

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

**Hyundai Motor Company
2004 Hyundai Accent 2 Door
NHTSA NUMBER: M40508**

**PREPARED BY:
MGA RESEARCH CORPORATION
5000 WARREN ROAD
BURLINGTON, WI 53105**



Test Date: December 2, 2003

Report Date: January 12, 2004

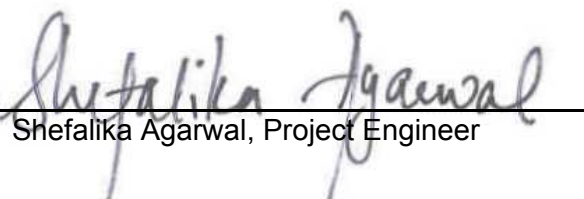
FINAL REPORT

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16. Abstract A 55/28 km/h 90° Moving Deformable Barrier NCAP side impact was conducted on the subject 2004 Hyundai Accent 2 Door to obtain new car assessment and research data indicant of FMVSS No. 214D performance. The test was conducted at MGA Research Corporation, in Burlington, Wisconsin, on December 2, 2003. The impact velocity of the Moving Deformable Barrier (MDB) was 62.1km/h, and the ambient temperature at the struck side (driver's) of the vehicle was 21°C. The target vehicle's maximum post test static crush was 343 mm at level 2. The test vehicle's occupant performance is as follows: <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>DRIVER</u></th> <th style="text-align: center;"><u>PASS.</u></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) Accel., g</td> <td style="text-align: center;">62</td> <td style="text-align: center;">54</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td style="text-align: center;">64</td> <td style="text-align: center;">70</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td style="text-align: center;">63</td> <td style="text-align: center;">71</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td style="text-align: center;">64</td> <td style="text-align: center;">70</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td style="text-align: center;">83</td> <td style="text-align: center;">75</td> </tr> <tr> <td>HIC</td> <td style="text-align: center;">356</td> <td style="text-align: center;">516</td> </tr> </tbody> </table> The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.					<u>DRIVER</u>	<u>PASS.</u>	Left Upper Rib (LUR) Accel., g	62	54	Left Lower Rib (LLR) Accel., g	64	70	Lower Spine (T ₁₂) Accel., g	63	71	Thoracic Trauma Index (TTI)	64	70	Pelvis (PEV) Accel., g	83	75	HIC	356	516
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17. Key Words New Car Assessment Program (NCAP) Side Impact Side Impact Dummy (SID/HIII) Occupant Side Impact Protection		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Adm. Technical Ref. Division, Room 5108 (NPO-230) 400 Seventh Street, S.W. Washington, D.C. 20590																						
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SECTION 1

PURPOSE AND TEST PROCEDURE

1.1 PURPOSE

This side impact test was conducted as part of the FY' 2004 test program sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-03-D-12005. The purpose of this test was to evaluate side impact protection in a 2004 Hyundai Accent 2 Door manufactured by Hyundai Motor Company.

1.2 TEST PROCEDURE

The side impact test was conducted in accordance with the Laboratory Test Procedure for New Car Assessment Program Side Impact Testing dated November 2002 and the corresponding MGA Research Corporation Test Procedure MGA-NHTSA5. The procedures for receiving, inspection, testing, and reporting of test results are described in the test procedures and are not repeated in this report.

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

SECTION 2

SUMMARY OF NCAP SIDE IMPACT TEST

2.1 SUMMARY OF SIDE IMPACT TEST

A model year 2004 Hyundai Accent 2 Door was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.1 km/h. The specified impact velocity range is from 61.1 to 62.7 km/h. The test (target) vehicle was stationary and positioned 63° to the line of forward motion. The weight of the vehicle as tested was 1294.7 kg and the test weight of the MDB was 1361.2 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on December 2, 2003.

One (1) real-time motion picture camera and nine (9) high-speed motion picture cameras were used to document the impact event. The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera. Camera locations and pertinent camera information are documented in the data sheets. Pre- and post-test photographs of the vehicle and Side Impact Dummies (SID/HIIIs) can be found in Appendix A. Two 50th percentile adult male SID/HIII's were placed in the driver and left rear passenger designated seating positions according to instructions specified in the Laboratory Test Procedure for New Car Assessment Program Side Impact Testing dated November 2002. Each SID/HIII was instrumented in the following locations:

- Left Upper Rib (LUR) uni-axial accelerometer (Y-axis primary and redundant)
- Left Lower Rib (LLR) uni-axial accelerometer (Y-axis primary and redundant)
- Lower Thoracic Spine (T12) uni-axial accelerometer (Y-axis primary and redundant)
- Pelvic (PEV) section uni-axial accelerometer (Y-axis primary and redundant)
- Head Center of Gravity (CG) tri-axial accelerometers (X, Y and Z axes primary and redundant)
- Upper Neck load cell (Fx, Fy, Fz, Mx, My, Mz)

The test vehicle was instrumented with twenty-five (25) structural accelerometers and the MDB was instrumented with six (6) accelerometers and two (2) contact switches on the bumper to compare left side to right side bumper impact timing. All data channels were recorded with a fully self contained on-board EME Data Acquisition System. The data was digitally sampled at 10,000 samples per second and processed per Appendix V of the Test Procedure.

2.2 GENERAL COMMENTS

The test vehicle sustained a maximum static crush of 343 mm at level 2, 1350 mm rearward of the left vertical impact point. The driver and passenger SID/HIII's, Serial Nos. 904 and 271 respectively, were calibrated just prior to this test. The SID/HIII's injury criteria are summarized as follows:

Measurements	Units	Driver	Passenger
Thoracic Trauma Index (TTI)	G's	64	70
Peak Pelvic G's (PEV)	G's	83	75
Head Injury Criteria (HIC)	none	356	516

Test summaries and post-test observations are presented in Section 3. The vehicle, camera, and occupant measurements are presented in Section 4. Appendix A contains the still photograph prints. Appendix B contains the driver and passenger SID/HIII's, vehicle, and MDB response data traces. Appendix C contains the SID/HIII's configuration and performance verification data. Appendix D contains the test equipment information.

TEST NOTES

There was no valid data collected for the following channels:

Driver Head Xr (After 25ms)

Driver Upper Rib Yr (After 38ms)

Left Mid B-Post Y (After 20ms)

The rear seat track accelerometer was not used in this test.

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

Test Vehicle: 2004 Hyundai Accent 2 Door
 Test Program: NCAP Side Impact

NHTSA No. M40508
 Test Date: 12/02/03

CONVERSION FACTORS USED IN THIS REPORT*

Quantity	Typical Application	English Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	mile/h	km/h	1.609
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.573
Pressure	Tire Pressure	lbf/in ²	kPa	7.0
Volume	Liquid	gal	liter	3.785
Temperature	General Use	°F	°C	$=(tf - 32)/1.8$
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf/ft	Nm	1.355

*Based on the Recommended Practice in SAE J916, May 85

DATA SHEET NO. 1**GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2004 Hyundai Accent 2 Door
 Test Program: NCAP Side Impact

NHTSA No. M40508
 Test Date: 12/02/03

TEST VEHICLE INFORMATION

Make	Hyundai
Model	Accent 2 Door
Body Style	Hatchback
NHTSA No.	M40508
VIN	KMHCF35C44U284713
Color	Glacier Blue
Delivery Date	11/19/03
Odometer Reading (mile)	121
Dealer	Boucher Chevrolet
Transmission	Manual
Final Drive	Front
Number of Cylinders	4
Engine Displacement (L)	1.6
Engine Placement	Longitudinal

TEST VEHICLE OPTIONS

Front Airbag	Yes
Side Airbags	Yes (Front Seat)
Power Windows	No
Power Steering	Yes
Power Door Locks	No
Tilt Wheel	No
Air Conditioning	Yes
Power Brakes	Yes
Disc Brakes, Front	Yes
Disc Brakes, Rear	No
Anti-lock Brakes	No
AM/FM/Clock	Yes
Anti-theft System	No
Cruise Control	No

DATA FROM CERTIFICATION LABEL

Manufactured By	Hyundai Motor Company
Date of Manufacture	08/03

GVWR (kg)	1555
GAWR Front (kg)	820
GAWR Rear (kg)	850

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	230	230
Cold / Test Pressure (kPa)	207	207
Recommended Tire Size	P175/70R13	P175/70R13
Tire Size on Vehicle	P175/70R13	P175/70R13
Tire Manufacturer	Hankook	Hankook

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Buckets	Bench	N/A	
Number Of Occupants	2	3	0	5
Capacity Wt. (VCW) (kg)				386
Cargo Wt. (RCLW) (kg)				45

DATA SHEET NO. 1... (continued)**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2004 Hyundai Accent 2 DoorNHTSA No. M40508Test Program: NCAP Side ImpactTest Date: 12/02/03**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	335.2	221.4		378.8	302.6	
Right	kg	321.6	217.3		342.0	271.3	
Ratio	%	60.0	40.0		55.7	44.3	
Totals	kg	656.8	438.7	1095.5	720.8	573.9	1294.7

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1095.5
Weight of 2 P572E ATDs	kg	161.5
Rated Cargo/Luggage Weight (RCLW)	kg	45.4
Calculated Vehicle Target Weight (TVTW)	kg	1302.4

* Actual As Tested Weight (ATW) will be TVTW -5/-10 kg

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG(aft of front axle)
As Delivered	mm	625	626	615	620	979
As Tested	mm	609	622	580	596	1084
Fully Loaded	mm	604	623	574	595	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2445
Total Vehicle Length at Left Side	mm	3475
Total Vehicle Length at Centerline	mm	4230
Total Vehicle Length at Right Side	mm	3475
Total Vehicle Width	mm	1632
Weight of Ballast in Cargo Area	kg	5.0
Amount of Stoddard Solvent in Fuel Tank	liters	42.0

TEST VEHICLE VERTICAL IMPACT LINE DATA

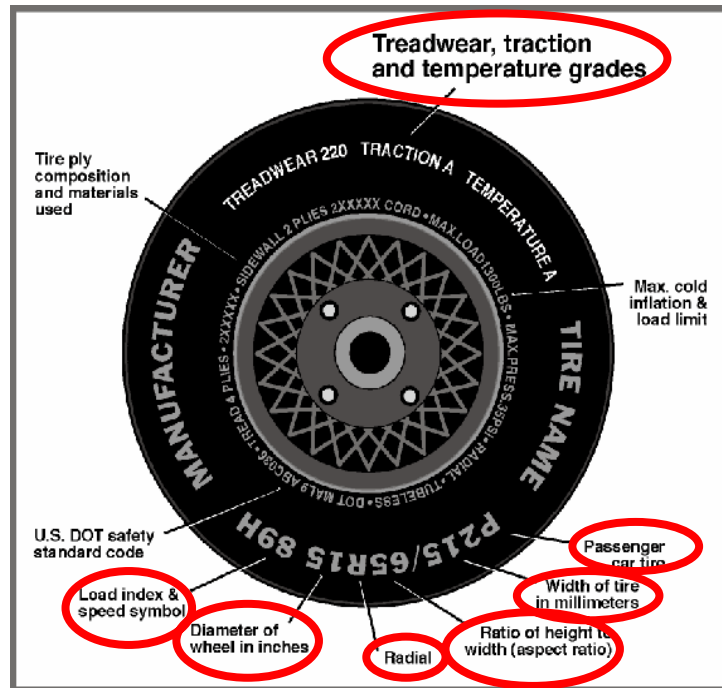
Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2445
Target Impact Point Aft of Front Axle	mm	283
Actual Impact Point Aft of Front Axle	mm	276

DATA SHEET NO. 2
TEST VEHICLE TIRE INFORMATION

Test Vehicle: 2004 Hyundai Accent 2 Door
 Test Program: NCAP Side Impact

NHTSA No.: M40508
 Test Date: 12/02/03

Vehicle Year	2004	Vehicle Make	Hyundai
VIN	KMHCF35C44U284713	Vehicle Model	Accent 2 Door



	Front	Rear
Tire Manufacturer	Hankook	Hankook
Tire Name	H406	H406
Tire Type	Radial	Radial
Tire Width (mm)	175	175
Ratio of Height to Width (aspect ratio)	70	70
Radial	R	R
Wheel Diameter	13	13
Load Index & Speed Symbol	82T	82T
Treadwear	340	340
Traction Grade	A	A
Temperature Grade	A	A

DATA SHEET NO. 3

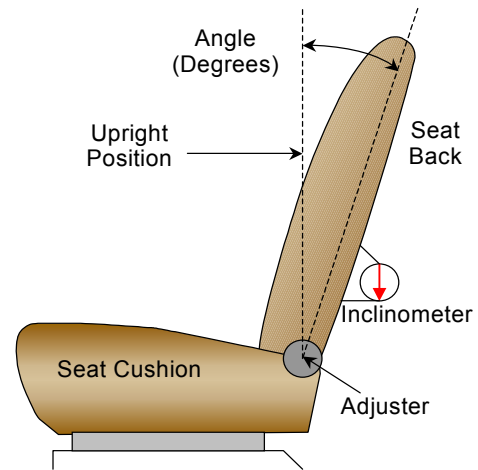
TEST VEHICLE INFORMATION

Test Vehicle: 2004 Hyundai Accent 2 Door
Test Program: NCAP Side Impact

NHTSA No. M40508
Test Date: 12/02/03

NORMAL DESIGN RIDING POSITION

The driver seat is positioned to the manufacturers designated angle. Seat back cover should be torn for attaching the inclinometer correctly on measurement position. One step of seat back recliner is 2° , so with 5 step from the fore initial lock position, 25.5° seat back angle will be obtained. The seat back angle for the driver and the passenger seats is 25.5 degrees.



FRONT SEAT ASSEMBLY

Driver seat back angle: 25.3°
Left Rear Passenger seat back angle: Non-adjustable

SEAT FORE/AFT POSITIONS

The seat should be positioned at the 9th lock position from the fore 1st lock position, then the distance between the end of track upper rail and track lower rail is to be 44.5mm.

Driver seat fore/aft total travel: 215 mm
Left Rear Passenger seat fore/aft total travel: non adjustable
Driver seat fore/aft position: 10th of 19 notch
Left Rear Passenger seat fore/aft position: non adjustable

DATA SHEET NO. 3... (continued)

TEST VEHICLE INFORMATION

Test Vehicle: 2004 Hyundai Accent 2 Door
Test Program: NCAP Side Impact

NHTSA No. M40508
Test Date: 12/02/03

FUEL TANK CAPACITY DATA

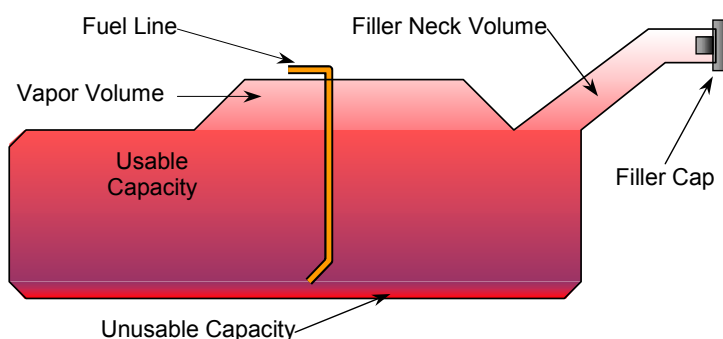
The "Usable Capacity" of the standard equipment fuel tank is: 45.0 liters

The "Usable Capacity" of any optional equipment fuel tank is: N/A liters

The "Usable Capacity" used for certification to FMVSS 301 requirements: 42.0 liters

Actual amount of Stoddard solvent added to vehicle for certification test: 42.0 liters

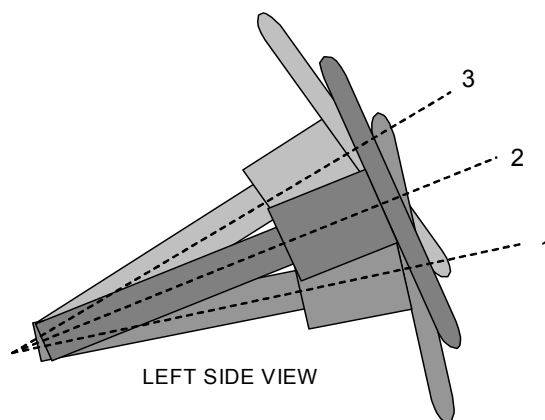
The fuel filler is located on the left hand side (driver's side) of the vehicle.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes, when it is moved through its full range of driving positions. This vehicle has non-tilt steering column (non adjustable type).



STEERING COLUMN ASSEMBLY

DATA SHEET NO. 4
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2004 Hyundai Accent 2 Door
Test Program: NCAP Side Impact

NHTSA No. M40508
Test Date: 12/02/03

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	335.2	221.4		378.8	302.6	
Right	kg	321.6	217.3		342.0	271.3	
Weight Ratio	%	60.0	40.0		55.7	44.3	
Totals	kg	656.8	438.7	1095.5	720.8	573.9	1294.7

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
Level 1	Sill Top Height	mm	173	235
Level 2	Occupant H-Point	mm	343	466
Level 3	Mid Door	mm	329	575
Level 4	Window Sill	mm	279	857
Level 5	Window Top	mm	75	1300
N/A	Maximum Penetration	mm	343	466

INSTRUMENTATION

Driver SID/HIII Instrumentation	22
Passenger SID/HIII Instrumentation	22
Vehicle Structure Accelerometers	25
MDB Accelerometers	6
Total	75

DATA SHEET NO. 5**MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS**

Test Vehicle: 2004 Hyundai Accent 2 Door
 Test Program: NCAP Side Impact

NHTSA No. M40508
 Test Date: 12/02/03

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheel base of Framework Carriage	2587
C.G. Location aft of Front Axle	1103

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	62.1
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.1
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.8

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

Vertical Location			From Centerline		Max. Crush
Level	Description	Height	Distance	Direction	
1	Center of Bumper (mm)	432	800	Left	139
2	Top of Bumper (mm)	533	800	Left	96
3	Mid Level (mm)	686	800	Left	138
4	Top of Stack (mm)	813	800	Left	147

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	6
Contact Switches	2
High Speed Cameras	2

DATA SHEET NO. 6
POST TEST OBSERVATIONS

Test Vehicle: 2004 Hyundai Accent 2 Door
Test Program: NCAP Side Impact

NHTSA No. M40508
Test Date: 12/02/03

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat SID/HIII	Rear Seat SID/HIII
Dummy Type / Serial No.	SID/HIII / 904	SID/HIII / 271
Head Contact	Airbag, Headrest, Left shoulder	C-Post
Upper Torso Contact	Airbag	Inner Panel
Lower Torso Contact	Mid Door	Inner Panel
Left Knee Contact	Right Knee	Inner Panel
Right Knee Contact	Left Knee	Left Knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Door Opening	Door remained closed and latched	Door remained closed and latched
Right Side Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
Seat Movement	0	0
Seat Back Failure	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No Separation
Sill Separation	None
Windshield Damage	None
Window Damage	Left Front and Left Rear
Other Notable Effects	None

AIRBAG DEPLOYMENT

	Driver	Front Passenger	Rear Passenger
Front	No	No	N/A
Side (Torso/Head Bag)	Yes	No	N/A

MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	7 mm forward
Vertical Offset	mm	+/-20	13 mm up

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 7

SID/HIII INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2004 Hyundai Accent 2 Door
 Test Program: NCAP Side Impact

NHTSA No. M40508
 Test Date: 12/02/03

THORAX AND PELVIS PEAK ACCELERATIONS (FIR 100 Filtered)

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Upper Rib (LUR)	Y	G's	61.9	39	-12.0	68	53.5	45	-4.9	86
Upper Rib (LUR) (R)	Y	G's	*	*	*	*	54.3	45	-4.7	86
Lower Rib (LLR)	Y	G's	64.3	37	-6.9	68	69.6	45	-14.8	71
Lower Rib (LLR) (R)	Y	G's	66.9	37	-7.3	68	69.1	45	-15.8	71
Lower Spine (T ₁₂)	Y	G's	62.9	35	-8.2	73	70.7	43	-12.2	68
Lower Spine (T ₁₂) (R)	Y	G's	61.9	35	-8.0	73	70.0	43	-12.2	68
Pelvis (PEV)	Y	G's	82.7	28	-7.8	50	75.4	35	-14.5	81
Pelvis (PEV) (R)	Y	G's	82.3	28	-7.6	49	75.2	35	-16.1	81

THORACIC TRAUMA INDEX (TTI) AND PELVIC ACCELERATION (FIR 100 Filtered)

Location	Driver				Passenger			
	LLR	T ₁₂	TTI(g)	PEV(g)	LLR	T ₁₂	TTI(g)	PEV(g)
Rib, Spine, and Pelvis	64.3	62.9	63.6	82.7	69.6	70.7	70.2	75.4
Rib, Spine, and Pelvis (R)	66.9	61.9	64.4	82.3	69.1	70.0	69.6	75.2

HEAD CG PEAK ACCELERATIONS (SAE CLASS 1000 Filtered)

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	1.5	23	-22.8	80	9.4	58	-38.7	68
Head CG	Y	G's	22.7	76	-4.0	24	116.1	47	-14.4	58
Head CG	Z	G's	49.0	53	-1.8	20	39.9	47	-55.7	57
Head CG Resultant		G's	53.6	53			121.6	47		

HEAD INJURY CRITERIA (SAE CLASS 1000 Filtered)

Location	Driver				Passenger			
	HIC	T ¹	T ²	Avg G's	HIC	T ¹	T ²	Avg G's
Head CG	356.2	42.6	78.6	39.6	516.0	43.7	70.9	51.4

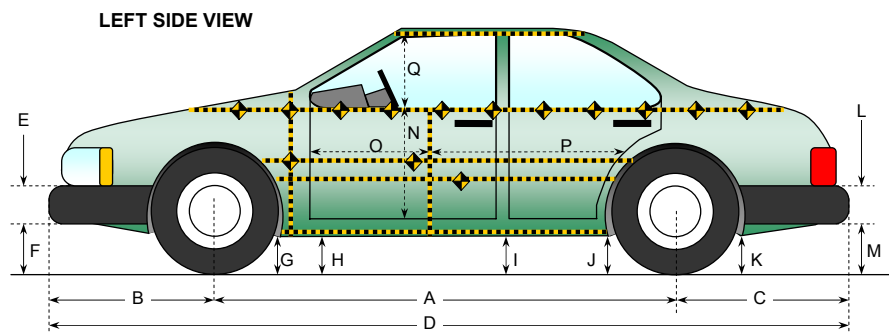
* No Valid Data collected after 38ms

Positive Acceleration Polarities: Longitudinal (X) = Forward
 (Conforms to SAE J211) Lateral (Y) = Right
 Vertical (Z) = Down

DATA SHEET NO. 8
VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2004 Hyundai Accent 2 Door
 Test Program: NCAP Side Impact

NHTSA No. M40508
 Test Date: 12/02/03



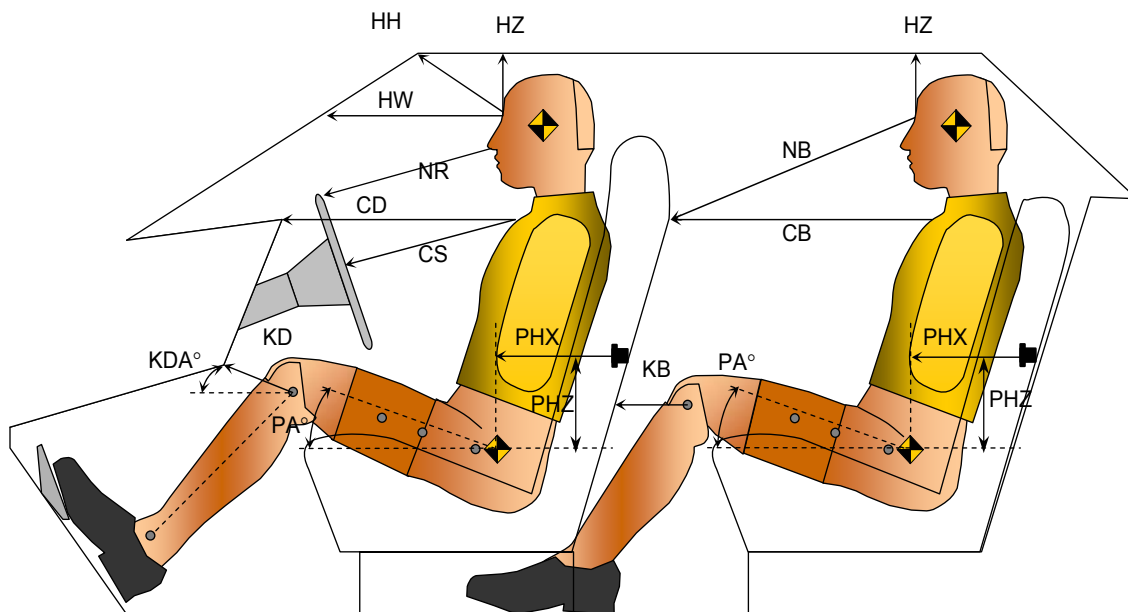
All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2445	2384	61
B	Front Axle to FSOV	835	856	-21
C	Rear Axle to RSOV	950	874	76
D	Total Length at Centerline	4230	4114	116
E	Front Bumper Thickness	135	135	0
F	Front Bumper Bottom to Ground	386	404	-18
G	Sill Height at Front Wheel Well	160	173	-13
H	Sill Height at Front Door Leading Edge	151	159	-8
I	Sill Height at "B" Pillar	148	138	10
J1	Sill Height at Rear Wheel Well	146	151	-5
J2	Pinch Weld Height at Rear Wheel Well	146	141	5
K	Sill Height Aft of Rear Wheel Well	215	196	19
L	Rear Bumper Thickness	120	120	0
M	Rear Bumper Bottom to Ground	435	423	12
N	Sill Height to Window Bottom Sill	635	495	140
O	Front Door Leading Edge to Impact CL	645	643	2
P	Rear Door Trailing Edge to Impact CL	647	646	1
Q	Front Window Opening	453	459	-6
R	Right Side Length	3475	3484	-9
S	Left Side Length	3475	3381	94
T	Vehicle Width at "B" Post	1632	1385	247

DATA SHEET NO. 9
SID/HII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2004 Hyundai Accent 2 Door
 Test Program: NCAP Side Impact

NHTSA No. M40508
 Test Date: 12/02/03

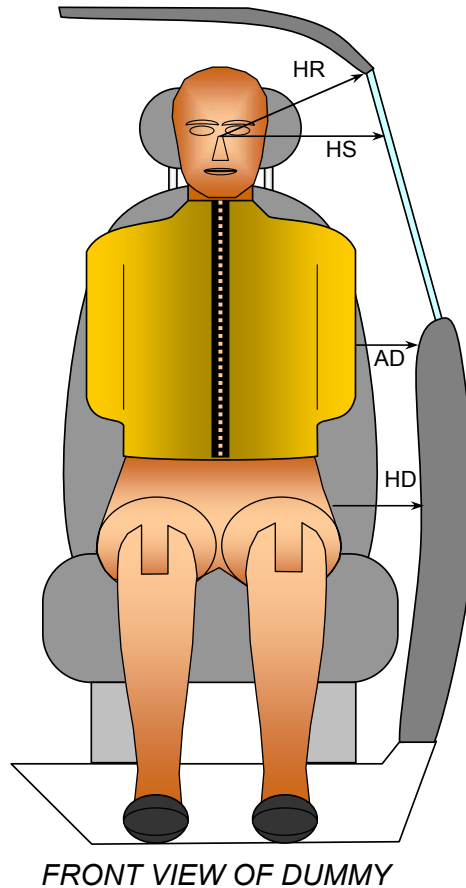


Driver Code	Pass. Code	Measurement Description	Driver 271		Passenger 904	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	444			
HW		Head to Windshield	613			
HZ	HZ	Head to Roof	152		132	
NR	NB	Nose to Rim/Nose to Seatback	522		509	
CD	CB	Chest to Dash or Seatback	569		440	
CS		Chest to Steering Wheel	396			
KDL	KBL	Left Knee to Dash or Seatback	164	18	139	10
KDR	KBR	Right Knee to Dash or Seatback	169	12	141	11
PA	PA	Pelvic Angle		23.8		24.1
PHX	PHX	H-Point to Striker (X-Axis)	422		425	
PHZ	PHZ	H-Point to Striker (Z-Axis)	124		136	

DATA SHEET NO. 10
SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2004 Hyundai Accent 2 Door
 Test Program: NCAP Side Impact

NHTSA No. M40508
 Test Date: 12/02/03

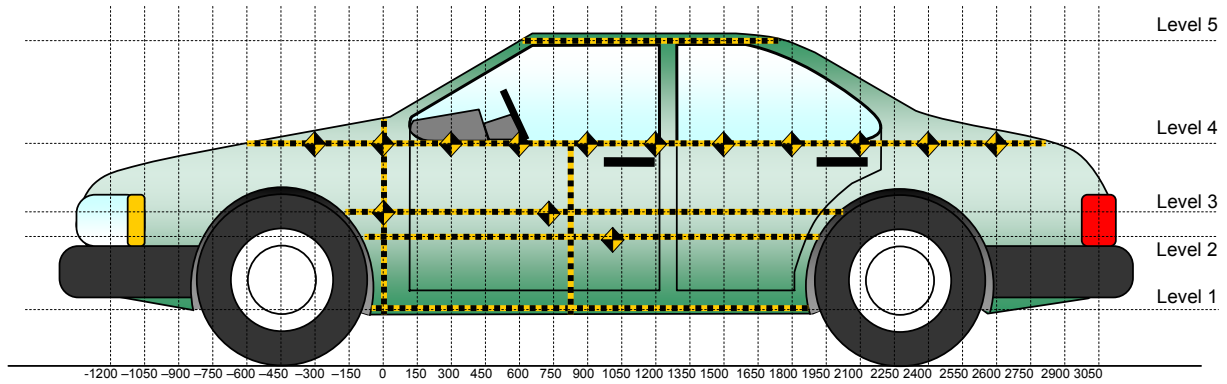


Code	Measurement Description	Units	Driver S/N 904	Passenger S/N 271
HR	Head to Side Header	mm	185	204
HS	Head to Side Window	mm	312	335
AD	Arm to Door	mm	104	118
HD	H-Point to Door	mm	156	163

DATA SHEET NO. 11
VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2004 Hyundai Accent 2 Door
 Test Program: NCAP Side Impact

NHTSA No. M40508
 Test Date: 12/02/03



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	1300
4	Window Sill	857
3	Mid Door	575
2	Occupant H-Point	466
1	Sill Top	235

DATA SHEET NO. 12
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2004 Hyundai Accent 2 Door
 Test Program: NCAP Side Impact

NHTSA No. M40508
 Test Date: 12/02/03

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-750				420					420					0	
-600				401					413					12	
-450				381					405					24	
-300				367					404					37	
-150				353					400					47	
0			266	346				400	408				134	62	
150	324	268	270	341		403	493	442	426		79	225	172	85	
300	322	268	268	339		445	542	520	462		123	274	252	123	
450	321	267	267	337		452	569	529	494		131	302	262	157	
600	321	267	266	338		468	580	538	516		147	313	272	178	
750	320	266	266	337	569	465	588	545	519	616	145	322	279	182	47
900	319	266	265	337	553	472	590	553	523	604	153	324	288	186	51
1050	319	267	265	335	553	482	604	562	530	604	163	337	297	195	51
1200	320	267	265	335	552	488	606	563	542	608	168	339	298	207	56
1350	320	267	266	335	550	493	610	562	558	617	173	343	296	223	67
1500	320	268	268	336	548	483	577	569	615	623	163	309	301	279	75
1650	317	268	268	336	547	459	598	597	564	617	142	330	329	228	70
1800	317	268	268	337	546	445	512	565	519	601	128	244	297	182	55
1950			267	340	551			430	444	597			163	104	46
2100			260	344				353	363				93	19	
2250			265	348				327	386				62	38	
2400			286	355				333	390				47	35	
2550			303	365				336	388				33	23	
2700			325	384				344	392				19	8	
2850			362					374					12		

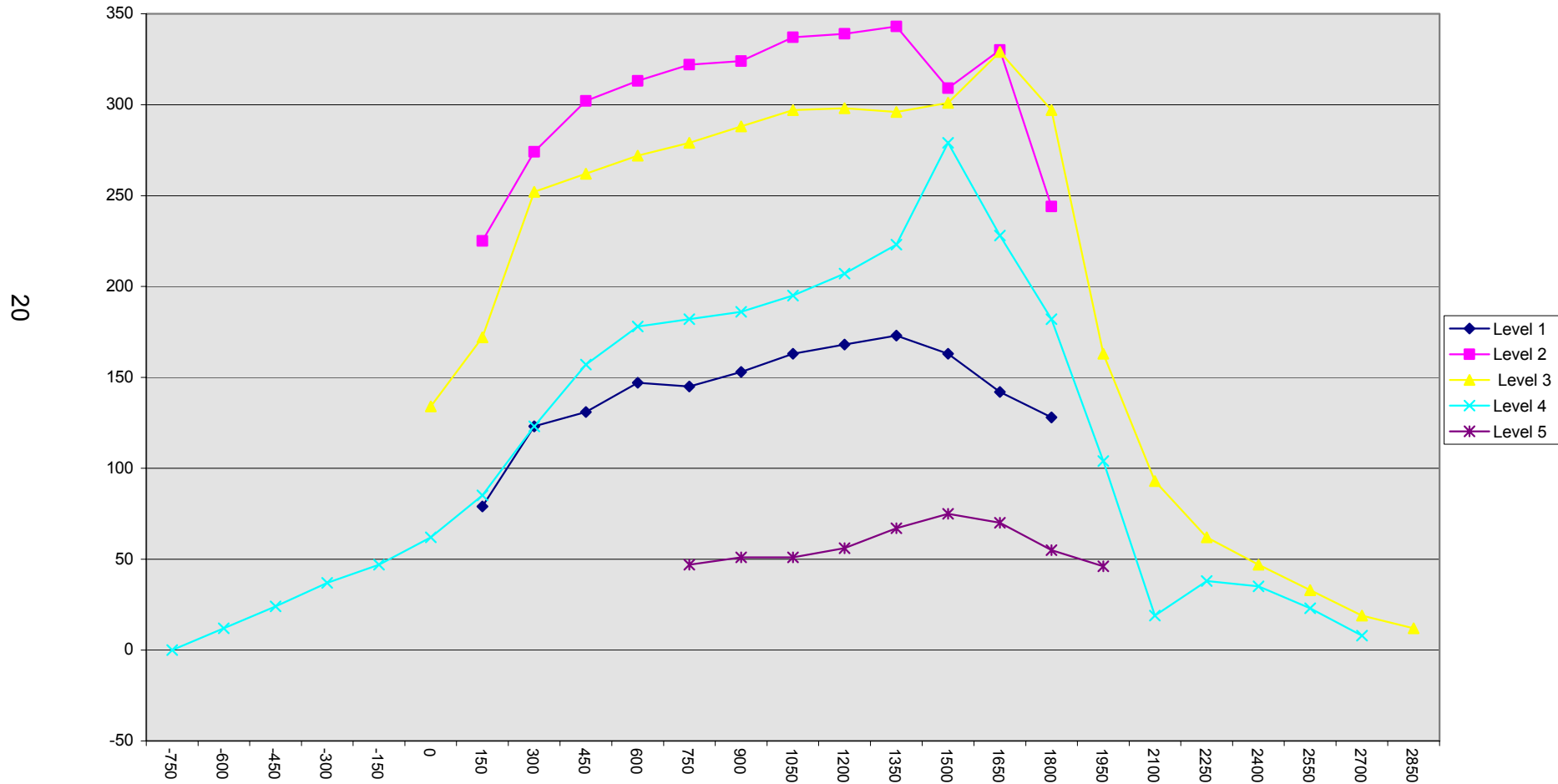
Reference plane is parallel to test vehicle longitudinal centerline.

Given dimensions = Reference plane to car body

DATA SHEET NO. 12...(continued)
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2004 Hyundai Accent 2 Door
Test Program: NCAP Side Impact

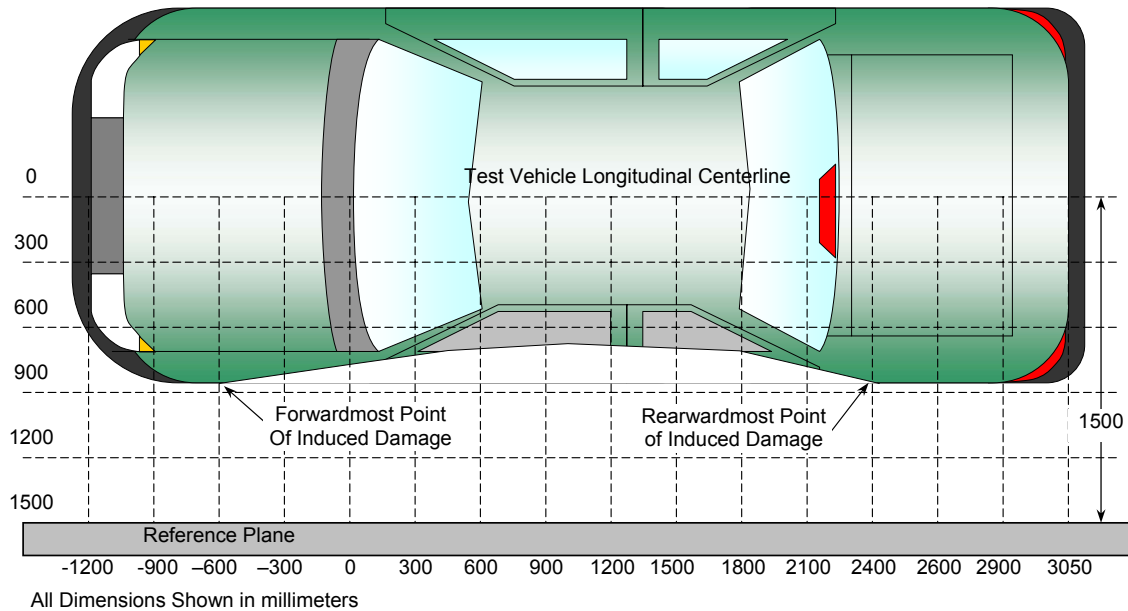
NHTSA No. M40508
Test Date: 12/02/03



DATA SHEET NO. 13
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2004 Hyundai Accent 2 Door
 Test Program: NCAP Side Impact

NHTSA No. M40508
 Test Date: 12/02/03



TOP VIEW

DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	2200 mm	4	384	392	8
2	2025 mm	4	342	413	71
3	1268 mm	2	267	607	340
4	600 mm	2	267	580	313
5	-72 mm	4	349	399	50
6	-750 mm	4	420	420	0

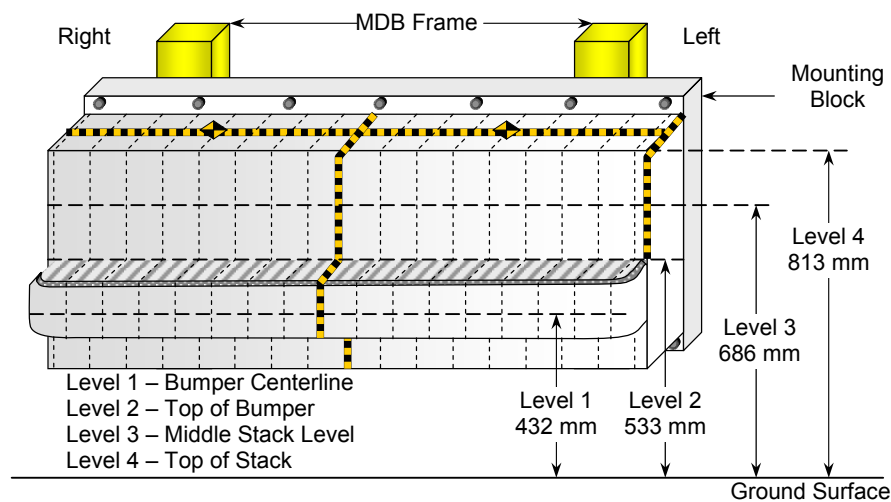
Reference plane is parallel to test vehicle longitudinal centerline.
 Given dimensions = Reference plane to car body.

DATA SHEET NO. 14

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2004 Hyundai Accent 2 Door
 Test Program: NCAP Side Impact

NHTSA No. M40508
 Test Date: 12/02/03



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	93	95	100	87	75	69	64	66	69	73	77	80	90	102	120	137	139
2	60	55	52	43	35	33	33	37	39	44	47	52	57	64	72	81	96
3	29	1	5	16	11	7	7	8	13	12	13	17	21	31	64	119	138
4	58	2	-7	-1	4	4	7	7	12	12	19	28	41	65	94	128	147

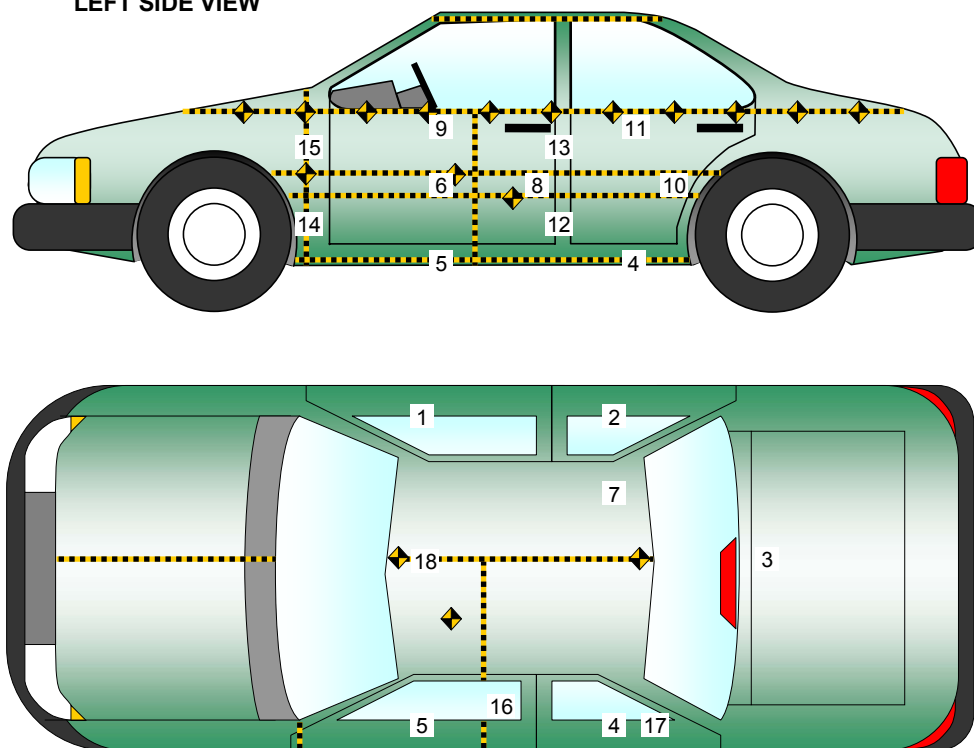
All Dimensions in mm

DATA SHEET NO. 15
VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2004 Hyundai Accent 2 Door
 Test Program: NCAP Side Impact

NHTSA No. M40508
 Test Date: 12/02/03

LEFT SIDE VIEW



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 Front Door Centerline
7	Right Rear Occupant Compartment
8	Left Front Door Mid-Rear
9	Left Front Door Upper Centerline

No.	Location
10	Left Rear Door Mid-Rear
11	Left Rear Door Upper Centerline
12	Left Lower B-Post
13	Left Middle B-Post
14	Left Lower A-Post
15	Left Middle A-Post
16	Front Seat Track
17	Rear Seat Track or Structure
18	Vehicle CG

DATA SHEET NO. 15...(continued)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2004 Hyundai Accent 2 Door
 Test Program: NCAP Side Impact

NHTSA No. M40508
 Test Date: 12/02/03

VEHICLE ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)			Peak Values (G's)				
		X	Y	Z	Axis	Max	Time	Min	Time
1	Right Sill at Front Seat	2309	638	190	X	4.1	58	-5.9	17
					Y	29.0	7	-2.0	117
					Z	5.4	41	-9.3	8
					RES	29.9	7		
2	Right Sill at Rear Seat	1271	638	195	X	4.4	59	-5.1	13
					Y	29.8	7	-4.3	83
					Z	9.4	50	-5.0	58
					RES	30.5	7		
3	Rear Floorpan Above Axle	890	0	310	X	5.8	20	-8.5	32
					Y	28.1	44	-4.9	88
					Z	9.1	8	-12.3	28
					RES	28.1	44		
4	Left Sill at Rear Door	1285	637	193	Y	101.3	20	-11.3	52
5	Left Sill at Front Door	2326	638	190	Y	35.4	21	-4.3	58
6	Left Front Door C/L	2181	815	429	Y	86.2	5	-106.7	8
7	Rear Occupant Compartment	1586	294	334	Y	28.2	7	-2.8	76
8	Left Front Door Mid-Rear	1947	713	420	Y	288.1	6	-91.5	17
9	Left Front Door Upper C/L	2220	705	660	Y	128.4	6	-88.8	24
10	Left Rear Door Mid-Rear	1091	670	683	Y	63.8	13	-14.8	38
11	Left Rear Door Upper C/L	1268	686	889	Y	98.4	21	-119.9	29
12	Left Lower B-Post	1708	664	317	Y	130.4	5	-20.5	59
13	Left Middle B-Post	1617	642	687	Y	*	*	*	*
14	Left Lower A-Post	2801	635	418	Y	127.4	5	-64.1	18
15	Left Middle A-Post	2825	750	813	Y	53.3	4	-13.1	24
16	Front Seat Track	2055	610	305	Y	88.6	15	-12.0	85
17	Rear Seat Track or Structure				Y				
18	Vehicle CG	2150	0	265	X	3.7	26	-9.0	17
					Y	25.8	6	-2.2	116
					Z	16.0	34	-24.9	24
					RES	31.8	20		

* No valid data after 20 msec.

See reference points on the following page.

DATA SHEET NO. 15...(continued)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2004 Hyundai Accent 2 Door
Test Program: NCAP Side Impact

NHTSA No. M40508
Test Date: 12/02/03

Reference Points X - Test Vehicle Rear Bumper (+ forward)
Y - Test Vehicle Centerline (+ to right)
Z - Ground Plane (+ down)

DATA SHEET NO. 16

MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY

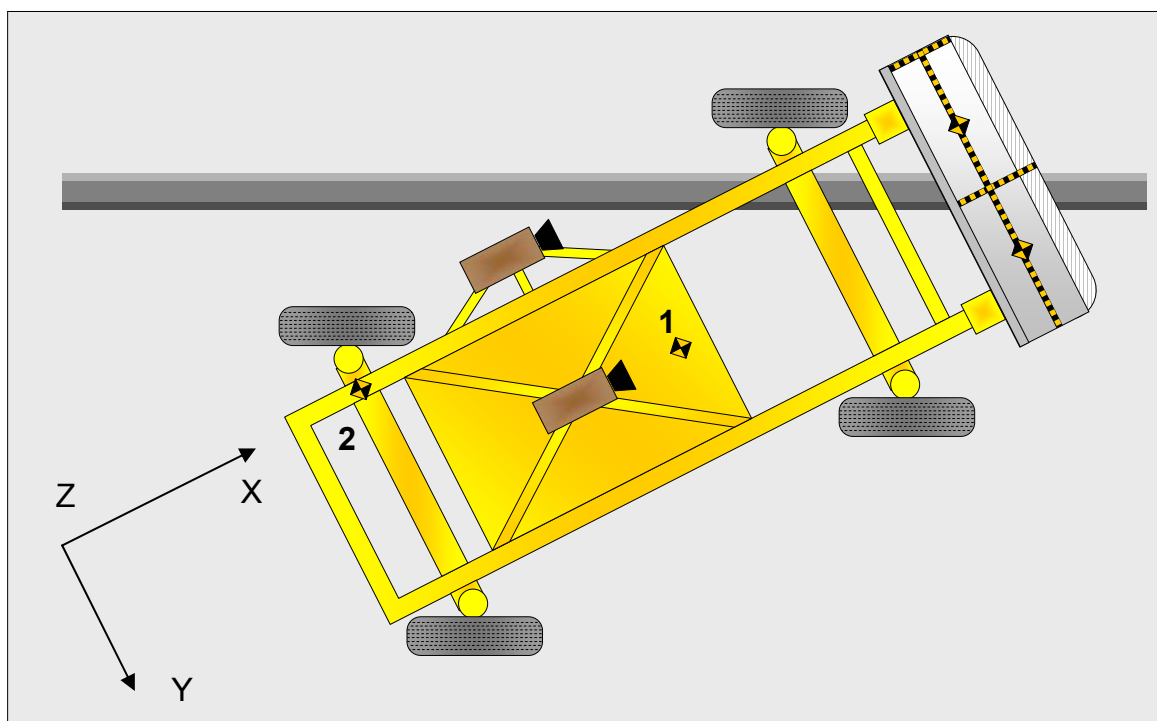
Test Vehicle: 2004 Hyundai Accent 2 Door
Test Program: NCAP Side Impact

NHTSA No. M40508
Test Date: 12/02/03

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	2.1	120	-20.1	40
					Y	3.4	54	-6.4	33
					Z	14.5	52	-13.0	46
					RES	22.4	40		
2	MDB Rear	-2591	-625	-622	X	2.3	98	-23.8	36
					Y	5.6	35	-1.4	127
					Z	3.9	41	-2.5	13
					RES	24.5	36		

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



DATA SHEET NO. 17
VEHICLE STRUCTURAL MEASUREMENTS

Test Vehicle: 2004 Hyundai Accent 2 Door
Test Program: NCAP Side Impact

NHTSA No. M40508
Test Date: 12/02/03

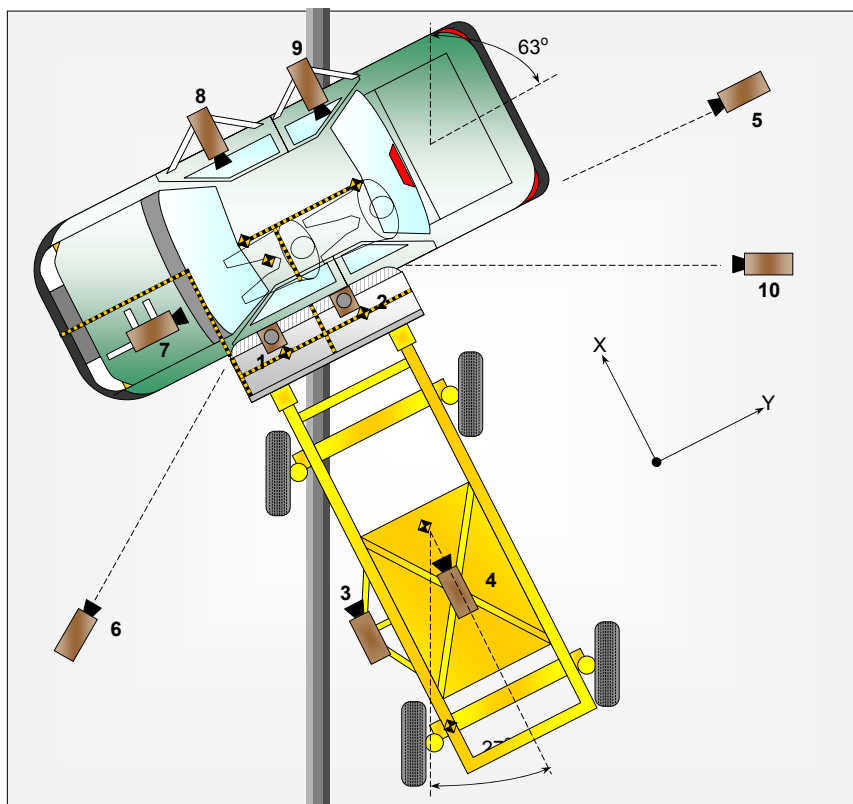
	Elements	Pre-Test (mm)
1	Total Length	4230
2	Total Width	1632
3	Bumper Top Height	524
4	Bumper Bottom Height	390
5	Longitudinal Member Top Height	207
6	Distance between Longitudinal Members	980
7	Longitudinal Member Width	62
8	Engine Top Height	780
9	Engine Bottom Height	185
10	Engine and gearbox width	800
11	Front bumper-engine distance	550
12	Front shock absorber fixing height	820
13	Bonnet leading edge height	675
14	Front shock absorber fixing width	1112
15	Front bumper – front axle distance	835
16	Front axle – a pillar distance	440
17	A-pillar – B-pillar distance	1275
18	B-Pillar – rear axle distance	730
19	B-pillar – C-pillar distance	995
20	Roof sill bottom height	1350
21	Roof sill top height	1382
22	Floor sill bottom height	190
23	Floor sill top height	285

DATA SHEET NO. 18

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2004 Hyundai Accent 2 Door
 Test Program: NCAP Side Impact

NHTSA No. M40508
 Test Date: 12/02/03



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Overall	0	0	5000	8	*
2	Overhead Close-up	640	290	5000	13	1156
3	MDB Onboard, Impact Point Close-up				35	1047
4	MDB Onboard, Centerline of Impact				13	1003
5	Right Side, Ground Level, Overall	4295	8320	1978	25	1010
6	Left Side, Ground Level, Overall	5264	-3795	1725	13	1042
7	Vehicle Onboard Front SID/HIII, Front				13	513
8	Vehicle Onboard Front SID/HIII, Side				8	515
9	Vehicle Onboard Rear SID/HIII, Side				8	508
10	Real Time Coverage				13	24

Reference Points X - Impact Line
 Y - MDB Left Edge Impact Point
 Z - Ground Plane

* no timing marks

DATA SHEET NO. 19
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Vehicle: 2004 Hyundai Accent 2 Door
Test Program: NCAP Side Impact

NHTSA No. M40508
Test Date: 12/02/03

Test Time: 12:21 pm

Temperature at Time of Impact: 21°C

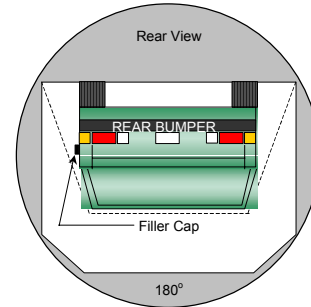
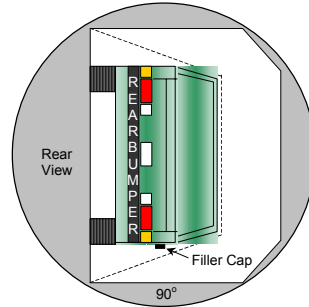
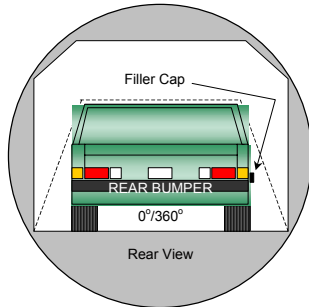
STODDARD SOLVENT SPILLAGE MEASUREMENTS

- A. From impact until vehicle motion ceases: 0 oz.
(Maximum Allowable = 1 ounce)
- B. For the 5 minute period after motion ceases: 0 oz.
(Maximum allowable = 5 ounces)
- C. For the following 25 minutes: 0 oz.
(Maximum allowable = 1 oz./minute)
- D. Spillage Details: None

DATA SHEET NO. 20
FMVSS 301 STATIC ROLLOVER DATA SHEET

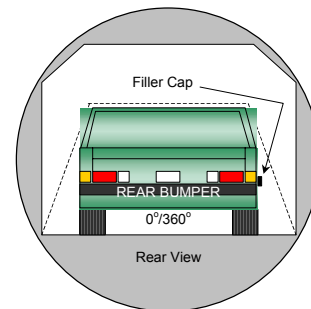
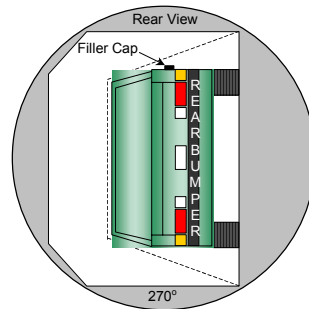
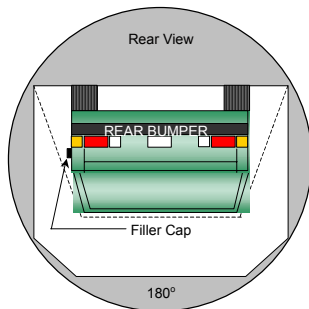
Test Vehicle: 2004 Hyundai Accent 2 Door
 Test Program: NCAP Side Impact

NHTSA No. M40508
 Test Date: 12/02/03



0° to 90°

90° to 180°



180° to 270°

270° to 360°

1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. Details of Stoddard Solvent Spillage locations: None

Rollover Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
0° to 90°	171	300	0
90° to 180°	150	300	0
180° to 270°	135	300	0
270° to 360°	140	300	0

APPENDIX A
PHOTOGRAPHS

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A-1.

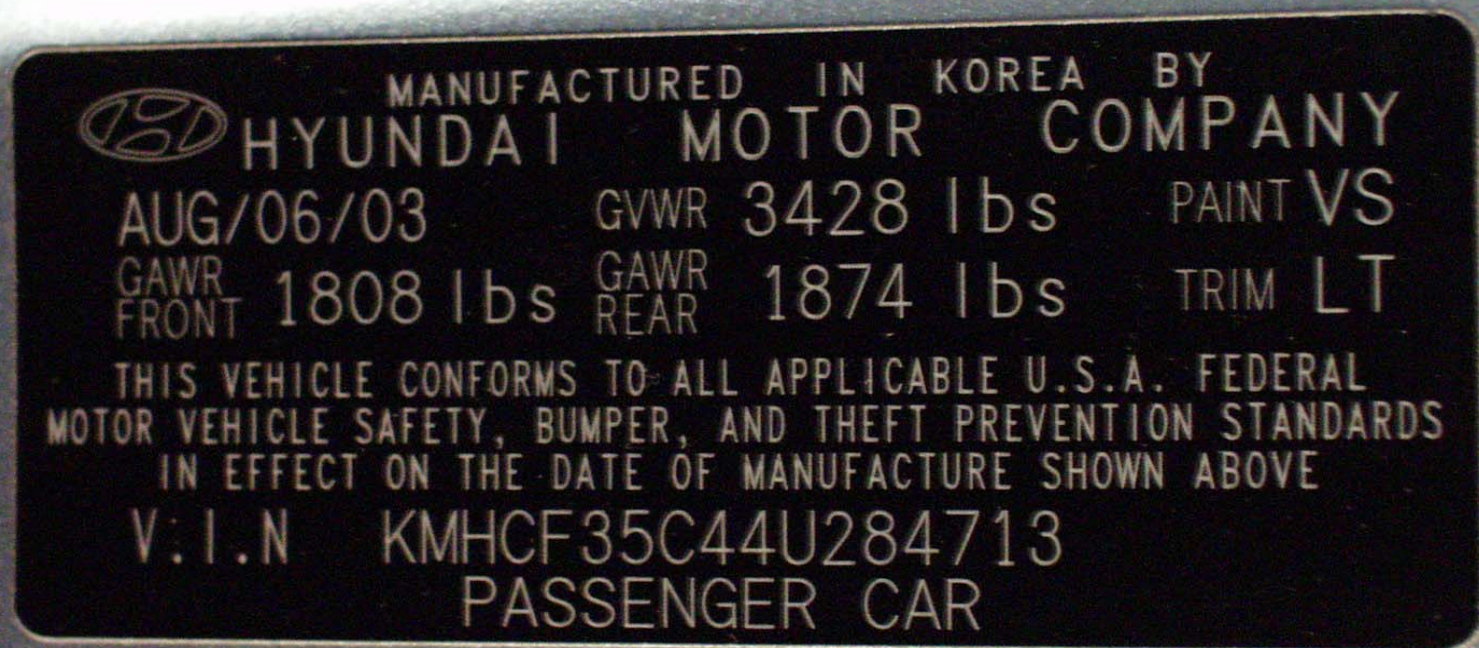


Left Front of Vehicle As Received

A-2.



Right Rear of Vehicle As Received



Vehicle Certification Label

11

TIRE INFLATION PRESSURE La Pression De Gonflage Des Pneus

VEHICLE CAPACITY WEIGHT, LBS: 850

Poids en lb de la capacité du véhicule, 850

SEATING CAPACITY: TOTAL 5 FRONT 2 REAR 3

Capacité de transport: total 5: 2 à l'avant
3 à l'arrière

TIRE PRESSURES-COLD, KPA(PSI) :

Pression de gonflage à froid kPa(lb/po2)

TIRE SIZE Dimension du pneu	UP TO 2 PERSONS Jusqu'à 2 Personnes		UP TO MAX. LOAD Pour charge maximum	
	FRONT Avant	REAR Arrière	FRONT Avant	REAR Arrière
P175/70 R13	207(30)	207(30)	230(33)	230(33)
P185/60 R14	207(30)	207(30)	230(33)	230(33)
T105/70 R14	414(60)	414(60)	414(60)	414(60)
T105/70 D14	414(60)	414(60)	414(60)	414(60)

Tire Placard



Pre-Test Front View of Test Vehicle



Post-Test Front View of Test Vehicle



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



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



Pre-test Left Side View of Test Vehicle



Post-Test Left Side View of Test Vehicle



Pre-Test Left Rear ¾ View of Test Vehicle



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



Pre-Test Rear View of Test Vehicle



Post-Test Rear View of Test Vehicle



Pre-Test MDB Positioned Against Vehicle (left side)



Pre-Test MDB Positioned Against Vehicle (right side)



Pre-Test MDB Positioned Against Vehicle Overhead View



Post-Test MDB and Vehicle (left side)



Post-Test MDB and Vehicle (right side)



Pre-Test Impact Point on Vehicle



Post-Test Impact Point on Vehicle



Pre-Test Fuel Filler Cap View



Post-Test Fuel Filler Cap View



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



Pre-Test Rear $\frac{3}{4}$ View of Right Front Door of Test Vehicle



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



Pre-Test Driver Dummy Left Side View



Post-Test Driver Dummy Left Side View



Pre-Test Driver Dummy Shoulder and Door Top View



Post-Test Driver Dummy Shoulder and Door Top View

A-31.



Pre-Test Driver Dummy Right Side View



Post-Test Driver Dummy Right Side View



Post-Test Driver Dummy Contact



Post-Test Driver Dummy Head Contact

A-35.



Pre-Test Passenger Dummy Left Side View



Post-Test Passenger Dummy Left Side View



Pre-Test Passenger Dummy Shoulder and Door Top View



Post-Test Passenger Dummy Shoulder and Door Top View



Pre-Test Passenger Dummy Right Side View



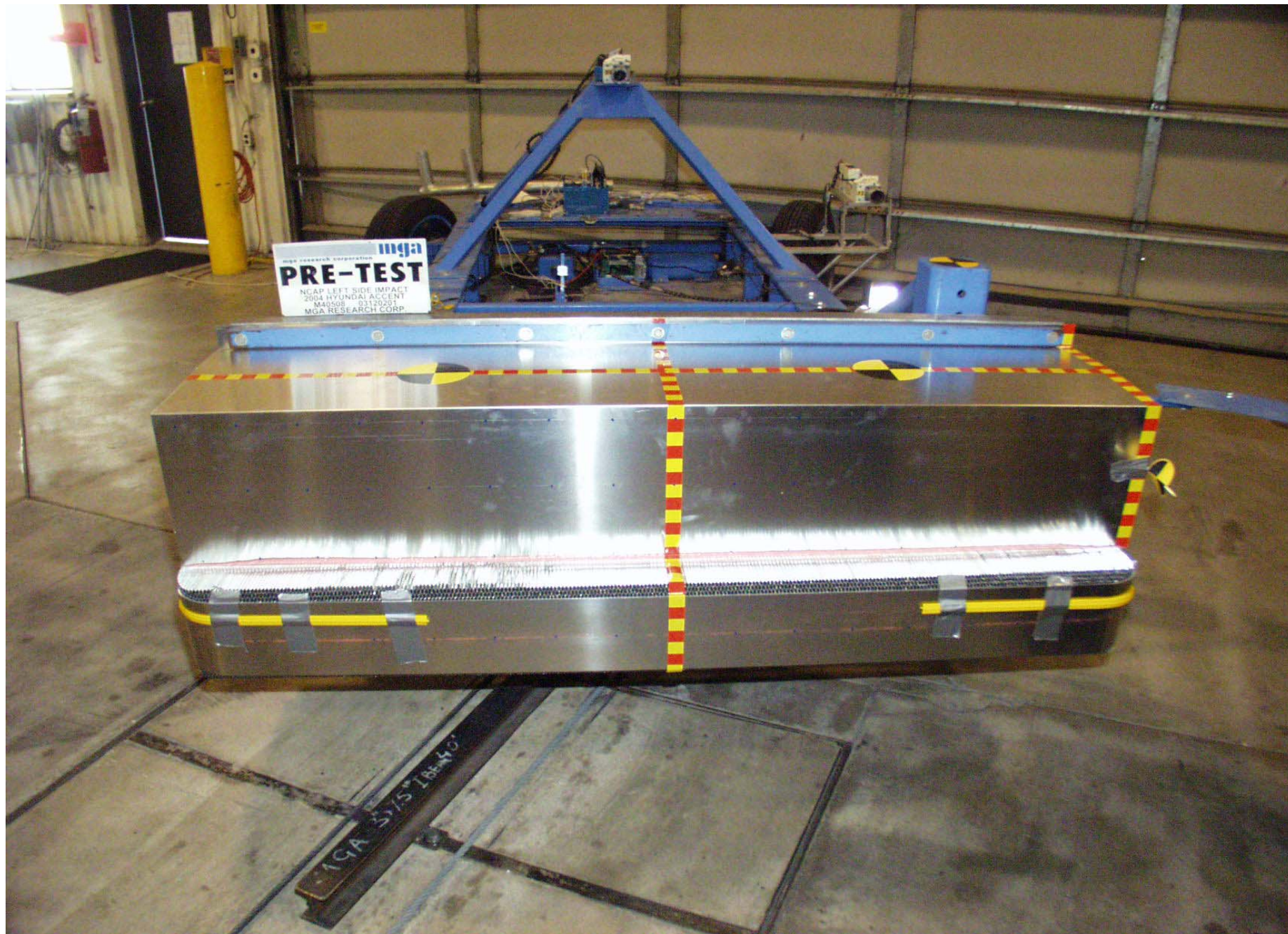
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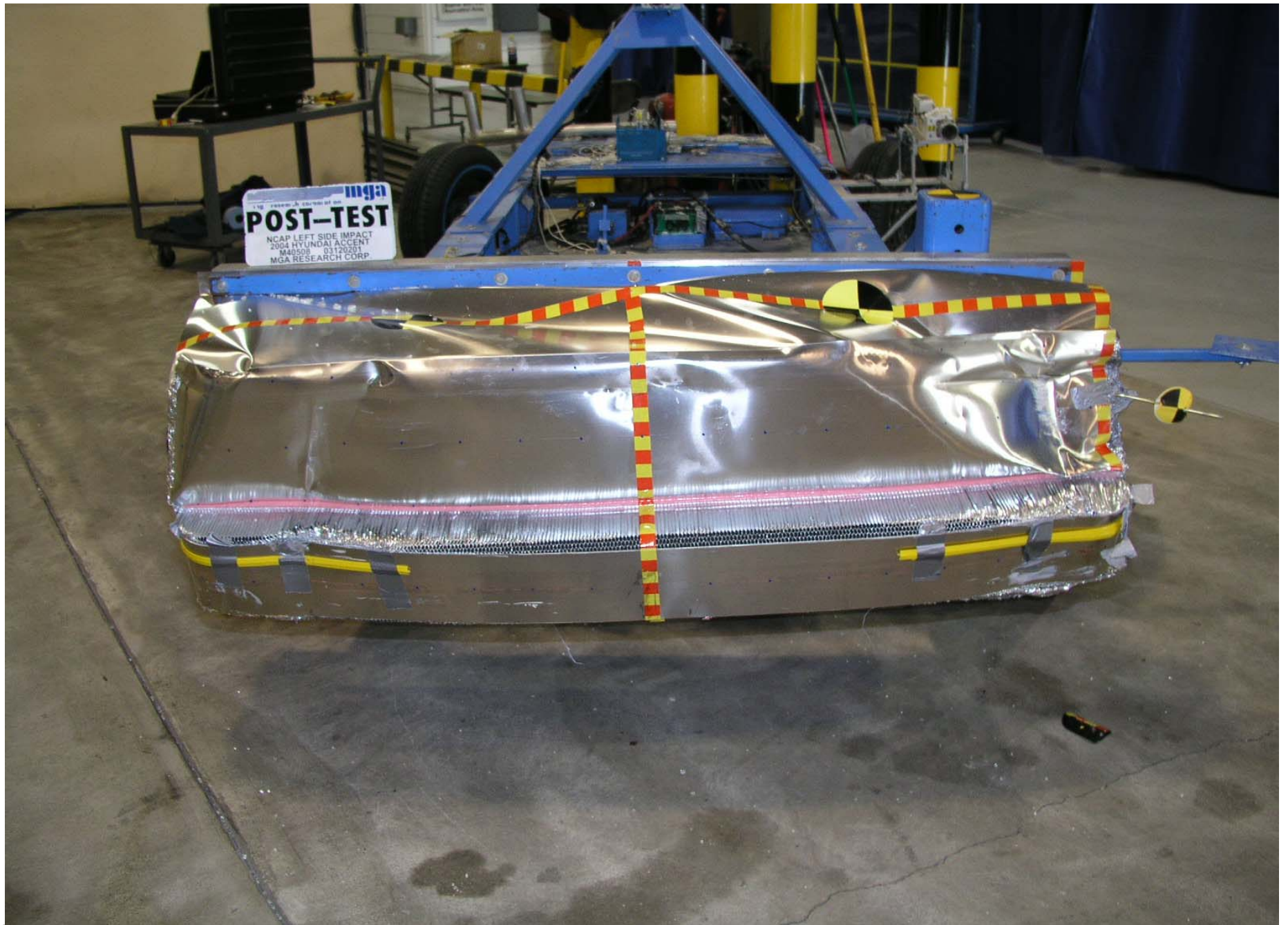
Post-Test Passenger Dummy Contact



Post-Test Passenger Dummy Head Contact



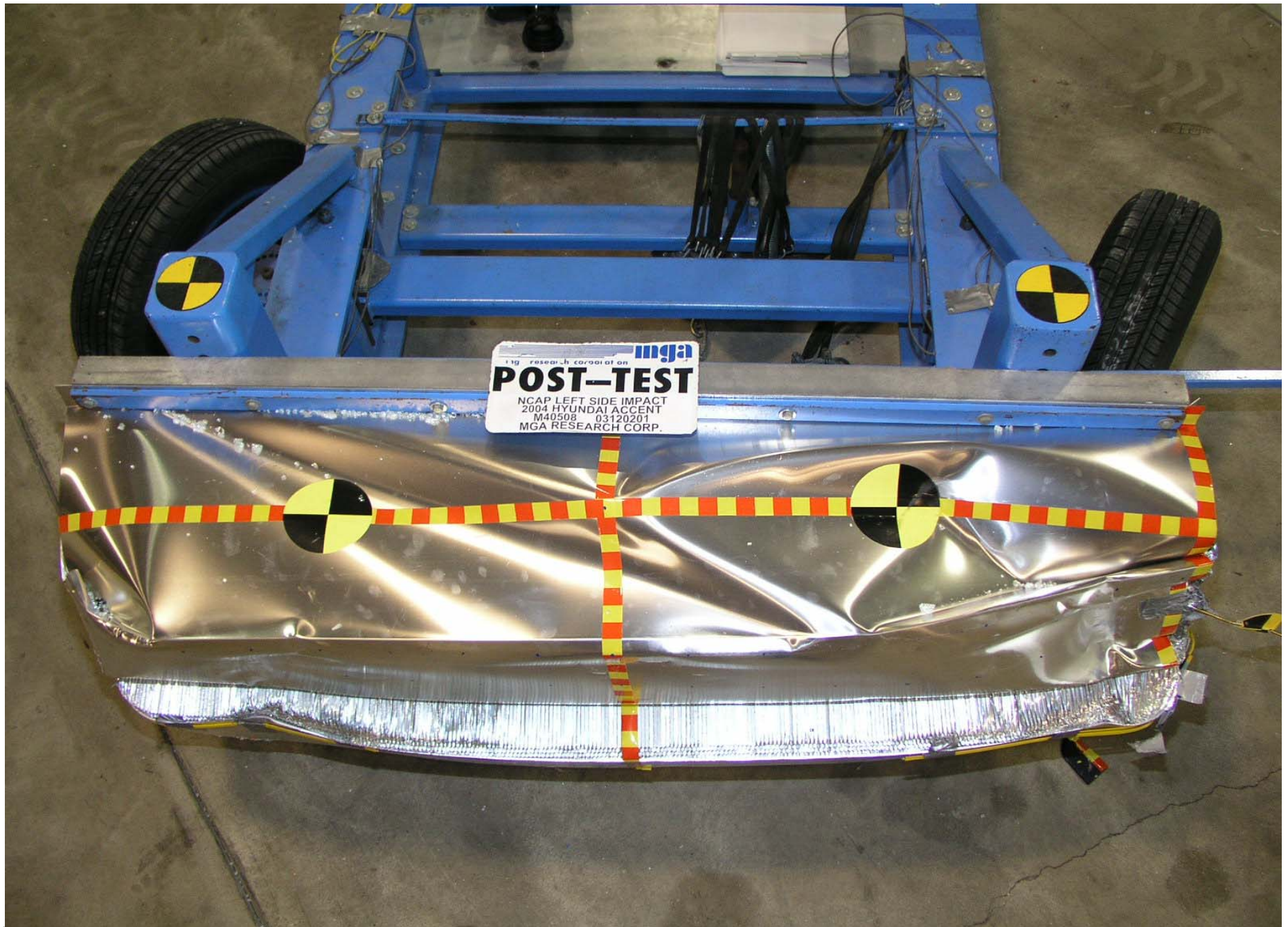
Pre-Test MDB Front View



Post-Test MDB Front View



Pre-Test MDB Top View



Post-Test MDB Top View



Pre-Test MDB Right Side View



Post-Test MDB Right Side View



Pre-Test MDB Left Side View

A-50.



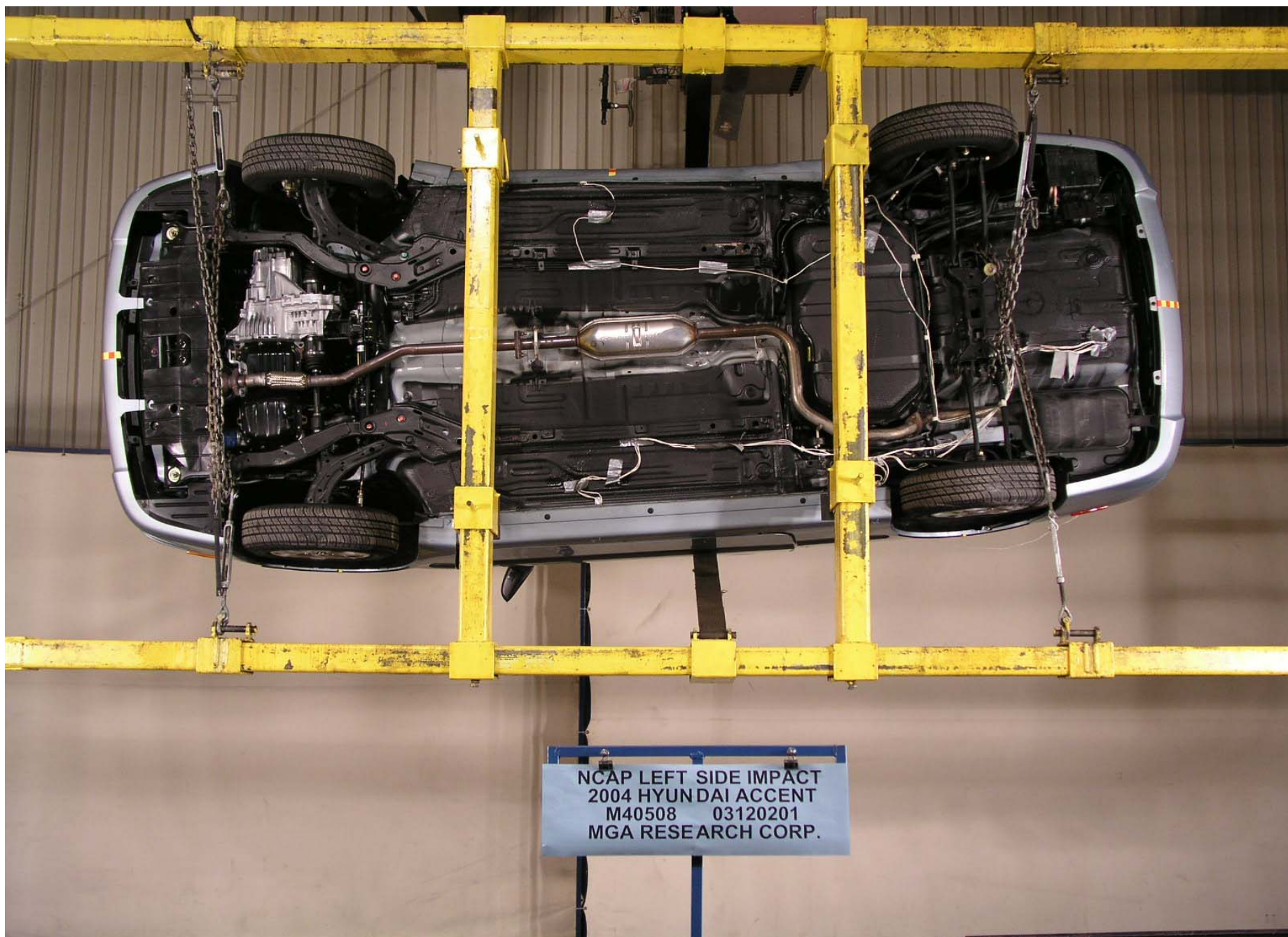
Post-Test MDB Left Side View



Rollover 90 Degrees



Rollover 180 Degrees



Rollover 270 Degrees



Rollover 360 Degrees



Vehicle Impact

APPENDIX B

SID/HIII, VEHICLE, AND MDB RESPONSE DATA

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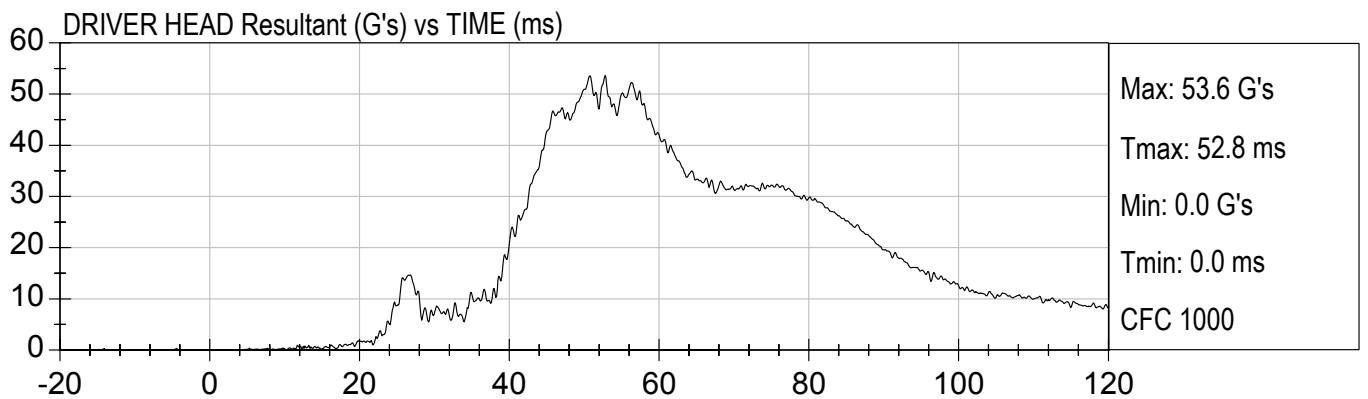
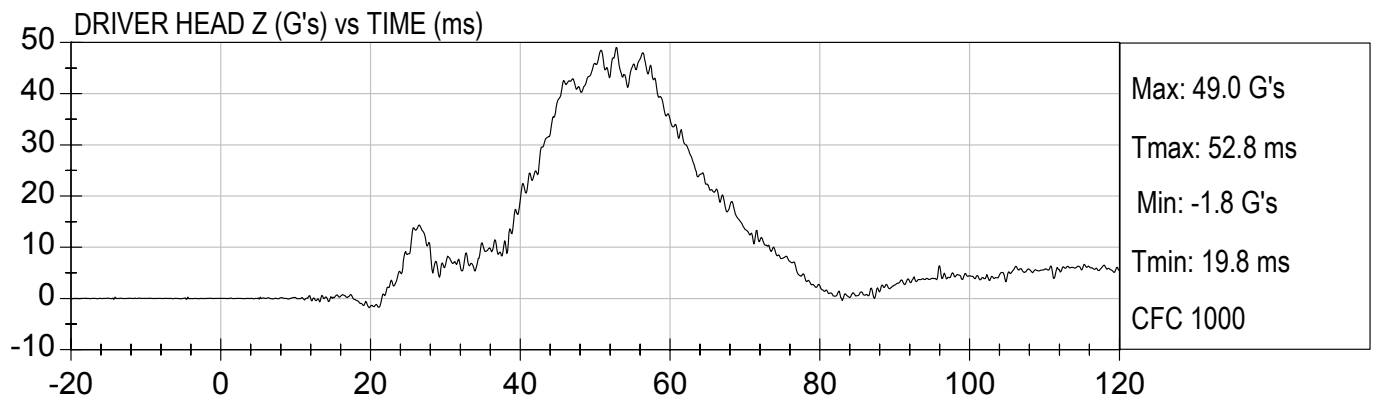
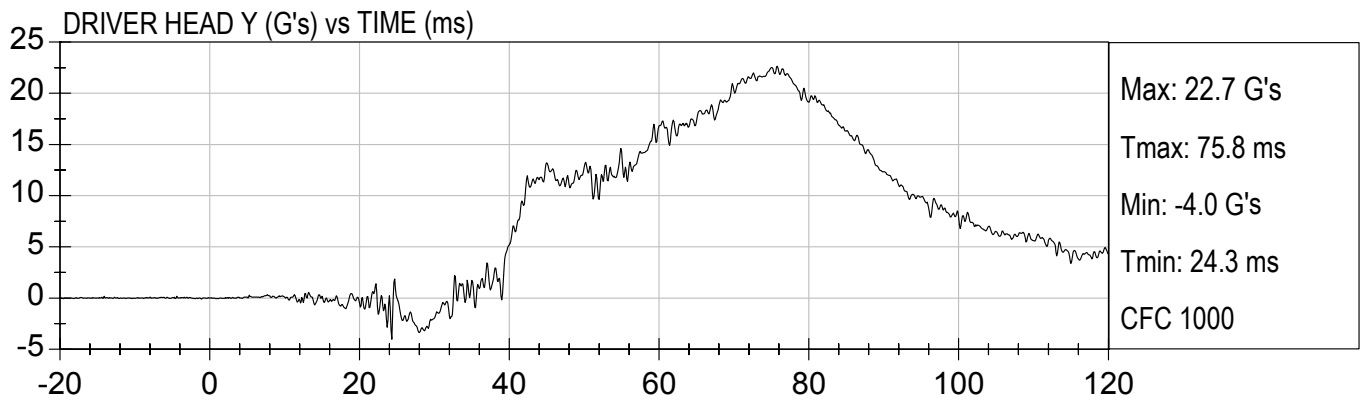
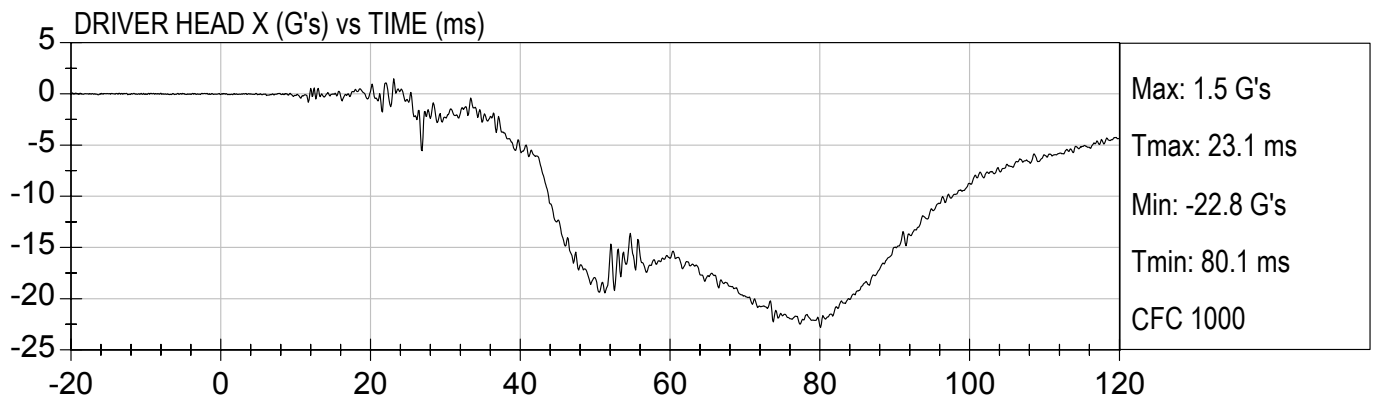
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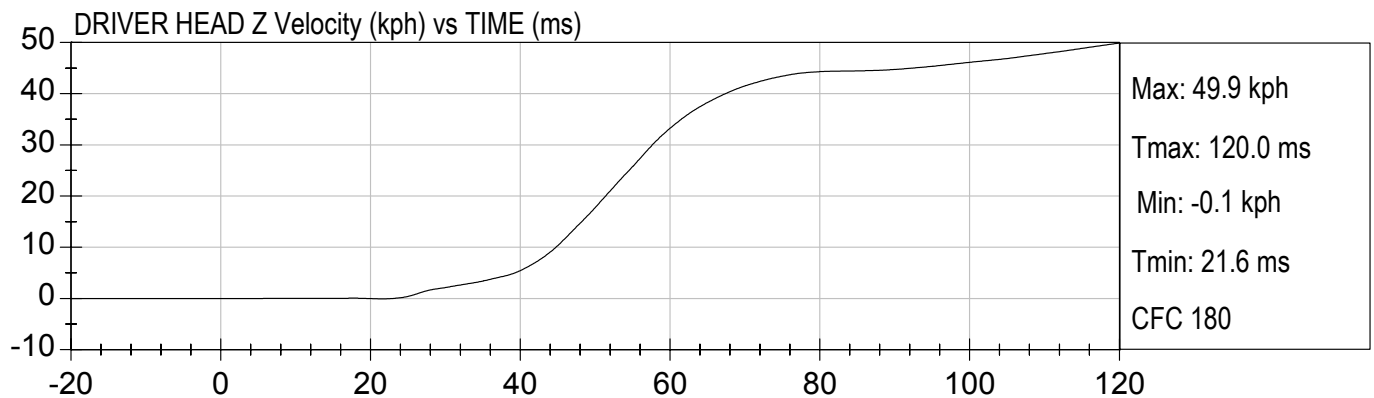
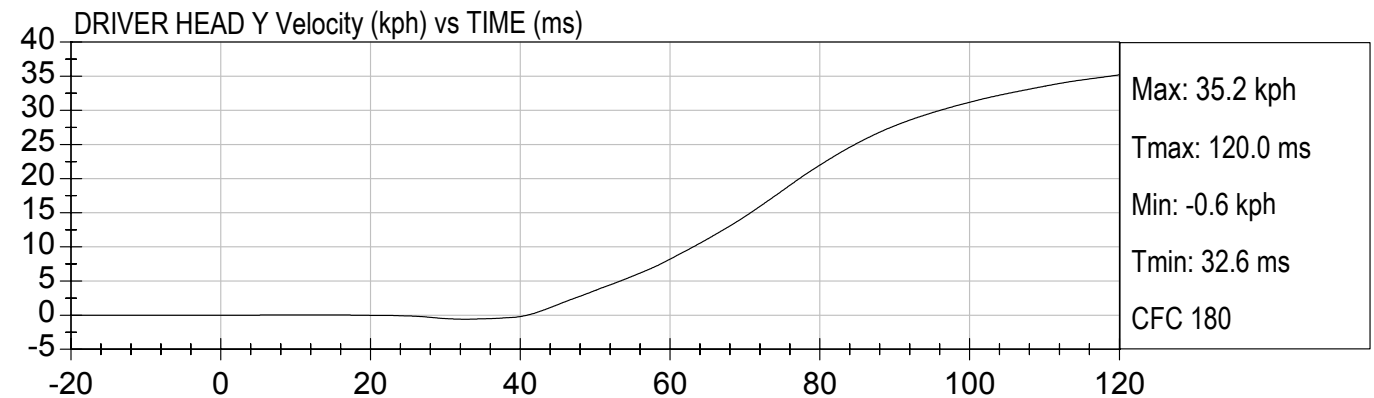
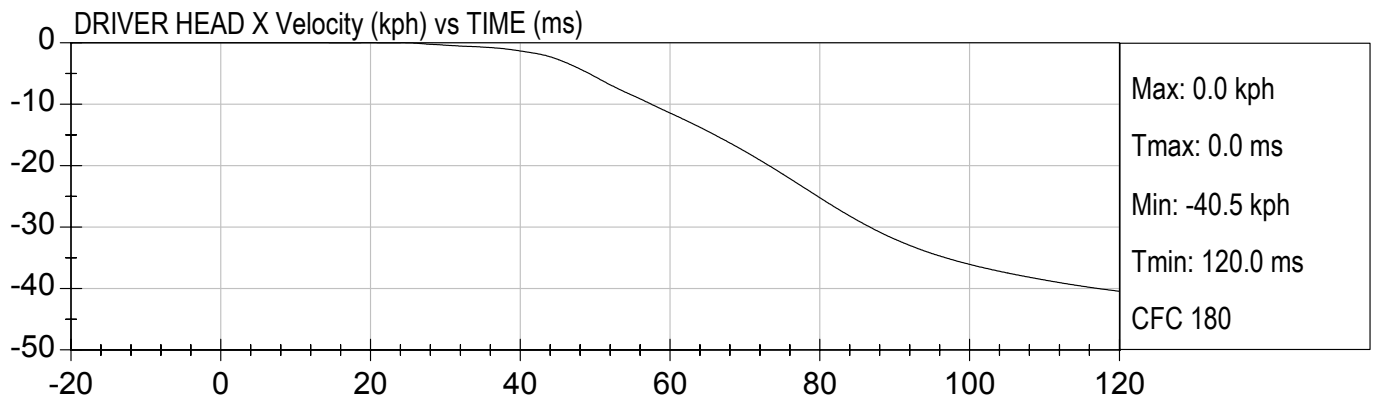
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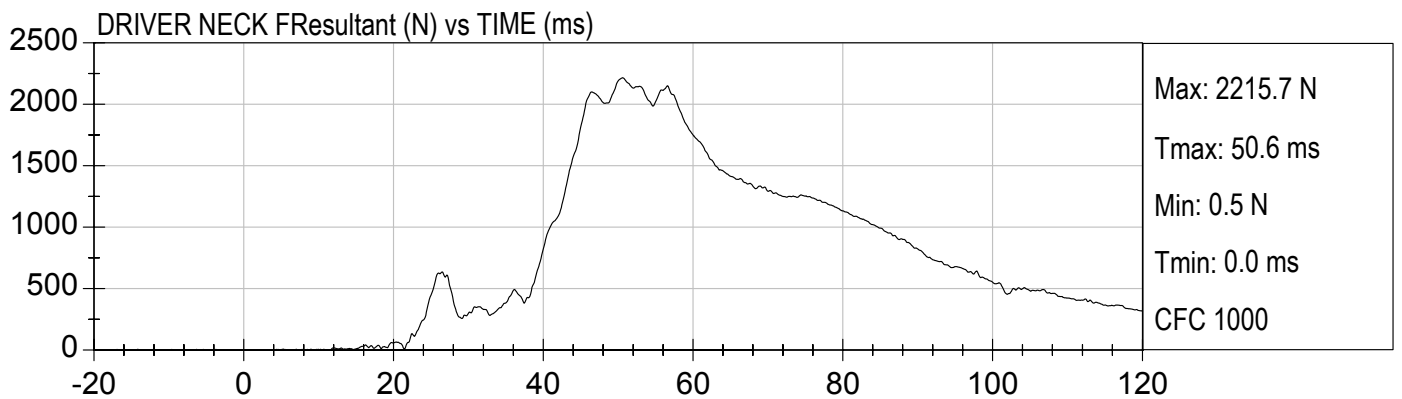
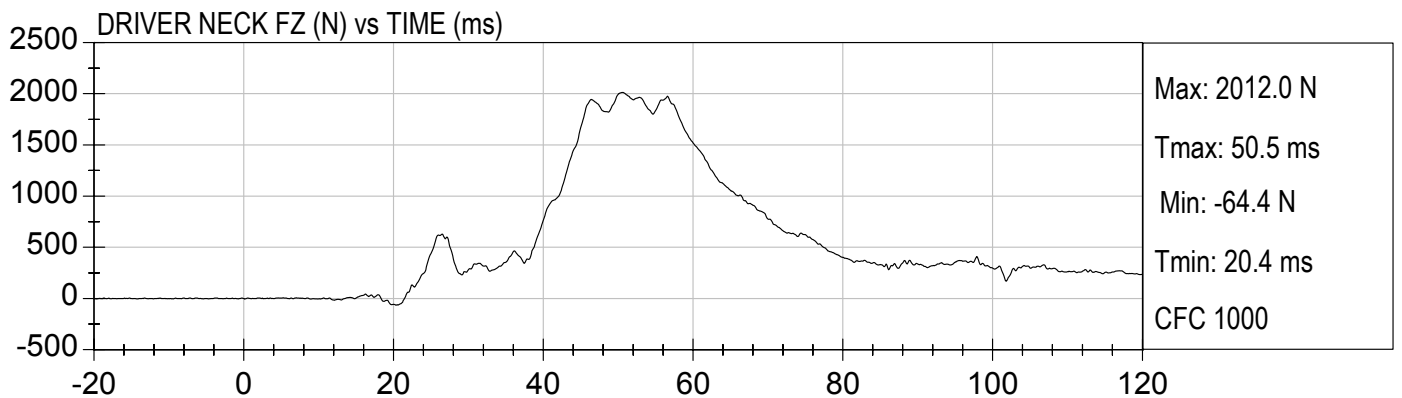
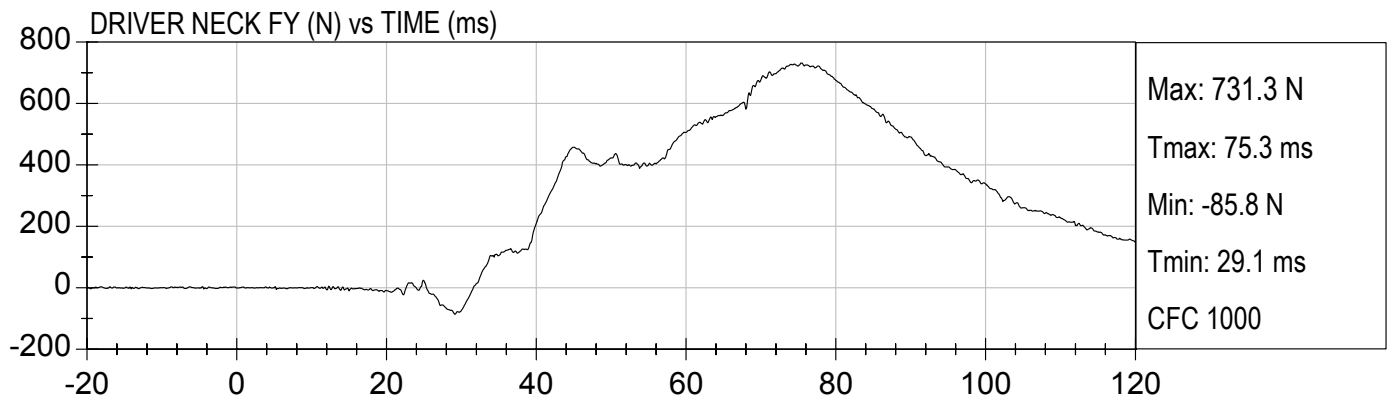
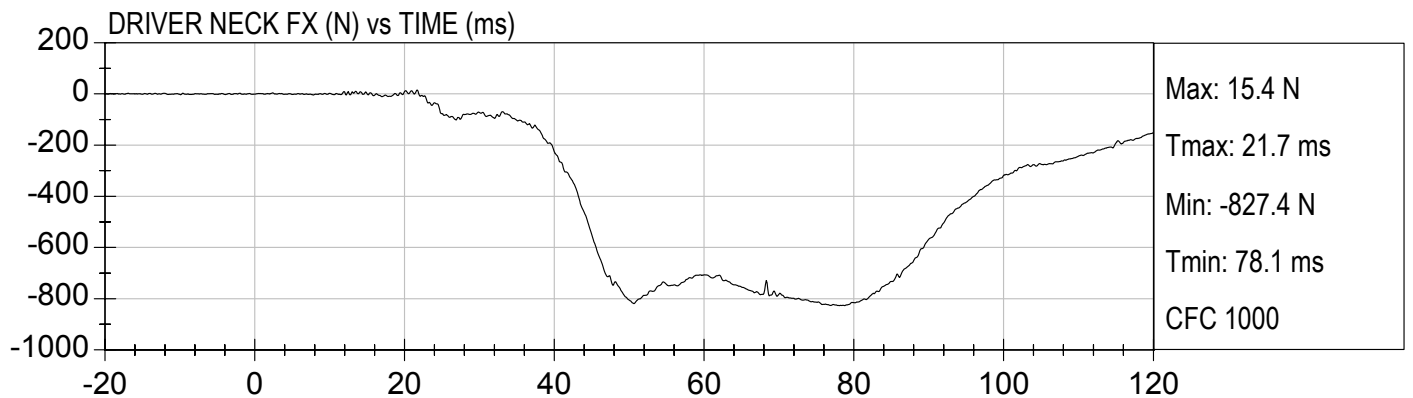
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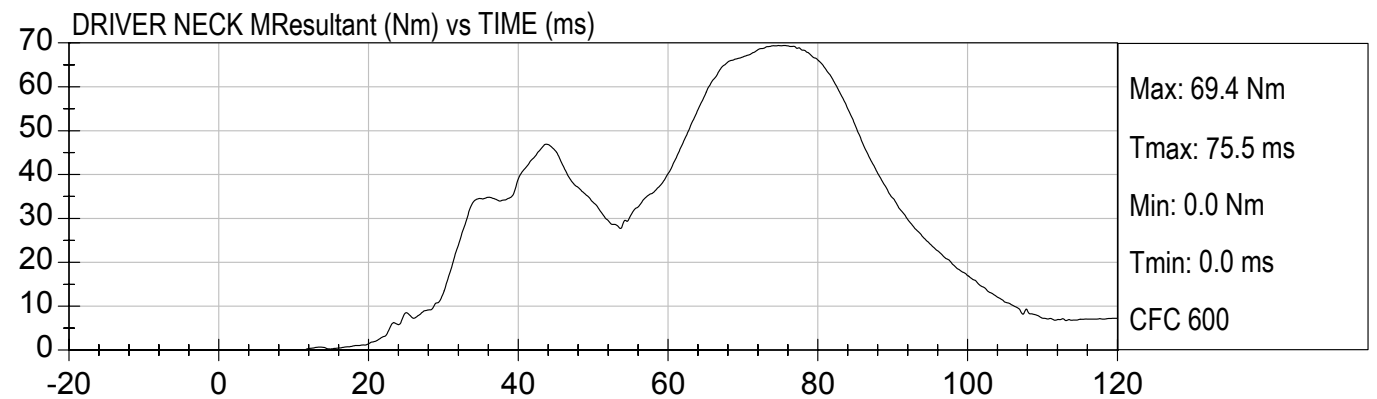
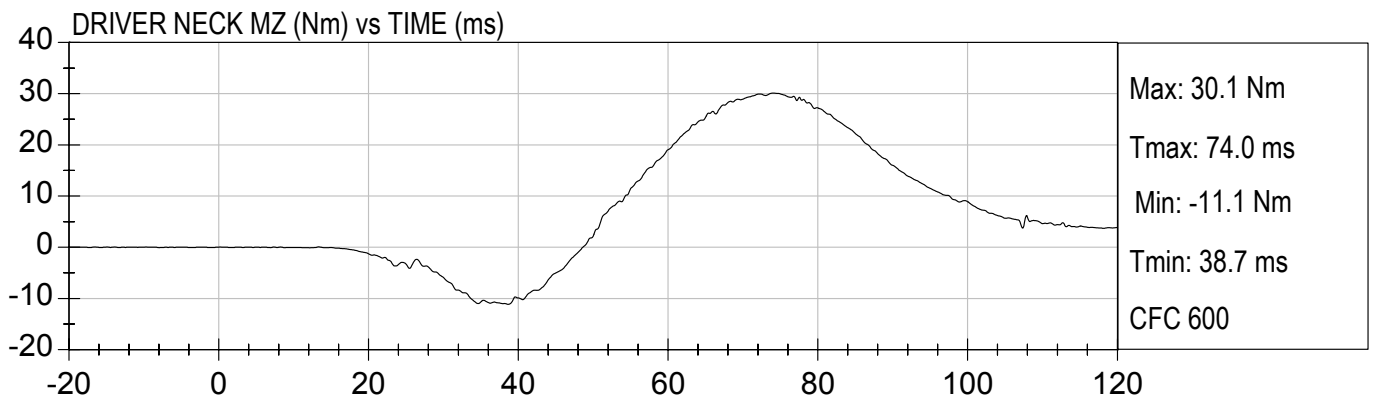
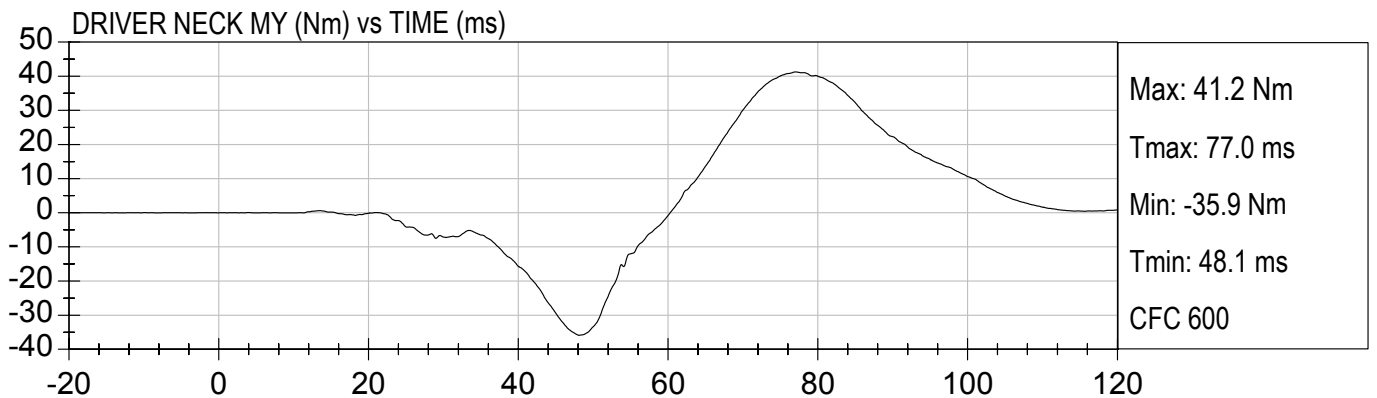
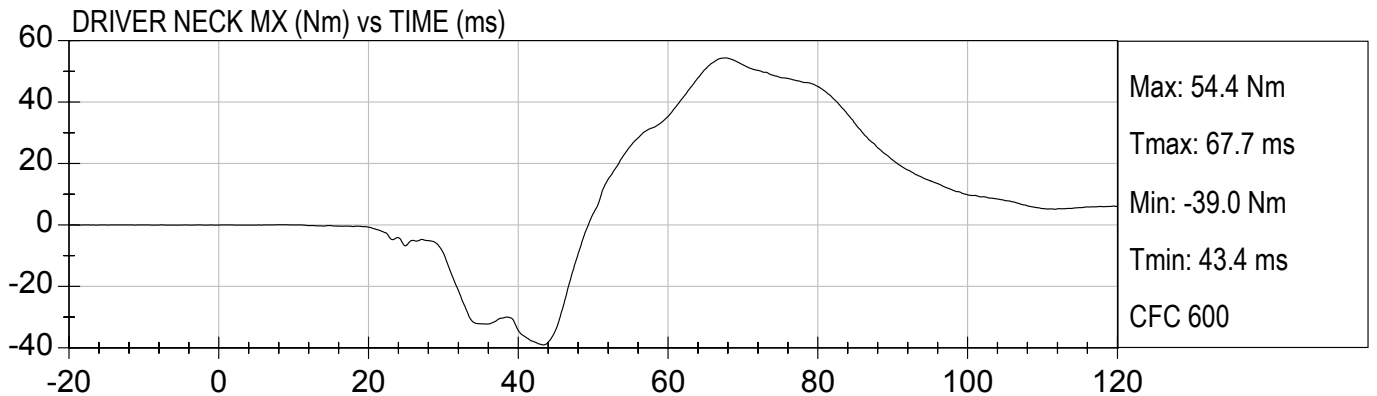
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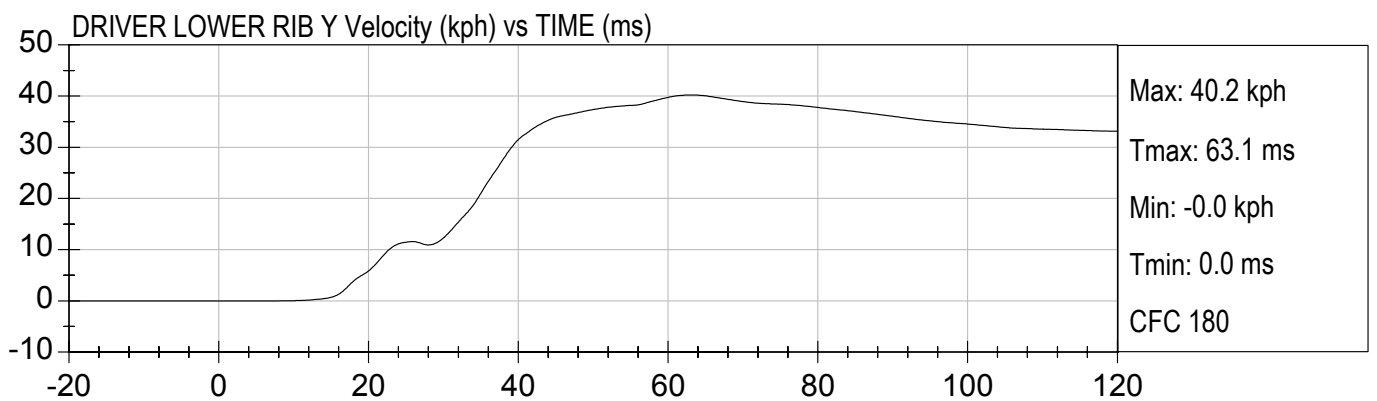
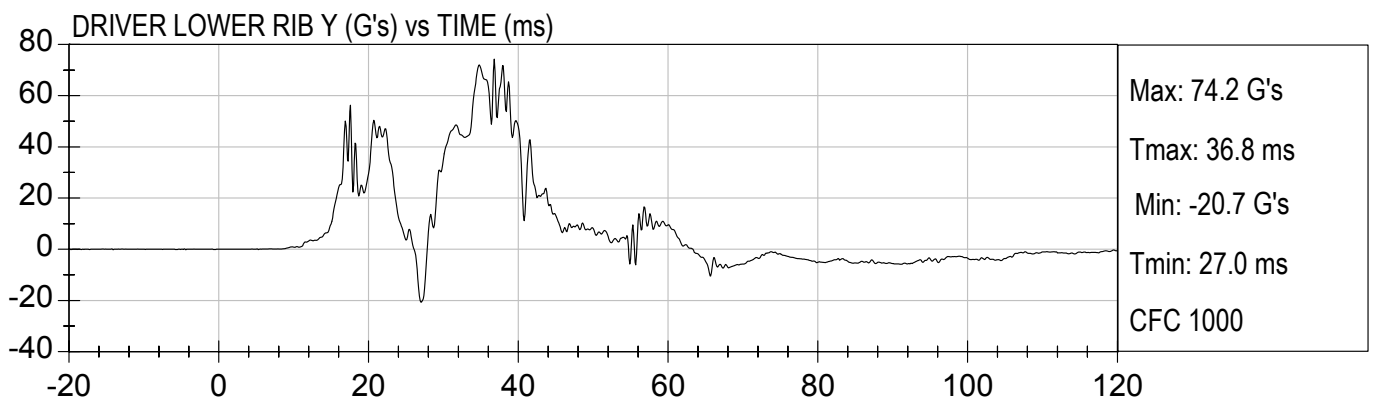
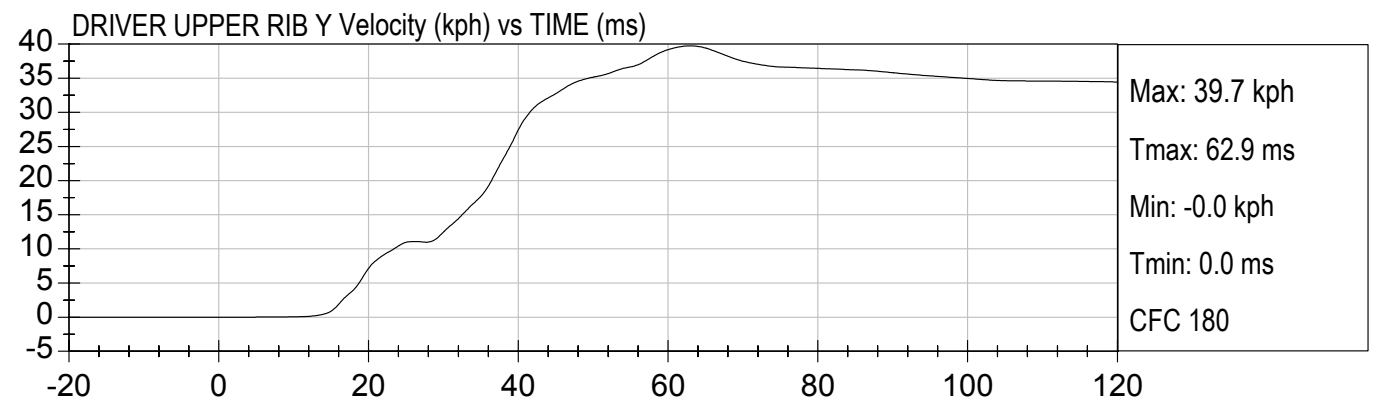
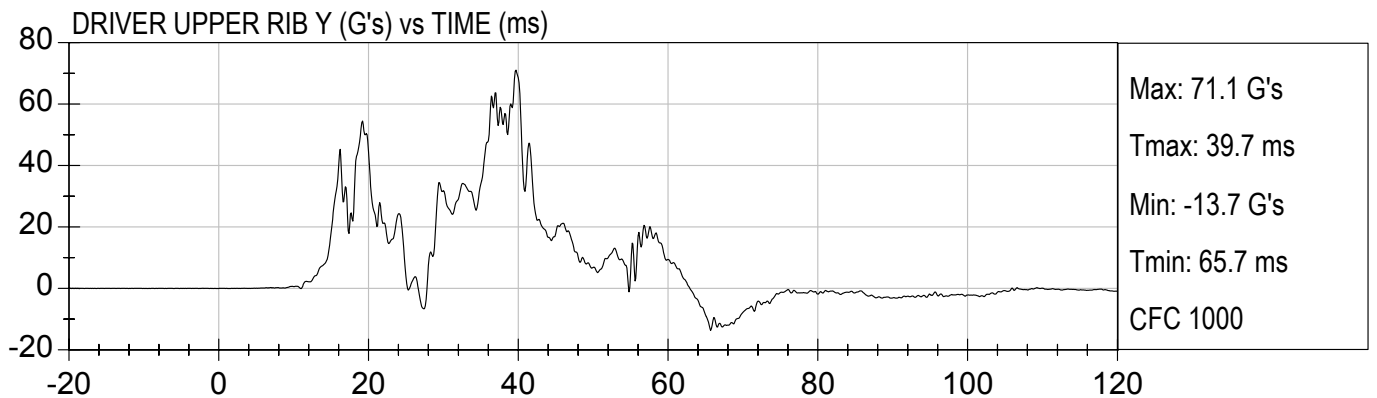
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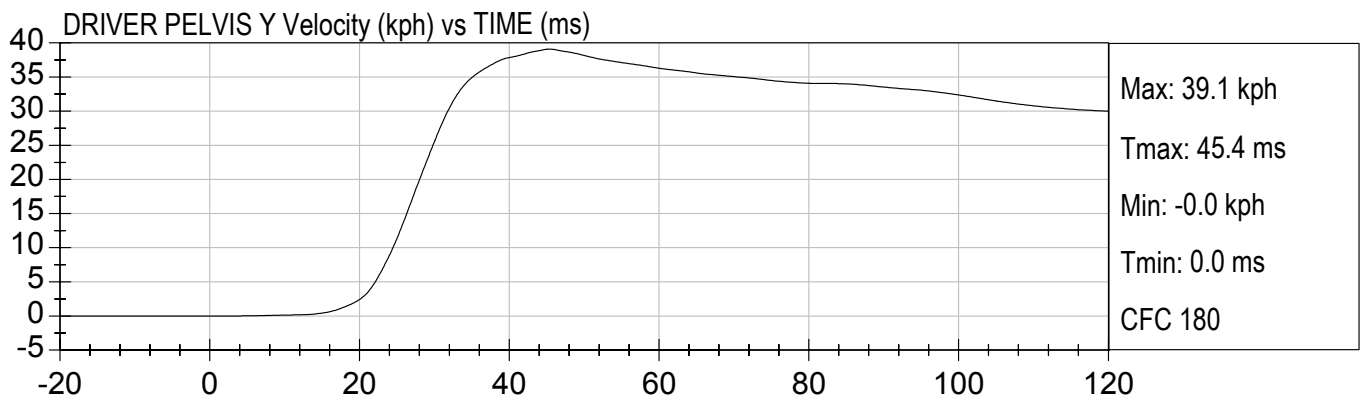
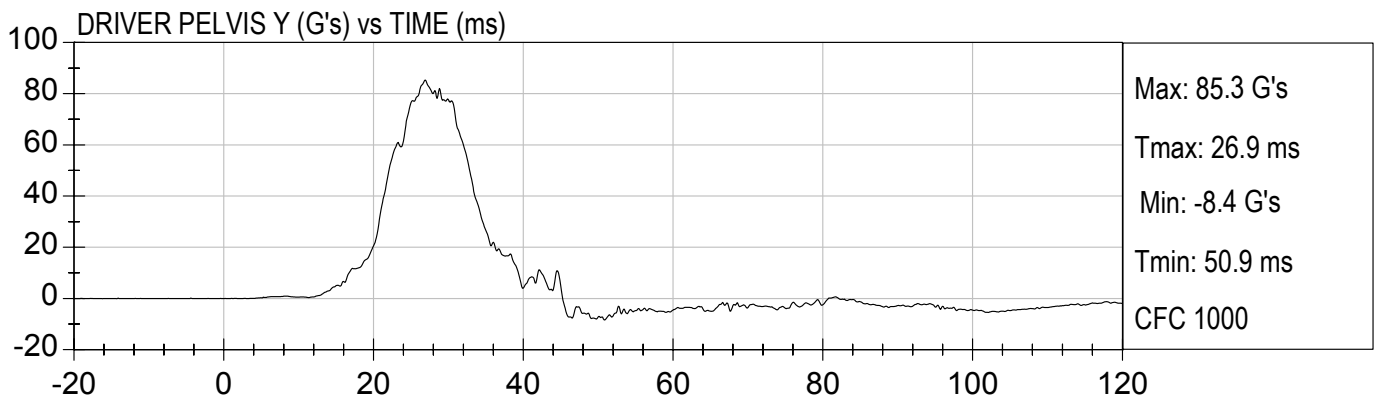
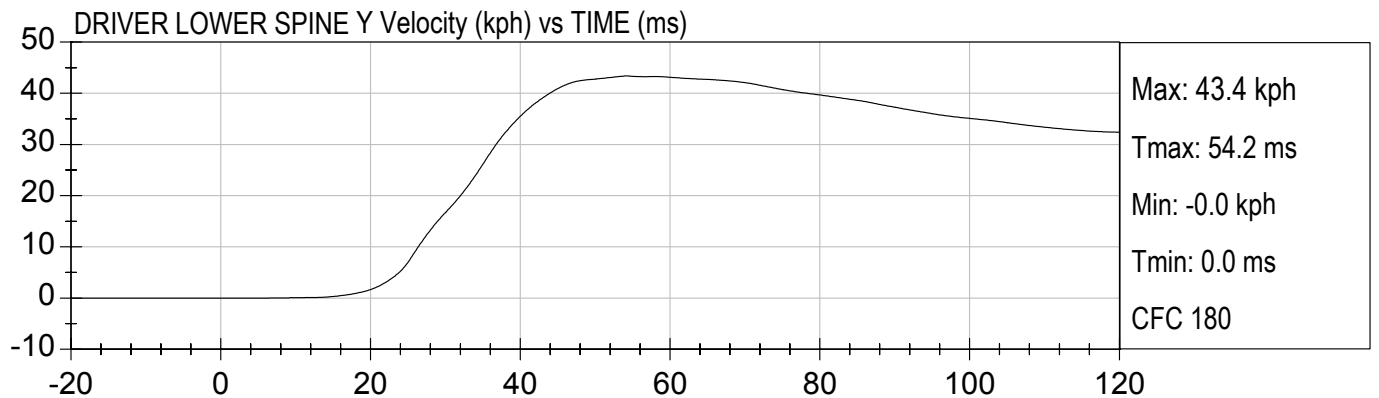
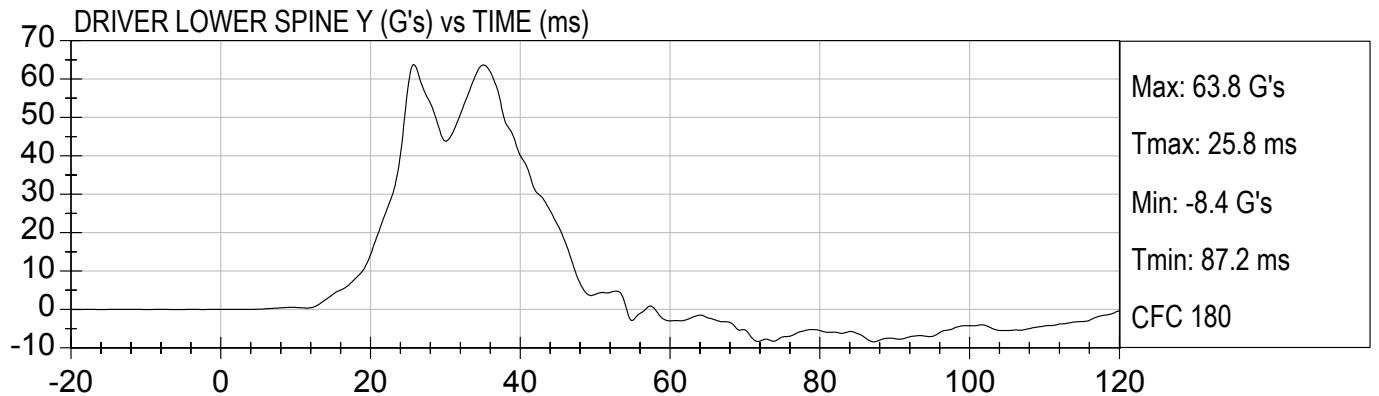


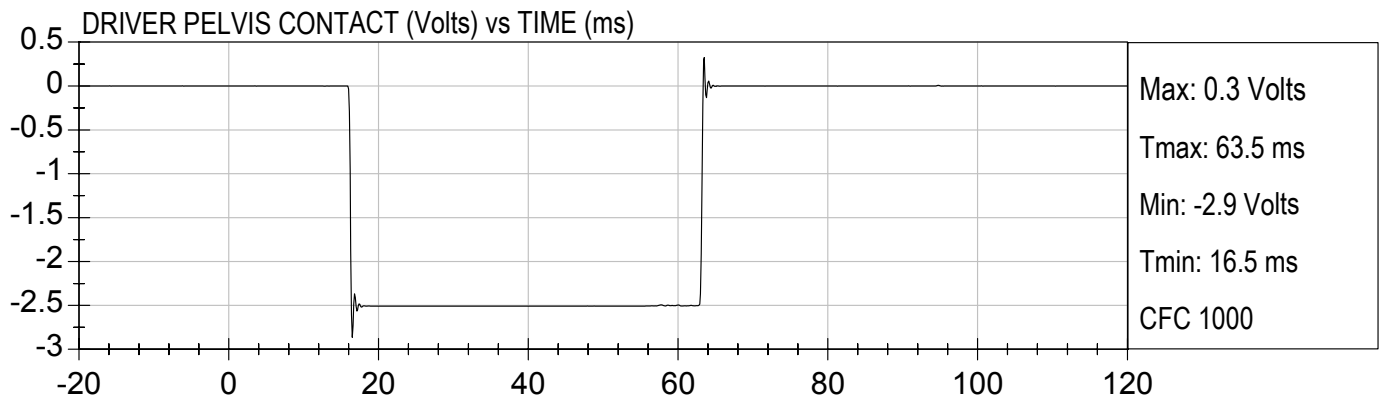
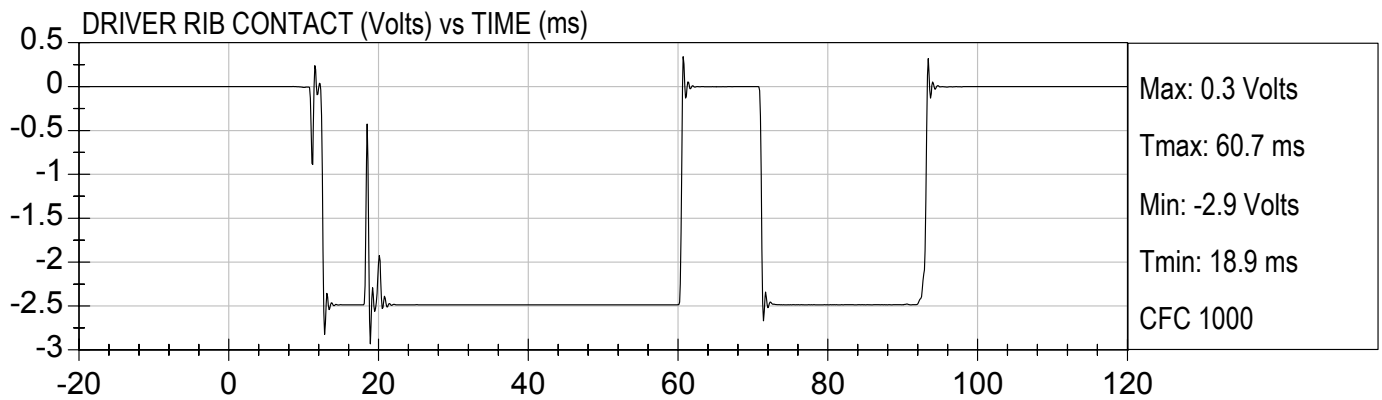


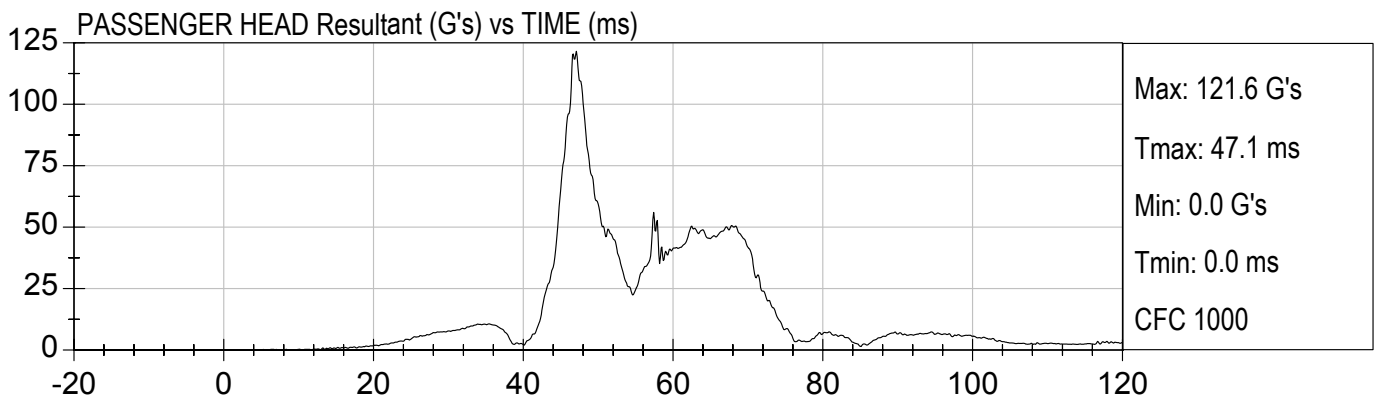
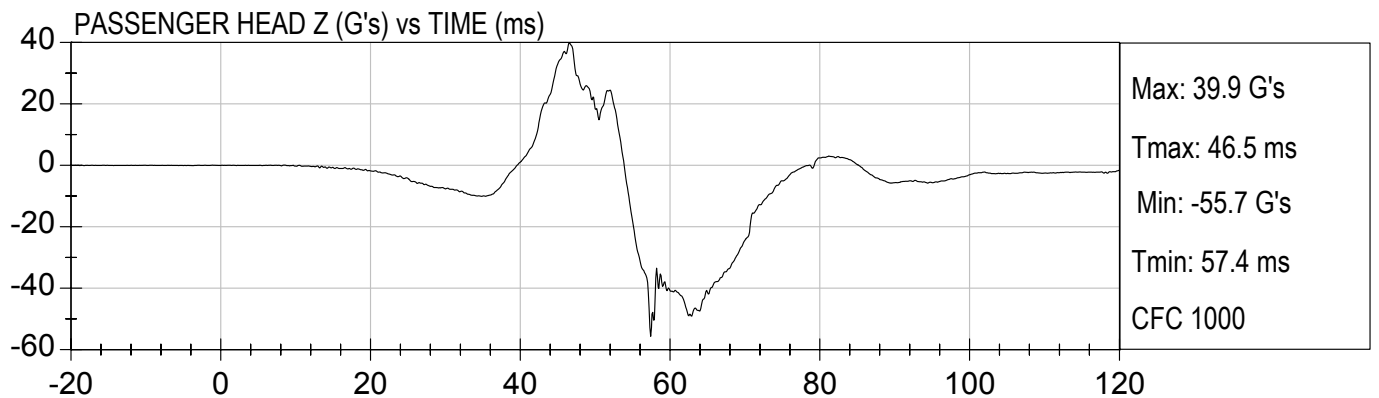
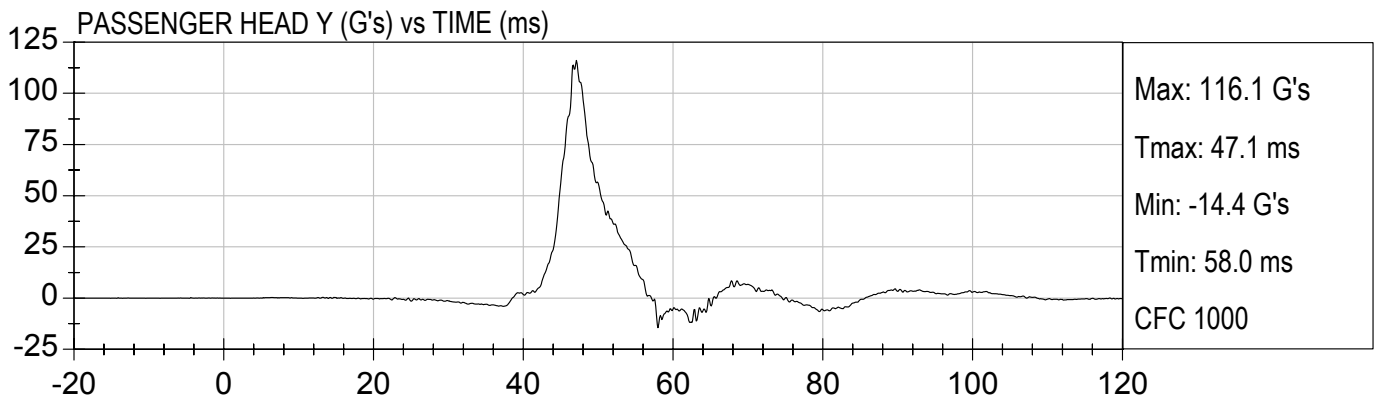
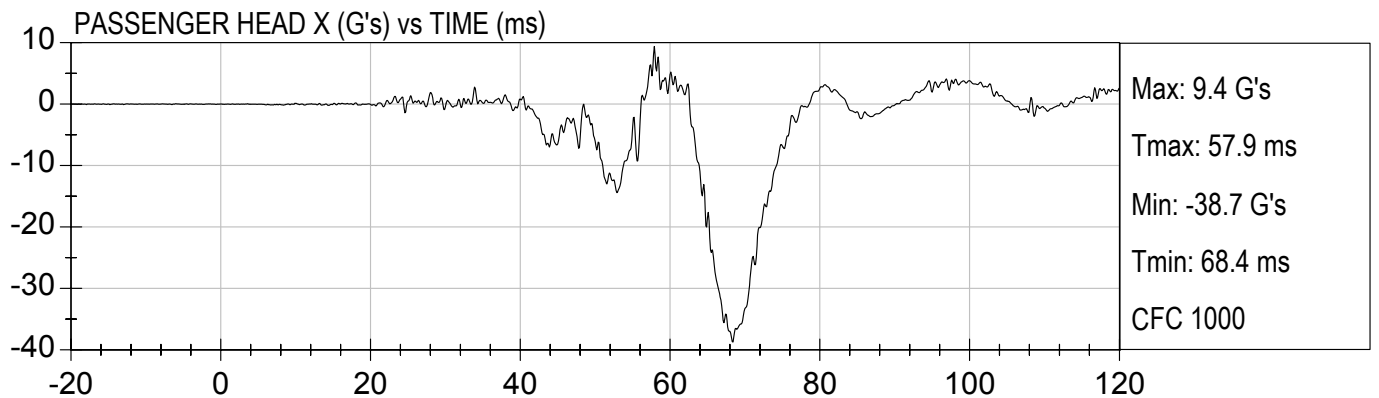


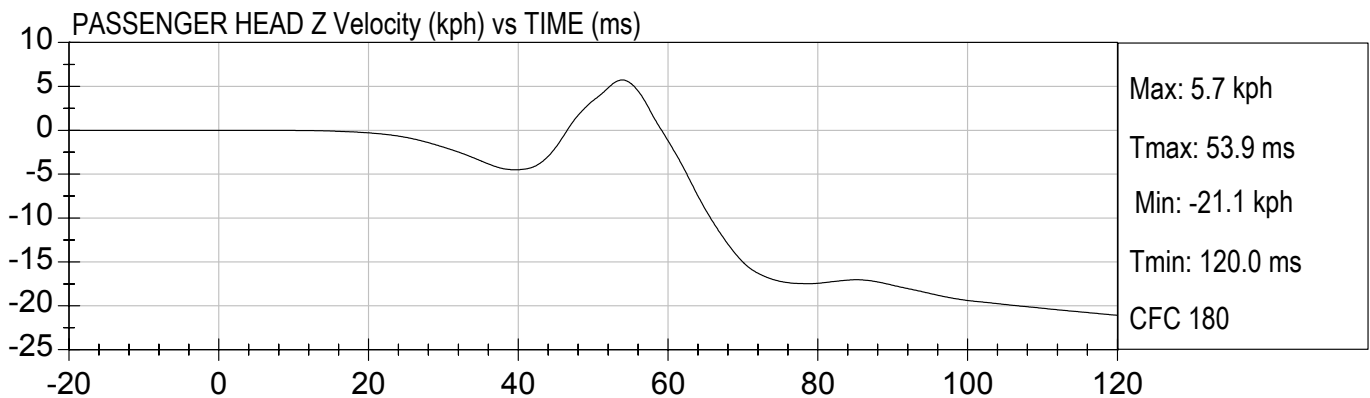
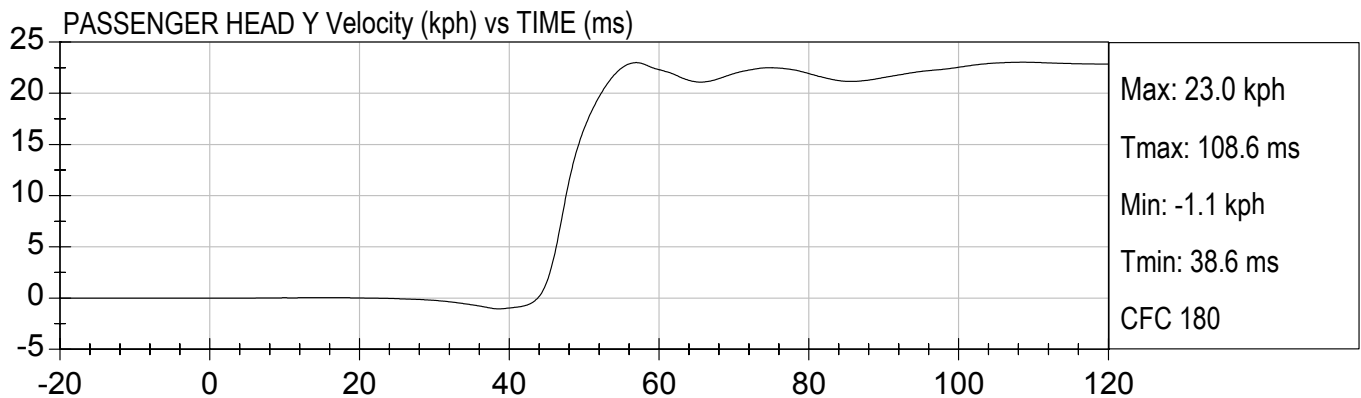
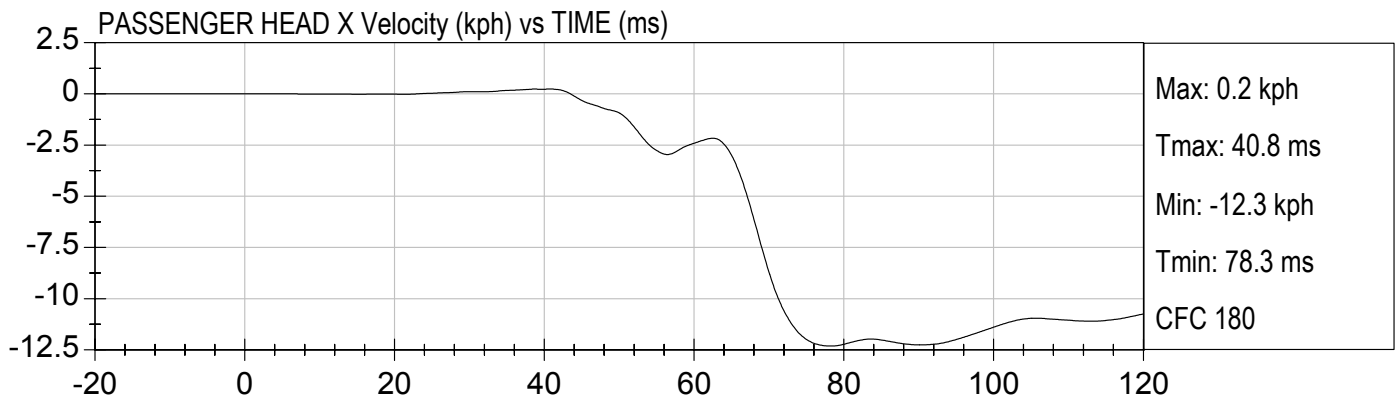






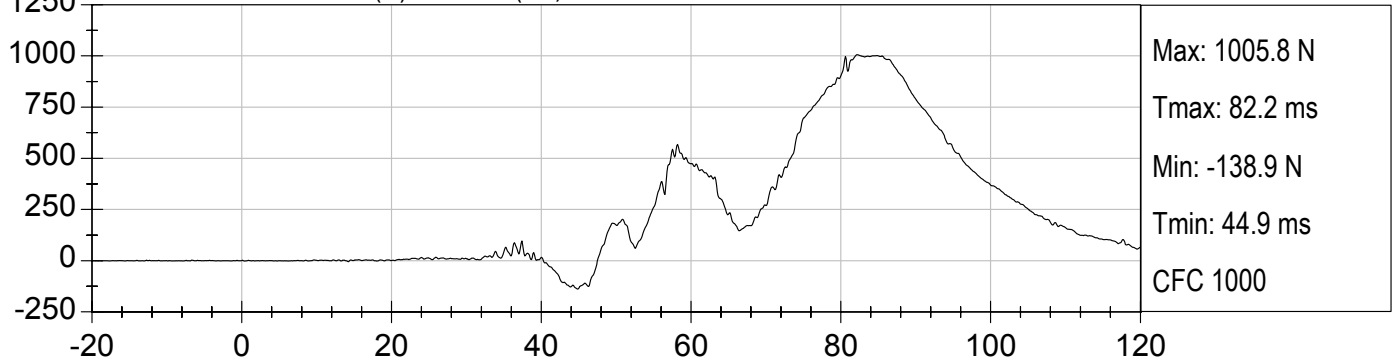




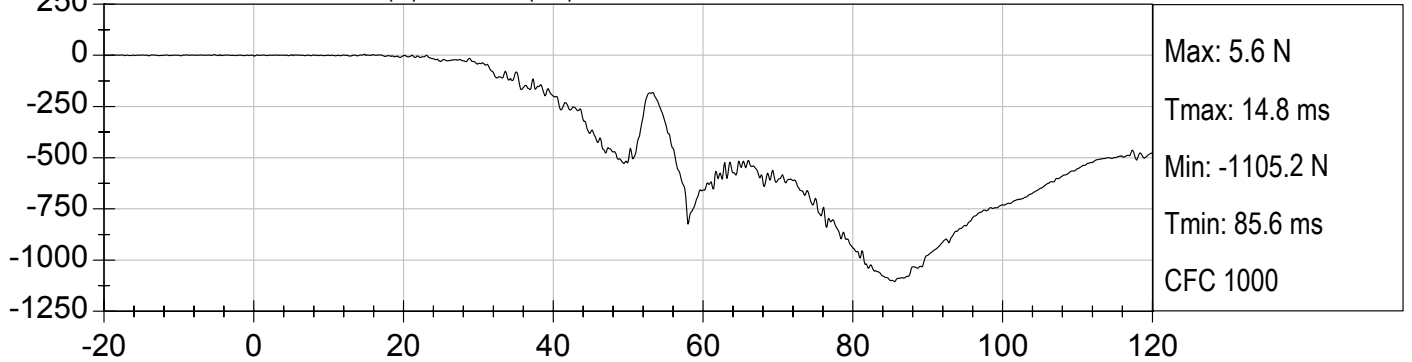




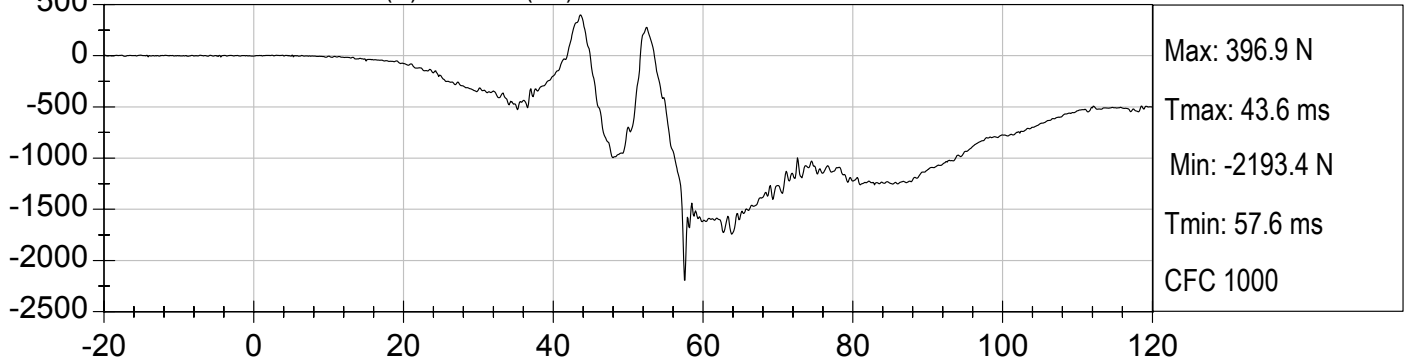
PASSENGER NECK FX (N) vs TIME (ms)



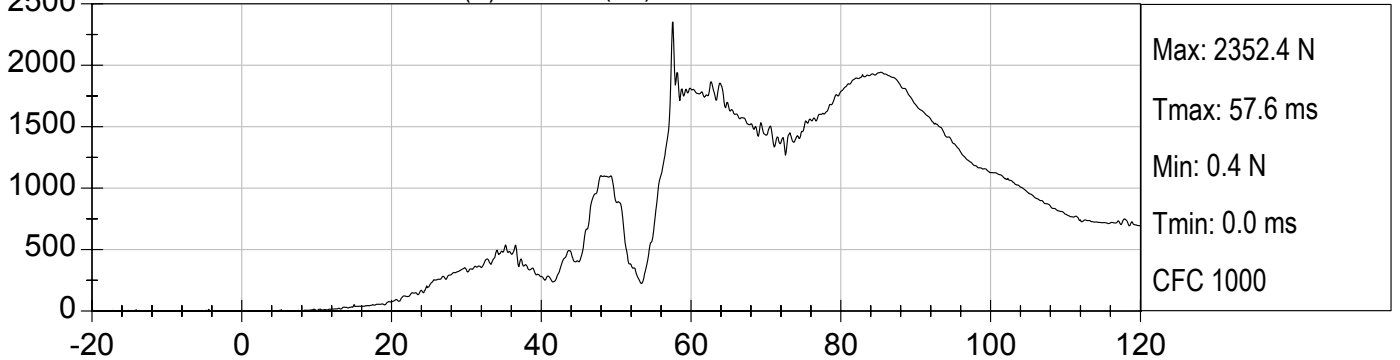
PASSENGER NECK FY (N) vs TIME (ms)

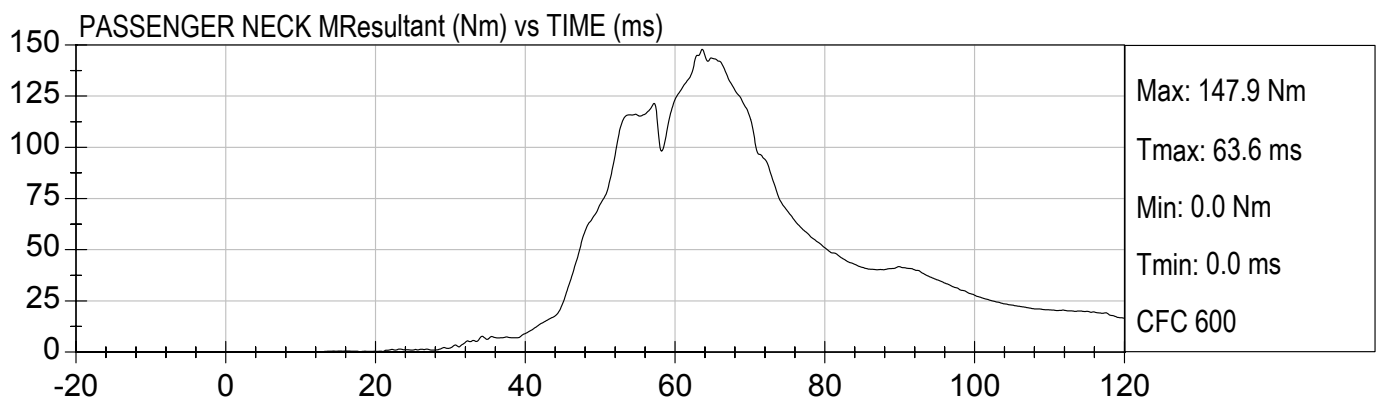
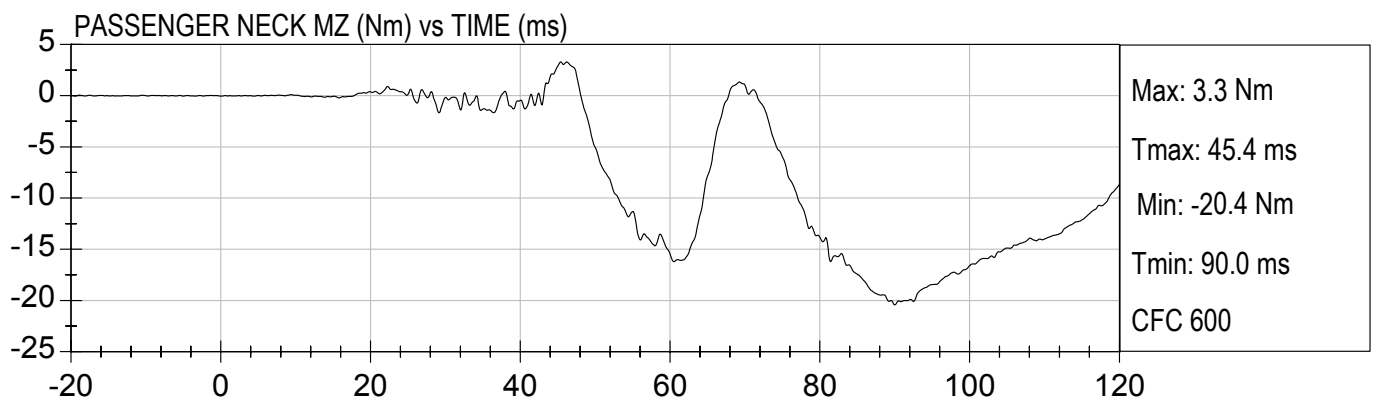
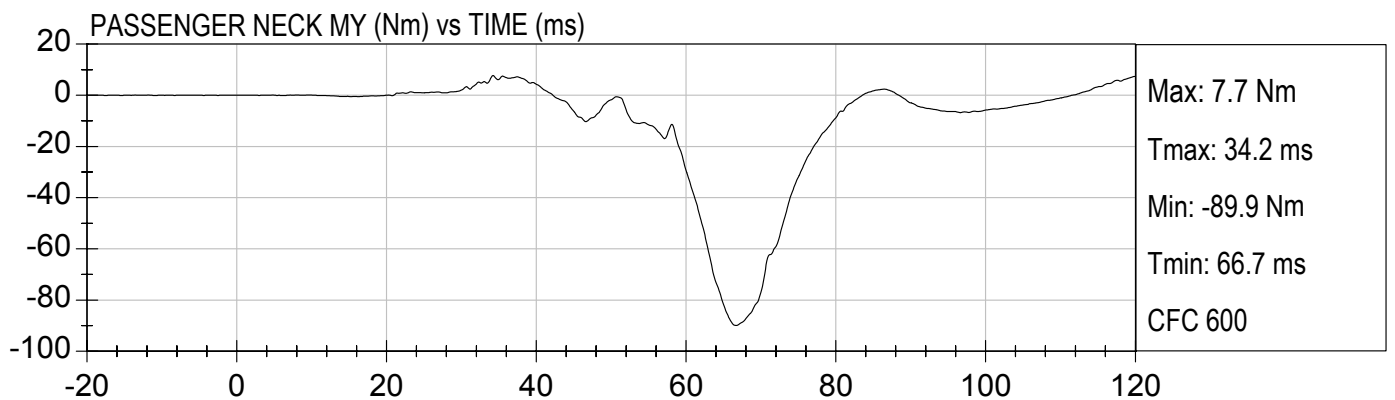
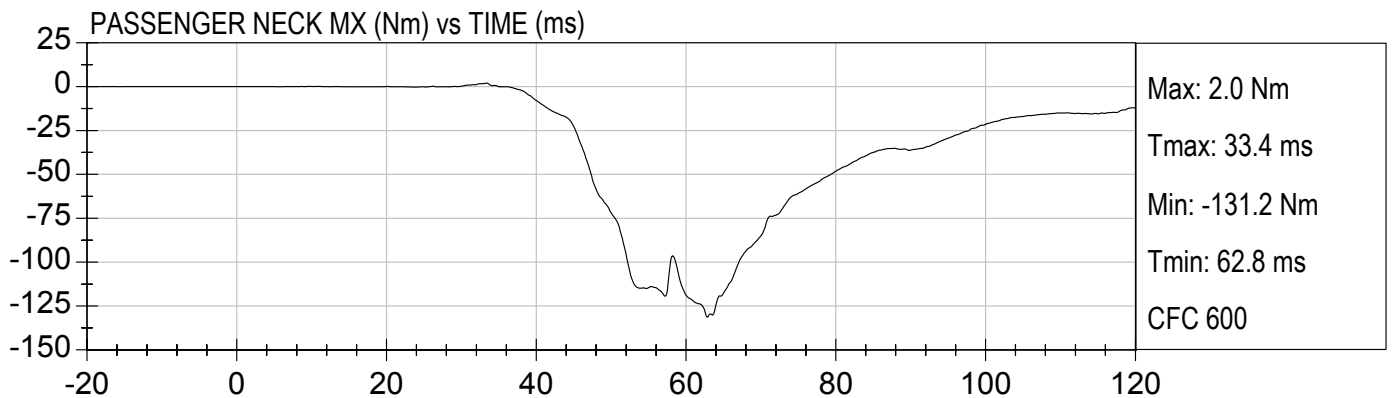


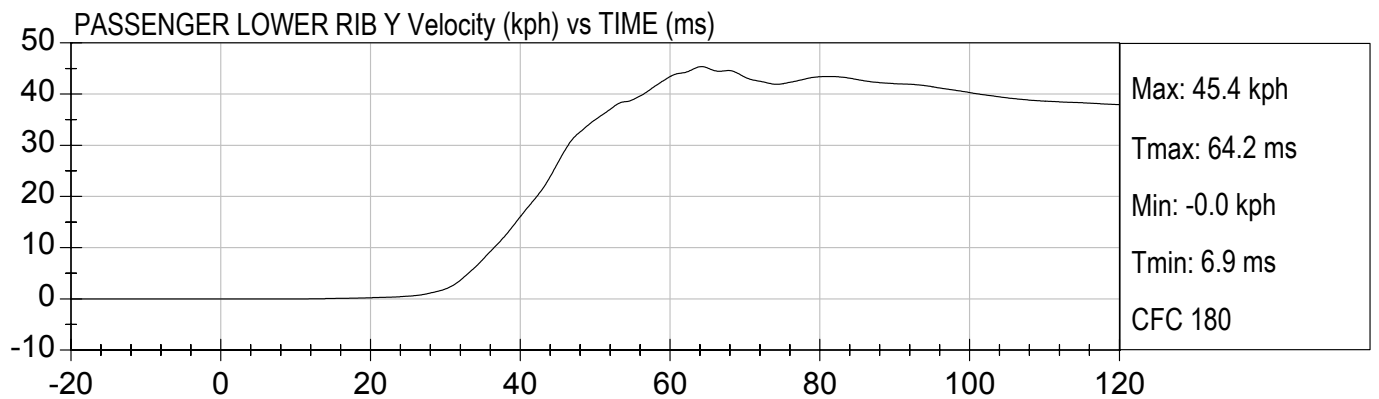
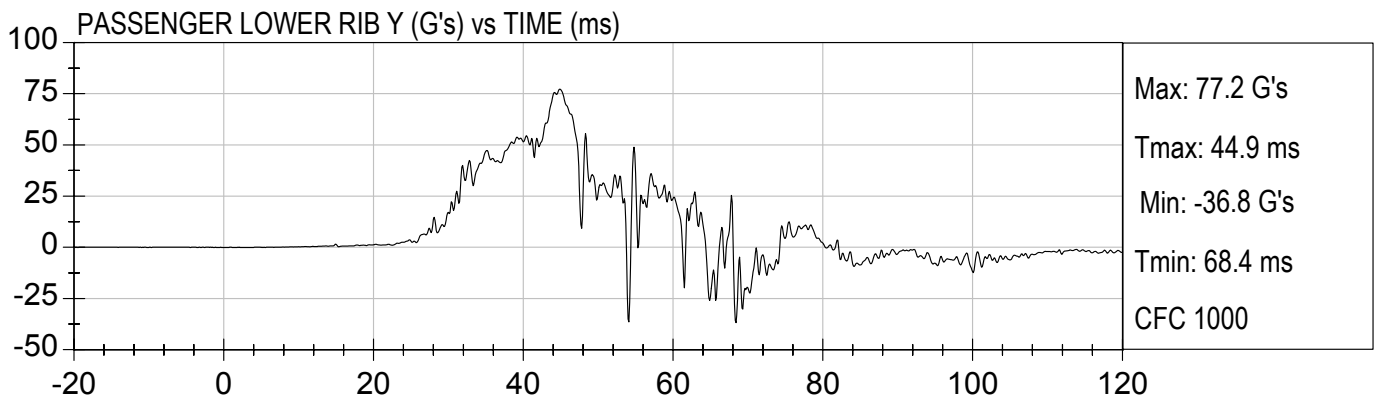
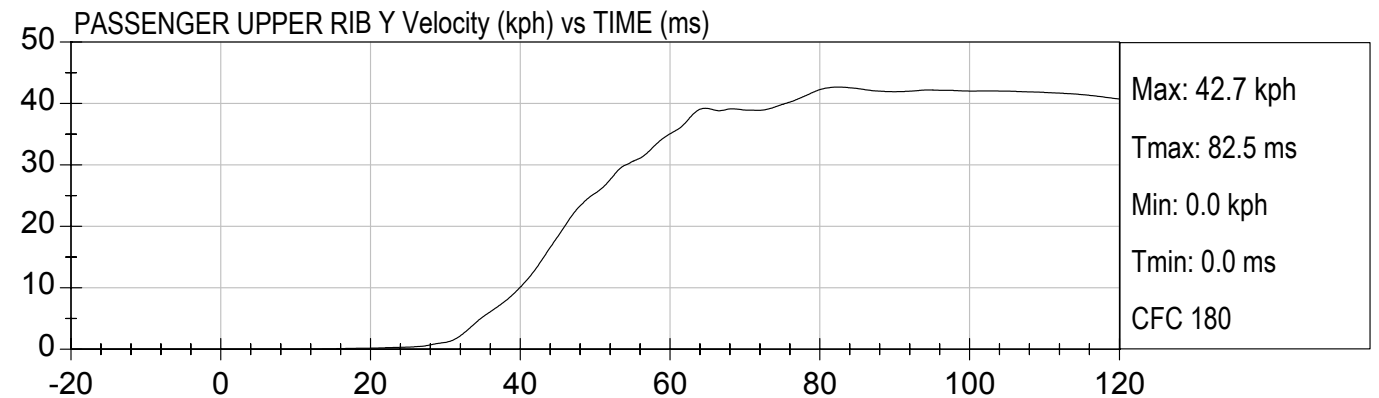
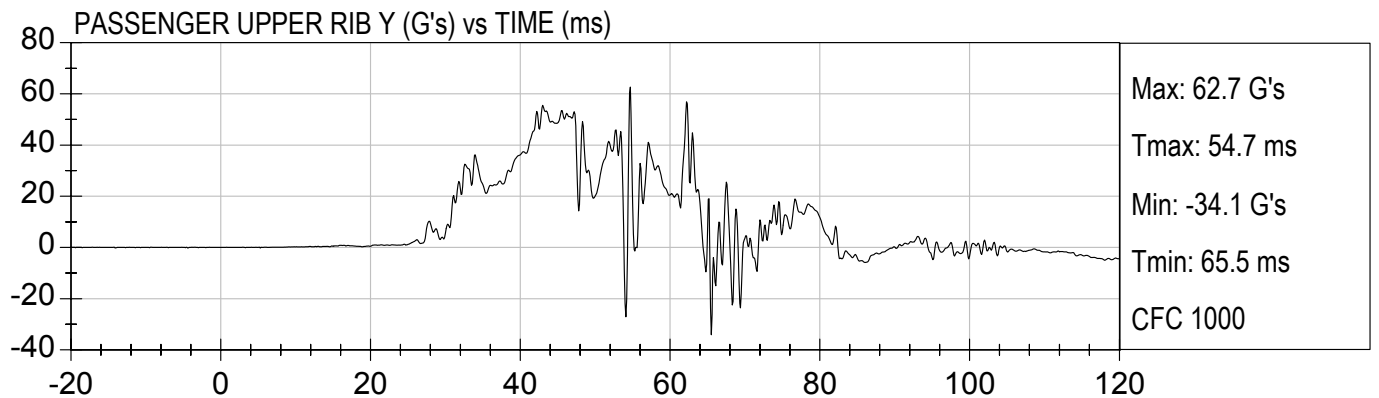
PASSENGER NECK FZ (N) vs TIME (ms)



PASSENGER NECK FResultant (N) vs TIME (ms)

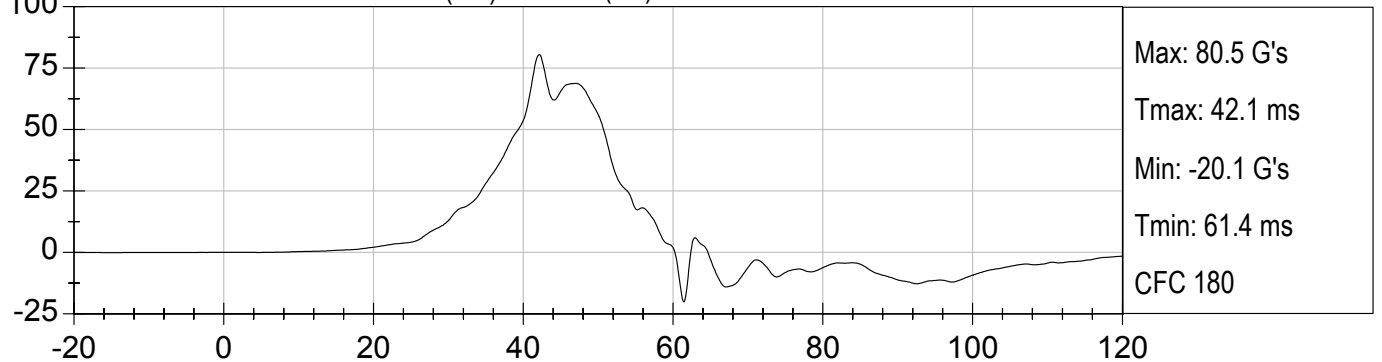




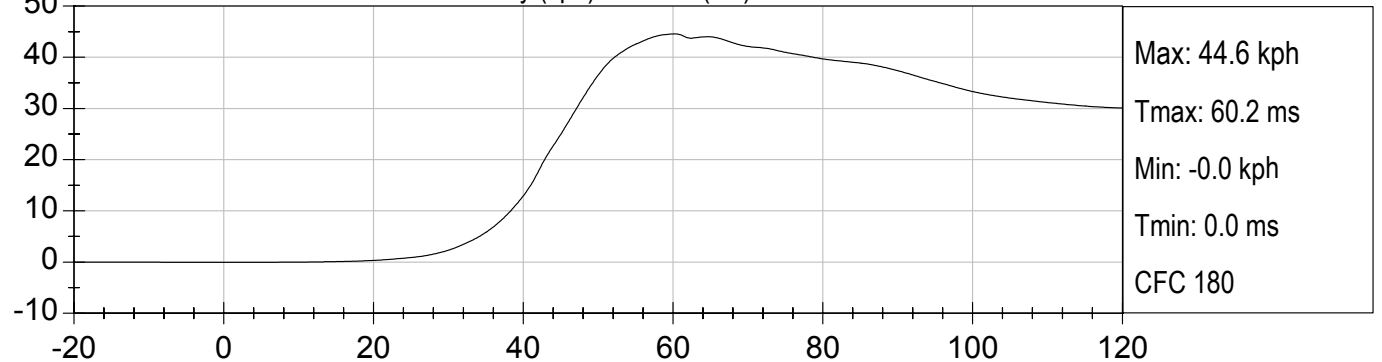




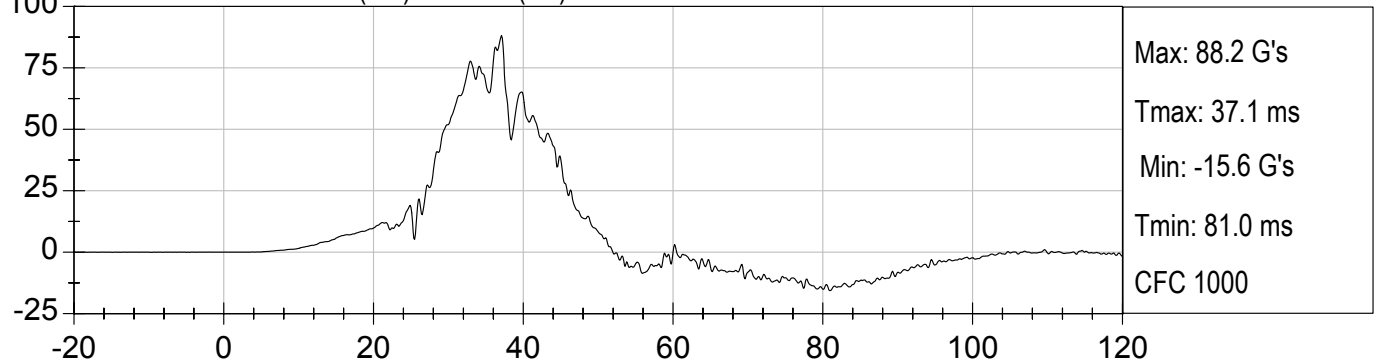
PASSENGER LOWER SPINE Y (G's) vs TIME (ms)



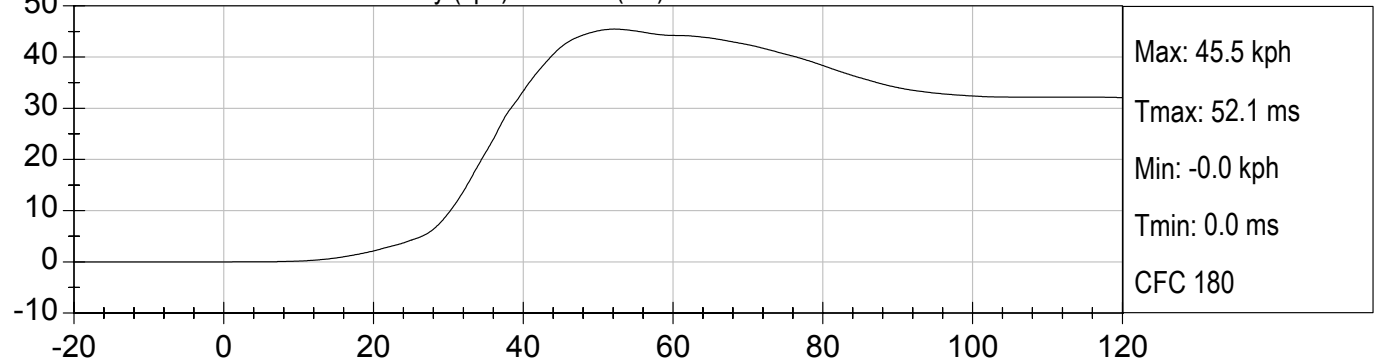
PASSENGER LOWER SPINE Y Velocity (kph) vs TIME (ms)

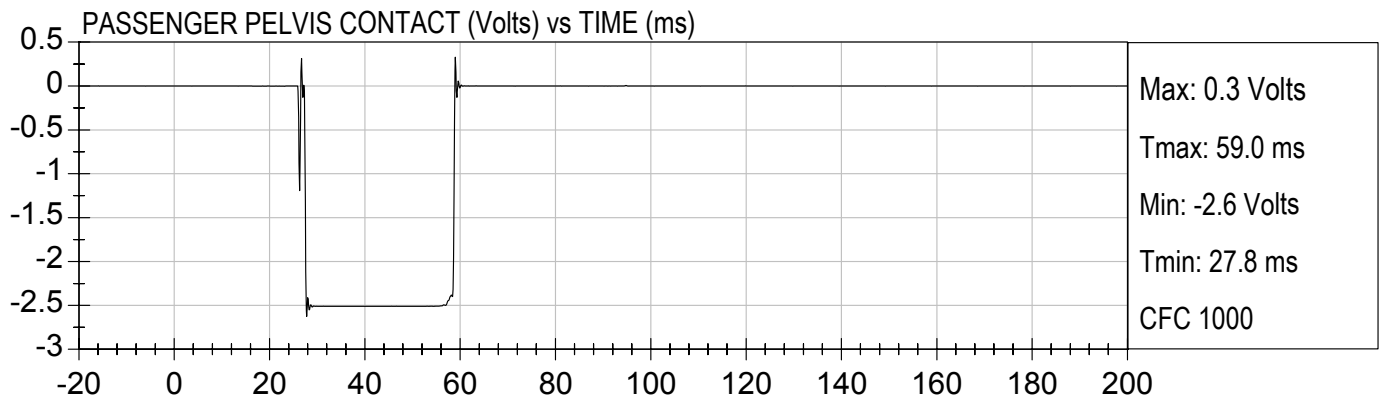
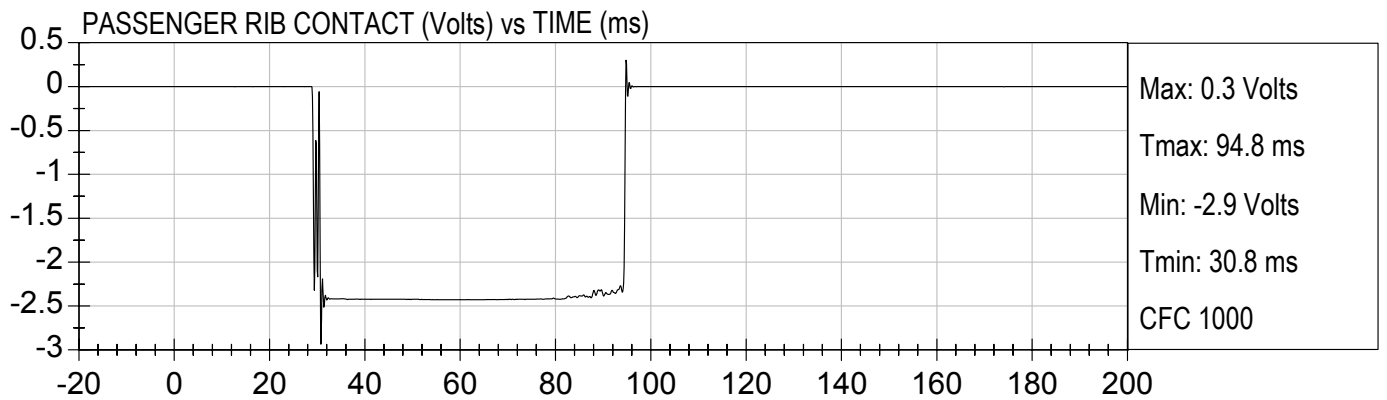


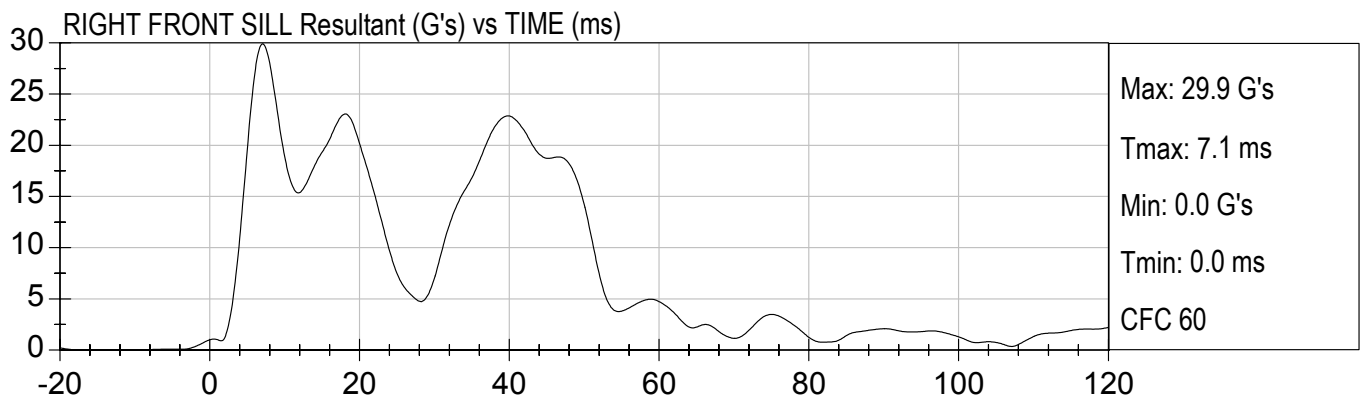
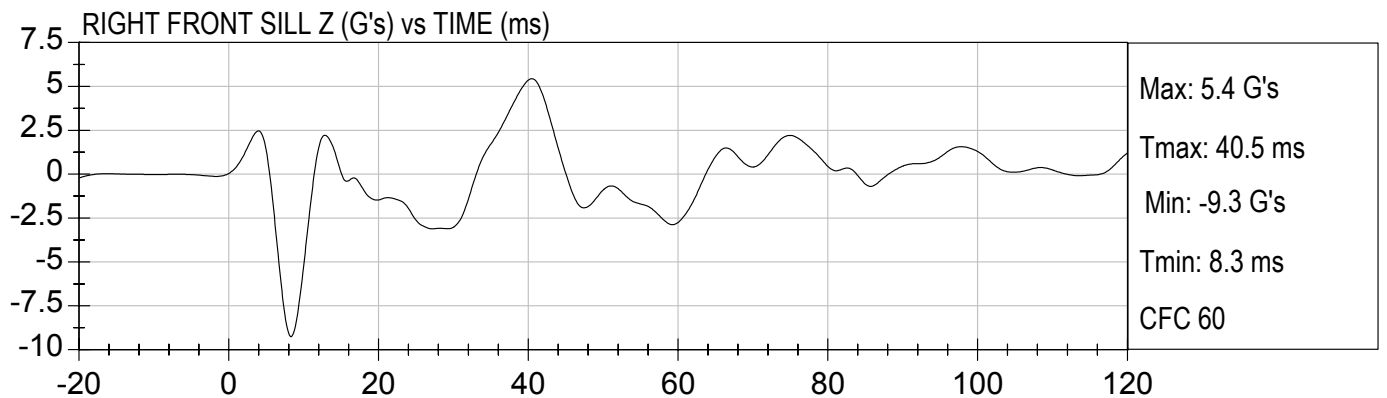
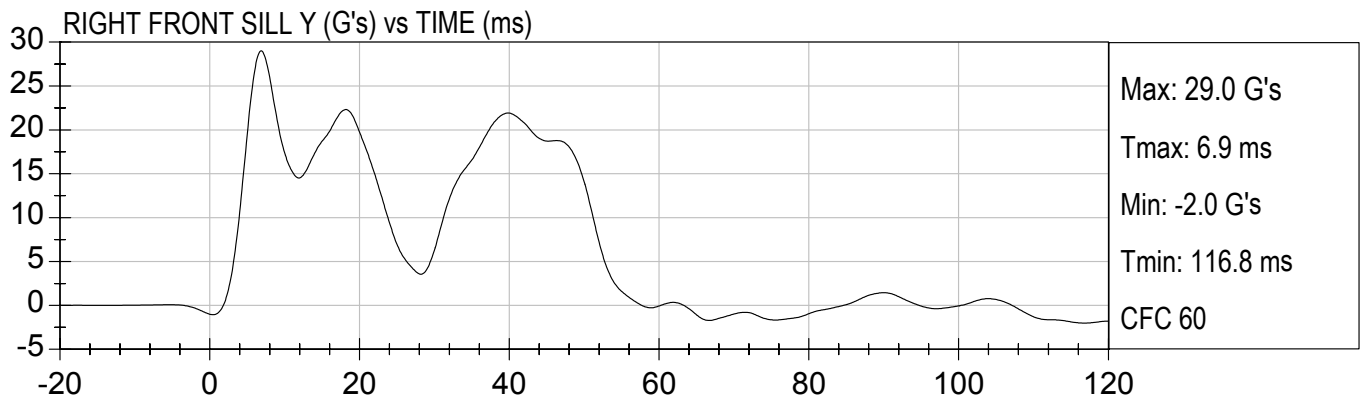
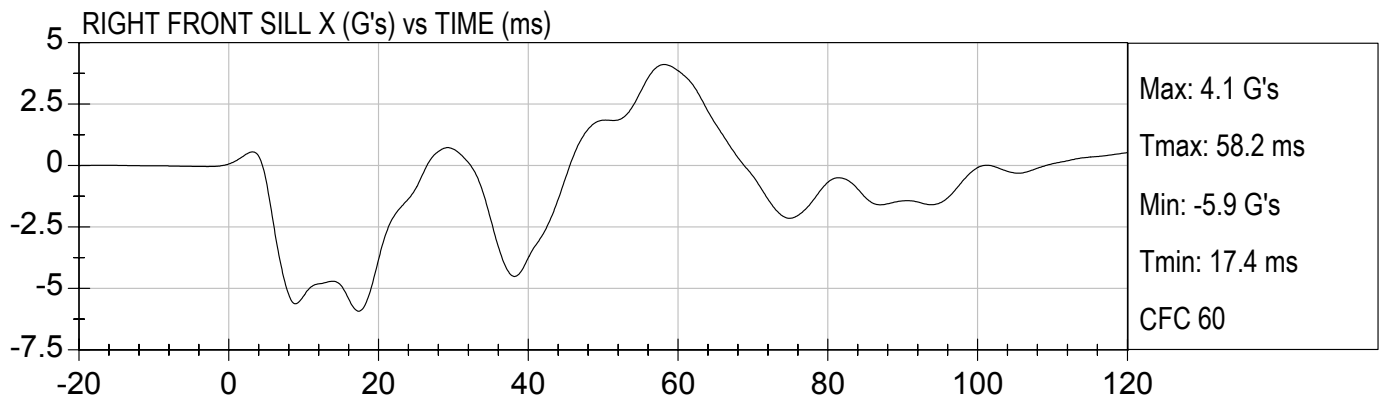
PASSENGER PELVIS Y (G's) vs TIME (ms)



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

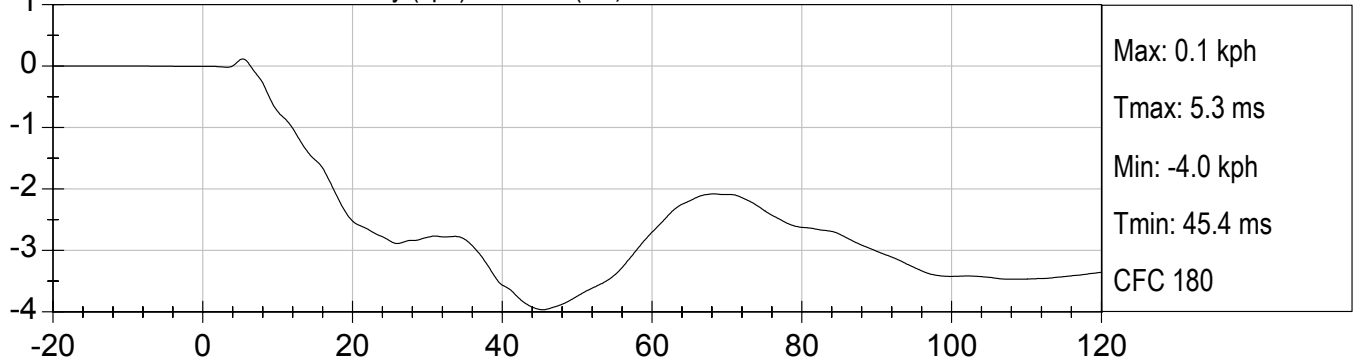




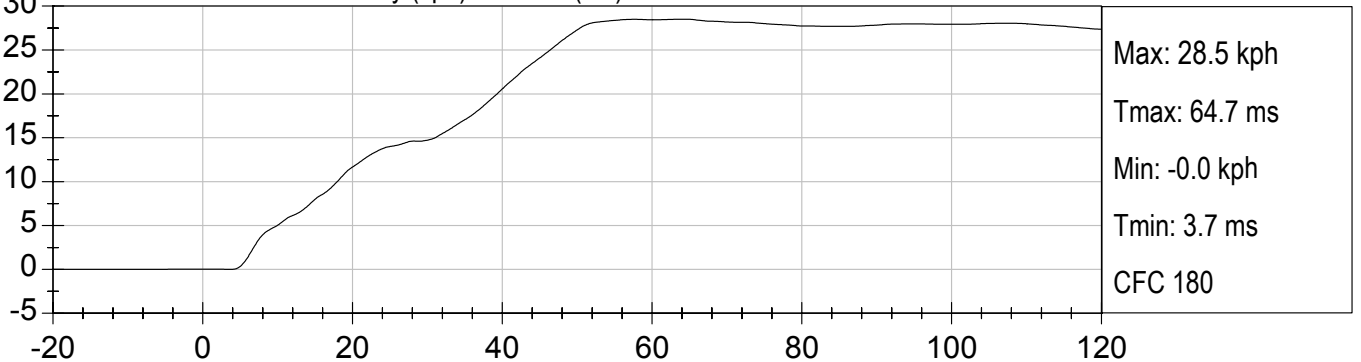




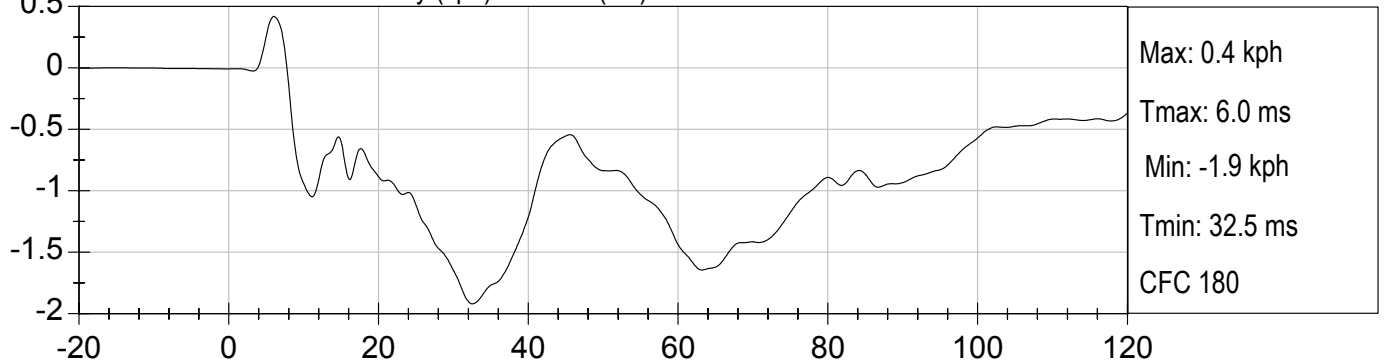
1 RIGHT FRONT SILL X Velocity (kph) vs TIME (ms)



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

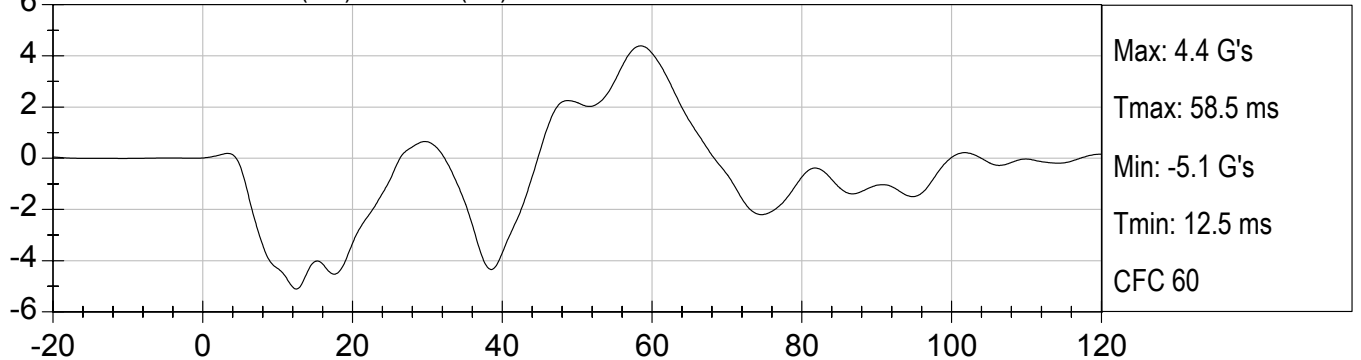


RIGHT FRONT SILL Z Velocity (kph) vs TIME (ms)

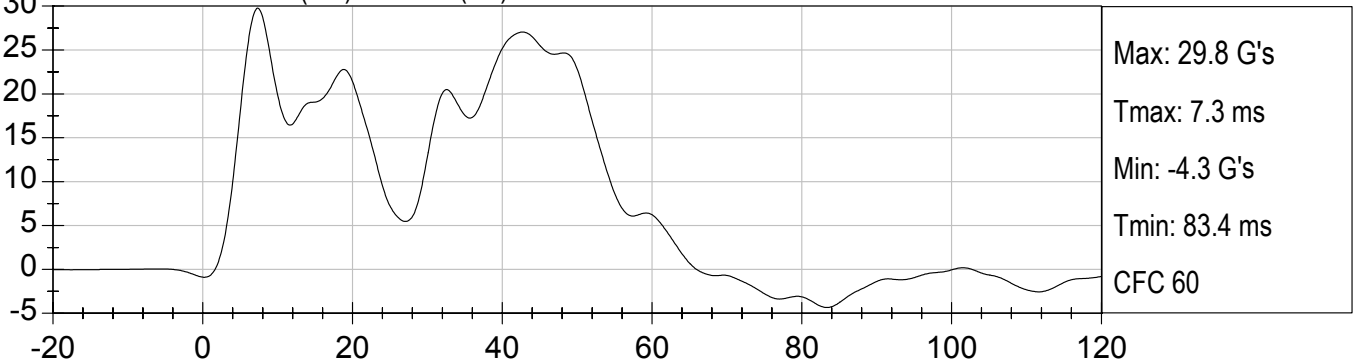




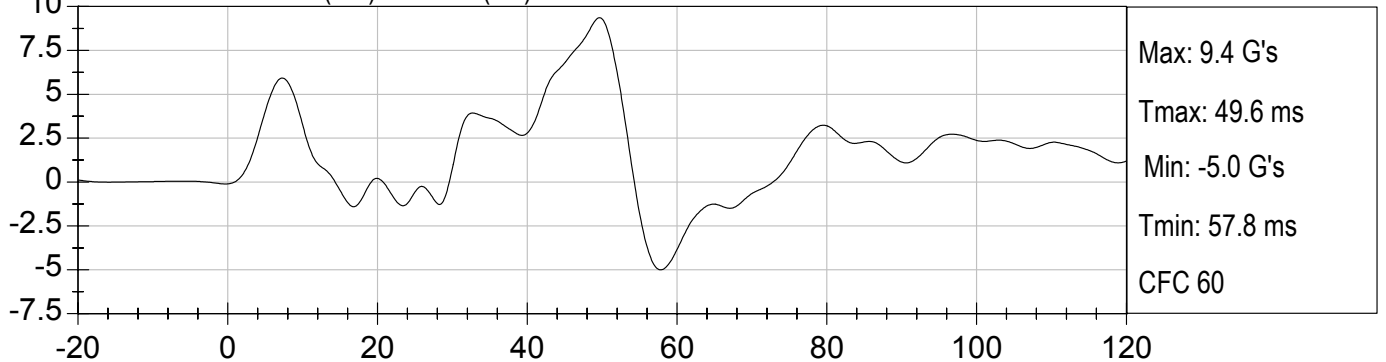
RIGHT REAR SILL X (G's) vs TIME (ms)



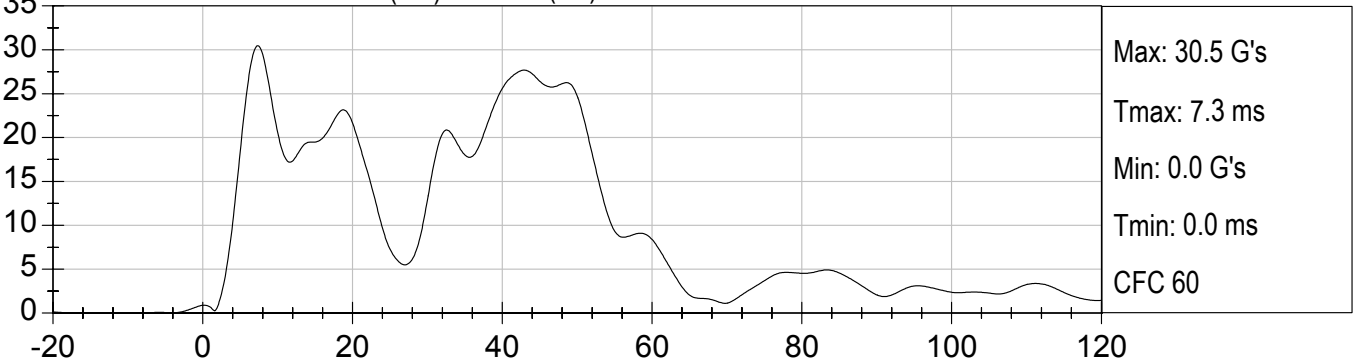
RIGHT REAR SILL Y (G's) vs TIME (ms)



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

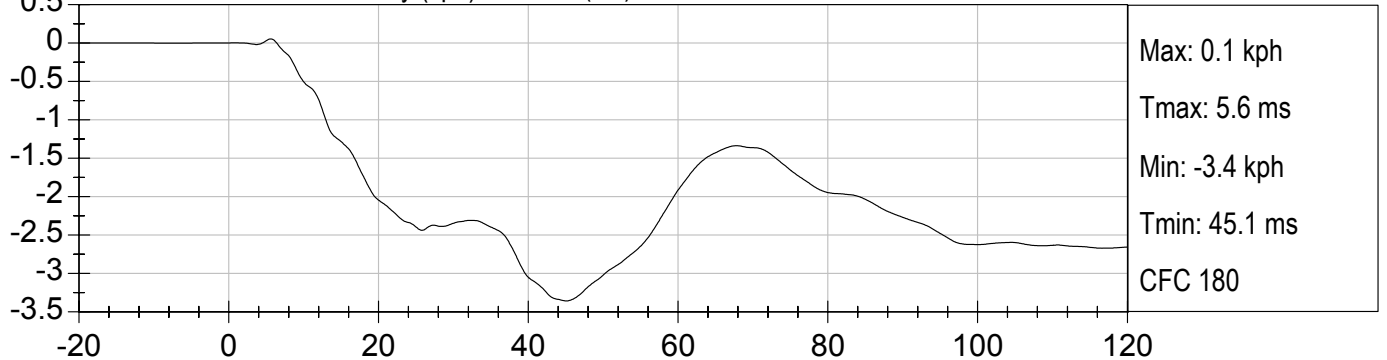


RIGHT REAR SILL Resultant (G's) vs TIME (ms)

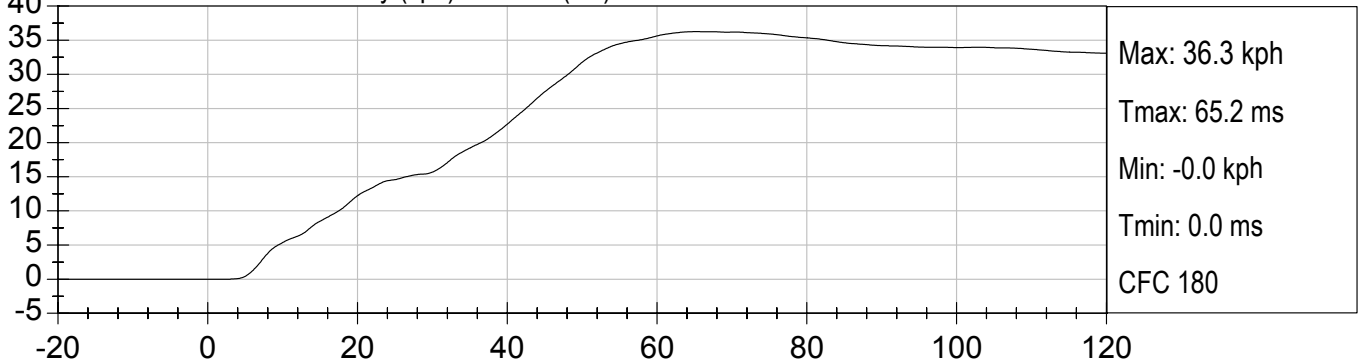




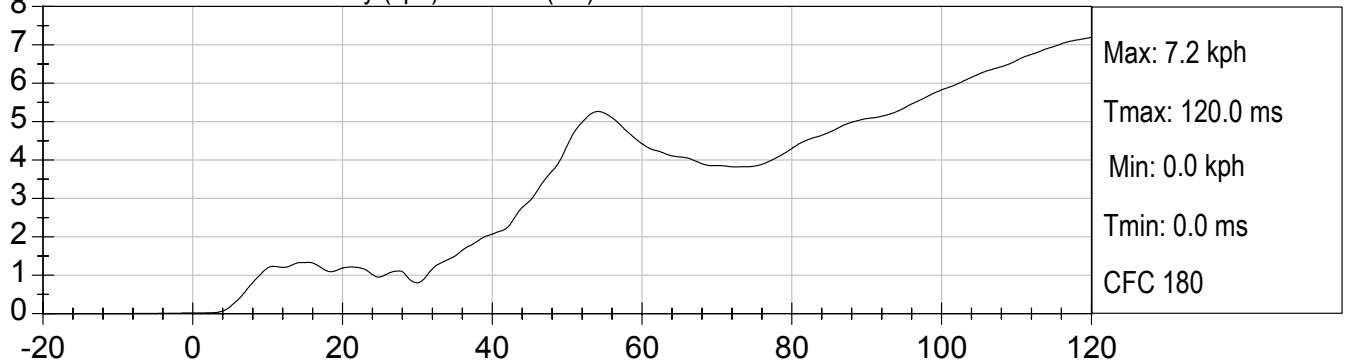
RIGHT REAR SILL X Velocity (kph) vs TIME (ms)

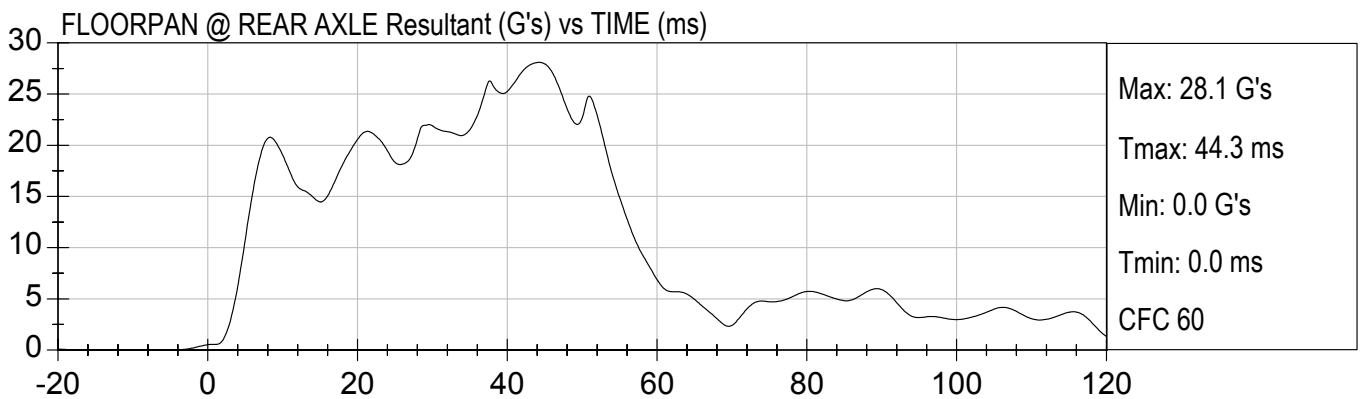
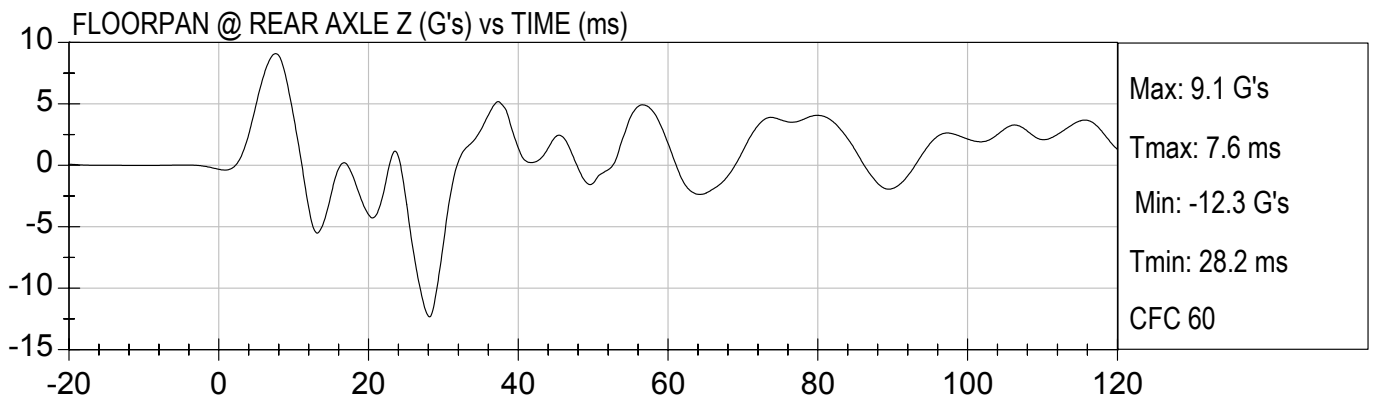
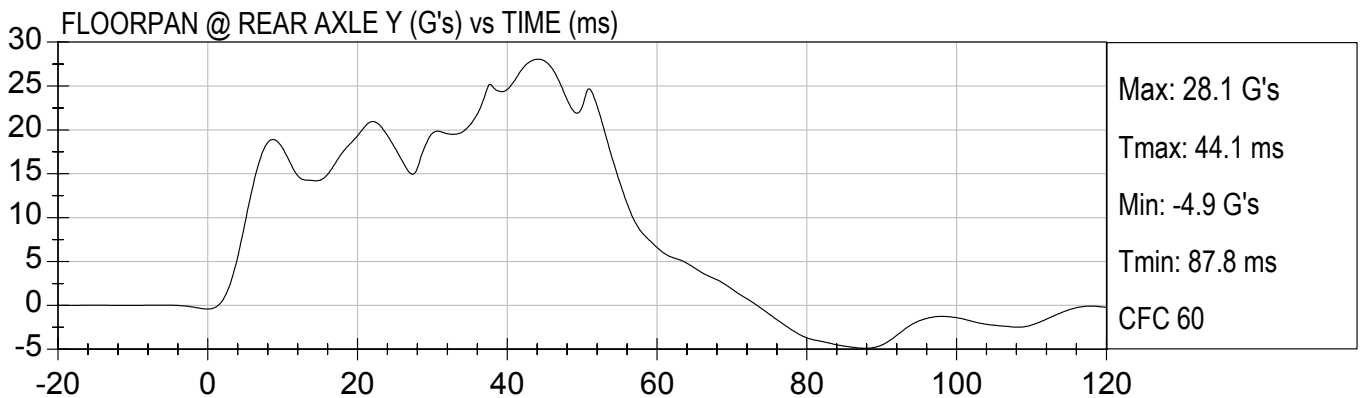
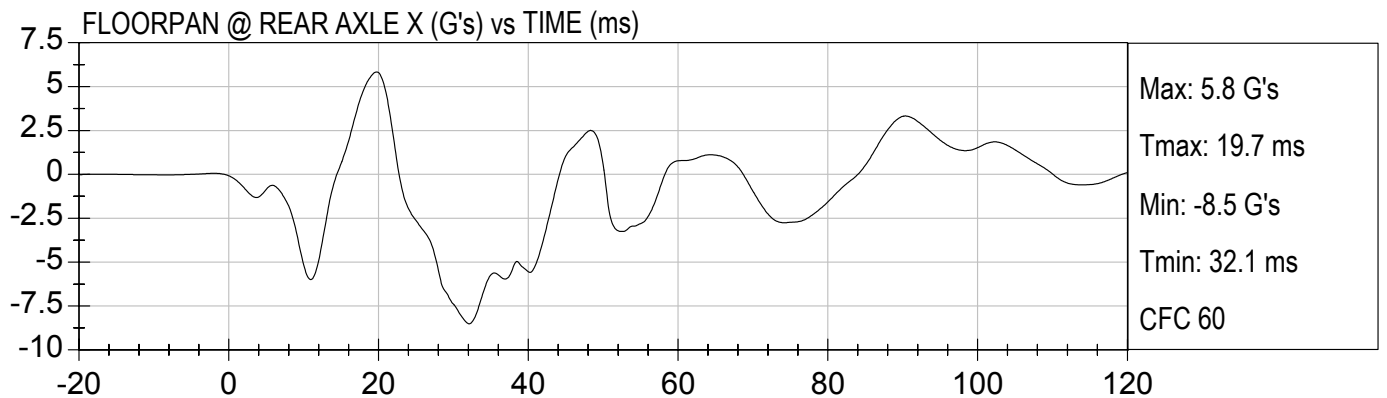


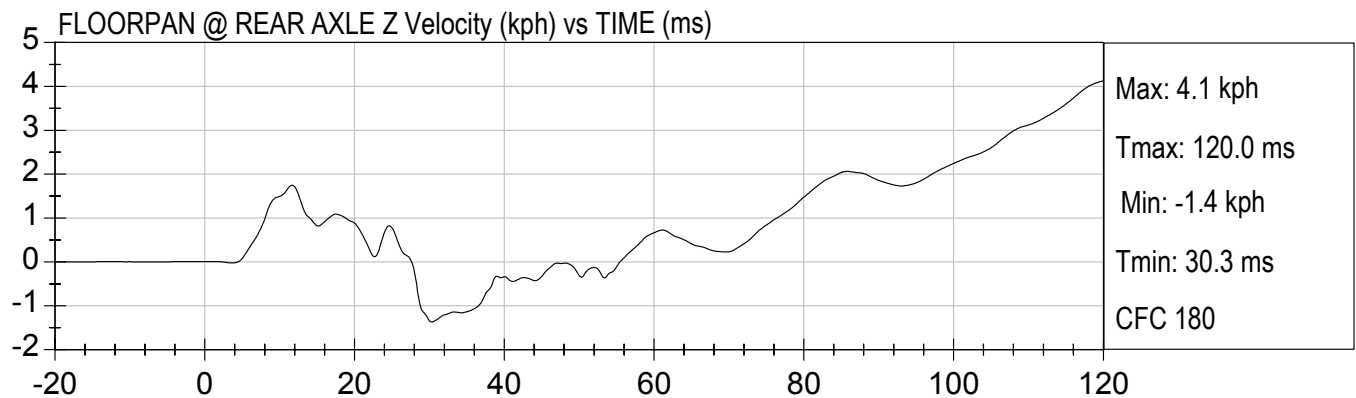
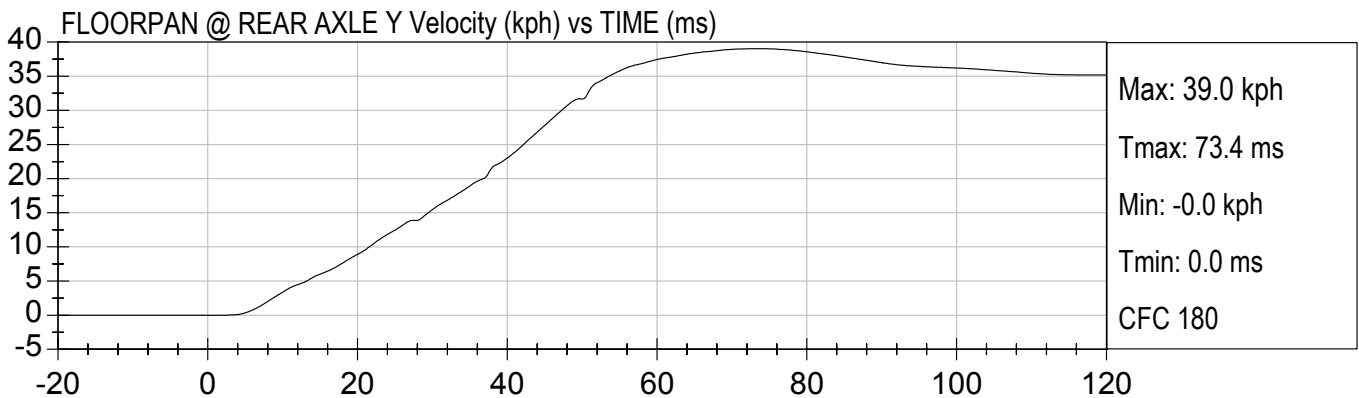
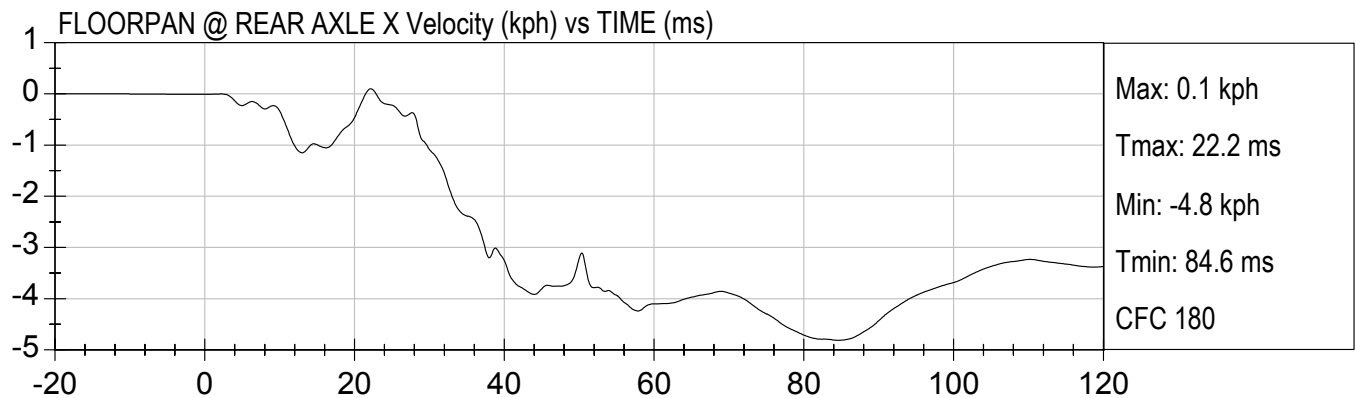
RIGHT REAR SILL Y Velocity (kph) vs TIME (ms)



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

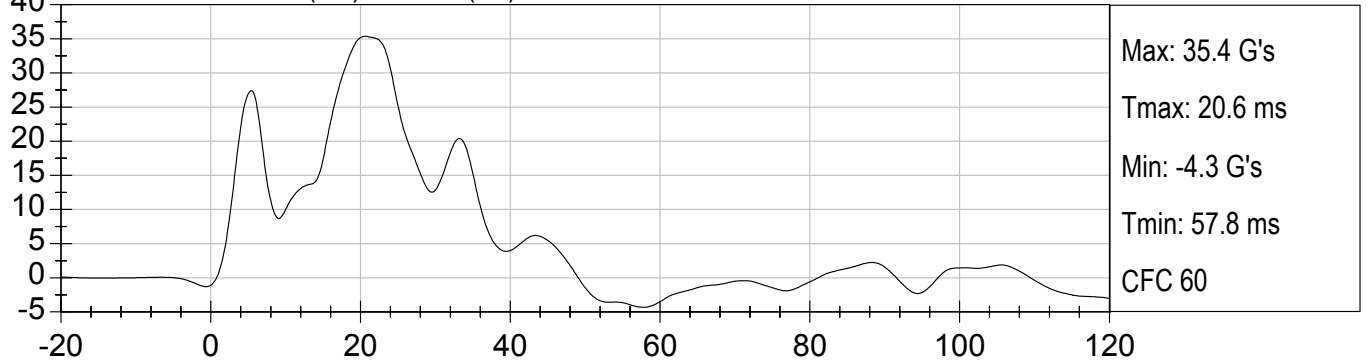




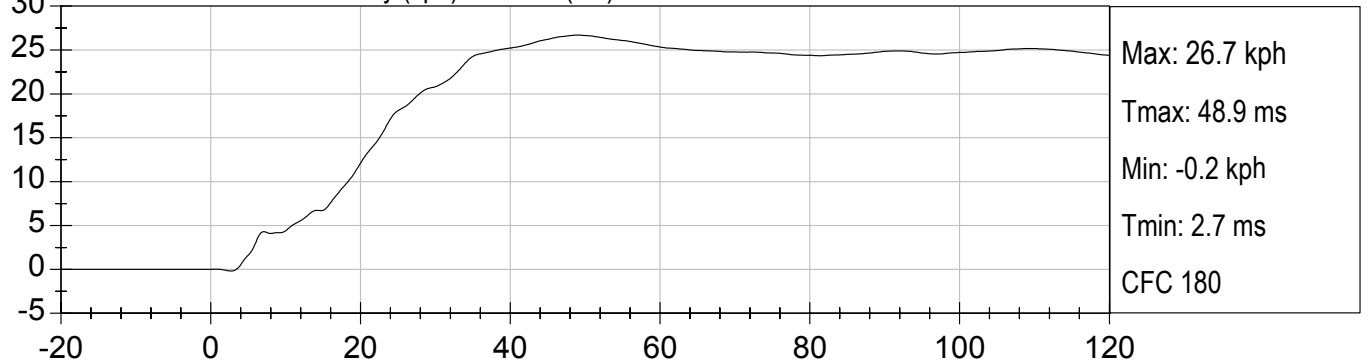




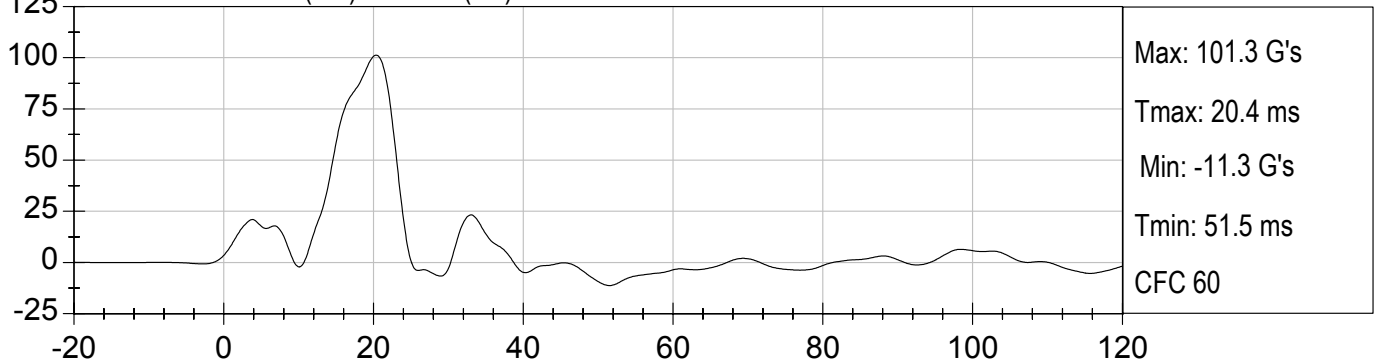
LEFT FRONT SILL Y (G's) vs TIME (ms)



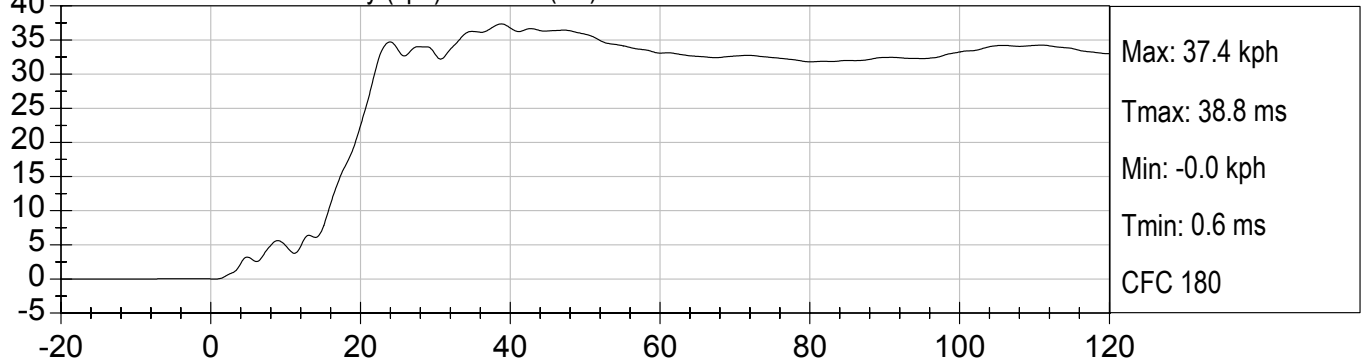
LEFT FRONT SILL Y Velocity (kph) vs TIME (ms)



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

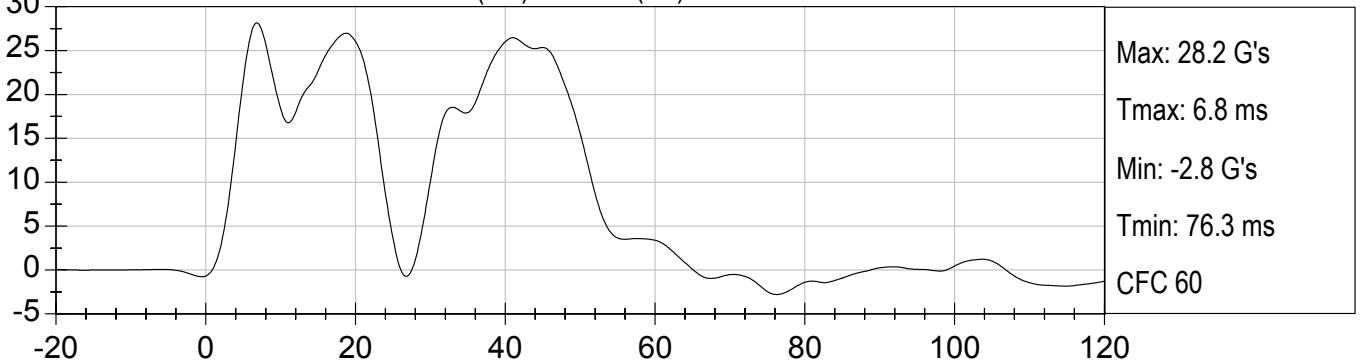


LEFT REAR SILL Y Velocity (kph) vs TIME (ms)

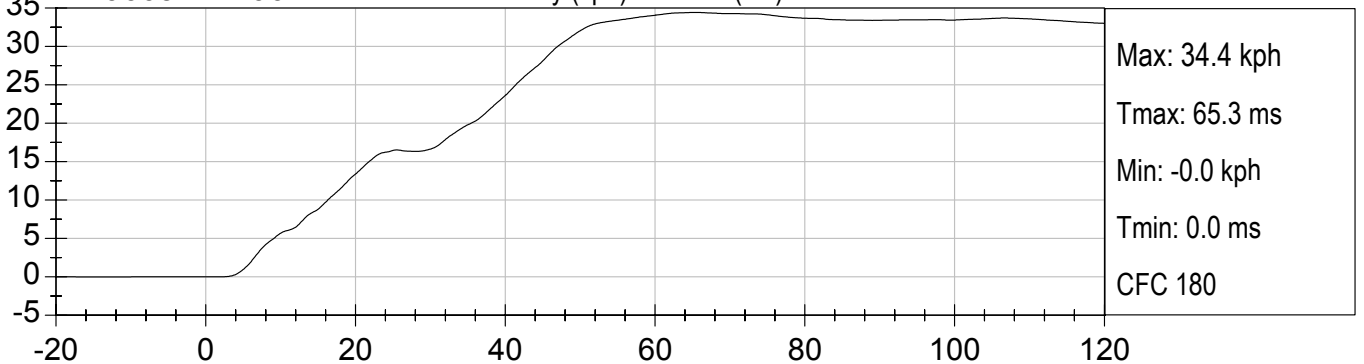




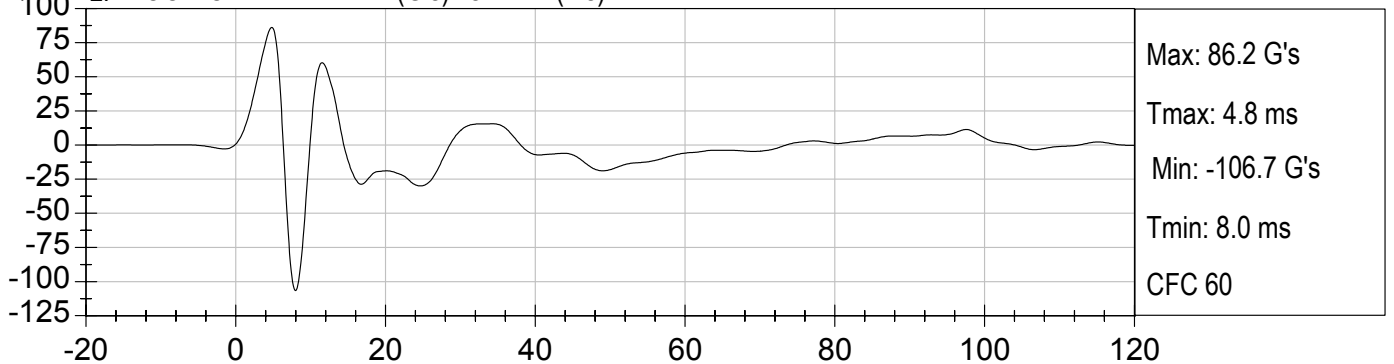
RR OCCUPANT COMPARTMENT Y (G's) vs TIME (ms)



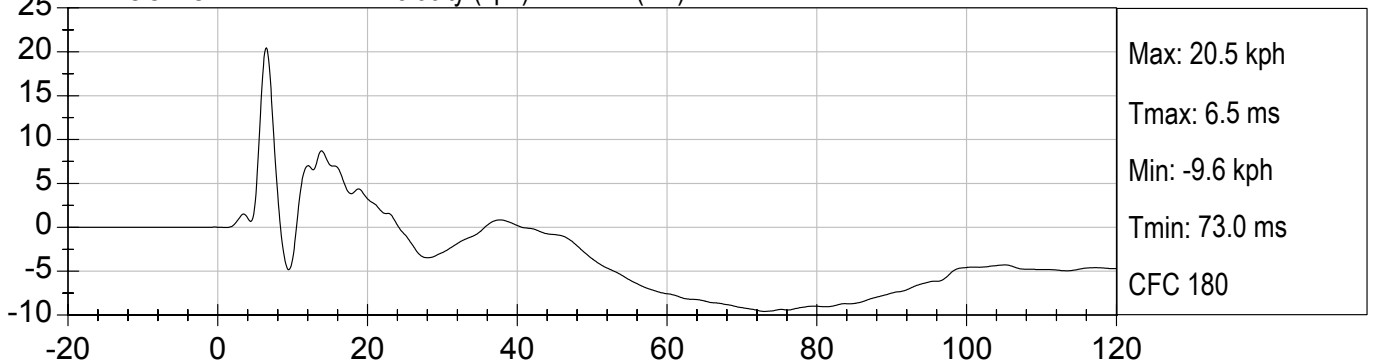
RR OCCUPANT COMPARTMENT Y Velocity (kph) vs TIME (ms)

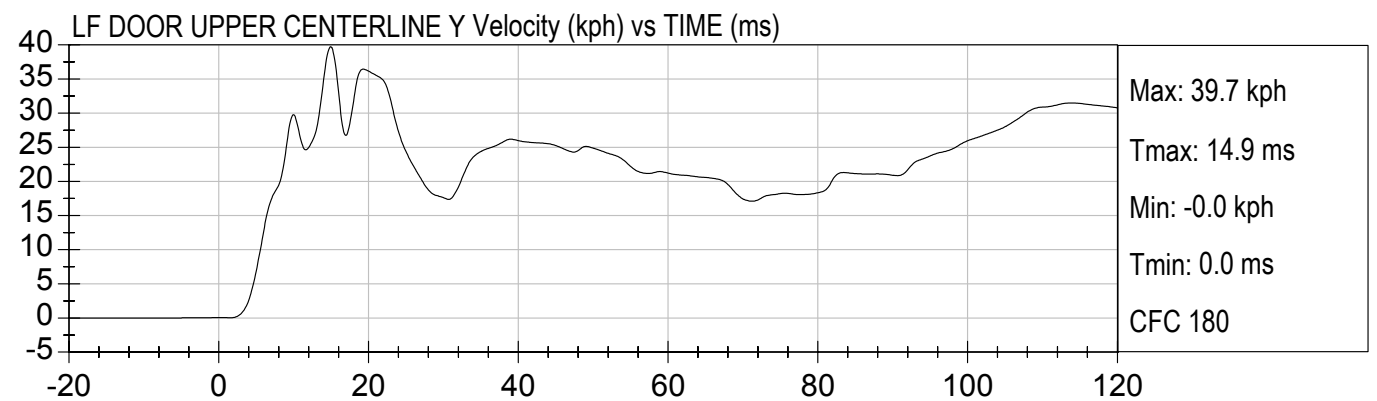
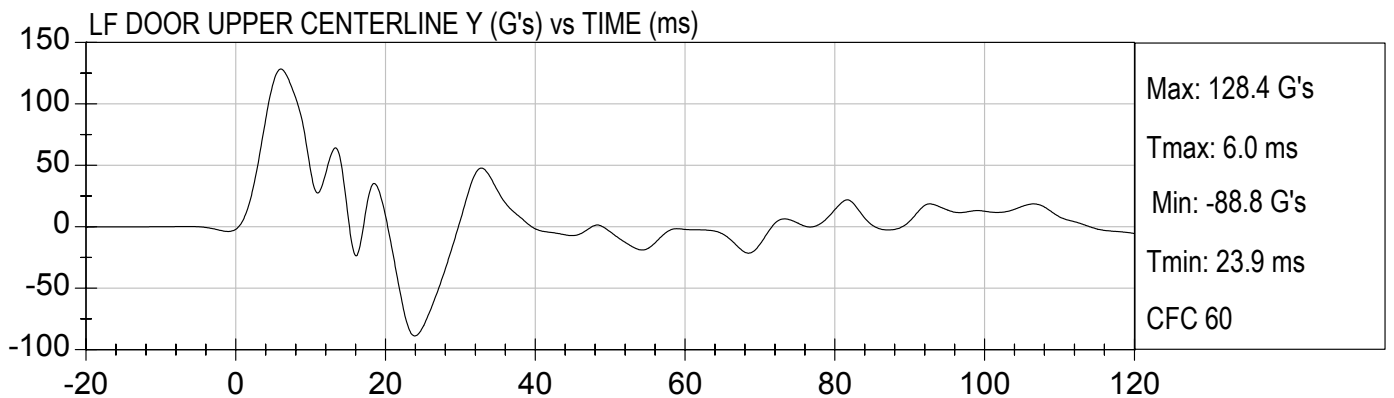
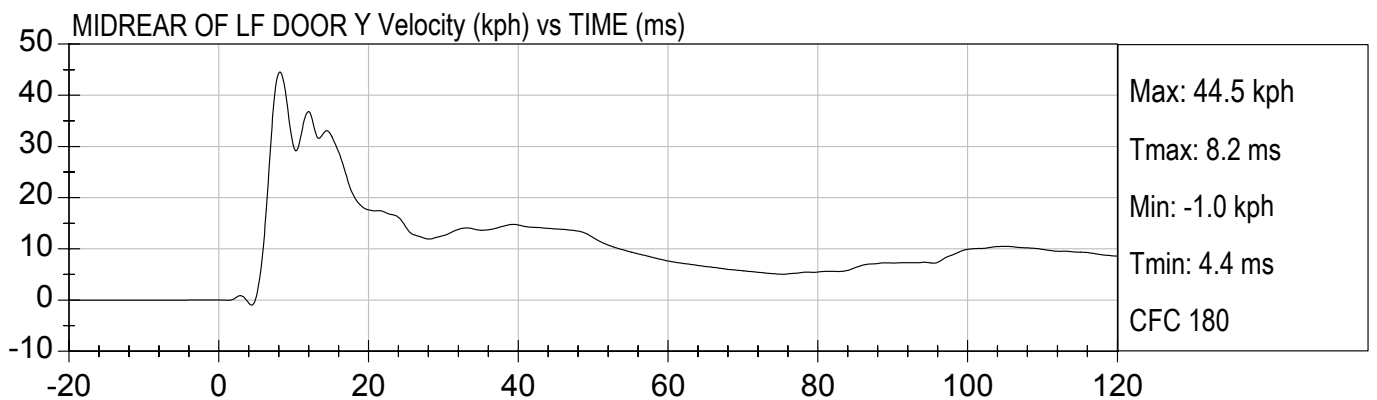
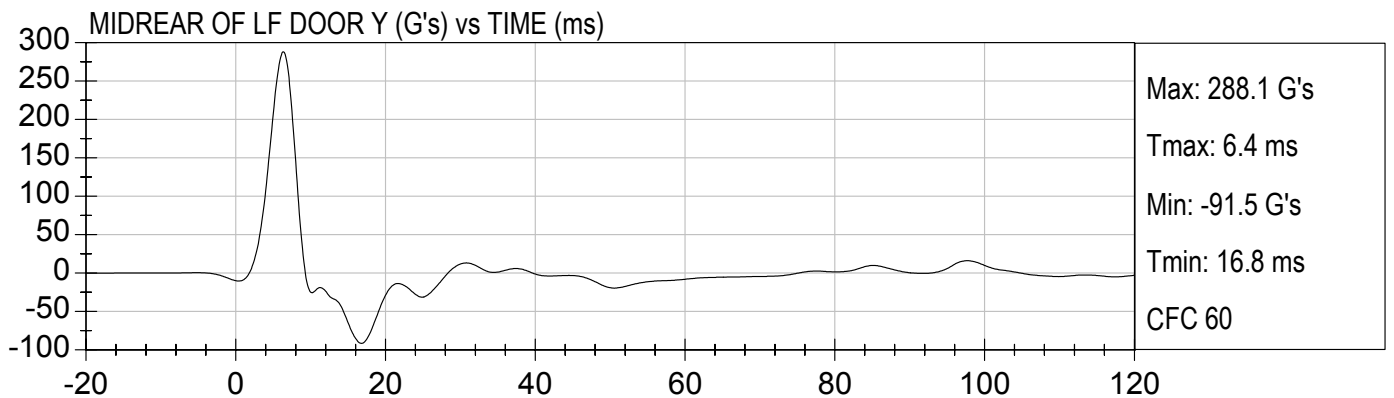


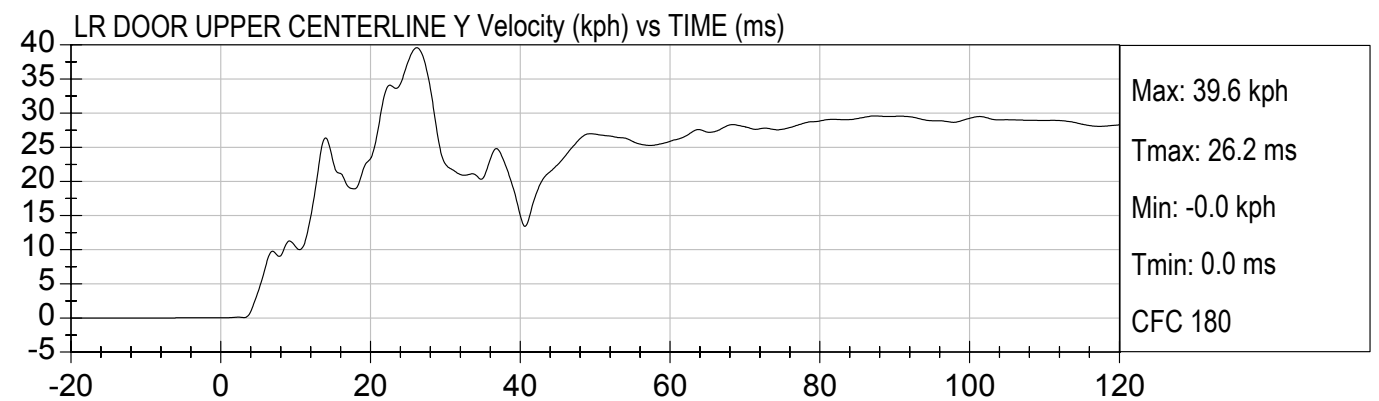
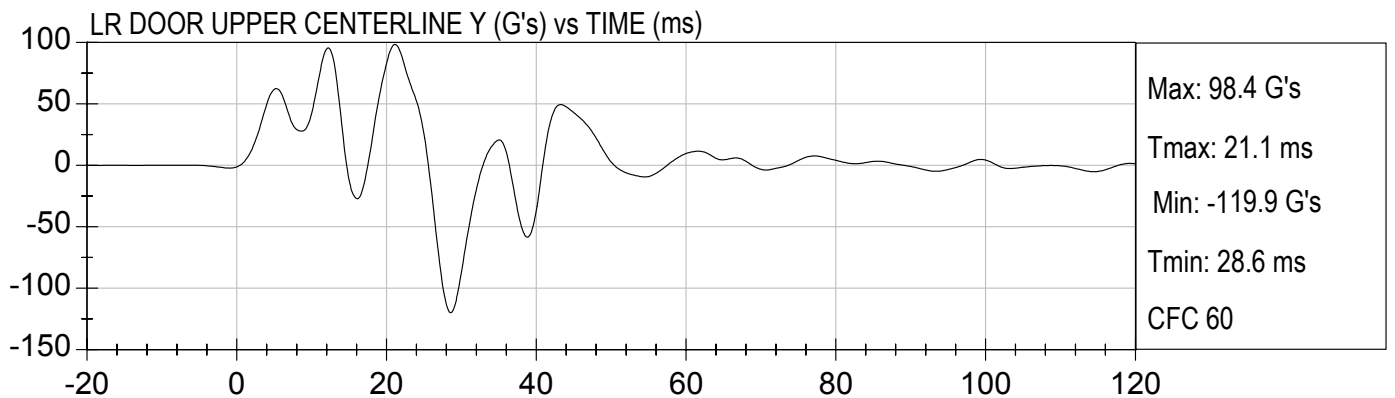
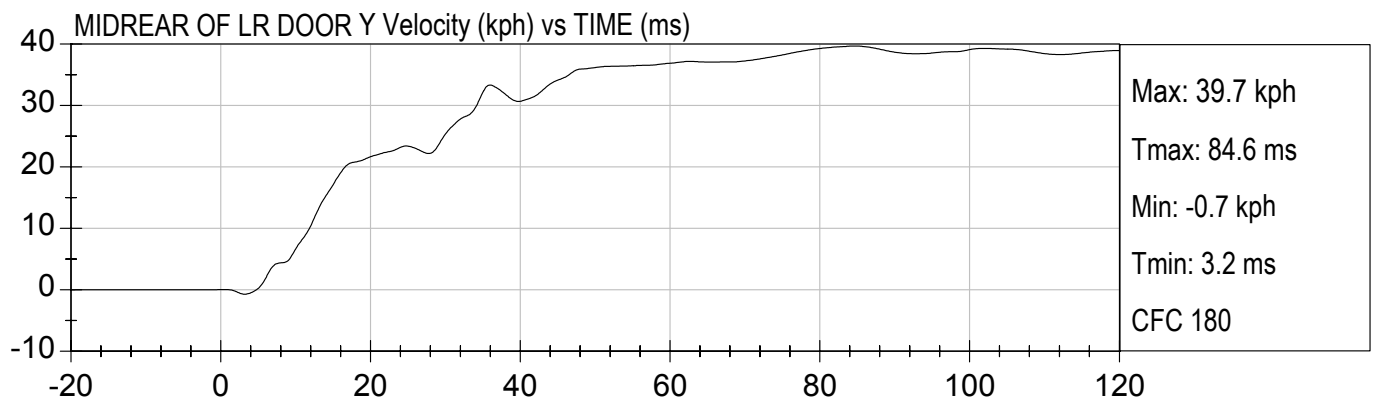
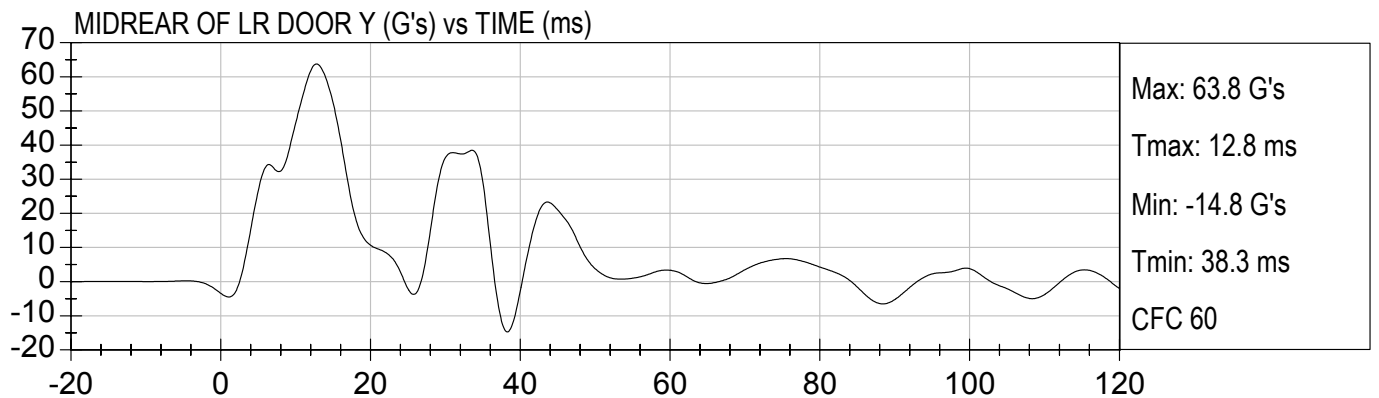
LF DOOR CENTERLINE Y (G's) vs TIME (ms)



LF DOOR CENTERLINE Y Velocity (kph) vs TIME (ms)

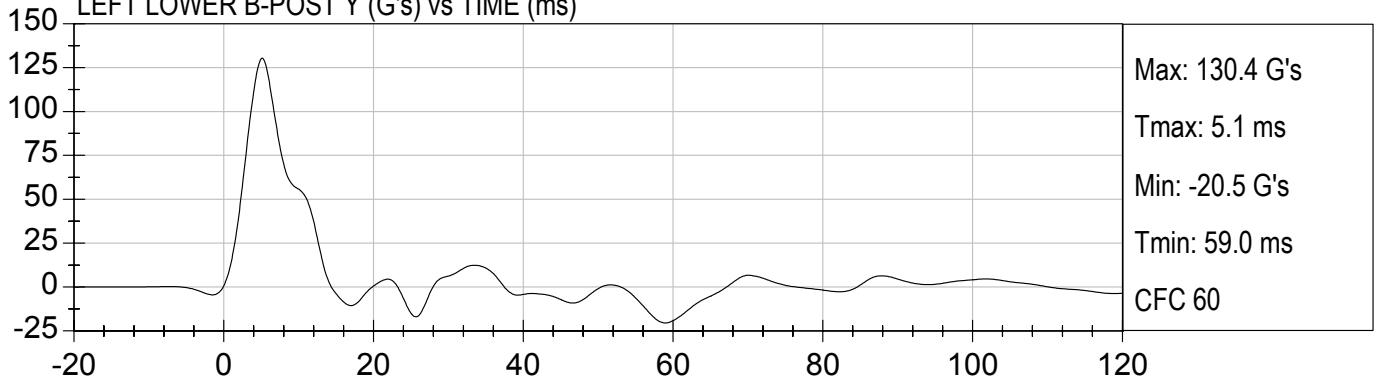




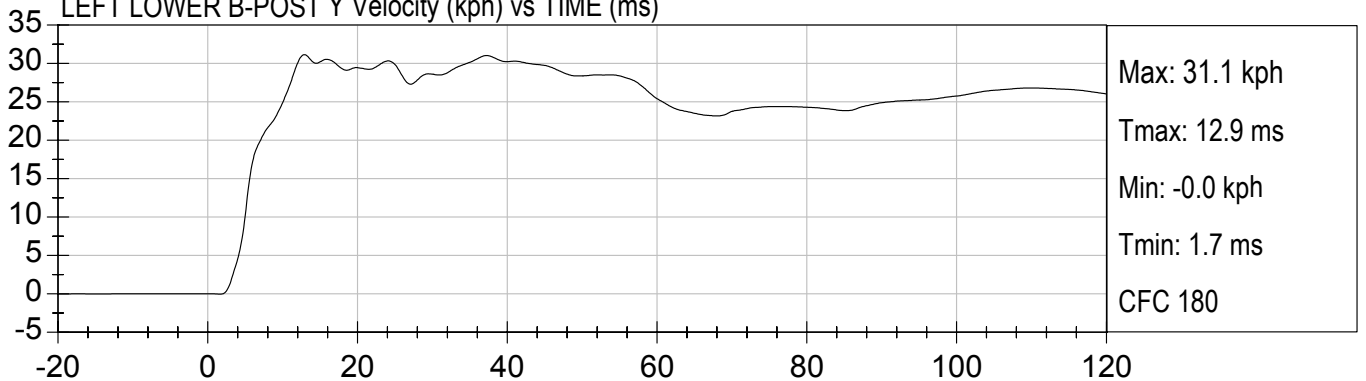




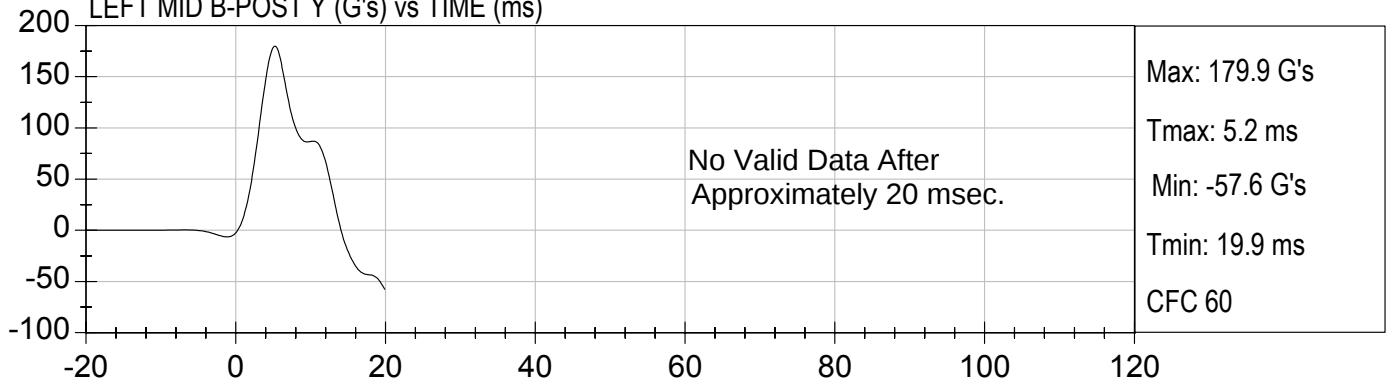
LEFT LOWER B-POST Y (G's) vs TIME (ms)



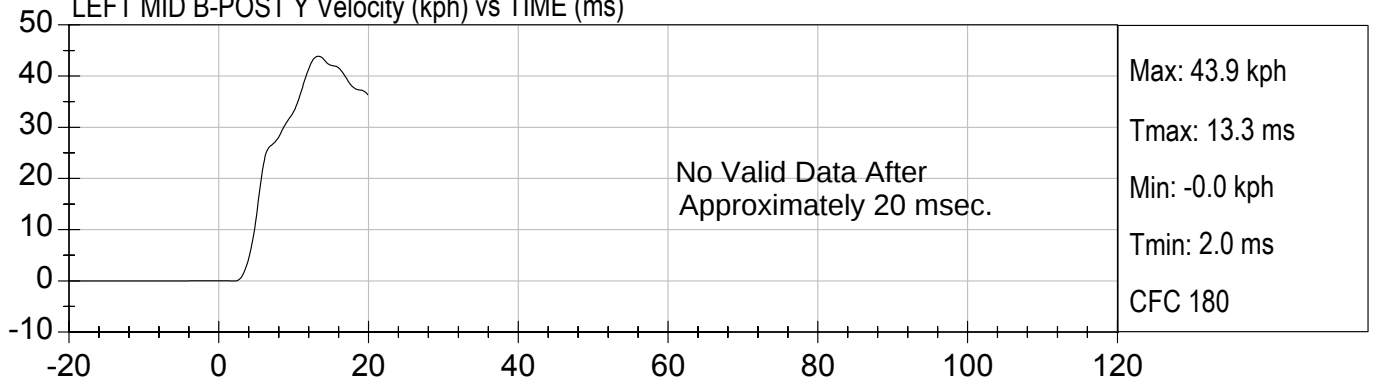
LEFT LOWER B-POST Y Velocity (kph) vs TIME (ms)



LEFT MID B-POST Y (G's) vs TIME (ms)

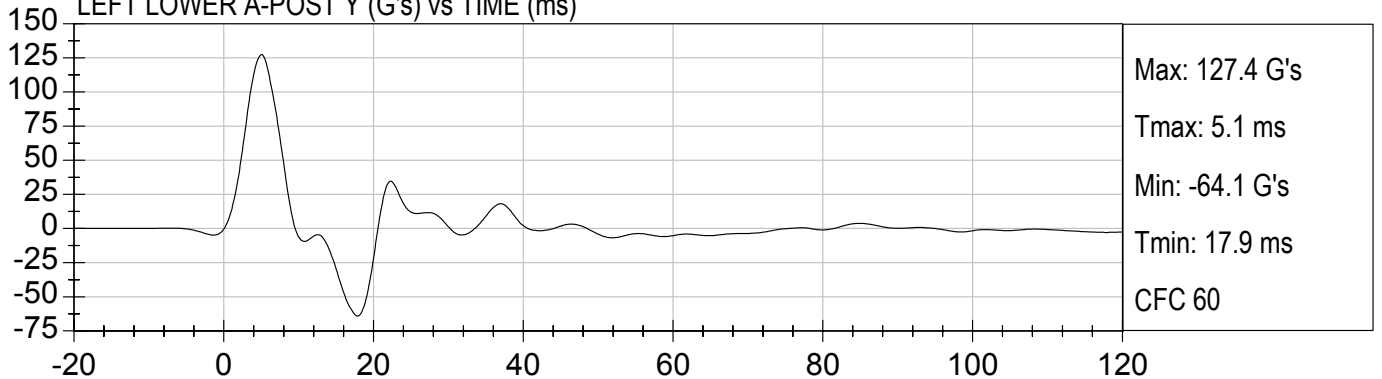


LEFT MID B-POST Y Velocity (kph) vs TIME (ms)

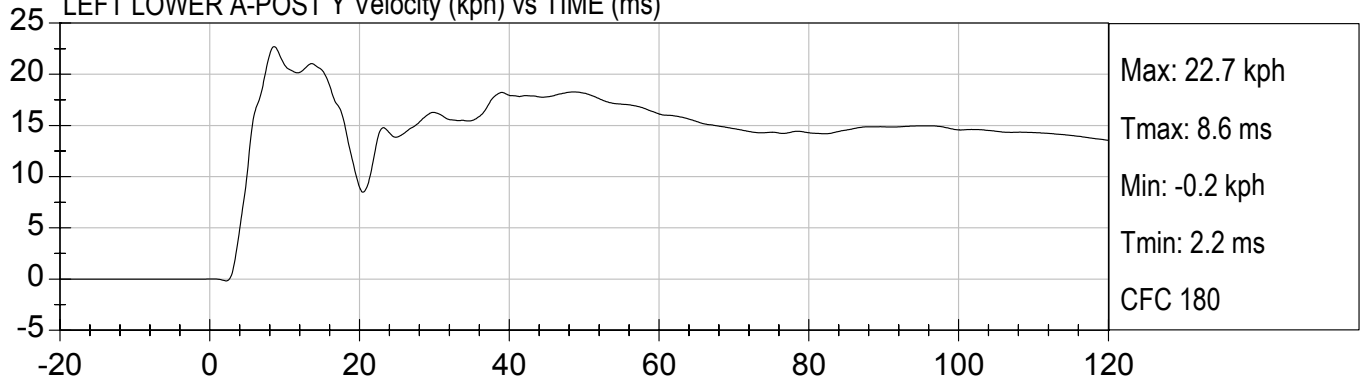




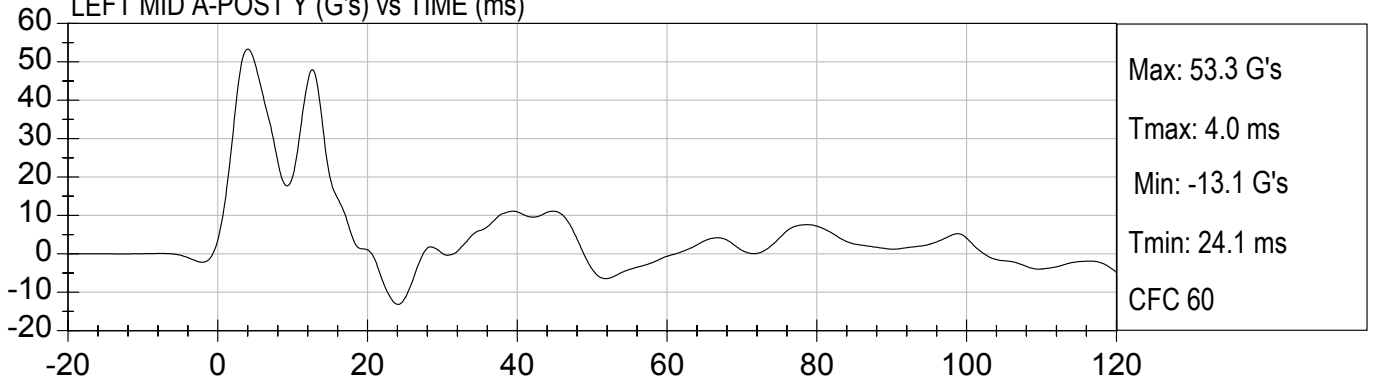
LEFT LOWER A-POST Y (G's) vs TIME (ms)



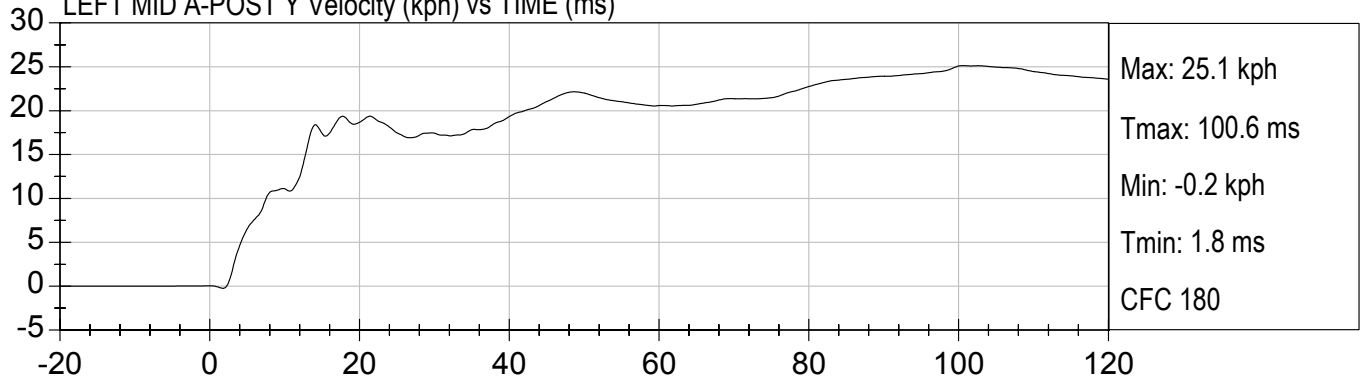
LEFT LOWER A-POST Y Velocity (kph) vs TIME (ms)



LEFT MID A-POST Y (G's) vs TIME (ms)

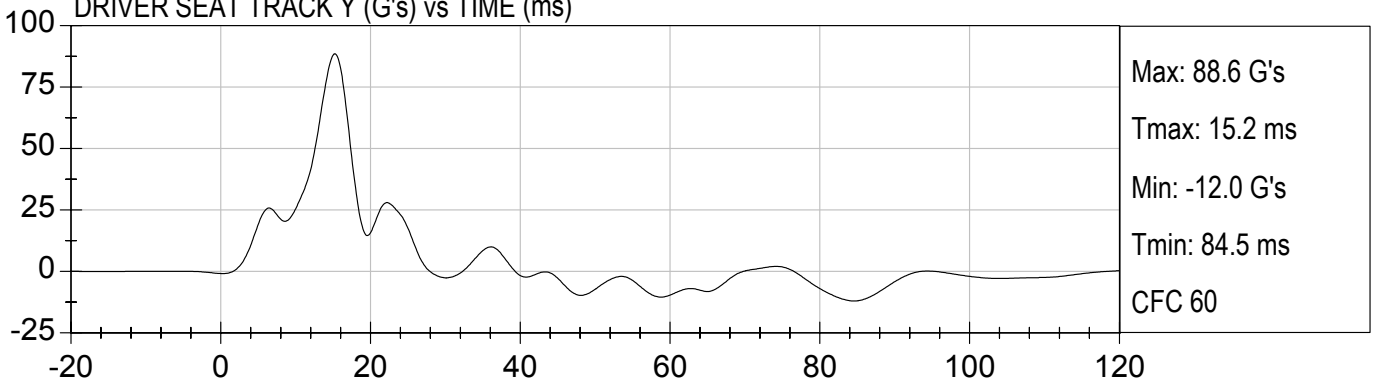


LEFT MID A-POST Y Velocity (kph) vs TIME (ms)

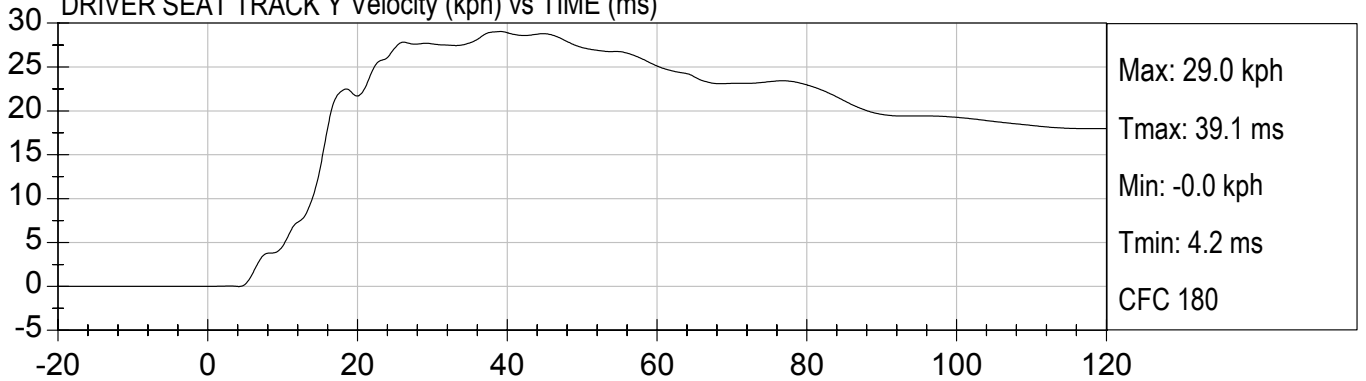


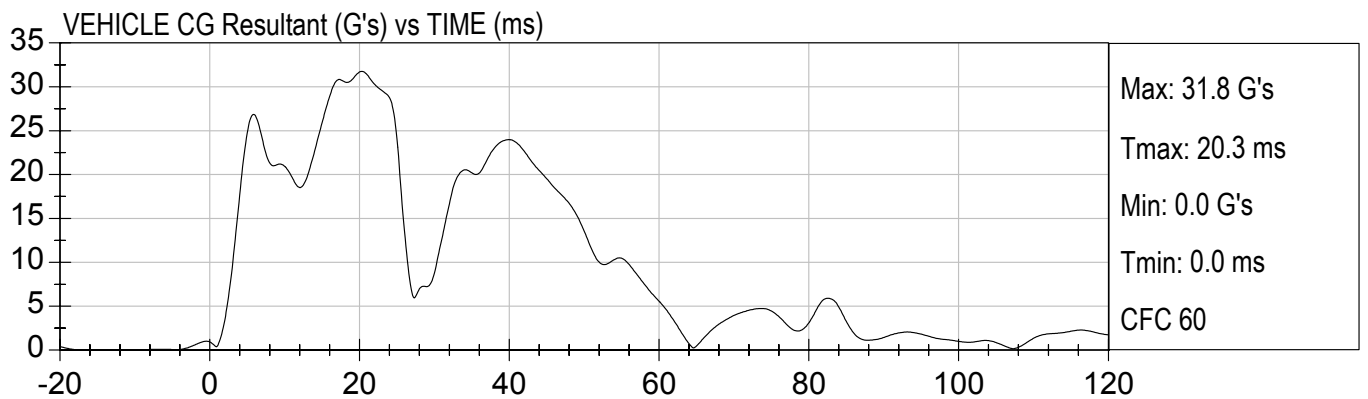
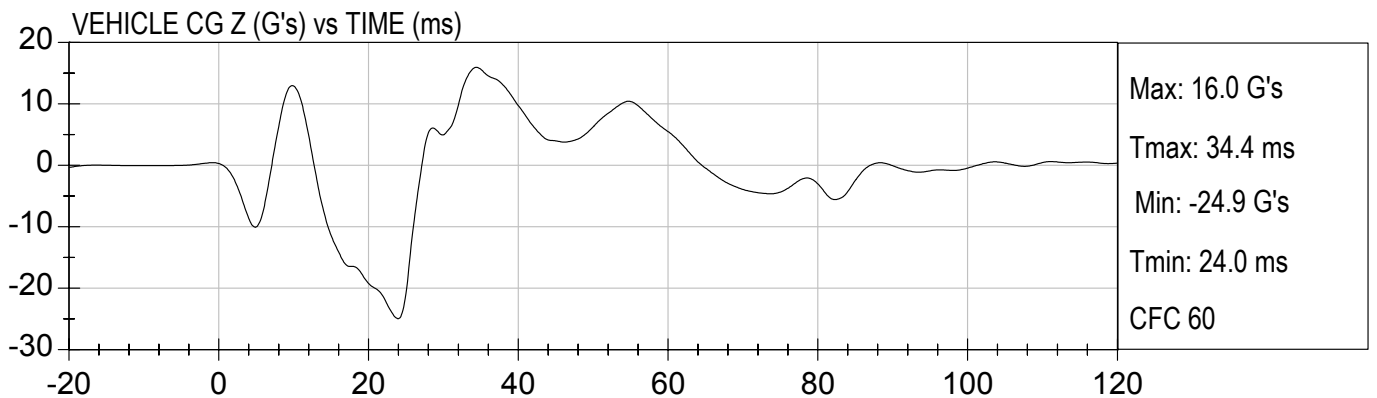
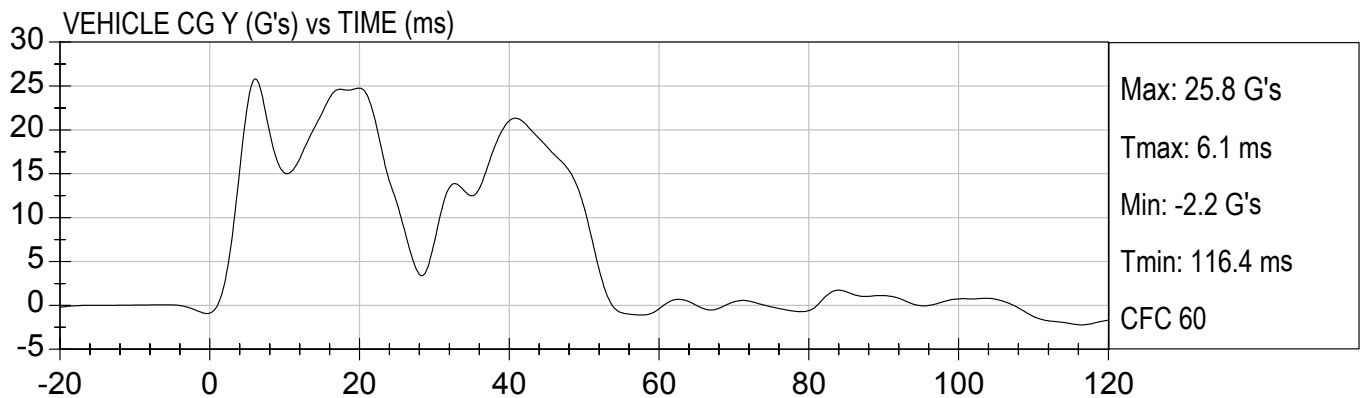
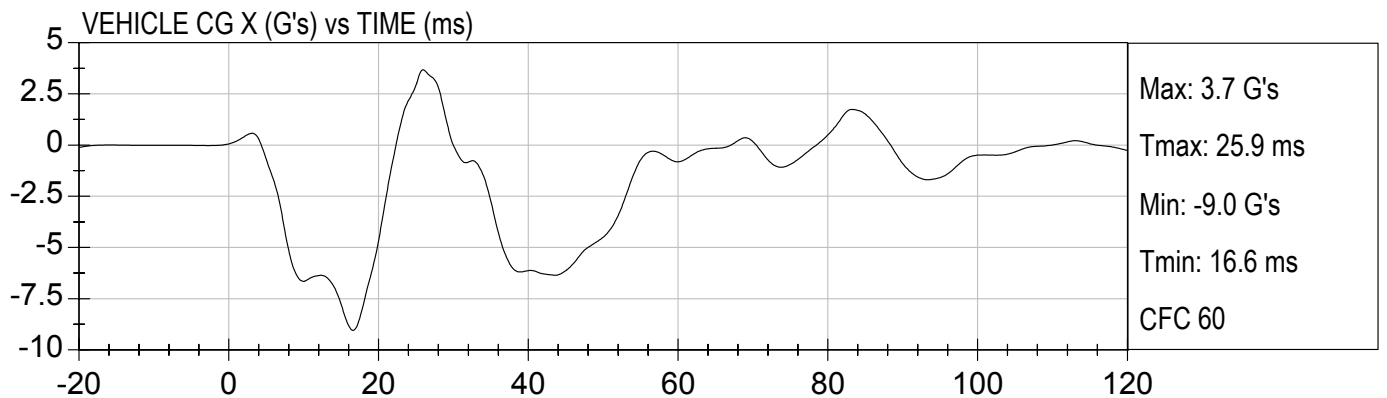


DRIVER SEAT TRACK Y (G's) vs TIME (ms)



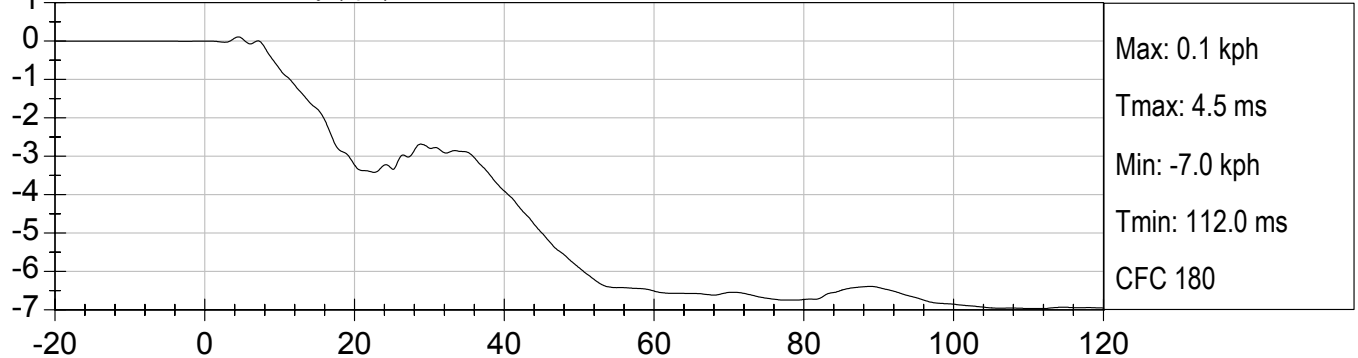
DRIVER SEAT TRACK Y Velocity (kph) vs TIME (ms)



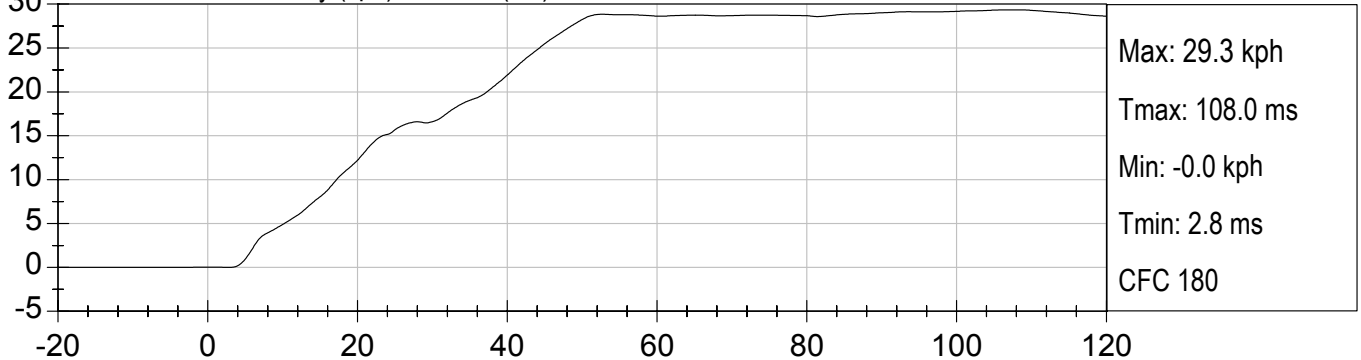




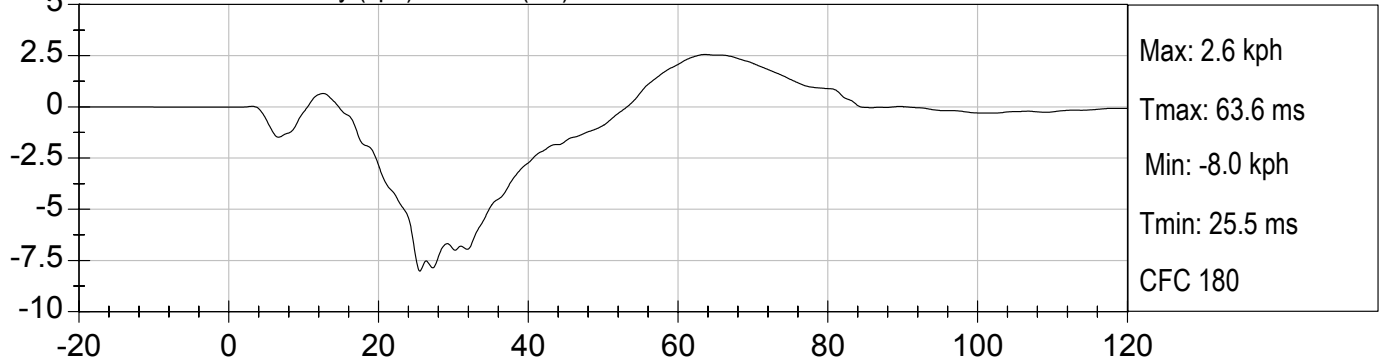
1 VEHICLE CG X Velocity (kph) vs TIME (ms)

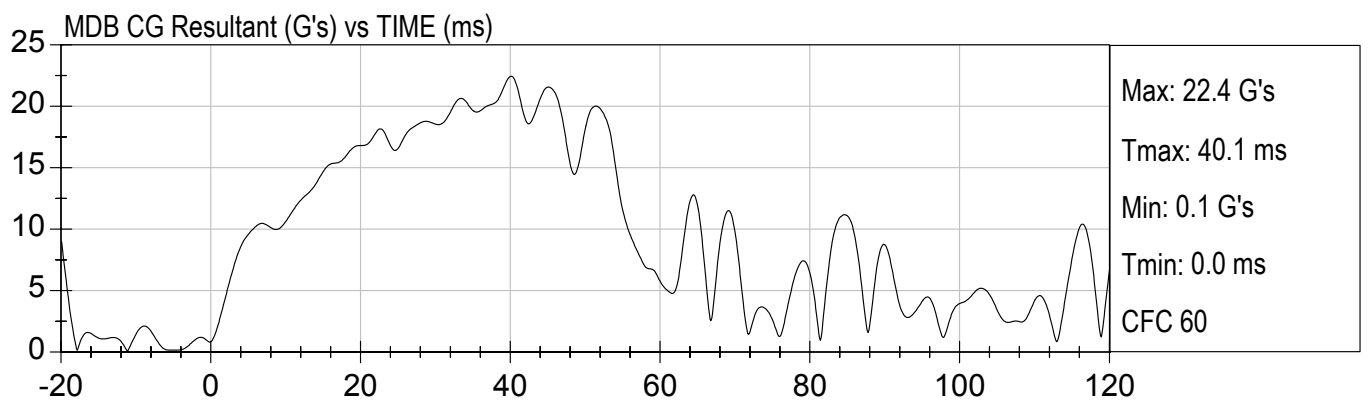
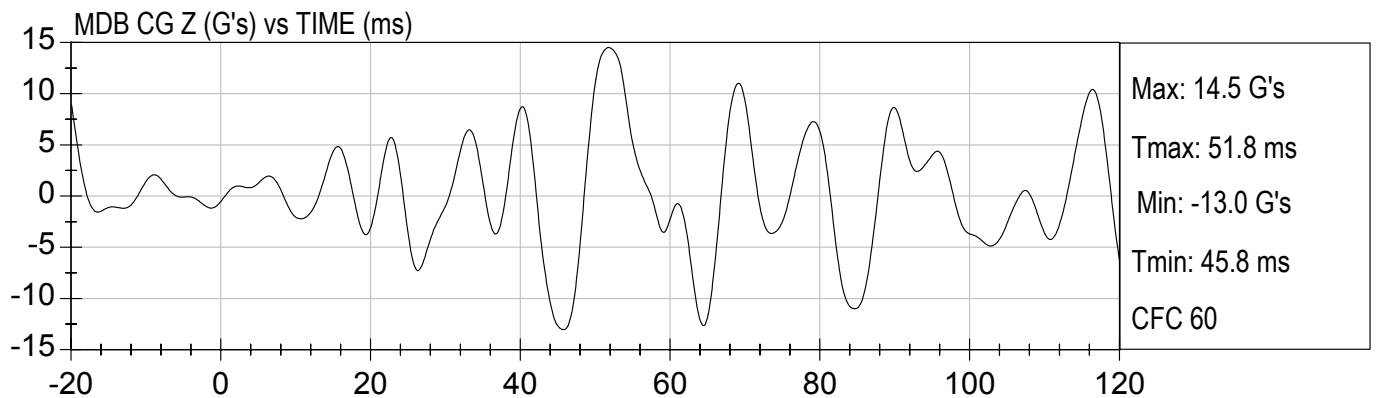
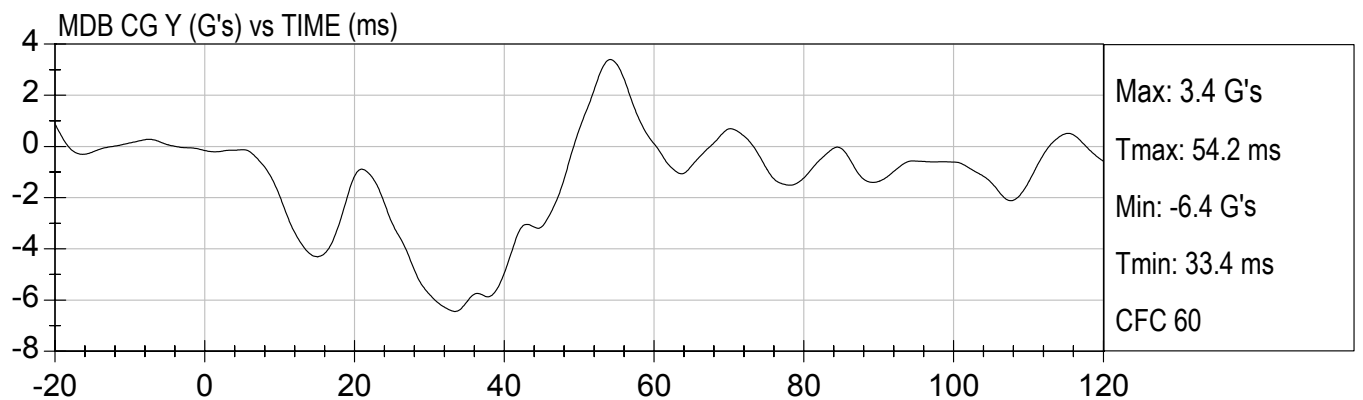
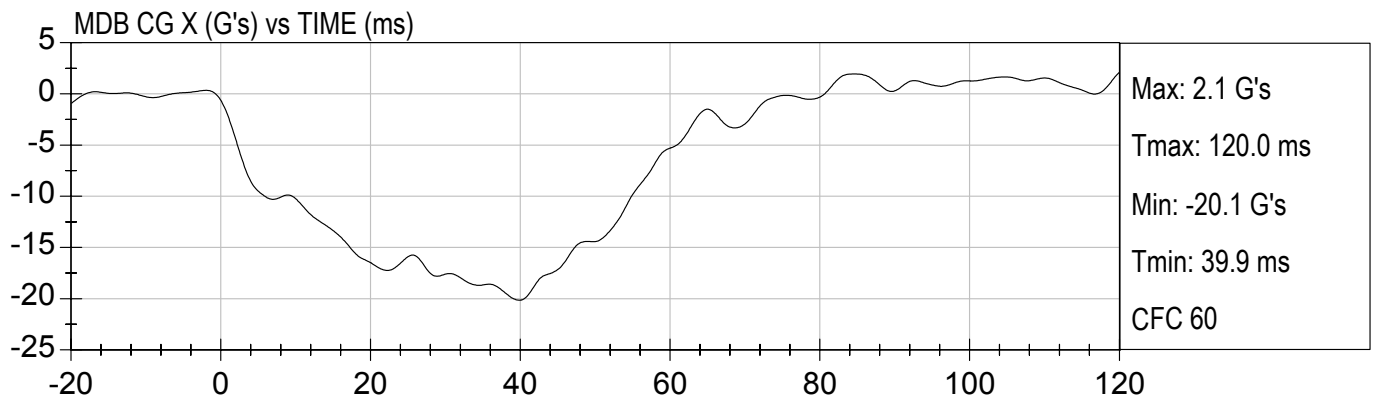


30 VEHICLE CG Y Velocity (kph) vs TIME (ms)



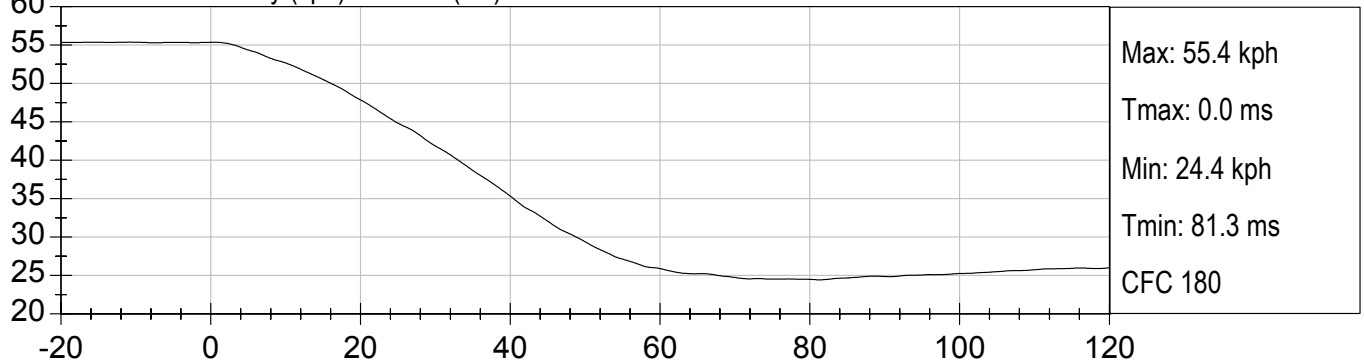
5 VEHICLE CG Z Velocity (kph) vs TIME (ms)



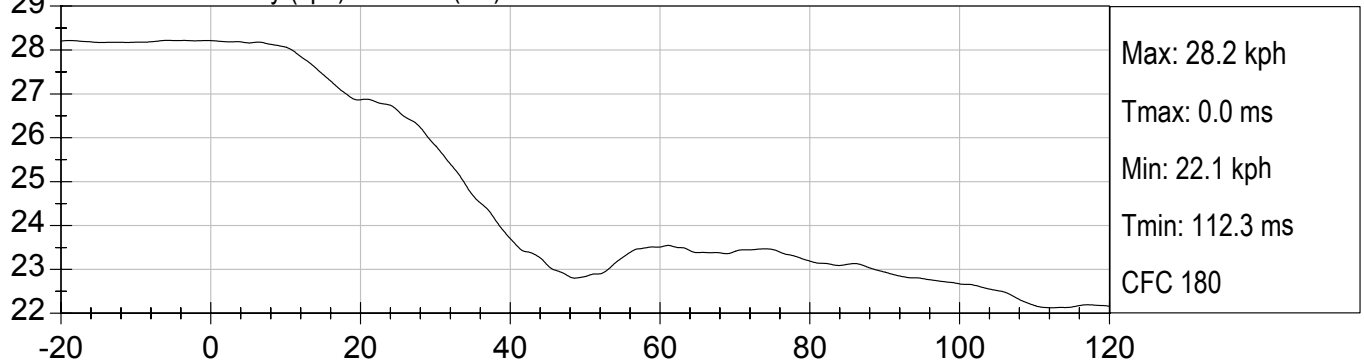




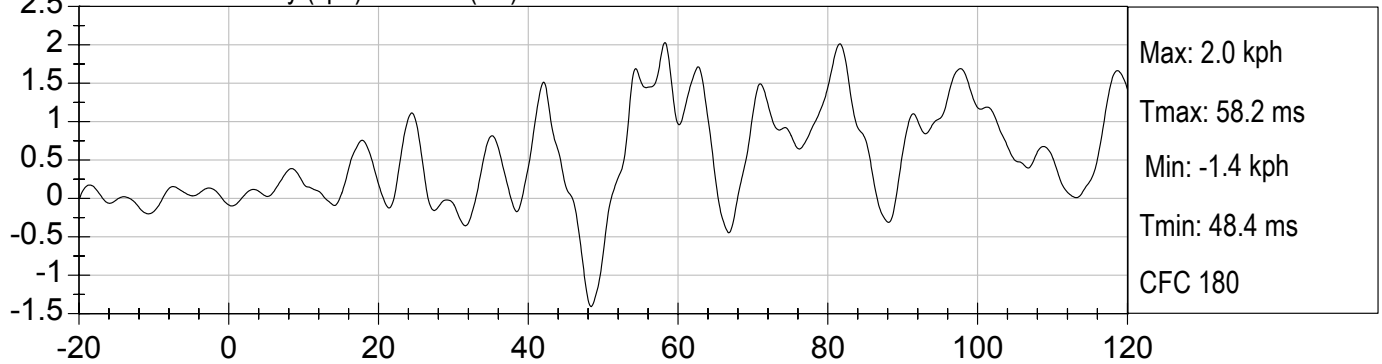
MDB CG X Velocity (kph) vs TIME (ms)

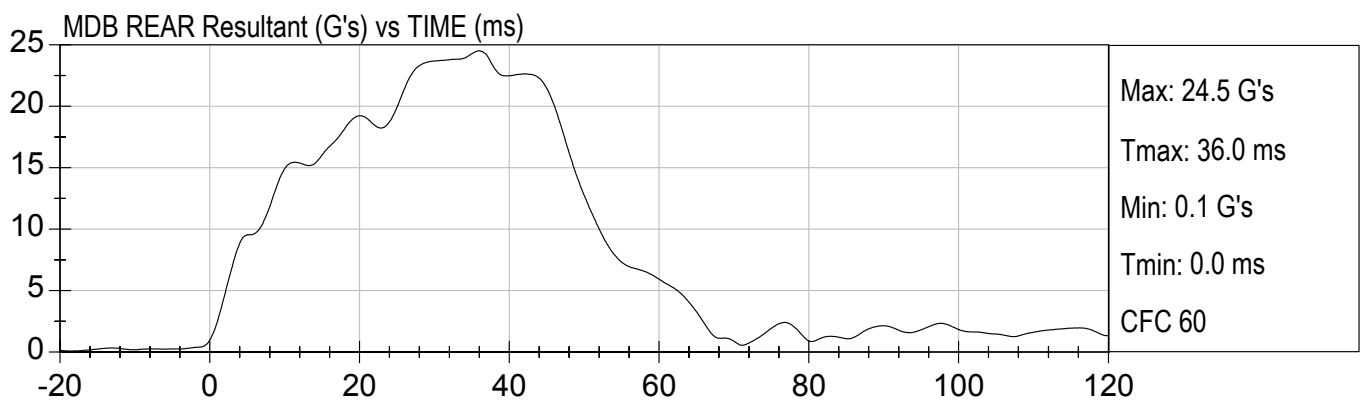
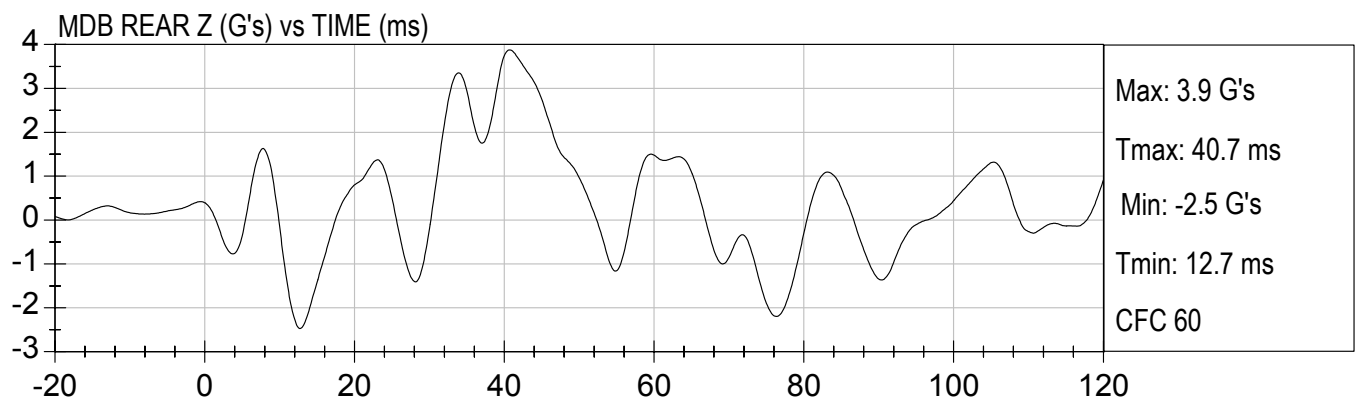
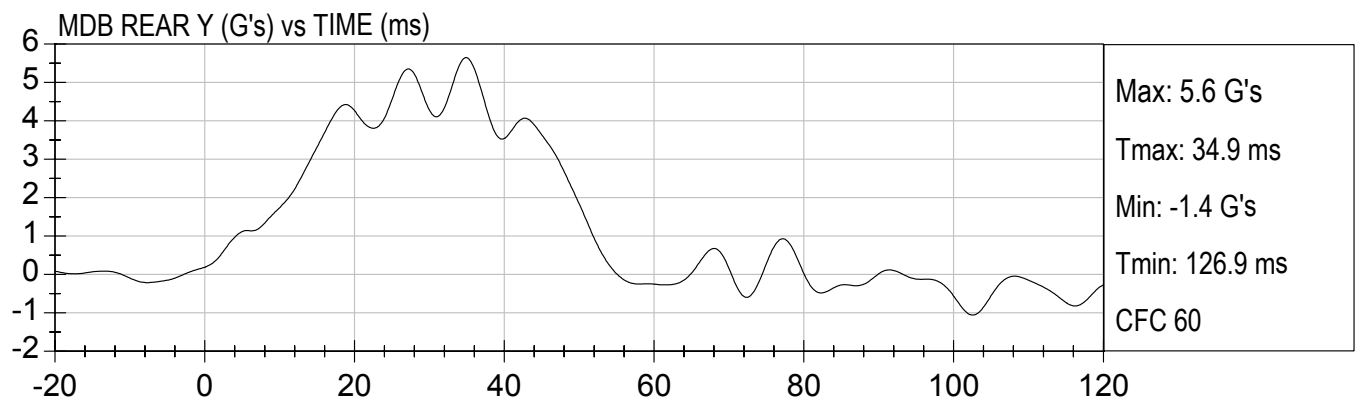
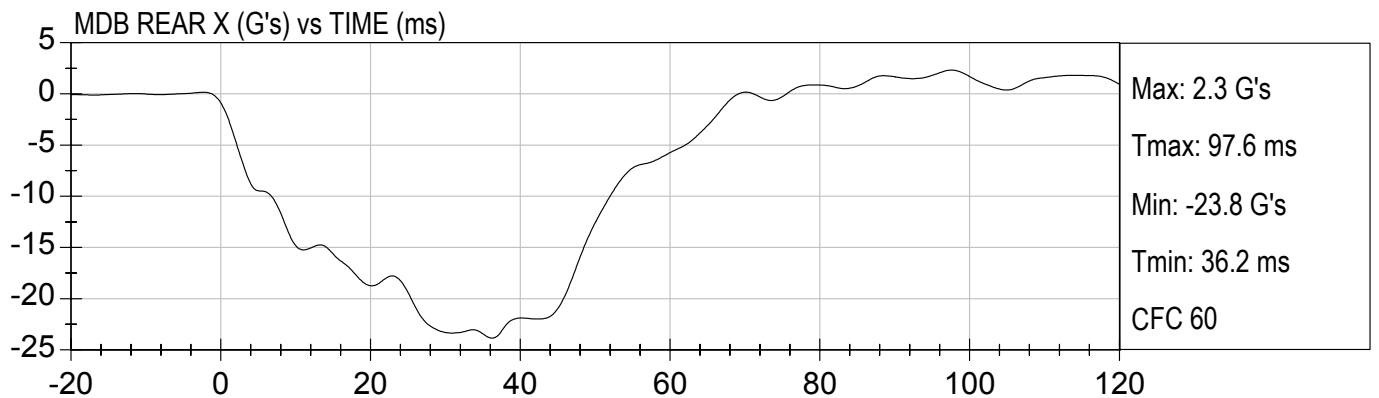


MDB CG Y Velocity (kph) vs TIME (ms)



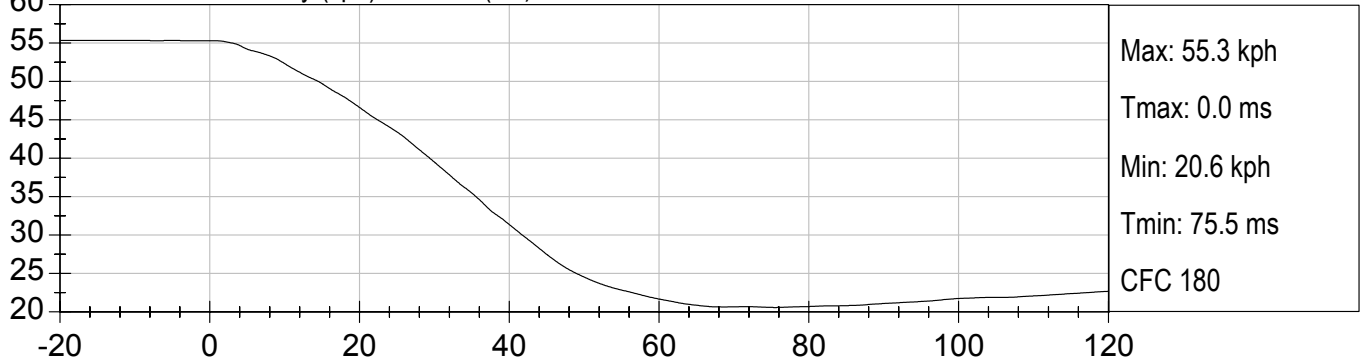
MDB CG Z Velocity (kph) vs TIME (ms)



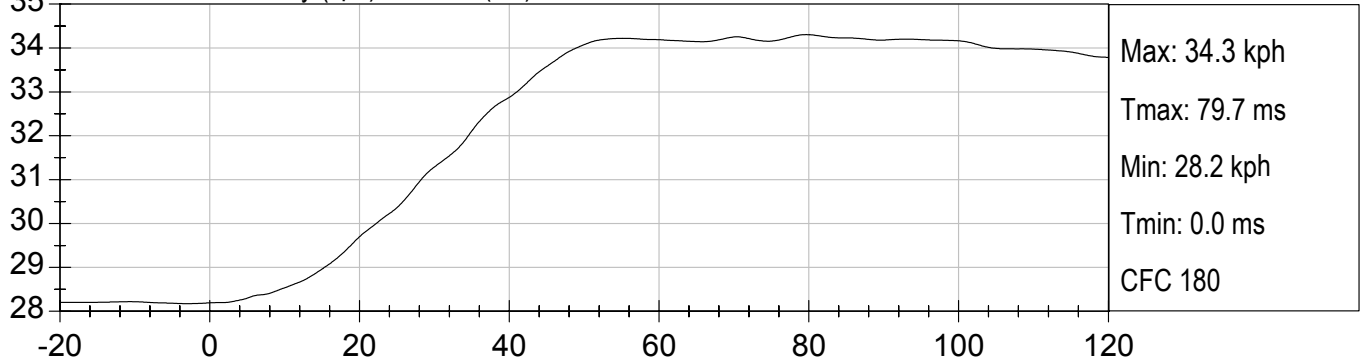




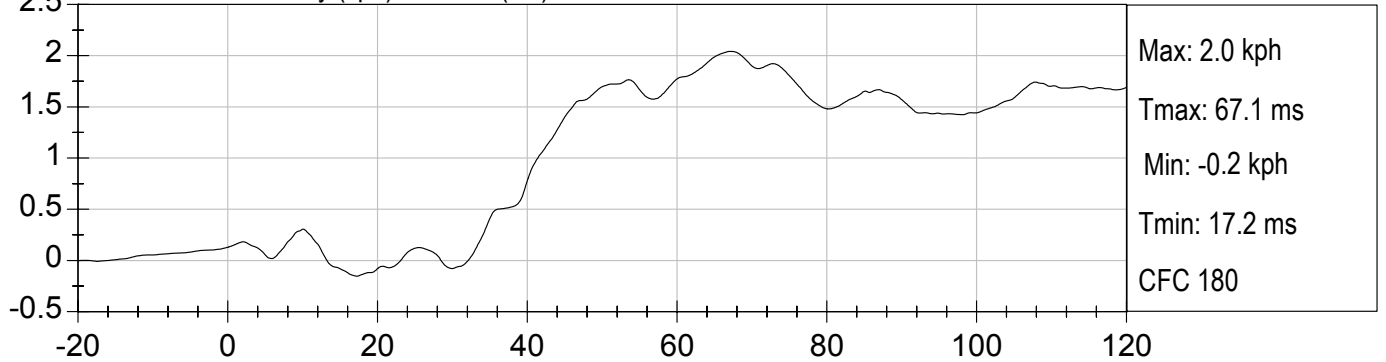
MDB REAR X Velocity (kph) vs TIME (ms)

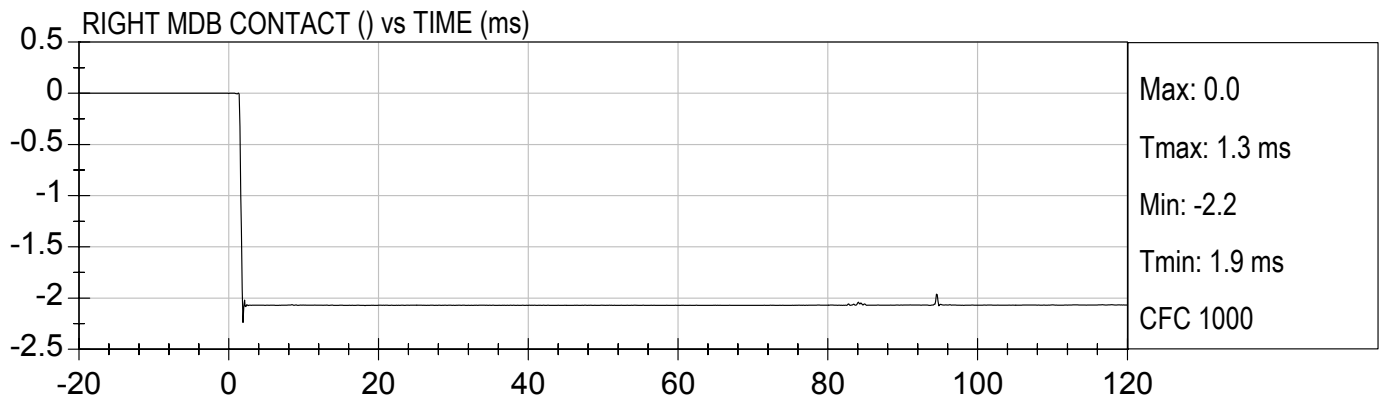
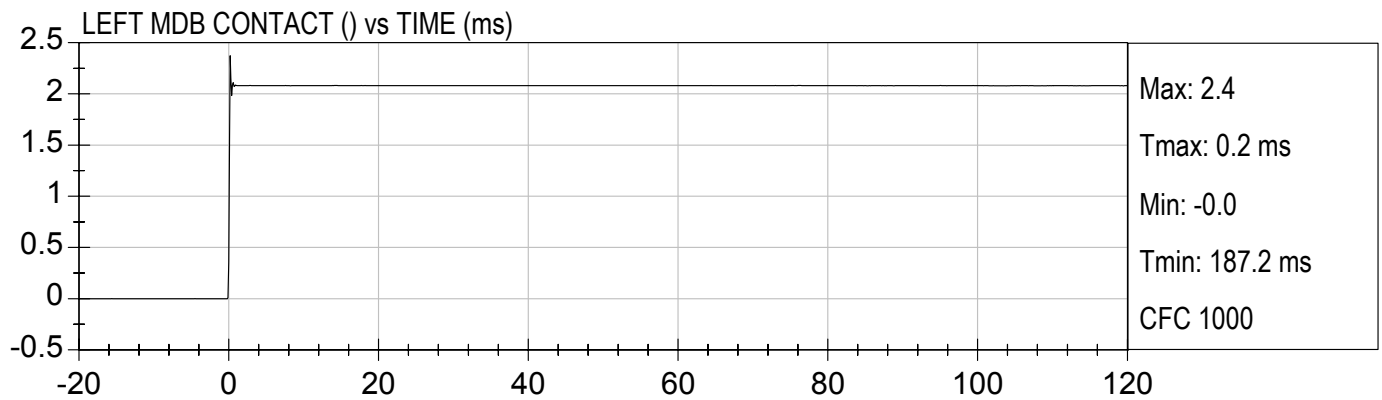


MDB REAR Y Velocity (kph) vs TIME (ms)



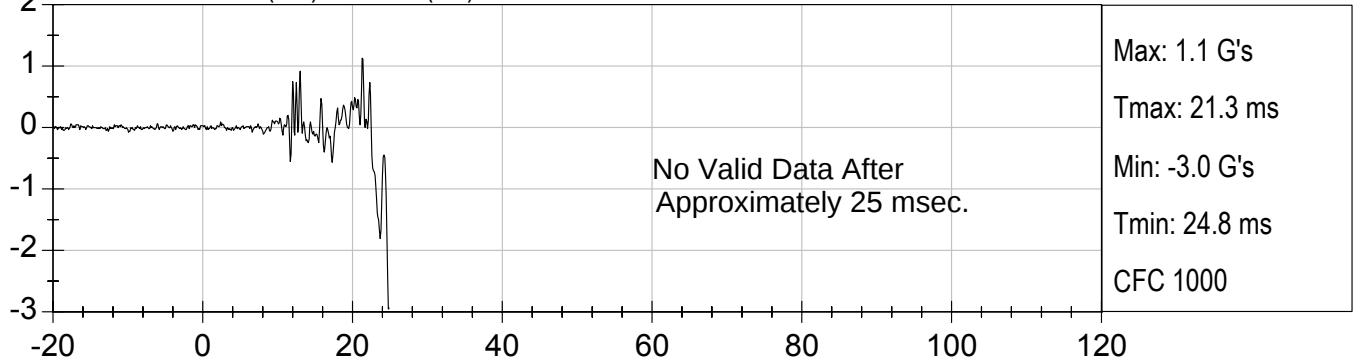
MDB REAR Z Velocity (kph) vs TIME (ms)



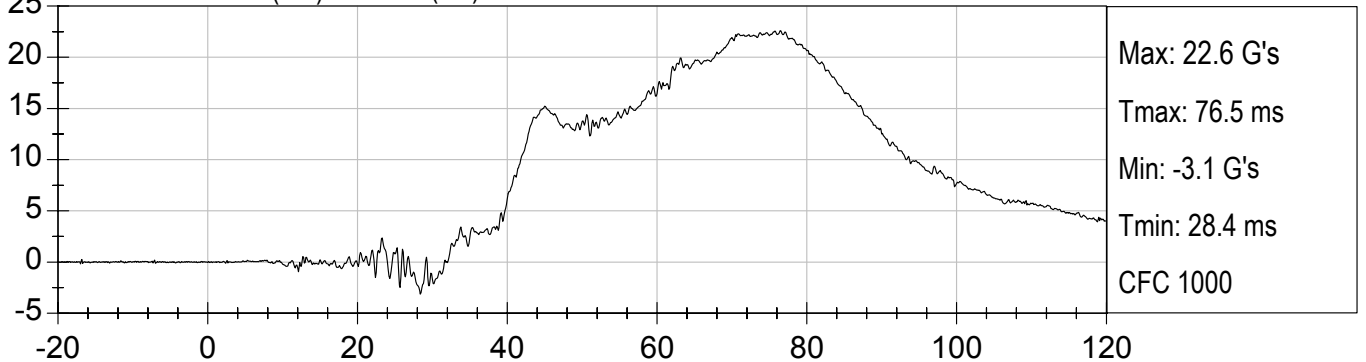




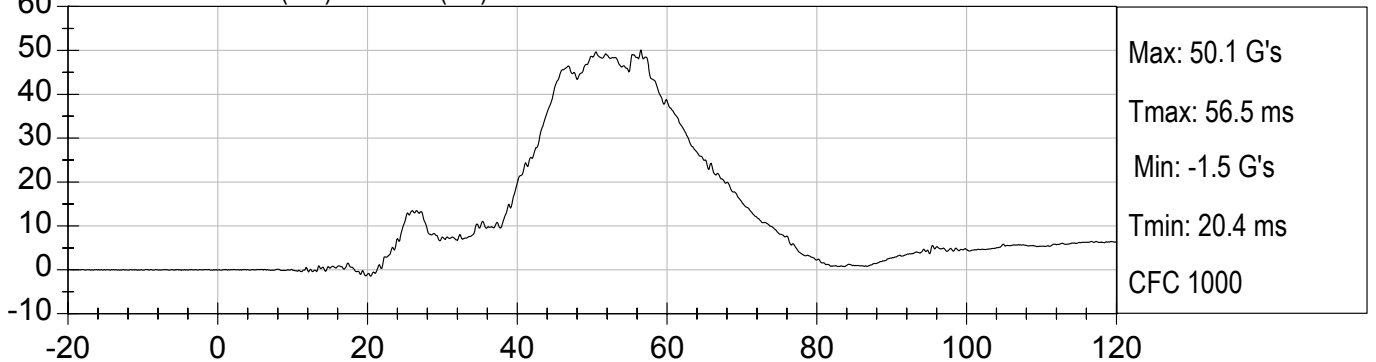
DRIVER HEAD Xr (G's) vs TIME (ms)



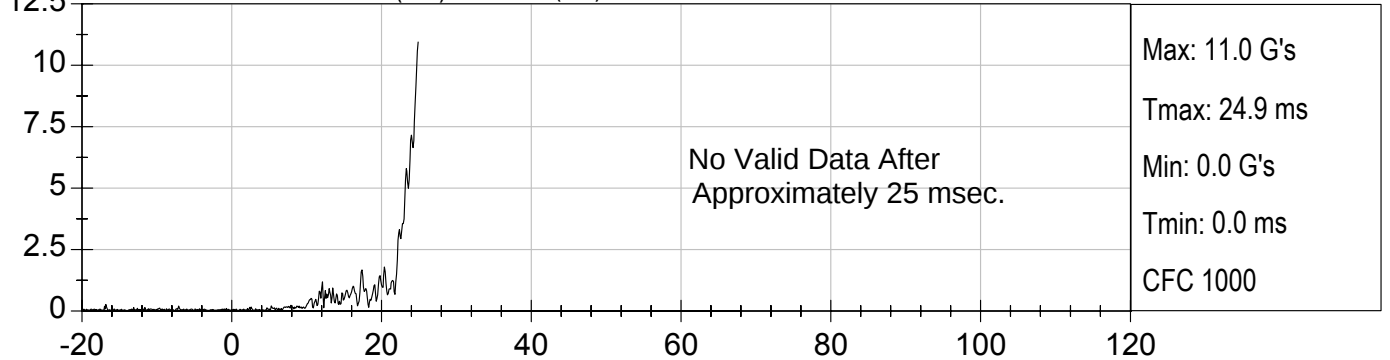
DRIVER HEAD Yr (G's) vs TIME (ms)

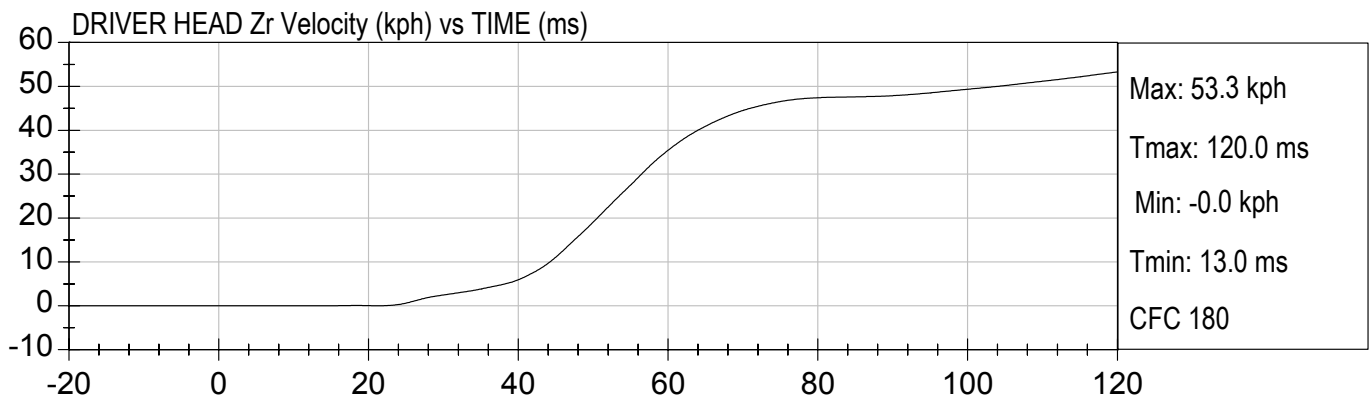
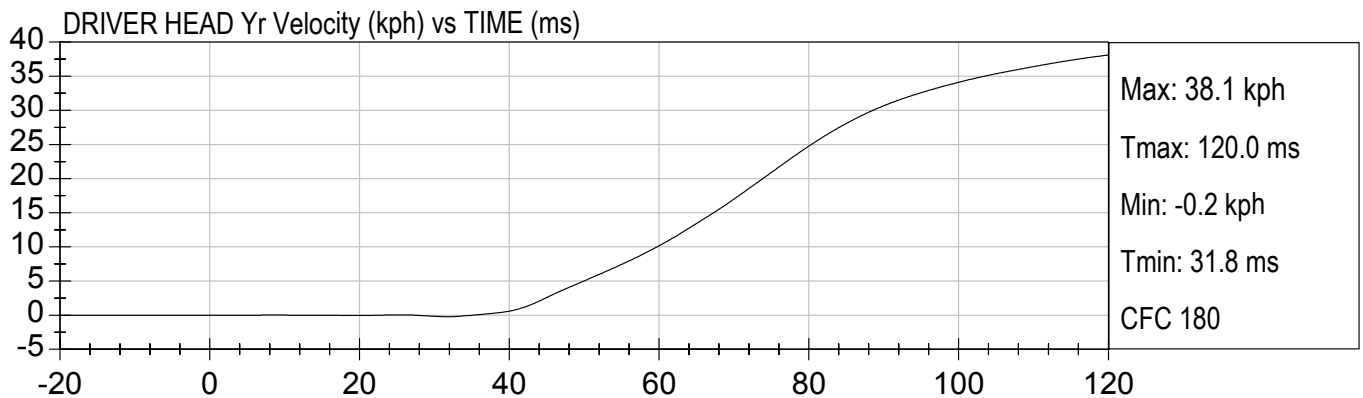
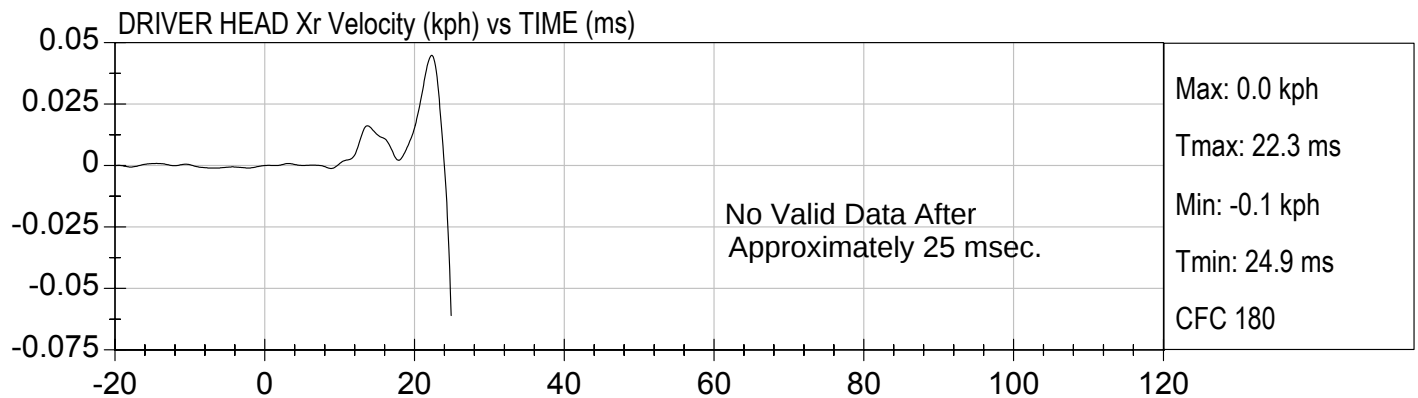


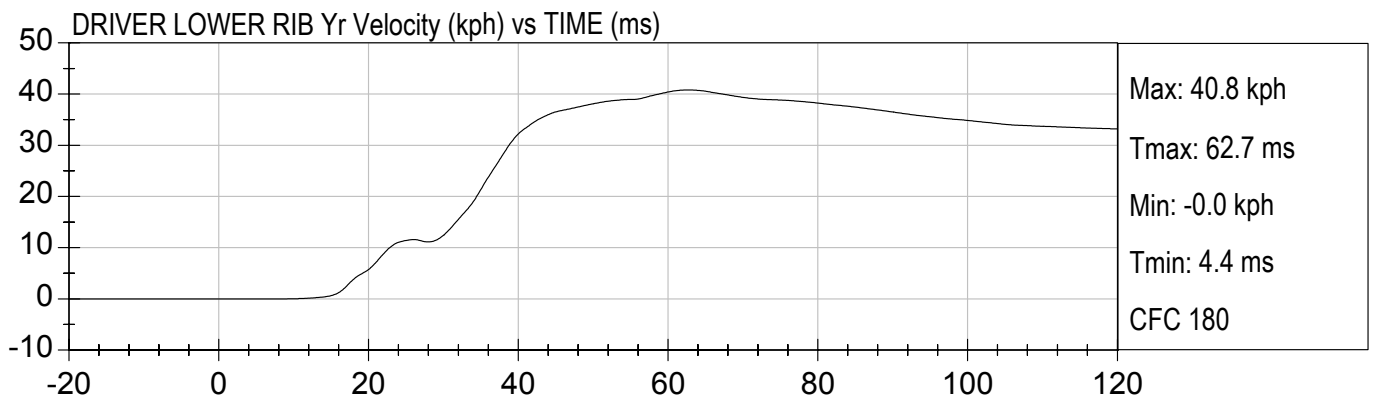
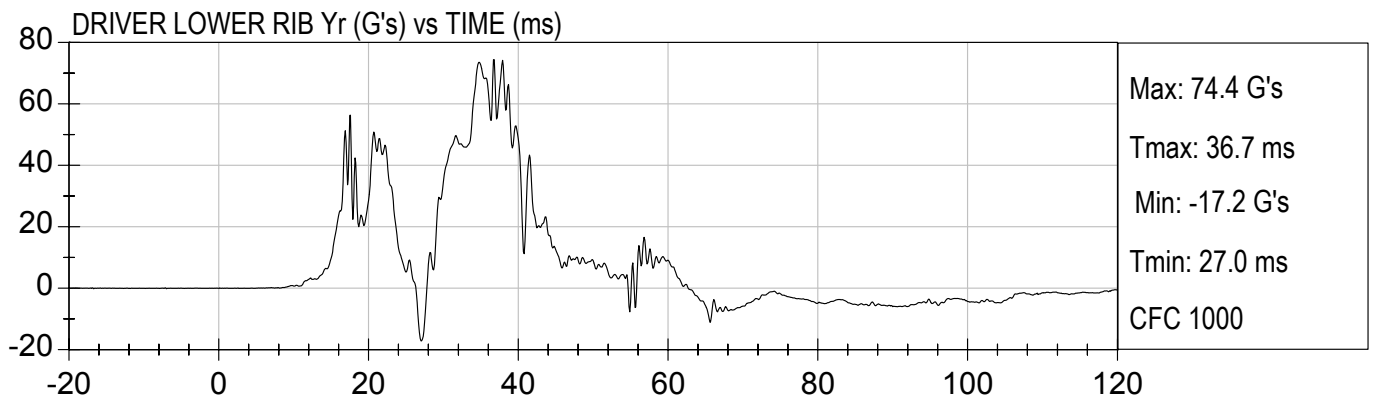
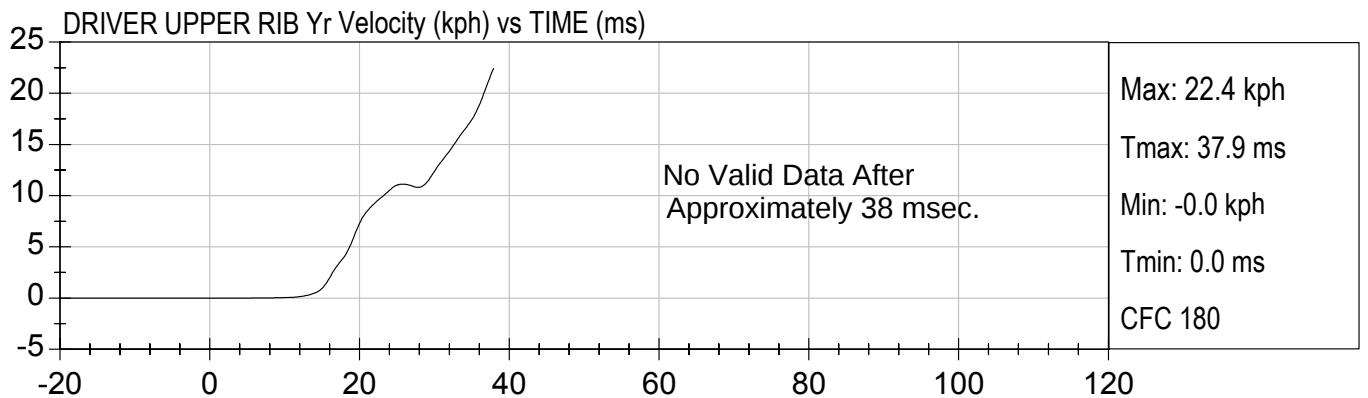
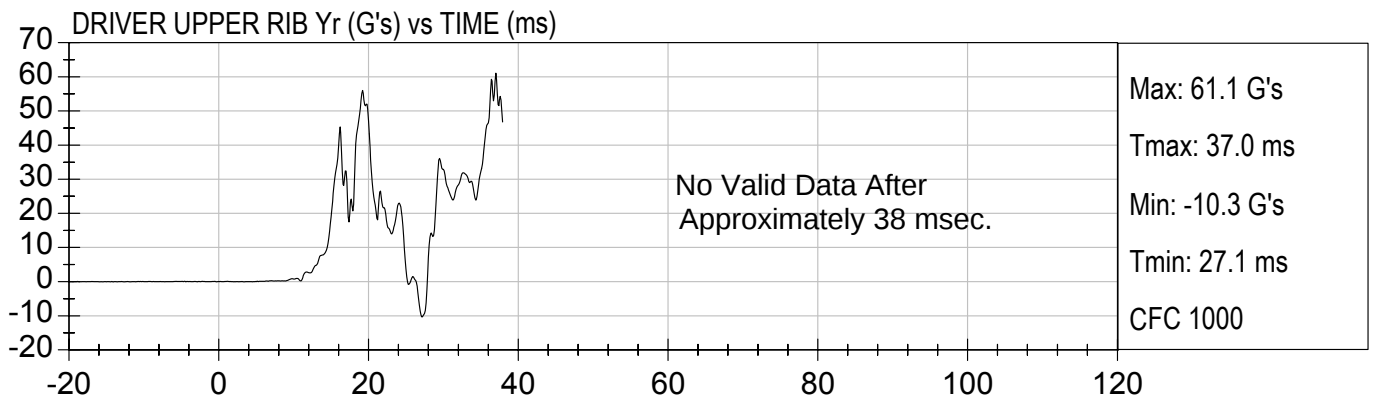
DRIVER HEAD Zr (G's) vs TIME (ms)

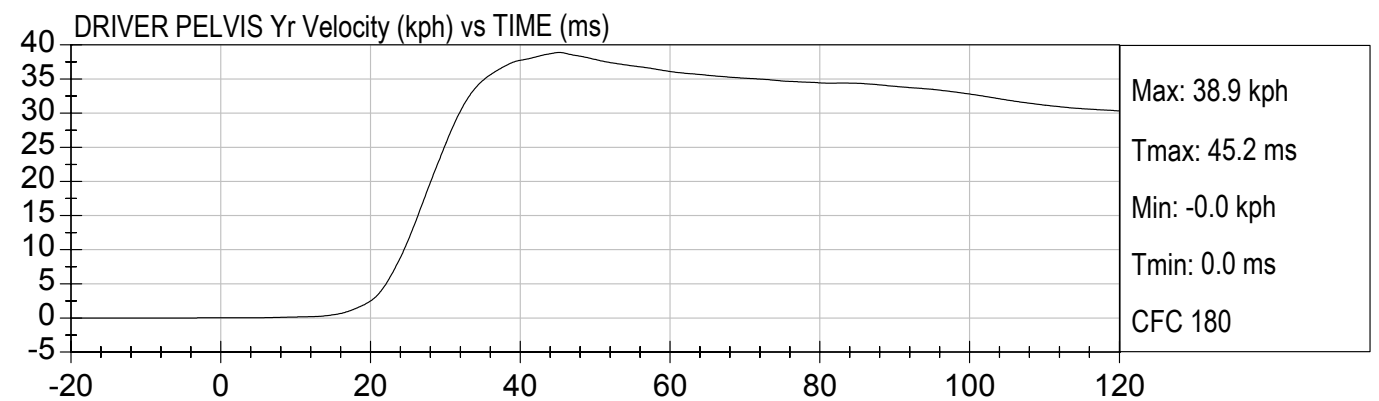
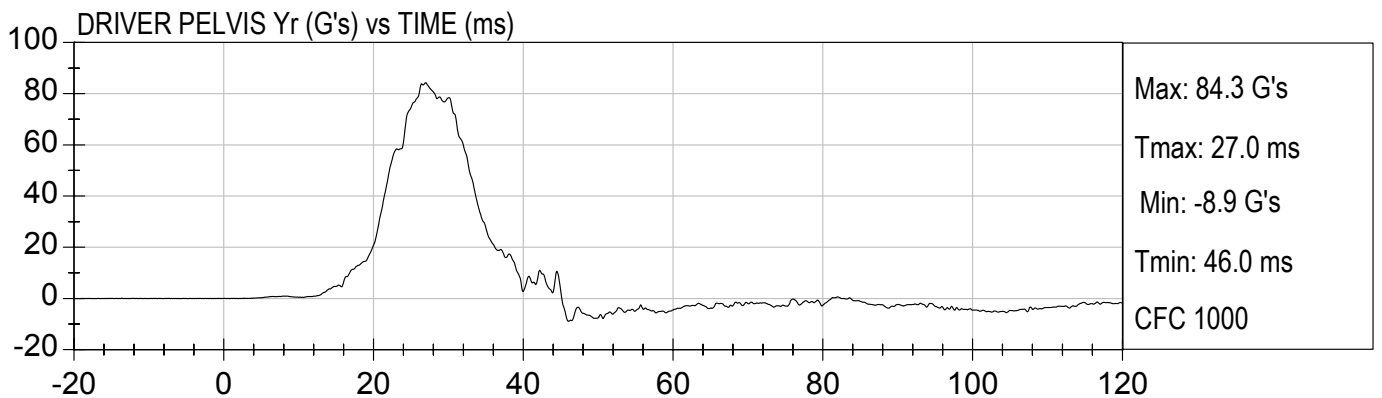
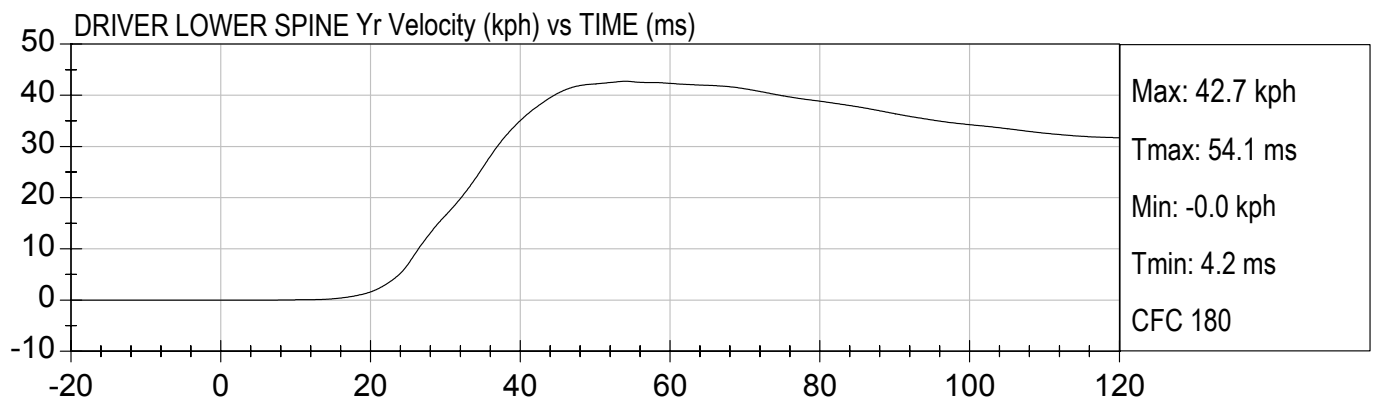
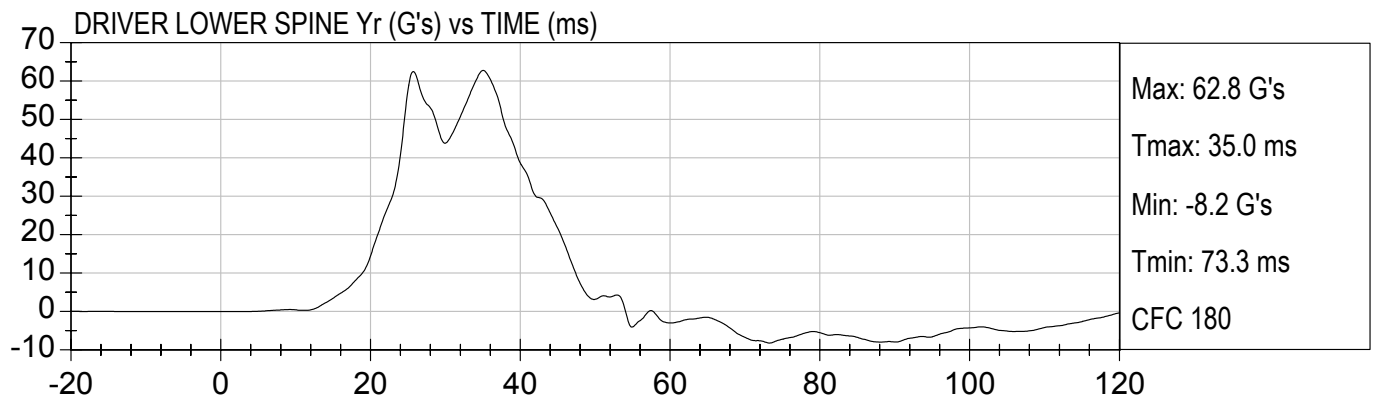


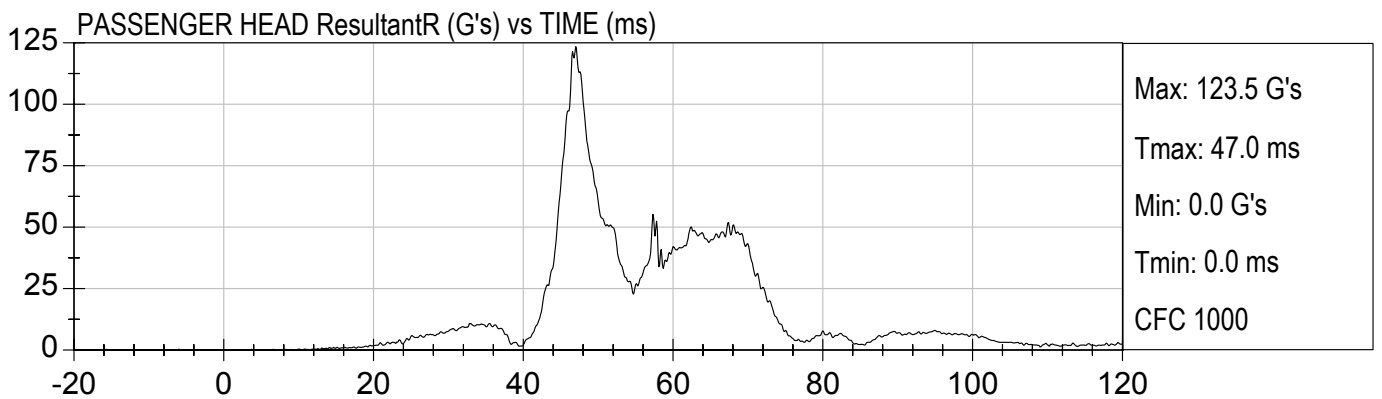
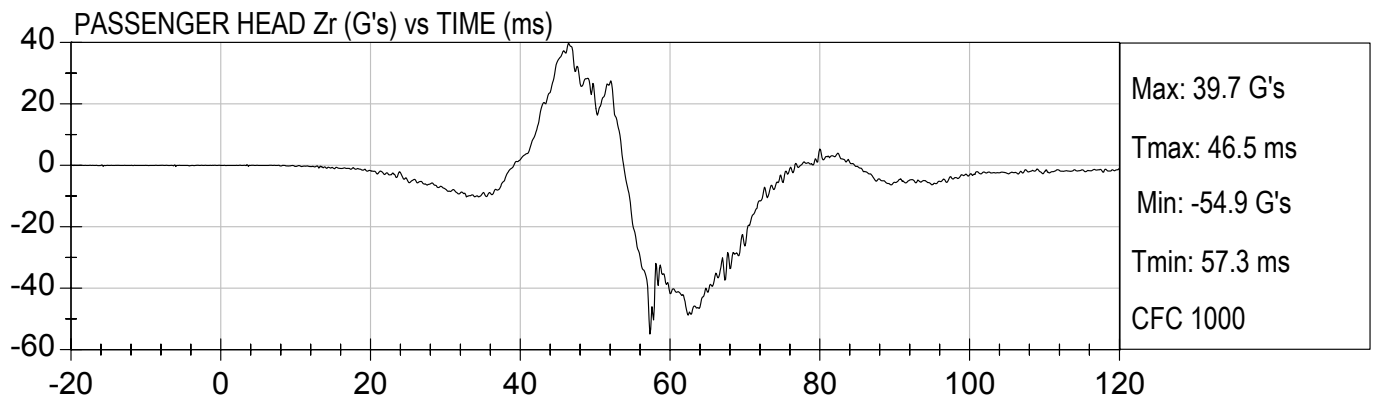
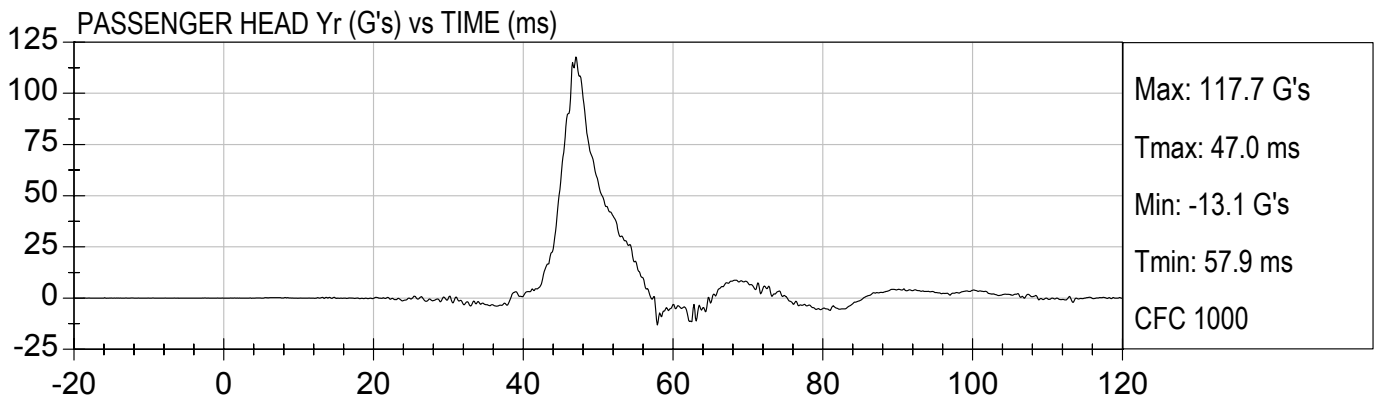
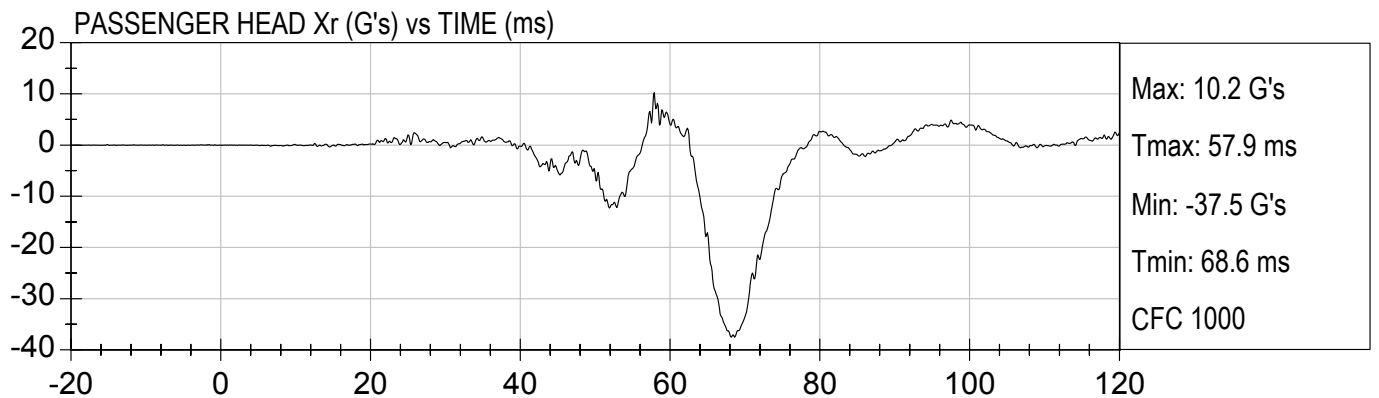
DRIVER HEAD ResultantR (G's) vs TIME (ms)

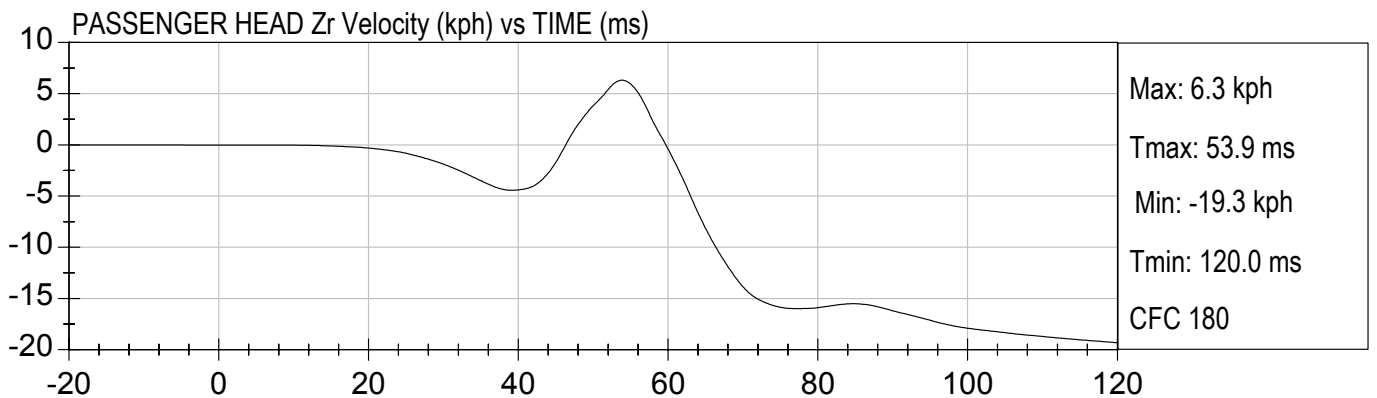
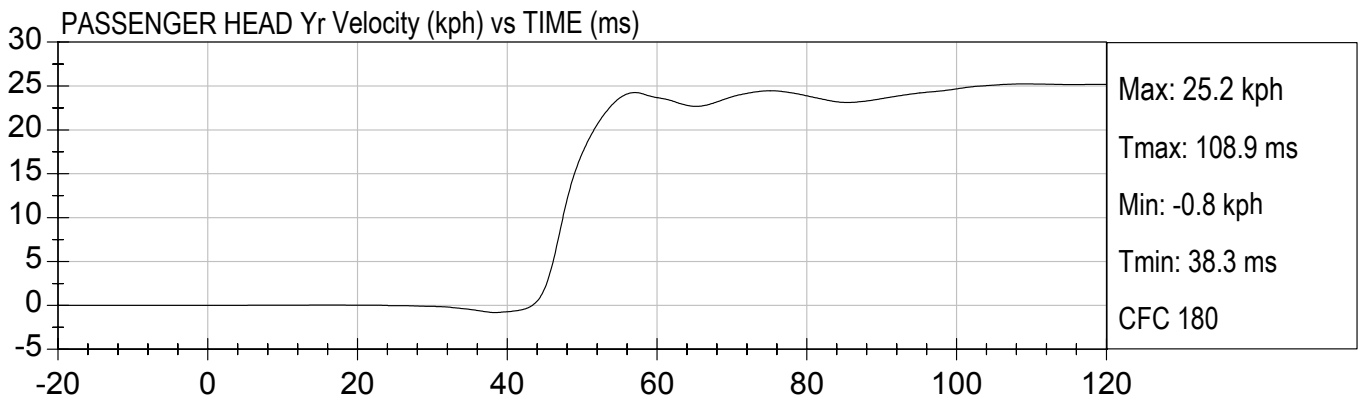
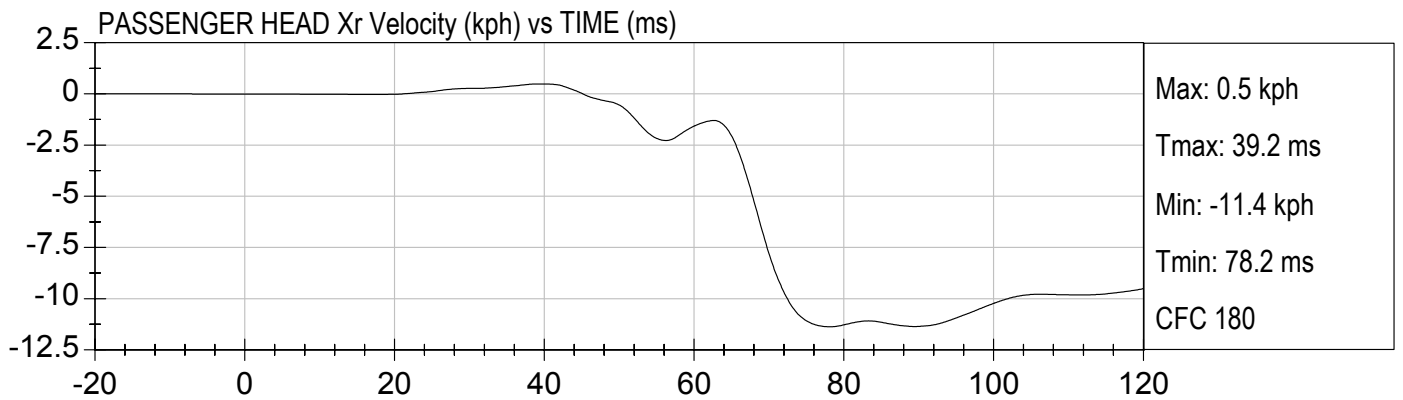


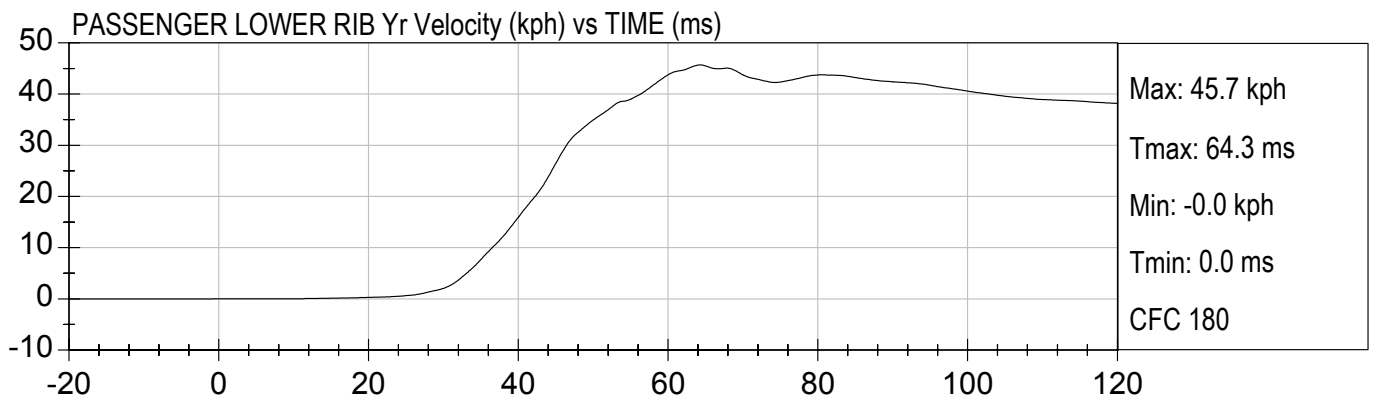
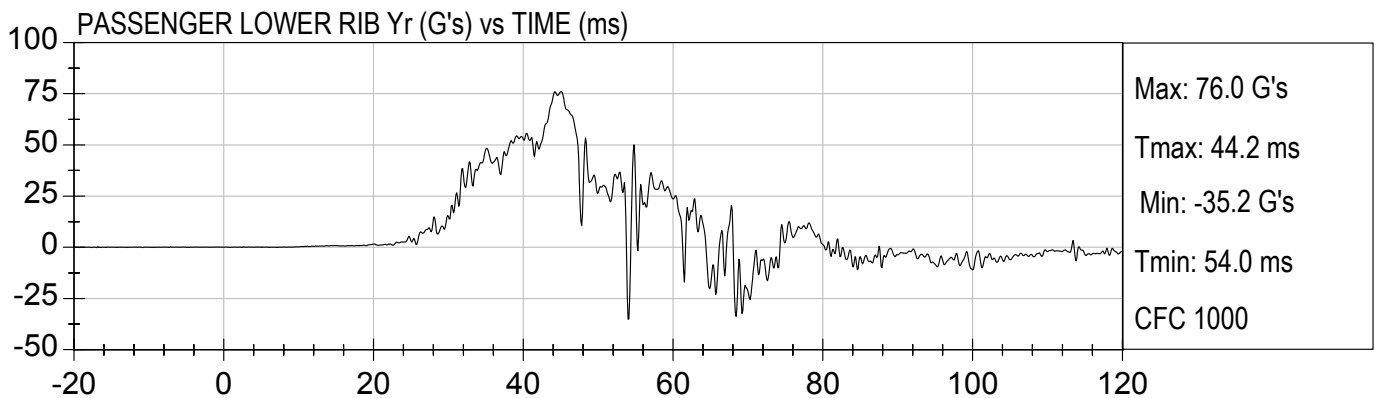
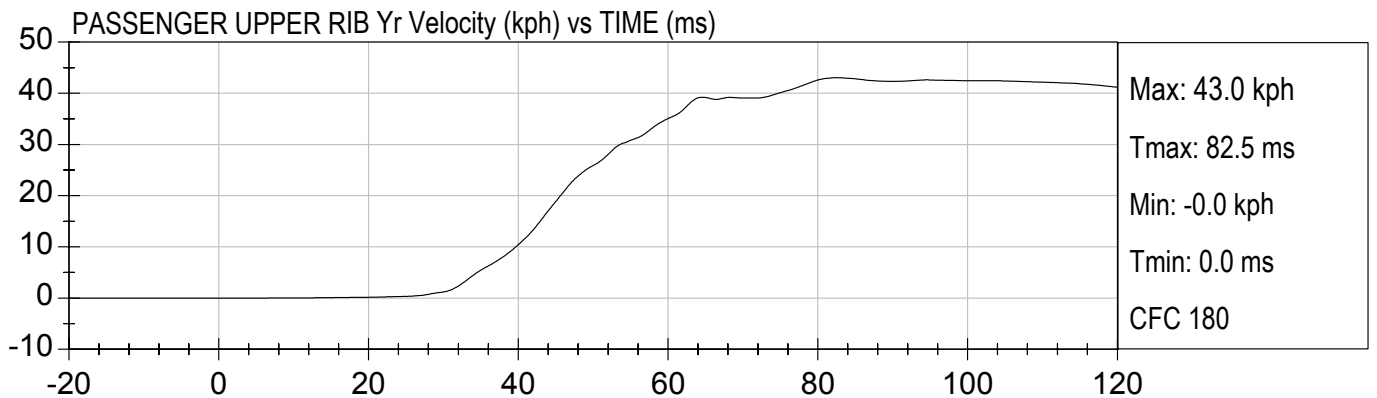
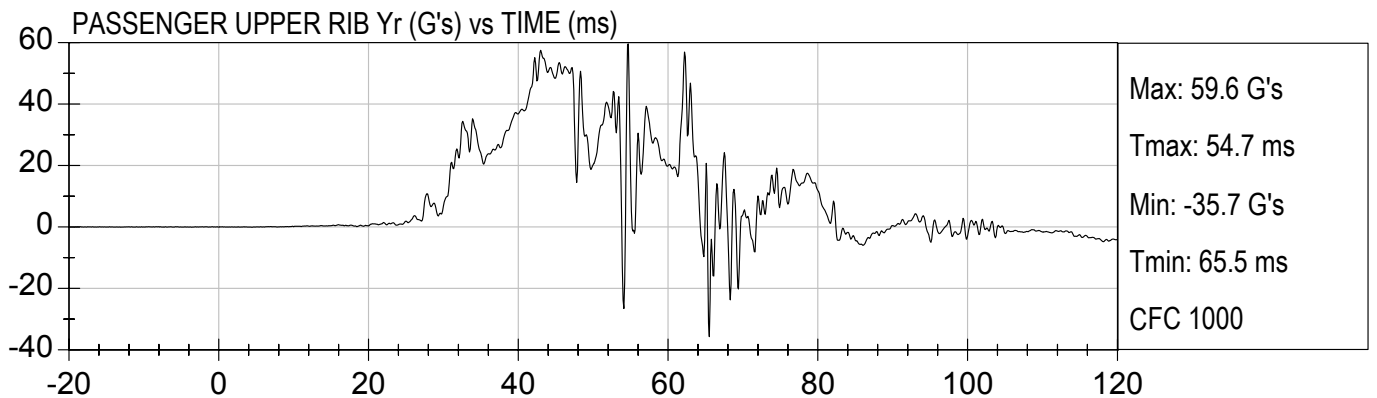


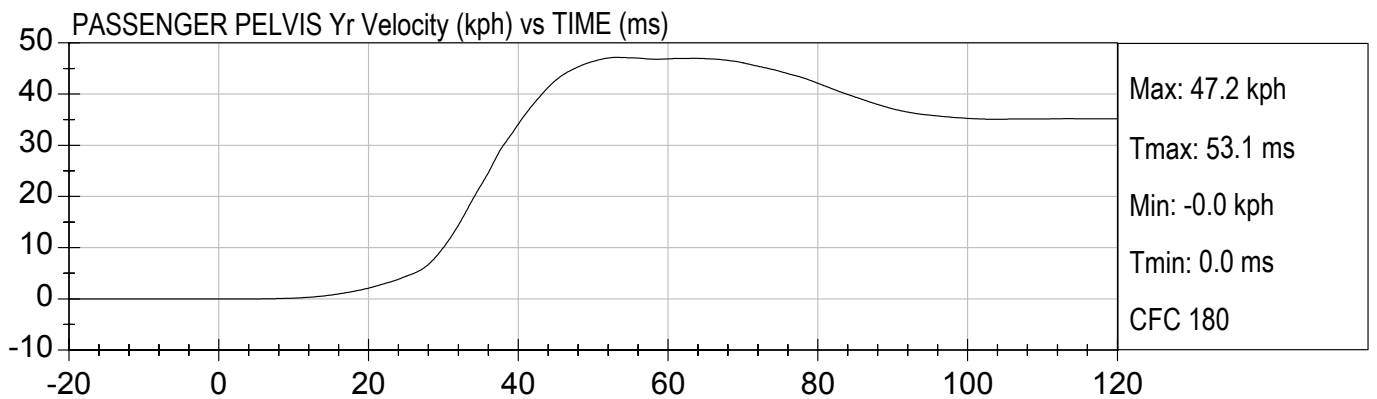
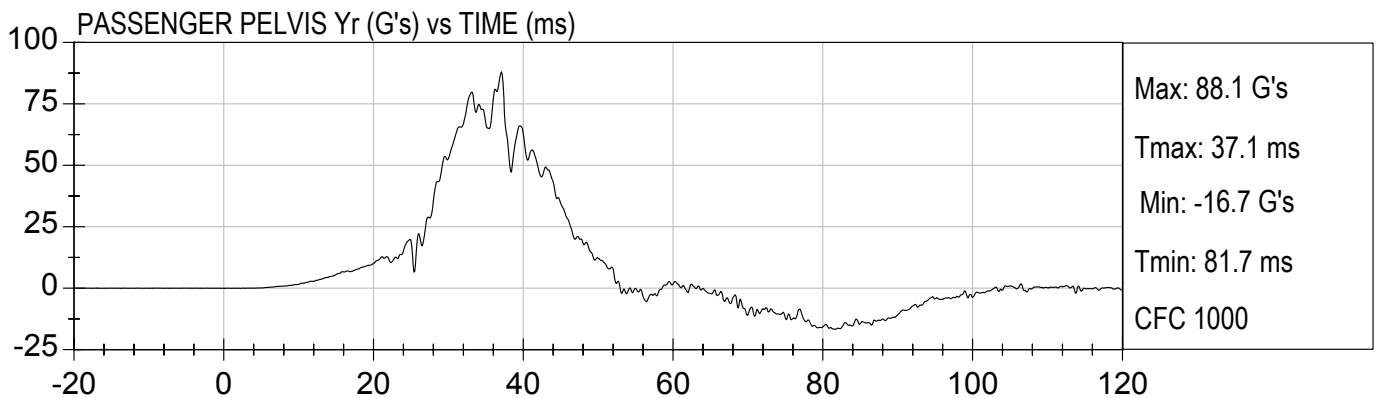
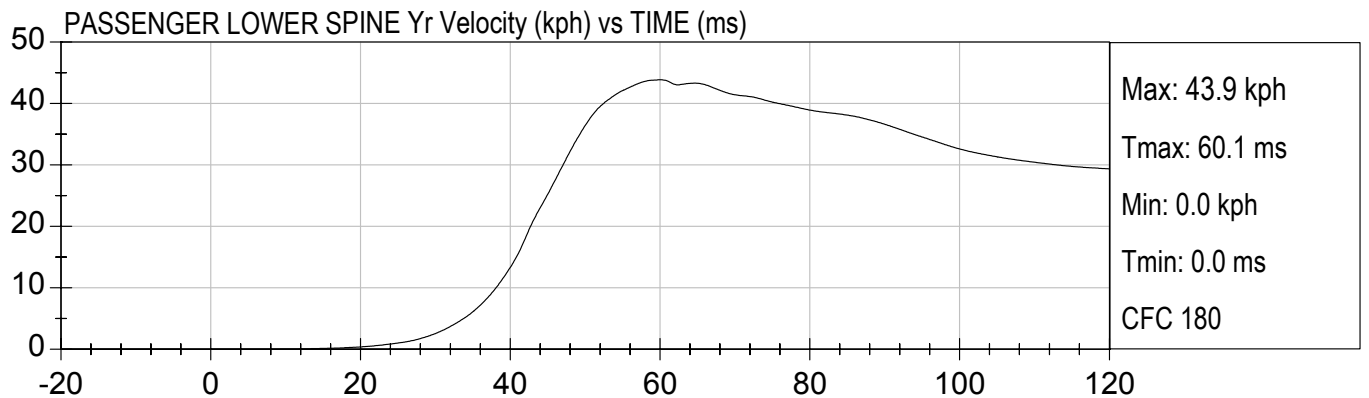
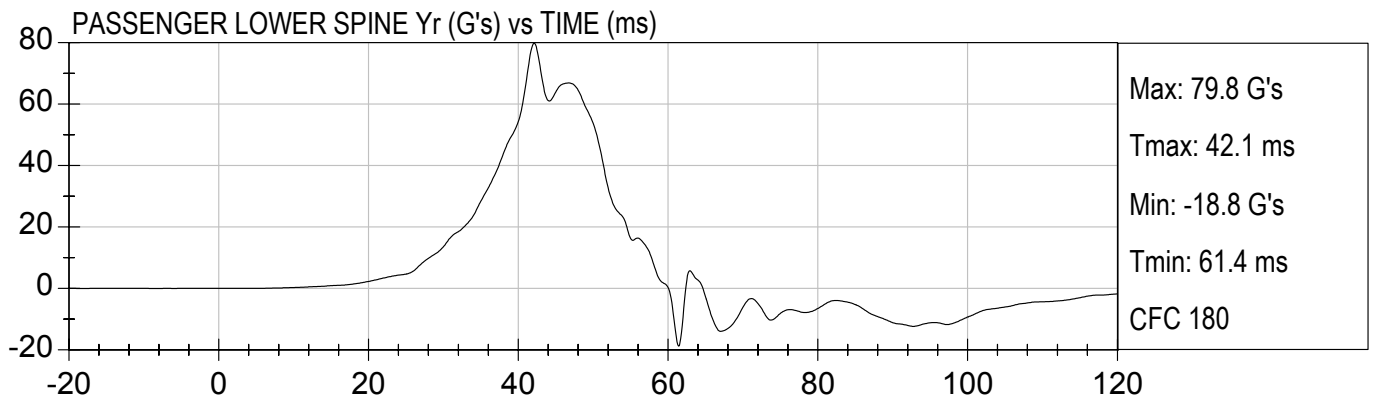


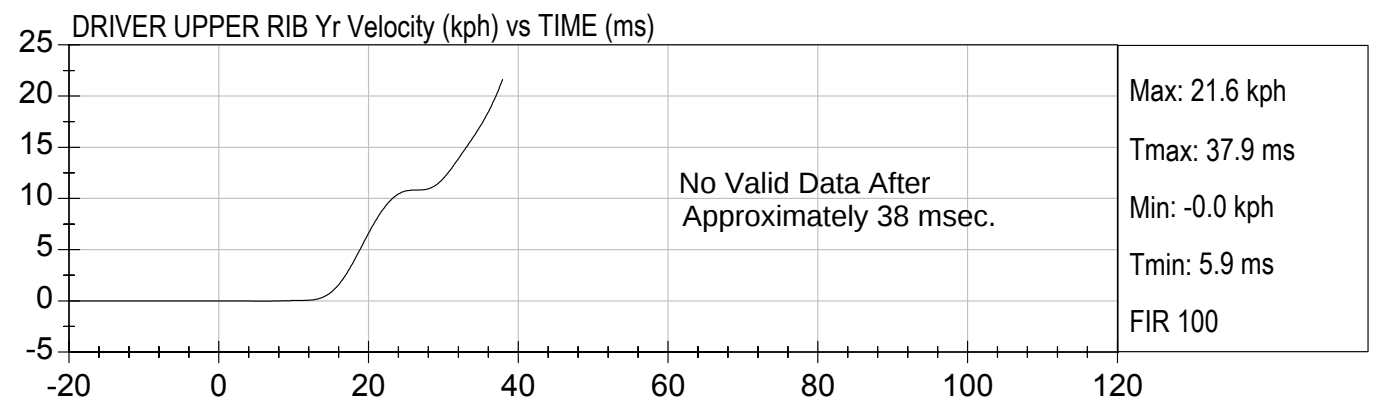
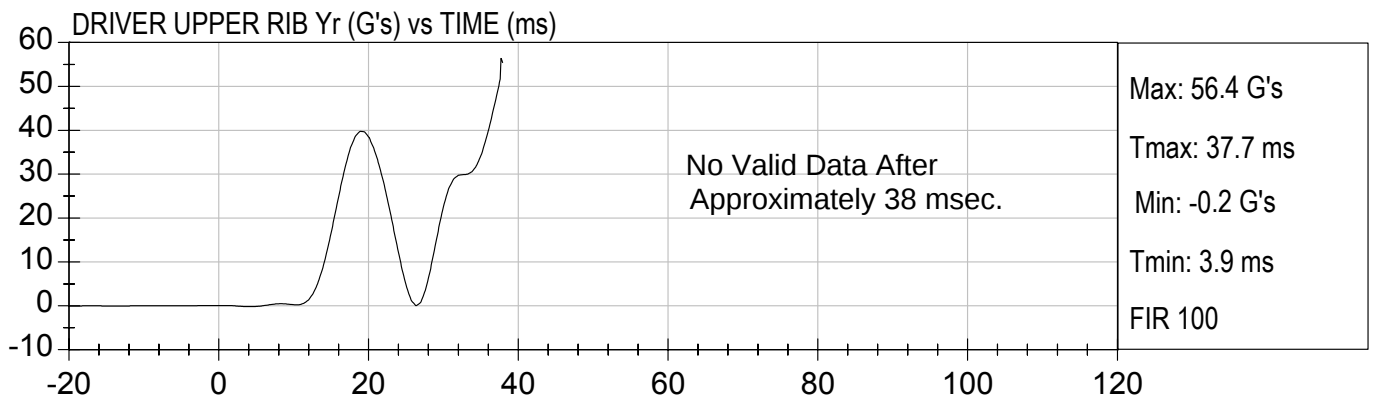
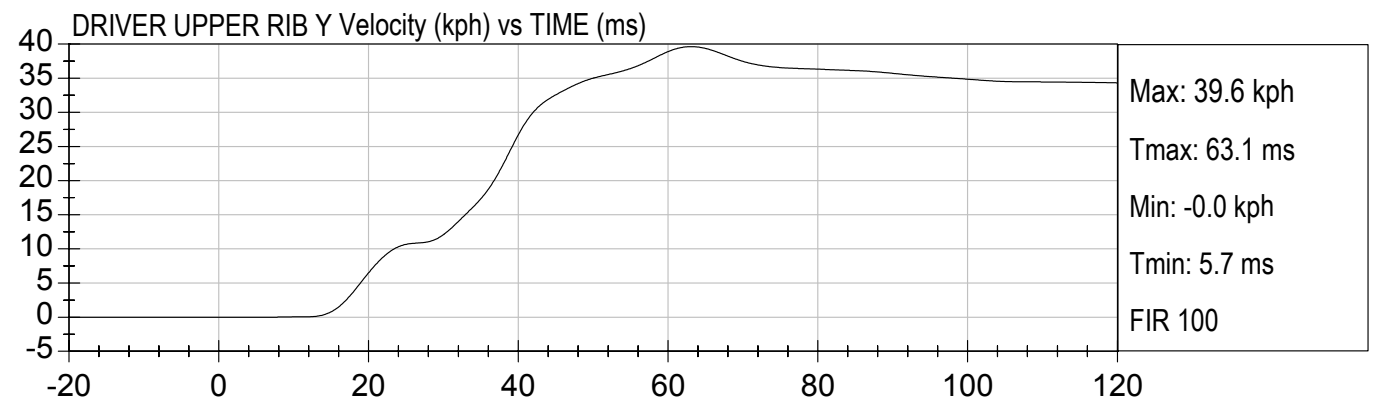
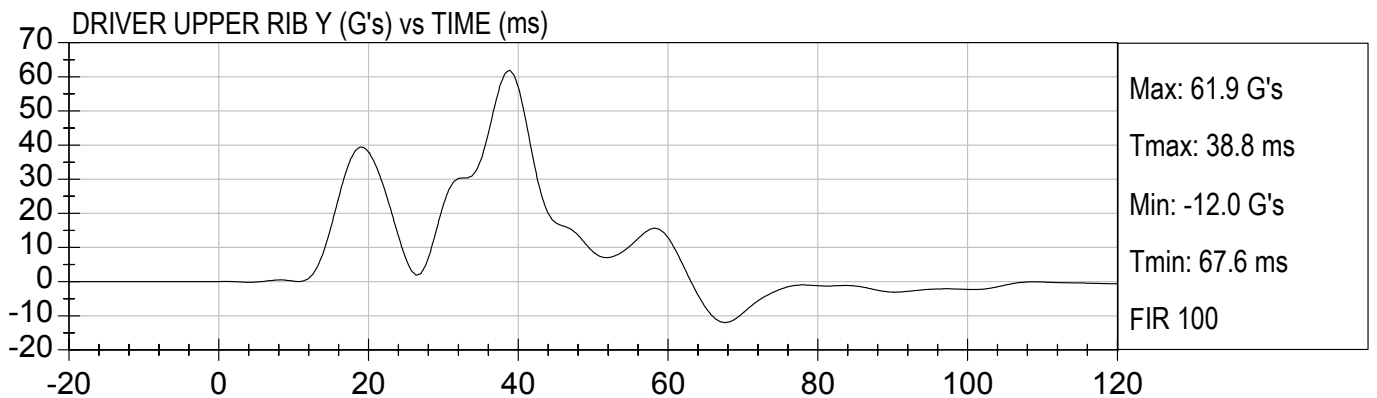


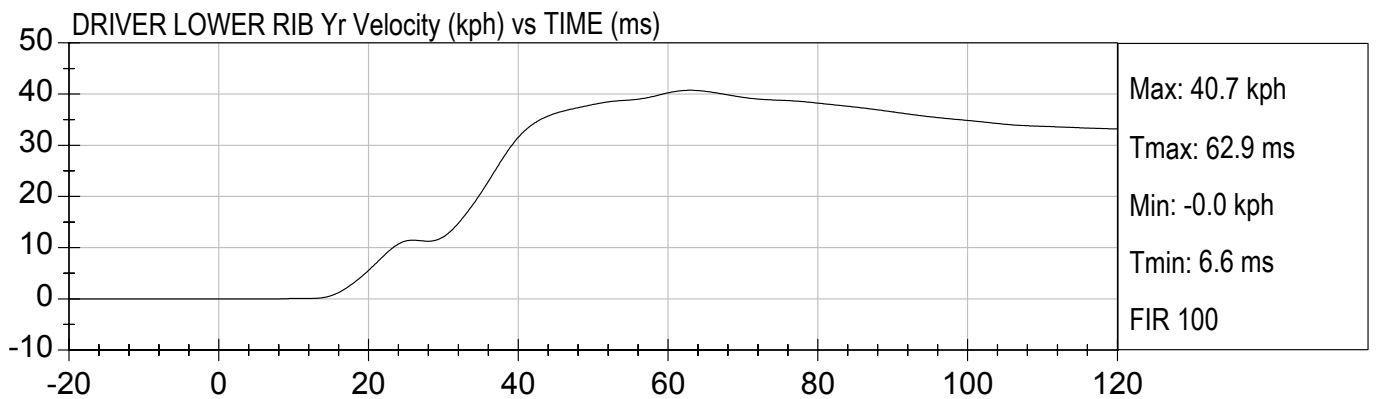
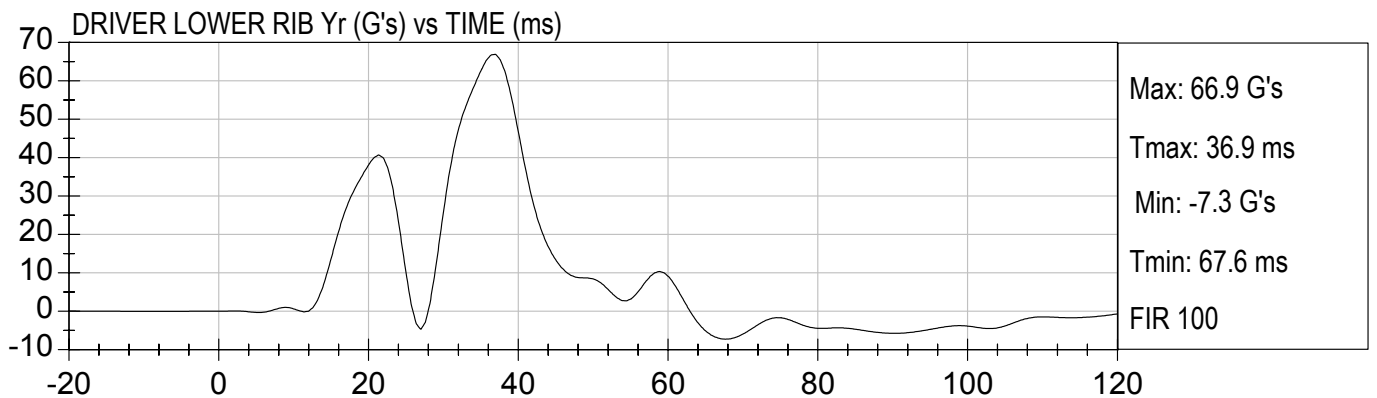
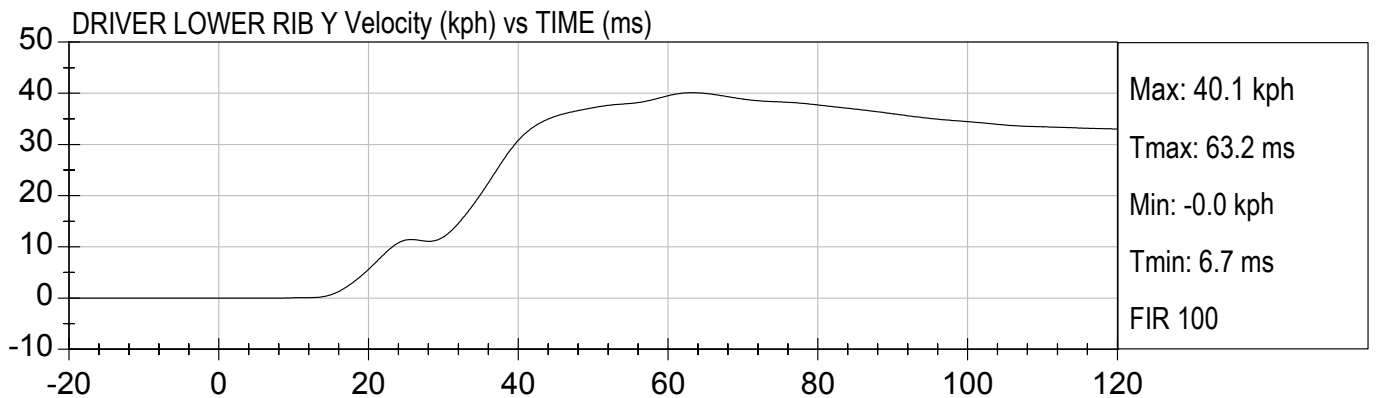
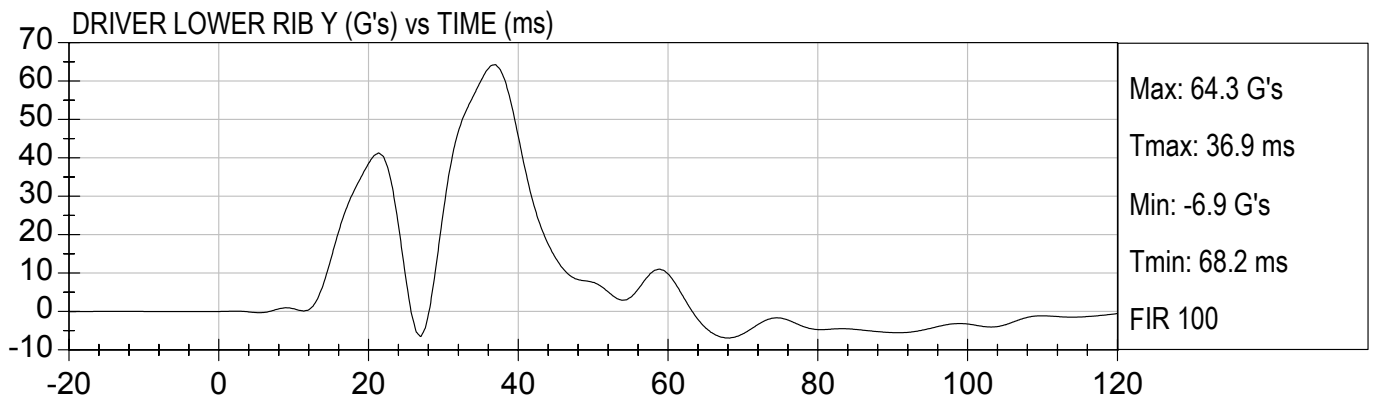


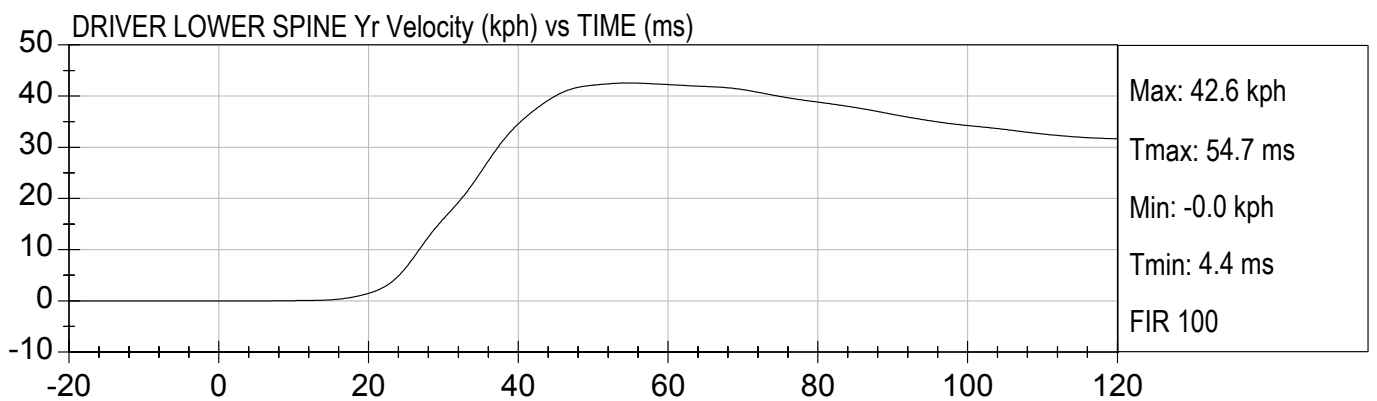
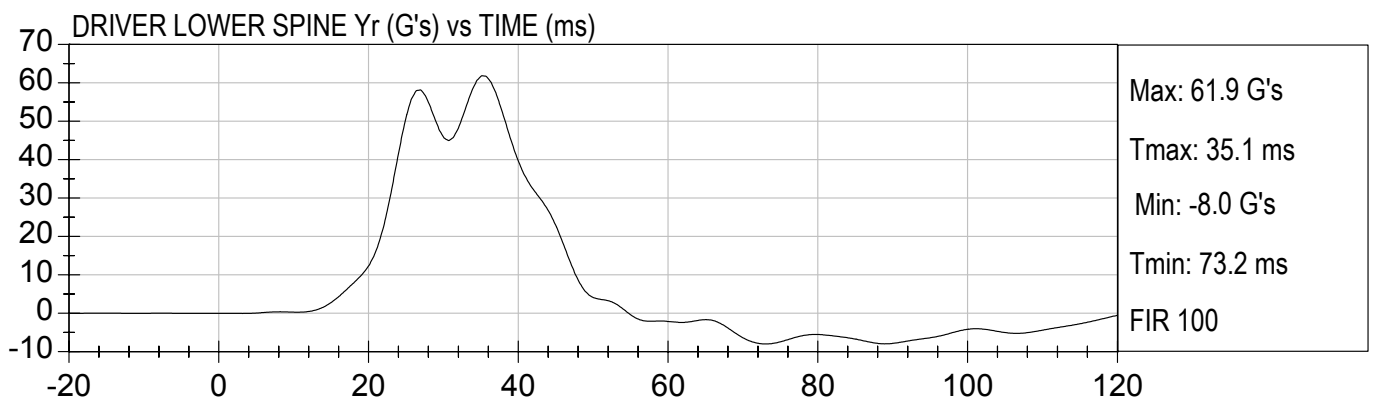
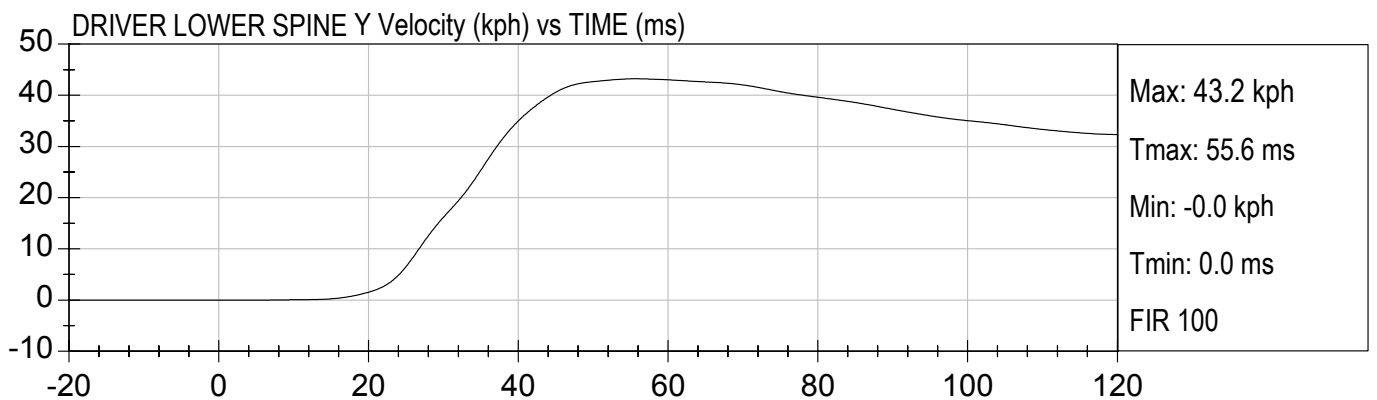
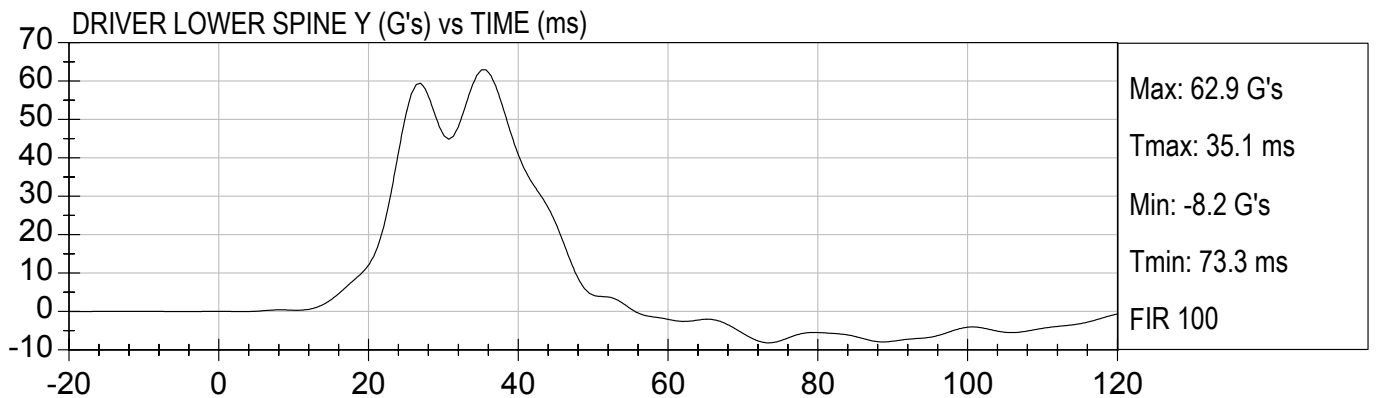






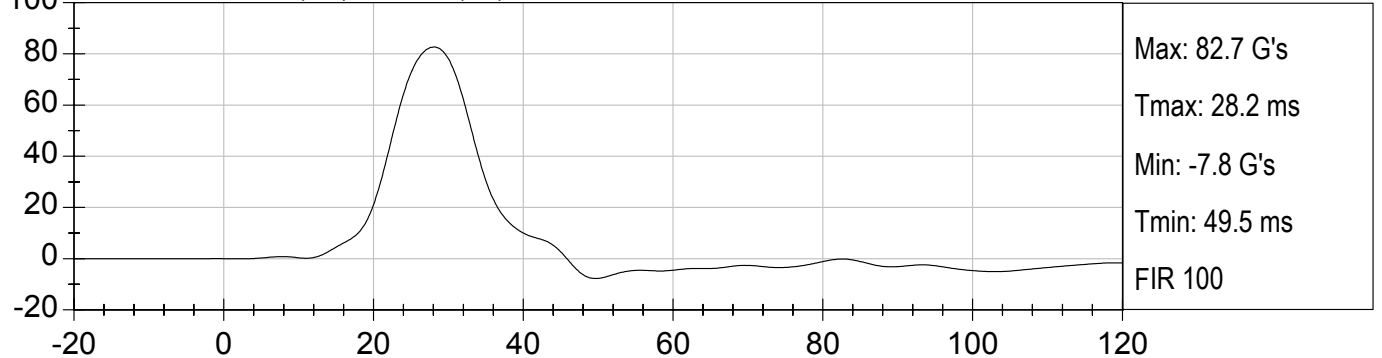




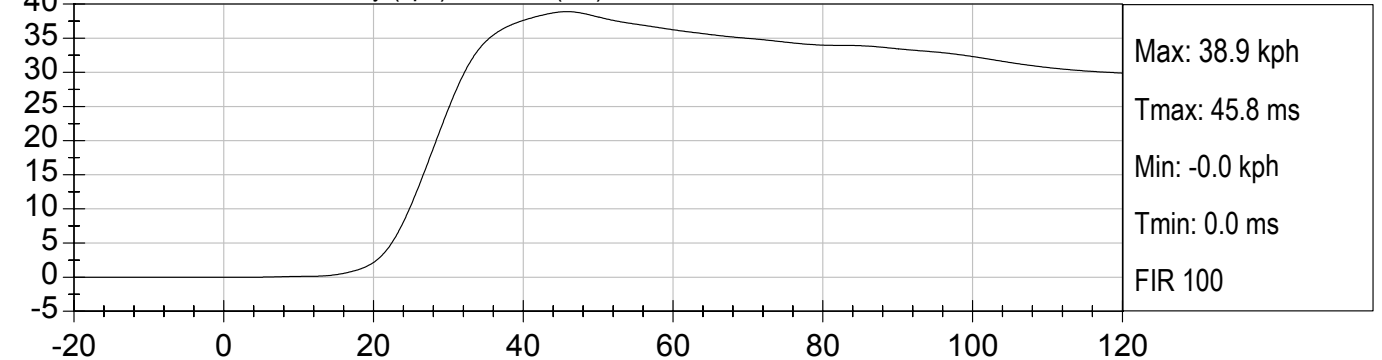




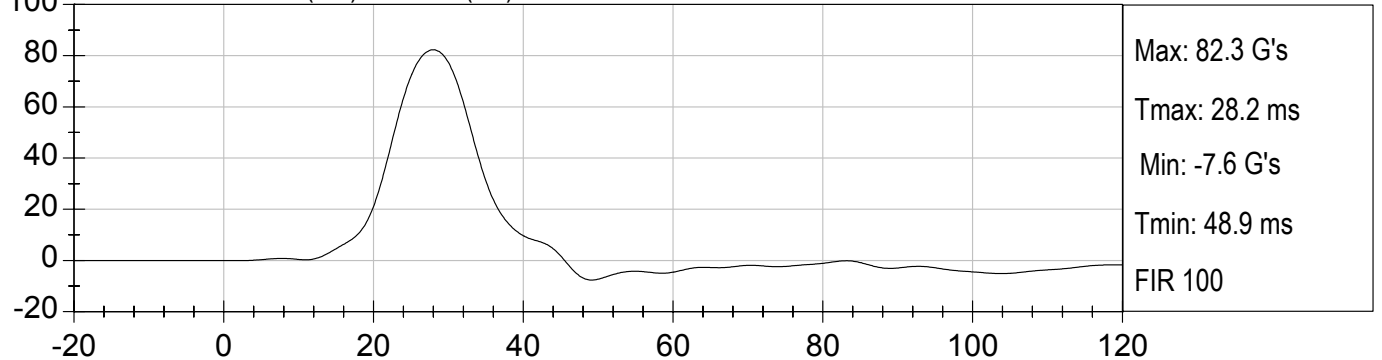
DRIVER PELVIS Y (G's) vs TIME (ms)



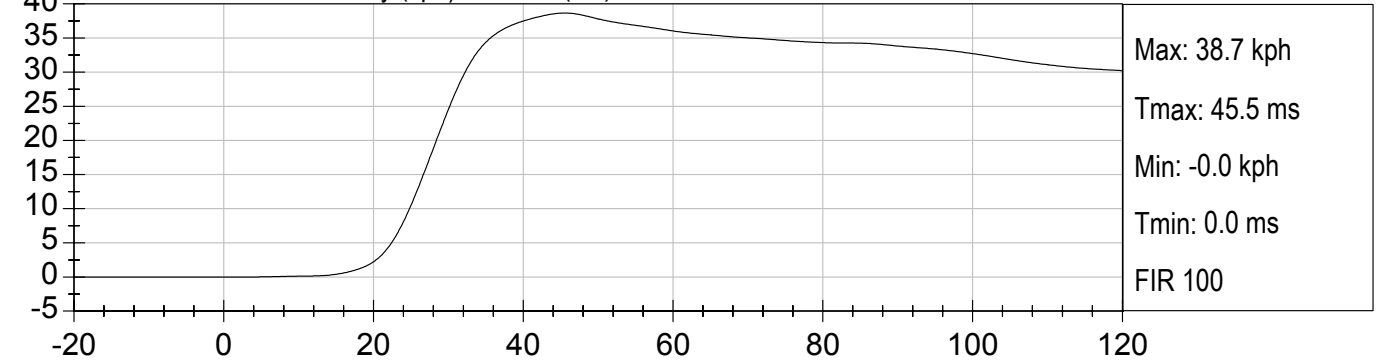
DRIVER PELVIS Y Velocity (kph) vs TIME (ms)

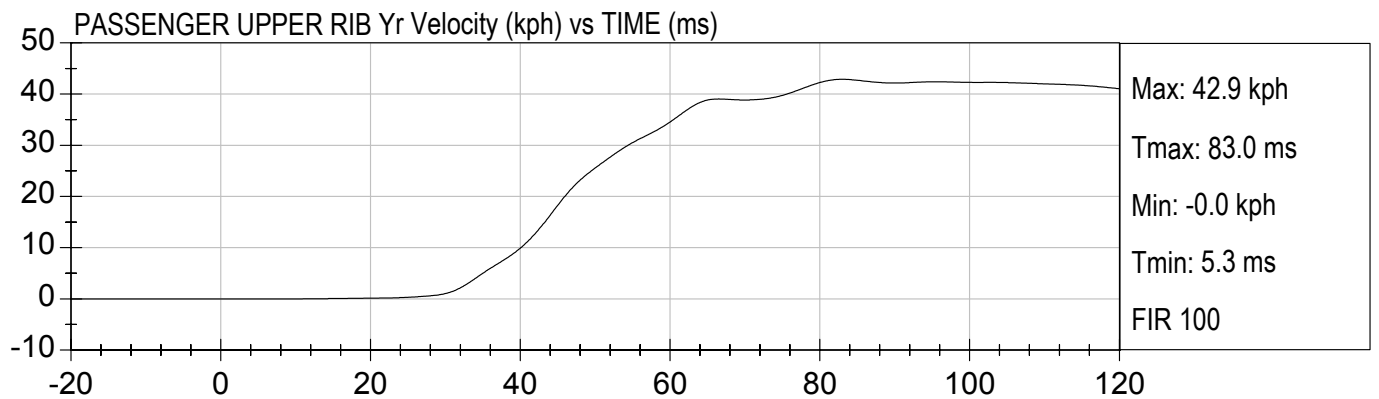
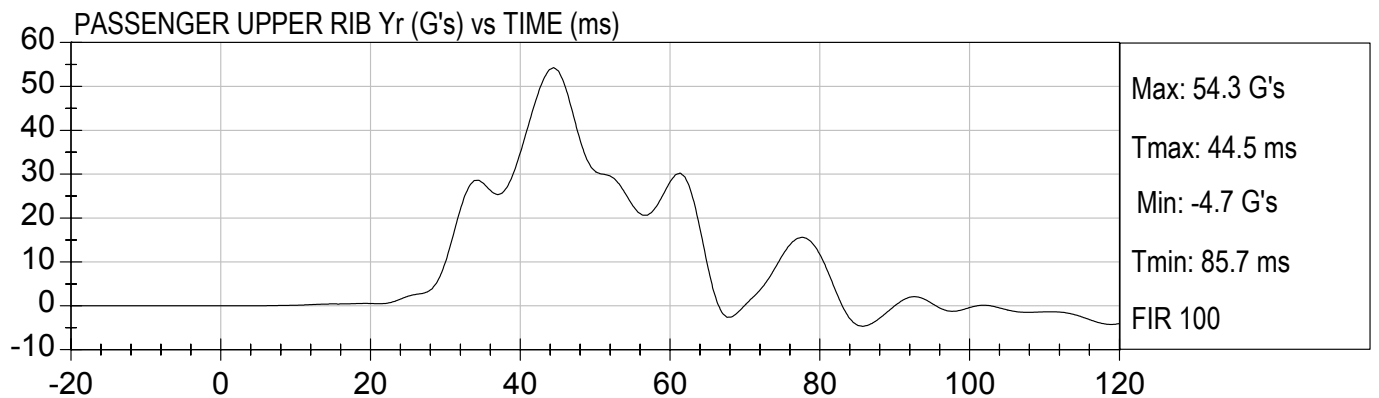
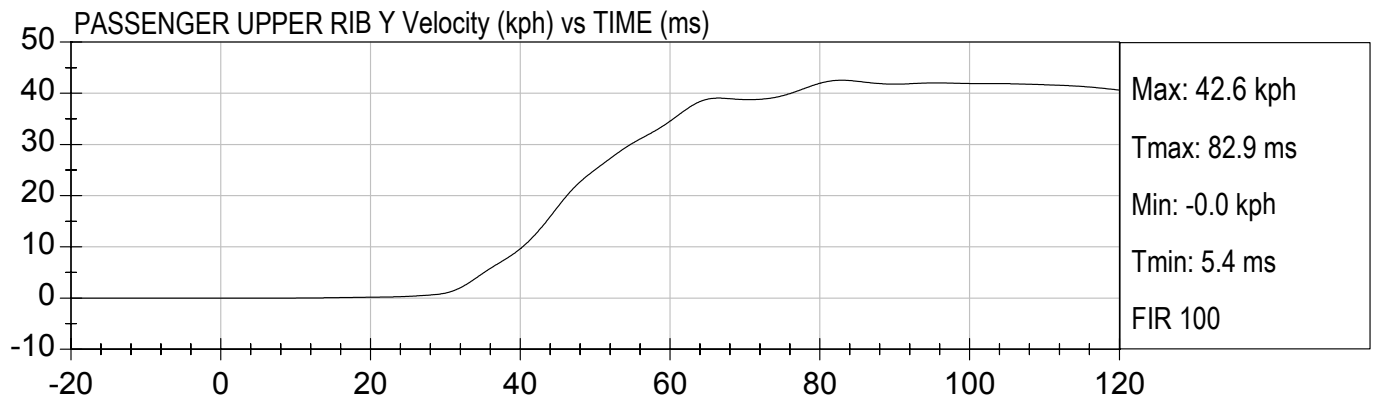
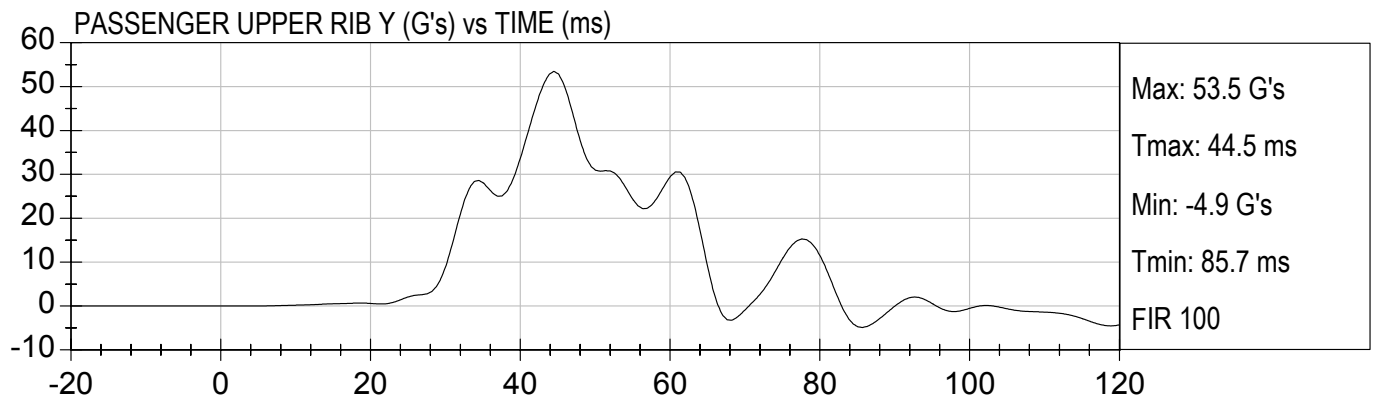


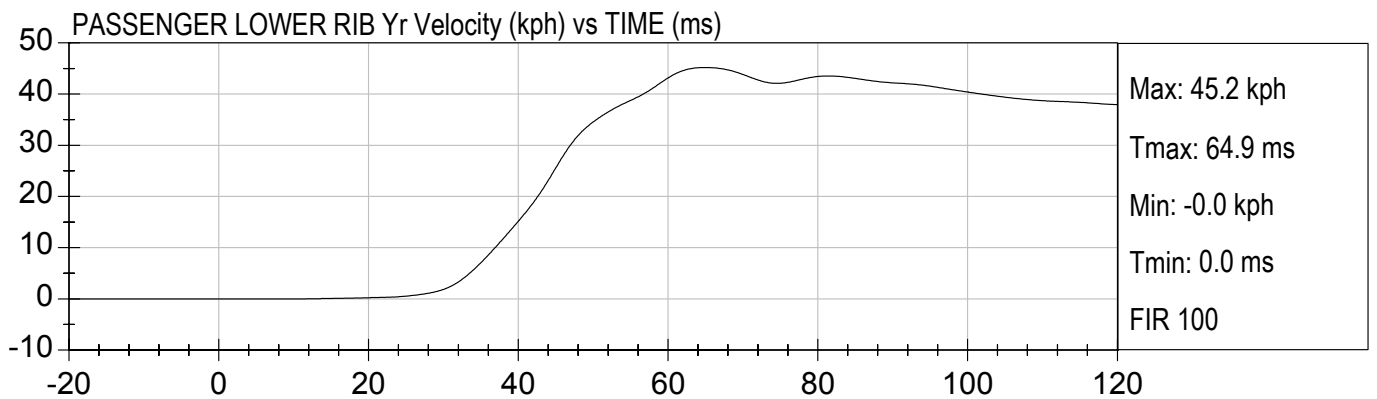
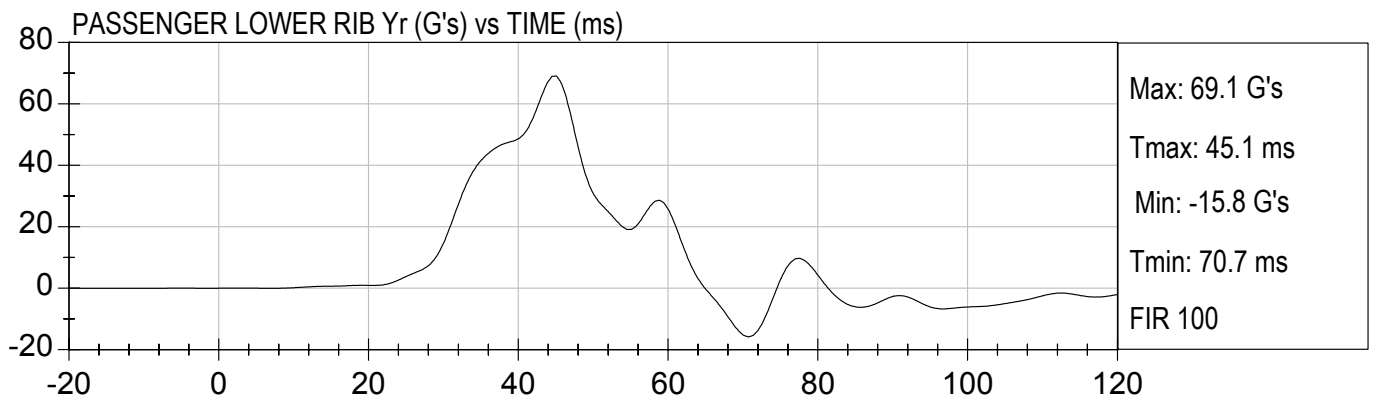
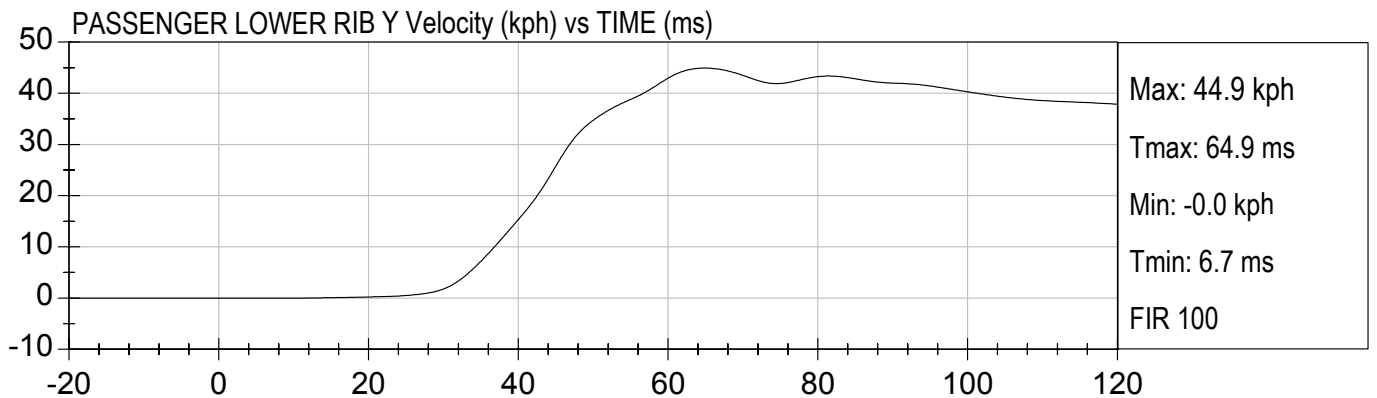
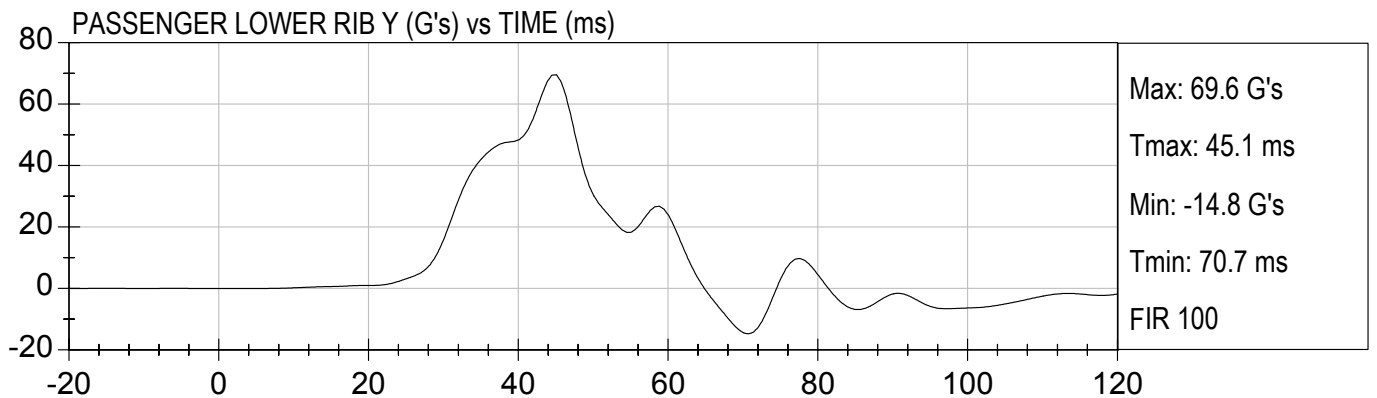
DRIVER PELVIS Yr (G's) vs TIME (ms)

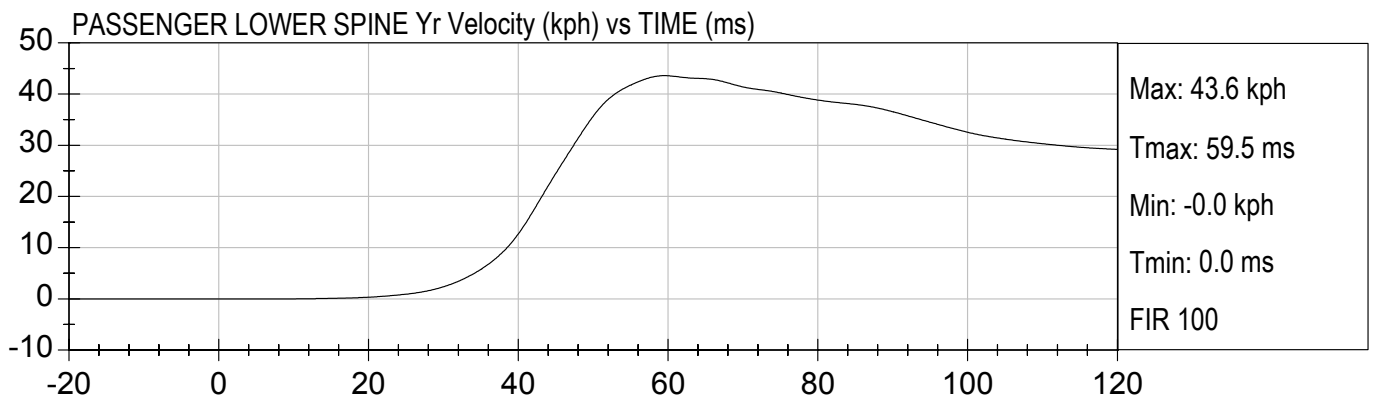
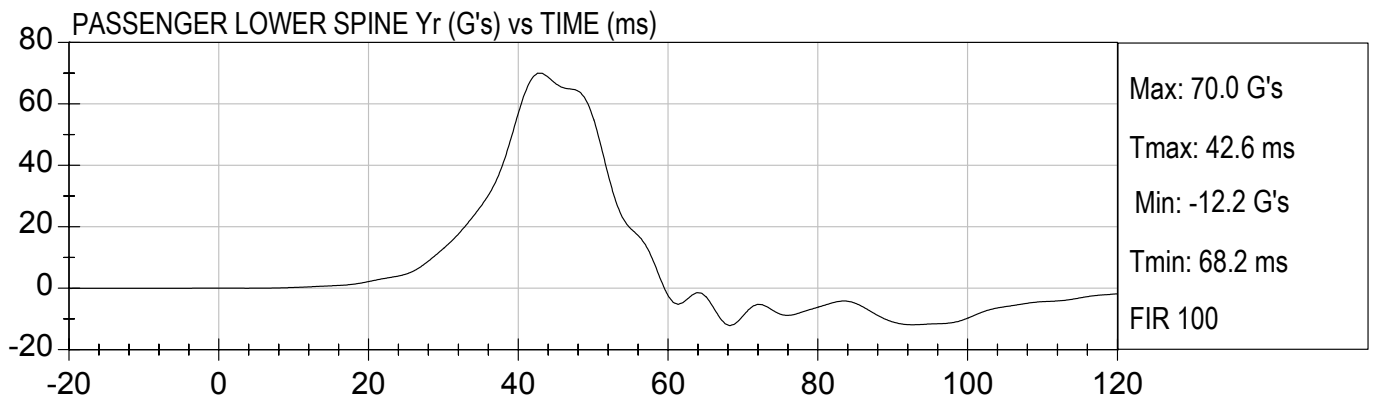
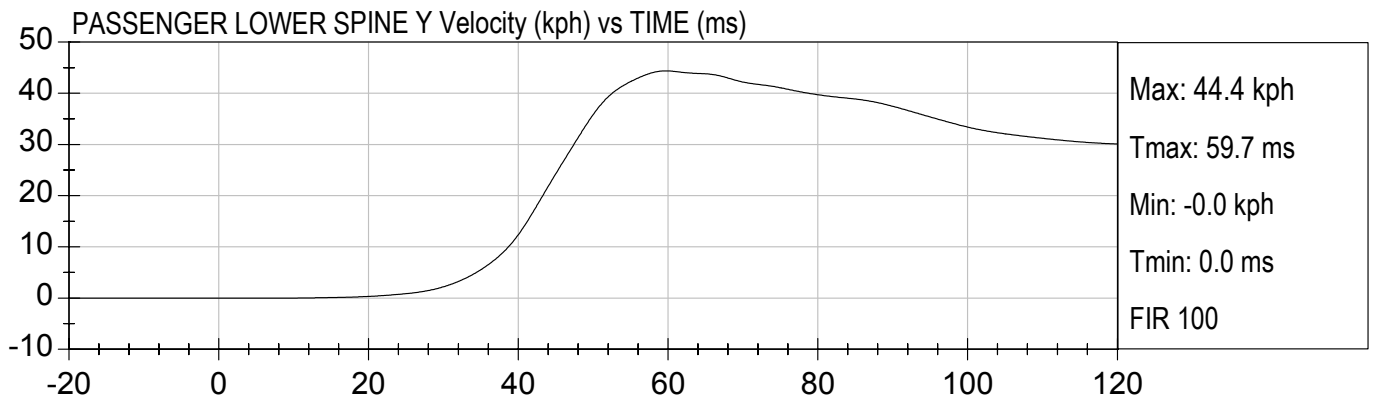
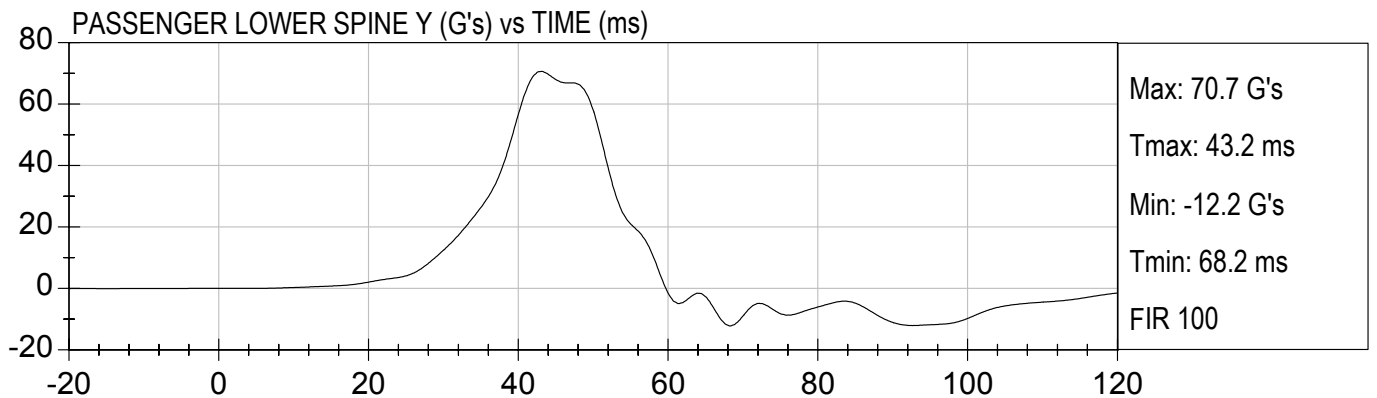


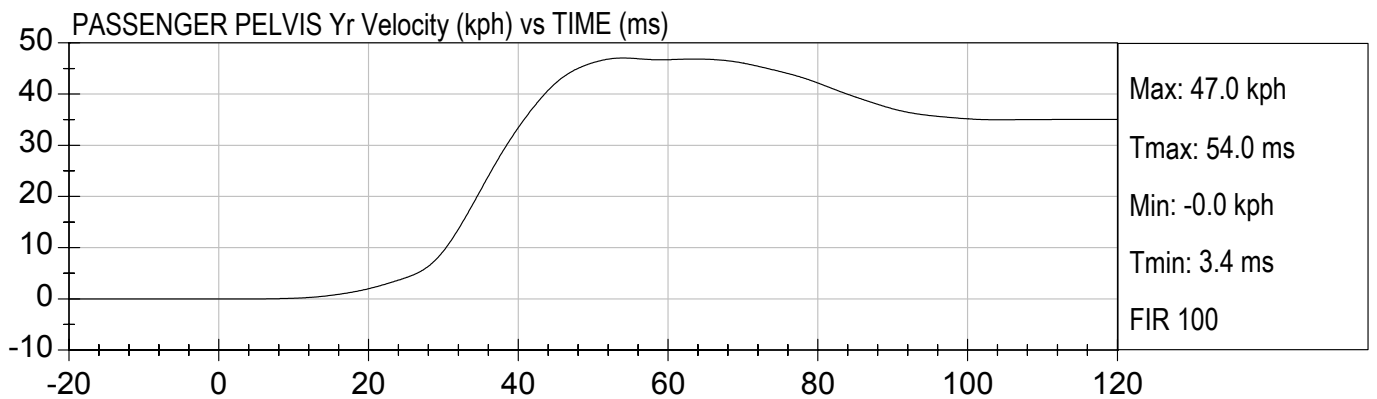
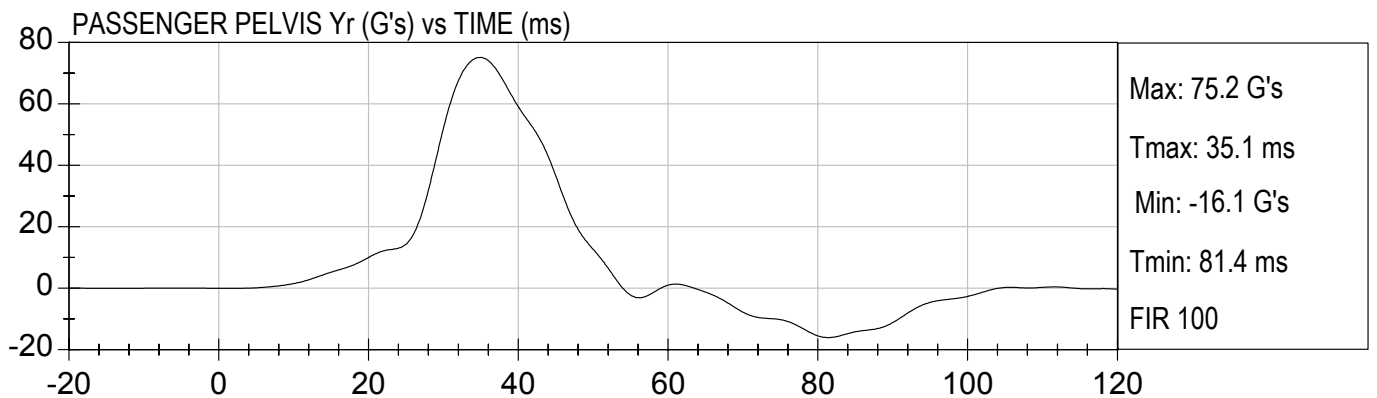
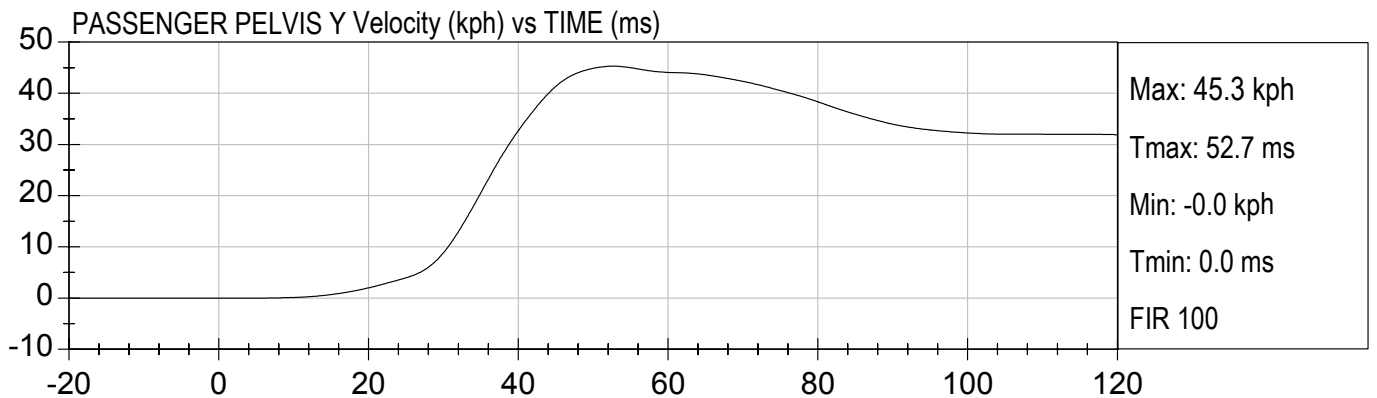
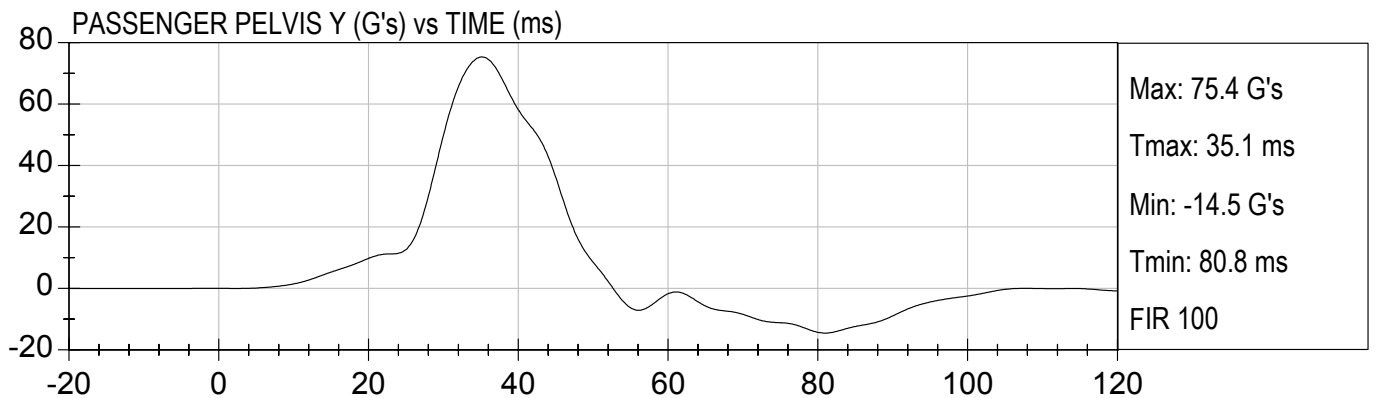
DRIVER PELVIS Yr Velocity (kph) vs TIME (ms)











APPENDIX C

SID/HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

CERTIFICATION DATA

Dummy Serial Number: 904

Calibration Test Results Summary

Dummy Serial Number: 904

Pre-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SID Calibration Data Sheet
Side Impact Dummy
External Measurements

ATD Serial No: 904

Test I.D: D03188

Tested Parameter	Units	Specification	Result	Pass/Fail
SH - Seated Height	mm	889 - 909	903	Pass
RH - Rib Height	mm	501 - 521	509	Pass
HP - Hip Pivot Height	mm	99 ref.	99	Pass
RD - Rib from Back Line	mm	229 - 241	240	Pass
KV - Knee Pivot to Back Line	mm	511 - 526	525	Pass
SW - Knee Pivot to Floor	mm	490 - 505	500	Pass
HW - Hip Width	mm	356 - 391	368	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

Shetalika Jaiswal
Approved By

11/12/2003
Test Date

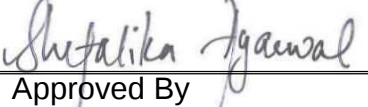
SID Calibration Data Sheet
Side Impact Dummy
Head Drop Calibration (Lateral)

ATD Serial No: 904

Test I.D: D031881

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	38	Pass
Peak Resultant Acceleration	G's	120 to 150	147	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-5	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

11/18/2003
Test Date



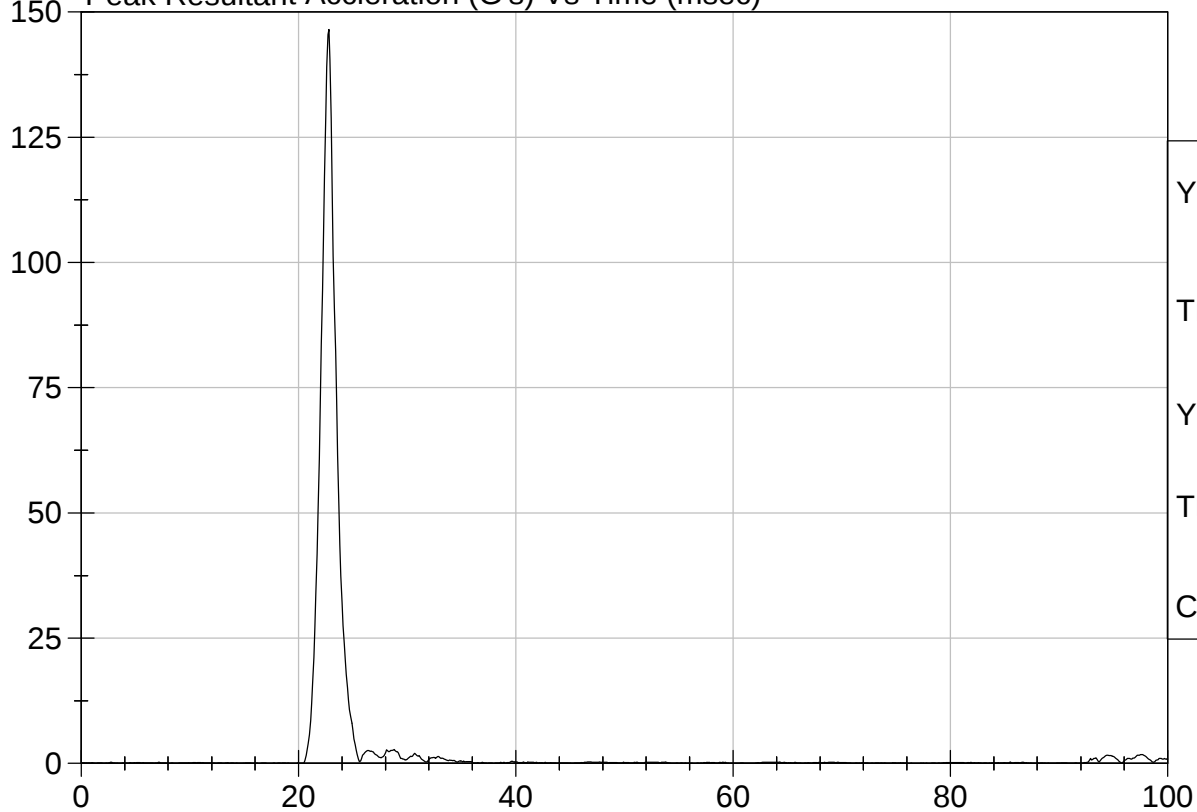
Test Description: Head Drop

Test Date: 11/18/2003

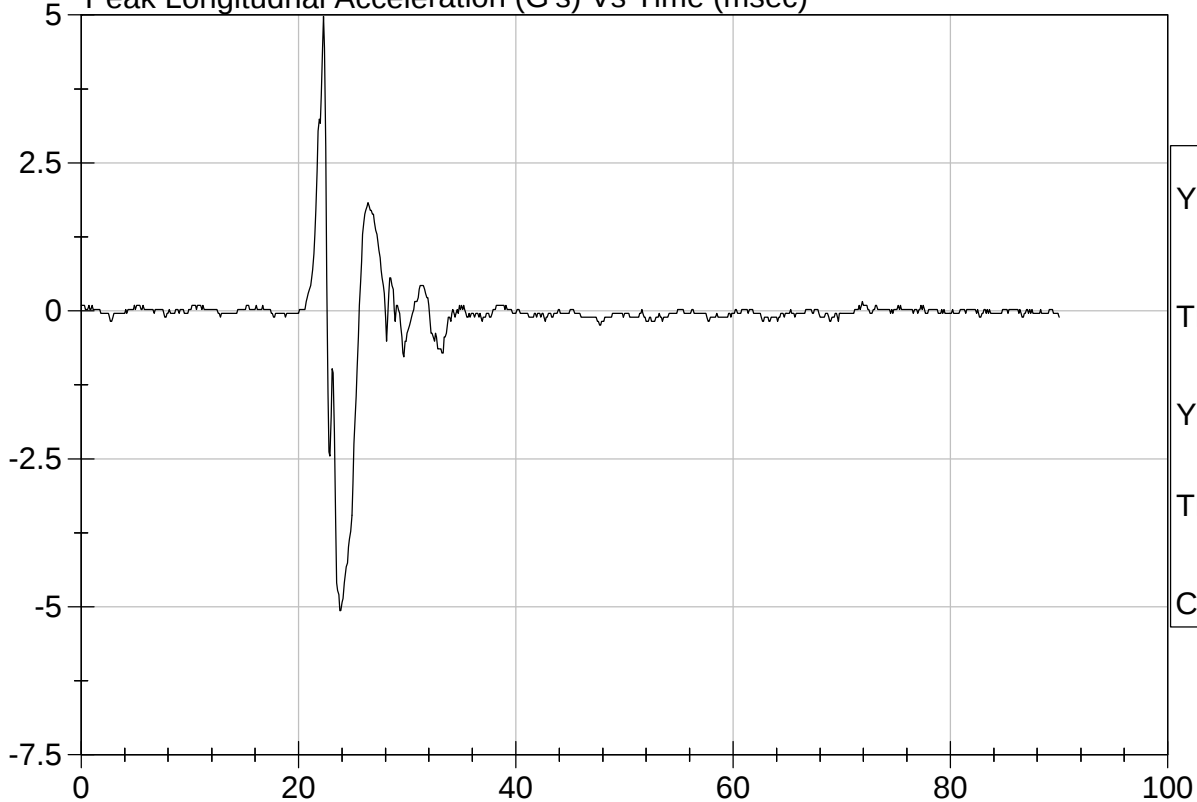
Component: D031881

Speed: 0 ft/s, 0.00 m/s

Peak Resultant Acceleration (G's) Vs Time (msec)



Peak Longitudnal Acceleration (G's) Vs Time (msec)



SID Calibration Data Sheet
Side Impact Dummy
Thorax Impact Test

ATD Serial No: 904

Test I.D: D031882

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Probe Velocity	m/s	4.27 - 4.33	4.29	Pass
Upper Rib	G's	37 - 46	40	Pass
Lower Rib	G's	37 - 46	41	Pass
Lower Spine	G's	15 - 22	20	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

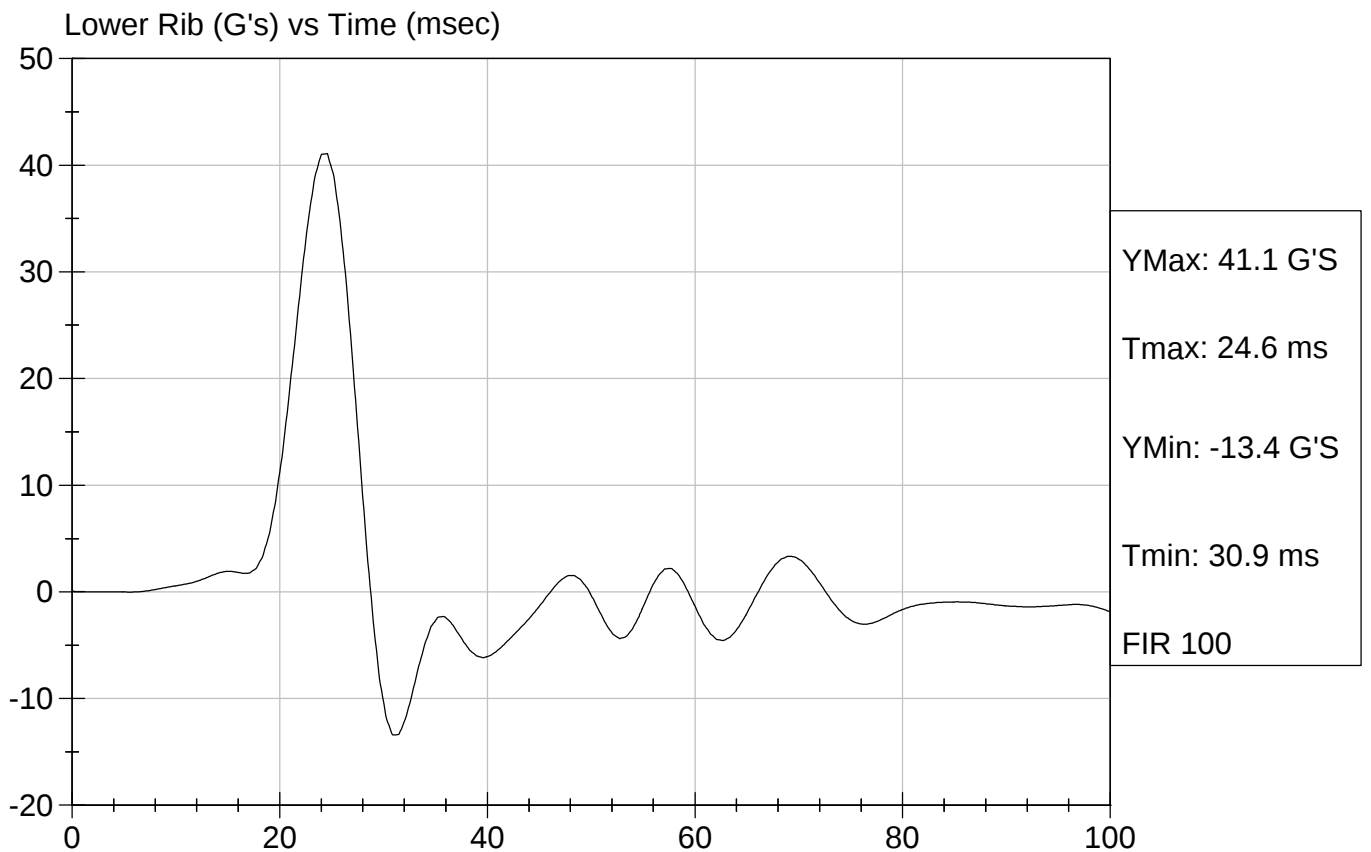
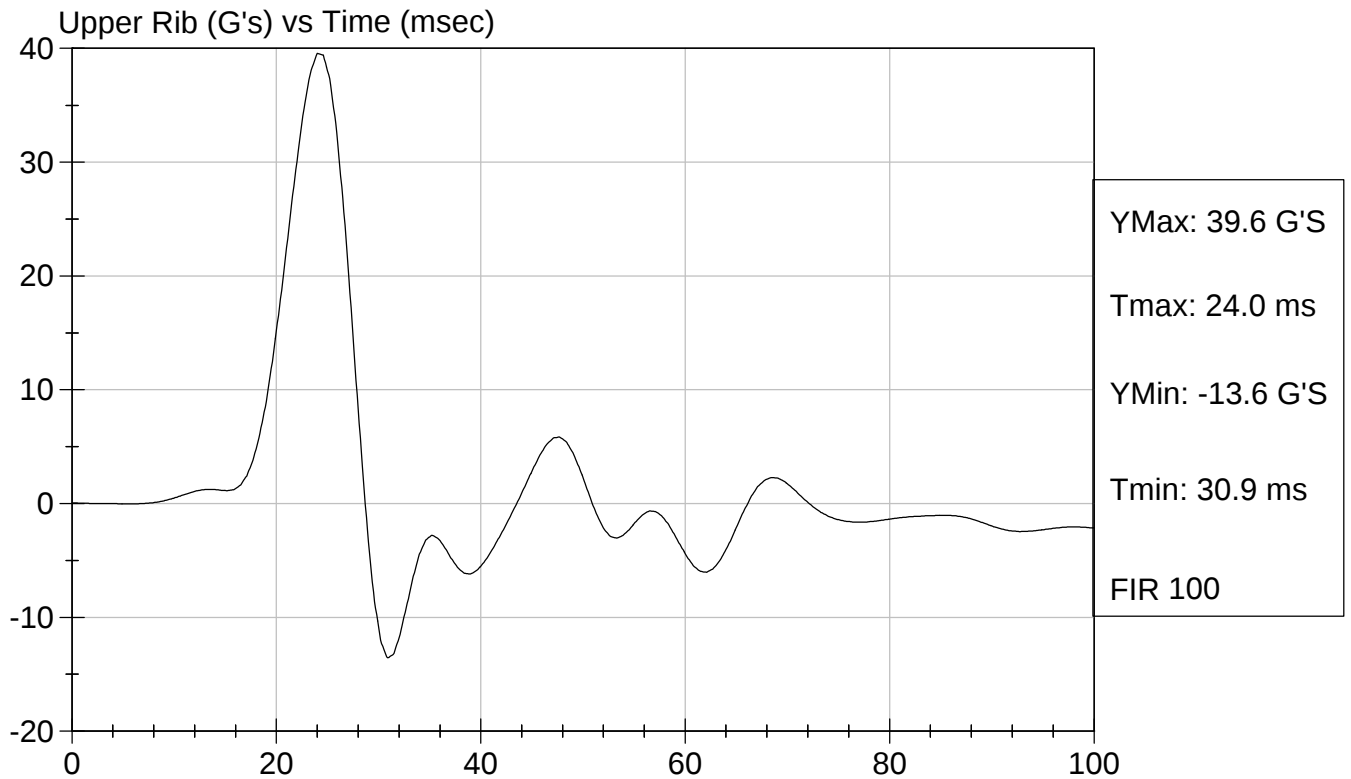
Shetalika Gansal
Approved By

11/20/2003
Test Date



Test Desc: Thorax Impact
Component ID: D031882

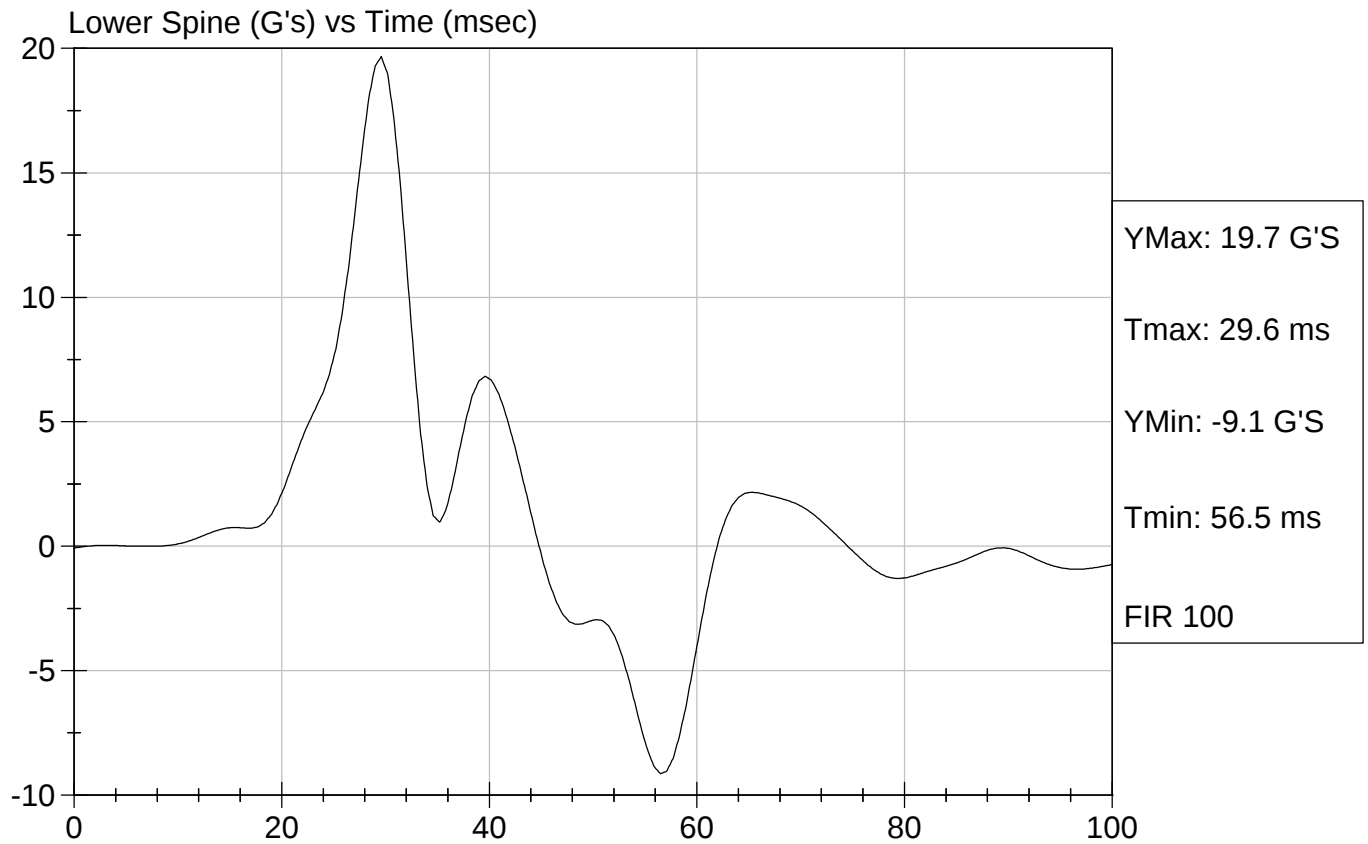
Test Date: 11/20/2003
Speed: 14.08 ft/sec, 4.29 m/sec





Test Desc: Thorax Impact
Component ID: D031882

Test Date: 11/20/2003
Speed: 14.08 ft/sec, 4.29 m/sec



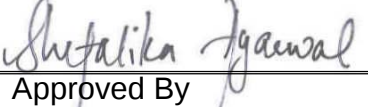
SID Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Test

ATD Serial No: 904

Test I.D: D031883

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Probe Velocity	m/s	4.27 - 4.33	4.32	Pass
Pelvis Acceleration	G's	40 - 60	44	Pass
Overall Test Results				Pass


Laboratory Technician

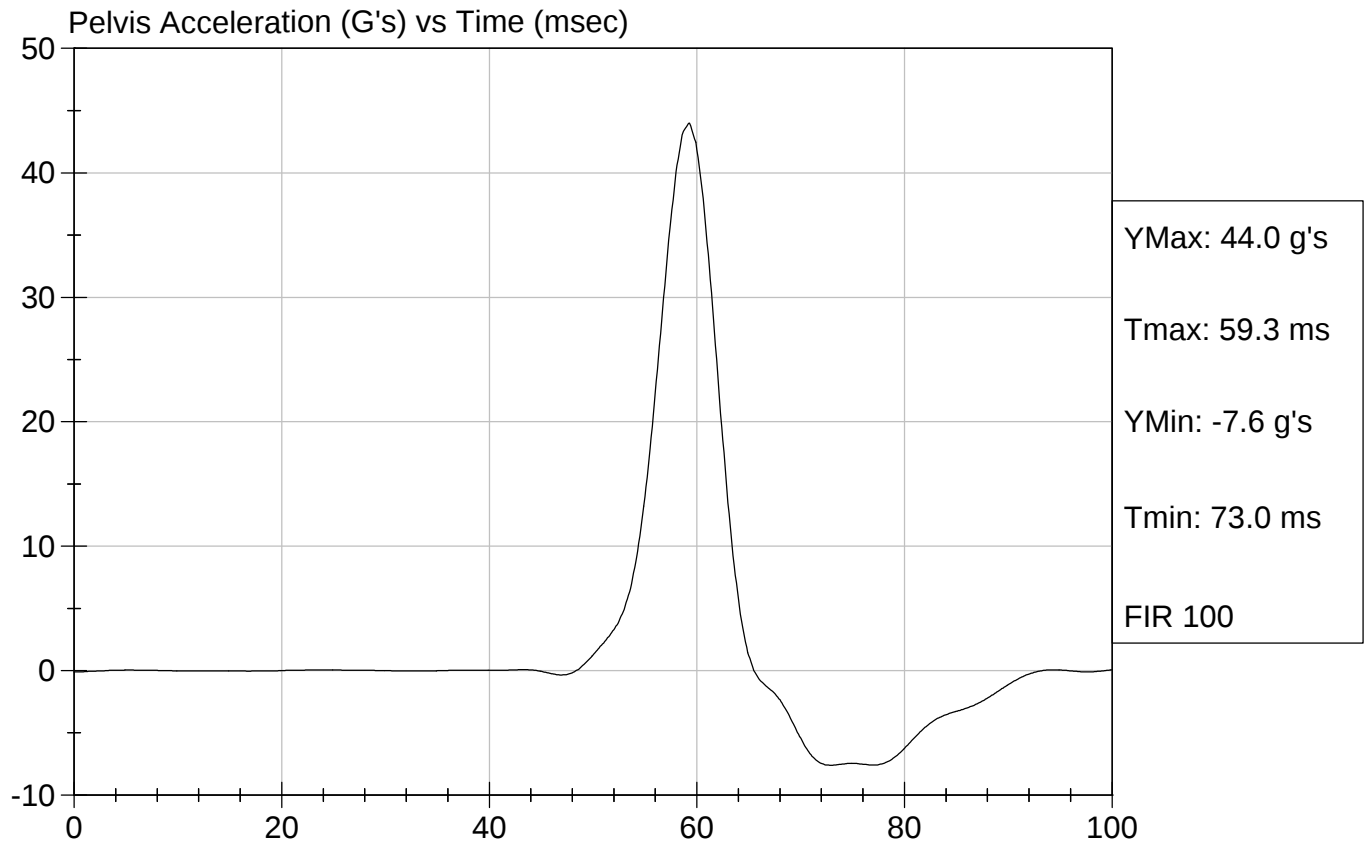

Approved By

11/19/2003
Test Date



Test Desc: Pelvis Impact
Component ID: D031883

Test Date: 11/19/2003
Speed: 14.16 ft/sec, 4.32 m/sec



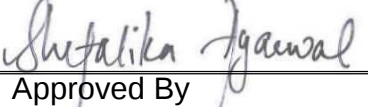
SID Calibration Data Sheet
Side Impact Dummy
Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 904

Test I.D: D031884

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Force At 12.7 mm	N	104 -162	139	Pass
Force At 19 mm	N	163 - 222	194	Pass
Force At 25.4 mm	N	222 - 280	257	Pass
Force At 33 mm	N	325 - 391	355	Pass
Overall Test Results				Pass


 Laboratory Technician


 Approved By

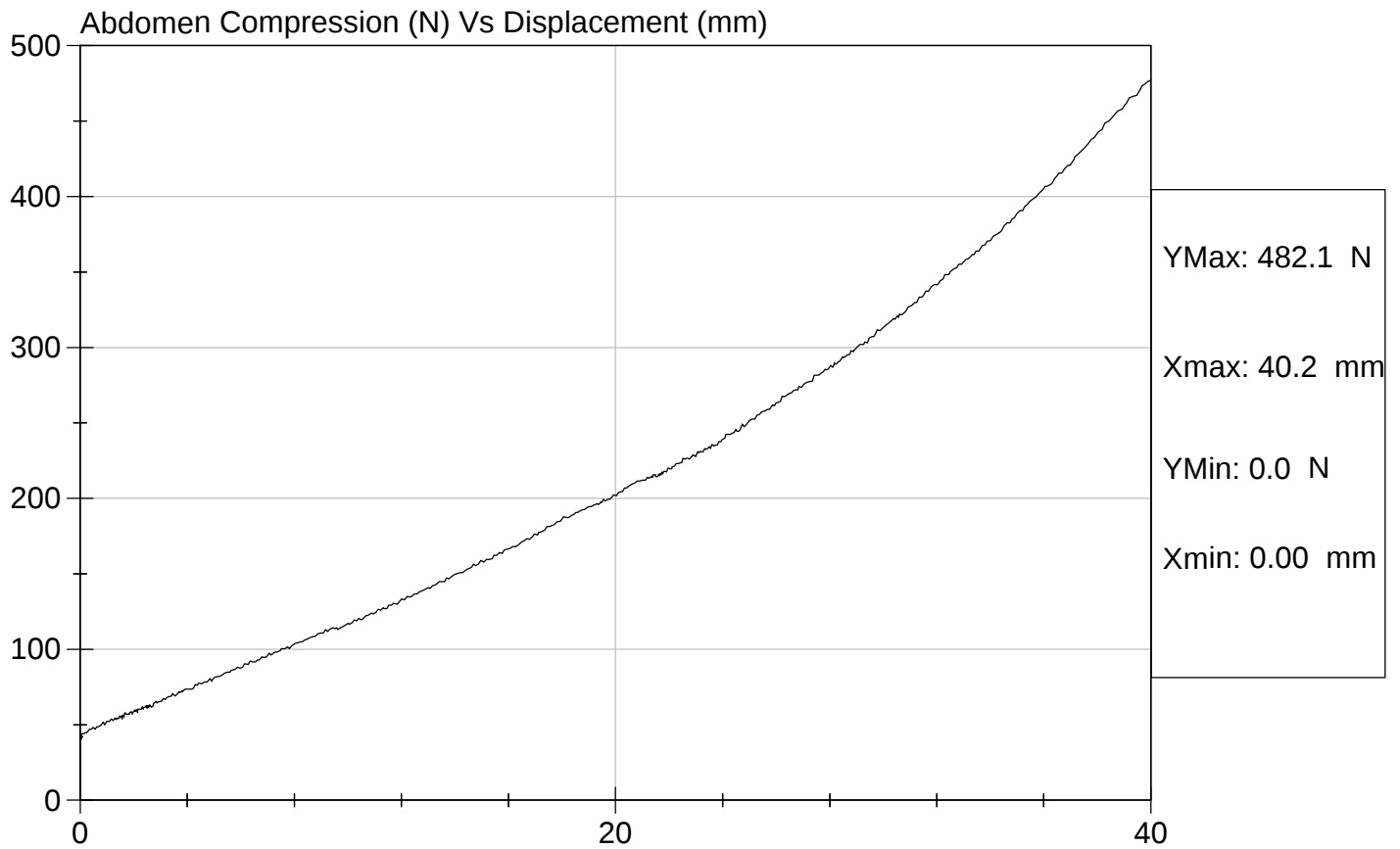
11/19/2003
 Test Date



Test Description: Abdomen Compression Test Date: 11/19/2003

Component: D031884

Speed: 0 ft/sec, 0 m/sec



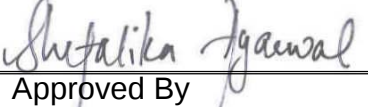
SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 904

Test I.D: D031885

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Force At 0 deg	N	0 - 26.7	0.0	Pass
Force At 20 deg	N	97.9 - 151.2	133.6	Pass
Force At 30 deg	N	151.2 - 204.6	185.9	Pass
Force At 40 deg	N	204.6 - 258.0	245.6	Pass
Return Angle	Deg	12 Maximum	5	Pass
Overall Test Results			Pass	


 Laboratory Technician


 Approved By

11/19/2003
 Test Date

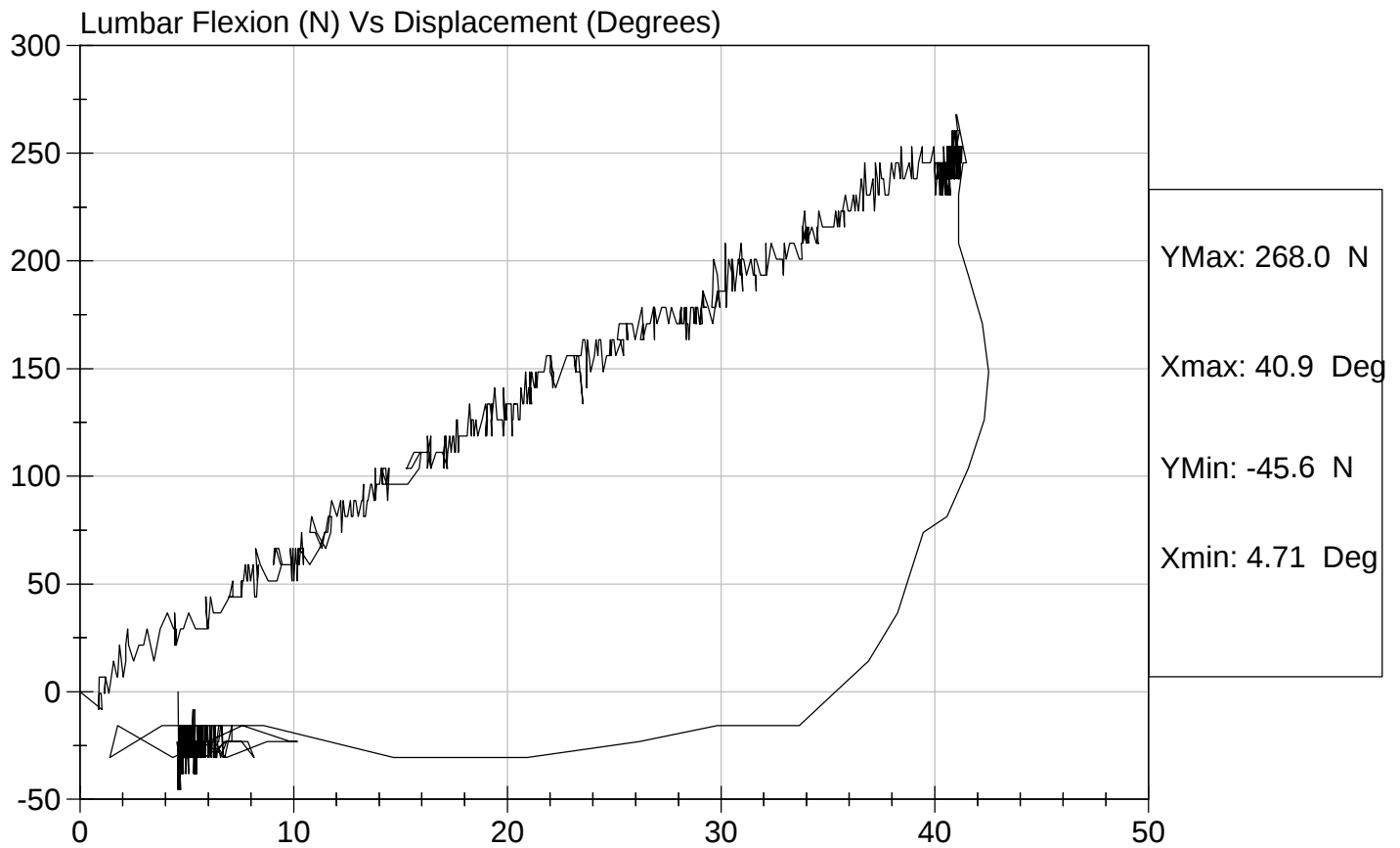


Test Description: Lumbar Flexion

Test Date: 11/19/2003

Component: D031885

Speed: 0 ft/sec, 0 m/sec



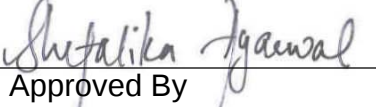
SID Calibration Data Sheet
Side Impact Dummy (SID)
Neck Pendulum Test

ATD Serial No: 904

Test I.D: D031889

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	28	Pass
Impact Velocity		m/s	6.89 to 7.13	7.10	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.21	Pass
	20 msec	m/s	4.12 to 5.10	4.45	Pass
	30 msec	m/s	5.73 to 7.01	6.28	Pass
	40 to 70 msec	m/s	6.27 to 7.64	7.02	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	70	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	59	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	80	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	55	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	10	Pass


 Laboratory Technician


 Approved By

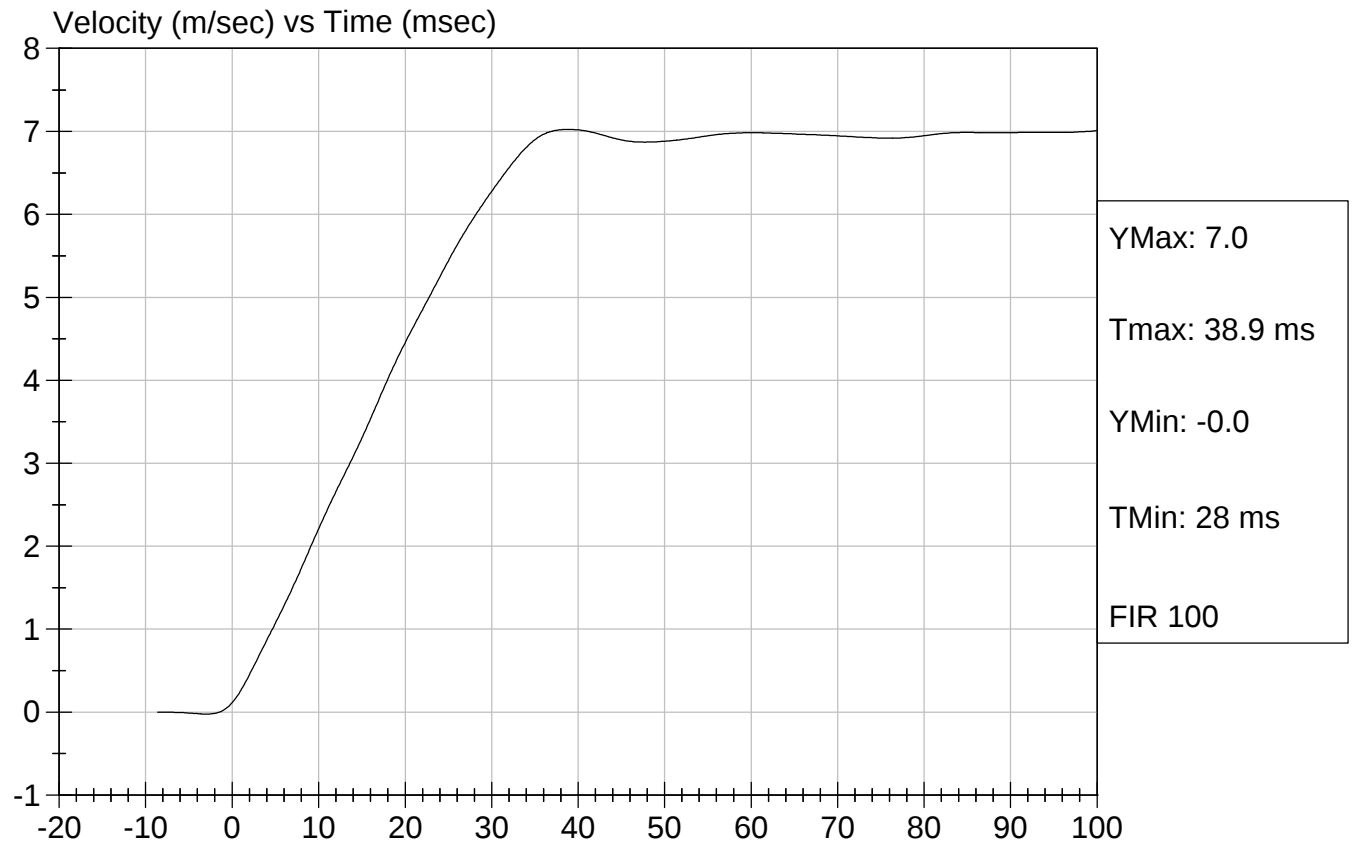
11/19/2003

Test Date



Test Desc: Neck Bending
Component ID: D031889

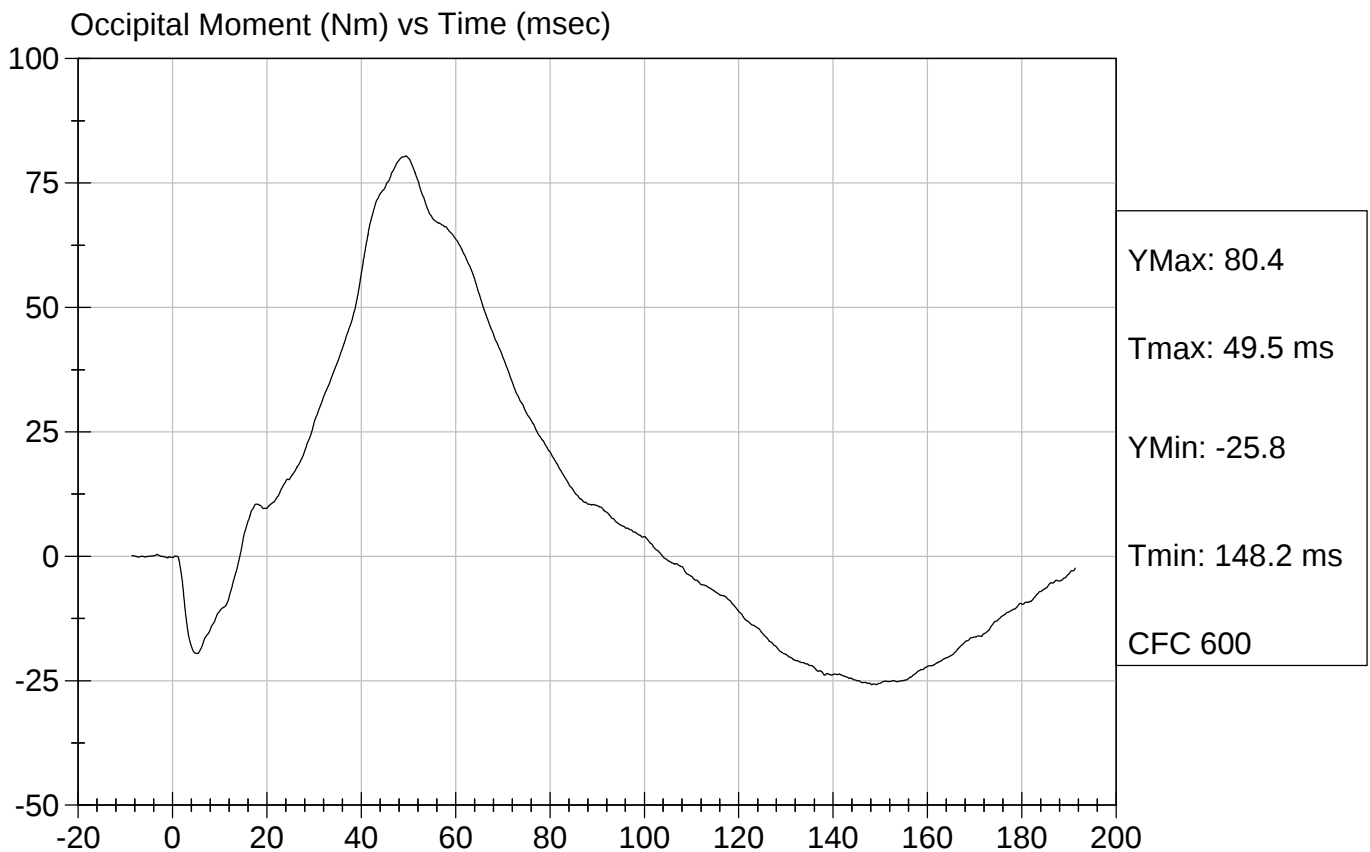
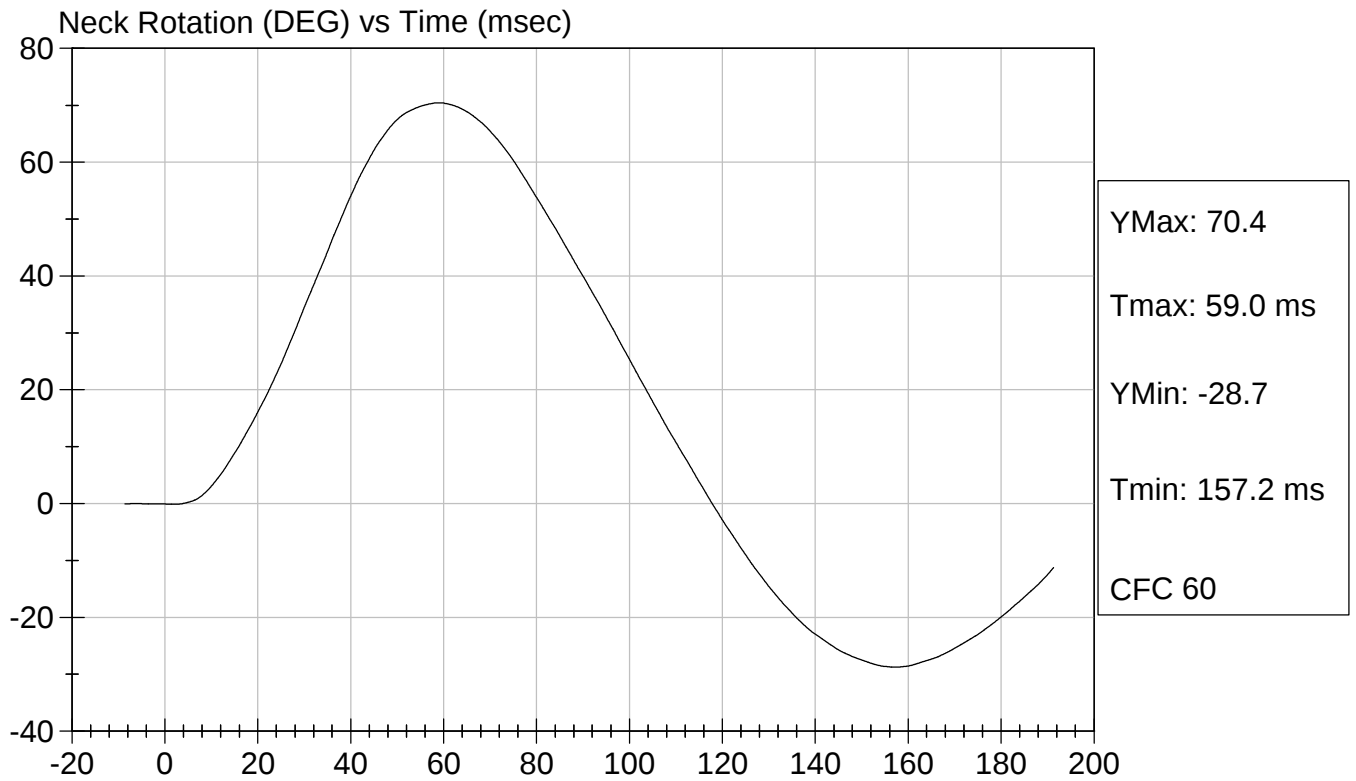
Test Date: 11/19/2003
Speed: 23.3 ft/sec, 7.10 m/sec





Test Desc: Neck Bending
Component ID: D031889

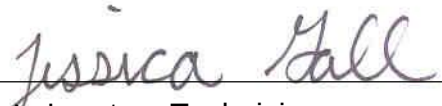
Test Date: 11/19/2003
Speed: 23.3 ft/sec, 7.10 m/sec

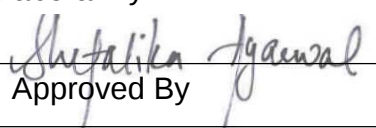


SID Calibration Data Sheet
Side Impact Dummy
Inspection Checklist

ATD Serial No: 904

Test Part	Items Checked	Result
Skin	Visual inspection	Pass
Head	Visual, ballast, accelerometer mount	Pass
Neck	Visual	Pass
Spine Box	Visual, ballast, accelerometer mount	Pass
Rib Cage	Visual, measure	Pass
Sternum	Visual	Pass
Lumbar Spine	Visual	Pass
Abdomen	Visual	Pass
Pelvis	Visual, palpate, accelerometer mount	Pass
Upper Legs	Visual	Pass
Knees	Visual	Pass
Lower Legs	Visual, range of motion	Pass
Ankles	Visual, range of motion	Pass
Feet	Visual, range of motion	Pass
Joints	1 to 2 g range	Pass
Other		Pass


 Laboratory Technician


 Approved By

11/20/2003
 Test Date

CERTIFICATION DATA

Dummy Serial Number: 271

Calibration Test Results Summary

Dummy Serial Number: 271

Pre-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

SID Calibration Data Sheet
Side Impact Dummy
External Measurements

ATD Serial No: 271

Test I.D: D03187

Tested Parameter	Units	Specification	Result	Pass/Fail
SH - Seated Height	mm	889 - 909	905	Pass
RH - Rib Height	mm	501 - 521	502	Pass
HP - Hip Pivot Height	mm	99 ref.	99	Pass
RD - Rib from Back Line	mm	229 - 241	239	Pass
KV - Knee Pivot to Back Line	mm	511 - 526	526	Pass
SW - Knee Pivot to Floor	mm	490 - 505	497	Pass
HW - Hip Width	mm	356 - 391	371	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

Shetalika Jansal
Approved By

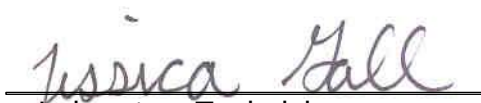
11/12/2003
Test Date

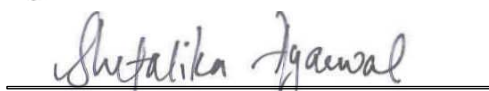
SID Calibration Data Sheet
Side Impact Dummy
Head Drop Calibration (Lateral)

ATD Serial No: 271

Test I.D: D031871

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	38	Pass
Peak Resultant Acceleration	G's	120 to 150	125	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-7	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

11/18/2003
Test Date



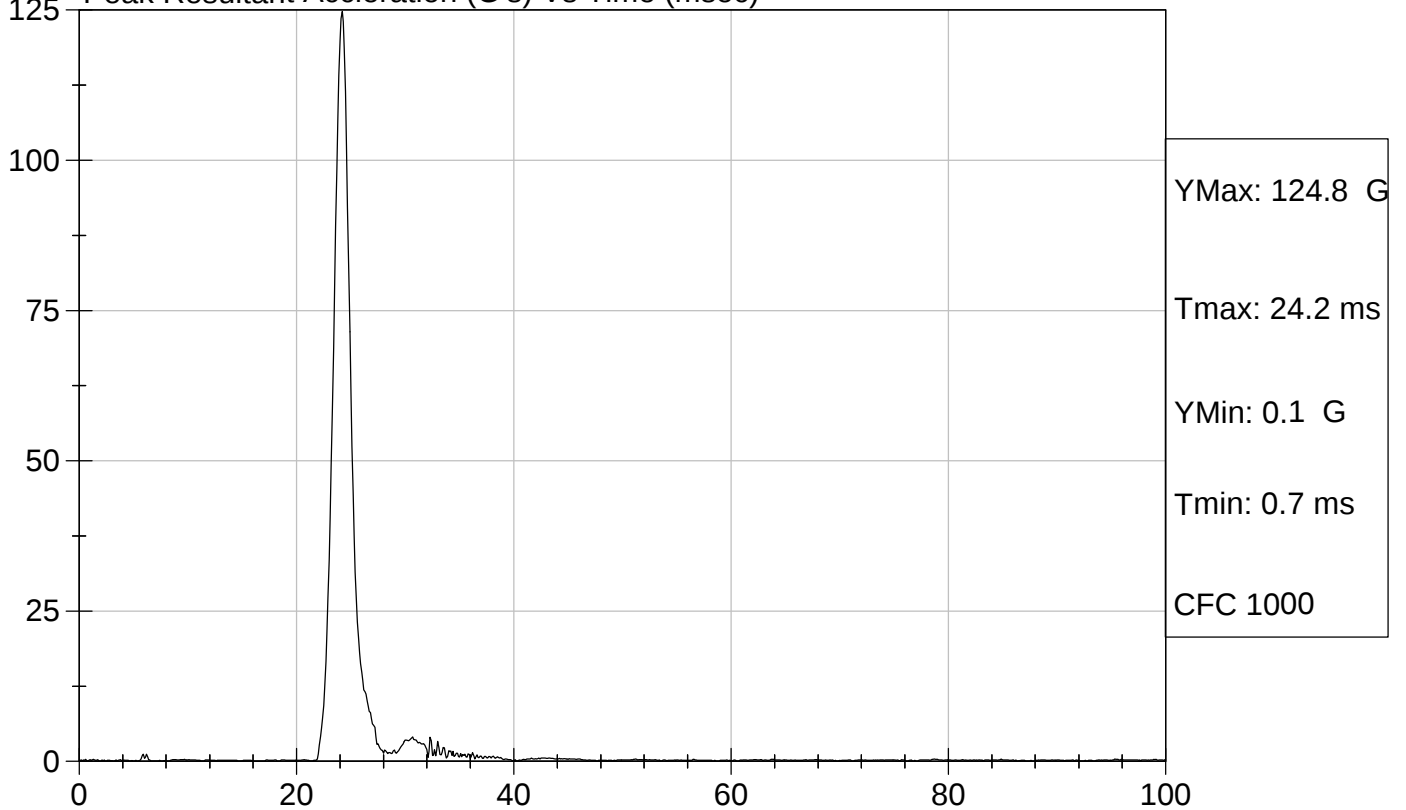
Test Description: Head Drop

Test Date: 11/18/2003

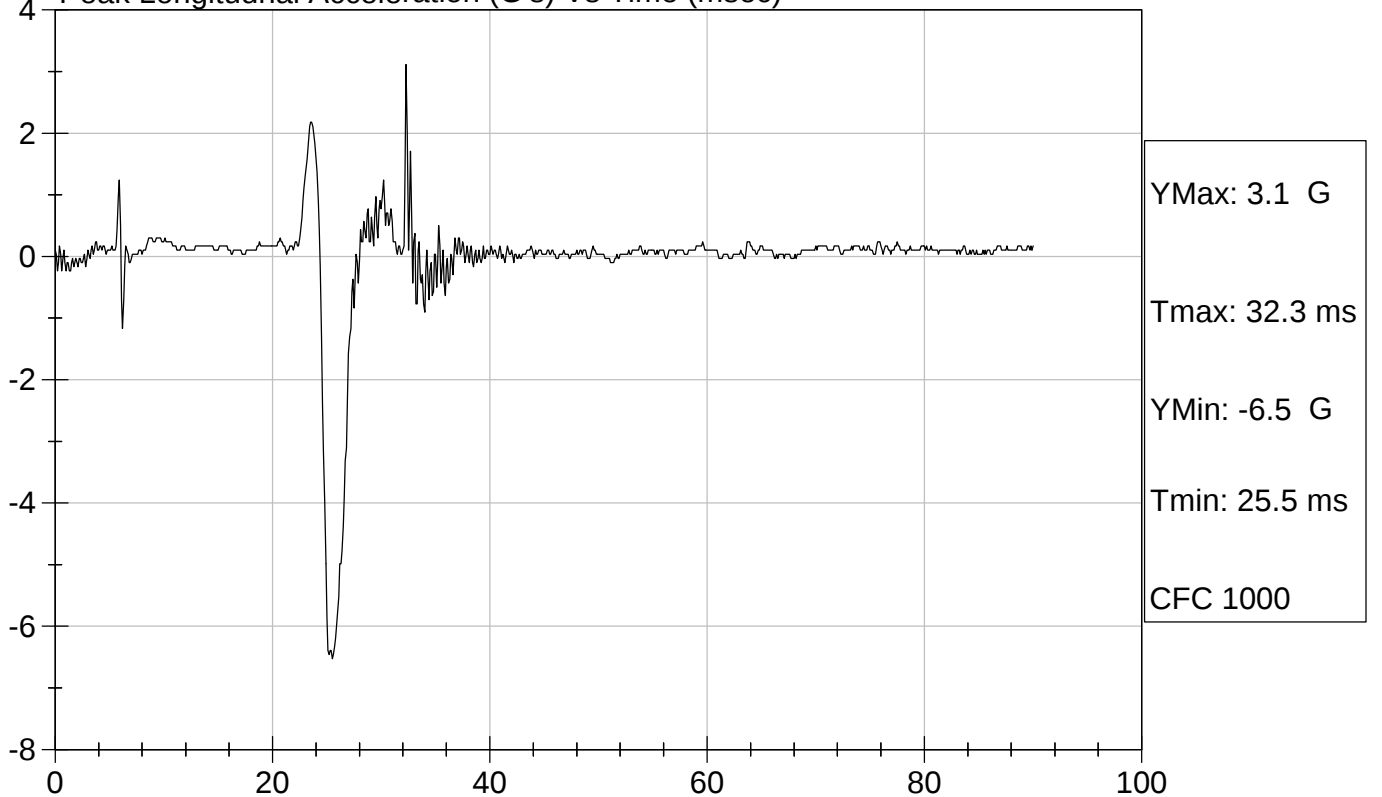
Component: D031871

Speed: 0 ft/s, 0.00 m/s

Peak Resultant Acceleration (G's) Vs Time (msec)



Peak Longitudnal Acceleration (G's) Vs Time (msec)

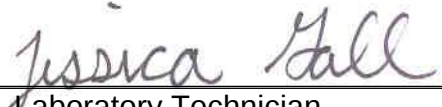


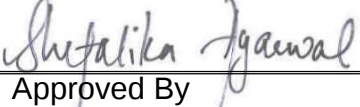
SID Calibration Data Sheet
Side Impact Dummy
Thorax Impact Test

ATD Serial No: 271

Test I.D: D031872

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Upper Rib	G's	37 - 46	45	Pass
Lower Rib	G's	37 - 46	43	Pass
Lower Spine	G's	15 - 22	19	Pass
Overall Test Results				Pass


Laboratory Technician

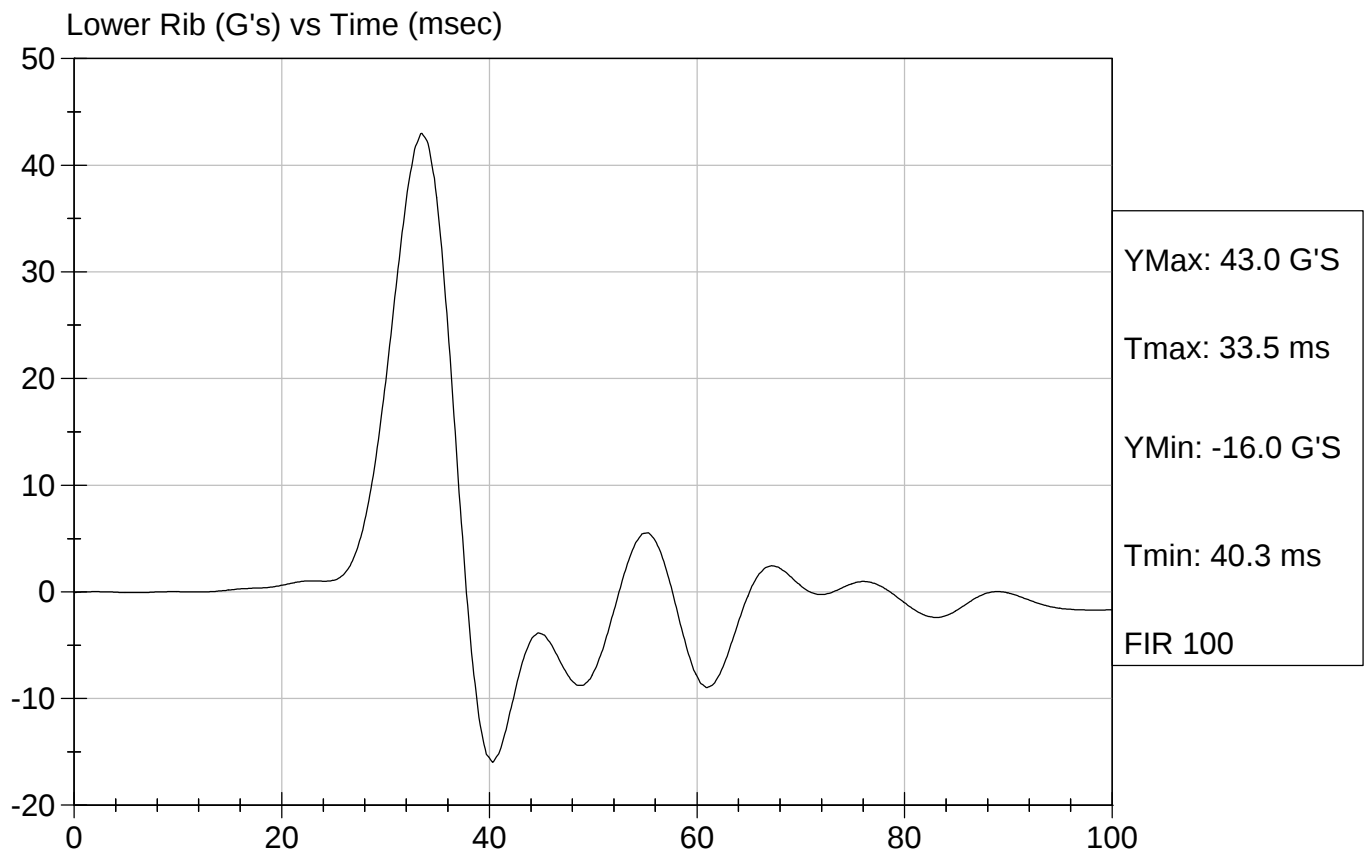
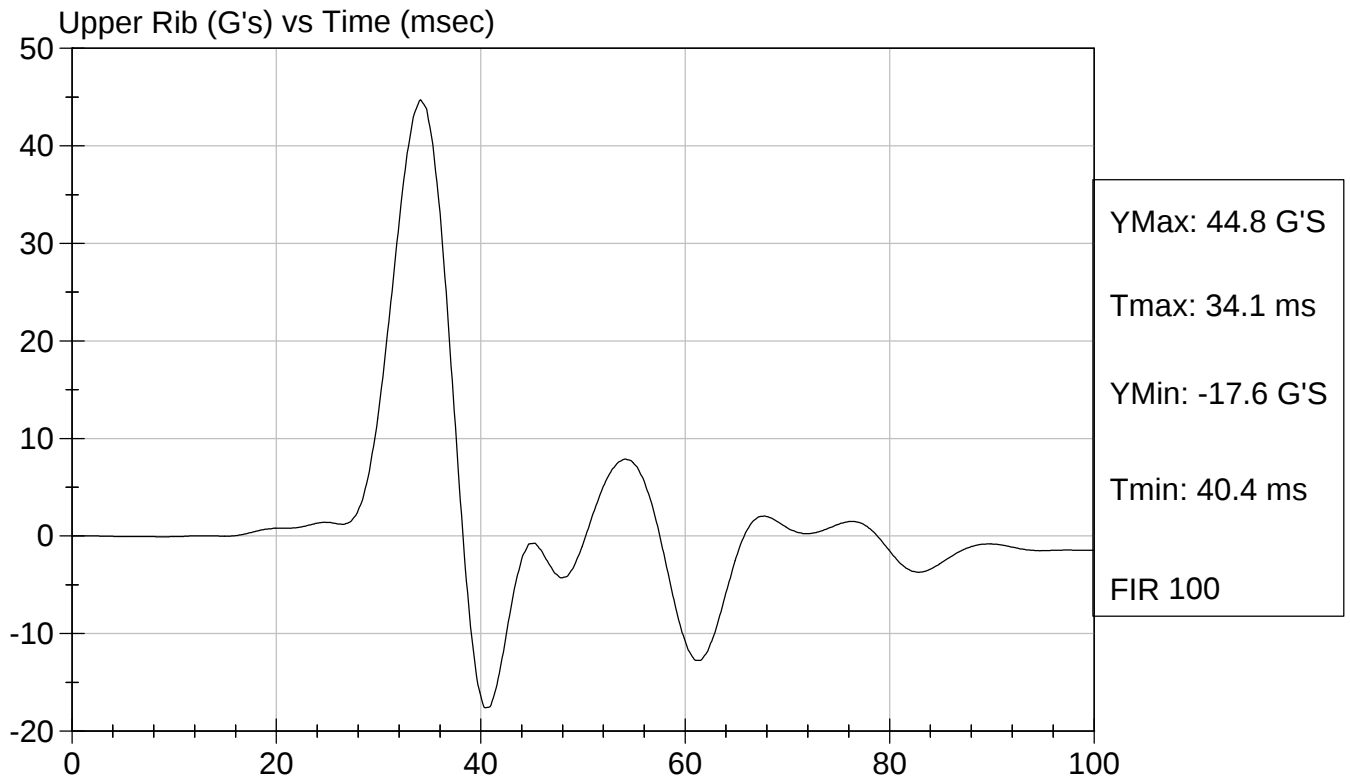

Approved By

11/20/2003
Test Date



Test Desc: Thorax Impact
Component ID: D031872

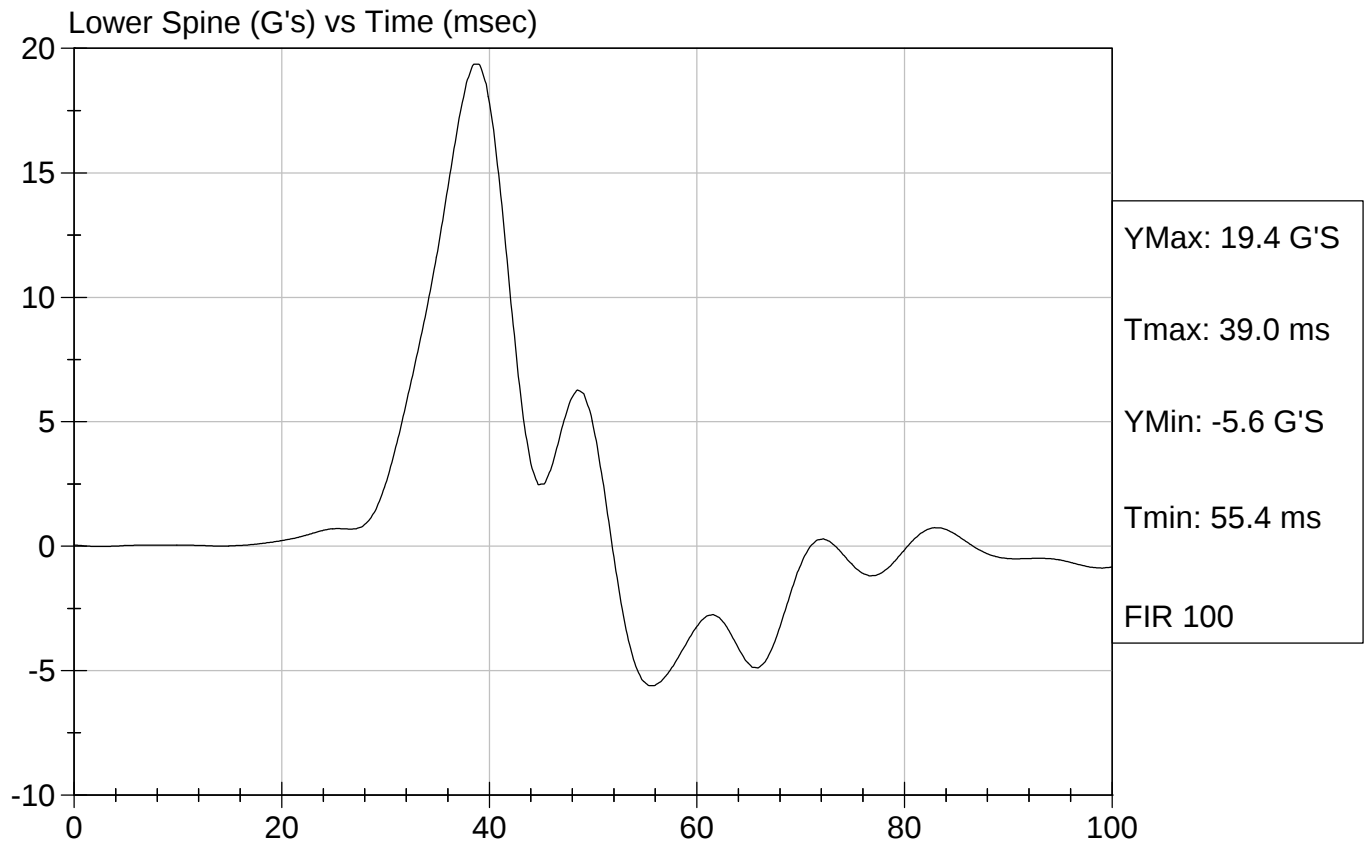
Test Date: 11/20/2003
Speed: 14.12 ft/sec, 4.30 m/sec





Test Desc: Thorax Impact
Component ID: D031872

Test Date: 11/20/2003
Speed: 14.12 ft/sec, 0.00 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Test

ATD Serial No: 271

Test I.D: D031873

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	31	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	44	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

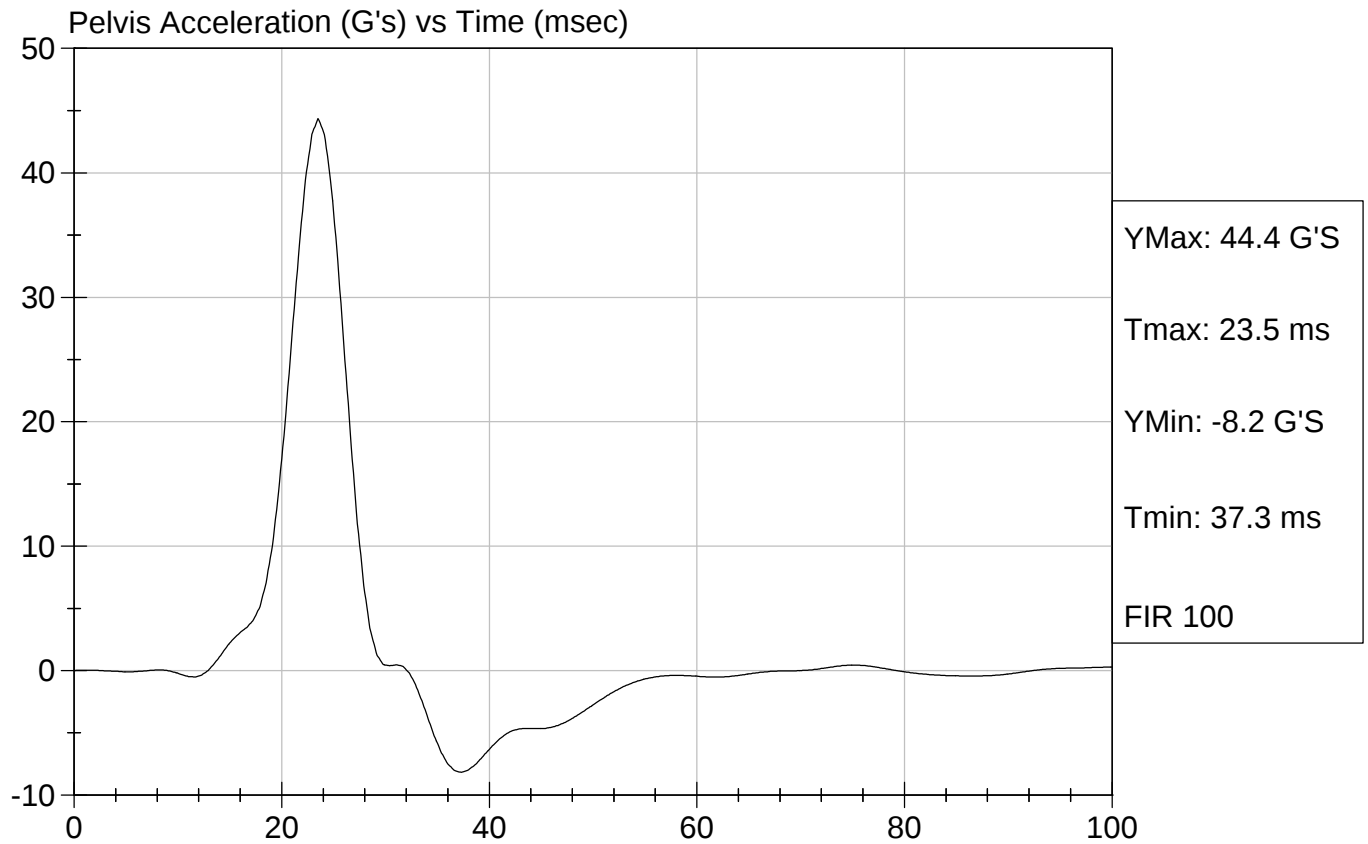
Shetalika Jaiswal
Approved By

11/20/2003
Test Date



Test Desc: Pelvis Impact
Component ID: D031873

Test Date: 11/20/2003
Speed: 14.12 ft/sec, 4.30 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 271

Test I.D: D031874

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Force At 12.7 mm	N	104 -162	142	Pass
Force At 19 mm	N	163 - 222	200	Pass
Force At 25.4 mm	N	222 - 280	268	Pass
Force At 33 mm	N	325 - 391	372	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

Shetalika Jaiswal
Approved By

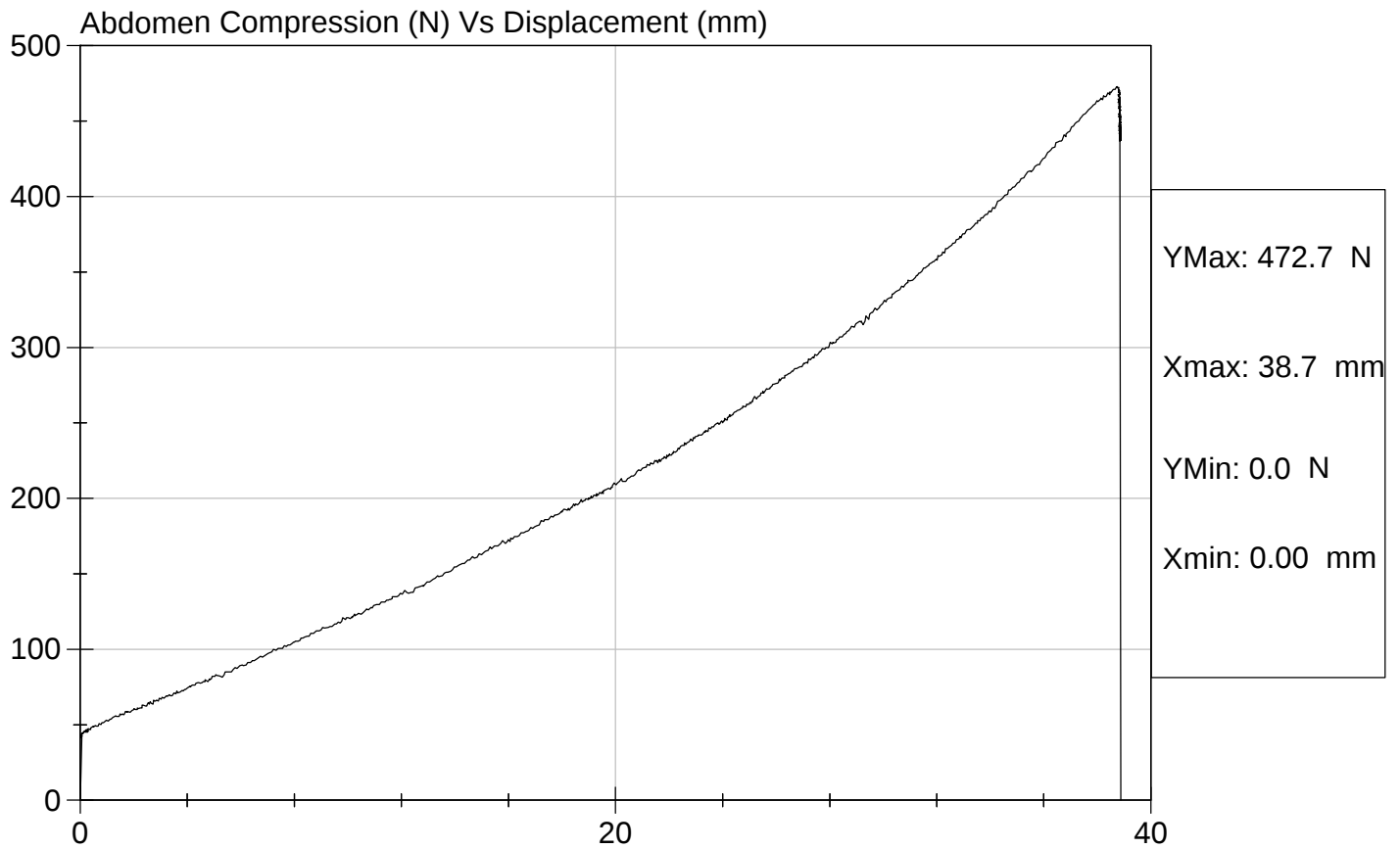
11/19/2003
Test Date



Test Description: Abdomen Compression Test Date: 11/19/2003

Component: D031874

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 271

Test I.D: D031875

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	28	Pass
Force At 0 deg	N	0 - 26.7	0.0	Pass
Force At 20 deg	N	97.9 - 151.2	125.4	Pass
Force At 30 deg	N	151.2 - 204.6	177.6	Pass
Force At 40 deg	N	204.6 - 258.0	229.9	Pass
Return Angle	Deg	12 Maximum	5	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

Shetalika Jaiswal
Approved By

11/19/2003
Test Date

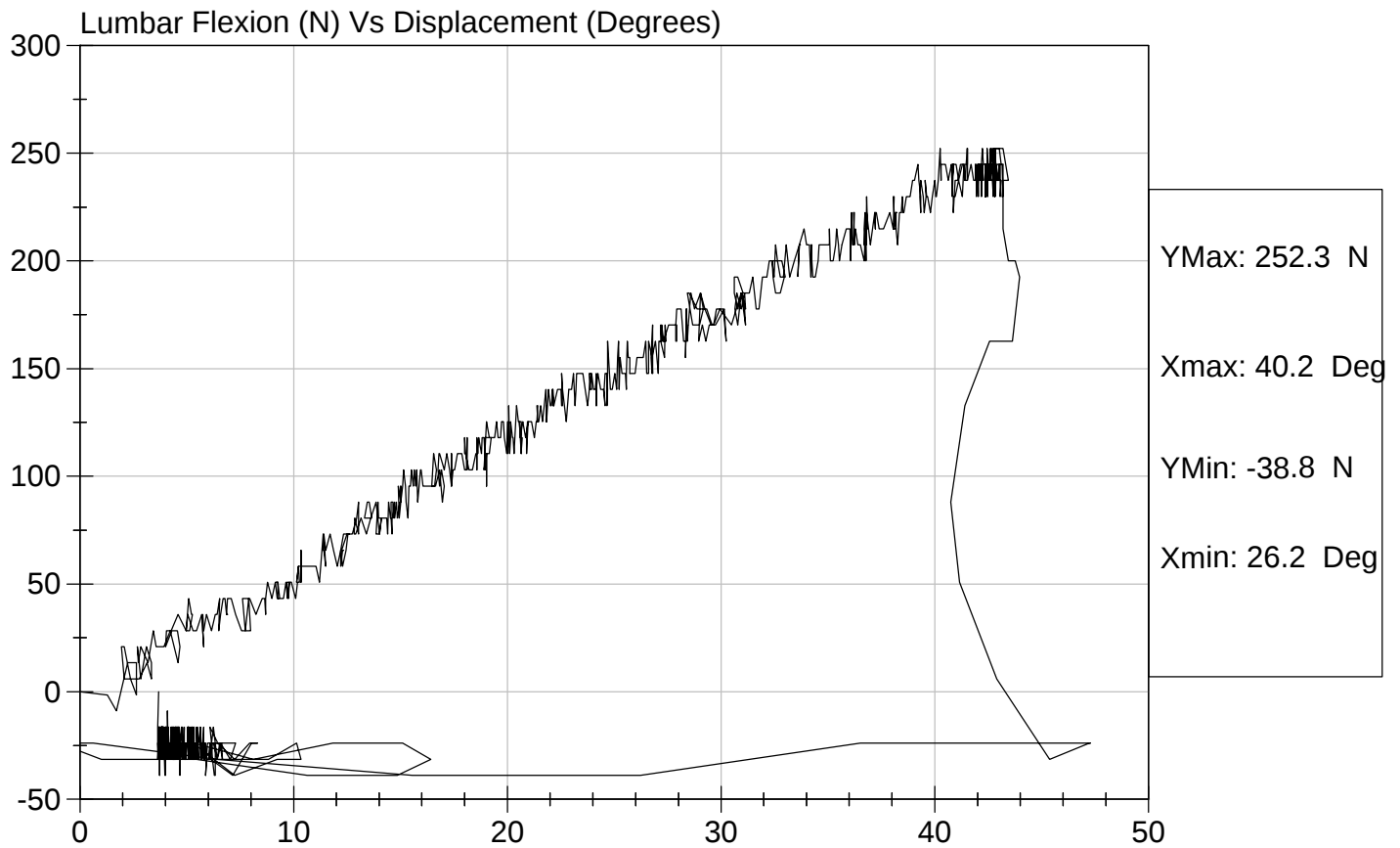


Test Description: Lumbar Flexion

Test Date: 11/19/2003

Component: D031875

Speed: 0 ft/sec, 0 m/sec



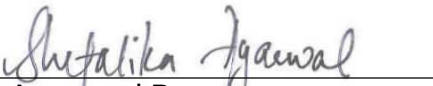
SID Calibration Data Sheet
Side Impact Dummy (SID)
Neck Pendulum Test

ATD Serial No: 271

Test I.D: D031879

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	28	Pass
Impact Velocity		m/s	6.89 to 7.13	7.03	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.39	Pass
	20 msec	m/s	4.12 to 5.10	4.73	Pass
	30 msec	m/s	5.73 to 7.01	6.54	Pass
	40 to 70 msec	m/s	6.27 to 7.64	7.01	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	75	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	61	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	79	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	55	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	9	Pass


 Laboratory Technician

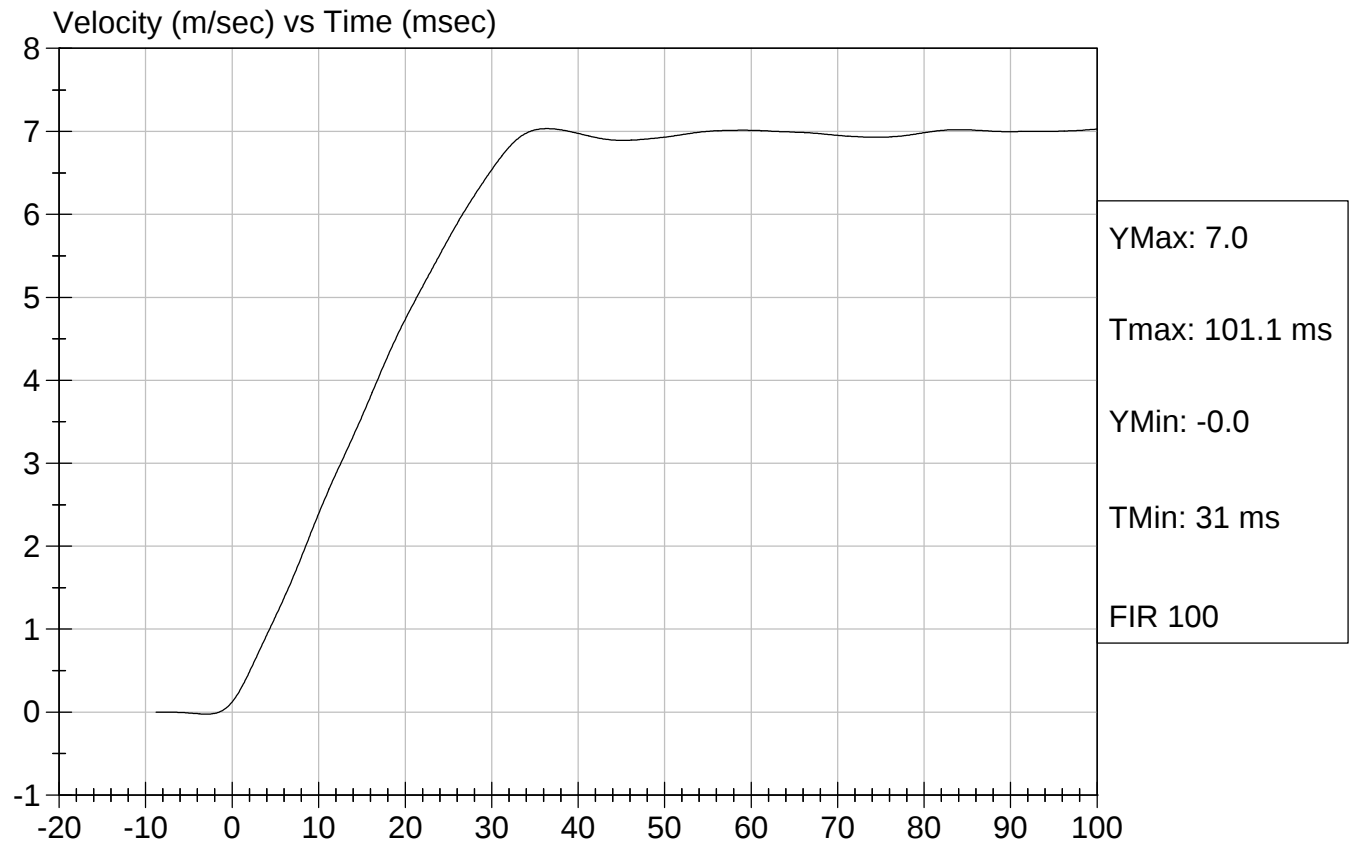

 Approved By

11/19/2003
 Test Date



Test Desc: Neck Bending
Component ID: D031879

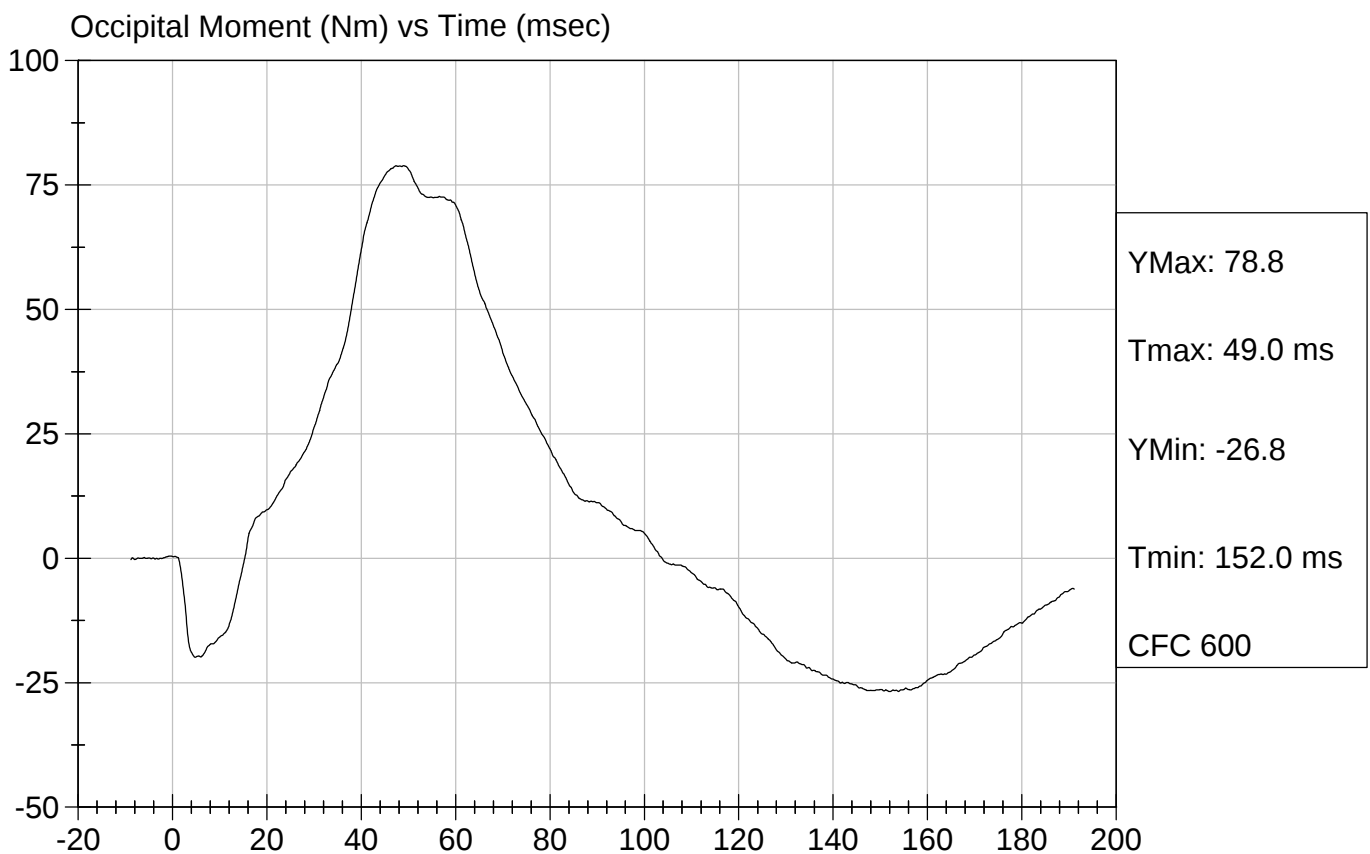
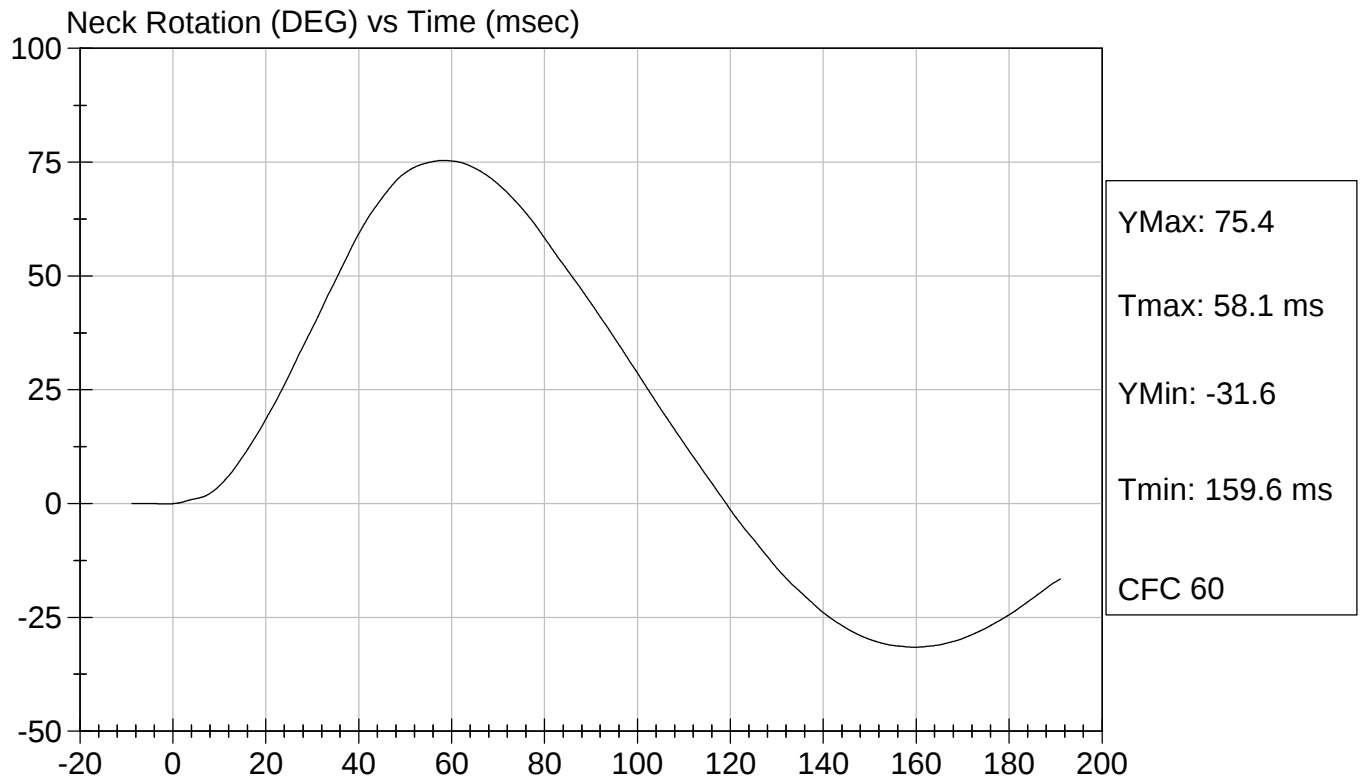
Test Date: 11/19/2003
Speed: 23.05 ft/sec, 7.03 m/sec





Test Desc: Neck Bending
Component ID: D031879

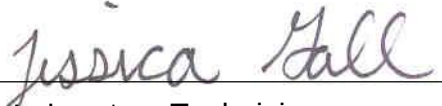
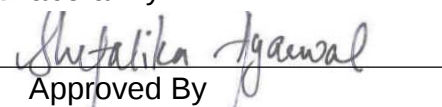
Test Date: 11/19/2003
Speed: 23.05 ft/sec, 7.03 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Inspection Checklist

ATD Serial No: 271

Test Part	Items Checked	Result
Skin	Visual inspection	Pass
Head	Visual, ballast, accelerometer mount	Pass
Neck	Visual	Pass
Spine Box	Visual, ballast, accelerometer mount	Pass
Rib Cage	Visual, measure	Pass
Sternum	Visual	Pass
Lumbar Spine	Visual	Pass
Abdomen	Visual	Pass
Pelvis	Visual, palpate, accelerometer mount	Pass
Upper Legs	Visual	Pass
Knees	Visual	Pass
Lower Legs	Visual, range of motion	Pass
Ankles	Visual, range of motion	Pass
Feet	Visual, range of motion	Pass
Joints	1 to 2 g range	Pass
Other		Pass


 Laboratory Technician

 Approved By

11/12/2003
 Test Date

CERTIFICATION DATA

Dummy Serial Number: 904

Calibration Test Results Summary

Dummy Serial Number: 904

Post-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

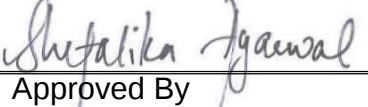
SID Calibration Data Sheet
Side Impact Dummy
External Measurements

ATD Serial No: 904

Test I.D: D03205

Tested Parameter	Units	Specification	Result	Pass/Fail
SH - Seated Height	mm	889 - 909	903	Pass
RH - Rib Height	mm	501 - 521	509	Pass
HP - Hip Pivot Height	mm	99 ref.	99	Pass
RD - Rib from Back Line	mm	229 - 241	240	Pass
KV - Knee Pivot to Back Line	mm	511 - 526	525	Pass
SW - Knee Pivot to Floor	mm	490 - 505	500	Pass
HW - Hip Width	mm	356 - 391	368	Pass
Overall Test Results			Pass	


 Laboratory Technician


 Approved By

11/12/2003
 Test Date

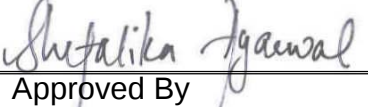
SID Calibration Data Sheet
Side Impact Dummy
Head Drop Calibration (Lateral)

ATD Serial No: 904

Test I.D: D032051

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Peak Resultant Acceleration	G's	120 to 150	150	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-7	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

12/11/2003
Test Date



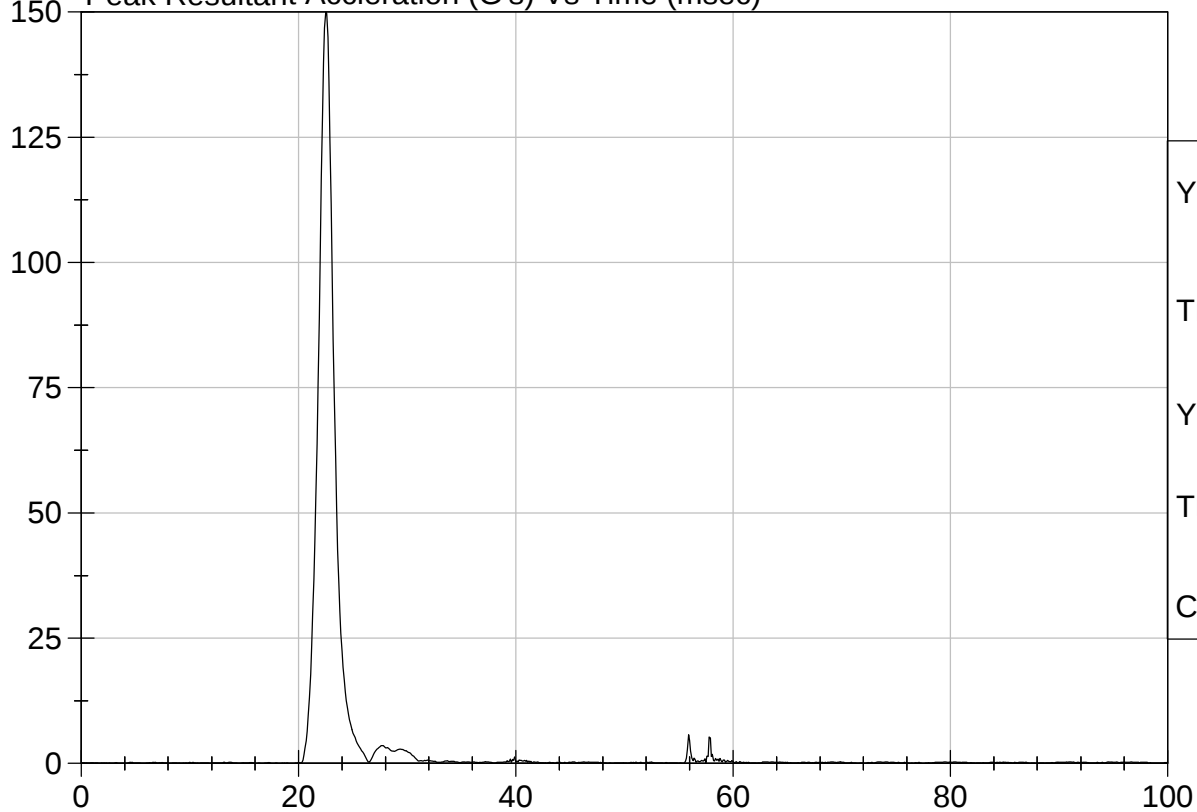
Test Description: Head Drop

Test Date: 12/11/2003

Component: D032051

Speed: 0 ft/s, 0.00 m/s

Peak Resultant Acceleration (G's) Vs Time (msec)



YMax: 150.0 G

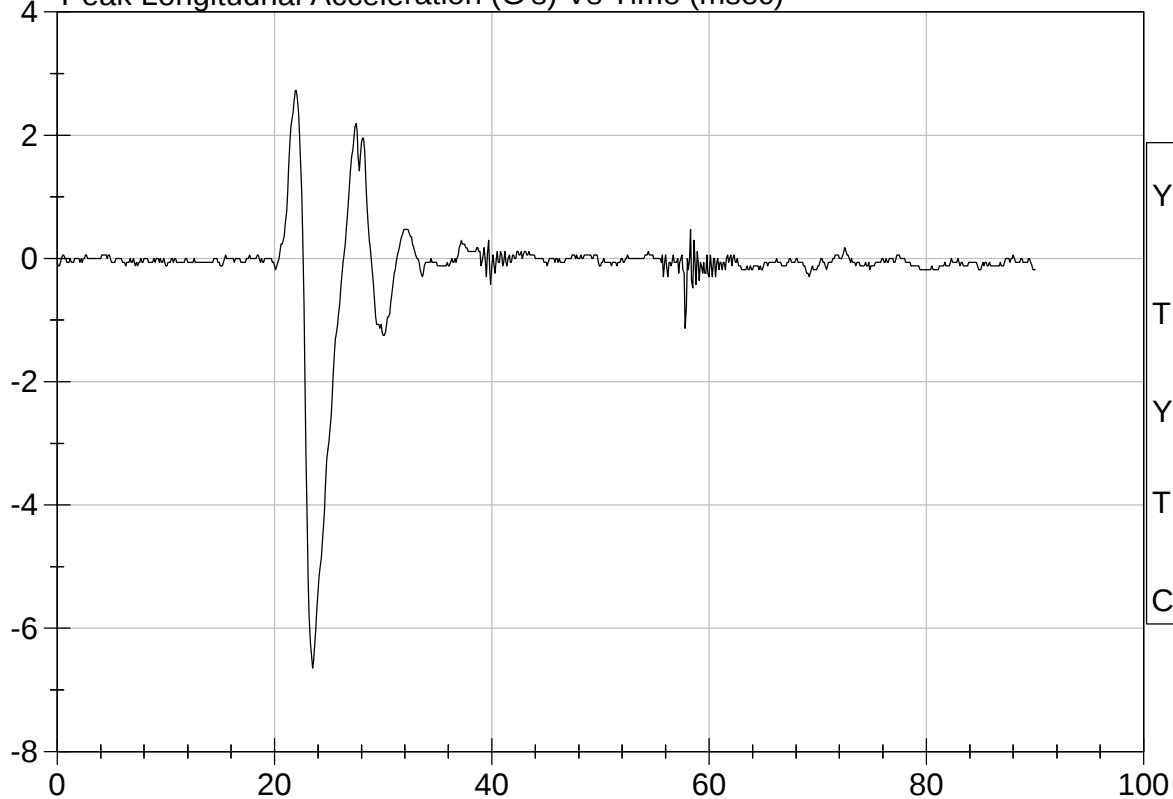
Tmax: 22.5 ms

YMin: 0.0 G

Tmin: -0.4 ms

CFC 1000

Peak Longitudnal Acceleration (G's) Vs Time (msec)



YMax: 2.7 G

Tmax: 21.9 ms

YMin: -6.6 G

Tmin: 23.5 ms

CFC 1000

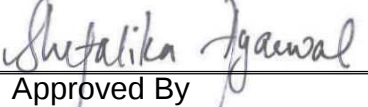
SID Calibration Data Sheet
Side Impact Dummy
Thorax Impact Test

ATD Serial No: 904

Test I.D: D032052

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Upper Rib	G's	37 - 46	41	Pass
Lower Rib	G's	37 - 46	40	Pass
Lower Spine	G's	15 - 22	19	Pass
Overall Test Results				Pass


Laboratory Technician

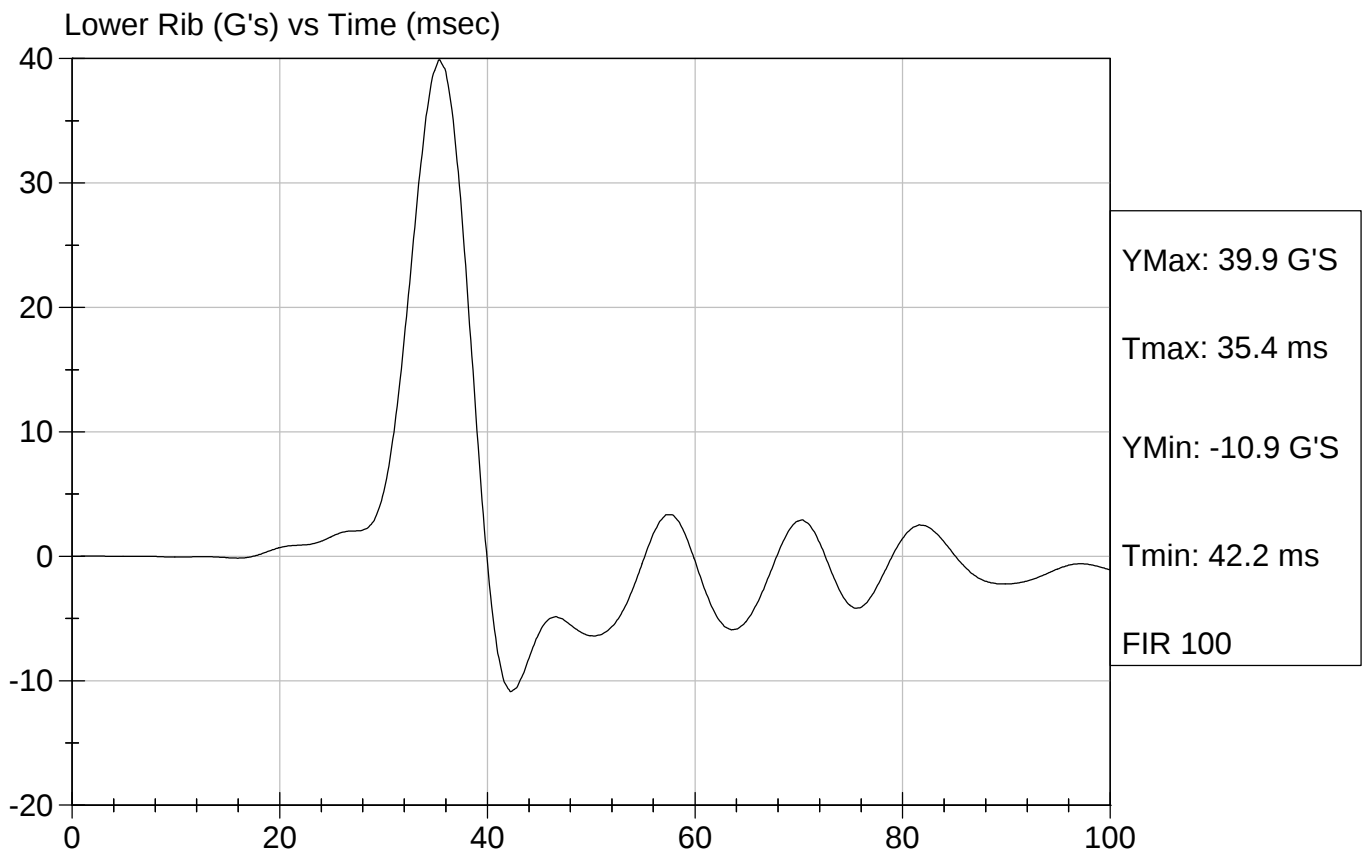
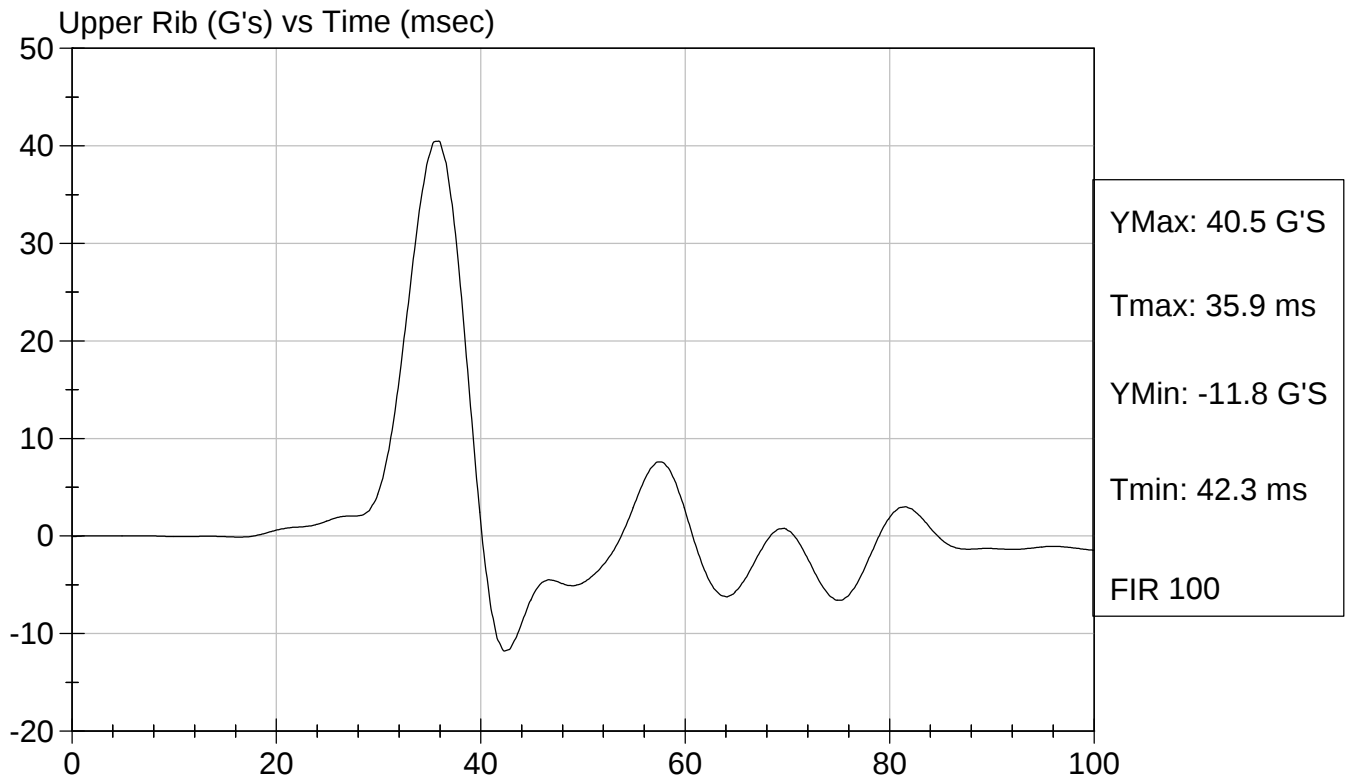

Approved By

12/11/2003
Test Date



Test Desc: Thorax Impact
Component ID: D032052

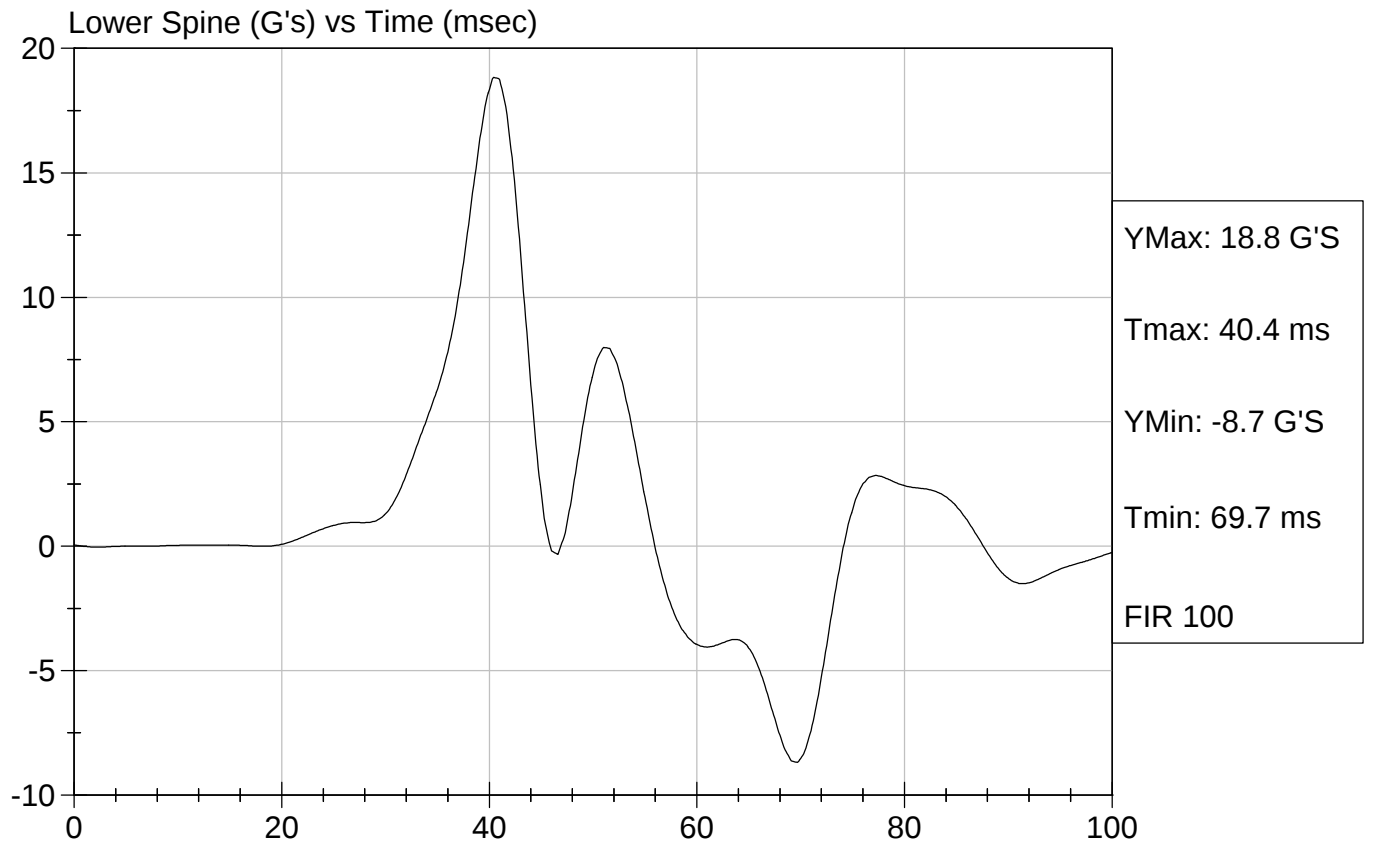
Test Date: 12/11/2003
Speed: 14.1 ft/sec, 4.30 m/sec





Test Desc: Thorax Impact
Component ID: D032052

Test Date: 12/11/2003
Speed: 14.1 ft/sec, 4.30 m/sec



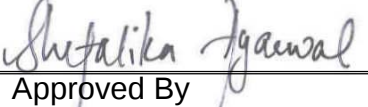
SID Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Test

ATD Serial No: 904

Test I.D: D032053

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Probe Velocity	m/s	4.27 - 4.33	4.29	Pass
Pelvis Acceleration	G's	40 - 60	44	Pass
Overall Test Results				Pass


Laboratory Technician

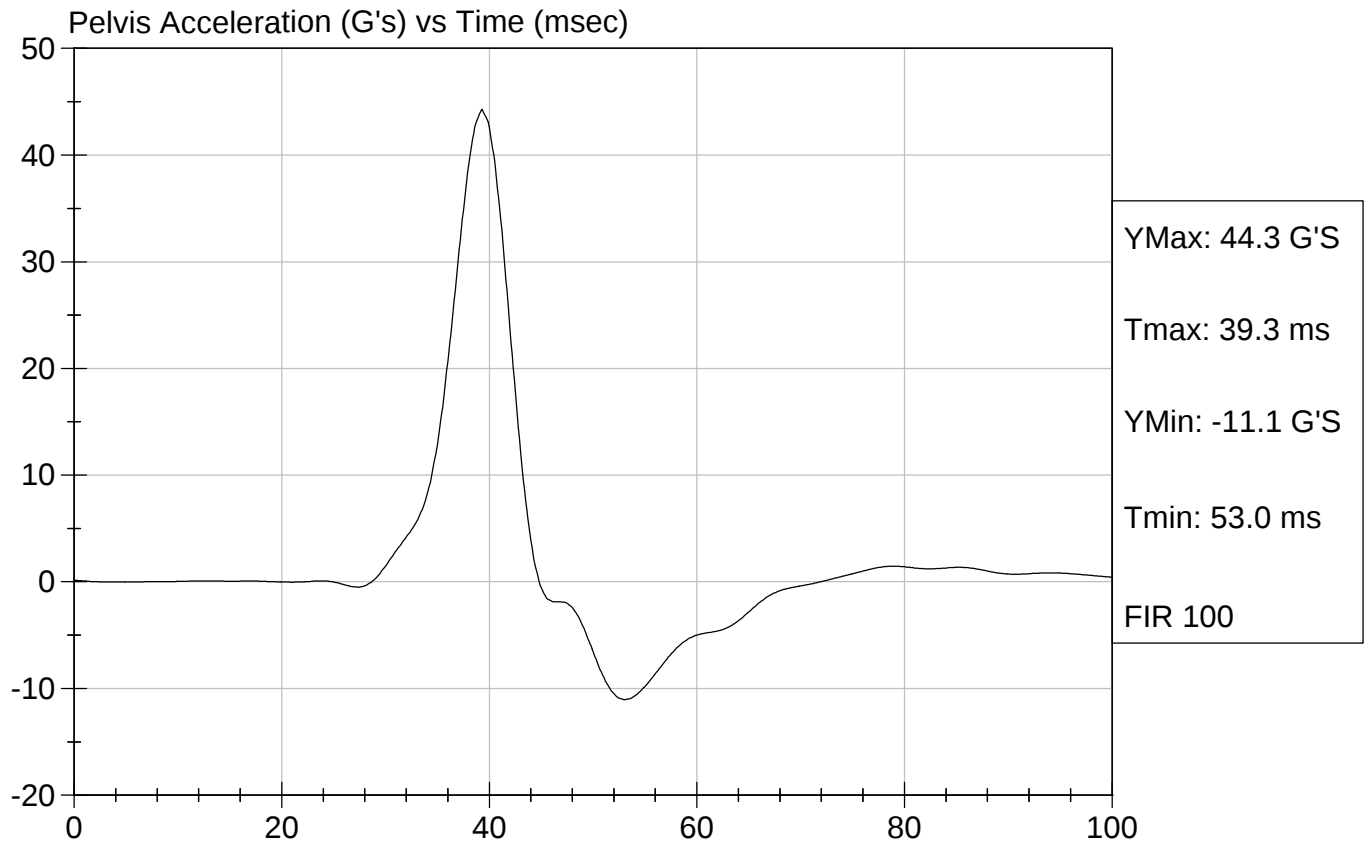

Approved By

12/11/2003
Test Date



Test Desc: Pelvis Impact
Component ID: D032053

Test Date: 12/11/2003
Speed: 14.06 ft/sec, 4.29 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 904

Test I.D: D032054

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	19.6	Pass
Laboratory Relative Humidity	%	10 to 70	23	Pass
Force At 12.7 mm	N	104 -162	139	Pass
Force At 19 mm	N	163 - 222	192	Pass
Force At 25.4 mm	N	222 - 280	254	Pass
Force At 33 mm	N	325 - 391	338	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

Shetalika Gansal
Approved By

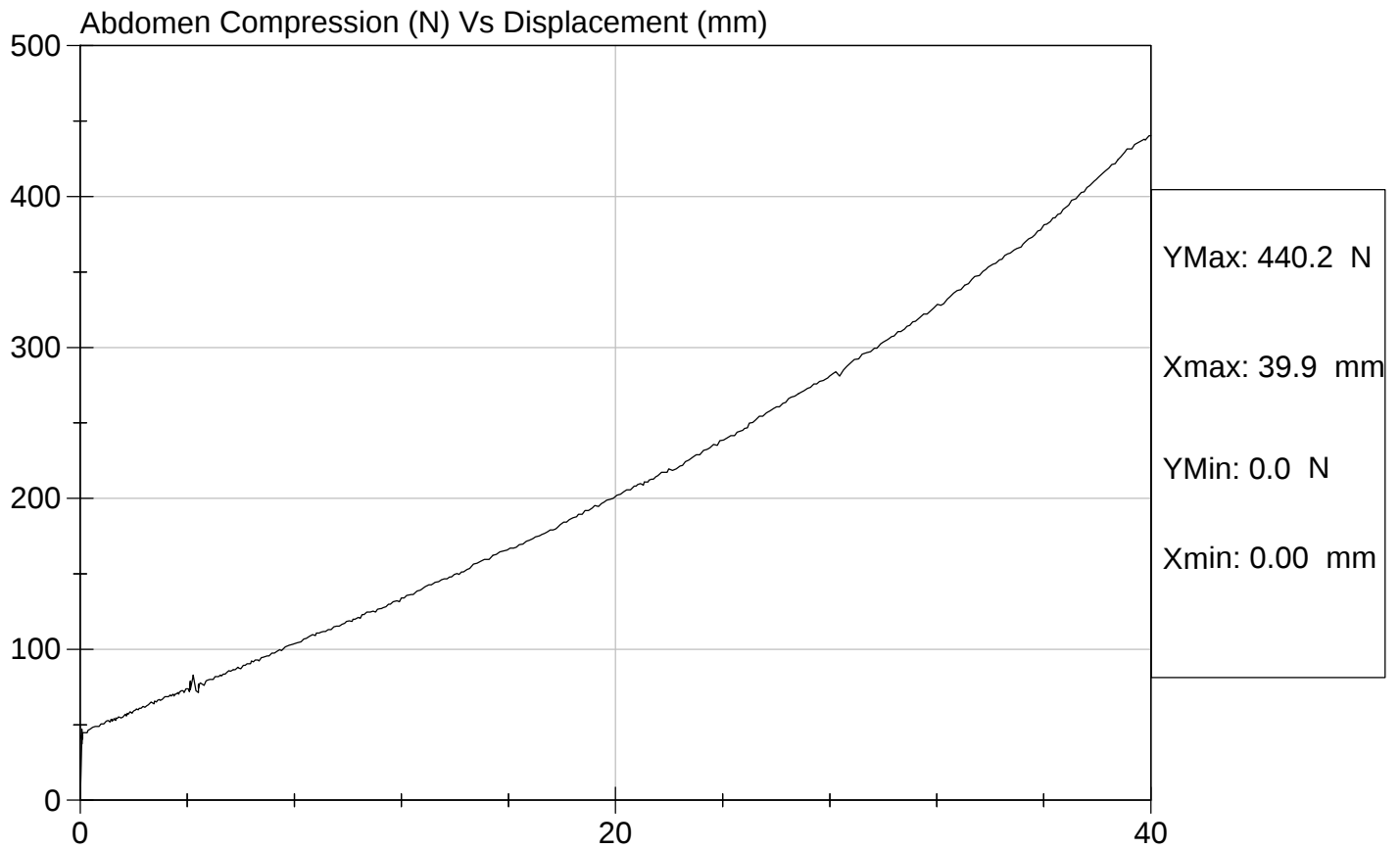
12/11/2003
Test Date



Test Description: Abdomen Compression Test Date: 12/11/2003

Component: D032054

Speed: 0 ft/sec, 0 m/sec



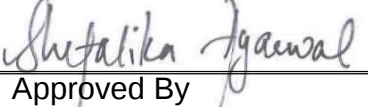
SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 904

Test I.D: D032055

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	35	Pass
Force At 0 deg	N	0 - 26.7	0.0	Pass
Force At 20 deg	N	97.9 - 151.2	137.7	Pass
Force At 30 deg	N	151.2 - 204.6	175.0	Pass
Force At 40 deg	N	204.6 - 258.0	257.2	Pass
Return Angle	Deg	12 Maximum	4	Pass
			Overall Test Results	Pass


 Laboratory Technician


 Approved By

12/10/2003
 Test Date

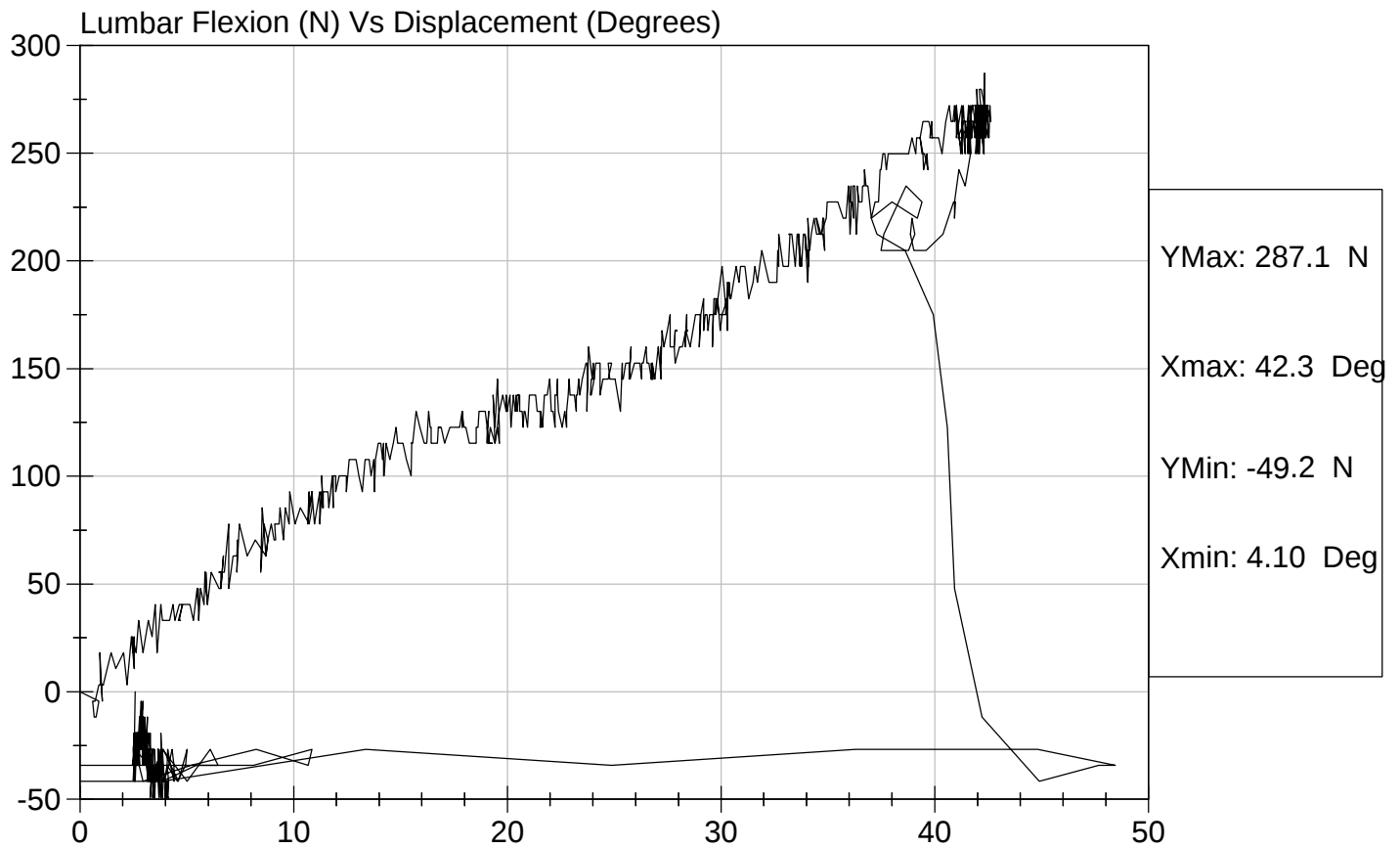


Test Description: Lumbar Flexion

Test Date: 12/10/2003

Component: D032055

Speed: 0 ft/sec, 0 m/sec



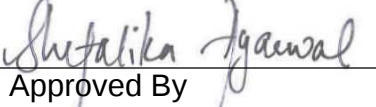
SID Calibration Data Sheet
Side Impact Dummy (SID)
Neck Pendulum Test

ATD Serial No: 904

Test I.D: D032059

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	35	Pass
Impact Velocity		m/s	6.89 to 7.13	6.90	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.27	Pass
	20 msec	m/s	4.12 to 5.10	4.49	Pass
	30 msec	m/s	5.73 to 7.01	6.30	Pass
	40 to 70 msec	m/s	6.27 to 7.64	7.09	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	69	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	60	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	80	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	53	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	9	Pass


 Laboratory Technician

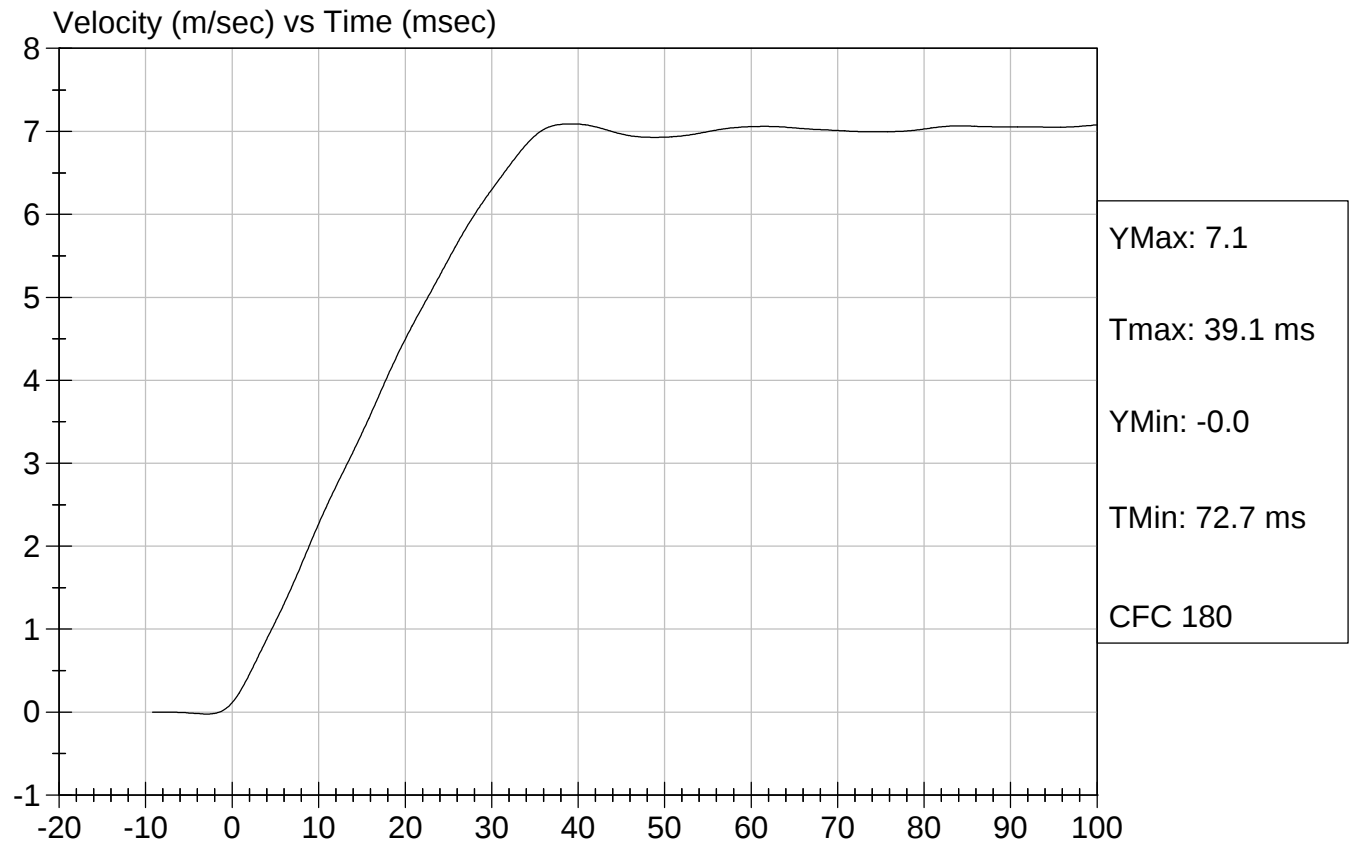

 Approved By

12/10/2003
 Test Date



Test Desc: Neck Bending
Component ID: D032059

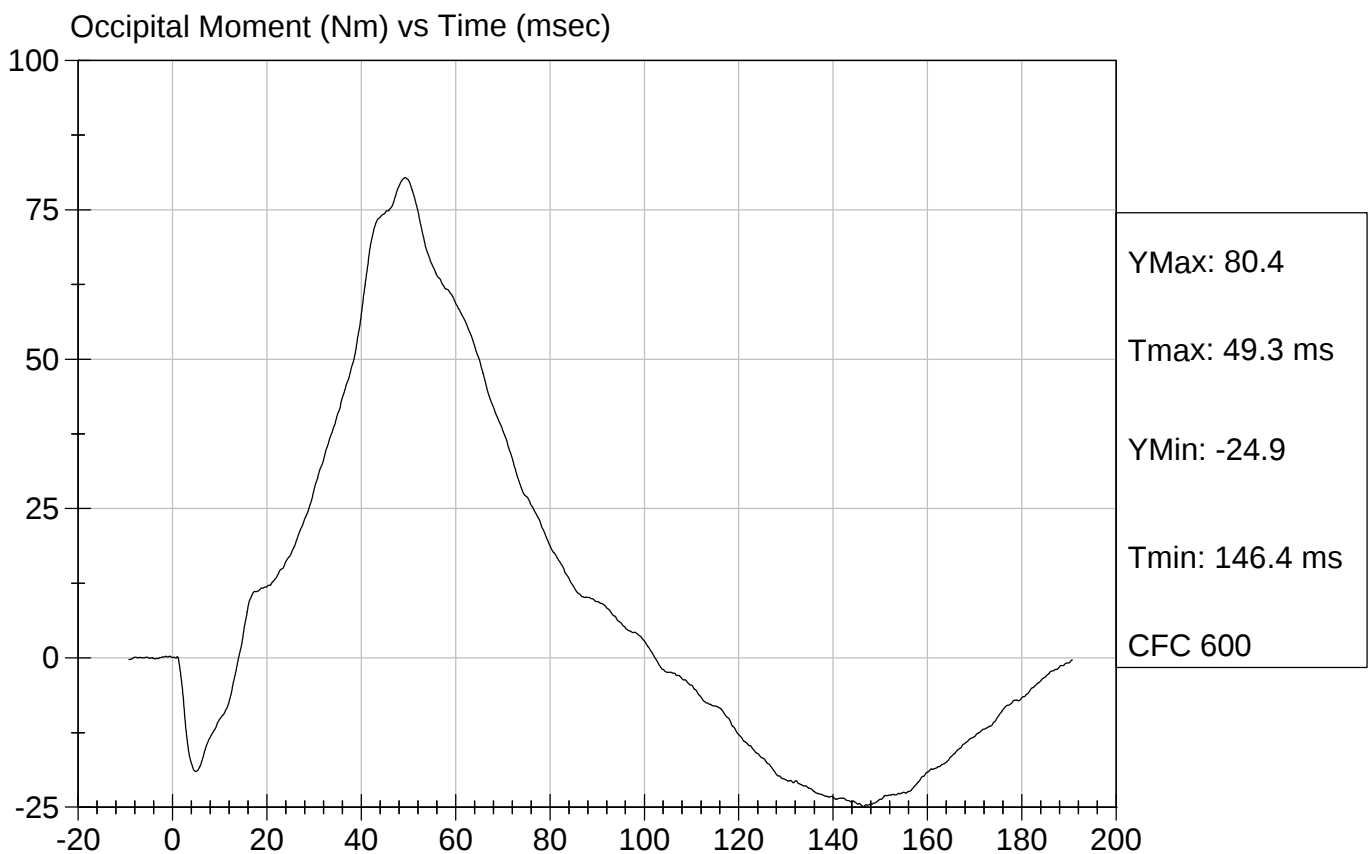
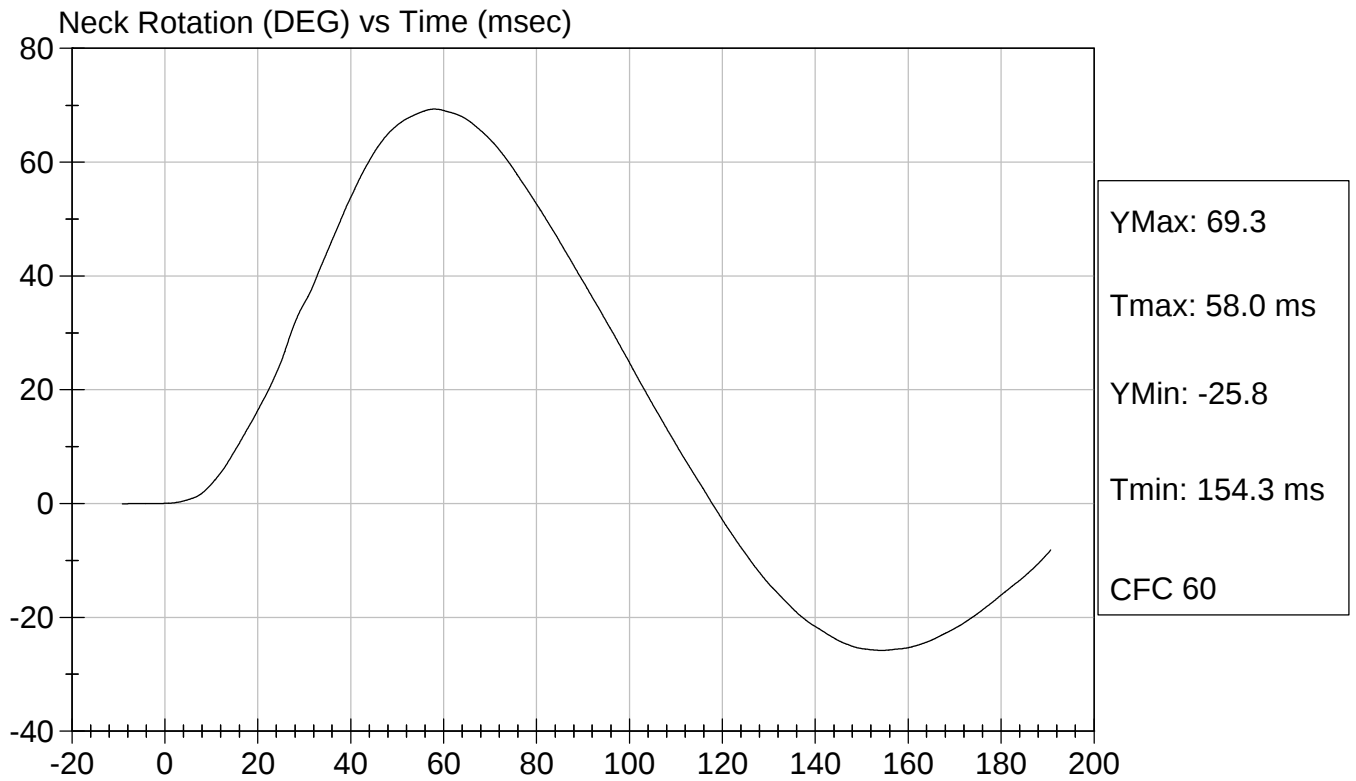
Test Date: 12/10/2003
Speed: 22.64 ft/sec, 6.90 m/sec





Test Desc: Neck Bending
Component ID: D032059

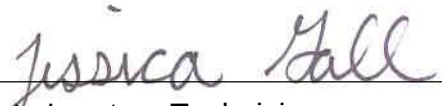
Test Date: 12/10/2003
Speed: 22.64 ft/sec, 6.90 m/sec

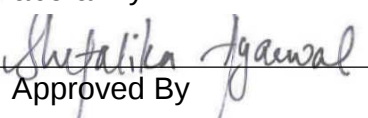


SID Calibration Data Sheet
Side Impact Dummy
Inspection Checklist

ATD Serial No: 904

Test Part	Items Checked	Result
Skin	Visual inspection	Pass
Head	Visual, ballast, accelerometer mount	Pass
Neck	Visual	Pass
Spine Box	Visual, ballast, accelerometer mount	Pass
Rib Cage	Visual, measure	Pass
Sternum	Visual	Pass
Lumbar Spine	Visual	Pass
Abdomen	Visual	Pass
Pelvis	Visual, palpate, accelerometer mount	Pass
Upper Legs	Visual	Pass
Knees	Visual	Pass
Lower Legs	Visual, range of motion	Pass
Ankles	Visual, range of motion	Pass
Feet	Visual, range of motion	Pass
Joints	1 to 2 g range	Pass
Other		Pass


 Laboratory Technician


 Approved By

12/11/2003
 Test Date

CERTIFICATION DATA

Dummy Serial Number: 271

Calibration Test Results Summary

Dummy Serial Number: 271

Post-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

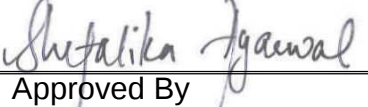
SID Calibration Data Sheet
Side Impact Dummy
External Measurements

ATD Serial No: 271

Test I.D: D03204

Tested Parameter	Units	Specification	Result	Pass/Fail
SH - Seated Height	mm	889 - 909	905	Pass
RH - Rib Height	mm	501 - 521	502	Pass
HP - Hip Pivot Height	mm	99 ref.	99	Pass
RD - Rib from Back Line	mm	229 - 241	239	Pass
KV - Knee Pivot to Back Line	mm	511 - 526	526	Pass
SW - Knee Pivot to Floor	mm	490 - 505	497	Pass
HW - Hip Width	mm	356 - 391	371	Pass
Overall Test Results			Pass	


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 Approved By

11/12/2003
 Test Date

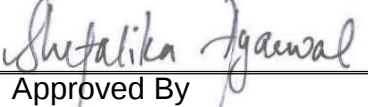
SID Calibration Data Sheet
Side Impact Dummy
Head Drop Calibration (Lateral)

ATD Serial No: 271

Test I.D: D032041

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Peak Resultant Acceleration	G's	120 to 150	138	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-7	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

12/11/2003
Test Date



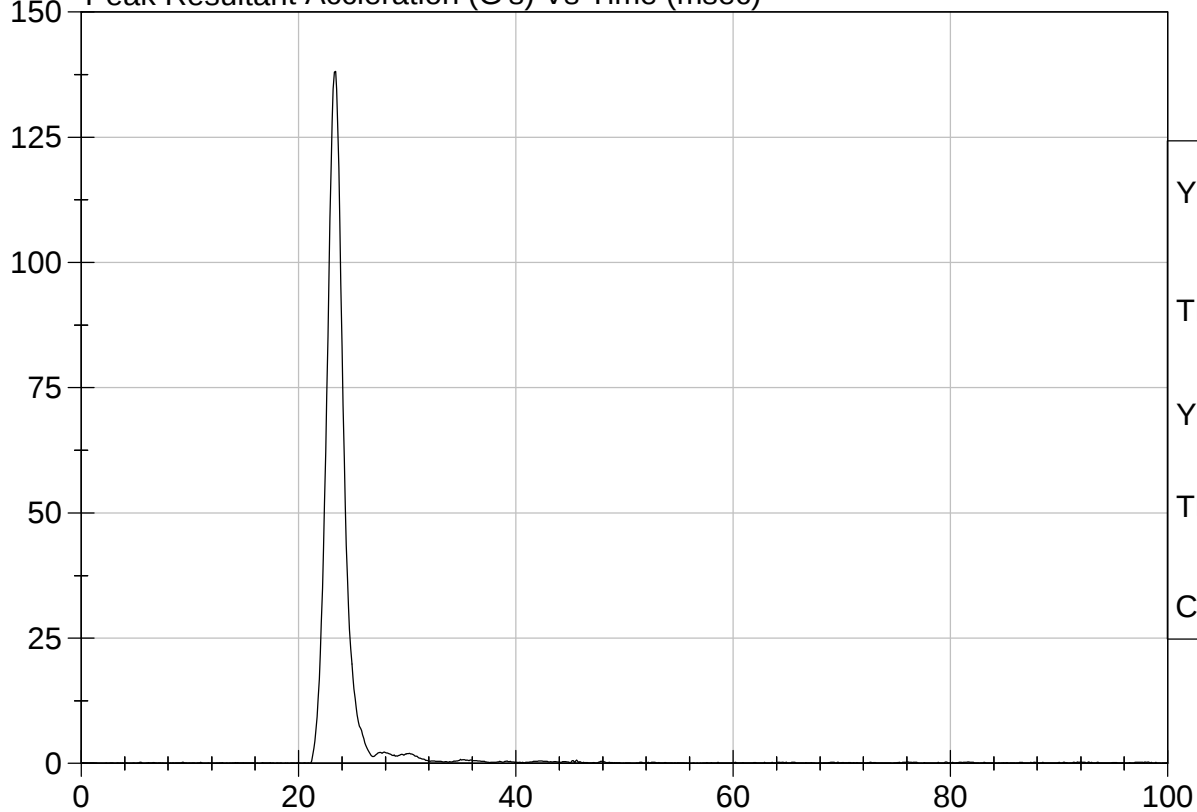
Test Description: Head Drop

Test Date: 12/11/2003

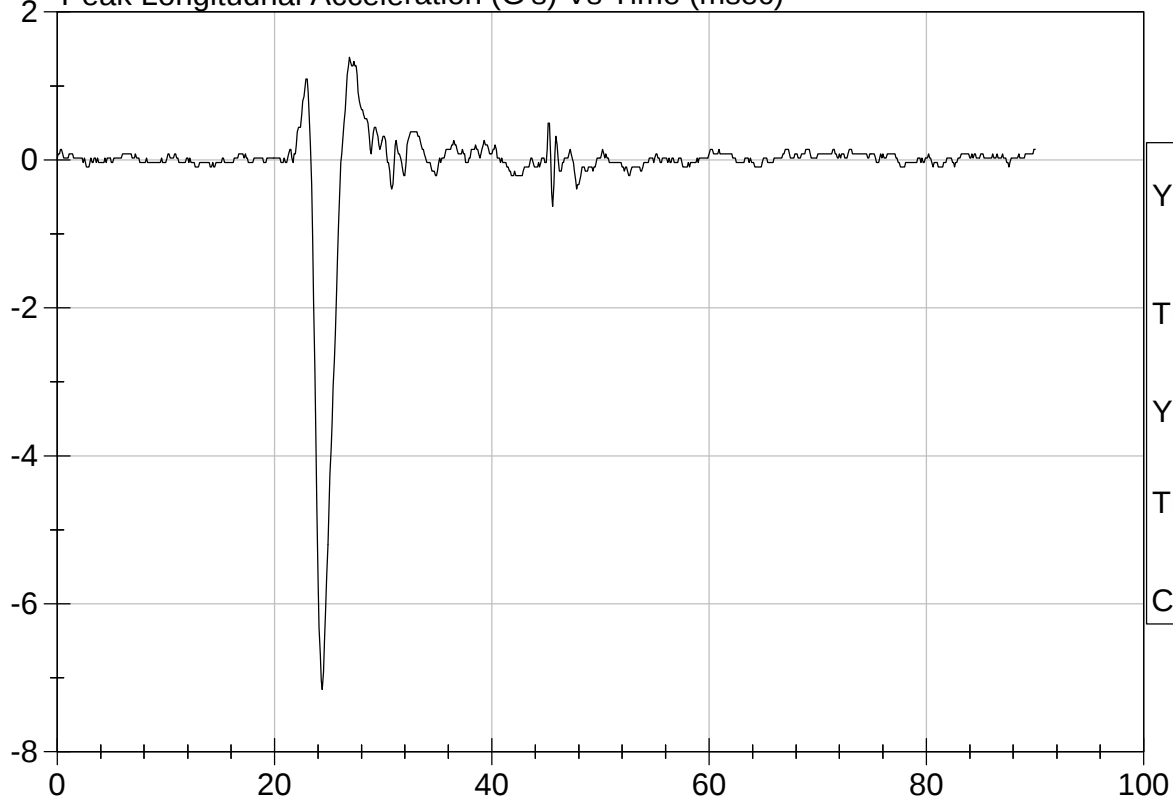
Component: D032041

Speed: 0 ft/s, 0.00 m/s

Peak Resultant Acceleration (G's) Vs Time (msec)



Peak Longitudnal Acceleration (G's) Vs Time (msec)



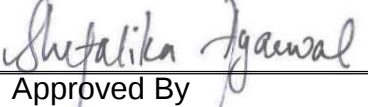
SID Calibration Data Sheet
Side Impact Dummy
Thorax Impact Test

ATD Serial No: 271

Test I.D: D032042

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Probe Velocity	m/s	4.27 - 4.33	4.30	Pass
Upper Rib	G's	37 - 46	45	Pass
Lower Rib	G's	37 - 46	44	Pass
Lower Spine	G's	15 - 22	20	Pass
Overall Test Results				Pass


Laboratory Technician

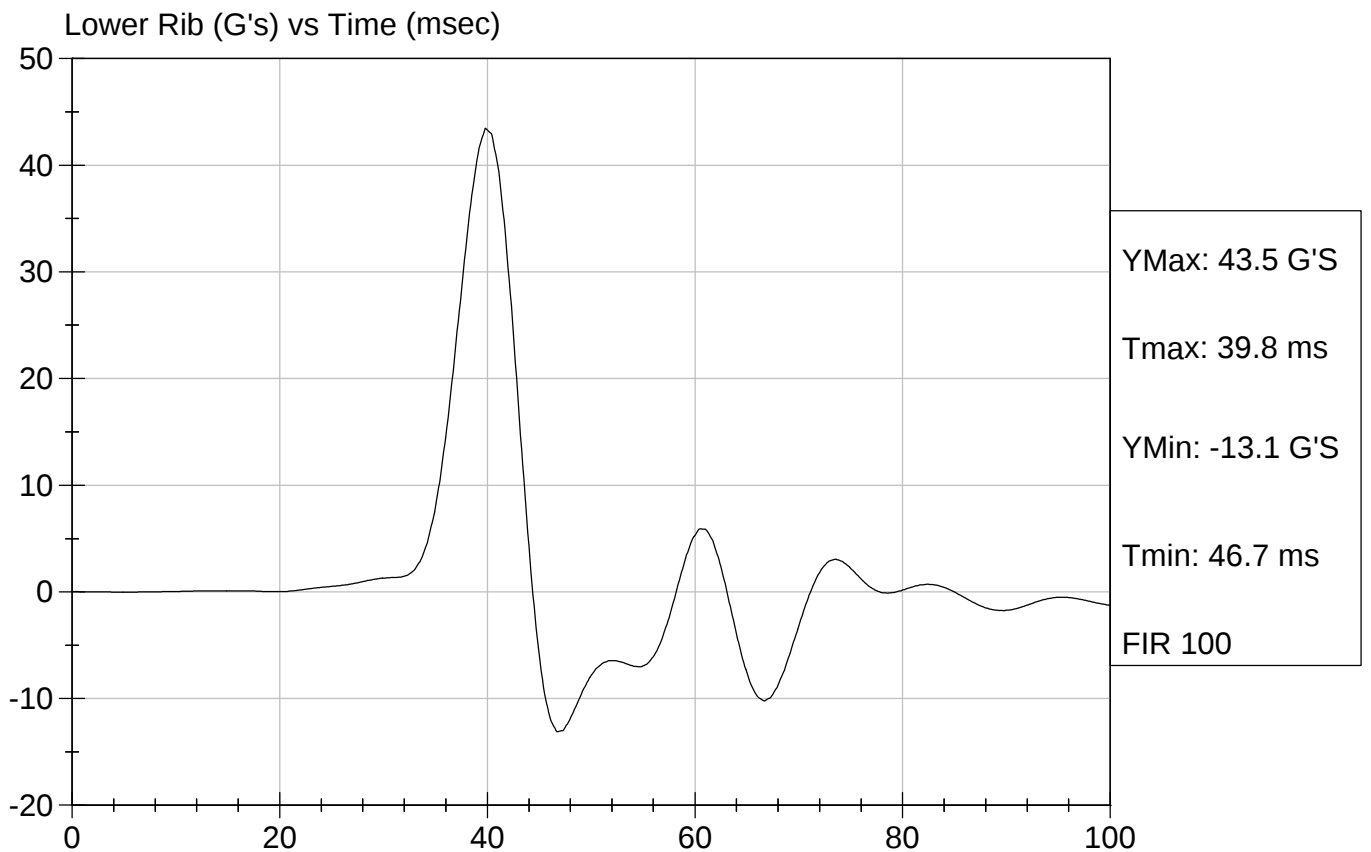
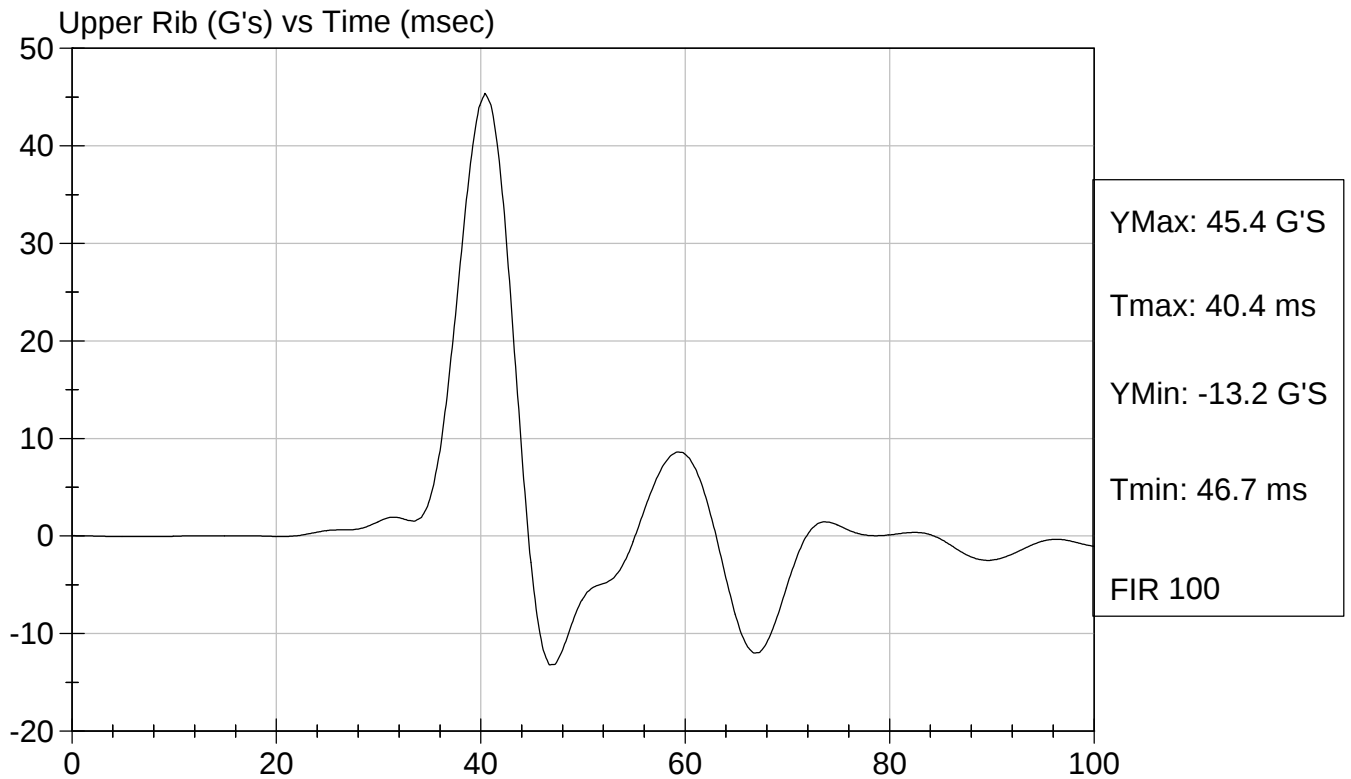

Approved By

12/11/2003
Test Date



Test Desc: Thorax Impact
Component ID: D032042

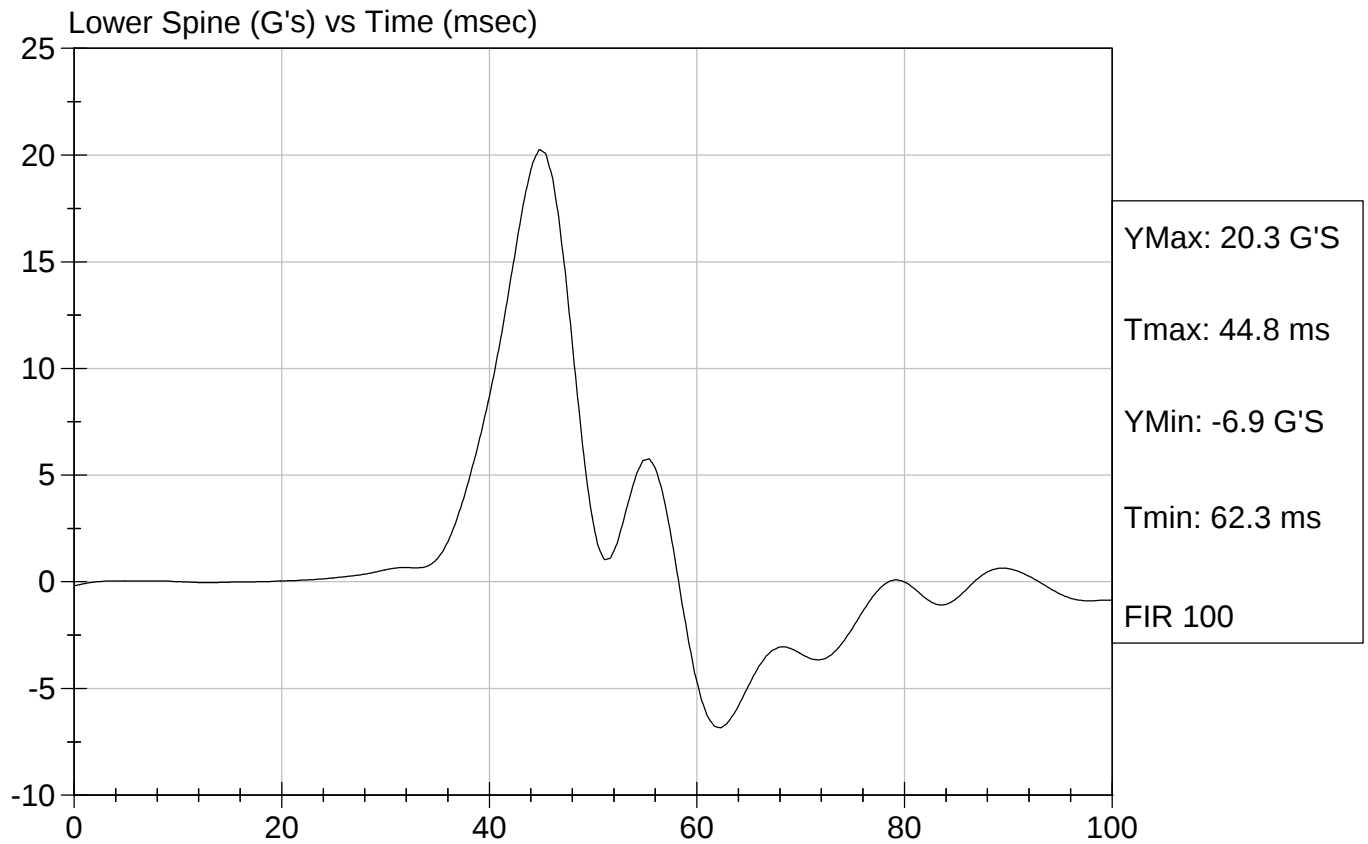
Test Date: 12/11/2003
Speed: 14.11 ft/sec, 4.30 m/sec





Test Desc: Thorax Impact
Component ID: D032042

Test Date: 12/11/2003
Speed: 14.11 ft/sec, 4.30 m/sec



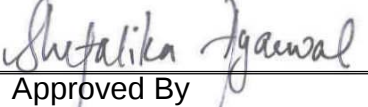
SID Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Test

ATD Serial No: 271

Test I.D: D032043

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Probe Velocity	m/s	4.27 - 4.33	4.32	Pass
Pelvis Acceleration	G's	40 - 60	42	Pass
Overall Test Results				Pass


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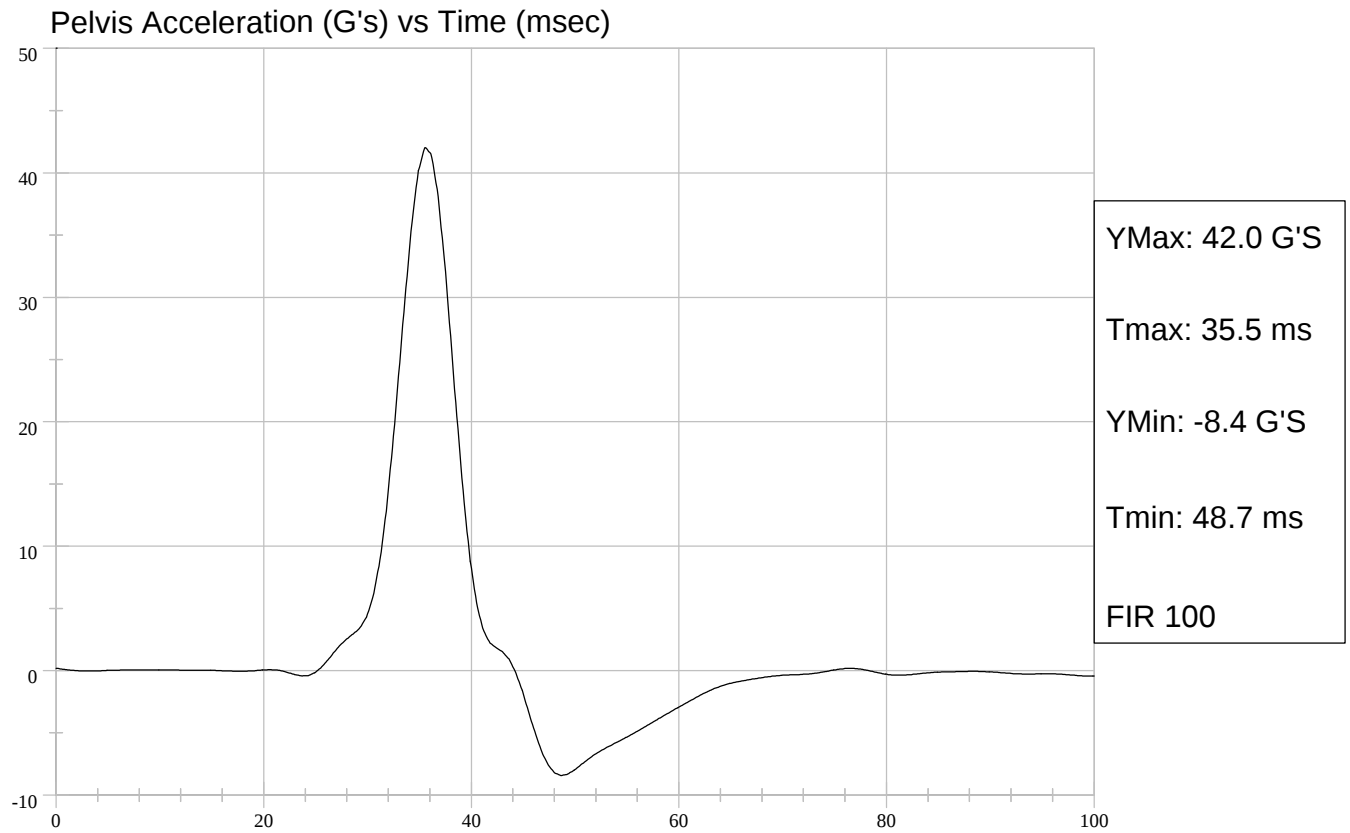

Approved By

12/11/2003
Test Date



Test Desc: Pelvis Impact
Component ID: D032043

Test Date: 12/11/2003
Speed: 14.18 ft/sec, 4.32 m/sec



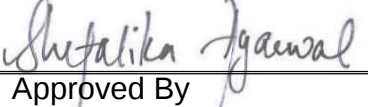
SID Calibration Data Sheet
Side Impact Dummy
Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 271

Test I.D: D032044

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	19.6	Pass
Laboratory Relative Humidity	%	10 to 70	23	Pass
Force At 12.7 mm	N	104 -162	142	Pass
Force At 19 mm	N	163 - 222	195	Pass
Force At 25.4 mm	N	222 - 280	258	Pass
Force At 33 mm	N	325 - 391	347	Pass
Overall Test Results				Pass


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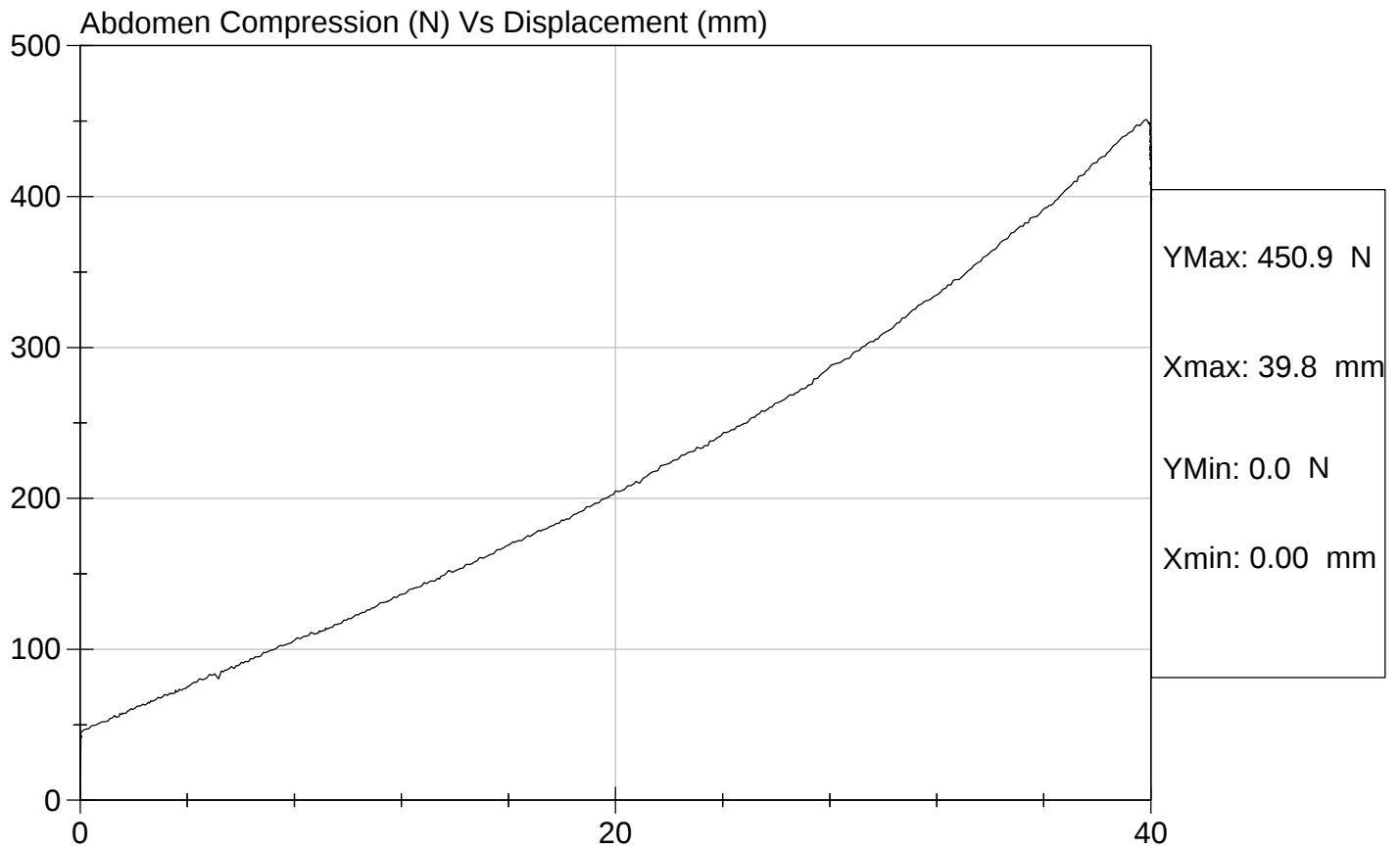
12/11/2003
 Test Date



Test Description: Abdomen Compression Test Date: 12/11/2003

Component: D032044

Speed: 0 ft/sec, 0 m/sec



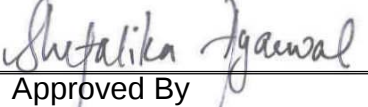
SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 271

Test I.D: D032045

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	35	Pass
Force At 0 deg	N	0 - 26.7	0.0	Pass
Force At 20 deg	N	97.9 - 151.2	114.9	Pass
Force At 30 deg	N	151.2 - 204.6	174.7	Pass
Force At 40 deg	N	204.6 - 258.0	234.4	Pass
Return Angle	Deg	12 Maximum	3	Pass
			Overall Test Results	Pass


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12/10/2003
 Test Date

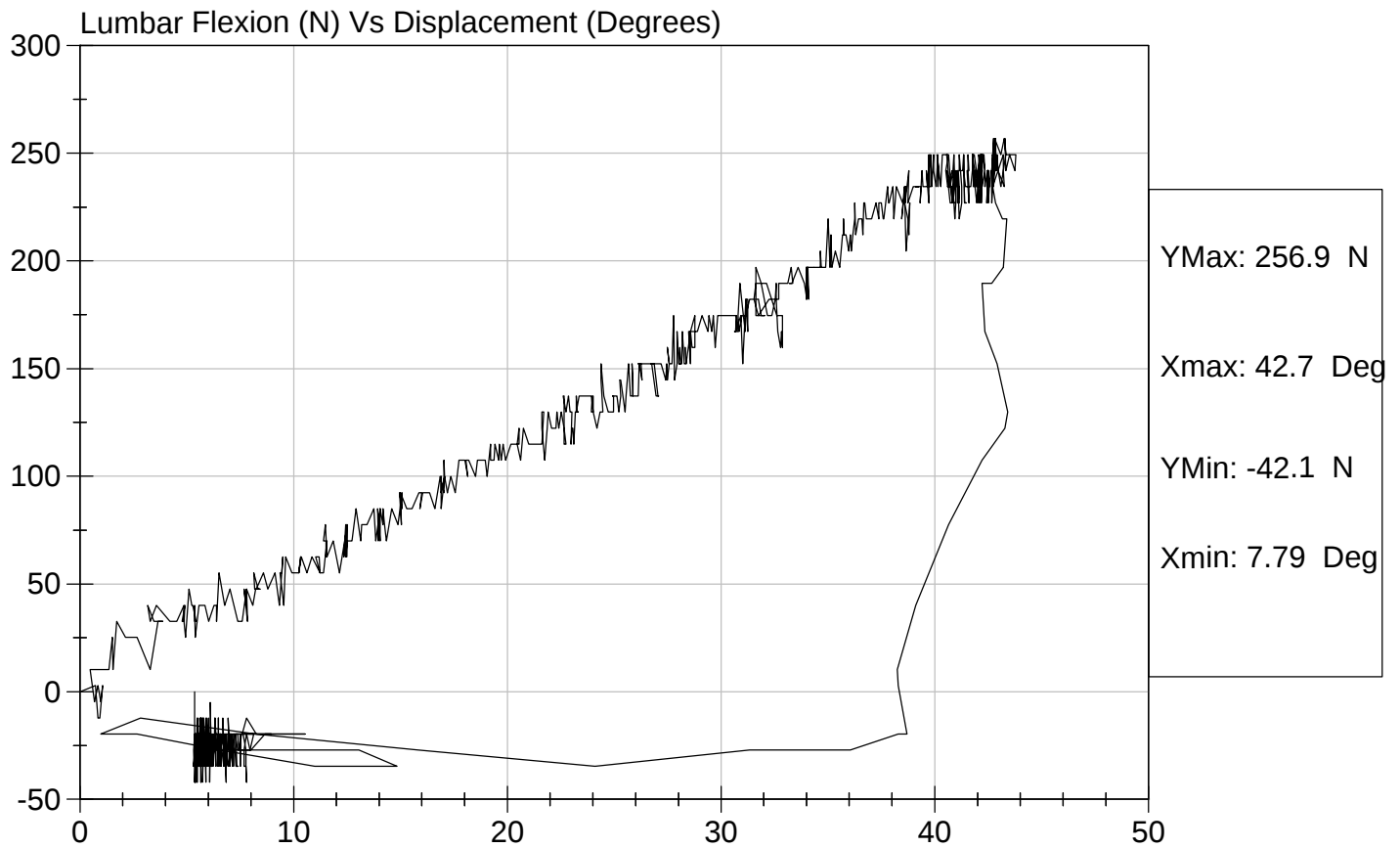


Test Description: Lumbar Flexion

Test Date: 12/10/2003

Component: D032045

Speed: 0 ft/sec, 0 m/sec



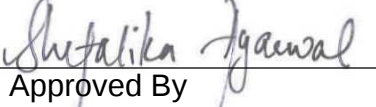
SID Calibration Data Sheet
Side Impact Dummy (SID)
Neck Pendulum Test

ATD Serial No: 271

Test I.D: D032049

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	35	Pass
Impact Velocity		m/s	6.89 to 7.13	7.10	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.19	Pass
	20 msec	m/s	4.12 to 5.10	4.45	Pass
	30 msec	m/s	5.73 to 7.01	6.30	Pass
	40 to 70 msec	m/s	6.27 to 7.64	7.18	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	72	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	61	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	79	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	55	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	11	Pass


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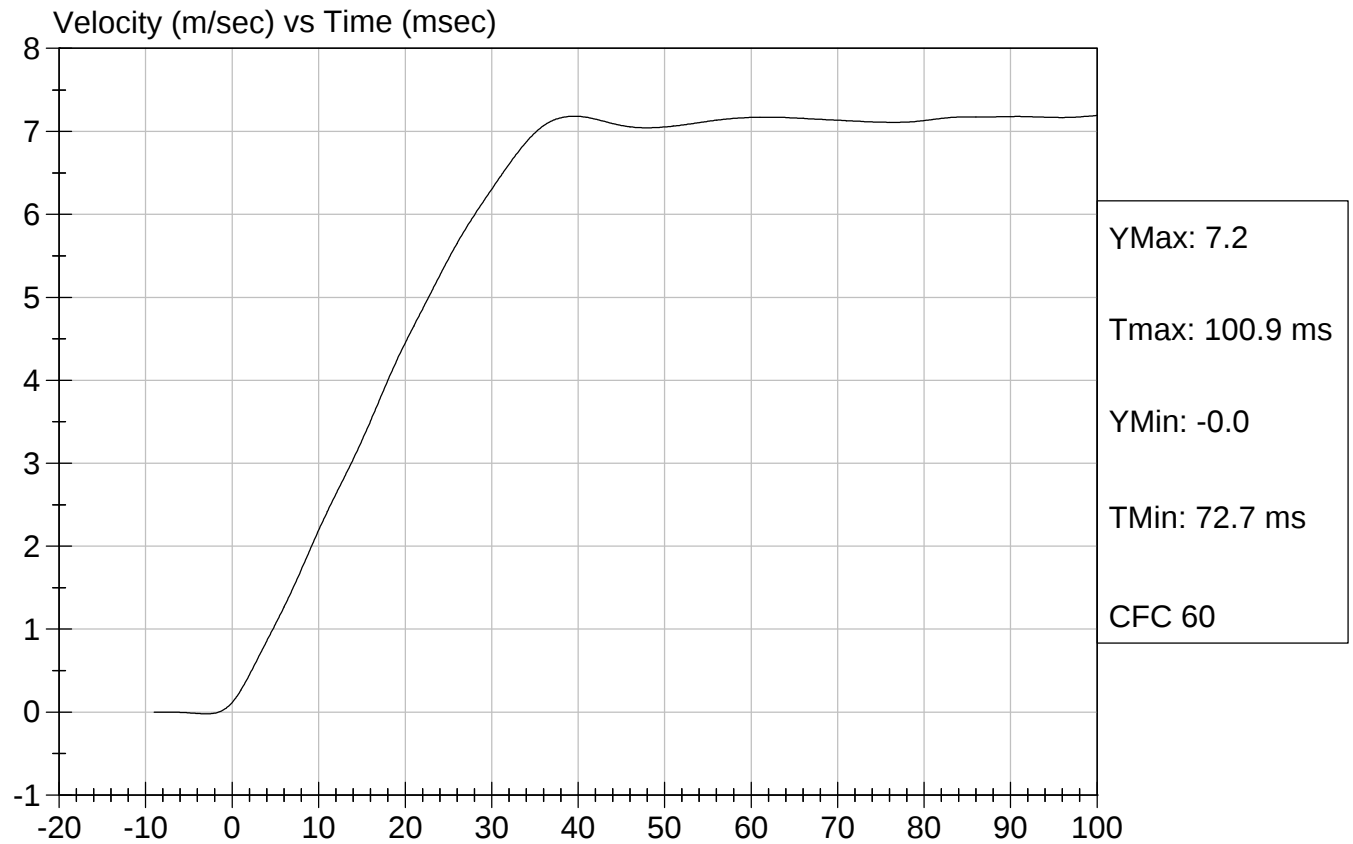
12/10/2003

Test Date



Test Desc: Neck Bending
Component ID: D032049

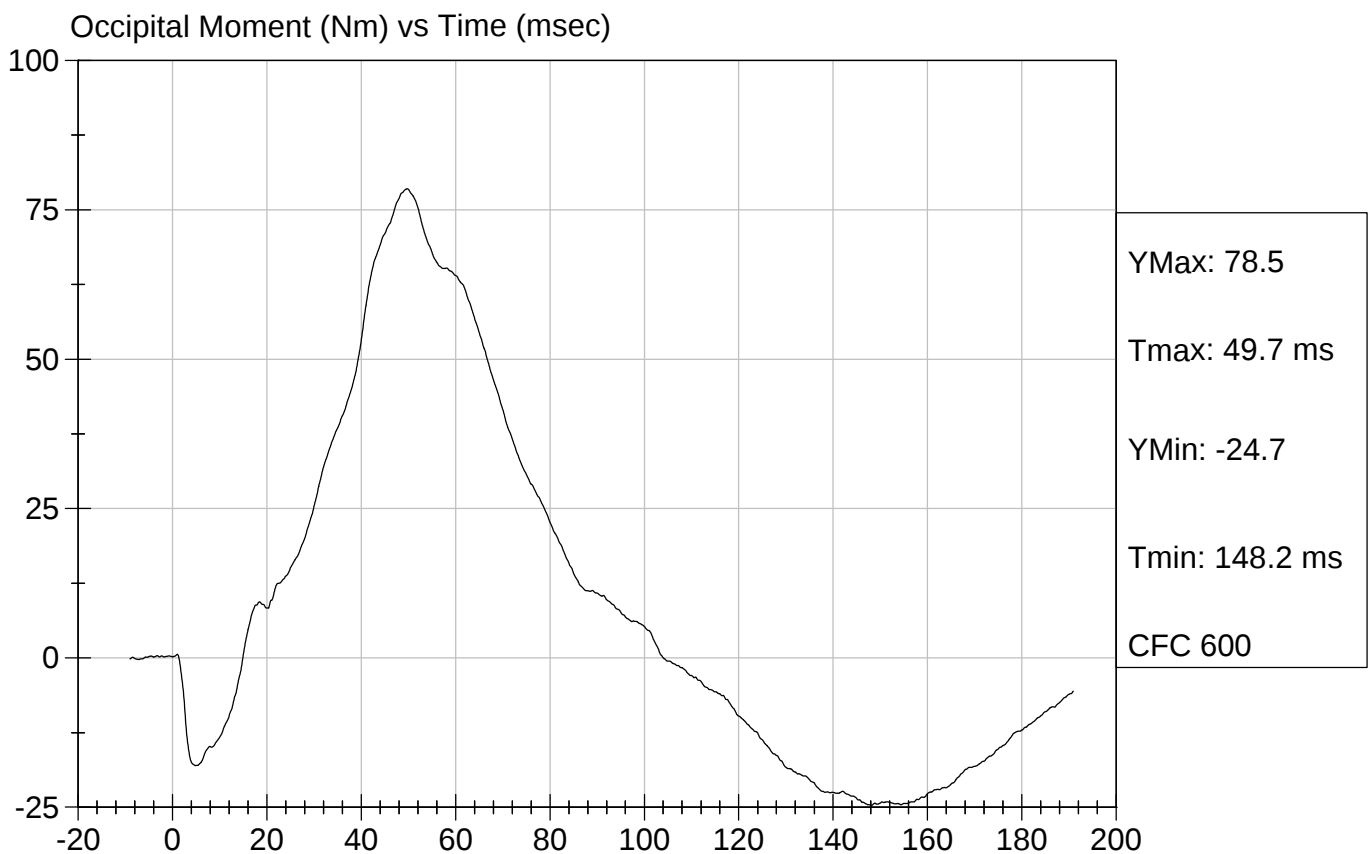
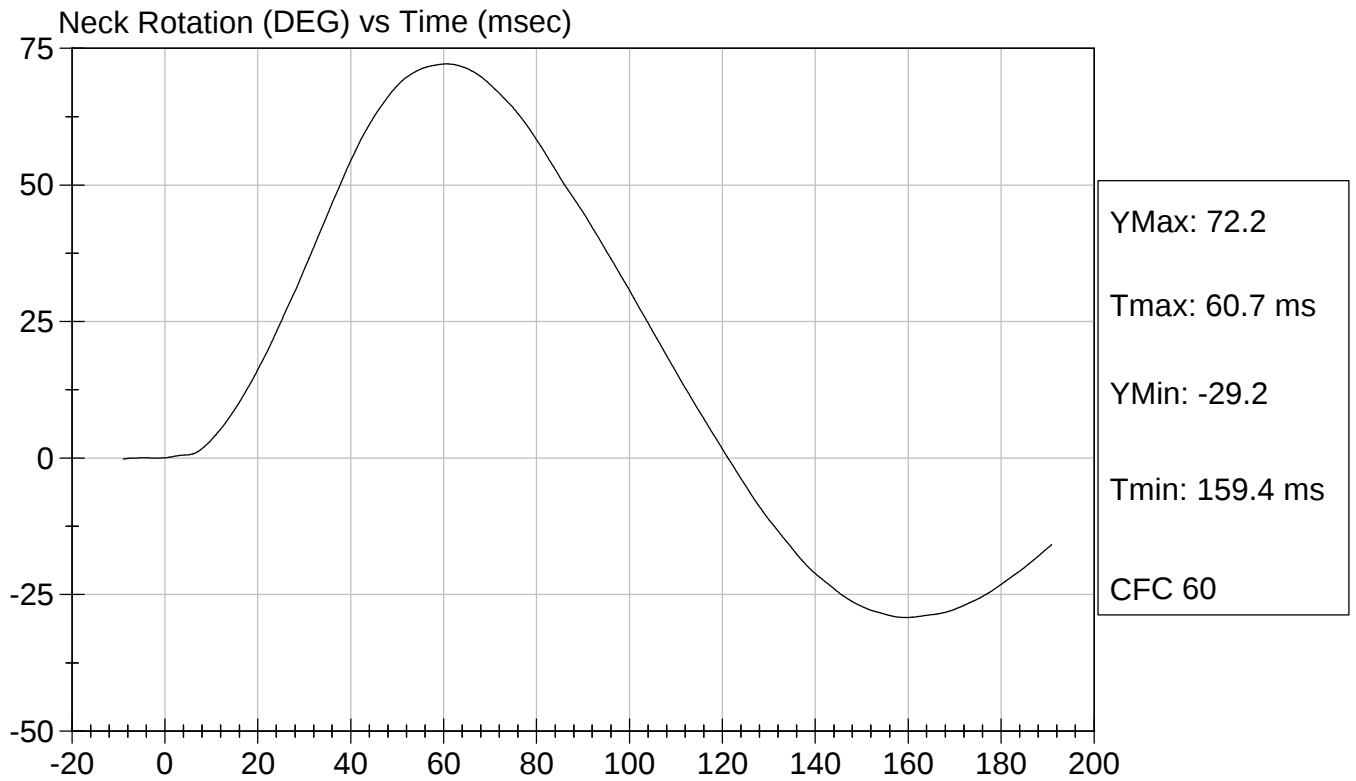
Test Date: 12/10/2003
Speed: 23.31 ft/sec, 7.10 m/sec





Test Desc: Neck Bending
Component ID: D032049

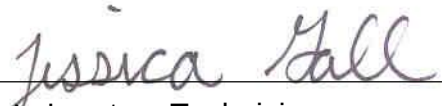
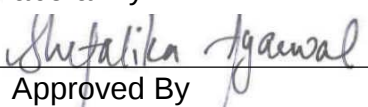
Test Date: 12/10/2003
Speed: 23.31 ft/sec, 7.10 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Inspection Checklist

ATD Serial No: 271

Test Part	Items Checked	Result
Skin	Visual inspection	Pass
Head	Visual, ballast, accelerometer mount	Pass
Neck	Visual	Pass
Spine Box	Visual, ballast, accelerometer mount	Pass
Rib Cage	Visual, measure	Pass
Sternum	Visual	Pass
Lumbar Spine	Visual	Pass
Abdomen	Visual	Pass
Pelvis	Visual, palpate, accelerometer mount	Pass
Upper Legs	Visual	Pass
Knees	Visual	Pass
Lower Legs	Visual, range of motion	Pass
Ankles	Visual, range of motion	Pass
Feet	Visual, range of motion	Pass
Joints	1 to 2 g range	Pass
Other		Pass


 Laboratory Technician

 Approved By

12/11/2003
 Test Date

APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

DUMMY AND VEHICLE CALIBRATION DATA

	INSTRUMENTS FOR DRIVER DUMMY NO. 904		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	J12450	Endevco	11/9/03
Lower Rib Y	J10420	Endevco	11/9/03
Lower Spine Y	AJ9F3	Endevco	11/9/03
Pelvis Y	AJ4K2	Endevco	11/9/03
Upper Rib Redundant Y	J12461	Endevco	11/9/03
Lower Rib Redundant Y	AJ820	Endevco	11/9/03
Lower Spine Redundant Y	AJ621	Endevco	11/9/03
Pelvis Redundant Y	ALCH7	Endevco	8/18/03
Head X	J13650	Endevco	11/10/03
Head Y	AKAA6	Endevco	11/10/03
Head Z	ALBA7	Endevco	11/10/03
Head Redundant X	J14007	Endevco	11/10/03
Head Redundant Y	J13424	Endevco	11/10/03
Head Redundant Z	AP2C4	Endevco	11/10/03
Neck Load Cell	1561	Denton	6/30/03

	INSTRUMENTS FOR PASSENGER DUMMY NO. 271		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AHR15	Endevco	5/23/03
Lower Rib Y	AN8P9	Endevco	11/10/03
Lower Spine Y	AGP28	Endevco	11/10/03
Pelvis Y	AJ420	Endevco	11/10/03
Upper Rib Redundant Y	AHW95	Endevco	5/23/03
Lower Rib Redundant Y	AN8M6	Endevco	11/10/03
Lower Spine Redundant Y	AJ9A7	Endevco	11/10/03
Pelvis Redundant Y	AMTA3	Endevco	11/10/03
Head X	AMP82	Endevco	11/10/03
Head Y	J11625	Endevco	11/10/03
Head Z	J10730	Endevco	11/10/03
Head Redundant X	J18843	Endevco	11/10/03
Head Redundant Y	J18953	Endevco	11/10/03
Head Redundant Z	J11014	Endevco	11/10/03
Neck Load Cell	606	Denton	8/26/03

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Front Door Centerline Y	99F251	Entran	9/11/03
Midrear of Left Rear Door Y	A08-M08	Entran	10/1/03
Left Front Door Upper Centerline Y	H01-N27	Entran	10/8/03
Midrear of Left Rear Door Y	A27-R01	Entran	11/7/03
Left Rear Door Upper Centerline Y	I12-F12	Entran	8/15/03
Left Mid A-Post Y	C12-M15	Entran	10/8/03
Left Lower A-Post Y	A08-M05	Entran	9/11/03
Left Mid B-Post Y	K21-N06	Entran	8/15/03
Left Lower B-Post Y	H14-N08	Entran	10/9/03
Floorpan @ Rear Axle X	G10-F09	Entran	10/17/03
Floorpan @ Rear Axle Y	G10-F04	Entran	10/17/03
Floorpan @ Rear Axle Z	G10-F06	Entran	10/17/03
Driver Seat Track Y	G01-N01	Entran	9/11/03
Right Front Sill X	A27-R16	Entran	10/9/03
Right Front Sill Y	A27-R17	Entran	10/9/03
Right Front Sill Z	C12-M10	Entran	10/9/03
Right Rear Sill X	E01-F02	Entran	11/12/03
Right Rear Sill Y	H01-N12	Entran	9/11/03
Right Rear Sill Z	A08-M04	Entran	9/11/03
Left Front Sill Y	H01-N18	Entran	6/2/03
Left Rear Sill Y	I12-F10	Entran	10/8/03
Right Rear Occupant Compartment Y	C12-M13	Entran	10/9/03
Vehicle CG X	H21-J08	Entran	10/9/03
Vehicle CG Y	H21-J04	Entran	10/9/03
Vehicle CG Z	H20-R03	Entran	10/9/03

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