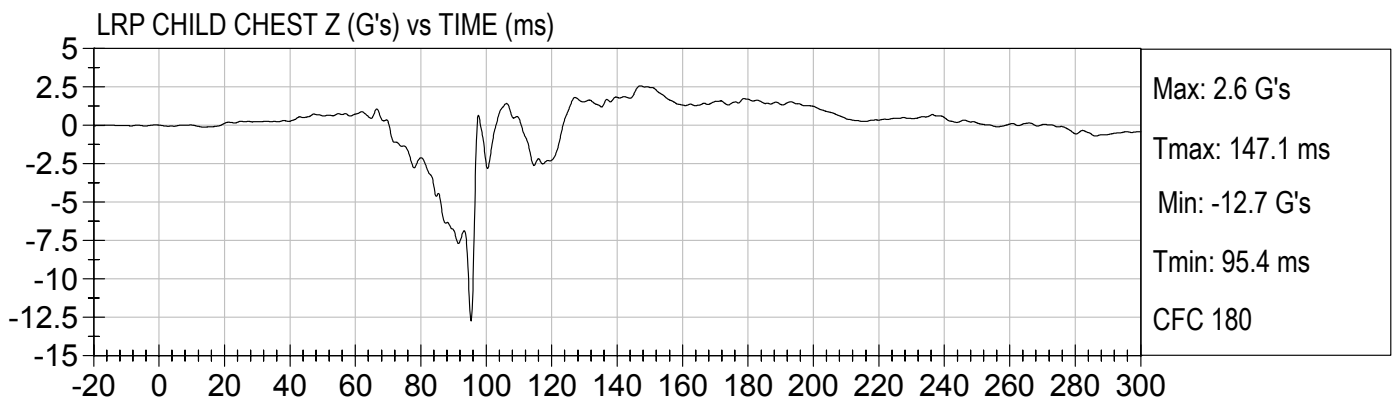
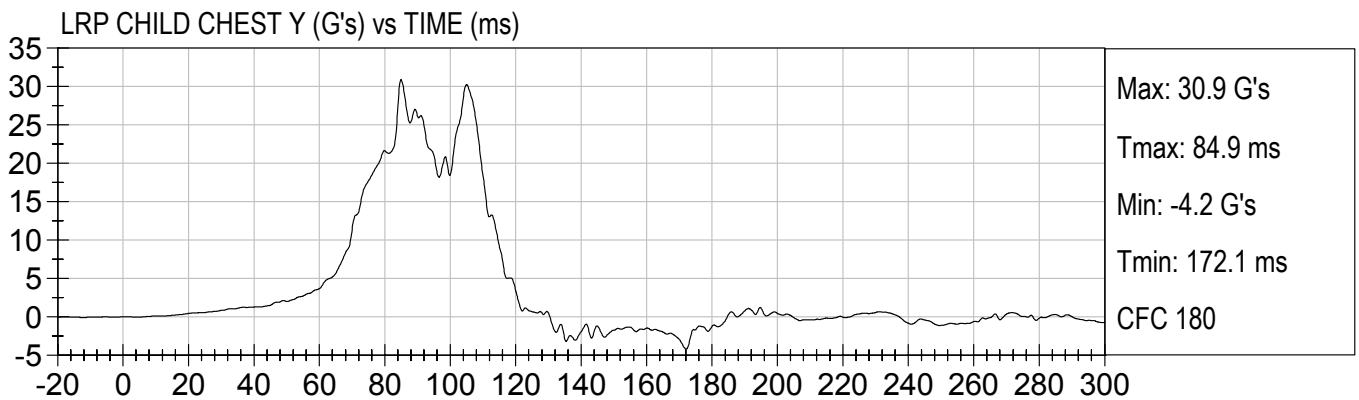
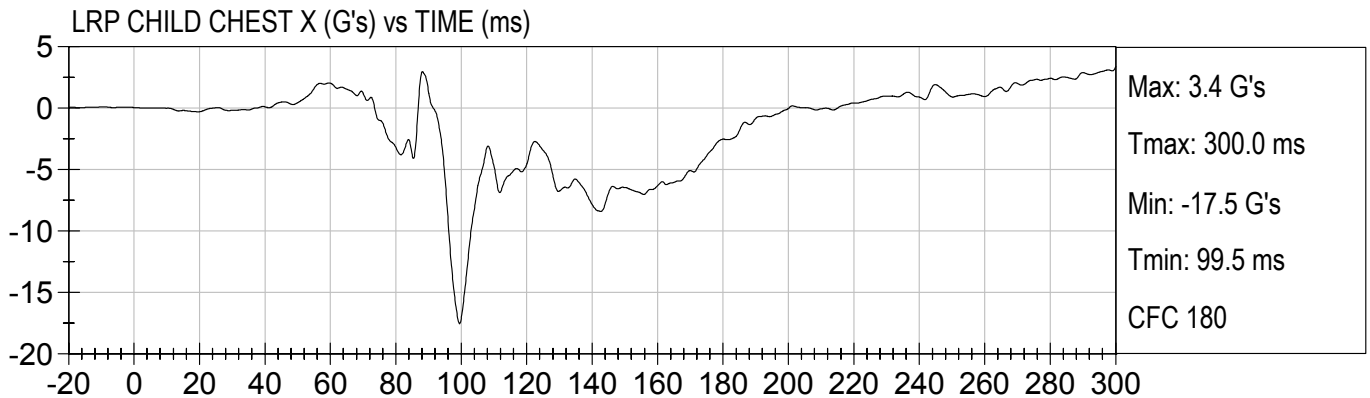


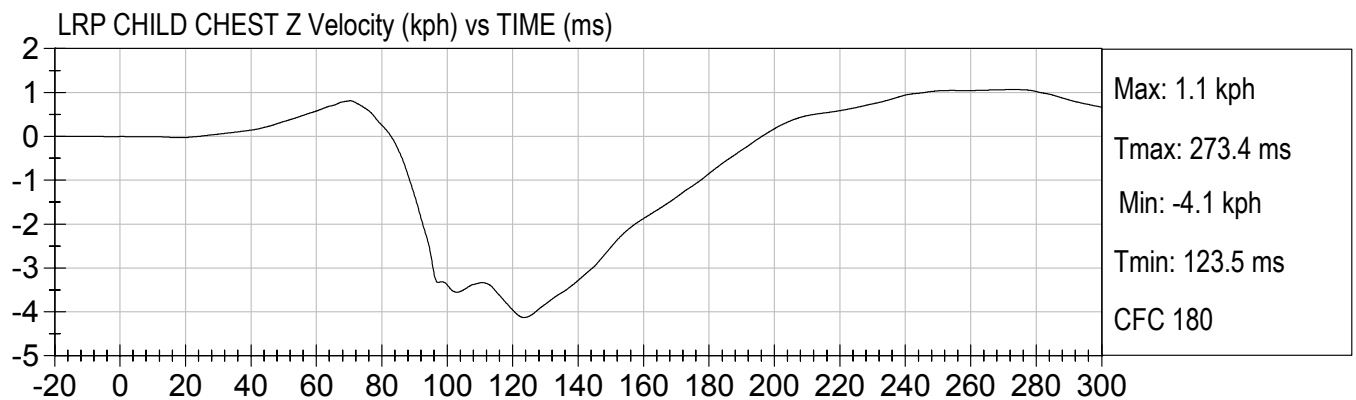
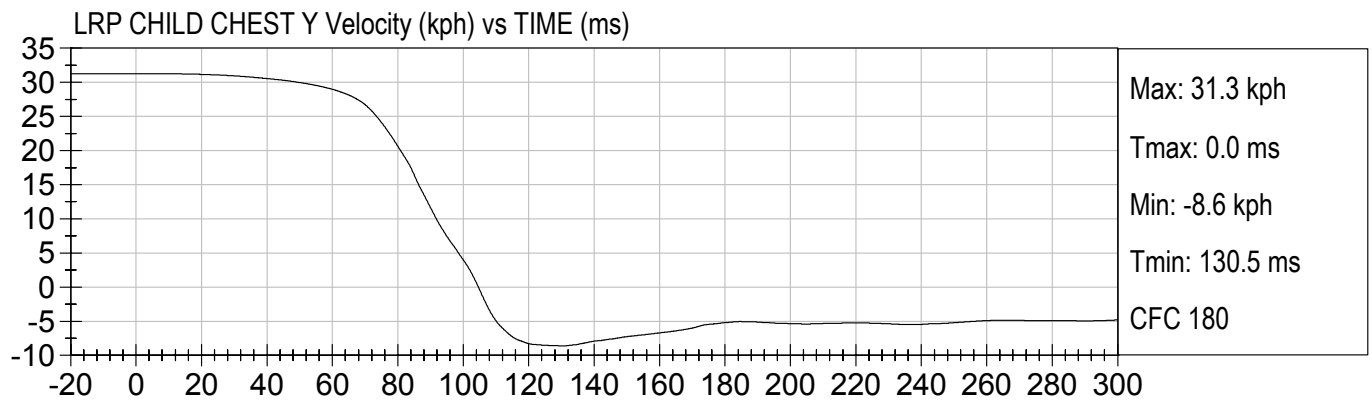
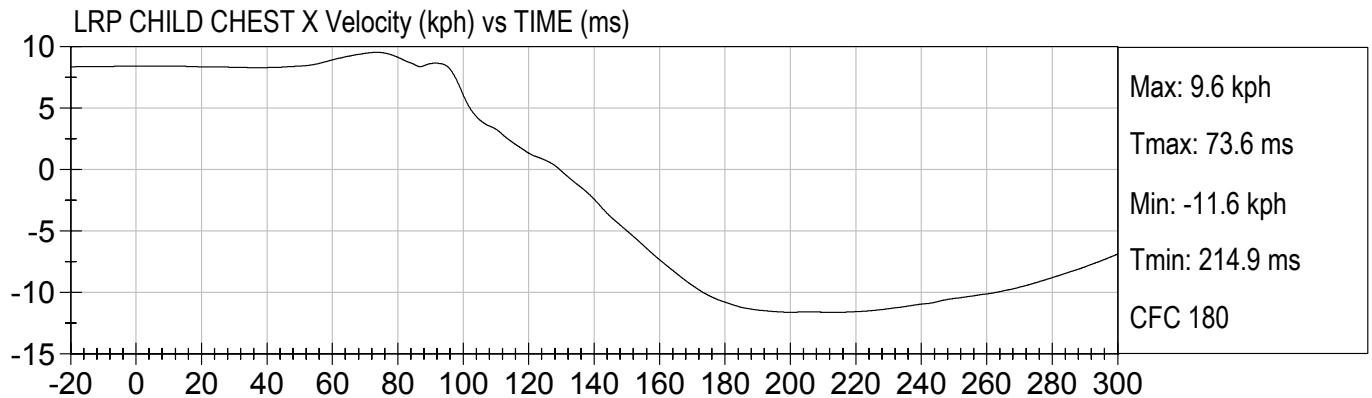
LRP CHILD LOWER NECK MZ (Nm) vs TIME (ms)

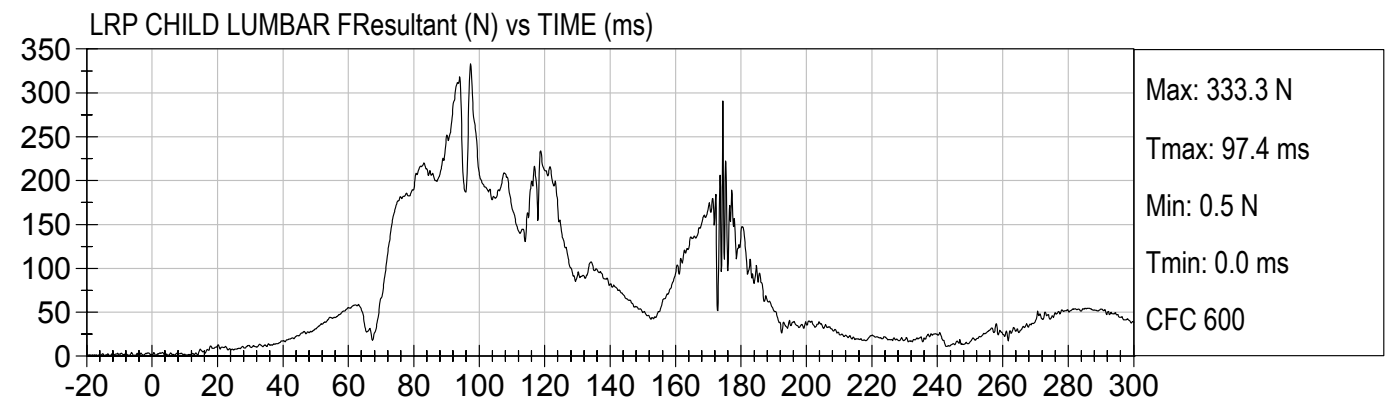
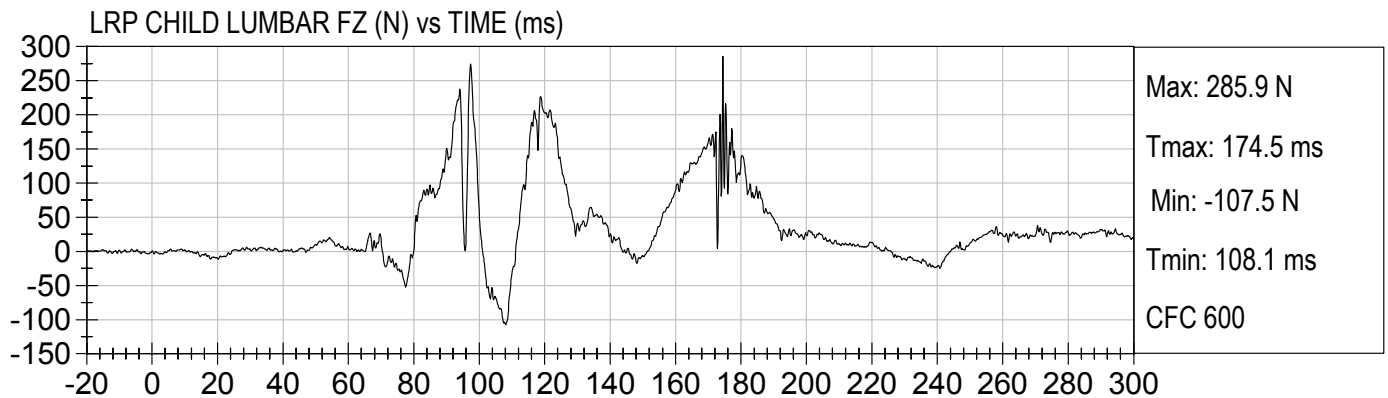
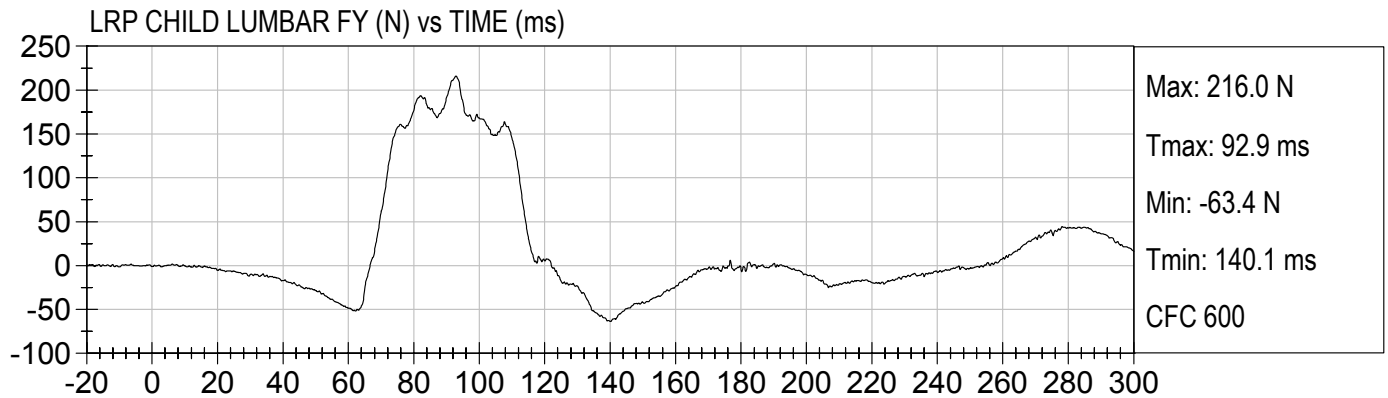
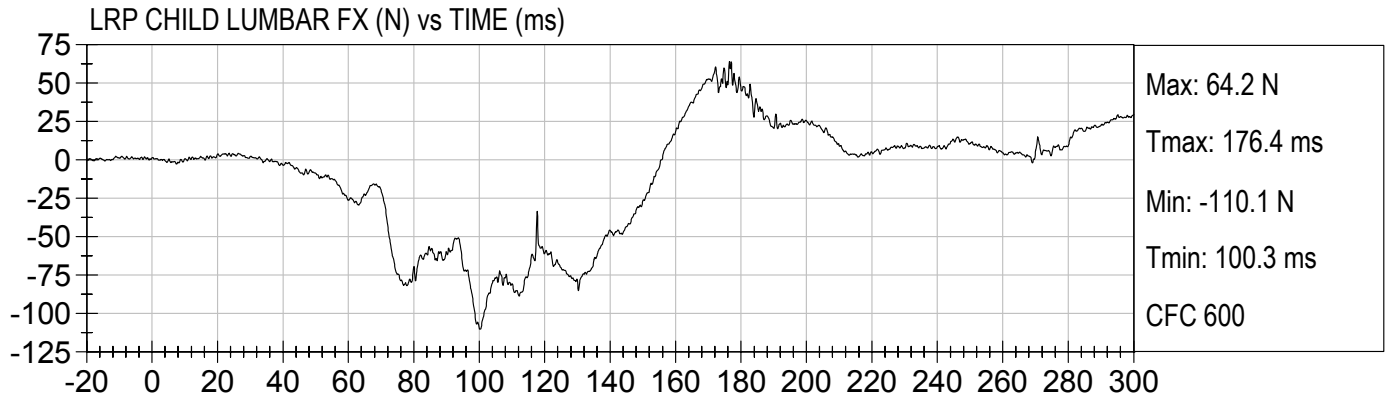


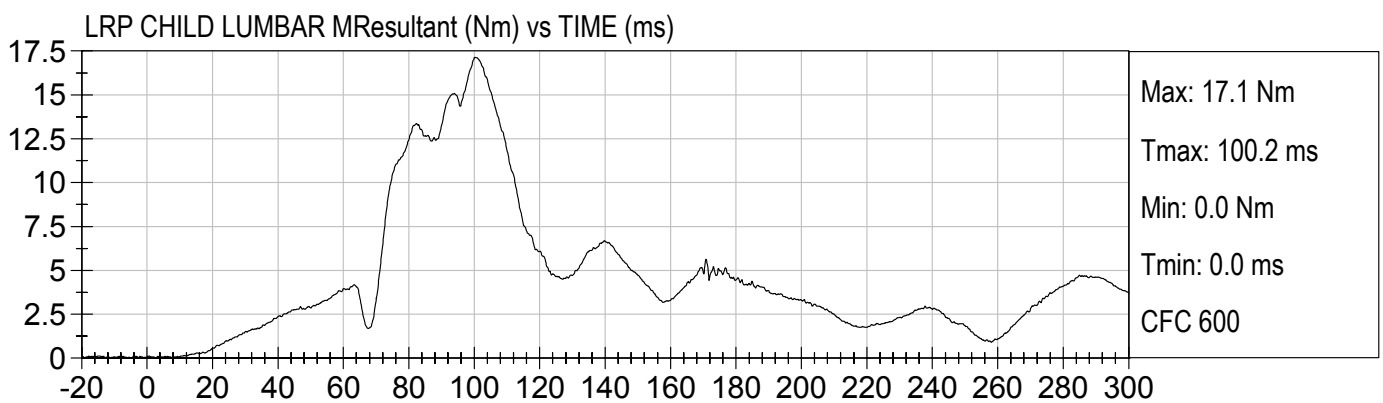
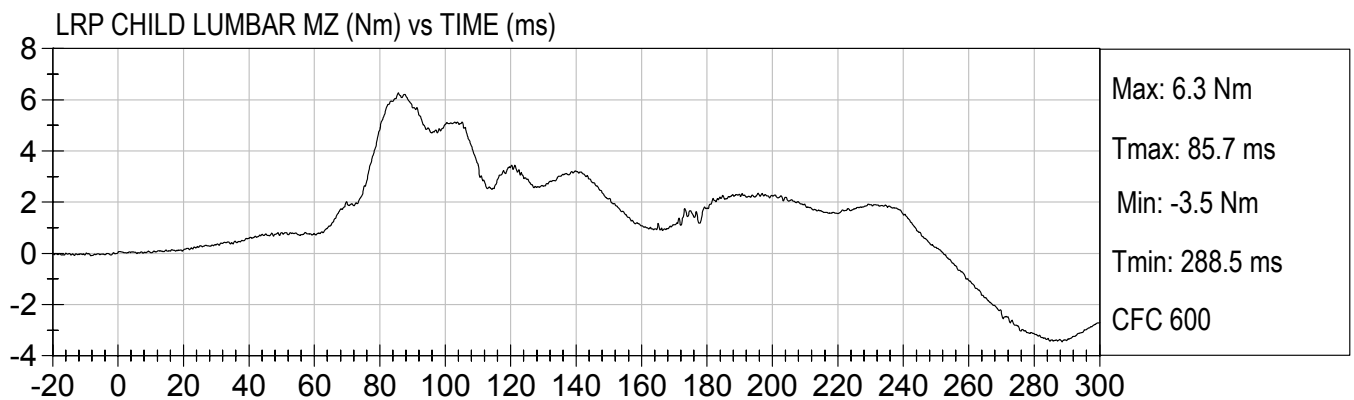
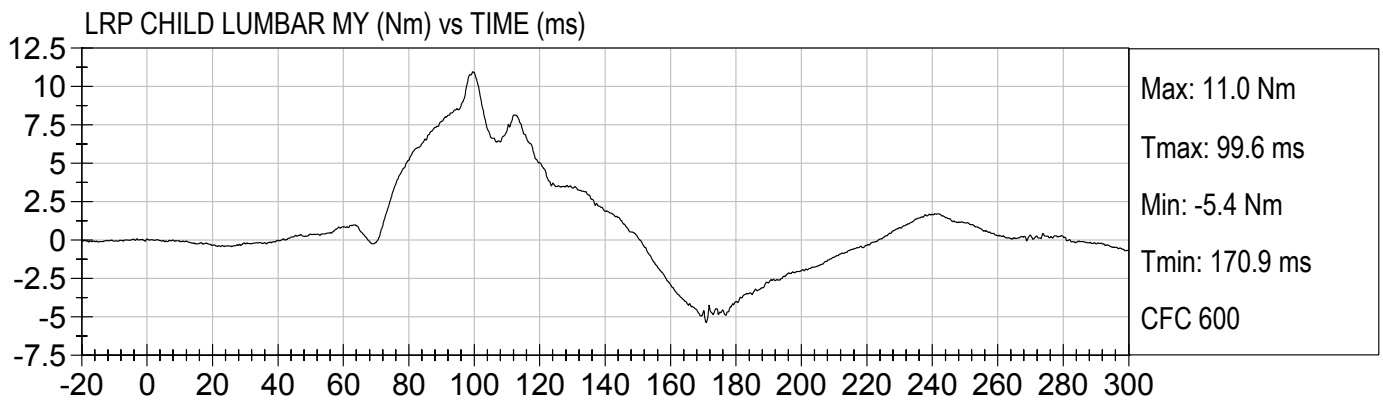
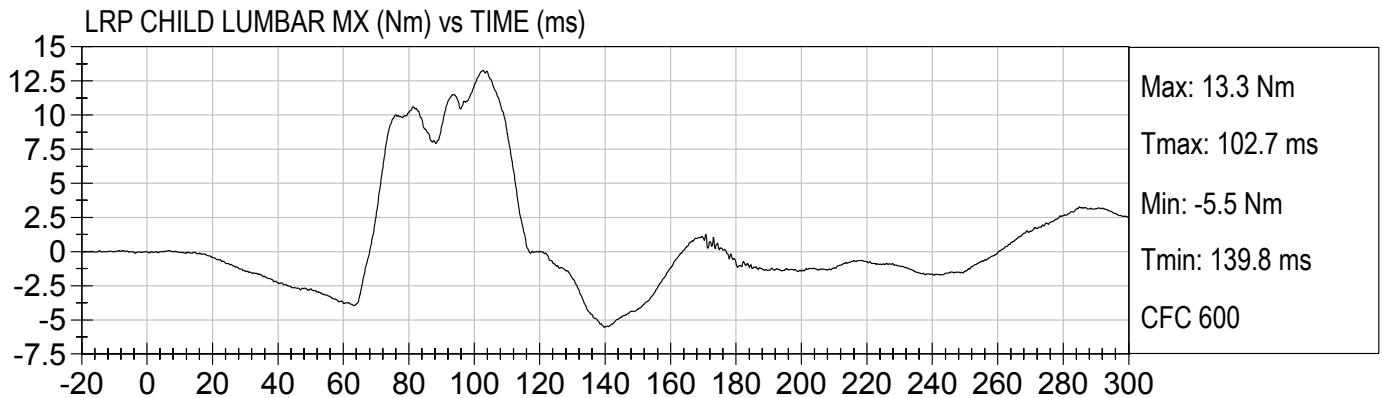
LRP CHILD LOWER NECK MResultant (Nm) vs TIME (ms)

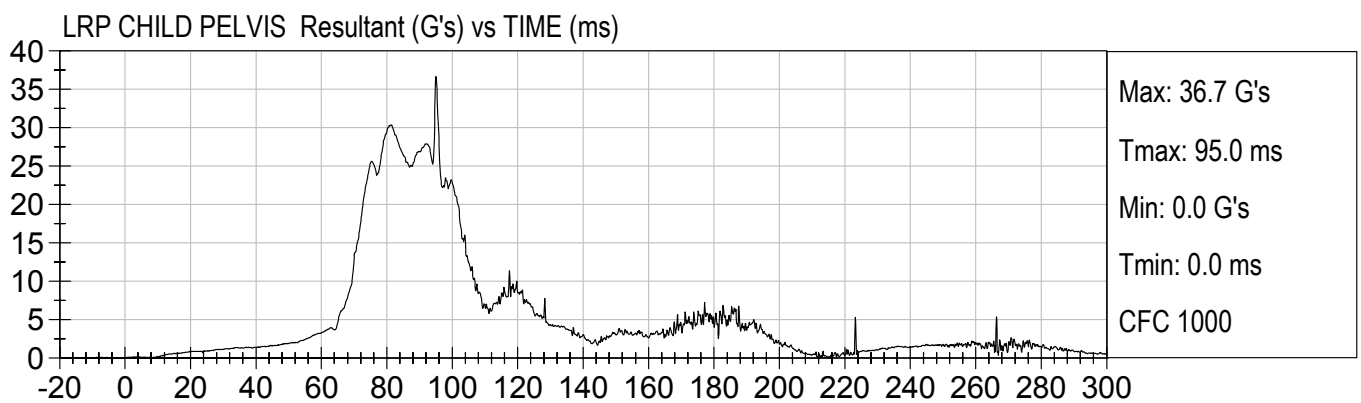
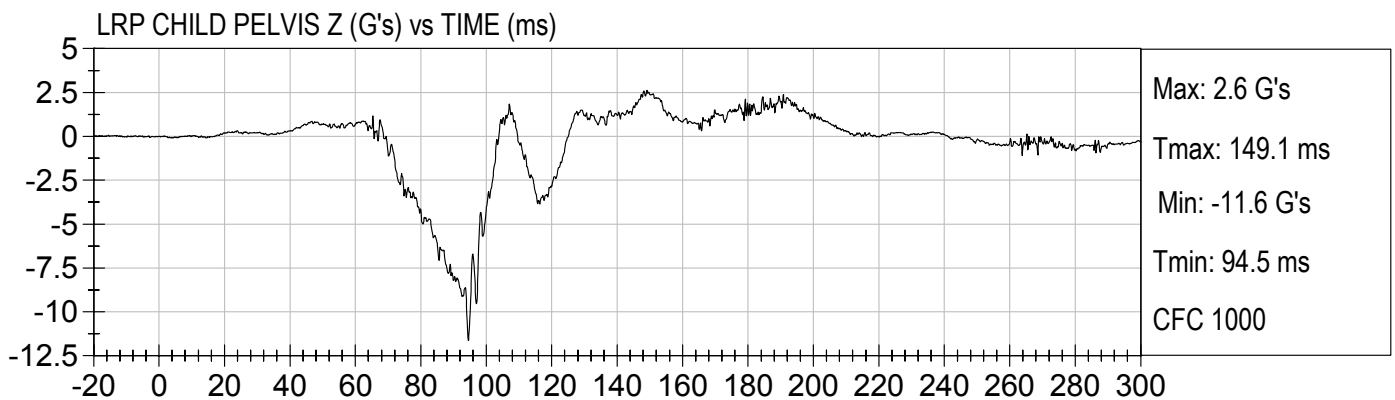
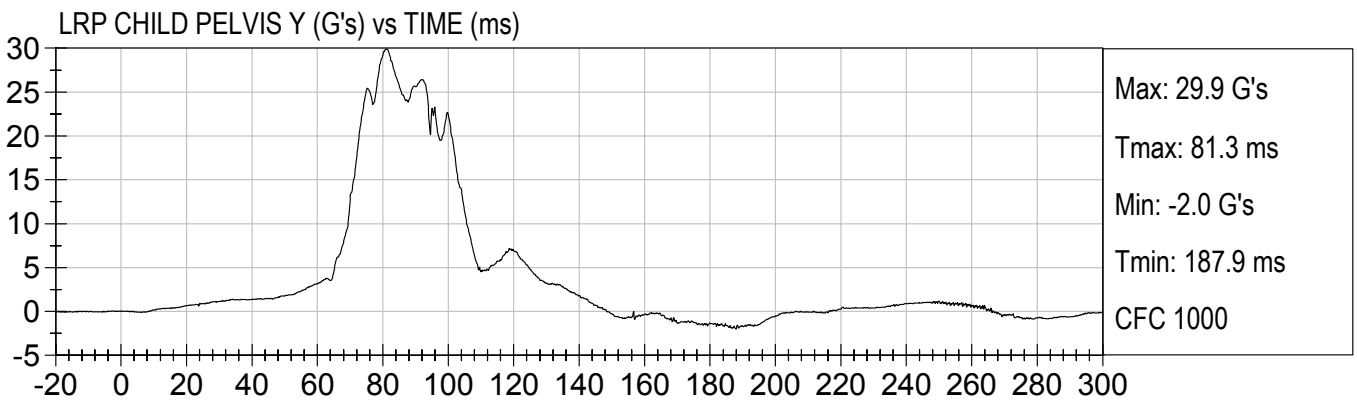
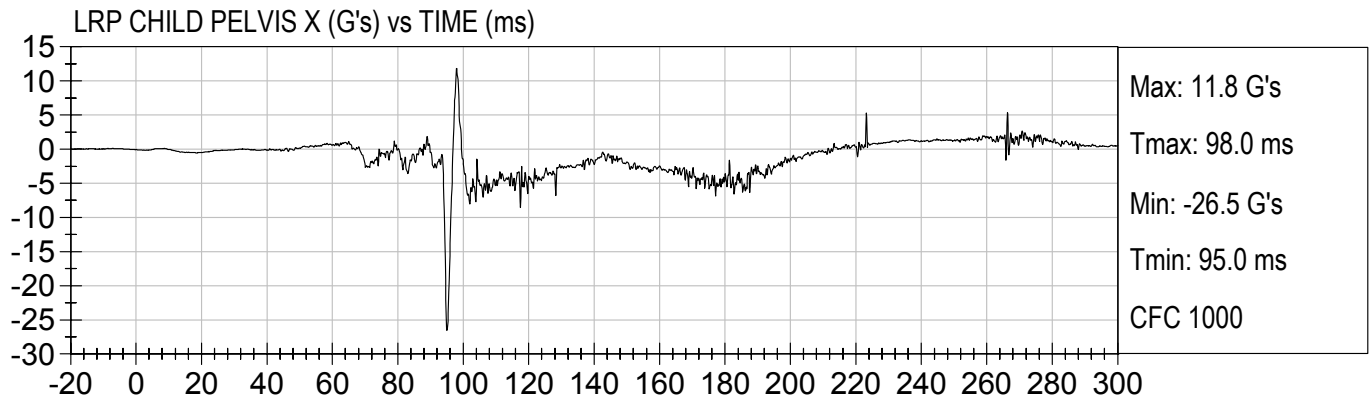


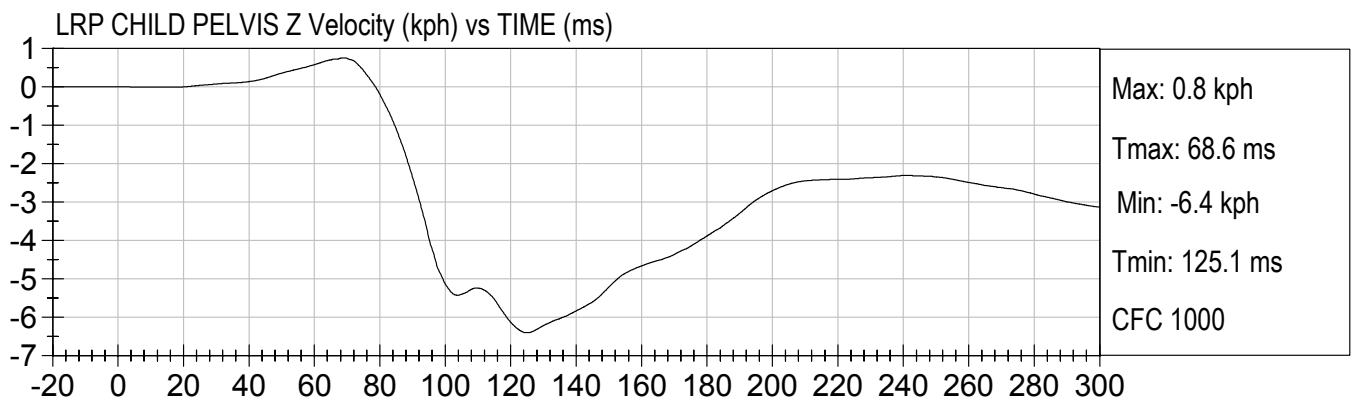
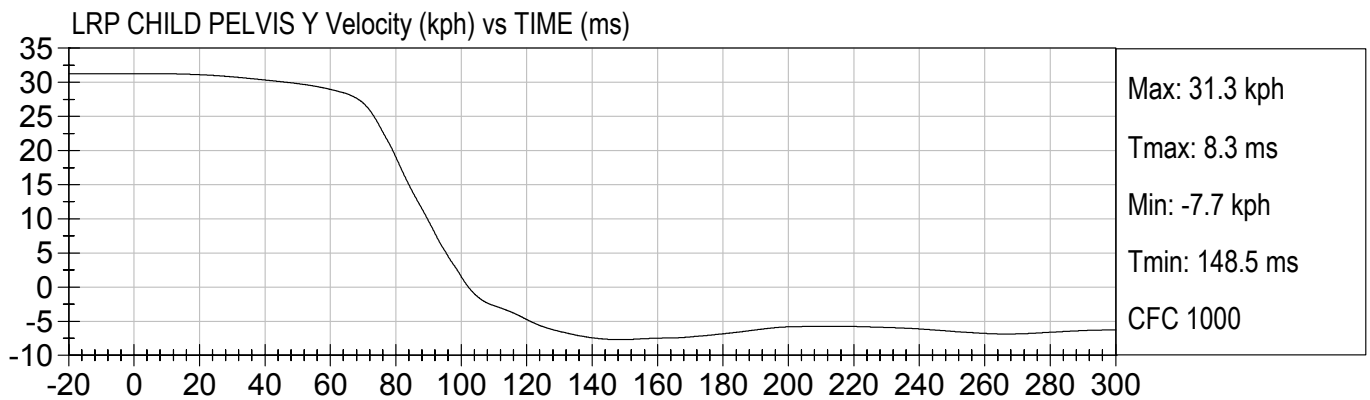
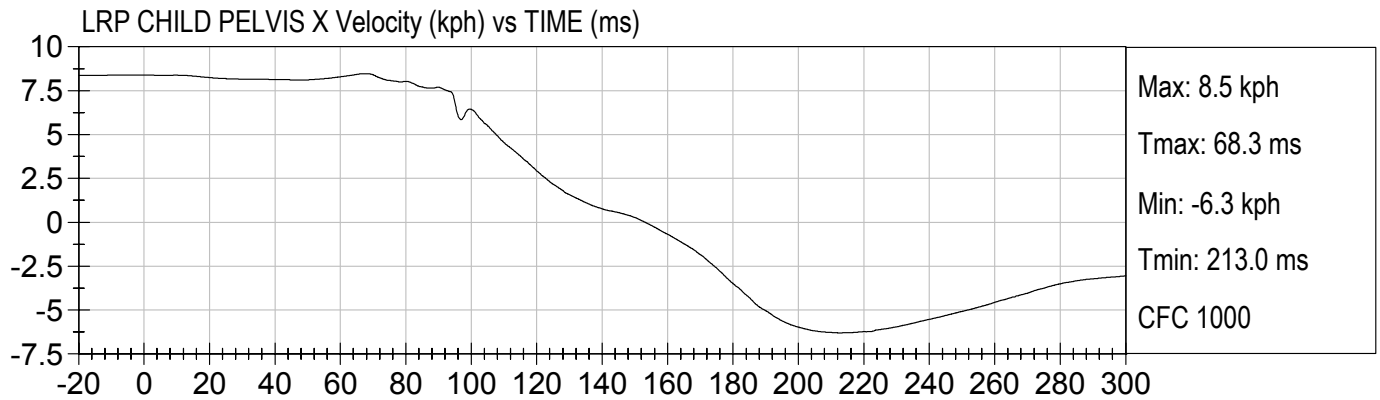






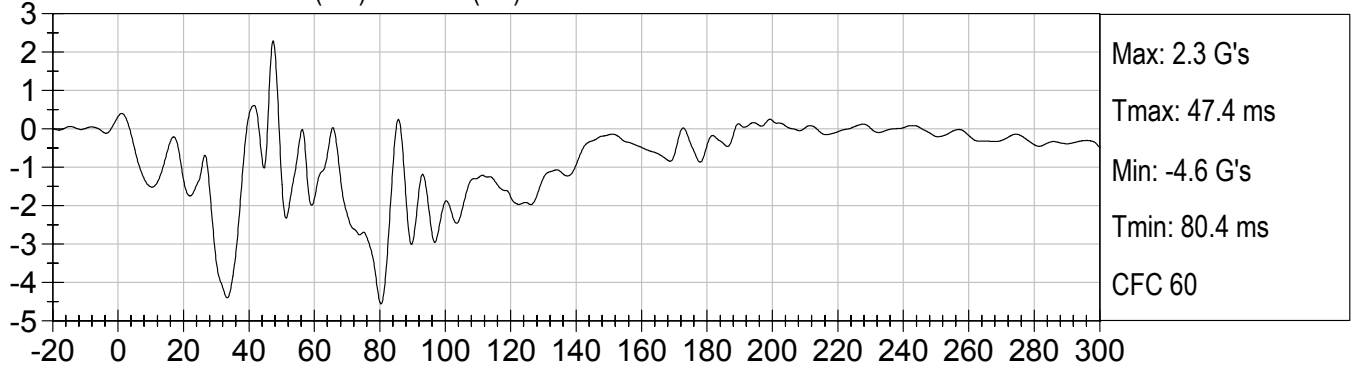




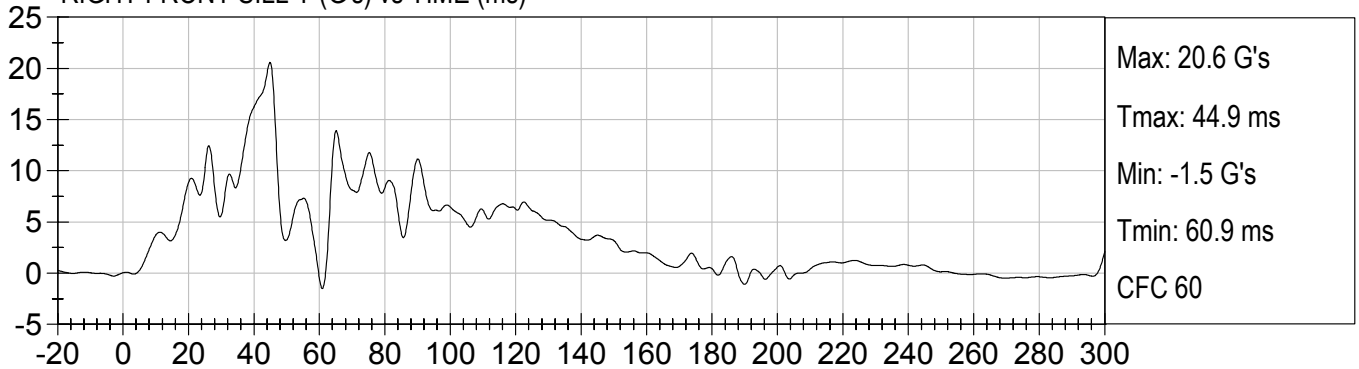




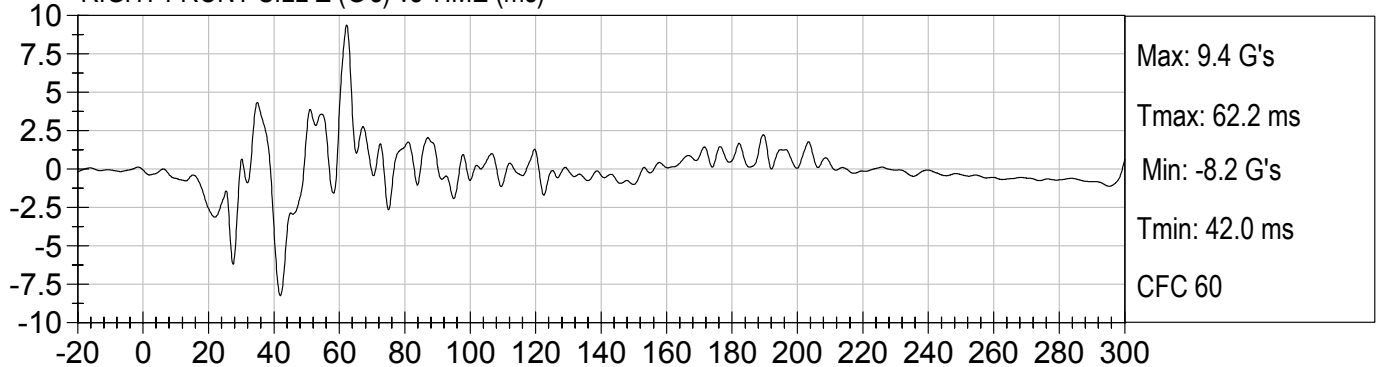
RIGHT FRONT SILL X (G's) vs TIME (ms)



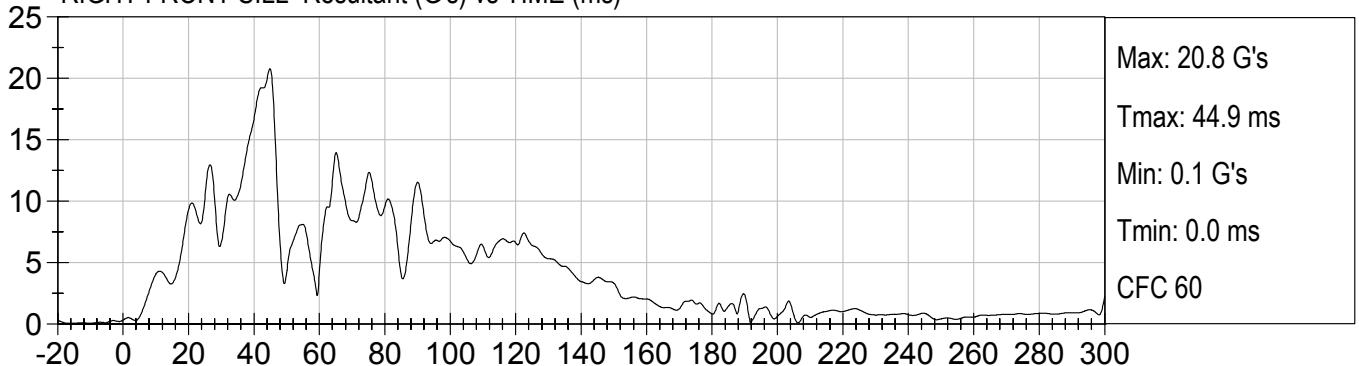
RIGHT FRONT SILL Y (G's) vs TIME (ms)



RIGHT FRONT SILL Z (G's) vs TIME (ms)

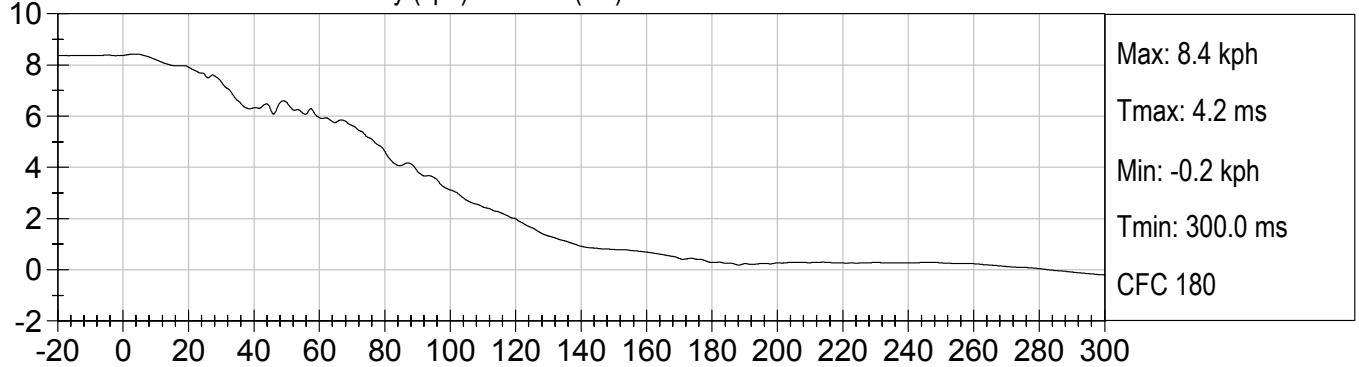


RIGHT FRONT SILL Resultant (G's) vs TIME (ms)

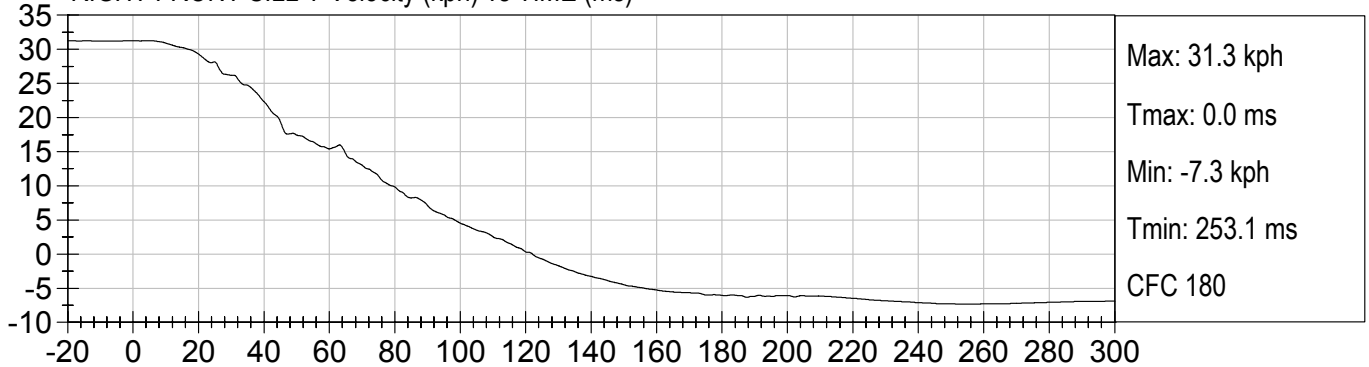




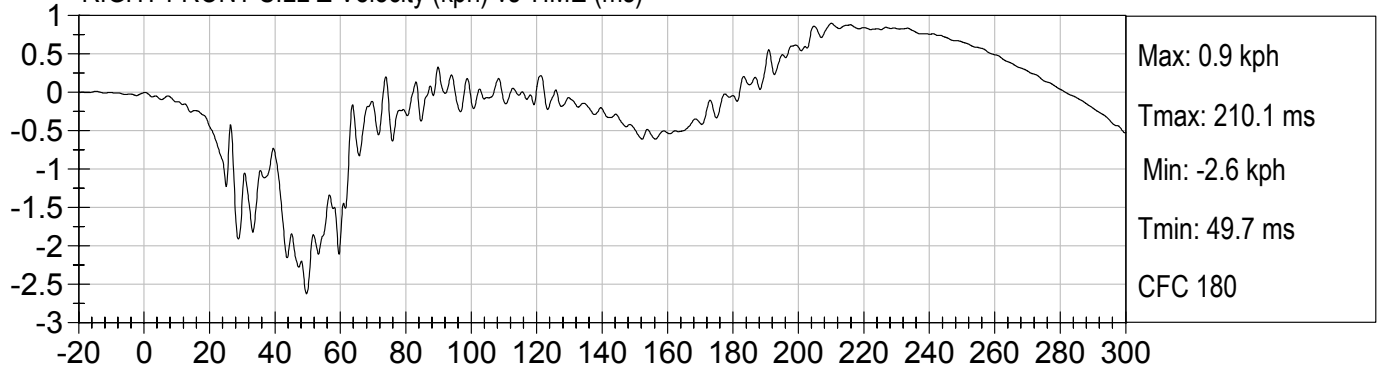
RIGHT FRONT SILL X Velocity (kph) vs TIME (ms)



RIGHT FRONT SILL Y Velocity (kph) vs TIME (ms)

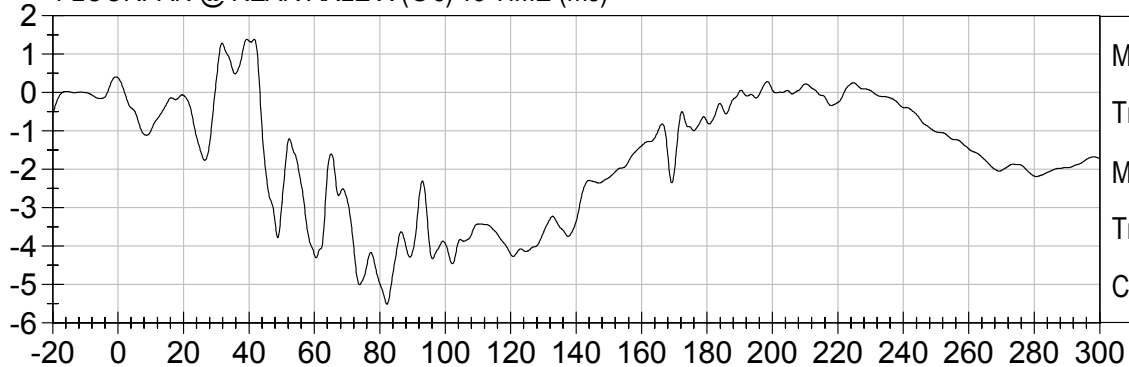


RIGHT FRONT SILL Z Velocity (kph) vs TIME (ms)

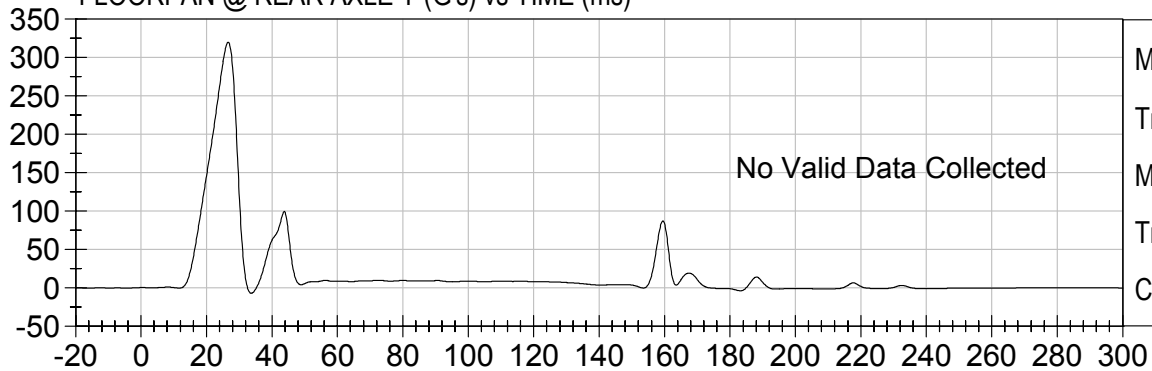




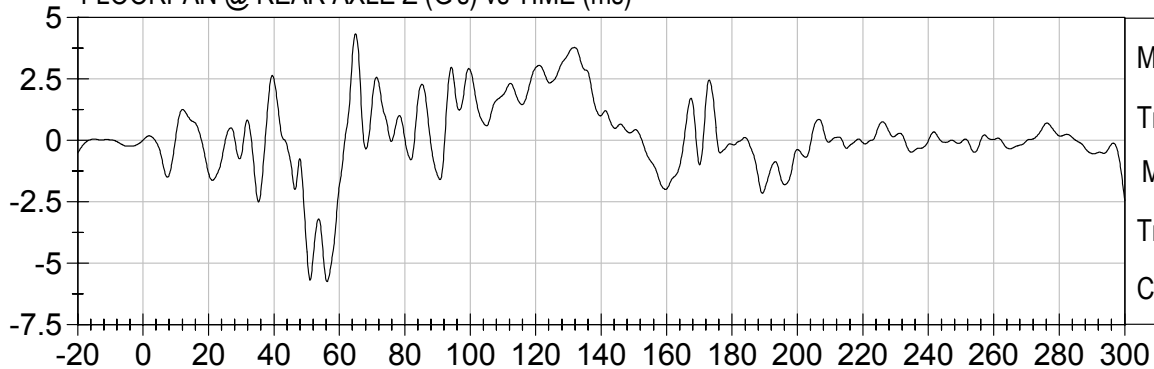
FLOORPAN @ REAR AXLE X (G's) vs TIME (ms)



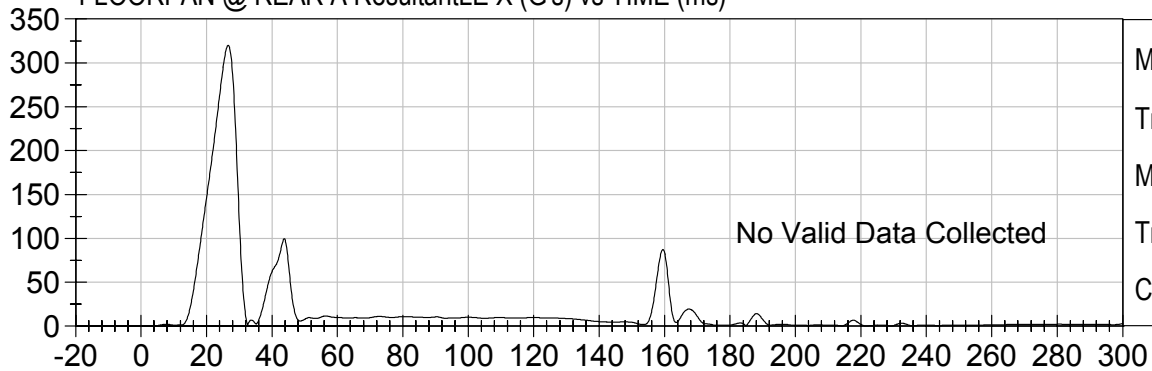
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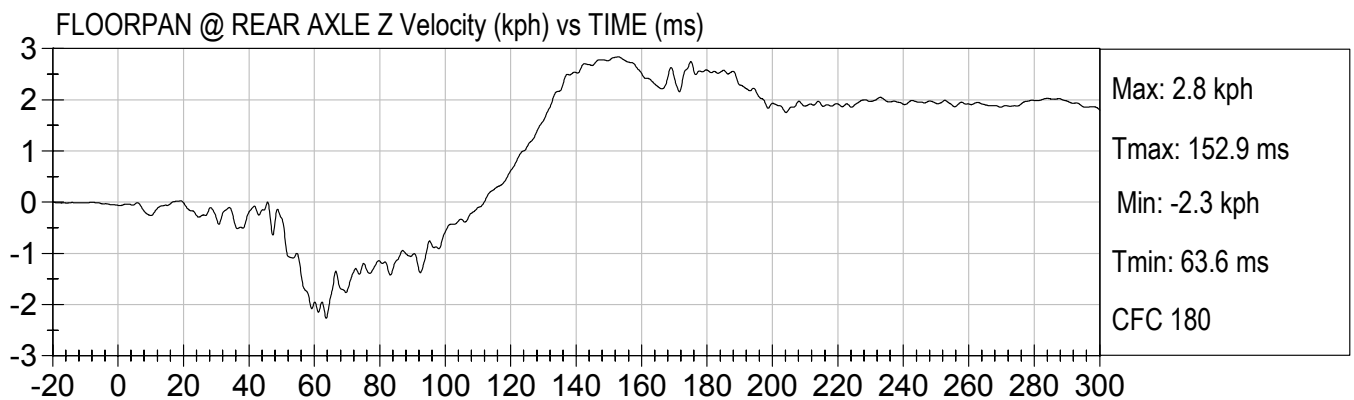
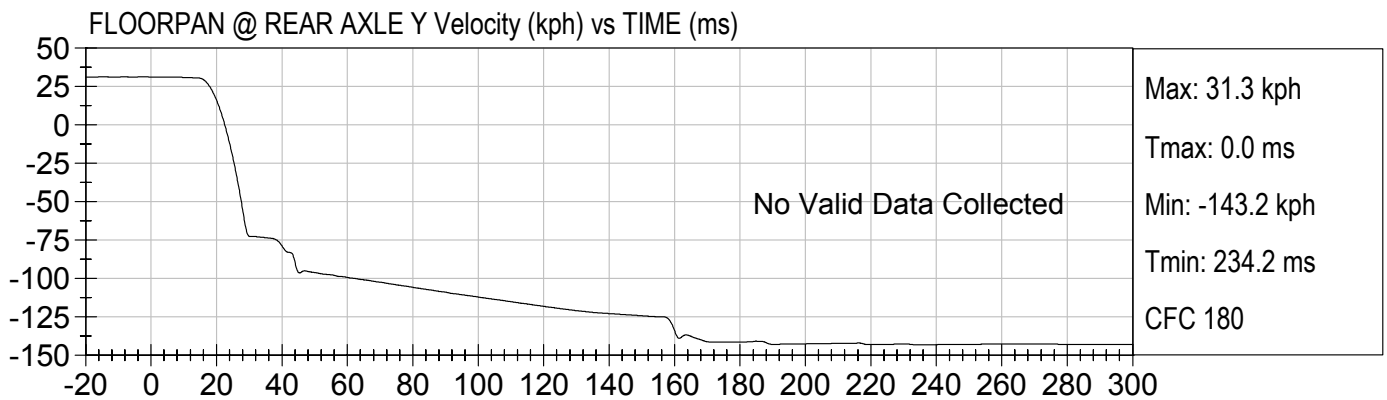
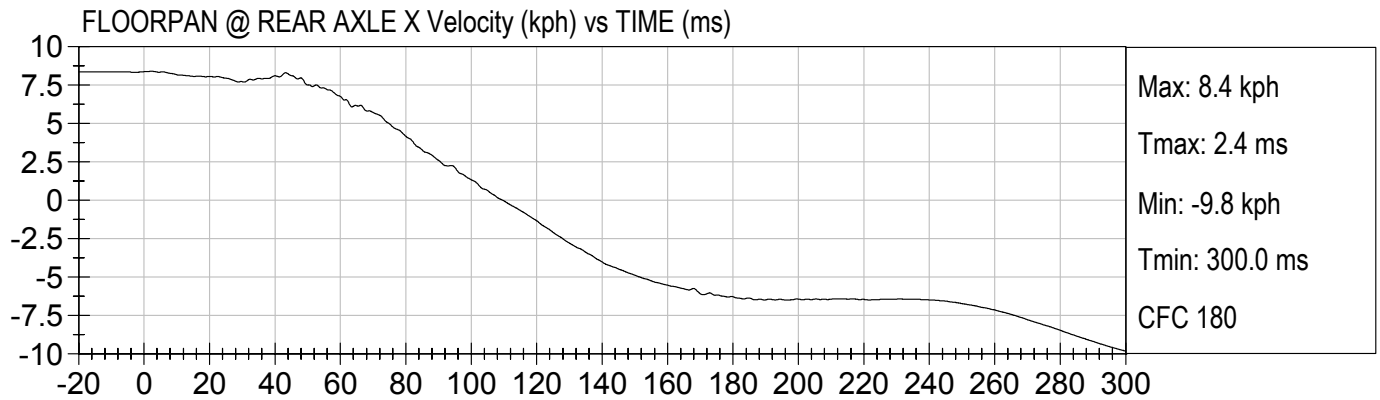


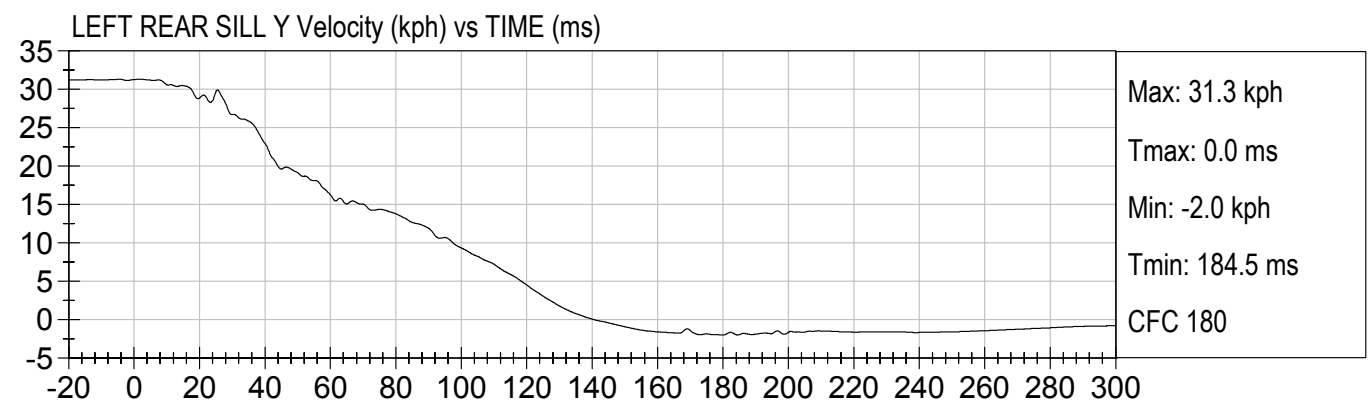
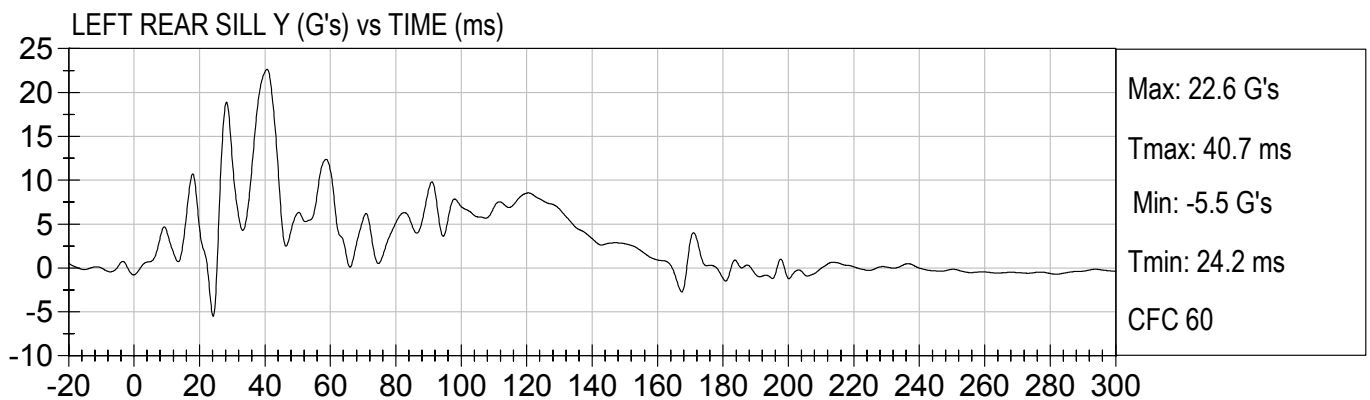
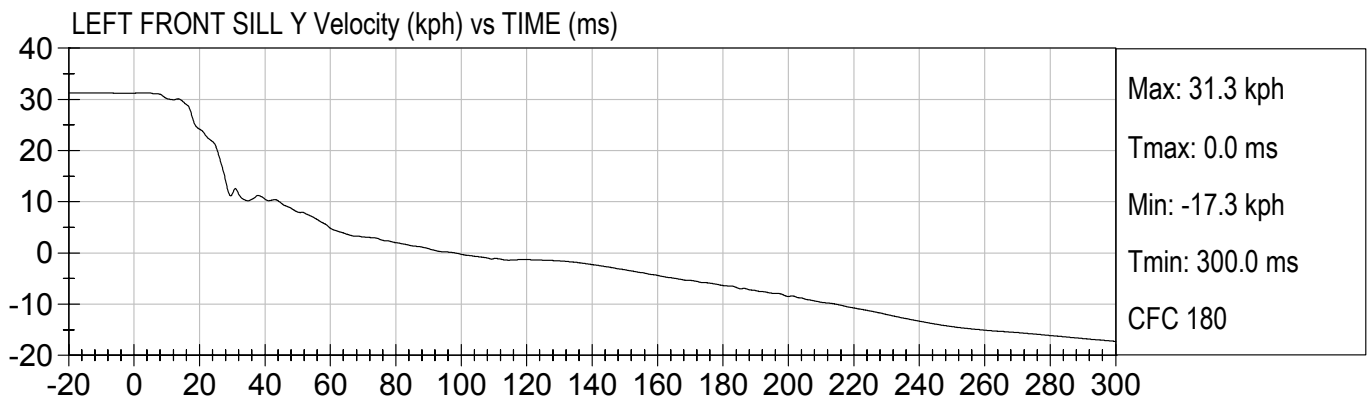
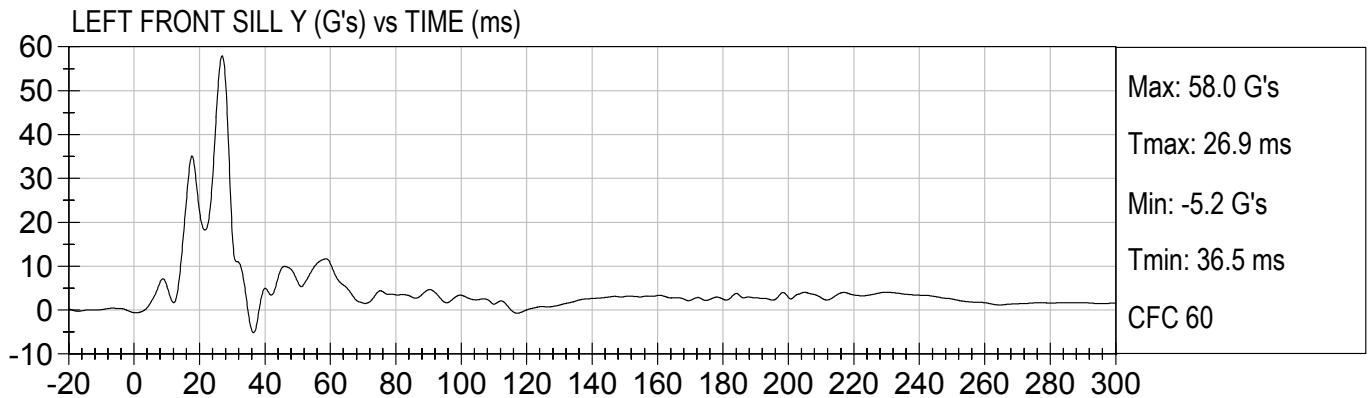
FLOORPAN @ REAR AXLE Z (G's) vs TIME (ms)

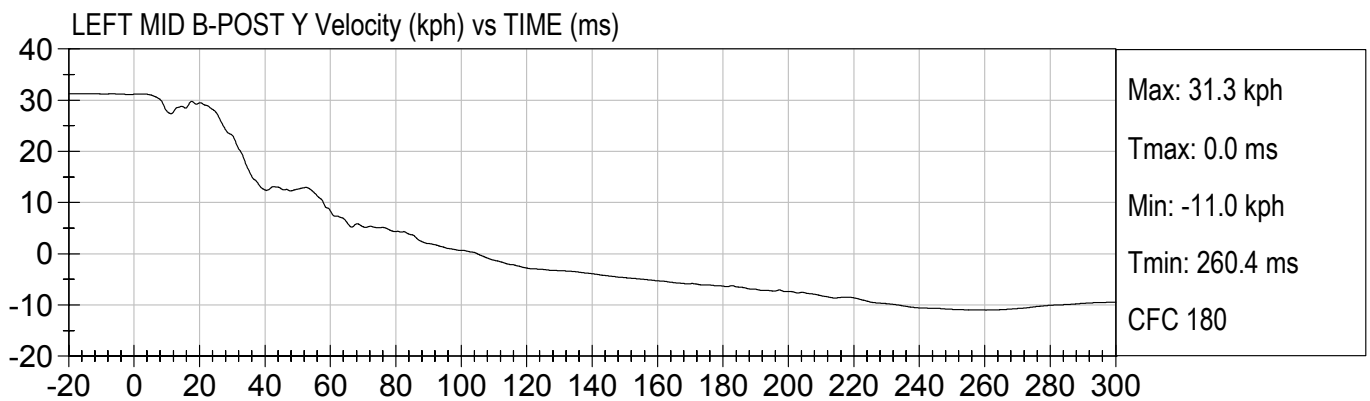
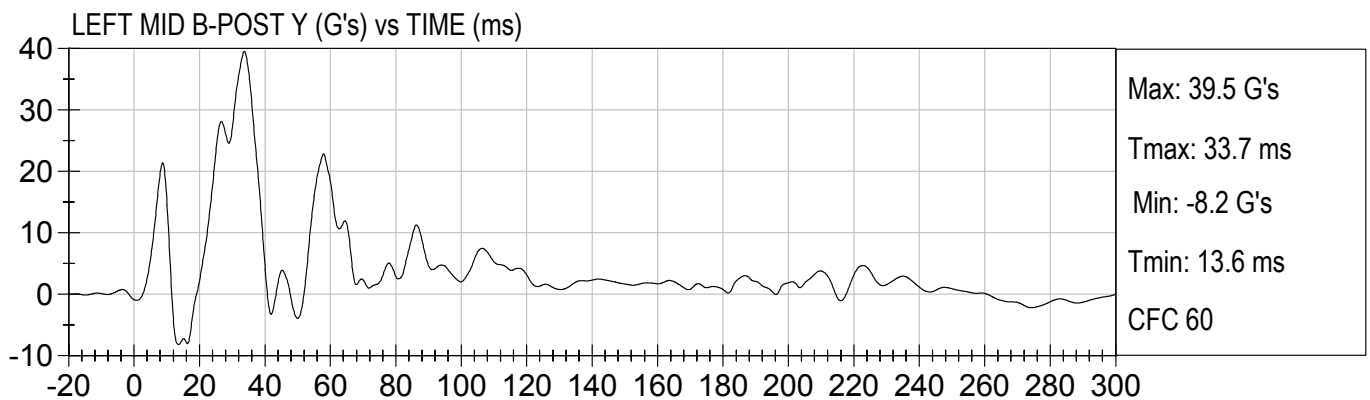
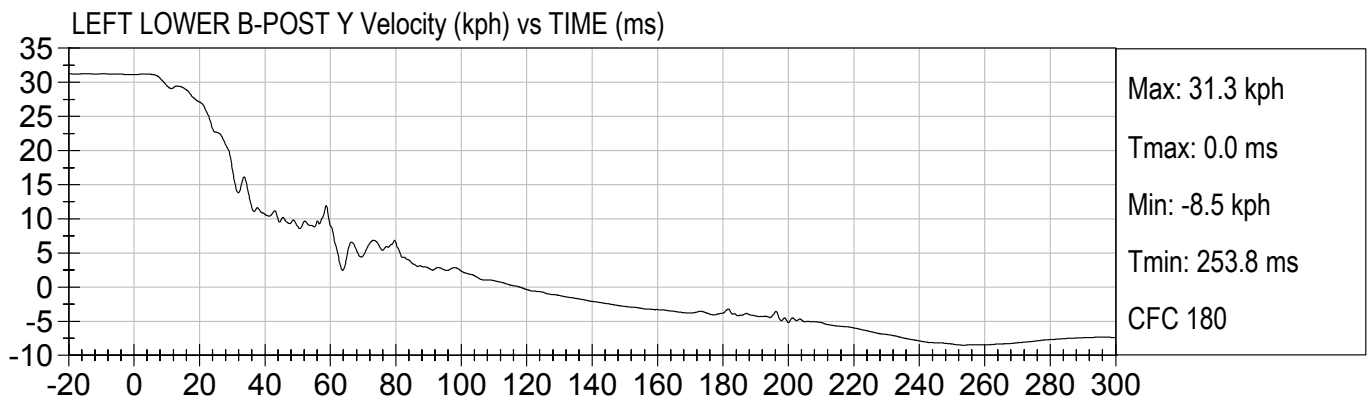
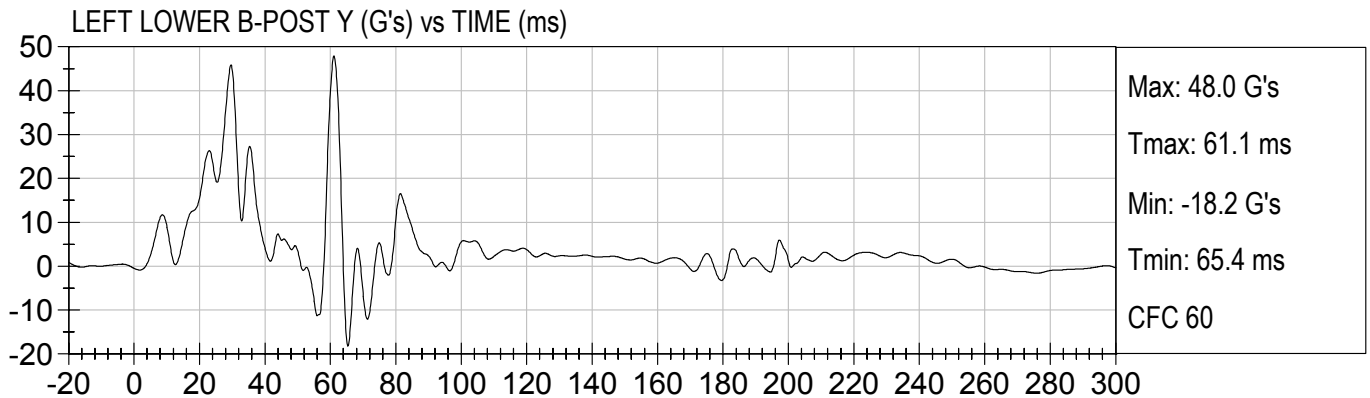


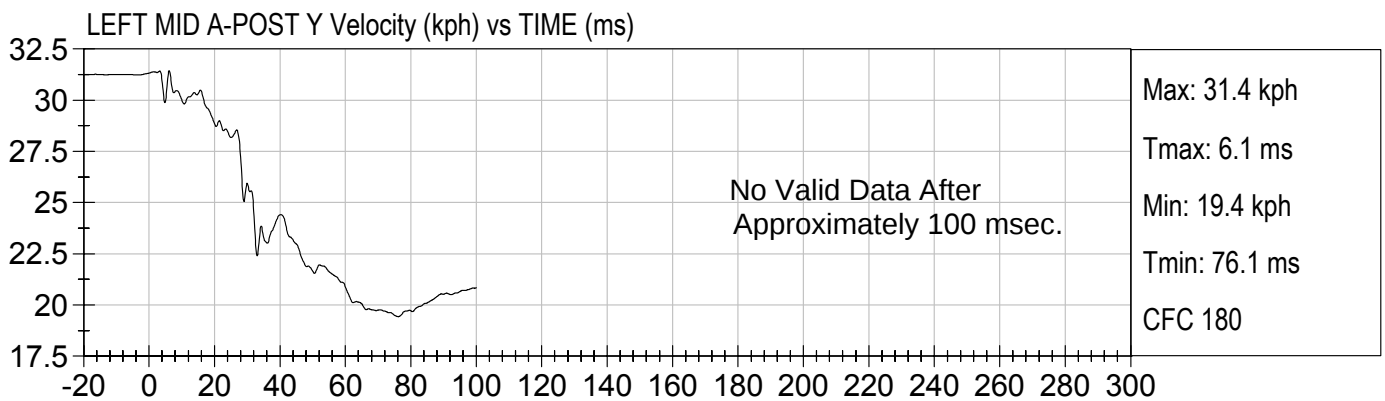
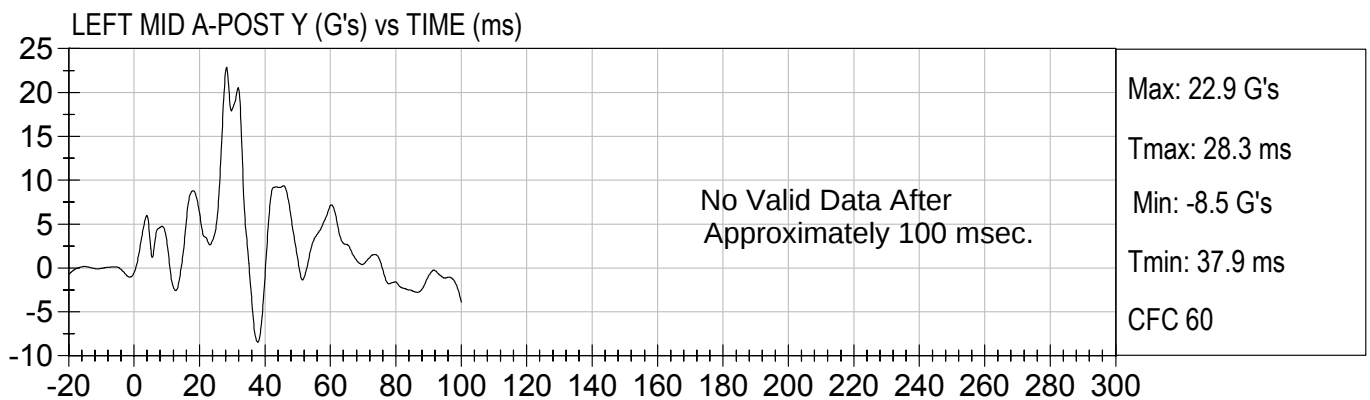
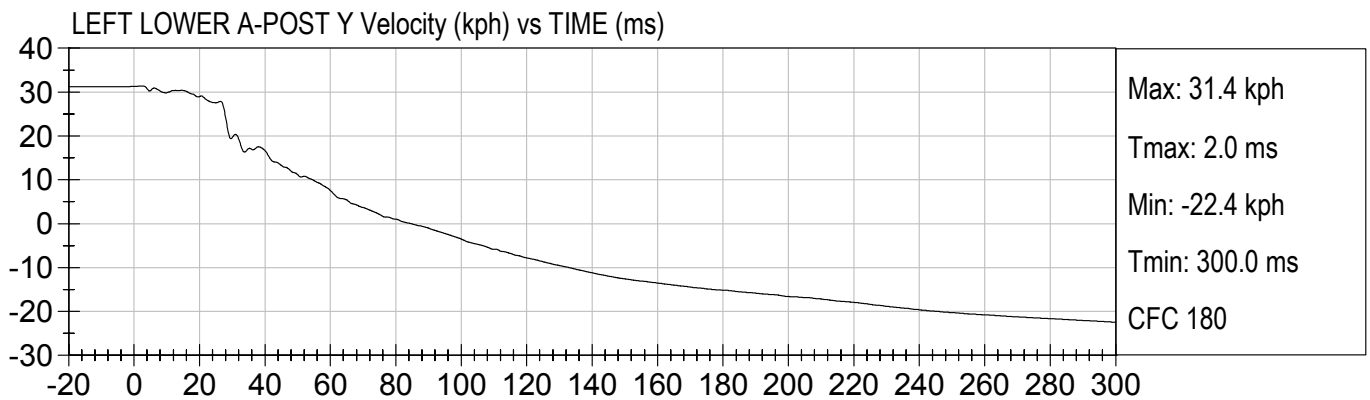
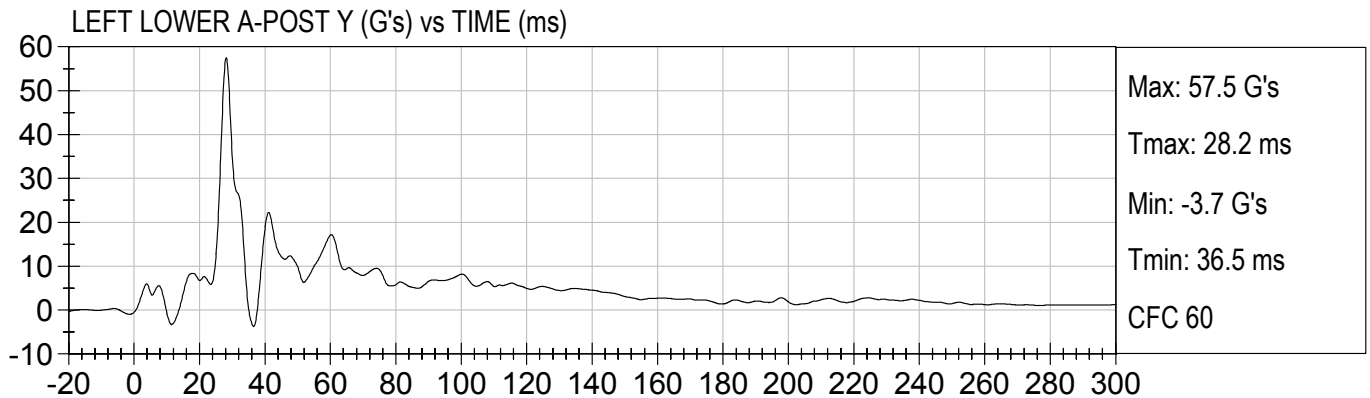
FLOORPAN @ REAR A ResultantLE X (G's) vs TIME (ms)

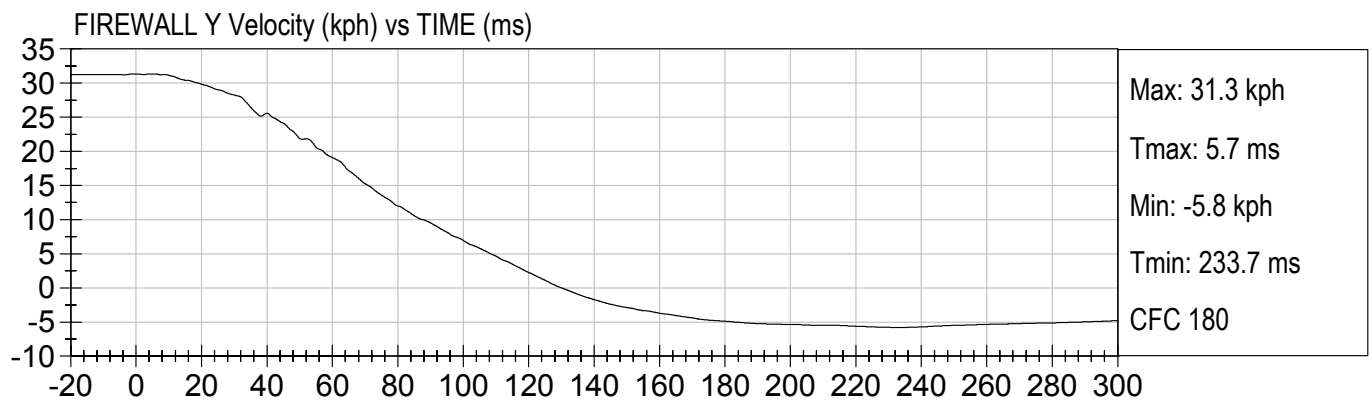
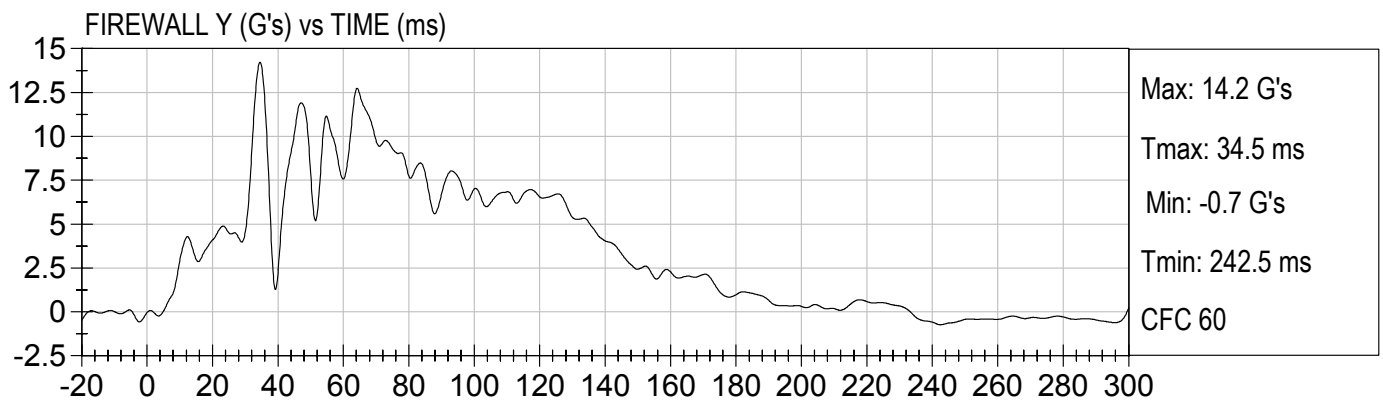
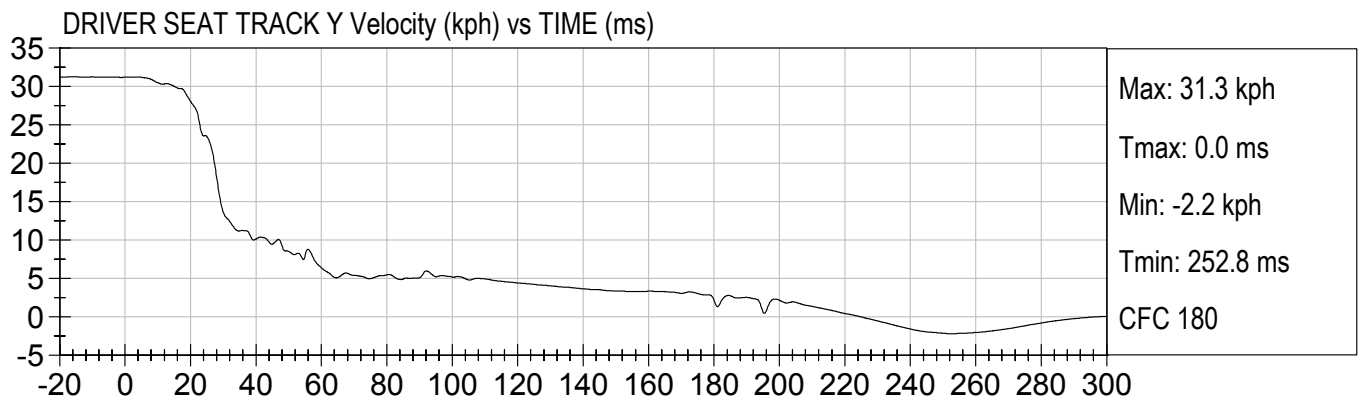
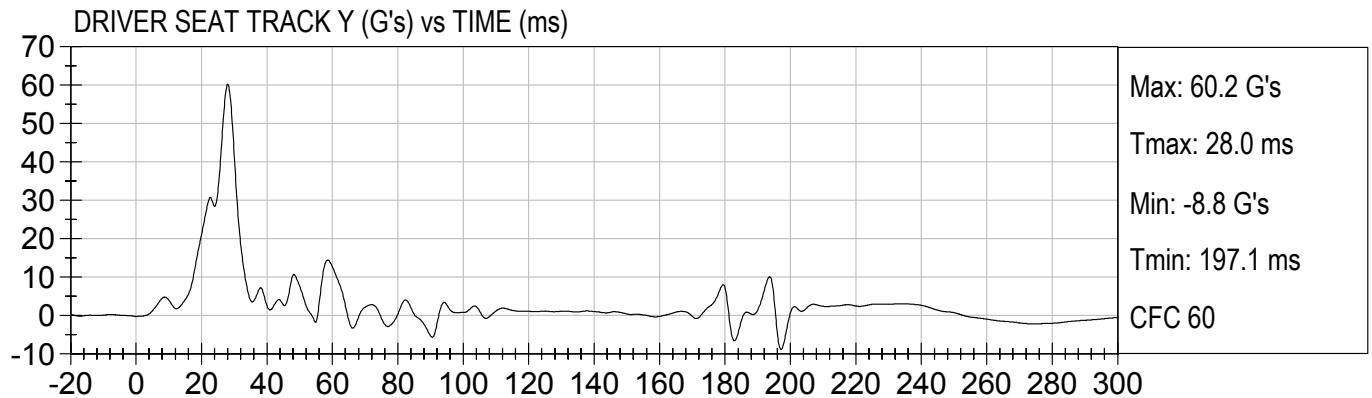


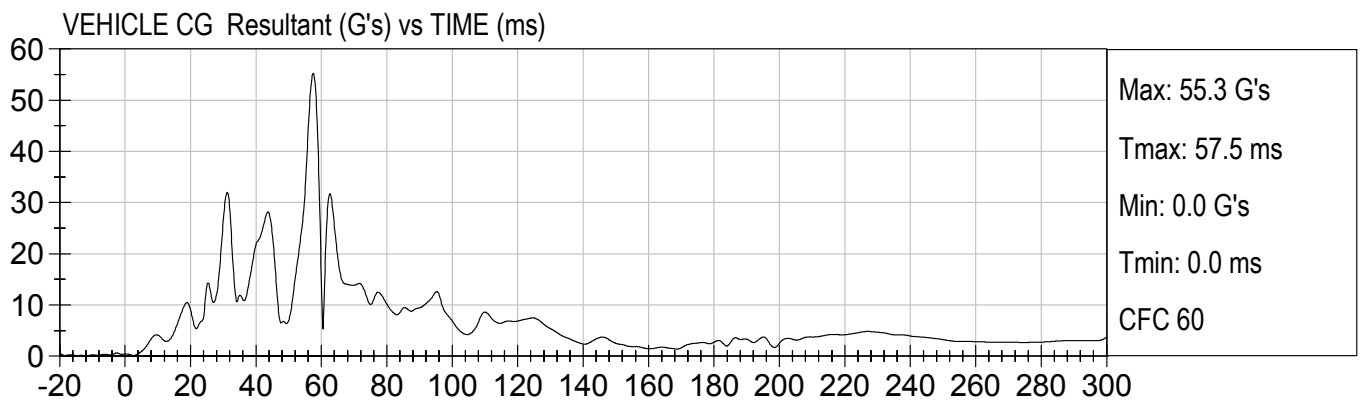
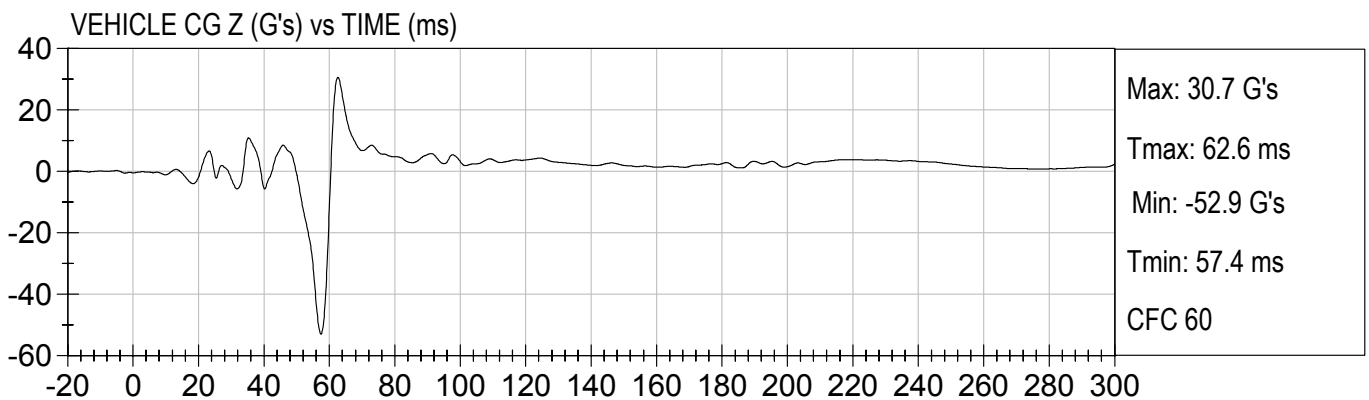
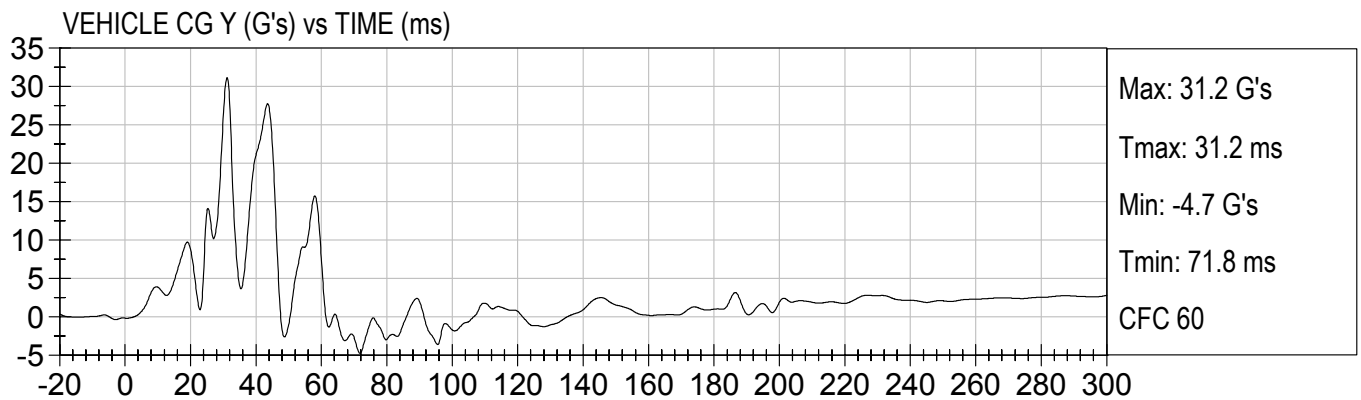
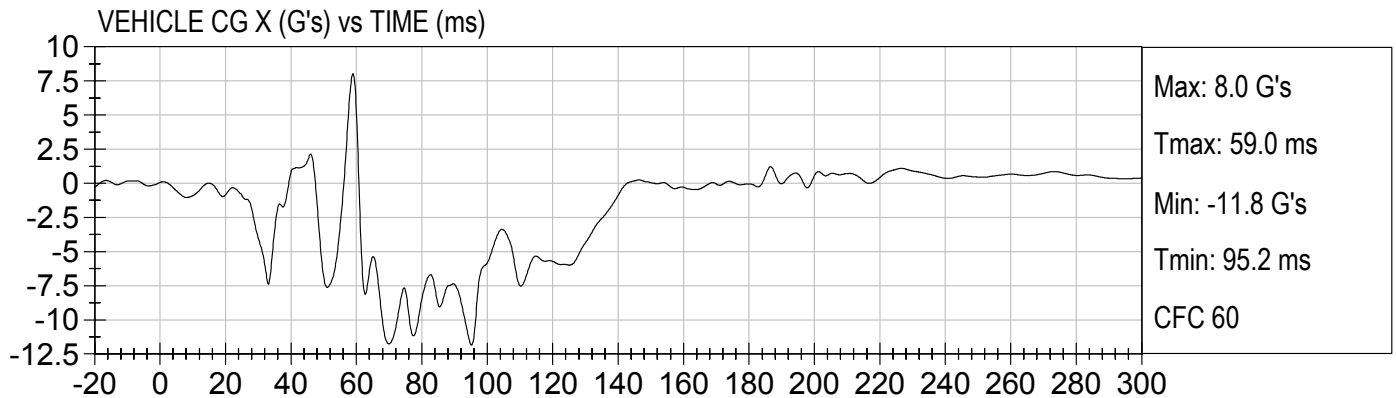


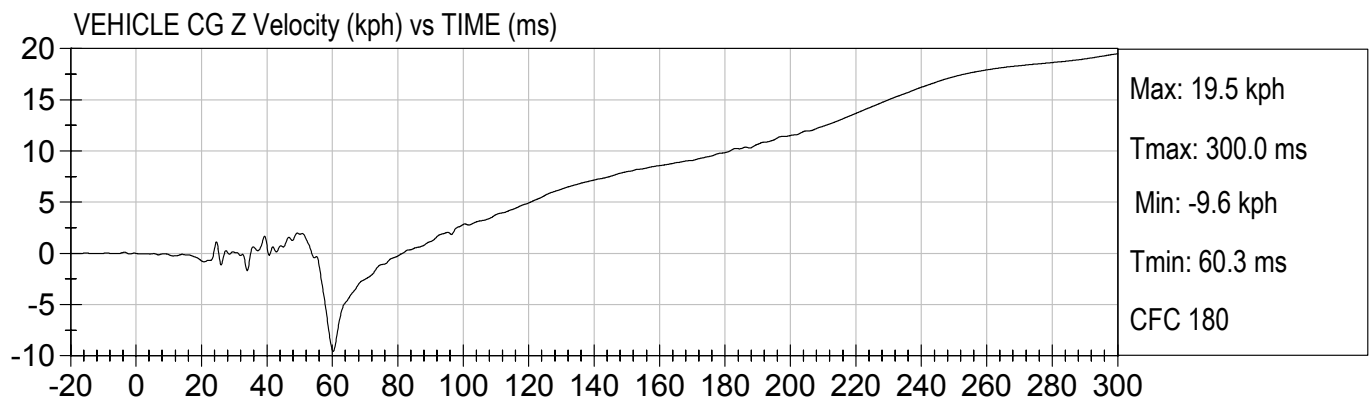
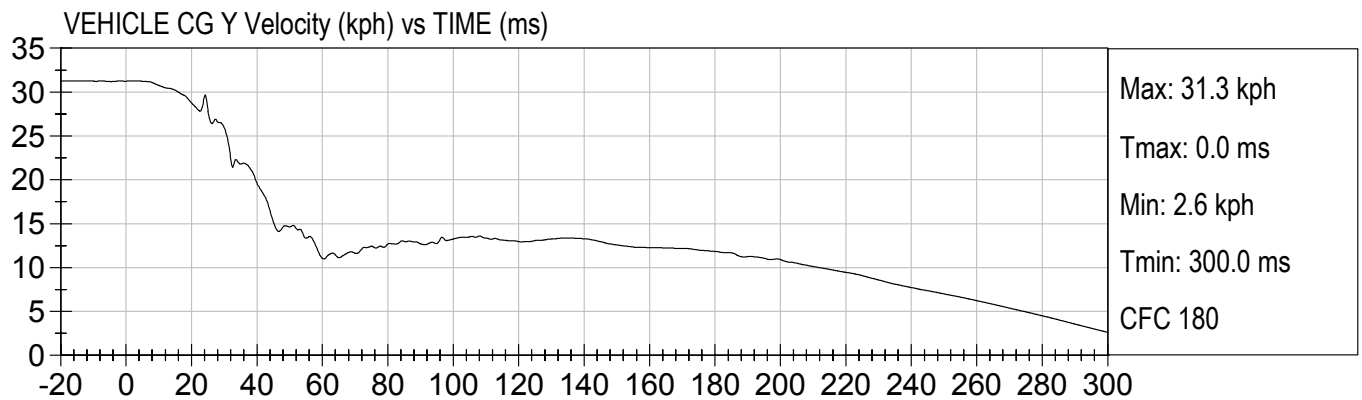
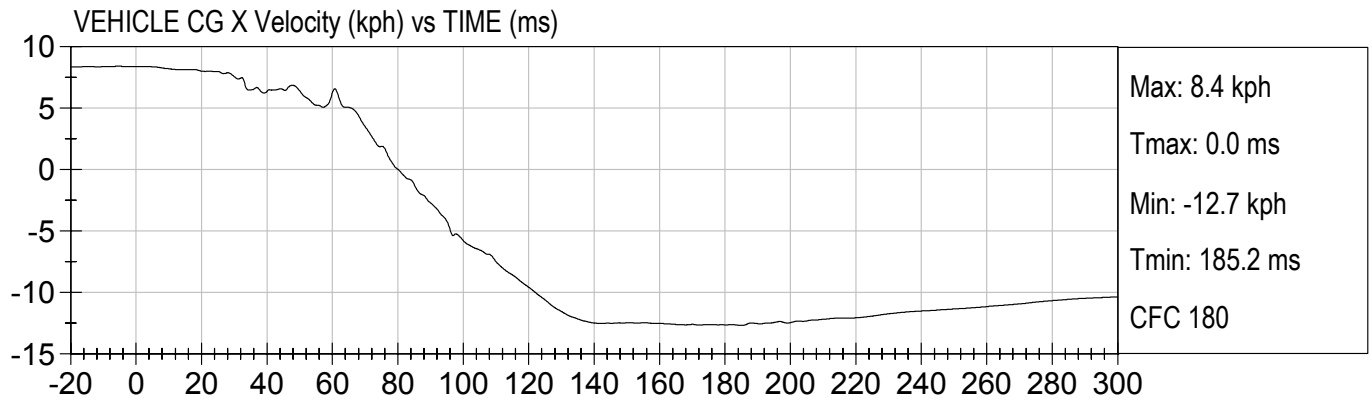


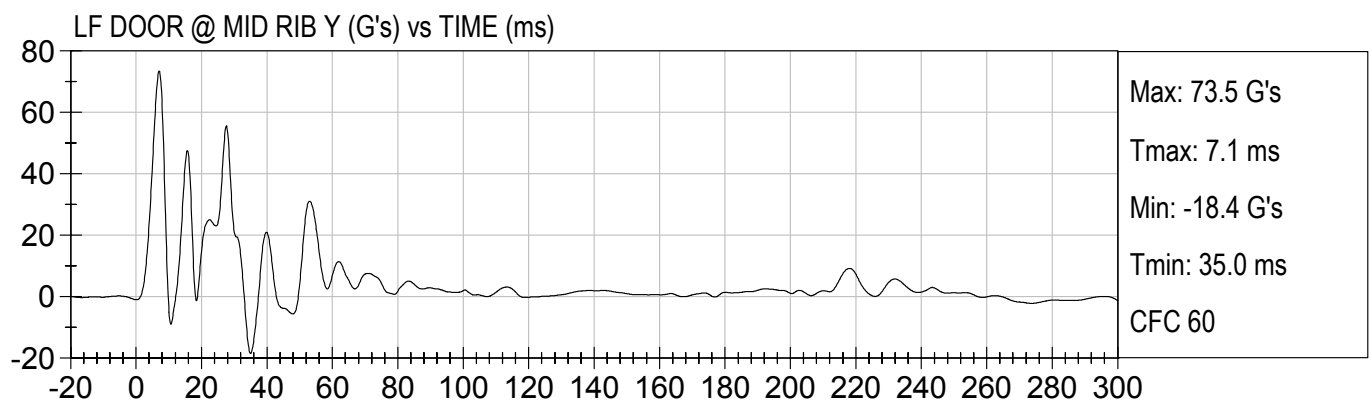
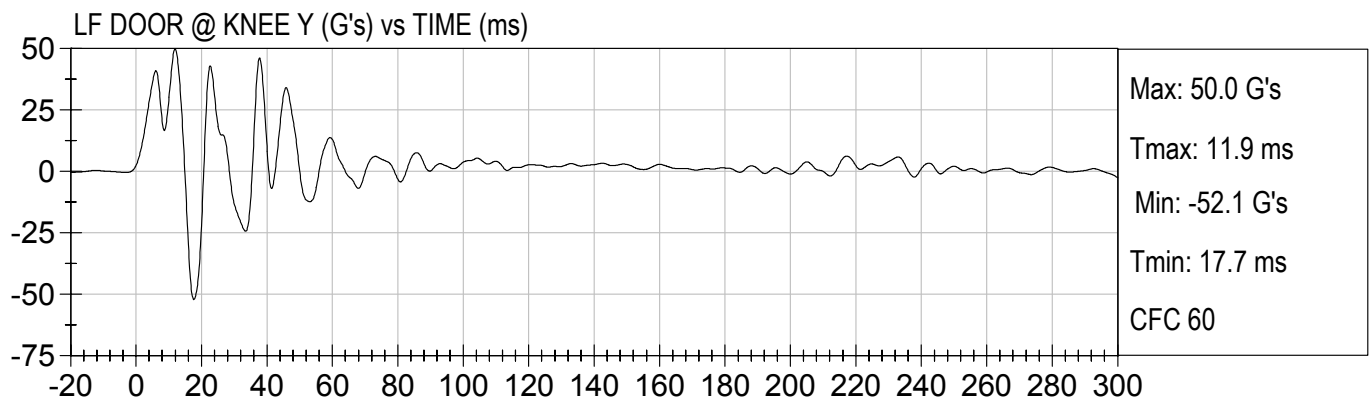
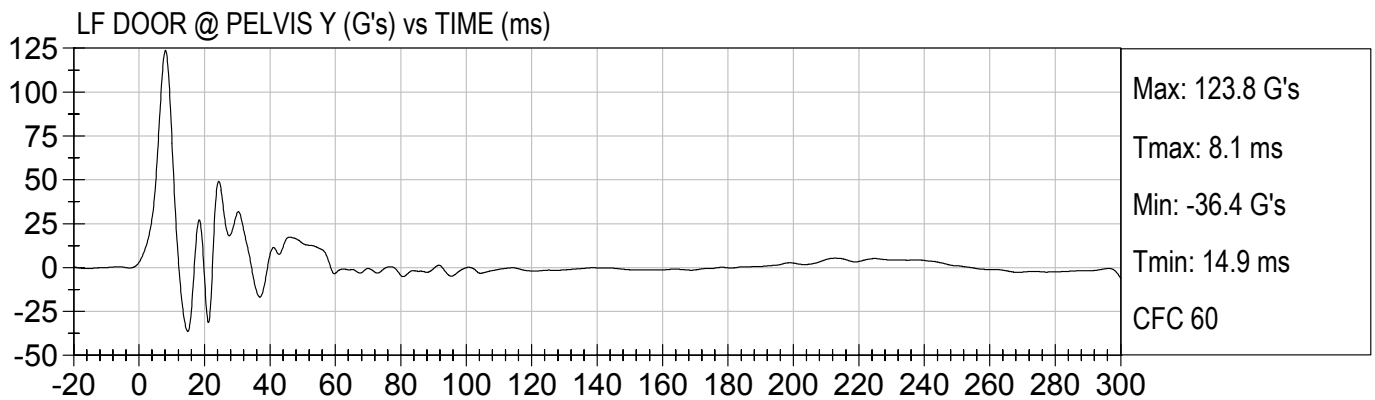
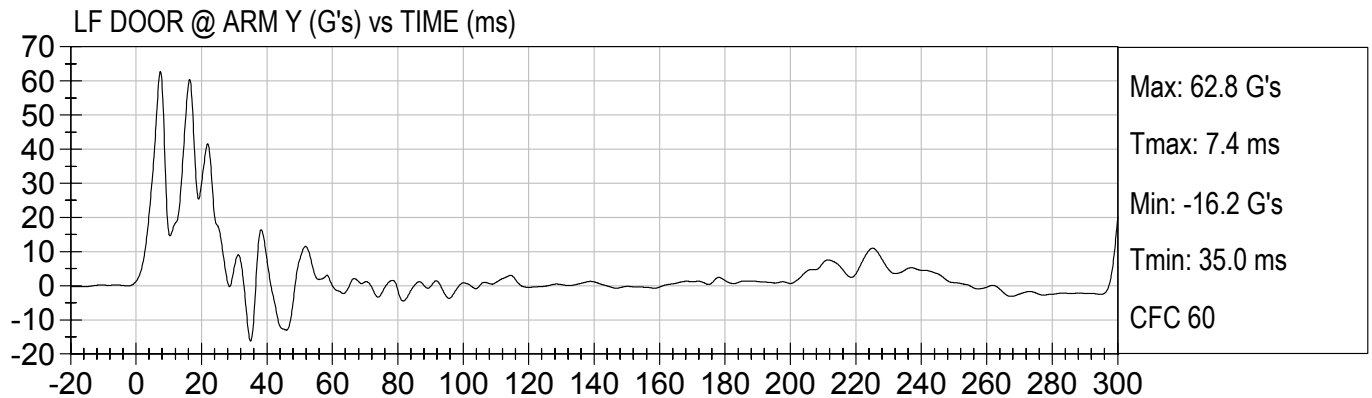


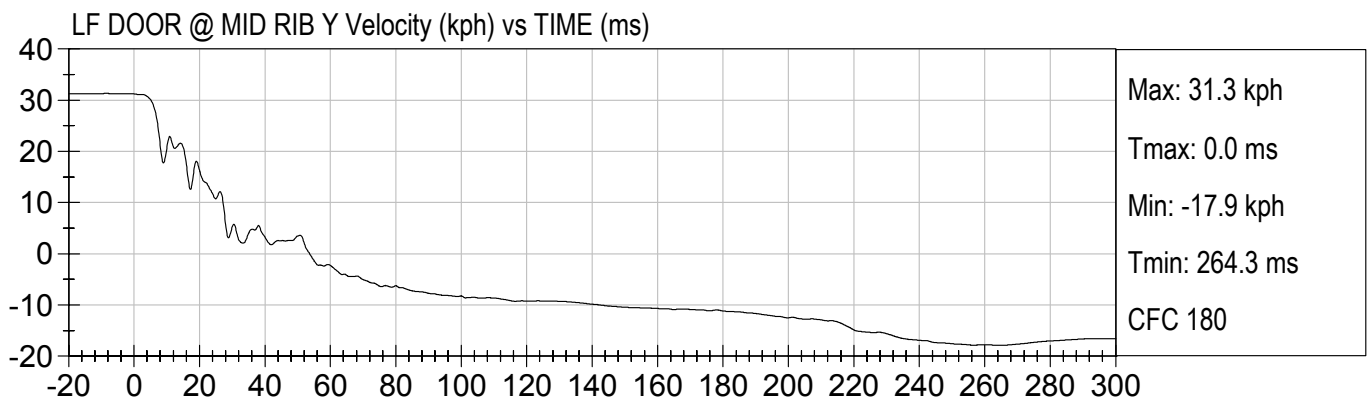
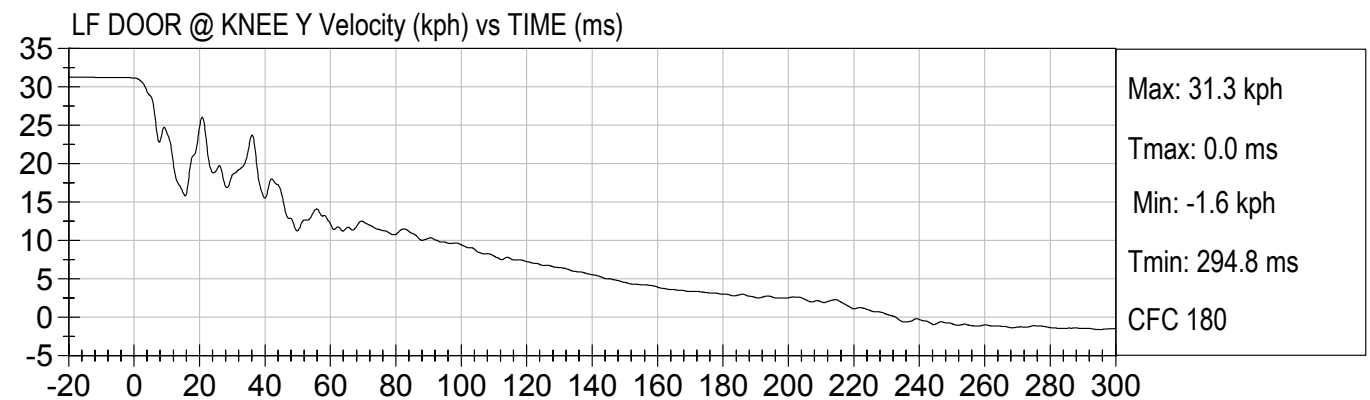
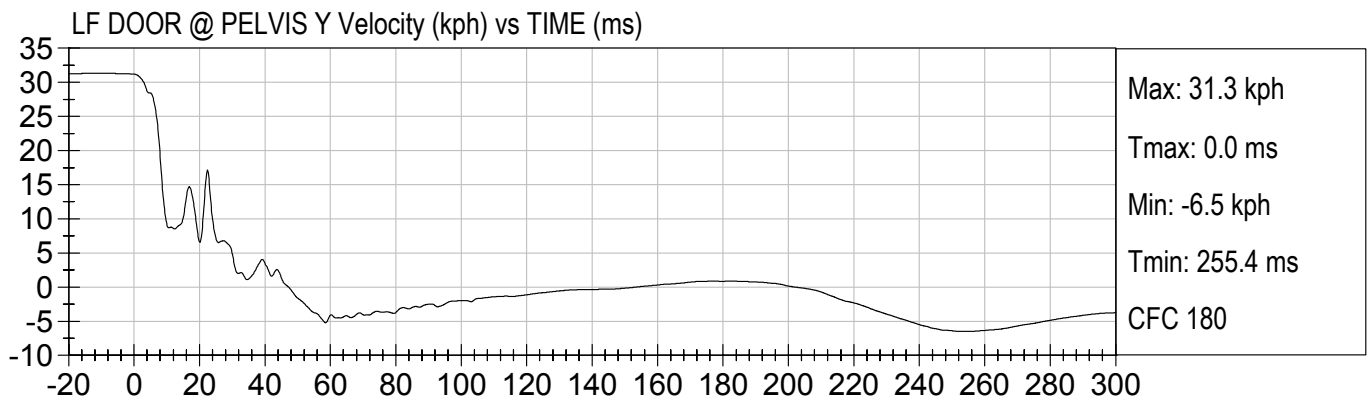
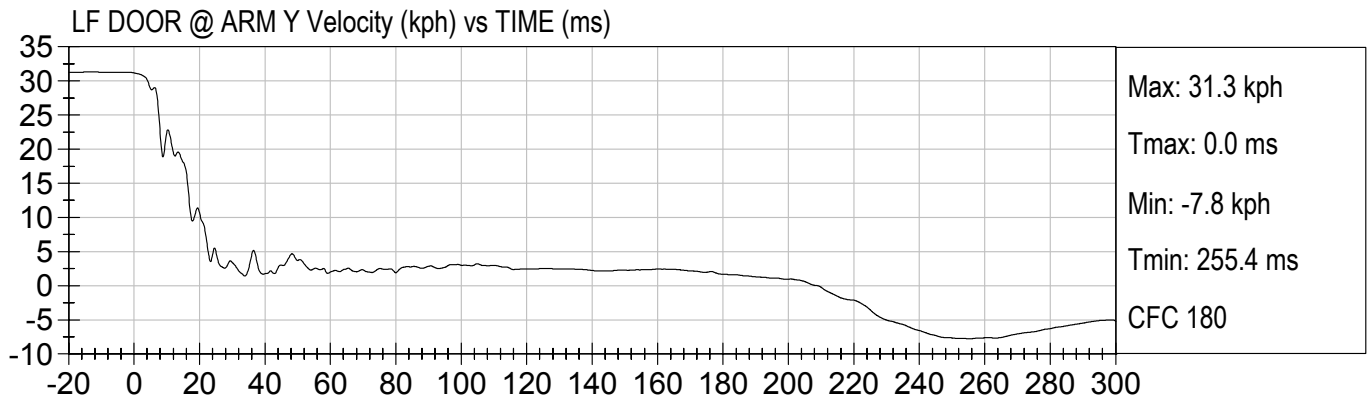


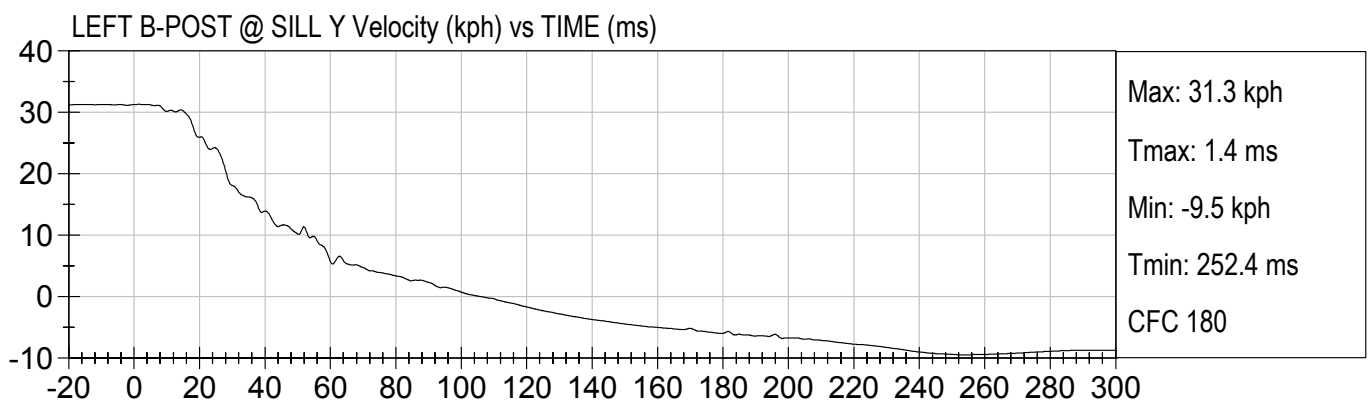
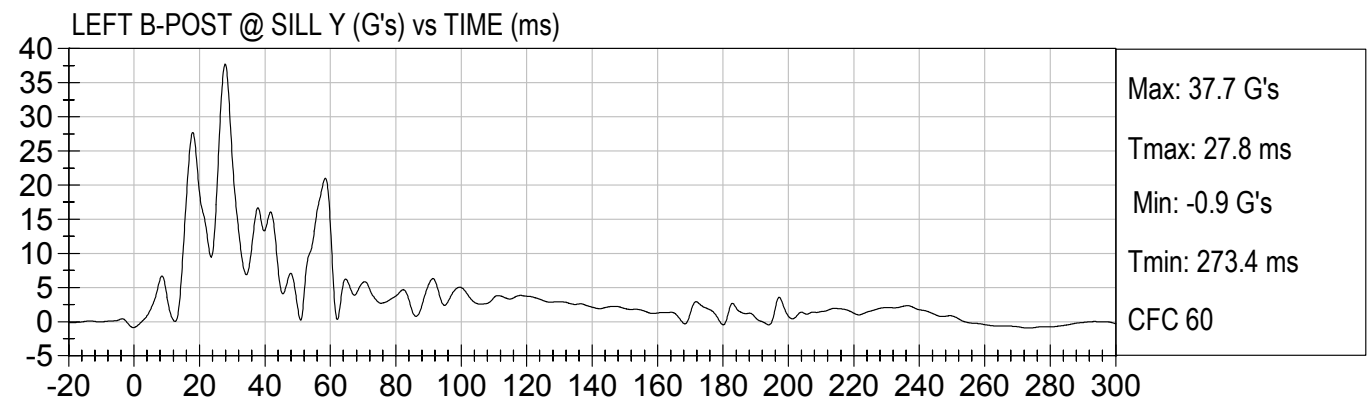
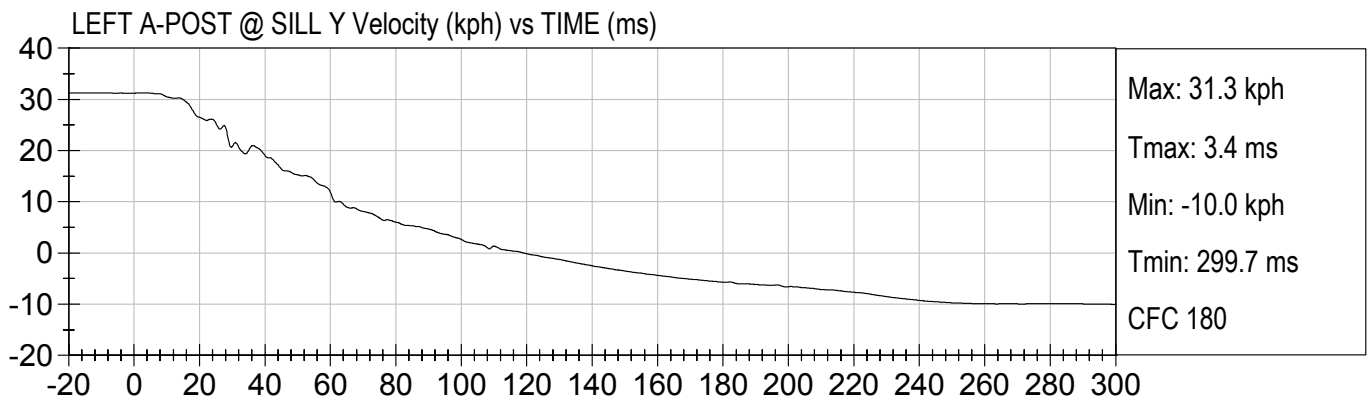
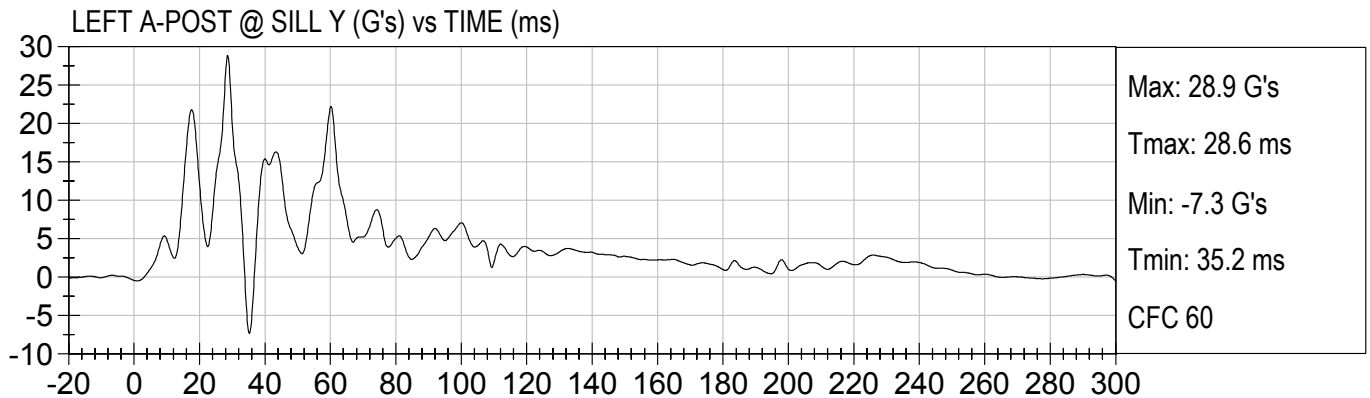


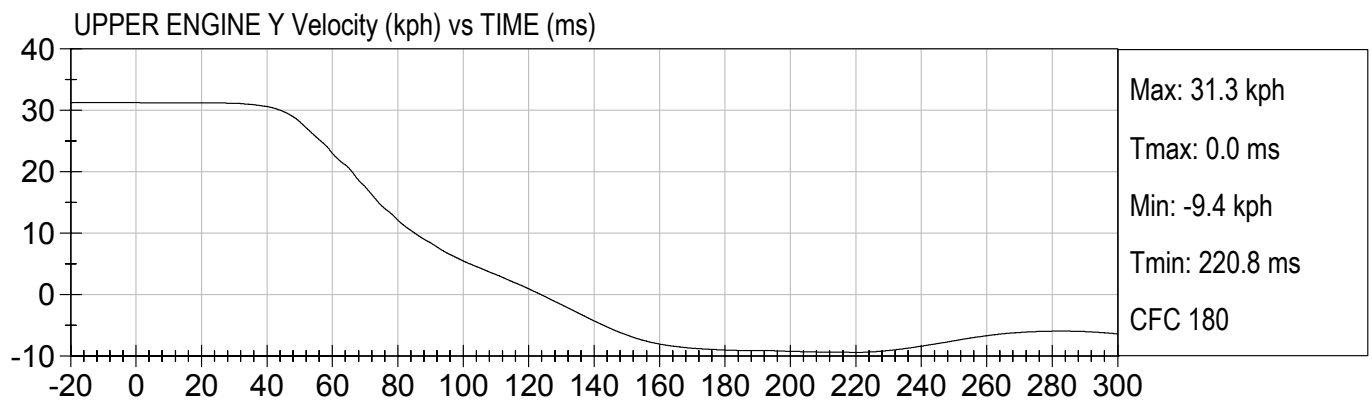
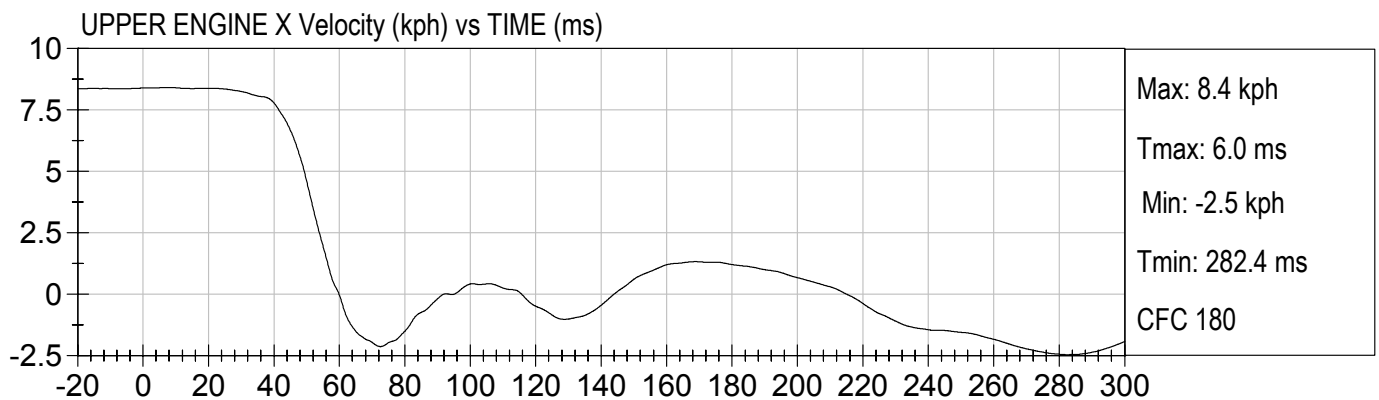
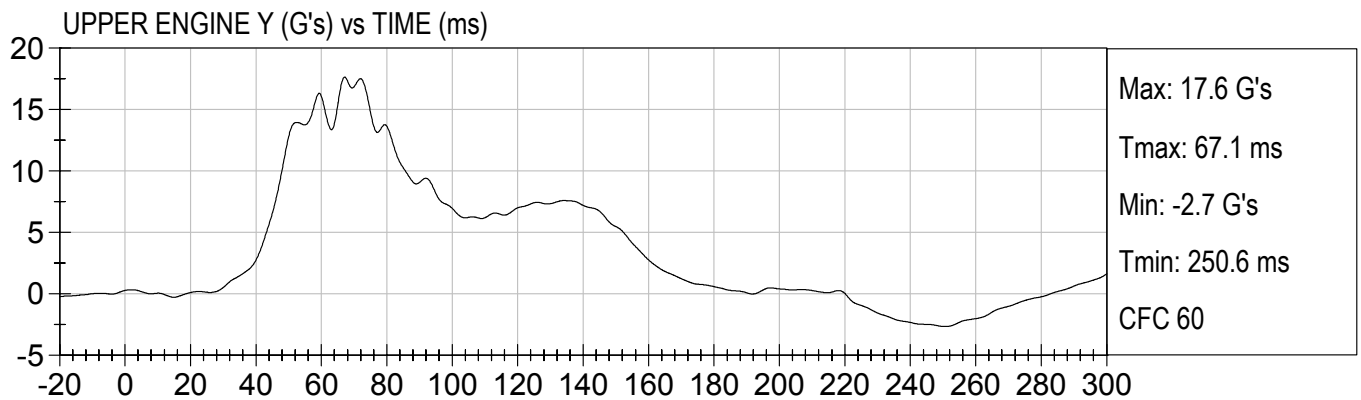
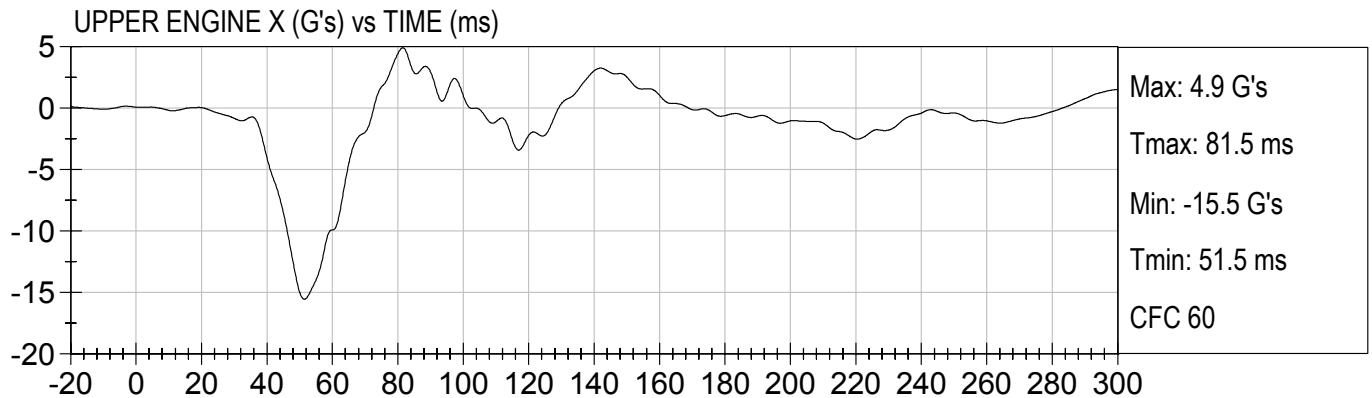


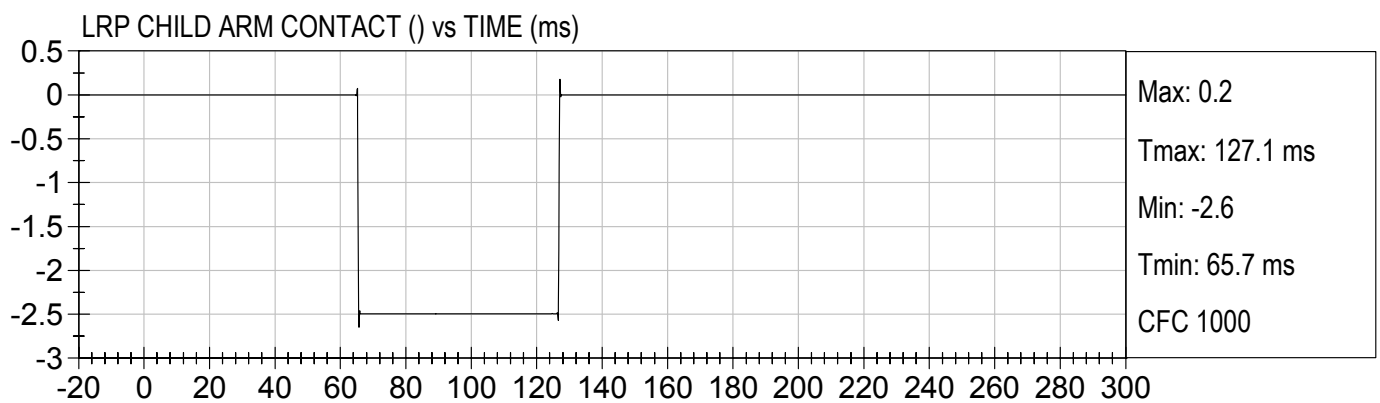
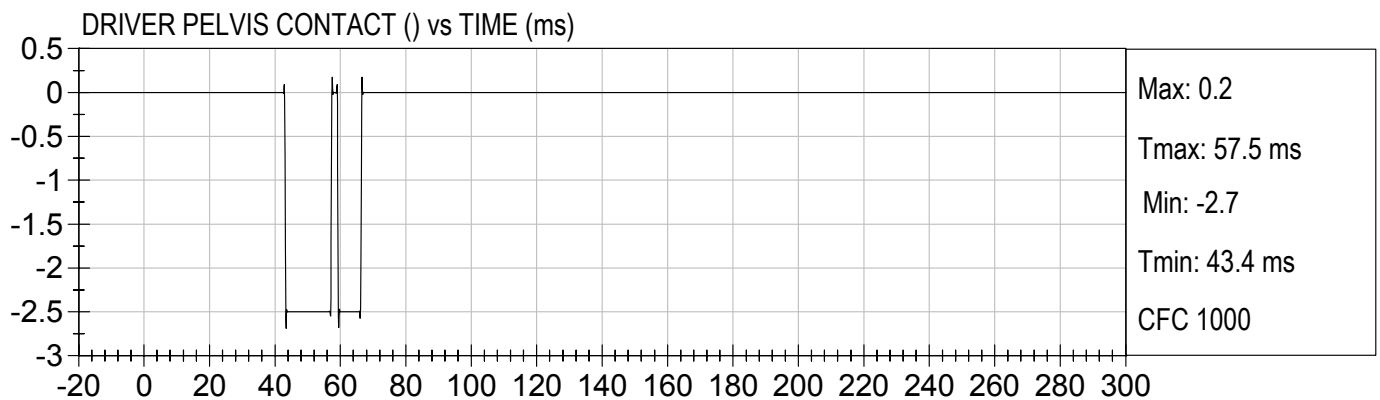
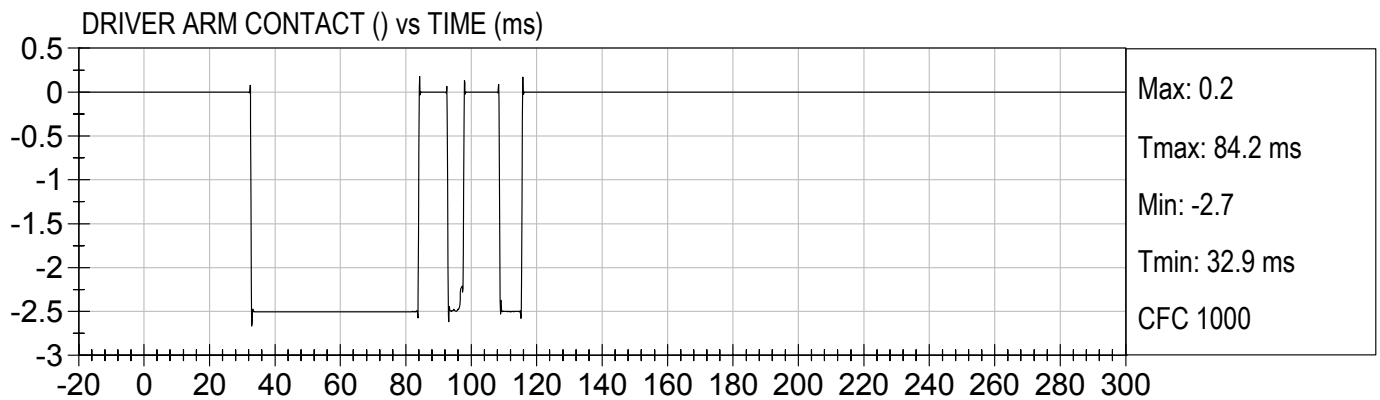
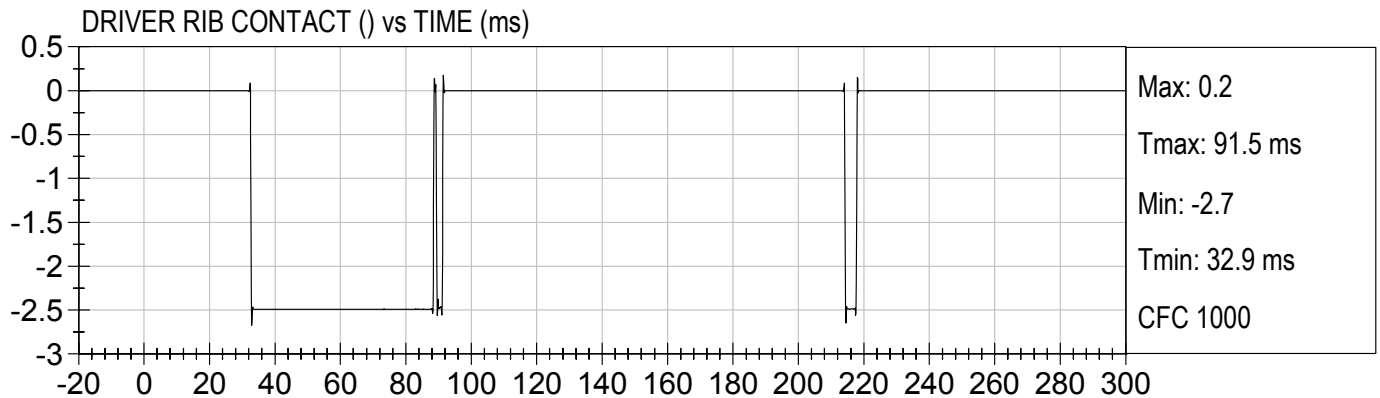












APPENDIX C

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

CERTIFICATION DATA

Dummy Serial Number: 020

PRE-TEST CALIBRATION

MGA RESEARCH CORPORATION
HEAD DROP TEST
SIDIIISD DUMMY

Date: 6/22/05
Dummy Serial Number: 020
Test Number: D051731

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	20.6° – 22.2°	21.1
Humidity	10% - 70%	38
Resultant Acceleration	125 - 145 g's	125
Peak Longitudinal Acceleration	(-15) – (+ 15) g's	10
Unimodal	<10%	YES

TEST MEETS SPECIFICATIONS

Technician: Jessica Hall

Approved By: David Winkelbauer

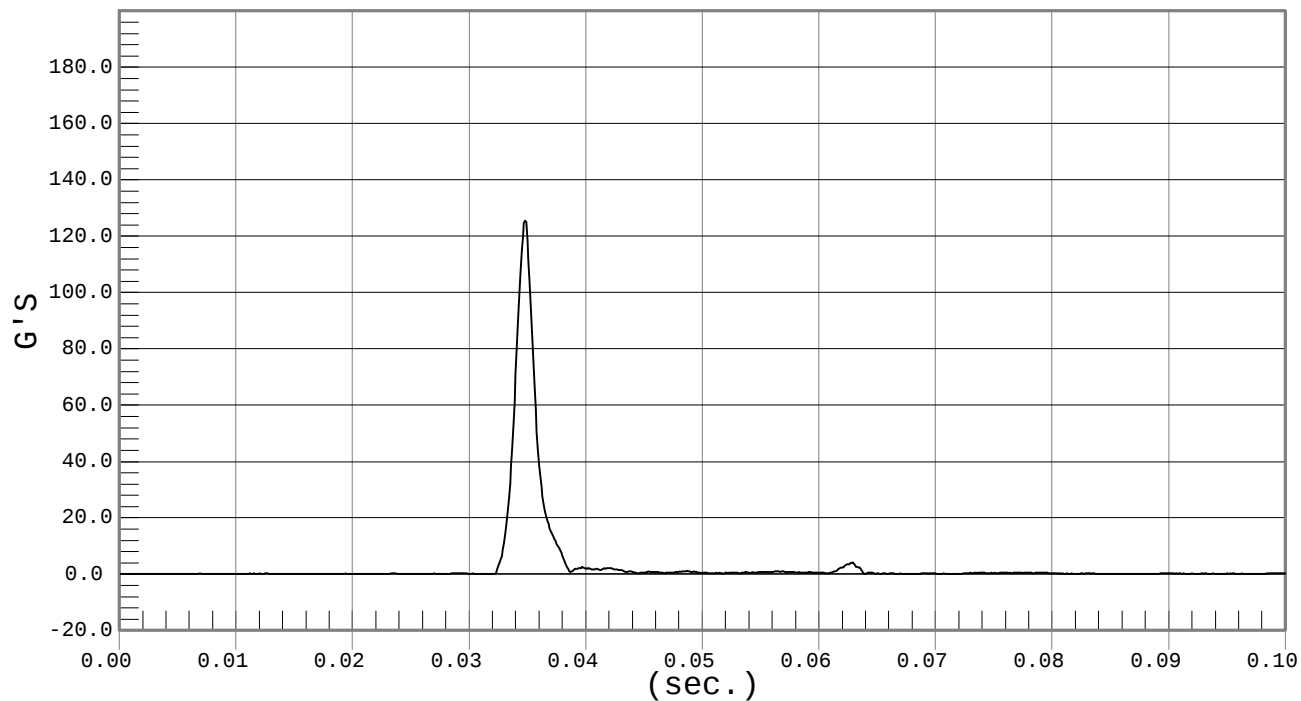


PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #020

Test Date: 06-22-05
Speed: 0.0 fps, 0.00 M/s

Ymin = .06 G'S @ 0.0000 sec., Ymax = 125.42 G'S @ 0.0347 sec.

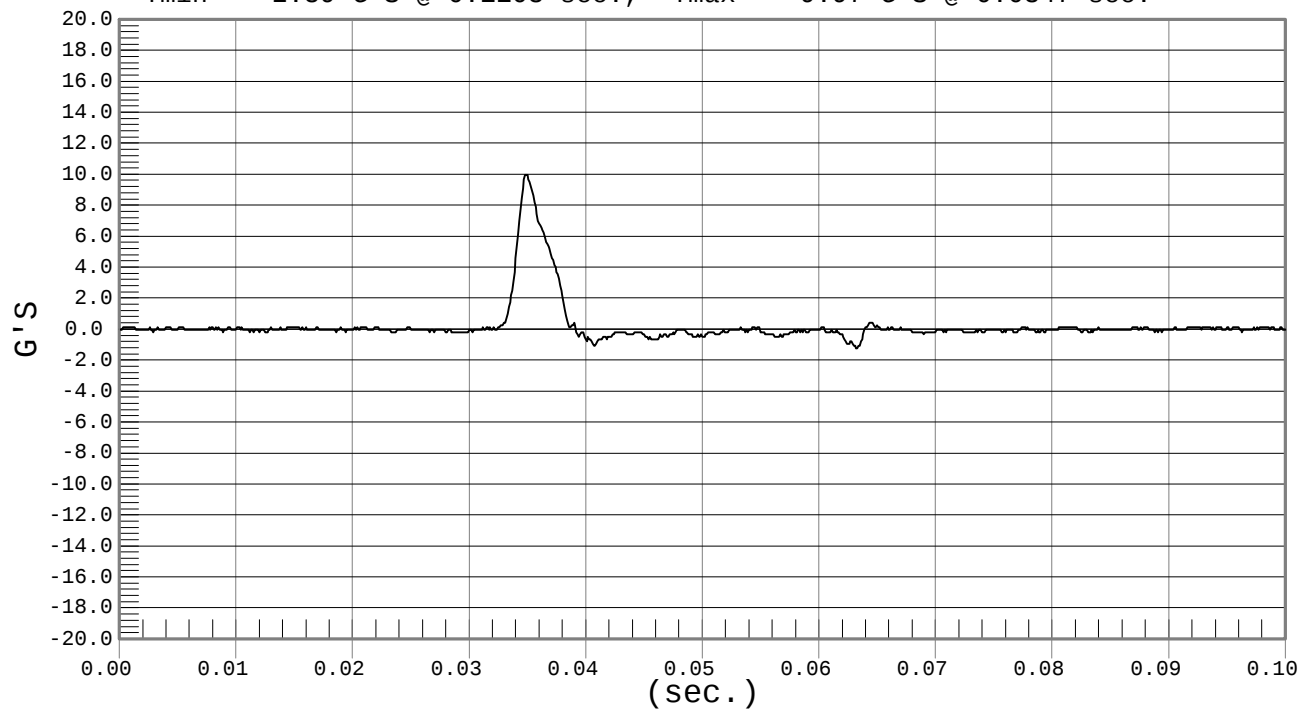


PEAK LONGITUDINAL ACCELARATION

Test Desc.: Head Drop
Component: Dummy #020

Test Date: 06-22-05
Speed: 0.0 fps, 0.00 M/s

Ymin = -2.89 G'S @ 0.1103 sec., Ymax = 9.97 G'S @ 0.0347 sec.



MGA RESEARCH CORPORATION
LATERAL NECK PENDULUM TEST
SIDIIISD DUMMY

Date: 6/22/05
Dummy Serial Number: 020
Test Number: D051732

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		20.6° – 22.2°	21.3
Humidity		10% - 70%	39
Impact Velocity (m/s)		5.51-5.63	5.63
Delta Velocity (m/s)	10 ms	2.20-2.80	2.36
	15 ms	3.40-4.10	3.47
	20 ms	4.50-5.40	4.65
	25 ms	5.50-6.10	5.55
	25-100 ms	5.20-6.20	5.65
Maximum D-Plane Rotation (deg)		74 - 79	74
Time of Maximum D-Plane Rotation		50-70	59
Maximum Occipital Condyle Moment during Rotation Interval (Nm)		(-45) – (-40)	-43
Time of Moment Decay to 0 Nm		113-123	113

TEST MEETS SPECIFICATIONS

Technician: Jessica Hall

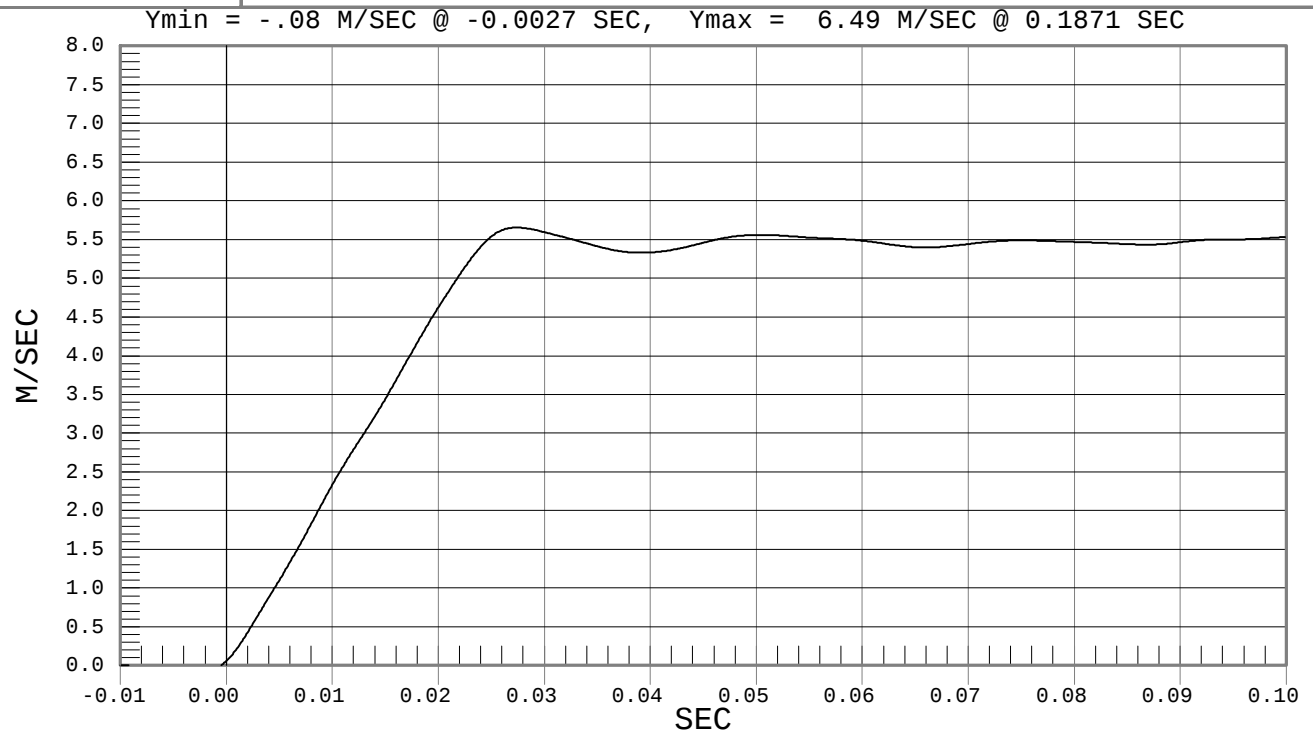
Approved By: David Winkelbauer



PENDULUM DECELERATION

Test Desc.: Neck Bending
Component: Dummy #020

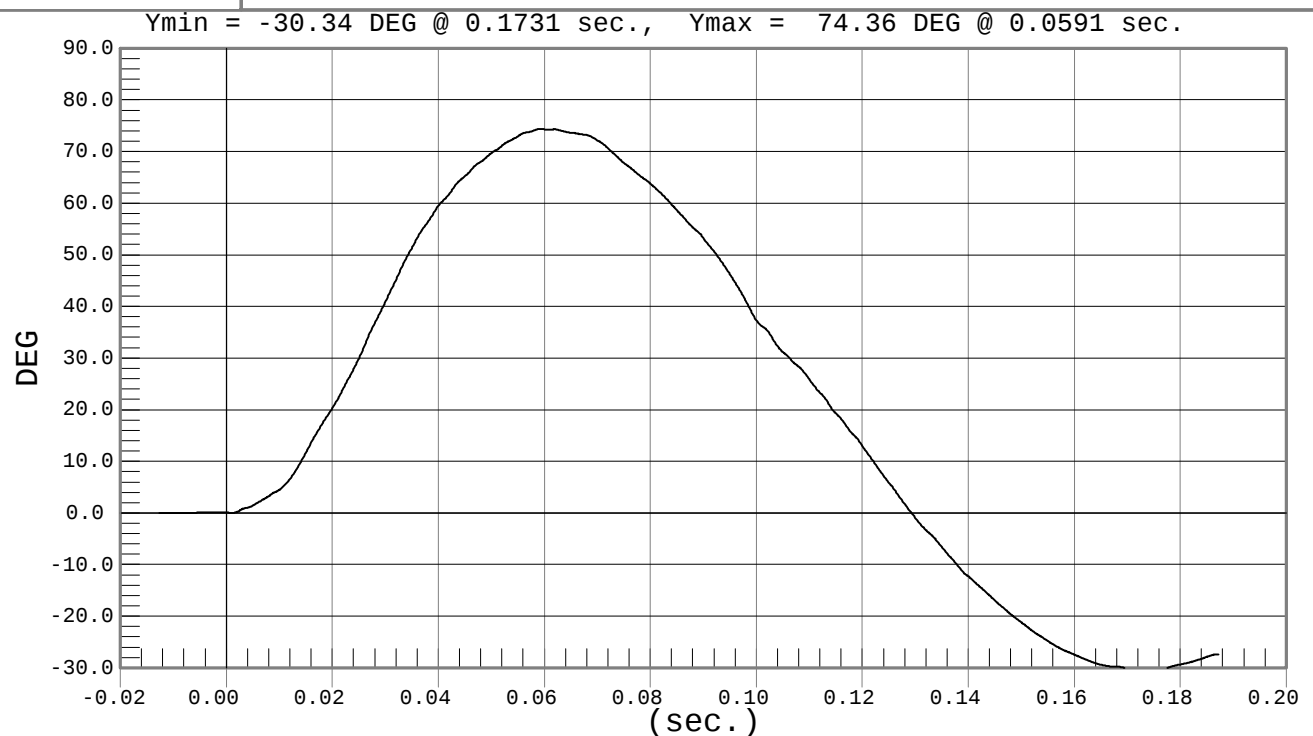
Test Date: 06-22-05
Speed: 18.5 fps, 5.63 M/s



FLEXION ANGLE

Test Desc.: Neck Bending
Component: Dummy #020

Test Date: 06-22-05
Speed: 18.5 fps, 5.63 M/s



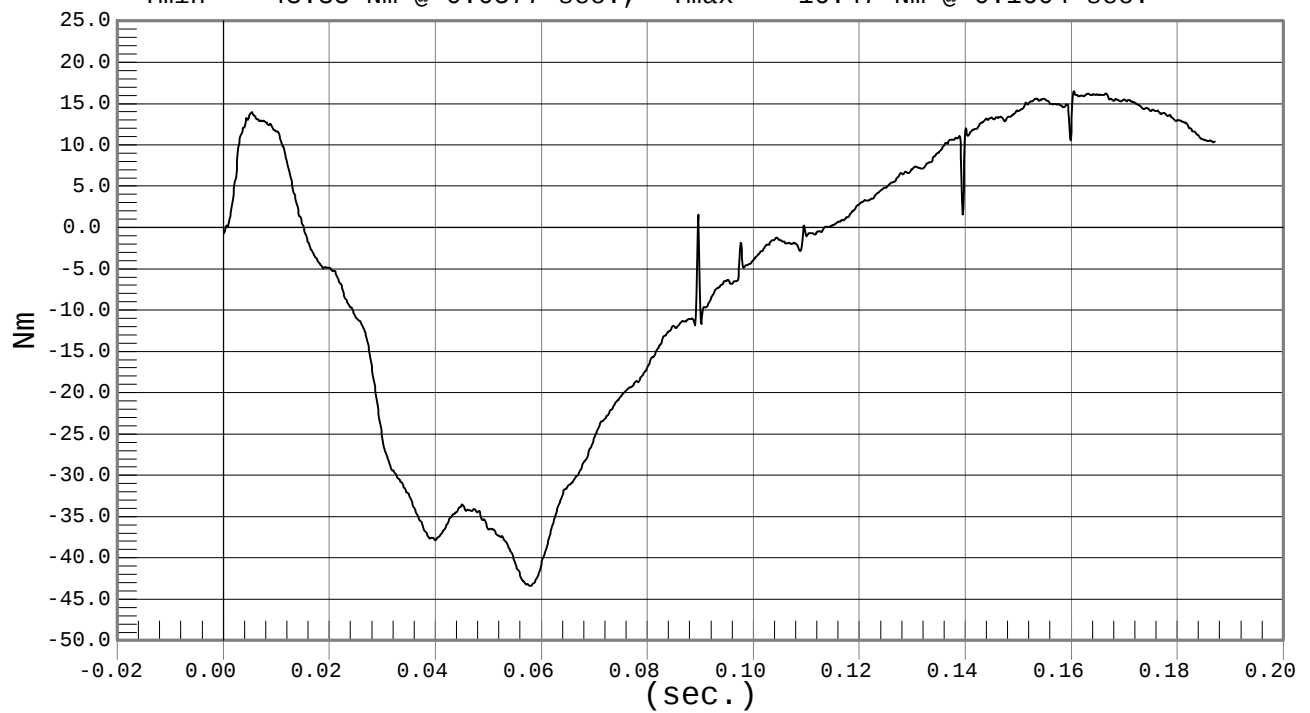


Test Desc.: Neck Bending
Component: Dummy #020

OCCIPITAL MOMENT

Test Date: 06-22-05
Speed: 18.5 fps, 5.63 M/s

Ymin = -43.38 Nm @ 0.0577 sec., Ymax = 16.47 Nm @ 0.1604 sec.



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
SIDIISD DUMMY

Date: 6/22/05
Dummy Serial Number: 020
Test Number: D051733

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	20.6° – 22.2°	21.7
Humidity	10% - 70%	38
Impact Velocity	4.41 - 4.59 m/s	4.50
Maximum Probe Force	1.6 - 2.4 kN	2.4
Shoulder Displacement	27 - 39 mm	33

TEST MEETS SPECIFICATIONS

Technician: Jessica Gall

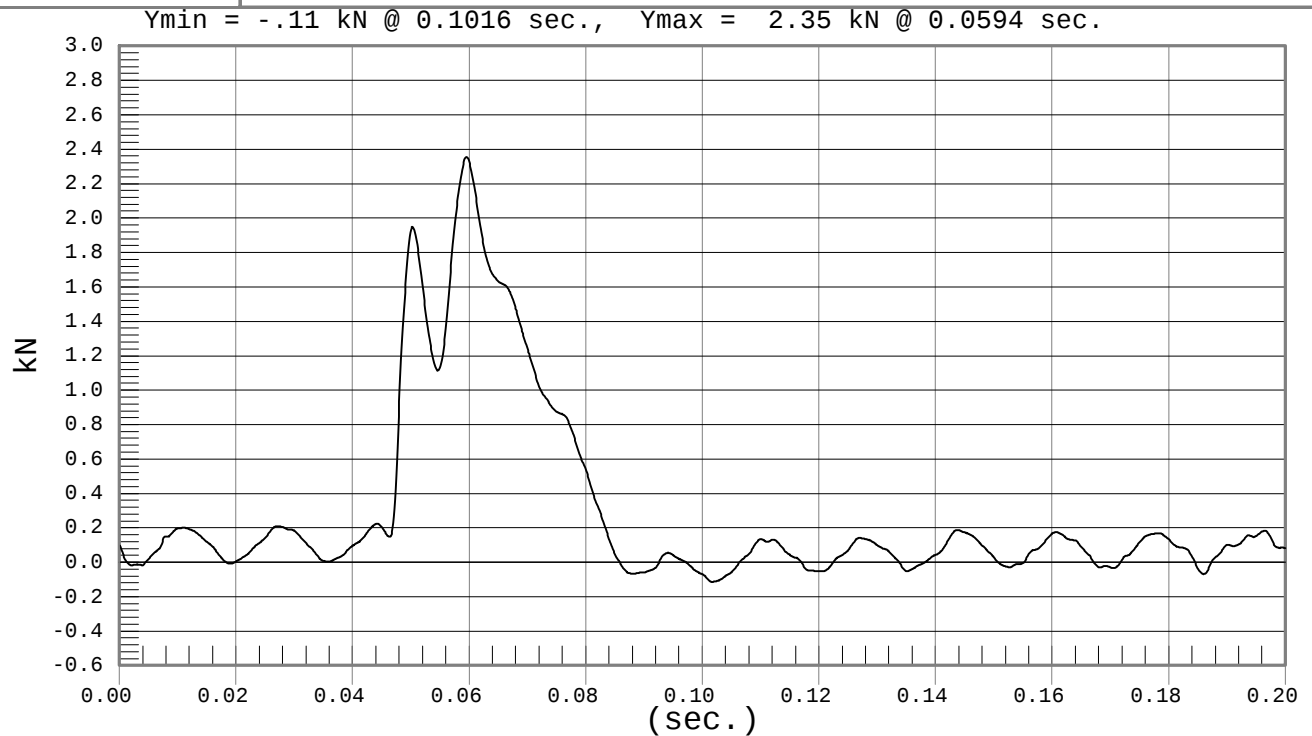
Approved By: David Winkelbauer



PROBE FORCE

Test Desc.: Shoulder Impact
Component: Dummy #020

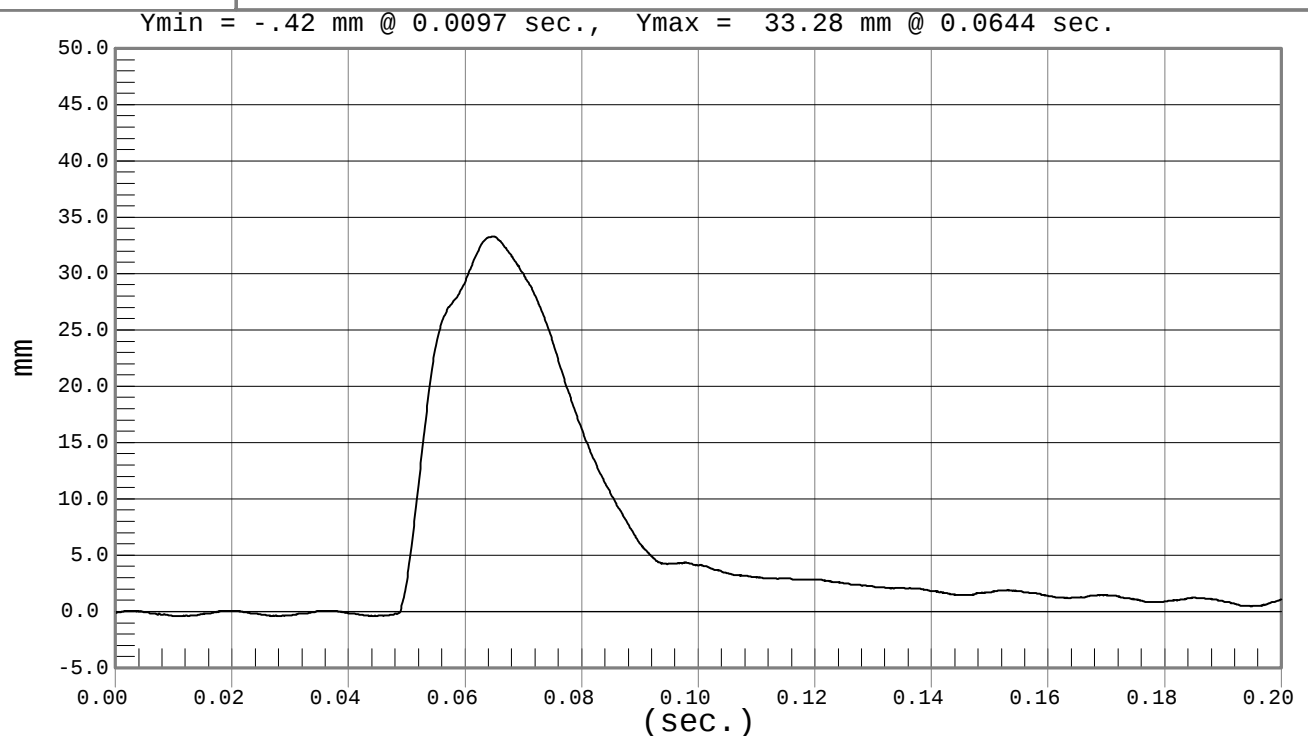
Test Date: 06-22-05
Speed: 14.8 fps, 4.50 M/s



SHOULDER DISPLACEMENT

Test Desc.: Shoulder Impact
Component: Dummy #020

Test Date: 06-22-05
Speed: 14.8 fps, 4.50 M/s



MGA RESEARCH CORPORATION
THORAX (WITH ARM) IMPACT TEST
SIDIIISD DUMMY

Date: 6/22/05
Dummy Serial Number: 020
Test Number: D051734

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	20.6° – 22.2°	21.8
Humidity	10% - 70%	38
Impact Velocity	6.57 - 6.84 m/s	6.71
Peak Probe Force	4.1 – 4.7 kN	4.4
Shoulder Displacement	30 - 42 mm	37
Upper Rib Displacement	23 - 35 mm	29
Middle Rib Displacement	29 - 44 mm	32
Lower Rib Displacement	33 - 40 mm	34
Upper Spine (T1) Y Acceleration	34 – 48 g's	38
Lower Spine (T12) Y Acceleration	30 - 38 g's	36

TEST MEETS SPECIFICATIONS

Technician: Jessica Hall

Approved By: David Winkelbauer

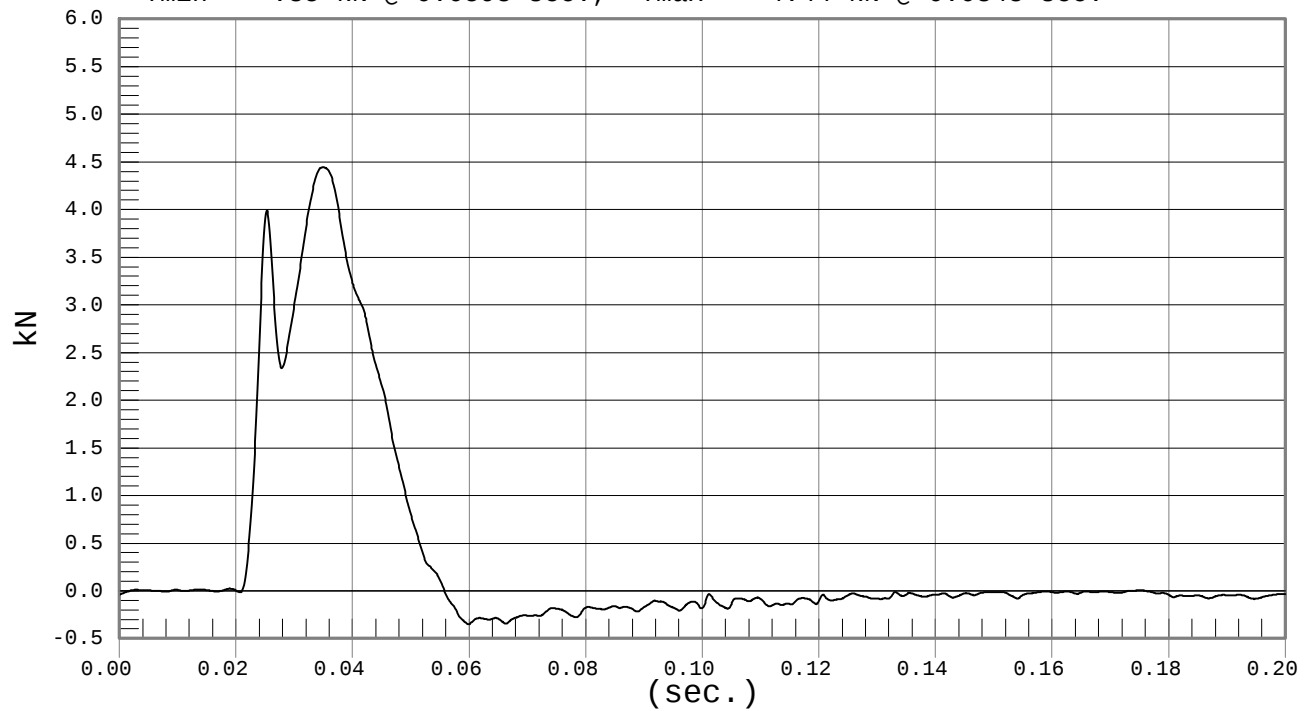


PROBE FORCE

Test Desc.: Thorax Impact With Arm
Component: Dummy #020

Test Date: 06-22-05
Speed: 22.0 fps, 6.71 M/s

Ymin = -.35 kN @ 0.0598 sec., Ymax = 4.44 kN @ 0.0348 sec.



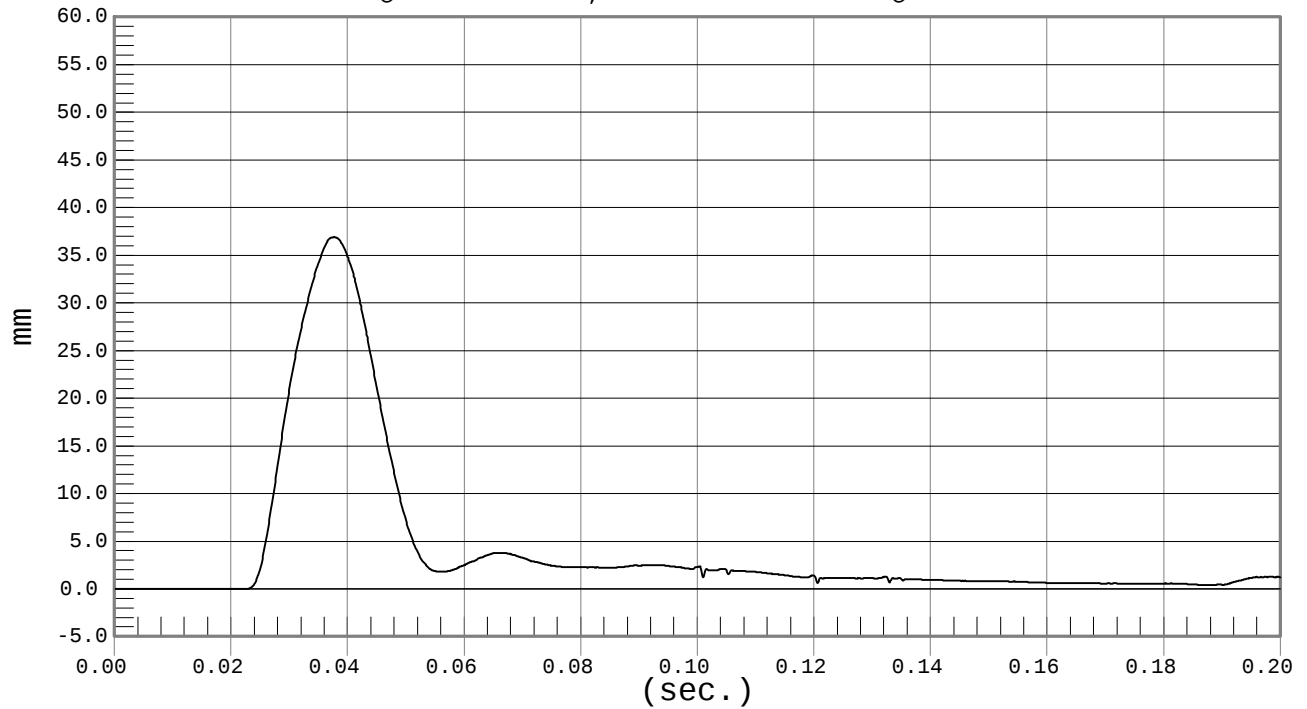


SHOULDER DISPLACEMENT

Test Desc.: Thorax Impact With Arm
Component: Dummy #020

Test Date: 06-22-05
Speed: 22.0 fps, 6.71 M/s

Ymin = -.01 mm @ 0.0191 sec., Ymax = 36.9 mm @ 0.0376 sec.

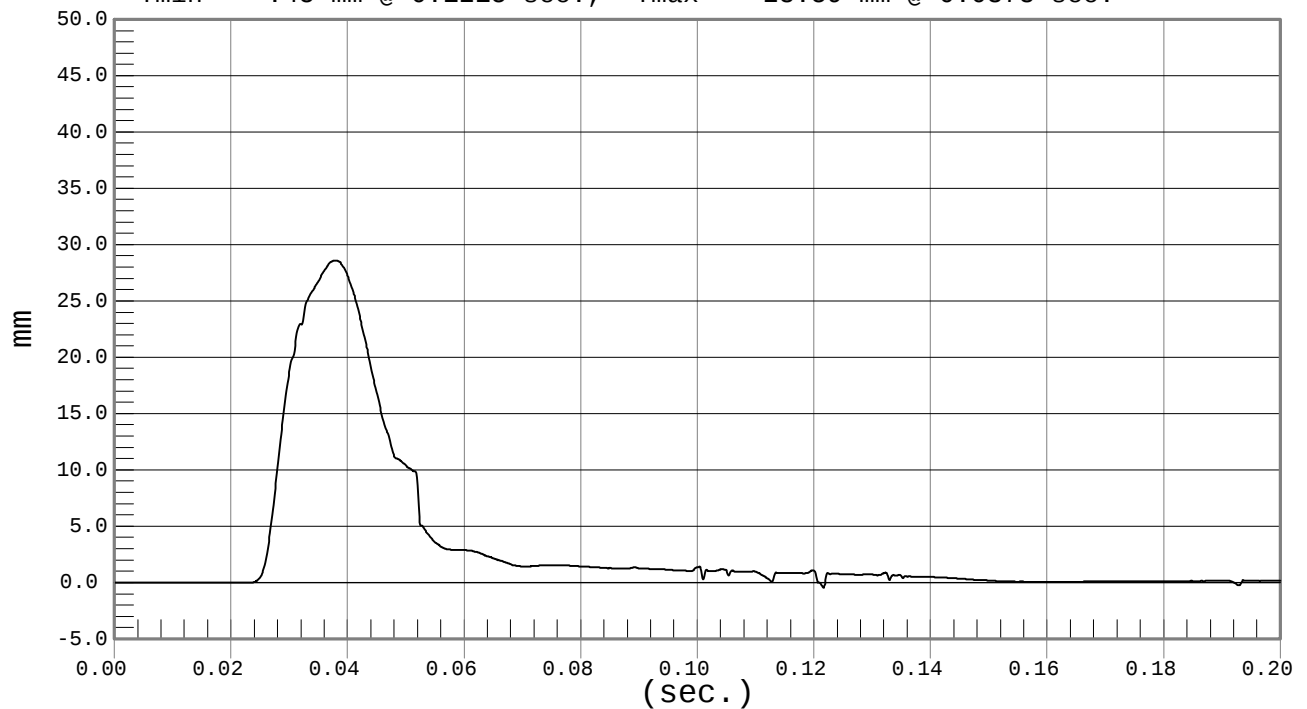


UPPER RIB DISPLACEMENT

Test Desc.: Thorax Impact With Arm
Component: Dummy #020

Test Date: 06-22-05
Speed: 22.0 fps, 6.71 M/s

Ymin = -.45 mm @ 0.1215 sec., Ymax = 28.59 mm @ 0.0378 sec.



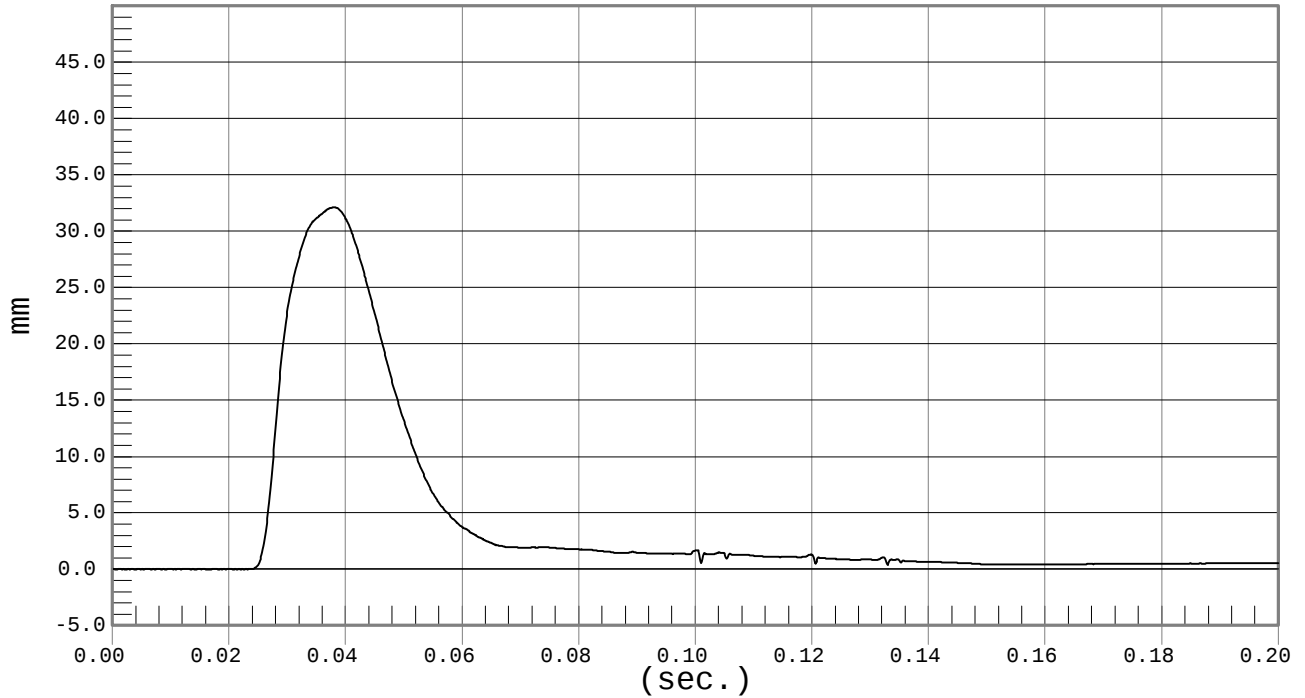


MIDDLE RIB DISPLACEMENT

Test Desc.: Thorax Impact With Arm
Component: Dummy #020

Test Date: 06-22-05
Speed: 22.0 fps, 6.71 M/s

Ymin = -.01 mm @ 0.0006 sec., Ymax = 32.13 mm @ 0.0379 sec.

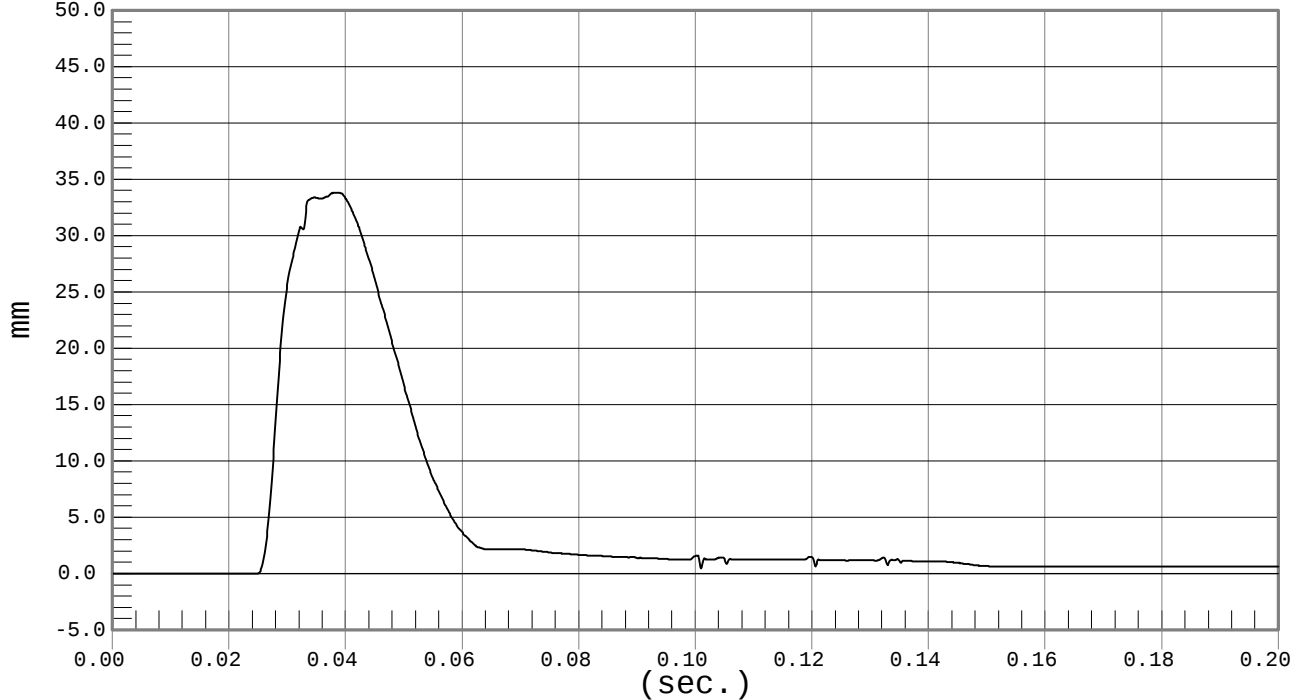


LOWER RIB DISPLACEMENT

Test Desc.: Thorax Impact With Arm
Component: Dummy #020

Test Date: 06-22-05
Speed: 22.0 fps, 6.71 M/s

Ymin = -.02 mm @ 0.0247 sec., Ymax = 33.79 mm @ 0.0383 sec.



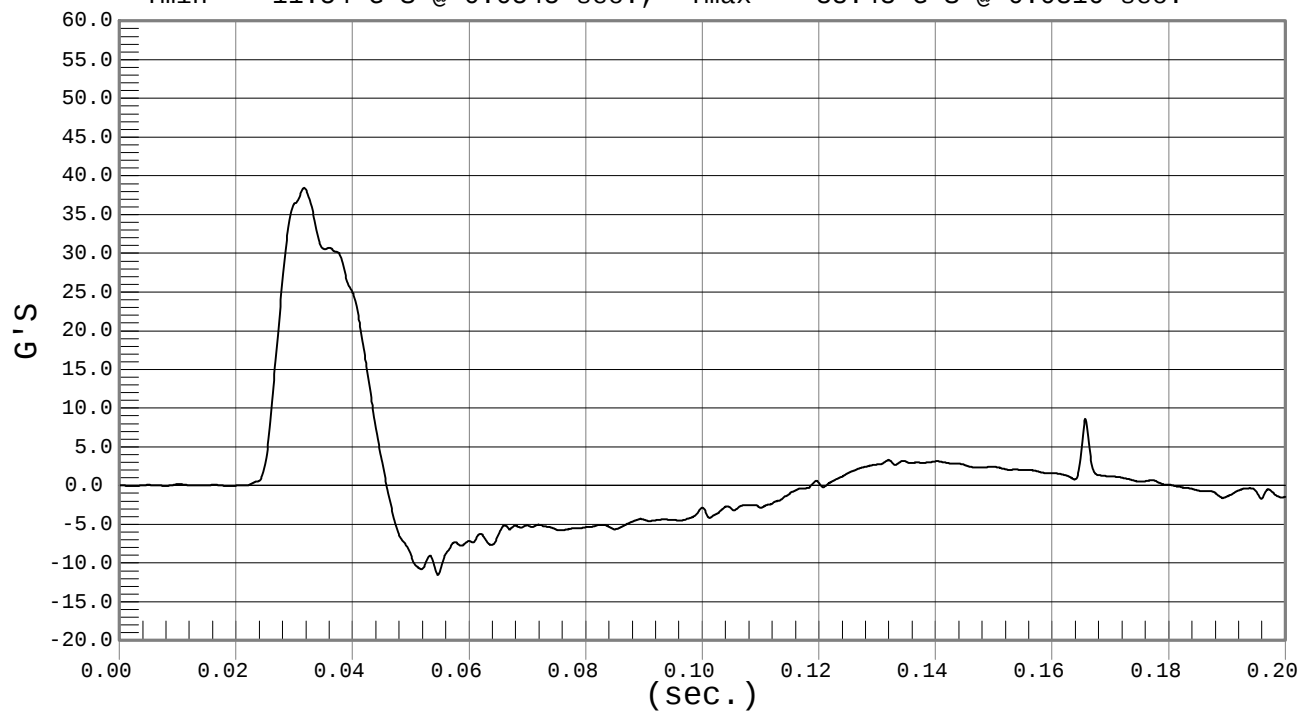


UPPER SPINE ACCELERATION

Test Desc.: Thorax Impact With Arm
Component: Dummy #020

Test Date: 06-22-05
Speed: 22.0 fps, 6.71 M/s

Ymin = -11.54 G'S @ 0.0545 sec., Ymax = 38.43 G'S @ 0.0316 sec.

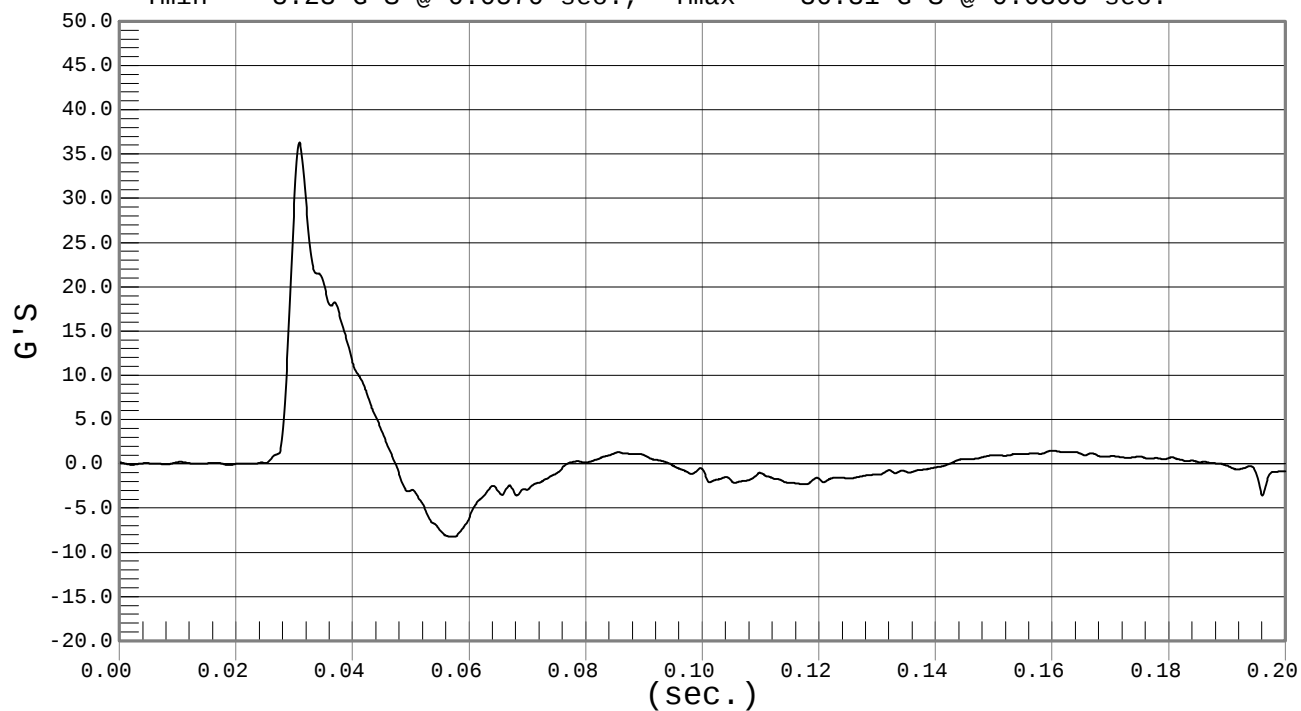


LOWER SPINE ACCELERATION

Test Desc.: Thorax Impact With Arm
Component: Dummy #020

Test Date: 06-22-05
Speed: 22.0 fps, 6.71 M/s

Ymin = -8.23 G'S @ 0.0570 sec., Ymax = 36.31 G'S @ 0.0308 sec.



MGA RESEARCH CORPORATION
THORAX (WITHOUT ARM) IMPACT TEST
SIDIIISD DUMMY

Date: 6/22/05
Dummy Serial Number: 020
Test Number: D051735

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	20.6° – 22.2°	21.3
Humidity	10% - 70%	37
Impact Velocity	4.20 - 4.40 m/s	4.26
Peak Probe Force	1.8 - 2.3 kN	2.3
Upper Rib Displacement	32 - 41 mm	36
Middle Rib Displacement	40 - 51 mm	41
Lower Rib Displacement	34 - 47 mm	37
Upper Spine (T1) Acceleration	13 - 18 g's	15
Lower Spine (T12) Acceleration	8 – 13 g's	9

TEST MEETS SPECIFICATIONS

Technician: Jessica Hall

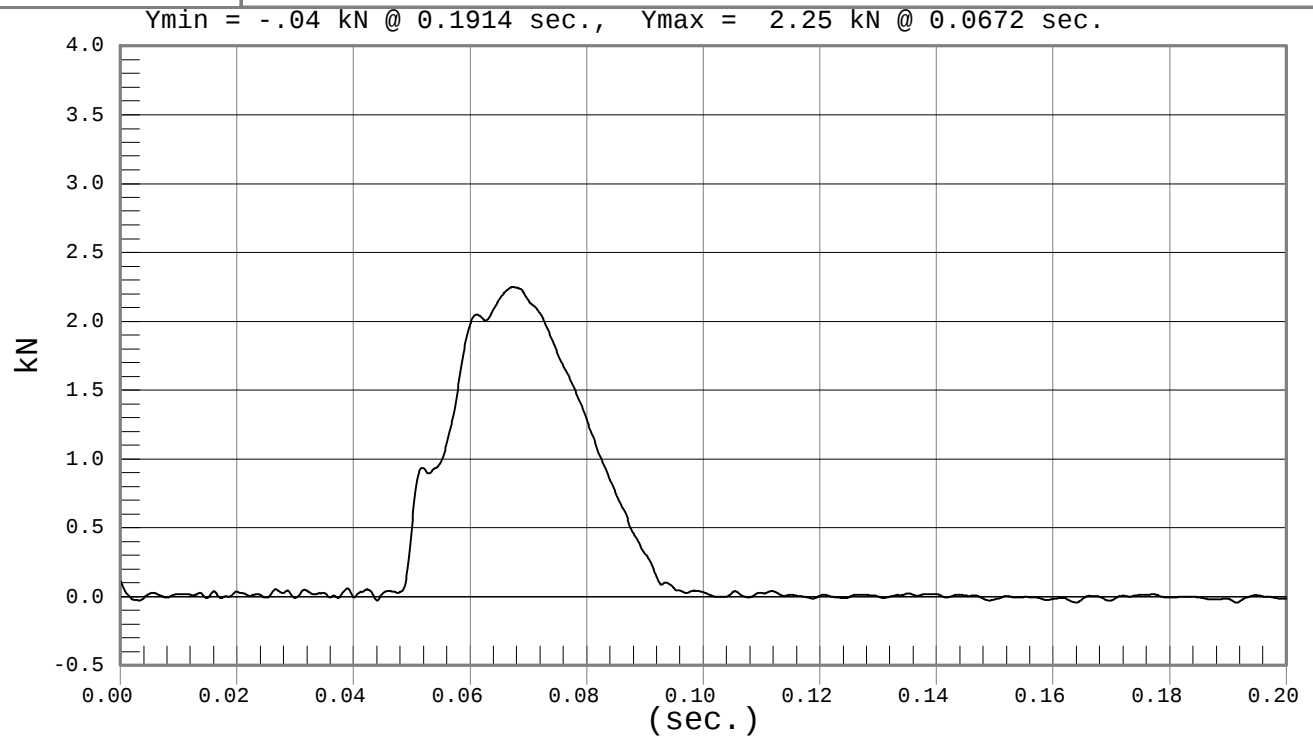
Approved By: David Winkelbauer



PROBE FORCE

Test Desc.: Thorax without Arm
Component: Dummy #020

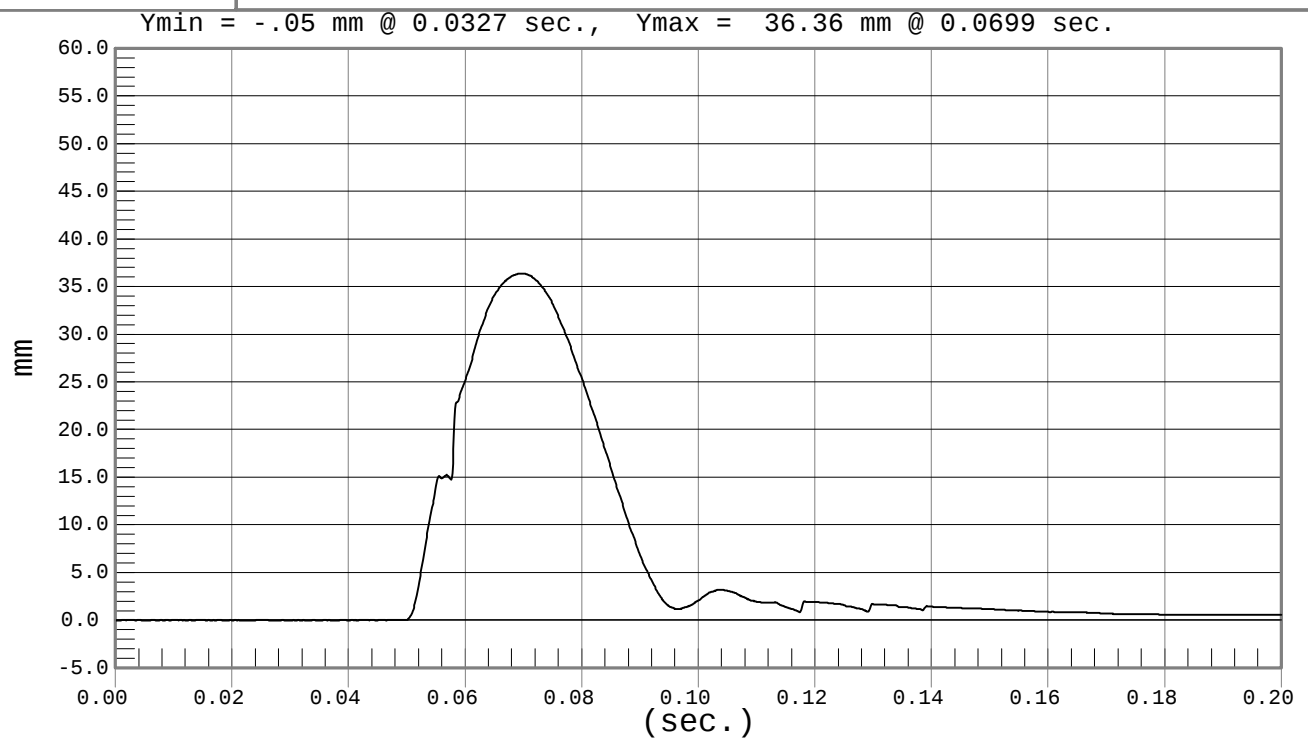
Test Date: 06-22-05
Speed: 14.0 fps, 4.26 M/s



UPPER RIB DISPLACEMENT

Test Desc.: Thorax without Arm
Component: Dummy #020

Test Date: 06-22-05
Speed: 14.0 fps, 4.26 M/s



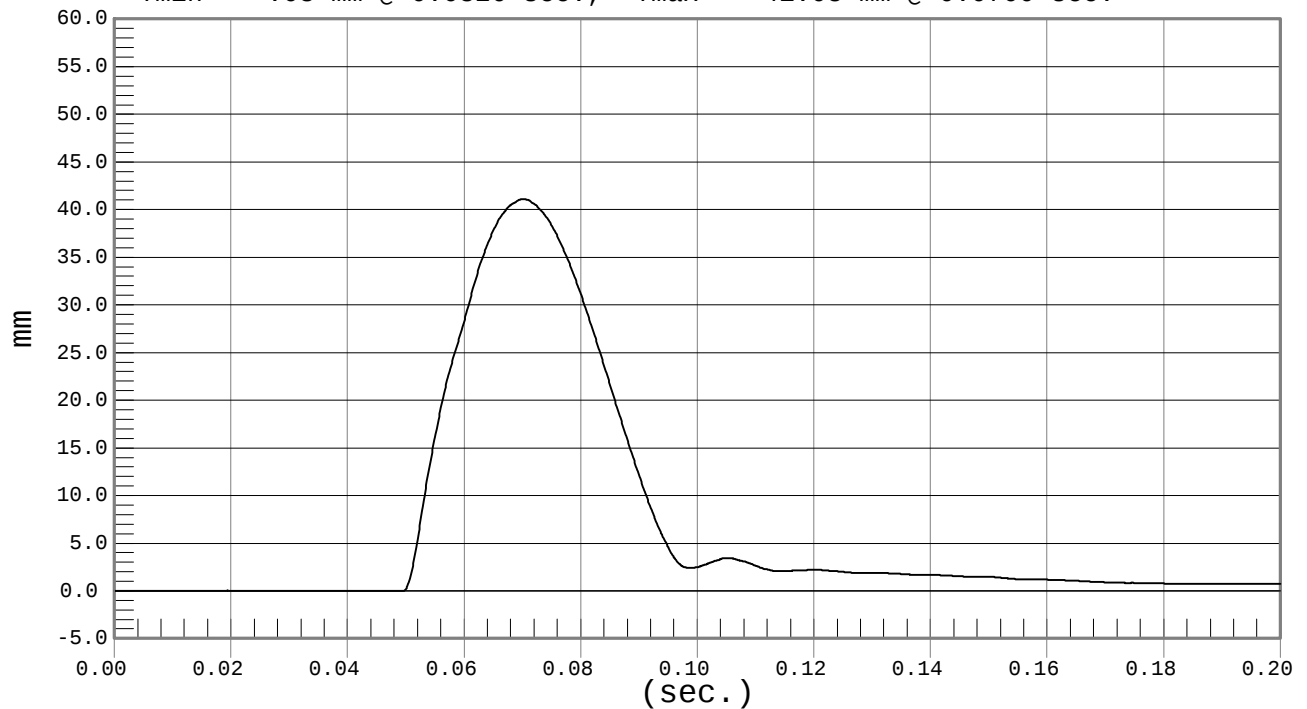


MIDDLE RIB DISPLACEMENT

Test Desc.: Thorax without Arm
Component: Dummy #020

Test Date: 06-22-05
Speed: 14.0 fps, 4.26 M/s

Ymin = -.03 mm @ 0.0326 sec., Ymax = 41.08 mm @ 0.0700 sec.

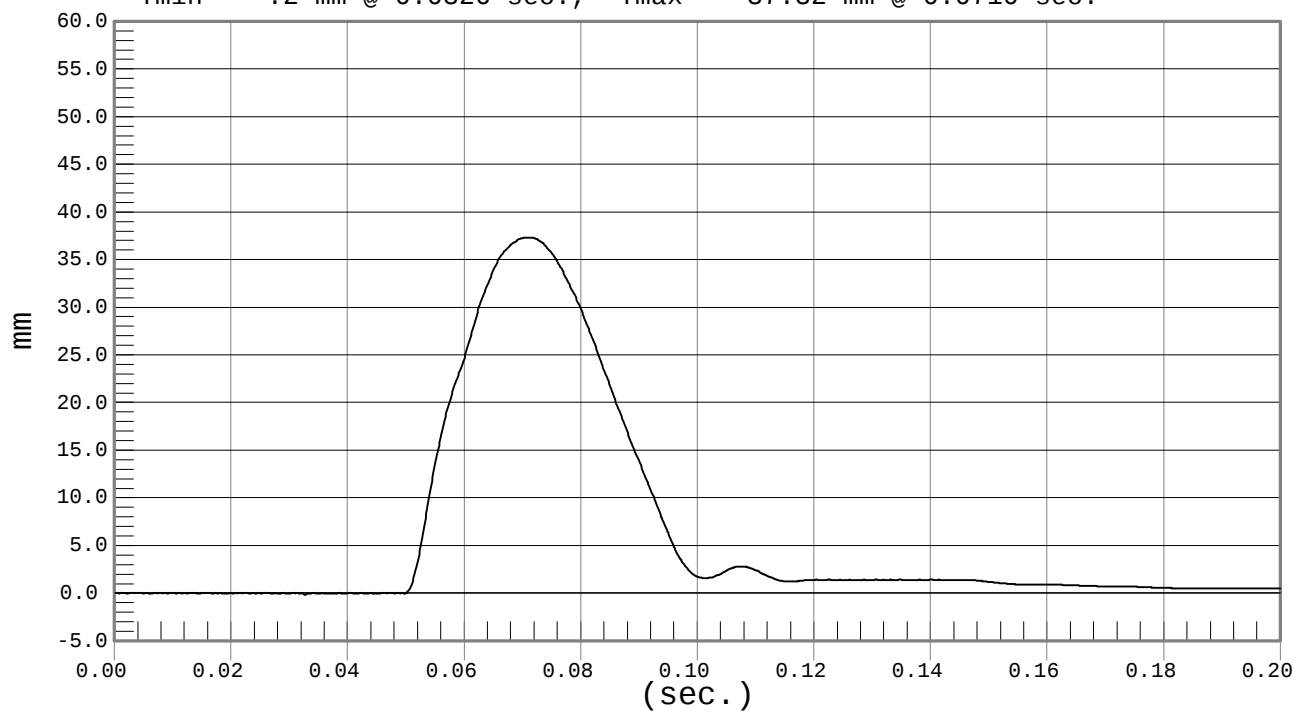


LOWER RIB DISPLACEMENT

Test Desc.: Thorax without Arm
Component: Dummy #020

Test Date: 06-22-05
Speed: 14.0 fps, 4.26 M/s

Ymin = -.2 mm @ 0.0326 sec., Ymax = 37.32 mm @ 0.0710 sec.



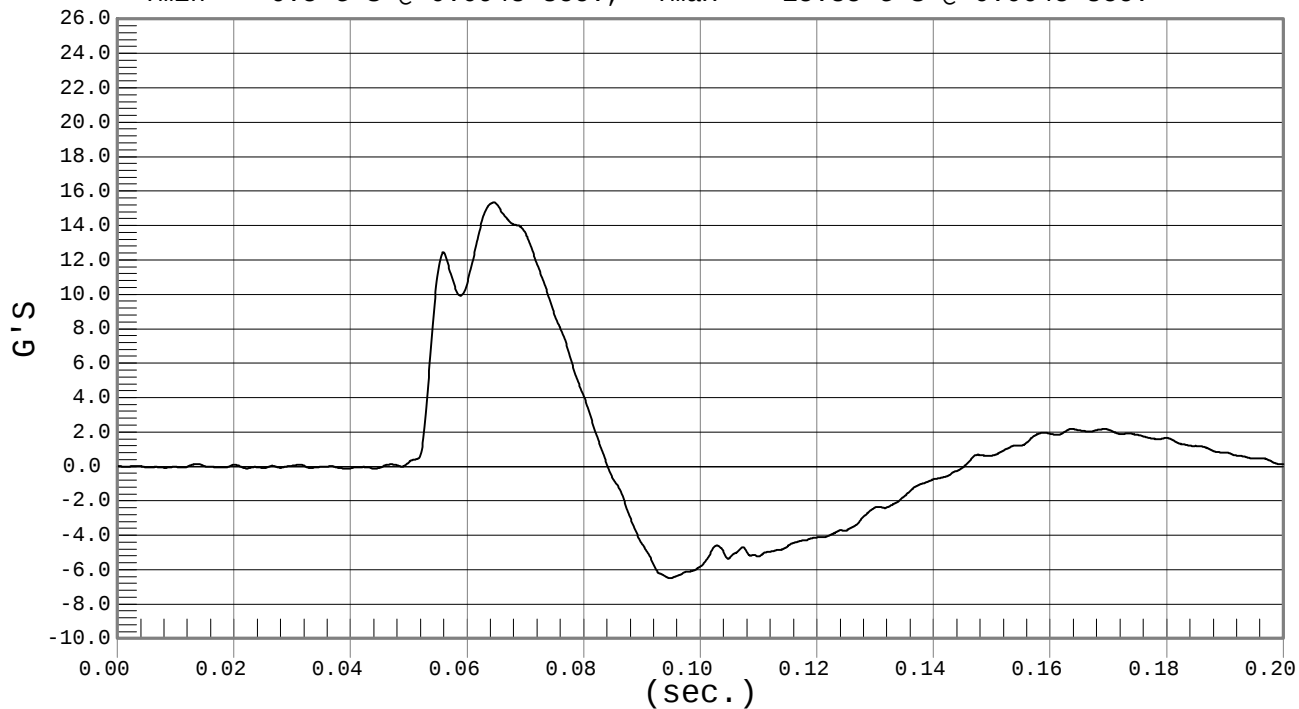


UPPER SPINE ACCELERATION

Test Desc.: Thorax without Arm
Component: Dummy #020

Test Date: 06-22-05
Speed: 14.0 fps, 4.26 M/s

Ymin = -6.5 G'S @ 0.0948 sec., Ymax = 15.35 G'S @ 0.0645 sec.

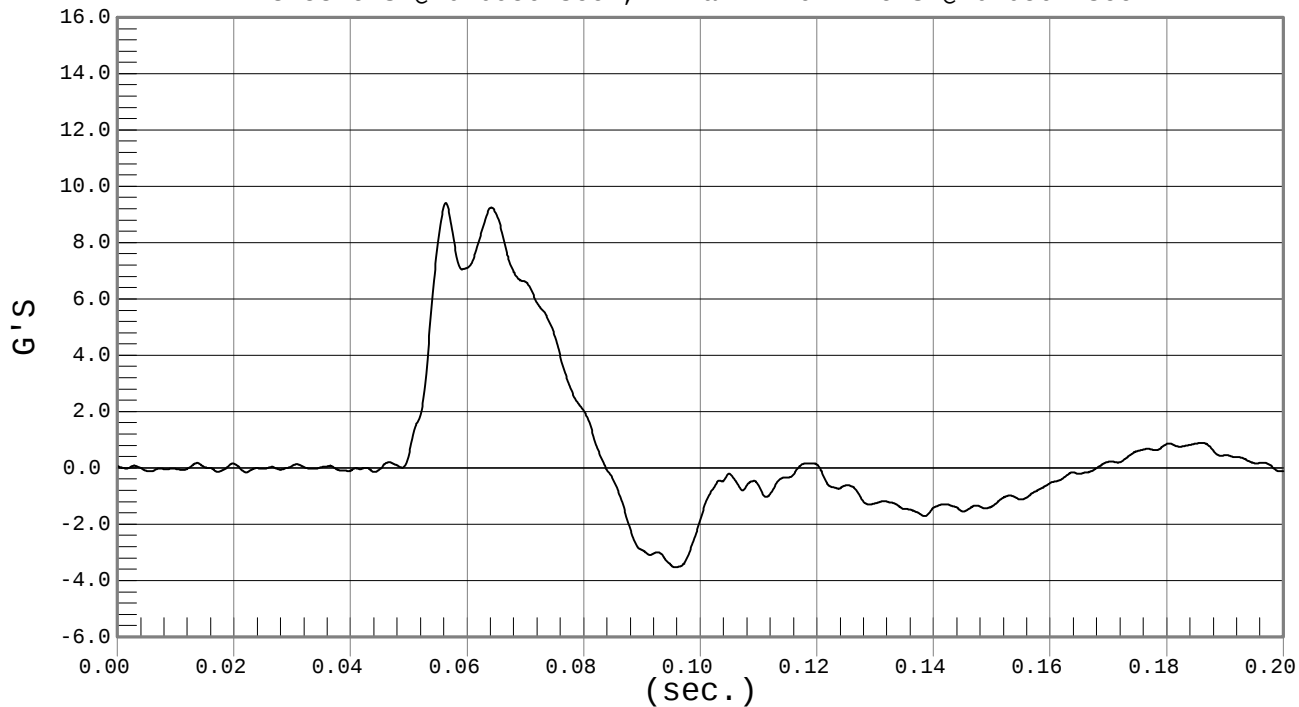


LOWER SPINE ACCELERATION

Test Desc.: Thorax without Arm
Component: Dummy #020

Test Date: 06-22-05
Speed: 14.0 fps, 4.26 M/s

Ymin = -3.53 G'S @ 0.0956 sec., Ymax = 9.41 G'S @ 0.0562 sec.



MGA RESEARCH CORPORATION
ABDOMINAL IMPACT TEST
SIDIIISD DUMMY

Date: 6/22/05
Dummy Serial Number: 020
Test Number: D051736

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	20.6° – 22.2°	21.1
Humidity	10% - 70%	36
Impact Velocity	4.41 - 4.59 m/s	4.42
Probe Force	1.3 - 1.9 kN	1.9
Upper Rib Displacement	44 - 55 mm	44
Lower Rib Displacement	44 - 56 mm	45
Upper Spine (T1) Y Acceleration	5 - 9 g's	6
Lower Spine (T12) Y Acceleration	9 - 13 g's	13

TEST MEETS SPECIFICATIONS

Technician: _____

Jessica Gall

Approved By: _____

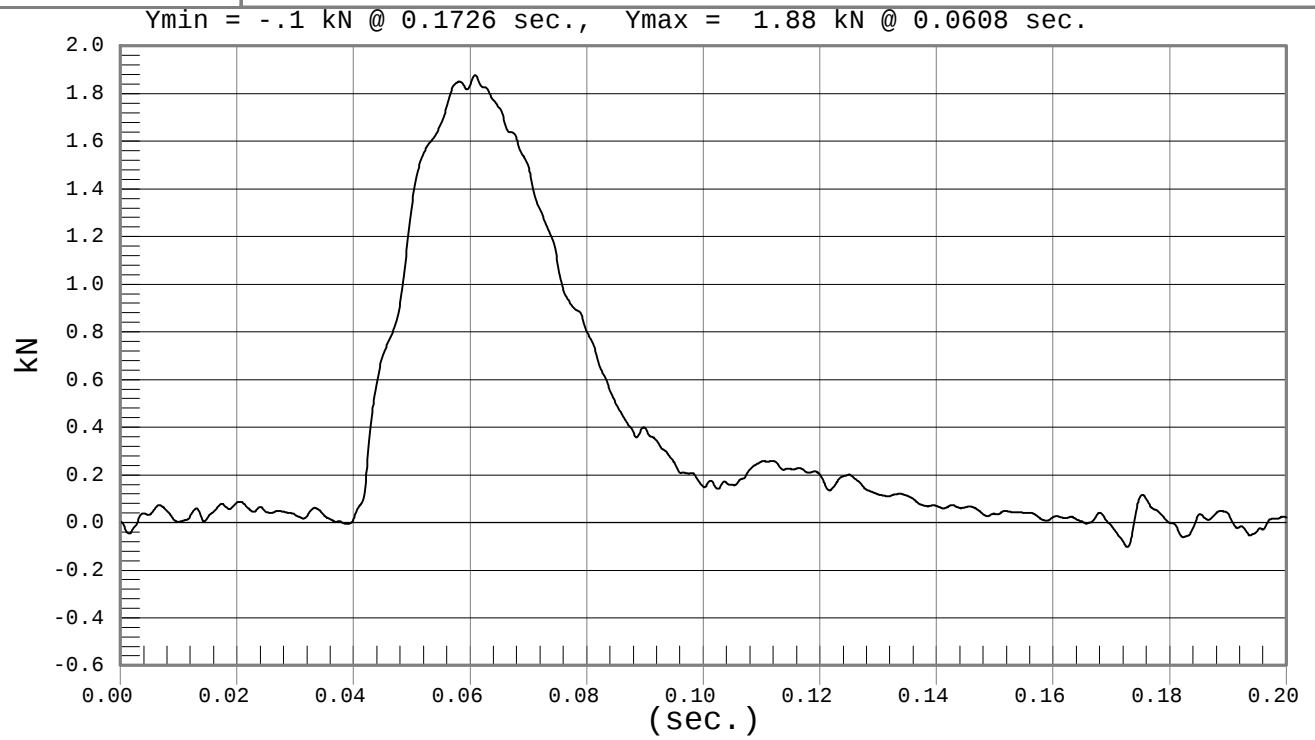
David Winkelbauer



PROBE FORCE

Test Desc.: Abdominal Impact
Component: Dummy #020

Test Date: 06-22-05
Speed: 14.5 fps, 4.42 M/s



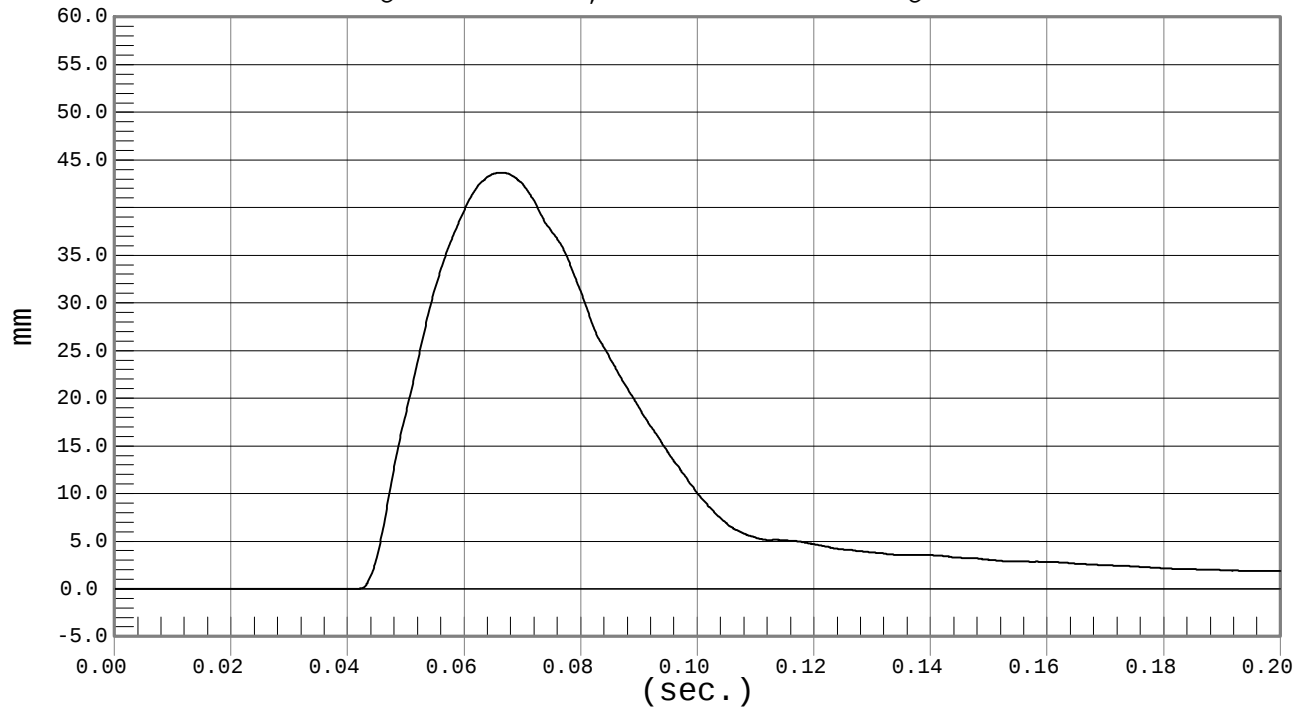


UPPER RIB DISPLACEMENT

Test Desc.: Abdominal Impact
Component: Dummy #020

Test Date: 06-22-05
Speed: 14.5 fps, 4.42 M/s

Ymin = -.03 mm @ 0.0008 sec., Ymax = 43.66 mm @ 0.0659 sec.

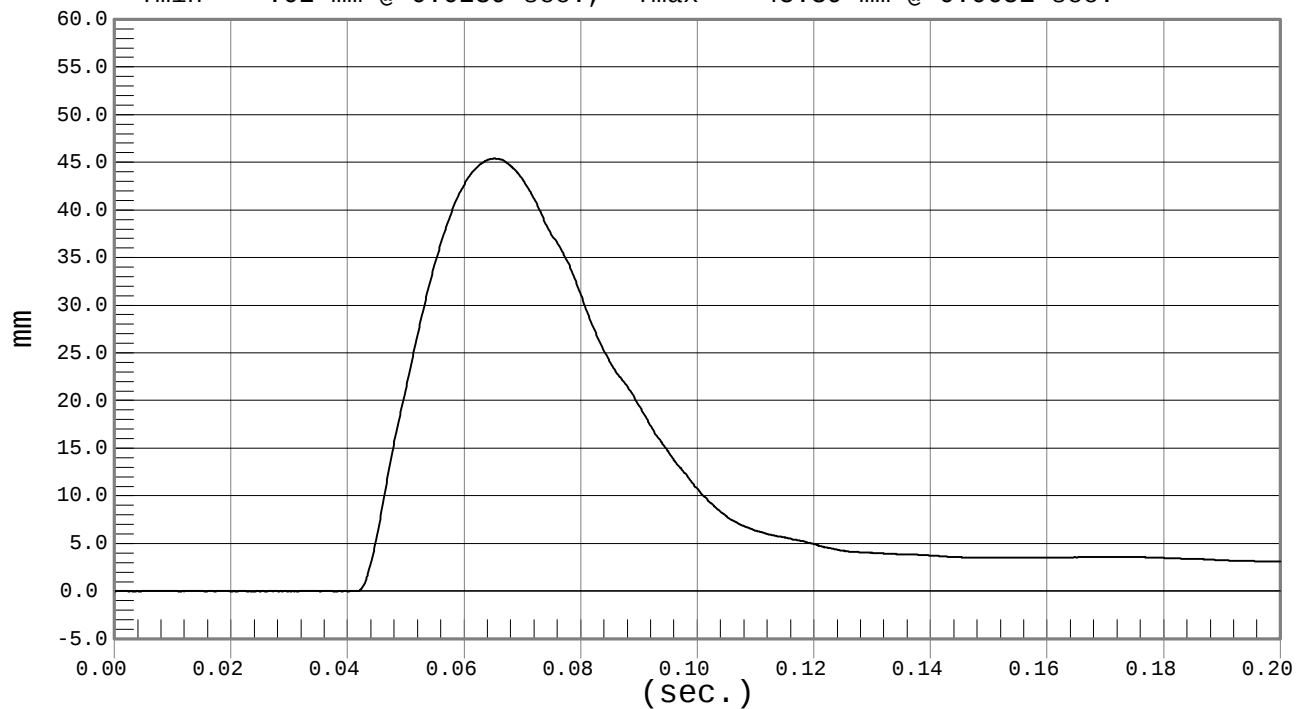


LOWER RIB DISPLACEMENT

Test Desc.: Abdominal Impact
Component: Dummy #020

Test Date: 06-22-05
Speed: 14.5 fps, 4.42 M/s

Ymin = -.02 mm @ 0.0239 sec., Ymax = 45.39 mm @ 0.0651 sec.



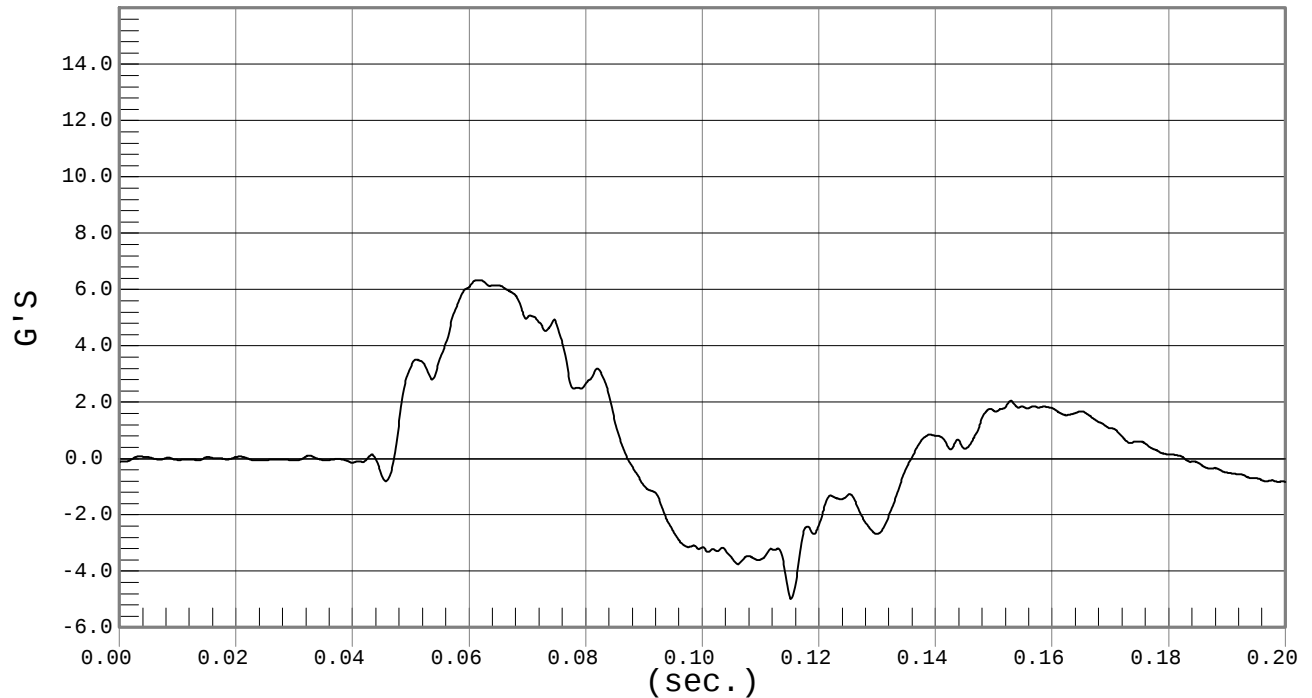


UPPER SPINE ACCELERATION

Test Desc.: Abdominal Impact
Component: Dummy #020

Test Date: 06-22-05
Speed: 14.5 fps, 4.42 M/s

Ymin = -4.99 G'S @ 0.1151 sec., Ymax = 6.34 G'S @ 0.0612 sec.

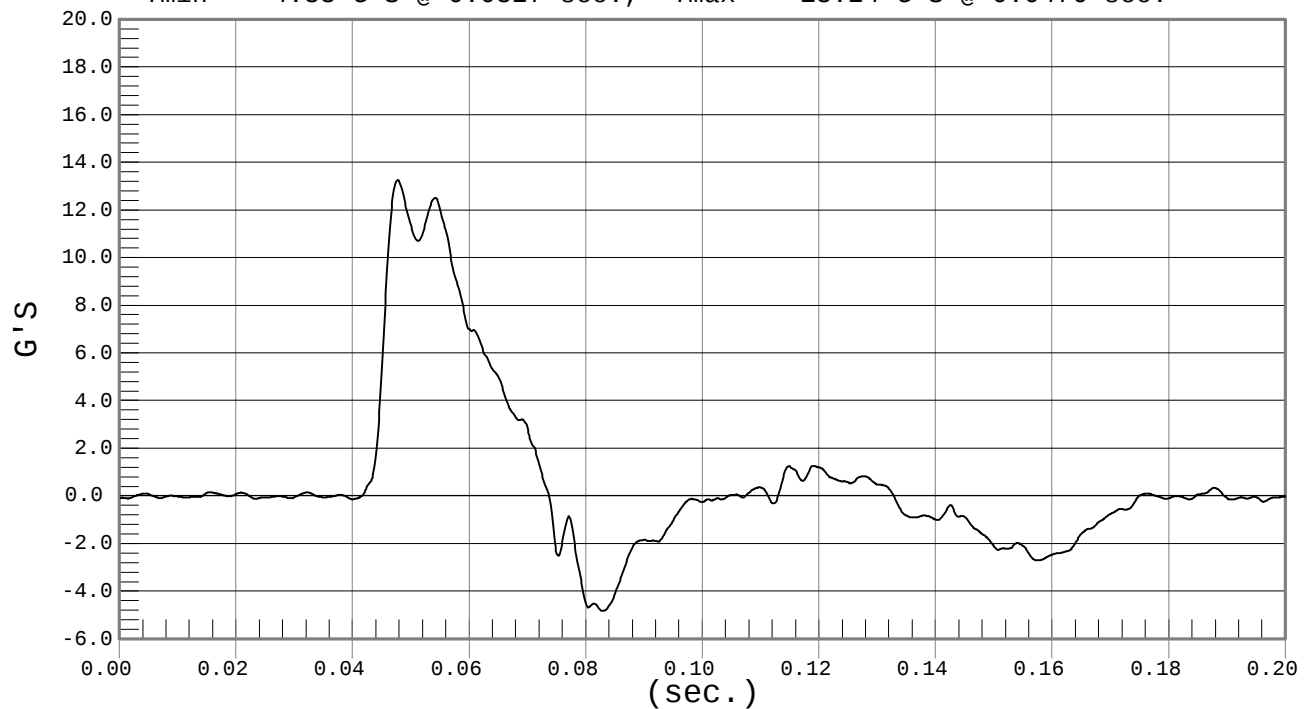


LOWER SPINE ACCELERATION

Test Desc.: Abdominal Impact
Component: Dummy #020

Test Date: 06-22-05
Speed: 14.5 fps, 4.42 M/s

Ymin = -4.83 G'S @ 0.0827 sec., Ymax = 13.24 G'S @ 0.0476 sec.



MGA RESEARCH CORPORATION
PELVIS IMPACT TEST
SIDIIsD DUMMY

Date: 6/22/02
Dummy Serial Number: 020
Test Number: D051737

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	20.6° – 22.2°	21.7
Humidity	10% - 70%	38
Impact Velocity	6.60 - 6.80 m/s	6.68
Peak Impactor Acceleration	40 – 48 g's	41
Pelvis Y Acceleration	40 – 48 g's	43
Peak Pelvis Acetabulum Force	3803 – 4505 N	3980

TEST MEETS SPECIFICATIONS

Technician: Jessica Hall

Approved By: David Winkelbauer

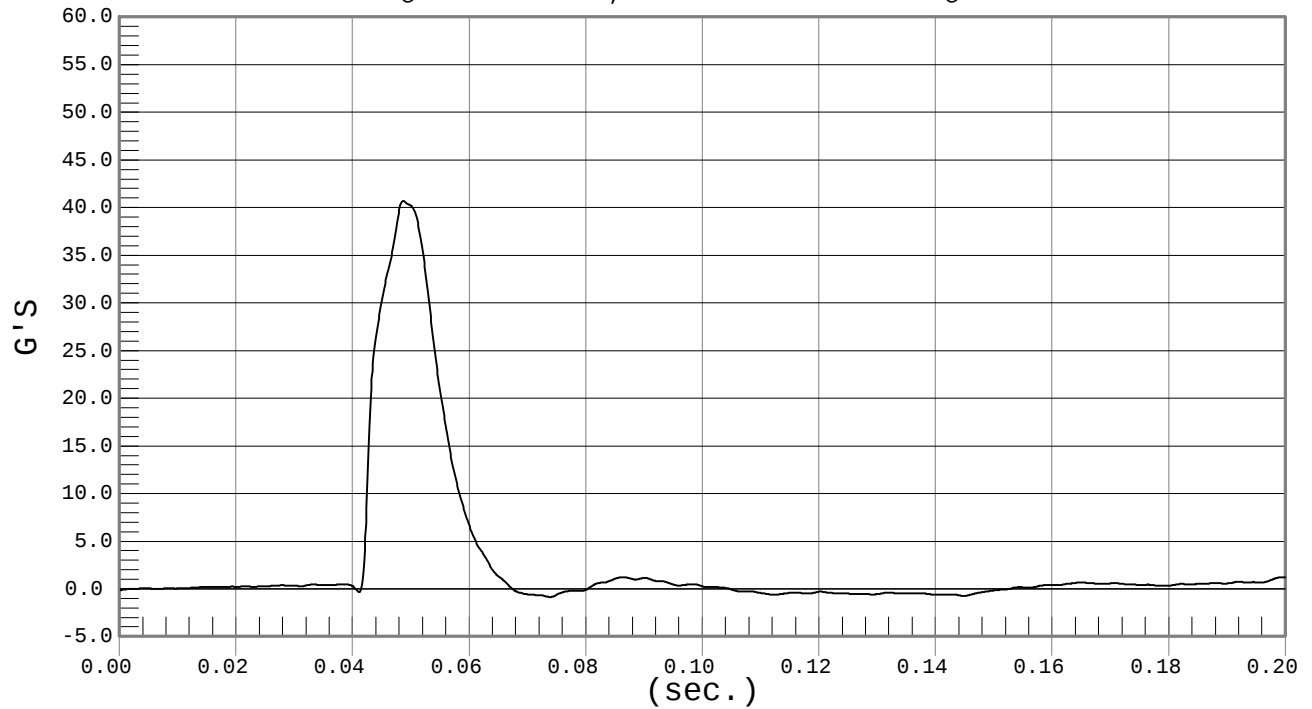


IMPACTOR ACCELERATION

Test Desc.: Pelvis Impact
Component: Dummy #020

Test Date: 06-22-05
Speed: 21.9 fps, 6.68 M/s

Ymin = -.86 G'S @ 0.0738 sec., Ymax = 40.69 G'S @ 0.0486 sec.

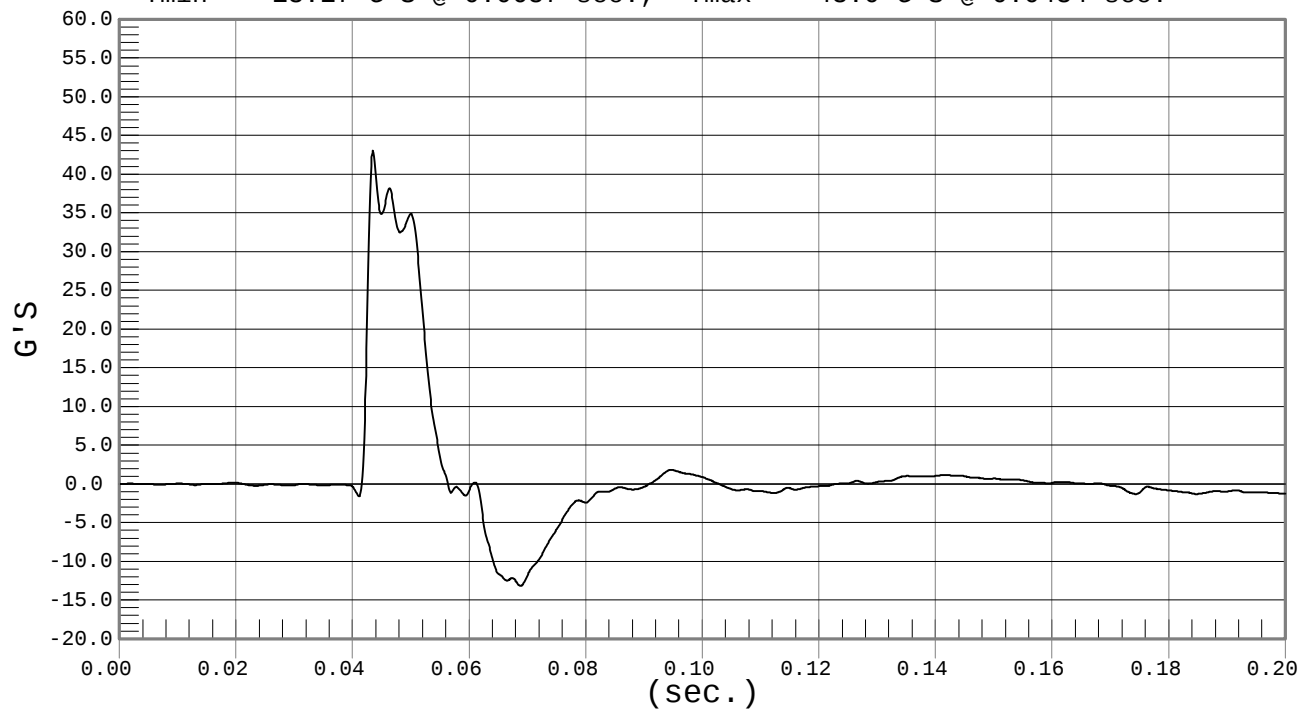


PELVIS ACCELERATION

Test Desc.: Pelvis Impact
Component: Dummy #020

Test Date: 06-22-05
Speed: 21.9 fps, 6.68 M/s

Ymin = -13.17 G'S @ 0.0687 sec., Ymax = 43.0 G'S @ 0.0434 sec.



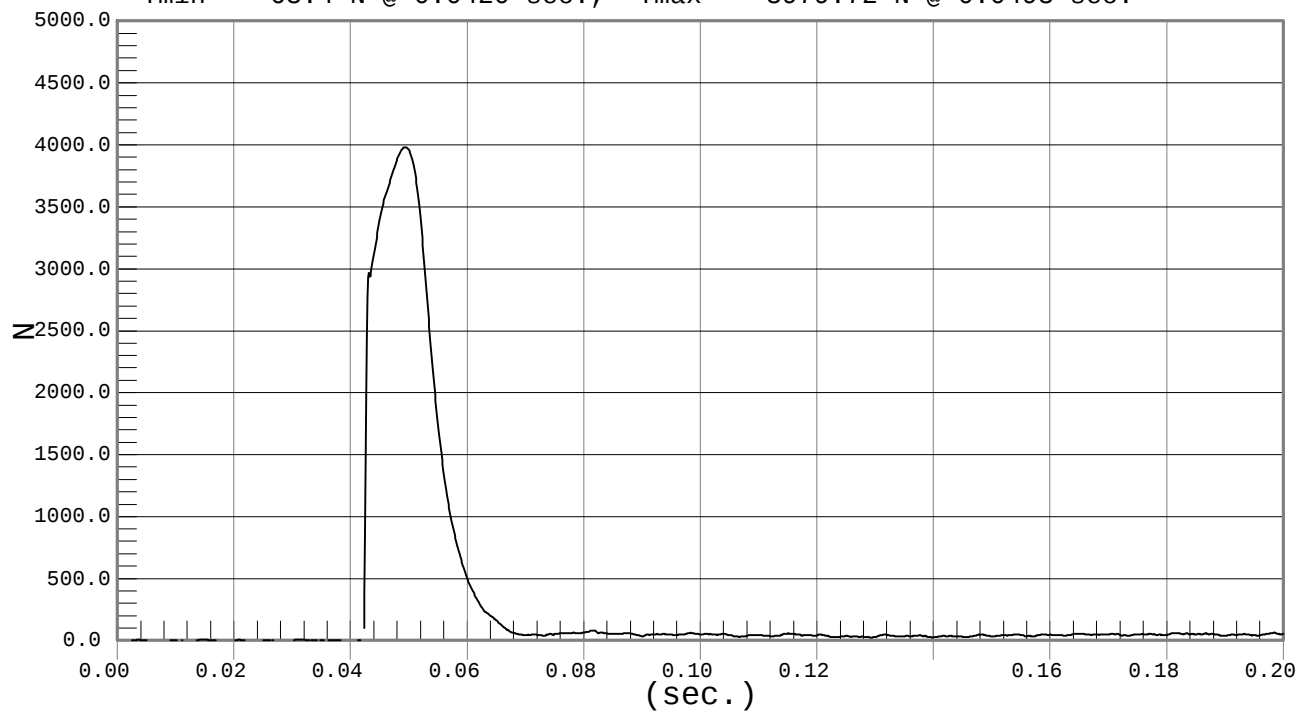


Test Desc.: Pelvis Impact
Component: Dummy #020

ACETABULUM FORCE

Test Date: 06-22-05
Speed: 21.9 fps, 6.68 M/s

Ymin = -63.4 N @ 0.0420 sec., Ymax = 3979.72 N @ 0.0493 sec.



CERTIFICATION DATA

Dummy Serial Number: 020

POST-TEST CALIBRATION

MGA RESEARCH CORPORATION
HEAD DROP TEST
SIDIIISD DUMMY

Date: 6/28/05
Dummy Serial Number: 020
Test Number: D051821

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	20.6° – 22.2°	21.6
Humidity	10% - 70%	44
Resultant Acceleration	125 - 145 g's	133
Peak Longitudinal Acceleration	(-15) – (+ 15) g's	8
Unimodal	<10%	YES

TEST MEETS SPECIFICATIONS

Technician: Jessica Hall

Approved By: David Winkelbauer

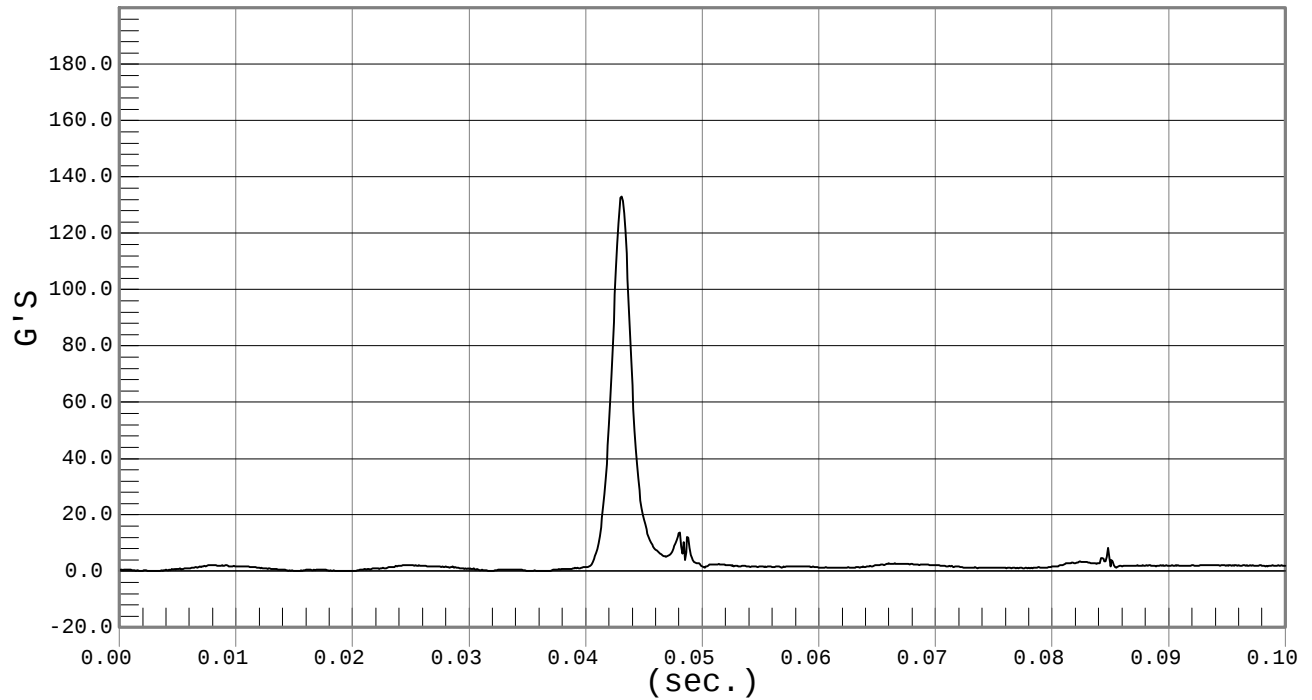


PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #020

Test Date: 06-28-05
Speed: 0.0 fps, 0.00 M/s

Ymin = .04 G'S @ 0.0030 sec., Ymax = 133.18 G'S @ 0.0430 sec.

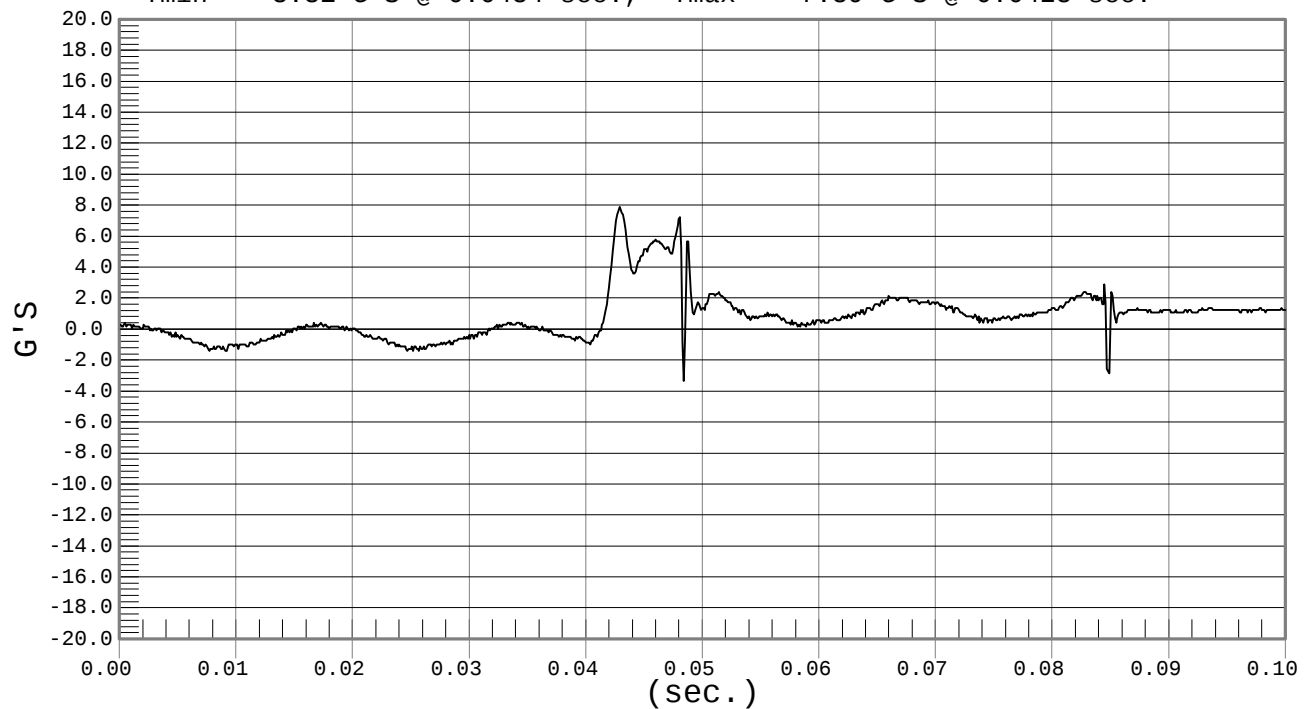


PEAK LONGITUDINAL ACCELARATION

Test Desc.: Head Drop
Component: Dummy #020

Test Date: 06-28-05
Speed: 0.0 fps, 0.00 M/s

Ymin = -3.31 G'S @ 0.0484 sec., Ymax = 7.89 G'S @ 0.0428 sec.



MGA RESEARCH CORPORATION
LATERAL NECK PENDULUM TEST
SIDIIISD DUMMY

Date: 6/28/05
Dummy Serial Number: 020
Test Number: D051822

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		20.6° – 22.2°	21.7
Humidity		10% - 70%	45
Impact Velocity (m/s)		5.51-5.63	5.63
Delta Velocity (m/s)	10 ms	2.20-2.80	2.54
	15 ms	3.40-4.10	3.78
	20 ms	4.50-5.40	5.04
	25 ms	5.50-6.10	5.78
	25-100 ms	5.20-6.20	5.81
Maximum D-Plane Rotation (deg)		74 - 79	75
Time of Maximum D-Plane Rotation		50-70	59
Maximum Occipital Condyle Moment during Rotation Interval (Nm)		(-45) – (-40)	-42
Time of Moment Decay to 0 Nm		113-123	113

TEST MEETS SPECIFICATIONS

Technician: Jessica Hall

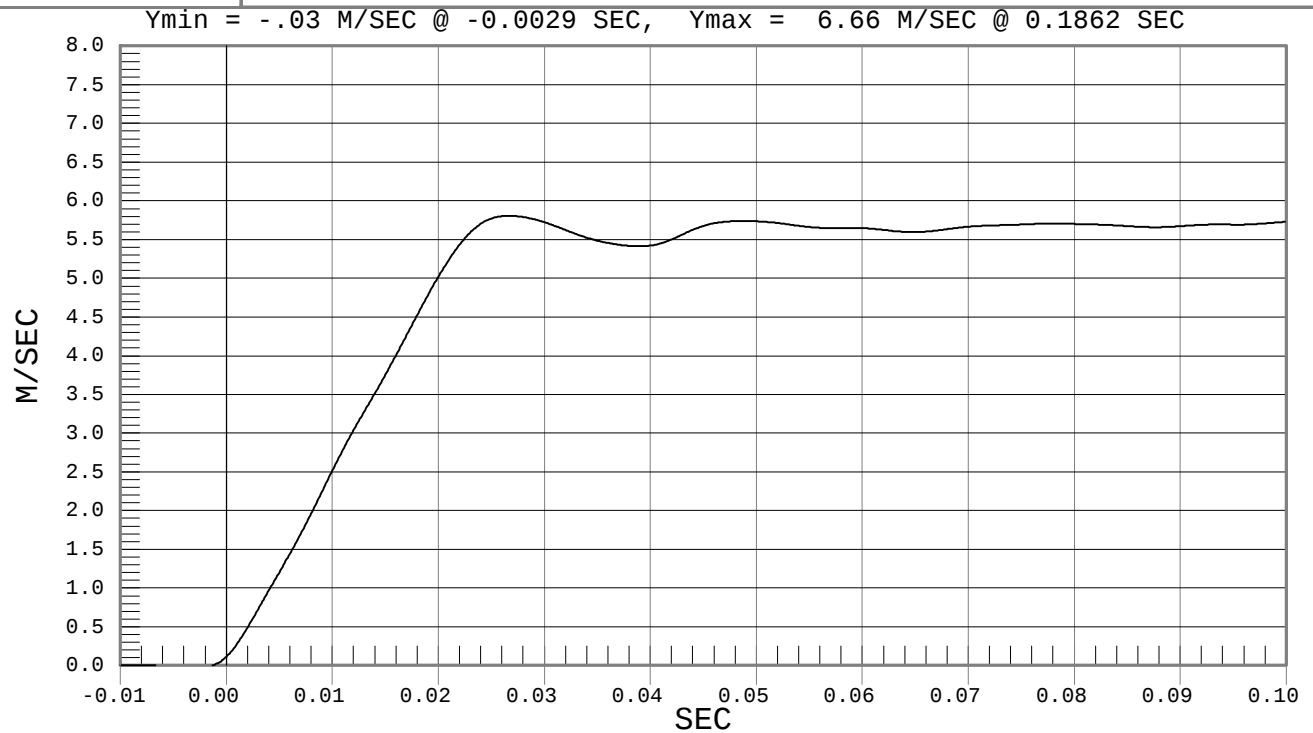
Approved By: David Winkelbauer



PENDULUM DECELERATION

Test Desc.: Neck Bending
Component: Dummy #020

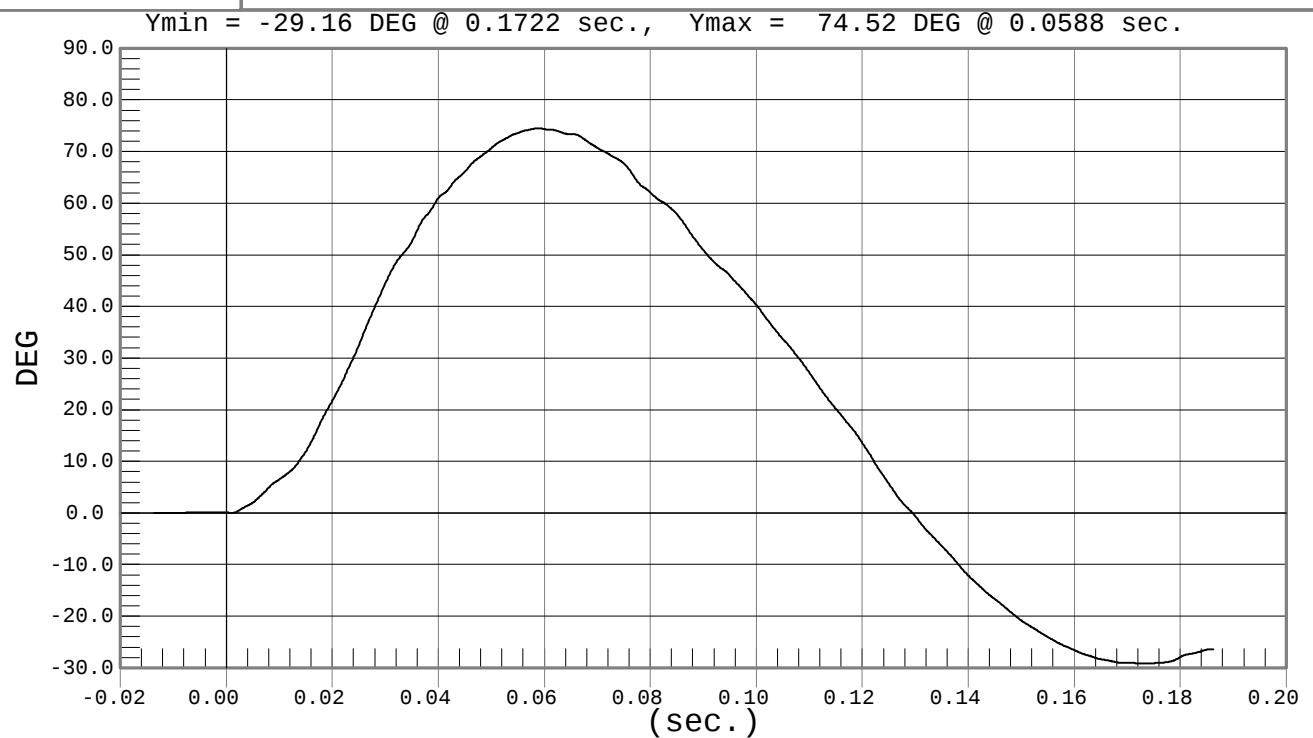
Test Date: 06-28-05
Speed: 18.5 fps, 5.63 M/s



FLEXION ANGLE

Test Desc.: Neck Bending
Component: Dummy #020

Test Date: 06-28-05
Speed: 18.5 fps, 5.63 M/s



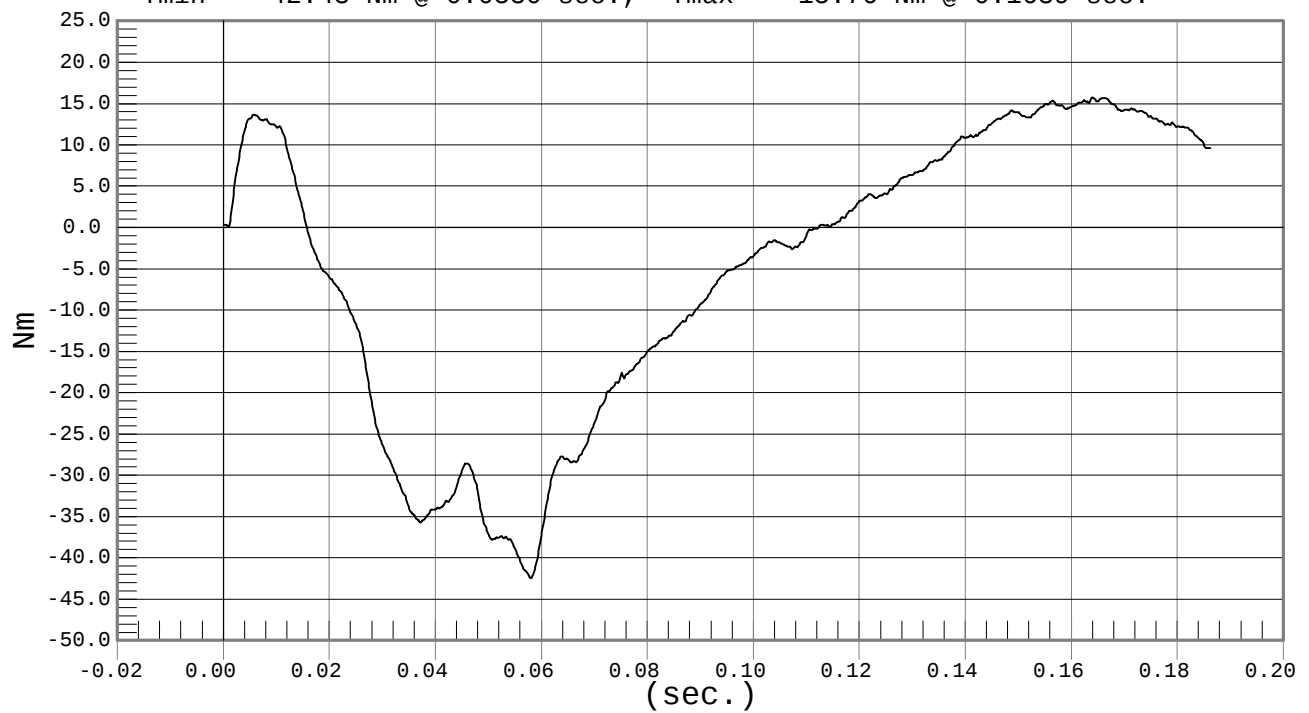


Test Desc.: Neck Bending
Component: Dummy #020

OCCIPITAL MOMENT

Test Date: 06-28-05
Speed: 18.5 fps, 5.63 M/s

Ymin = -42.43 Nm @ 0.0580 sec., Ymax = 15.76 Nm @ 0.1639 sec.



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
SIDIIISD DUMMY

Date: 6/30/05
Dummy Serial Number: 020
Test Number: D051823

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	20.6° – 22.2°	22.0
Humidity	10% - 70%	44
Impact Velocity	4.41 - 4.59 m/s	4.51
Maximum Probe Force	1.6 - 2.4 kN	2.1
Shoulder Displacement	27 - 39 mm	35

TEST MEETS SPECIFICATIONS

Technician: _____

Jessica Hall

Approved By: _____

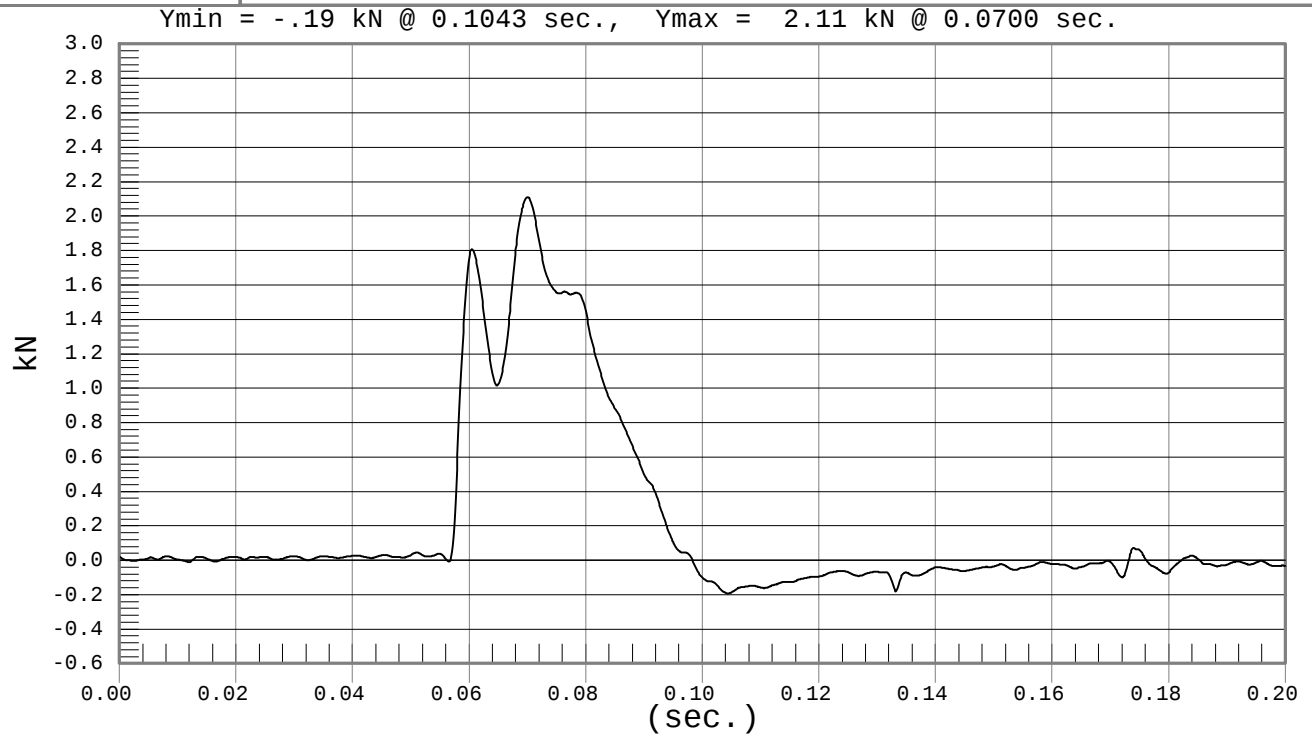
David Winkelbauer



PROBE FORCE

Test Desc.: Shoulder Impact
Component: Dummy #020

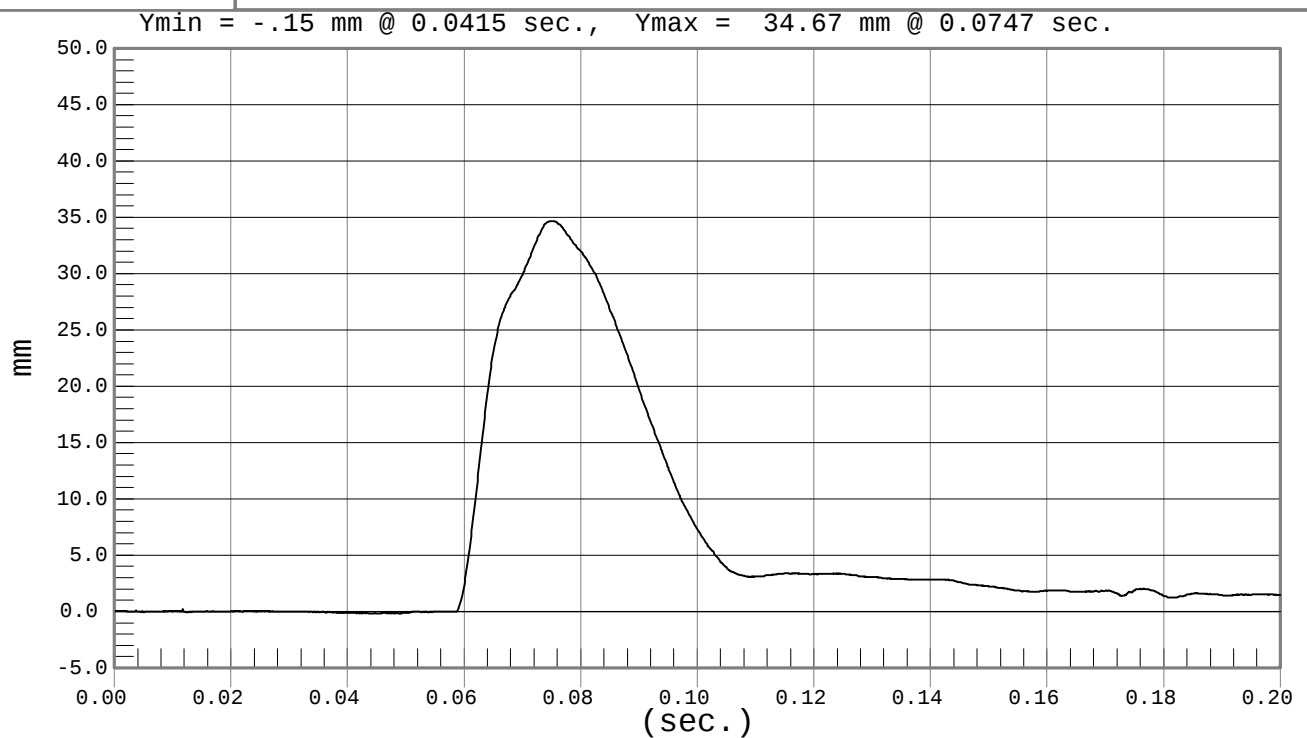
Test Date: 06-30-05
Speed: 14.8 fps, 4.51 M/s



SHOULDER DISPLACEMENT

Test Desc.: Shoulder Impact
Component: Dummy #020

Test Date: 06-30-05
Speed: 14.8 fps, 4.51 M/s



MGA RESEARCH CORPORATION
THORAX (WITH ARM) IMPACT TEST
SIDIIISD DUMMY

Date: 6/30/05
Dummy Serial Number: 02
Test Number: D051824

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	20.6° – 22.2°	22.0
Humidity	10% - 70%	44
Impact Velocity	6.57 - 6.84 m/s	6.72
Peak Probe Force	4.1 – 4.7 kN	4.4
Shoulder Displacement	30 - 42 mm	37
Upper Rib Displacement	23 - 35 mm	31
Middle Rib Displacement	29 - 44 mm	33
Lower Rib Displacement	33 - 40 mm	34
Upper Spine (T1) Y Acceleration	34 – 48 g's	38
Lower Spine (T12) Y Acceleration	30 - 38 g's	34

TEST MEETS SPECIFICATIONS

Technician: Jessica Hall

Approved By: David Winkelbauer

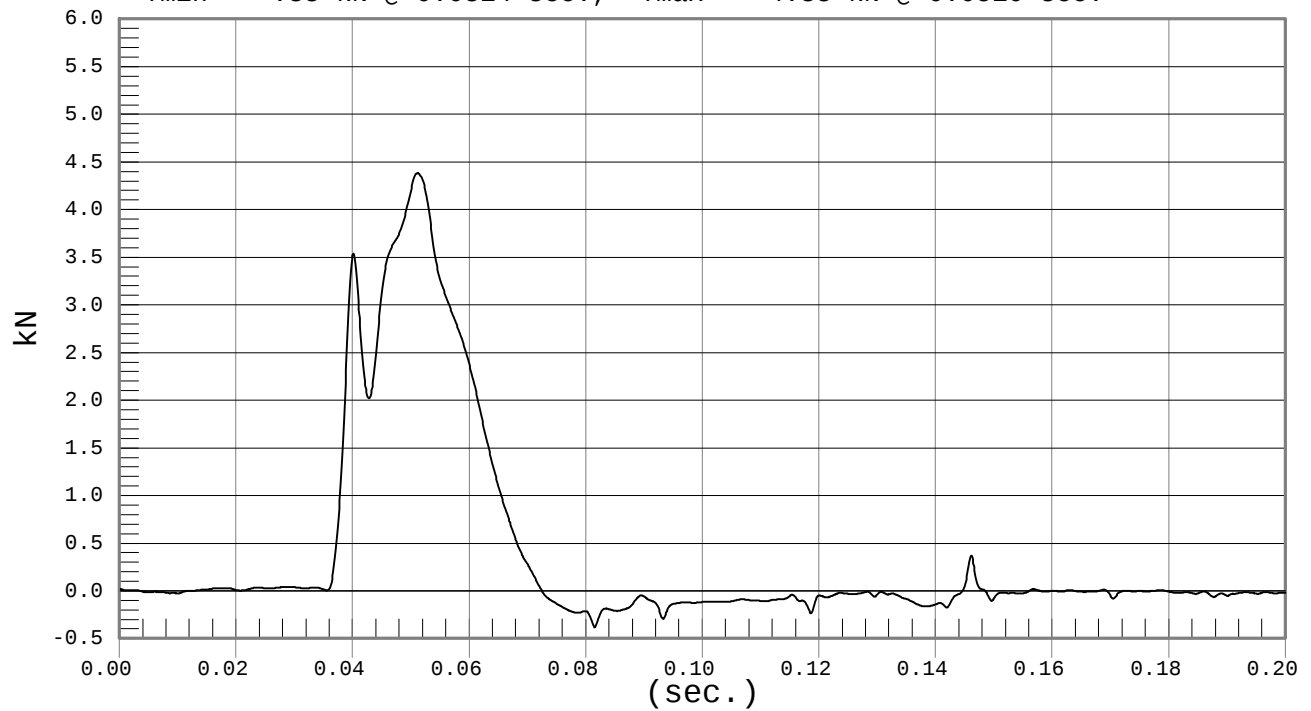


PROBE FORCE

Test Desc.: Thorax With Arm Impact
Component: Dummy #020

Test Date: 06-30-05
Speed: 22.0 fps, 6.72 M/s

Ymin = -.38 kN @ 0.0814 sec., Ymax = 4.38 kN @ 0.0510 sec.



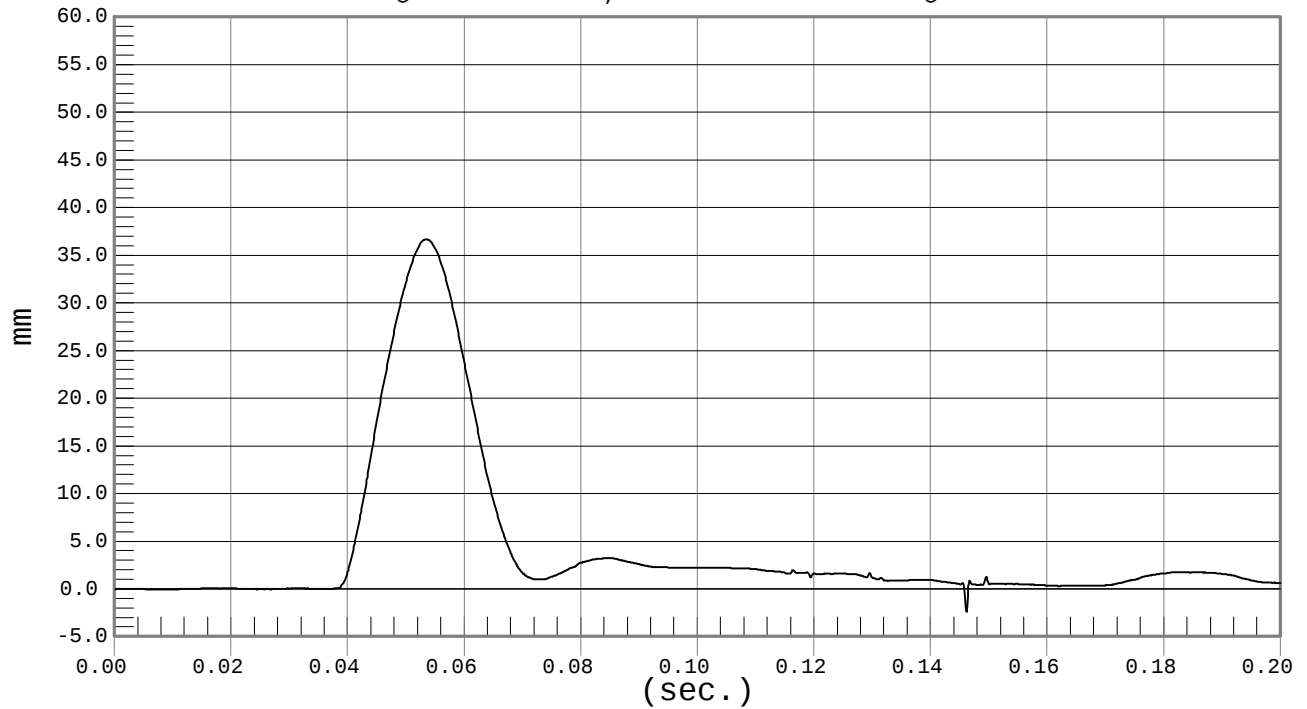


SHOULDER DISPLACEMENT

Test Desc.: Thorax With Arm Impact
Component: Dummy #020

Test Date: 06-30-05
Speed: 22.0 fps, 6.72 M/s

Ymin = -2.38 mm @ 0.1461 sec., Ymax = 36.68 mm @ 0.0534 sec.

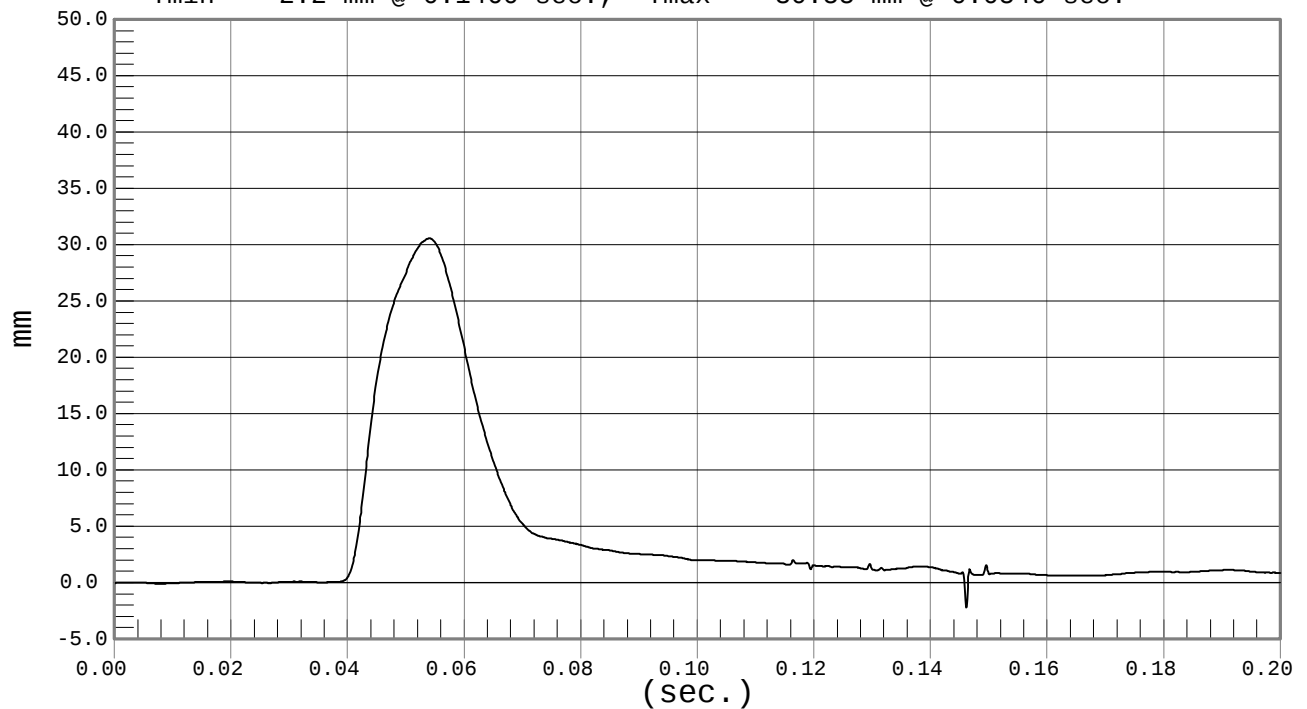


UPPER RIB DISPLACEMENT

Test Desc.: Thorax With Arm Impact
Component: Dummy #020

Test Date: 06-30-05
Speed: 22.0 fps, 6.72 M/s

Ymin = -2.2 mm @ 0.1460 sec., Ymax = 30.55 mm @ 0.0540 sec.

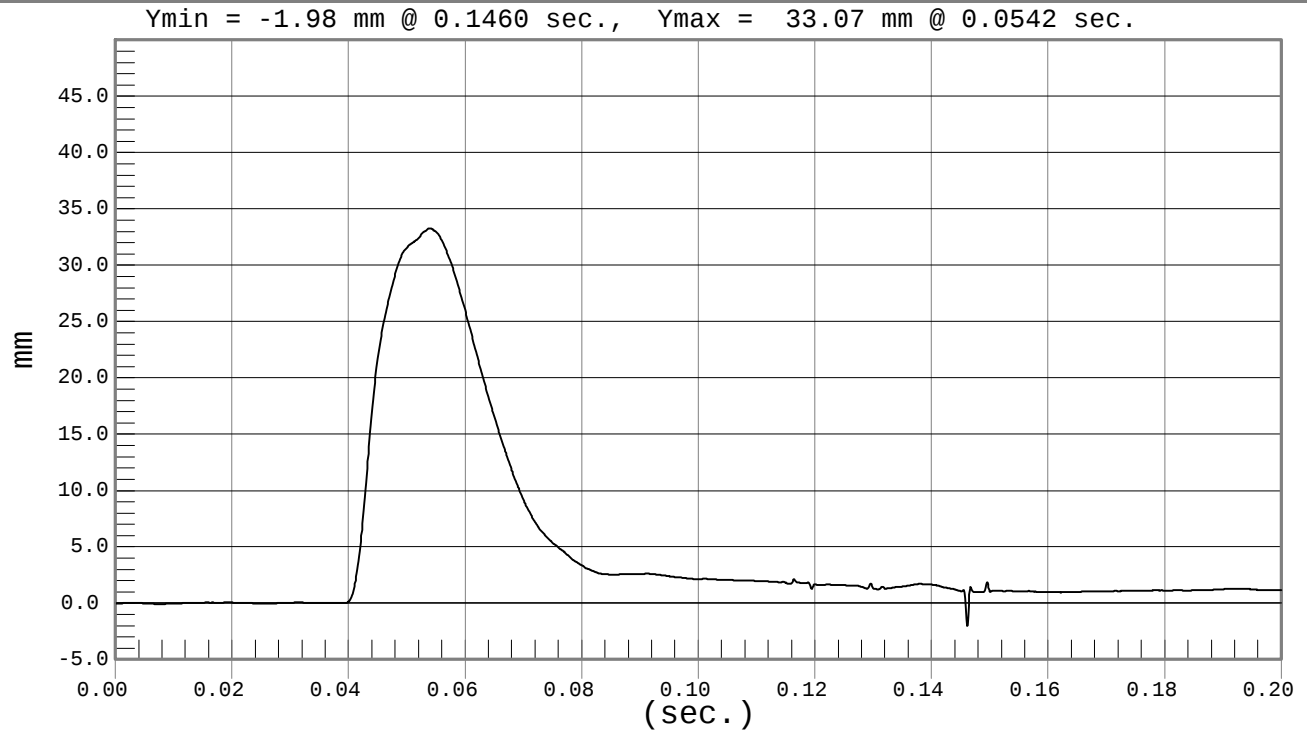




MIDDLE RIB DISPLACEMENT

Test Desc.: Thorax With Arm Impact
Component: Dummy #020

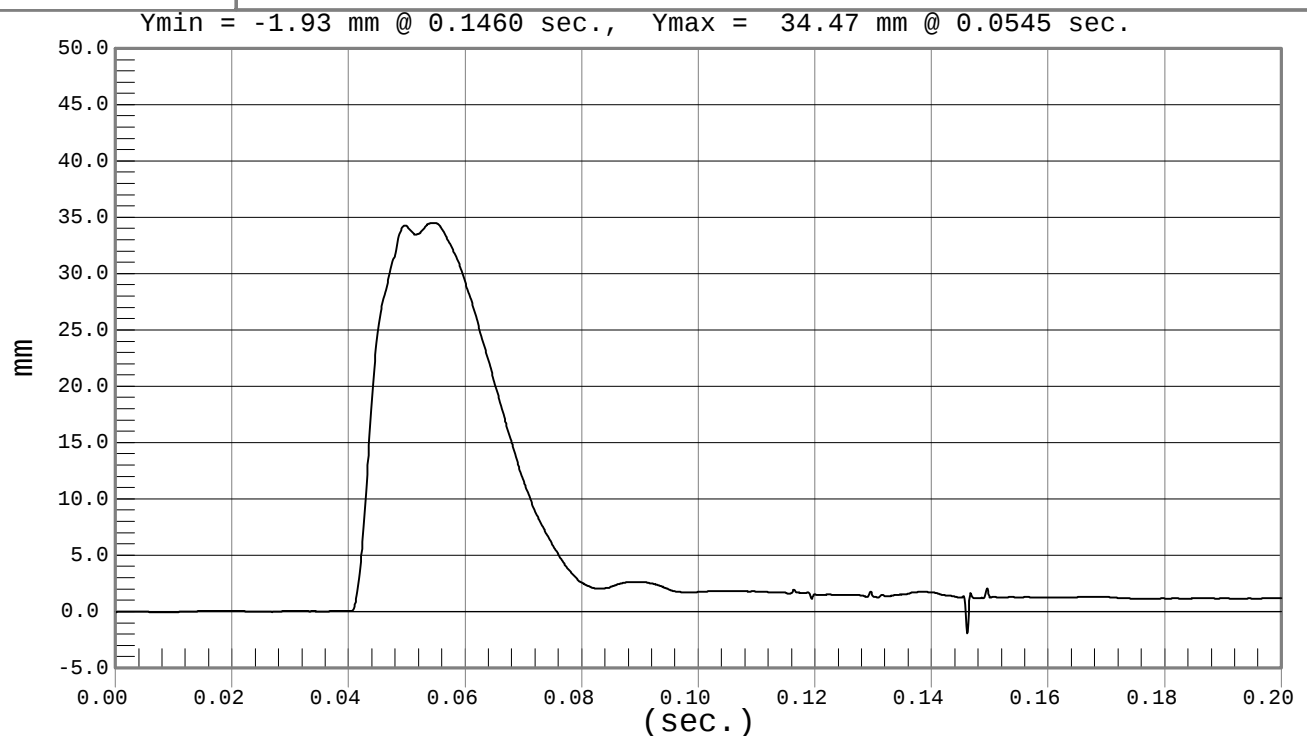
Test Date: 06-30-05
Speed: 22.0 fps, 6.72 M/s



LOWER RIB DISPLACEMENT

Test Desc.: Thorax With Arm Impact
Component: Dummy #020

Test Date: 06-30-05
Speed: 22.0 fps, 6.72 M/s



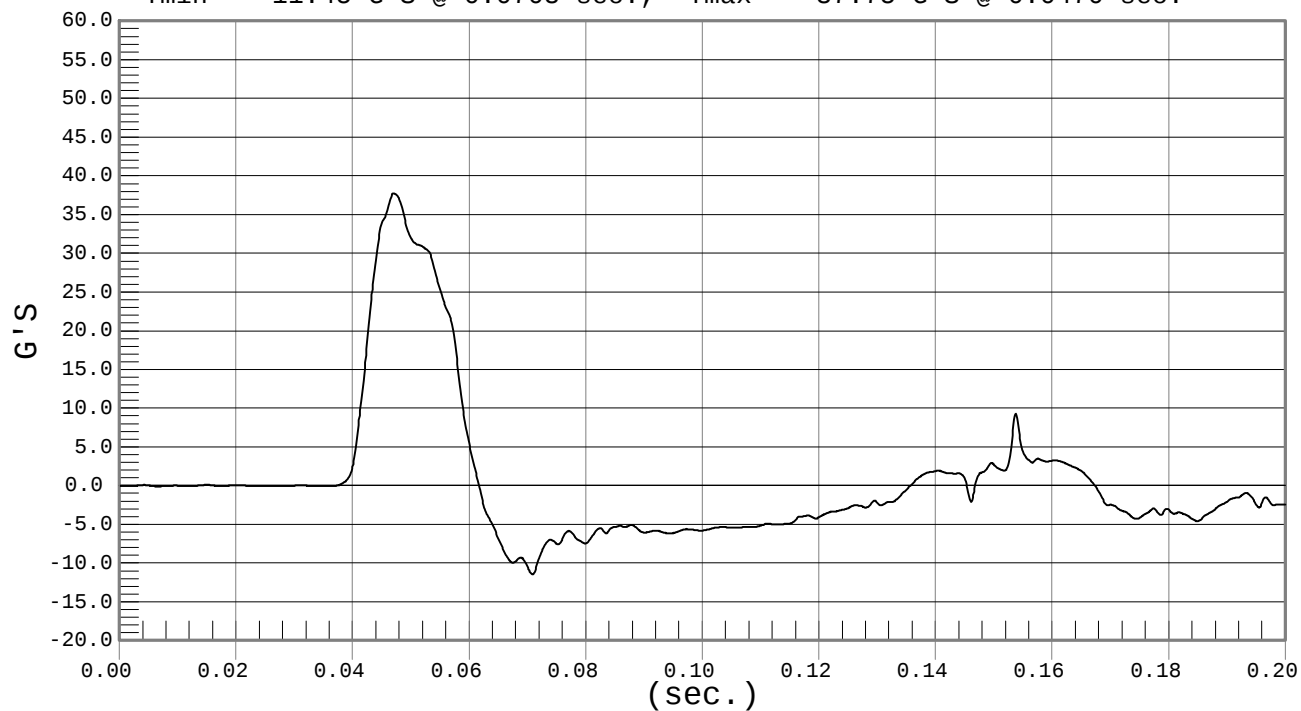


UPPER SPINE ACCELERATION

Test Desc.: Thorax With Arm Impact
Component: Dummy #020

Test Date: 06-30-05
Speed: 22.0 fps, 6.72 M/s

Ymin = -11.45 G'S @ 0.0708 sec., Ymax = 37.75 G'S @ 0.0470 sec.

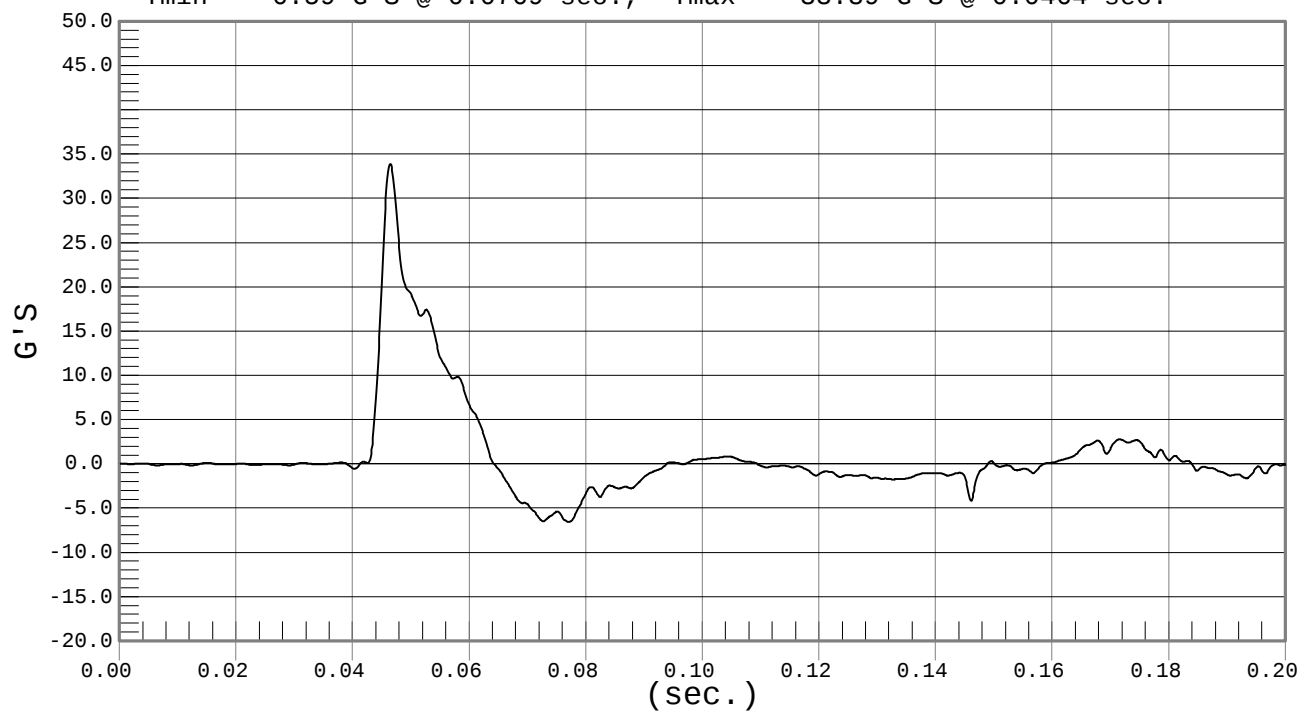


LOWER SPINE ACCELERATION

Test Desc.: Thorax With Arm Impact
Component: Dummy #020

Test Date: 06-30-05
Speed: 22.0 fps, 6.72 M/s

Ymin = -6.59 G'S @ 0.0769 sec., Ymax = 33.89 G'S @ 0.0464 sec.



MGA RESEARCH CORPORATION
THORAX (WITHOUT ARM) IMPACT TEST
SIDIIISD DUMMY

Date: 6/28/05
Dummy Serial Number: 020
Test Number: D051825

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	20.6° – 22.2°	21.2
Humidity	10% - 70%	43
Impact Velocity	4.20 - 4.40 m/s	4.31
Peak Probe Force	1.8 - 2.3 kN	2.2
Upper Rib Displacement	32 - 41 mm	35
Middle Rib Displacement	40 - 51 mm	40
Lower Rib Displacement	34 - 47 mm	42
Upper Spine (T1) Acceleration	13 - 18 g's	15
Lower Spine (T12) Acceleration	8 – 13 g's	9

TEST MEETS SPECIFICATIONS

Technician: Jessica Hall

Approved By: David Winkelbauer

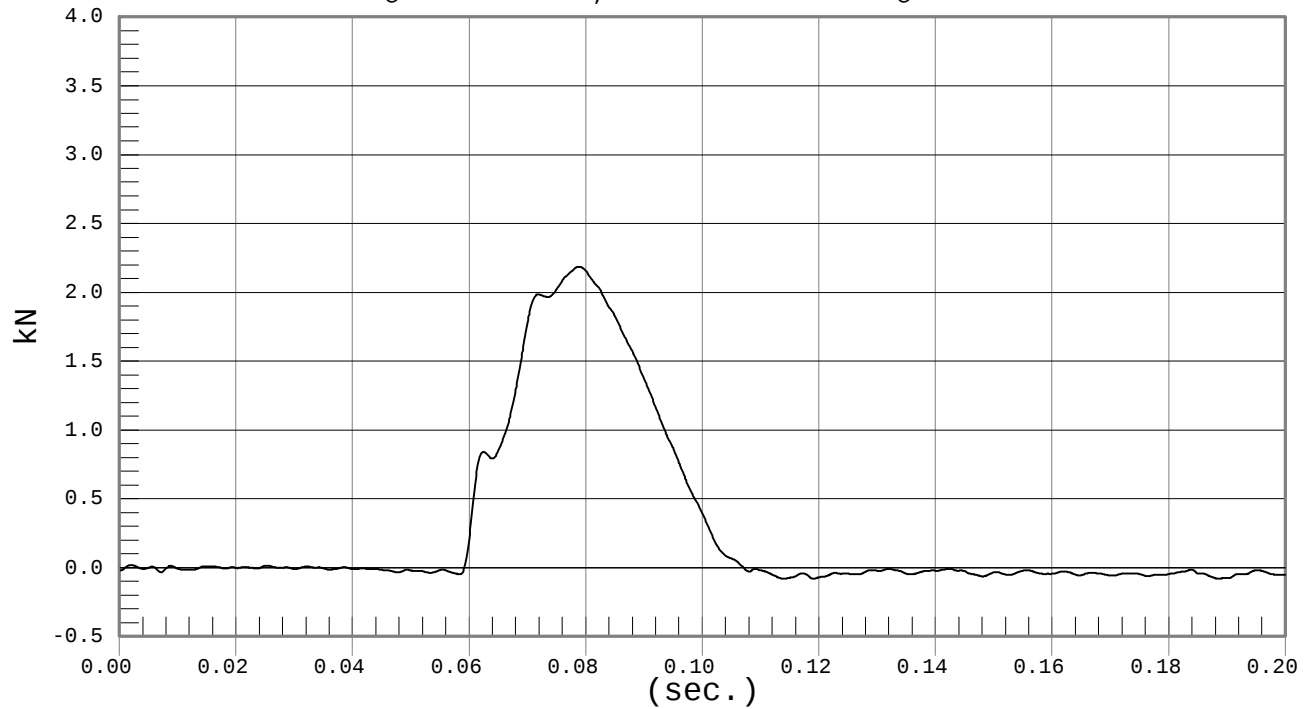


PROBE FORCE

Test Desc.: Thorax Without Arm
Component: Dummy #020

Test Date: 06-28-05
Speed: 14.1 fps, 4.31 M/s

Ymin = -.08 kN @ 0.1885 sec., Ymax = 2.19 kN @ 0.0788 sec.

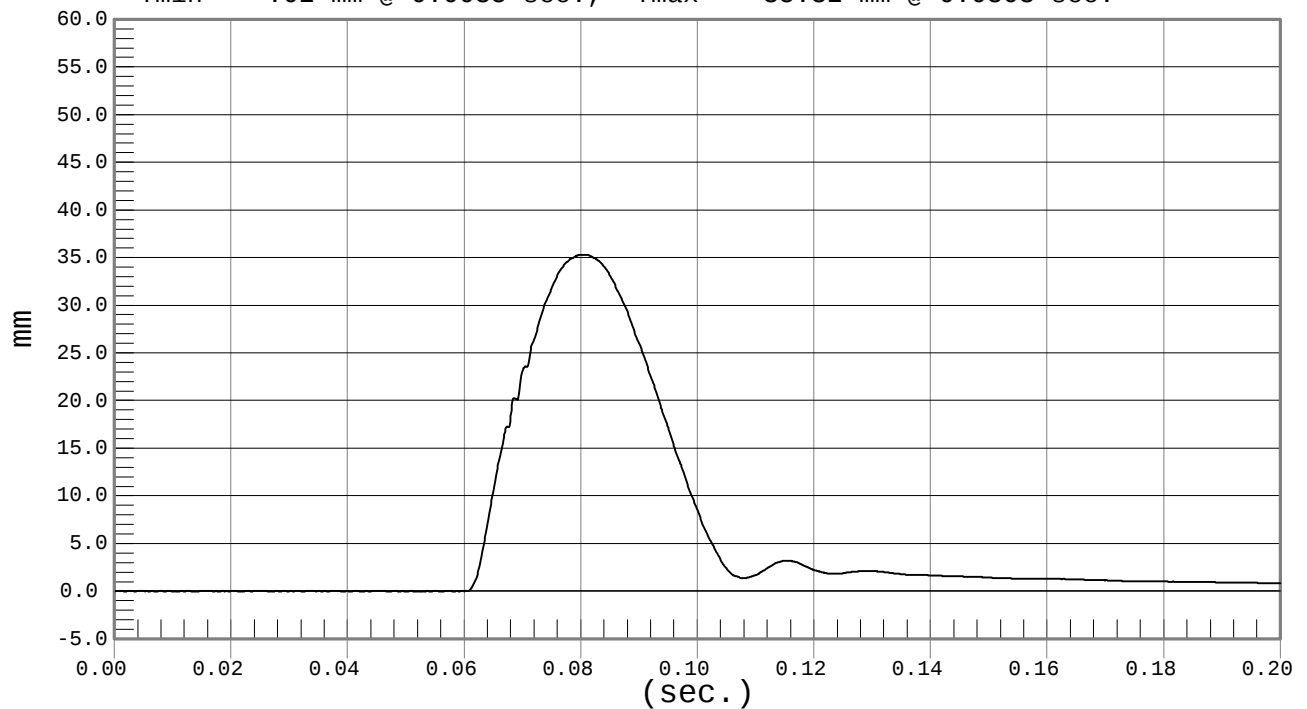


UPPER RIB DISPLACEMENT

Test Desc.: Thorax Without Arm
Component: Dummy #020

Test Date: 06-28-05
Speed: 14.1 fps, 4.31 M/s

Ymin = -.02 mm @ 0.0085 sec., Ymax = 35.32 mm @ 0.0803 sec.



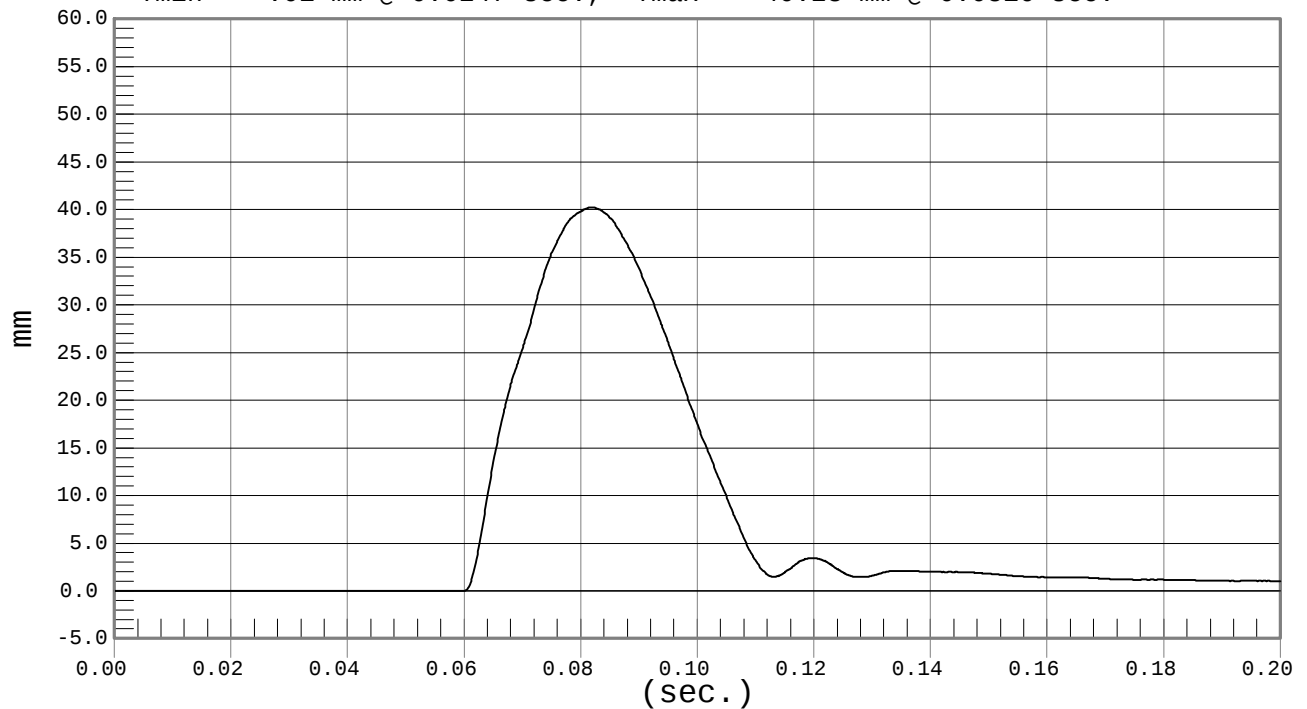


MIDDLE RIB DISPLACEMENT

Test Desc.: Thorax Without Arm
Component: Dummy #020

Test Date: 06-28-05
Speed: 14.1 fps, 4.31 M/s

Ymin = -.01 mm @ 0.0247 sec., Ymax = 40.23 mm @ 0.0816 sec.

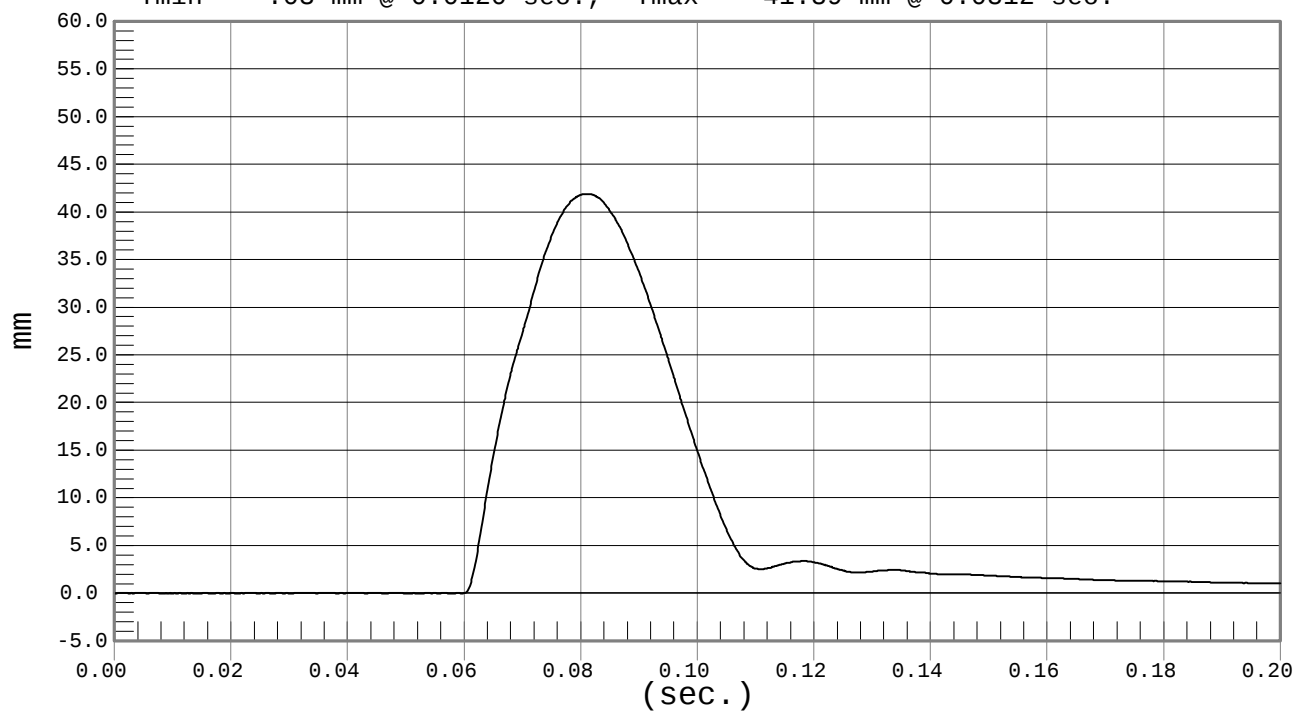


LOWER RIB DISPLACEMENT

Test Desc.: Thorax Without Arm
Component: Dummy #020

Test Date: 06-28-05
Speed: 14.1 fps, 4.31 M/s

Ymin = -.03 mm @ 0.0120 sec., Ymax = 41.89 mm @ 0.0812 sec.



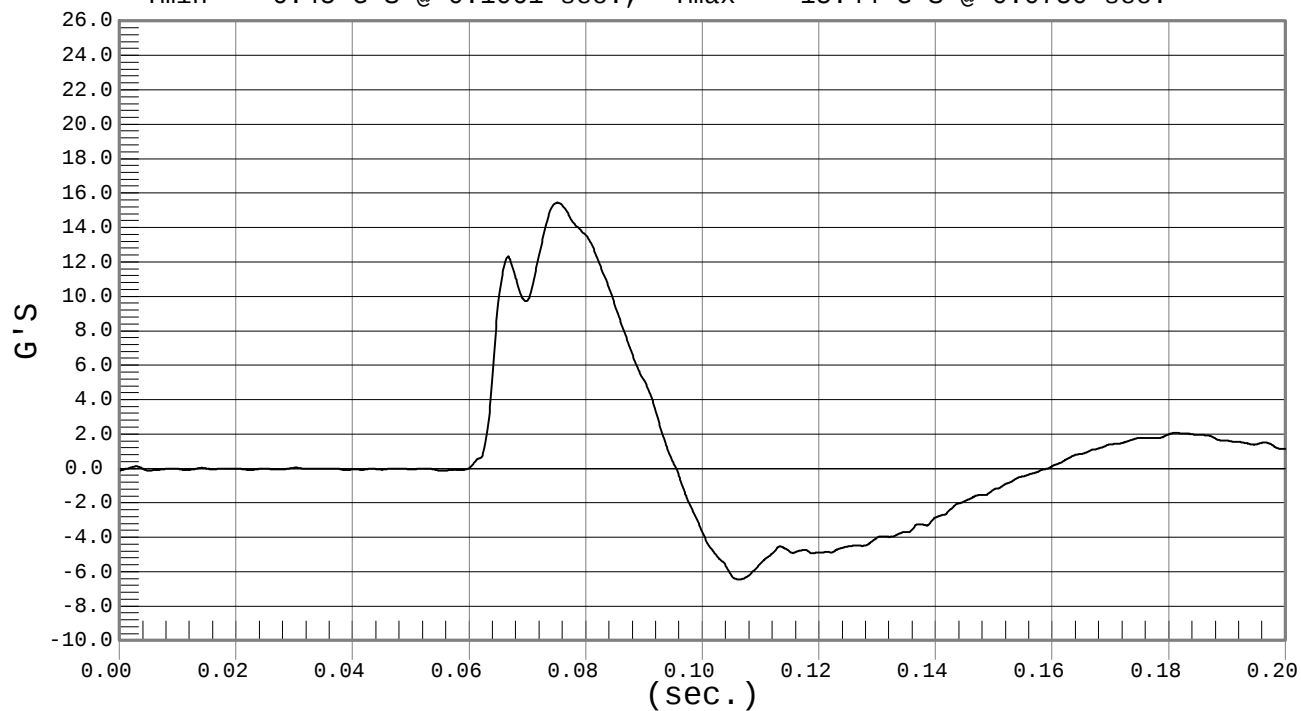


UPPER SPINE ACCELERATION

Test Desc.: Thorax Without Arm
Component: Dummy #020

Test Date: 06-28-05
Speed: 14.1 fps, 4.31 M/s

Ymin = -6.45 G'S @ 0.1061 sec., Ymax = 15.44 G'S @ 0.0750 sec.

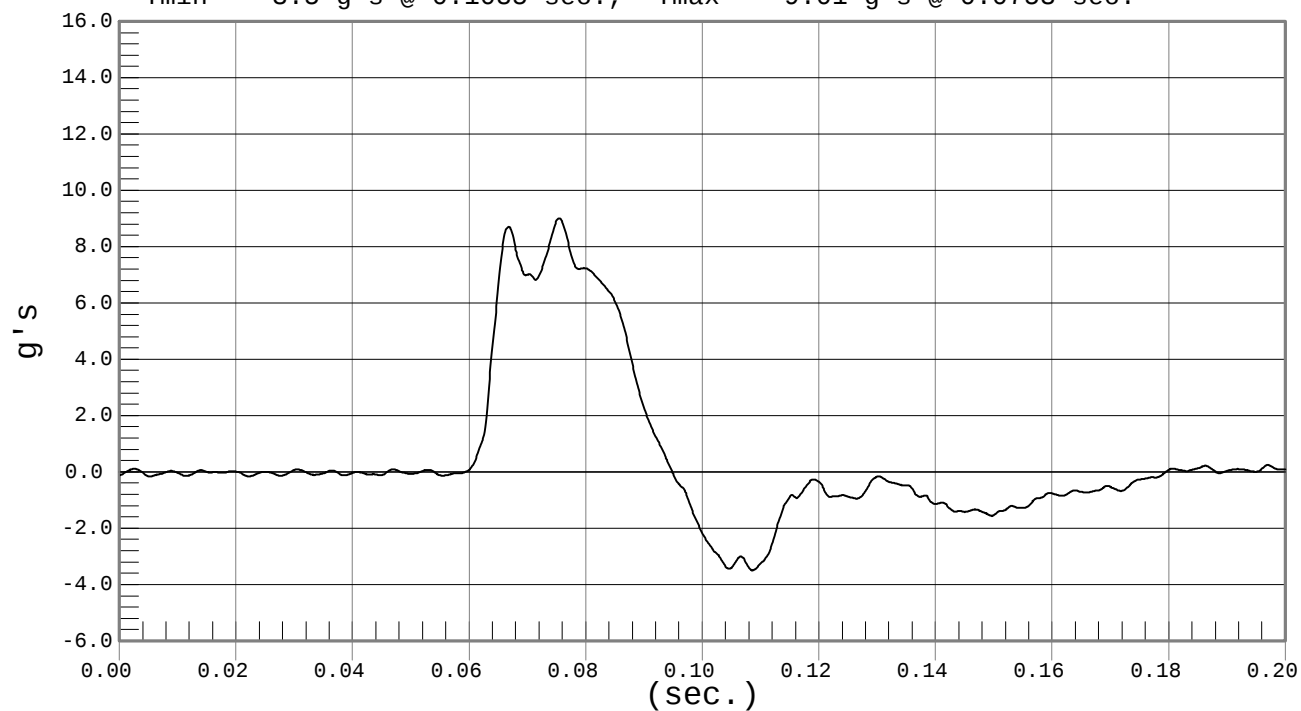


LOWER SPINE ACCELERATION

Test Desc.: Thorax Without Arm
Component: Dummy #020

Test Date: 06-28-05
Speed: 14.1 fps, 4.31 M/s

Ymin = -3.5 g's @ 0.1085 sec., Ymax = 9.01 g's @ 0.0753 sec.



MGA RESEARCH CORPORATION
ABDOMINAL IMPACT TEST
SIDIIISD DUMMY

Date: 6/28/05
Dummy Serial Number: 020
Test Number: D051826

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	20.6° – 22.2°	21.4
Humidity	10% - 70%	45
Impact Velocity	4.41 - 4.59 m/s	4.48
Probe Force	1.3 - 1.9 kN	1.9
Upper Rib Displacement	44 - 55 mm	44
Lower Rib Displacement	44 - 56 mm	44
Upper Spine (T1) Y Acceleration	5 - 9 g's	7
Lower Spine (T12) Y Acceleration	9 - 13 g's	13

TEST MEETS SPECIFICATIONS

Technician: _____

Jessica Hall

Approved By: _____

David Winkelbauer

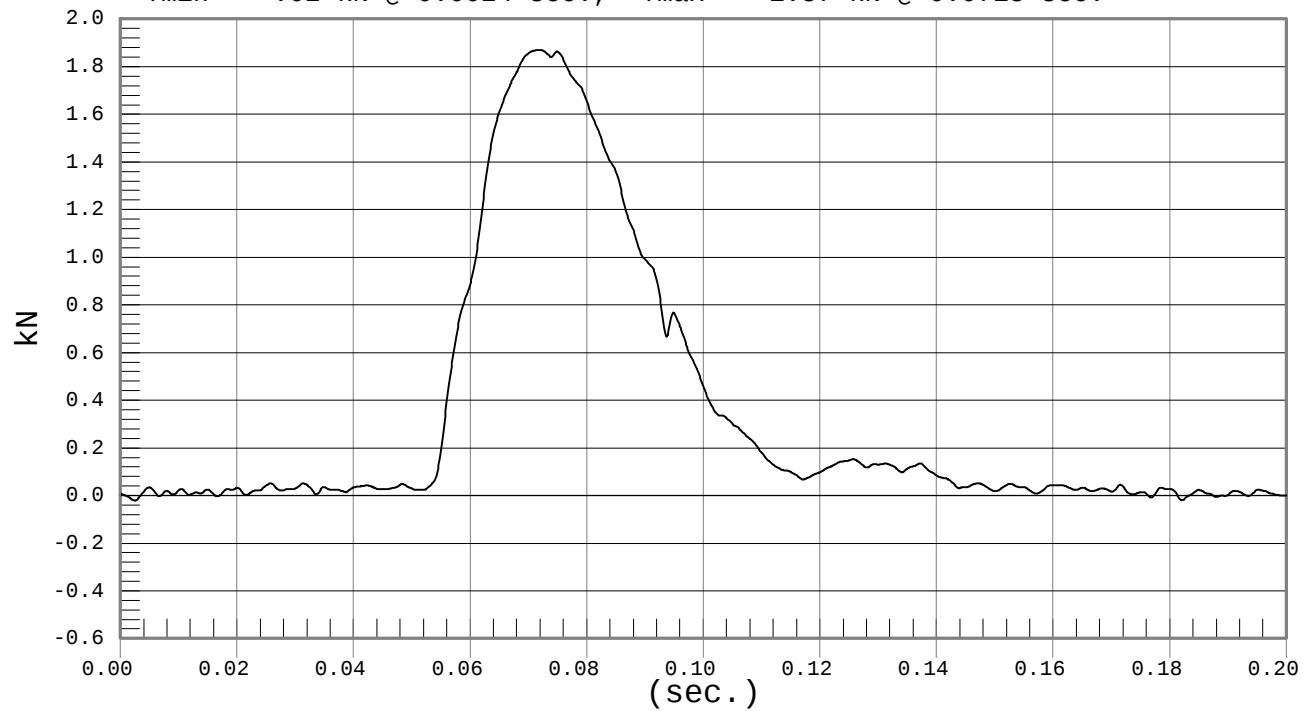


PROBE FORCE

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 06-28-05
Speed: 14.7 fps, 4.48 M/s

Ymin = -.02 kN @ 0.0024 sec., Ymax = 1.87 kN @ 0.0718 sec.



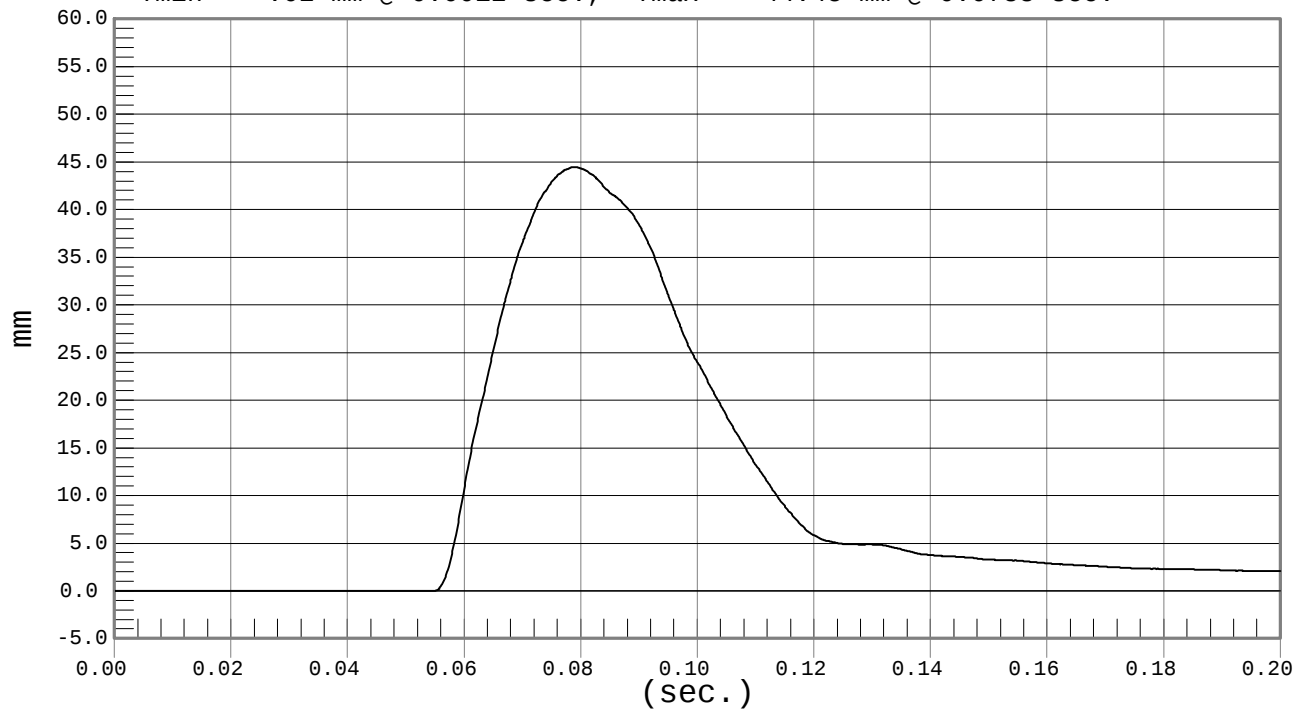


UPPER RIB DISPLACEMENT

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 06-28-05
Speed: 14.7 fps, 4.48 M/s

Ymin = -.02 mm @ 0.0012 sec., Ymax = 44.45 mm @ 0.0788 sec.

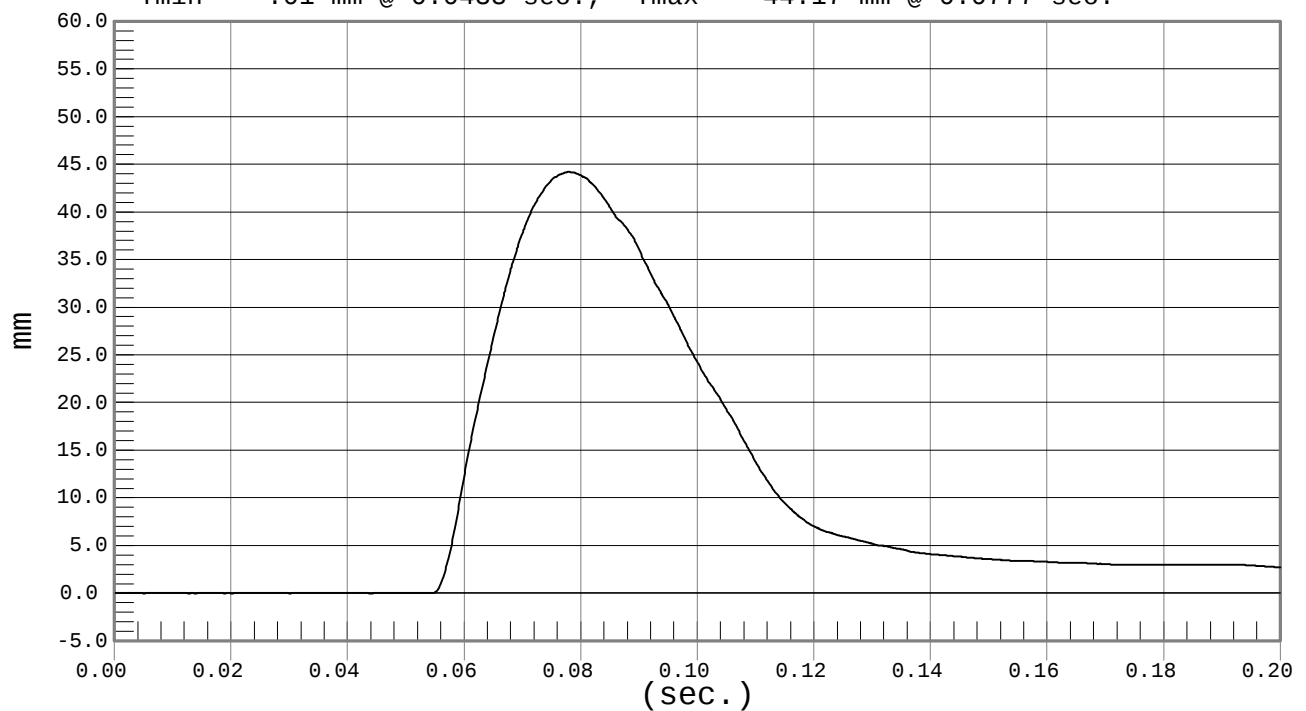


LOWER RIB DISPLACEMENT

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 06-28-05
Speed: 14.7 fps, 4.48 M/s

Ymin = -.01 mm @ 0.0438 sec., Ymax = 44.17 mm @ 0.0777 sec.



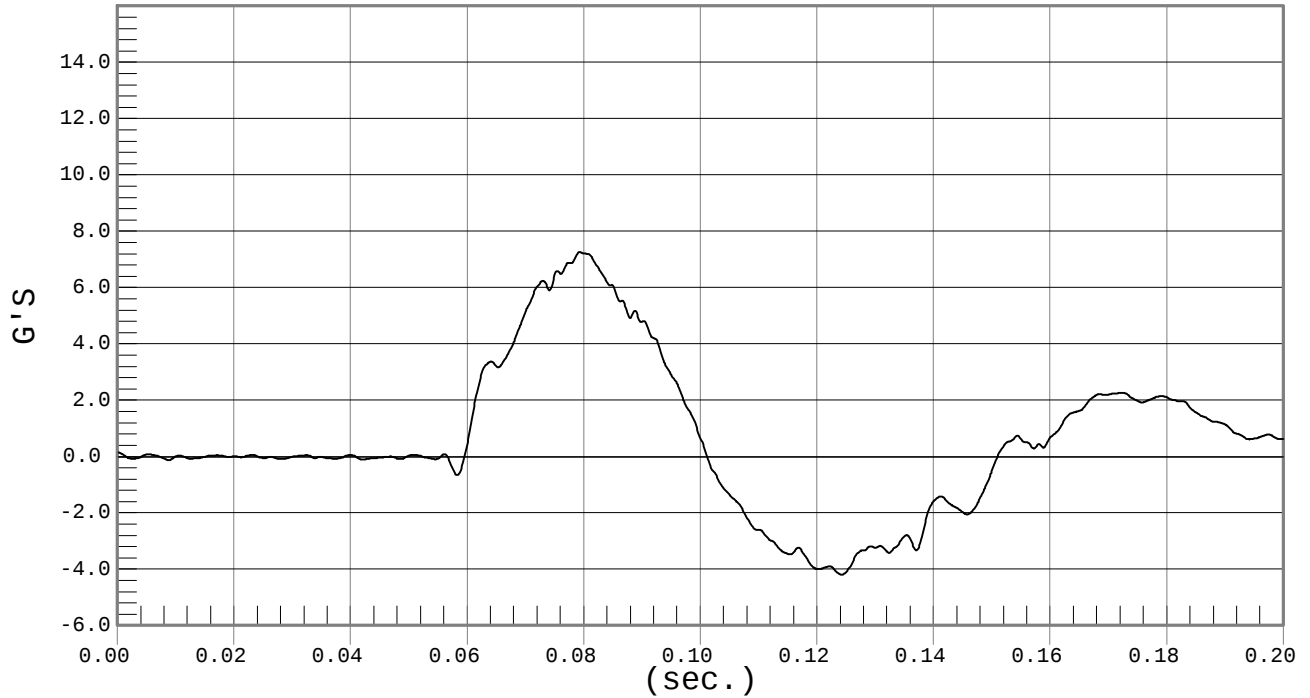


UPPER SPINE ACCELERATION

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 06-28-05
Speed: 14.7 fps, 4.48 M/s

Ymin = -4.2 G'S @ 0.1241 sec., Ymax = 7.27 G'S @ 0.0792 sec.

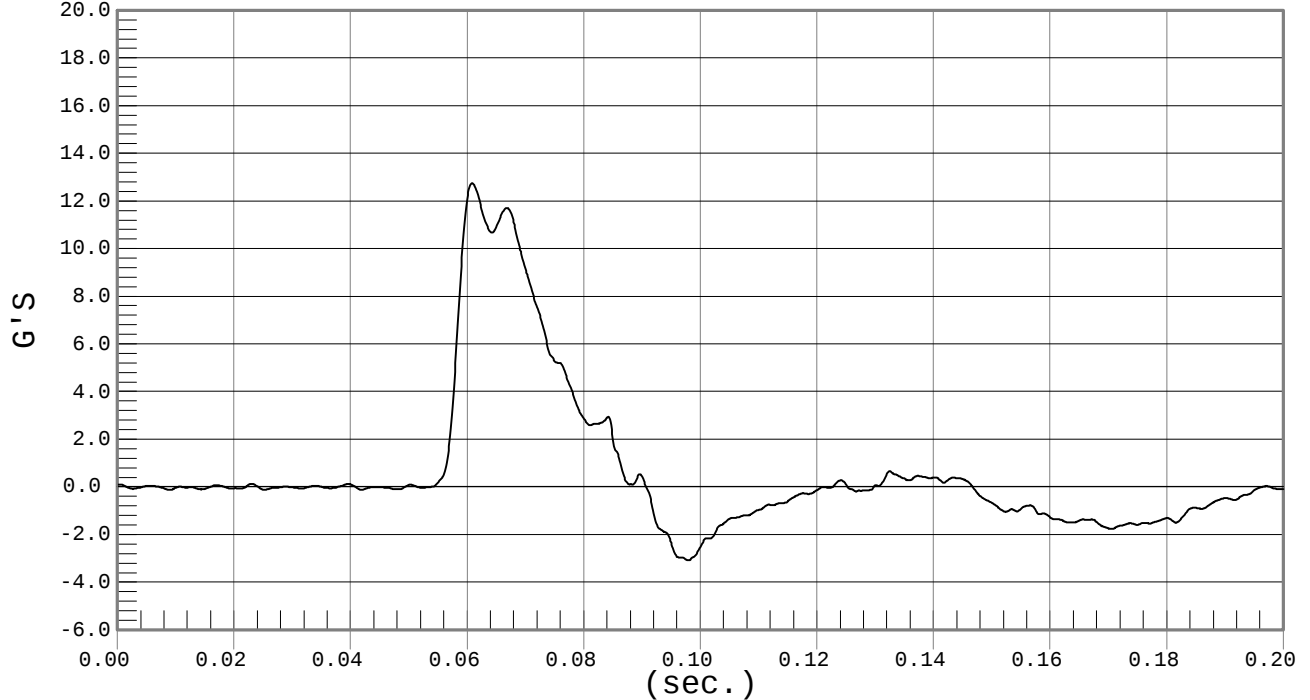


LOWER SPINE ACCELERATION

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 06-28-05
Speed: 14.7 fps, 4.48 M/s

Ymin = -3.08 G'S @ 0.0979 sec., Ymax = 12.73 G'S @ 0.0607 sec.



MGA RESEARCH CORPORATION
PELVIS IMPACT TEST
SIDIIsD DUMMY

Date: 6/28/05
Dummy Serial Number: 020
Test Number: D051827

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	20.6° – 22.2°	21.7
Humidity	10% - 70%	44
Impact Velocity	6.60 - 6.80 m/s	6.70
Peak Impactor Acceleration	40 – 48 g's	40
Pelvis Y Acceleration	40 – 48 g's	40
Peak Pelvis Acetabulum Force	3803 – 4505 N	3982

TEST MEETS SPECIFICATIONS

Technician: _____

Jessica Hall

Approved By: _____

David Winkelbauer

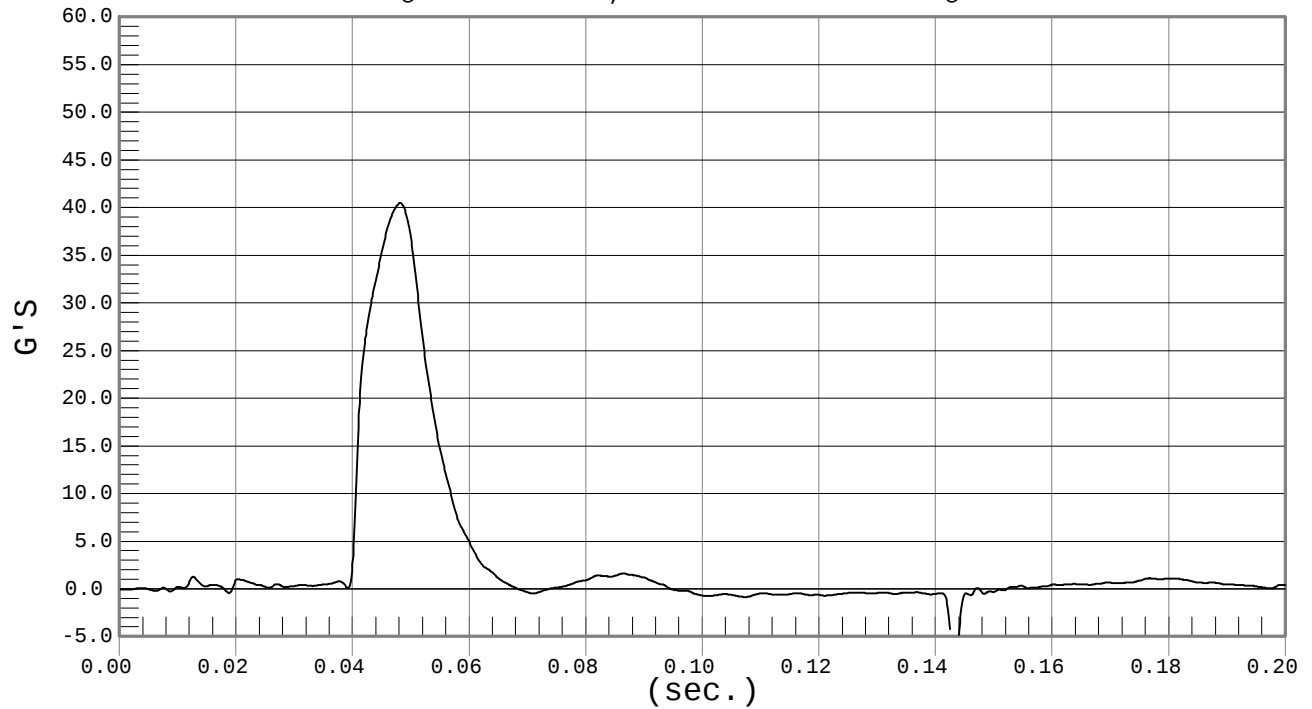


IMPACTOR ACCELERATION

Test Desc.: Pelvis Impact
Component: Dummy #020

Test Date: 06-28-05
Speed: 22.0 fps, 6.70 M/s

Ymin = -9.3 G'S @ 0.1432 sec., Ymax = 40.49 G'S @ 0.0481 sec.

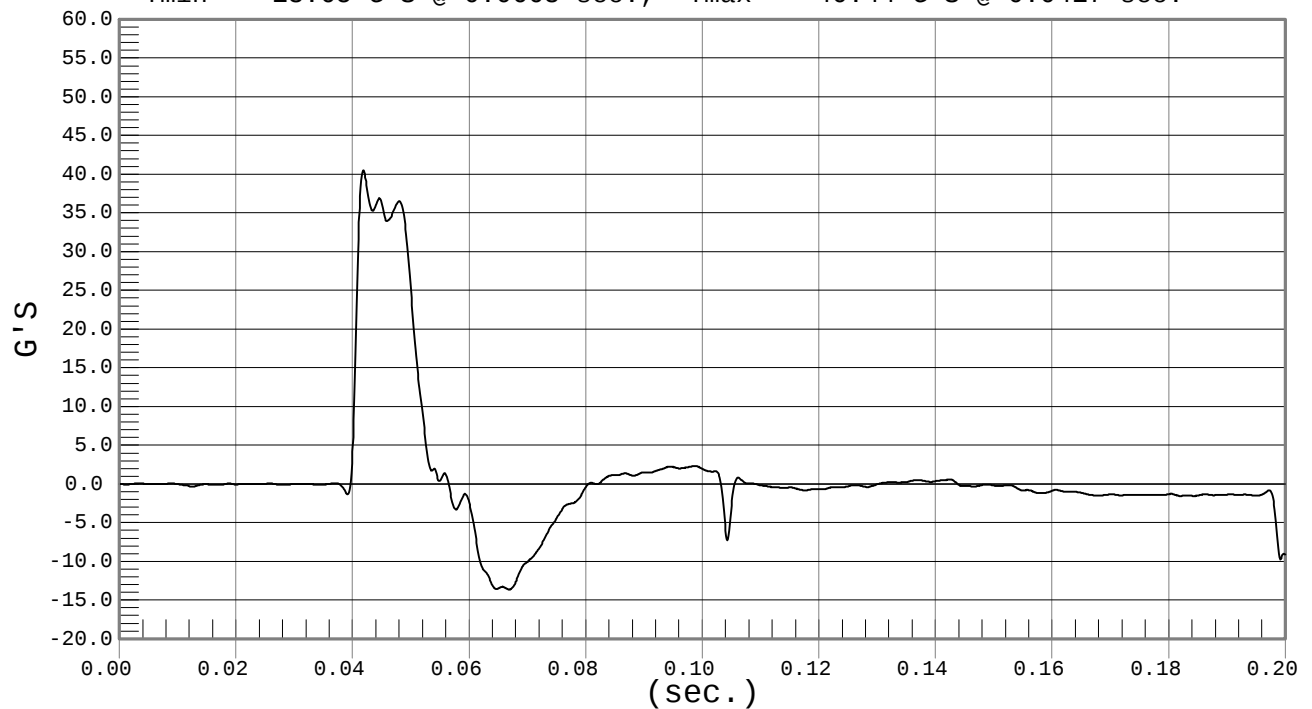


PELVIS ACCELERATION

Test Desc.: Pelvis Impact
Component: Dummy #020

Test Date: 06-28-05
Speed: 22.0 fps, 6.70 M/s

Ymin = -13.65 G'S @ 0.0668 sec., Ymax = 40.44 G'S @ 0.0417 sec.



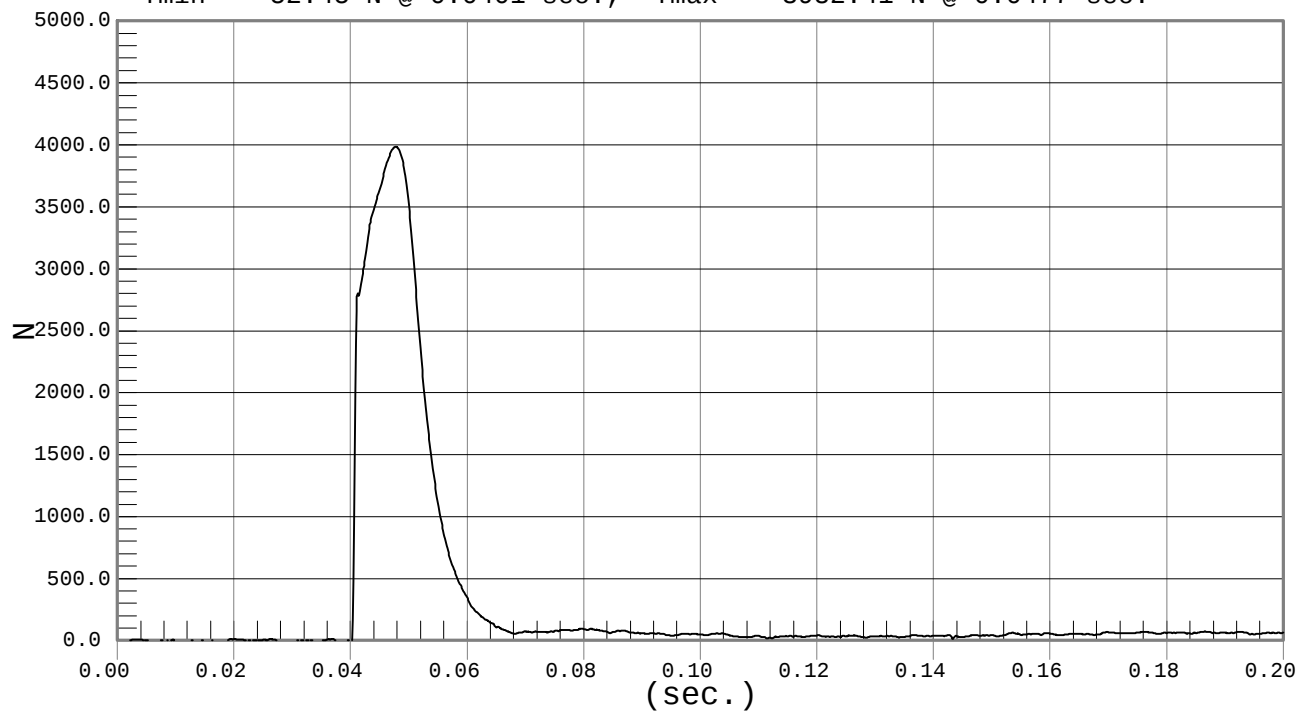


ACETABULUM FORCE

Component: Dummy #020

Speed: 22.0 fps, 6.70 M/s

Ymin = -52.45 N @ 0.0401 sec., Ymax = 3982.41 N @ 0.0477 sec.



MGA RESEARCH CORPORATION
ILIAC IMPACT TEST
SIDIIISD DUMMY

Date: 6/28/05
Dummy Serial Number: 020
Test Number: D051828

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	20.6° – 22.2°	21.4
Humidity	10% - 70%	45
Impact Velocity	4.20 – 4.40 m/s	4.39
Peak Impactor Acceleration	41 – 47 g's	41
Pelvis Y Acceleration	32 – 40 g's	39
Peak Pelvis Iliac Force	4841 – 5491 N	5007

TEST MEETS SPECIFICATIONS

Technician: Jessica Hall

Approved By: David Winkelbauer

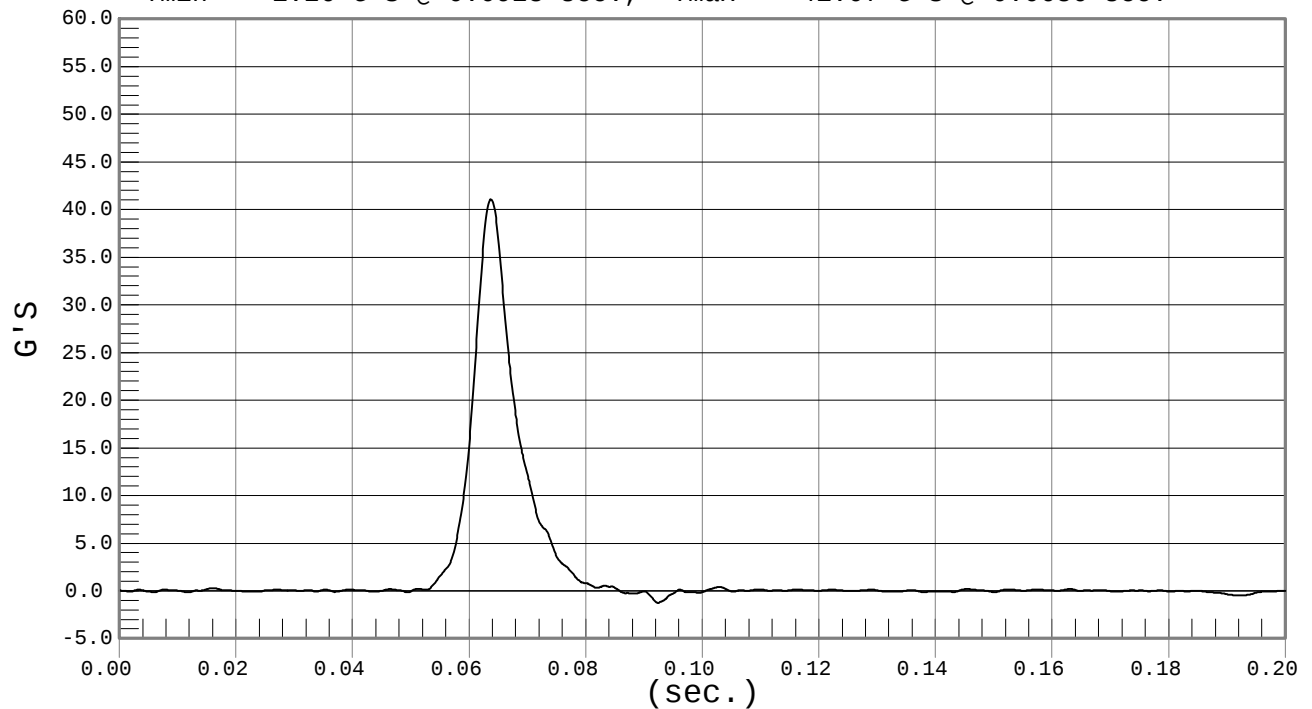


IMPACTOR ACCELERATION

Test Desc.: Iliac Impact
Component: Dummy #020

Test Date: 06-28-05
Speed: 14.4 fps, 4.39 M/s

Ymin = -1.26 G'S @ 0.0923 sec., Ymax = 41.07 G'S @ 0.0636 sec.

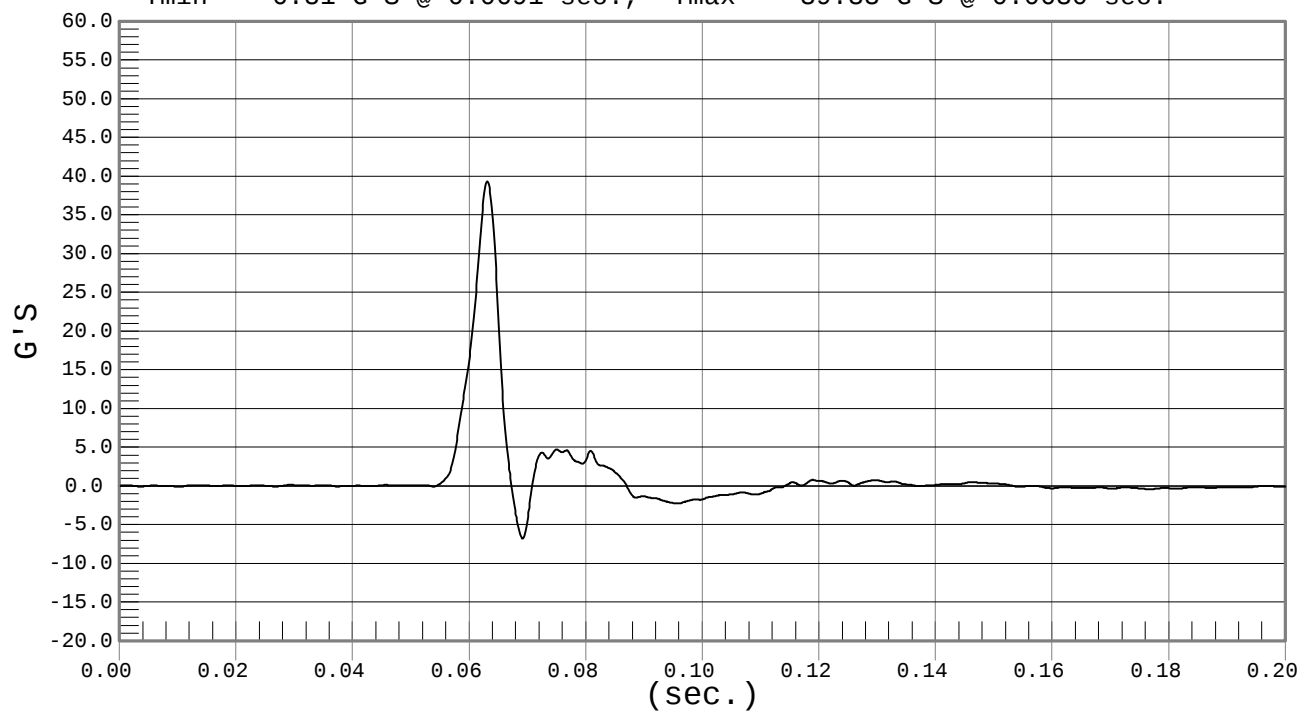


PELVIS ACCELERATION

Test Desc.: Iliac Impact
Component: Dummy #020

Test Date: 06-28-05
Speed: 14.4 fps, 4.39 M/s

Ymin = -6.81 G'S @ 0.0691 sec., Ymax = 39.33 G'S @ 0.0630 sec.



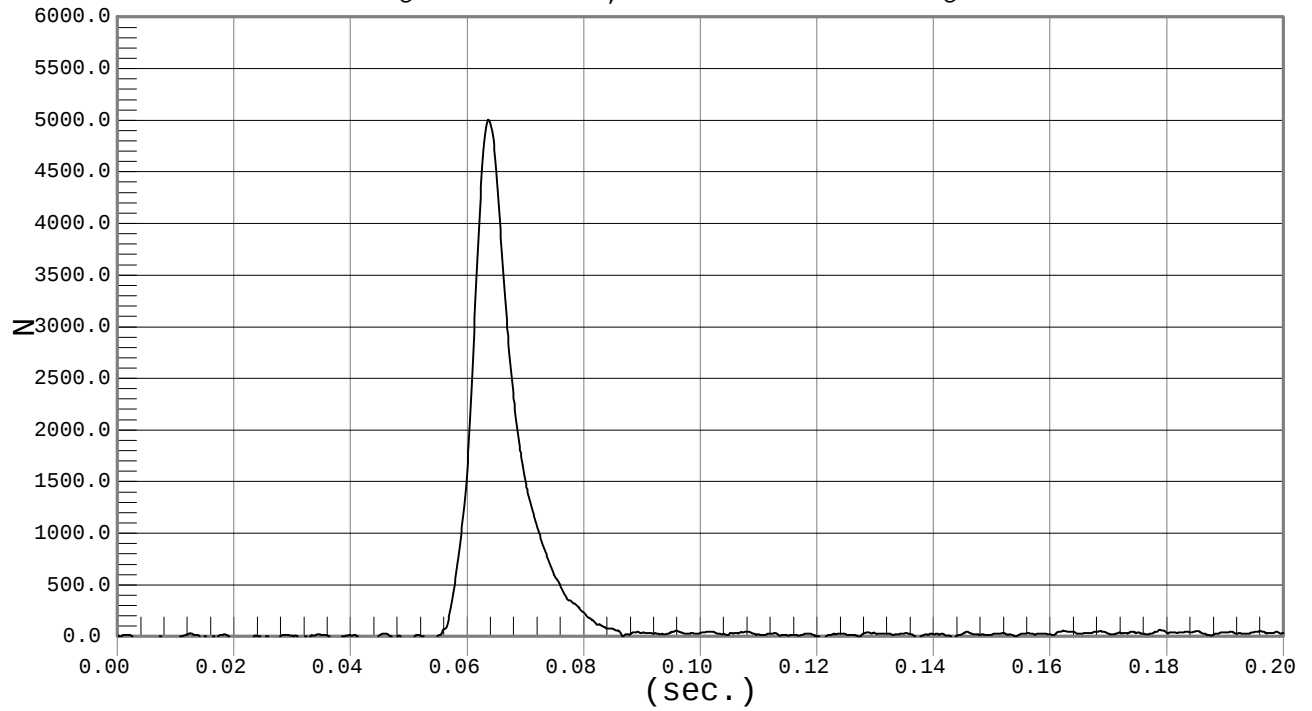


ILIAC FORCE

Test Desc.: Iliac Impact
Component: Dummy #020

Test Date: 06-28-05
Speed: 14.4 fps, 4.39 M/s

Ymin = -21.39 N @ 0.0037 sec., Ymax = 5006.53 N @ 0.0635 sec.



APPENDIX D
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

DUMMY CALIBRATION DATA

	INSTRUMENTS FOR LEFT FRONT DUMMY SIDIIsD: 020		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X Accelerometer	J25-R13	Entran	2/01/05
Head Y Accelerometer	J26-H01	Entran	2/01/05
Head Z Accelerometer	J26-H09	Entran	2/01/05
Head X Redundant	J25-R15	Entran	2/01/05
Head Y Redundant	J26-H04	Entran	2/01/05
Head Z Redundant	J26-H10	Entran	2/01/05
Upper Neck Load Cell	286	Denton	5/03/05
Upper Arm X	J14-J07	Entran	2/01/05
Upper Arm Y	J13-A23	Entran	2/01/05
Upper Arm Z	J21-Z03	Entran	2/01/05
Shoulder DY	020SHLD	Servo	5/26/05
Shoulder Force Load Cell	110	FTSS	5/03/05
Upper Thorax Rib DY	020RIB1	Servo	5/10/05
Mid Thorax Rib DY	020RIB2	Servo	5/10/05
Lower Thorax Rib DY	020RIB3	Servo	5/10/05
Upper Abdominal Rib DY	020RIB4	Servo	5/10/05
Lower Abdominal Rib DY	020RIB5	Servo	5/10/05
Upper Spine X	J07-H23	Entran	2/01/05
Upper Spine Y	I20-J10	Entran	2/01/05
Upper Spine Z	J07-H14	Entran	2/01/05
Lower Spine X	G22-D16	Entran	4/27/05
Lower Spine Y	F17-Y03	Entran	4/27/05
Lower Spine Z	G21-M14	Entran	4/27/05
Left Acetabulum FY	ACG115FY	FTSS	5/02/05
Left Ilium Crest FY	IWG112FY	FTSS	5/02/05
Pelvis X Accelerometer	G22-D21	Entran	4/27/05
Pelvis Y Accelerometer	F17-Y04	Entran	4/27/05
Pelvis Z Accelerometer	G22-D20	Entran	4/27/05
Lumbar Load Cell	107	FTSS	5/03/05

	INSTRUMENTS FOR LEFT REAR DUMMY: Q6		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X Accelerometer	AH0F0	Endevco	2/02/05
Head Y Accelerometer	AJ808	Endevco	2/02/05
Head Z Accelerometer	J13851	Endevco	2/02/05
Upper Neck Load Cell	93	Denton	3/03/03
Lower Neck Load Cell	92	Denton	3/03/03
Chest X	J13656	Endevco	2/02/05
Chest Y	J19173	Endevco	2/02/05
Chest Z	P27020	Endevco	2/02/05
Pelvis X Accelerometer	AJ9D9	Endevco	6/03/05
Pelvis Y Accelerometer	AJ820	Endevco	6/03/05
Pelvis Z Accelerometer	AGM47	Endevco	6/03/05
Lumbar Load Cell	91	Denton	3/04/03

VEHICLE INSTRUMENTS CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Lower A-Post Y	C10-Z04	Entran	4/22/05
Left Mid A-Post Y	C06-L09	Entran	3/24/05
Left Lower B-Post Y	C06-L11	Entran	3/24/05
Left Mid B-Post Y	C06-L02	Entran	3/24/05
Floorpan @ Rear Axle X	C29-L16	Entran	4/28/05
Floorpan @ Rear Axle Y	C29-L27	Entran	4/28/05
Floorpan @ Rear Axle Z	C29-L20	Entran	4/28/05
Driver Seat Track Y	B16-Z29	Entran	3/17/05
Right Front Sill X	C21-G01	Entran	4/28/05
Right Front Sill Y	C29-L30	Entran	4/28/05
Right Front Sill Z	C29-L13	Entran	4/28/05
Left Rear Sill Y	C10-Z03	Entran	3/31/05
Left Front Sill Y	C21-G12	Entran	4/28/05
Vehicle CG X	C09-Y09	Entran	3/31/05
Vehicle CG Y	C11-Z13	Entran	3/31/05
Vehicle CG Z	B19-Z01	Entran	3/03/05
Left Front Door @ Pelvis	D04-Z01	Entran	4/22/05
Left Front Door @ Arm	D03-Z20	Entran	4/22/05
Left Front Door @ Knee	C09-Y07	Entran	3/31/05
Left Front Door @ Mid Rib	D03-Z26	Entran	4/22/05
Left A-Post @ Sill Y	C04-L06	Entran	3/24/05
Left B-Post @ Sill Y	C21-G10	Entran	4/28/05
Upper Engine X	C06-L19	Entran	3/24/05
Upper Engine Y	C04-L10	Entran	3/24/05
Firewall Y	K03-J16	Entran	1/21/05