

REPORT NUMBER: TO12-MGA-2003-004

**FULL SCALE SIDE IMPACT TESTS OF BASELINE VEHICLES
Task Order # T0008 / RFP # 0012**

**NCAP LEFT SIDE IMPACT
DRIVER SID IIs BASELINE
PASSENGER SID IIs W/FRG**

**Ford Motor Company
2001 Ford Focus 4 door
NHTSA No. # R11316**

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March 17, 2003

FINAL REPORT SUBMITTED: August 15, 2003

**PREPARED FOR:
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This final test report was prepared for the U.S. Department of Transportation, Volpe National Transportation System Center, under Contract No. DTRS57-98-D-00041.

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SECTION 1
PURPOSE AND TEST PROCEDURE

This side impact test was conducted as part of Contract No. DTRS57-98-D-00041, Task Order T0008, RFP 0012, sponsored by the U.S. Department of Transportation, Volpe National Transportation System Center. The purpose of this test was to compare the response of the standard SID IIs dummy with a modified version of the SID IIs with floating rib guides.

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

SECTION 2

SUMMARY OF SIDE IMPACT TEST

A 2001 Ford Focus 4 door was impacted on the left side by a Moving Deformable Barrier (MDB) which was moving forward in a 27 degree position to the tow road guidance system at a velocity of 61.8 kph (38.4 mph). The target vehicle was stationary and positioned at an angle of 63 degrees to the line of forward motion. The side impact test was conducted by MGA Research Corporation in Burlington, WI on March 17, 2003. Pre- and post-test photographs of the test vehicle, the MDB and the side impact dummies are included in Appendix A.

Two SID IIs side impact dummies were placed in the left front (baseline SID IIs) and left rear (SID IIs w/FRG) designated seating positions according to instructions specified in the FMVSS 208 Laboratory Test Procedure (TP208-12) appendix G which is dated January 14, 2003. The side impact event was documented by ten high speed cameras. 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 side impact dummy (SID IIs) 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. Appendix E contains the SID IIs dummy peak responses.

SECTION 2... (continued)
SUMMARY OF SIDE IMPACT TEST

Rib Deflection (mm) CFC 180	Driver 020	Passenger 033
Upper Thorax Rib	-31.4	-28.6
Mid Thorax Rib	-30.6	-25.0
Lower Thorax Rib	-48.1	-22.6
Upper Abdominal Rib	-55.8	-30.8
Lower Abdominal Rib	-45.4	-32.3
Rib Deflection Rate (m/sec) CFC 180	Driver 020	Passenger 033
Upper Thorax Rib	-4.9	-2.4
Mid Thorax Rib	-4.6	-2.7
Lower Thorax Rib	-6.5	-3.6
Upper Abdominal Rib	-8.5	-4.4
Lower Abdominal Rib	-7.5	-5.1
Viscous Criteria CFC 180	Driver 020	Passenger 033
Upper Thorax Rib	0.6	0.4
Mid Thorax Rib	0.7	0.2
Lower Thorax Rib	1.2	0.3
Upper Abdominal Rib	1.9	0.6
Lower Abdominal Rib	1.3	0.7

Abdominal Forces (N) CFC 600	Driver 020	Passenger 033
Left Acetabulum Force	2507.7	3231.5
Left Ilium Crest Force	4823.7	NO DATA
Right Ilium Crest Force	785.7	656.8
Pubic Symphysis Force	-668.5	-889.7
Sum of Left Acetabulum and Left Ilium	7310.6	NO DATA

HIC 15		Driver 020	Passenger 033
	T1 (msec)	38.6	49.7
	T2 (msec)	53.6	62.4
	T2 – T1 (msec)	15.0	12.7
	HIC	383	780

HIC 36		Driver 020	Passenger 033
	T1 (msec)	36.0	49.7
	T2 (msec)	72.0	62.4
	T2 – T1 (msec)	36.0	12.7
	HIC	638	780

Fir Filtered	Driver 020	Passenger 033
Upper Spine Y (g's)	67.5	83.3
Lower Spine Y (g's)	84.2	86.9
Upper Thorax Rib Y (g's)	141.3	75.4
Mid Thorax Rib Y (g's)	119.9	82.3
Lower Thorax Rib Y (g's)	149.7	138.0
Upper Abdominal Rib Y (g's)	214.8	128.8
Lower Abdominal Rib Y (g's)	203.7	145.4
Pelvis Y (g's)	78.8	92.8

TEST NOTES

The driver dummy (020) had baseline content. The driver was not set up to collect femur data. The lower neck bracket was adjusted forward to level the dummy head to +/-0.5 degrees.

The passenger dummy (033) had floating rib guides. The lower neck bracket was adjusted forward to level the dummy head to +/-0.5 degrees.

No valid data was collected for the following channels:

- Floorpan @ Rear Axle X

- Floorpan @ Rear Axle Y

- Floorpan @ Rear Axle Z

- Pass Left Ilium Crest Y

- Passenger Lumbar MX

SECTION 3
SIDE IMPACT DUMMY (SID II_s) AND VEHICLE TEST DATA

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2001 Ford Focus 4 door

Test Date: March 17, 2003

TEST VEHICLE INFORMATION

TEST VEHICLE OPTIONS

Make / Model	Ford / Focus
Body Style	4 door
NHTSA No.	R11316
VIN	1FAFP34P11W142103
Odometer Reading	75,874 miles
Transmission	Manual
Final Drive	Front
Number of Cylinders	4
Engine Displacement (L)	2.0
Engine Placement	Lateral

Front Airbag	Yes
Side Airbags	No
Power Windows	Yes
Power Steering	Yes
Power Door Locks	Yes
Tilt Wheel	Yes
Air Conditioning	Yes
Power Brakes	Yes
AM/FM	Yes
Cruise Control	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company
Date of Manufacture	10/00

GVWR (kg)	1646
GAWR Front (kg)	895
GAWR Rear (kg)	791

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	221	221
Cold / Test Pressure (kPa)	221	221
Recommended Tire Size	P195/60R15	P195/60R15
Tire Size on Vehicle	P195/60R15	P195/60R15
Tire Manufacturer	Touring/USA1	Kelly

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Contour		
Number Of Occupants x 68.04 kg.	2	3		340
Capacity Wt. (VCW) (kg)				375
Cargo Wt. (RCLW) (kg)				35

DATA SHEET NO. 1... (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2001 Ford Focus 4 door

Test Date: March 17, 2003

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	372.0	238.1		427.3	303.9	
Right	kg	372.4	242.7		396.0	299.8	
Ratio	%	60.8	39.2		57.7	42.3	
Totals	kg	744.4	480.8	1225.2	823.3	603.7	1427.0

Weight of Ballast in Vehicle = 0

TARGET TEST WEIGHT

Measured Parameter	Units	Value
Vehicle Target Weight (TVTW)*	kg	1427.0

* = matches previous vehicle tests

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG(aft of front axle)
As Delivered	mm	652	652	664	664	1026
As Tested	mm	635	641	635	645	1107
Fully Loaded	mm	628	645	625	641	

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2616
Target Impact Point Aft of Front Axle	mm	368
Actual Impact Point Aft of Front Axle	mm	379

DATA SHEET NO. 1... (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2001 Ford Focus 4 door

Test Date: March 17, 2003

NORMAL DESIGN RIDING POSITION

Driver seat back angle: Full Forward Position (6.8° On Seat Frame)

Rear passenger seat back angle: Not Adjustable

SEAT FORE/AFT POSITIONS

Driver seat fore/aft total travel: 17 Positions

Rear passenger seat fore/aft total travel: Not Adjustable

Driver seat fore/aft position: Full Forward

Rear passenger seat fore/aft position: Not Adjustable

HEAD RESTRAINT POSITION

The head restraint was placed in the lowest position per the TP208-12 procedure.

SEAT BELT UPPER ANCHORAGE

The D ring was placed in the full down position.

STEERING COLUMN ADJUSTMENT

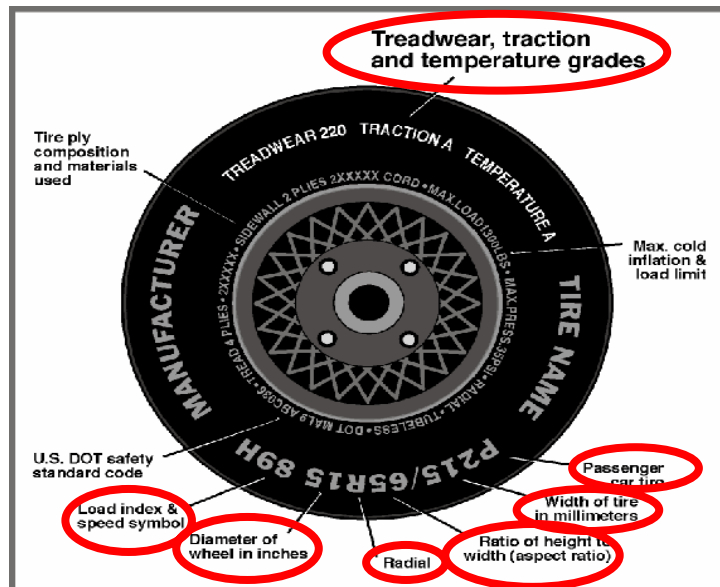
The steering column was placed in the mid position.

DATA SHEET NO. 2
TEST VEHICLE TIRE INFORMATION

Test Vehicle: 2001 Ford Focus

Test Date: March 17, 2003

Vehicle Year	2002	Vehicle Make	Ford
VIN	1FAFP34P11W142103	Vehicle Model	Focus



	Front	Rear
Tire Manufacturer	Touring/USA1	Kelly
Tire Name	Steel Radial/Supreme	Charger
Tire Type	Passenger	Passenger
Tire Width (mm)	195	195
Ratio of Height to Width (aspect ratio)	60	60
Radial	R	R
Wheel Diameter	15	15
Load Index & Speed Symbol	87T/87S	87S
Treadwear	520/440	440
Traction Grade	A	A
Temperature Grade	B	B

DATA SHEET NO. 3

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Test Vehicle: 2001 Ford Focus 4 door

Test Date: March 17, 2003

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheel base of Framework Carriage	2590
C.G. Location aft of Front Axle	1127

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	449.4	239.9	
Right	kg	331.3	340.6	
Ratio	%	57.4	42.6	
Totals	kg	780.7	580.5	1361.2

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.8
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.5
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.1

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

Vertical Location			From Centerline		Max. Crush
Level	Description	Height	Distance	Direction	
1	Center of Bumper (mm)	432	800	Right	122
2	Top of Bumper (mm)	533	800	Left	76
3	Mid Level (mm)	686	800	Left	114
4	Top of Stack (mm)	813	800	Left	153

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	2
High Speed Cameras	2

DATA SHEET NO. 4

POST TEST OBSERVATIONS

Test Vehicle: 2001 Ford Focus 4 door

Test Date: March 17, 2003

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat	Rear Seat
Dummy Type / Serial No.	SID IIs / 020	SID IIs / 033
Head Contact	Window sill, Headrest	Window sill, C post, Top of seat
Upper Torso Contact	Door trim panel	Door trim panel
Lower Torso Contact	Door trim panel	Door trim panel
Left Knee Contact	Door trim panel	Door trim panel
Right Knee Contact	Left knee	Left knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Door Opening	Remained closed and latched	Remained closed and latched
Right Side Door Opening	Remained closed and latched	Remained closed and latched
Left Side Seat Movement	None	None
Left Side Seat Back Failure	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No failures
Sill Separation	None
Windshield Damage	Broke
Window Damage	Left side driver and passenger broke
Other Notable Effects	None

AIRBAG DEPLOYMENT

	Driver	Front Passenger	Rear Passenger
Front	Yes	Yes	
Side			

MDB LEFT EDGE IMPACT POINT DATA

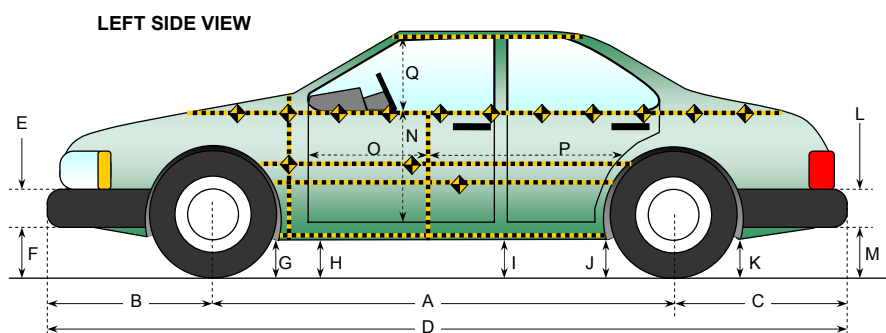
Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	11 Rearward
Vertical Offset	mm	+/-20	11 Up

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 5
VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2001 Ford Focus 4 door

Test Date: March 17, 2003



All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2616	2549	67
B	Front Axle to FSOV	840	808	32
C	Rear Axle to RSOV	913	906	7
D	Total Length at Centerline	4369	4263	106
E	Front Bumper Thickness	238	238	0
F	Front Bumper Bottom to Ground	386	410	-24
G	Sill Height at Front Wheel Well	153	190	-37
H	Sill Height at Front Door Leading Edge	147	187	-40
I	Sill Height at "B" Pillar	147	180	-33
J1	Sill Height at Rear Wheel Well	149	139	10
J2	Pinch Weld Height at Rear Wheel Well	142	166	-24
K	Sill Height Aft of Rear Wheel Well	258	253	5
L	Rear Bumper Thickness	307	307	0
M	Rear Bumper Bottom to Ground	404	396	8
N	Sill Height to Window Bottom Sill	695	624	71
O	Front Door Leading Edge to Impact CL	746	740	6
P	Rear Door Trailing Edge to Impact CL	1210	1097	113
Q	Front Window Opening	425	417	8
R	Right Side Length	3607	3605	2
S	Left Side Length	3605	3499	106
T	Vehicle Width at "B" Post	1796	1393	403

DATA SHEET NO. 6

SID IIs DRIVER CLEARANCE DIMENSIONS

Test Vehicle: 2001 Ford Focus 4 door

Test Date: March 17, 2003

AA	Ankle to Ankle	Taken between the center points of both ankles, after the feet are placed.	236
AD	Arm to Door	Horizontal measurement taken from the center point of the elbow to the first contact point of the door panel.	147
HA	Head to A pillar	Horizontal measurement taken from the center of the head's outboard CG target to the A pillar.	372
HCM	Hub to Chest	Minimum horizontal distance measured from the hub to the dummy's chest.	166
HD	H point to Door	Horizontal measurement taken from the H point hole to the first contact point of the door panel.	146
HH	Head to Header	Taken from center point between eyes to header directly in front of dummy.	57
HR	Head to Roof	Taken from the center of the outboard target to the roof edge (not the upper edge of the car door), perpendicular to the long axis of the car. If a tape measure is held from the target and extends below the roof, the point to measure is at the low edge of the roof line, which will make contact with the tape measure.	221
HS	Head to Side Window	Taken from the center of the outboard target to the side window, measured horizontally and perpendicular to the long axis of the car. In cases where the window is not fully up, a flat bar should be placed across the window opening to simulate the position of the window.	342
HW	Head to Windshield	Taken from the center point between the dummy's eyes to the point on the windshield directly level with the dummy's forehead.	561
KDL	Knee to Dash Left	Taken from the knee pivot point to the point on the dash that is directly level with the center of the knee.	129
KK	Knee to Knee	With the legs in a vertical plane after the feet are placed, the measurement is taken from outside flange to outside flange.	216
NAS	Neck Angle Seated	Taken from the neck when the dummy is seated across two of the "vertebral discs" of the neck.	4.9
NR	Nose to Rim	Taken from the tip of the nose to the steering wheel rim at the 12 o'clock position.	217
PA	Pelvic Angle	Taken by placing an inclinometer on the H point bar.	22.2
RA	Rim to Abd	Taken from the point where the bottom of the chest jacket and the pelvic structure meet to the steering wheel rim at the 6 o'clock position	84
SA	Seat Back Angle	Taken from the lower left corner of the driver seat frame.	6.8
SCH	Steering Wheel to Chest	Horizontal measurement taken from the center of the steering wheel to the dummy's chest.	183
SCR	Steering Wheel to Chest	Taken from the center of the steering wheel to the top of the rib guide.	172
SHH	Striker to H point Horizontal	Taken from the H point to the driver door striker.	336
SHV	Striker to H point Vertical	Taken from the H point to the driver door striker. Value is negative if the striker is above the H point and positive if the striker is below the H point.	118
SK	Striker to Knee	Taken from the center point of the knee to the striker.	732
SKA	Striker to Knee Angle	Taken on top of the tape measure while it is extended from the center point of the knee to the striker.	5.1

DATA SHEET NO. 7

SID IIs PASSENGER CLEARANCE DIMENSIONS

Test Vehicle: 2001 Ford Focus 4 door

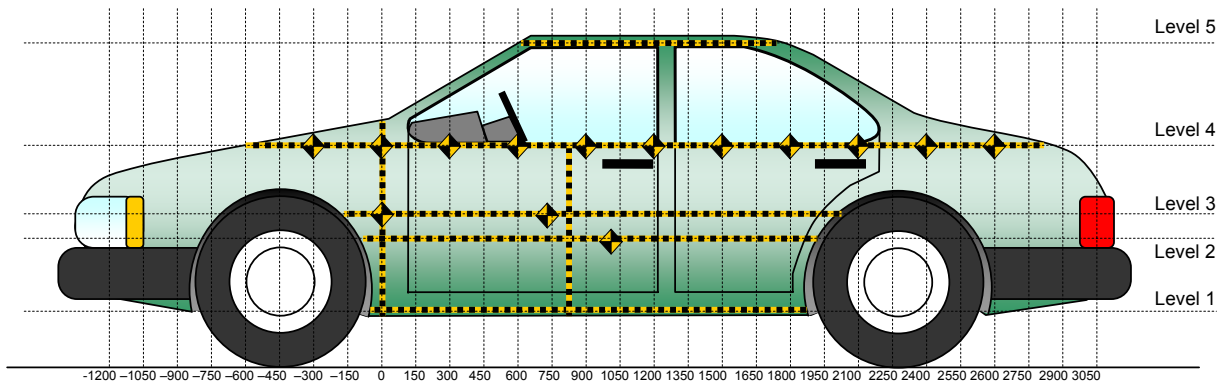
Test Date: March 17, 2003

AA	Ankle to Ankle	Taken between the center points of both ankles, after the feet are placed.	203
AD	Arm to Door	Horizontal measurement taken from the center point of the elbow to the first contact point of the door panel.	134
CS	Chest to Seat	Horizontal measurement taken from the top rib guide in the chest to a point on the back of the driver seat.	734
HC	Head to C pillar	Horizontal measurement taken from the center of the head's outboard CG target to the C pillar.	214
HD	H Point to Door	Horizontal measurement taken from the H point hole to the first contact point of the door panel.	150
HHR	Head to Head Restraint	Taken from center point between eyes to header directly in front of dummy.	756
HR	Head to Roof	Taken from the center of the outboard target to the roof edge (not the upper edge of the car door), perpendicular to the long axis of the car. If a tape measure is held from the target and extends below the roof, the point to measure is at the low edge of the roof line, which will make contact with the tape measure.	243
HS	Head to Side Window	Taken from the center of the outboard target to the side window, measured horizontally and perpendicular to the long axis of the car. In cases where the window is not fully up, a flat bar should be placed across the window opening to simulate the position of the window.	319
KK	Knee to Knee	With the legs in a vertical plane after the feet are placed, the measurement is taken from outside flange to outside flange.	217
NAS	Neck Angle Seated	Taken from the neck when the dummy is seated across two of the "vertebral discs" of the neck.	1.9 Fwd
PA	Pelvic Angle	Taken by placing an inclinometer on the H point bar.	22.5
SA	Seat Back Angle	Taken from the lower left corner of the passenger seat frame.	26.2
SHH	Striker to H point Horizontal	Taken from the H point to the driver door striker.	238
SHV	Striker to H point Vertical	Taken from the H point to the driver door striker. Value is negative if the striker is above the H point and positive if the striker is below the H point.	288
SK	Striker to Knee	Taken from the center point of the knee to the striker.	683
SKA	Striker to Knee Angle	Taken on top of the tape measure while it is extended from the center point of the knee to the striker.	19.9

DATA SHEET NO. 8
VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2001 Ford Focus 4 door

Test Date: March 17, 2003



All Measurements Shown in mm

LEFT SIDE VIEW

Measurements are taken with vehicle in the as tested condition.
Measurements along the vertical 800 mm.
All measurements below in mm.

Level	Measurement Description	Height Above Ground
5	Window	1350
4	Window Sill	896
3	Mid Door	566
2	Occupant H-Point	510
1	Sill Top	237

DATA SHEET NO. 9
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2001 Ford Focus 4 door

Test Date: March 17, 2003

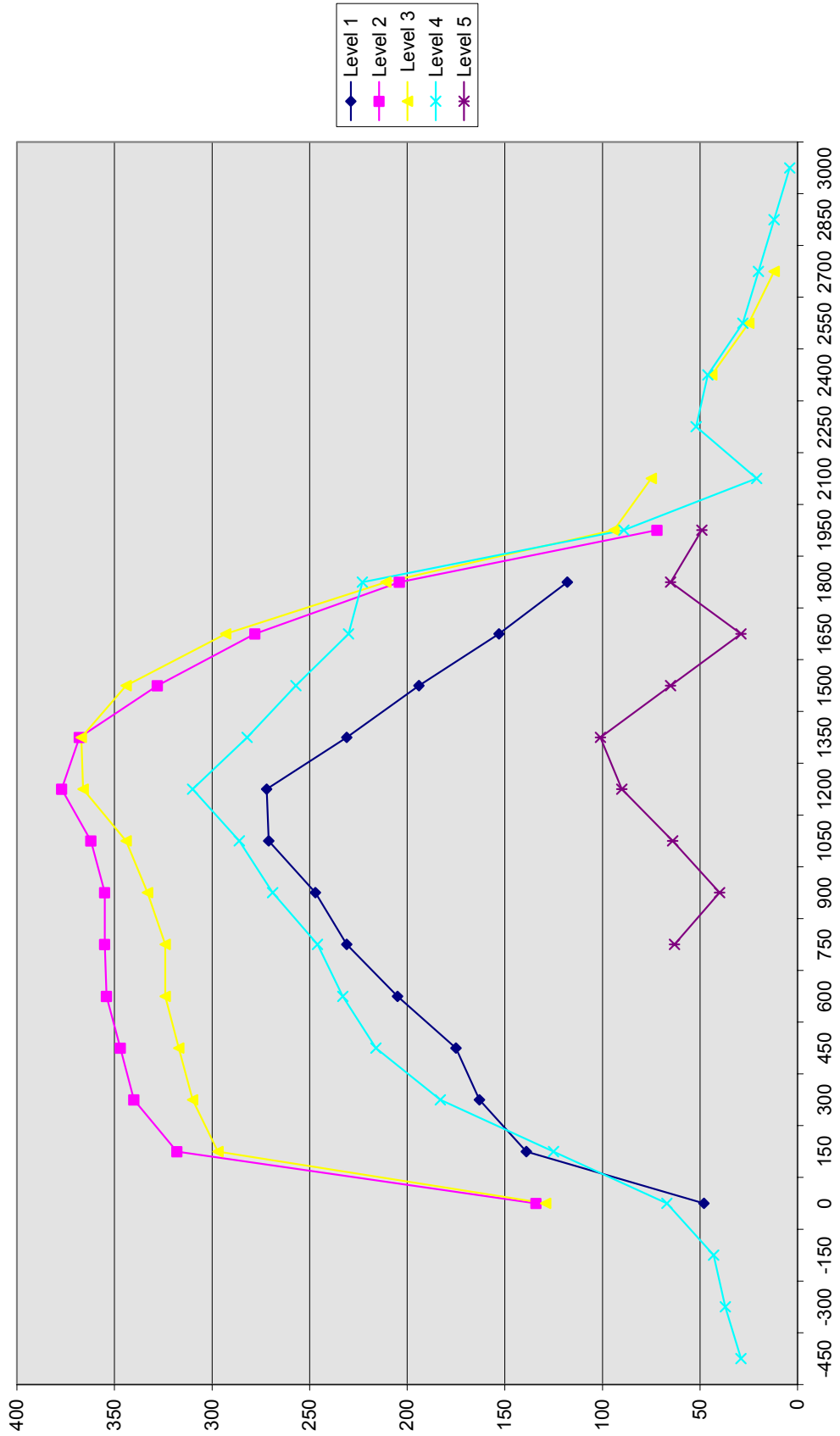
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1050															
-900															
-750															
-600															
-450				368					397					29	
-300				343					380					37	
-150				327					370					43	
0	297	267	256	315		345	401	385	382		48	134	129	67	
150	297	262	263	310		436	580	560	435		139	318	297	125	
300	302	256	260	305		465	596	570	488		163	340	310	183	
450	305	255	258	304		480	602	575	520		175	347	317	216	
600	305	254	256	302		510	608	580	535		205	354	324	233	
750	304	252	256	301	522	535	607	580	547	585	231	355	324	246	63
900	305	251	255	301	519	552	606	588	570	559	247	355	333	269	40
1050	305	251	255	304	521	576	613	599	590	585	271	362	344	286	64
1200	305	255	256	305	524	577	632	622	615	614	272	377	366	310	90
1350	305	252	256	308	525	536	620	623	590	626	231	368	367	282	101
1500	308	252	256	311	529	502	580	600	568	594	194	328	344	257	65
1650	302	254	257	316	534	455	532	550	546	563	153	278	293	230	29
1800	289	260	260	320	538	407	464	471	543	603	118	204	211	223	65
1950		260	259	325	546		332	353	414	595		72	94	89	49
2100			255	330				330	351				75	21	
2250				337					389					52	
2400			254	343				298	389				44	46	
2550			271	349				296	377				25	28	
2700			283	355				295	375				12	20	
2850				364					376					12	
3000				377					381					4	
3150															
3300															

Reference plane is parallel to test vehicle longitudinal centerline.

Given dimensions = Reference plane to car body

DATA SHEET NO. 9... (continued)
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2001 Ford Focus 4 door Test Date: March 17, 2003

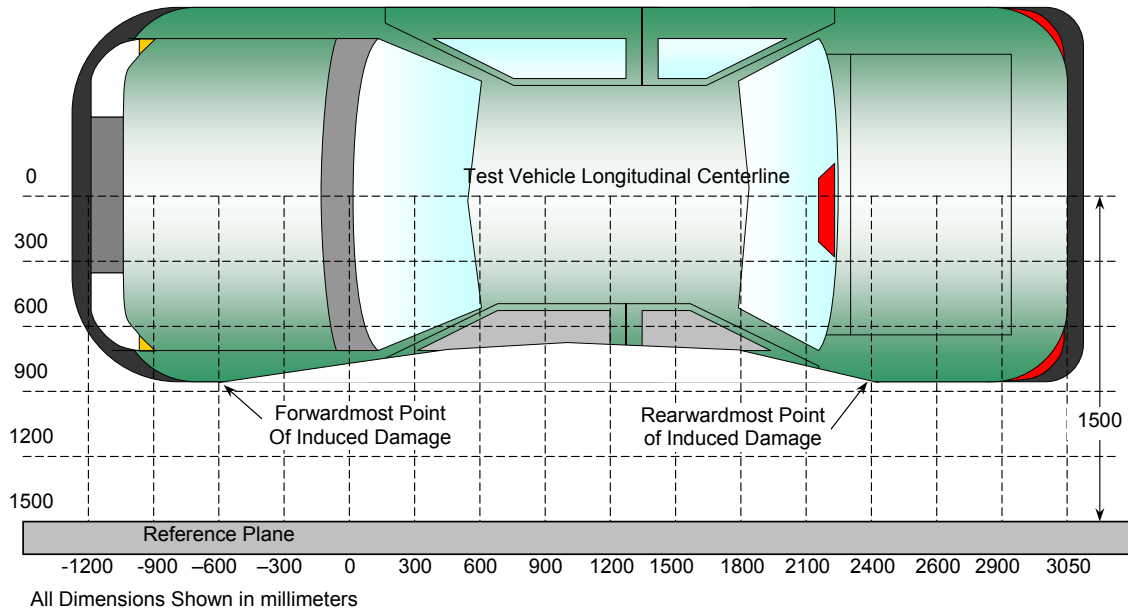


Measurement in mm.

DATA SHEET NO. 10
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2001 Ford Focus 4 door

Test Date: March 17, 2003



TOP VIEW

Damage Profile Distances

DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	3000 mm	4	377	381	4
2	2320 mm	4	340	399	59
3	1550 mm	2	252	580	328
4	850 mm	1.5	287	626	339
5	150 mm	2	262	580	318
6	-450 mm	4	367	397	30

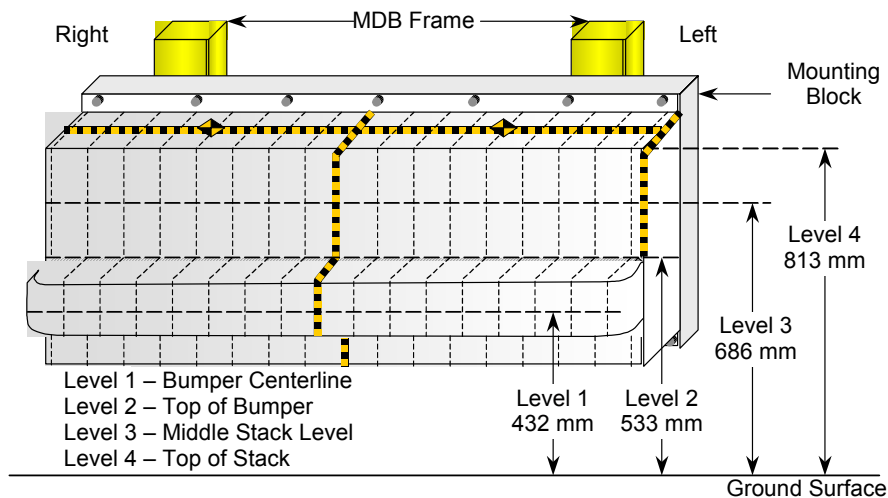
Reference plane is parallel to test vehicle longitudinal centerline.
 Given dimensions = Reference plane to car body.

DATA SHEET NO. 11

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2001 Ford Focus 4 door

Test Date: March 17, 2003



DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C _L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	122	92	66	50	40	43	43	44	47	51	55	61	68	75	78	103	115
2	48	32	36	29	24	25	25	28	29	36	36	41	49	52	59	64	76
3	49	0	1	4	5	4	4	6	7	7	9	10	12	15	24	68	114
4	52	13	0	-3	3	1	6	8	12	9	9	13	19	31	56	99	153

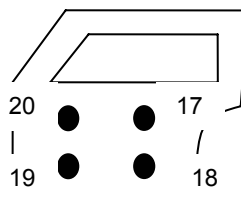
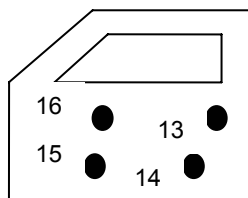
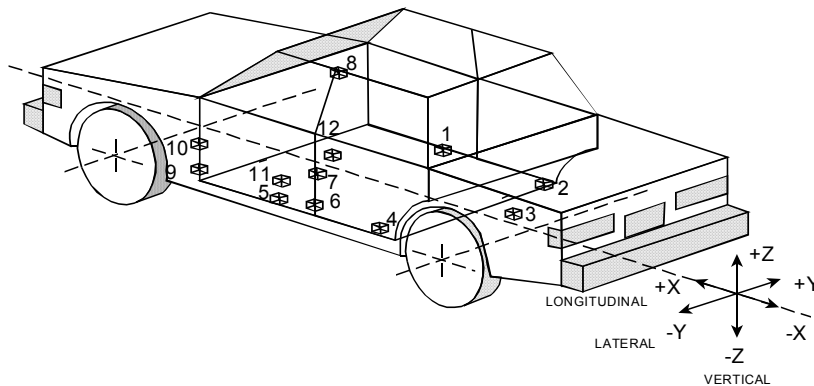
All Dimensions in mm

DATA SHEET NO. 12

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2001 Ford Focus 4 door

Test Date: March 17, 2003



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

No.	Location
13	Left Front Door @ Mid Rib
14	Left Front Door @ Pelvis
15	Left Front Door @ Knee
16	Left Front Door @ Arm
17	Left Rear Door @ Mid Rib
18	Left Rear Door @ Pelvis
19	Left Rear Door @ Knee
20	Left Rear Door @ Arm
21	Left Driver Seat Frame
22	Right Driver Seat Frame
23	Right Rear Occupant Compartment

DATA SHEET NO. 12... (continued)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2001 Ford Focus 4 door

Test Date: March 17, 2003

VEHICLE ACCELEROMETER PEAK DATA

Loc. No.	Accelerometer Location	Longitudinal (X) Maximum (g's) (CFC 60)		Lateral (Y) Maximum (g's) (CFC 60)		Vertical (Z) Maximum (g's) (CFC 60)		Result. (g's) (CFC 60)
		Pos	Neg	Pos	Neg	Pos	Neg	Max
1	Right Sill at Front Seat	8.6	17.2	21.3	2.5	4.2	4.4	23.7
2	Right Sill at Rear Seat	2.1	7.0	29.7	2.7	5.8	5.3	30.6
3	Rear Floorpan Above Axle**	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA
4	Left Sill at Rear Door			3.0	2.4			
5	Left Sill at Front Door			61.9	1.6			
6	Left Lower B Post			76.0	22.6			
7	Left Mid B Post			192.2	33.9			
8	Left Upper B Post			68.8	13.6			
9	Left Lower A Post			51.5	10.2			
10	Left Mid A Post			72.2	23.9			
11	Driver Seat Track			114.2	18.3			
12	Vehicle CG	11.1	19.9	32.5	14.7	53.7	13.8	64.6
13	Left Front Door @ Mid Rib			163.2	177.1			
14	Left Front Door @ Pelvis			185.5	68.4			
15	Left Front Door @ Knee			237.9	95.3			
16	Left Front Door @ Arm			191.5	145.6			
17	Left Rear Door @ Mid Rib			175.3	111.8			
18	Left Rear Door @ Pelvis			154.0	81.6			
19	Left Rear Door @ Knee			252.2	140.0			
20	Left Rear Door @ Arm			191.7	120.3			
21	Left Driver Seat Frame			103.9	27.1			
22	Right Driver Seat Frame			83.2	23.4			
23	Right Rear Occupant Compartment			36.5	2.3			

** No valid data collected

DATA SHEET NO. 12... (continued)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2001 Ford Focus 4 door

Test Date: March 17, 2003

VEHICLE ACCELEROMETER COORDINATES

Loc. No.	Description	Coordinates (mm)		
		X	Y	Z
1	Right Sill at Front Seat	2482	658	191
2	Right Sill at Rear Seat	1634	682	200
3	Rear Floorpan Above Axle	1041	0	501
4	Left Sill at Rear Door	1360	-700	211
5	Left Sill at Front Door	2323	-700	194
6	Left Lower B Post	1956	-658	266
7	Left Mid B Post	1954	-698	976
8	Left Upper B Post	1934	-493	1435
9	Left Lower A Post	2999	-673	467
10	Left Mid A Post	2997	-753	963
11	Driver Seat Track	2174	-552	366
12	Vehicle CG	2419	0	230
13	Left Front Door @ Mid Rib	2189	-714	956
14	Left Front Door @ Pelvis	2276	-732	424
15	Left Front Door @ Knee	2643	-712	688
16	Left Front Door @ Arm	2444	-725	944
17	Left Rear Door @ Mid Rib	1306	-730	994
18	Left Rear Door @ Pelvis	1563	-726	454
19	Left Rear Door @ Knee	1778	-721	692
20	Left Rear Door @ Arm	1550	-718	951
21	Left Driver Seat Frame	1924	-510	768
22	Right Driver Seat Frame	1924	-165	783
23	Right Rear Occupant Compartment	1798	358	428

Reference Points X – Rear Bumper (+forward)
 Y – Vehicle Centerline (+ right)
 Z – Ground Level (+ up)

DATA SHEET NO. 13

MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY

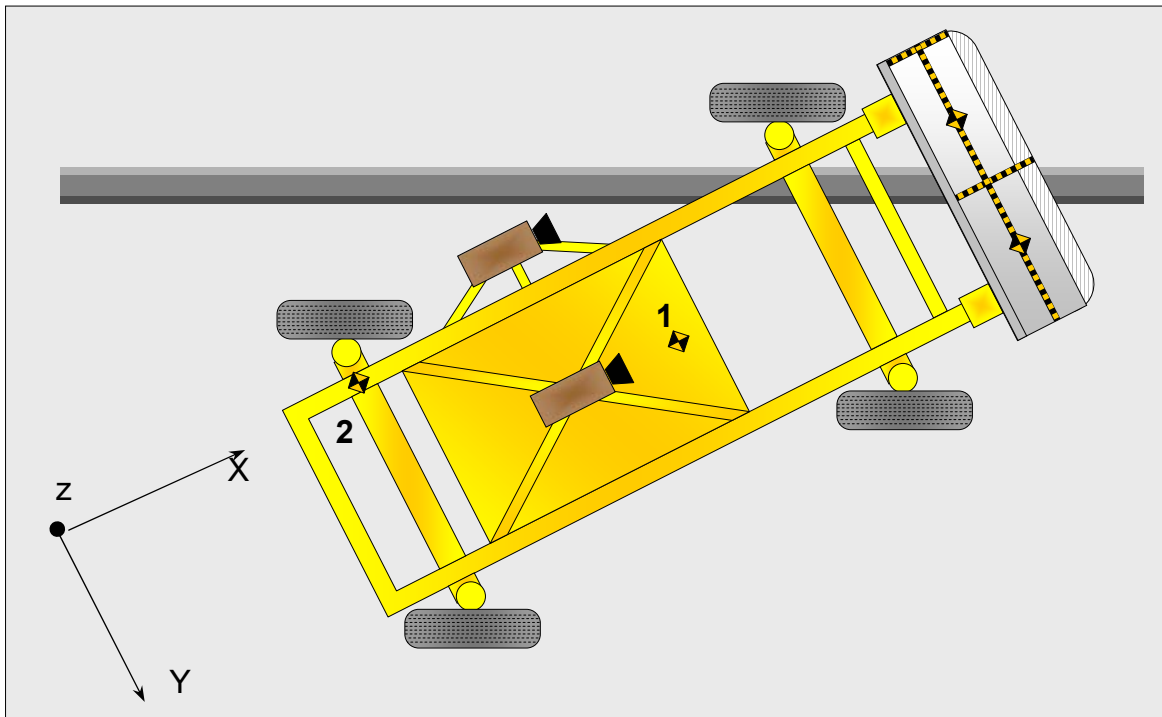
Test Vehicle: 2001 Ford Focus 4 door

Test Date: March 17, 2003

MDB ACCELEROMETER PEAK DATA AND LOCATIONS

Loc. No.	Accelerometer Location	Measurement (mm)			Peak Values (G's)				
		X	Y	Z	Axis	Max	Time	Min	Time
1	MDB CG	-1092	0	483	X	1.3	112.9	19.0	38.5
					Y	1.4	50.9	7.1	17.8
					Z	20.0	73.6	19.6	79.2
					RES	22.8	52.1		
2	MDB Rear	-2591	-625	622	X	1.3	188.0	17.2	32.2
					Y	5.2	28.5	2.7	222.1

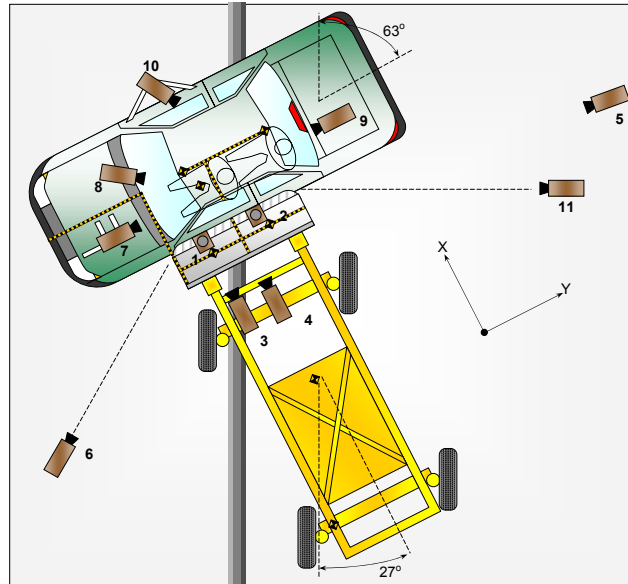
Reference Points X - MDB Front Axle (+ forward)
 Y - MDB Centerline (+ to right)
 Z - Ground Plane (+ down)



DATA SHEET NO. 14
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2001 Ford Focus 4 door

Test Date: March 17, 2003



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Overall				8	1070
2	Overhead Close-up				25	985
3	MDB Onboard, Impact Point Close-up				35	1010
4	MDB Onboard, Centerline of Impact				13	1005
5	Rear Impact				25	1036
6	Front Impact				13	NT
7	Vehicle Onboard Front SID, Front				13	515
8	Vehicle Onboard Front SID, Hip					*
9	Vehicle Onboard Rear SID, Hip				13	*
10	Vehicle Onboard Rear SID, Rear					513
11	Real Time Coverage				13	24

Reference Points X - + Forward of Impact

Y - MDB Left Edge Impact Point (+ right)

Z - Ground Plane (+ up)

*High Speed Video

APPENDIX A
PHOTOGRAPHS

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Pre-Test Front View of Test Vehicle



Pre-Test Rear View of Test Vehicle

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Post-Test Rear View of Test Vehicle

A-4.



Pre-Test Left Side View of Test Vehicle

A-5.



Post-Test Left Side View of Test Vehicle



Pre-Test MDB Positioned Against Vehicle (right side)

A-7.



Pre-Test MDB Positioned Against Vehicle (left side)

A-8.



Pre-Test MDB Positioned Against Vehicle (overhead view)



Post-Test MDB and Vehicle (right side)



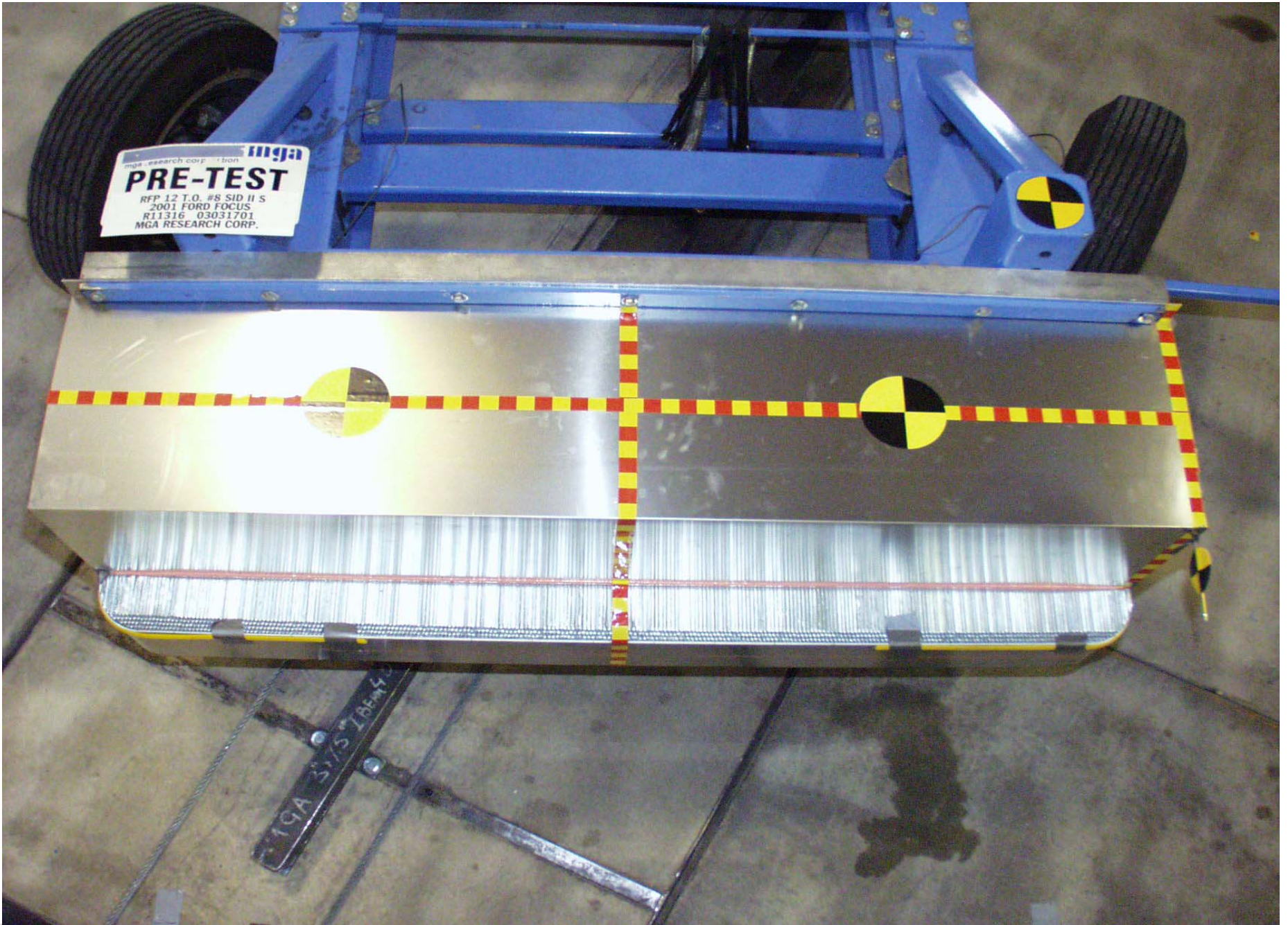
Post-Test MDB and Vehicle (left side)

A-11.



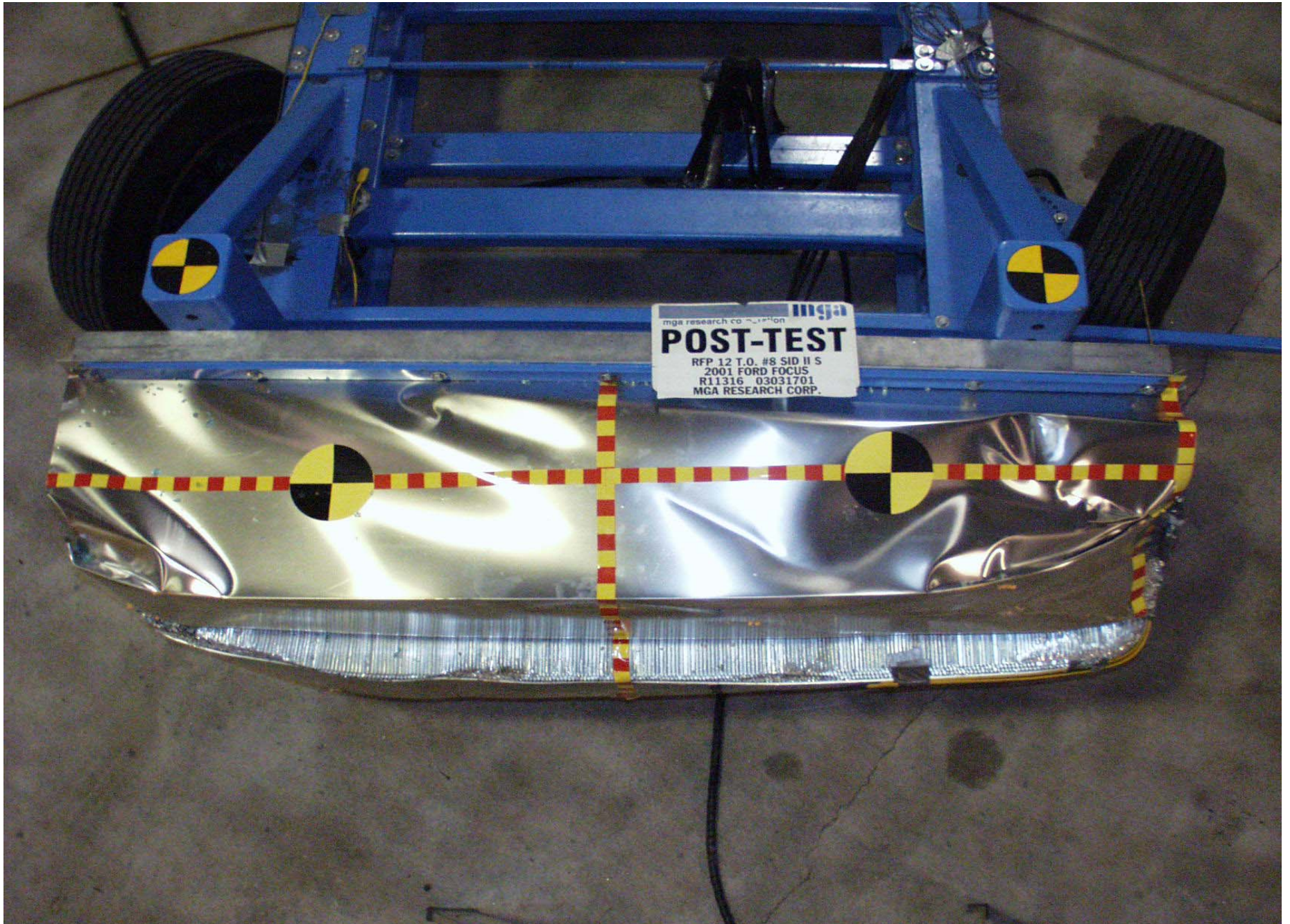
Post-Test MDB and Vehicle (overhead view)

A-12.



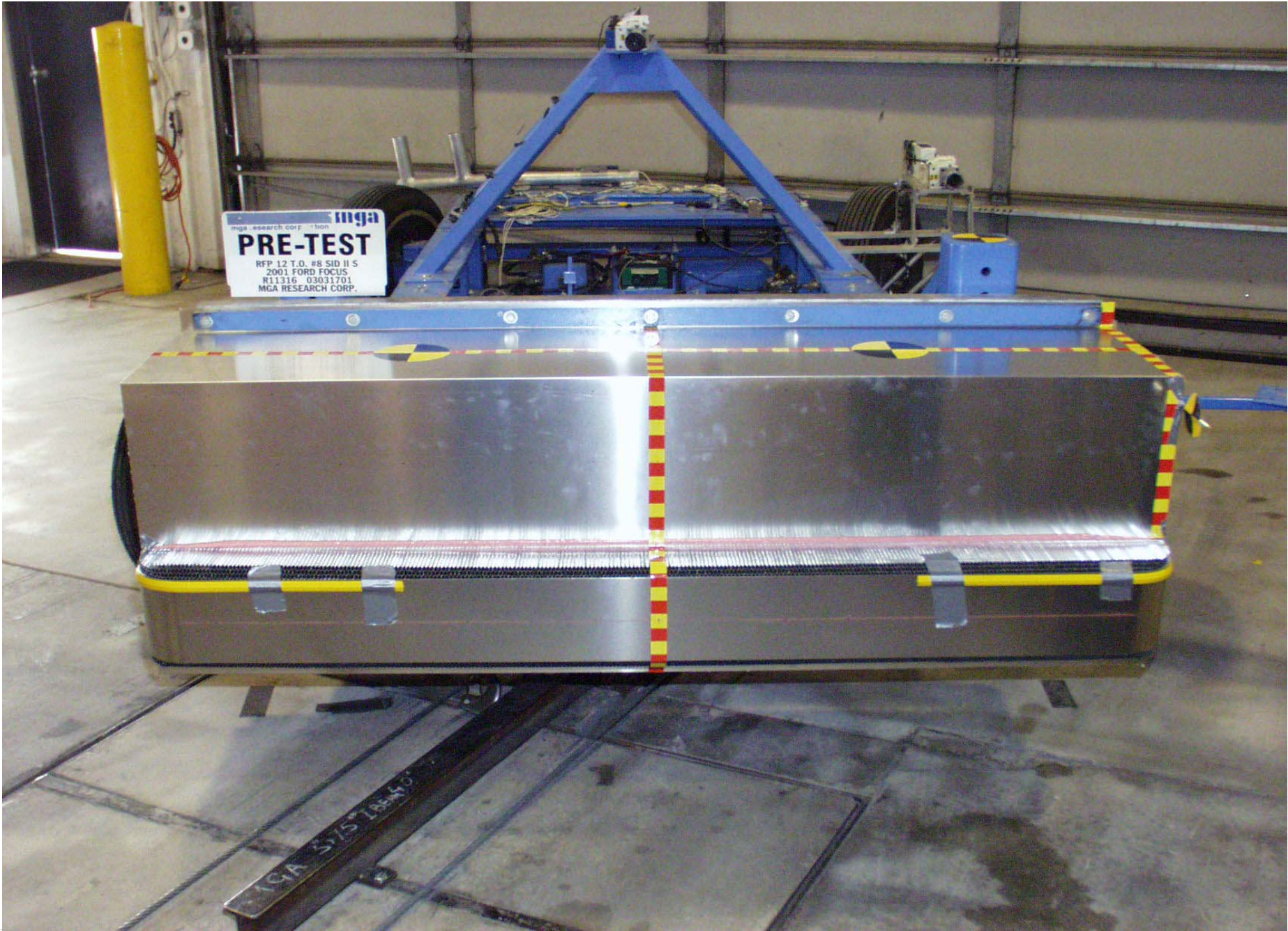
Pre-Test MDB Top View

A-13.



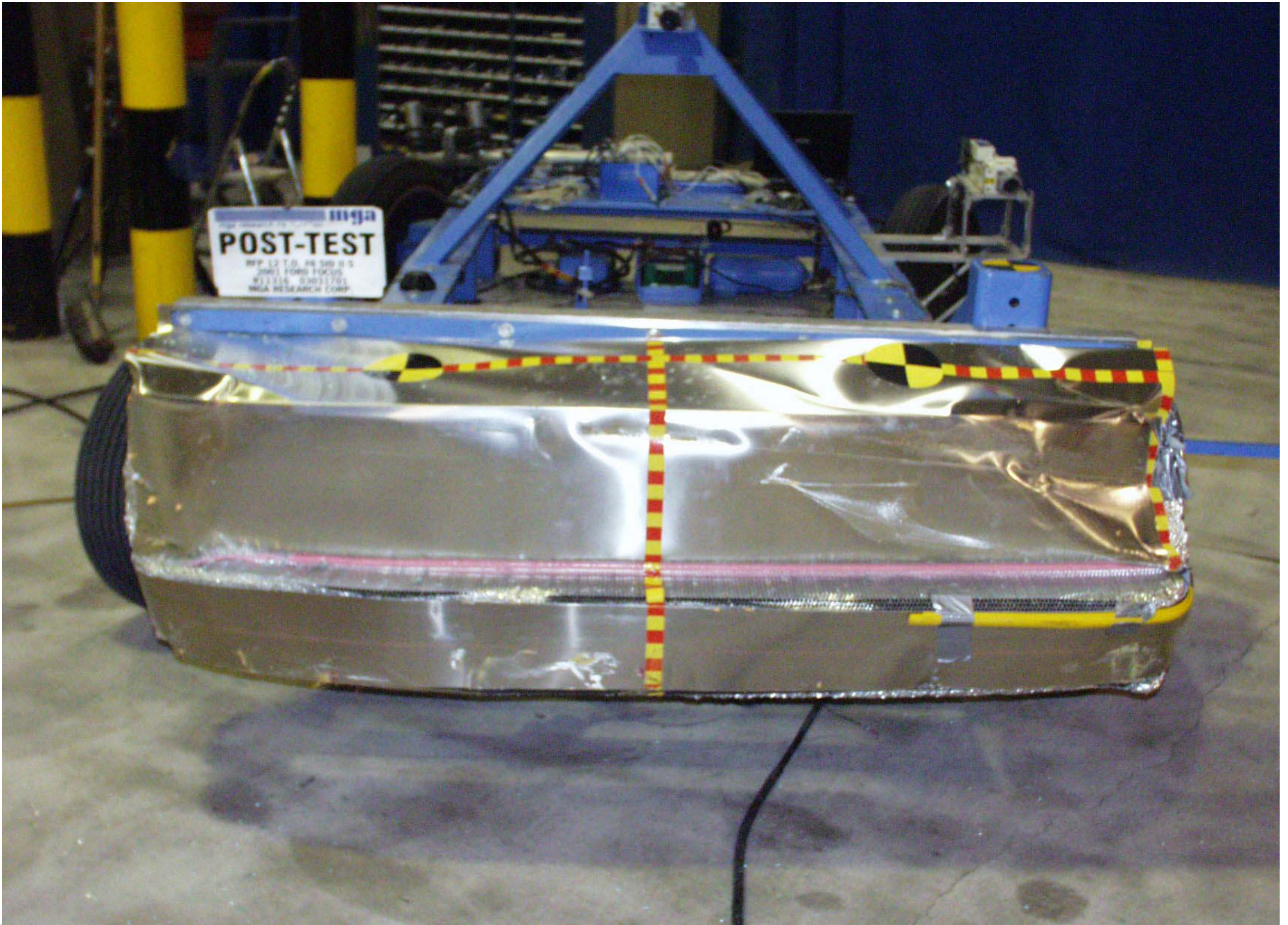
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Pre-Test MDB Front View

A-15.



Post-Test MDB Front View

A-16.



Pre-Test MDB Left Side View

A-17.



Post-Test MDB Left Side View

A-18.



Pre-Test MDB Right Side View



Post-Test MDB Right Side View



Pre-Test Driver Dummy Left Side View

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Post-Test Driver Dummy Left Side View



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



Pre-Test Driver Dummy Right Side View



Post-Test Driver Dummy Right Side View



Pre-Test Driver Dummy Shoulder and Door Top View



Post-Test Driver Dummy Shoulder and Door Top View



Pre-Test Passenger Dummy Left Side View



Post-Test Passenger Dummy Left Side View



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



Pre-Test Passenger Dummy Right Side View



Post-Test Passenger Dummy Right Side View



Pre-Test Passenger Dummy Shoulder and Door Top View



Post-Test Passenger Dummy Shoulder and Door Top View



Post-Test Driver Dummy Head Contact



Post-Test Driver Dummy Lower Body Contact



Post-Test Passenger Dummy Head Contact

A-37.



Post-Test Passenger Dummy Lower Body Contact



Pre-Test Impact Point on Vehicle



Post-Test Impact Point on Vehicle

A-40.

focus RECOMMENDED TIRE SIZE AND INFLATION PRESSURE (COLD)
 DIMENSIONS DES PNEUS et PRESSIONS DE GONFLAGE RECOMMANDÉES (FROID)

TIRE SIZE DIMENSIONS DES PNEUS	LOAD RANGE CHARGE NOMINALE	PRESSION PNEU (COLD)	
		AVANT FRONT	ARRIÈRE REAR
P185/65 R14 85S* **	ALL	221 kpa / 32 PSI	221 kpa / 32 PSI
P195/60 R15 87T*	ALL	221 kpa / 32 PSI	221 kpa / 32 PSI
P205/50 R16 86H*	ALL	234 kpa / 34 PSI	234 kpa / 34 PSI
T125/80 R15 95M* TEMPORAL SPARE PNEU DE SECOURS PROVISOIRE	ALL	415 kpa / 60 PSI	415 kpa / 60 PSI

*MUST BE REPLACED WITH AN EQUIVALENT TYPE SPEED RATED TIRE. **SNOW CHAINS MAY ONLY BE USED WITH THIS TIRE.
 *NE REMPLACER QUE PAR UN PNEU DONT L'INDICE DE VITESSE EST LE MEME. **N'UTILISER DES CHAÎNES À NEIGE QU'AVEC CE TYPE DE PNEU.

TOTAL LOAD = OCCUPANTS PLUS LUGGAGE		CHARGE TOTALE = OCCUPANTS PLUS BAGAGES		
MAXIMUM LOAD CHARGE MAXIMALE	OCCUPANTS OCCUPANTS	DISTRIBUTION RÉPARTITION		
		FRONT AVANT	REAR ARRIÈRE	LUGGAGE BAGAGES
375 kg/826.7 lb	5	2	3	35 kg/77.2 lb

FOR SUSTAINED HIGH SPEED, TRAILER TOWING, RECREATIONAL ACCESSORIES, SNOW CHAINS OR TEMPORAL SPARE INFORMATION - SEE OWNER GUIDE.
 HAUTES VITESSES SOUTENUES, REMORQUES, ACCESSOIRES DE LOISIRS, CHAÎNES À NEIGE ET PNEU DE SECOURS PROVISOIRE : CONSULTER LE GUIDE DU PROPRIÉTAIRE.

YU5A-F06099-AD

Tire Placard

MFD. BY FORD MOTOR CO. IN U.S.A.

DATE: 10/00

GVWR: 3620LB/1641KG

FRONT GAWR: 1971LB 894KG

REAR GAWR: 1745LB 791KG

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: 1FAFP34P11W142103

TYPE: PASSENGER

F0035

R0032



EXT PNT: UA

IRC: 41 LDSO:

BRK	INT TR	TP/PS	R	AXLE	TR	SPR	1AKIA
A	EA		3	NN	A		SOA

UPC ▼ F85B-1520472-AB

A-41.



Impact

APPENDIX B

SID IIS, VEHICLE, AND MDB RESPONSE DATA

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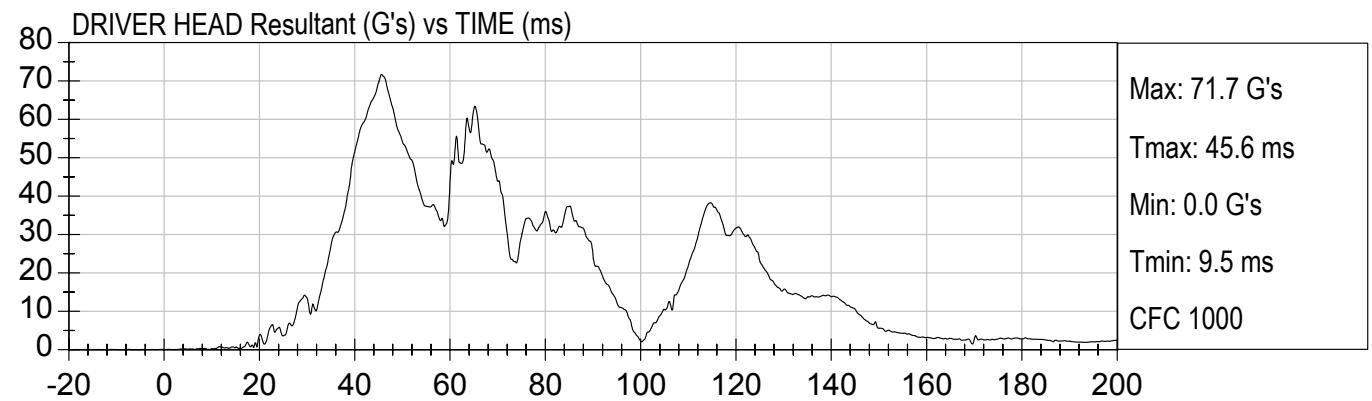
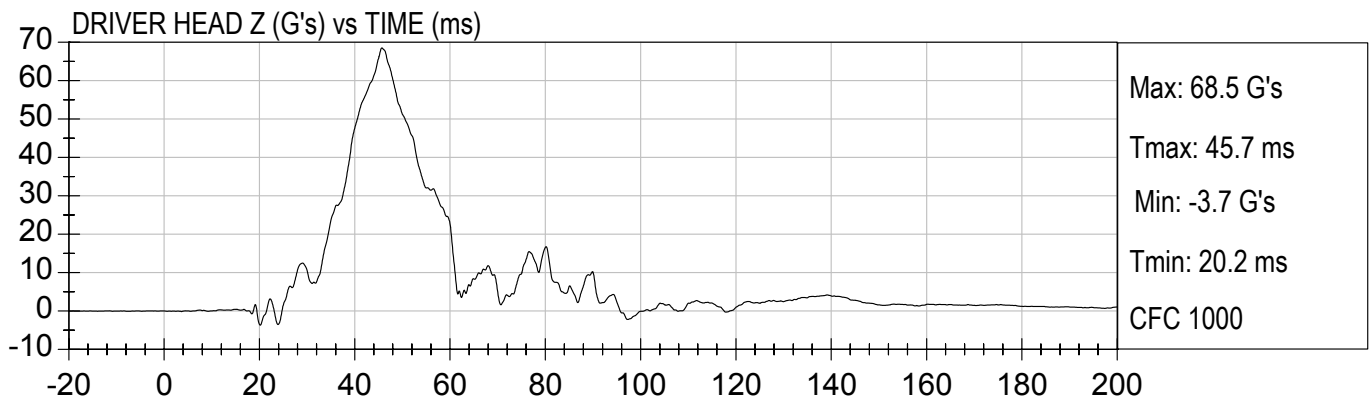
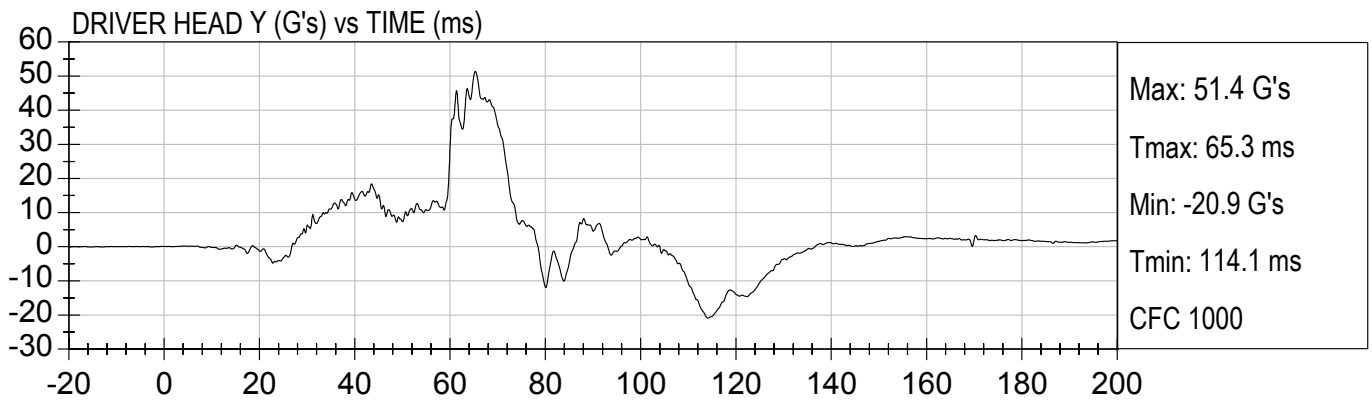
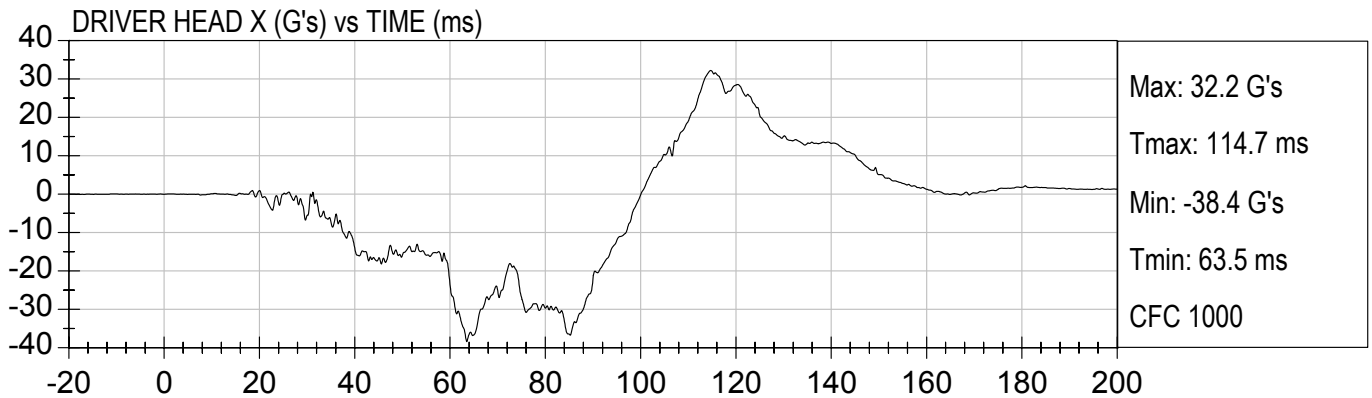
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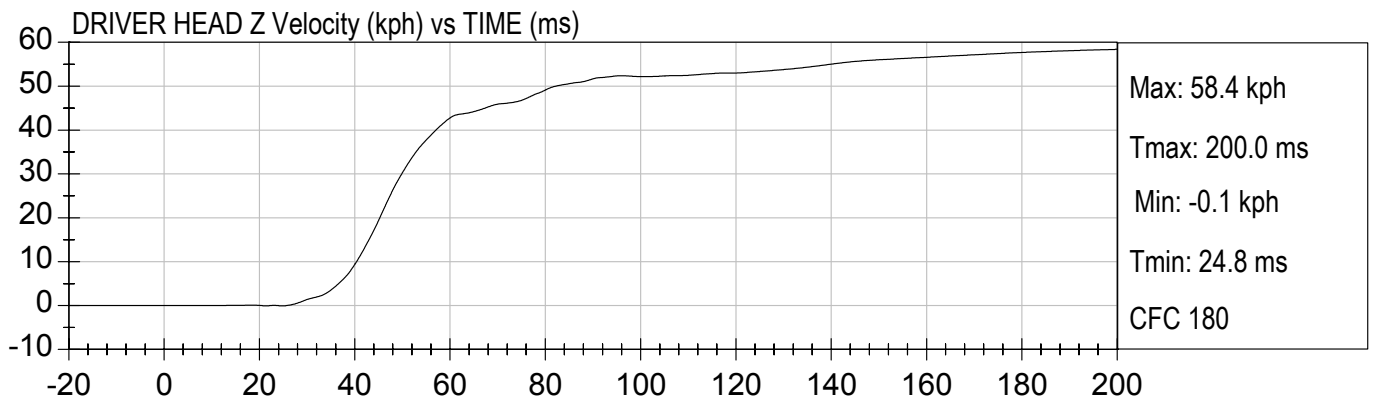
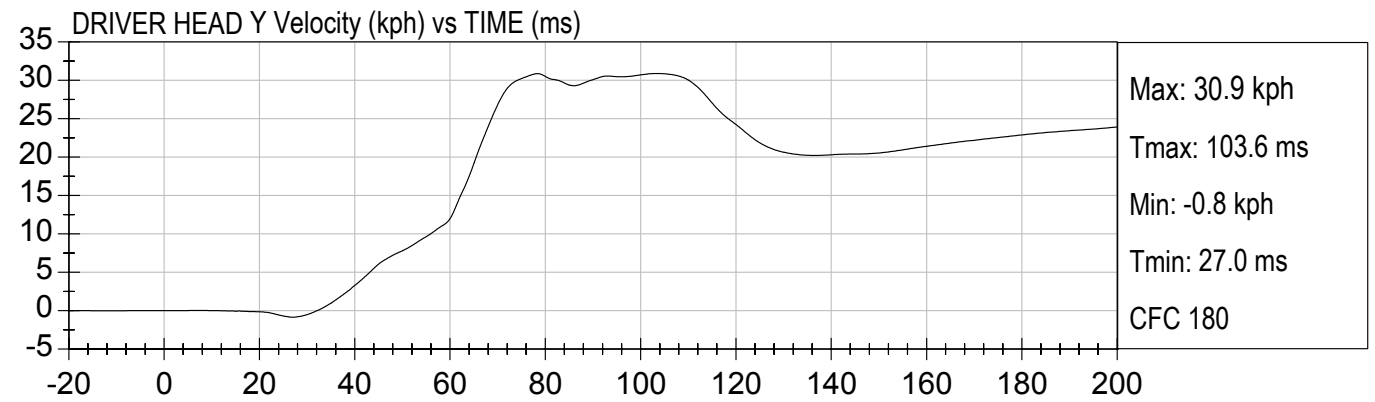
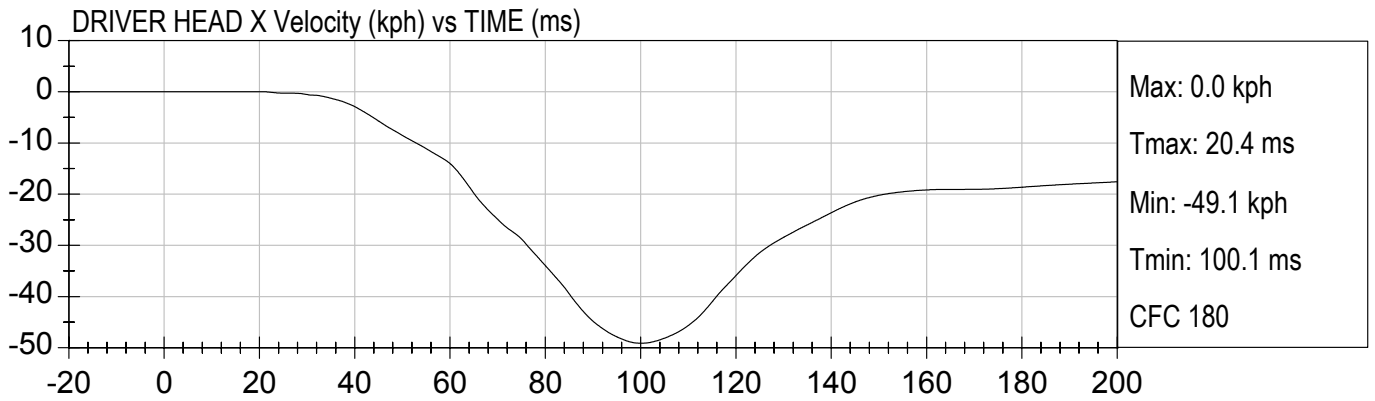
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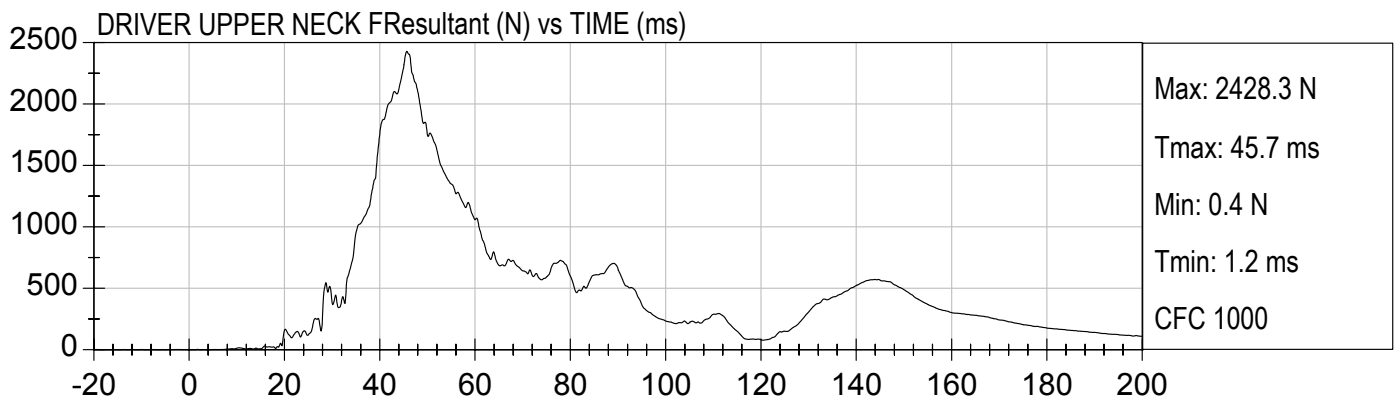
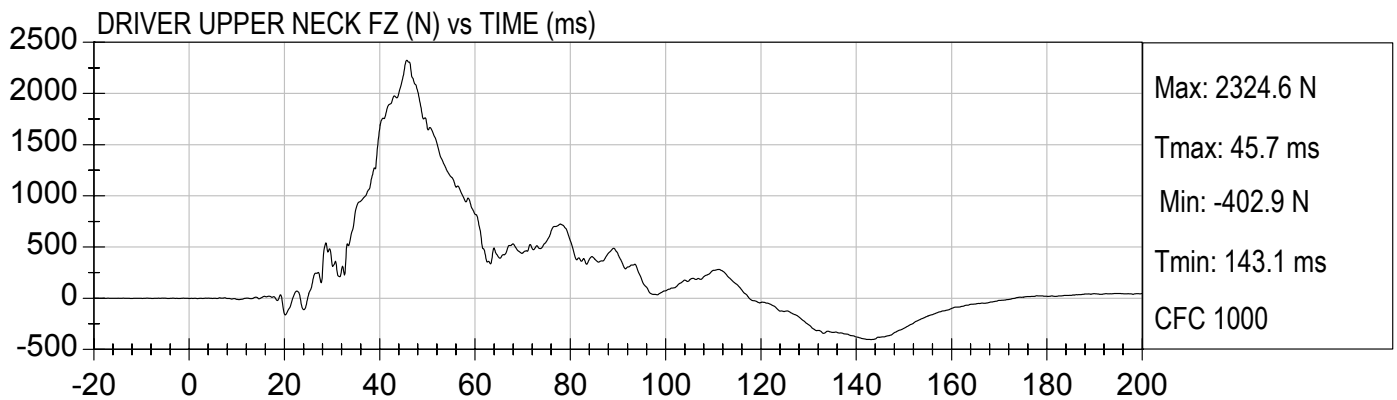
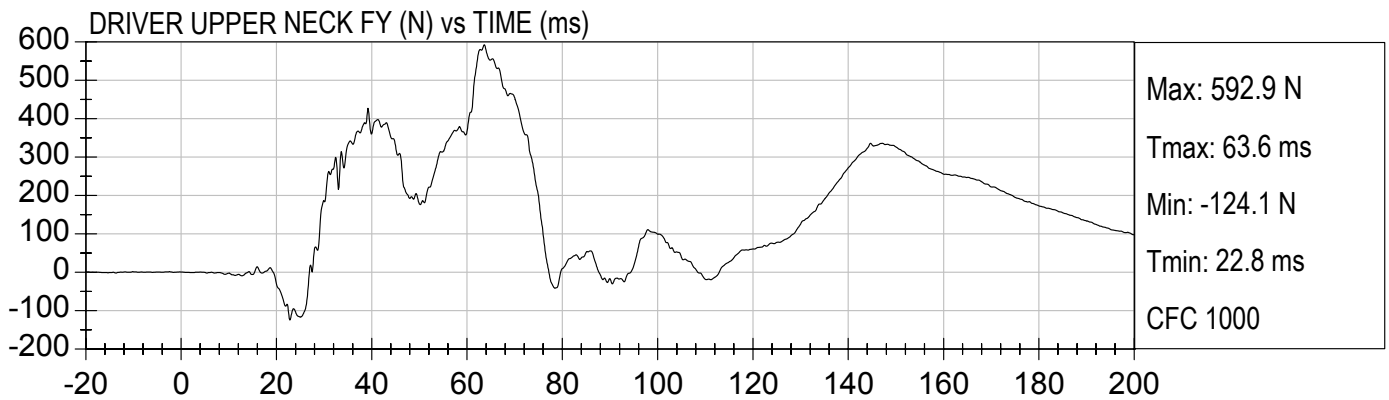
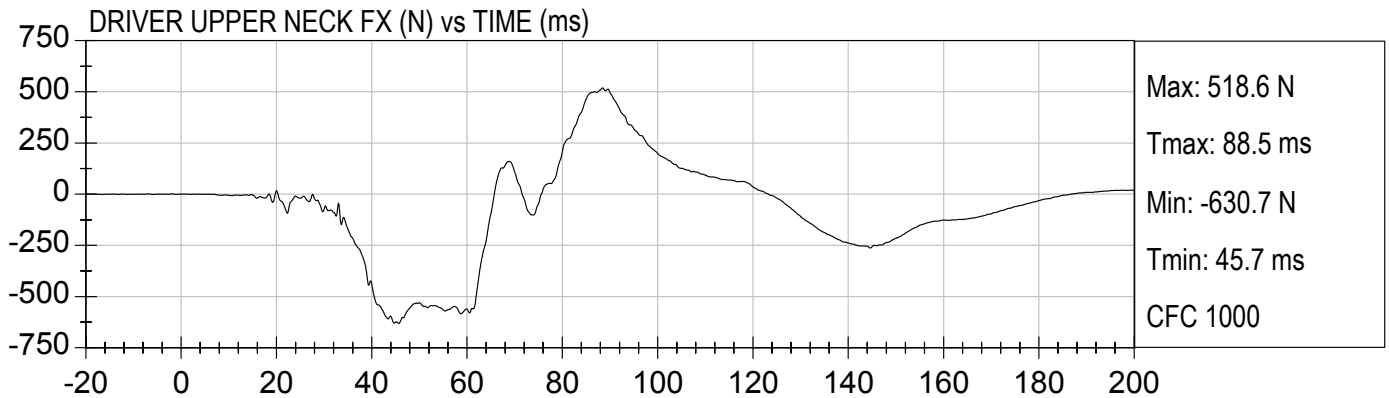
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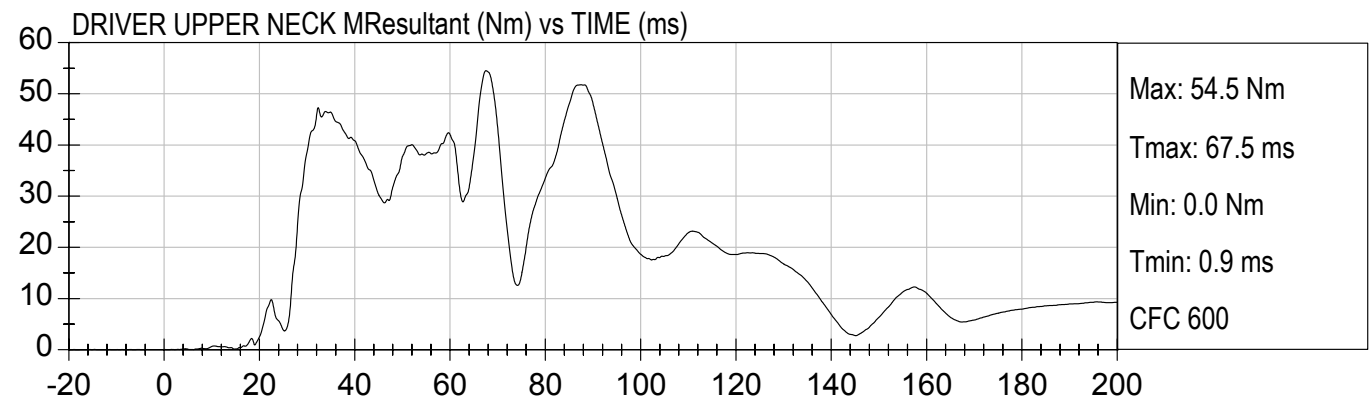
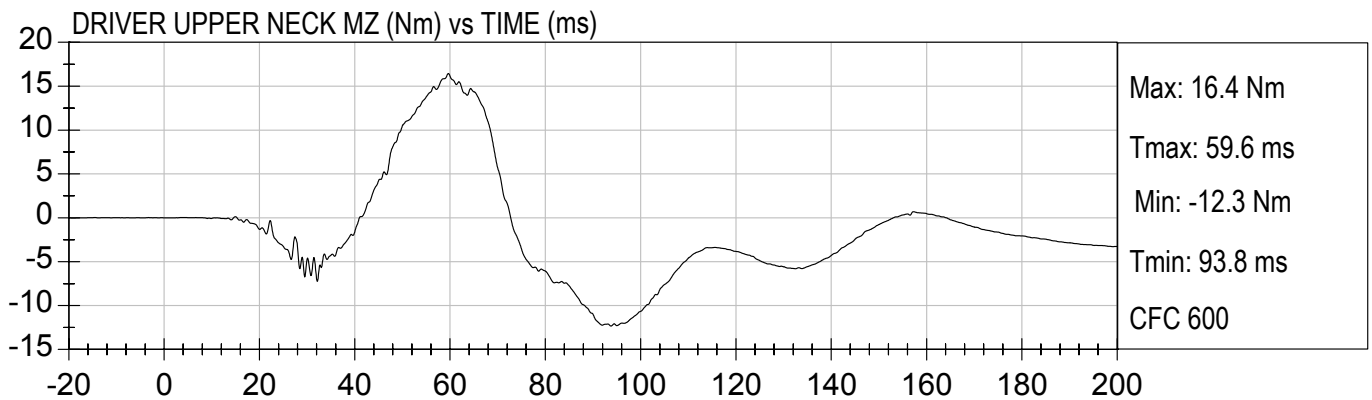
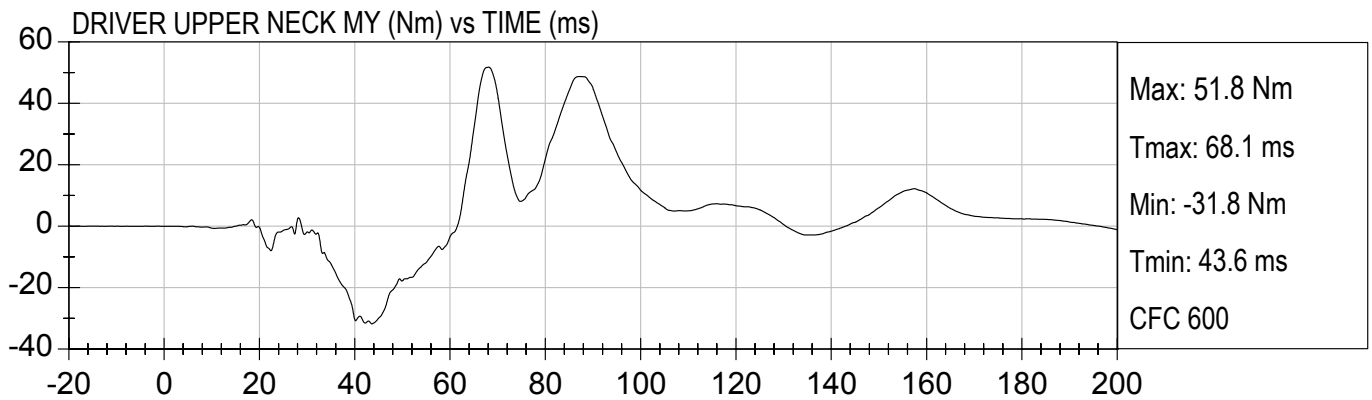
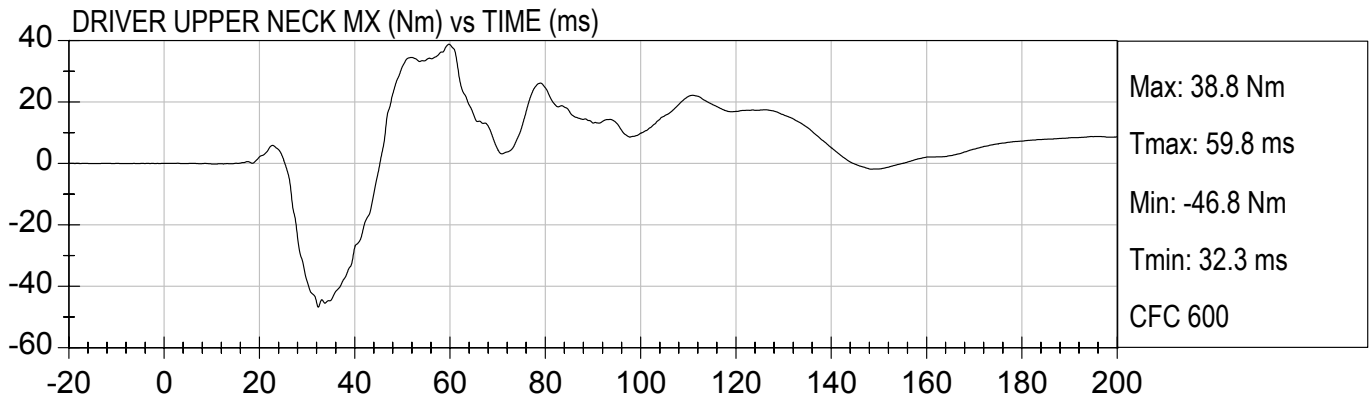
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Figure No. 396.	LR Passenger Front Rib to Rib Guide 2 vs. Time	B-118
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Figure No. 401.	LR Passenger Rear Rib to Rib Guide 3 vs. Time	B-119
Figure No. 402.	LR Passenger Rear Rib to Rib Guide 4 vs. Time	B-119

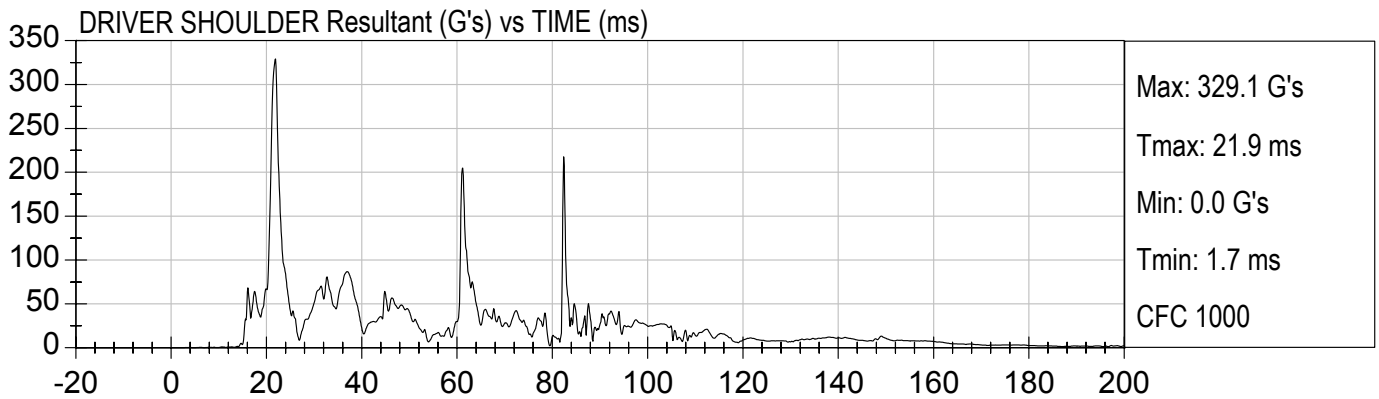
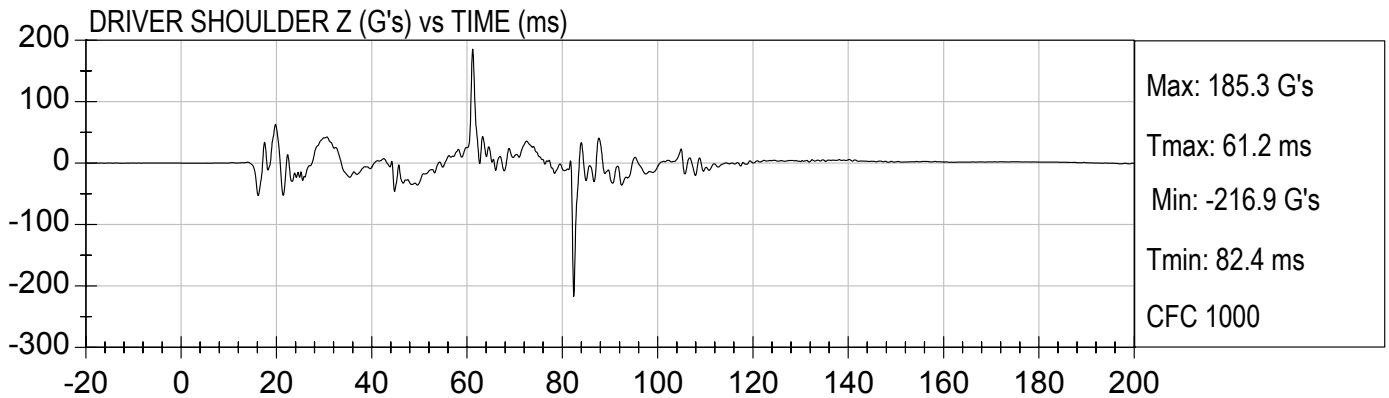
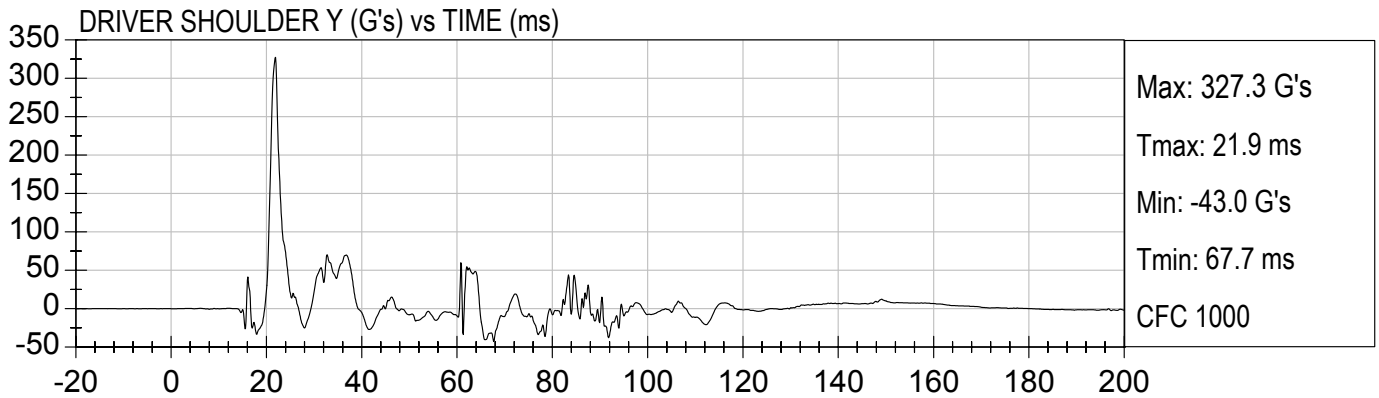
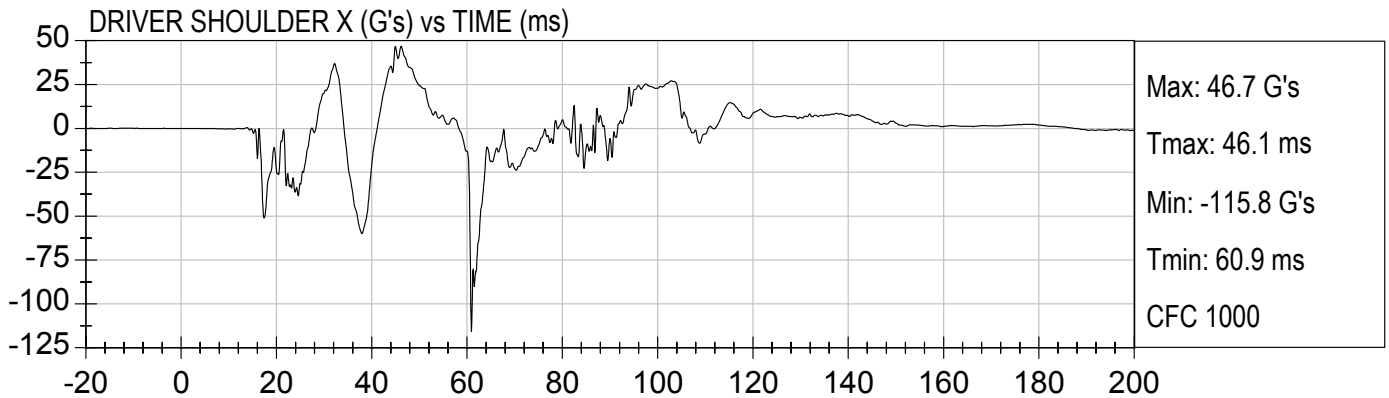
Figure No. 403.	LR Passenger Front Rib to Rib Guide 5 vs. Time	B-120
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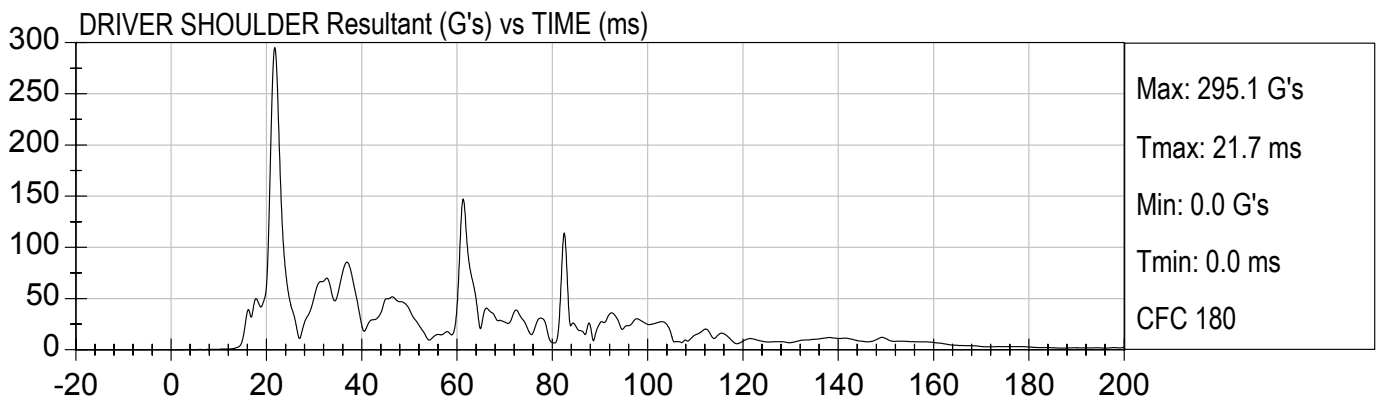
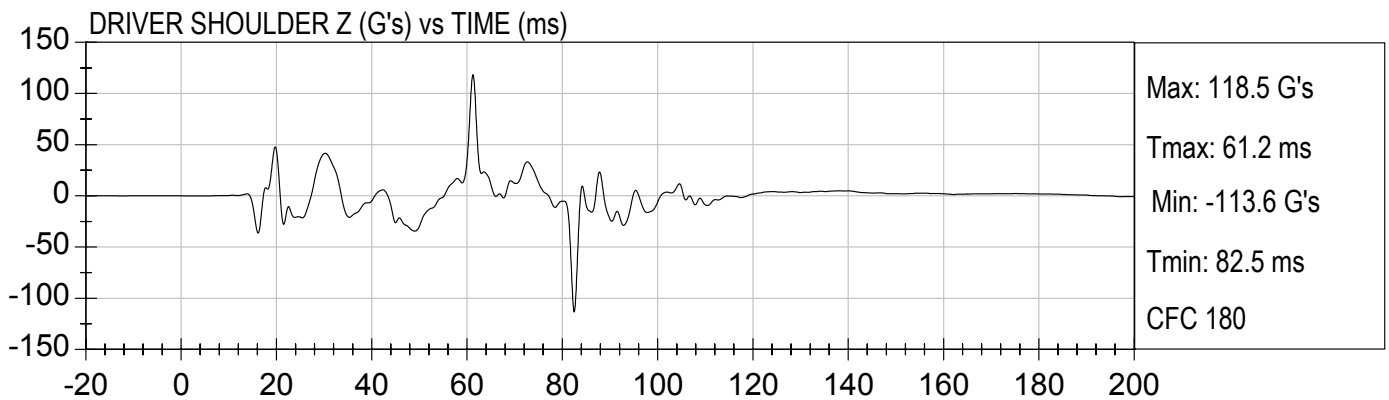
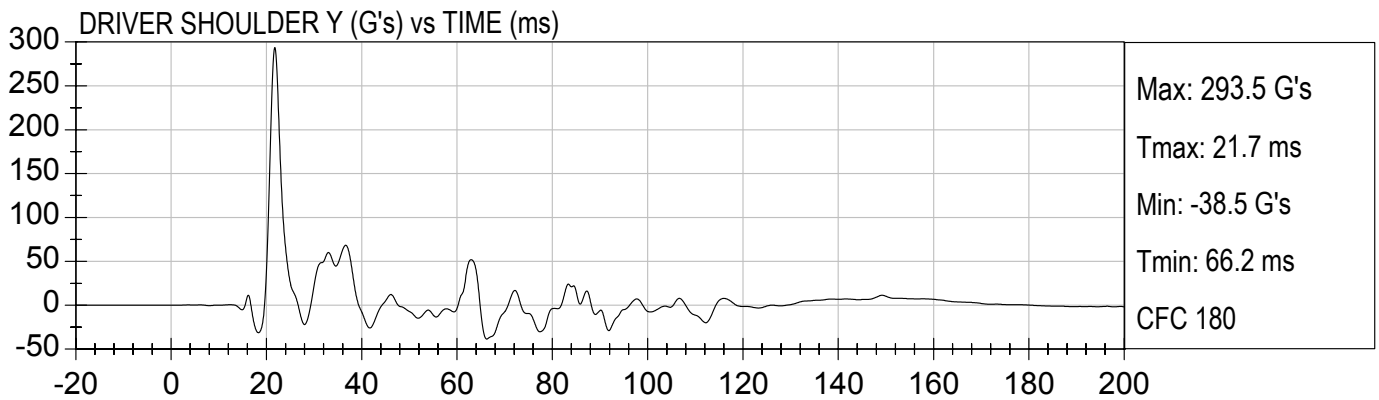
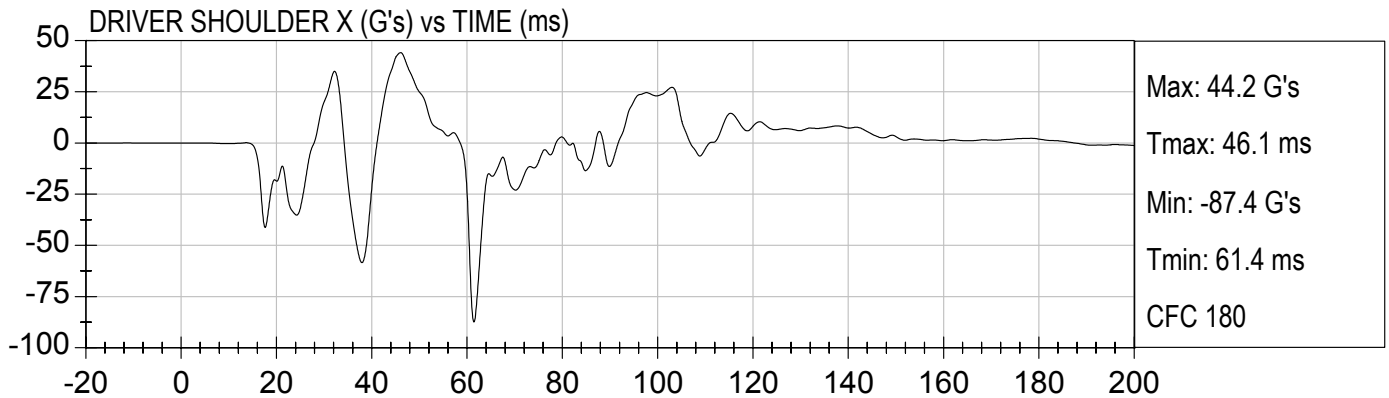


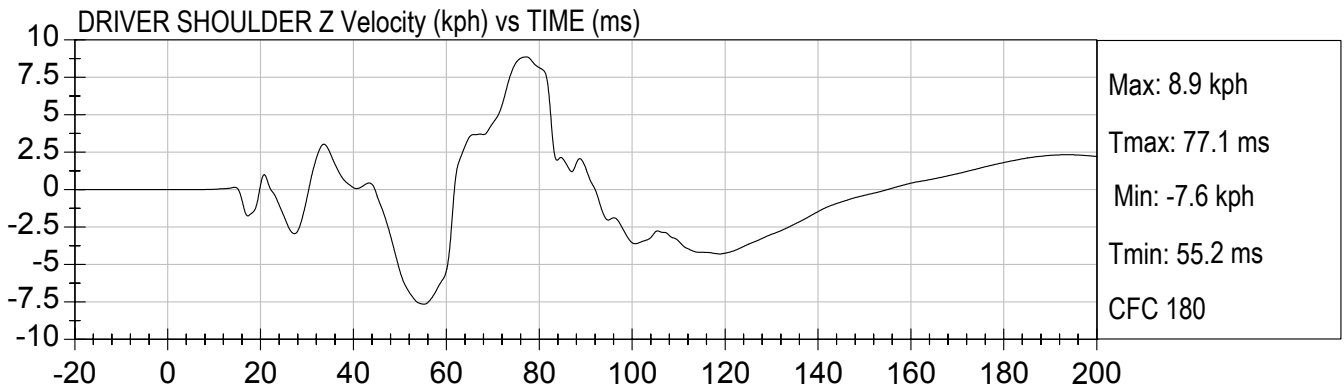
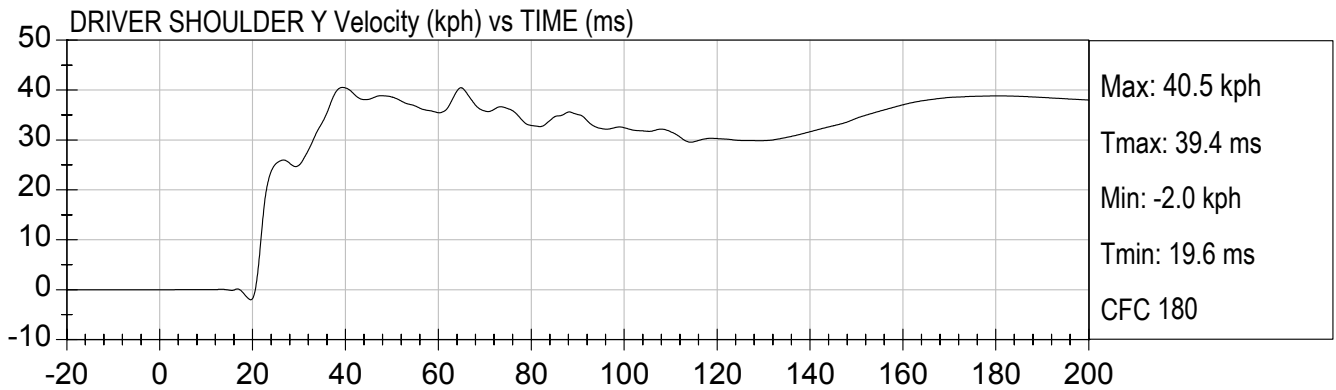
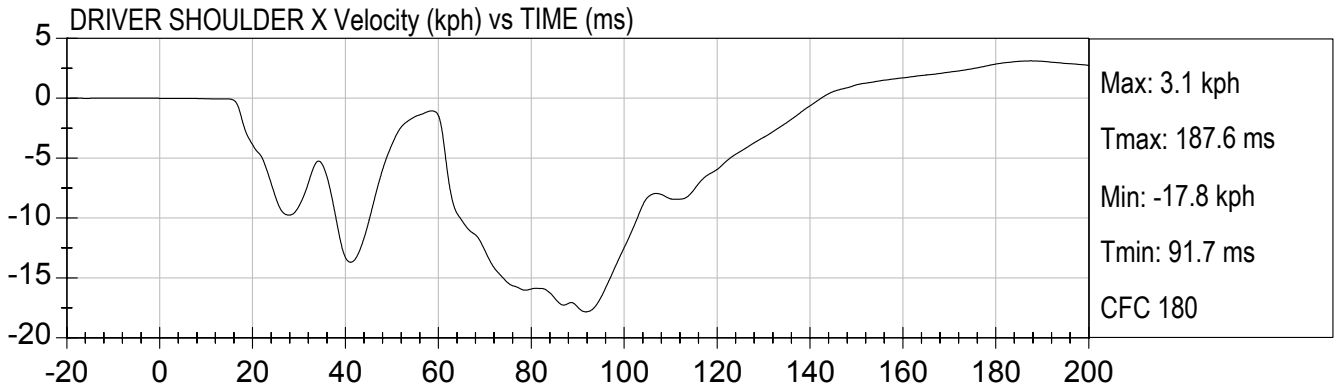


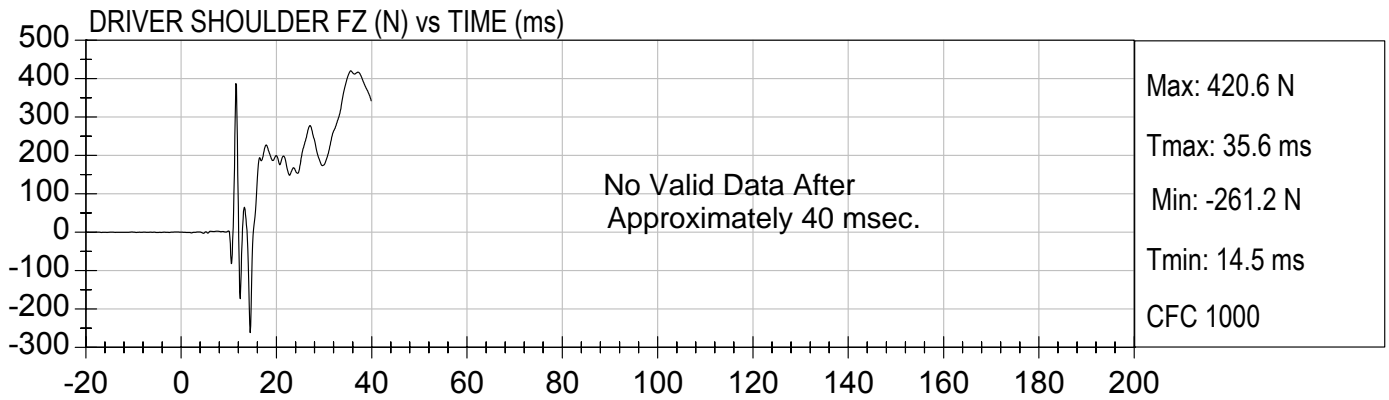
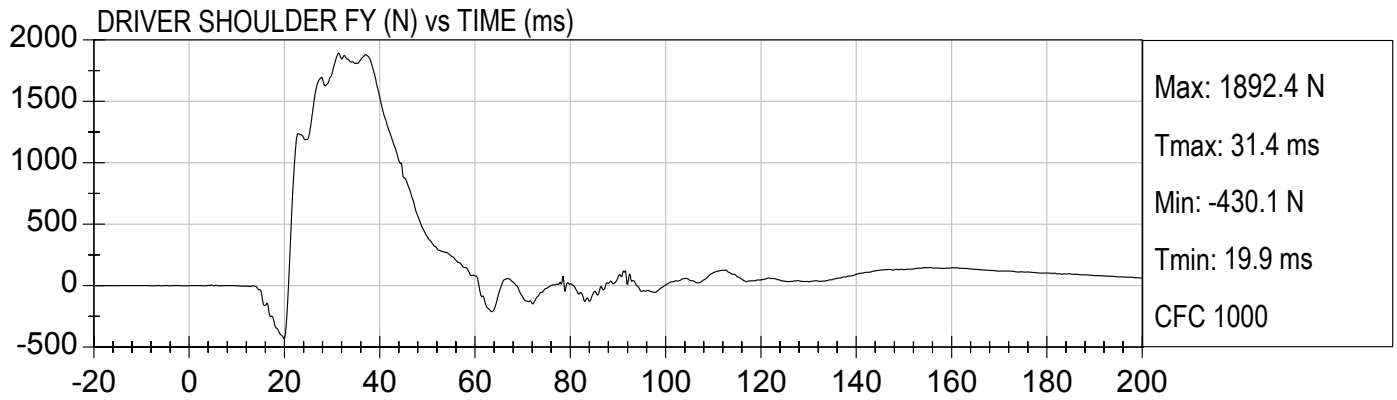
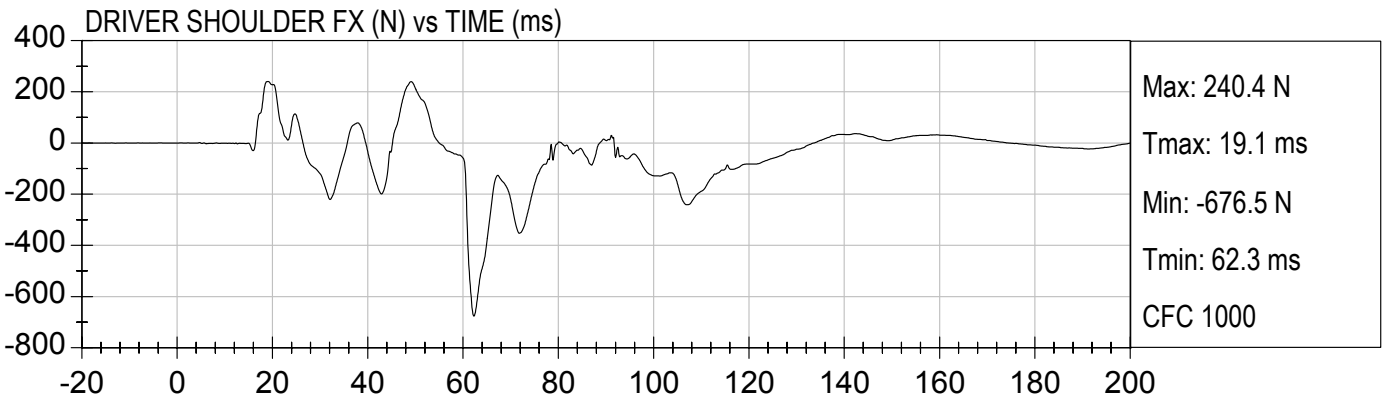


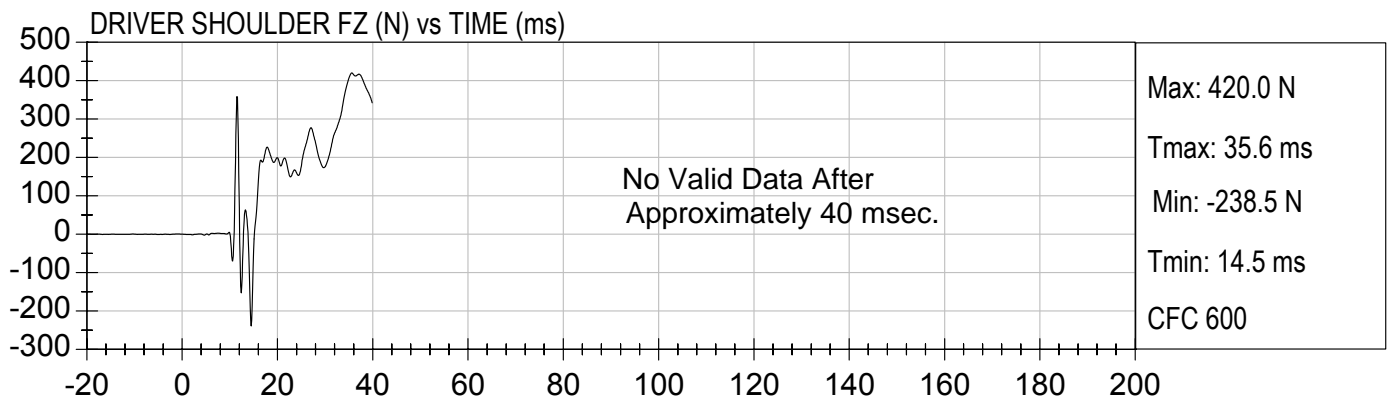
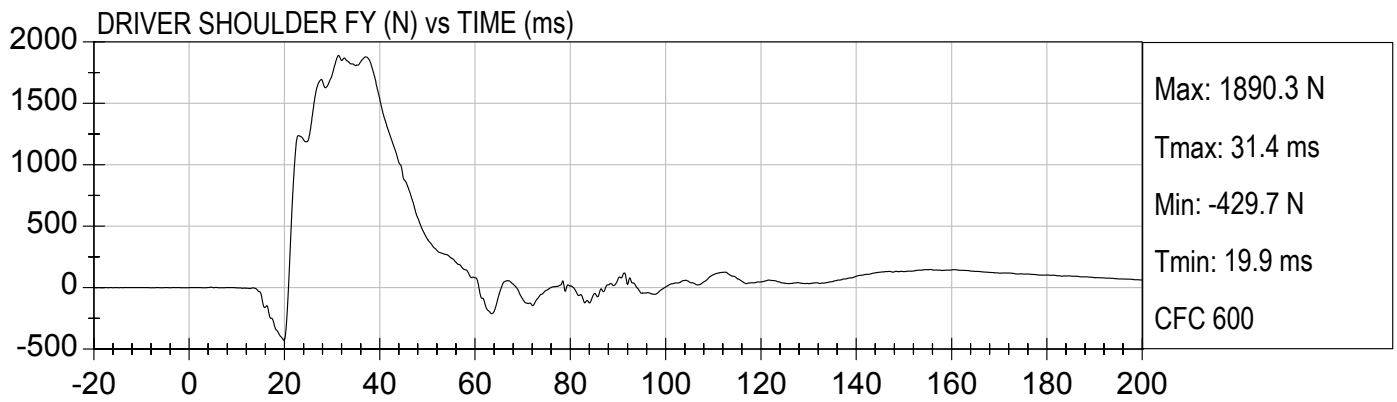
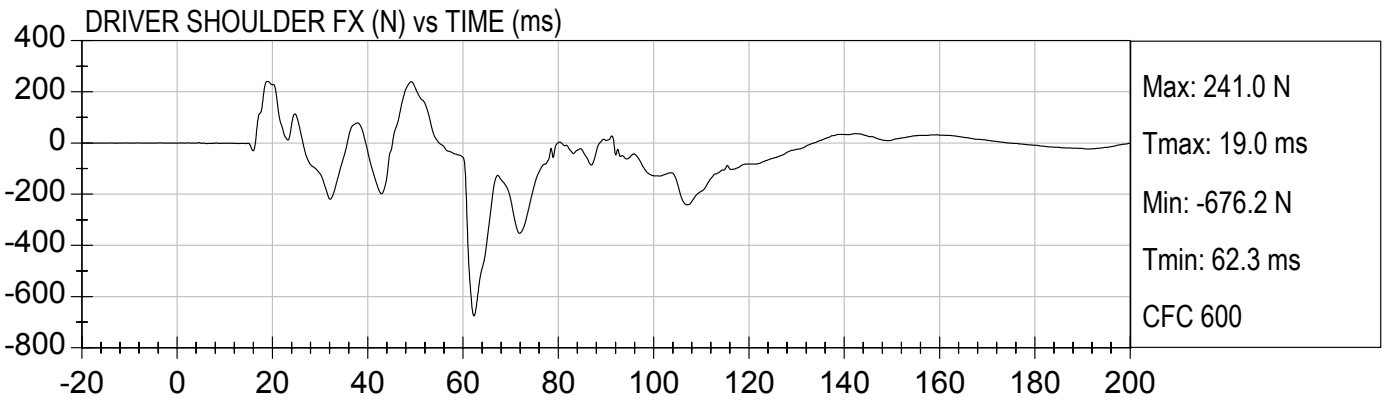


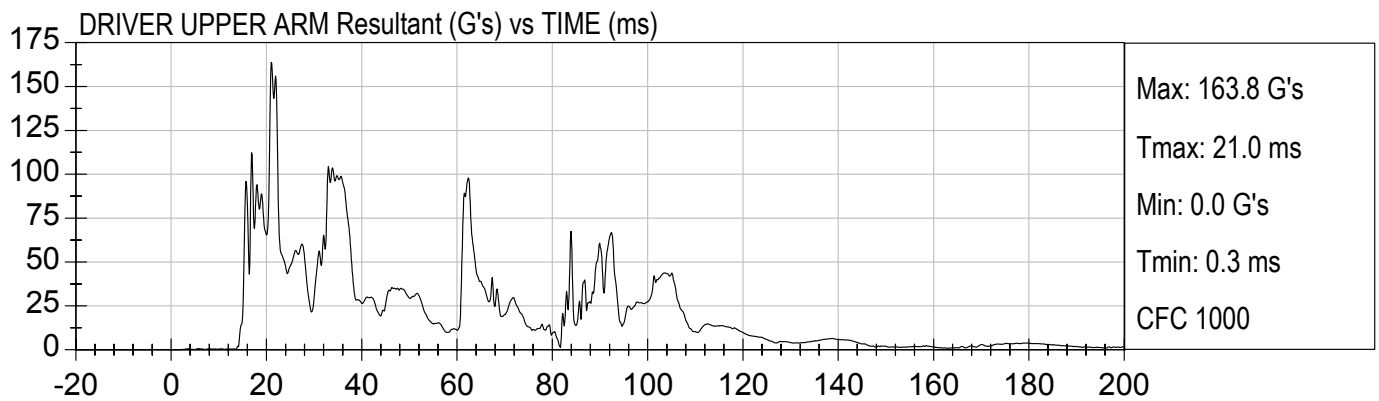
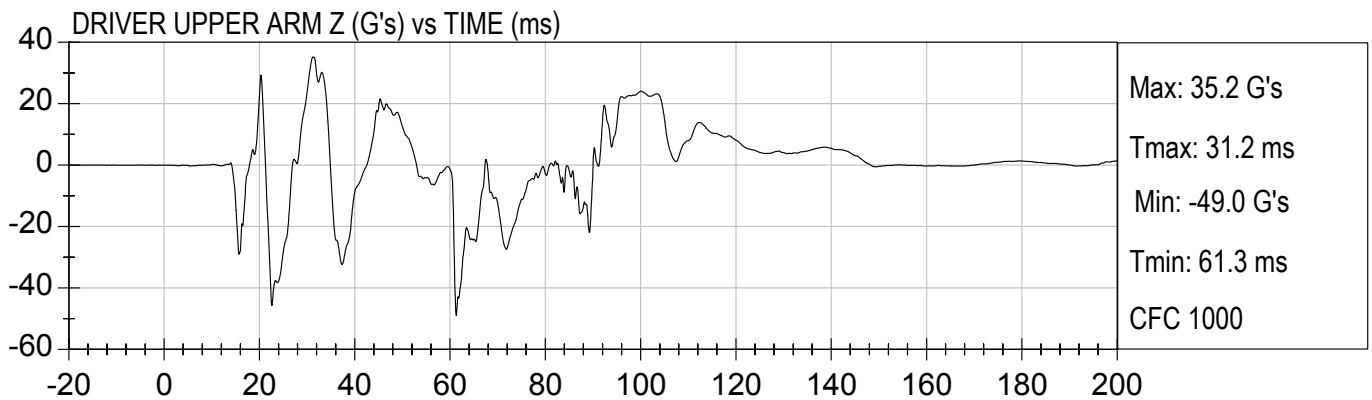
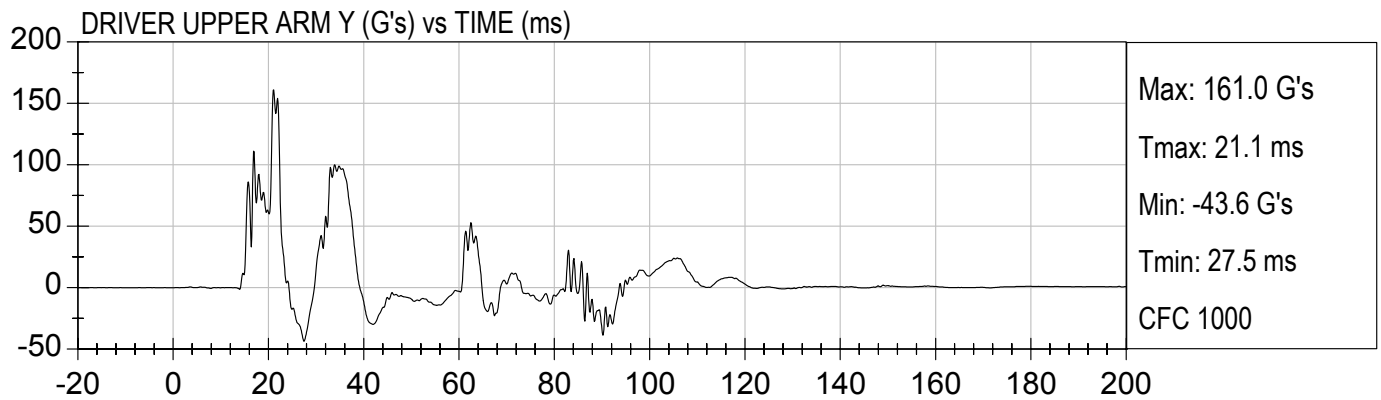
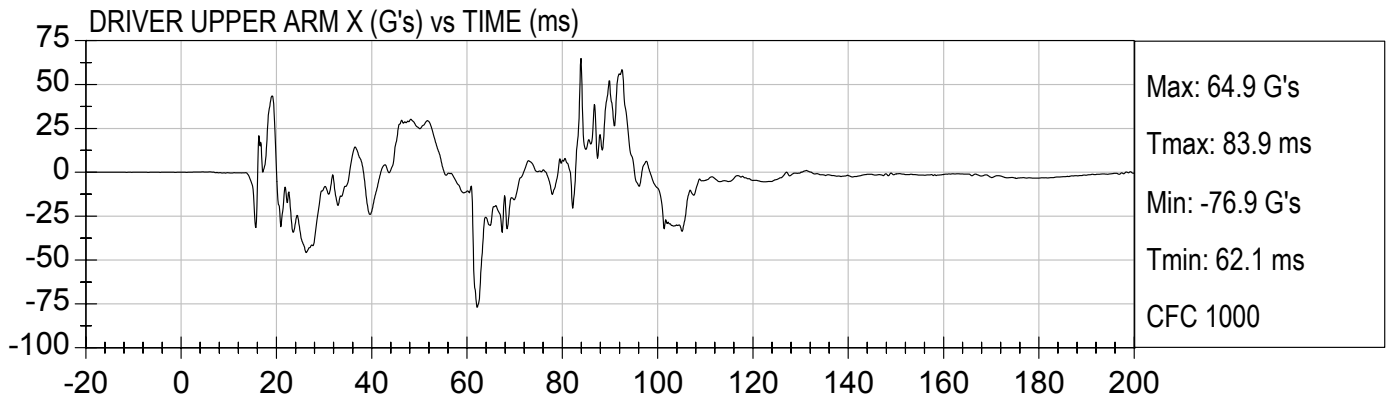


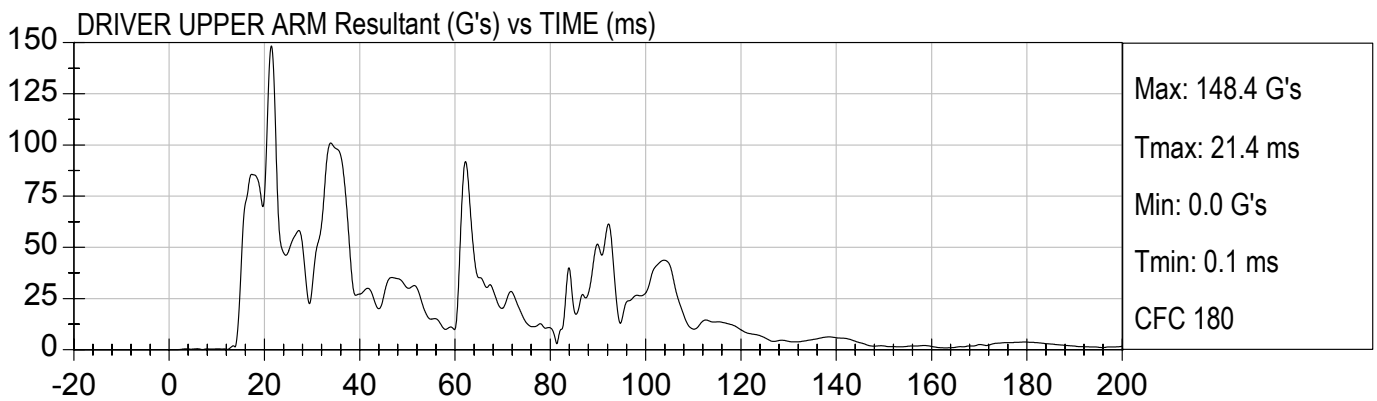
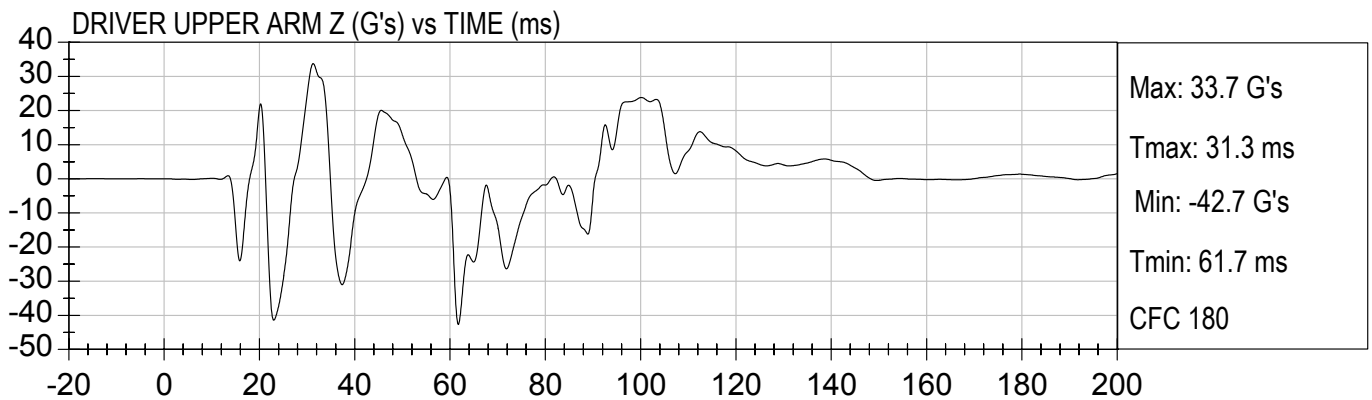
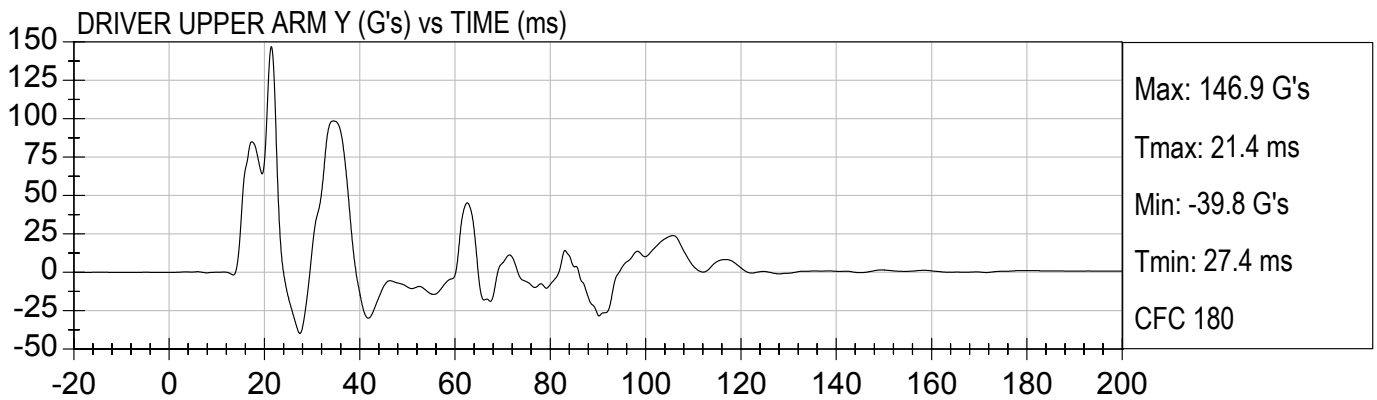
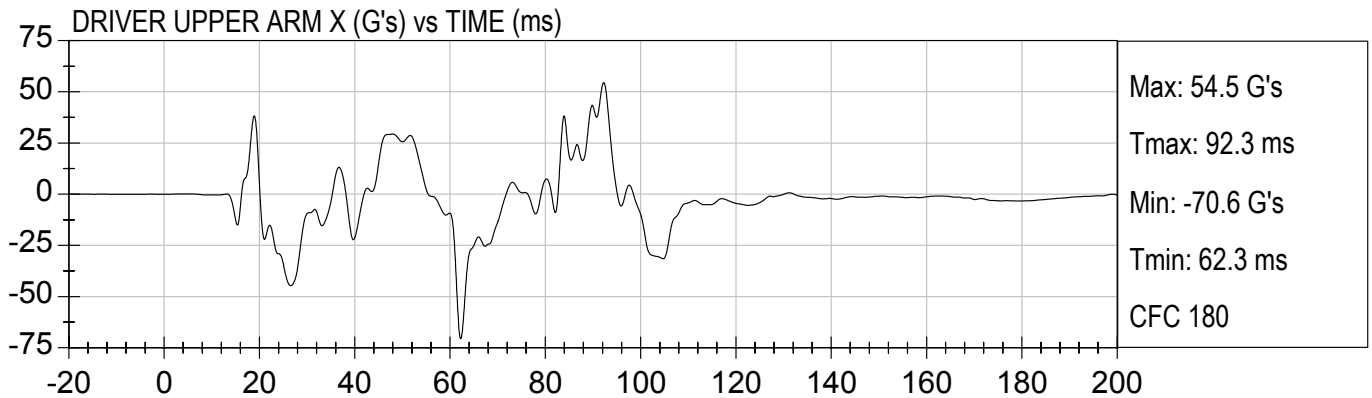


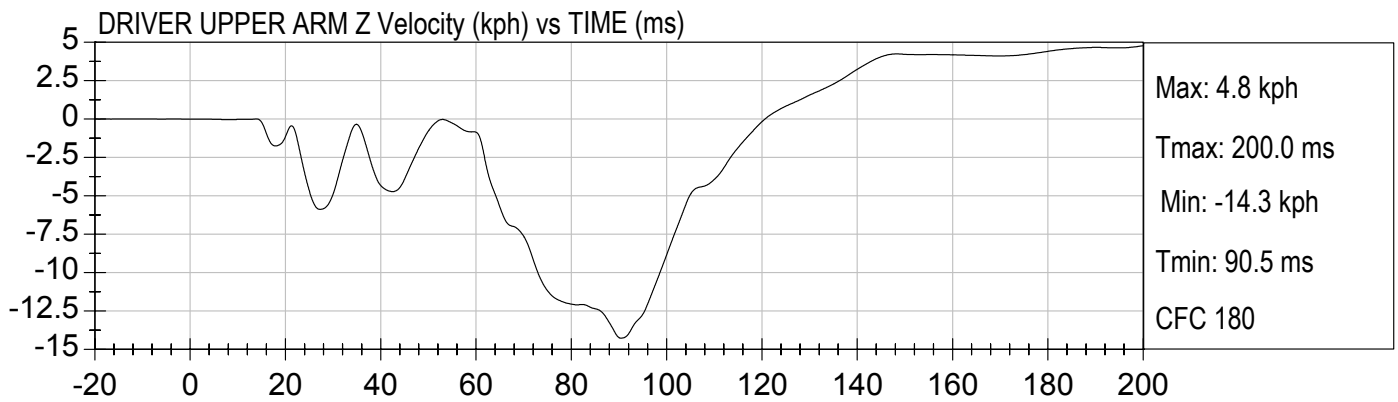
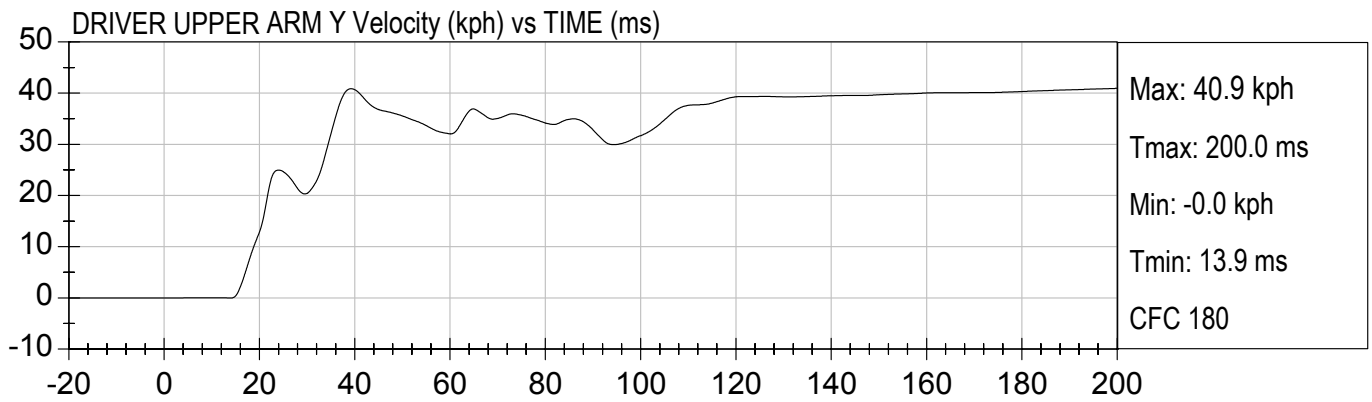
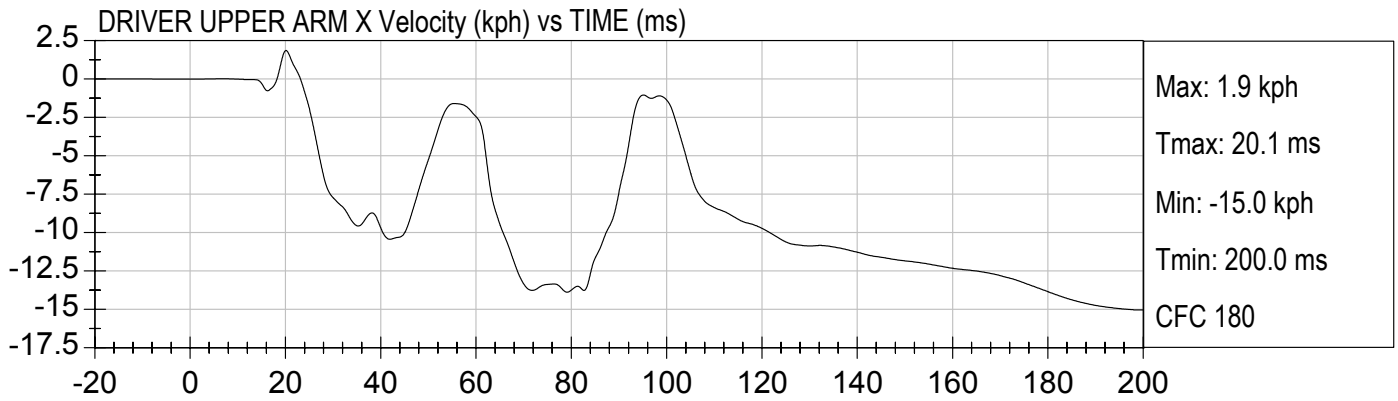


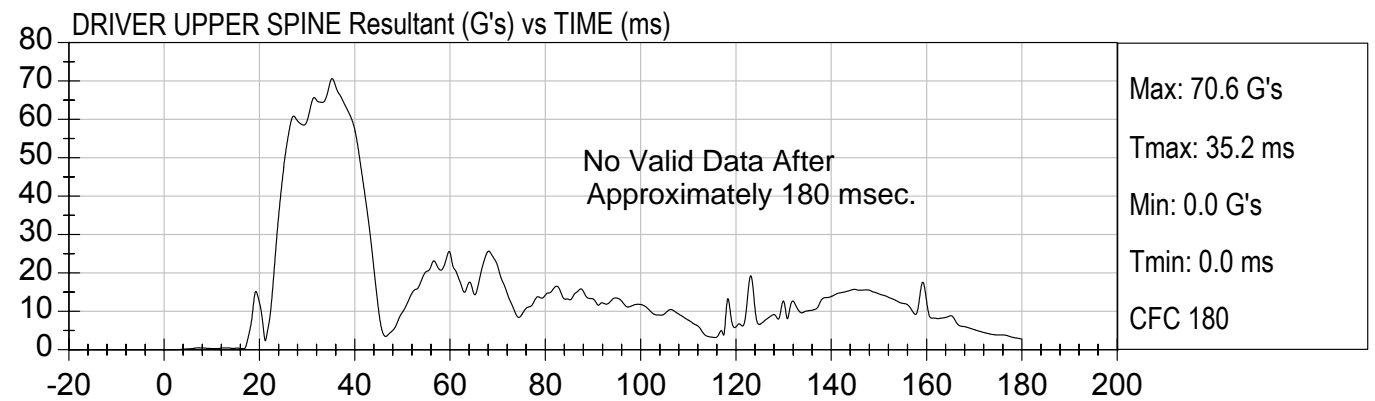
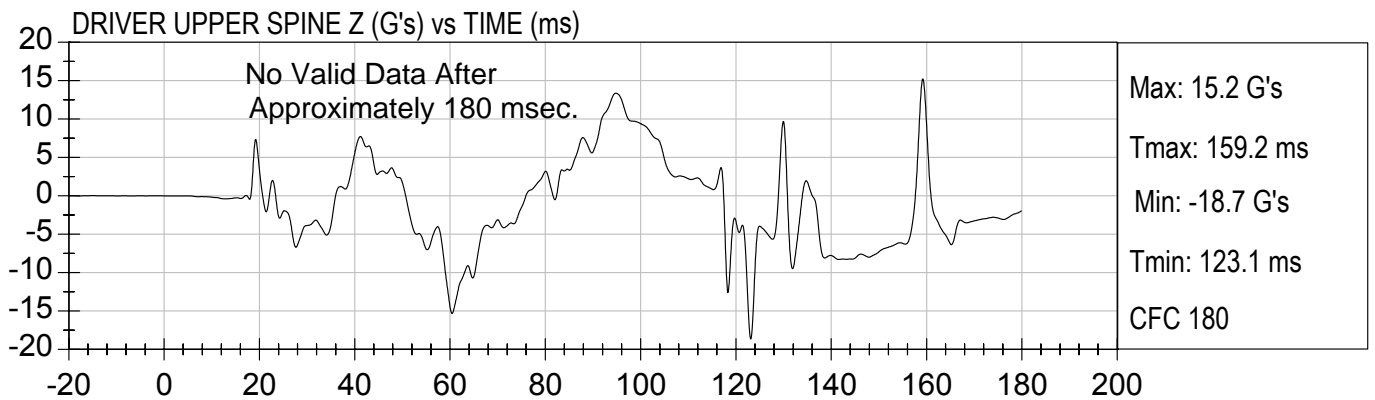
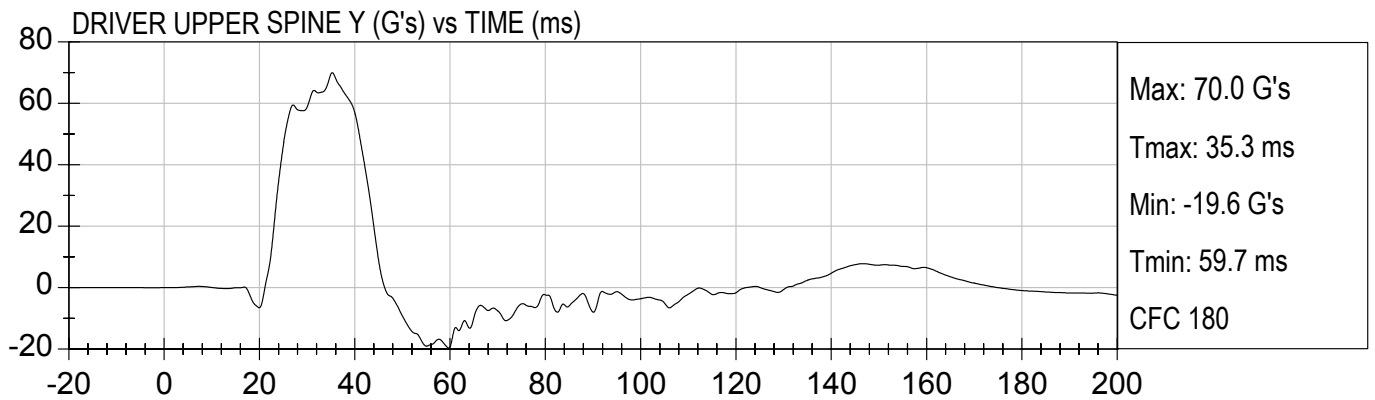
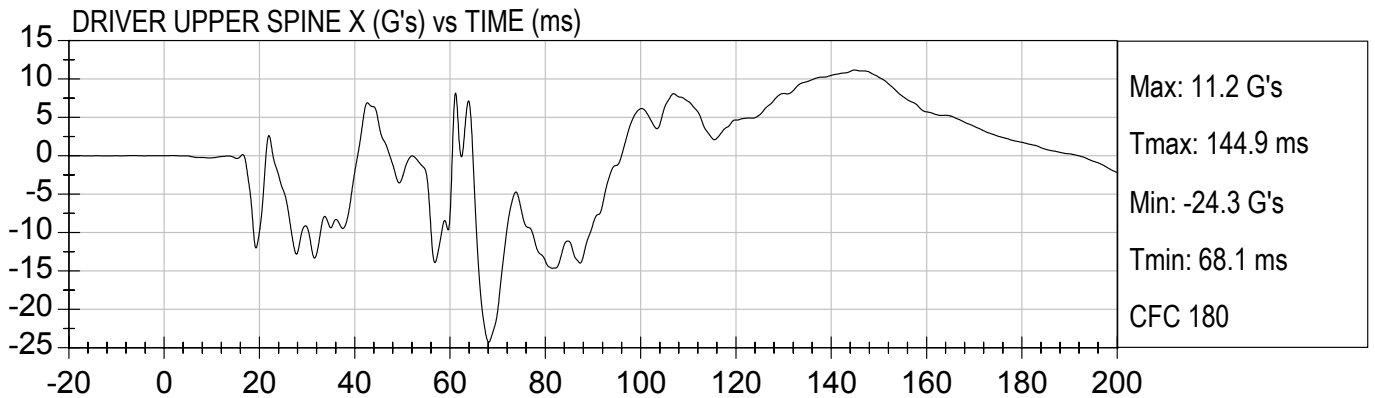


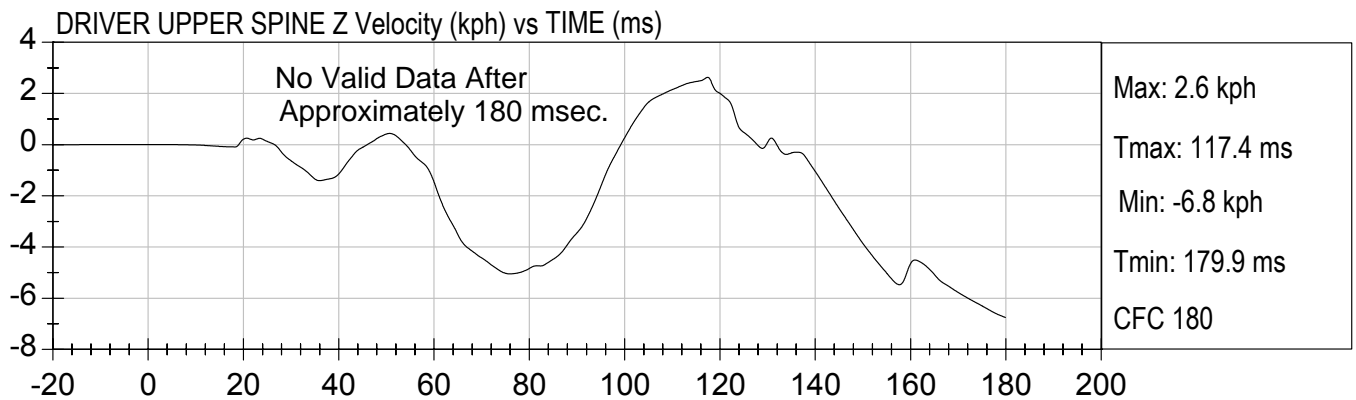
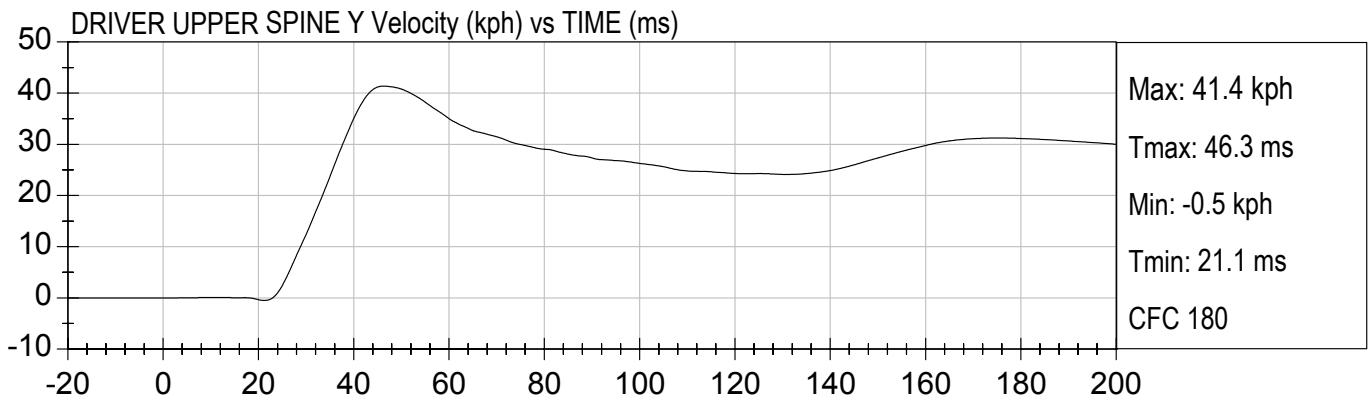
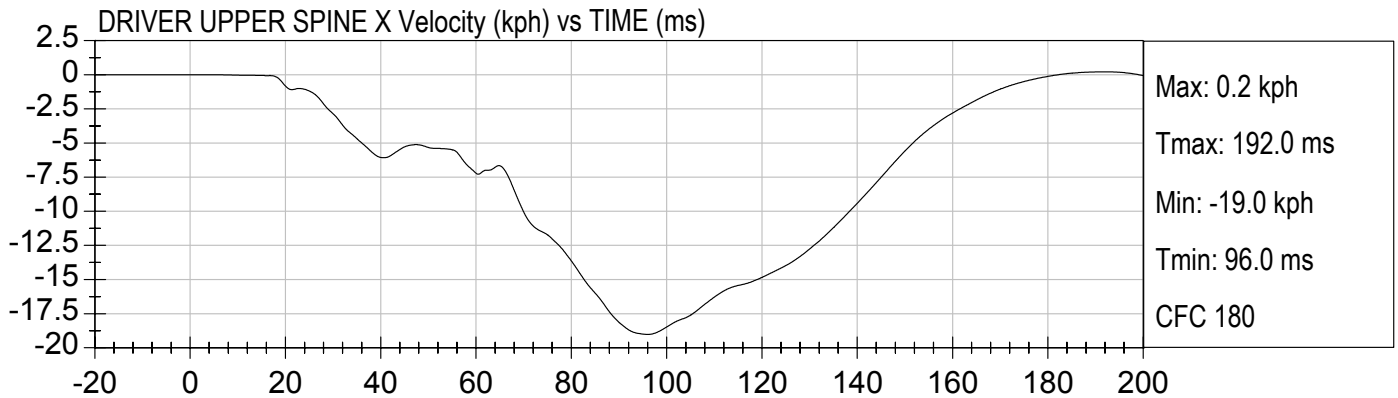


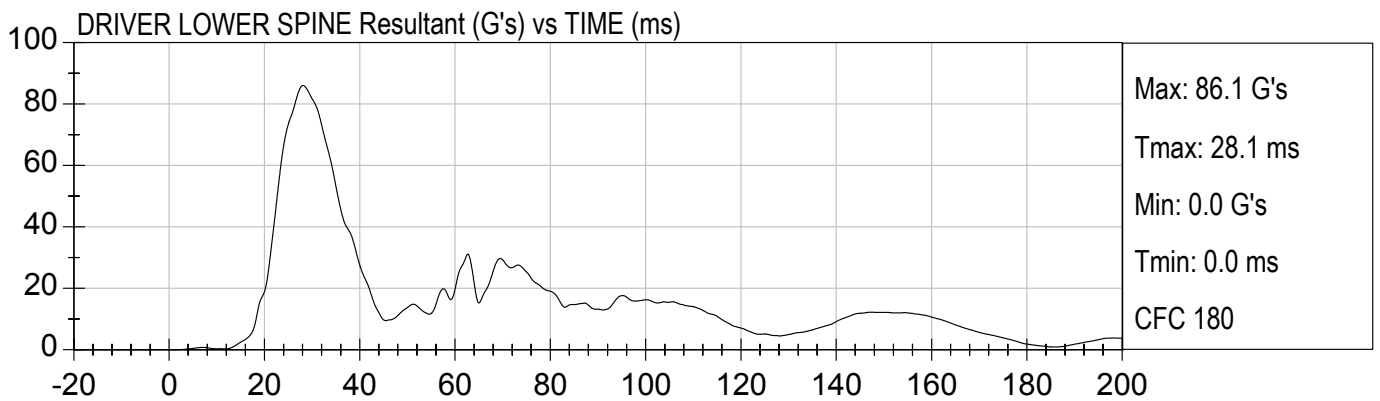
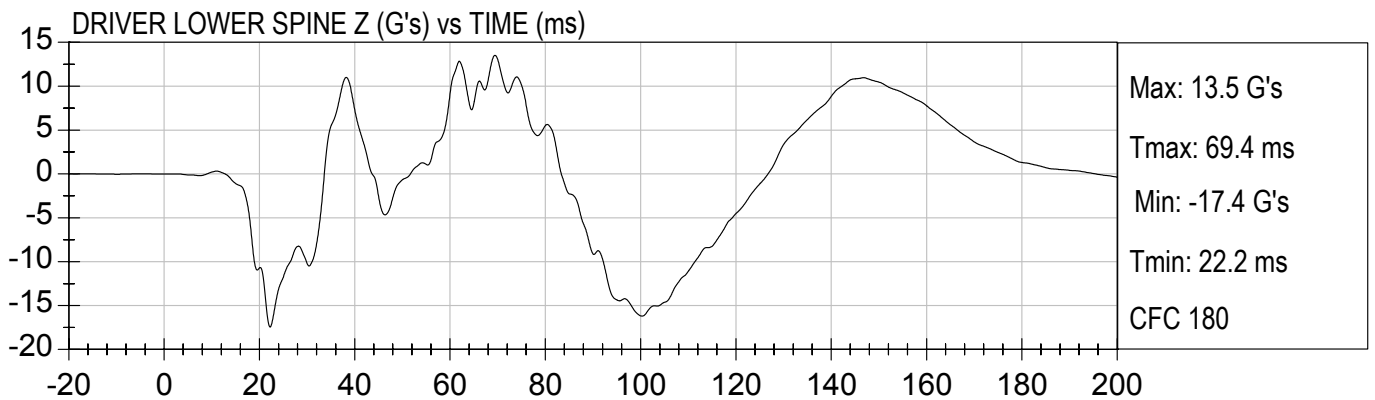
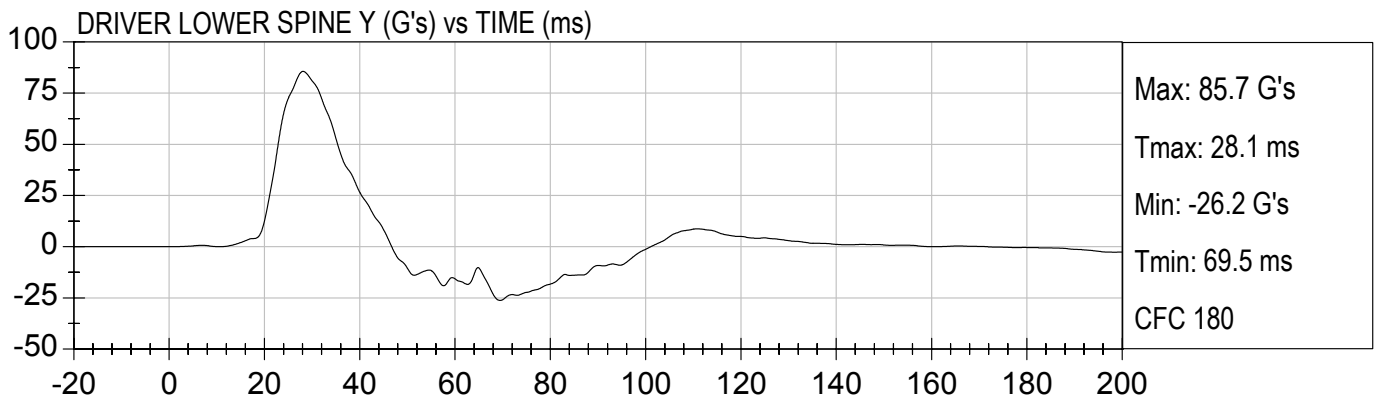
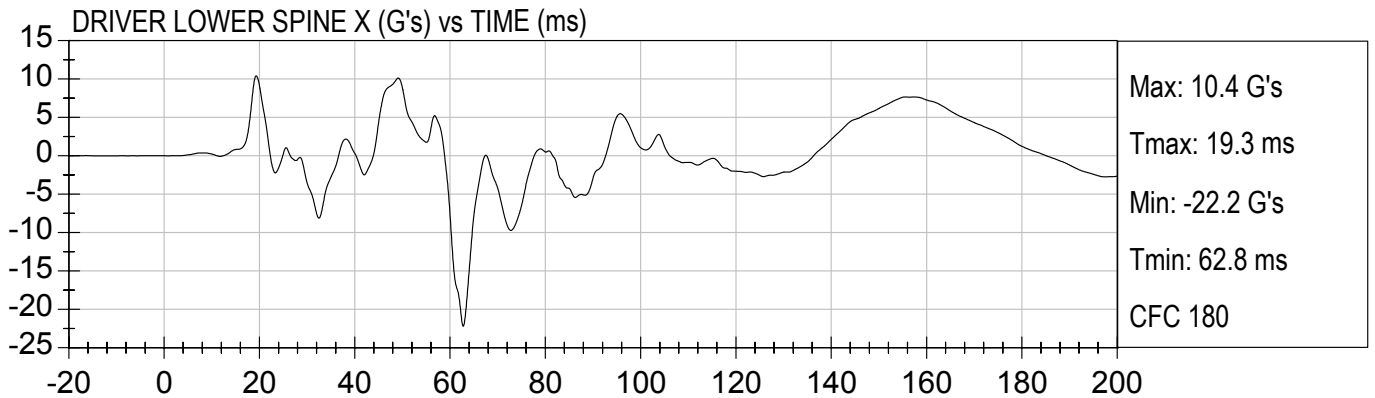






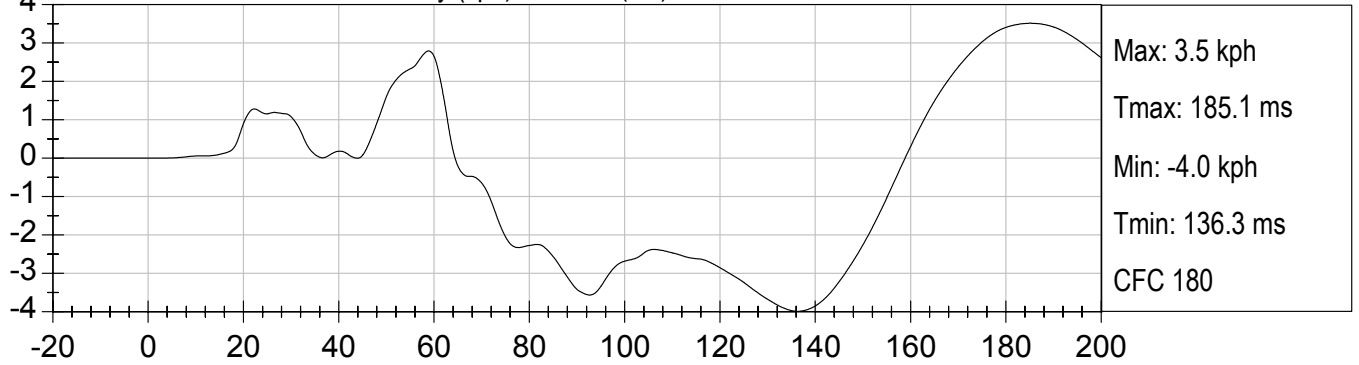




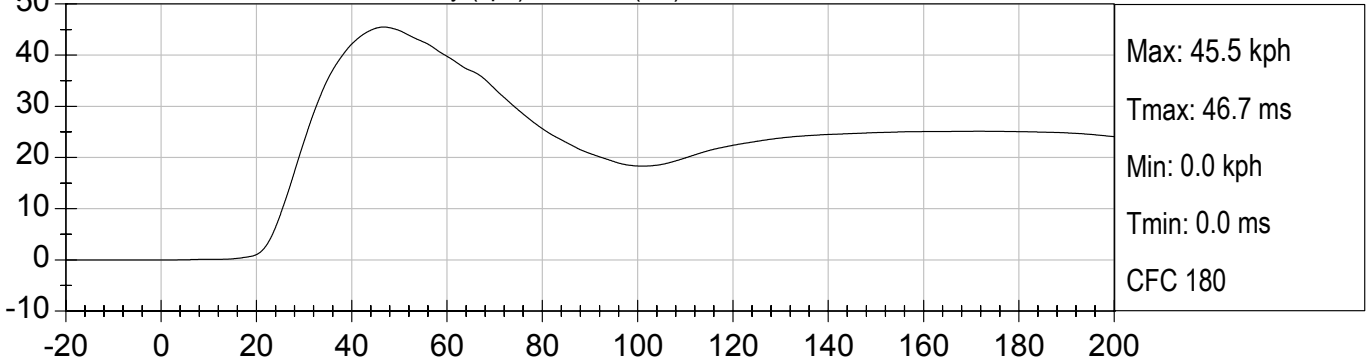




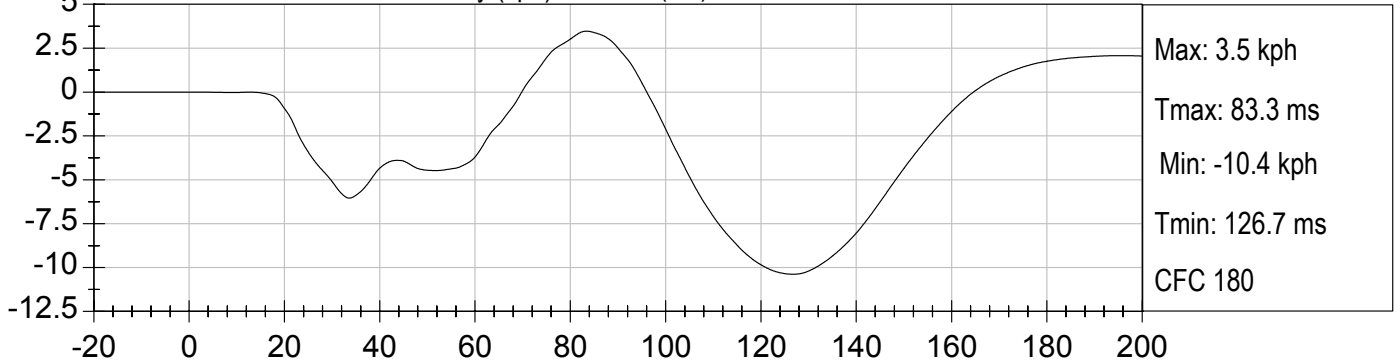
DRIVER LOWER SPINE X Velocity (kph) vs TIME (ms)

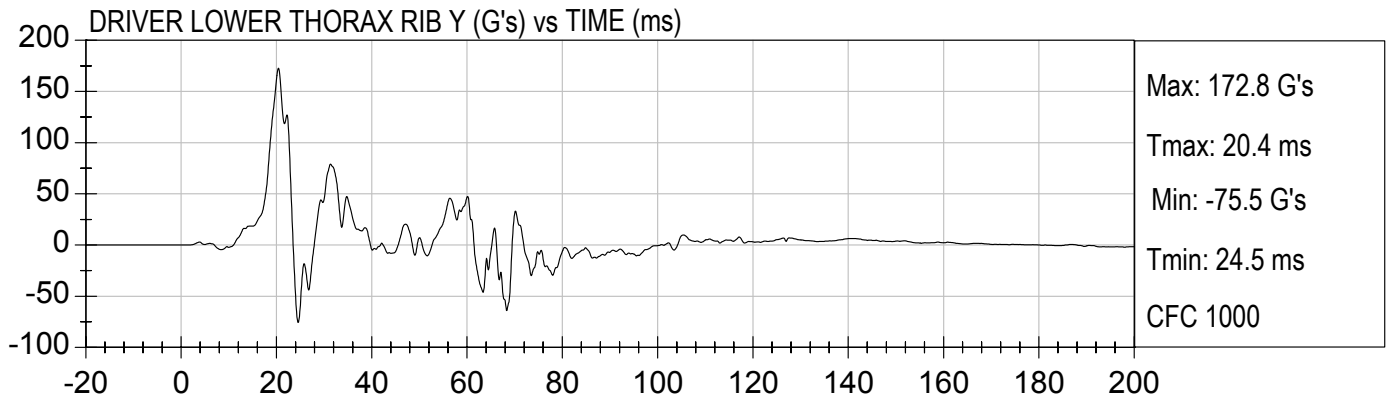
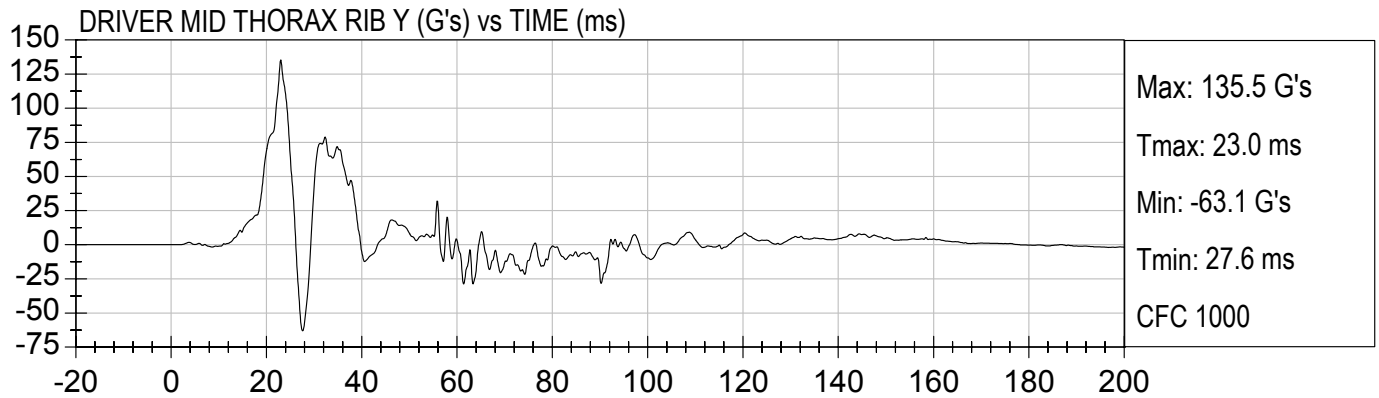
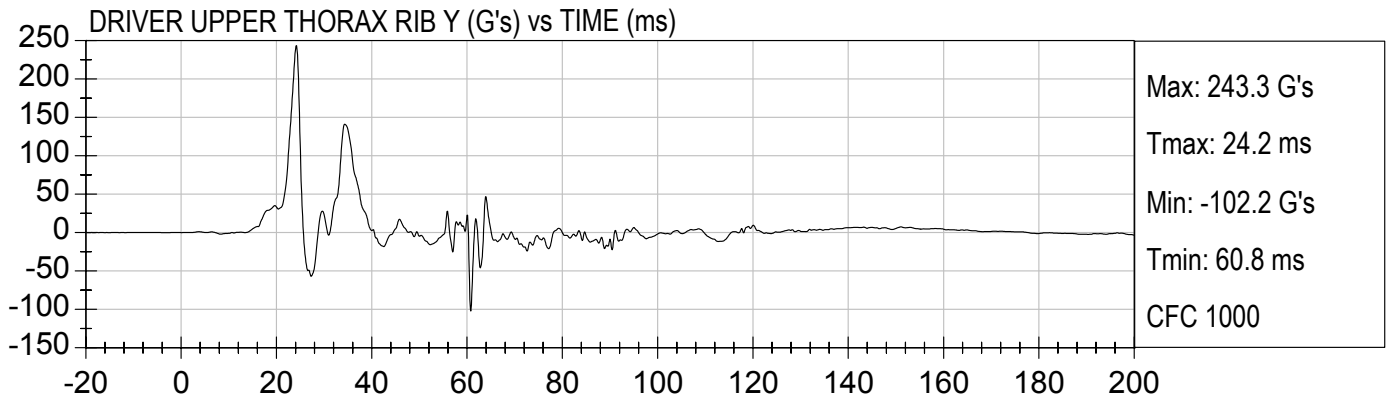


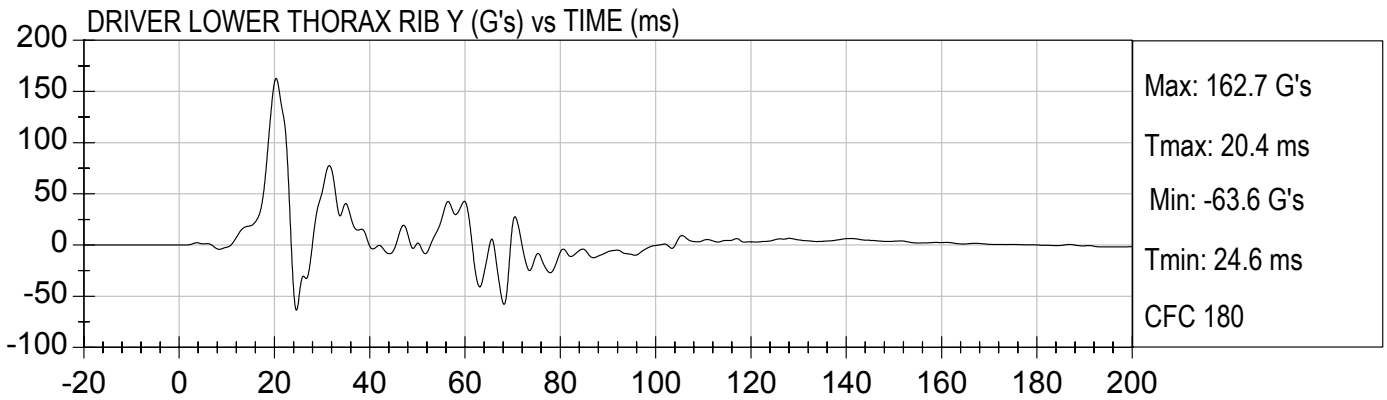
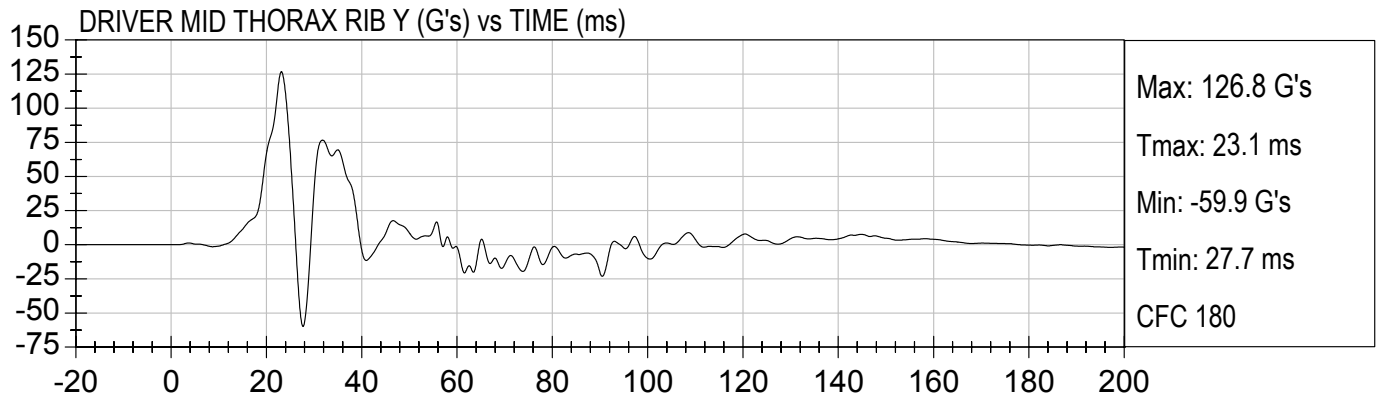
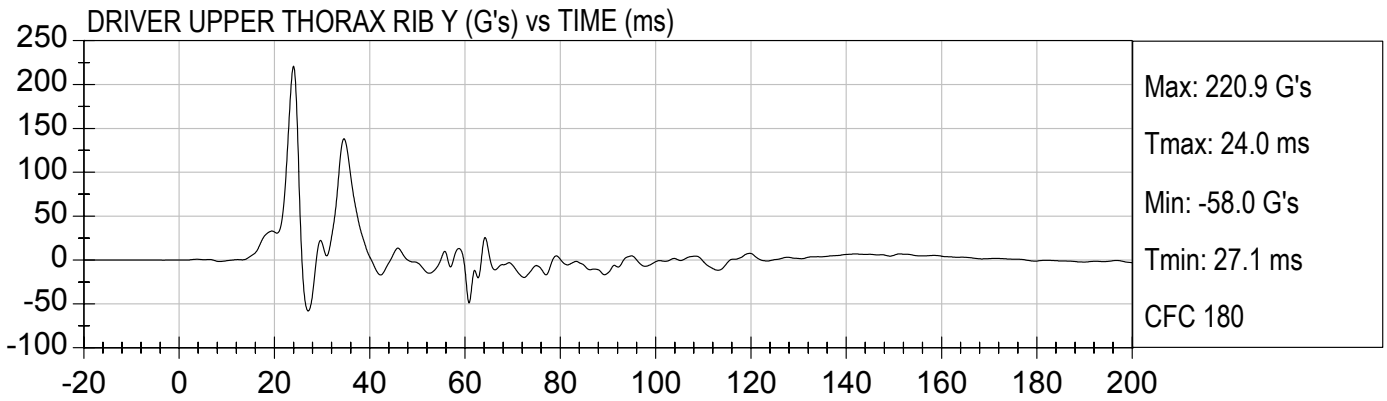
DRIVER LOWER SPINE Y Velocity (kph) vs TIME (ms)

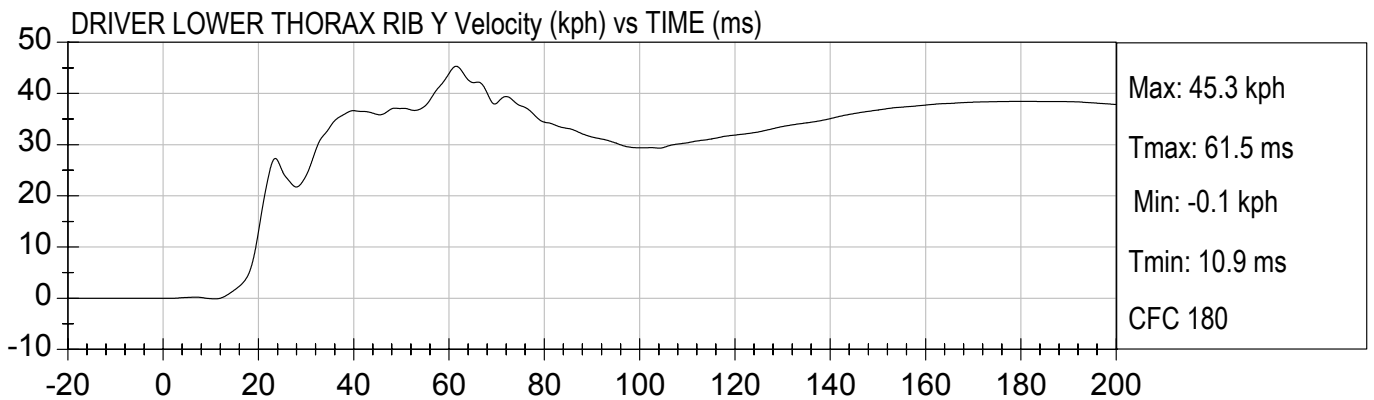
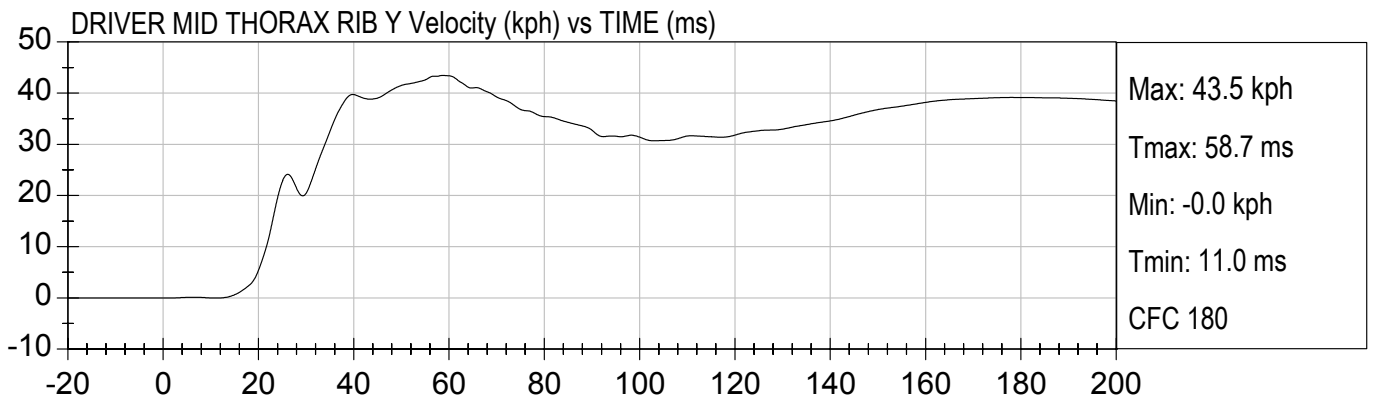
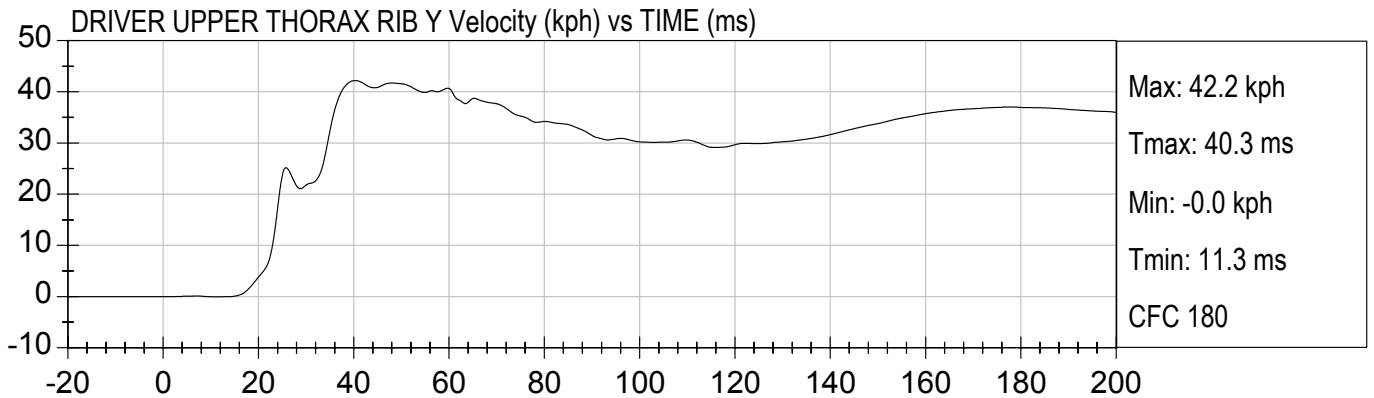


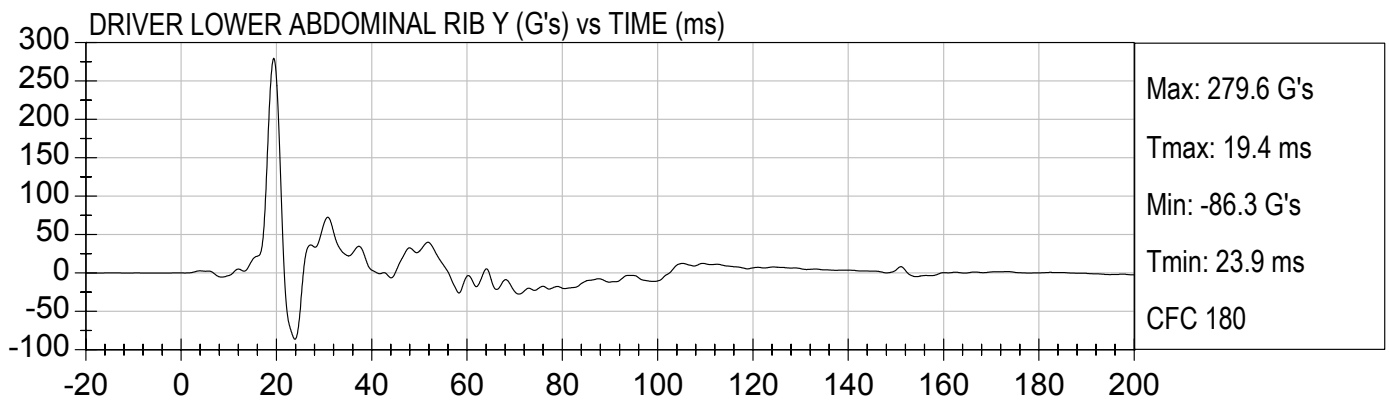
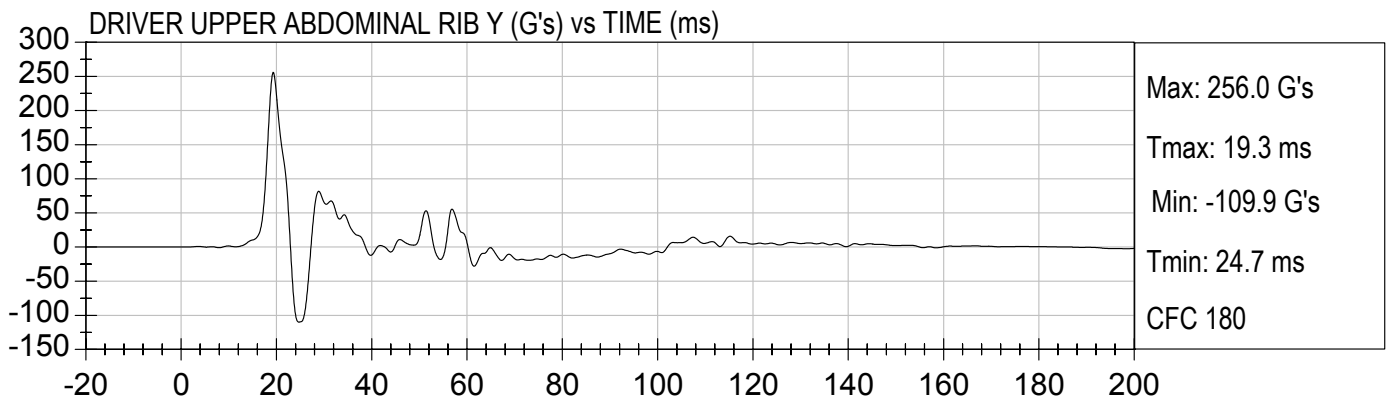
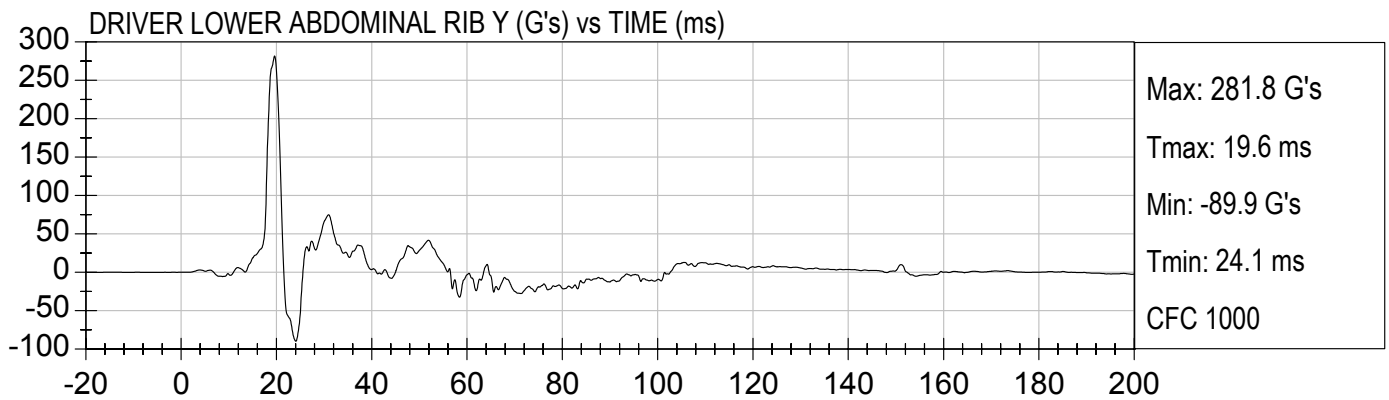
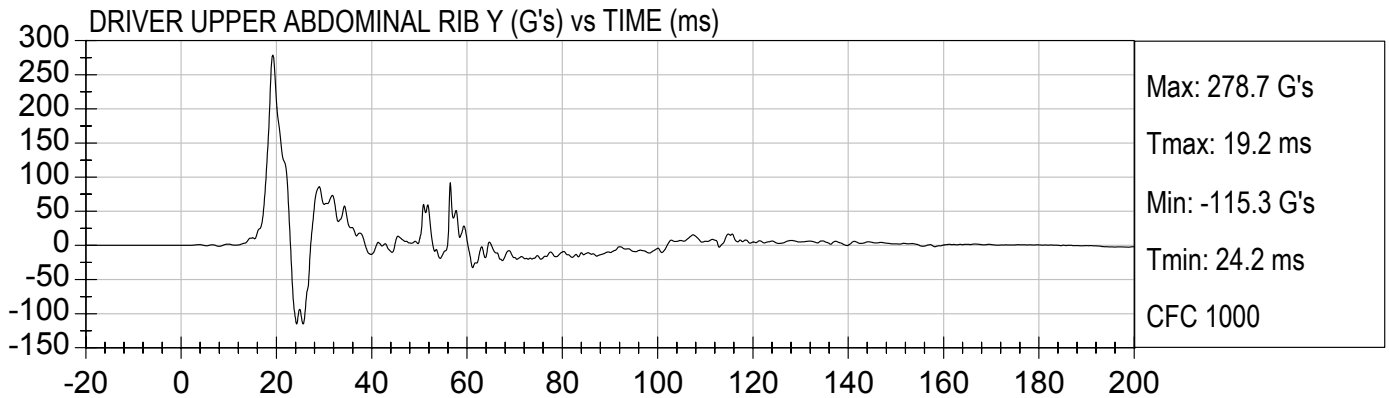
DRIVER LOWER SPINE Z Velocity (kph) vs TIME (ms)

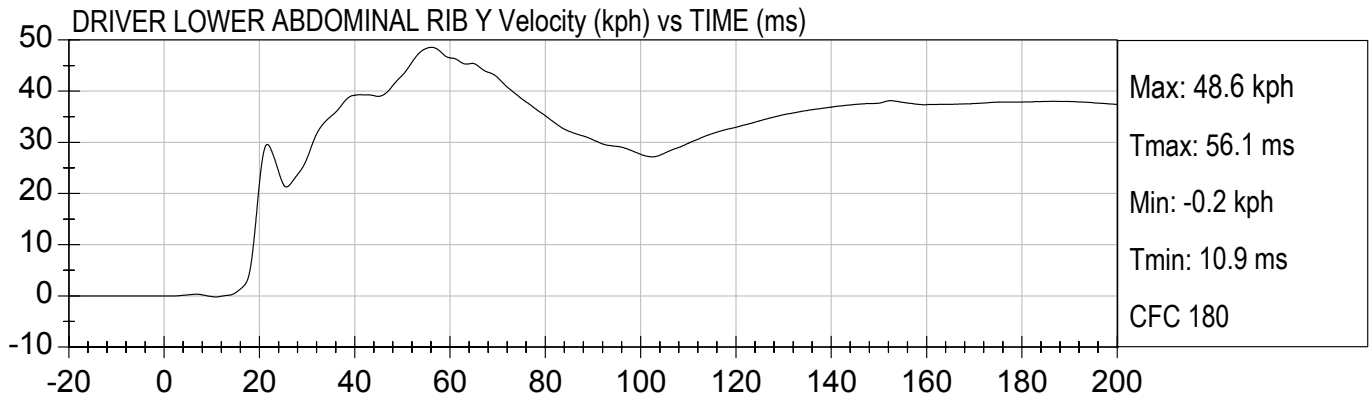
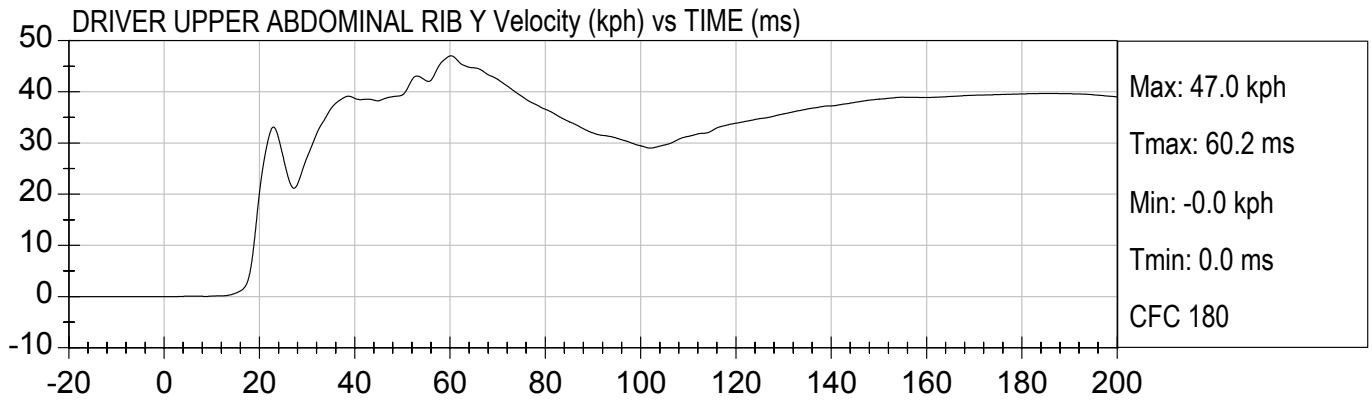


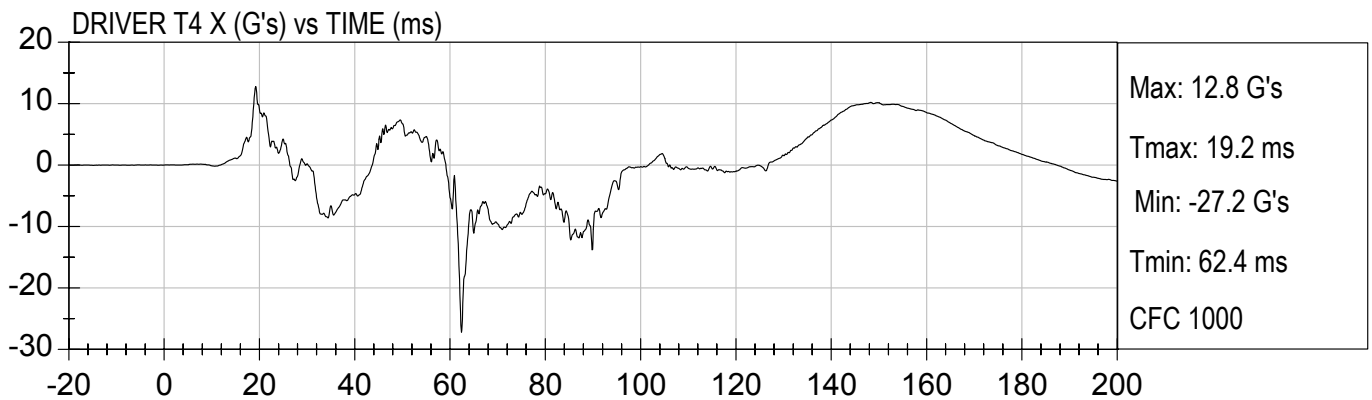
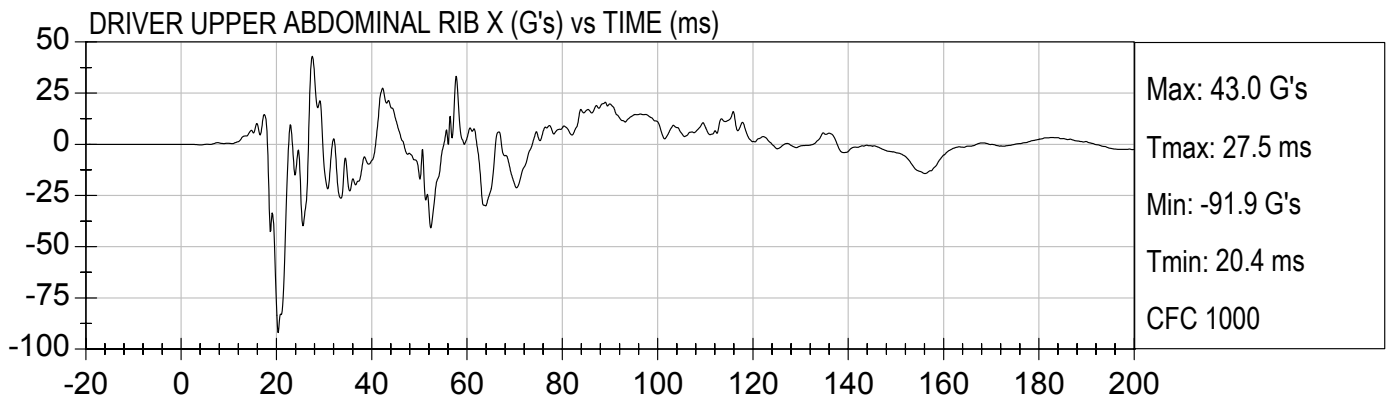
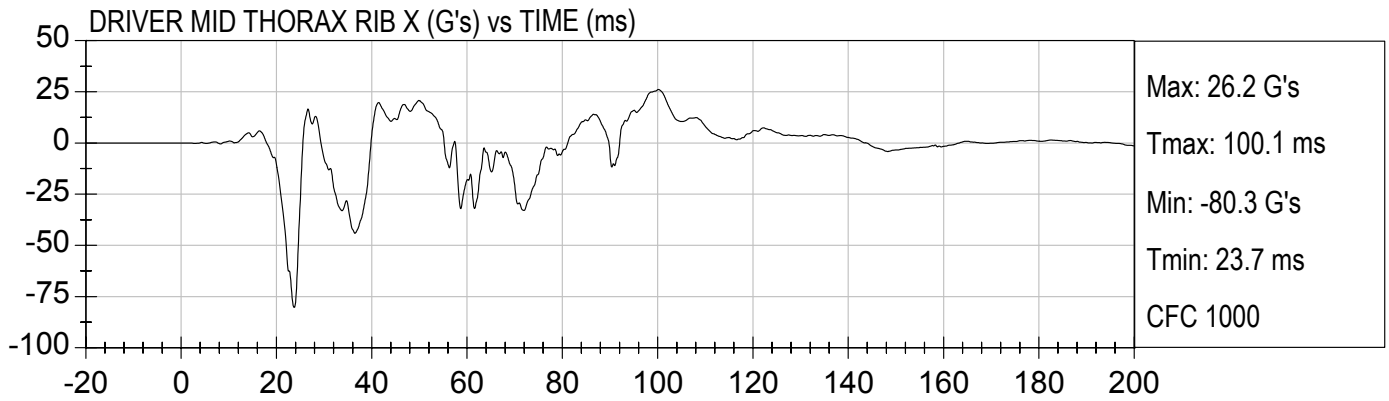


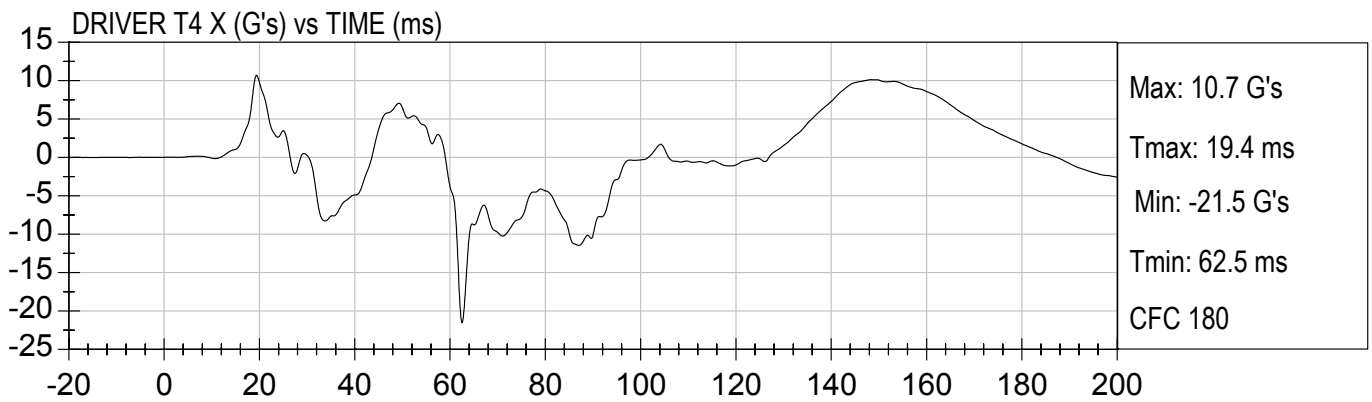
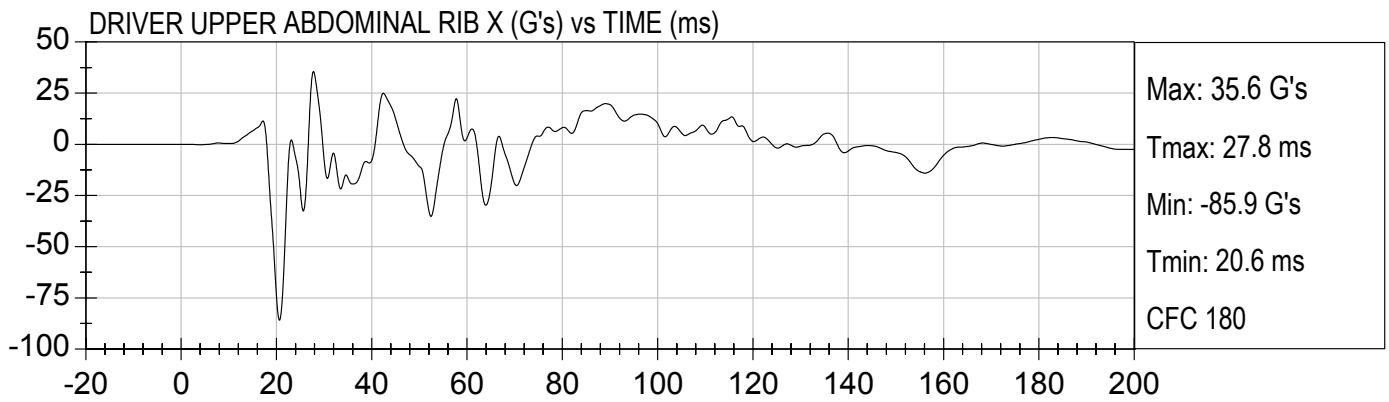
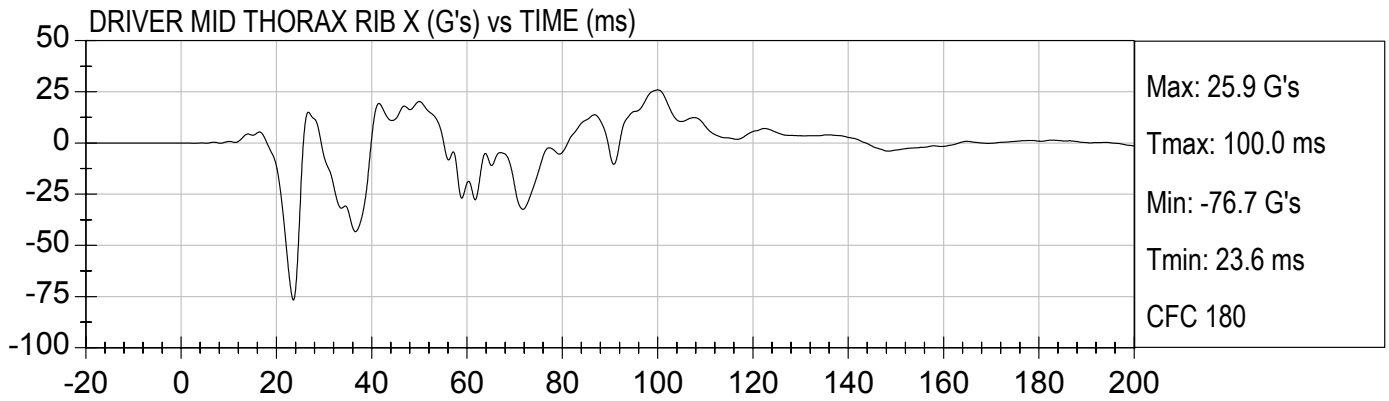


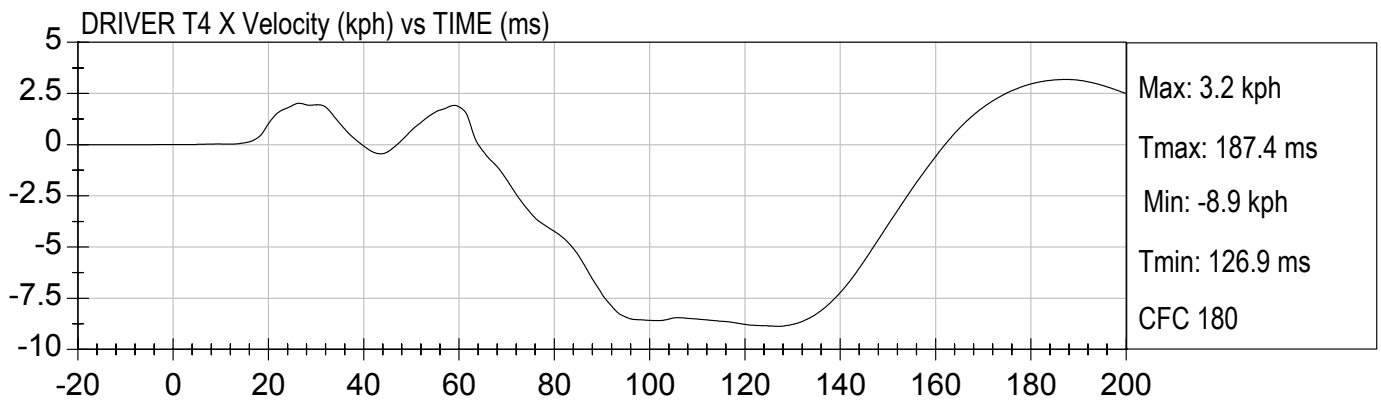
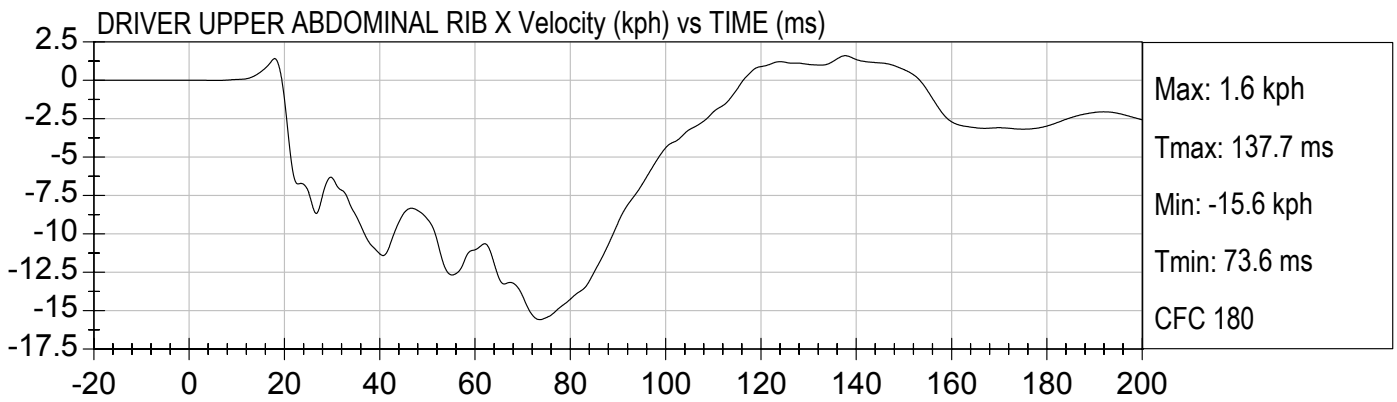
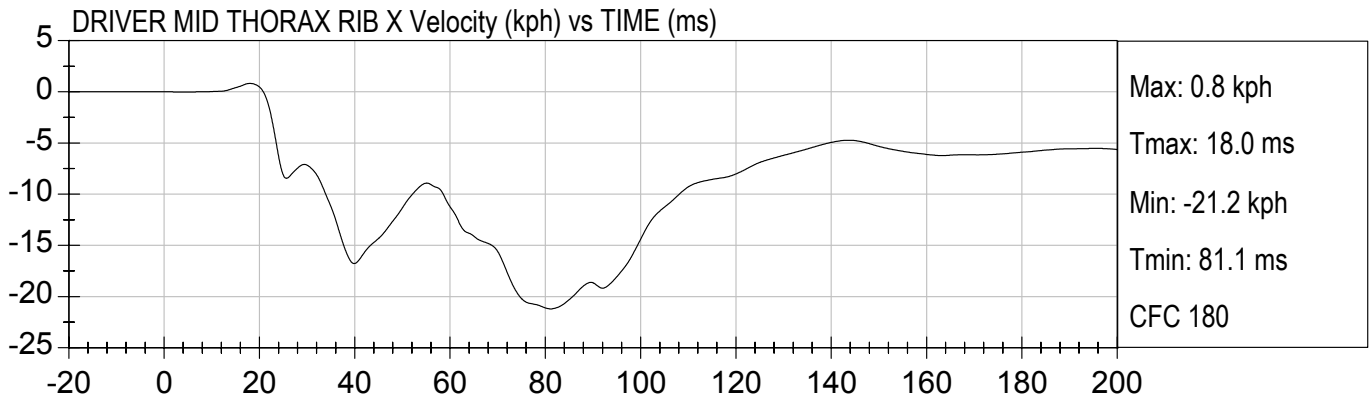






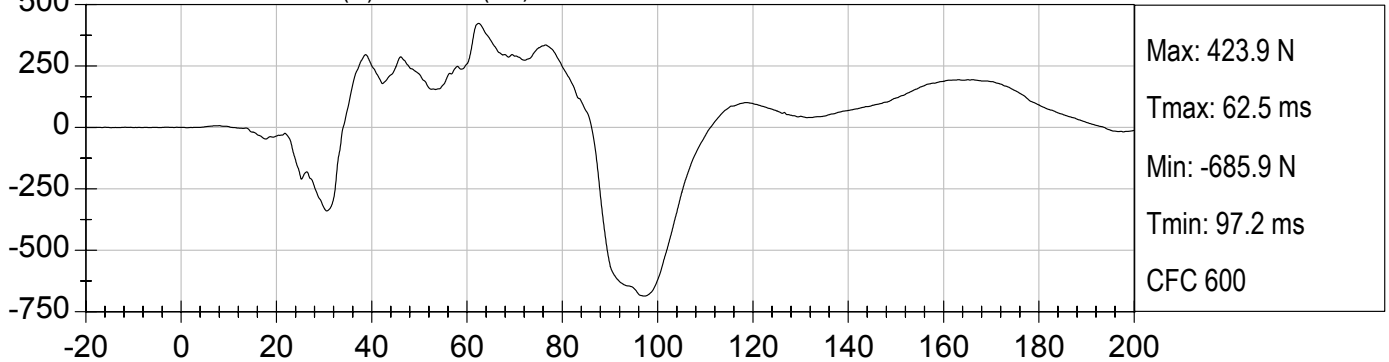




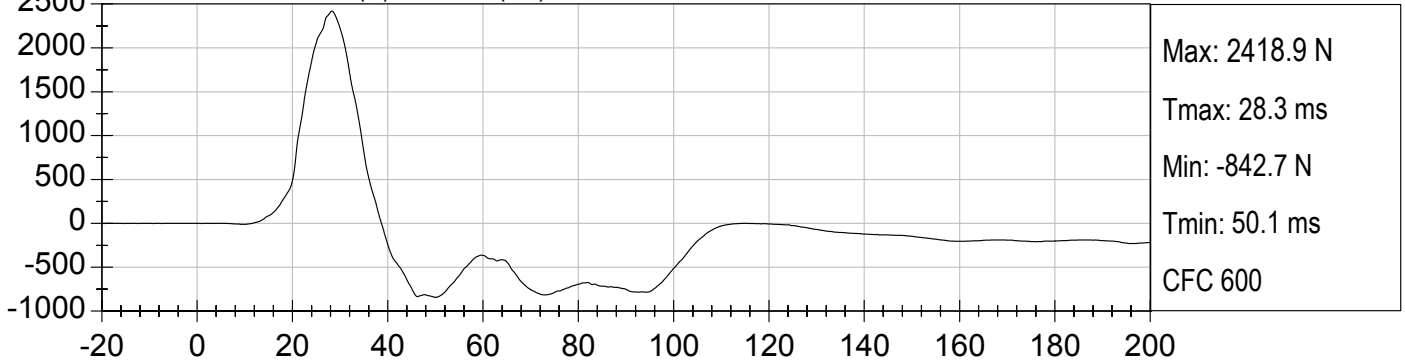




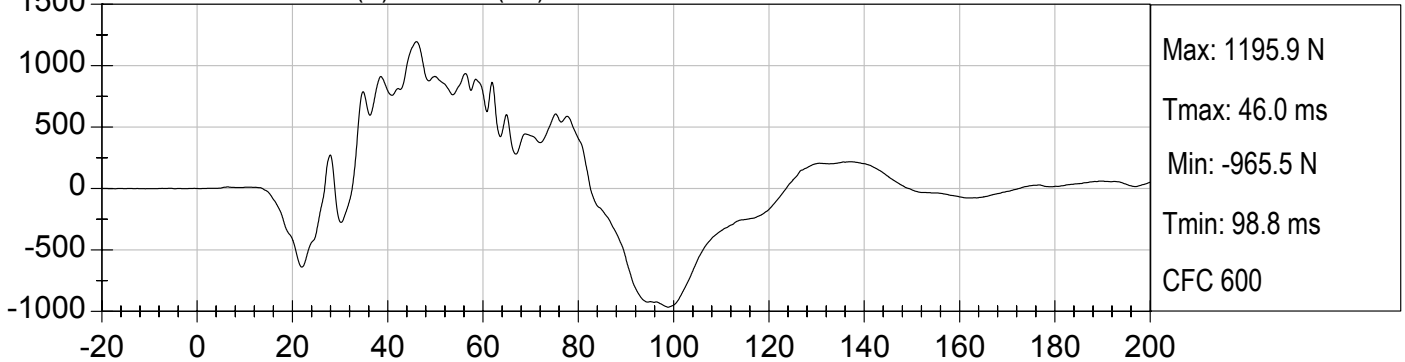
DRIVER LUMBAR FX (N) vs TIME (ms)



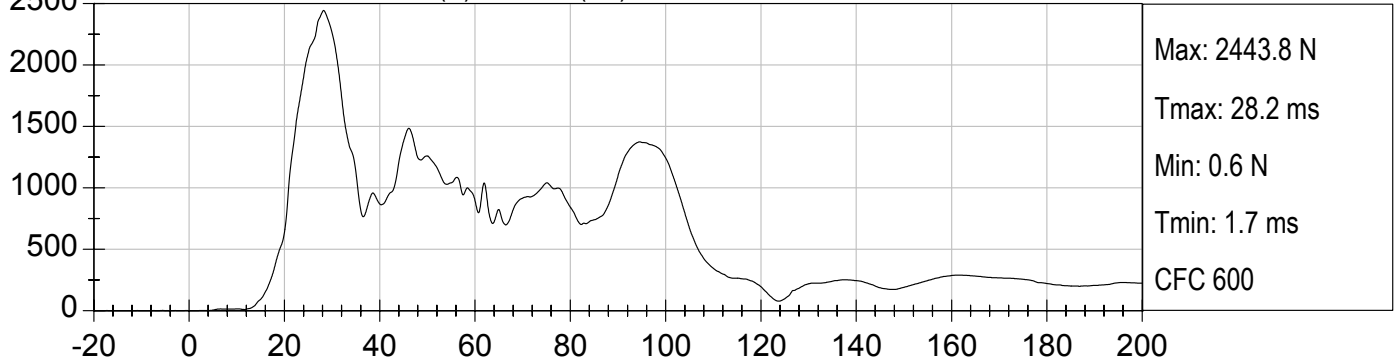
DRIVER LUMBAR FY (N) vs TIME (ms)

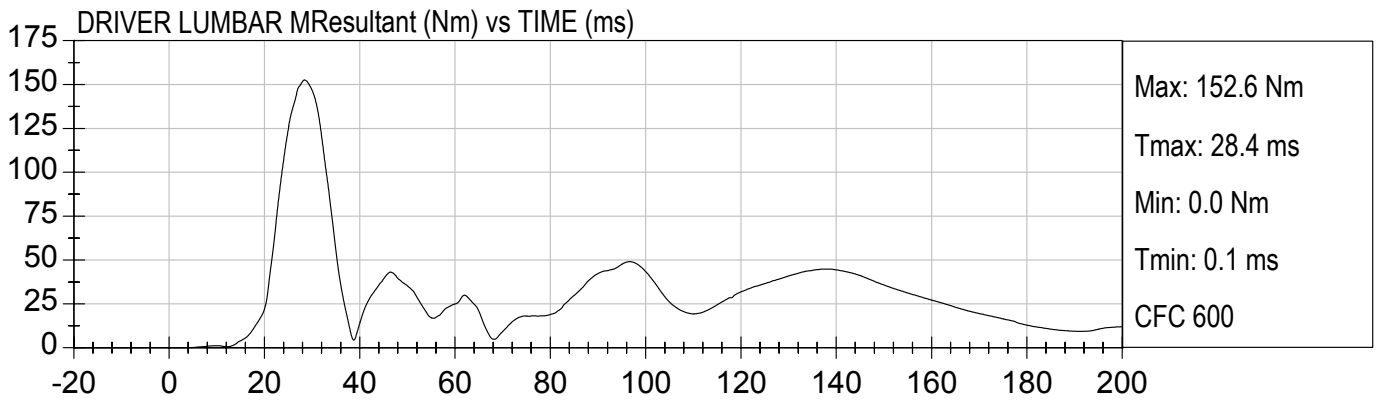
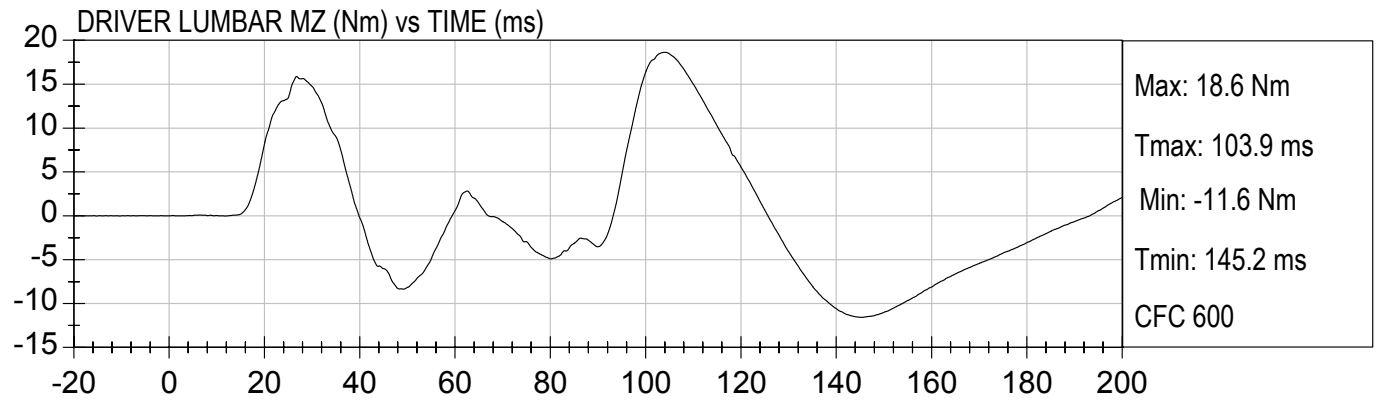
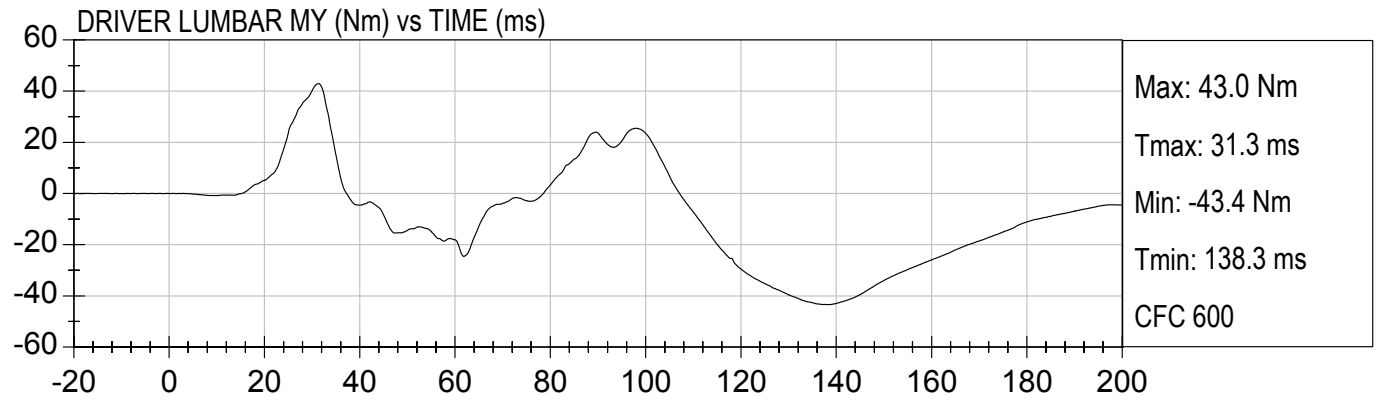
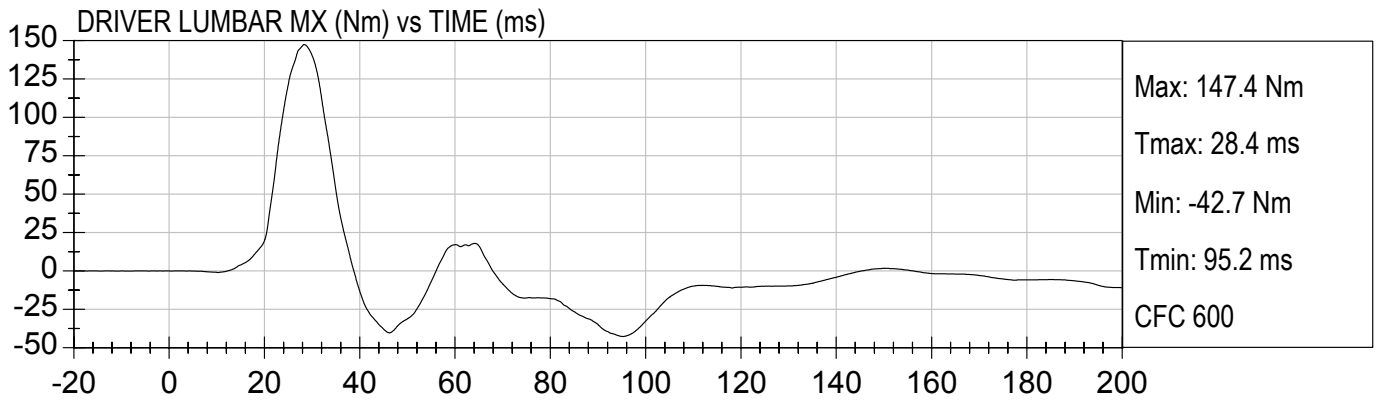


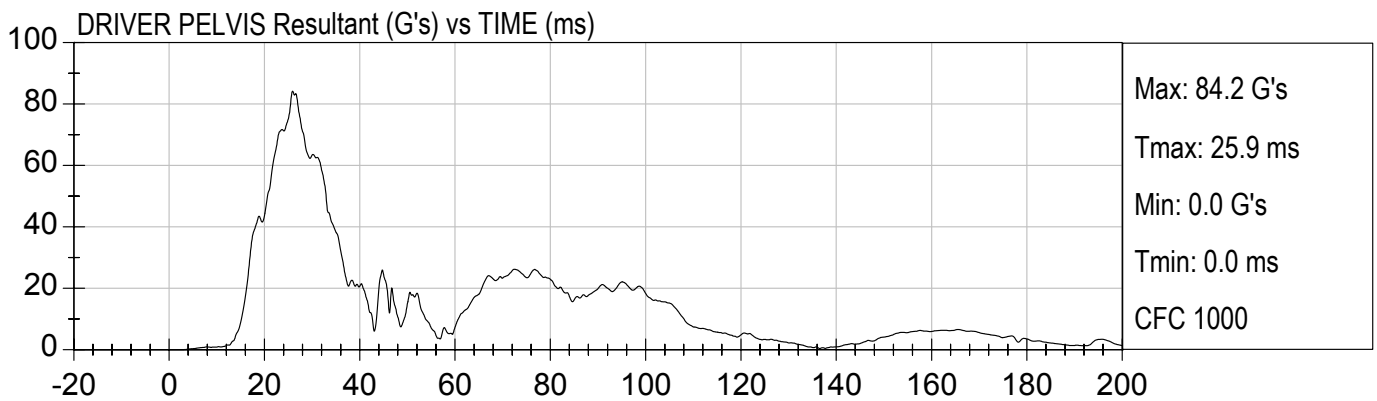
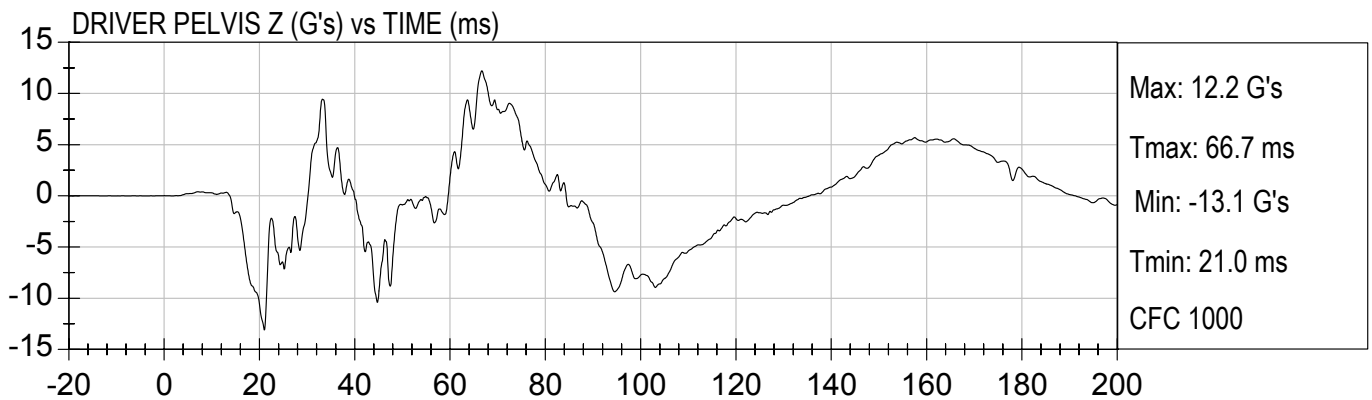
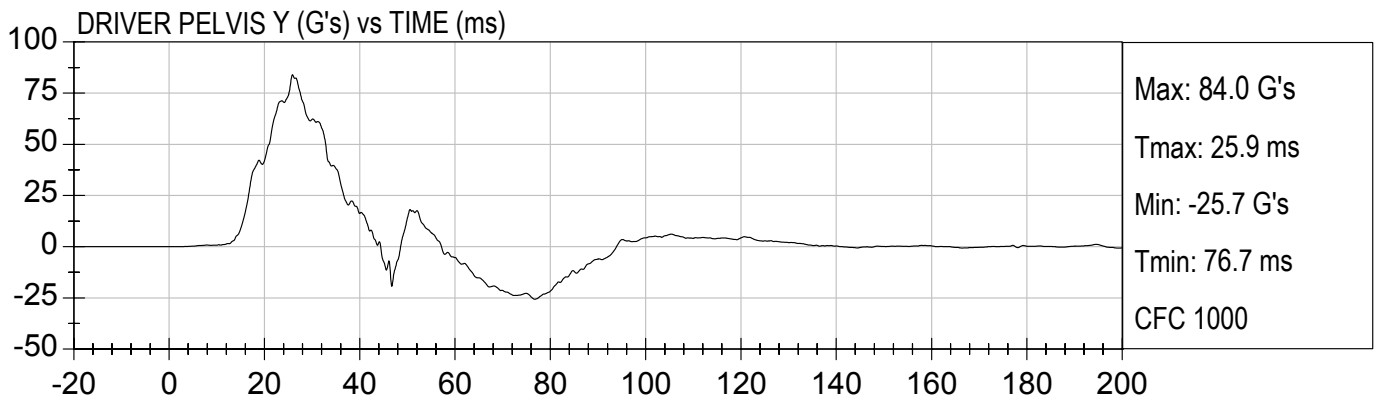
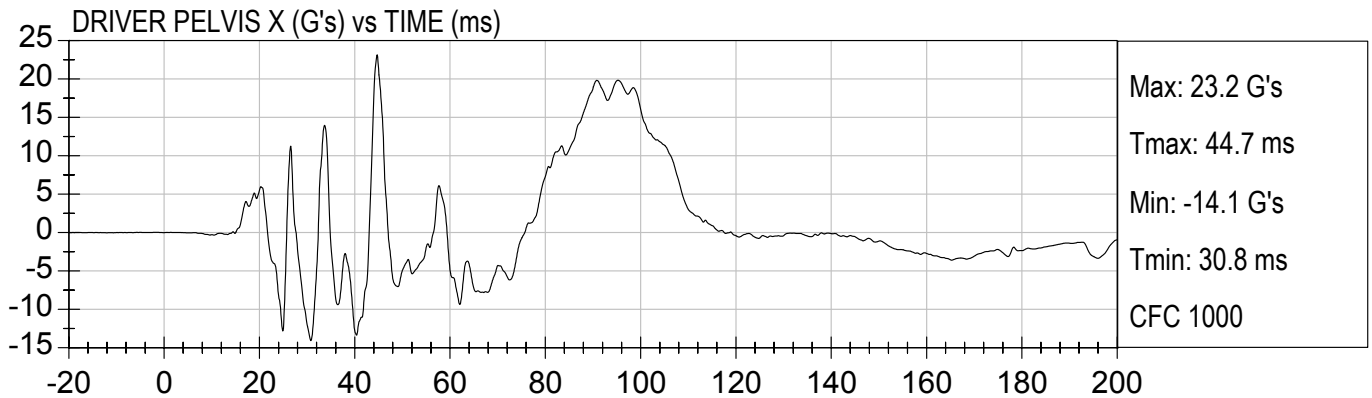
DRIVER LUMBAR FZ (N) vs TIME (ms)



DRIVER LUMBAR FResultant (N) vs TIME (ms)

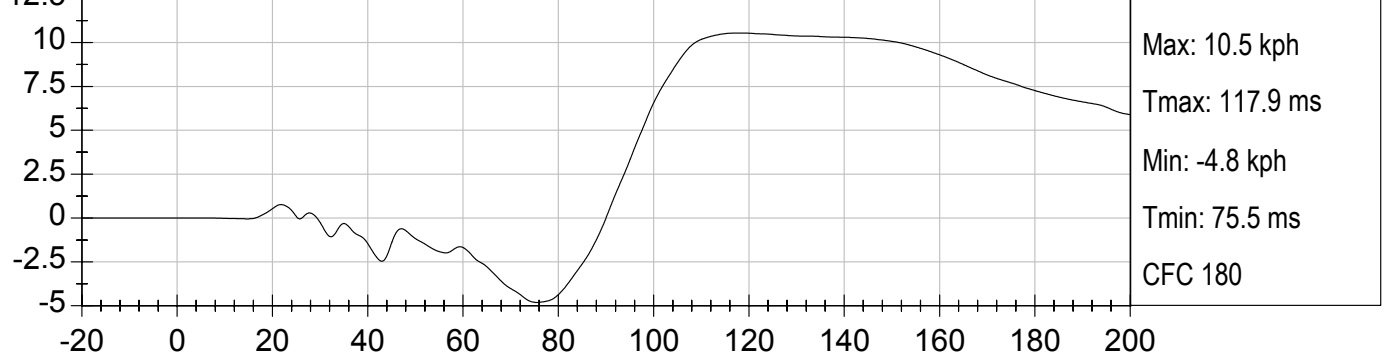




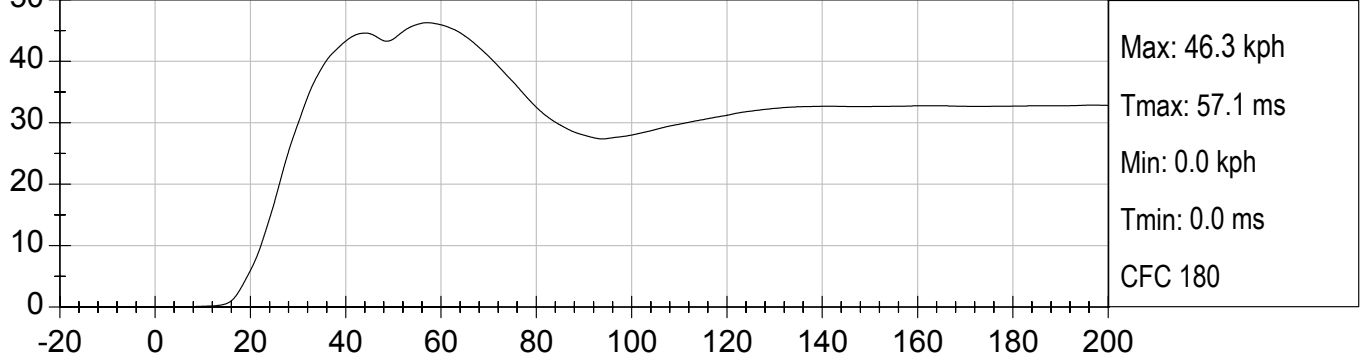




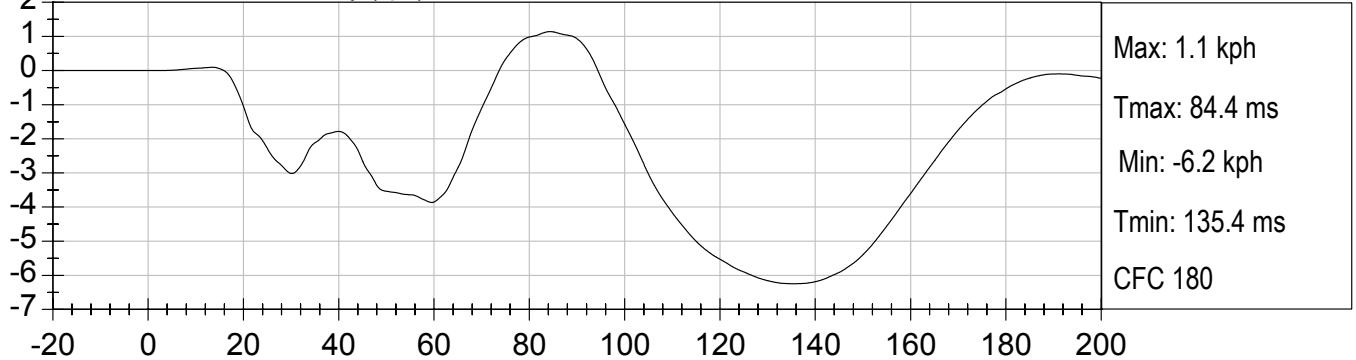
DRIVER PELVIS X Velocity (kph) vs TIME (ms)

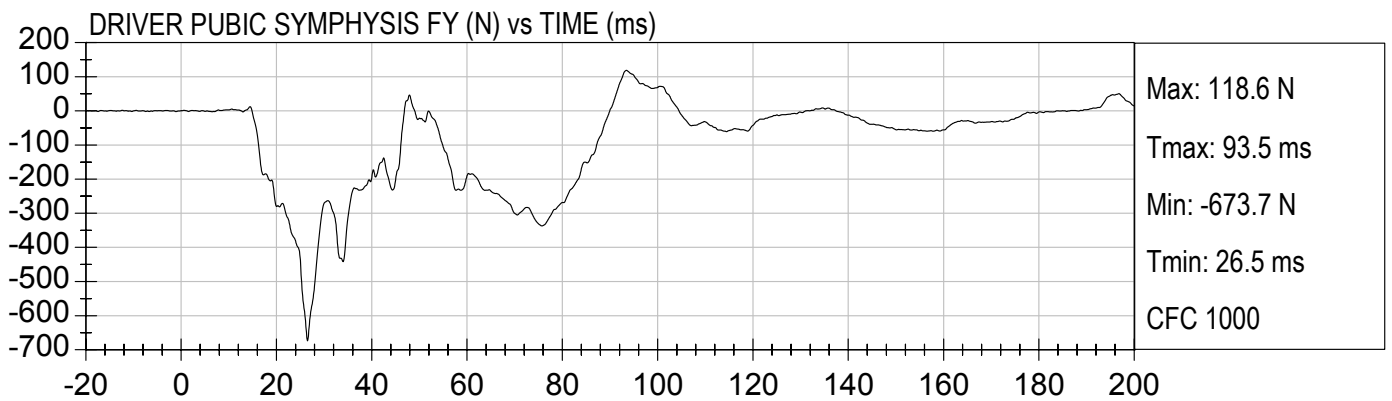
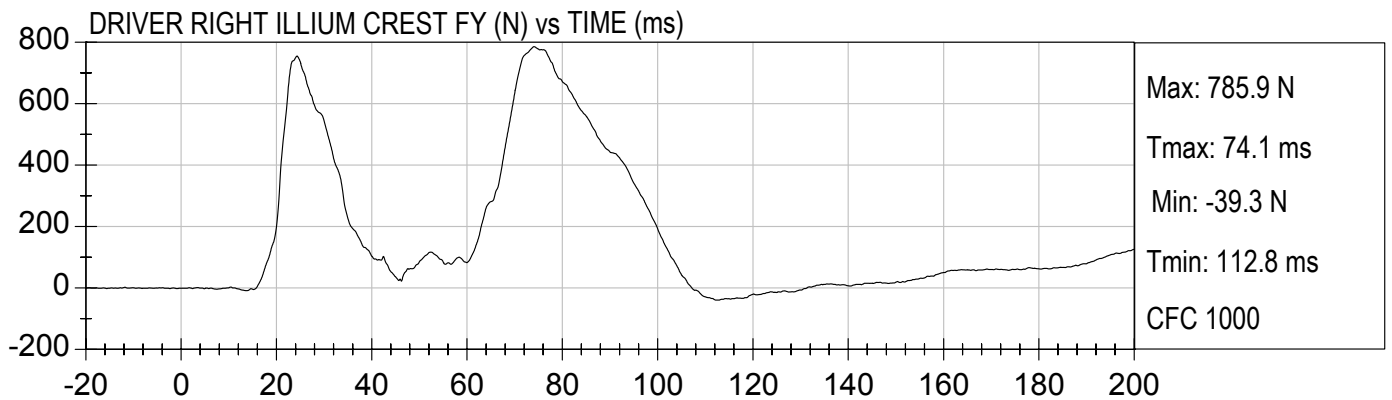
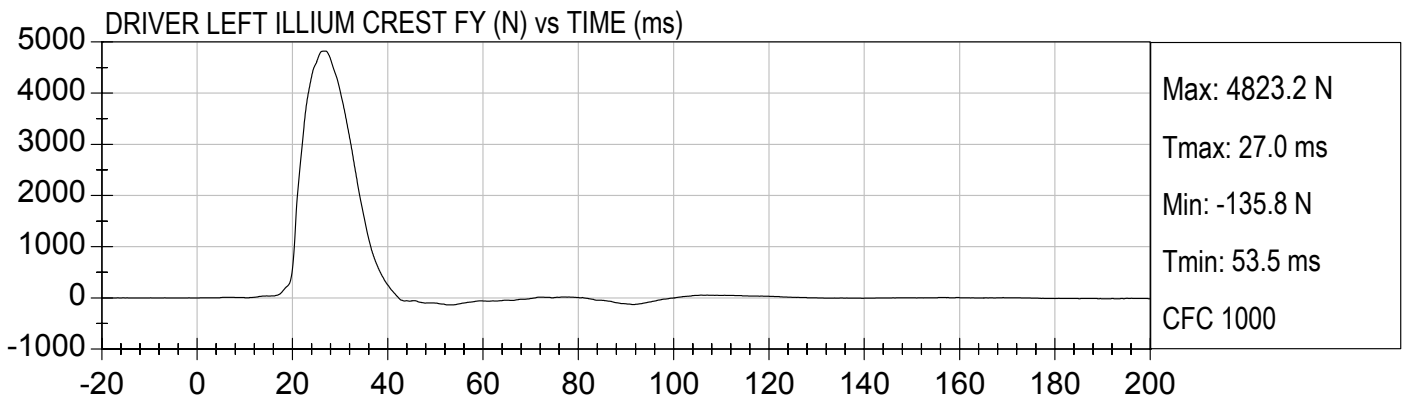
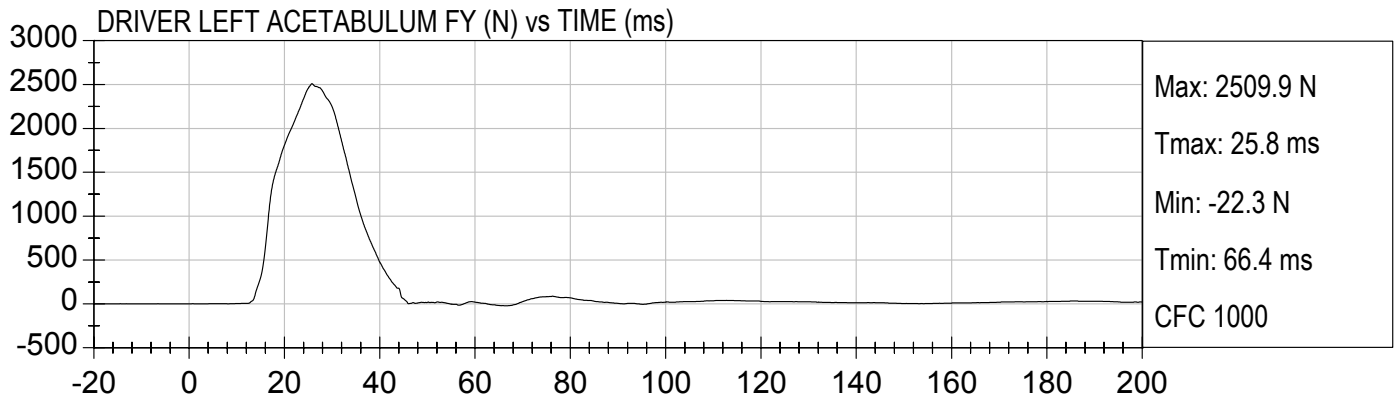


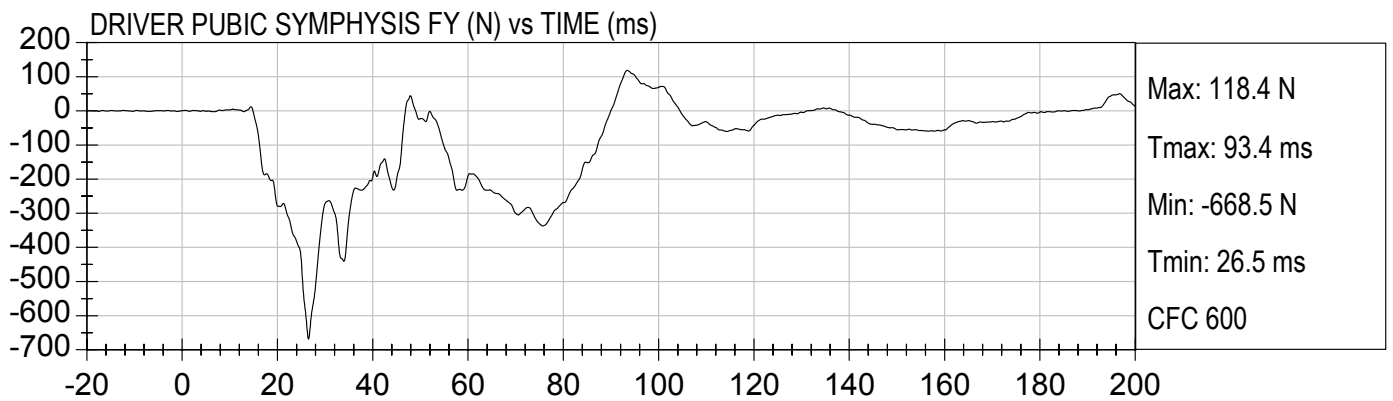
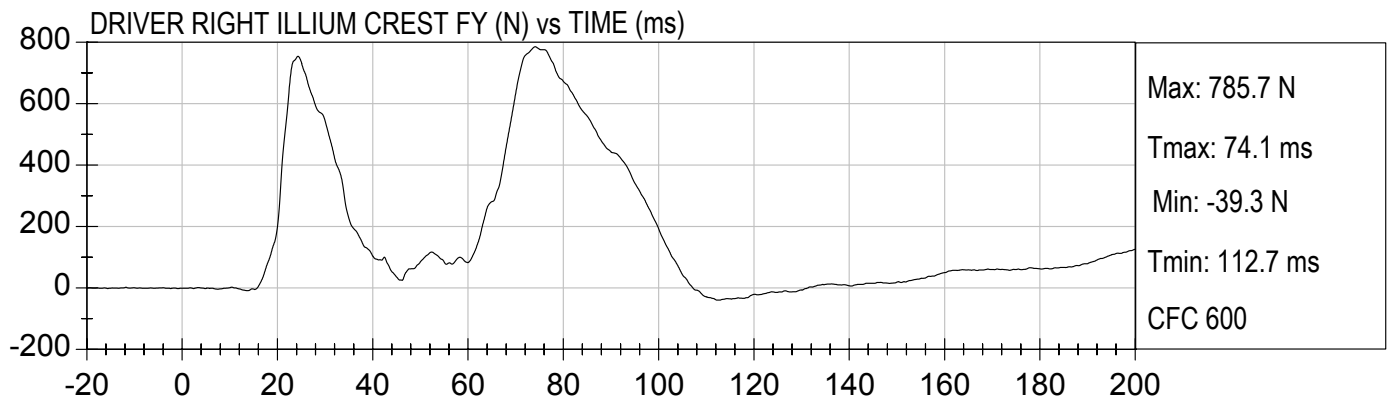
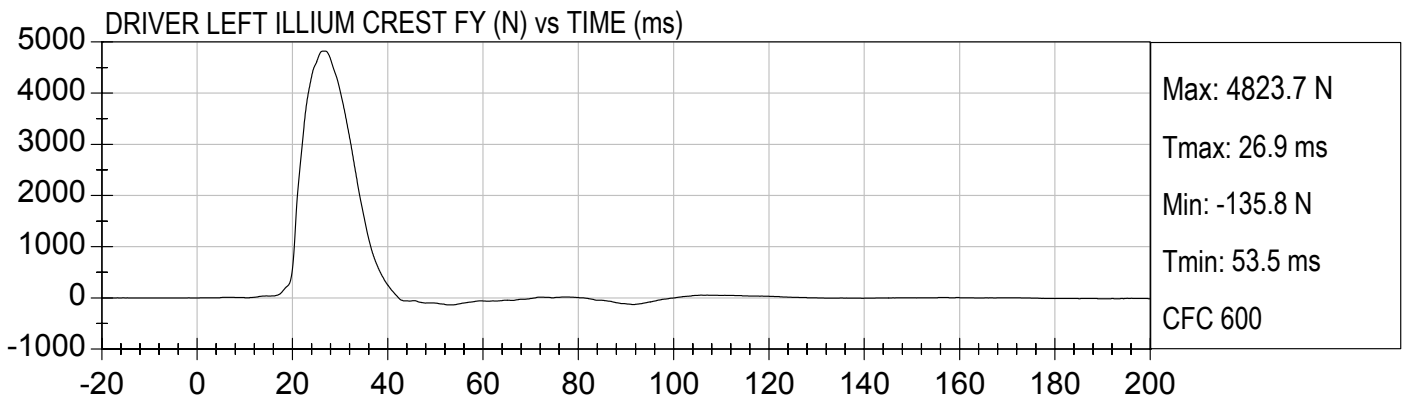
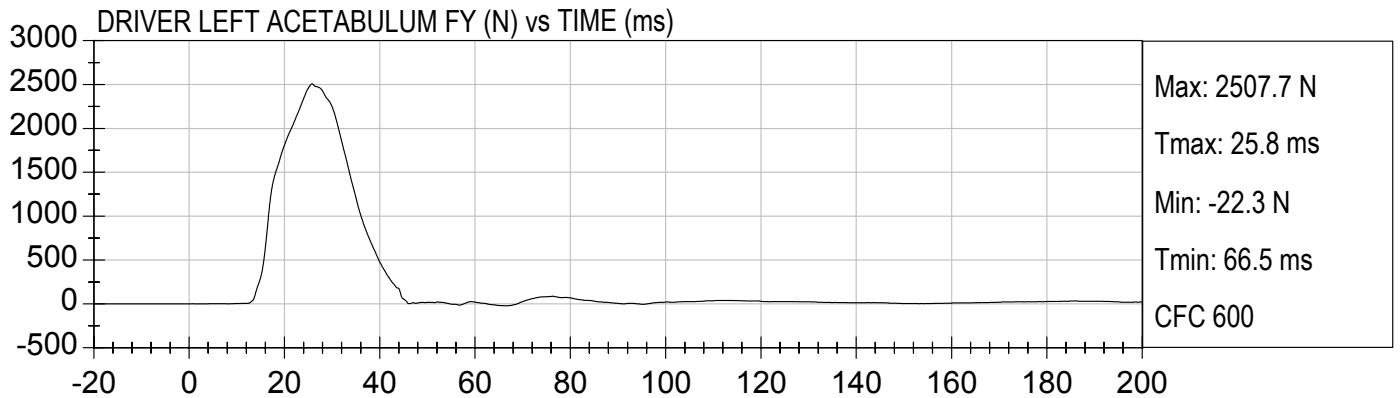
DRIVER PELVIS Y Velocity (kph) vs TIME (ms)

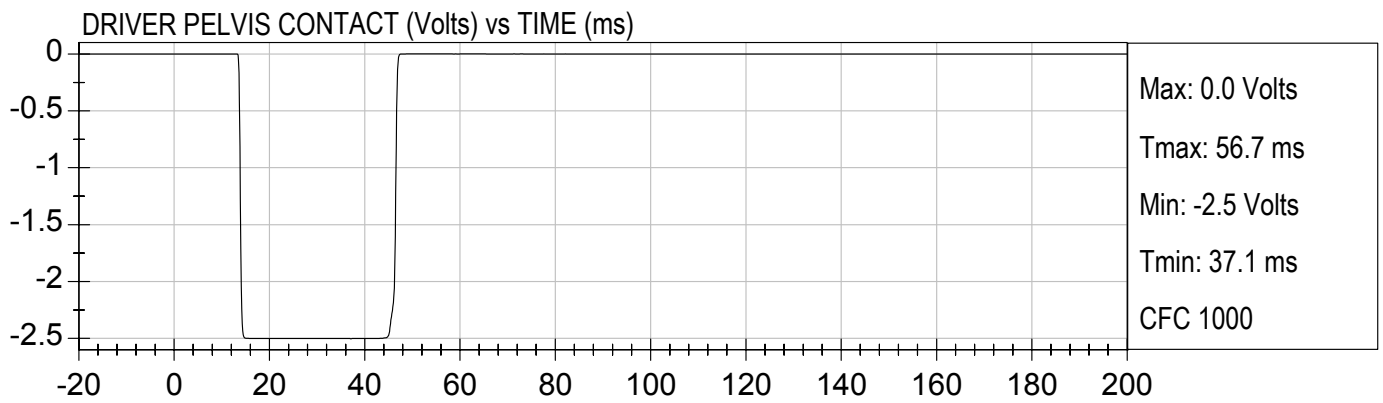
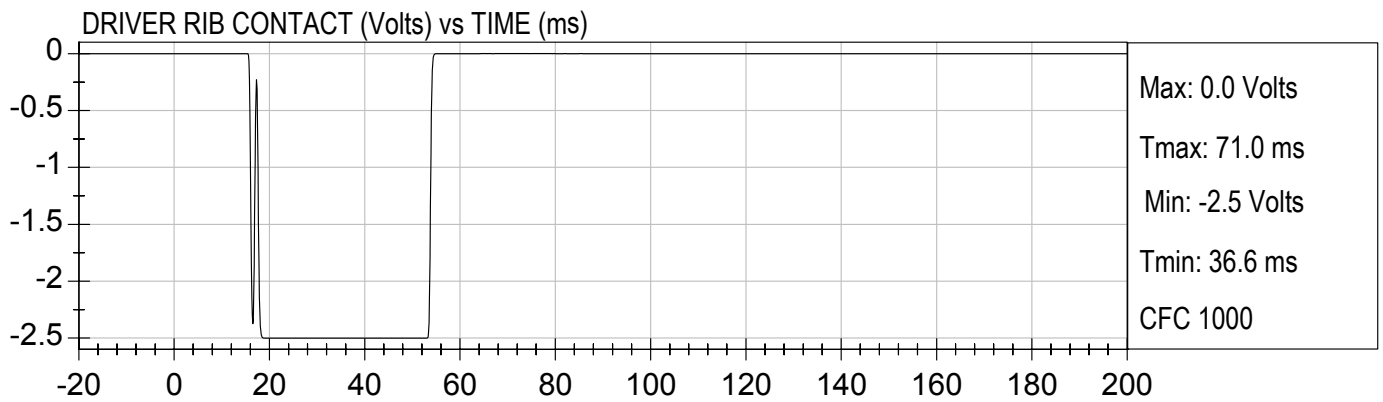
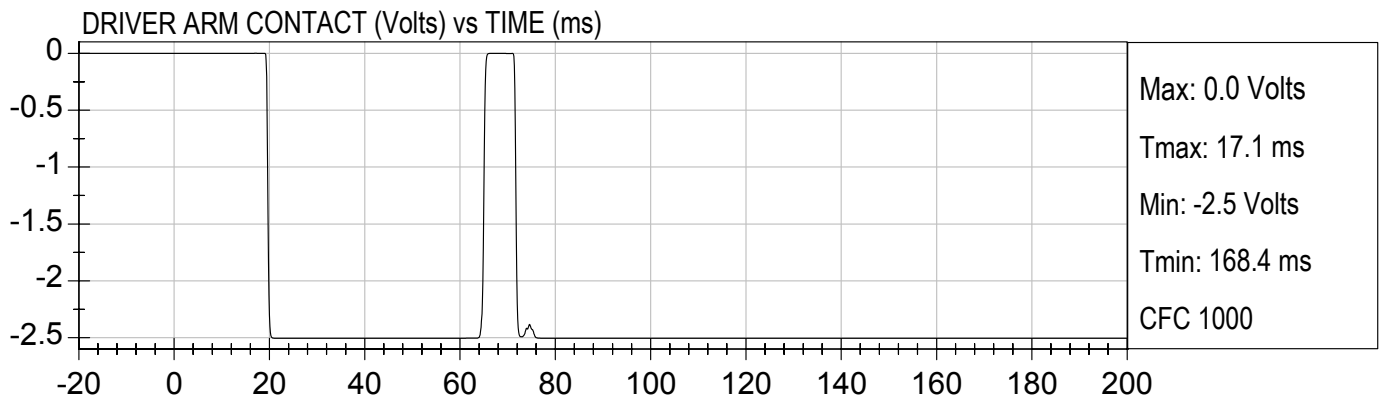
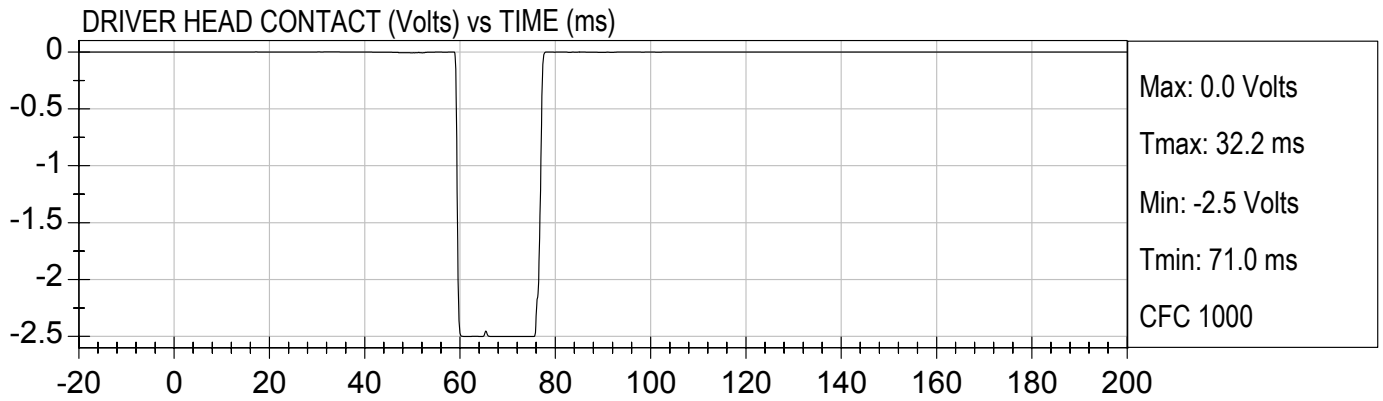


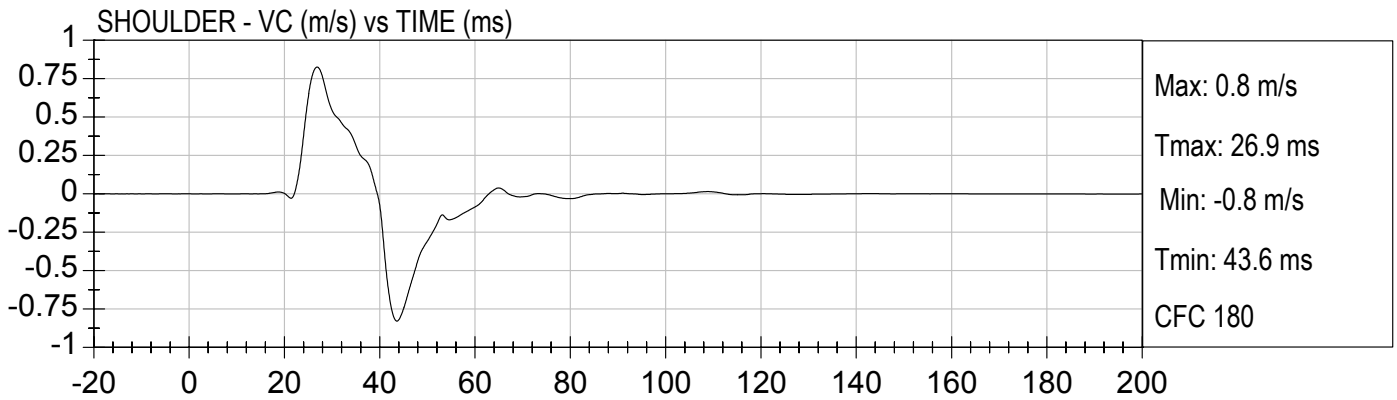
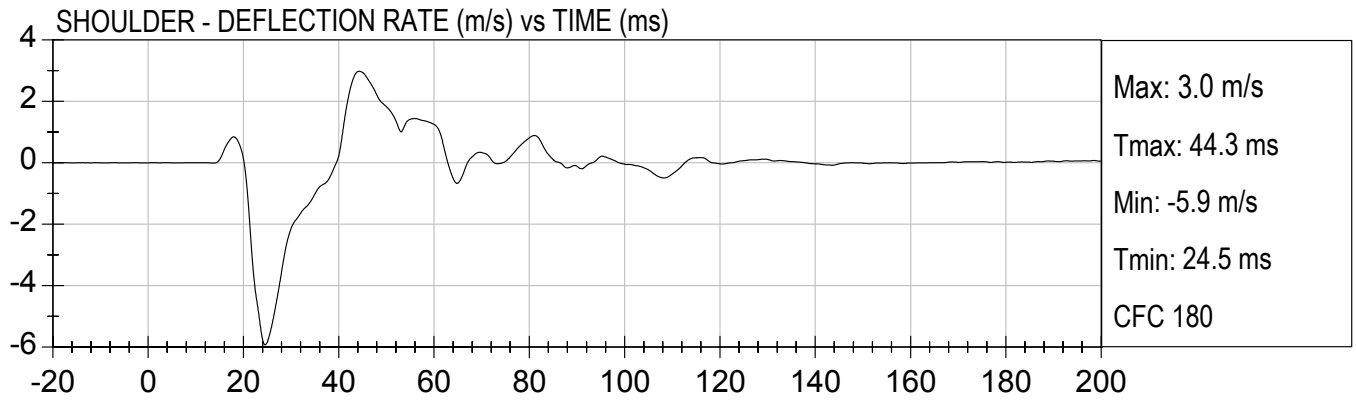
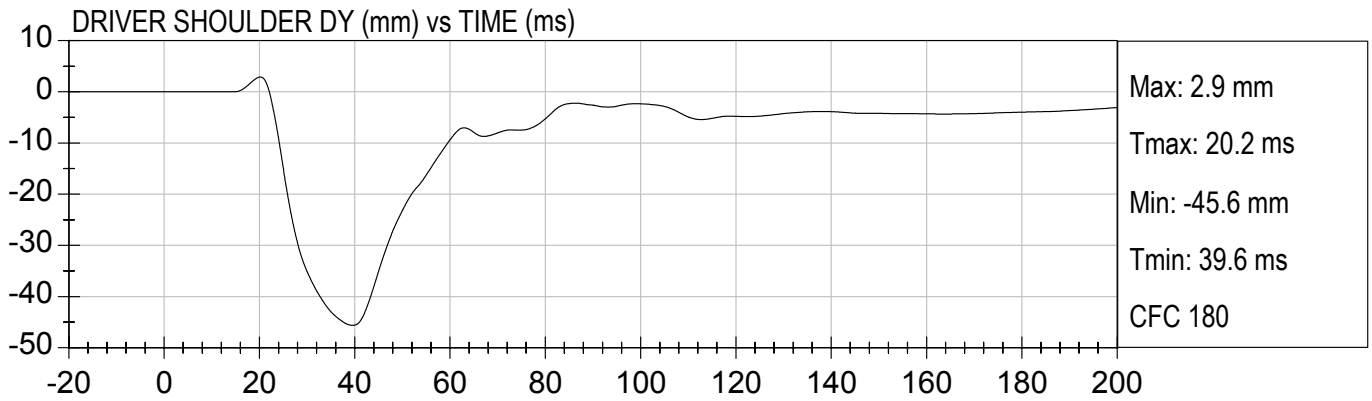
DRIVER PELVIS Z Velocity (kph) vs TIME (ms)

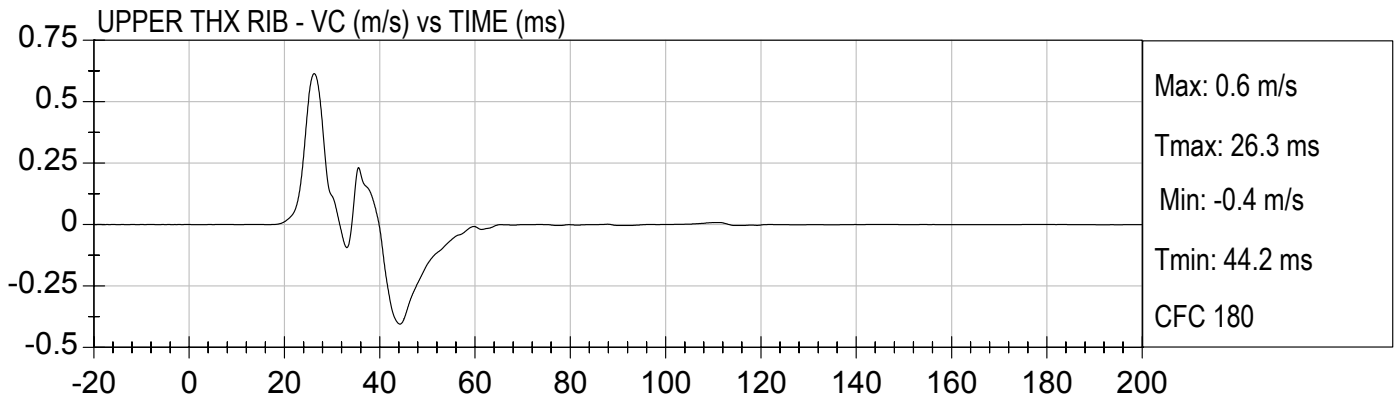
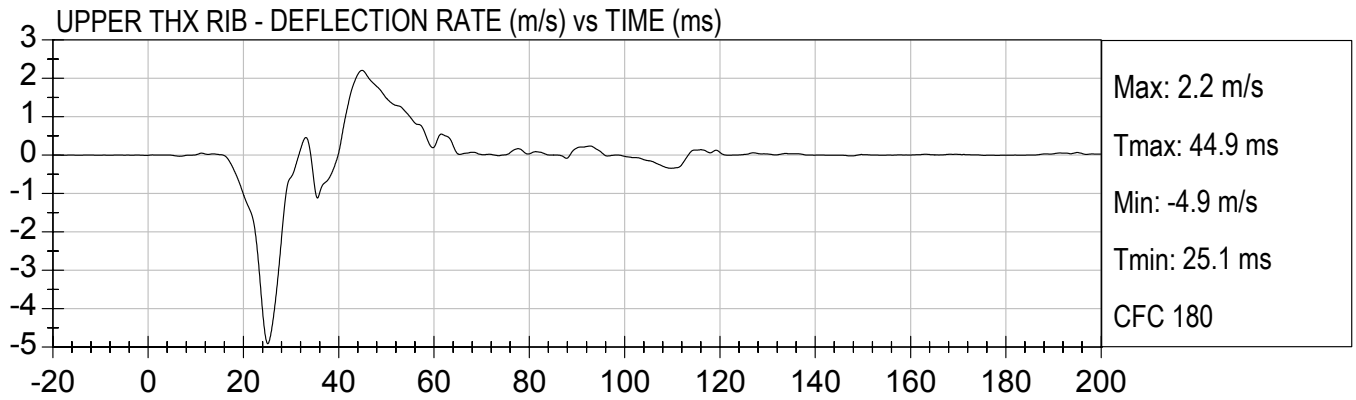
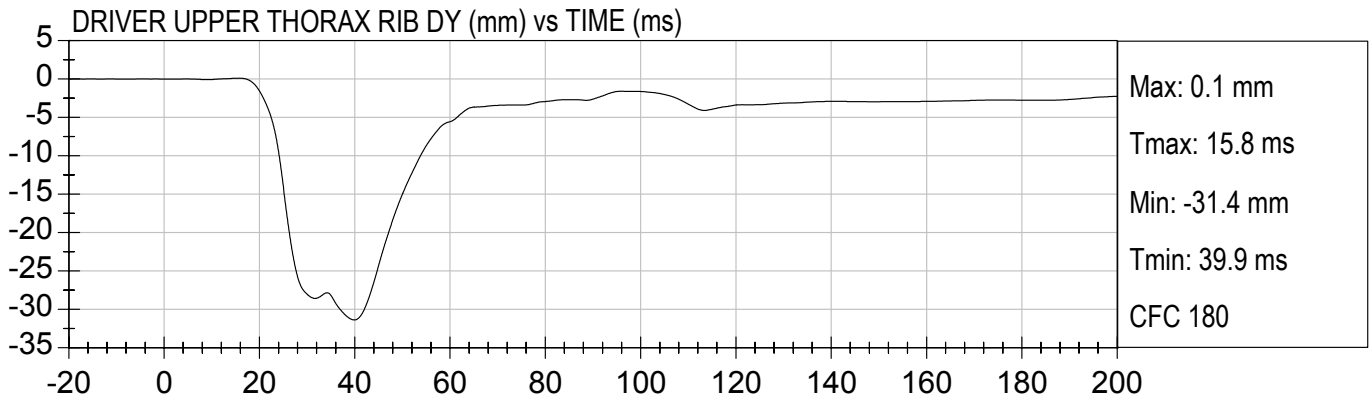


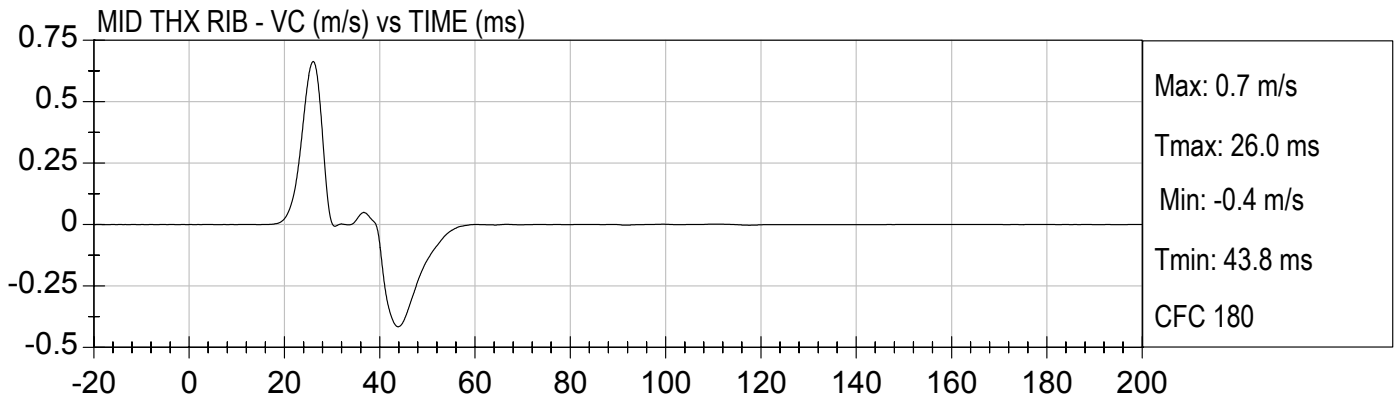
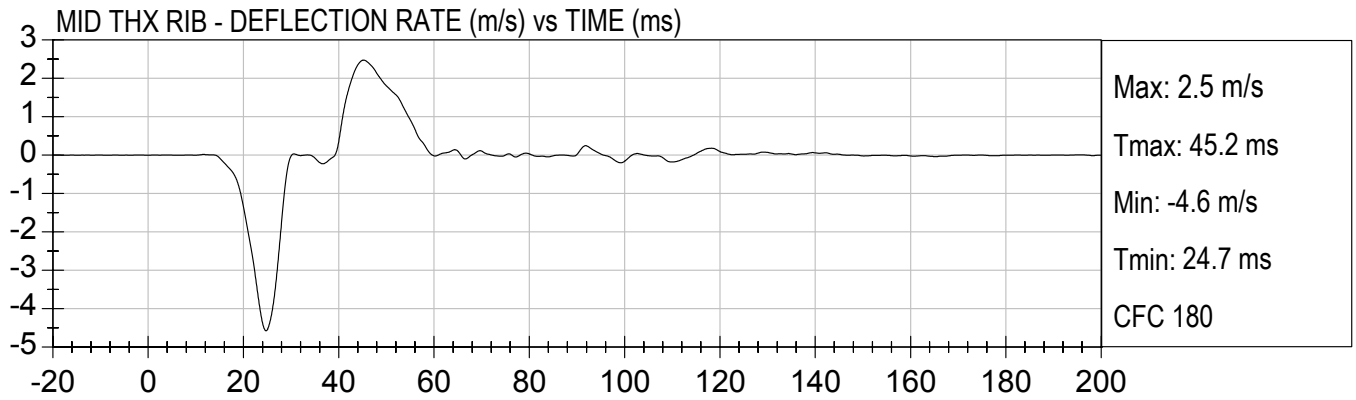
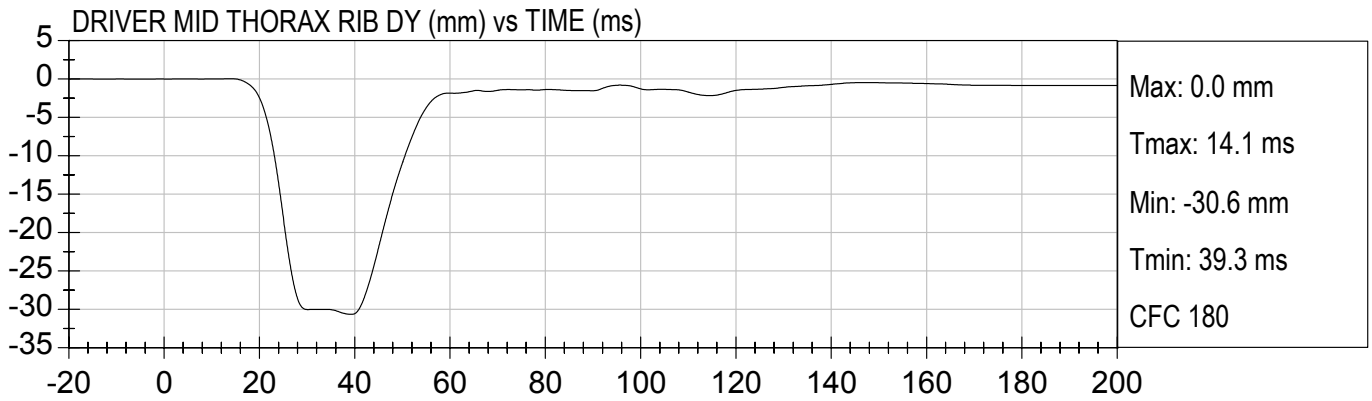


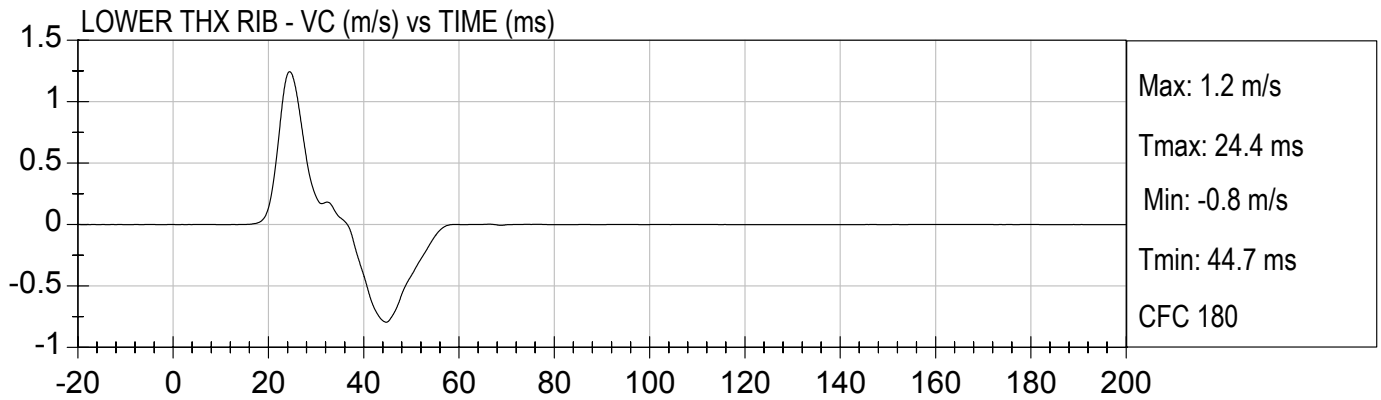
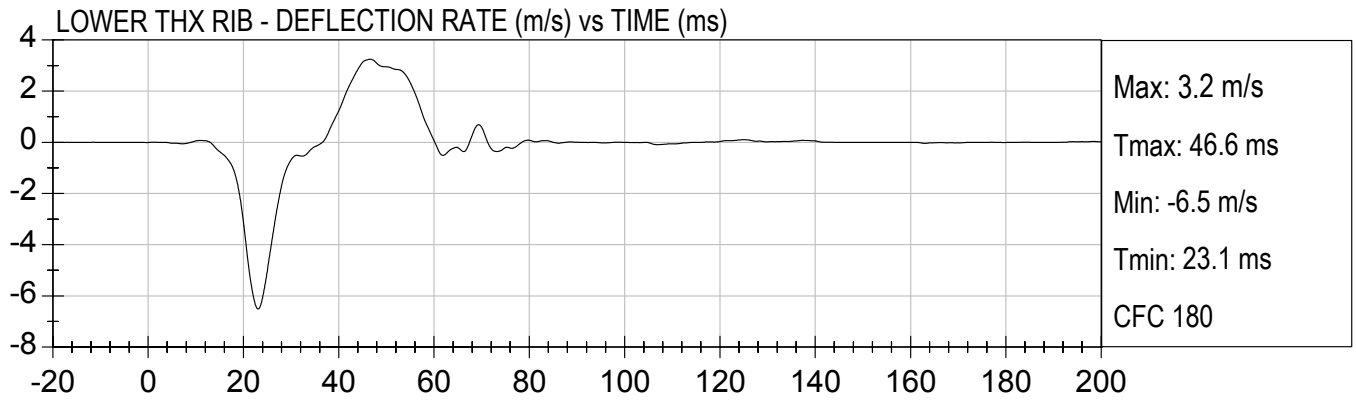
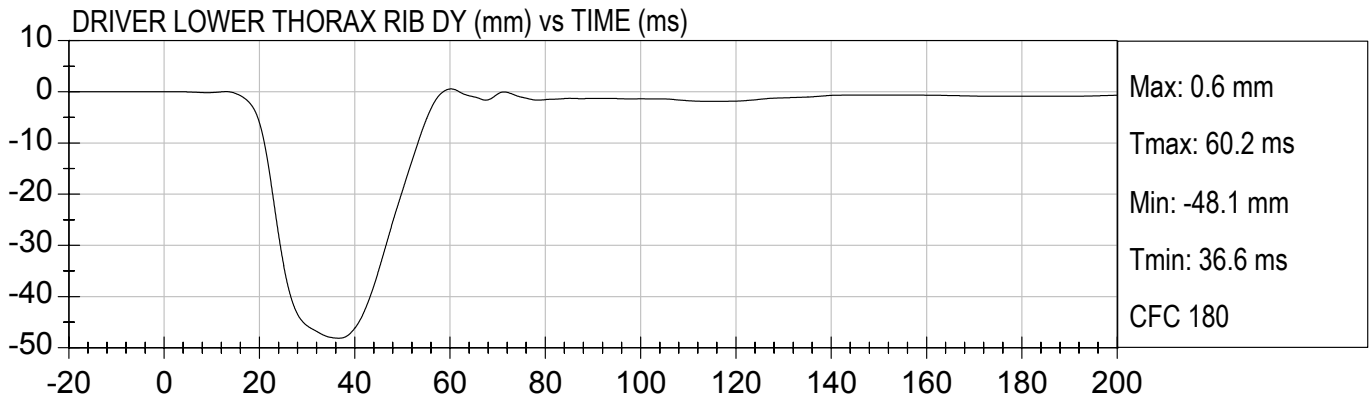


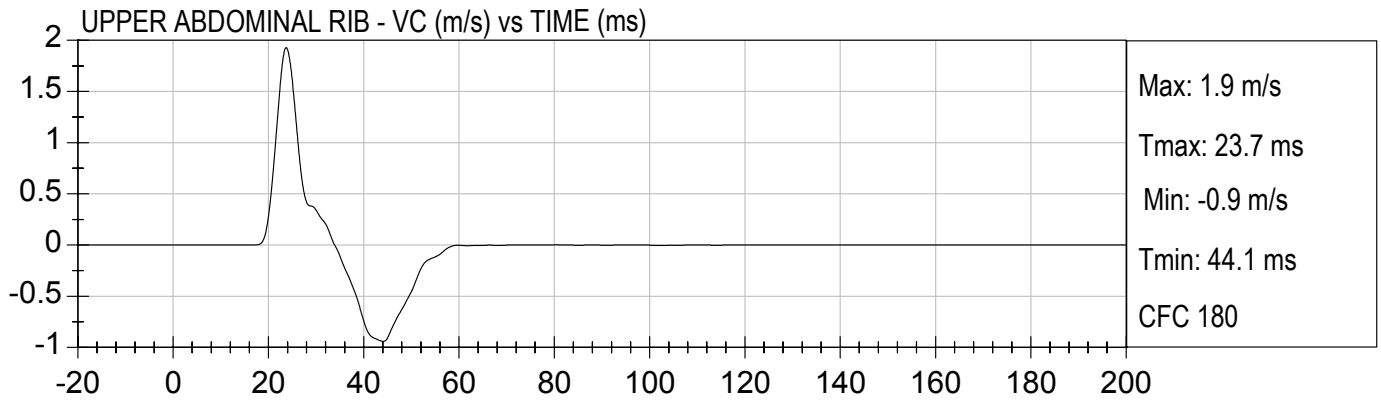
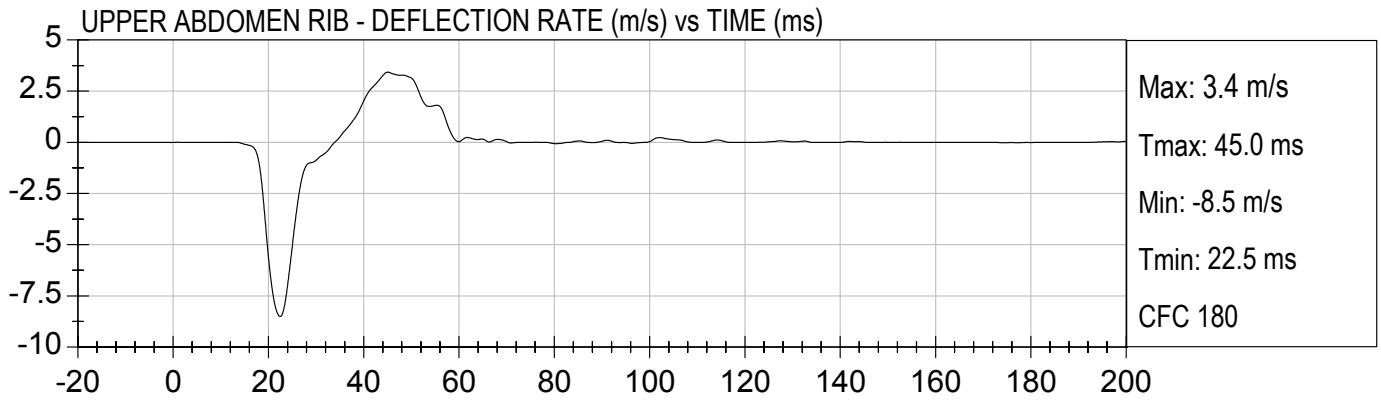
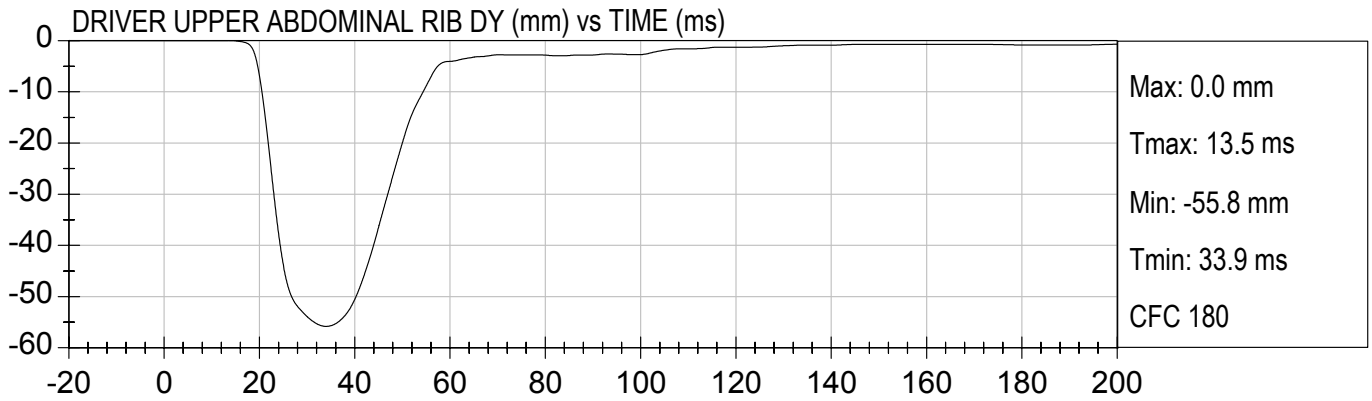


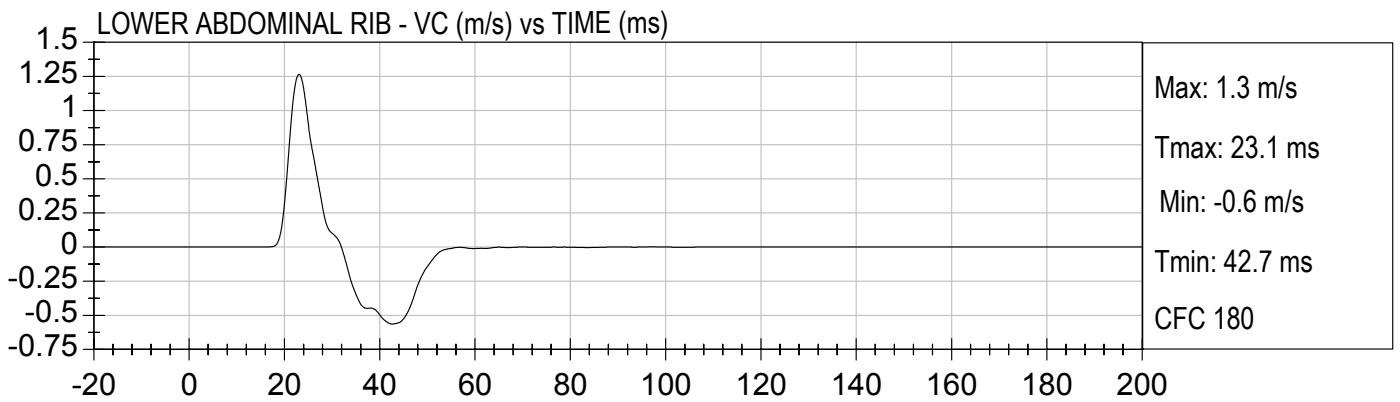
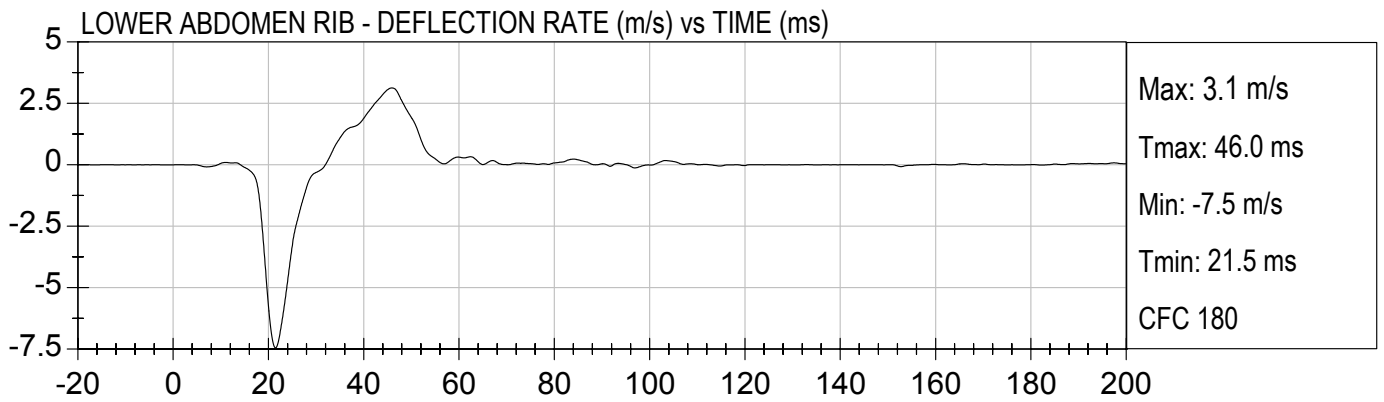
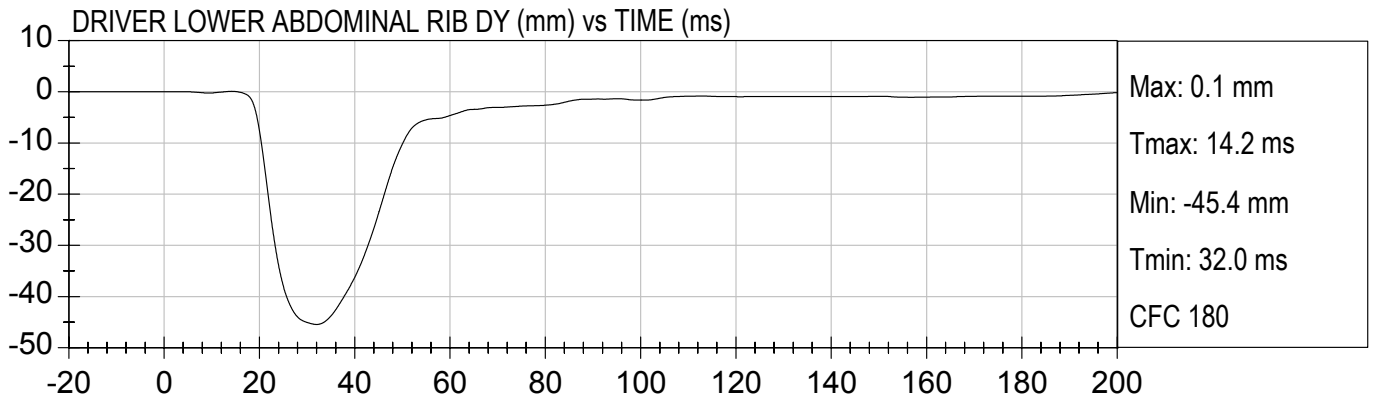


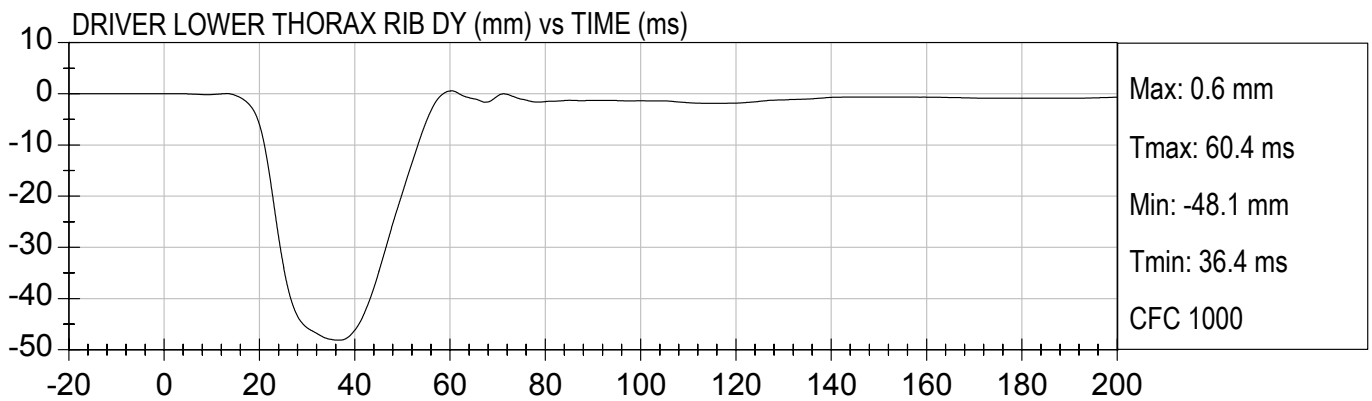
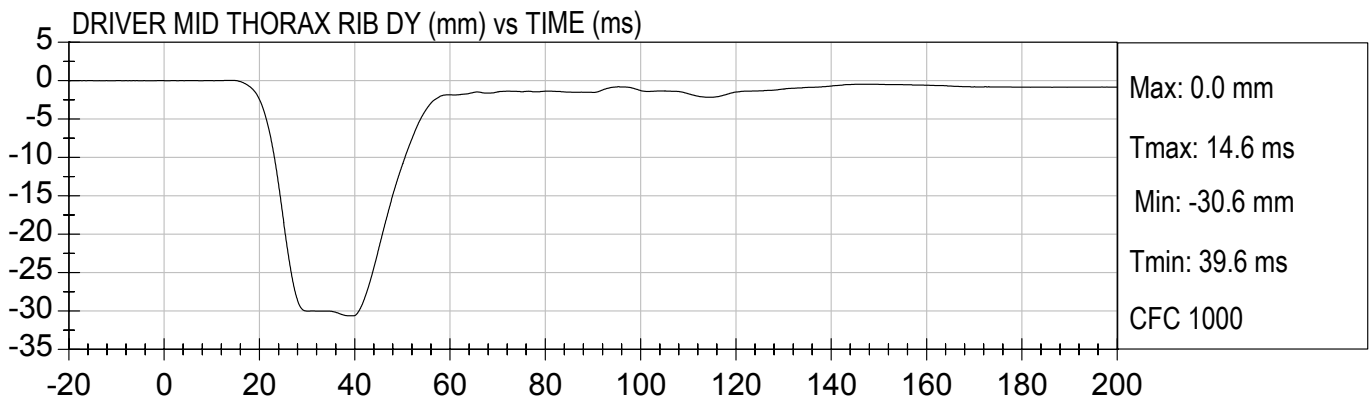
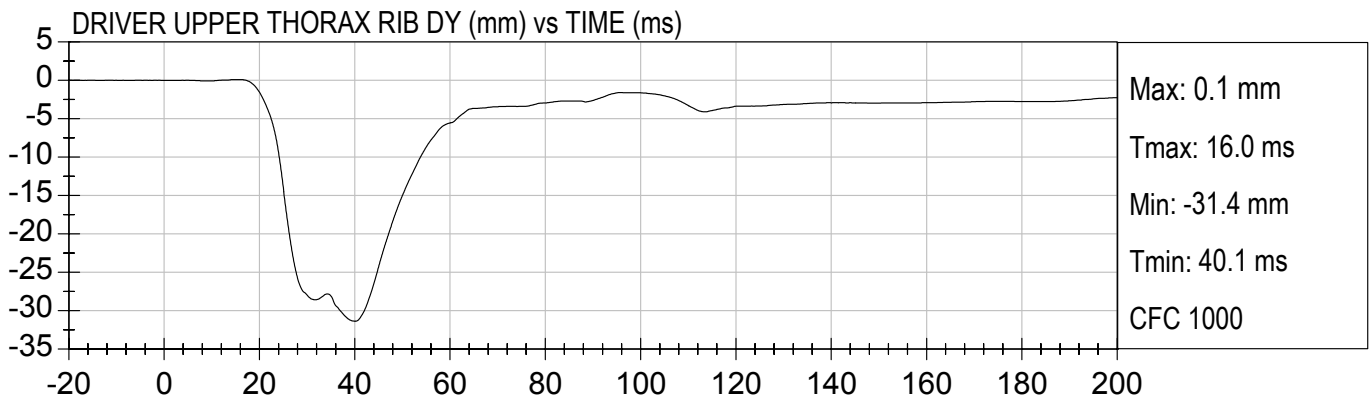
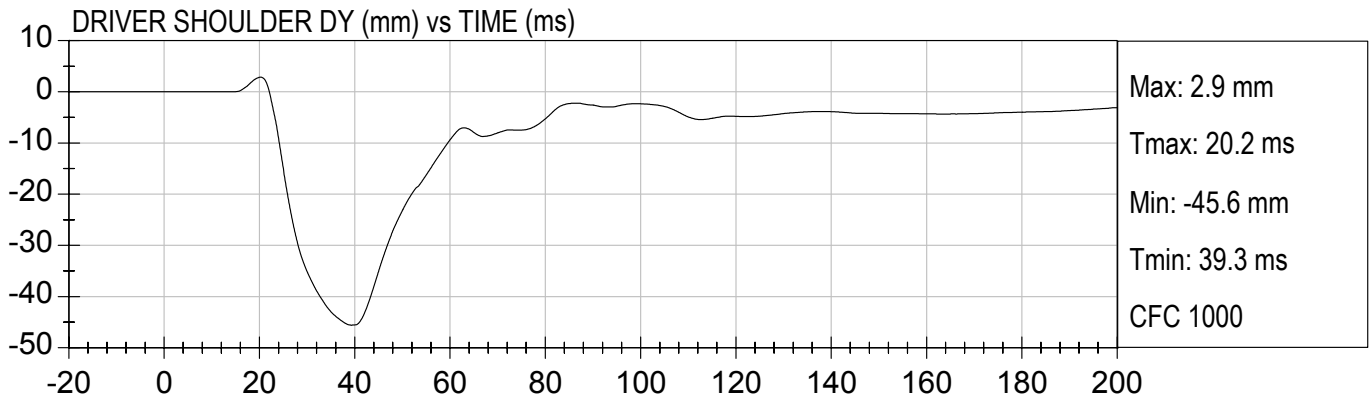


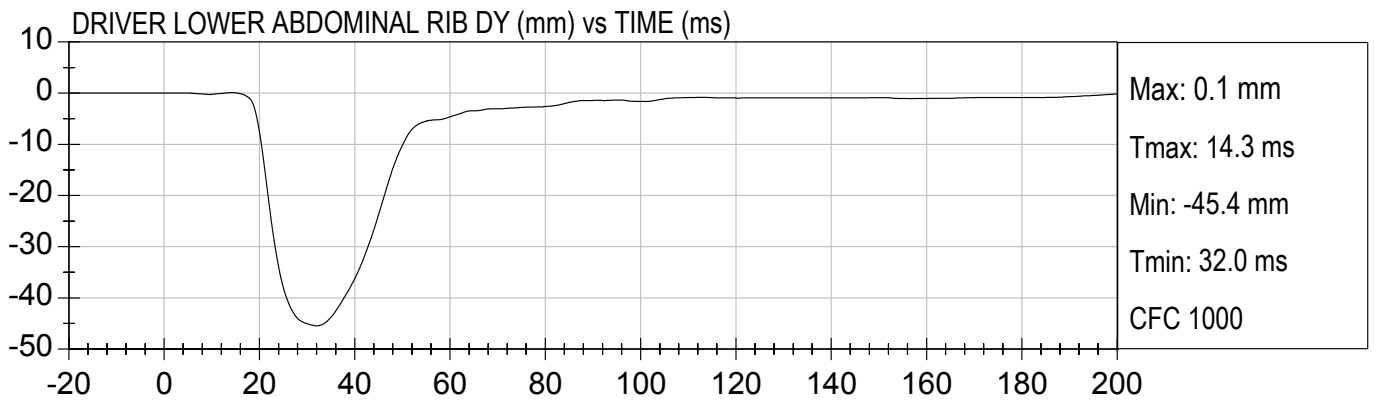
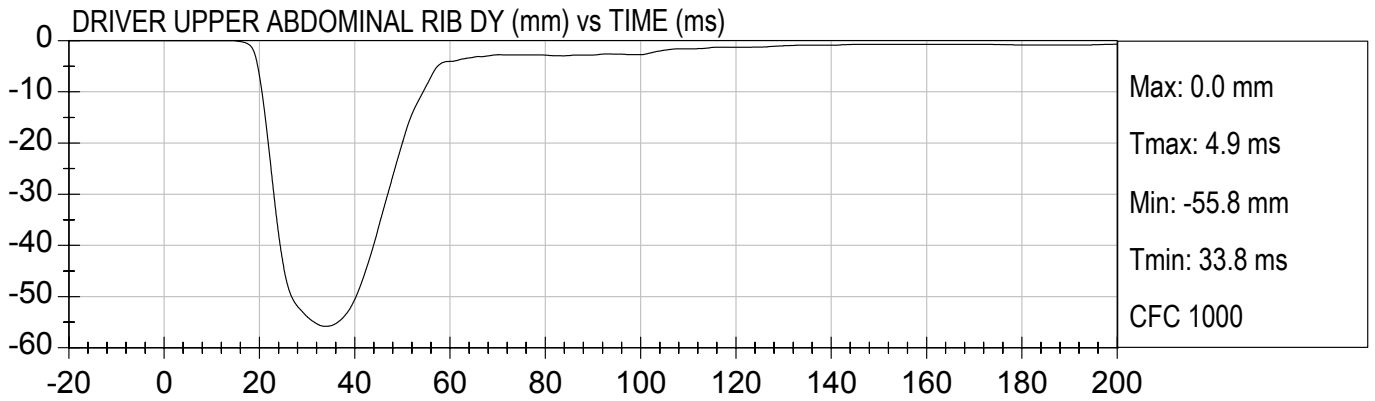


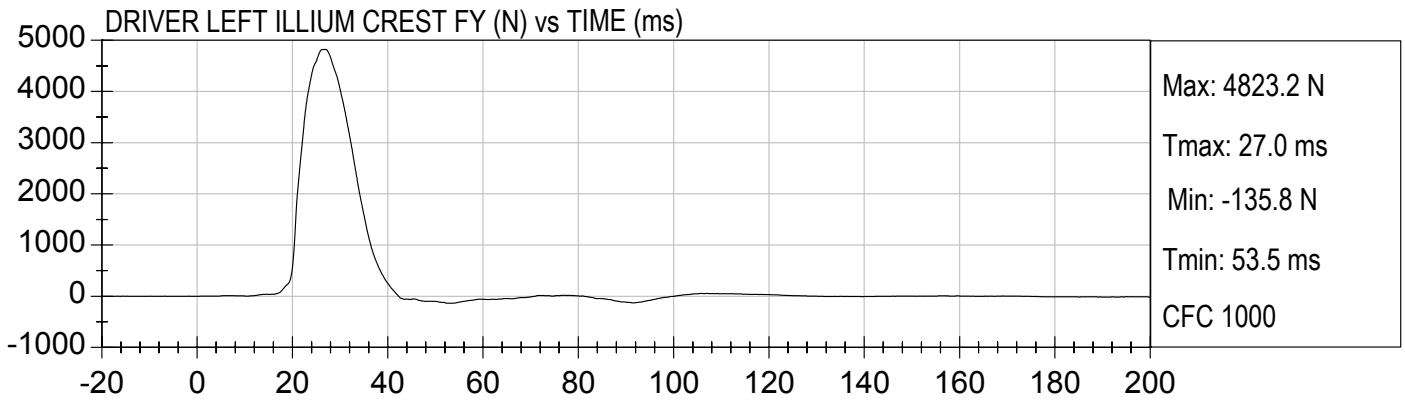
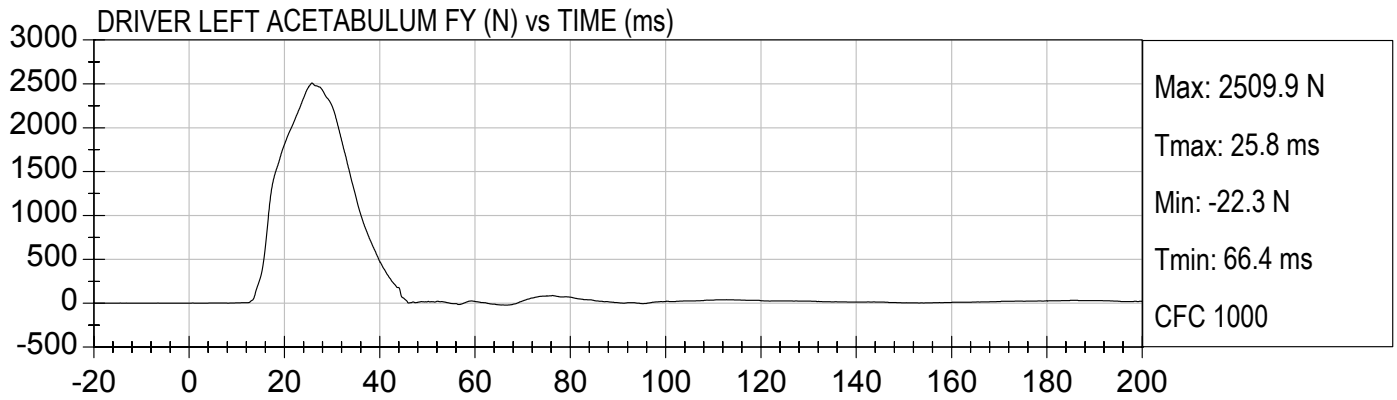
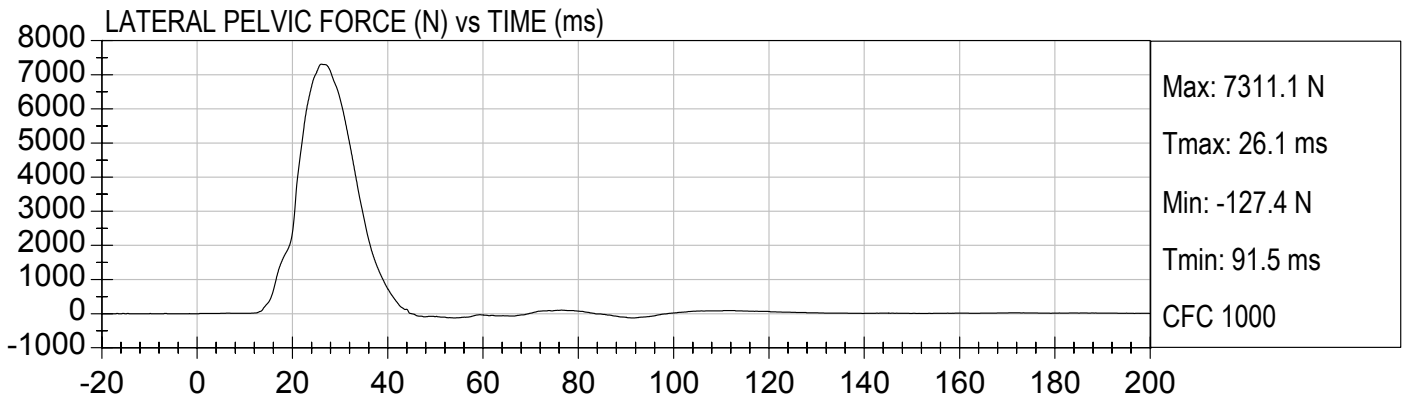


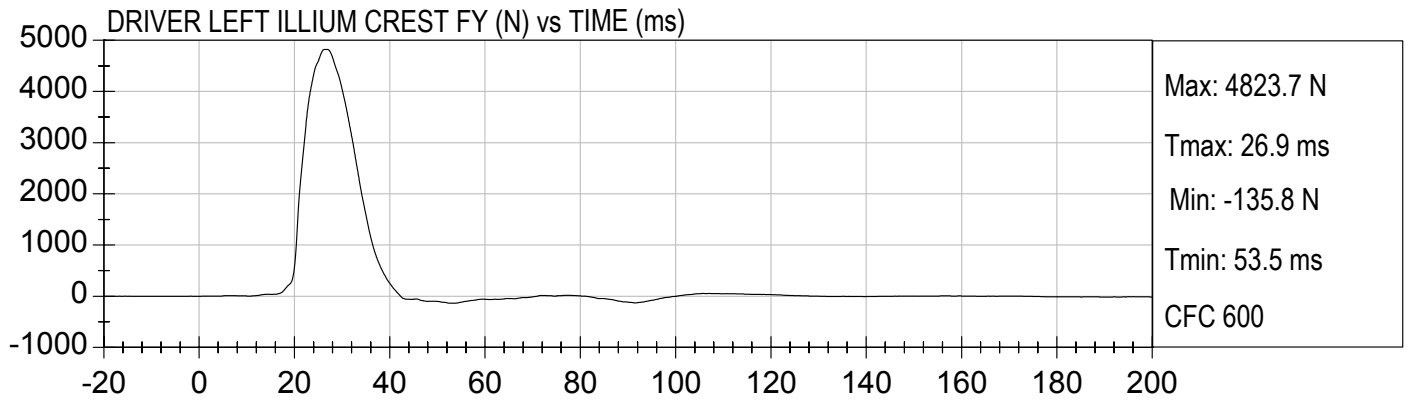
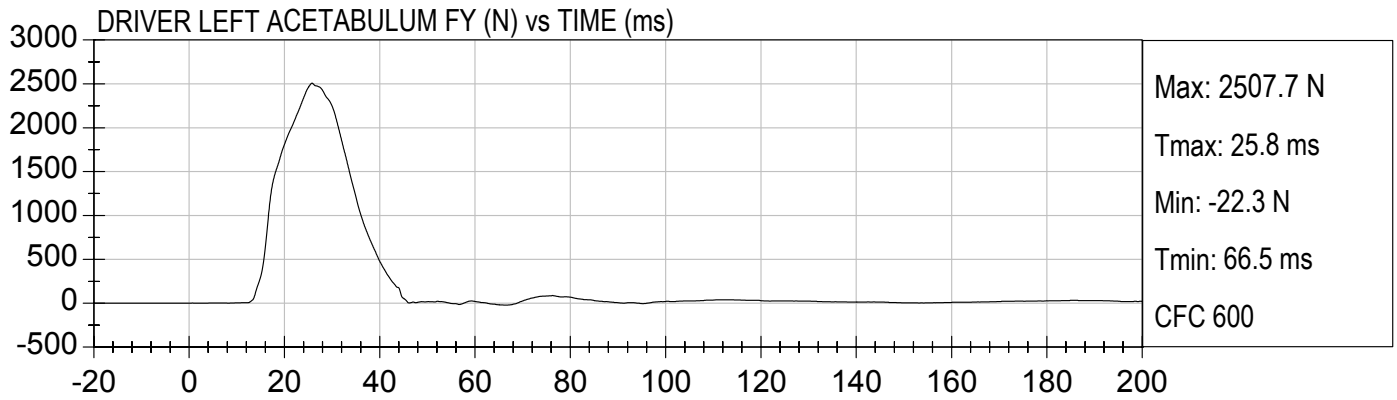
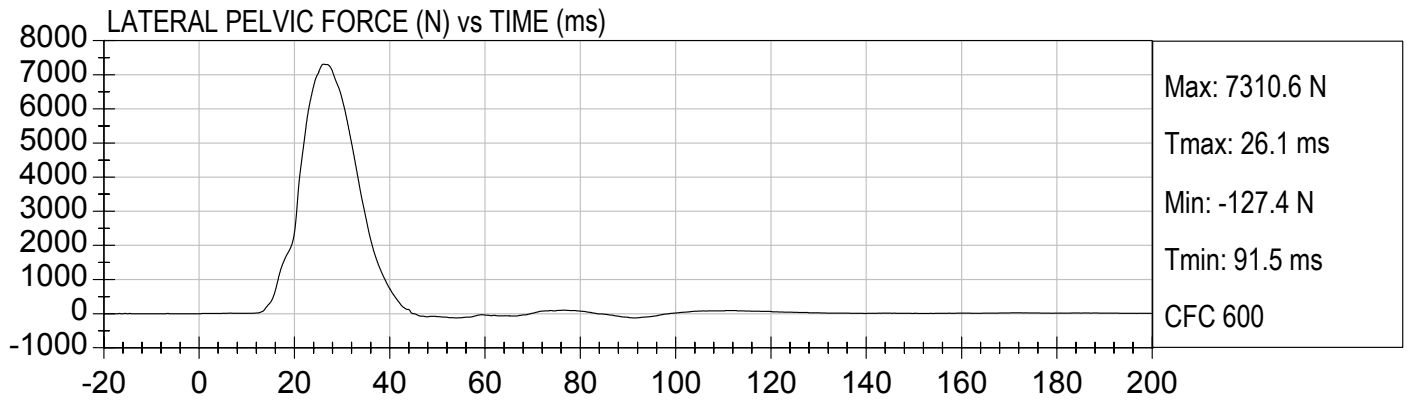


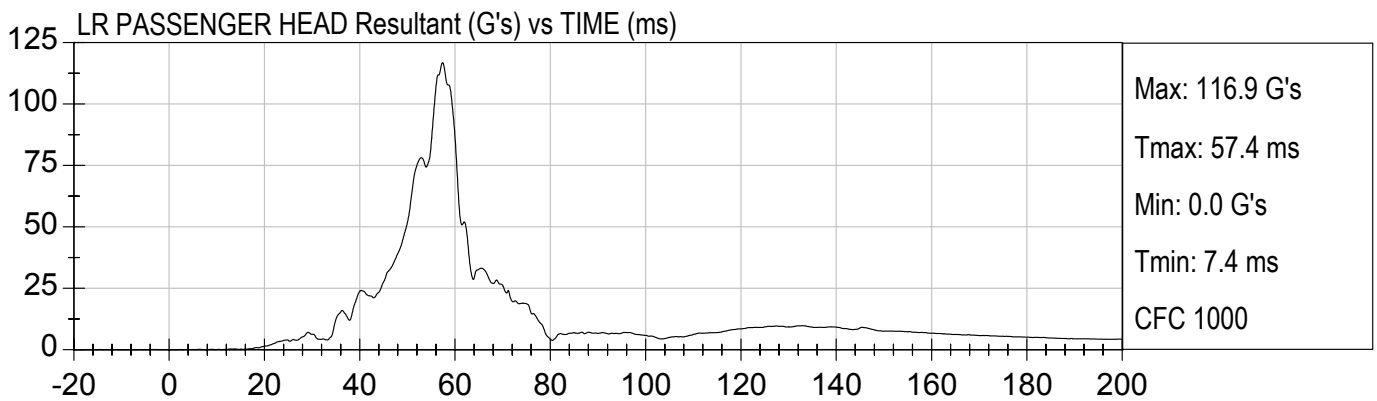
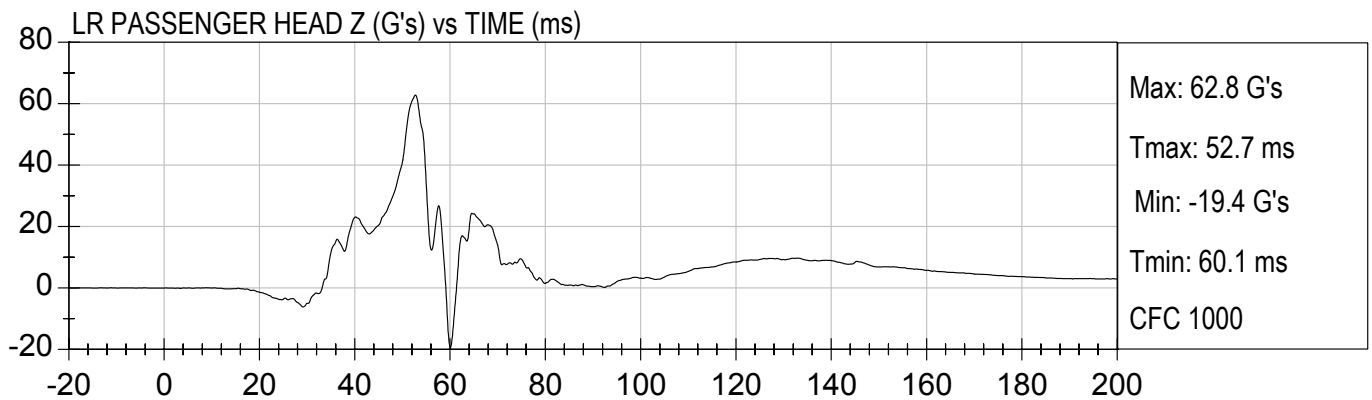
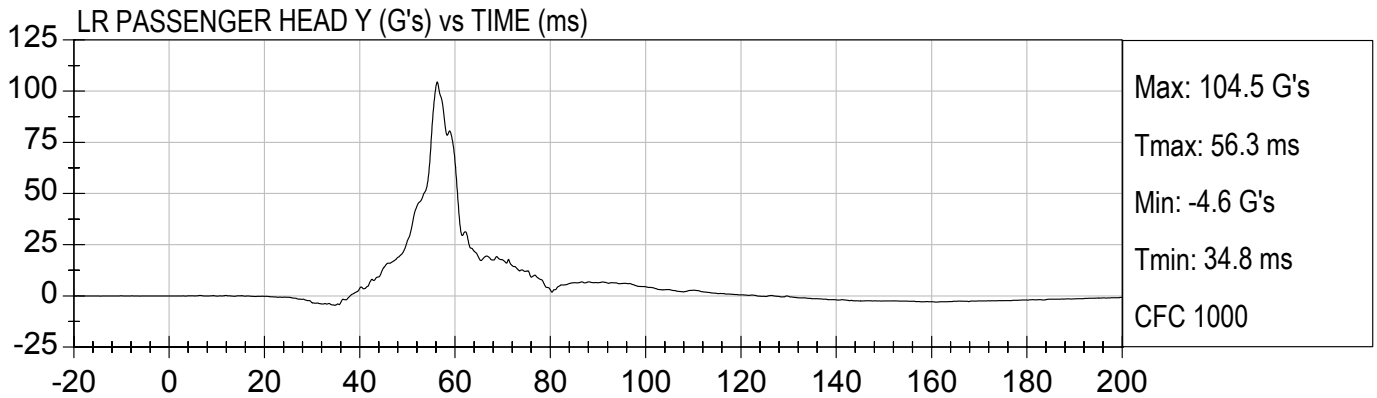
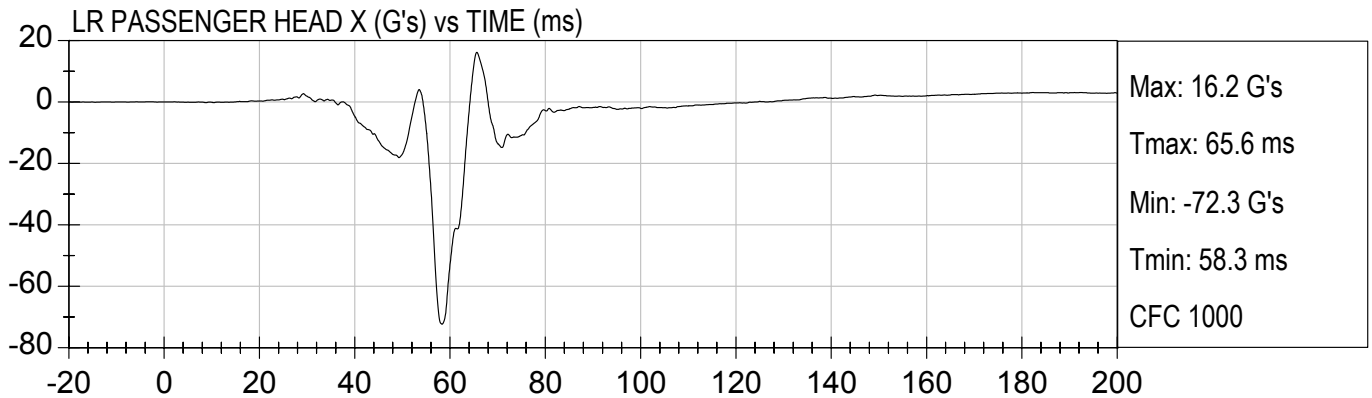


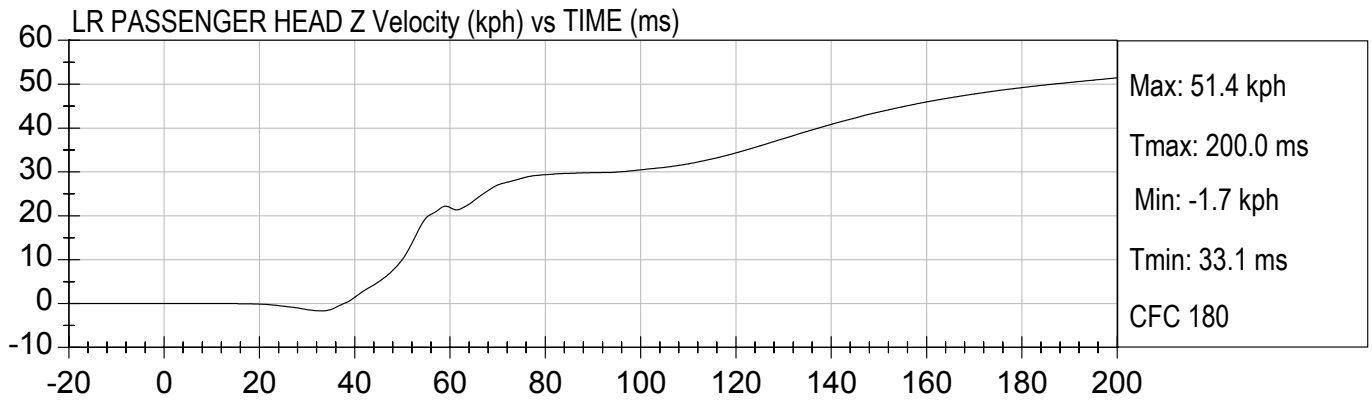
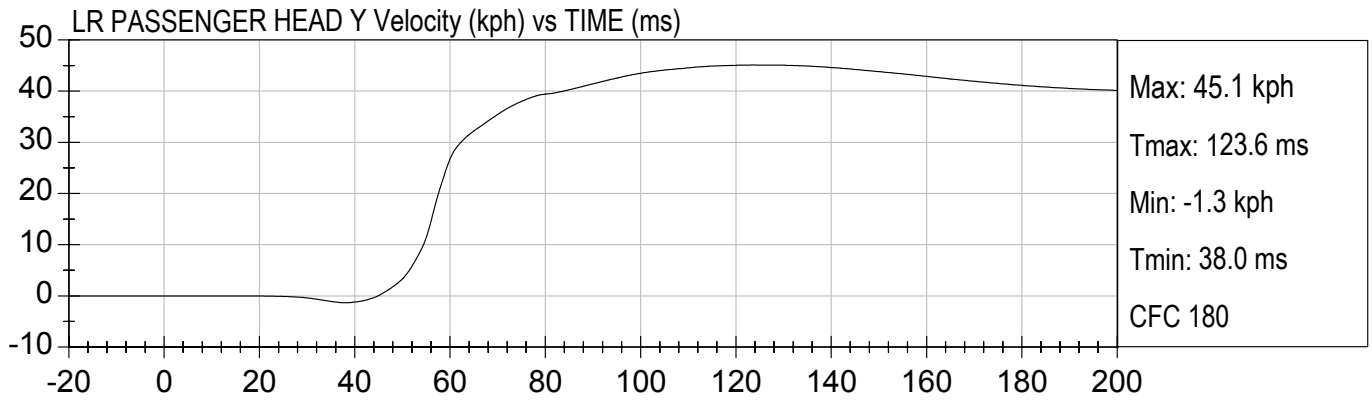
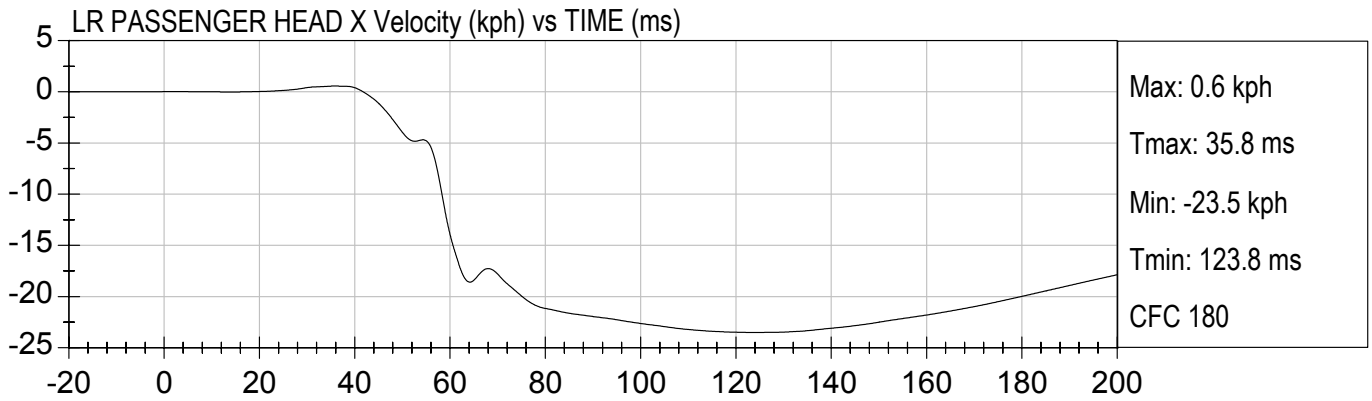


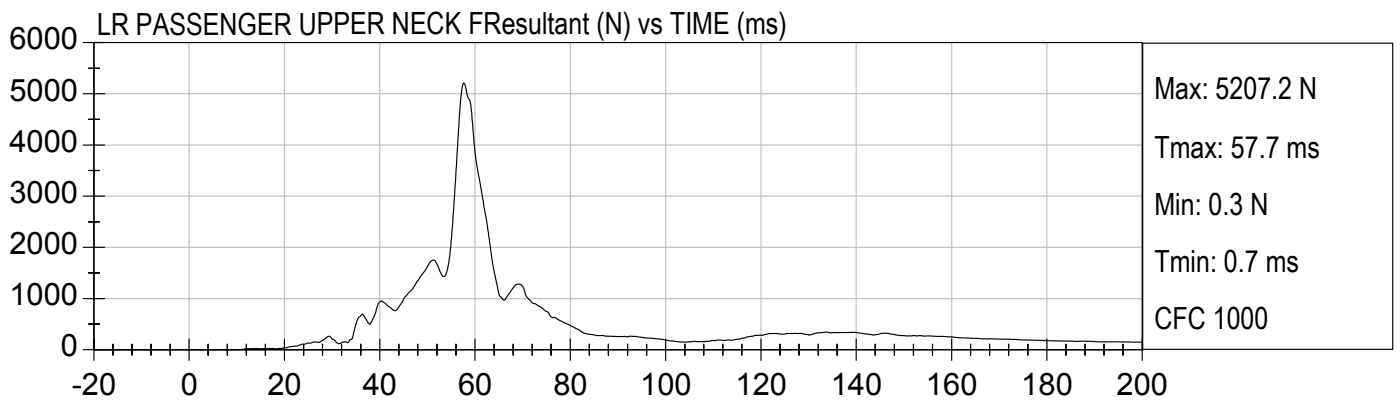
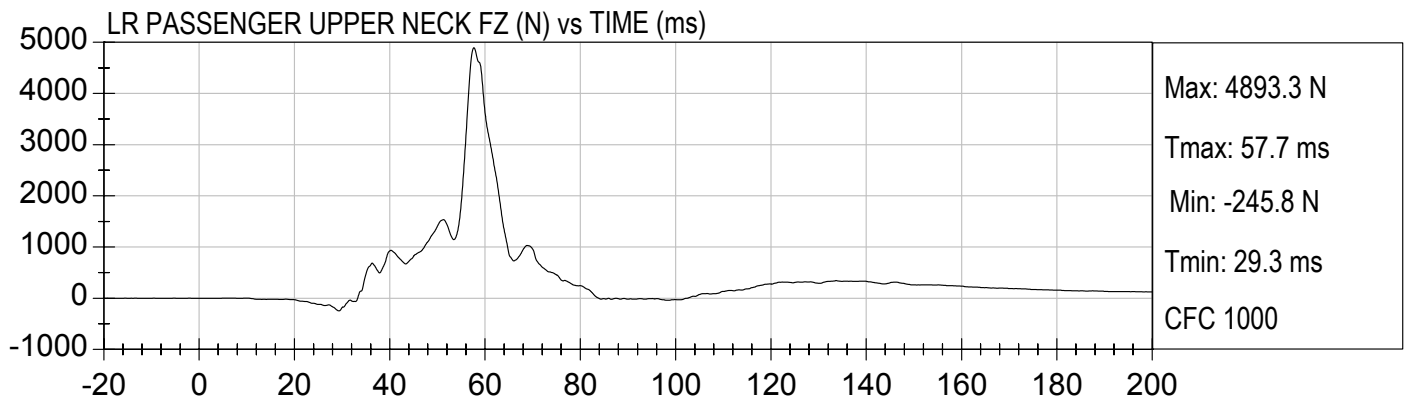
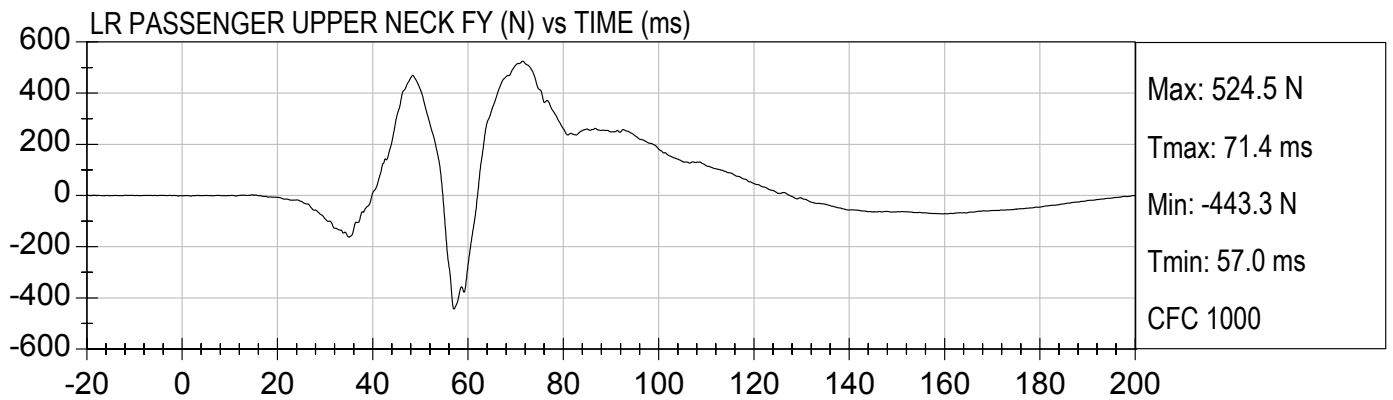
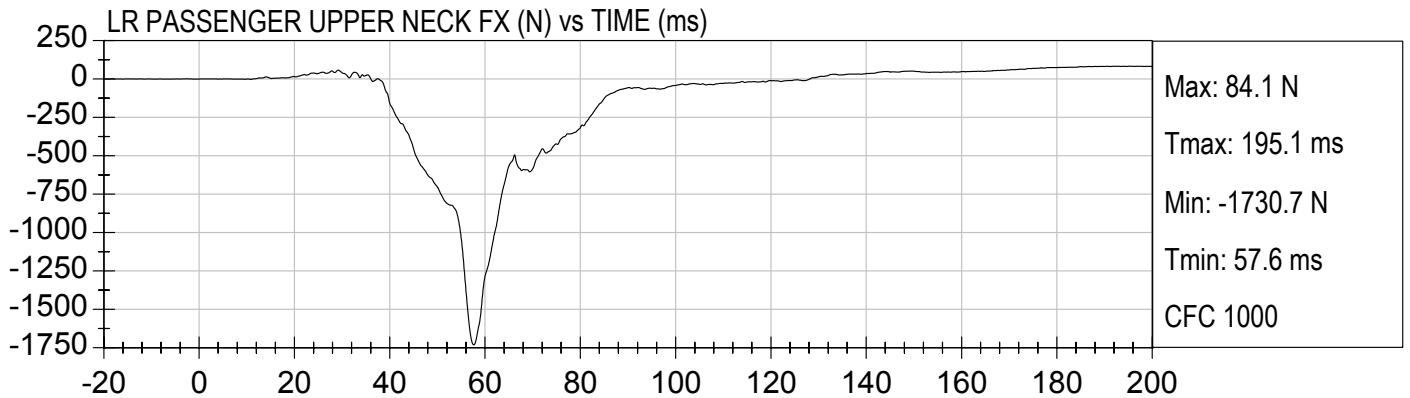


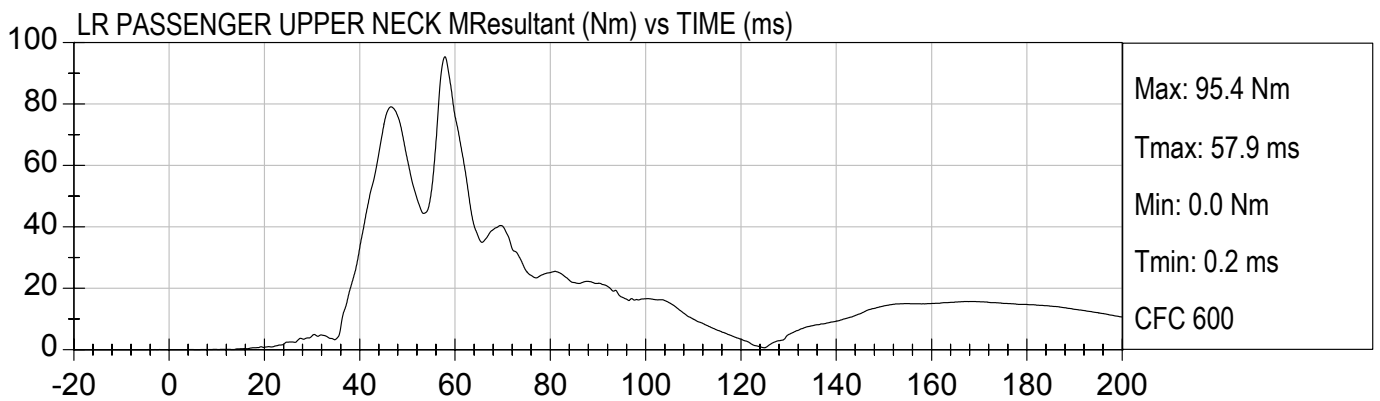
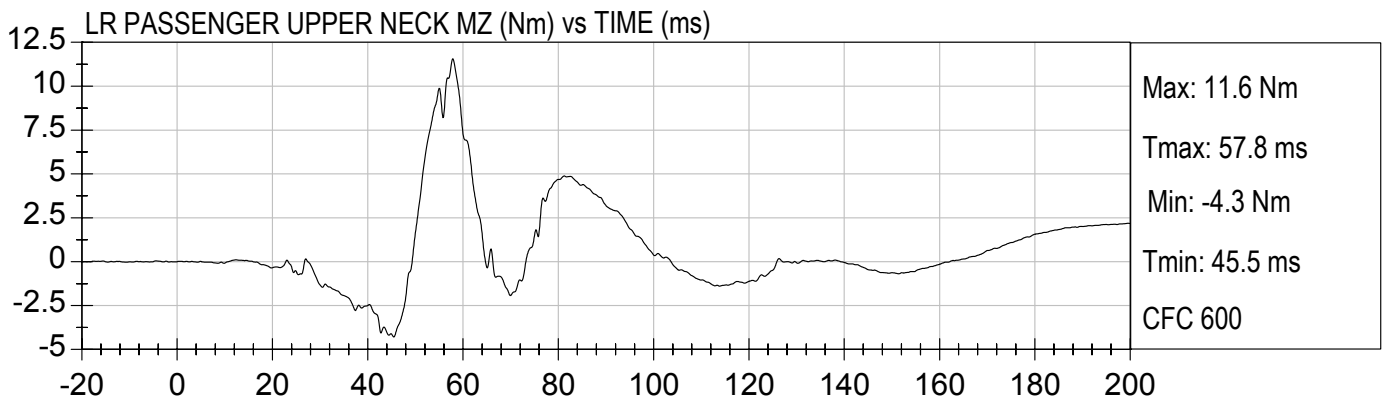
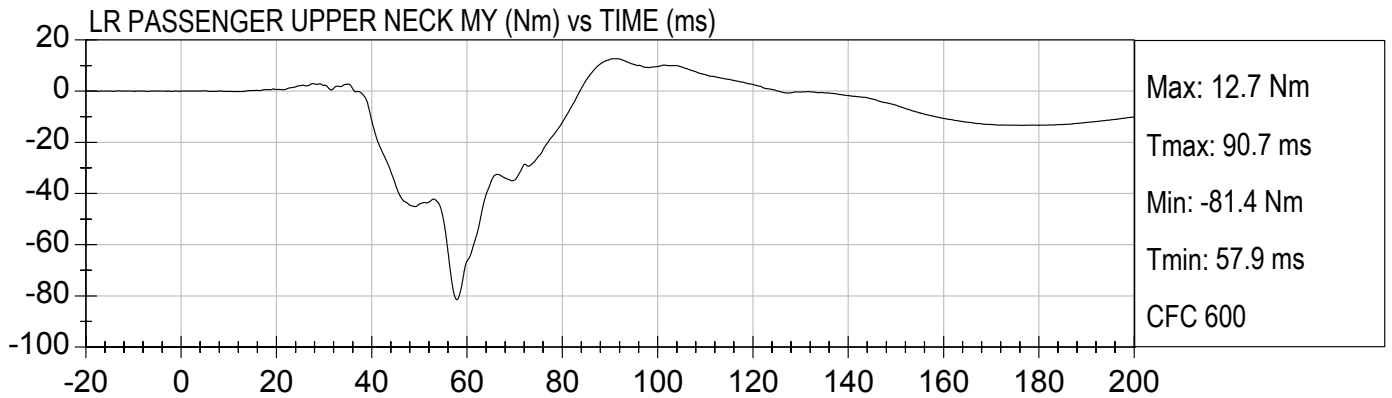
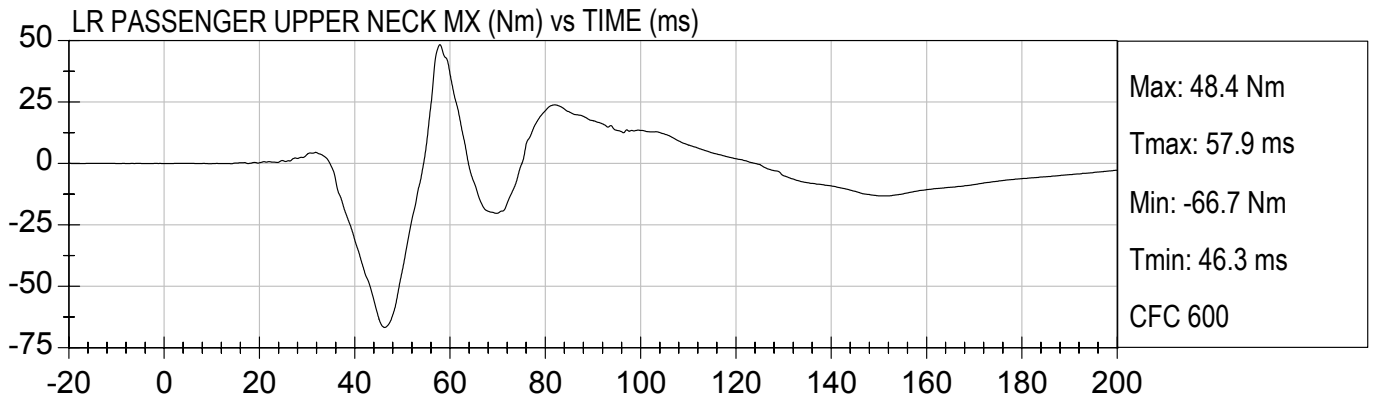


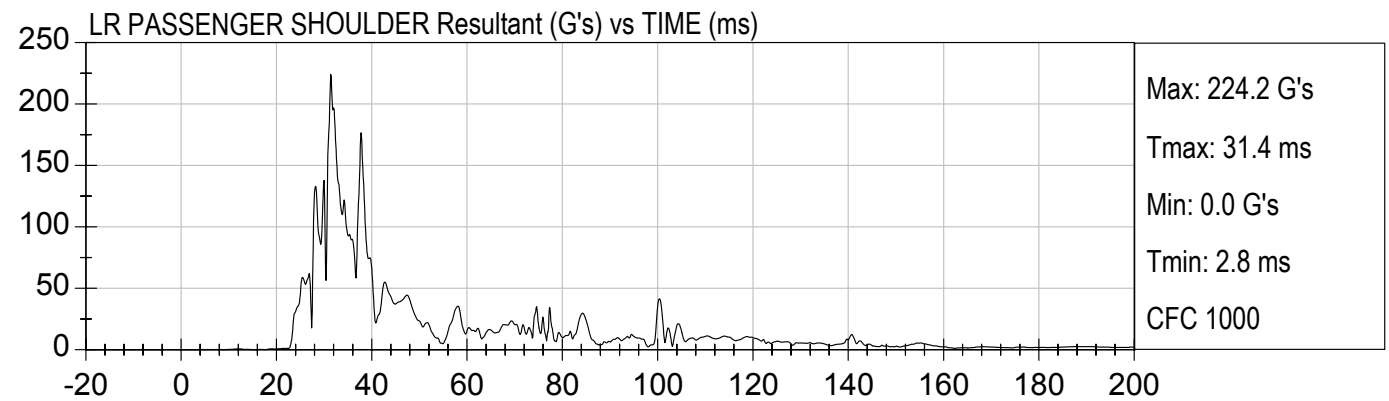
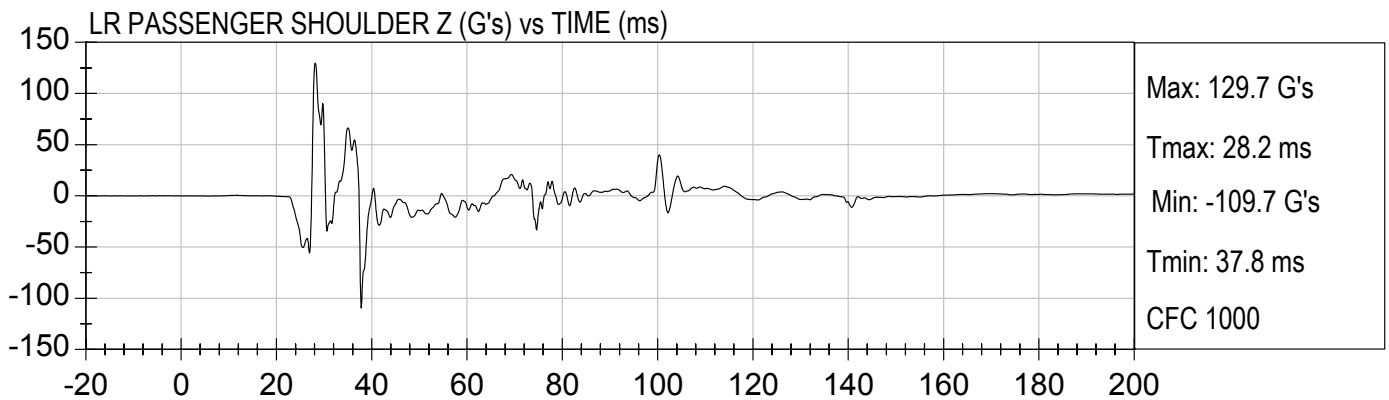
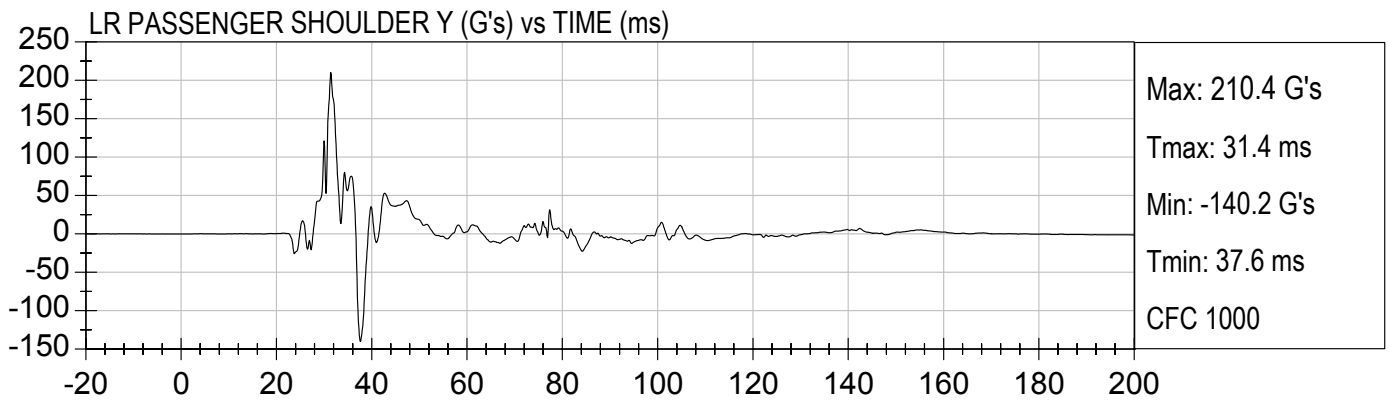
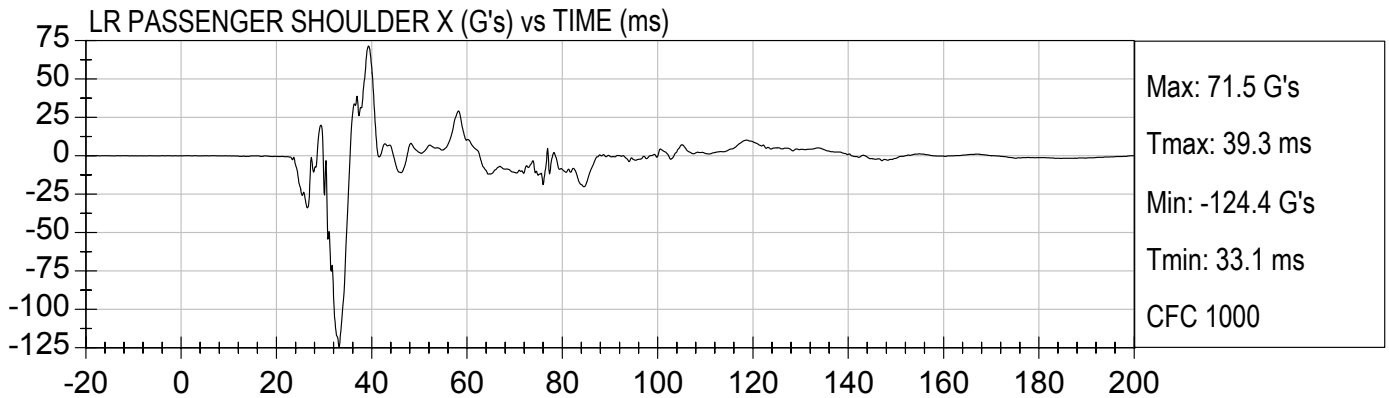


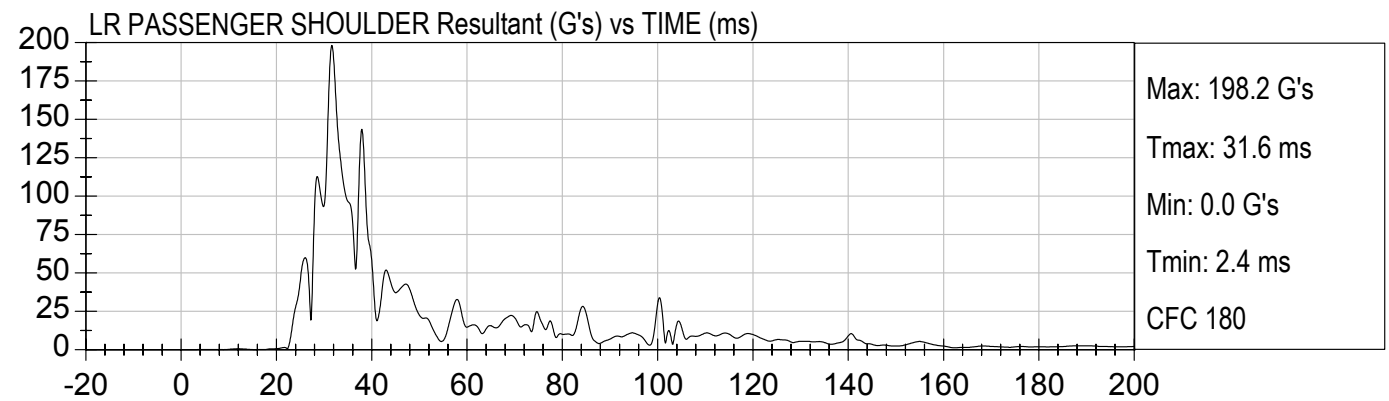
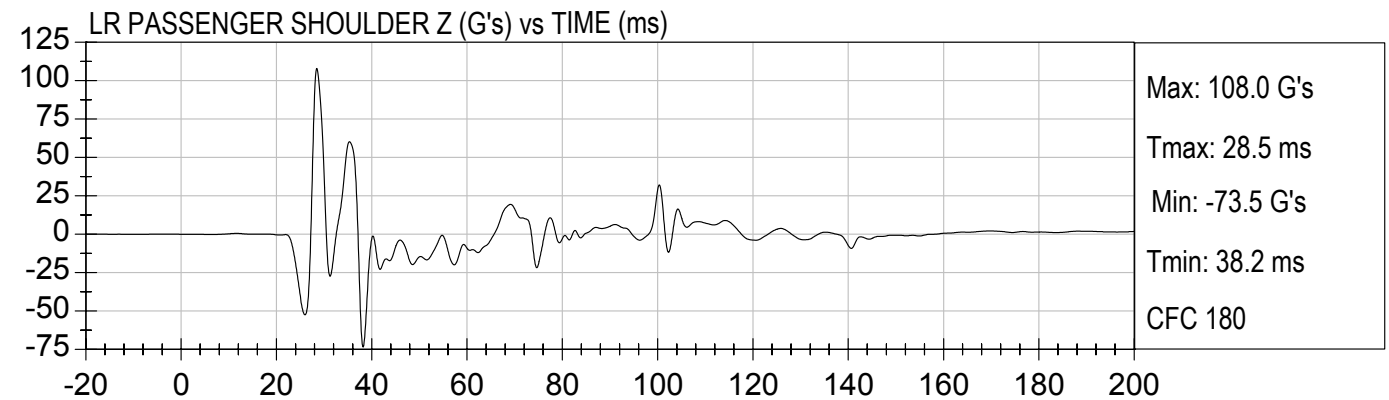
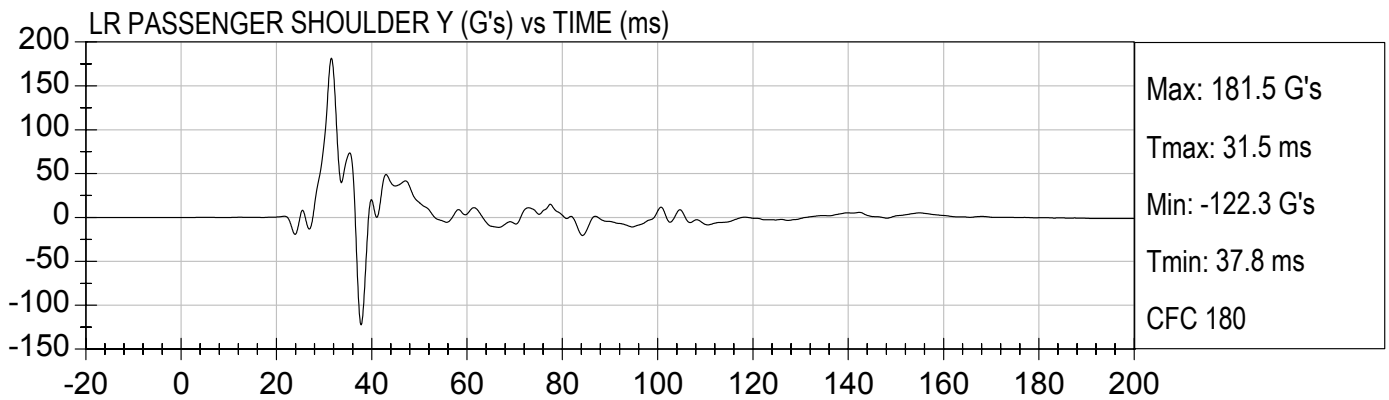
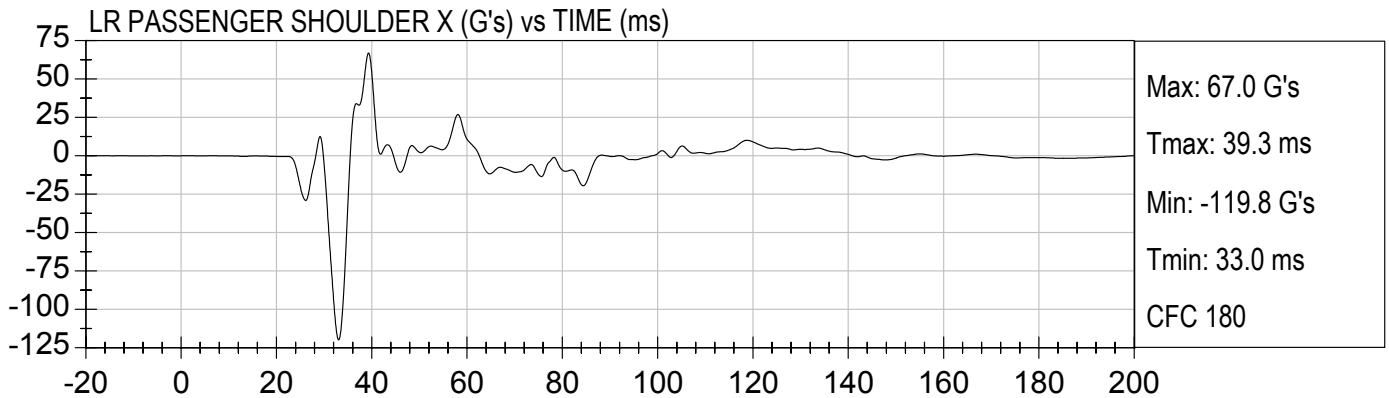


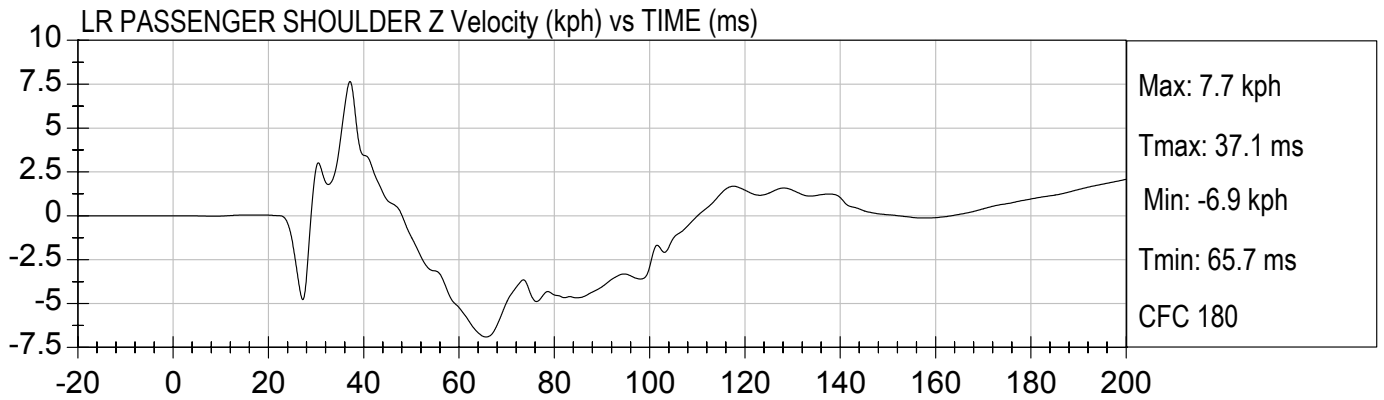
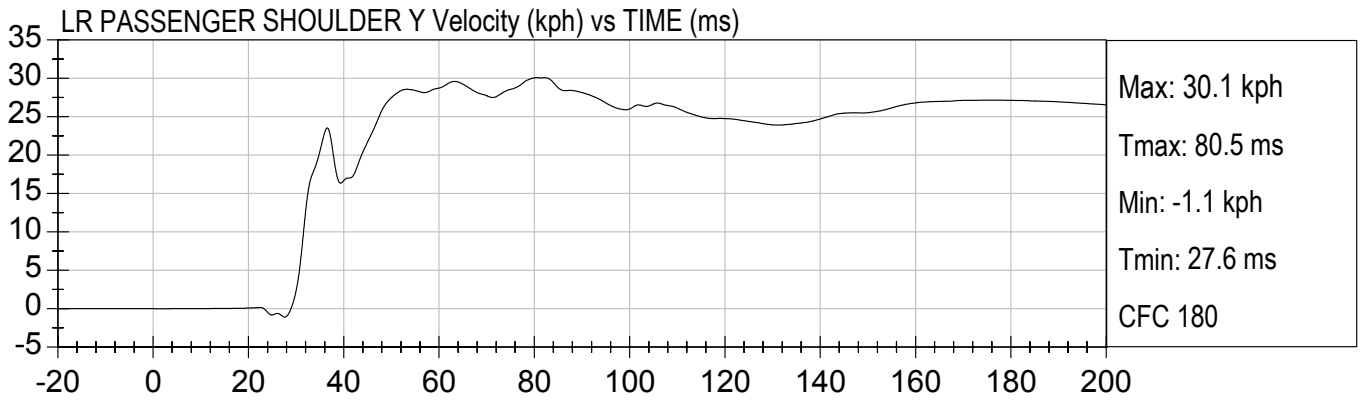
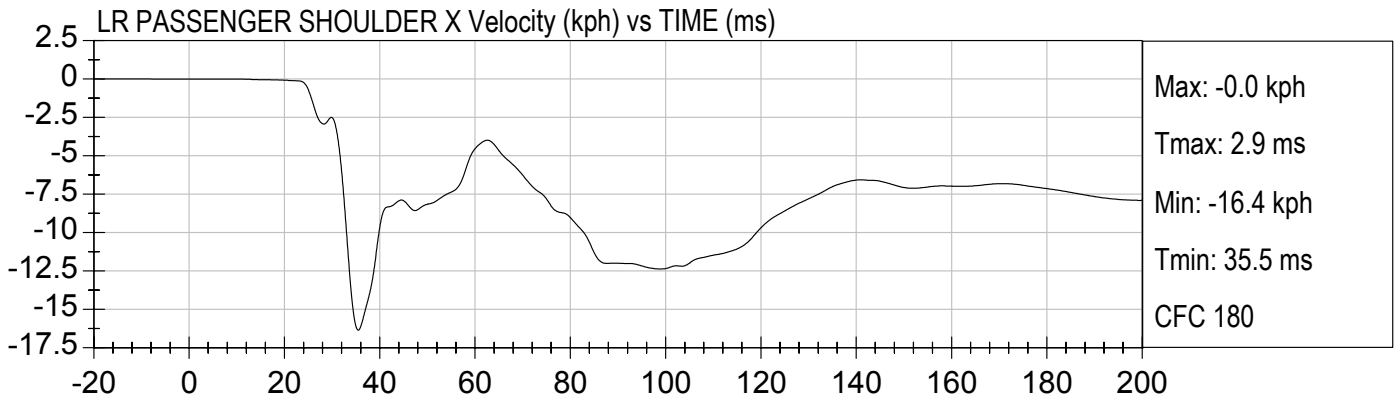


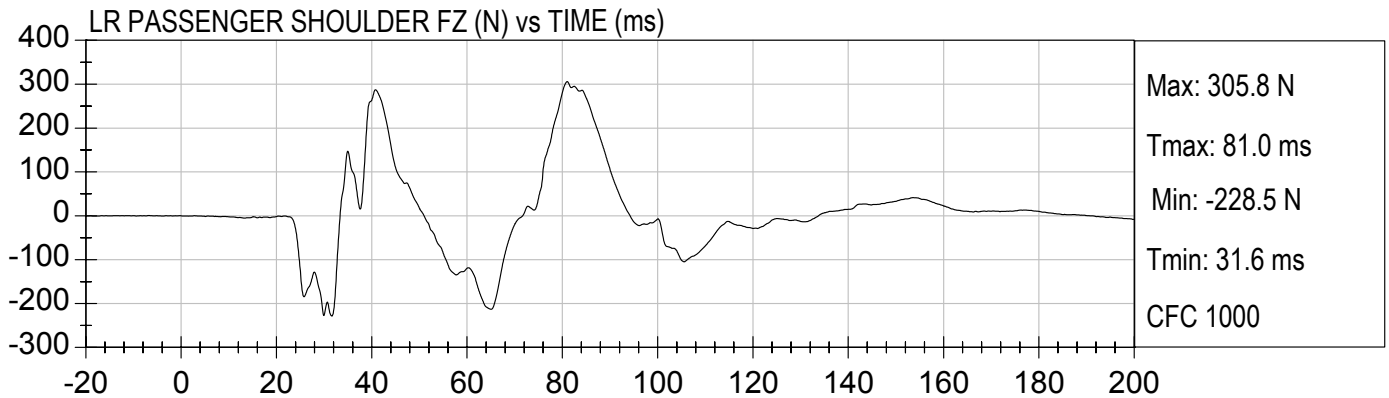
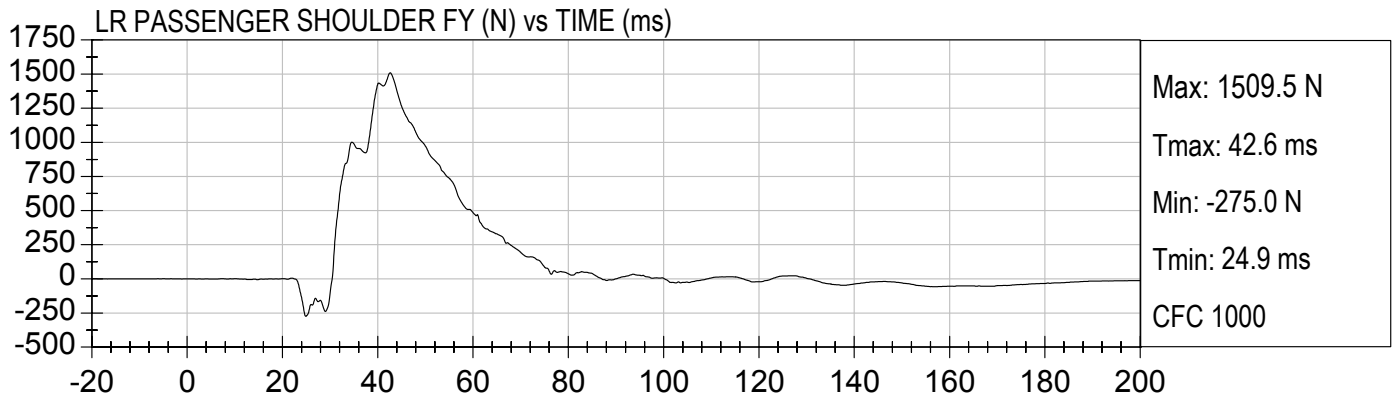
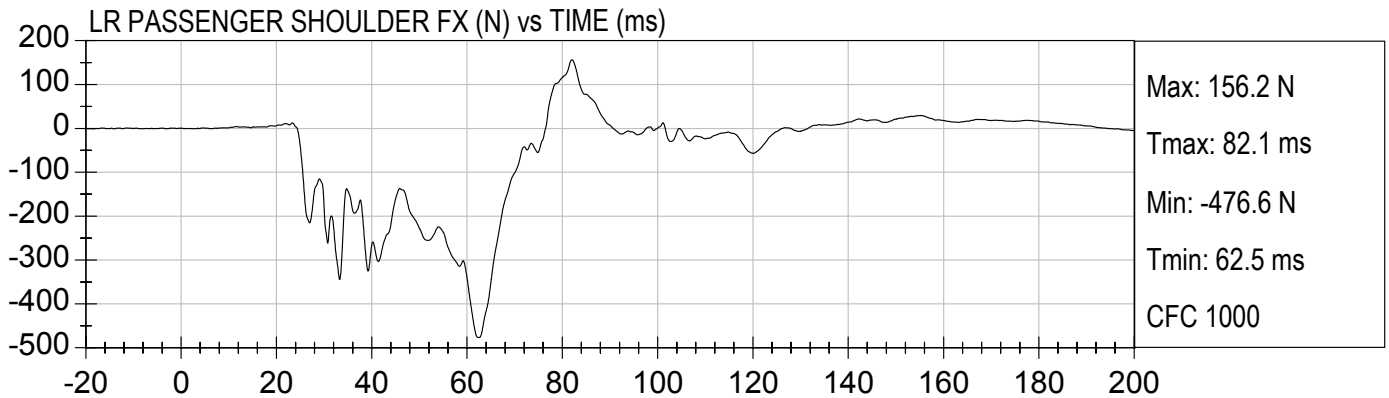


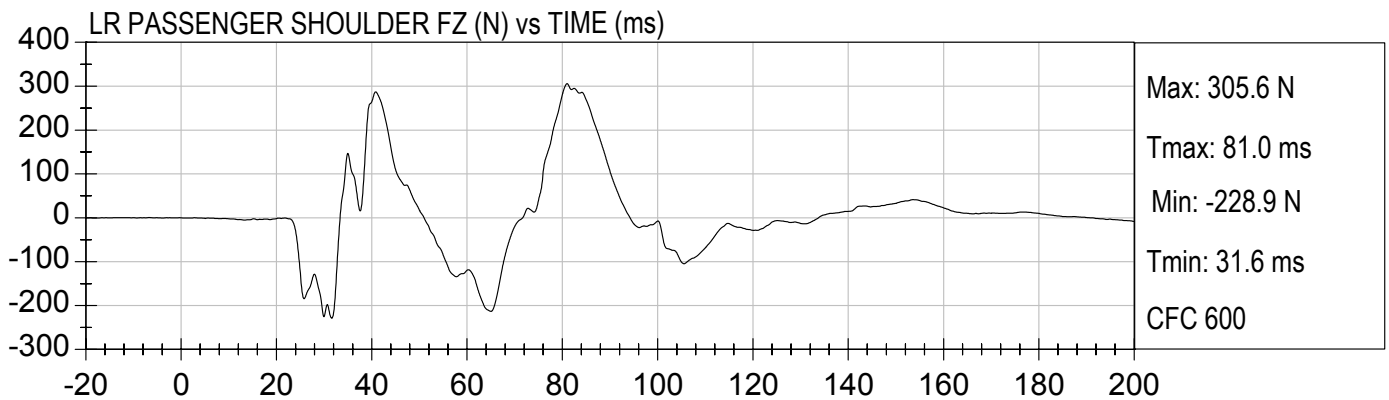
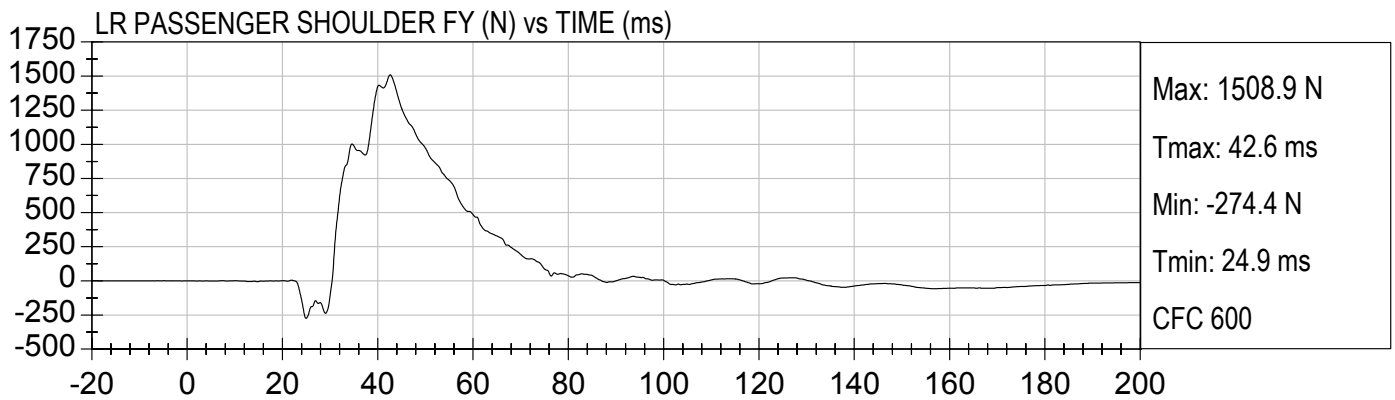
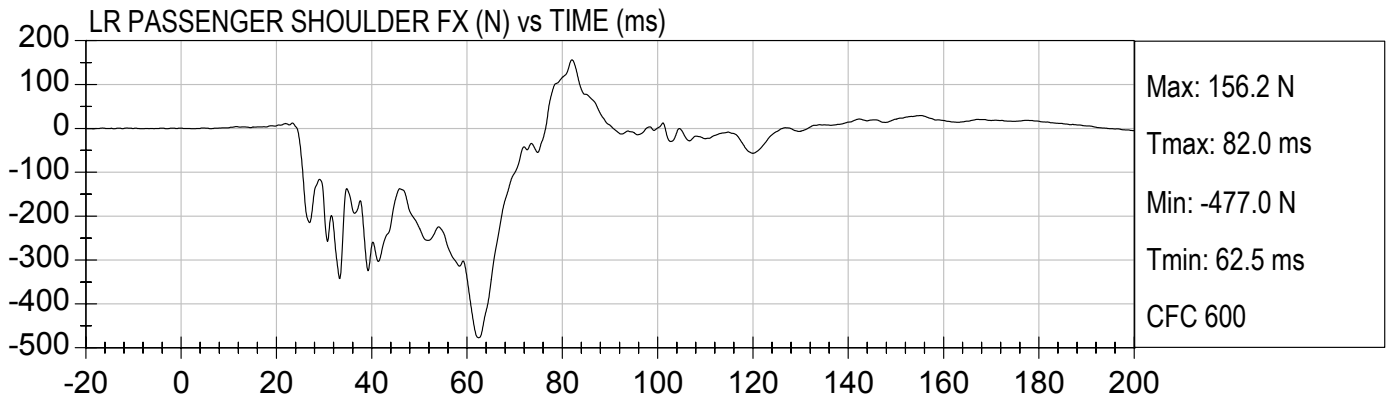


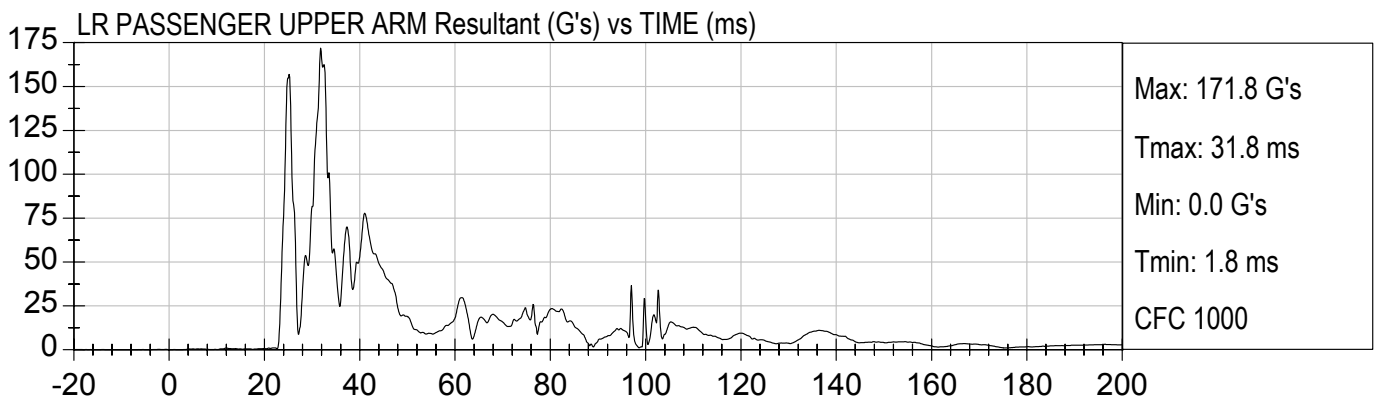
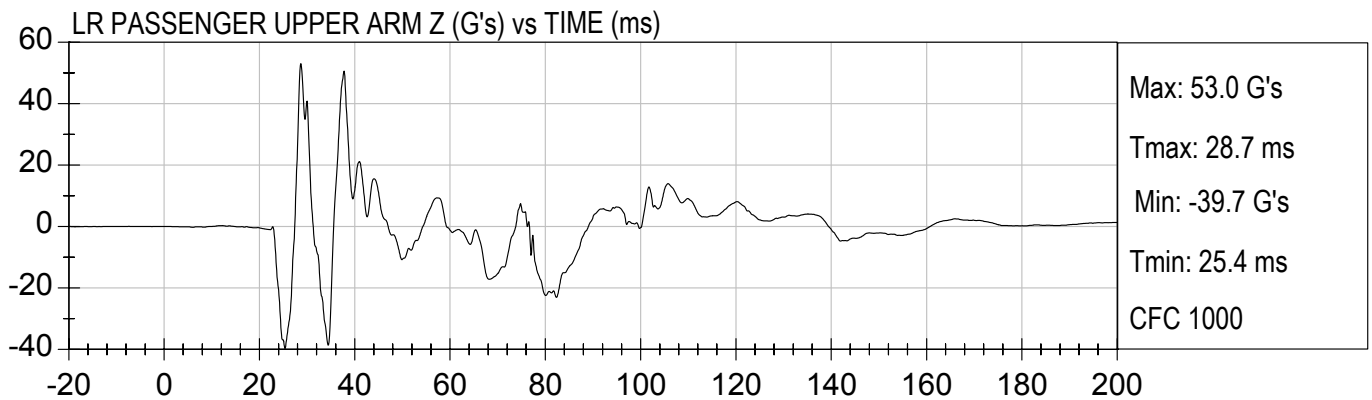
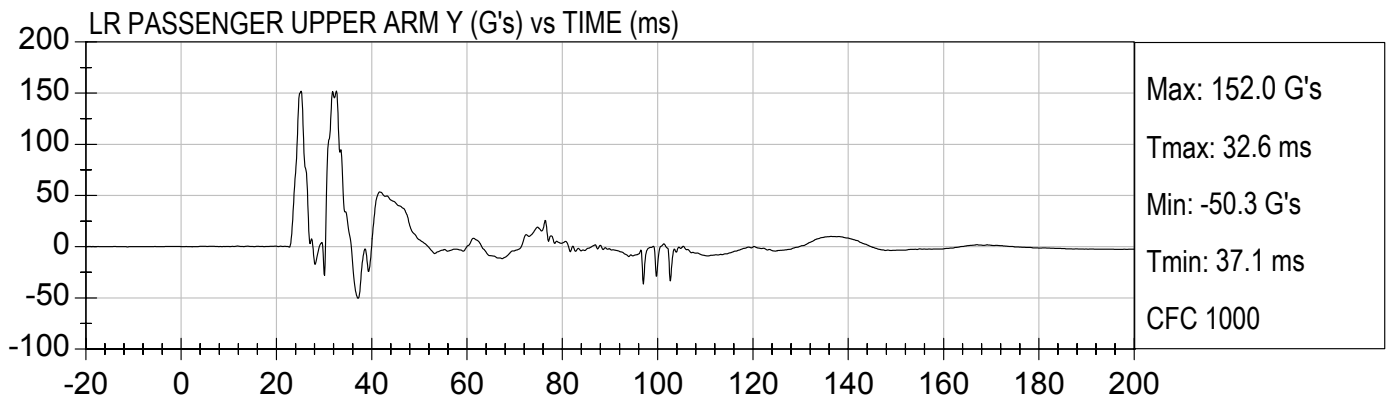
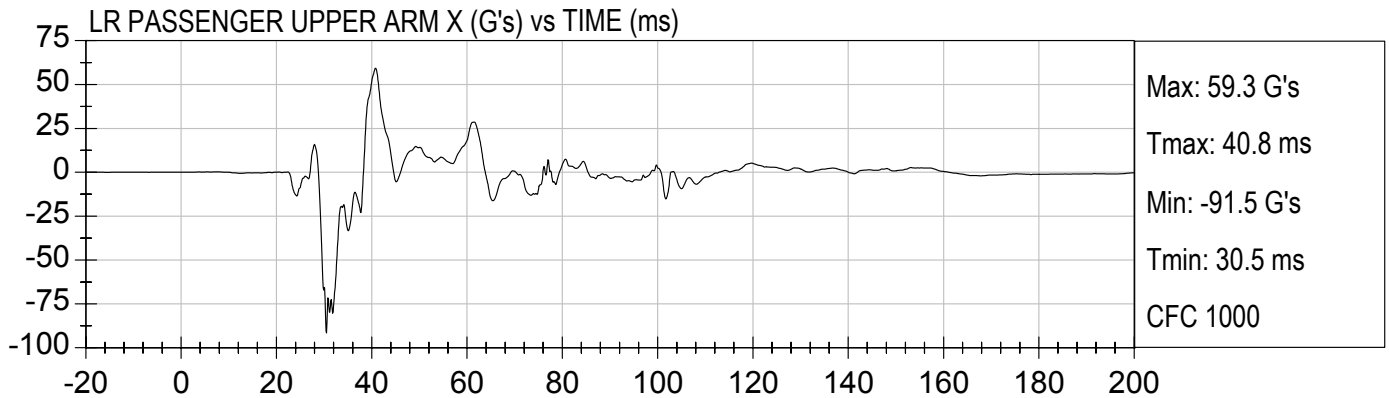


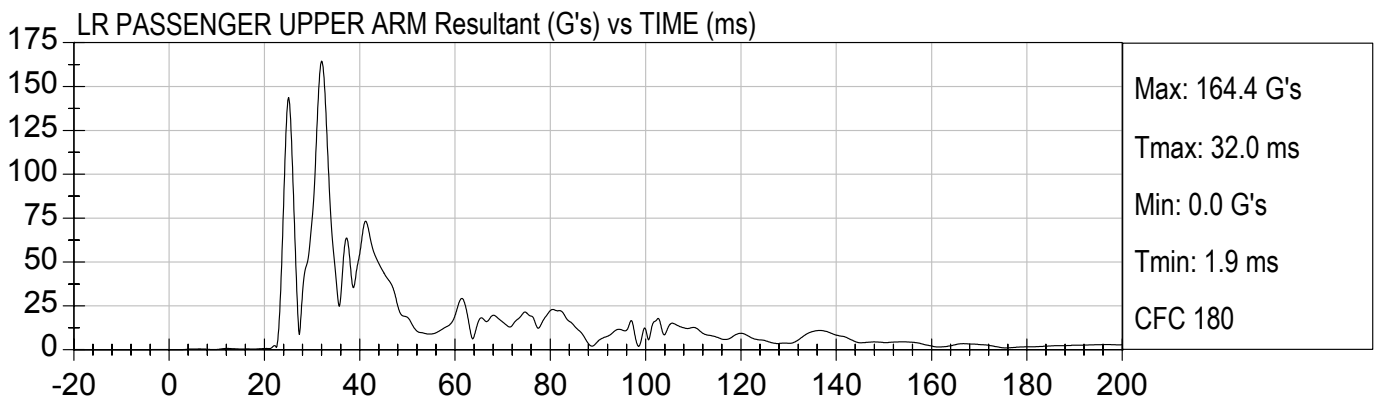
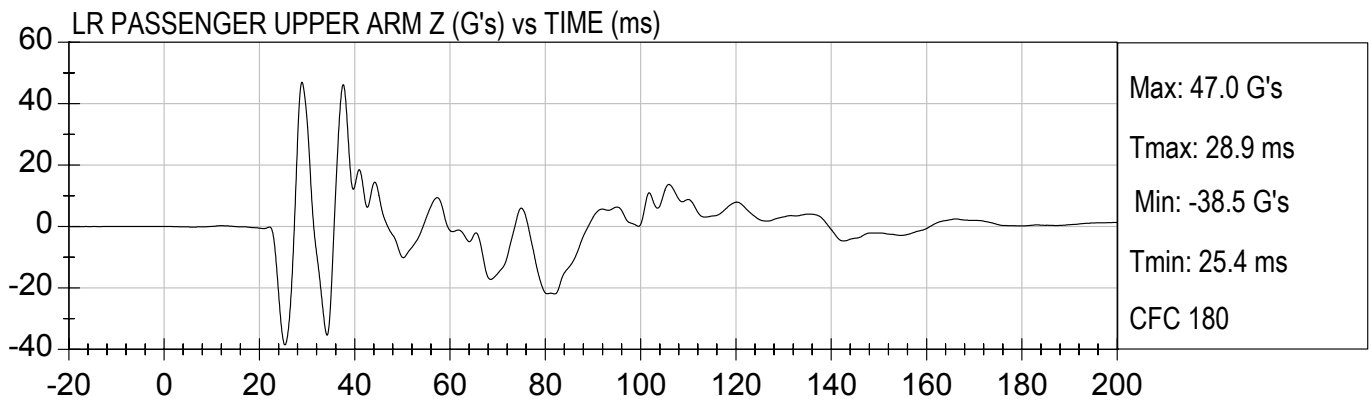
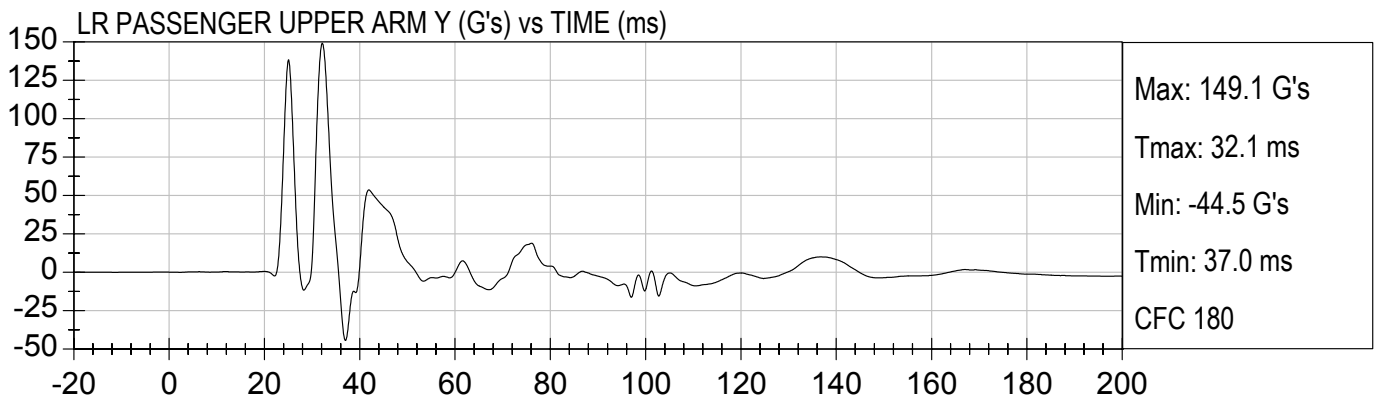
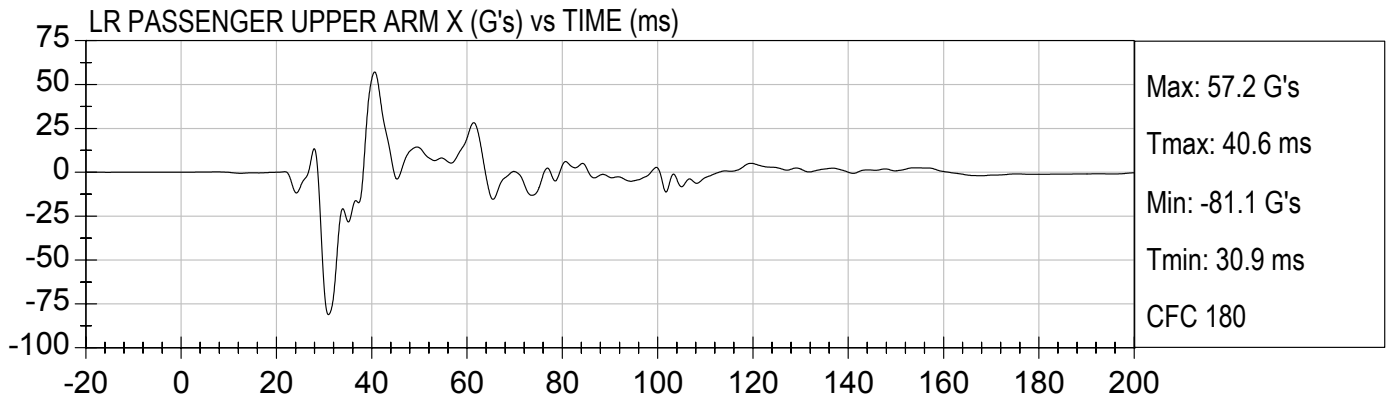


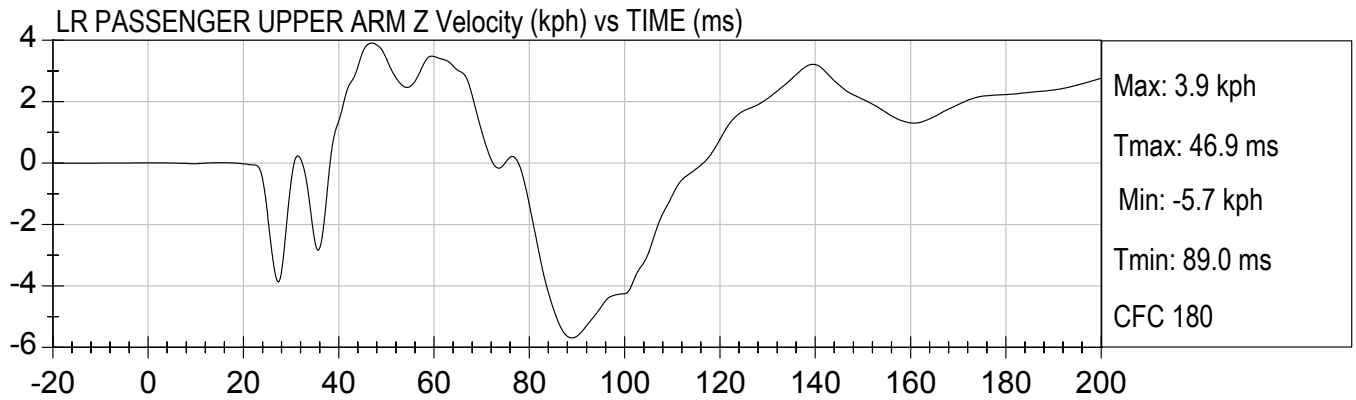
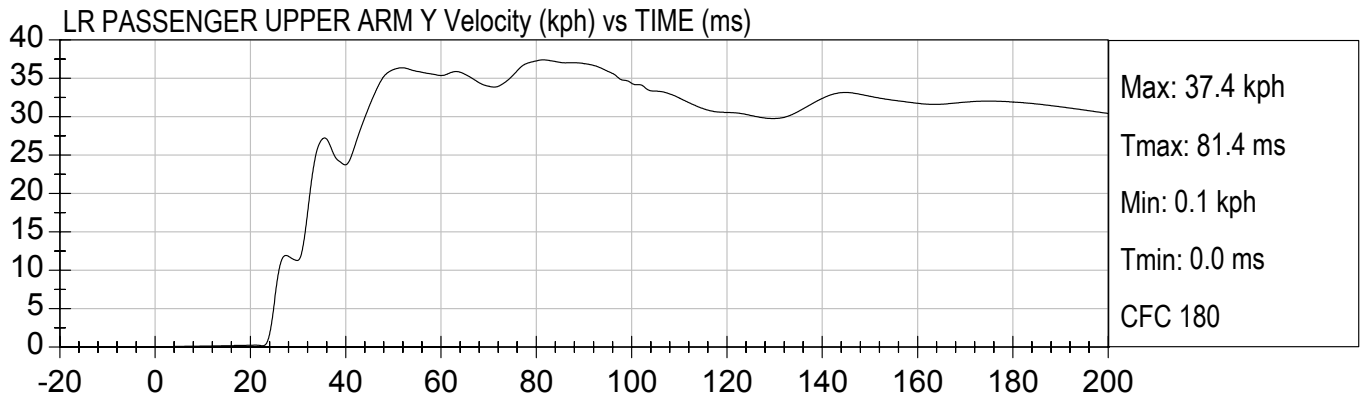
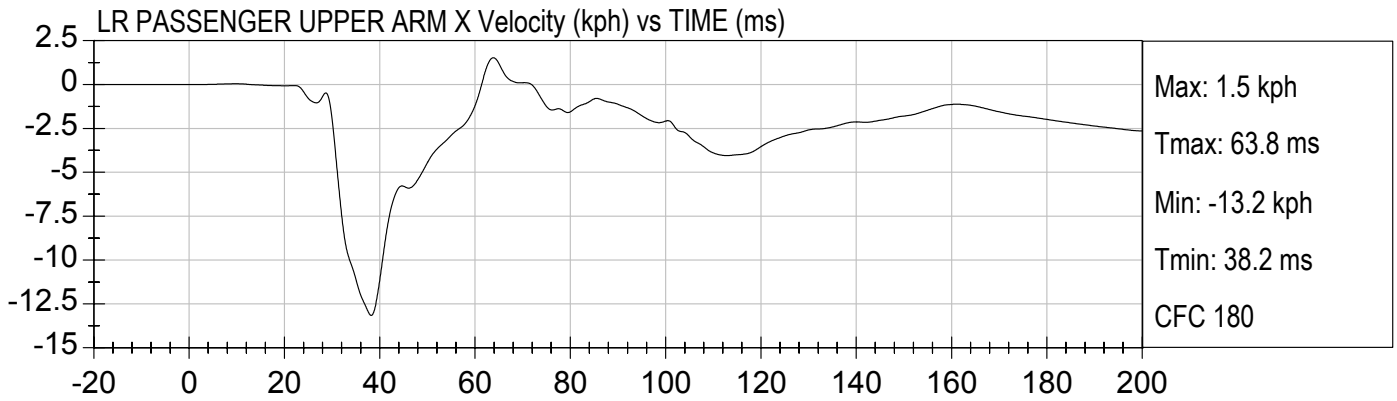


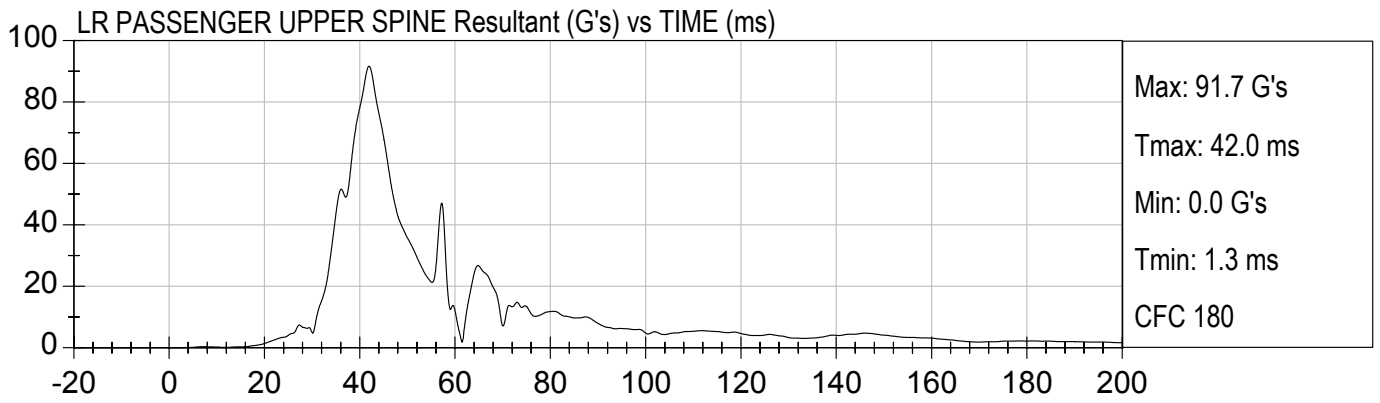
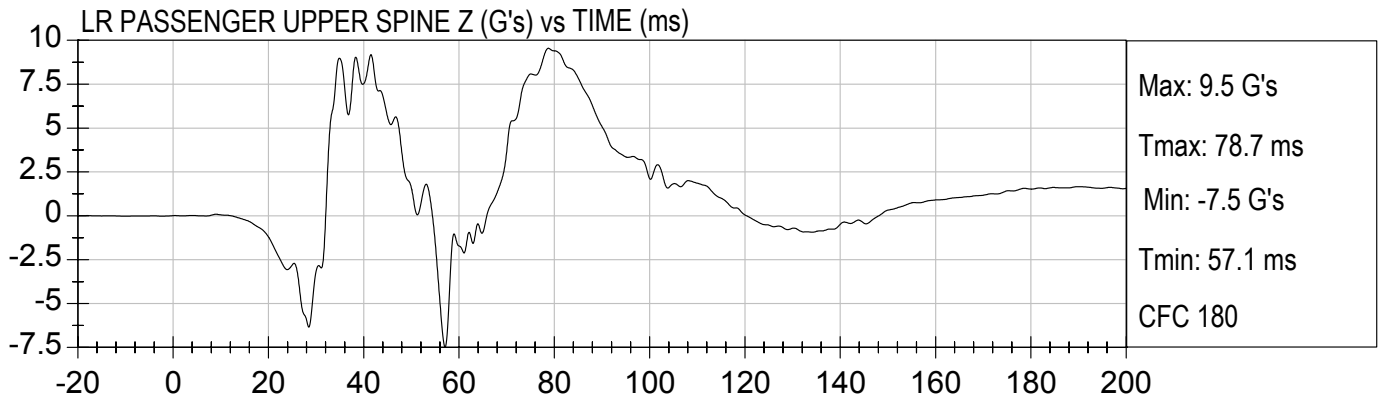
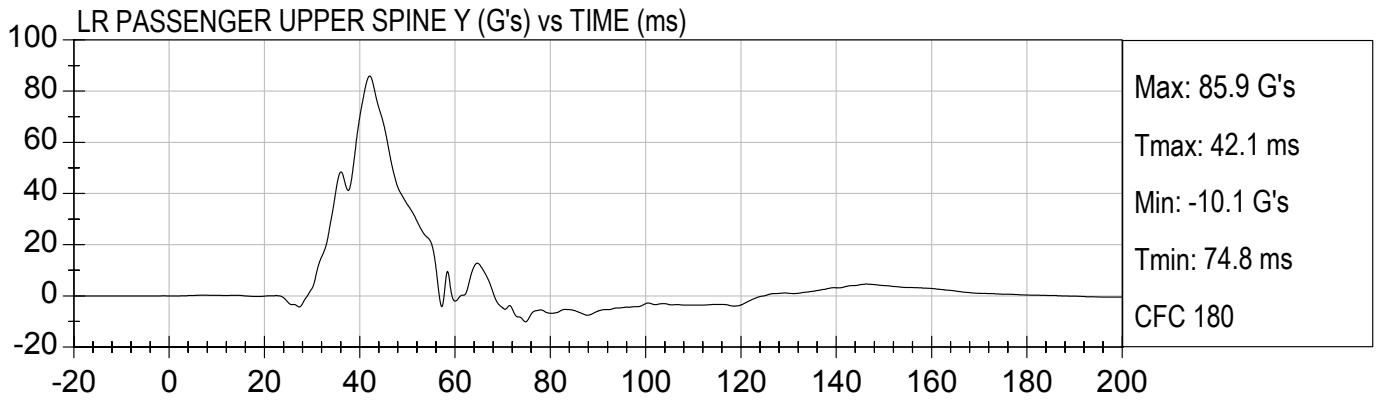
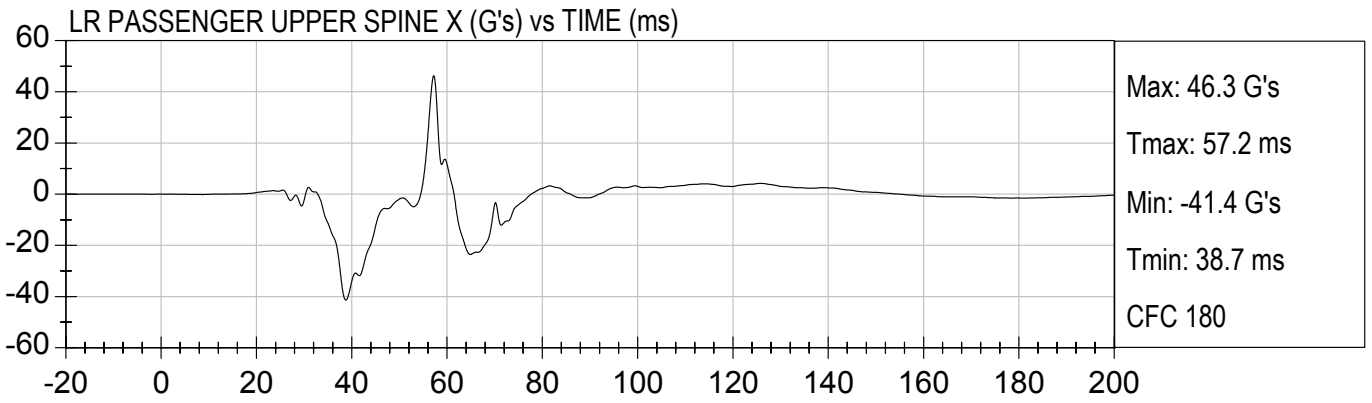


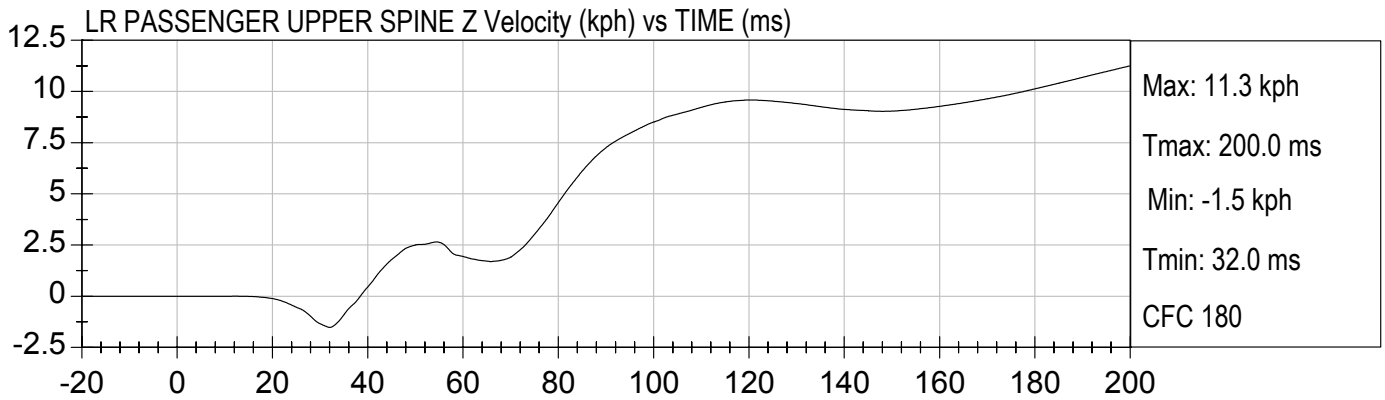
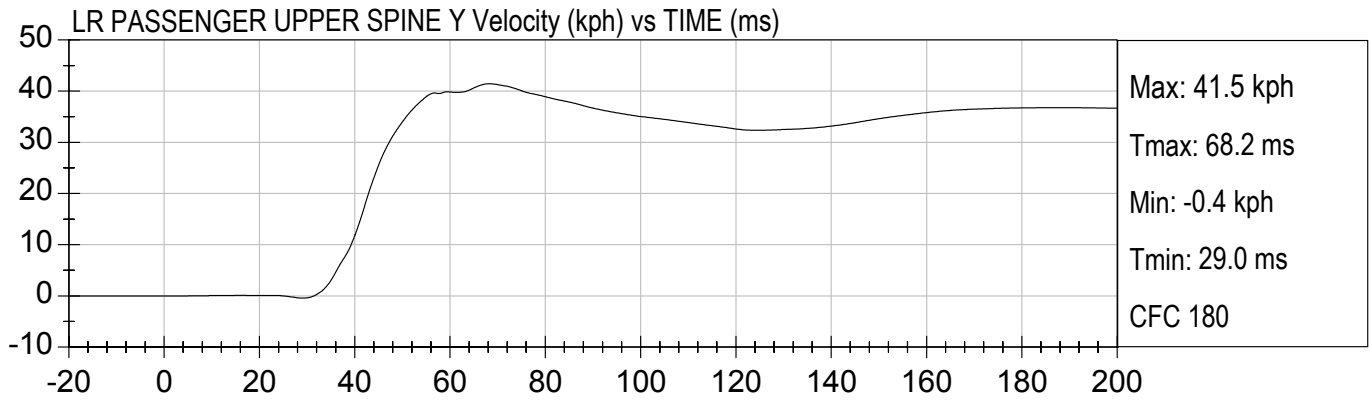
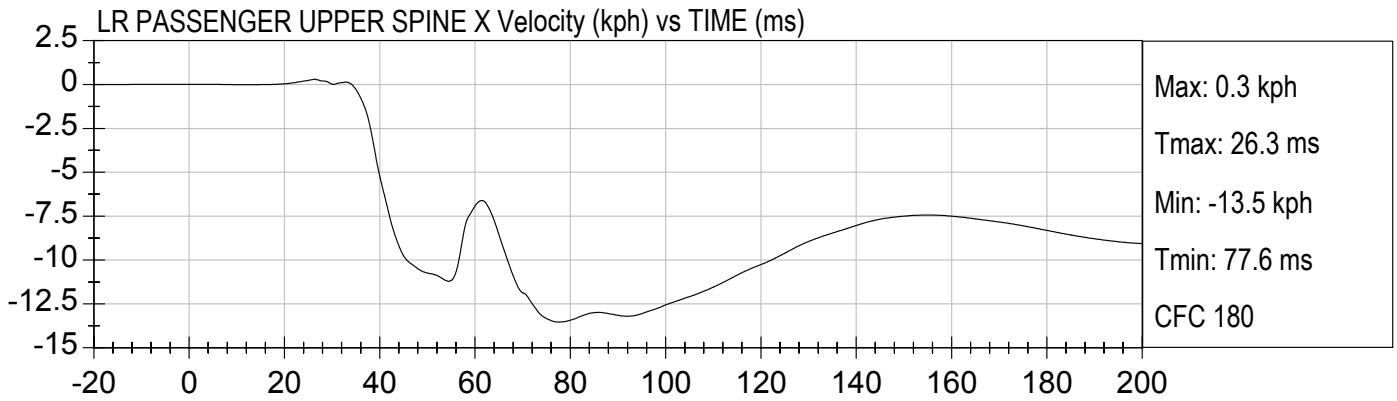


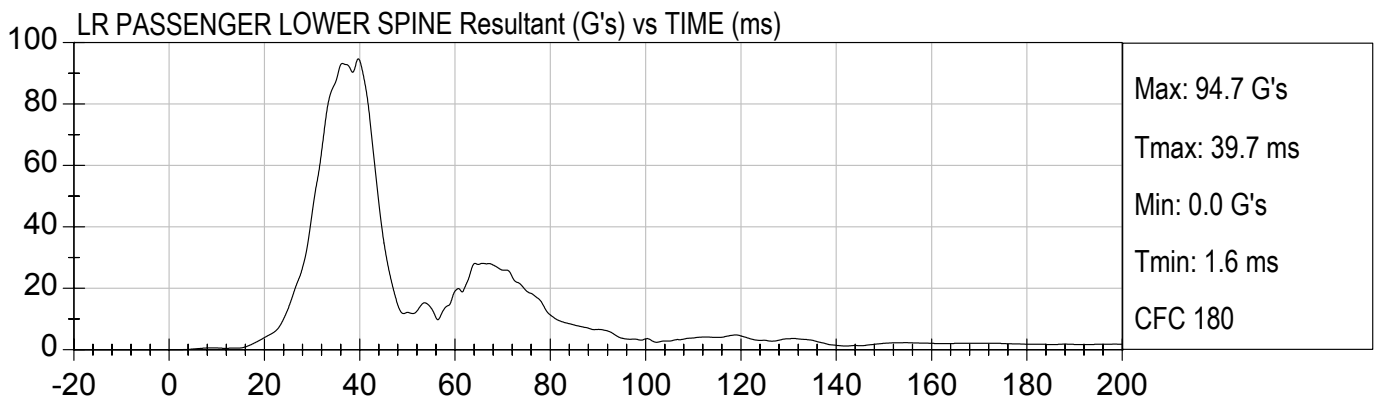
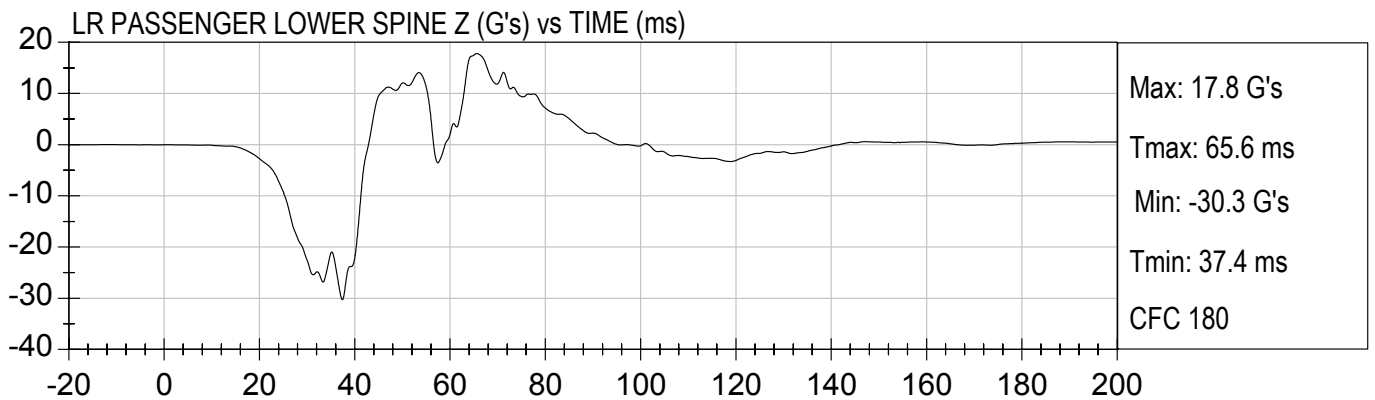
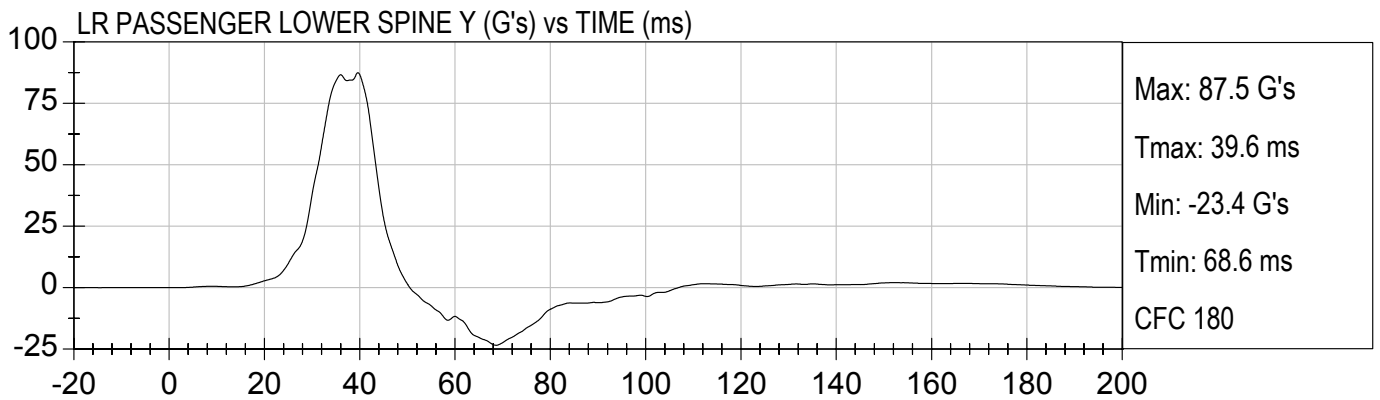
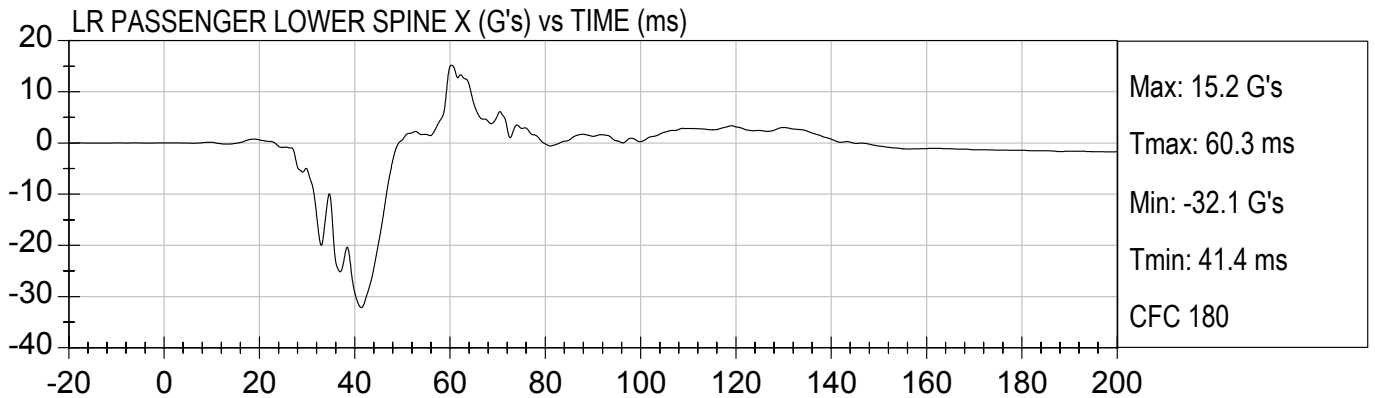


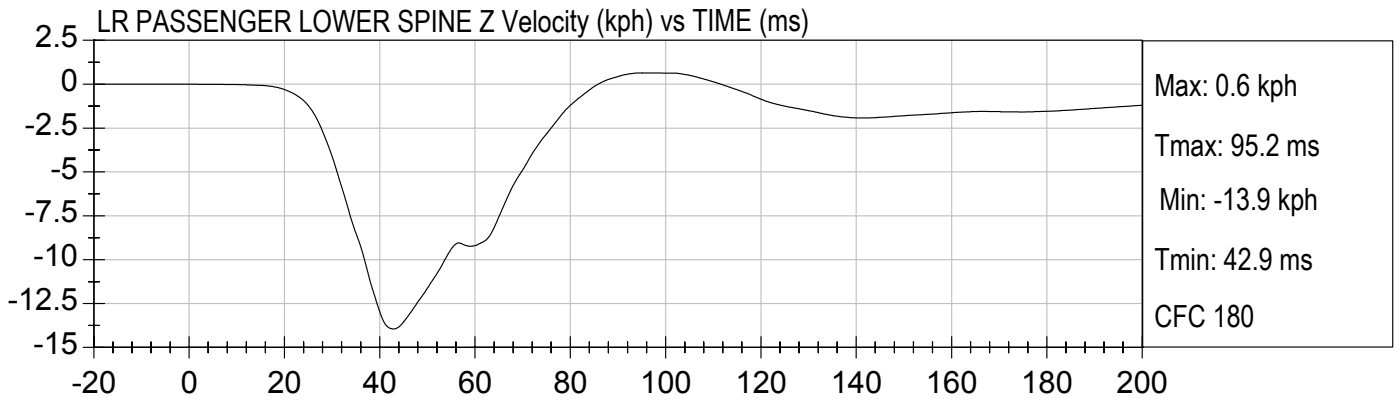
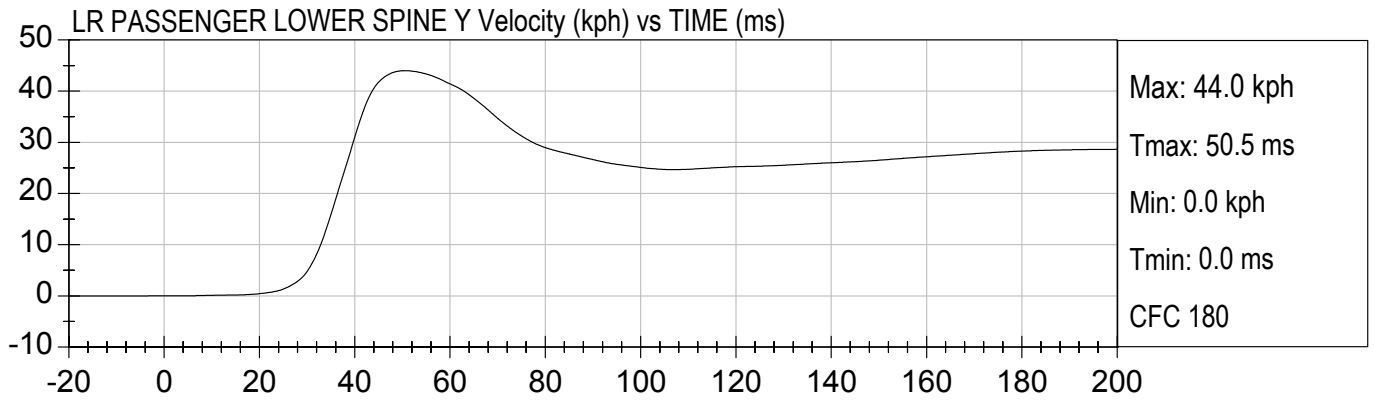
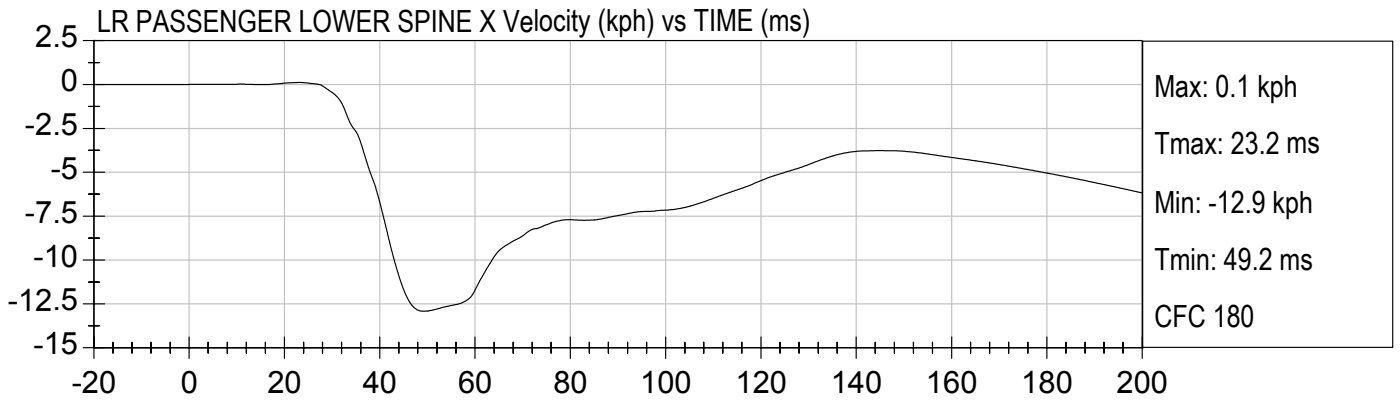






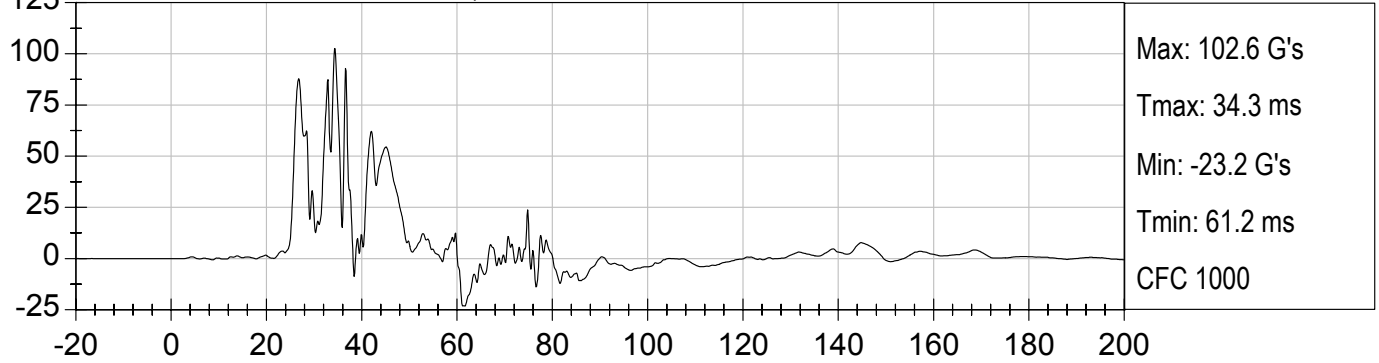




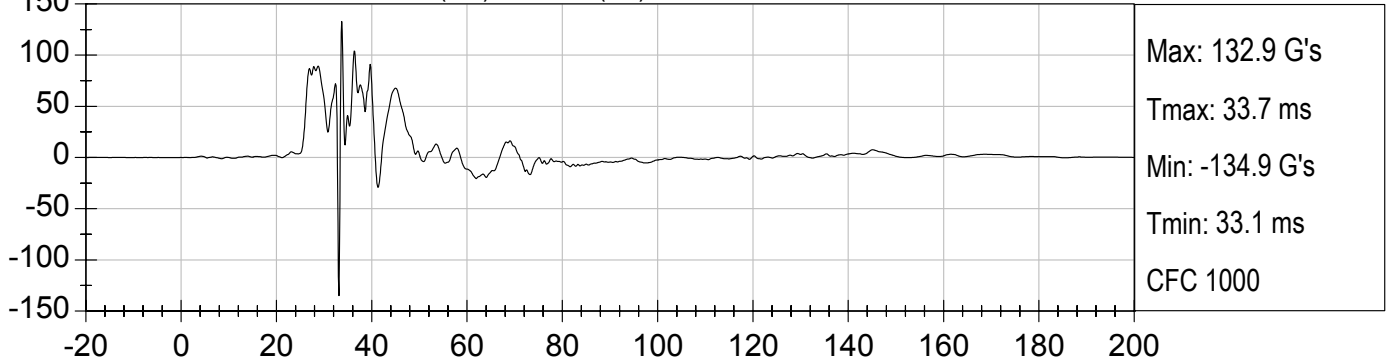




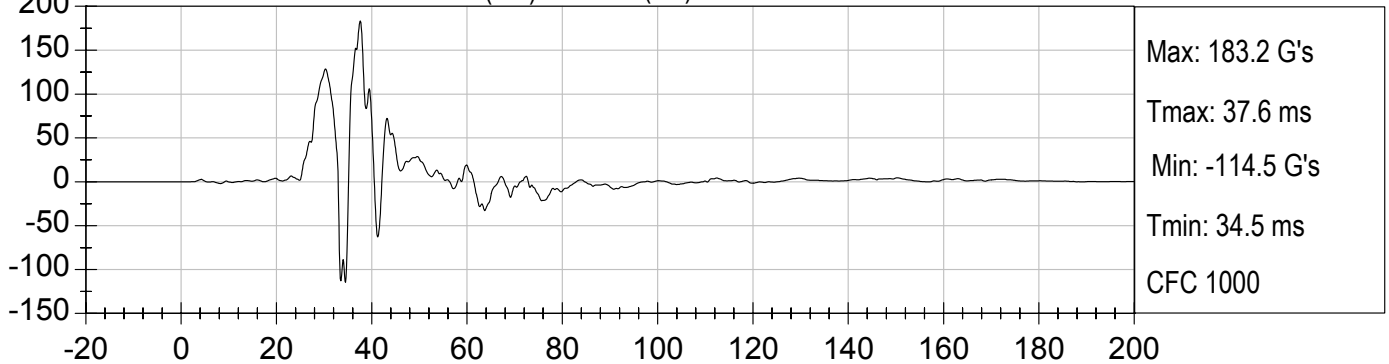
LR PASS UPPER THORAX RIB Y (G's) vs TIME (ms)



LR PASS MID THORAX RIB Y (G's) vs TIME (ms)

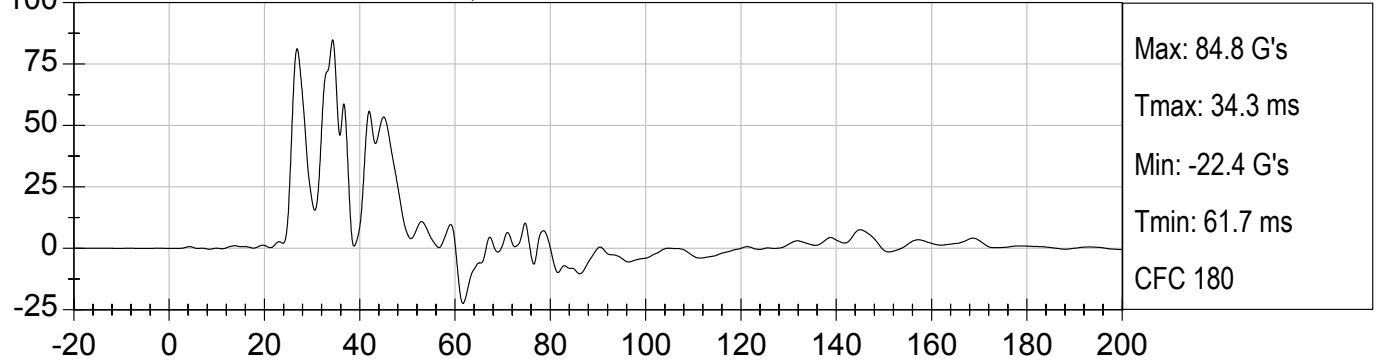


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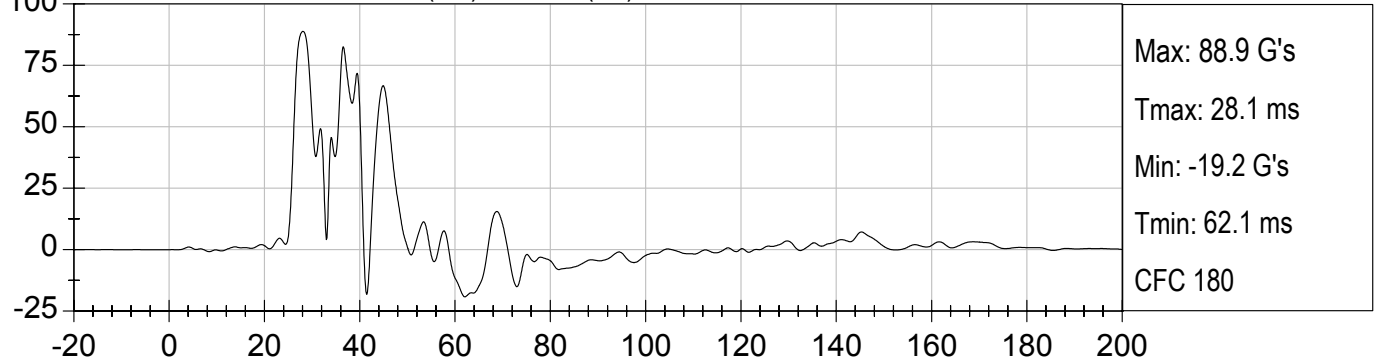




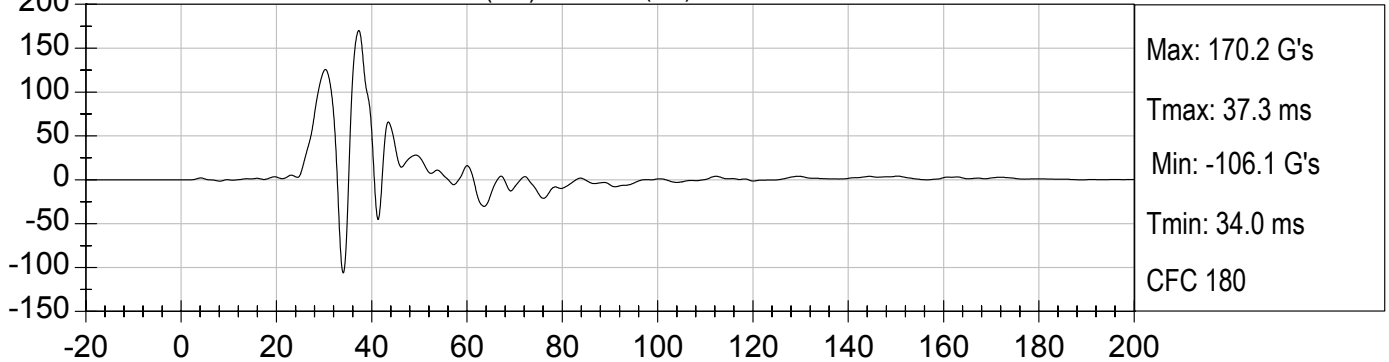
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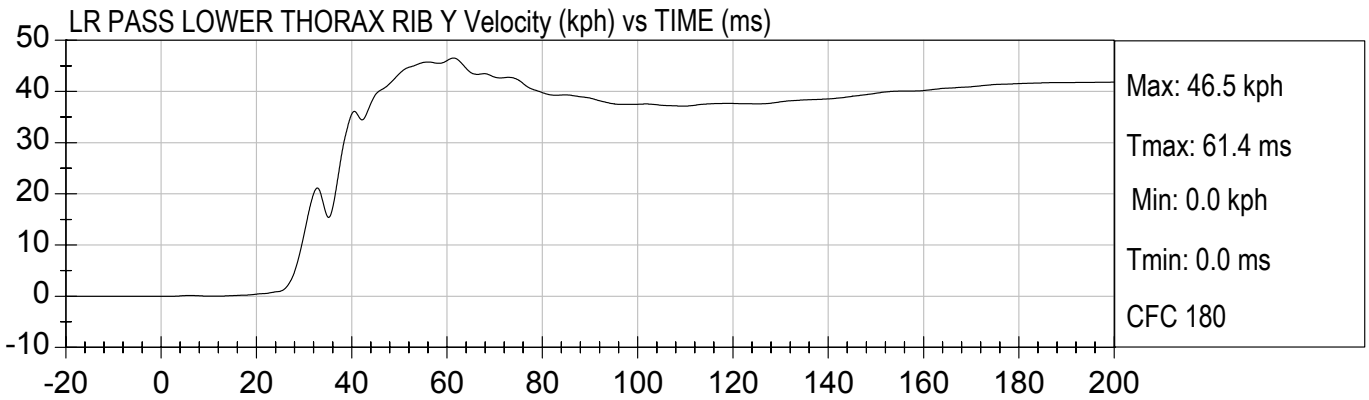
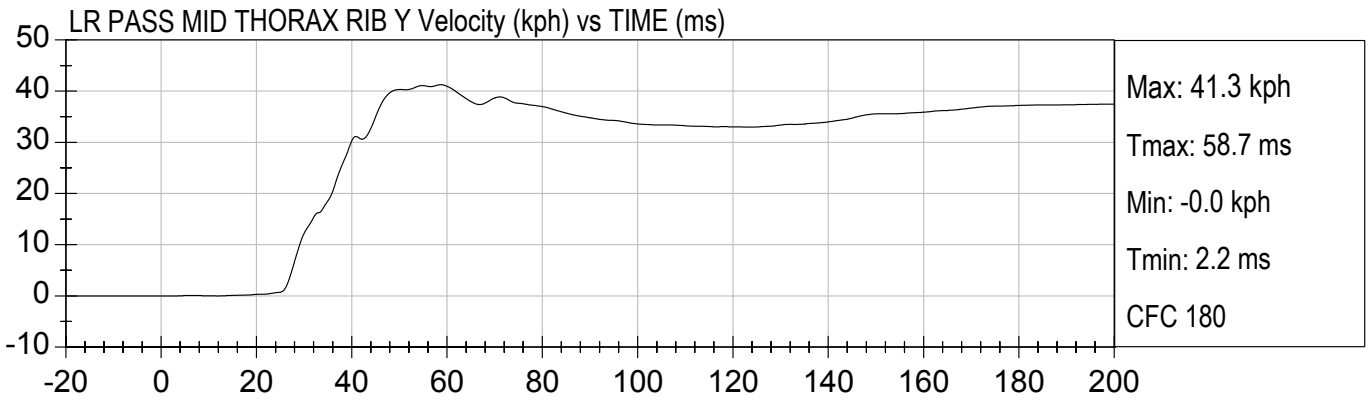
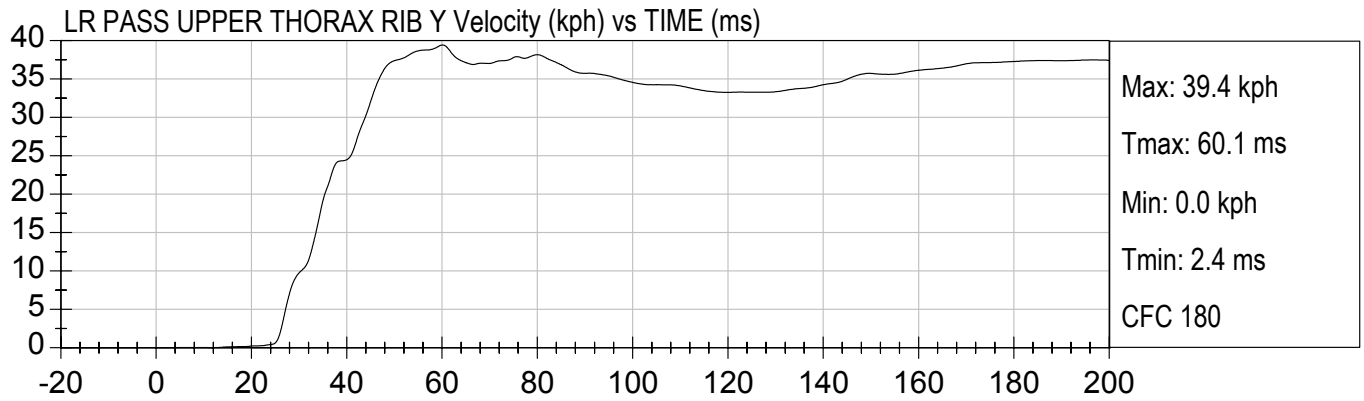


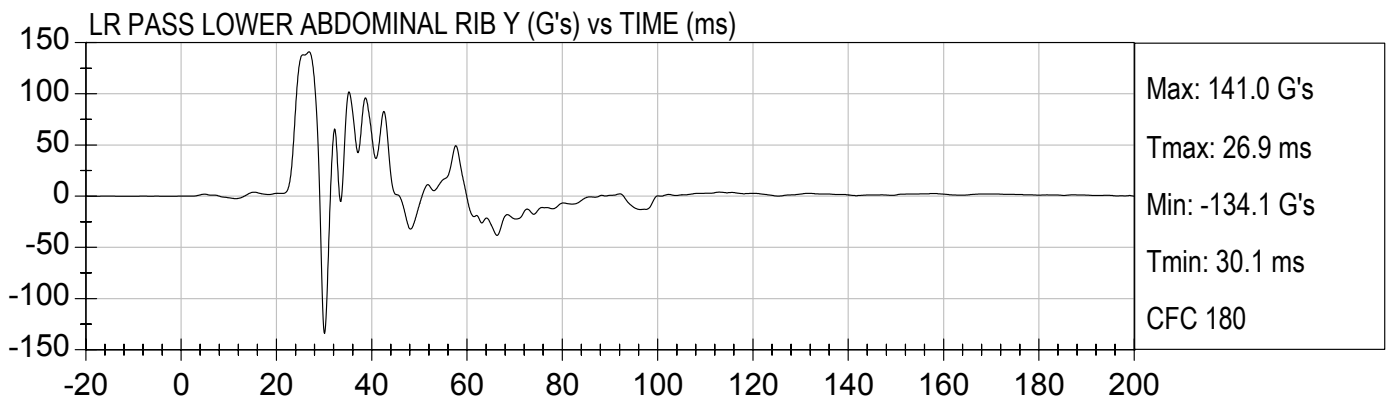
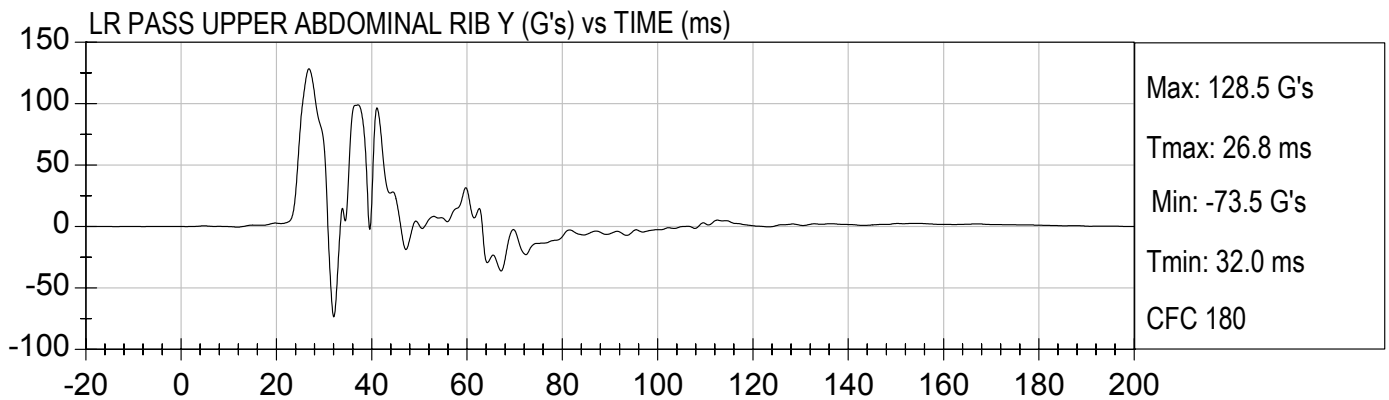
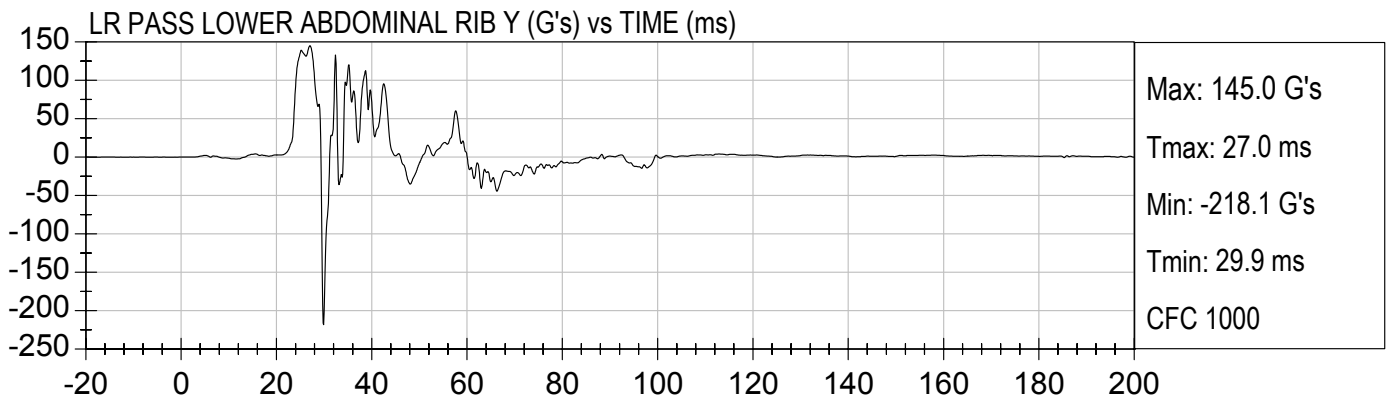
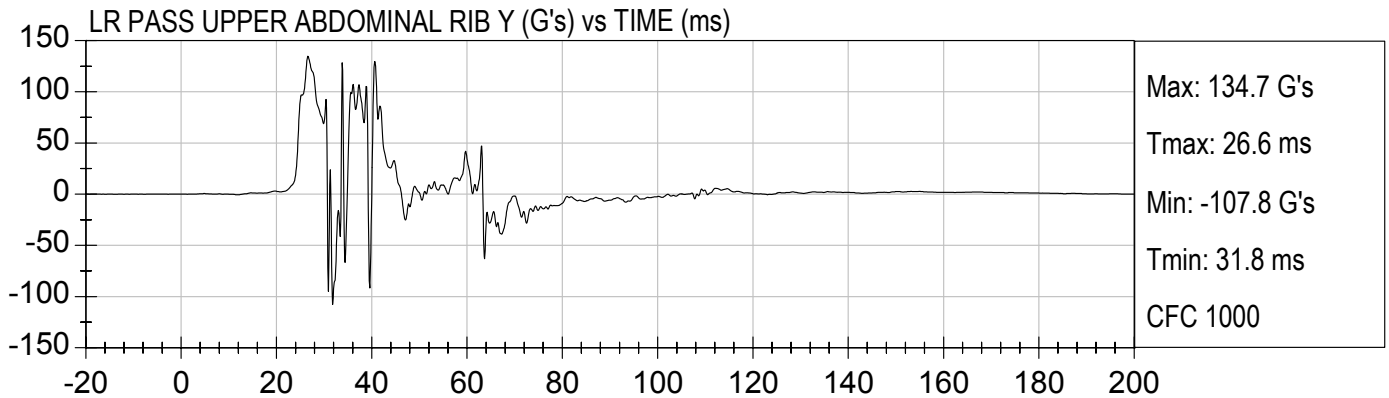
LR PASS MID THORAX RIB Y (G's) vs TIME (ms)



LR PASS LOWER THORAX RIB Y (G's) vs TIME (ms)

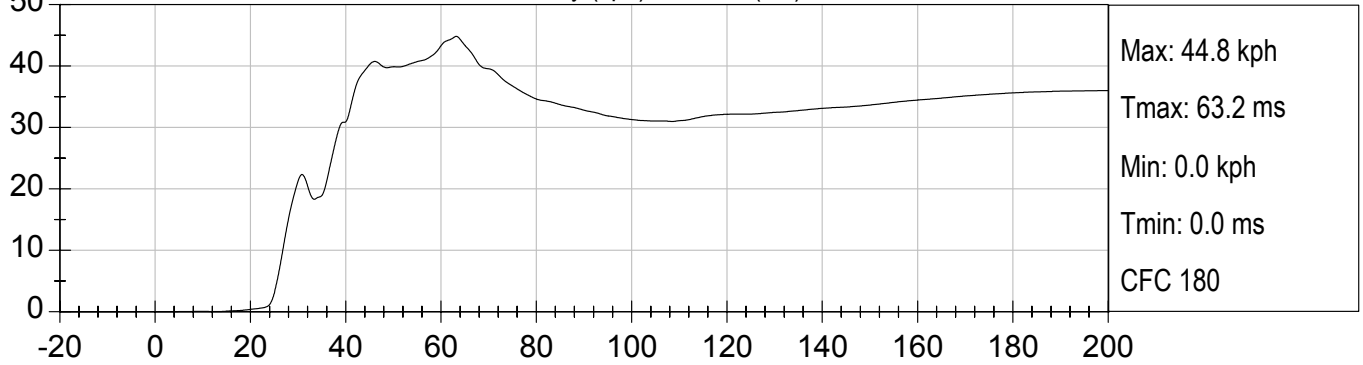




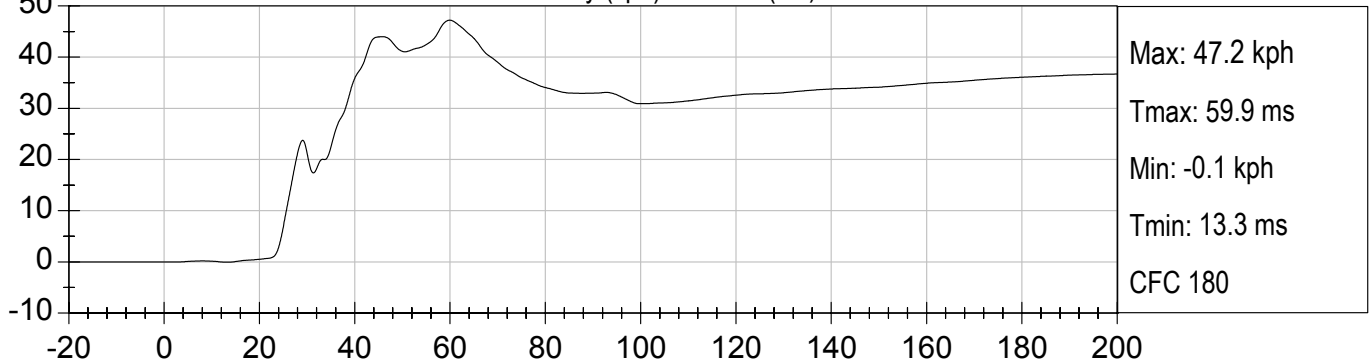


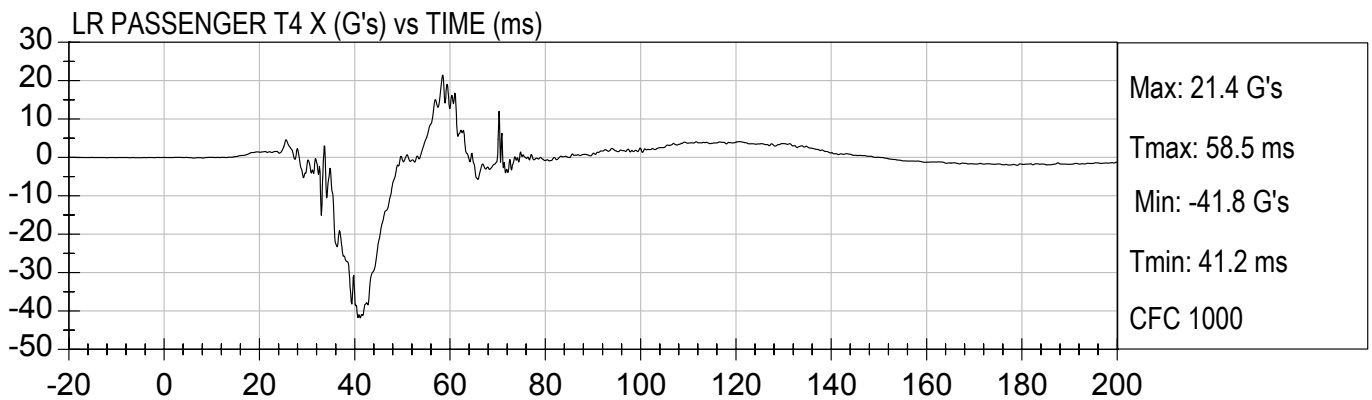
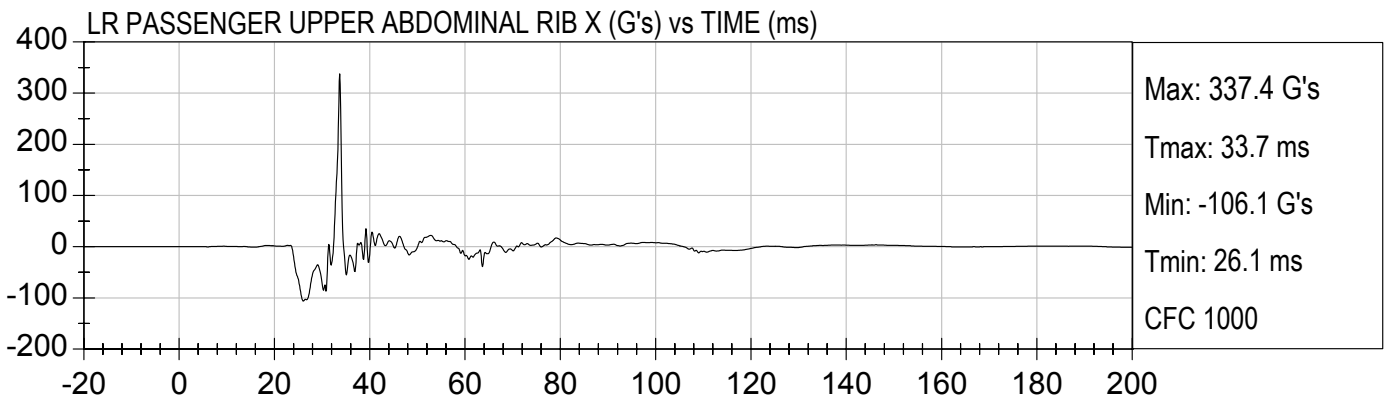
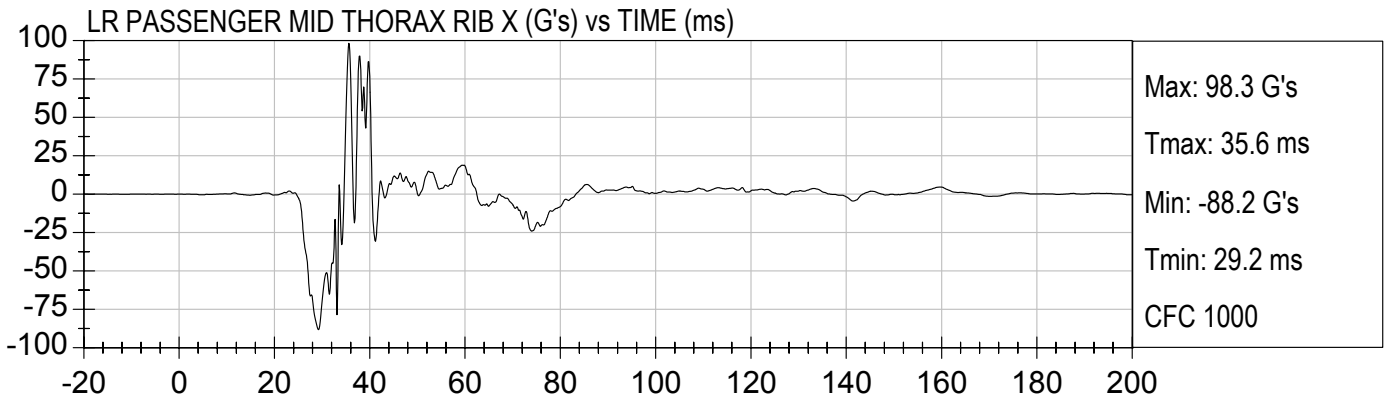


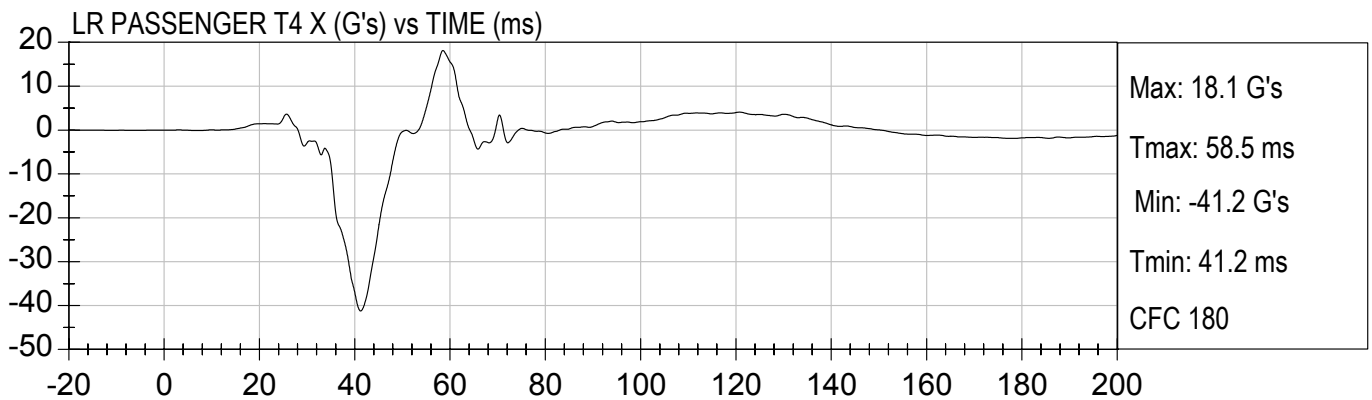
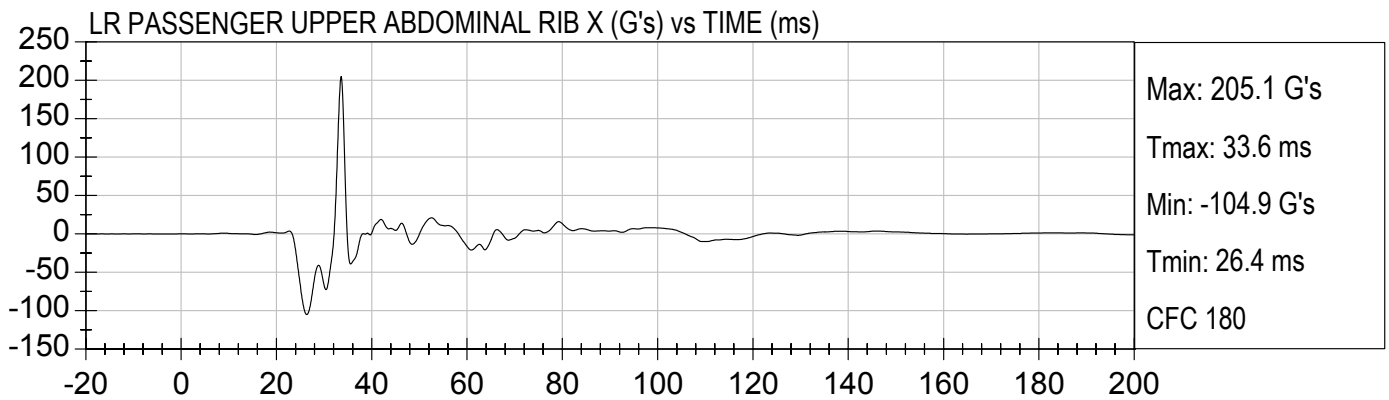
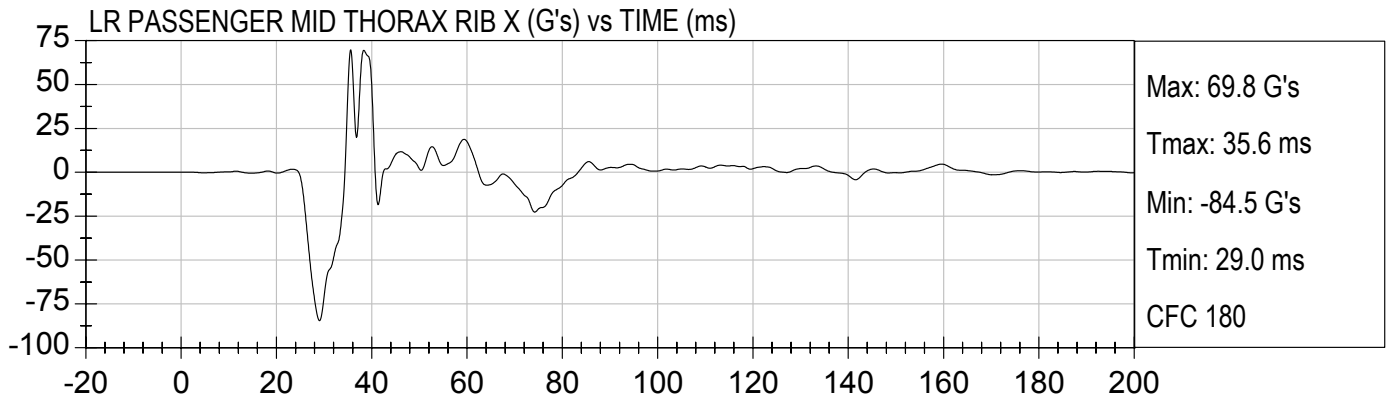
LR PASS UPPER ABDOMINAL RIB Y Velocity (kph) vs TIME (ms)

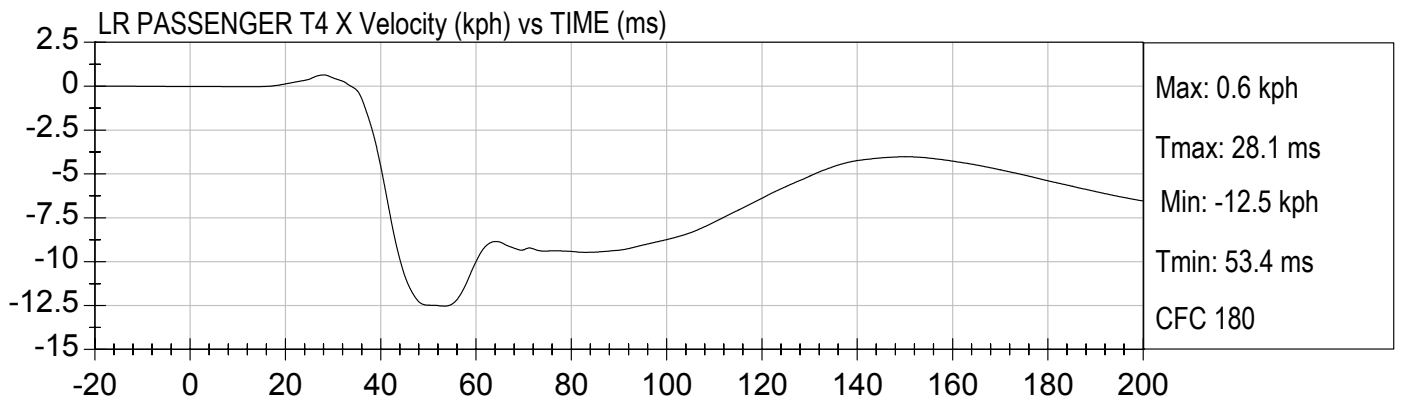
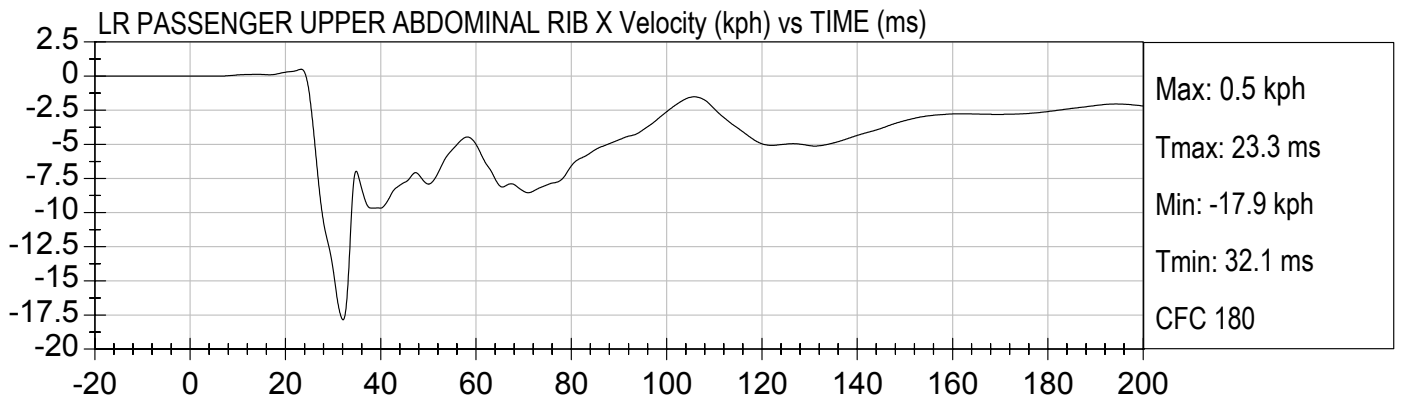
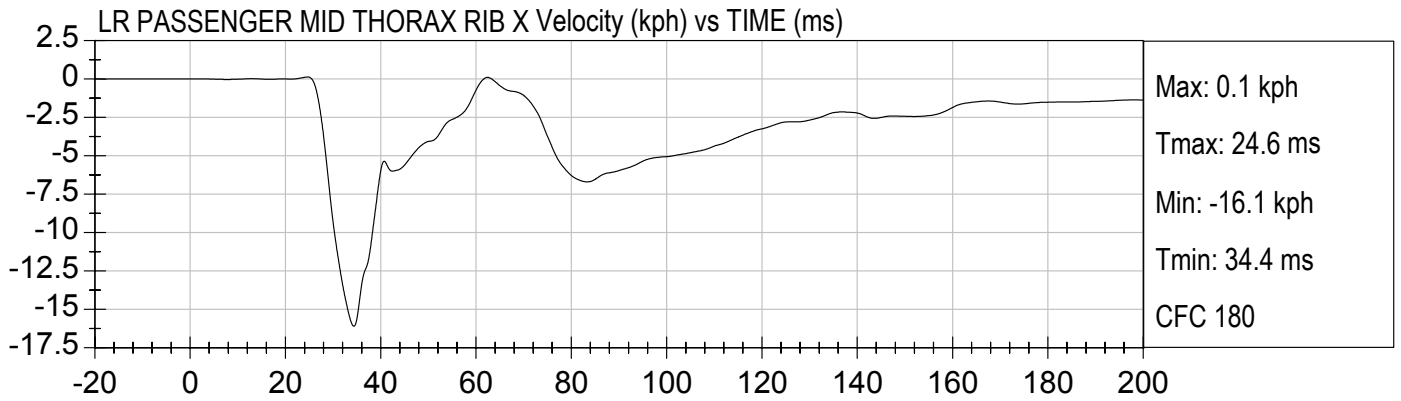


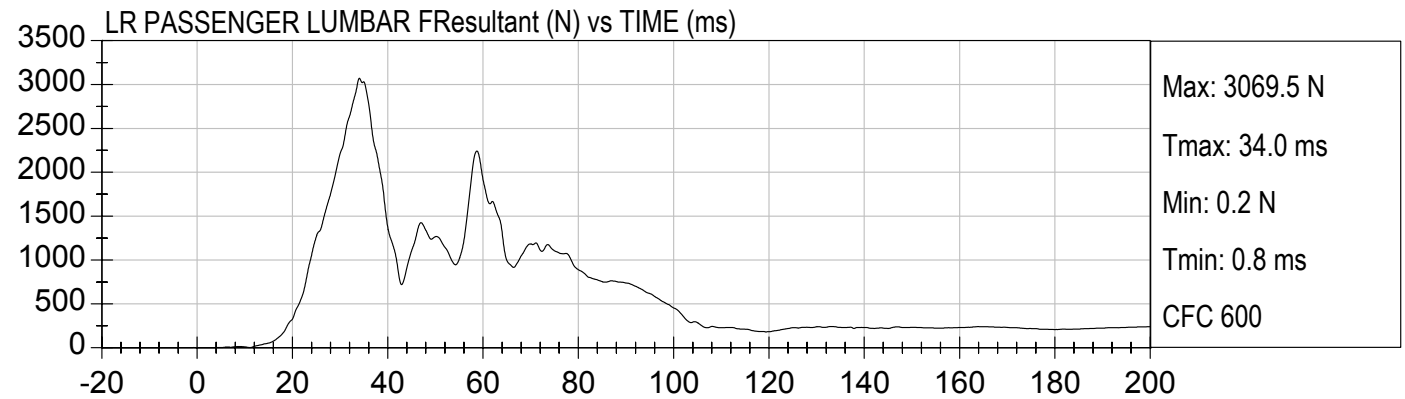
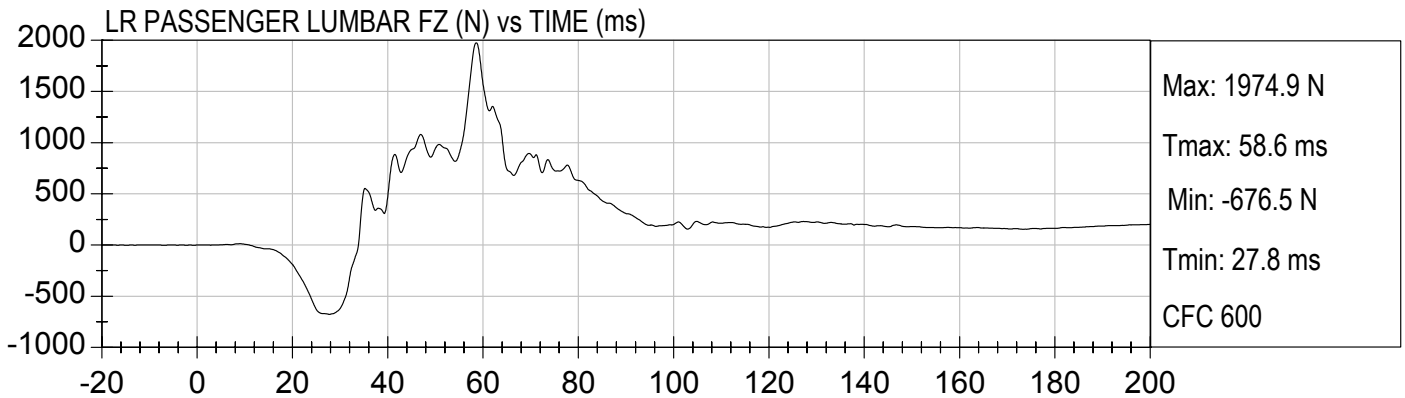
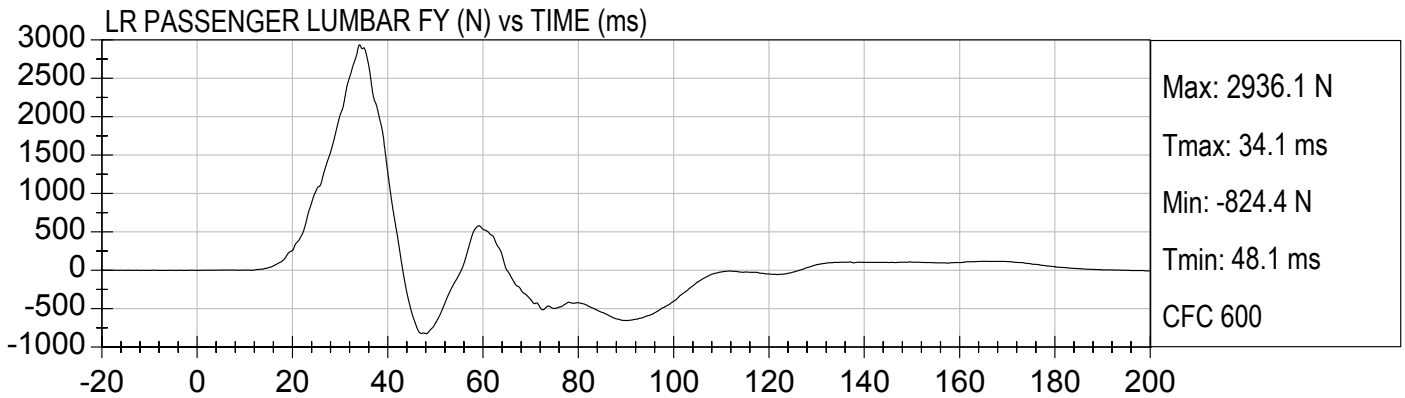
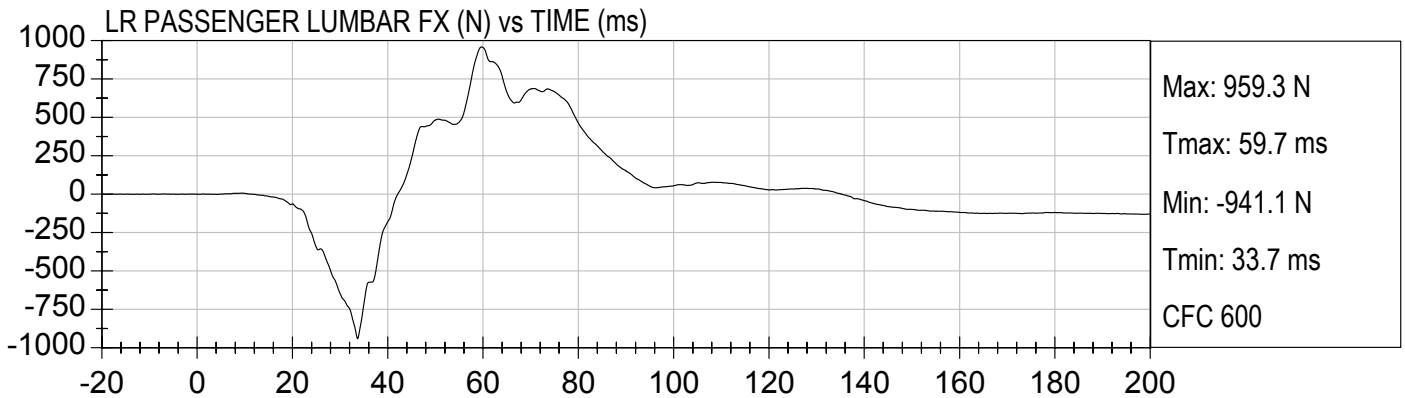
LR PASS LOWER ABDOMINAL RIB Y Velocity (kph) vs TIME (ms)

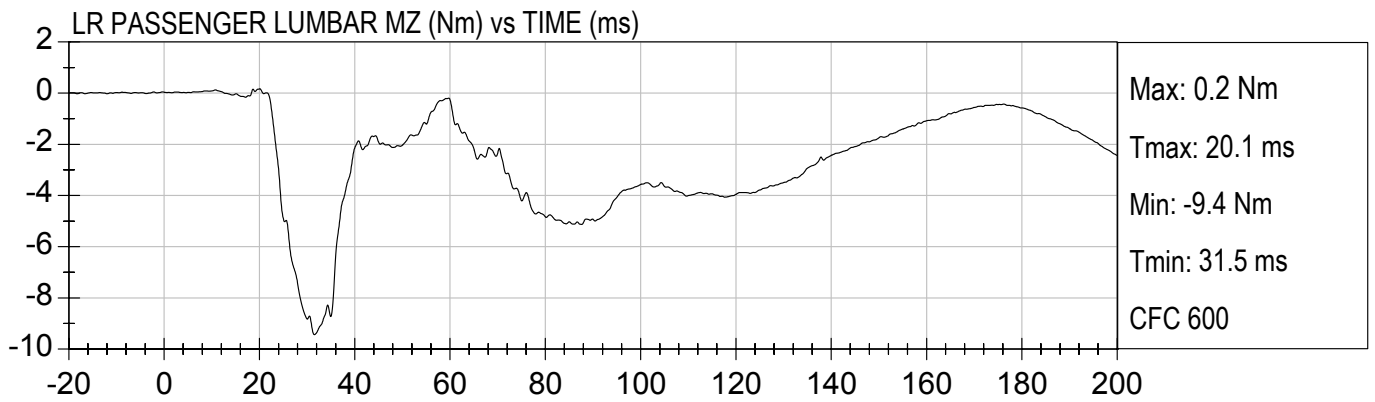
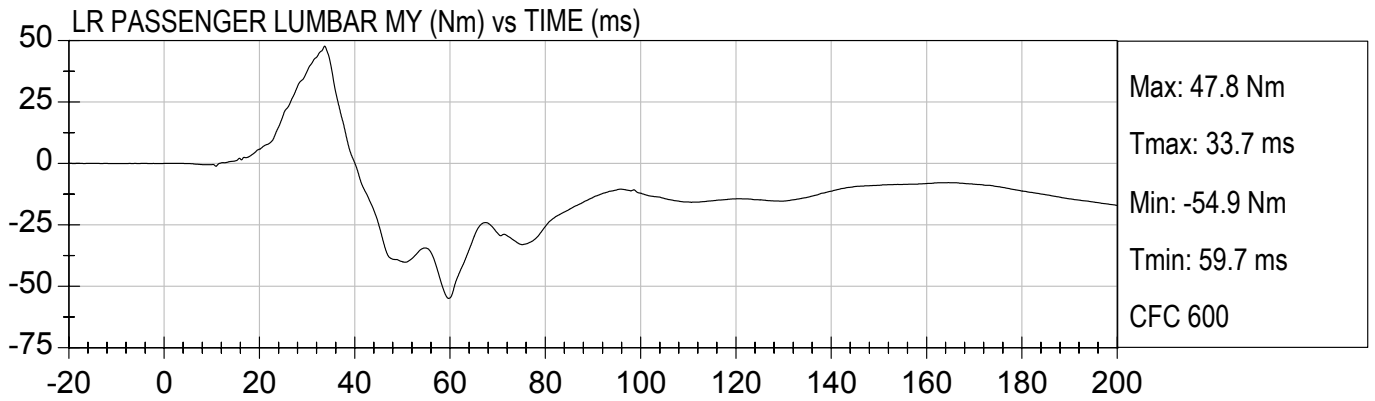


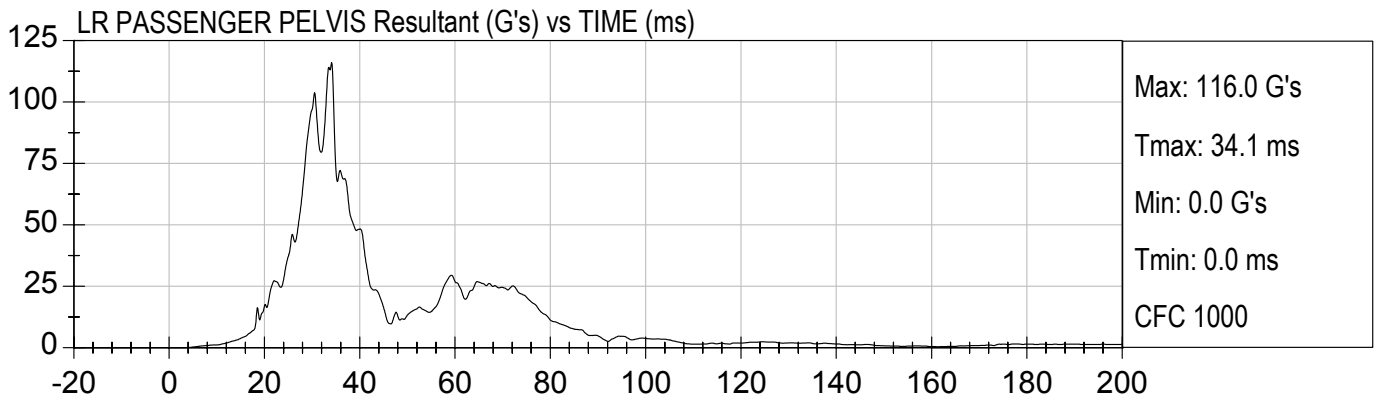
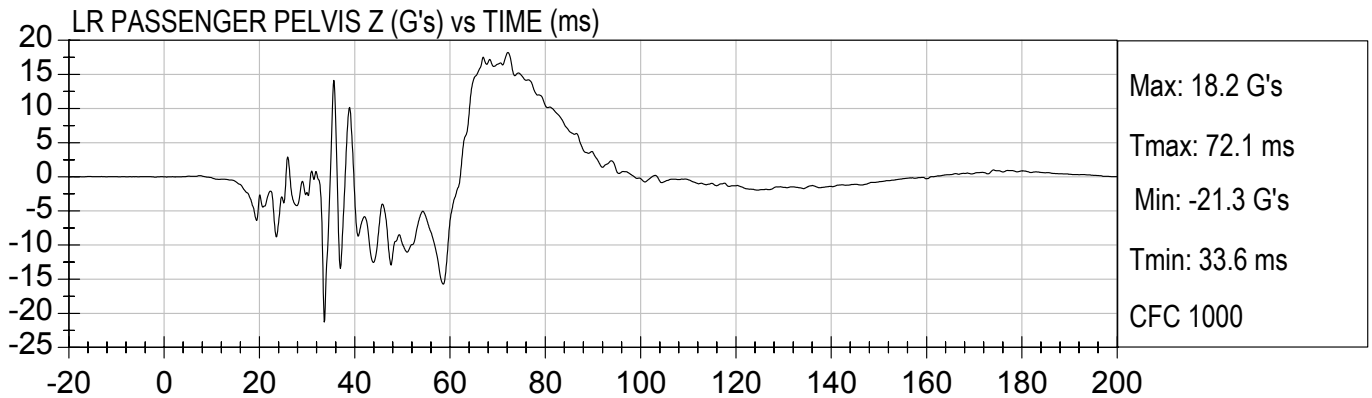
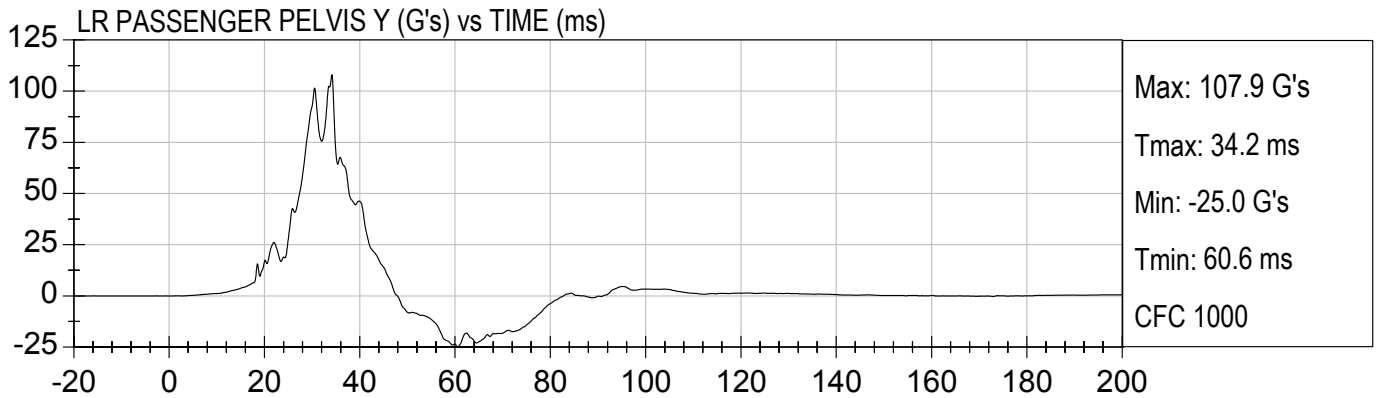
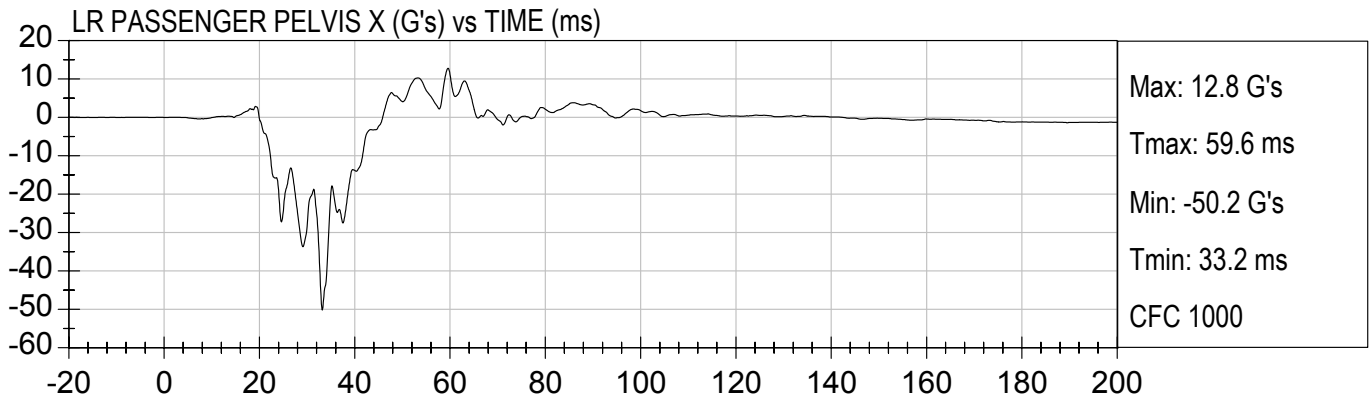


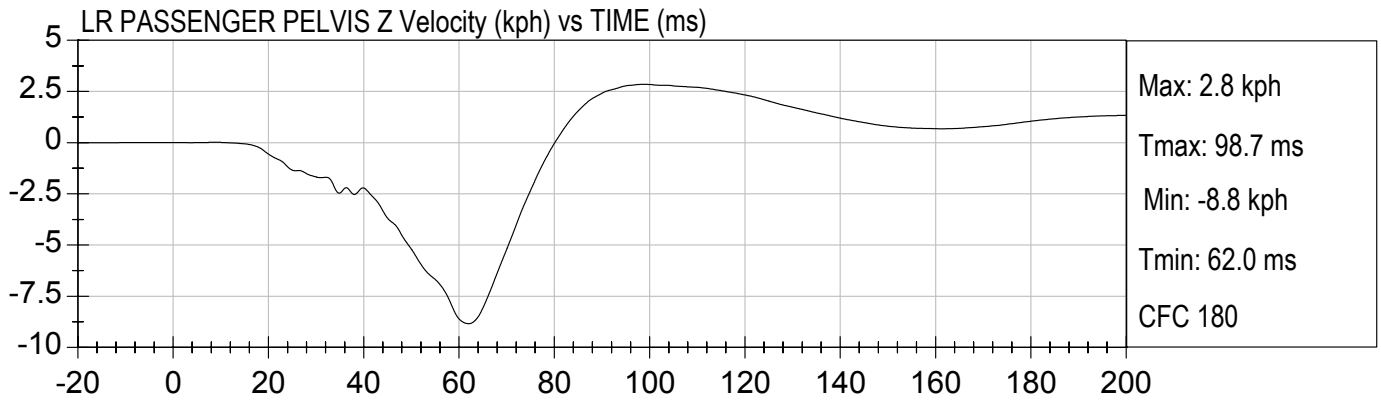
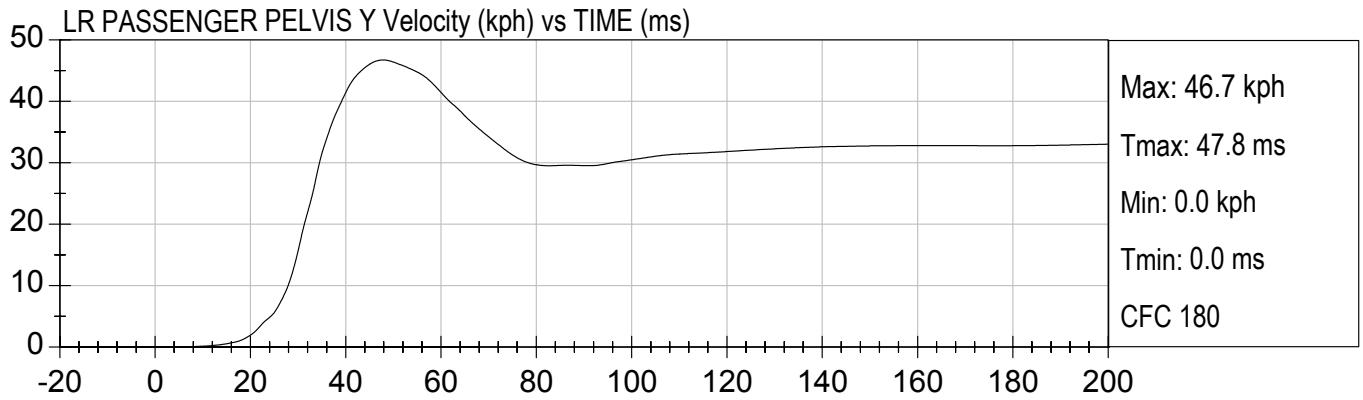
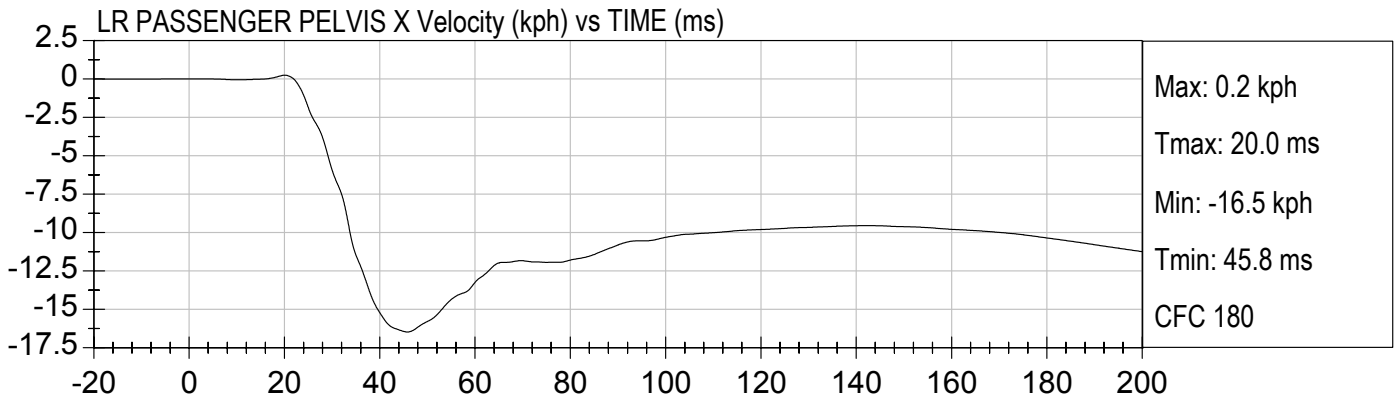


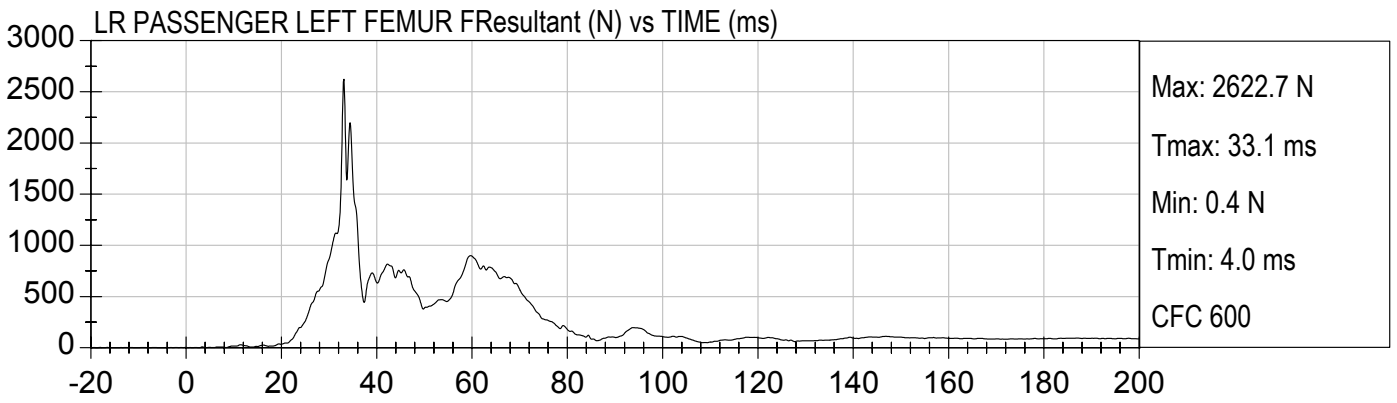
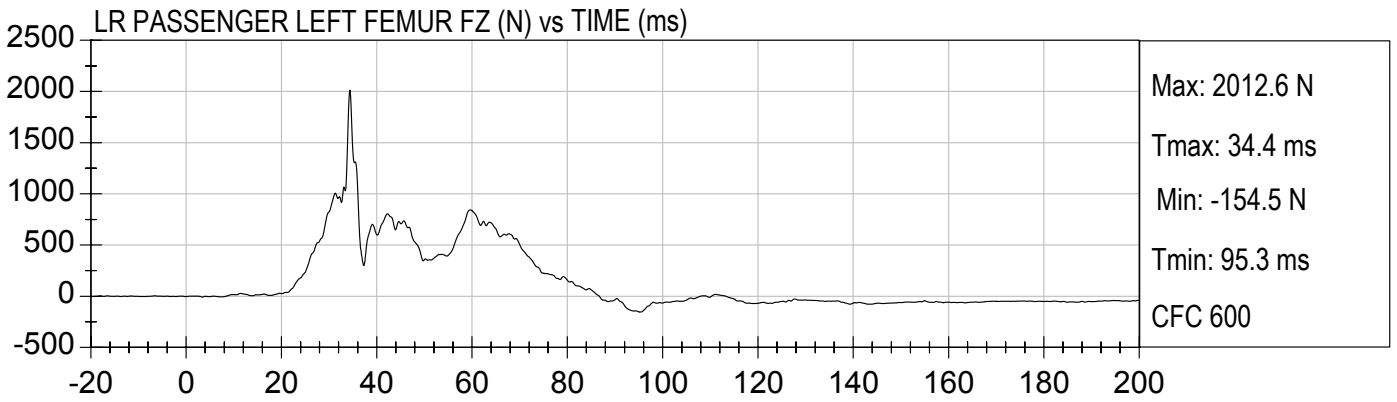
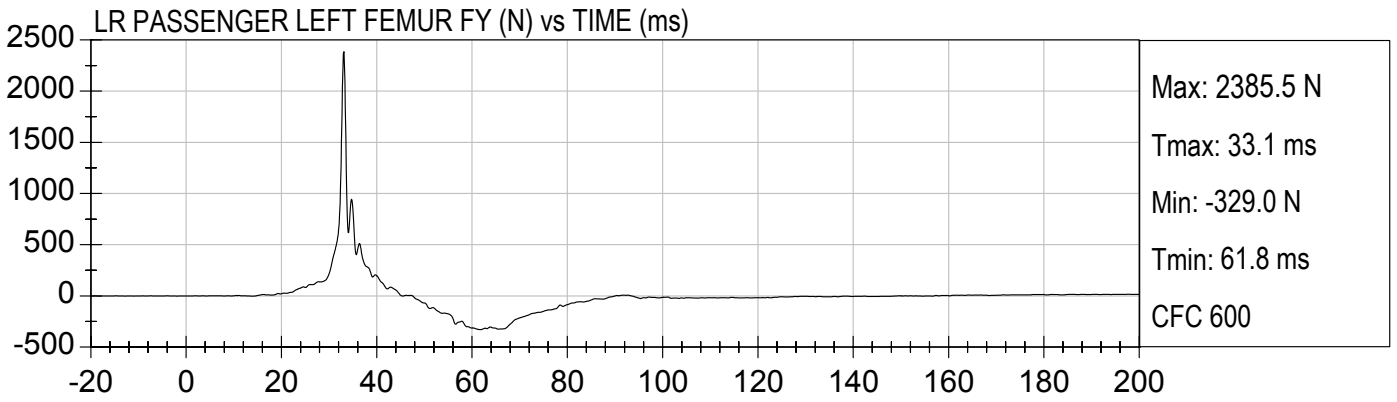
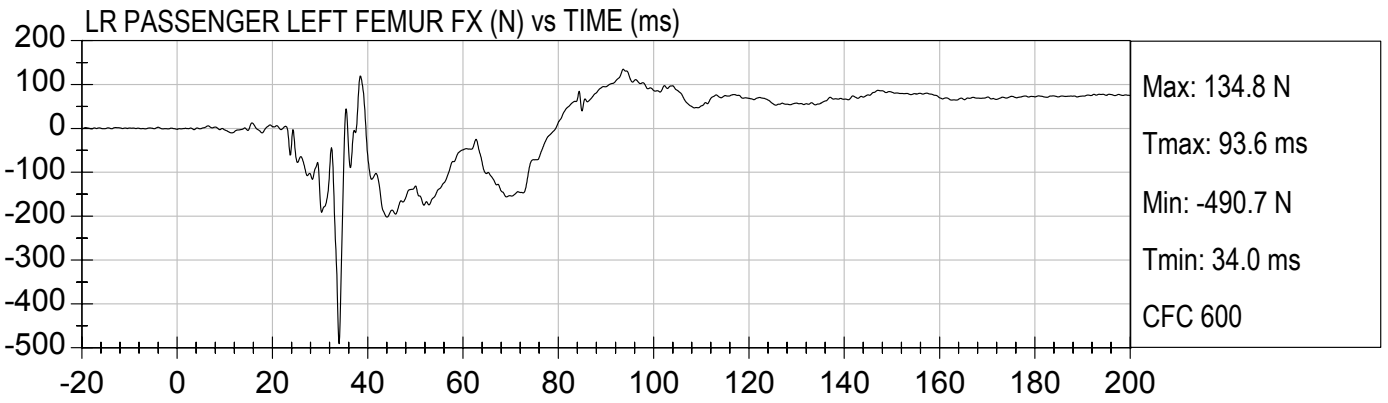


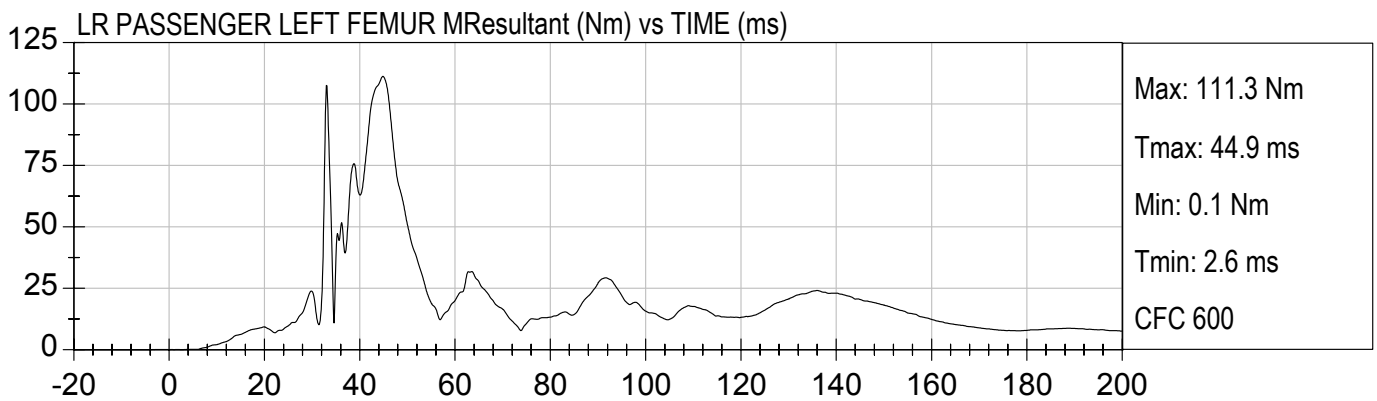
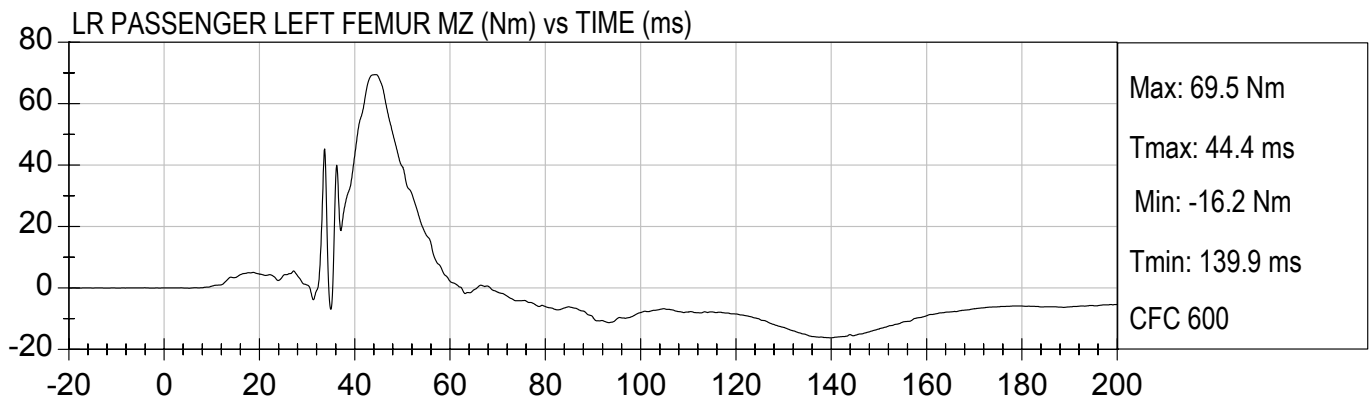
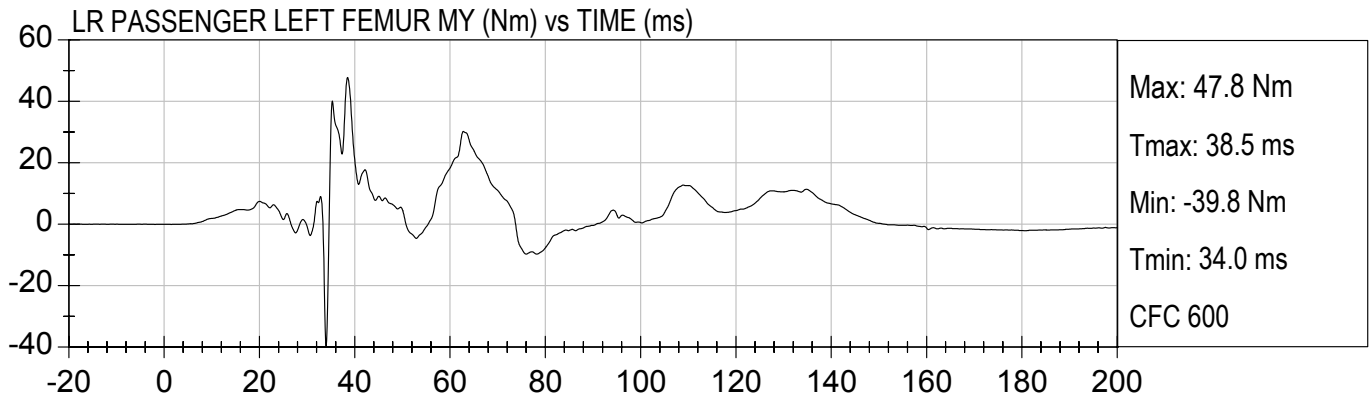
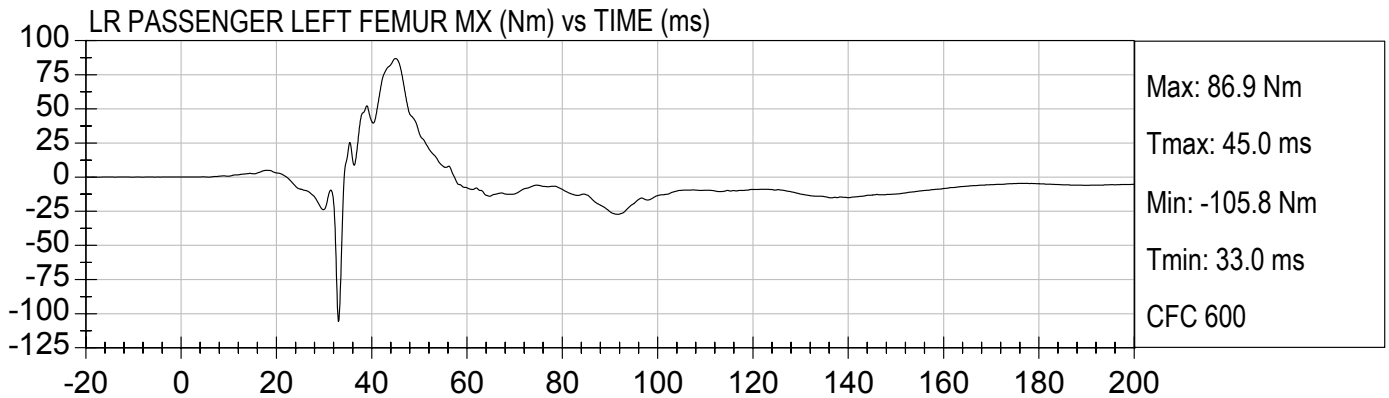


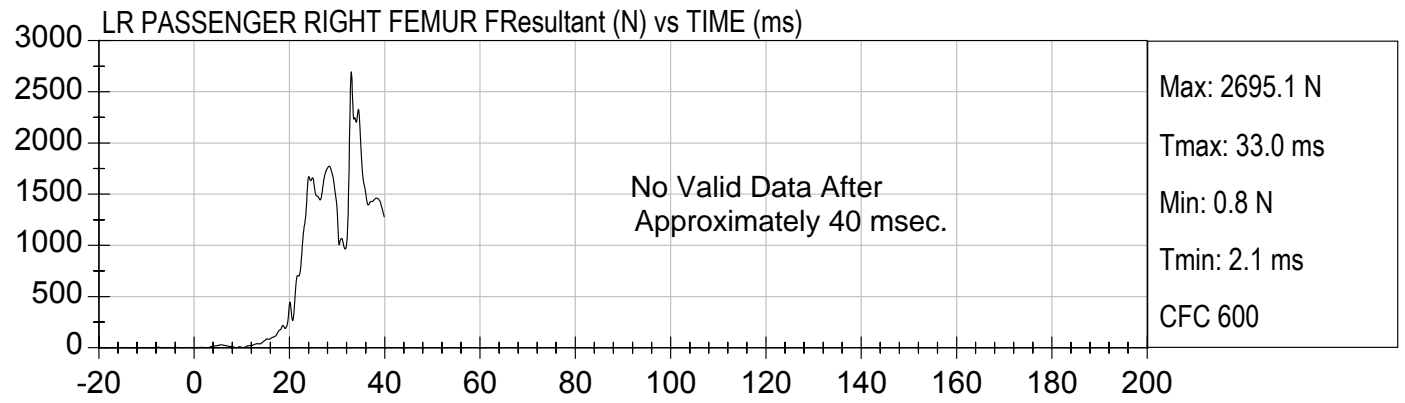
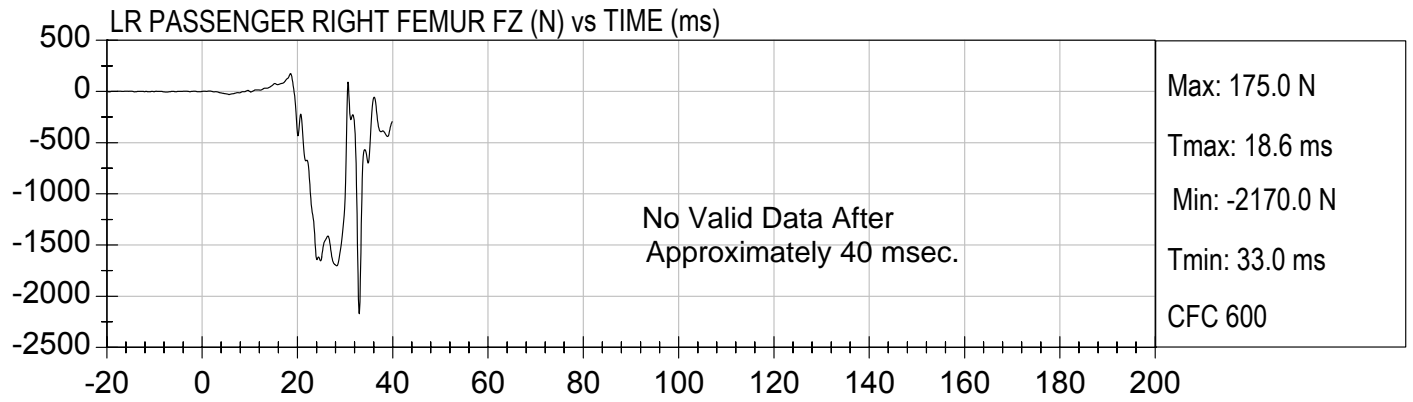
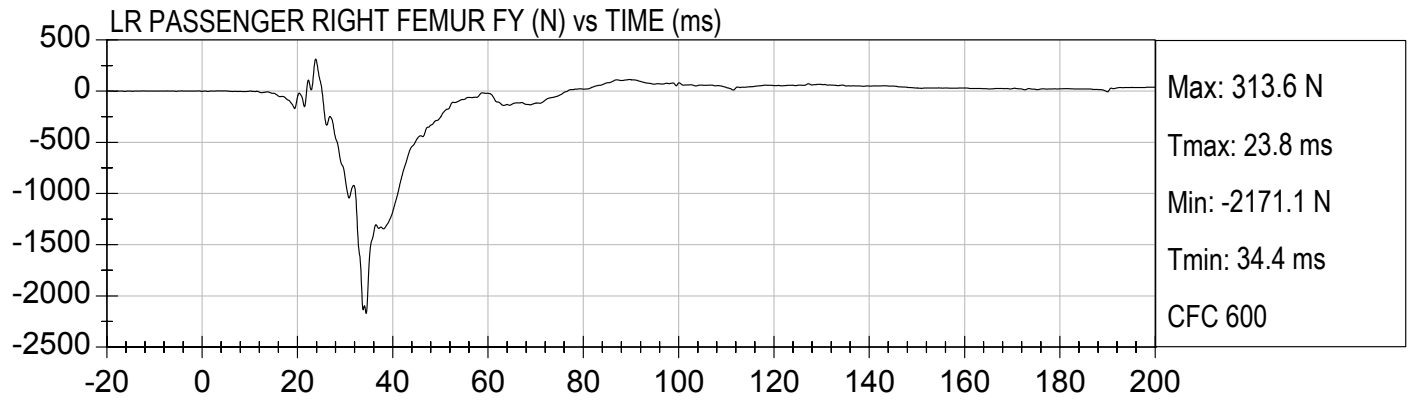
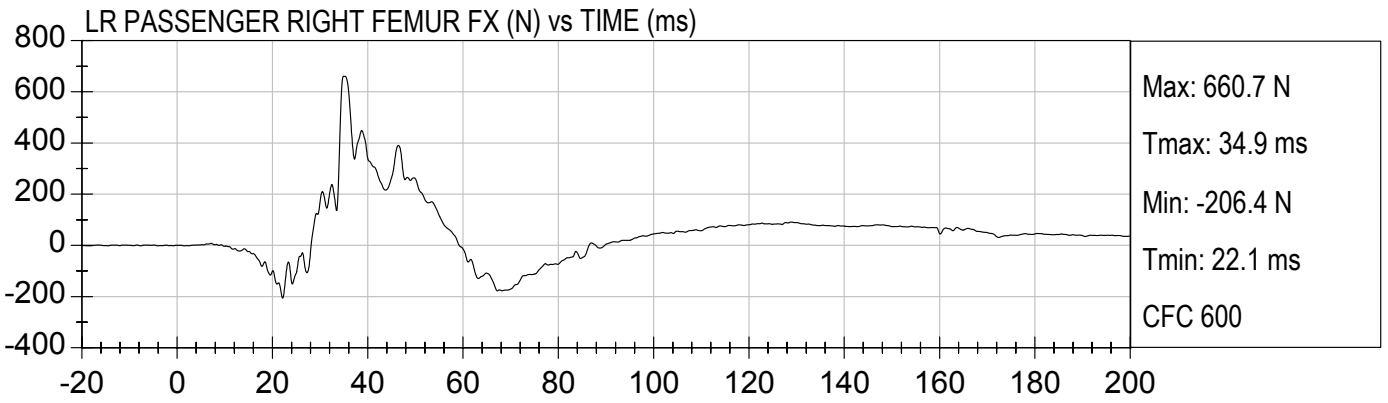


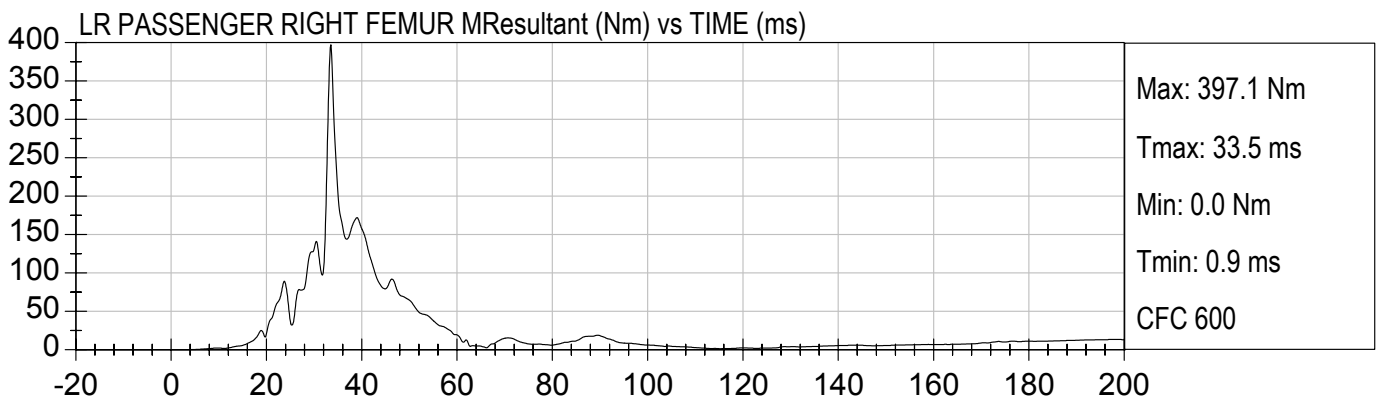
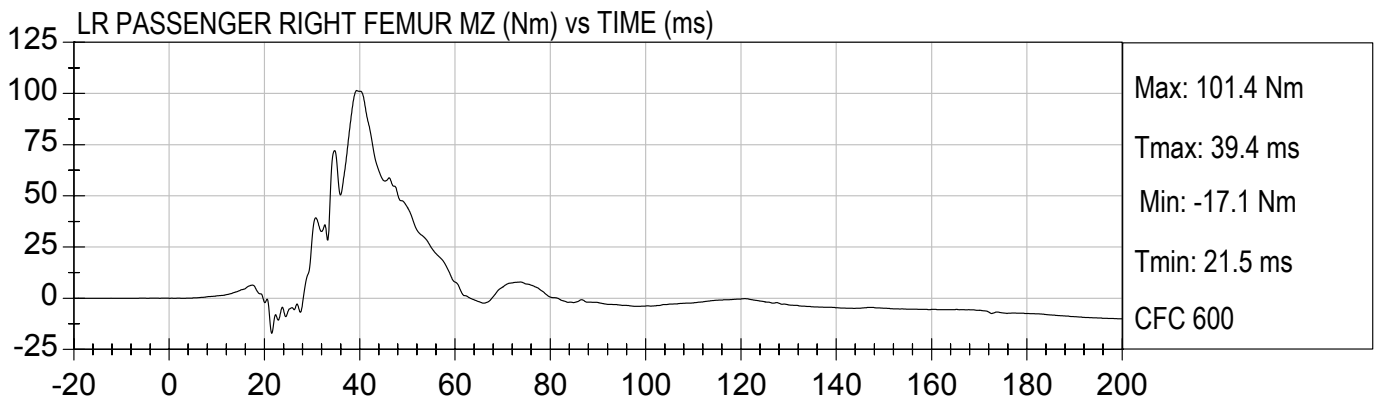
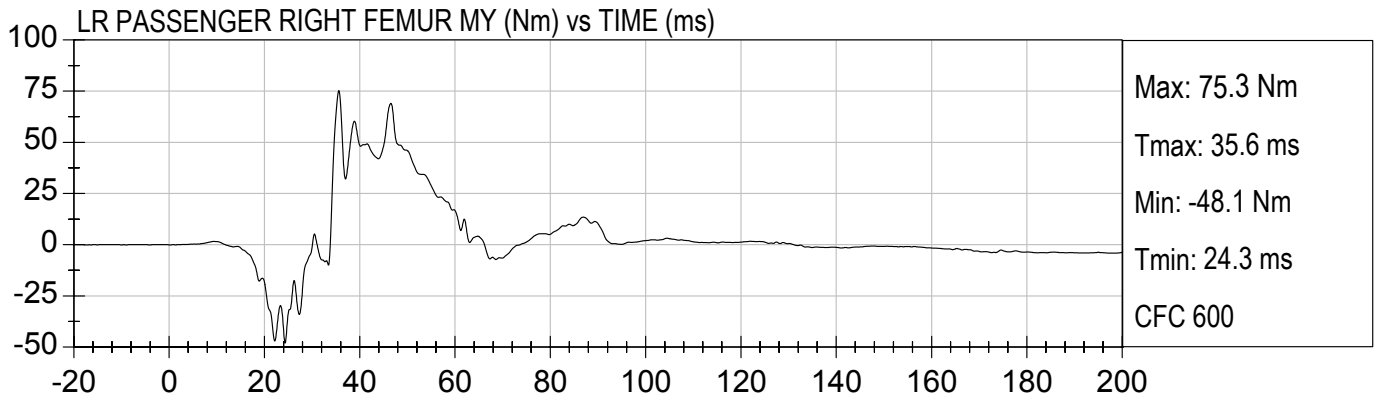
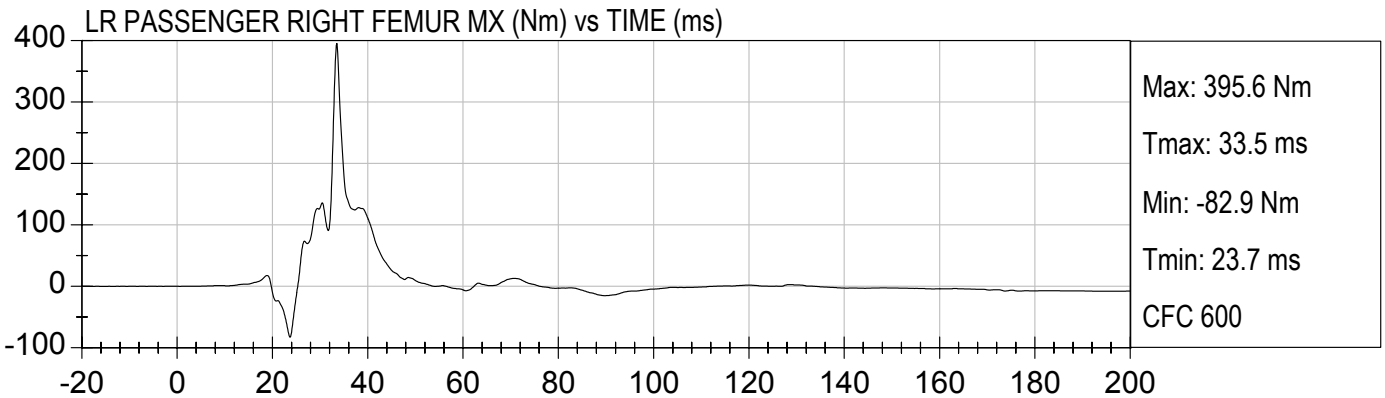


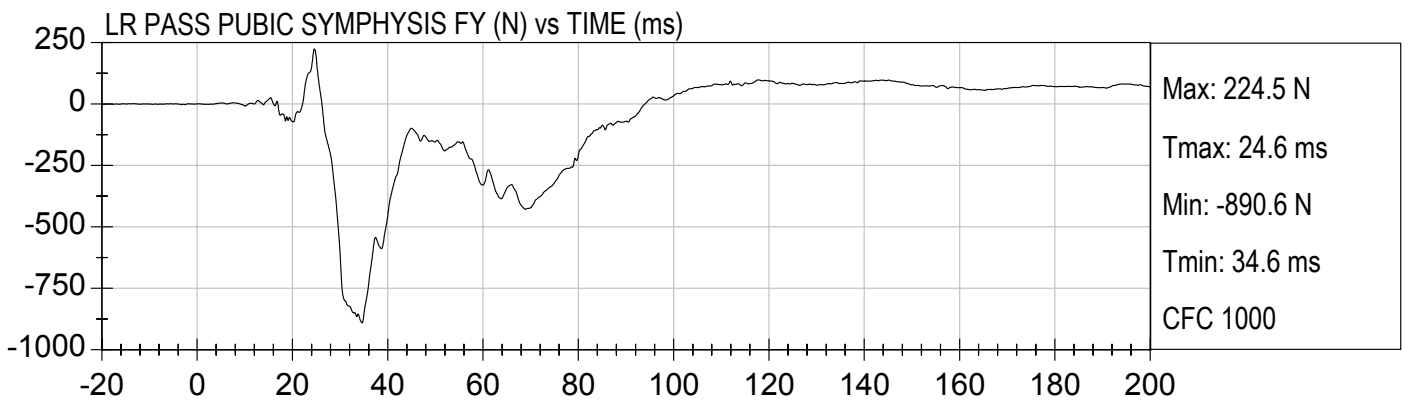
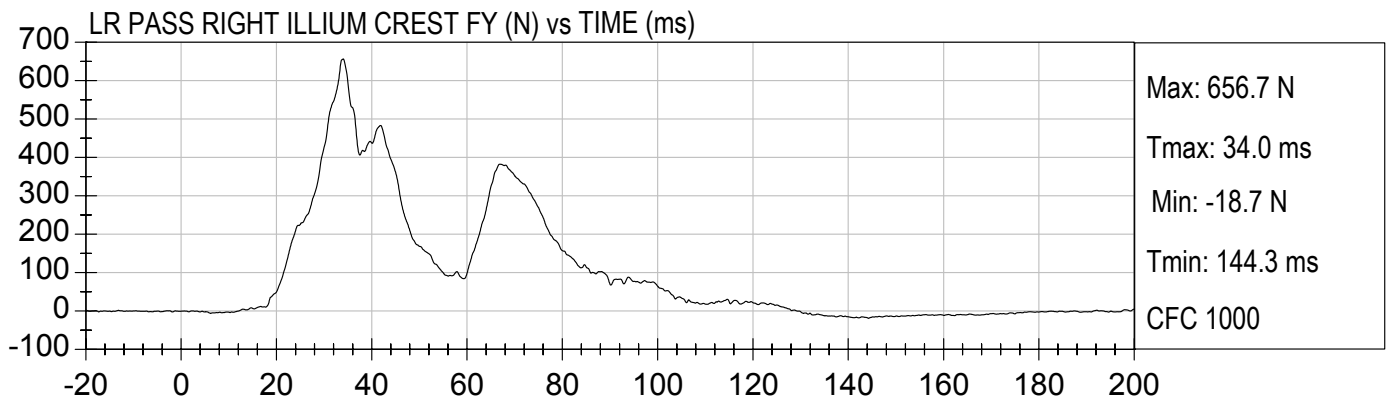
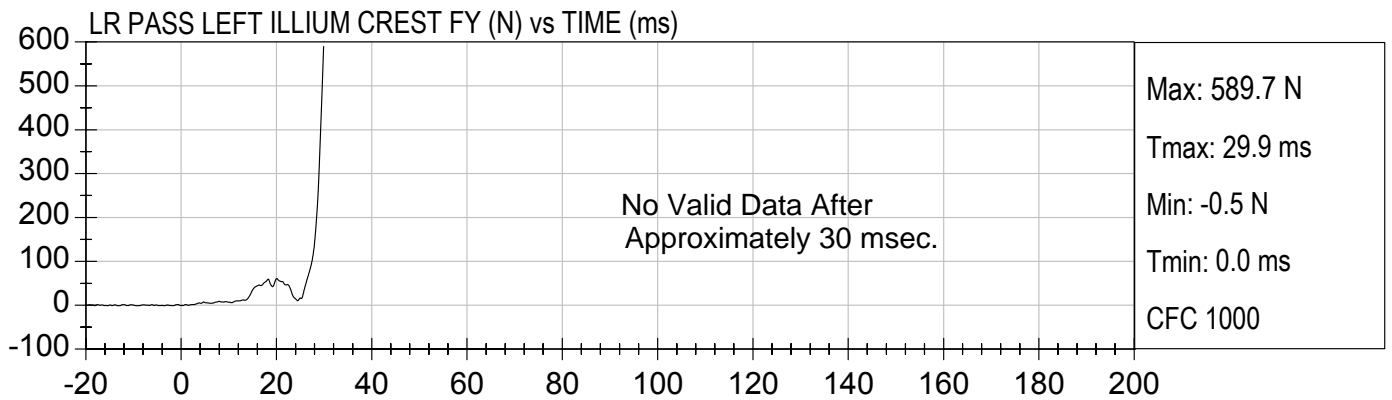
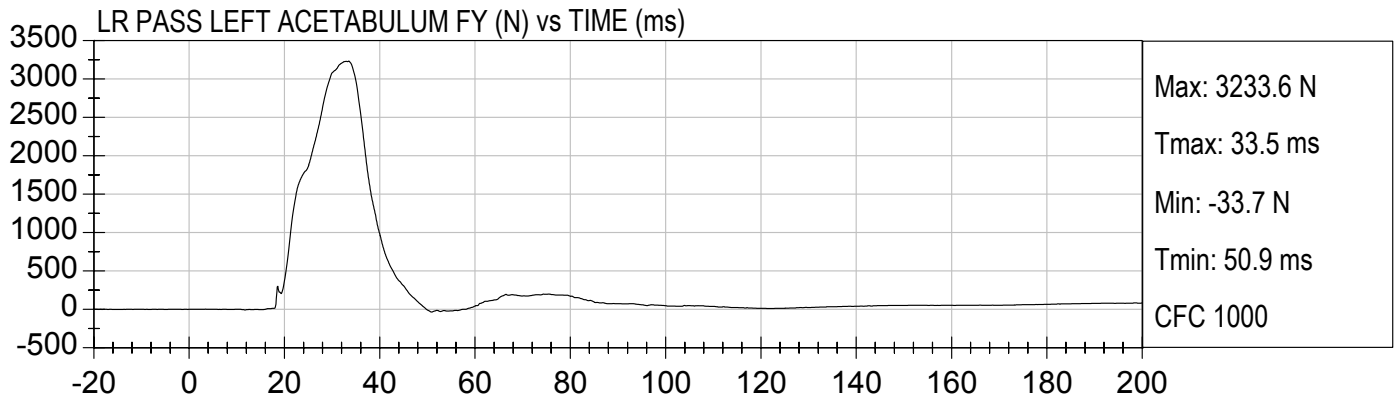


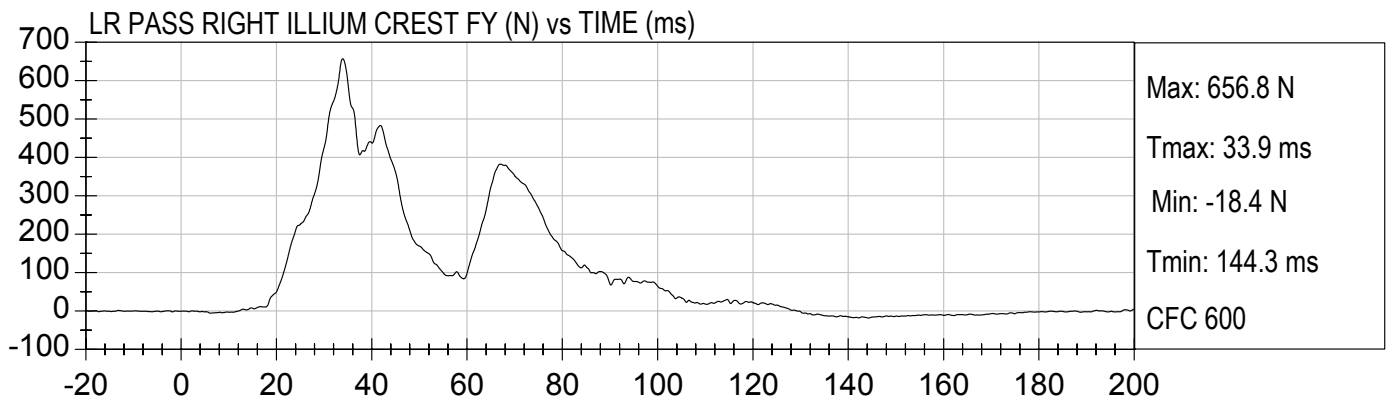
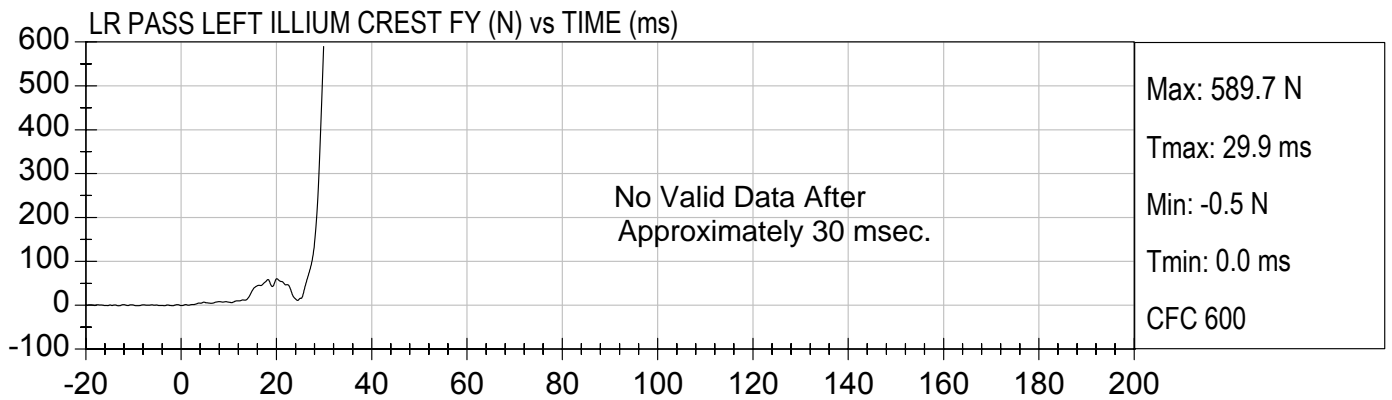
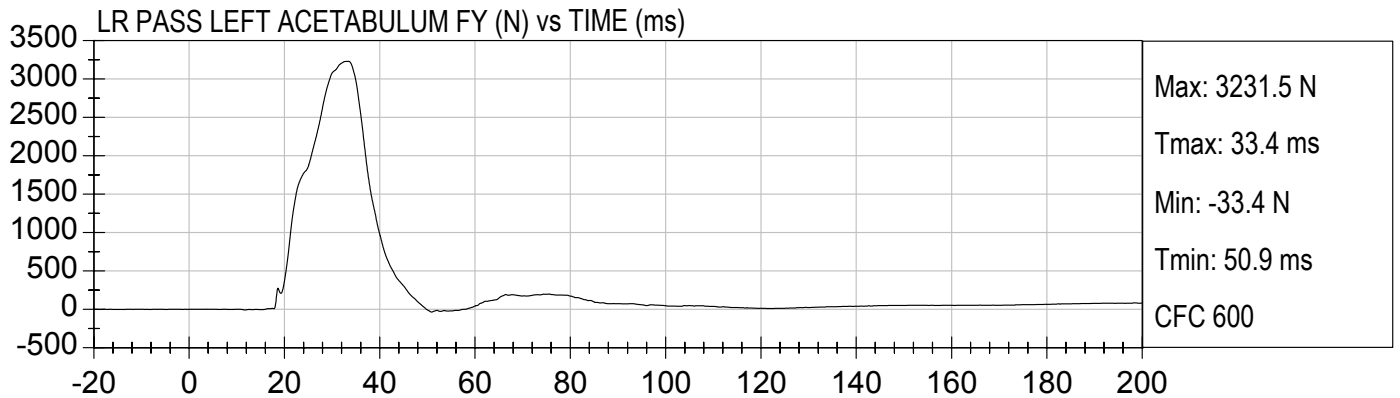


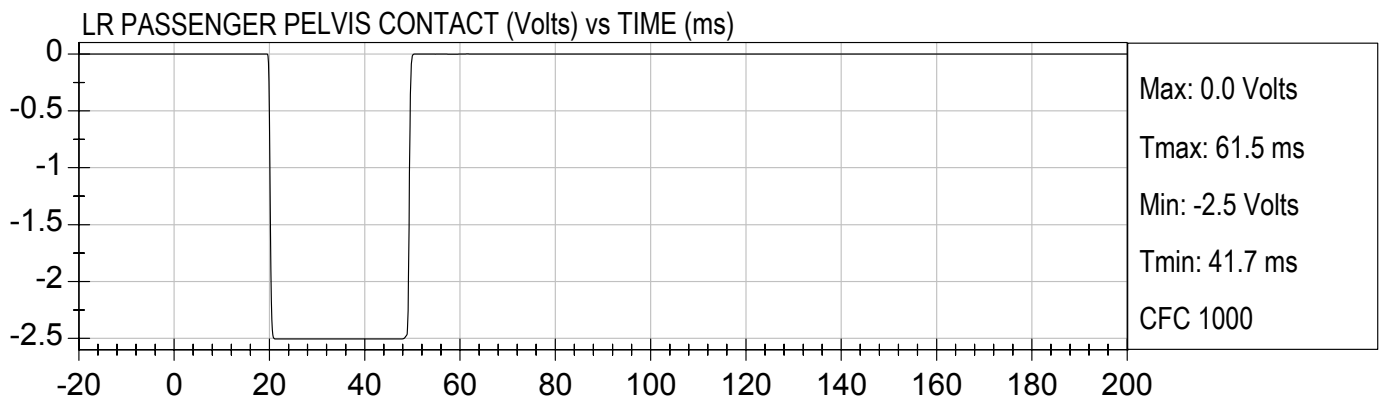
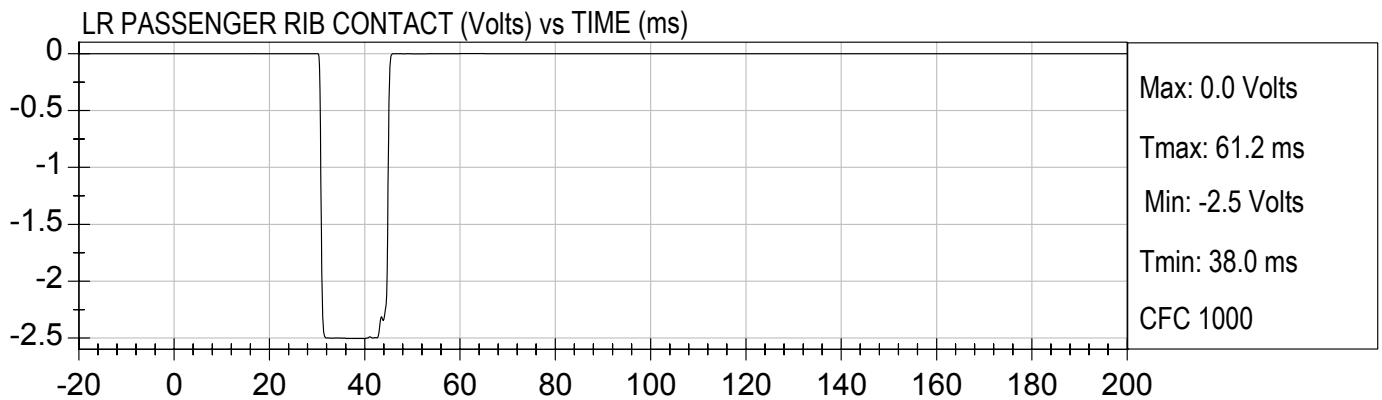
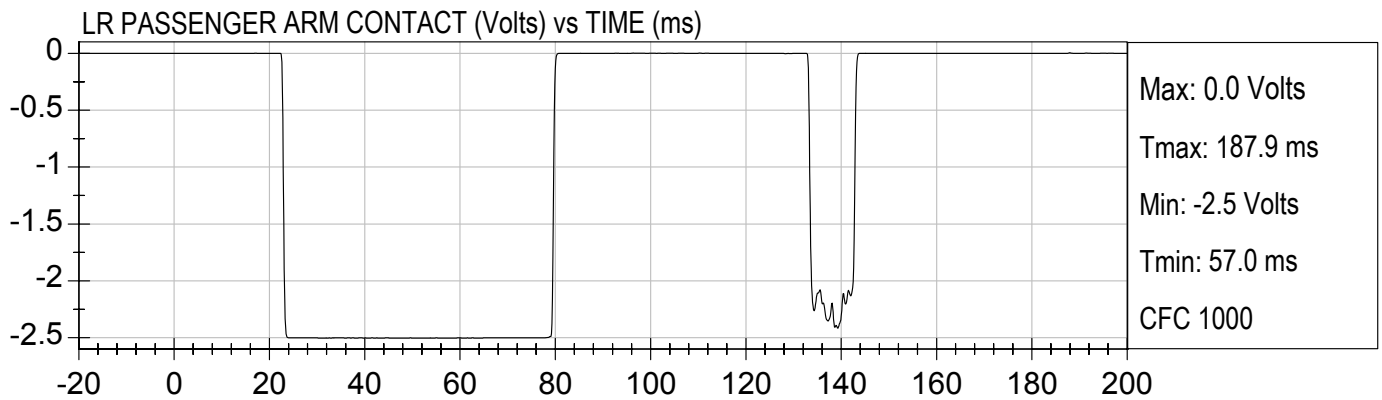
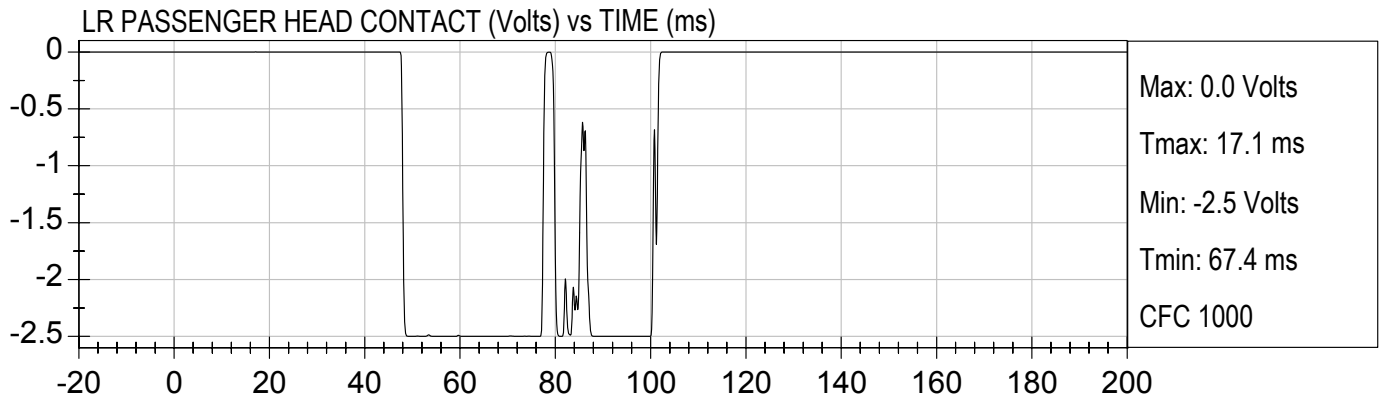


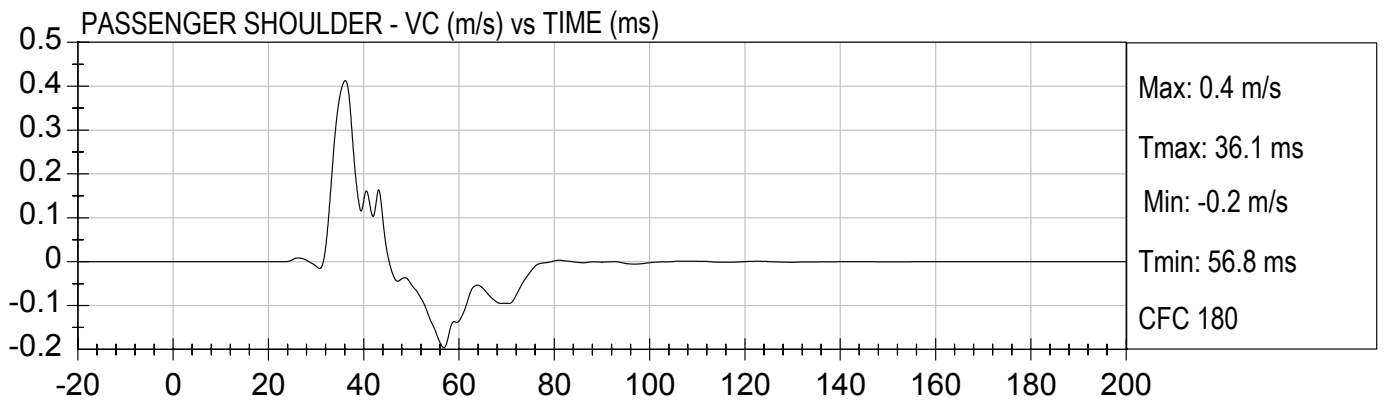
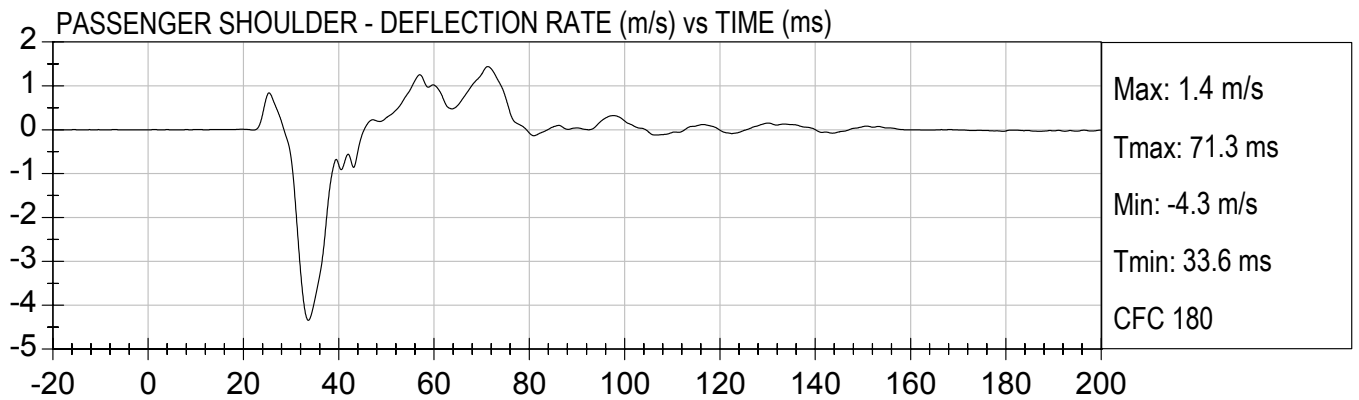
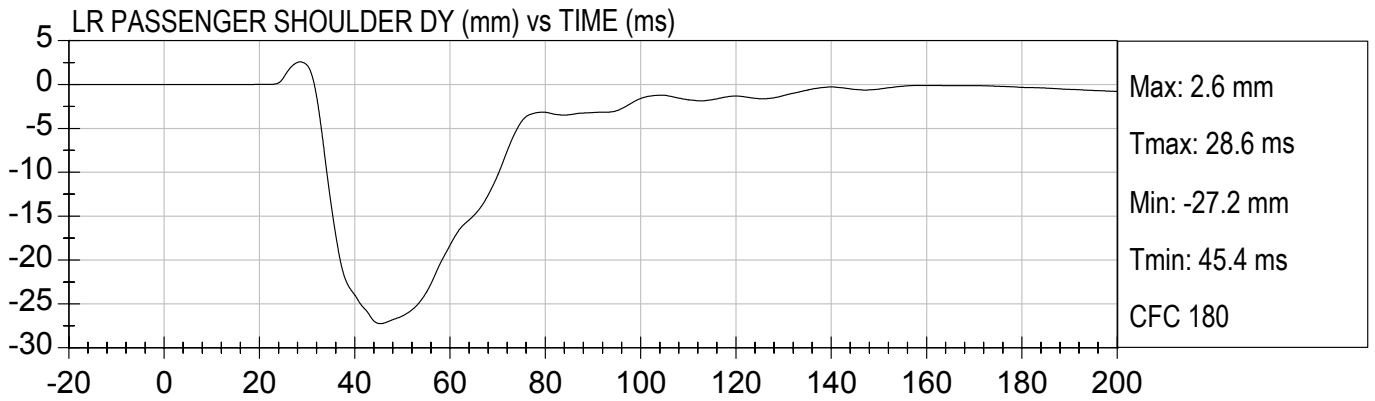


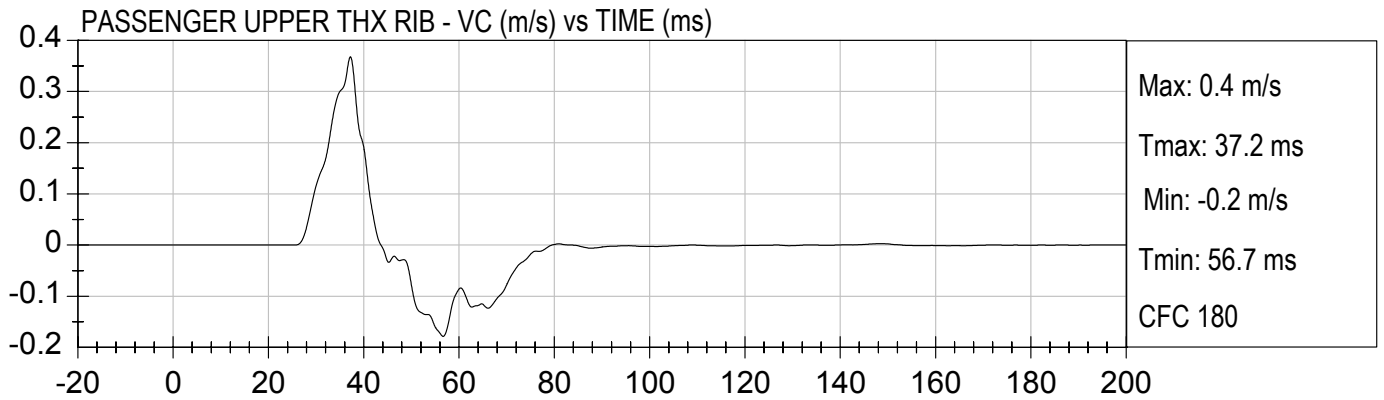
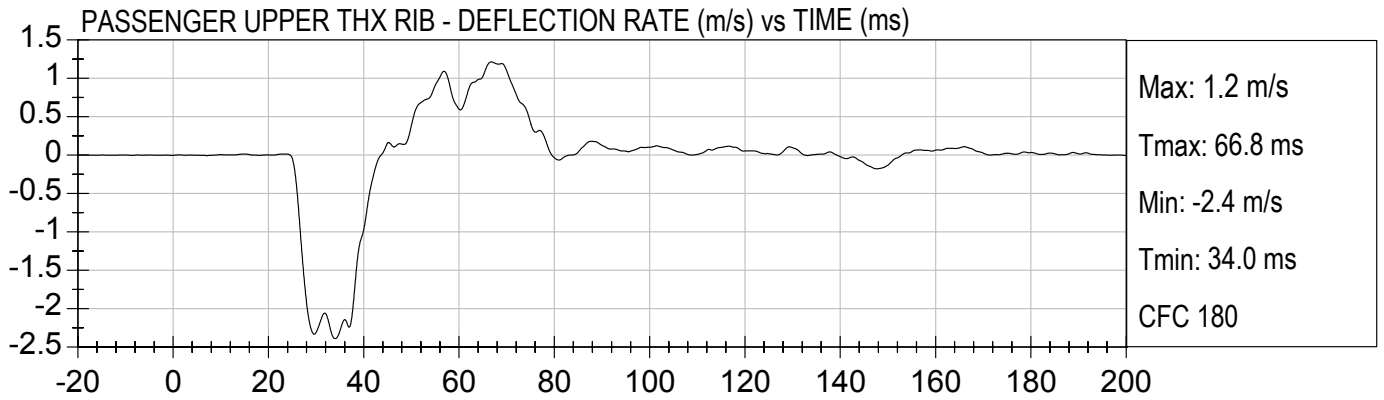
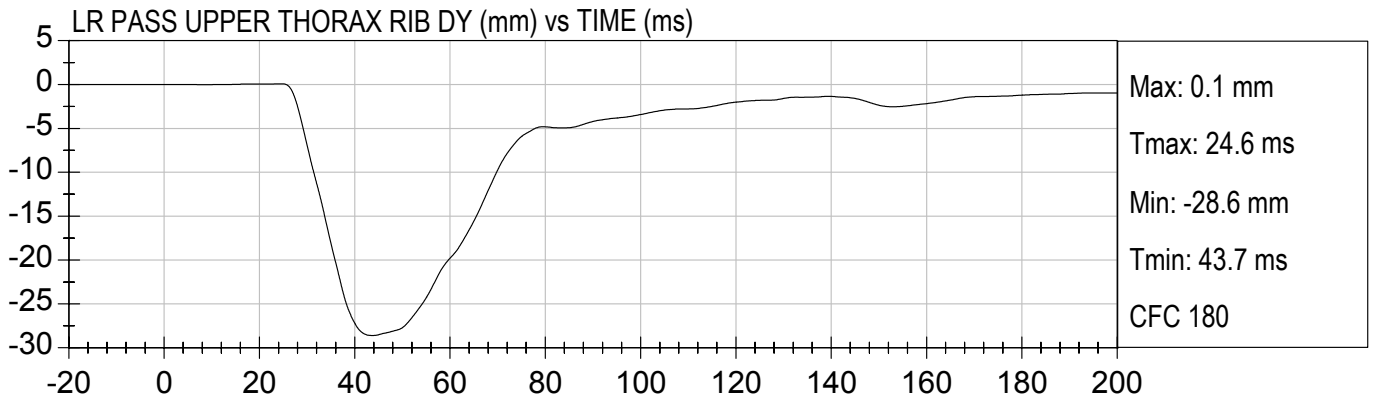


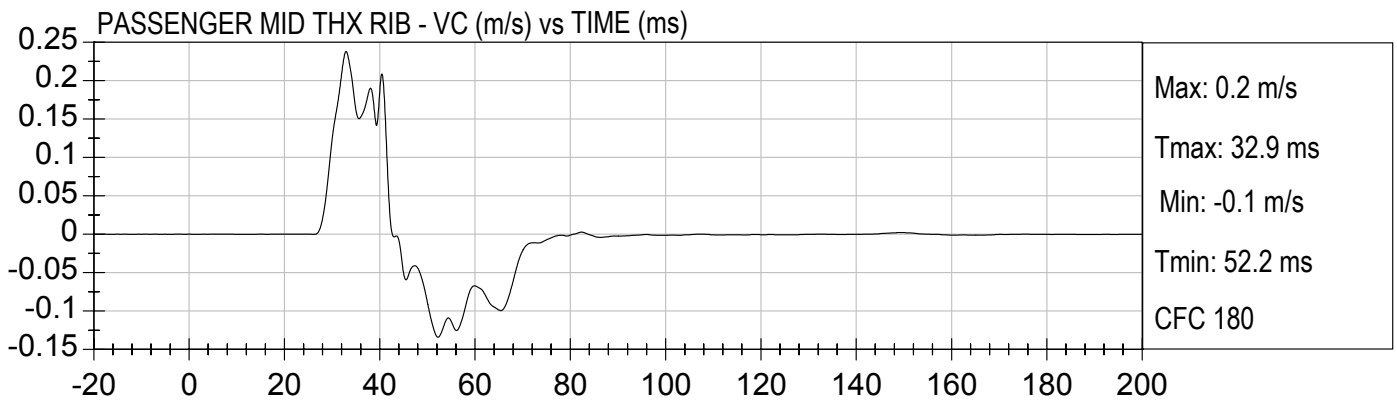
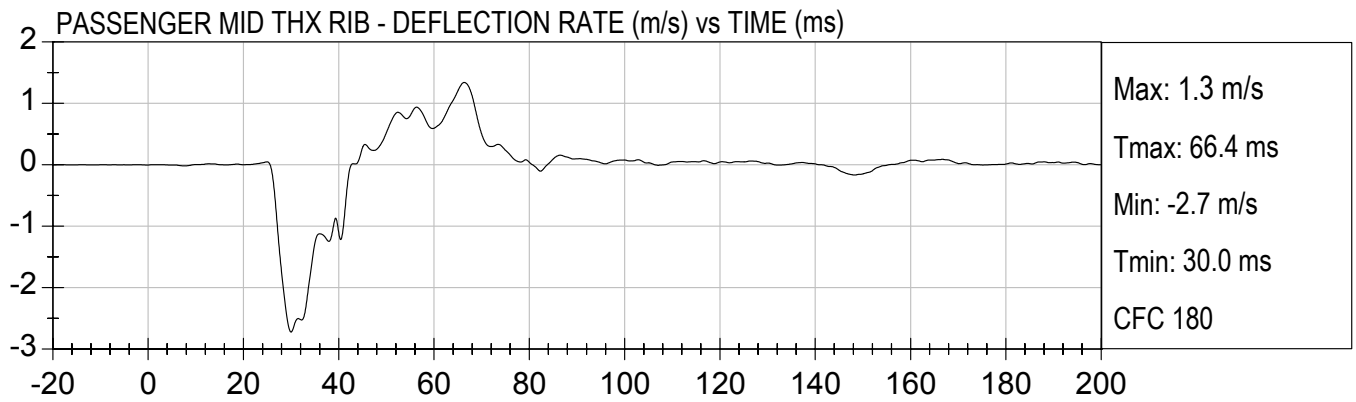
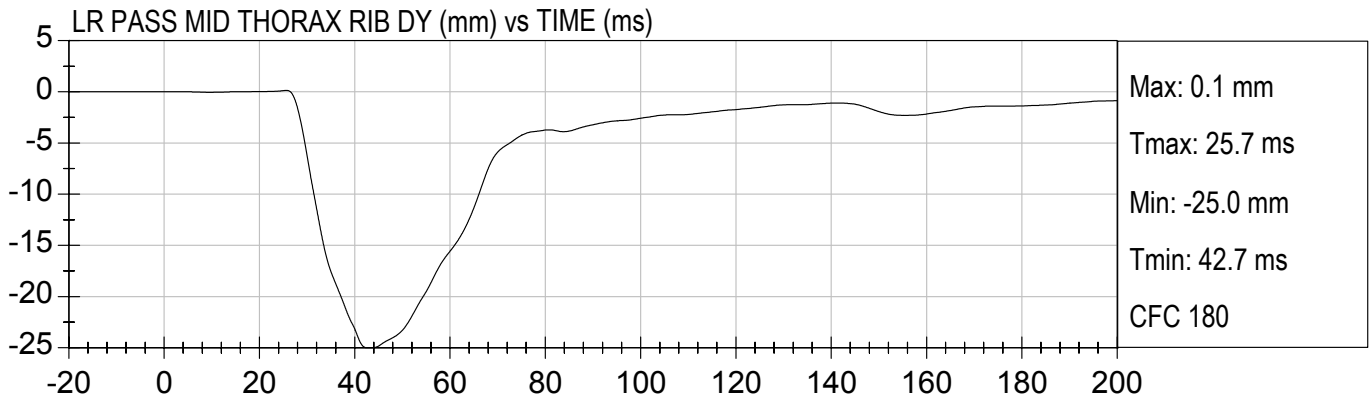


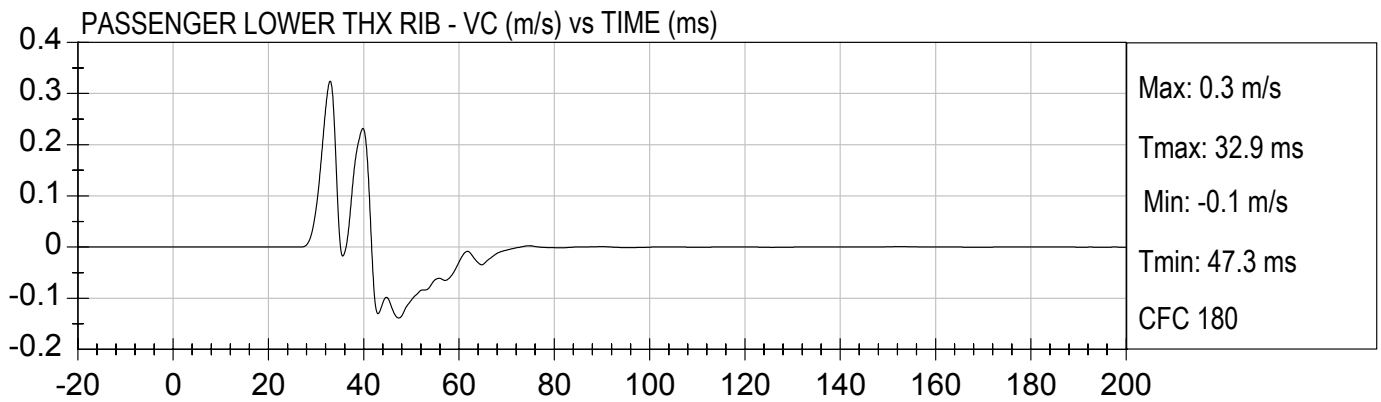
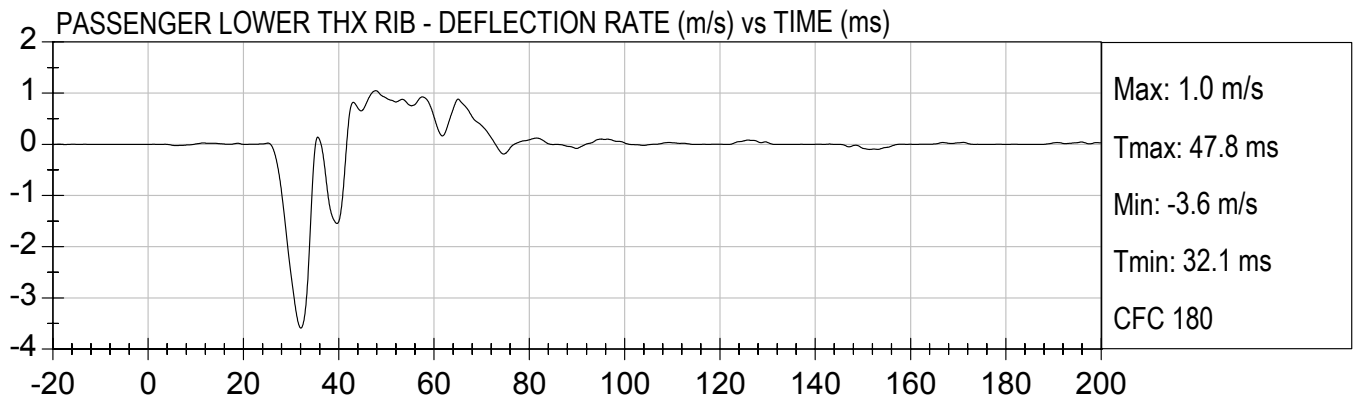
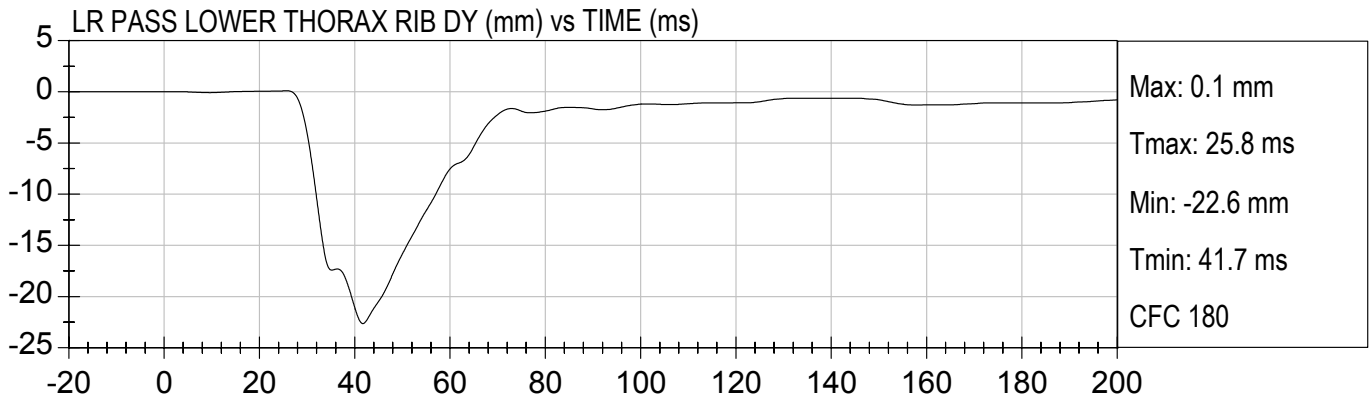


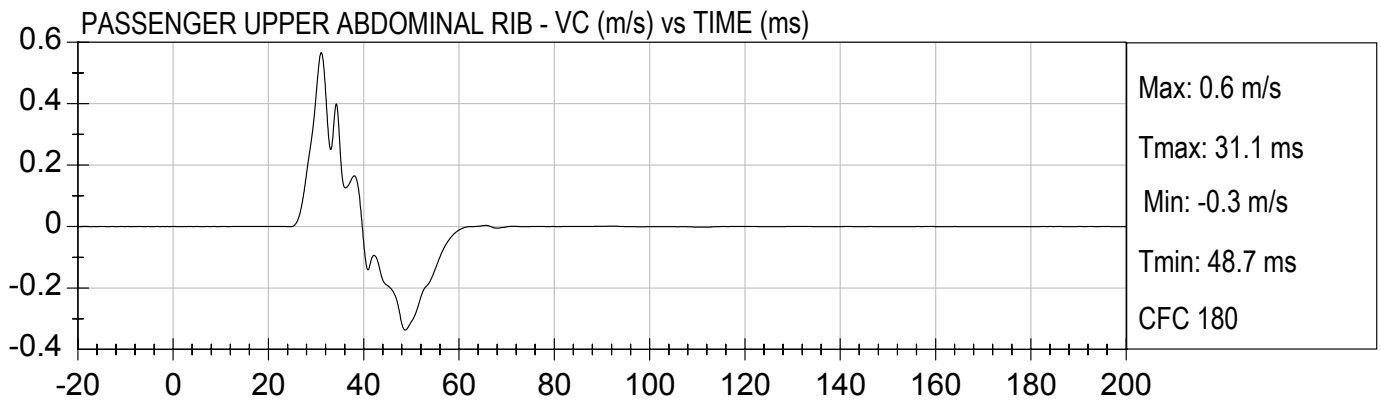
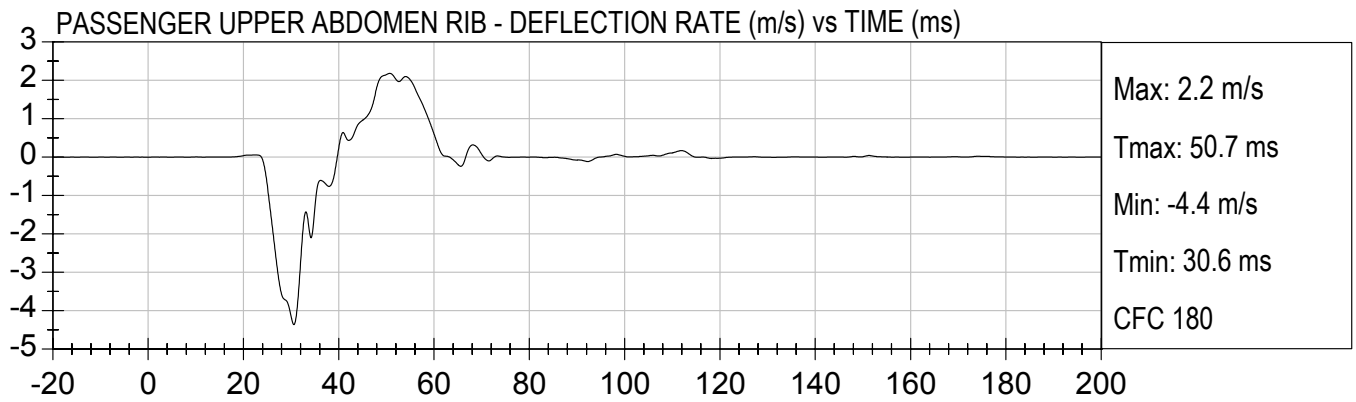
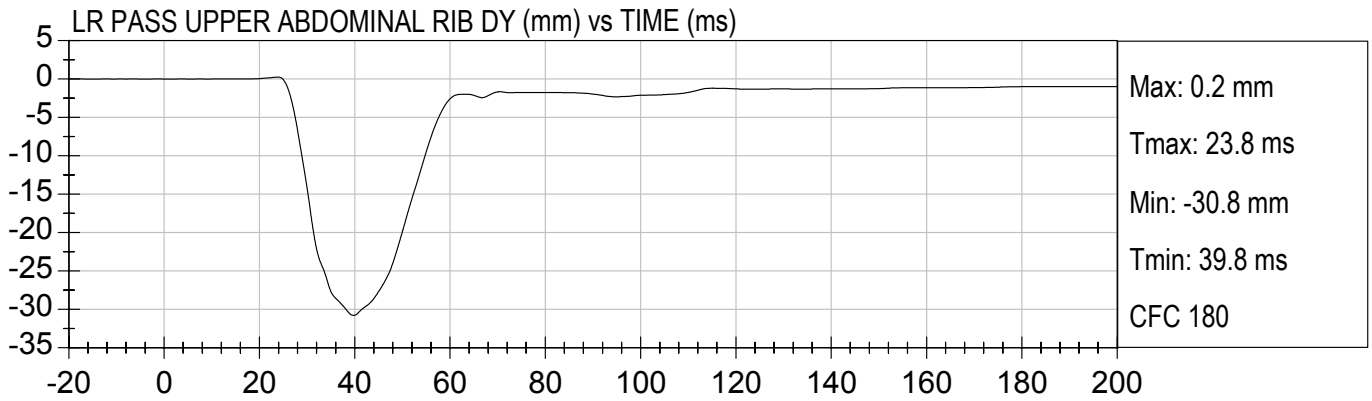


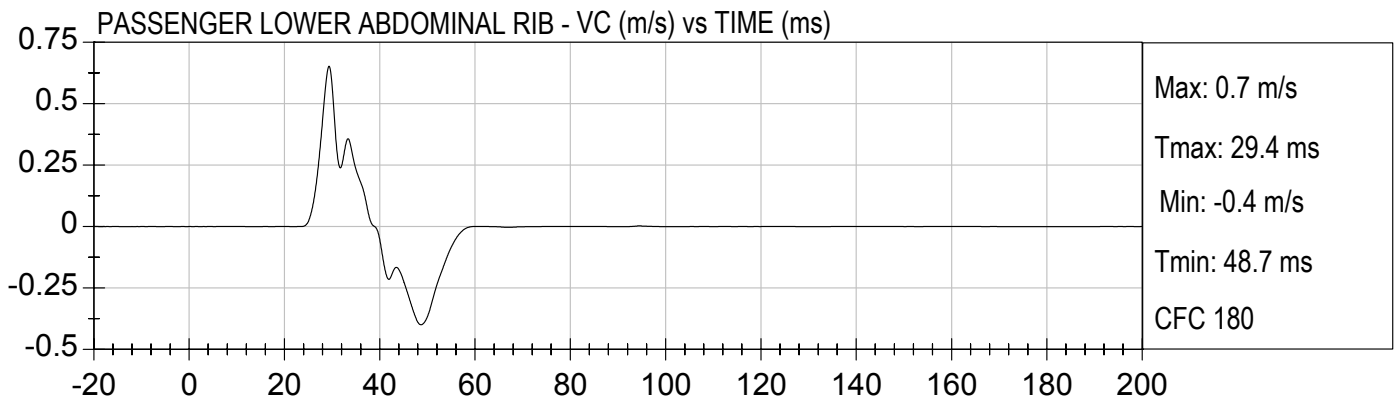
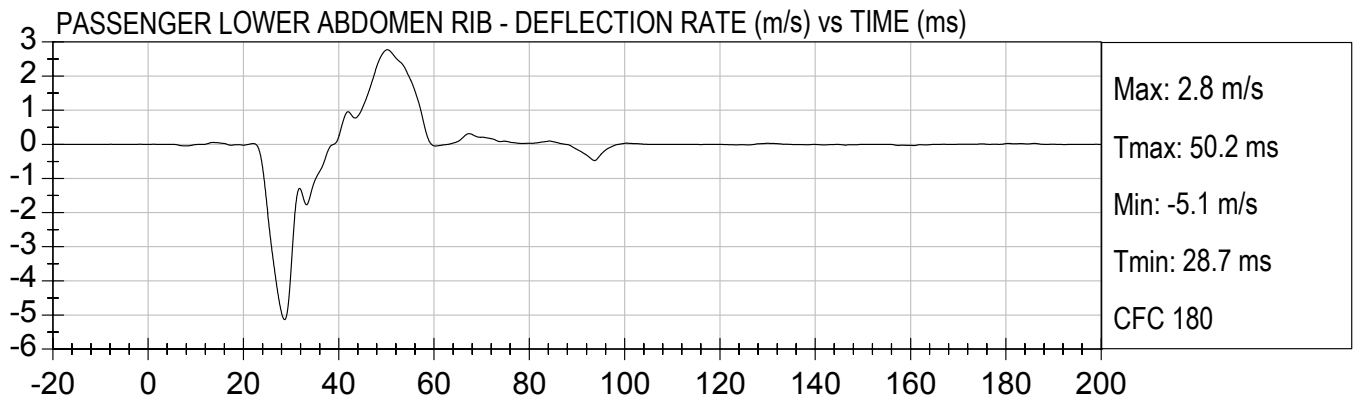
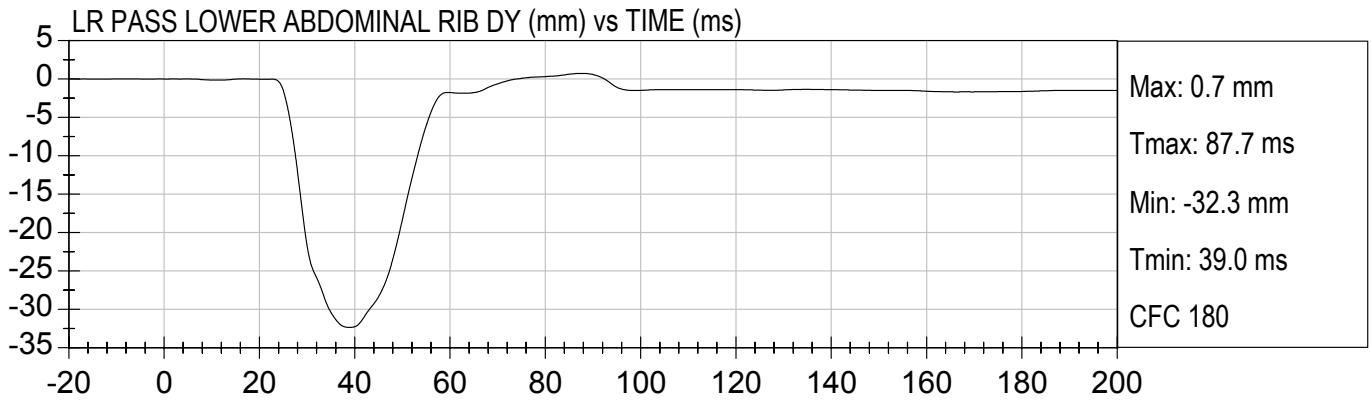


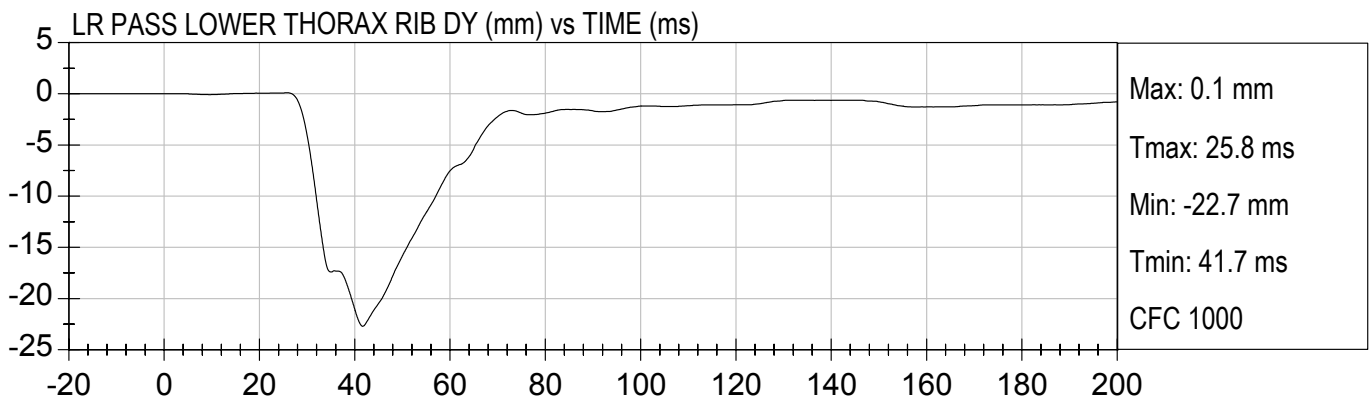
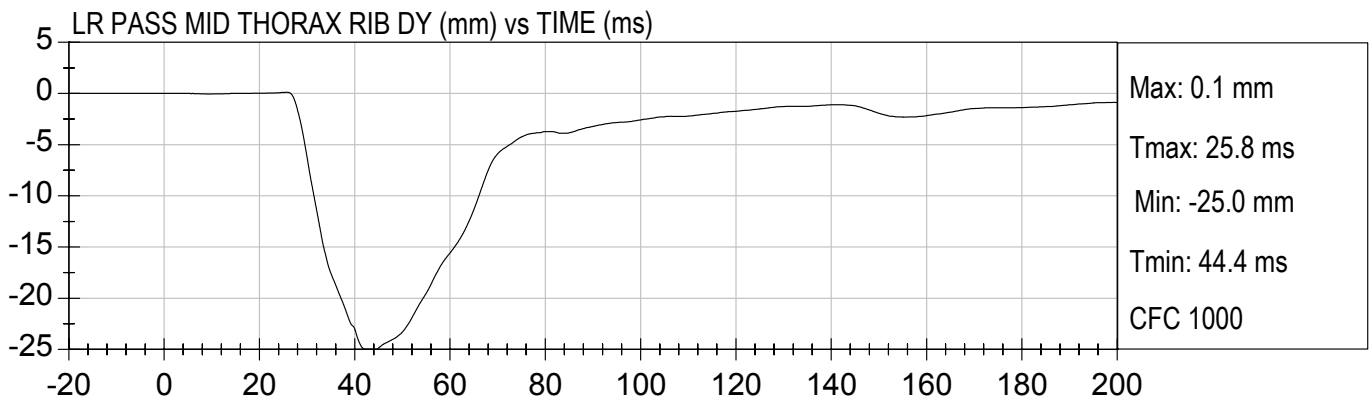
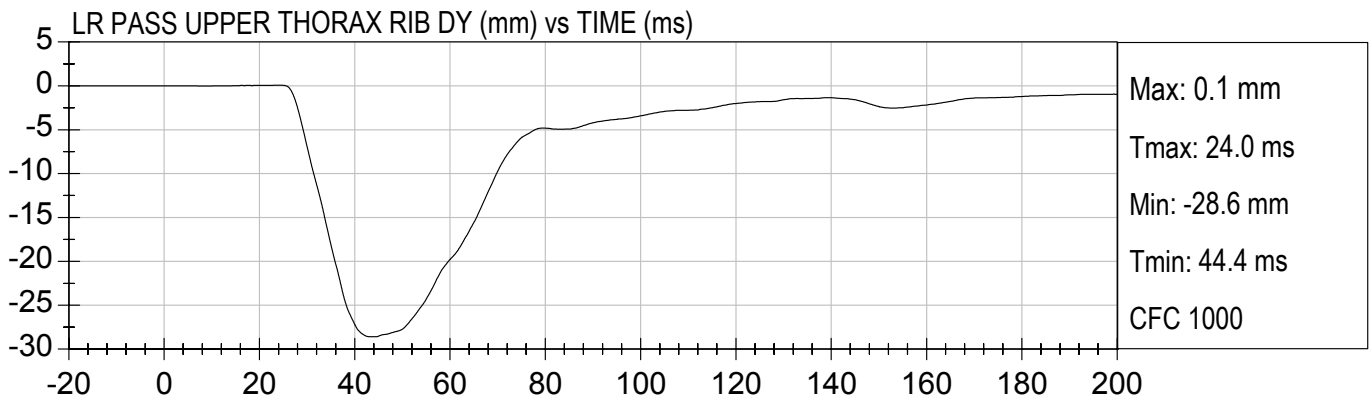
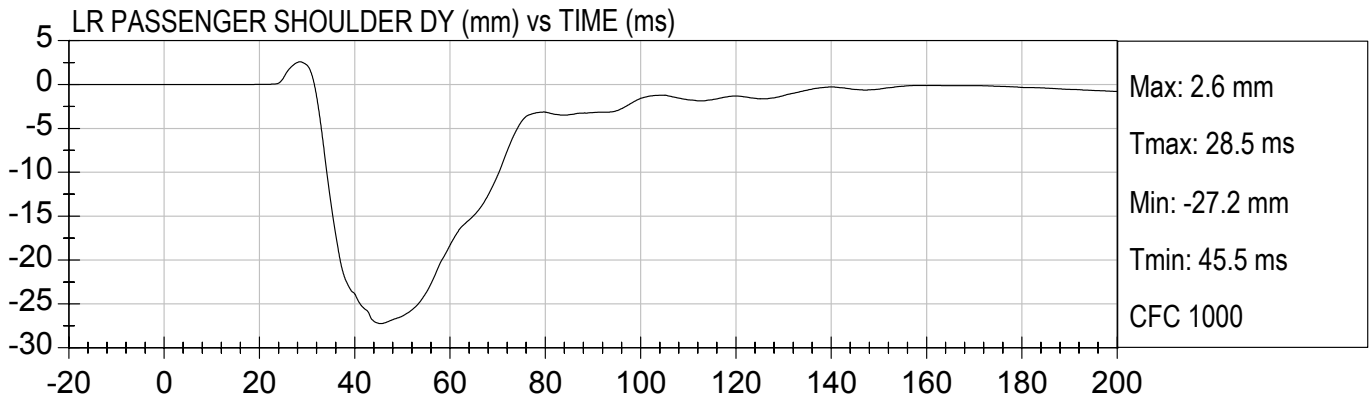


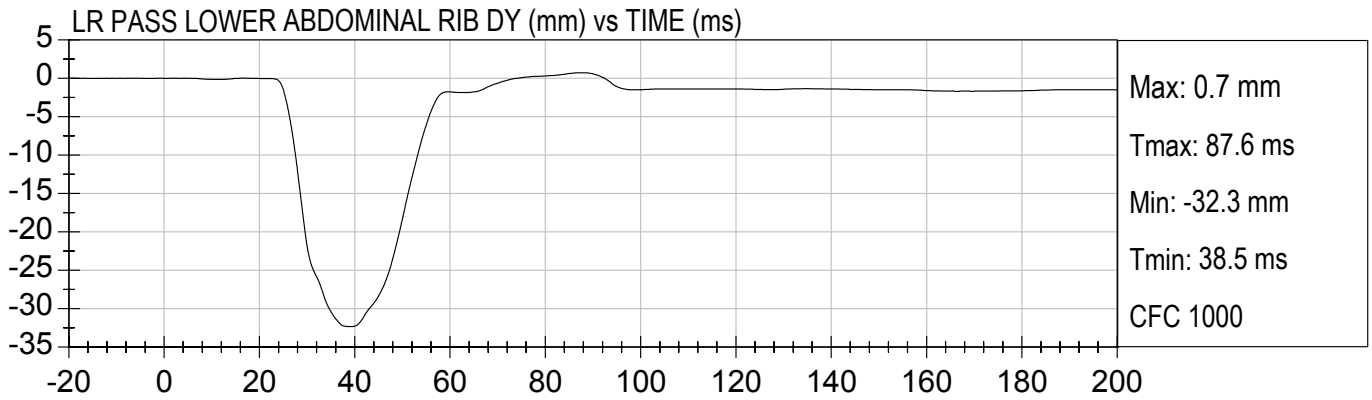
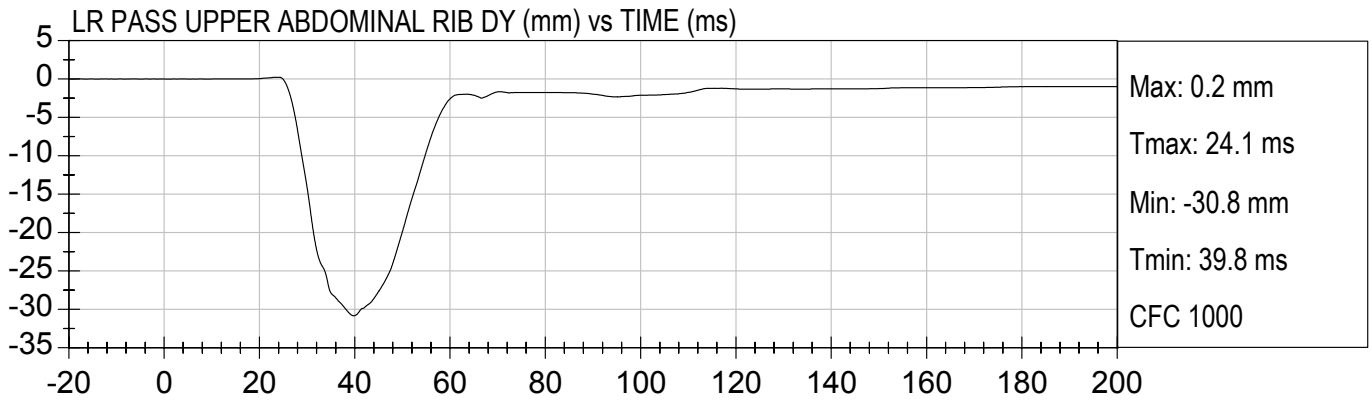


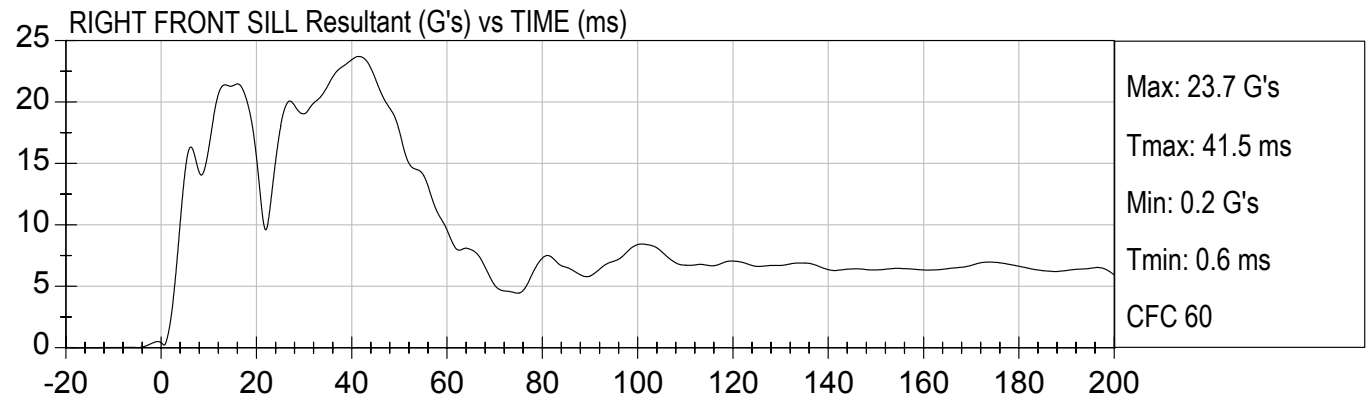
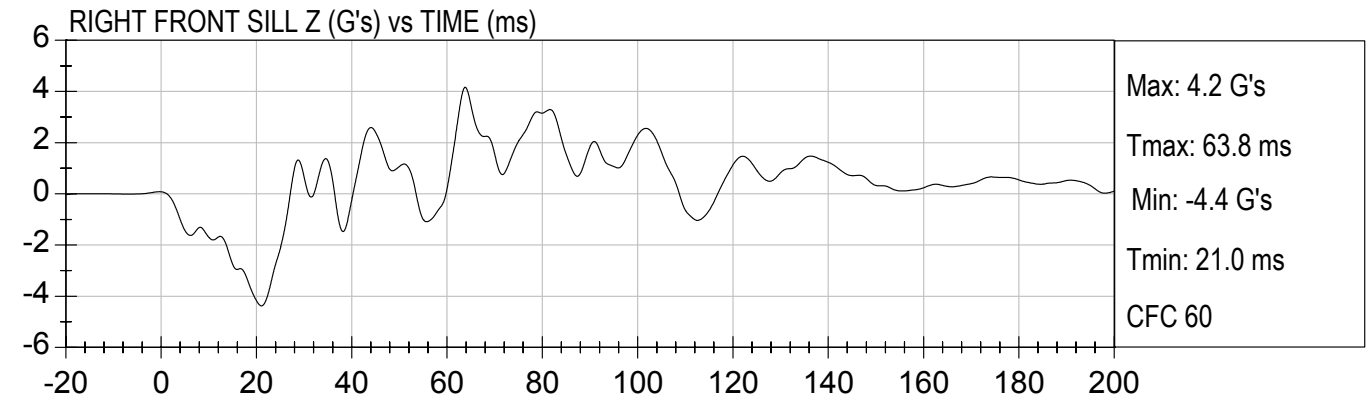
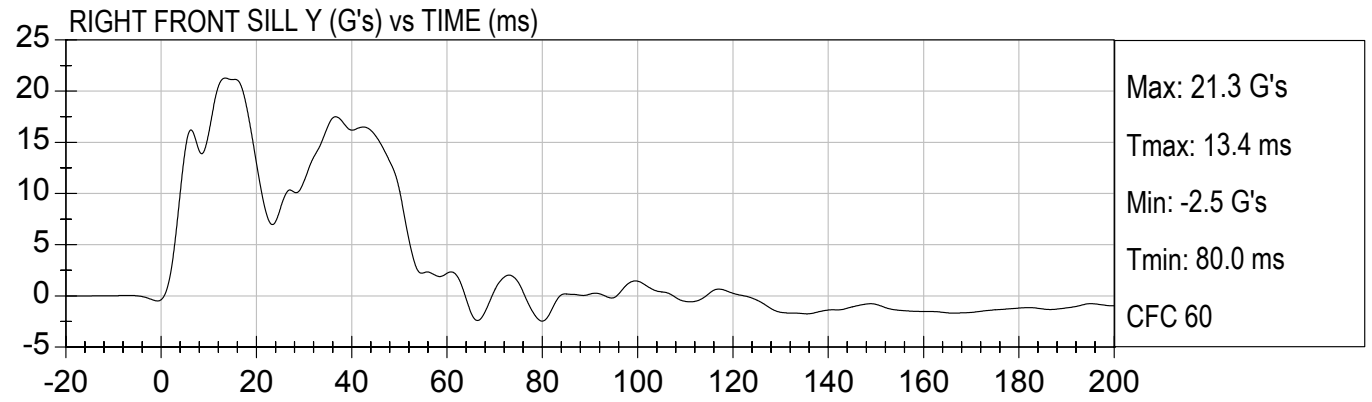
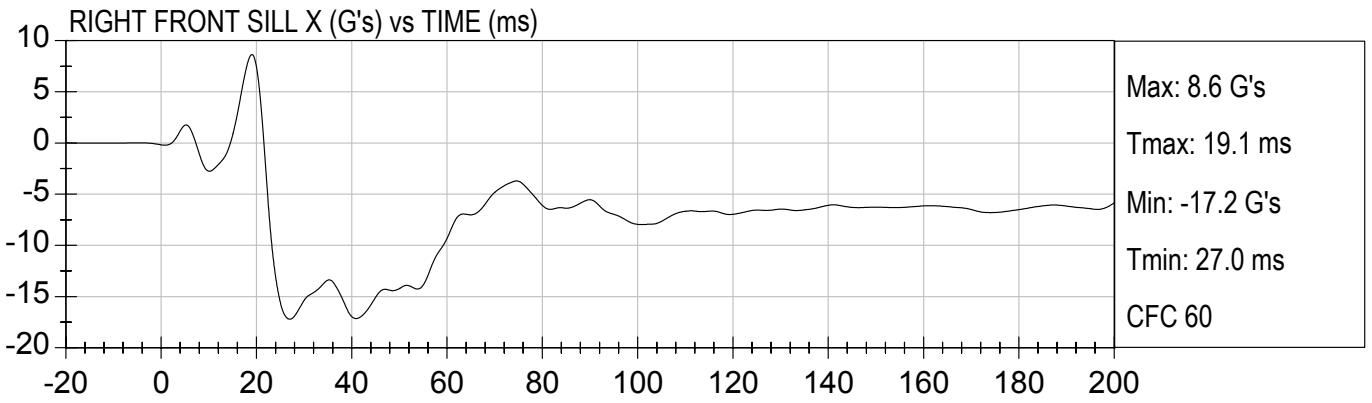


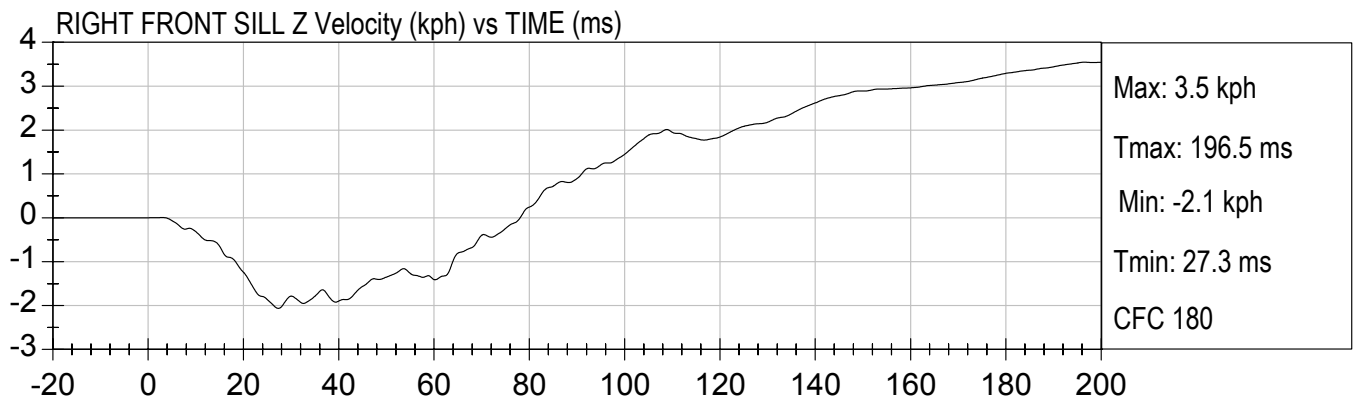
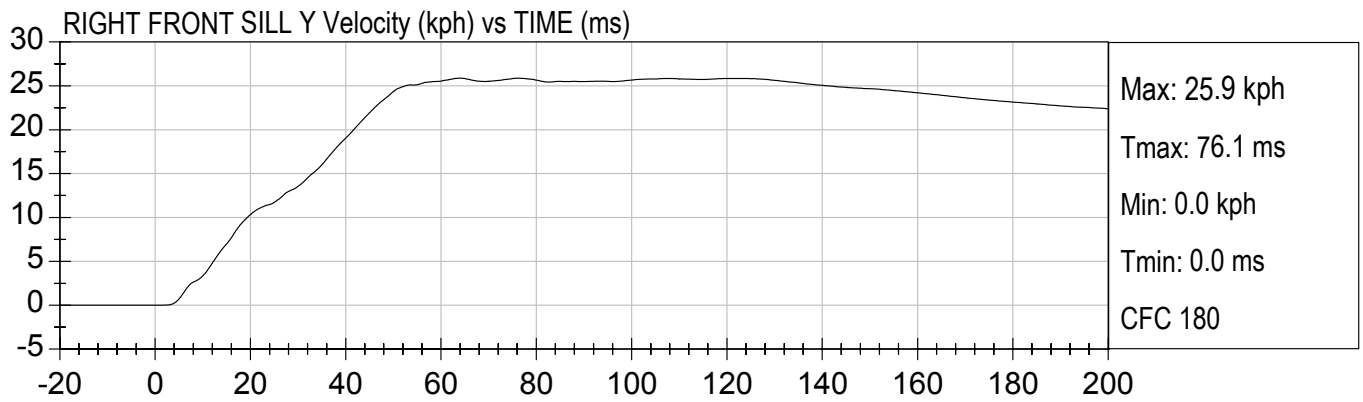
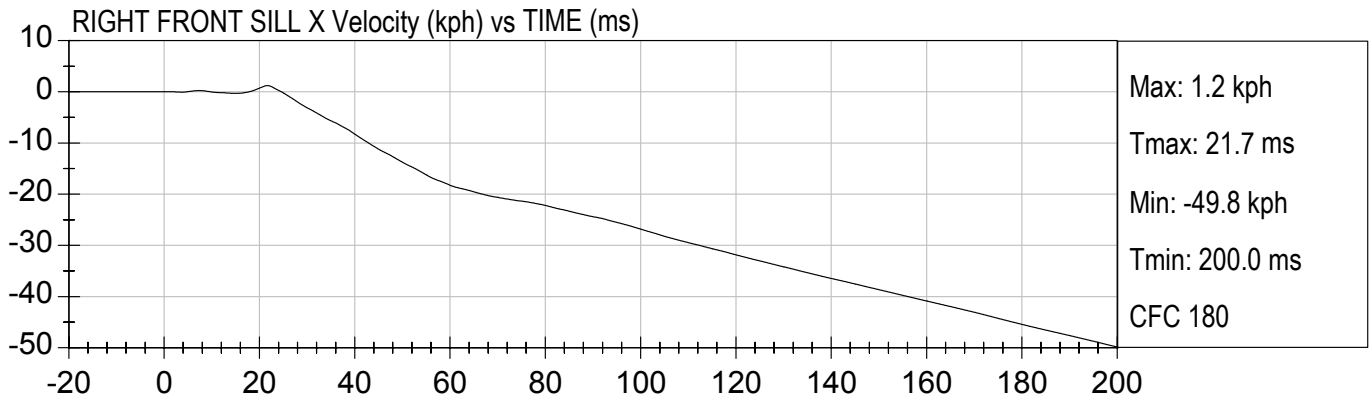






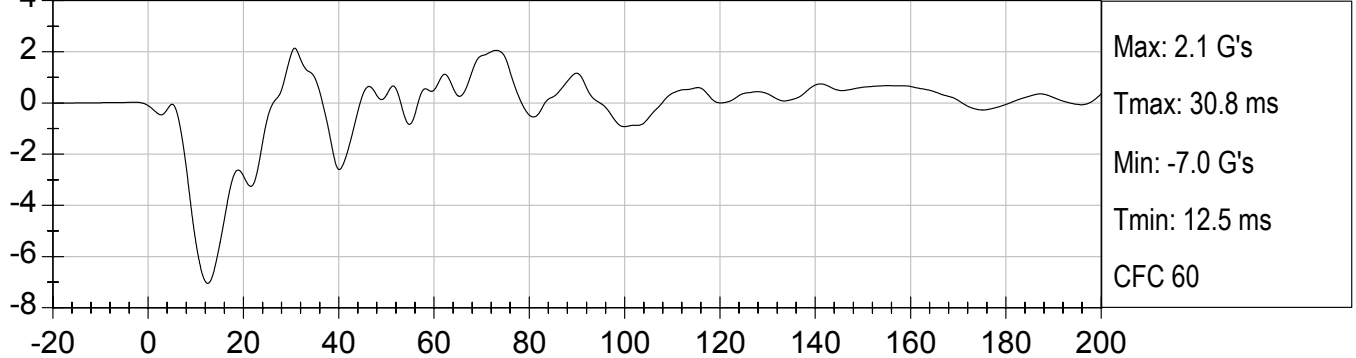




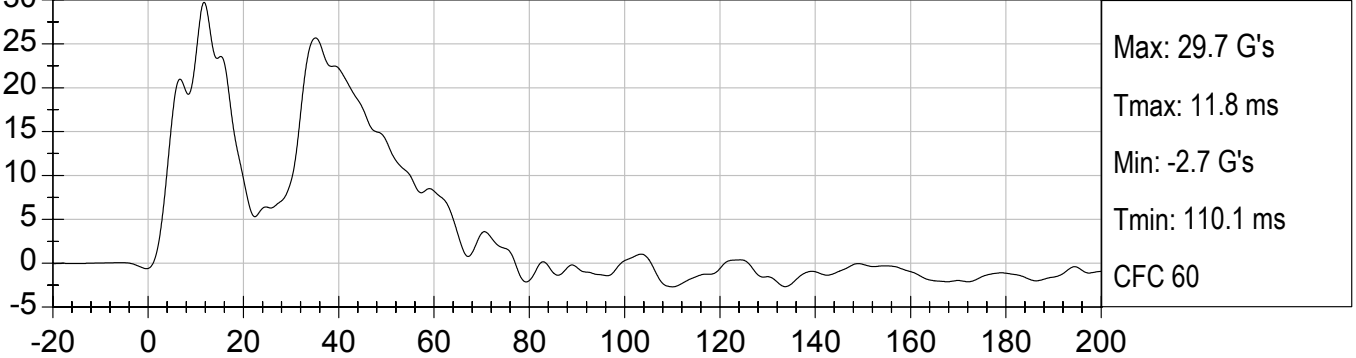




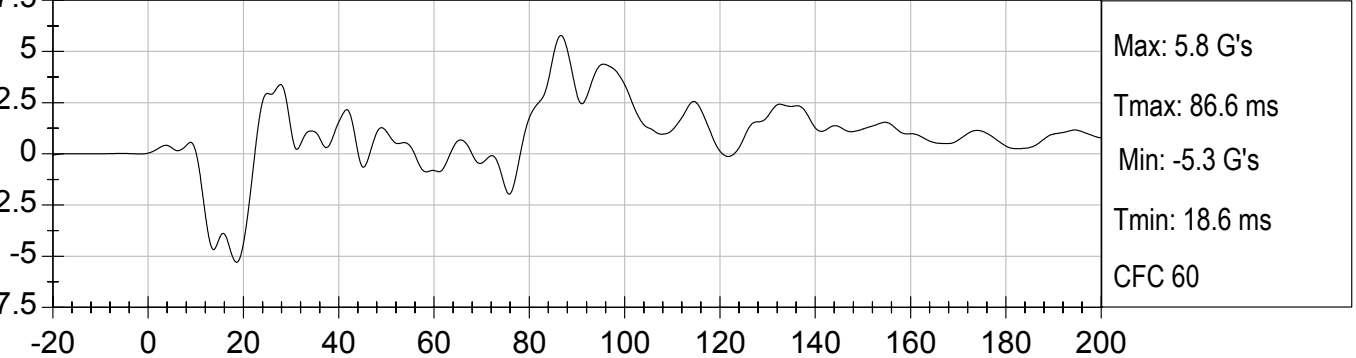
RIGHT REAR SILL X (G's) vs TIME (ms)



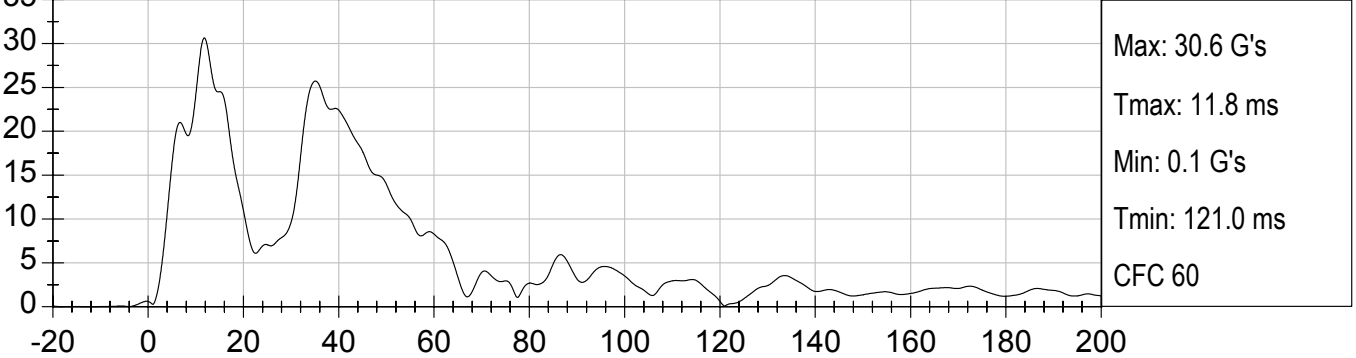
RIGHT REAR SILL Y (G's) vs TIME (ms)

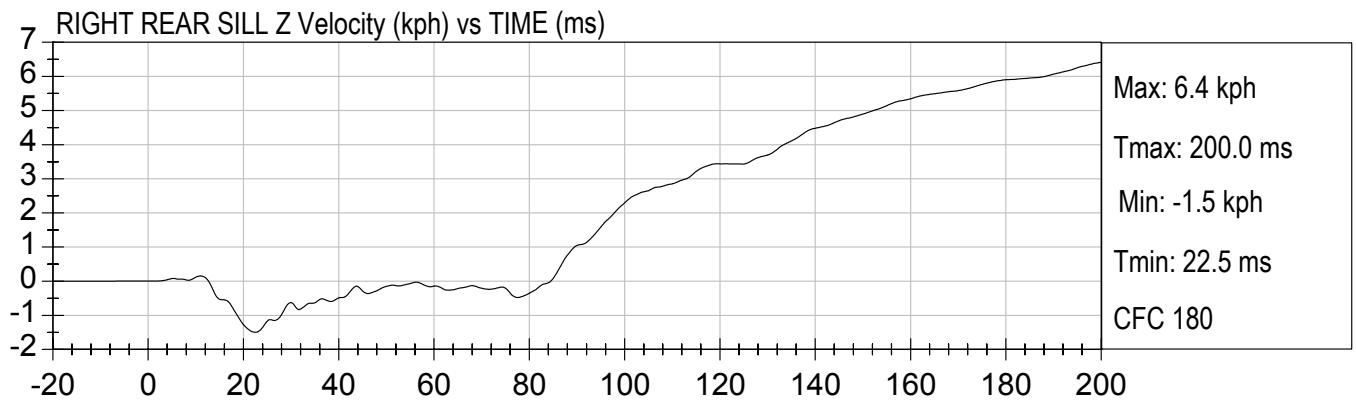
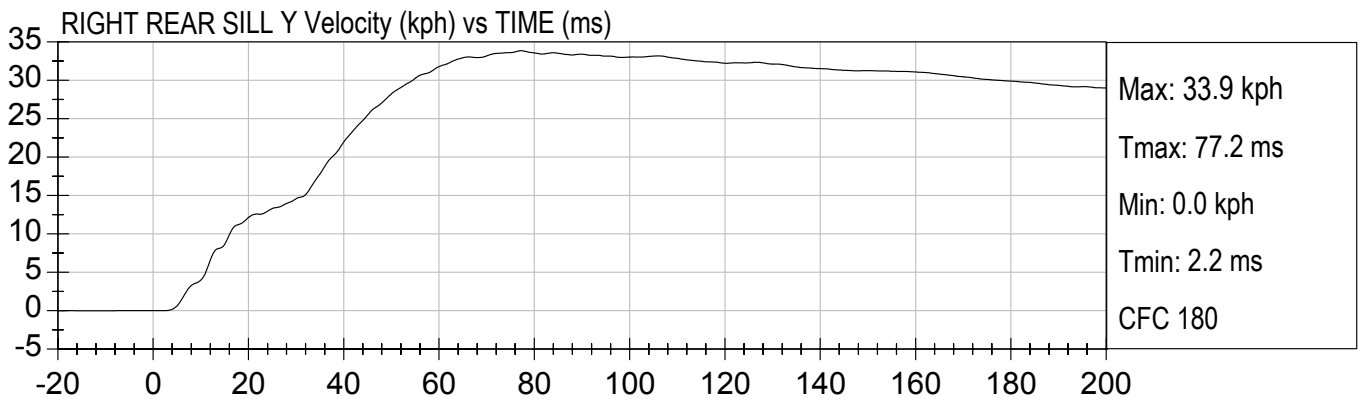
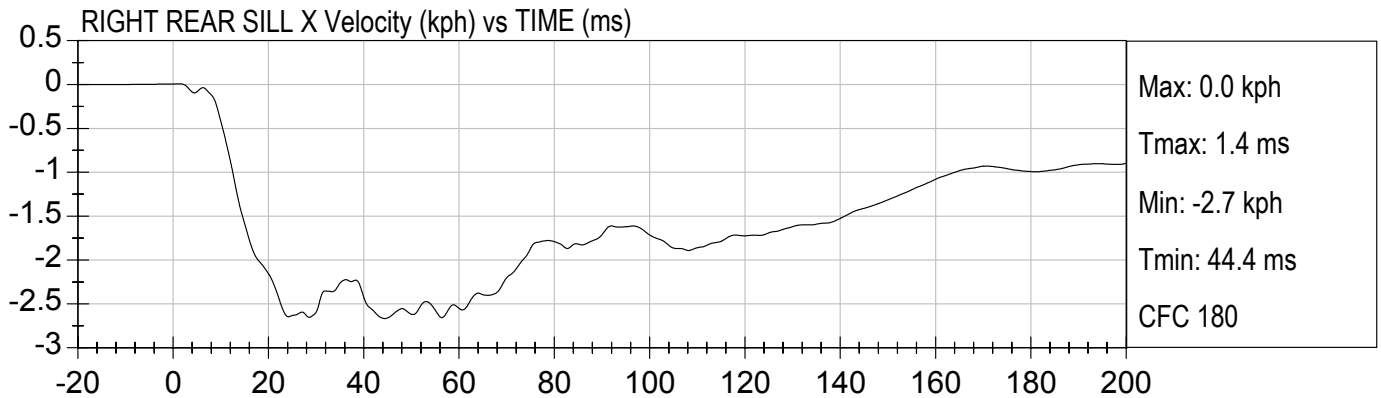


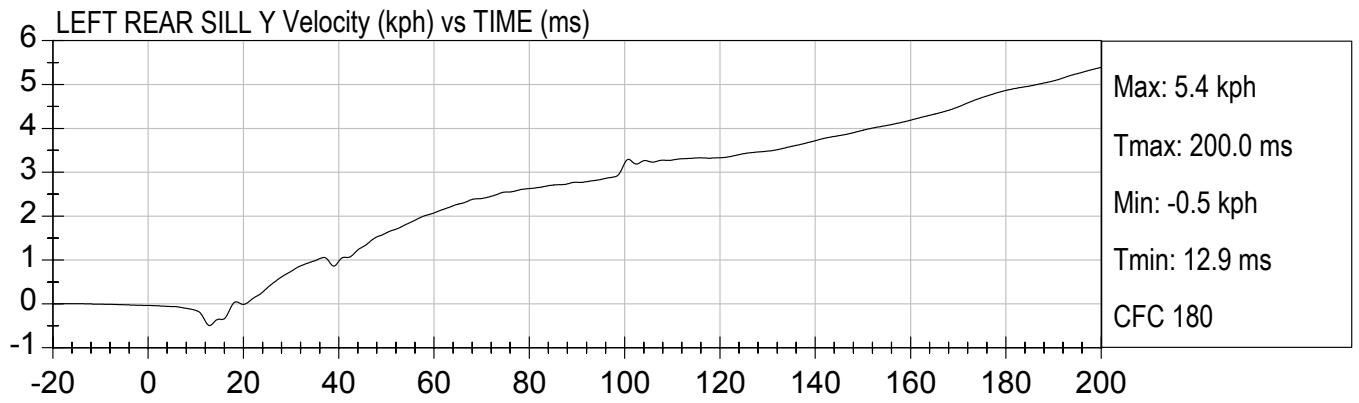
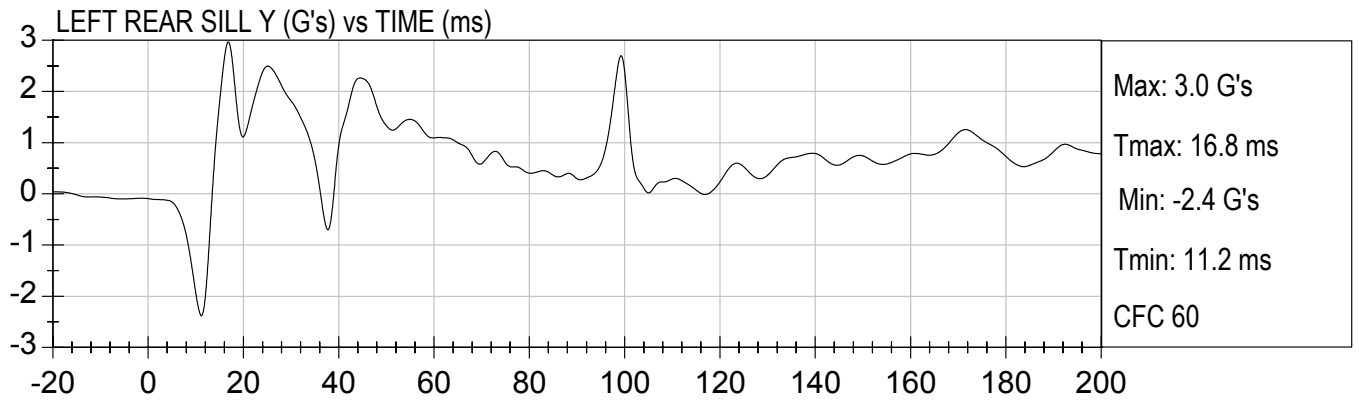
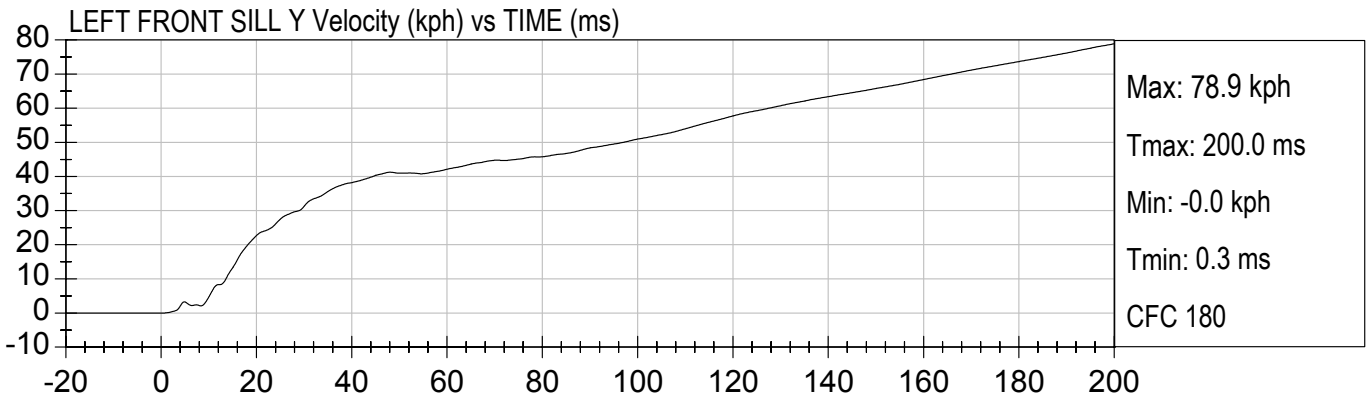
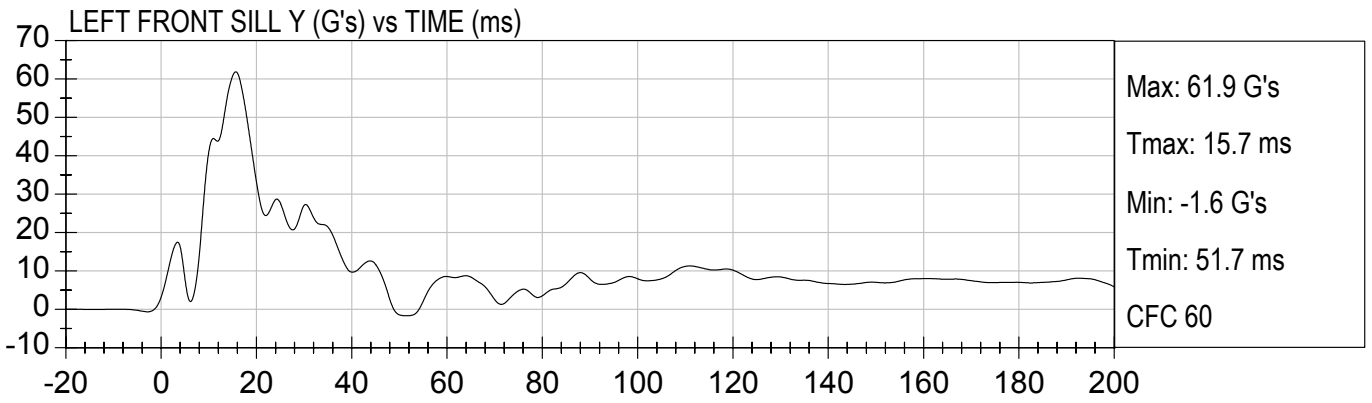
RIGHT REAR SILL Z (G's) vs TIME (ms)

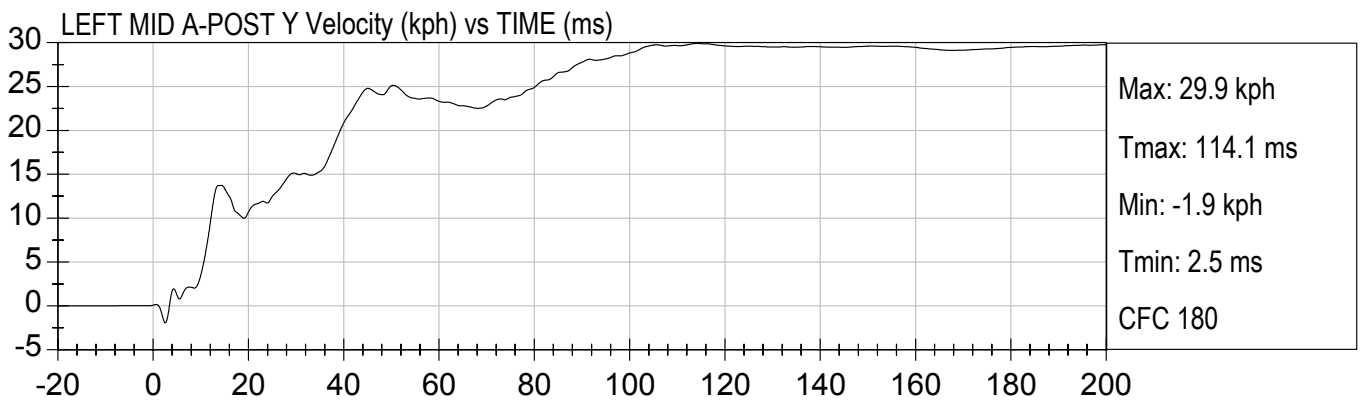
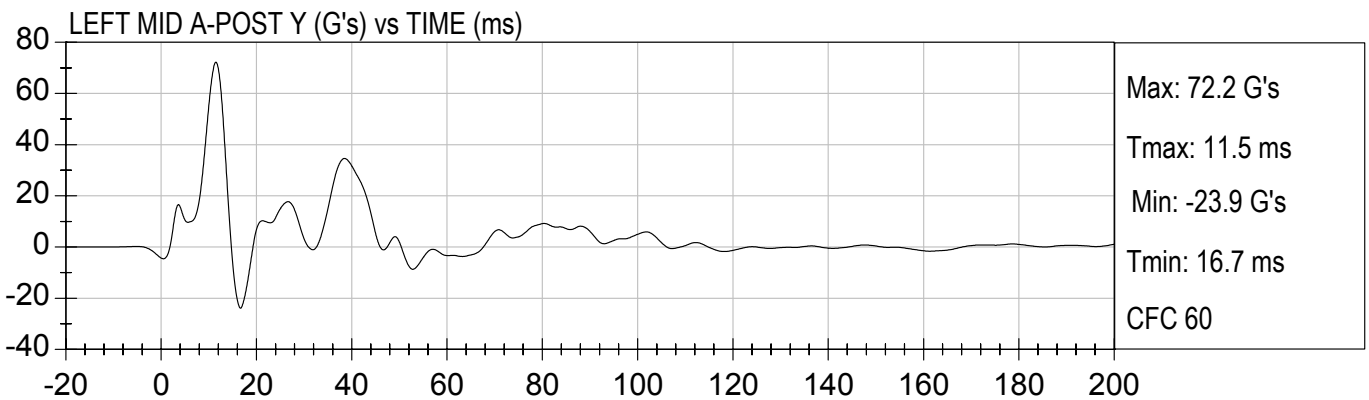
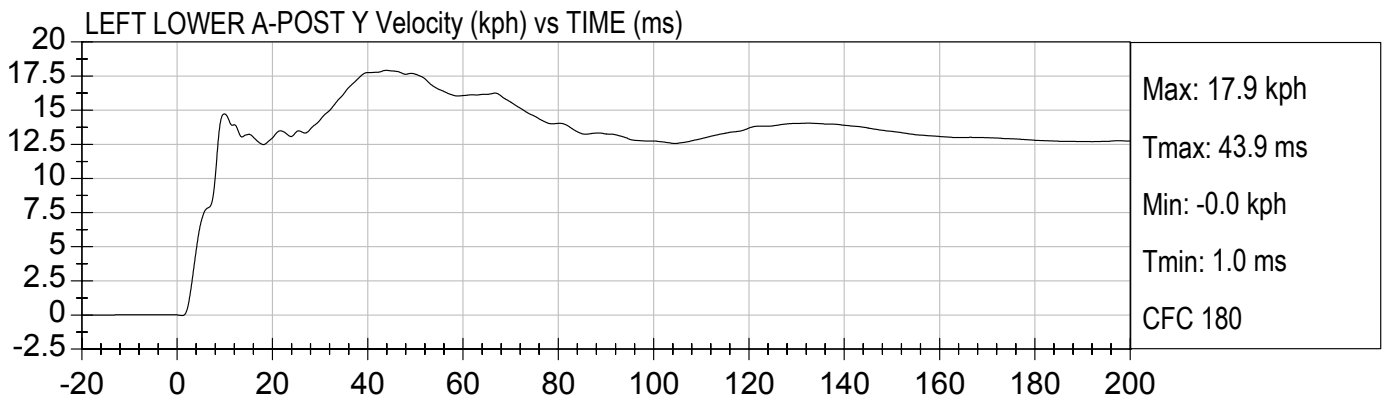
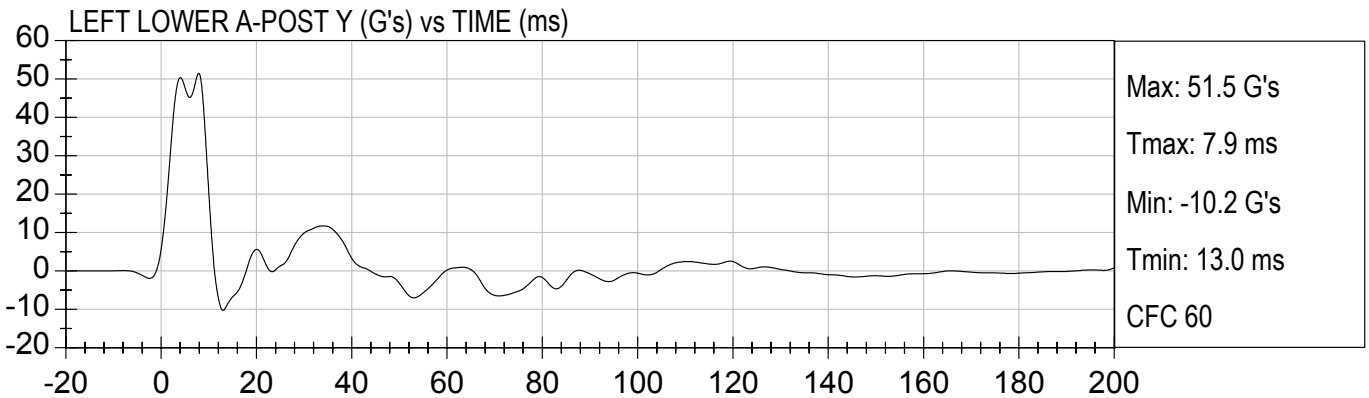


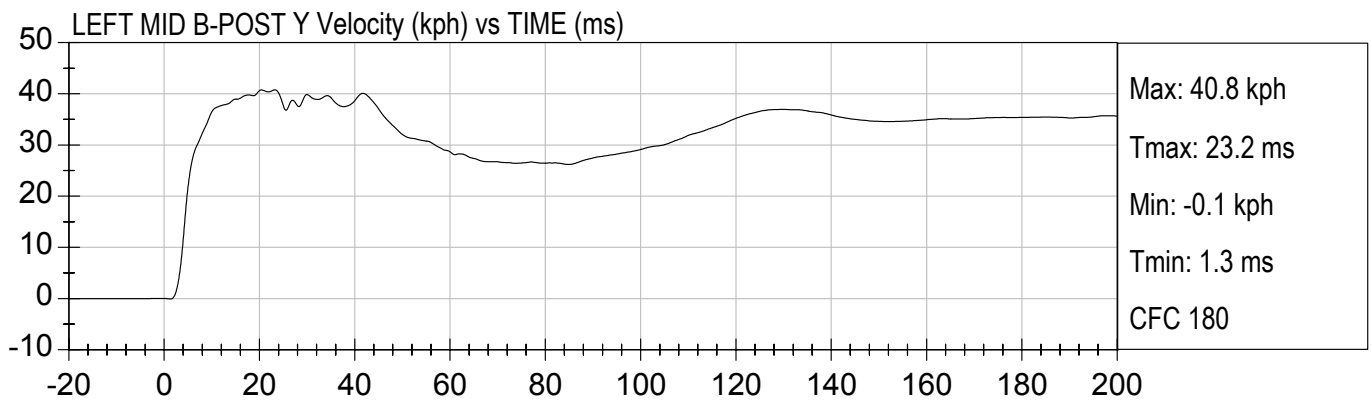
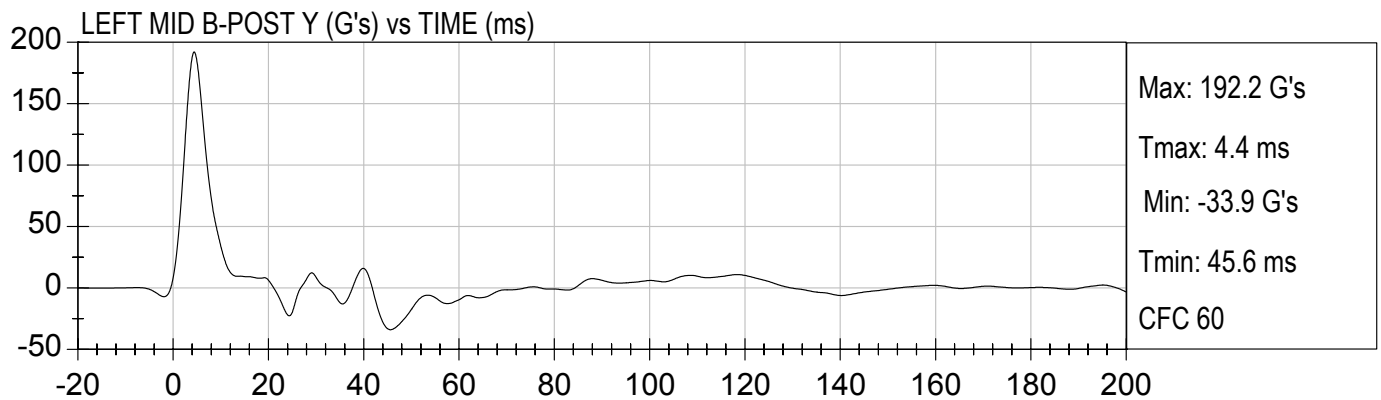
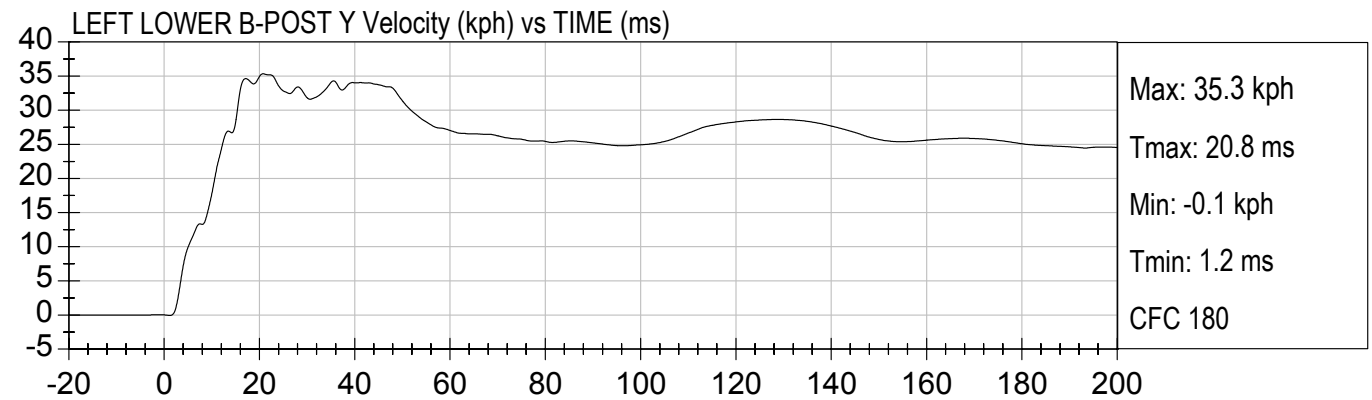
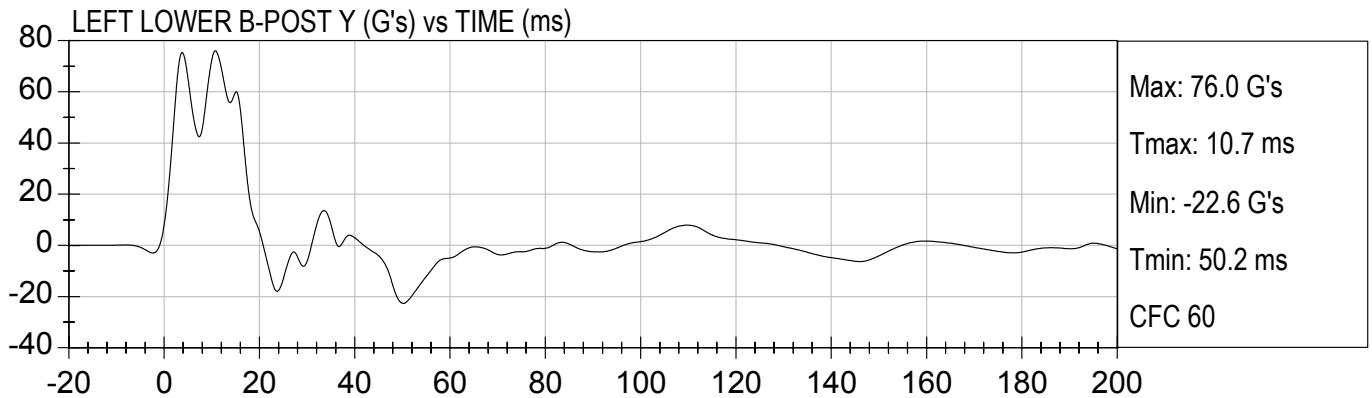
RIGHT REAR SILL Resultant (G's) vs TIME (ms)

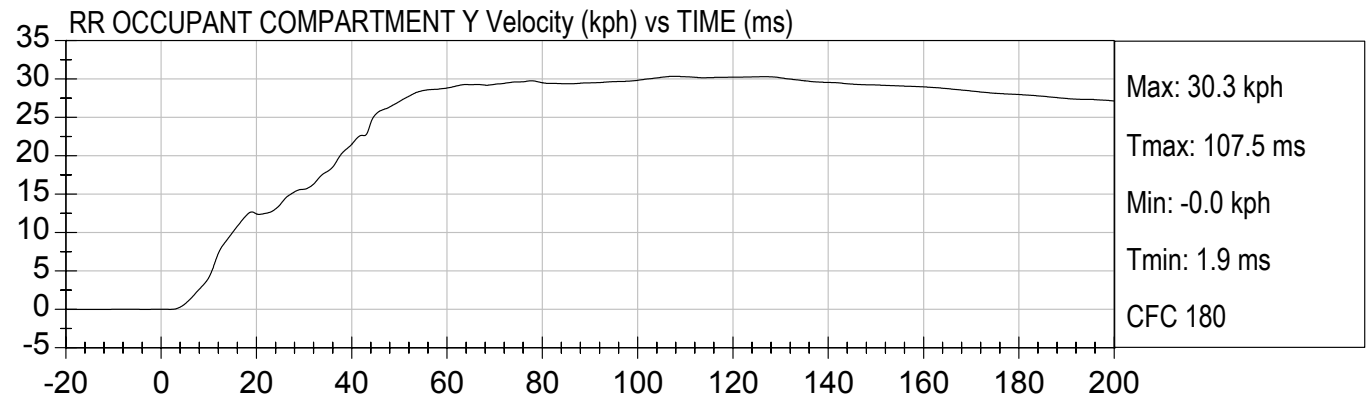
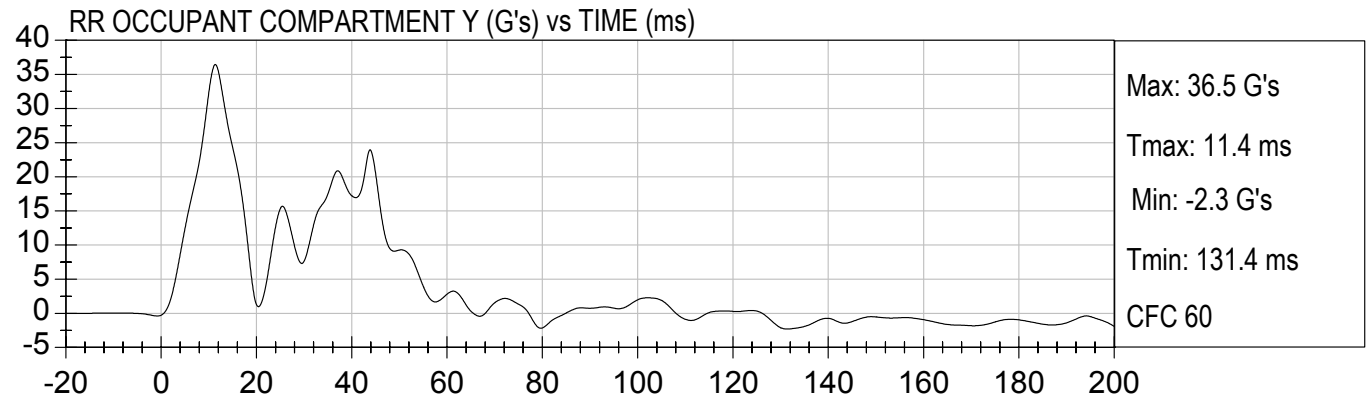
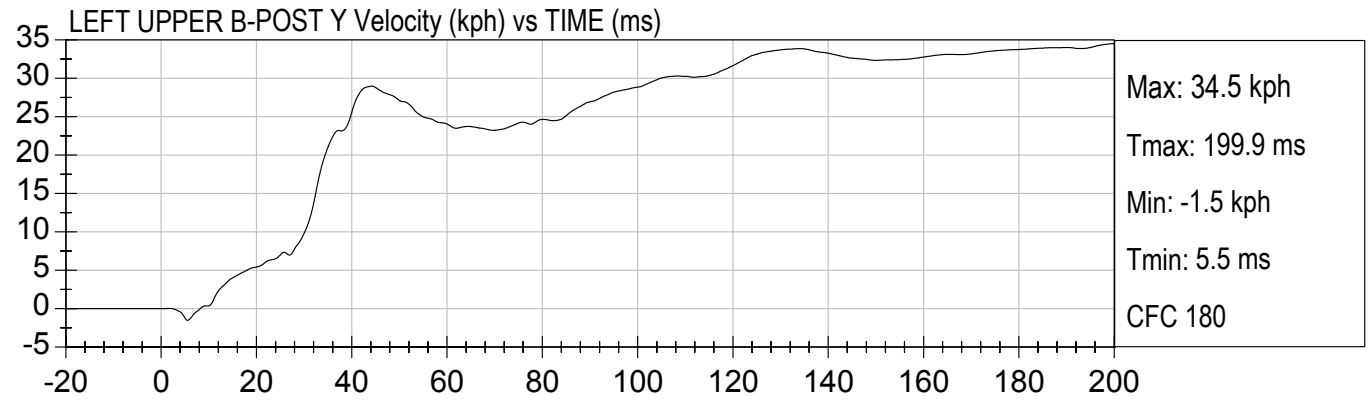
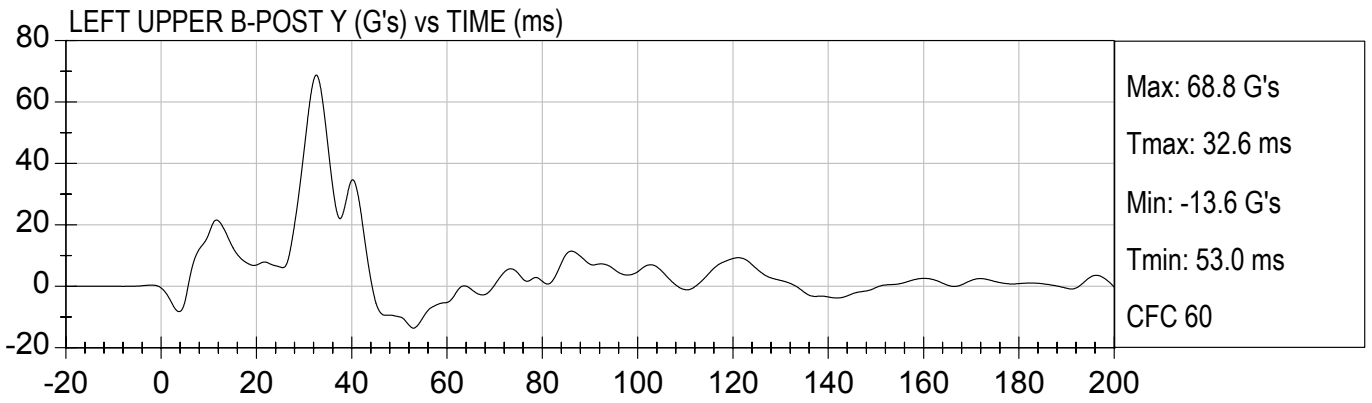






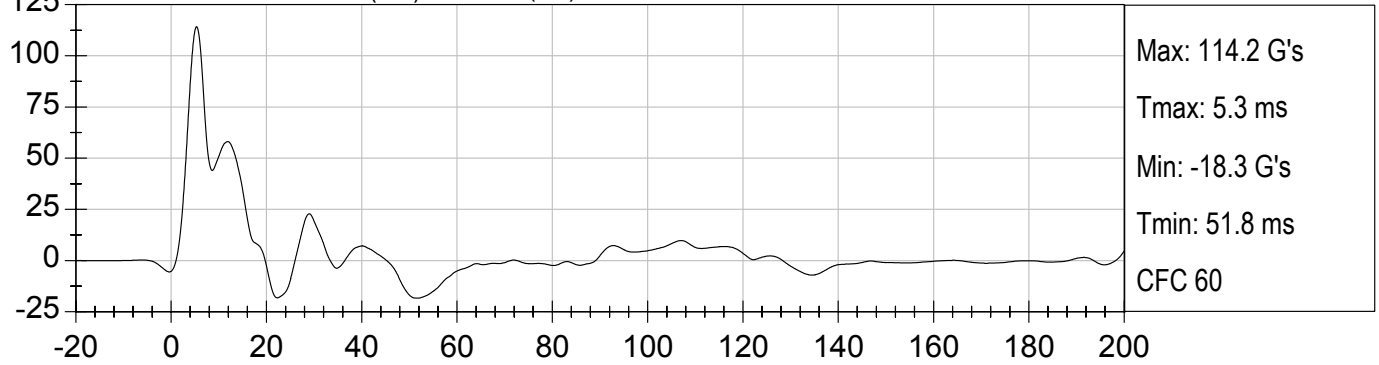




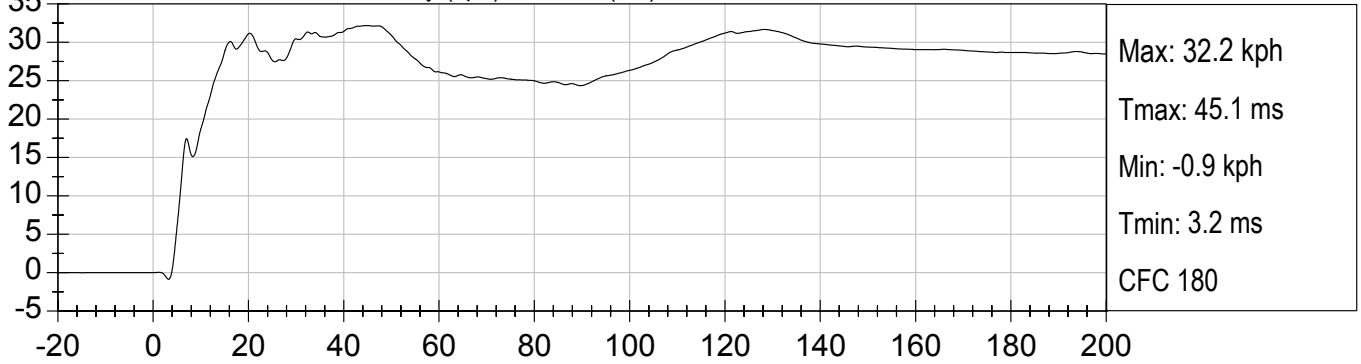




DRIVER SEAT TRACK Y (G's) vs TIME (ms)

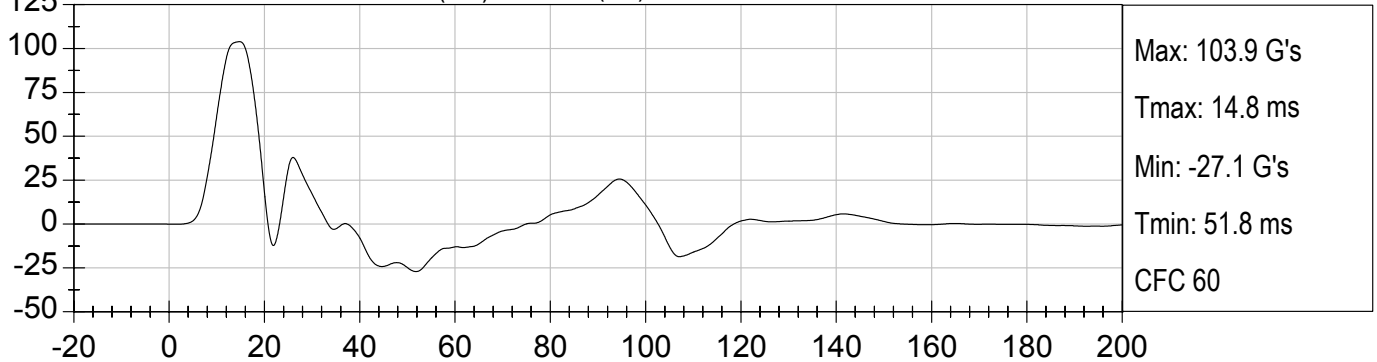


DRIVER SEAT TRACK Y Velocity (kph) vs TIME (ms)

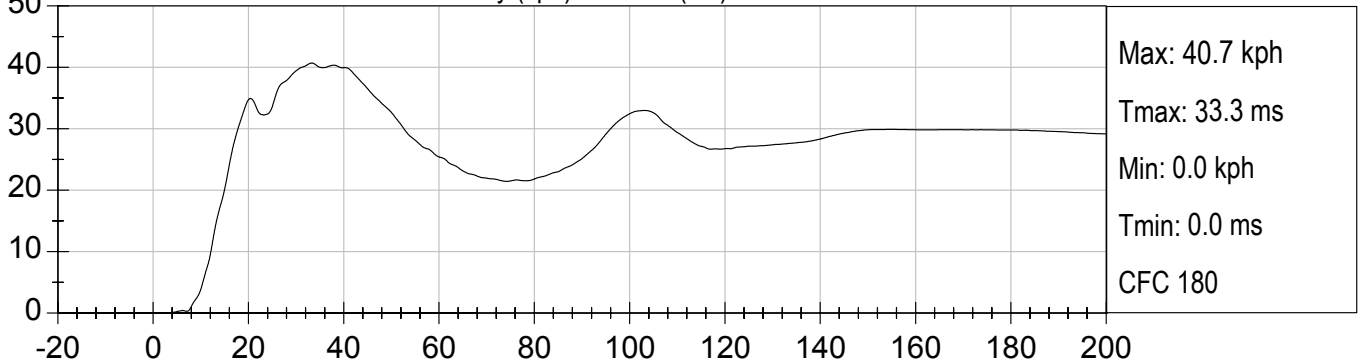




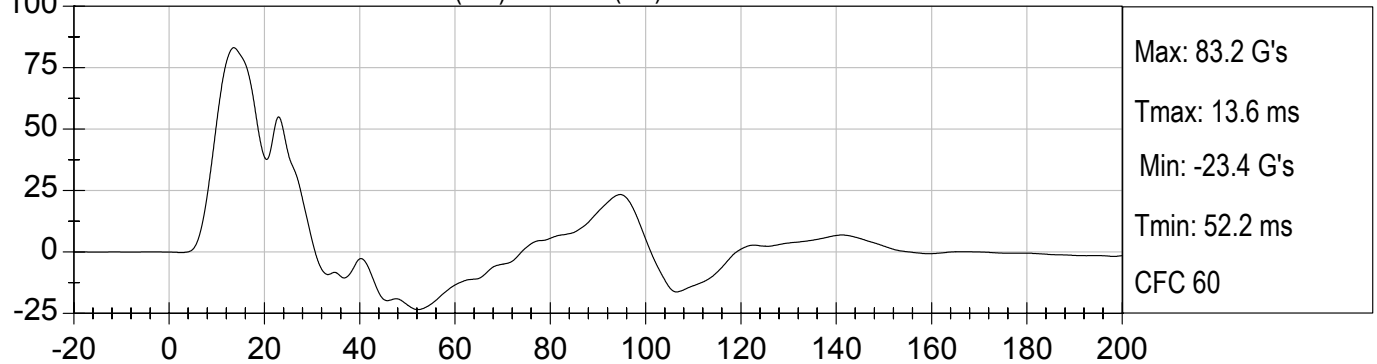
DRIVER LEFT SEAT FRAME Y (G's) vs TIME (ms)



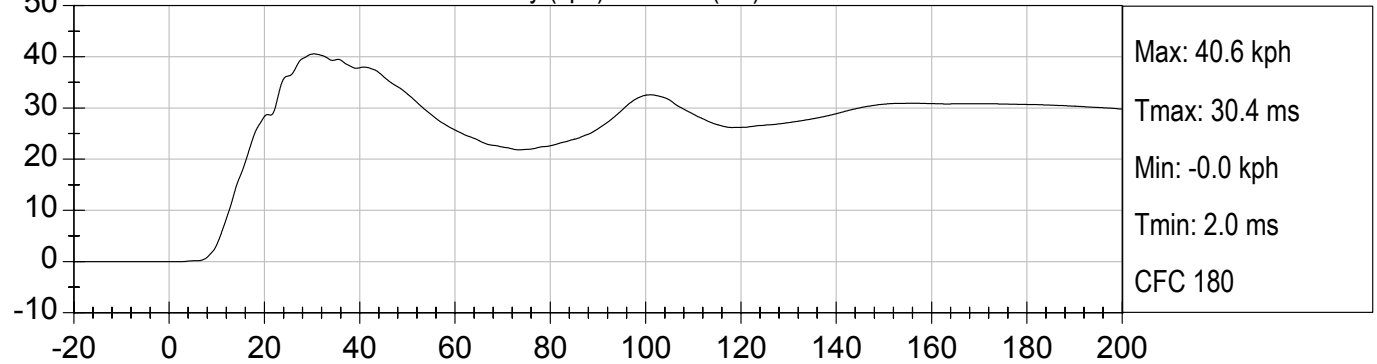
DRIVER LEFT SEAT FRAME Y Velocity (kph) vs TIME (ms)

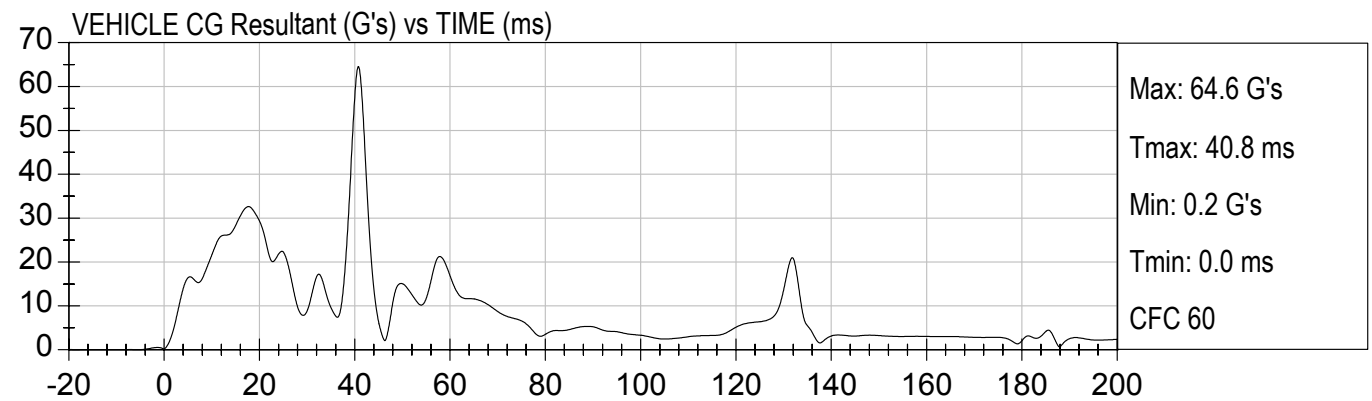
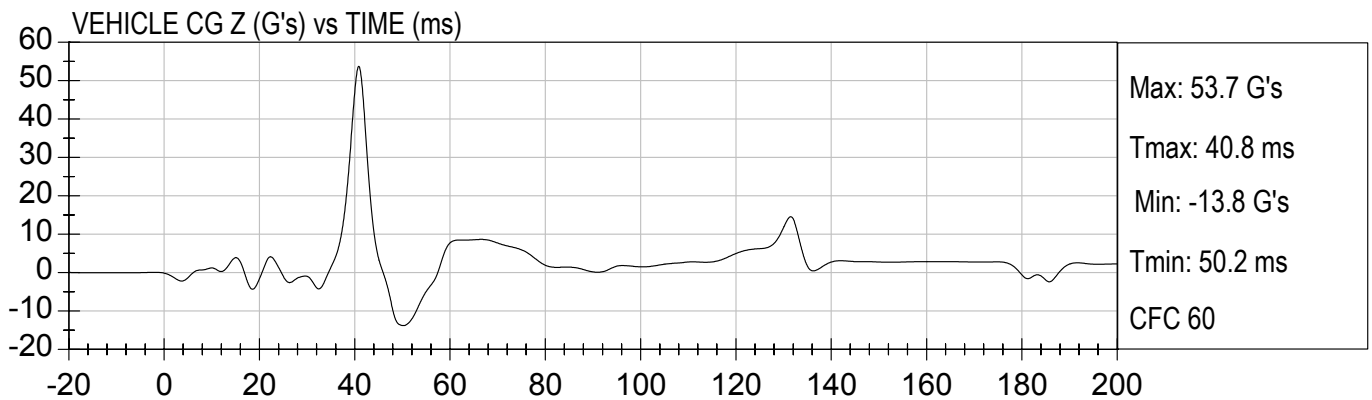
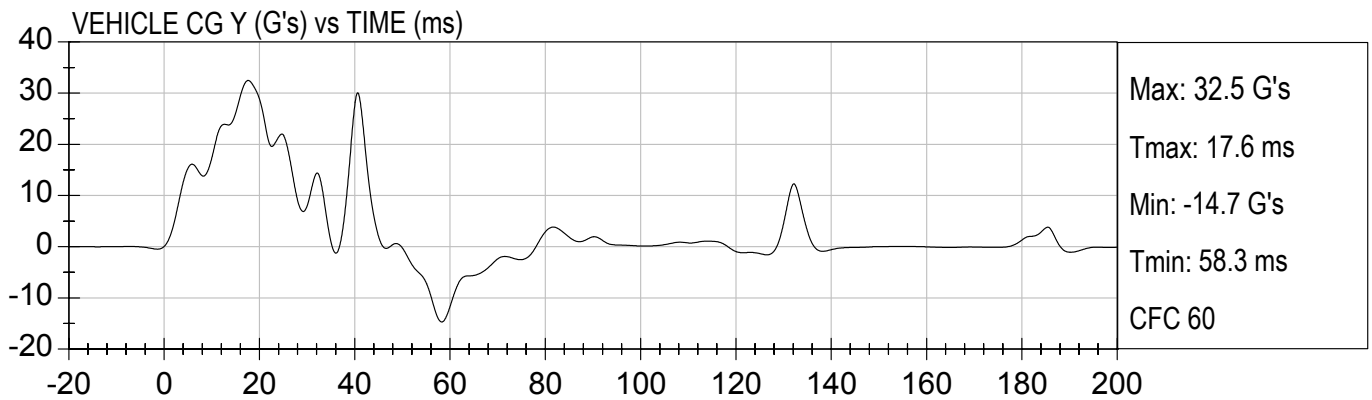
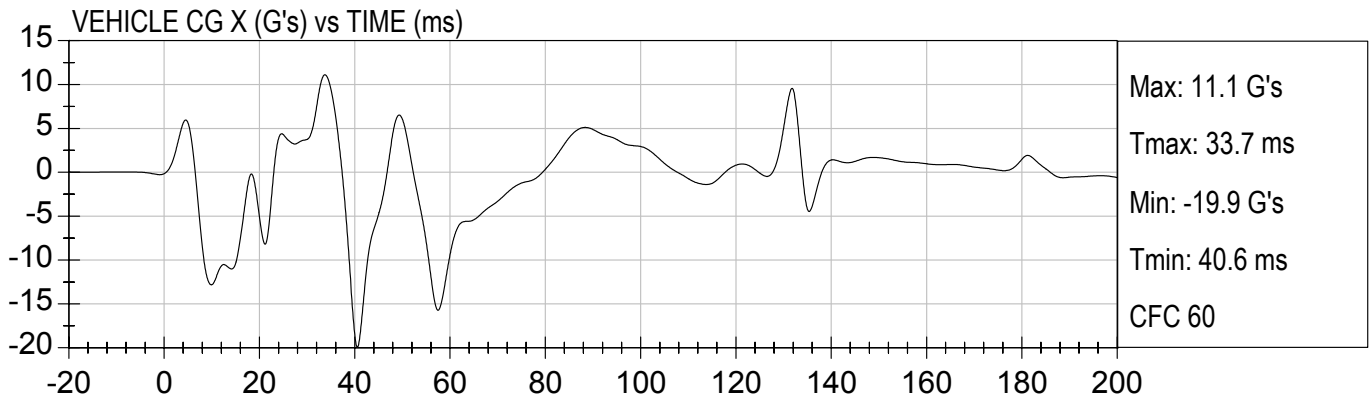


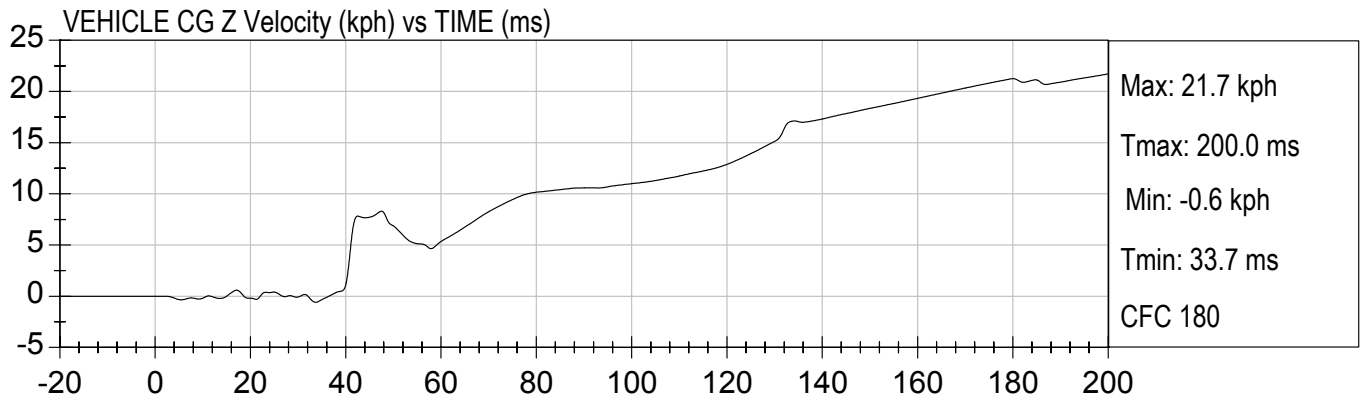
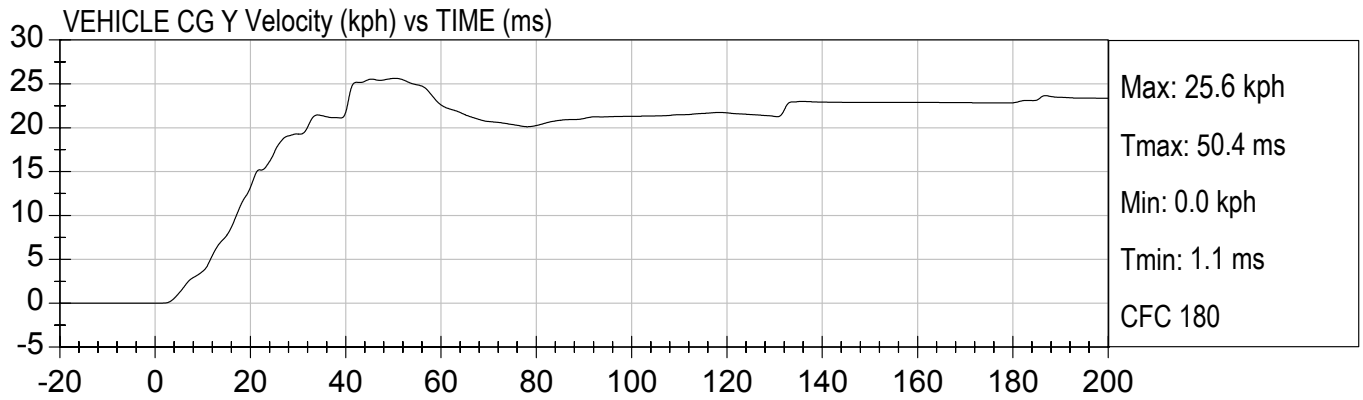
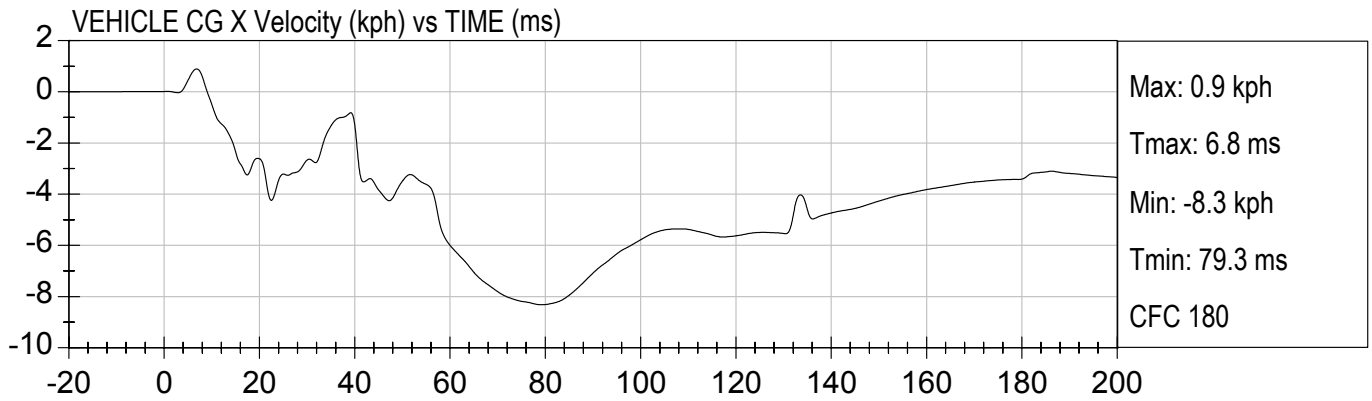
DRIVER RIGHT SEAT FRAME Y (G's) vs TIME (ms)

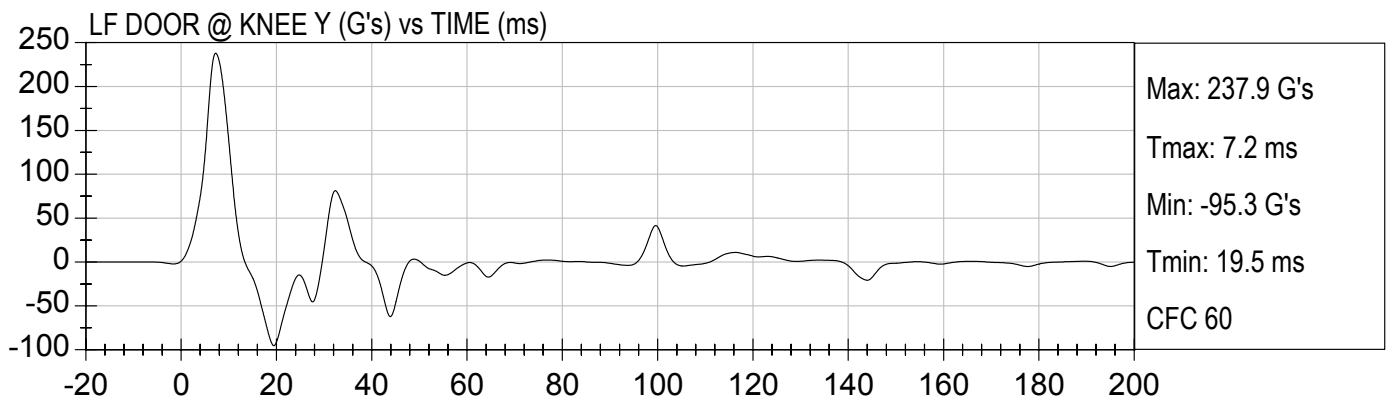
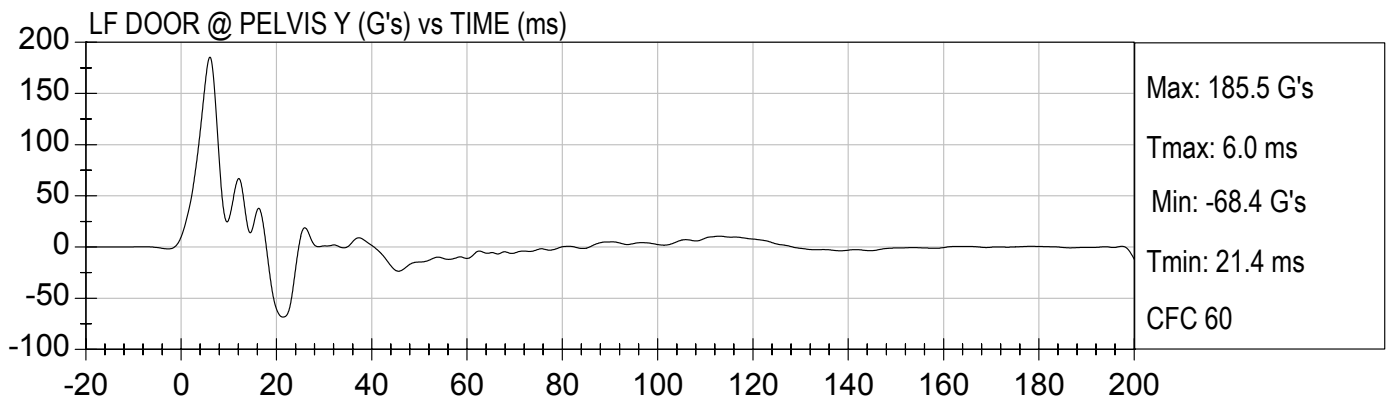
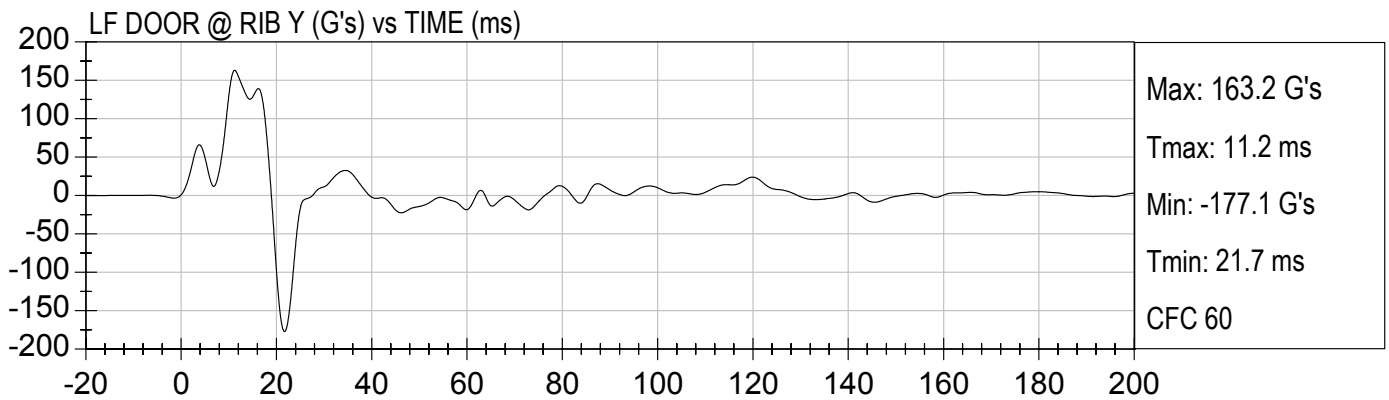
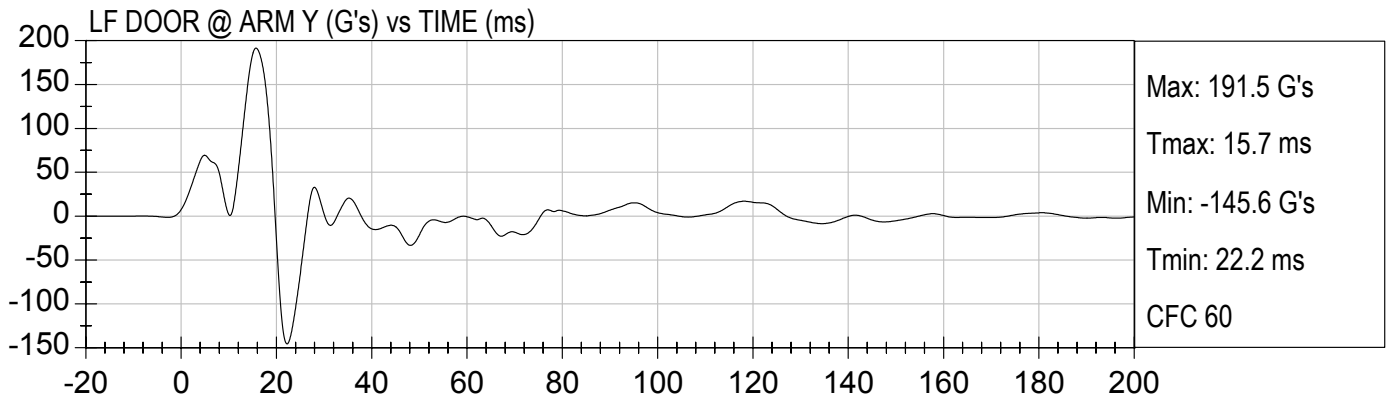


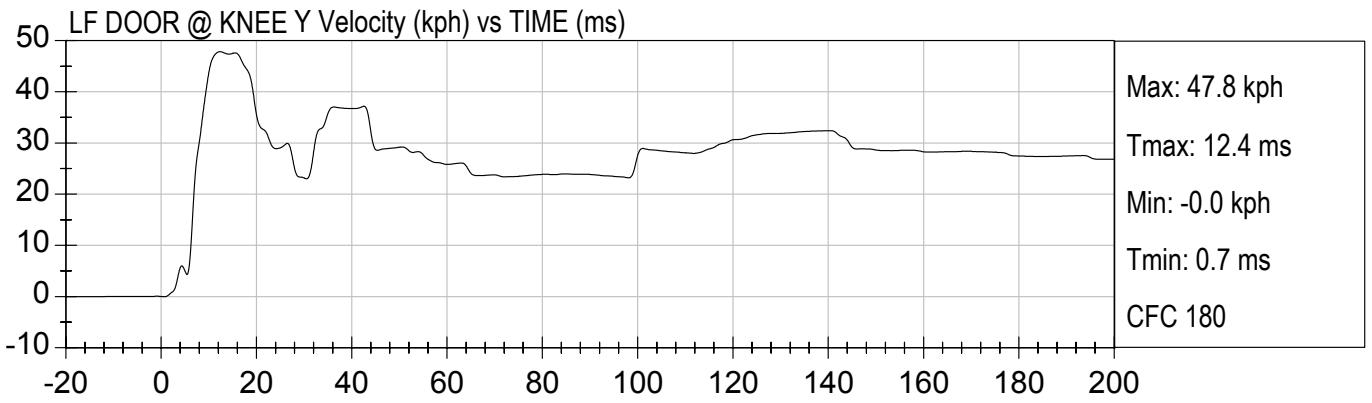
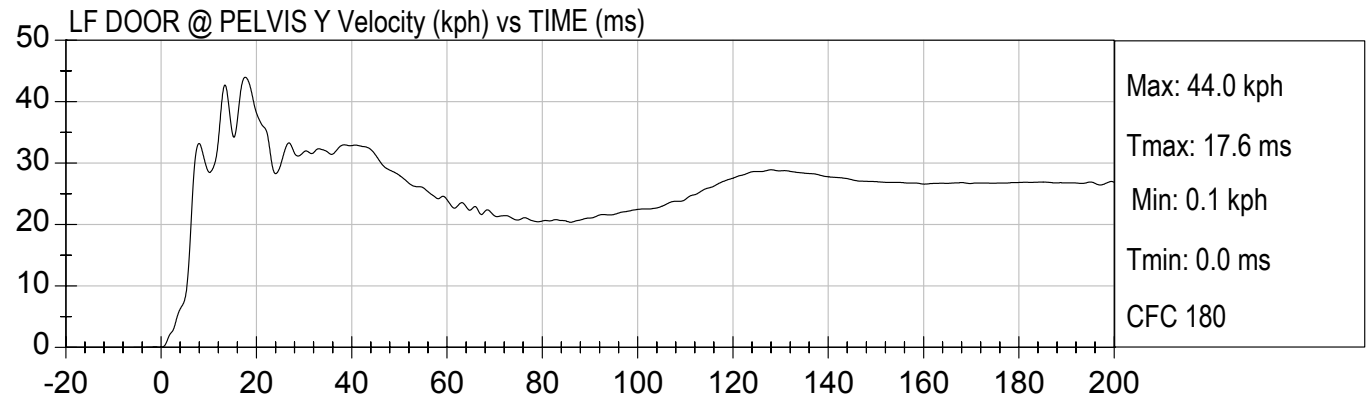
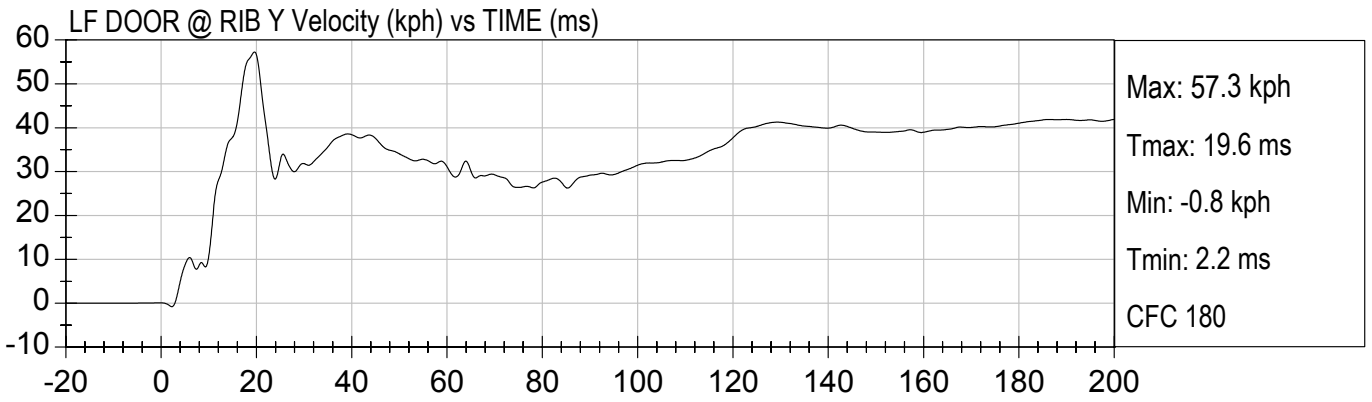
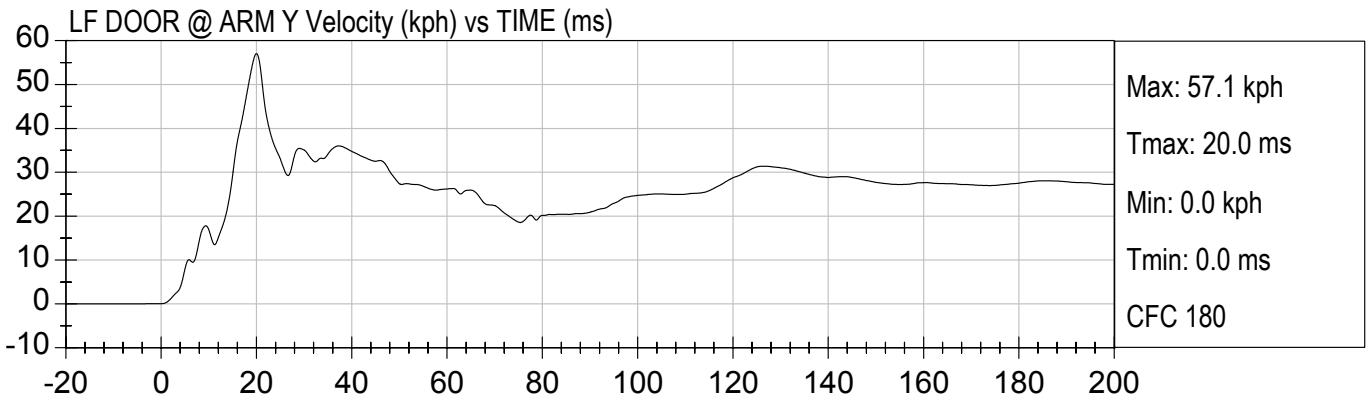
DRIVER RIGHT SEAT FRAME Y Velocity (kph) vs TIME (ms)

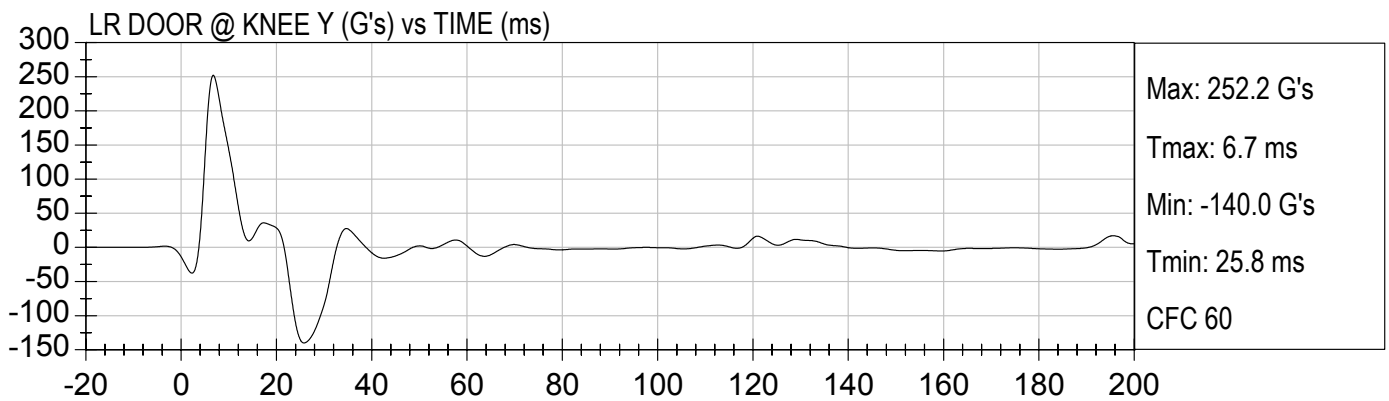
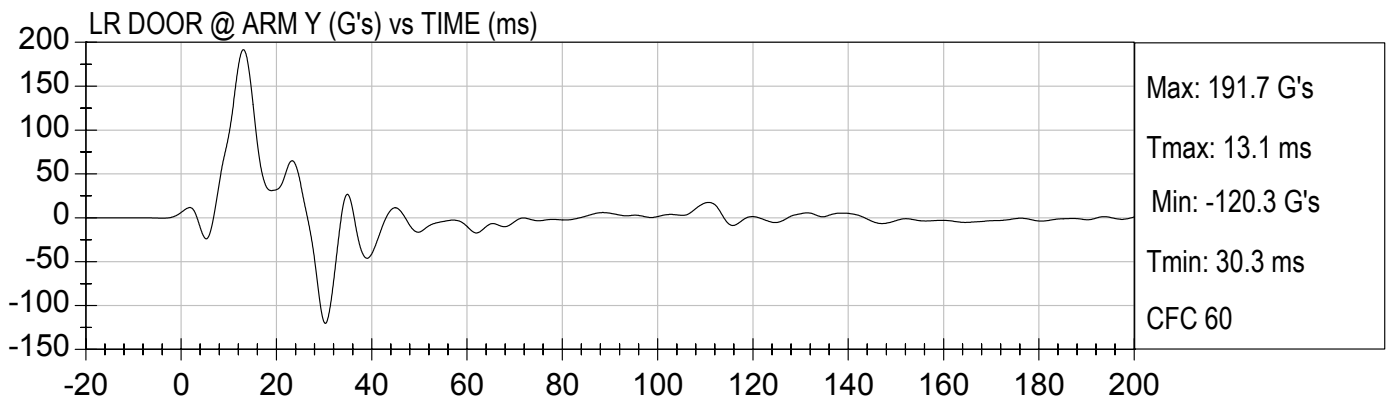
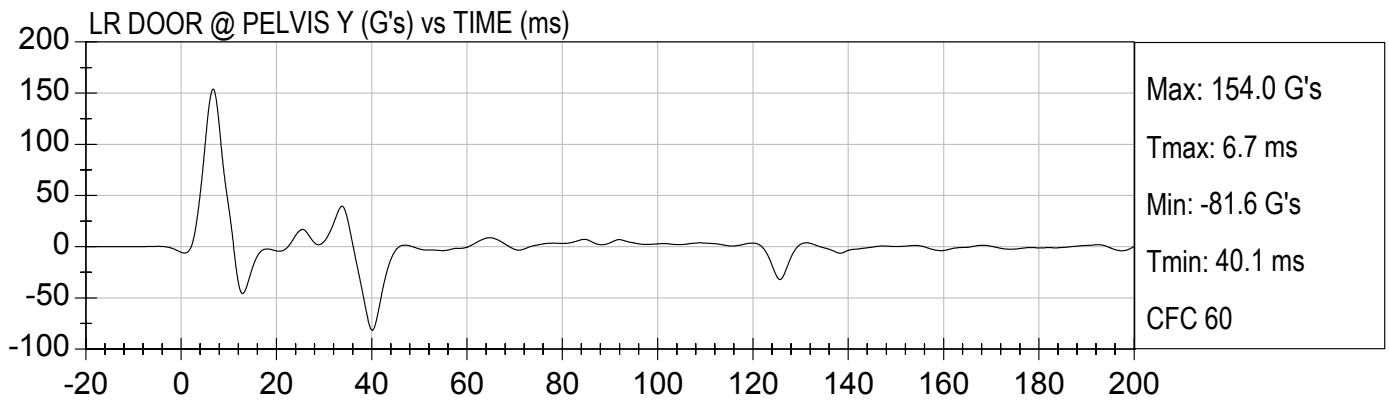
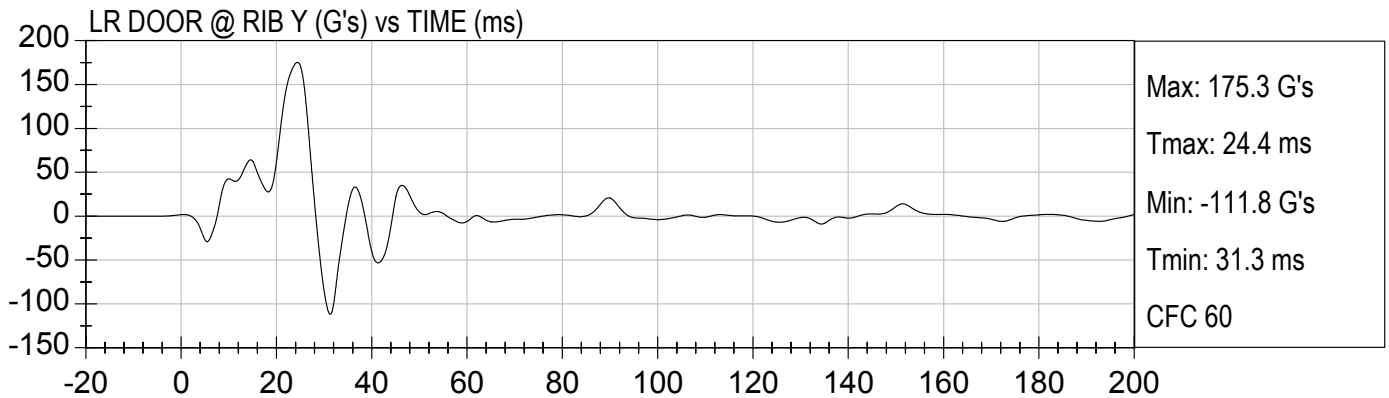


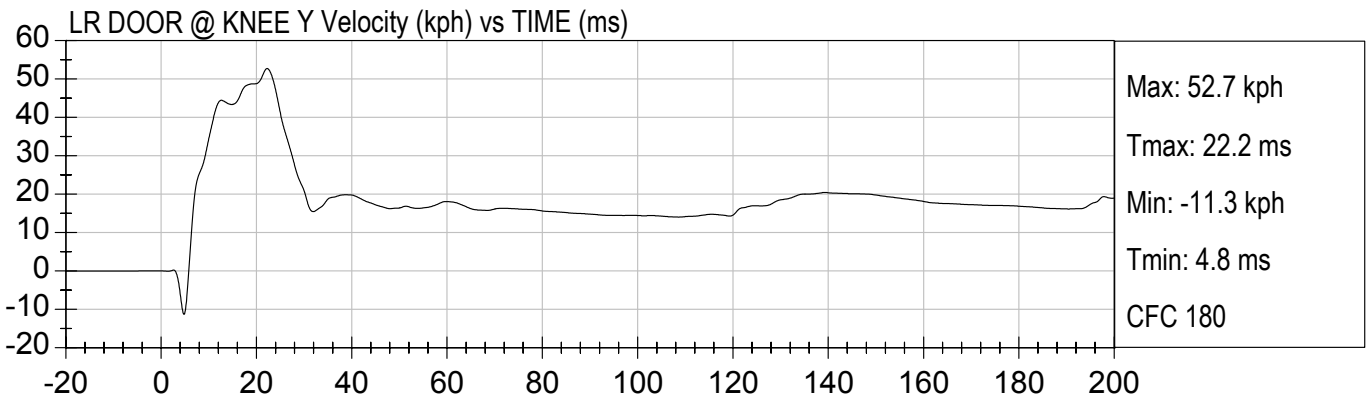
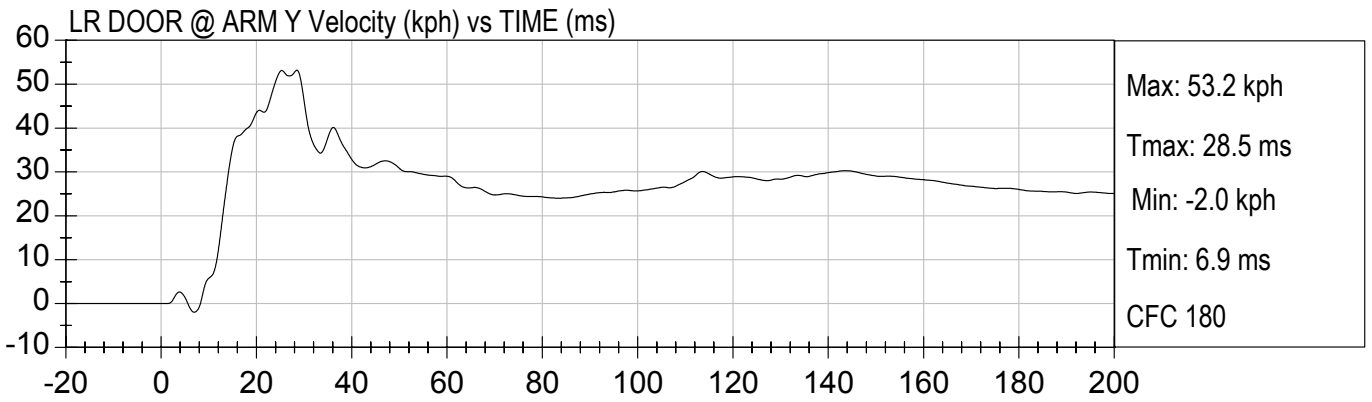
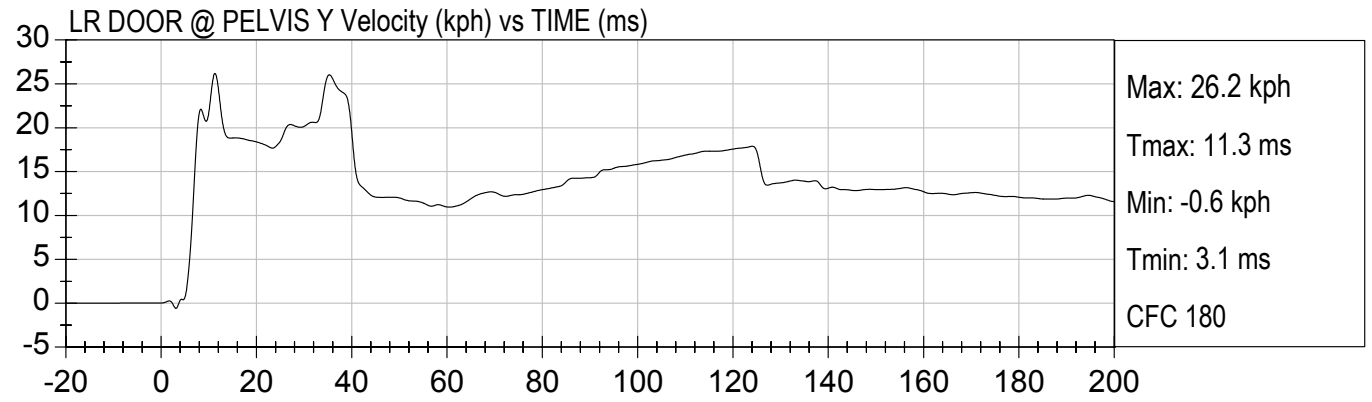
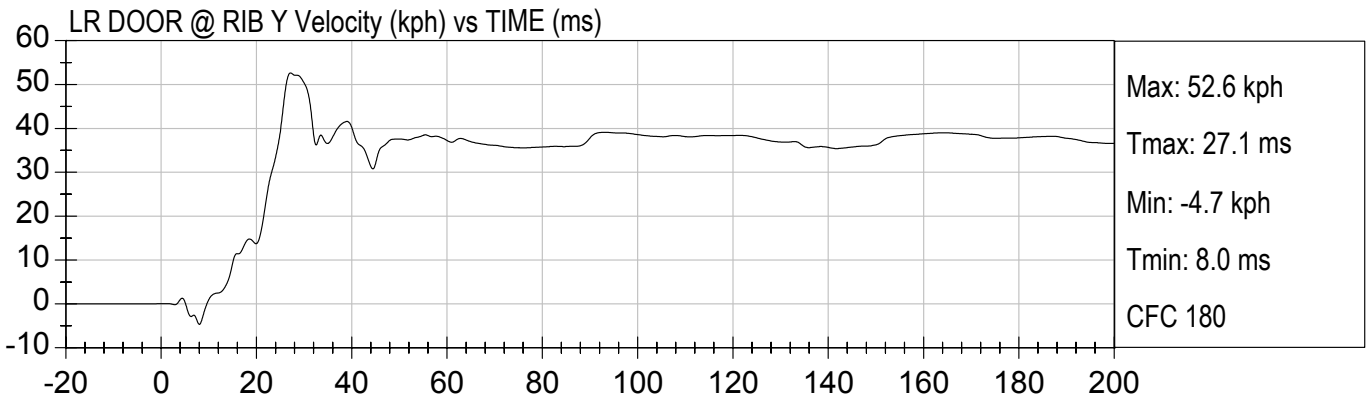


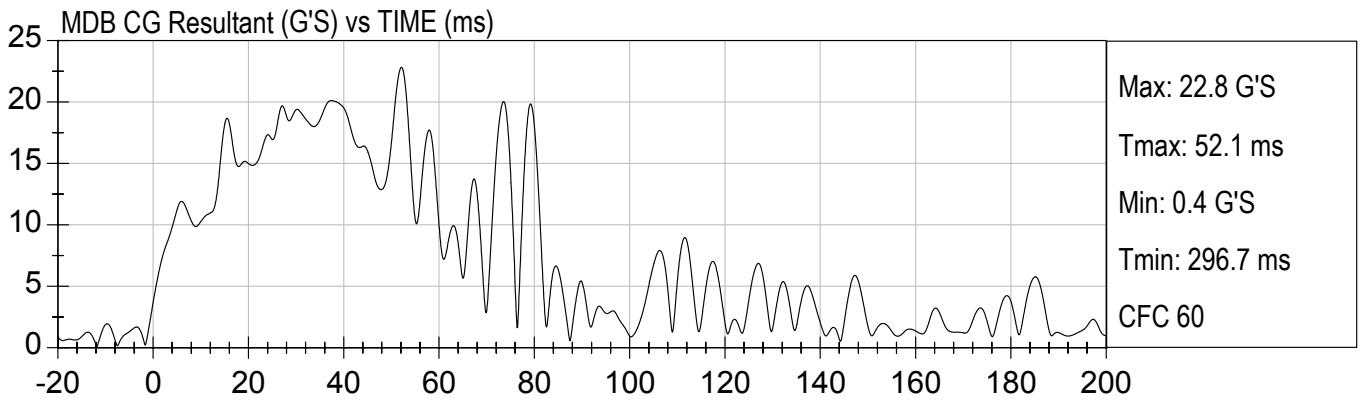
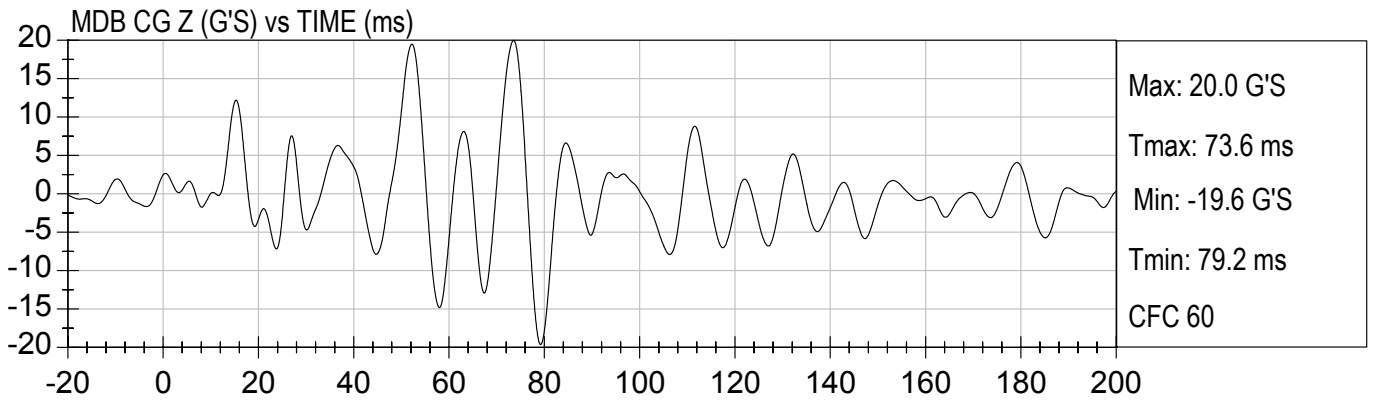
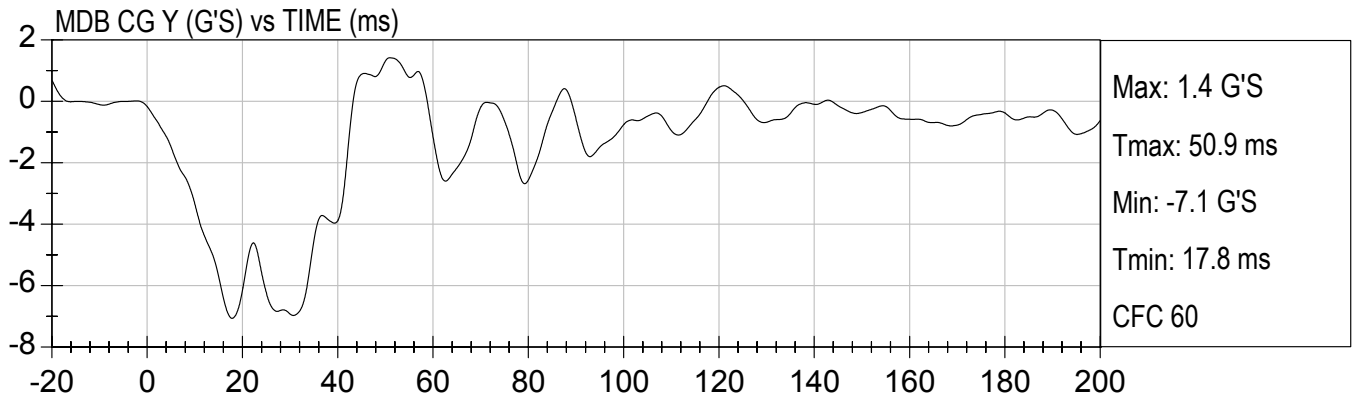
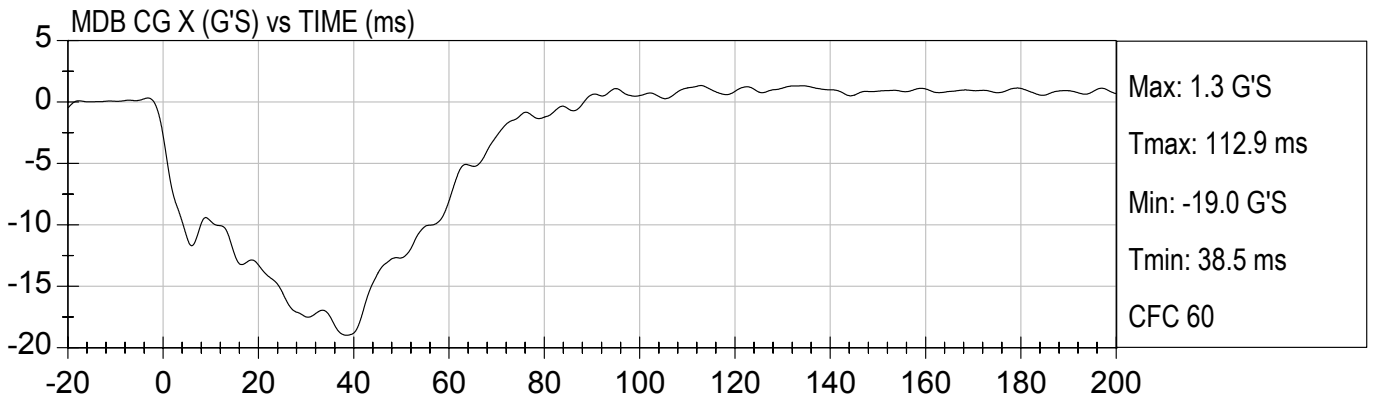






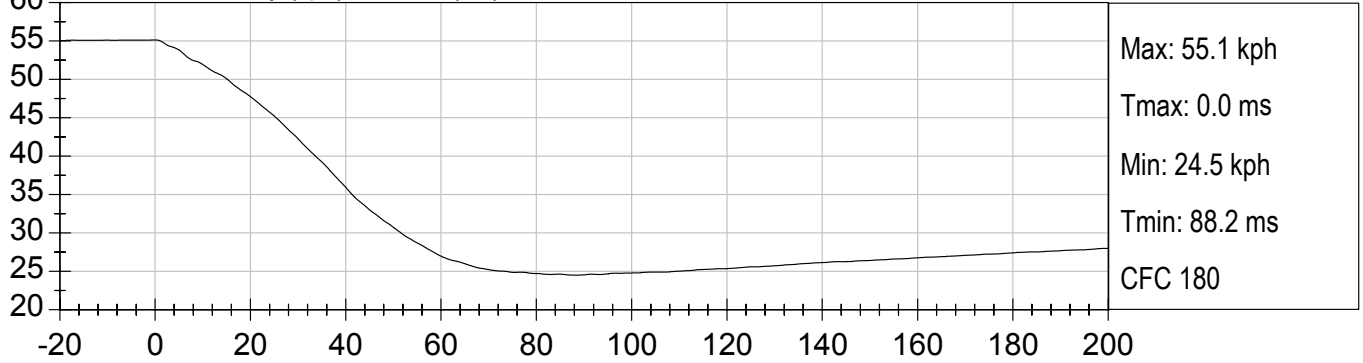




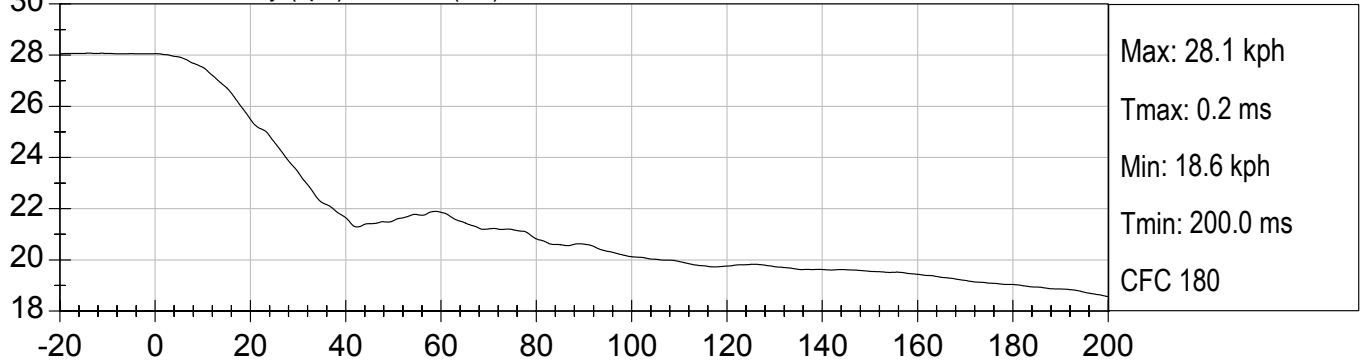




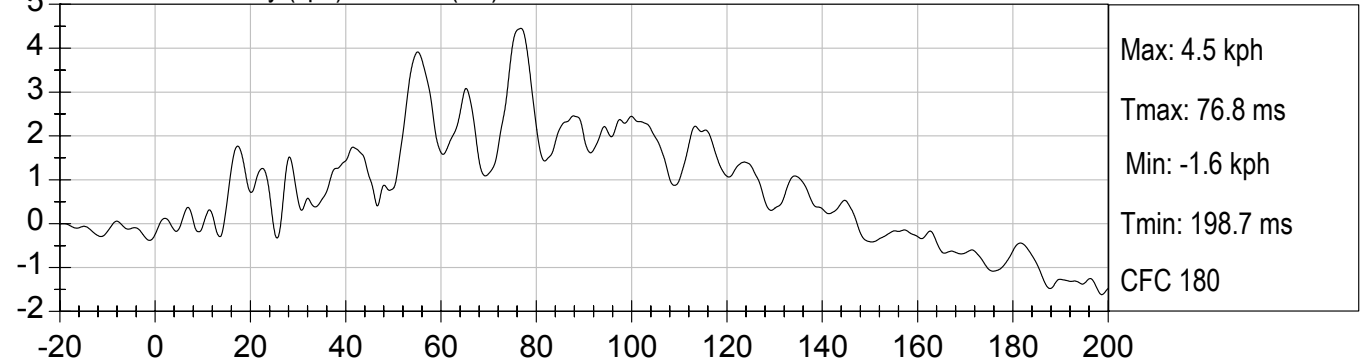
MDB CG X Velocity (kph) vs TIME (ms)

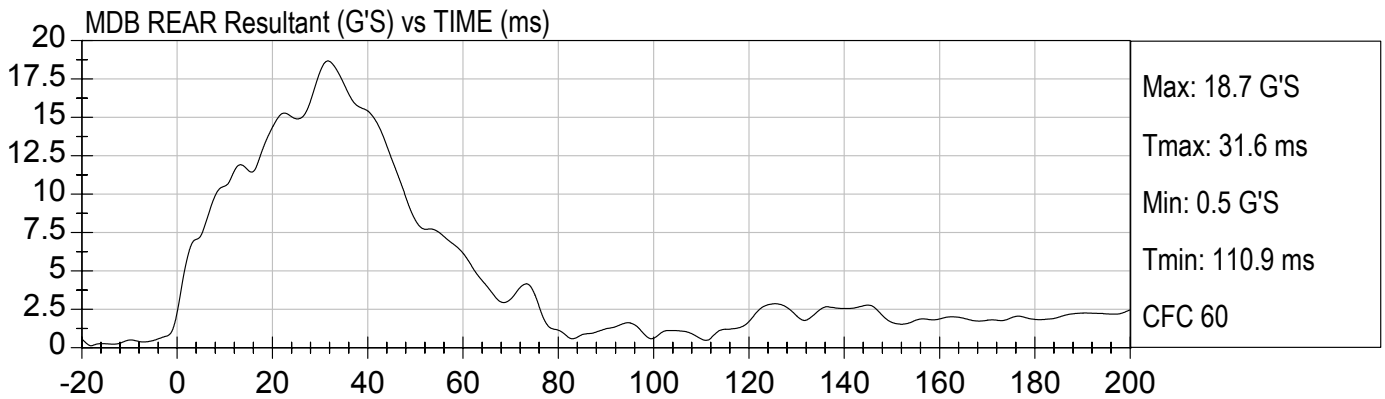
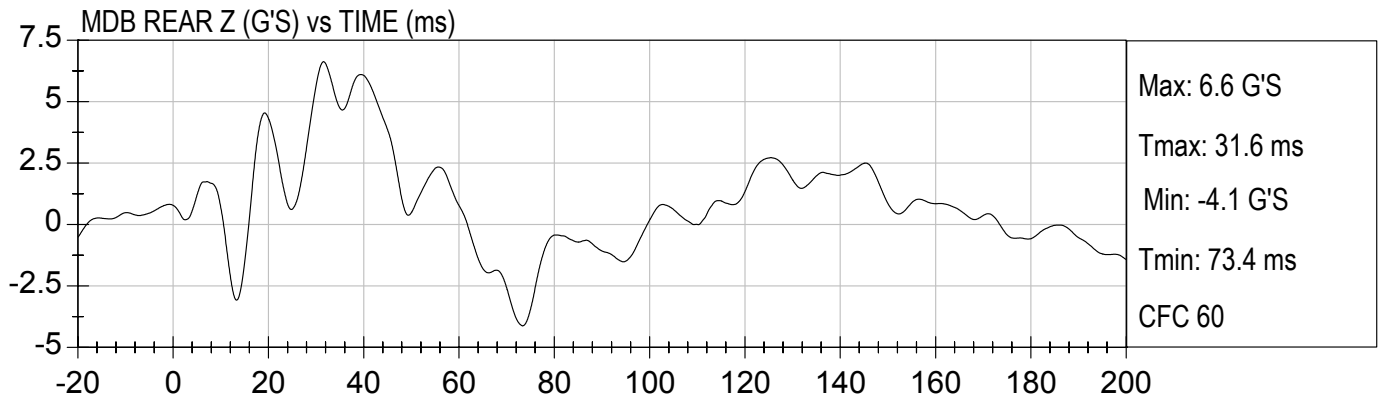
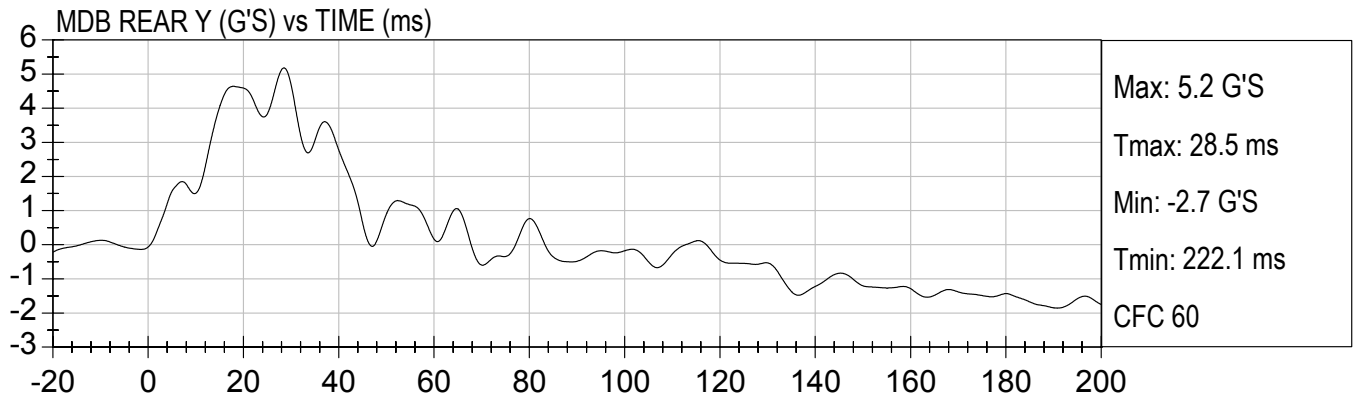
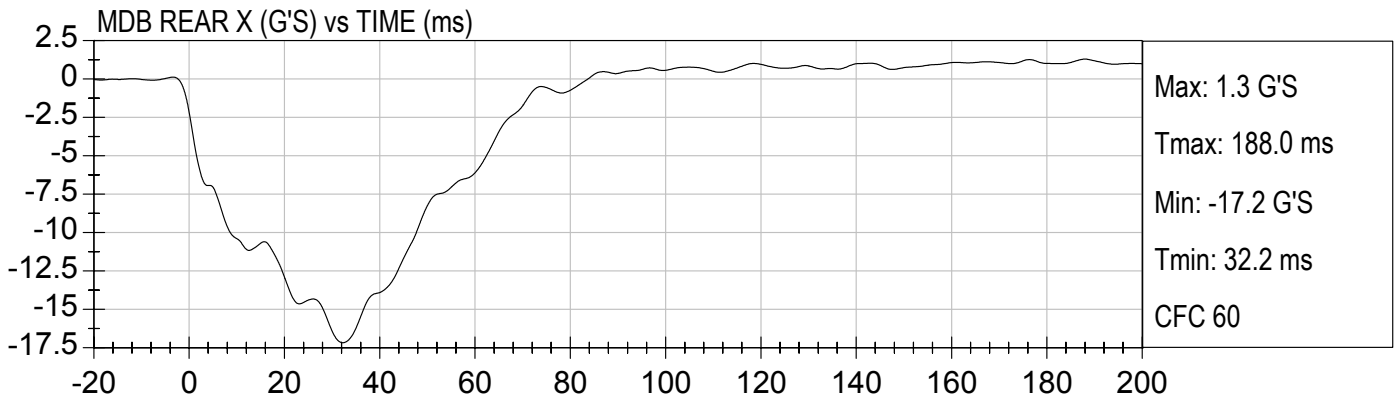


MDB CG Y Velocity (kph) vs TIME (ms)



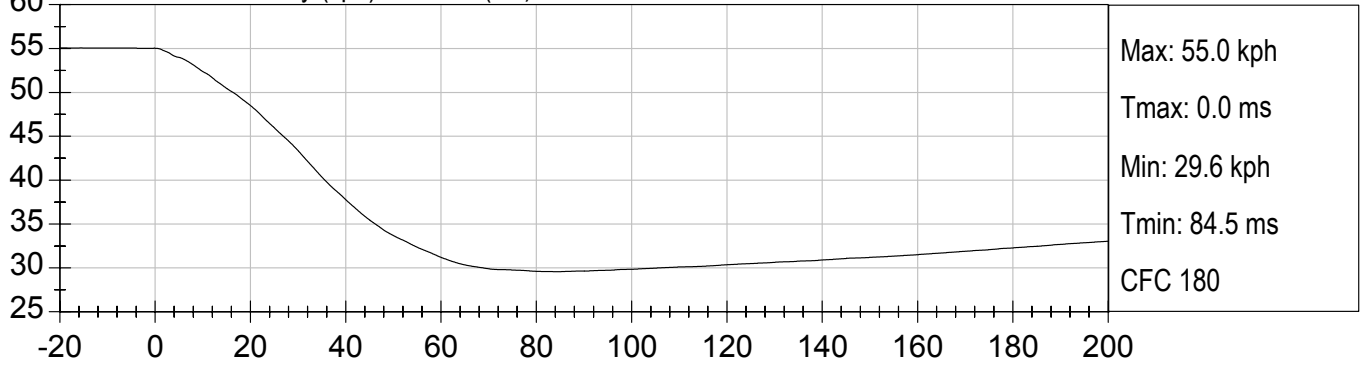
MDB CG Z Velocity (kph) vs TIME (ms)



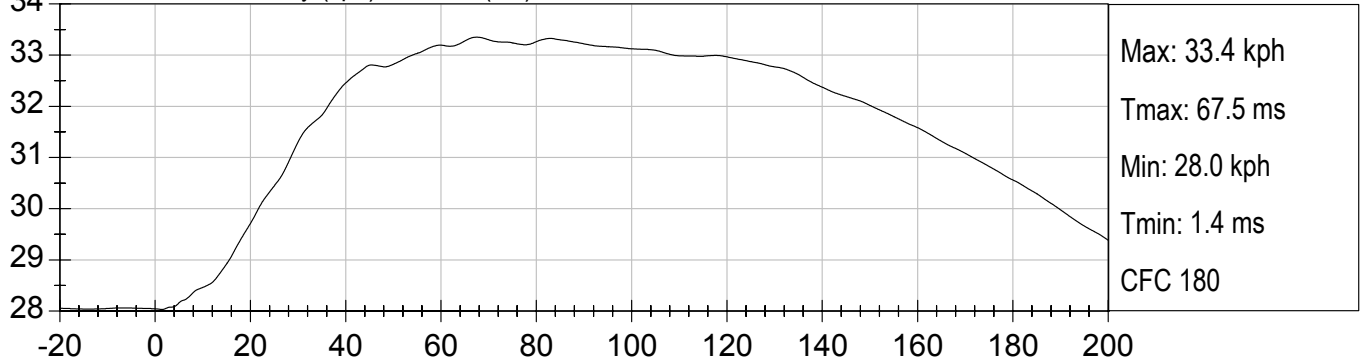




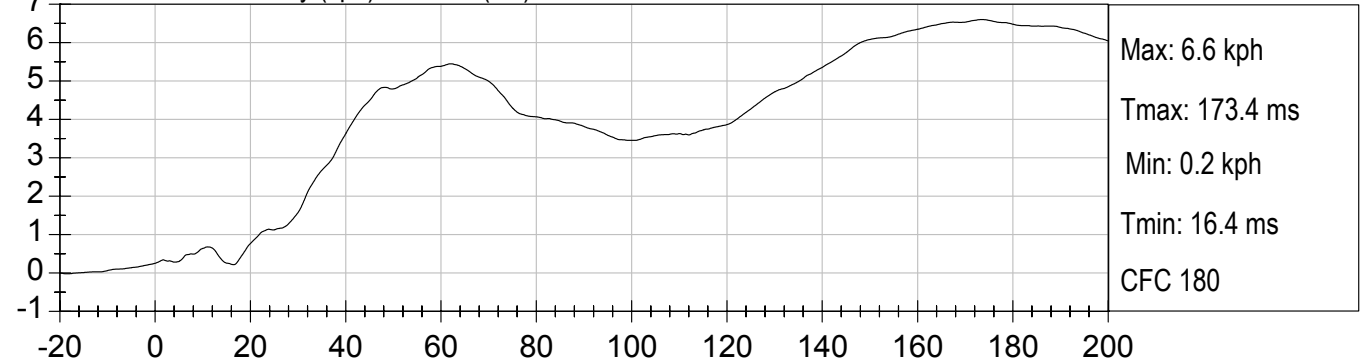
MDB REAR X Velocity (kph) vs TIME (ms)

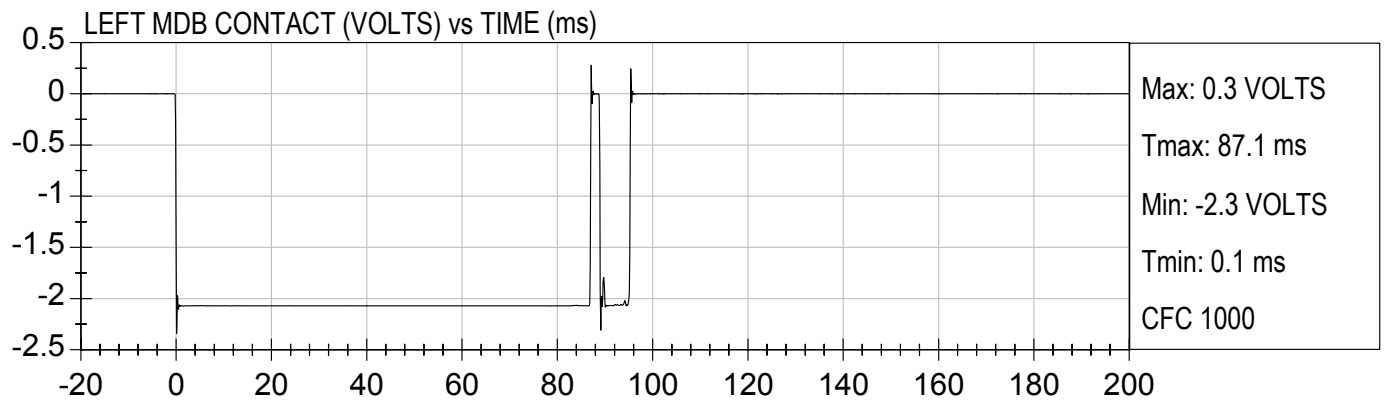


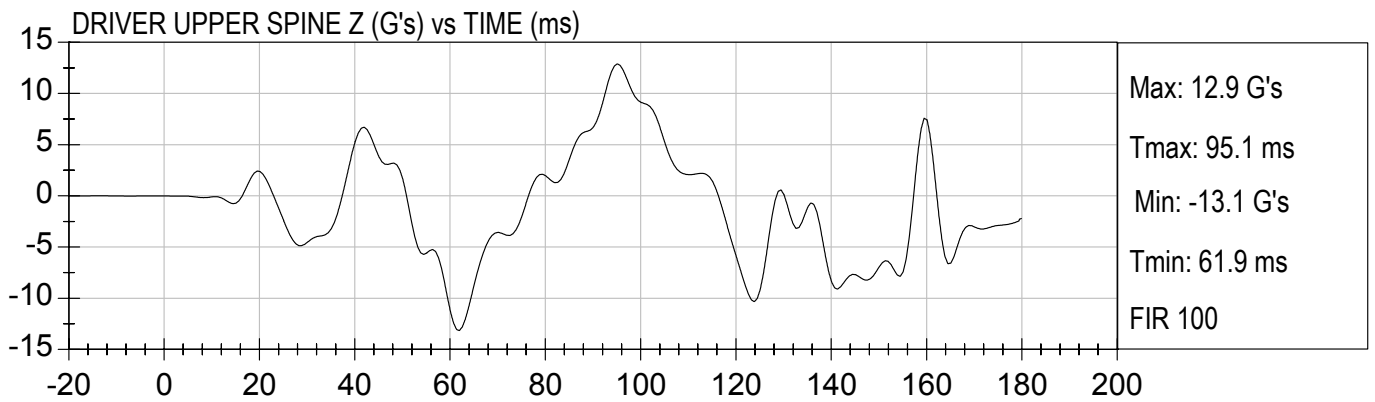
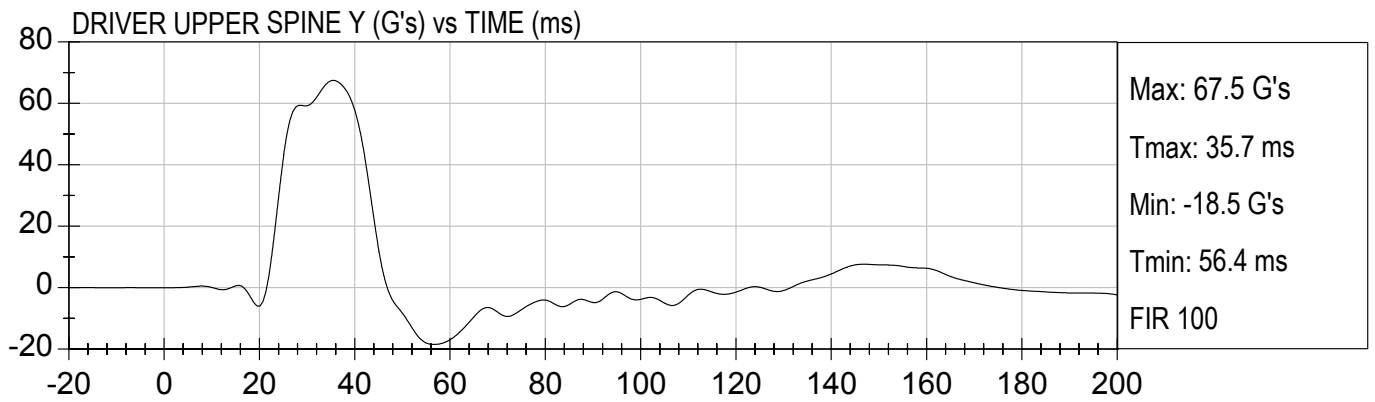
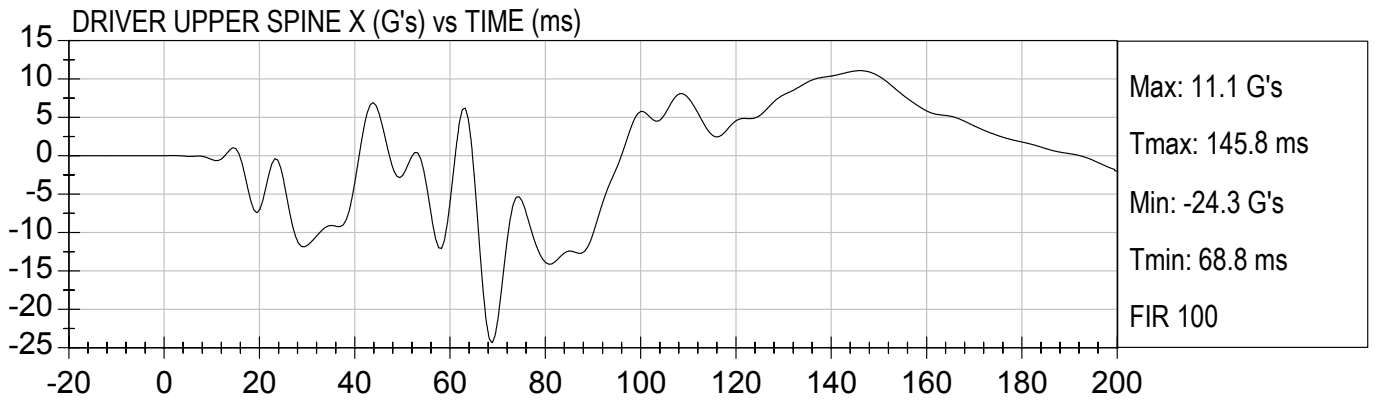
MDB REAR Y Velocity (kph) vs TIME (ms)

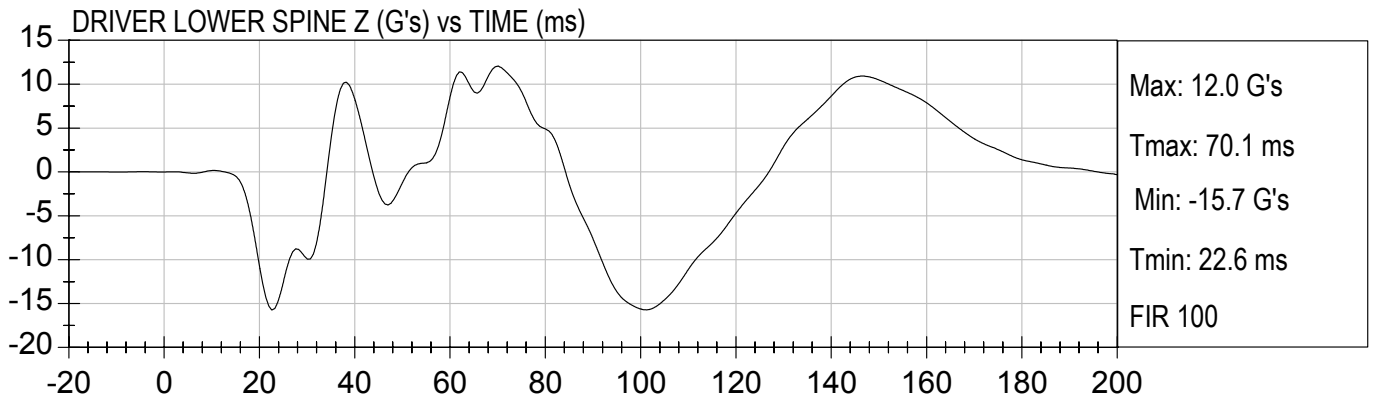
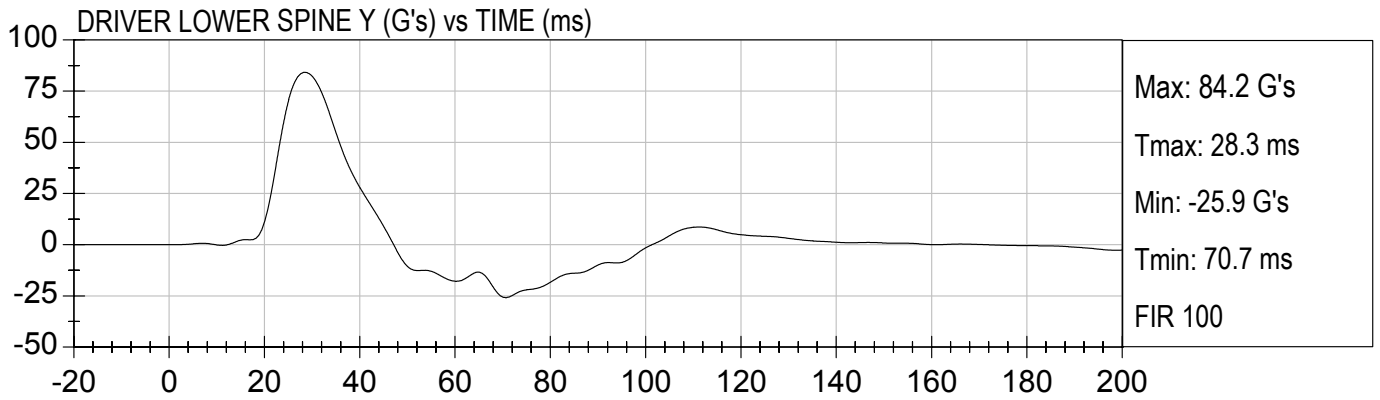
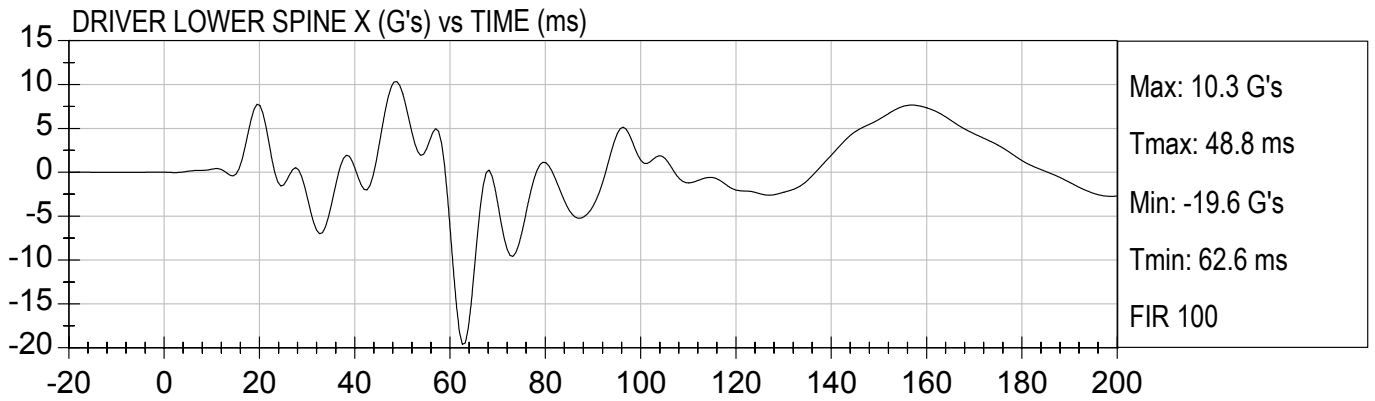


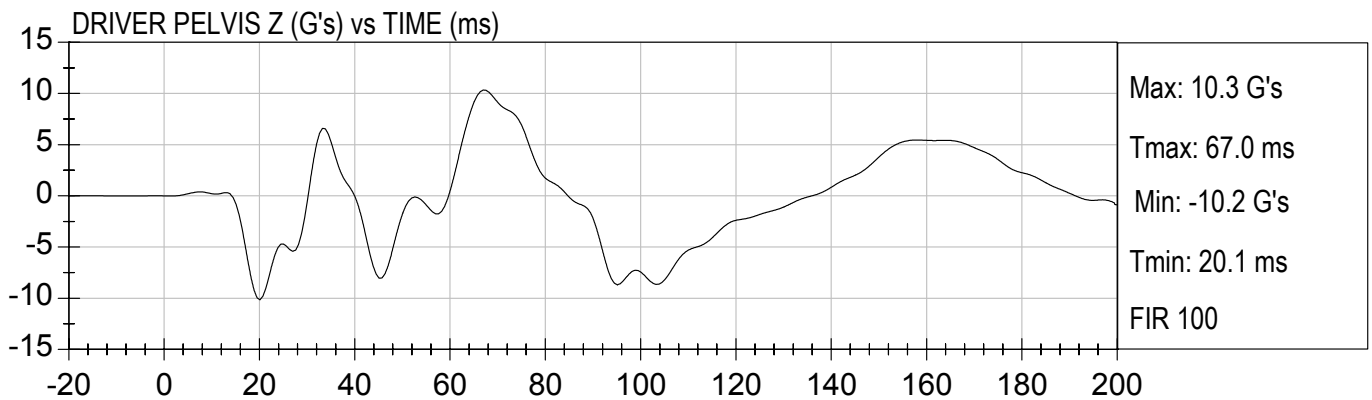
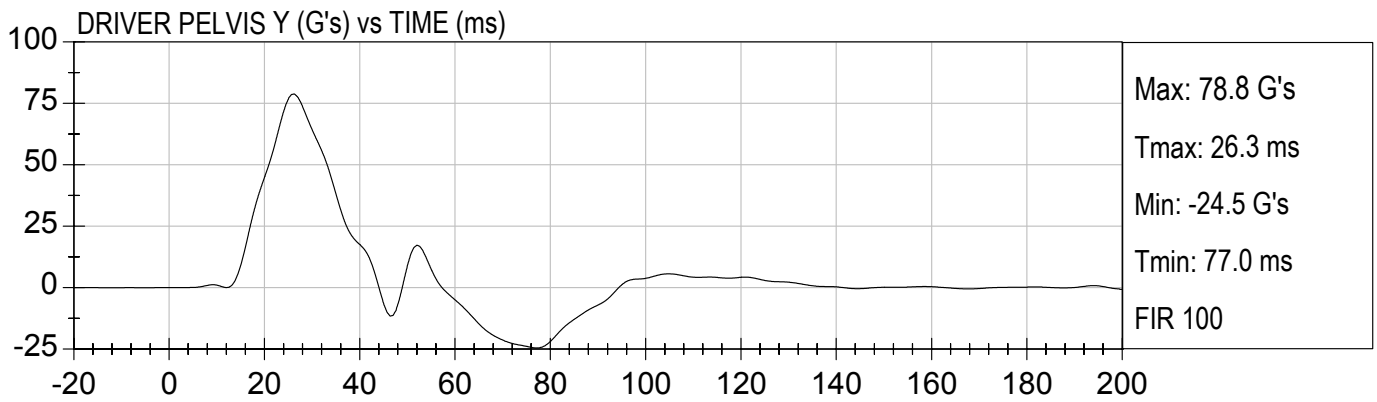
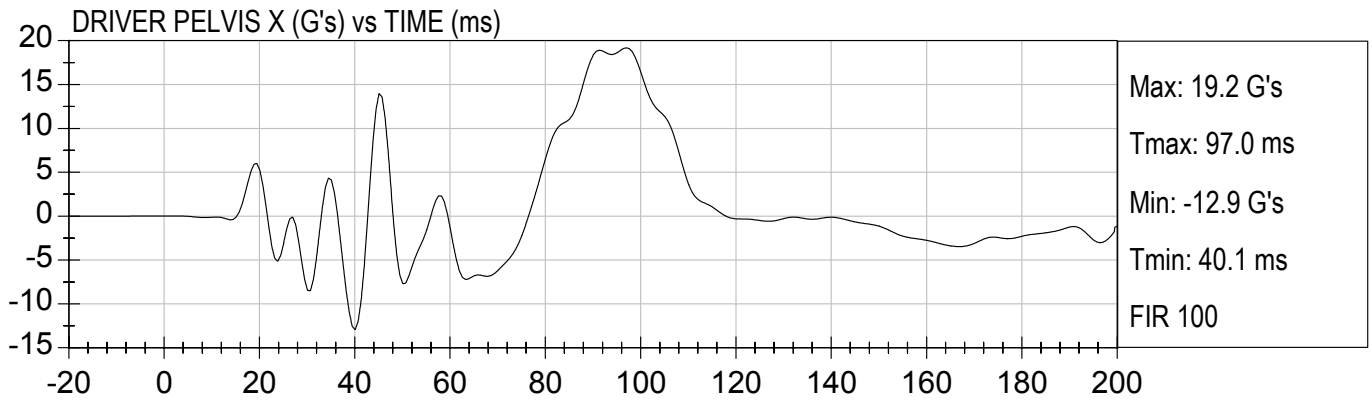
MDB REAR Z Velocity (kph) vs TIME (ms)

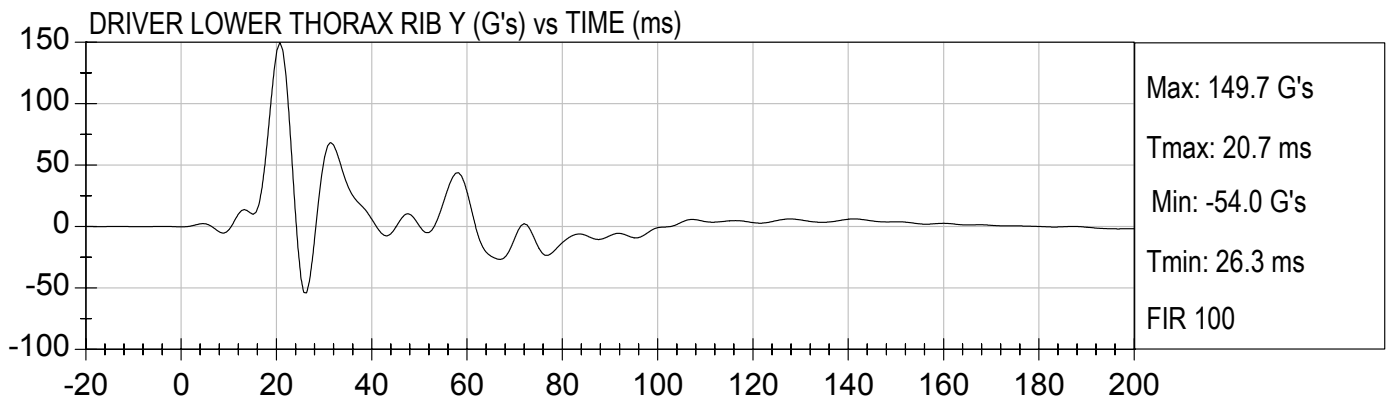
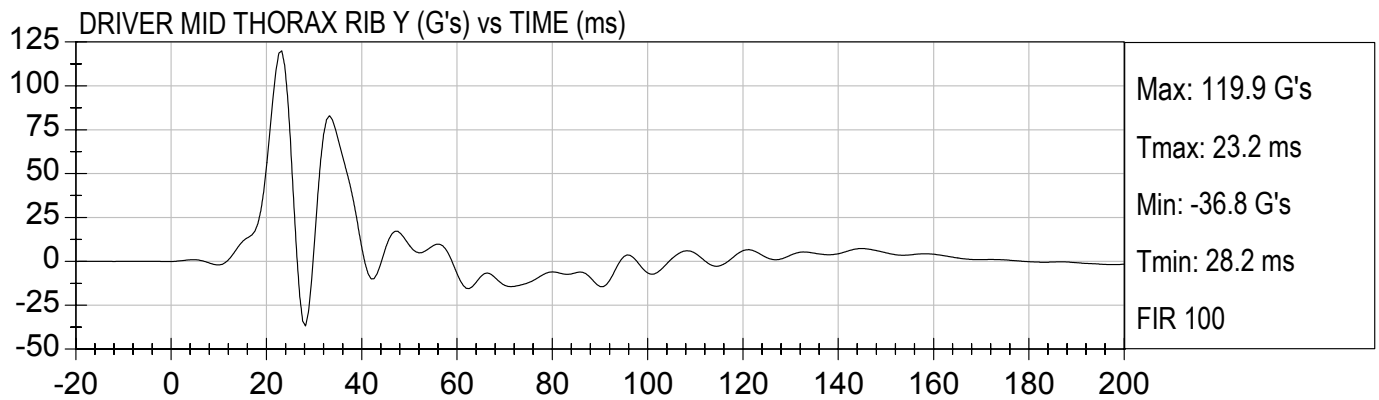
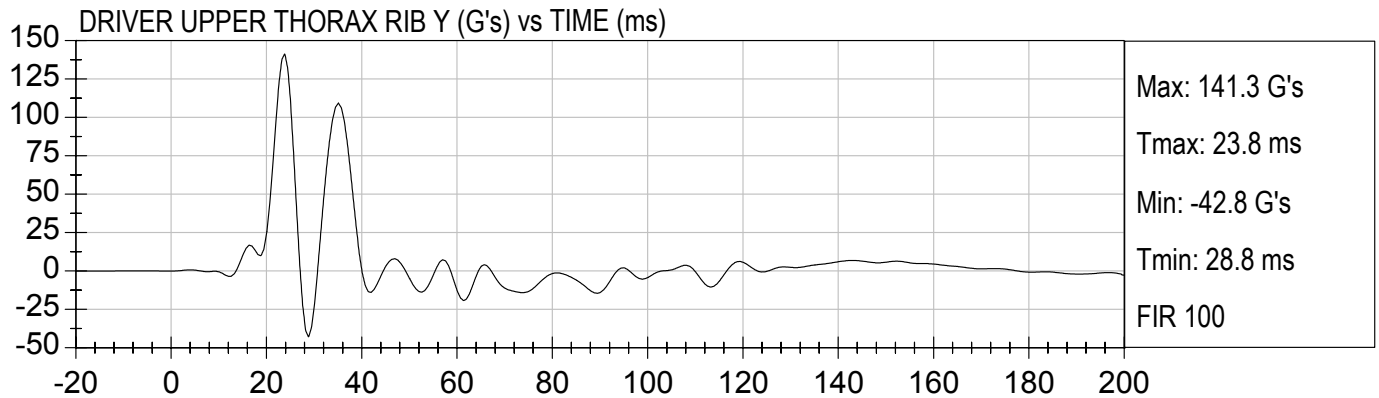


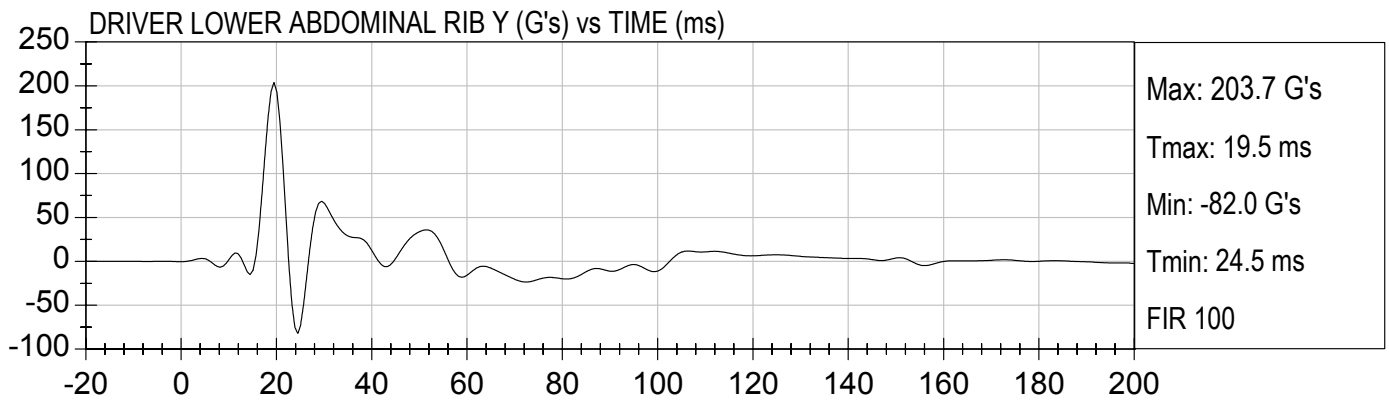
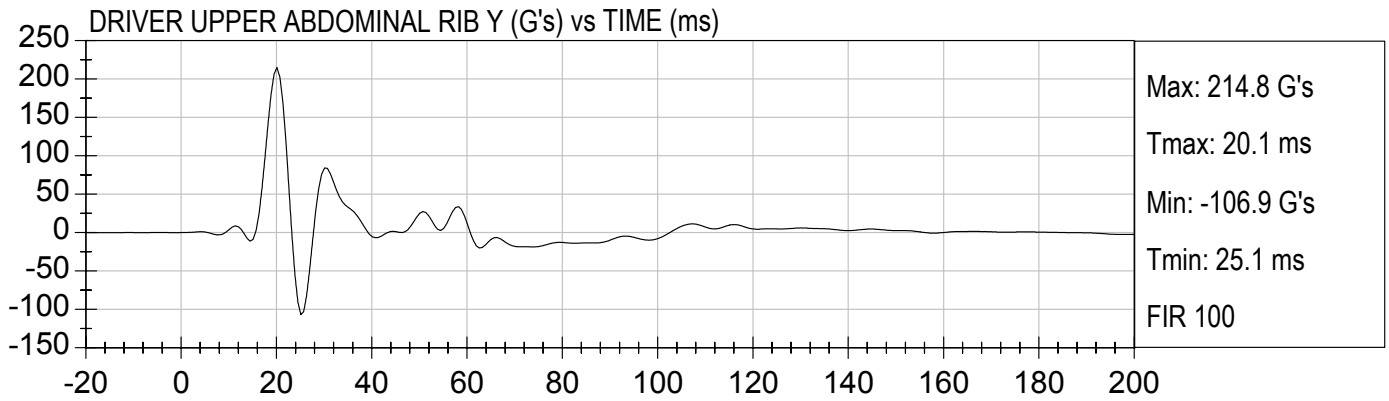


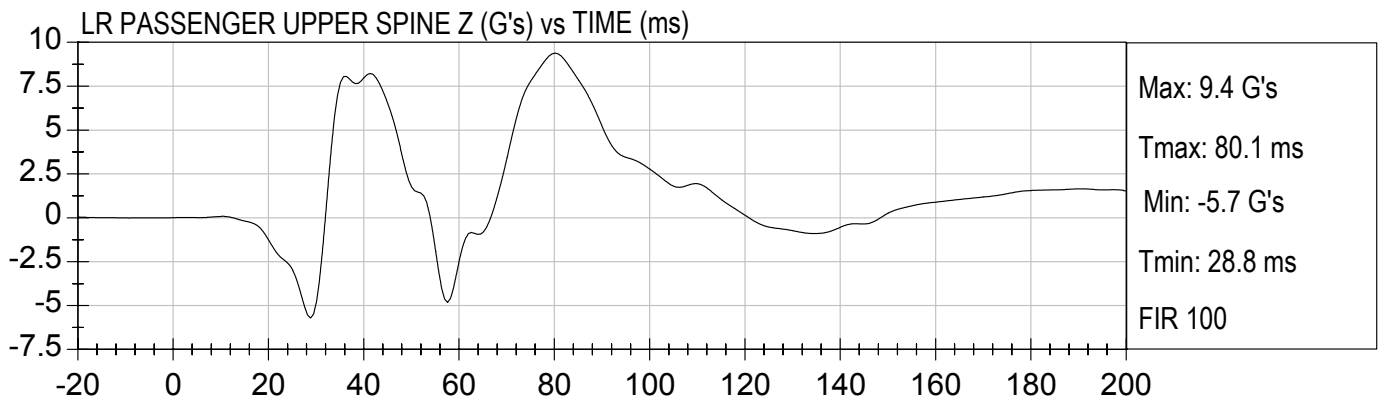
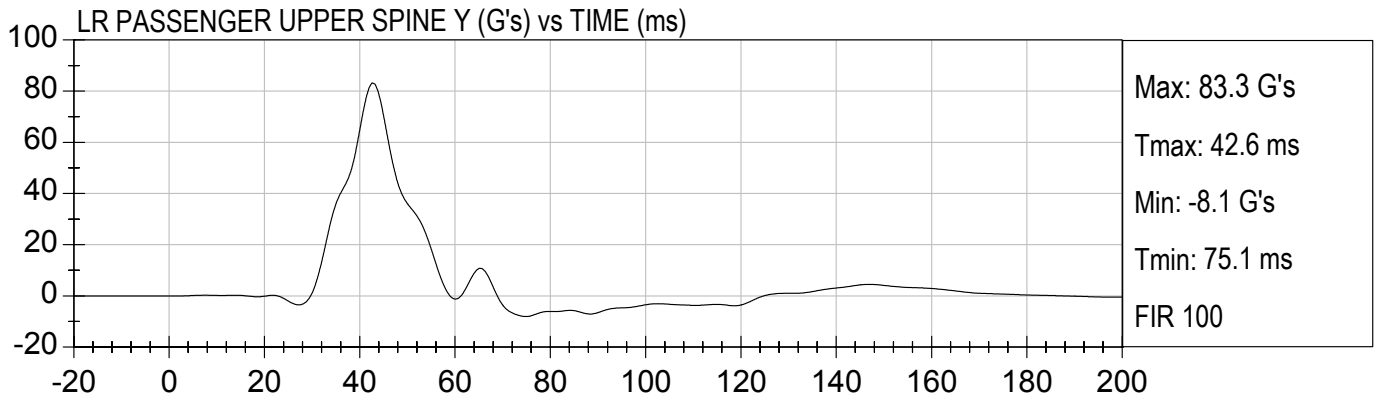
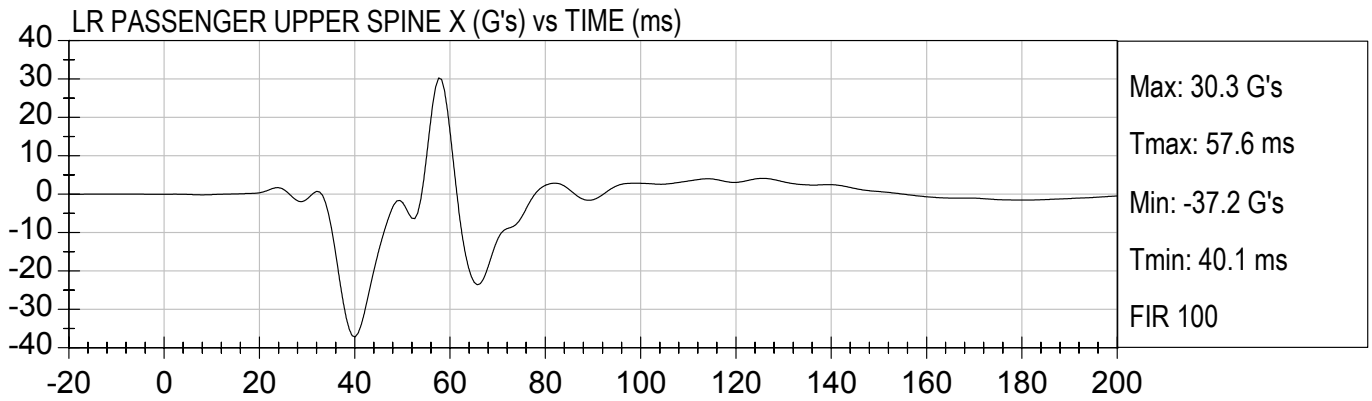


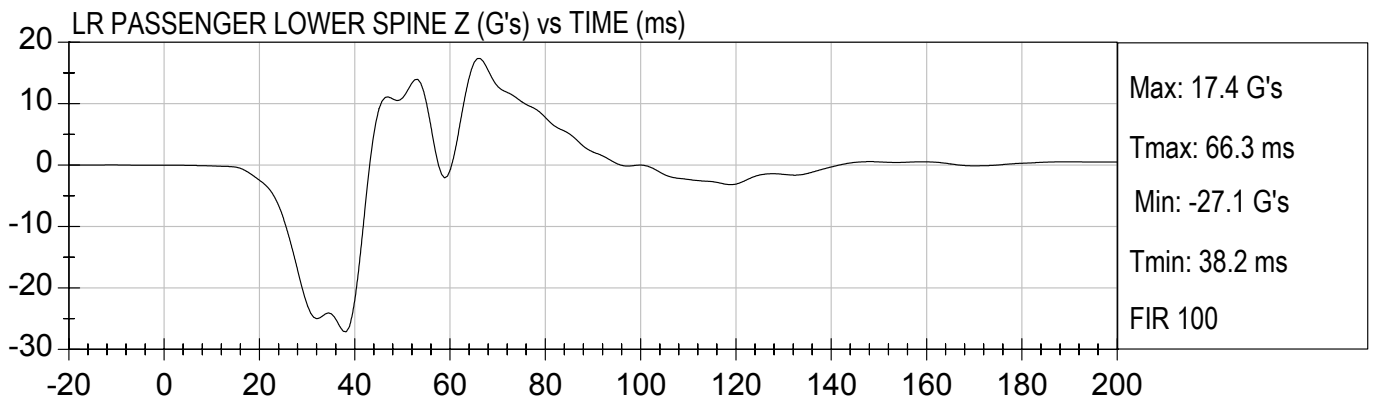
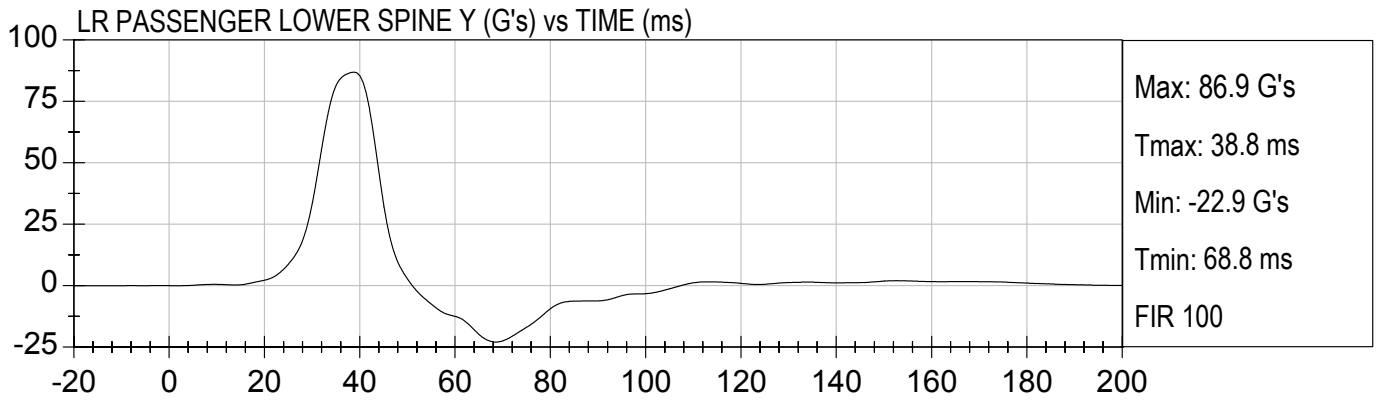
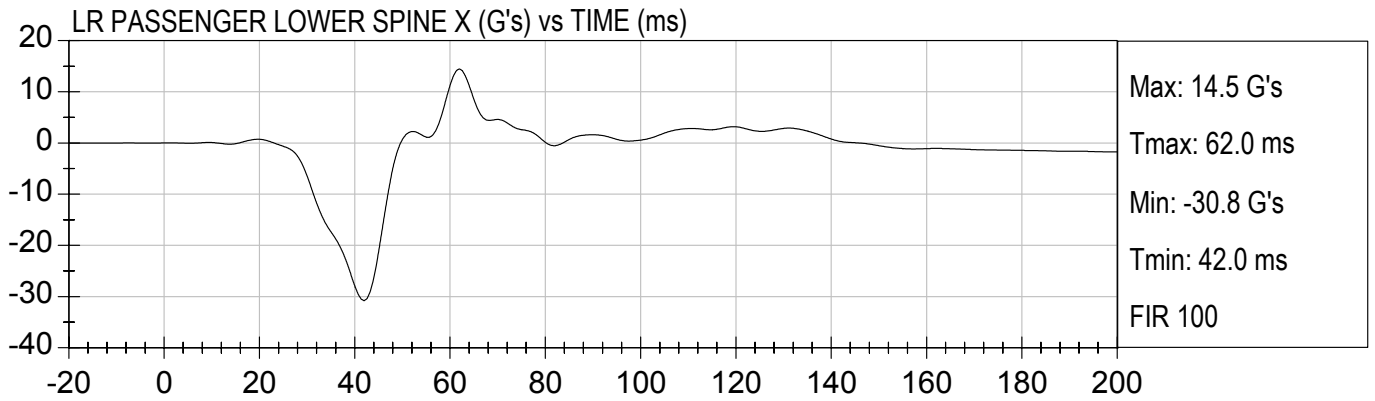


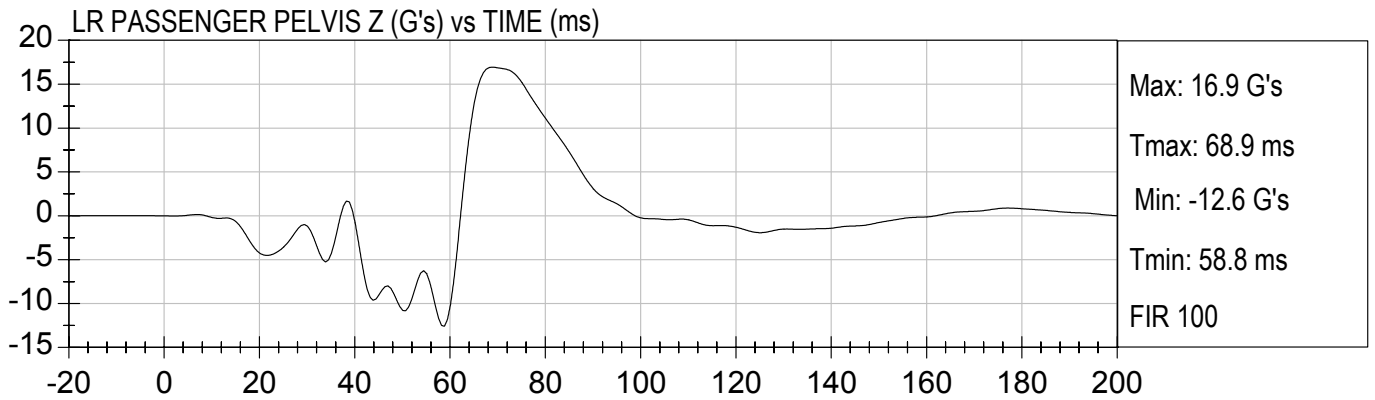
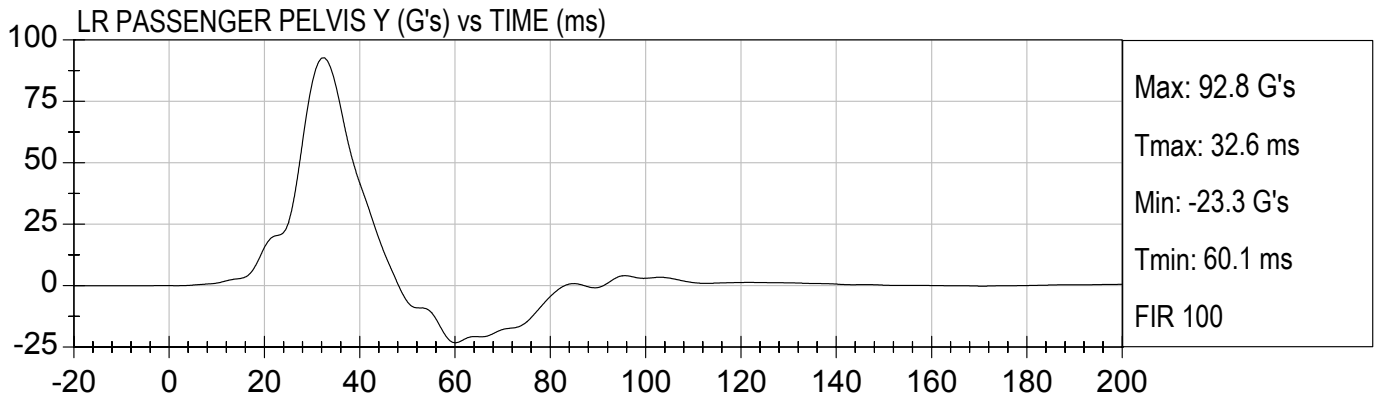
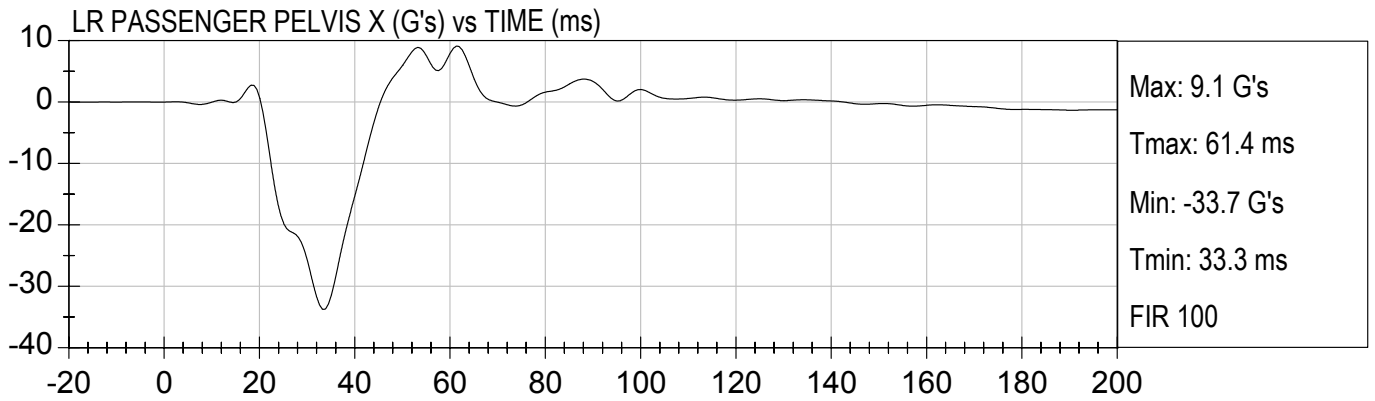


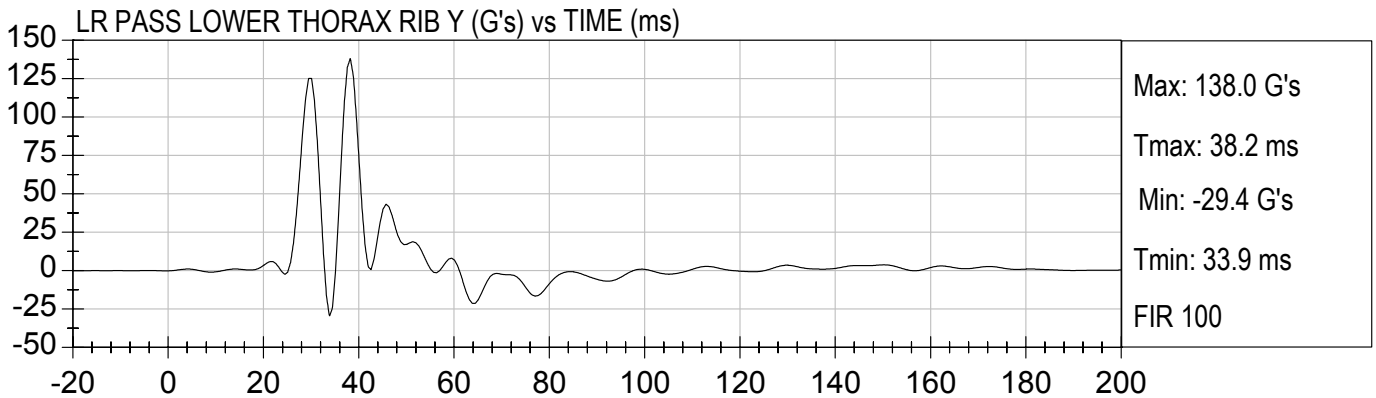
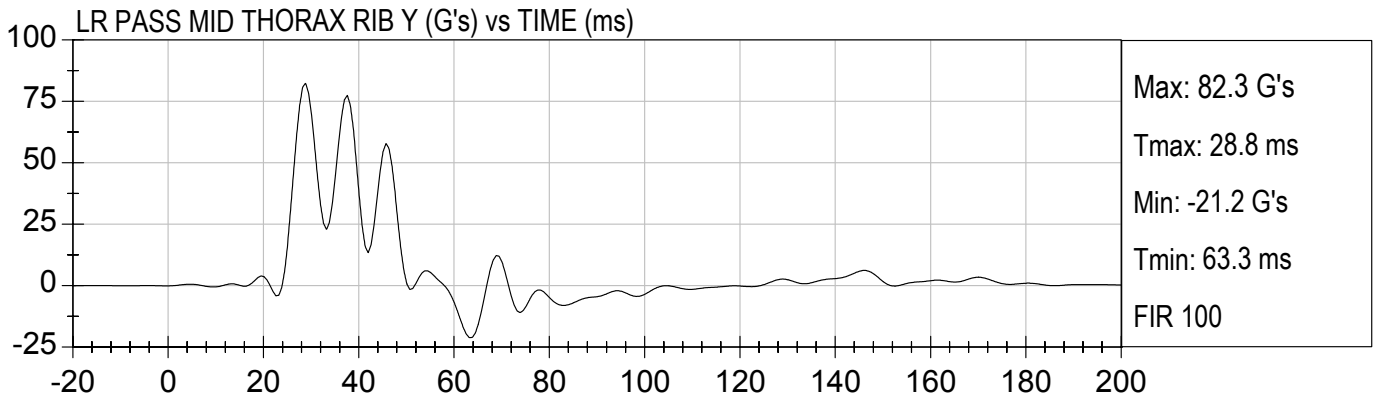
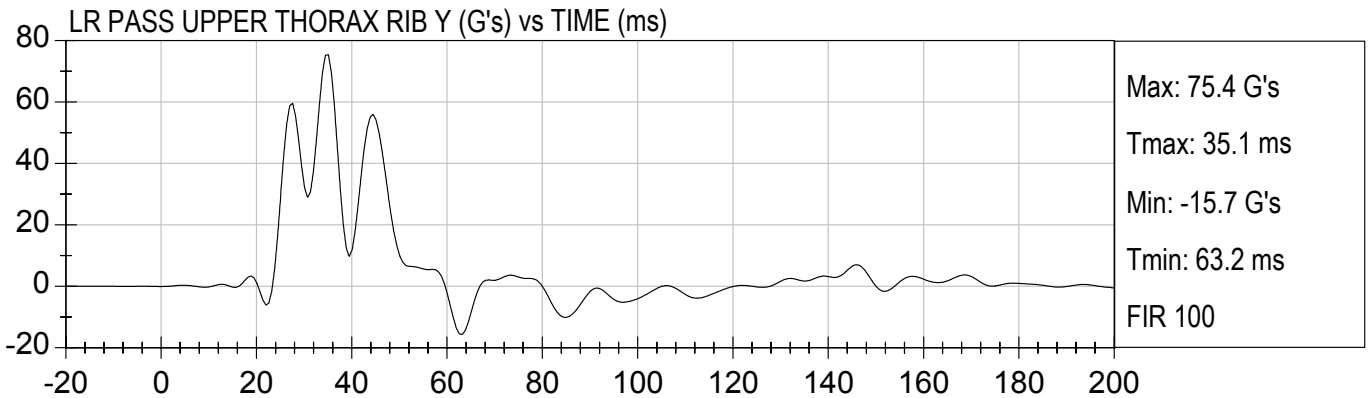






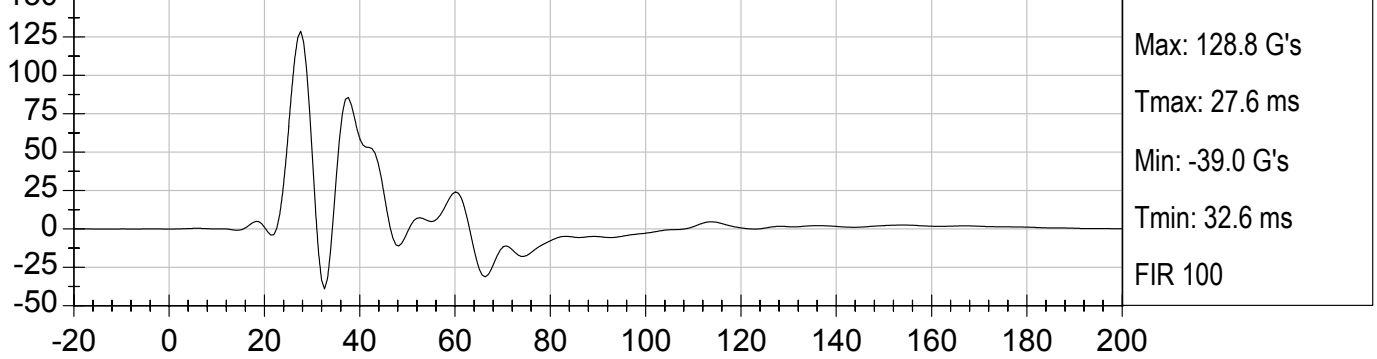




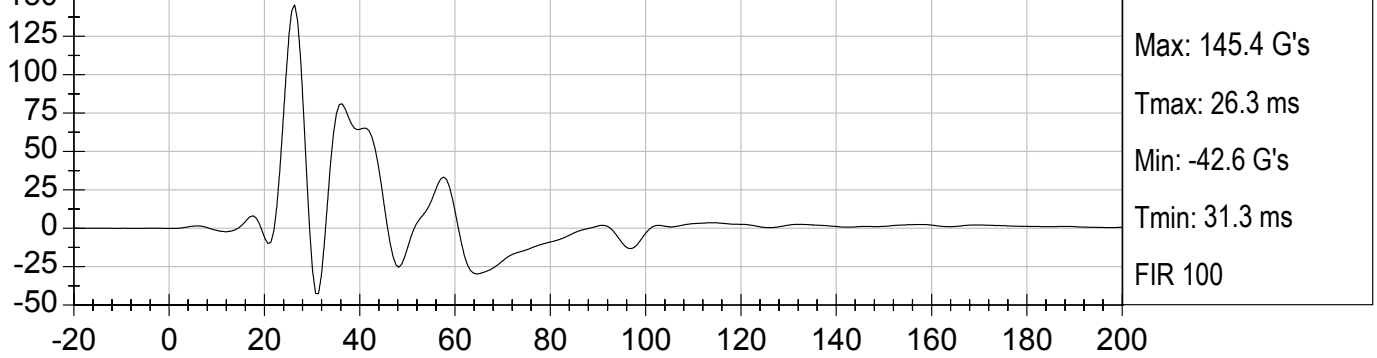


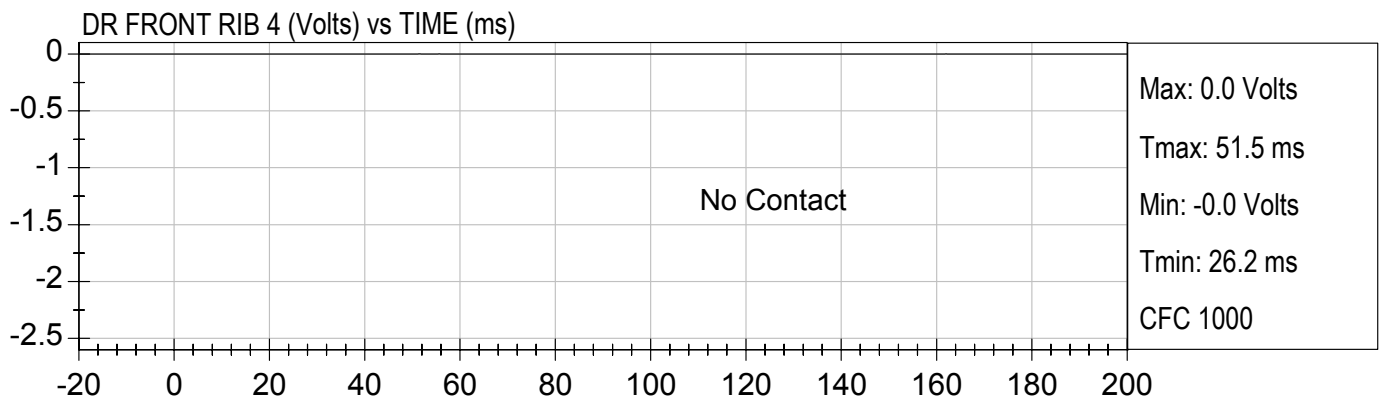
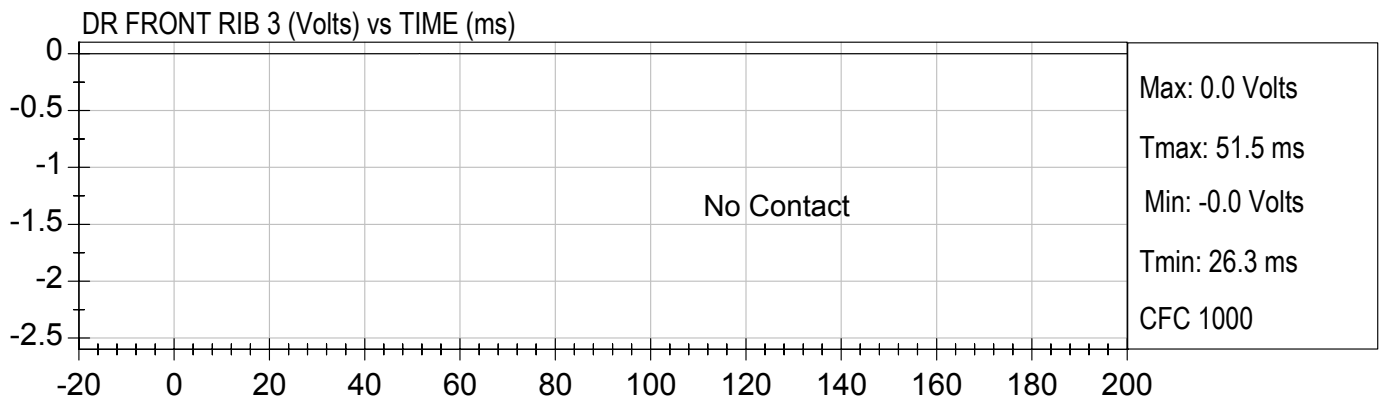
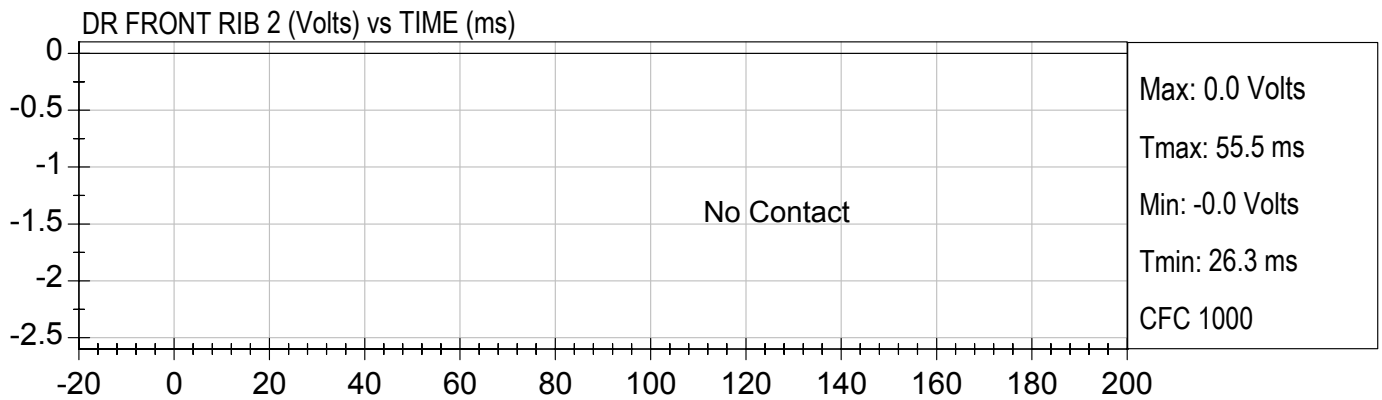
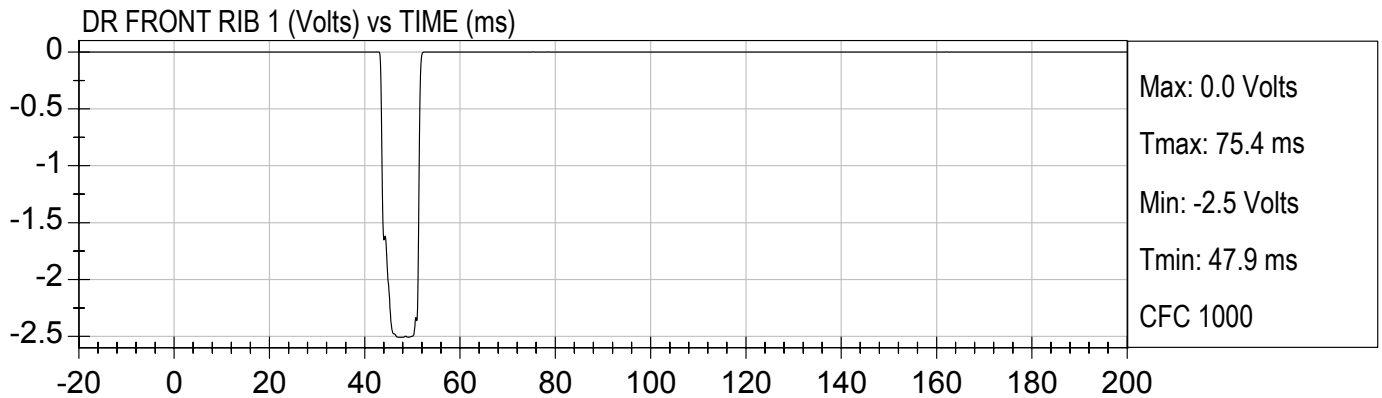


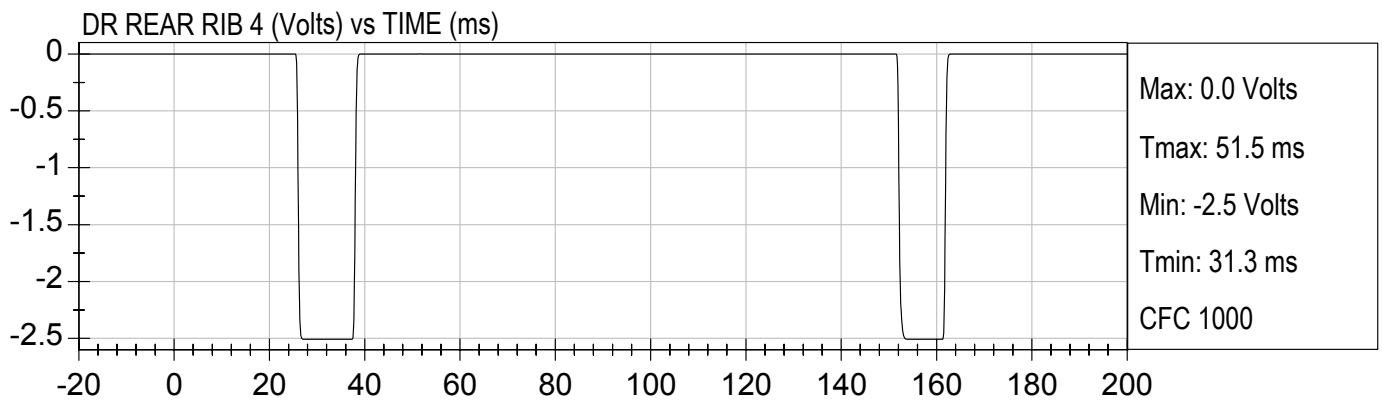
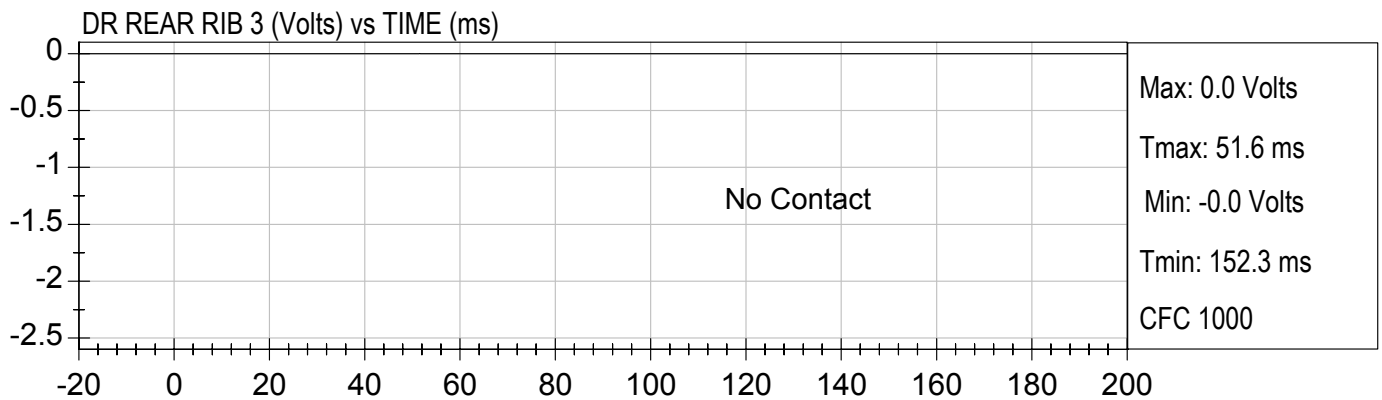
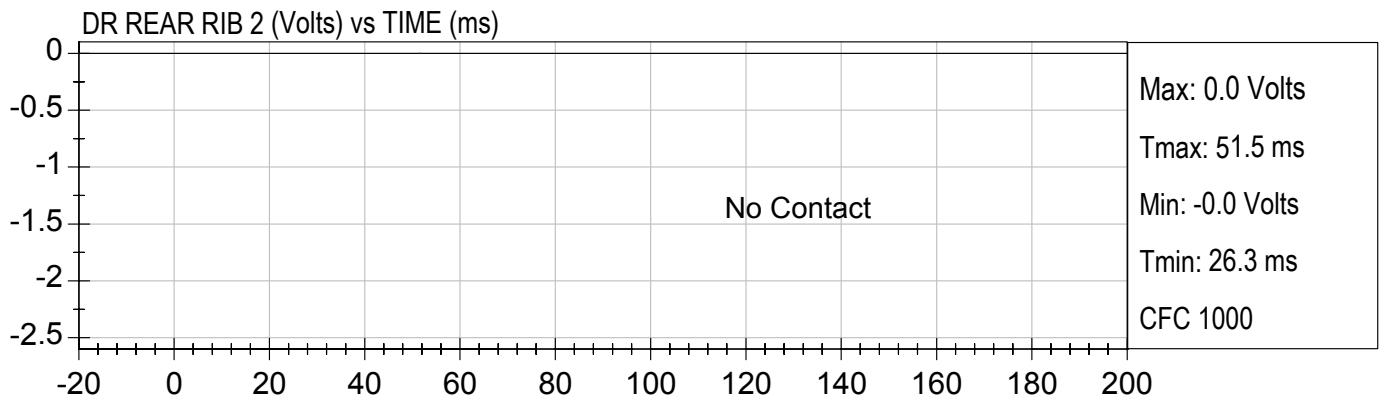
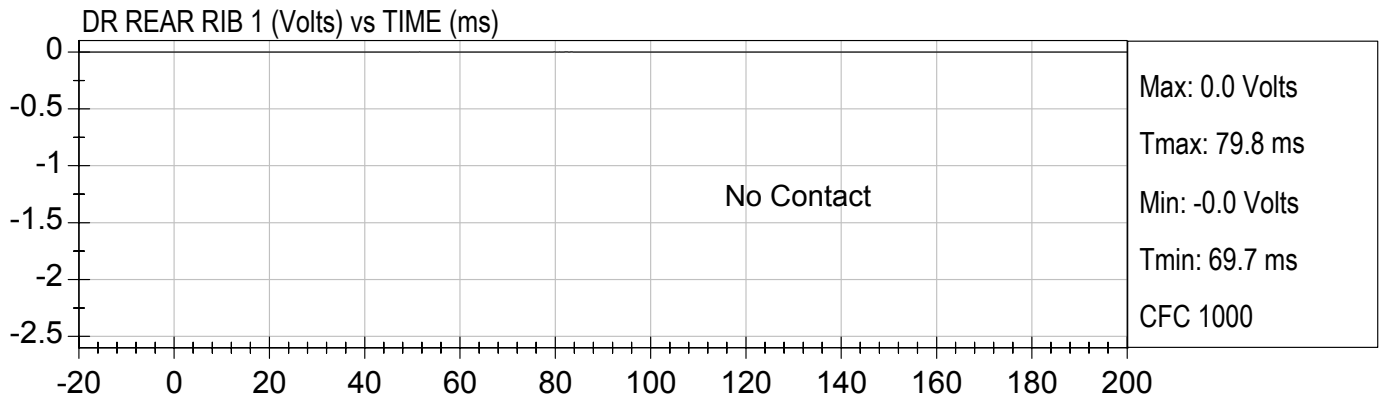
LR PASS UPPER ABDOMINAL RIB Y (G's) vs TIME (ms)

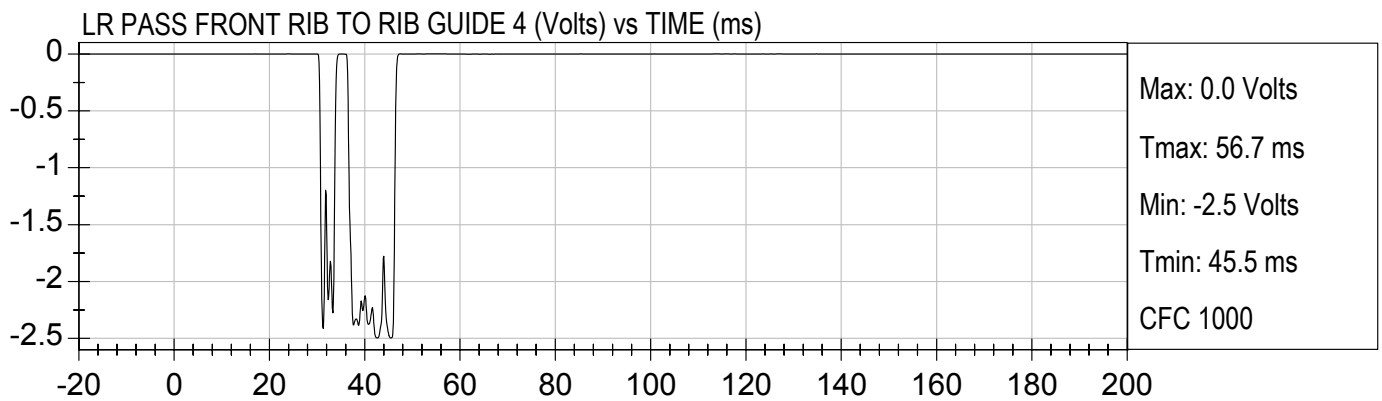
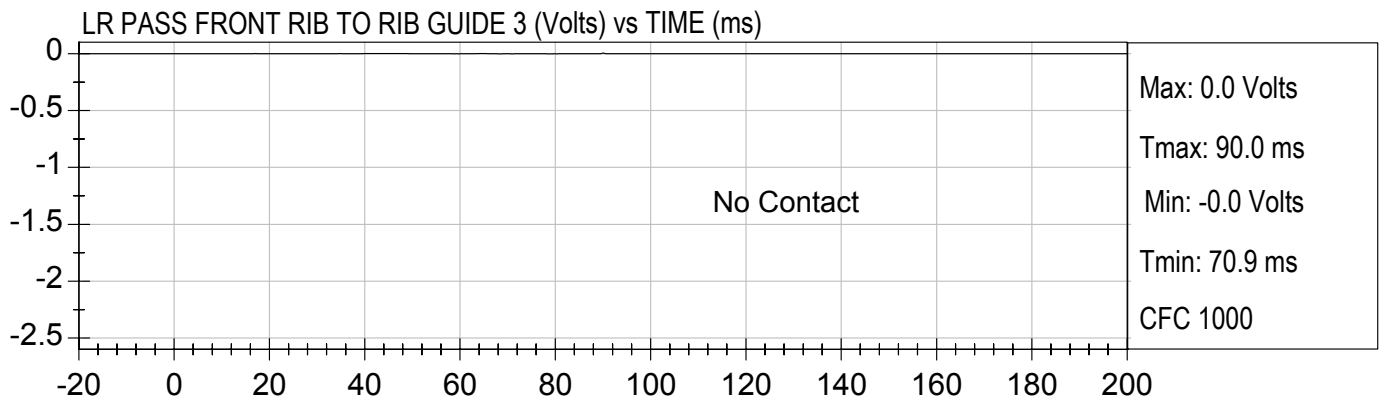
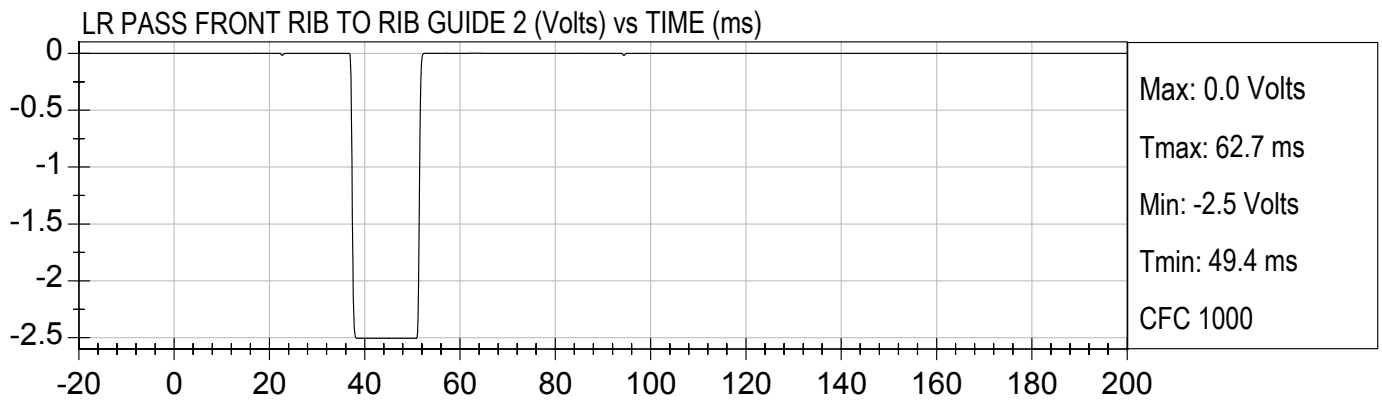
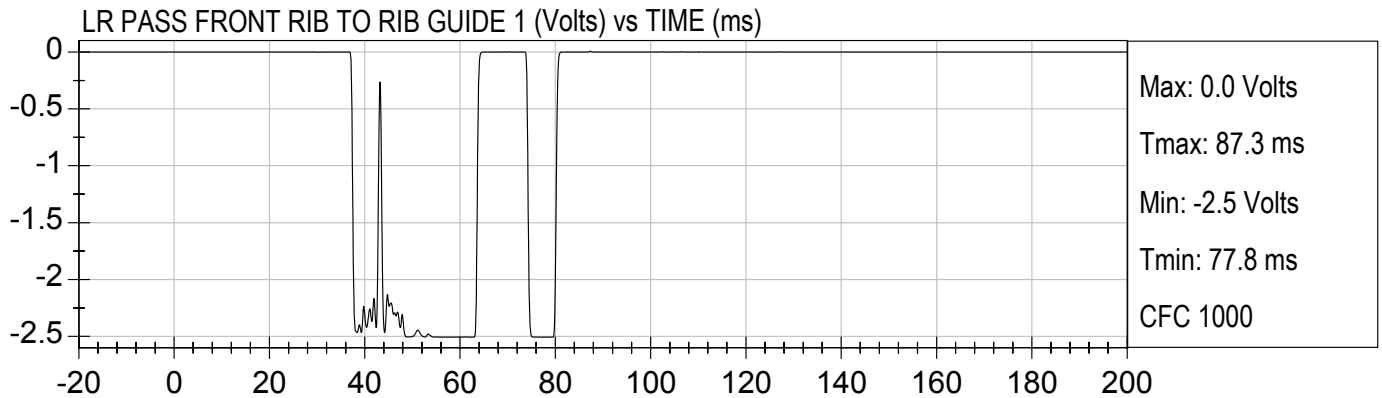


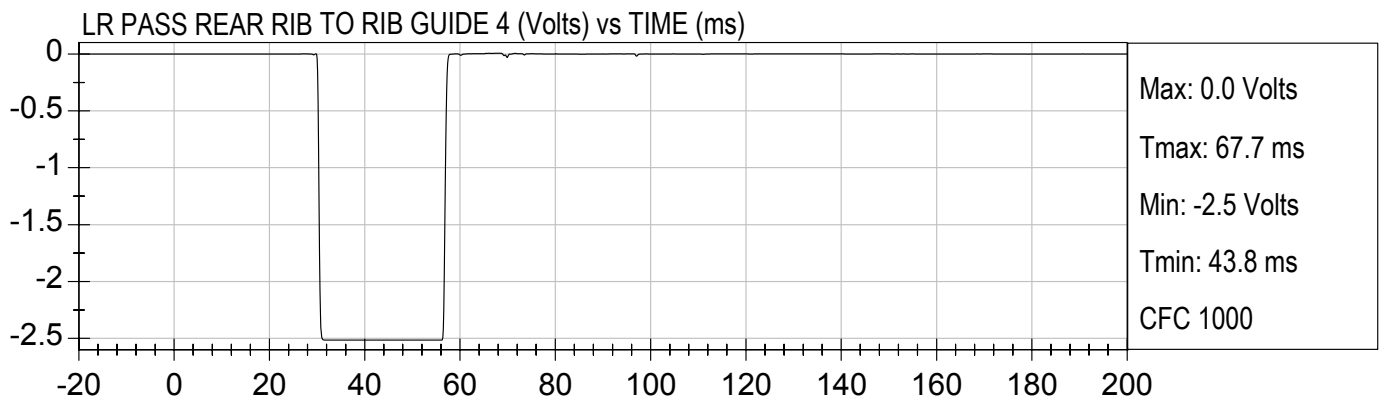
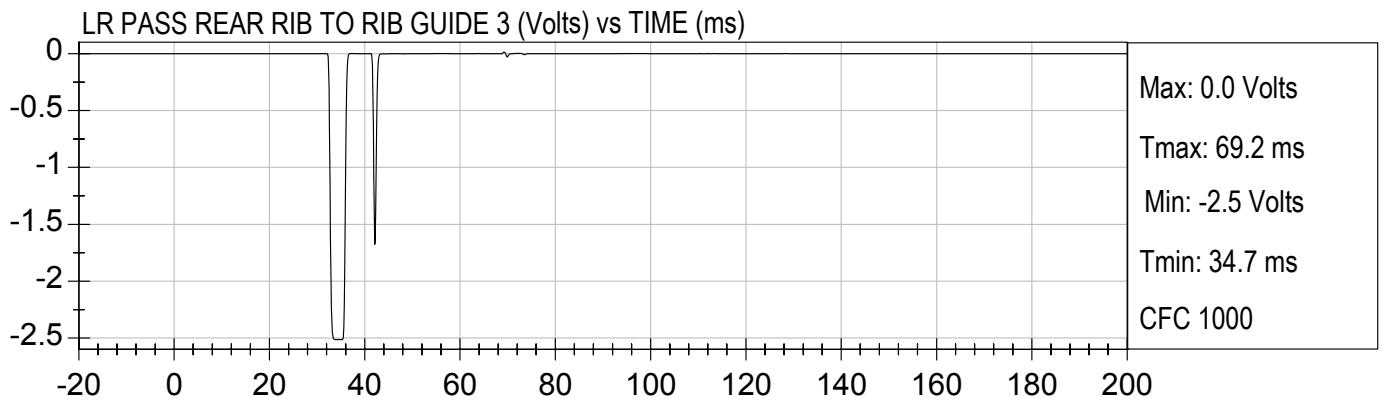
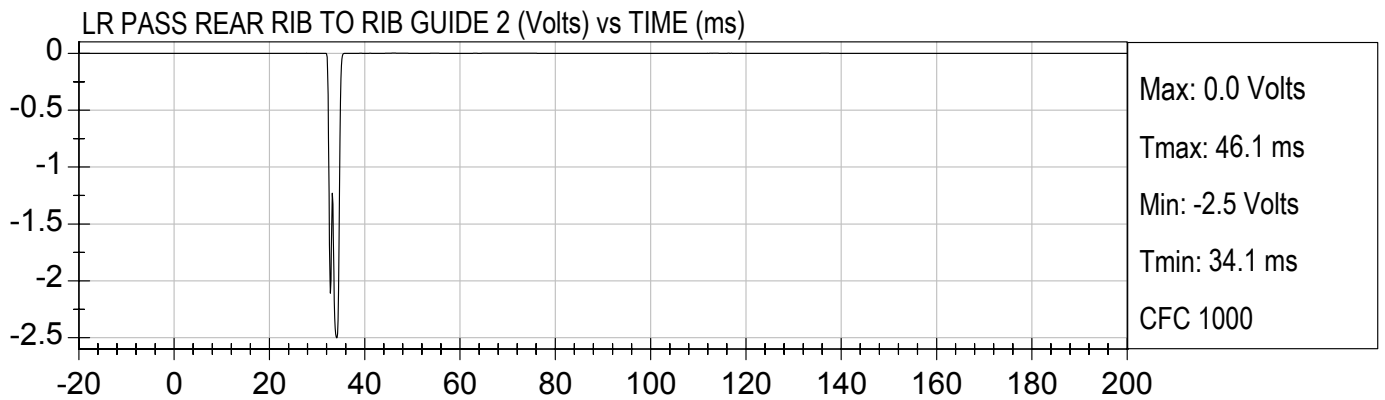
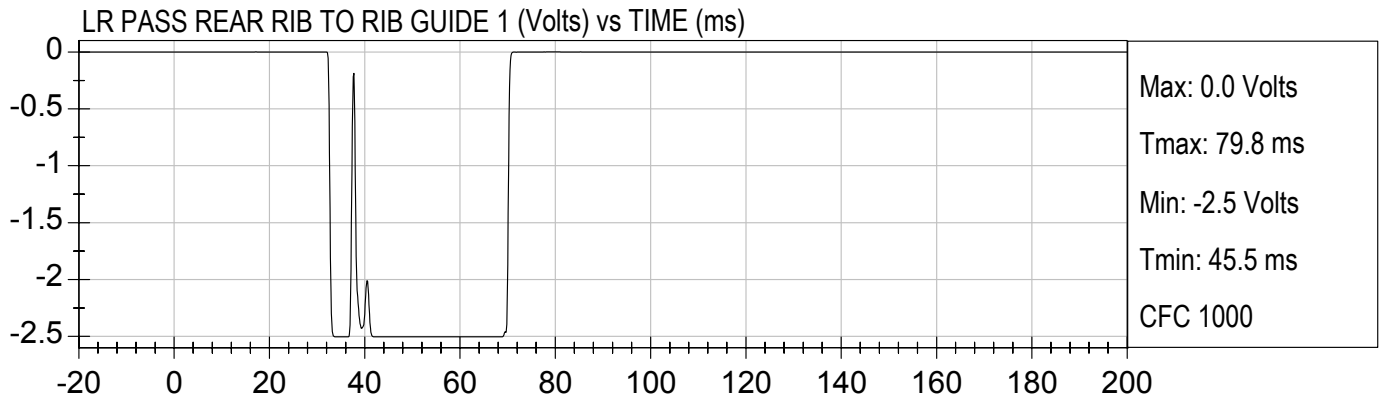
LR PASS LOWER ABDOMINAL RIB Y (G's) vs TIME (ms)

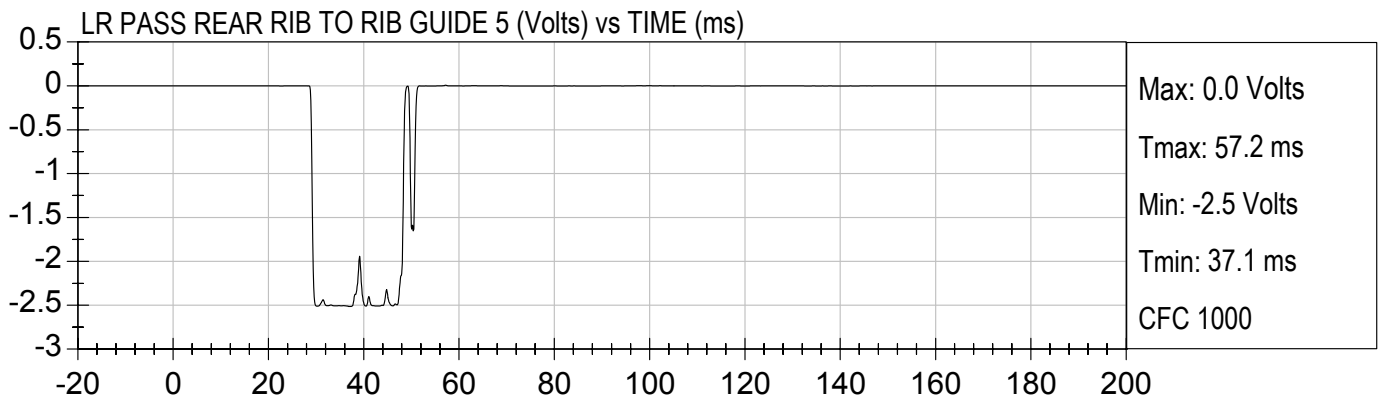
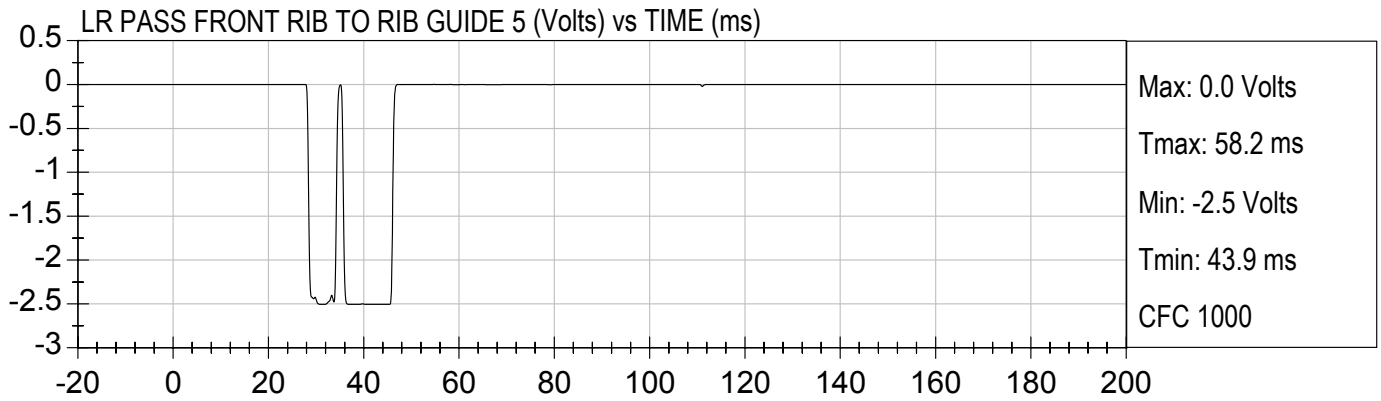


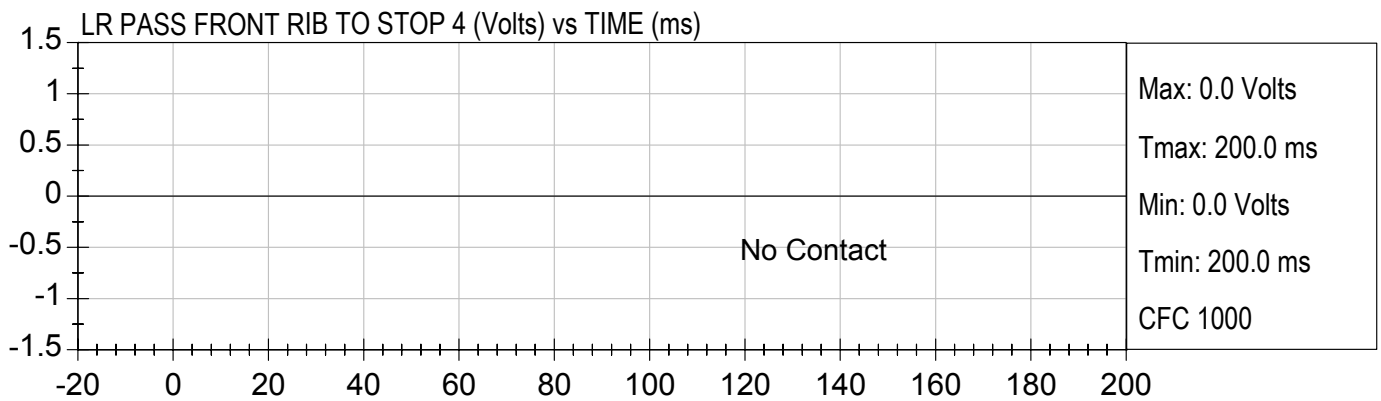
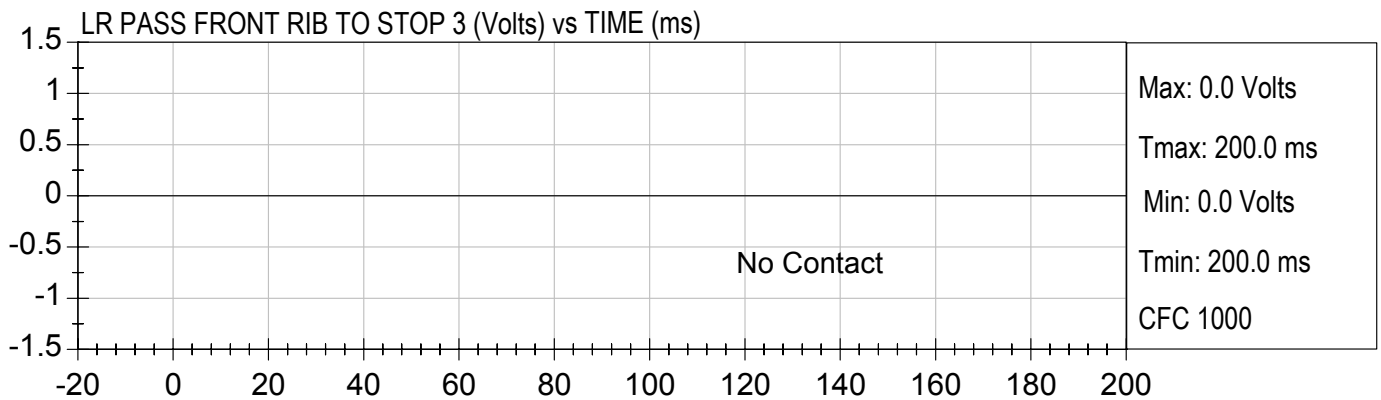
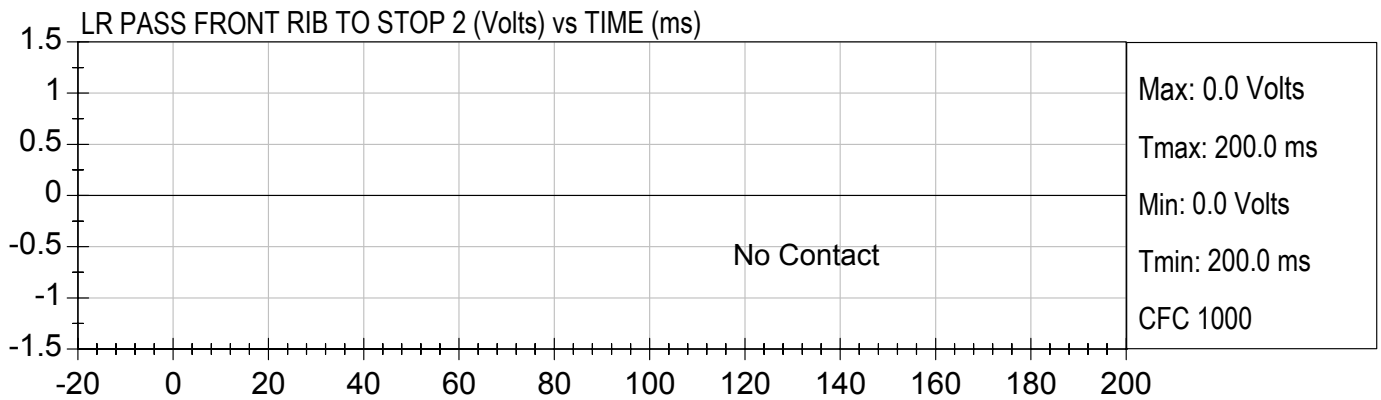
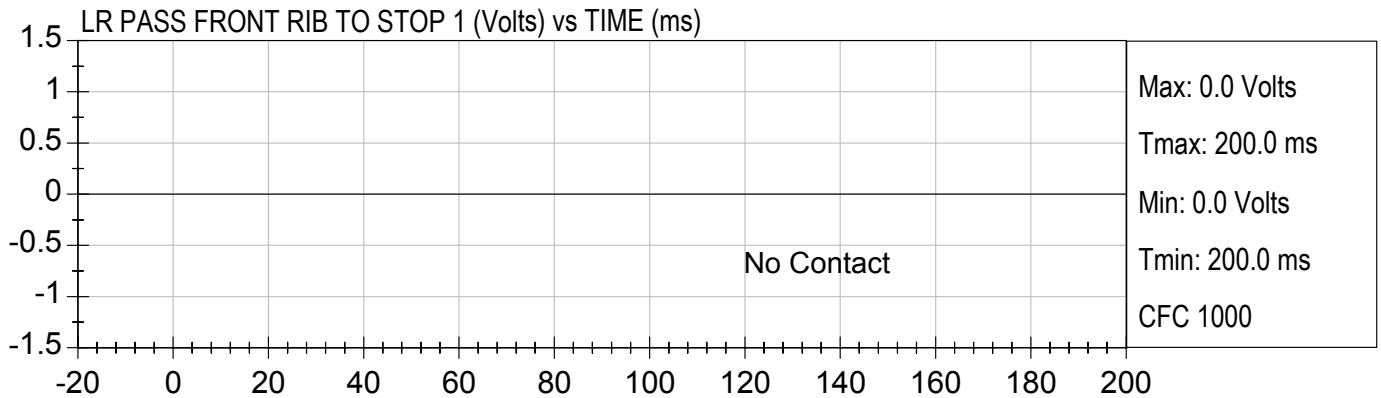


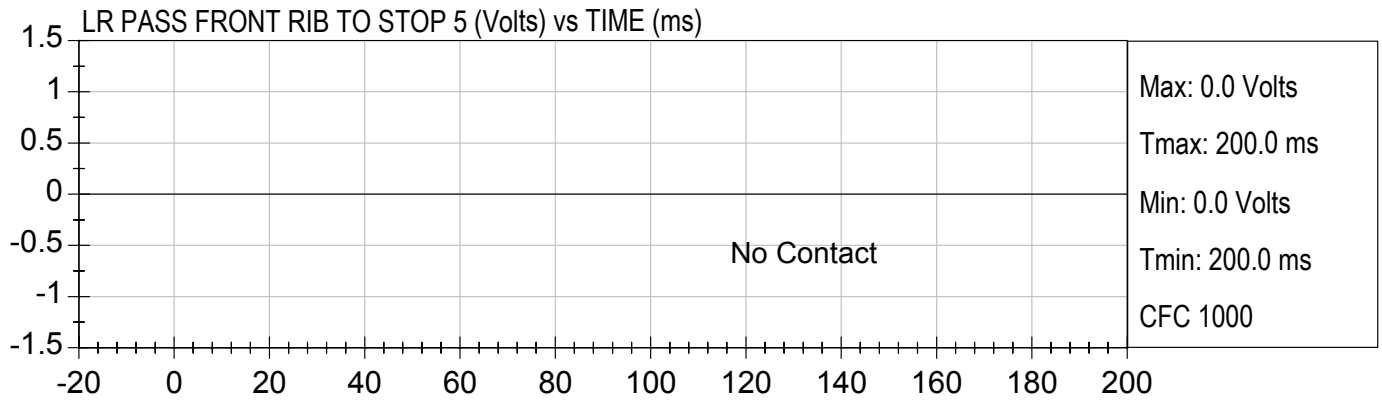


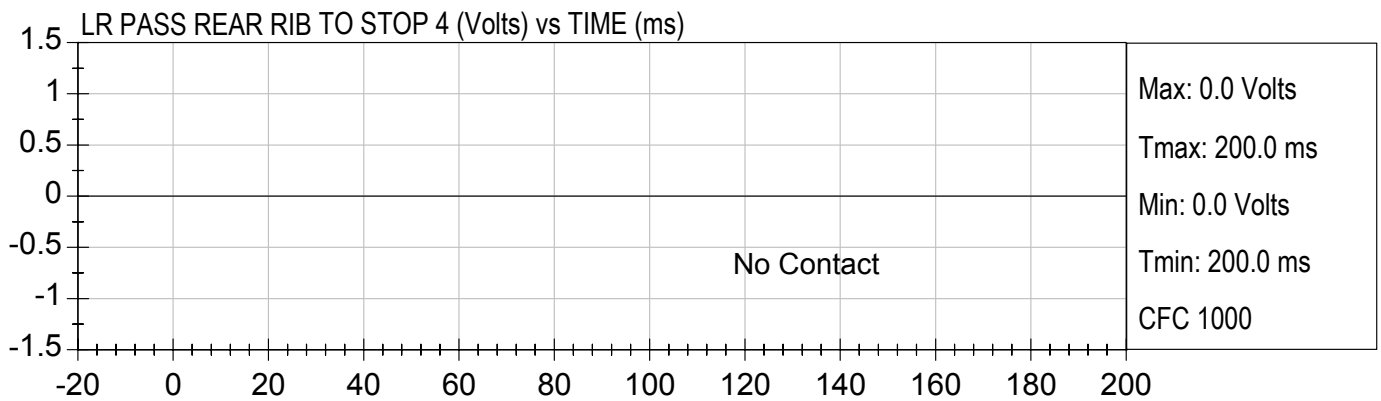
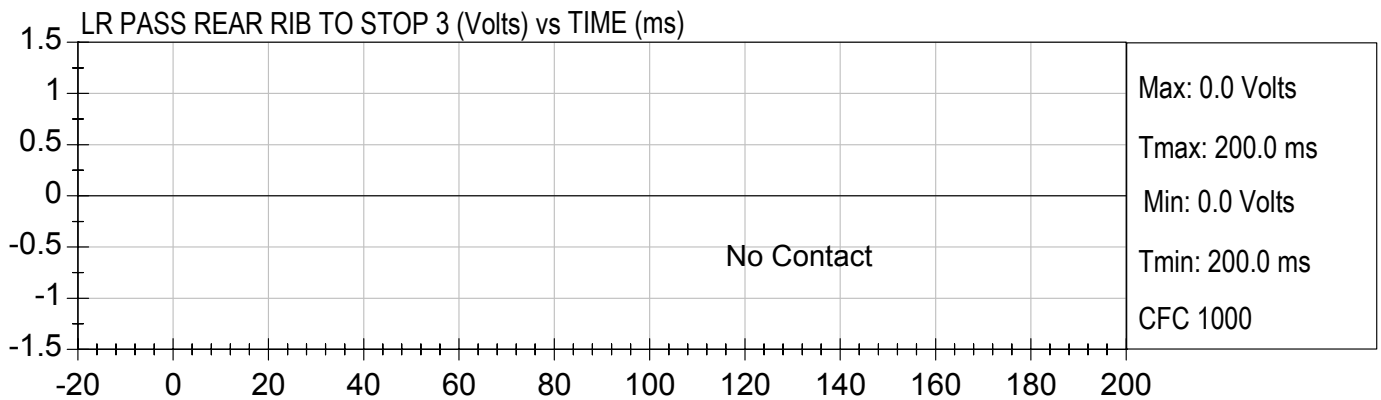
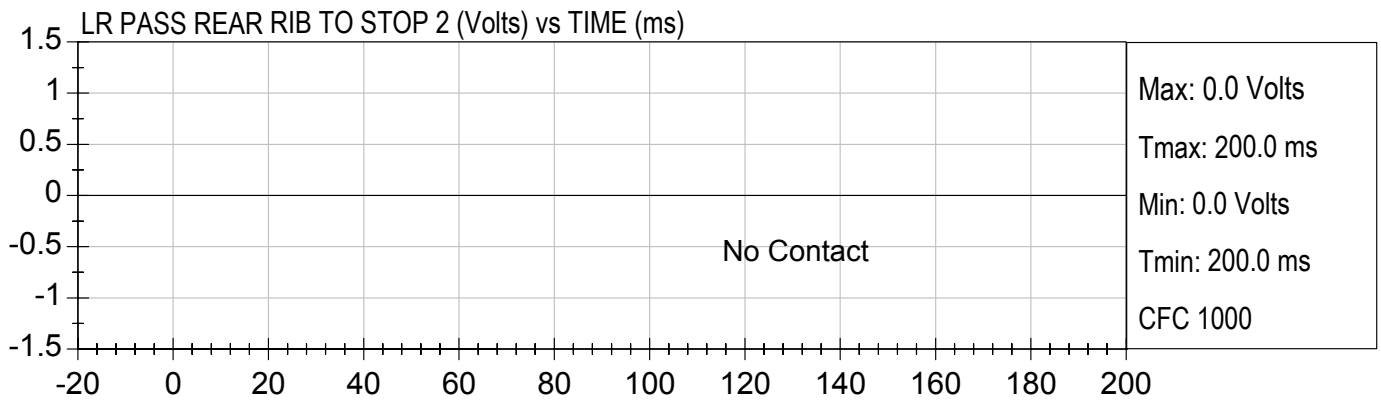
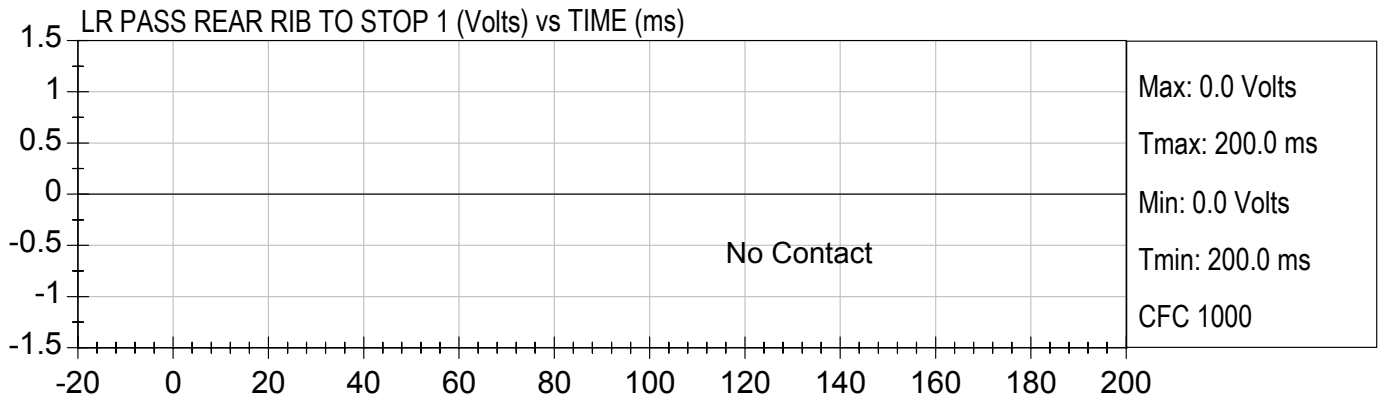


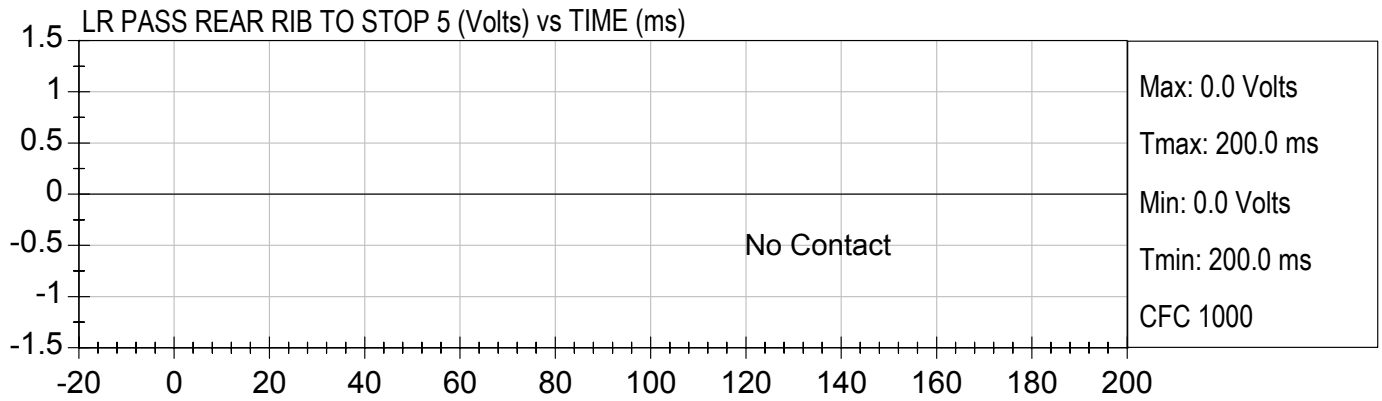












APPENDIX C

SID IIs CONFIGURATION AND PERFORMANCE VERIFICATION DATA

CERTIFICATION DATA

Dummy Serial Number: 020

Calibration Test Results Summary

Dummy Serial Number: 020

Pre-Test Calibration

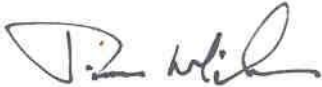
Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck did not pass all impact test requirements.
Shoulder Impact Test:	The shoulder passed all impact test requirements.
Thorax (with arm) Test:	The thorax did not pass all impact test requirements.
Thorax (without arm) Test:	The thorax did not pass all impact test requirements.
Abdomen Impact Test:	The abdomen passed all impact test requirements.
Pelvis Test:	The pelvis passed all impact test requirements.

MGA RESEARCH CORPORATION
 HEAD DROP TEST
 SID IIs DUMMY

Date: 3/14/03
 Dummy Serial Number: 020
 Test Number: D03281/D03301

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03281</u>	<u>D03301</u>
Temperature (°C)	18.9° – 25.6°	20.7	20.8
Humidity	10% - 70%	20	21
Resultant Acceleration	115 - 145 g's	132	126
Peak Longitudinal Acceleration	(-15) – (+ 15) g's	-7	4

TEST MEETS SPECIFICATIONS

Technician: 

Approved By: David Winkelbauer

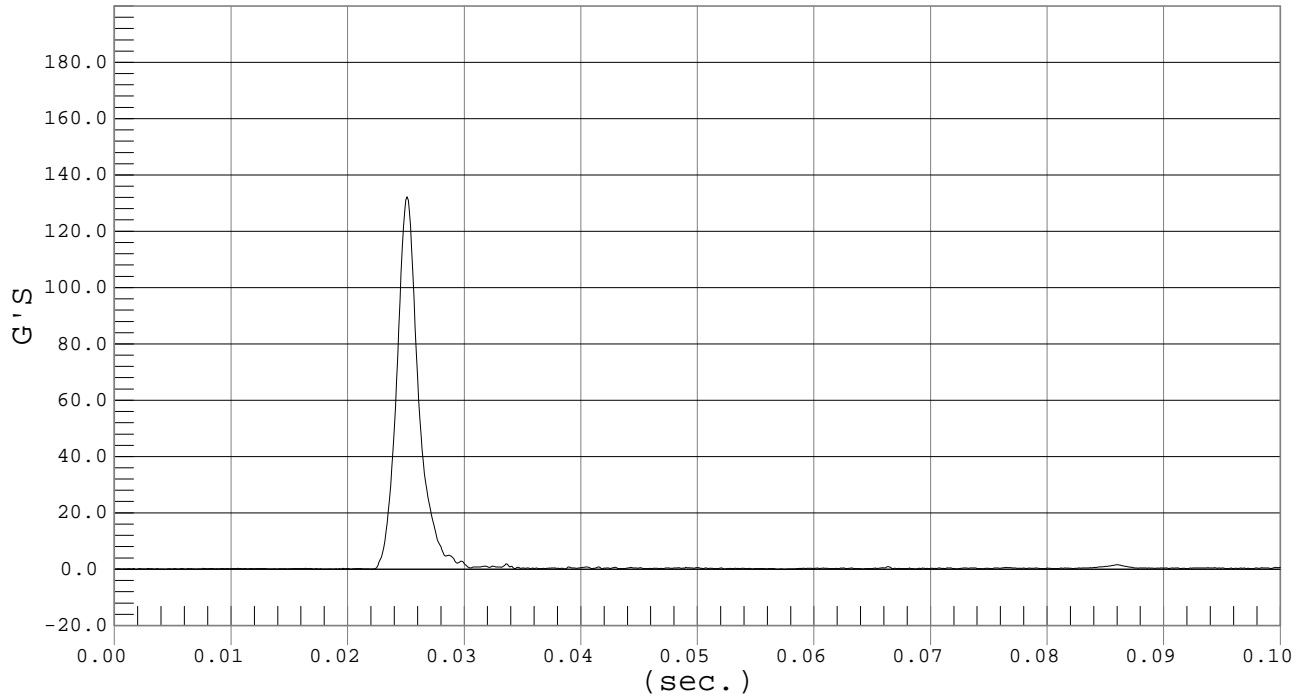


PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #020

Test Date: 03-14-03
Speed: 0.0 fps, 0.00 M/s

Ymin = .03 G'S @ 0.0001 sec., Ymax = 132.24 G'S @ 0.0250 sec.

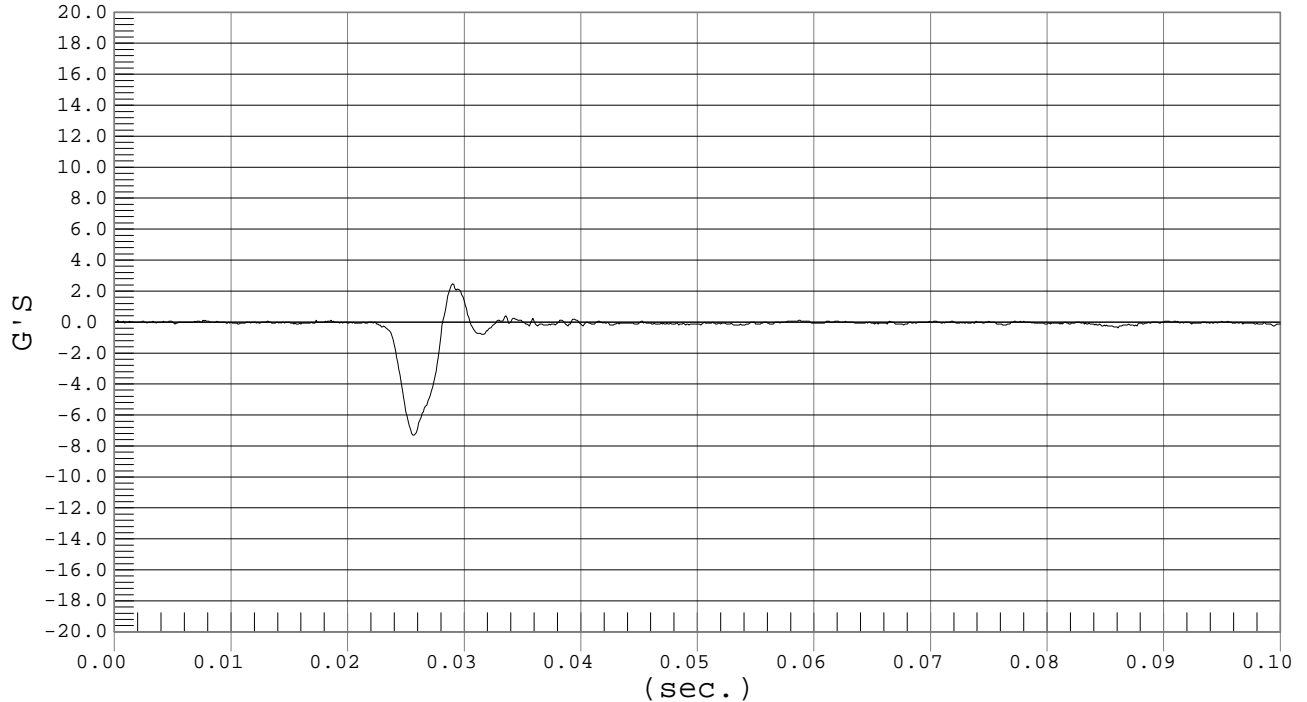


PEAK LONGITUDINAL ACCELARATION

Test Desc.: Head Drop
Component: Dummy #020

Test Date: 03-14-03
Speed: 0.0 fps, 0.00 M/s

Ymin = -7.3 G'S @ 0.0255 sec., Ymax = 4.49 G'S @ 0.1174 sec.



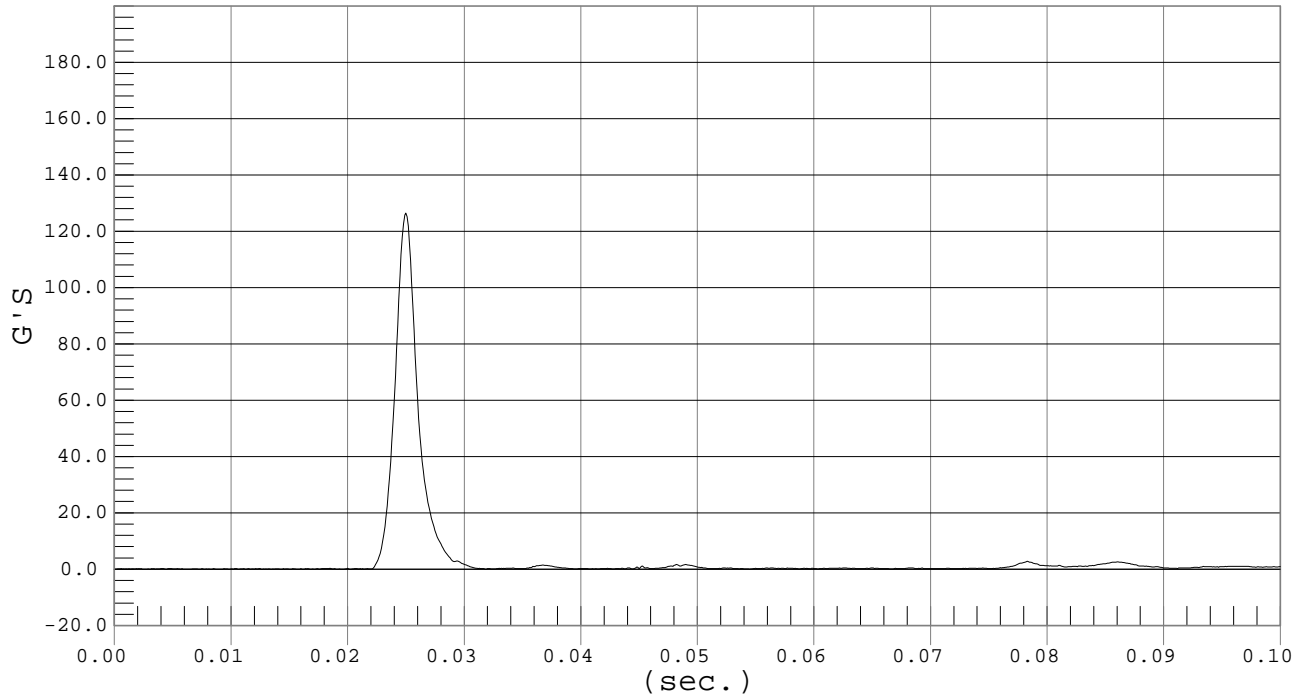


PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #020

Test Date: 03-14-03
Speed: 0.0 fps, 0.00 M/s

Ymin = .03 G'S @ 0.0000 sec., Ymax = 126.48 G'S @ 0.0249 sec.

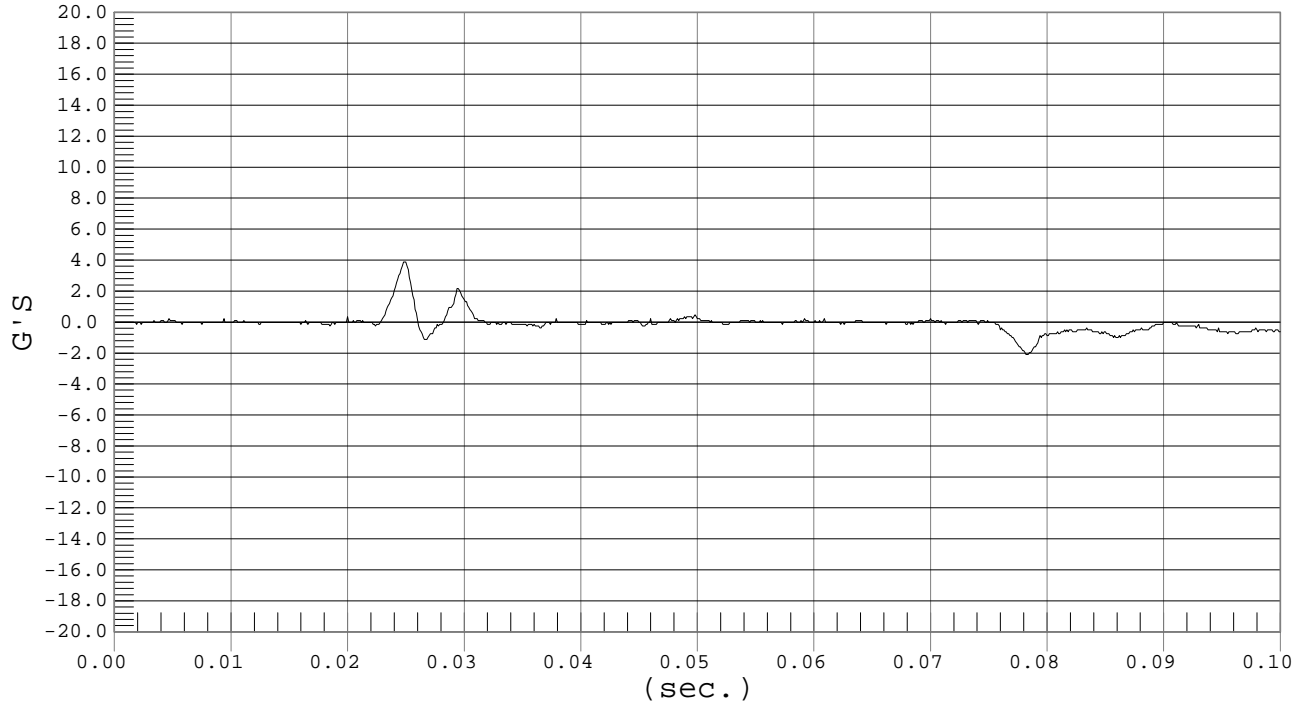


PEAK LONGITUDINAL ACCELARATION

Test Desc.: Head Drop
Component: Dummy #020

Test Date: 03-14-03
Speed: 0.0 fps, 0.00 M/s

Ymin = -2.09 G'S @ 0.0781 sec., Ymax = 3.99 G'S @ 0.1330 sec.

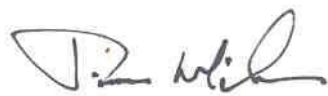


MGA RESEARCH CORPORATION
LATERAL NECK PENDULUM TEST
SID IIs DUMMY

Date: 3/13/03
 Dummy Serial Number: 020
 Test Number: D03282/D03302

TEST PARAMETER		SPECIFICATION	TEST RESULTS	
			<u>D03282</u>	<u>D03302</u>
Temperature (°C)		20.8° – 22.2°	20.9	21.1
Humidity		10% - 70%	23	25
Impact Velocity (m/s)		5.51-5.63	5.51	5.61
Delta Velocity (m/s)	10 ms	2.10-2.70	2.10	2.14
	15 ms	3.00-3.80	3.21	3.23
	20 ms	4.20-5.20	4.37	4.36
	25-60 ms	5.00-6.40	5.58	6.12
Peak D-Plane Rotation (deg)		72-82	70*	67*
Decay Time of D-Plane Rotation Peak to Zero Degree (ms)		60-83	66	64
Peak Occipital Condyle Moment (Nm)		(-43) – (-36)	-44*	-44*
Time at 10 or -10 Nm after Peak Moment (ms)		90 – 98	90	86*
Time of last Moment Peak to Max Rotation (ms)		<14	11	10
Front Pot Peak Rotation (deg)		59 – 72	57*	54*
Time of Front Pot Peak Rotation (ms)		61 – 73	65	61
Rear Pot Peak Rotation (deg)		47 – 56	46*	44*
Time of Rear Pot Peak Rotation (ms)		62 – 73	59*	59*

TEST MEETS SPECIFICATIONS

Technician: 

Approved By: David Winkelbauer

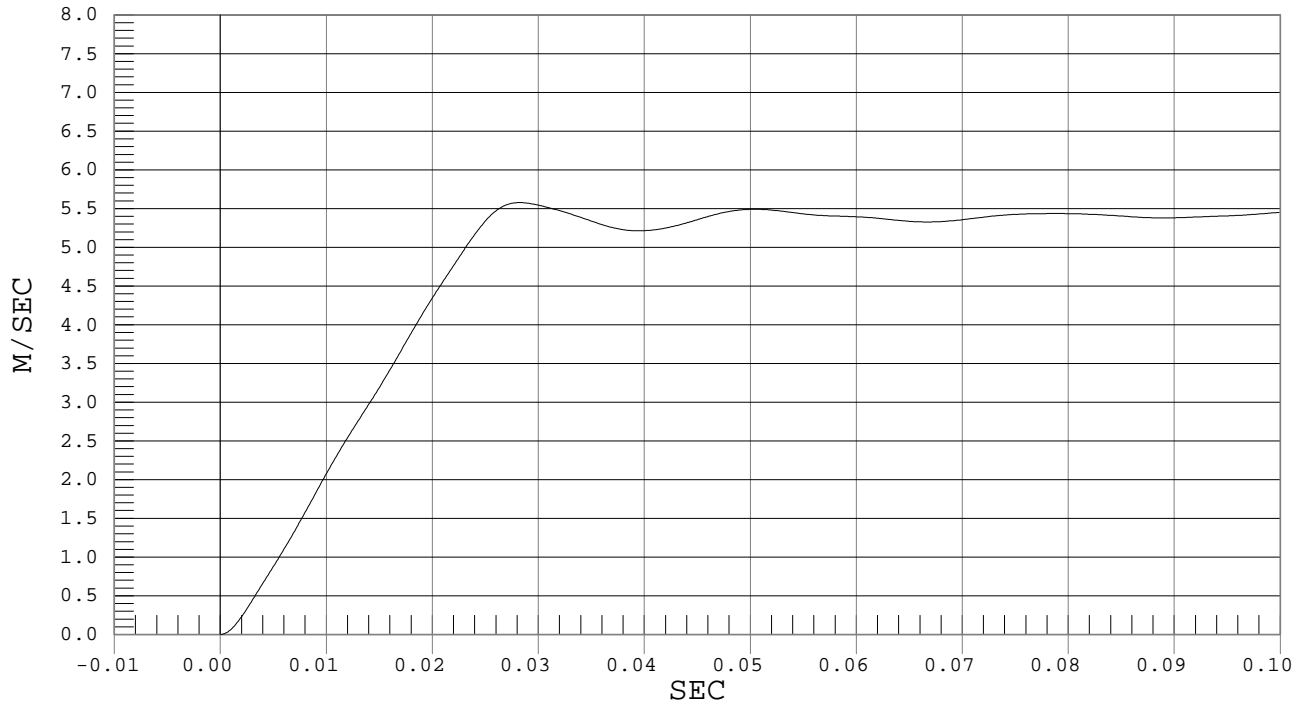


PENDULUM DECELERATION

Test Desc.: Neck Bending
Component: Dummy #020

Test Date: 03-13-03
Speed: 18.1 fps, 5.51 M/s

Ymin = 0 M/SEC @ 0.0000 SEC, Ymax = 6.62 M/SEC @ 0.1900 SEC

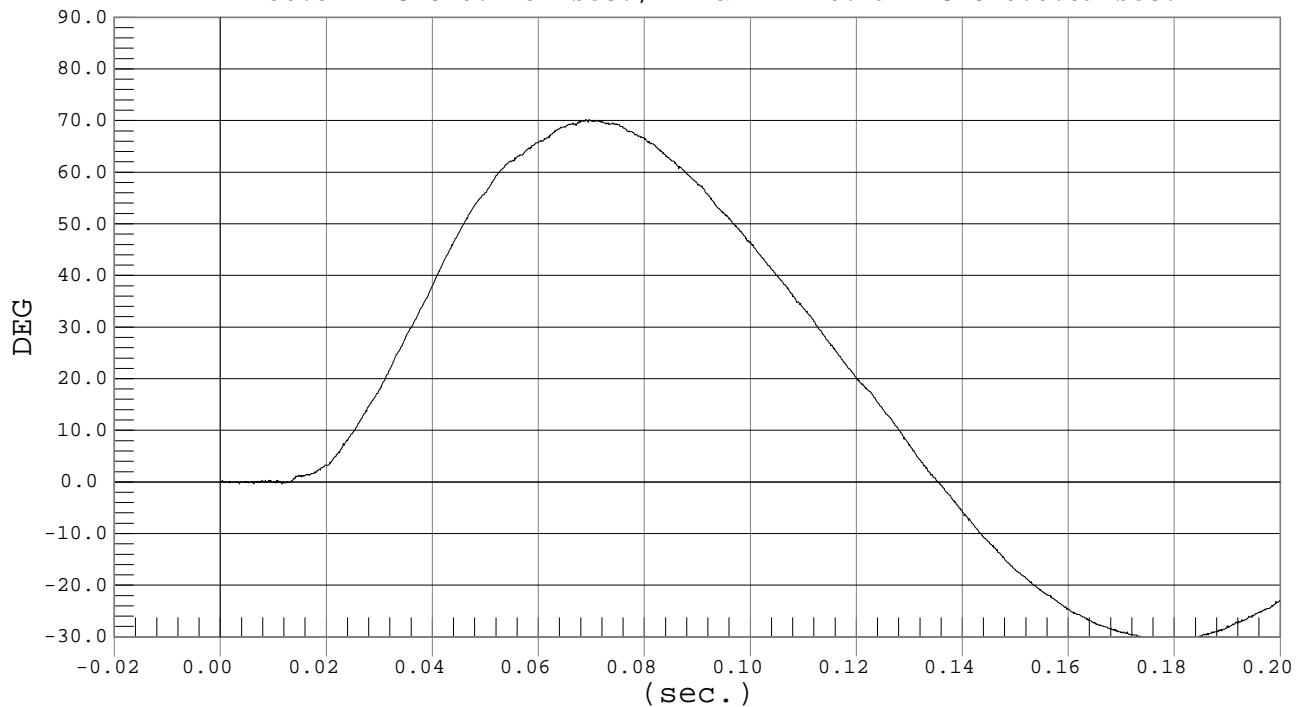


FLEXION ANGLE

Test Desc.: Neck Bending
Component: Dummy #020

Test Date: 03-13-03
Speed: 18.1 fps, 5.51 M/s

Ymin = -30.52 DEG @ 0.1752 sec., Ymax = 70.19 DEG @ 0.0689 sec.



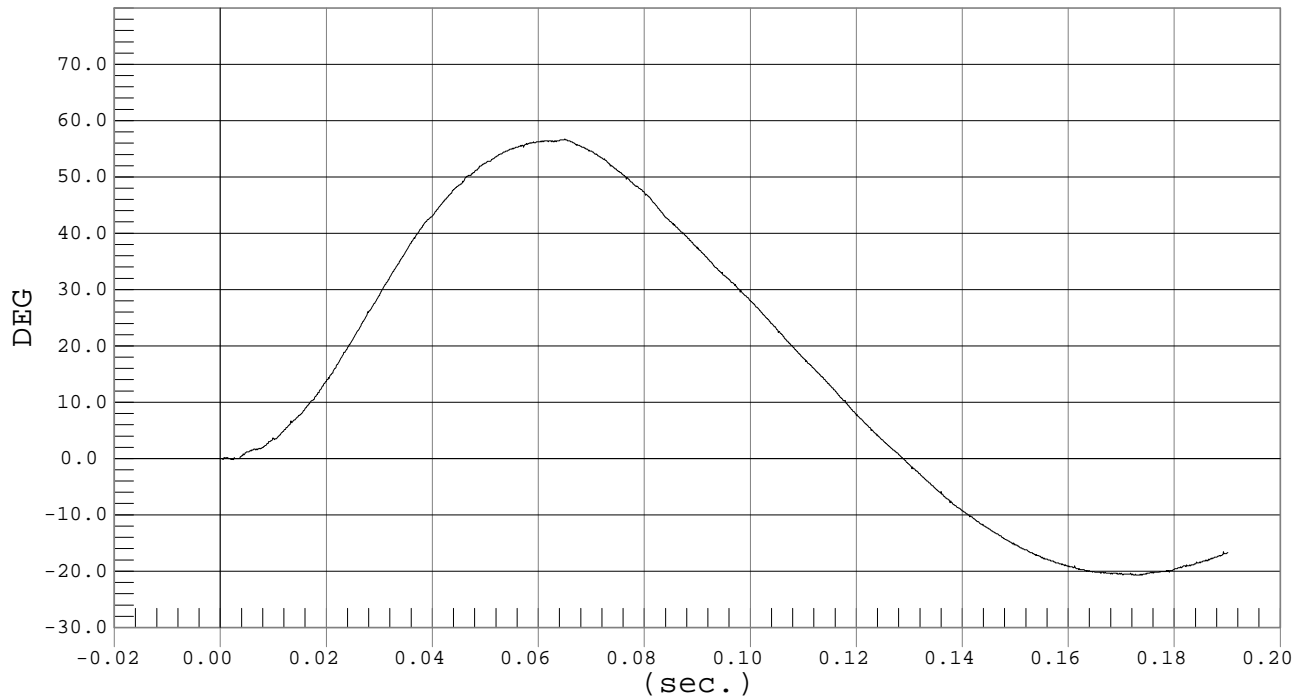


Test Desc.: Neck Bending
Component: Dummy #020

FRONT

Test Date: 03-13-03
Speed: 18.1 fps, 5.51 M/s

Ymin = -20.7 DEG @ 0.1702 sec., Ymax = 56.77 DEG @ 0.0649 sec.

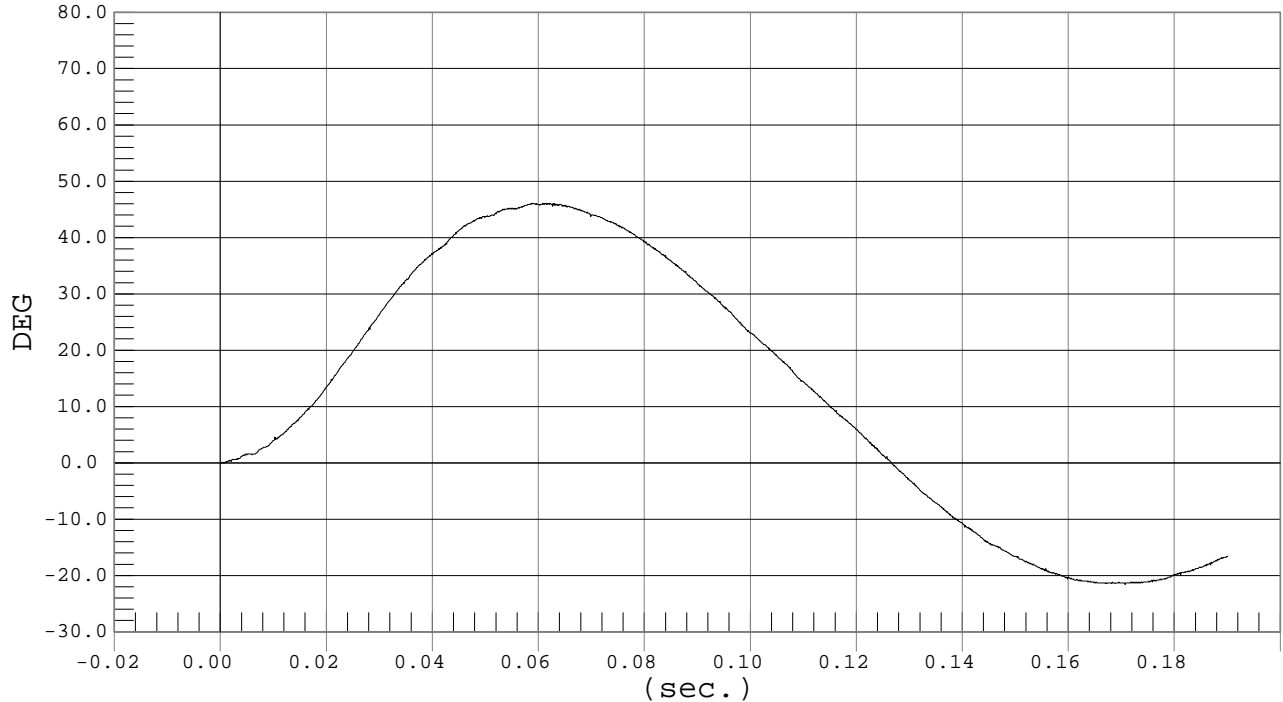


Test Desc.: Neck Bending
Component: Dummy #020

REAR

Test Date: 03-13-03
Speed: 18.1 fps, 5.51 M/s

Ymin = -21.64 DEG @ 0.1706 sec., Ymax = 46.05 DEG @ 0.0585 sec.



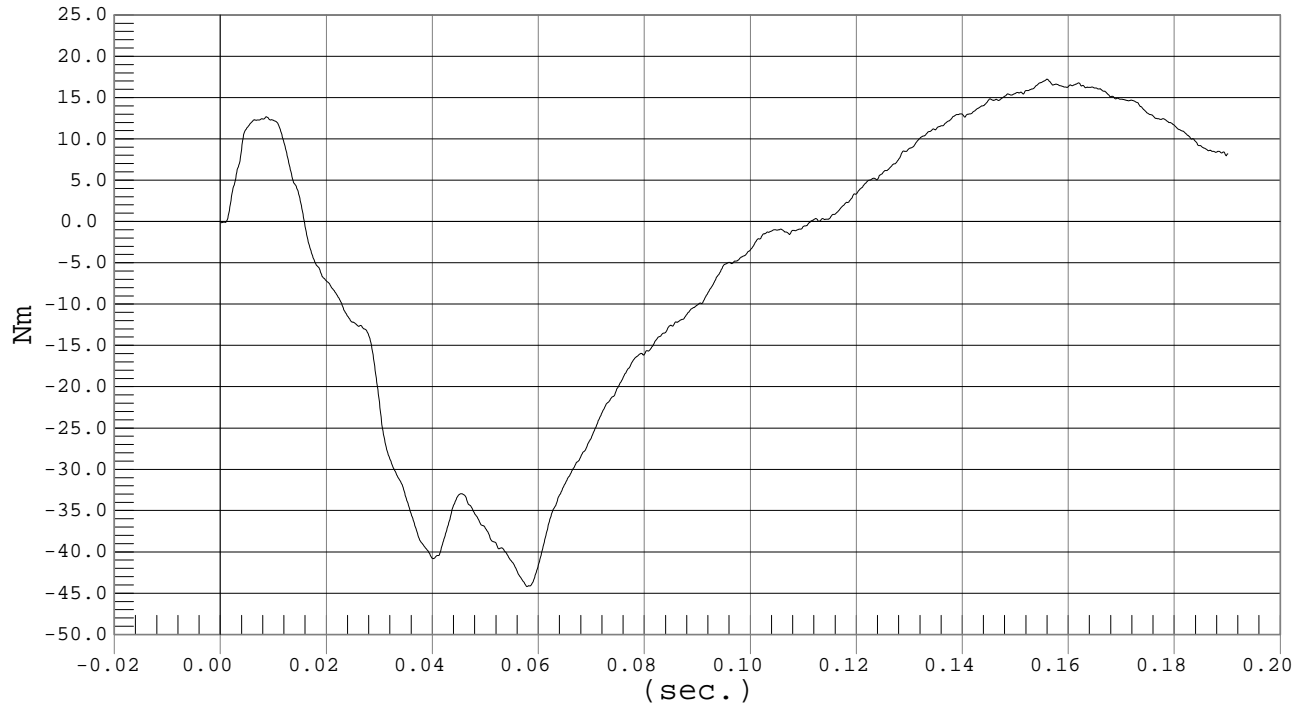


Test Desc.: Neck Bending
Component: Dummy #020

OCCIPITAL MOMENT

Test Date: 03-13-03
Speed: 18.1 fps, 5.51 M/s

Ymin = -44.18 Nm @ 0.0578 sec., Ymax = 17.24 Nm @ 0.1559 sec.



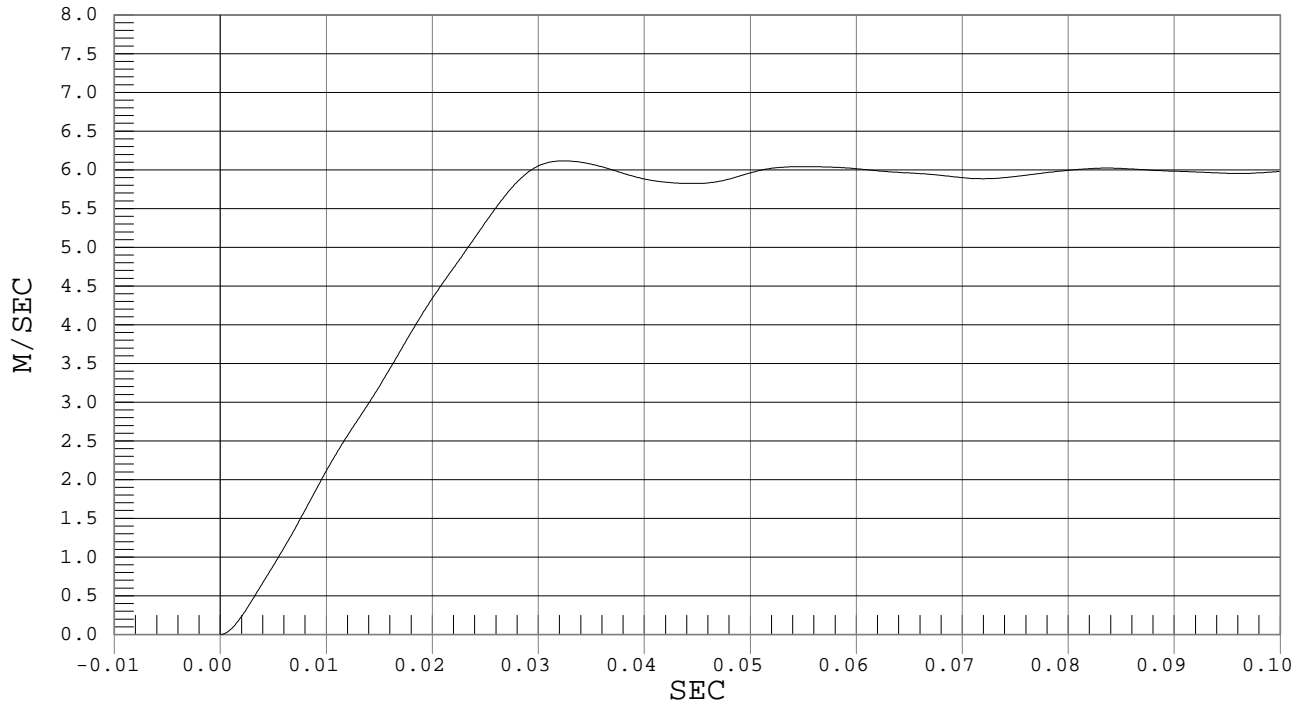


PENDULUM DECELERATION

Test Desc.: Neck Bending
Component: Dummy #020

Test Date: 03-13-03
Speed: 18.4 fps, 5.61 M/s

Ymin = 0 M/SEC @ 0.0000 SEC, Ymax = 7.23 M/SEC @ 0.1873 SEC

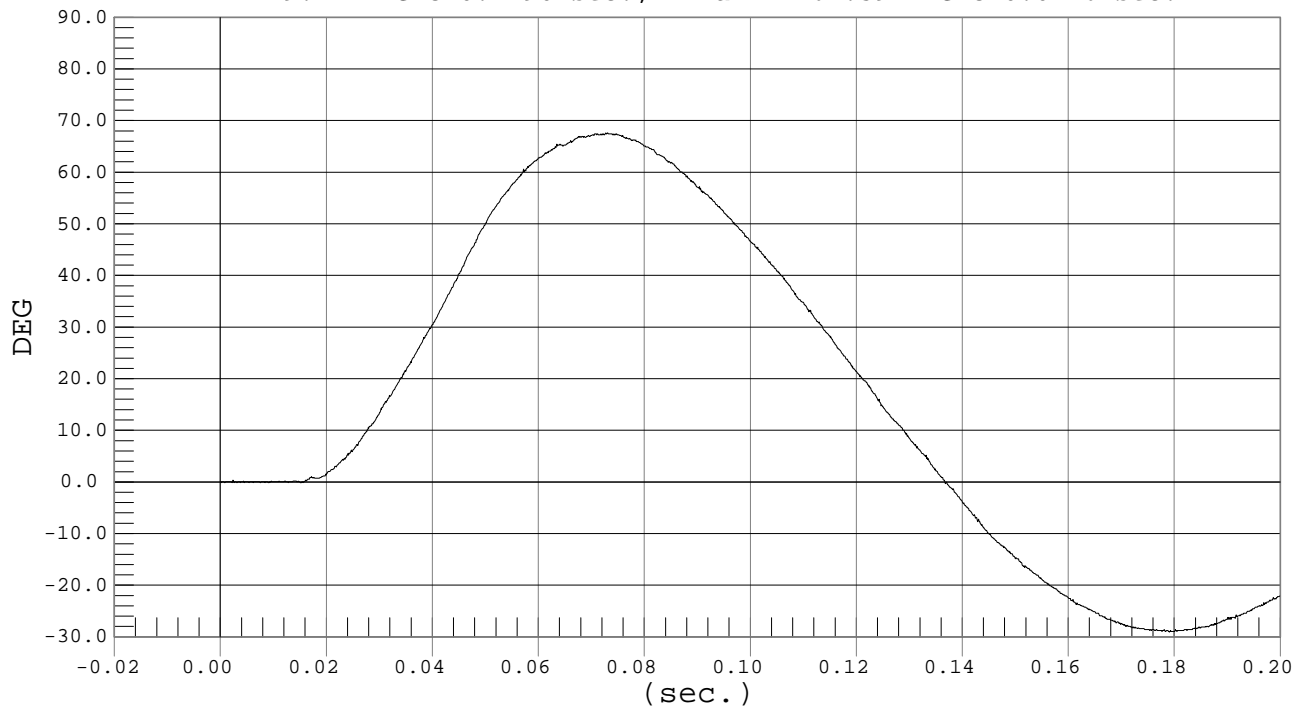


FLEXION ANGLE

Test Desc.: Neck Bending
Component: Dummy #020

Test Date: 03-13-03
Speed: 18.4 fps, 5.61 M/s

Ymin = -29.11 DEG @ 0.1790 sec., Ymax = 67.59 DEG @ 0.0726 sec.



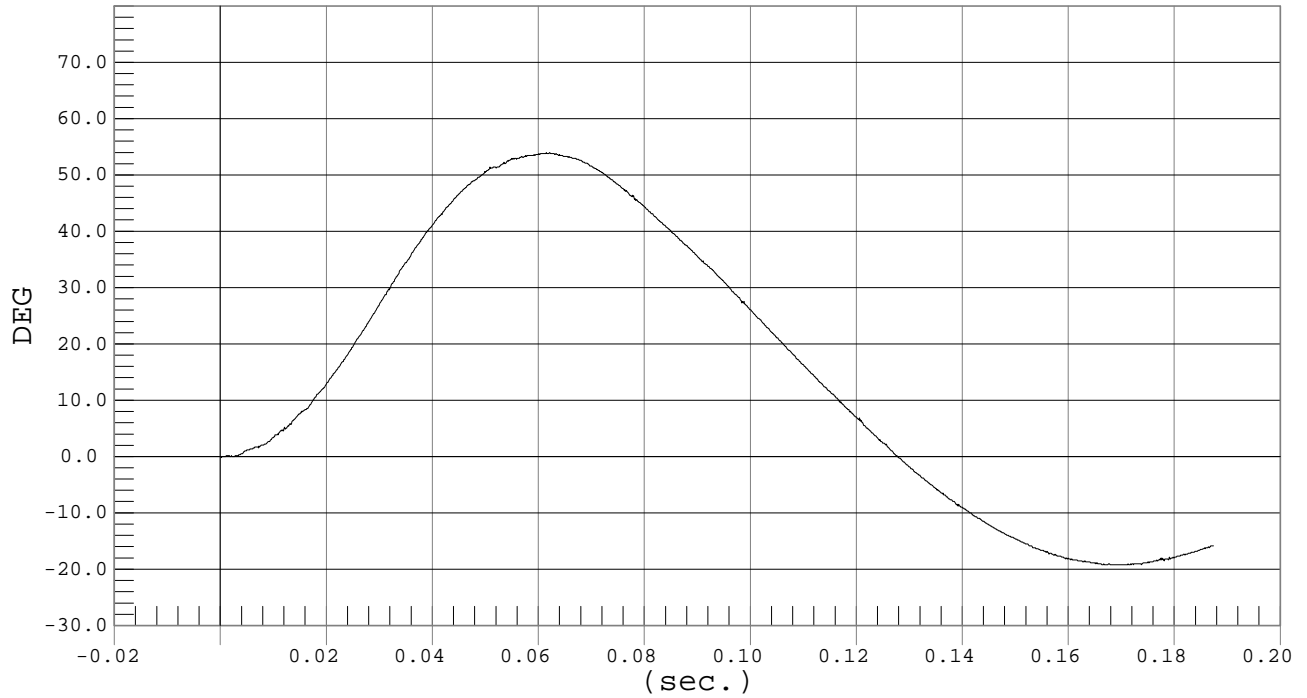


Test Desc.: Neck Bending
Component: Dummy #020

FRONT

Test Date: 03-13-03
Speed: 18.4 fps, 5.61 M/s

Ymin = -19.18 DEG @ 0.1662 sec., Ymax = 53.95 DEG @ 0.0614 sec.

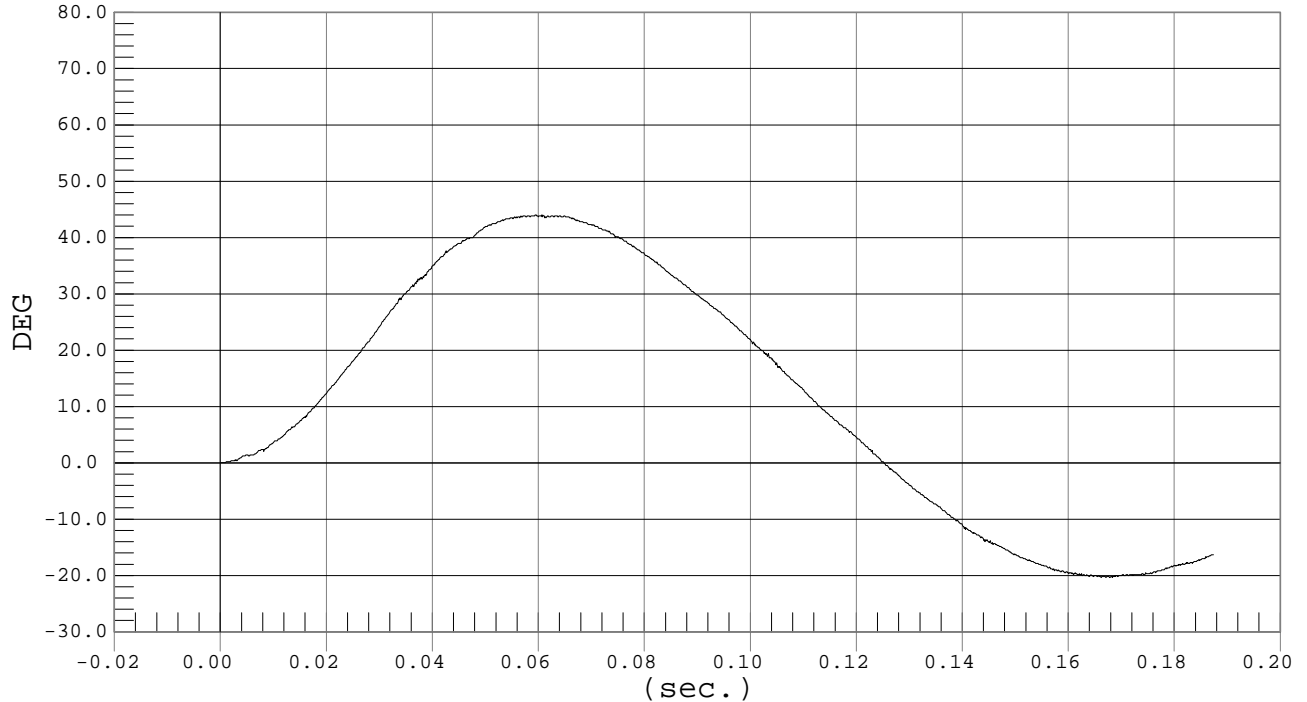


Test Desc.: Neck Bending
Component: Dummy #020

REAR

Test Date: 03-13-03
Speed: 18.4 fps, 5.61 M/s

Ymin = -20.35 DEG @ 0.1661 sec., Ymax = 44 DEG @ 0.0593 sec.



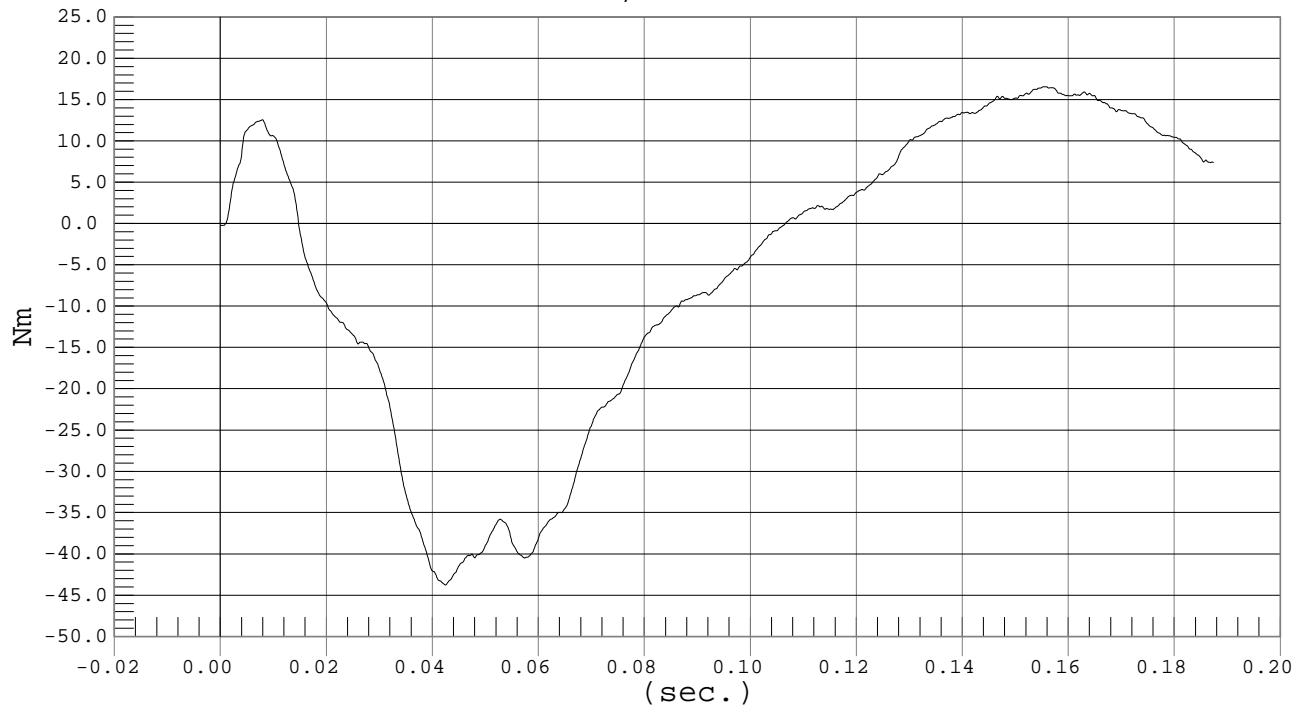


Test Desc.: Neck Bending
Component: Dummy #020

OCCIPITAL MOMENT

Test Date: 03-13-03
Speed: 18.4 fps, 5.61 M/s

Ymin = -43.76 Nm @ 0.0424 sec., Ymax = 16.56 Nm @ 0.1557 sec.



MGA RESEARCH CORPORATION
 SHOULDER IMPACT TEST
 SID IIs DUMMY

Date: 3/16/03
 Dummy Serial Number: 020
 Test Number: D03283/D03303

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03283</u>	<u>D03303</u>
Temperature (°C)	20.8° – 22.2°	20.9	21.0
Humidity	10% - 70%	22	19
Impact Velocity	4.41 - 4.59 m/s	4.52	4.51
Probe Force	1.6 - 2.4 kN	2.1	2.3
Shoulder Displacement	27-39 mm	31	29

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

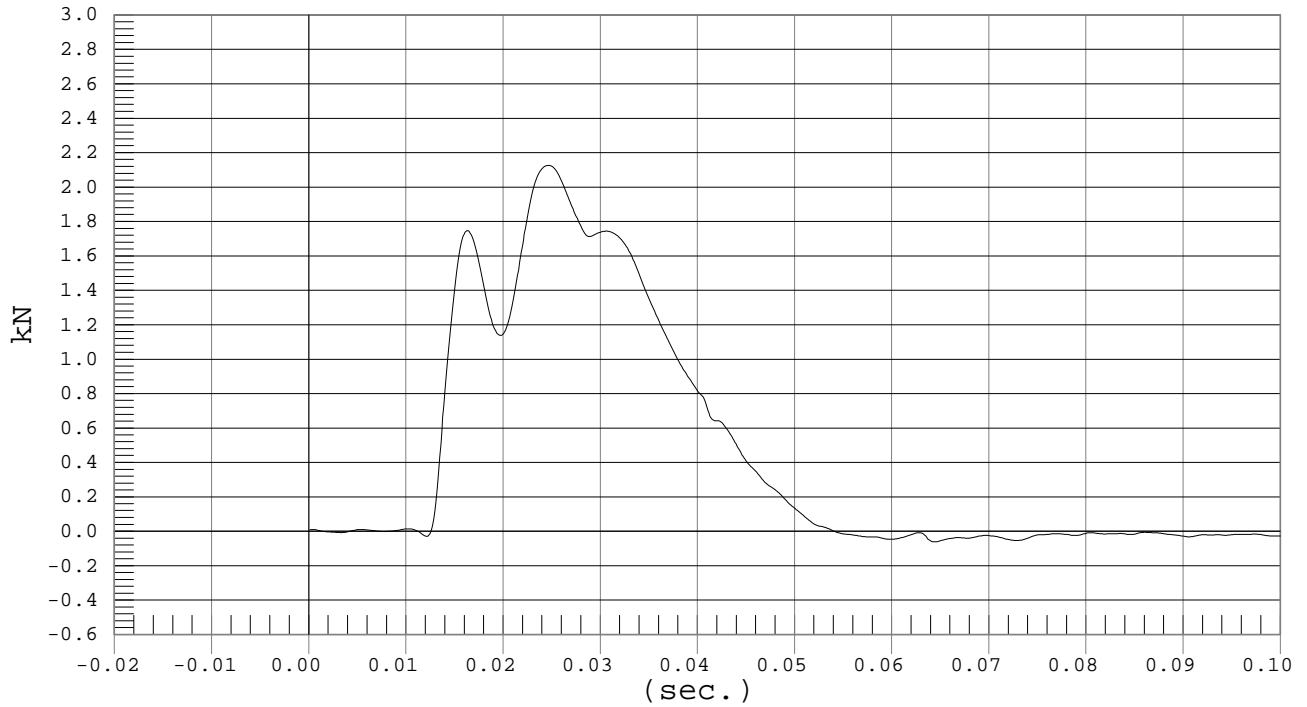


PROBE FORCE

Test Desc.: Shoulder Impact
Component: Dummy #020

Test Date: 03-14-03
Speed: 14.8 fps, 4.52 M/s

Ymin = -.06 kN @ 0.0643 sec., Ymax = 2.13 kN @ 0.0246 sec.

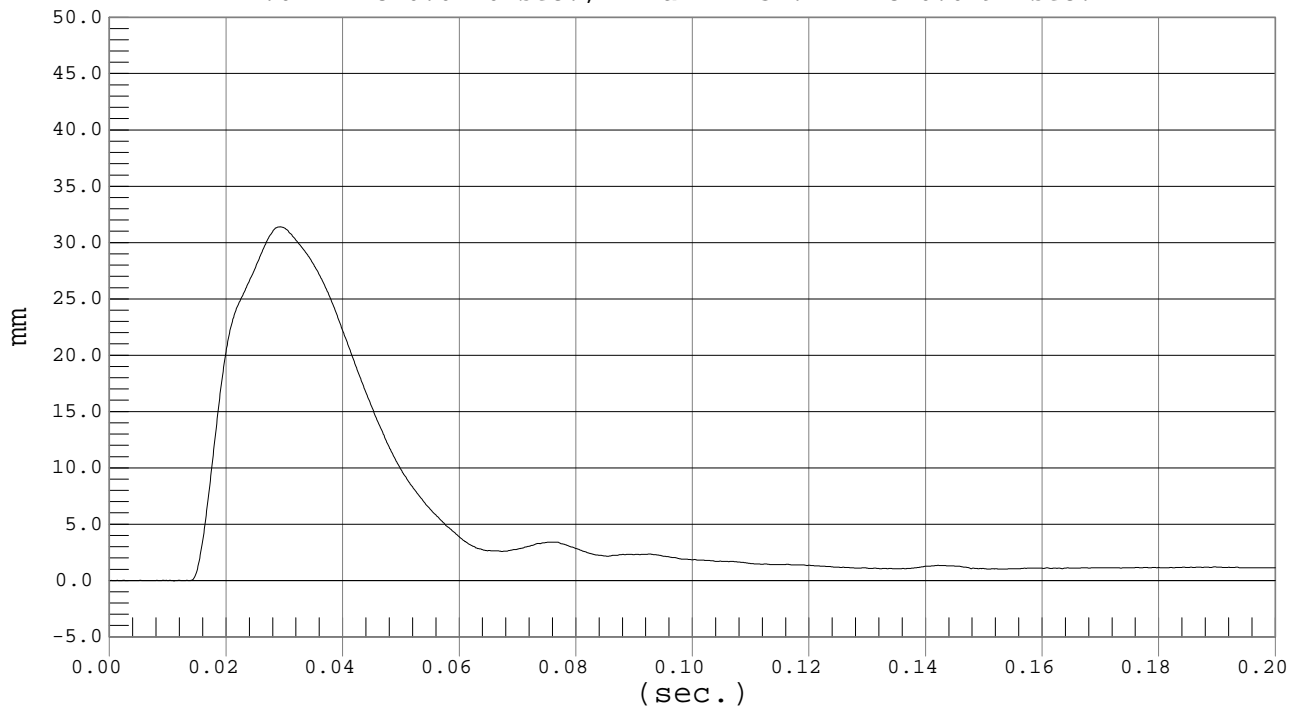


SHOULDER DISPLACEMENT

Test Desc.: Shoulder Impact
Component: Dummy #020

Test Date: 03-14-03
Speed: 14.8 fps, 4.52 M/s

Ymin = -.04 mm @ 0.0110 sec., Ymax = 31.4 mm @ 0.0292 sec.



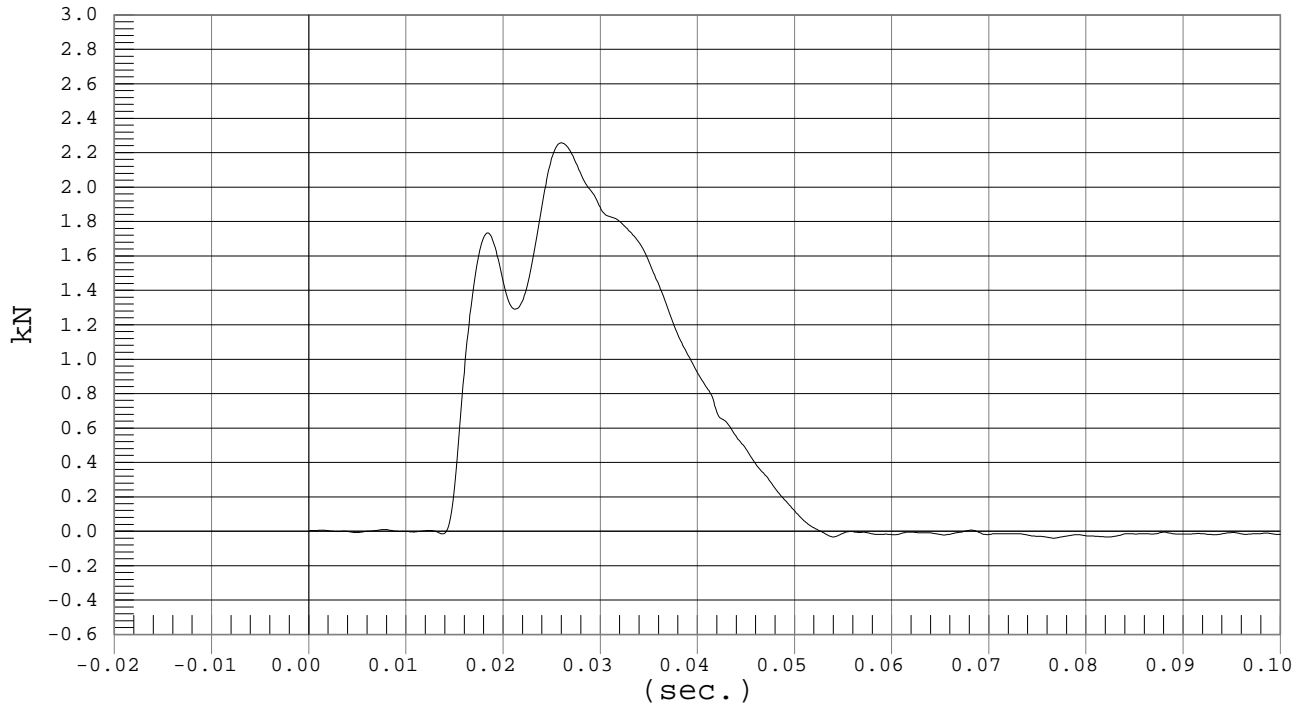


PROBE FORCE

Test Desc.: Shoulder Impact
Component: Dummy #020

Test Date: 03-16-03
Speed: 14.8 fps, 4.51 M/s

Ymin = -.04 kN @ 0.0766 sec., Ymax = 2.26 kN @ 0.0259 sec.

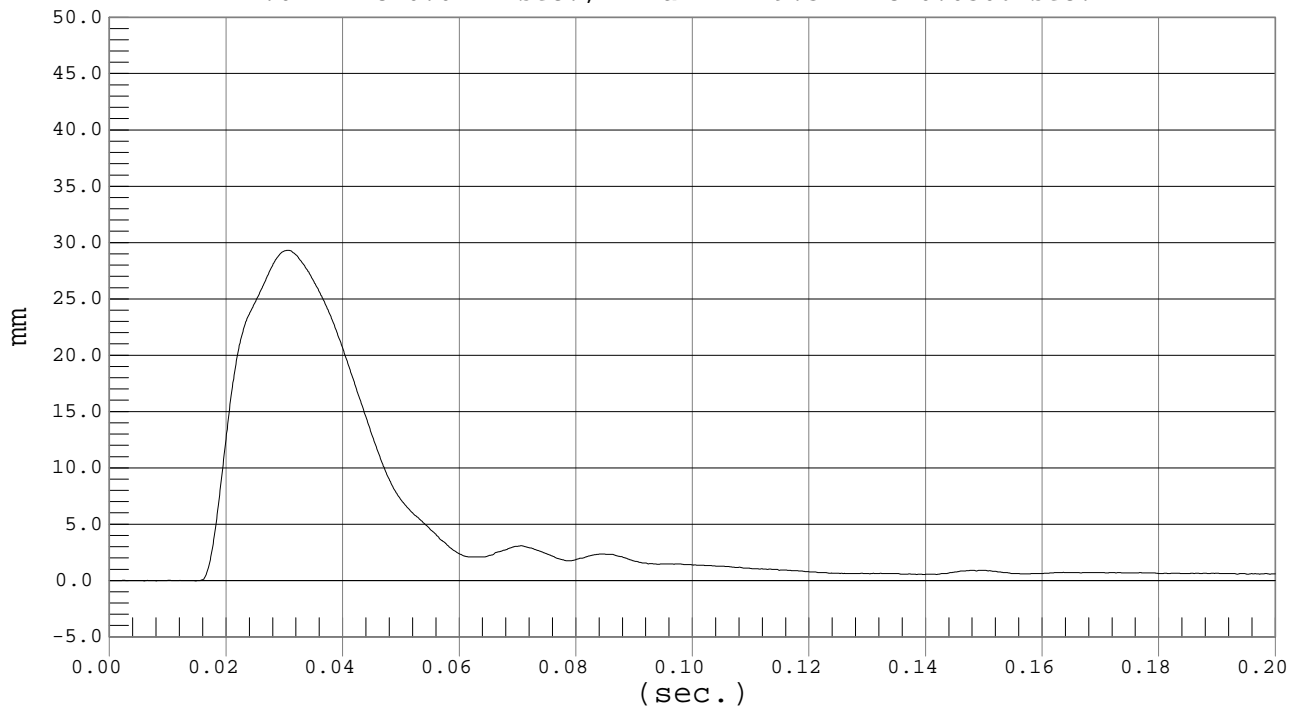


SHOULDER DISPLACEMENT

Test Desc.: Shoulder Impact
Component: Dummy #020

Test Date: 03-16-03
Speed: 14.8 fps, 4.51 M/s

Ymin = -.04 mm @ 0.0147 sec., Ymax = 29.3 mm @ 0.0306 sec.



MGA RESEARCH CORPORATION
 THORAX (WITH ARM) IMPACT TESTS
 SID IIs DUMMY

Date: 3/16/03
 Dummy Serial Number: 020
 Test Number: D03284/D03304

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03284</u>	<u>D03304</u>
Temperature (°C)	20.8° – 22.2°	21.0	21.2
Humidity	10% - 70%	22	23
Impact Velocity	6.57 - 6.84 m/s	6.74	6.75
Probe Force	4.1 – 4.7 kN	4.2	4.4
Upper Spine Acceleration	34 – 48 g's	43	45
Lower Spine Acceleration	31 - 36 g's	29*	30.9*
Upper Rib Displacement	23 - 35 mm	27	26
Middle Rib Displacement	29 - 44 mm	33	32
Lower Rib Displacement	33 - 40 mm	38	36
Shoulder Displacement	30 - 42 mm	29*	29*

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

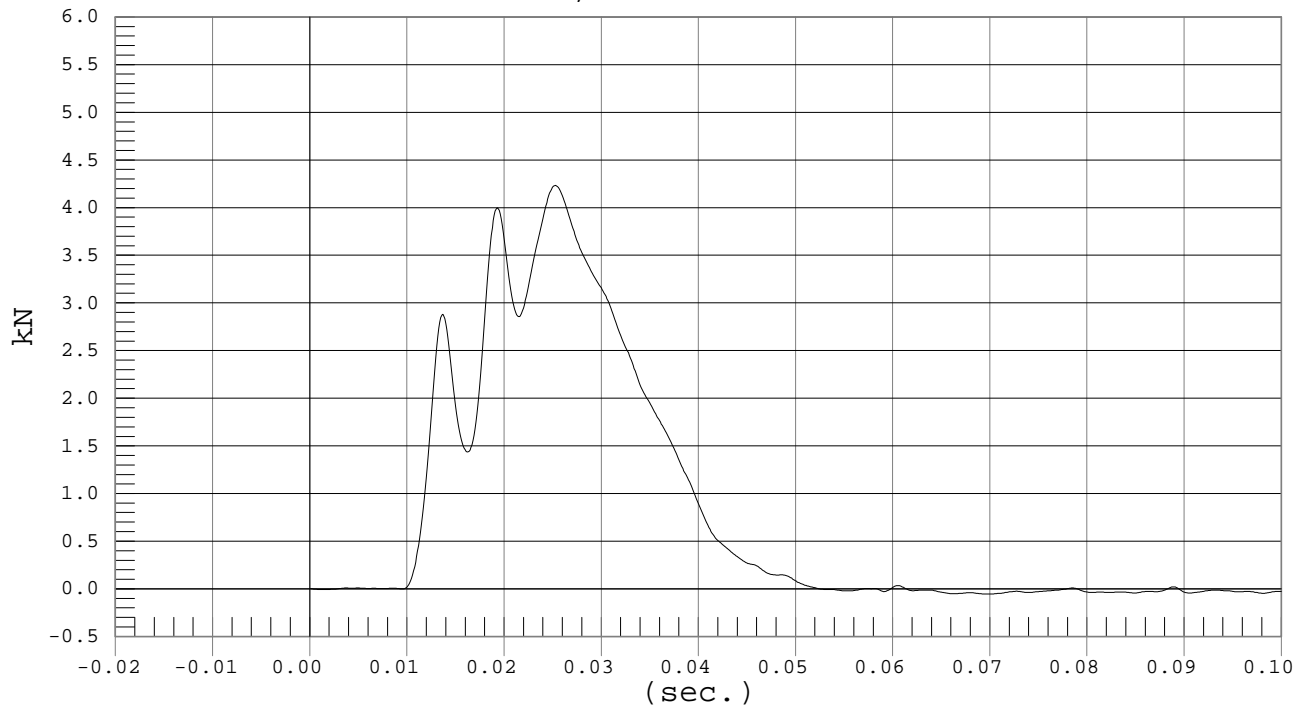


Test Desc.: Thorax With Arm
Component: Dummy #020

PROBE FORCE

Test Date: 03-14-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -.1 kN @ 0.1850 sec., Ymax = 4.23 kN @ 0.0252 sec.



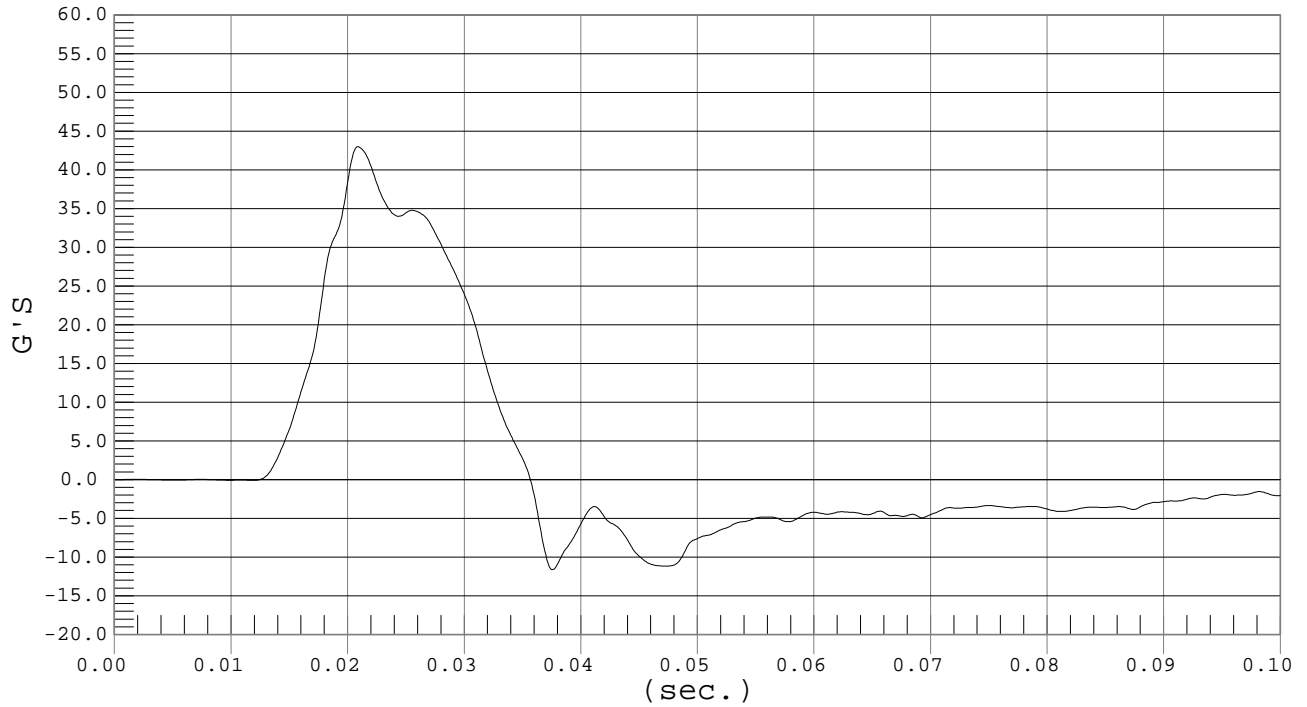


UPPER SPINE ACCELERATION

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

Test Date: 03-14-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -11.64 G'S @ 0.0375 sec., Ymax = 42.99 G'S @ 0.0208 sec.

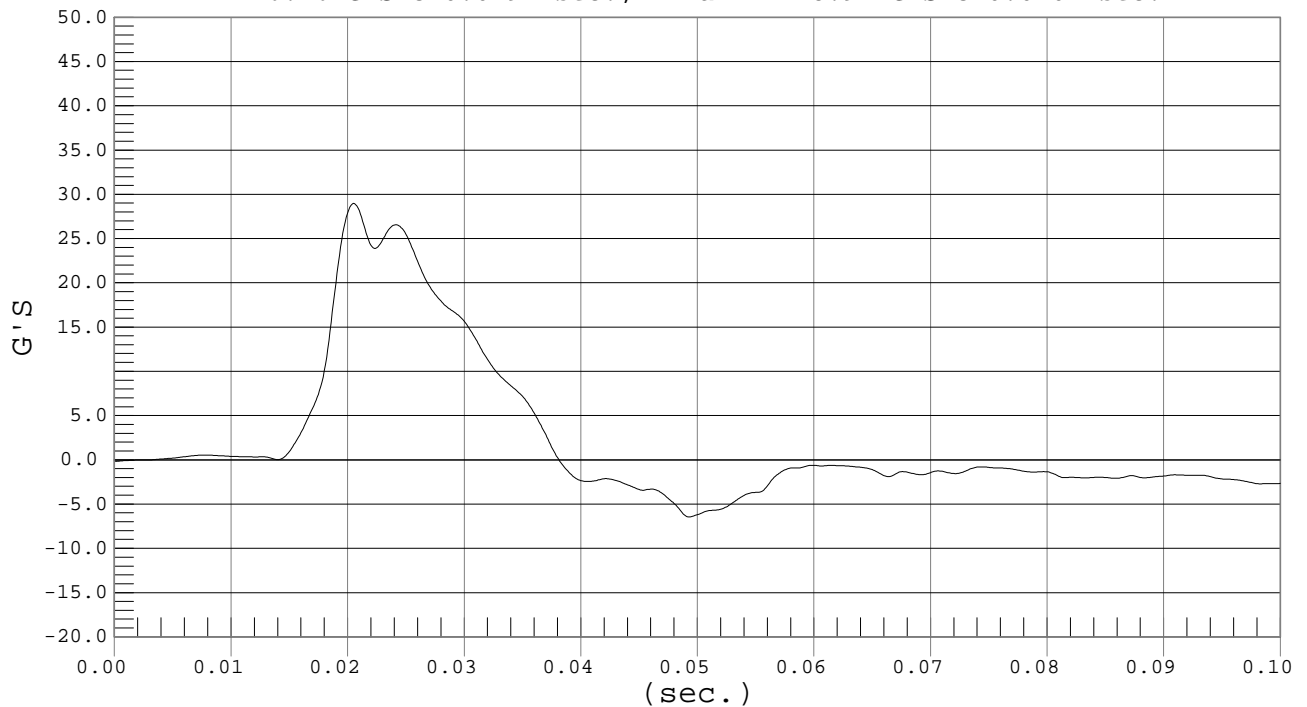


LOWER SPINE ACCELERATION

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

Test Date: 03-14-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -6.46 G'S @ 0.0492 sec., Ymax = 28.97 G'S @ 0.0204 sec.



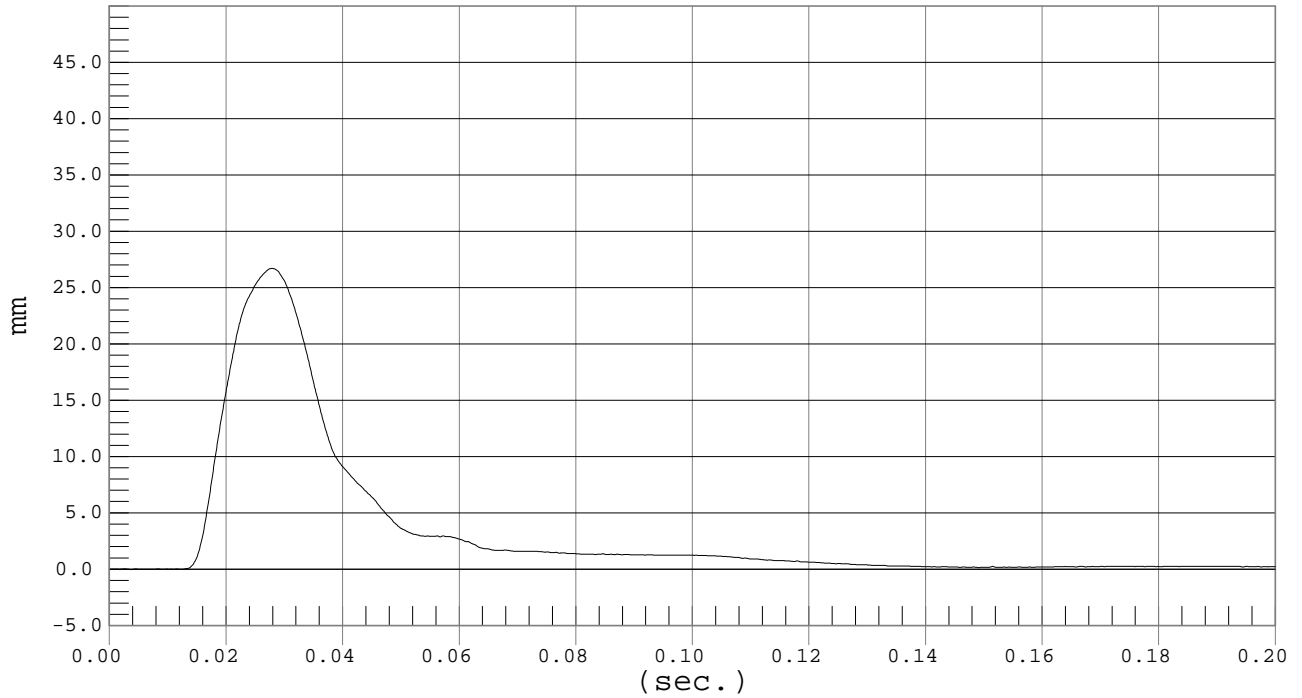


UPPER RIB DISPLACEMENT

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

Test Date: 03-14-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -.02 mm @ 0.0036 sec., Ymax = 26.71 mm @ 0.0278 sec.

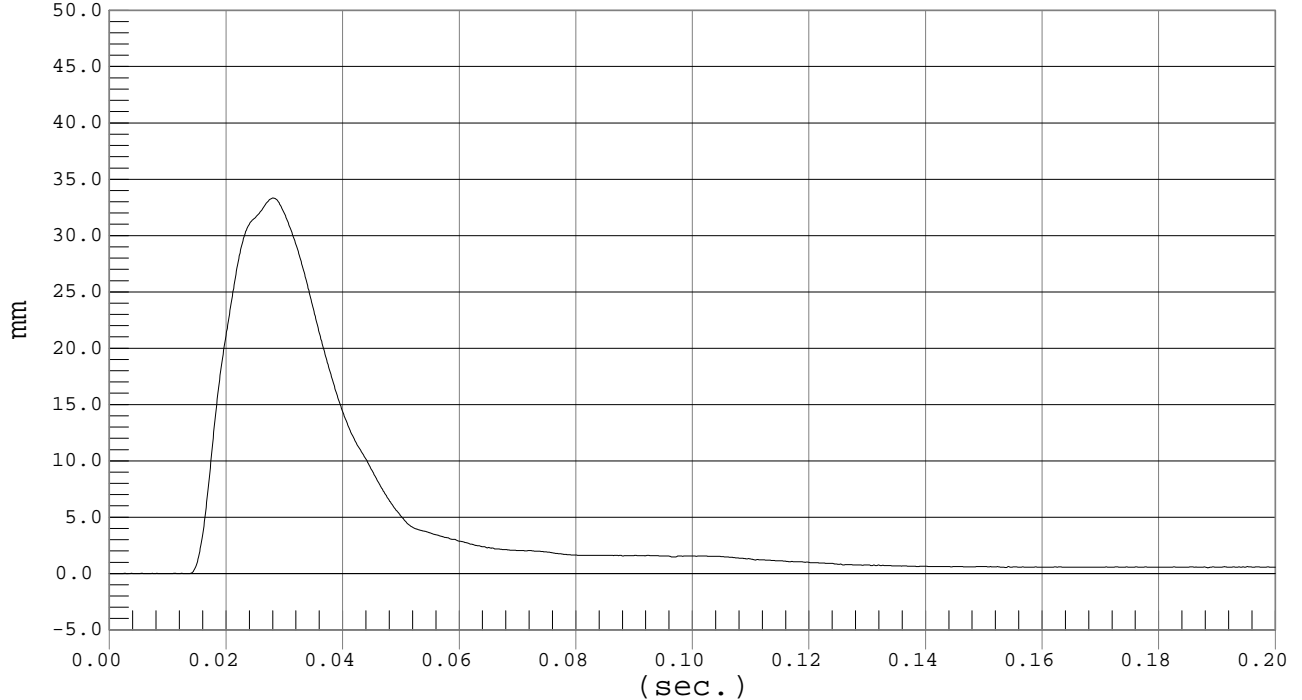


MIDDLE RIB DISPLACEMENT

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

Test Date: 03-14-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -.02 mm @ 0.0076 sec., Ymax = 33.33 mm @ 0.0280 sec.



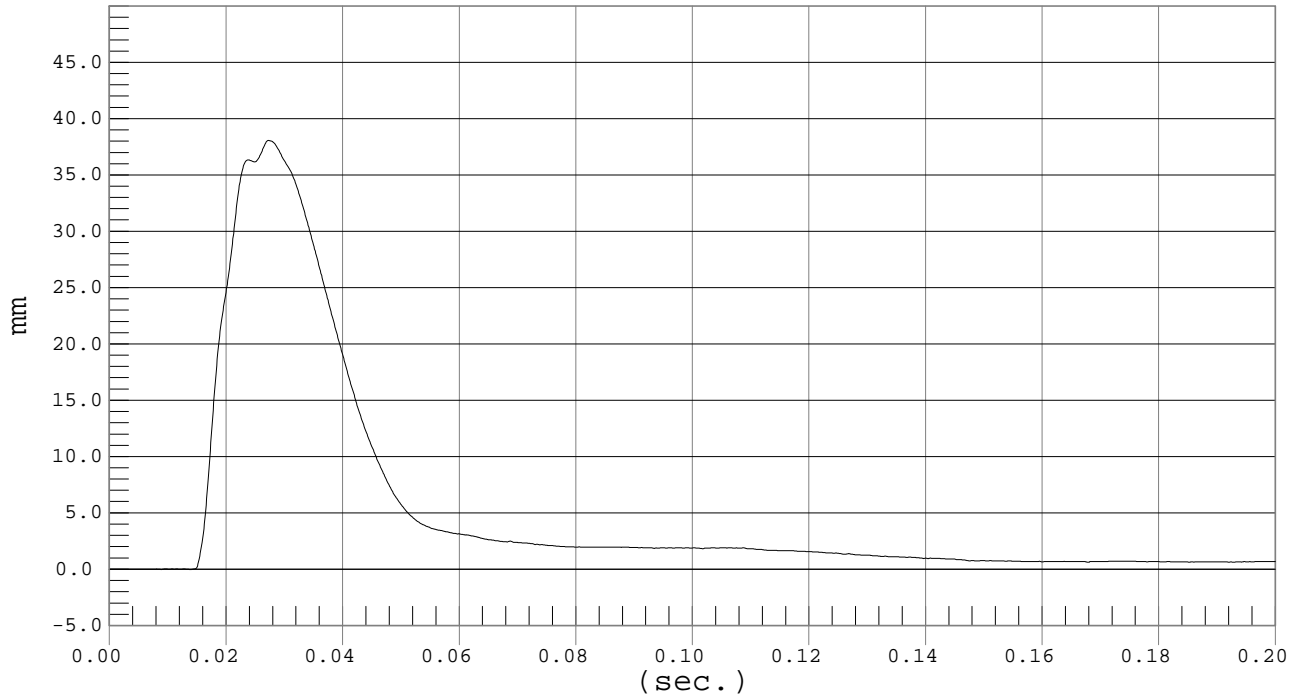


LOWER RIB DISPLACEMENT

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

Test Date: 03-14-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -0.03 mm @ 0.0138 sec., Ymax = 38.07 mm @ 0.0272 sec.

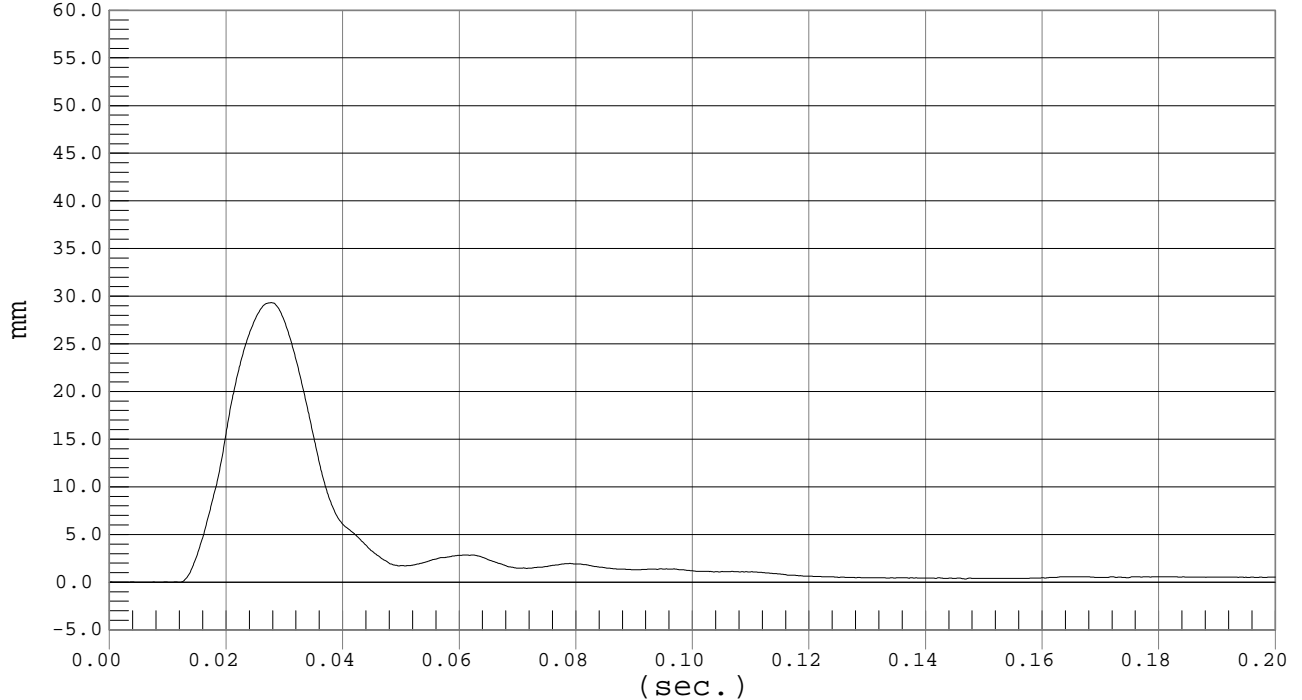


SHOULDER DISPLACEMENT

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

Test Date: 03-14-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -0.01 mm @ 0.0120 sec., Ymax = 29.32 mm @ 0.0276 sec.



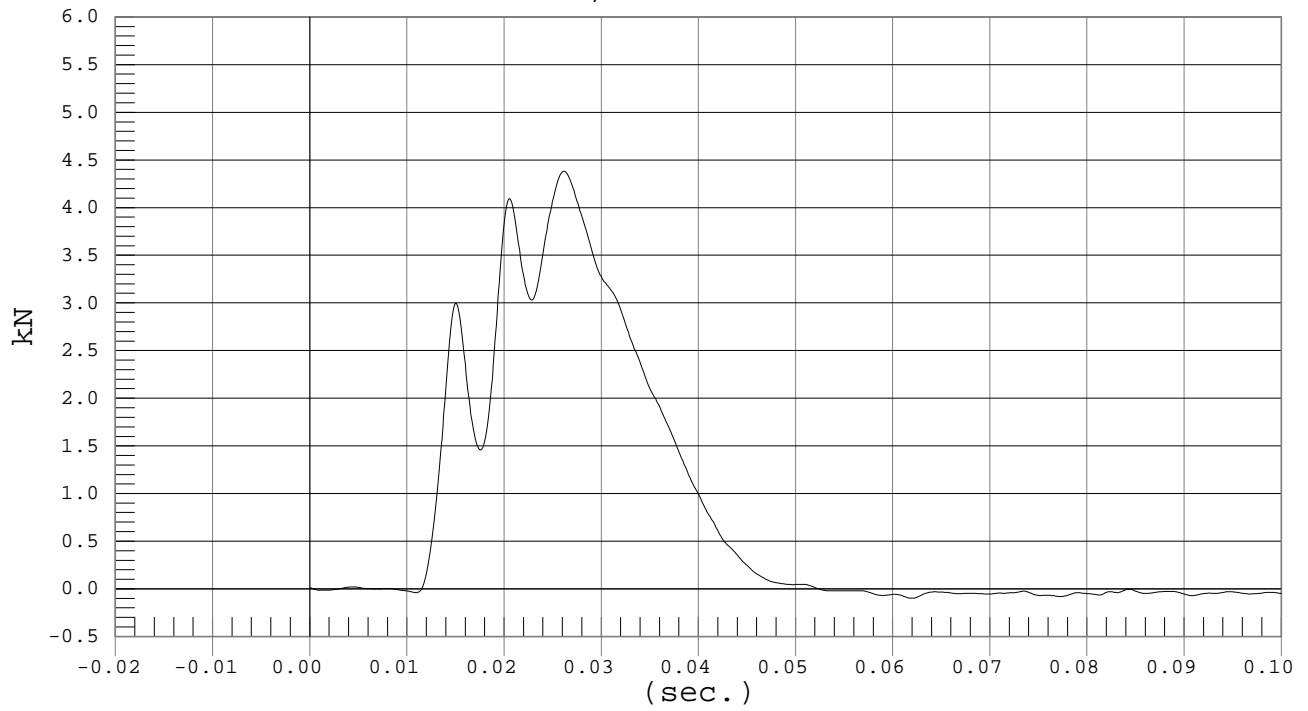


Test Desc.: Thorax With Arm
Component: Dummy #020

PROBE FORCE

Test Date: 03-16-03
Speed: 22.2 fps, 6.75 M/s

Ymin = -.15 kN @ 0.1930 sec., Ymax = 4.38 kN @ 0.0261 sec.



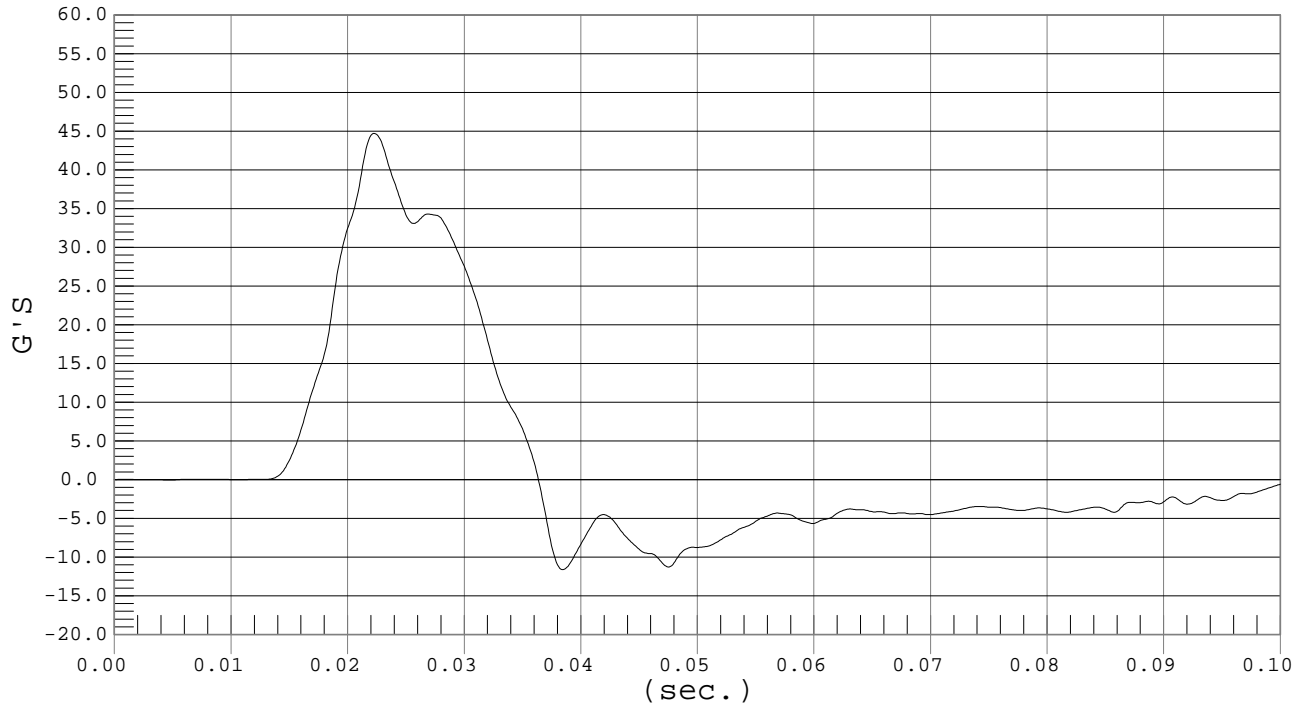


UPPER SPINE ACCELERATION

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

Test Date: 03-16-03
Speed: 22.2 fps, 6.75 M/s

Ymin = -11.64 G'S @ 0.0384 sec., Ymax = 44.71 G'S @ 0.0222 sec.

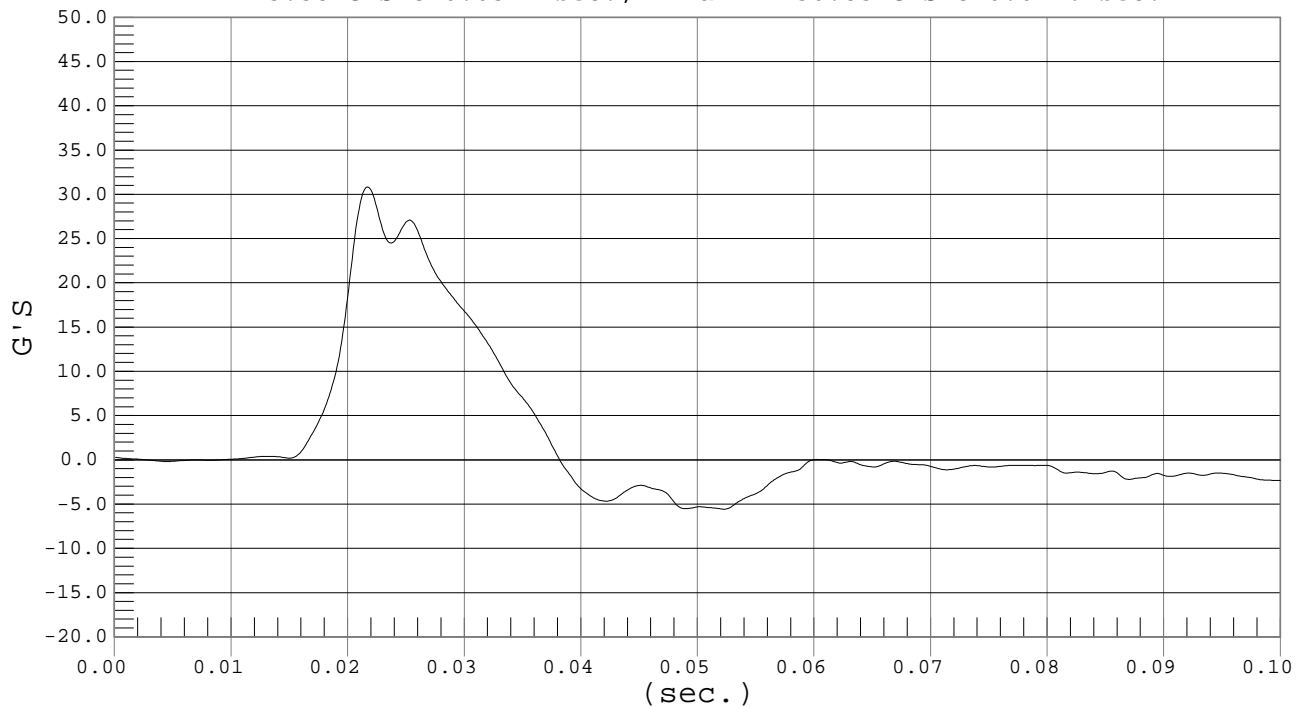


LOWER SPINE ACCELERATION

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

Test Date: 03-16-03
Speed: 22.2 fps, 6.75 M/s

Ymin = -5.58 G'S @ 0.0522 sec., Ymax = 30.83 G'S @ 0.0216 sec.



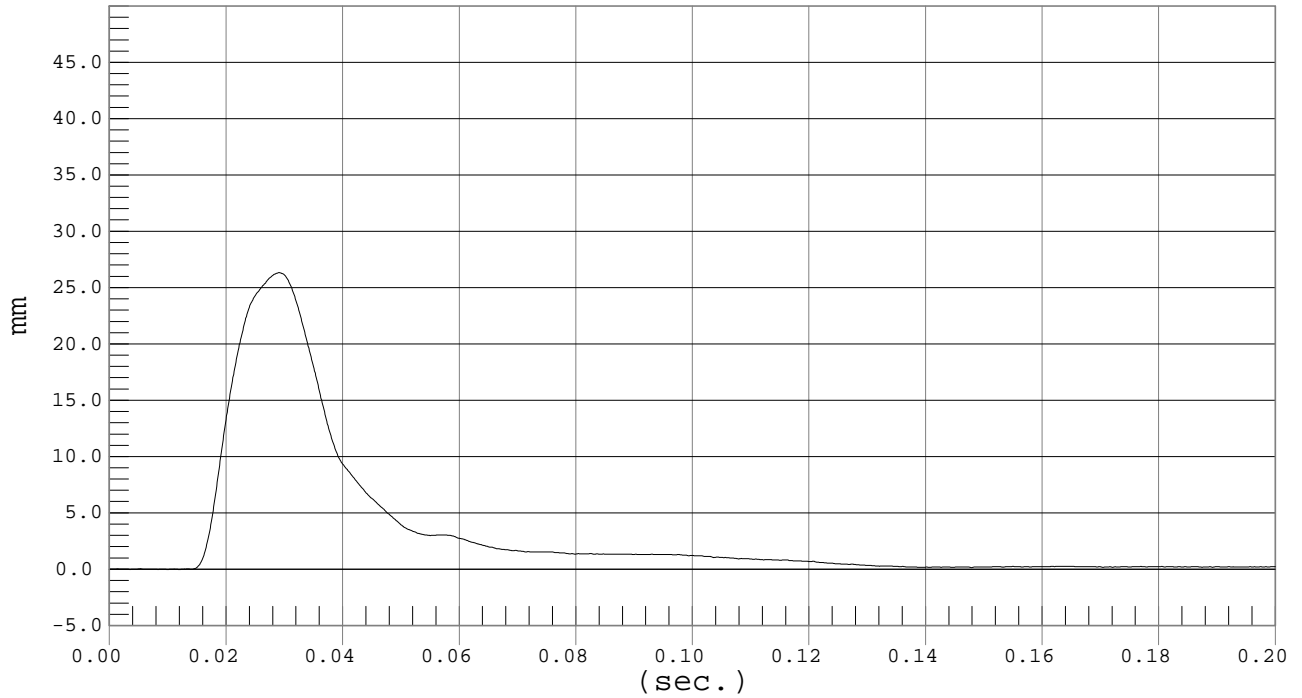


UPPER RIB DISPLACEMENT

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

Test Date: 03-16-03
Speed: 22.2 fps, 6.75 M/s

Ymin = $-.03$ mm @ 0.0119 sec., Ymax = 26.32 mm @ 0.0290 sec.

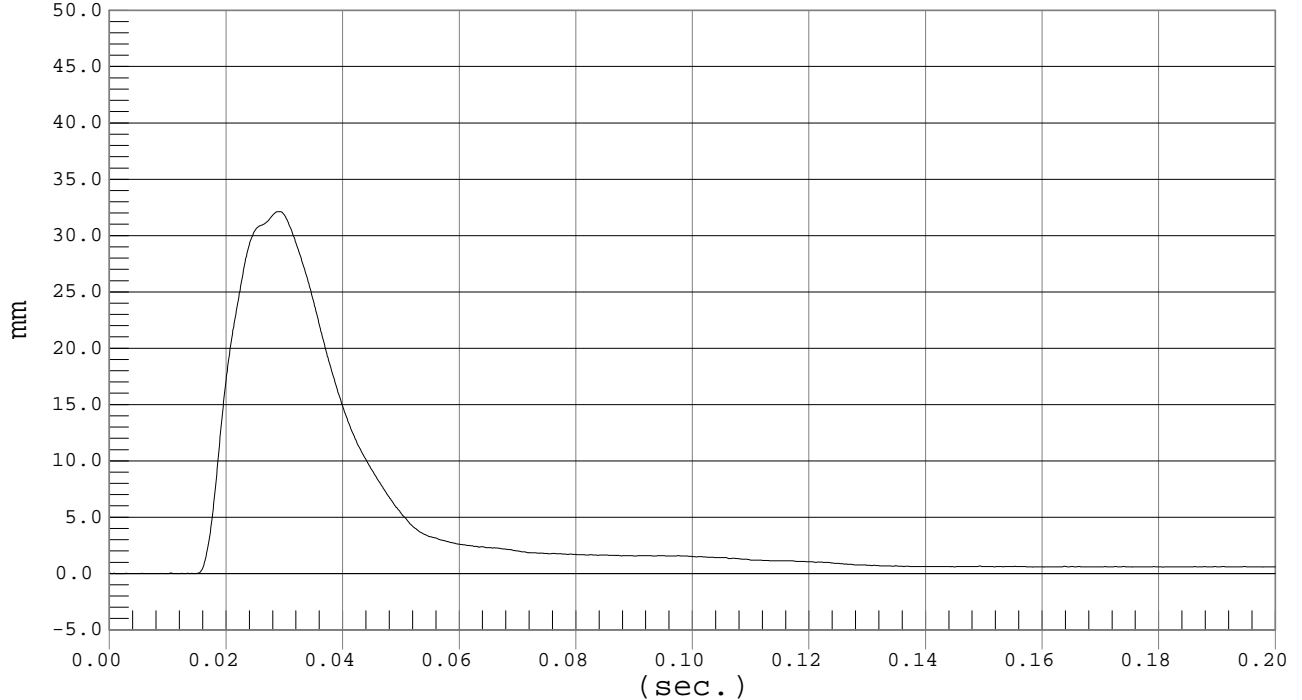


MIDDLE RIB DISPLACEMENT

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

Test Date: 03-16-03
Speed: 22.2 fps, 6.75 M/s

Ymin = $-.03$ mm @ 0.0085 sec., Ymax = 32.13 mm @ 0.0291 sec.



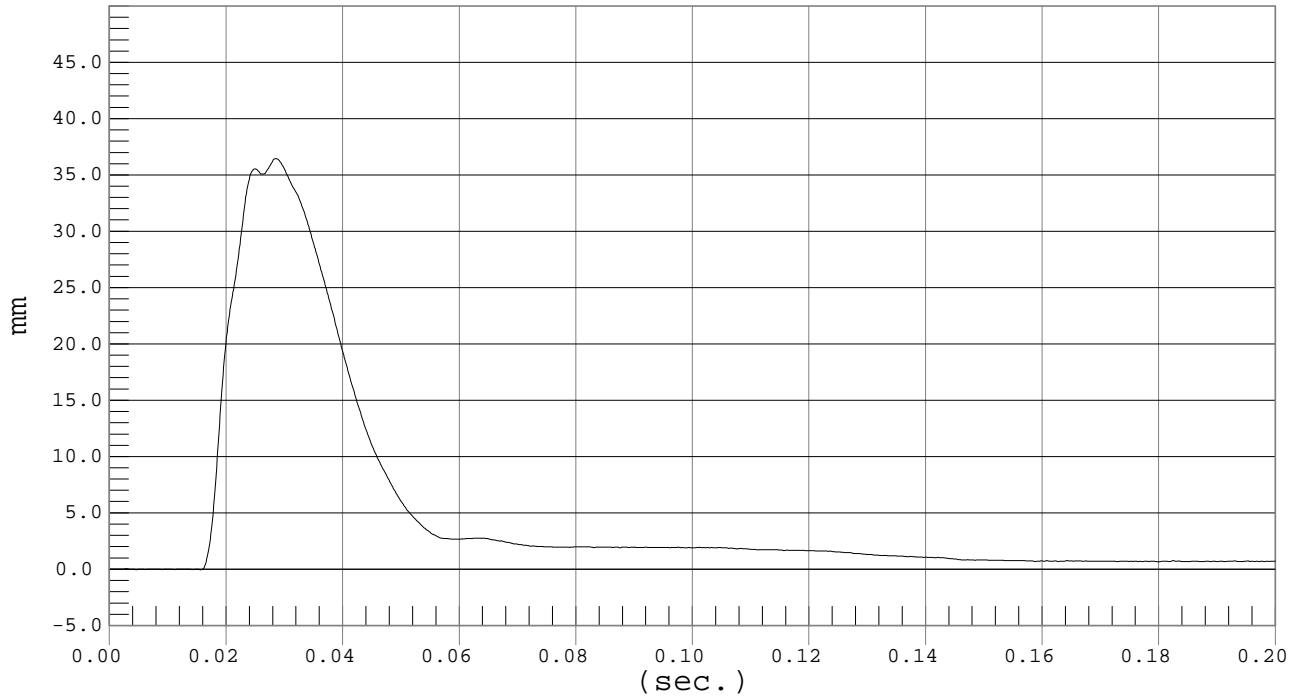


LOWER RIB DISPLACEMENT

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

Test Date: 03-16-03
Speed: 22.2 fps, 6.75 M/s

Ymin = -.06 mm @ 0.0156 sec., Ymax = 36.45 mm @ 0.0284 sec.

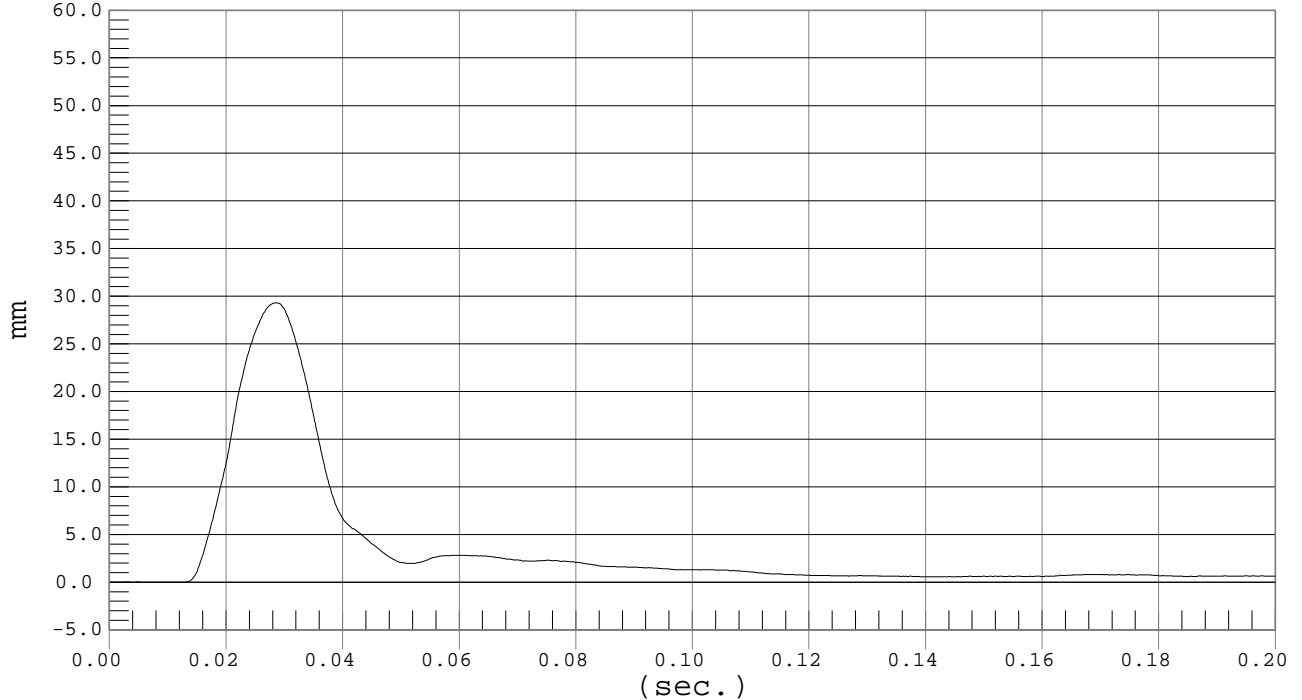


SHOULDER DISPLACEMENT

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

Test Date: 03-16-03
Speed: 22.2 fps, 6.75 M/s

Ymin = -.02 mm @ 0.0015 sec., Ymax = 29.3 mm @ 0.0284 sec.



MGA RESEARCH CORPORATION
 THORAX (WITHOUT ARM) IMPACT TESTS
 SID IIs DUMMY

Date: 3/16/03
 Dummy Serial Number: 020
 Test Number: D03285/D03305

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03285</u>	<u>D03305</u>
Temperature (°C)	20.8° – 22.2°	21.1	21.3
Humidity	10% - 70%	22	22
Impact Velocity	4.2 - 4.4m/s	4.25	4.26
Probe Force	1.8 - 2.3 kN	2.1	2.1
Upper Spine Acceleration	13 - 18 g's	16	16
Lower Spine Acceleration	8 - 13 g's	11	11
Upper Rib Displacement	32 - 41 mm	35	35
Middle Rib Displacement	40 - 51 mm	40	38*
Lower Rib Displacement	34 - 47 mm	37	33*

TEST DOES NOT MEET SPECIFICATIONS

Technician: _____

Approved By: _____

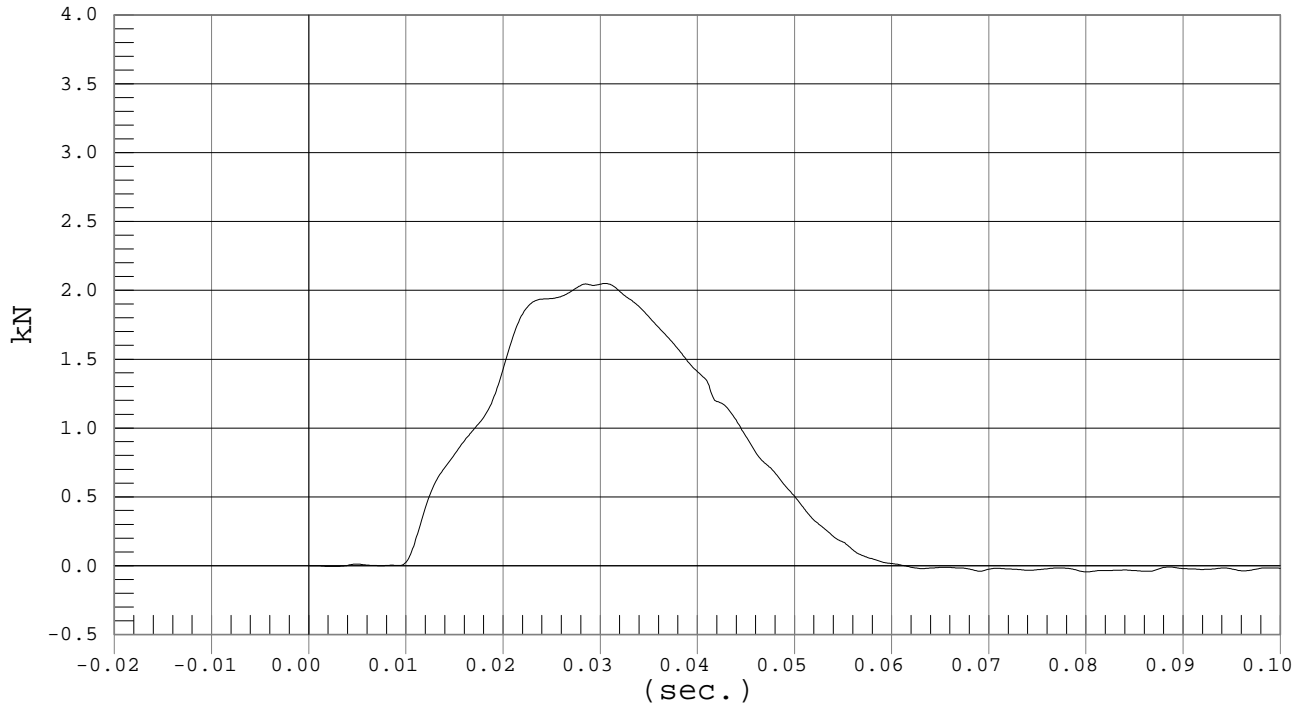


PROBE FORCE

Test Desc.: THORAX WITHOUT ARM
Component: Dummy #020

Test Date: 03-14-03
Speed: 14.0 fps, 4.25 M/s

Ymin = -.04 kN @ 0.0800 sec., Ymax = 2.05 kN @ 0.0304 sec.

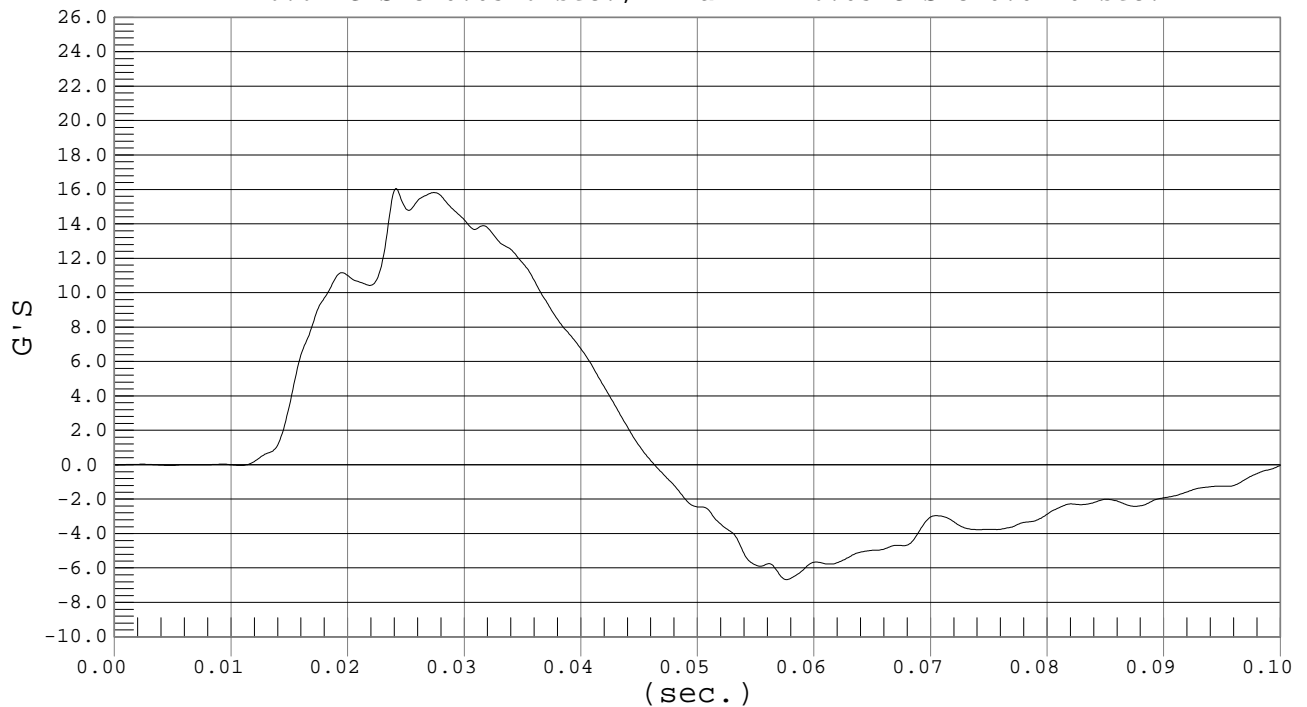


UPPER SPINE ACCELERATION

Test Desc.: THORAX WITHOUT ARM
Component: Dummy #020

Test Date: 03-14-03
Speed: 14.0 fps, 4.25 M/s

Ymin = -6.67 G'S @ 0.0576 sec., Ymax = 16.05 G'S @ 0.0240 sec.



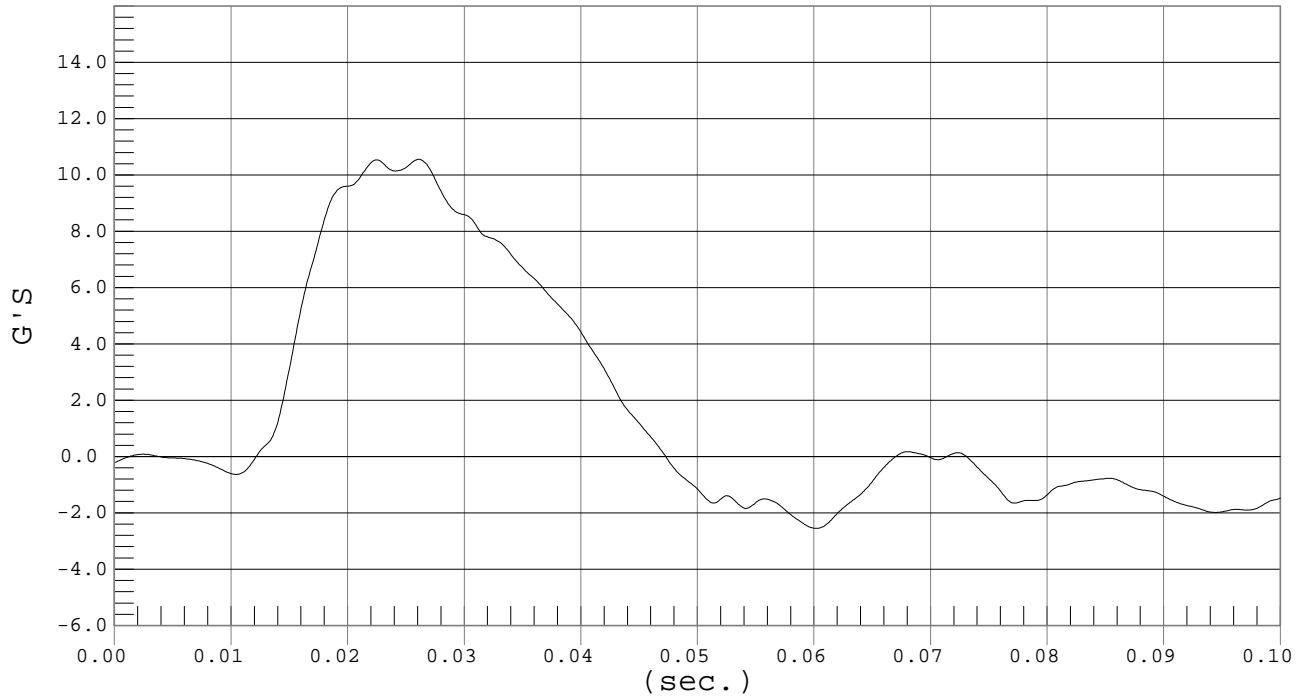


LOWER SPINE ACCELERATION

Test Desc.: THORAX WITHOUT ARM
Component: Dummy #020

Test Date: 03-14-03
Speed: 14.0 fps, 4.25 M/s

Ymin = -2.55 G'S @ 0.0601 sec., Ymax = 10.55 G'S @ 0.0260 sec.

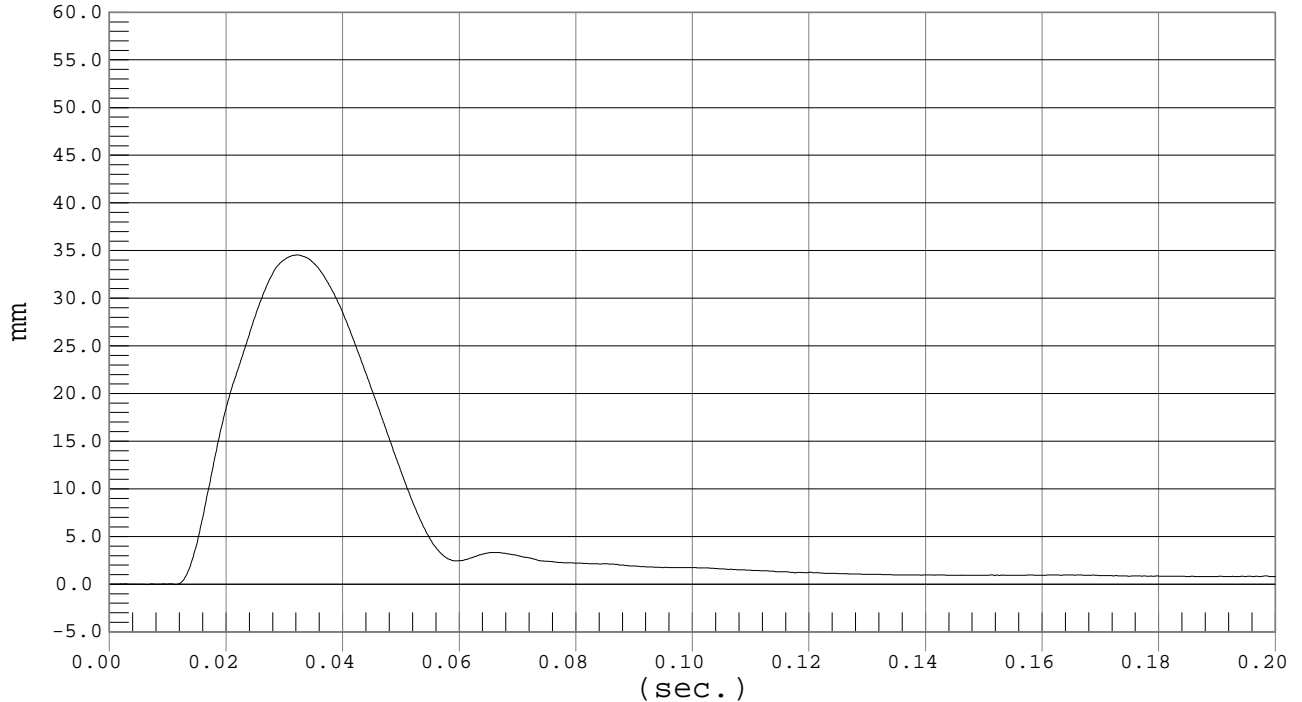


UPPER RIB DISPLACEMENT

Test Desc.: THORAX WITHOUT ARM
Component: Dummy #020

Test Date: 03-14-03
Speed: 14.0 fps, 4.25 M/s

Ymin = -.03 mm @ 0.0063 sec., Ymax = 34.52 mm @ 0.0323 sec.



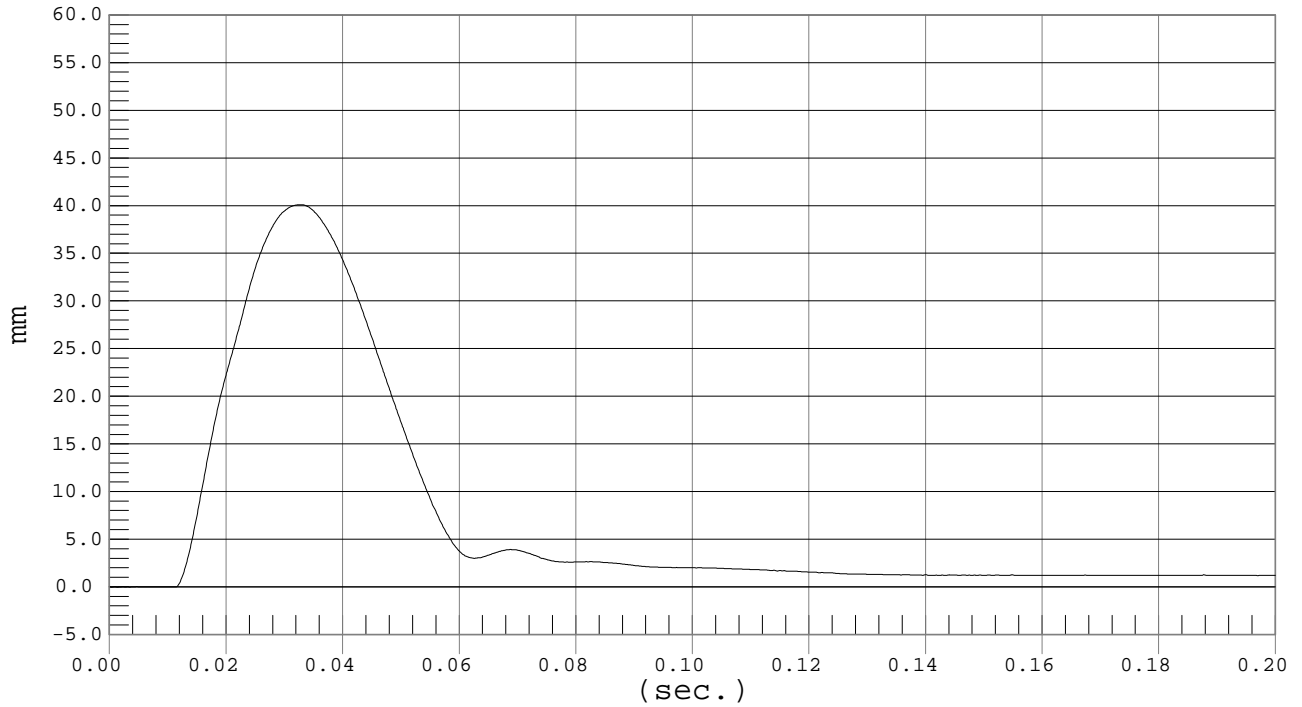


MIDDLE RIB DISPLACEMENT

Test Desc.: THORAX WITHOUT ARM
Component: Dummy #020

Test Date: 03-14-03
Speed: 14.0 fps, 4.25 M/s

Ymin = -.03 mm @ 0.0013 sec., Ymax = 40.08 mm @ 0.0329 sec.

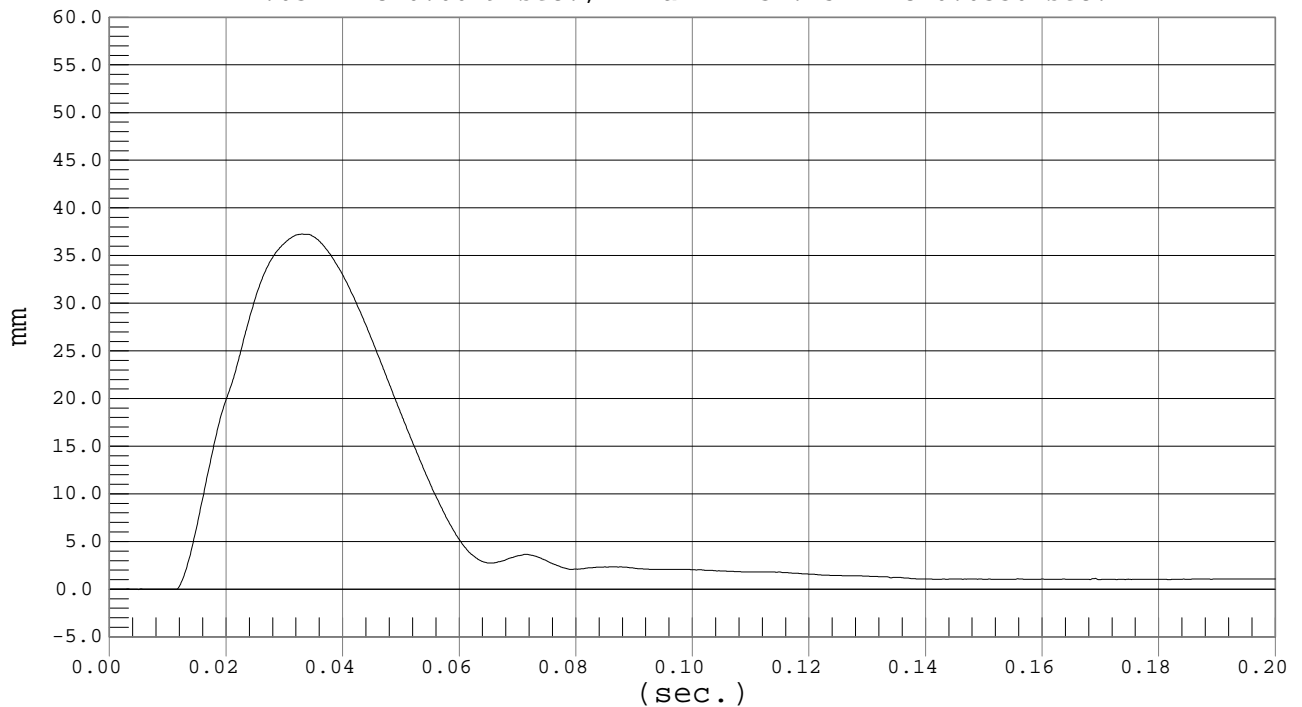


LOWER RIB DISPLACEMENT

Test Desc.: THORAX WITHOUT ARM
Component: Dummy #020

Test Date: 03-14-03
Speed: 14.0 fps, 4.25 M/s

Ymin = -.03 mm @ 0.0049 sec., Ymax = 37.25 mm @ 0.0330 sec.



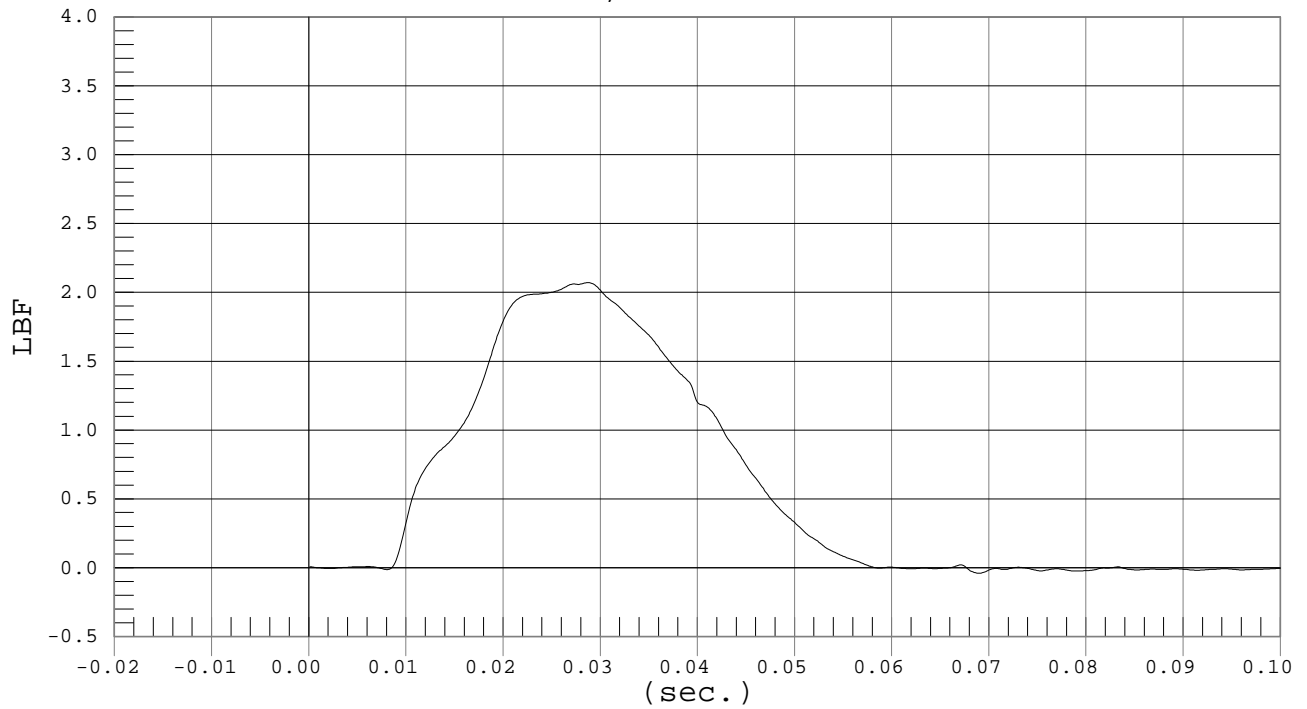


PROBE FORCE

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

Test Date: 03-16-03
Speed: 14.0 fps, 4.26 M/s

Ymin = -.06 LBF @ 0.1430 sec., Ymax = 2.07 LBF @ 0.0287 sec.

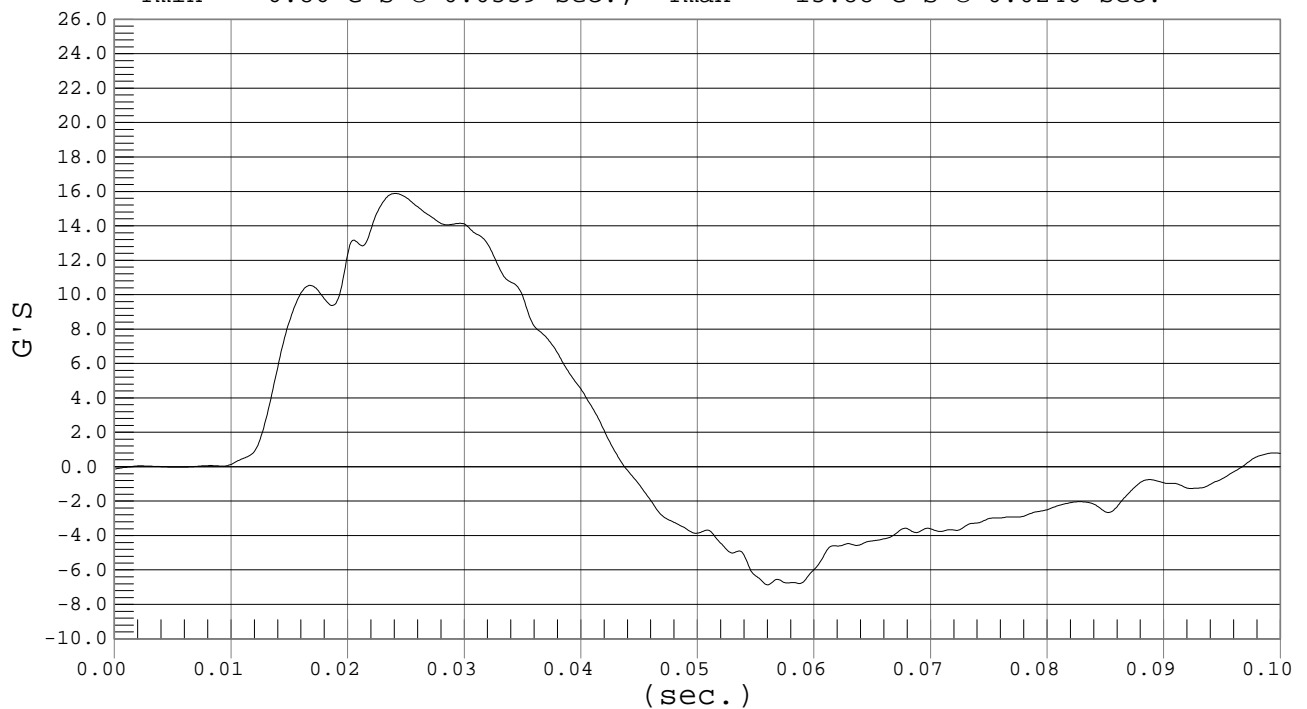


UPPER SPINE ACCELERATION

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

Test Date: 03-16-03
Speed: 14.0 fps, 4.26 M/s

Ymin = -6.86 G'S @ 0.0559 sec., Ymax = 15.88 G'S @ 0.0240 sec.



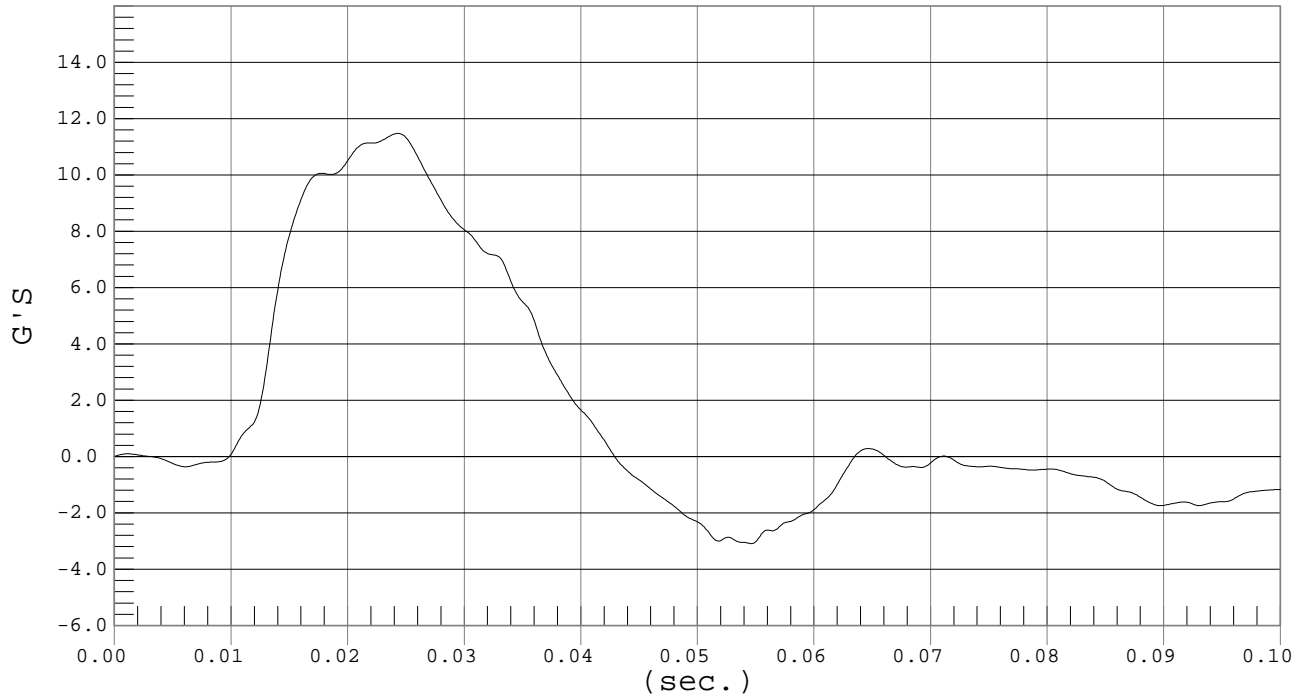


LOWER SPINE ACCELERATION

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

Test Date: 03-16-03
Speed: 14.0 fps, 4.26 M/s

Ymin = -3.09 G'S @ 0.0545 sec., Ymax = 11.47 G'S @ 0.0242 sec.

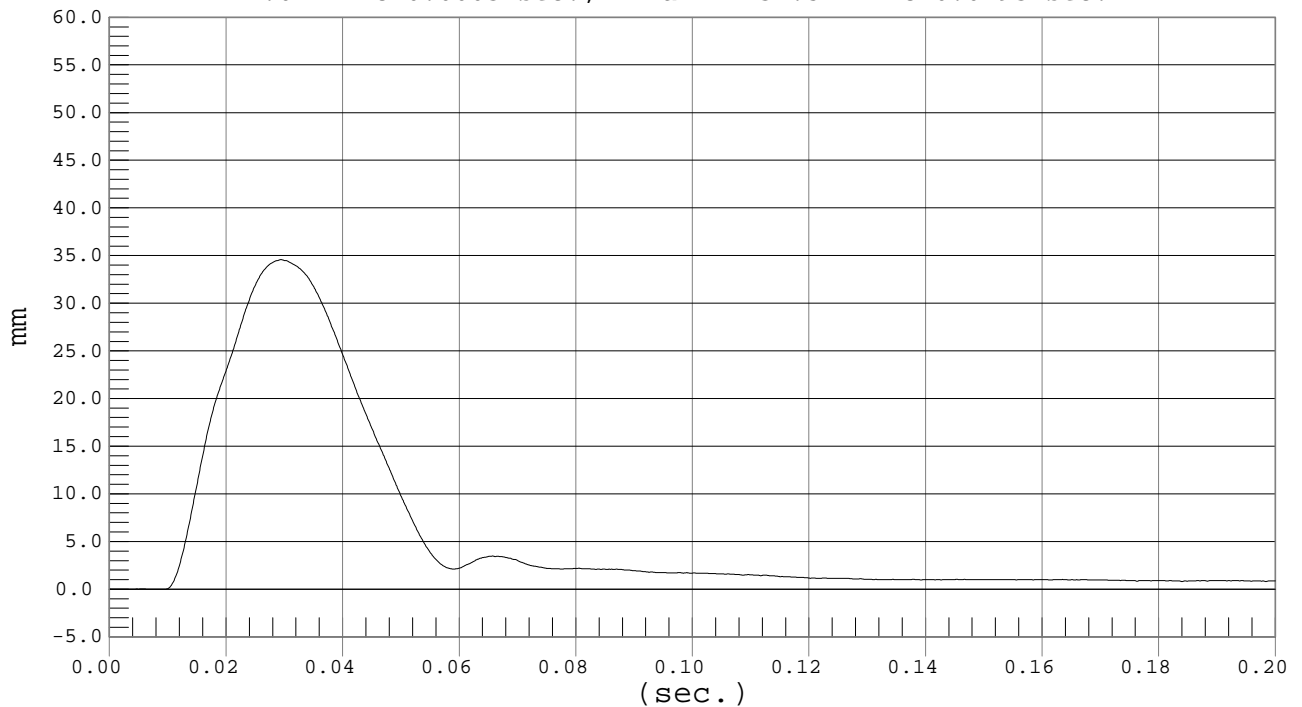


UPPER RIB DISPLACEMENT

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

Test Date: 03-16-03
Speed: 14.0 fps, 4.26 M/s

Ymin = -.01 mm @ 0.0003 sec., Ymax = 34.57 mm @ 0.0293 sec.



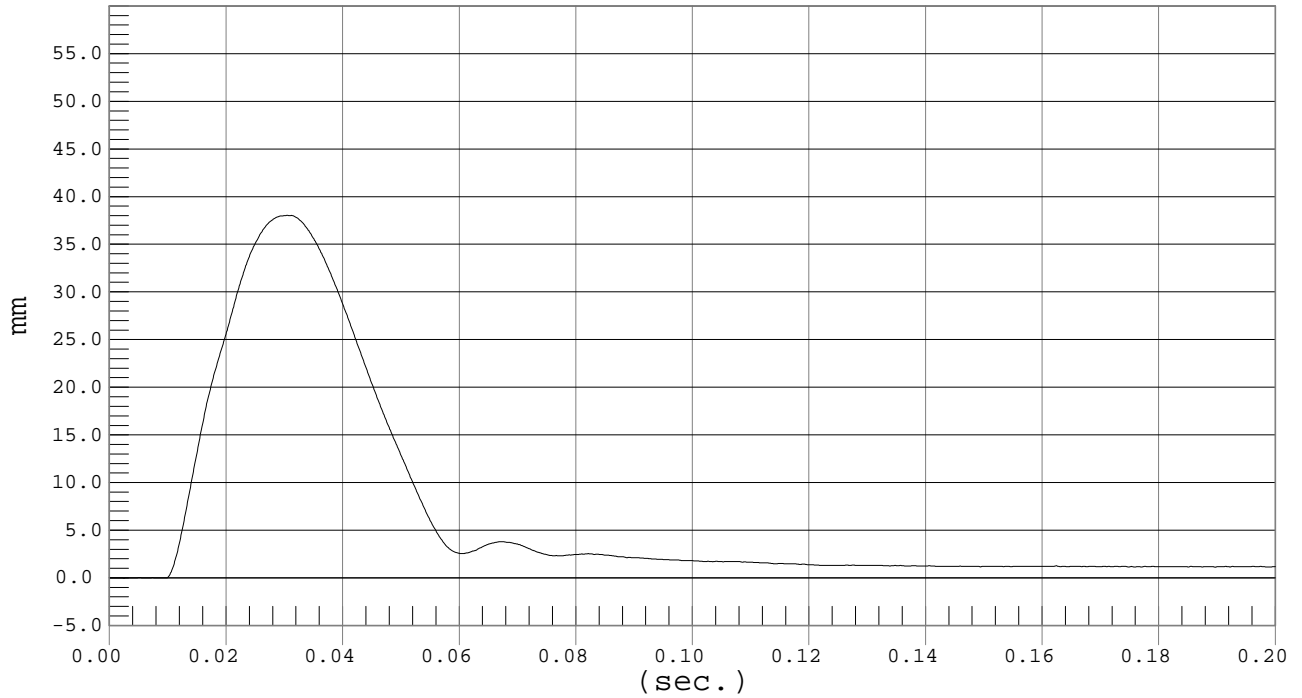


MIDDLE RIB DISPLACEMENT

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

Test Date: 03-16-03
Speed: 14.0 fps, 4.26 M/s

Ymin = -.02 mm @ 0.0024 sec., Ymax = 38.02 mm @ 0.0304 sec.

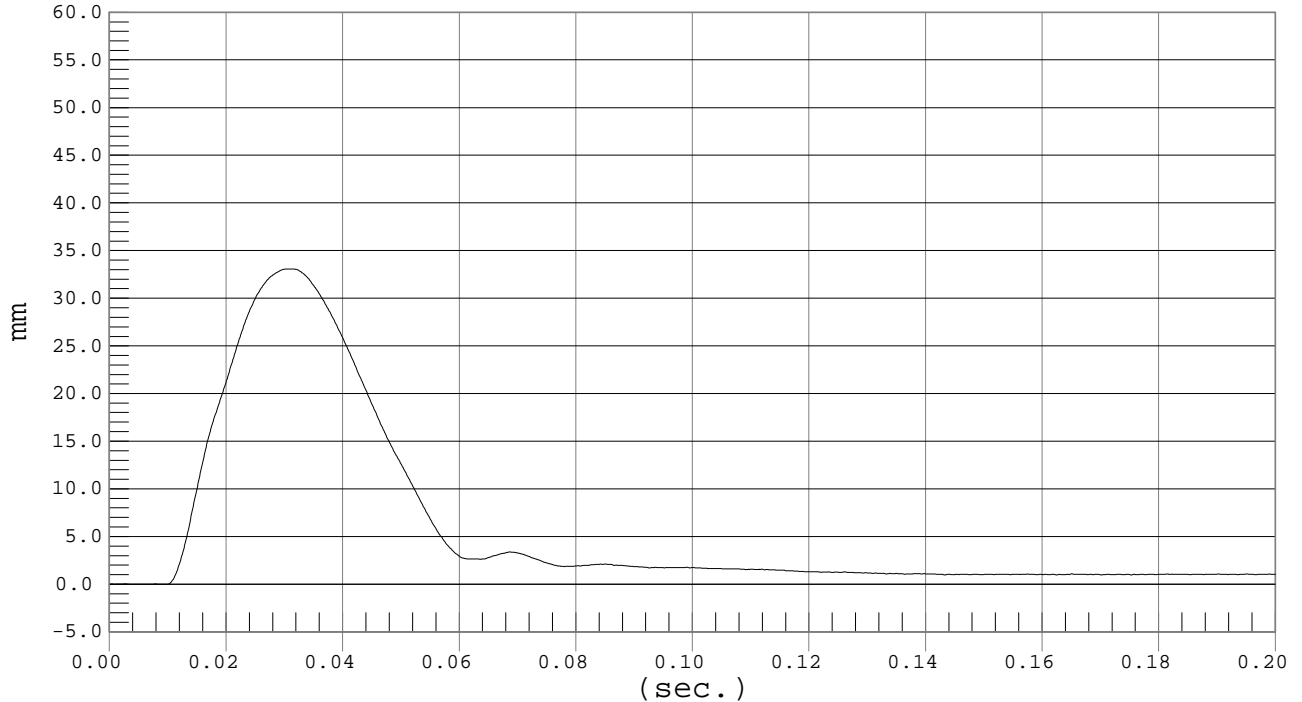


LOWER RIB DISPLACEMENT

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

Test Date: 03-16-03
Speed: 14.0 fps, 4.26 M/s

Ymin = -.04 mm @ 0.0008 sec., Ymax = 33.07 mm @ 0.0305 sec.



MGA RESEARCH CORPORATION
 ABDOMINAL IMPACT TEST
 SID IIs DUMMY

Date: 3/16/03
 Dummy Serial Number: 020
 Test Number: D03286/D03306

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03286</u>	<u>D03306</u>
Temperature (°C)	20.8° – 22.2°	21.1	21.2
Humidity	10% - 70%	21	22
Impact Velocity	4.41 - 4.59 m/s	4.51	4.51
Probe Force	1.3 - 1.9 kN	1.6	1.6
Upper Spine Acceleration	5 - 9 g's	7	8
Lower Spine Acceleration	10 - 12 g's	11	11
Upper Rib Displacement	44 - 55 mm	49	45
Middle Rib Displacement	44 - 56 mm	48	45

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

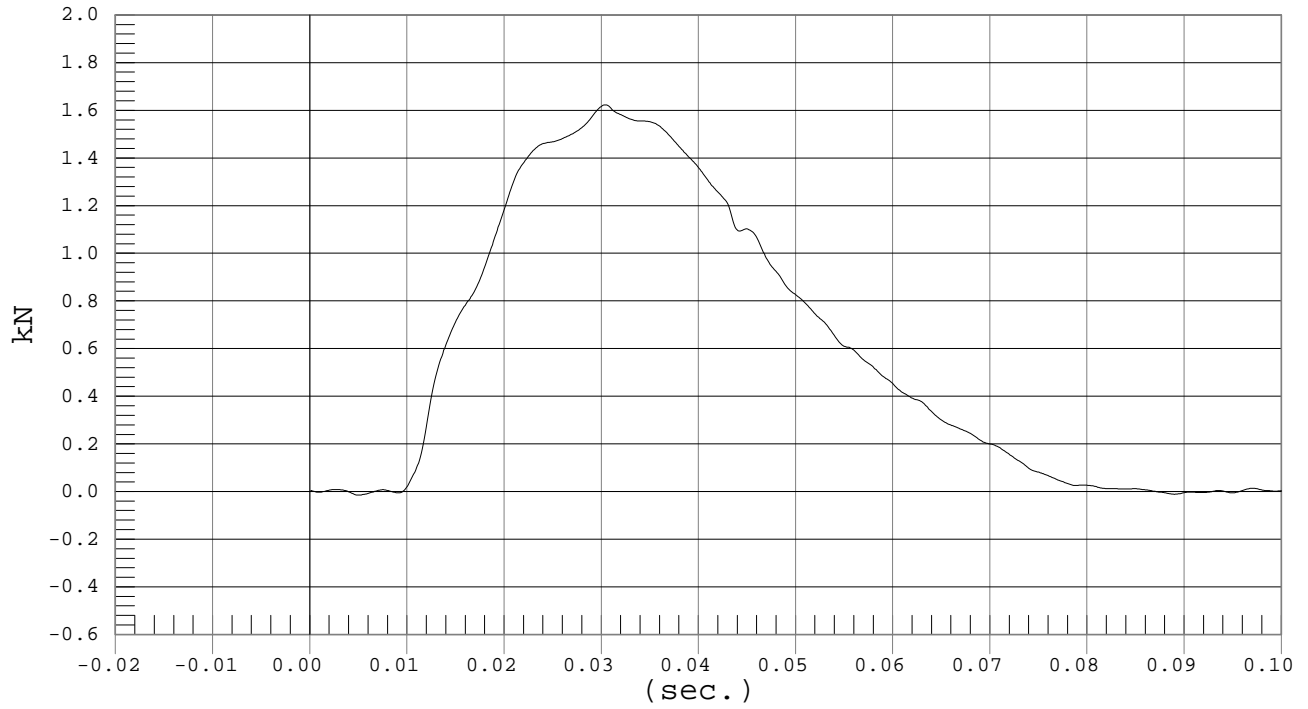


Test Desc.: Abdomen Impact
Component: Dummy #020

PROBE FORCE

Test Date: 03-14-03
Speed: 14.8 fps, 4.51 M/s

Ymin = -.01 kN @ 0.0049 sec., Ymax = 1.62 kN @ 0.0303 sec.



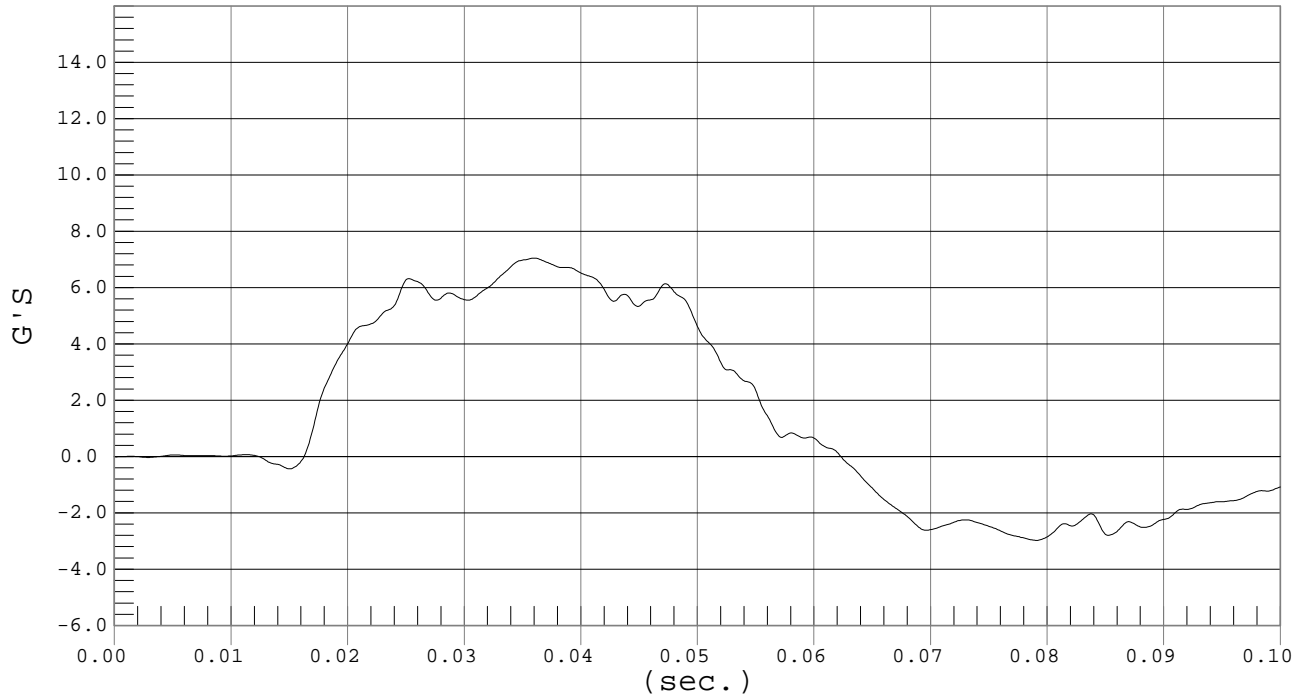


UPPER SPINE ACCELERATION

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 03-14-03
Speed: 14.8 fps, 4.51 M/s

Ymin = -2.98 G'S @ 0.0790 sec., Ymax = 7.05 G'S @ 0.0359 sec.

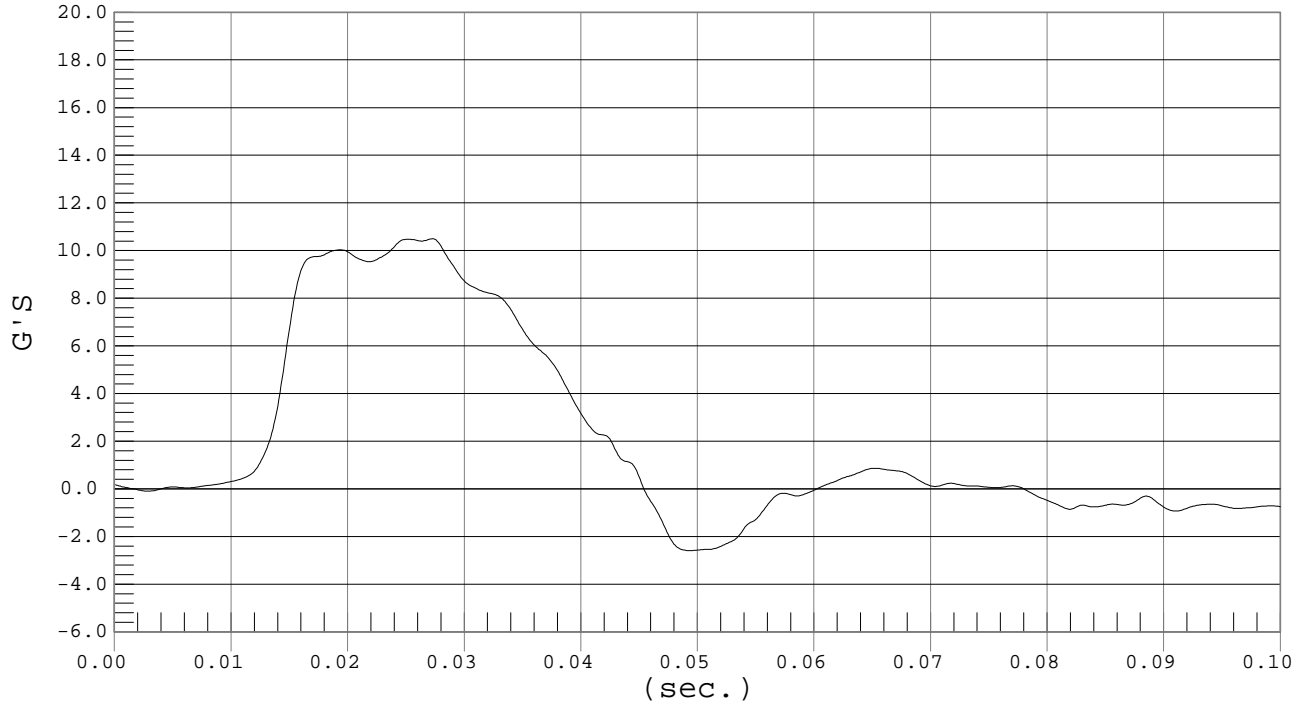


LOWER SPINE ACCELERATION

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 03-14-03
Speed: 14.8 fps, 4.51 M/s

Ymin = -2.59 G'S @ 0.0493 sec., Ymax = 10.5 G'S @ 0.0272 sec.



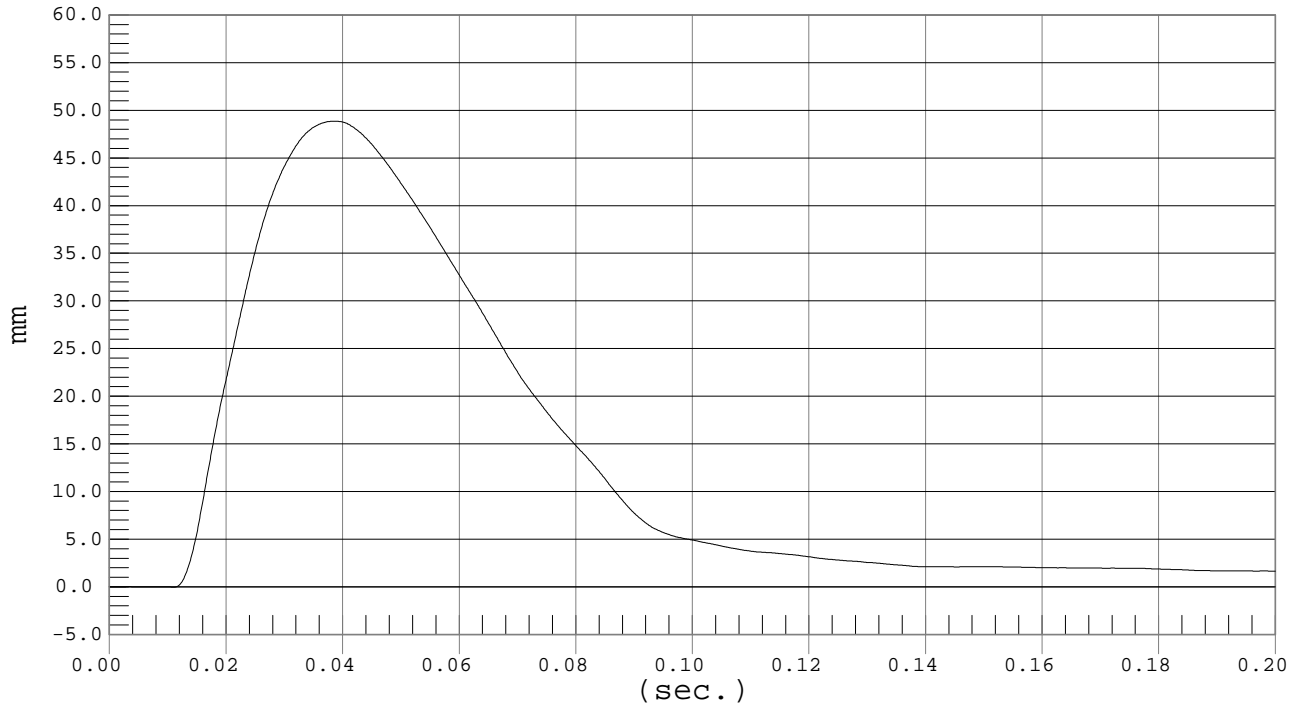


UPPER RIB DISPLACEMENT

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 03-14-03
Speed: 14.8 fps, 4.51 M/s

Ymin = -.03 mm @ 0.0109 sec., Ymax = 48.85 mm @ 0.0386 sec.

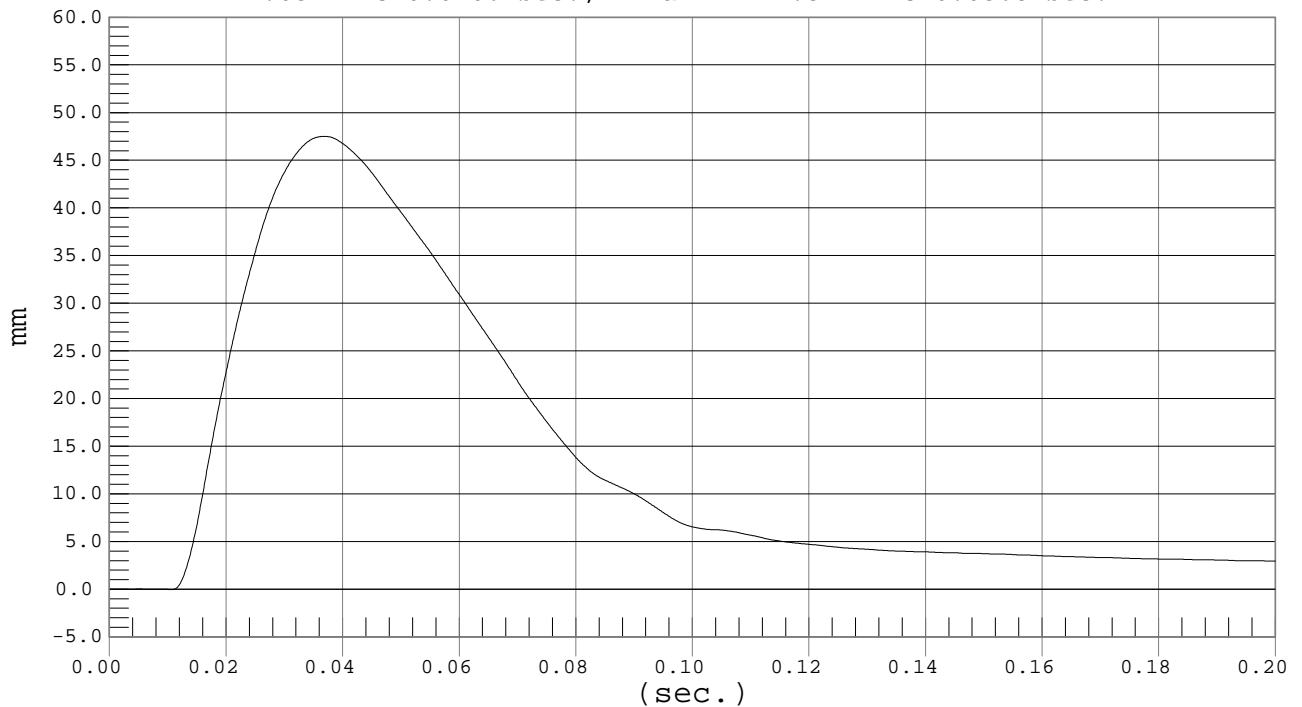


LOWER RIB DISPLACEMENT

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 03-14-03
Speed: 14.8 fps, 4.51 M/s

Ymin = -.03 mm @ 0.0106 sec., Ymax = 47.51 mm @ 0.0368 sec.



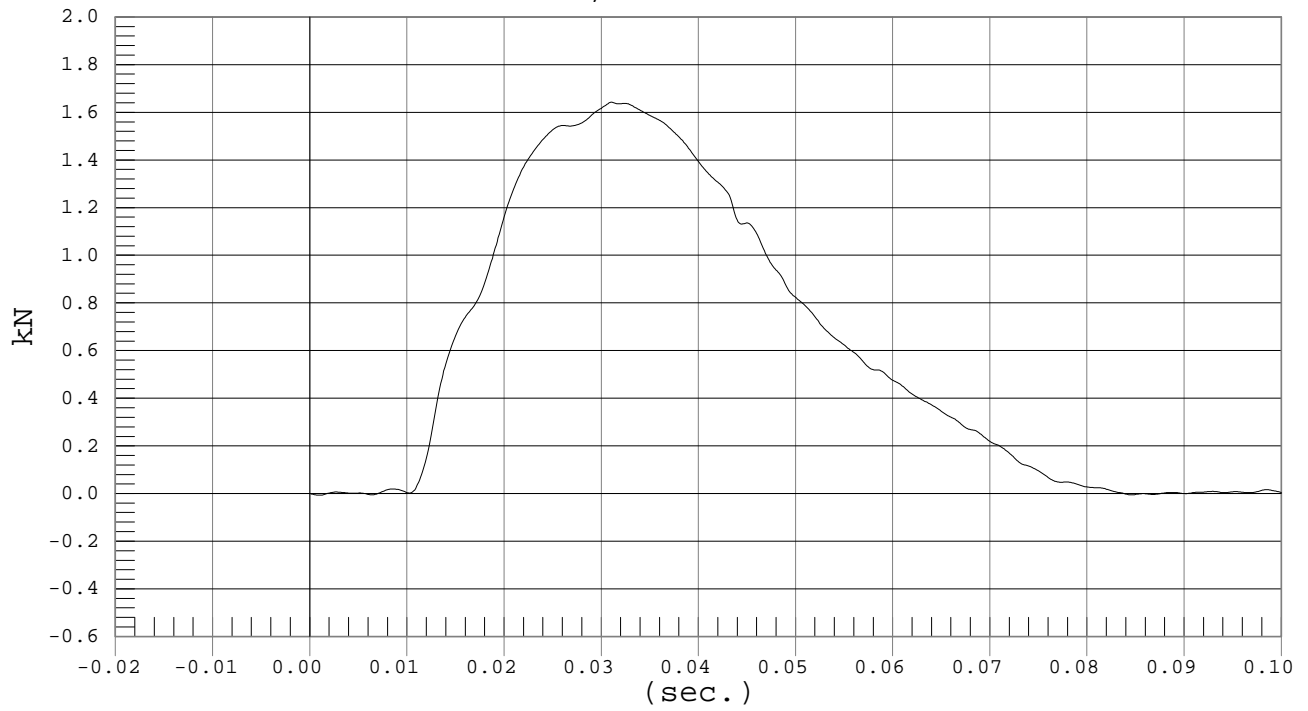


Test Desc.: Abdomen Impact
Component: Dummy #020

PROBE FORCE

Test Date: 03-16-03
Speed: 14.8 fps, 4.51 M/s

Ymin = -.01 kN @ 0.0009 sec., Ymax = 1.64 kN @ 0.0310 sec.



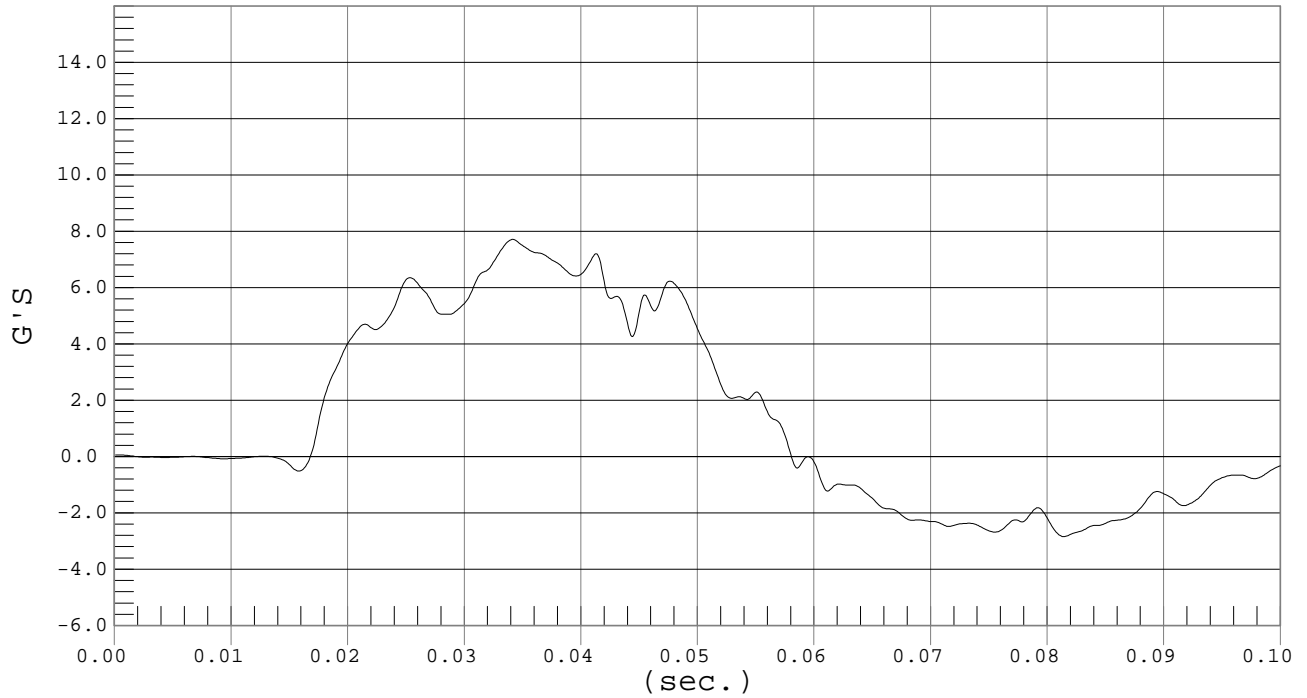


UPPER SPINE ACCELERATION

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 03-16-03
Speed: 14.8 fps, 4.51 M/s

Ymin = -2.84 G'S @ 0.0813 sec., Ymax = 7.71 G'S @ 0.0341 sec.

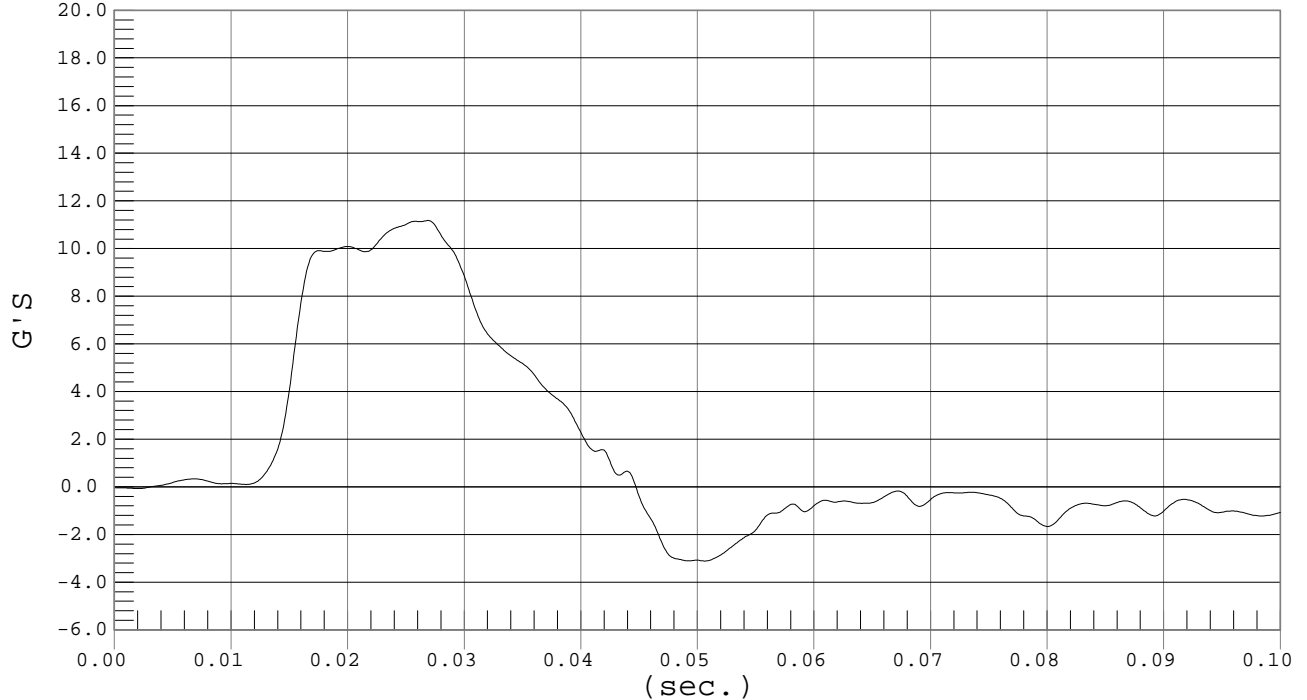


LOWER SPINE ACCELERATION

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 03-16-03
Speed: 14.8 fps, 4.51 M/s

Ymin = -3.11 G'S @ 0.0506 sec., Ymax = 11.18 G'S @ 0.0268 sec.



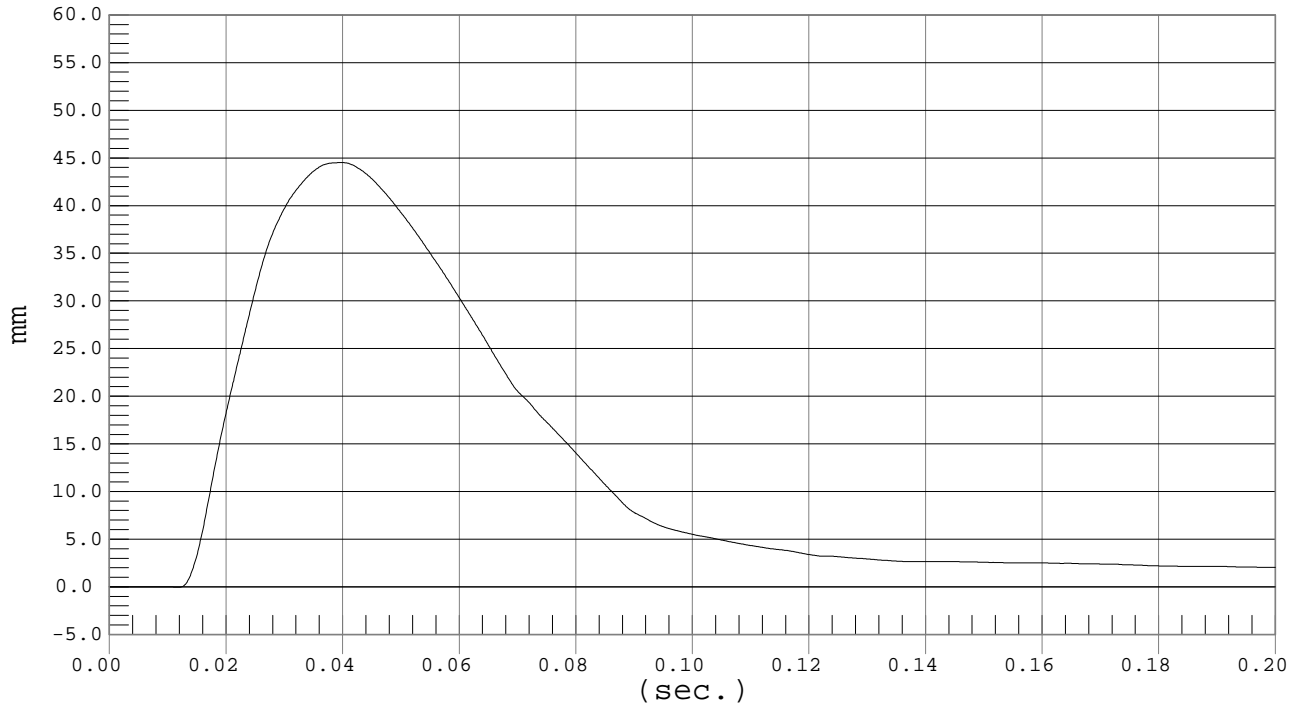


UPPER RIB DISPLACEMENT

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 03-16-03
Speed: 14.8 fps, 4.51 M/s

Ymin = -.04 mm @ 0.0118 sec., Ymax = 44.51 mm @ 0.0398 sec.

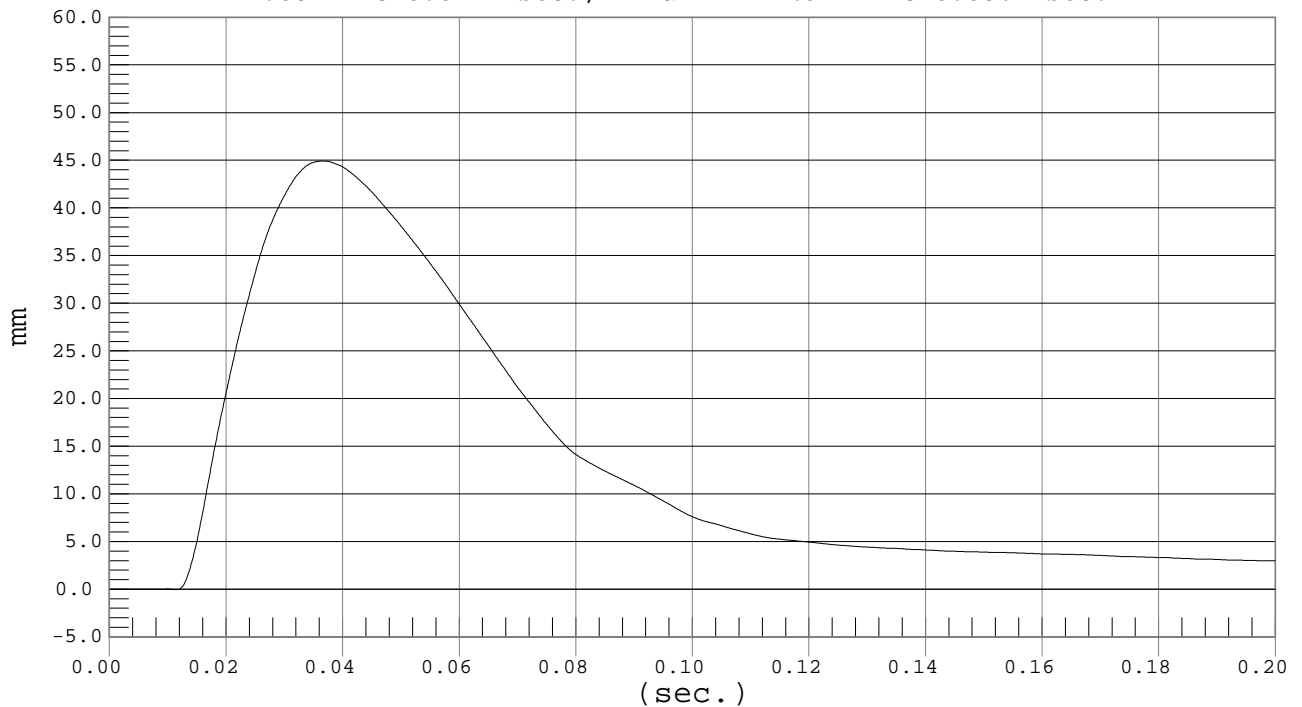


LOWER RIB DISPLACEMENT

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 03-16-03
Speed: 14.8 fps, 4.51 M/s

Ymin = -.05 mm @ 0.0114 sec., Ymax = 44.92 mm @ 0.0367 sec.



MGA RESEARCH CORPORATION
 PELVIS IMPACT TEST
 SID IIs DUMMY

Date: 3/14/03
 Dummy Serial Number: 020
 Test Number: D03289/D03309

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03289</u>	<u>D03309</u>
Temperature (°C)	20.8° – 22.2°	21.1	21.2
Humidity	10% - 70%	21	22
Impact Velocity	6.57 - 6.84 m/s	6.71	6.75
Probe Force	5.0 - 7.2 kN	5.2	5.3
Pelvis G's	46 - 60 g's	53	53

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

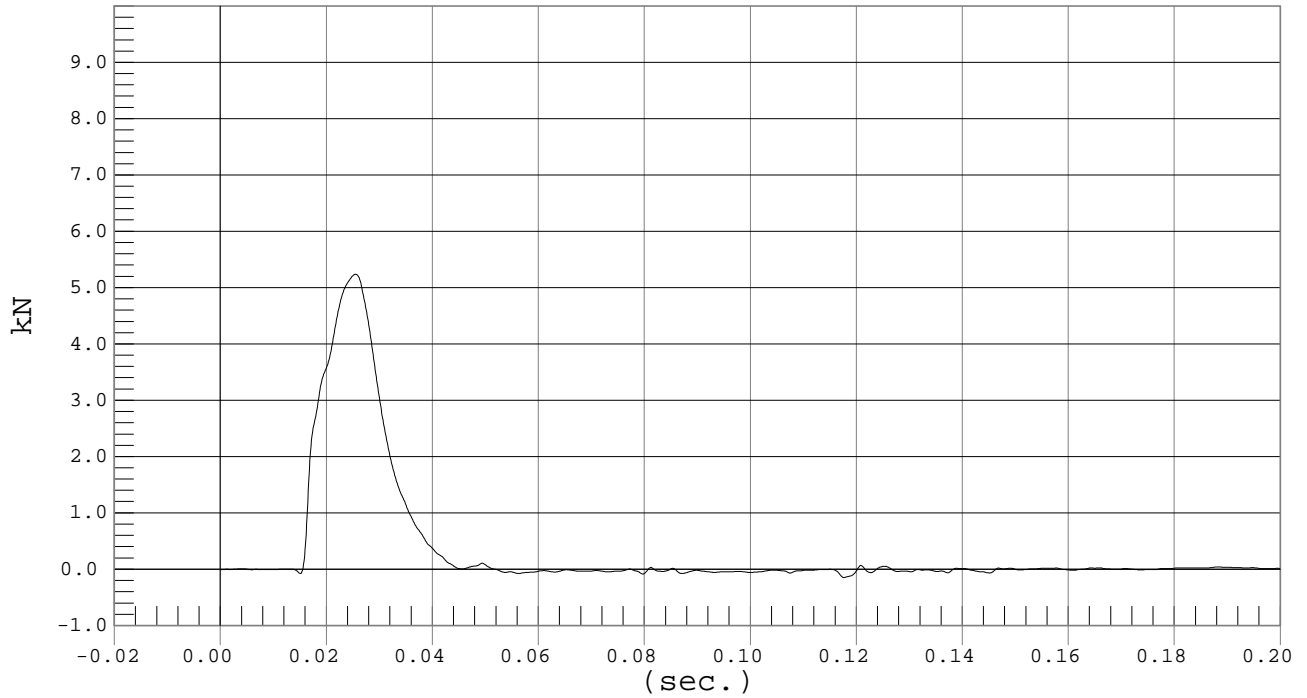


IMPACTOR FORCE

Test Desc.: Pelvis Impact
Component: Dummy #020

Test Date: 03-14-03
Speed: 22.0 fps, 6.71 M/s

Ymin = -.15 kN @ 0.1176 sec., Ymax = 5.23 kN @ 0.0254 sec.

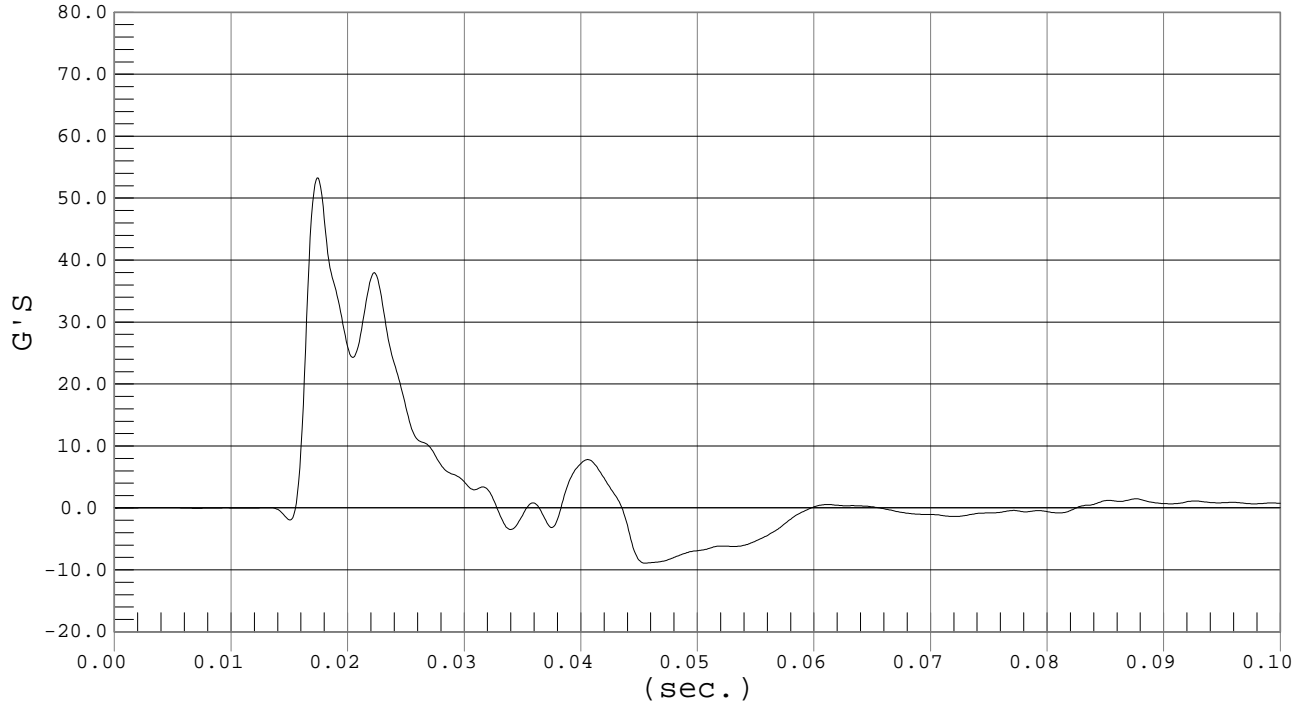


PELVIS ACCELERATION

Test Desc.: Pelvis Impact
Component: Dummy #020

Test Date: 03-14-03
Speed: 22.0 fps, 6.71 M/s

Ymin = -8.93 G'S @ 0.0454 sec., Ymax = 53.3 G'S @ 0.0173 sec.



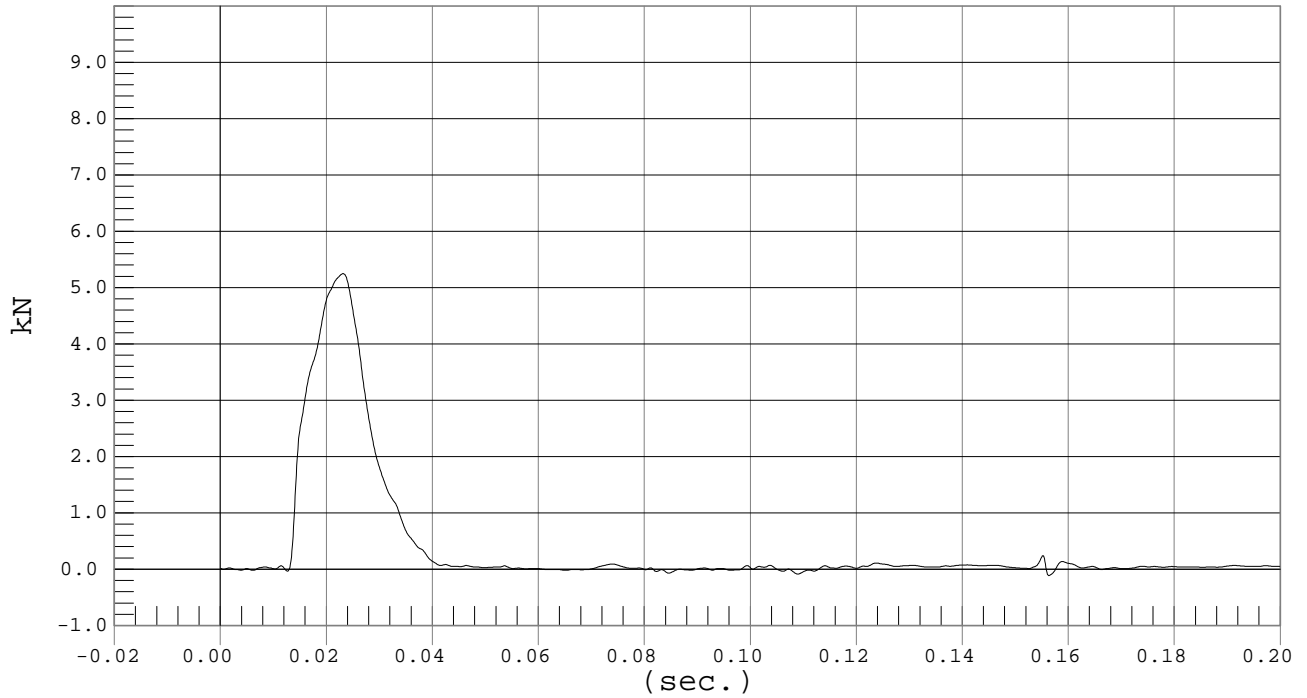


IMPACTOR FORCE

Test Desc.: Pelvis Impact
Component: Dummy #020

Test Date: 03-14-03
Speed: 22.1 fps, 6.75 M/s

Ymin = -.11 kN @ 0.1563 sec., Ymax = 5.25 kN @ 0.0231 sec.

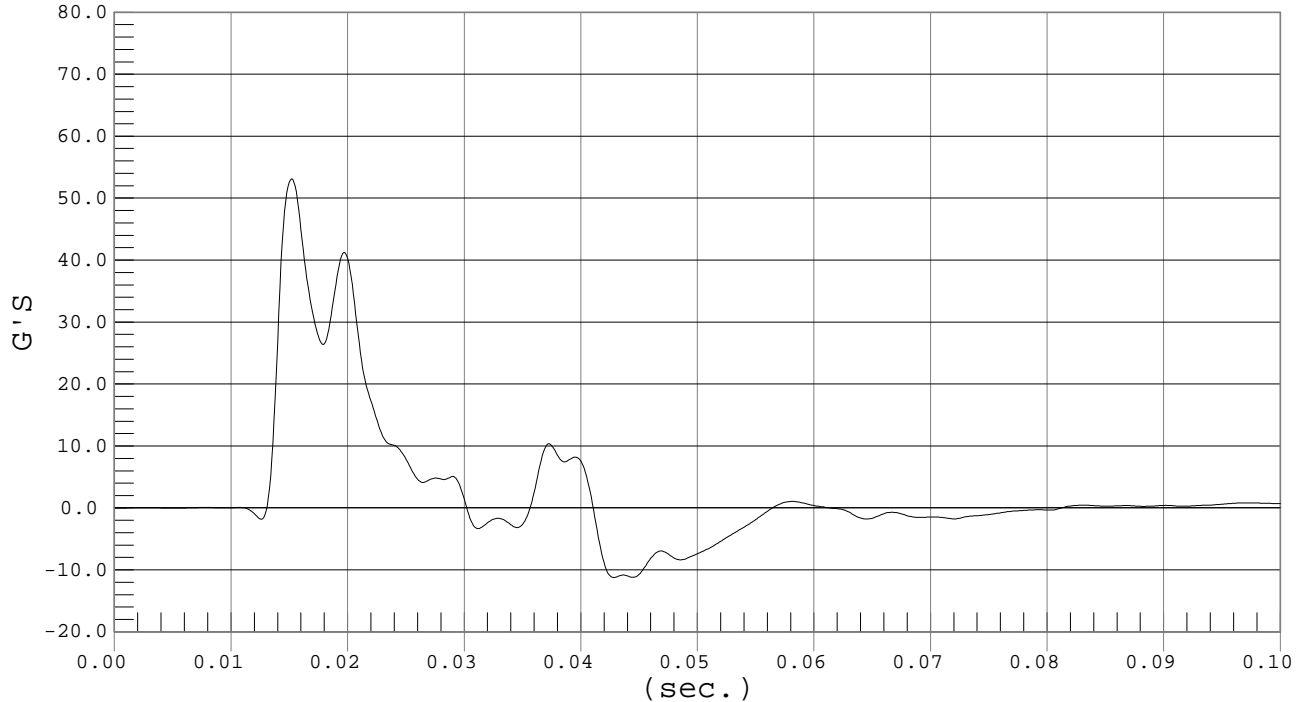


PELVIS ACCELERATION

Test Desc.: Pelvis Impact
Component: Dummy #020

Test Date: 03-14-03
Speed: 22.1 fps, 6.75 M/s

Ymin = -11.23 G'S @ 0.0427 sec., Ymax = 53.13 G'S @ 0.0151 sec.



CERTIFICATION DATA

Dummy Serial Number: 033

Calibration Test Results Summary

Dummy Serial Number: 033

Pre-Test Calibration

Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck did not pass all impact test requirements.
Shoulder Impact Test:	The shoulder passed all impact test requirements.
Thorax (with arm) Test:	The thorax passed all impact test requirements.
Thorax (without arm) Test:	The thorax passed all impact test requirements.
Abdomen Impact Test:	The abdomen passed all impact test requirements.
Pelvis Test:	The pelvis passed all impact test requirements.

MGA RESEARCH CORPORATION
 HEAD DROP TEST
 SID IIs DUMMY

Date: 3/14/03
 Dummy Serial Number: 033
 Test Number: D03291/D03311

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03291</u>	<u>D03311</u>
Temperature (°C)	18.9° – 25.6°	20.5	20.5
Humidity	10% - 70%	20	20
Resultant Accel	115 - 145 g's	117	121
Peak Longitudinal Accel	(-15) – (+ 15) g's	5	4

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

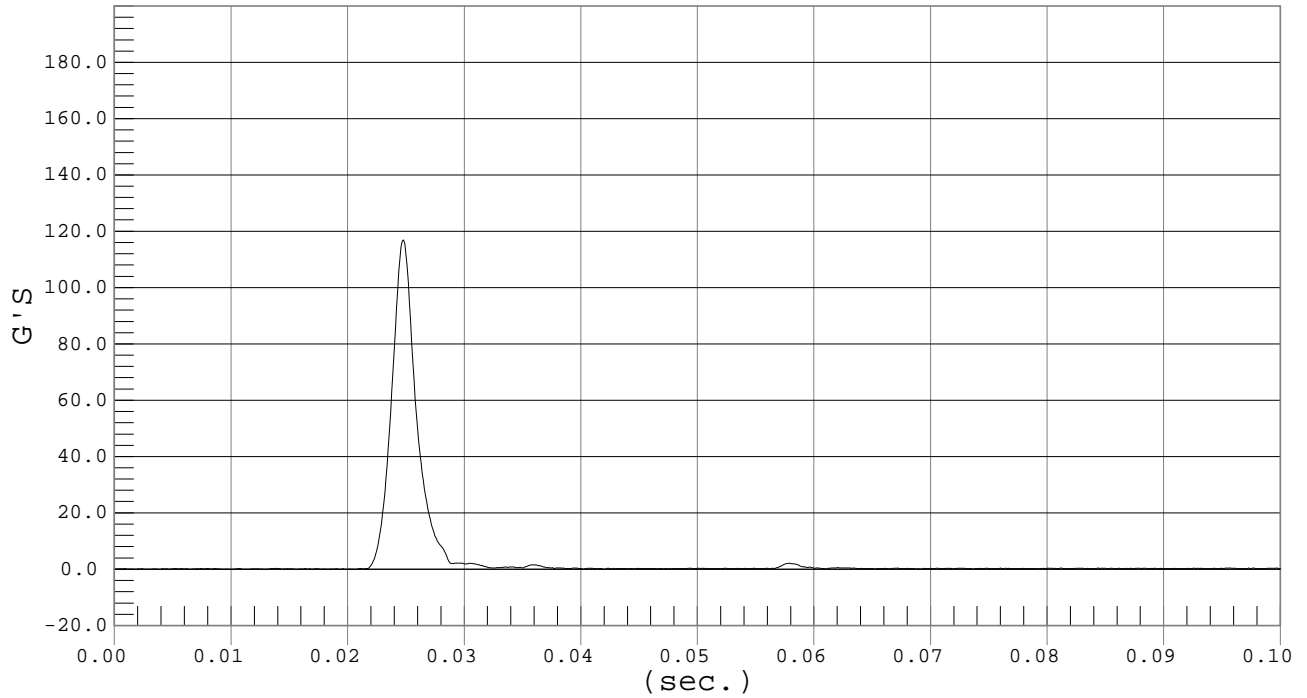


PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #033

Test Date: 03-14-03
Speed: 0.0 fps, 0.00 M/s

Ymin = .04 G'S @ 0.0001 sec., Ymax = 116.87 G'S @ 0.0247 sec.

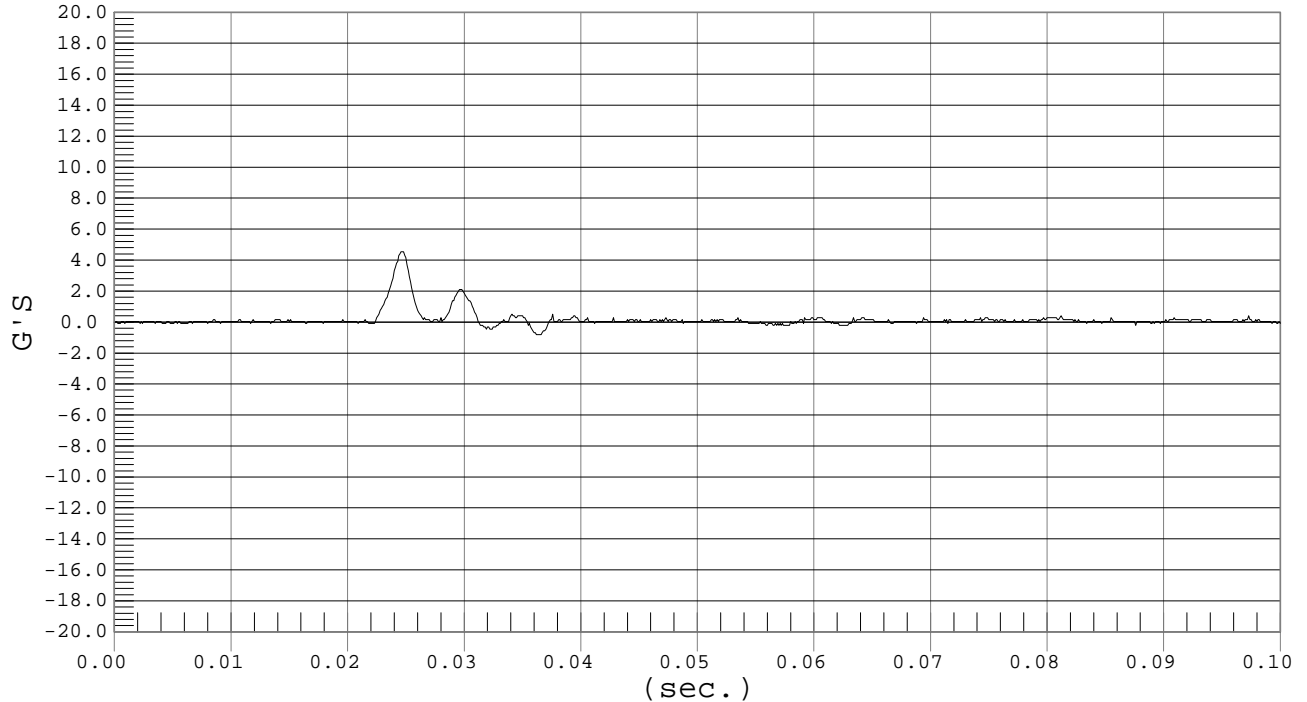


PEAK LONGITUDINAL ACCELARATION

Test Desc.: Head Drop
Component: Dummy #033

Test Date: 03-14-03
Speed: 0.0 fps, 0.00 M/s

Ymin = -2.76 G'S @ 0.1211 sec., Ymax = 4.53 G'S @ 0.0245 sec.



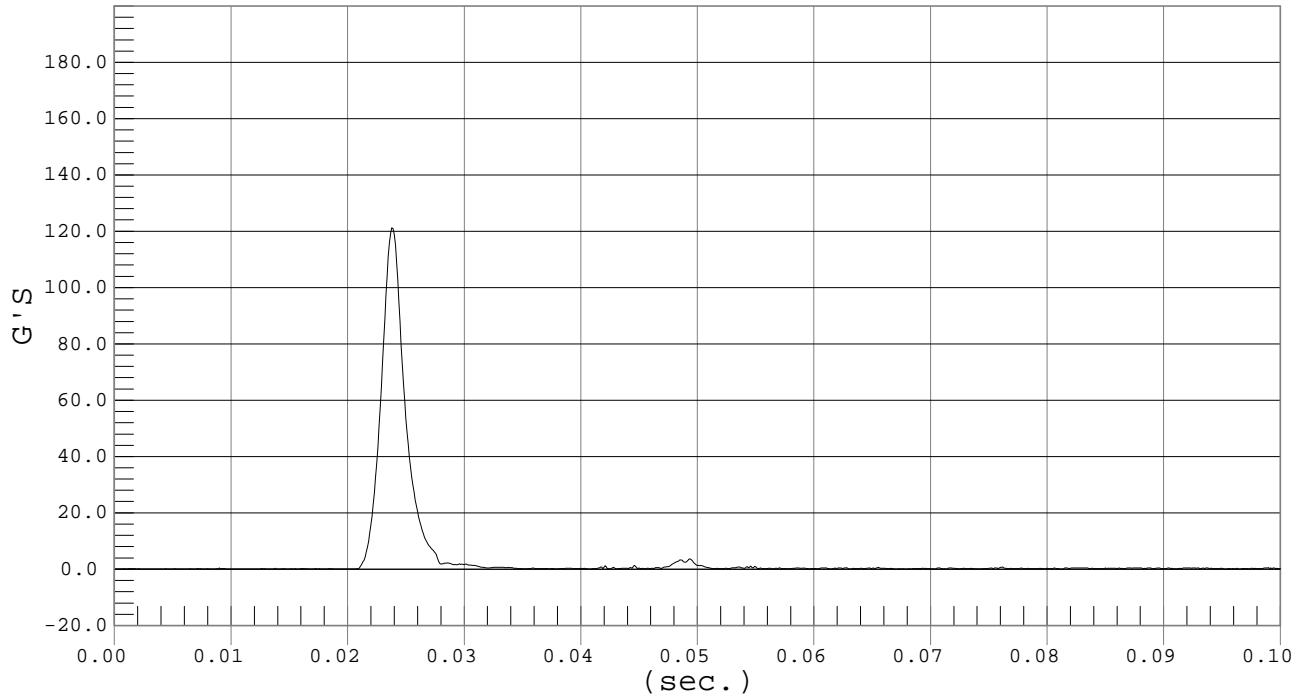


PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #033

Test Date: 03-14-03
Speed: 0.0 fps, 0.00 M/s

Ymin = .07 G'S @ 0.0015 sec., Ymax = 121.24 G'S @ 0.0237 sec.

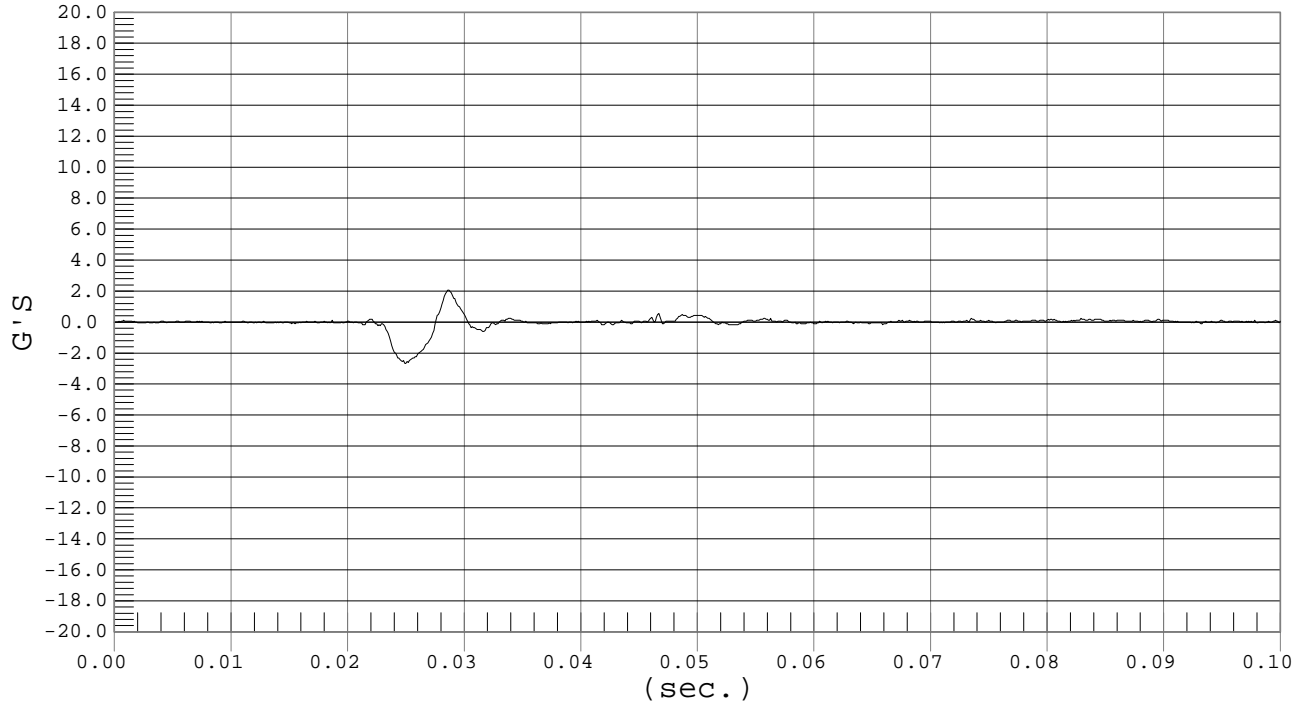


PEAK LONGITUDINAL ACCELARATION

Test Desc.: Head Drop
Component: Dummy #033

Test Date: 03-14-03
Speed: 0.0 fps, 0.00 M/s

Ymin = -2.67 G'S @ 0.0248 sec., Ymax = 3.65 G'S @ 0.1323 sec.



MGA RESEARCH CORPORATION
LATERAL NECK PENDULUM TEST
SID IIs DUMMY

Date: 3/14/03
 Dummy Serial Number: 033
 Test Number: D03292/D03312

TEST PARAMETER		SPECIFICATION	TEST RESULTS	
			<u>D03292</u>	<u>D03312</u>
Temperature (°C)		20.8° – 22.2°	21.1	21.1
Humidity		10% - 70%	23	23
Impact Velocity (m/s)		5.51-5.63	5.61	5.61
Delta Velocity (m/s)	10 ms	2.10-2.70	2.14	2.33
	15 ms	3.00-3.80	3.21	3.49
	20 ms	4.20-5.20	4.37	4.69
	25-60 ms	5.00-6.40	5.84	5.55
Peak D-Plane Rotation (deg)		72-82	73	77
Decay Time of D-Plane Rotation Peak to Zero Degree (ms)		60-83	66	67
Peak Occipital Condyle Moment (Nm)		(-43) – (-36)	-42	-43
Time at 10 or -10 Nm after Peak Moment (ms)		90 – 98	93	91
Time of last Moment Peak to Max Rotation (ms)		<14	9	12
Front Pot Peak Rotation (deg)		59 – 72	64	66
Time of Front Pot Peak Rotation (ms)		61 – 73	66	65
Rear Pot Peak Rotation (deg)		47 – 56	50	51
Time of Rear Pot Peak Rotation (ms)		62 – 73	62	61*

*TEST DOES NOT MEET SPECIFICATIONS

Technician: _____

Approved By: _____

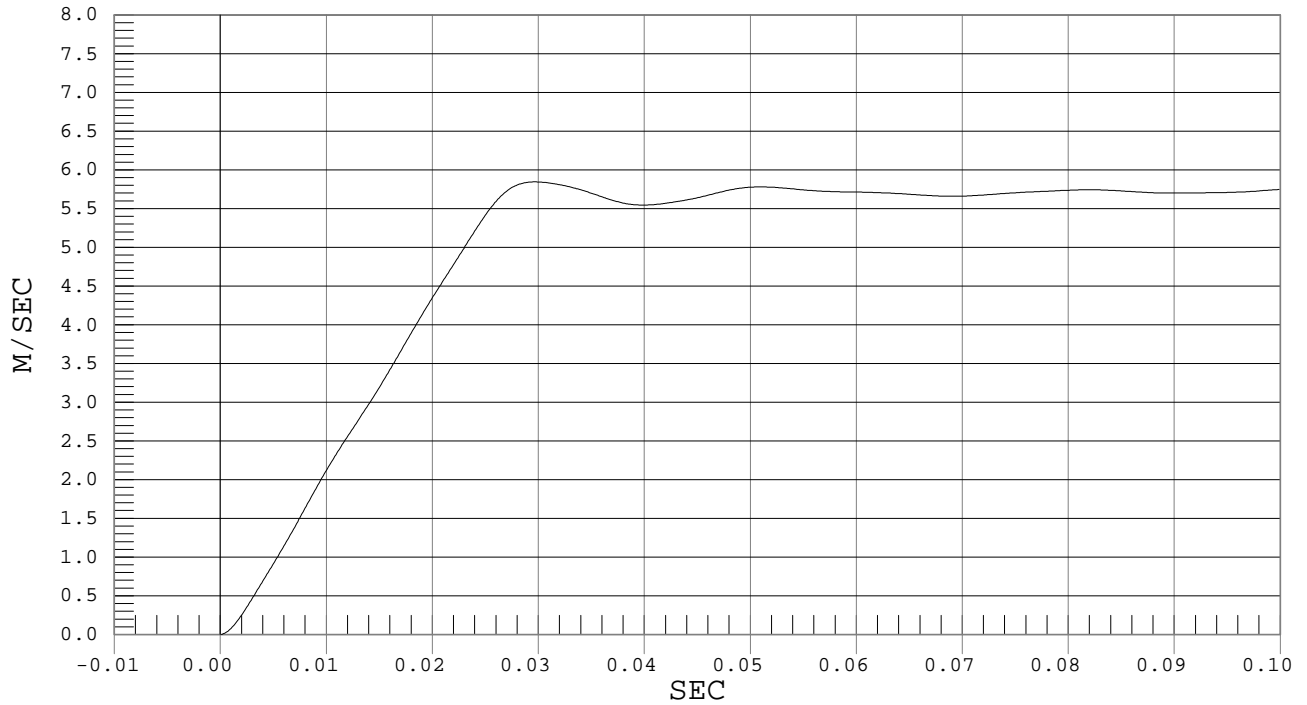


PENDULUM DECELERATION

Test Desc.: Neck Bending
Component: Dummy #033

Test Date: 03-14-03
Speed: 18.4 fps, 5.61 M/s

Ymin = 0 M/SEC @ 0.0000 SEC, Ymax = 6.9 M/SEC @ 0.1930 SEC

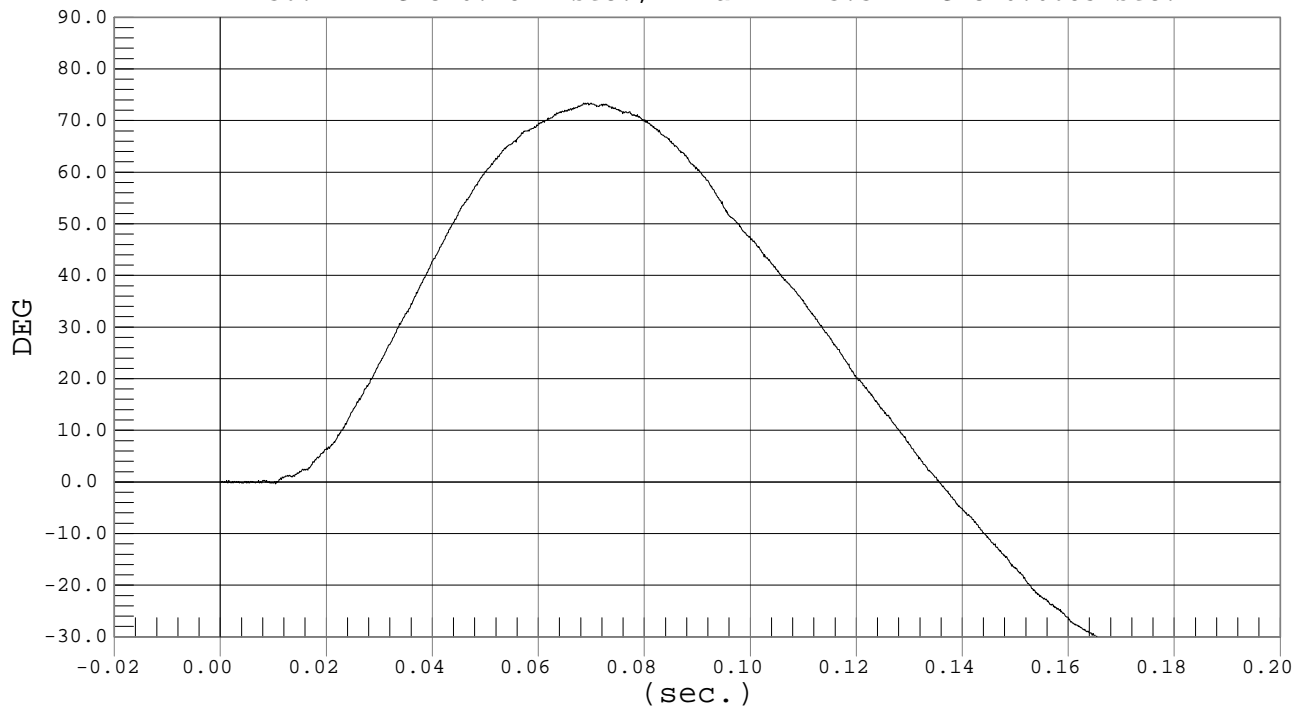


FLEXION ANGLE

Test Desc.: Neck Bending
Component: Dummy #033

Test Date: 03-14-03
Speed: 18.4 fps, 5.61 M/s

Ymin = -36.22 DEG @ 0.1841 sec., Ymax = 73.34 DEG @ 0.0685 sec.



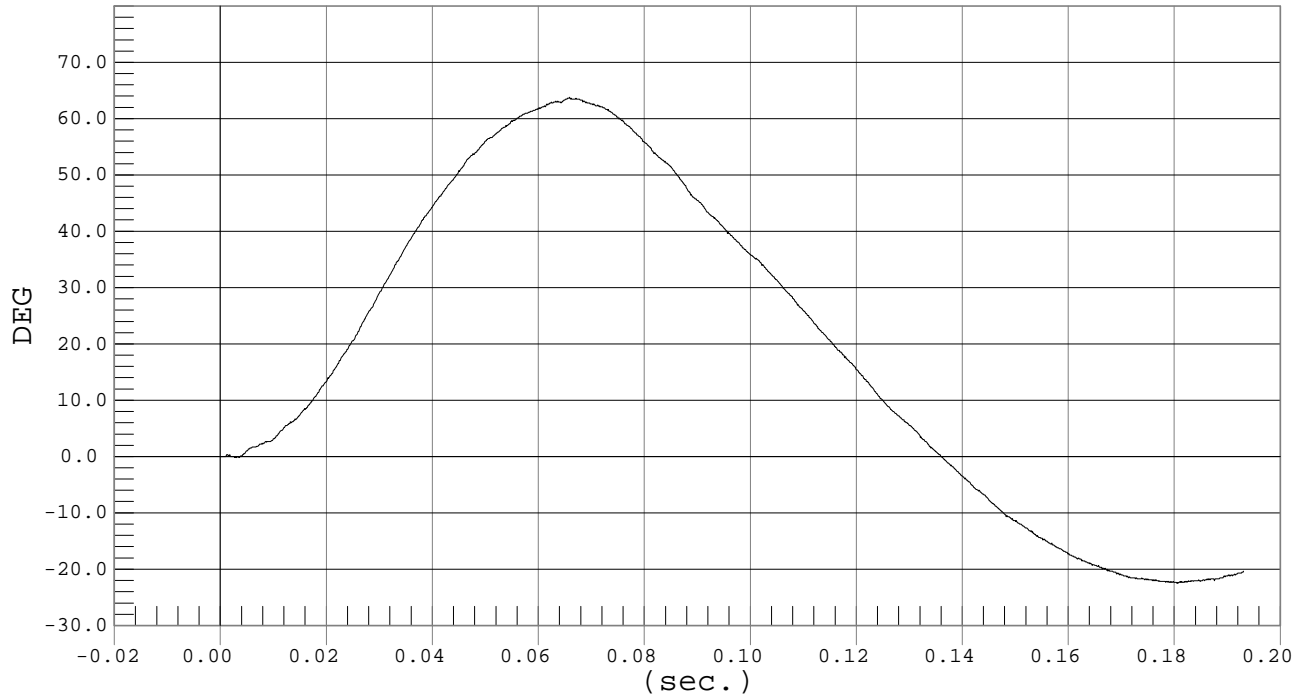


Test Desc.: Neck Bending
Component: Dummy #033

FRONT

Test Date: 03-14-03
Speed: 18.4 fps, 5.61 M/s

Ymin = -22.53 DEG @ 0.1804 sec., Ymax = 63.79 DEG @ 0.0658 sec.

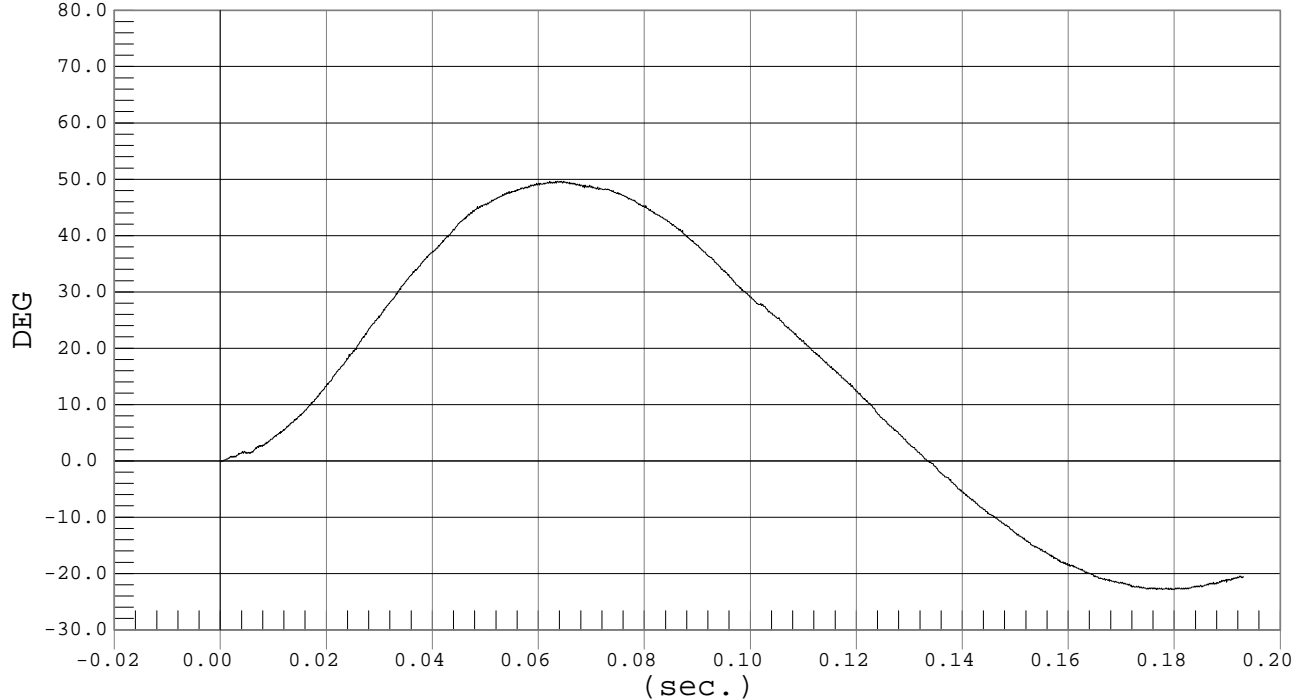


Test Desc.: Neck Bending
Component: Dummy #033

REAR

Test Date: 03-14-03
Speed: 18.4 fps, 5.61 M/s

Ymin = -22.89 DEG @ 0.1766 sec., Ymax = 49.64 DEG @ 0.0621 sec.



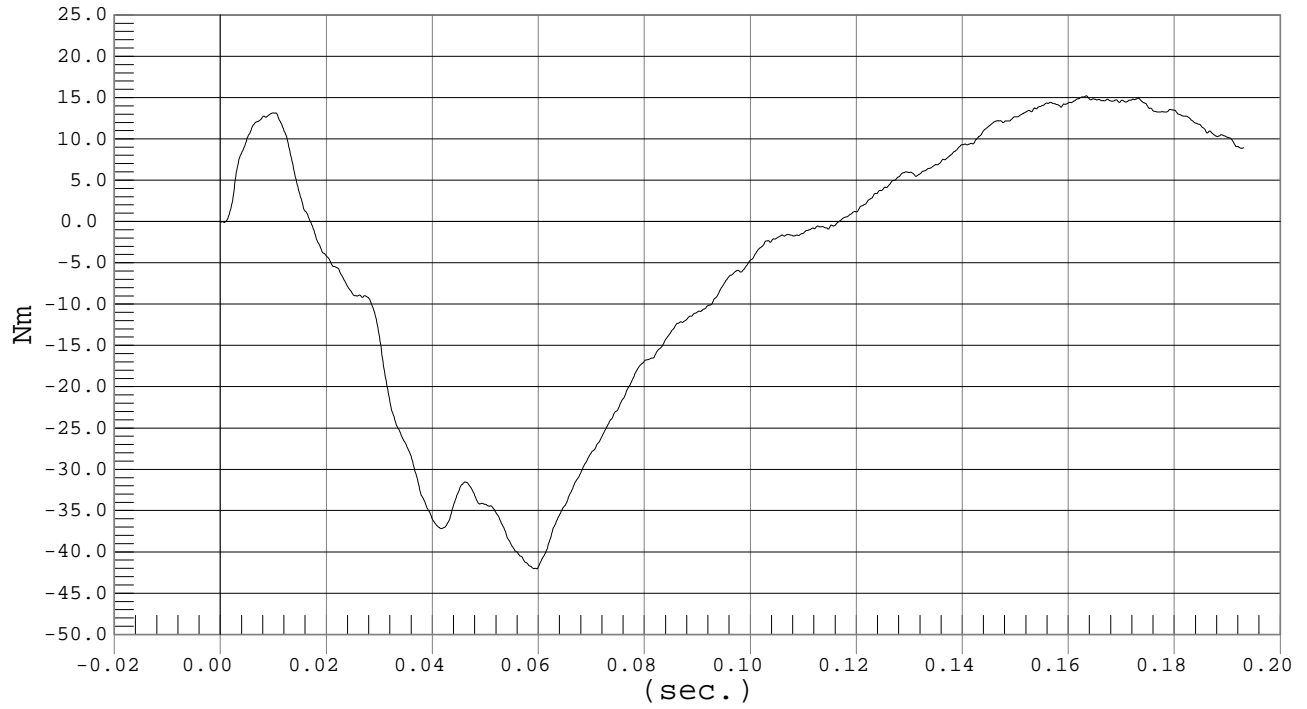


Test Desc.: Neck Bending
Component: Dummy #033

OCCIPITAL MOMENT

Test Date: 03-14-03
Speed: 18.4 fps, 5.61 M/s

Ymin = -42.04 Nm @ 0.0596 sec., Ymax = 15.21 Nm @ 0.1633 sec.



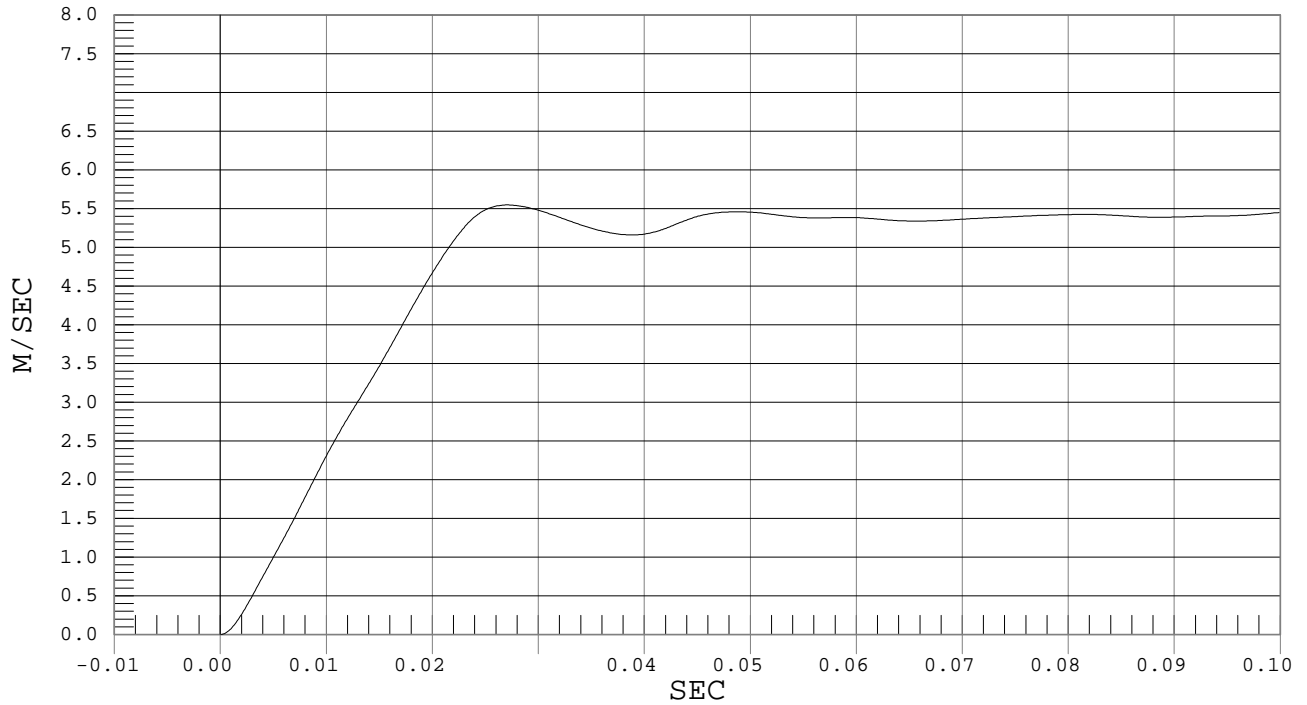


PENDULUM DECELERATION

Test Desc.: Neck Bending
Component: Dummy #033

Test Date: 03-14-03
Speed: 18.4 fps, 5.61 M/s

Ymin = 0 M/SEC @ 0.0000 SEC, Ymax = 6.57 M/SEC @ 0.1930 SEC

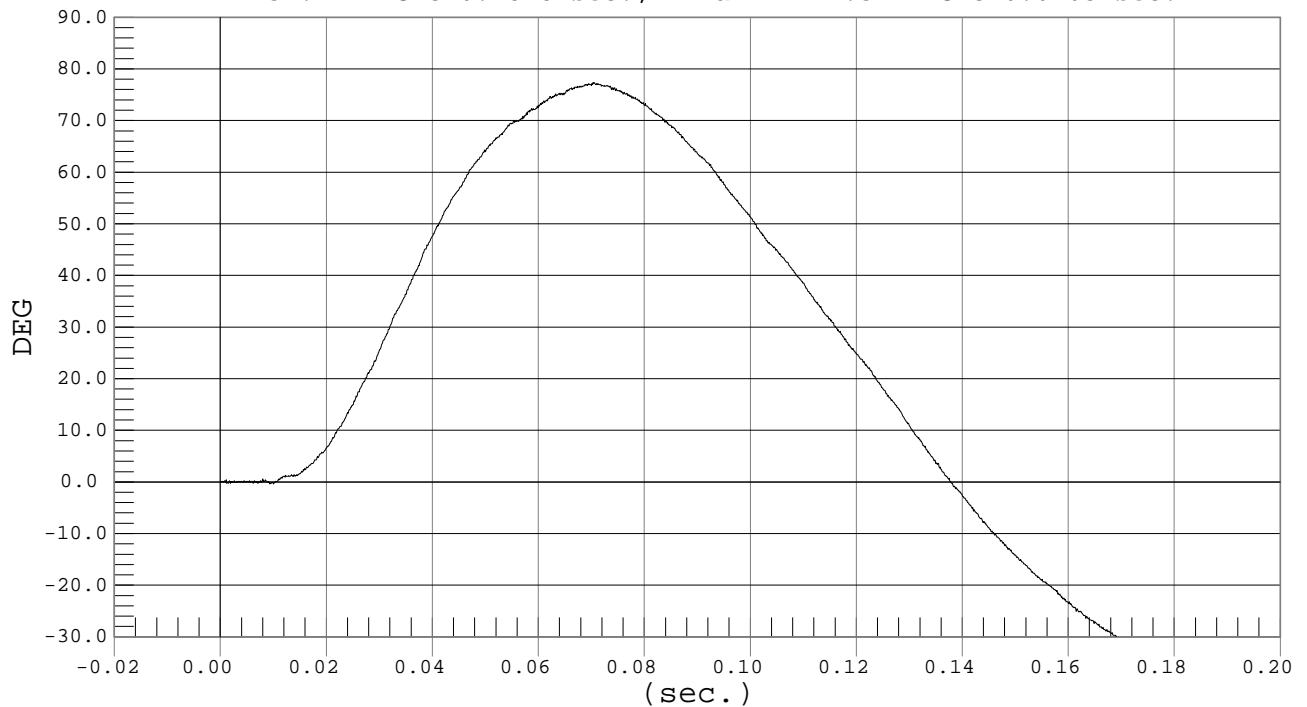


FLEXION ANGLE

Test Desc.: Neck Bending
Component: Dummy #033

Test Date: 03-14-03
Speed: 18.4 fps, 5.61 M/s

Ymin = -34.74 DEG @ 0.1848 sec., Ymax = 77.32 DEG @ 0.0705 sec.



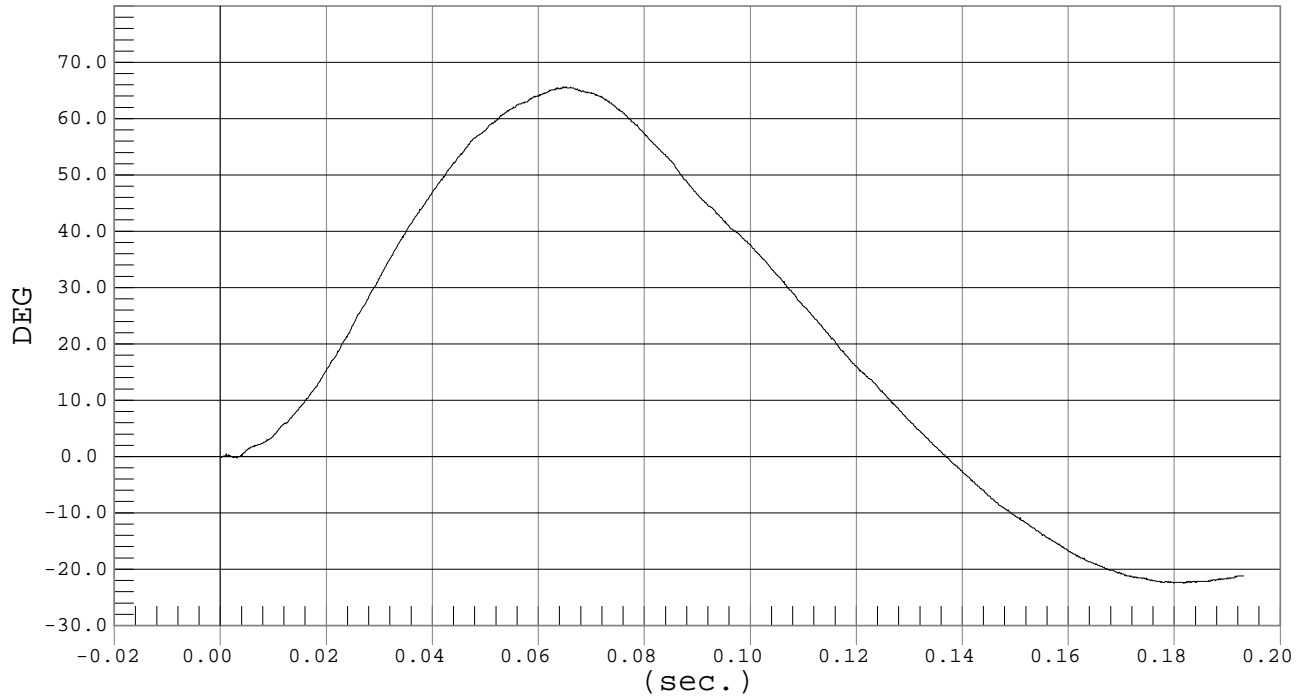


Test Desc.: Neck Bending
Component: Dummy #033

FRONT

Test Date: 03-14-03
Speed: 18.4 fps, 5.61 M/s

Ymin = -22.53 DEG @ 0.1799 sec., Ymax = 65.62 DEG @ 0.0645 sec.

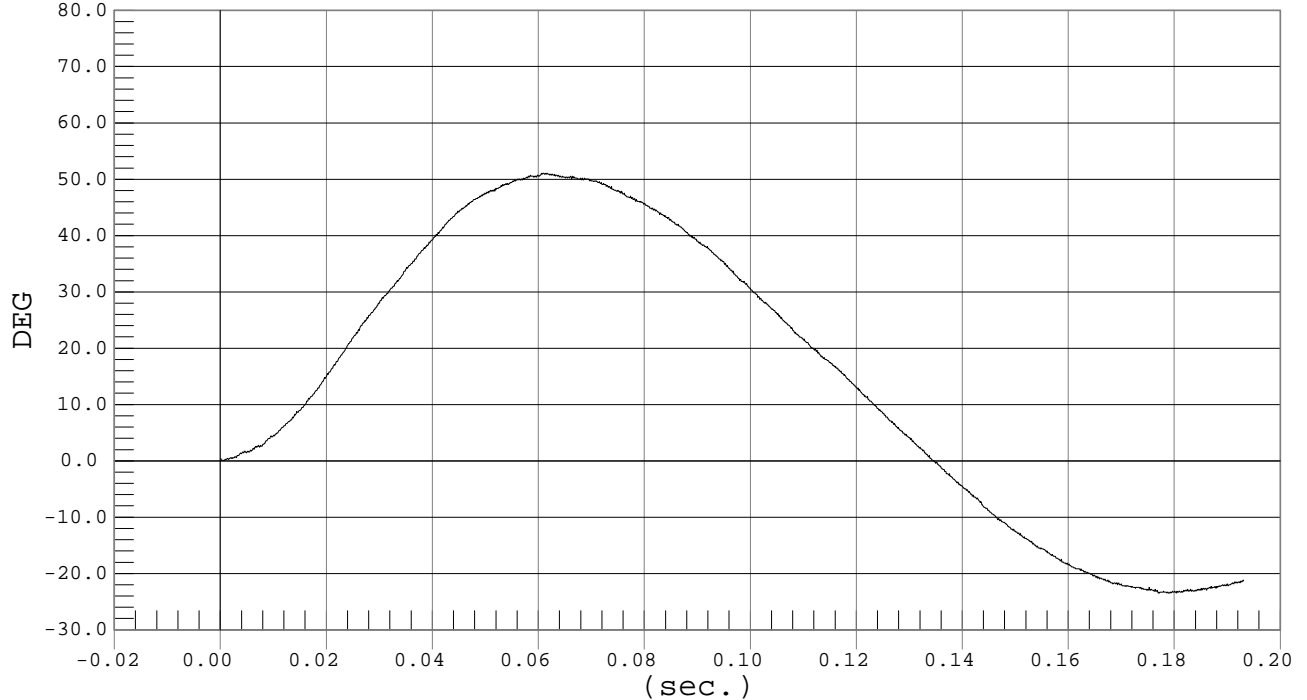


Test Desc.: Neck Bending
Component: Dummy #033

REAR

Test Date: 03-14-03
Speed: 18.4 fps, 5.61 M/s

Ymin = -23.48 DEG @ 0.1769 sec., Ymax = 51.06 DEG @ 0.0605 sec.



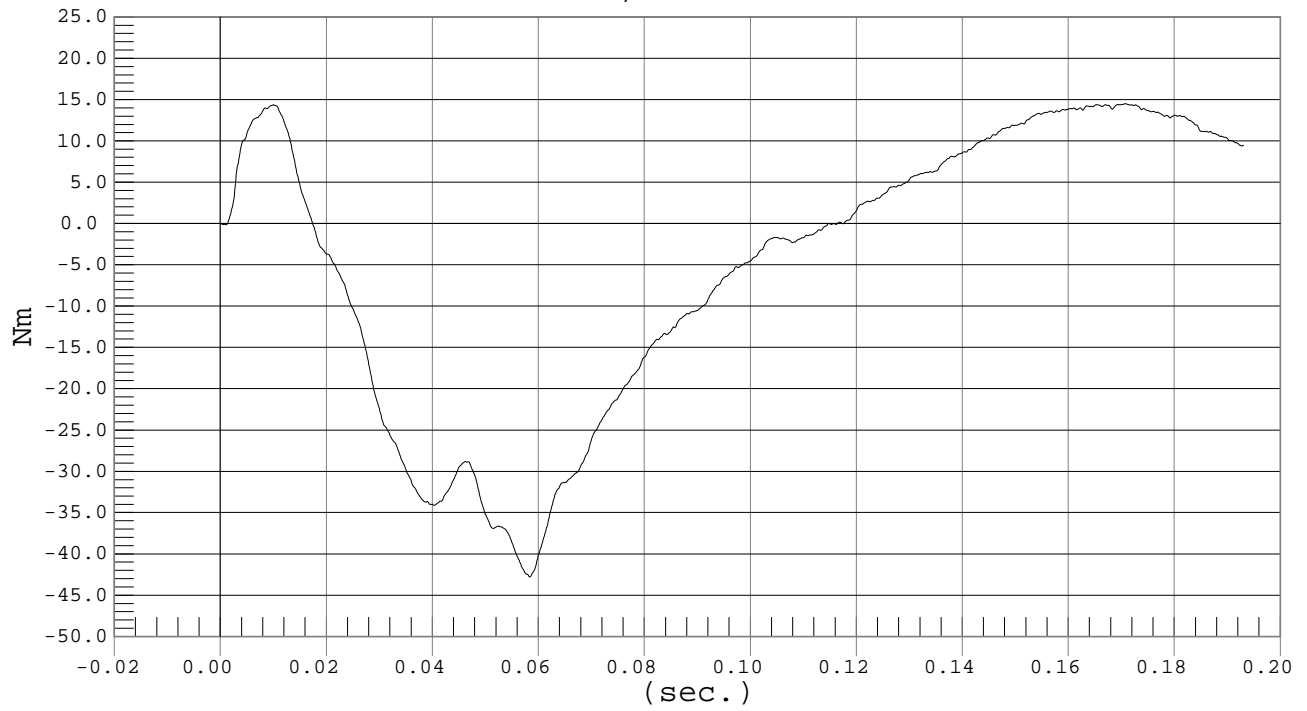


Test Desc.: Neck Bending
Component: Dummy #033

OCCIPITAL MOMENT

Test Date: 03-14-03
Speed: 18.4 fps, 5.61 M/s

Ymin = -42.79 Nm @ 0.0583 sec., Ymax = 14.5 Nm @ 0.1706 sec.



MGA RESEARCH CORPORATION
 SHOULDER IMPACT TEST
 SID IIs DUMMY

Date: 1/13/03
 Dummy Serial Number: 033
 Test Number: D03293/D03313

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03293</u>	<u>D03313</u>
Temperature (°C)	20.8° – 22.2°	21.0	21.1
Humidity	10% - 70%	25	23
Impact Velocity	4.41 - 4.59 m/s	4.45	4.50
Probe Force	1.6 - 2.4 kN	2.1	2.2
Shoulder Displacement	27-39 mm	33	33

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

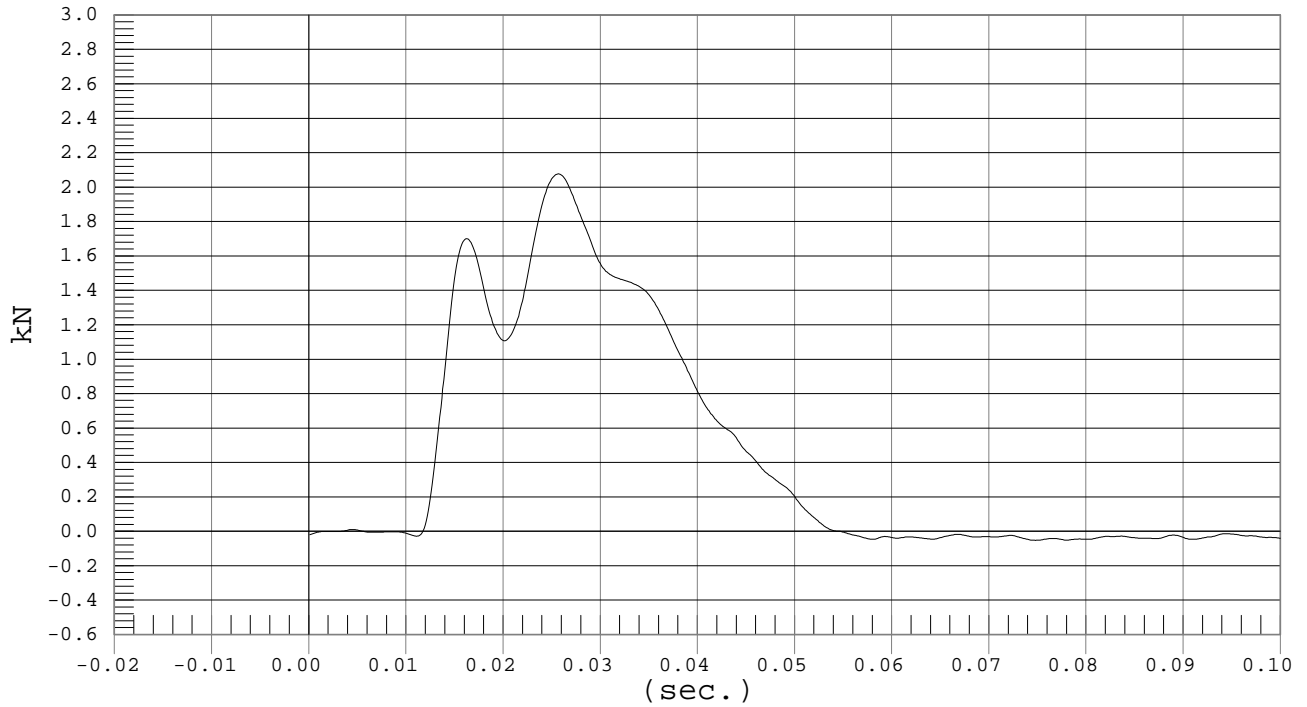


PROBE FORCE

Test Desc.: Shoulder Impact
Component: Dummy #033

Test Date: 03-12-03
Speed: 14.6 fps, 4.45 M/s

Ymin = -.05 kN @ 0.0747 sec., Ymax = 2.08 kN @ 0.0256 sec.

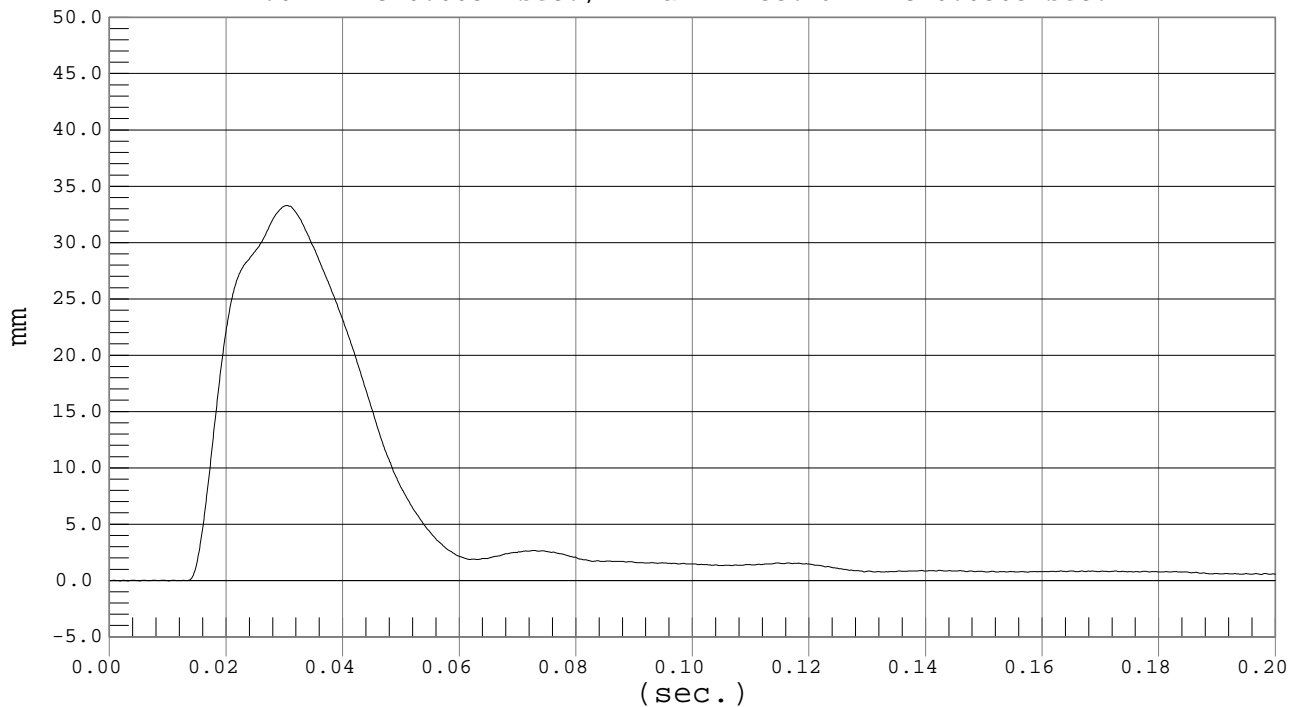


SHOULDER DISPLACEMENT

Test Desc.: Shoulder Impact
Component: Dummy #033

Test Date: 03-12-03
Speed: 14.6 fps, 4.45 M/s

Ymin = -.04 mm @ 0.0051 sec., Ymax = 33.29 mm @ 0.0303 sec.



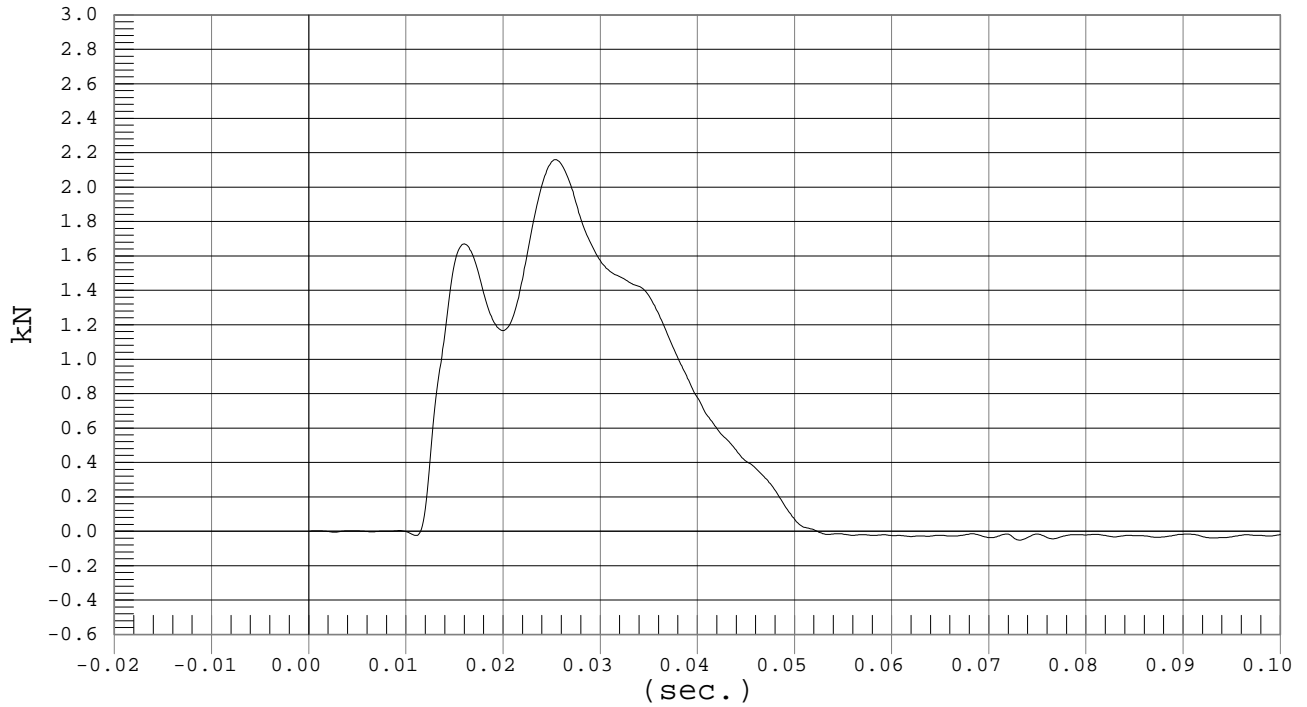


PROBE FORCE

Test Desc.: Shoulder Impact
Component: Dummy #033

Test Date: 03-13-03
Speed: 14.8 fps, 4.50 M/s

Ymin = -.07 kN @ 0.1563 sec., Ymax = 2.16 kN @ 0.0253 sec.

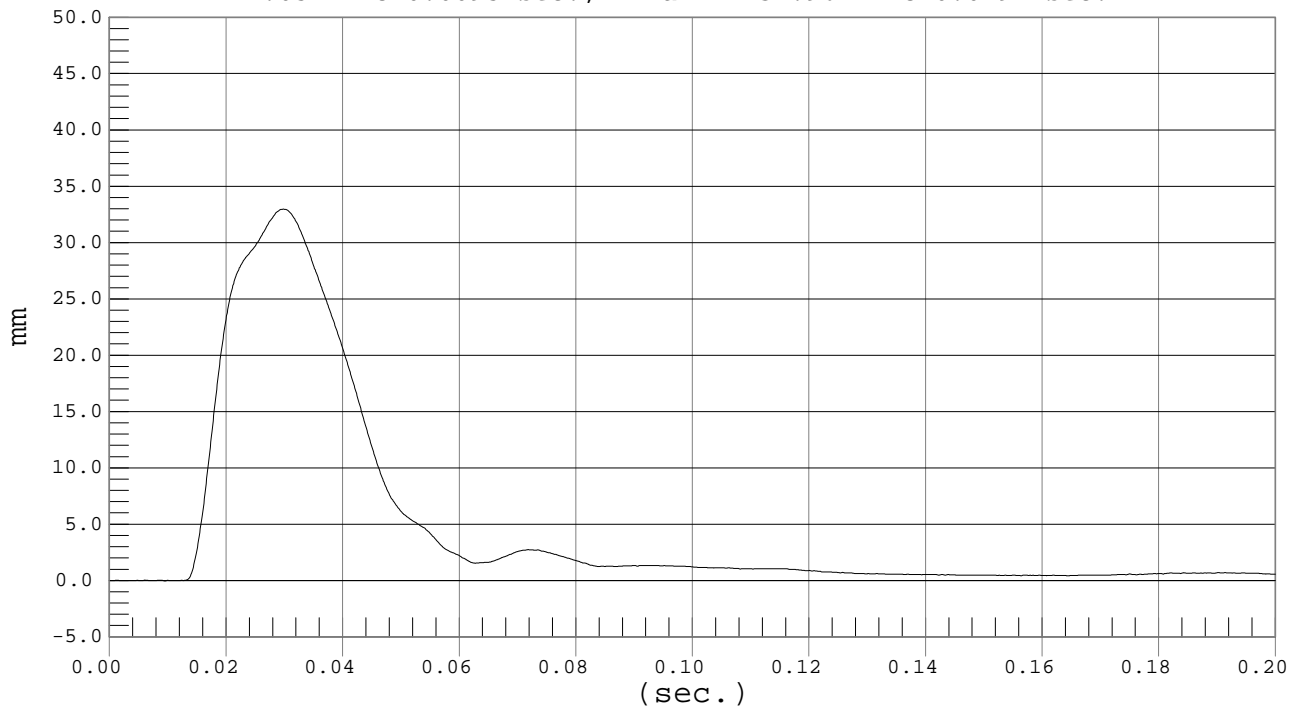


SHOULDER DISPLACEMENT

Test Desc.: Shoulder Impact
Component: Dummy #033

Test Date: 03-13-03
Speed: 14.8 fps, 4.50 M/s

Ymin = -.05 mm @ 0.0095 sec., Ymax = 32.96 mm @ 0.0297 sec.



MGA RESEARCH CORPORATION
 THORAX (WITH ARM) IMPACT TESTS
 SID IIs DUMMY

Date: 3/12/03
 Dummy Serial Number: 033
 Test Number: D03294/D03314

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03294</u>	<u>D03314</u>
Temperature (°C)	20.8° – 22.2°	21.2	21.0
Humidity	10% - 70%	24	24
Impact Velocity	6.57 - 6.84 m/s	6.74	6.68
Probe Force	4.1 – 4.7 kN	4.6	4.4
Upper Spine Acceleration	34 – 48 g's	41	43
Lower Spine Acceleration	31 - 36 g's	35	35
Upper Rib Displacement	23 - 35 mm	29	29
Middle Rib Displacement	29 - 44 mm	33	33
Lower Rib Displacement	33 - 40 mm	36	36
Shoulder Displacement	30 - 42 mm	36	36

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

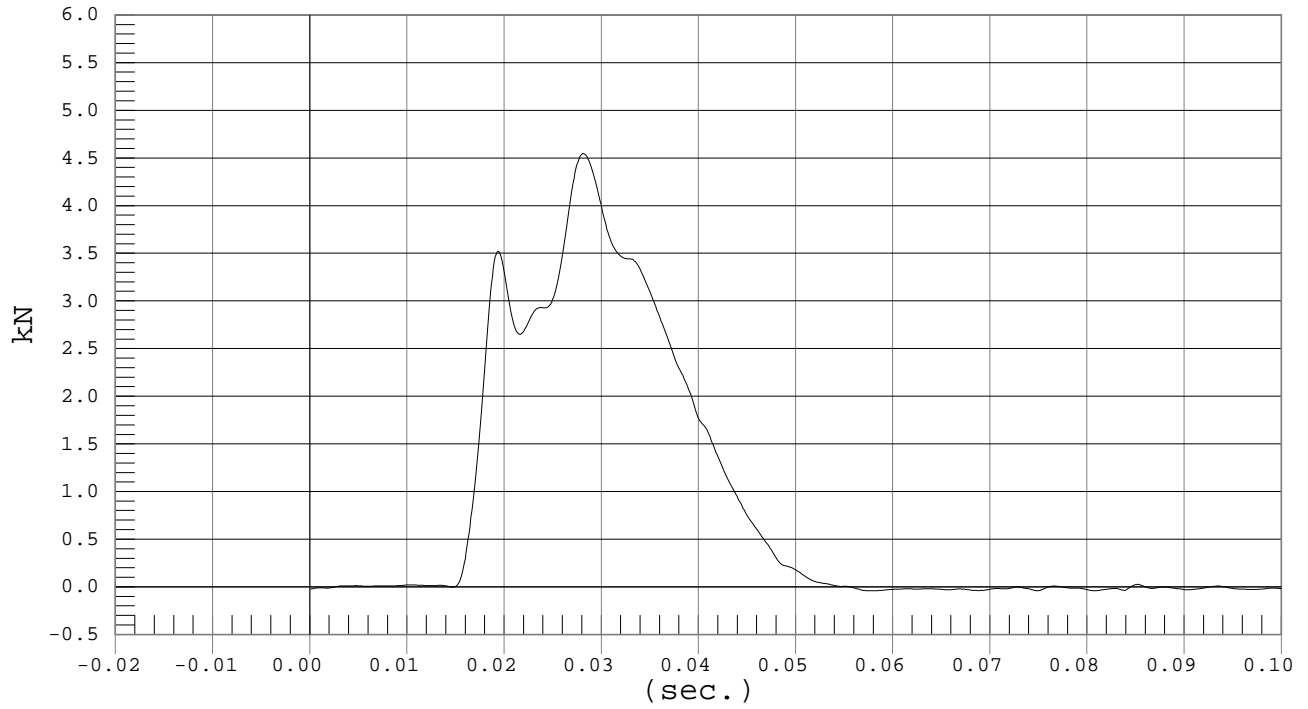


Test Desc.: Thorax with Arm
Component: Dummy #033

PROBE FORCE

Test Date: 03-12-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -.11 kN @ 0.1912 sec., Ymax = 4.55 kN @ 0.0281 sec.



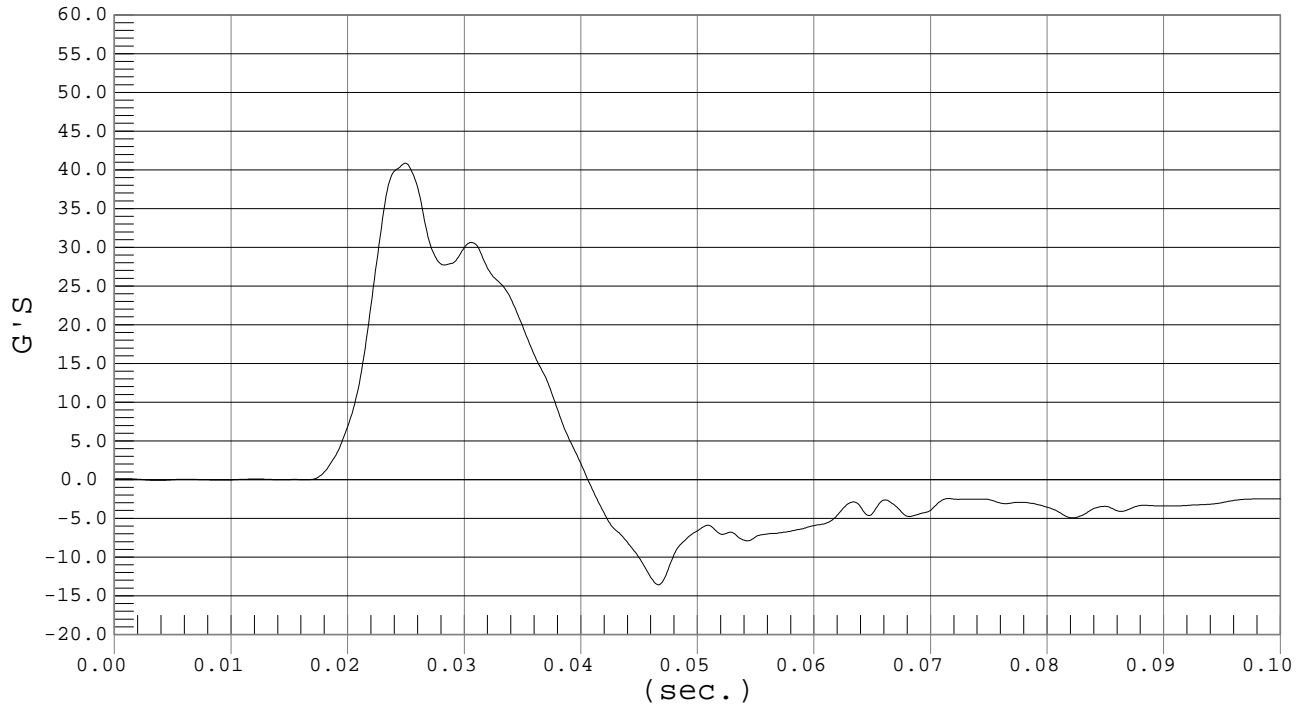


UPPER SPINE ACCELERATION

Test Desc.: Thorax with Arm
Component: Dummy #033

Test Date: 03-12-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -13.58 G'S @ 0.0466 sec., Ymax = 40.86 G'S @ 0.0249 sec.

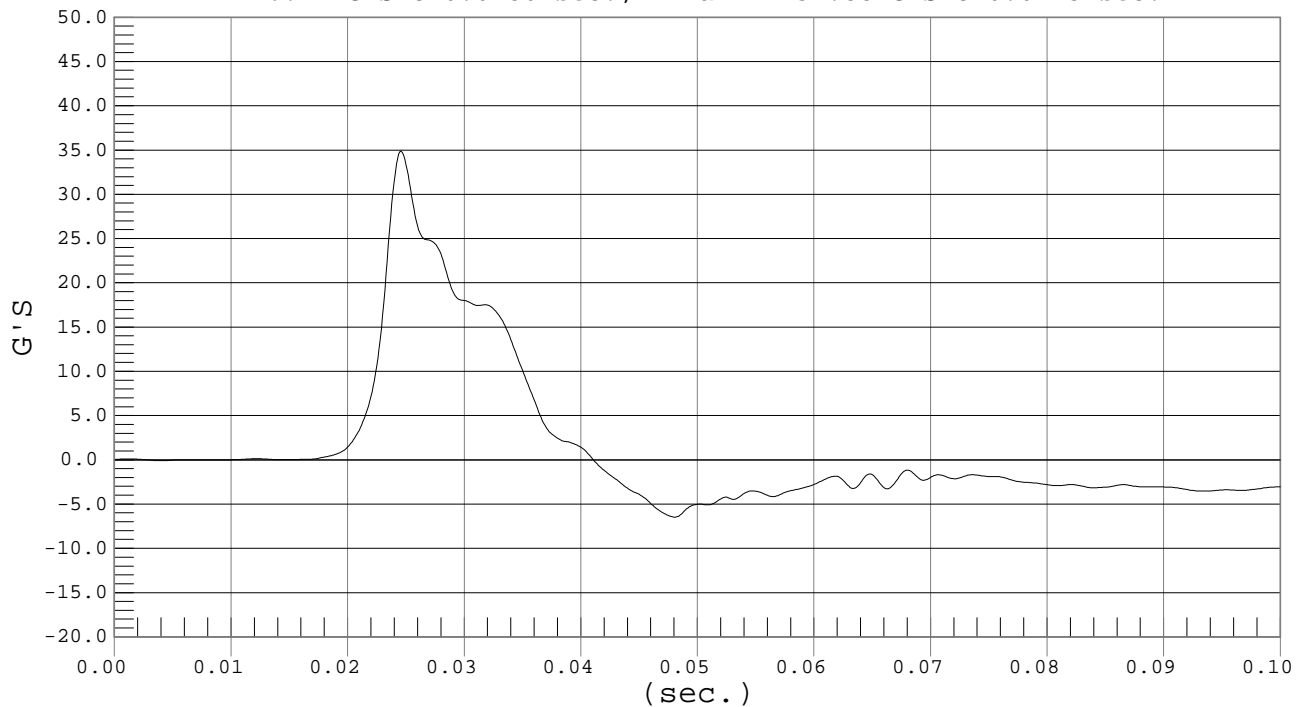


LOWER SPINE ACCELERATION

Test Desc.: Thorax with Arm
Component: Dummy #033

Test Date: 03-12-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -6.47 G'S @ 0.0480 sec., Ymax = 34.88 G'S @ 0.0245 sec.



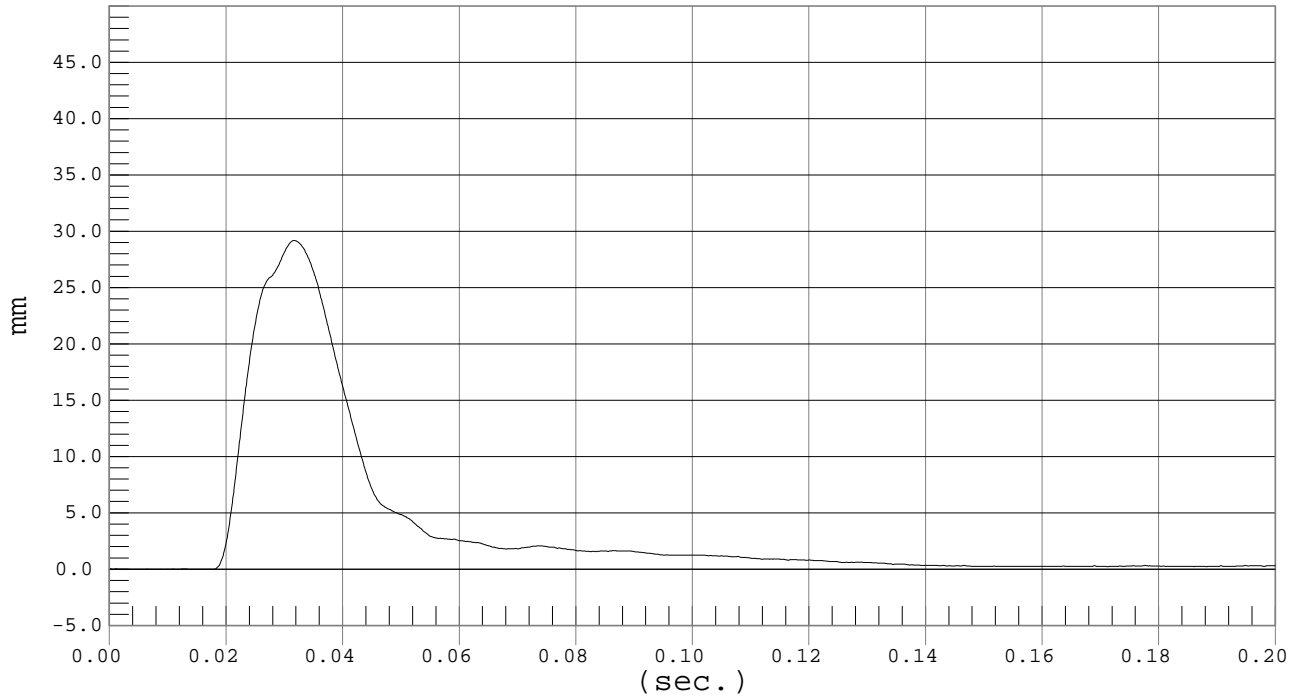


UPPER RIB DISPLACEMENT

Test Desc.: Thorax with Arm
Component: Dummy #033

Test Date: 03-12-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -.02 mm @ 0.0005 sec., Ymax = 29.18 mm @ 0.0316 sec.

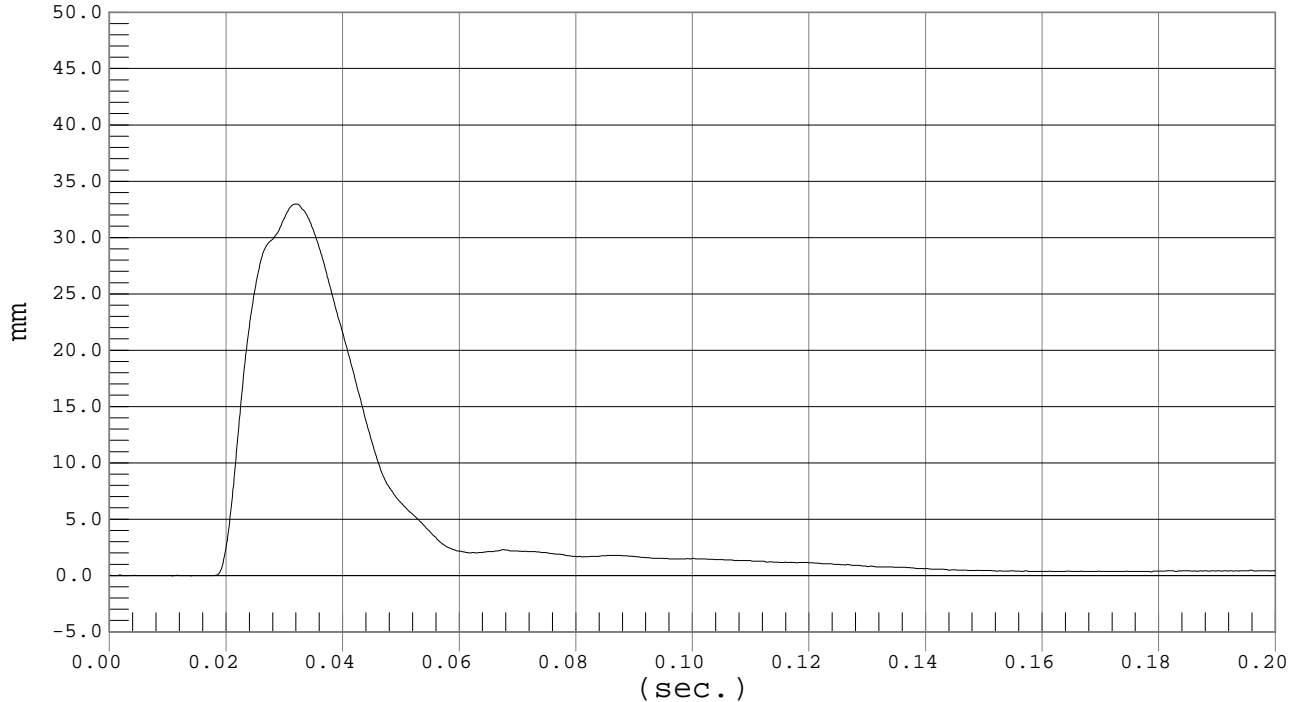


MIDDLE RIB DISPLACEMENT

Test Desc.: Thorax with Arm
Component: Dummy #033

Test Date: 03-12-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -.04 mm @ 0.0107 sec., Ymax = 32.98 mm @ 0.0320 sec.



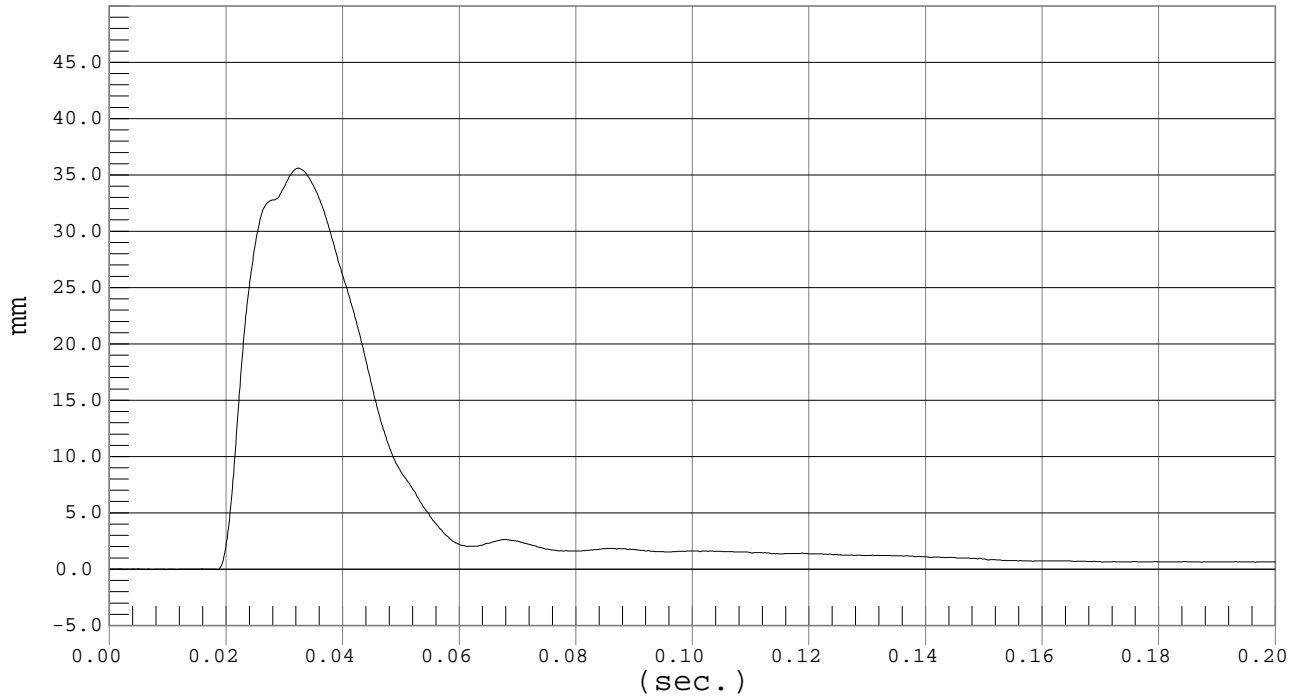


LOWER RIB DISPLACEMENT

Test Desc.: Thorax with Arm
Component: Dummy #033

Test Date: 03-12-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -.04 mm @ 0.0073 sec., Ymax = 35.6 mm @ 0.0323 sec.

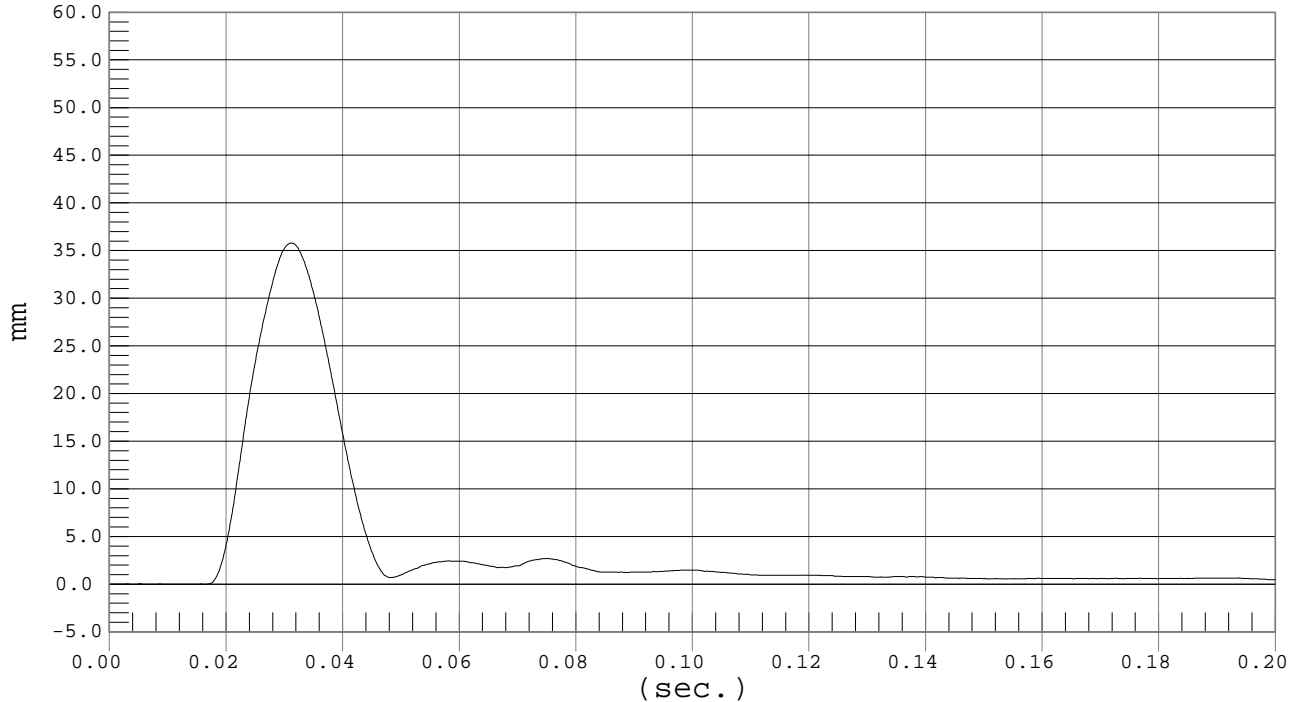


SHOULDER DISPLACEMENT

Test Desc.: Thorax with Arm
Component: Dummy #033

Test Date: 03-12-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -.01 mm @ 0.0024 sec., Ymax = 35.77 mm @ 0.0312 sec.



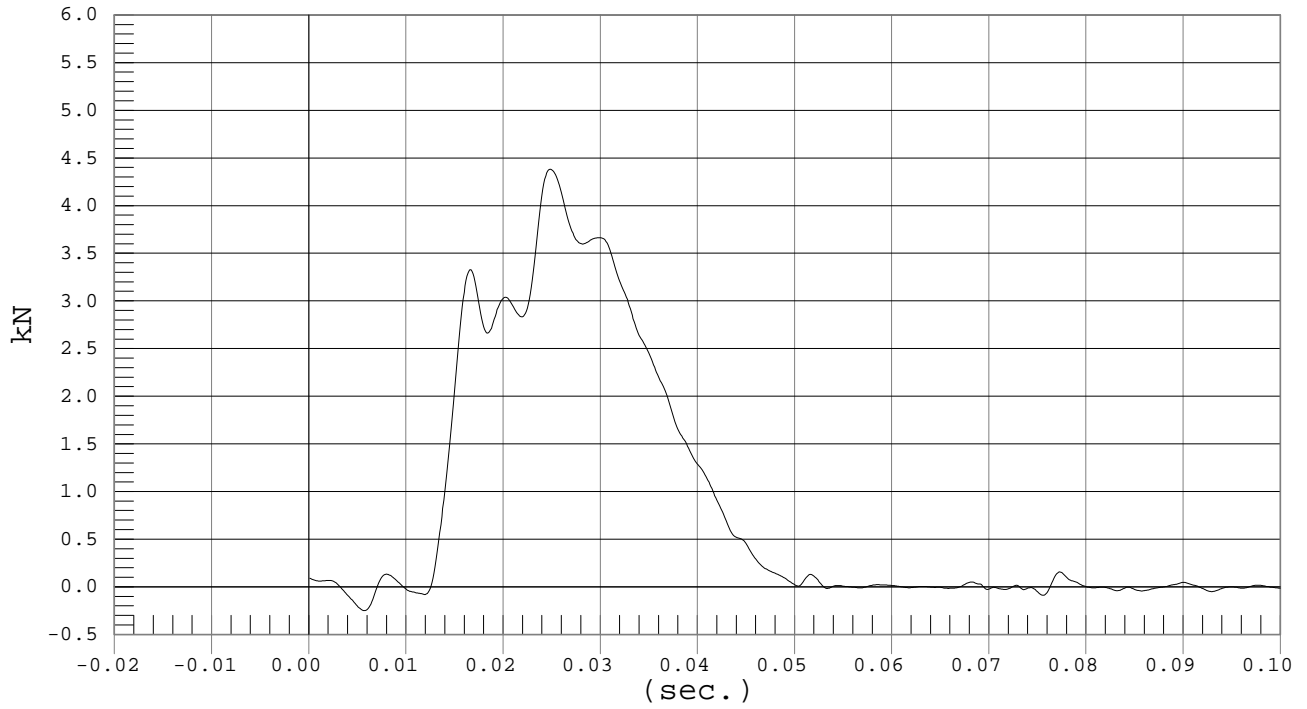


PROBE FORCE

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 21.9 fps, 6.68 M/s

Ymin = -.25 kN @ 0.0056 sec., Ymax = 4.38 kN @ 0.0248 sec.



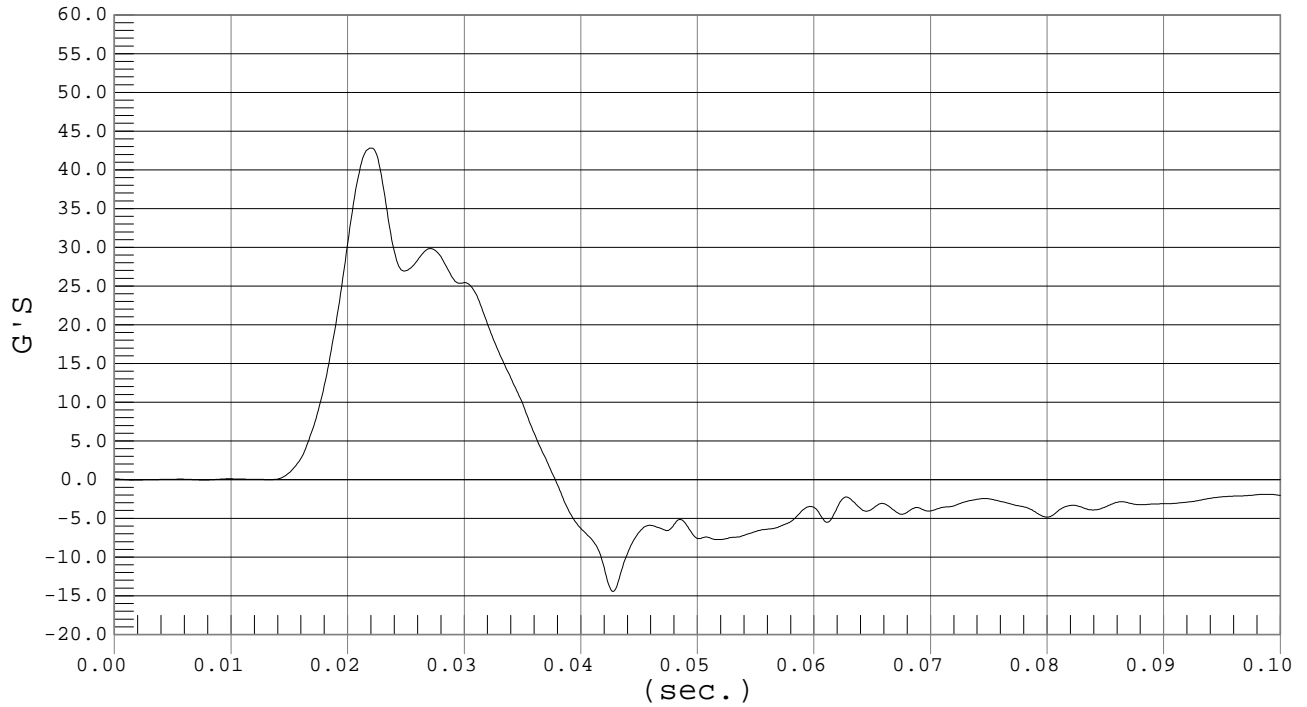


UPPER SPINE ACCELERATION

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 21.9 fps, 6.68 M/s

Ymin = -14.44 G'S @ 0.0427 sec., Ymax = 42.83 G'S @ 0.0219 sec.

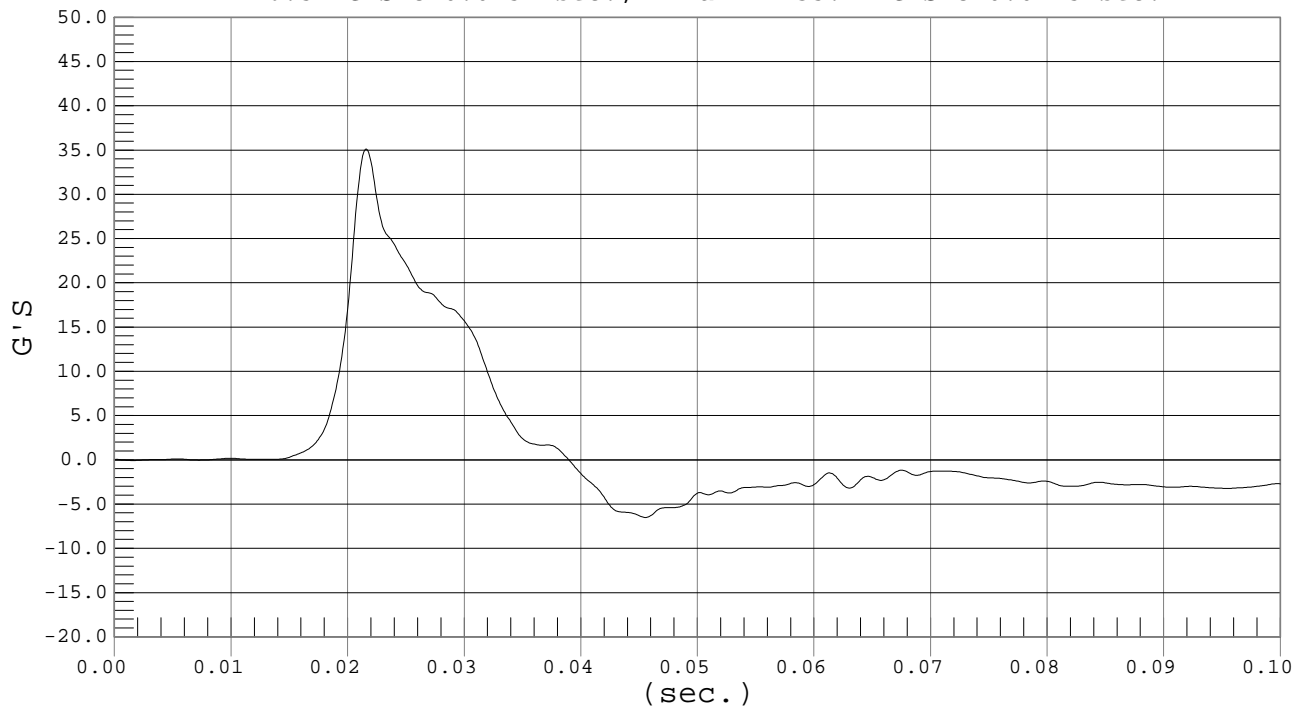


LOWER SPINE ACCELERATION

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 21.9 fps, 6.68 M/s

Ymin = -6.51 G'S @ 0.0454 sec., Ymax = 35.11 G'S @ 0.0215 sec.



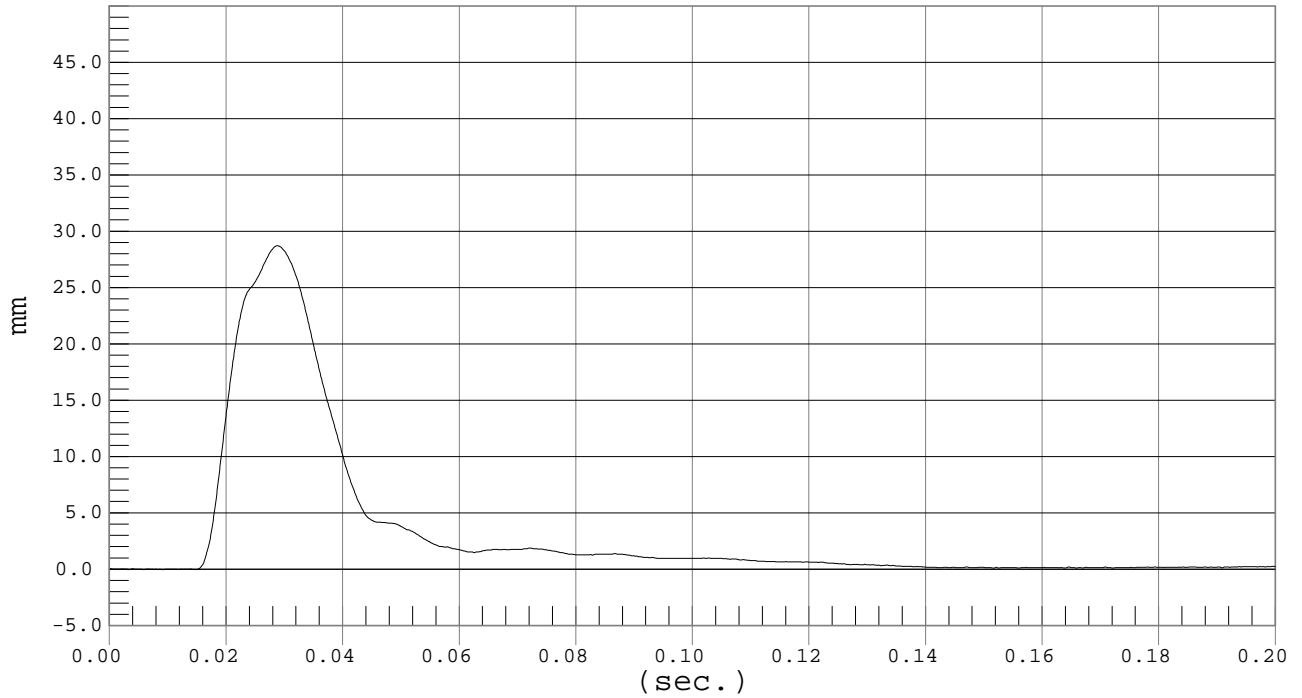


UPPER RIB DISPLACEMENT

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 21.9 fps, 6.68 M/s

Ymin = -.03 mm @ 0.0033 sec., Ymax = 28.71 mm @ 0.0287 sec.

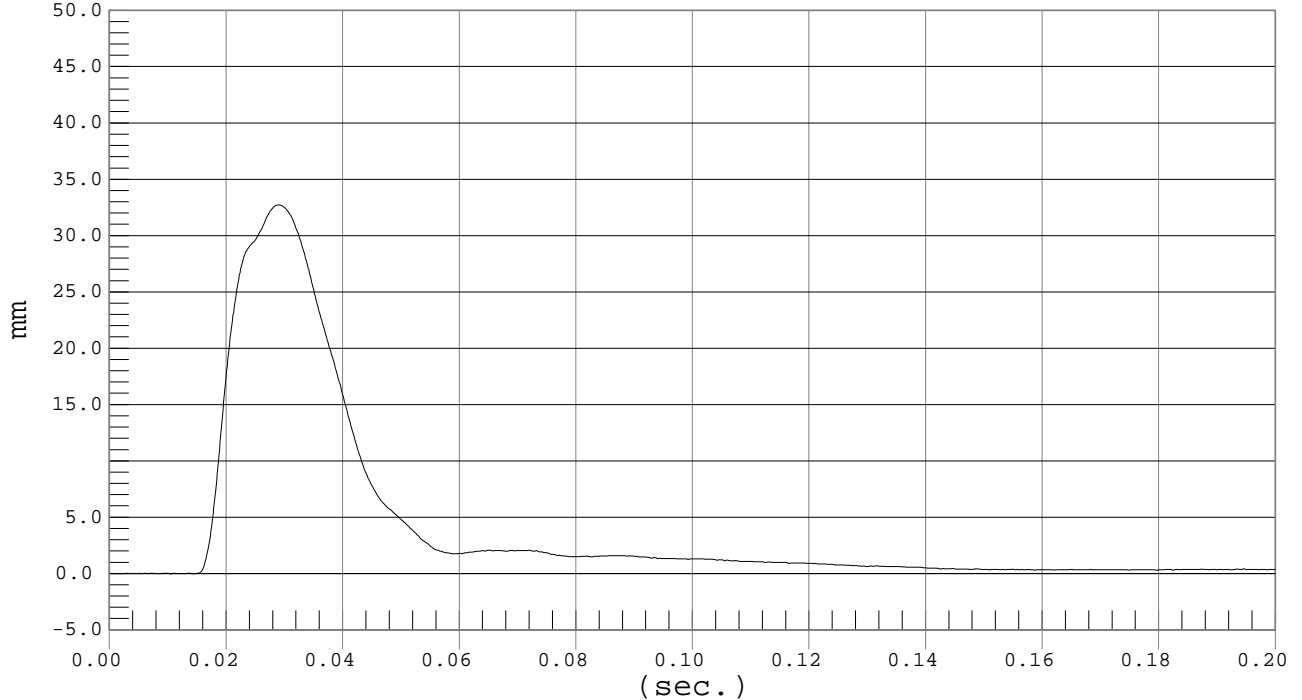


MIDDLE RIB DISPLACEMENT

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 21.9 fps, 6.68 M/s

Ymin = -.04 mm @ 0.0104 sec., Ymax = 32.72 mm @ 0.0289 sec.



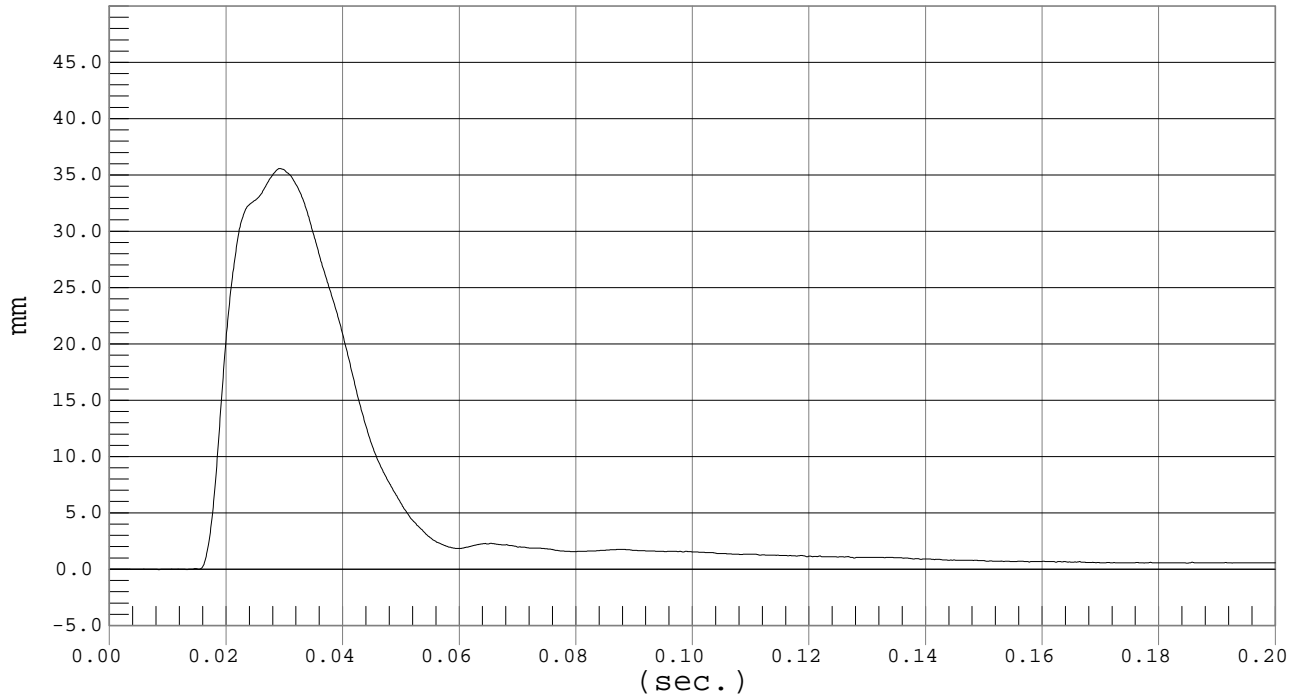


LOWER RIB DISPLACEMENT

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 21.9 fps, 6.68 M/s

Ymin = $-.06$ mm @ 0.0084 sec., Ymax = 35.57 mm @ 0.0291 sec.

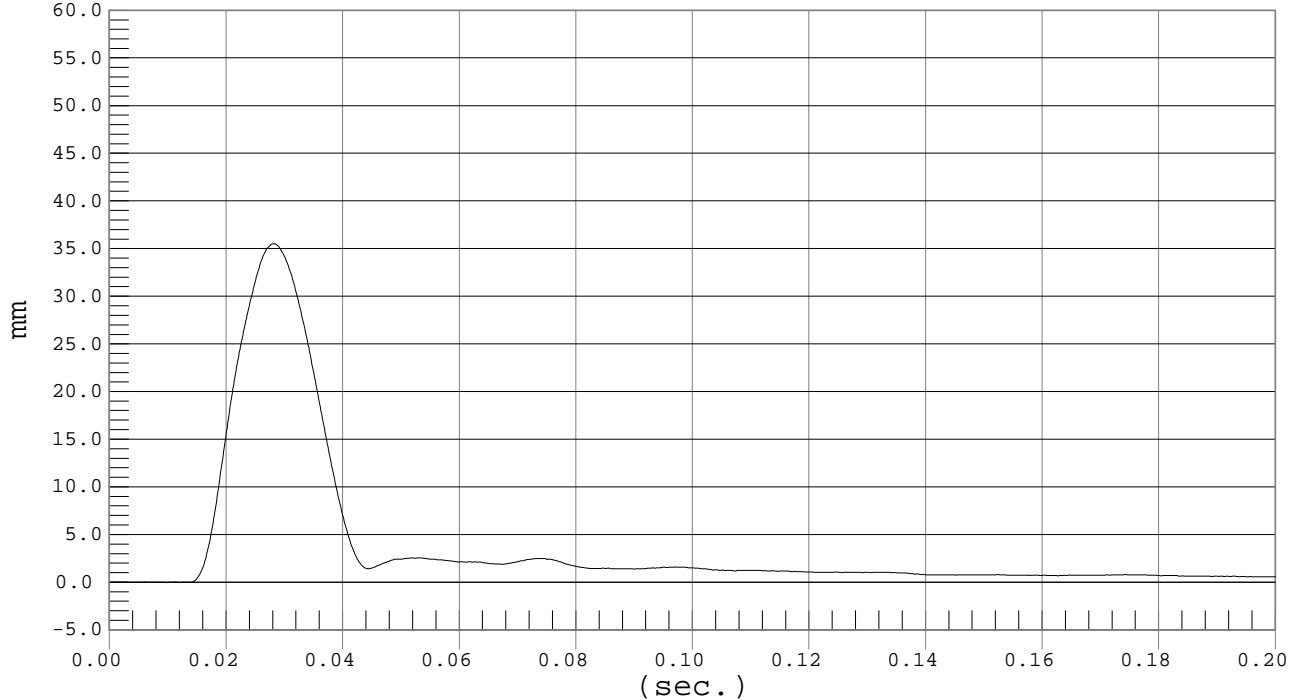


SHOULDER DISPLACEMENT

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 21.9 fps, 6.68 M/s

Ymin = $-.05$ mm @ 0.0120 sec., Ymax = 35.5 mm @ 0.0281 sec.



MGA RESEARCH CORPORATION
 THORAX (WITHOUT ARM) IMPACT TESTS
 SID IIs DUMMY

Date: 3/13/03
 Dummy Serial Number: 033
 Test Number: D03295/D03315

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03295</u>	<u>D03315</u>
Temperature (°C)	20.8° – 22.2°	21.0	21.3
Humidity	10% - 70%	24	23
Impact Velocity	4.2 - 4.4m/s	4.2	4.3
Probe Force	1.8 - 2.3 kN	2.0	2.0
Upper Spine Acceleration	13 - 18 g's	14	15
Lower Spine Acceleration	8 - 13 g's	9	10
Upper Rib Displacement	32 - 41 mm	35	38
Middle Rib Displacement	40 - 51 mm	41	43
Lower Rib Displacement	34 - 47 mm	41	40

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

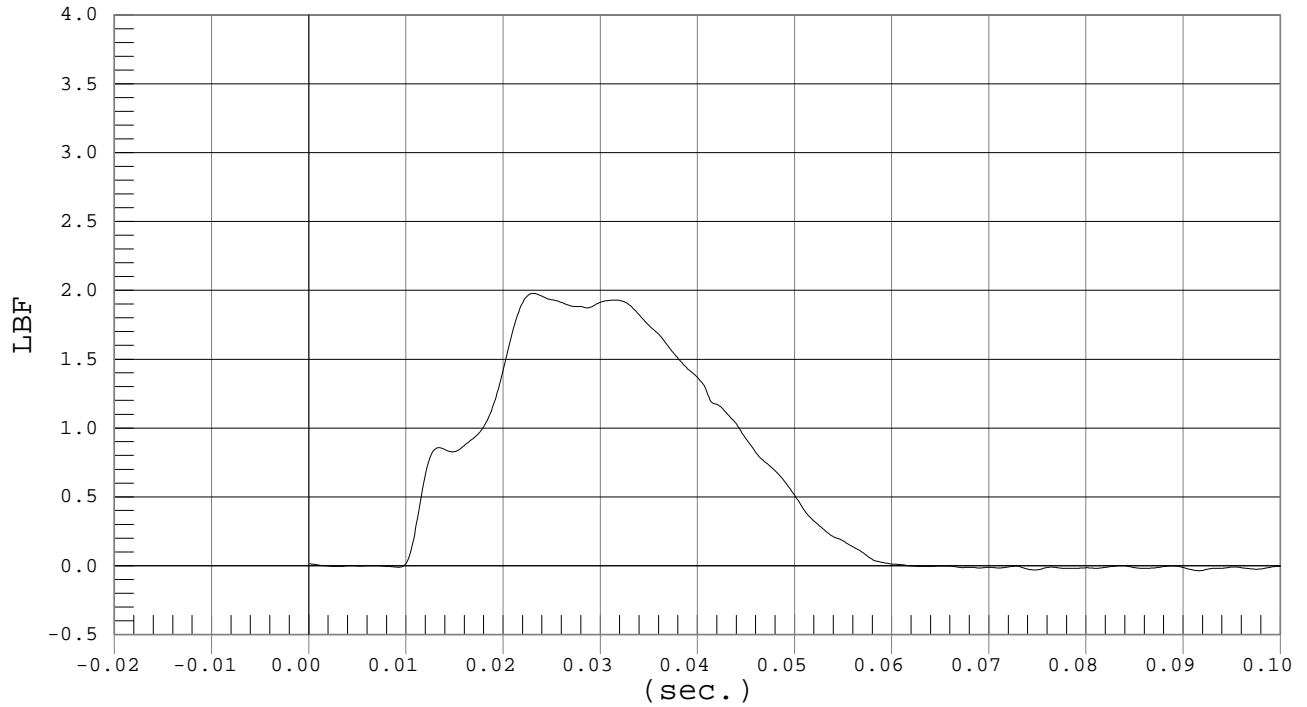


PROBE FORCE

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 13.8 fps, 4.21 M/s

Ymin = -.04 LBF @ 0.0915 sec., Ymax = 1.98 LBF @ 0.0230 sec.

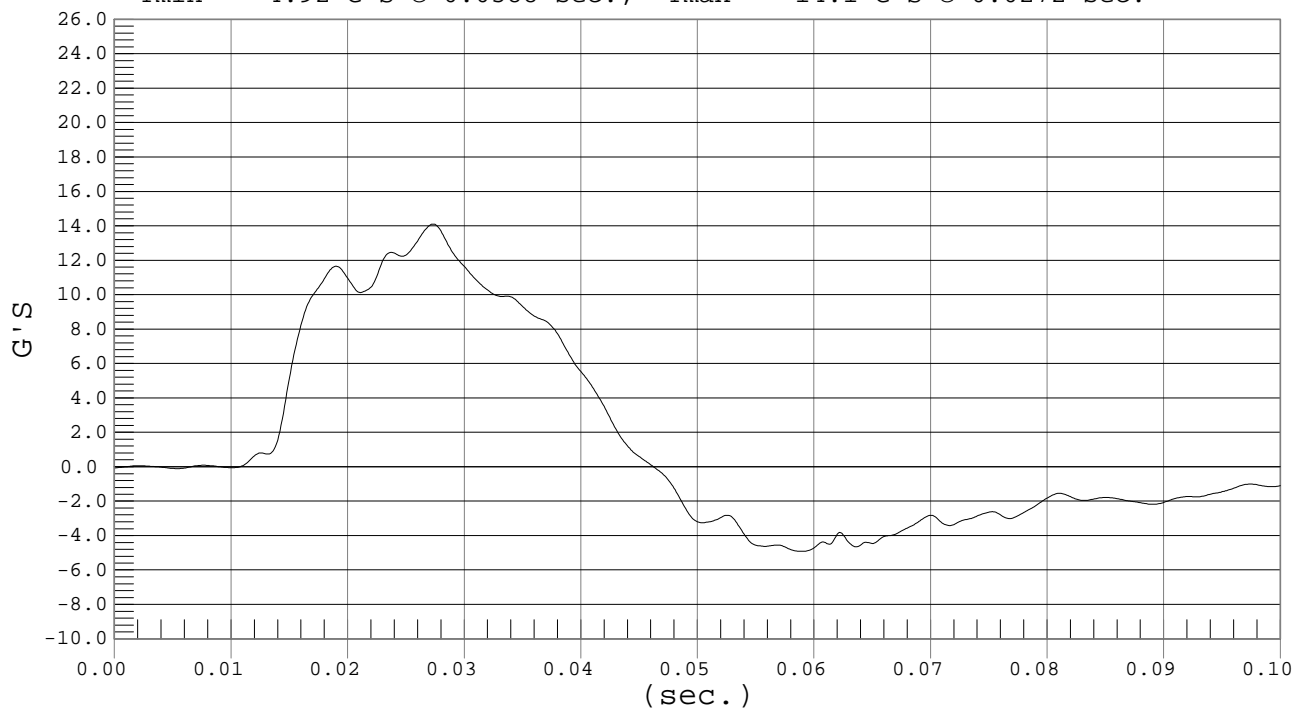


UPPER SPINE ACCELERATION

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 13.8 fps, 4.21 M/s

Ymin = -4.92 G'S @ 0.0588 sec., Ymax = 14.1 G'S @ 0.0272 sec.



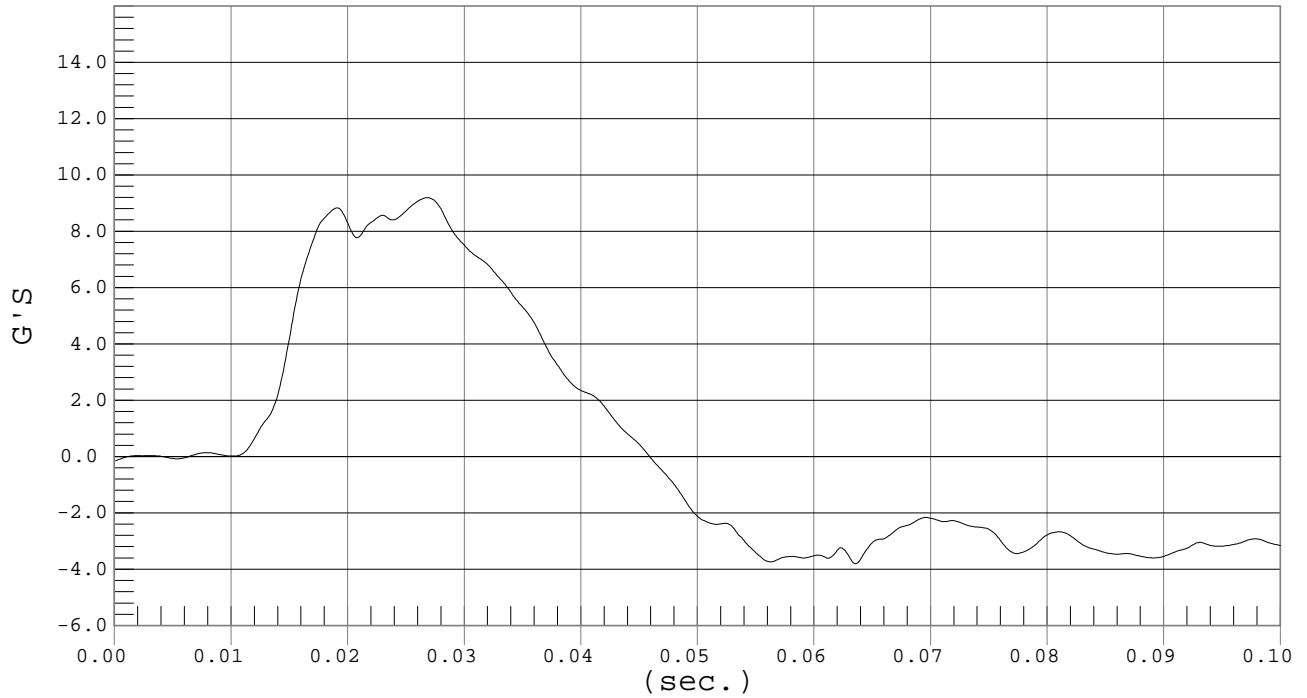


LOWER SPINE ACCELERATION

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 13.8 fps, 4.21 M/s

Ymin = -3.8 G'S @ 0.0635 sec., Ymax = 9.19 G'S @ 0.0267 sec.

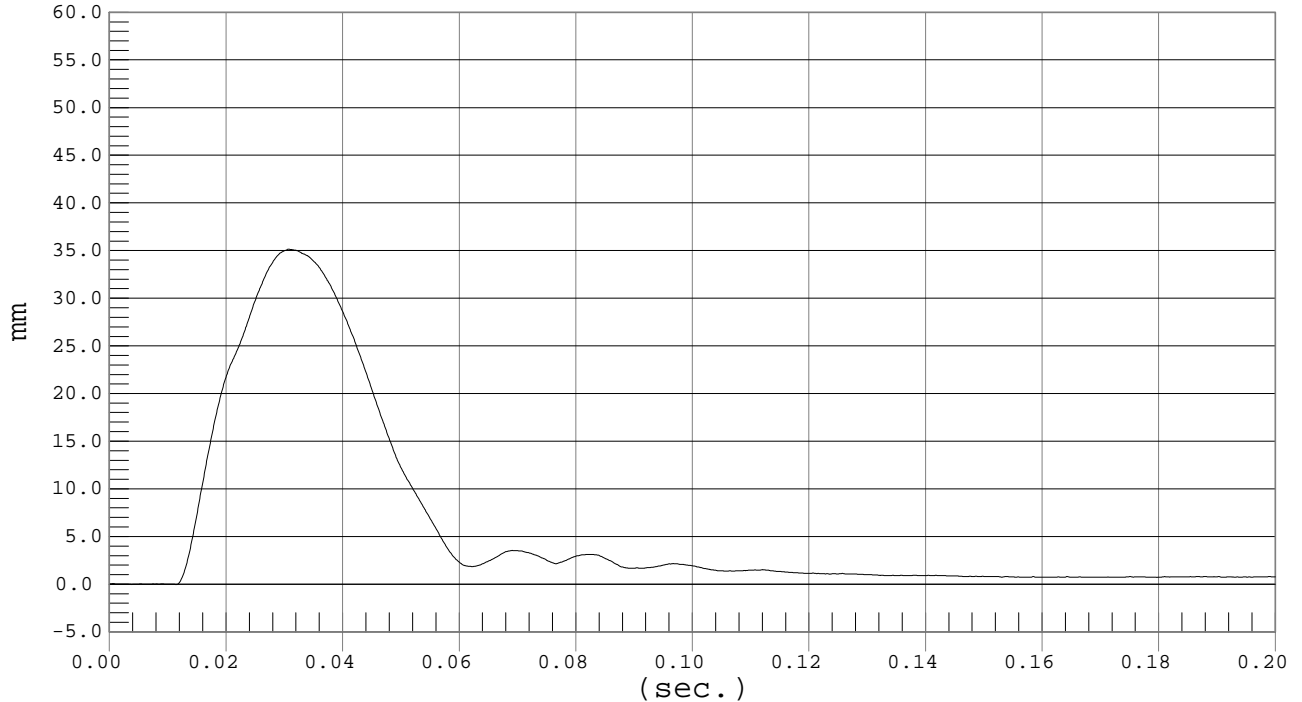


UPPER RIB DISPLACEMENT

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 13.8 fps, 4.21 M/s

Ymin = -.04 mm @ 0.0114 sec., Ymax = 35.14 mm @ 0.0306 sec.



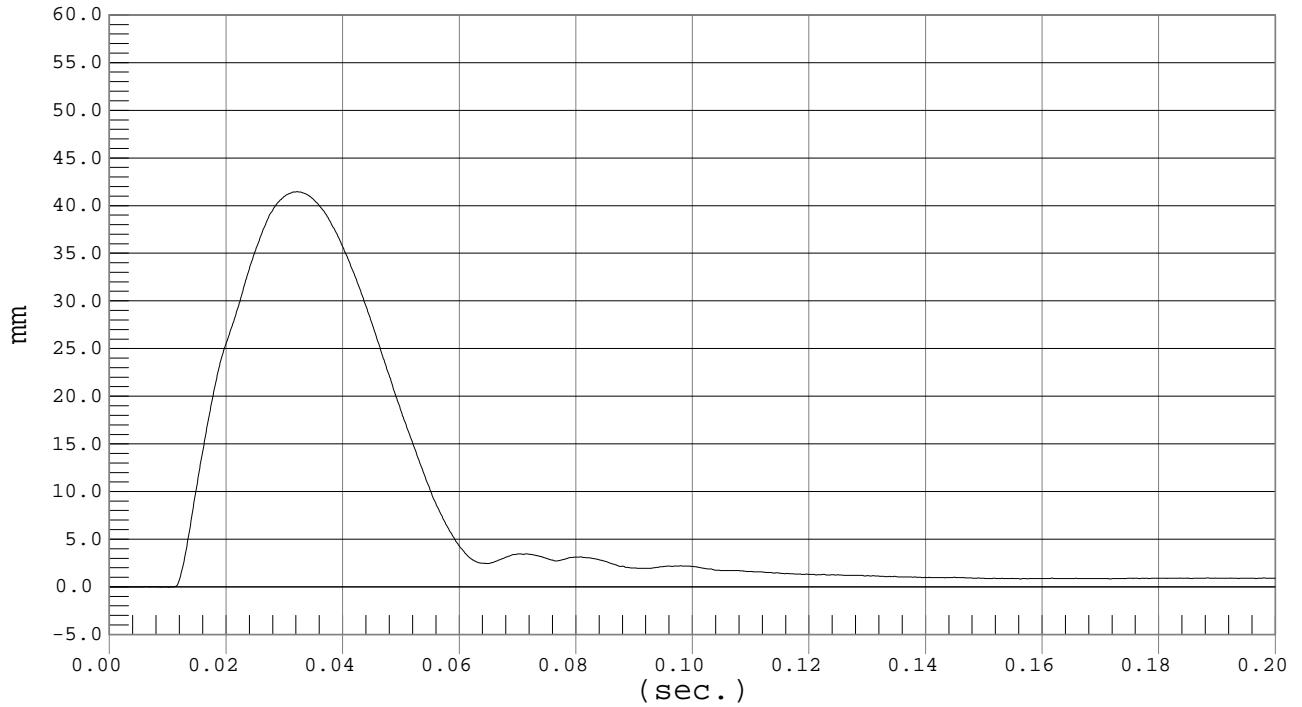


MIDDLE RIB DISPLACEMENT

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 13.8 fps, 4.21 M/s

Ymin = -.03 mm @ 0.0101 sec., Ymax = 41.45 mm @ 0.0321 sec.

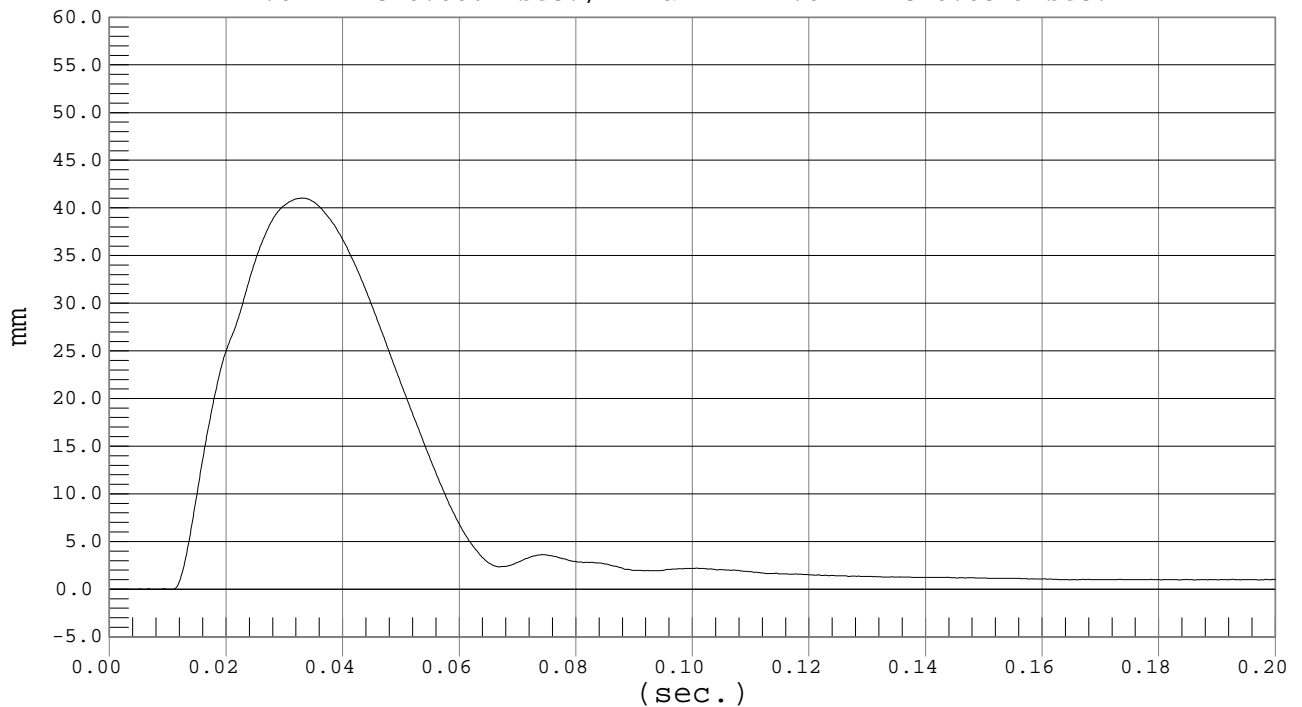


LOWER RIB DISPLACEMENT

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 13.8 fps, 4.21 M/s

Ymin = -.01 mm @ 0.0061 sec., Ymax = 41.04 mm @ 0.0329 sec.



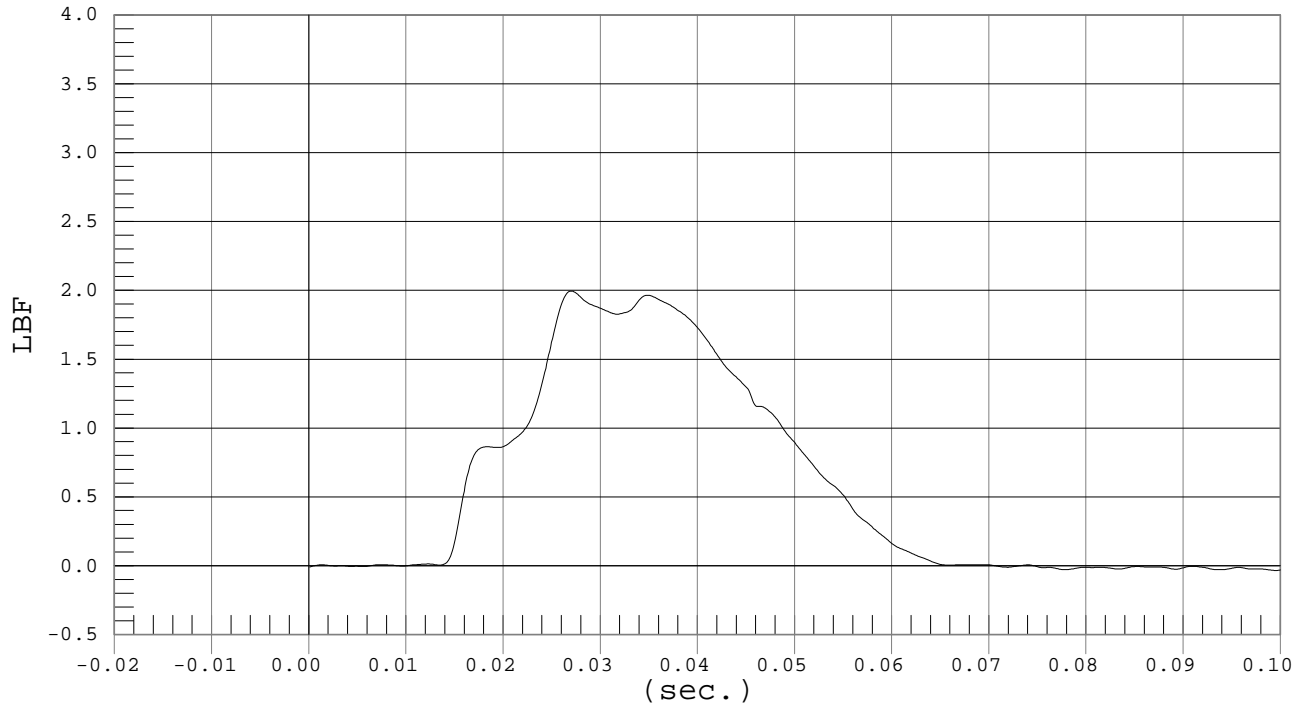


PROBE FORCE

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 14.0 fps, 4.27 M/s

Ymin = -.04 LBF @ 0.1156 sec., Ymax = 1.99 LBF @ 0.0269 sec.

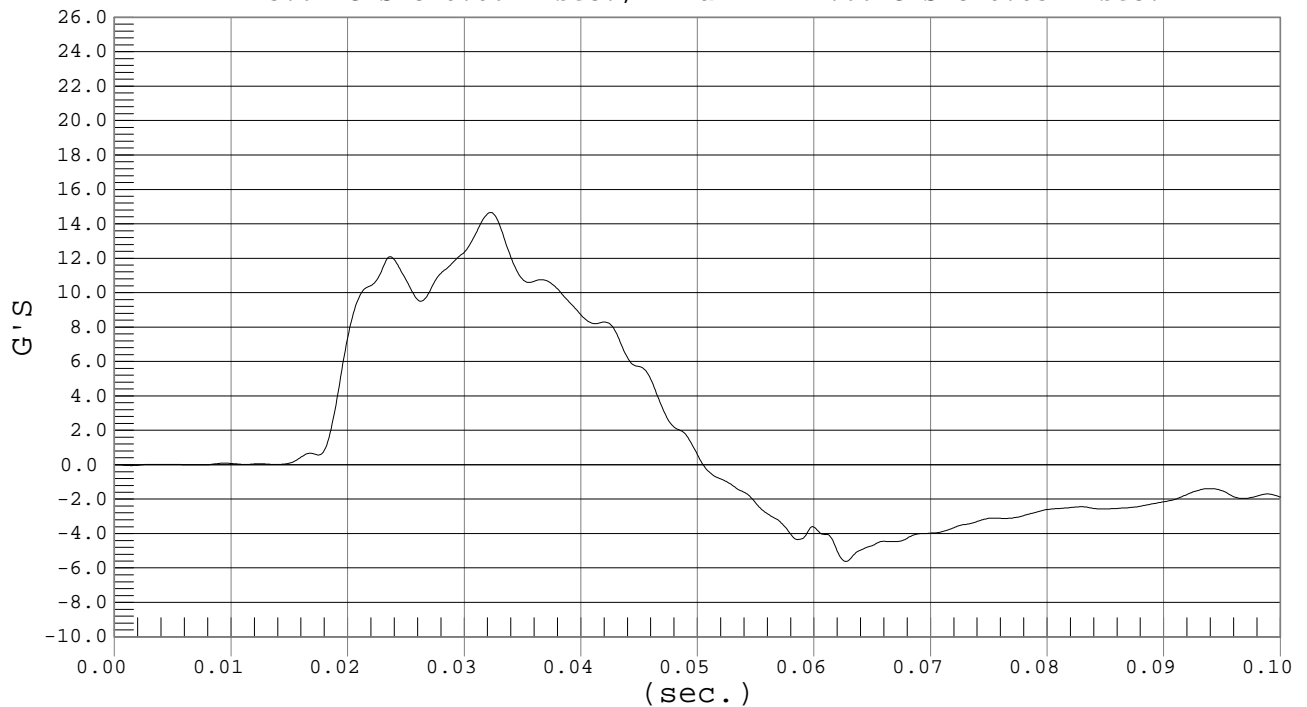


UPPER SPINE ACCELERATION

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 14.0 fps, 4.27 M/s

Ymin = -5.62 G'S @ 0.0627 sec., Ymax = 14.66 G'S @ 0.0322 sec.



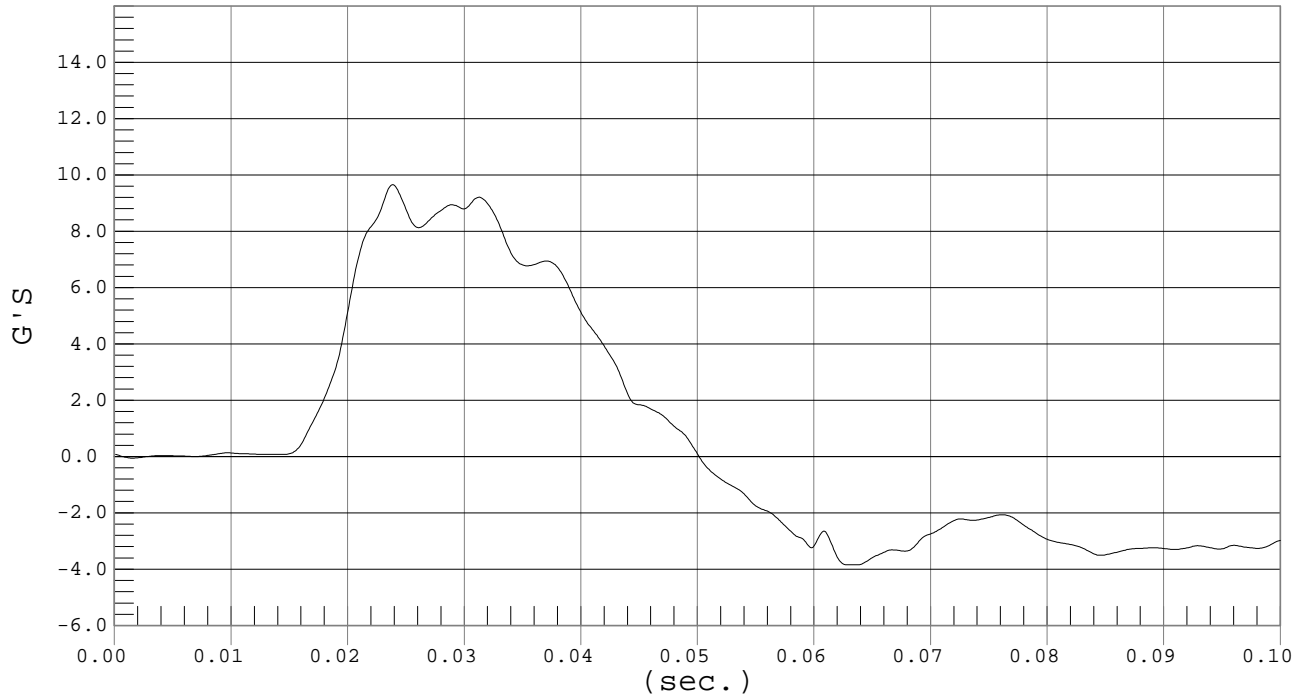


LOWER SPINE ACCELERATION

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 14.0 fps, 4.27 M/s

Ymin = -3.85 G'S @ 0.0633 sec., Ymax = 9.65 G'S @ 0.0238 sec.

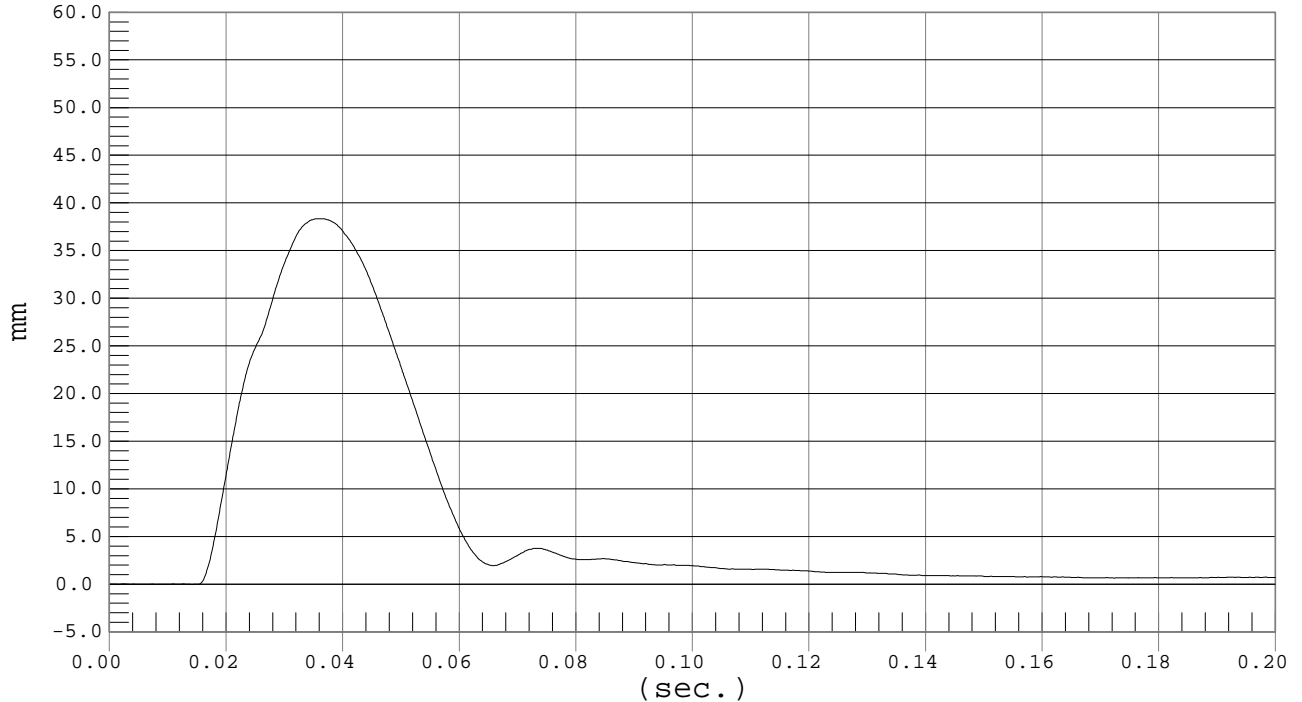


UPPER RIB DISPLACEMENT

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 14.0 fps, 4.27 M/s

Ymin = -.03 mm @ 0.0014 sec., Ymax = 38.35 mm @ 0.0360 sec.



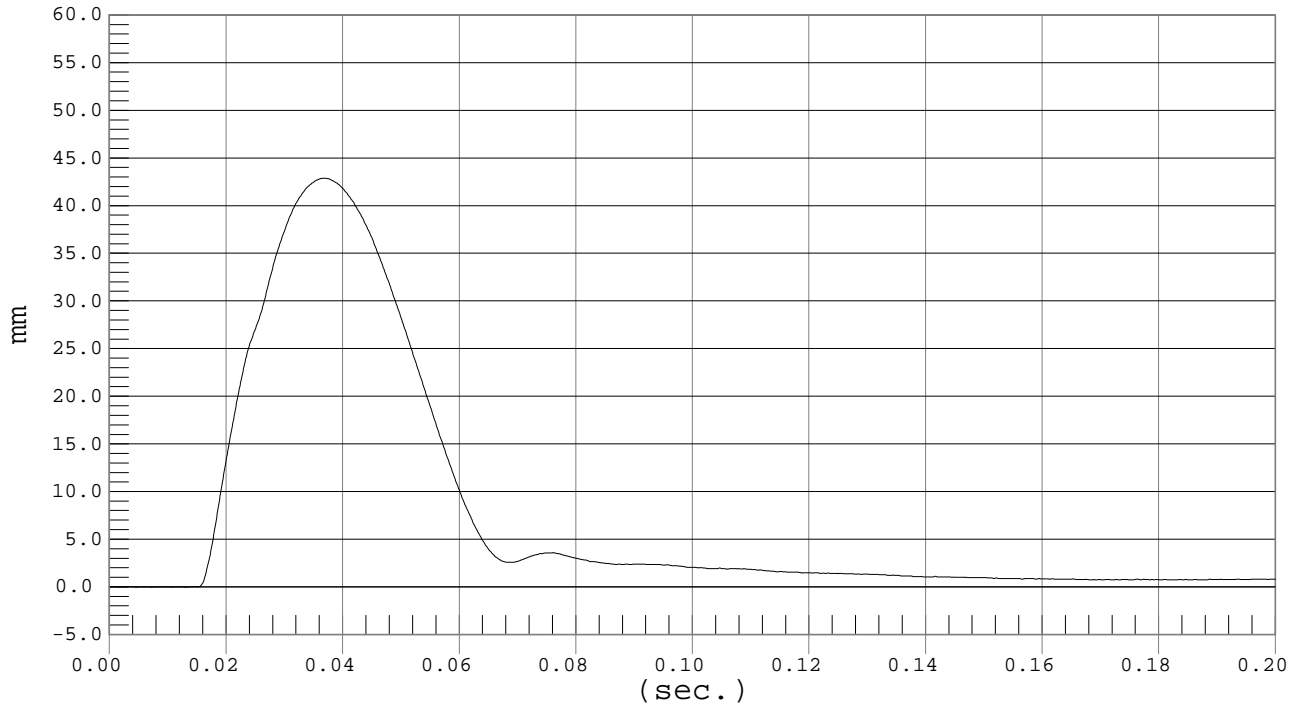


MIDDLE RIB DISPLACEMENT

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 14.0 fps, 4.27 M/s

Ymin = -0.05 mm @ 0.0130 sec., Ymax = 42.88 mm @ 0.0368 sec.

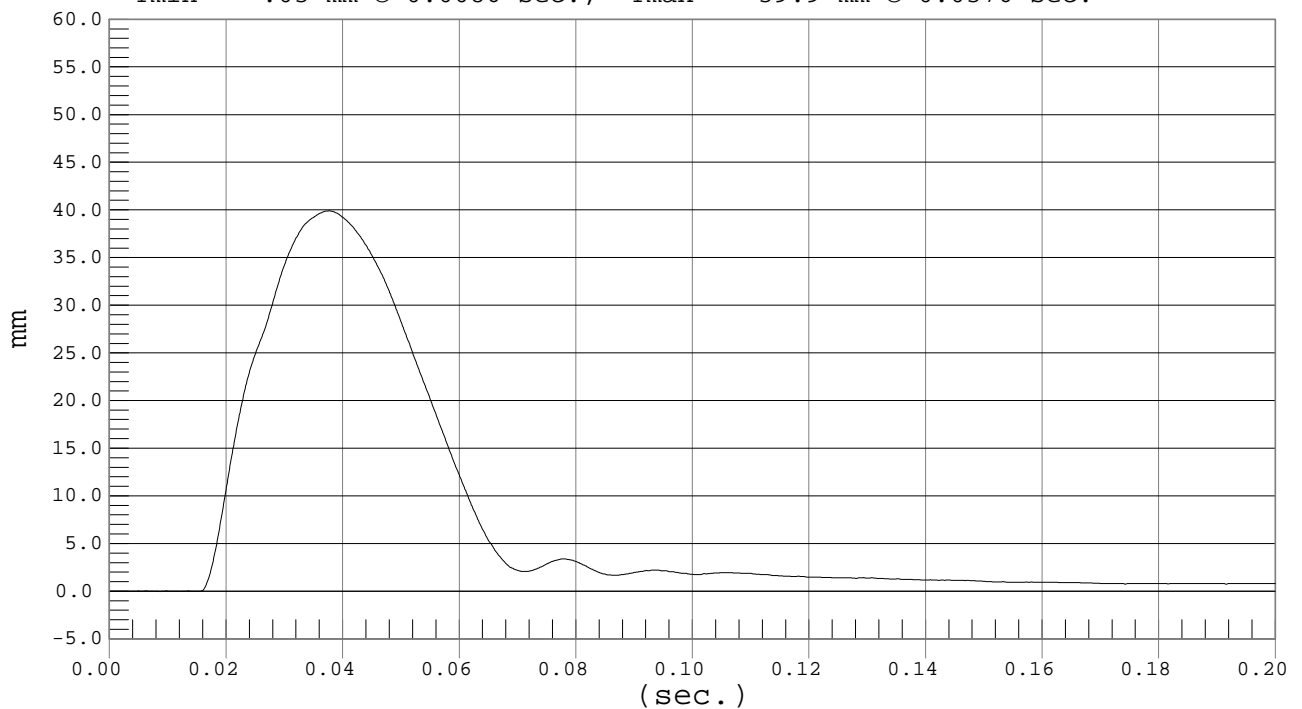


LOWER RIB DISPLACEMENT

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-13-03
Speed: 14.0 fps, 4.27 M/s

Ymin = -0.03 mm @ 0.0086 sec., Ymax = 39.9 mm @ 0.0376 sec.



MGA RESEARCH CORPORATION
 ABDOMINAL IMPACT TEST
 SID IIs DUMMY

Date: 3/13/03
 Dummy Serial Number: 033
 Test Number: D03296/D03316

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03296</u>	<u>D03316</u>
Temperature (°C)	20.8° – 22.2°	20.8	21.1
Humidity	10% - 70%	22	24
Impact Velocity	4.41 - 4.59 m/s	4.49	4.50
Probe Force	1.3 - 1.9 kN	1.8	1.7
Upper Spine Acceleration	5 - 9 g's	6	6
Lower Spine Acceleration	10 - 12 g's	14*	13 *
Upper Rib Displacement	44 - 55 mm	47	47
Middle Rib Displacement	44 - 56 mm	46	48

*TEST DOES NOT MEET SPECIFICATIONS

Technician: _____

Approved By: _____

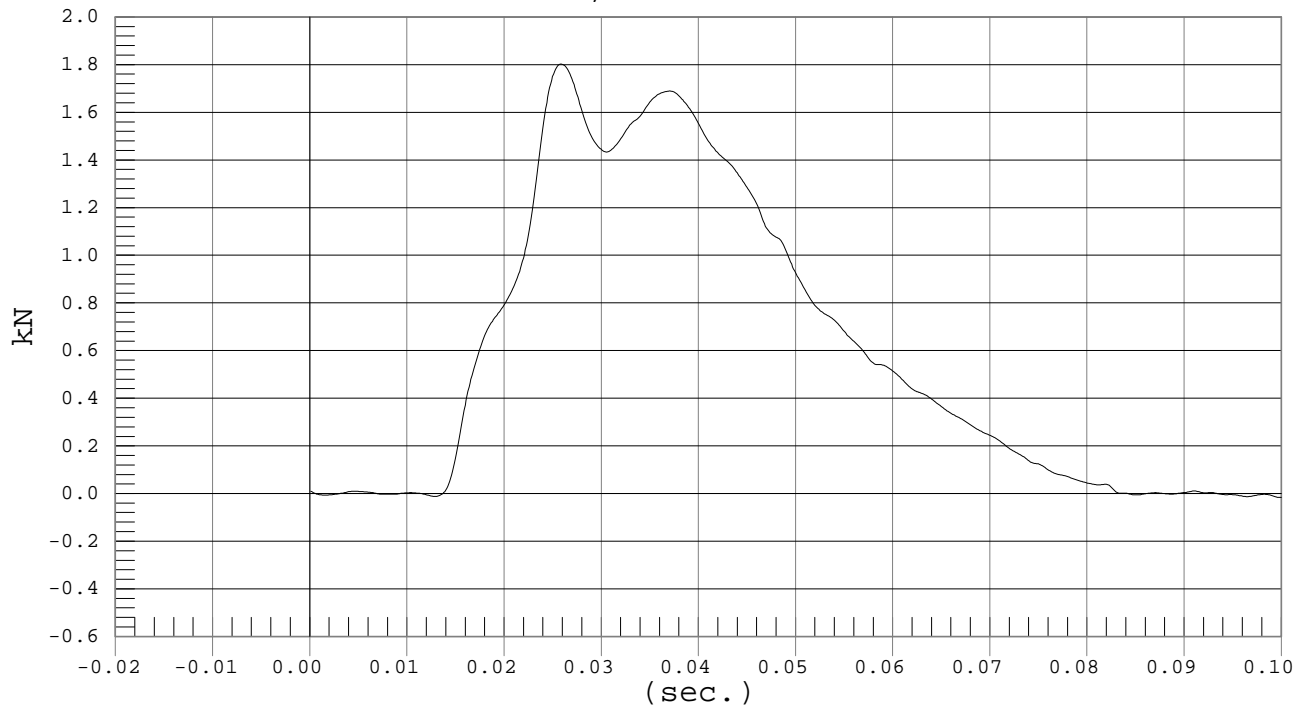


Test Desc.: Abdomen Impact
Component: Dummy #033

PROBE FORCE

Test Date: 03-13-03
Speed: 14.7 fps, 4.49 M/s

Ymin = -.04 kN @ 0.1116 sec., Ymax = 1.8 kN @ 0.0258 sec.



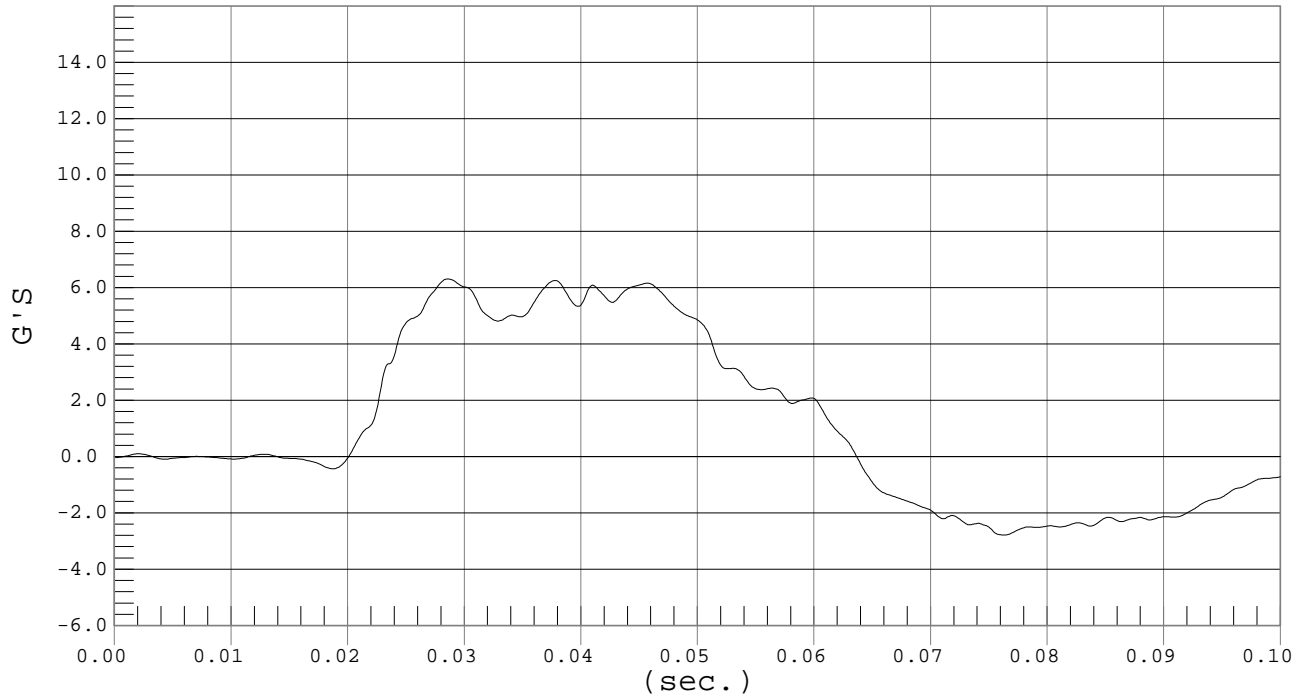


UPPER SPINE ACCELERATION

Test Desc.: Abdomen Impact
Component: Dummy #033

Test Date: 03-13-03
Speed: 14.7 fps, 4.49 M/s

Ymin = -2.79 G'S @ 0.0762 sec., Ymax = 6.31 G'S @ 0.0285 sec.

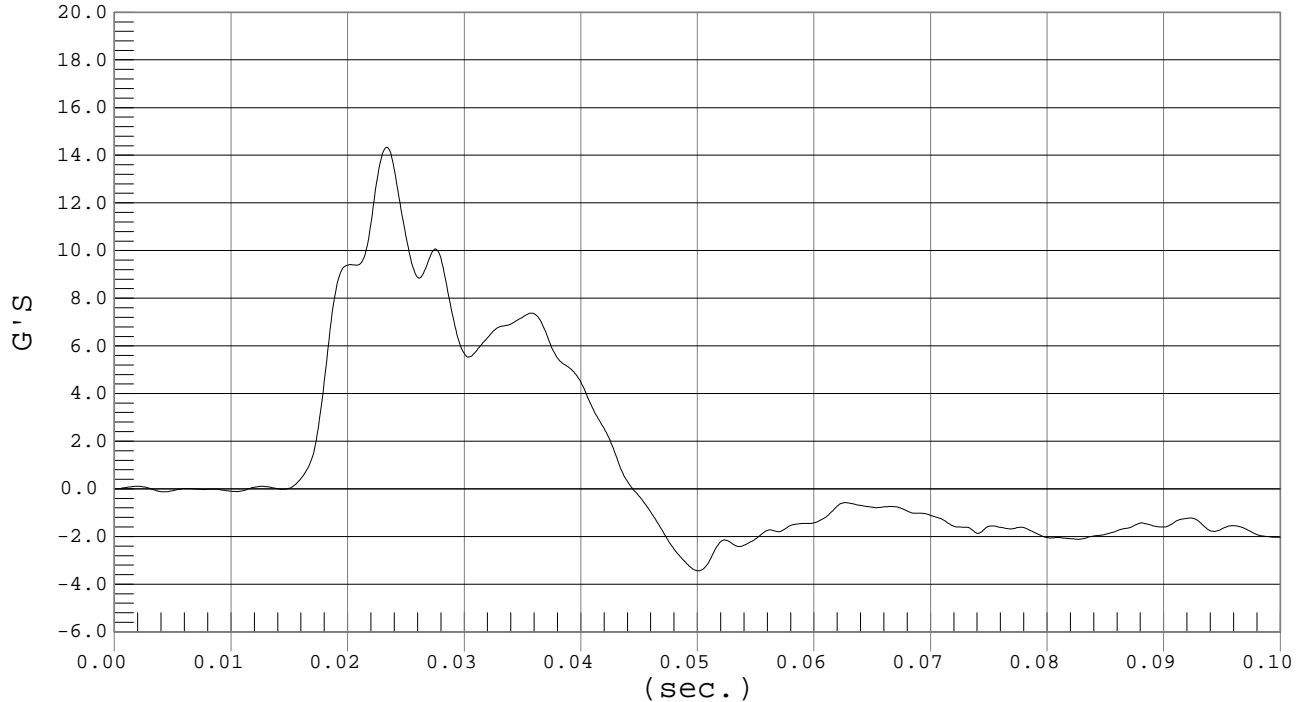


LOWER SPINE ACCELERATION

Test Desc.: Abdomen Impact
Component: Dummy #033

Test Date: 03-13-03
Speed: 14.7 fps, 4.49 M/s

Ymin = -3.44 G'S @ 0.0500 sec., Ymax = 14.33 G'S @ 0.0233 sec.



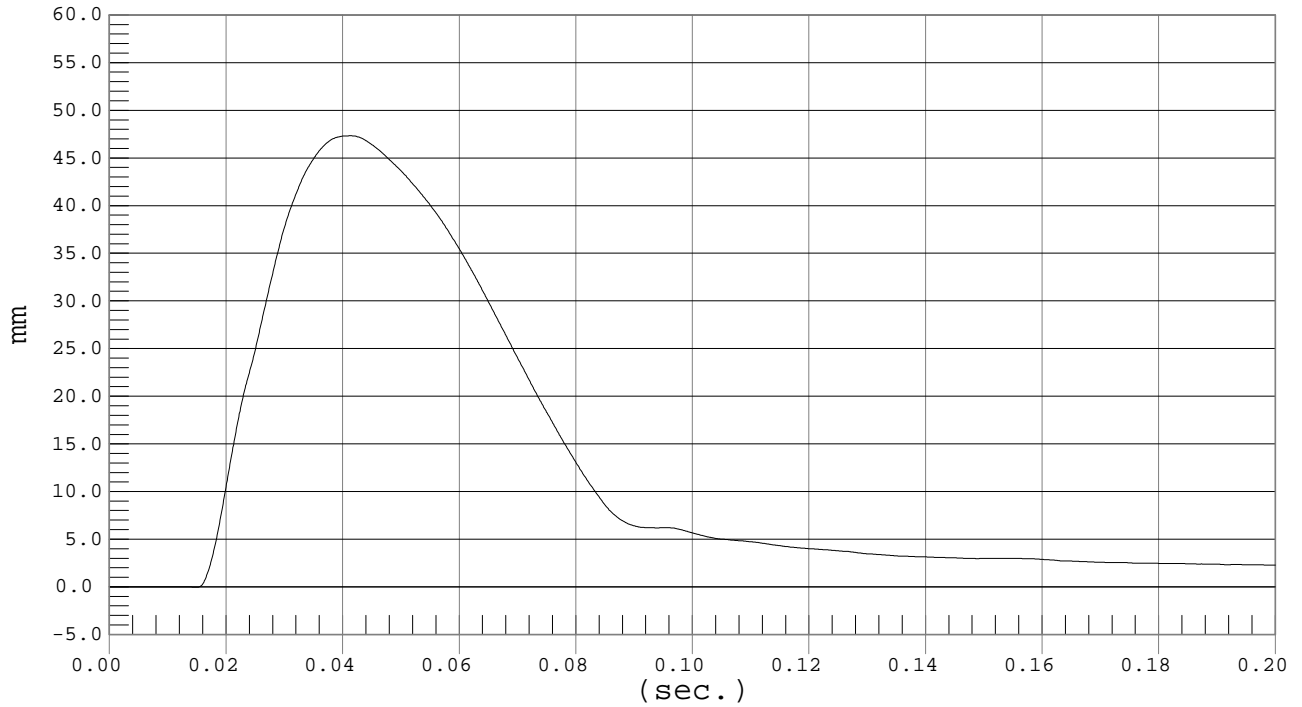


UPPER RIB DISPLACEMENT

Test Desc.: Abdomen Impact
Component: Dummy #033

Test Date: 03-13-03
Speed: 14.7 fps, 4.49 M/s

Ymin = -.05 mm @ 0.0149 sec., Ymax = 47.33 mm @ 0.0413 sec.

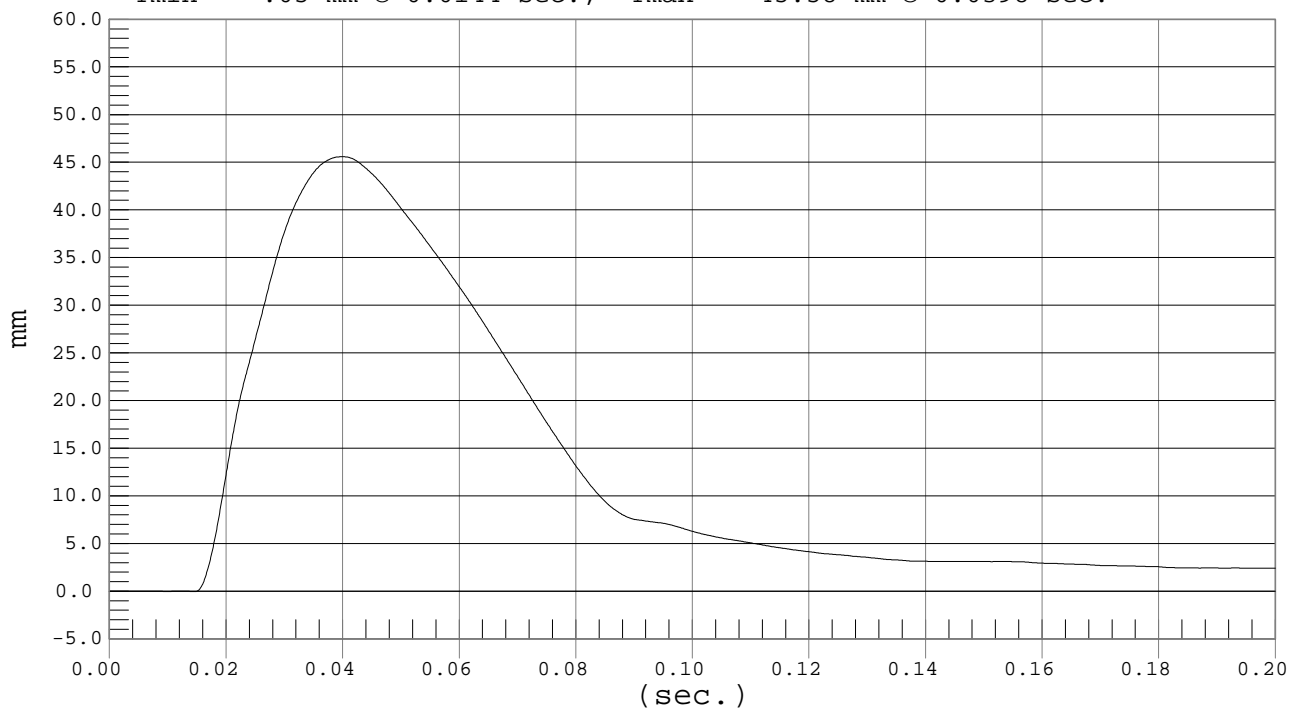


LOWER RIB DISPLACEMENT

Test Desc.: Abdomen Impact
Component: Dummy #033

Test Date: 03-13-03
Speed: 14.7 fps, 4.49 M/s

Ymin = -.05 mm @ 0.0144 sec., Ymax = 45.58 mm @ 0.0398 sec.



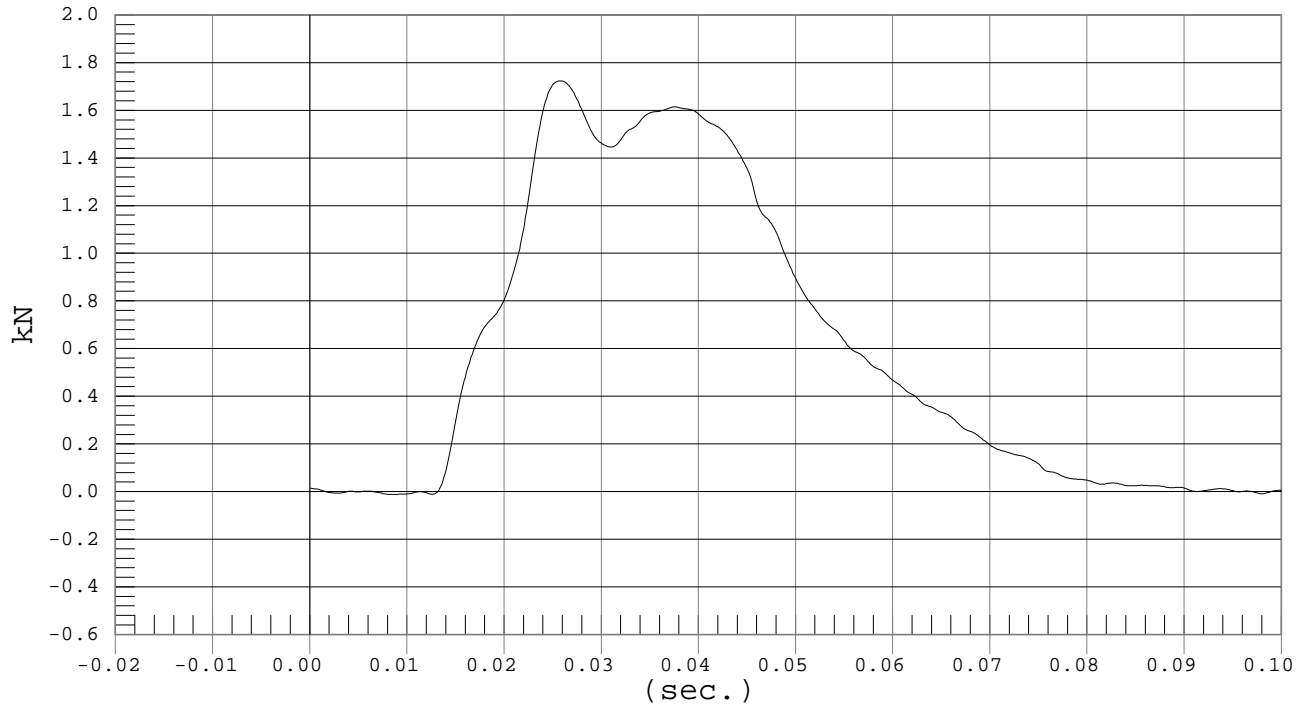


Test Desc.: Abdomen Impact
Component: Dummy #033

PROBE FORCE

Test Date: 03-13-03
Speed: 14.8 fps, 4.50 M/s

Ymin = -.01 kN @ 0.0082 sec., Ymax = 1.72 kN @ 0.0257 sec.



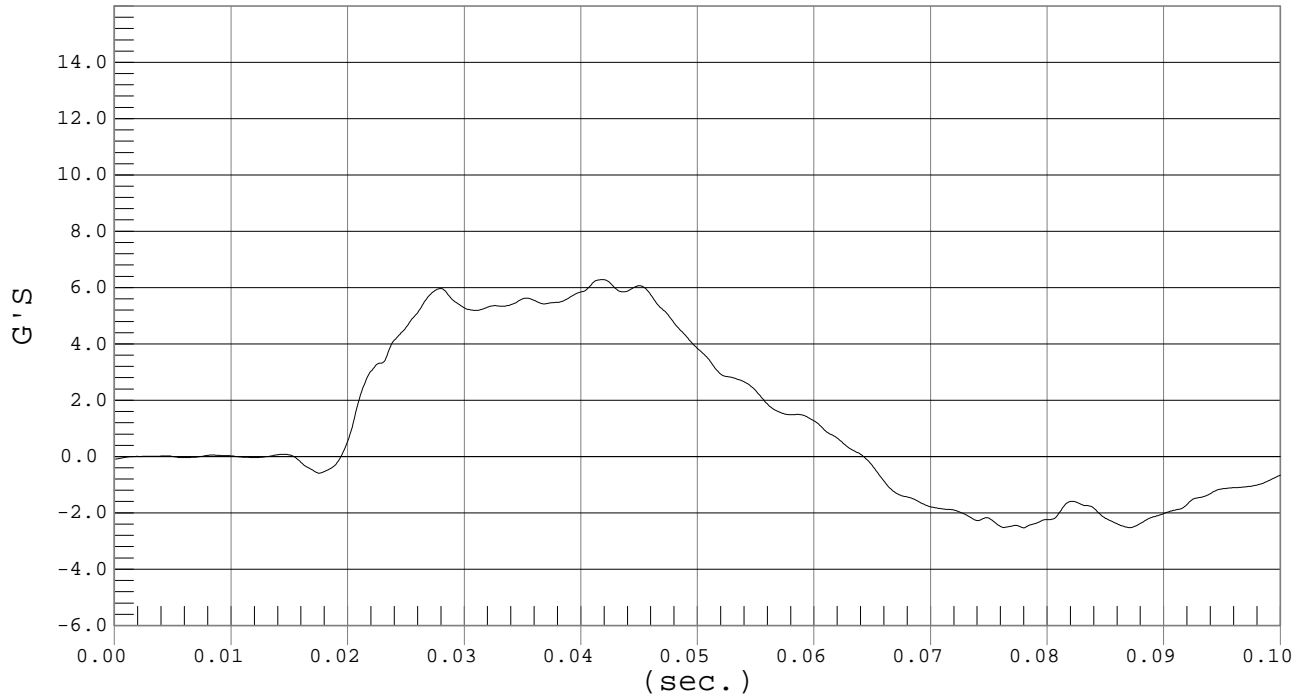


UPPER SPINE ACCELERATION

Test Desc.: Abdomen Impact
Component: Dummy #033

Test Date: 03-13-03
Speed: 14.8 fps, 4.50 M/s

Ymin = -2.53 G'S @ 0.0779 sec., Ymax = 6.28 G'S @ 0.0417 sec.

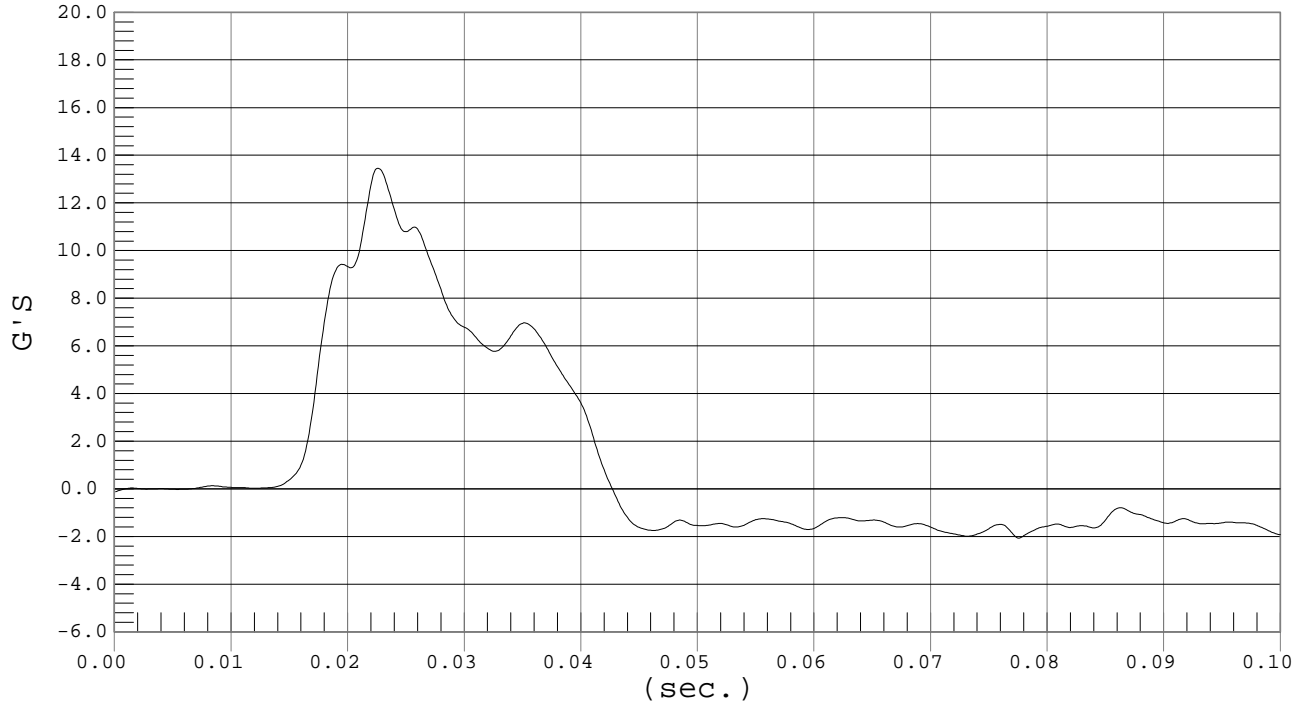


LOWER SPINE ACCELERATION

Test Desc.: Abdomen Impact
Component: Dummy #033

Test Date: 03-13-03
Speed: 14.8 fps, 4.50 M/s

Ymin = -2.07 G'S @ 0.0775 sec., Ymax = 13.46 G'S @ 0.0225 sec.



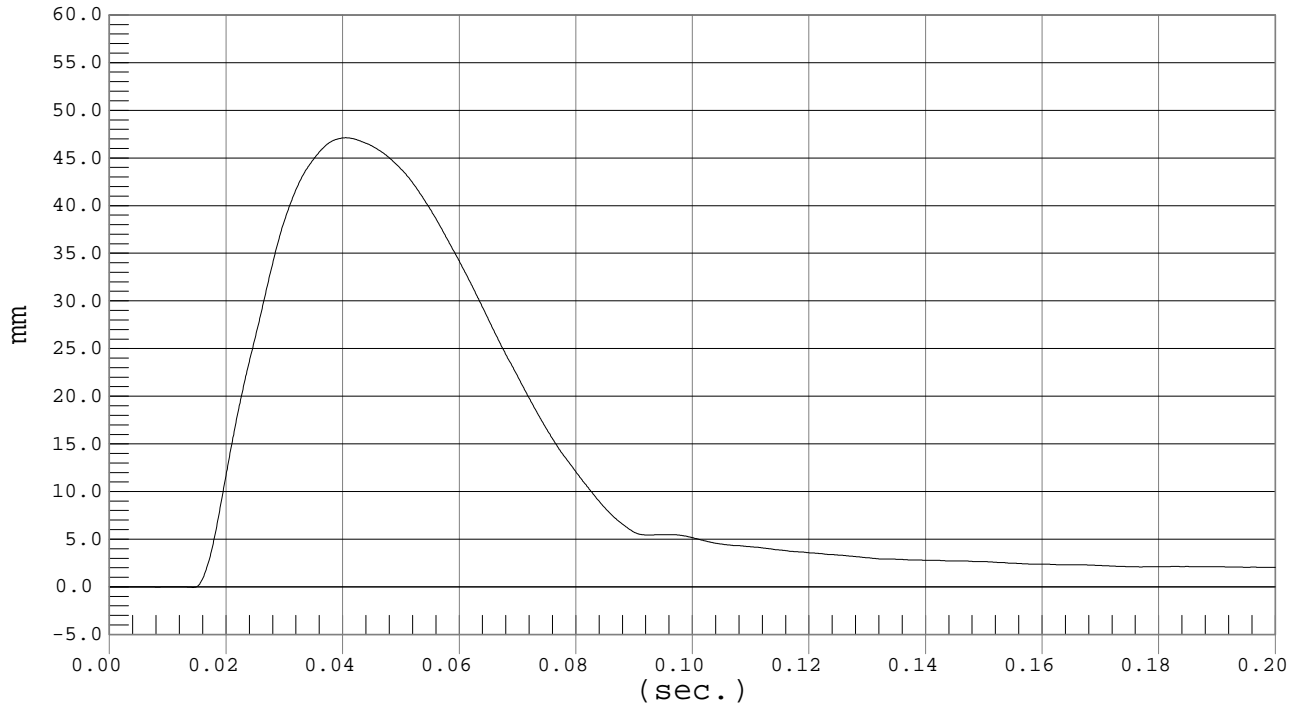


UPPER RIB DISPLACEMENT

Test Desc.: Abdomen Impact
Component: Dummy #033

Test Date: 03-13-03
Speed: 14.8 fps, 4.50 M/s

Ymin = -.06 mm @ 0.0143 sec., Ymax = 47.11 mm @ 0.0404 sec.

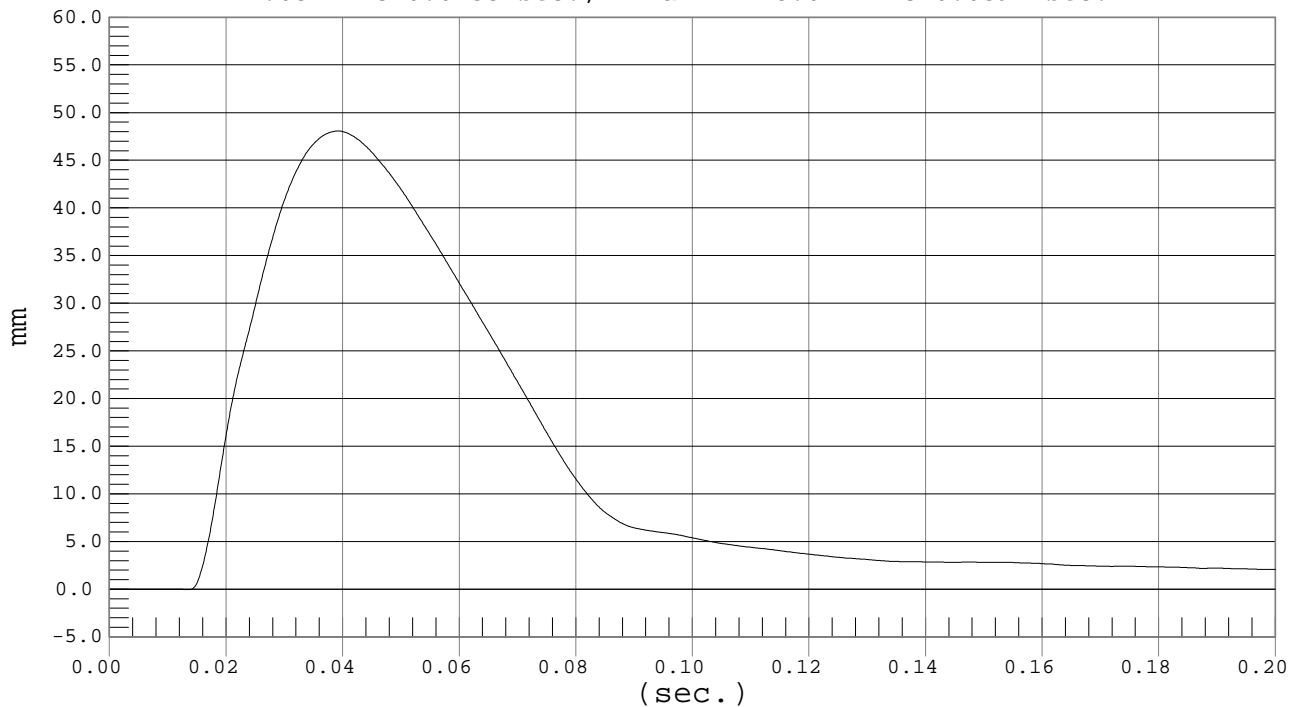


LOWER RIB DISPLACEMENT

Test Desc.: Abdomen Impact
Component: Dummy #033

Test Date: 03-13-03
Speed: 14.8 fps, 4.50 M/s

Ymin = -.05 mm @ 0.0135 sec., Ymax = 48.07 mm @ 0.0391 sec.



MGA RESEARCH CORPORATION
PELVIS IMPACT TEST
SID IIs DUMMY

Date: 3/13/03
Dummy Serial Number: 033
Test Number: D03299/D03319

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03299</u>	<u>D03319</u>
Temperature (°C)	20.8° – 22.2°	20.8	20.9
Humidity	10% - 70%	23	25
Impact Velocity	6.57 - 6.84 m/s	6.74	6.74
Probe Force	5.0 - 7.2 kN	5.6	5.7
Pelvis G's	46 - 60 g's	50	47

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

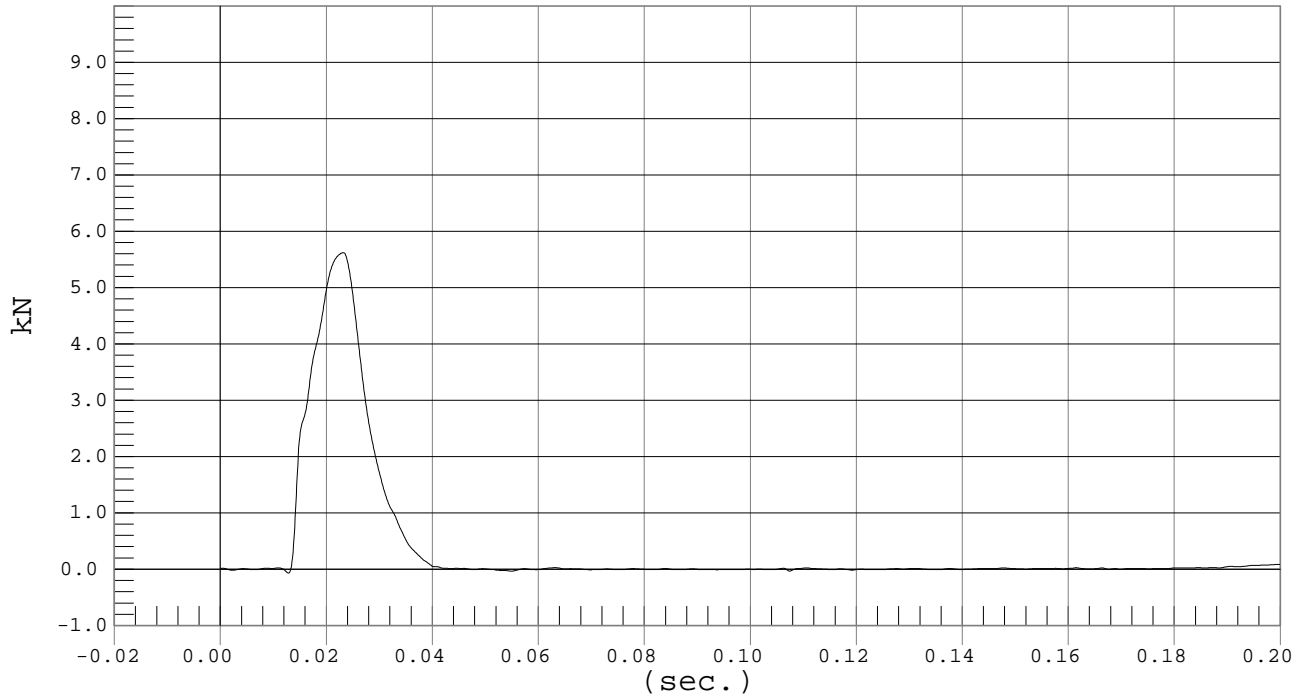


IMPACTOR FORCE

Test Desc.: Pelvis Impact
Component: Dummy #033

Test Date: 03-13-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -.07 kN @ 0.0127 sec., Ymax = 5.62 kN @ 0.0231 sec.

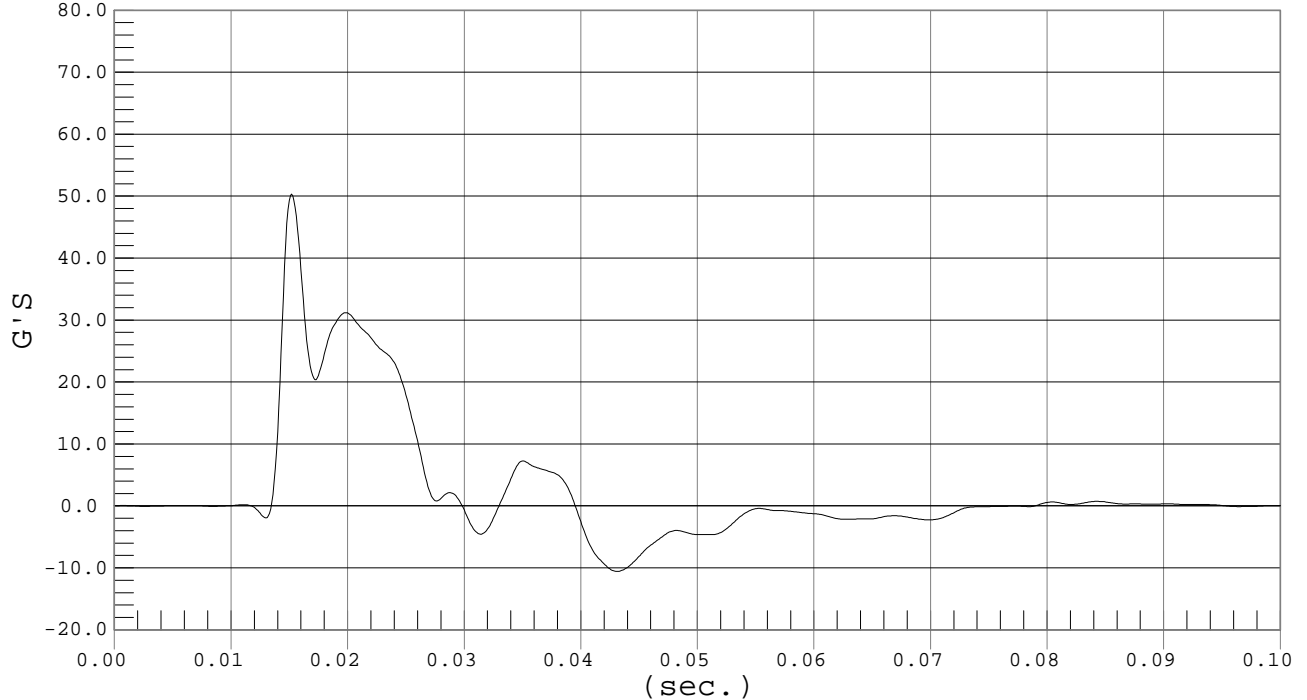


PELVIS ACCELERATION

Test Desc.: Pelvis Impact
Component: Dummy #033

Test Date: 03-13-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -10.58 G'S @ 0.0430 sec., Ymax = 50.32 G'S @ 0.0151 sec.



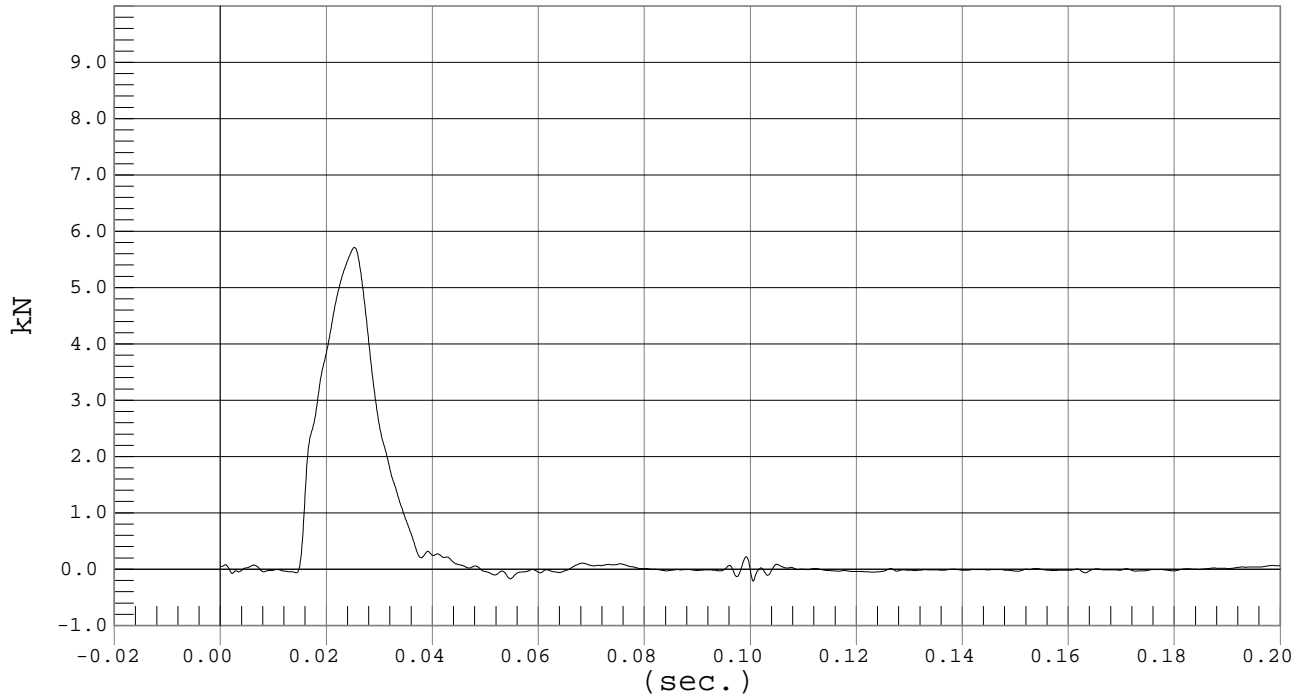


IMPACTOR FORCE

Test Desc.: Pelvis Impact
Component: Dummy #033

Test Date: 03-14-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -.21 kN @ 0.1004 sec., Ymax = 5.71 kN @ 0.0252 sec.

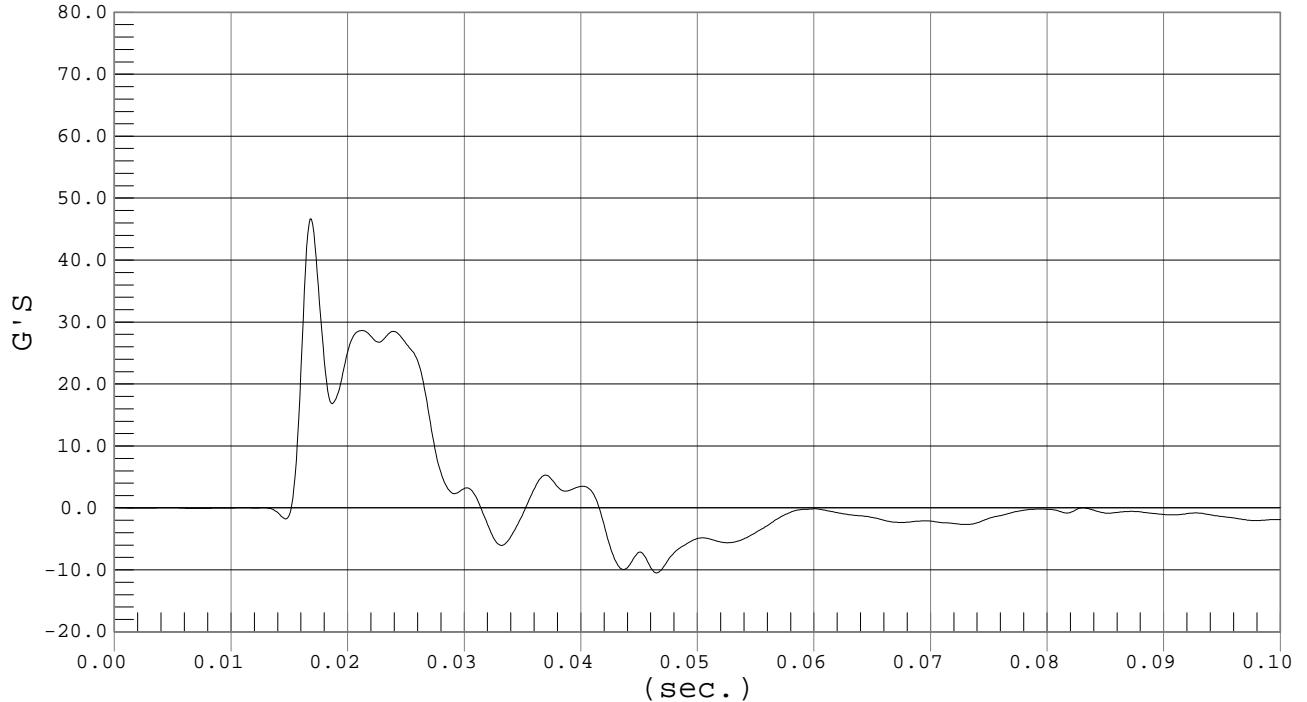


PELVIS ACCELERATION

Test Desc.: Pelvis Impact
Component: Dummy #033

Test Date: 03-14-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -10.5 G'S @ 0.0464 sec., Ymax = 46.65 G'S @ 0.0167 sec.



CERTIFICATION DATA

Dummy Serial Number: 020

Calibration Test Results Summary

Dummy Serial Number: 020

Post-Test Calibration

Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck did not pass all impact test requirements.
Shoulder Impact Test:	The shoulder passed all impact test requirements.
Thorax (with arm) Test:	The thorax did not pass all impact test requirements.
Thorax (without arm) Test:	The thorax did not pass all impact test requirements.
Abdomen Impact Test:	The abdomen did not pass all impact test requirements.
Pelvis Test:	The pelvis passed all impact test requirements.

MGA RESEARCH CORPORATION
 HEAD DROP TEST
 SID IIs DUMMY

Date: 4/3/03
 Dummy Serial Number: 020
 Test Number: D03361/D03371

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03361</u>	<u>D03371</u>
Temperature (°C)	18.9° – 25.6°	21.0	21.0
Humidity	10% - 70%	28	28
Resultant Accel	115 - 145 g's	123	125
Peak Longitudinal Accel	(-15) - (+15) g's	5	5

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

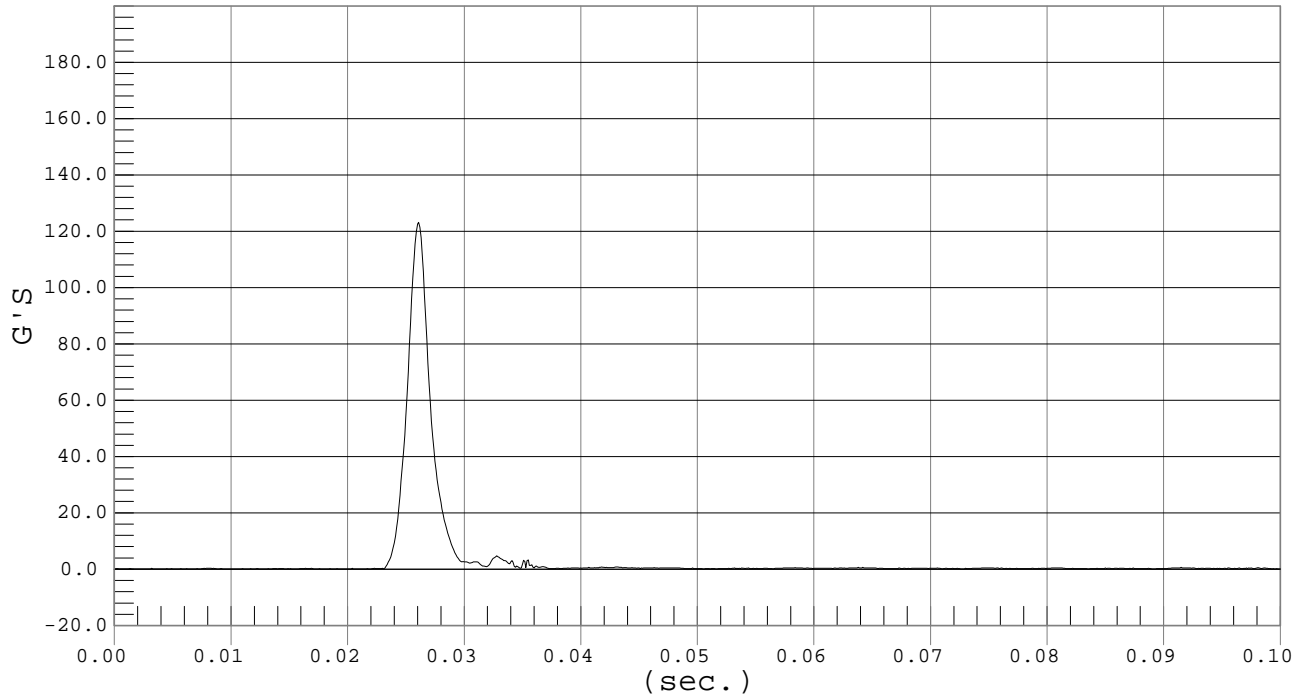


PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #020

Test Date: 04-03-03
Speed: 0.0 fps, 0.00 M/s

Ymin = .08 G'S @ 0.0015 sec., Ymax = 123.16 G'S @ 0.0260 sec.

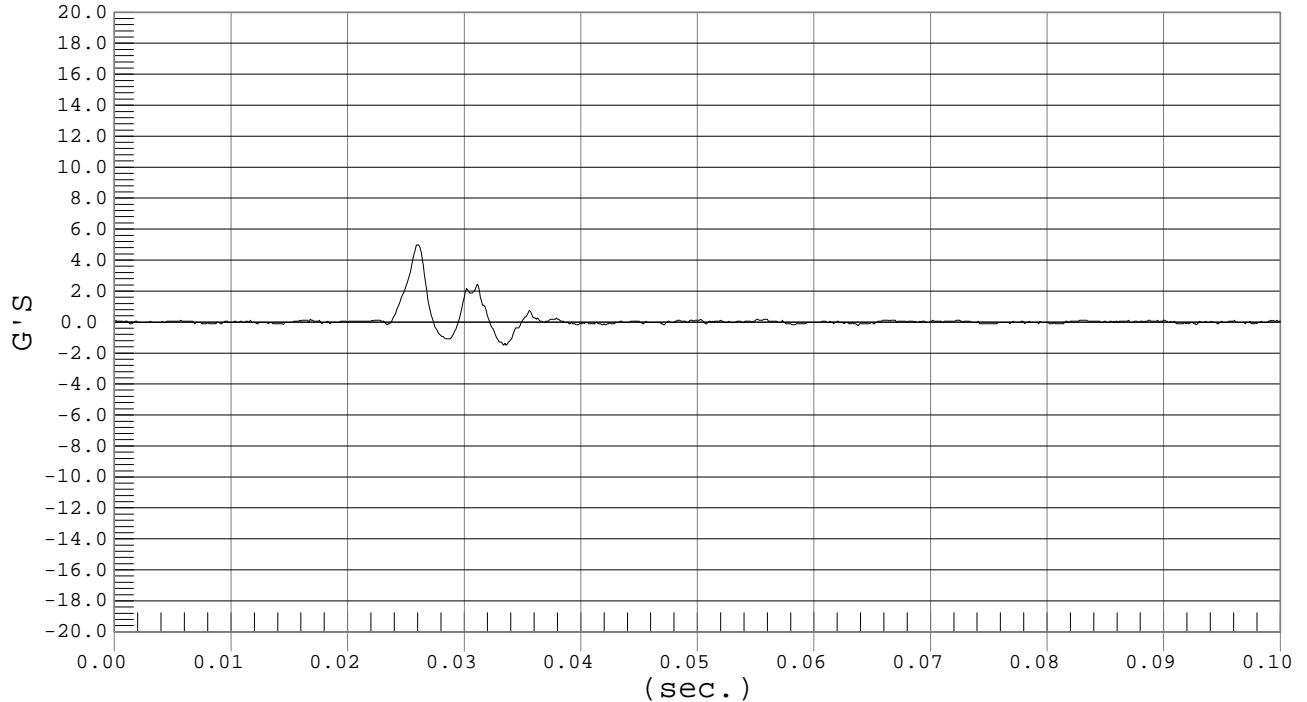


PEAK LONGITUDINAL ACCELARATION

Test Desc.: Head Drop
Component: Dummy #020

Test Date: 04-03-03
Speed: 0.0 fps, 0.00 M/s

Ymin = -1.5 G'S @ 0.0333 sec., Ymax = 4.97 G'S @ 0.0258 sec.



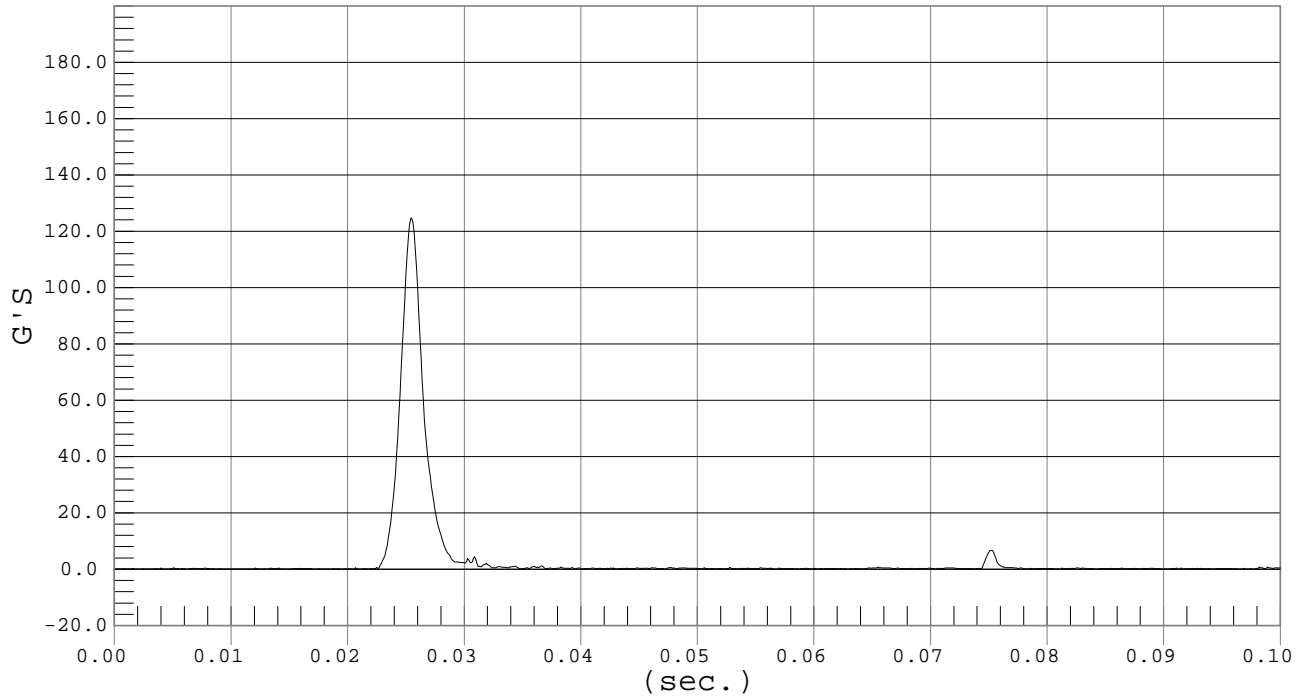


PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #020

Test Date: 04-03-03
Speed: 0.0 fps, 0.00 M/s

Ymin = .06 G'S @ 0.0000 sec., Ymax = 124.78 G'S @ 0.0254 sec.

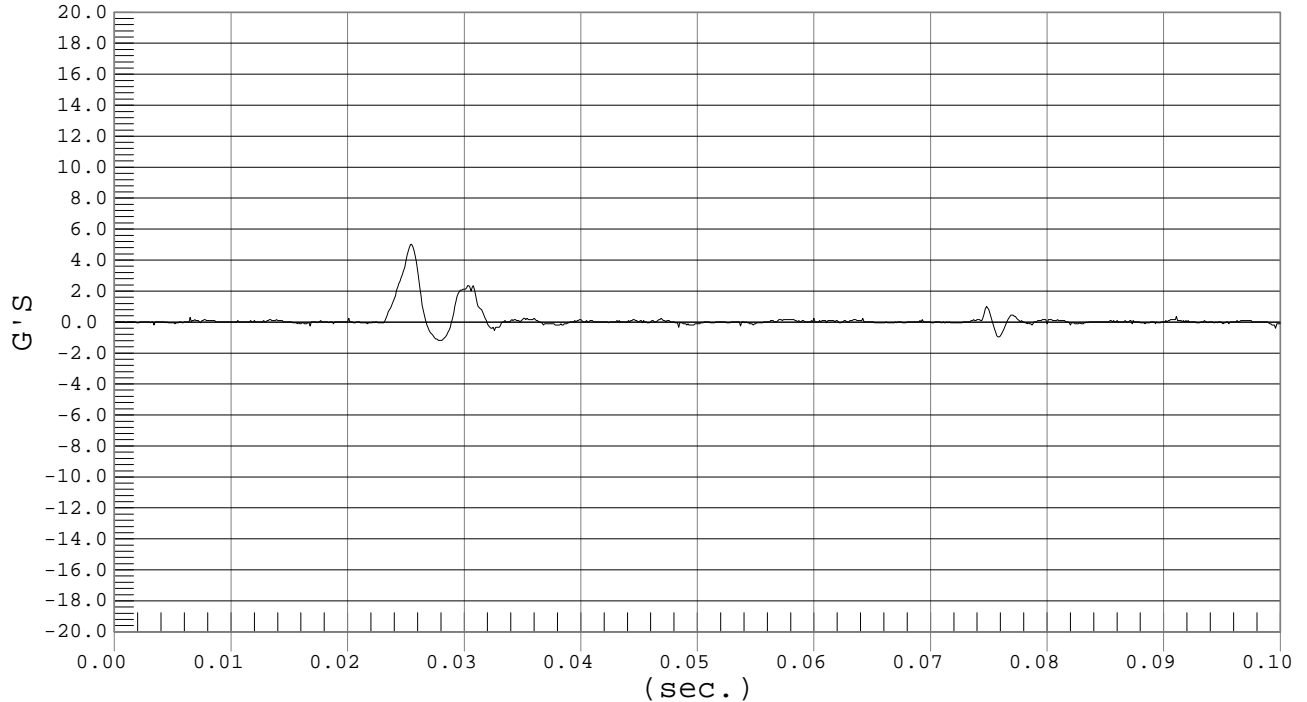


PEAK LONGITUDINAL ACCELERATION

Test Desc.: Head Drop
Component: Dummy #020

Test Date: 04-03-03
Speed: 0.0 fps, 0.00 M/s

Ymin = -2.51 G'S @ 0.1460 sec., Ymax = 5.02 G'S @ 0.0253 sec.



MGA RESEARCH CORPORATION
LATERAL NECK PENDULUM TEST
SID IIs DUMMY

Date: 3/20/03
 Dummy Serial Number: 020
 Test Number: D03362/ D03372

TEST PARAMETER		SPECIFICATION	TEST RESULTS	
			<u>D03362</u>	<u>D03372</u>
Temperature (°C)		20.8° – 22.2°	21.4	21.6
Humidity		10% - 70%	27	25
Impact Velocity (m/s)		5.51-5.63	5.59	5.60
Delta Velocity (m/s)	10 ms	2.10-2.70	2.41	2.31
	15 ms	3.00-3.80	3.56	3.47
	20 ms	4.20-5.20	4.78	4.74
	25-60 ms	5.00-6.40	5.70	5.68
Peak D-Plane Rotation (deg)		72-82	73	76
Decay Time of D-Plane Rotation Peak to Zero Degree (ms)		60-83	65	67
Peak Occipital Condyle Moment (Nm)		(-43) – (-36)	-46*	-46*
Time at 10 or -10 Nm after Peak Moment (ms)		90 – 98	90	90
Time of last Moment Peak to Max Rotation (ms)		<14	2	11
Front Pot Peak Rotation (deg)		59 – 72	59	63
Time of Front Pot Peak Rotation (ms)		61 – 73	63	64
Rear Pot Peak Rotation (deg)		47 – 56	49	50
Time of Rear Pot Peak Rotation (ms)		62 – 73	61*	60*

* TEST DOES NOT MEET SPECIFICATIONS

Technician: _____

Approved By: _____

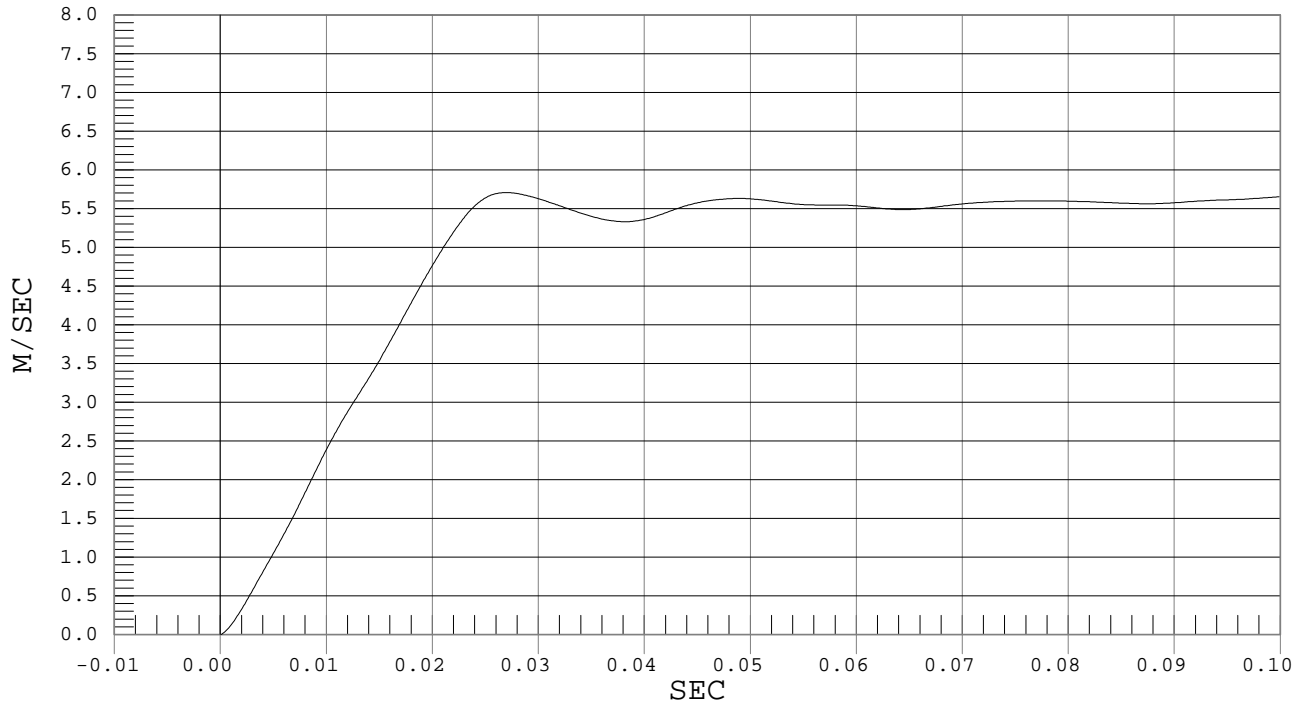


PENDULUM DECELERATION

Test Desc.: Neck Bending
Component: Dummy #020

Test Date: 03-20-03
Speed: 18.3 fps, 5.59 M/s

Ymin = 0 M/SEC @ 0.0000 SEC, Ymax = 6.92 M/SEC @ 0.1904 SEC

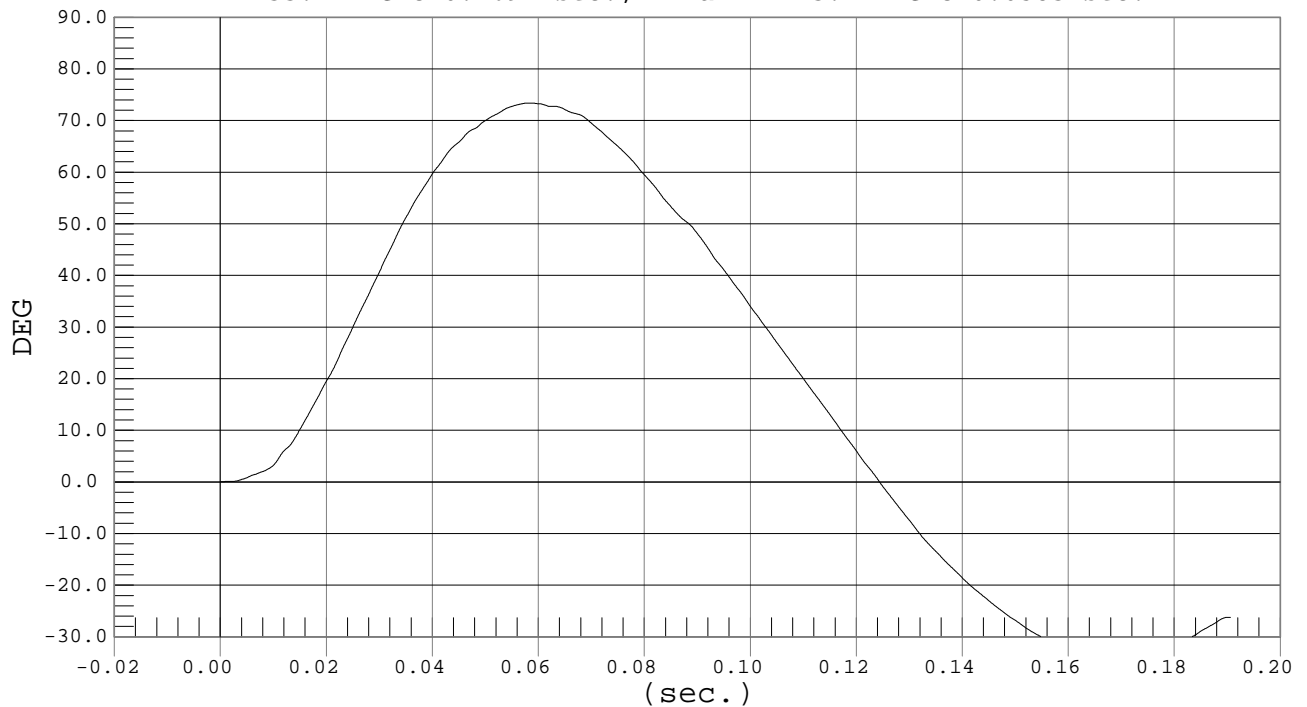


FLEXION ANGLE

Test Desc.: Neck Bending
Component: Dummy #020

Test Date: 03-20-03
Speed: 18.3 fps, 5.59 M/s

Ymin = -33.7 DEG @ 0.1691 sec., Ymax = 73.4 DEG @ 0.0583 sec.



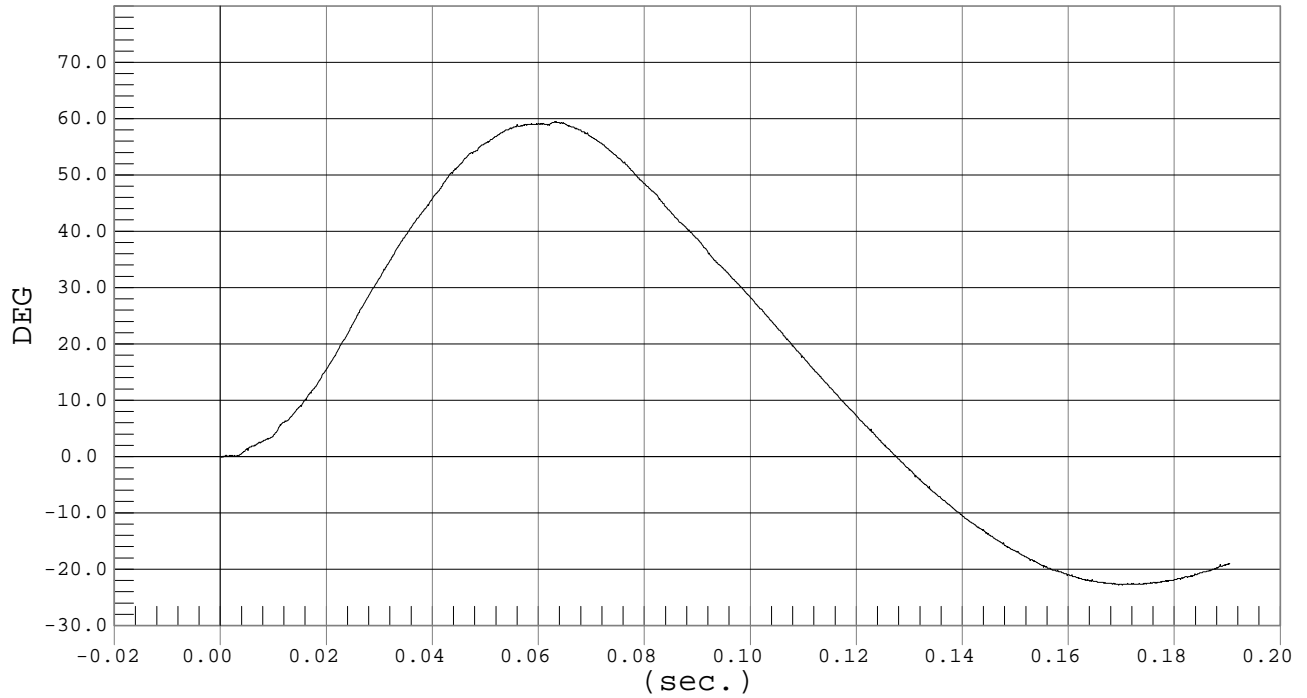


Test Desc.: Neck Bending
Component: Dummy #020

FRONT

Test Date: 03-20-03
Speed: 18.3 fps, 5.59 M/s

Ymin = -22.83 DEG @ 0.1694 sec., Ymax = 59.48 DEG @ 0.0630 sec.

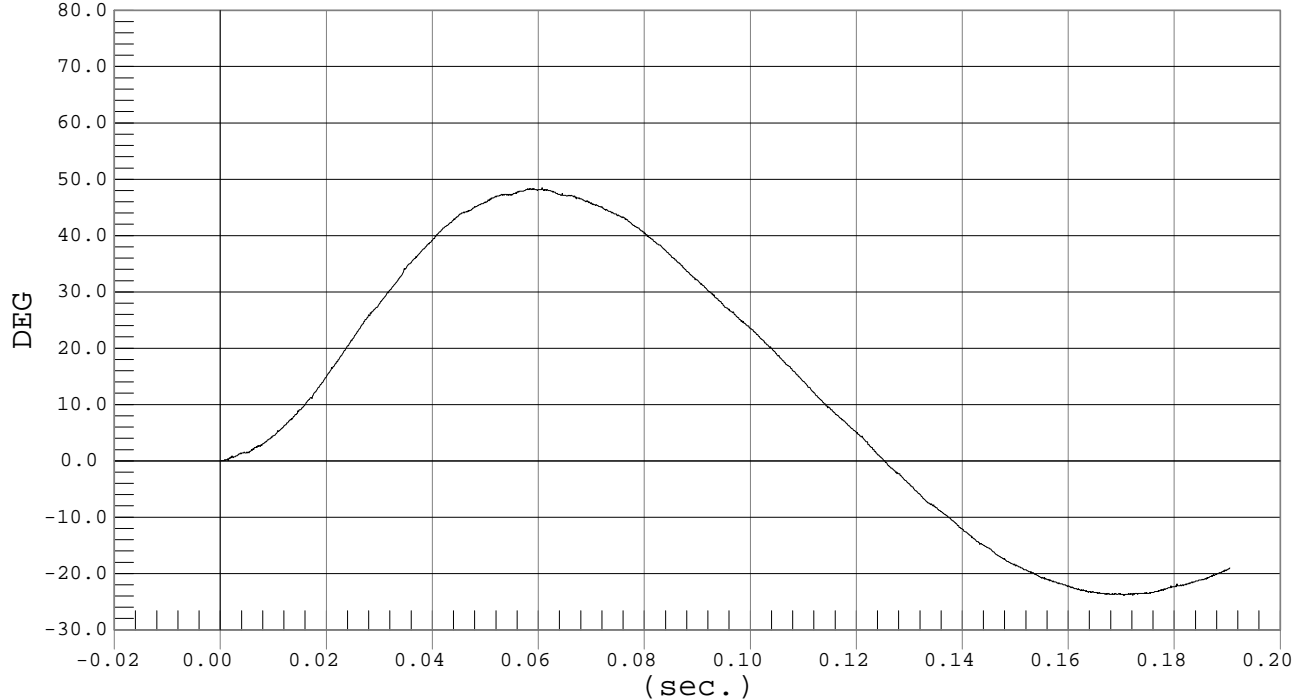


Test Desc.: Neck Bending
Component: Dummy #020

REAR

Test Date: 03-20-03
Speed: 18.3 fps, 5.59 M/s

Ymin = -23.86 DEG @ 0.1703 sec., Ymax = 48.51 DEG @ 0.0606 sec.



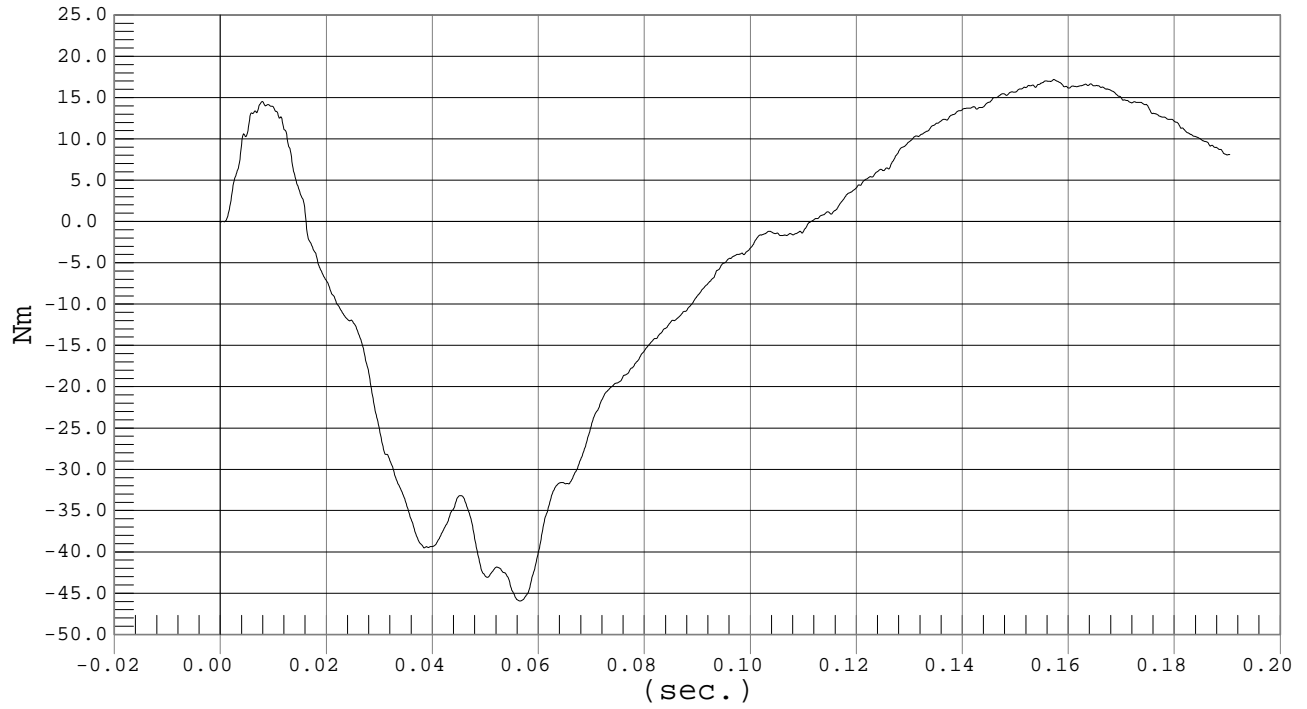


Test Desc.: Neck Bending
Component: Dummy #020

OCCIPITAL MOMENT

Test Date: 03-20-03
Speed: 18.3 fps, 5.59 M/s

Ymin = -45.95 Nm @ 0.0565 sec., Ymax = 17.19 Nm @ 0.1572 sec.



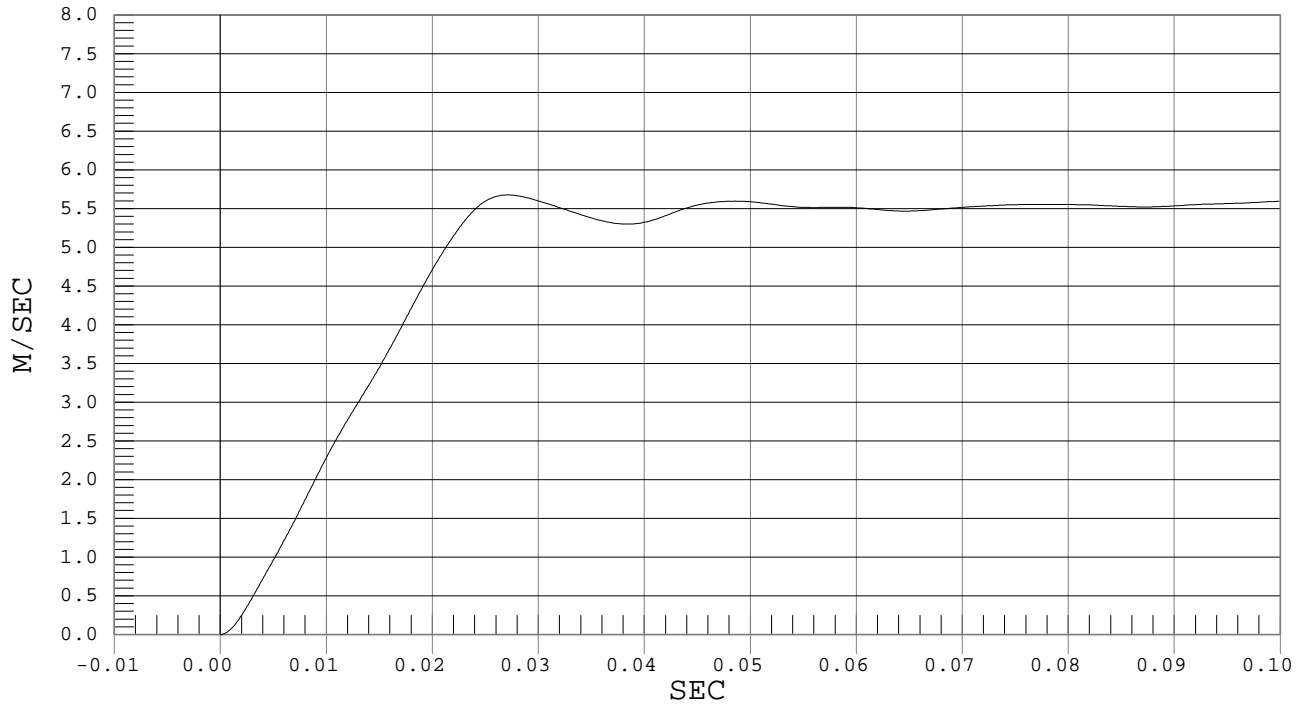


PENDULUM DECELERATION

Test Desc.: Neck Bending
Component: Dummy #020

Test Date: 03-20-03
Speed: 18.4 fps, 5.60 M/s

Ymin = 0 M/SEC @ 0.0000 SEC, Ymax = 6.8 M/SEC @ 0.1906 SEC

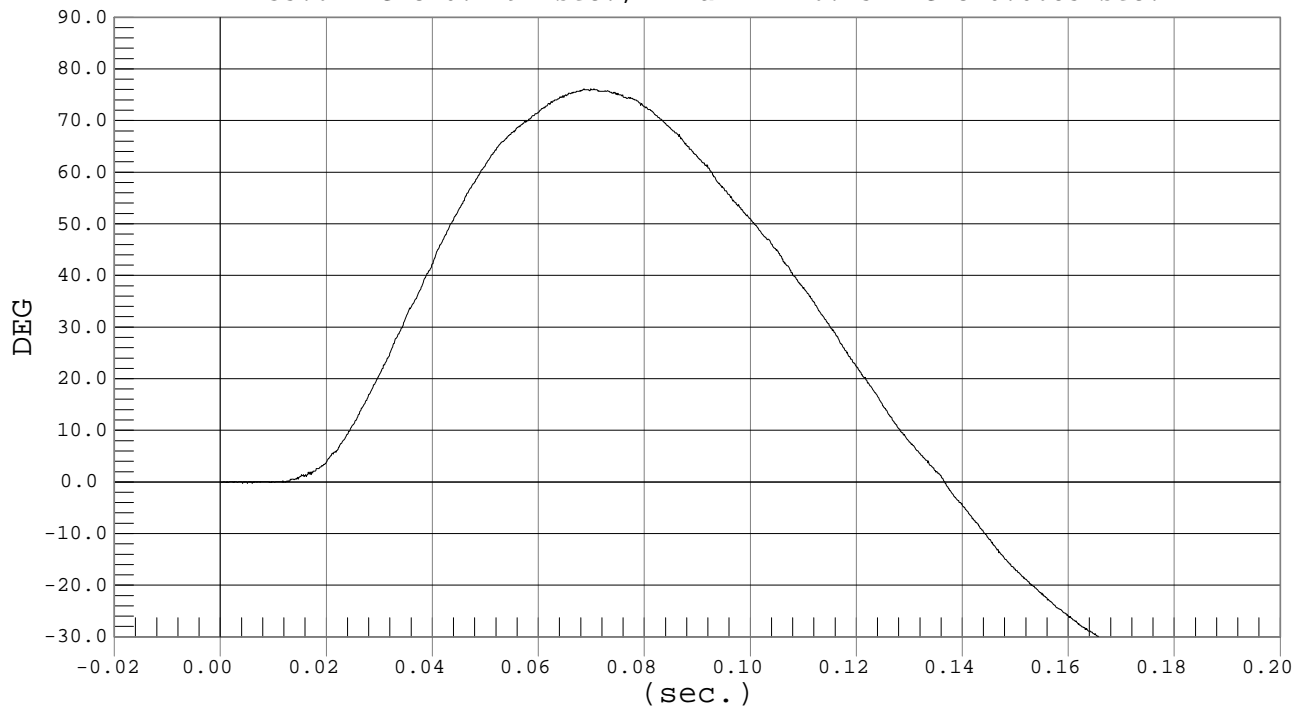


FLEXION ANGLE

Test Desc.: Neck Bending
Component: Dummy #020

Test Date: 03-20-03
Speed: 18.4 fps, 5.60 M/s

Ymin = -35.6 DEG @ 0.1792 sec., Ymax = 76.15 DEG @ 0.0685 sec.



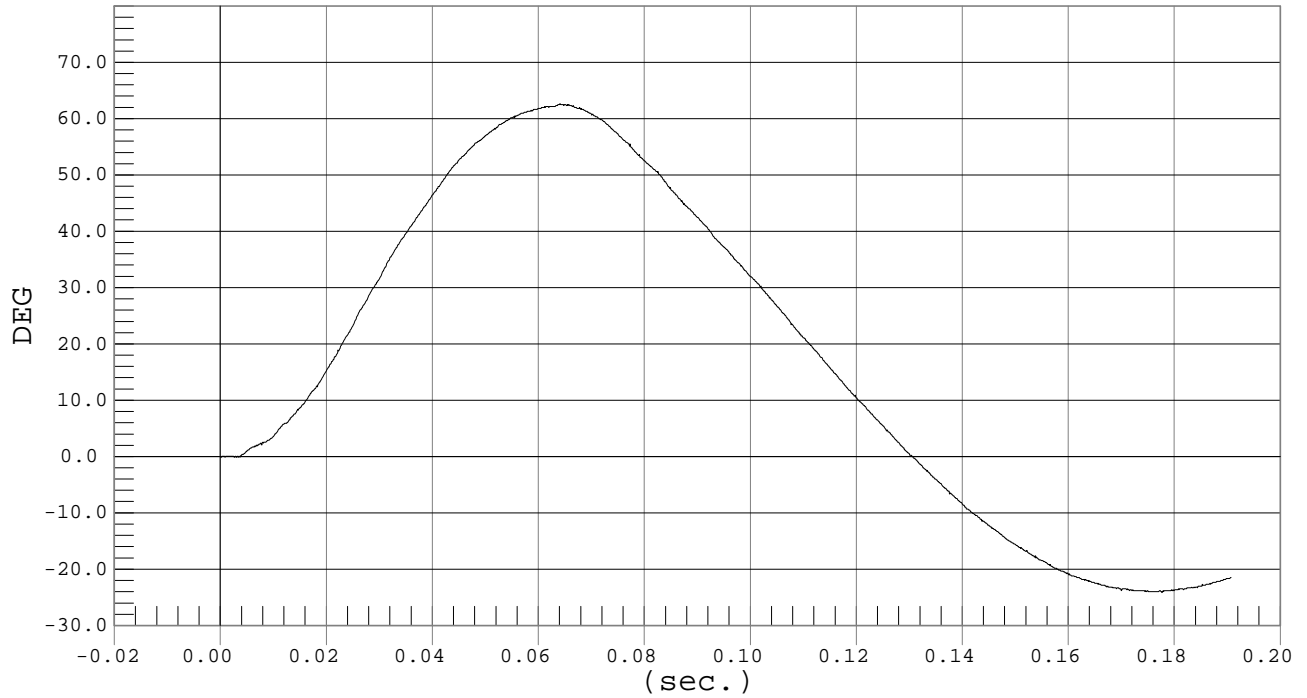


Test Desc.: Neck Bending
Component: Dummy #020

FRONT

Test Date: 03-20-03
Speed: 18.4 fps, 5.60 M/s

Ymin = -24.17 DEG @ 0.1776 sec., Ymax = 62.65 DEG @ 0.0640 sec.

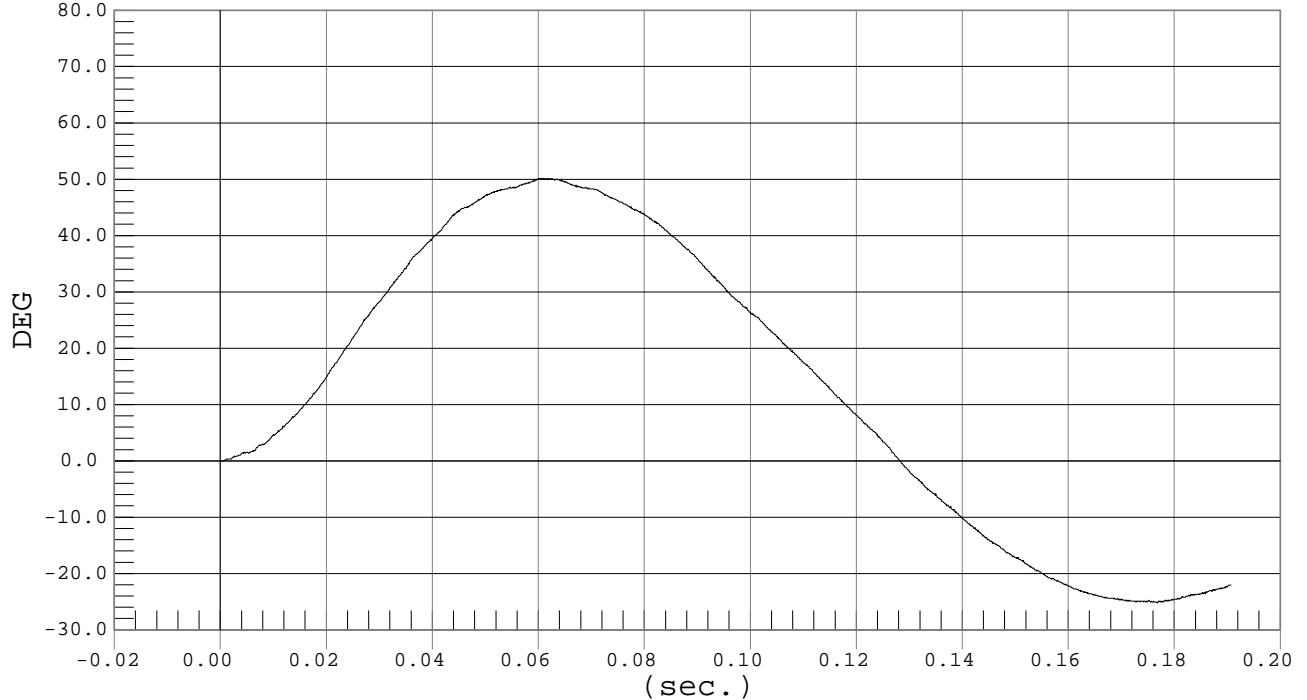


Test Desc.: Neck Bending
Component: Dummy #020

REAR

Test Date: 03-20-03
Speed: 18.4 fps, 5.60 M/s

Ymin = -25.23 DEG @ 0.1767 sec., Ymax = 50.15 DEG @ 0.0599 sec.



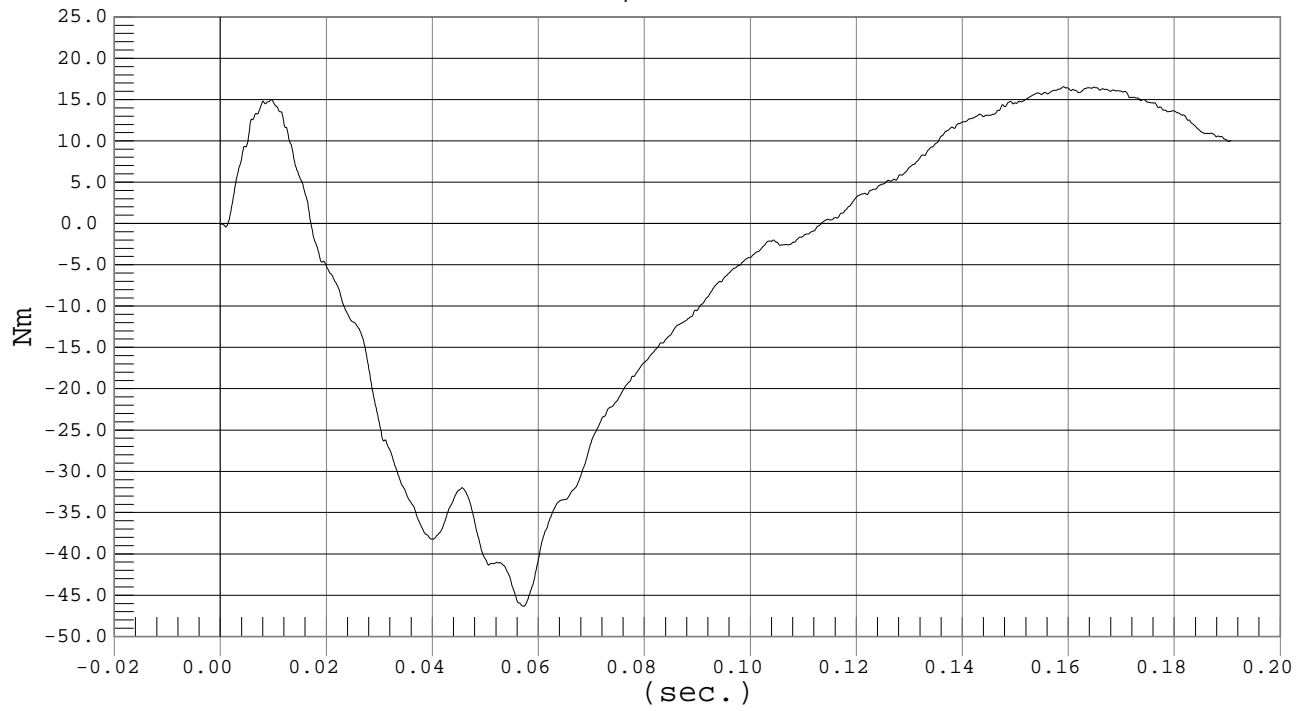


Test Desc.: Neck Bending
Component: Dummy #020

OCCIPITAL MOMENT

Test Date: 03-20-03
Speed: 18.4 fps, 5.60 M/s

Ymin = -46.34 Nm @ 0.0570 sec., Ymax = 16.56 Nm @ 0.1590 sec.



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
SID IIs DUMMY

Date: 4/2/03
Dummy Serial Number: 020
Test Number: D03363/D03373

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03363</u>	<u>D03373</u>
Temperature (°C)	20.8° – 22.2°	21.3	21.3
Humidity	10% - 70%	30	30
Impact Velocity	4.41 - 4.59 m/s	4.49	4.50
Probe Force	1.6 - 2.4 kN	2.3	2.3
Shoulder Displacement	27-39 mm	31	30

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

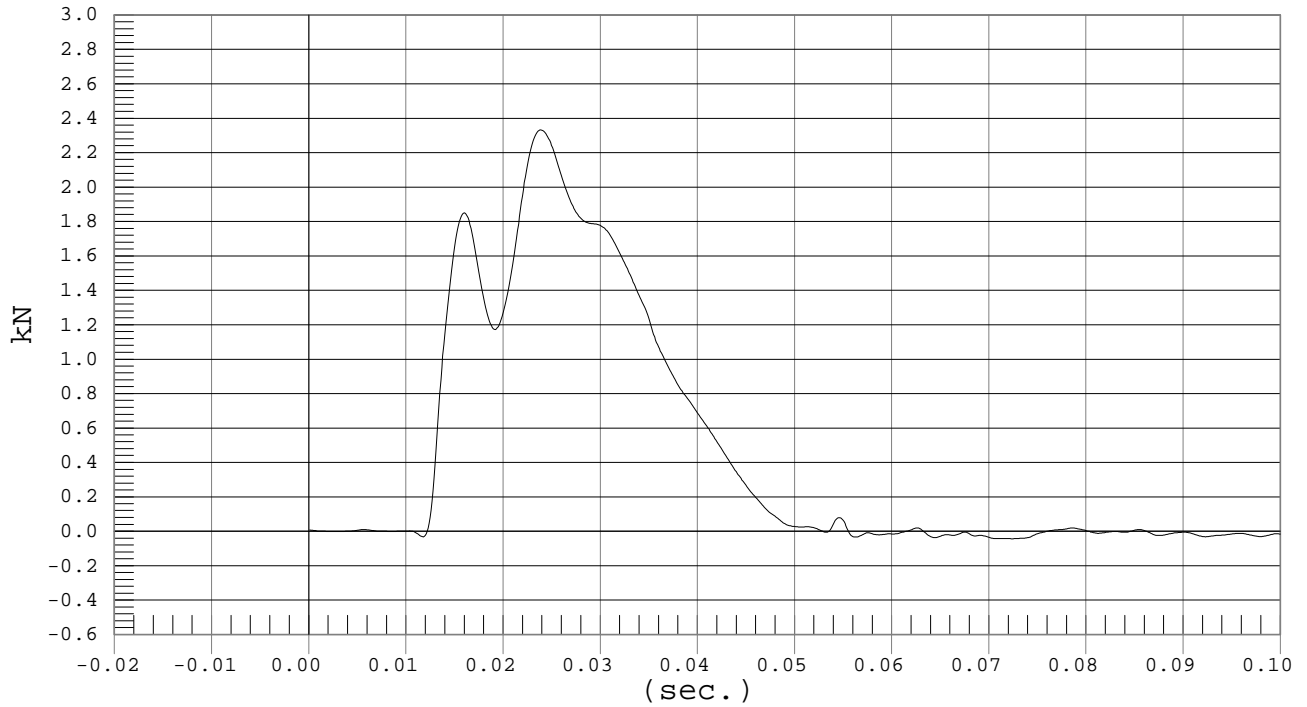


PROBE FORCE

Test Desc.: Shoulder Impact
Component: Dummy #020

Test Date: 04-02-03
Speed: 14.7 fps, 4.49 M/s

Ymin = -.04 kN @ 0.0723 sec., Ymax = 2.33 kN @ 0.0238 sec.

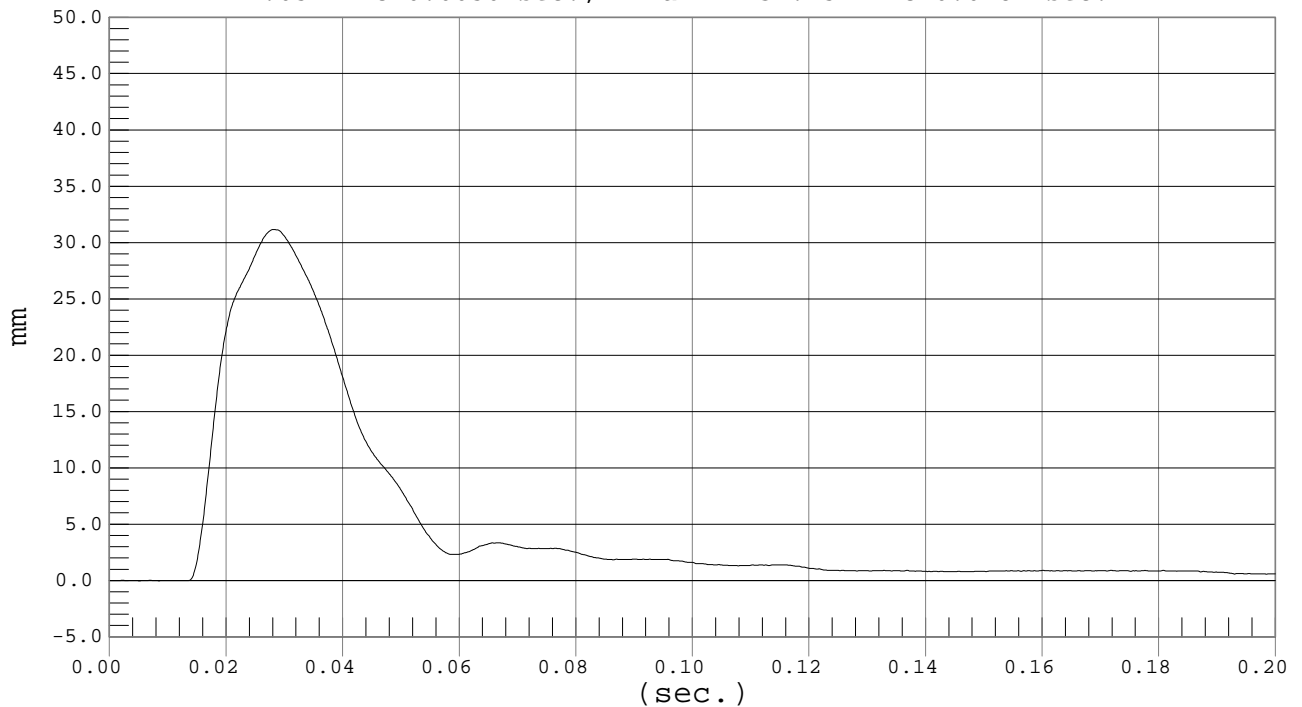


SHOULDER DISPLACEMENT

Test Desc.: Shoulder Impact
Component: Dummy #020

Test Date: 04-02-03
Speed: 14.7 fps, 4.49 M/s

Ymin = -.05 mm @ 0.0050 sec., Ymax = 31.15 mm @ 0.0281 sec.



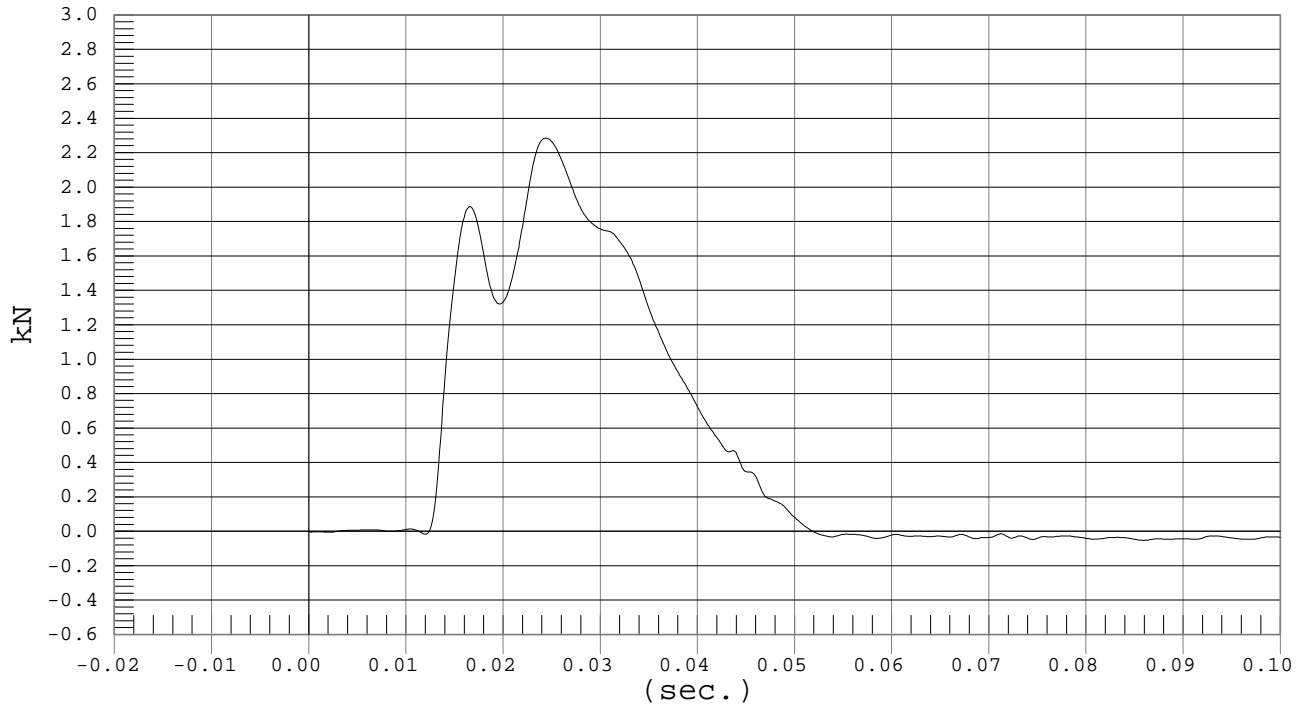


PROBE FORCE

Test Desc.: Shoulder Impact
Component: Dummy #020

Test Date: 04-02-03
Speed: 14.7 fps, 4.50 M/s

Ymin = -.06 kN @ 0.1433 sec., Ymax = 2.28 kN @ 0.0243 sec.

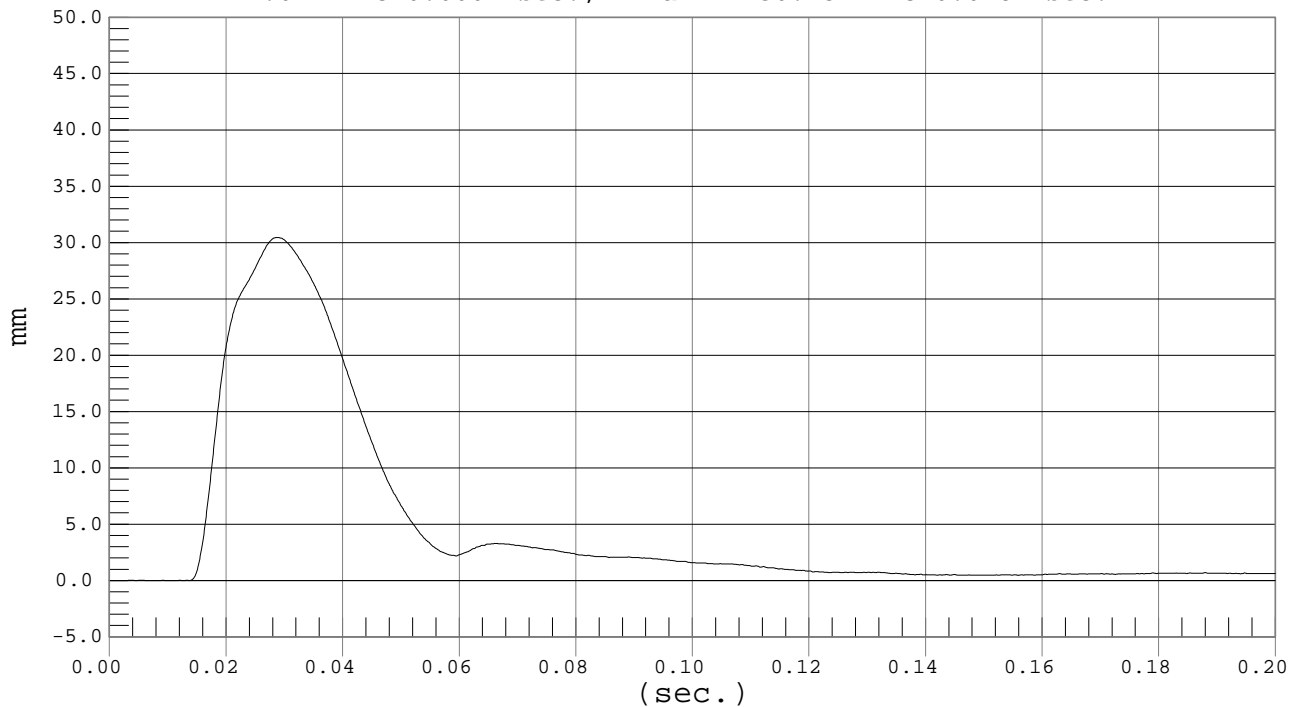


SHOULDER DISPLACEMENT

Test Desc.: Shoulder Impact
Component: Dummy #020

Test Date: 04-02-03
Speed: 14.7 fps, 4.50 M/s

Ymin = -.02 mm @ 0.0007 sec., Ymax = 30.45 mm @ 0.0287 sec.



MGA RESEARCH CORPORATION
 THORAX (WITH ARM) IMPACT TESTS
 SID IIs DUMMY

Date: 4/2/03
 Dummy Serial Number: 020
 Test Number: D03364/D03374

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03364</u>	<u>D03374</u>
Temperature (°C)	20.8° – 22.2°	21.4	21.3
Humidity	10% - 70%	30	30
Impact Velocity	6.57 - 6.84 m/s	6.74	6.72
Probe Force	4.1 – 4.7 kN	4.41	4.41
Upper Spine Acceleration	34 – 48 g's	43	45
Lower Spine Acceleration	31 - 36 g's	29*	29
Upper Rib Displacement	23 - 35 mm	27	29
Middle Rib Displacement	29 - 44 mm	35	36
Lower Rib Displacement	33 - 40 mm	42*	41*
Shoulder Displacement	30 - 42 mm	27*	28*

* TEST DOES NOT MEET SPECIFICATIONS

Technician: _____

Approved By: _____

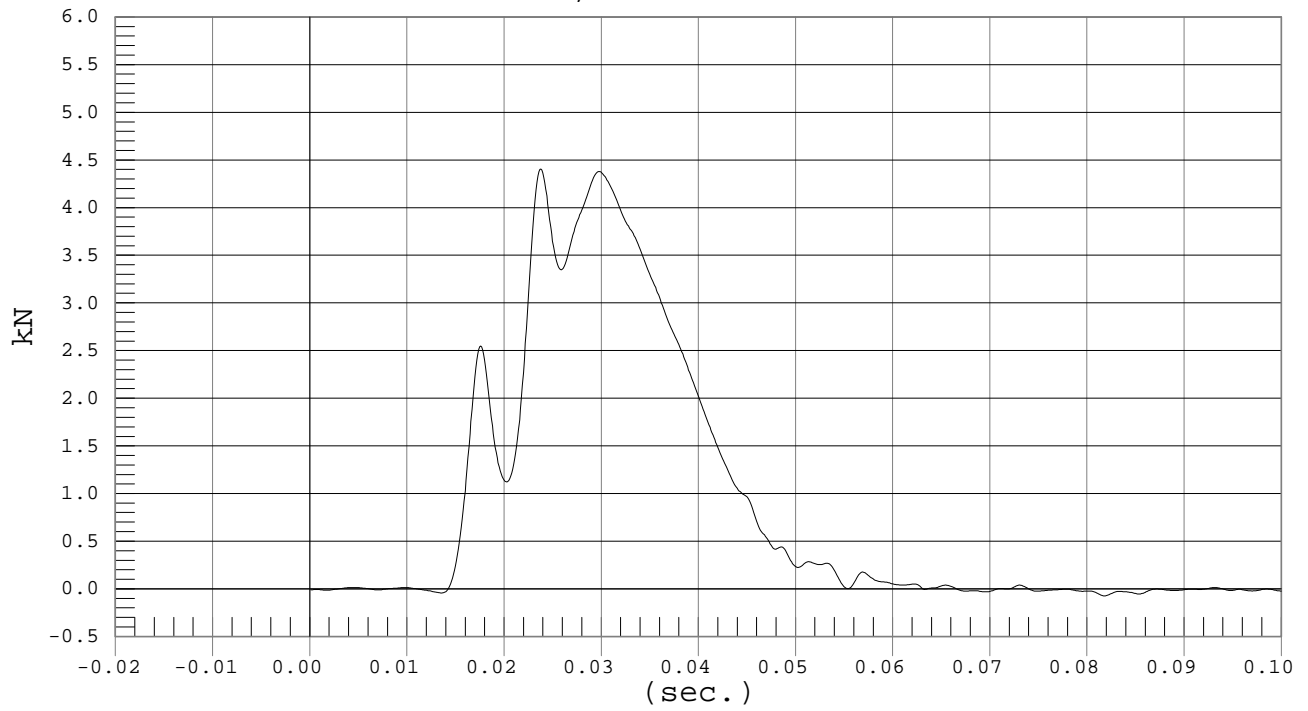


Test Desc.: Thorax With Arm
Component: Dummy #020

PROBE FORCE

Test Date: 04-02-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -.1 kN @ 0.1887 sec., Ymax = 4.41 kN @ 0.0237 sec.



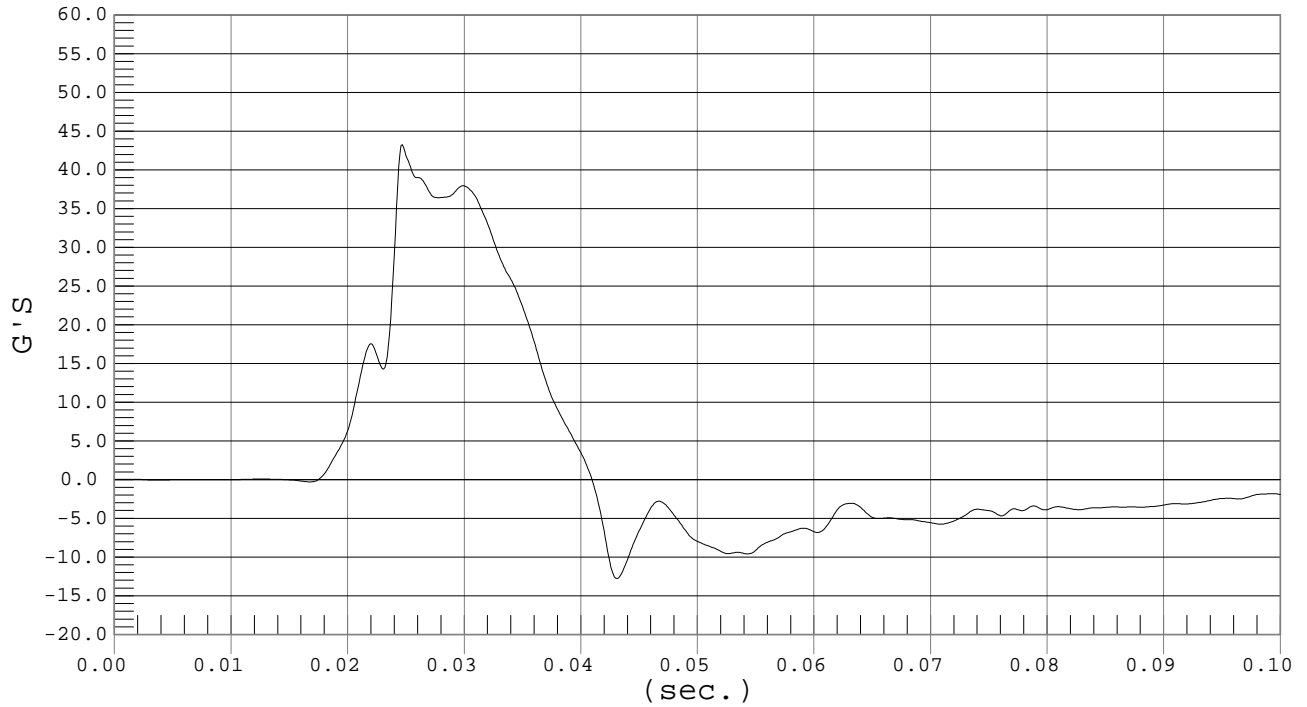


UPPER SPINE ACCELERATION

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

Test Date: 04-02-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -12.77 G'S @ 0.0430 sec., Ymax = 43.27 G'S @ 0.0246 sec.

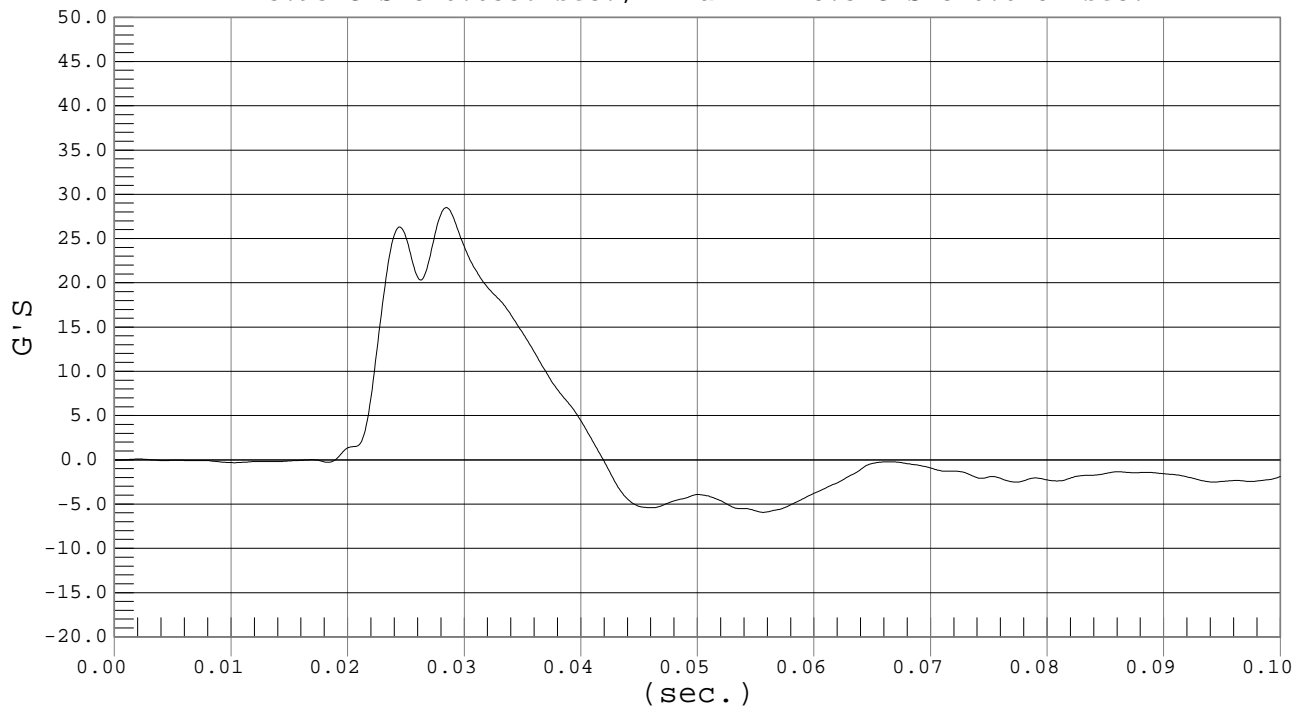


LOWER SPINE ACCELERATION

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

Test Date: 04-02-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -5.93 G'S @ 0.0556 sec., Ymax = 28.5 G'S @ 0.0284 sec.



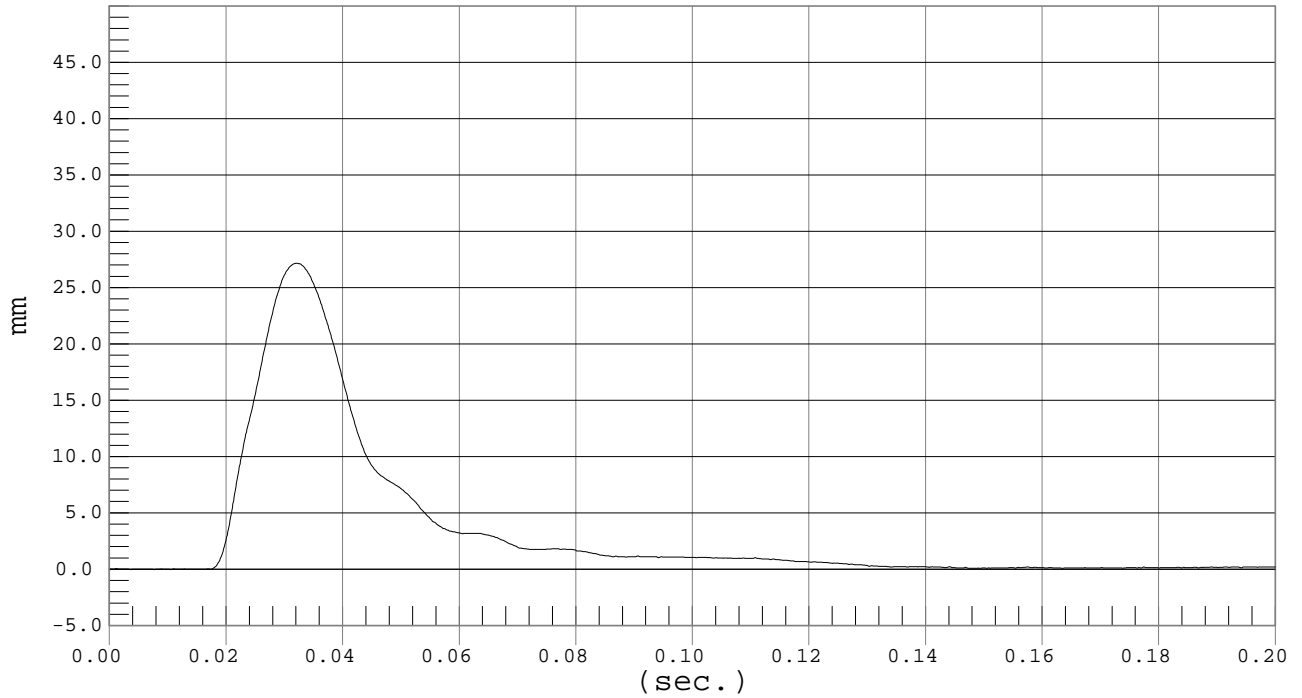


UPPER RIB DISPLACEMENT

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

Test Date: 04-02-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -.04 mm @ 0.0076 sec., Ymax = 27.16 mm @ 0.0320 sec.

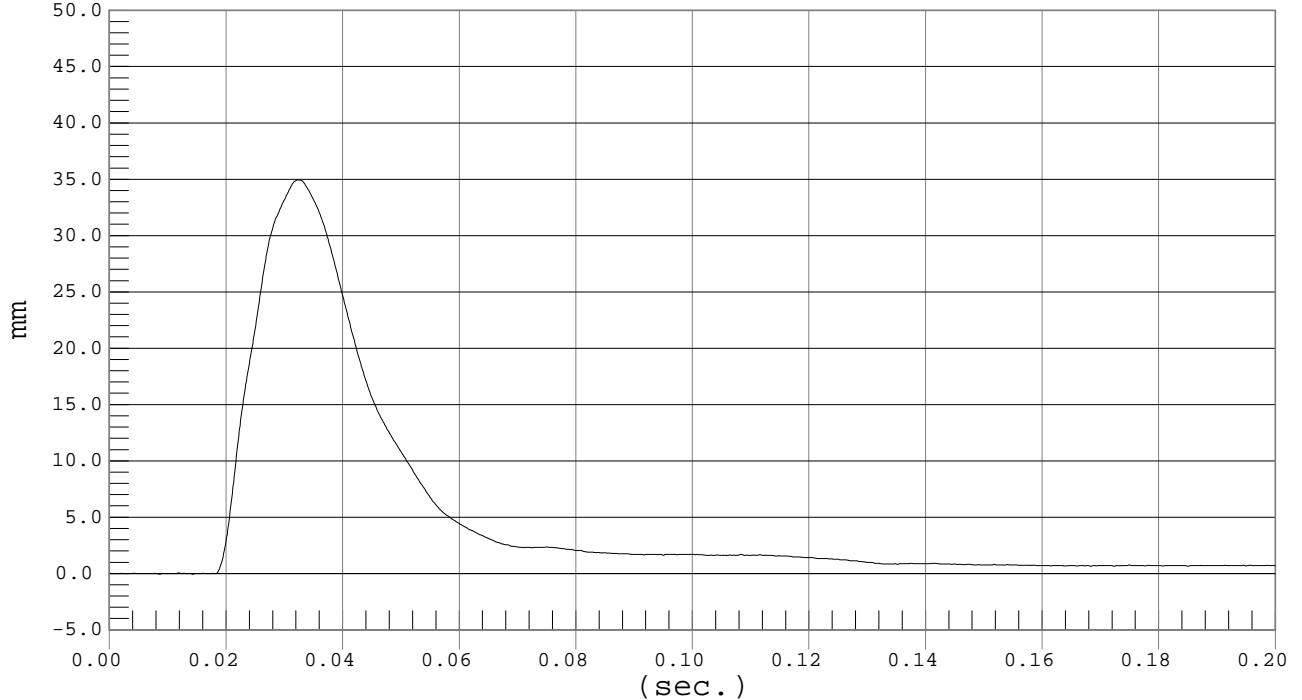


MIDDLE RIB DISPLACEMENT

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

Test Date: 04-02-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -.06 mm @ 0.0142 sec., Ymax = 34.93 mm @ 0.0325 sec.



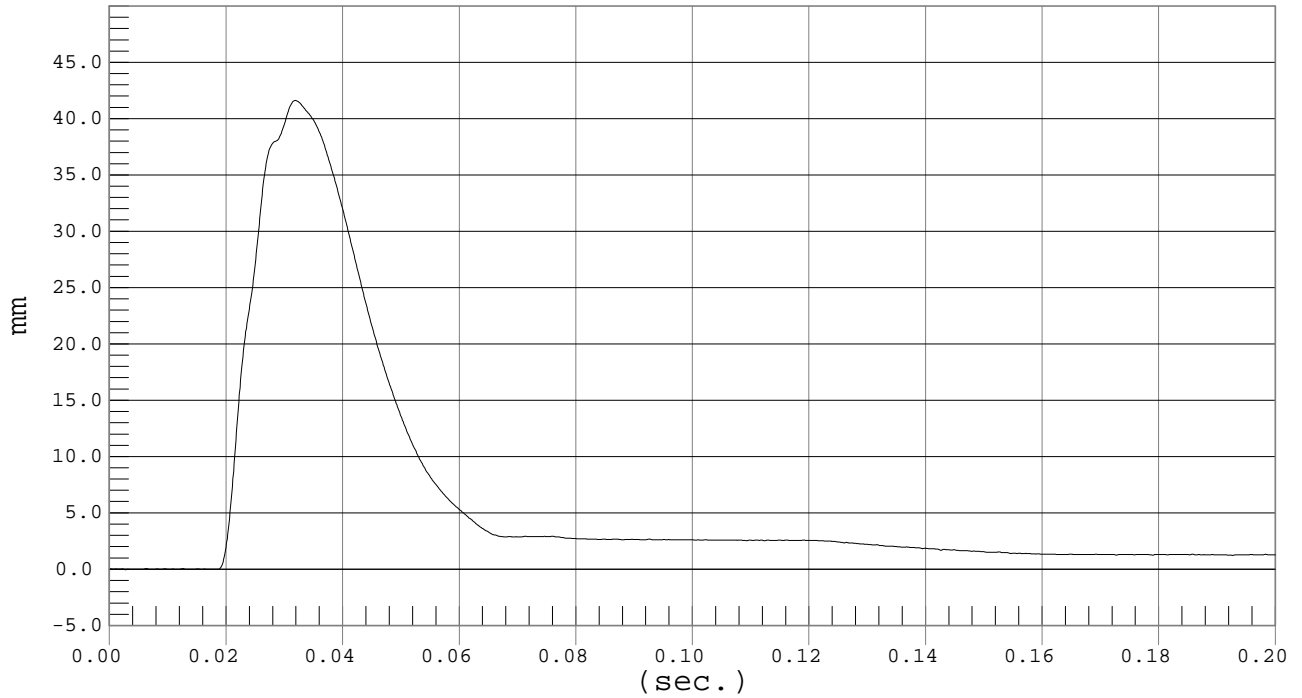


LOWER RIB DISPLACEMENT

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

Test Date: 04-02-03
Speed: 22.1 fps, 6.74 M/s

Ymin = $-.06$ mm @ 0.0027 sec., Ymax = 41.62 mm @ 0.0318 sec.

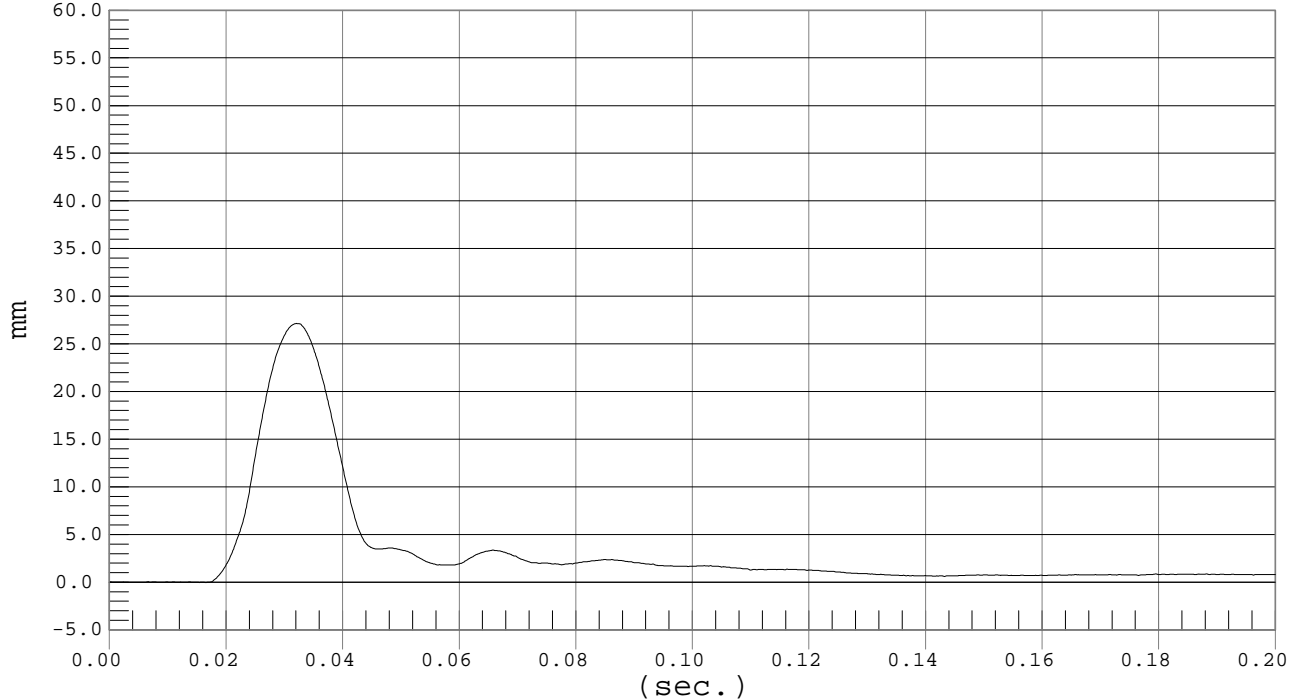


SHOULDER DISPLACEMENT

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

Test Date: 04-02-03
Speed: 22.1 fps, 6.74 M/s

Ymin = $-.05$ mm @ 0.0165 sec., Ymax = 27.14 mm @ 0.0320 sec.



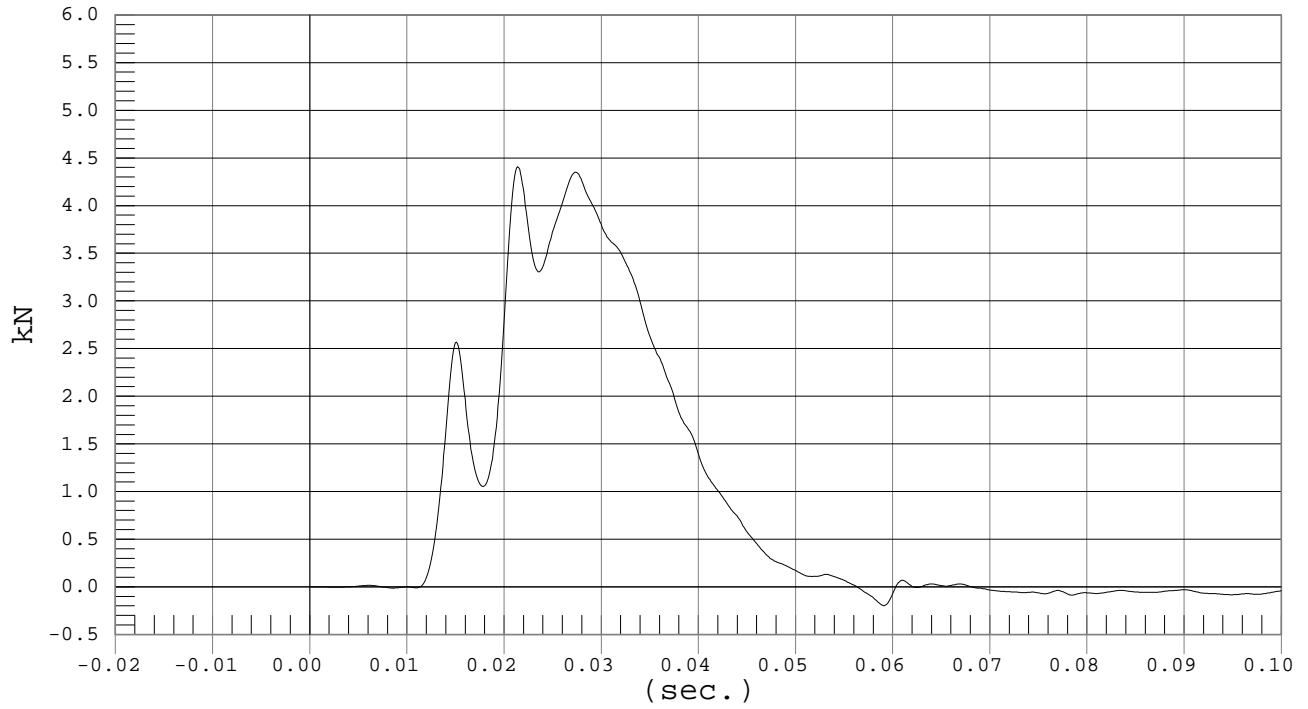


Test Desc.: Thorax With Arm
Component: Dummy #020

PROBE FORCE

Test Date: 04-02-03
Speed: 22.1 fps, 6.72 M/s

Ymin = -.2 kN @ 0.0590 sec., Ymax = 4.41 kN @ 0.0213 sec.



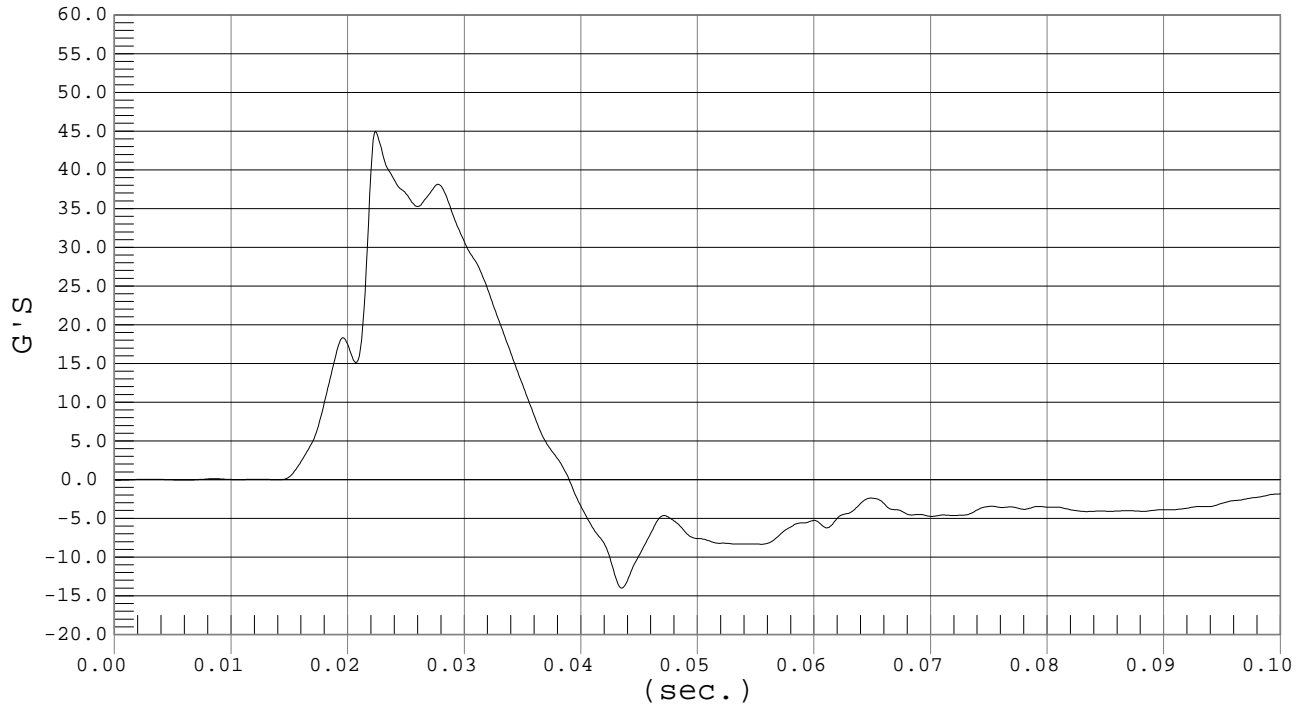


UPPER SPINE ACCELERATION

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

Test Date: 04-02-03
Speed: 22.1 fps, 6.72 M/s

Ymin = -14.01 G'S @ 0.0434 sec., Ymax = 45 G'S @ 0.0223 sec.

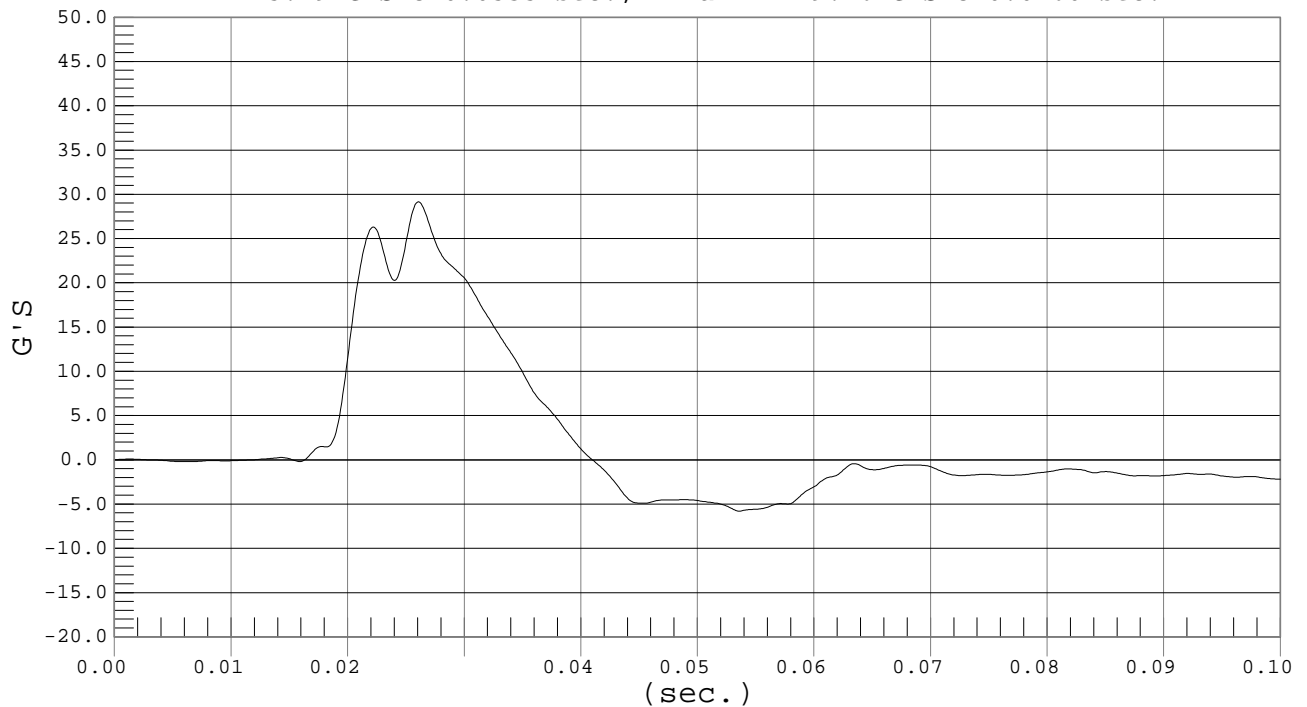


LOWER SPINE ACCELERATION

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

Test Date: 04-02-03
Speed: 22.1 fps, 6.72 M/s

Ymin = -5.79 G'S @ 0.0535 sec., Ymax = 29.16 G'S @ 0.0260 sec.



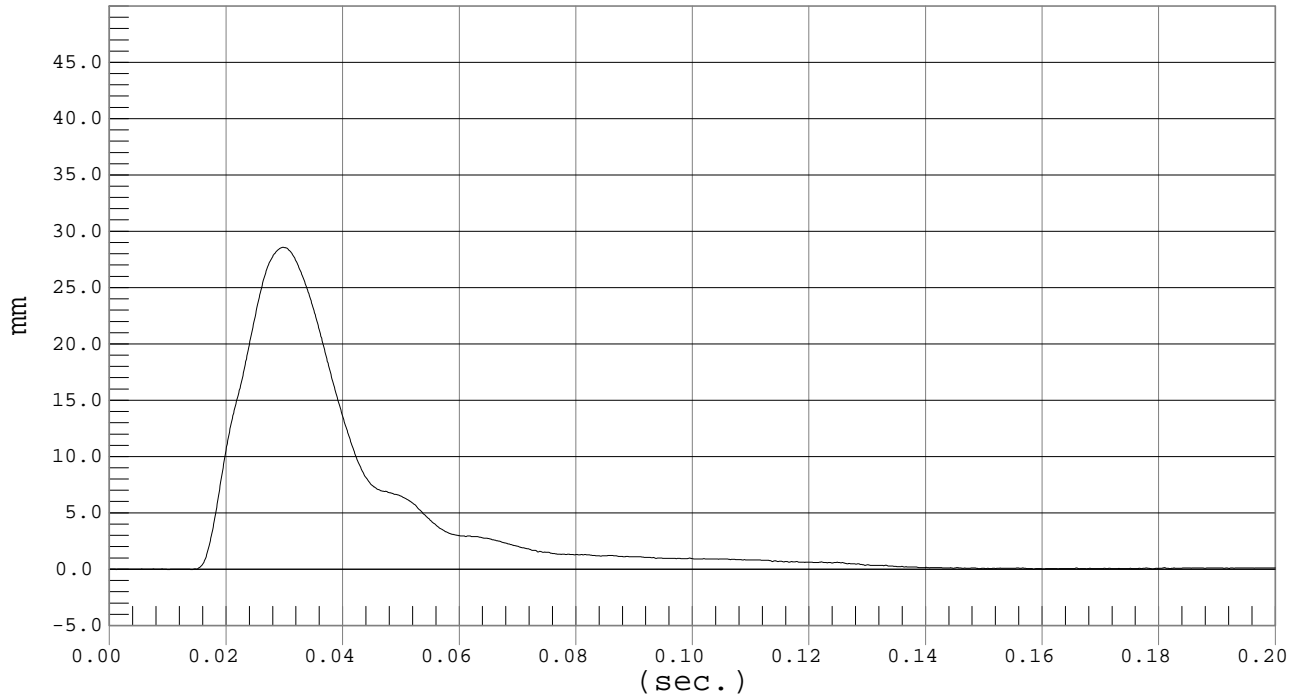


UPPER RIB DISPLACEMENT

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

Test Date: 04-02-03
Speed: 22.1 fps, 6.72 M/s

Ymin = -.05 mm @ 0.0100 sec., Ymax = 28.57 mm @ 0.0297 sec.

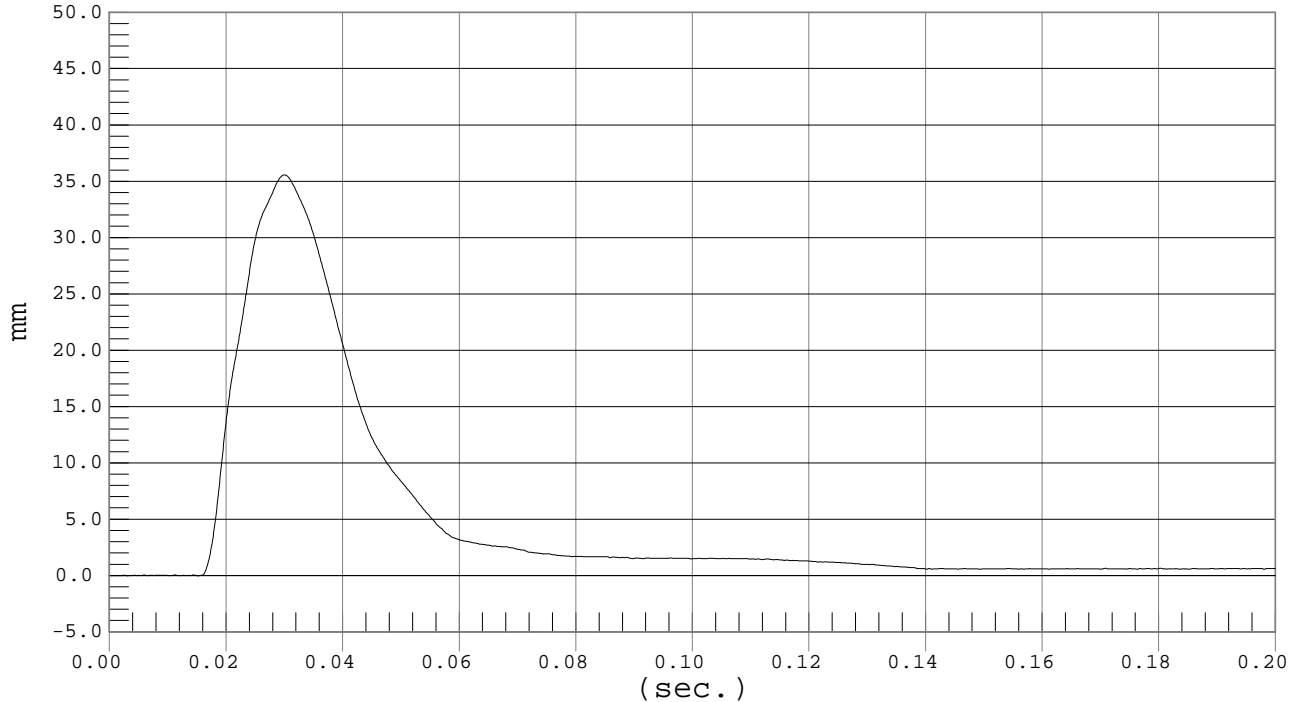


MIDDLE RIB DISPLACEMENT

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

Test Date: 04-02-03
Speed: 22.1 fps, 6.72 M/s

Ymin = -.04 mm @ 0.0151 sec., Ymax = 35.57 mm @ 0.0300 sec.



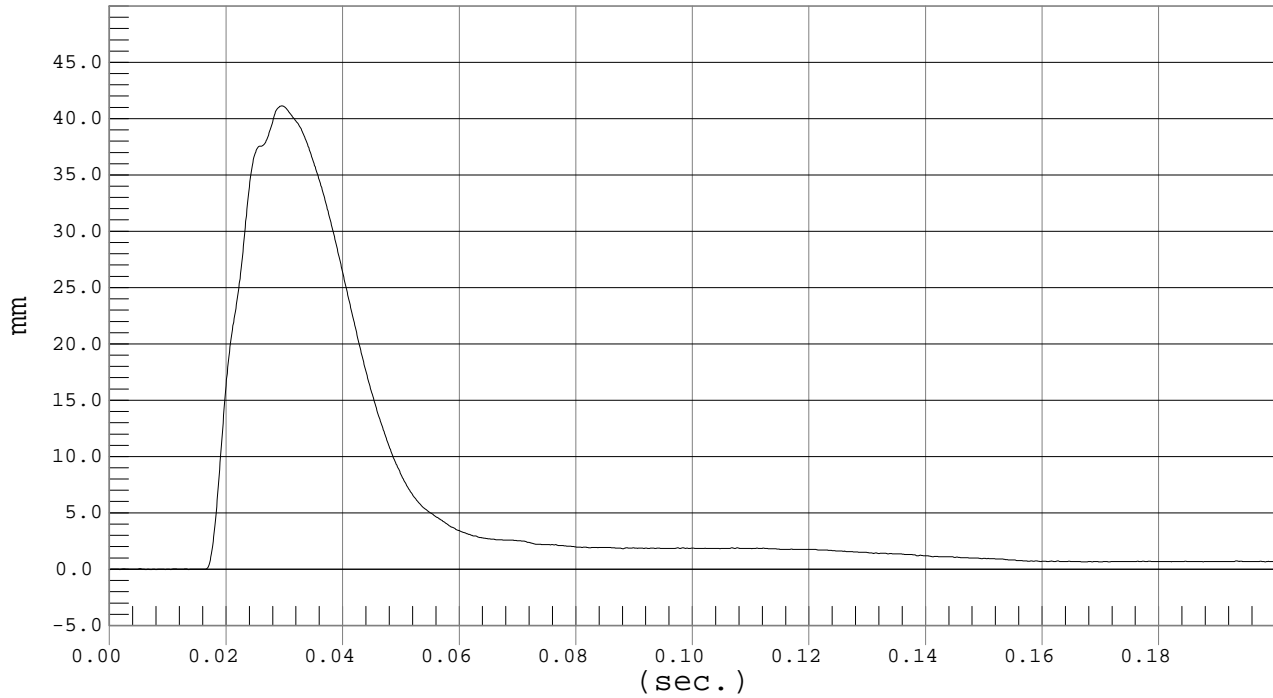


LOWER RIB DISPLACEMENT

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

Test Date: 04-02-03
Speed: 22.1 fps, 6.72 M/s

Ymin = -.04 mm @ 0.0070 sec., Ymax = 41.13 mm @ 0.0295 sec.

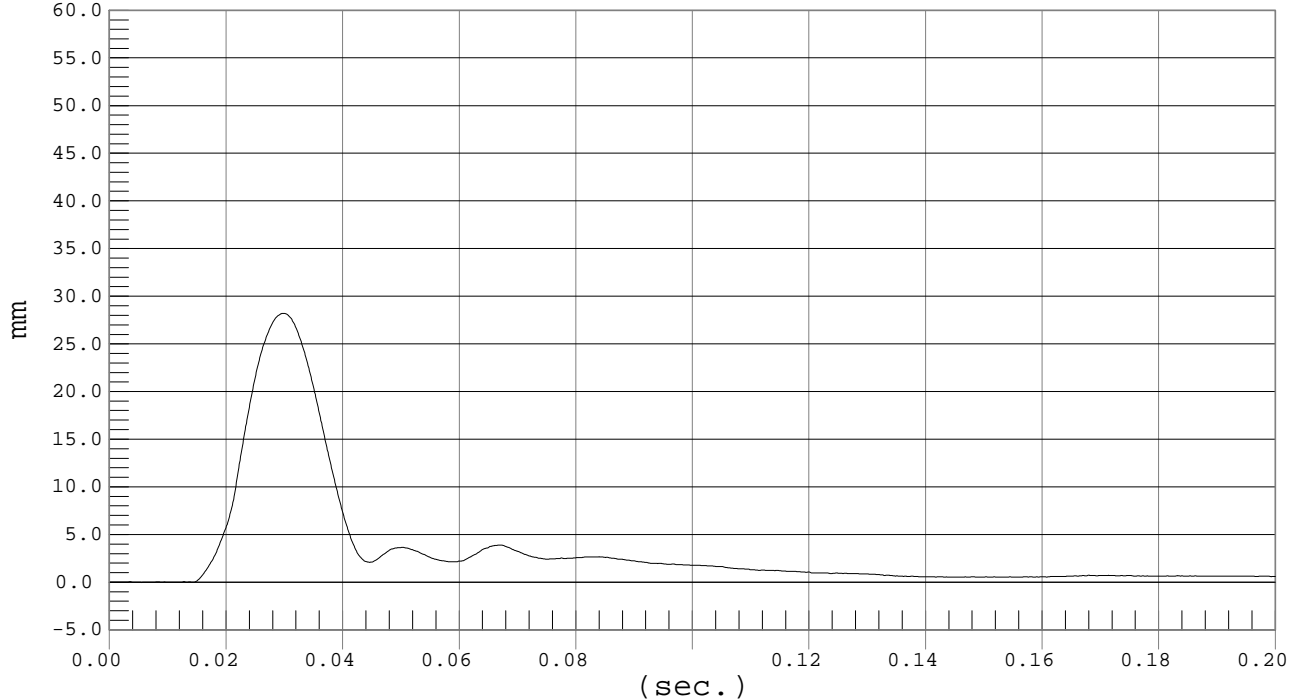


SHOULDER DISPLACEMENT

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

Test Date: 04-02-03
Speed: 22.1 fps, 6.72 M/s

Ymin = -.02 mm @ 0.0054 sec., Ymax = 28.19 mm @ 0.0296 sec.

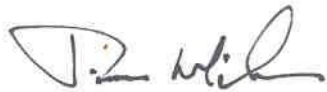


MGA RESEARCH CORPORATION
 THORAX (WITHOUT ARM) IMPACT TESTS
 SID IIs DUMMY

Date: 4/2/03
 Dummy Serial Number: 020
 Test Number: D03365/D03375

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03365</u>	<u>D03375</u>
Temperature (°C)	20.8° – 22.2°	21.0	21.0
Humidity	10% - 70%	30	30
Impact Velocity	4.2 - 4.4m/s	4.25	4.27
Probe Force	1.8 - 2.3 kN	2.3	2.3
Upper Spine Acceleration	13 - 18 g's	16	20.6*
Lower Spine Acceleration	8 - 13 g's	12	13
Upper Rib Displacement	32 - 41 mm	31.8*	31.95*
Middle Rib Displacement	40 - 51 mm	39*	39.5*
Lower Rib Displacement	34 - 47 mm	38	38

* TEST DOES NOT MEET SPECIFICATIONS

Technician: 

Approved By: 

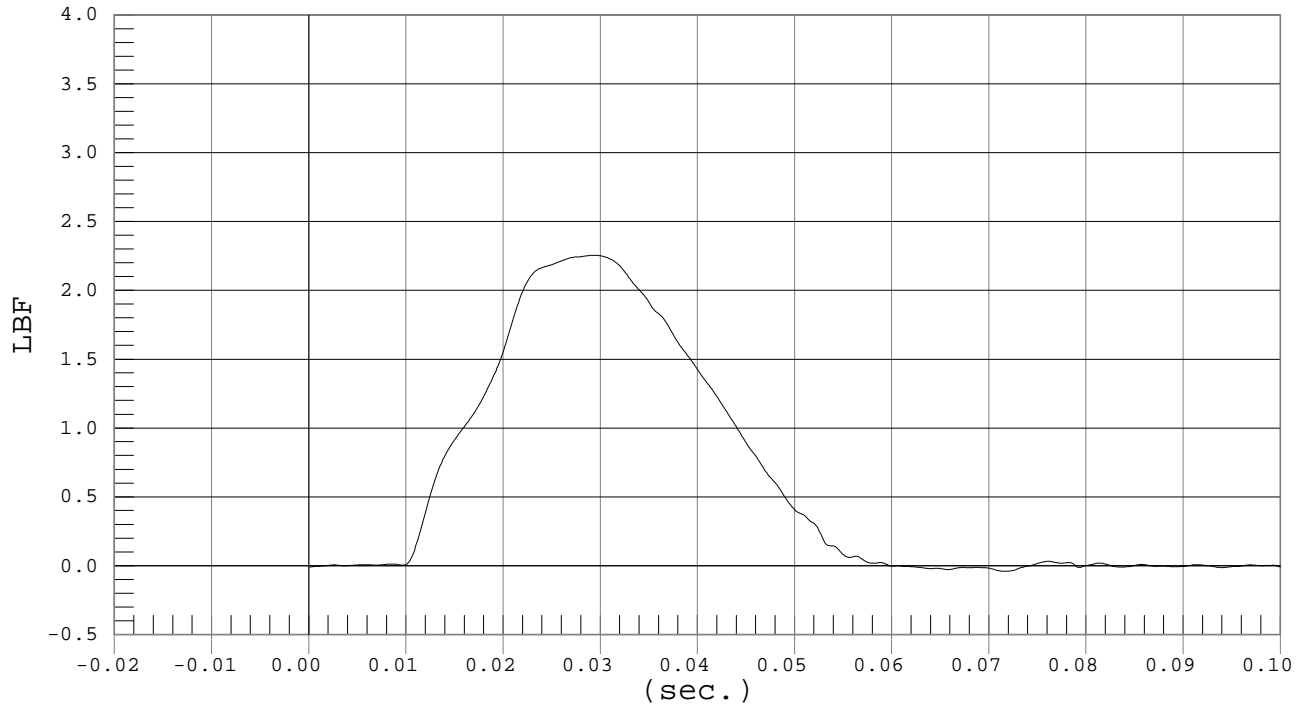


PROBE FORCE

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

Test Date: 04-02-03
Speed: 14.0 fps, 4.26 M/s

Ymin = -.04 LBF @ 0.0716 sec., Ymax = 2.26 LBF @ 0.0292 sec.

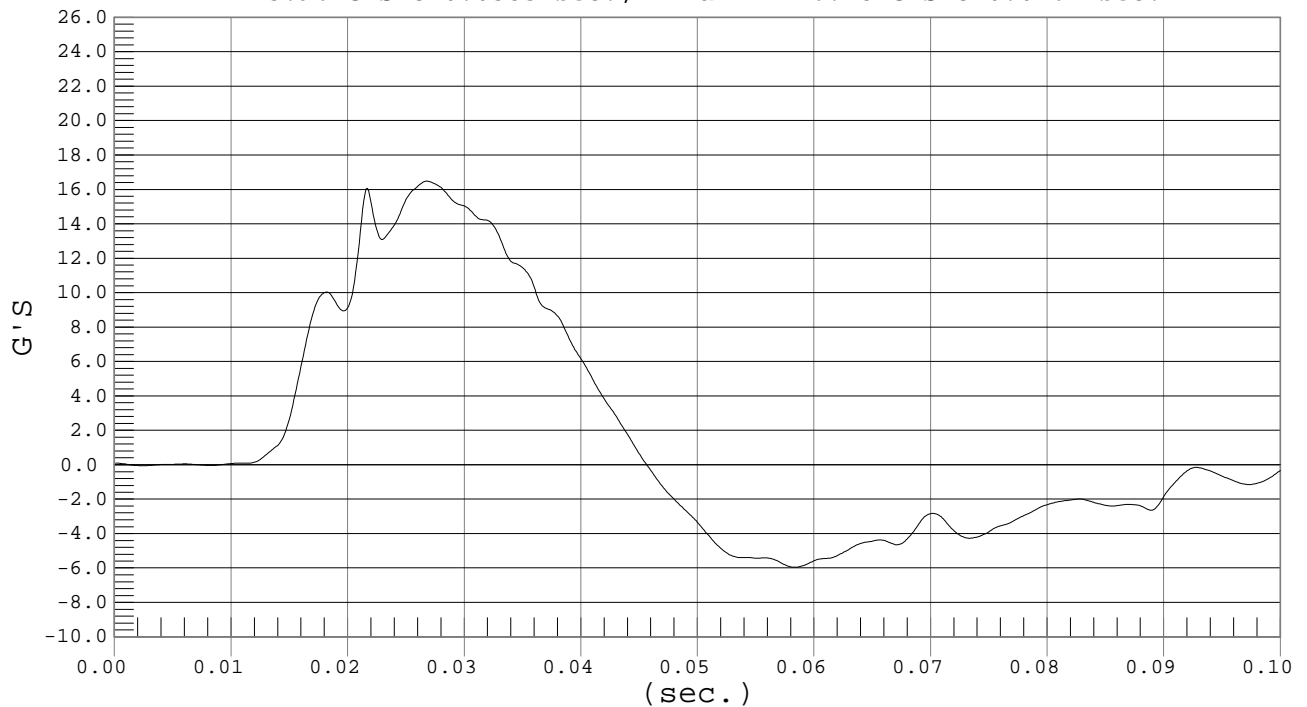


UPPER SPINE ACCELERATION

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

Test Date: 04-02-03
Speed: 14.0 fps, 4.26 M/s

Ymin = -5.96 G'S @ 0.0583 sec., Ymax = 16.48 G'S @ 0.0267 sec.



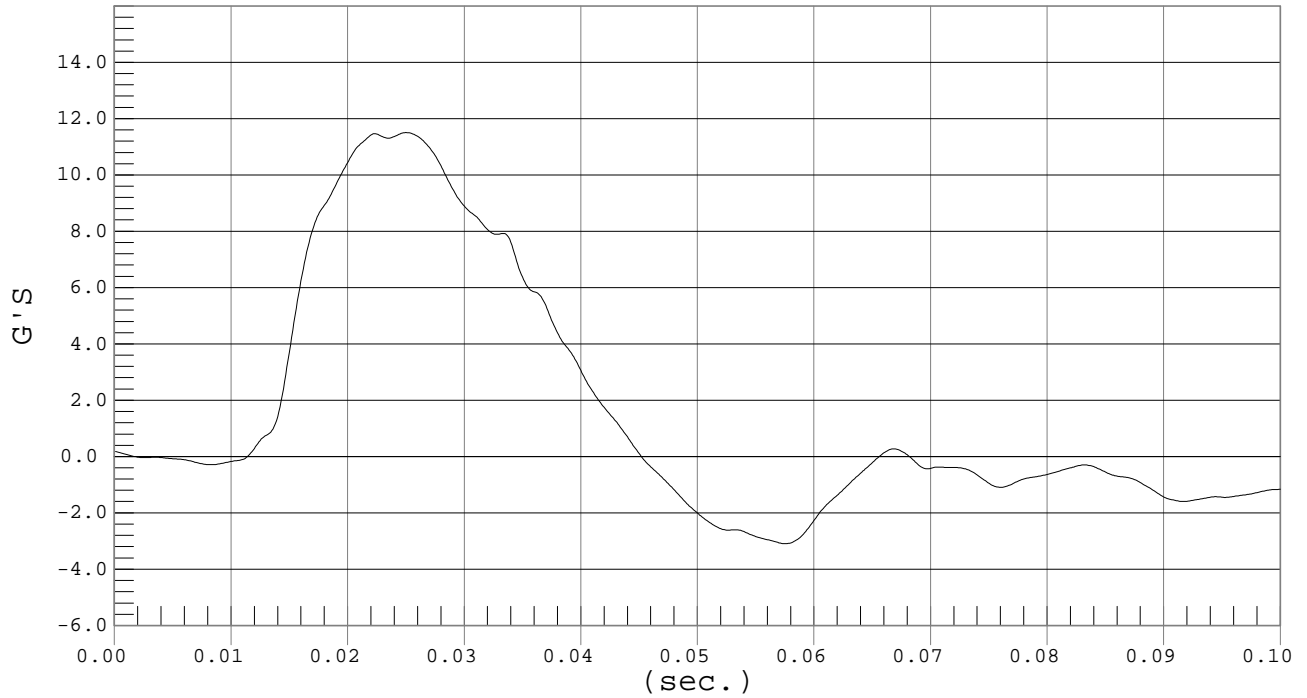


LOWER SPINE ACCELERATION

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

Test Date: 04-02-03
Speed: 14.0 fps, 4.26 M/s

Ymin = -3.09 G'S @ 0.0574 sec., Ymax = 11.51 G'S @ 0.0249 sec.

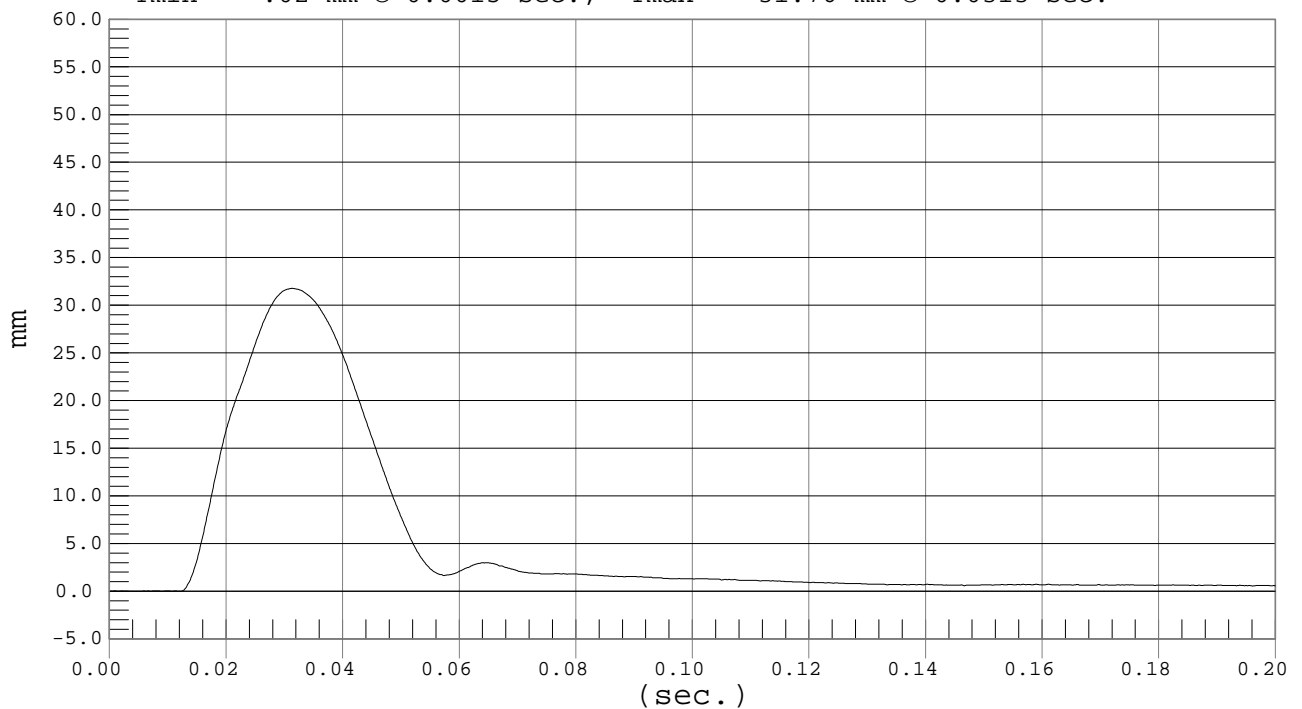


UPPER RIB DISPLACEMENT

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

Test Date: 04-02-03
Speed: 14.0 fps, 4.26 M/s

Ymin = -.02 mm @ 0.0015 sec., Ymax = 31.76 mm @ 0.0313 sec.



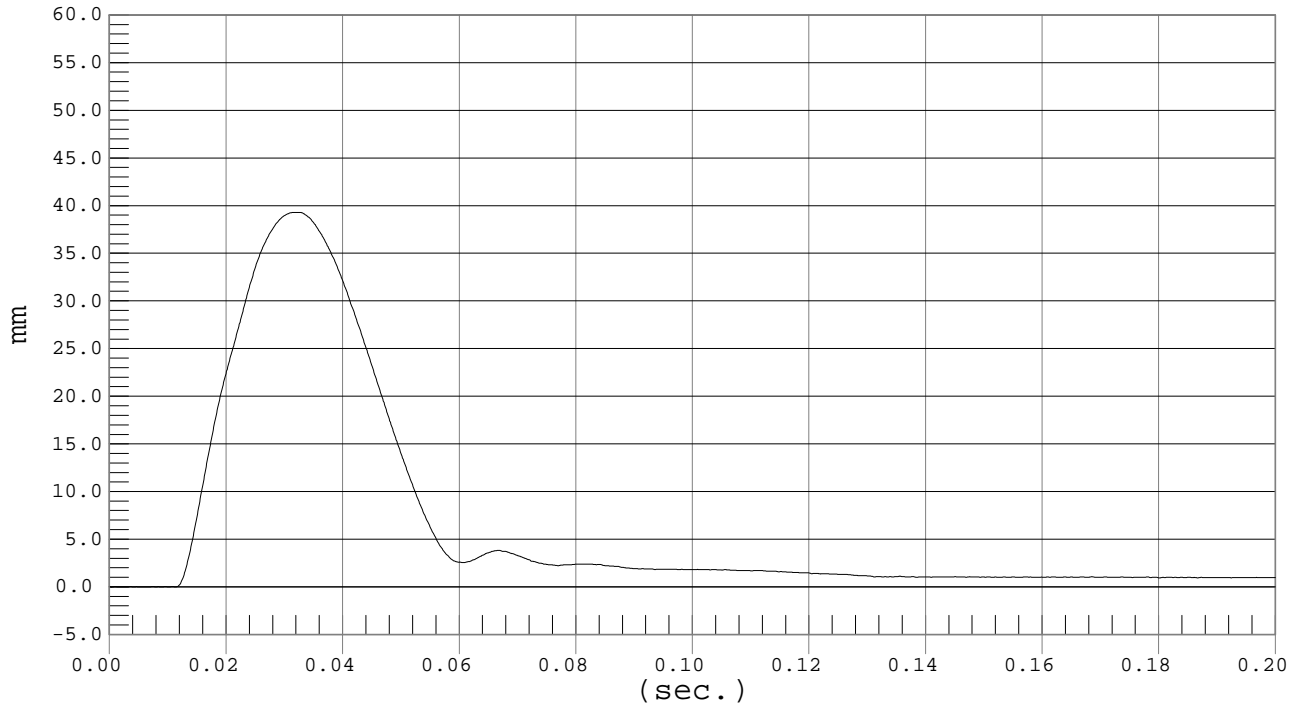


MIDDLE RIB DISPLACEMENT

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

Test Date: 04-02-03
Speed: 14.0 fps, 4.26 M/s

Ymin = -.03 mm @ 0.0003 sec., Ymax = 39.28 mm @ 0.0315 sec.

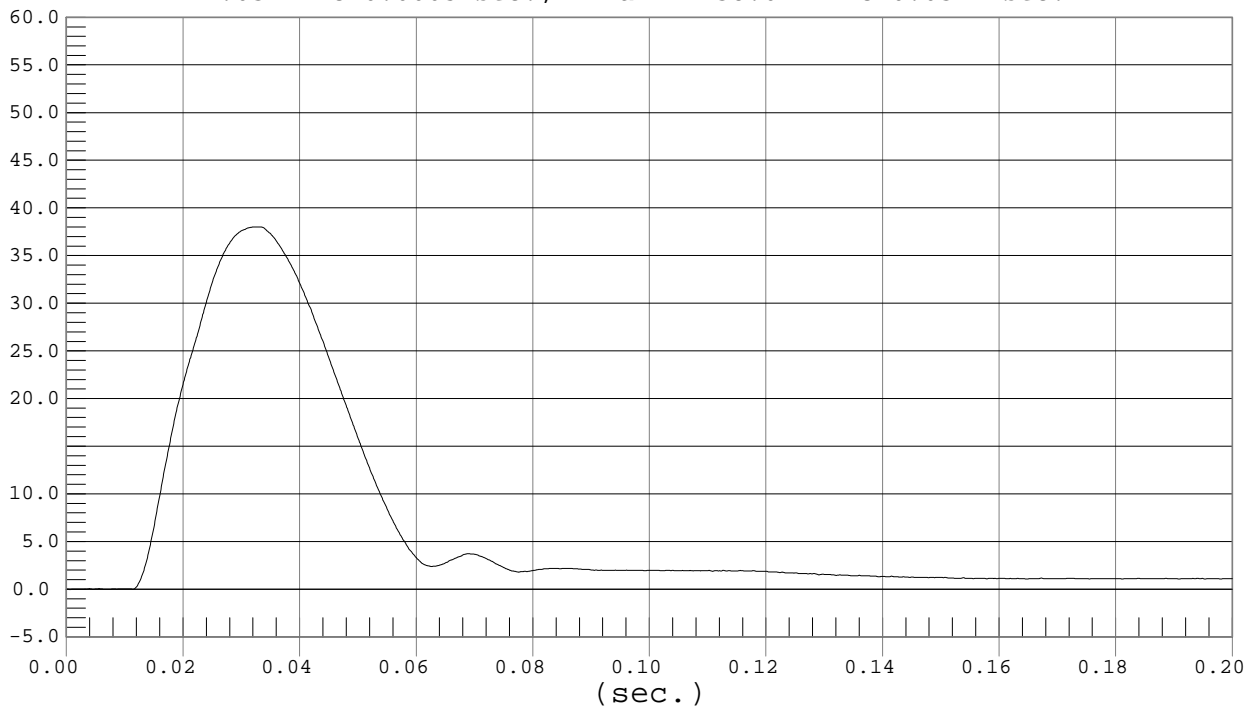


LOWER RIB DISPLACEMENT

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

Test Date: 04-02-03
Speed: 14.0 fps, 4.26 M/s

Ymin = -.03 mm @ 0.0005 sec., Ymax = 38.01 mm @ 0.0321 sec.



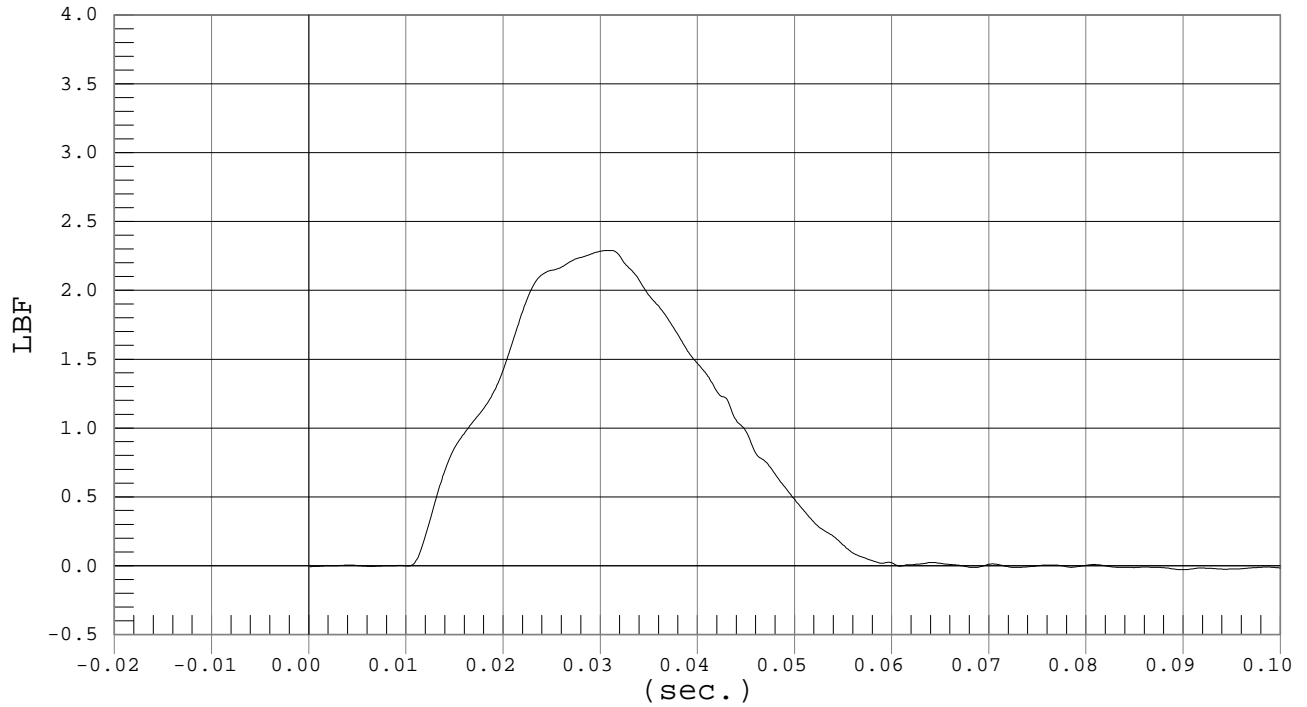


PROBE FORCE

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

Test Date: 04-02-03
Speed: 14.0 fps, 4.27 M/s

Ymin = -.04 LBF @ 0.1780 sec., Ymax = 2.29 LBF @ 0.0308 sec.

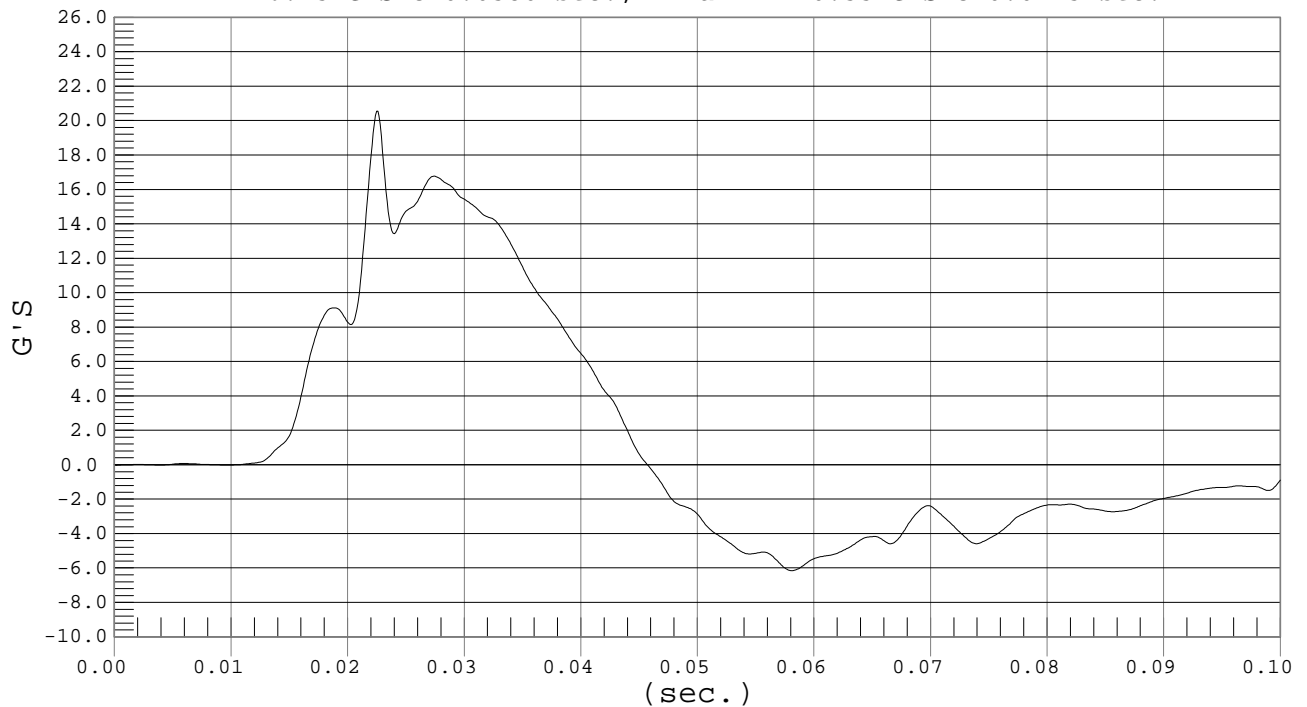


UPPER SPINE ACCELERATION

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

Test Date: 04-02-03
Speed: 14.0 fps, 4.27 M/s

Ymin = -6.15 G'S @ 0.0580 sec., Ymax = 20.55 G'S @ 0.0225 sec.



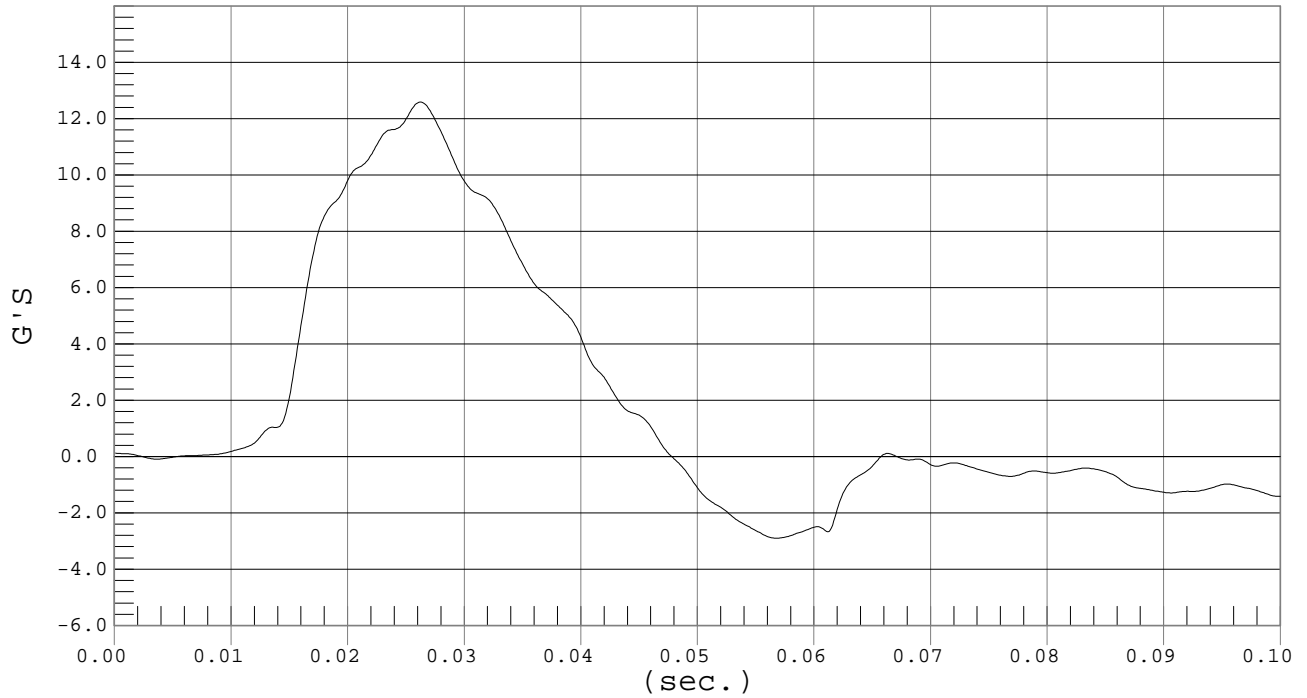


LOWER SPINE ACCELERATION

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

Test Date: 04-02-03
Speed: 14.0 fps, 4.27 M/s

Ymin = -2.9 G'S @ 0.0567 sec., Ymax = 12.59 G'S @ 0.0262 sec.

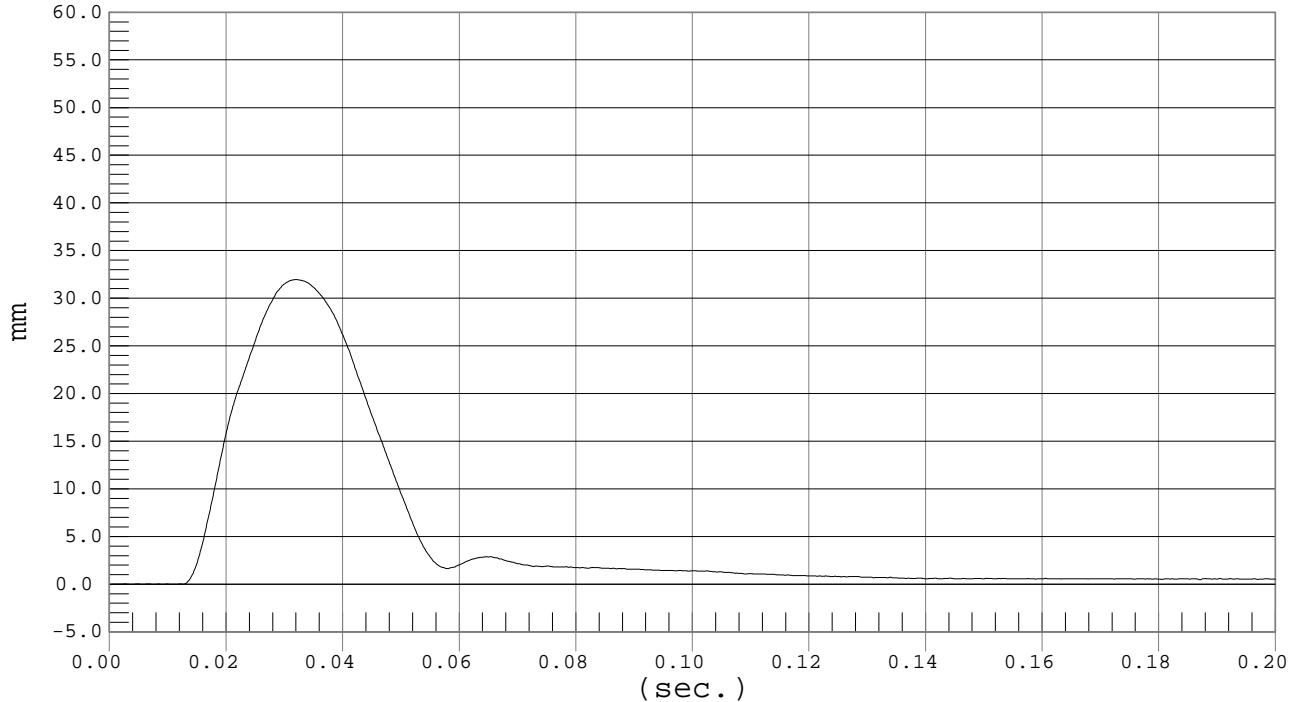


UPPER RIB DISPLACEMENT

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

Test Date: 04-02-03
Speed: 14.0 fps, 4.27 M/s

Ymin = -.03 mm @ 0.0003 sec., Ymax = 31.95 mm @ 0.0319 sec.



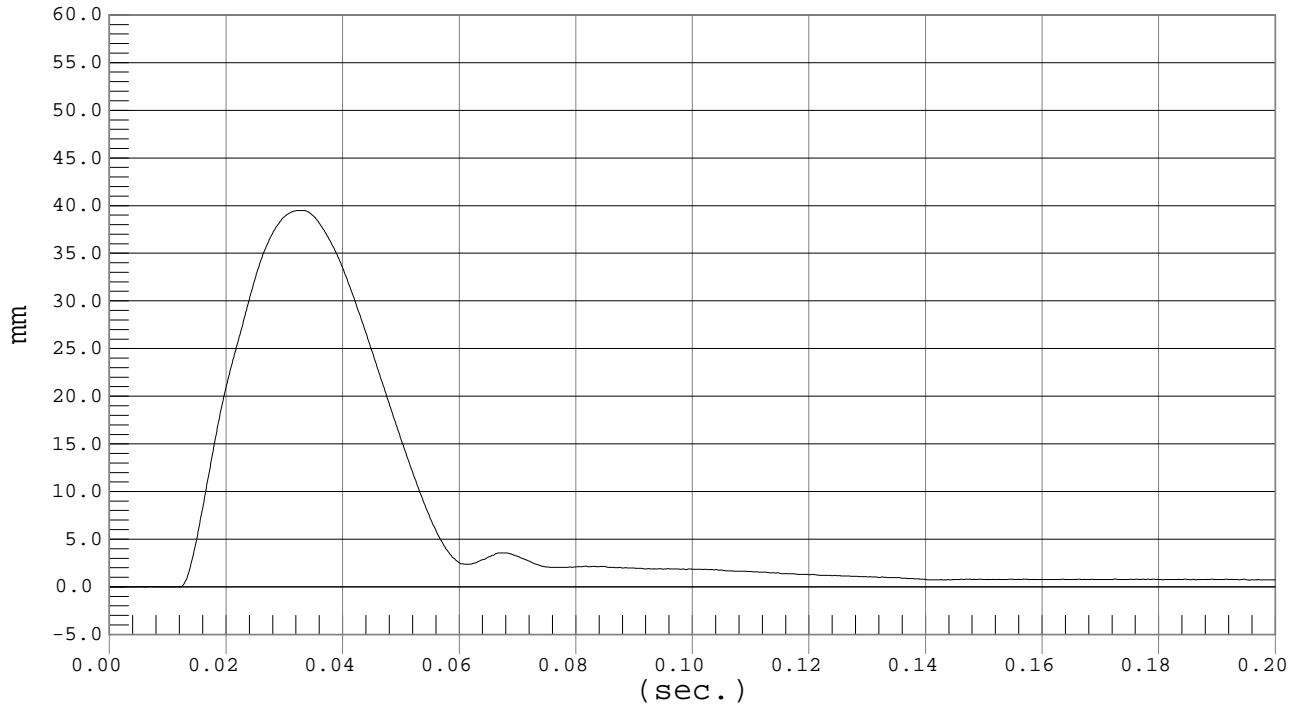


MIDDLE RIB DISPLACEMENT

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

Test Date: 04-02-03
Speed: 14.0 fps, 4.27 M/s

Ymin = -.02 mm @ 0.0020 sec., Ymax = 39.49 mm @ 0.0334 sec.

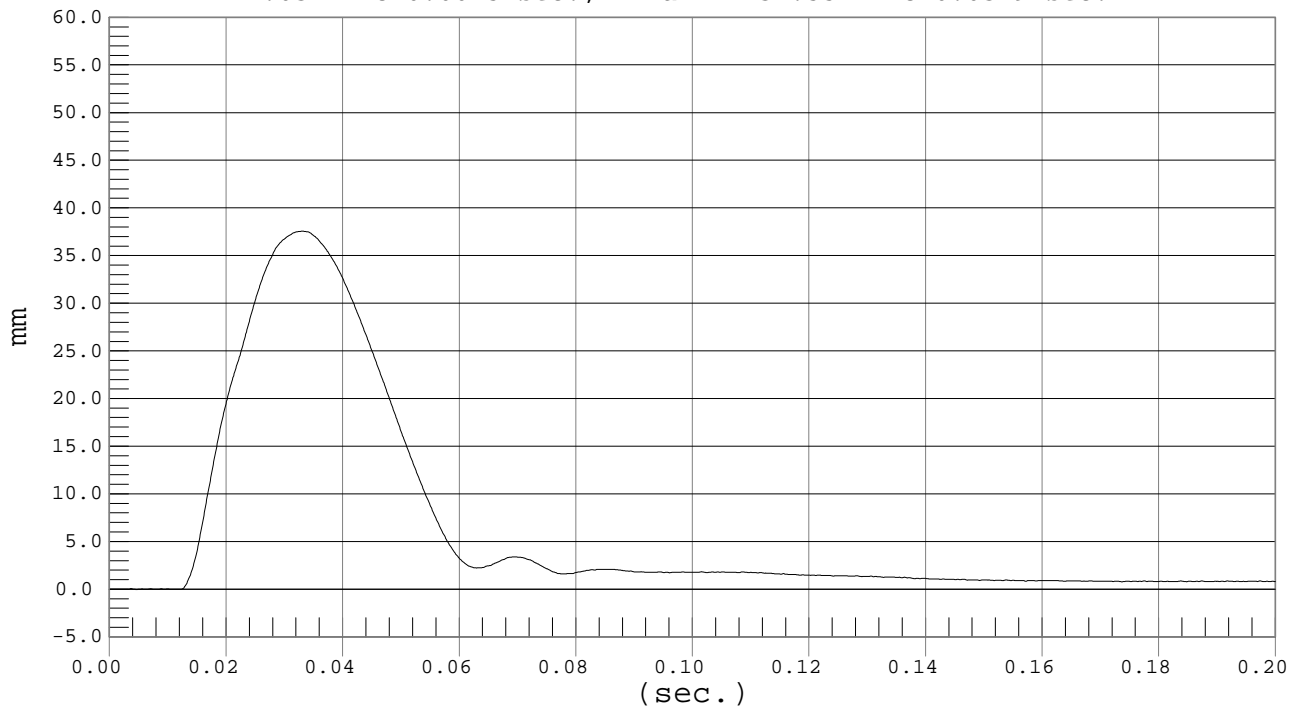


LOWER RIB DISPLACEMENT

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

Test Date: 04-02-03
Speed: 14.0 fps, 4.27 M/s

Ymin = -.03 mm @ 0.0045 sec., Ymax = 37.55 mm @ 0.0329 sec.



MGA RESEARCH CORPORATION
 ABDOMINAL IMPACT TEST
 SID IIs DUMMY

Date: 4/2/03
 Dummy Serial Number: 020
 Test Number: D03369/D03379

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03369</u>	<u>D03379</u>
Temperature (°C)	20.8° – 22.2°	21.1	21.3
Humidity	10% - 70%	29	30
Impact Velocity	4.41 - 4.59 m/s	4.48	4.52
Probe Force	1.3 - 1.9 kN	1.64	1.7
Upper Spine Acceleration	5 - 9 g's	7	8
Lower Spine Acceleration	10 - 12 g's	9.7*	11
Upper Rib Displacement	44 - 55 mm	48	49
Middle Rib Displacement	44 - 56 mm	54	49

* TEST DOES NOT MEET SPECIFICATIONS

Technician: _____

Approved By: _____

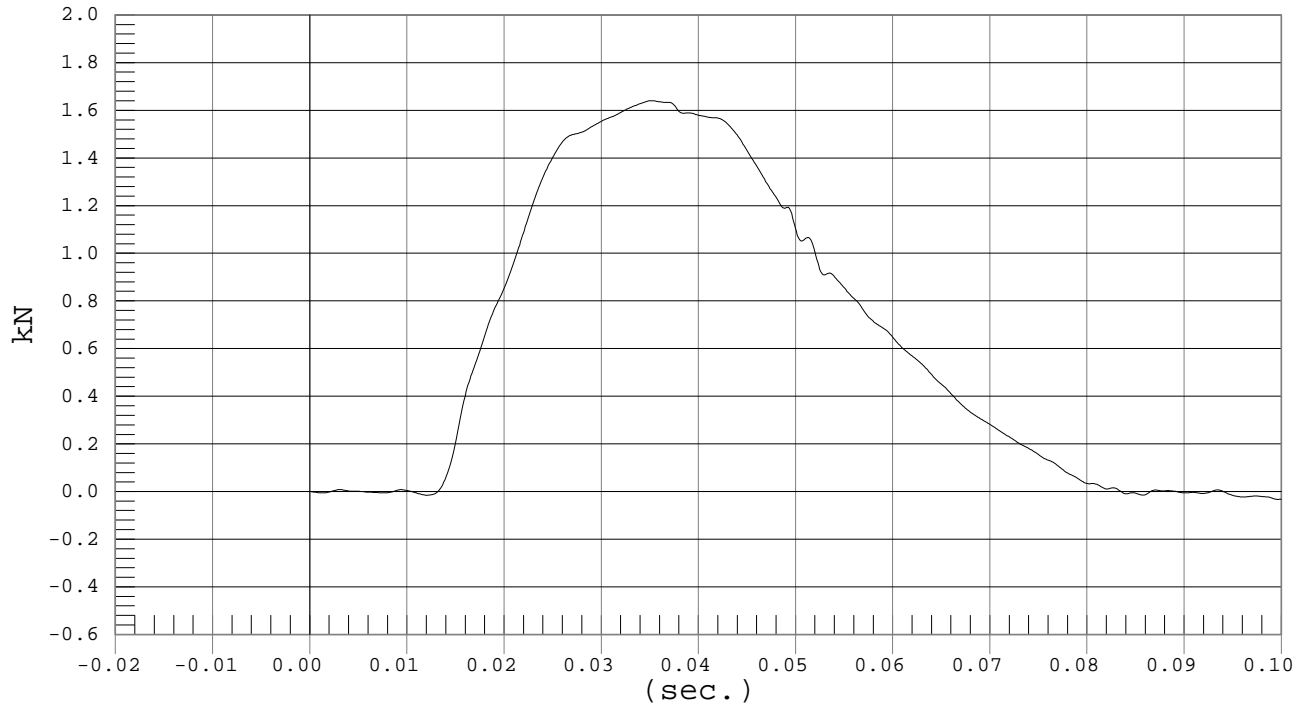


Test Desc.: Abdomen Impact
Component: Dummy #020

PROBE FORCE

Test Date: 04-02-03
Speed: 14.7 fps, 4.48 M/s

Ymin = -.07 kN @ 0.1065 sec., Ymax = 1.64 kN @ 0.0351 sec.



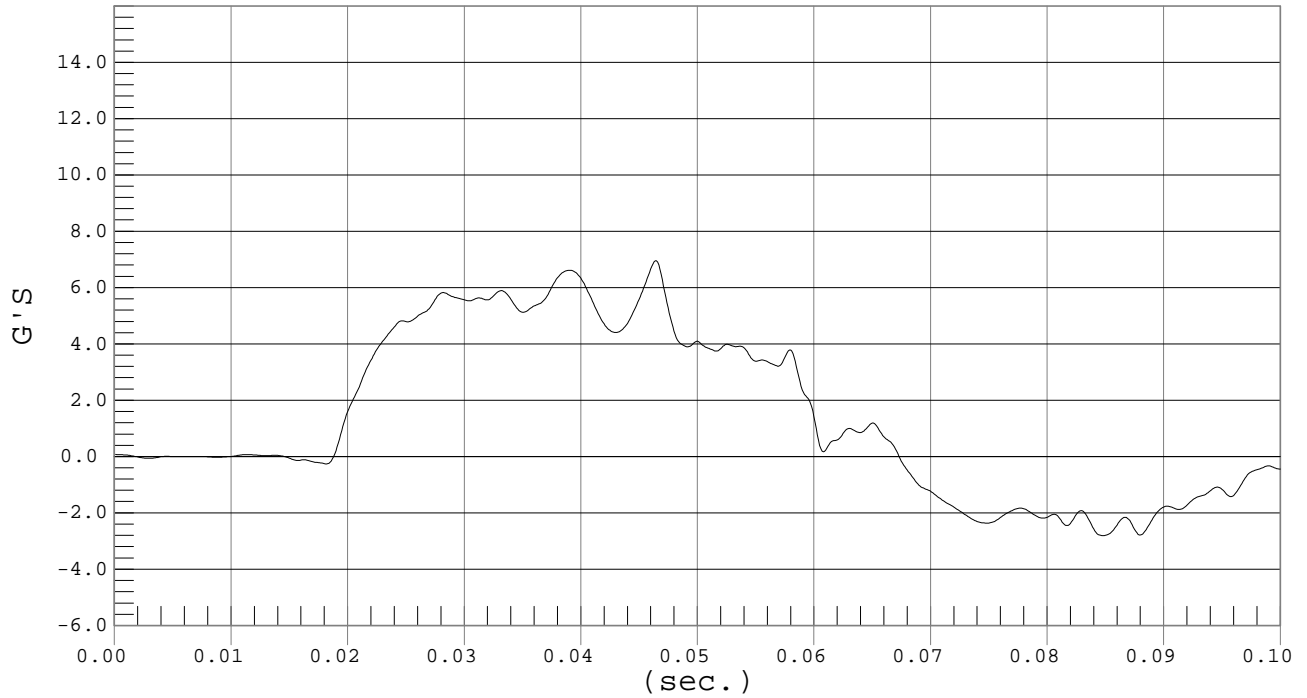


UPPER SPINE ACCELERATION

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 04-02-03
Speed: 14.7 fps, 4.48 M/s

Ymin = -2.81 G'S @ 0.0847 sec., Ymax = 6.96 G'S @ 0.0463 sec.

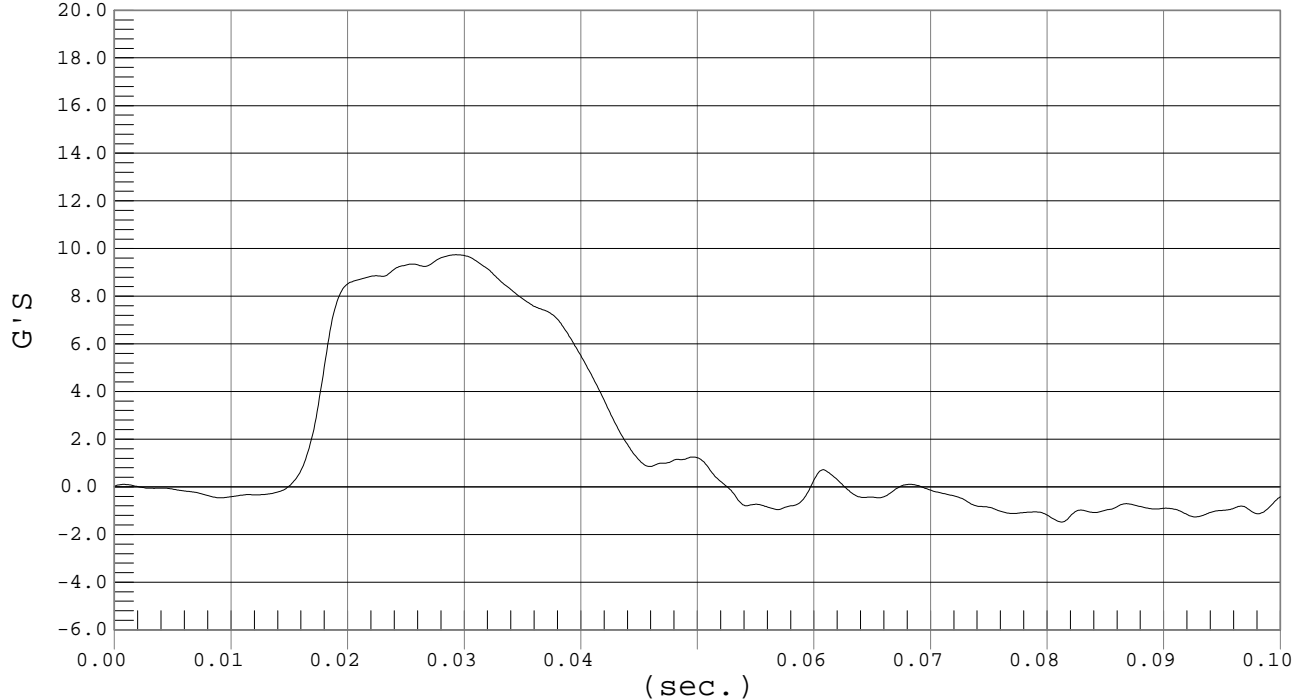


LOWER SPINE ACCELERATION

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 04-02-03
Speed: 14.7 fps, 4.48 M/s

Ymin = -1.48 G'S @ 0.0811 sec., Ymax = 9.74 G'S @ 0.0292 sec.



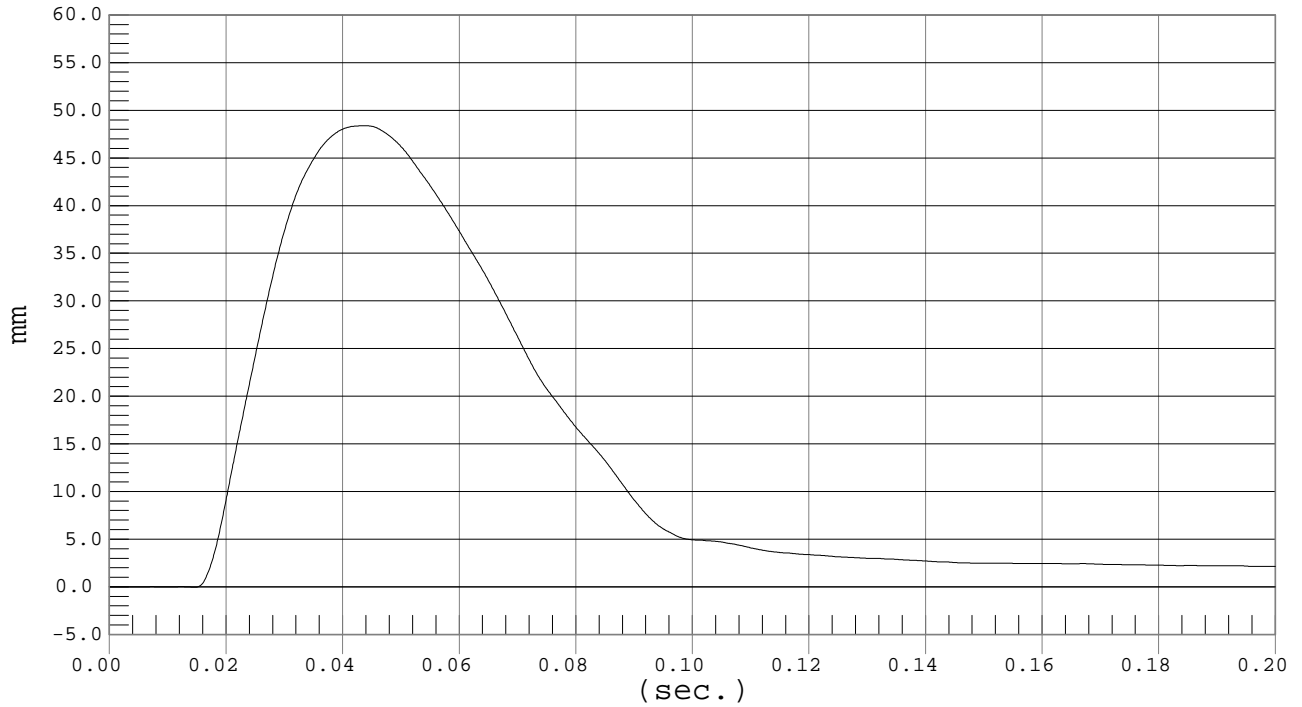


UPPER RIB DISPLACEMENT

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 04-02-03
Speed: 14.7 fps, 4.48 M/s

Ymin = -.03 mm @ 0.0145 sec., Ymax = 48.37 mm @ 0.0436 sec.

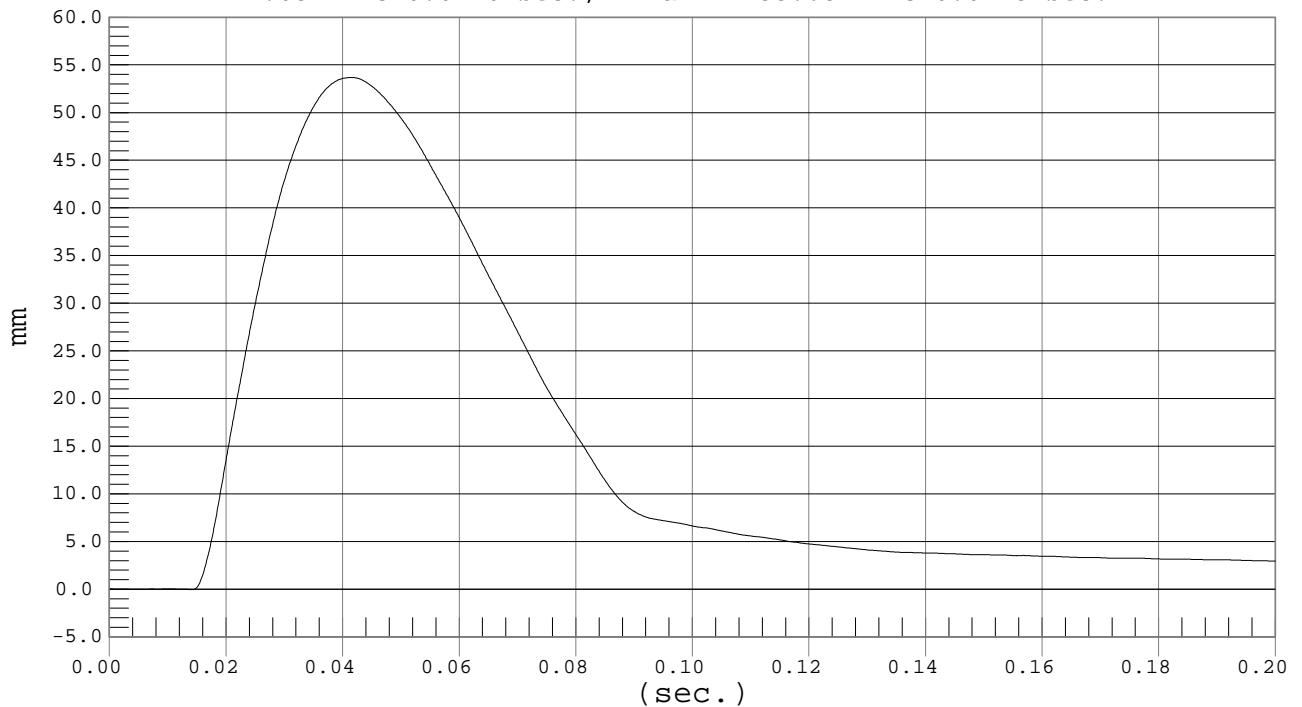


LOWER RIB DISPLACEMENT

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 04-02-03
Speed: 14.7 fps, 4.48 M/s

Ymin = -.05 mm @ 0.0140 sec., Ymax = 53.68 mm @ 0.0415 sec.



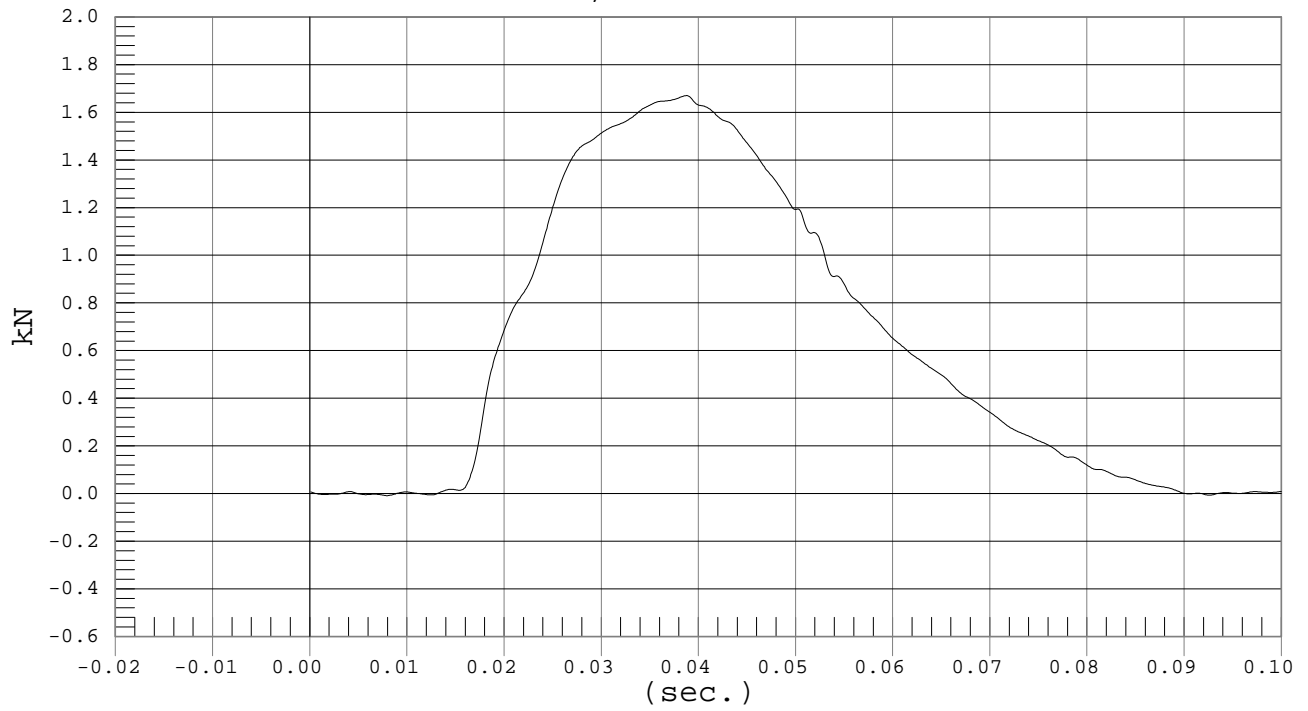


Test Desc.: Abdomen Impact
Component: Dummy #020

PROBE FORCE

Test Date: 04-02-03
Speed: 14.8 fps, 4.52 M/s

Ymin = -.02 kN @ 0.1076 sec., Ymax = 1.67 kN @ 0.0387 sec.



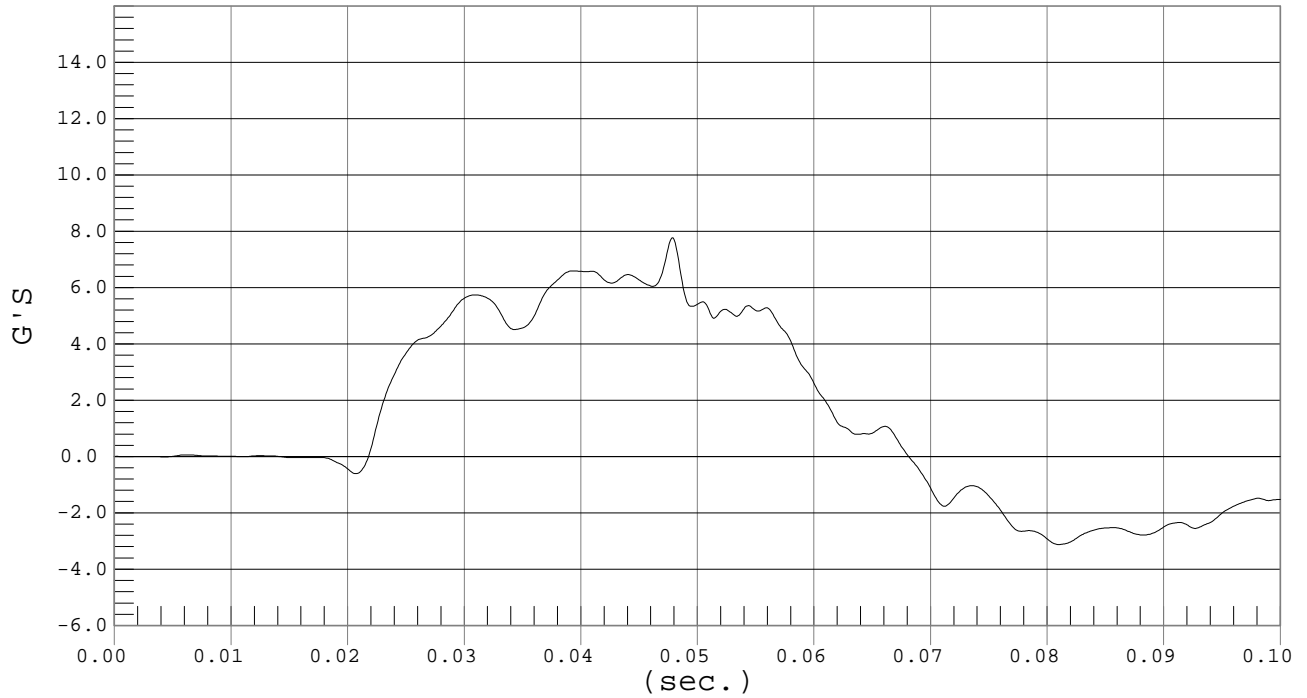


UPPER SPINE ACCELERATION

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 04-02-03
Speed: 14.8 fps, 4.52 M/s

Ymin = -3.13 G'S @ 0.0809 sec., Ymax = 7.77 G'S @ 0.0478 sec.

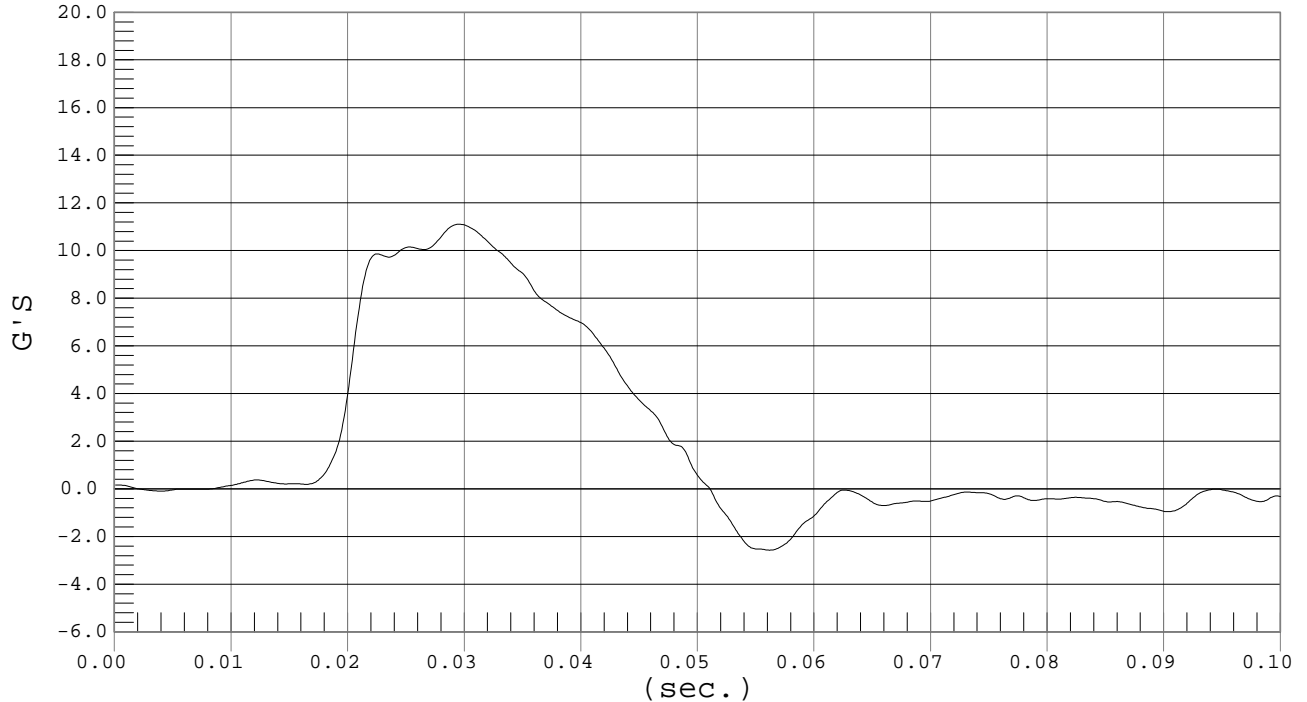


LOWER SPINE ACCELERATION

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 04-02-03
Speed: 14.8 fps, 4.52 M/s

Ymin = -2.58 G'S @ 0.0561 sec., Ymax = 11.1 G'S @ 0.0295 sec.



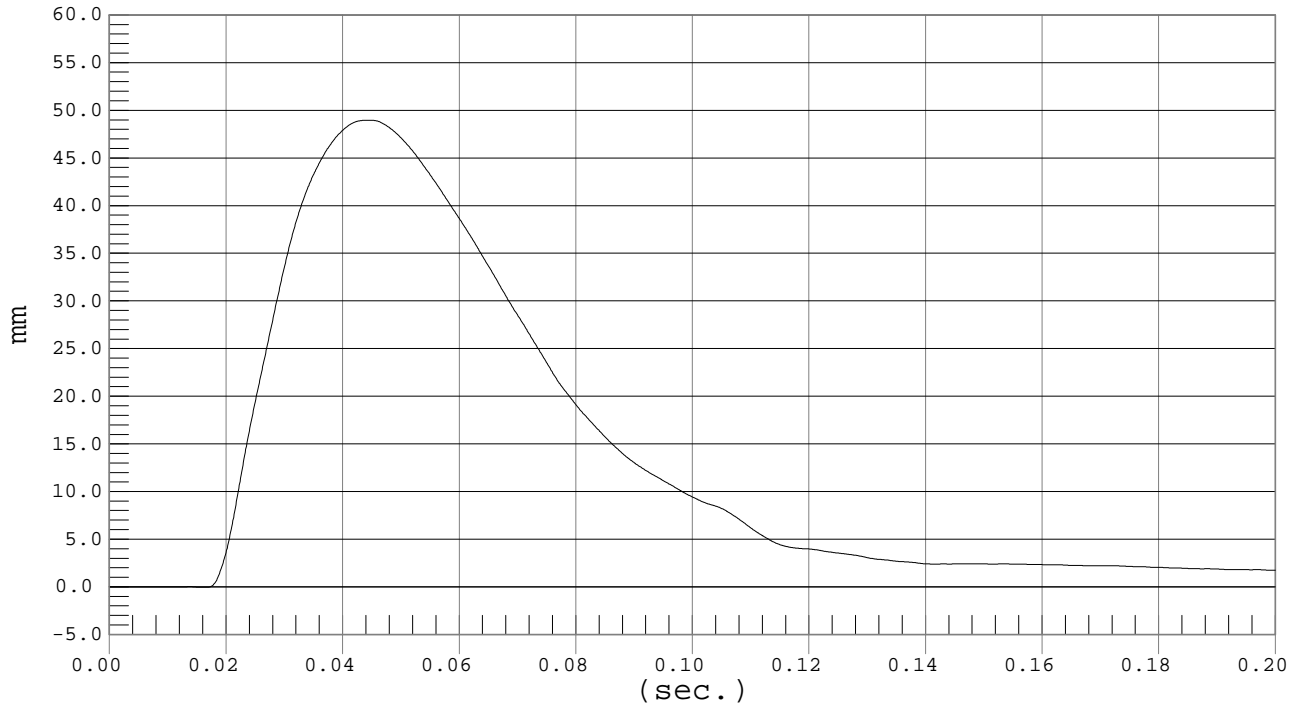


UPPER RIB DISPLACEMENT

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 04-02-03
Speed: 14.8 fps, 4.52 M/s

Ymin = -.04 mm @ 0.0166 sec., Ymax = 48.95 mm @ 0.0445 sec.

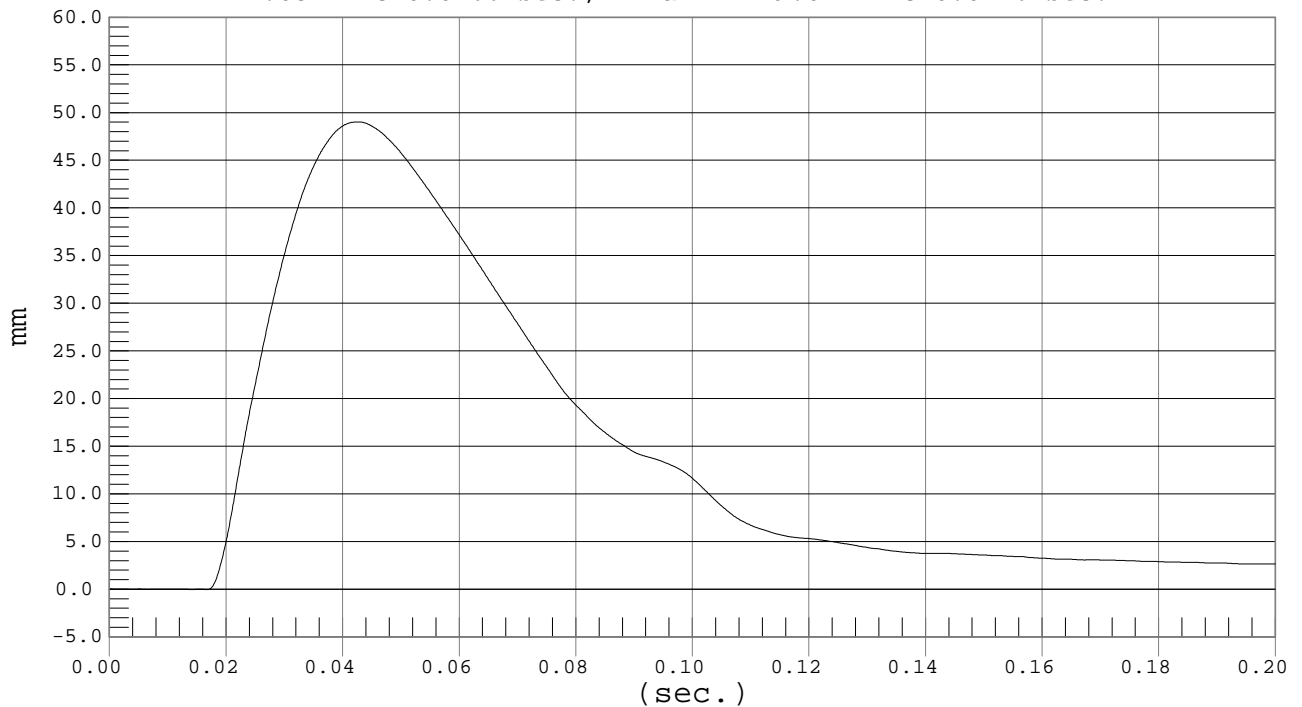


LOWER RIB DISPLACEMENT

Test Desc.: Abdomen Impact
Component: Dummy #020

Test Date: 04-02-03
Speed: 14.8 fps, 4.52 M/s

Ymin = -.05 mm @ 0.0166 sec., Ymax = 49.02 mm @ 0.0426 sec.



MGA RESEARCH CORPORATION
PELVIS IMPACT TEST
SID IIs DUMMY

Date: 4/2/03
Dummy Serial Number: 020
Test Number: D03369/D03379

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03369</u>	<u>D03379</u>
Temperature (°C)	20.8° – 22.2°	21.1	21.0
Humidity	10% - 70%	29	30
Impact Velocity	6.57 - 6.84 m/s	6.76	6.76
Probe Force	5.0 - 7.2 kN	5.6	5.7
Pelvis G's	46 - 60 g's	51	49

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

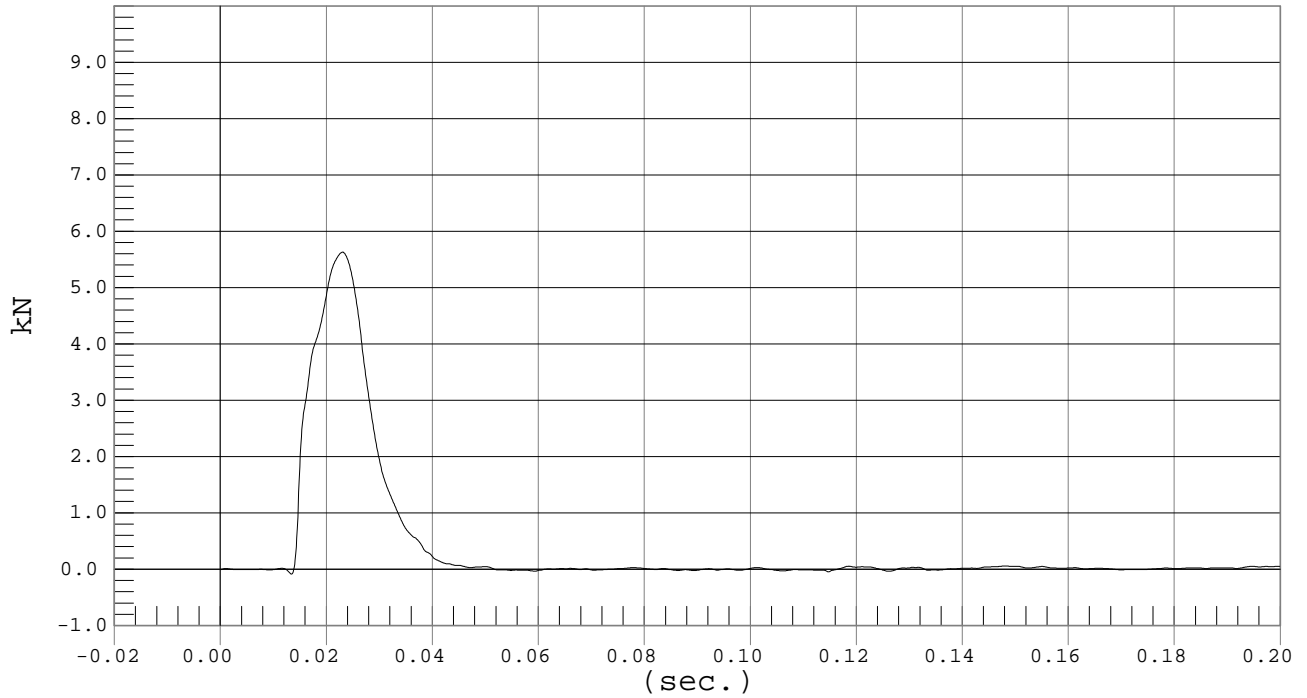


IMPACTOR FORCE

Test Desc.: Pelvis Impact
Component: Dummy #020

Test Date: 04-02-03
Speed: 22.2 fps, 6.76 M/s

Ymin = -.09 kN @ 0.0133 sec., Ymax = 5.63 kN @ 0.0230 sec.

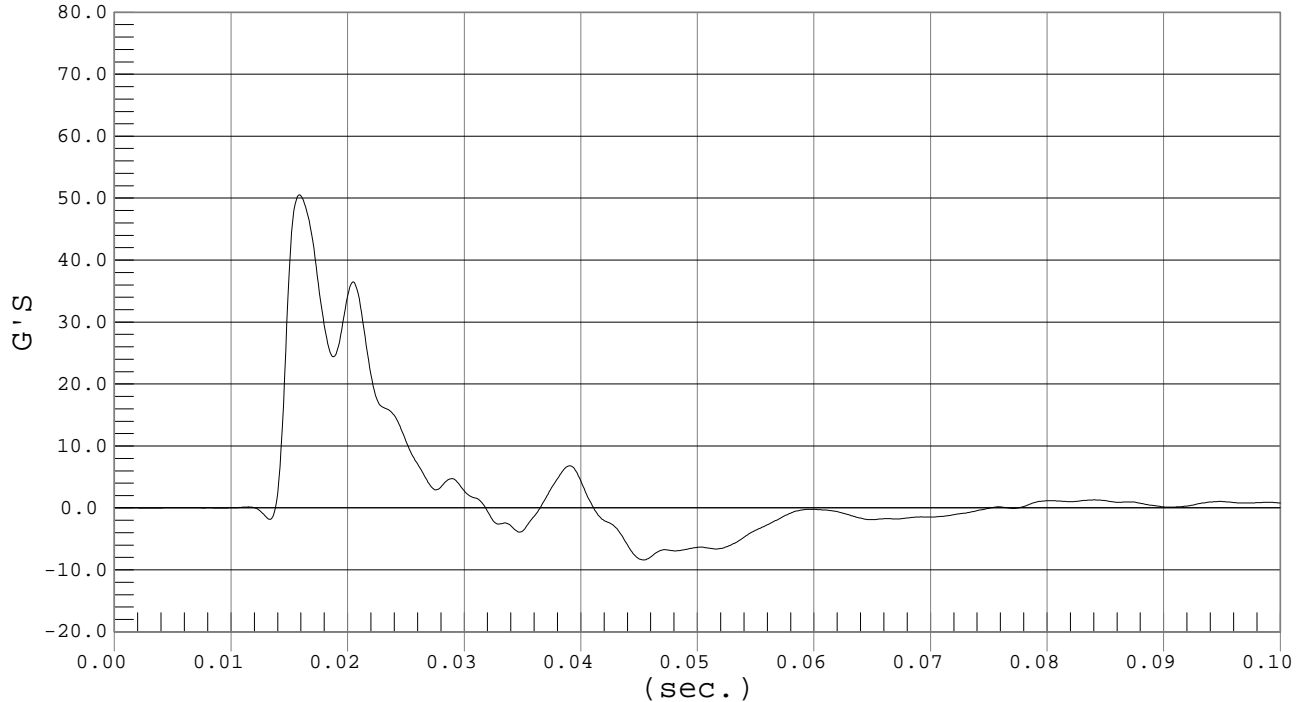


PELVIS ACCELERATION

Test Desc.: Pelvis Impact
Component: Dummy #020

Test Date: 04-02-03
Speed: 22.2 fps, 6.76 M/s

Ymin = -8.4 G'S @ 0.0453 sec., Ymax = 50.53 G'S @ 0.0158 sec.



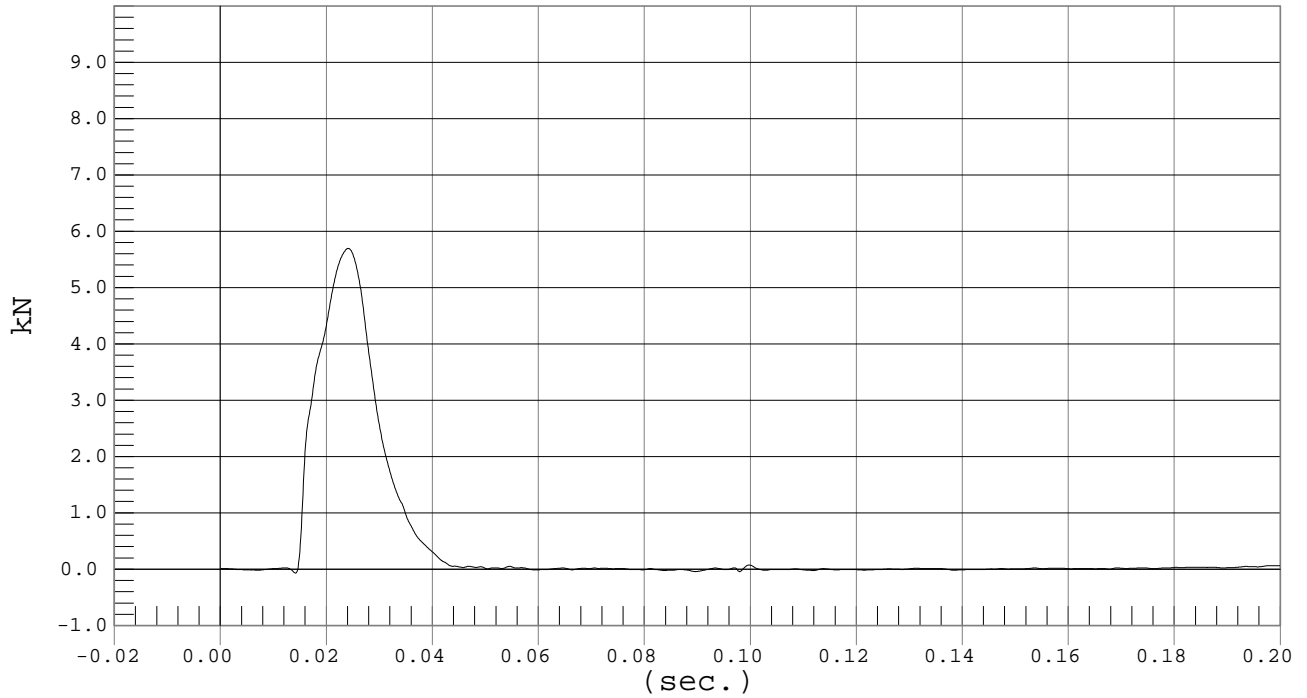


IMPACTOR FORCE

Test Desc.: Pelvis Impact
Component: Dummy #020

Test Date: 04-02-03
Speed: 22.2 fps, 6.76 M/s

Ymin = -.07 kN @ 0.0141 sec., Ymax = 5.7 kN @ 0.0240 sec.

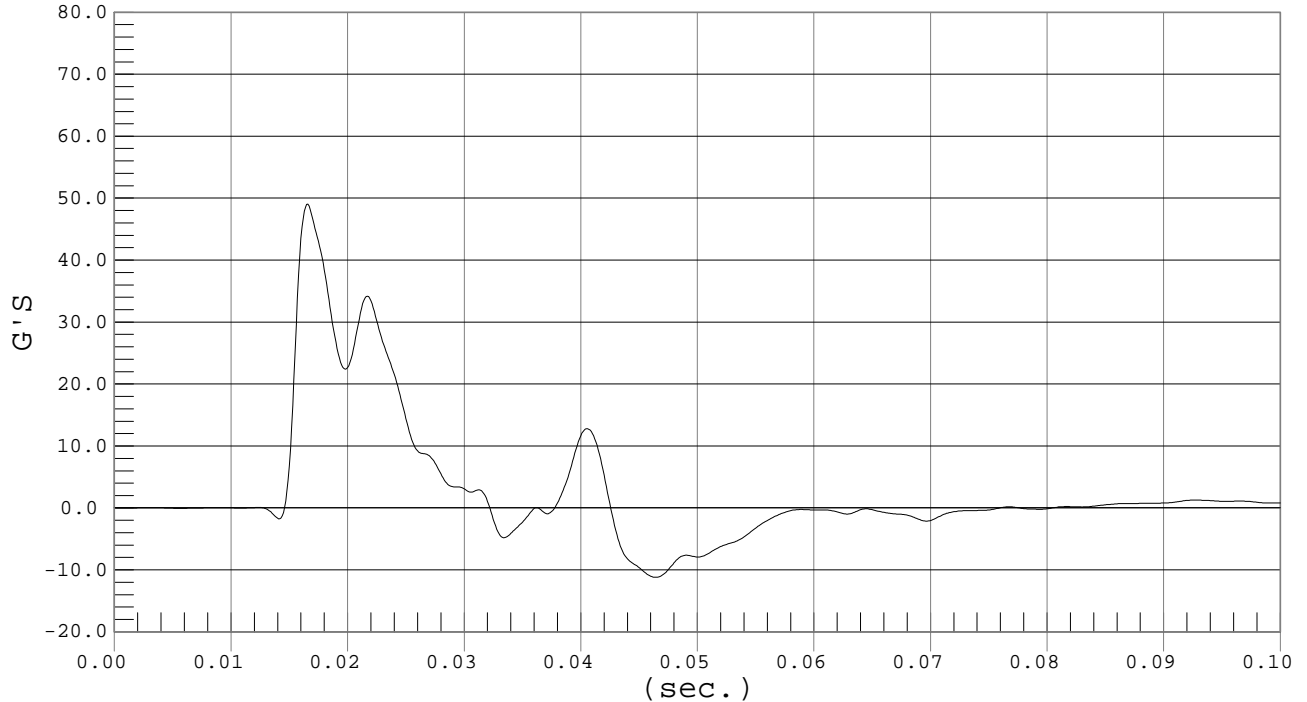


PELVIS ACCELERATION

Test Desc.: Pelvis Impact
Component: Dummy #020

Test Date: 04-02-03
Speed: 22.2 fps, 6.76 M/s

Ymin = -11.21 G'S @ 0.0463 sec., Ymax = 49.03 G'S @ 0.0165 sec.



CERTIFICATION DATA

Dummy Serial Number: 033

Calibration Test Results Summary

Dummy Serial Number: 033

Post-Test Calibration

Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all impact test requirements.
Shoulder Impact Test:	The shoulder passed all impact test requirements.
Thorax (with arm) Test:	The thorax did not pass all impact test requirements.
Thorax (without arm) Test:	The thorax did not pass all impact test requirements.
Abdomen Impact Test:	The abdomen did not pass all impact test requirements.
Pelvis Test:	The pelvis passed all impact test requirements.

MGA RESEARCH CORPORATION
HEAD DROP TEST
SID IIs DUMMY

Date: 3/19/03
Dummy Serial Number: 033
Test Number: D03381/D03391

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03381</u>	<u>D03391</u>
Temperature (°C)	18.9° – 25.6°	20.7	21.3
Humidity	10% - 70%	26	28
Resultant Accel	115 - 145 g's	118	118
Peak Longitudinal Accel	(-15) – (+ 15) g's	7	10

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

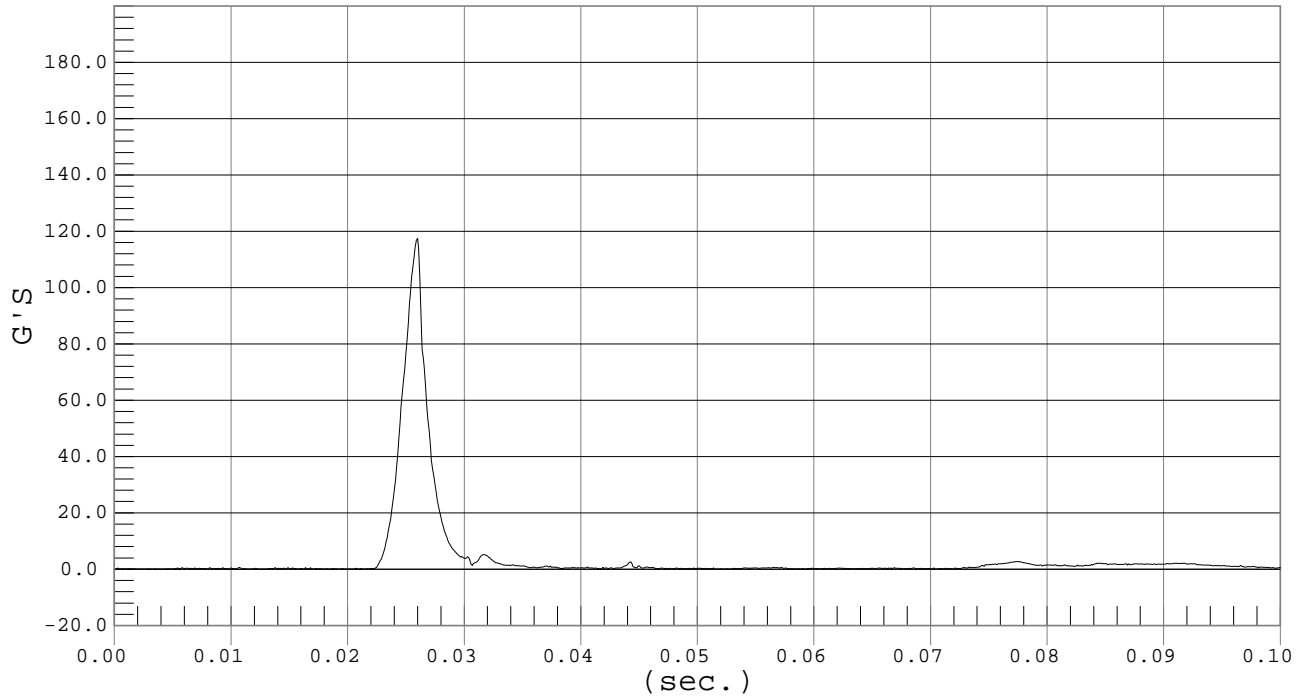


PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #033

Test Date: 03-19-03
Speed: 0.0 fps, 0.00 M/s

Ymin = .07 G'S @ 0.0005 sec., Ymax = 117.54 G'S @ 0.0259 sec.

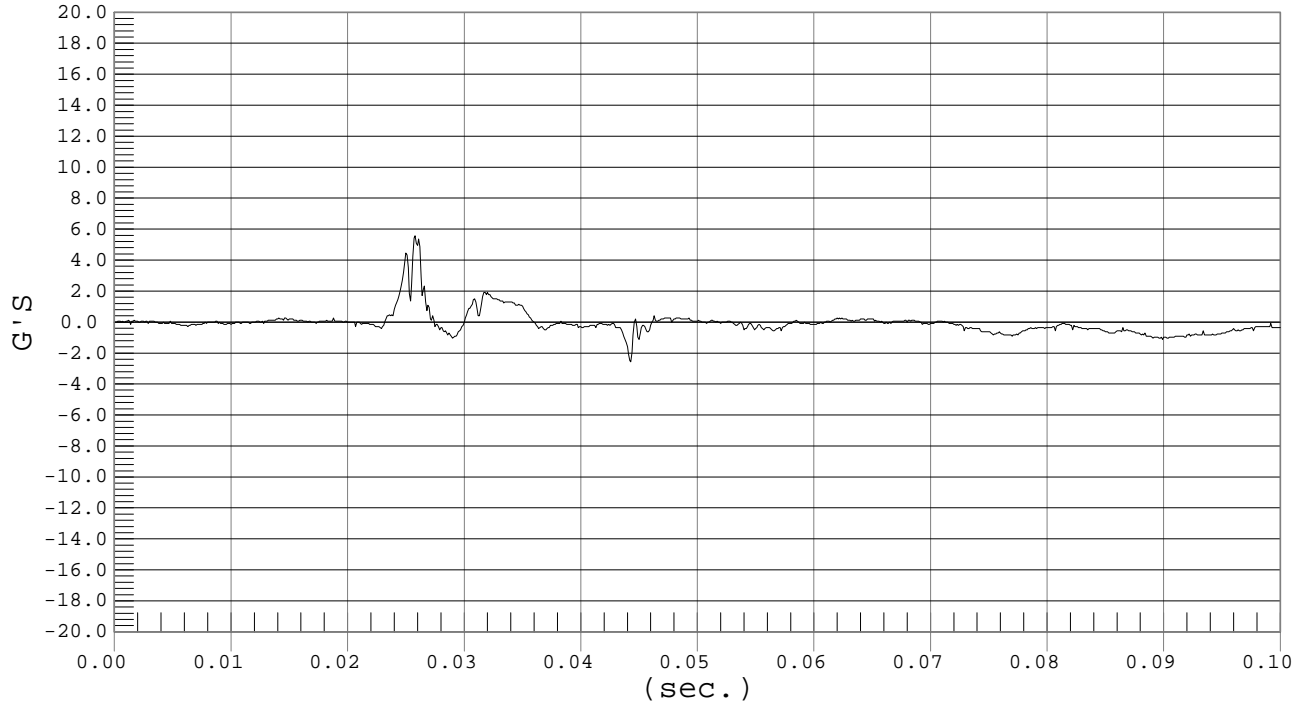


PEAK LONGITUDINAL ACCELARATION

Test Desc.: Head Drop
Component: Dummy #033

Test Date: 03-19-03
Speed: 0.0 fps, 0.00 M/s

Ymin = -2.56 G'S @ 0.0442 sec., Ymax = 7.01 G'S @ 0.1334 sec.



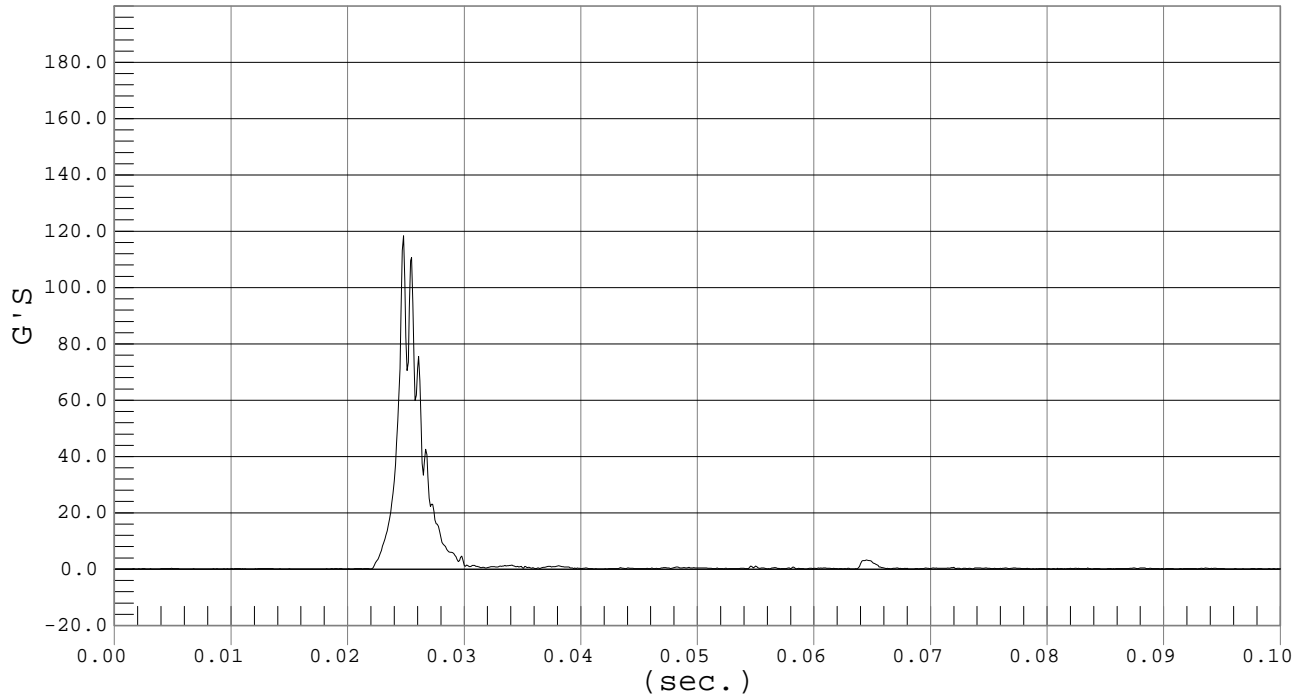


PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #033

Test Date: 03-19-03
Speed: 0.0 fps, 0.00 M/s

Ymin = .07 G'S @ 0.0002 sec., Ymax = 118.34 G'S @ 0.0247 sec.

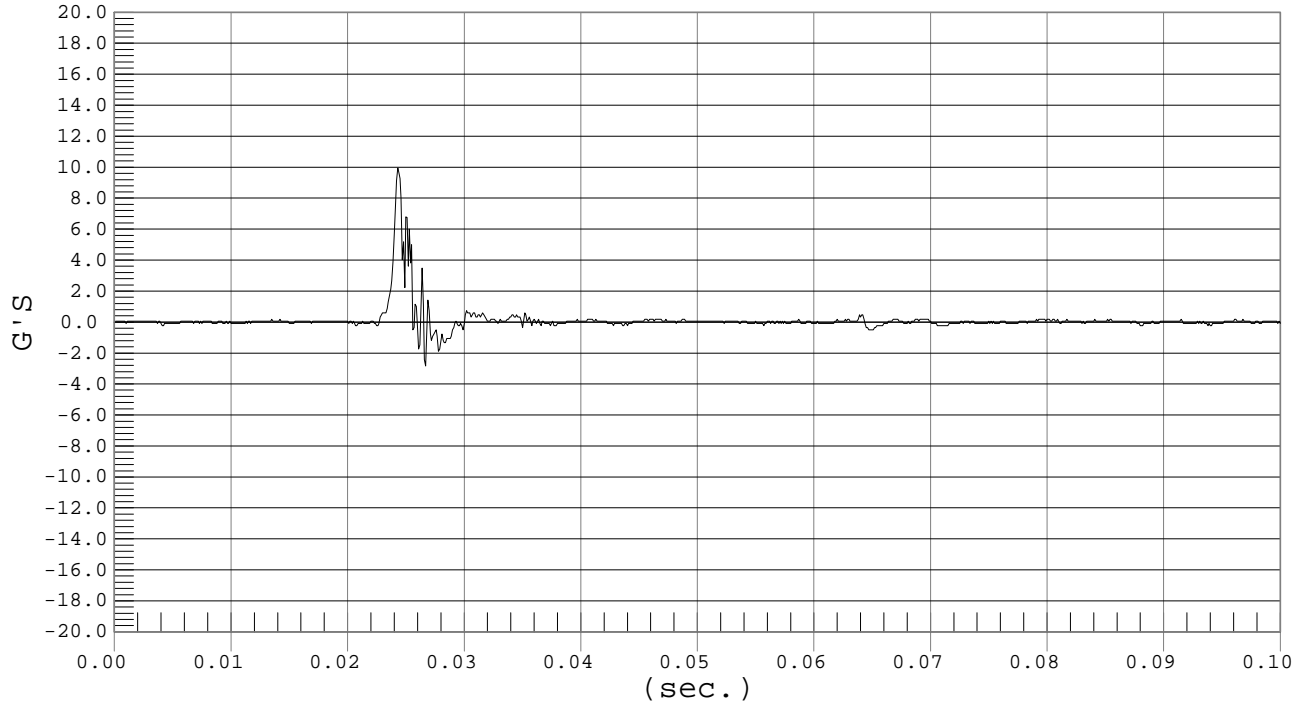


PEAK LONGITUDINAL ACCELARATION

Test Desc.: Head Drop
Component: Dummy #033

Test Date: 03-19-03
Speed: 0.0 fps, 0.00 M/s

Ymin = -4.91 G'S @ 0.1007 sec., Ymax = 9.95 G'S @ 0.0242 sec.



MGA RESEARCH CORPORATION
LATERAL NECK PENDULUM TEST
SID IIs DUMMY

Date: 3/27/03
 Dummy Serial Number: 033
 Test Number: D03382/D03392

TEST PARAMETER		SPECIFICATION	TEST RESULTS	
			<u>D03382</u>	<u>D03392</u>
Temperature (°C)		20.8° – 22.2°	20.9	21.1
Humidity		10% - 70%	25	24
Impact Velocity (m/s)		5.51-5.63	5.58	5.57
Delta Velocity (m/s)	10 ms	2.10-2.70	2.48	2.33
	15 ms	3.00-3.80	3.72	3.51
	20 ms	4.20-5.20	5.02	4.76
	25-60 ms	5.00-6.40	5.61	5.49
Peak D-Plane Rotation (deg)		72-82	75	79
Decay Time of D-Plane Rotation Peak to Zero Degree (ms)		60-83	73	72
Peak Occipital Condyle Moment (Nm)		(-43) – (-36)	-42	-42
Time at 10 or -10 Nm after Peak Moment (ms)		90 – 98	91	92
Time of last Moment Peak to Max Rotation (ms)		<14	7	12
Front Pot Peak Rotation (deg)		59 – 72	66	66
Time of Front Pot Peak Rotation (ms)		61 – 73	65	64
Rear Pot Peak Rotation (deg)		47 – 56	52	53
Time of Rear Pot Peak Rotation (ms)		62 – 73	68	65

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

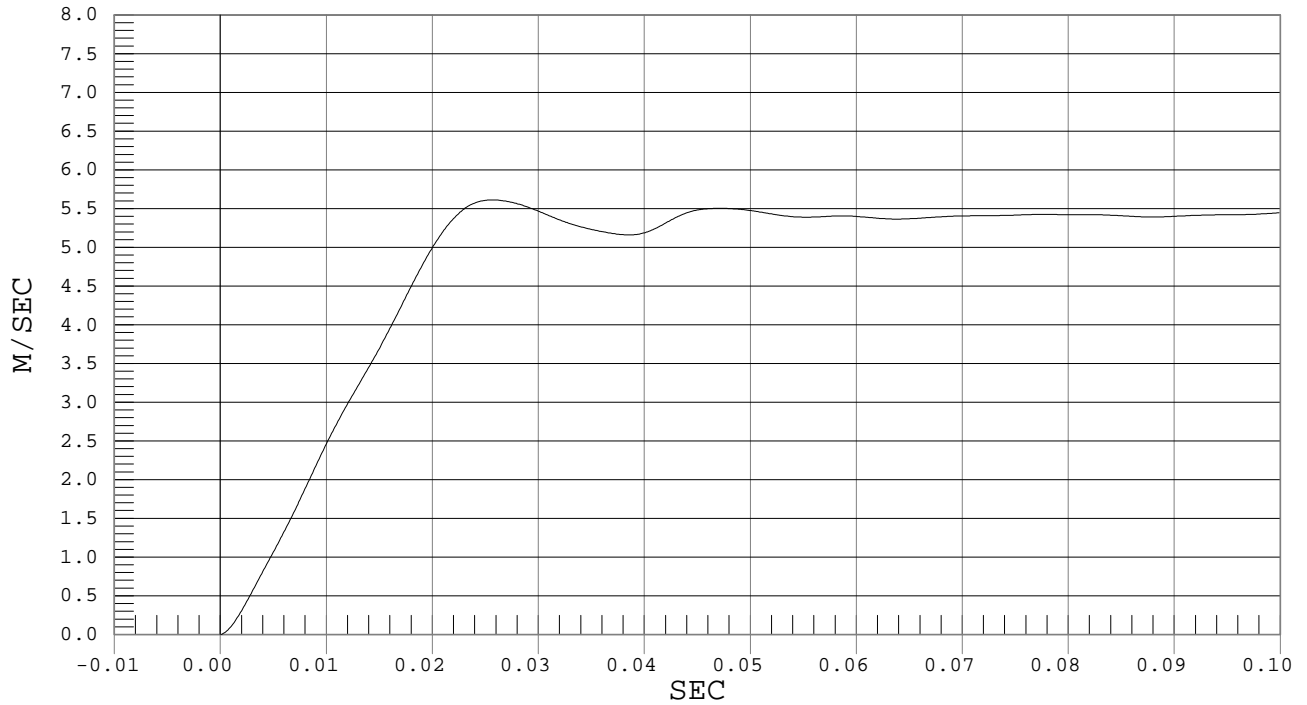


PENDULUM DECELERATION

Test Desc.: Neck Bending
Component: Dummy #033

Test Date: 03-19-03
Speed: 18.3 fps, 5.58 M/s

Ymin = 0 M/SEC @ 0.0000 SEC, Ymax = 6.44 M/SEC @ 0.1922 SEC

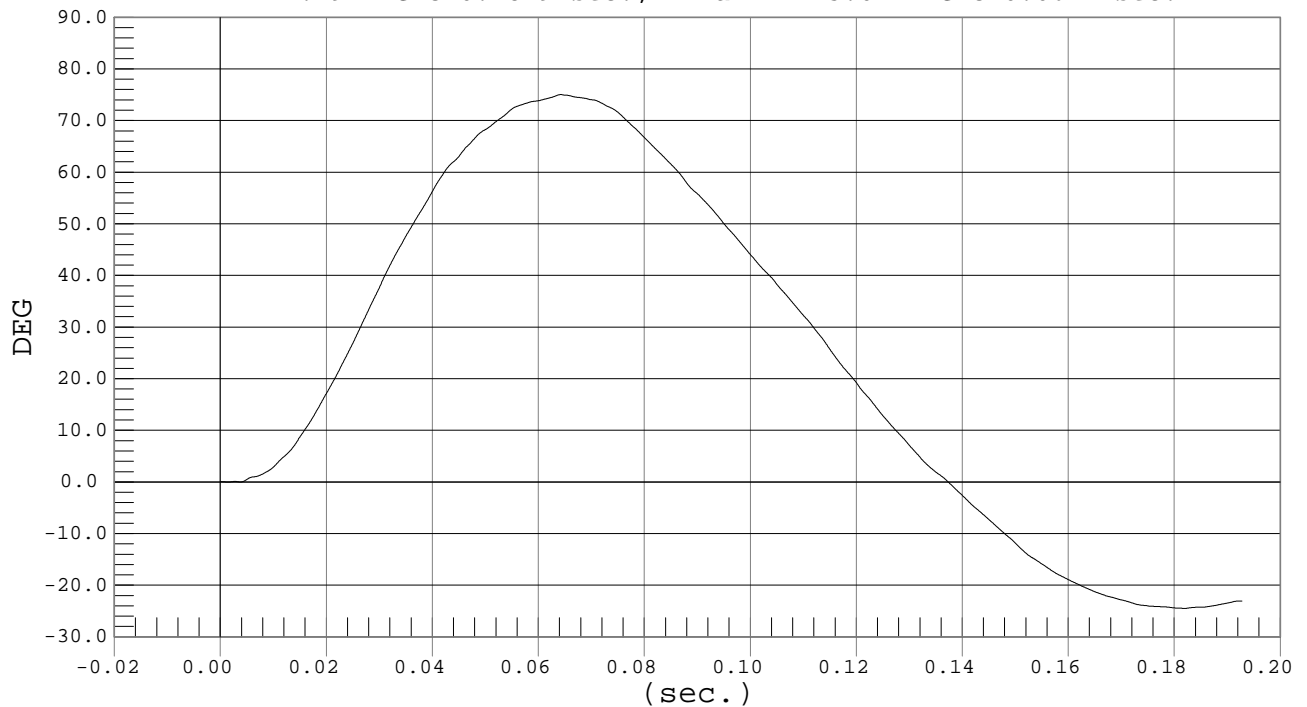


FLEXION ANGLE

Test Desc.: Neck Bending
Component: Dummy #033

Test Date: 03-19-03
Speed: 18.3 fps, 5.58 M/s

Ymin = -24.49 DEG @ 0.1819 sec., Ymax = 75.02 DEG @ 0.0641 sec.



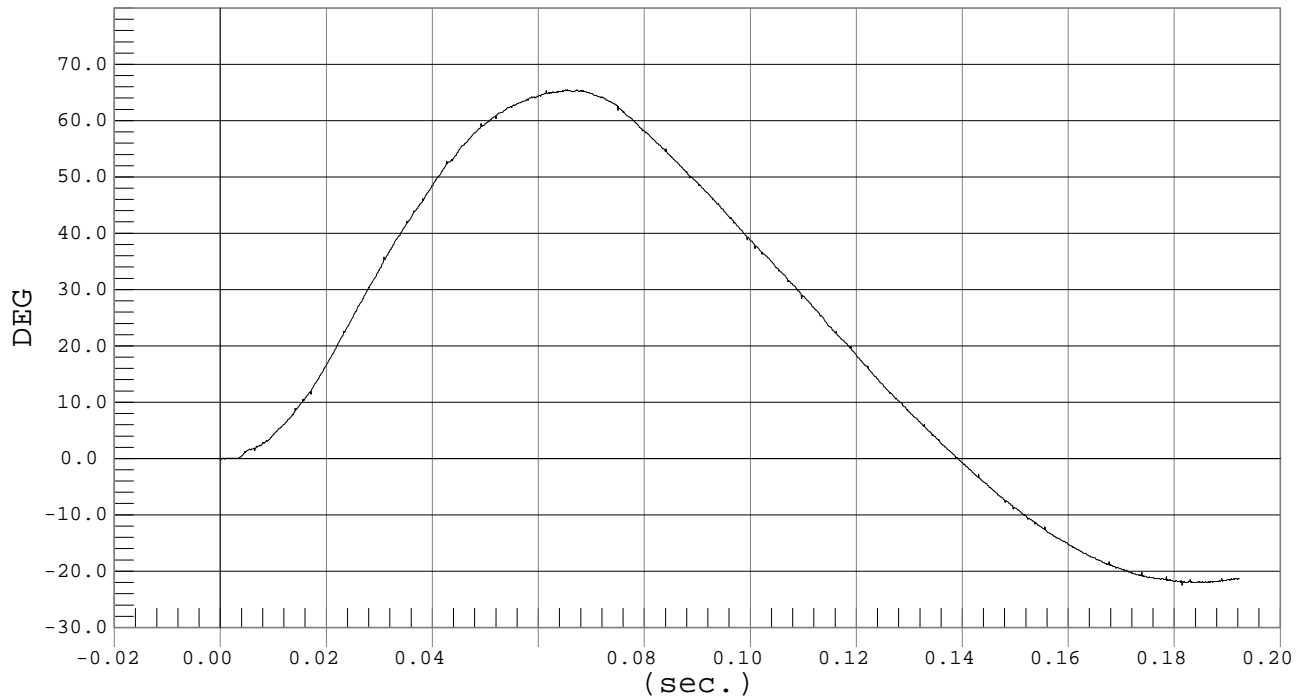


Test Desc.: Neck Bending
Component: Dummy #033

FRONT

Test Date: 03-19-03
Speed: 18.3 fps, 5.58 M/s

Ymin = -22.49 DEG @ 0.1814 sec., Ymax = 65.5 DEG @ 0.0651 sec.

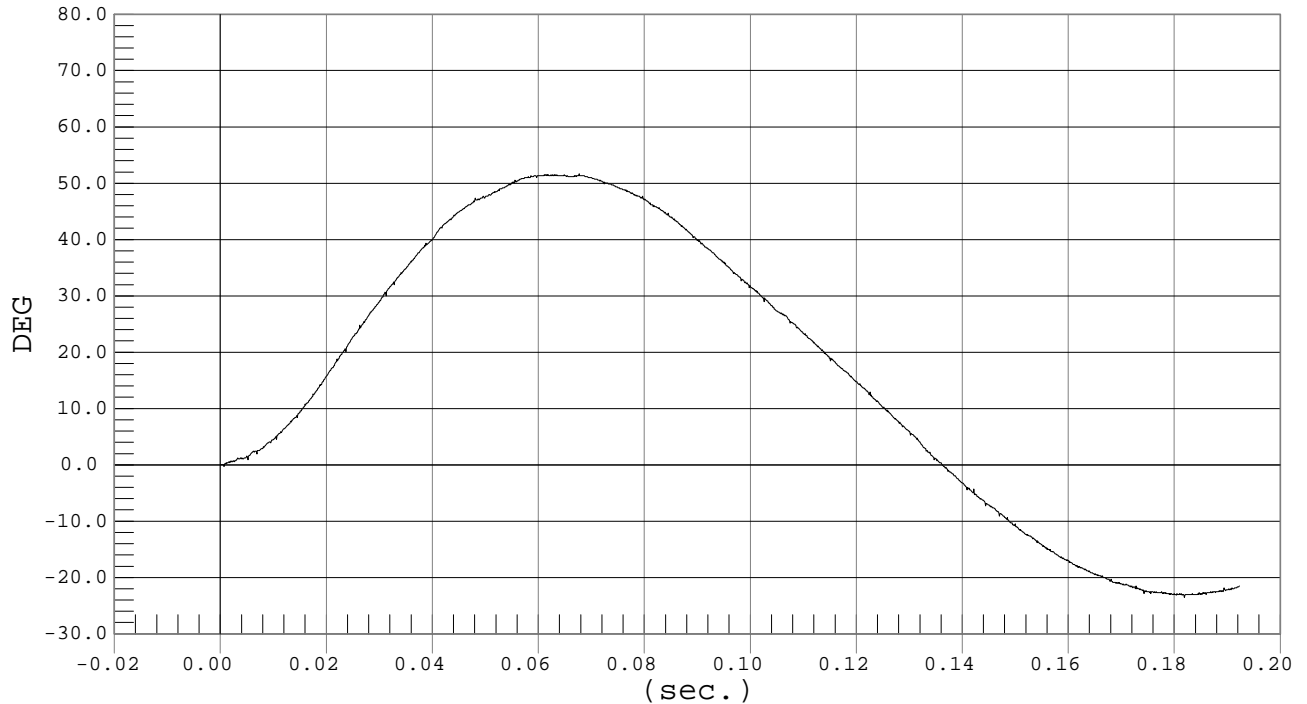


Test Desc.: Neck Bending
Component: Dummy #033

REAR

Test Date: 03-19-03
Speed: 18.3 fps, 5.58 M/s

Ymin = -23.51 DEG @ 0.1818 sec., Ymax = 51.7 DEG @ 0.0676 sec.



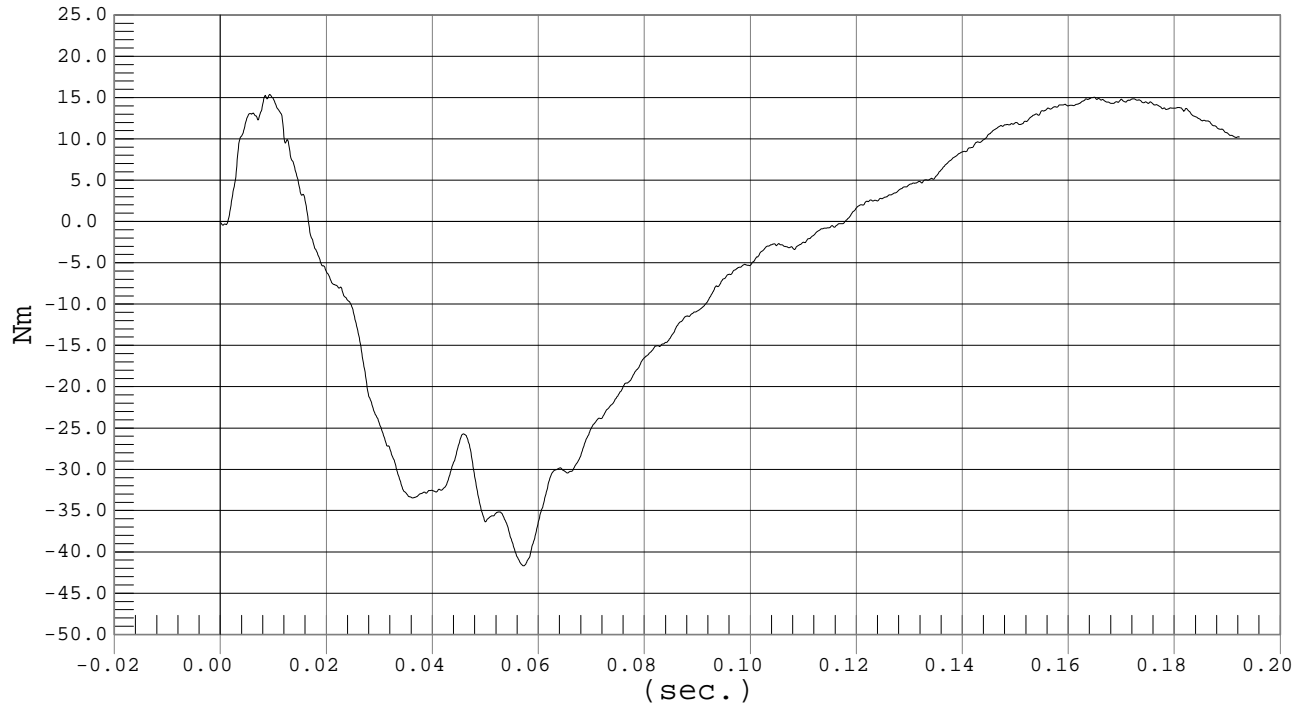


Test Desc.: Neck Bending
Component: Dummy #033

OCCIPITAL MOMENT

Test Date: 03-19-03
Speed: 18.3 fps, 5.58 M/s

Ymin = -41.69 Nm @ 0.0571 sec., Ymax = 15.37 Nm @ 0.0092 sec.



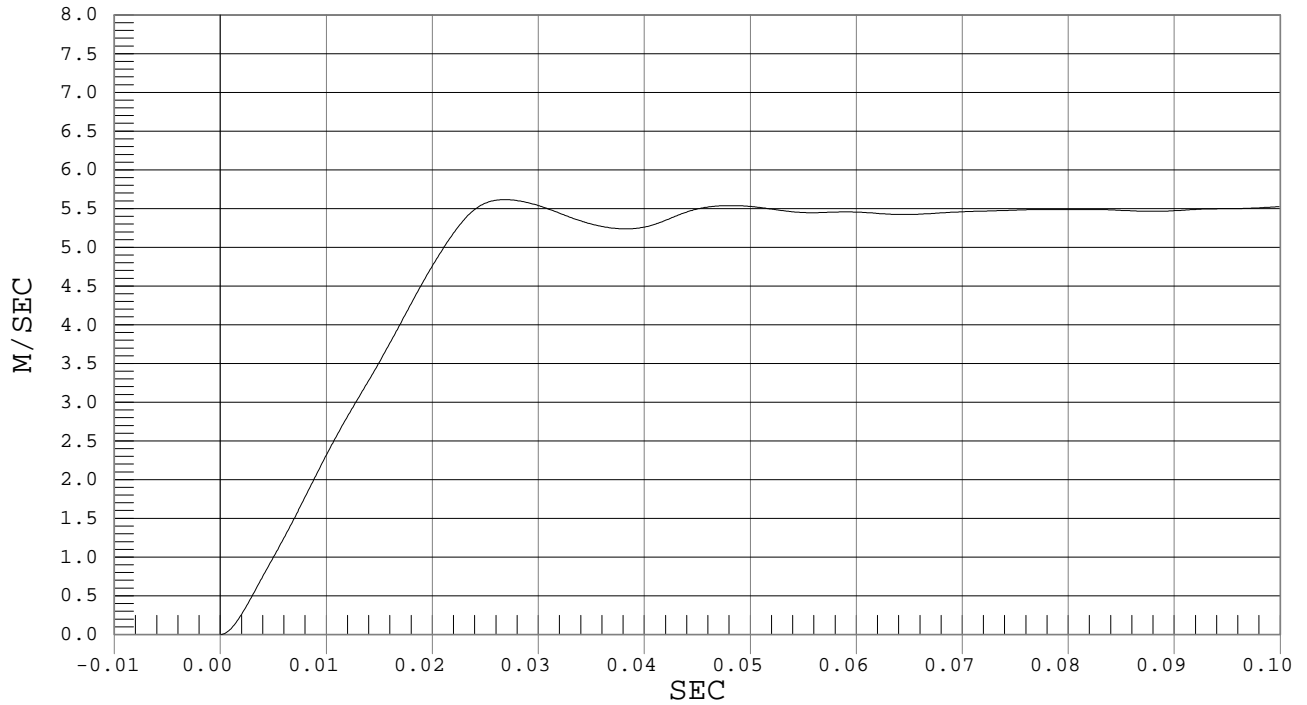


PENDULUM DECELERATION

Test Desc.: Neck Bending
Component: Dummy #033

Test Date: 03-19-03
Speed: 18.3 fps, 5.57 M/s

Ymin = 0 M/SEC @ 0.0000 SEC, Ymax = 6.59 M/SEC @ 0.1922 SEC

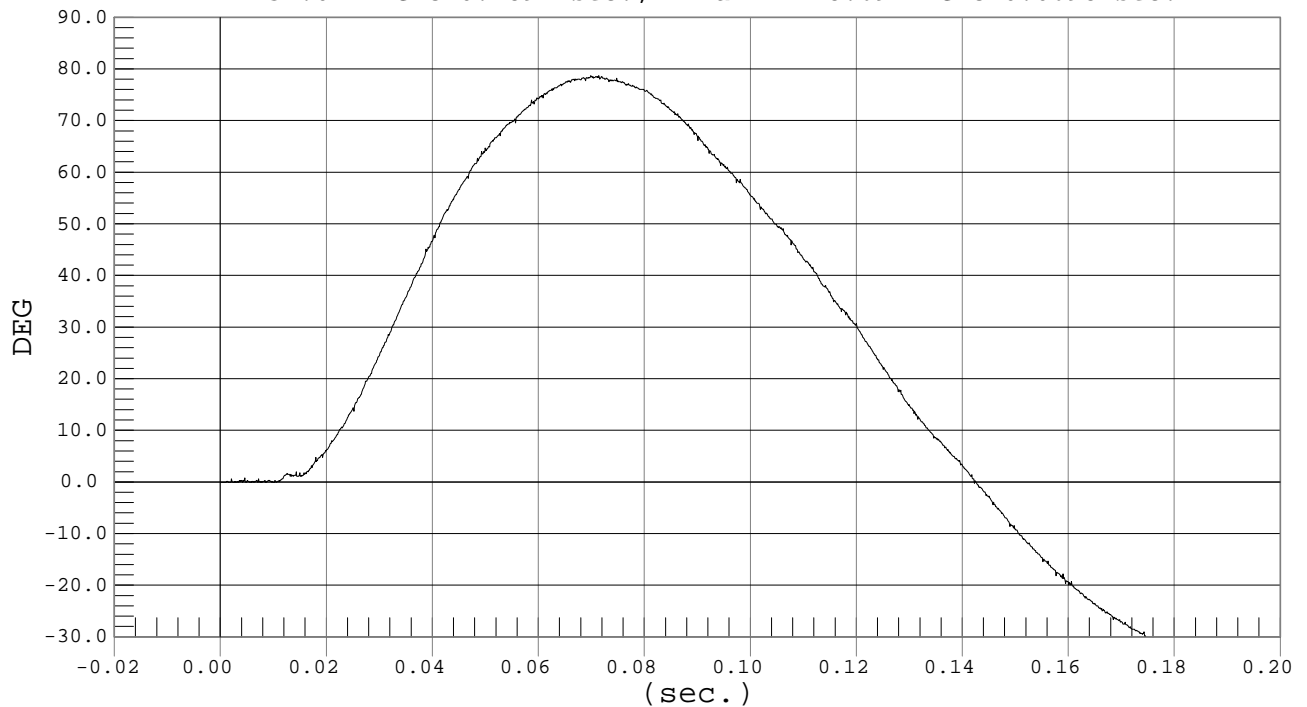


FLEXION ANGLE

Test Desc.: Neck Bending
Component: Dummy #033

Test Date: 03-19-03
Speed: 18.3 fps, 5.57 M/s

Ymin = -34.04 DEG @ 0.1892 sec., Ymax = 78.69 DEG @ 0.0698 sec.



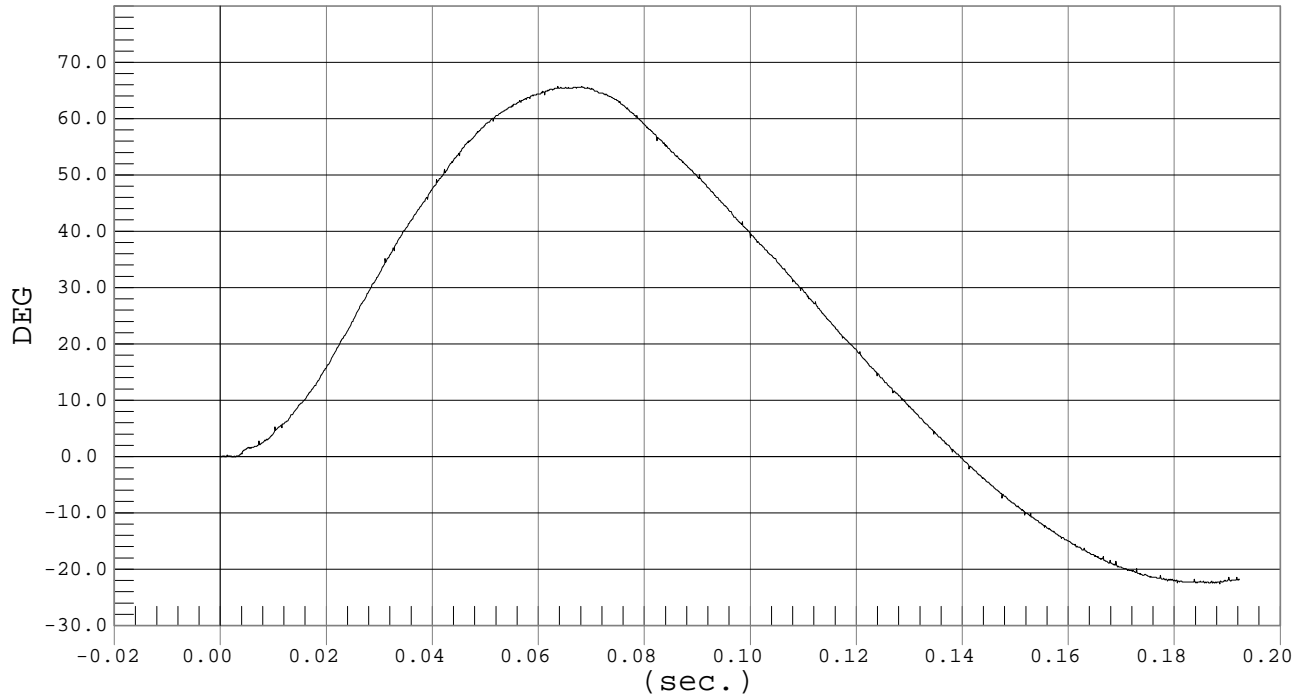


Test Desc.: Neck Bending
Component: Dummy #033

FRONT

Test Date: 03-19-03
Speed: 18.3 fps, 5.57 M/s

Ymin = -22.59 DEG @ 0.1885 sec., Ymax = 65.72 DEG @ 0.0636 sec.

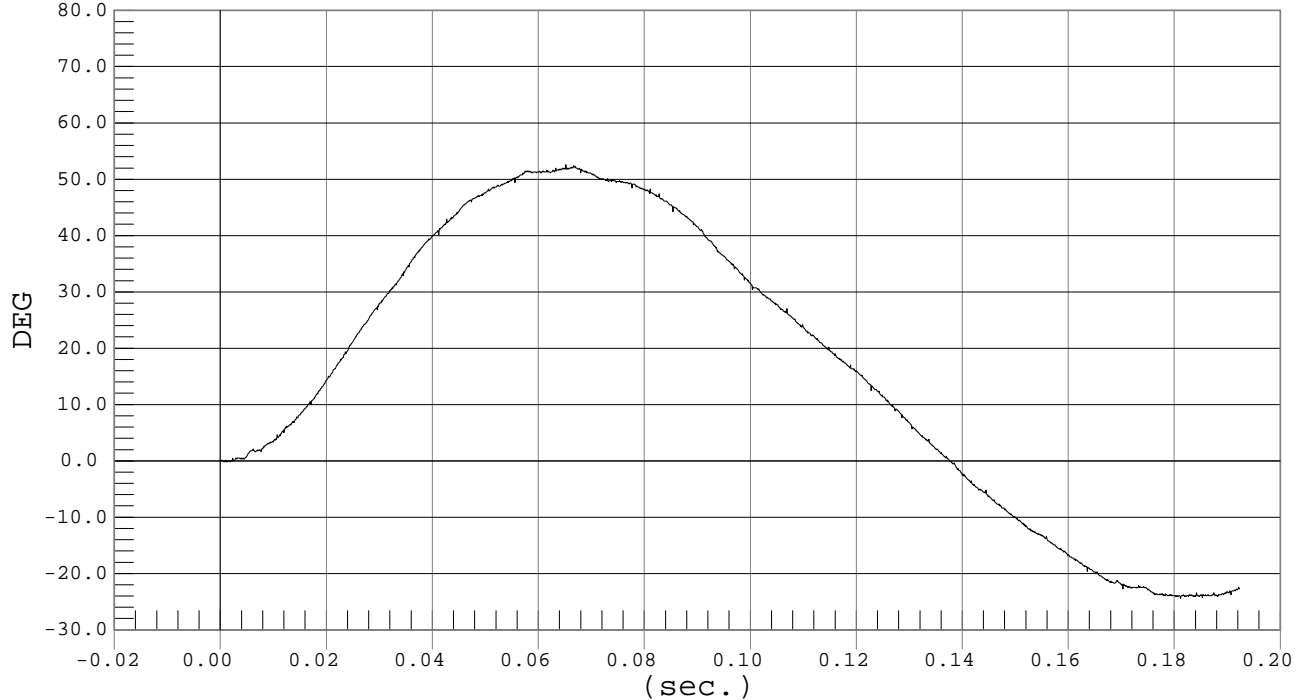


Test Desc.: Neck Bending
Component: Dummy #033

REAR

Test Date: 03-19-03
Speed: 18.3 fps, 5.57 M/s

Ymin = -24.43 DEG @ 0.1811 sec., Ymax = 52.62 DEG @ 0.0651 sec.



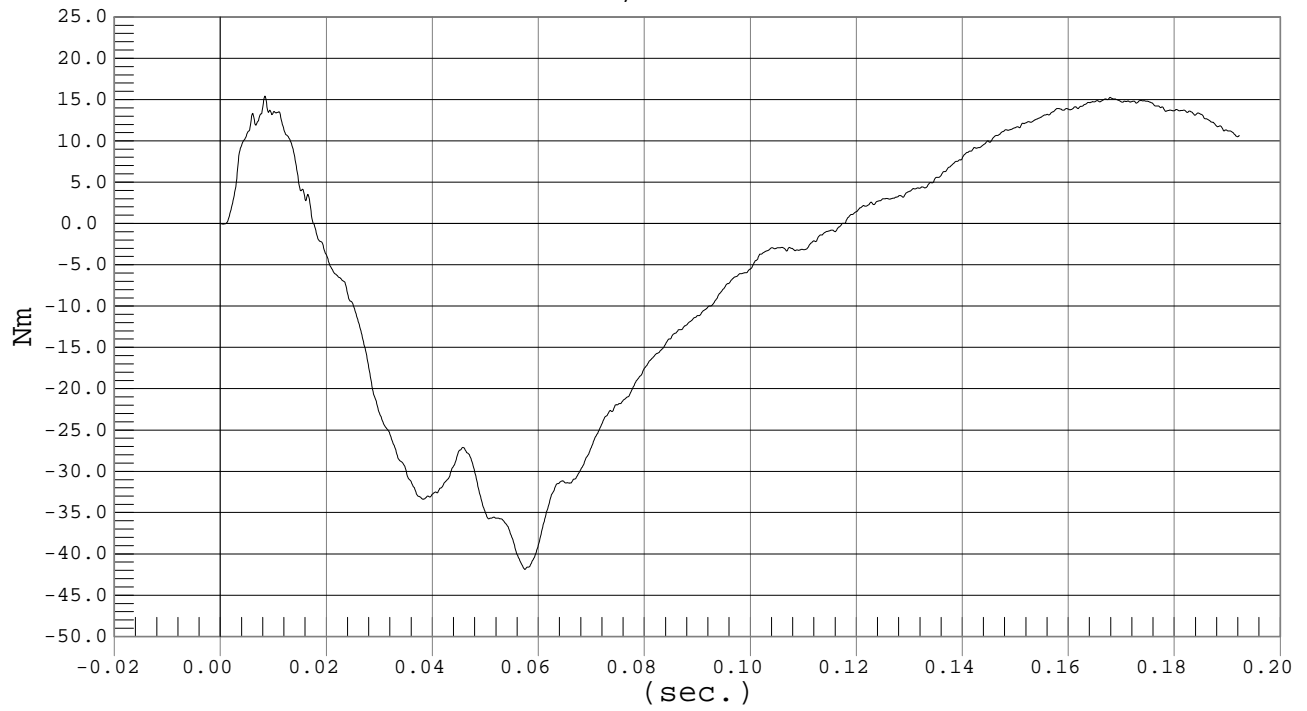


Test Desc.: Neck Bending
Component: Dummy #033

OCCIPITAL MOMENT

Test Date: 03-19-03
Speed: 18.3 fps, 5.57 M/s

Ymin = -41.86 Nm @ 0.0574 sec., Ymax = 15.43 Nm @ 0.0083 sec.



MGA RESEARCH CORPORATION
 SHOULDER IMPACT TEST
 SID IIs DUMMY

Date: 3/19/03
 Dummy Serial Number: 033
 Test Number: D03383/D03393

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03383</u>	<u>D03393</u>
Temperature (°C)	20.8° – 22.2°	21.0	21.3
Humidity	10% - 70%	26	25
Impact Velocity	4.41 - 4.59 m/s	4.52	4.52
Probe Force	1.6 - 2.4 kN	2.3	2.3
Shoulder Displacement	27-39 mm	32	32

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

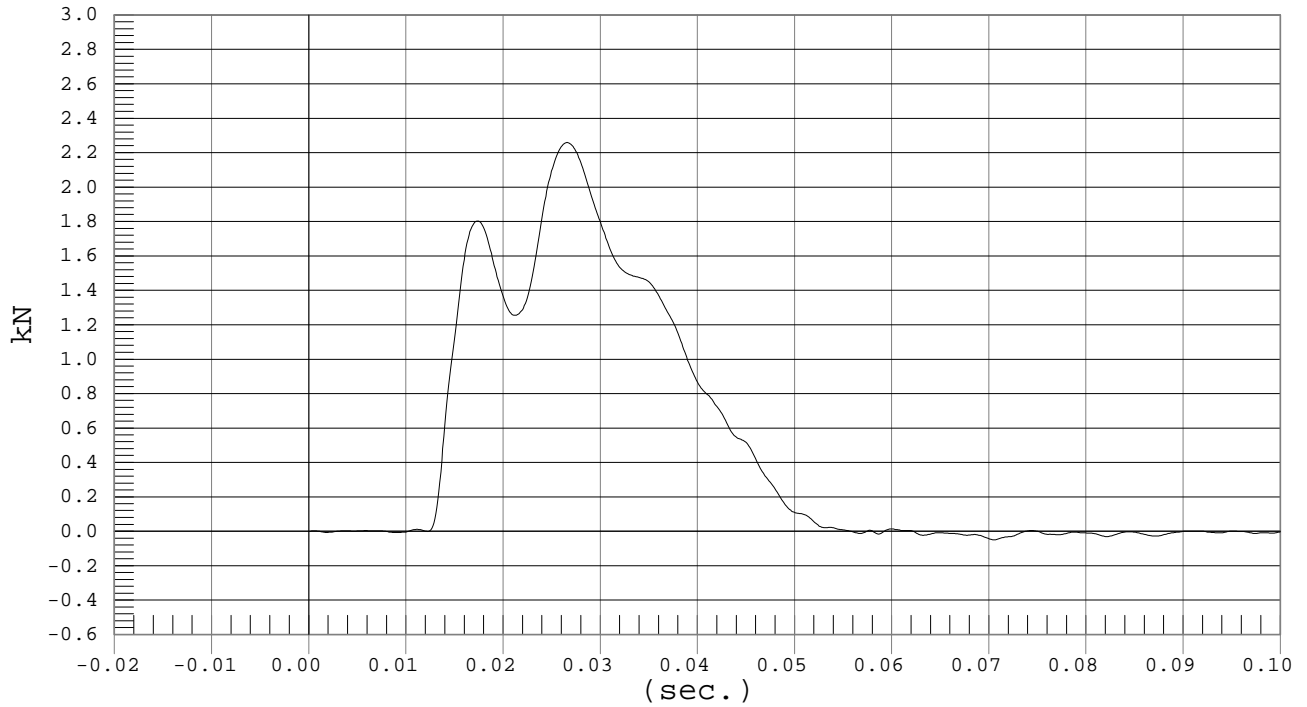


PROBE FORCE

Test Desc.: Shoulder Impact
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.8 fps, 4.52 M/s

Ymin = -.05 kN @ 0.0704 sec., Ymax = 2.26 kN @ 0.0265 sec.

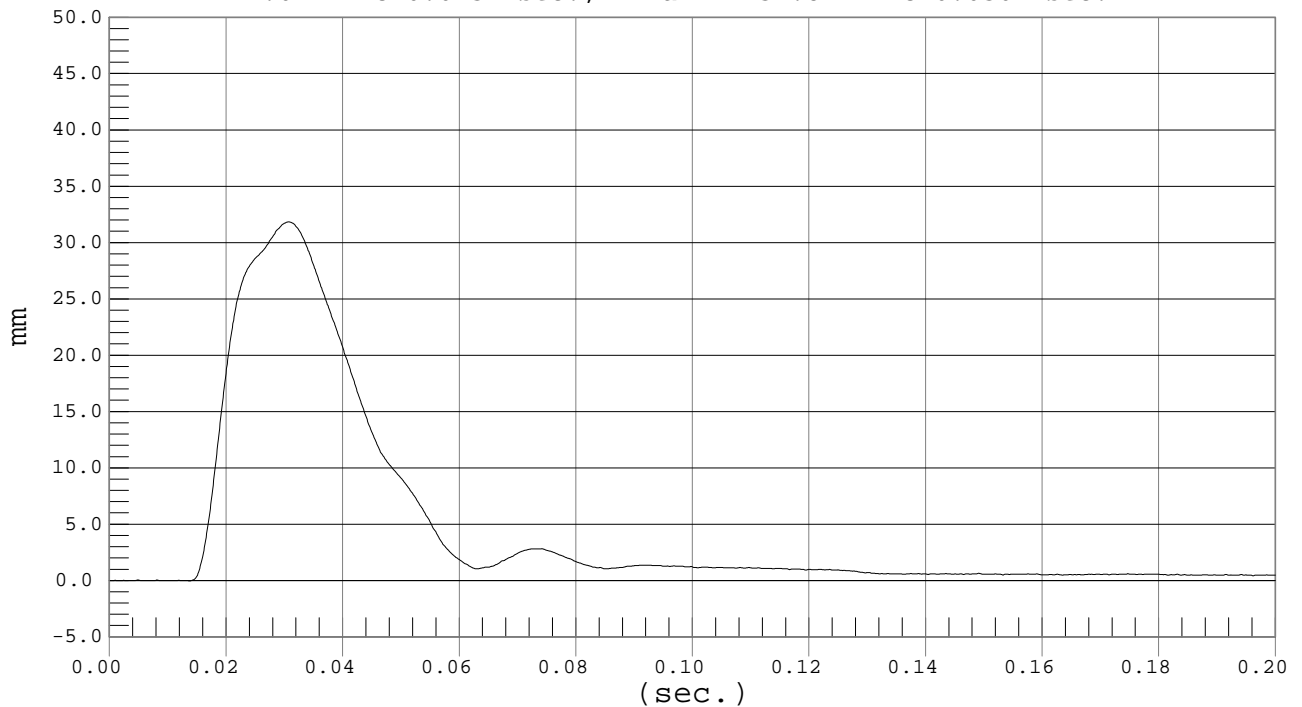


SHOULDER DISPLACEMENT

Test Desc.: Shoulder Impact
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.8 fps, 4.52 M/s

Ymin = -.04 mm @ 0.0137 sec., Ymax = 31.84 mm @ 0.0307 sec.



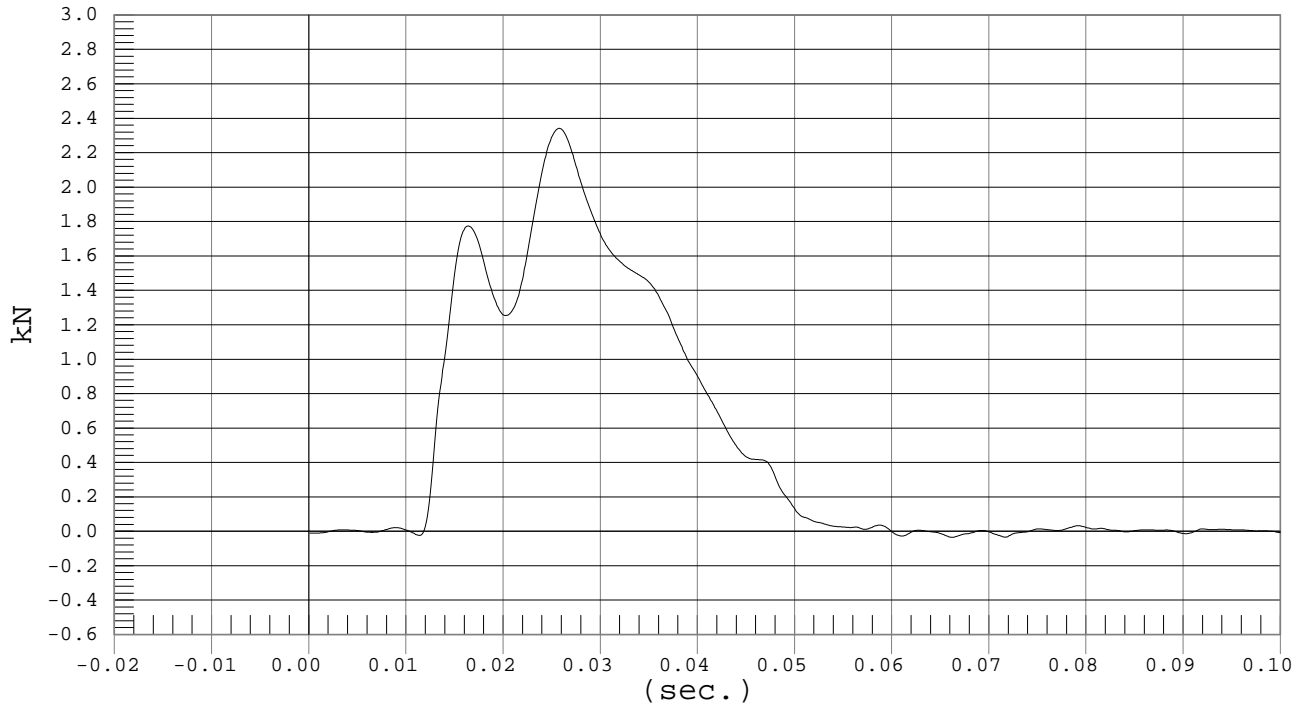


PROBE FORCE

Test Desc.: Shoulder Impact
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.8 fps, 4.52 M/s

Ymin = -.04 kN @ 0.0661 sec., Ymax = 2.34 kN @ 0.0257 sec.

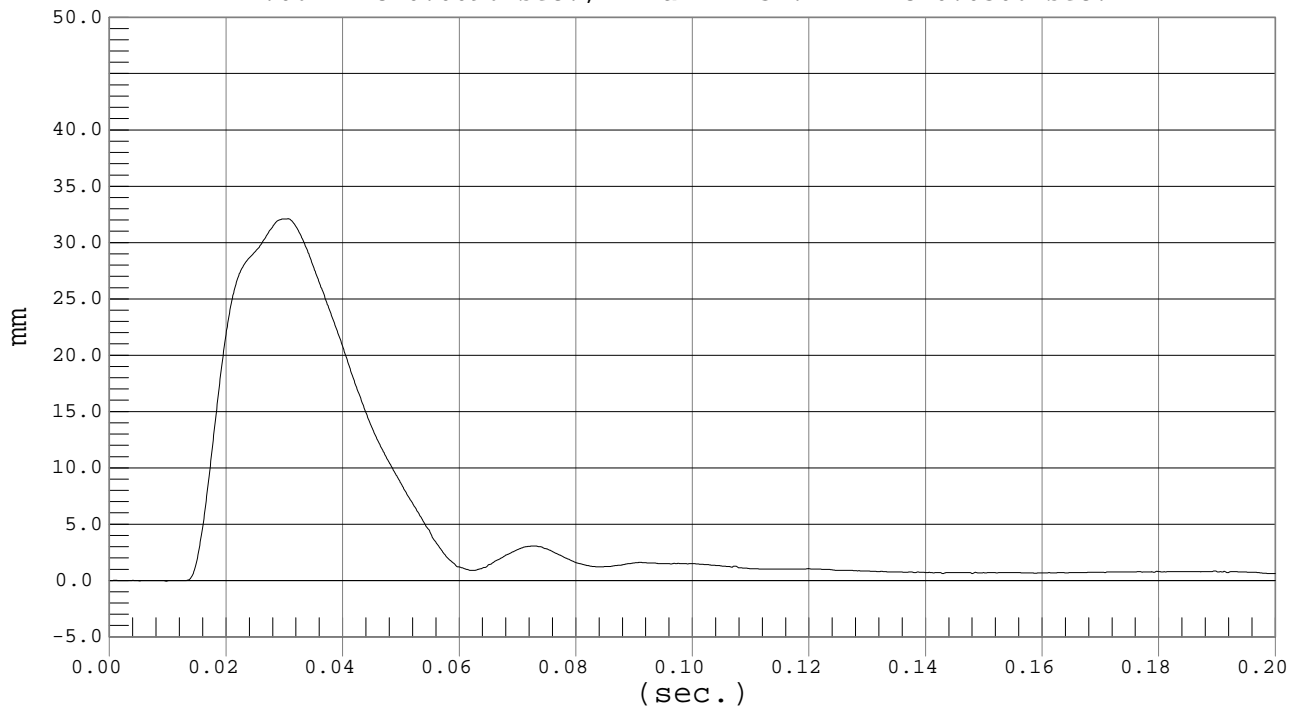


SHOULDER DISPLACEMENT

Test Desc.: Shoulder Impact
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.8 fps, 4.52 M/s

Ymin = -.06 mm @ 0.0096 sec., Ymax = 32.11 mm @ 0.0306 sec.



MGA RESEARCH CORPORATION
 THORAX (WITH ARM) IMPACT TESTS
 SID IIs DUMMY

Date: 3/19/03
 Dummy Serial Number: 033
 Test Number: D03384/D03394

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03384</u>	<u>D03394</u>
Temperature (°C)	20.8° – 22.2°	21.0	21.2
Humidity	10% - 70%	26	25
Impact Velocity	6.57 - 6.84 m/s	6.74	6.75
Probe Force	4.1 – 4.7 kN	4.78*	4.78*
Upper Spine Acceleration	34 – 48 g's	42	42
Lower Spine Acceleration	31 - 36 g's	36	35
Upper Rib Displacement	23 - 35 mm	28	29
Middle Rib Displacement	29 - 44 mm	33	33
Lower Rib Displacement	33 - 40 mm	36	37
Shoulder Displacement	30 - 42 mm	33	35

*TEST DOES NOT MEET SPECIFICATIONS

Technician: _____

Approved By: _____

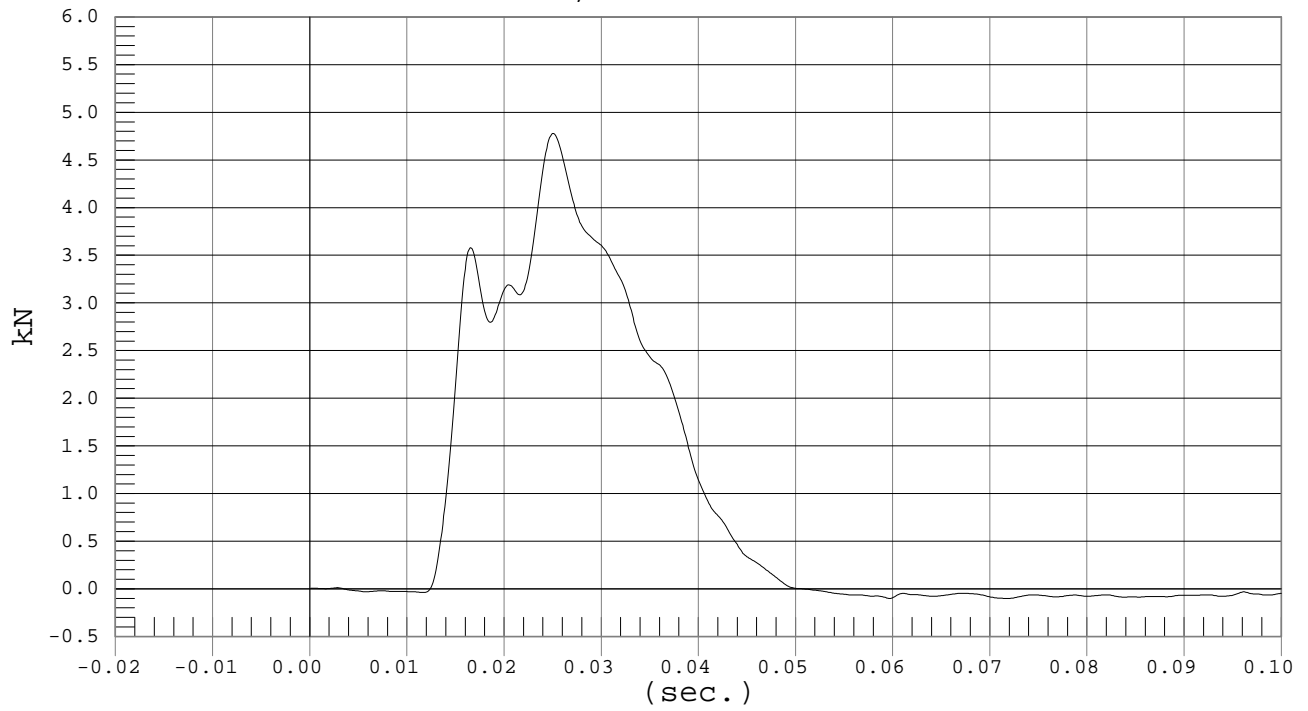


Test Desc.: Thorax With Arm
Component: Dummy #033

PROBE FORCE

Test Date: 03-19-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -.5 kN @ 0.1145 sec., Ymax = 4.78 kN @ 0.0250 sec.



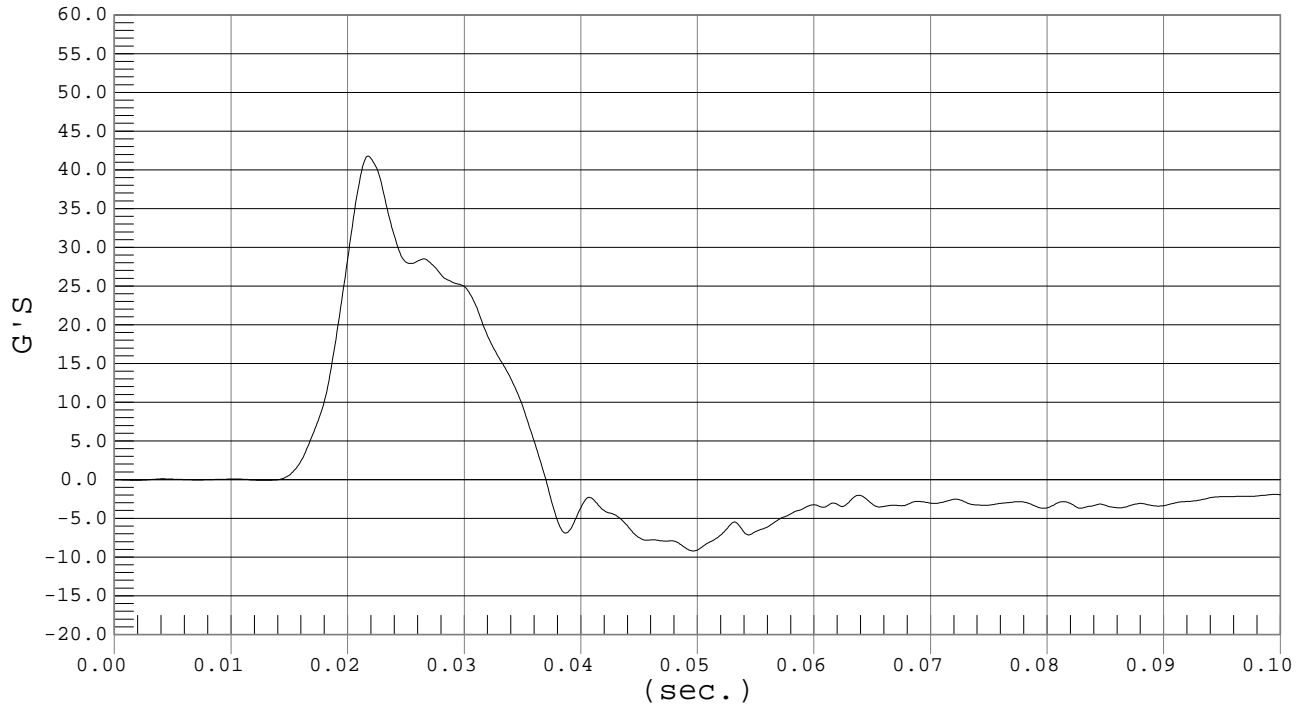


UPPER SPINE ACCELERATION

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -9.22 G'S @ 0.0496 sec., Ymax = 41.77 G'S @ 0.0216 sec.

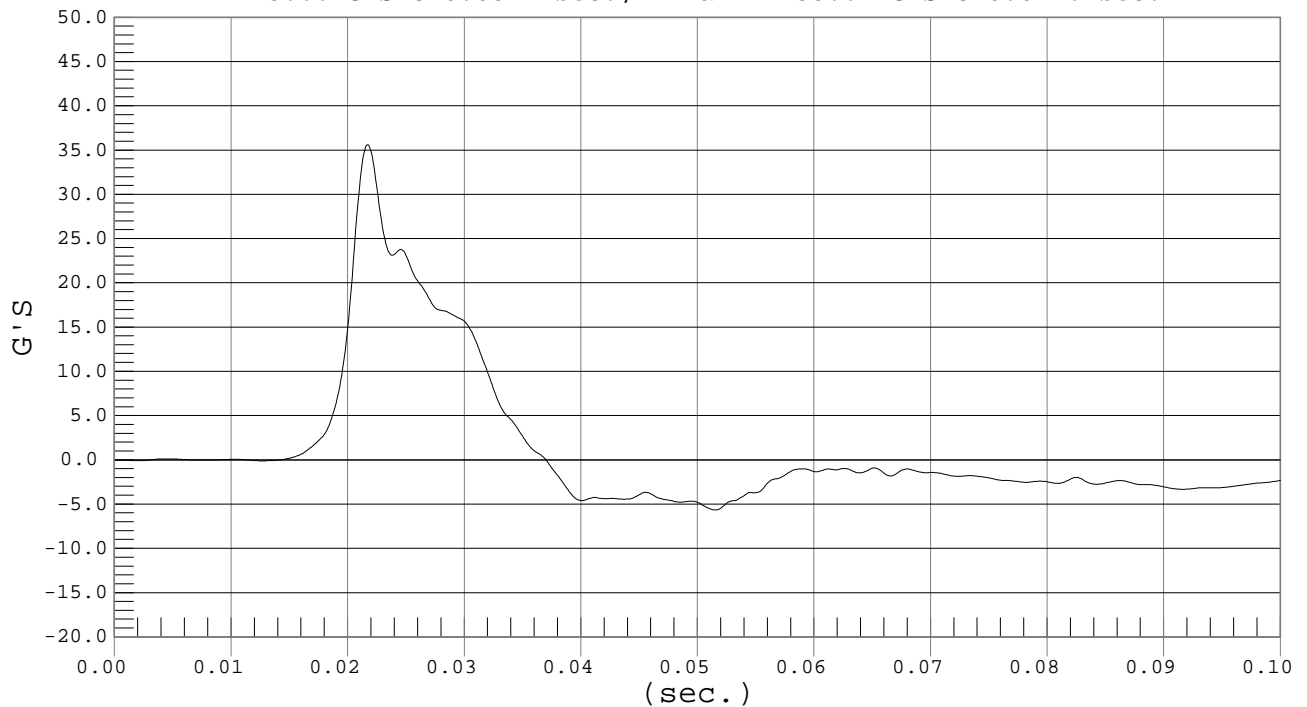


LOWER SPINE ACCELERATION

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -5.66 G'S @ 0.0514 sec., Ymax = 35.61 G'S @ 0.0216 sec.



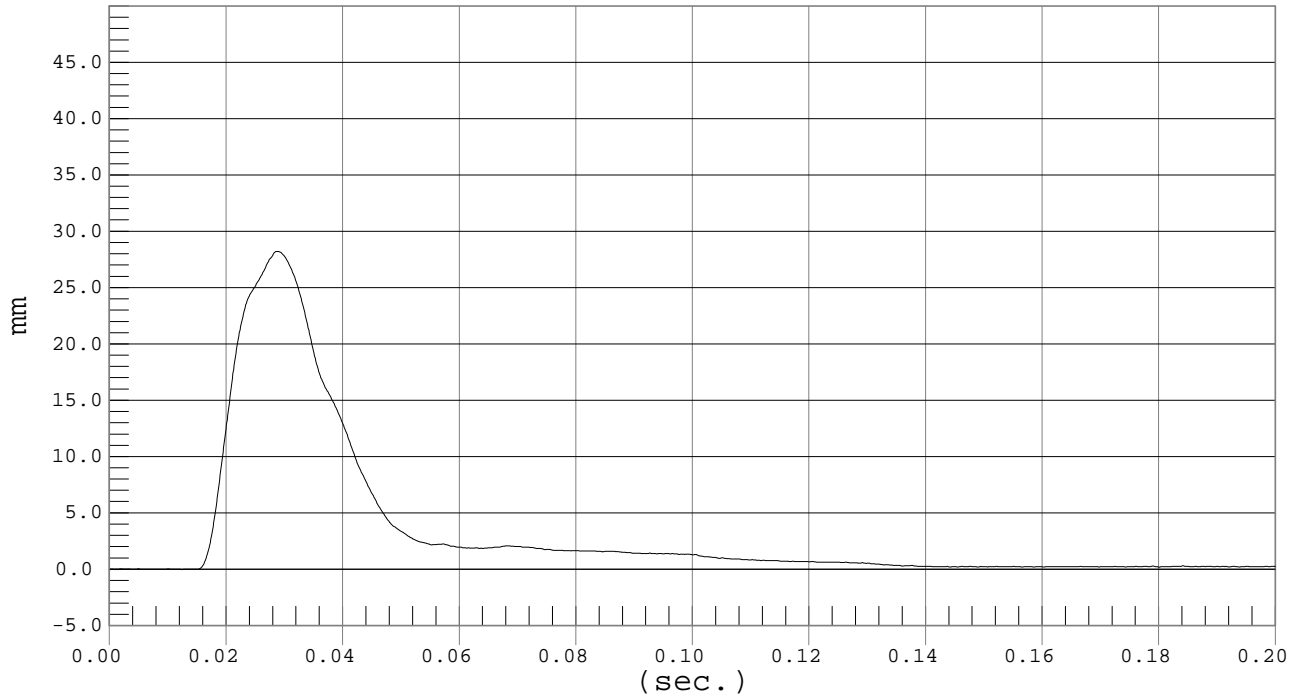


UPPER RIB DISPLACEMENT

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -.02 mm @ 0.0014 sec., Ymax = 28.21 mm @ 0.0287 sec.

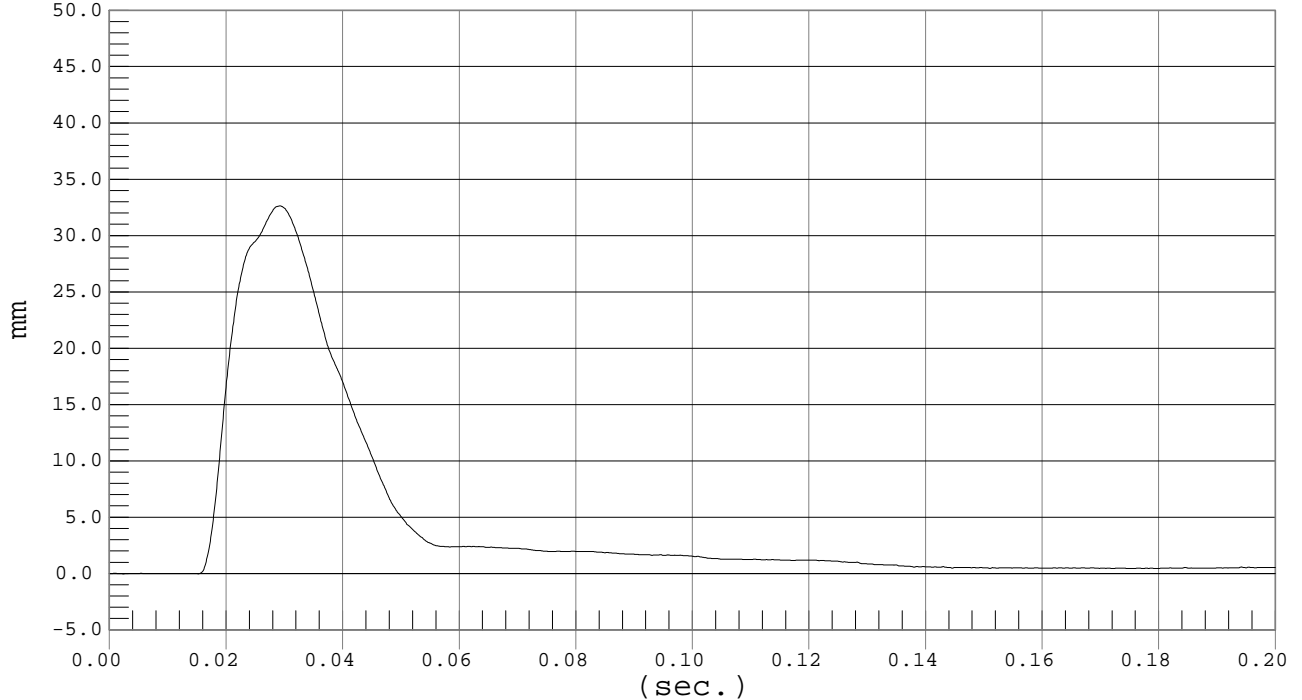


MIDDLE RIB DISPLACEMENT

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 22.1 fps, 6.74 M/s

Ymin = -.04 mm @ 0.0023 sec., Ymax = 32.64 mm @ 0.0291 sec.



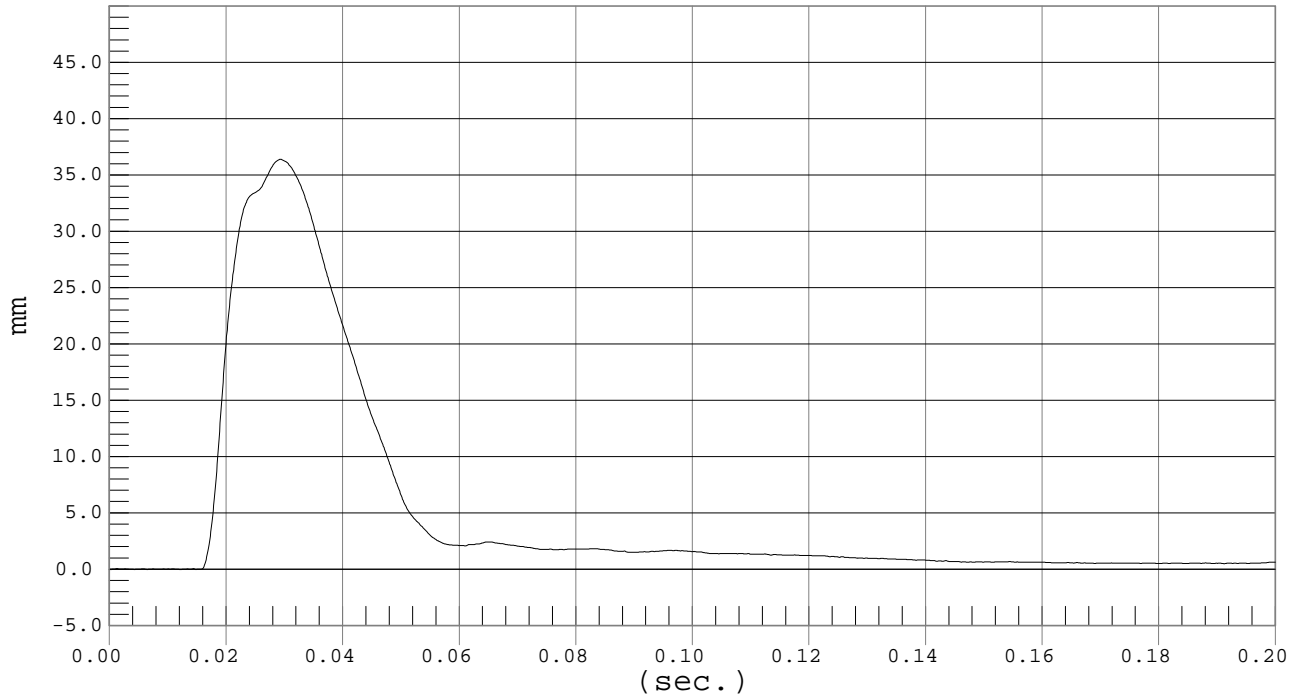


LOWER RIB DISPLACEMENT

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 22.1 fps, 6.74 M/s

Ymin = $-.03$ mm @ 0.0121 sec., Ymax = 36.39 mm @ 0.0293 sec.

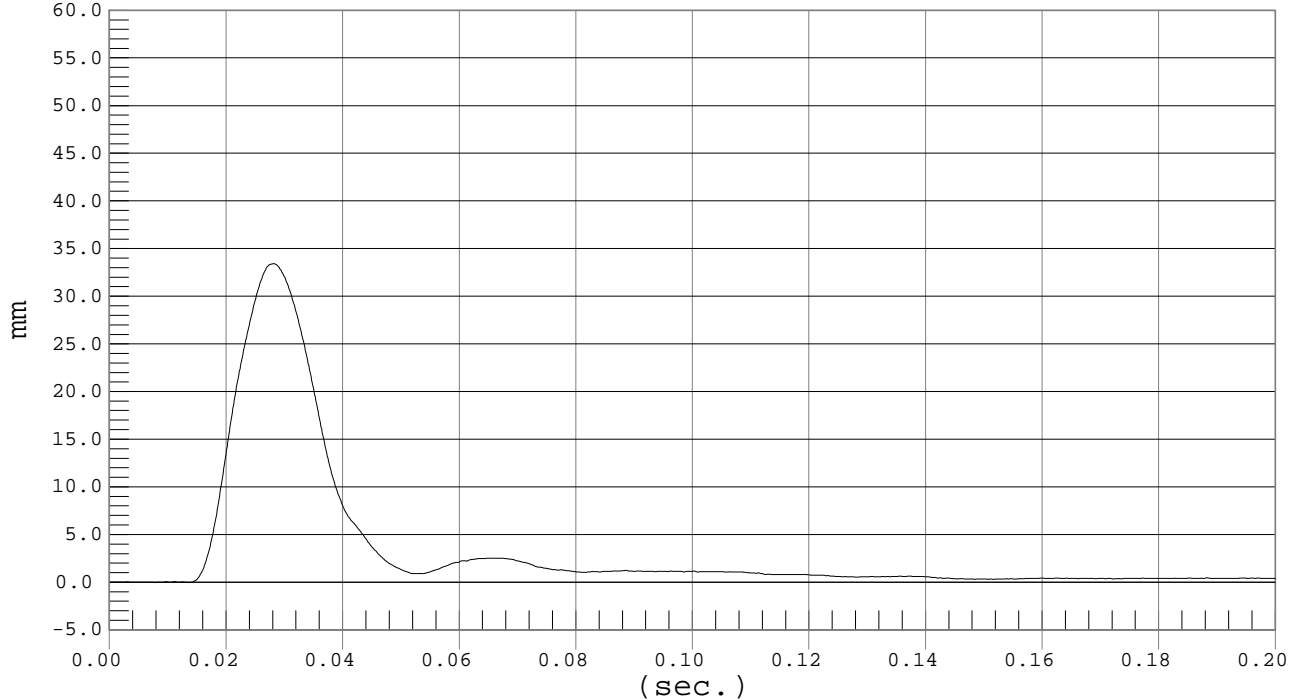


SHOULDER DISPLACEMENT

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 22.1 fps, 6.74 M/s

Ymin = $-.04$ mm @ 0.0077 sec., Ymax = 33.42 mm @ 0.0281 sec.



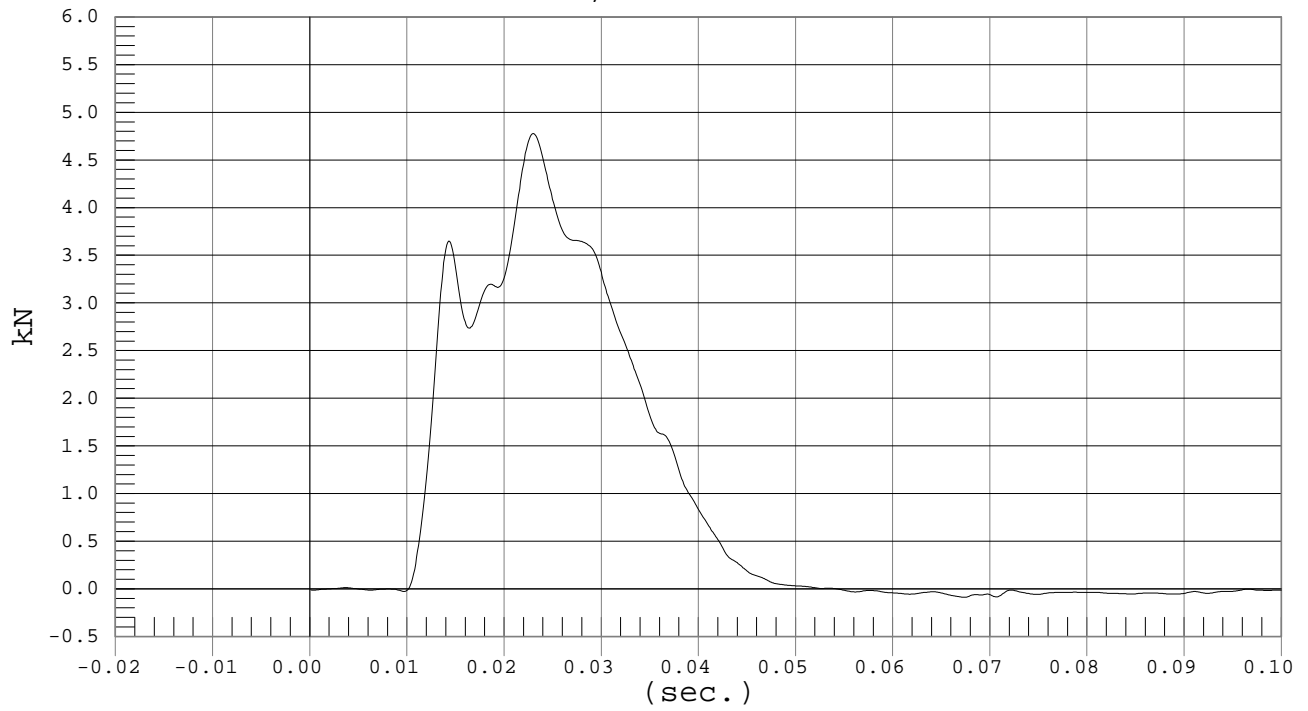


Test Desc.: Thorax With Arm
Component: Dummy #033

PROBE FORCE

Test Date: 03-19-03
Speed: 22.1 fps, 6.75 M/s

Ymin = -.11 kN @ 0.1217 sec., Ymax = 4.78 kN @ 0.0229 sec.



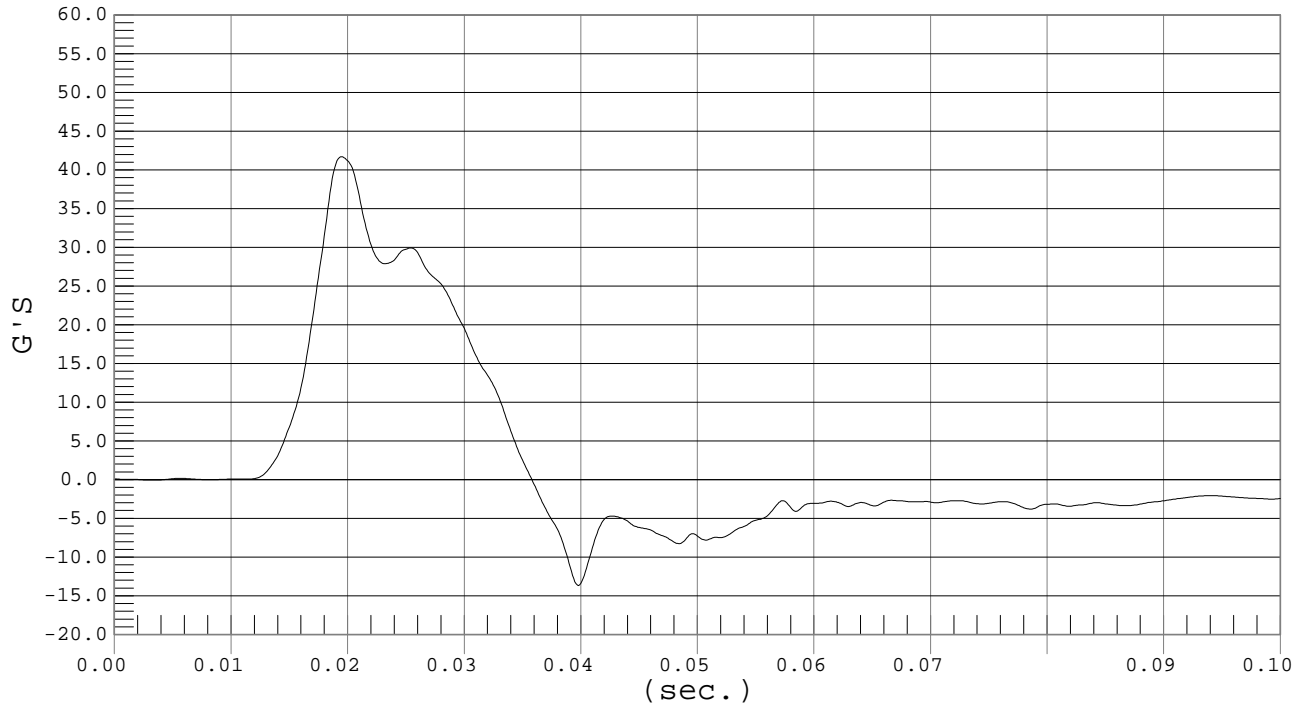


UPPER SPINE ACCELERATION

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 22.1 fps, 6.75 M/s

Ymin = -13.66 G'S @ 0.0397 sec., Ymax = 41.71 G'S @ 0.0194 sec.

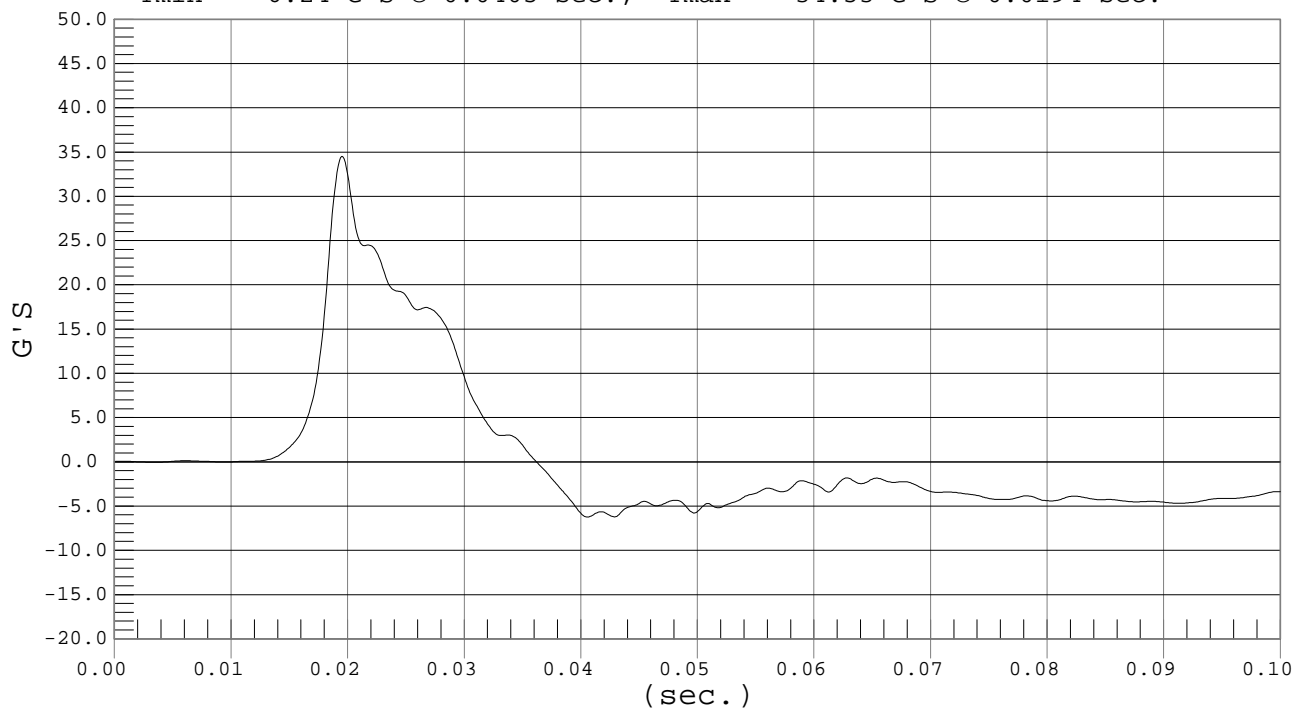


LOWER SPINE ACCELERATION

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 22.1 fps, 6.75 M/s

Ymin = -6.24 G'S @ 0.0405 sec., Ymax = 34.53 G'S @ 0.0194 sec.



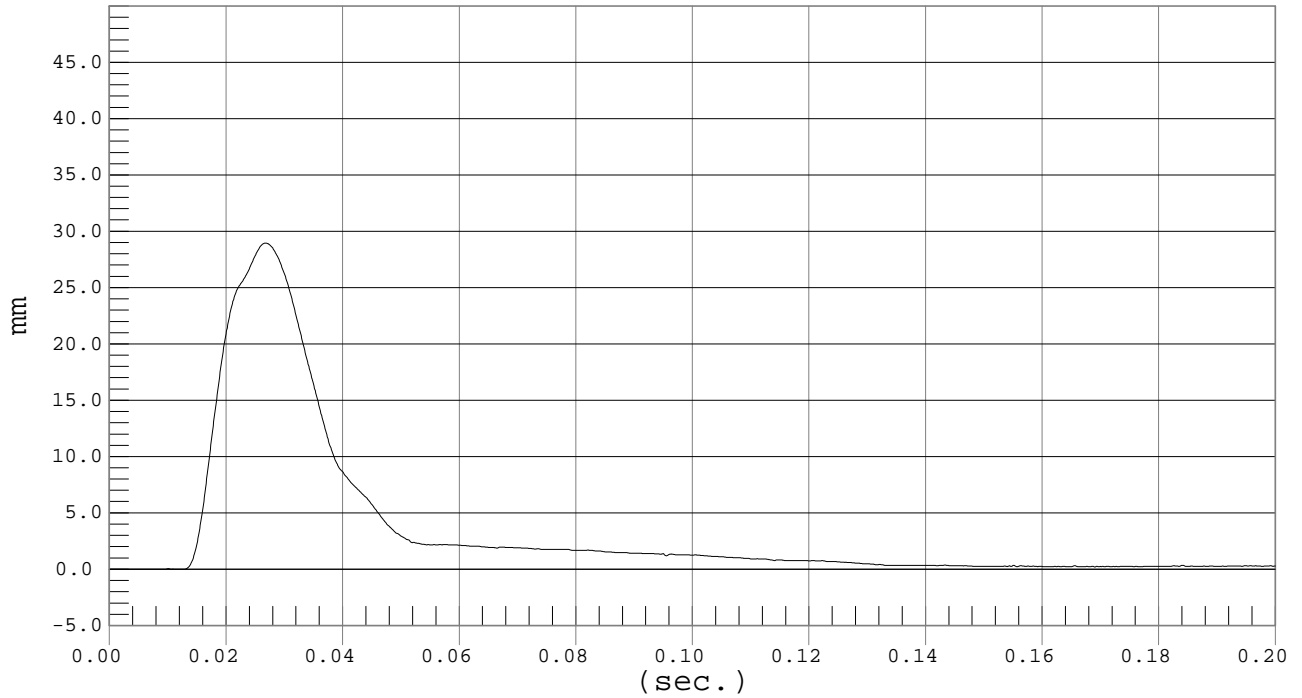


UPPER RIB DISPLACEMENT

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 22.1 fps, 6.75 M/s

Ymin = -.01 mm @ 0.0094 sec., Ymax = 28.95 mm @ 0.0267 sec.

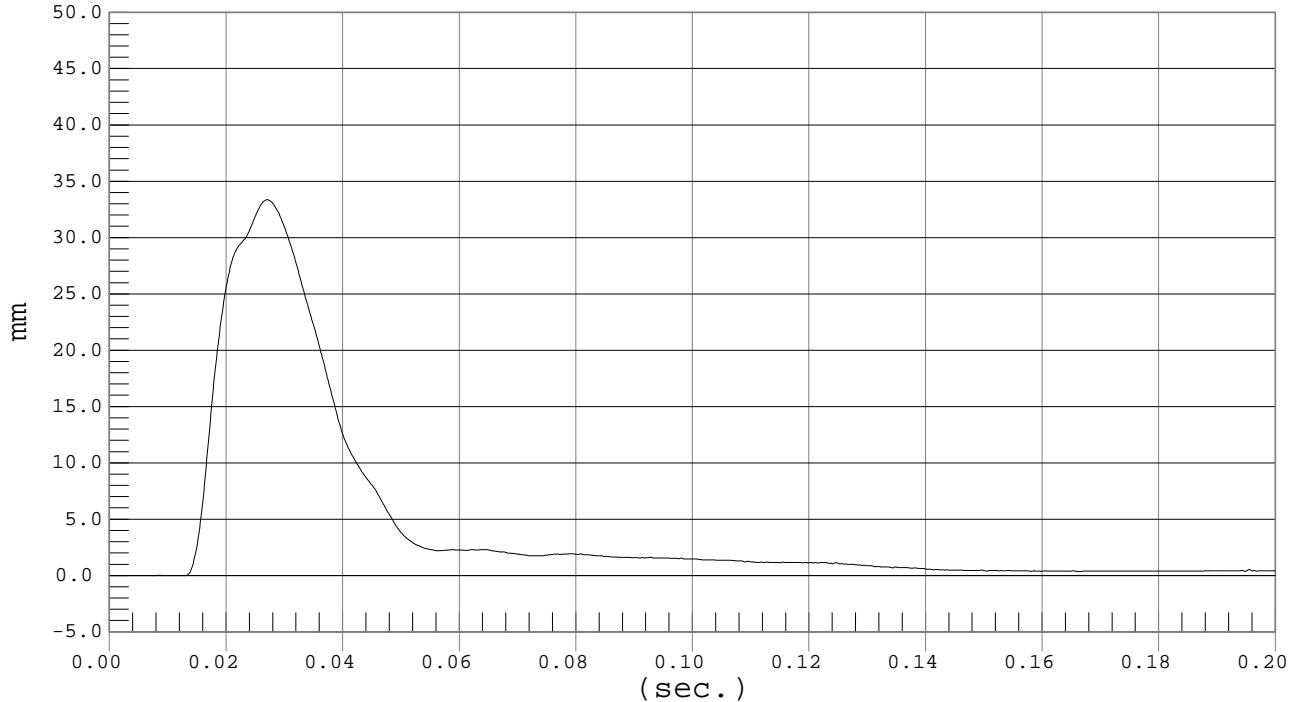


MIDDLE RIB DISPLACEMENT

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 22.1 fps, 6.75 M/s

Ymin = -.02 mm @ 0.0061 sec., Ymax = 33.36 mm @ 0.0270 sec.



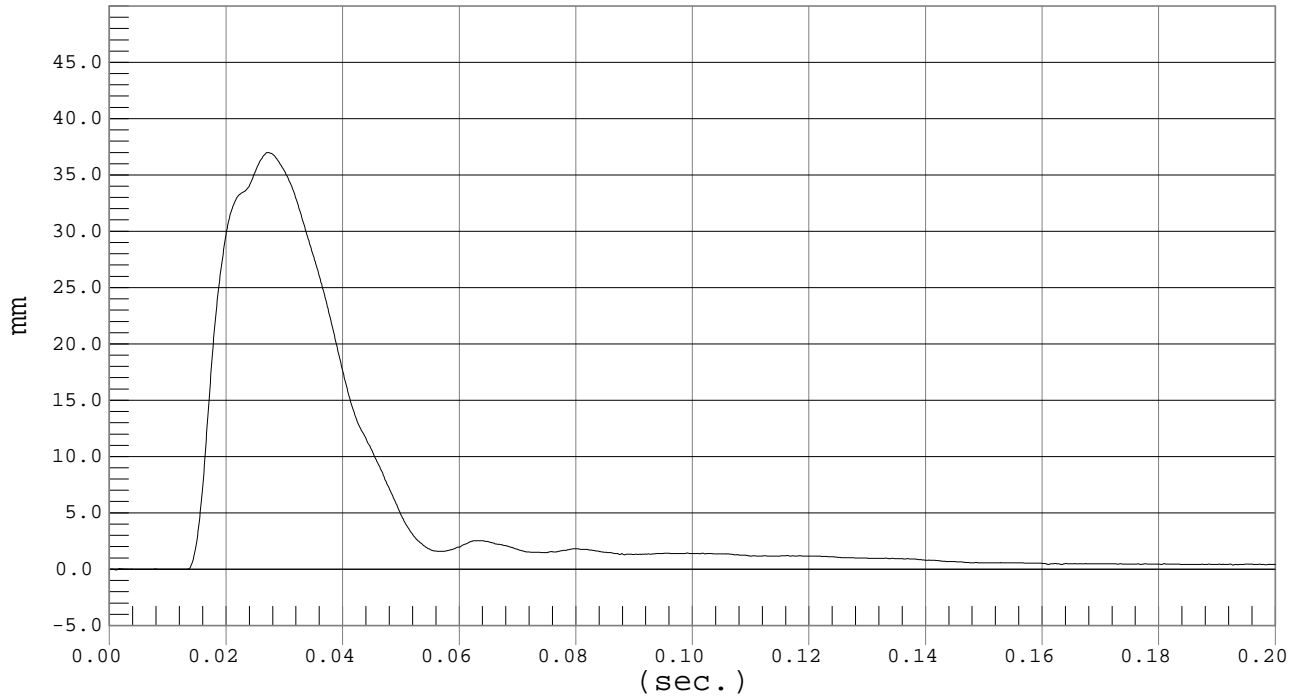


LOWER RIB DISPLACEMENT

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 22.1 fps, 6.75 M/s

Ymin = -0.07 mm @ 0.0010 sec., Ymax = 37 mm @ 0.0271 sec.

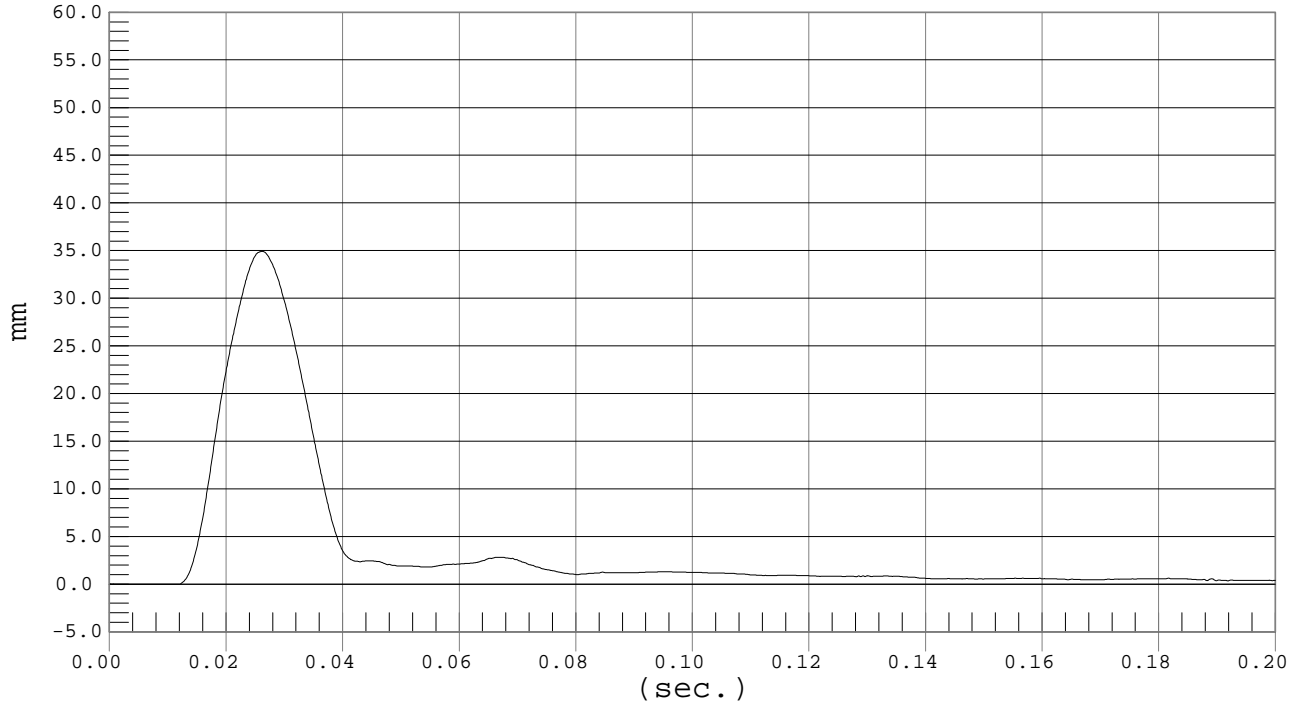


SHOULDER DISPLACEMENT

Test Desc.: Thorax With Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 22.1 fps, 6.75 M/s

Ymin = -0.01 mm @ 0.0010 sec., Ymax = 34.92 mm @ 0.0261 sec.



MGA RESEARCH CORPORATION
 THORAX (WITHOUT ARM) IMPACT TESTS
 SID IIs DUMMY

Date: 3/19/03
 Dummy Serial Number: 033
 Test Number: D03385/D03395

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03385</u>	<u>D03395</u>
Temperature (°C)	20.8° – 22.2°	21.1	21.2
Humidity	10% - 70%	26	25
Impact Velocity	4.2 - 4.4m/s	4.3	4.3
Probe Force	1.8 - 2.3 kN	2.1	2.2
Upper Spine Acceleration	13 - 18 g's	15	15
Lower Spine Acceleration	8 - 13 g's	10	11
Upper Rib Displacement	32 - 41 mm	37	31*
Middle Rib Displacement	40 - 51 mm	43	39.8*
Lower Rib Displacement	34 - 47 mm	42	42

* TEST DOES NOT MEET SPECIFICATIONS

Technician: _____

Approved By: _____

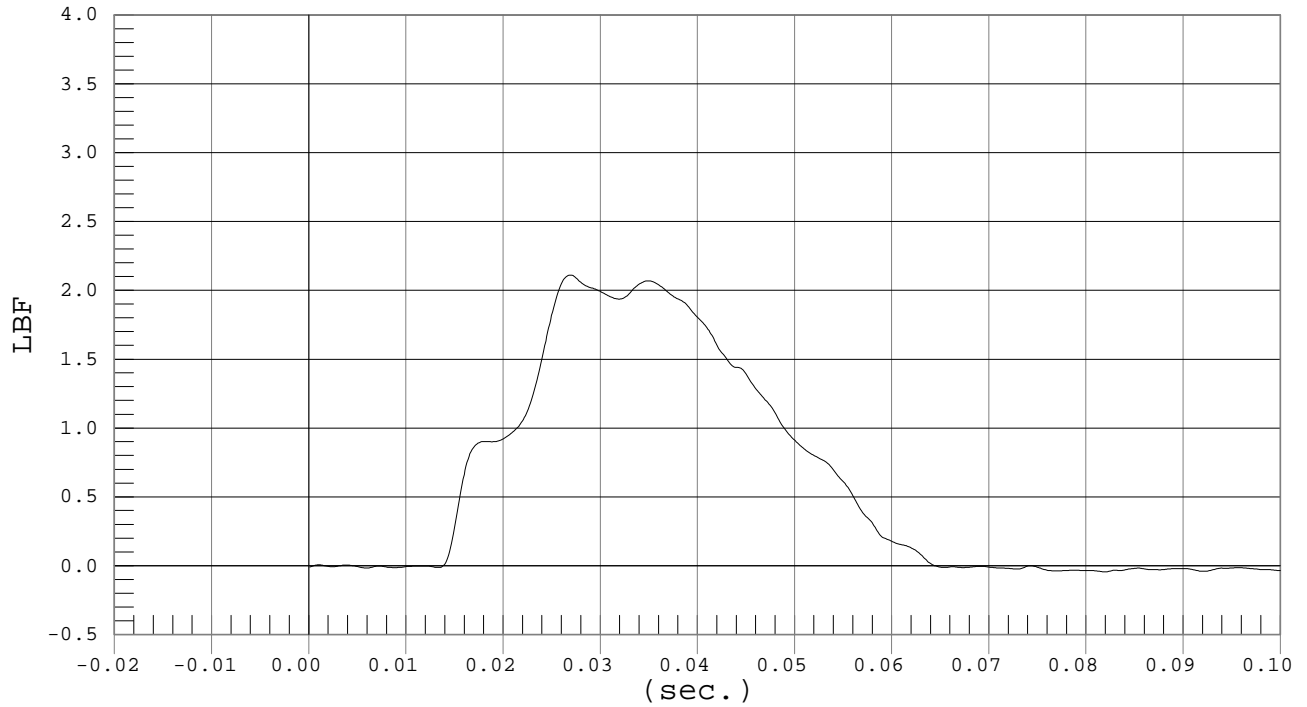


PROBE FORCE

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.1 fps, 4.31 M/s

Ymin = -.05 LBF @ 0.1080 sec., Ymax = 2.11 LBF @ 0.0268 sec.

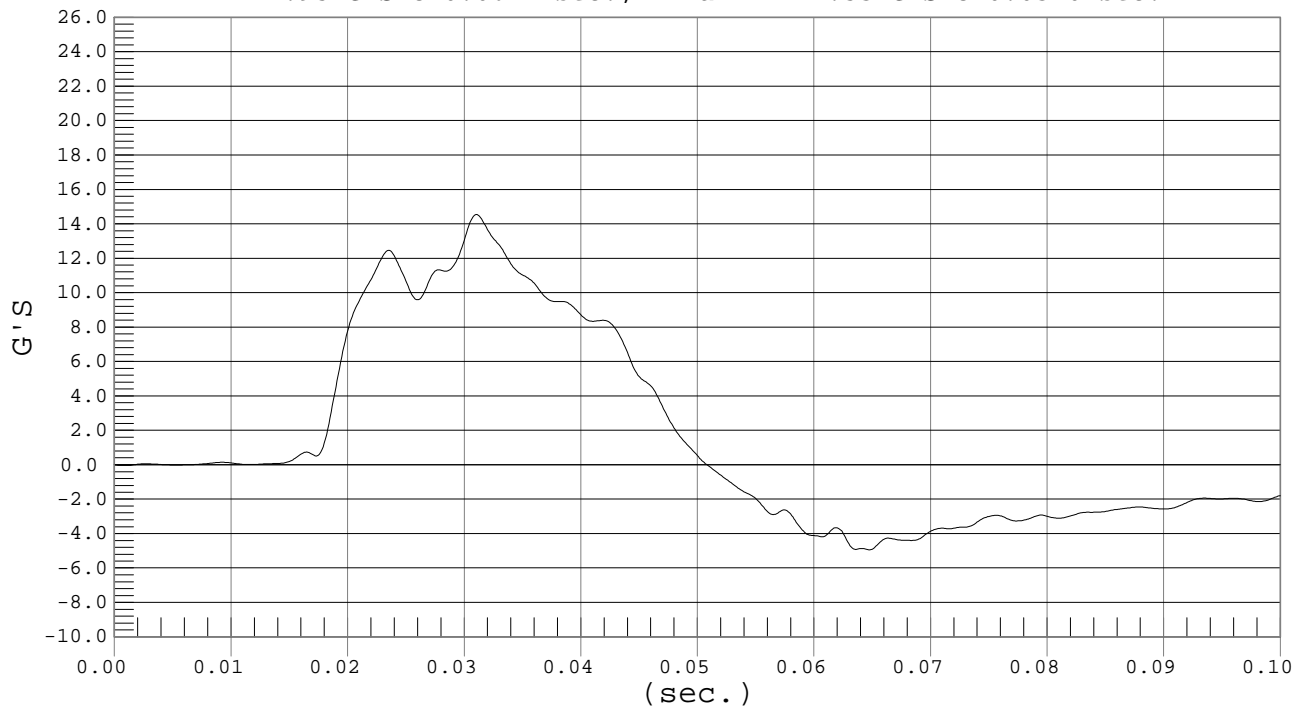


UPPER SPINE ACCELERATION

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.1 fps, 4.31 M/s

Ymin = -4.95 G'S @ 0.0647 sec., Ymax = 14.53 G'S @ 0.0310 sec.



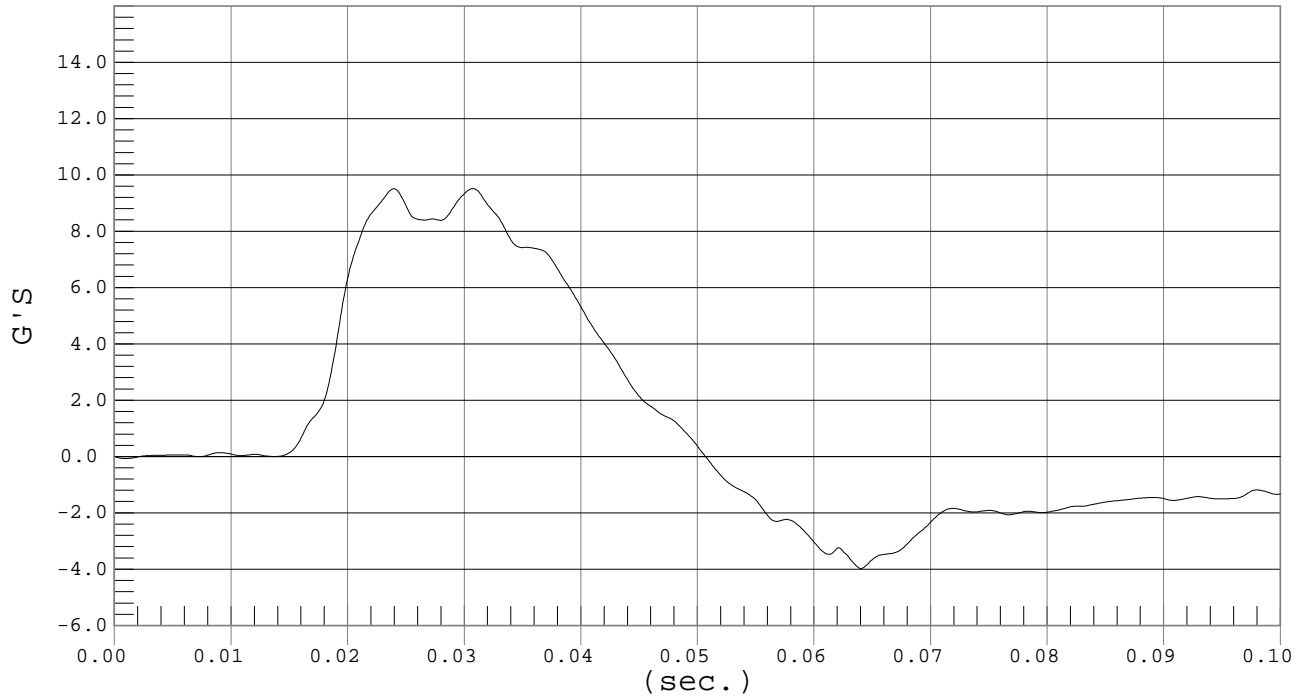


LOWER SPINE ACCELERATION

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.1 fps, 4.31 M/s

Ymin = -3.98 G'S @ 0.0639 sec., Ymax = 9.52 G'S @ 0.0307 sec.

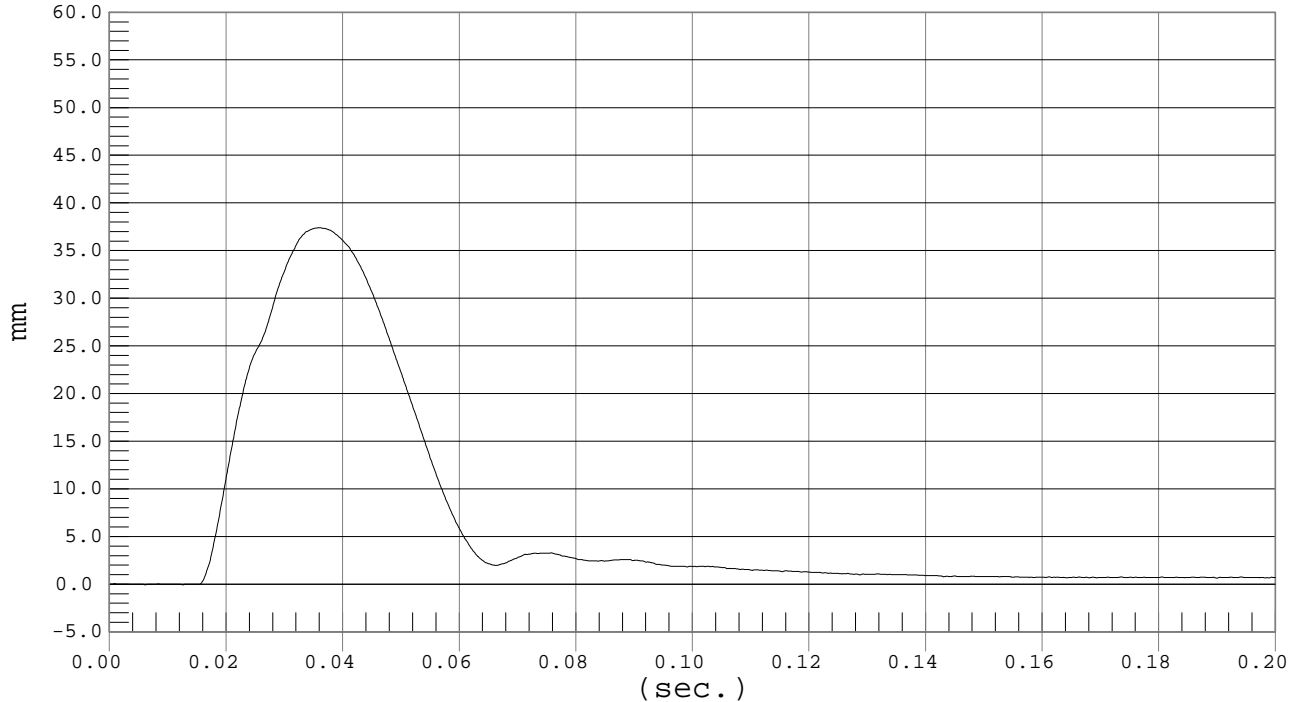


UPPER RIB DISPLACEMENT

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.1 fps, 4.31 M/s

Ymin = -.07 mm @ 0.0061 sec., Ymax = 37.39 mm @ 0.0359 sec.



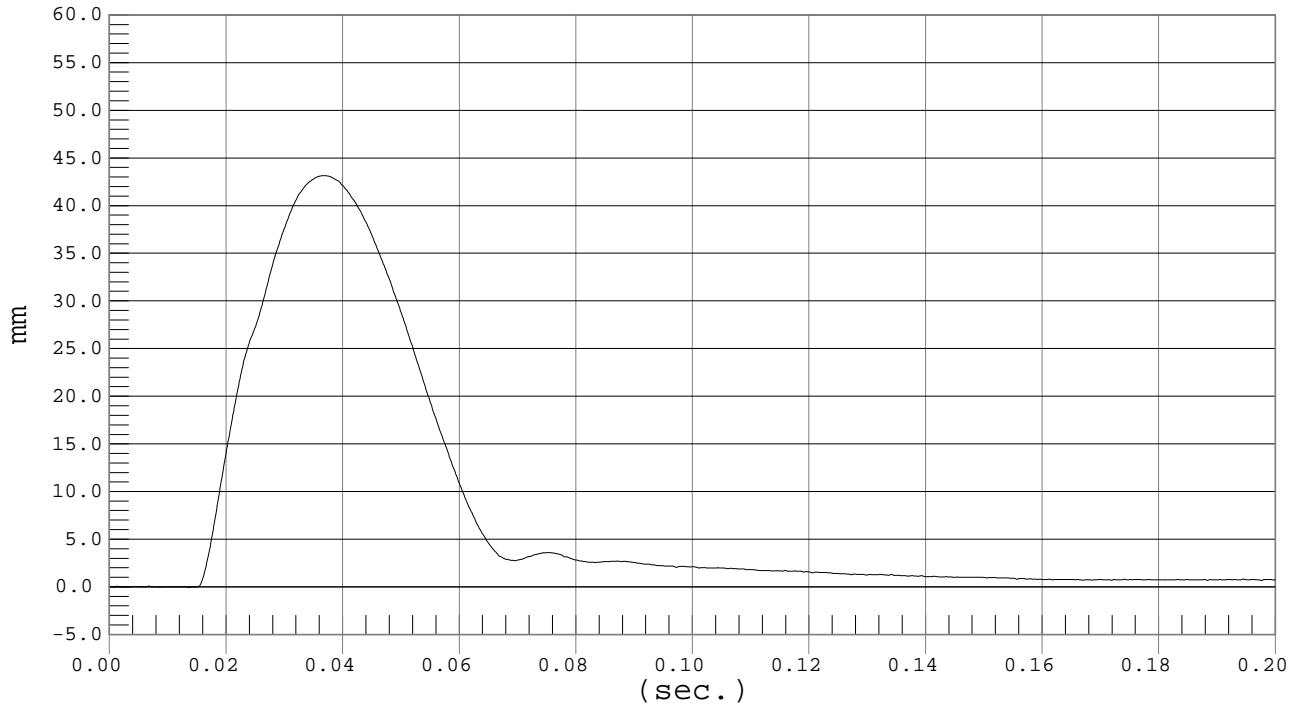


MIDDLE RIB DISPLACEMENT

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.1 fps, 4.31 M/s

Ymin = $-.08$ mm @ 0.0136 sec., Ymax = 43.15 mm @ 0.0365 sec.

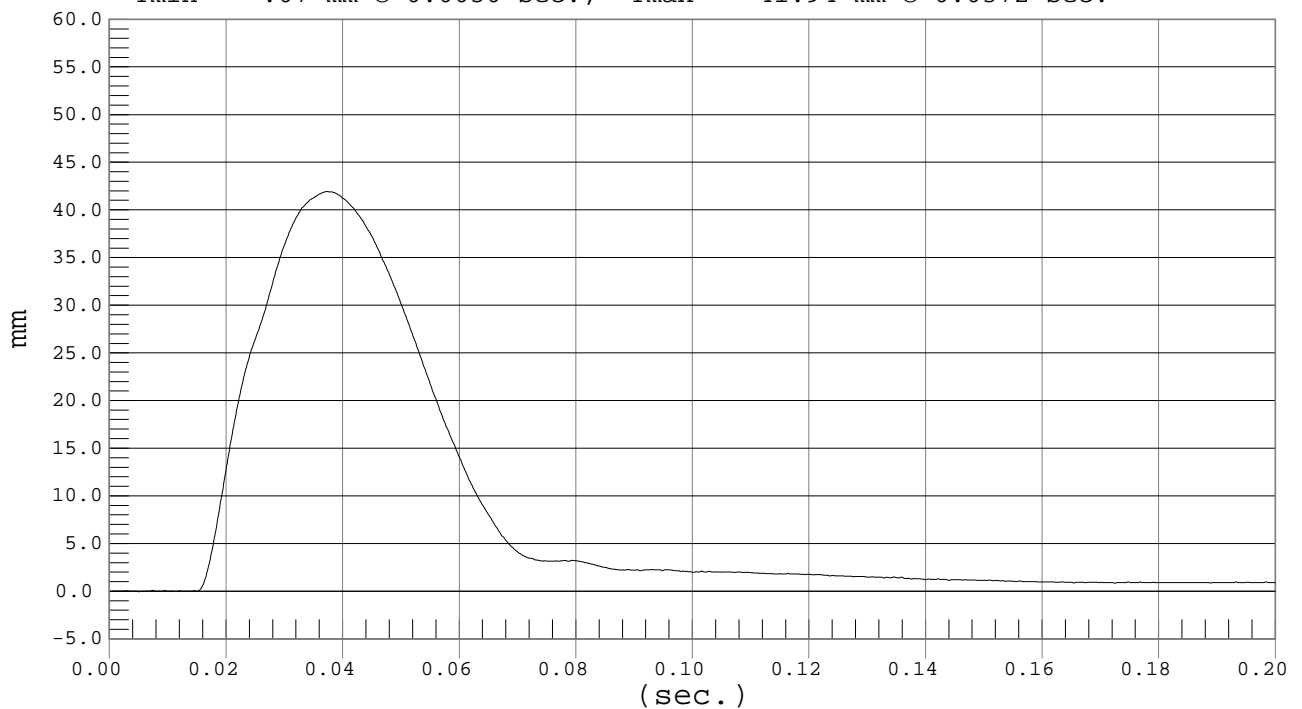


LOWER RIB DISPLACEMENT

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.1 fps, 4.31 M/s

Ymin = $-.07$ mm @ 0.0050 sec., Ymax = 41.94 mm @ 0.0372 sec.



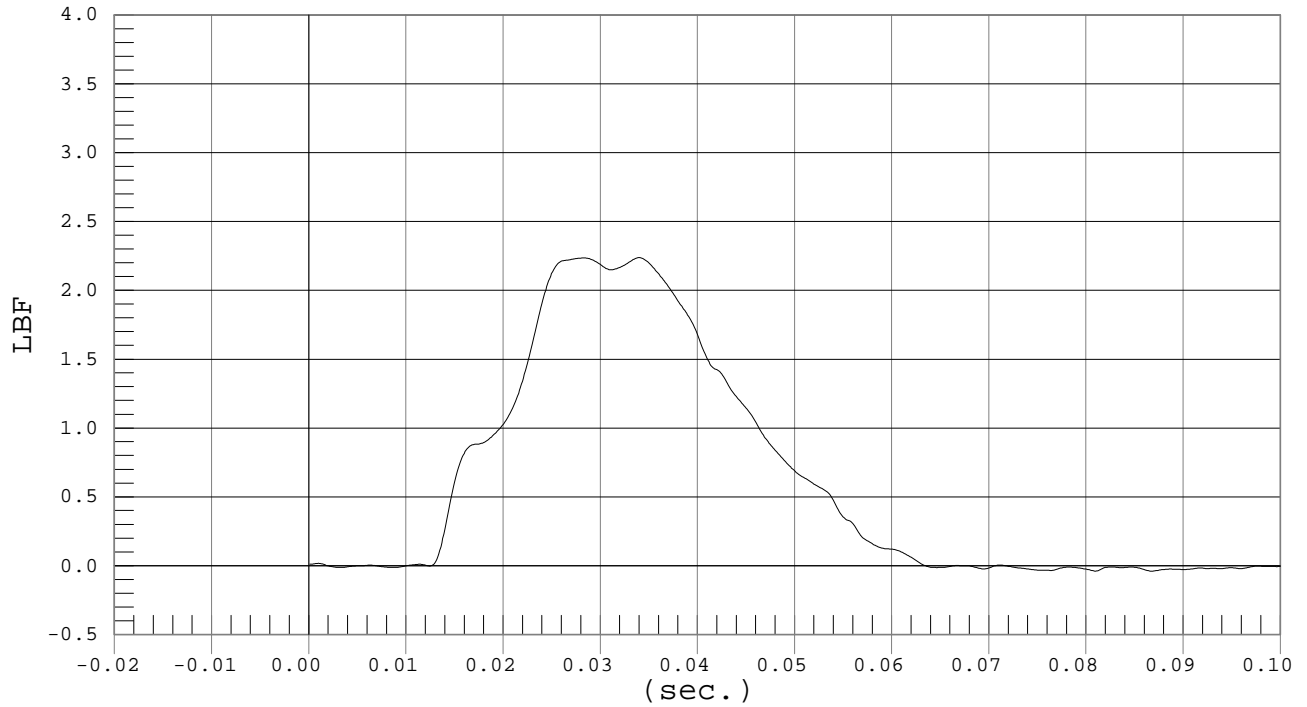


PROBE FORCE

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.2 fps, 4.33 M/s

Ymin = -.06 LBF @ 0.1225 sec., Ymax = 2.24 LBF @ 0.0339 sec.

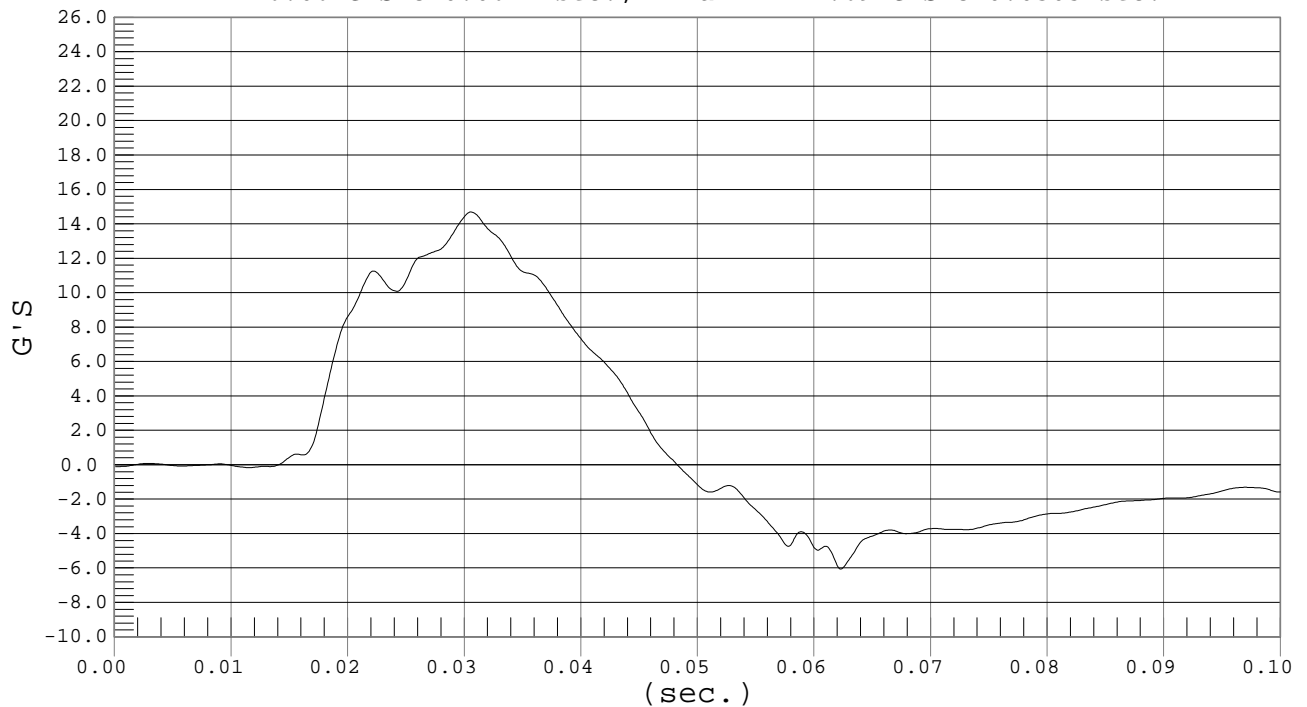


UPPER SPINE ACCELERATION

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.2 fps, 4.33 M/s

Ymin = -6.06 G'S @ 0.0622 sec., Ymax = 14.69 G'S @ 0.0305 sec.



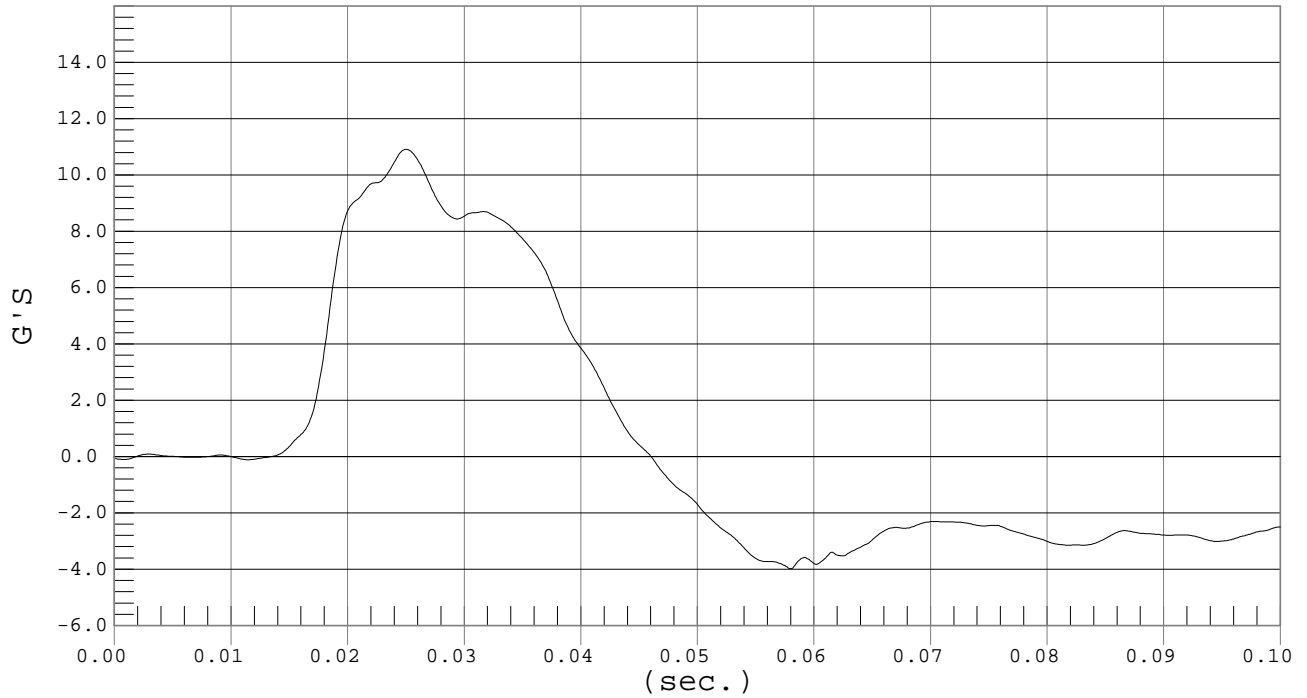


LOWER SPINE ACCELERATION

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.2 fps, 4.33 M/s

Ymin = -3.98 G'S @ 0.0579 sec., Ymax = 10.91 G'S @ 0.0249 sec.

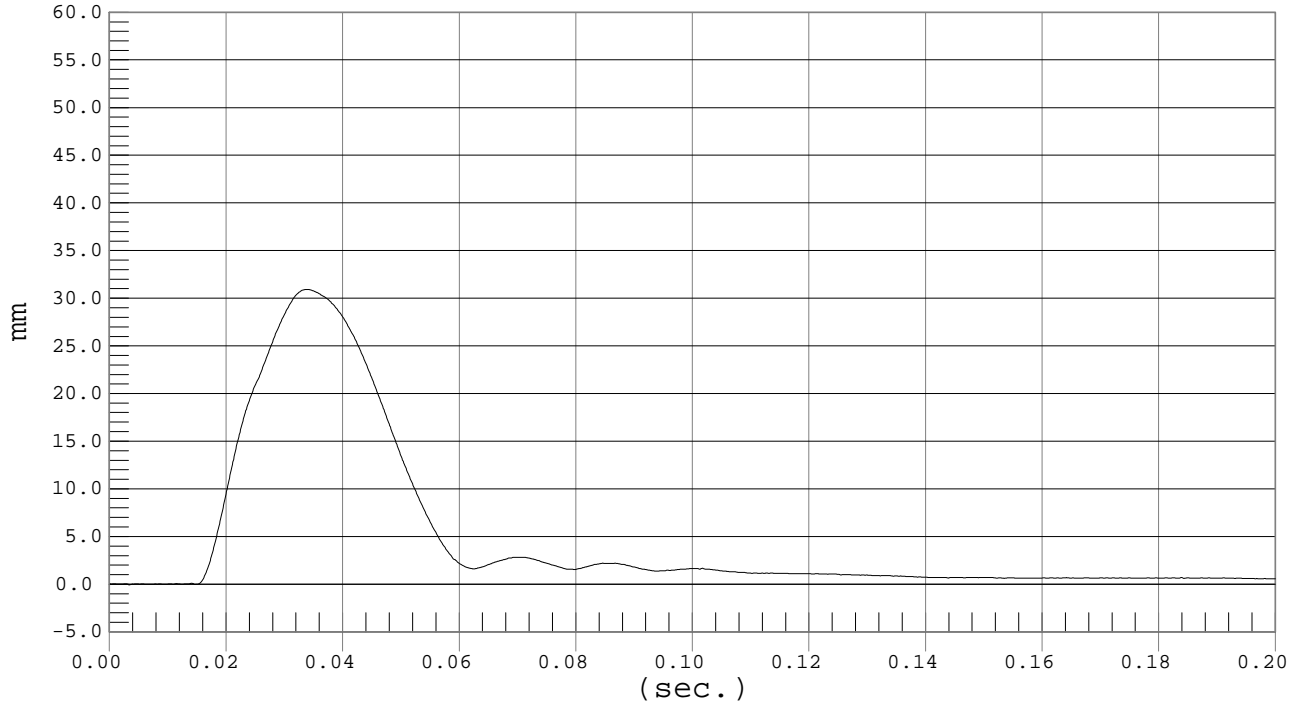


UPPER RIB DISPLACEMENT

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.2 fps, 4.33 M/s

Ymin = -.08 mm @ 0.0033 sec., Ymax = 30.92 mm @ 0.0337 sec.



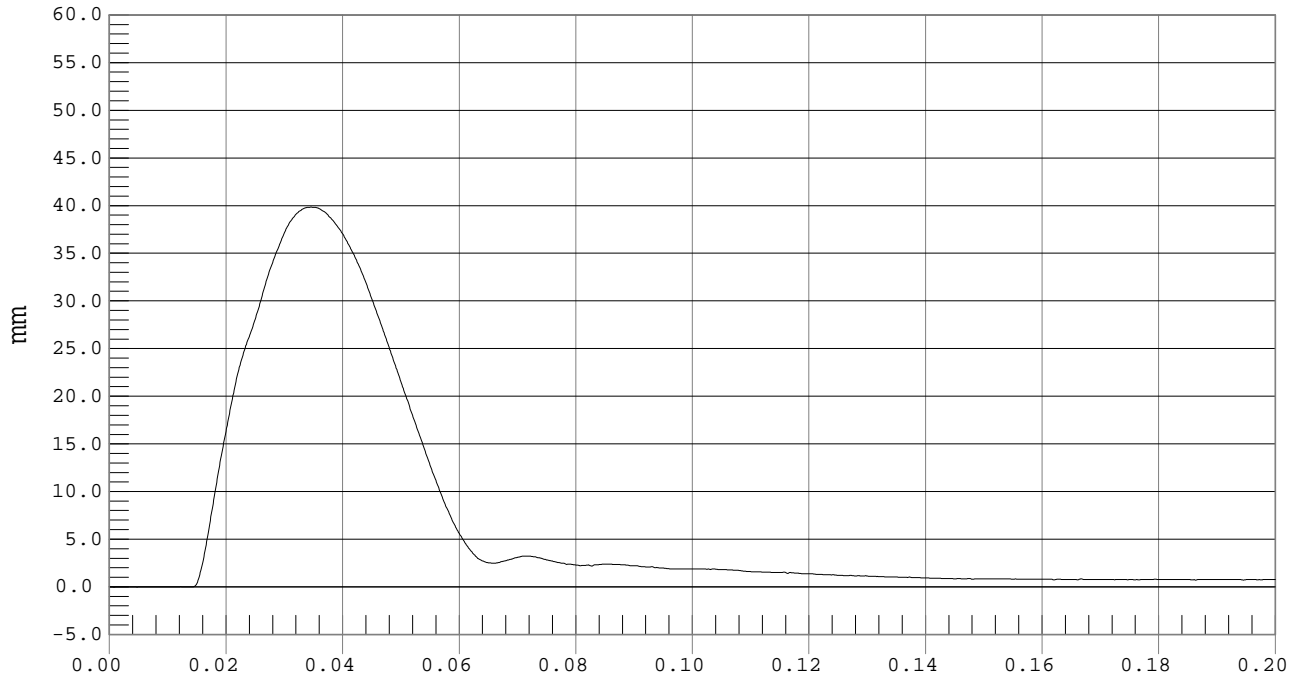


MIDDLE RIB DISPLACEMENT

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.2 fps, 4.33 M/s

Ymin = -.02 mm @ 0.0006 sec., Ymax = 39.84 mm @ 0.0345 sec.

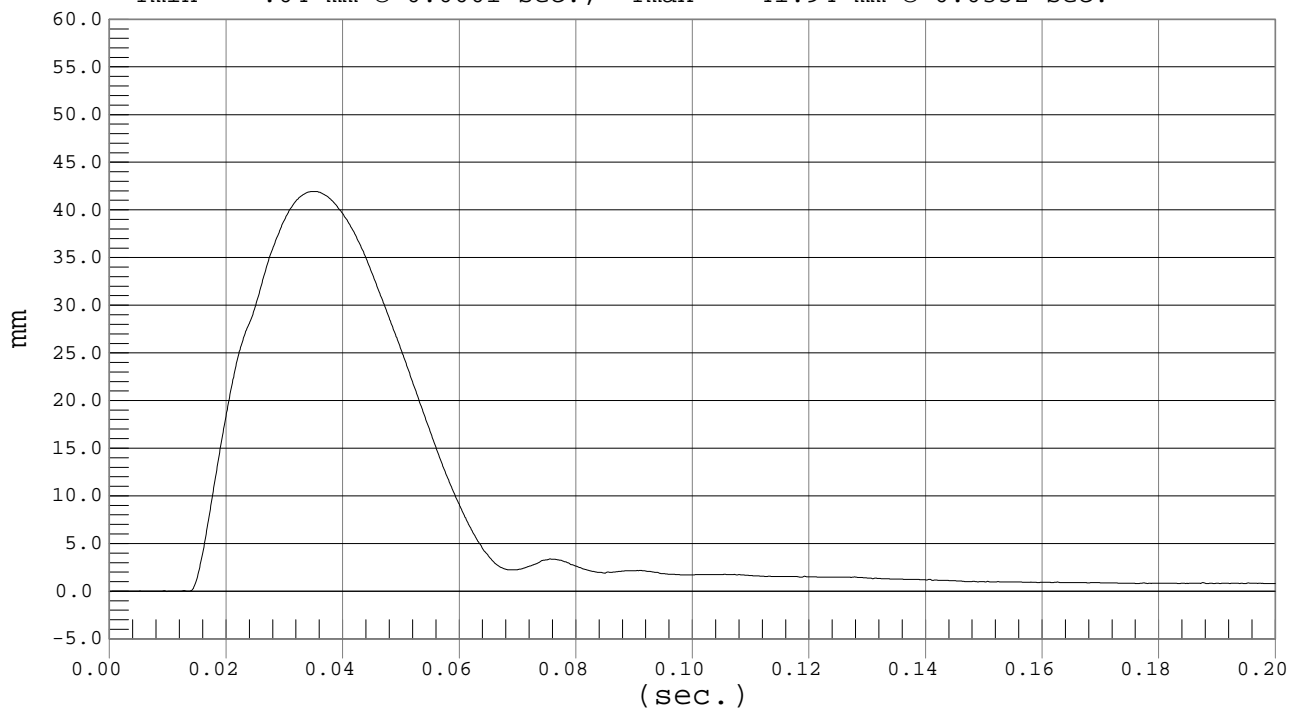


LOWER RIB DISPLACEMENT

Test Desc.: Thorax Without Arm
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.2 fps, 4.33 M/s

Ymin = -.04 mm @ 0.0001 sec., Ymax = 41.94 mm @ 0.0352 sec.



MGA RESEARCH CORPORATION
 ABDOMINAL IMPACT TEST
 SID IIs DUMMY

Date: 3/19/03
 Dummy Serial Number: 033
 Test Number: D03386/D03396

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03386</u>	<u>D03396</u>
Temperature (°C)	20.8° – 22.2°	21.2	21.3
Humidity	10% - 70%	26	25
Impact Velocity	4.41 - 4.59 m/s	4.52	4.50
Probe Force	1.3 - 1.9 kN	1.6	1.7
Upper Spine Acceleration	5 - 9 g's	7	6
Lower Spine Acceleration	10 - 12 g's	15*	15*
Upper Rib Displacement	44 - 55 mm	47	48
Middle Rib Displacement	44 - 56 mm	42*	46

* TEST DOES NOT MEET SPECIFICATIONS

Technician: _____

Approved By: _____

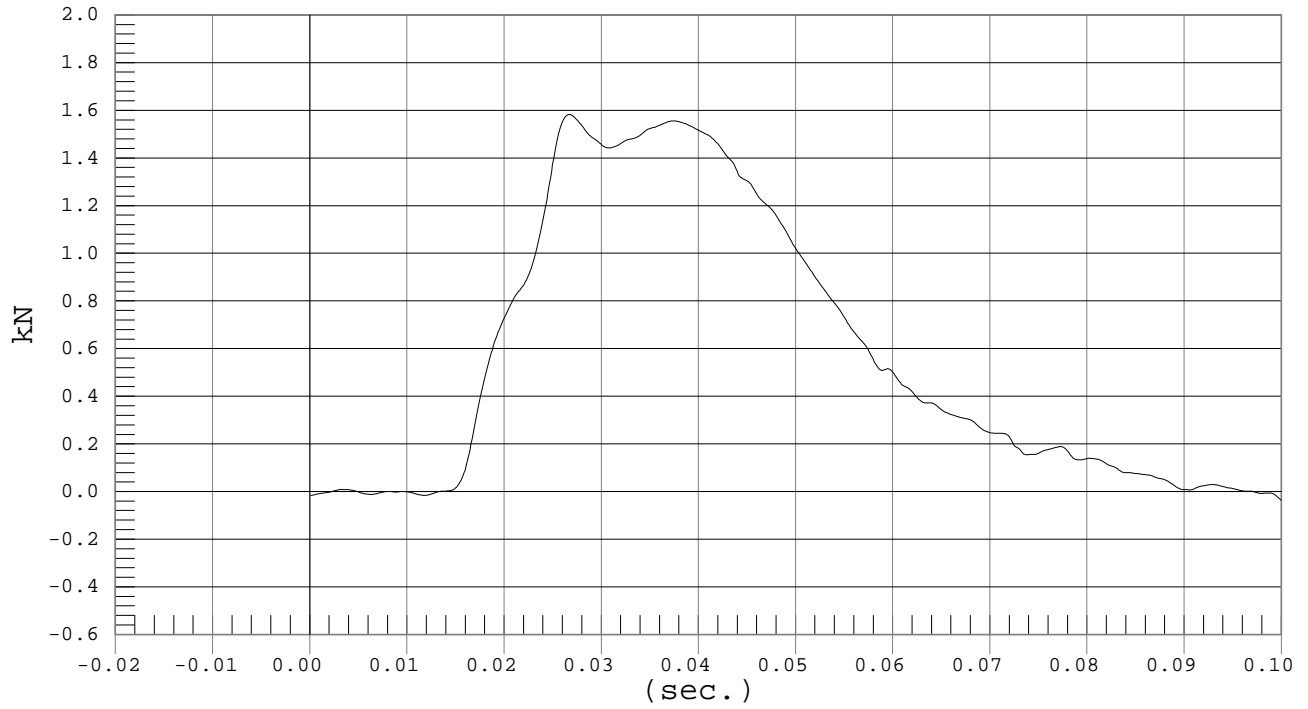


Test Desc.: Abdomen Impact
Component: Dummy #033

PROBE FORCE

Test Date: 03-19-03
Speed: 14.8 fps, 4.52 M/s

Ymin = -.04 kN @ 0.1004 sec., Ymax = 1.58 kN @ 0.0266 sec.



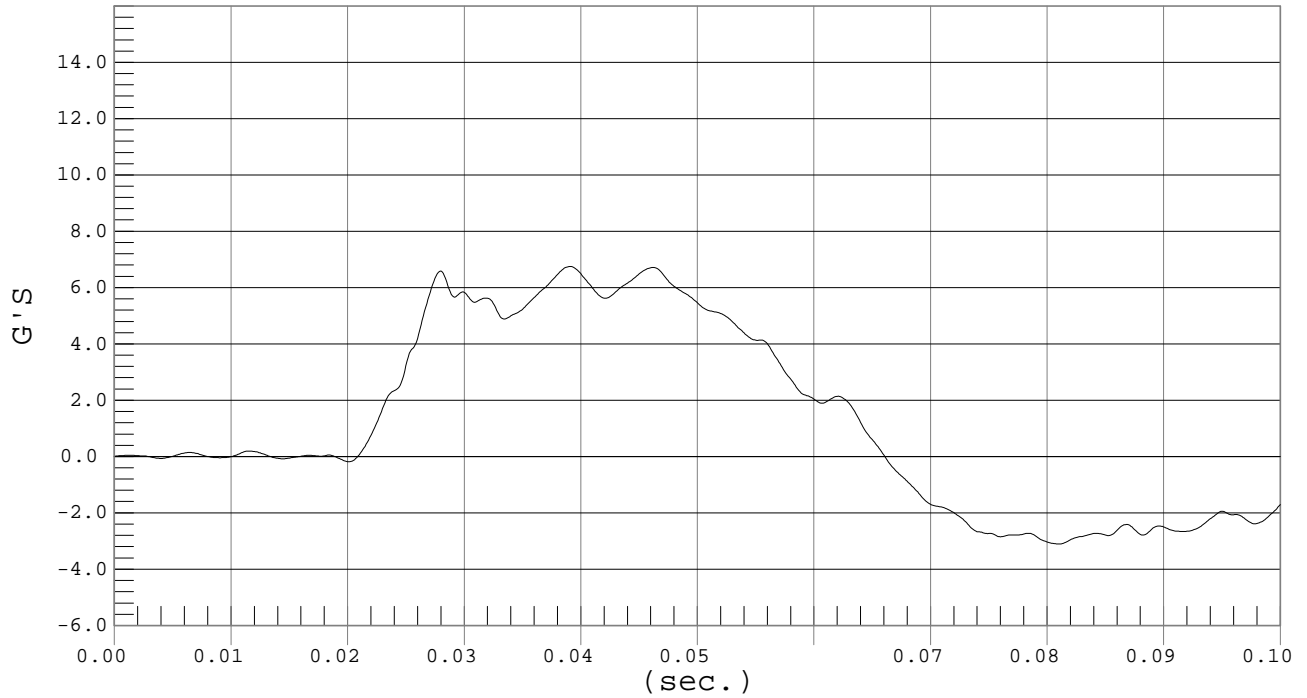


UPPER SPINE ACCELERATION

Test Desc.: Abdomen Impact
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.8 fps, 4.52 M/s

Ymin = -3.1 G'S @ 0.0809 sec., Ymax = 6.75 G'S @ 0.0390 sec.

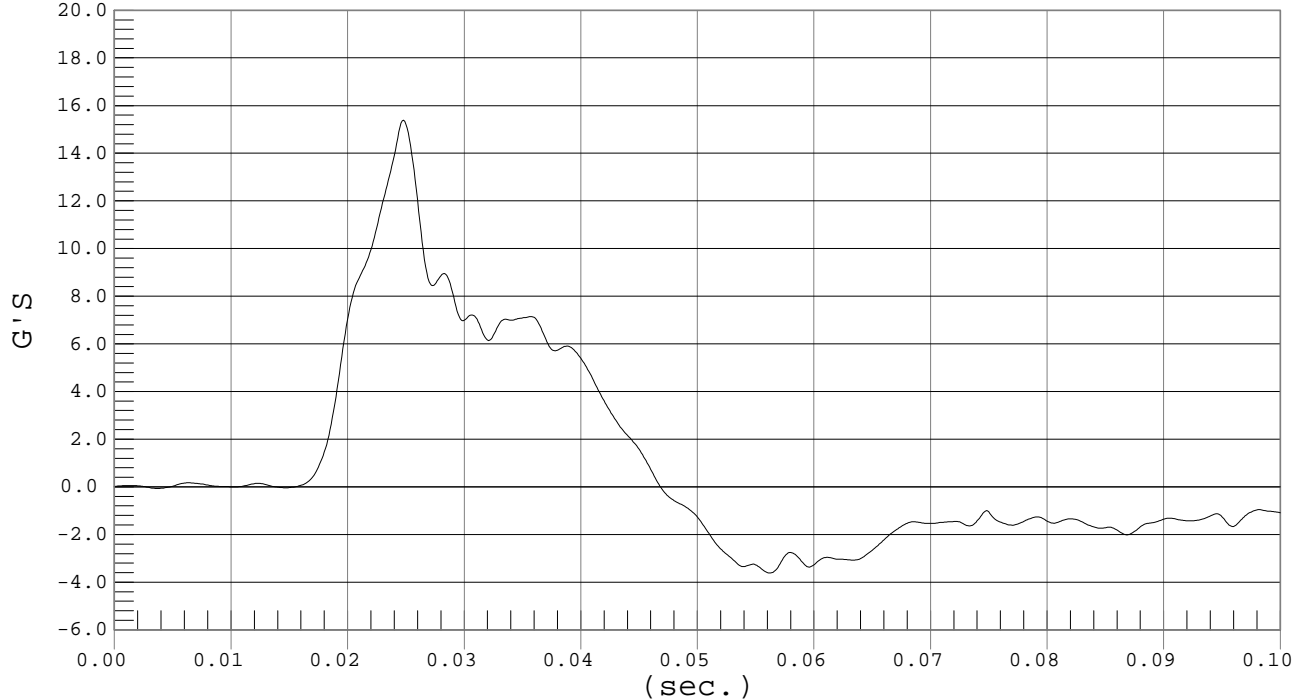


LOWER SPINE ACCELERATION

Test Desc.: Abdomen Impact
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.8 fps, 4.52 M/s

Ymin = -3.62 G'S @ 0.0561 sec., Ymax = 15.39 G'S @ 0.0247 sec.



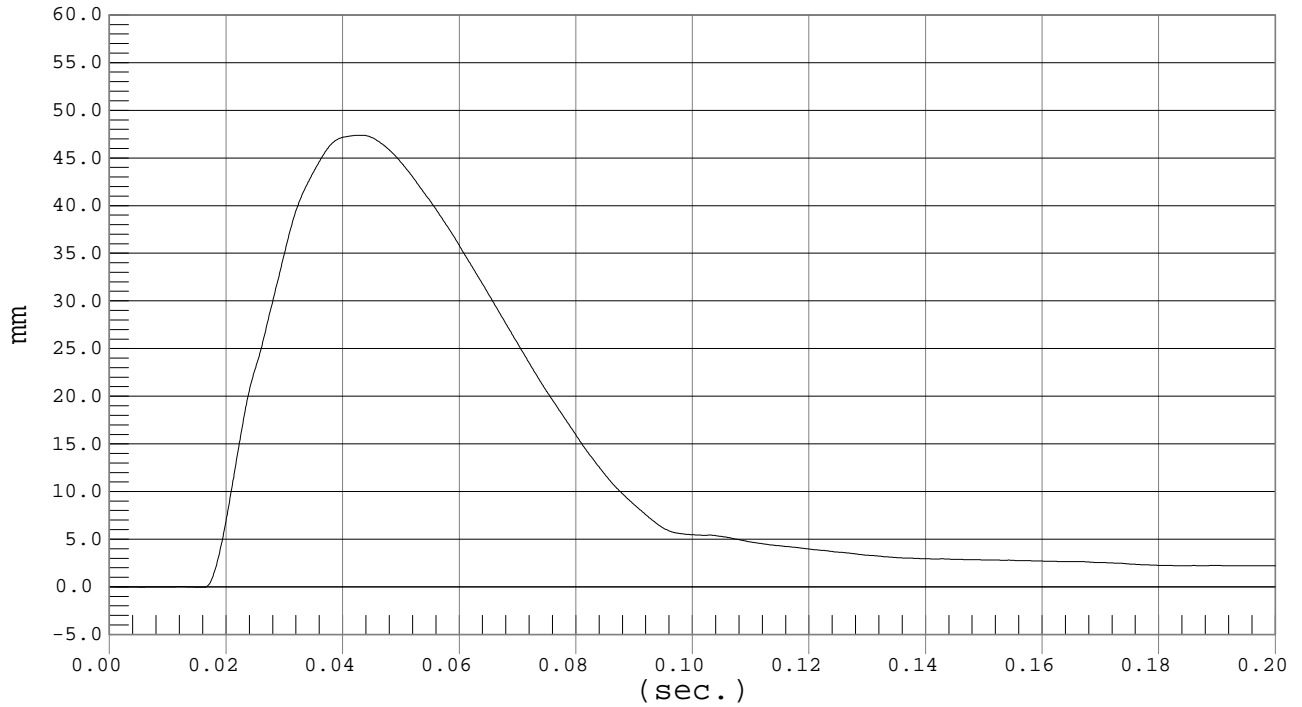


UPPER RIB DISPLACEMENT

Test Desc.: Abdomen Impact
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.8 fps, 4.52 M/s

Ymin = -.05 mm @ 0.0160 sec., Ymax = 47.38 mm @ 0.0430 sec.

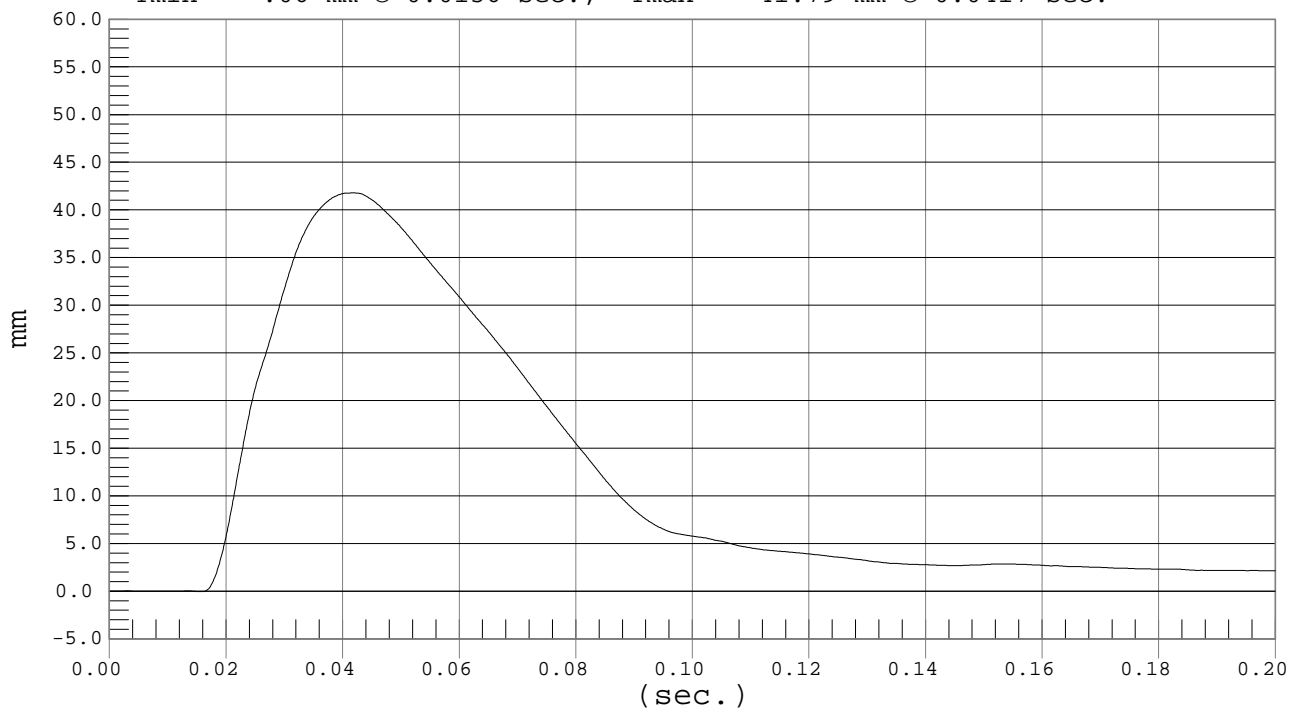


LOWER RIB DISPLACEMENT

Test Desc.: Abdomen Impact
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.8 fps, 4.52 M/s

Ymin = -.06 mm @ 0.0156 sec., Ymax = 41.79 mm @ 0.0417 sec.



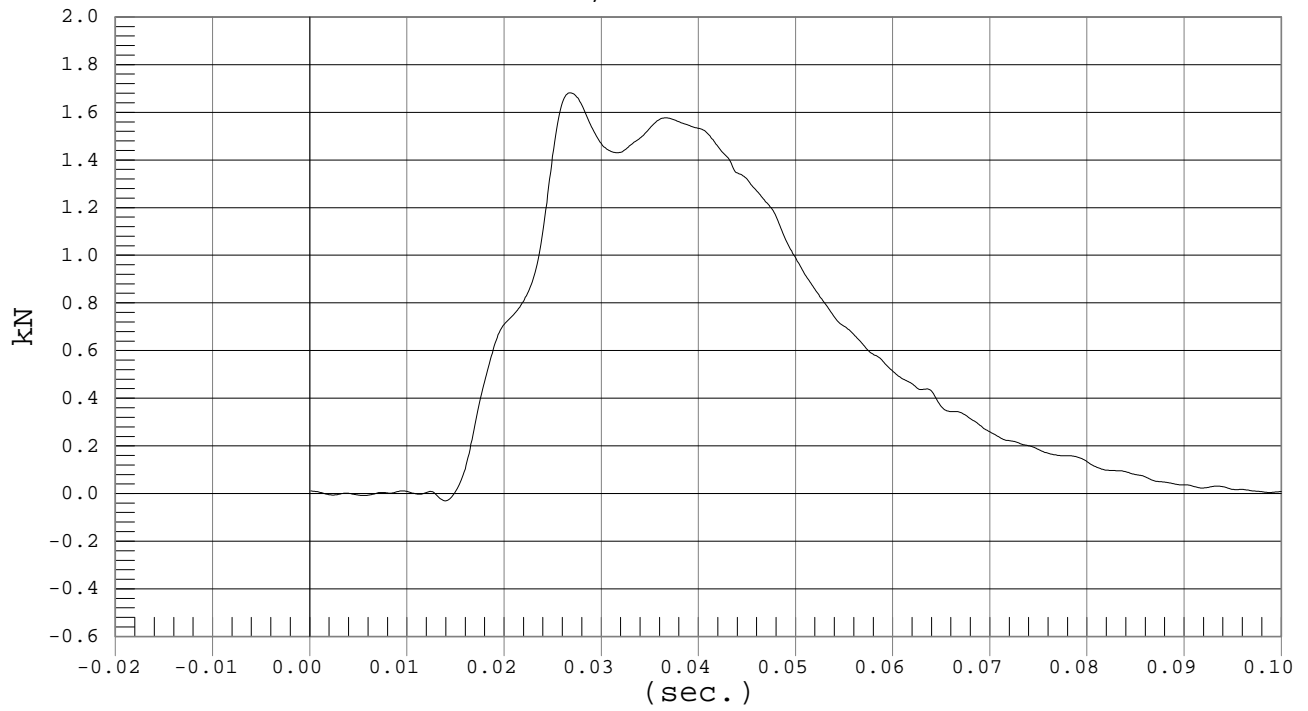


Test Desc.: Abdomen Impact
Component: Dummy #033

PROBE FORCE

Test Date: 03-19-03
Speed: 14.8 fps, 4.50 M/s

Ymin = -.03 kN @ 0.0139 sec., Ymax = 1.68 kN @ 0.0267 sec.



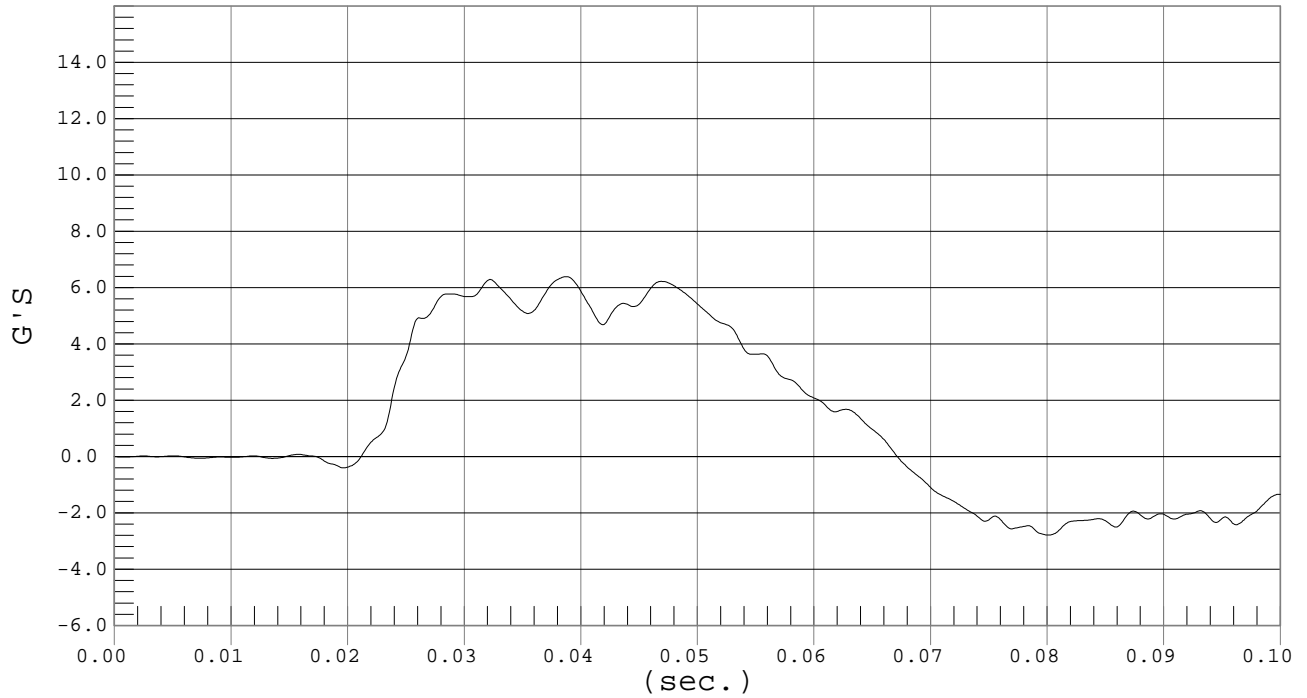


UPPER SPINE ACCELERATION

Test Desc.: Abdomen Impact
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.8 fps, 4.50 M/s

Ymin = -2.79 G'S @ 0.0800 sec., Ymax = 6.39 G'S @ 0.0387 sec.

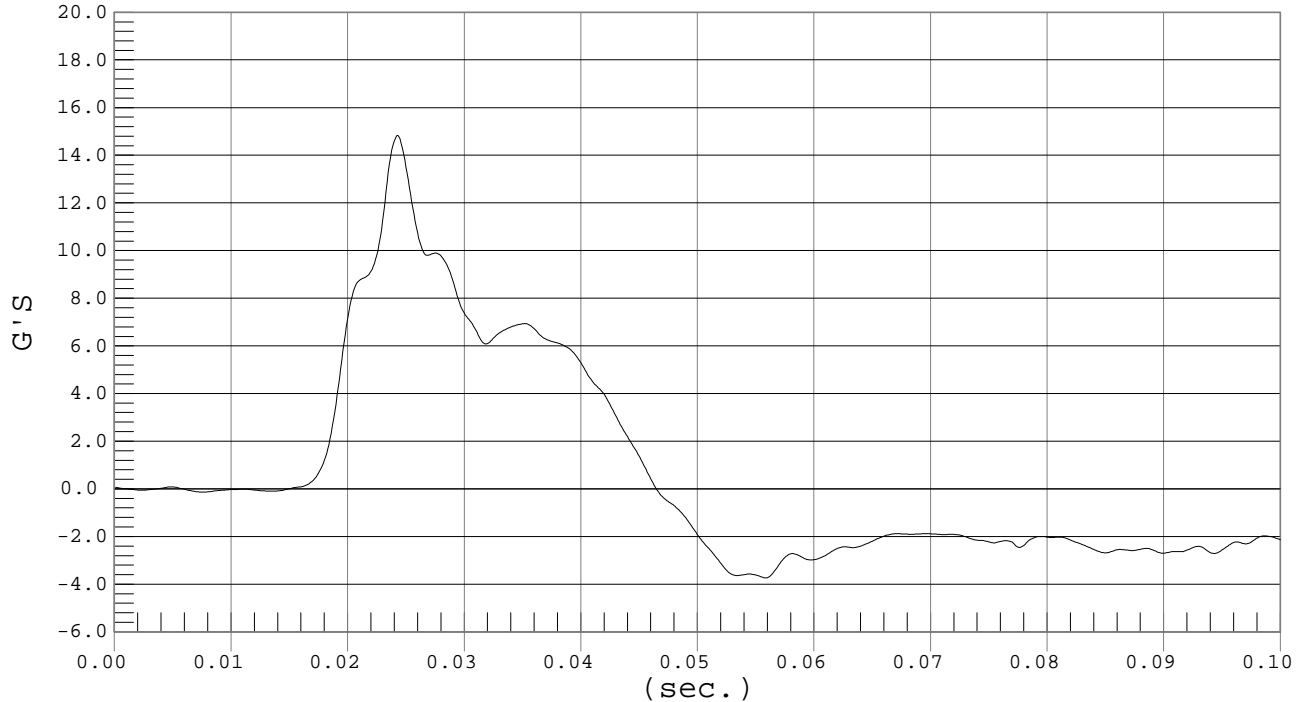


LOWER SPINE ACCELERATION

Test Desc.: Abdomen Impact
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.8 fps, 4.50 M/s

Ymin = -3.74 G'S @ 0.0558 sec., Ymax = 14.83 G'S @ 0.0242 sec.



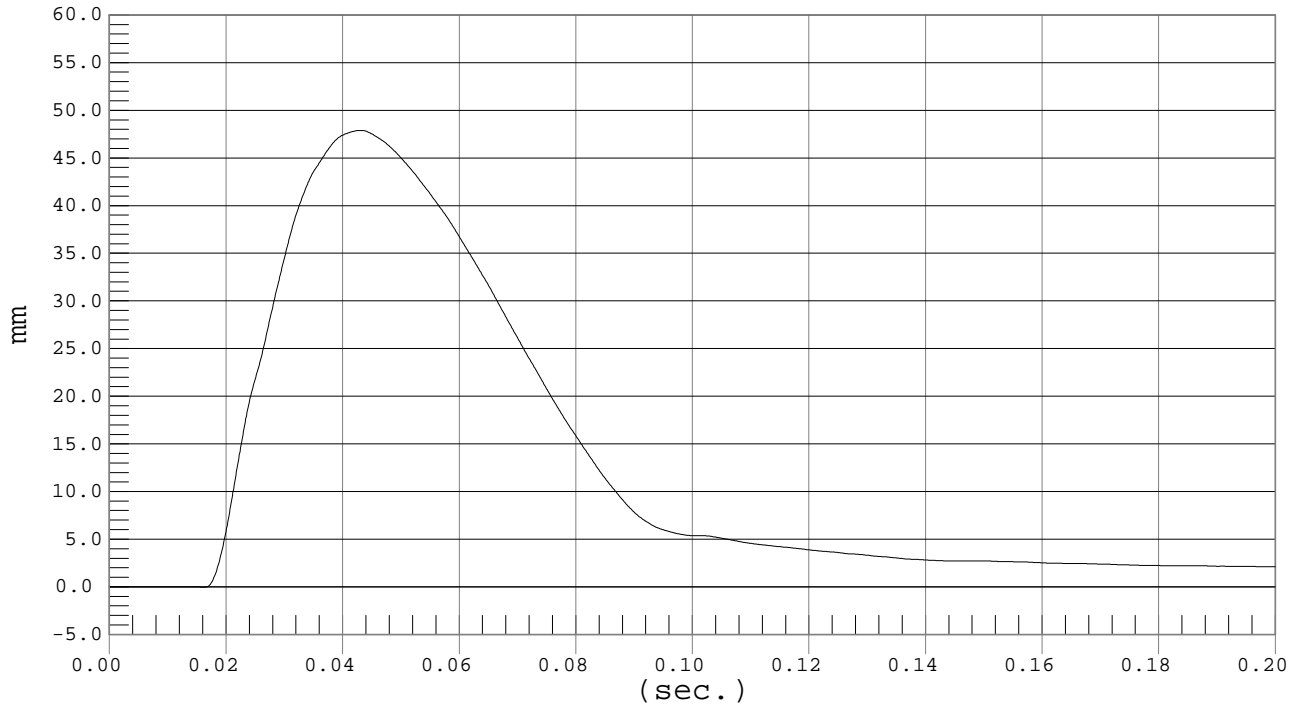


UPPER RIB DISPLACEMENT

Test Desc.: Abdomen Impact
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.8 fps, 4.50 M/s

Ymin = -.04 mm @ 0.0162 sec., Ymax = 47.89 mm @ 0.0430 sec.

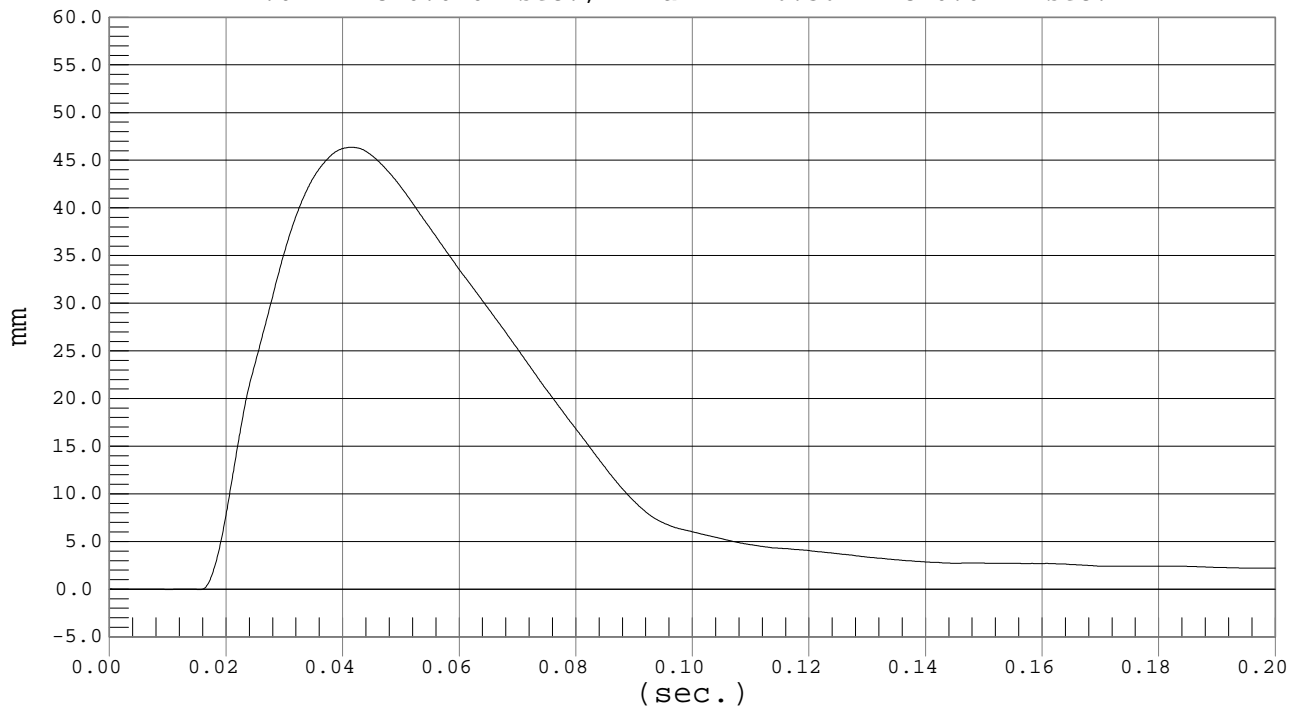


LOWER RIB DISPLACEMENT

Test Desc.: Abdomen Impact
Component: Dummy #033

Test Date: 03-19-03
Speed: 14.8 fps, 4.50 M/s

Ymin = -.04 mm @ 0.0101 sec., Ymax = 46.36 mm @ 0.0414 sec.



MGA RESEARCH CORPORATION
PELVIS IMPACT TEST
SID IIs DUMMY

Date: 3/18/03 , 3/19/03

Dummy Serial Number: 033

Test Number: D03389/D03399

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
		<u>D03389</u>	<u>D03399</u>
Temperature (°C)	20.8° – 22.2°	21.7	21.4
Humidity	10% - 70%	25	24
Impact Velocity	6.57 - 6.84 m/s	6.75	6.75
Probe Force	5.0 - 7.2 kN	5.8	6.5
Pelvis G's	46 - 60 g's	48	48

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

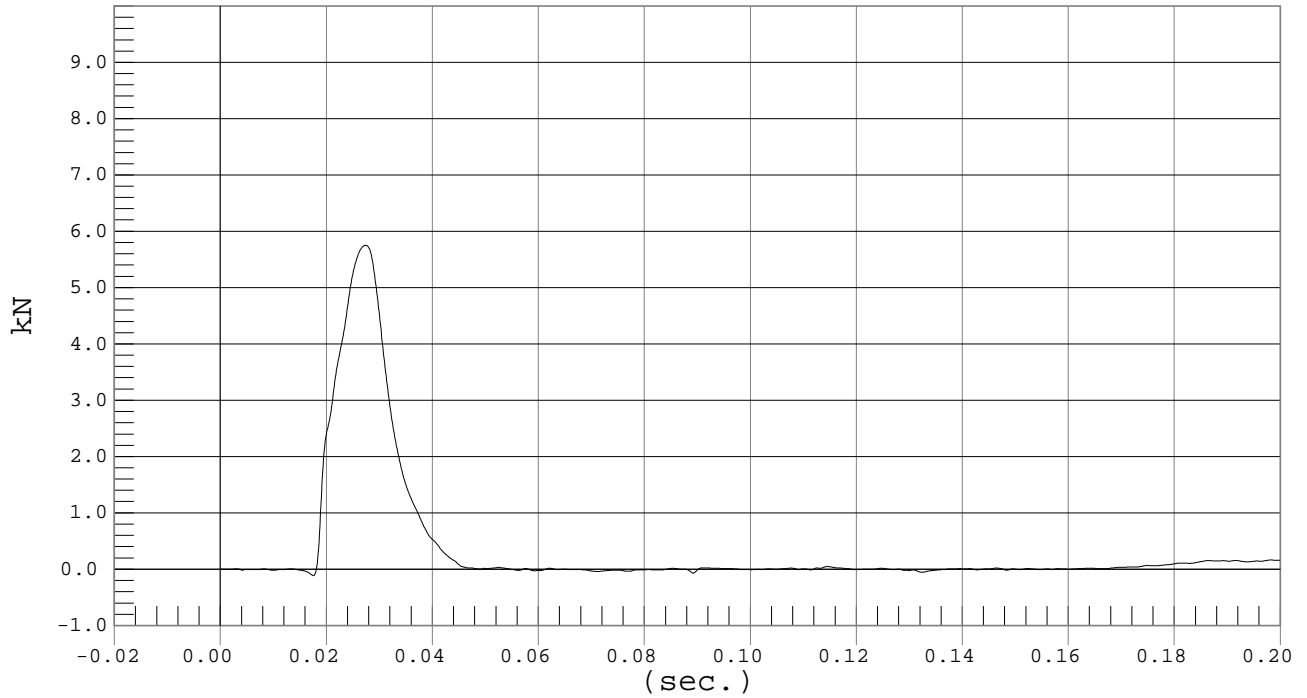


IMPACTOR FORCE

Test Desc.: Pelvis Impact
Component: Dummy #033

Test Date: 03-18-03
Speed: 22.2 fps, 6.75 M/s

Ymin = -.11 kN @ 0.0174 sec., Ymax = 5.75 kN @ 0.0273 sec.

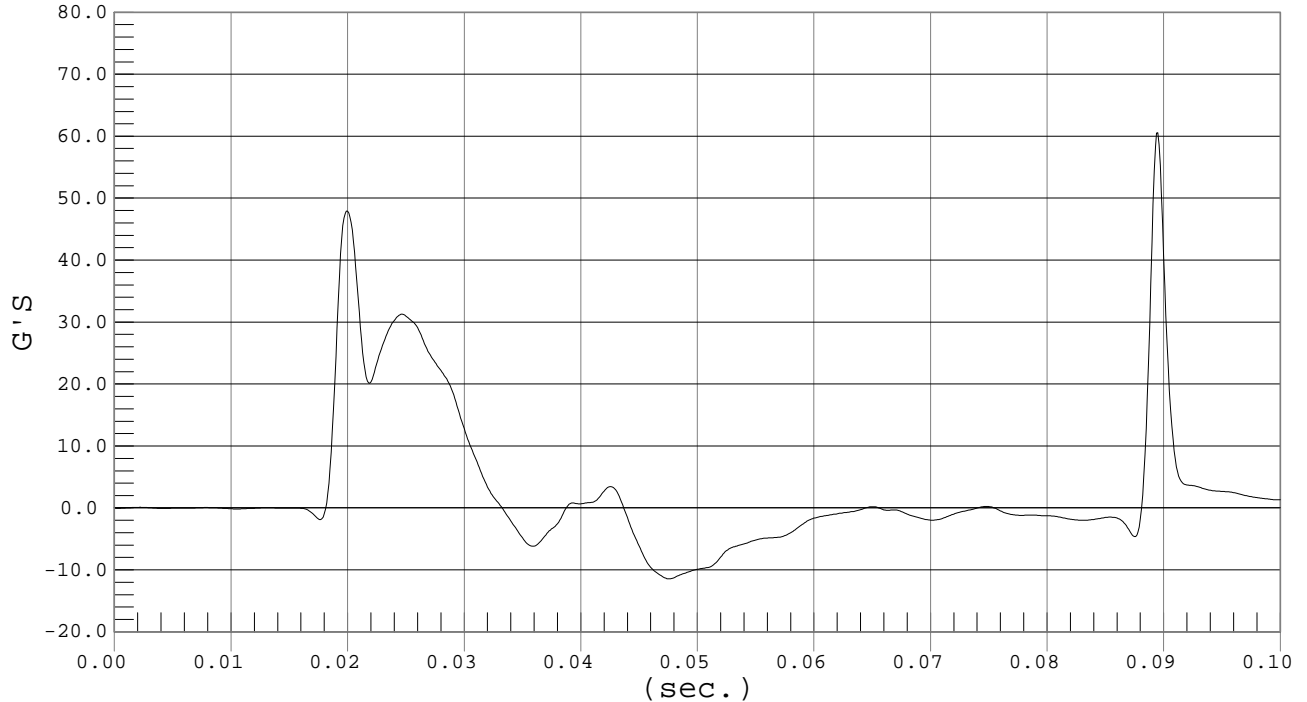


PELVIS ACCELERATION

Test Desc.: Pelvis Impact
Component: Dummy #033

Test Date: 03-18-03
Speed: 22.2 fps, 6.75 M/s

Ymin = -11.46 G'S @ 0.0475 sec., Ymax = 60.54 G'S @ 0.0894 sec.



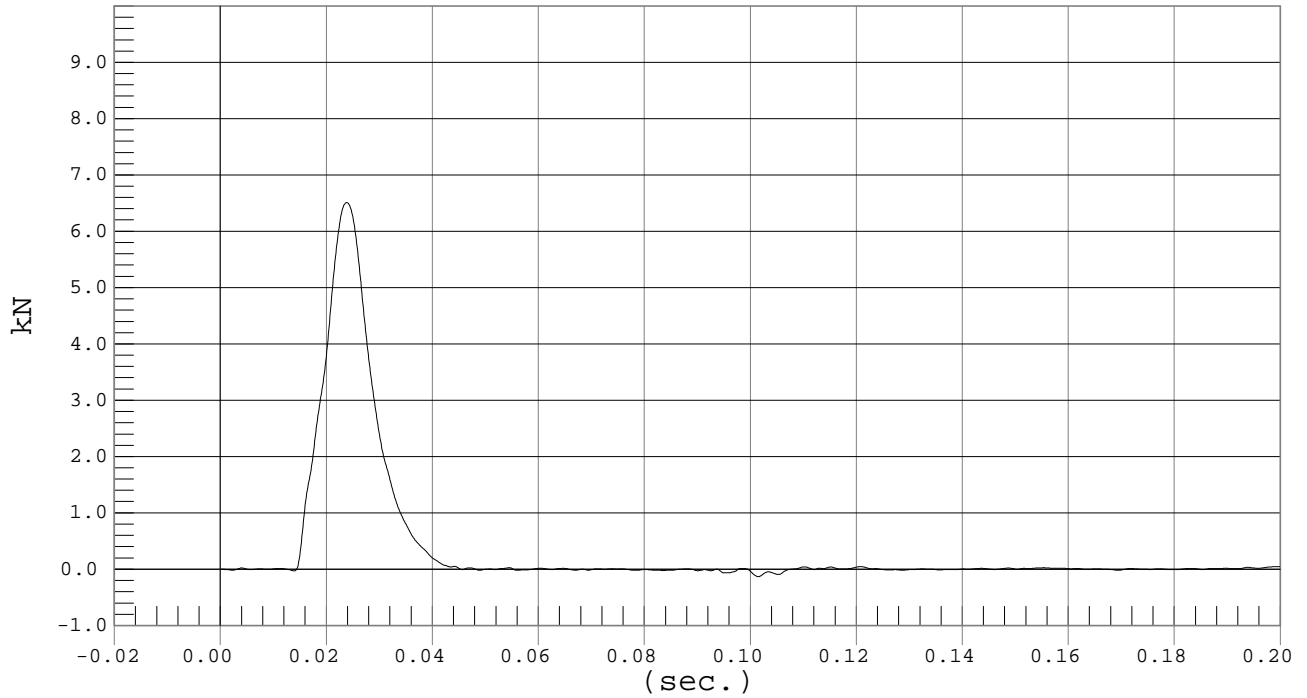


IMPACTOR FORCE

Test Desc.: Pelvis Impact
Component: Dummy #033

Test Date: 03-19-03
Speed: 22.1 fps, 6.75 M/s

Ymin = -.13 kN @ 0.1014 sec., Ymax = 6.51 kN @ 0.0237 sec.

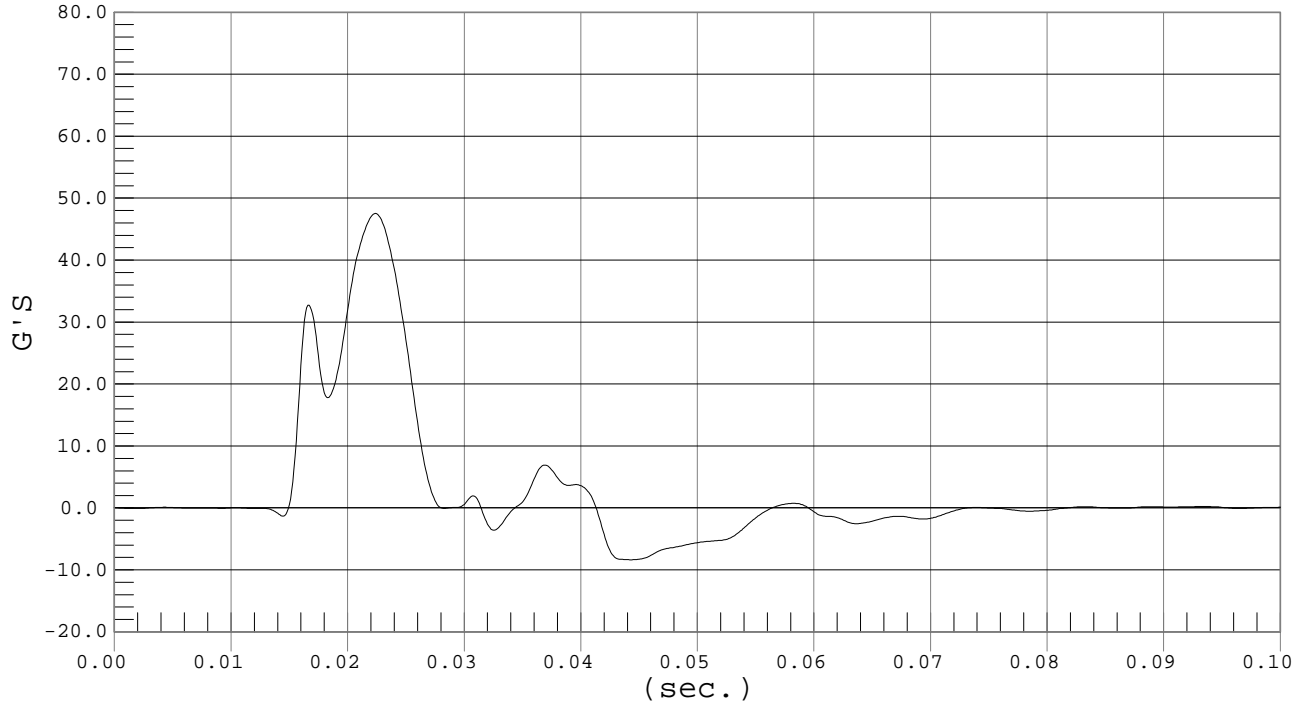


PELVIS ACCELERATION

Test Desc.: Pelvis Impact
Component: Dummy #033

Test Date: 03-19-03
Speed: 22.1 fps, 6.75 M/s

Ymin = -8.38 G'S @ 0.0442 sec., Ymax = 47.52 G'S @ 0.0223 sec.



APPENDIX D
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

DUMMY AND VEHICLE CALIBRATION DATA

	INSTRUMENTS FOR LEFT FRONT DUMMY SID 2S: 020		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X Accelerometer	ANAT6	Endevco	2/14/03
Head Y Accelerometer	J13938	Endevco	2/14/03
Head Z Accelerometer	J13630	Endevco	2/14/03
Driver Upper Neck FX	N606FX	Denton	1/30/03
Driver Upper Neck FY	N606FY	Denton	1/30/03
Driver Upper Neck FZ	N606FZ	Denton	1/30/03
Driver Upper Neck MX	N606MX	Denton	1/30/03
Driver Upper Neck MY	N606MY	Denton	1/30/03
Driver Upper Neck MZ	N606MZ	Denton	1/30/03
Driver Upper Arm X	J13653	Endevco	2/12/03
Driver Upper Arm Y	J13713	Endevco	2/12/03
Driver Upper Arm Z	J13649	Endevco	2/12/03
Driver Shoulder X	AJ412	Endevco	1/21/03
Driver Shoulder Y	J18260	Endevco	1/21/03
Driver Shoulder Z	AKAH1	Endevco	1/21/03
Driver Shoulder FX	S110FX	FTSS	10/28/02
Driver Shoulder FY	S110Fy	FTSS	10/28/02
Driver Shoulder FZ	S110FZ	FTSS	10/28/02
Driver Upper Thorax Rib Y	AH1F9	Entran	2/12/03
Driver Mid Thorax Rib Y	AH097	Entran	2/12/03
Driver Mid Thorax Rib X	J14008	Entran	1/15/03
Driver Lower Thorax Rib Y	AH0F0	Endevco	2/12/03
Driver Upper Abdominal Rib Y	J13642	Entran	8/8/02
Driver Upper Abdominal Rib X	ALFL9	Entran	2/12/03
Driver Lower Abdominal Rib Y	AKAC4	Entran	8/8/02
Driver T4 X	AJ820	Endevco	10/9/02
Driver Shoulder DY	S2S1	Honeywell	3/7/03
Driver Upper Thorax Rib DY	S2R1	Honeywell	3/7/03
Driver Mid Thorax Rib DY	S2R2	Honeywell	3/7/03
Driver Lower Thorax Rib DY	S2R3	Honeywell	3/7/03
DR Upper Abdominal Rib DY	S2R4	Honeywell	3/7/03
DR Lower Abdominal Rib DY	S2R5	Honeywell	3/7/03
Driver Upper Spine X	J22107	Entran	1/21/03
Driver Upper Spine Y	J22055	Entran	1/21/03
Driver Upper Spine Z	J20965	Entran	1/21/03
Driver Lower Spine X	AP042	Entran	1/15/03
Driver Lower Spine Y	AP120	Entran	1/15/03
Driver Lower Spine Z	ALEK9	Entran	1/15/03
Driver Lumbar FX	L101FX	FTSS	1/17/03
Driver Lumbar FY	L101FY	FTSS	1/17/03

INSTRUMENTS FOR FRONT DUMMY: 020 CONT'D			
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Driver Lumbar FZ	L110FZ	FTSS	1/17/03
Driver Lumbar MX	L101MX	FTSS	1/17/03
Driver Lumbar MY	L101MY	FTSS	1/17/03
Driver Lumbar MZ	L101MZ	FTSS	1/17/03
Driver Left Acetabulum FY	AC114FY	FTSS	1/17/03
Driver Left Ilium Crest FY	IW112FY	FTSS	1/17/03
Driver Right Ilium Crest FY	IW114FY	FTSS	1/17/03
Pubic Symphysis FY	P113FY	FTSS	5/16/02
Pelvis X Accelerometer	J2098	Entran	1/15/03
Pelvis Y Accelerometer	J17709	Entran	1/15/03
Pelvis Z Accelerometer	J20473	Entran	1/15/03

	INSTRUMENTS FOR LEFT REAR DUMMY SID 2S: 033		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Passenger Head X	P17858	Endevco	1/10/03
Passenger Head Y	P12566	Endevco	1/10/03
Passenger Head Z	P15638	Endevco	10/8/02
Pass. Upper Neck Force X	N304FX	FTSS	6/14/02
Pass. Upper Neck Force Y	N304FY	FTSS	6/14/02
Passenger Upper Neck Force Z	N304FZ	FTSS	6/14/02
Pass. Upper Neck Moment X	N304MX	FTSS	6/14/02
Pass. Upper Neck Moment Y	N304MY	FTSS	6/14/02
Pass. Upper Neck Moment Z	N304MZ	FTSS	6/14/02
Passenger Upper Arm X	B02A25-N1	Entran	1/9/03
Passenger Upper Arm Y	02A16-A13	Entran	1/9/03
Passenger Upper Arm Z	B02A25-N04	Entran	1/9/03
Passenger Shoulder X	P17848	Entran	1/10/03
Passenger Shoulder Y	P16336	Entran	1/10/03
Passenger Shoulder Z	P16225	Entran	1/10/03
Passenger Shoulder Force X	S101FX	FTSS	6/25/02
Passenger Shoulder Force Y	S101FY	FTSS	6/25/02
Passenger Shoulder Force Z	S101FZ	FTSS	6/25/02
Pass. Upper Thorax Rib Y	01J02-F07	Entran	1/8/03
Pass. Mid Thorax Rib Y	B02A18-N03	Entran	1/8/03
Pass. Mid Thorax Rib X	AHT13	Endevco	1/24/03
Pass. Lower Thorax Rib Y	P15951	Endevco	1/10/03
Pass. Upper Abdominal Rib Y	99H30-Z07	Entran	1/9/03
Pass. Upper Abdominal Rib X	APY16	Entran	1/30/03
Pass. Lower Abdominal Rib Y	01J02-F12	Entran	1/9/03
Passenger T4 X	AGTY1	Entran	1/8/03
Passenger Shoulder DY	020SHD	Honeywell	1/13/03
Pass. Upper Thorax Rib DY	020RB1	Honeywell	1/13/03
Pass. Mid Thorax Rib DY	020RB2	Honeywell	1/13/03
Pass. Lower Thorax Rib DY	020RB3	Honeywell	1/13/03
Pass. Upper Abdominal Rib DY	020RB4	Honeywell	1/13/03
Pass. Lower Abdominal Rib DY	020RB5	Honeywell	1/13/03
Passenger Upper Spine X	B02A09-F04	Endevco	1/9/03
Passenger Upper Spine Y	01G25-N18	Endevco	1/9/03
Passenger Upper Spine Z	02A16-A12	Endevco	1/9/03
Passenger Lower Spine X	02A16-A03	Endevco	1/9/03
Passenger Lower Spine Y	B02A18-N14	Endevco	1/9/03
Passenger Lower Spine Z	02A04-A24	Endevco	1/9/03
Passenger Lumbar Force X	L104FX	FTSS	6/24/02
Passenger Lumbar Force Y	L104FY	FTSS	5/10/02

	INSTRUMENTS FOR LEFT REAR DUMMY 033 CONT'D		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Passenger Lumbar Force Z	L104FZ	FTSS	8/15/02
Passenger Lumbar Moment X	L104MX	FTSS	8/15/02
Passenger Lumbar Moment Y	L104MY	FTSS	6/24/02
Passenger Lumbar Moment Z	L104MZ	FTSS	6/24/02
Pass. Left Acetabulum FY	AC111FY	FTSS	6/25/02
Pass. Left Ilium Crest FY	IW113FY	FTSS	6/25/02
Pass. Right Ilium Crest FY	IW115FY	FTSS	6/25/02
Pass. Pubic Symphysis FY	P106FY	FTSS	6/24/02
Passenger Pelvis X	B02A25-N05	Entran	1/9/03
Passenger Pelvis Y	B02A18-N13	Entran	1/9/03
Passenger Pelvis Z	02A18-N03	Entran	1/9/03
Pass. Right Femur Force X	F107FX	FTSS	1/20/03
Pass. Right Femur Force Y	F107FY	FTSS	1/20/03
Pass. Right Femur Force Z	F107FZ	FTSS	1/20/03
Pass. Right Femur Moment X	F107FX	FTSS	1/20/03
Pass. Right Femur Moment Y	F107MY	FTSS	1/20/03
Pass. Right Femur Moment Z	F107FZ	FTSS	1/20/03
Passenger Left Femur Force X	F109FX	FTSS	1/20/03
Passenger Left Femur Force Y	F109FY	FTSS	1/20/03
Passenger Left Femur Force Z	F109FZ	FTSS	1/20/03
Pass. Left Femur Moment X	F109MX	FTSS	1/20/03
Pass. Left Femur Moment Y	F109MY	FTSS	1/20/03
Pass. Left Femur Moment Z	F109MZ	FTSS	1/20/03

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Mid A-Post Y	ALFP5	ENTRAN	11/4/02
Left Lower A-Post Y	G03-N12	ENTRAN	10/7/02
Left Mid B-Post Y	G01-N09	ENTRAN	2/24/03
Left Lower B-Post Y	K21-N26	ENTRAN	2/24/03
Left Upper B-Post Y	G01-N21	ENTRAN	1/16/03
RR Occupant Compartment Y	H05-F09	ENTRAN	10/31/02
Floorpan @ Rear Axle X	A08-M06	ENTRAN	2/24/03
Floorpan @ Rear Axle Y	A08-M04	ENTRAN	2/24/03
Floorpan @ Rear Axle Z	A08-M02	ENTRAN	2/24/03
Driver Seat Track Y	G01-N02	ENTRAN	2/24/03
Driver Left Seat Frame Y	G01-N06	ENTRAN	2/24/03
Driver Right Seat Frame Y	G01-N23	ENTRAN	2/24/03
Right Front Sill X	A08-M09	ENTRAN	2/24/03
Right Front Sill Y	A08-N02	ENTRAN	2/24/03
Right Front Sill Z	A08-M05	ENTRAN	2/24/03
Right Rear Sill X	A08-M10	ENTRAN	2/24/03
Right Rear Sill Y	L12-F06	ENTRAN	2/24/03
Right Rear Sill Z	L12-F01	ENTRAN	2/24/03
Left Rear Sill Y	H01-N33	ENTRAN	11/19/02
Left Front Sill Y	99F341	ENTRAN	1/30/03
Vehicle CG X	A09-N37	ENTRAN	2/24/03
Vehicle CG Y	A08-M11	ENTRAN	2/24/03
Vehicle CG Z	A08-M03	ENTRAN	2/24/03
Left Front Door @ Rib Y	H05-F17	ENTRAN	10/31/02
Left Front Door @ Pelvis Y	H01-N24	ENTRAN	10/30/02
Left Front Door @ Arm Y	H01-N22	ENTRAN	10/30/02
Left Front Door @ Knee Y	H05-F03	ENTRAN	10/30/02
Left Rear Door @ Rib Y	L23-A01	ENTRAN	2/24/03
Left Rear Door @ Pelvis Y	G01-N20	ENTRAN	2/24/03
Left Rear Door @ Knee Y	H01-N23	ENTRAN	11/19/02
Left Rear Door @ Arm Y	H01-N32	ENTRAN	11/19/02

Note: All Endevco accelerometers are Model No. 7264-2000
 All Entran accelerometers are Model No. EGE-72

APPENDIX E
SID IIS DUMMY PEAK RESPONSES

DRIVER PEAK RESPONSE TABLE

Location	Peak Response						
				2001 Ford Focus 3/17/03 SID IIS 020		2001 Ford Focus 3/17/03 SID IIS 033	
	Class	Axis	Units	Peak	Time	Peak	Time
Head	1000	X	G	-38.4	63.5	-72.3	58.3
	1000	Y	G	51.4	65.3	104.5	56.3
	1000	Z	G	68.5	45.7	62.8	52.7
	1000	RES	G	71.7	45.6	116.9	57.4
Head Injury Criteria (HIC)				383		780	
t1				38.6		49.7	
t2				53.6		62.4	
HIC 36				638		780	
t1				36		49.7	
t2				72		62.4	
Upper Neck Force	1000	X	N	-630.7	45.7	-1730.7	57.6
	1000	Y	N	592.9	63.6	524.5	71.4
	1000	Z	N	2324.6	45.7	4893.3	57.7
	1000	RES	N	2428.3	45.7	5207.2	57.7
Upper Neck Moment	600	X	Nm	-46.8	32.3	-66.7	46.3
	600	Y	Nm	51.8	68.1	-81.4	57.9
	600	Z	Nm	16.4	59.6	11.6	57.8
	600	RES	Nm	54.5	67.5	95.4	57.9
Shoulder G's	180	X	G	-87.4	61.4	-119.8	33.0
	180	Y	G	293.5	21.7	181.5	31.5
	180	Z	G	118.5	61.2	108.0	28.5
	180	RES	G	295.1	21.7	198.2	31.6

DRIVER PEAK RESPONSE TABLE (CONTINUED)

Location	Peak Response						
				2001 Ford Focus 3/17/03 SID IIS 020		2001 Ford Focus 3/17/03 SID IIS 033	
	Class	Axis	Units	Peak	Time	Peak	Time
Shoulder Force	600	X	N	-676.2	62.3	-477.0	62.5
	600	Y	N	1890.3	31.4	1508.9	42.6
	600	Z	N	420.0	35.6	305.6	81.0
Upper Arm	180	X	G	-70.6	62.3	-81.1	30.9
	180	Y	G	146.9	21.4	149.1	32.1
	180	Z	G	-42.7	61.7	47.0	28.9
	180	RES	G	148.4	21.4	164.4	32.0
Upper Spine	180	X	G	-24.3	68.1	46.3	57.2
	180	Y	G	70.0	35.3	85.9	42.1
	180	Z	G	-18.7	123.1	9.5	78.7
	180	RES	G	70.6	35.2	91.7	42.0
Upper Thorax Rib	180	Y	G	220.9	24.0	84.8	34.3
Mid Thorax Rib	180	Y	G	126.8	23.1	88.9	28.1
Lower Thorax Rib	180	Y	G	162.7	20.4	170.2	37.3
Upper Abdominal Rib	180	Y	G	256.0	19.3	128.5	26.8
Lower Abdominal Rib	180	Y	G	279.6	19.4	141.0	26.9
Shoulder Deflection	180	Y	mm	-45.6	39.6	-27.2	45.4

DRIVER PEAK RESPONSE TABLE (CONTINUED)

Location	Peak Response						
				2001 Ford Focus 3/17/03 SID IIS 020		2001 Ford Focus 3/17/03 SID IIS 033	
	Class	Axis	Units	Peak	Time	Peak	Time
Upper Thorax Deflection	180	Y	mm	-31.4	39.9	-28.6	43.7
Middle Thorax Deflection	180	Y	mm	-30.6	39.3	-25.0	42.7
Lower Thorax Deflection	180	Y	mm	-48.1	36.6	-22.6	41.7
Upper Abdominal Rib Deflection	180	Y	mm	-55.8	33.9	-30.8	39.8
Lower Abdominal Rib Deflection	180	Y	mm	-45.4	32.0	-32.3	39.0
Shoulder Deflection Rate	180	Y	m/s	-5.9	24.5	-4.3	33.6
Upper Thorax Deflection Rate	180	Y	m/s	-4.9	25.1	-2.4	34.0
Middle Thorax Deflection Rate	180	Y	m/s	-4.6	24.7	-2.7	30.0
Lower Thorax Deflection Rate	180	Y	m/s	-6.5	23.1	-3.6	32.1
Upper Abdominal Rib Deflection Rate	180	Y	m/s	-8.5	22.5	-4.4	30.6
Lower Abdominal Rib Deflection Rate	180	Y	m/s	-7.5	21.5	-5.1	28.7
Shoulder VC	180	Y	m/s	0.8	26.9	0.4	36.1
Upper Thorax Rib VC	180	Y	m/s	0.6	26.3	0.4	37.2
Mid Thorax Rib VC	180	Y	m/s	0.7	26.0	0.2	32.9
Lower Thorax Rib VC	180	Y	m/s	1.2	24.4	0.3	32.9
Upper Abdominal Rib VC	180	Y	m/s	1.9	23.7	0.6	31.1
Lower Abdominal Rib VC	180	Y	m/s	1.3	23.1	0.7	29.4

DRIVER PEAK RESPONSE TABLE (CONTINUED)

Location	Peak Response						
				2001 Ford Focus 3/17/03 SID IIS 020		2001 Ford Focus 3/17/03 SID IIS 033	
	Class	Axis	Units	Peak	Time	Peak	Time
Lower Spine	180	X	G	-22.2	62.8	-32.1	41.4
	180	Y	G	85.7	28.1	87.5	39.6
	180	Z	G	-17.4	22.2	-30.3	37.4
	180	RES	G	86.1	28.1	94.7	39.7
Lumbar Force	600	X	N	-685.9	97.2	959.3	59.7
	600	Y	N	2418.9	28.3	2936.1	34.1
	600	Z	N	1195.9	46.0	1974.9	58.6
Lumbar Moment	600	X	Nm	147.4	28.4		
	600	Y	Nm	-43.4	138.3	-54.9	59.7
	600	Z	Nm	18.6	103.9	-9.4	31.5
Left Acetabulum Force	600	Y	N	2507.7	25.8	3231.5	33.4
Left Ilium Crest Force	600	Y	N	4823.7	26.9	No Data	
Sum of Left Acetabulum & Left Ilium Crest	600	Y	N	7310.6	26.1	No Data	
Right Ilium Crest	600	Y	N	785.7	74.1	656.8	33.9
Pubic Symphysis Force	600	Y	N	-668.5	26.5	-889.7	34.6
Right Femur Force	600	X	N			660.7	34.9
	600	Y	N			-2171.1	34.4
	600	Z	N			-2170	33.0
	600	RES	N			2695.1	33.0

DRIVER PEAK RESPONSE TABLE (CONTINUED)

Location	Peak Response						
				2001 Ford Focus 3/17/03 SID IIS 020		2001 Ford Focus 3/17/03 SID IIS 033	
	Class	Axis	Units	Peak	Time	Peak	Time
Right Femur Moment	600	X	Nm			395.6	33.5
	600	Y	Nm			75.3	35.6
	600	Z	Nm			101.4	39.4
	600	RES	Nm			397.1	33.5
Left Femur Force	600	X	N			-490.7	34.0
	600	Y	N			2385.5	33.1
	600	Z	N			2012.6	34.4
	600	RES	N			2622.7	33.1
Left Femur Moment	600	X	Nm			-105.8	33.0
	600	Y	Nm			47.8	38.5
	600	Z	Nm			69.5	44.4
	600	RES	Nm			111.3	44.9
Pelvis	1000	X	G	23.2	44.7	-50.2	33.2
	1000	Y	G	84.0	25.9	107.9	34.2
	1000	Z	G	-13.1	21.0	-21.3	33.6