

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

**Toyota Motor Manufacturing
2005 Toyota Corolla Matrix
NHTSA NUMBER: M55103**

**PREPARED BY:
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BURLINGTON, WI 53105**



Test Date: September 20, 2004

Report Date: November 30, 2004

FINAL REPORT

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

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-03-D-12005.

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Date: 11/30/04

FINAL REPORT ACCEPTED BY:

COTR, Side Impact

Date of Acceptance

Technical Report Documentation Page

1. Report No. NCAPSIDE-MGA-2005-002	2. Government Accession No.	3. Recipient's Catalog No.																						
4. Title and Subtitle Final Report of New Car Assessment Program Side Impact Testing of 2005 Toyota Corolla Matrix NHTSA No.: M55103		5. Report Date November 30, 2004																						
		6. Performing Organization Code MGA																						
7. Author(s) Shefalika Naik, Project Engineer		8. Performing Organization Report No. NCAPSIDE-MGA-2005-002																						
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		10. Work Unit No.																						
		11. Contract or Grant No. DTNH22-03-D-12005																						
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Rulemaking, Office of Crashworthiness Standards 400 Seventh Street, SW, Room 5311 Washington, D.C. 20590		13. Type of Report and Period Covered: <i>Final Report</i> 9/20/04 to 11/30/04																						
		14. Sponsoring Agency Code NVS-111																						
15. Supplementary Notes																								
16. Abstract A 55/28 km/h 90° Moving Deformable Barrier NCAP side impact was conducted on the subject 2005 Toyota Corolla Matrix 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 September 20, 2004. 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 283 mm at level 2. The test vehicle's occupant performance is as follows: <table style="margin-left: auto; margin-right: auto; border: none;"> <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;">63.5</td> <td style="text-align: center;">54.3</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td style="text-align: center;">74.8</td> <td style="text-align: center;">61.2</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td style="text-align: center;">72.8</td> <td style="text-align: center;">58.3</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td style="text-align: center;">73.8</td> <td style="text-align: center;">59.8</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td style="text-align: center;">90.7</td> <td style="text-align: center;">68.6</td> </tr> <tr> <td>HIC</td> <td style="text-align: center;">366.7</td> <td style="text-align: center;">596.3</td> </tr> </tbody> </table>					<u>DRIVER</u>	<u>PASS.</u>	Left Upper Rib (LUR) Accel., g	63.5	54.3	Left Lower Rib (LLR) Accel., g	74.8	61.2	Lower Spine (T ₁₂) Accel., g	72.8	58.3	Thoracic Trauma Index (TTI)	73.8	59.8	Pelvis (PEV) Accel., g	90.7	68.6	HIC	366.7	596.3
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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.																								
17. Key Words New Car Assessment Program (NCAP) Side Impact Side Impact Hybrid III 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																						
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 230	22. Price																					

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SECTION 1

PURPOSE AND TEST PROCEDURE

1.1 PURPOSE

This side impact test was conducted as part of the FY' 2005 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 2005 Toyota Corolla Matrix manufactured by Toyota Motor Manufacturing.

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 2005 Toyota Corolla Matrix 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 1423.8 kg and the test weight of the MDB was 1361.2 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on September 20, 2004.

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 DTS TDAS Pro 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 283 mm at level 2, 1200 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	73.8	59.8
Peak Pelvic G's (PEV)	G's	90.7	68.6
Head Injury Criteria (HIC)	none	366.7	596.3

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 channel:

Left Rear Sill Y

SECTION 3

SIDE IMPACT HYBRID III DUMMY (SID/HIII) AND VEHICLE TEST DATA

Test Vehicle: 2005 Toyota Corolla Matrix
Test Program: NCAP Side Impact

NHTSA No. M55103
Test Date: 09/20/04

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	$=(t_f - 32)/1.8$
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: 2005 Toyota Corolla Matrix
 Test Program: NCAP Side Impact

NHTSA No. M55103
 Test Date: 09/20/04

TEST VEHICLE INFORMATION

Make	Toyota
Model	Corolla Matrix
Body Style	4-door CUV
NHTSA No.	M55103
VIN	2T1KR32E75C360064
Color	Black
Delivery Date	8/26/04
Odometer Reading (mile)	41
Dealer	Wilde Toyota
Transmission	Manual
Final Drive	Front
Number of Cylinders	4
Engine Displacement (L)	1.8
Engine Placement	Lateral
Automatic Door Locks (ADL)	No
Owner's Manual Details Instructions on Disabling ADLs	NA

TEST VEHICLE OPTIONS

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Toyota Motor Manufacturing Canada, Inc.	GVWR (kg)	1744
Date of Manufacture	08/04	GAWR Front (kg)	914
		GAWR Rear (kg)	839

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	308	308
Cold / Test Pressure (kPa)	220	220
Recommended Tire Size	P205/55R16	P205/55R16
Tire Size on Vehicle	P205/55R16	P205/55R16
Tire Manufacturer	Continental	Continental

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	NA	
Number Of Occupants	2	3	0	5
Capacity Wt. (VCW) (kg)				390
Cargo Wt. (RCLW) (kg)				49.9

DATA SHEET NO. 1... (continued)**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2005 Toyota Corolla MatrixNHTSA No. M55103Test Program: NCAP Side ImpactTest Date: 09/20/04**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	363.3	250.8		412.3	336.1	
Right	kg	346.6	258.6		358.8	316.6	
Ratio	%	58.2	41.8		54.2	45.8	
Totals	kg	709.9	509.4	1219.3	771.1	652.7	1423.8

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1219.3
Weight of 2 P572E ATDs	kg	161.5
Rated Cargo/Luggage Weight (RCLW)	kg	49.9
Calculated Vehicle Target Weight (TVTW)	kg	1430.7

* 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	706	705	721	715	1088
As Tested	mm	698	689	672	700	1194
Fully Loaded	mm	692	697	685	684	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2605
Total Vehicle Length at Left Side	mm	3342
Total Vehicle Length at Centerline	mm	4330
Total Vehicle Length at Right Side	mm	3341
Total Vehicle Width	mm	1713
Weight of Ballast in Cargo Area	kg	15.9
Amount of Stoddard Solvent in Fuel Tank	liters	45.8

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2605
Target Impact Point Aft of Front Axle	mm	363
Actual Impact Point Aft of Front Axle	mm	376

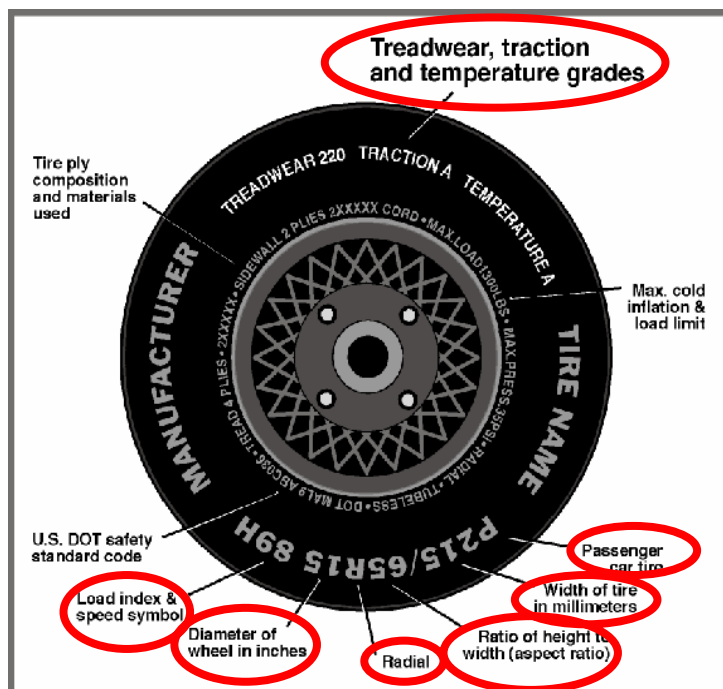
DATA SHEET NO. 2

TEST VEHICLE TIRE INFORMATION

Test Vehicle: 2005 Toyota Corolla Matrix
Test Program: NCAP Side Impact

NHTSA No.: M55103
Test Date: 09/20/04

Vehicle Year	2005	Vehicle Make	Toyota
VIN	2T1KR32E75C360064	Vehicle Model	Corolla Matrix



	Front	Rear
Tire Manufacturer	Continental	Continental
Tire Name	Touring CTC	Touring CTC
Tire Type	P	P
Tire Width (mm)	205	205
Ratio of Height to Width (aspect ratio)	55	55
Radial	R	R
Wheel Diameter	16	16
Load Index & Speed Symbol	89H	89H
Treadwear	360	360
Traction Grade	A	A
Temperature Grade	A	A

DATA SHEET NO. 3

TEST VEHICLE INFORMATION

Test Vehicle: 2005 Toyota Corolla Matrix
Test Program: NCAP Side Impact

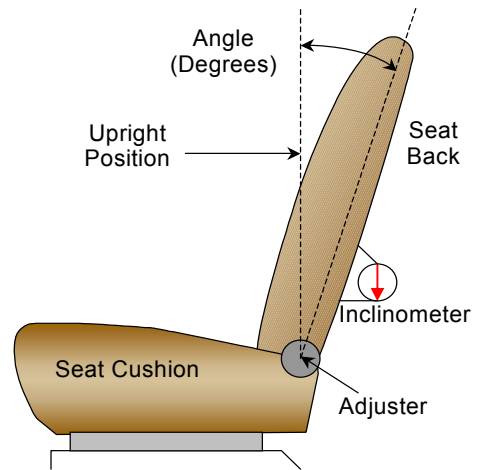
NHTSA No. M55103
Test Date: 09/20/04

NORMAL DESIGN RIDING POSITION

The driver and passenger seat back is positioned to the manufacturer's designated angle.

Driver total number of detents: 22 detents
Driver detent position: 3rd detent with the forward most defined as 0

The rear seat has no adjustable mechanism.



FRONT SEAT ASSEMBLY

SEAT FORE/AFT POSITIONS

The driver seat is manually operated.

Driver seat fore/aft total travel: 17 positions
Driver seat fore/aft position: 8th position with the forward most defined as 0

The rear seat has no adjustable mechanism.

DATA SHEET NO. 3... (continued)

TEST VEHICLE INFORMATION

Test Vehicle: 2005 Toyota Corolla Matrix
Test Program: NCAP Side Impact

NHTSA No. M55103
Test Date: 09/20/04

FUEL TANK CAPACITY DATA

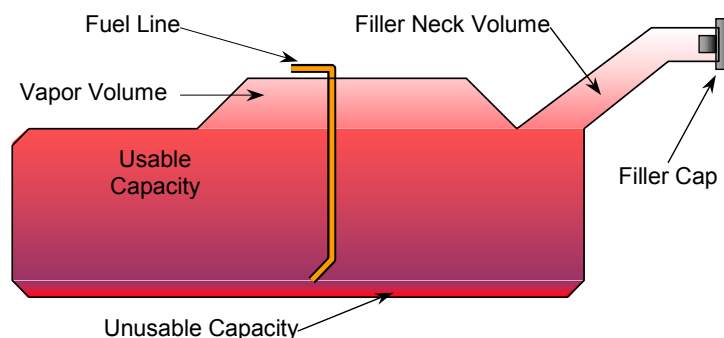
The "Usable Capacity" of the standard equipment fuel tank is: 50.0 liters

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

The "Usable Capacity" used for certification to FMVSS 301 requirements: 50.0 liters

Actual amount of Stoddard solvent added to vehicle for certification test: 45.8 liters

The fuel pump will pump fuel when the ignition is on.



VEHICLE FUEL TANK ASSEMBLY

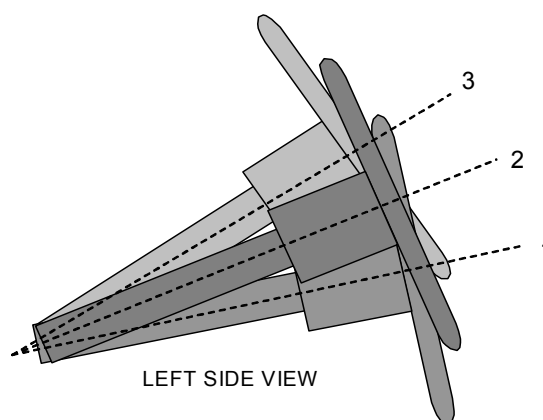
STEERING COLUMN ADJUSTMENT

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.

Lowermost, position 1: 25.9°

Geometric center, position 2: 28.1°

Uppermost, Position 3: 30.4°



STEERING COLUMN ASSEMBLY

DATA SHEET NO. 4
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2005 Toyota Corolla Matrix
 Test Program: NCAP Side Impact

NHTSA No. M55103
 Test Date: 09/20/04

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	363.3	250.8		412.3	336.1	
Right	kg	346.6	258.6		358.8	316.6	
Weight Ratio	%	58.2	41.8		54.2	45.8	
Totals	kg	709.9	509.4	1219.3	771.1	652.7	1423.8

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
Level 1	Sill Top Height	mm	120	261
Level 2	Occupant H-Point	mm	283	525
Level 3	Mid Door	mm	242	634
Level 4	Window Sill	mm	153	975
Level 5	Window Top	mm	4	1346
N/A	Maximum Penetration	mm	283	525

INSTRUMENTATION

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

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

Test Vehicle: 2005 Toyota Corolla Matrix
 Test Program: NCAP Side Impact

NHTSA No. M55103
 Test Date: 09/20/04

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	Right	171
2	Top of Bumper (mm)	533	800	Right	100
3	Mid Level (mm)	686	800	Left	80
4	Top of Stack (mm)	813	800	Left	126

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	6
Contact Switches	2
High Speed Cameras	2

DATA SHEET NO. 6
POST TEST OBSERVATIONS

Test Vehicle: 2005 Toyota Corolla Matrix
Test Program: NCAP Side Impact

NHTSA No. M55103
Test Date: 09/20/04

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	Headrest, D-ring	Headrest, C-Pillar
Upper Torso Contact	Door Panel	Door Panel
Lower Torso Contact	Door Panel	Door Panel
Left Knee Contact	Door Panel	Door Panel
Right Knee Contact	Left Knee	Left Knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Locked/Unlocked Doors	Doors were unlocked	Doors were unlocked
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	Windshield broke
Window Damage	Left Front and Left Rear Broke
Other Notable Effects	None

AIRBAG DEPLOYMENT

	Driver	Front Passenger	Rear Passenger
Front	Yes	N/A	N/A
Side (Torso Bag)	N/A	N/A	N/A
Curtain	N/A	N/A	N/A

MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	13mm rear
Vertical Offset	mm	+/-20	18mm up

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 7

SID/HIII INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2005 Toyota Corolla Matrix
 Test Program: NCAP Side Impact

NHTSA No. M55103
 Test Date: 09/20/04

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	63.5	30	-16.4	69	54.3	40	-3.1	161
Upper Rib (LUR) (R)	Y	G's	64.3	30	-16.2	70	54.6	40	-3.2	161
Lower Rib (LLR)	Y	G's	74.8	31	-15.0	68	61.2	40	-11.2	65
Lower Rib (LLR) (R)	Y	G's	74.3	31	-14.4	69	63.7	40	-8.0	65
Lower Spine (T ₁₂)	Y	G's	72.8	31	-7.2	107	58.3	43	-8.9	70
Lower Spine (T ₁₂) (R)	Y	G's	72.7	31	-7.3	107	57.2	43	-9.2	70
Pelvis (PEV)	Y	G's	90.7	27	-18.9	48	68.6	33	-4.5	129
Pelvis (PEV) (R)	Y	G's	91.1	27	-15.4	48	69.6	33	-4.8	123

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	74.8	72.8	73.8	90.7	61.2	58.3	59.8	68.6
Rib, Spine, and Pelvis (R)	74.3	72.7	73.5	91.1	63.7	57.2	60.5	69.6

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	17.1	152	-17.8	68	11.0	238	-17.9	47
Head CG	Y	G's	24.7	74	-5.9	32	111.9	48	-10.1	78
Head CG	Z	G's	60.6	53	-3.7	19	7.1	213	-37.7	56
Head CG Resultant		G's	63.6	53			113.2	48		

HEAD INJURY CRITERIA (SAE CLASS 1000 Filtered)

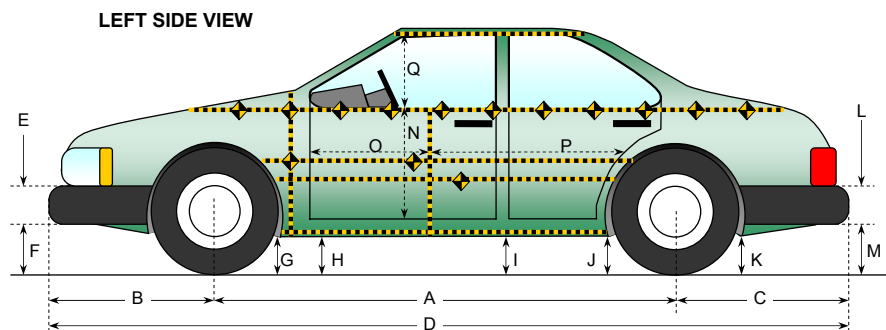
Location	Driver				Passenger			
	HIC	T ¹	T ²	Avg G's	HIC	T ¹	T ²	Avg G's
Head CG	366.7	45.8	81.8	40.1	596.3	46.2	63.1	65.9

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: 2005 Toyota Corolla Matrix
 Test Program: NCAP Side Impact

NHTSA No. M55103
 Test Date: 09/20/04



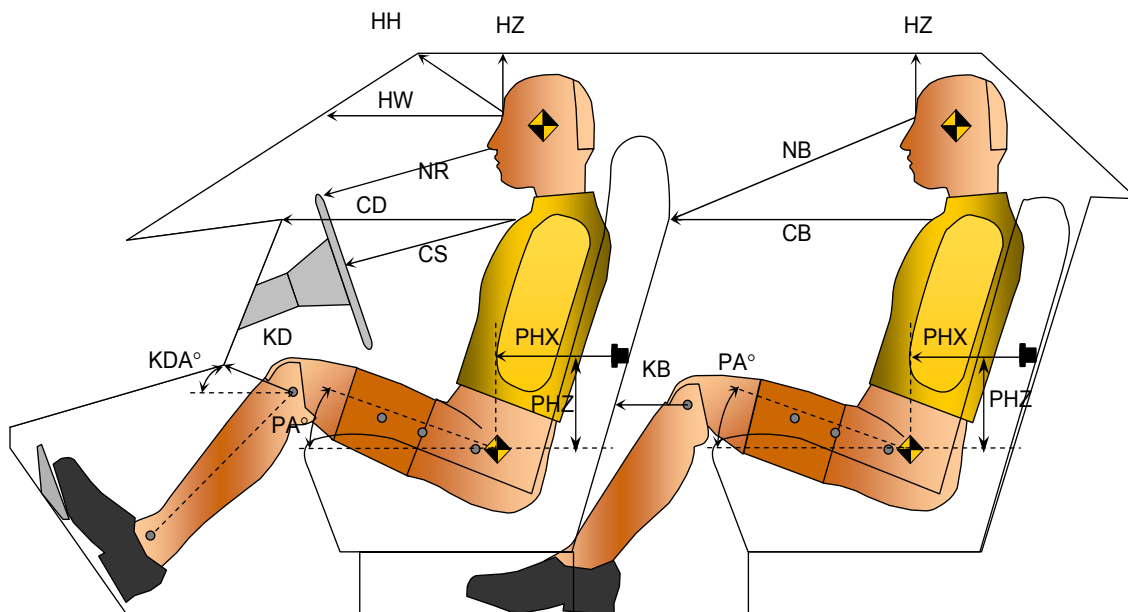
All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2605	2609	-4
B	Front Axle to FSOV	925	906	19
C	Rear Axle to RSOV	800	804	-4
D	Total Length at Centerline	4330	4319	11
E	Front Bumper Thickness	170	170	0
F	Front Bumper Bottom to Ground	424	435	-11
G	Sill Height at Front Wheel Well	182	204	-22
H	Sill Height at Front Door Leading Edge	187	211	-24
I	Sill Height at "B" Pillar	180	213	-33
J1	Sill Height at Rear Wheel Well	182	192	-10
J2	Pinch Weld Height at Rear Wheel Well	172	213	-41
K	Sill Height Aft of Rear Wheel Well	250	249	1
L	Rear Bumper Thickness	138	138	0
M	Rear Bumper Bottom to Ground	412	423	-11
N	Sill Height to Window Bottom Sill	737	706	31
O	Front Door Leading Edge to Impact CL	771	715	56
P	Rear Door Trailing Edge to Impact CL	1105	1085	20
Q	Front Window Opening	436	417	19
R	Right Side Length	3341	3347	-6
S	Left Side Length	3342	3311	31
T	Vehicle Width at "B" Post	1713	1435	278

DATA SHEET NO. 9
SID/HII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2005 Toyota Corolla Matrix
 Test Program: NCAP Side Impact

NHTSA No. M55103
 Test Date: 09/20/04

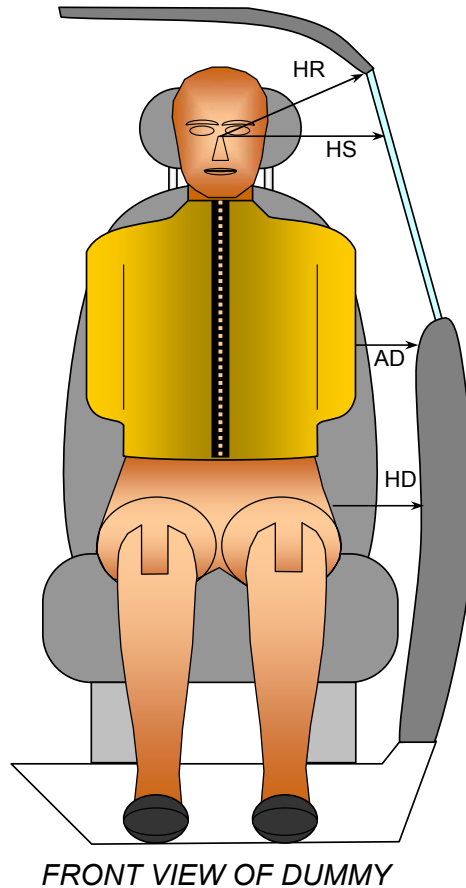


Driver Code	Pass. Code	Measurement Description	Driver S/N 904		Passenger S/N 271	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	364			
HW		Head to Windshield	594			
HZ	HZ	Head to Roof	210		201	
NR	NB	Nose to Rim/Nose to Seatback	466		605	
CD	CB	Chest to Dash or Seatback	566		526	
CS		Chest to Steering Wheel	364			
KDL	KBL	Left Knee to Dash or Seatback	172	22.5	188	10.7
KDR	KBR	Right Knee to Dash or Seatback	179	30.1	184	10.3
PA	PA	Pelvic Angle		23.6		24.8
PHX	PHX	H-Point to Striker (X-Axis)	193		240	
PHZ	PHZ	H-Point to Striker (Z-Axis)	209		317	

DATA SHEET NO. 10
SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2005 Toyota Corolla Matrix
 Test Program: NCAP Side Impact

NHTSA No. M55103
 Test Date: 09/20/04

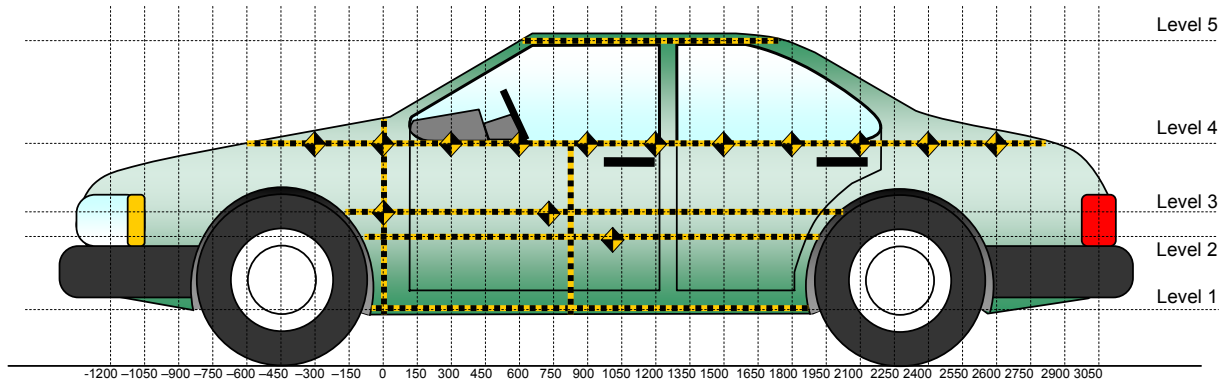


Code	Measurement Description	Units	Driver S/N 904	Passenger S/N 271
HR	Head to Side Header	mm	191	191
HS	Head to Side Window	mm	292	308
AD	Arm to Door	mm	71	55
HD	H-Point to Door	mm	129	122

DATA SHEET NO. 11
VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2005 Toyota Corolla Matrix
 Test Program: NCAP Side Impact

NHTSA No. M55103
 Test Date: 09/20/04



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	1346
4	Window Sill	975
3	Mid Door	634
2	Occupant H-Point	525
1	Sill Top	261

DATA SHEET NO. 12
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2005 Toyota Corolla Matrix
Test Program: NCAP Side Impact

NHTSA No. M55103
Test Date: 09/20/04

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600				330					310					-20	
-450				320					303					-17	
-300				313					302					-11	
-150				309					308					-1	
0		238	235	308			365	318	312			127	83	4	
150	285	251	244	310		307	490	459	345		22	239	215	35	
300	290	258	248	310		365	503	482	382		75	245	234	72	
450	290	260	250	314		380	495	485	405		90	235	235	91	
600	290	260	250	312	555	390	485	468	391	530	100	225	218	79	-25
750	292	261	252	313	544	405	479	450	386	526	113	218	198	73	-18
900	292	262	252	314	544	406	473	432	377	530	114	211	180	63	-14
1050	288	262	254	315	540	408	453	419	370	535	120	191	165	55	-5
1200	290	264	255	320	540	409	547	497	473	538	119	283	242	153	-2
1350	294	264	256	320	540	410	540	489	463	544	116	276	233	143	4
1500	288	258	258	320	542	385	520	480	442	544	97	262	222	122	2
1650	285	240	250	325	545	365	483	473	425	543	80	243	223	100	-2
1800	278	232	235	330	557	340	407	401	378	545	62	175	166	48	-12
1950			225	332				303	350				78	18	
2100				345					362					17	
2250				350					357					7	
2400			238	363				245	359				7	-4	
2550															
2700															
2850															
3000															

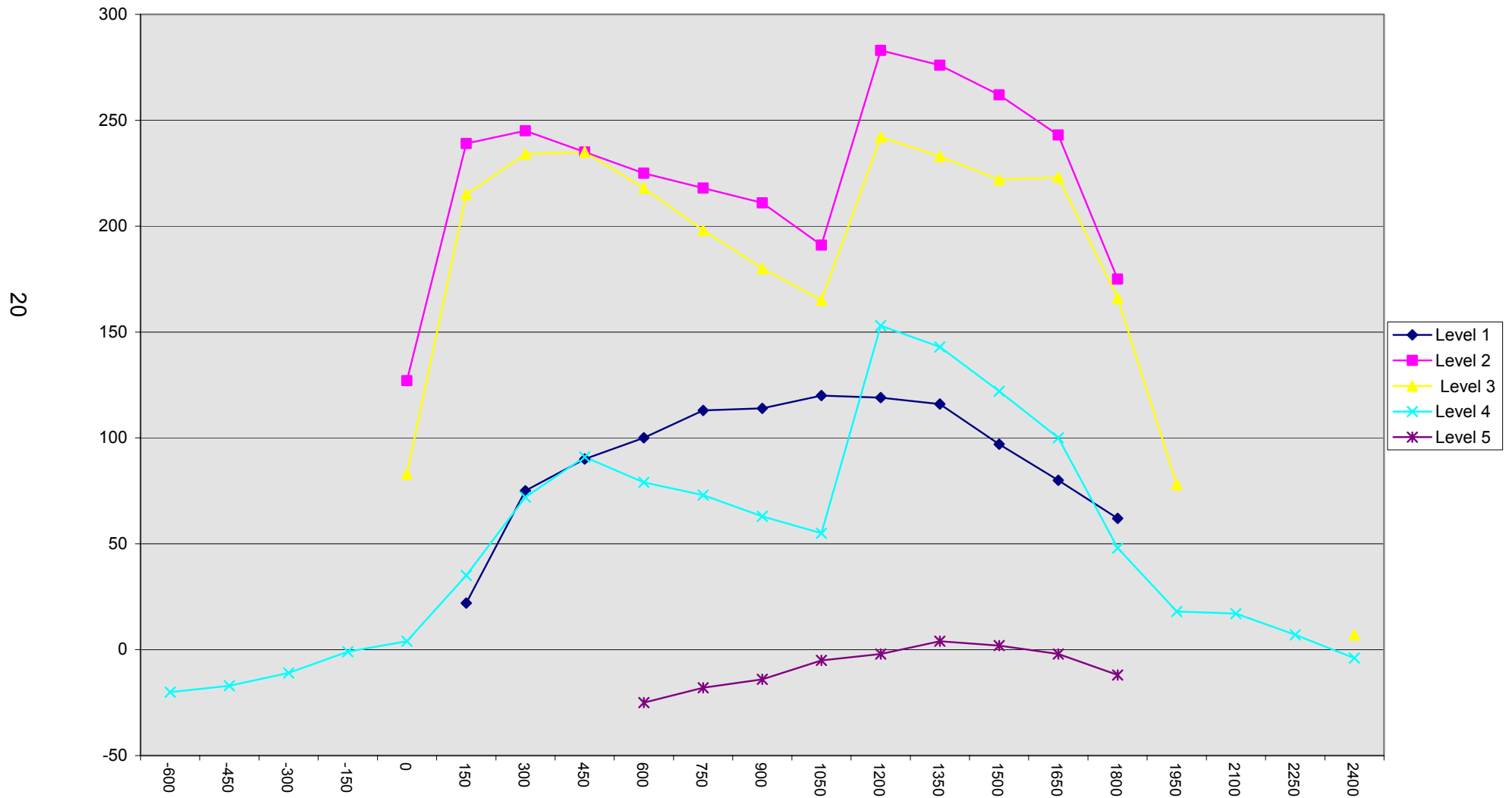
Reference plane is parallel to test vehicle longitudinal centerline.

Given dimensions = Reference plane to car body

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

Test Vehicle: 2005 Toyota Corolla Matrix
Test Program: NCAP Side Impact

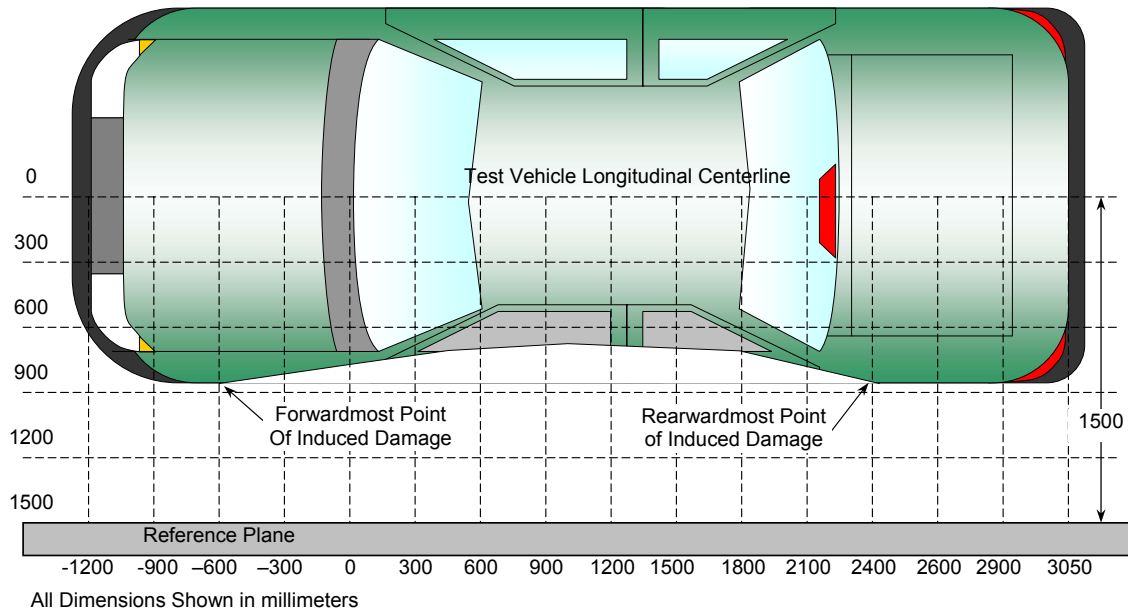
NHTSA No. M55103
Test Date: 09/20/04



DATA SHEET NO. 13
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2005 Toyota Corolla Matrix
 Test Program: NCAP Side Impact

NHTSA No. M55103
 Test Date: 09/20/04



TOP VIEW

DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	2250 mm	4	350	357	7
2	1740 mm	2	235	480	245
3	1230 mm	2	264	544	280
4	720 mm	2	260	481	221
5	210 mm	2	255	490	235
6	-300 mm	4	313	302	-11

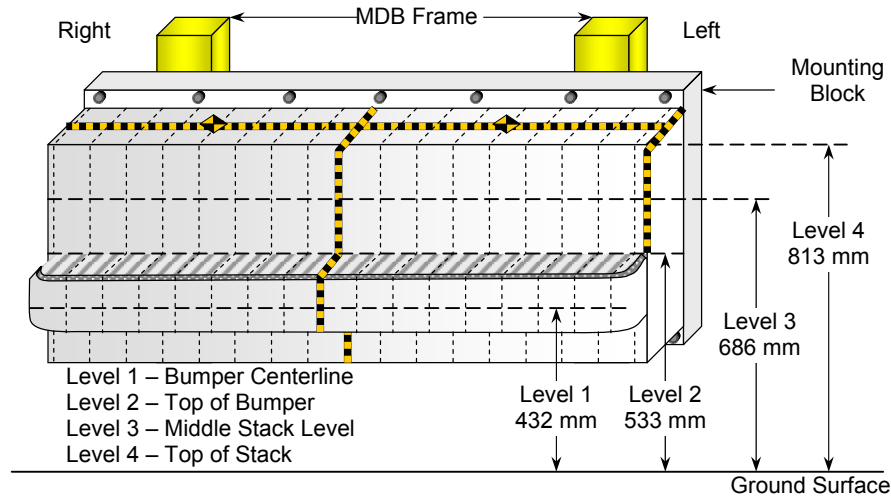
Reference plane is parallel to test vehicle longitudinal centerline.
 Given dimensions = Reference plane to car body.

DATA SHEET NO. 14

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2005 Toyota Corolla Matrix
 Test Program: NCAP Side Impact

NHTSA No. M55103
 Test Date: 09/20/04



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	171	142	108	84	74	73	75	74	72	69	71	72	74	74	79	99	111
2	100	79	54	44	41	34	35	36	34	34	33	33	32	32	38	45	67
3	73	44	25	13	4	5	10	10	5	5	6	8	10	11	15	21	80
4	107	57	25	8	4	15	44	33	22	13	10	8	10	16	33	64	126

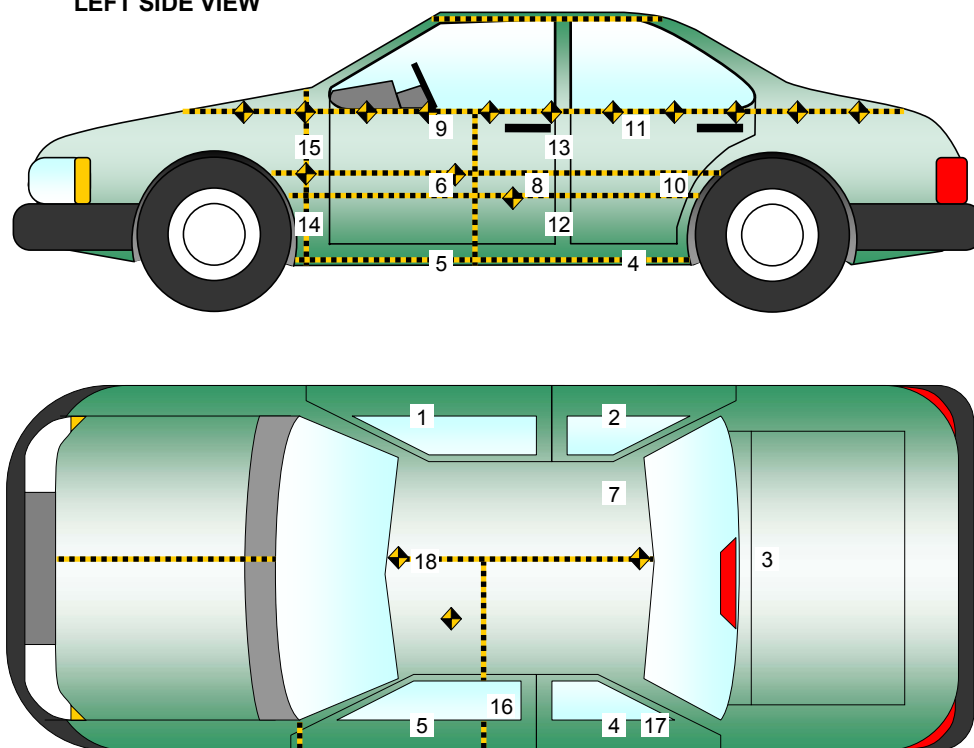
All Dimensions in mm

DATA SHEET NO. 15
VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2005 Toyota Corolla Matrix
 Test Program: NCAP Side Impact

NHTSA No. M55103
 Test Date: 09/20/04

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: 2005 Toyota Corolla Matrix
 Test Program: NCAP Side Impact

NHTSA No. M55103
 Test Date: 09/20/04

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	2413	677	215	X	5.0	23	-8.0	19
					Y	29.0	19	-3.3	83
					Z	5.3	72	-5.4	22
					RES	30.2	19		
2	Right Sill at Rear Seat	1320	700	265	X	5.8	23	-8.8	19
					Y	24.8	7	-5.4	82
					Z	6.1	86	-7.8	25
					RES	25.2	7		
3	Rear Floorpan Above Axle	902	0	600	X	5.0	56	-8.1	19
					Y	25.9	39	-3.4	84
					Z	12.1	13	-5.3	20
					RES	26.4	39		
4	Left Sill at Rear Door	1340	-700	232	Y	*	*	*	*
5	Left Sill at Front Door	2540	-677	220	Y	20.8	11	-6.2	76
6	Left Front Door C/L	2165	-770	445	Y	145.3	5	-87.1	10
7	Rear Occupant Compartment	1700	400	270	Y	25.6	6	-3.6	83
8	Left Front Door Mid-Rear	2371	-760	457	Y	101.4	8	-112.0	12
9	Left Front Door Upper C/L	2395	-770	761	Y	269.3	11	-265.7	16
10	Left Rear Door Mid-Rear	1348	-750	713	Y	134.5	20	-93.4	24
11	Left Rear Door Upper C/L	1477	-730	772	Y	119.3	8	-139.3	42
12	Left Lower B-Post	1862	-710	478	Y	128.6	4	-60.2	20
13	Left Middle B-Post	1873	-685	758	Y	201.2	5	-48.2	27
14	Left Lower A-Post	2910	-640	345	Y	51.2	11	-36.0	18
15	Left Middle A-Post	2962	-775	940	Y	46.2	11	-14.6	18
16	Front Seat Track	2032	-542	342	Y	114.7	14	-98.4	18
17	Rear Seat Track or Structure				Y				
18	Vehicle CG	2312	0	283	X	2.9	20	-9.7	9
					Y	8.8	32	-10.3	19
					Z	2.3	84	-25.6	17
					RES	26.4	17		

* No valid data collected
 See reference points on the following page.

DATA SHEET NO. 15...(continued)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2005 Toyota Corolla Matrix
Test Program: NCAP Side Impact

NHTSA No. M55103
Test Date: 09/20/04

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

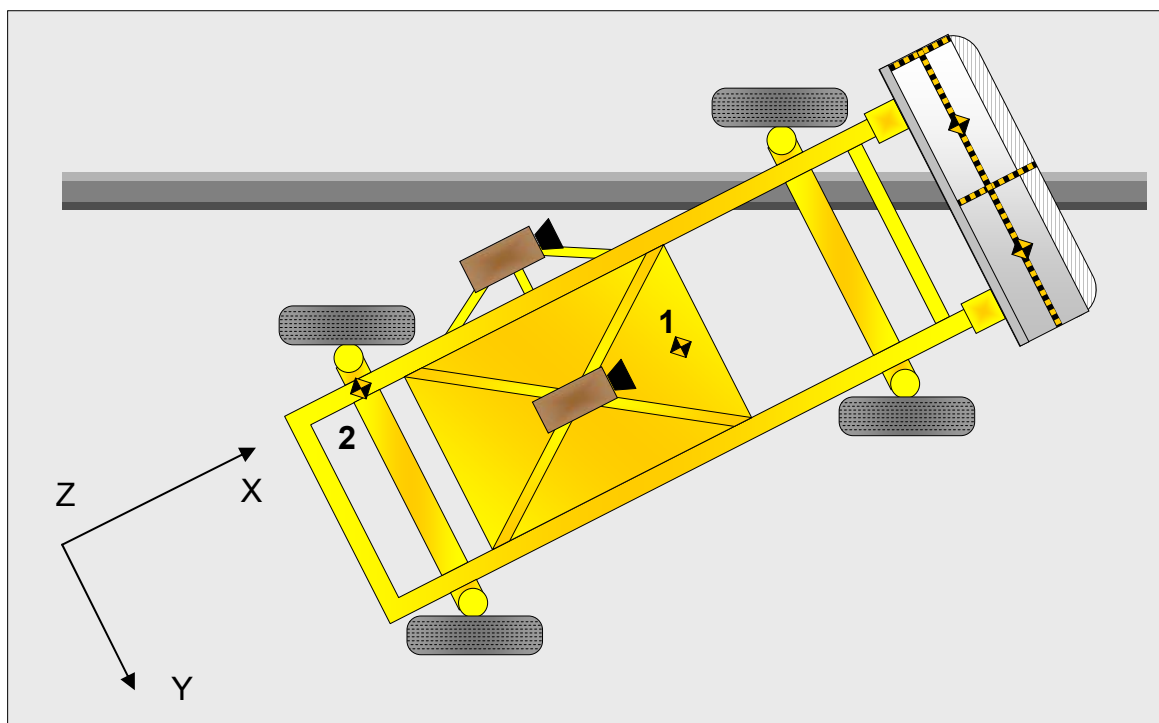
Test Vehicle: 2005 Toyota Corolla Matrix
 Test Program: NCAP Side Impact

NHTSA No. M55103
 Test Date: 09/20/04

MDB ACCELEROMETER PEAK DATA AND LOCATIONS

Loc. No.	Accelerometer Location	Measurement (mm)			Peak Values (G's)				
		X	Y	Z	Axis	Max	Time	Min	Time
1	MDB CG	-1092	0	-483	X	1.1	93	-20.8	39
					Y	2.5	58	-6.9	41
					Z	27.3	58	-25.7	64
					RES	28.8	58		
2	MDB Rear	-2591	-625	-622	X	1.6	123	-23.1	31
					Y	4.4	29	-2.0	59
					Z	4.7	60	-2.2	55
					RES	23.4	31		

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: 2005 Toyota Corolla Matrix
Test Program: NCAP Side Impact

NHTSA No. M55103
Test Date: 09/20/04

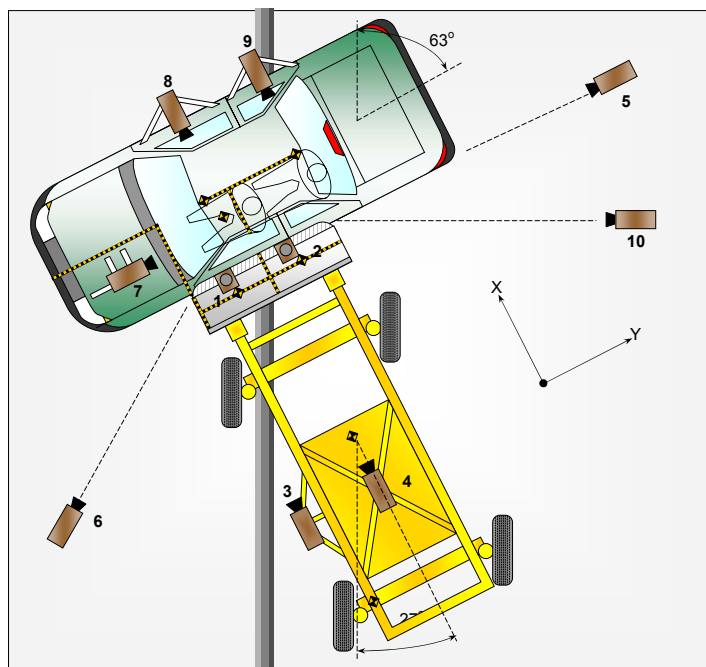
	Elements	Pre-Test (mm)
1	Total Length	4330
2	Total Width	1713
3	Bumper Top Height	600
4	Bumper Bottom Height	432
5	Longitudinal Member Top Height	340
6	Distance between Longitudinal Members	1025
7	Longitudinal Member Width	82
8	Engine Top Height	845
9	Engine Bottom Height	210
10	Engine and gearbox width	720
11	Front bumper-engine distance	300
12	Front shock absorber fixing height	880
13	Bonnet leading edge height	610
14	Front shock absorber fixing width	1140
15	Front bumper – front axle distance	945
16	Front axle – a pillar distance	440
17	A-pillar – B-pillar distance	1050
18	B-Pillar – rear axle distance	1095
19	B-pillar – C-pillar distance	890
20	Roof sill bottom height	1485
21	Roof sill top height	1562
22	Floor sill bottom height	255
23	Floor sill top height	313

DATA SHEET NO. 18

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2005 Toyota Corolla Matrix
 Test Program: NCAP Side Impact

NHTSA No. M55103
 Test Date: 09/20/04



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Close-up	0	-1680	5900	50	1000
2	Overhead Overall	160	0	5050	14	1000
3	MDB Onboard, Impact Point Close-up				25	1000
4	MDB Onboard, Centerline of Impact				13	1000
5	Right Side, Ground Level, Overall	150	8350	1395	19	1000
6	Left Side, Ground Level, Overall	55	-5200	1520	19	1000
7	Vehicle Onboard Front SID/HIII, Front				13	1000
8	Vehicle Onboard Front SID/HIII, Side				13	1000
9	Vehicle Onboard Rear SID/HIII, Side				13	1000
10	Real Time Coverage				13	24

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

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

Test Vehicle: 2005 Toyota Corolla Matrix
Test Program: NCAP Side Impact

NHTSA No. M55103
Test Date: 09/20/04

Test Time: 1:10 pm

Temperature at Time of Impact: 21°C

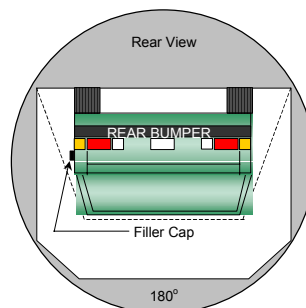
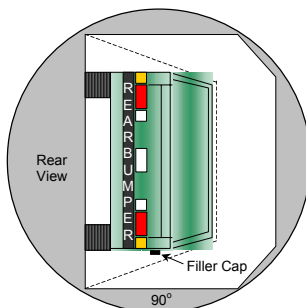
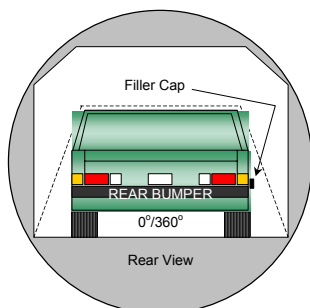
STODDARD SOLVENT SPILLAGE MEASUREMENTS

- 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

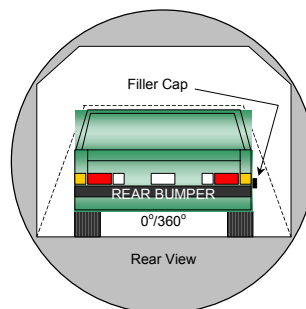
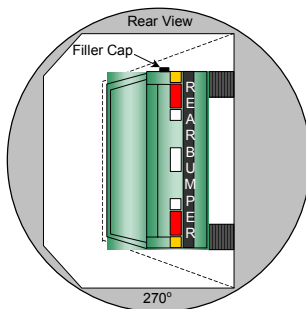
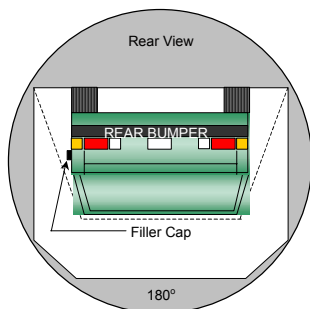
Test Vehicle: 2005 Toyota Corolla Matrix
 Test Program: NCAP Side Impact

NHTSA No. M55103
 Test Date: 09/20/04



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°	174	300	0
90° to 180°	151	300	0
180° to 270°	138	300	0
270° to 360°	159	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

MFD.BY: TOYOTA MOTOR MANUFACTURING,
CANADA, INC. 08/04
GVWR 3845 LB GAWR FR 2015LB RR 1850LB
THIS VEHICLE CONFORMS TO ALL APPLICABLE
FEDERAL MOTOR VEHICLE SAFETY BUMPER AND
THEFT PREVENTION STANDARDS IN EFFECT ON
THE DATE OF MANUFACTURE SHOWN ABOVE.
2T1KR32E75C360064 PASS.CAR



C/TR: 1F4/FA13 ZZE132L-DHMDKA
A/TM: -02A/C59 MADE IN CANADA 670



AD

CHARGEMENT

2: ARRIÈRE 3
Chargement ne
soib.

DE
E À FROID

0kPa, 32PSI

0kPa, 32PSI

FLAGE À FROID

60PSI

S,

N4

A-3.

Vehicle Certification Label



TIRE AND LOADING INFORMATION

SEATING CAPACITY : TOTAL 5
FRONT 2 : REAR 3

The combined weight of occupants and cargo should never exceed 390kg or 860lbs.

ORIGINAL TIRE SIZE	COLD TIRE INFLATION PRESSURE	
P205/55R16	FRONT	220kPa, 32PSI
	REAR	220kPa, 32PSI
COMPACT SPARE TIRE	COLD TIRE INFLATION PRESSURE	
T135/70R16	420kPa, 60PSI	

**SEE OWNER'S MANUAL FOR
ADDITIONAL INFORMATION**

INFORMATION SUR LES PNEUS ET LE CHARGEMENT

NOMBRE DE PLACES ASSISES : TOTAL 5
AVANT 2 : ARRIÈRE 3

Le poids total des occupants et du chargement ne doit jamais être supérieur à 390kg ou 860lb.

DIMENSION DES PNEUS D'ORIGINE	PRESSION DE GONFLAGE À FROID	
P205/55R16	AVANT	220kPa, 32PSI
	ARRIÈRE	220kPa, 32PSI
ROUE DE SECOURS COMPACTE	PRESSION DE GONFLAGE À FROID	
T135/70R16	420kPa, 60PSI	

**POUR DE PLUS AMPLES INFORMATIONS,
VOIR LE MANUEL DU PROPRIÉTAIRE**

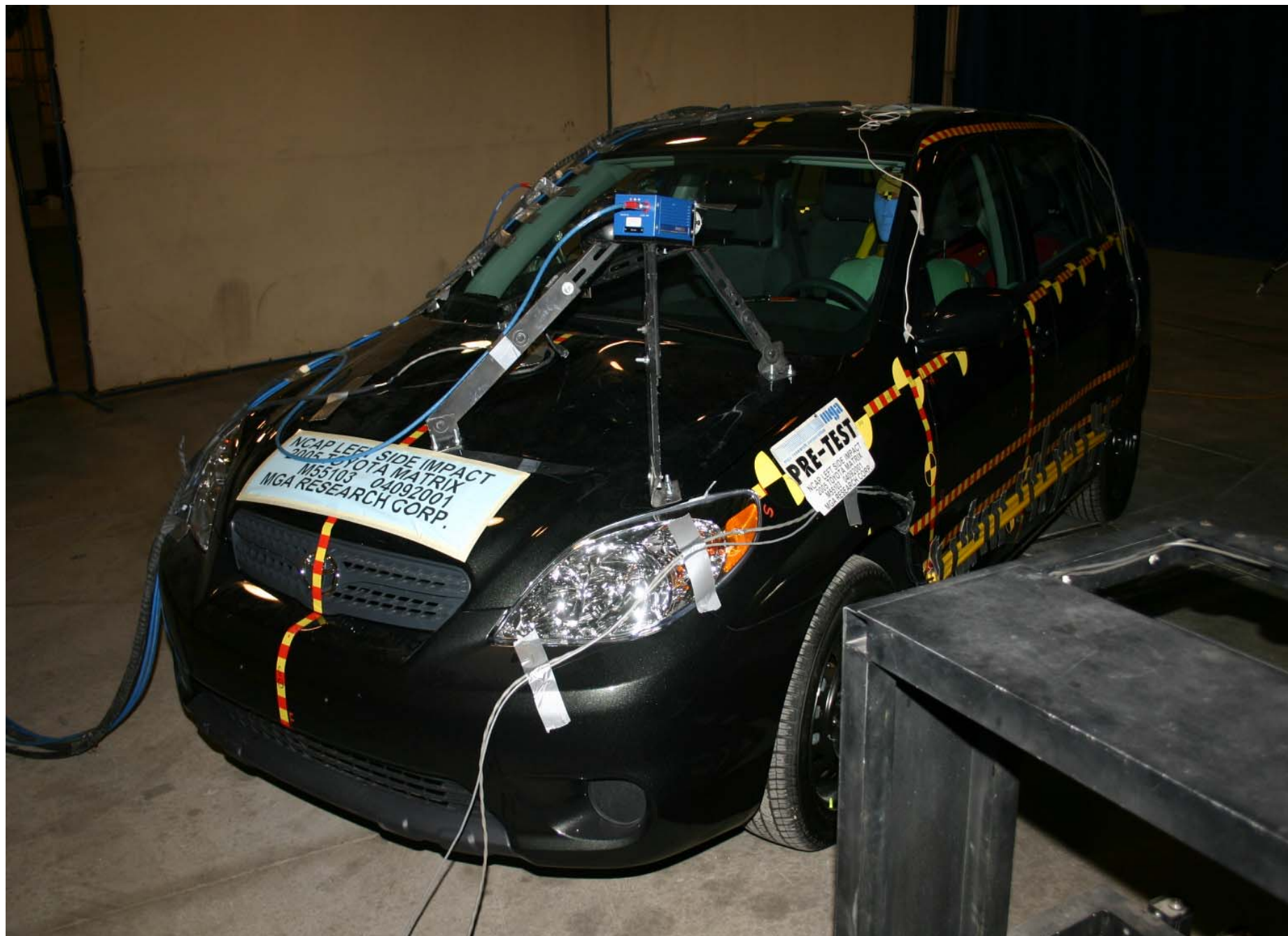
01170 **N4**



Pre-Test Front View of Test Vehicle



Post-Test Front View of Test Vehicle



Pre-Test Left Front ¾ View of Test Vehicle



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

A-9.



Pre-Test Left Side View of Test Vehicle



Post-Test Left Side View of Test Vehicle



Pre-Test Left Rear 3/4 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



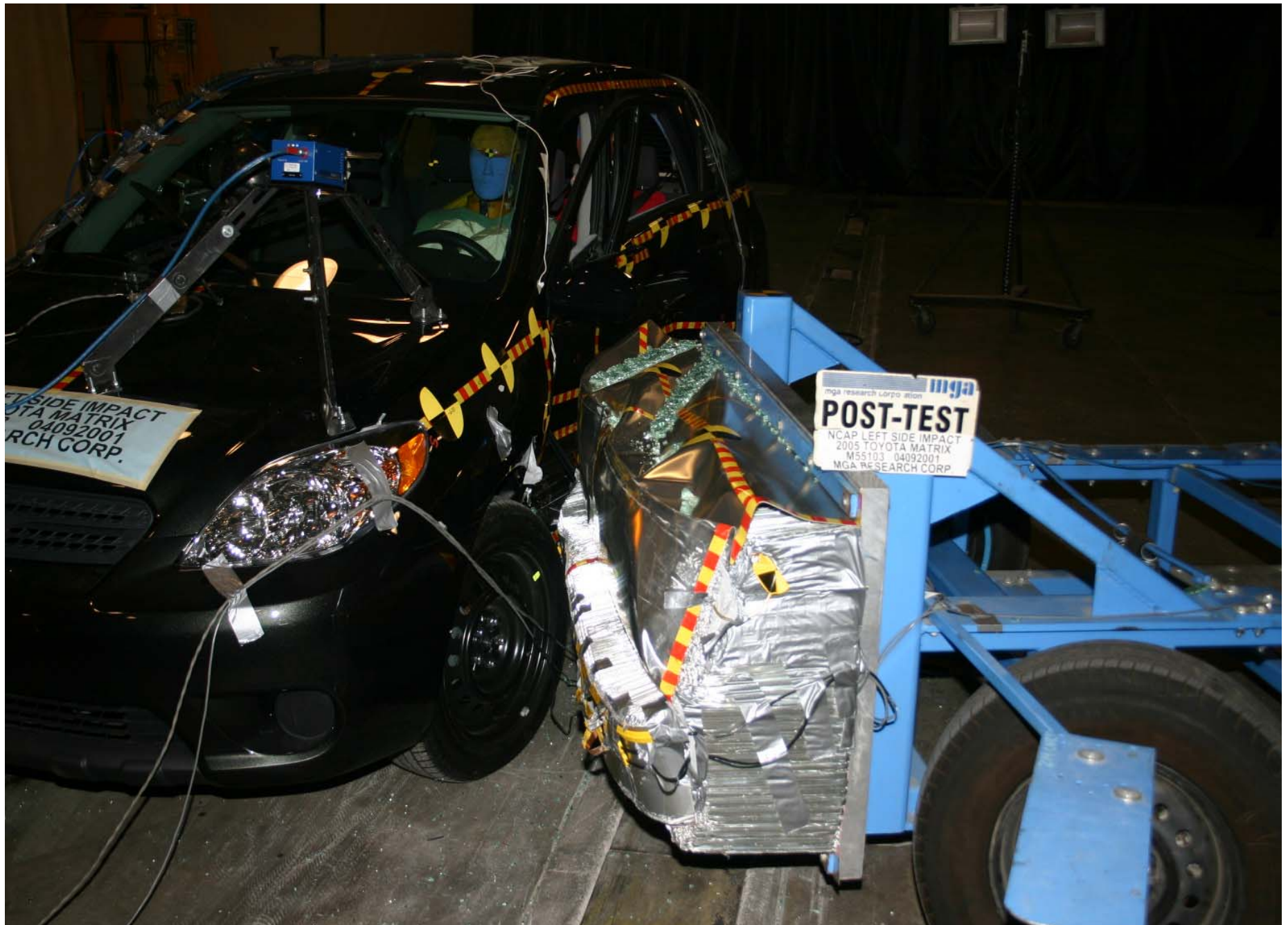
Pre-Test MDB (left side) Positioned Against Vehicle



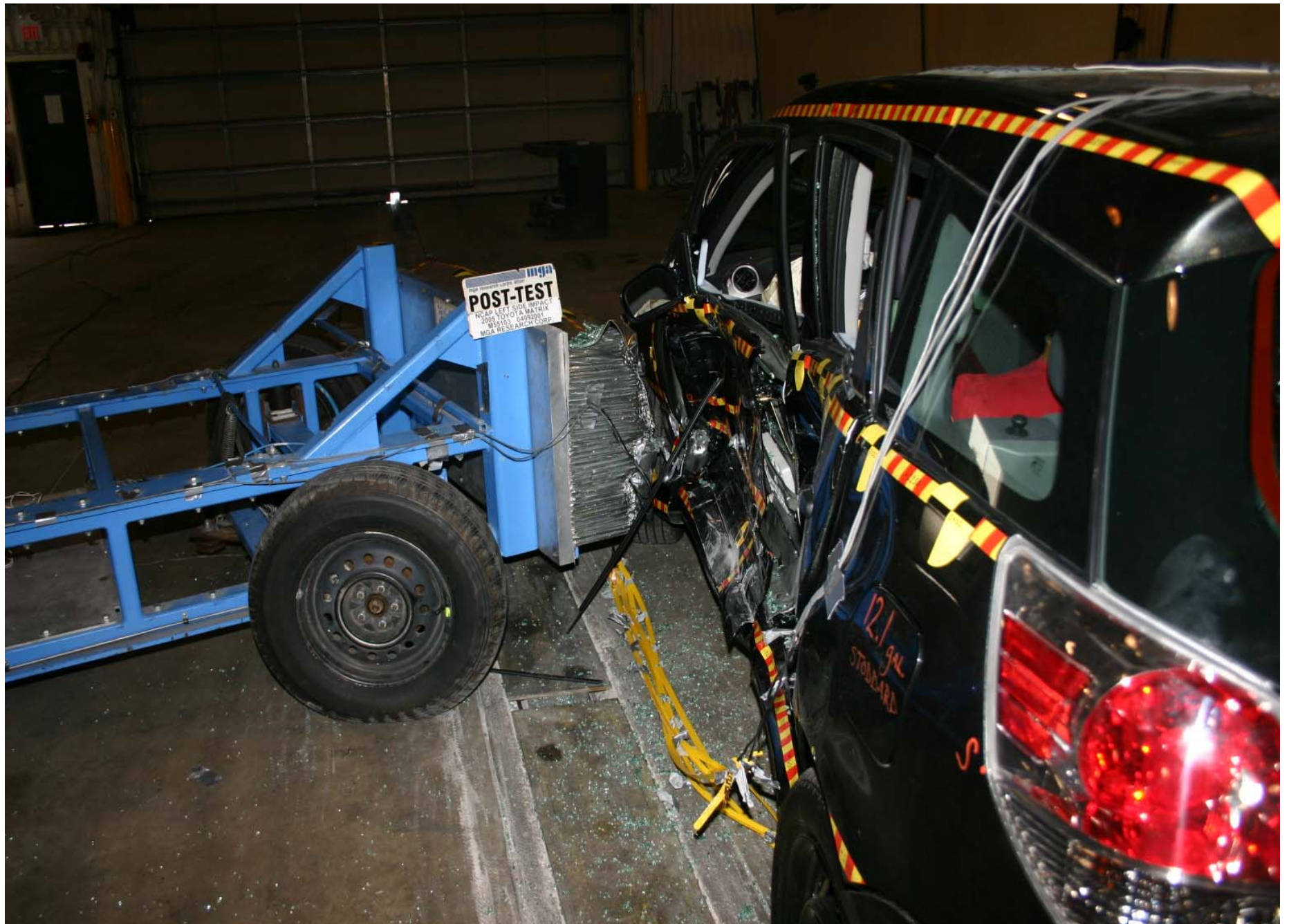
Pre-Test MDB (right side) Positioned Against Vehicle



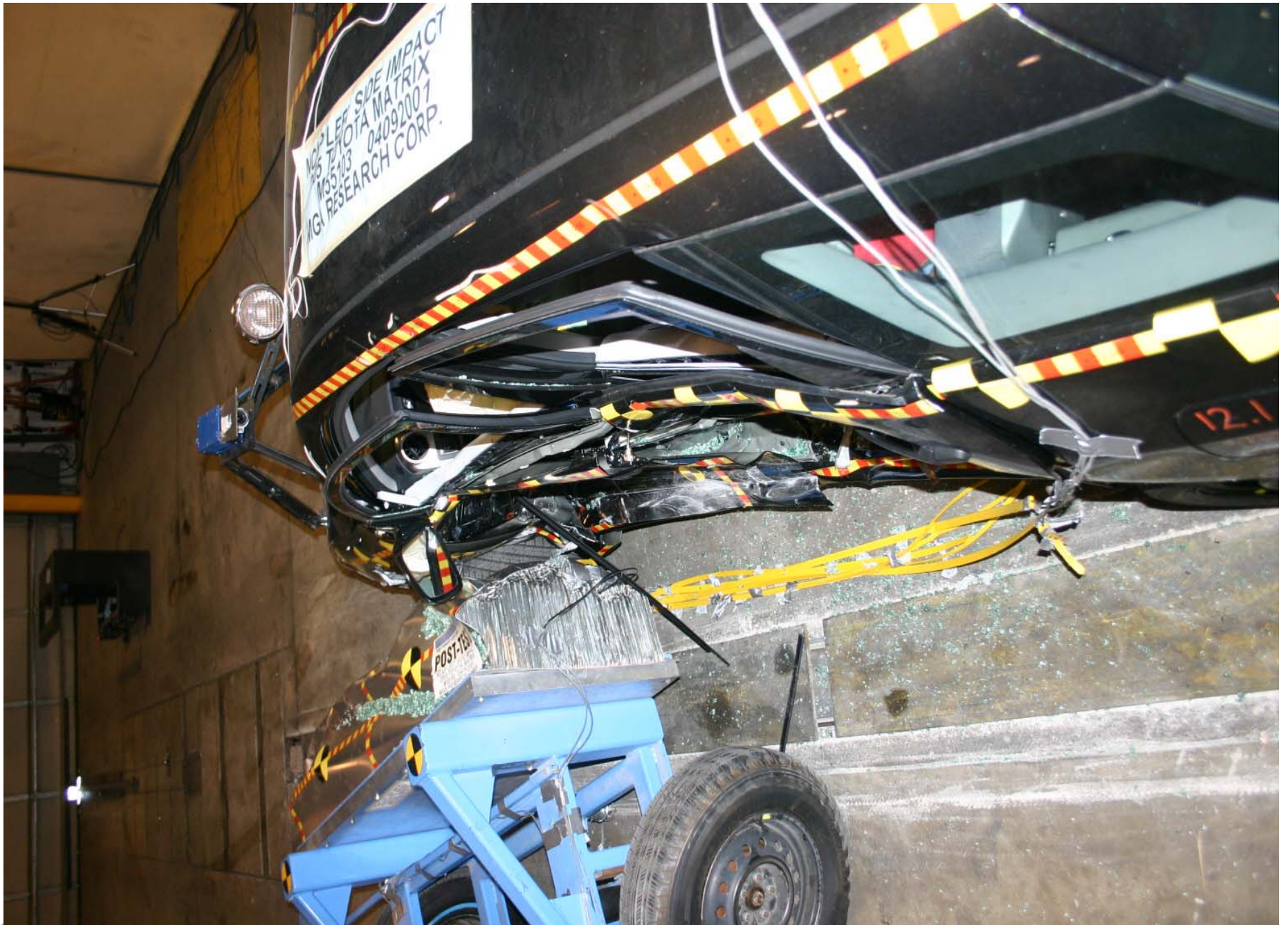
Pre-Test MDB Positioned Against Vehicle Overhead View



Post-Test MDB (left side) and Vehicle



Post-Test MDB (right side) and Vehicle



Post-Test MDB and Vehicle Overhead View



Pre-Test Impact Point on Vehicle



Post-Test Impact Point on Vehicle



Post-Test Fuel Filler Cap View



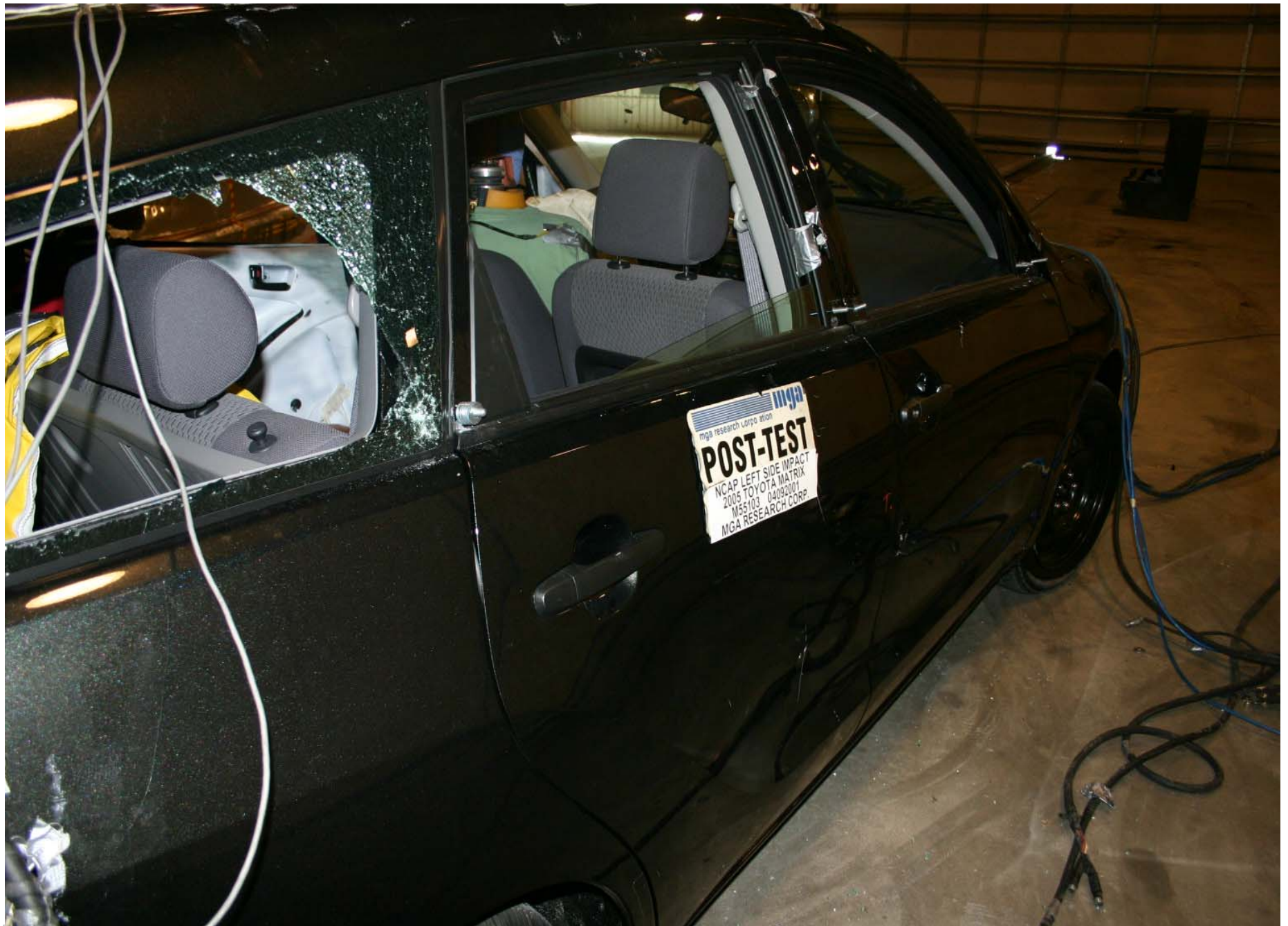
Pre-Test Three-Quarter View of Left Side Doors of Test Vehicle



Post-Test Three-Quarter View of Left Side Doors of Test Vehicle



Pre-Test Three-Quarter View of Right Side Doors of Test Vehicle



Post-Test Three-Quarter View of Right Side Doors 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



Pre-Test Driver Dummy Right Side View



Post-Test Driver Dummy Right Side View

A-35.



Post-Test Driver Dummy Contact



Post-Test Driver Dummy Head Contact



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



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



Post-Test Passenger Dummy Right Side View



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



Post-Test MDB Left Side View

A-54.



Rollover 90 Degrees



Rollover 180 Degrees



Rollover 270 Degrees

A-57.



Rollover 360 Degrees

A black SUV is parked in a garage. The license plate is white with the word 'WOMANLY' in black letters. A blue car is visible in the background, partially obscured by a white barrier. The garage has a concrete floor and a white wall with a grid of small windows.

APPENDIX B

SID/HIII, VEHICLE, AND MDB RESPONSE DATA

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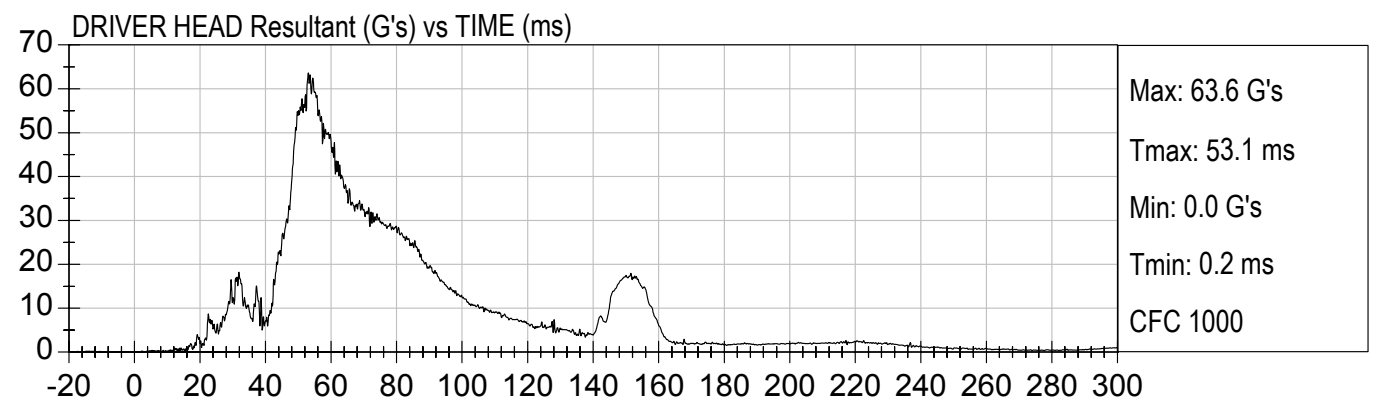
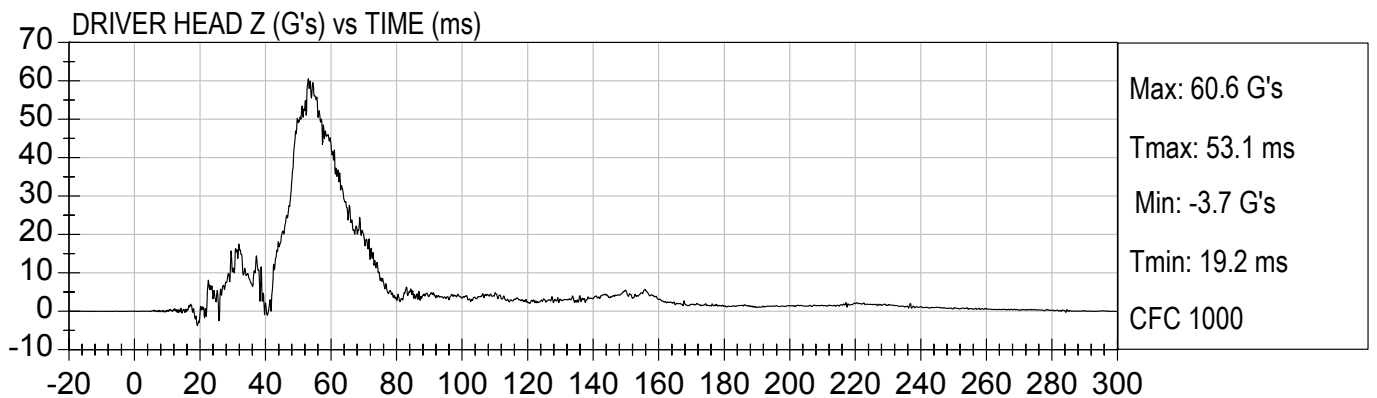
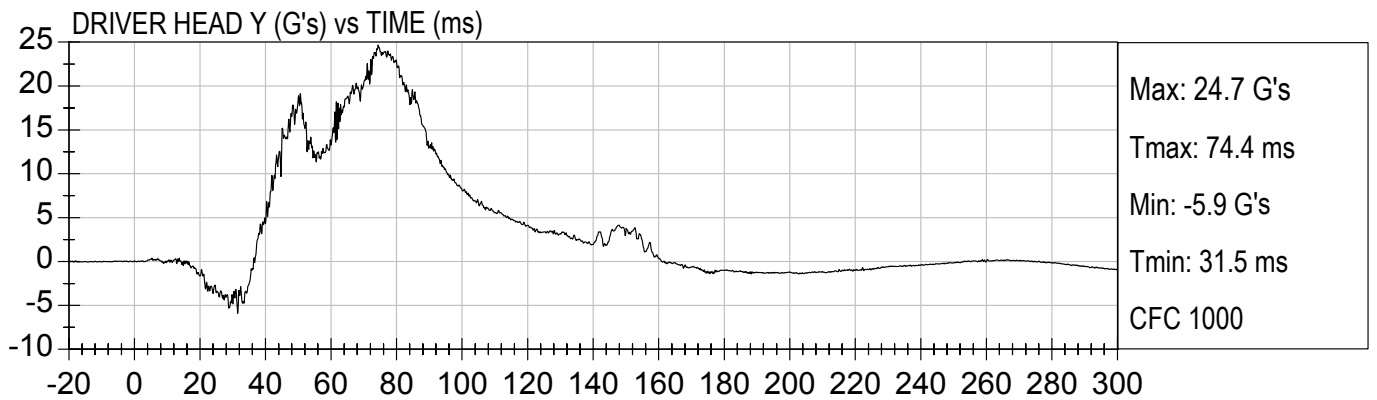
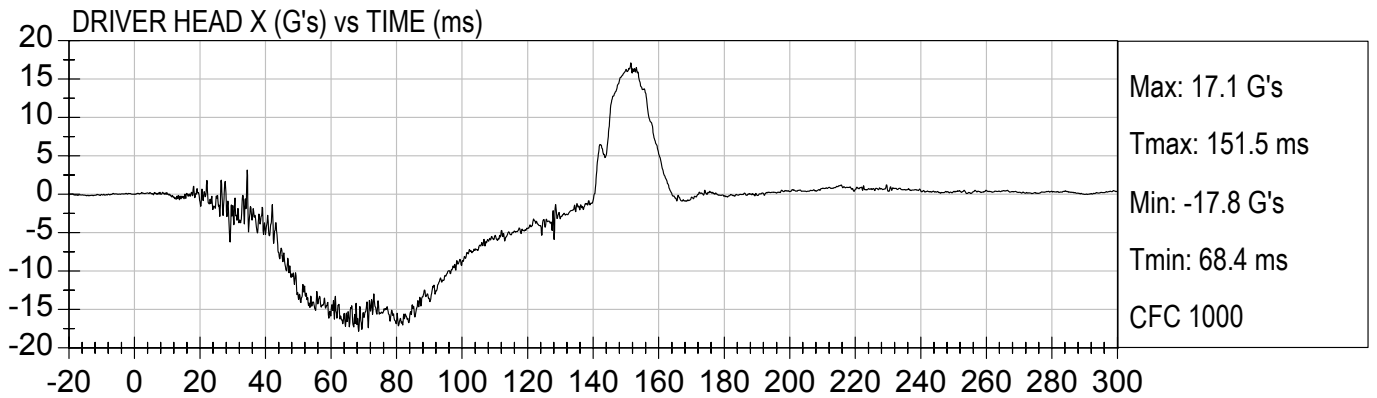
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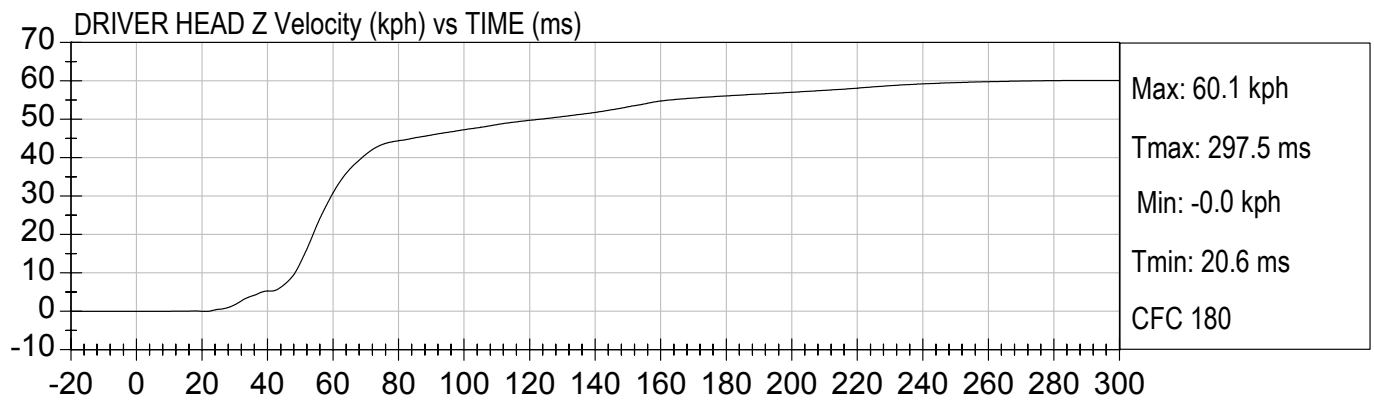
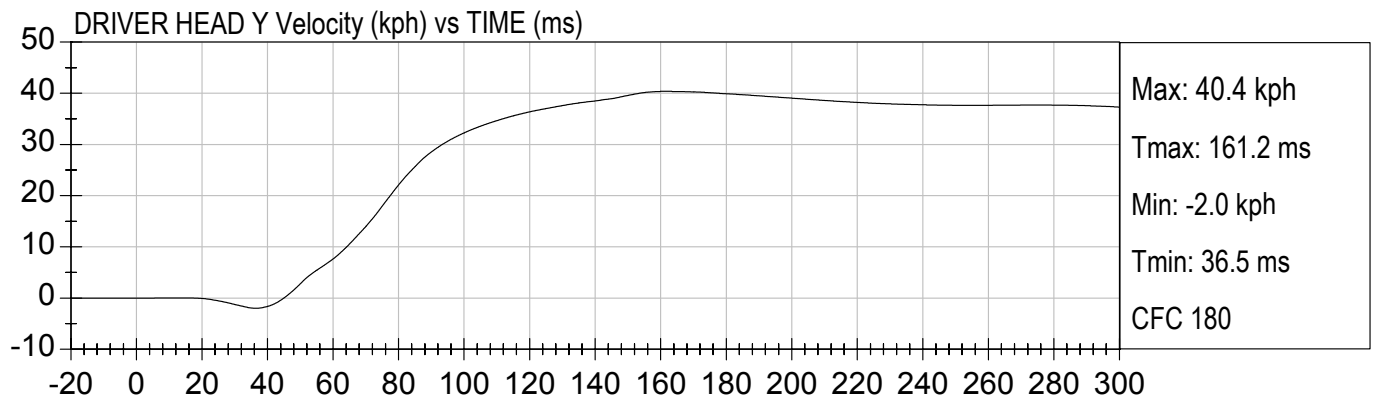
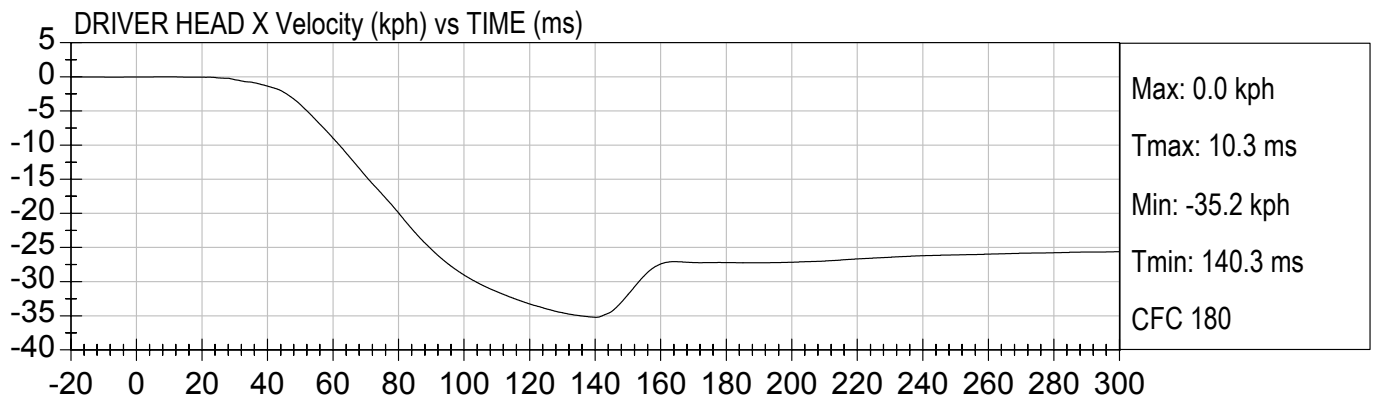
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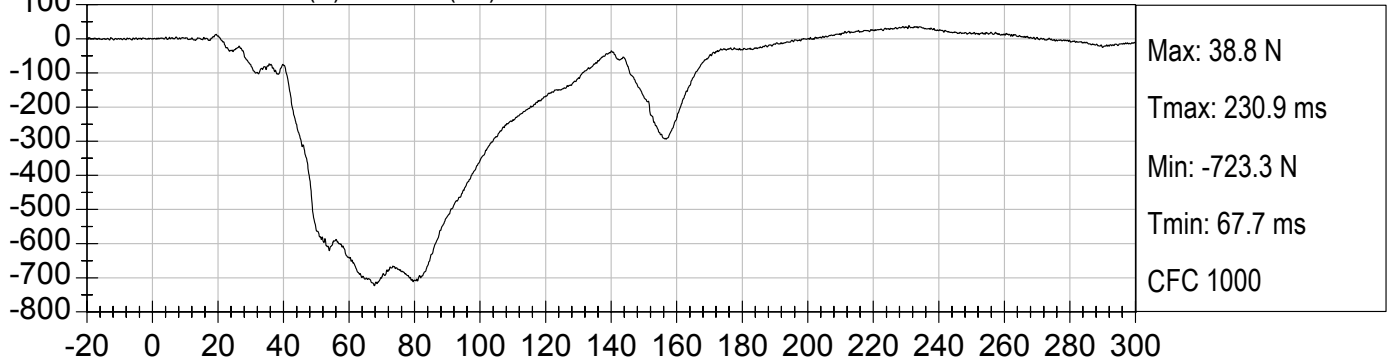
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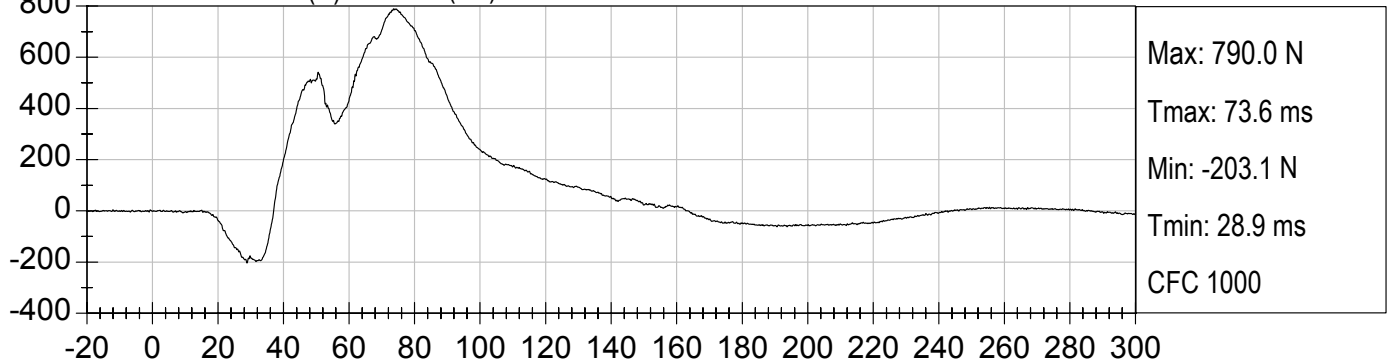




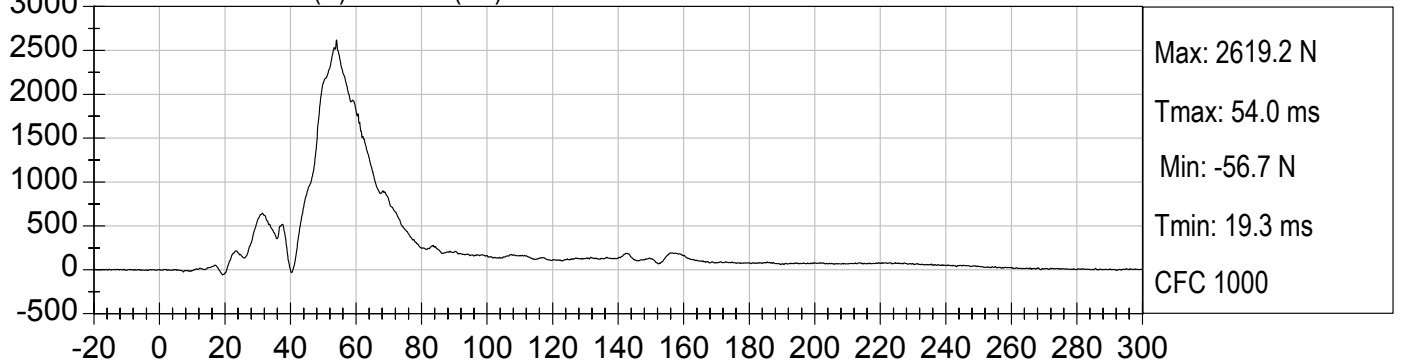
DRIVER NECK FX (N) vs TIME (ms)



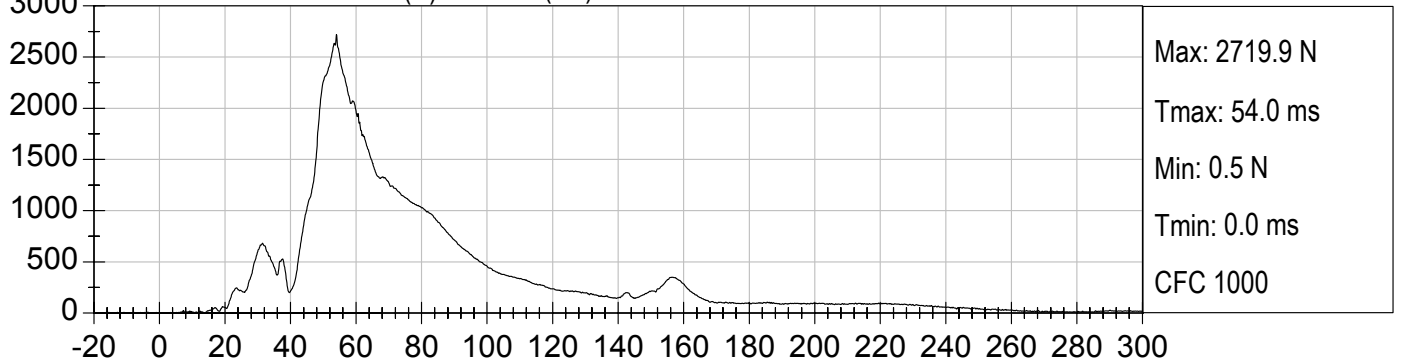
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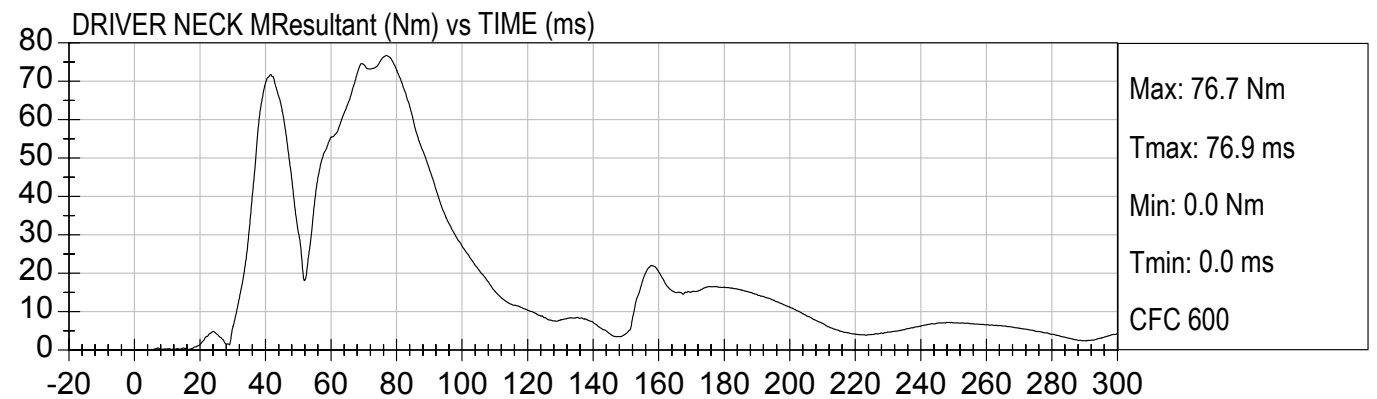
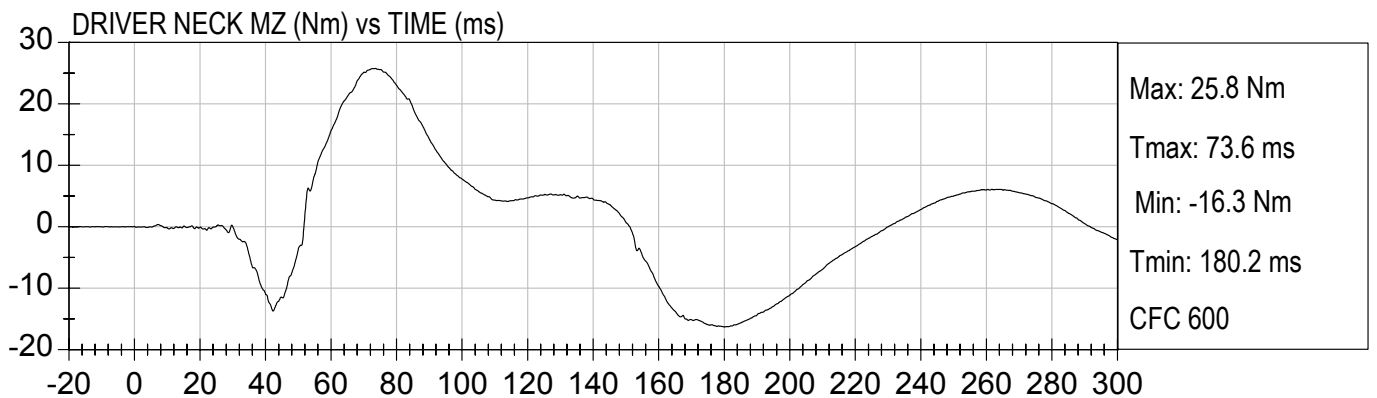
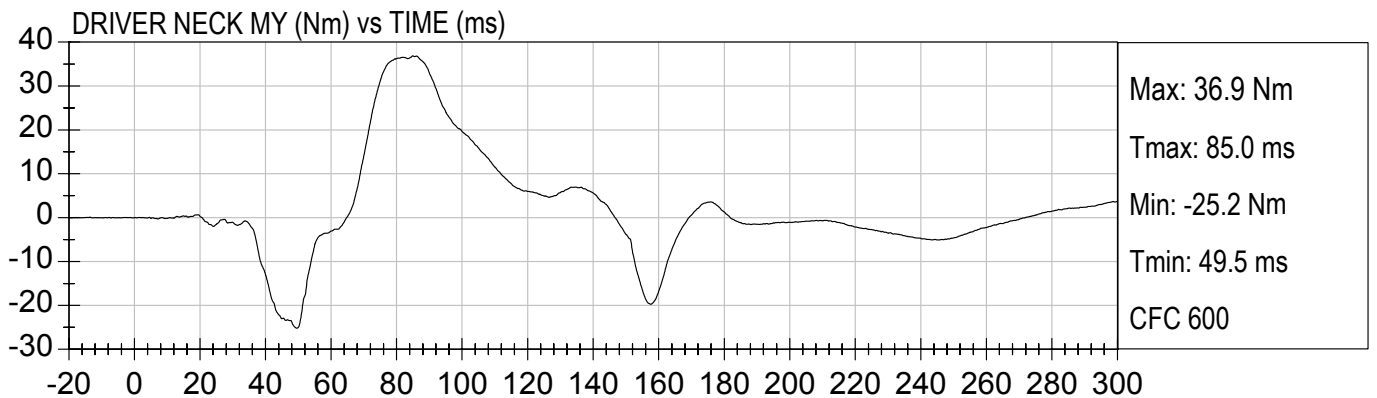
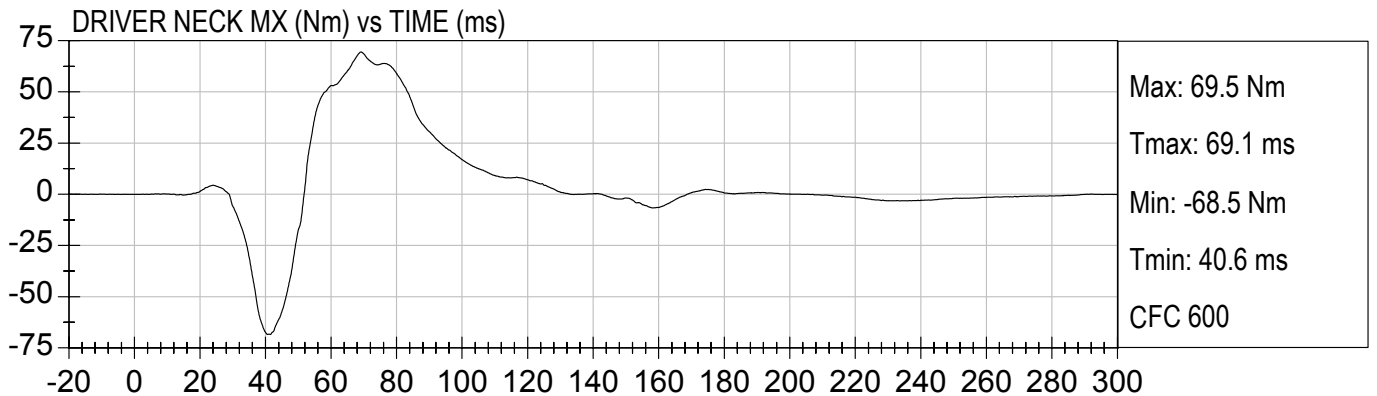


DRIVER NECK FZ (N) vs TIME (ms)



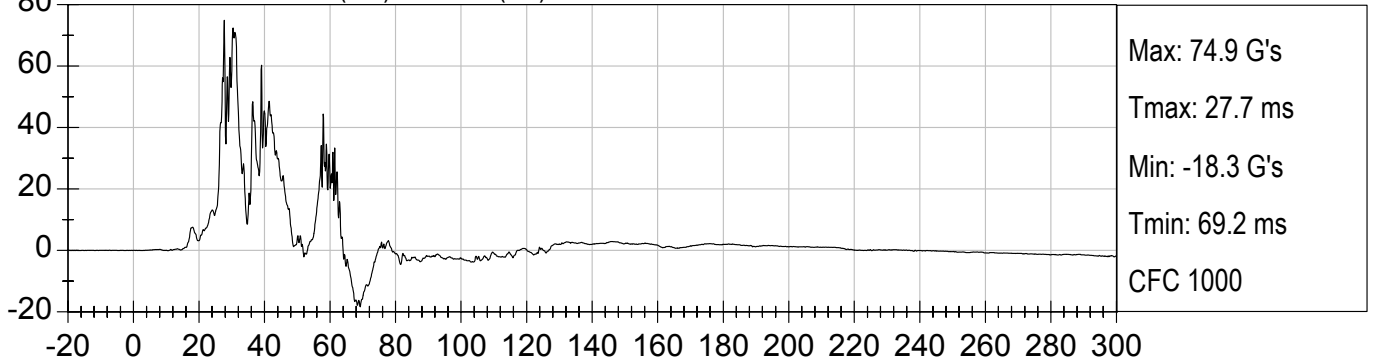
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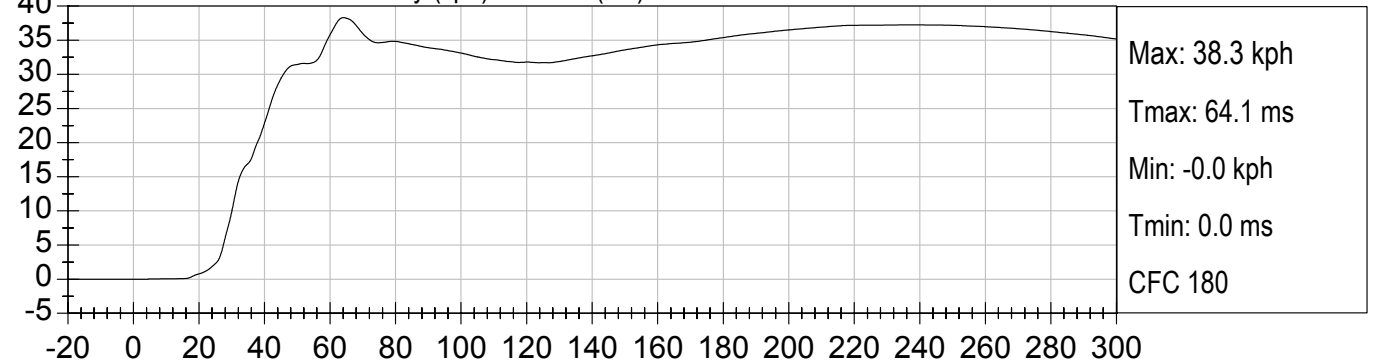




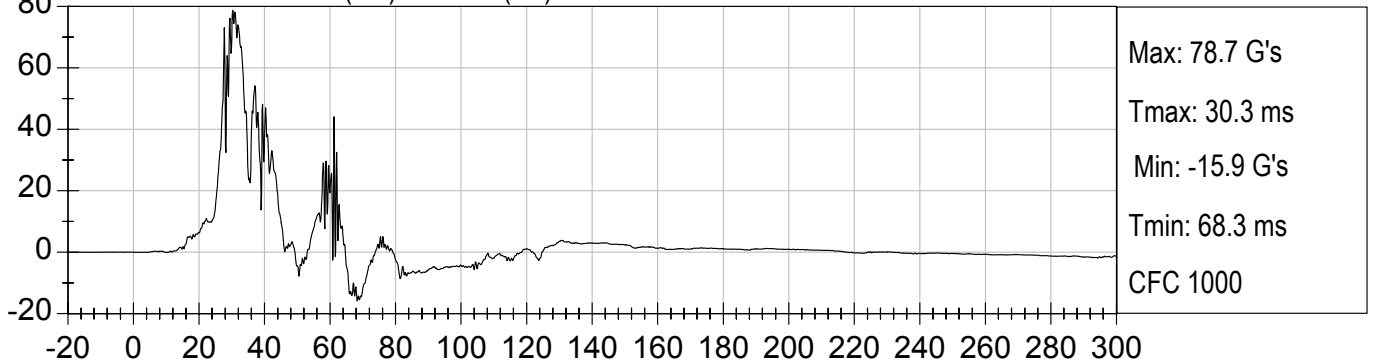
DRIVER UPPER RIB Y (G's) vs TIME (ms)



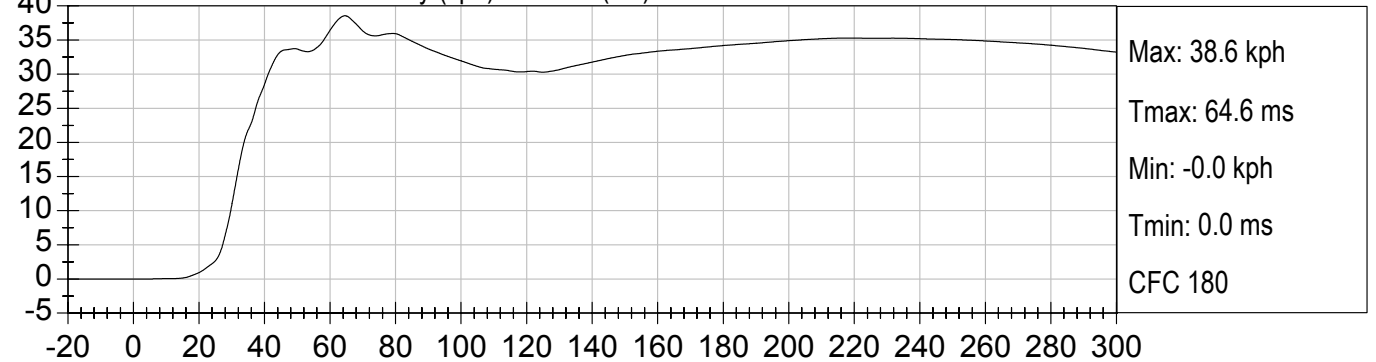
DRIVER UPPER RIB Y Velocity (kph) vs TIME (ms)

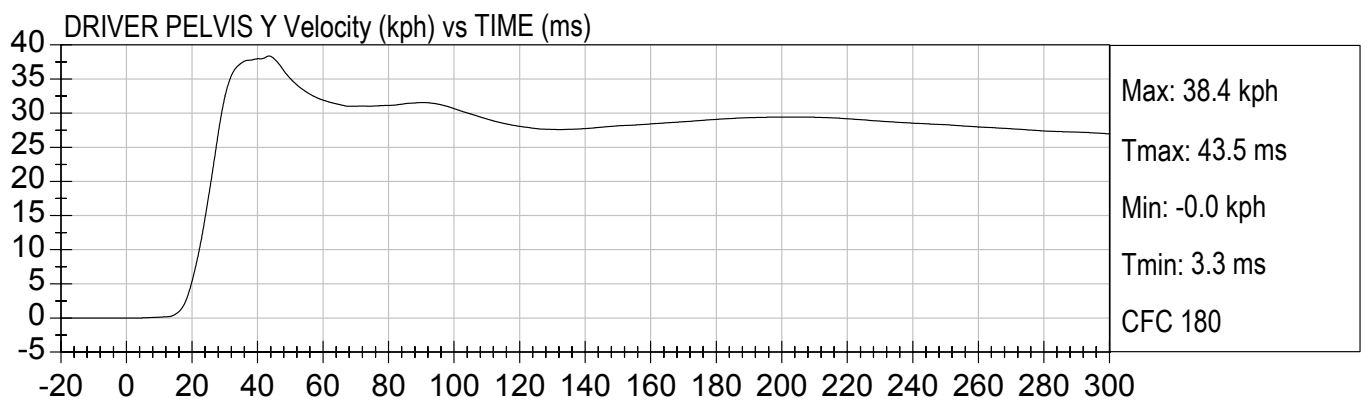
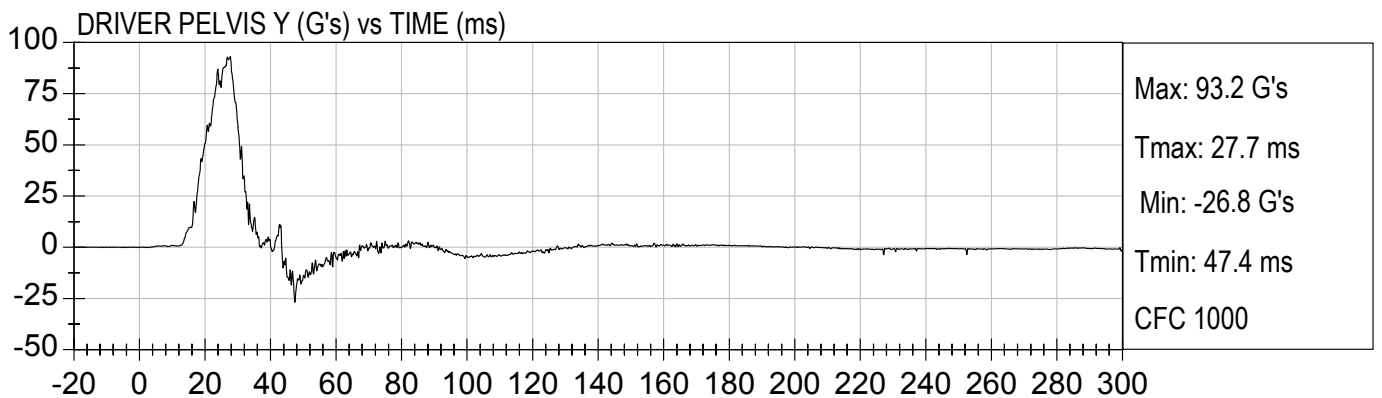
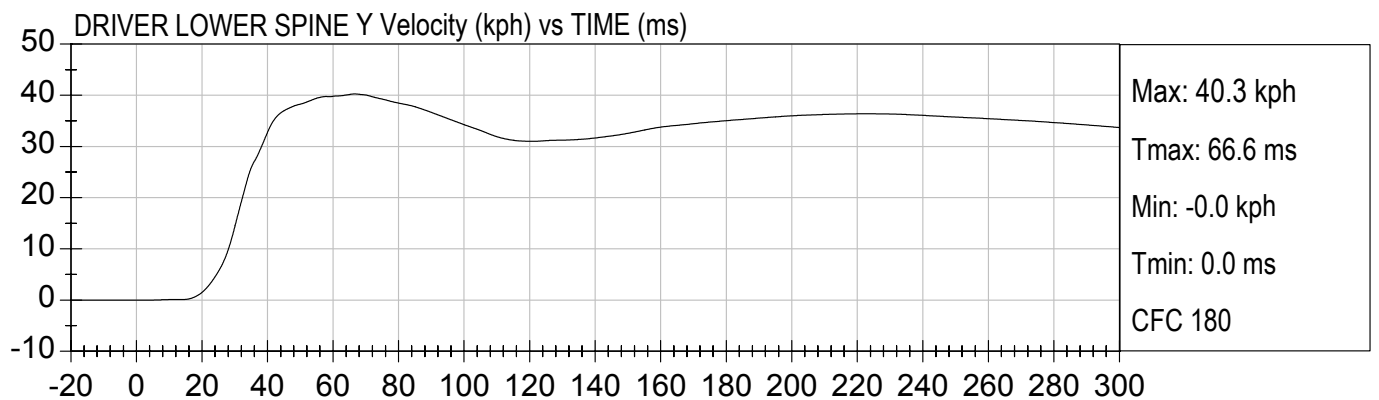
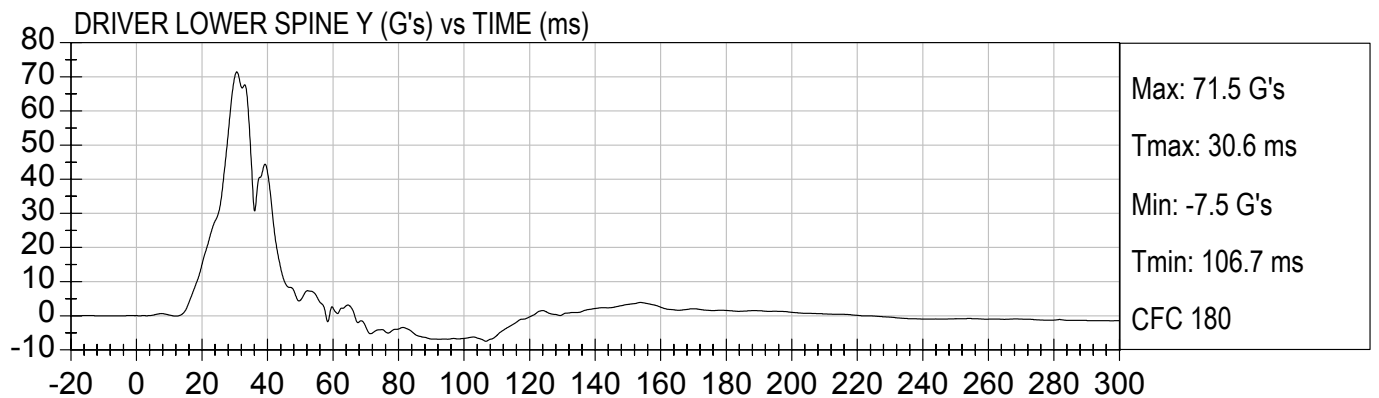


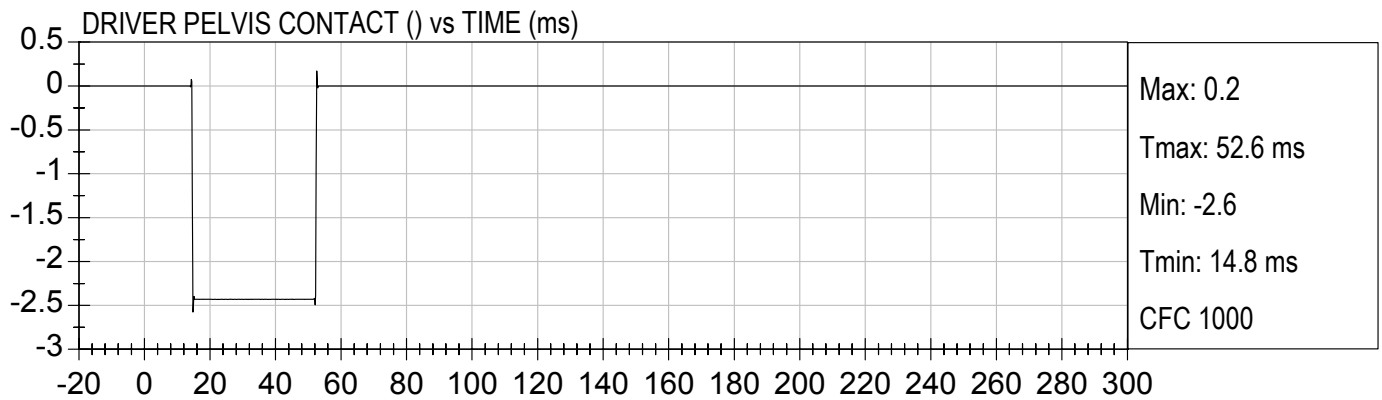
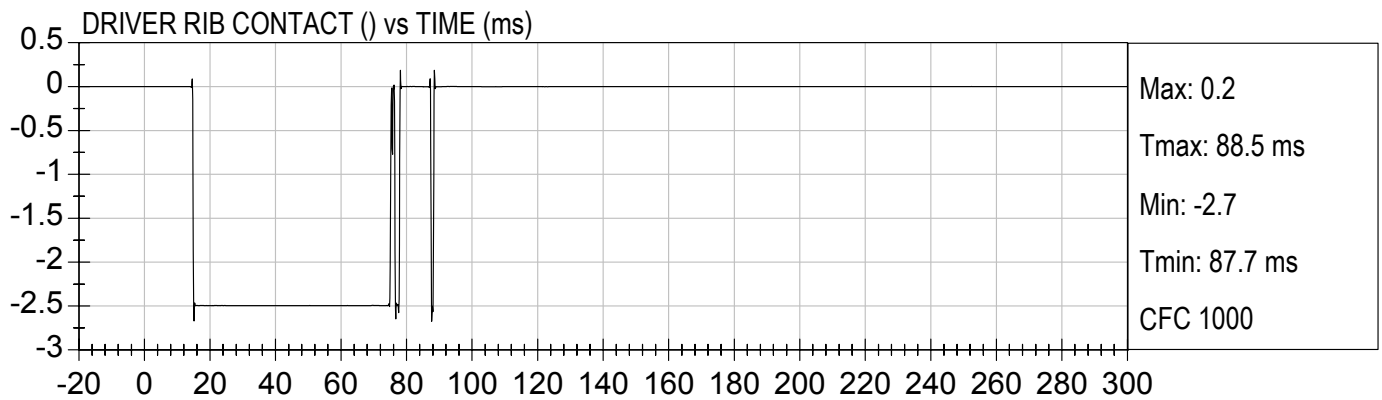
DRIVER LOWER RIB Y (G's) vs TIME (ms)

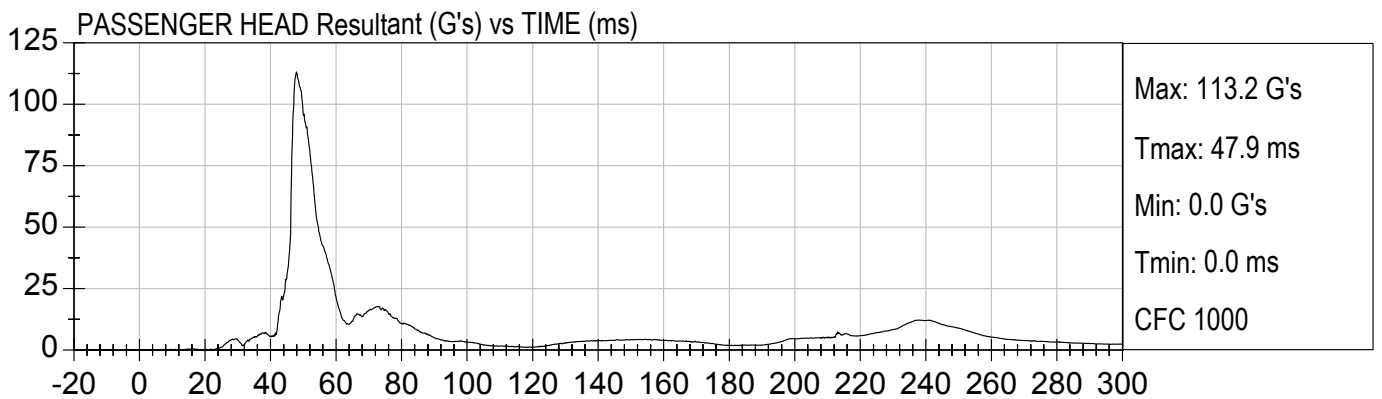
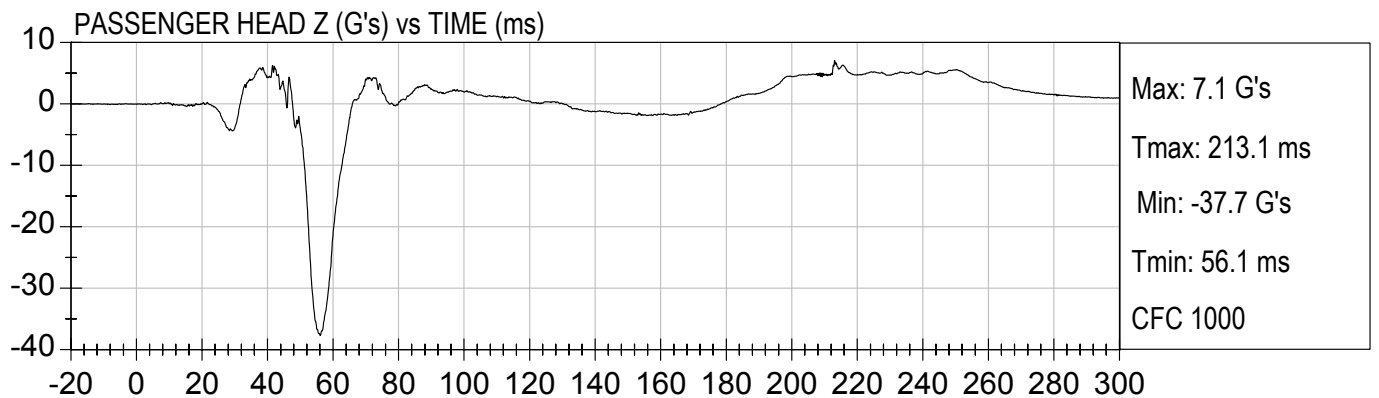
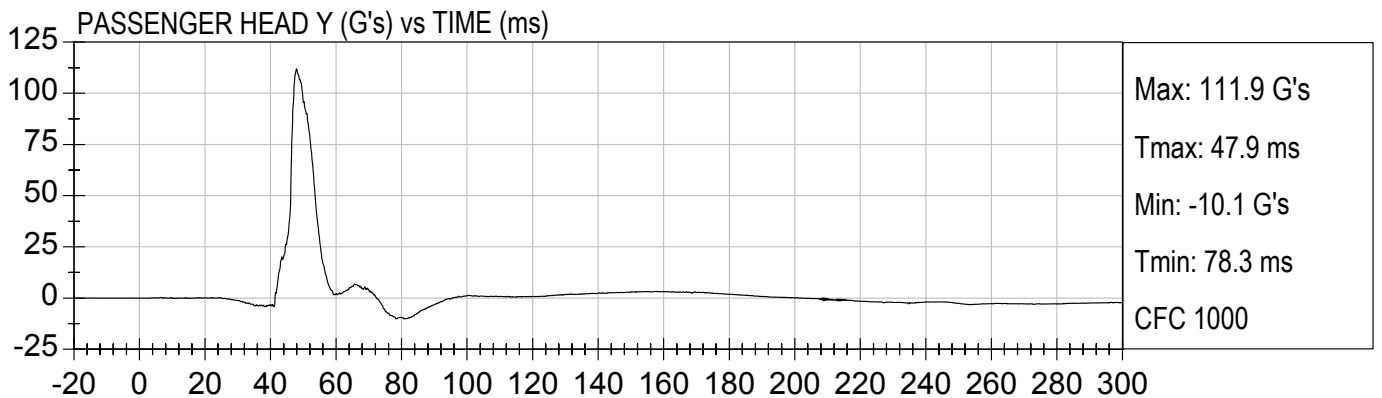
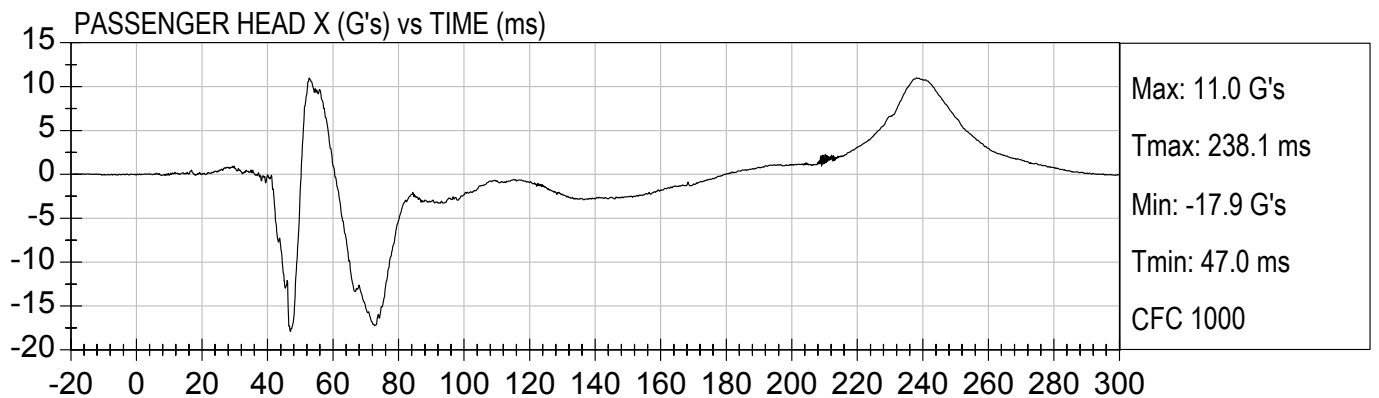


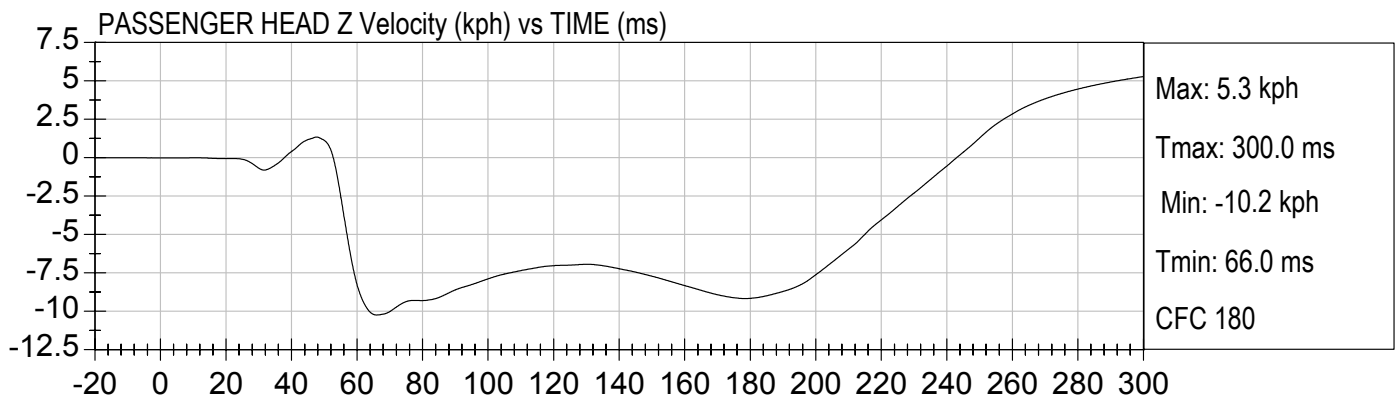
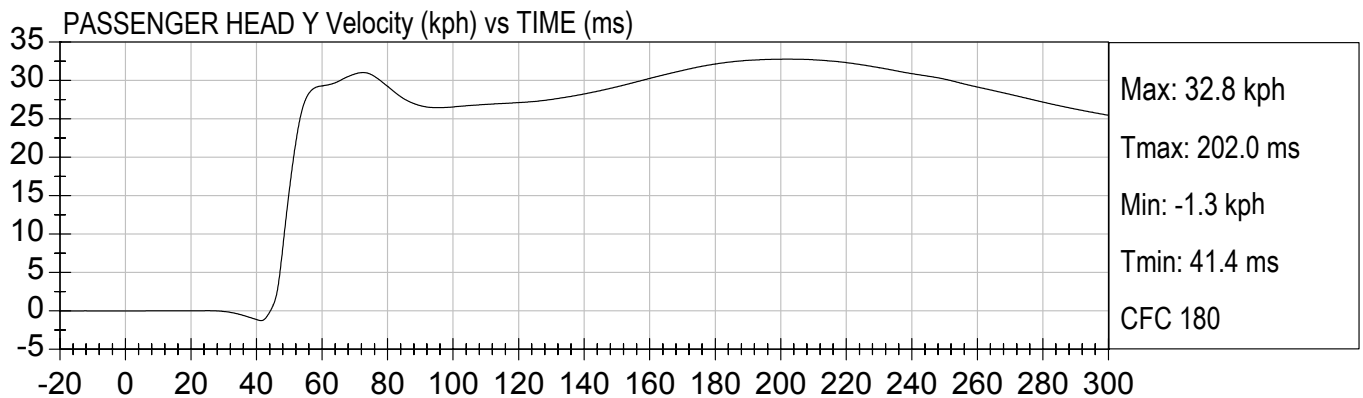
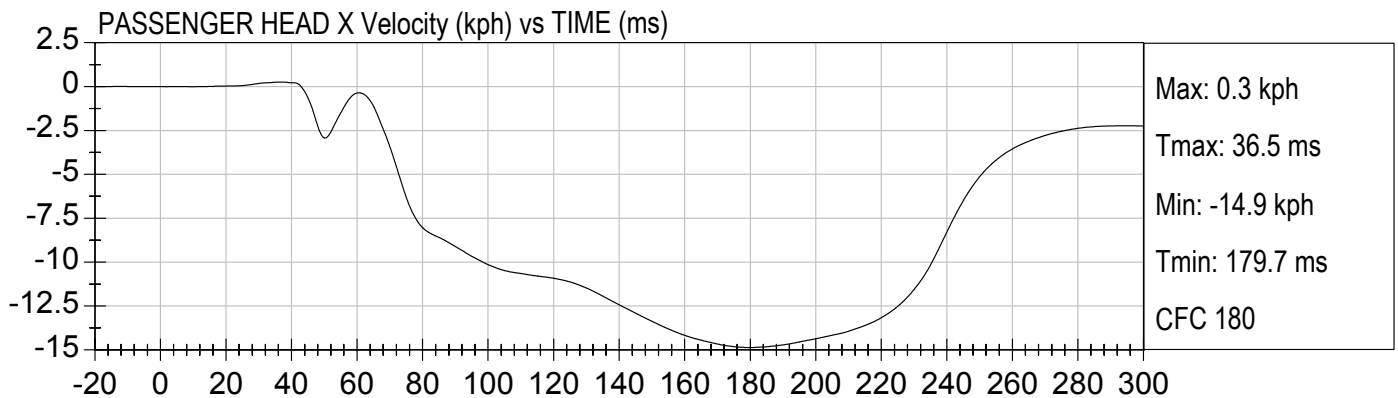
DRIVER LOWER RIB Y Velocity (kph) vs TIME (ms)





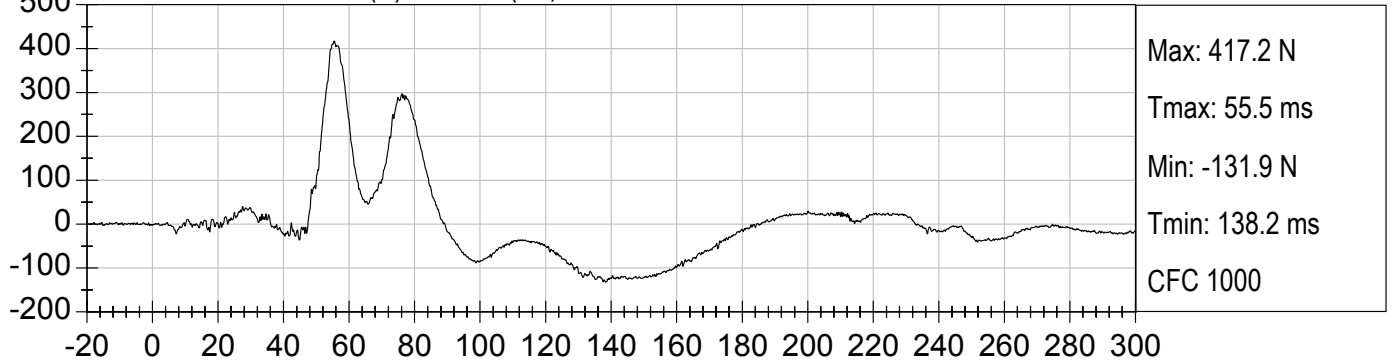




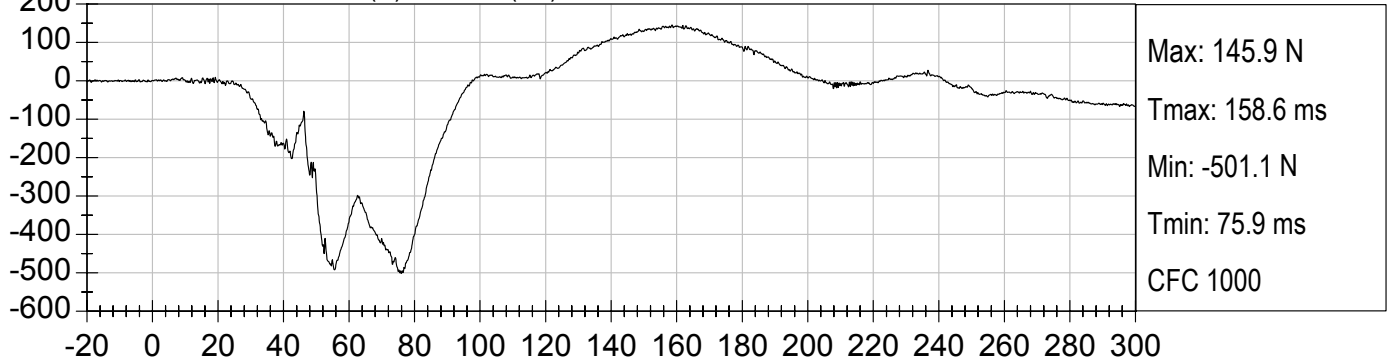




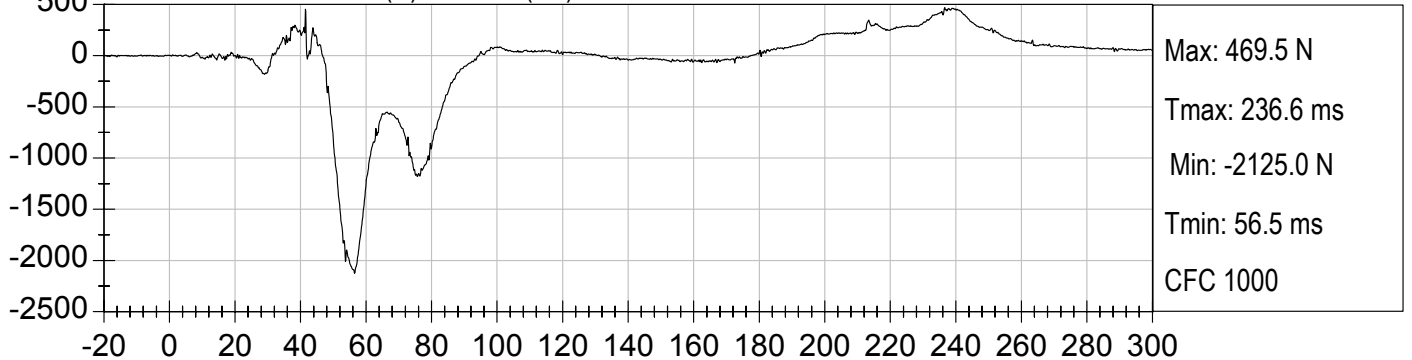
PASSENGER NECK FX (N) vs TIME (ms)



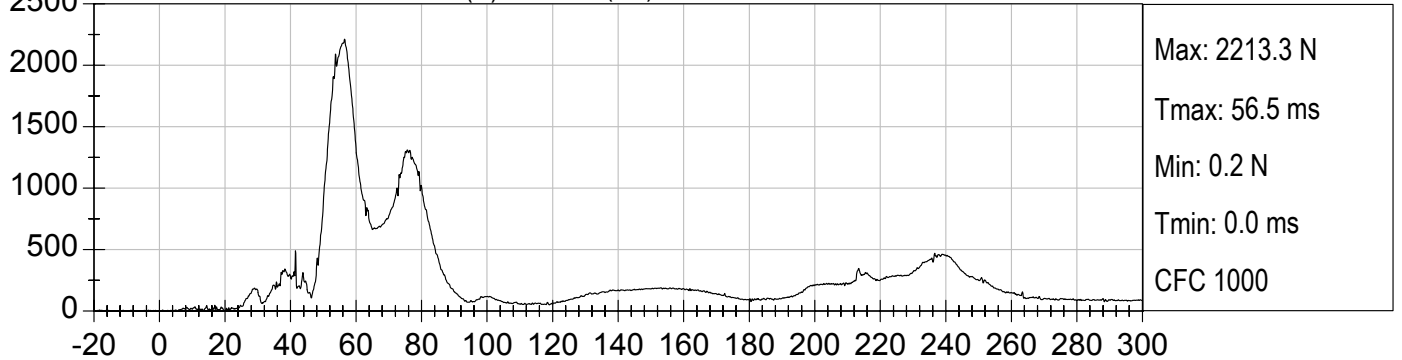
PASSENGER NECK FY (N) vs TIME (ms)

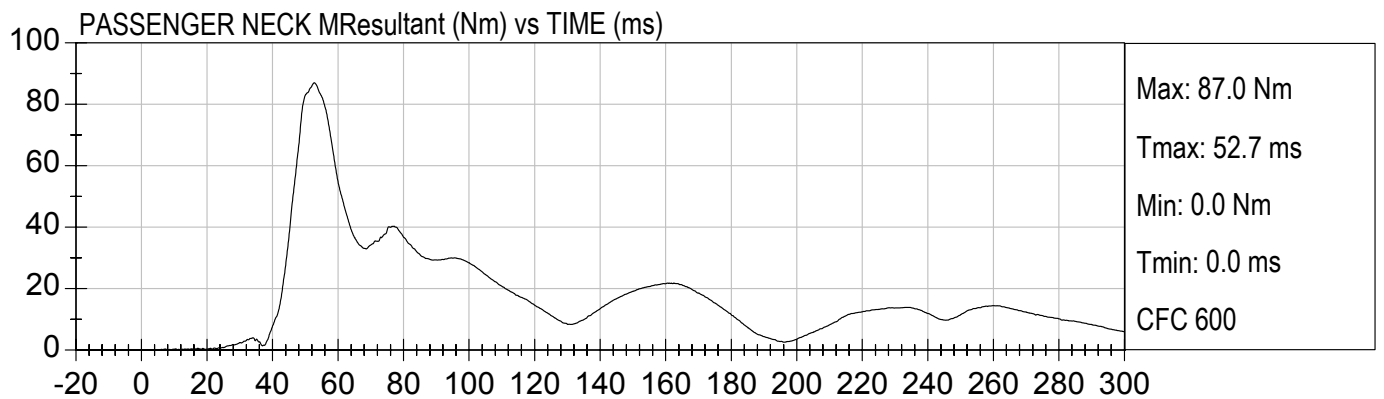
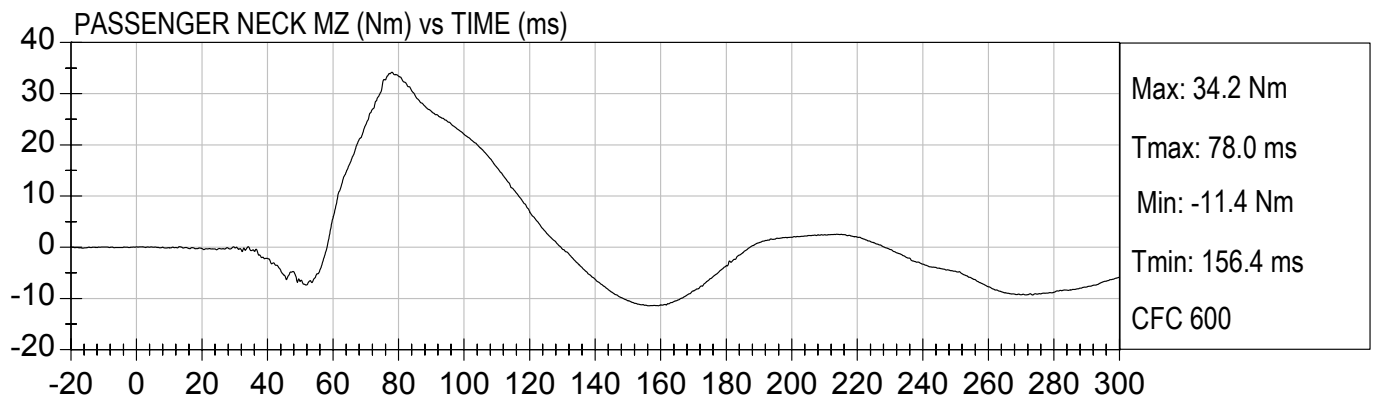
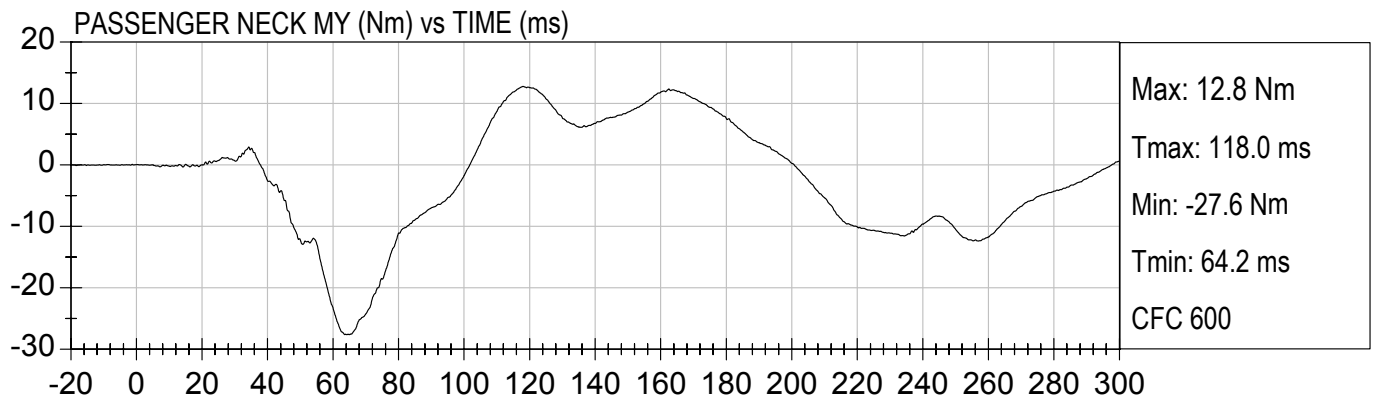
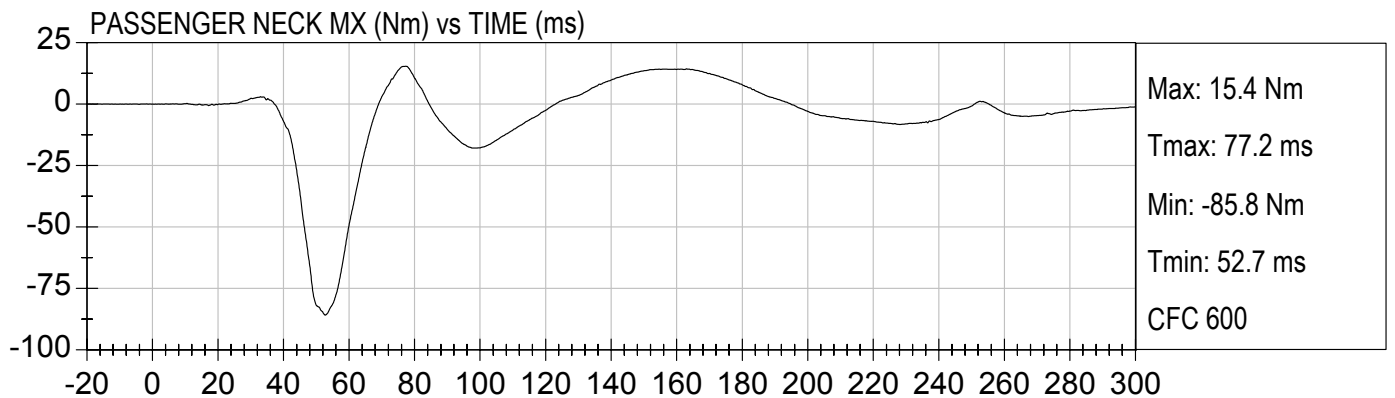


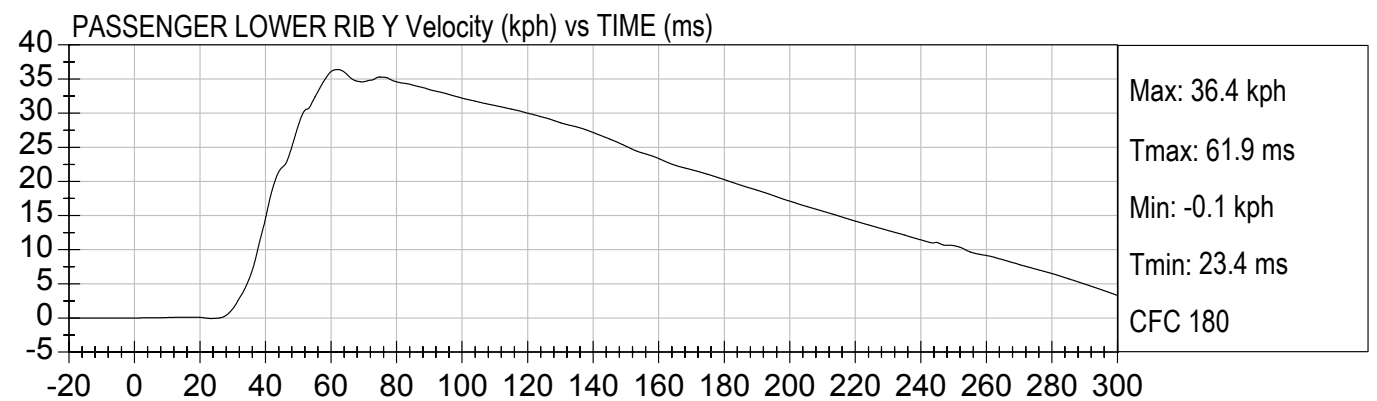
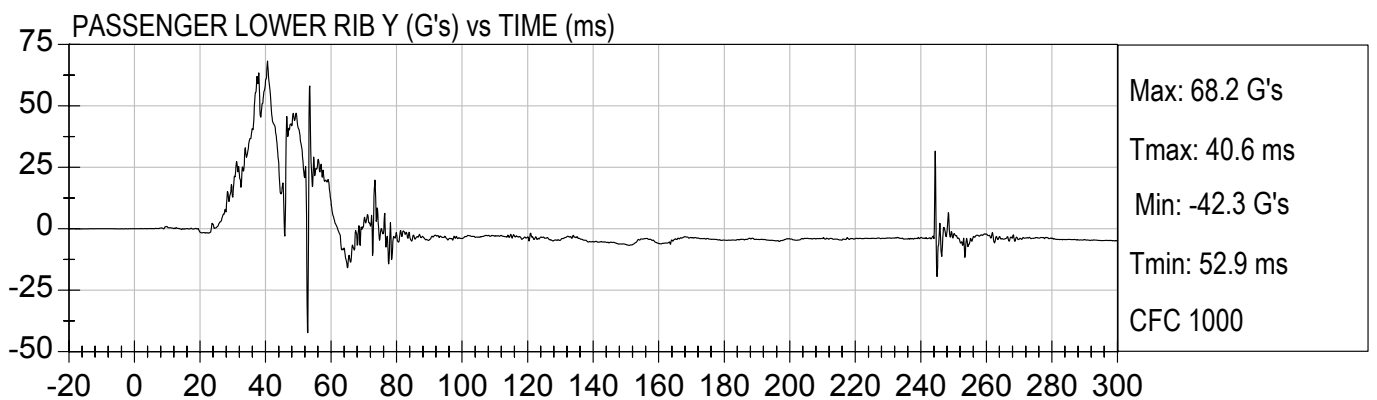
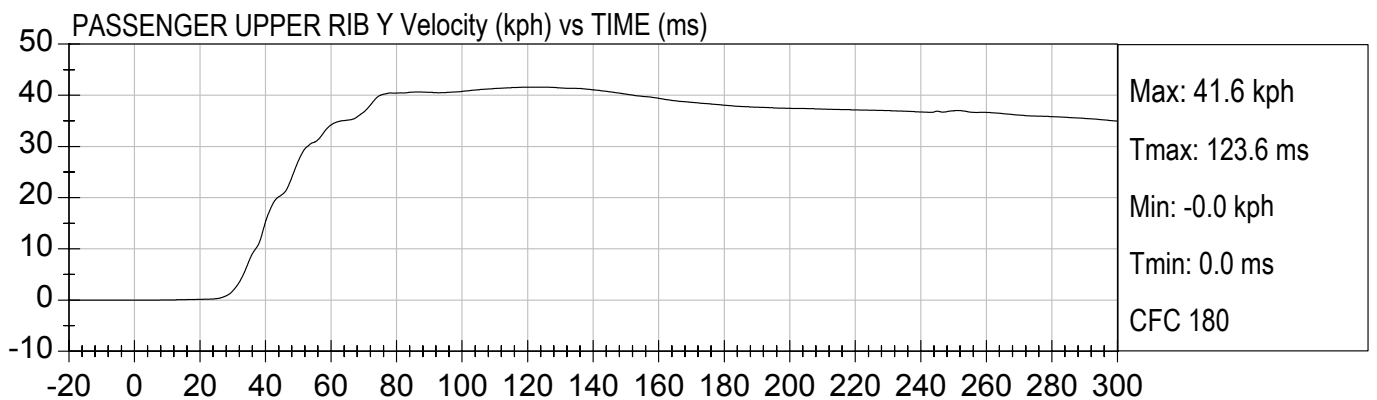
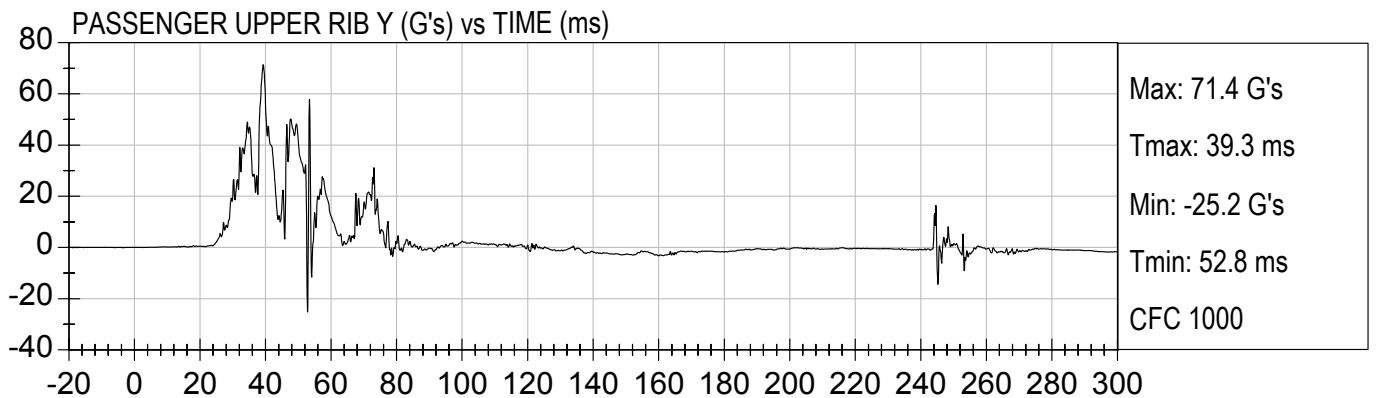
PASSENGER NECK FZ (N) vs TIME (ms)

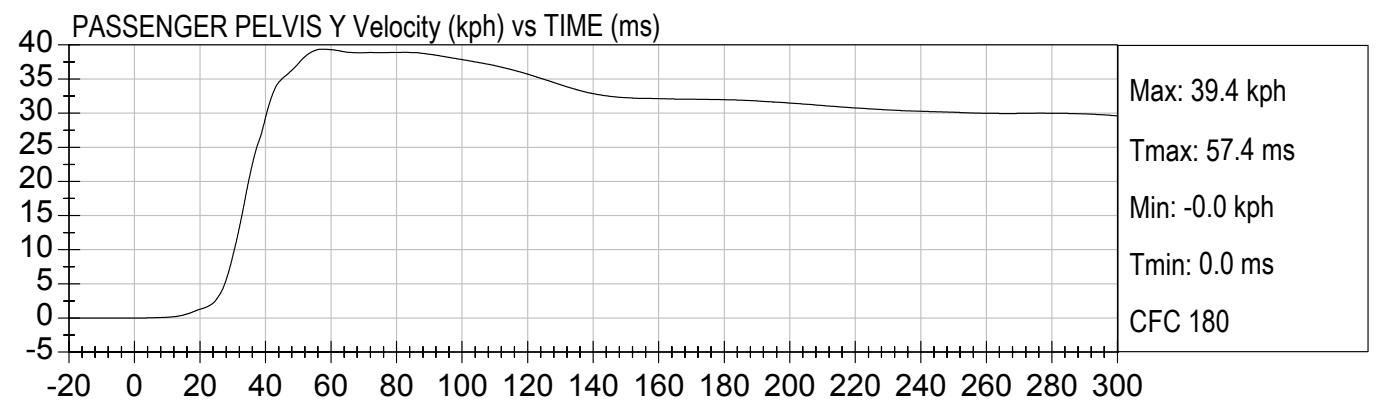
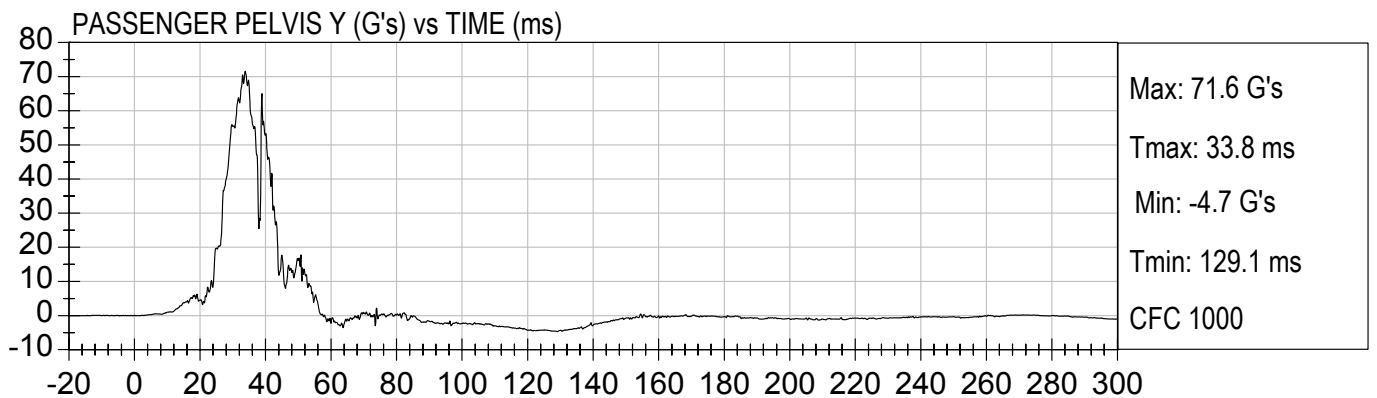
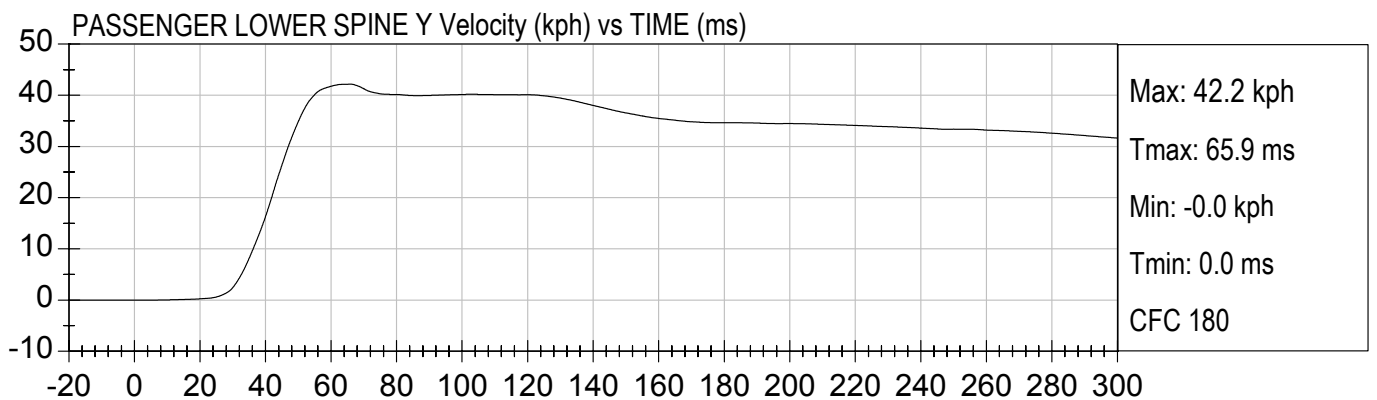
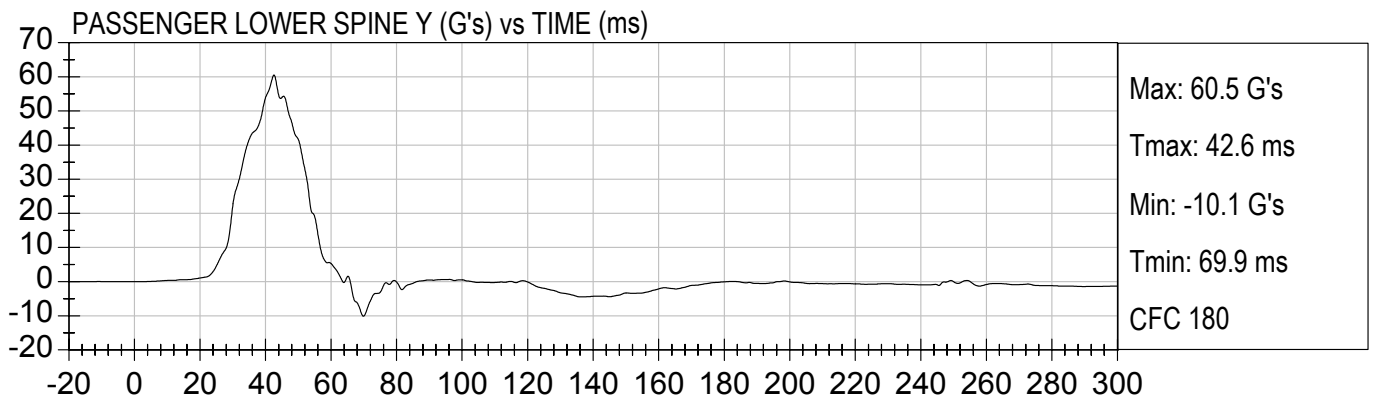


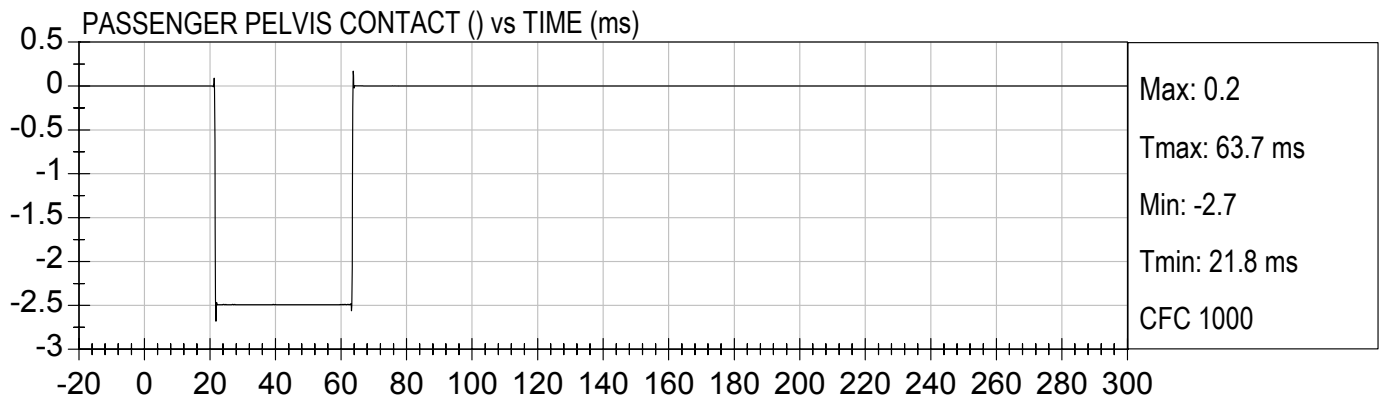
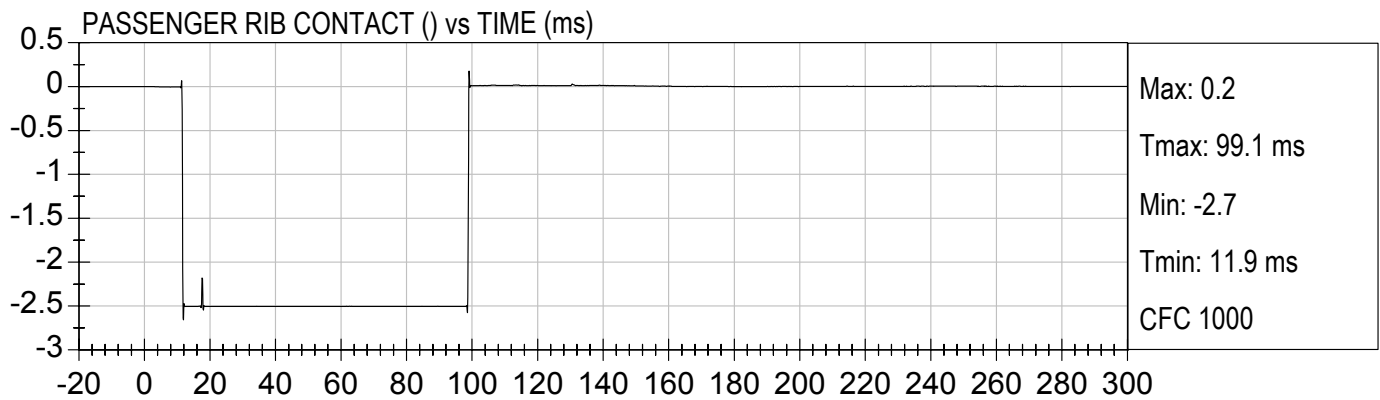
PASSENGER NECK FResultant (N) vs TIME (ms)

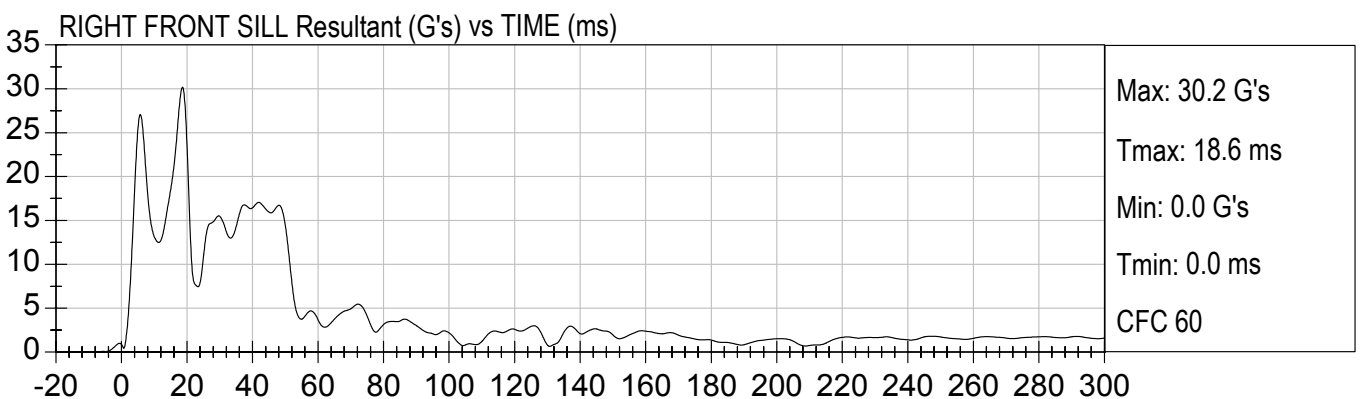
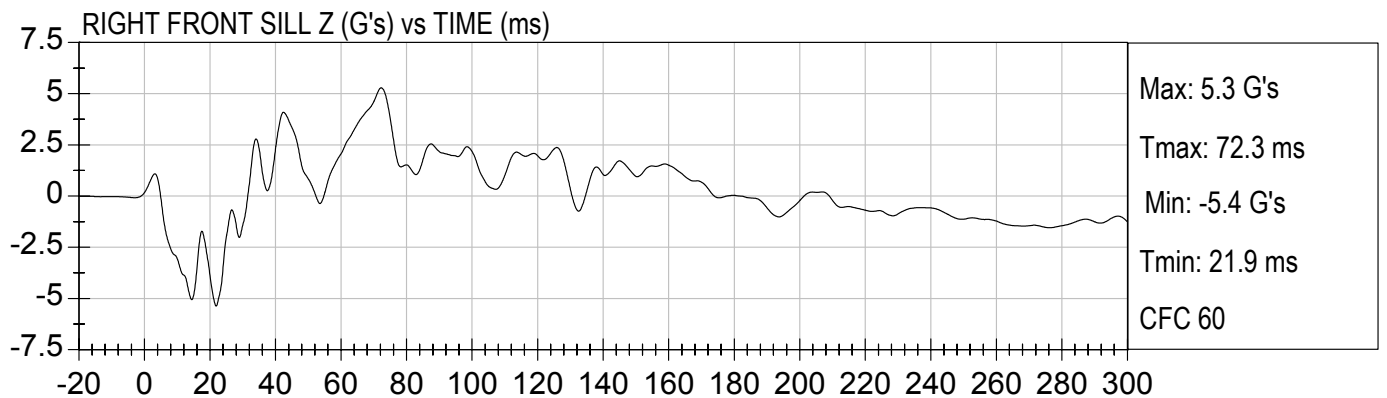
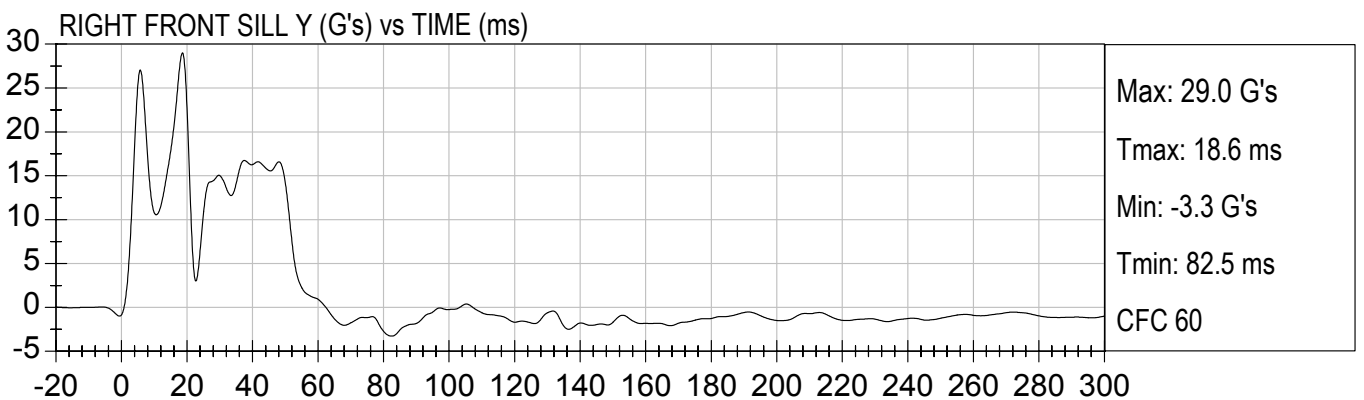
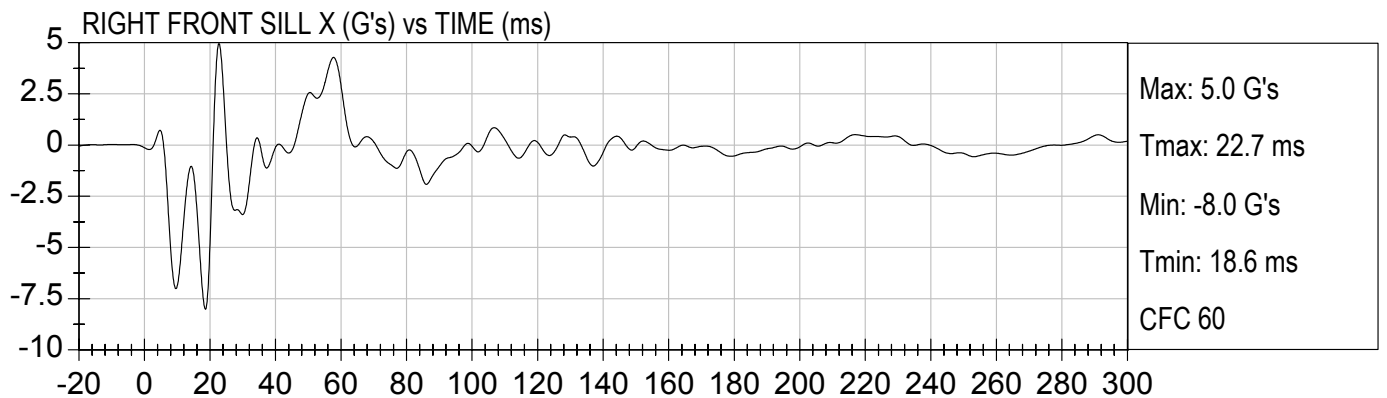


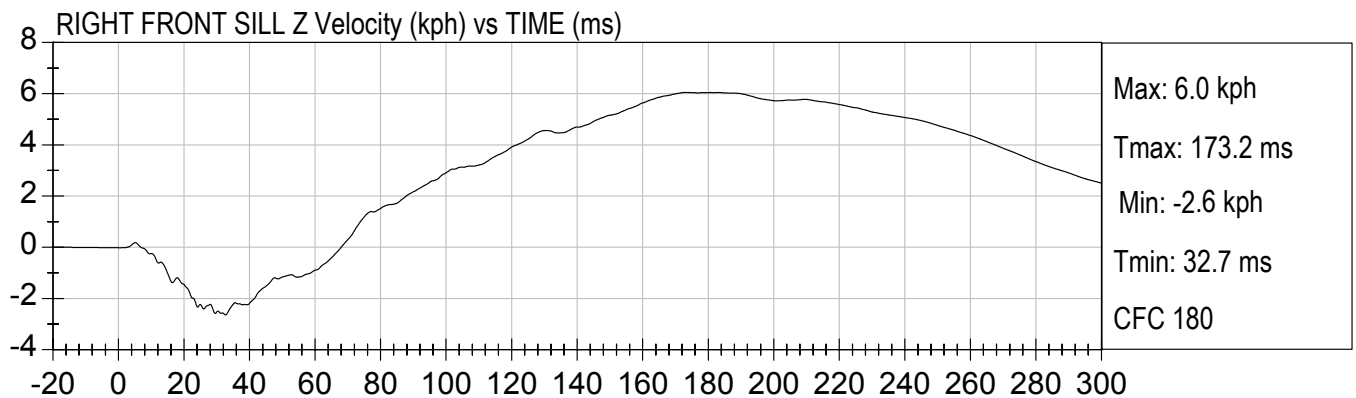
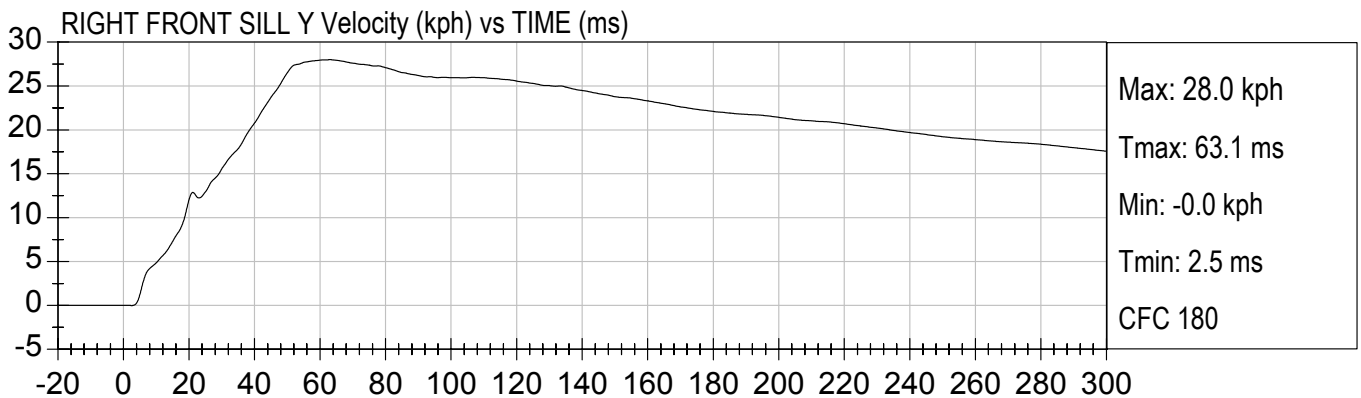
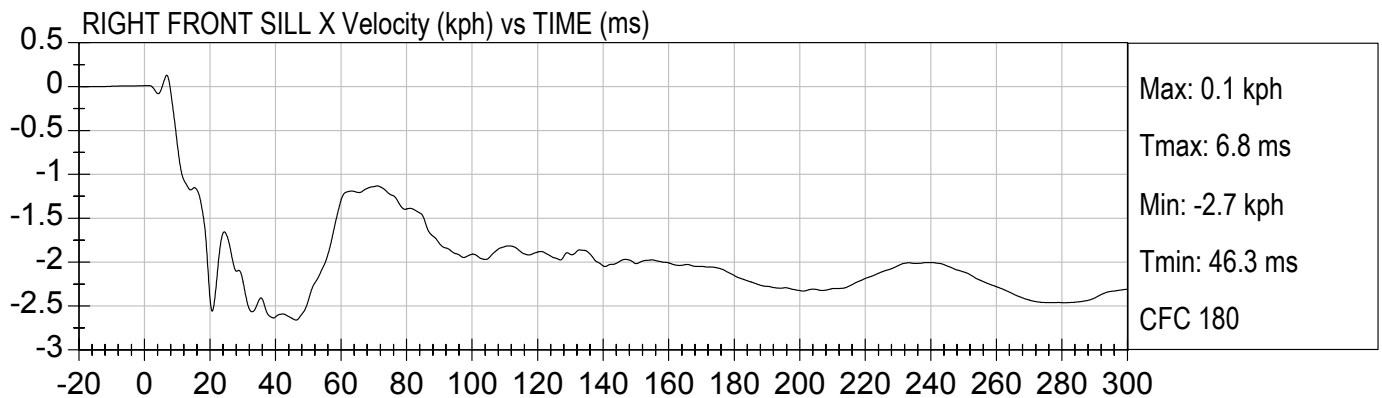






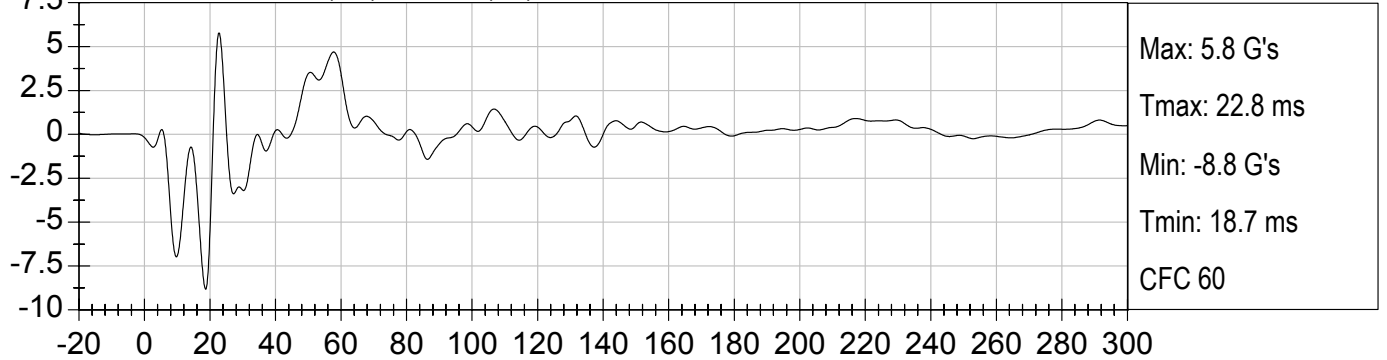




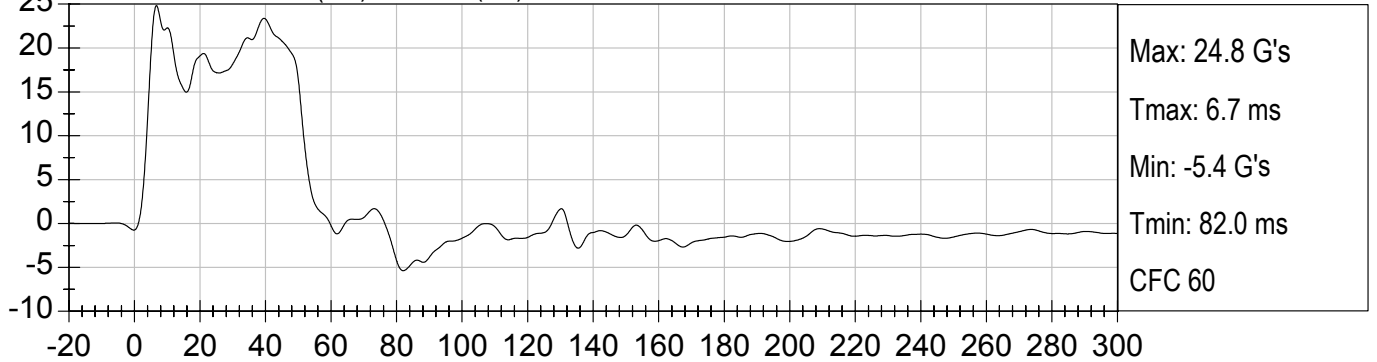




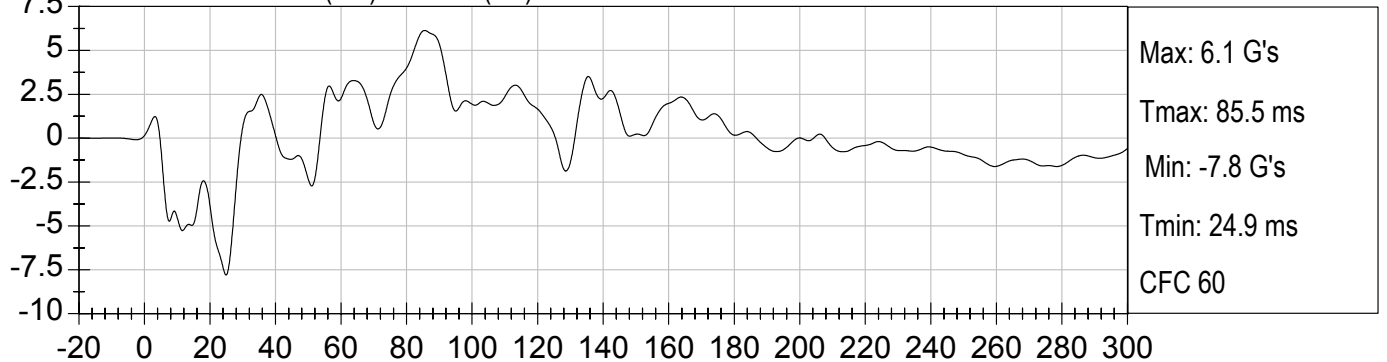
RIGHT REAR SILL X (G's) vs TIME (ms)



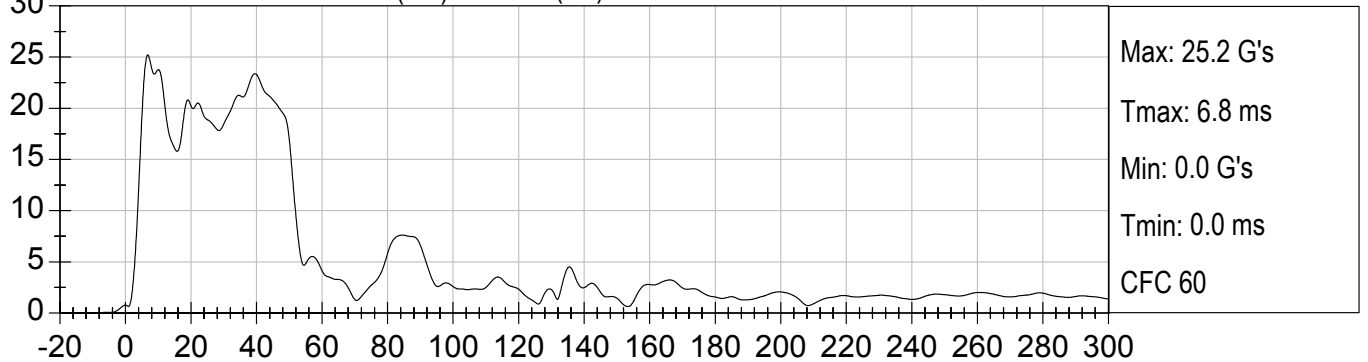
RIGHT REAR SILL Y (G's) vs TIME (ms)

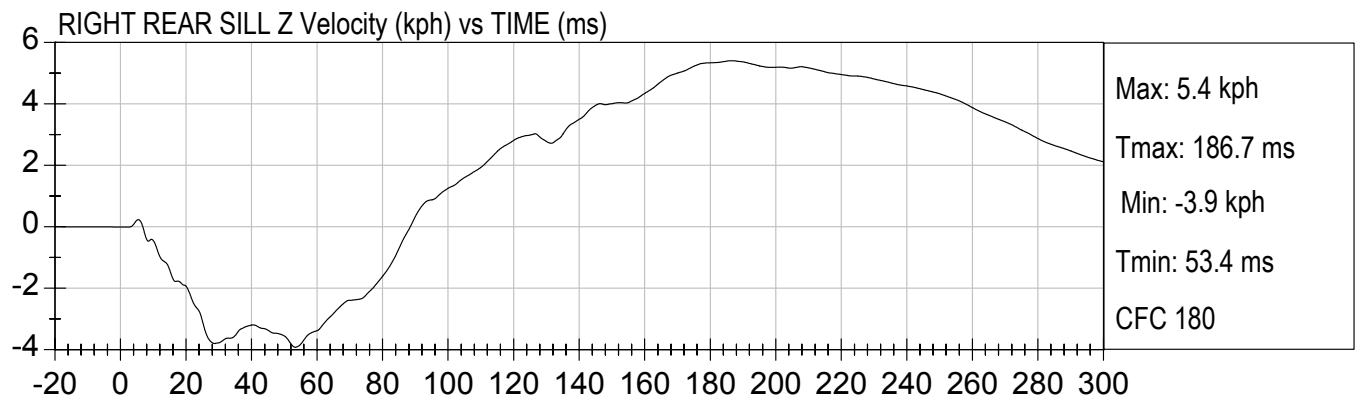
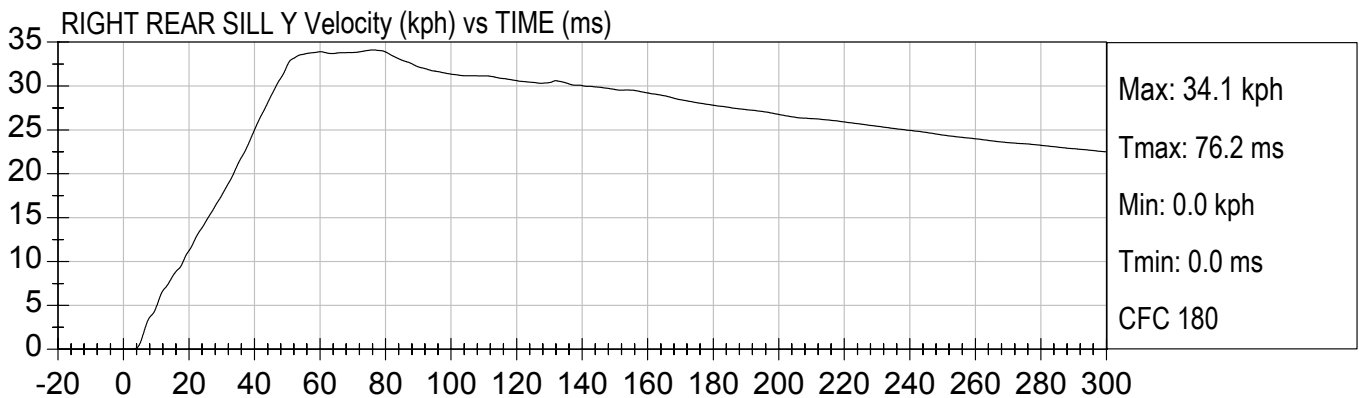
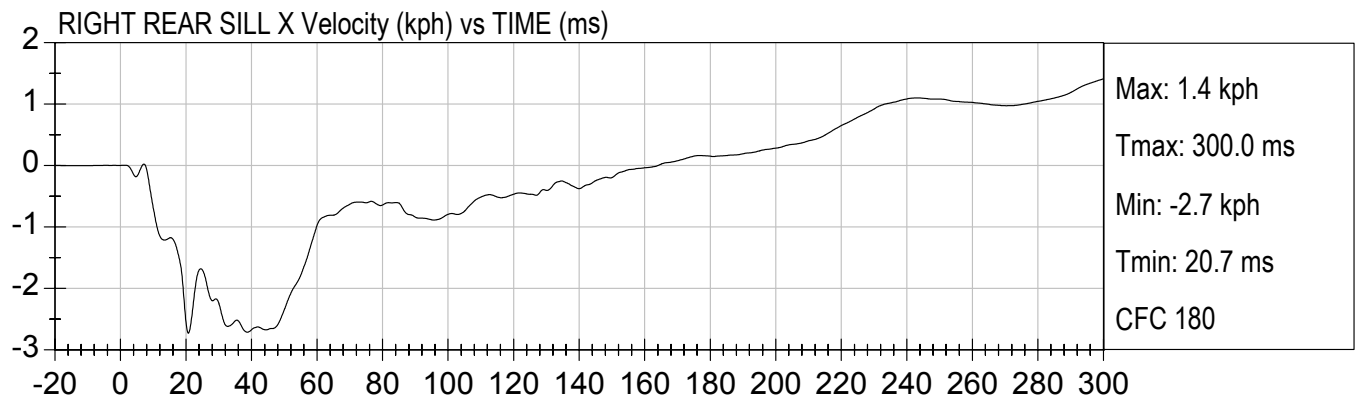


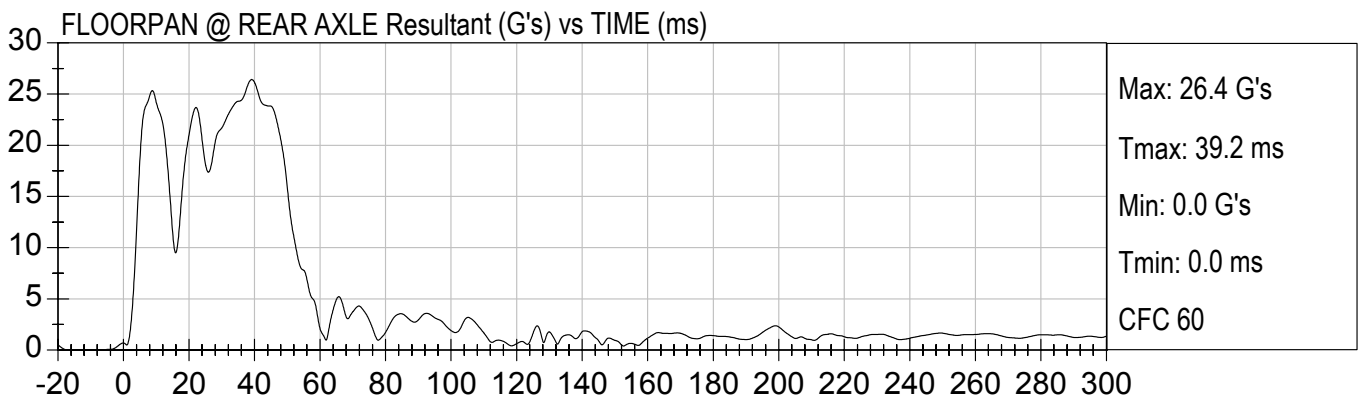
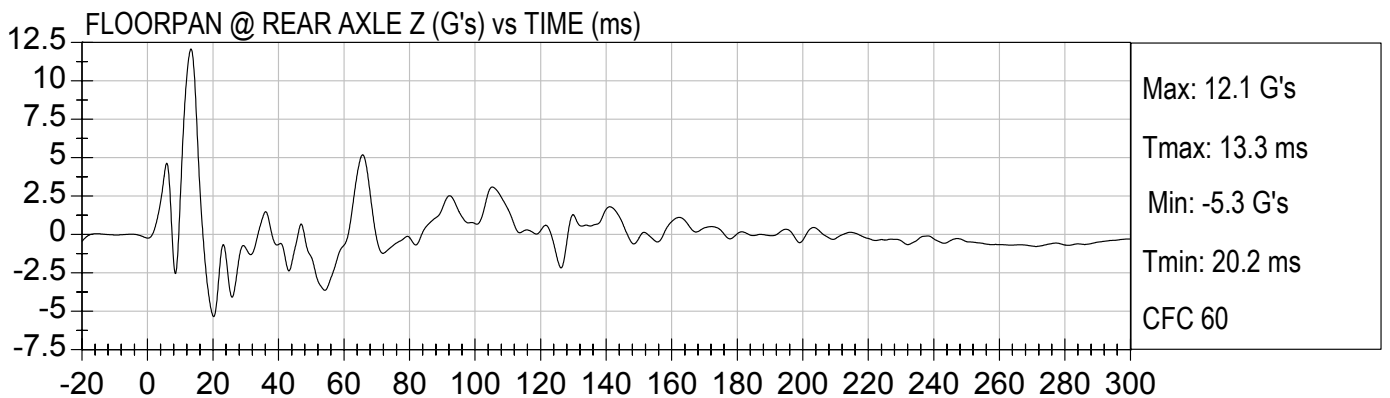
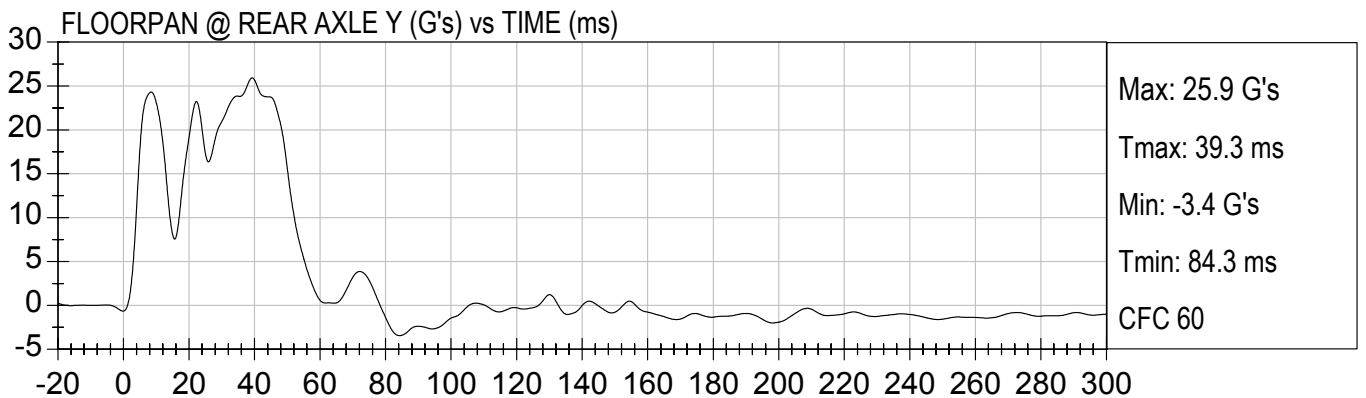
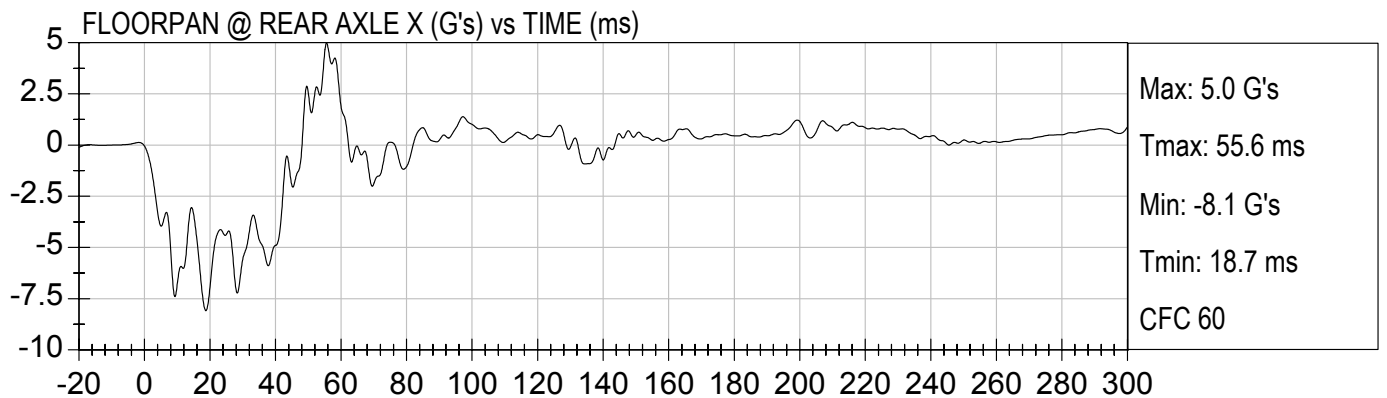
RIGHT REAR SILL Z (G's) vs TIME (ms)



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

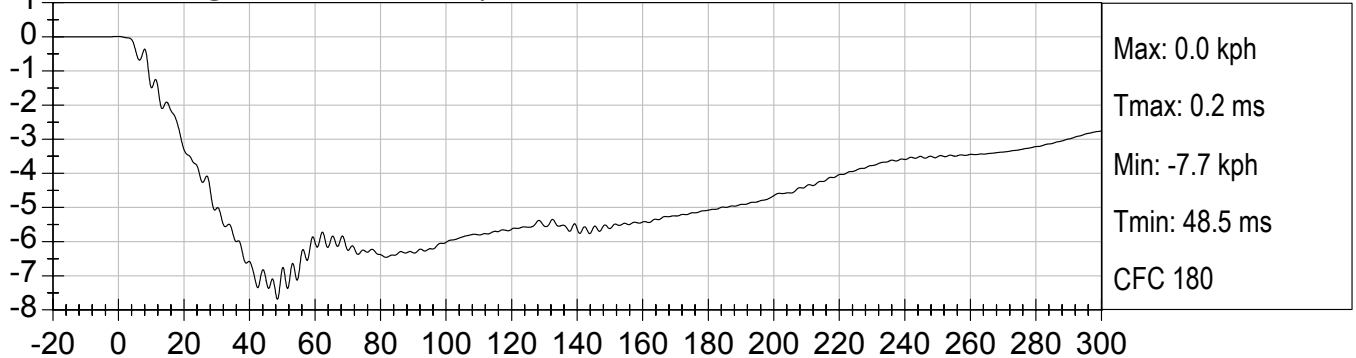




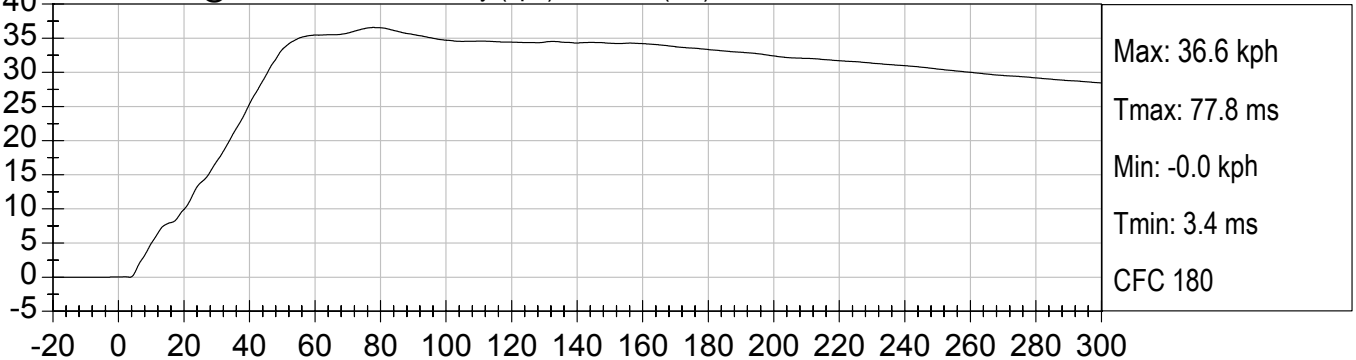




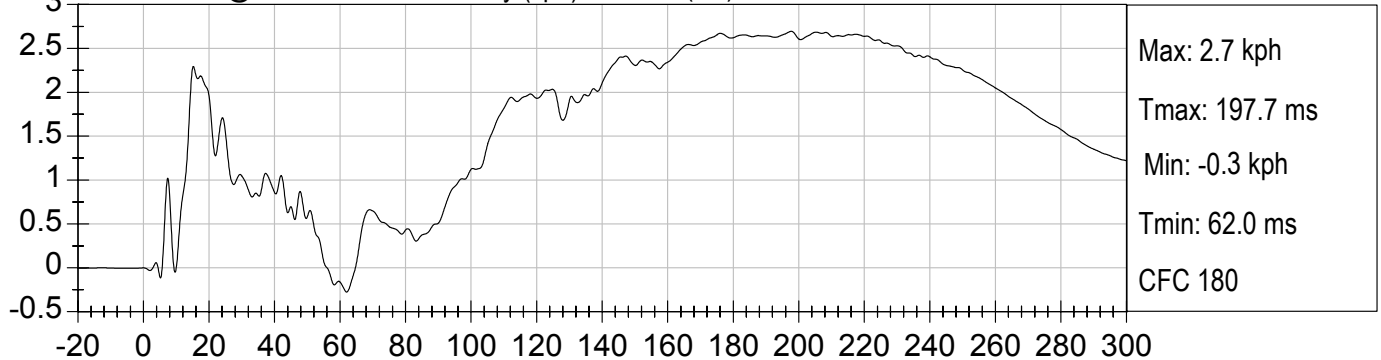
1 FLOORPAN @ REAR AXLE X Velocity (kph) vs TIME (ms)

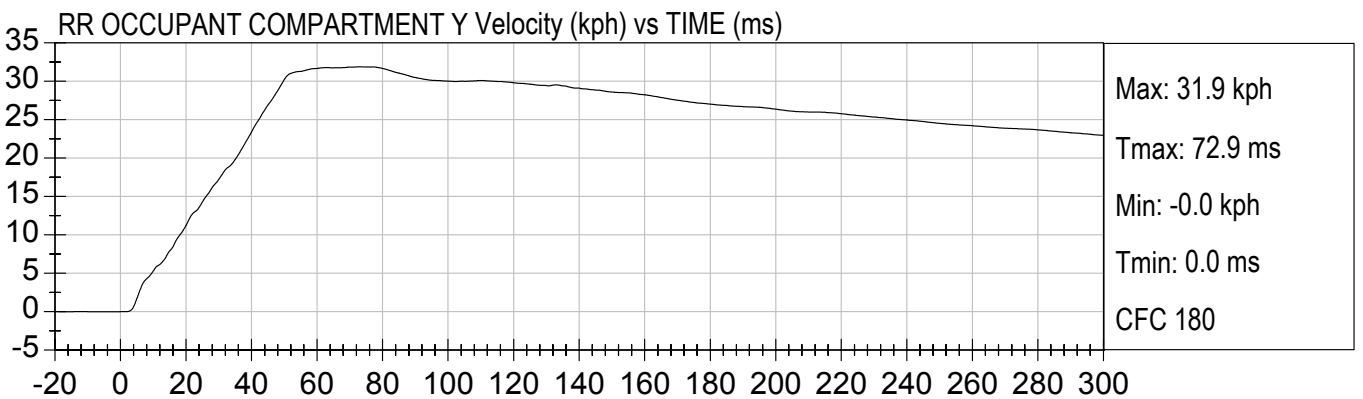
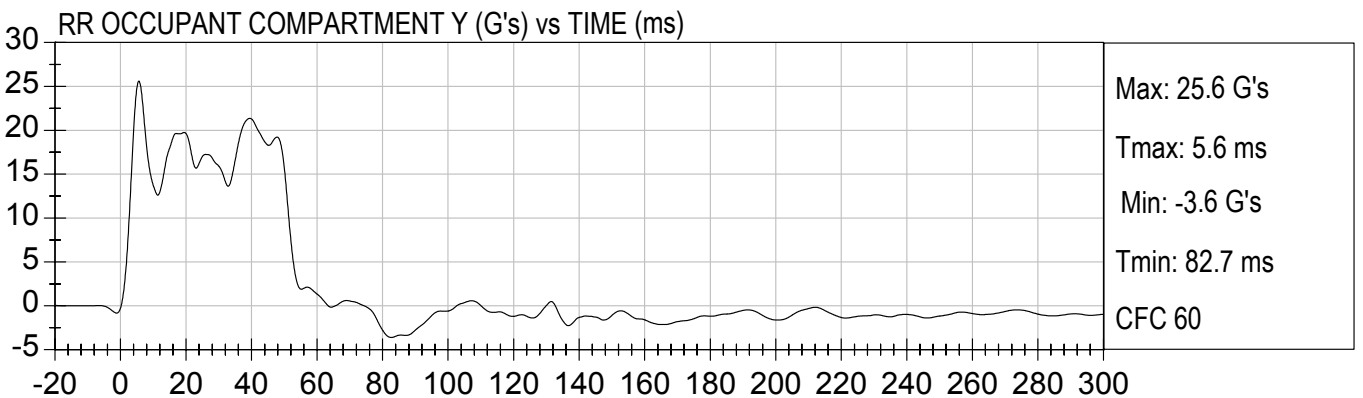
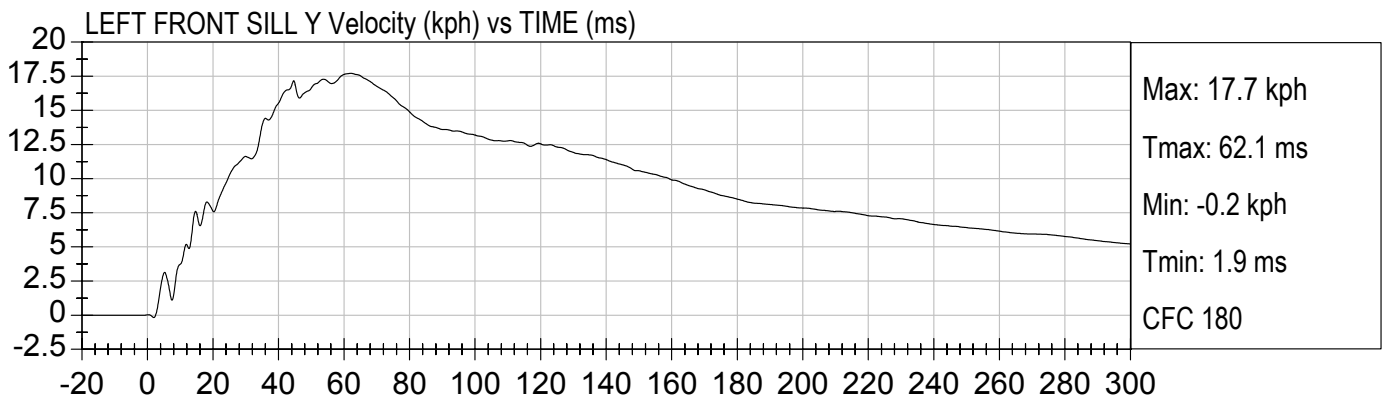
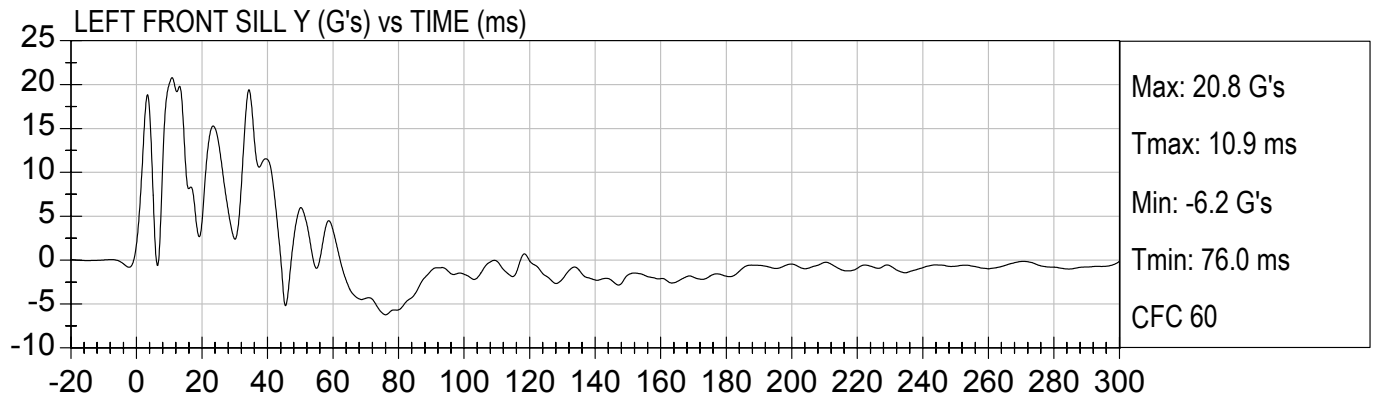


40 FLOORPAN @ REAR AXLE Y Velocity (kph) vs TIME (ms)



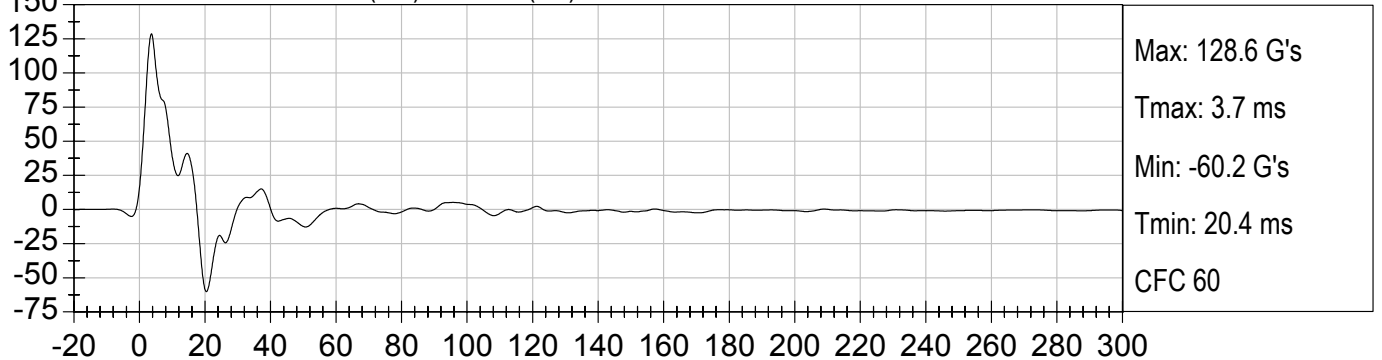
3 FLOORPAN @ REAR AXLE Z Velocity (kph) vs TIME (ms)



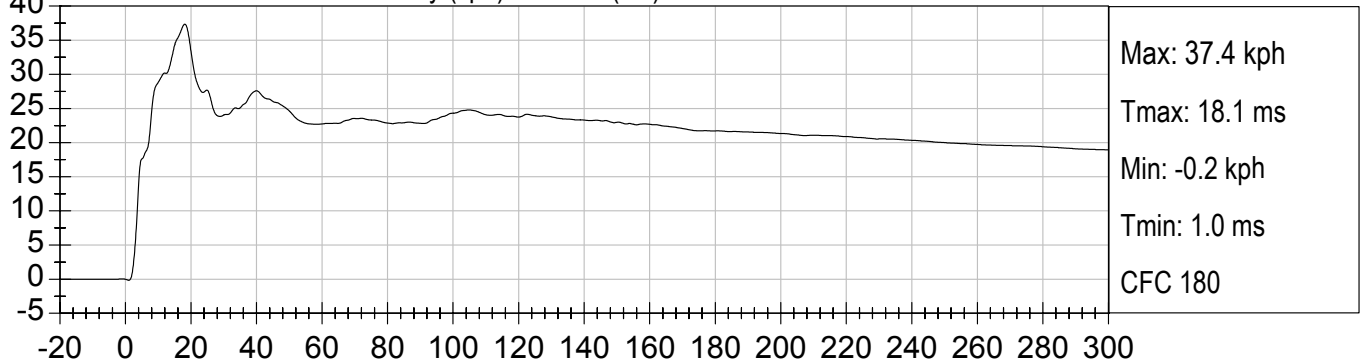




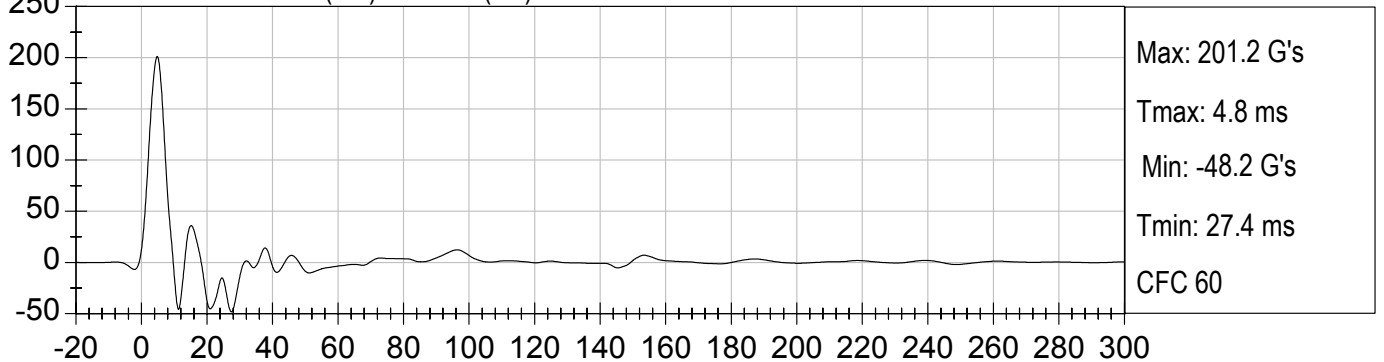
LEFT LOWER B-POST Y (G's) vs TIME (ms)



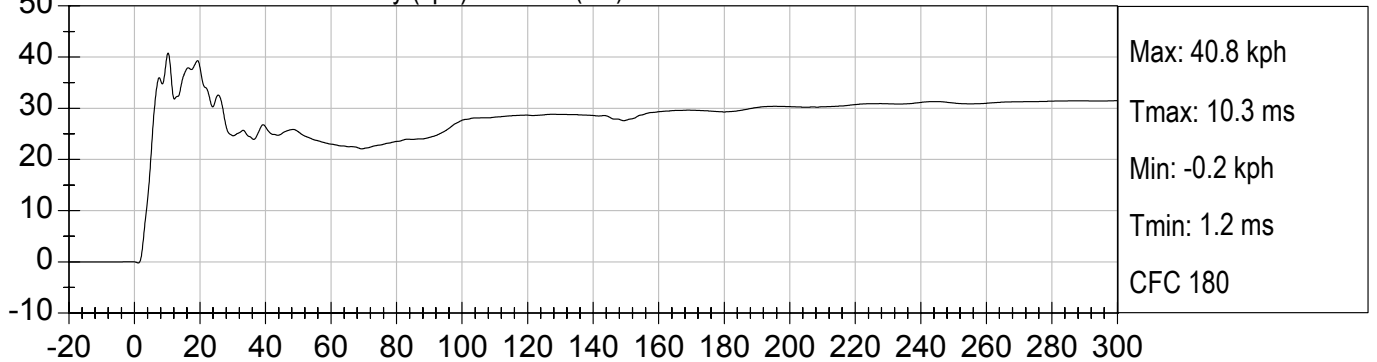
LEFT LOWER B-POST Y Velocity (kph) vs TIME (ms)

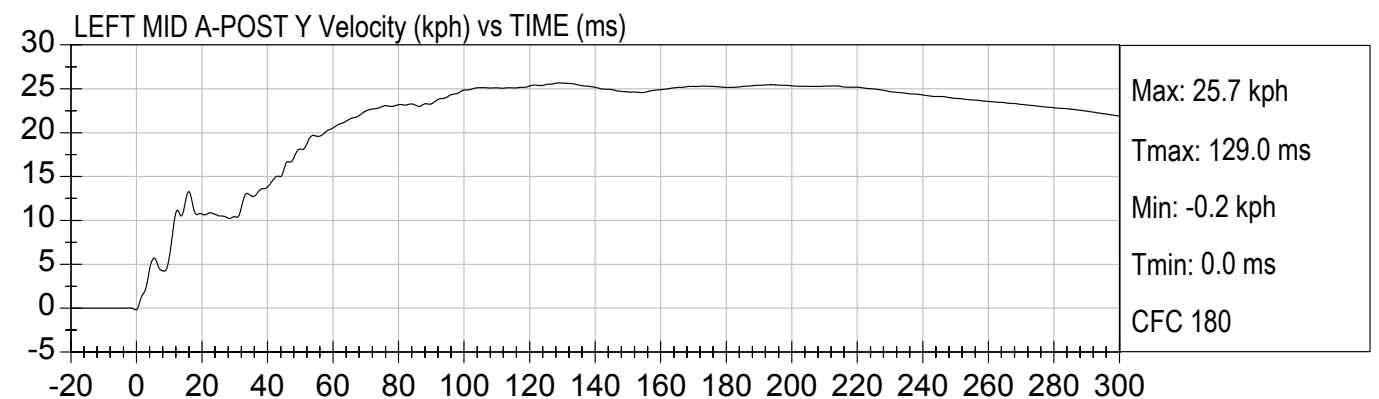
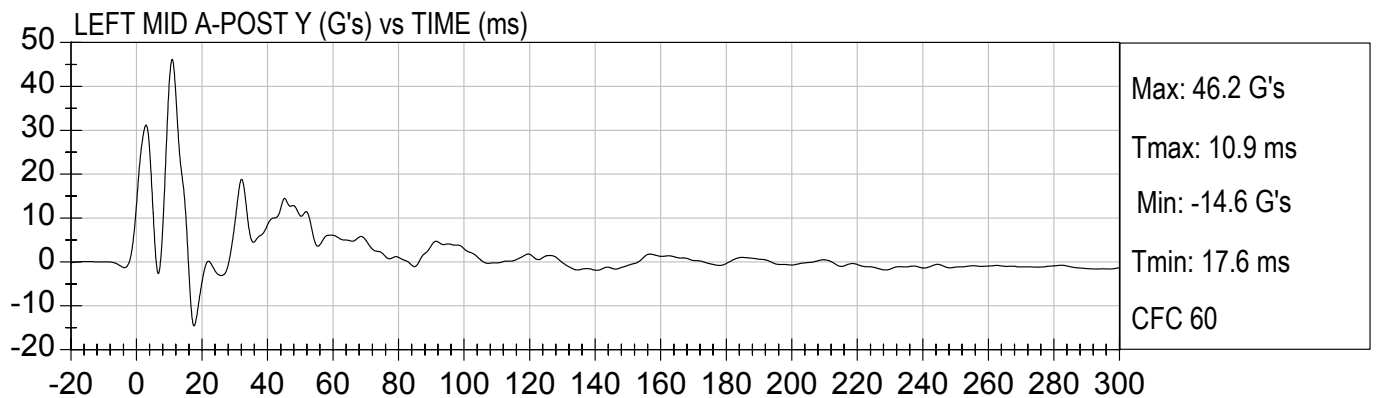
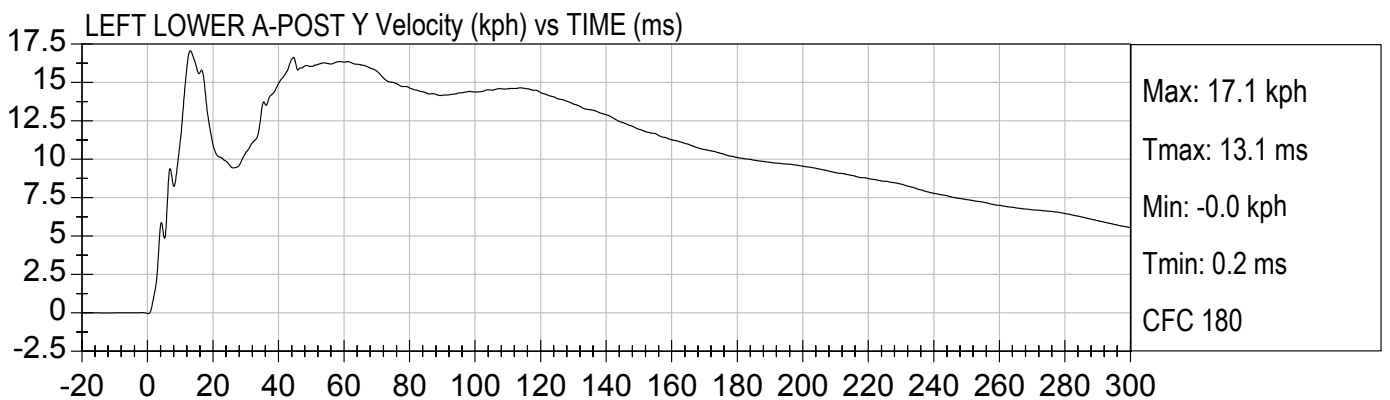
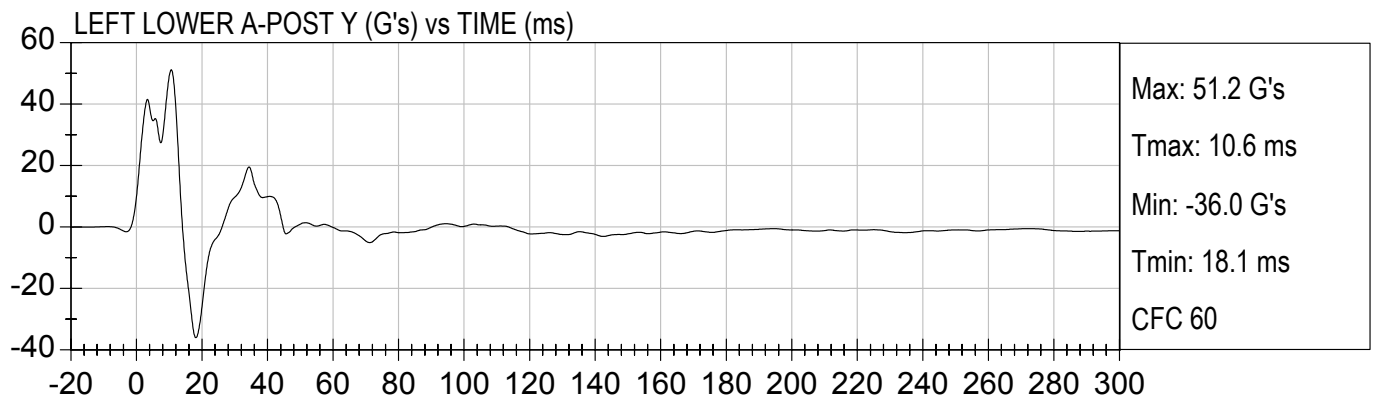


LEFT MID B-POST Y (G's) vs TIME (ms)



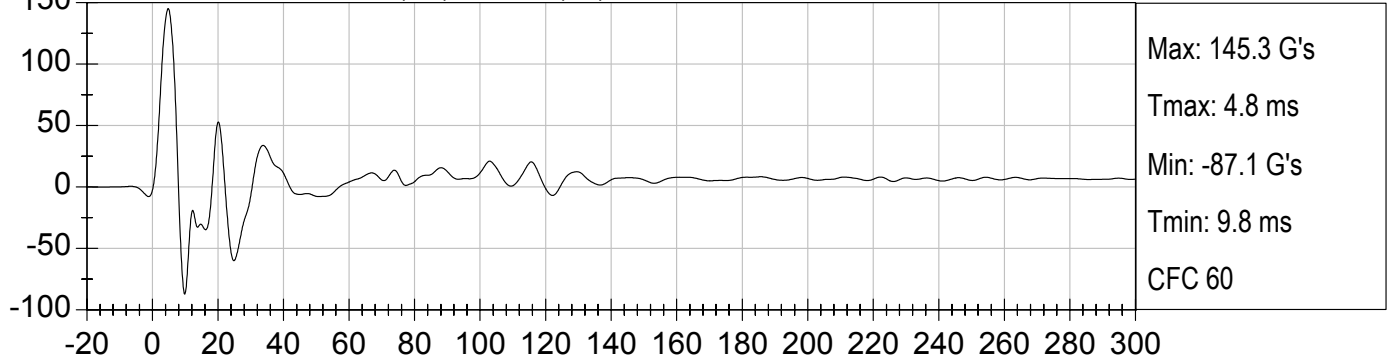
LEFT MID B-POST Y Velocity (kph) vs TIME (ms)



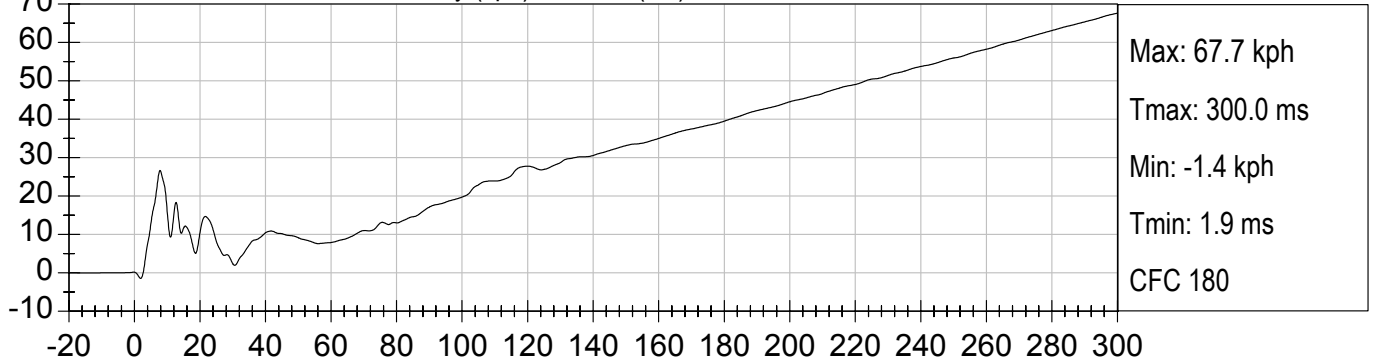




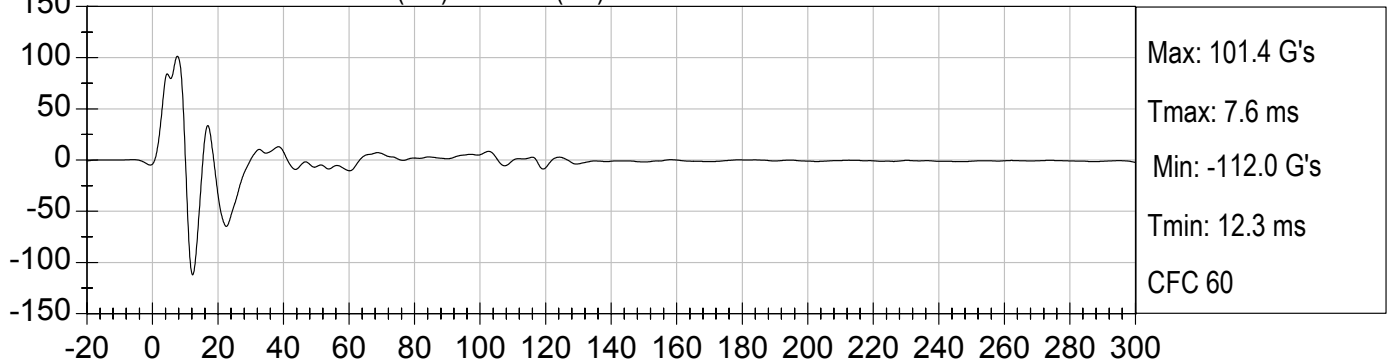
LF DOOR CENTERLINE Y (G's) vs TIME (ms)



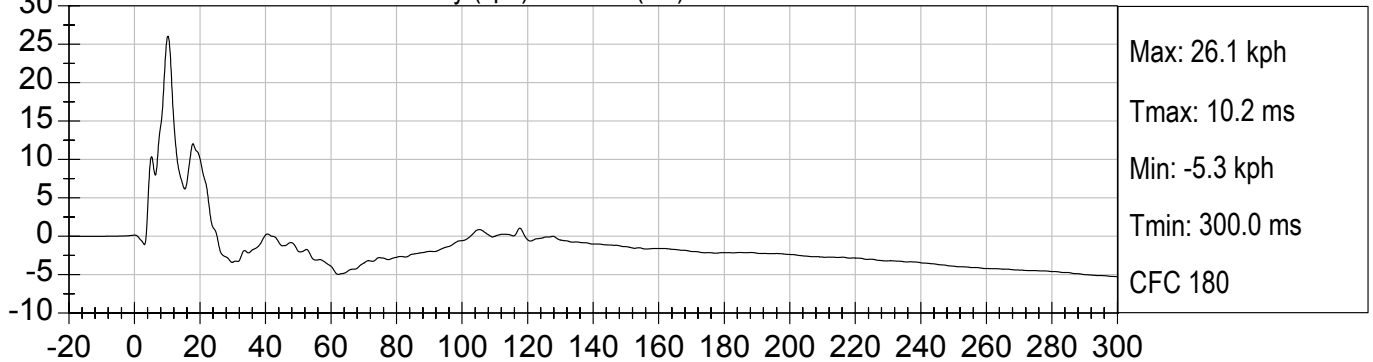
LF DOOR CENTERLINE Y Velocity (kph) vs TIME (ms)



MIDREAR OF LF DOOR Y (G's) vs TIME (ms)

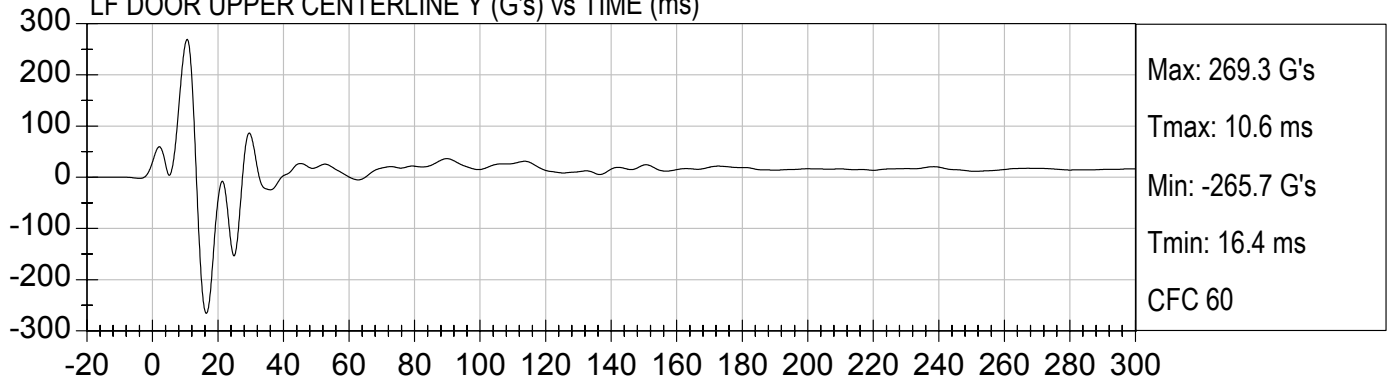


MIDREAR OF LF DOOR Y Velocity (kph) vs TIME (ms)

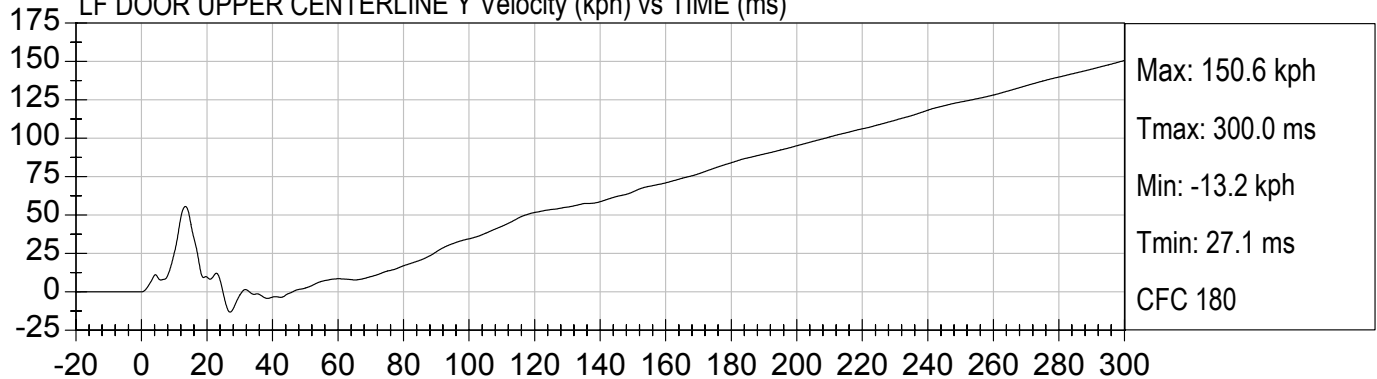




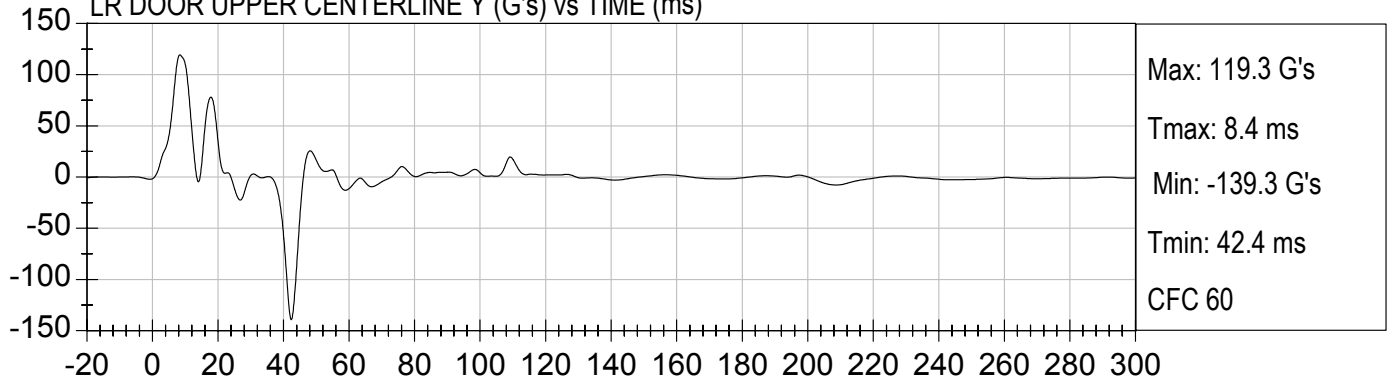
LF DOOR UPPER CENTERLINE Y (G's) vs TIME (ms)



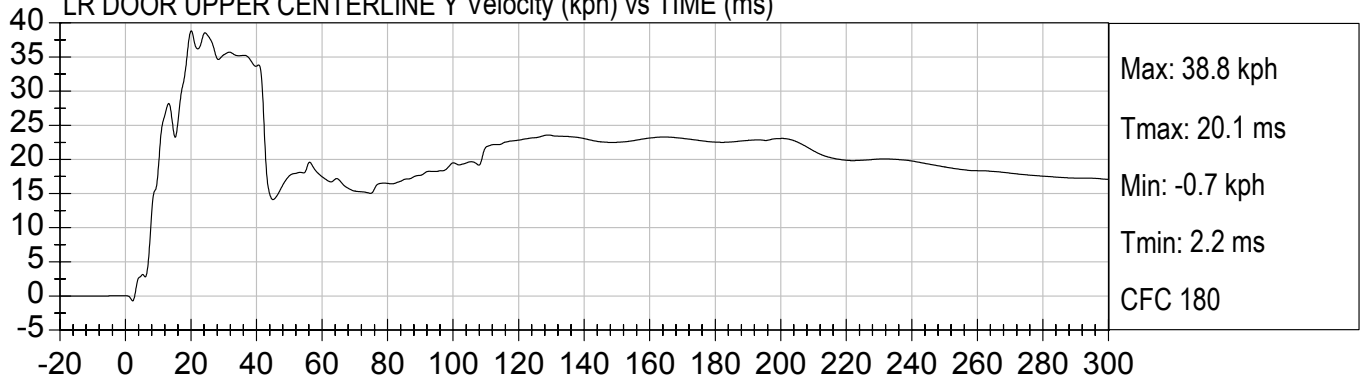
LF DOOR UPPER CENTERLINE Y Velocity (kph) vs TIME (ms)

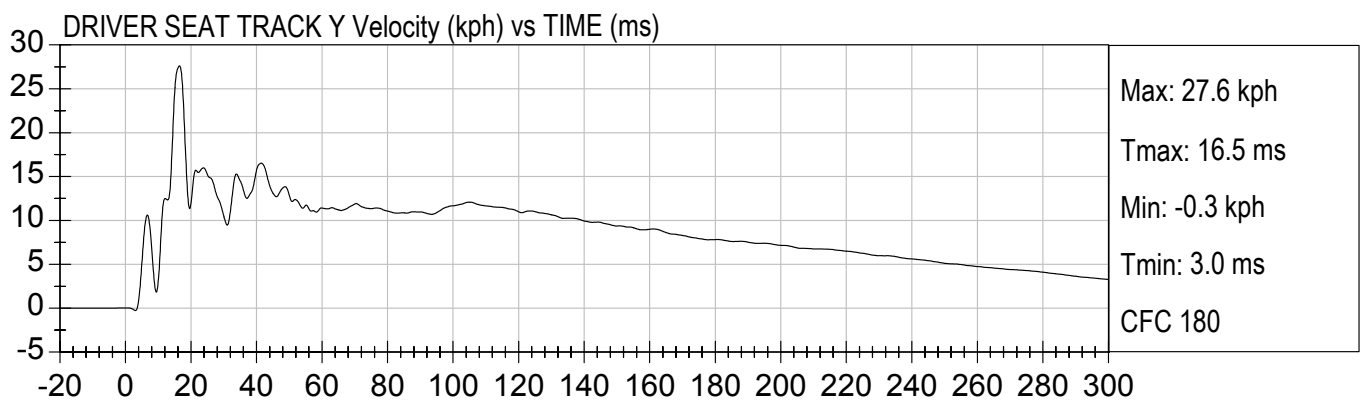
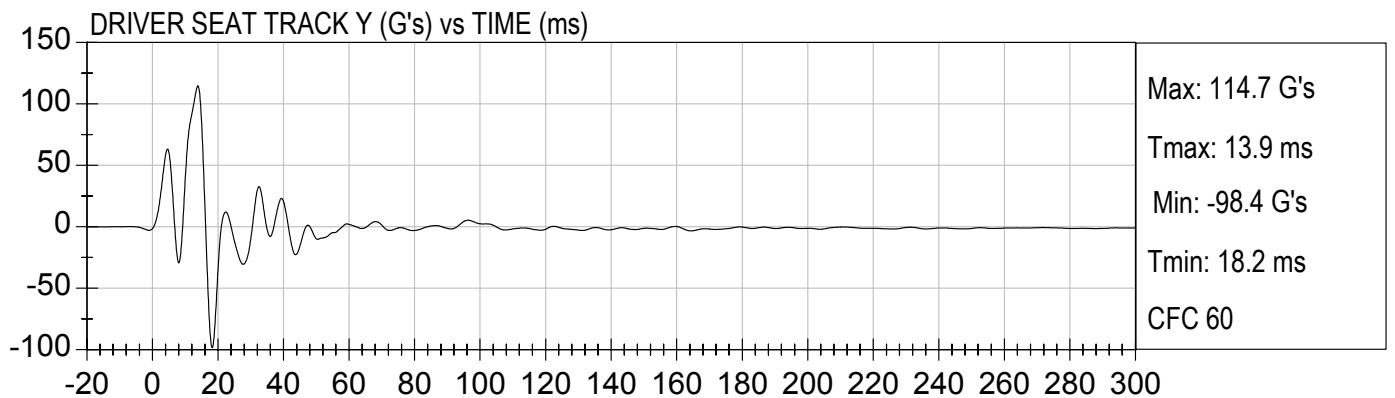
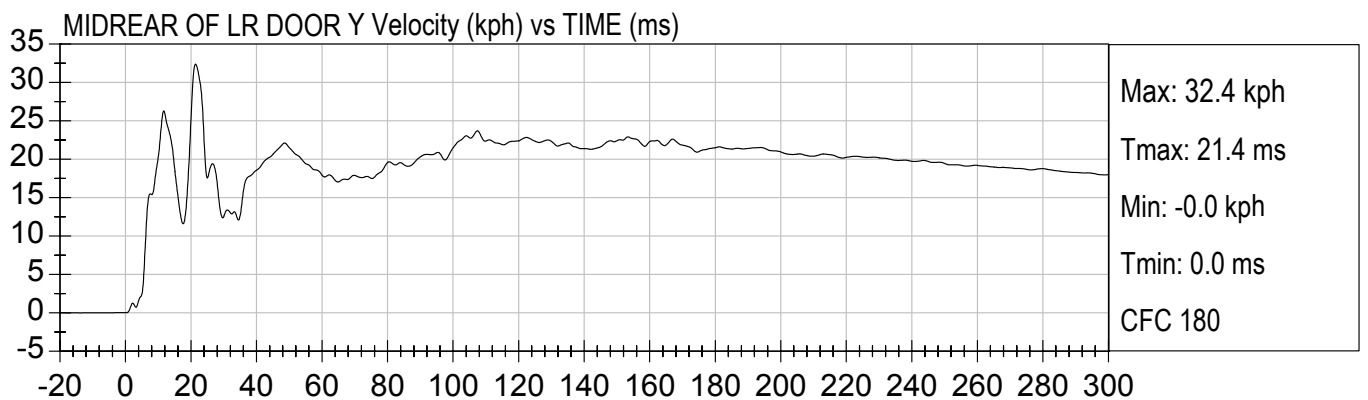
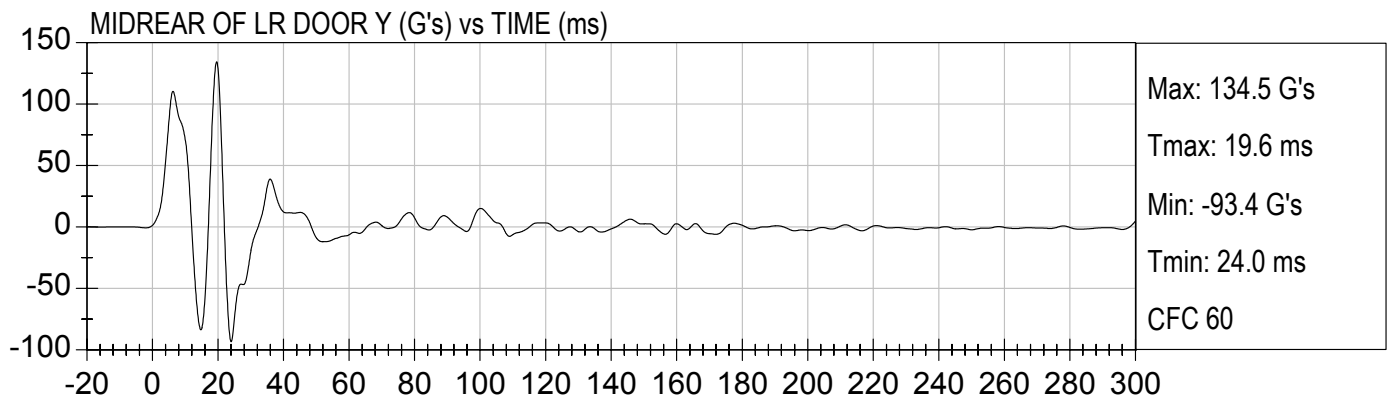


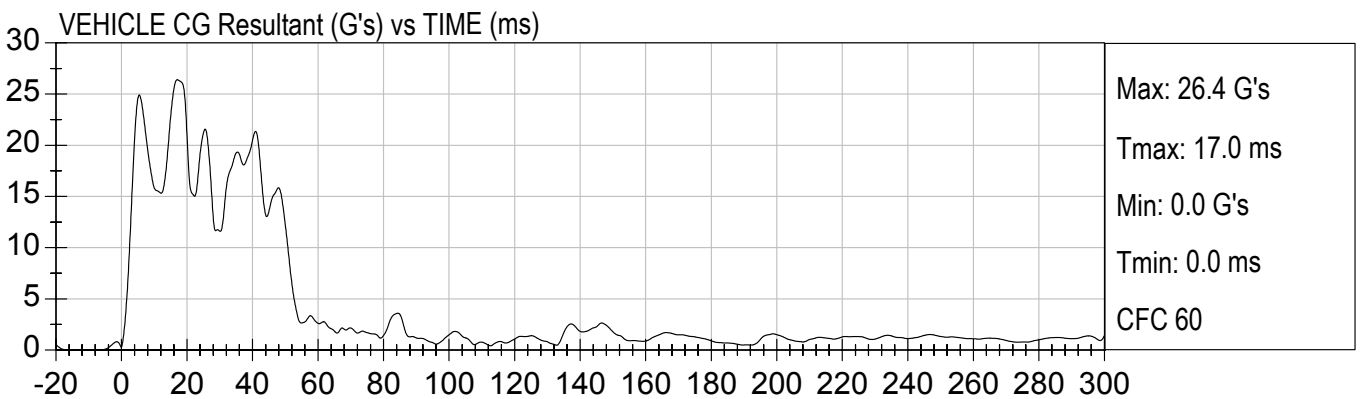
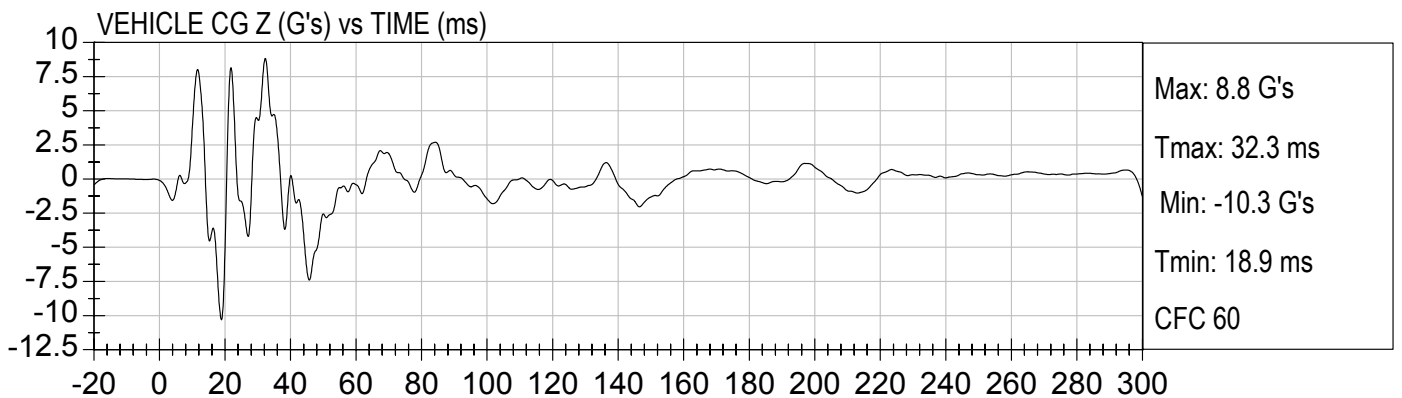
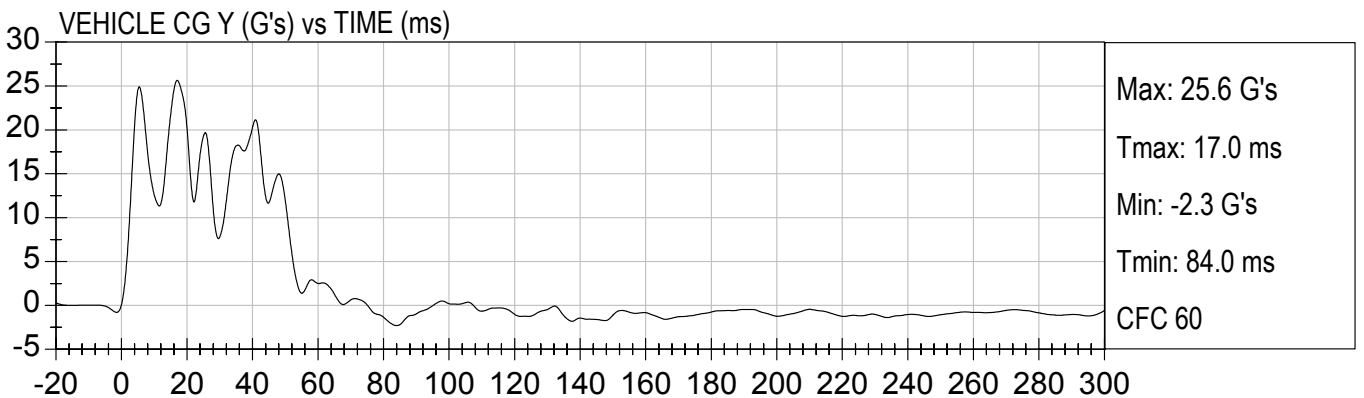
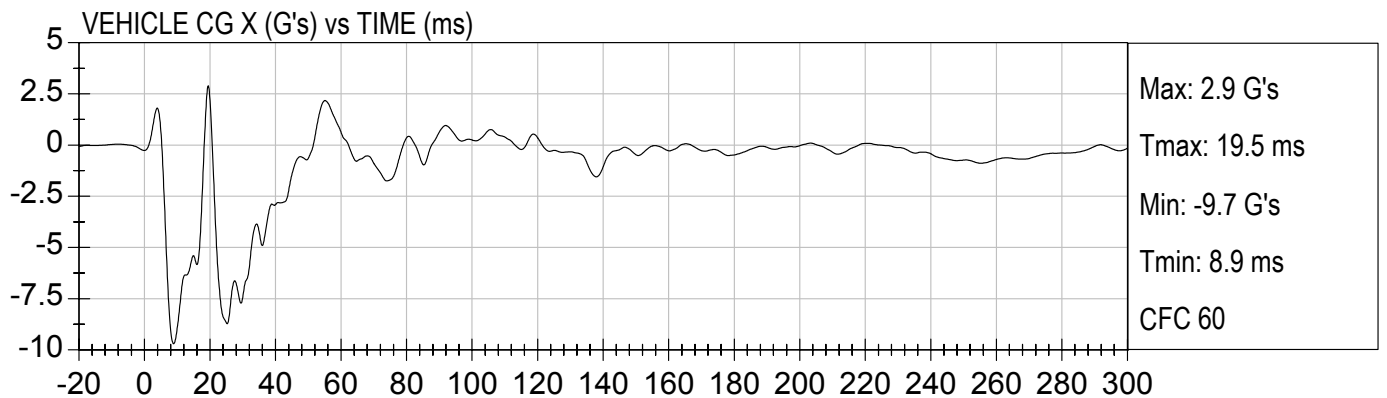
LR DOOR UPPER CENTERLINE Y (G's) vs TIME (ms)

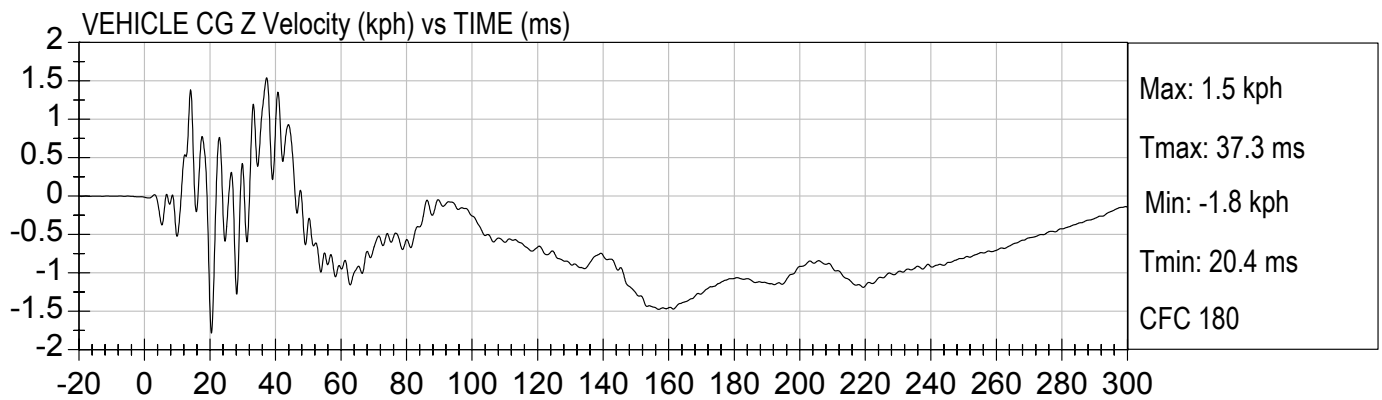
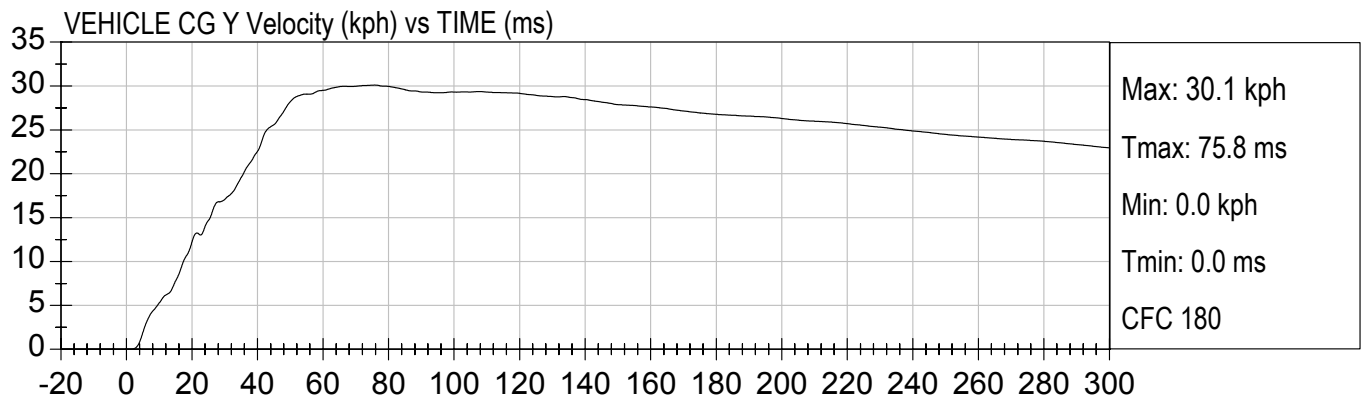
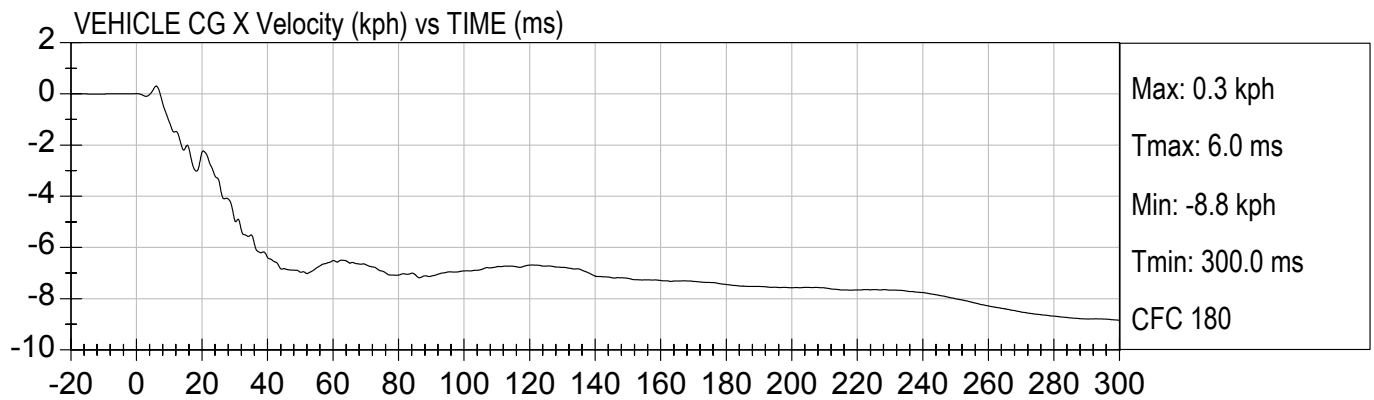


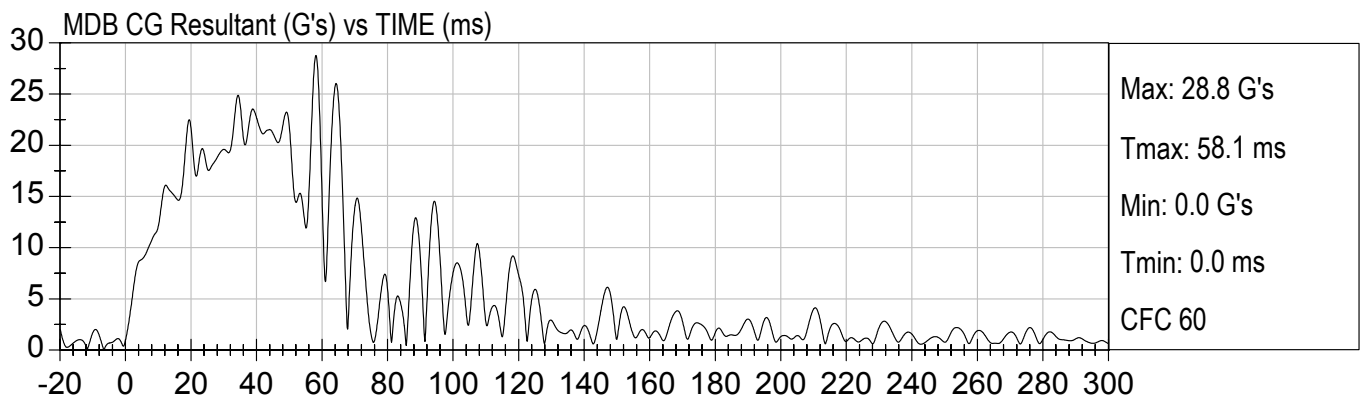
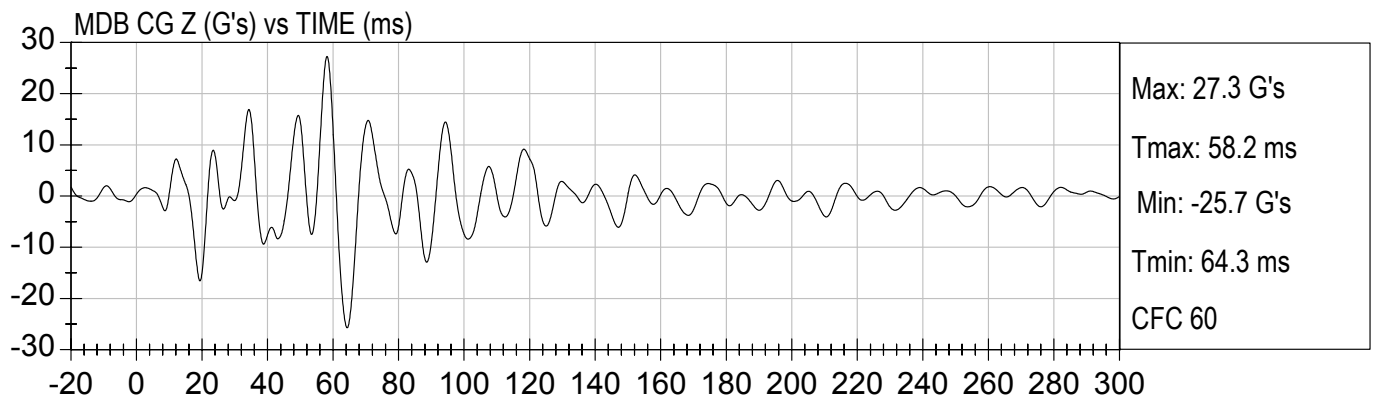
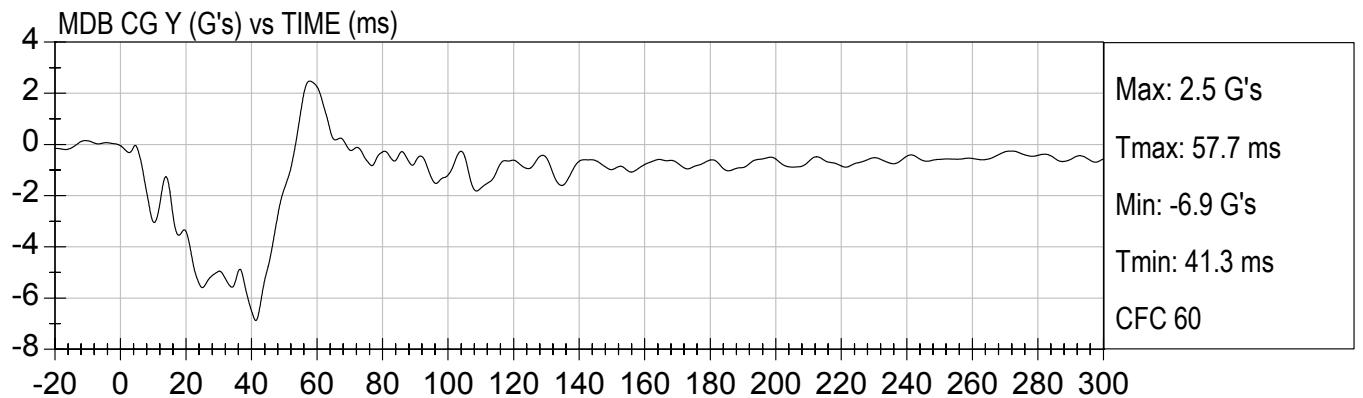
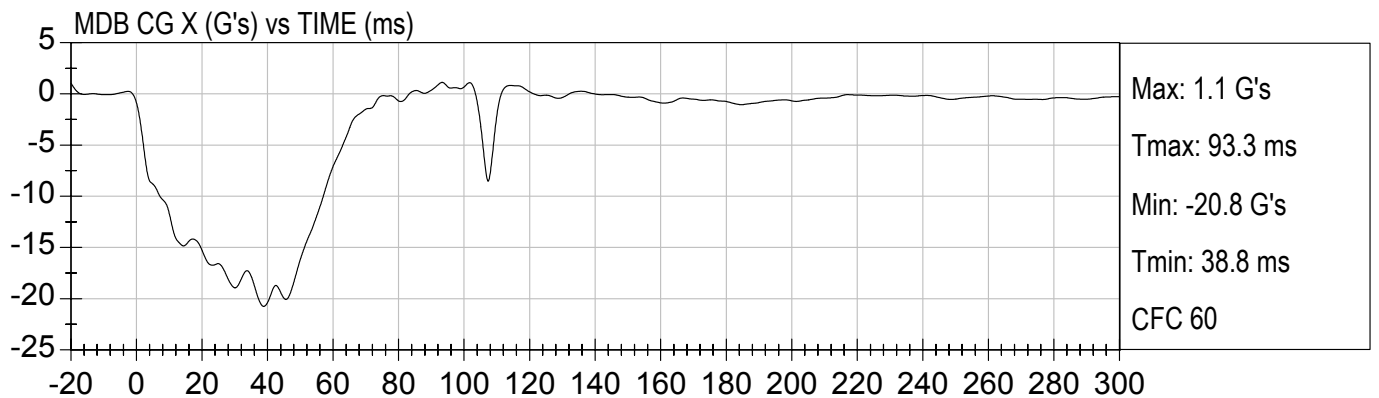
LR DOOR UPPER CENTERLINE Y Velocity (kph) vs TIME (ms)

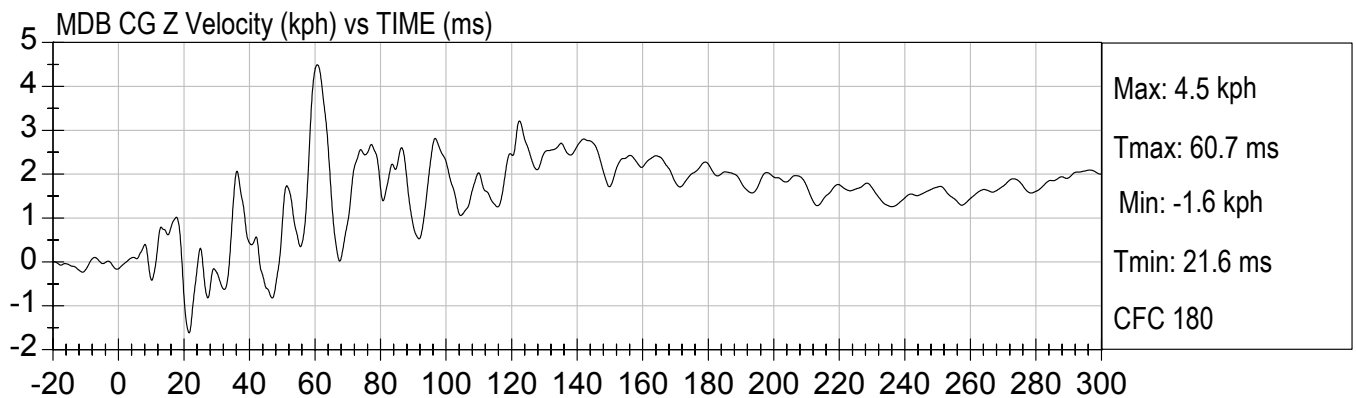
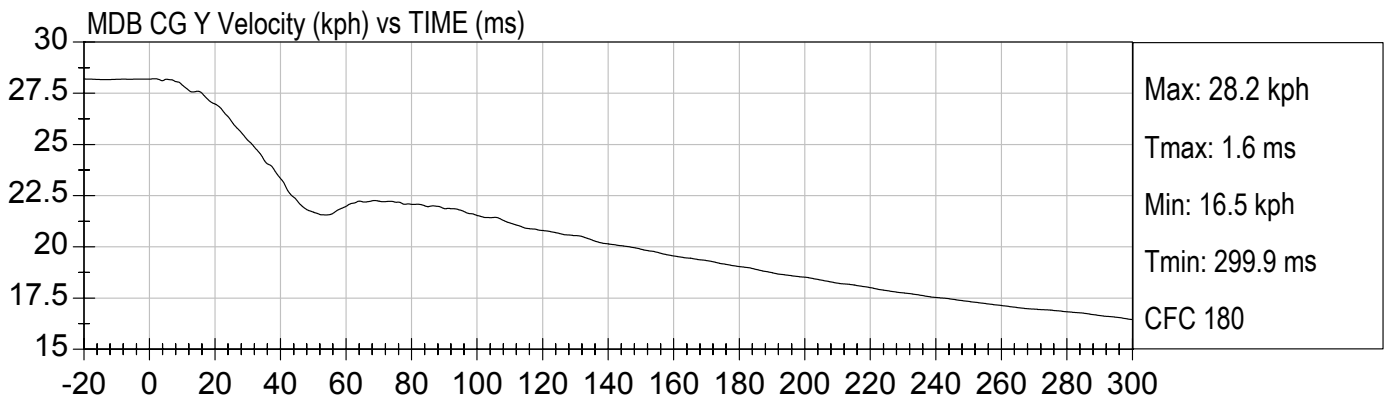
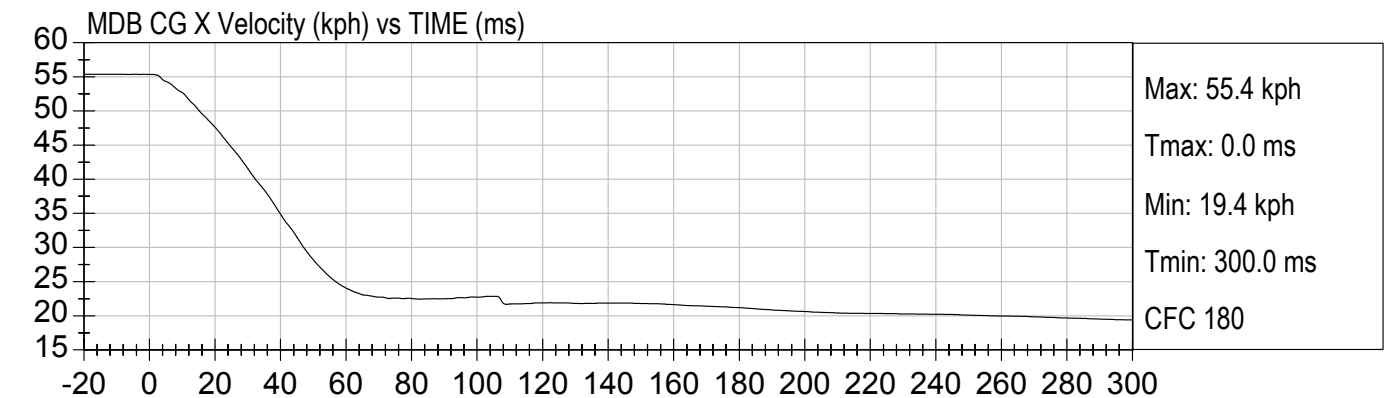


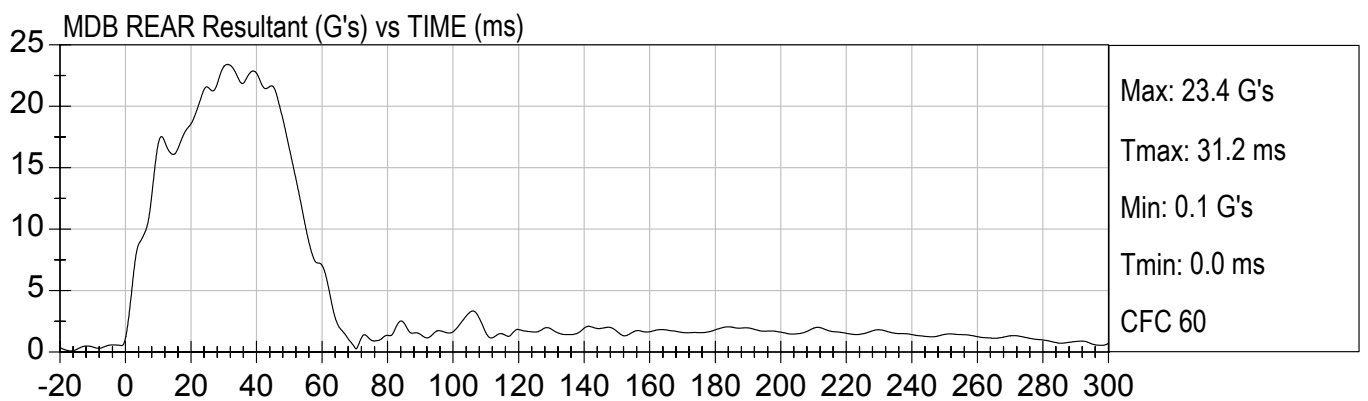
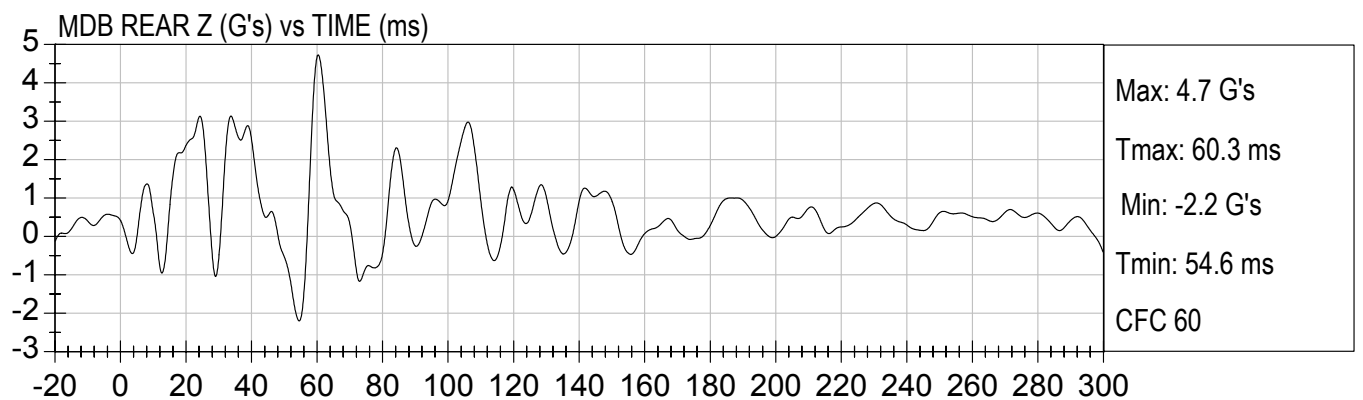
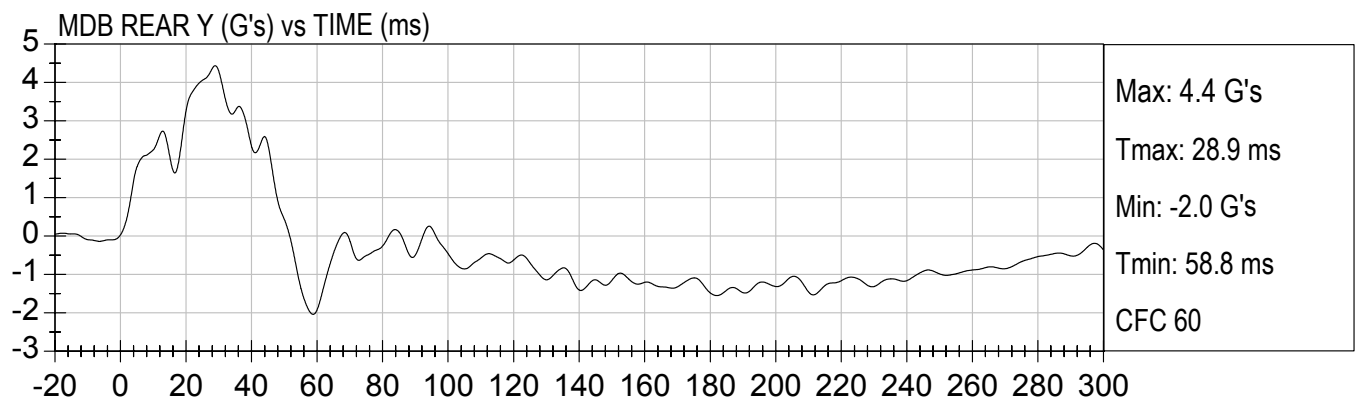
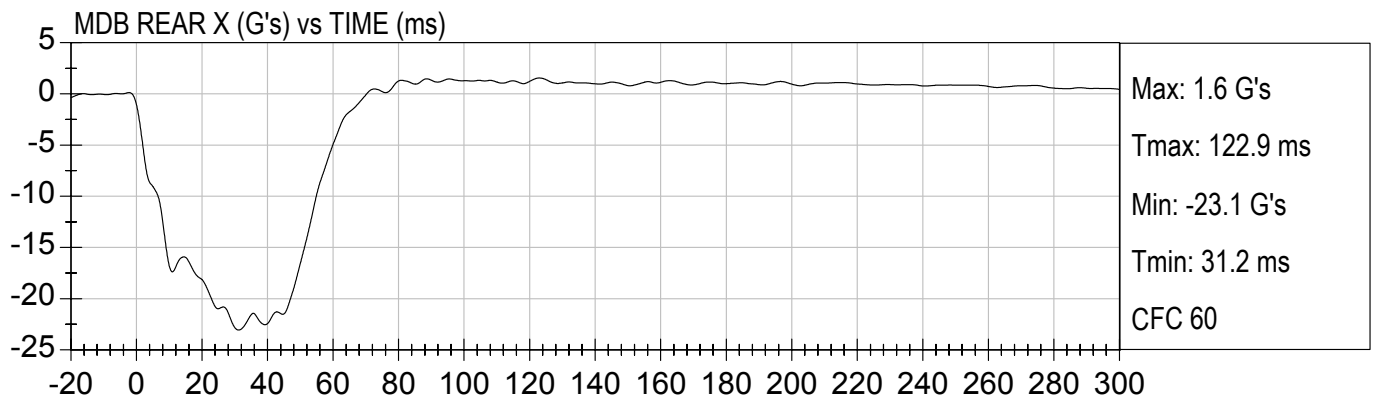






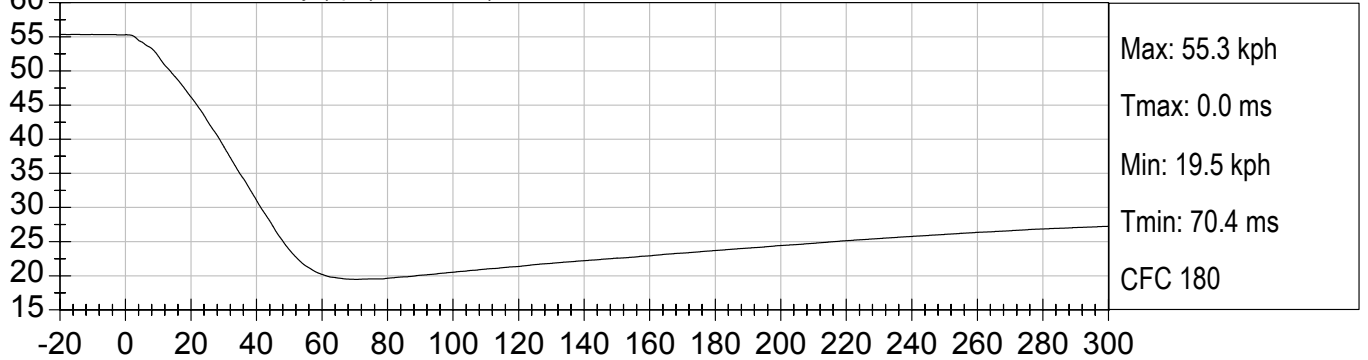




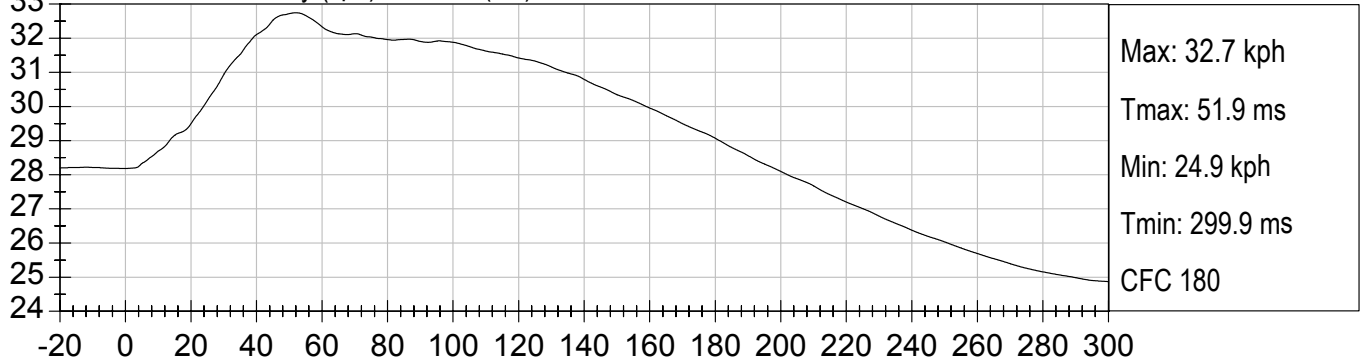




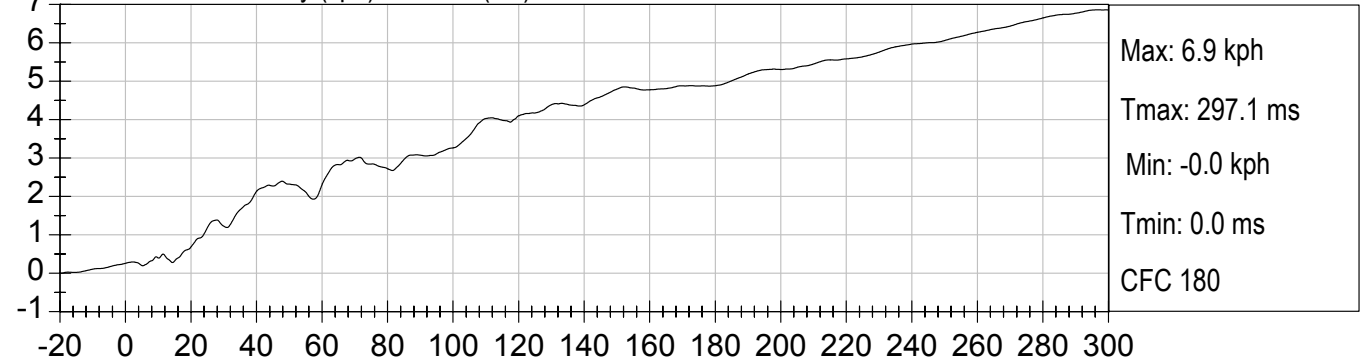
MDB REAR X Velocity (kph) vs TIME (ms)

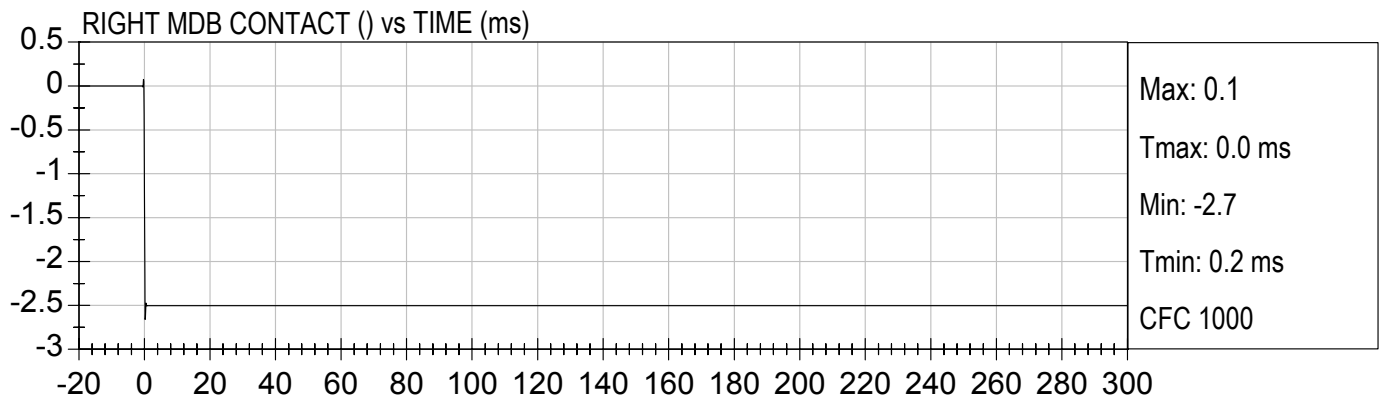
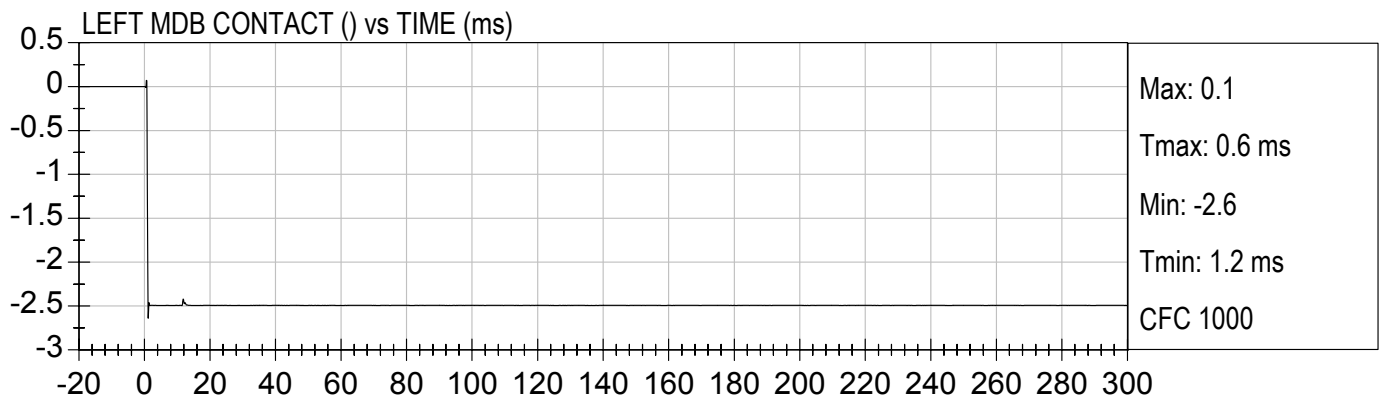


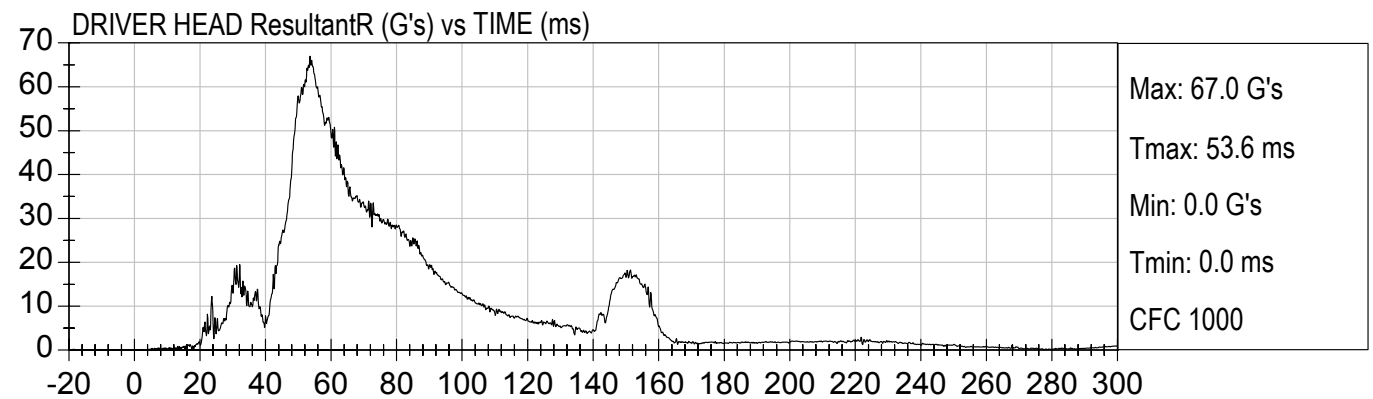
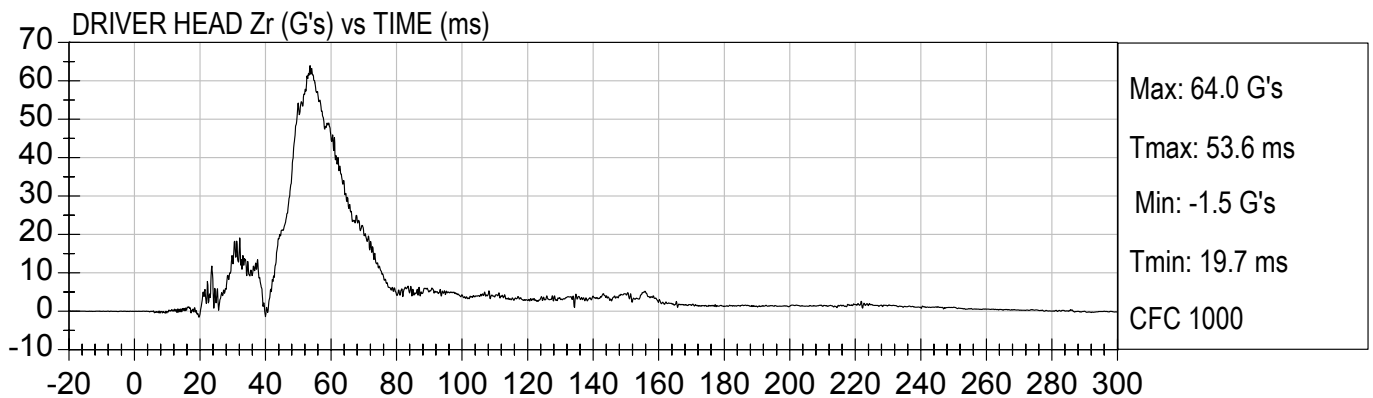
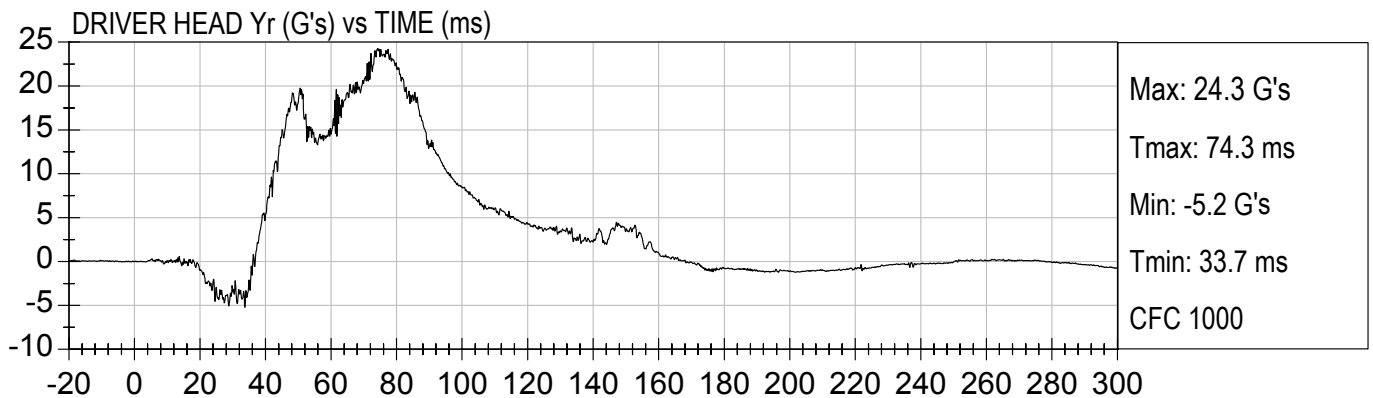
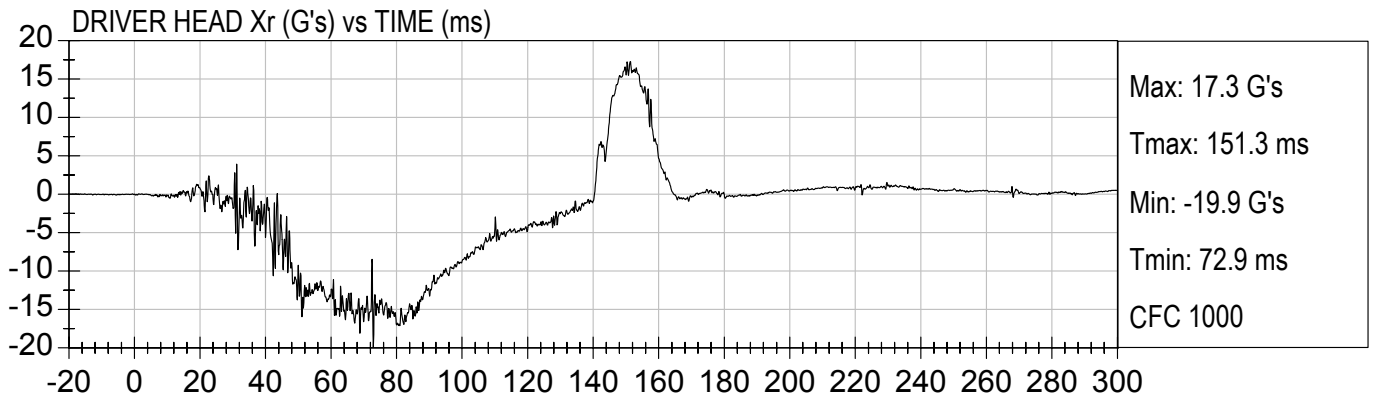
MDB REAR Y Velocity (kph) vs TIME (ms)

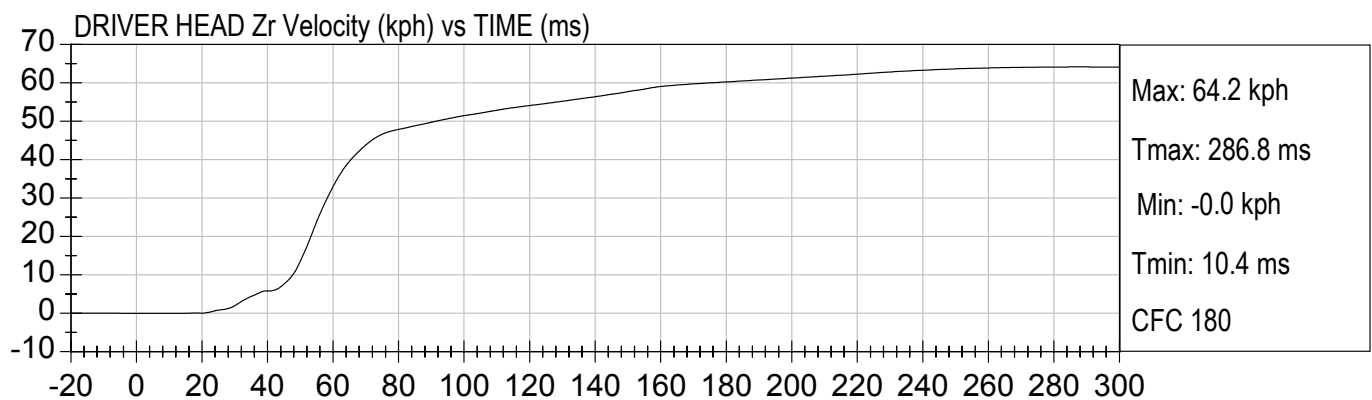
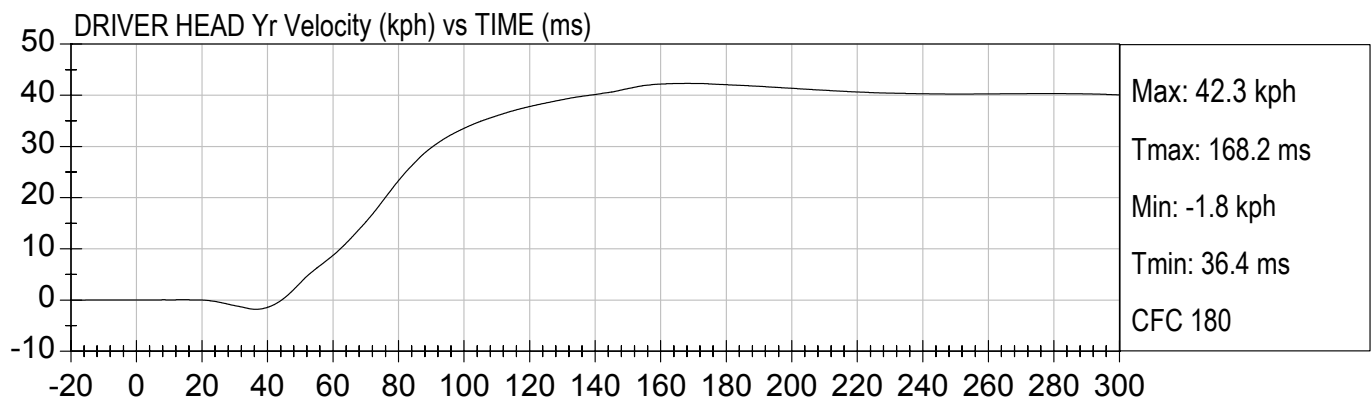
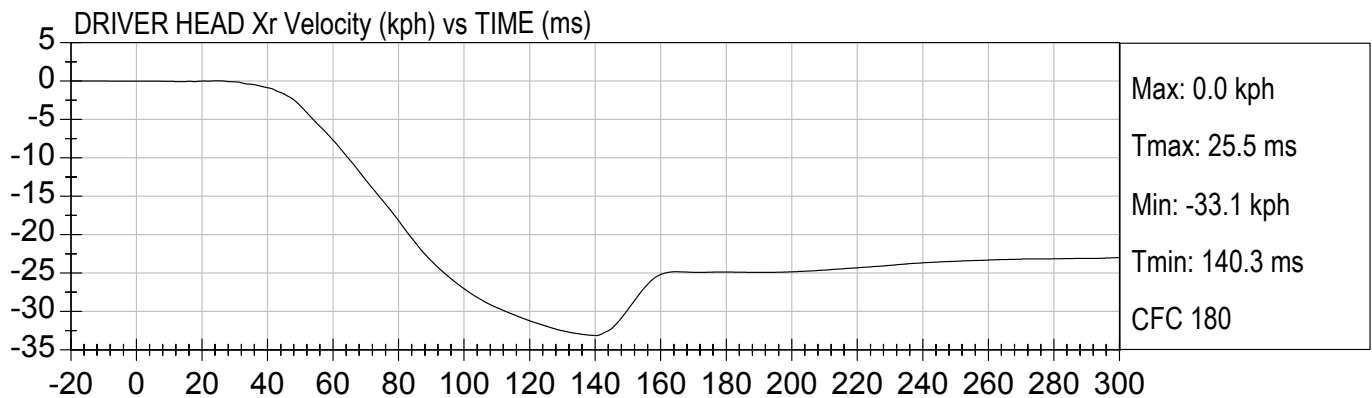


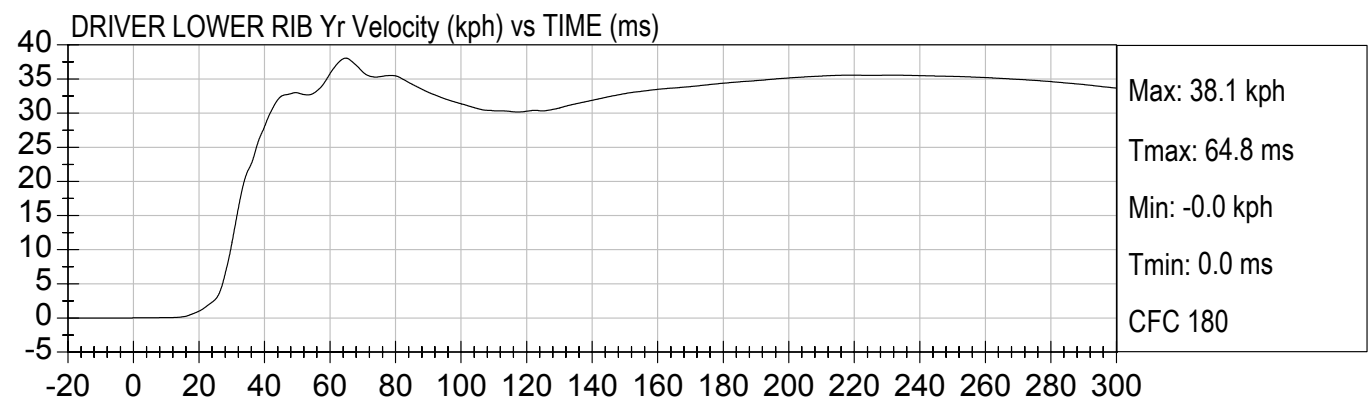
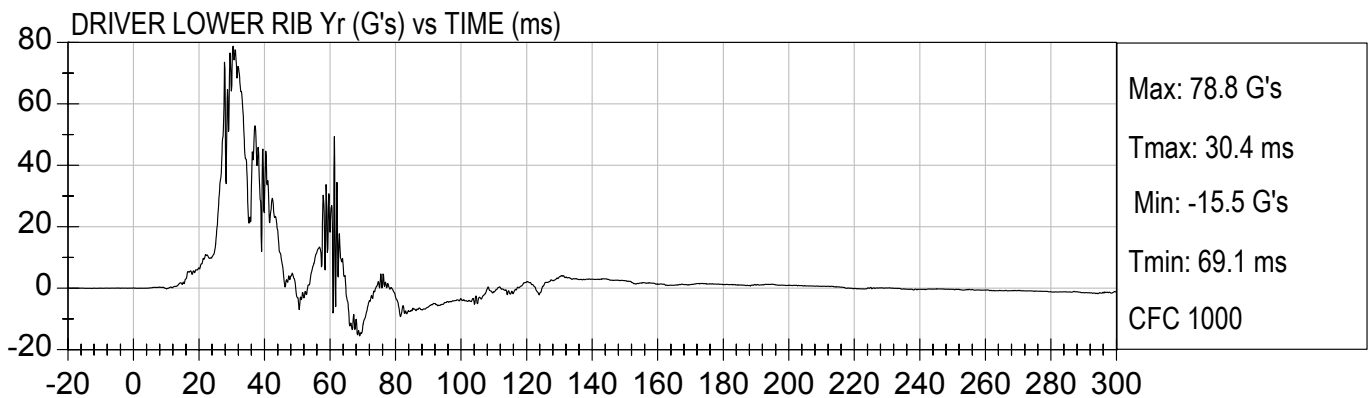
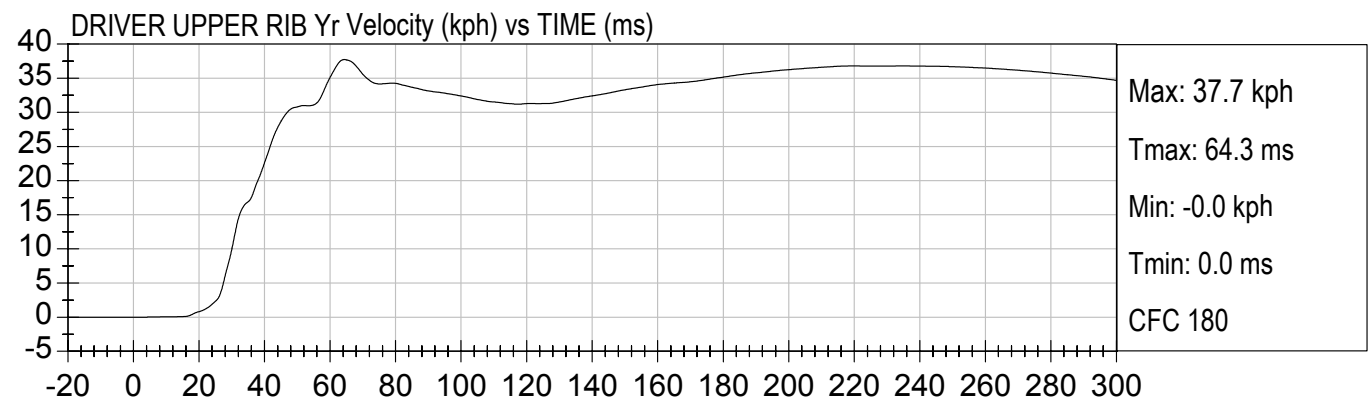
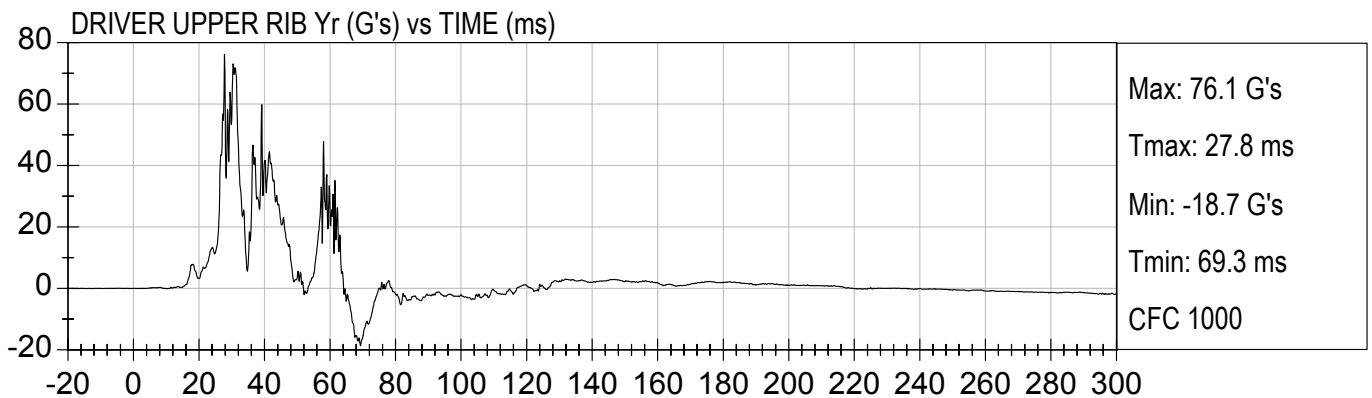
MDB REAR Z Velocity (kph) vs TIME (ms)

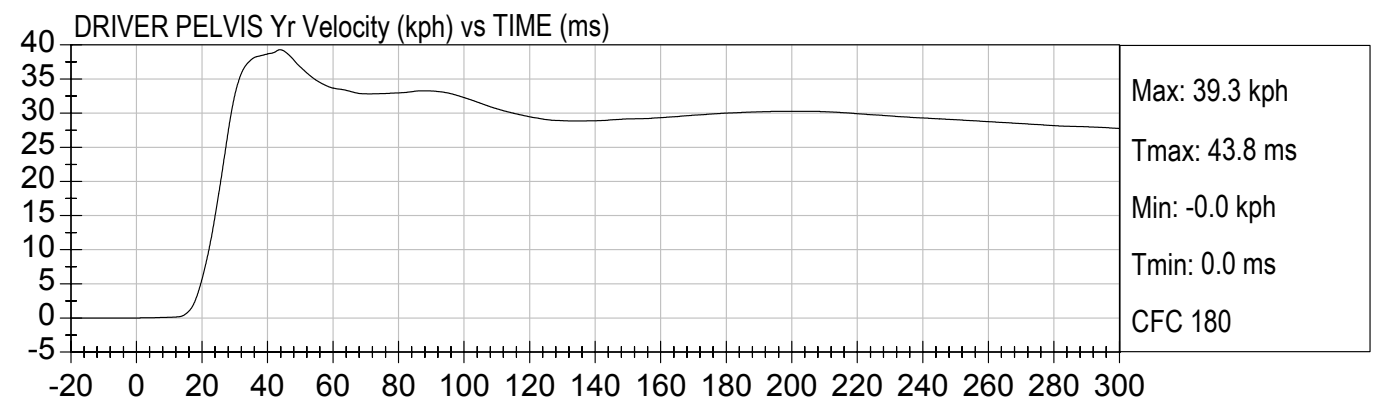
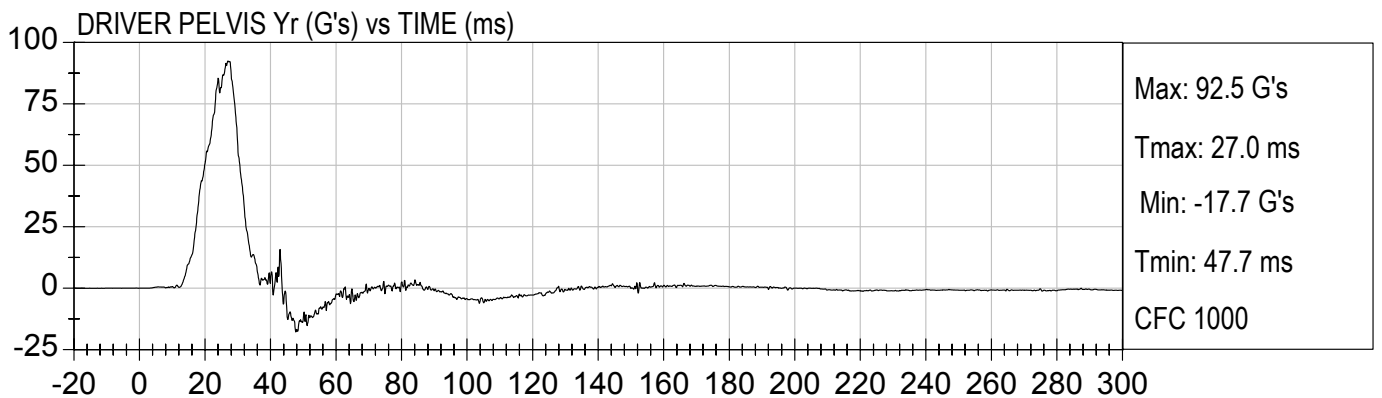
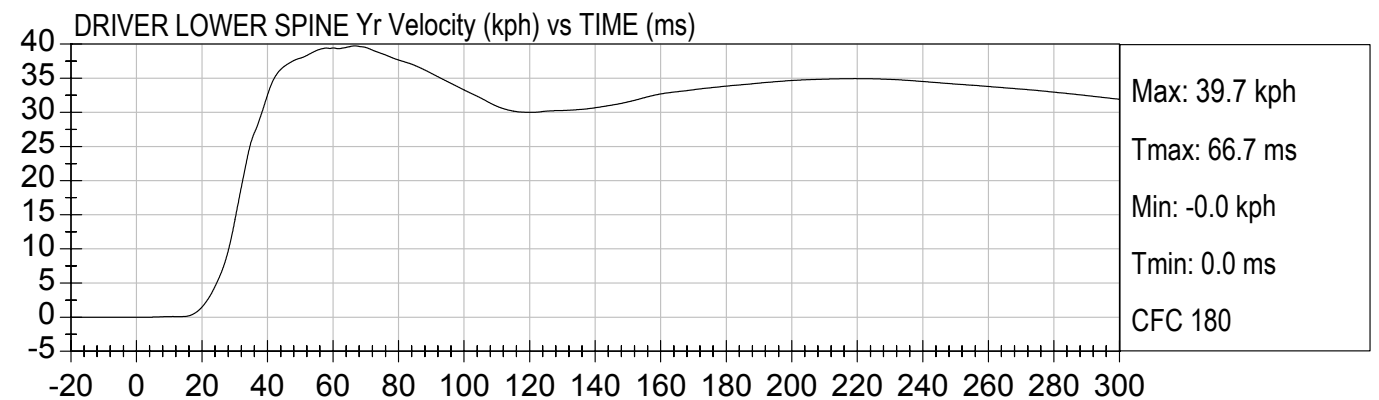
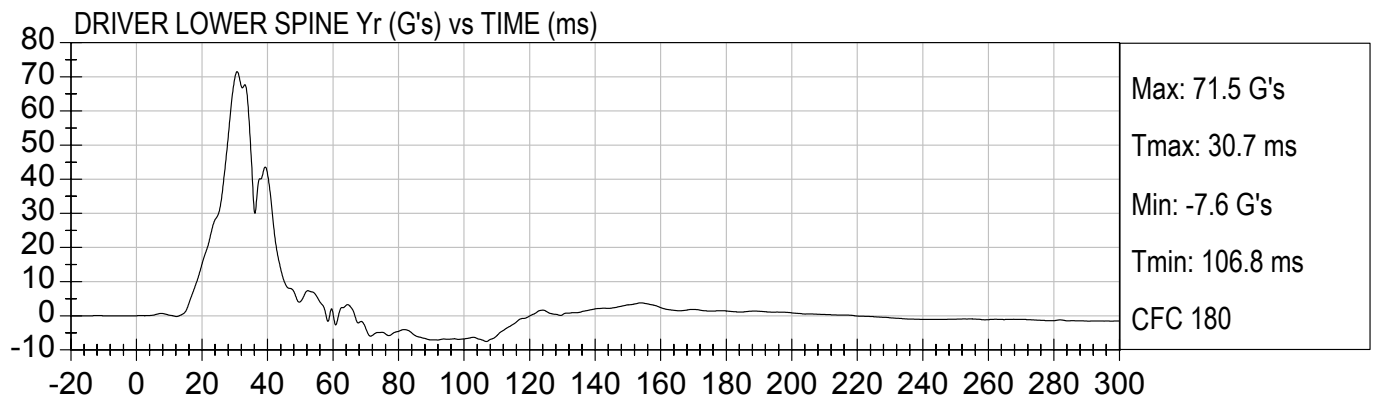


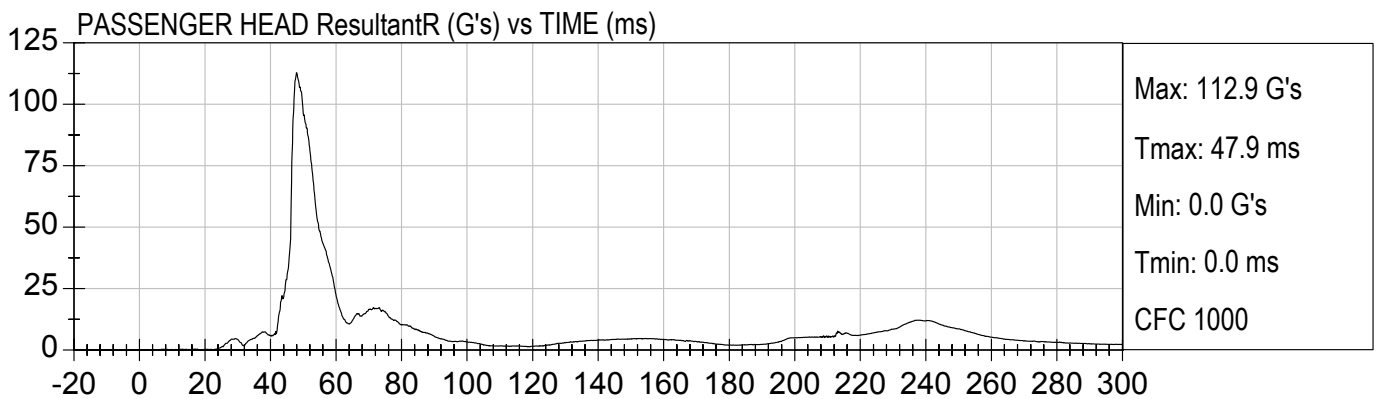
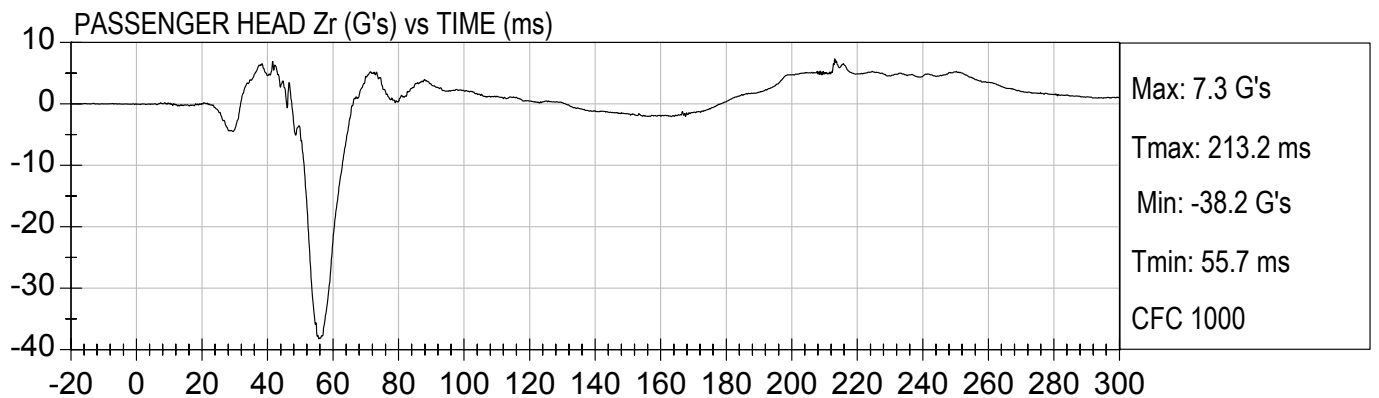
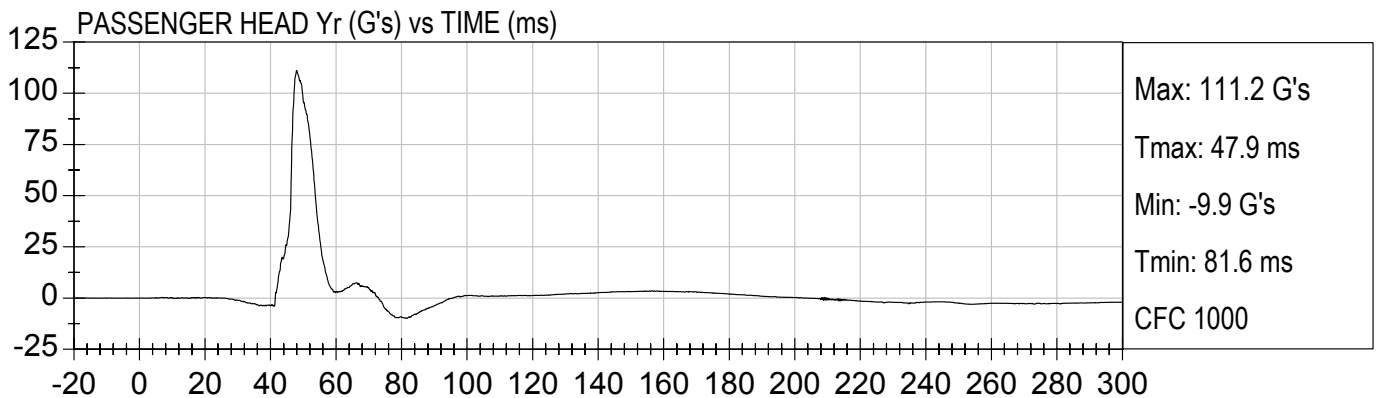
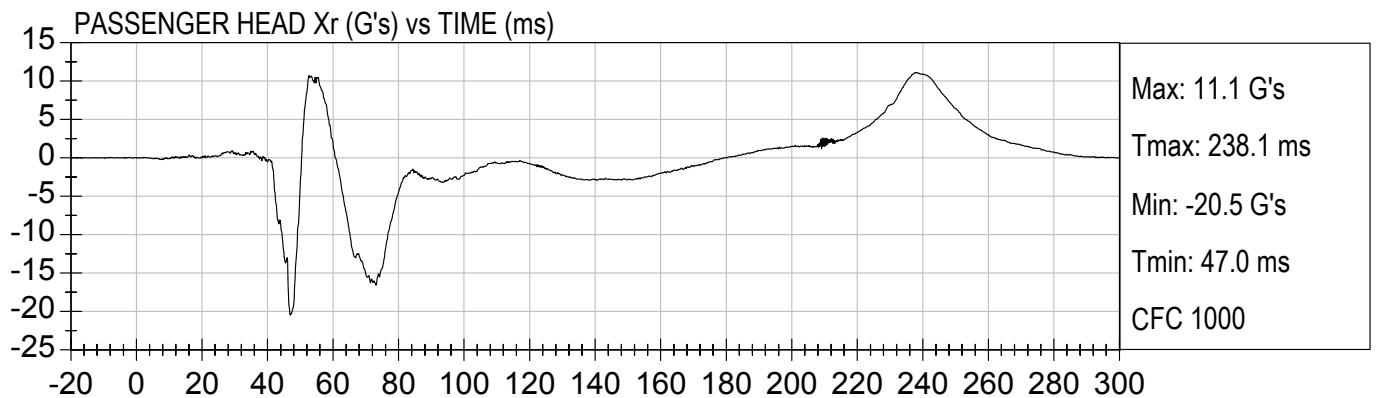


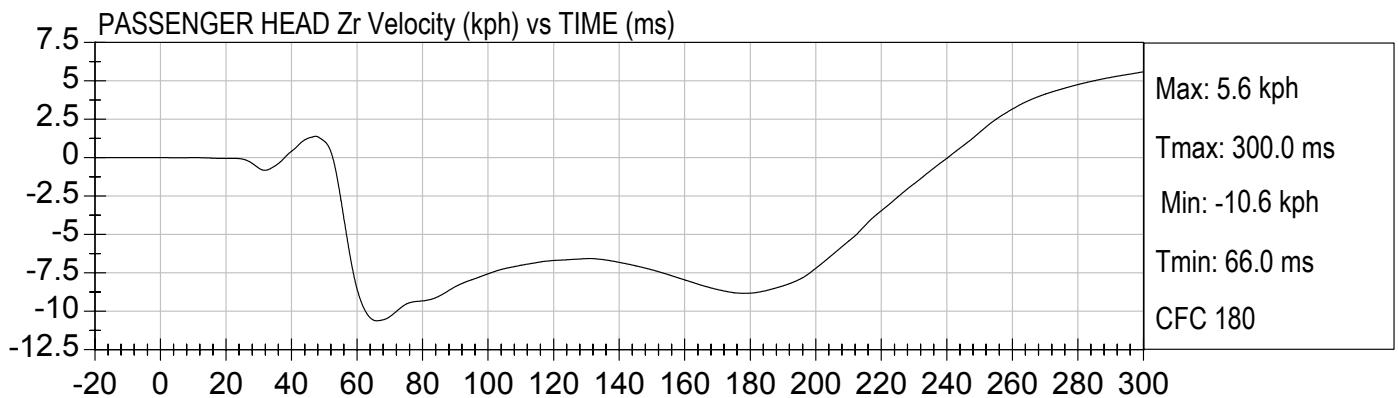
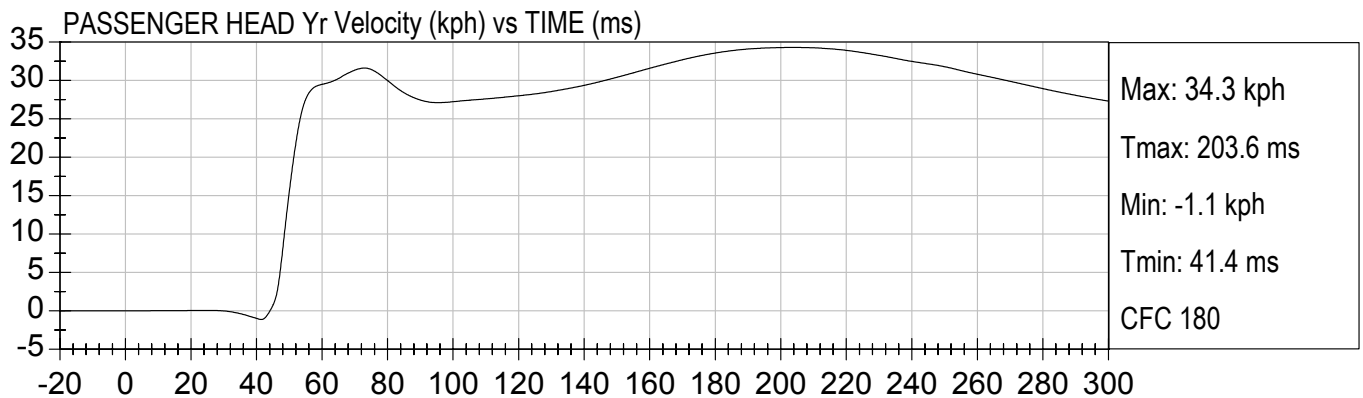
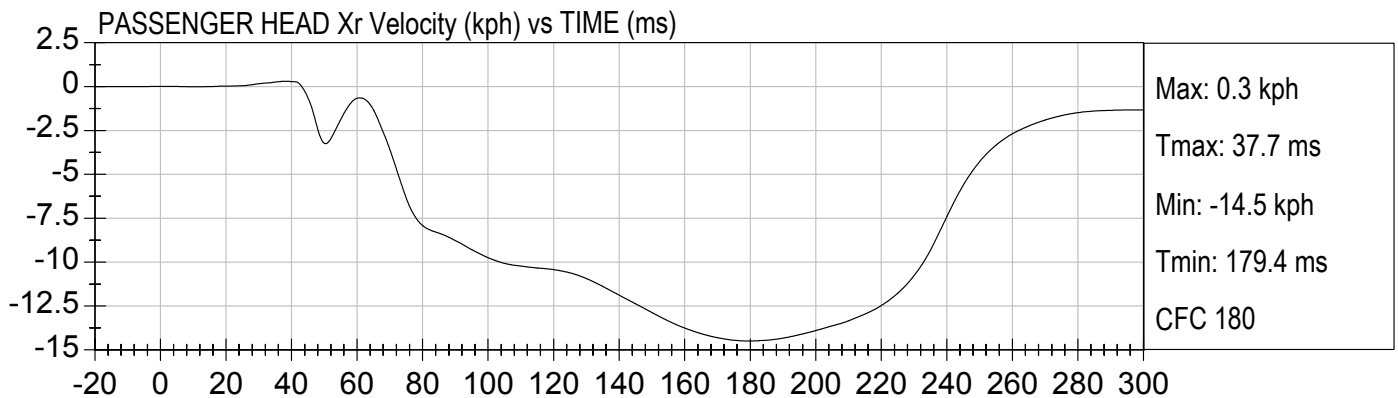


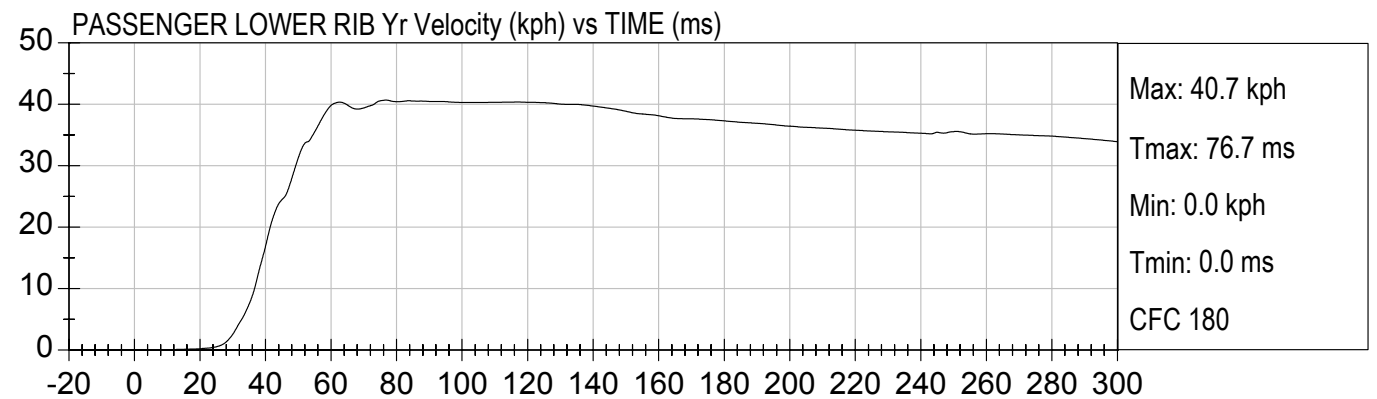
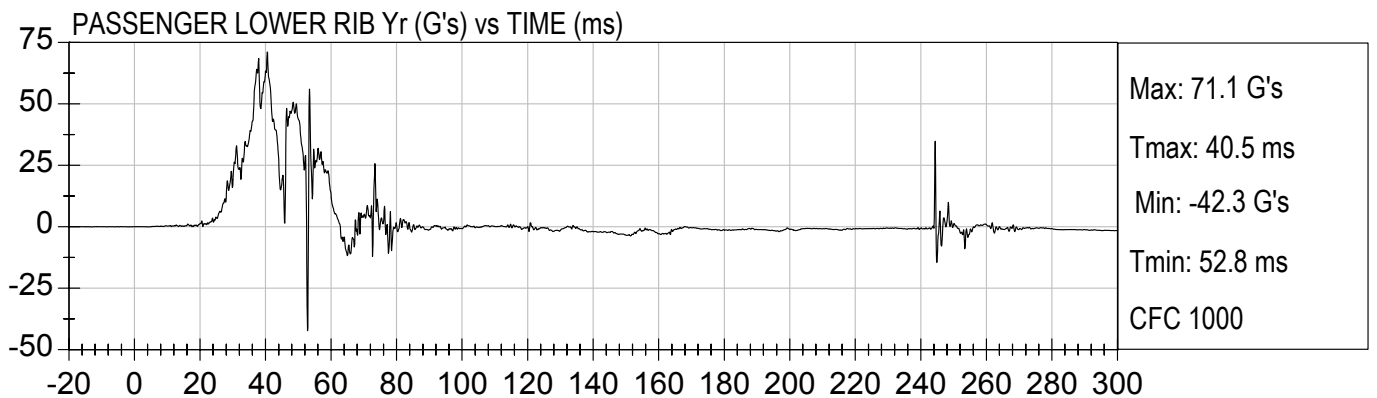
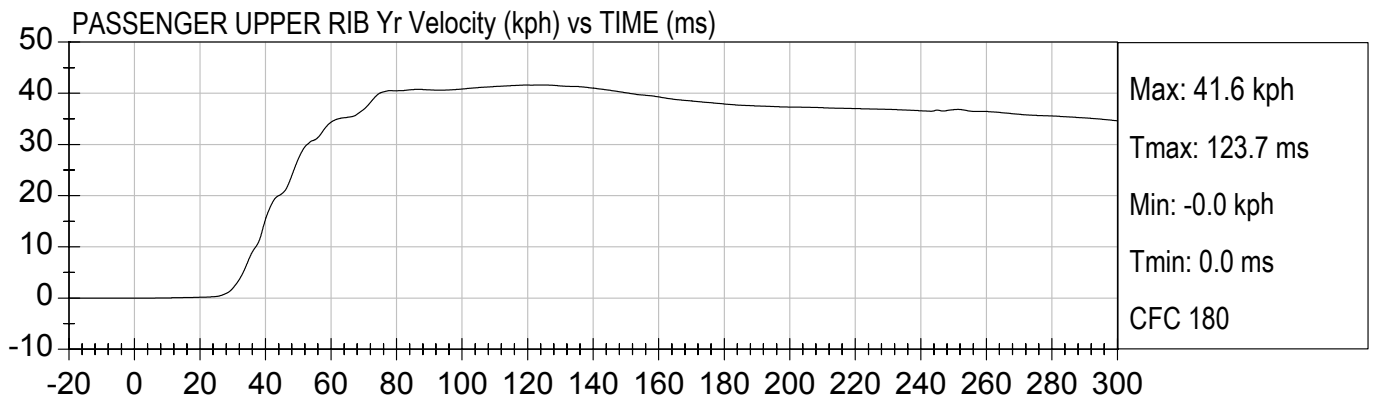
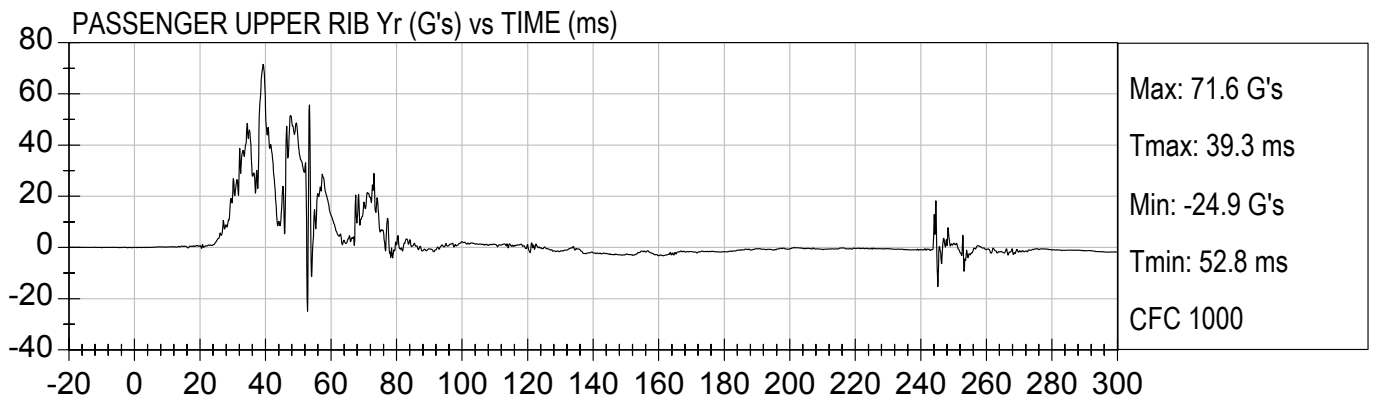


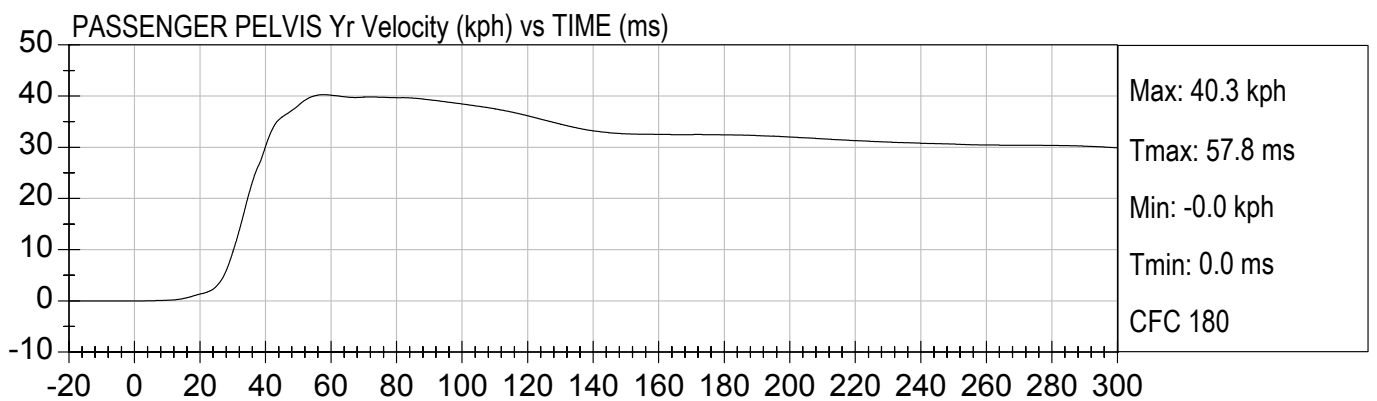
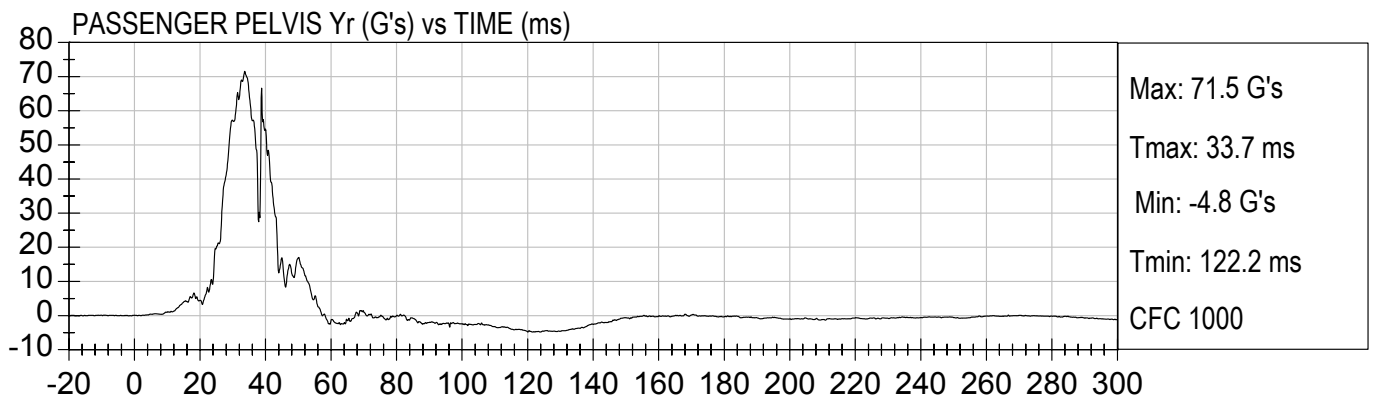
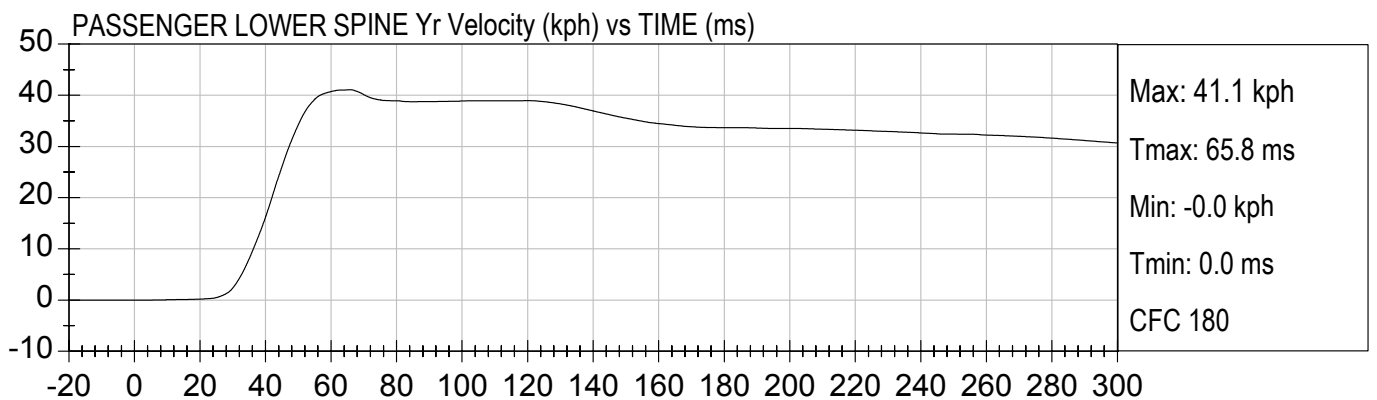
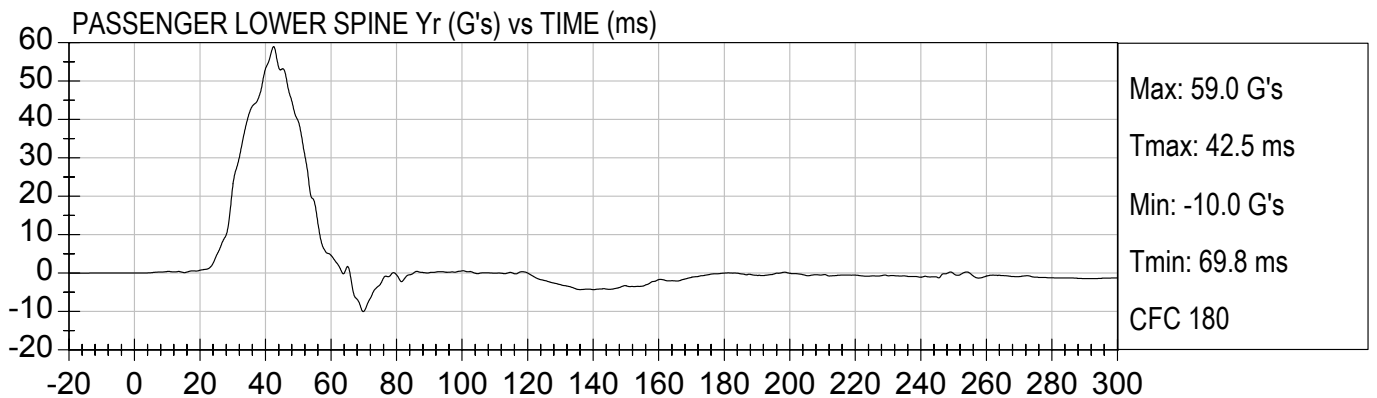


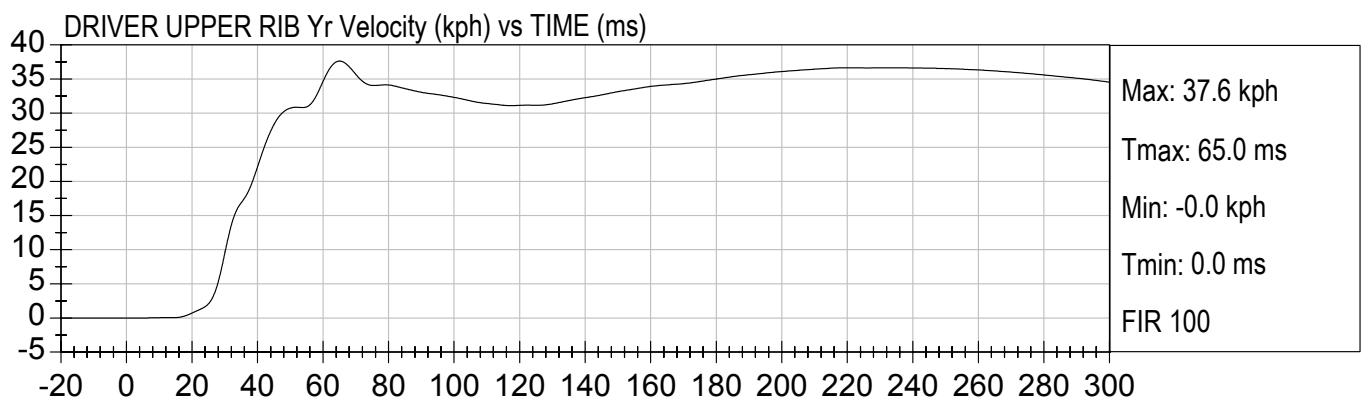
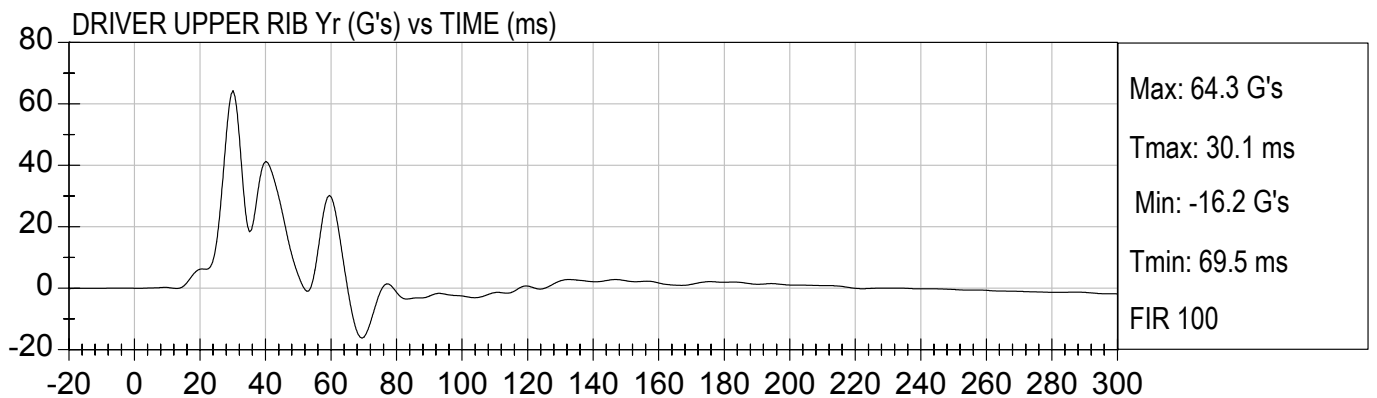
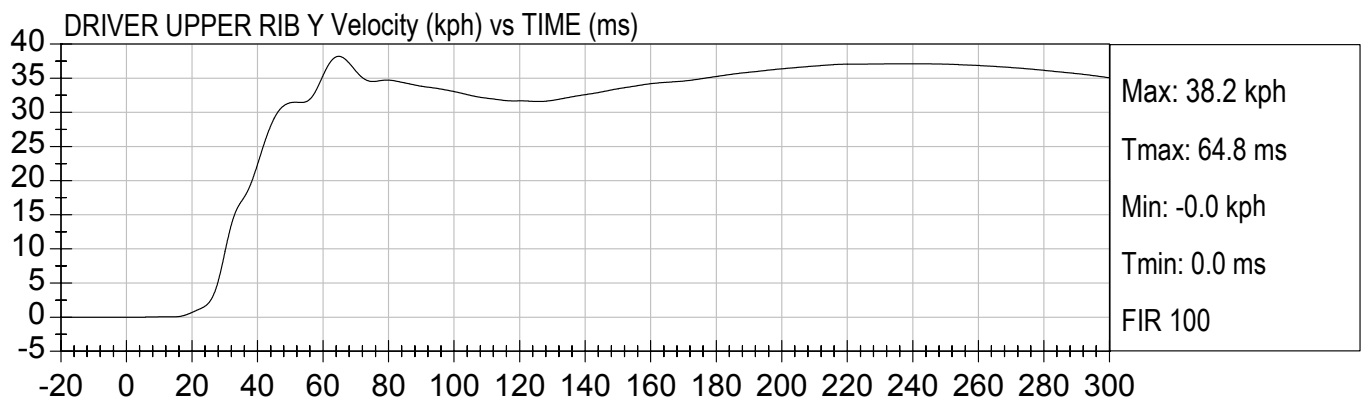
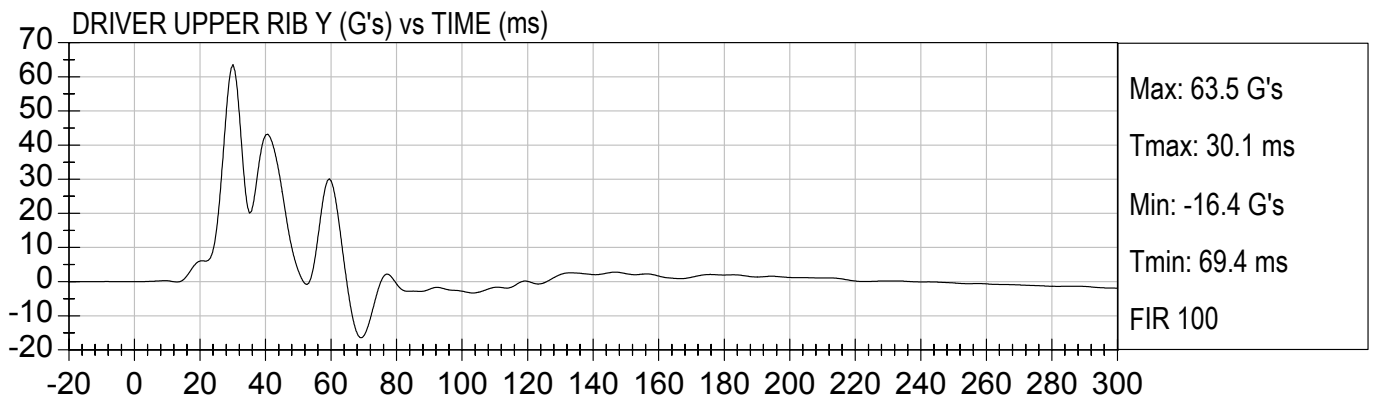


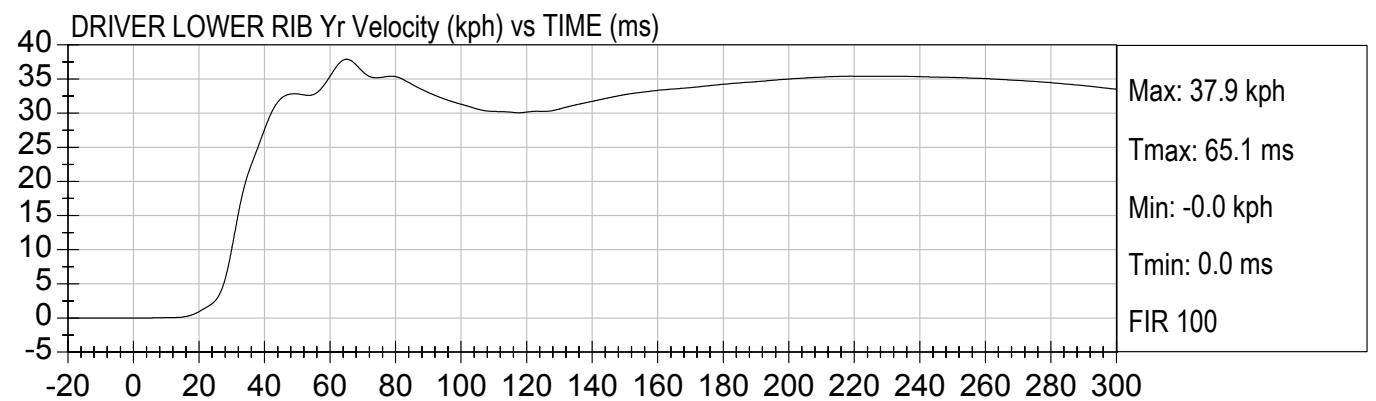
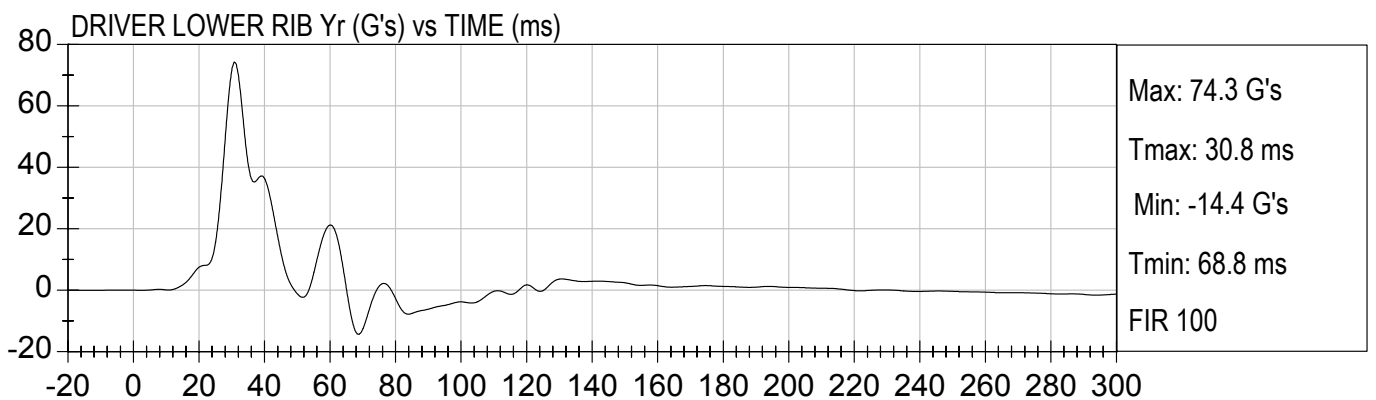
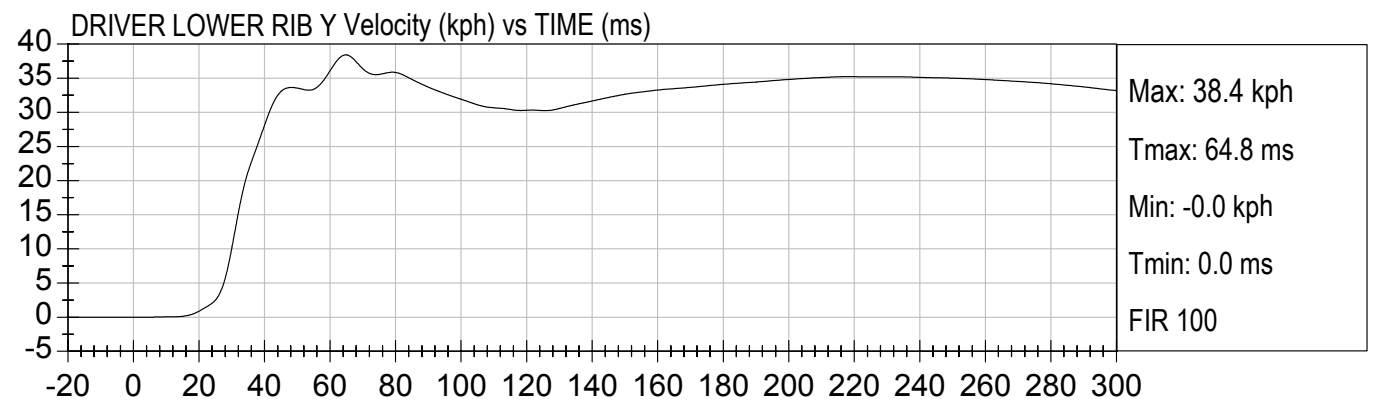
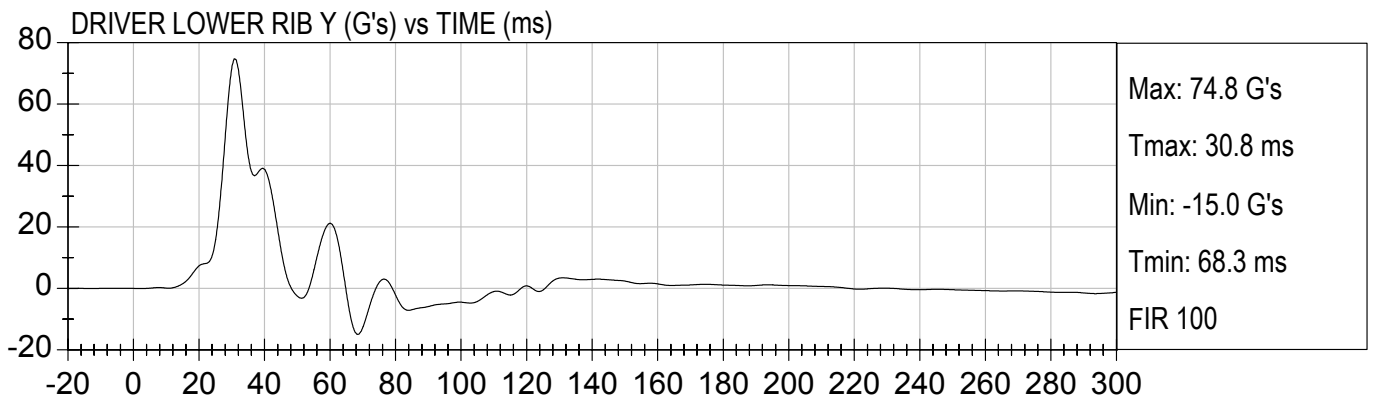


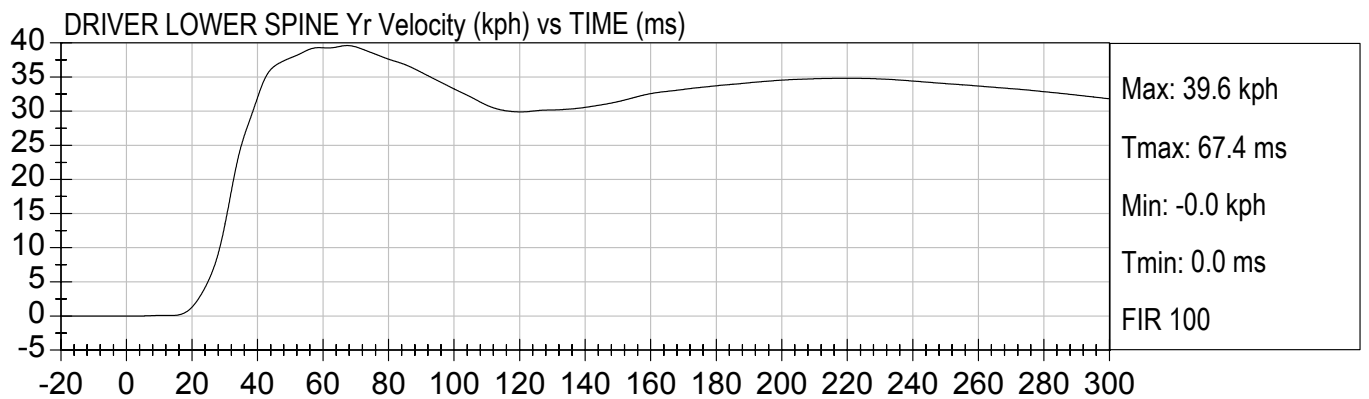
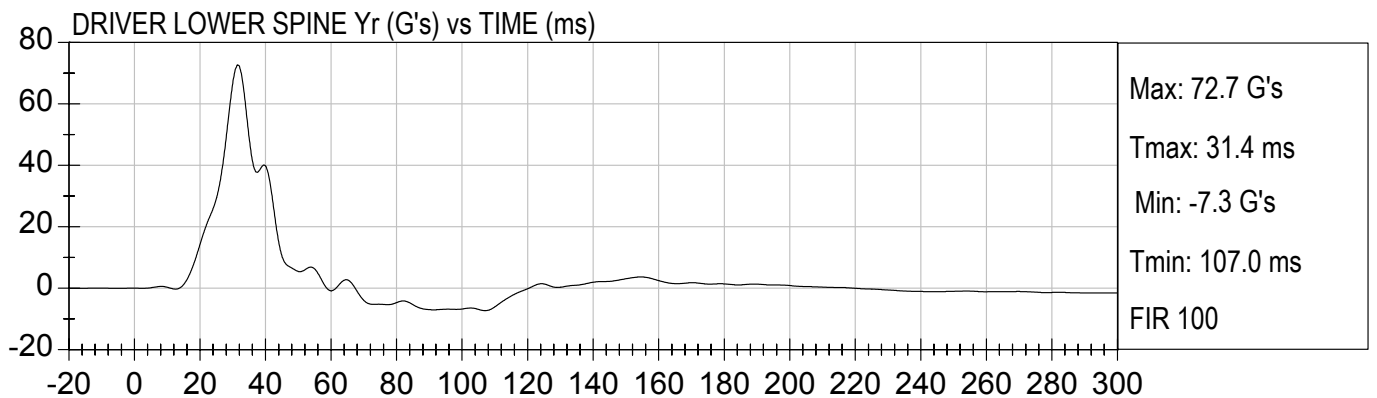
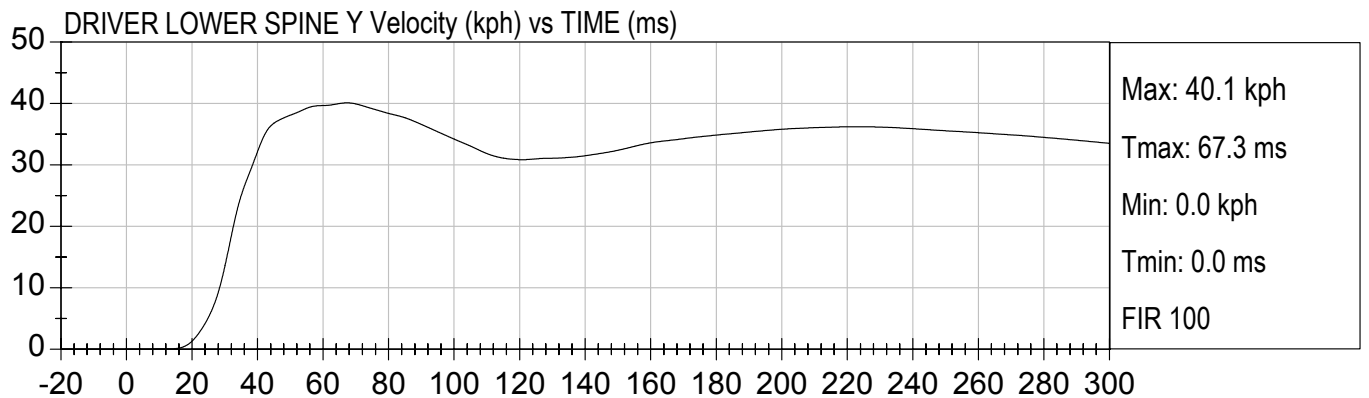
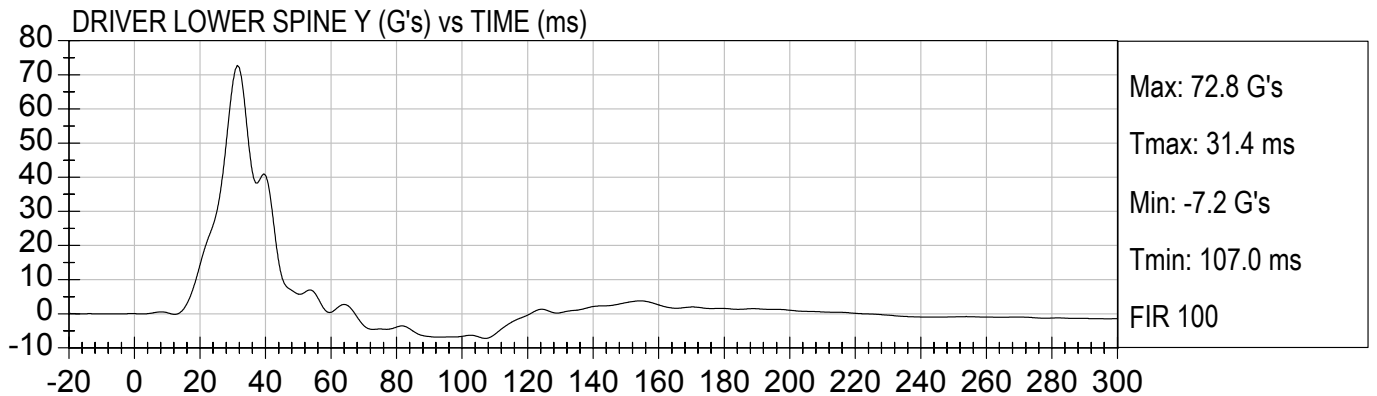






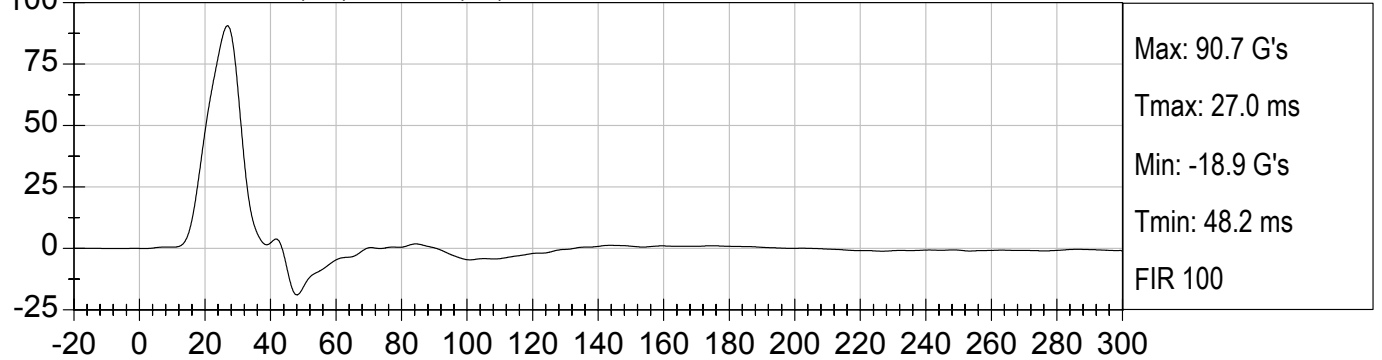




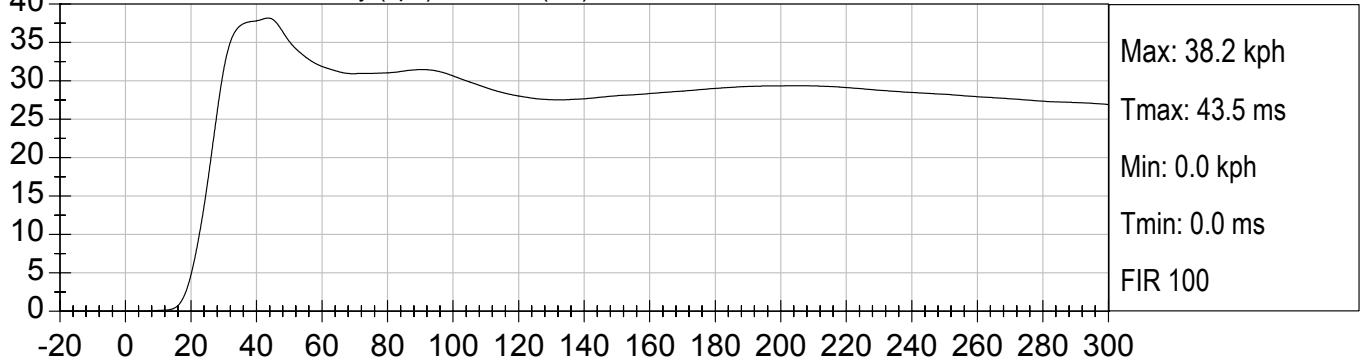




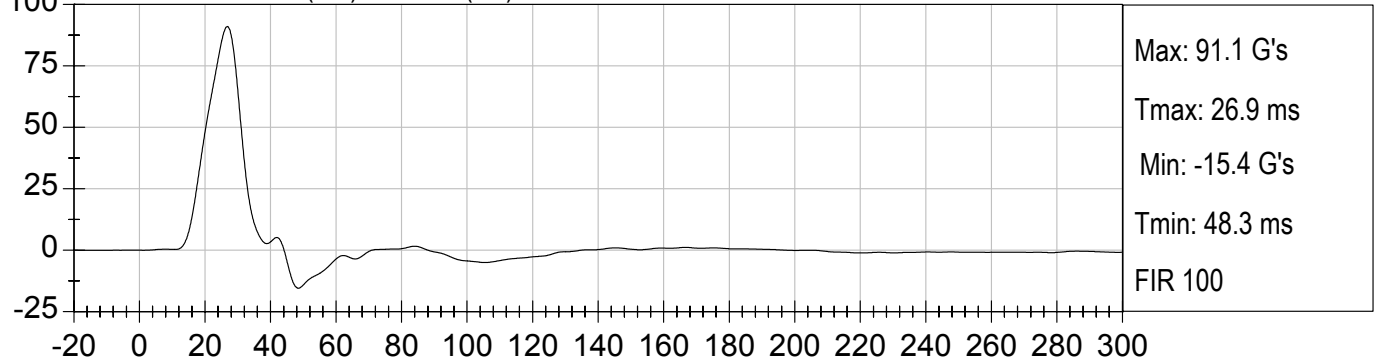
DRIVER PELVIS Y (G's) vs TIME (ms)



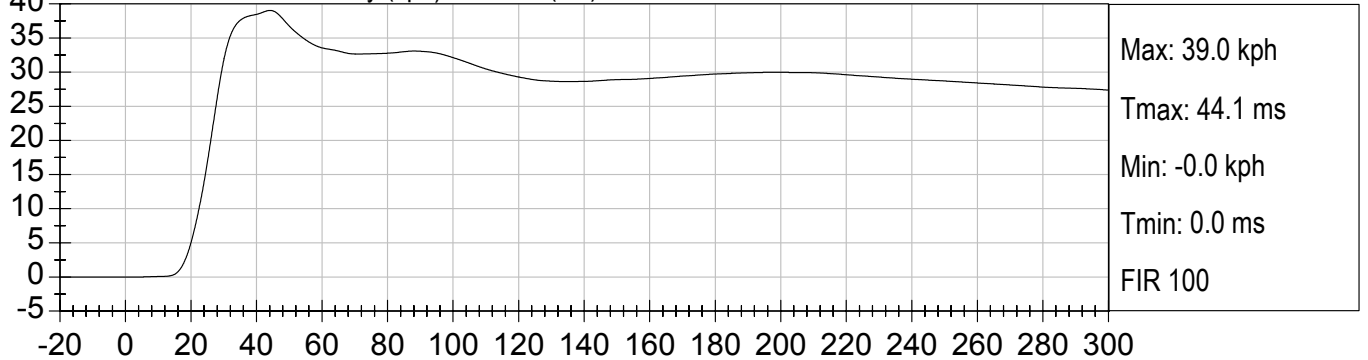
DRIVER PELVIS Y Velocity (kph) vs TIME (ms)

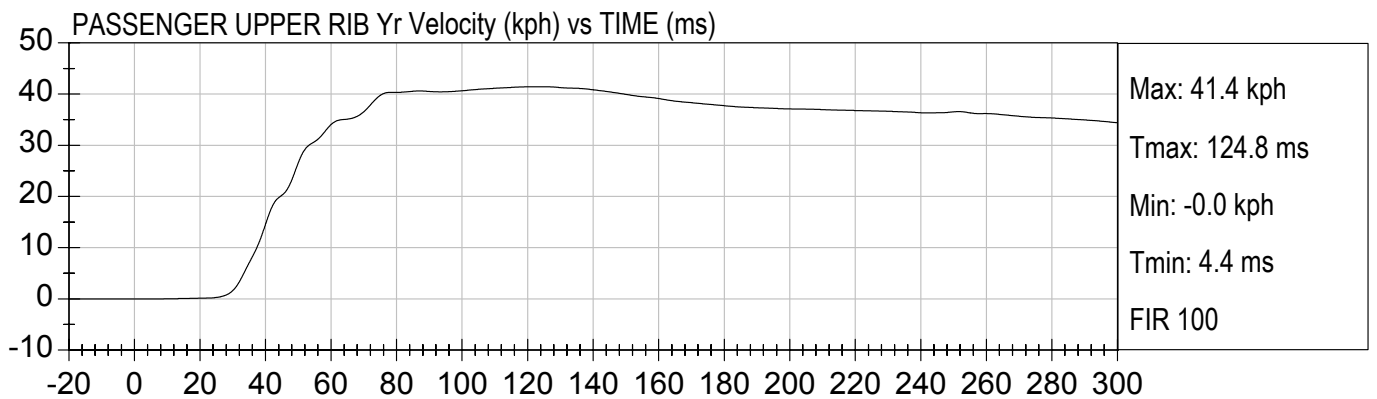
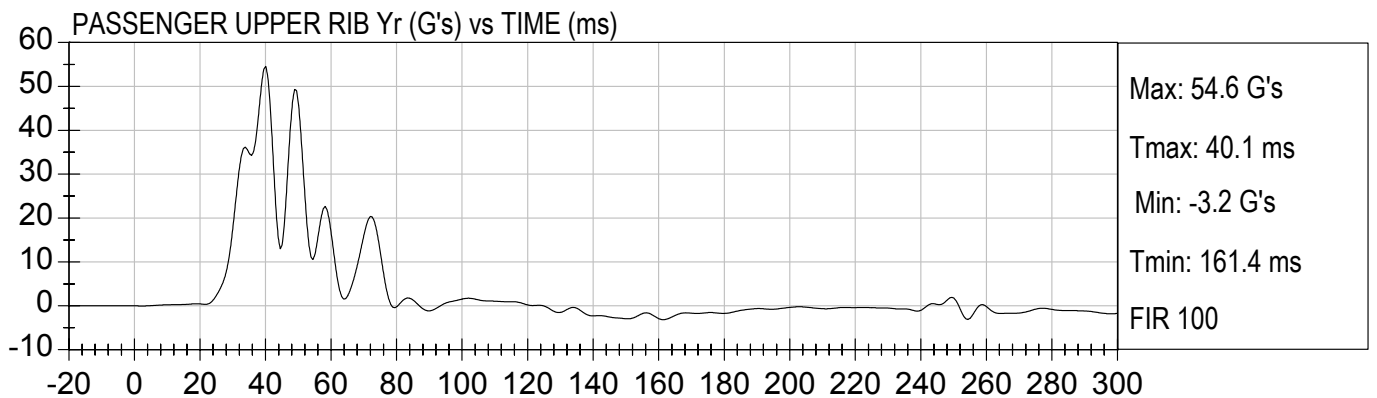
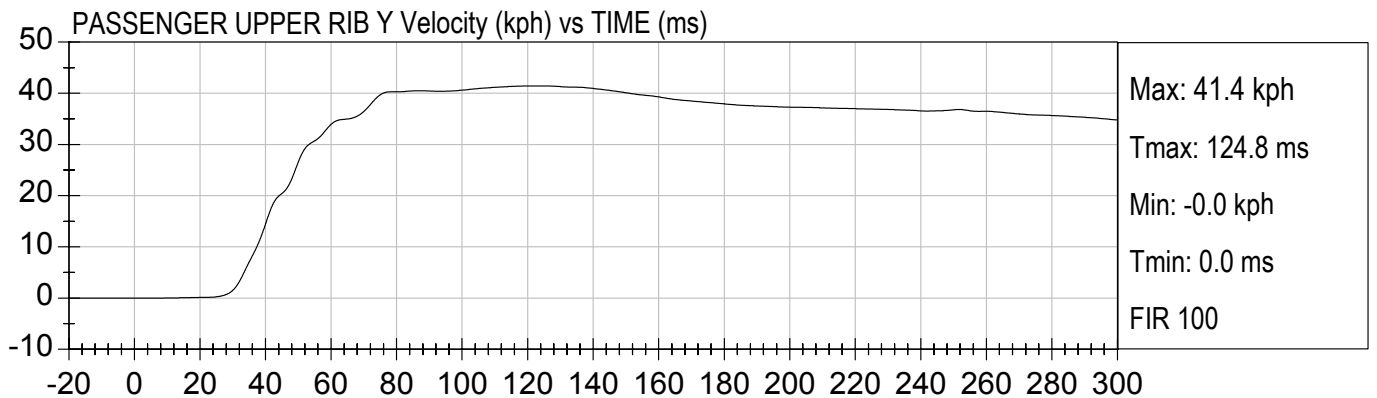
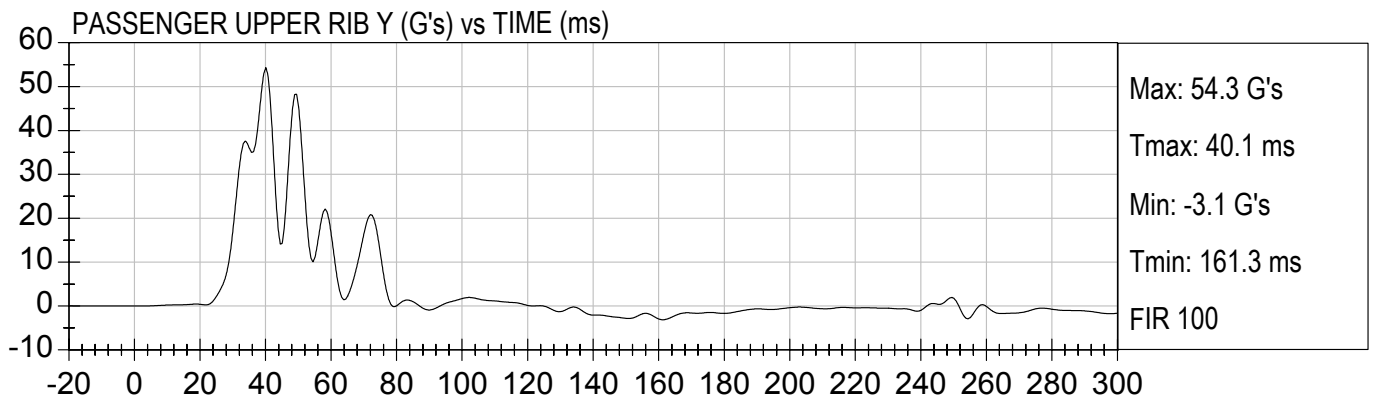


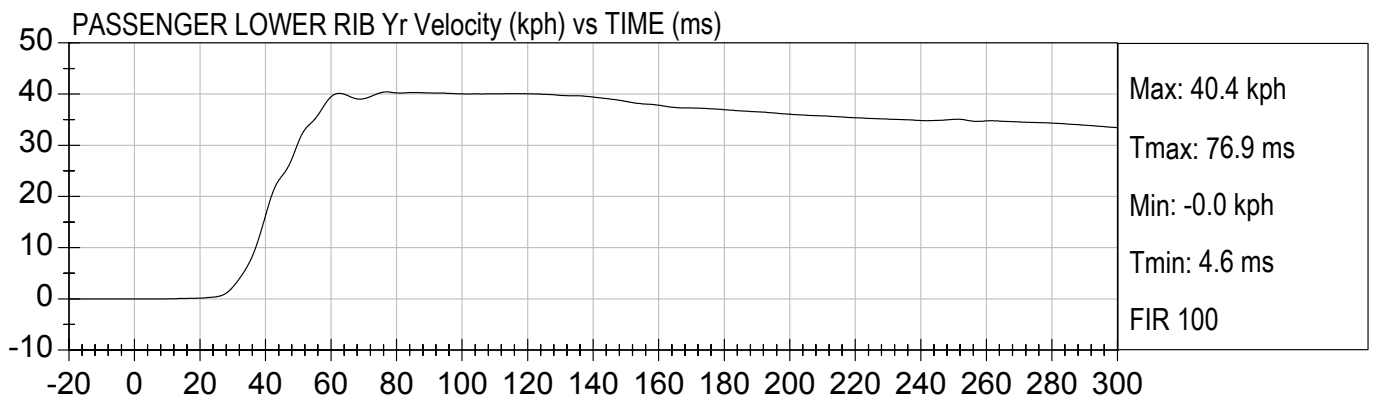
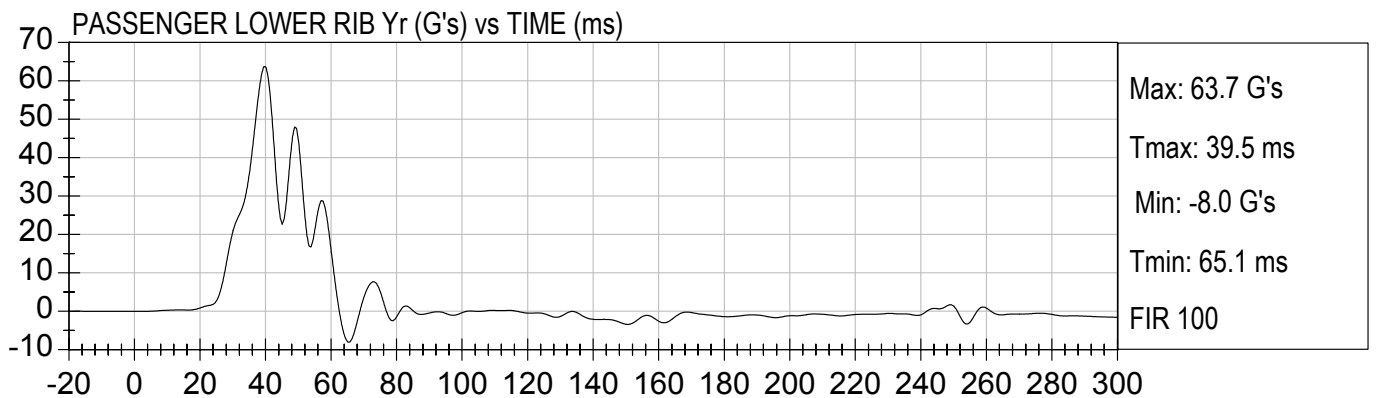
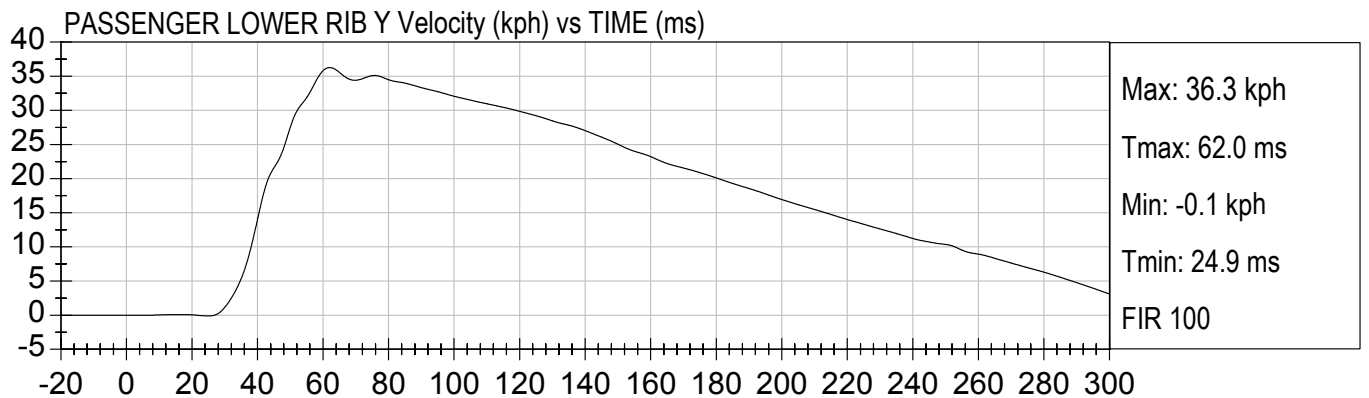
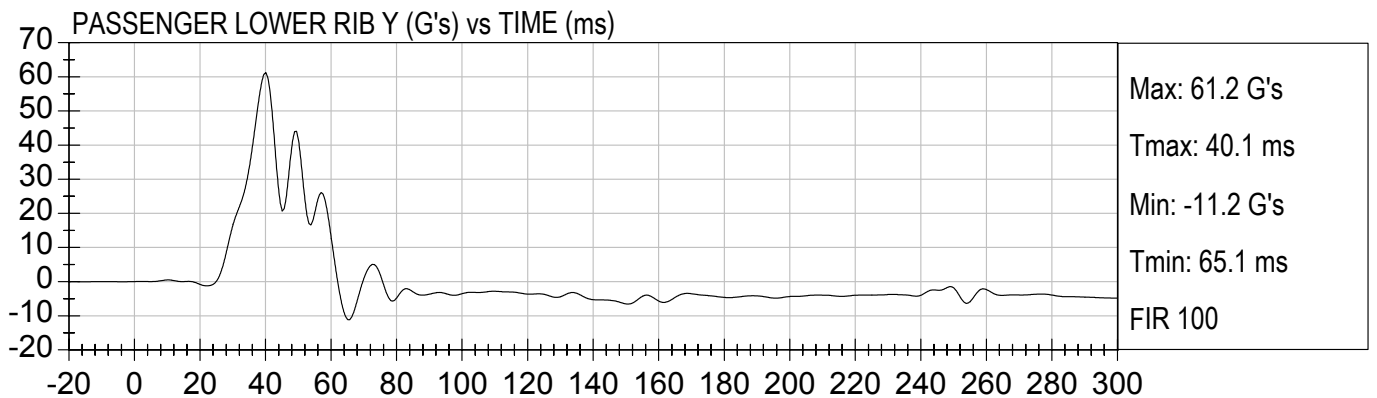
DRIVER PELVIS Yr (G's) vs TIME (ms)

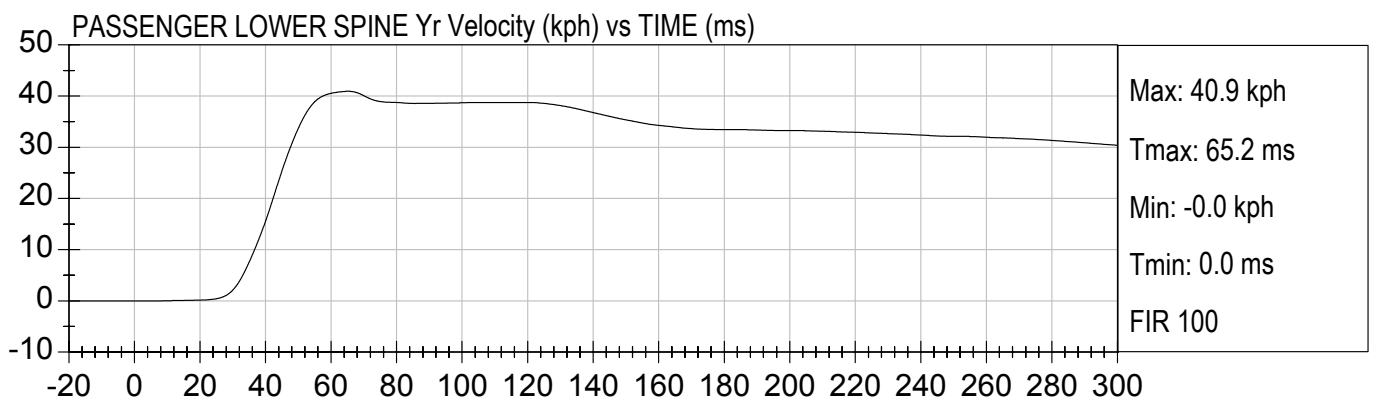
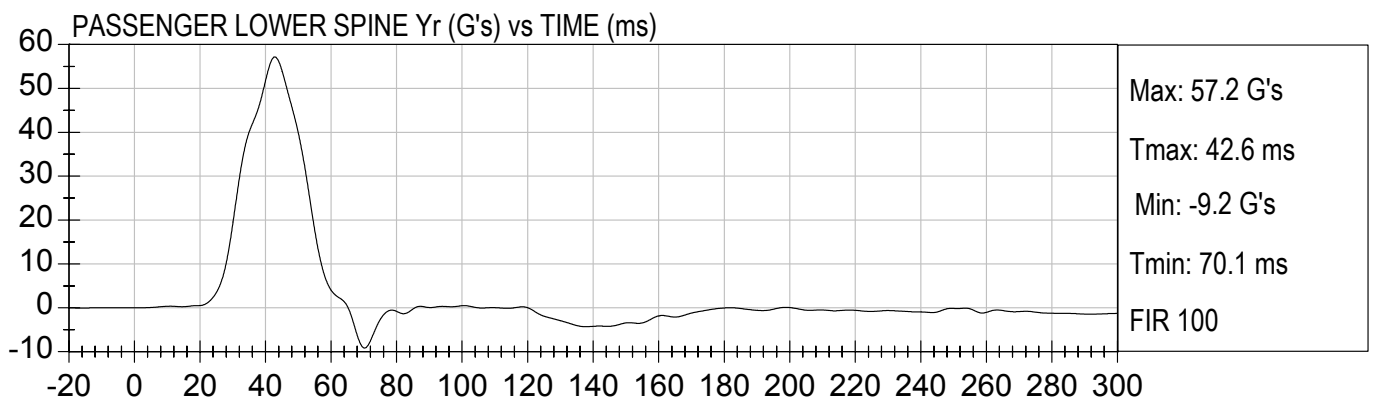
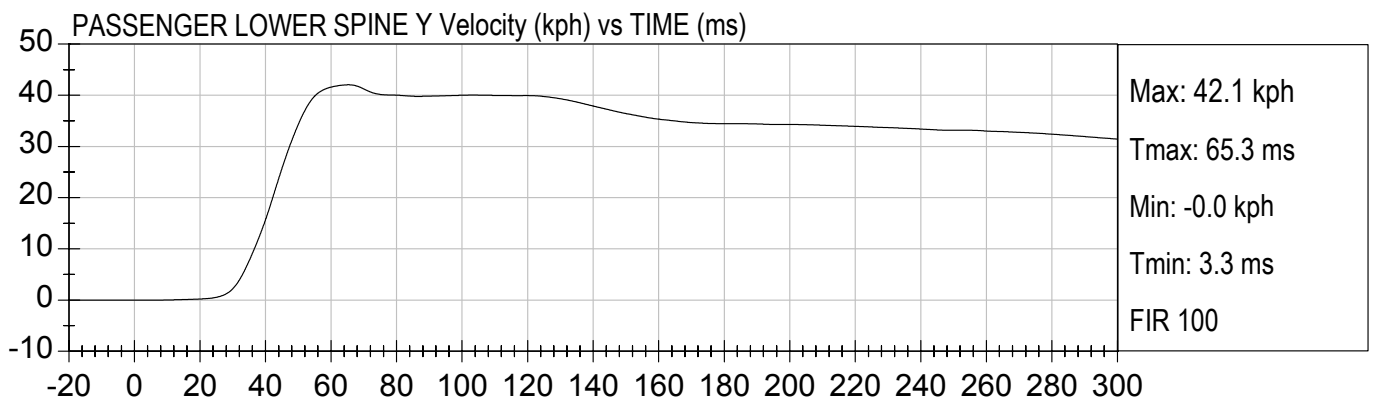
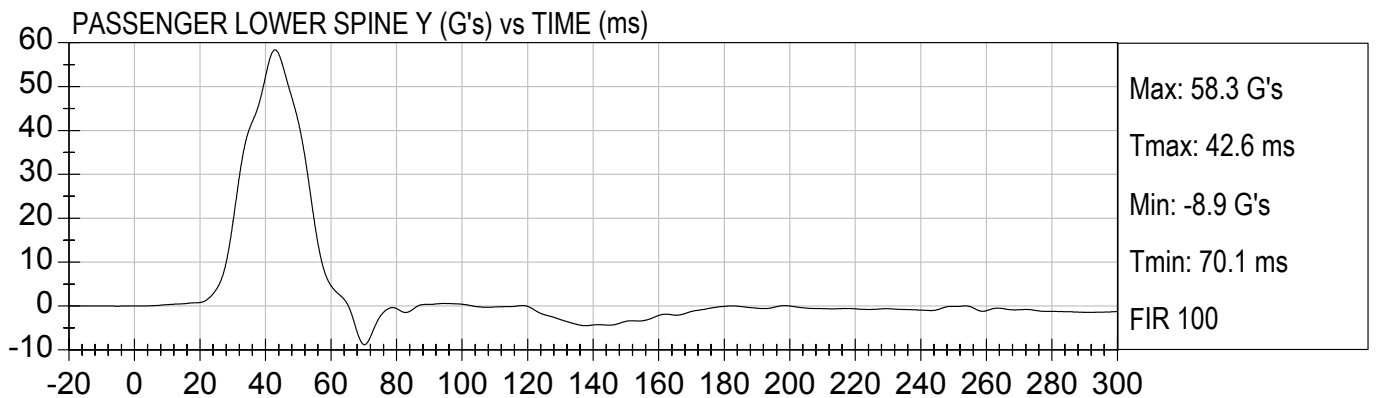


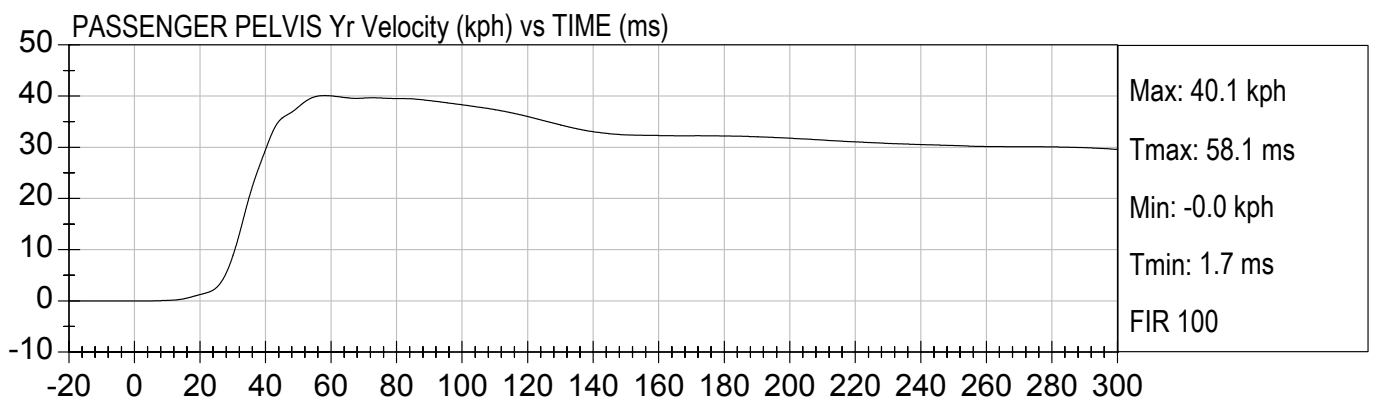
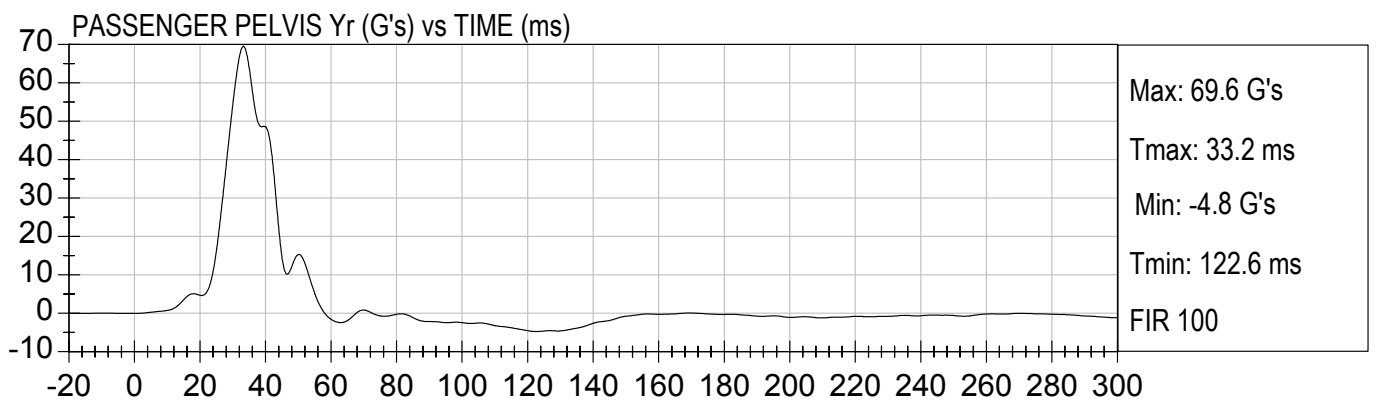
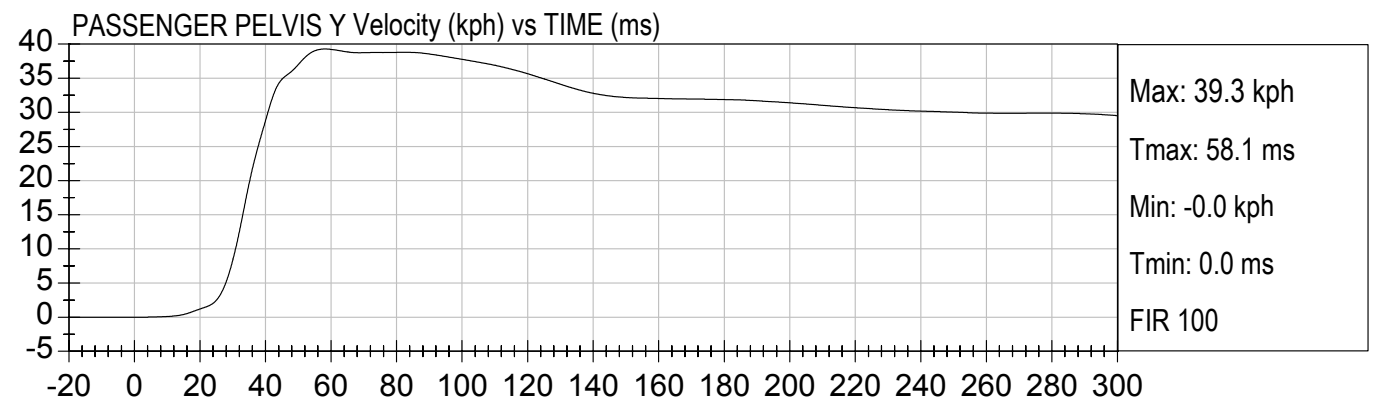
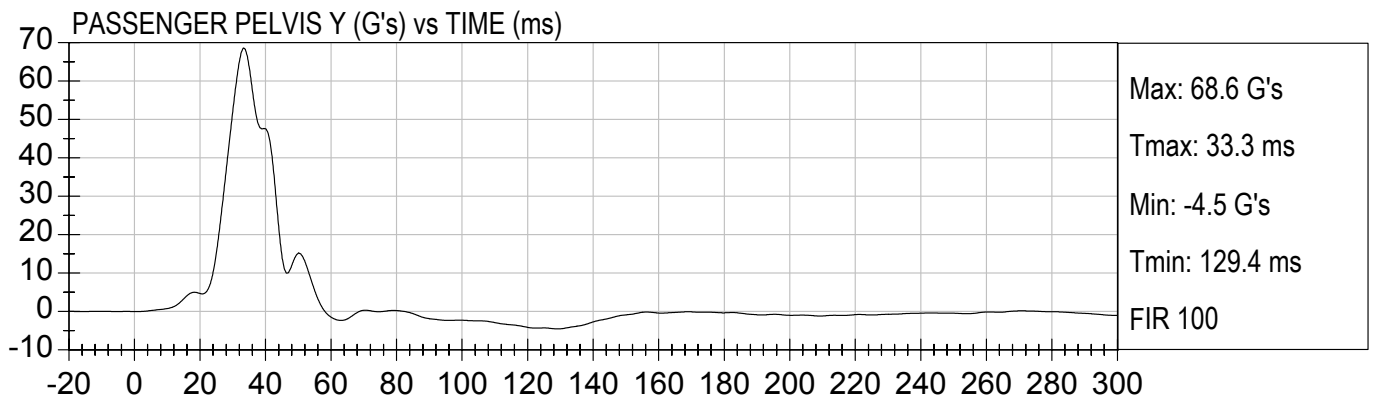
DRIVER PELVIS Yr Velocity (kph) vs TIME (ms)











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.
Neck Pendulum Test:	The neck passed all pendulum 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: D04202

Tested Parameter	Units	Specification	Result	Pass/Fail
SH - Seated Height	mm	889 - 909	906	Pass
RH - Rib Height	mm	501 - 521	507	Pass
HP - Hip Pivot Height	mm	99 ref.	99	Pass
RD - Rib from Back Line	mm	229 - 241	241	Pass
KV - Knee Pivot to Back Line	mm	511 - 526	517	Pass
SW - Knee Pivot to Floor	mm	490 - 505	497	Pass
HW - Hip Width	mm	356 - 391	360	Pass
Overall Test Results			Pass	

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

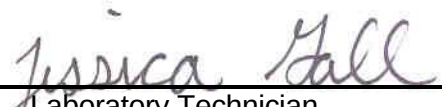
09/15/2004
Test Date

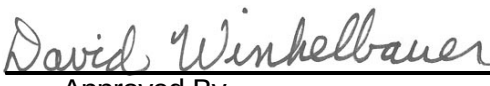
SID Calibration Data Sheet
Side Impact Dummy
Head Drop Calibration (Lateral)

ATD Serial No: 904

Test I.D: D042241

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	50	Pass
Peak Resultant Acceleration	G's	120 to 150	145	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	8	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

09/15/2004
Test Date



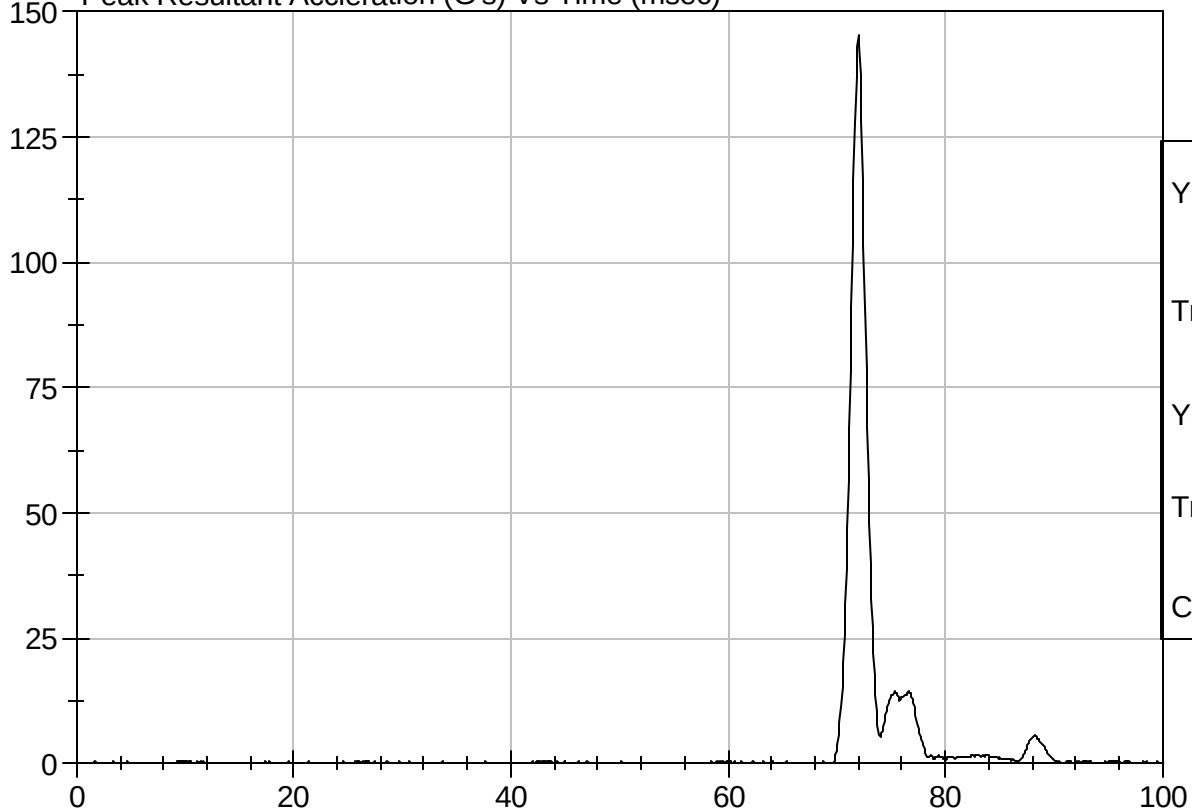
Test Description: Head Drop

Test Date: 09/15/2004

Component: D042241

Speed: 0 ft/s, 0.00 m/s

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



YMax: 145.3 G

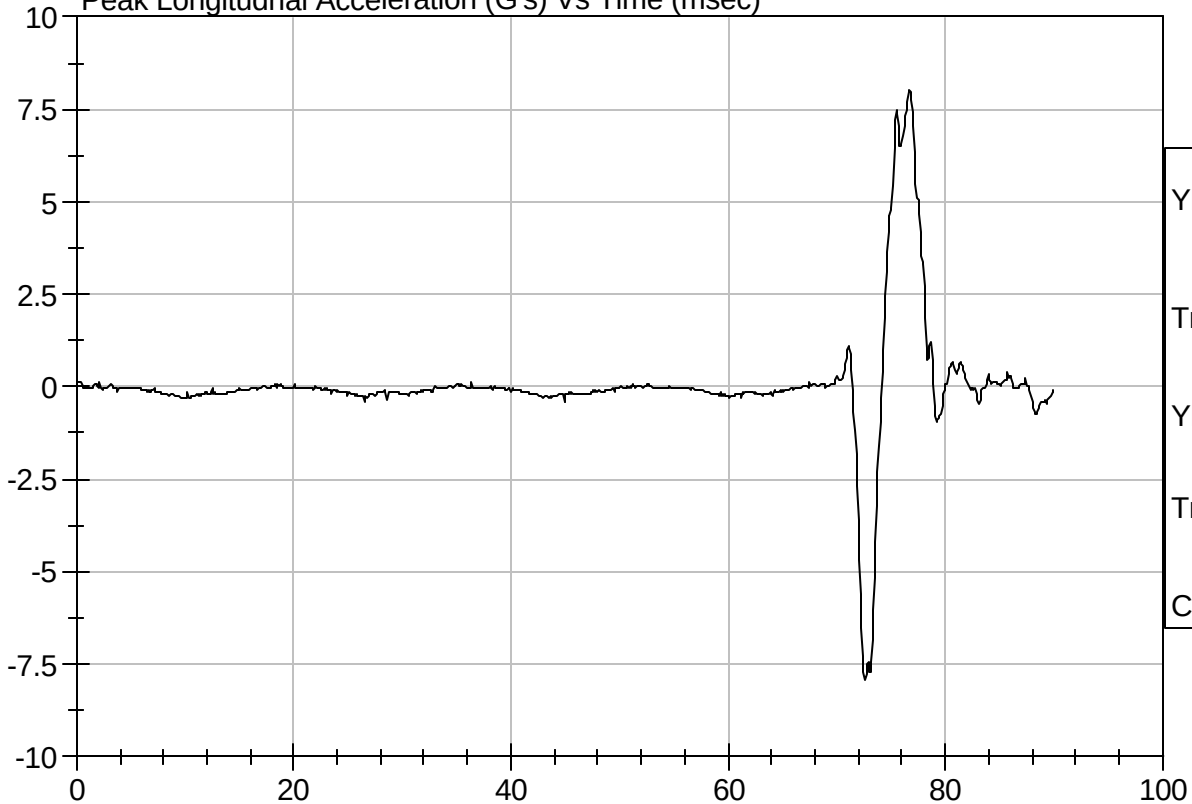
Tmax: 72.0 ms

YMin: 0.0 G

Tmin: 2.0 ms

CFC 1000

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



YMax: 8.0 G

Tmax: 76.7 ms

YMin: -7.9 G

Tmin: 72.6 ms

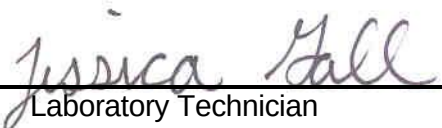
CFC 1000

SID Calibration Data Sheet
Side Impact Dummy
Thorax Impact Test

ATD Serial No: 904

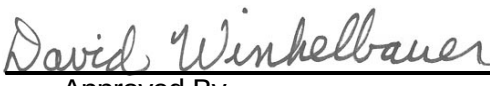
Test I.D: D042242

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	49	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	22	Pass
Overall Test Results				Pass


Laboratory Technician

09/15/2004

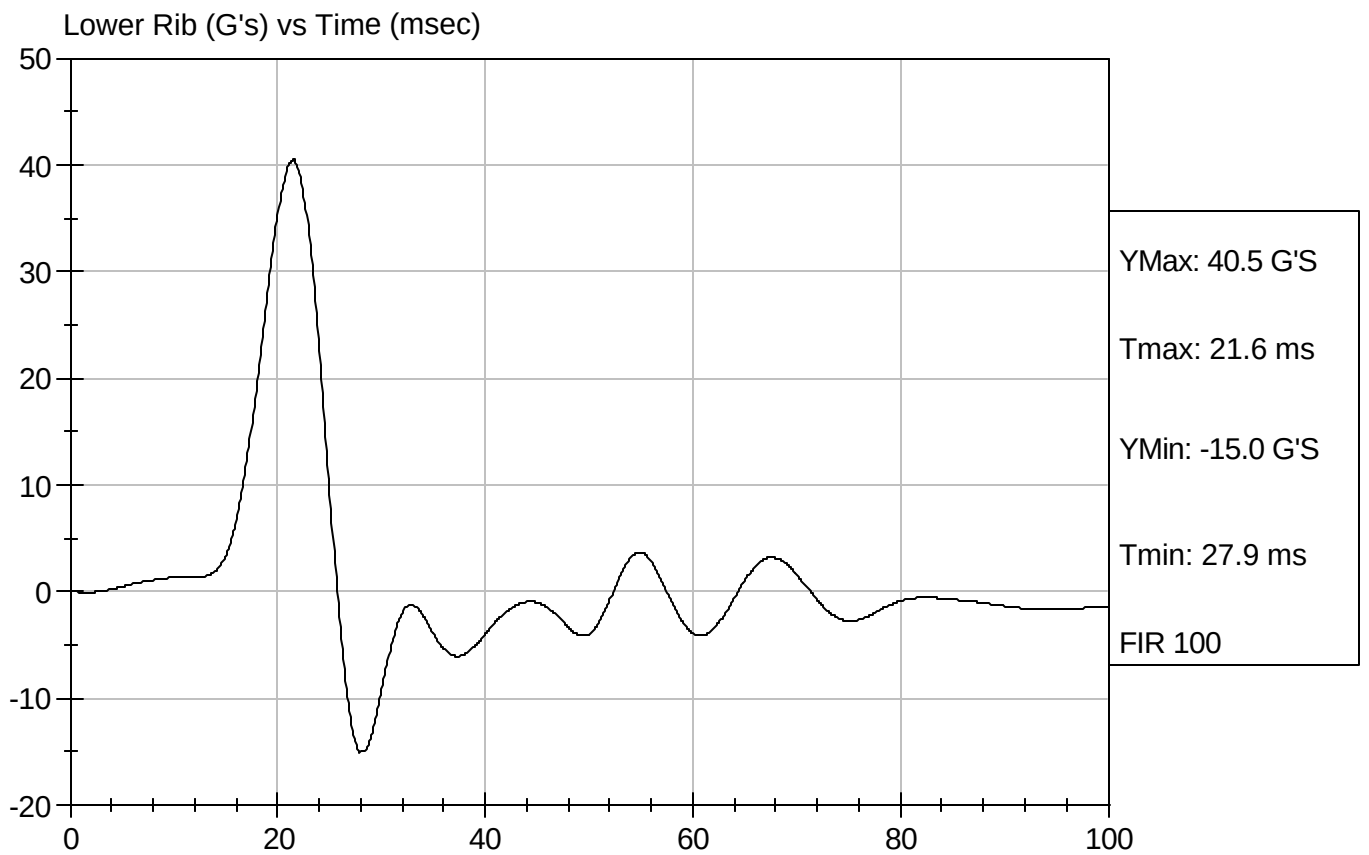
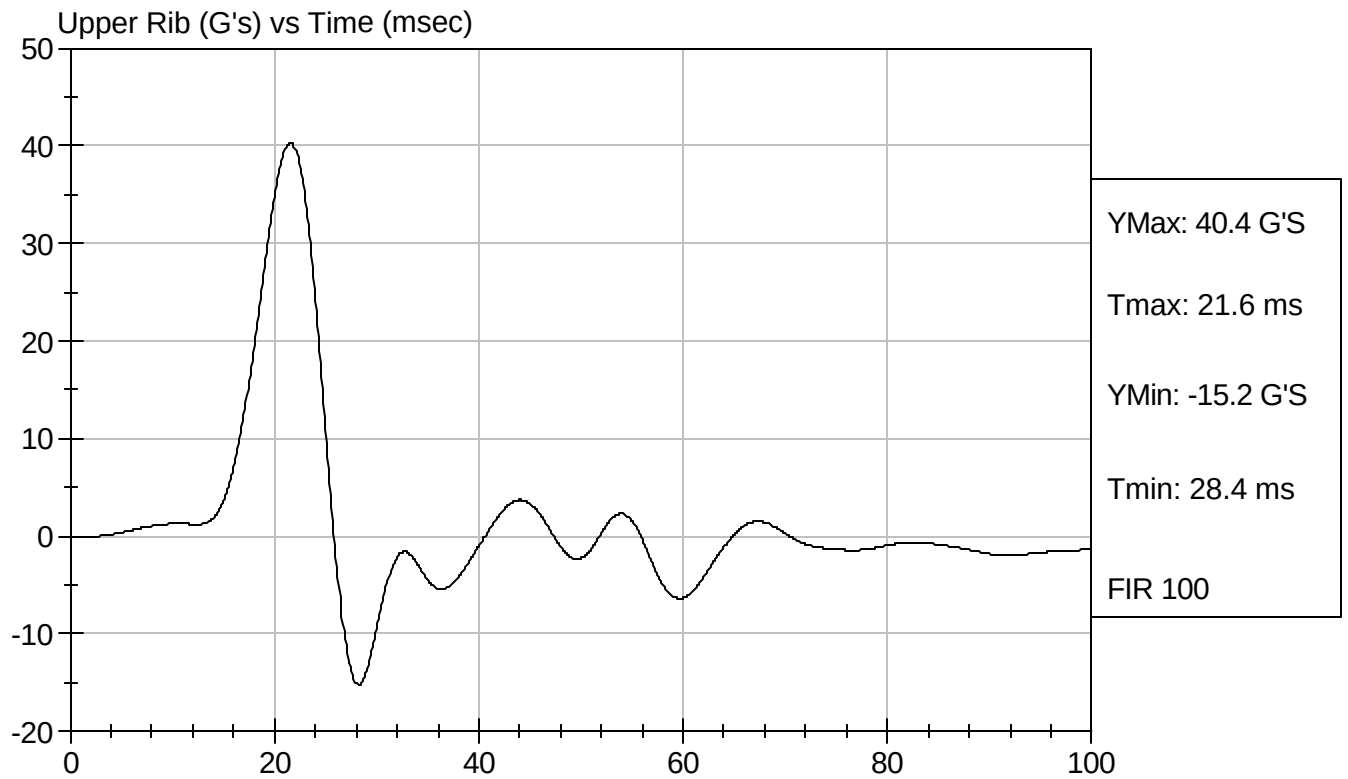
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D042242

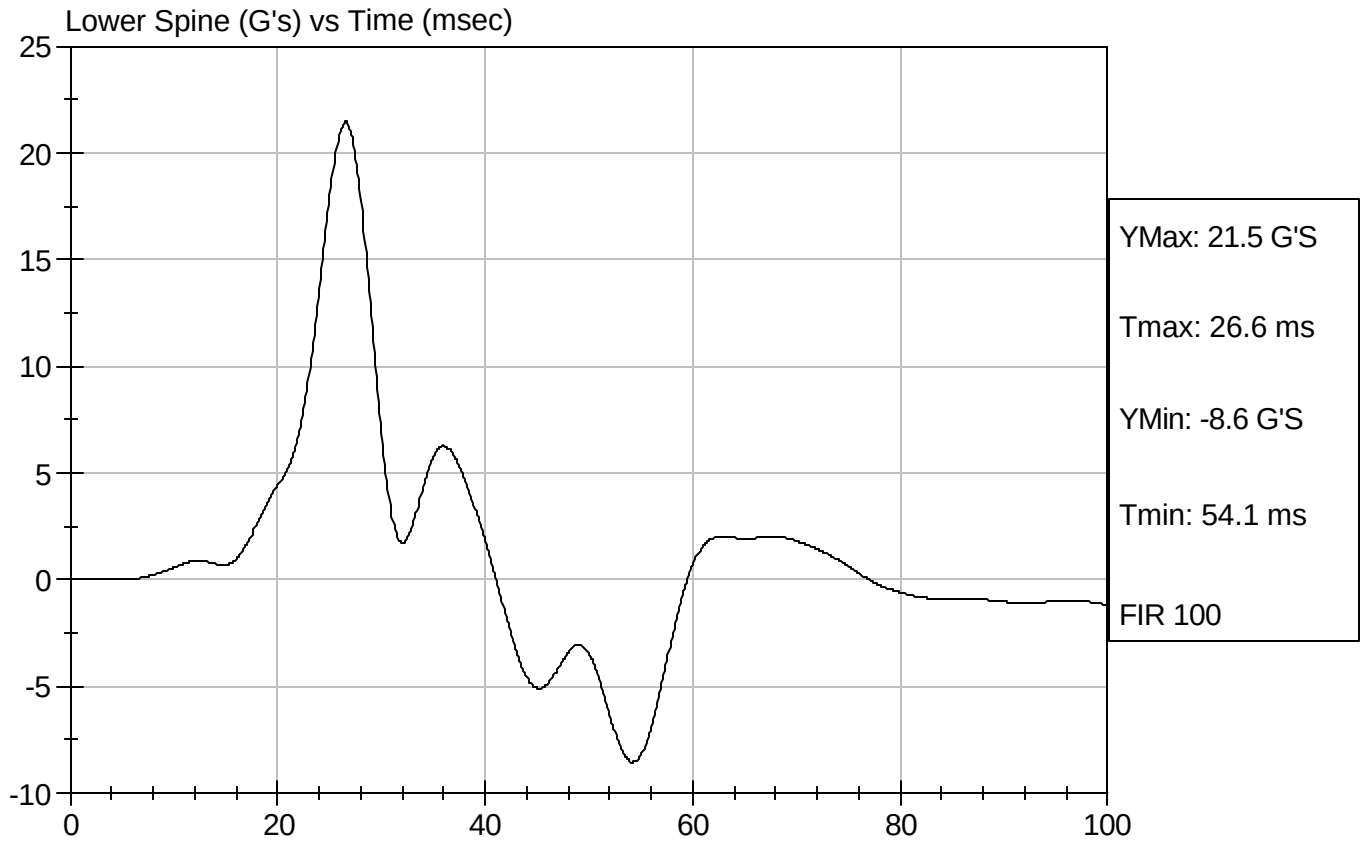
Test Date: 09/15/2004
Speed: 14.07 ft/sec, 4.29 m/sec





Test Desc: Thorax Impact
Component ID: D042242

Test Date: 09/15/2004
Speed: 14.07 ft/sec, 4.29 m/sec

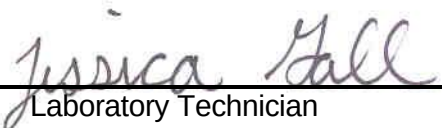


SID Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Test

ATD Serial No: 904

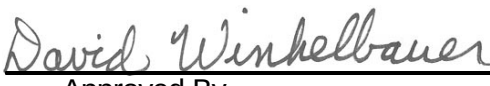
Test I.D: D042243

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	50	Pass
Probe Velocity	m/s	4.27 - 4.33	4.28	Pass
Pelvis Acceleration	G's	40 - 60	49	Pass
			Overall Test Results	Pass


Laboratory Technician

09/15/2004

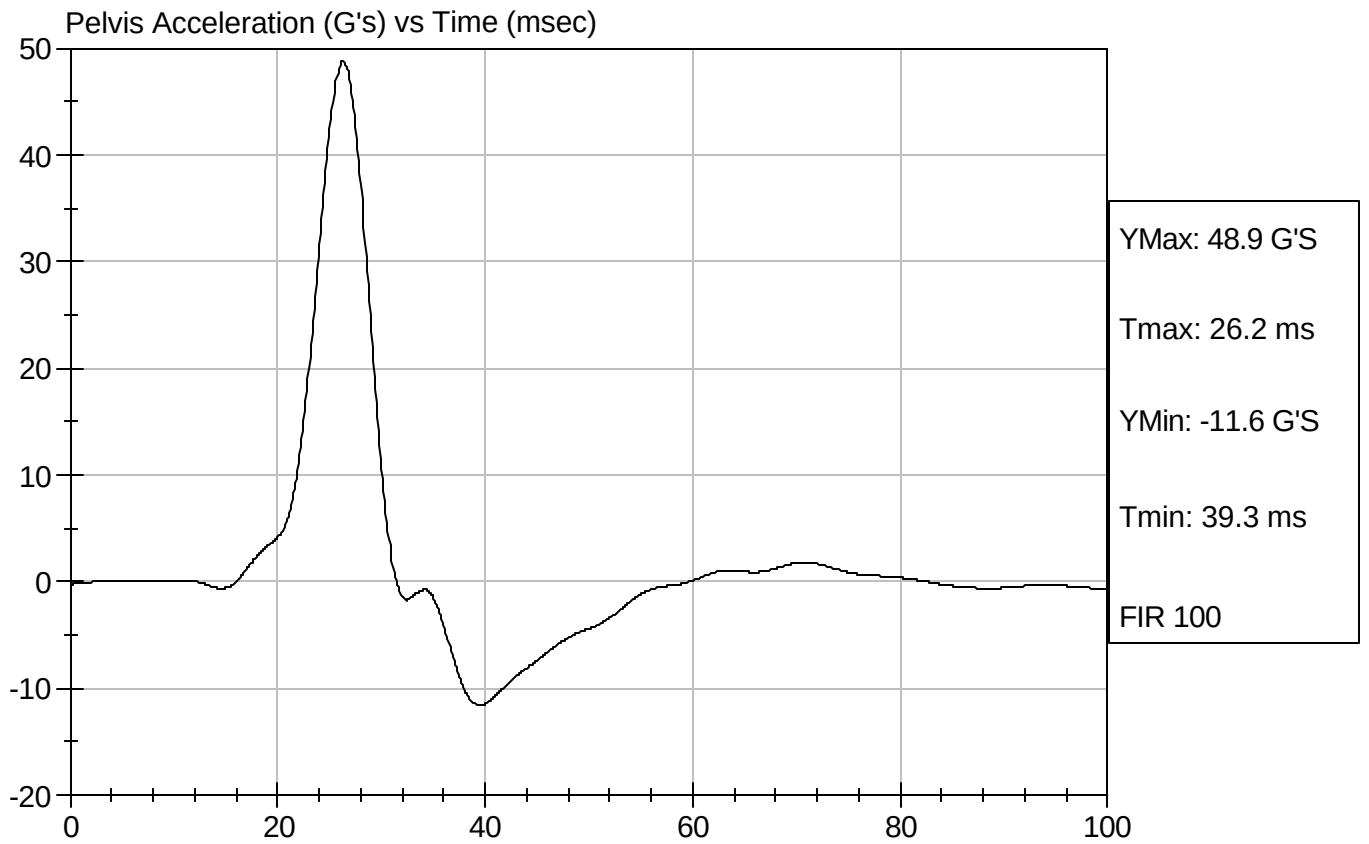
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D042243

Test Date: 09/15/2004
Speed: 14.04 ft/sec, 4.28 m/sec

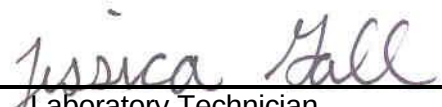


SID Calibration Data Sheet
Side Impact Dummy
Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 904

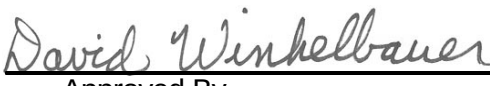
Test I.D: D042244

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	51	Pass
Force At 12.7 mm	N	104 -162	148	Pass
Force At 19 mm	N	163 - 222	206	Pass
Force At 25.4 mm	N	222 - 280	274	Pass
Force At 33 mm	N	325 - 391	380	Pass
Overall Test Results				Pass


Laboratory Technician

09/16/2004

Test Date


Approved By

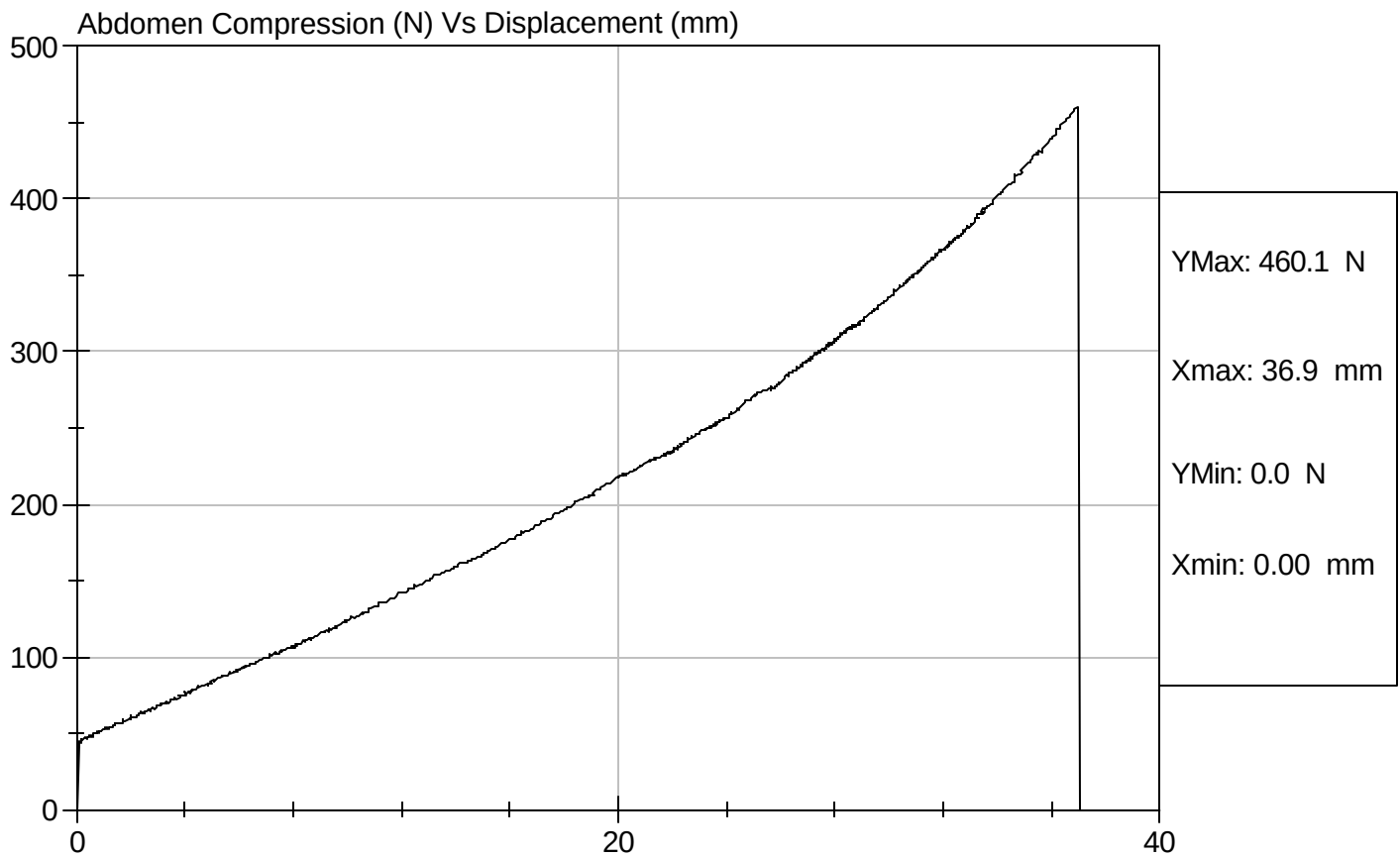


Test Description: Abdomen Compression

Test Date: 09/16/2004

Component: D042244

Speed: 0 ft/sec, 0 m/sec

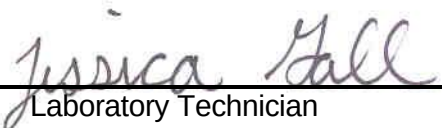


SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

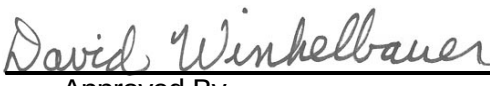
ATD Serial No: 904

Test I.D: D042245

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Force At 0 deg	N	0 - 26.7	0.0	Pass
Force At 20 deg	N	97.9 - 151.2	119.1	Pass
Force At 30 deg	N	151.2 - 204.6	175.4	Pass
Force At 40 deg	N	204.6 - 258.0	231.8	Pass
Return Angle	Deg	12 Maximum	4	Pass
			Overall Test Results	Pass


 Laboratory Technician

09/16/2004
 Test Date


 Approved By

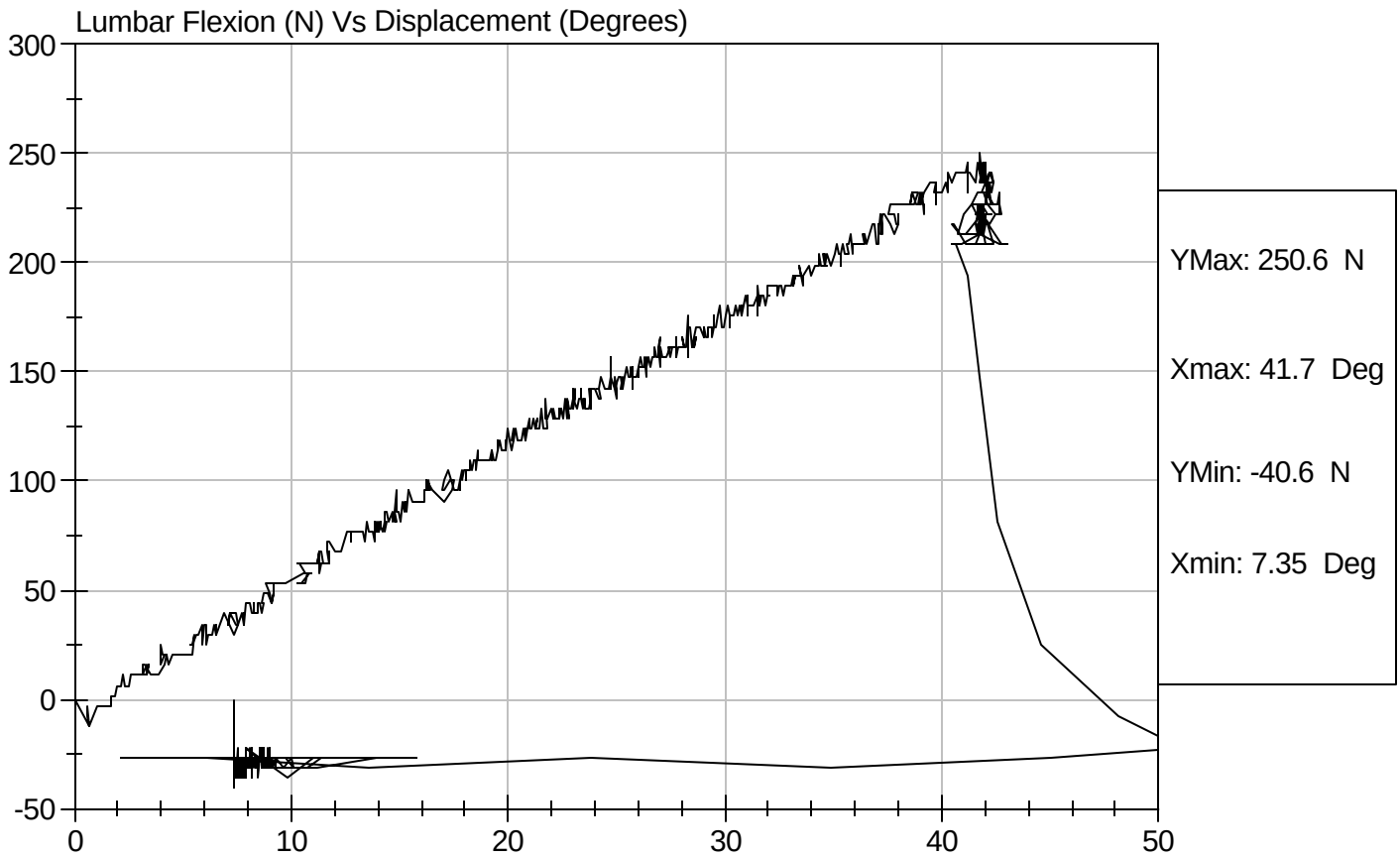


Test Description: Lumbar Flexion

Test Date: 09/16/2004

Component: D042245

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Thoracic Shock Absorber Calibration

ATD Serial No: 904

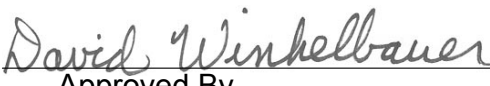
Test I.D: D042028

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	56	Pass
Velocity 3.05 m/s	Force	N	836 - 1125	918	Pass
	Displacement	mm	30 - 35	31	Pass
Velocity 4.27 m/s	Force	N	1730 - 2099	1,766	Pass
	Displacement	mm	32 - 37	34	Pass
Velocity 6.1 m/s	Force	N	3741 - 4448	4,045	Pass
	Displacement	mm	33 - 40	36	Pass
Overall Test Results					Pass


 Laboratory Technician

08/26/2004

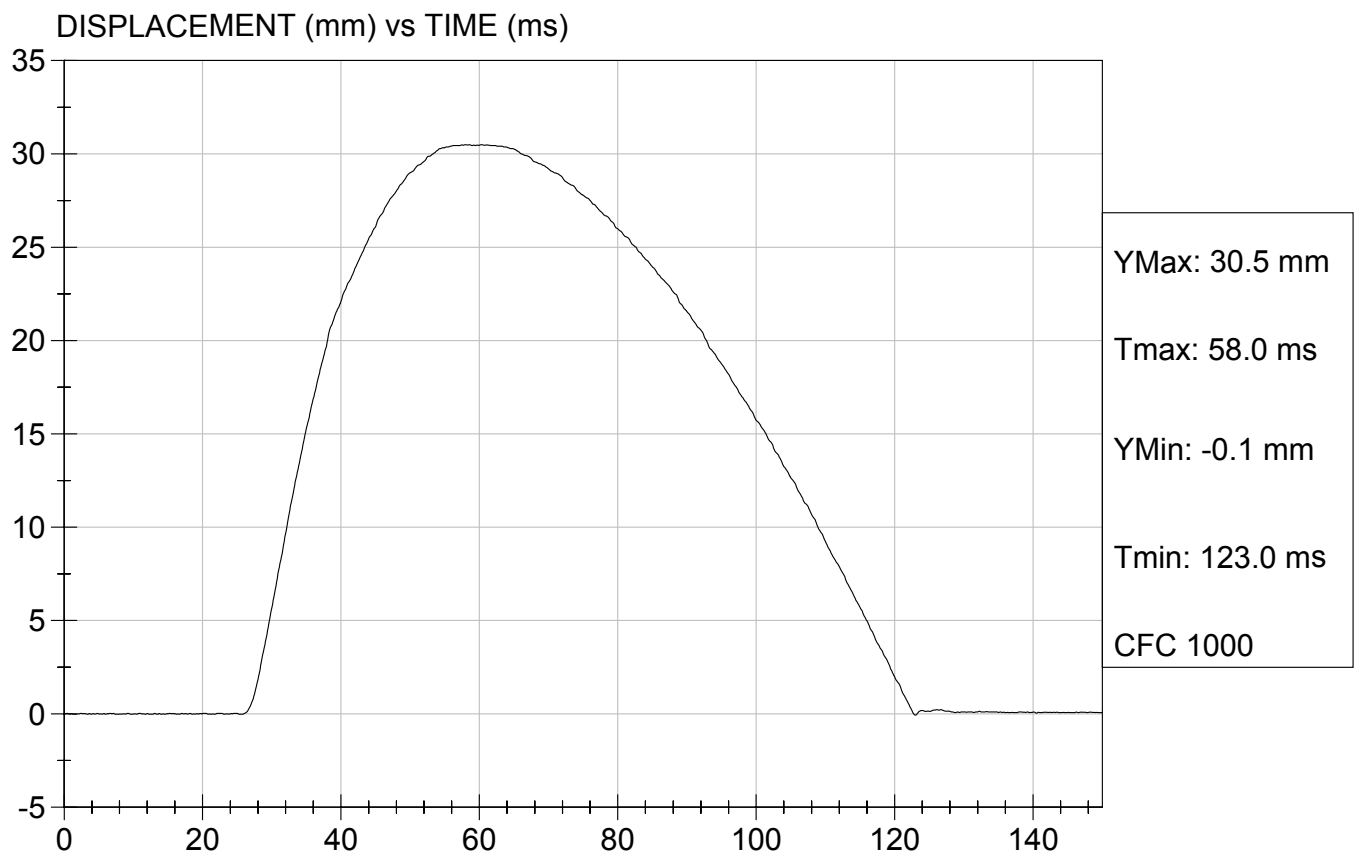
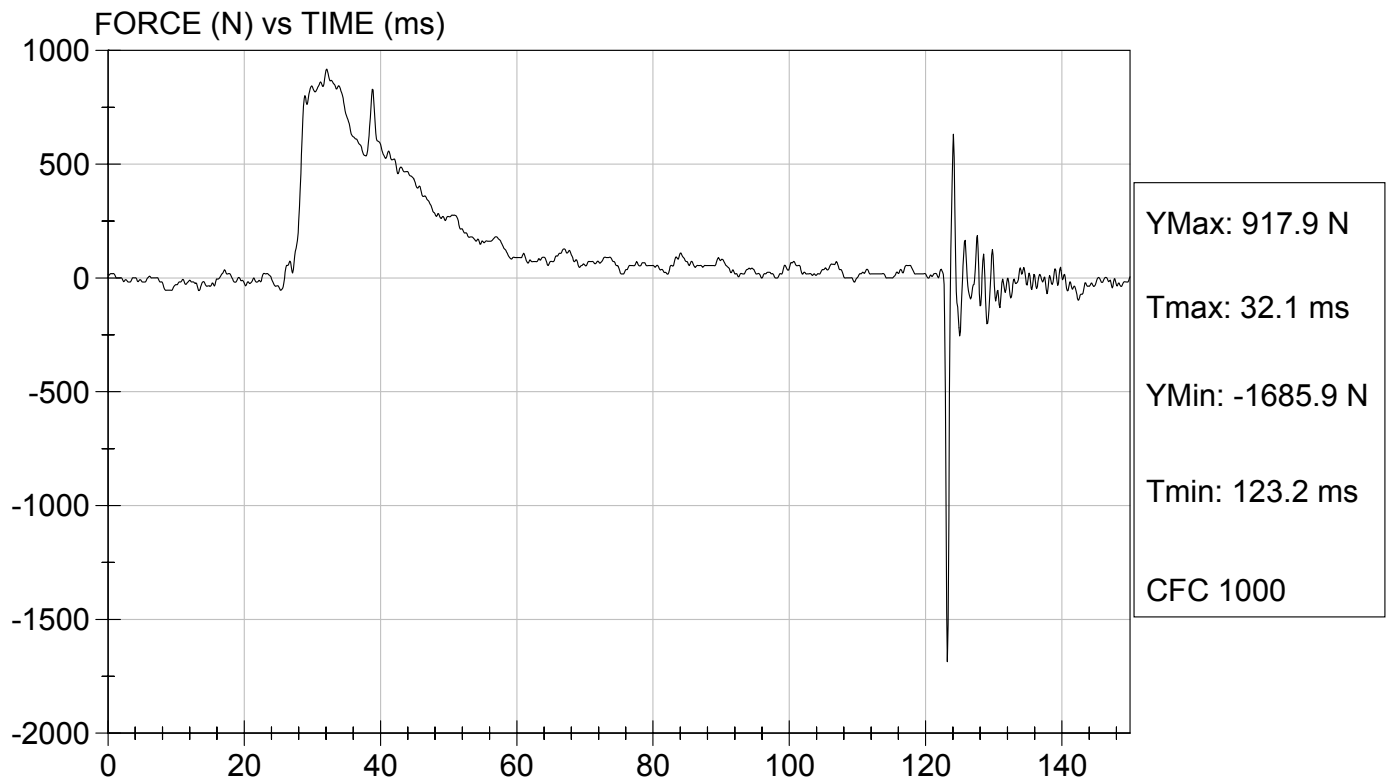
Test Date


 Approved By



Test Desc: Dampener Impact
Component ID: D042026

Test Date: 08/26/2004
Speed: 10 ft/sec, 3.05 m/sec

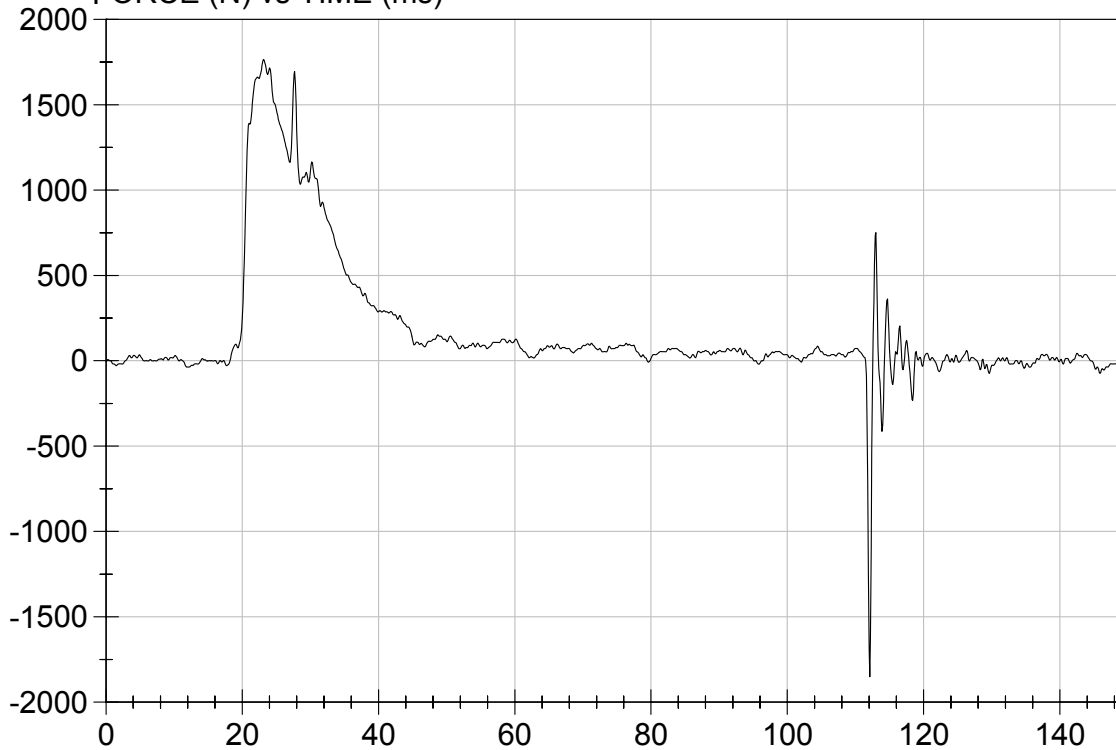




Test Desc: Dampener Impact
Component ID: D042027

Test Date: 08/26/2004
Speed: 14.01 ft/sec, 4.27 m/sec

FORCE (N) vs TIME (ms)



YMax: 1766.0 N

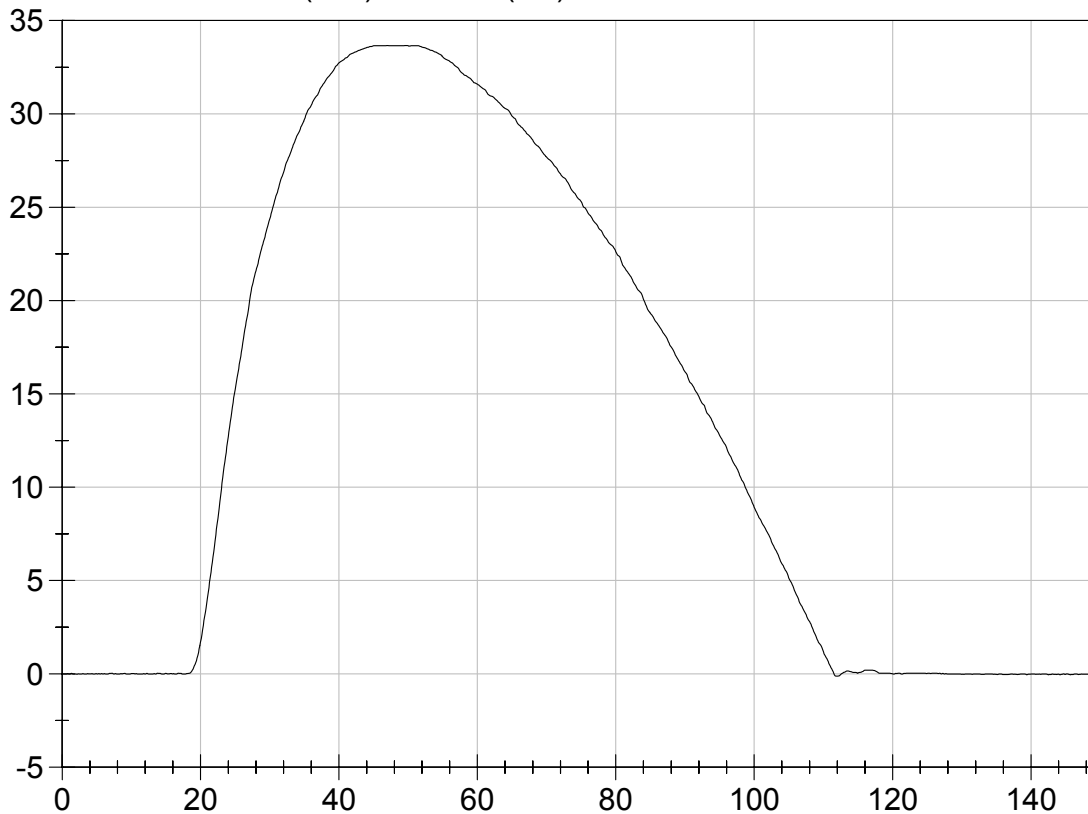
Tmax: 23.1 ms

YMin: -1850.4 N

Tmin: 112.1 ms

CFC 1000

DISPLACEMENT (mm) vs TIME (ms)



YMax: 33.7 mm

Tmax: 47.0 ms

YMin: -0.1 mm

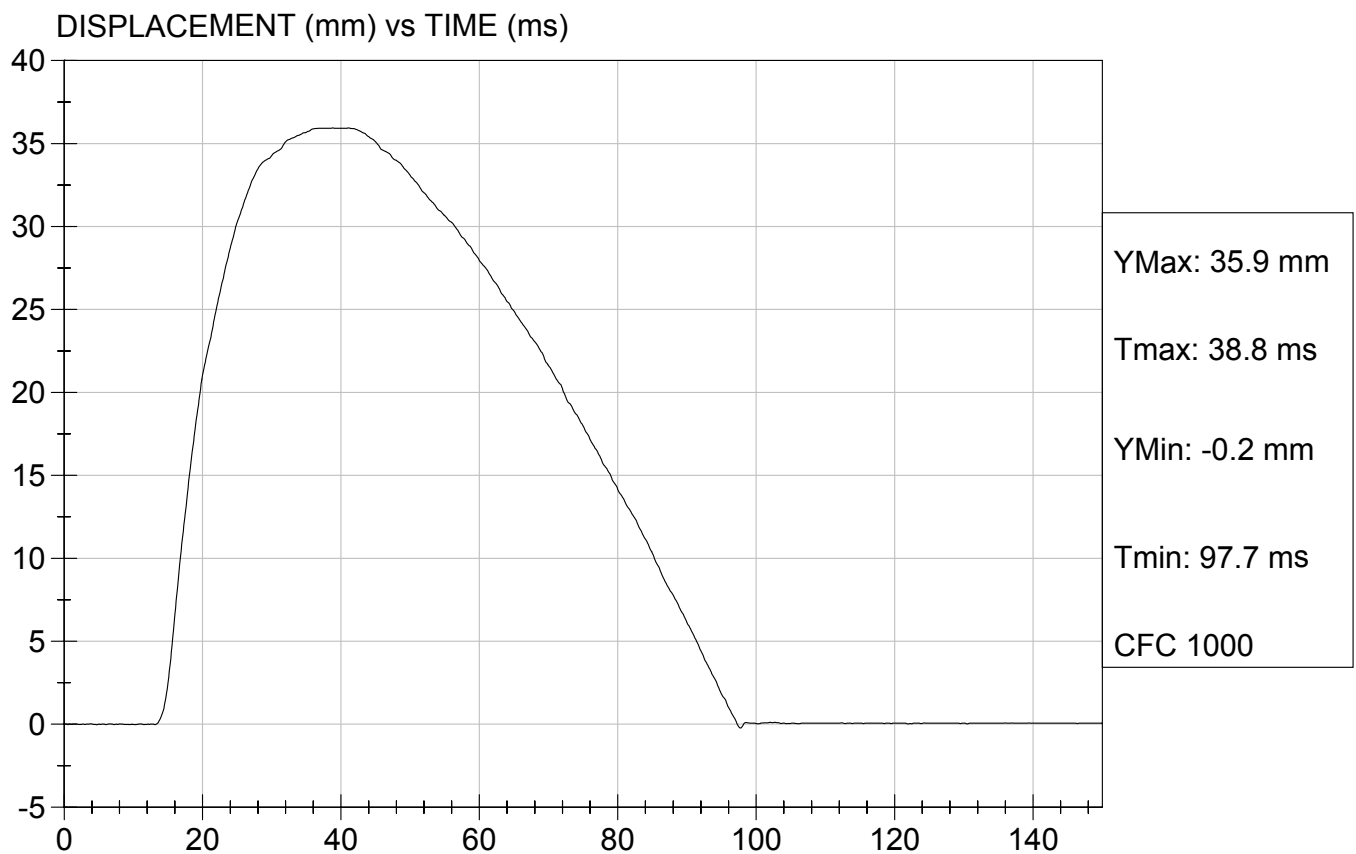
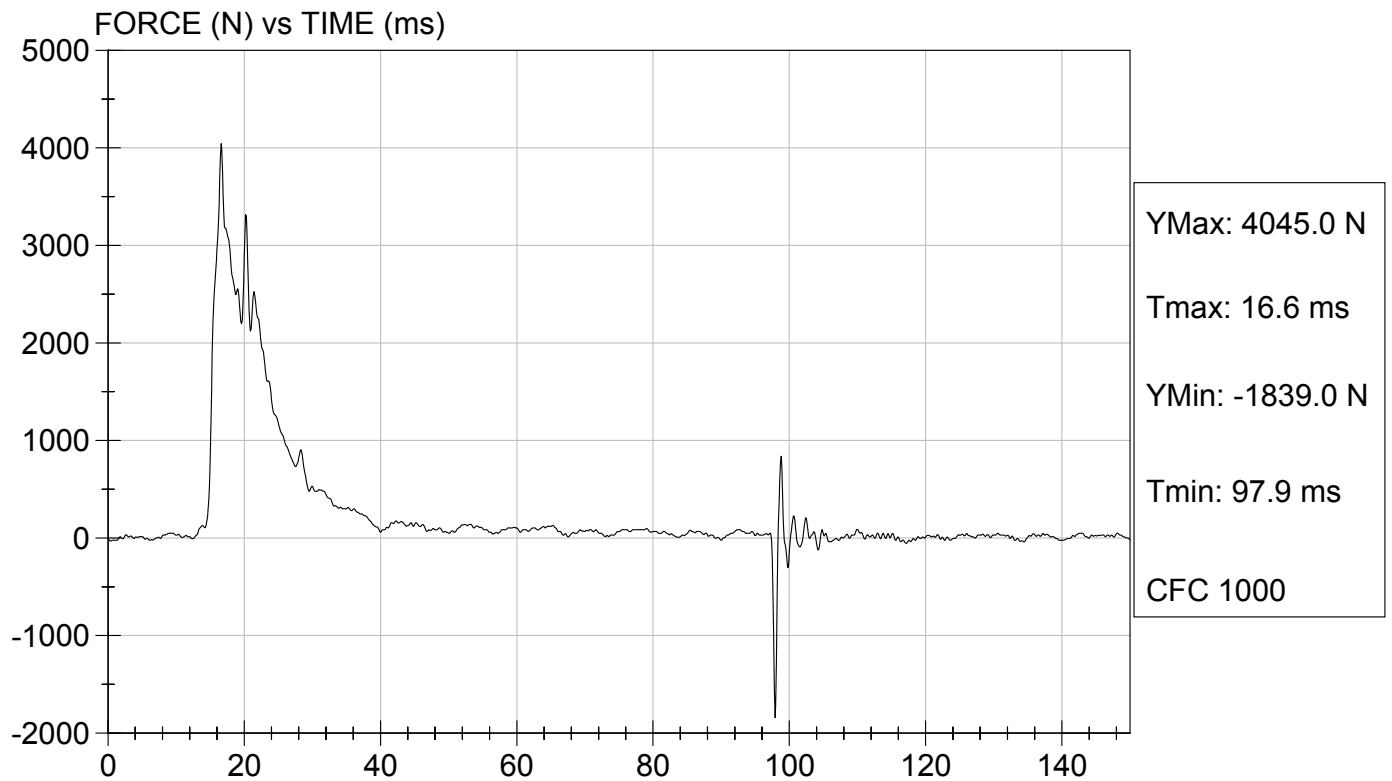
Tmin: 111.8 ms

CFC 1000



Test Desc: Dampener Impact
Component ID: D042028

Test Date: 08/26/2004
Speed: 20 ft/sec, 6.10 m/sec



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

ATD Serial No: 904

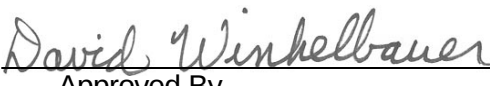
Test I.D: D042249

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	20.8	Pass
Laboratory Relative Humidity		%	10 to 70	42	Pass
Impact Velocity		m/s	6.89 to 7.13	7.06	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.26	Pass
	20 msec	m/s	4.12 to 5.10	4.48	Pass
	30 msec	m/s	5.73 to 7.01	6.19	Pass
	40 to 70 msec	m/s	6.27 to 7.64	7.19	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	72	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	62	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	82	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	54	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	9	Pass


 Laboratory Technician

09/16/2004

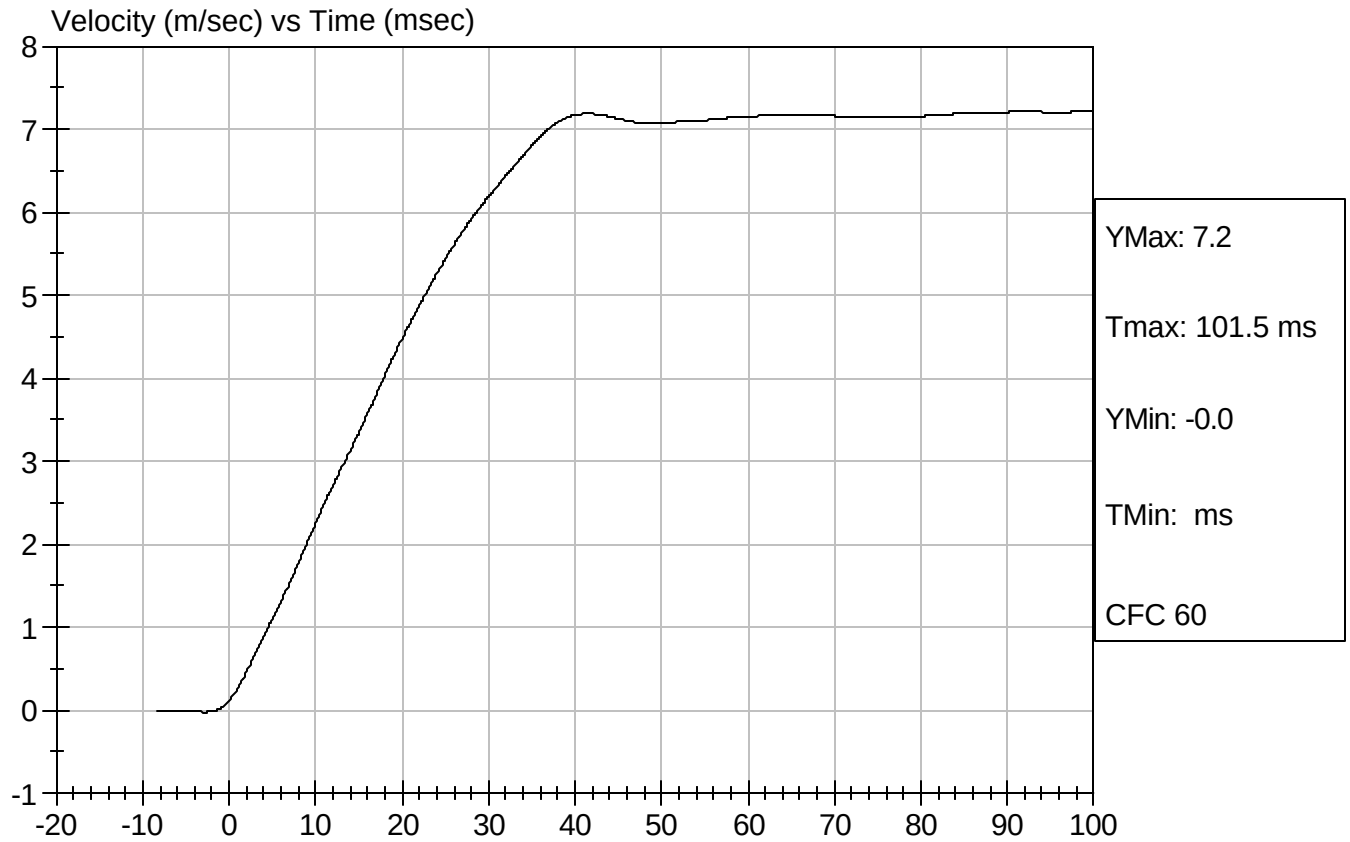
Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D042249

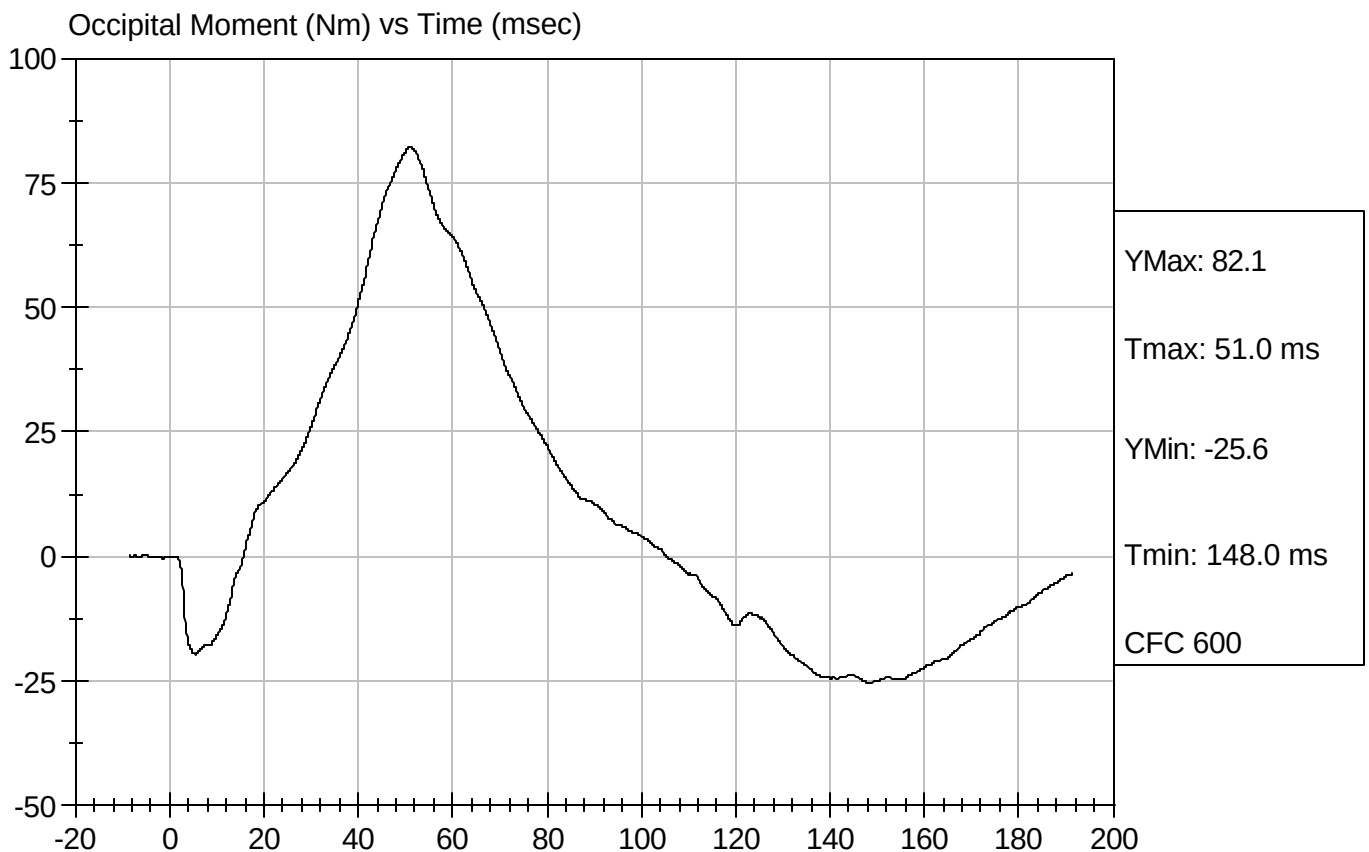
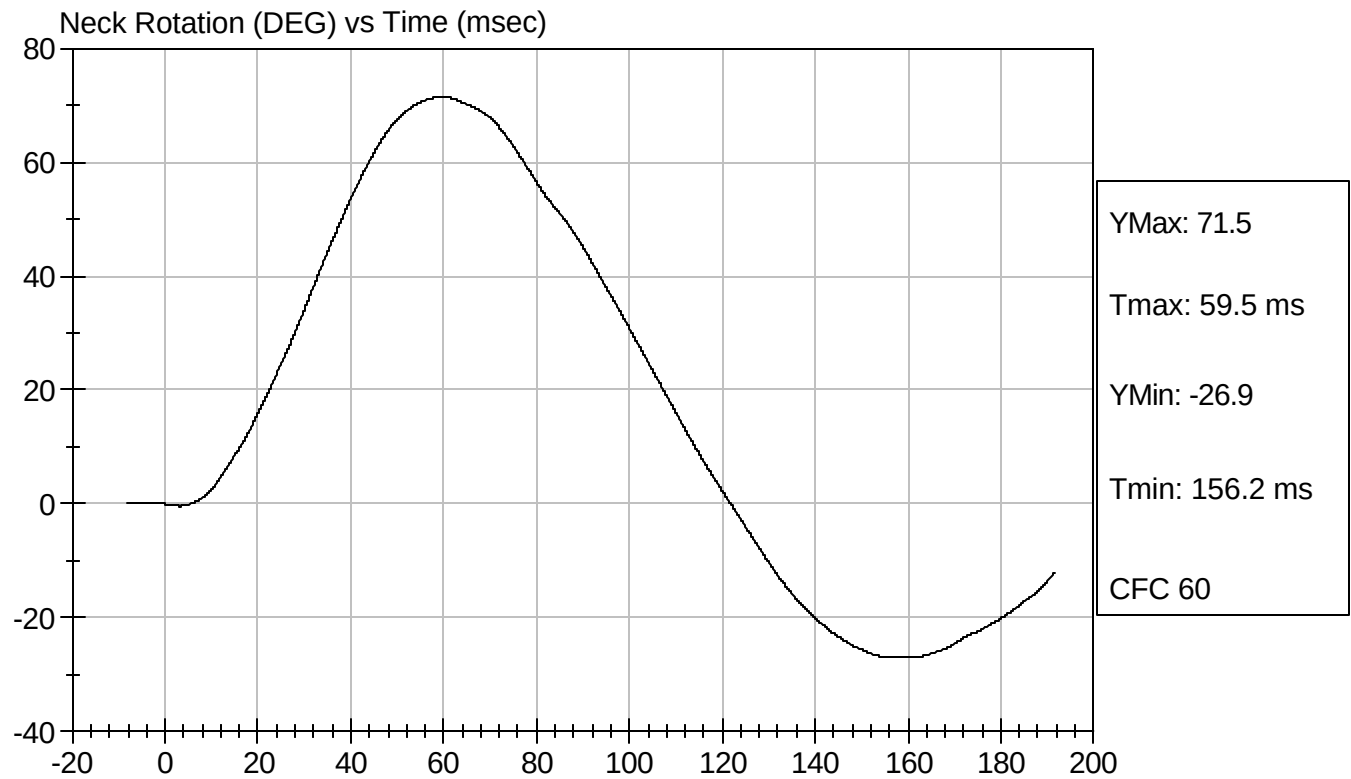
Test Date: 09/16/2004
Speed: 23.15 ft/sec, 7.06 m/sec





Test Desc: Neck Bending
Component ID: D042249

Test Date: 09/16/2004
Speed: 23.15 ft/sec, 7.06 m/sec



Calibration Test Results Summary

Dummy Serial Number: 904

Post-Test Calibration

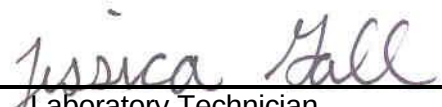
Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all pendulum test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

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

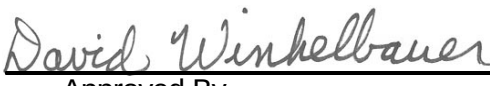
ATD Serial No: 904

Test I.D: D042261

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	41	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	9	Pass
Overall Test Results				Pass


Laboratory Technician

09/21/2004
Test Date


Approved By



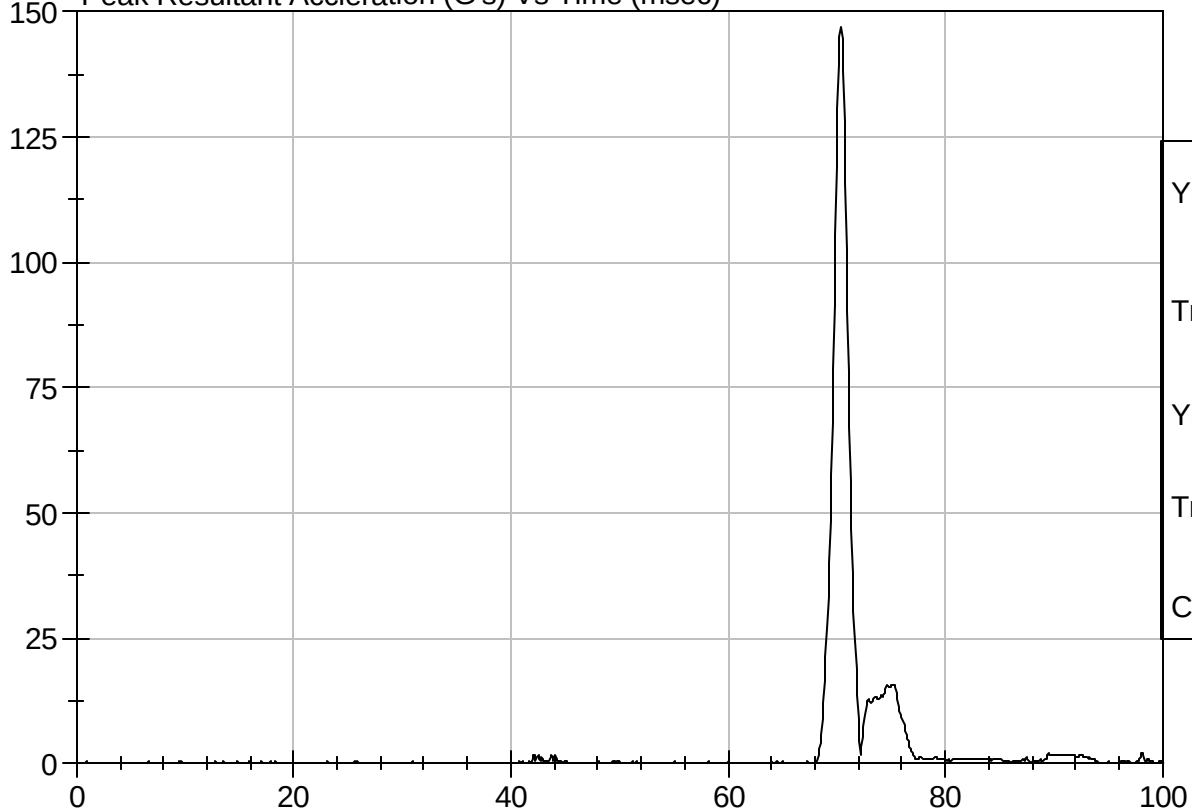
Test Description: Head Drop

Test Date: 09/21/2004

Component: D042261

Speed: 0 ft/s, 0.00 m/s

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



YMax: 146.9 G

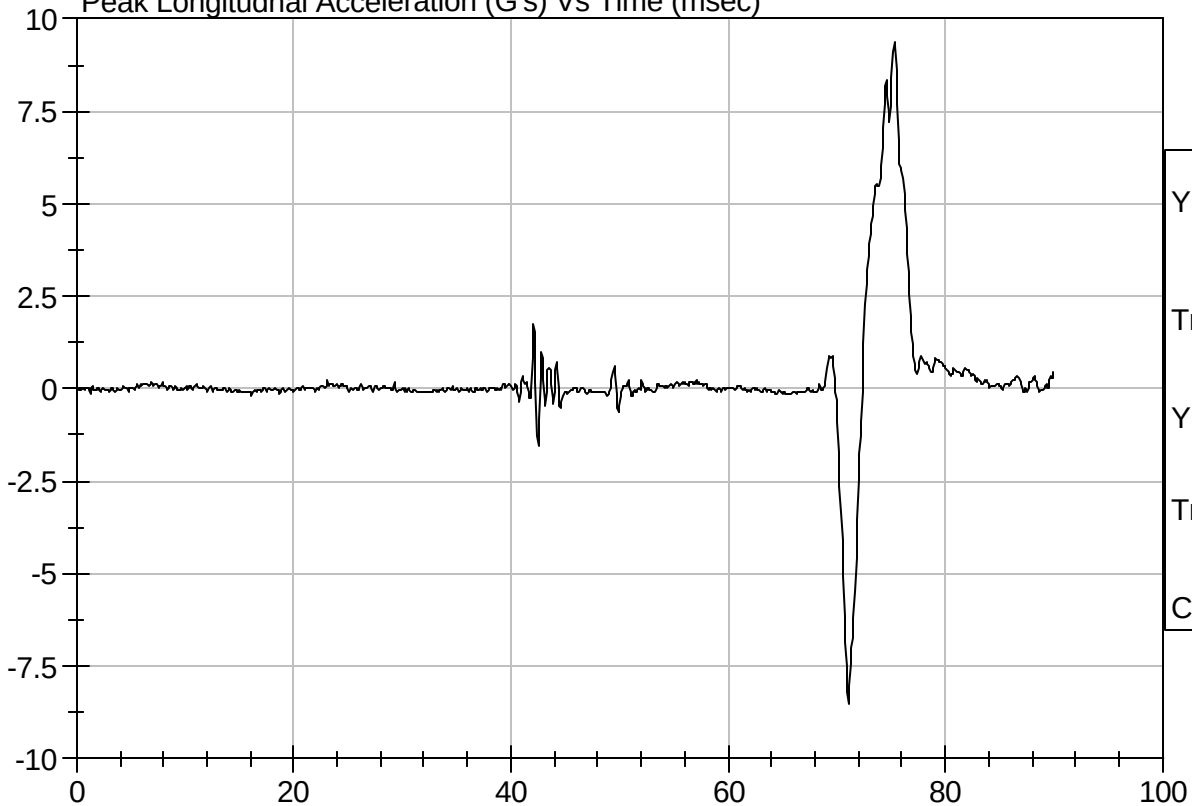
Tmax: 70.4 ms

YMin: 0.0 G

Tmin: 1.2 ms

CFC 1000

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



YMax: 9.4 G

Tmax: 75.3 ms

YMin: -8.5 G

Tmin: 71.1 ms

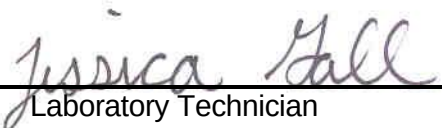
CFC 1000

SID Calibration Data Sheet
Side Impact Dummy
Thorax Impact Test

ATD Serial No: 904

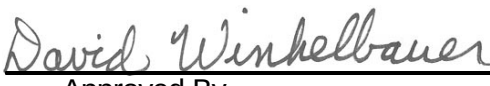
Test I.D: D042262

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Probe Velocity	m/s	4.27 - 4.33	4.27	Pass
Upper Rib	G's	37 - 46	41	Pass
Lower Rib	G's	37 - 46	41	Pass
Lower Spine	G's	15 - 22	20	Pass
Overall Test Results				Pass


Laboratory Technician

09/21/2004

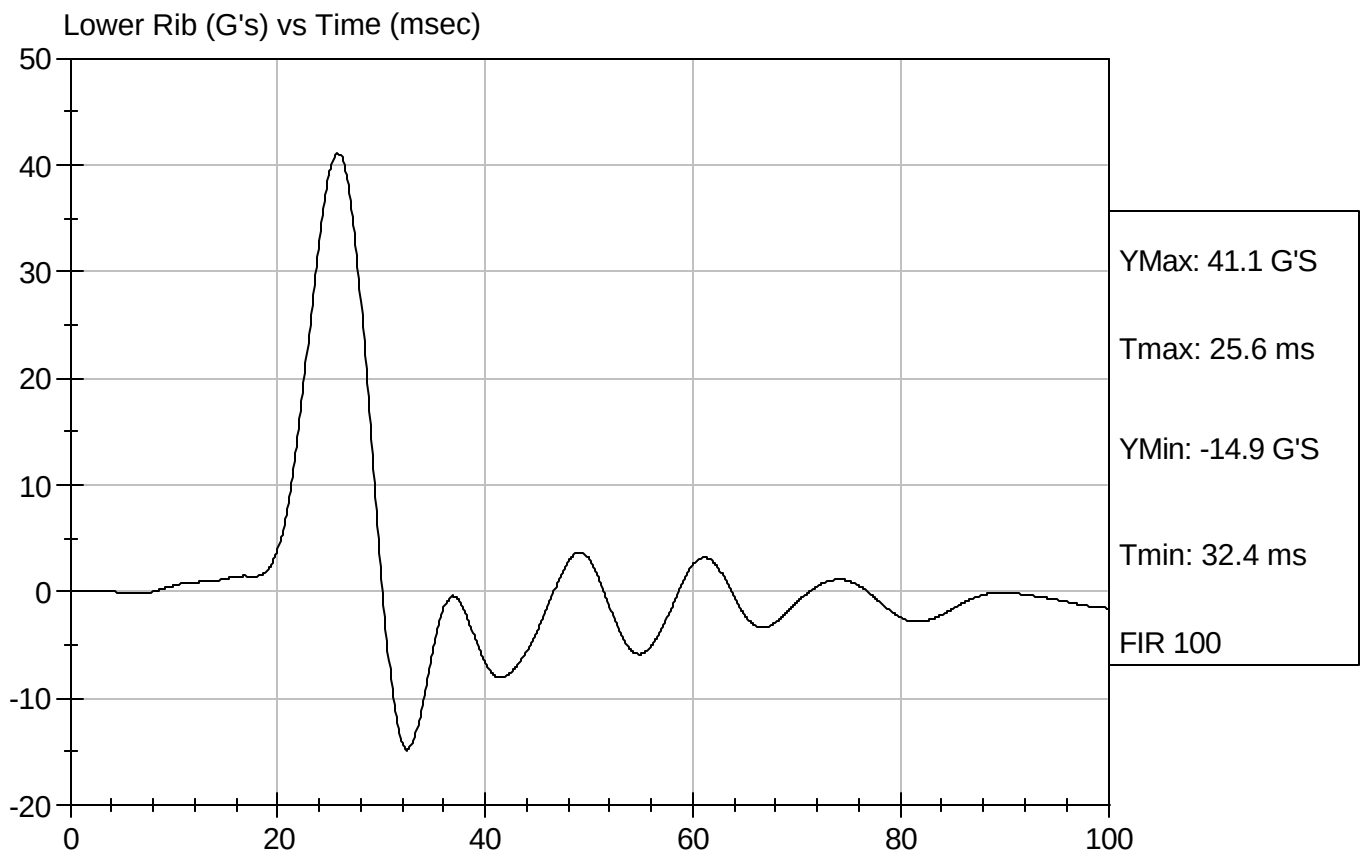
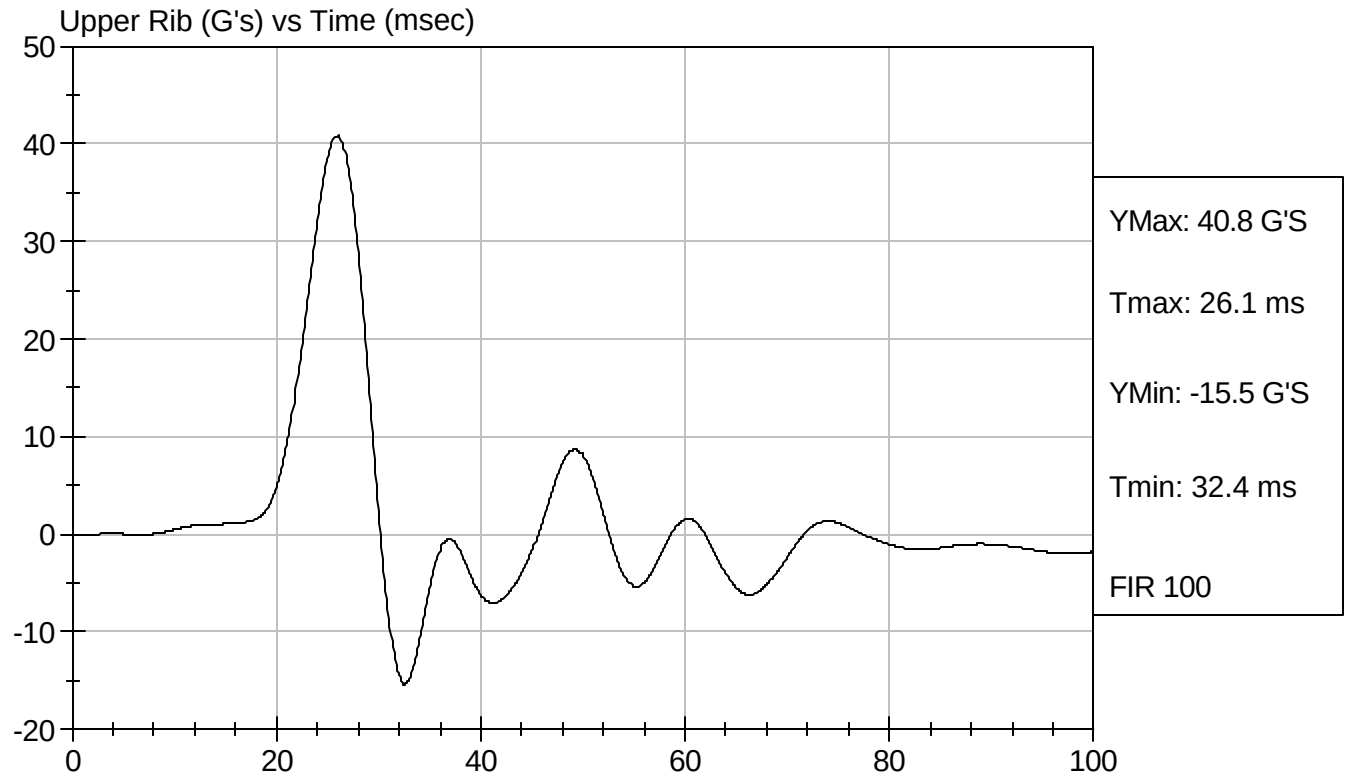
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D042262

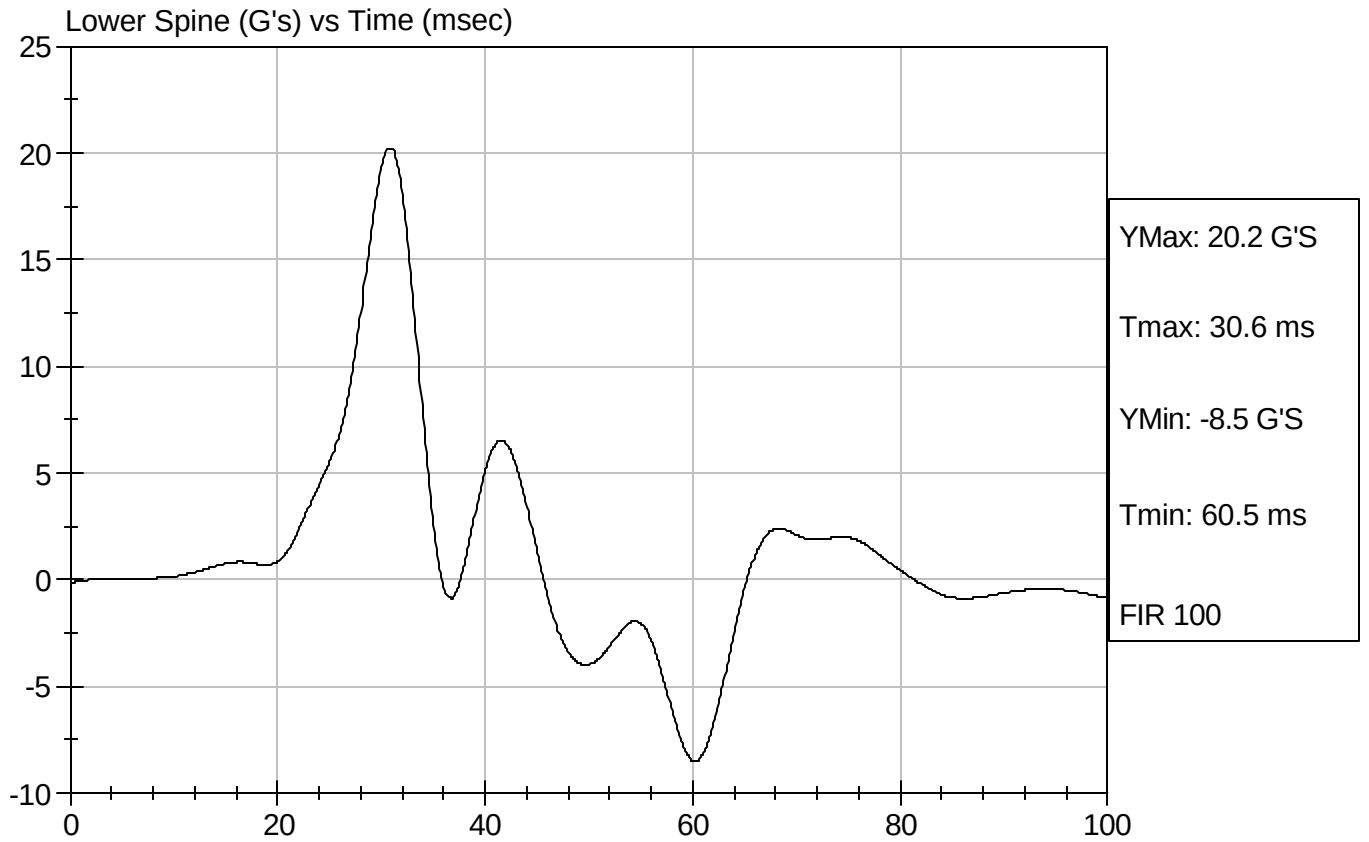
Test Date: 09/21/2004
Speed: 14.02 ft/sec, 4.27 m/sec





Test Desc: Thorax Impact
Component ID: D042262

Test Date: 09/21/2004
Speed: 14.02 ft/sec, 4.27 m/sec

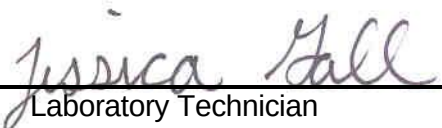


SID Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Test

ATD Serial No: 904

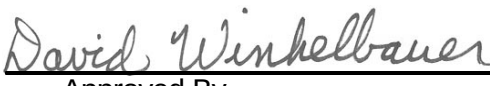
Test I.D: D042263

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	42	Pass
Probe Velocity	m/s	4.27 - 4.33	4.29	Pass
Pelvis Acceleration	G's	40 - 60	52	Pass
			Overall Test Results	Pass


Laboratory Technician

09/21/2004

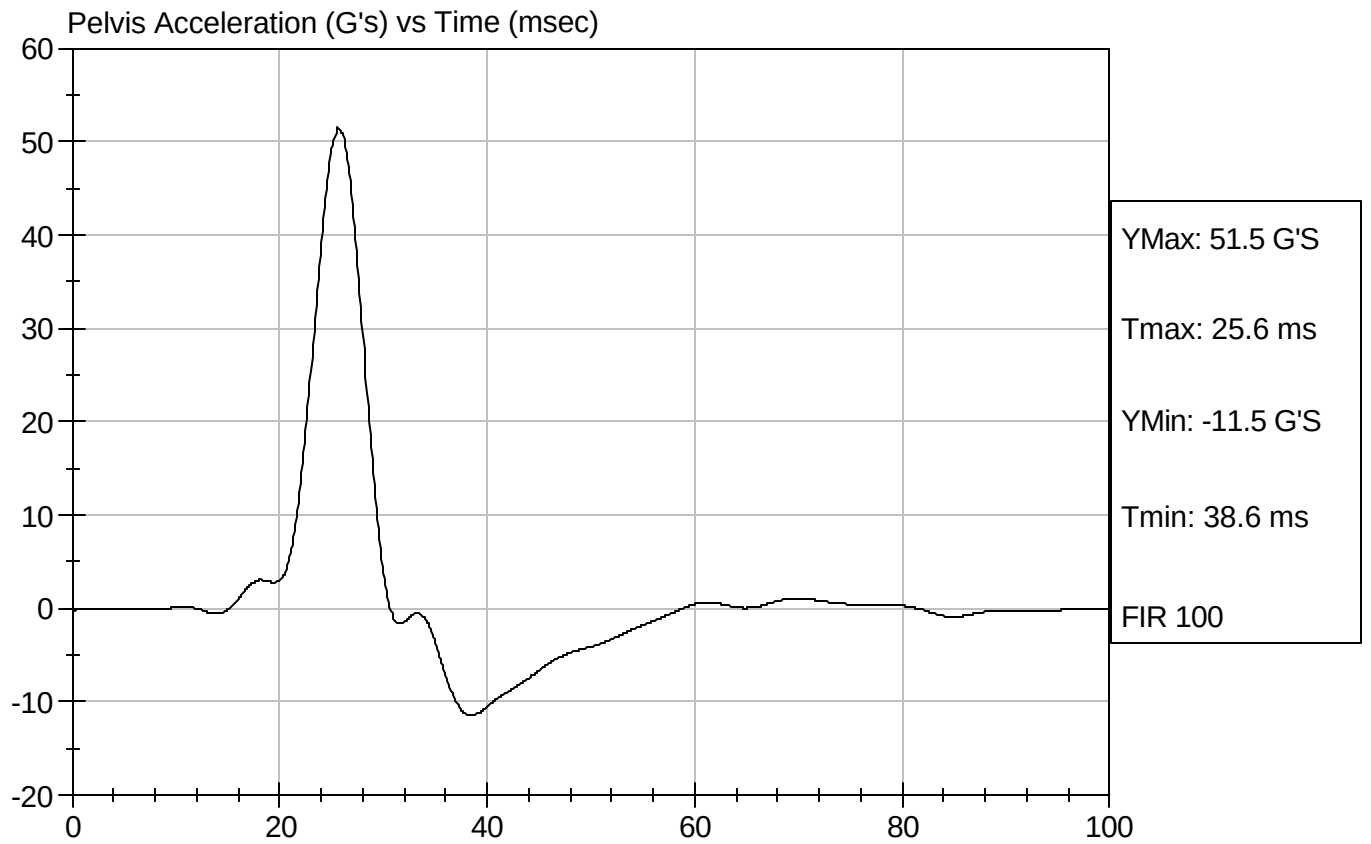
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D042263

Test Date: 09/21/2004
Speed: 14.07 ft/sec, 4.29 m/sec

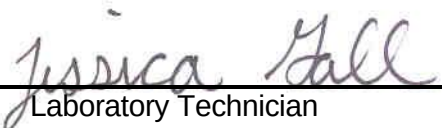


SID Calibration Data Sheet
Side Impact Dummy
Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 904

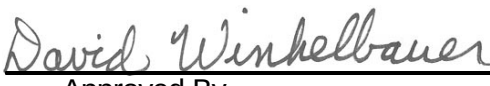
Test I.D: D042264

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Force At 12.7 mm	N	104 -162	140	Pass
Force At 19 mm	N	163 - 222	198	Pass
Force At 25.4 mm	N	222 - 280	270	Pass
Force At 33 mm	N	325 - 391	378	Pass
Overall Test Results				Pass


Laboratory Technician

09/21/2004

Test Date


Approved By

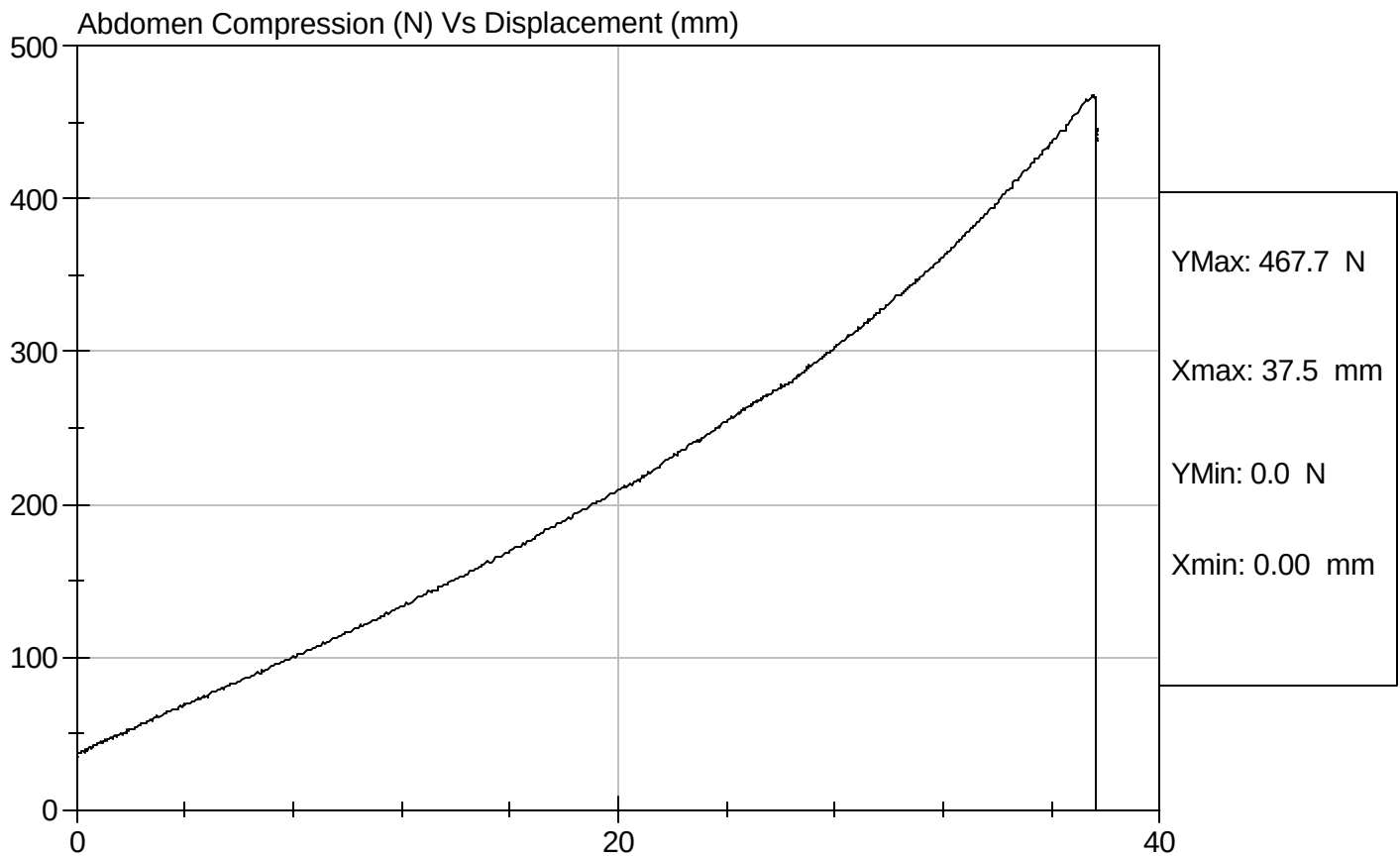


Test Description: Abdomen Compression

Test Date: 09/21/2004

Component: D042264

Speed: 0 ft/sec, 0 m/sec

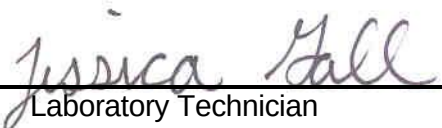


SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 904

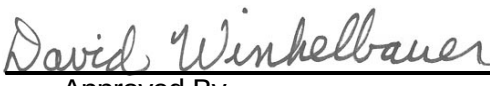
Test I.D: D042265

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Force At 0 deg	N	0 - 26.7	0.0	Pass
Force At 20 deg	N	97.9 - 151.2	135.4	Pass
Force At 30 deg	N	151.2 - 204.6	196.4	Pass
Force At 40 deg	N	204.6 - 258.0	248.1	Pass
Return Angle	Deg	12 Maximum	7	Pass
Overall Test Results			Pass	


Laboratory Technician

09/21/2004

Test Date


Approved By

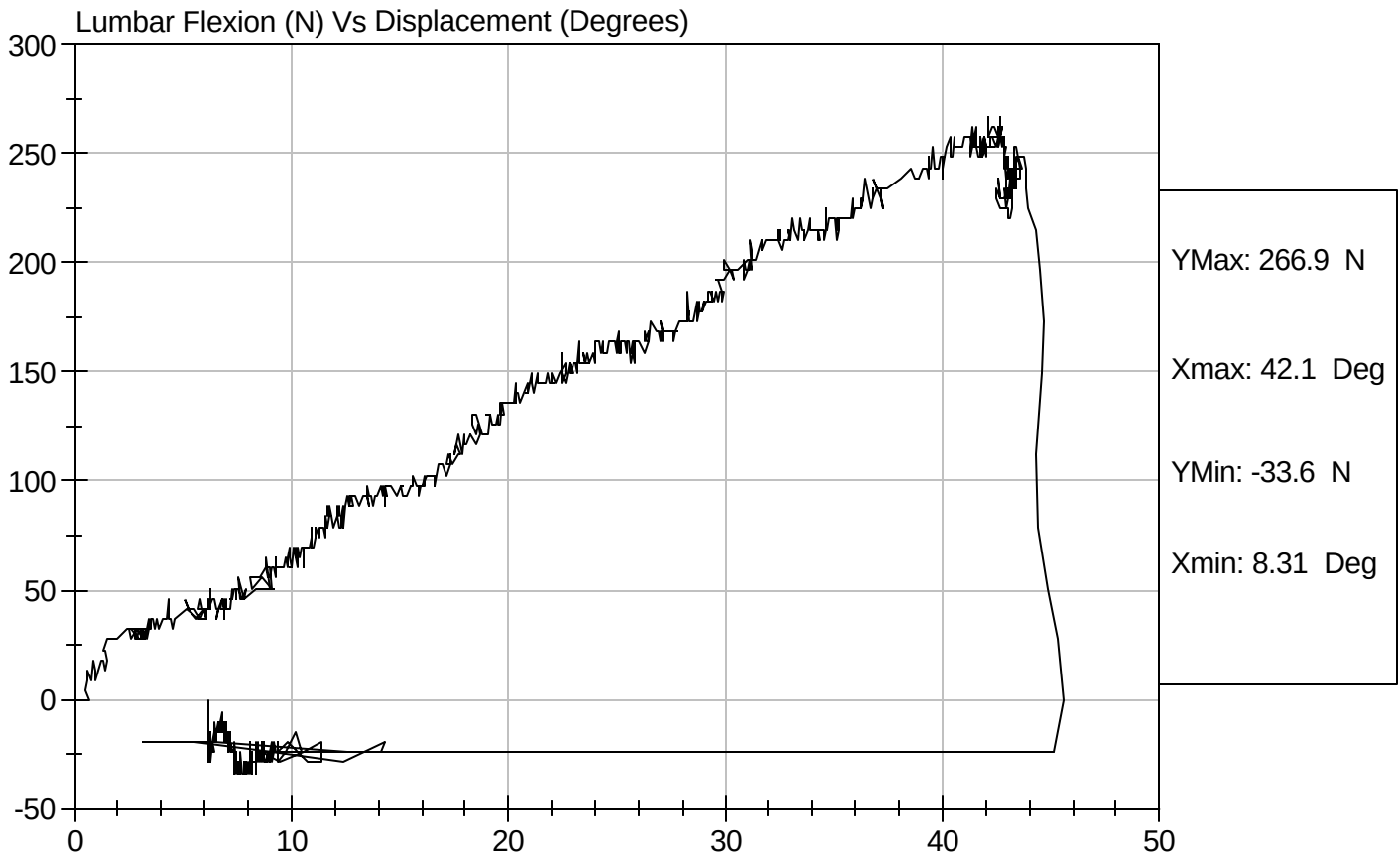


Test Description: Lumbar Flexion

Test Date: 09/21/2004

Component: D042265

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: D042269

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.0	Pass
Laboratory Relative Humidity		%	10 to 70	40	Pass
Impact Velocity		m/s	6.89 to 7.13	7.07	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.15	Pass
	20 msec	m/s	4.12 to 5.10	4.21	Pass
	30 msec	m/s	5.73 to 7.01	5.92	Pass
	40 to 70 msec	m/s	6.27 to 7.64	7.10	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	77	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	58	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	10	Pass


 Laboratory Technician

09/21/2004

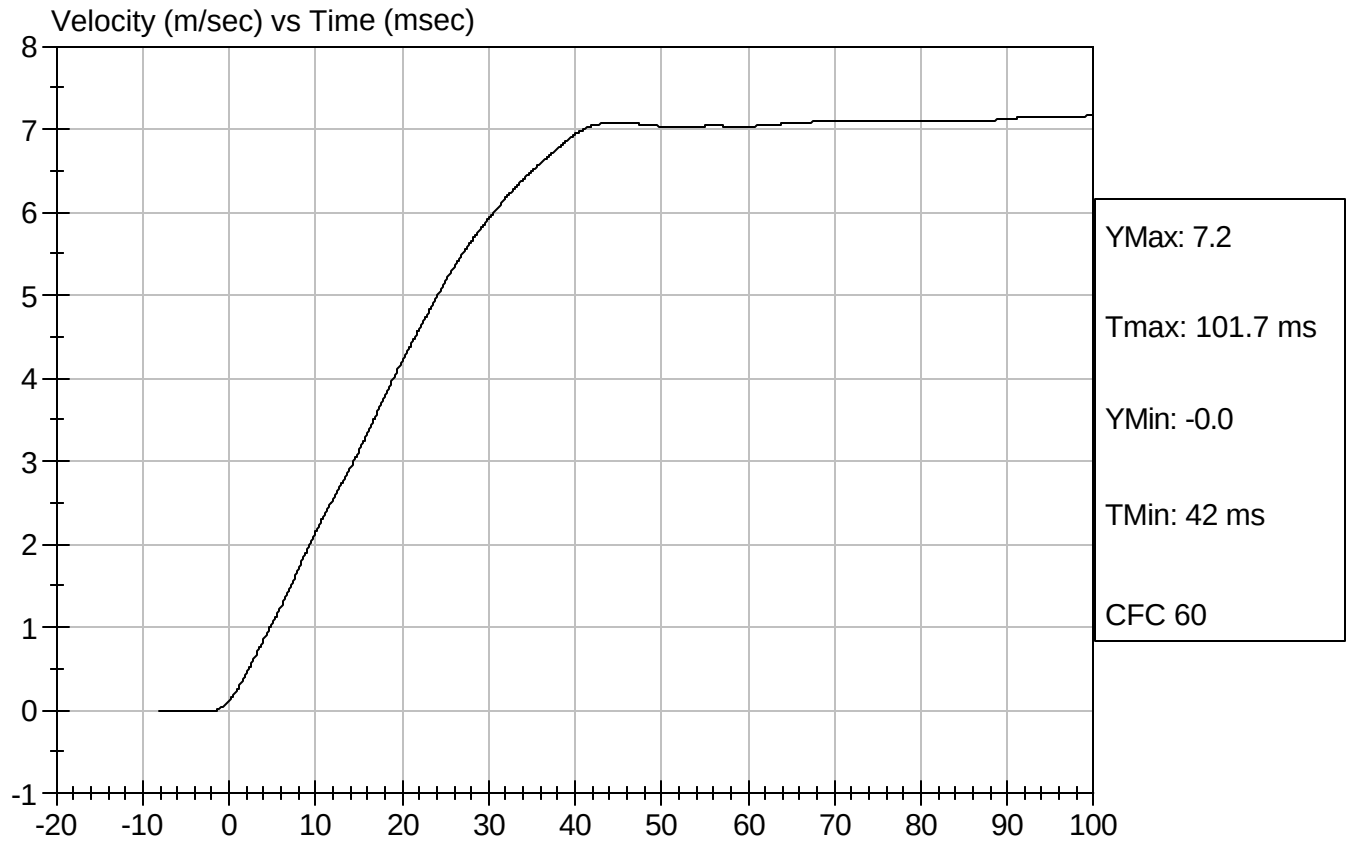
Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D042269

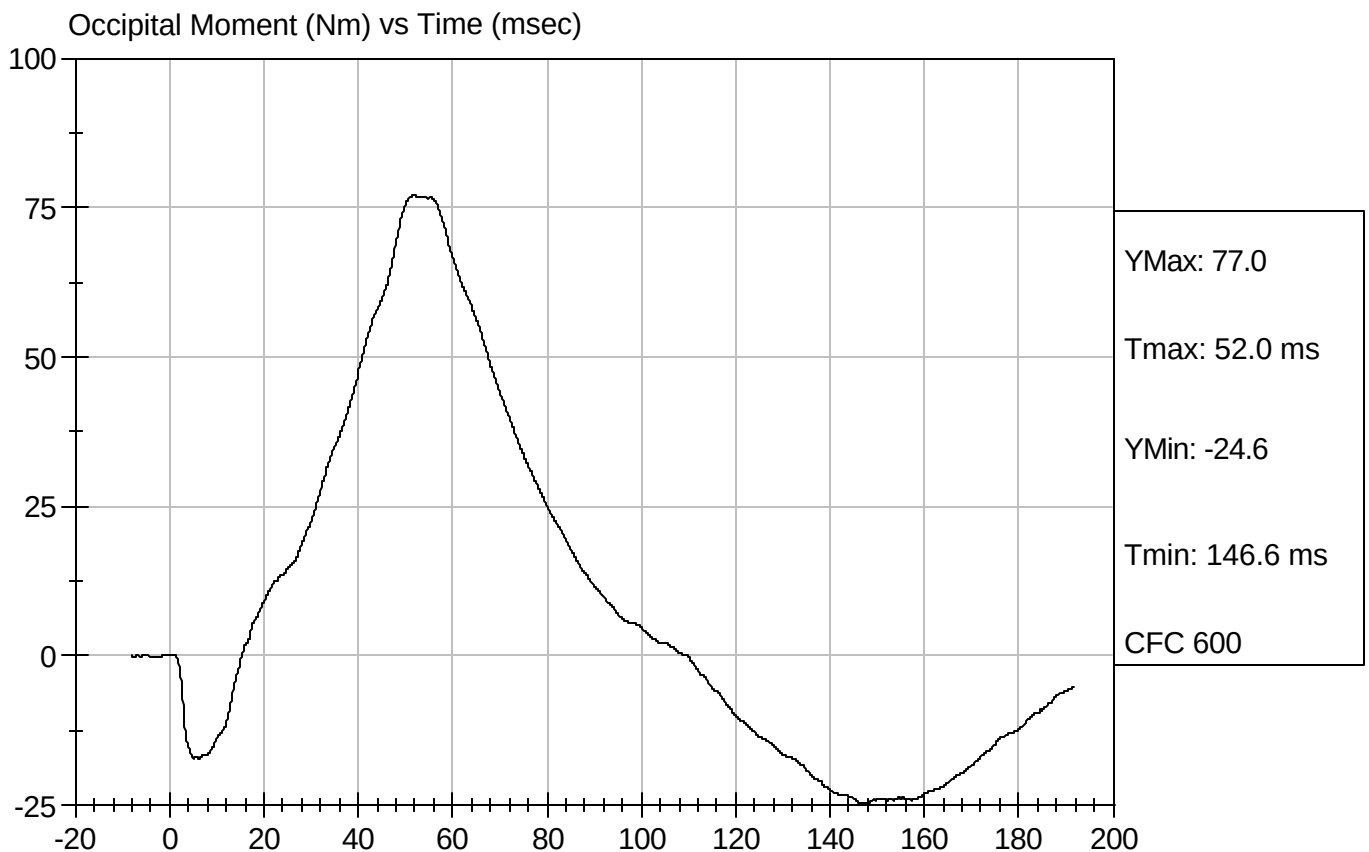
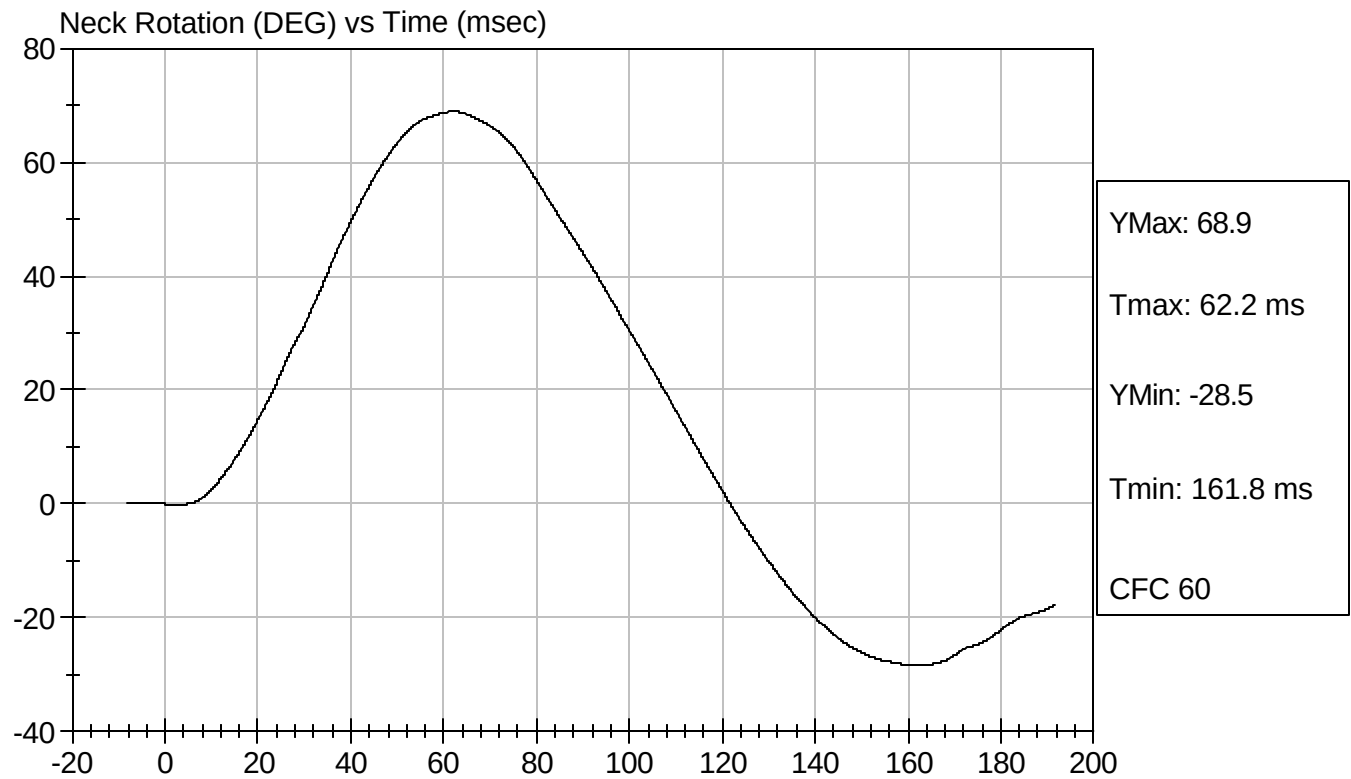
Test Date: 09/21/2004
Speed: 23.18 ft/sec, 7.07 m/sec





Test Desc: Neck Bending
Component ID: D042269

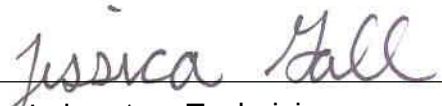
Test Date: 09/21/2004
Speed: 23.18 ft/sec, 7.07 m/sec



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

09/21/2004

Test Date

CERTIFICATION DATA

Dummy Serial Number: 271

Calibration Test Results Summary

Dummy Serial Number: 271

Pre-Test Calibration

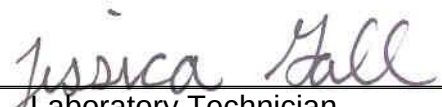
External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all pendulum test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis 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.

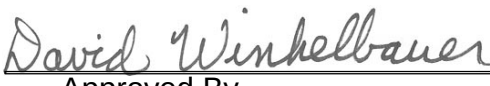
SID Calibration Data Sheet
Side Impact Dummy
External Measurements

ATD Serial No: 271

Test I.D: D04201

Tested Parameter	Units	Specification	Result	Pass/Fail
SH - Seated Height	mm	889 - 909	905	Pass
RH - Rib Height	mm	501 - 521	512	Pass
HP - Hip Pivot Height	mm	99 ref.	99	Pass
RD - Rib from Back Line	mm	229 - 241	233	Pass
KV - Knee Pivot to Back Line	mm	511 - 526	525	Pass
SW - Knee Pivot to Floor	mm	490 - 505	499	Pass
HW - Hip Width	mm	356 - 391	362	Pass
Overall Test Results			Pass	


Laboratory Technician


Approved By

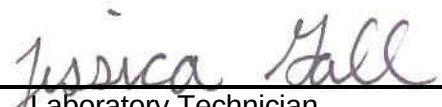
09/15/2004
Test Date

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

ATD Serial No: 271

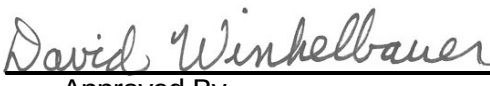
Test I.D: D042231

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	50	Pass
Peak Resultant Acceleration	G's	120 to 150	137	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-11	Pass
Overall Test Results				Pass


Laboratory Technician

09/15/2004

Test Date


Approved By



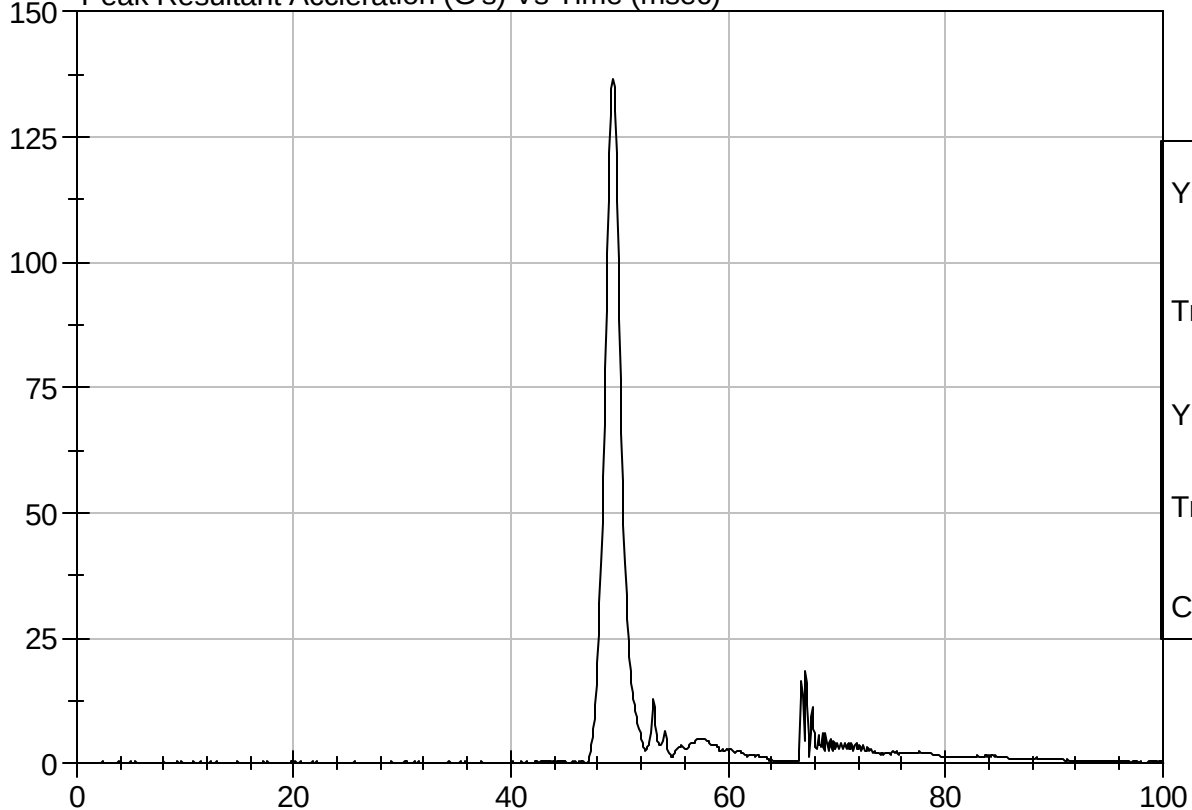
Test Description: Head Drop

Test Date: 09/15/2004

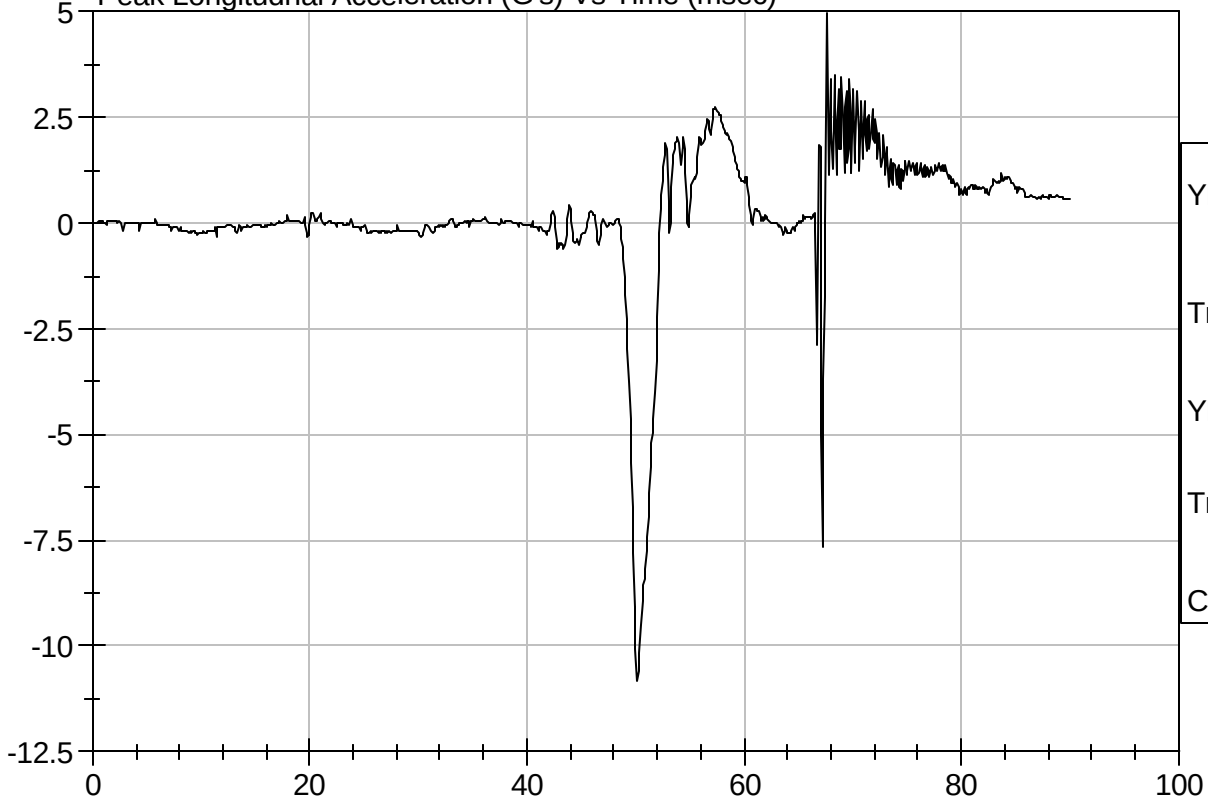
Component: D042231

Speed: 0 ft/s, 0.00 m/s

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



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

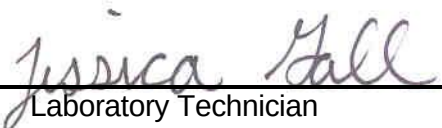


SID Calibration Data Sheet
Side Impact Dummy
Thorax Impact Test

ATD Serial No: 271

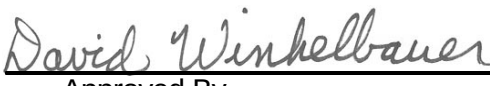
Test I.D: D042232

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	49	Pass
Probe Velocity	m/s	4.27 - 4.33	4.29	Pass
Upper Rib	G's	37 - 46	44	Pass
Lower Rib	G's	37 - 46	44	Pass
Lower Spine	G's	15 - 22	21	Pass
Overall Test Results				Pass


Laboratory Technician

09/15/2004

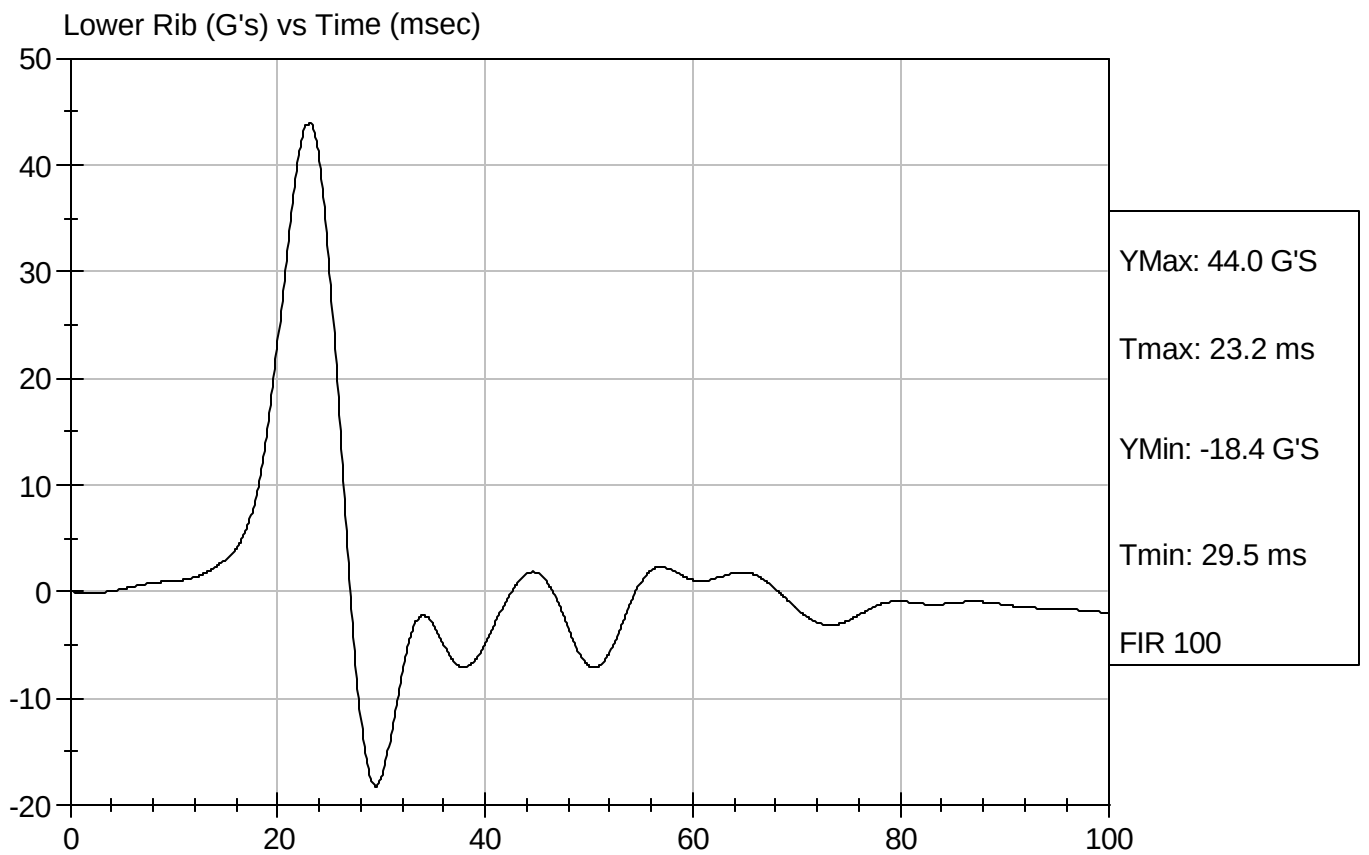
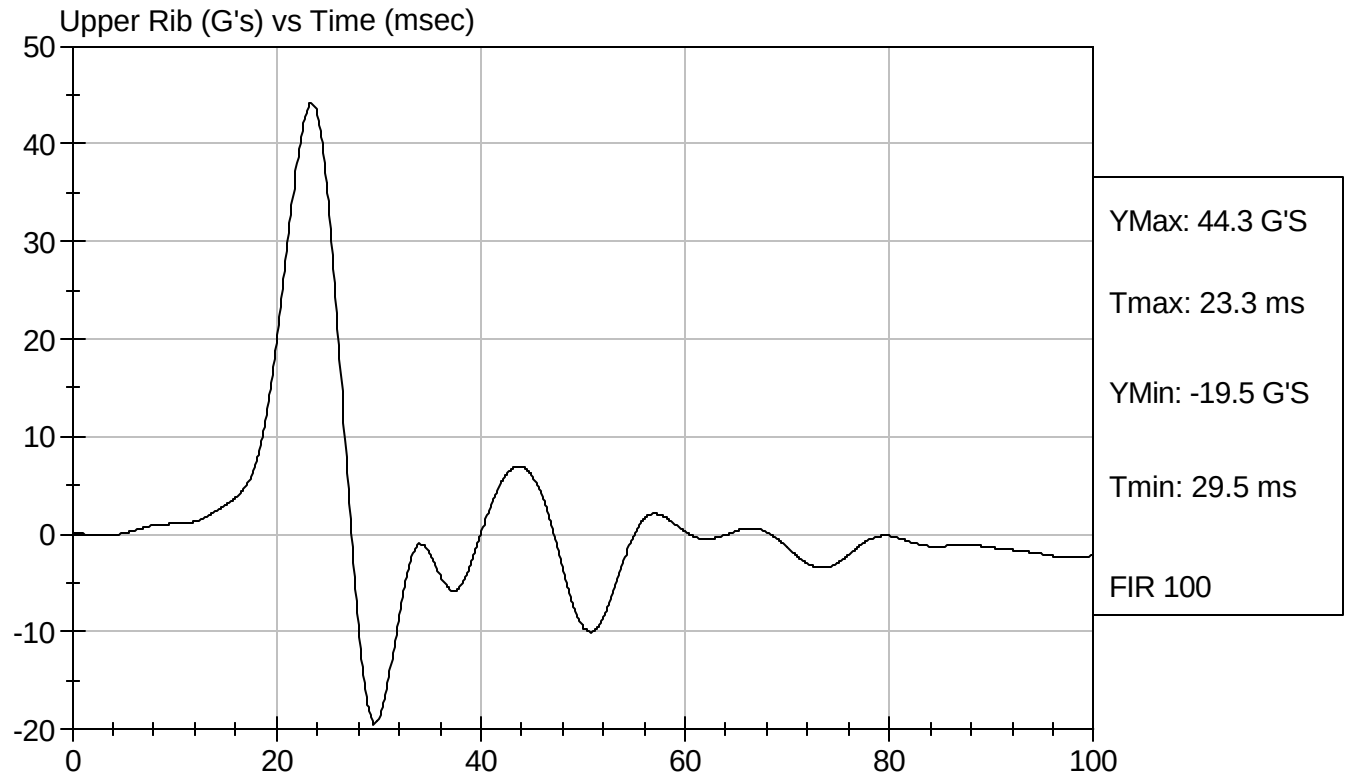
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D042232

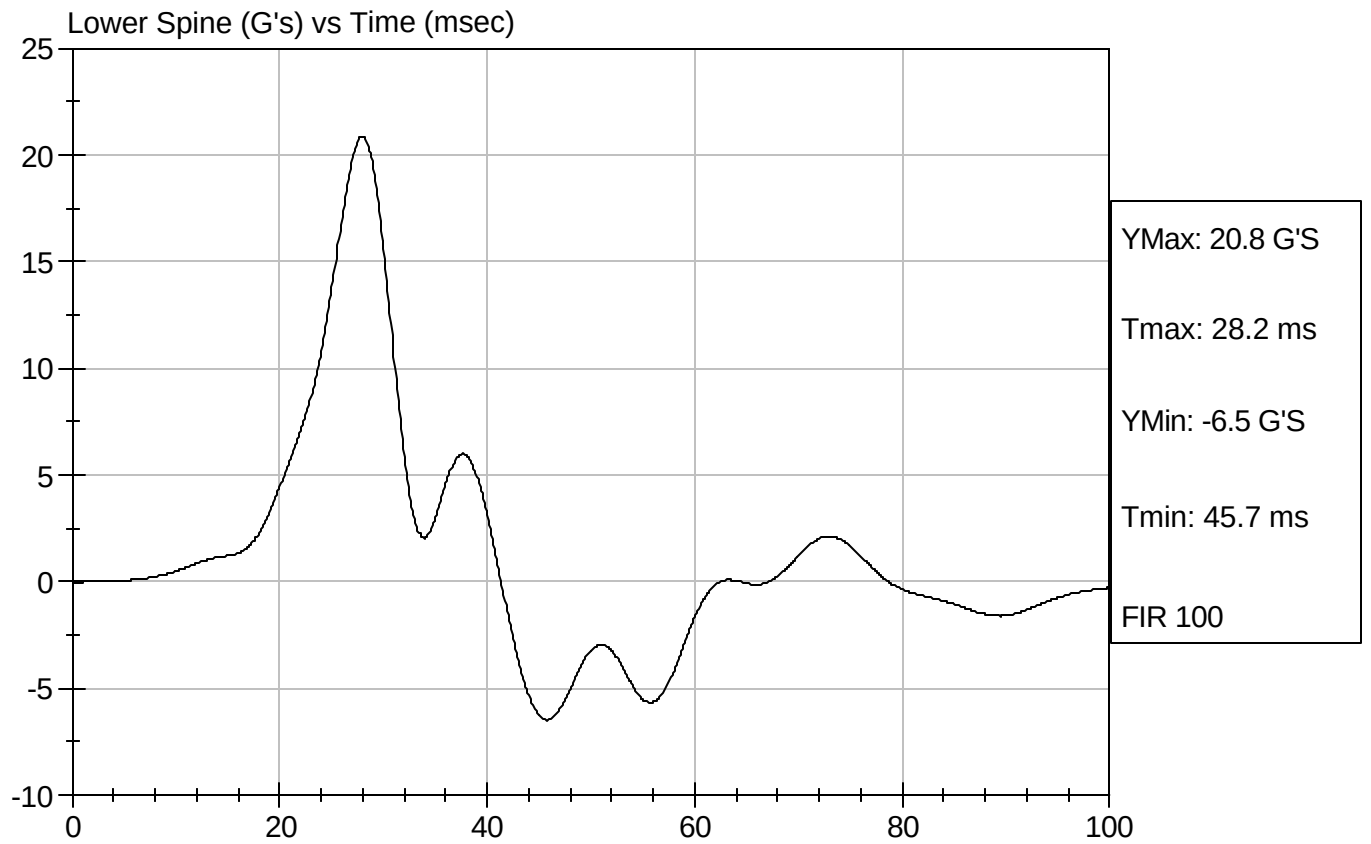
Test Date: 09/15/2004
Speed: 14.09 ft/sec, 4.29 m/sec





Test Desc: Thorax Impact
Component ID: D042232

Test Date: 09/15/2004
Speed: 14.09 ft/sec, 4.29 m/sec

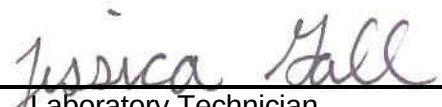


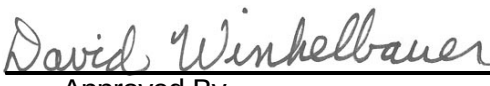
SID Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Test

ATD Serial No: 271

Test I.D: D042233

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	49	Pass
Probe Velocity	m/s	4.27 - 4.33	4.29	Pass
Pelvis Acceleration	G's	40 - 60	48	Pass
			Overall Test Results	Pass


Laboratory Technician

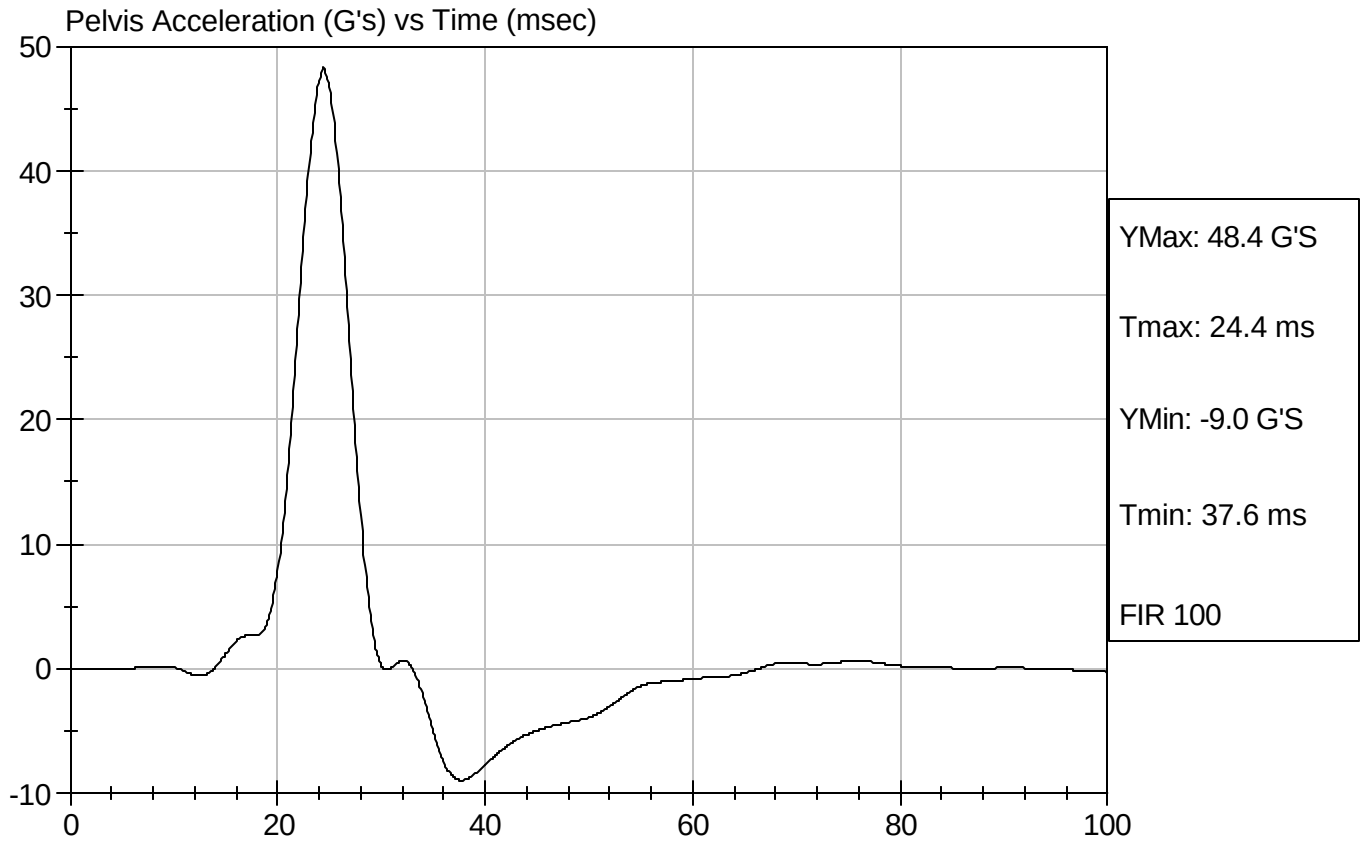

Approved By

09/15/2004
Test Date



Test Desc: Pelvis Impact
Component ID: D042233

Test Date: 09/15/2004
Speed: 14.06 ft/sec, 4.29 m/sec

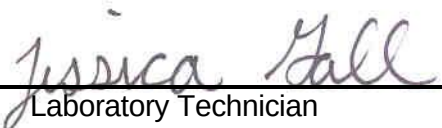


SID Calibration Data Sheet
Side Impact Dummy
Abdominal Compression Calibration (Pre-Load = 10 lbs)

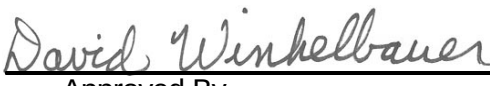
ATD Serial No: 271

Test I.D: D042234

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	51	Pass
Force At 12.7 mm	N	104 -162	144	Pass
Force At 19 mm	N	163 - 222	200	Pass
Force At 25.4 mm	N	222 - 280	261	Pass
Force At 33 mm	N	325 - 391	377	Pass
			Overall Test Results	Pass


Laboratory Technician

09/15/2004
Test Date


Approved By

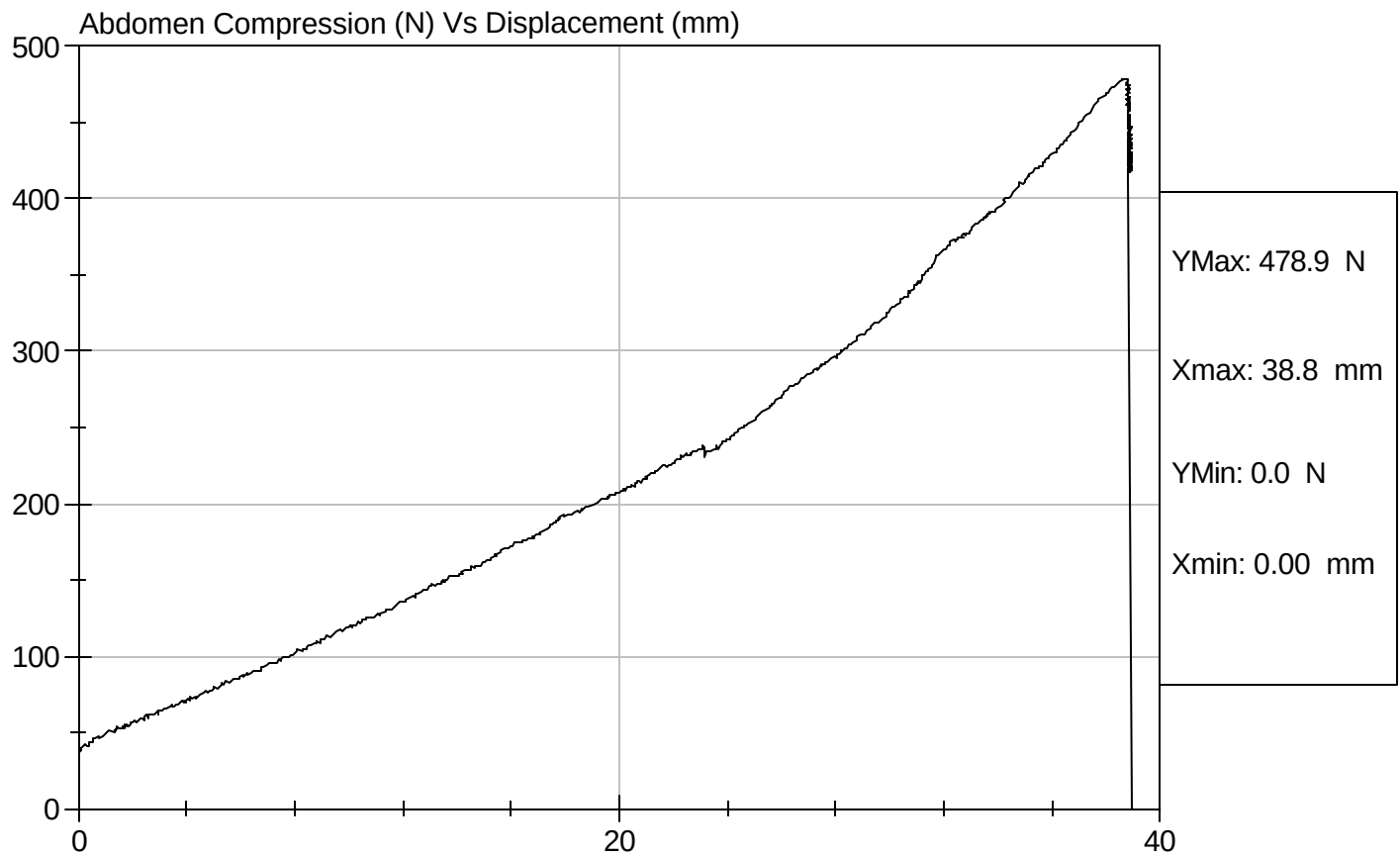


Test Description: Abdomen Compression

Test Date: 09/15/2004

Component: D042234

Speed: 0 ft/sec, 0 m/sec

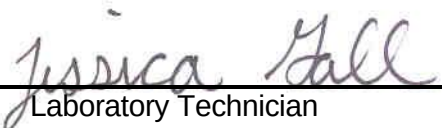


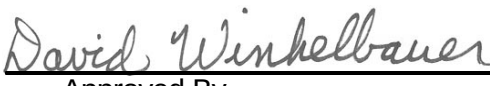
SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 271

Test I.D: D042235

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Force At 0 deg	N	0 - 26.7	0.0	Pass
Force At 20 deg	N	97.9 - 151.2	103.6	Pass
Force At 30 deg	N	151.2 - 204.6	160.0	Pass
Force At 40 deg	N	204.6 - 258.0	230.4	Pass
Return Angle	Deg	12 Maximum	6	Pass
			Overall Test Results	Pass


Laboratory Technician


Approved By

09/16/2004

Test Date

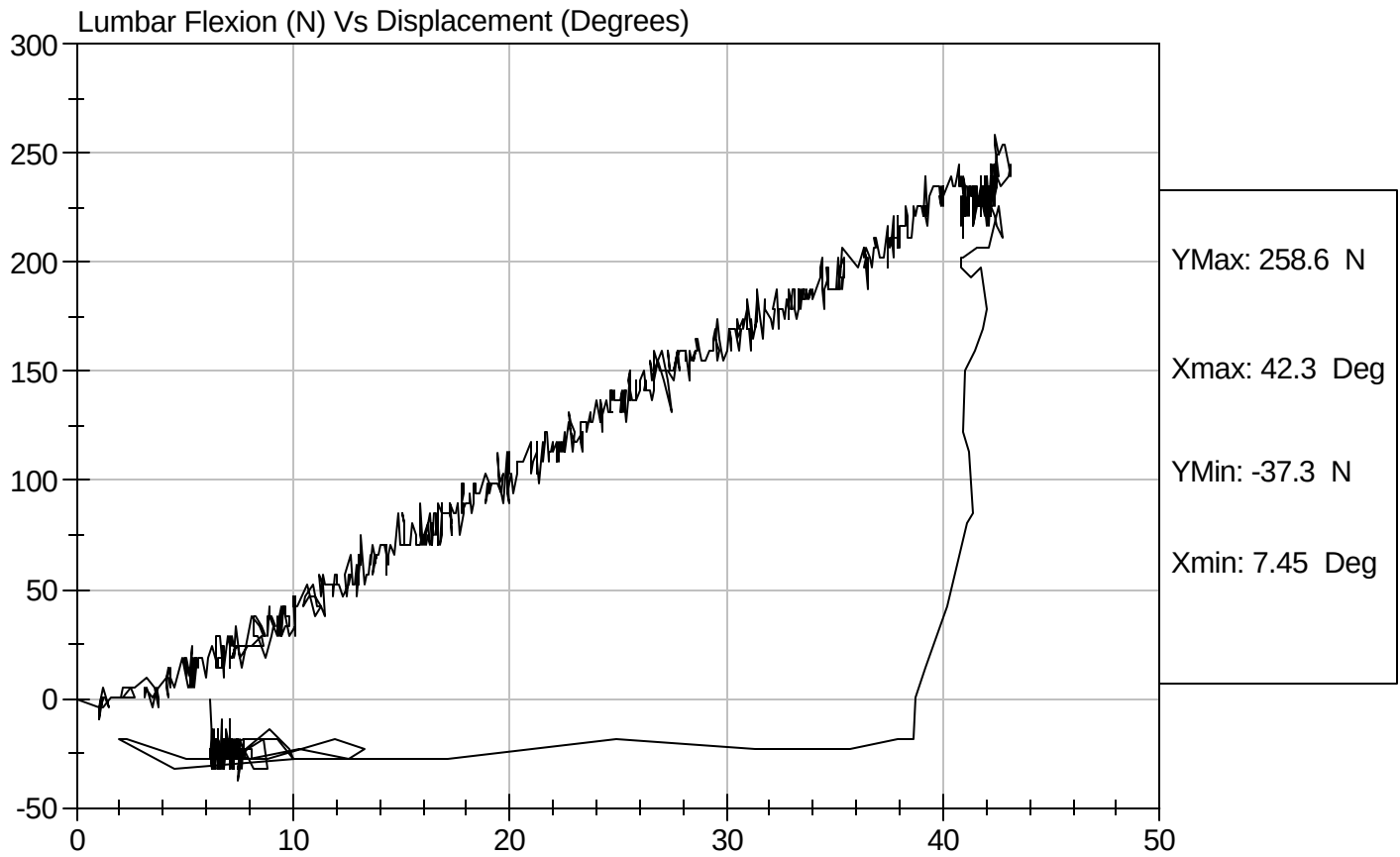


Test Description: Lumbar Flexion

Test Date: 09/16/2004

Component: D042235

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Thoracic Shock Absorber Calibration

ATD Serial No: 271

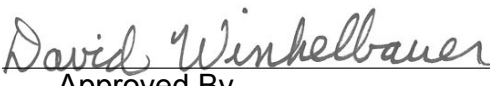
Test I.D: D042018

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	54	Pass
Velocity 3.05 m/s	Force	N	836 - 1125	897	Pass
	Displacement	mm	30 - 35	33	Pass
Velocity 4.27 m/s	Force	N	1730 - 2099	1,750	Pass
	Displacement	mm	32 - 37	36	Pass
Velocity 6.1 m/s	Force	N	3741 - 4448	3,798	Pass
	Displacement	mm	33 - 40	38	Pass
Overall Test Results					Pass


 Laboratory Technician

08/26/2004

Test Date

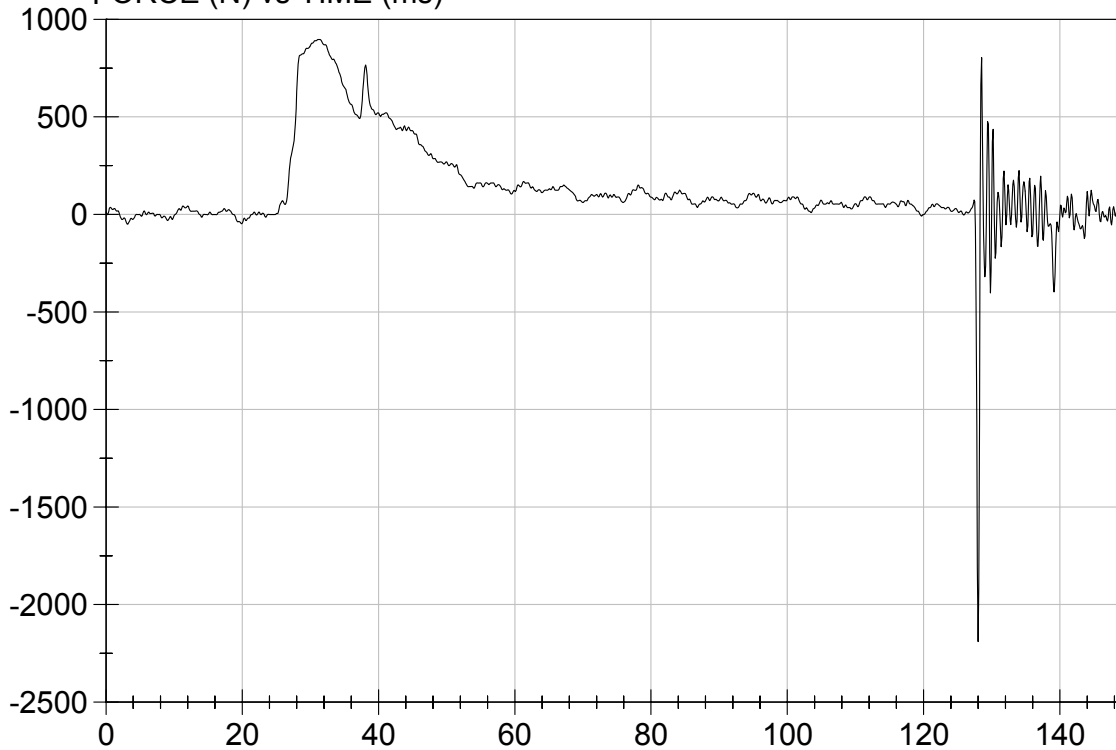

 Approved By



Test Desc: Dampener Impact
Component ID: D042016

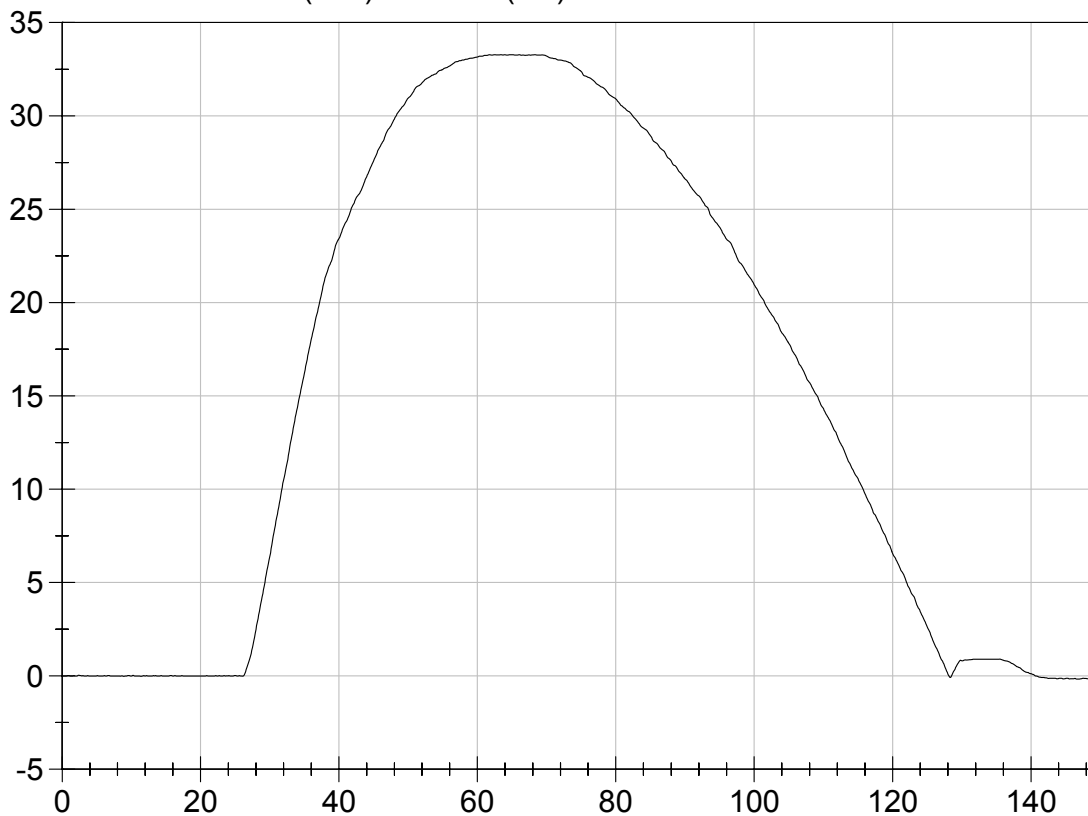
Test Date: 08/26/2004
Speed: 10 ft/sec, 3.05 m/sec

FORCE (N) vs TIME (ms)



YMax: 897.2 N
Tmax: 31.4 ms
YMin: -2189.1 N
Tmin: 128.0 ms
CFC 1000

DISPLACEMENT (mm) vs TIME (ms)



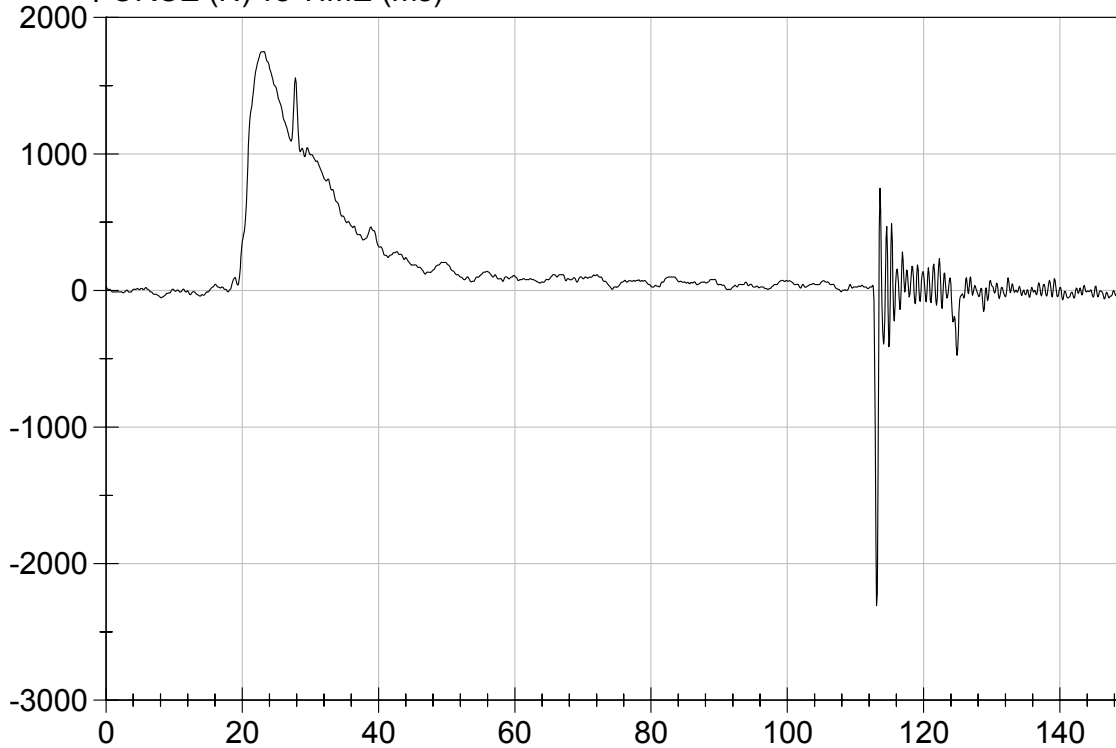
YMax: 33.3 mm
Tmax: 63.4 ms
YMin: -0.2 mm
Tmin: 171.0 ms
CFC 1000



Test Desc: Dampener Impact
Component ID: D042017

Test Date: 08/26/2004
Speed: 14.01 ft/sec, 4.27 m/sec

FORCE (N) vs TIME (ms)



YMax: 1750.2 N

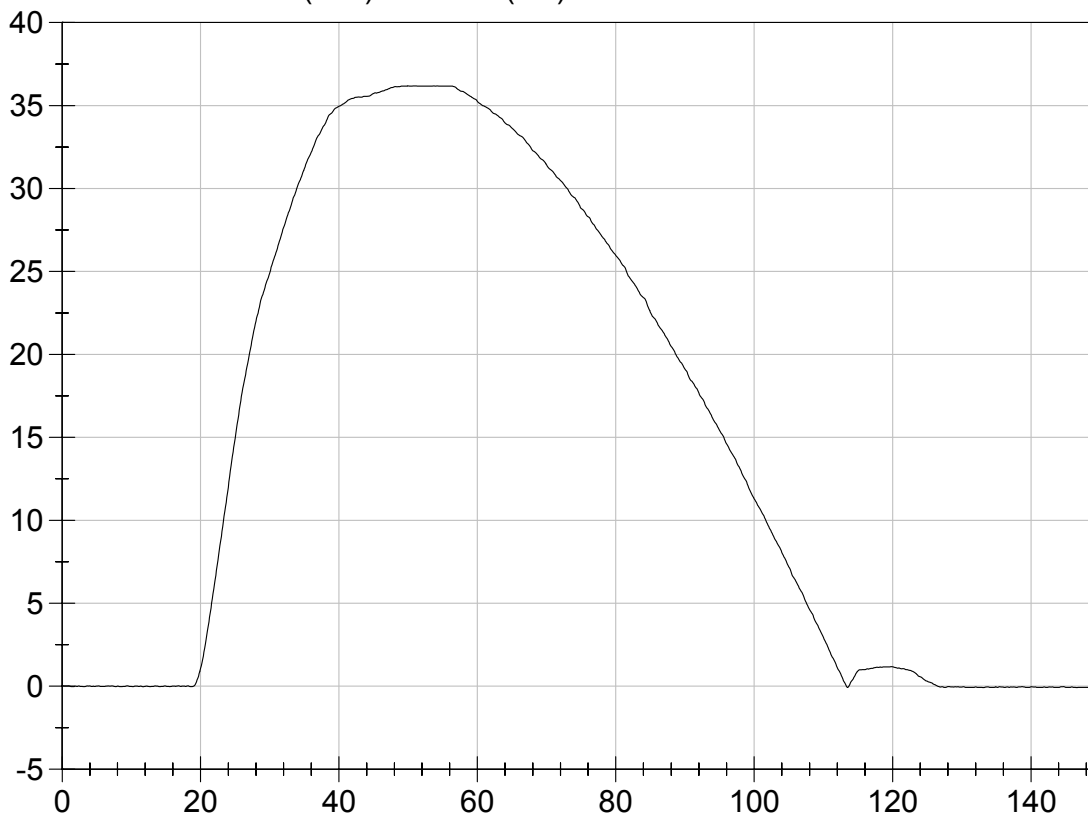
Tmax: 23.2 ms

YMin: -2307.8 N

Tmin: 113.1 ms

CFC 1000

DISPLACEMENT (mm) vs TIME (ms)



YMax: 36.2 mm

Tmax: 53.7 ms

YMin: -0.1 mm

Tmin: 133.1 ms

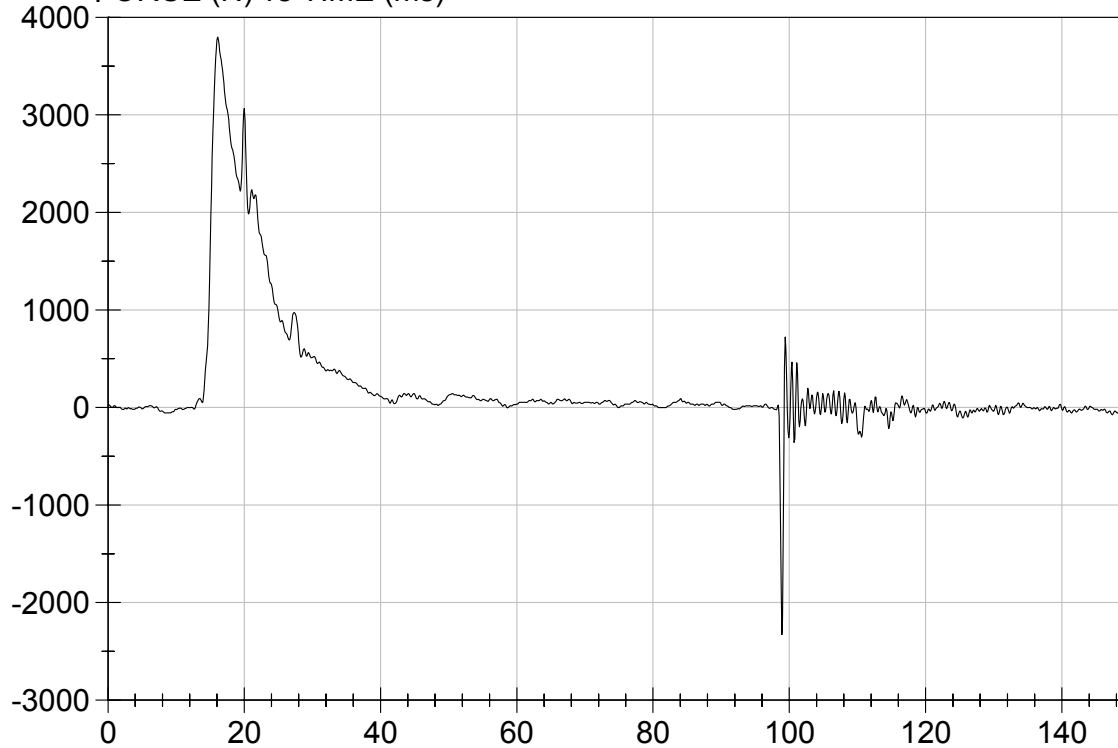
CFC 1000



Test Desc: Dampener Impact
Component ID: D042018

Test Date: 08/26/2004
Speed: 20 ft/sec, 6.1 m/sec

FORCE (N) vs TIME (ms)



YMax: 3798.0 N

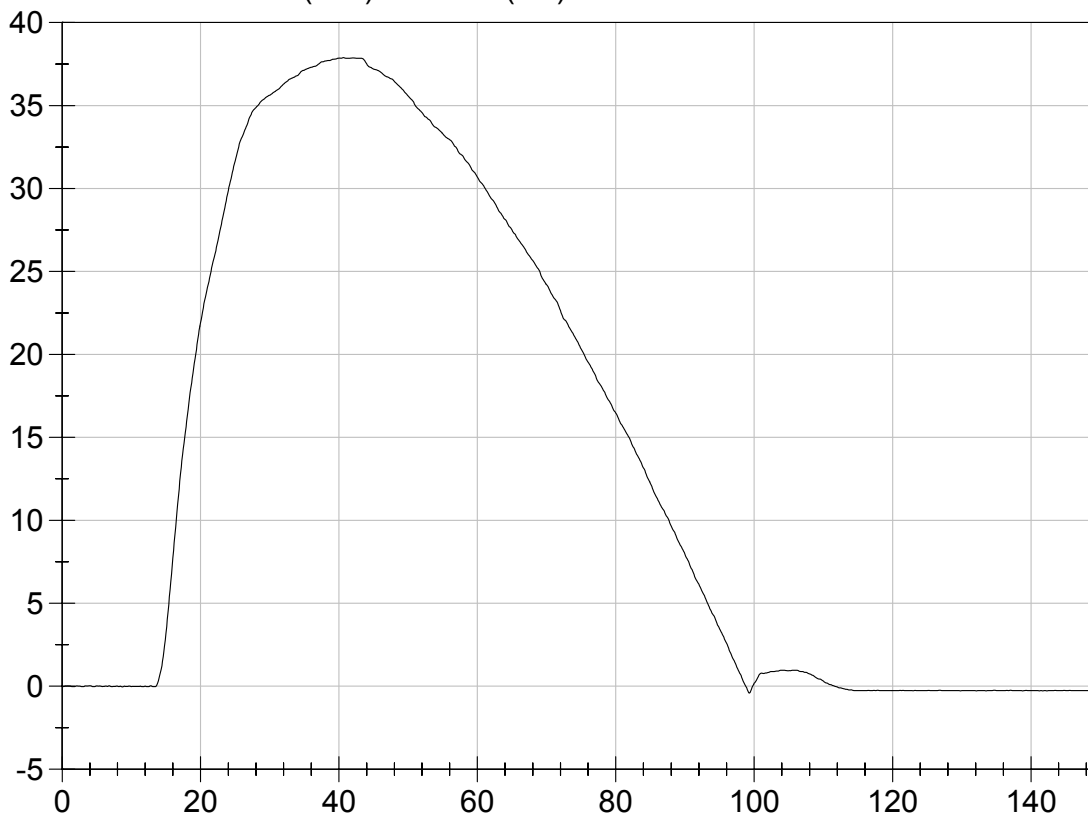
Tmax: 16.1 ms

YMin: -2327.6 N

Tmin: 98.9 ms

CFC 1000

DISPLACEMENT (mm) vs TIME (ms)



YMax: 37.9 mm

Tmax: 40.7 ms

YMin: -0.4 mm

Tmin: 99.3 ms

CFC 1000

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

ATD Serial No: 271

Test I.D: D042239

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	20.8	Pass
Laboratory Relative Humidity		%	10 to 70	42	Pass
Impact Velocity		m/s	6.89 to 7.13	7.08	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.22	Pass
	20 msec	m/s	4.12 to 5.10	4.42	Pass
	30 msec	m/s	5.73 to 7.01	6.20	Pass
	40 to 70 msec	m/s	6.27 to 7.64	7.10	Pass
Midsagittal Plane Max Rotation		deg	66 to 82	73	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	62	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	80	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	58	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	10	Pass


 Laboratory Technician

09/16/2004

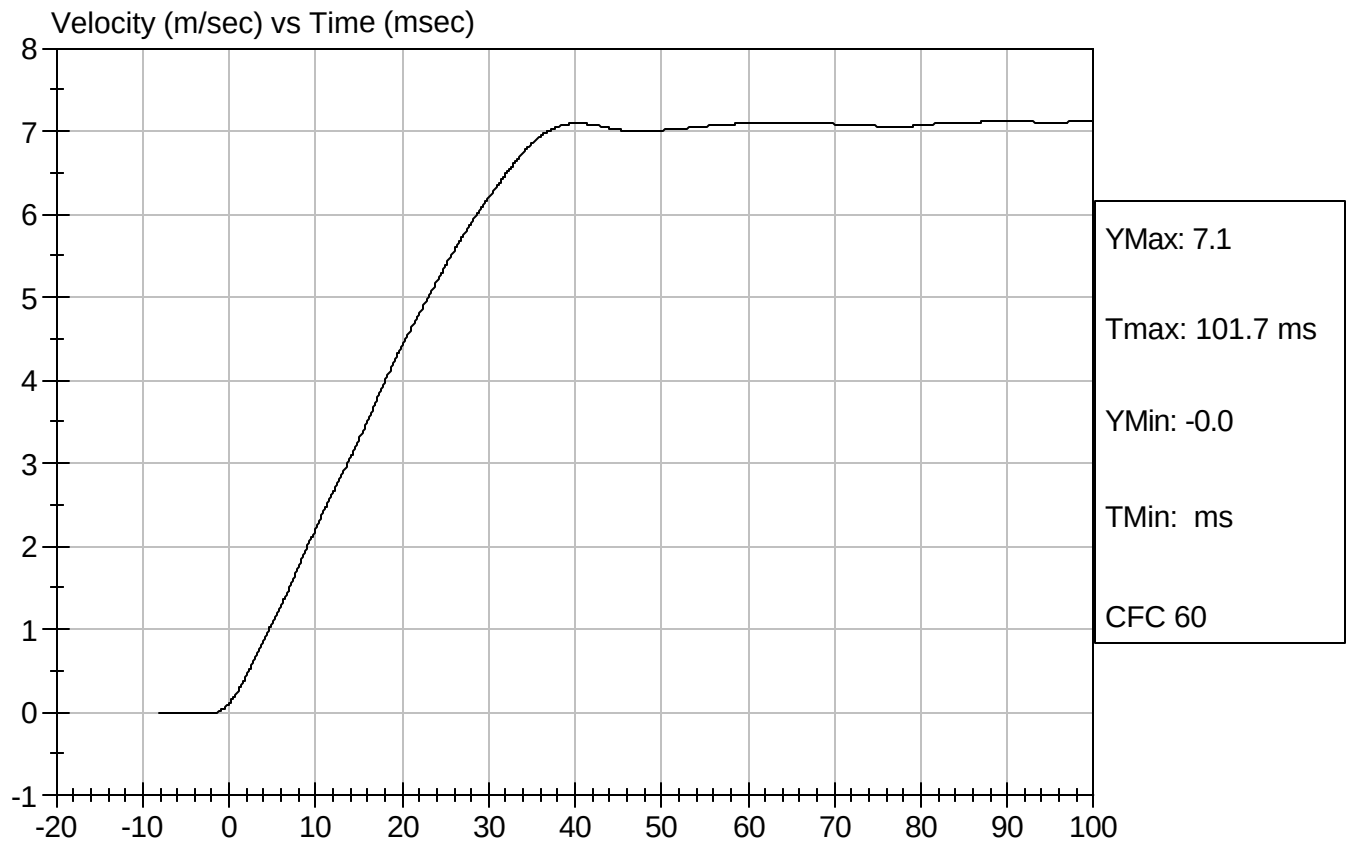
Test Date


 Approved By



Test Desc: Neck Bending
Component ID: D042239

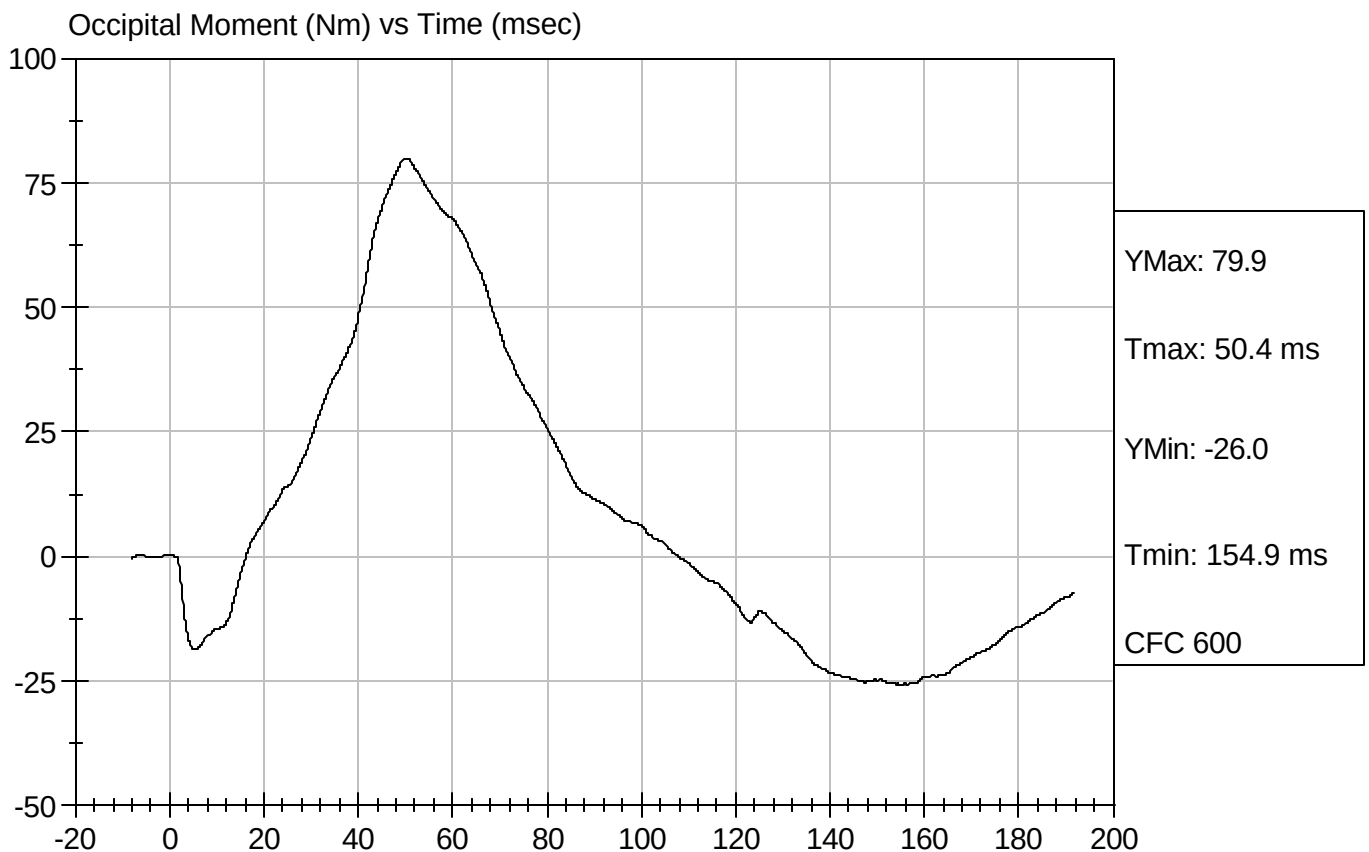
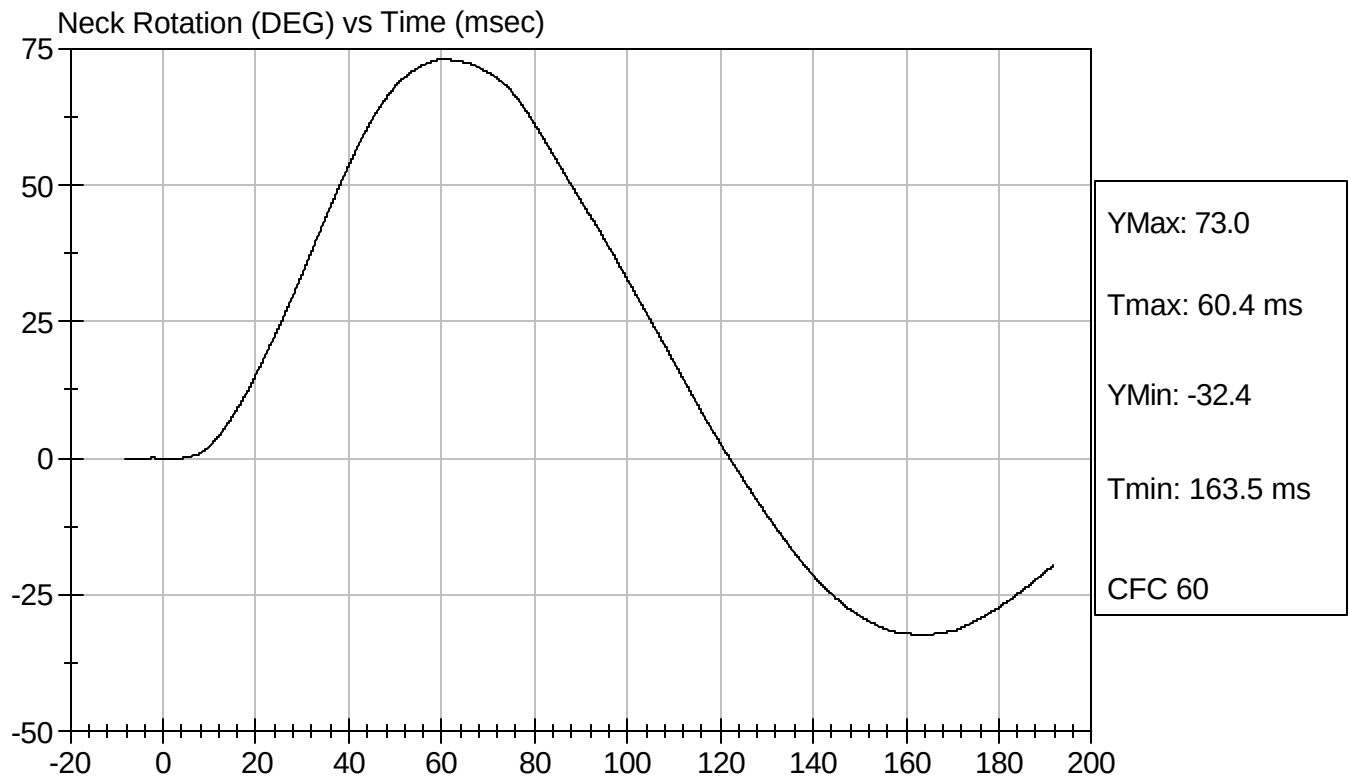
Test Date: 09/16/2004
Speed: 23.24 ft/sec, 7.08 m/sec





Test Desc: Neck Bending
Component ID: D042239

Test Date: 09/16/2004
Speed: 23.24 ft/sec, 7.08 m/sec



Calibration Test Results Summary

Dummy Serial Number: 271

Post-Test Calibration

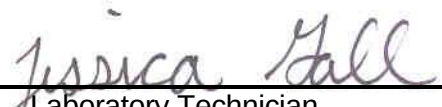
Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all pendulum test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

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

ATD Serial No: 271

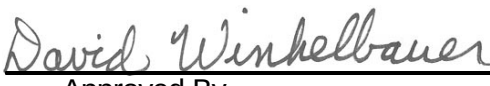
Test I.D: D042251

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	41	Pass
Peak Resultant Acceleration	G's	120 to 150	128	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-11	Pass
Overall Test Results				Pass


Laboratory Technician

09/21/2004

Test Date


Approved By



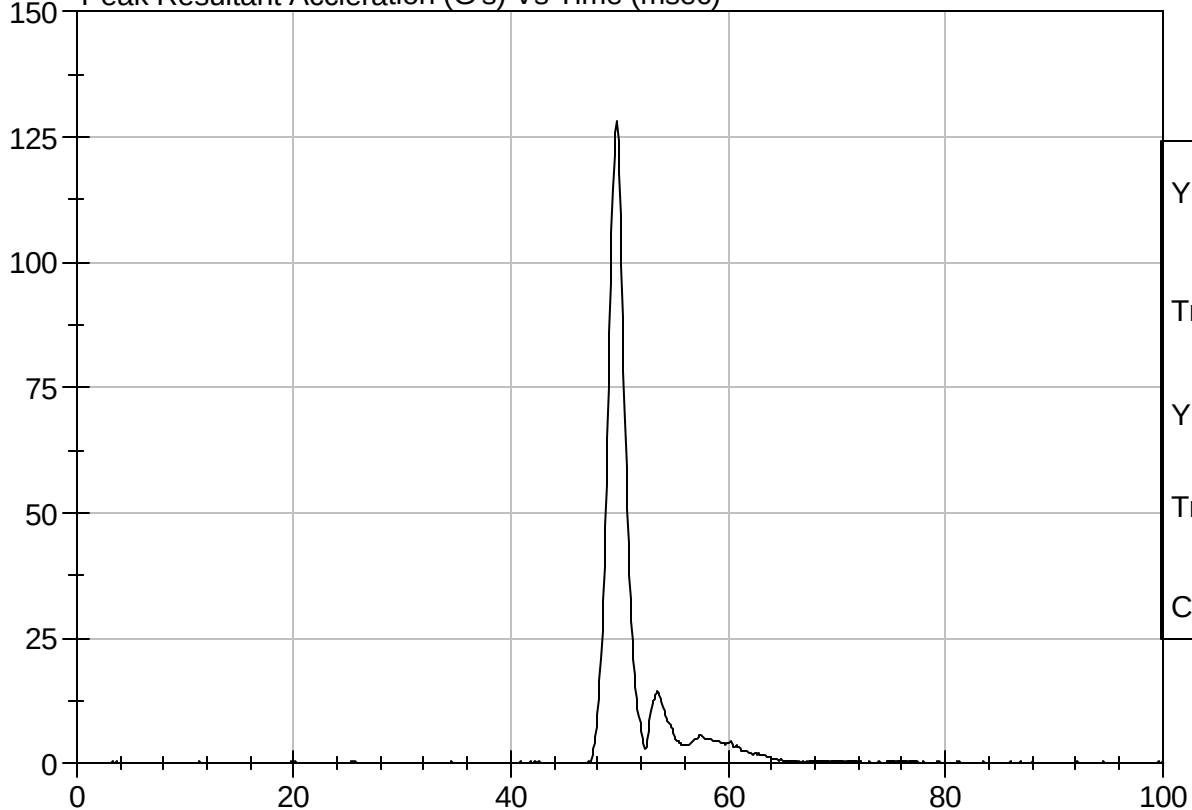
Test Description: Head Drop

Test Date: 09/21/2004

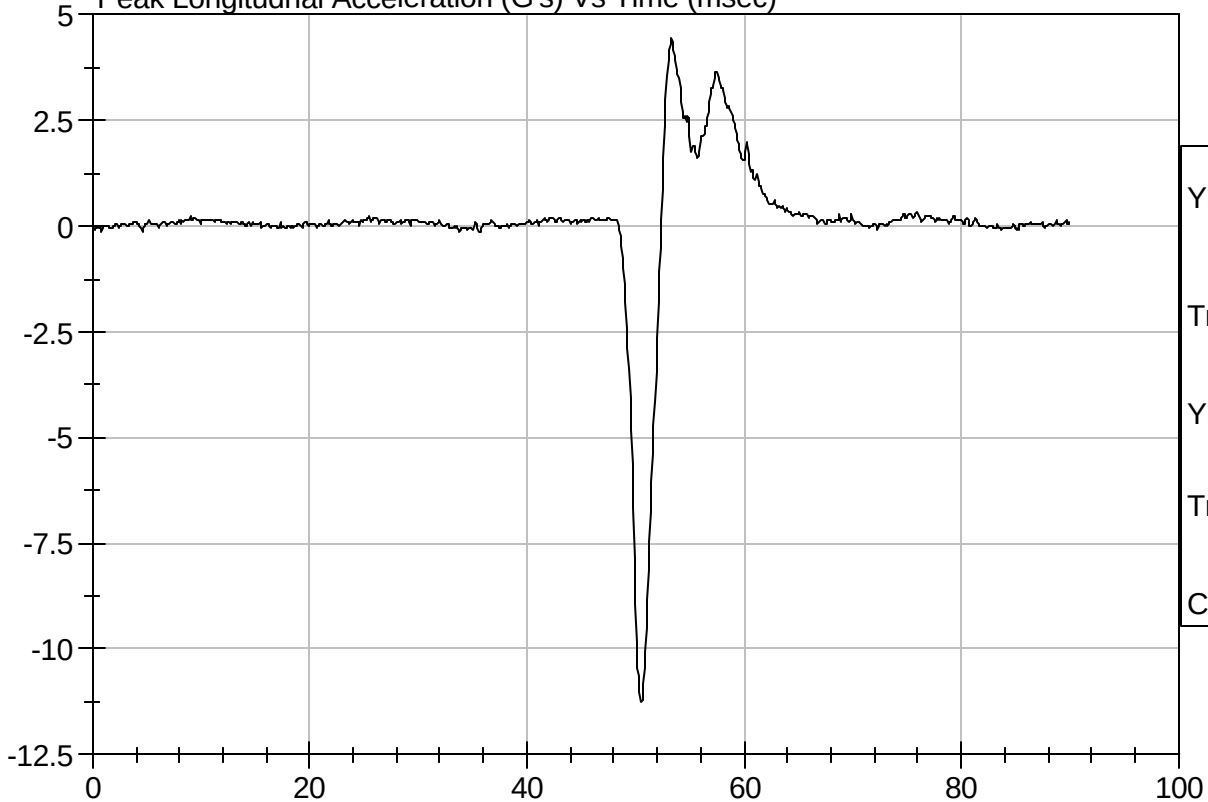
Component: D042251

Speed: 0 ft/s, 0.00 m/s

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



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

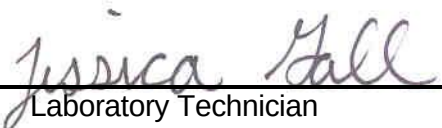


SID Calibration Data Sheet
Side Impact Dummy
Thorax Impact Test

ATD Serial No: 271

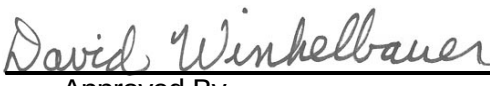
Test I.D: D042252

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	42	Pass
Probe Velocity	m/s	4.27 - 4.33	4.28	Pass
Upper Rib	G's	37 - 46	45	Pass
Lower Rib	G's	37 - 46	45	Pass
Lower Spine	G's	15 - 22	21	Pass
Overall Test Results				Pass


Laboratory Technician

09/21/2004

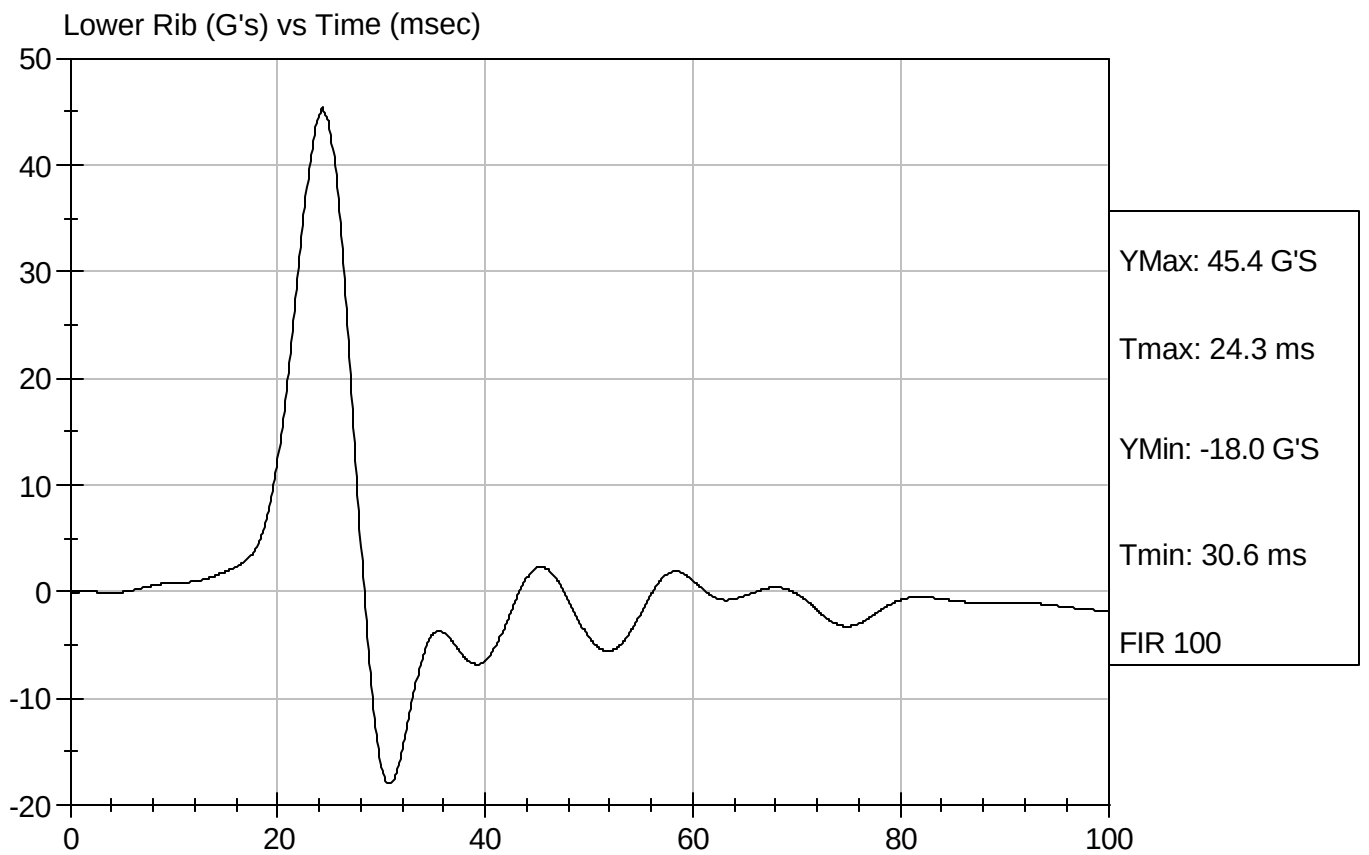
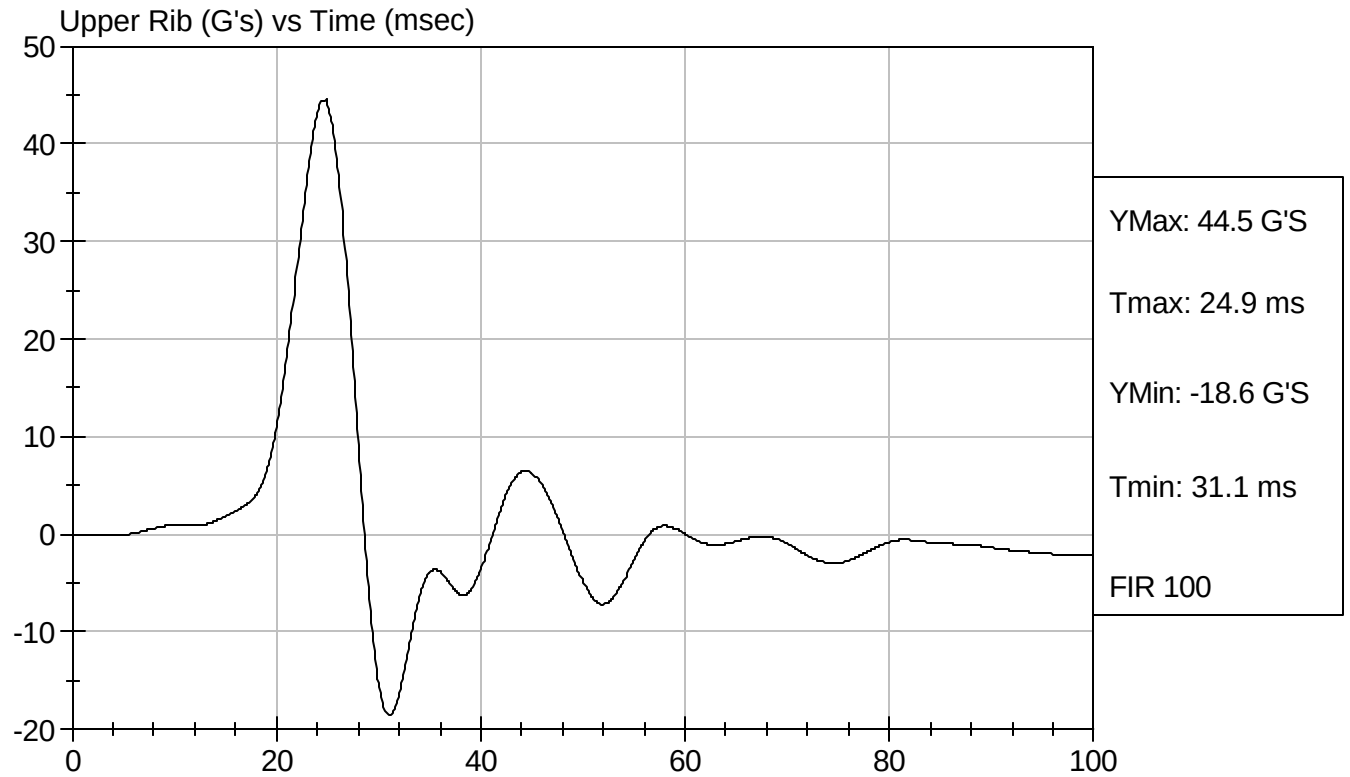
Test Date


Approved By



Test Desc: Thorax Impact
Component ID: D042252

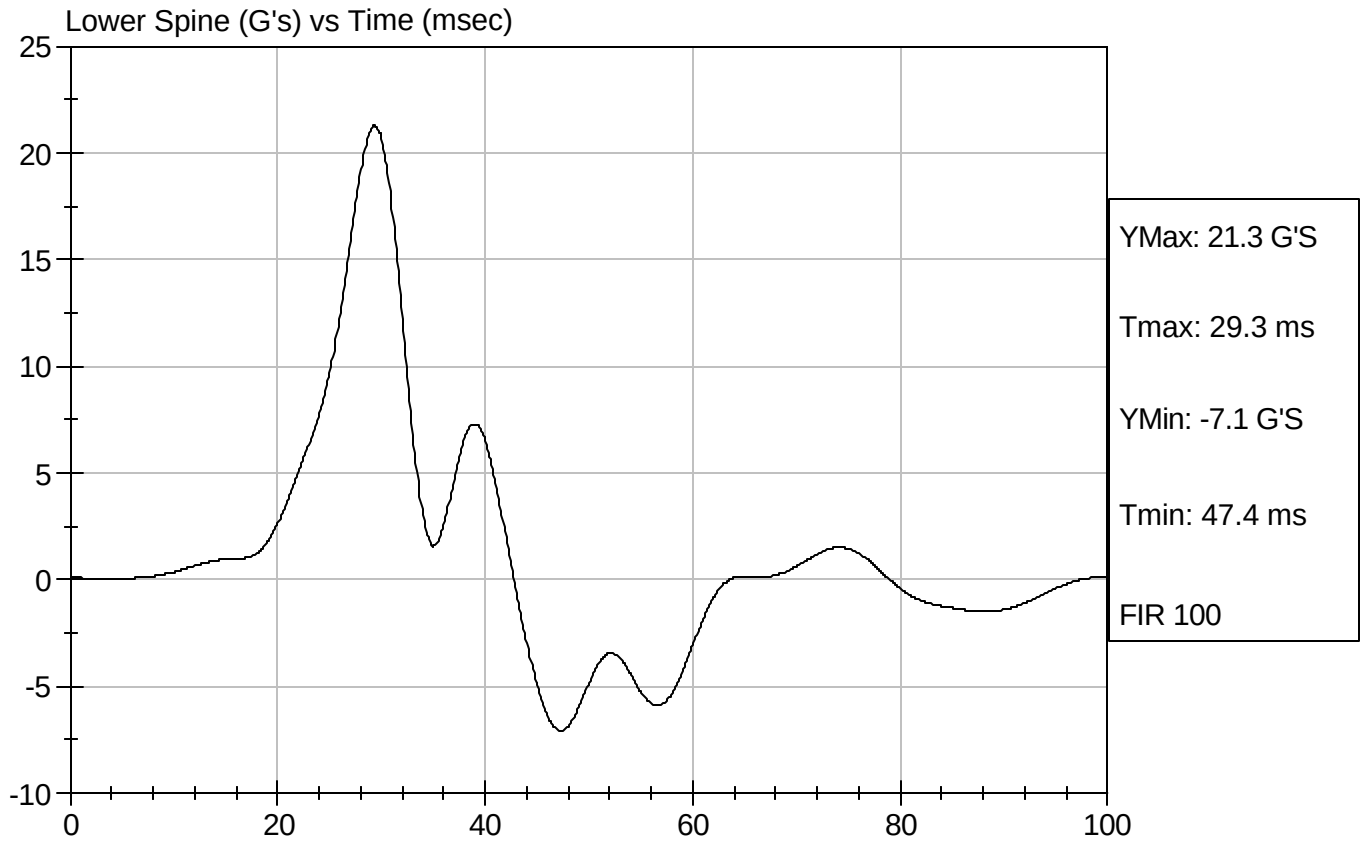
Test Date: 09/21/2004
Speed: 14.04 ft/sec, 4.28 m/sec





Test Desc: Thorax Impact
Component ID: D042252

Test Date: 09/21/2004
Speed: 14.04 ft/sec, 4.28 m/sec

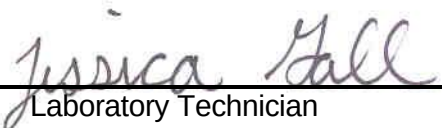


SID Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Test

ATD Serial No: 271

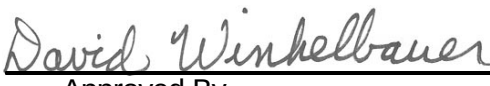
Test I.D: D042253

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	43	Pass
Probe Velocity	m/s	4.27 - 4.33	4.28	Pass
Pelvis Acceleration	G's	40 - 60	48	Pass
Overall Test Results			Pass	


Laboratory Technician

09/21/2004

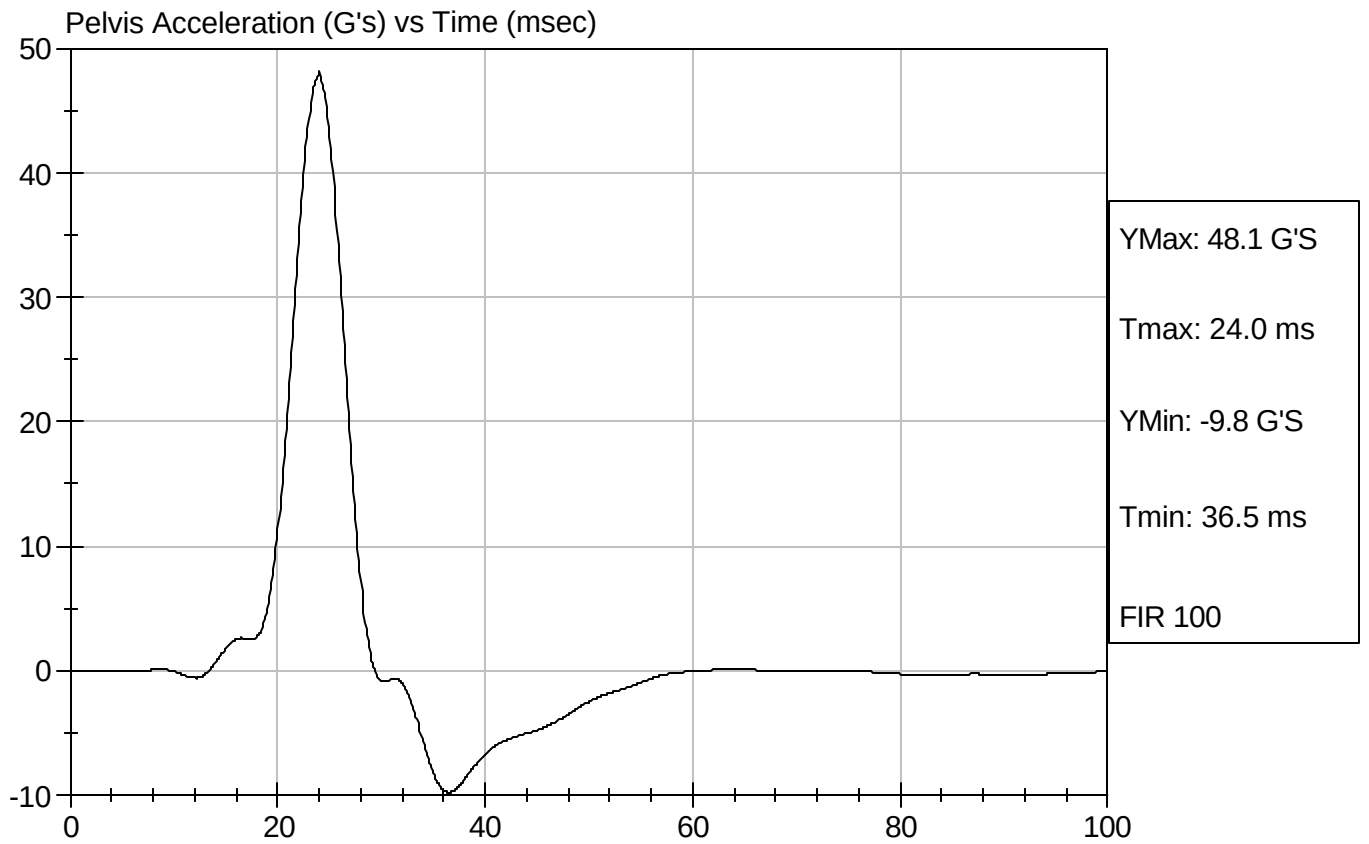
Test Date


Approved By



Test Desc: Pelvis Impact
Component ID: D042253

Test Date: 09/21/2004
Speed: 14.04 ft/sec, 4.28 m/sec

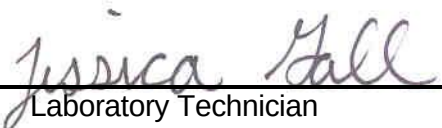


SID Calibration Data Sheet
Side Impact Dummy
Abdominal Compression Calibration (Pre-Load = 10 lbs)

ATD Serial No: 271

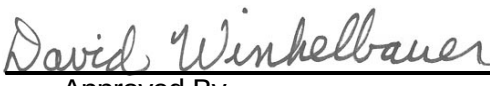
Test I.D: D042254

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Force At 12.7 mm	N	104 -162	149	Pass
Force At 19 mm	N	163 - 222	207	Pass
Force At 25.4 mm	N	222 - 280	273	Pass
Force At 33 mm	N	325 - 391	389	Pass
			Overall Test Results	Pass


Laboratory Technician

09/21/2004

Test Date


Approved By

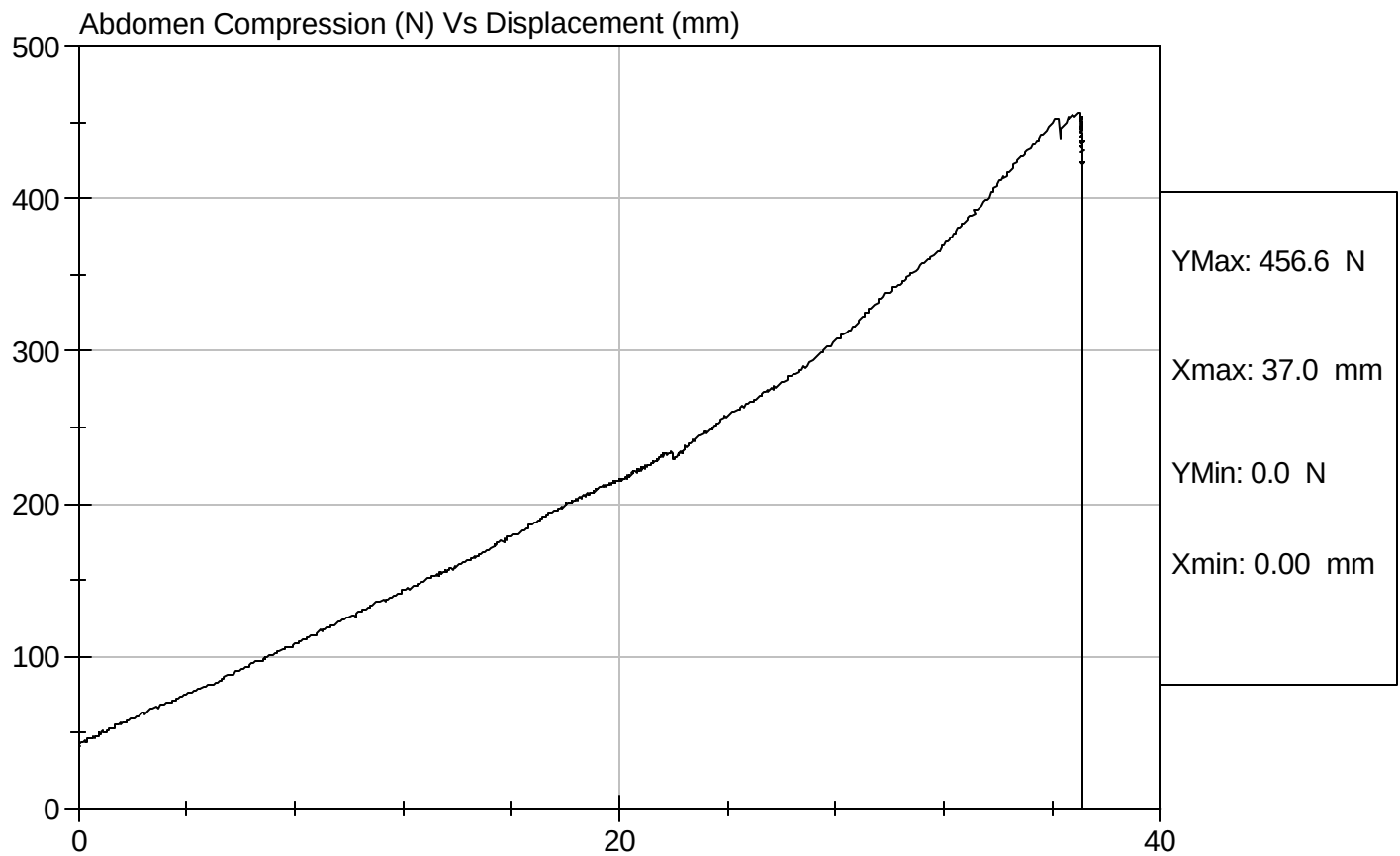


Test Description: Abdomen Compression

Test Date: 09/21/2004

Component: D042254

Speed: 0 ft/sec, 0 m/sec

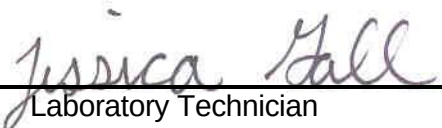


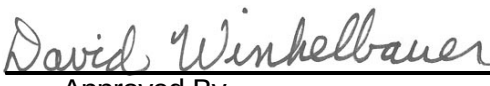
SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 271

Test I.D: D042255

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Force At 0 deg	N	0 - 26.7	0.0	Pass
Force At 20 deg	N	97.9 - 151.2	116.3	Pass
Force At 30 deg	N	151.2 - 204.6	172.7	Pass
Force At 40 deg	N	204.6 - 258.0	214.9	Pass
Return Angle	Deg	12 Maximum	6	Pass
			Overall Test Results	Pass


Laboratory Technician


Approved By

09/21/2004

Test Date

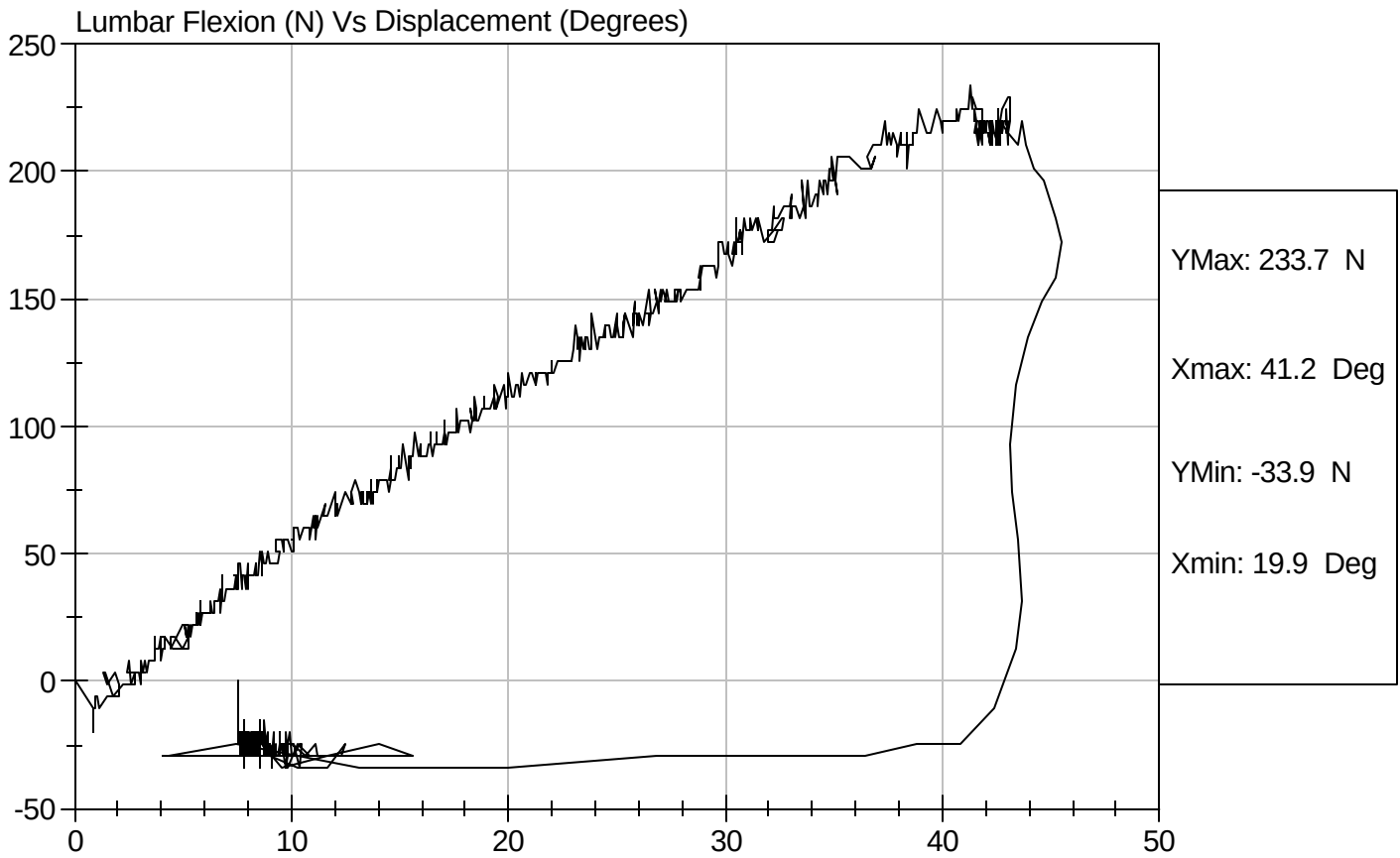


Test Description: Lumbar Flexion

Test Date: 09/21/2004

Component: D042255

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: D042259

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	42	Pass
Impact Velocity		m/s	6.89 to 7.13	7.05	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.22	Pass
	20 msec	m/s	4.12 to 5.10	4.48	Pass
	30 msec	m/s	5.73 to 7.01	6.36	Pass
	40 to 70 msec	m/s	6.27 to 7.64	7.19	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	60	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	12	Pass


 Laboratory Technician

09/21/2004

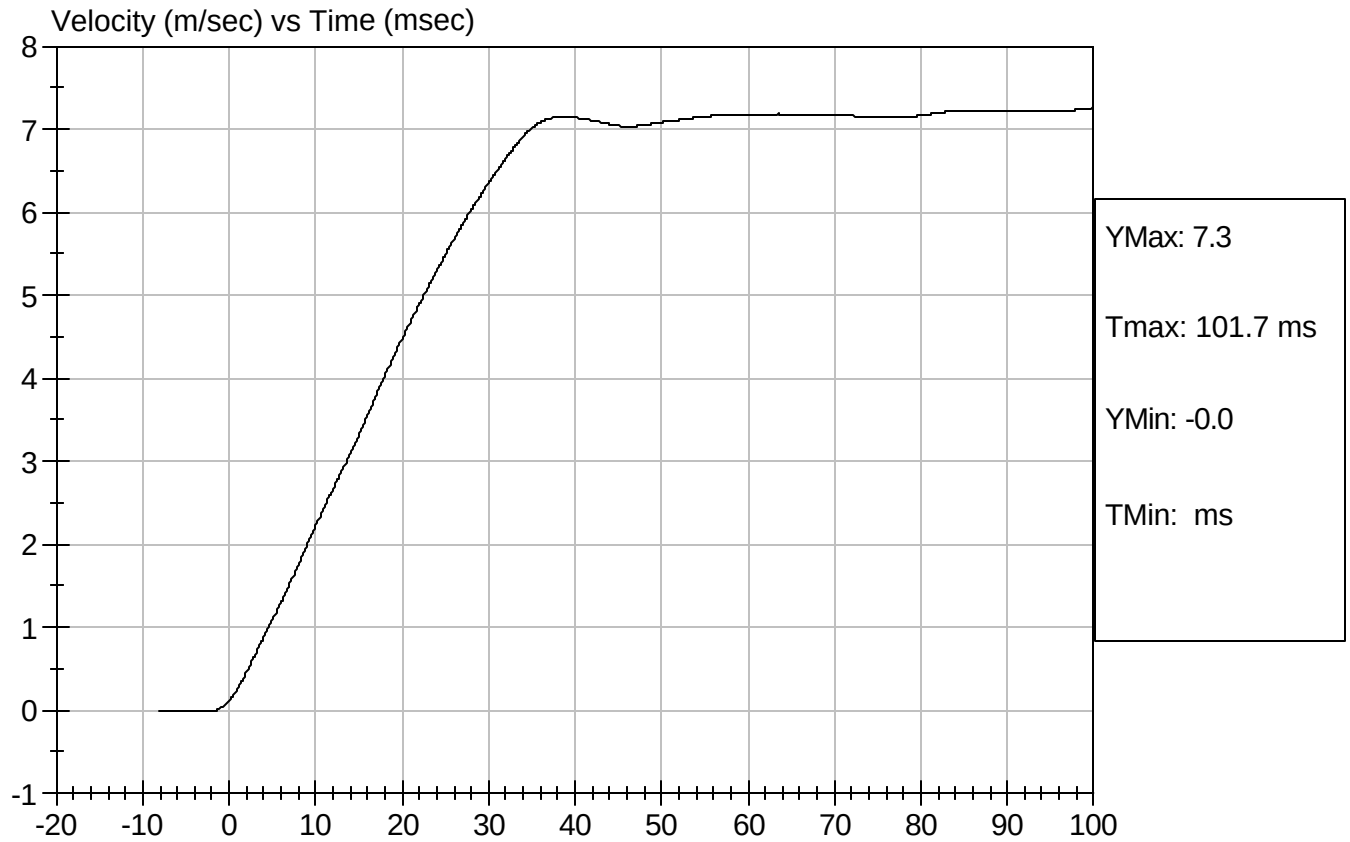
Test Date


 Approved By



Test Desc: Neck Flexion
Component ID: D042259

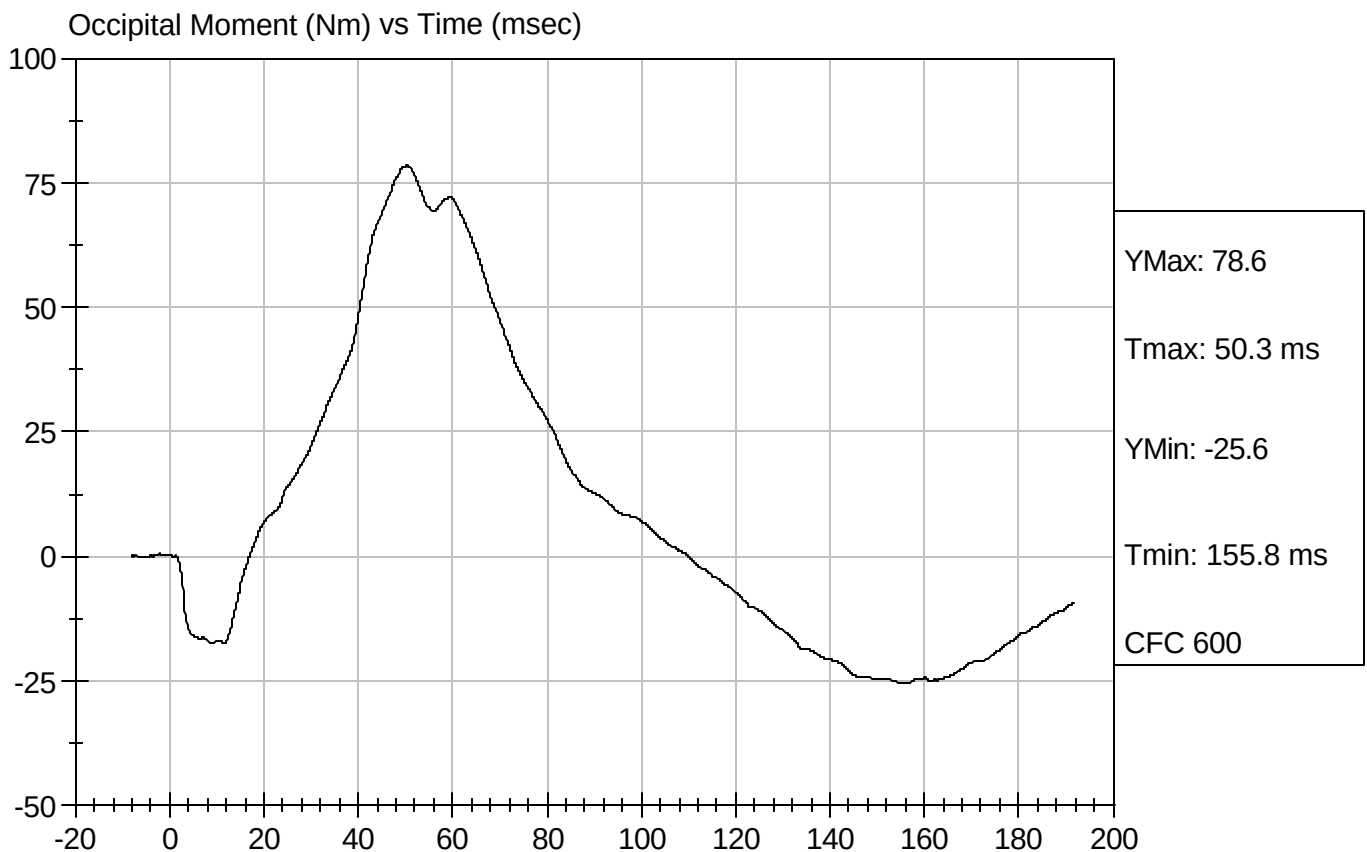
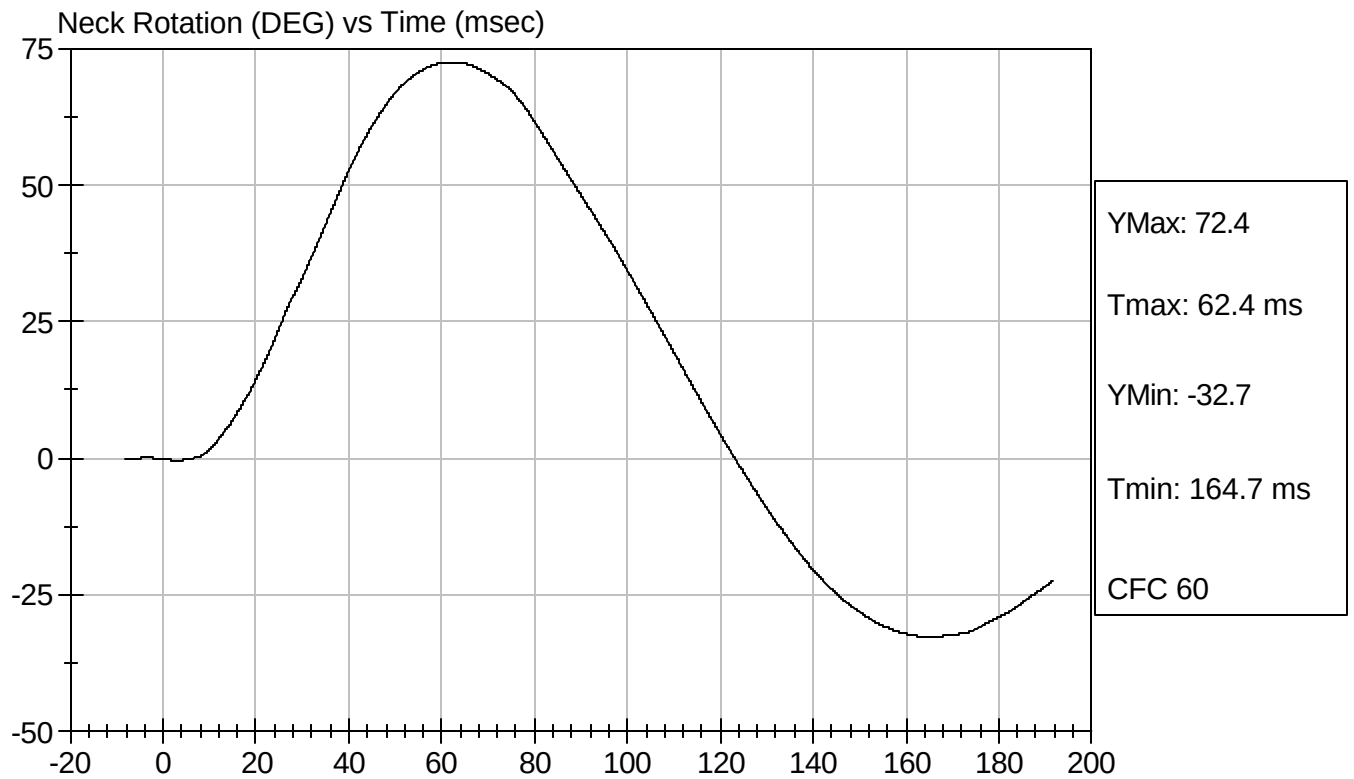
Test Date: 09/21/2004
Speed: 23.14 ft/sec, 7.05 m/sec





Test Desc: Neck Flexion
Component ID: D042259

Test Date: 09/21/2004
Speed: 23.14 ft/sec, 7.05 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

Jessica Hall
Laboratory Technician
David Winkelbauer
Approved By

09/21/2004
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	J03-J09	Entran	8/23/04
Lower Rib Y	J23-J08	Entran	8/23/04
Lower Spine Y	J14-J17	Entran	8/19/04
Pelvis Y	AH0A2	Endevco	8/24/04
Upper Rib Redundant Y	J14-J14	Entran	8/23/04
Lower Rib Redundant Y	J23-J04	Entran	8/23/04
Lower Spine Redundant Y	J13658	Endevco	4/08/04
Pelvis Redundant Y	AJ462	Endevco	8/24/04
Head X	AGTY6	Endevco	8/23/04
Head Y	AALH1	Endevco	8/23/04
Head Z	J13943	Endevco	8/23/04
Head Redundant X	AN8D2	Endevco	8/23/04
Head Redundant Y	J10195	Endevco	8/23/04
Head Redundant Z	J11166	Endevco	8/23/04
Neck Load Cell	1673	Entran	6/22/04

	INSTRUMENTS FOR PASSENGER DUMMY NO.271		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AHR15	Endevco	8/19/04
Lower Rib Y	J21612	Endevco	8/19/04
Lower Spine Y	ALCR0	Endevco	8/23/04
Pelvis Y	AGTM8	Endevco	8/24/04
Upper Rib Redundant Y	AP2D6	Endevco	8/19/04
Lower Rib Redundant Y	AHW95	Endevco	8/19/04
Lower Spine Redundant Y	AH0N9	Endevco	8/23/04
Pelvis Redundant Y	AMRR4	Endevco	8/23/04
Head X	F14-B19	Entran	9/10/04
Head Y	F09-N09	Entran	9/10/04
Head Z	F14-A12	Entran	9/10/04
Head Redundant X	F11-H07	Entran	9/10/04
Head Redundant Y	F11-H19	Entran	9/10/04
Head Redundant Z	F28-N04	Entran	9/10/04
Neck Load Cell	253	Denton	4/27/04

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Front Door Centerline Y	L18-N13	Entran	9/13/04
Midrear of Left Front Door Y	L13-R28	Entran	9/13/04
Left Front Door Upper Centerline Y	L17-D22	Entran	8/24/04
Midrear of Left Rear Door Y	H21-J04	Entran	6/04/04
Left Rear Door Upper Centerline Y	H01-N12	Entran	8/24/04
Left Mid A-Post Y	K18-J06	Entran	7/26/04
Left Lower A-Post Y	G03-N06	Entran	4/19/04
Left Mid B-Post Y	K07-R20	Entran	7/26/04
Left Lower B-Post Y	I15-Z05	Entran	5/28/04
Floorpan @ Rear Axle X	E01-F01	Entran	4/16/04
Floorpan @ Rear Axle Y	I16-B07	Entran	4/16/04
Floorpan @ Rear Axle Z	L17-D09	Entran	4/24/04
Right Front Sill X	L17-D26	Entran	7/26/04
Right Front Sill Y	L17-D07	Entran	7/26/04
Right Front Sill Z	L17-D02	Entran	7/26/04
Right Rear Sill X	K20-J06	Entran	7/26/04
Right Rear Sill Y	K07-R24	Entran	7/26/04
Right Rear Sill Z	K18-D13	Entran	7/26/04
Left Front Sill Y	A27-R06	Entran	9/13/04
Left Rear Sill Y	L17-D05	Entran	9/13/04
Right Rear Occupant Compartment Y	L18-N12	Entran	8/24/04
Vehicle CG X	L20-B11	Entran	8/24/04
Vehicle CG Y	I16-B04	Entran	8/25/04
Vehicle CG Z	H20-R06	Entran	8/25/04