

REPORT NUMBER: NCAPSIDE-MGA-2005-001

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

**Toyota Motor Corporation
2005 Toyota Corolla
NHTSA NUMBER: M55109**

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



Test Date: September 15, 2004

Final Report Date: October 14, 2004

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
RULEMAKING
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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: 10/14/04

FINAL REPORT ACCEPTED BY:

COTR, Side Impact

Date of Acceptance

Technical Report Documentation Page

1. Report No. NCAPSIDE-MGA-2005-001		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 NHTSA No.: M55109				5. Report Date October 14, 2004																						
				6. Performing Organization Code MGA																						
7. Author(s) Shefalika Naik, Project Engineer				8. Performing Organization Report No. NCAPSIDE-MGA-2005-001																						
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: Final Report 9/15/04 to 10/14/04																						
				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 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 15, 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 318 mm at level 2. The test vehicle's occupant performance is as follows:																										
<table border="0" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:50%;"></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>DRIVER</u></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>PASS.</u></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) Accel., g</td> <td style="text-align: center;">55.1</td> <td style="text-align: center;">58.0</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td style="text-align: center;">70.7</td> <td style="text-align: center;">80.8</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td style="text-align: center;">71.9</td> <td style="text-align: center;">61.2</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td style="text-align: center;">71.3</td> <td style="text-align: center;">71.0</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td style="text-align: center;">107.1</td> <td style="text-align: center;">83.3</td> </tr> <tr> <td>HIC</td> <td style="text-align: center;">673.3</td> <td style="text-align: center;">944.2</td> </tr> </tbody> </table>							<u>DRIVER</u>	<u>PASS.</u>	Left Upper Rib (LUR) Accel., g	55.1	58.0	Left Lower Rib (LLR) Accel., g	70.7	80.8	Lower Spine (T ₁₂) Accel., g	71.9	61.2	Thoracic Trauma Index (TTI)	71.3	71.0	Pelvis (PEV) Accel., g	107.1	83.3	HIC	673.3	944.2
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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 237	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 manufactured by Toyota Motor Corporation.

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 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 1365.7 kg and the test weight of the MDB was 1361.2 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on September 15, 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/HIII's) 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 318 mm at level 2, 1200 mm rearward of the left vertical impact point. The driver and passenger SID/HIII's, Serial Nos. 271 and 904 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	71.3	71.0
Peak Pelvic G's (PEV)	G's	107.1	83.3
Head Injury Criteria (HIC)	none	673.3	944.2

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

The trunk door opened on impact. (See Appendix A for photos)

The gas cap door opened and filler neck came out. (See Appendix A for photos)

The cart video cameras collected video as the cart was moving down the track and missed the impact event. This was due to a small kink in the trigger cable that caused an early trigger as the cart was coming down the track.

There was questionable data collected for the following channels:

Driver Upper Rib Yr – after 35 ms

MDB CG X – after 100 ms

SECTION 3

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

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

NHTSA No. M55109
Test Date: 09/15/04

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	$=(tf - 32)/1.8$
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf/ft	Nm	1.355

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

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

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

NHTSA No. M55109
 Test Date: 09/15/04

TEST VEHICLE INFORMATION

Make	Toyota
Model	Corolla
Body Style	4-Door Sedan
NHTSA No.	M55109
VIN	1NXBR32E55Z375077
Color	Metallic Dark Grey
Delivery Date	8/26/04
Odometer Reading (mile)	44
Dealer	Wilde Toyota
Transmission	Automatic
Final Drive	Overdrive
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	Yes
Power Steering	Yes
Power Door Locks	Yes
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	New United Motor Manufacturing	GVWR (kg)	1626
Date of Manufacture	07/04	GAWR Front (kg)	855
		GAWR Rear (kg)	780

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold / Test Pressure (kPa)	210	210
Recommended Tire Size	P185/65R15	P185/65R15
Tire Size on Vehicle	P185/65R15	P185/65R15
Tire Manufacturer	Goodyear	Goodyear

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Buckets	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 NHTSA No. M55109
 Test Program: NCAP Side Impact Test Date: 09/15/04

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	368.3	221.4		425.0	294.4	
Right	kg	352.0	220.9		370.1	276.2	
Ratio	%	62.0	38.0		58.2	41.8	
Totals	kg	720.3	442.3	1162.6	795.1	570.6	1365.7

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1162.6
Weight of 2 P572E ATDs	kg	161.5
Rated Cargo/Luggage Weight (RCLW)	kg	49.9
Calculated Vehicle Target Weight (TVTW)	kg	1374.0

* 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	684	686	702	705	988
As Tested	mm	668	679	660	669	1085
Fully Loaded	mm	679	665	669	654	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2596
Total Vehicle Length at Left Side	mm	3601
Total Vehicle Length at Centerline	mm	4529
Total Vehicle Length at Right Side	mm	3601
Total Vehicle Width	mm	1704
Weight of Ballast in Cargo Area	kg	0.0
Amount of Stoddard Solvent in Fuel Tank	liters	46.0

TEST VEHICLE VERTICAL IMPACT LINE DATA

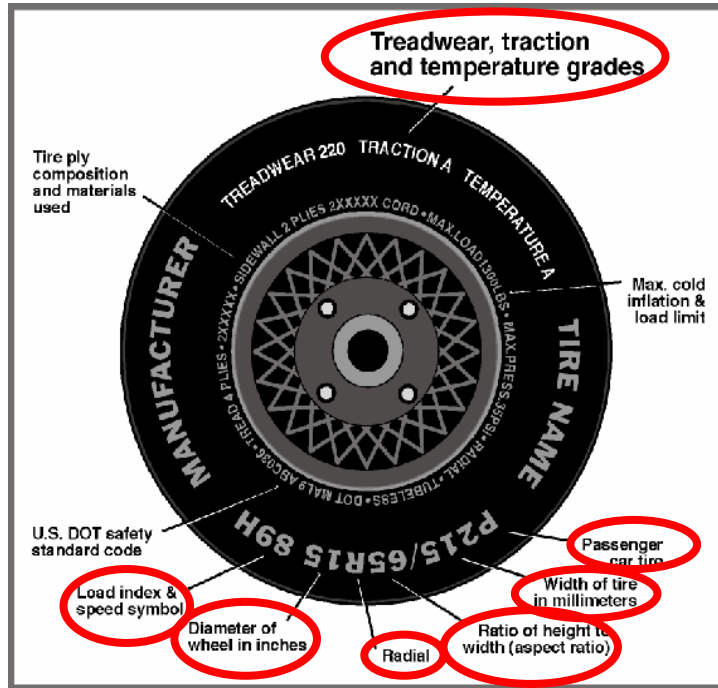
Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2596
Target Impact Point Aft of Front Axle	mm	358
Actual Impact Point Aft of Front Axle	mm	359

DATA SHEET NO. 2
TEST VEHICLE TIRE INFORMATION

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

NHTSA No.: M55109
Test Date: 09/15/04

Vehicle Year	2005	Vehicle Make	Toyota
VIN	1NXBR32E55Z375077	Vehicle Model	Corolla



	Front	Rear
Tire Manufacturer	Good year	Good year
Tire Name	Integrity	Integrity
Tire Type	P	P
Tire Width (mm)	185	185
Ratio of Height to Width (aspect ratio)	65	65
Radial	R	R
Wheel Diameter	15	15
Load Index & Speed Symbol	86S	86S
Treadwear	460	460
Traction Grade	A	A
Temperature Grade	B	B

DATA SHEET NO. 3

TEST VEHICLE INFORMATION

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

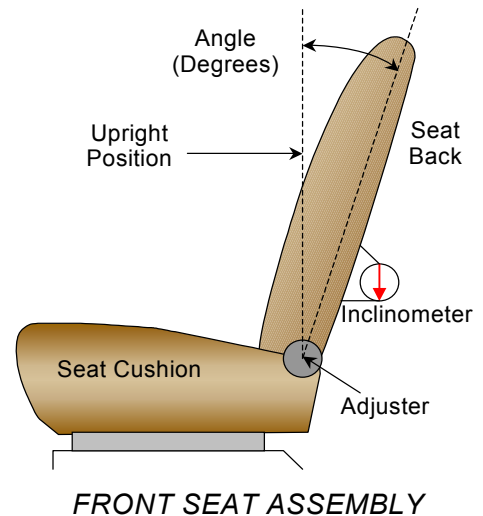
NHTSA No. M55109
Test Date: 09/15/04

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.



SEAT FORE/AFT POSITIONS

Position of the driver seat and the passenger seat:

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
Test Program: NCAP Side Impact

NHTSA No. M55109
Test Date: 09/15/04

FUEL TANK CAPACITY DATA

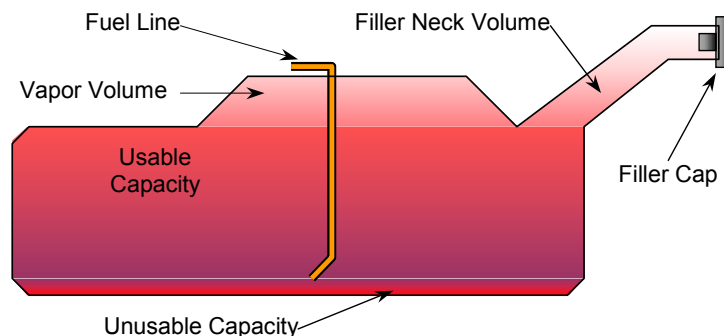
The "Usable Capacity" of the standard equipment fuel tank is: 50.0 liters

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: 46.0 liters

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



VEHICLE FUEL TANK ASSEMBLY

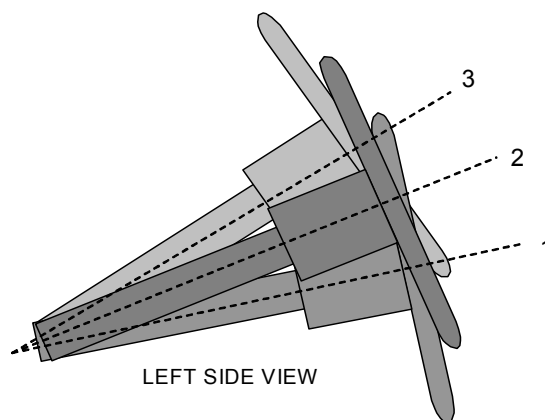
STEERING COLUMN ADJUSTMENT

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: 25.0°

Geometric center, position 2: 27.0°

Uppermost, Position 3: 29.1°



STEERING COLUMN ASSEMBLY

DATA SHEET NO. 4
TEST VEHICLE SUMMARY OF RESULTS

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

NHTSA No. M55109
 Test Date: 09/15/04

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	368.3	221.4		425.0	294.4	
Right	kg	352.0	220.9		370.1	276.2	
Weight Ratio	%	62.0	38.0		58.2	41.8	
Totals	kg	720.3	442.3	1162.6	795.1	570.6	1365.7

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
Level 1	Sill Top Height	mm	156	250
Level 2	Occupant H-Point	mm	318	565
Level 3	Mid Door	mm	299	628
Level 4	Window Sill	mm	175	945
Level 5	Window Top	mm	147	1390
N/A	Maximum Penetration	mm	318	565

INSTRUMENTATION

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

DATA SHEET NO. 5

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

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

NHTSA No. M55109
 Test Date: 09/15/04

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	900	Right	99
2	Top of Bumper (mm)	533	800	Right	49
3	Mid Level (mm)	686	800	Right	75
4	Top of Stack (mm)	813	800	Left	121

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	6
Contact Switches	2
High Speed Cameras	2*

* The high speed camera did not record the impact event. See Test Notes section for details.

DATA SHEET NO. 6

POST TEST OBSERVATIONS

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

NHTSA No. M55109
 Test Date: 09/15/04

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat SID/HIII	Rear Seat SID/HIII
Dummy Type / Serial No.	SID/HIII / 271	SID/HIII / 904
Head Contact	Headrest, Left Shoulder	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 Rear Broke
Other Notable Effects	The trunk door and gas cap opened during impact and filler neck came out.

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	1 mm rear
Vertical Offset	mm	+/-20	12 mm up

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 7

SID/HIII INJURY CRITERIA AND SENSOR DATA

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

NHTSA No. M55109
 Test Date: 09/15/04

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	55.1	32	-24.9	64	58.0	38	-6.1	147
Upper Rib (LUR) (R)	Y	G's	*	*	*	*	55.4	38	-5.9	148
Lower Rib (LLR)	Y	G's	70.7	33	-17.0	64	80.8	38	-13.8	63
Lower Rib (LLR) (R)	Y	G's	69.6	33	-16.6	64	77.6	38	-12.9	63
Lower Spine (T ₁₂)	Y	G's	71.9	28	-12.0	77	61.2	40	-11.5	68
Lower Spine (T ₁₂) (R)	Y	G's	70.4	28	-12.5	77	61.1	40	-13.8	70
Pelvis (PEV)	Y	G's	107.1	23	-20.5	46	83.3	28	-9.2	58
Pelvis (PEV) (R)	Y	G's	109.4	23	-19.9	46	83.7	28	-7.2	59

* No valid data collected after 35 msec.

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	70.7	71.9	71.3	107.1	80.8	61.2	71.0	83.3
Rib, Spine, and Pelvis (R)	69.6 *	70.4	70.0 *	109.4	77.6	61.1	69.4	83.7

* TTI could not be calculated due to questionable Driver Upper Rib Redundant data.

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	11.0	169	-40.0	77	10.4	156	-24.1	45
Head CG	Y	G's	54.6	77	-9.5	29	136.9	45	-9.1	35
Head CG	Z	G's	71.4	51	-1.7	38	20.6	39	-45.2	55
Head CG Resultant		G's	76.5	50			139.0	45		

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	673.3	45.6	81.6	51.1	944.2	42.1	50.9	102.9

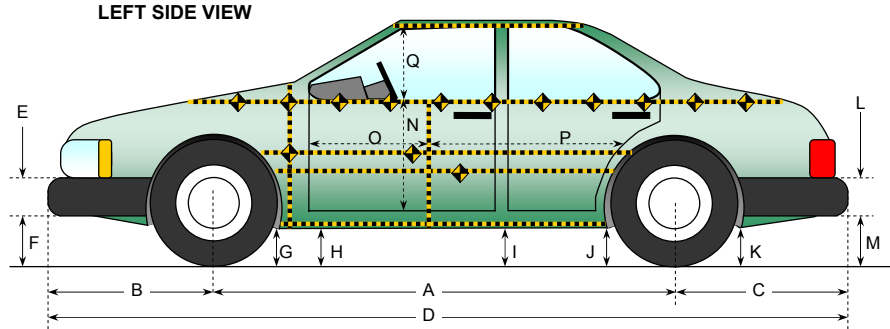
Positive Acceleration Polarities: Longitudinal (X) = Forward
 (Conforms to SAE J211) Lateral (Y) = Right
 Vertical (Z) = Down

DATA SHEET NO. 8

VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

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

NHTSA No. M55109
 Test Date: 09/15/04



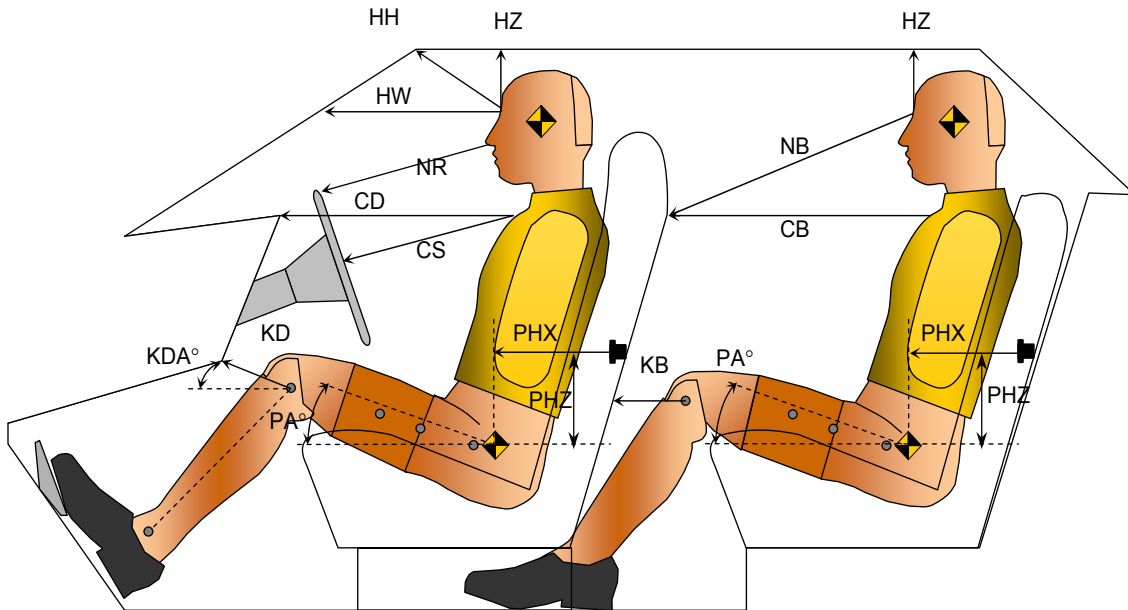
All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2596	2595	1
B	Front Axle to FSOV	930	925	5
C	Rear Axle to RSOV	1003	950	53
D	Total Length at Centerline	4529	4470	59
E	Front Bumper Thickness	189	189	0
F	Front Bumper Bottom to Ground	403	410	-7
G	Sill Height at Front Wheel Well	187	225	-38
H	Sill Height at Front Door Leading Edge	167	220	-53
I	Sill Height at "B" Pillar	171	235	-64
J1	Sill Height at Rear Wheel Well	170	250	-80
J2	Pinch Weld Height at Rear Wheel Well	168	226	-58
K	Sill Height Aft of Rear Wheel Well	220	210	10
L	Rear Bumper Thickness	160	160	0
M	Rear Bumper Bottom to Ground	402	404	-2
N	Sill Height to Window Bottom Sill	685	546	139
O	Front Door Leading Edge to Impact CL	767	738	29
P	Rear Door Trailing Edge to Impact CL	1142	1113	29
Q	Front Window Opening	424	406	18
R	Right Side Length	3601	3613	-12
S	Left Side Length	3601	3564	37
T	Vehicle Width at "B" Post	1704	1415	289

DATA SHEET NO. 9
SID/HII LONGITUDINAL CLEARANCE DIMENSIONS

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

NHTSA No. M55109
 Test Date: 09/15/04

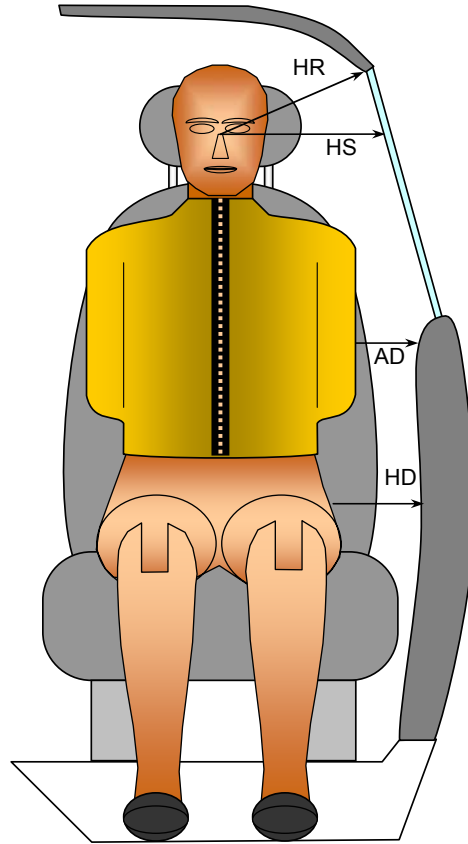


Driver Code	Pass. Code	Measurement Description	Driver S/N 271		Passenger S/N 904	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	329			
HW		Head to Windshield	559			
HZ	HZ	Head to Roof	169		124	
NR	NB	Nose to Rim/Nose to Seatback	450		637	
CD	CB	Chest to Dash or Seatback	516		564	
CS		Chest to Steering Wheel	348			
KDL	KBL	Left Knee to Dash or Seatback	151	17.9	222	16.2
KDR	KBR	Right Knee to Dash or Seatback	139	24.3	226	22.3
PA	PA	Pelvic Angle		24.7		24.0
PHX	PHX	H-Point to Striker (X-Axis)	182		246	
PHZ	PHZ	H-Point to Striker (Z-Axis)	216		322	

DATA SHEET NO. 10
SID/HIII LATERAL CLEARANCE DIMENSIONS

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

NHTSA No. M55109
 Test Date: 09/15/04



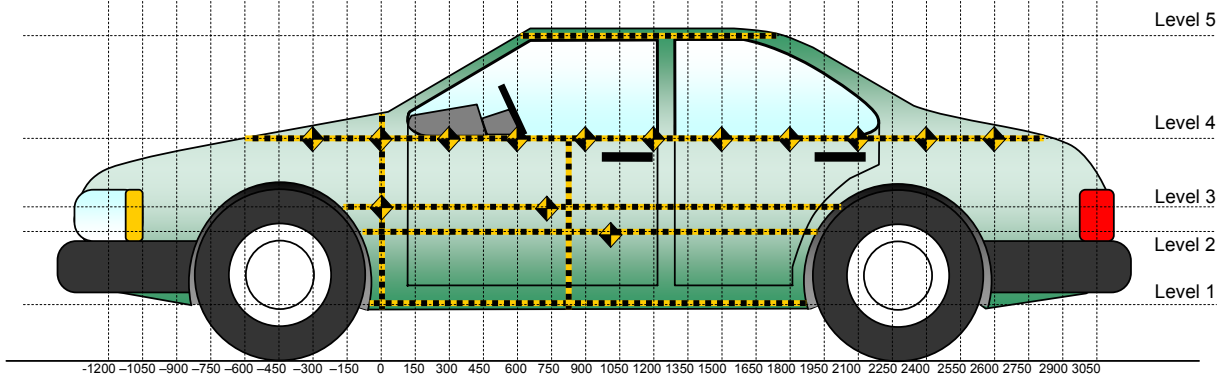
FRONT VIEW OF DUMMY

Code	Measurement Description	Units	Driver S/N 271	Passenger S/N 904
HR	Head to Side Header	mm	180	182
HS	Head to Side Window	mm	312	299
AD	Arm to Door	mm	71	69
HD	H-Point to Door	mm	151	169

DATA SHEET NO. 11
VEHICLE SIDE MEASUREMENTS

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

NHTSA No. M55109
Test Date: 09/15/04



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	1390
4	Window Sill	945
3	Mid Door	628
2	Occupant H-Point	565
1	Sill Top	250

DATA SHEET NO. 12
VEHICLE EXTERIOR CRUSH PROFILES

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

NHTSA No. M55109
 Test Date: 09/15/04

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750				392					392					0	
-600				366					368					2	
-450				348					355					7	
-300				337					350					13	
-150				327					350					23	
0		260	260	325			380	357	365			120	97	40	
150	300	265	263	325		409	545	520	392		109	280	257	67	
300	301	265	263	323		432	558	520	440		131	293	257	117	
450	302	264	262	324		435	553	518	490		133	289	256	166	
600	303	263	260	322		440	568	543	485		137	305	283	163	
750	301	261	259	322	541	446	573	533	485	560	145	312	274	163	19
900	303	260	258	320	536	459	575	516	488	560	156	315	258	168	24
1050	301	259	256	323	532	452	568	514	484	564	151	309	258	161	32
1200	302	262	259	323	526	447	580	543	498	570	145	318	284	175	44
1350	304	261	259	323	523	440	578	558	498	570	136	317	299	175	47
1500	304	262	259	325	521	425	558	544	495	555	121	296	285	170	34
1650	303	263	260	327	517	415	537	518	460	548	112	274	258	133	31
1800	301	263	262	327	518	398	492	490	405	532	97	229	228	78	14
1950		257	260	331	527		420	395	382	538		163	135	51	11
2100			254	331				353	385				99	54	
2250				338					365					27	
2400			263	345				290	360				27	15	
2550		275	281	357			294	295	358			19	14	1	
2700		291	300	371			303	308	370			12	8	-1	
2850		307	315	390			310	322	385			3	7	-5	
3000															

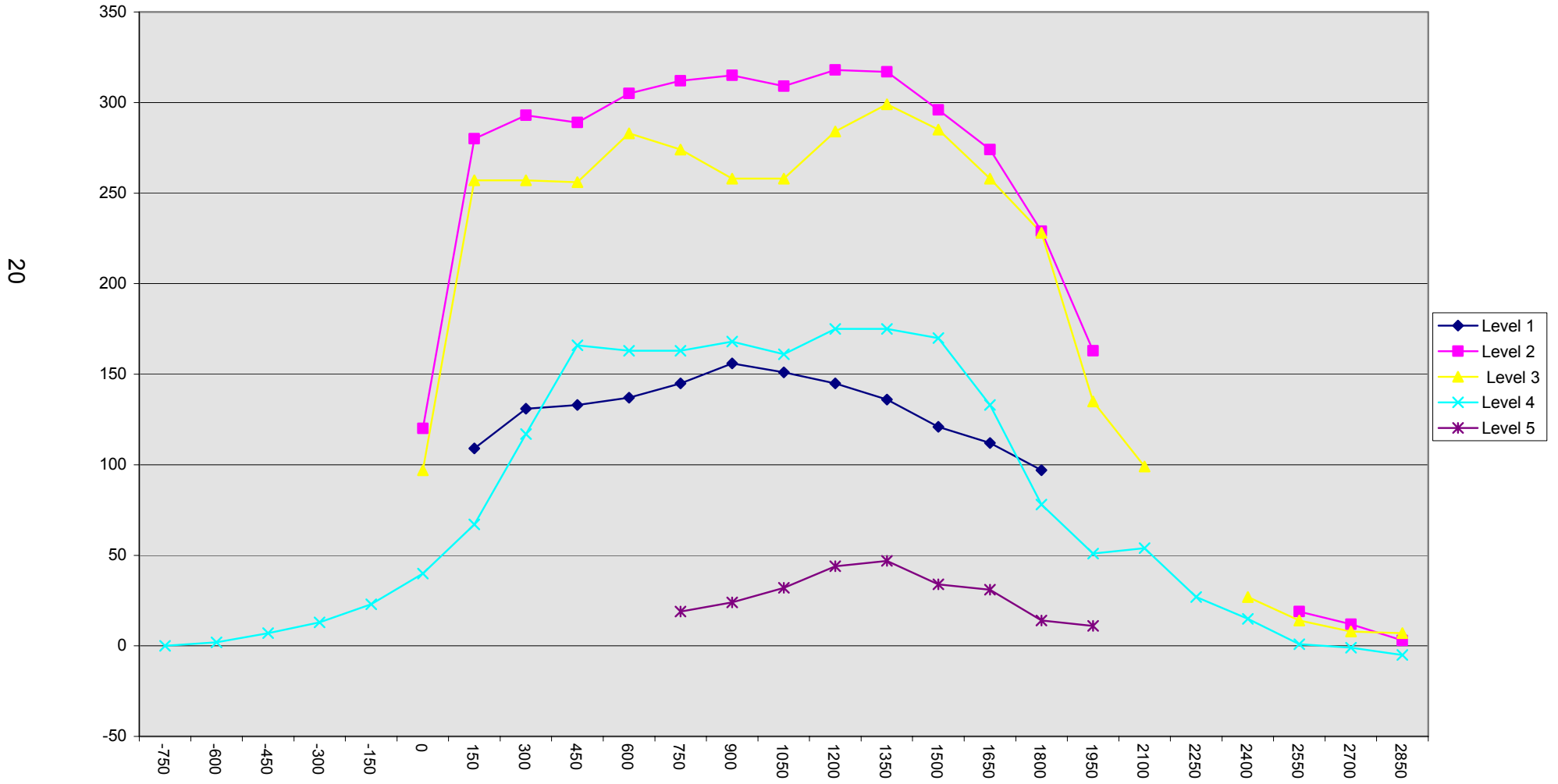
Reference plane is parallel to test vehicle longitudinal centerline.

Given dimensions = Reference plane to car body

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

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

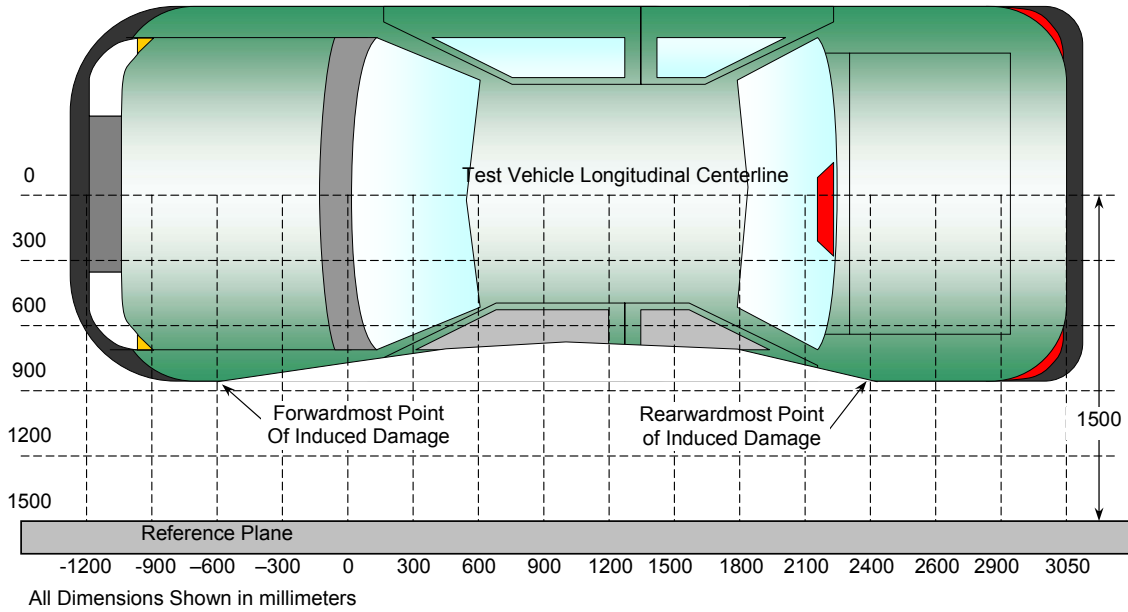
NHTSA No. M55109
Test Date: 09/15/04



DATA SHEET NO. 13
VEHICLE DAMAGE PROFILE DISTANCES

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

NHTSA No. M55109
 Test Date: 09/15/04



TOP VIEW

DAMAGE PROFILE DISTANCES

DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	2700 mm	4	371	370	-1
2	1877 mm	3	260	435	175
3	1202 mm	2	265	580	315
4	525 mm	2	263	562	299
5	-100 mm	4	326	360	34
6	-750 mm	4	392	392	0

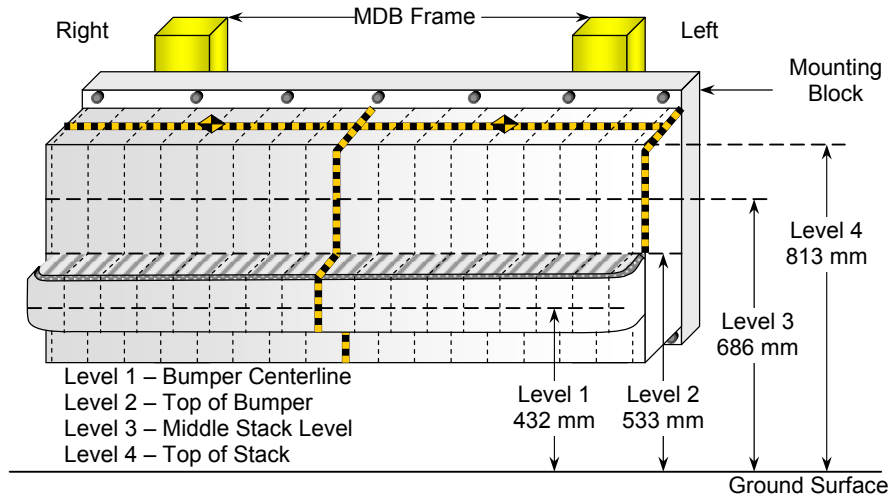
Reference plane is parallel to test vehicle longitudinal centerline.
 Given dimensions = Reference plane to car body.

DATA SHEET NO. 14

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

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

NHTSA No. M55109
 Test Date: 09/15/04



DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C _L	Distance Left of Center							
	800	700	600	500	400	300	200	100		0	100	200	300	400	500	600	700
1	98	99	86	76	68	71	69	68	68	68	69	69	70	72	73	81	91
2	49	36	28	25	23	24	25	29	29	29	29	31	32	31	34	37	48
3	75	37	18	11	5	8	23	22	9	5	6	9	7	9	11	16	57
4	80	31	4	-2	0	10	37	57	40	13	7	5	7	13	37	72	121

All Dimensions in mm

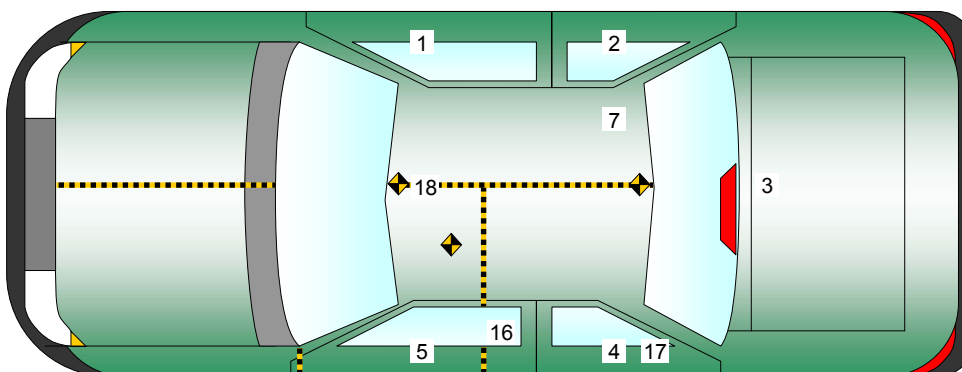
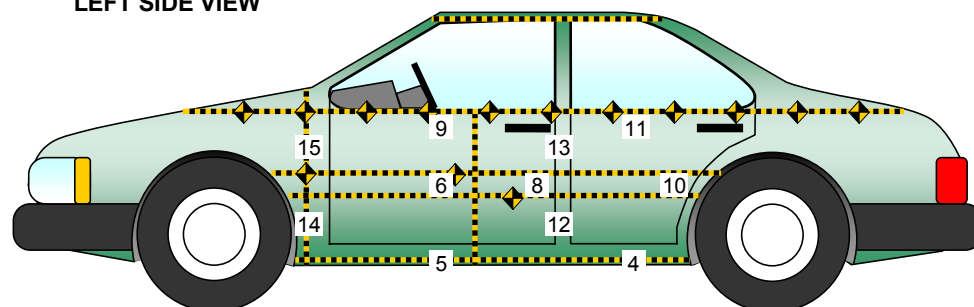
DATA SHEET NO. 15

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

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

NHTSA No. M55109
 Test Date: 09/15/04

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
 Test Program: NCAP Side Impact

NHTSA No. M55109
 Test Date: 09/15/04

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	2550	690	220	X	5.4	33	-9.4	10
					Y	28.7	19	-3.7	69
					Z	5.8	72	-6.8	20
					RES	29.9	20		
2	Right Sill at Rear Seat	1765	690	223	X	5.4	33	-8.8	10
					Y	28.9	7	-4.1	84
					Z	6.2	36	-10.0	23
					RES	29.3	7		
3	Rear Floorpan Above Axle	1005	0	510	X	3.2	55	-14.5	9
					Y	30.7	34	-4.3	84
					Z	9.2	38	-12.3	53
					RES	32.2	8		
4	Left Sill at Rear Door	1750	-690	220	Y	34.4	15	-9.6	81
5	Left Sill at Front Door	2580	-690	221	Y	32.1	14	-13.2	8
6	Left Front Door C/L	2611	-770	440	Y	60.9	4	-44.3	8
7	Rear Occupant Compartment	1836	-300	330	Y	27.9	20	-3.4	85
8	Left Front Door Mid-Rear	2362	-770	440	Y	164.0	5	-76.7	21
9	Left Front Door Upper C/L	2628	-770	665	Y	89.2	6	-64.1	22
10	Left Rear Door Mid-Rear	1428	-770	665	Y	96.6	8	-67.6	26
11	Left Rear Door Upper C/L	1682	-770	730	Y	178.0	8	-64.4	24
12	Left Lower B-Post	2070	-690	558	Y	156.6	4	-91.3	19
13	Left Middle B-Post	2040	-690	894	Y	135.0	4	-67.7	23
14	Left Lower A-Post	2987	-680	318	Y	78.2	10	-68.6	17
15	Left Middle A-Post	3110	-756	870	Y	56.0	3	-23.6	18
16	Front Seat Track				Y	88.2	12	-64.3	18
17	Rear Seat Track or Structure				Y				
18	Vehicle CG	2595	0	340	X	3.6	55	-11.8	8
					Y	28.4	18	-1.6	148
					Z	10.0	44	-4.3	35
					RES	28.4	18		

See reference points on the following page.

DATA SHEET NO. 15...(continued)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

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

NHTSA No. M55109
Test Date: 09/15/04

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

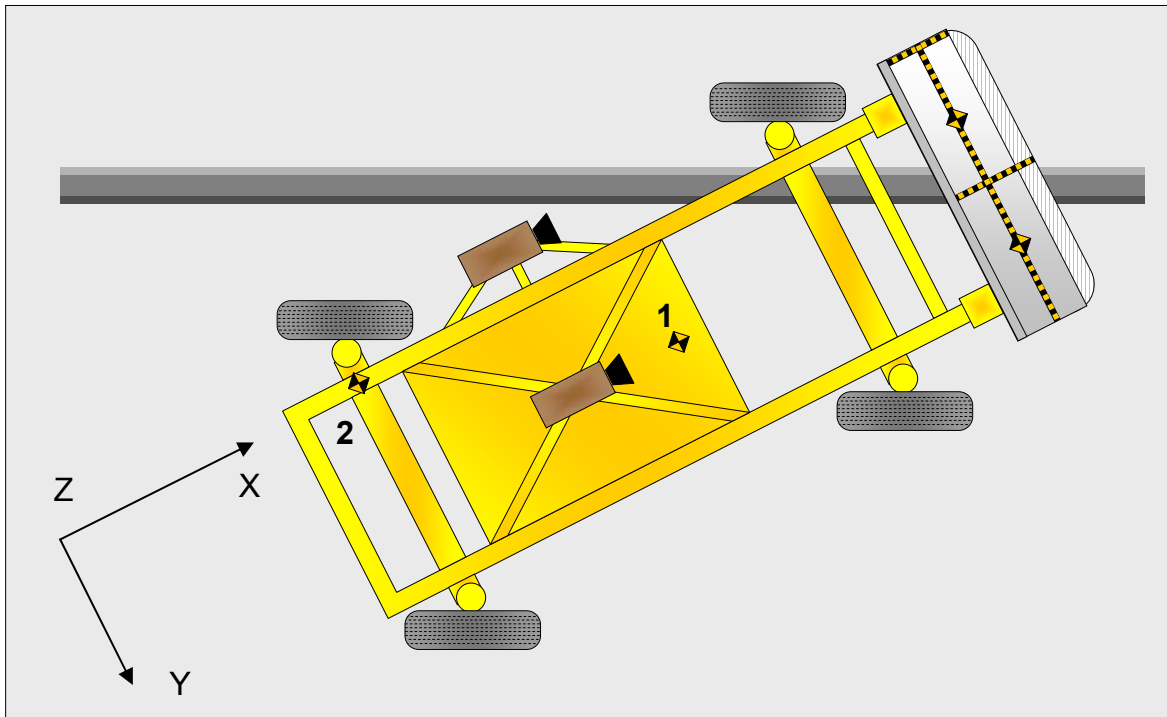
Test Vehicle: 2005 Toyota Corolla
 Test Program: NCAP Side Impact

NHTSA No. M55109
 Test Date: 09/15/04

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	*	*	*	*
					Y	3.6	56	-8.0	34
					Z	37.3	57	-22.2	63
					RES	38.7	57		
2	MDB Rear	-2591	-625	-622	X	1.9	107	-23.2	32
					Y	4.6	36	-2.0	58
					Z	4.9	21	-3.6	53
					RES	23.8	32		

* No valid data collected after 100ms
 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
 Test Program: NCAP Side Impact

NHTSA No. M55109
 Test Date: 09/15/04

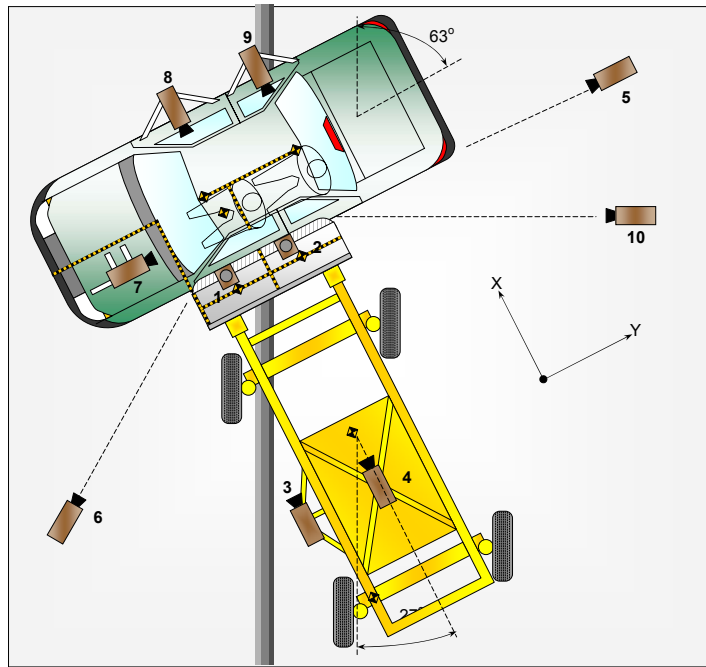
	Elements	Pre-Test (mm)
1	Total Length	4529
2	Total Width	1704
3	Bumper Top Height	650
4	Bumper Bottom Height	505
5	Longitudinal Member Top Height	335
6	Distance between Longitudinal Members	1020
7	Longitudinal Member Width	67
8	Engine Top Height	930
9	Engine Bottom Height	295
10	Engine and gearbox width	895
11	Front bumper-engine distance	410
12	Front shock absorber fixing height	972
13	Bonnet leading edge height	860
14	Front shock absorber fixing width	1140
15	Front bumper – front axle distance	930
16	Front axle – a pillar distance	430
17	A-pillar – B-pillar distance	1075
18	B-Pillar – rear axle distance	1094
19	B-pillar – C-pillar distance	1000
20	Roof sill bottom height	1415
21	Roof sill top height	1465
22	Floor sill bottom height	260
23	Floor sill top height	317

DATA SHEET NO. 18

HIGH SPEED CAMERA LOCATIONS AND DATA

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

NHTSA No. M55109
 Test Date: 09/15/04



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Close-up	160	0	5050	14	1000
2	Overhead Overall	0	1680	5900	50	1000
3	MDB Onboard, Impact Point Close-up				25	*
4	MDB Onboard, Centerline of Impact				13	*
5	Right Side, Ground Level, Overall	200	7380	1495	19	1000
6	Left Side, Ground Level, Overall	200	-5200	1510	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

* Camera did not run.

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
Test Program: NCAP Side Impact

NHTSA No. M55109
Test Date: 09/15/04

Test Time: 12:15 pm

Temperature at Time of Impact: 21°C

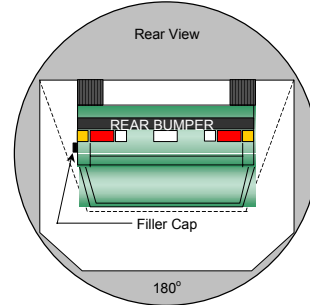
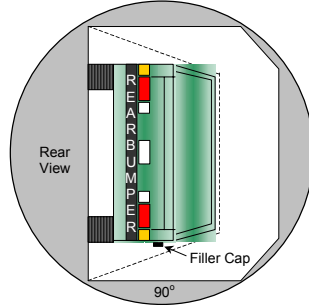
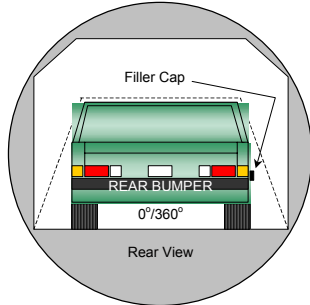
STODDARD SOLVENT SPILLAGE MEASUREMENTS

- 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

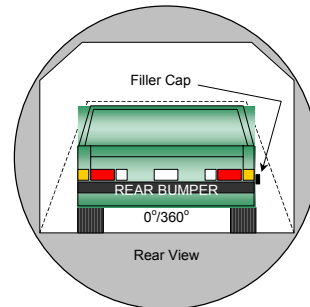
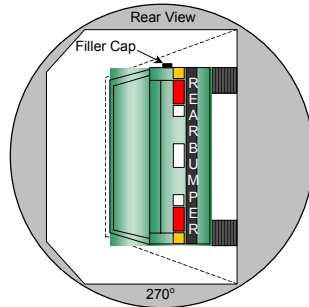
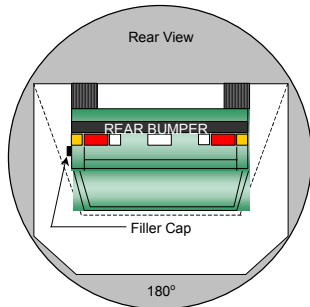
Test Vehicle: 2005 Toyota Corolla
 Test Program: NCAP Side Impact

NHTSA No. M55109
 Test Date: 09/15/04



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°	164	300	0
90° to 180°	151	300	0
180° to 270°	136	300	0
270° to 360°	161	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

A-3.

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MFD. BY: NEW UNITED MOTOR MANUFACTURING
INC. 07/04

GVWR 3585LB GAWR FR 1885LB RR 1720LB
THIS VEHICLE CONFORMS TO ALL APPLICABLE
FEDERAL MOTOR VEHICLE SAFETY, BUMPER AND
THEFT PREVENTION STANDARDS IN EFFECT ON
THE DATE OF MANUFACTURE SHOWN ABOVE.

1NXBR32E55Z375077 PASS CAR



C/TR: 1E3/FA11
A/TM: -02A/A245E

MODEL: ZZE130L-DEPDKA

BA3519248

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	
P185/65R15	FRONT	210kPa, 30PSI
	REAR	210kPa, 30PSI
COMPACT SPARE TIRE	COLD TIRE INFLATION PRESSURE	
T125/70R16	420kPa, 60PSI	

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

02480

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	
P185/65R15	AVANT	210kPa, 30PSI
	ARRIÈRE	210kPa, 30PSI
ROUE DE SECOURS COMPACTE	PRESSION DE GONFLAGE À FROID	
T125/70R16	420kPa, 60PSI	

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

NO



Pre-Test Front View of Test Vehicle



Post-Test Front View of Test Vehicle



Pre-Test Left Front ¾ View of Test Vehicle

A-8.



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

A-9.



Pre-Test Left Side View of Test Vehicle

A-10.



Post-Test Left Side View of Test Vehicle



Pre-Test Left Rear ¼ View of Test Vehicle

A-12.



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

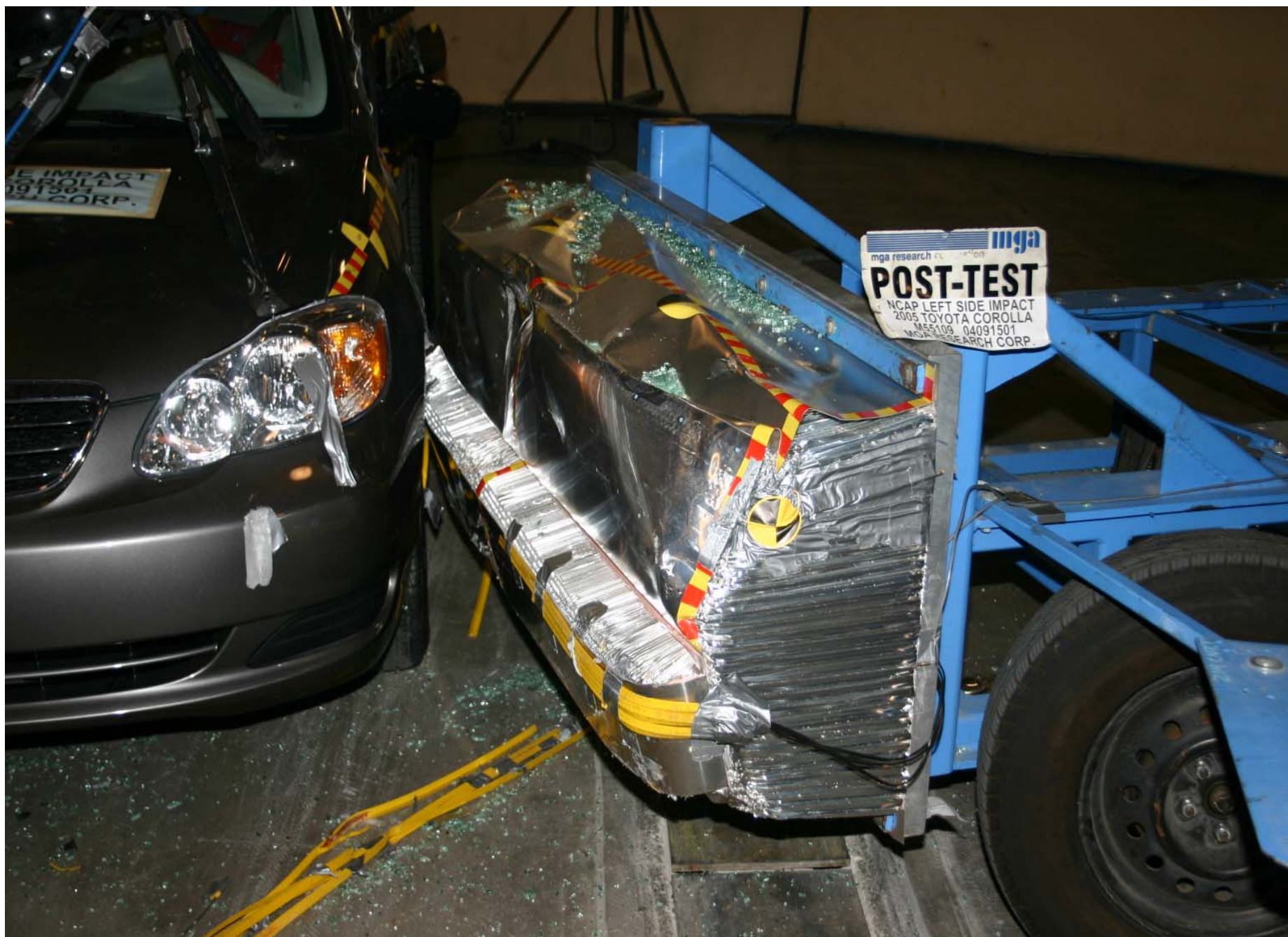


Pre-Test MDB (right side) Positioned Against Vehicle



A-17.

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

A-21.



Pre-Test Impact Point on Vehicle

A-22.



Post-Test Impact Point on Vehicle



Pre-Test Fuel Filler Cap View

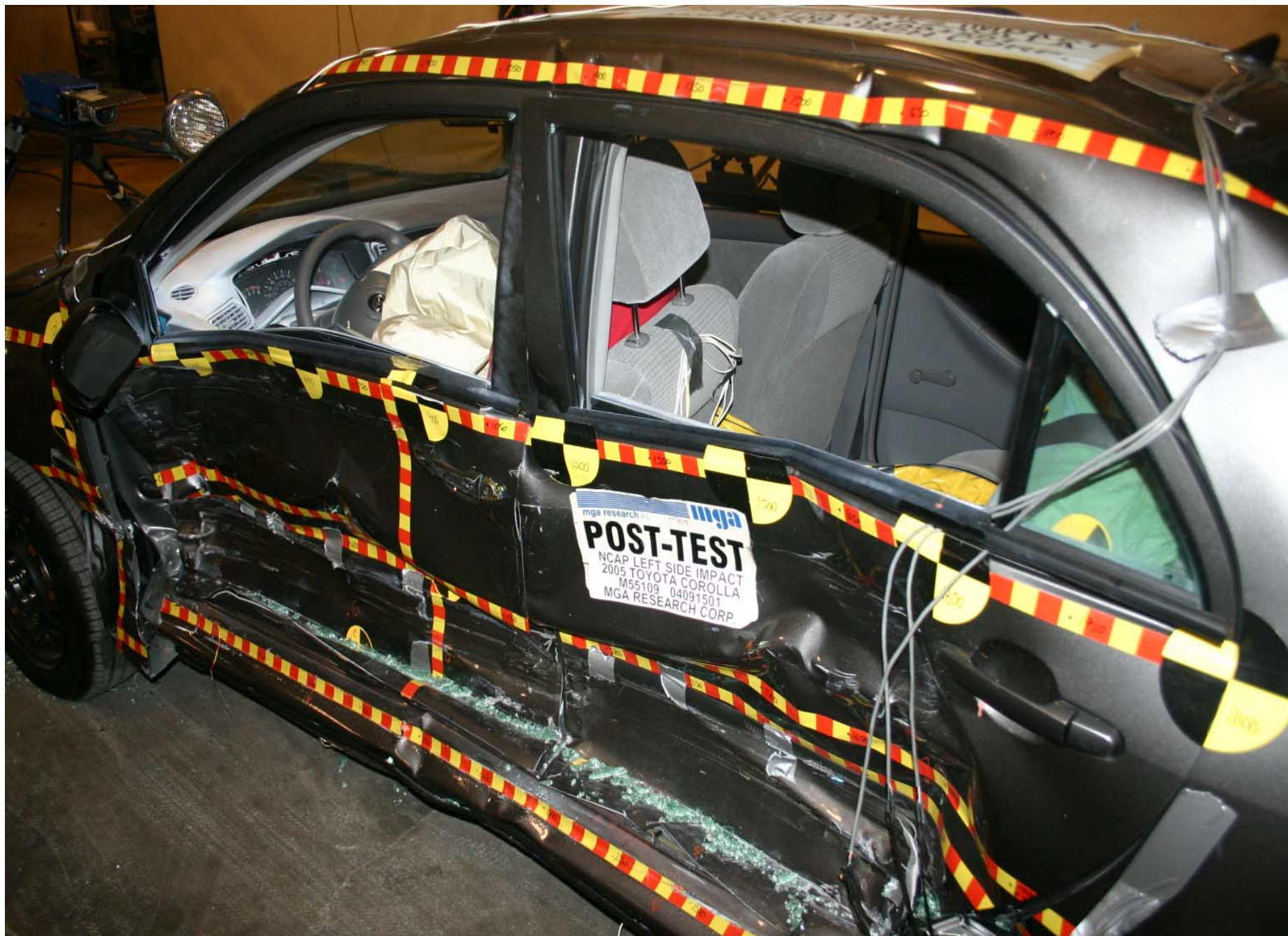
A-24.



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)

A-30.



Pre-Test Driver Dummy Left Side View

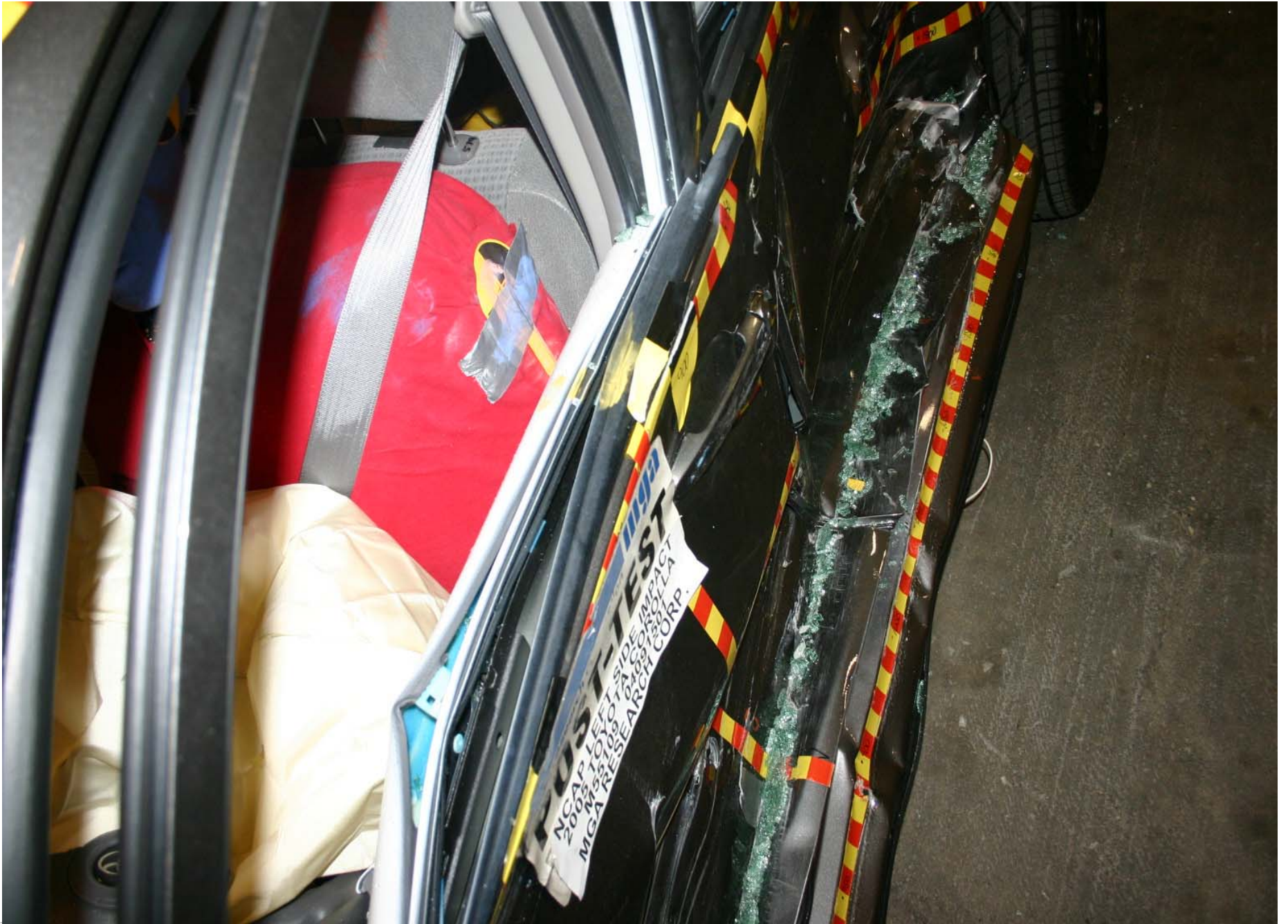


Post-Test Driver Dummy Left Side View



Pre-Test Driver Dummy Shoulder and Door Top View

A-33.



Post-Test Driver Dummy Shoulder and Door Top View

A-34.



Pre-Test Driver Dummy Right Side View

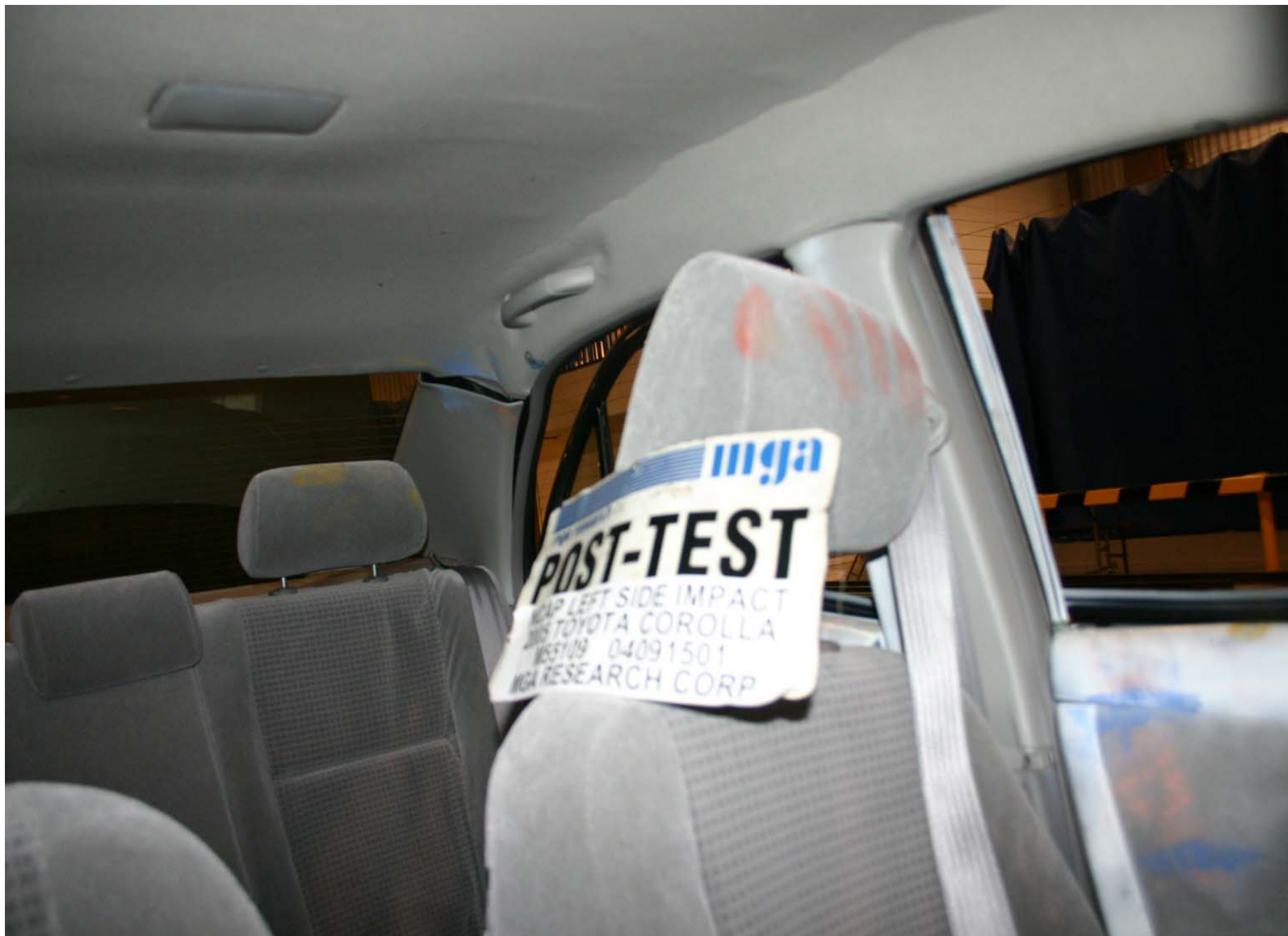


Post-Test Driver Dummy Right Side View

A-36.



Post-Test Driver Dummy Contact



Post-Test Driver Dummy Head Contact



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

A-39.



Pre-Test Passenger Dummy Left Side View



Post-Test Passenger Dummy Left Side View

A-41.



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

A-44.



Post-Test Passenger Dummy Right Side View

A-45.

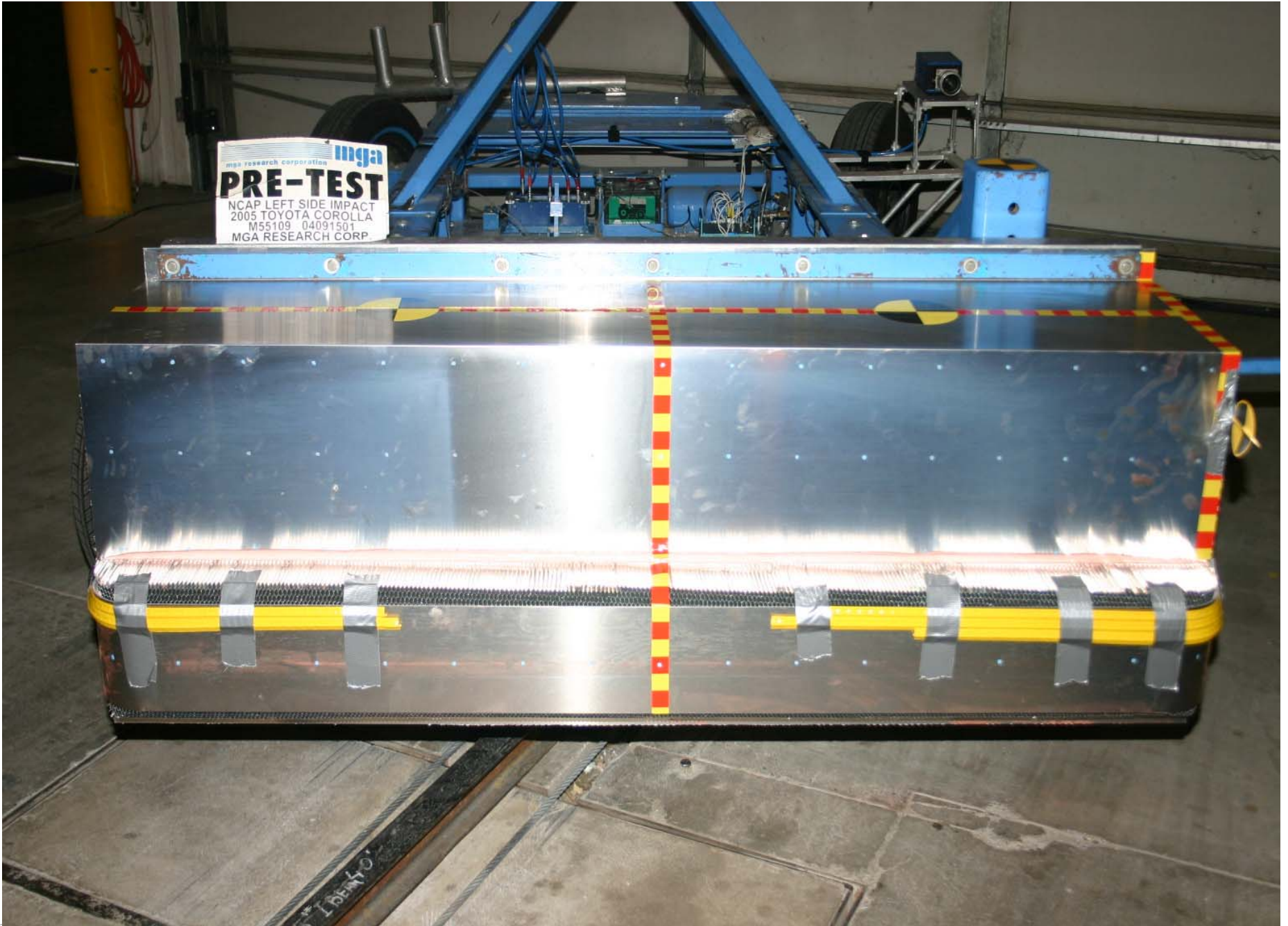


Post-Test Passenger Dummy Contact



Post-Test Passenger Dummy Head Contact

A-47.

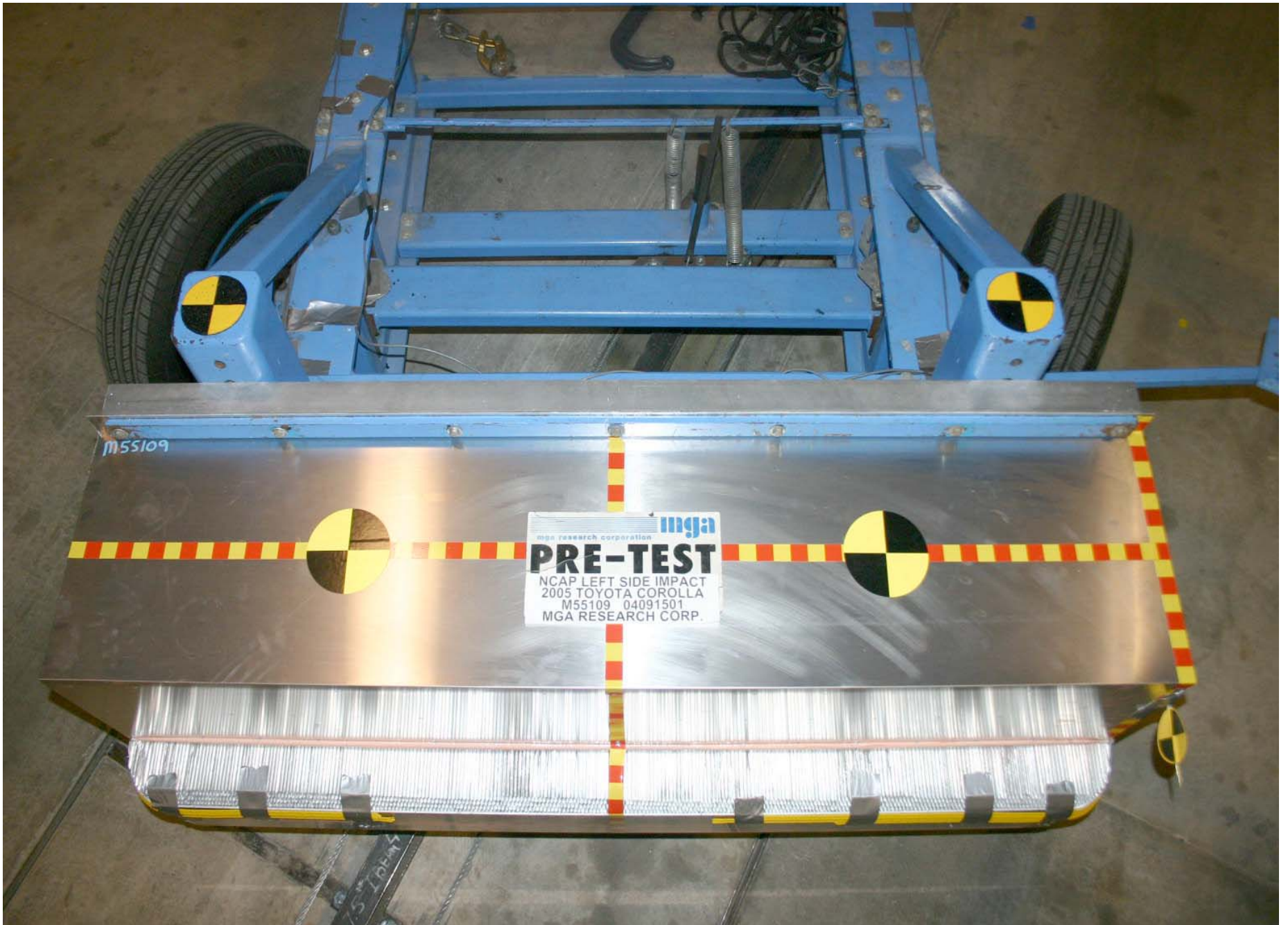


Pre-Test MDB Front View

A-48.



Post-Test MDB Front View



Pre-Test MDB Top View

A-50.



Post-Test MDB Top View



A-51.

Pre-Test MDB Right Side View

A-52.



Post-Test MDB Right Side View

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Pre-Test MDB Left Side View

A-54.



Post-Test MDB Left Side View



A-55.

Rollover 90 Degrees

A-56.



Rollover 180 Degrees

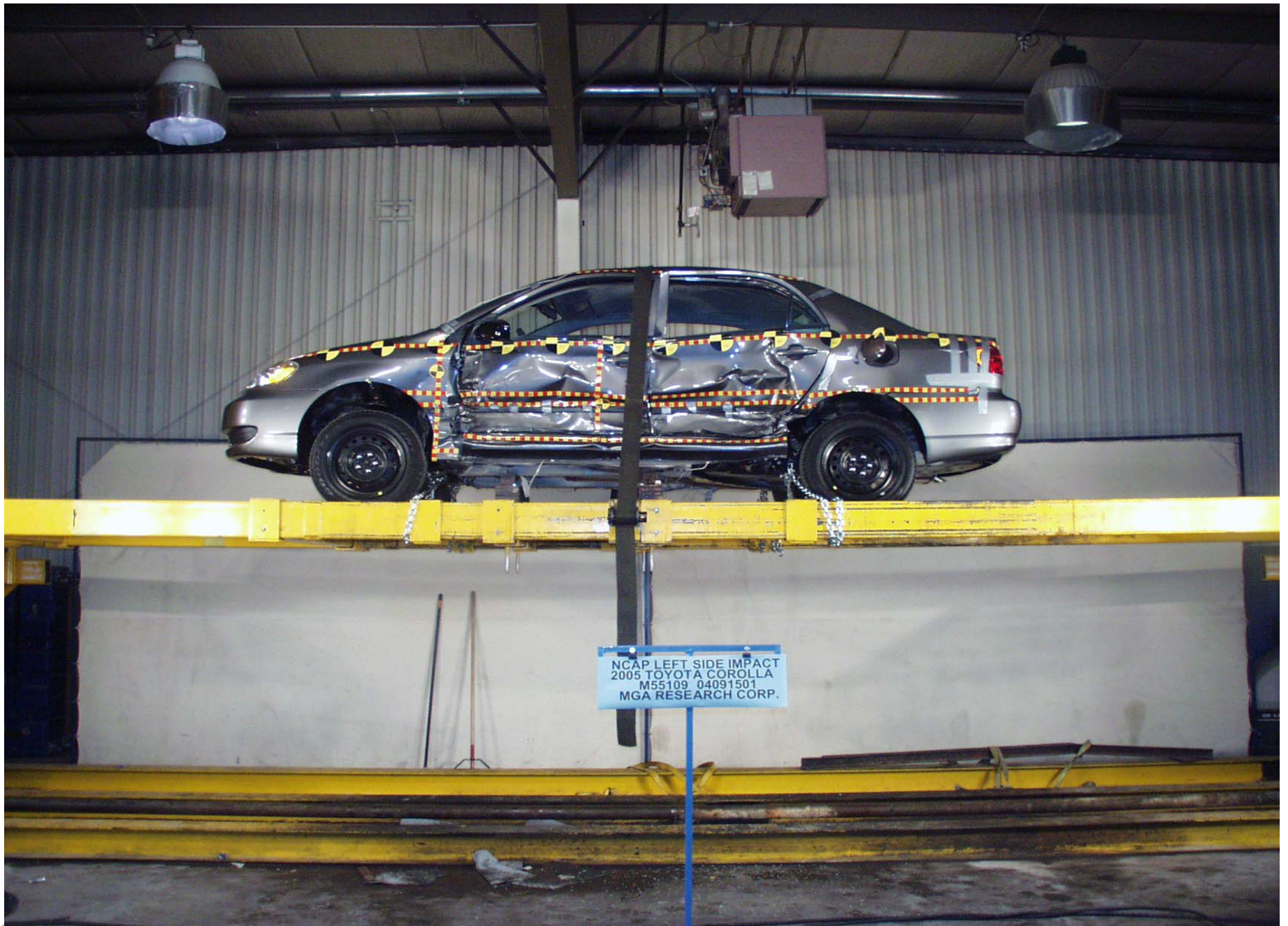
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NCAP LEFT SIDE IMPACT
2005 TOYOTA COROLLA
M55109 04091501
MGA RESEARCH CORP.

Rollover 270 Degrees

A-58.



Rollover 360 Degrees

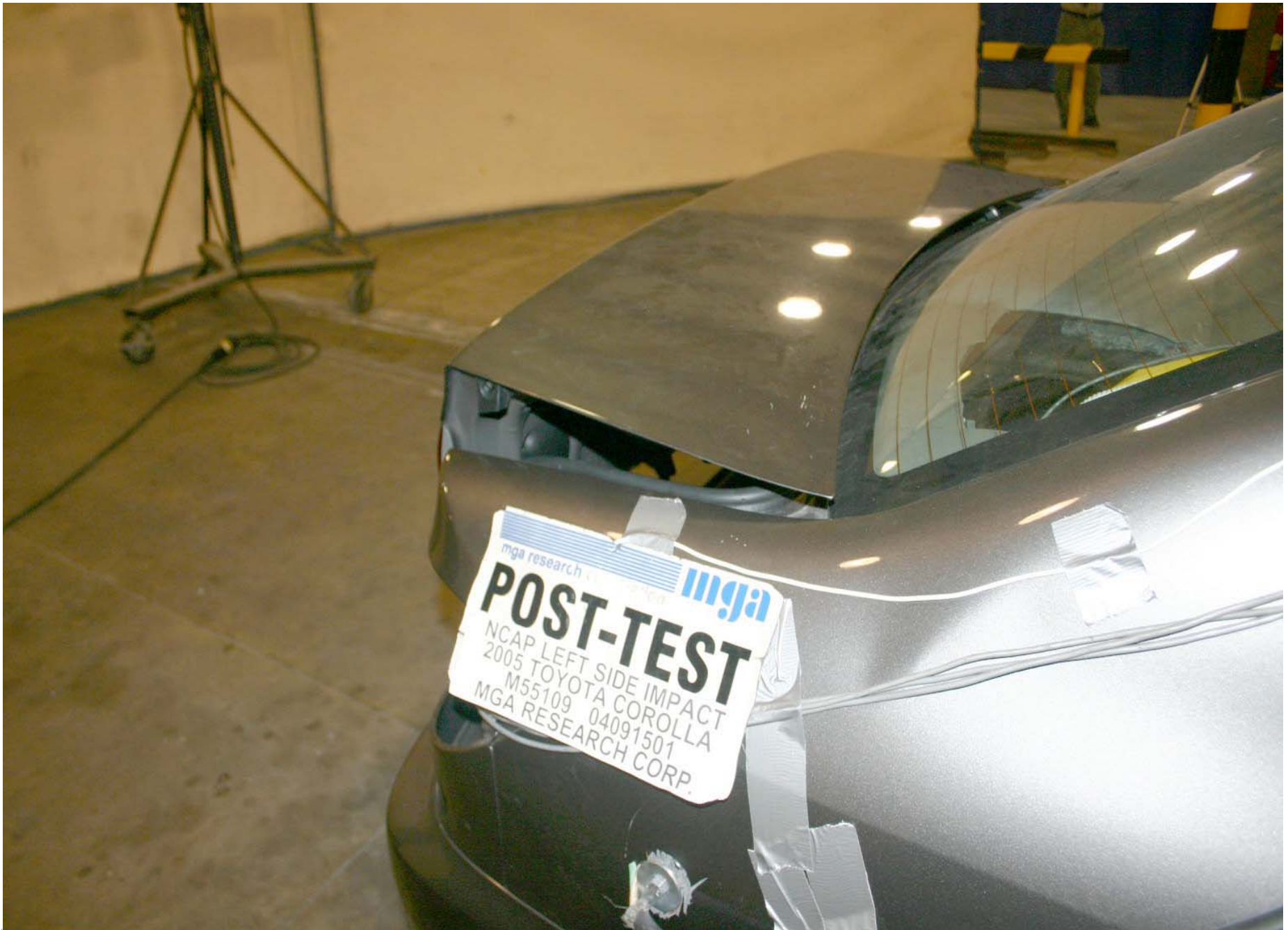
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Vehicle Impact



Post-Test Trunk Left Side View



Post-Test Trunk Right Side View



Post-Test Fuel Filler Cap View

APPENDIX B

SID/HIII, VEHICLE, AND MDB RESPONSE DATA

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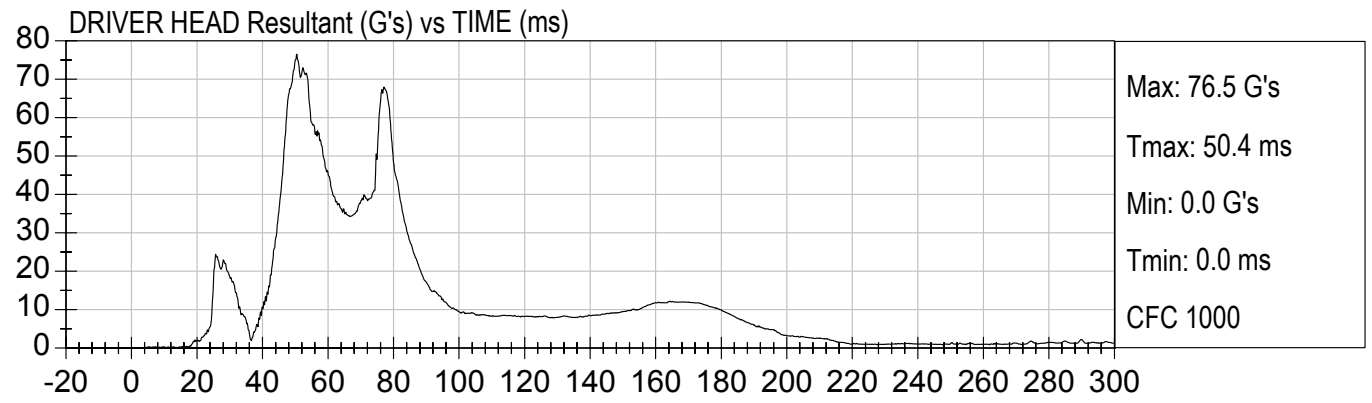
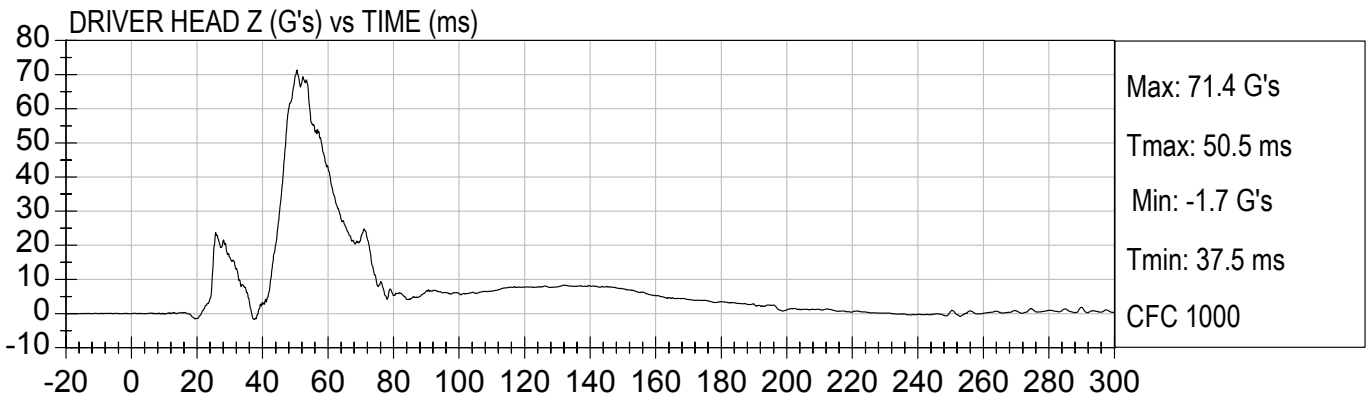
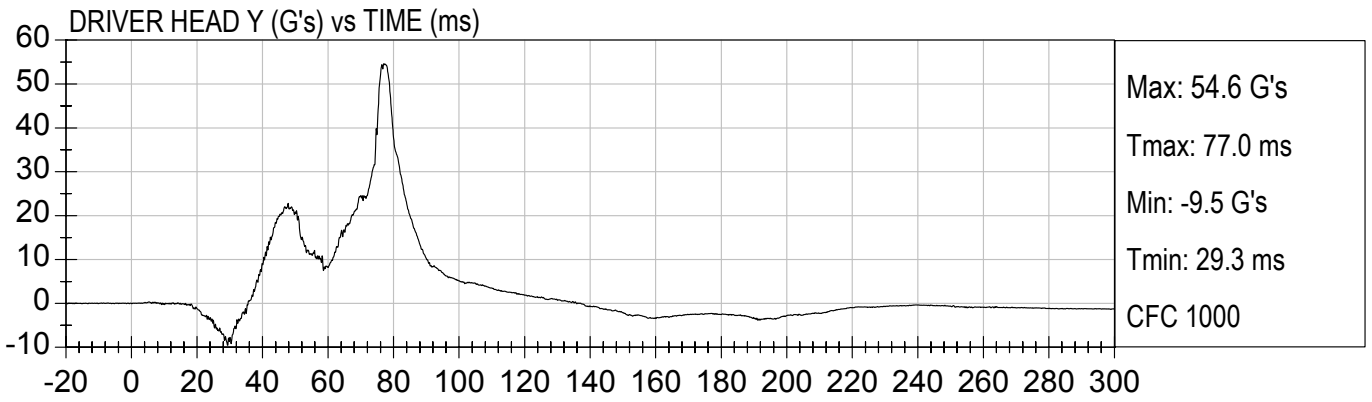
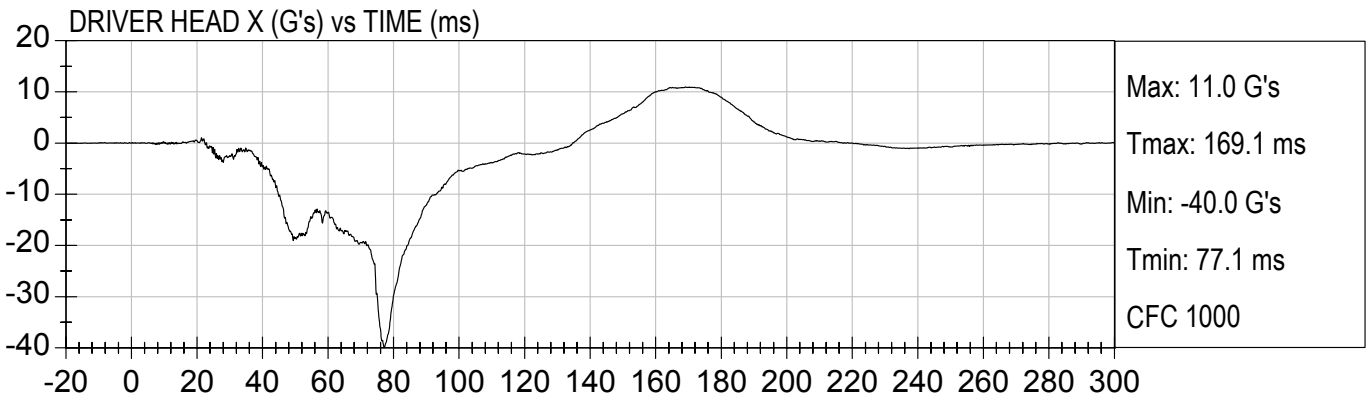
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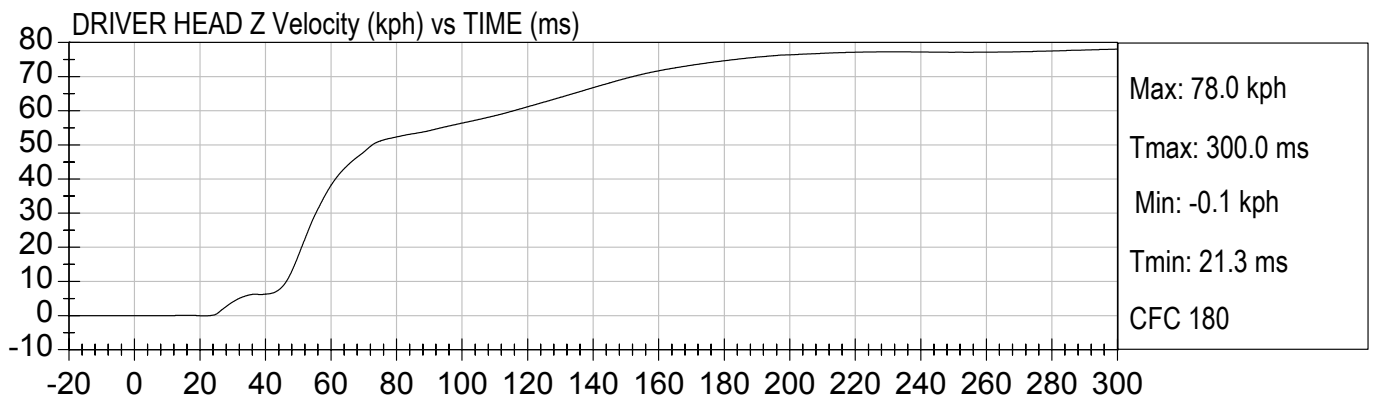
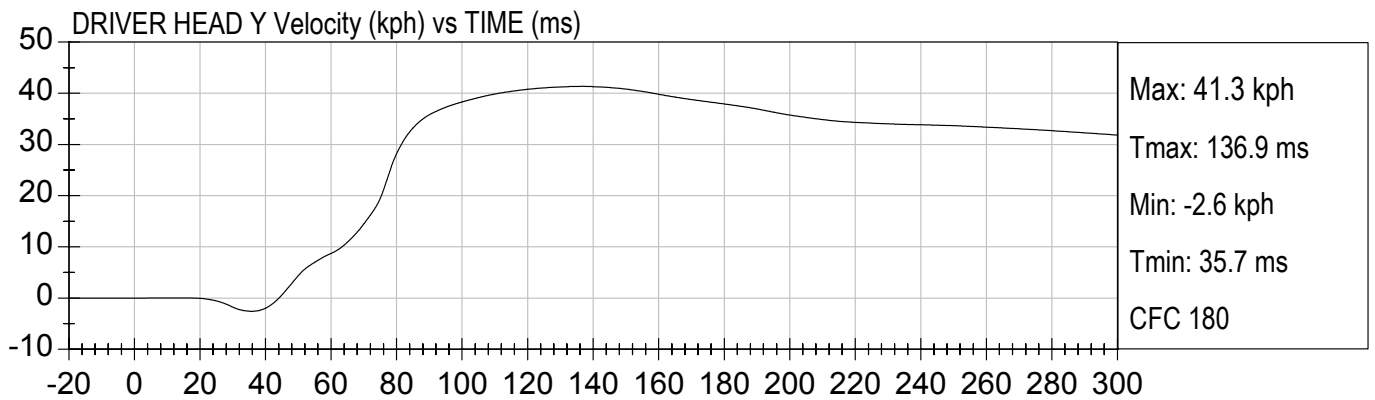
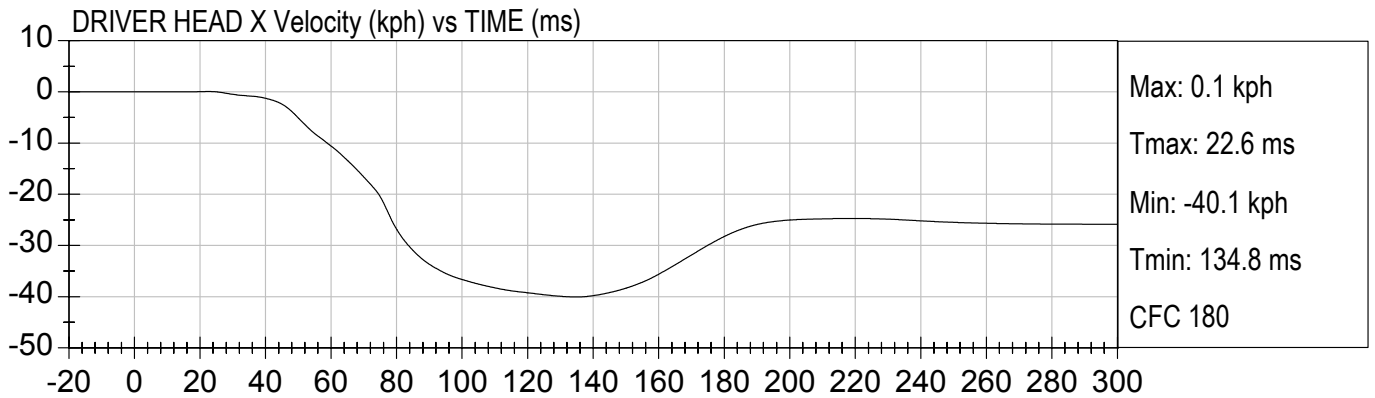
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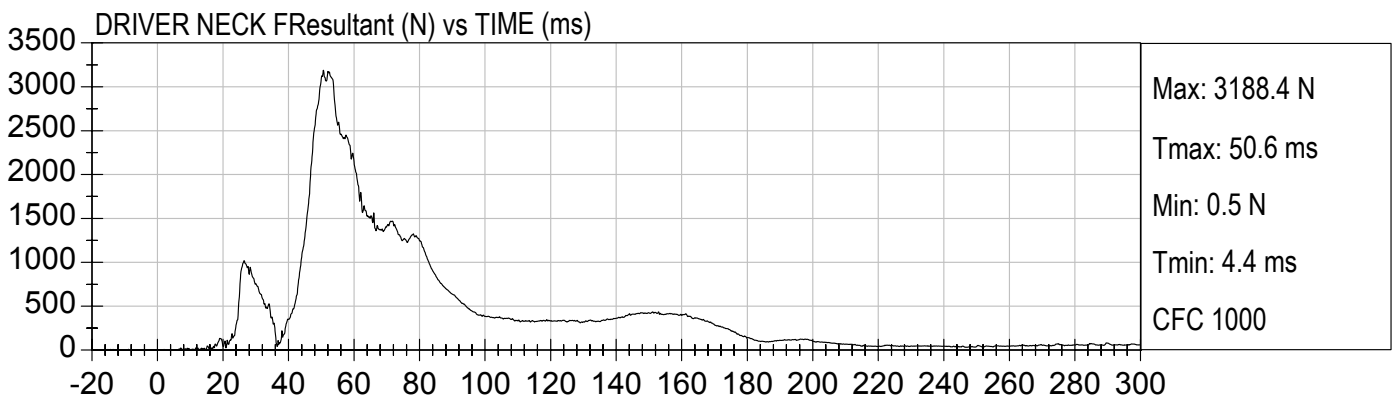
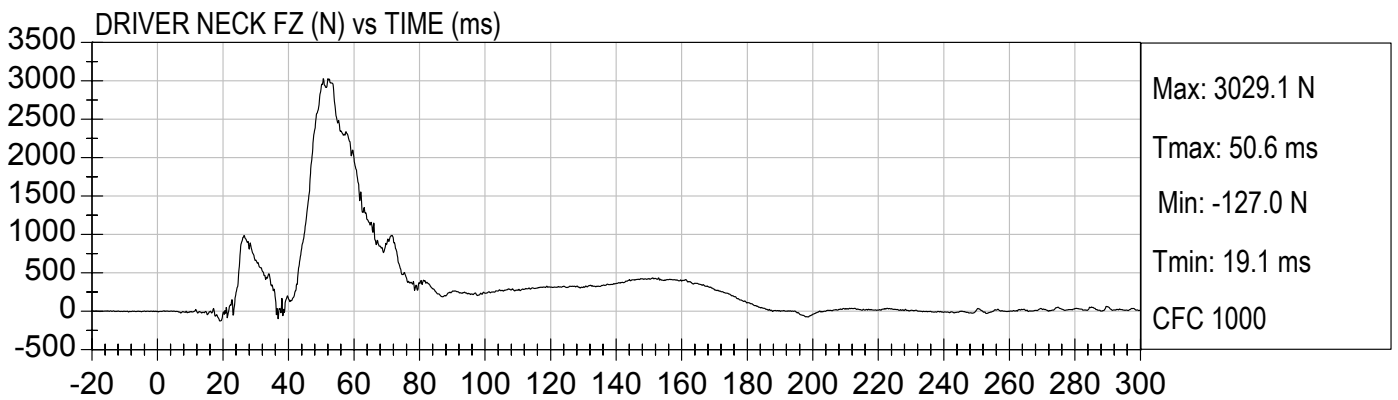
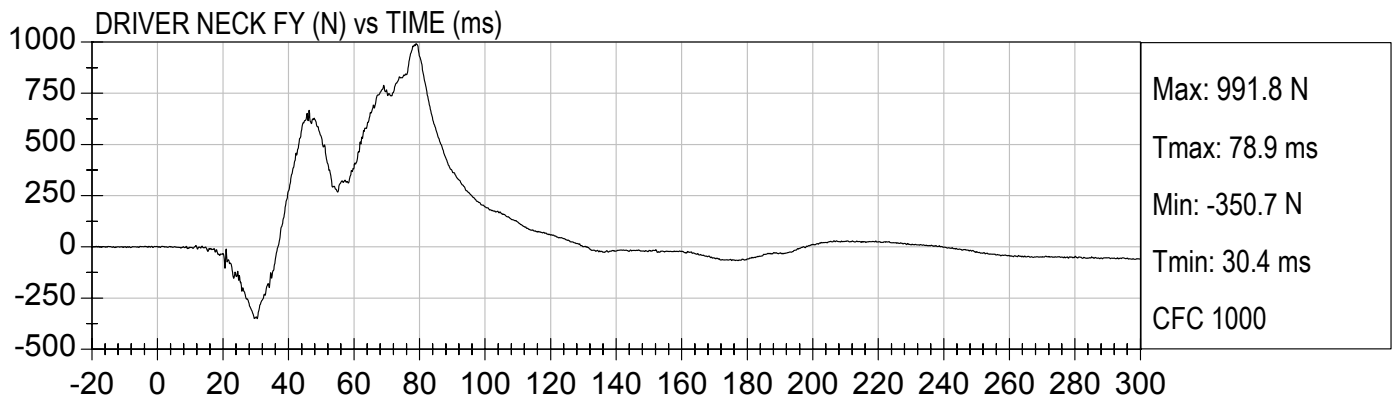
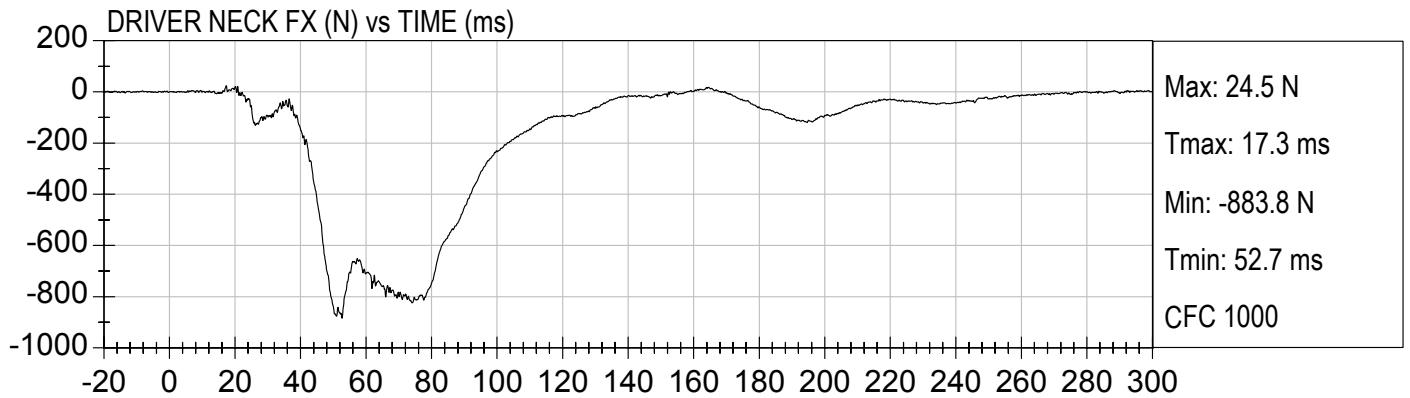
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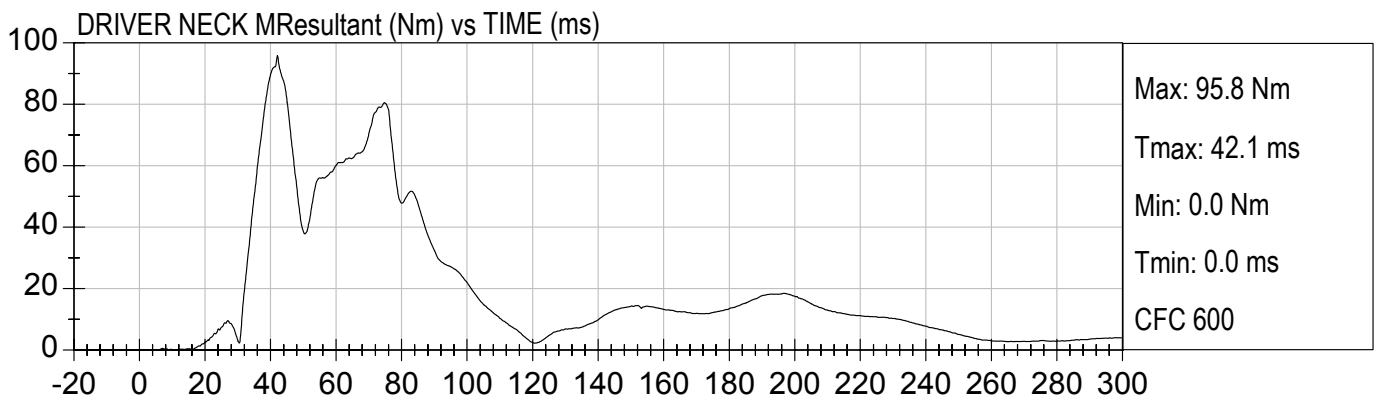
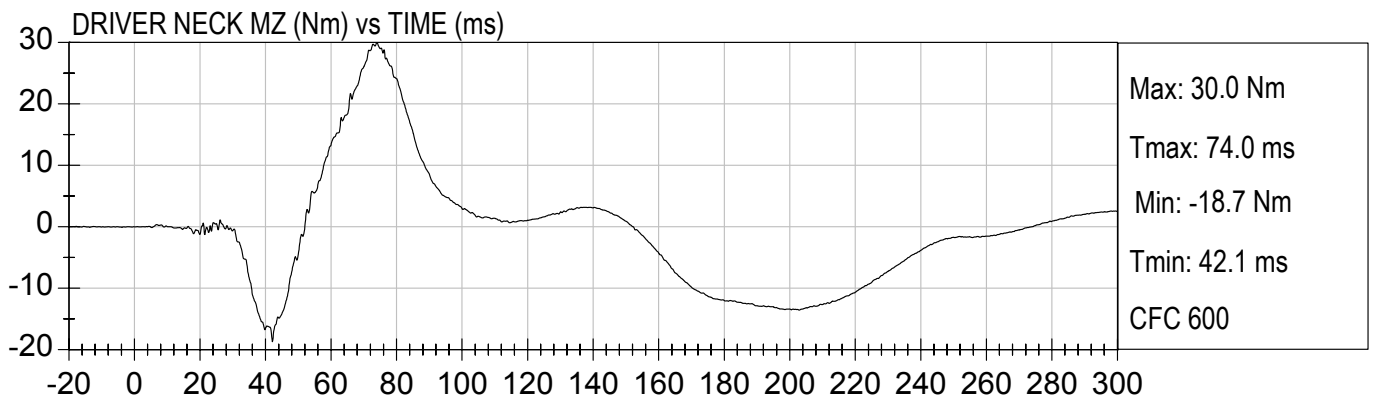
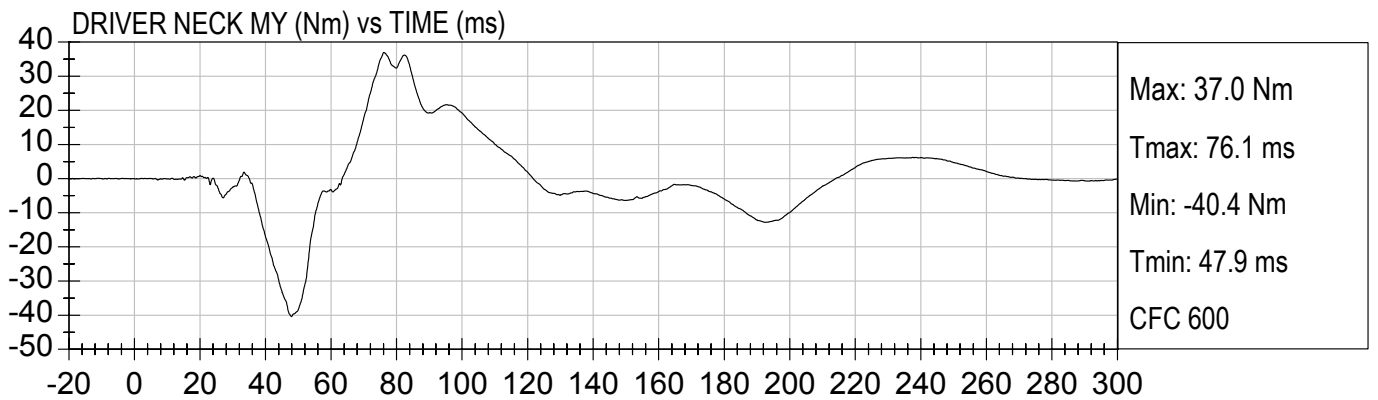
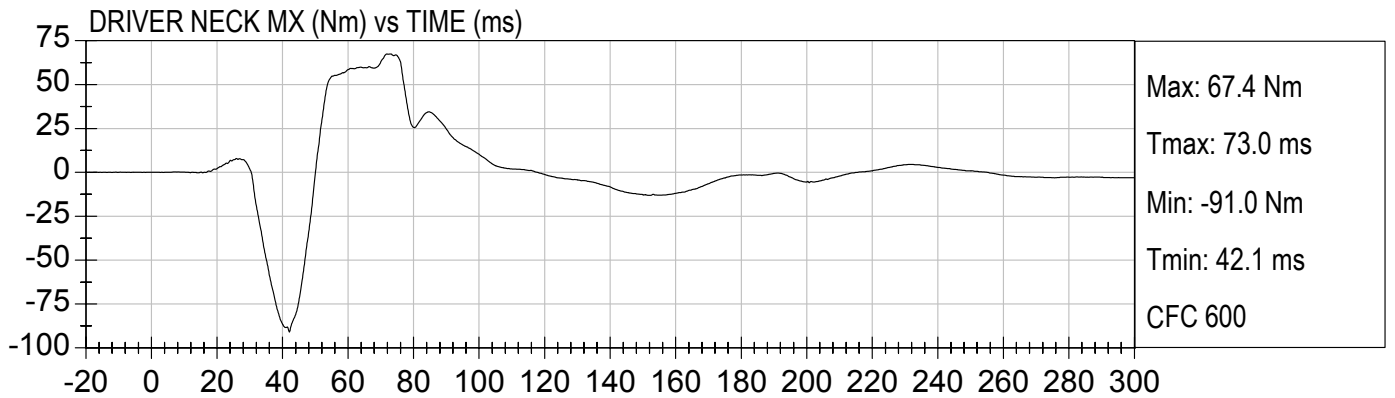
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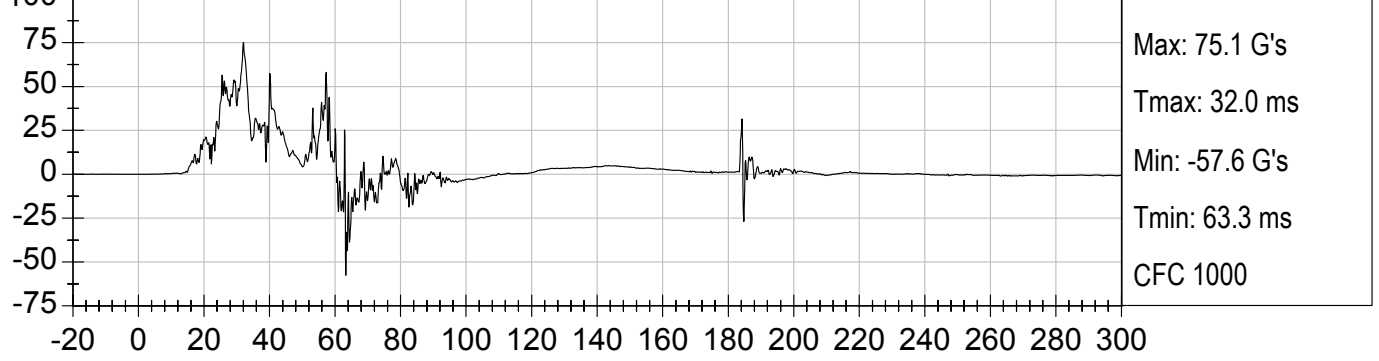




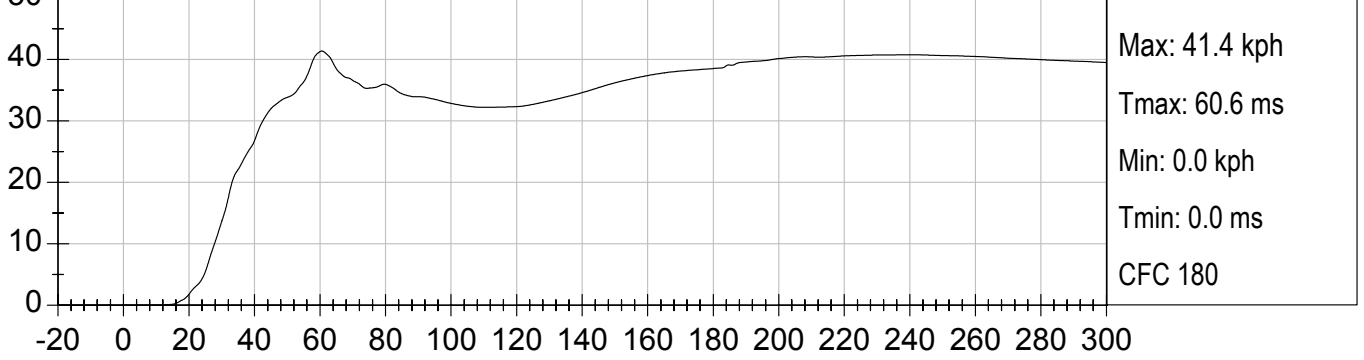




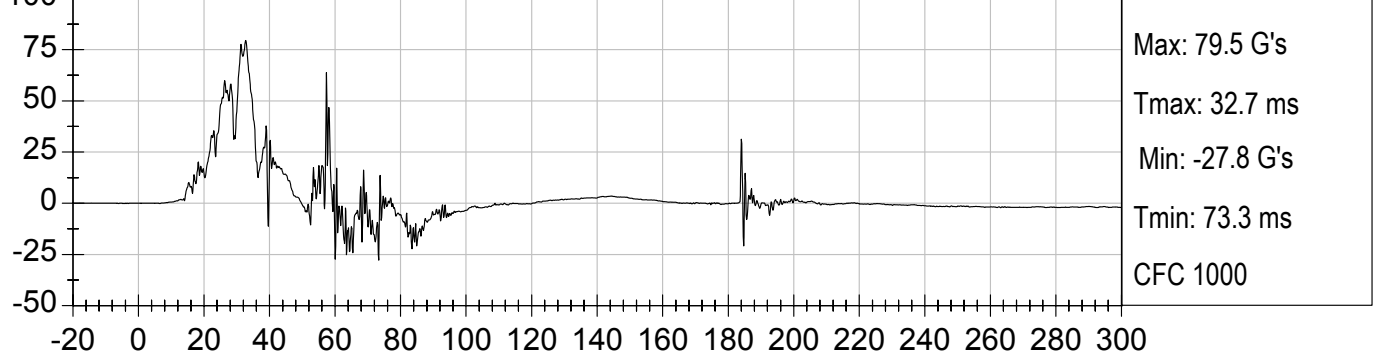
DRIVER UPPER RIB Y (G's) vs TIME (ms)



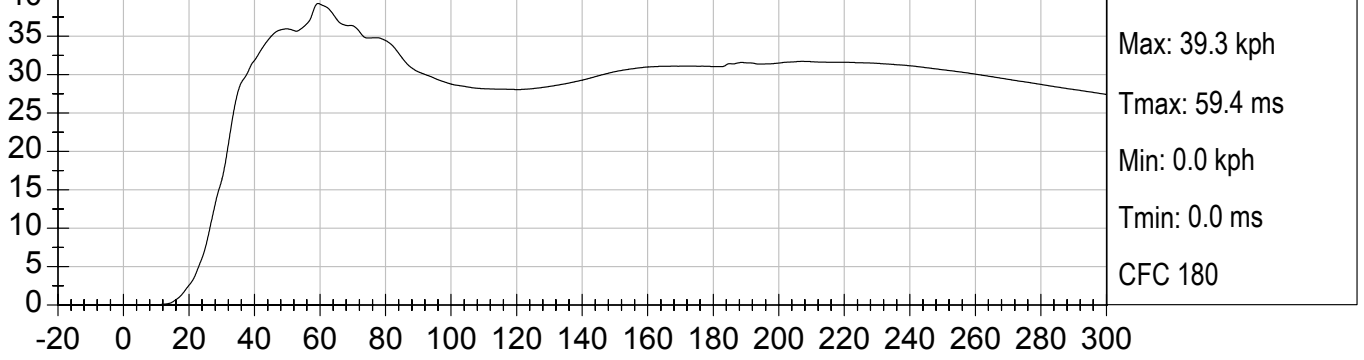
DRIVER UPPER RIB Y Velocity (kph) vs TIME (ms)

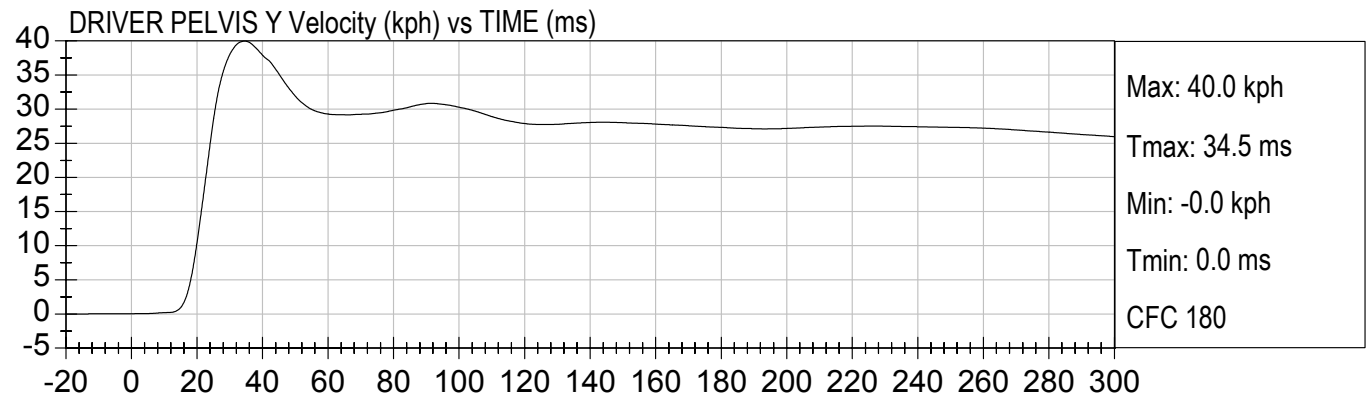
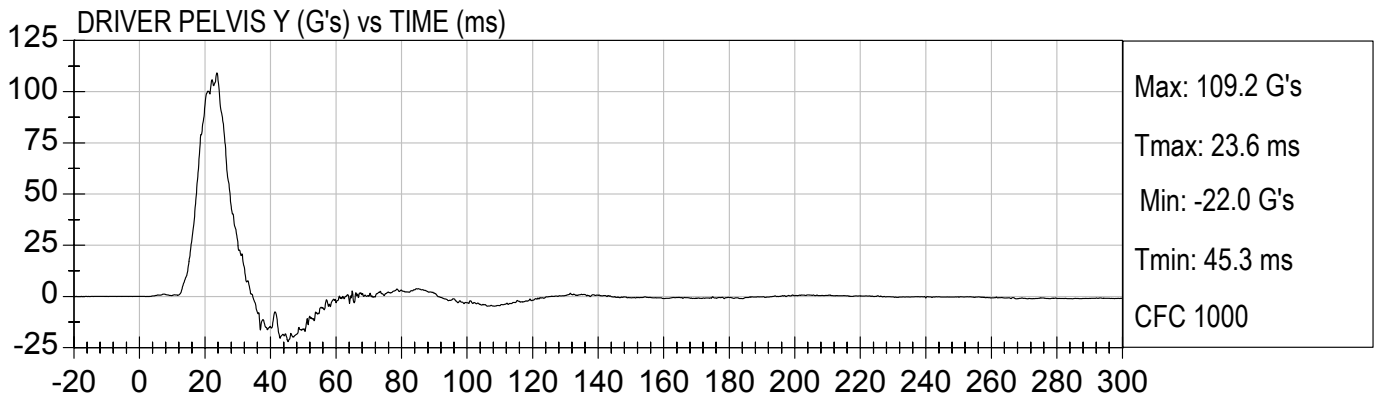
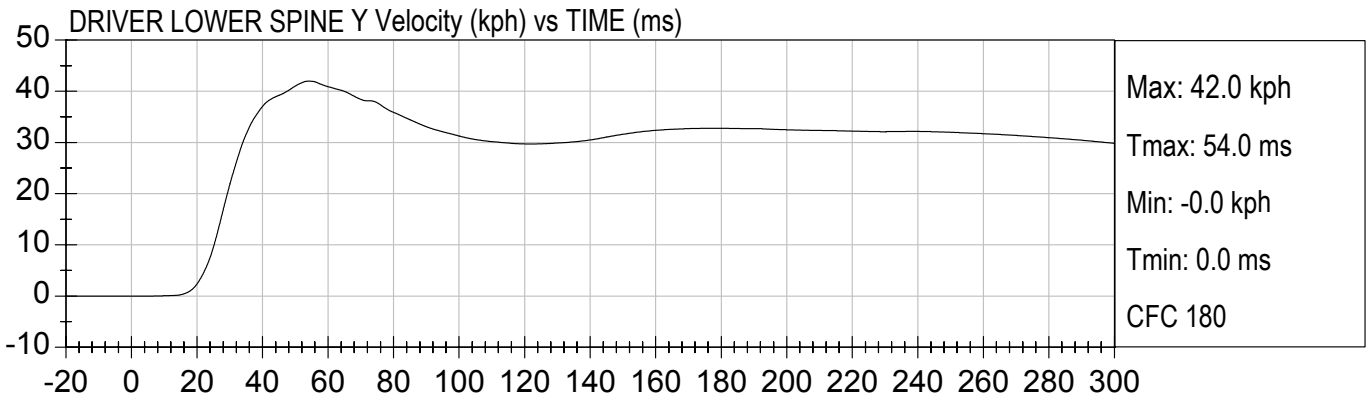
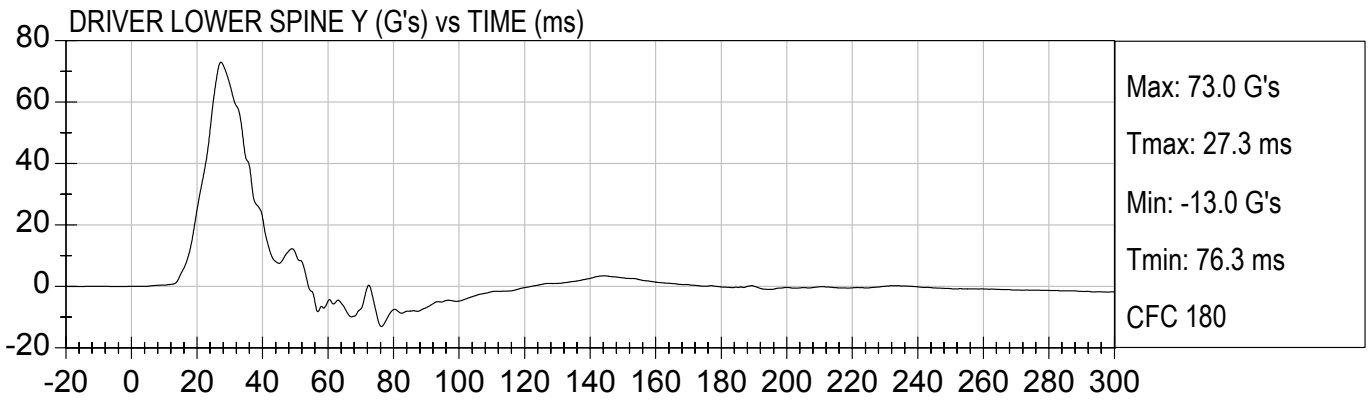


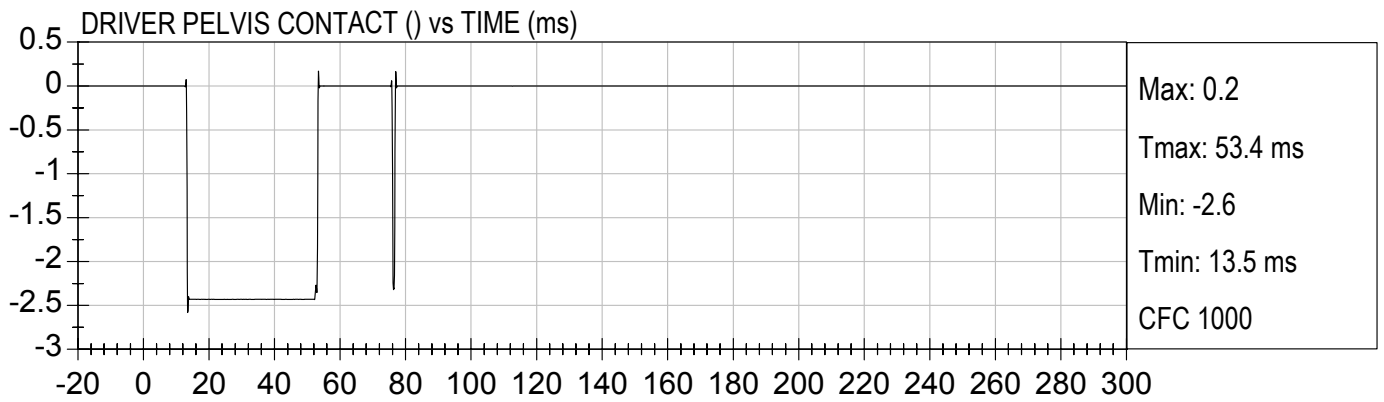
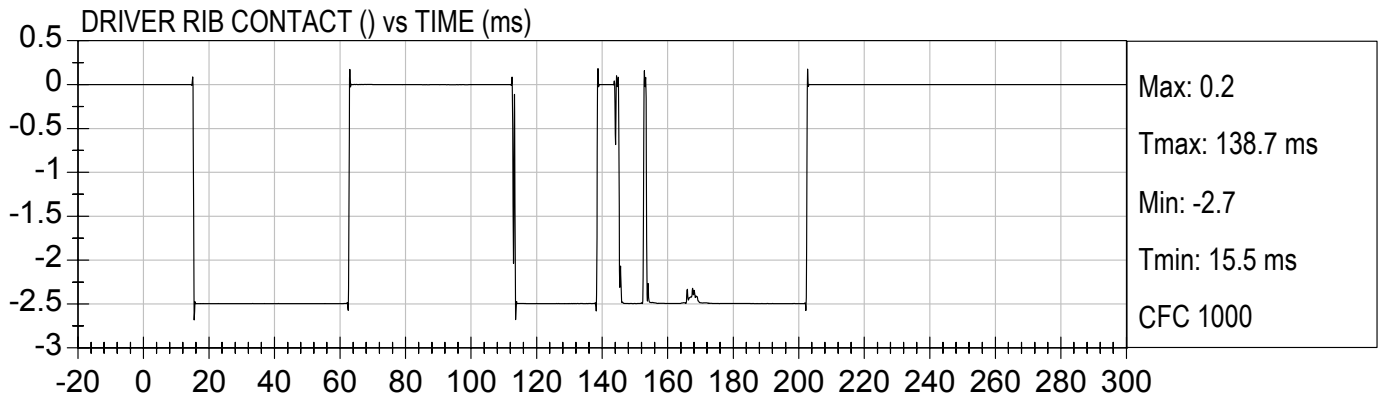
DRIVER LOWER RIB Y (G's) vs TIME (ms)

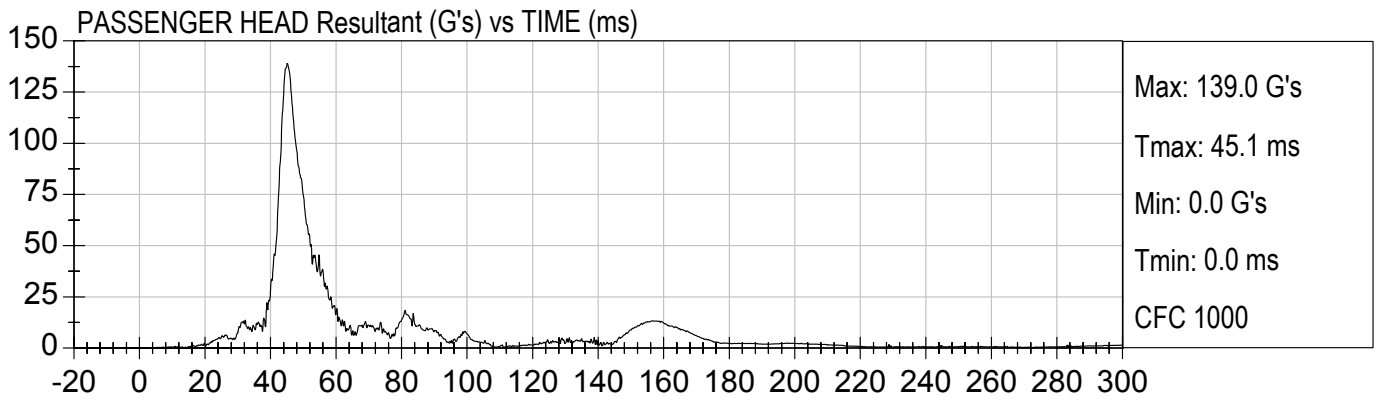
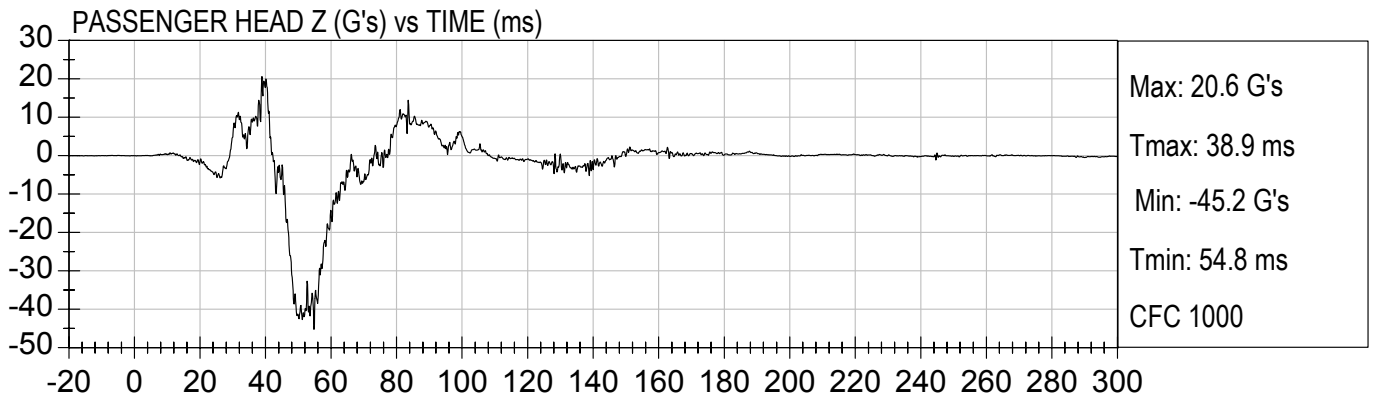
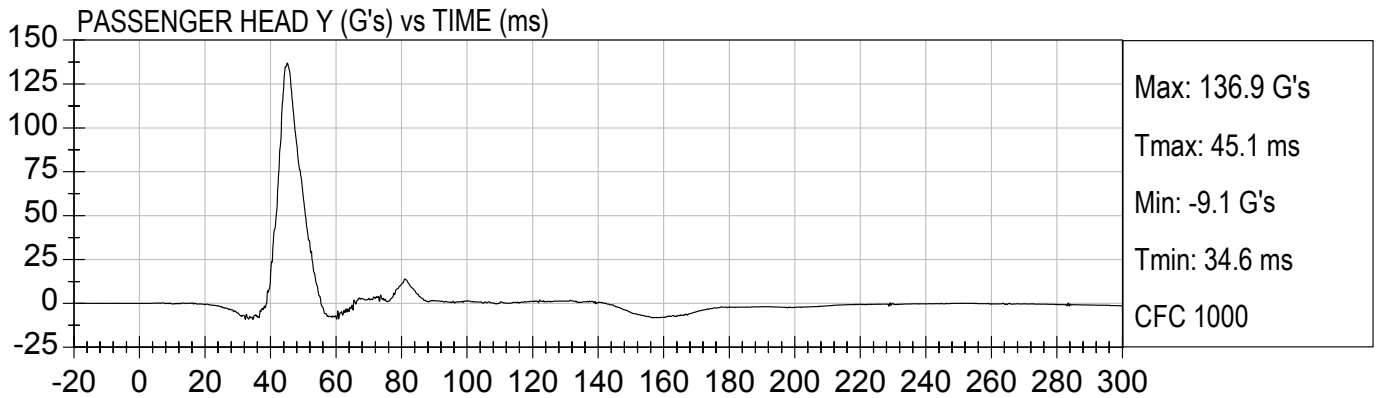
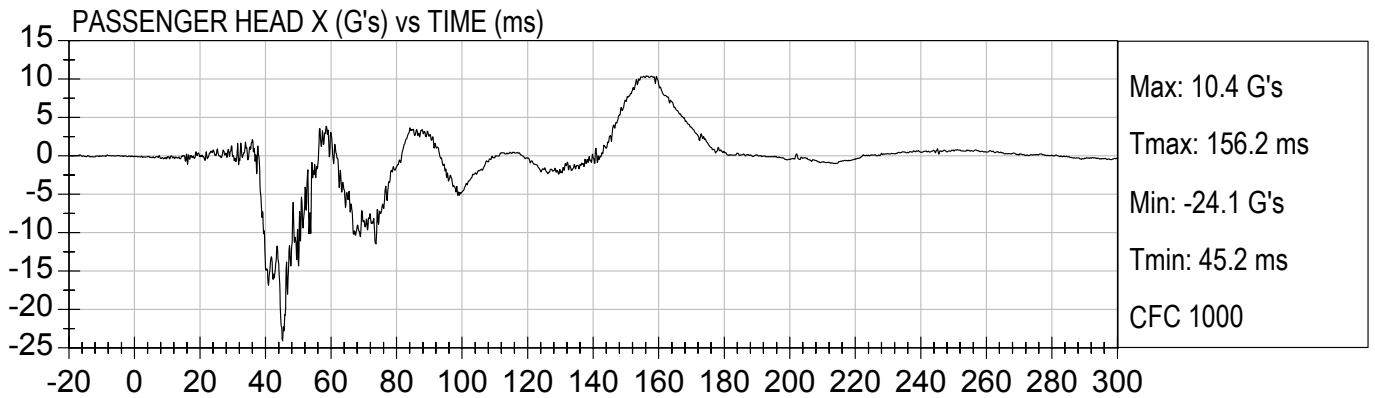


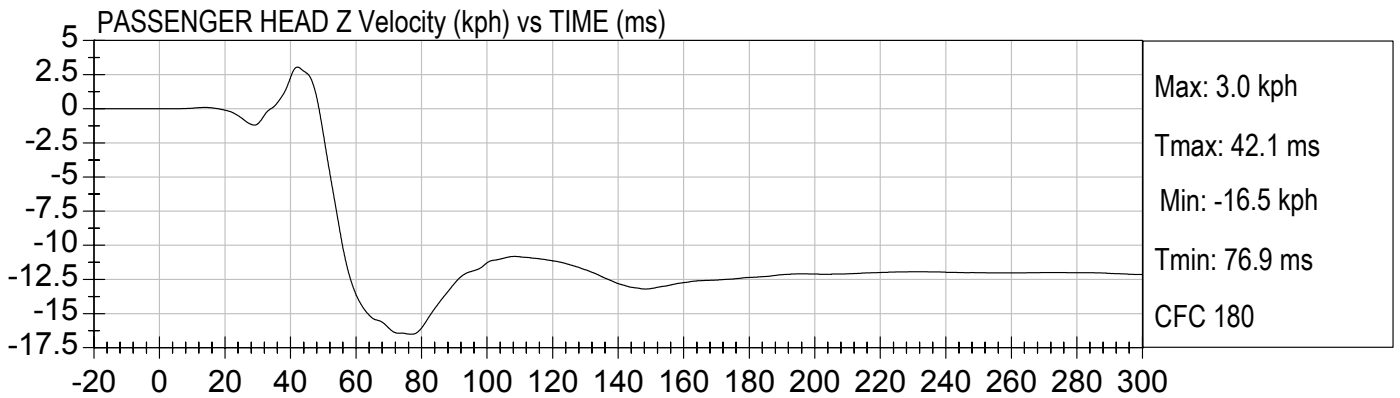
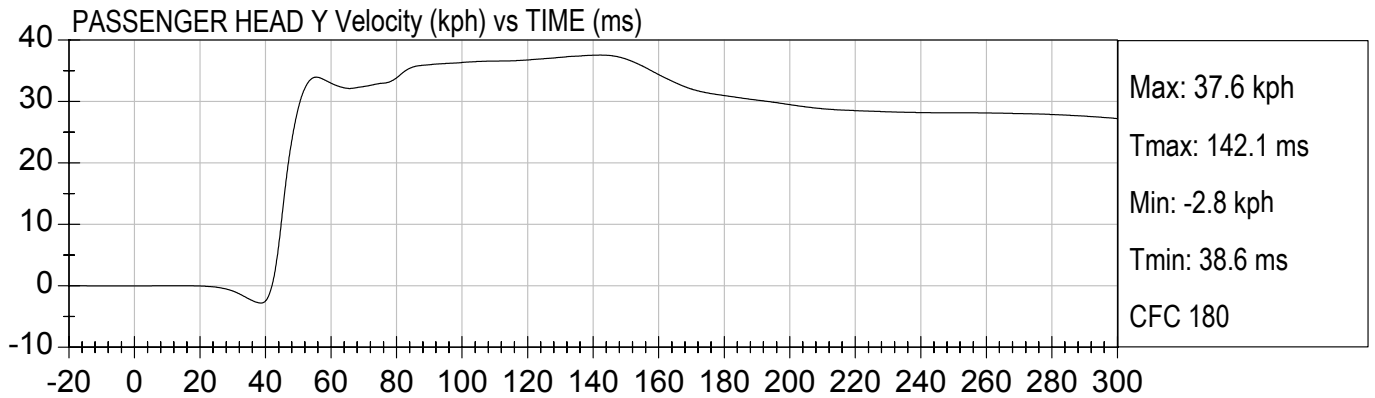
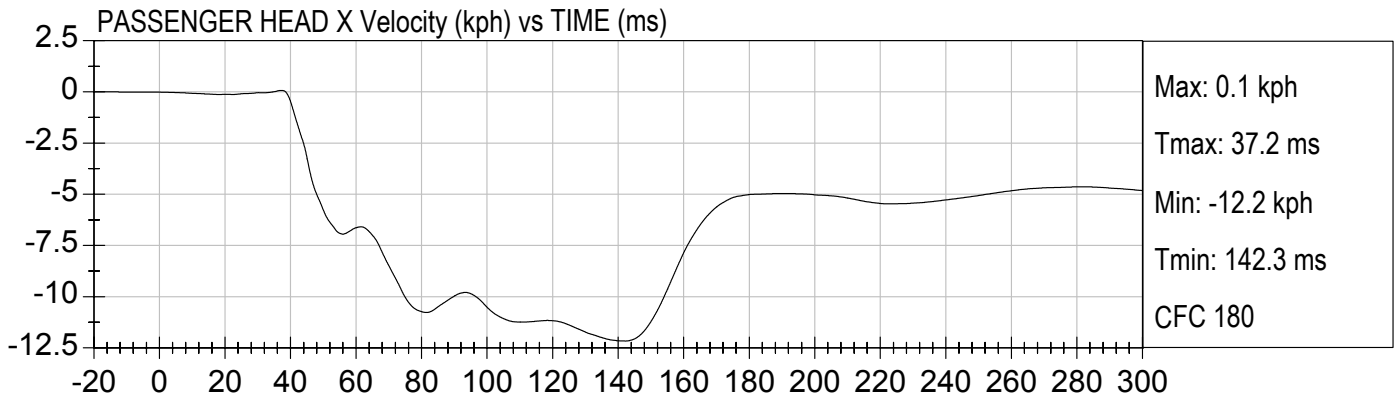
DRIVER LOWER RIB Y Velocity (kph) vs TIME (ms)

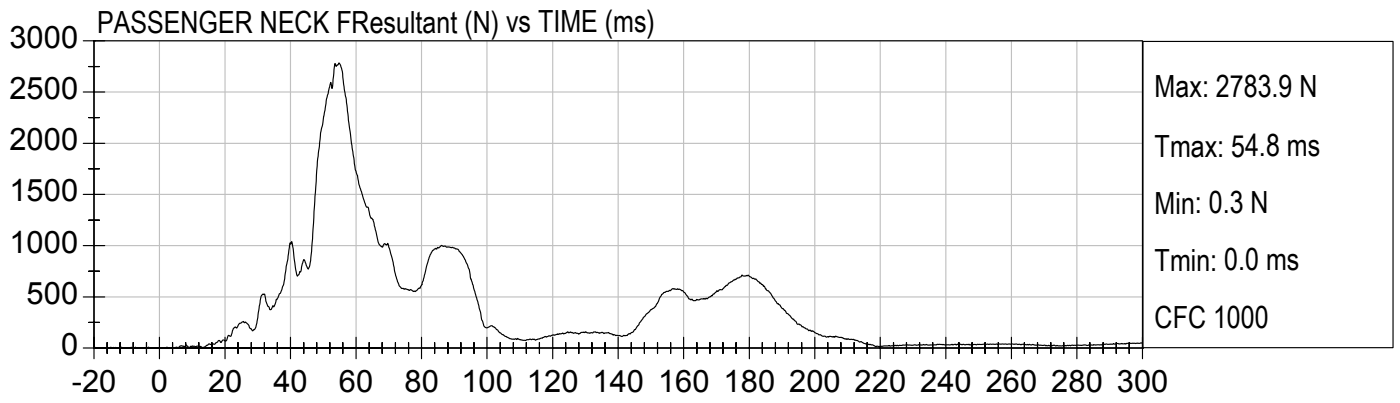
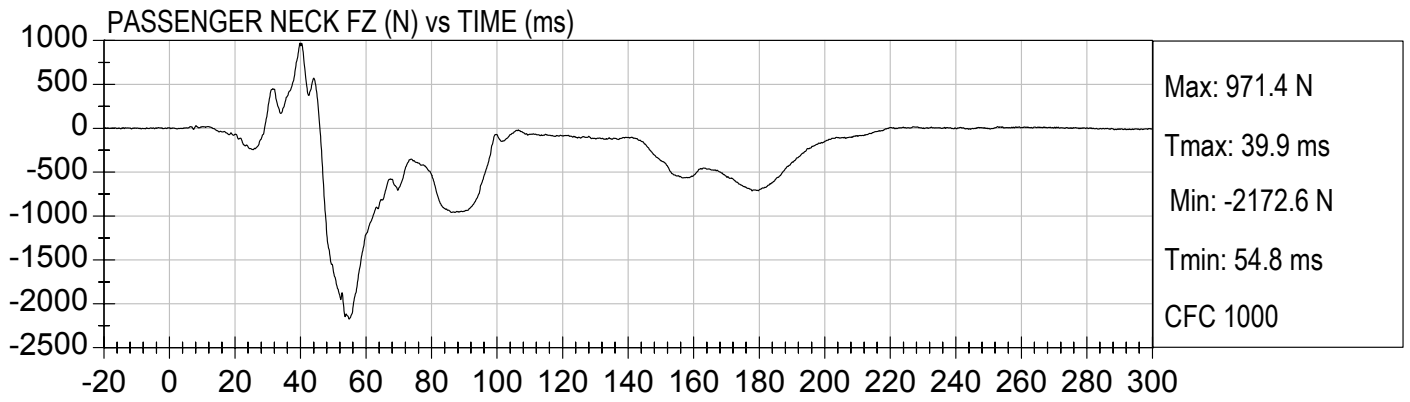
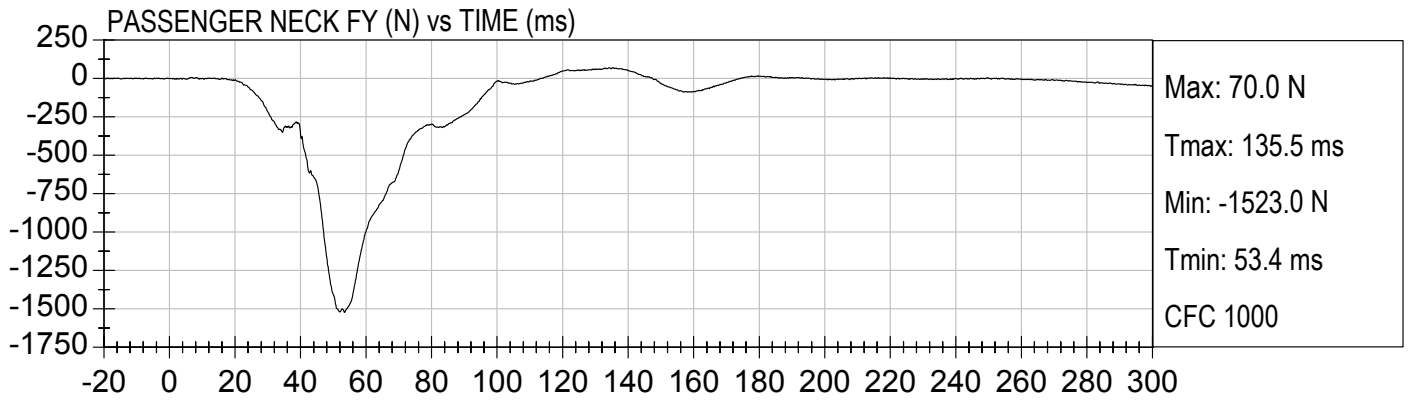
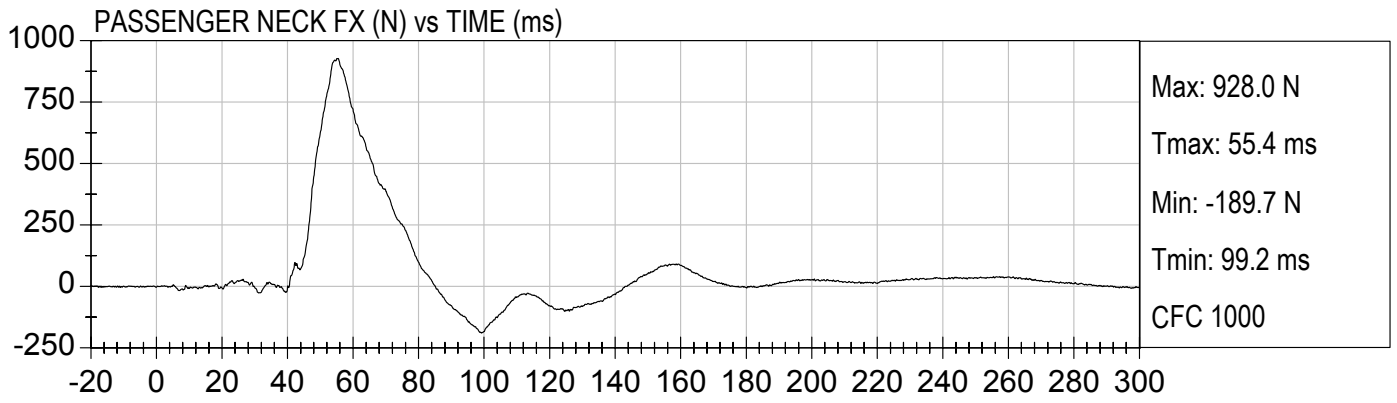


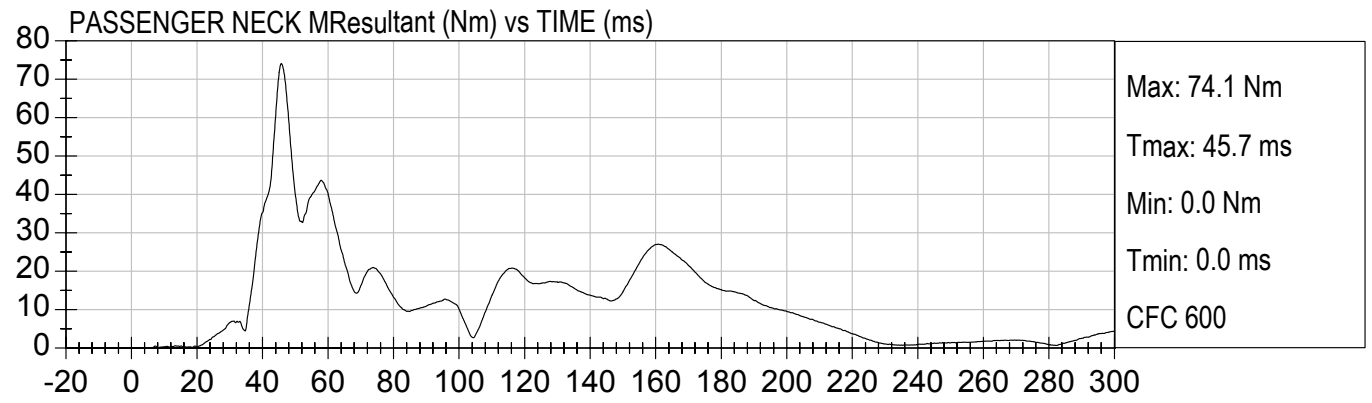
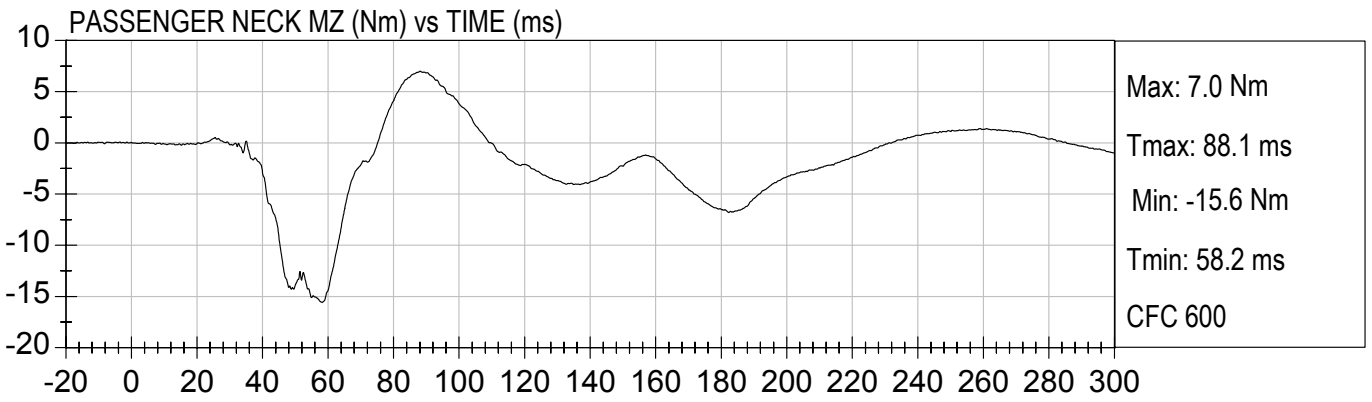
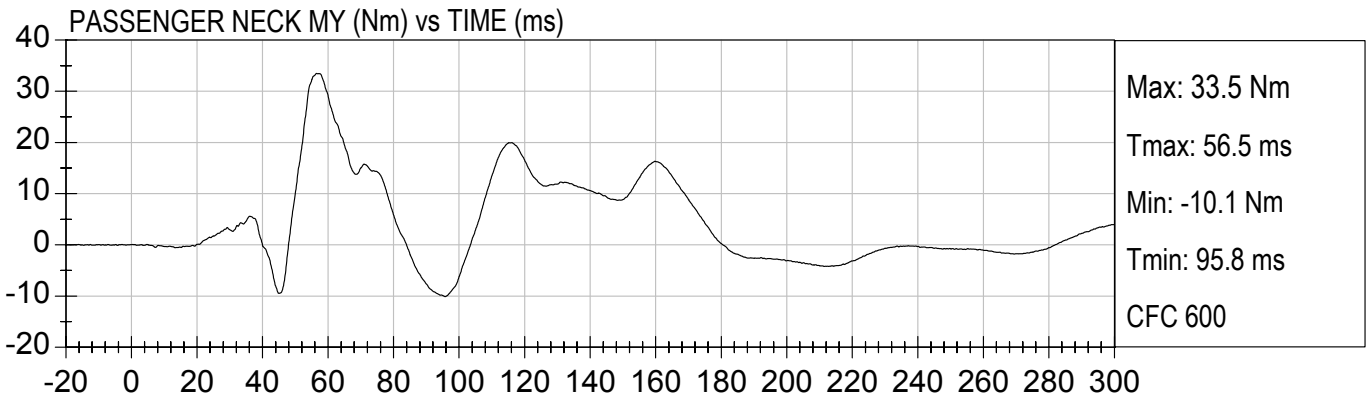
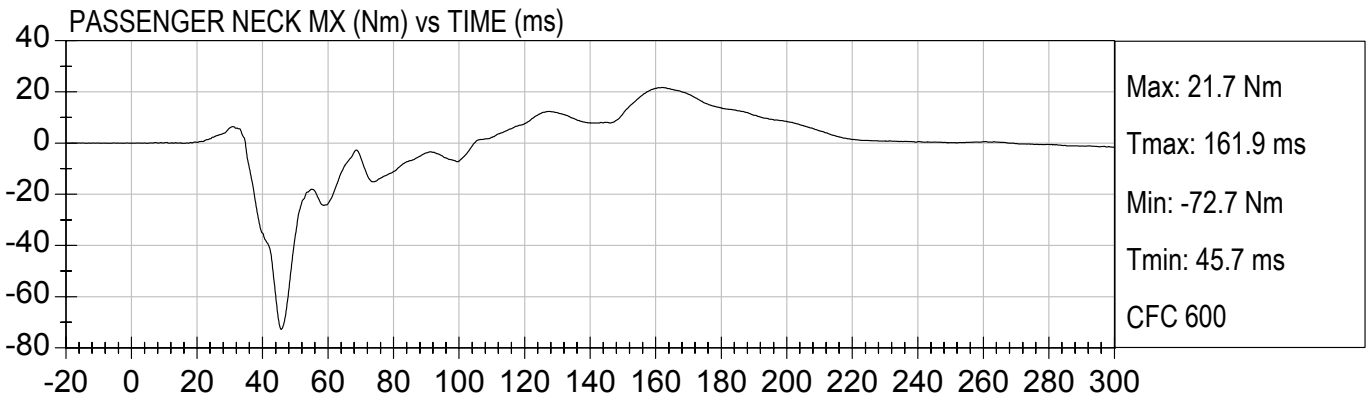


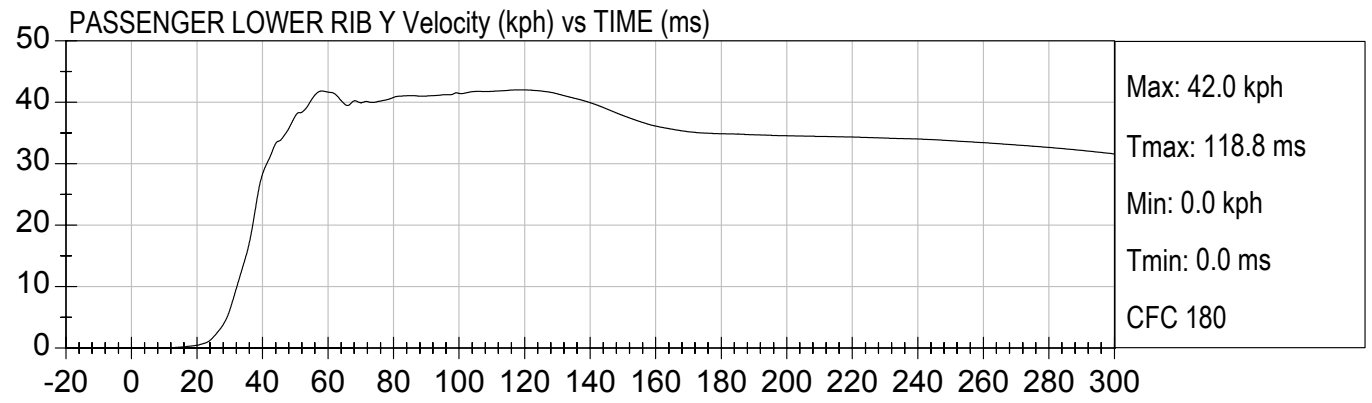
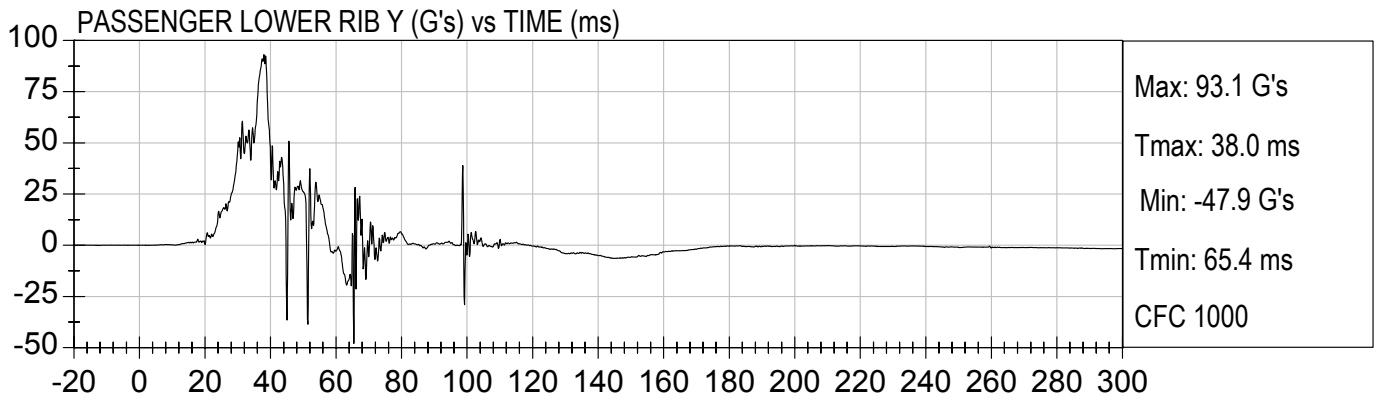
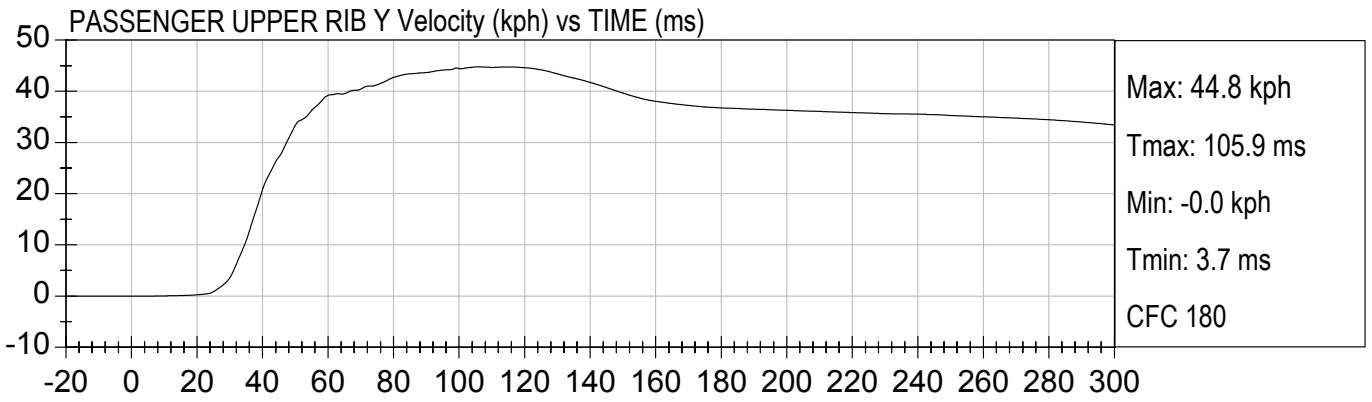
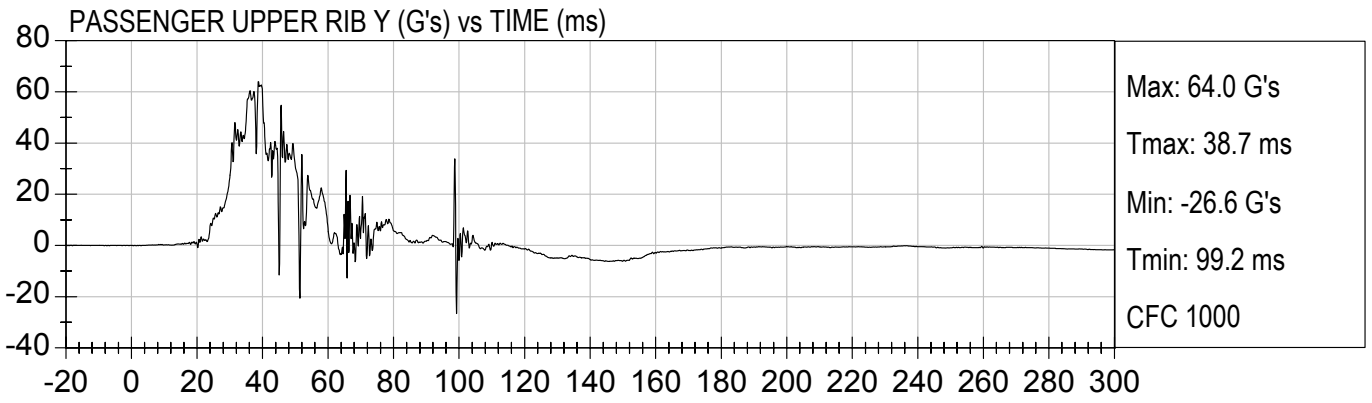


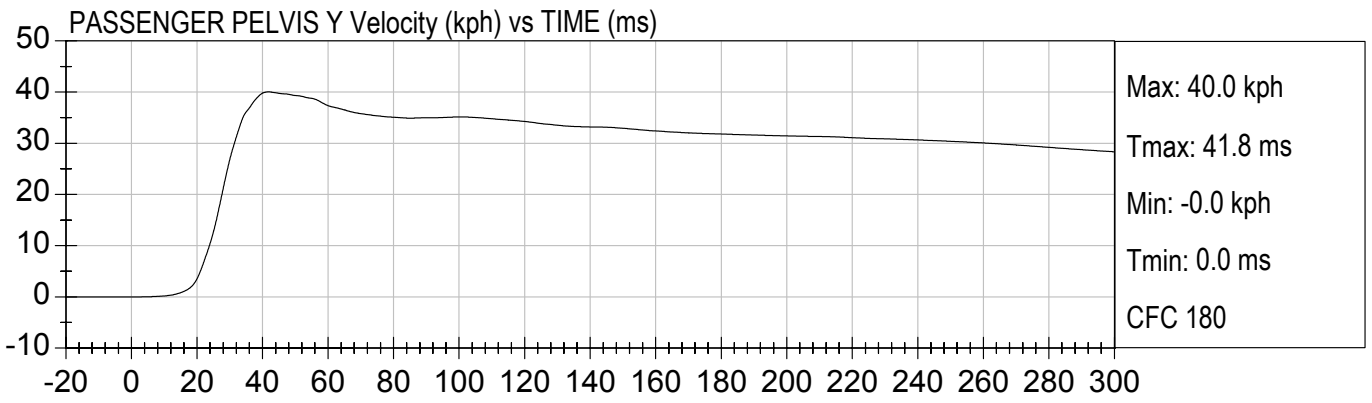
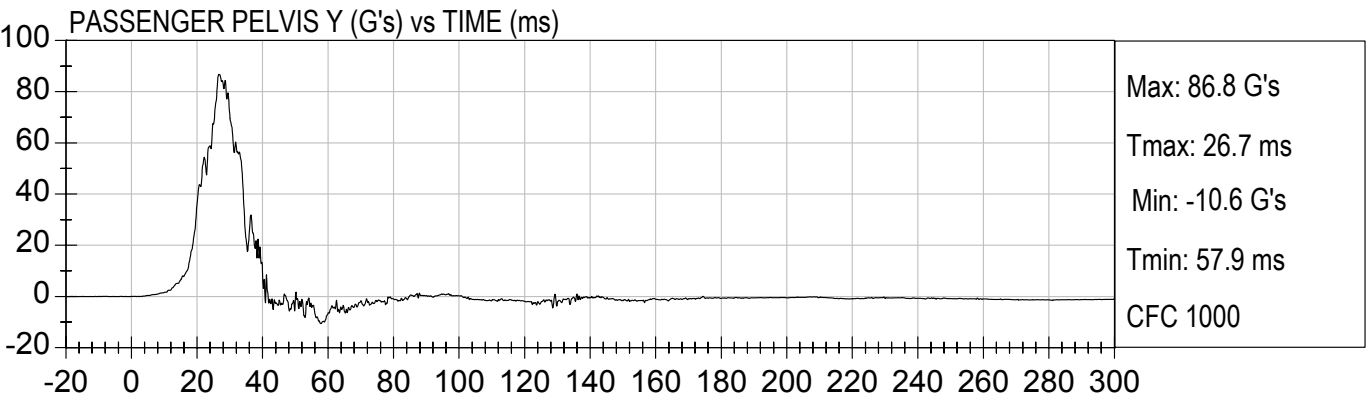
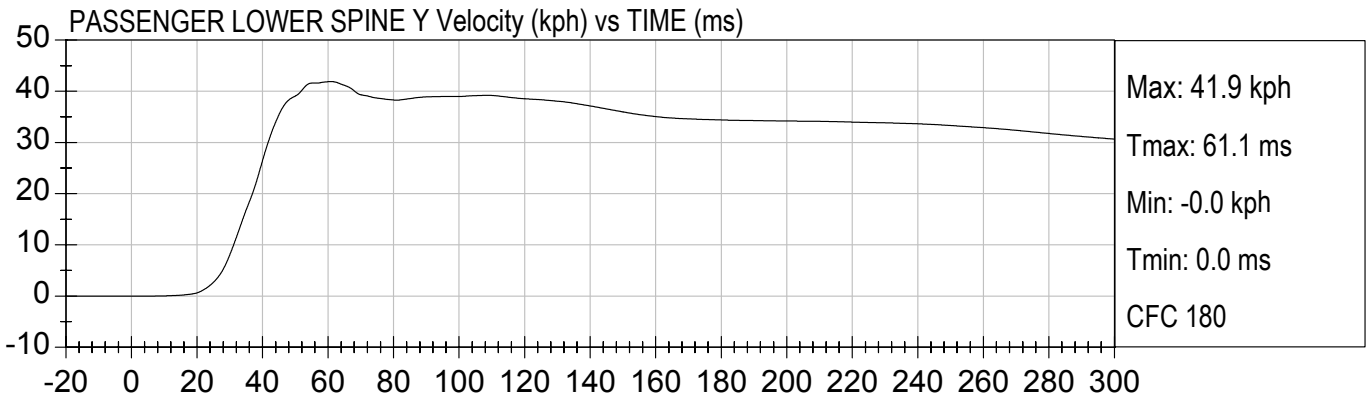
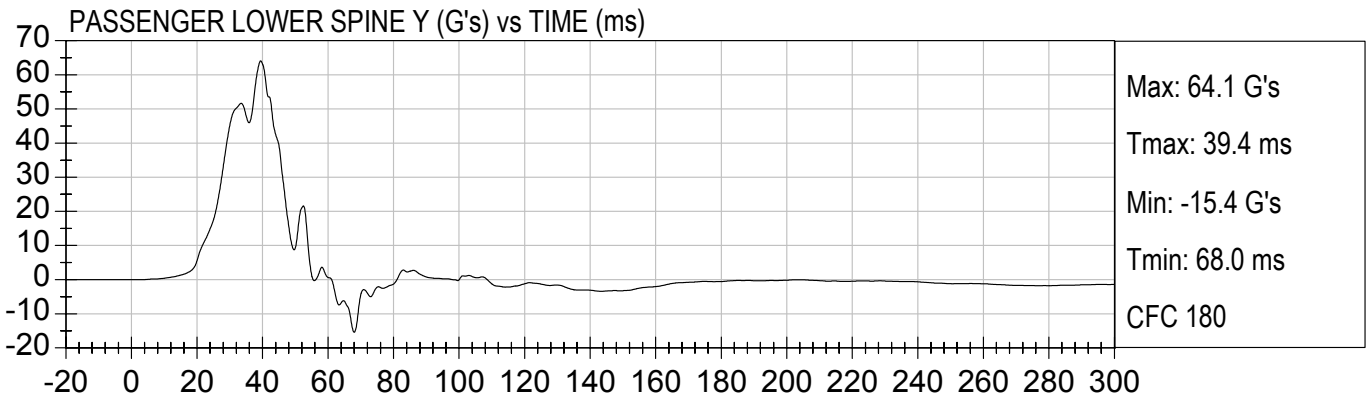


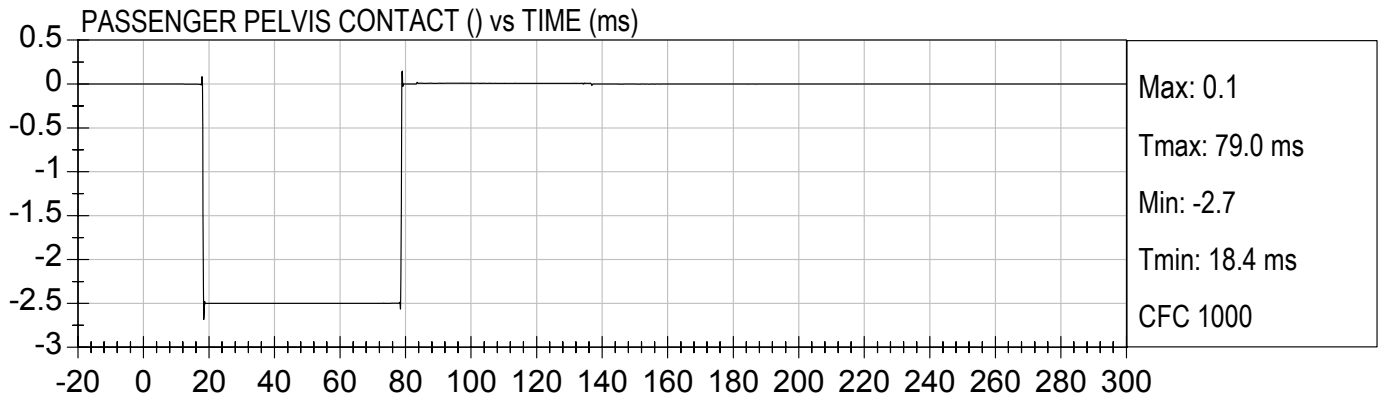
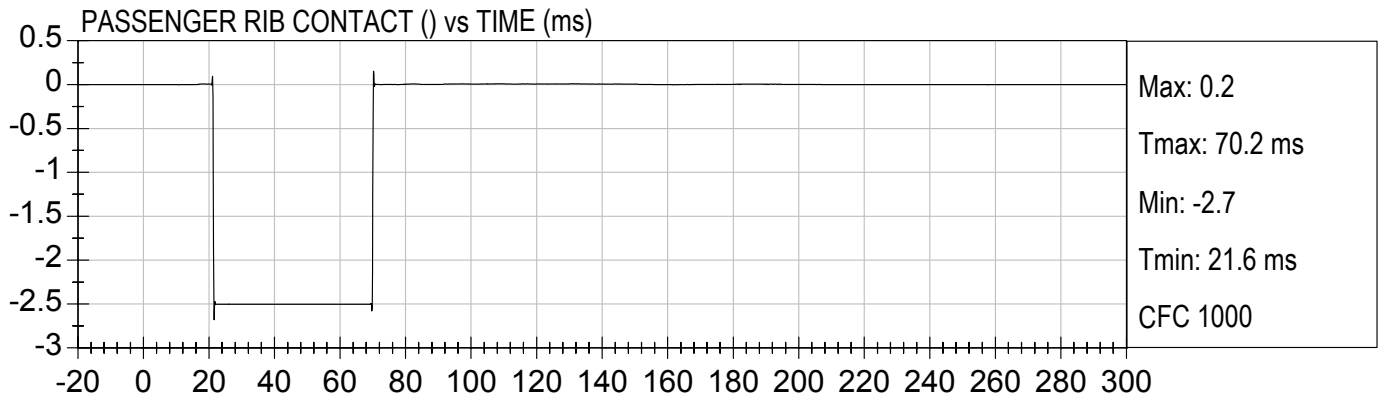


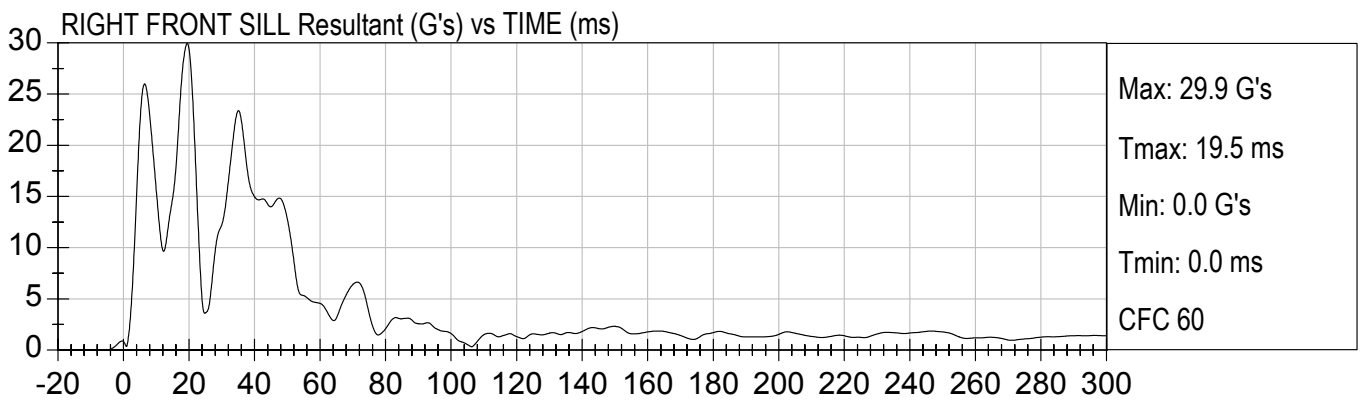
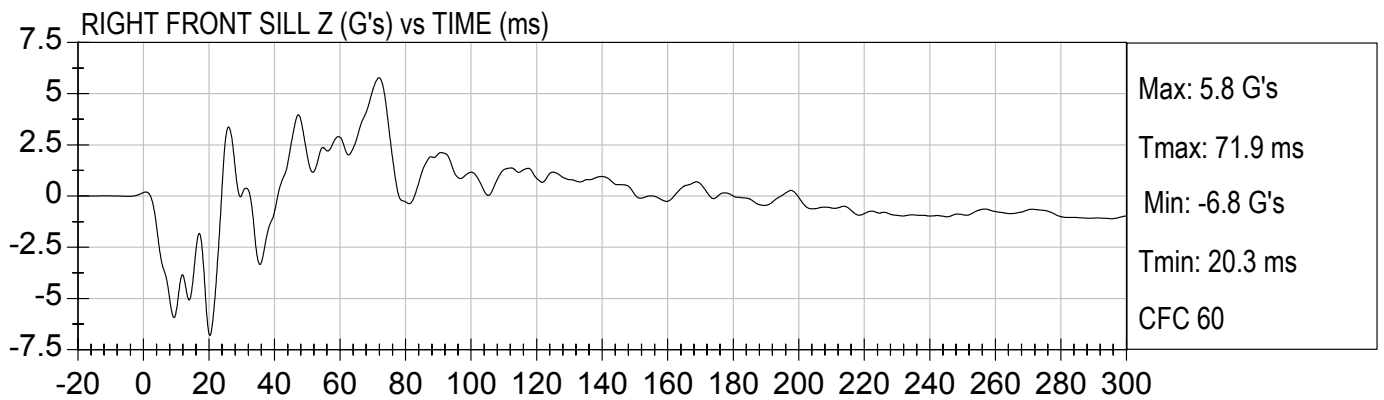
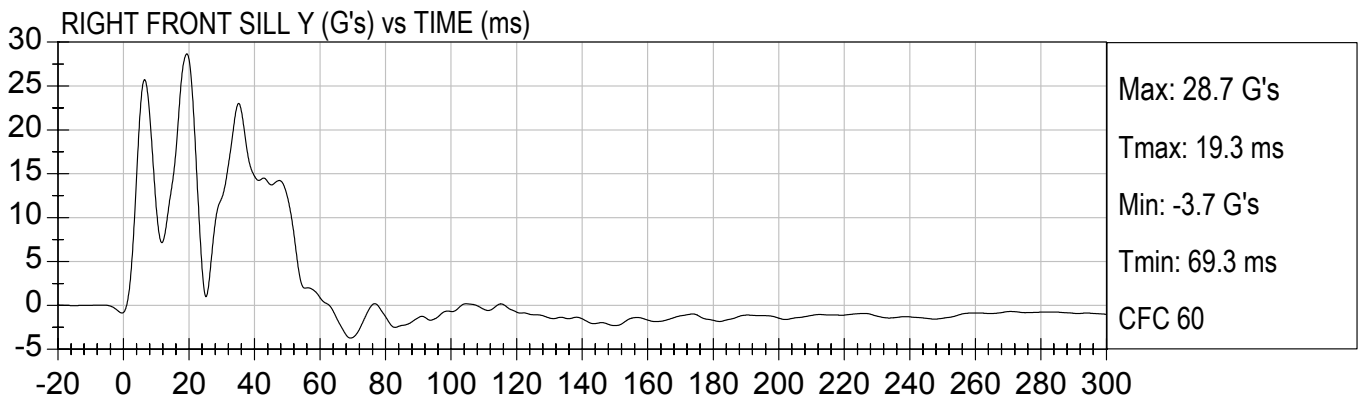
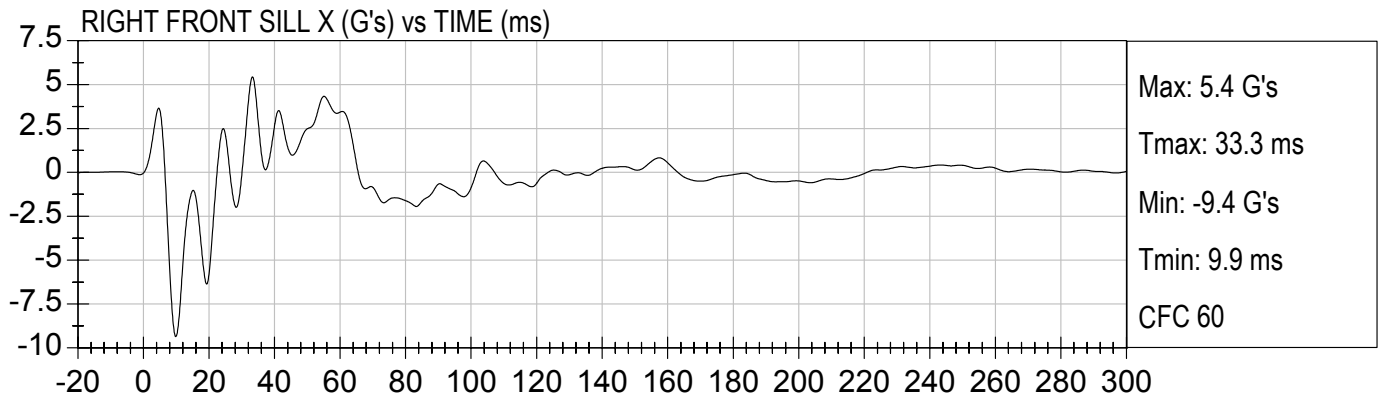


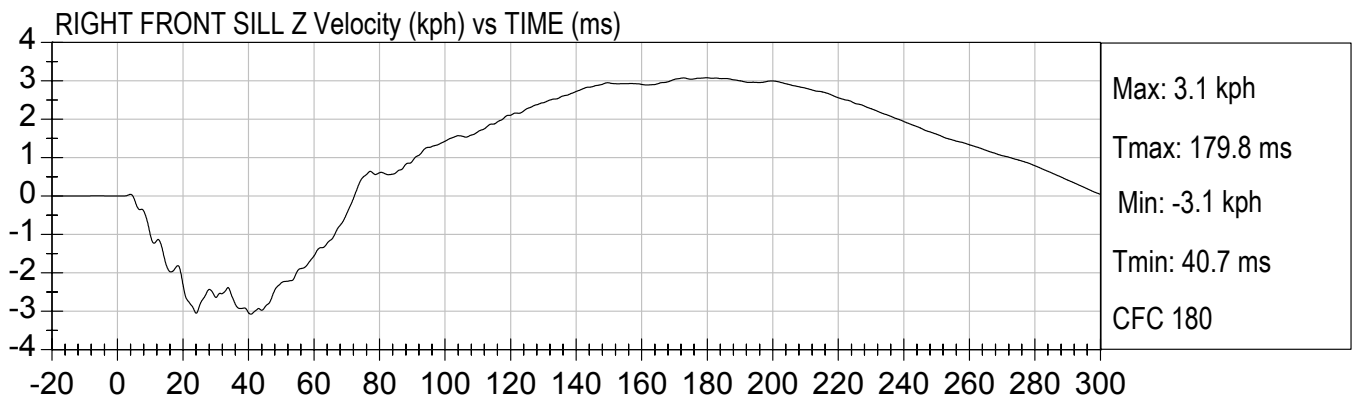
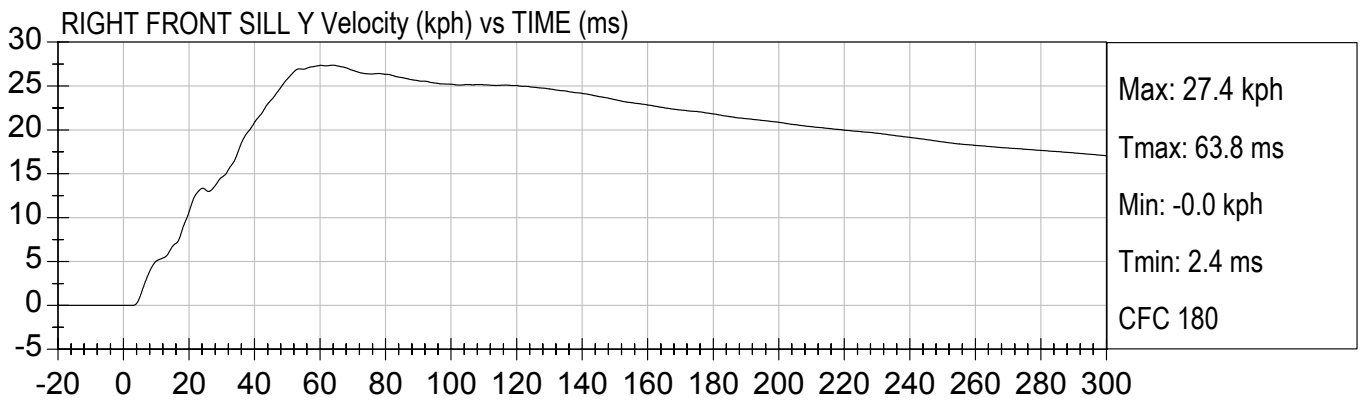
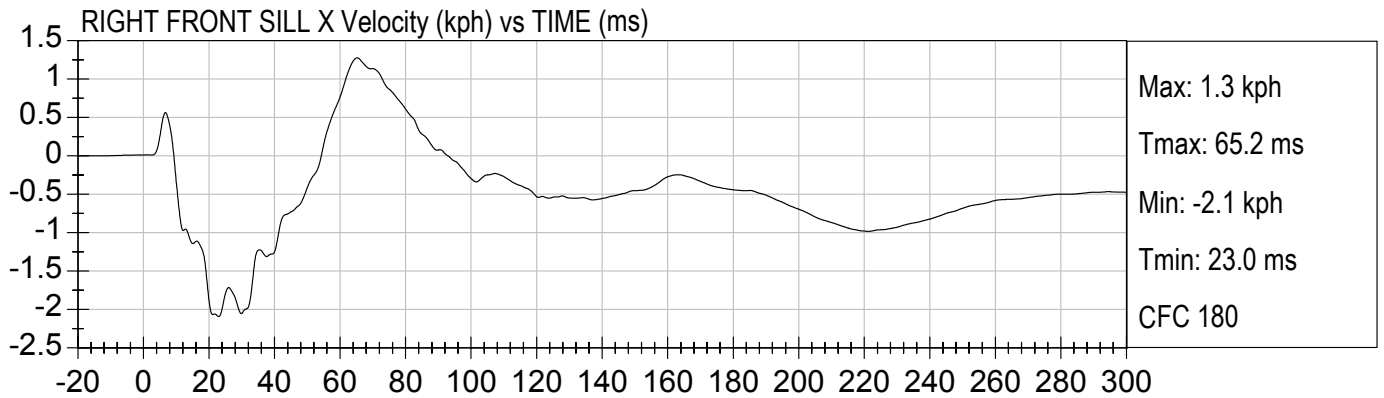


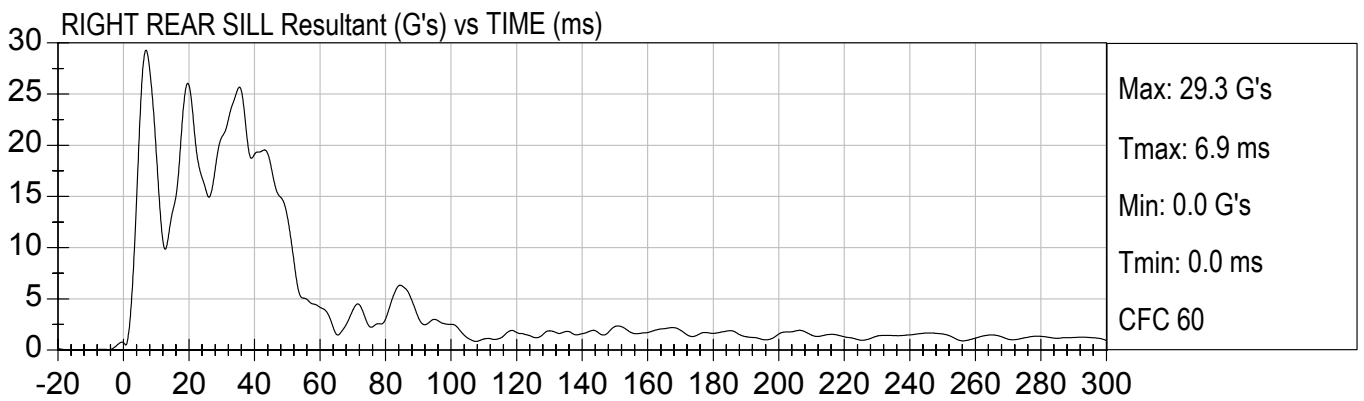
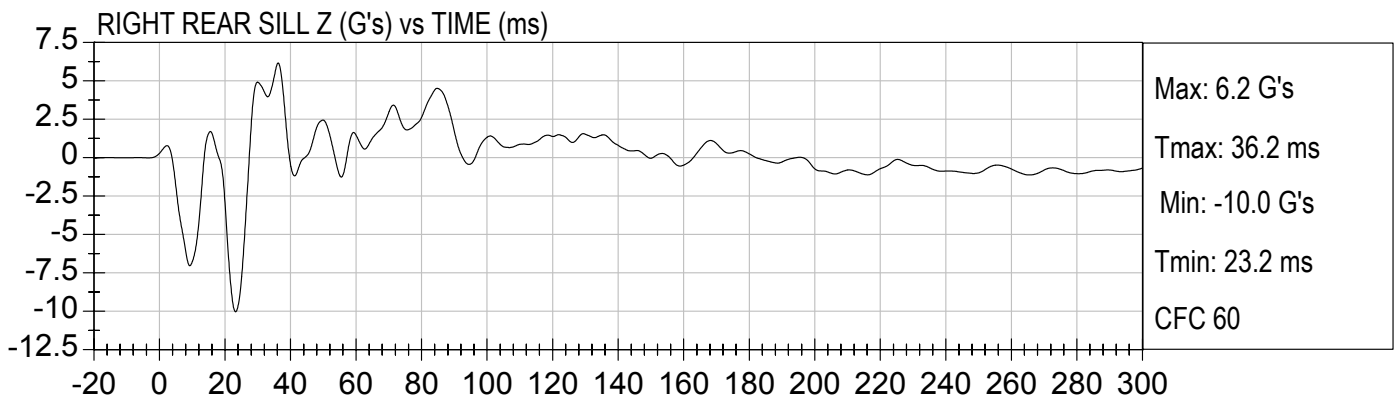
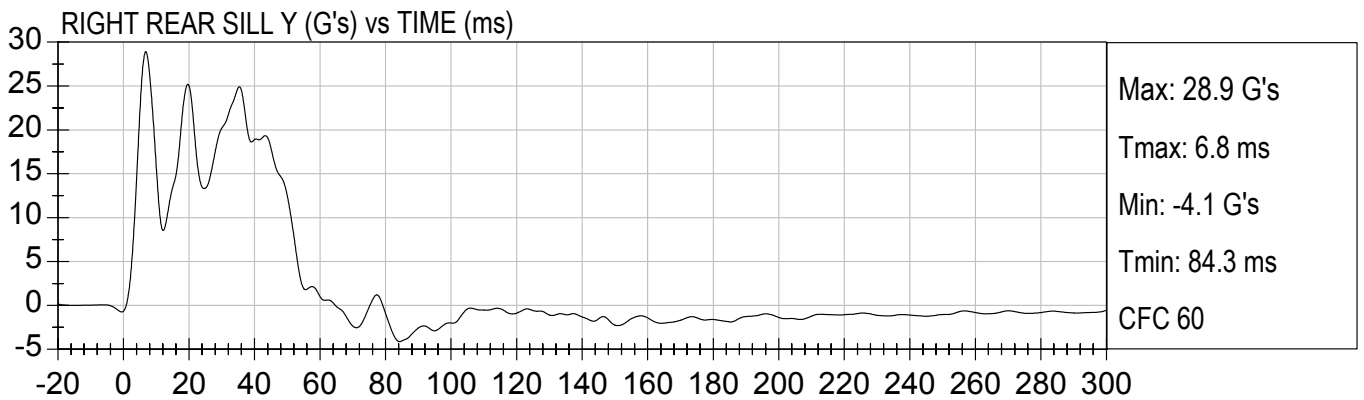
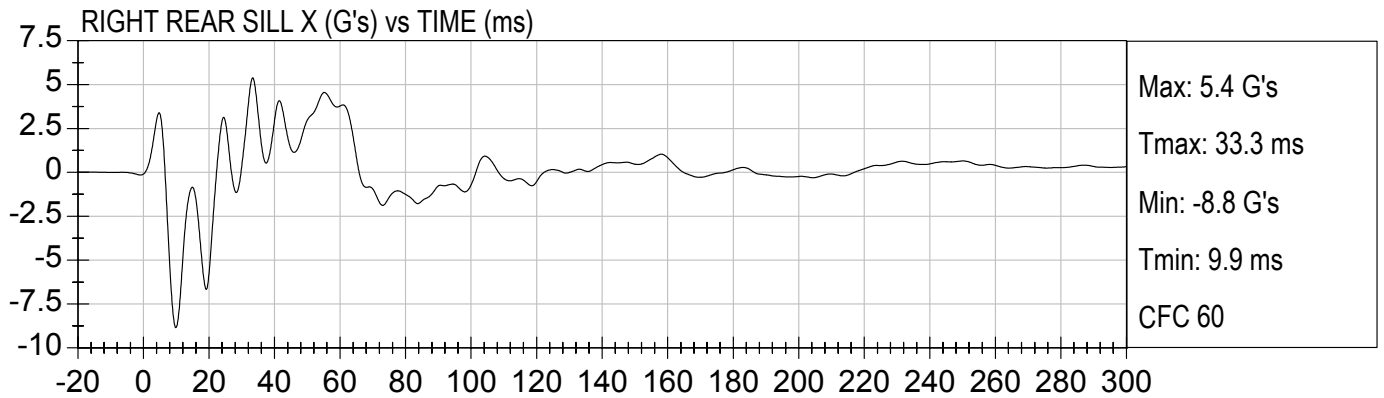


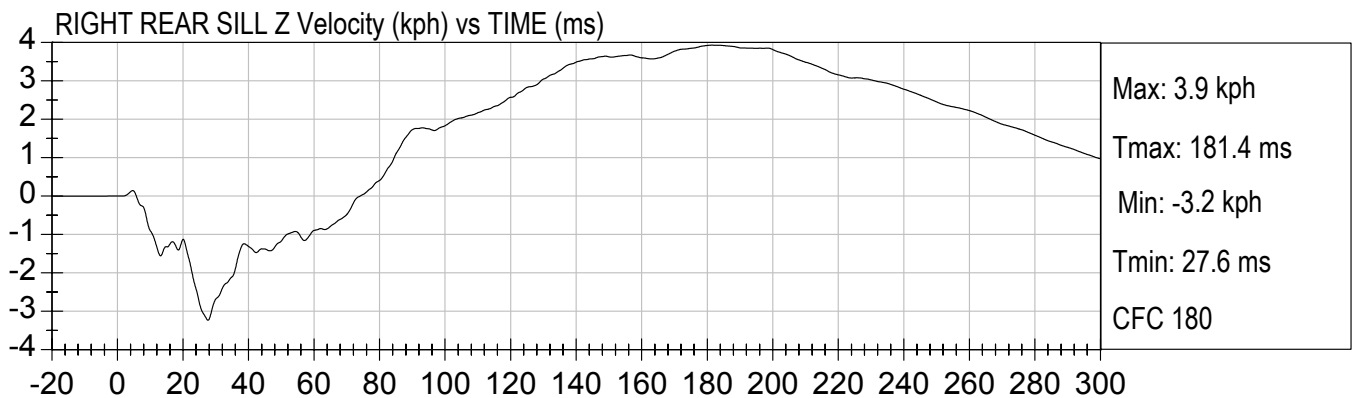
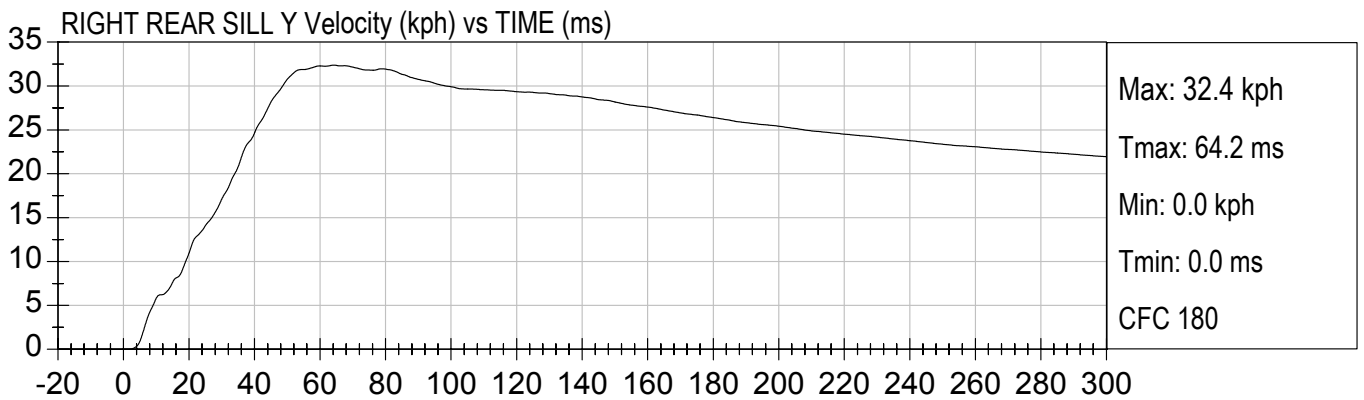
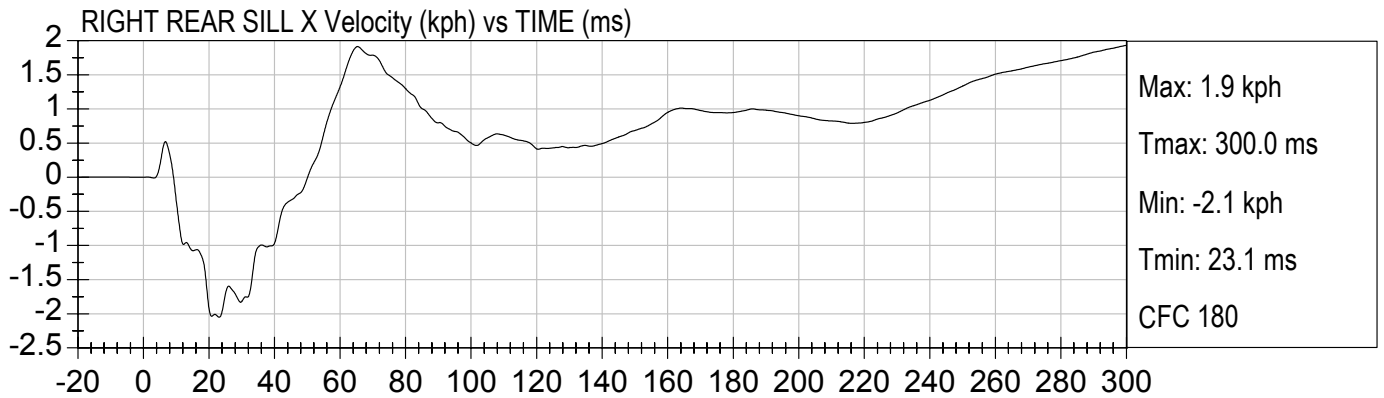


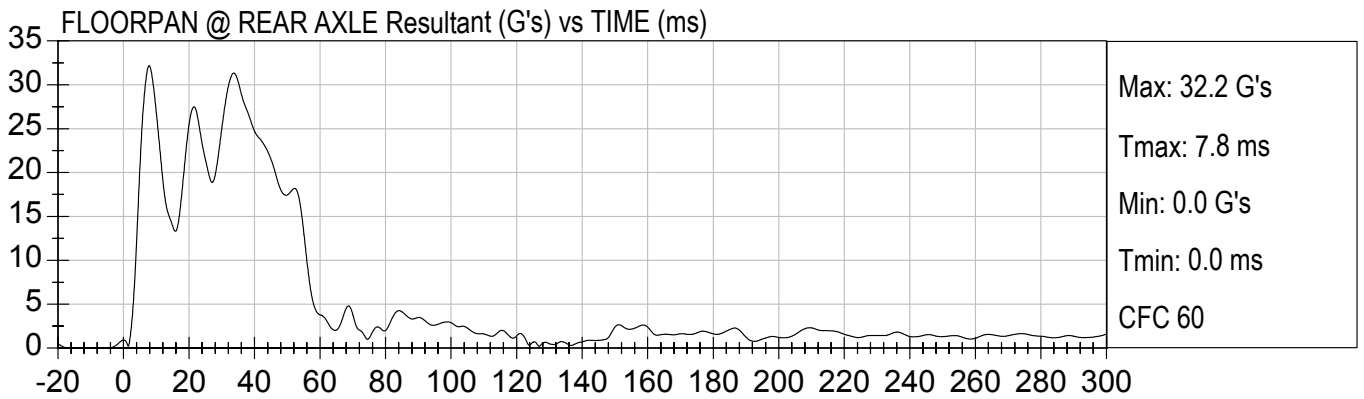
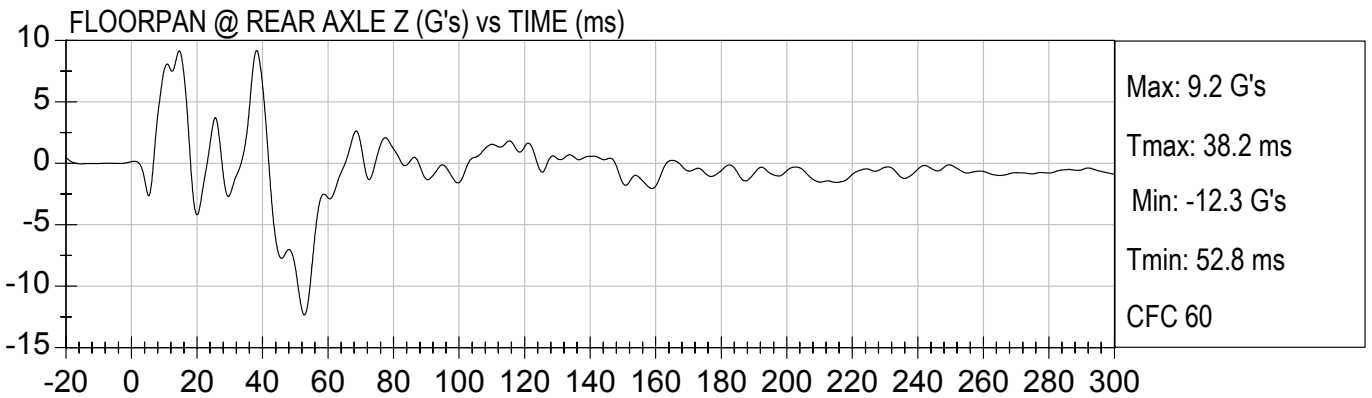
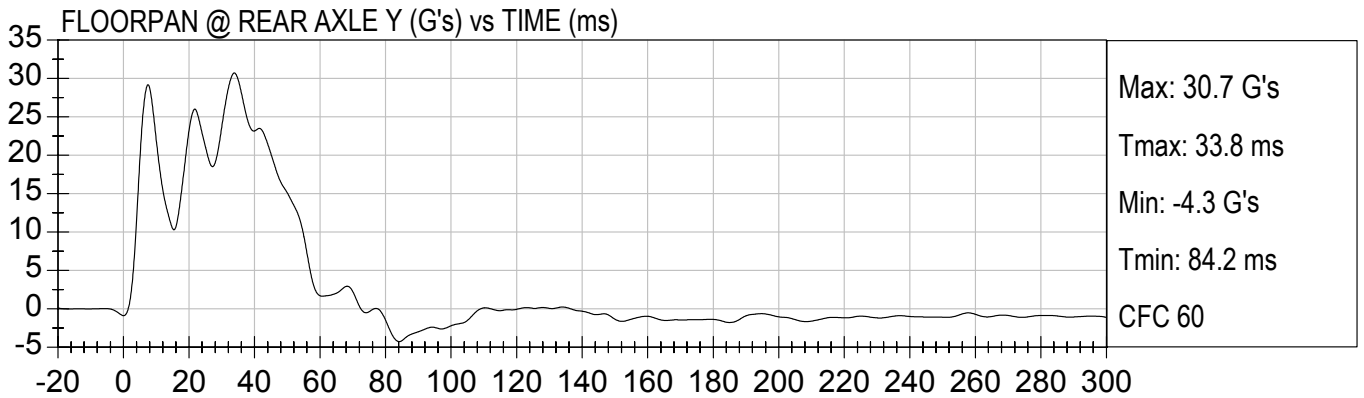
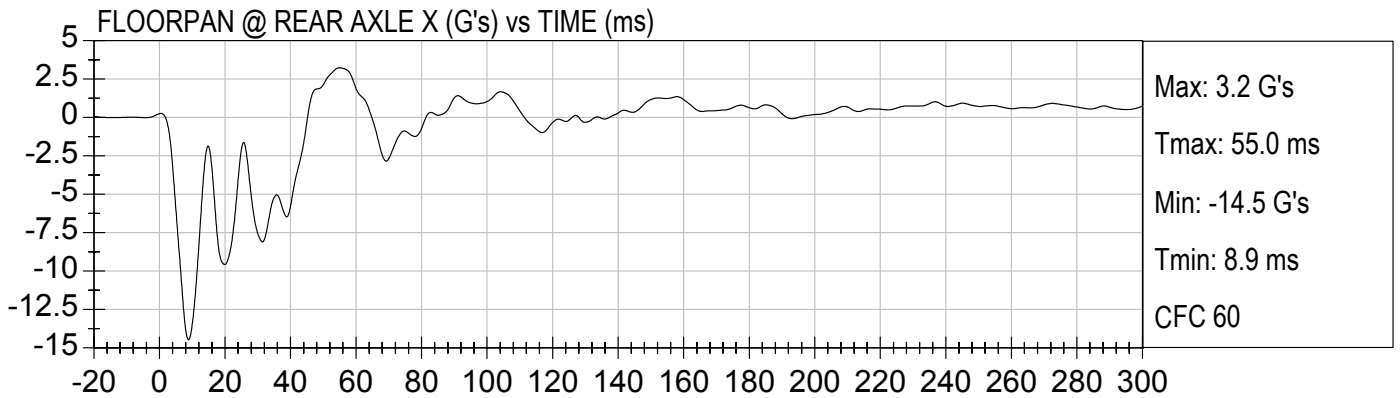


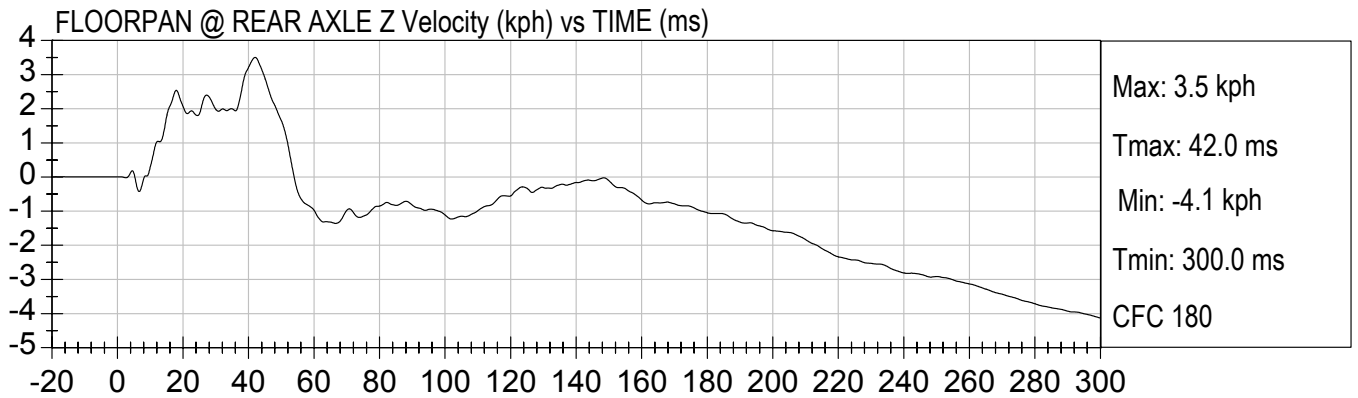
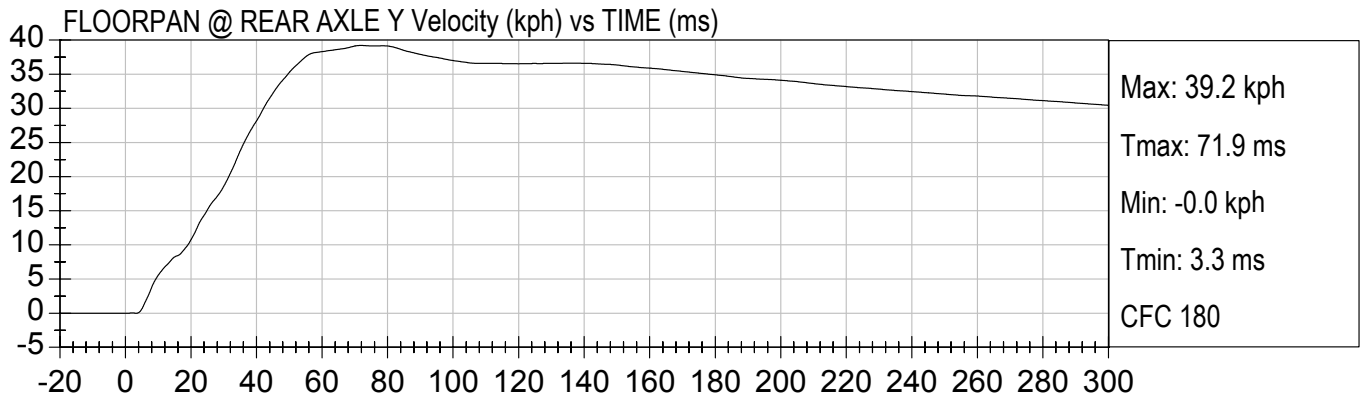
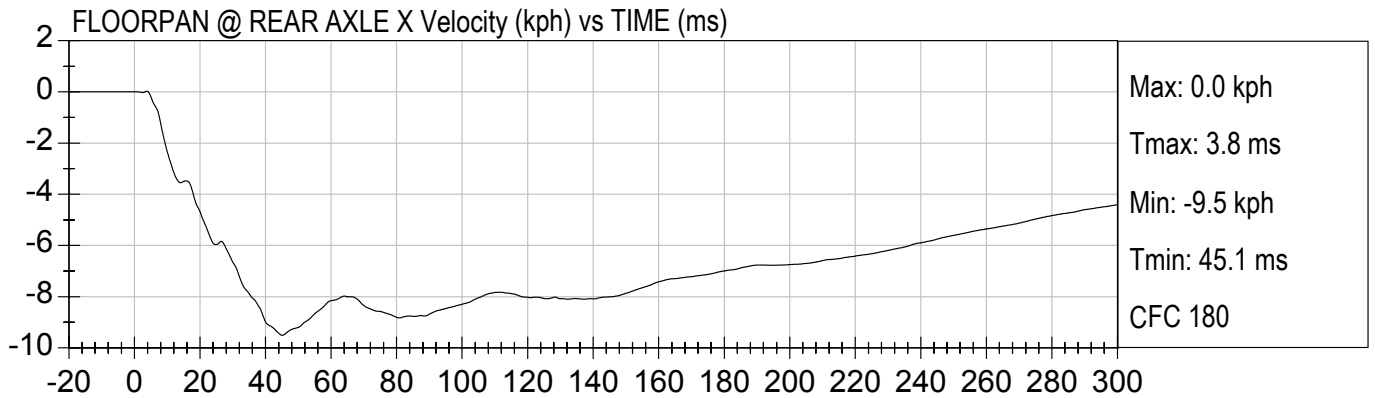


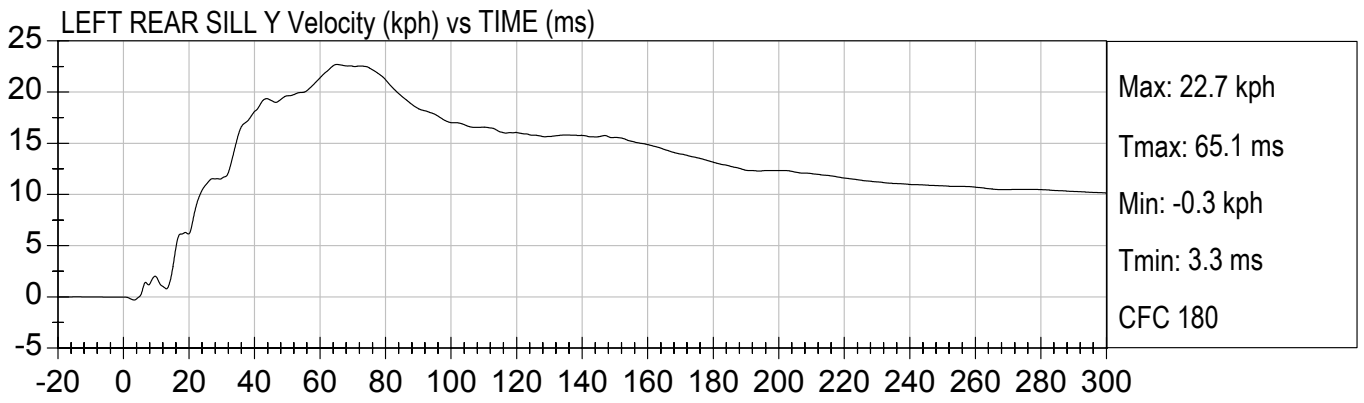
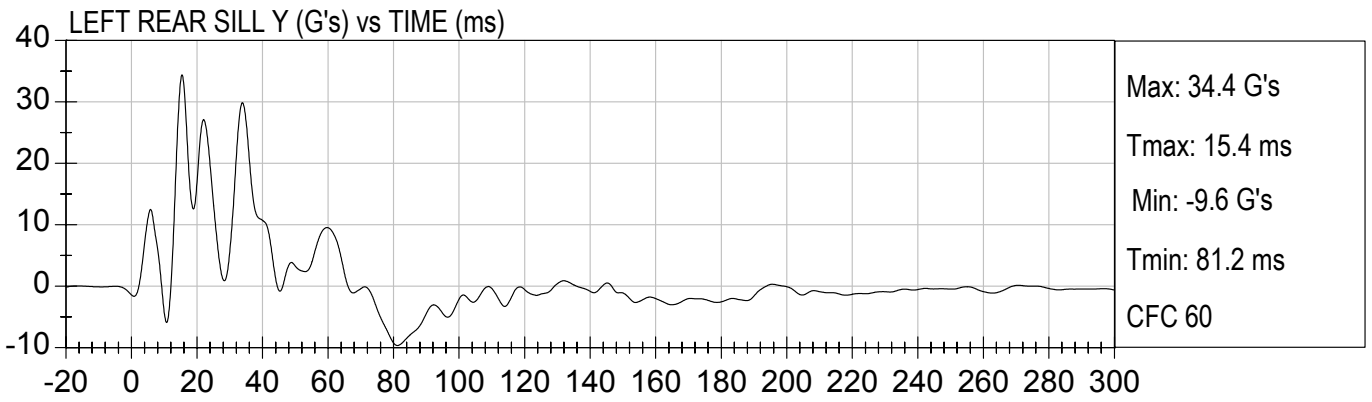
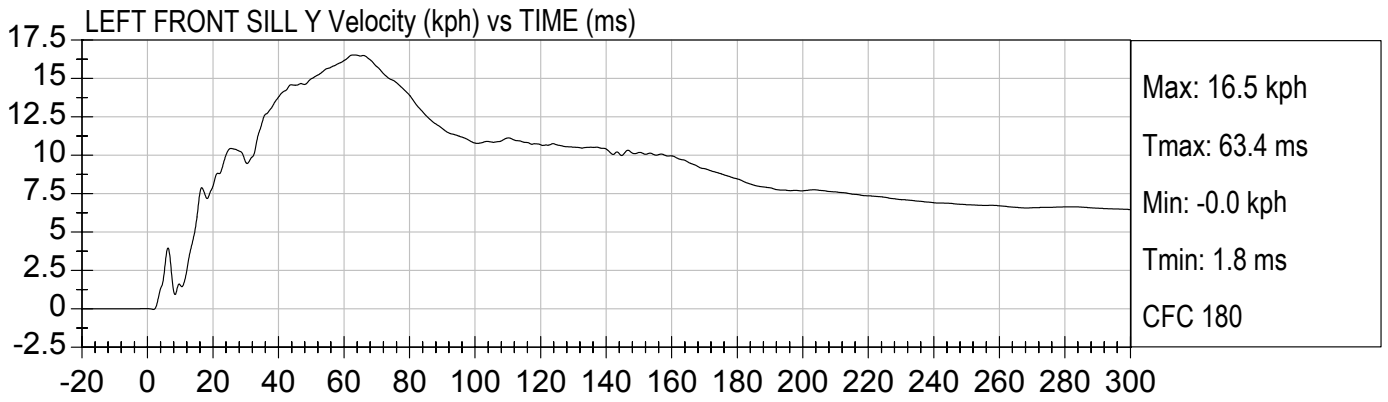
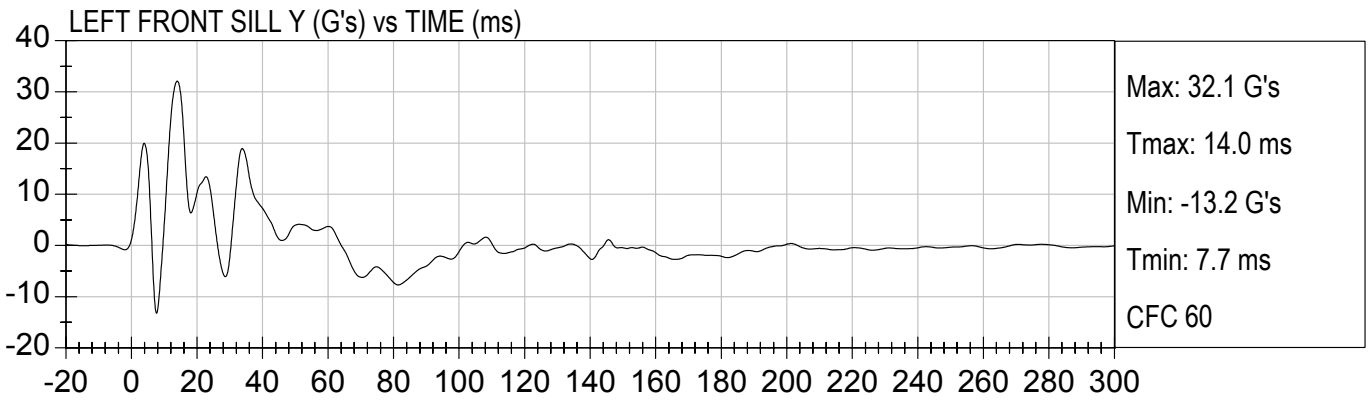






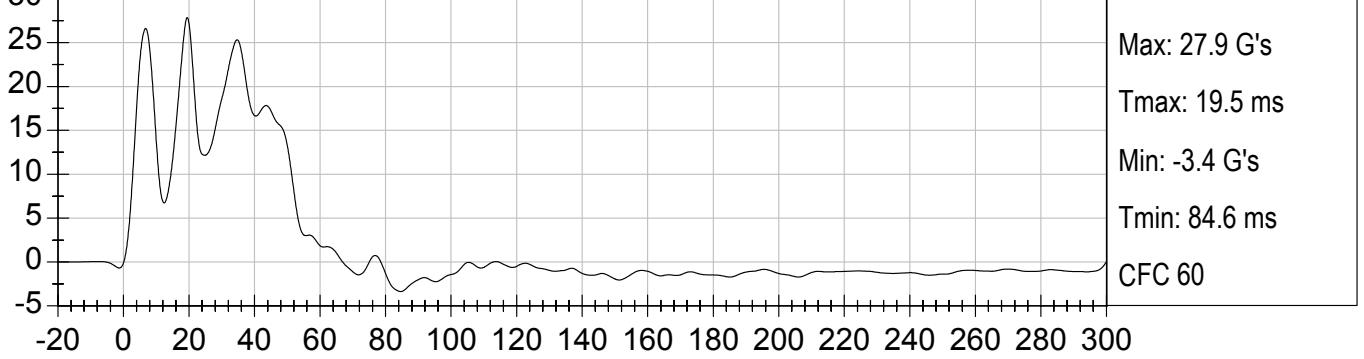




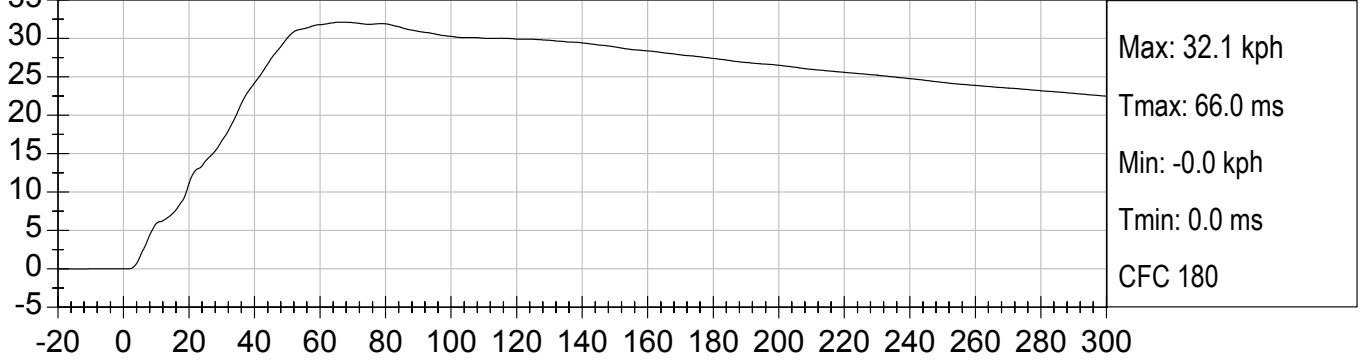


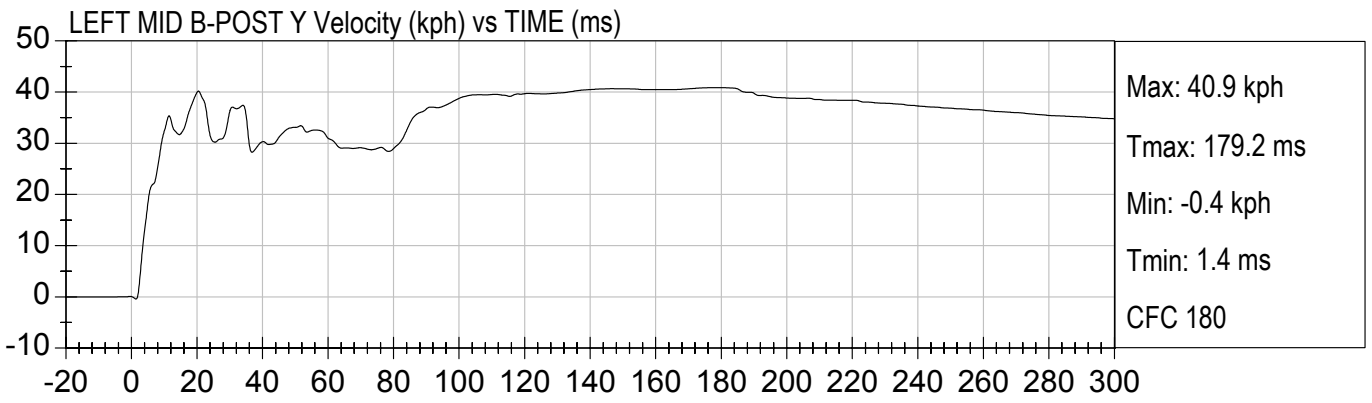
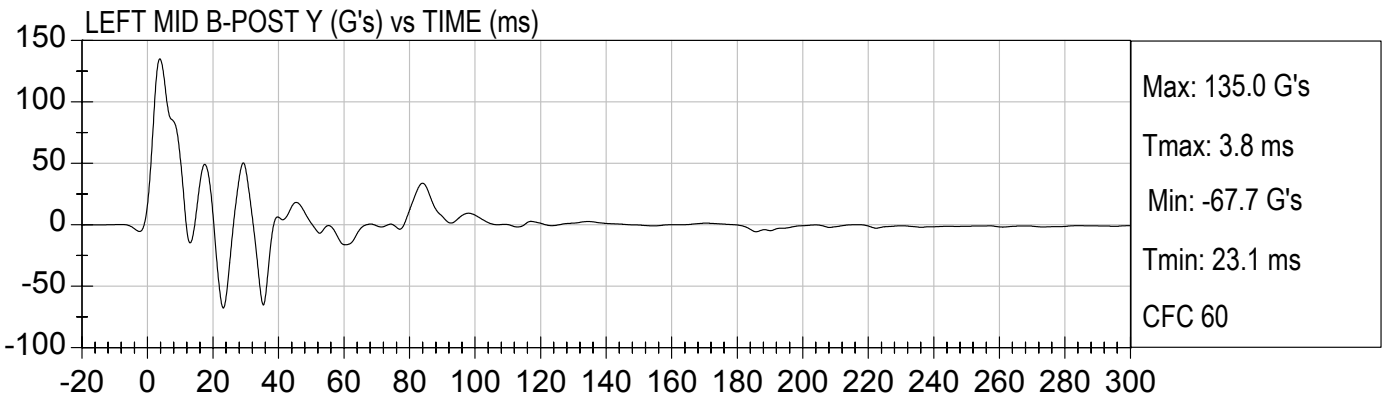
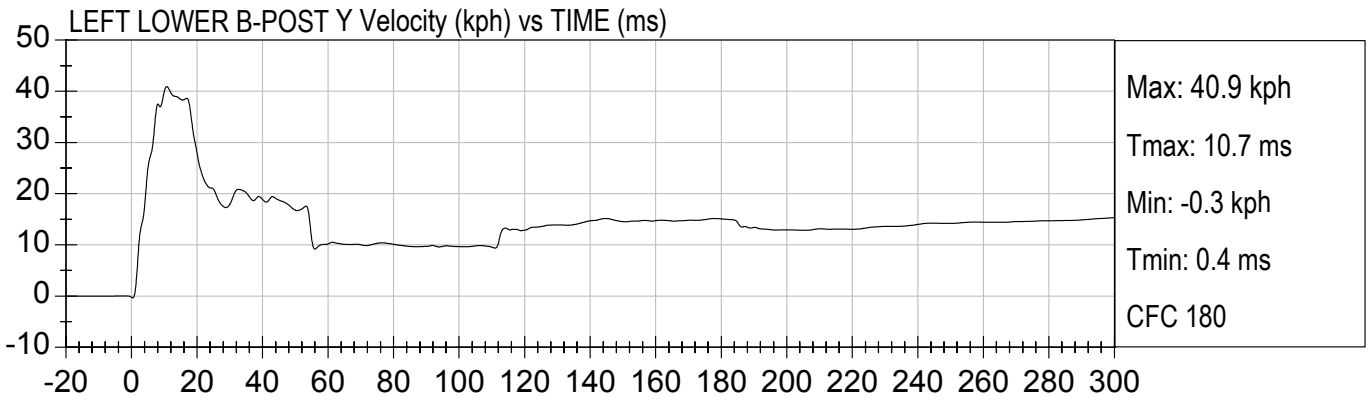
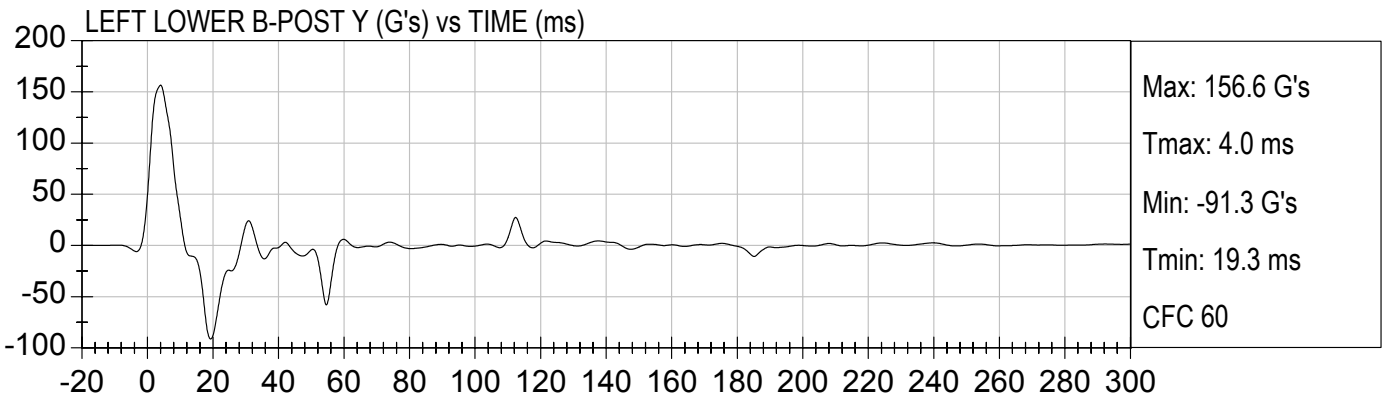


RR OCCUPANT COMPARTMENT Y (G's) vs TIME (ms)



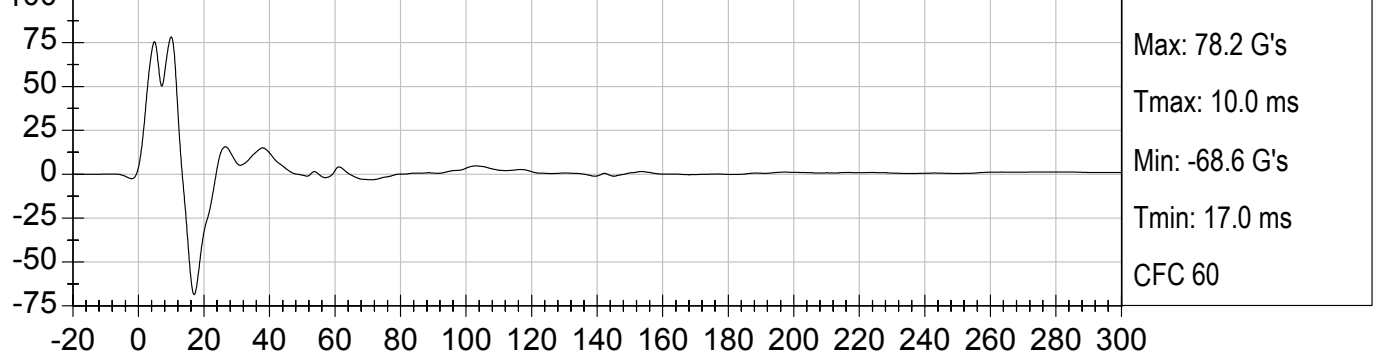
RR OCCUPANT COMPARTMENT Y Velocity (kph) vs TIME (ms)



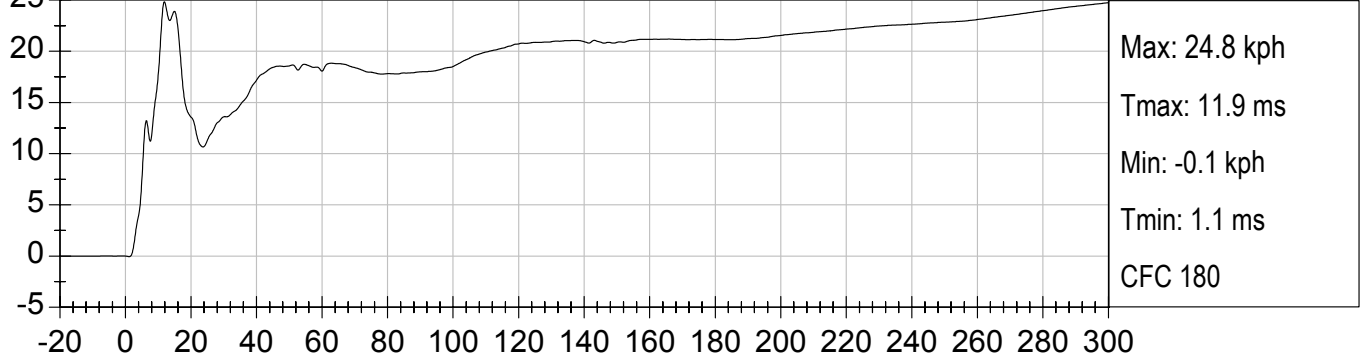




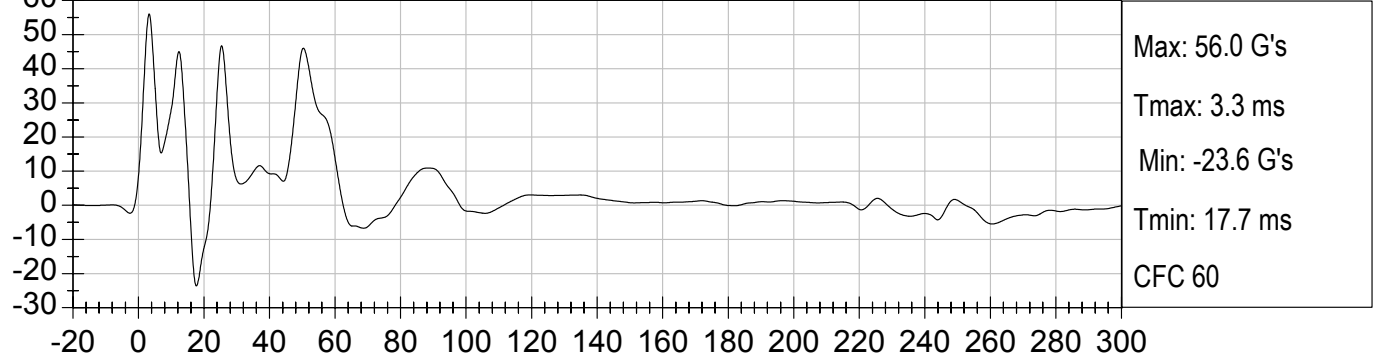
LEFT LOWER A-POST Y (G's) vs TIME (ms)



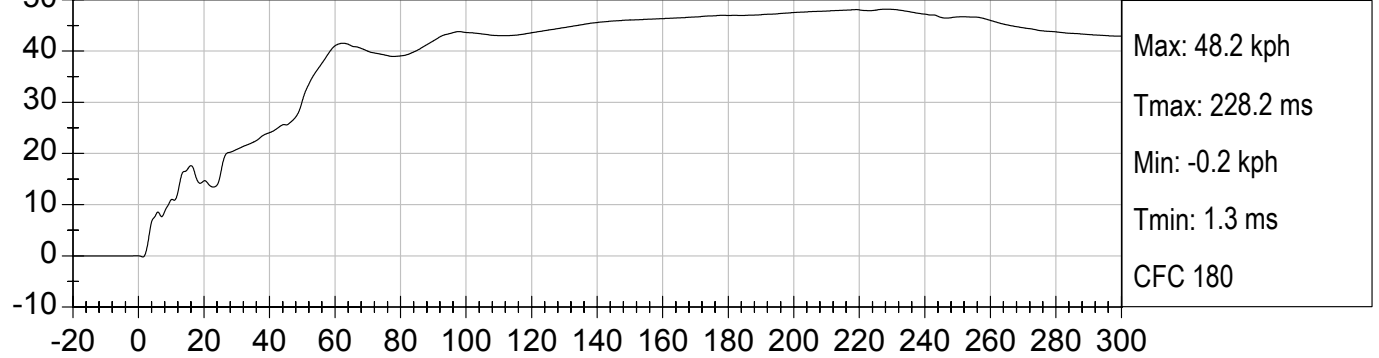
LEFT LOWER A-POST Y Velocity (kph) vs TIME (ms)



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

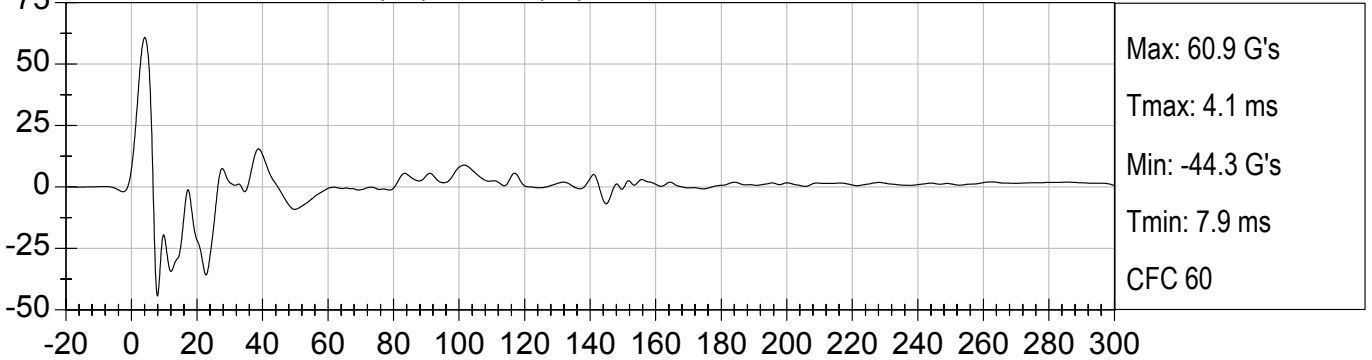


LEFT MID A-POST Y Velocity (kph) vs TIME (ms)

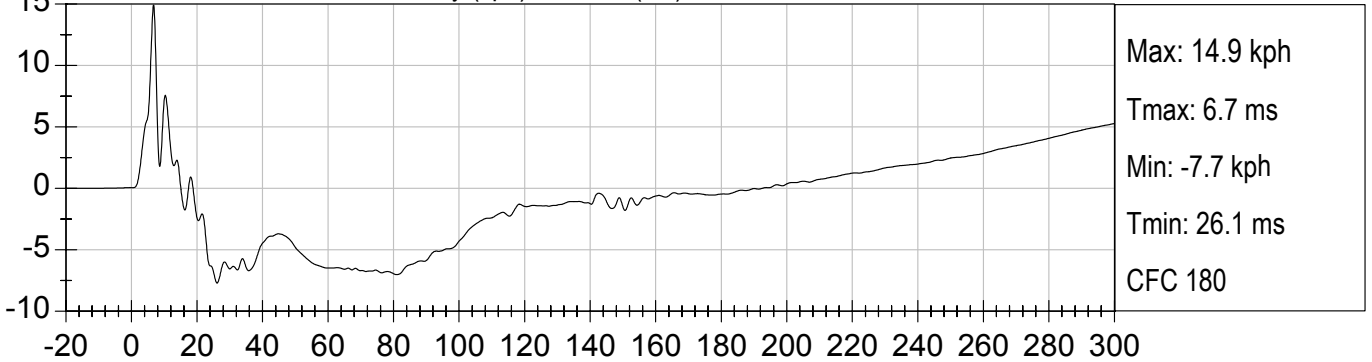




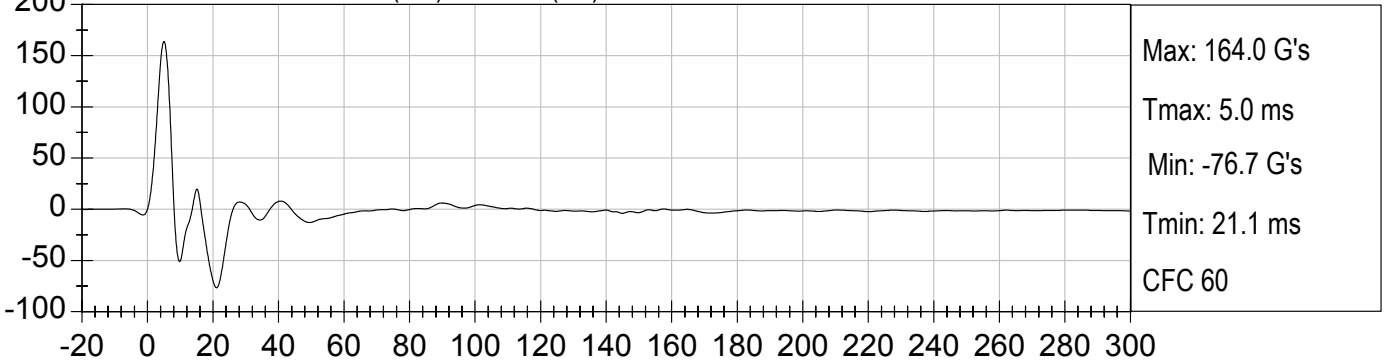
LF DOOR CENTERLINE Y (G's) vs TIME (ms)



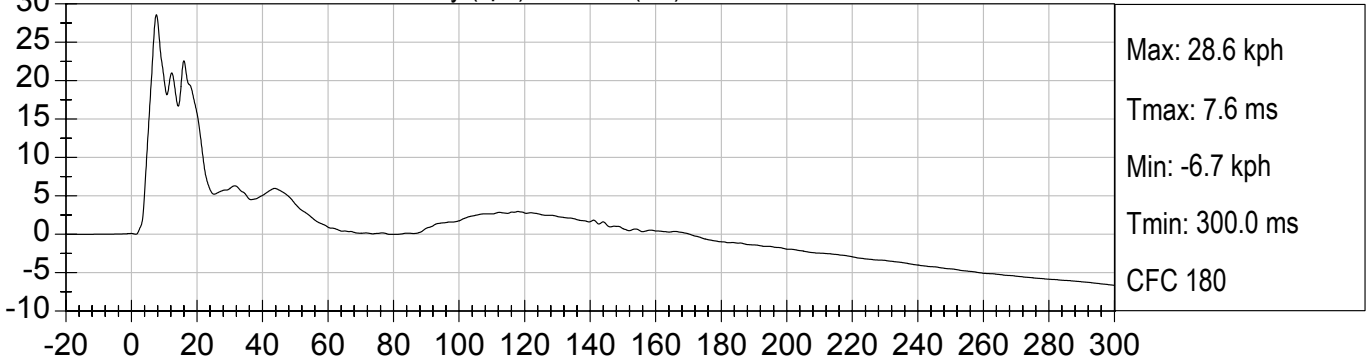
LF DOOR CENTERLINE Y Velocity (kph) vs TIME (ms)



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

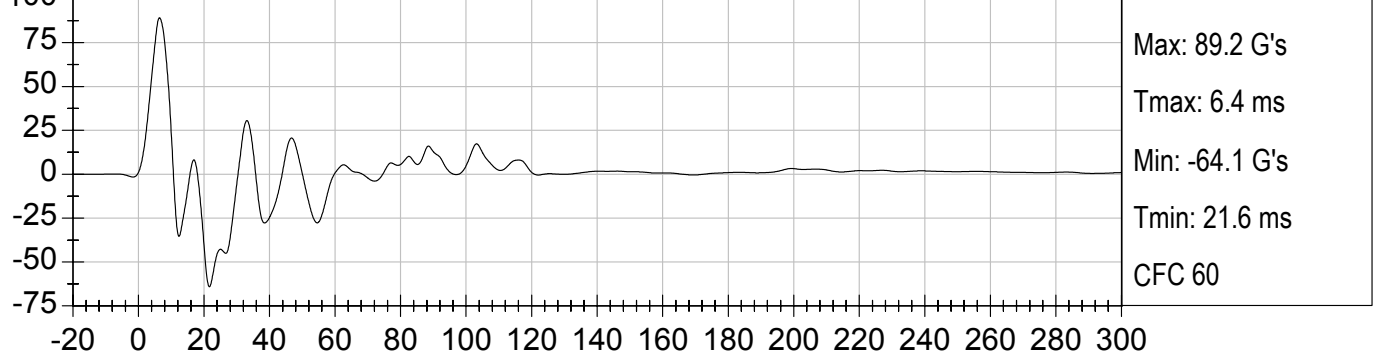


MIDREAR OF LF DOOR Y Velocity (kph) vs TIME (ms)

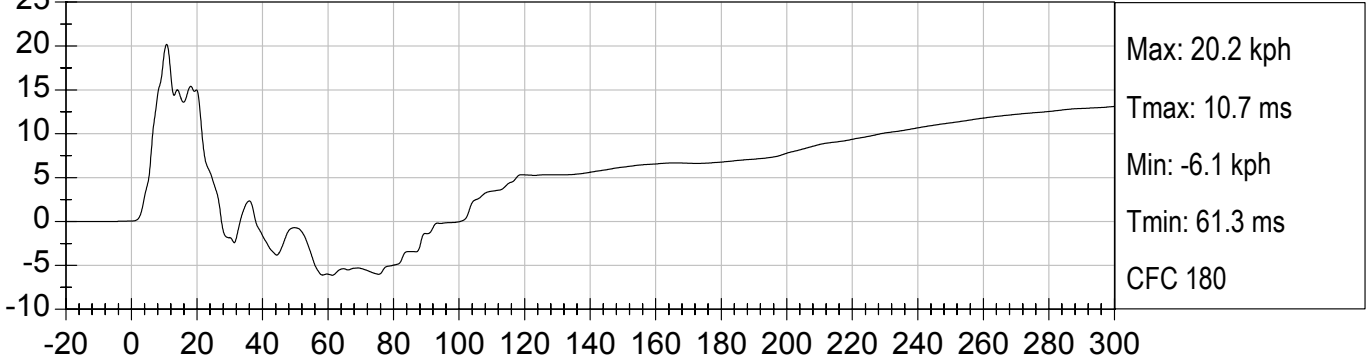




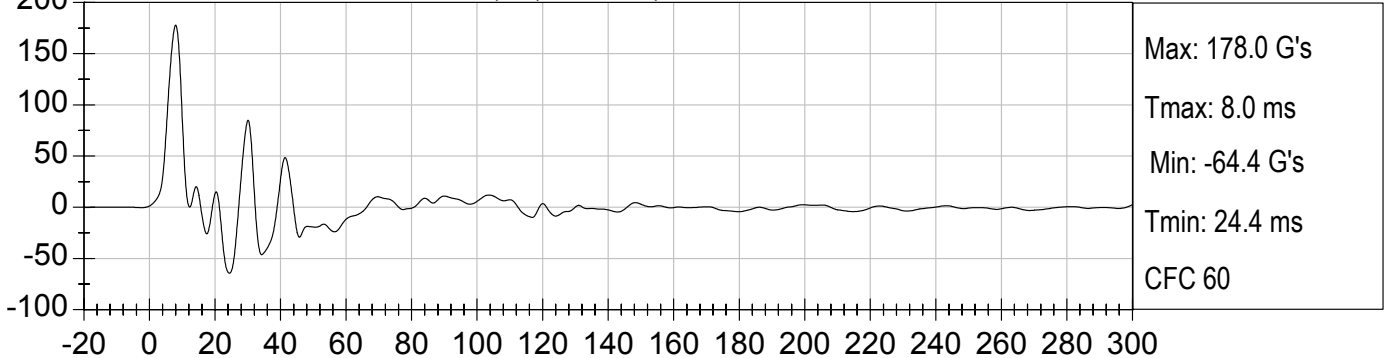
LF DOOR UPPER CENTERLINE Y (G's) vs TIME (ms)



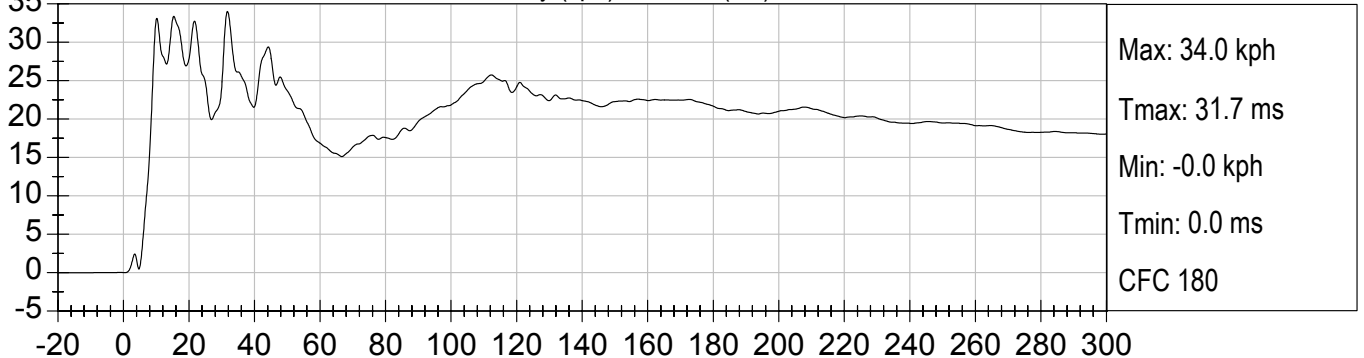
LF DOOR UPPER CENTERLINE Y Velocity (kph) vs TIME (ms)

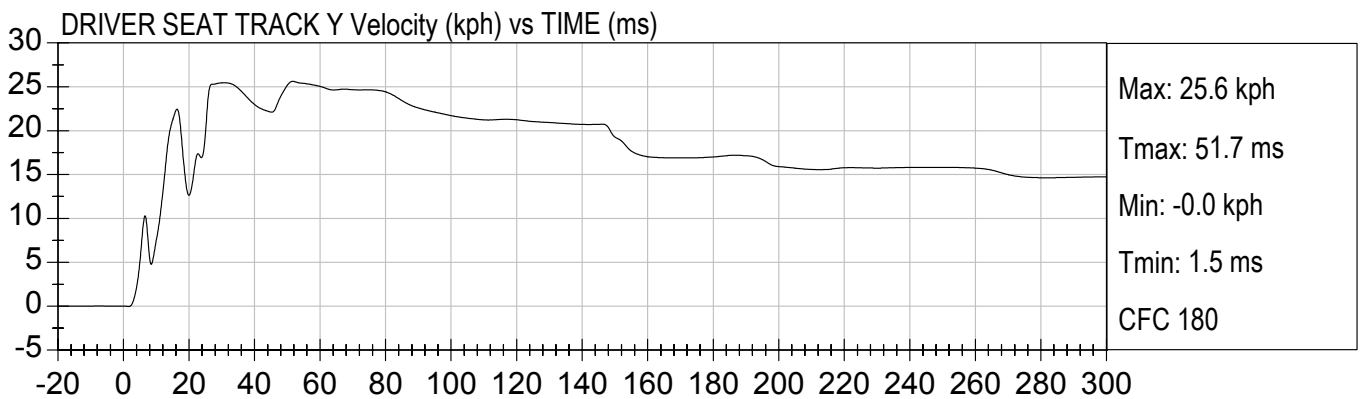
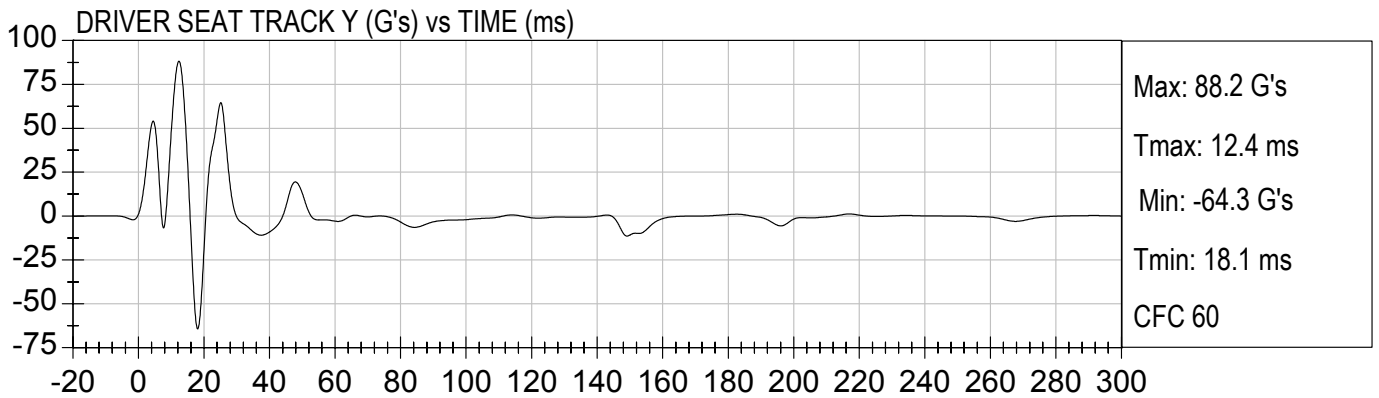
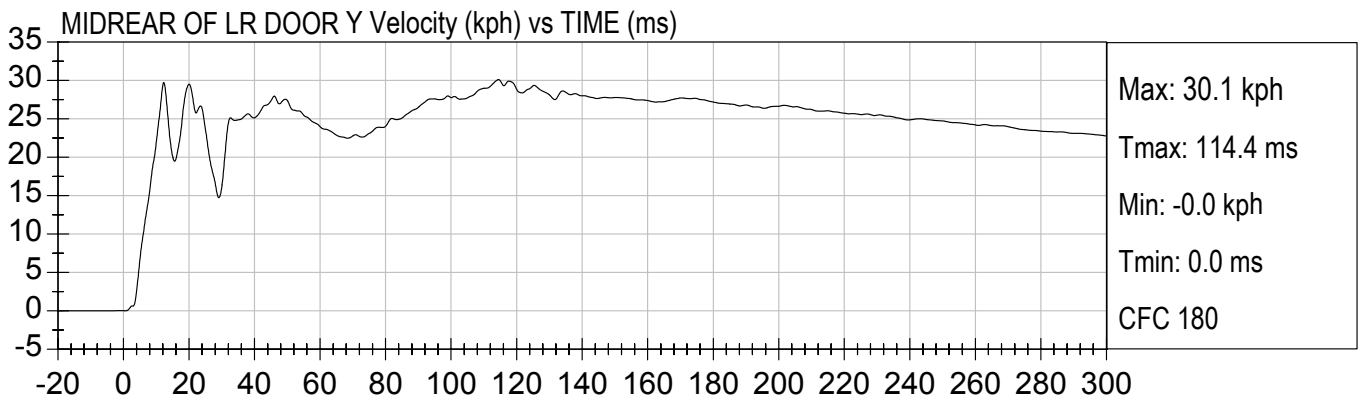
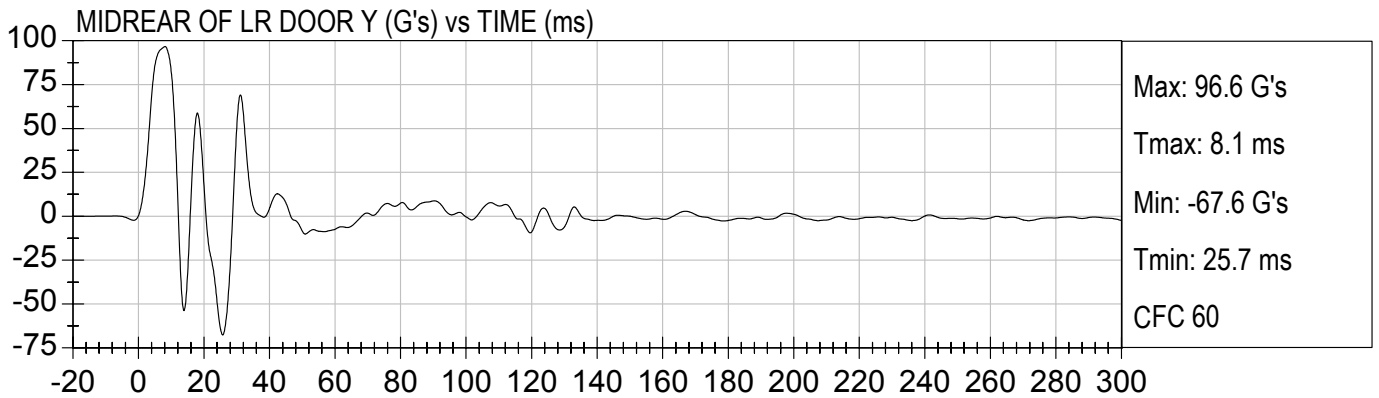


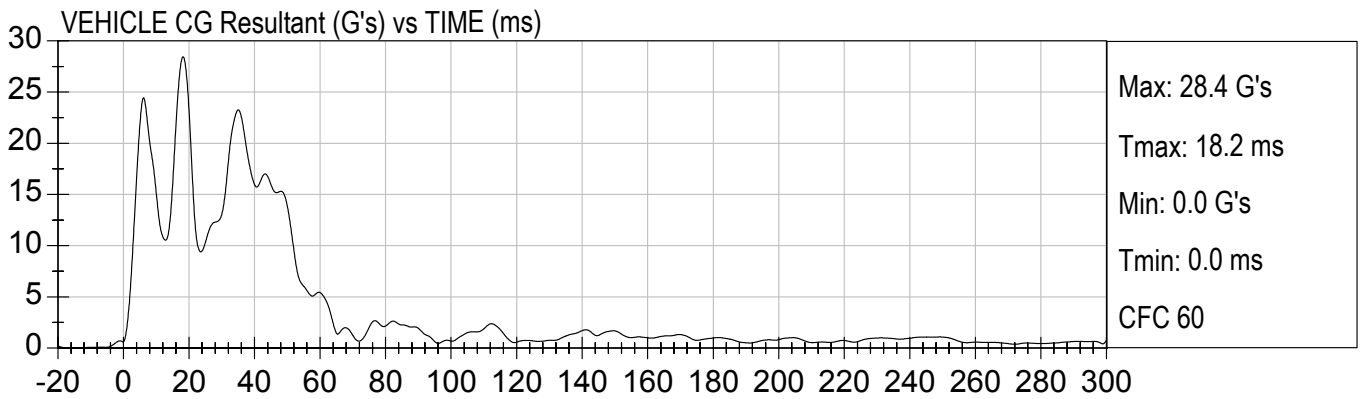
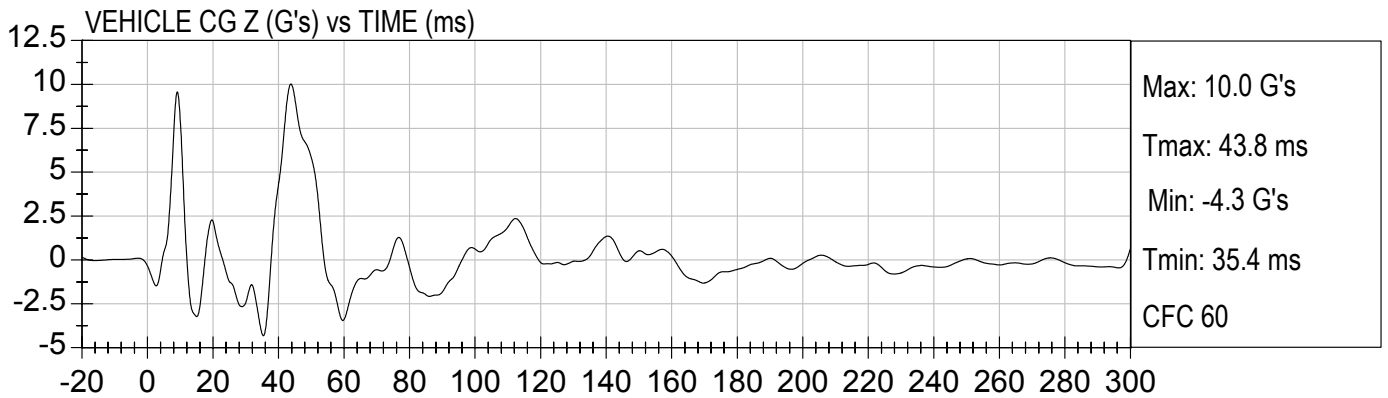
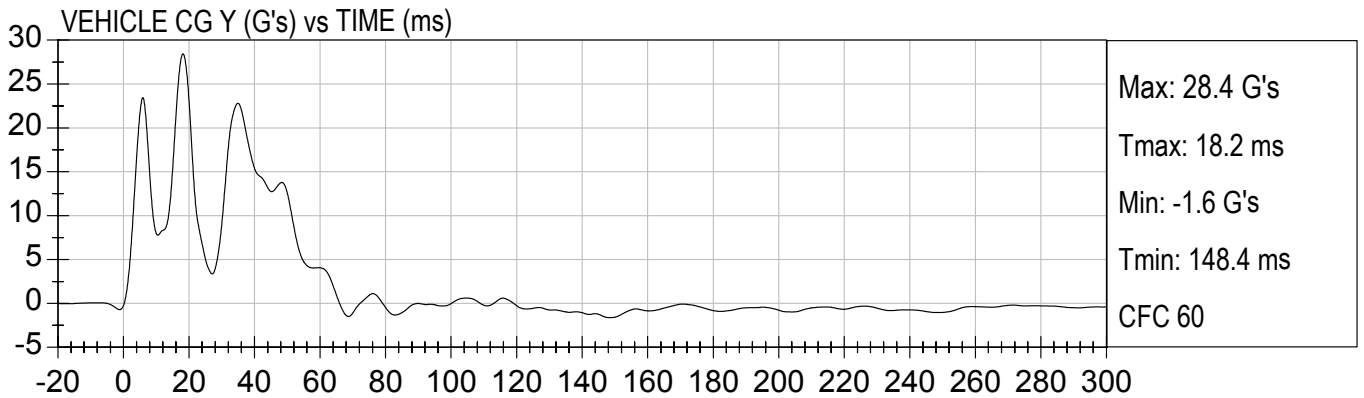
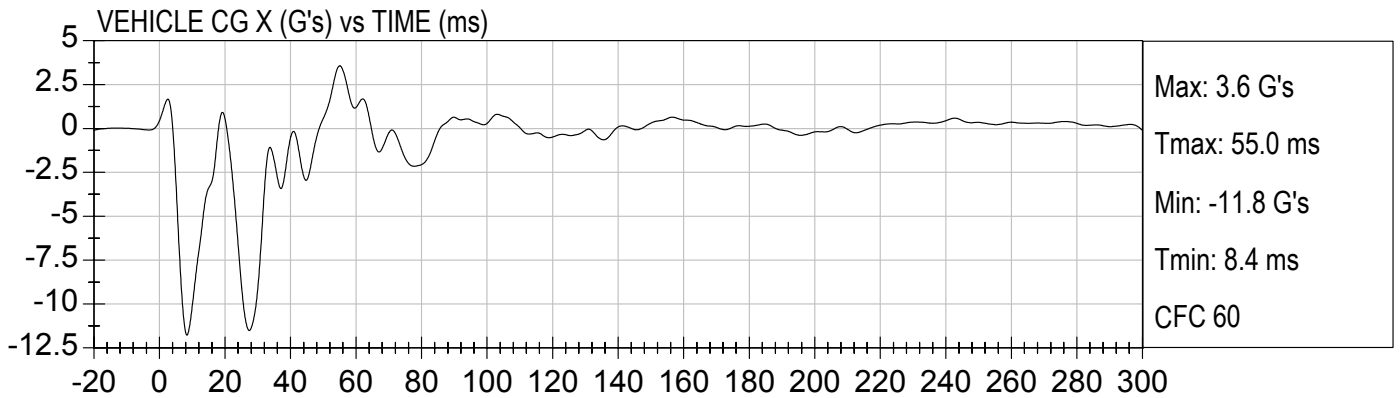
LR DOOR UPPER CENTERLINE Y (G's) vs TIME (ms)



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

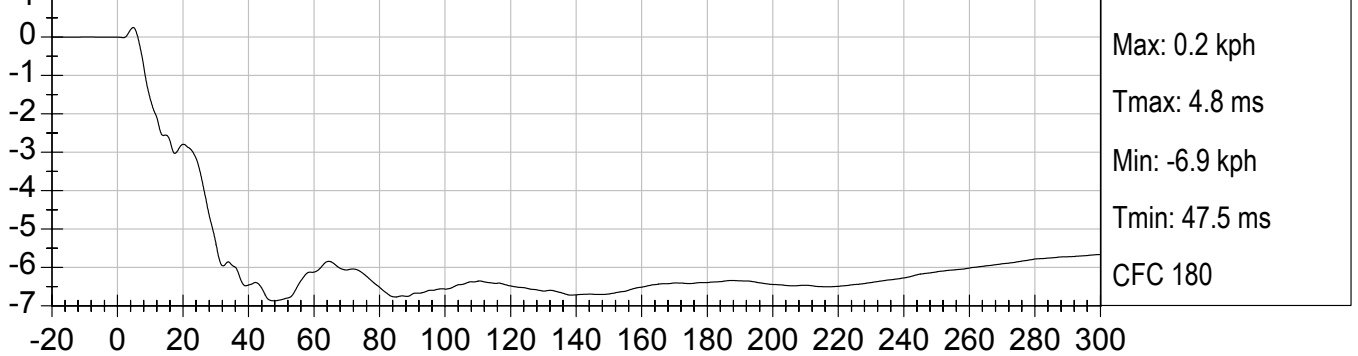




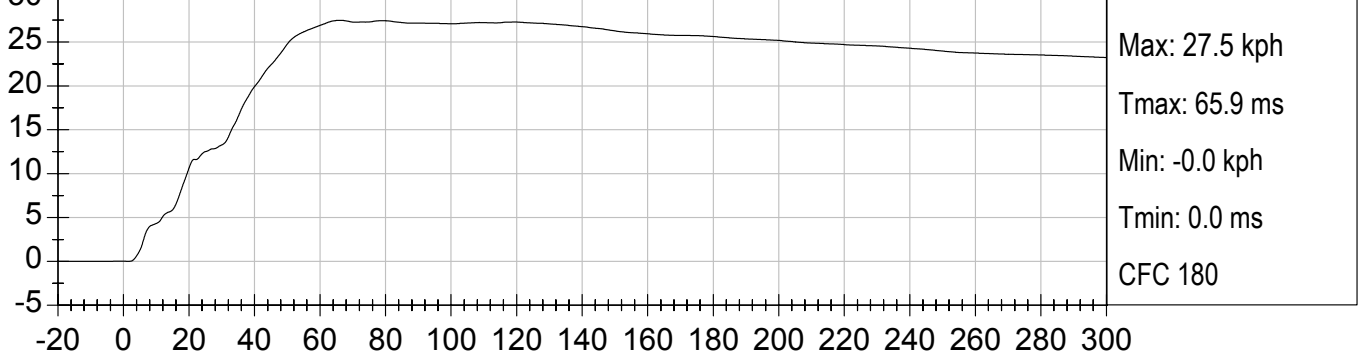




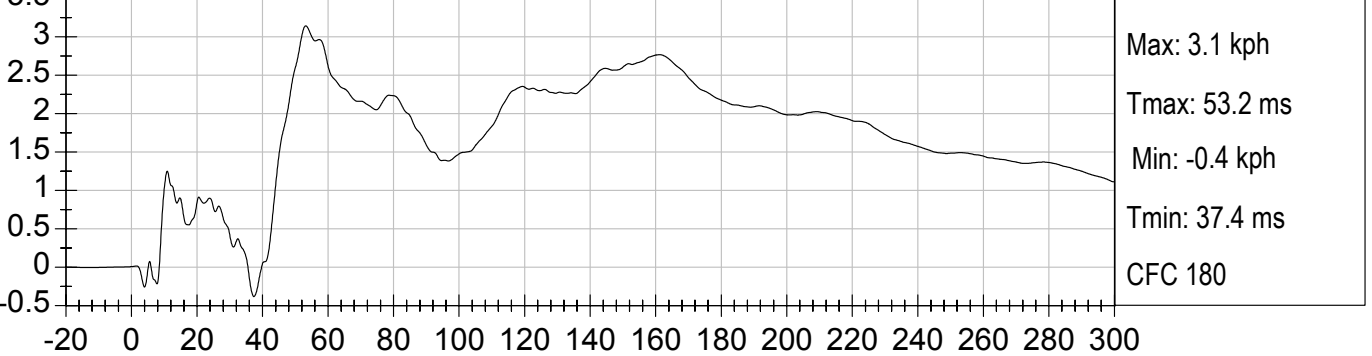
1 VEHICLE CG X Velocity (kph) vs TIME (ms)

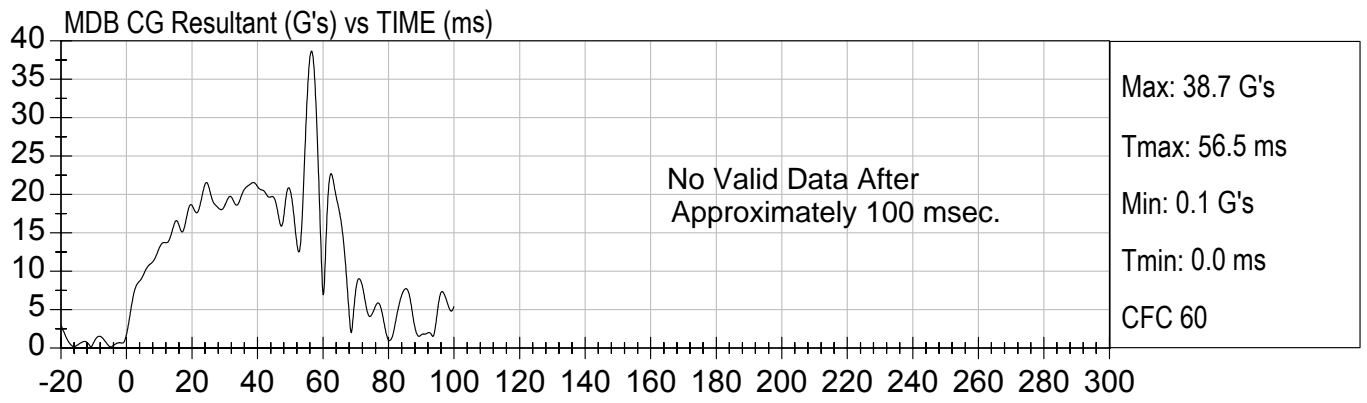
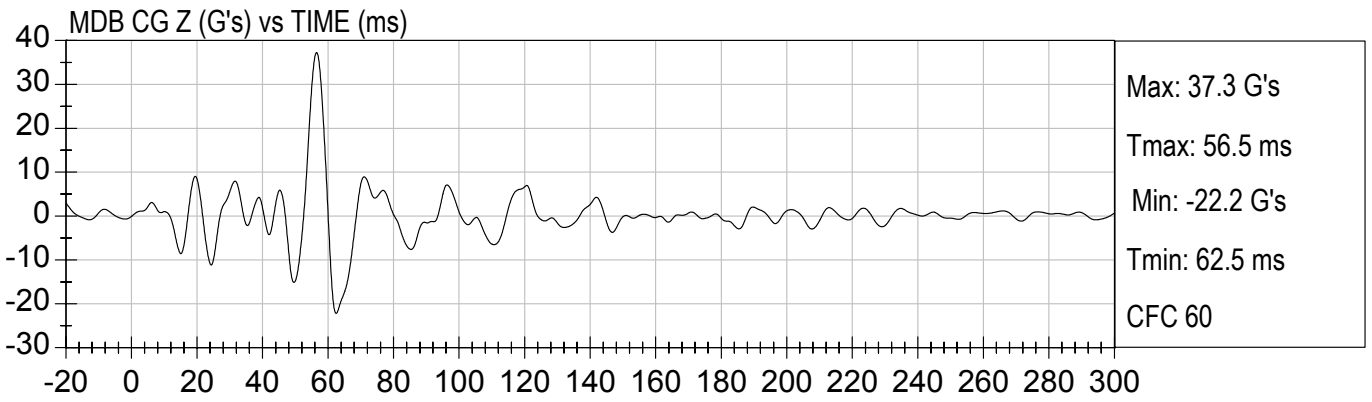
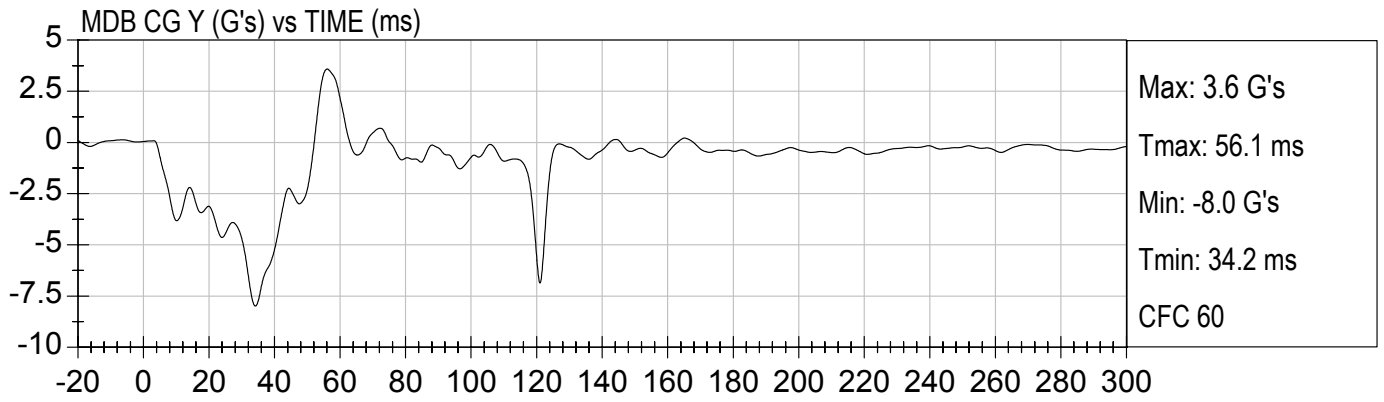
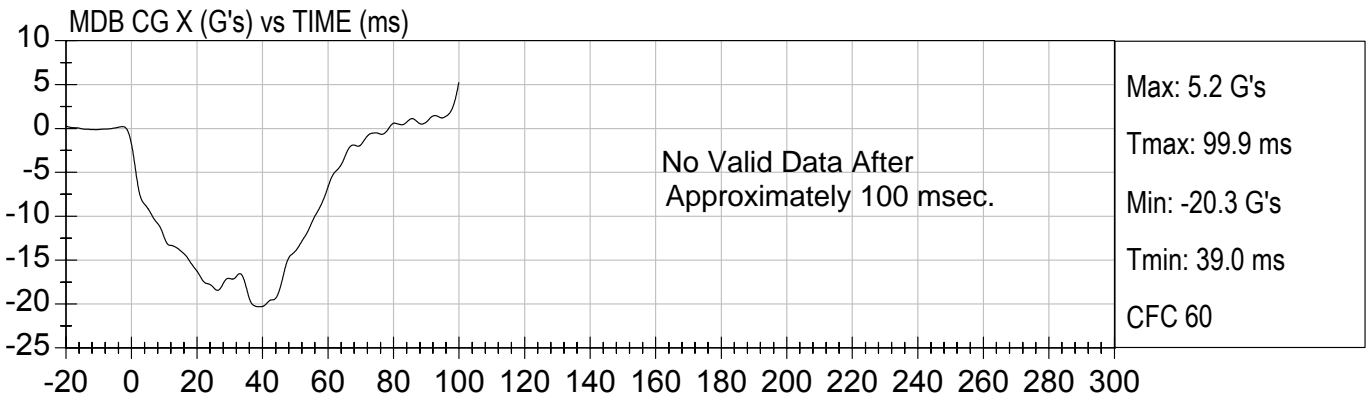


30 VEHICLE CG Y Velocity (kph) vs TIME (ms)



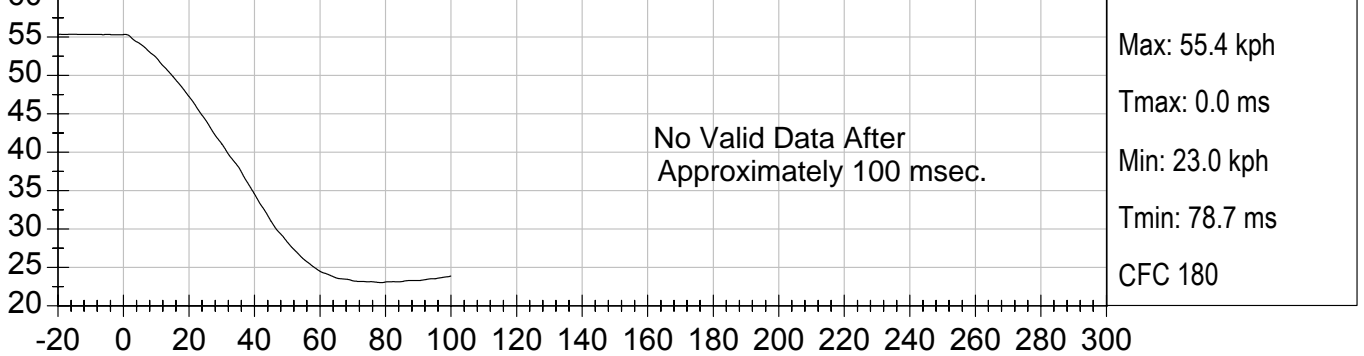
3.5 VEHICLE CG Z Velocity (kph) vs TIME (ms)



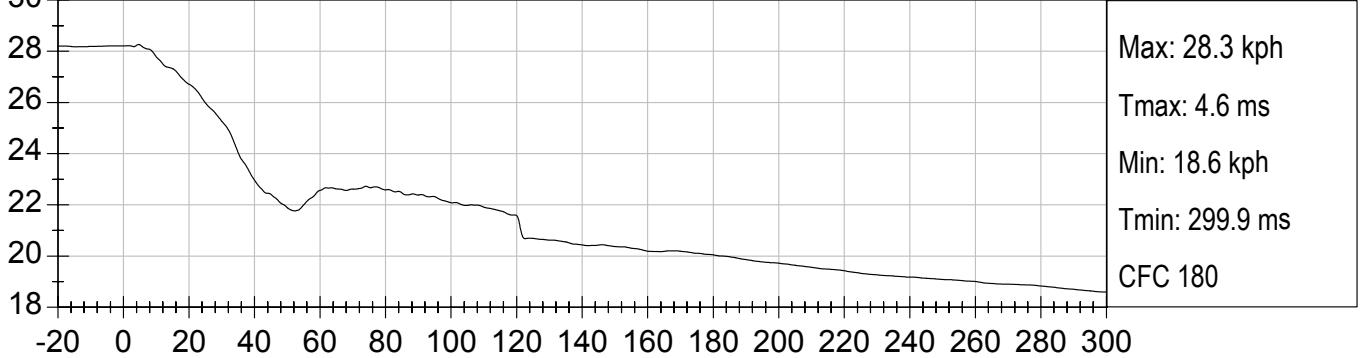




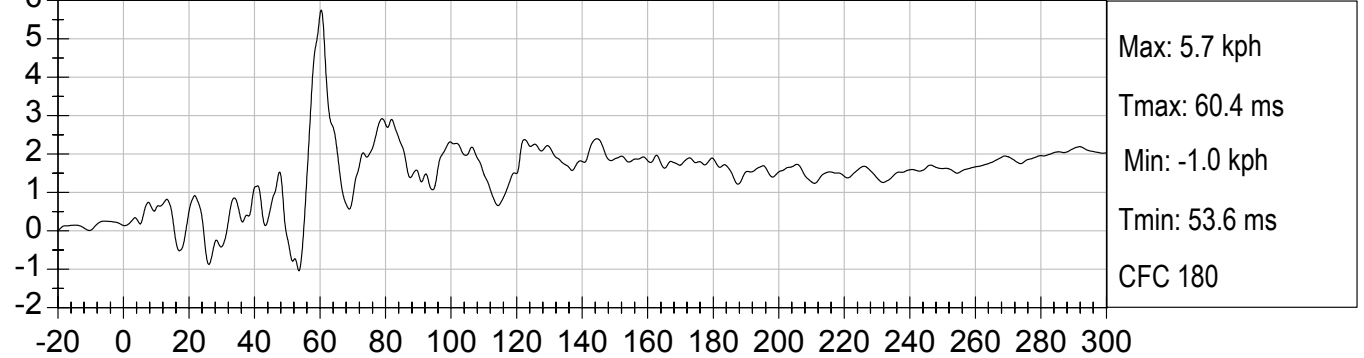
MDB CG X Velocity (kph) vs TIME (ms)

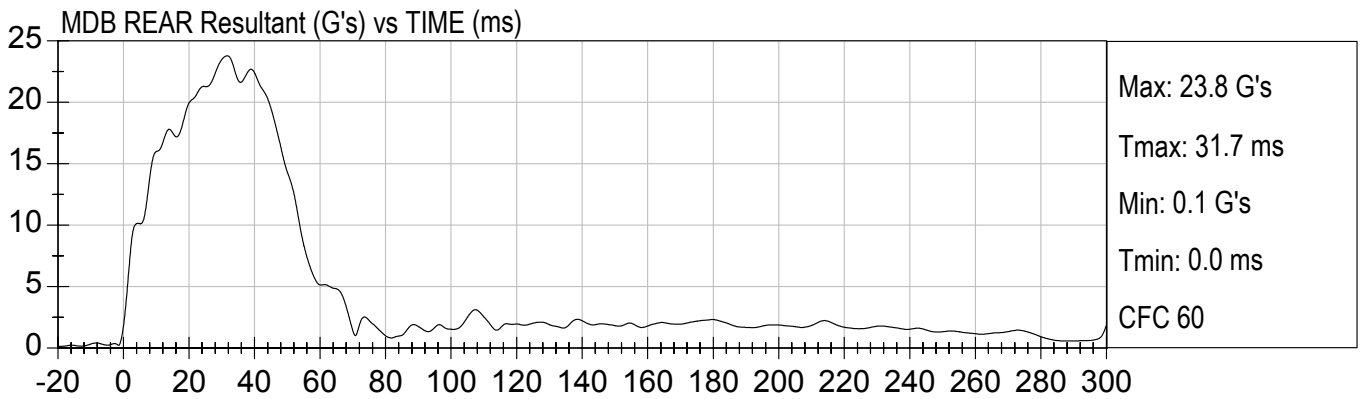
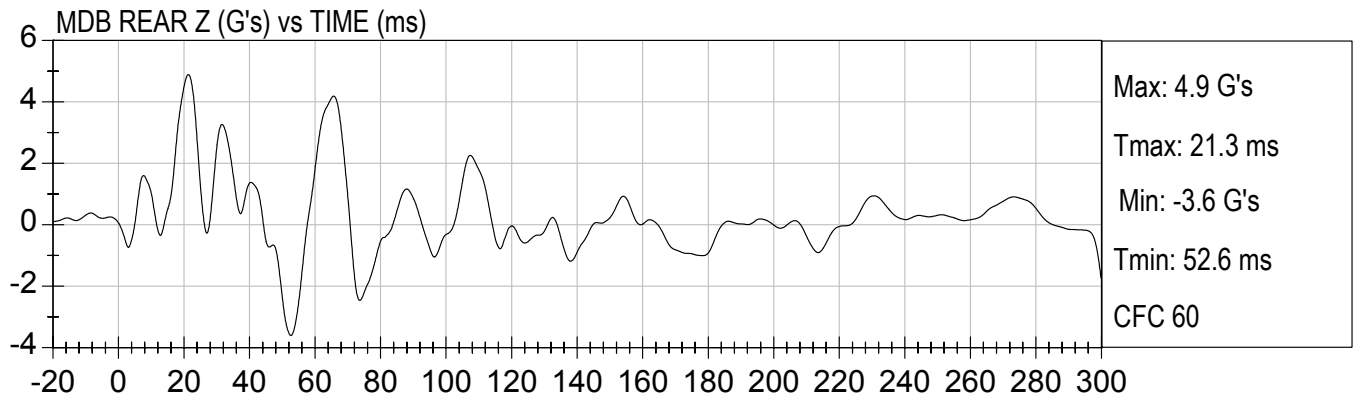
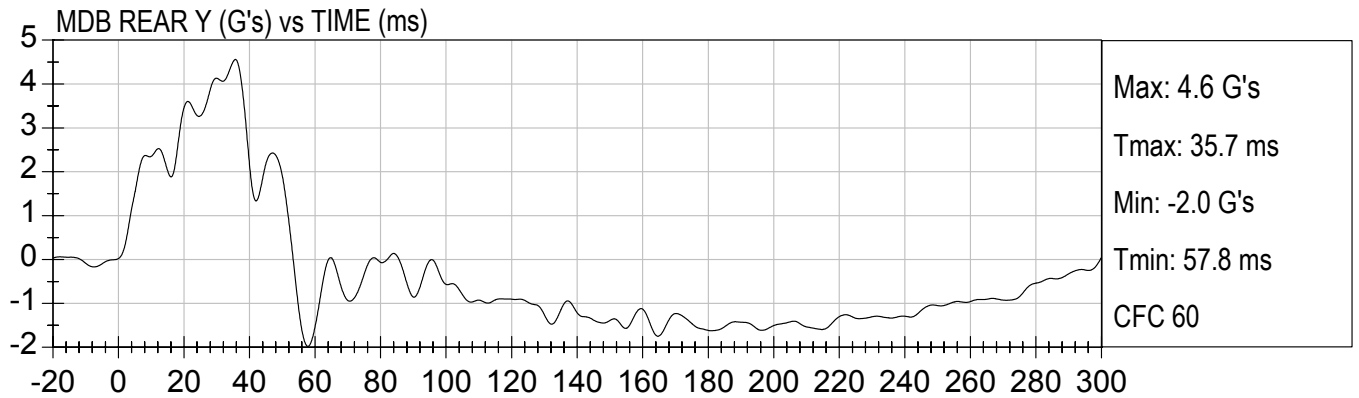
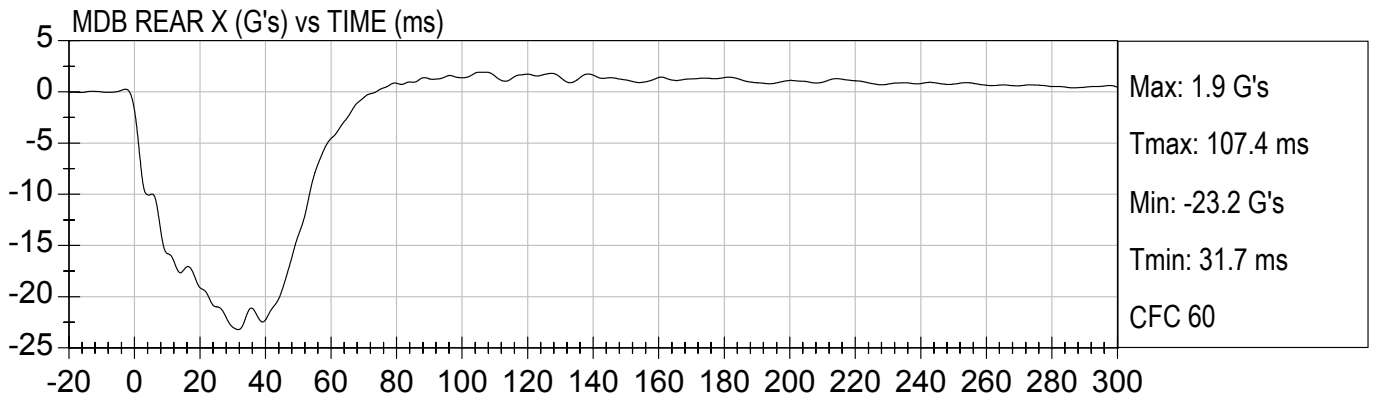


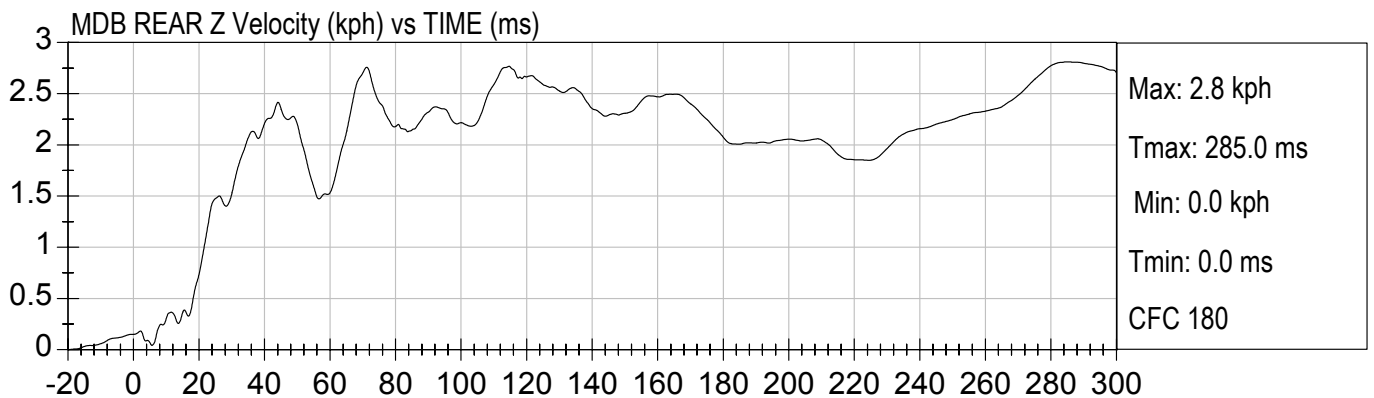
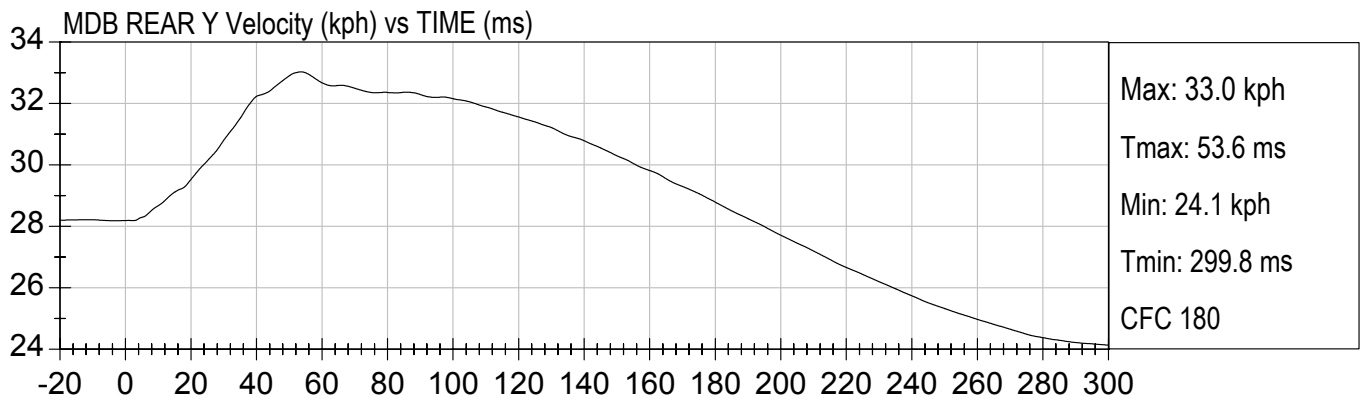
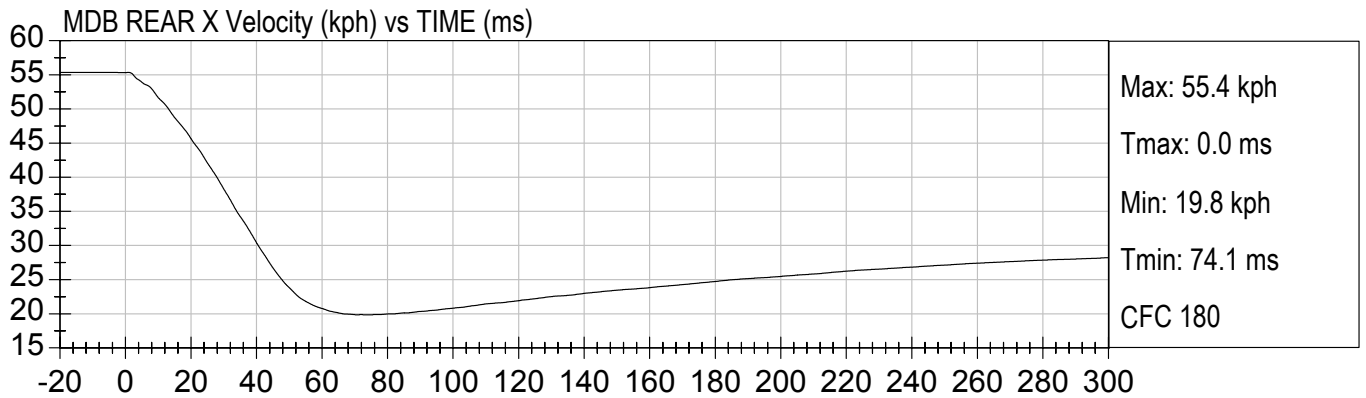
MDB CG Y Velocity (kph) vs TIME (ms)

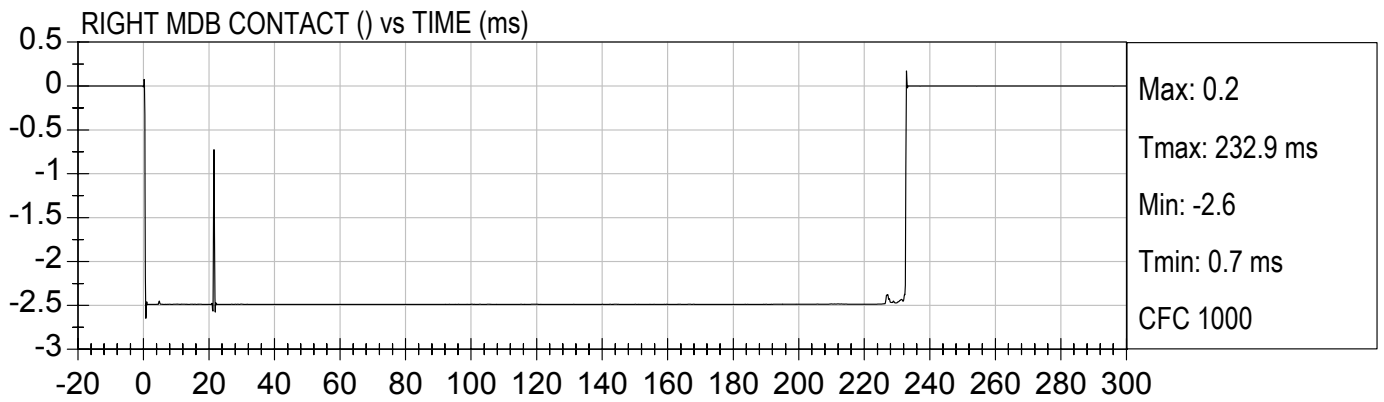
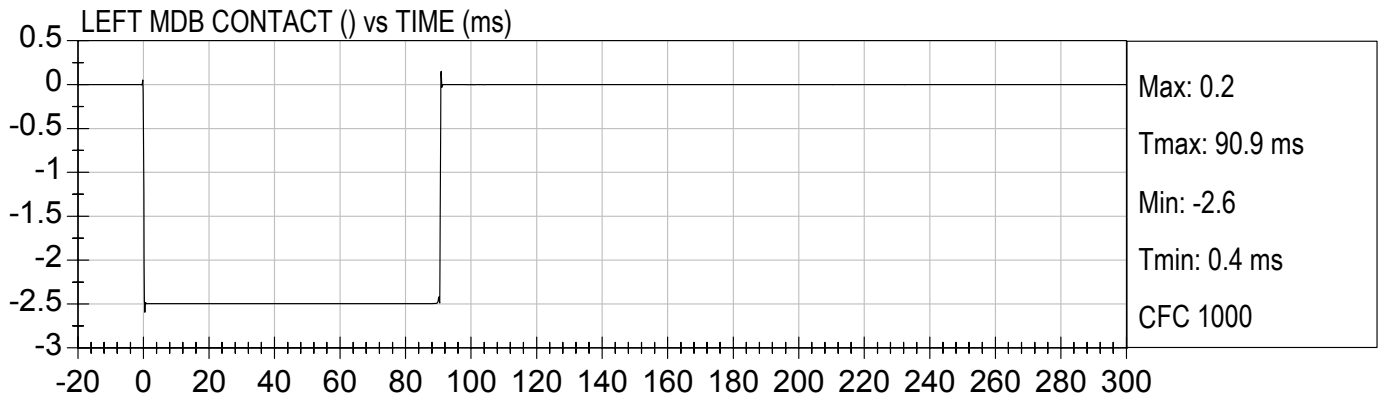


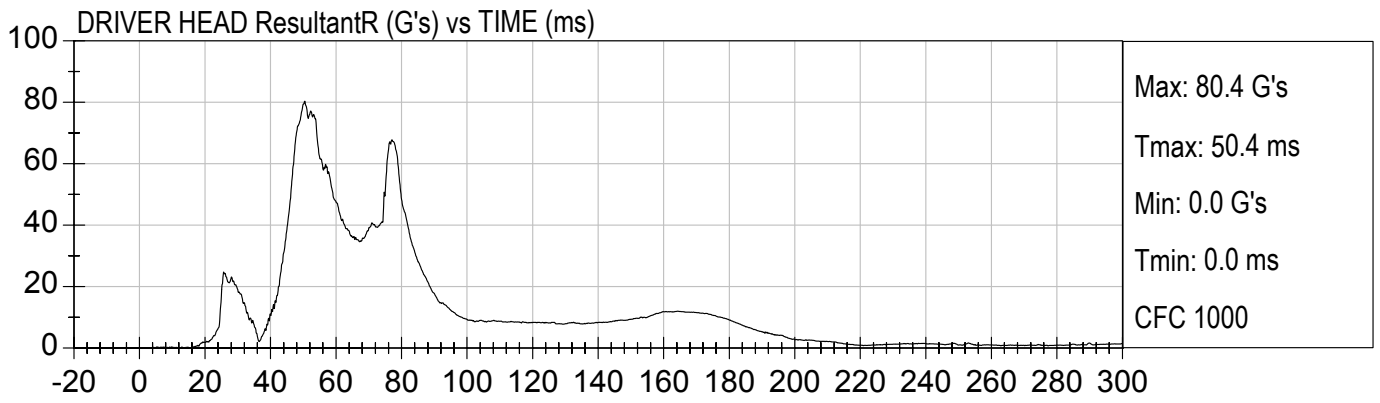
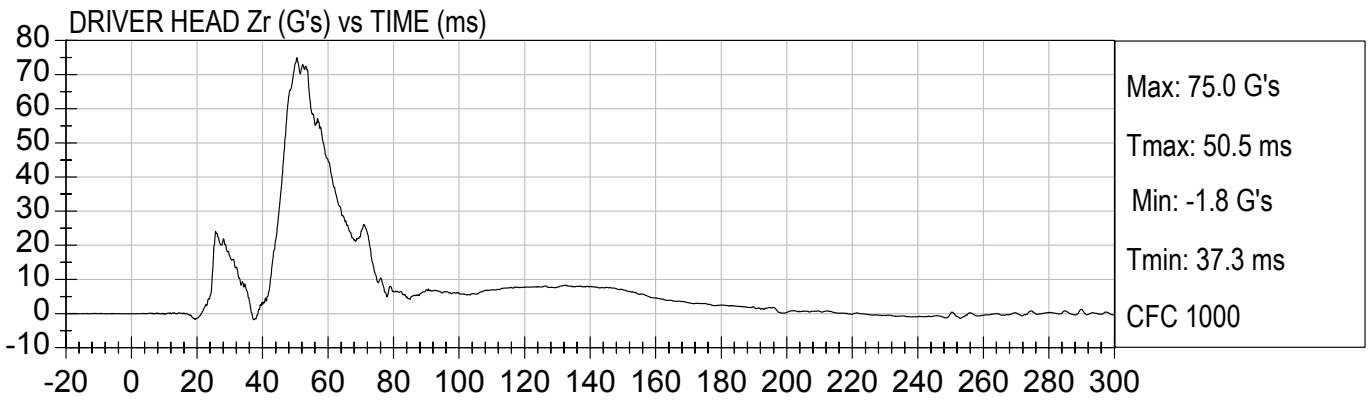
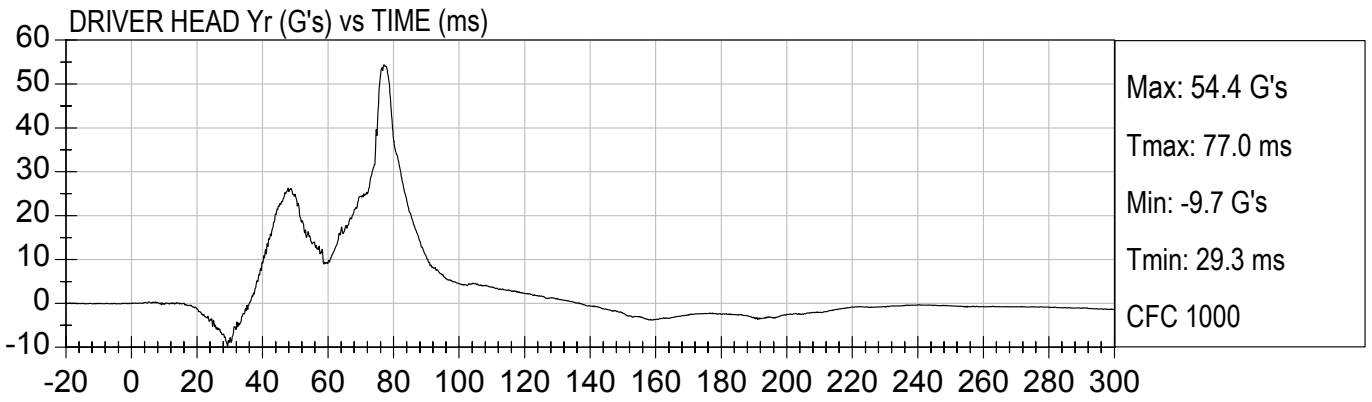
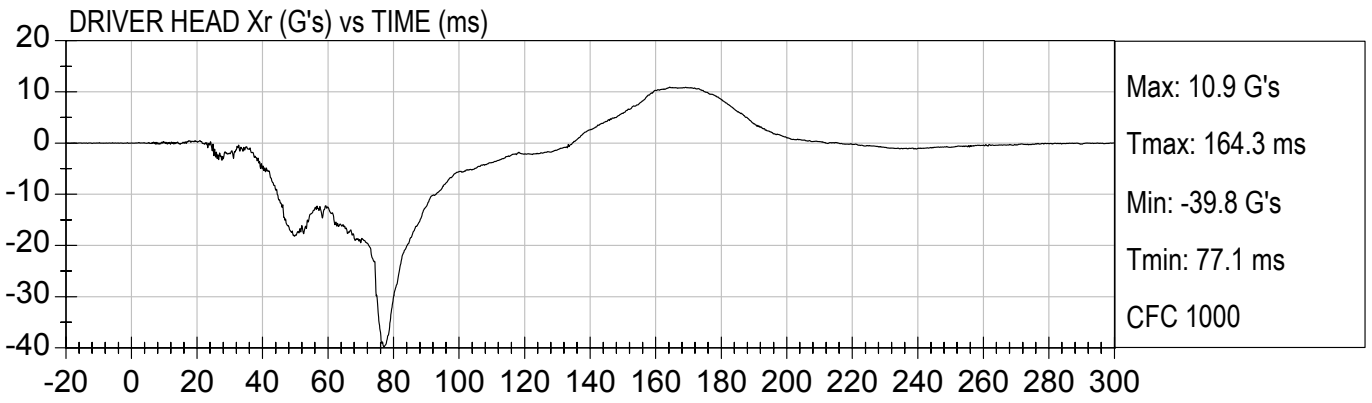
MDB CG Z Velocity (kph) vs TIME (ms)

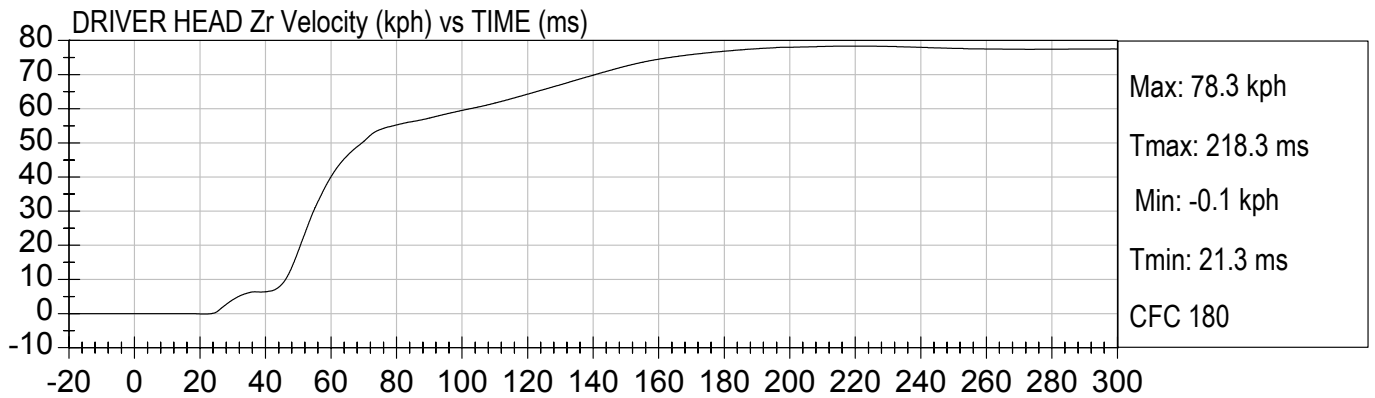
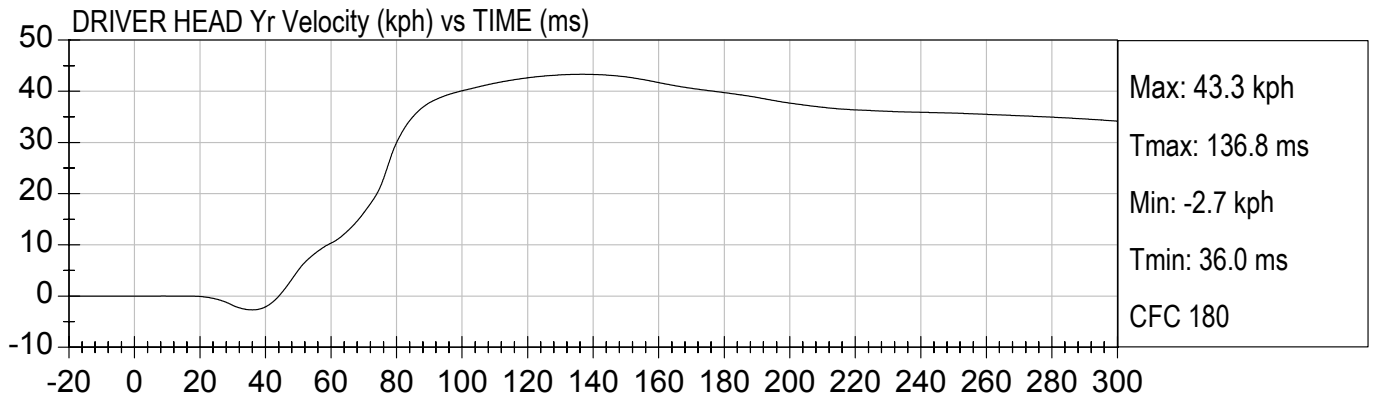
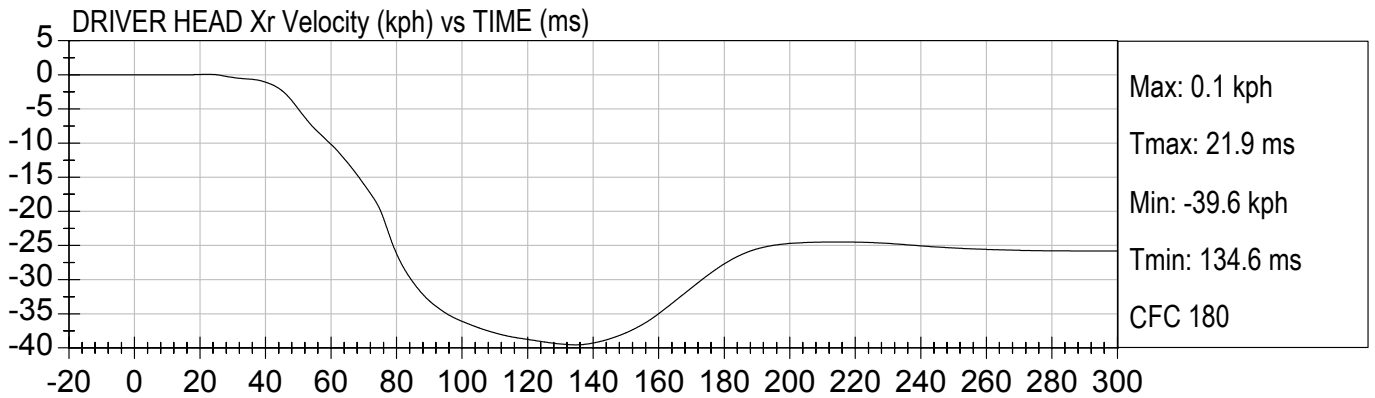


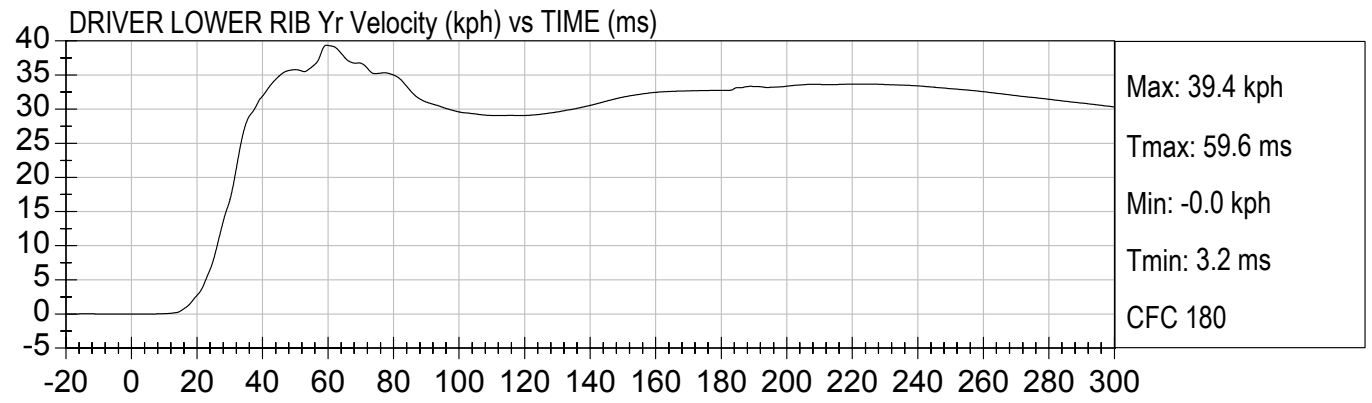
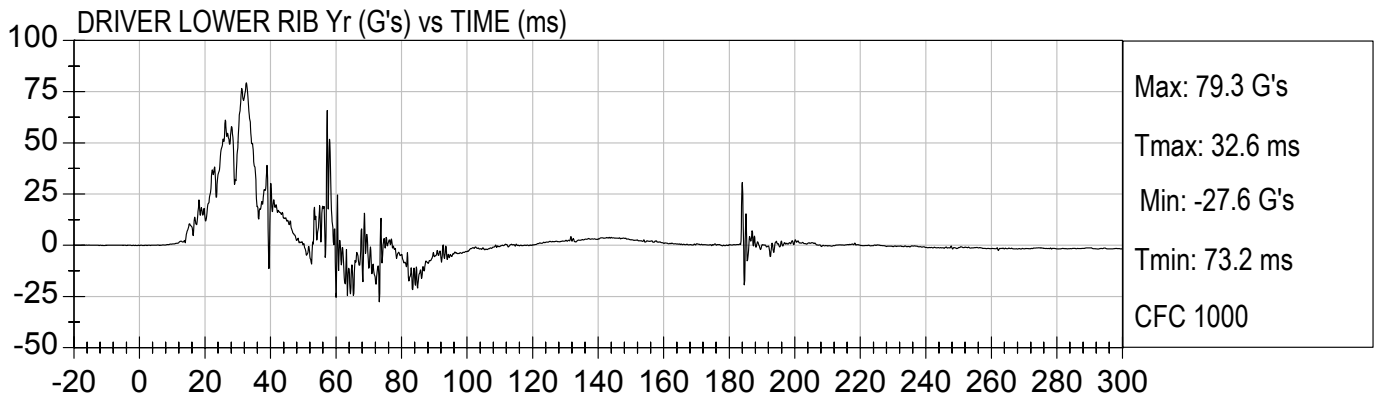
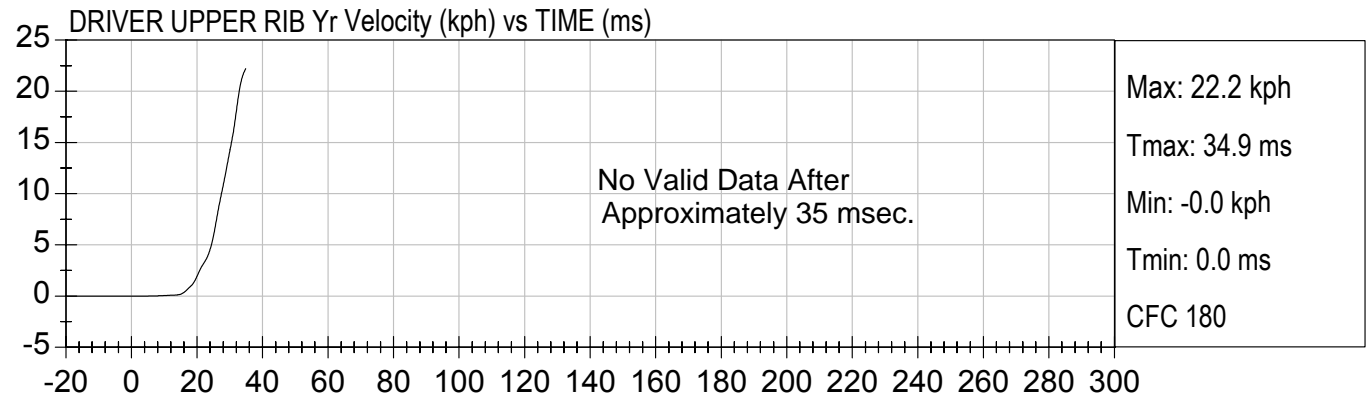
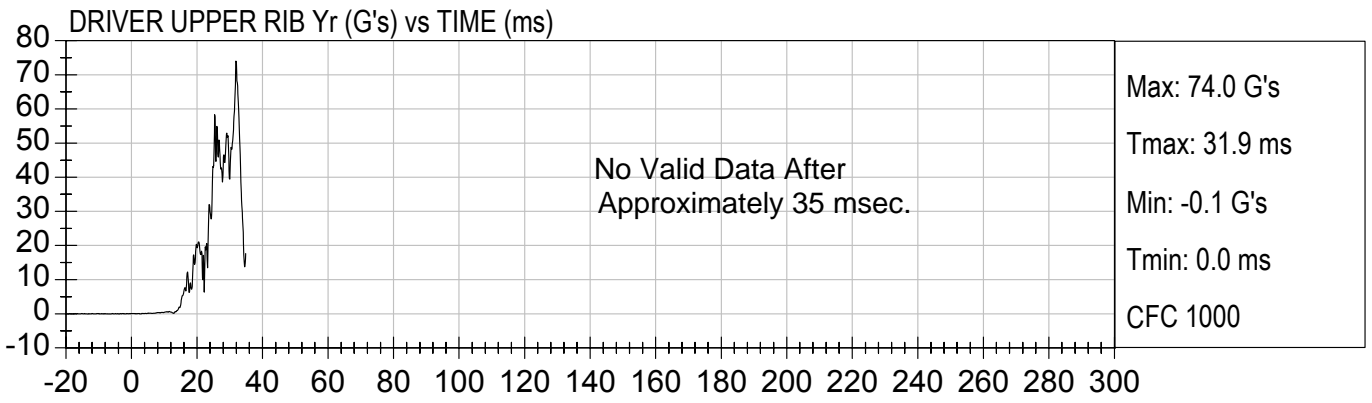


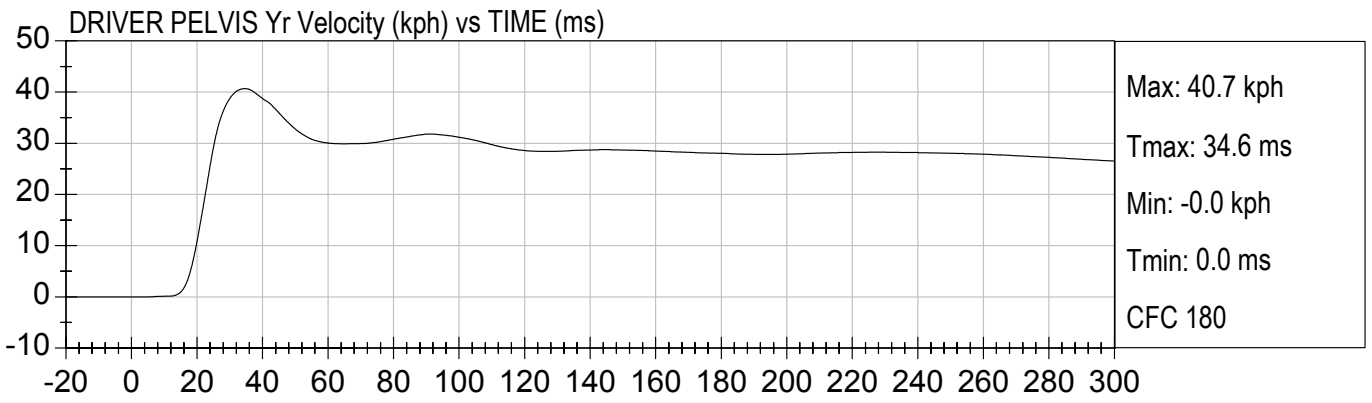
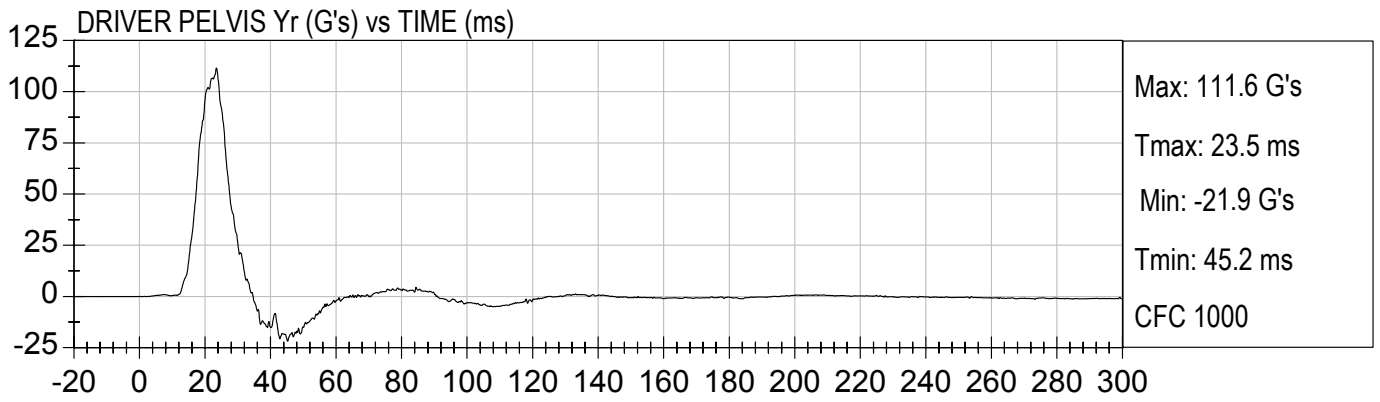
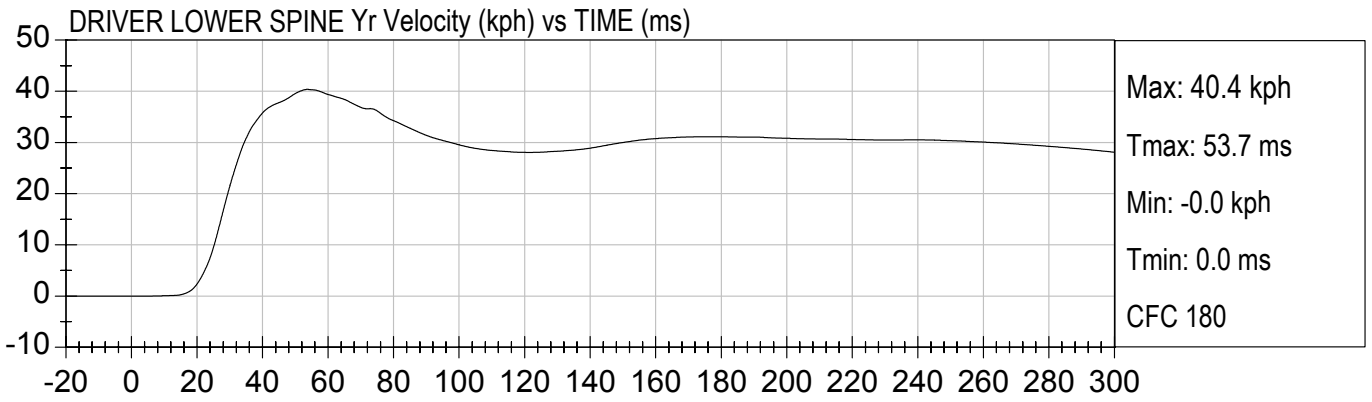
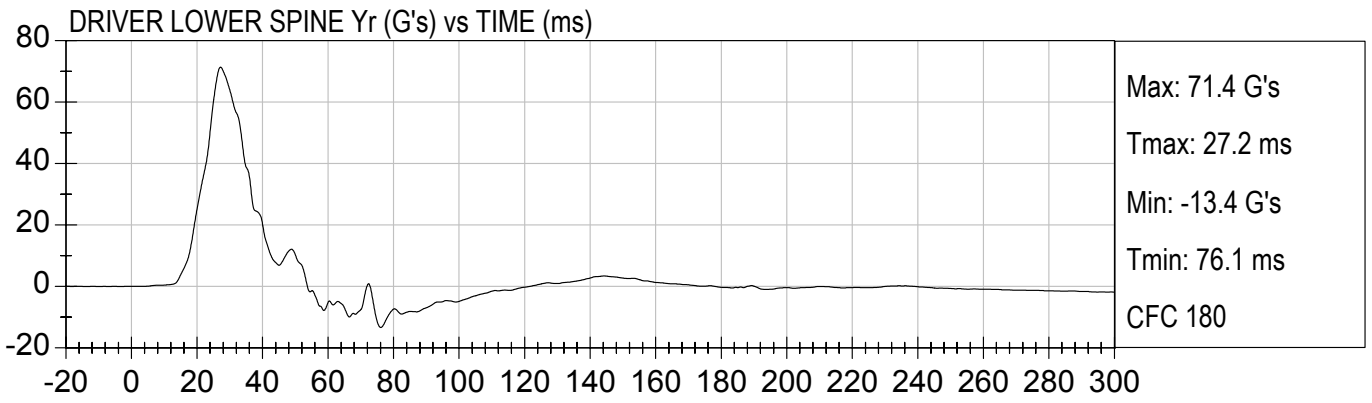


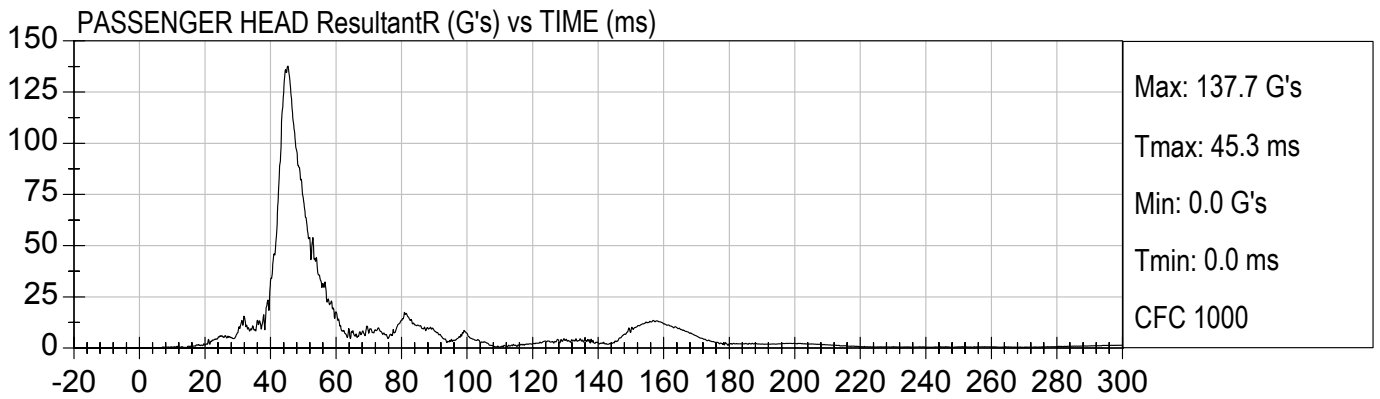
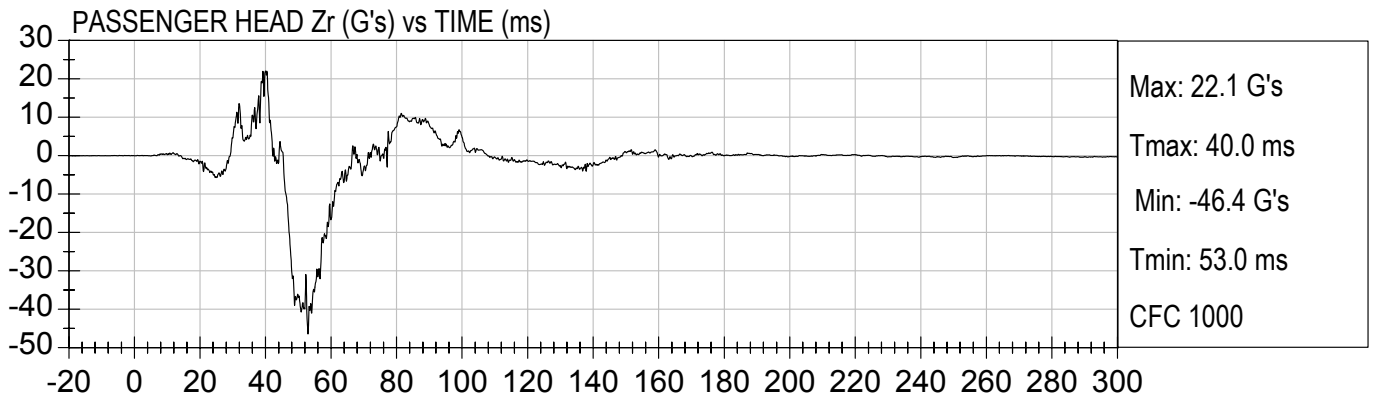
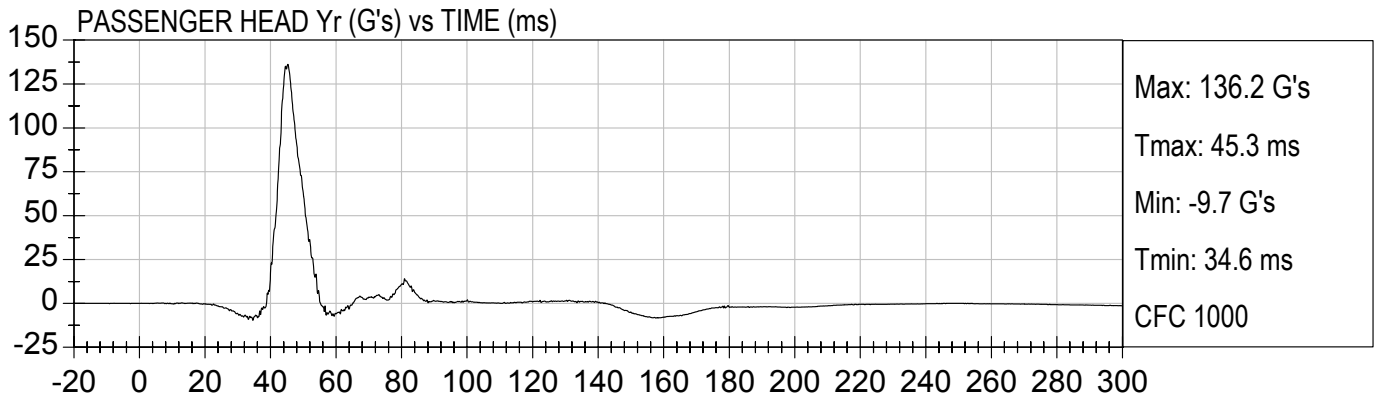
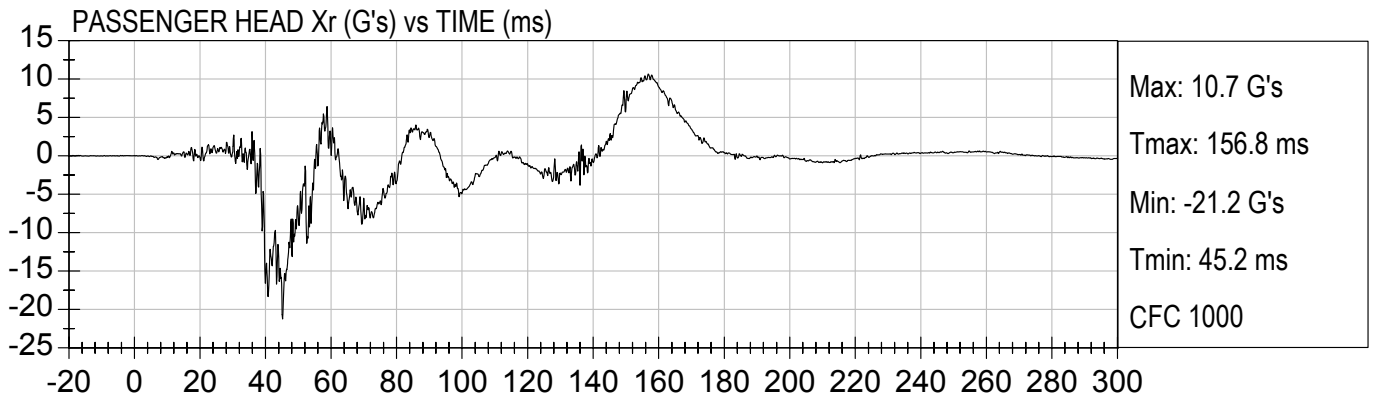


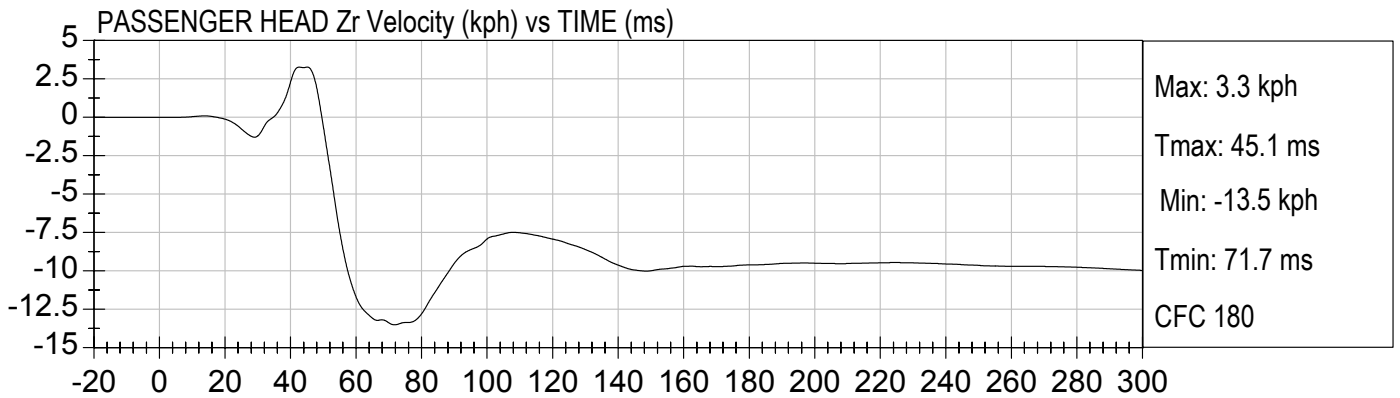
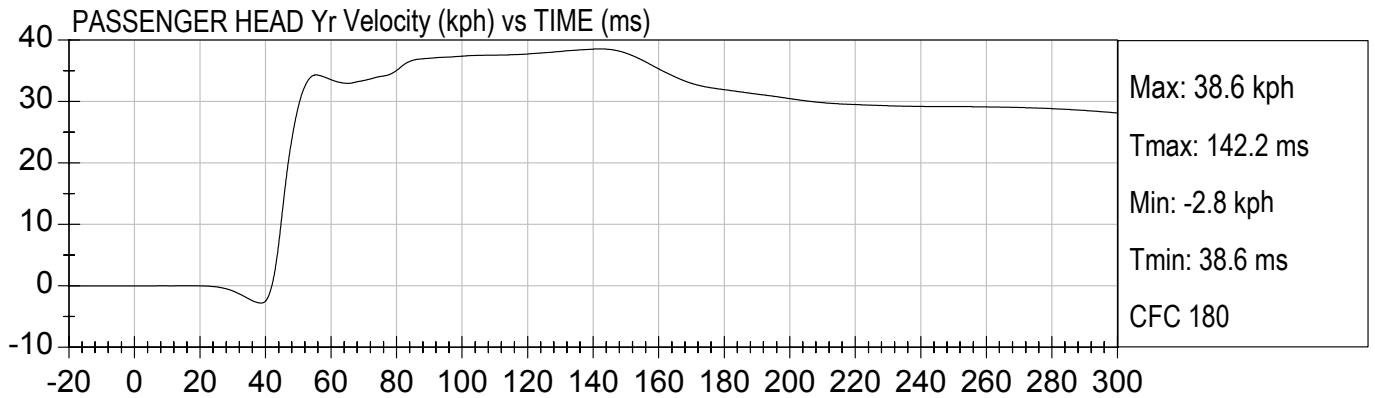
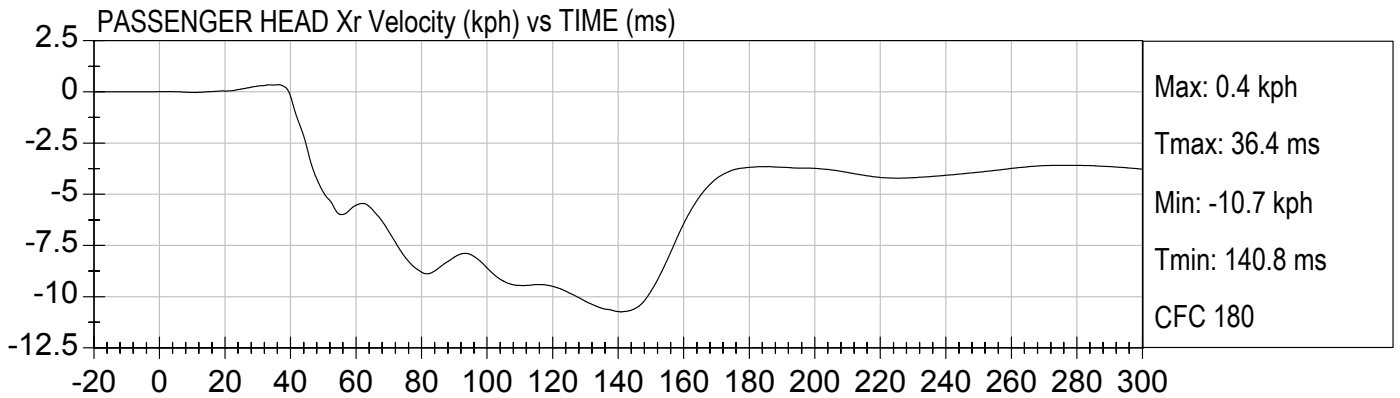


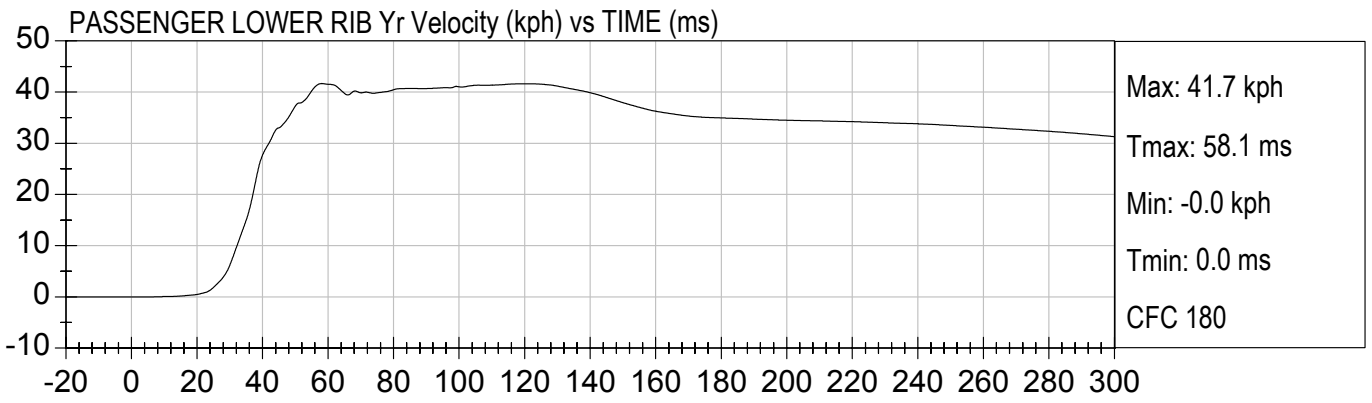
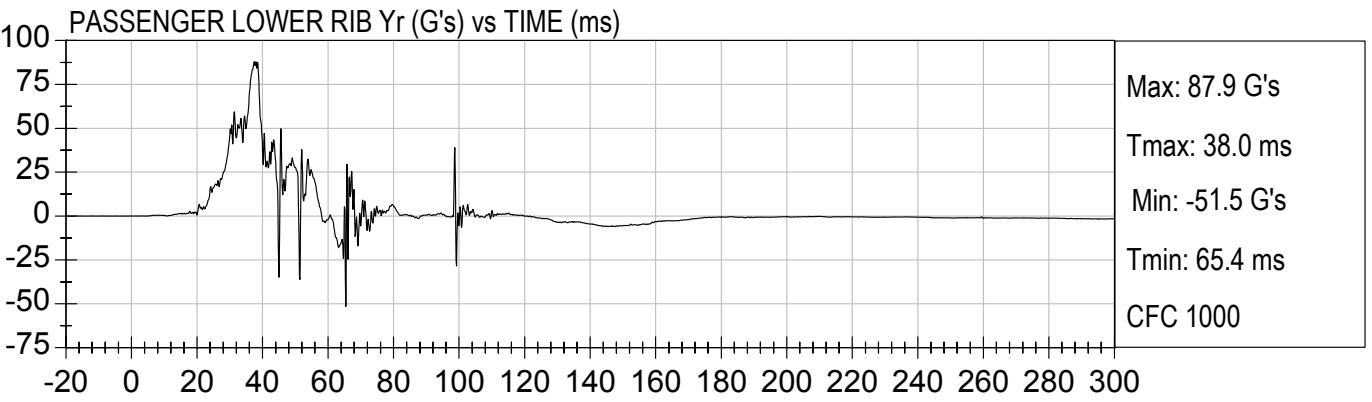
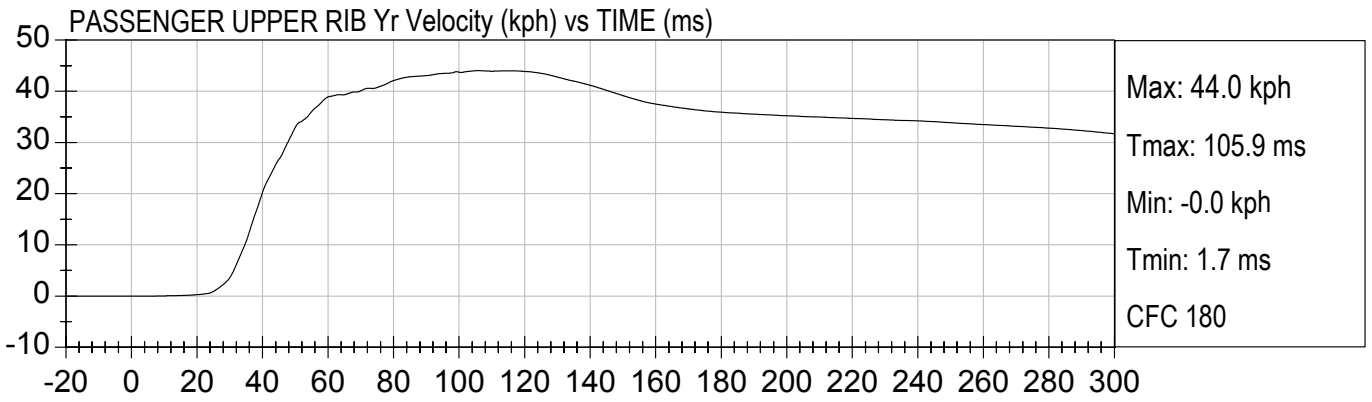
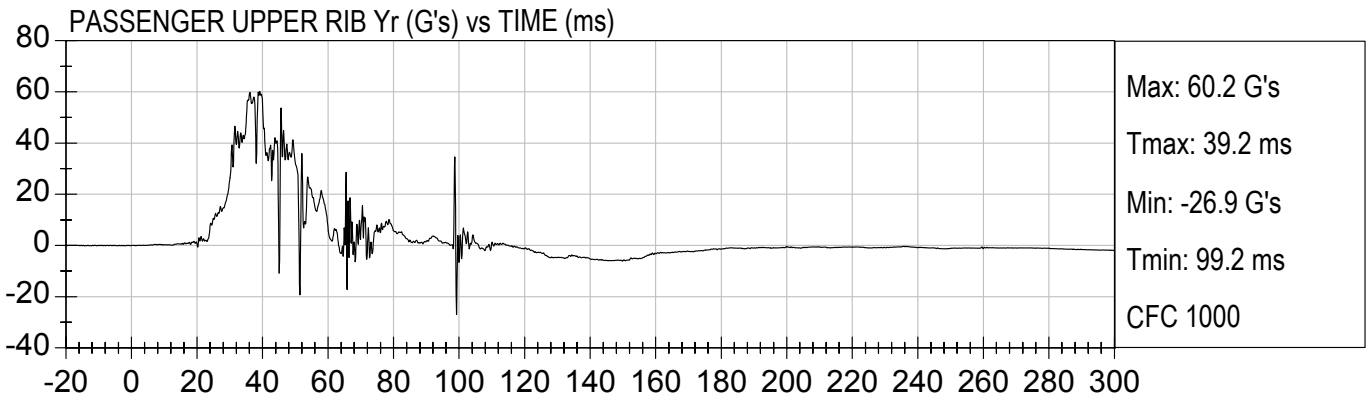


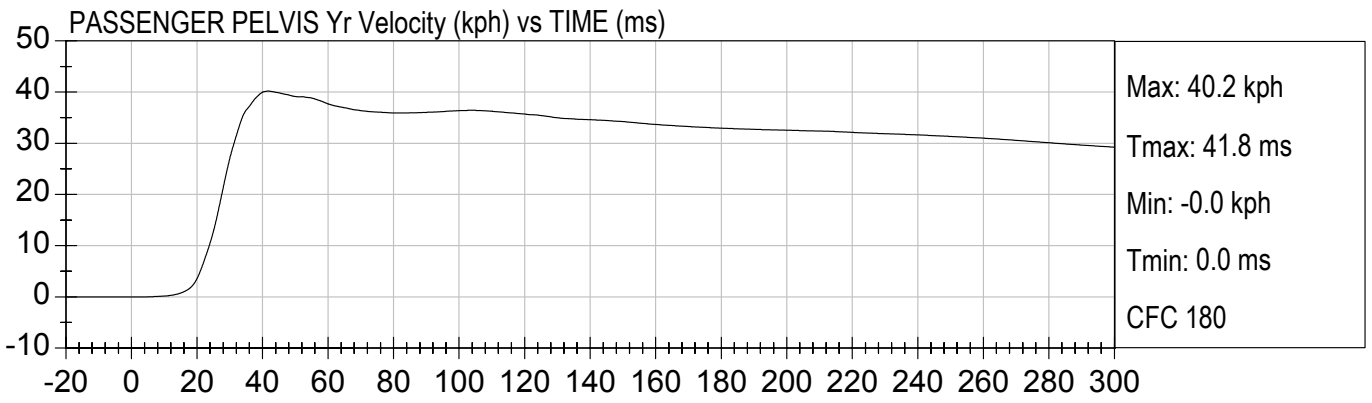
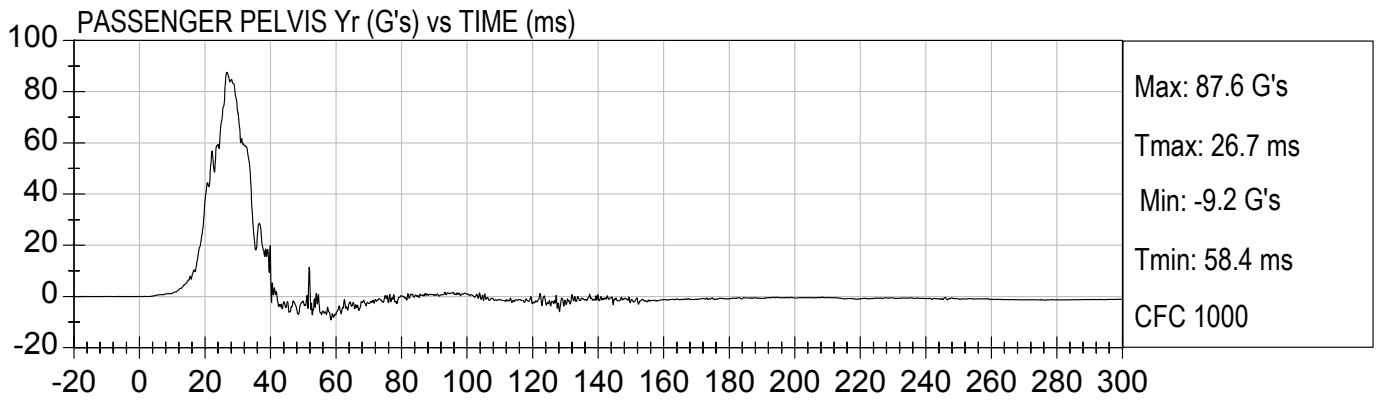
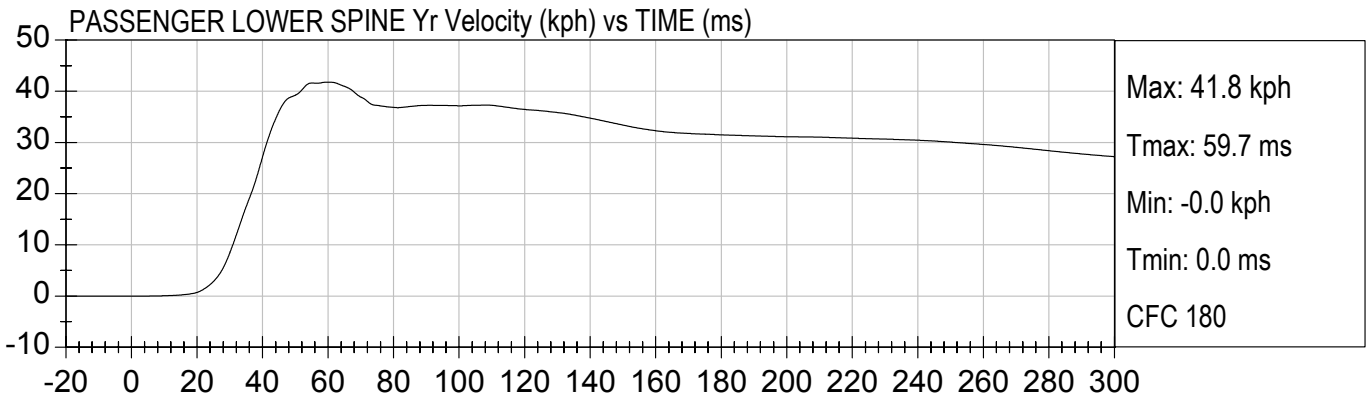
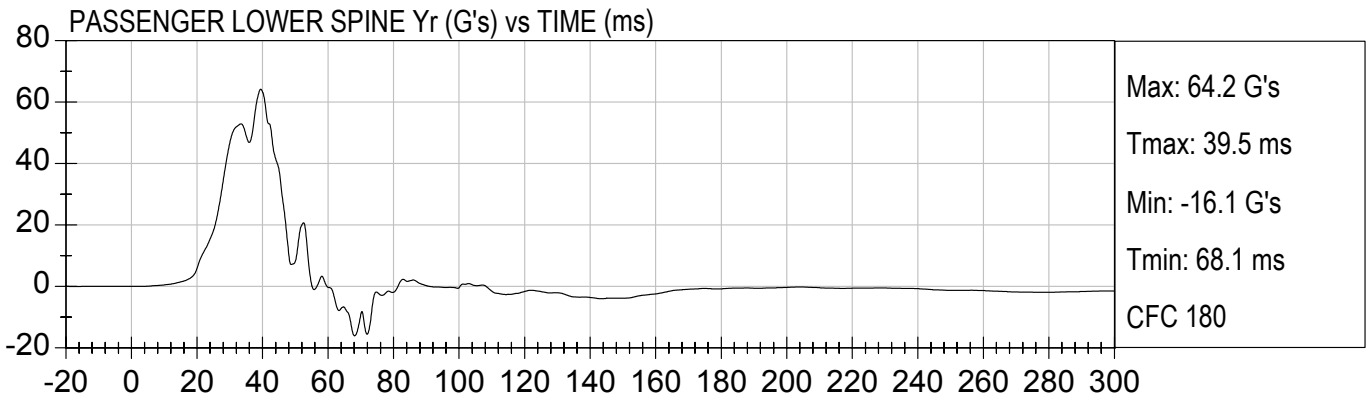


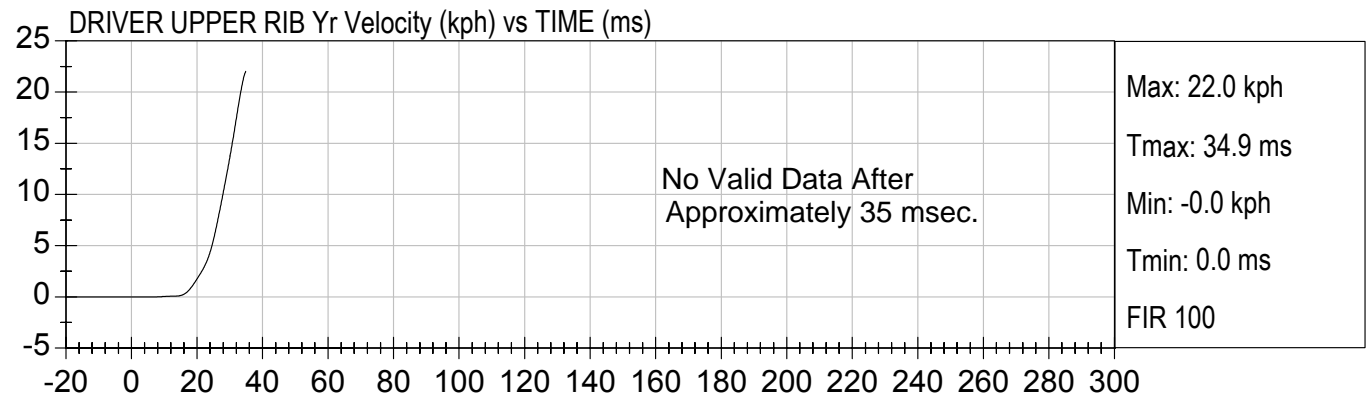
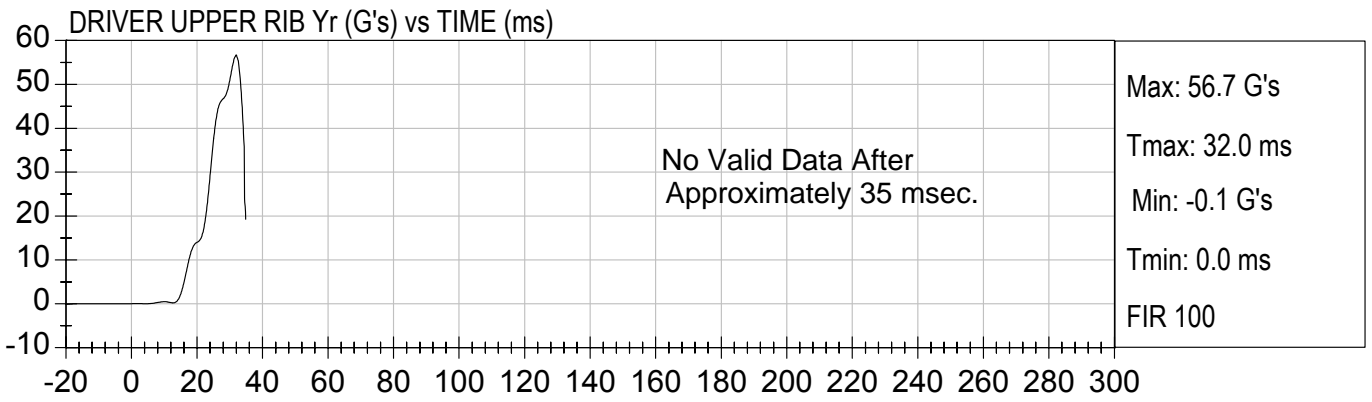
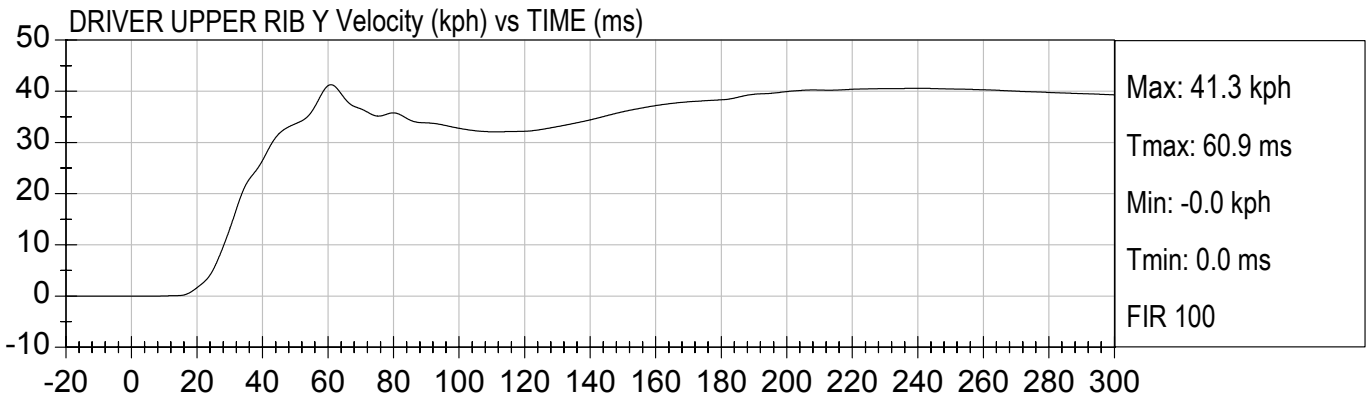
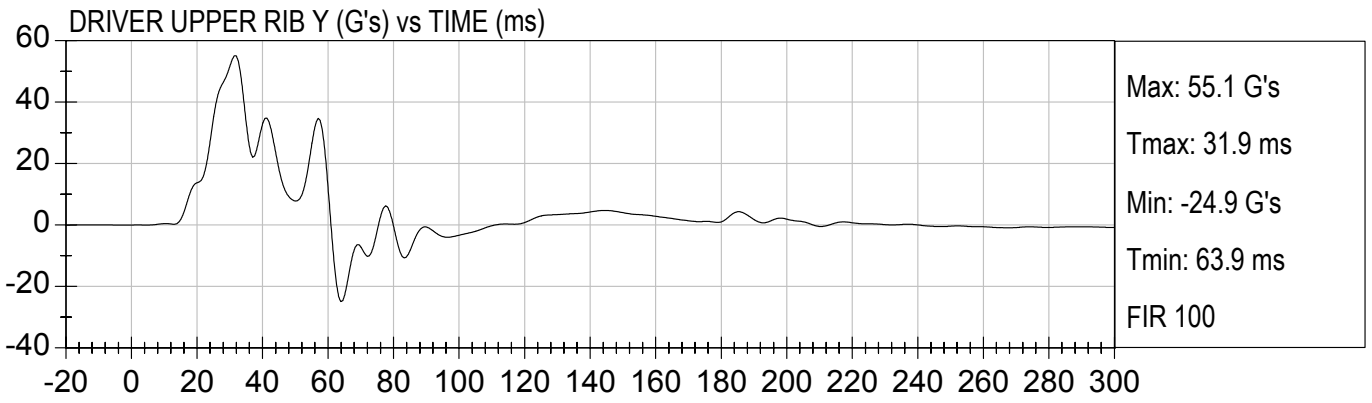


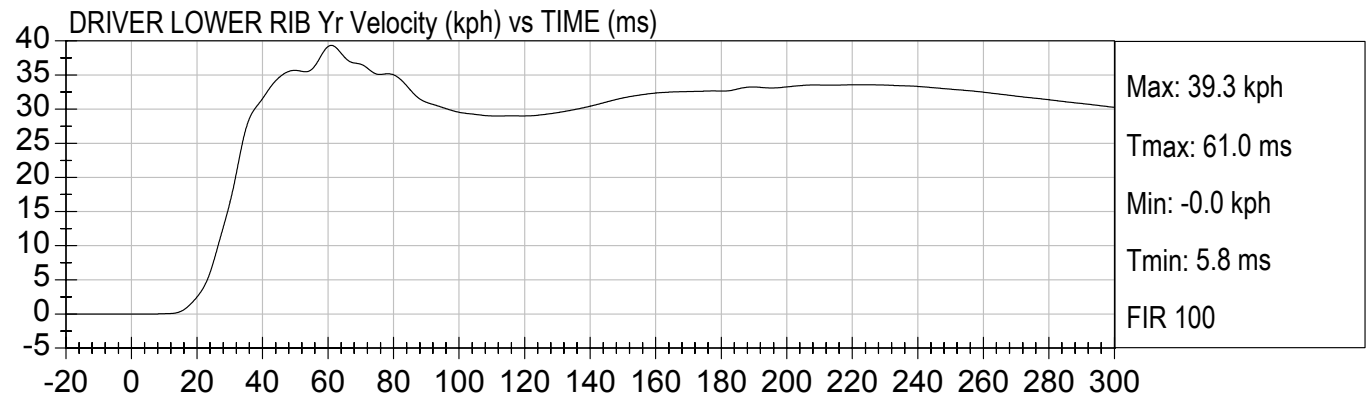
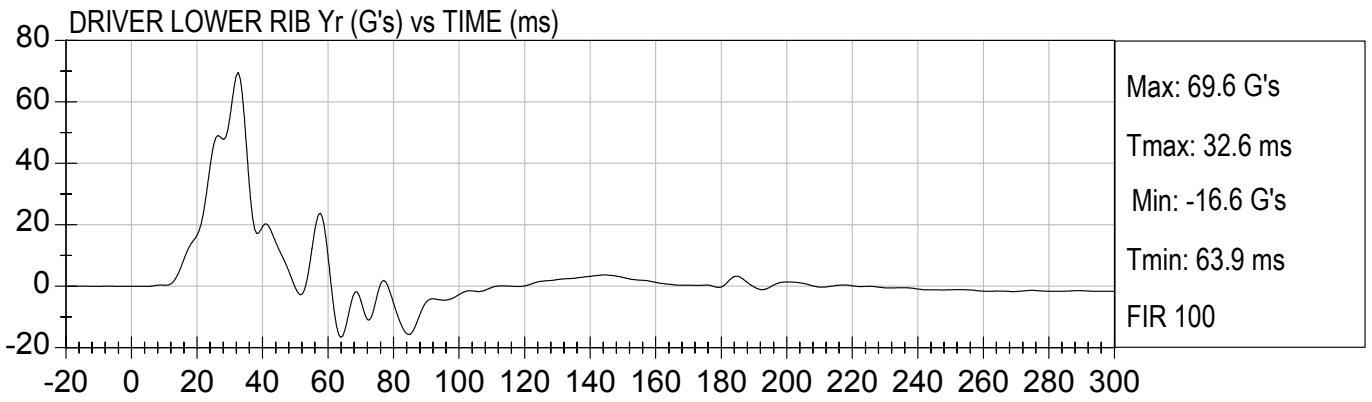
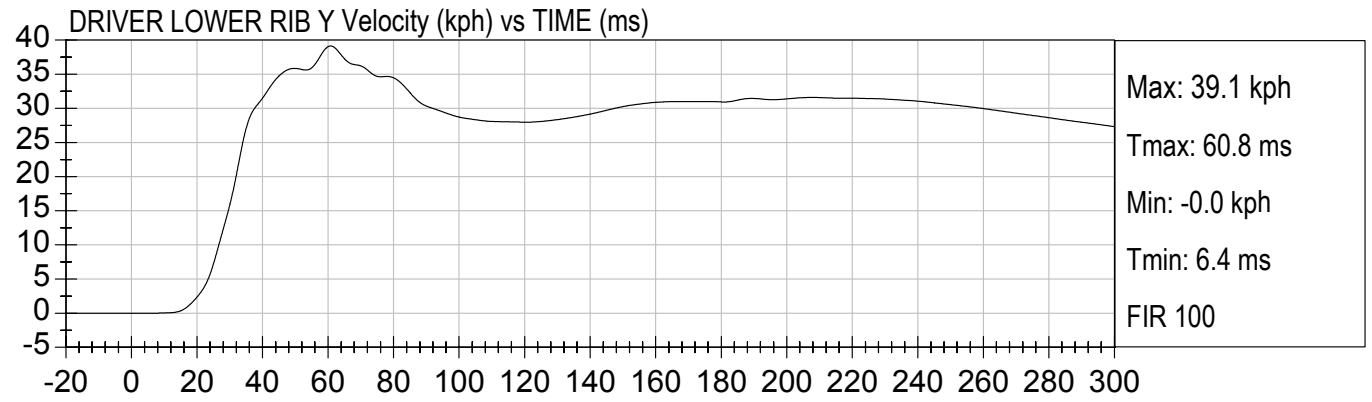
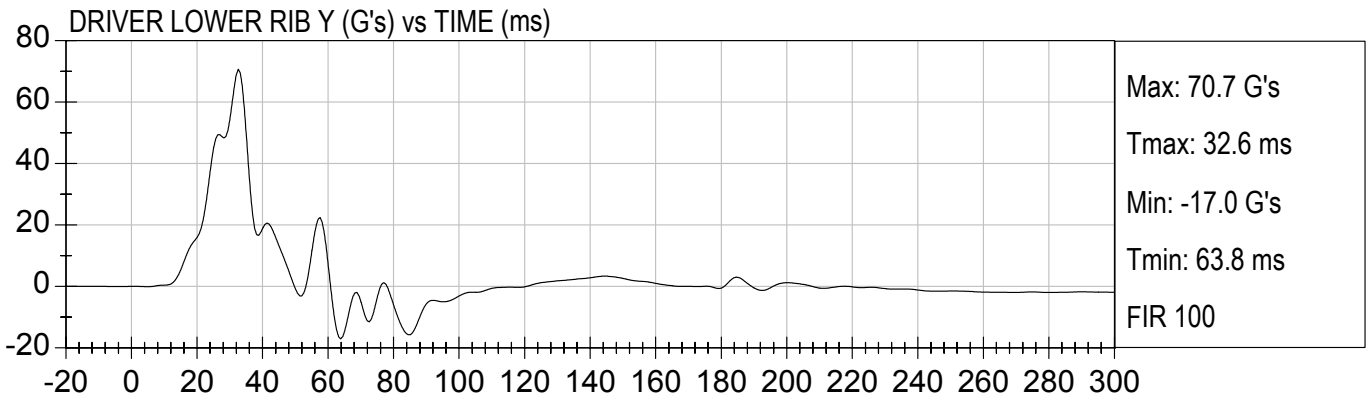


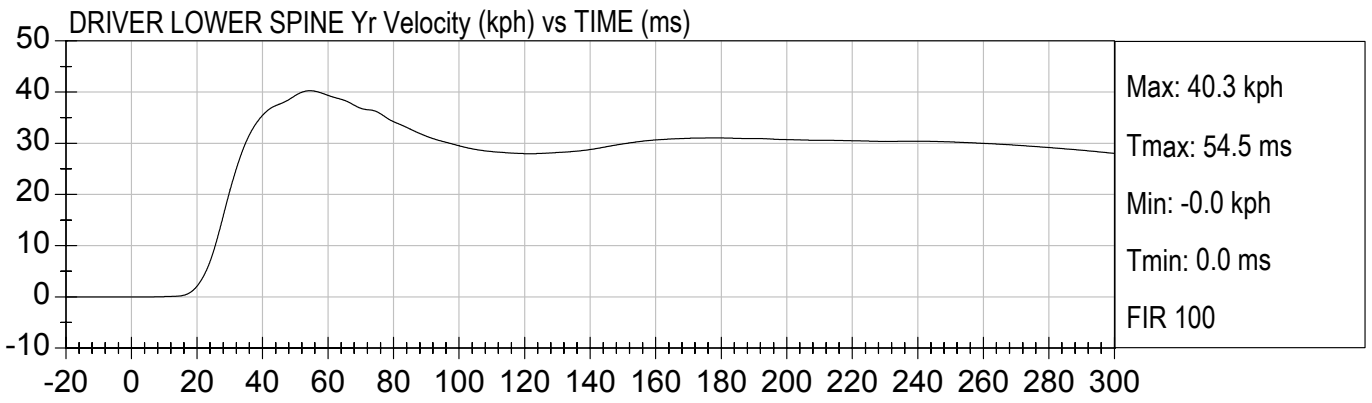
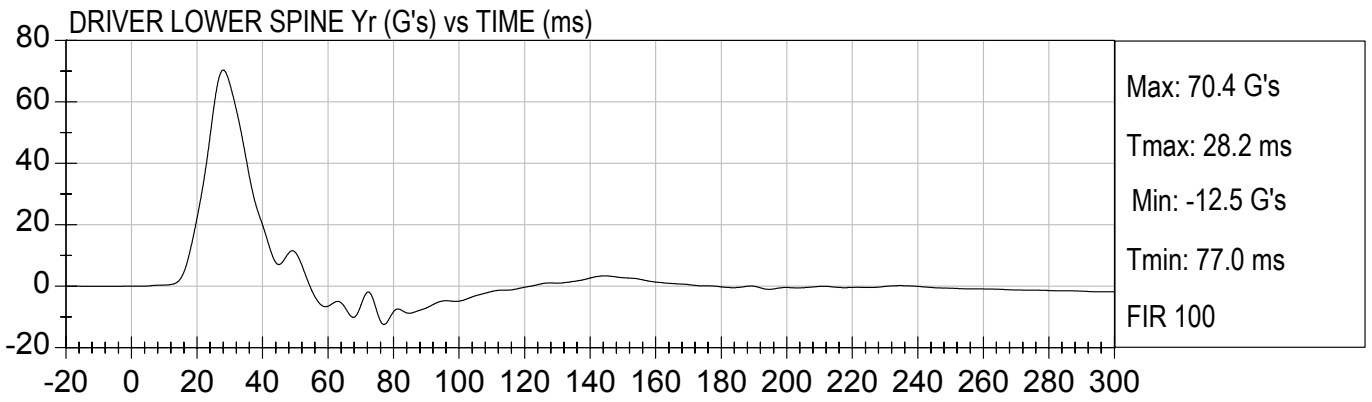
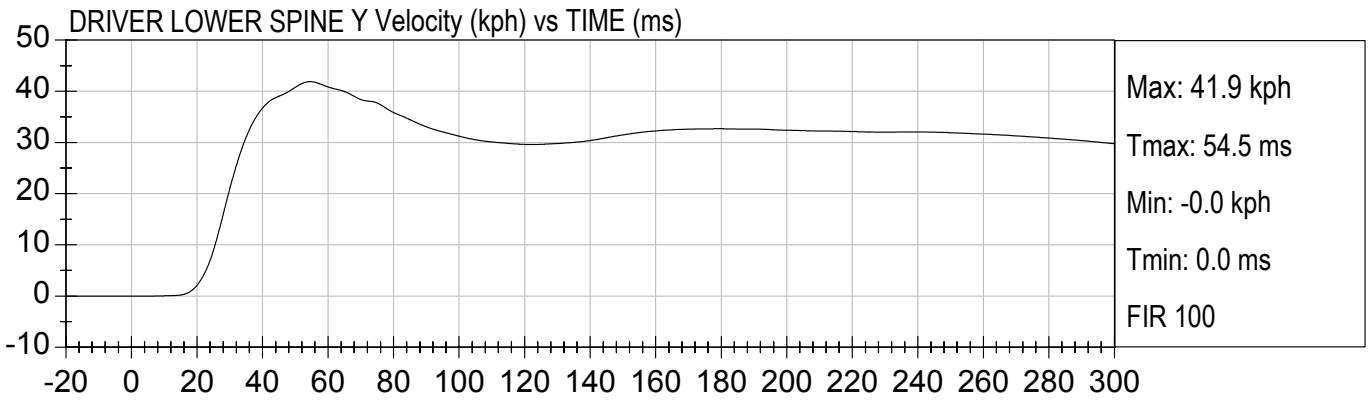
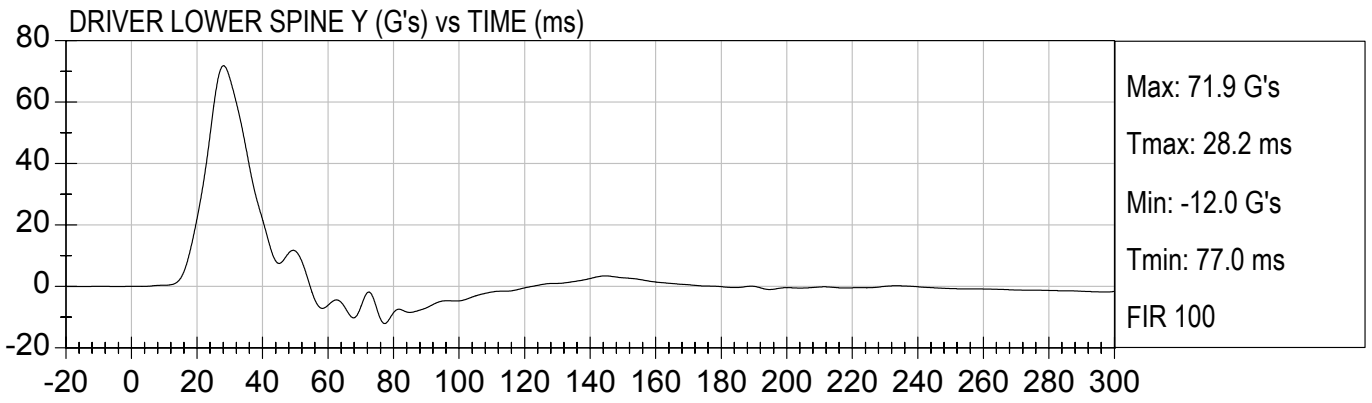


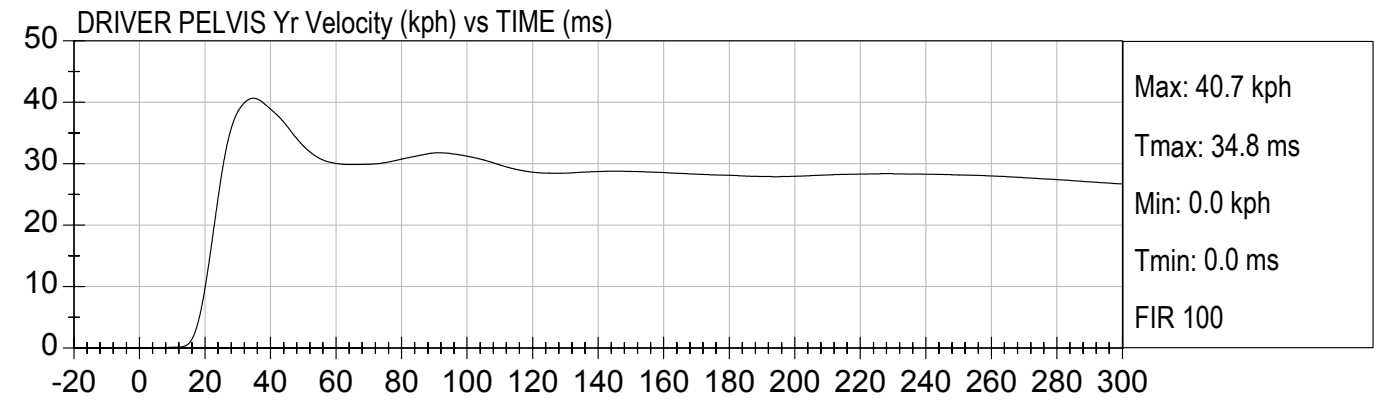
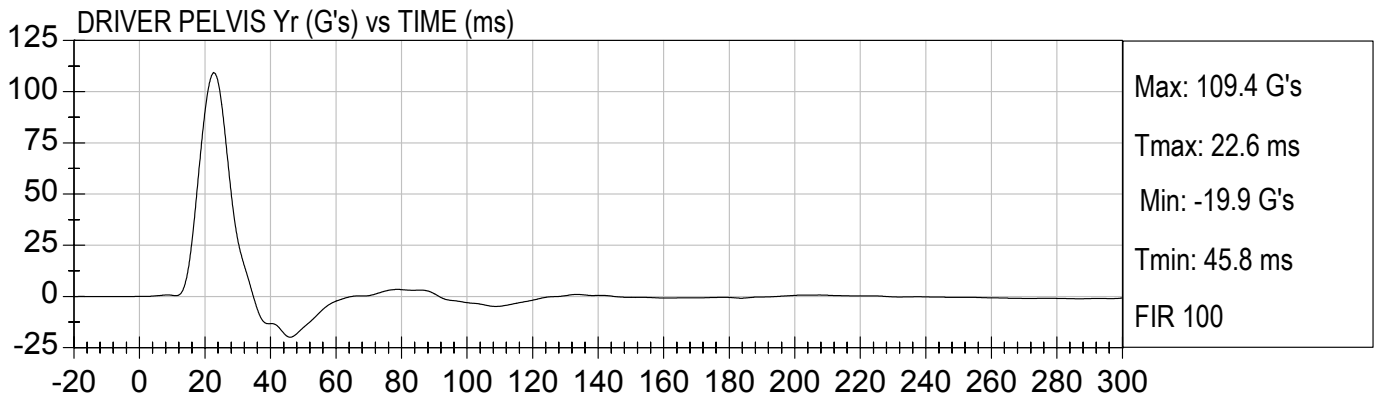
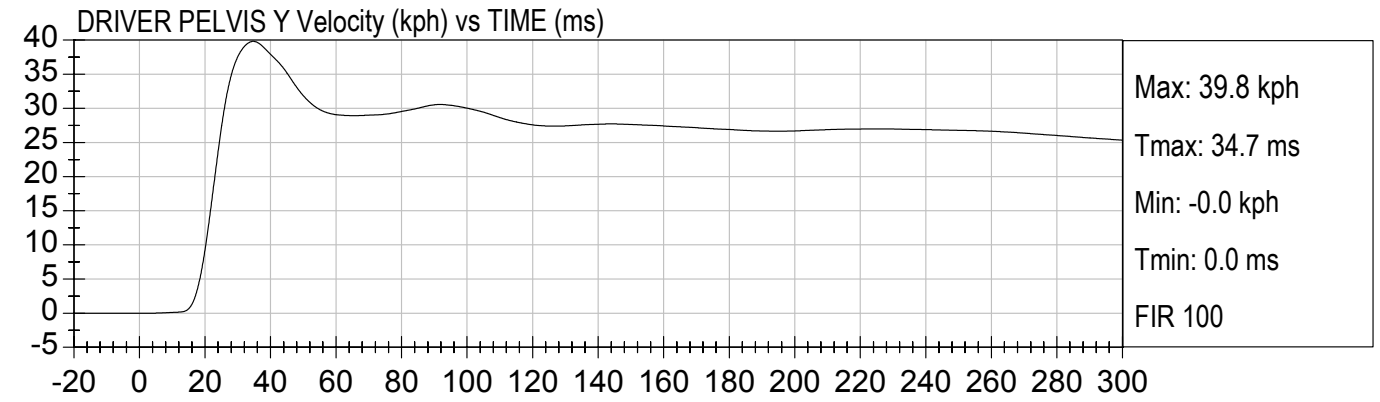
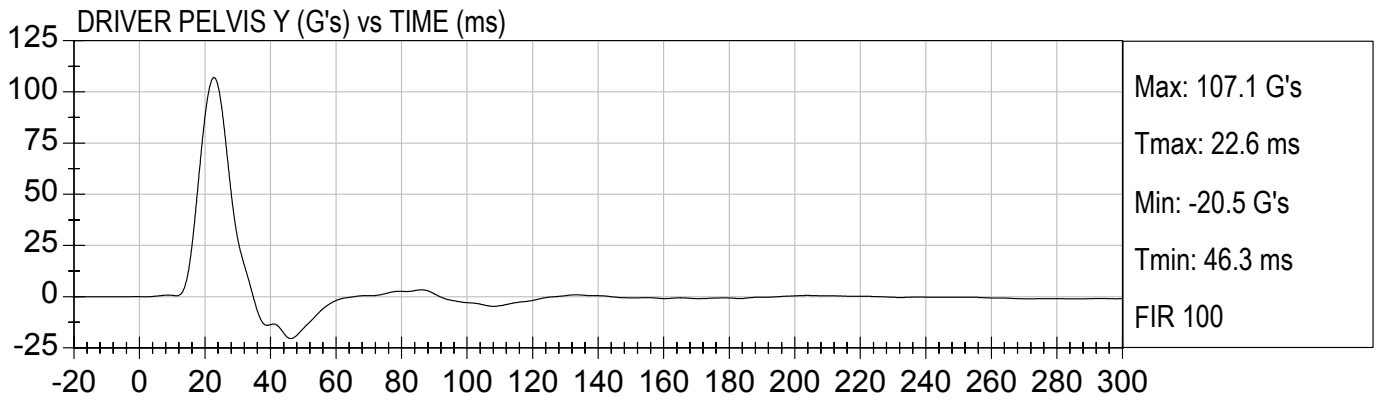


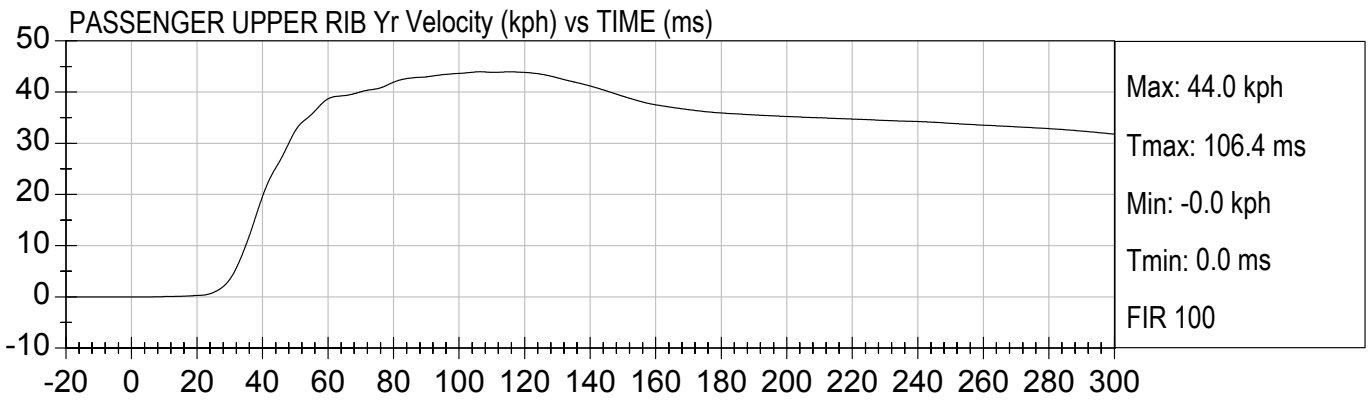
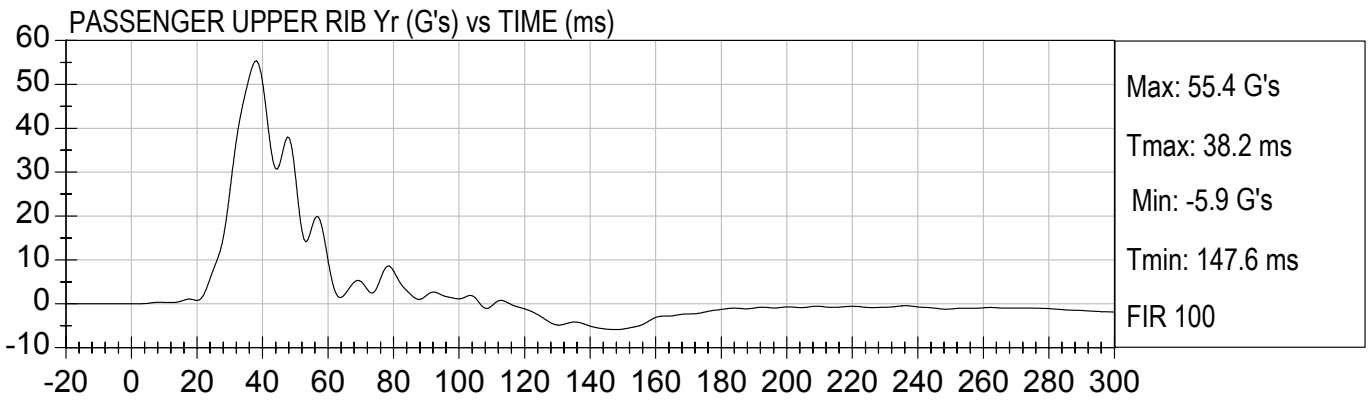
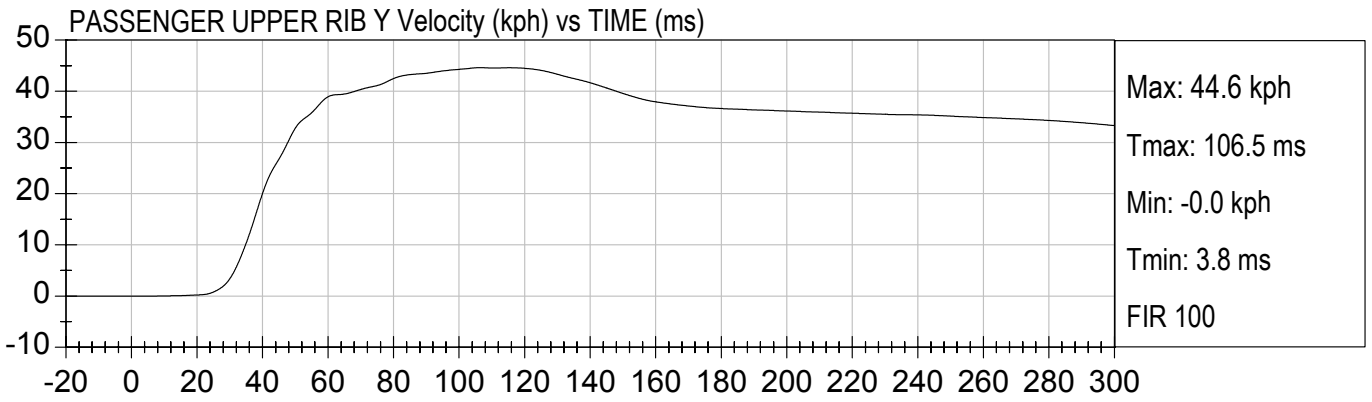
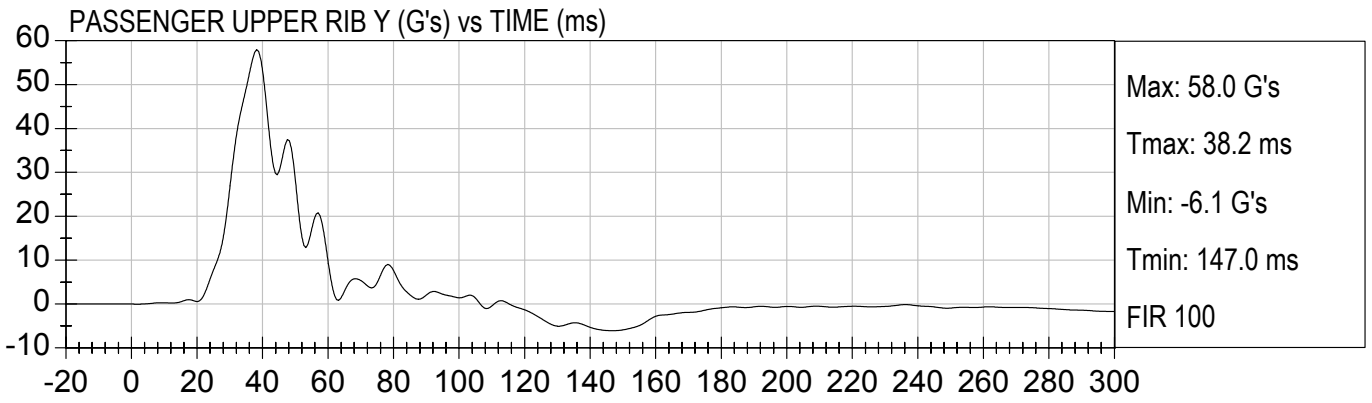


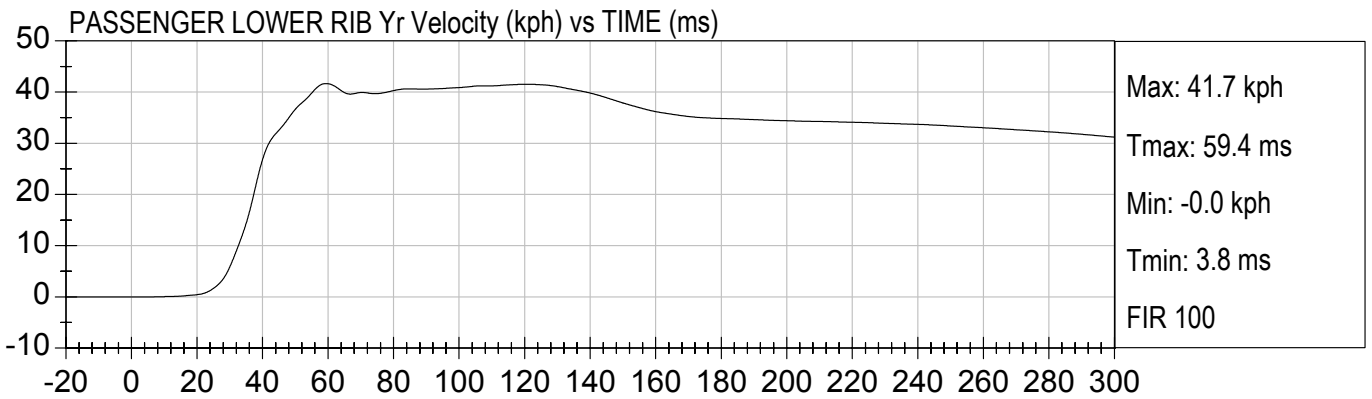
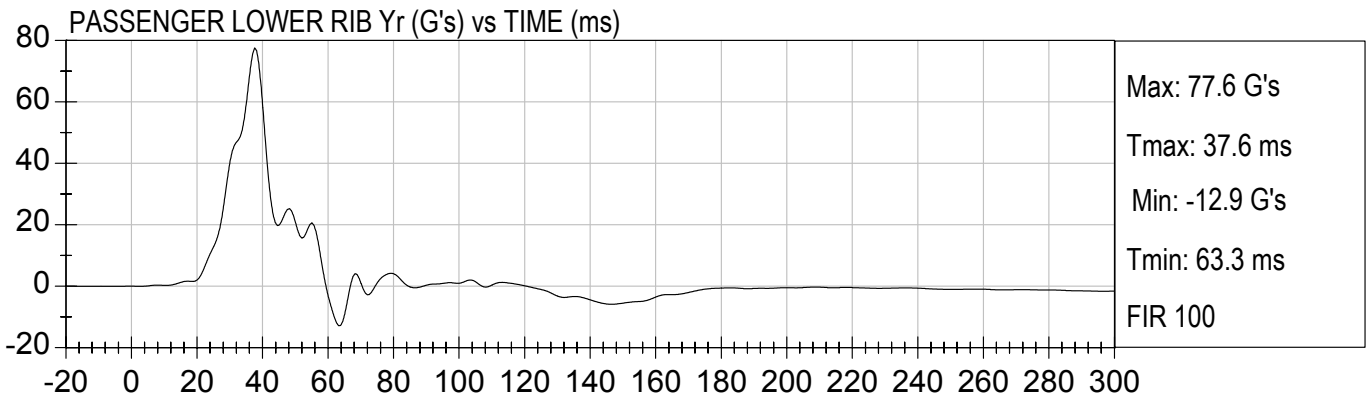
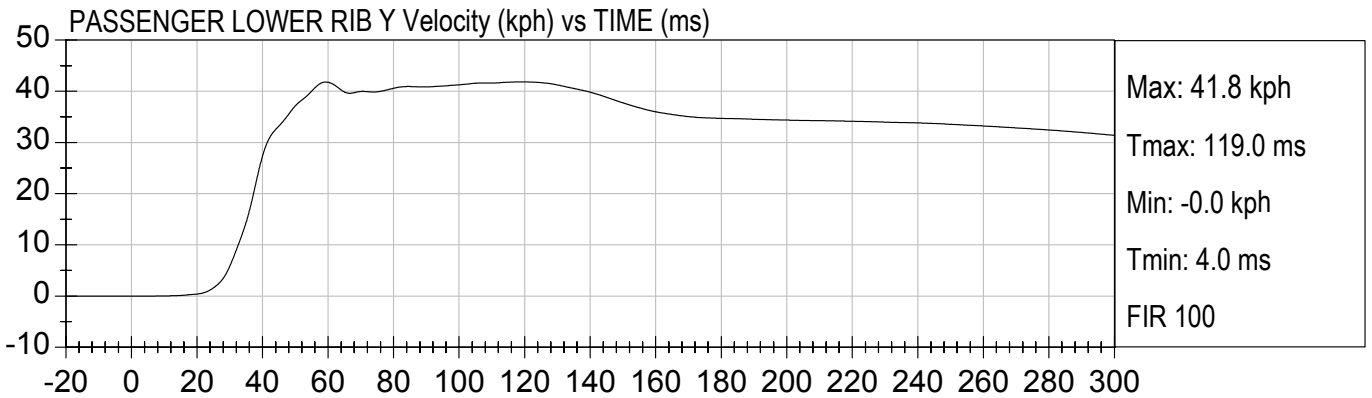
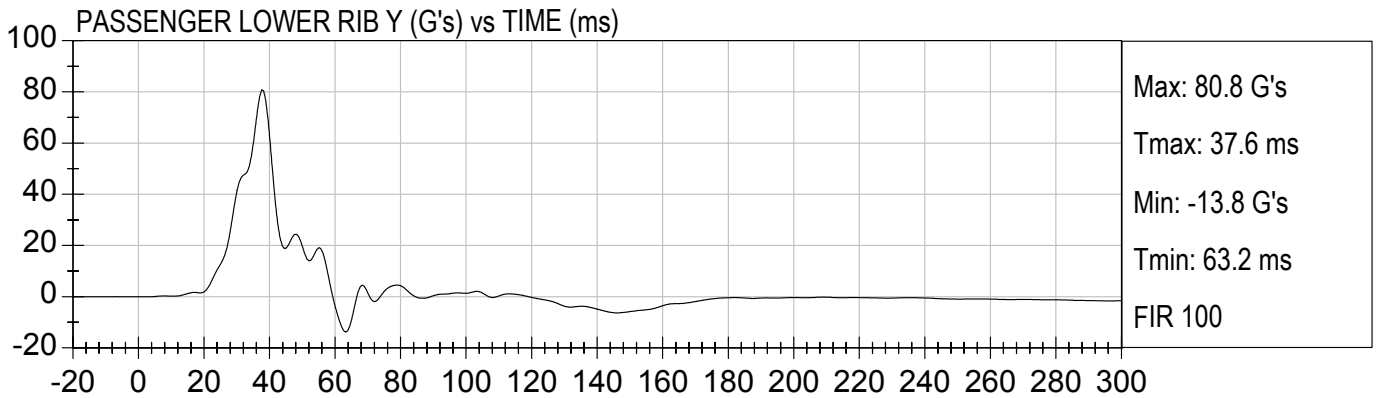


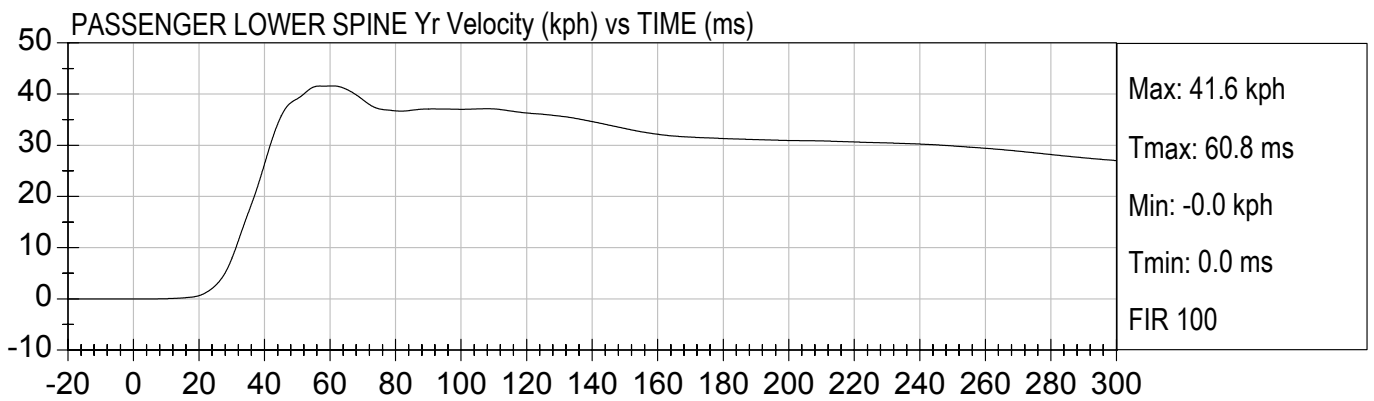
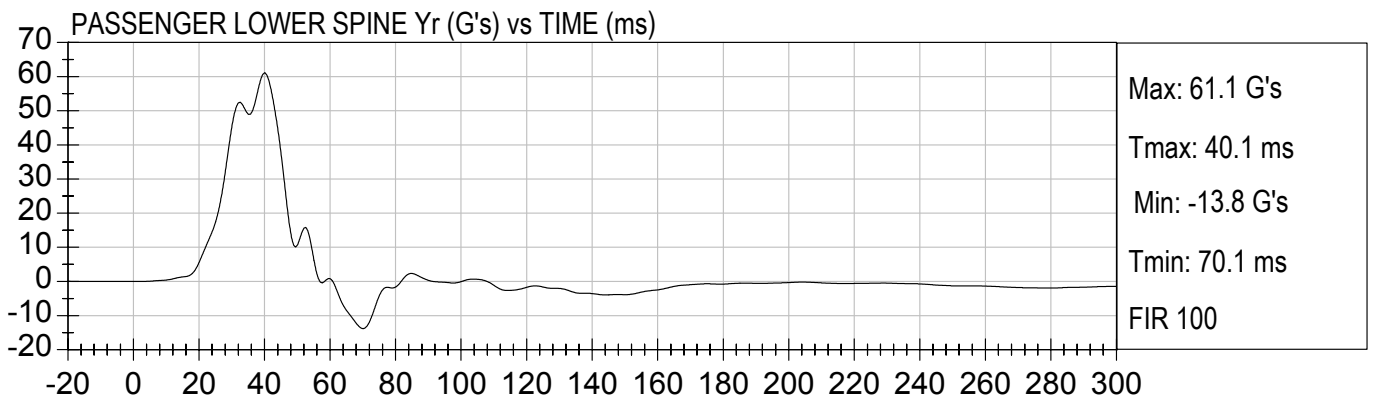
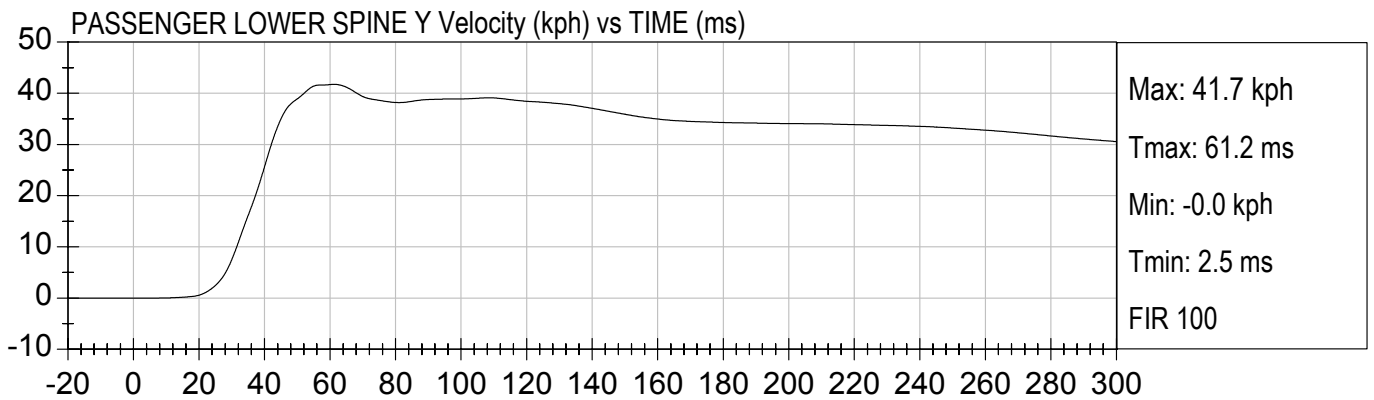
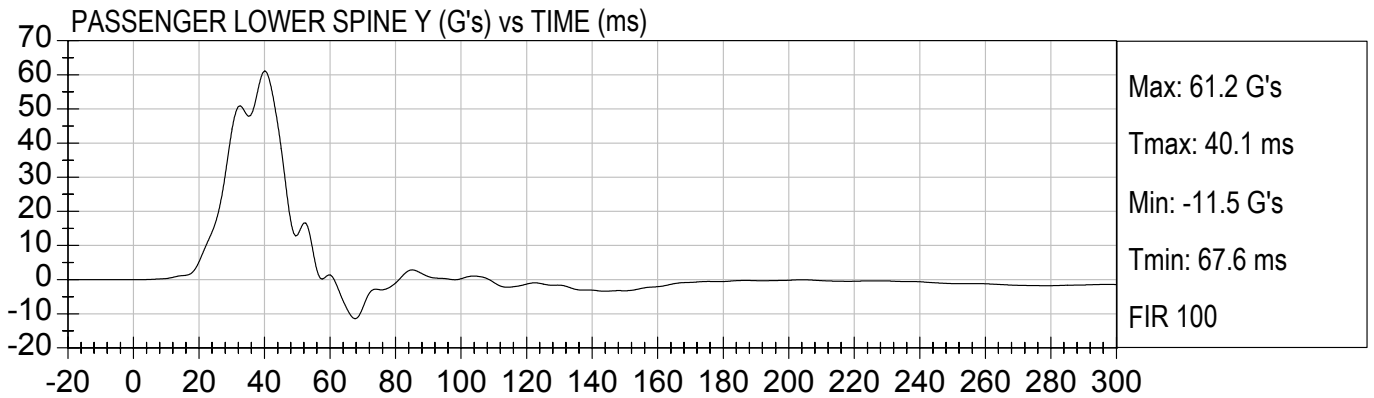


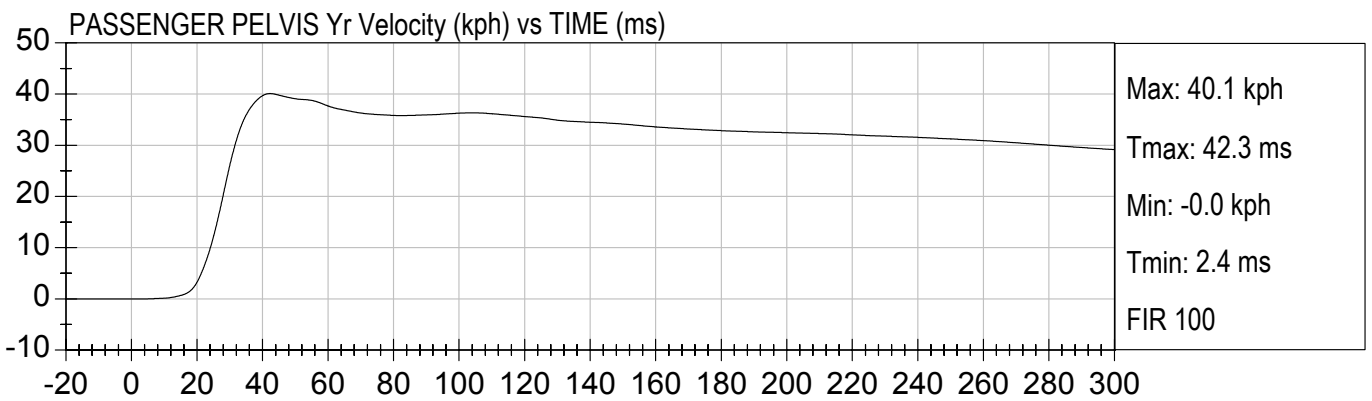
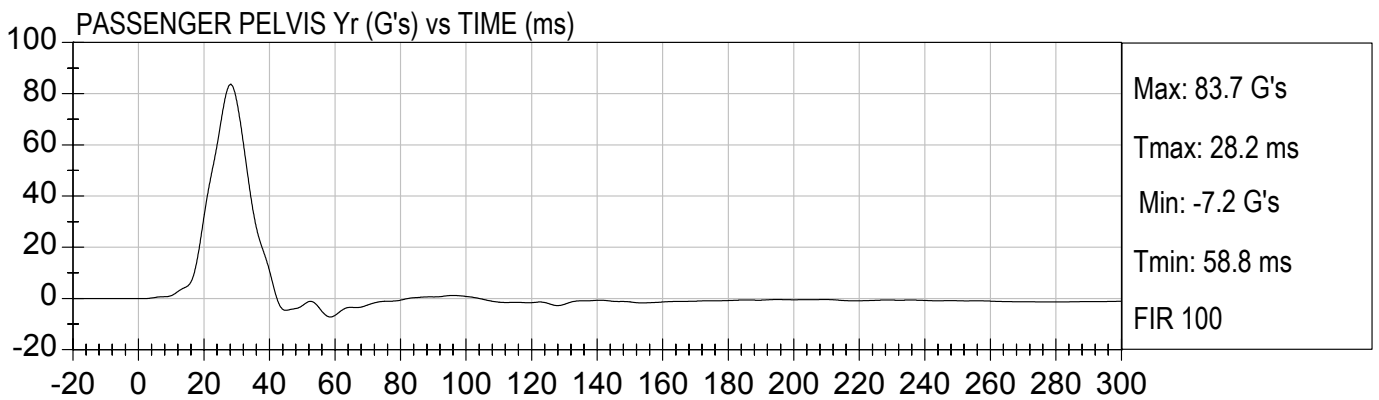
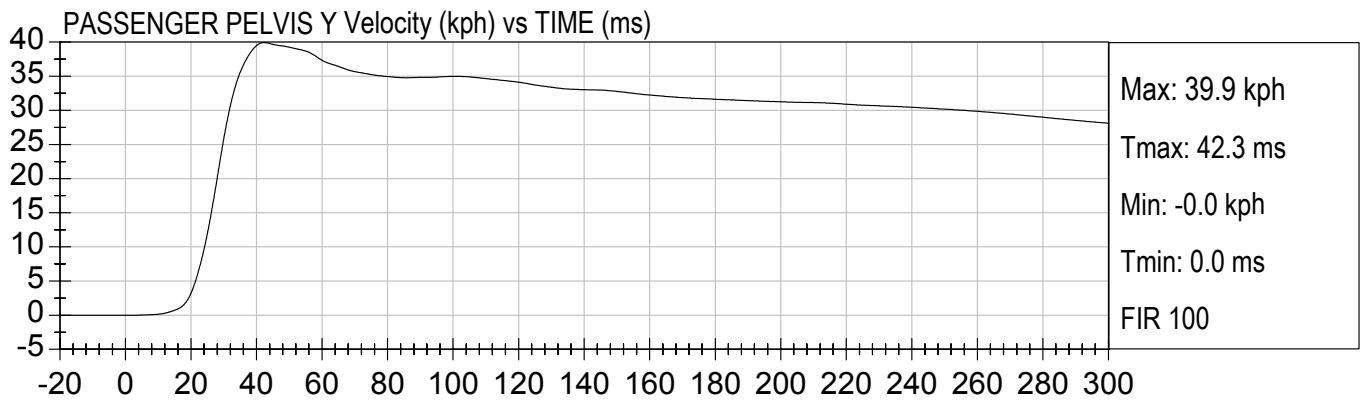
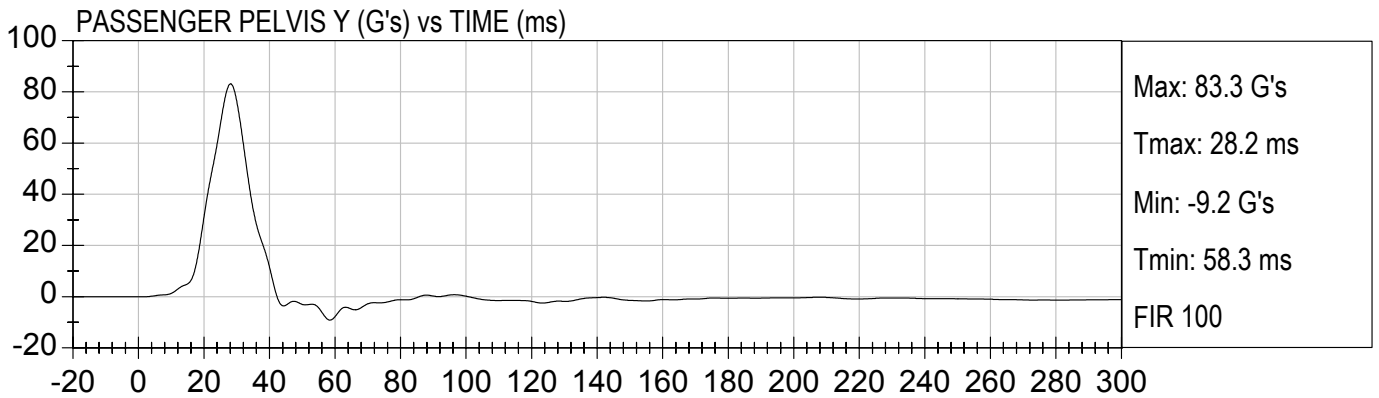












APPENDIX C

SID/HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

CERTIFICATION DATA

Dummy Serial Number: 271

Calibration Test Results Summary

Dummy Serial Number: 271

Pre-Test Calibration

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

SID Calibration Data Sheet
Side Impact Dummy
External Measurements

ATD Serial No: 271

Test I.D.: 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

Jessica Hall
 Laboratory Technician

8/27/04
 Test Date

David Winkelbauer
 Approved By

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

ATD Serial No: 271

Test I.D.: D042011

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	53	Pass
Peak Resultant Acceleration	G's	120 to 150	140	Pass
Is Resultant Curve Unimodal?	Yes/No	15% of peak	Yes	Pass
Peak Longitudnal Acceleration	G's	+/- 15	-10	Pass
Overall Test Results				Pass

Jessica Hall
 Laboratory Technician

08/24/2004
 Test Date

David Winkelbauer
 Approved By



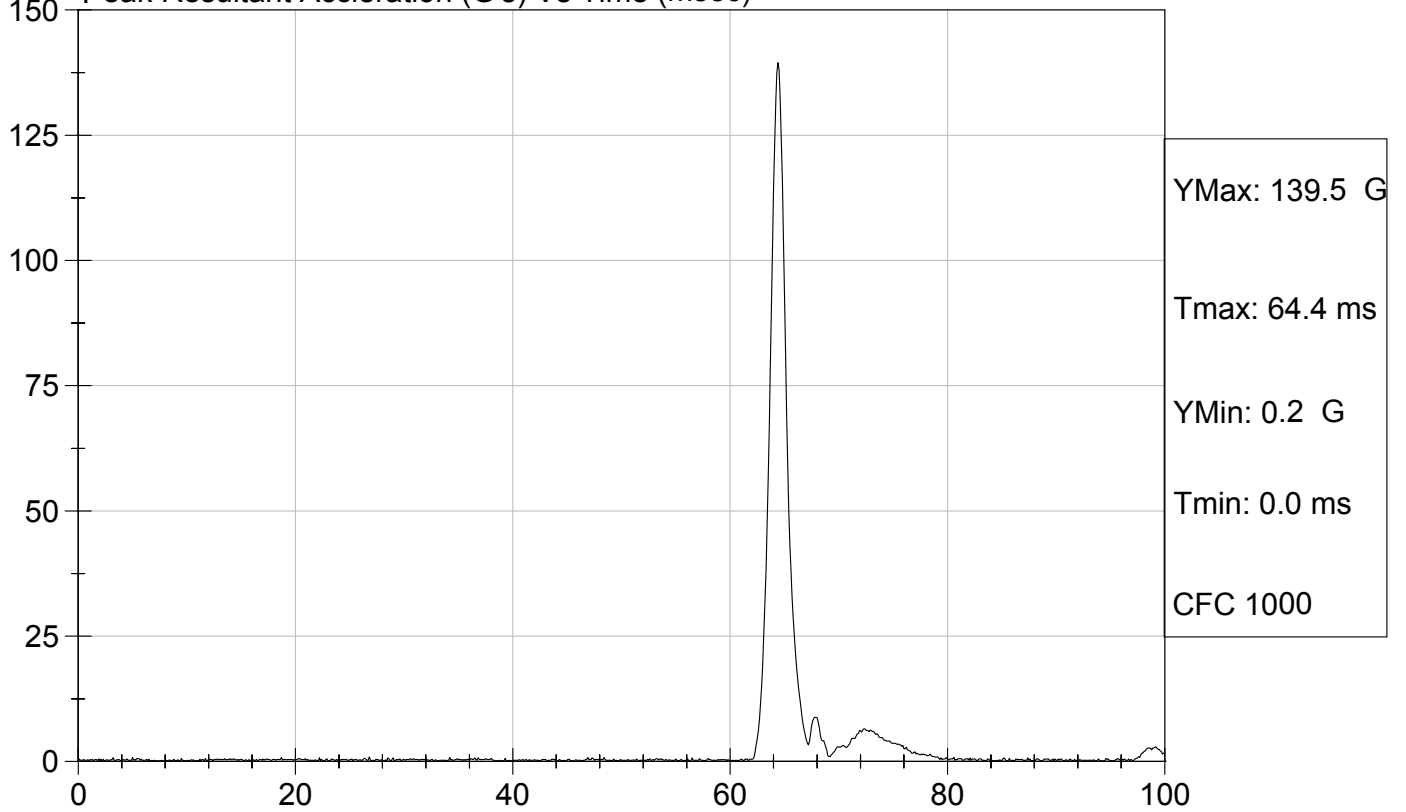
Test Description: Head Drop

Test Date: 08/24/2004

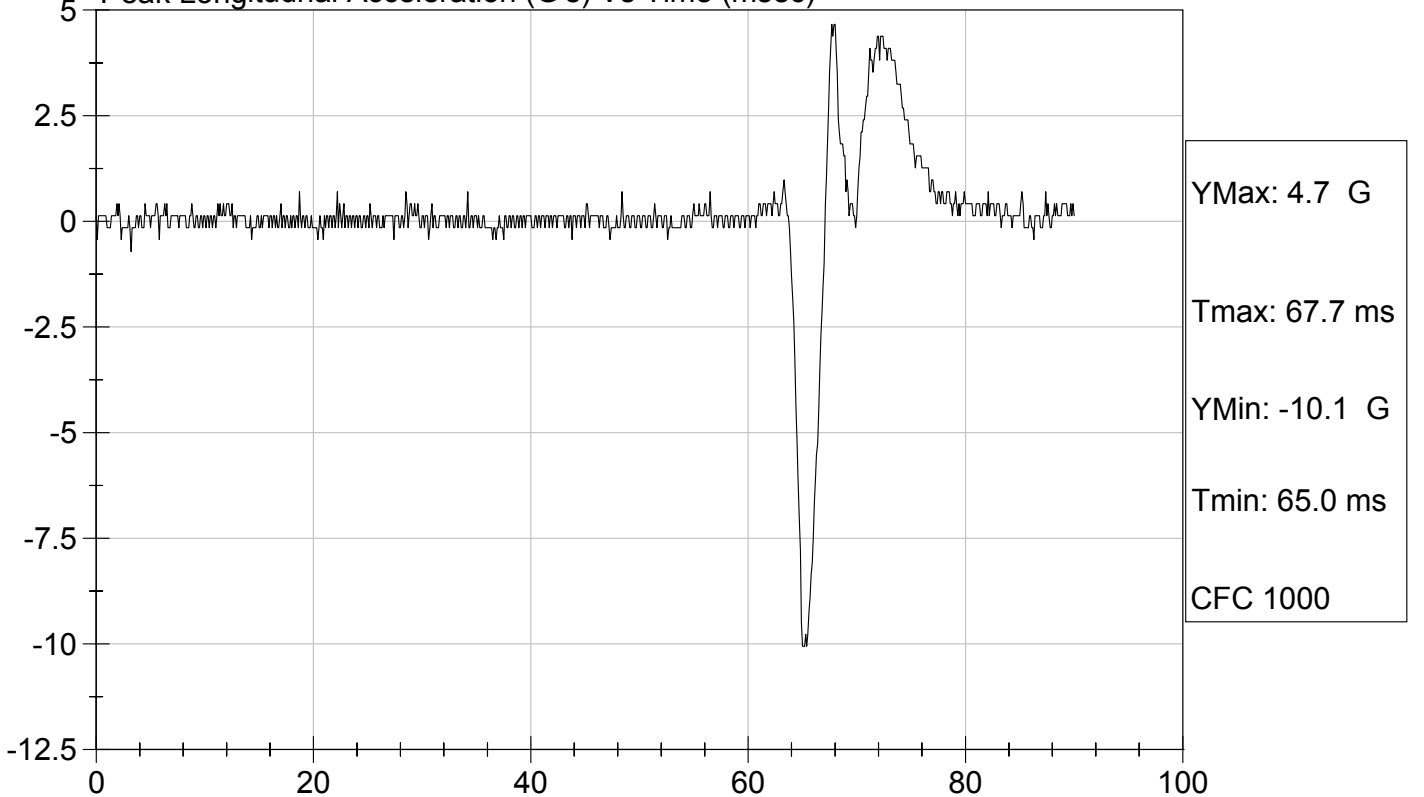
Component: D042011

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.: D042012

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	54	Pass
Probe Velocity	m/s	4.27 - 4.33	4.31	Pass
Upper Rib	G's	37 - 46	45	Pass
Lower Rib	G's	37 - 46	44	Pass
Lower Spine	G's	15 - 22	20	Pass
Overall Test Results				Pass

Jessica Hall
 Laboratory Technician

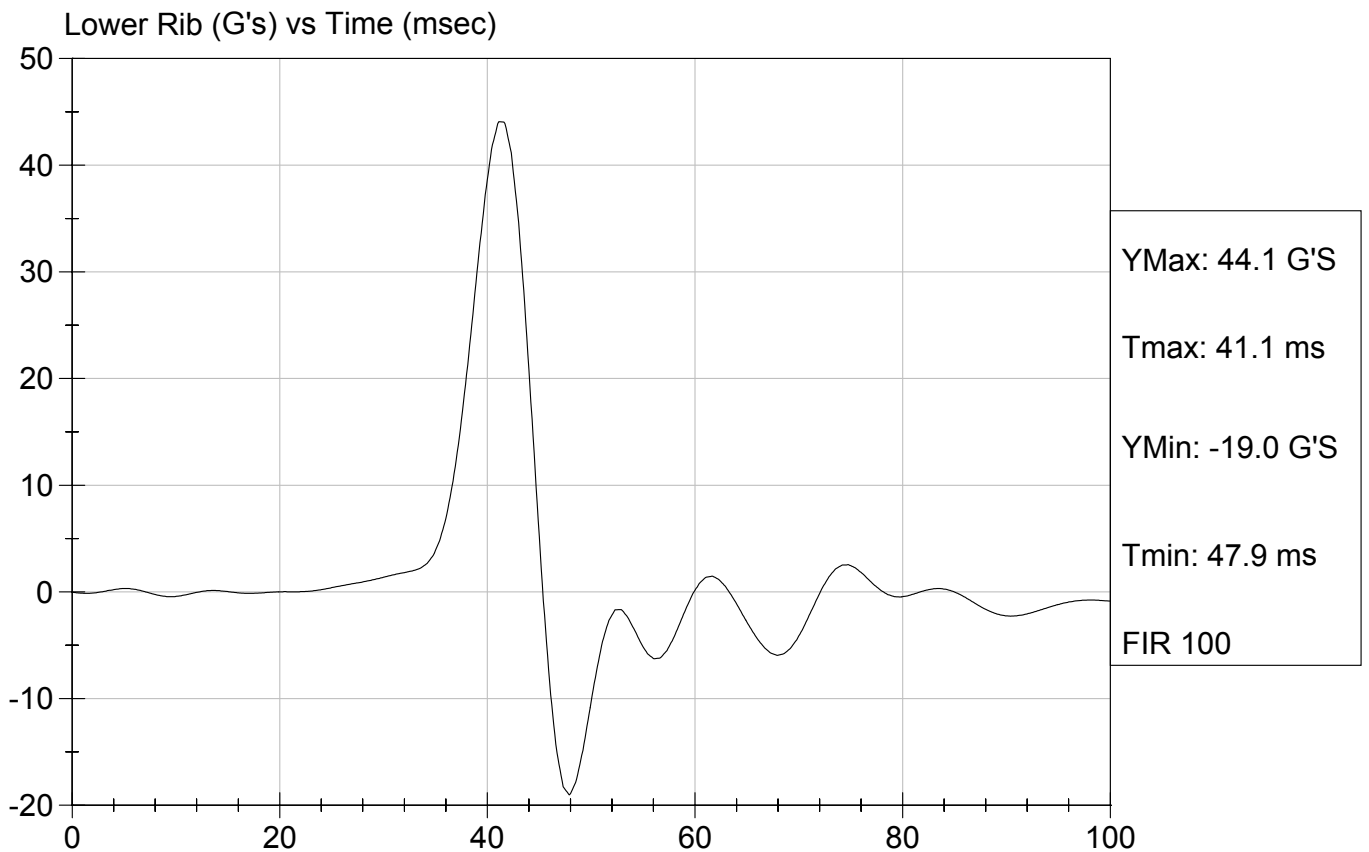
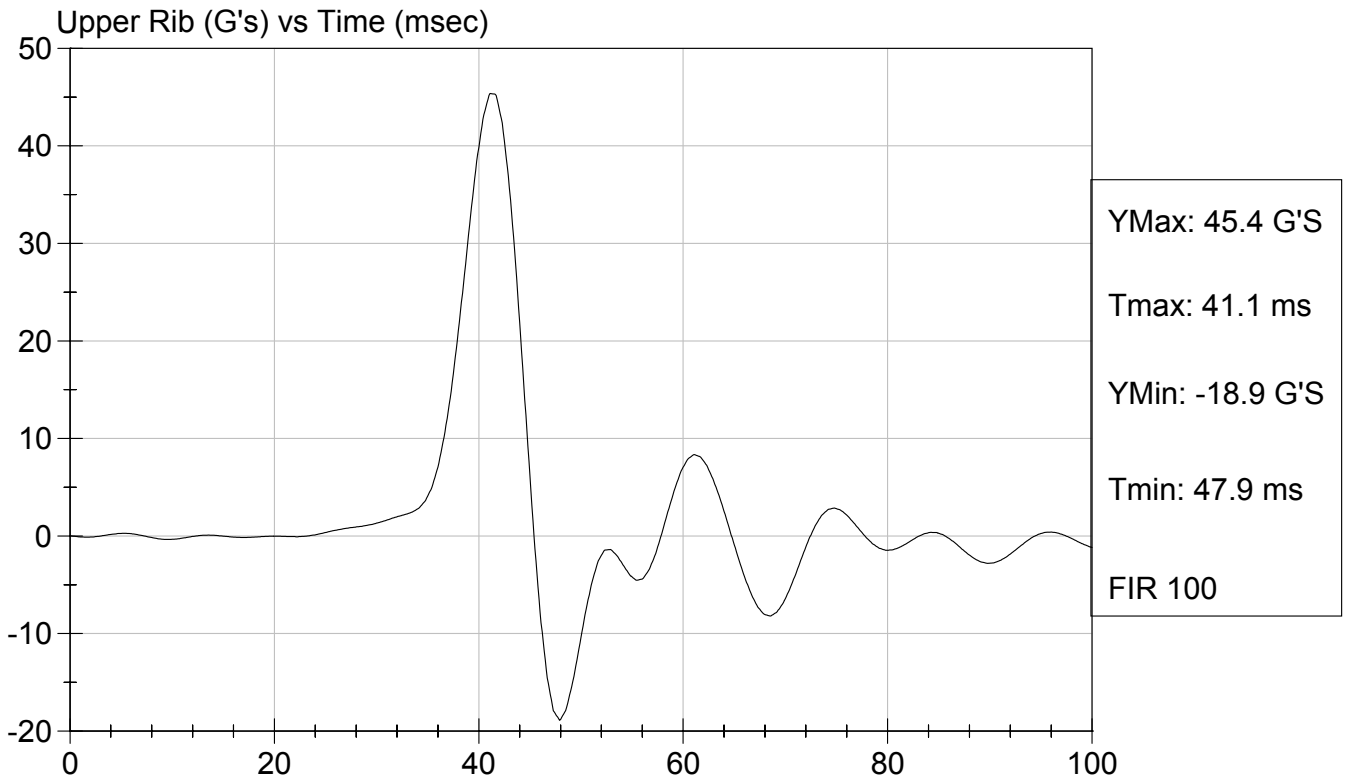
08/26/2004
 Test Date

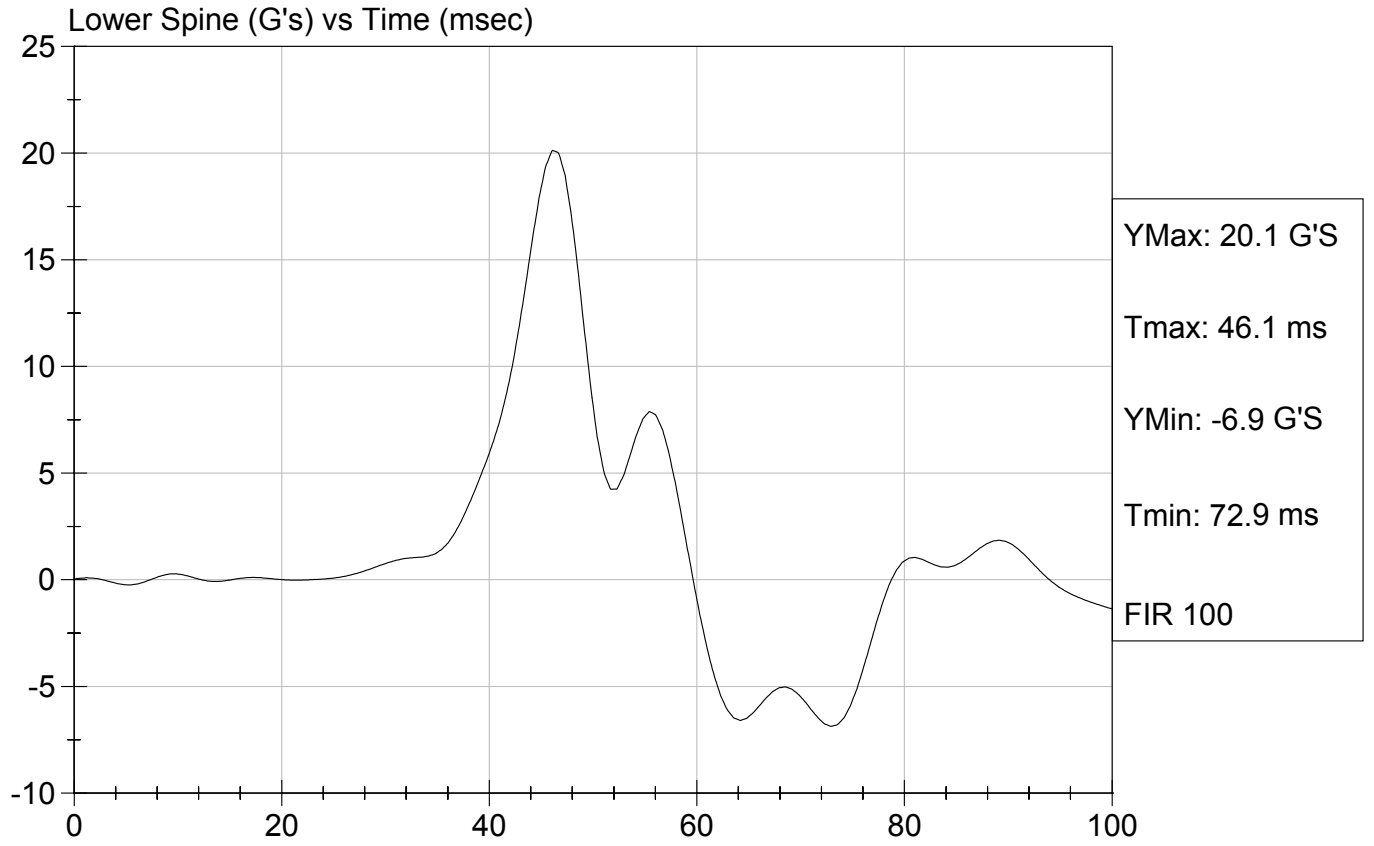
David Winkelbauer
 Approved By



Test Desc: Thorax Impact
Component ID: D042012

Test Date: 08/26/2004
Speed: 14.14 ft/sec, 4.31 m/sec





SID Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Test

ATD Serial No: 489

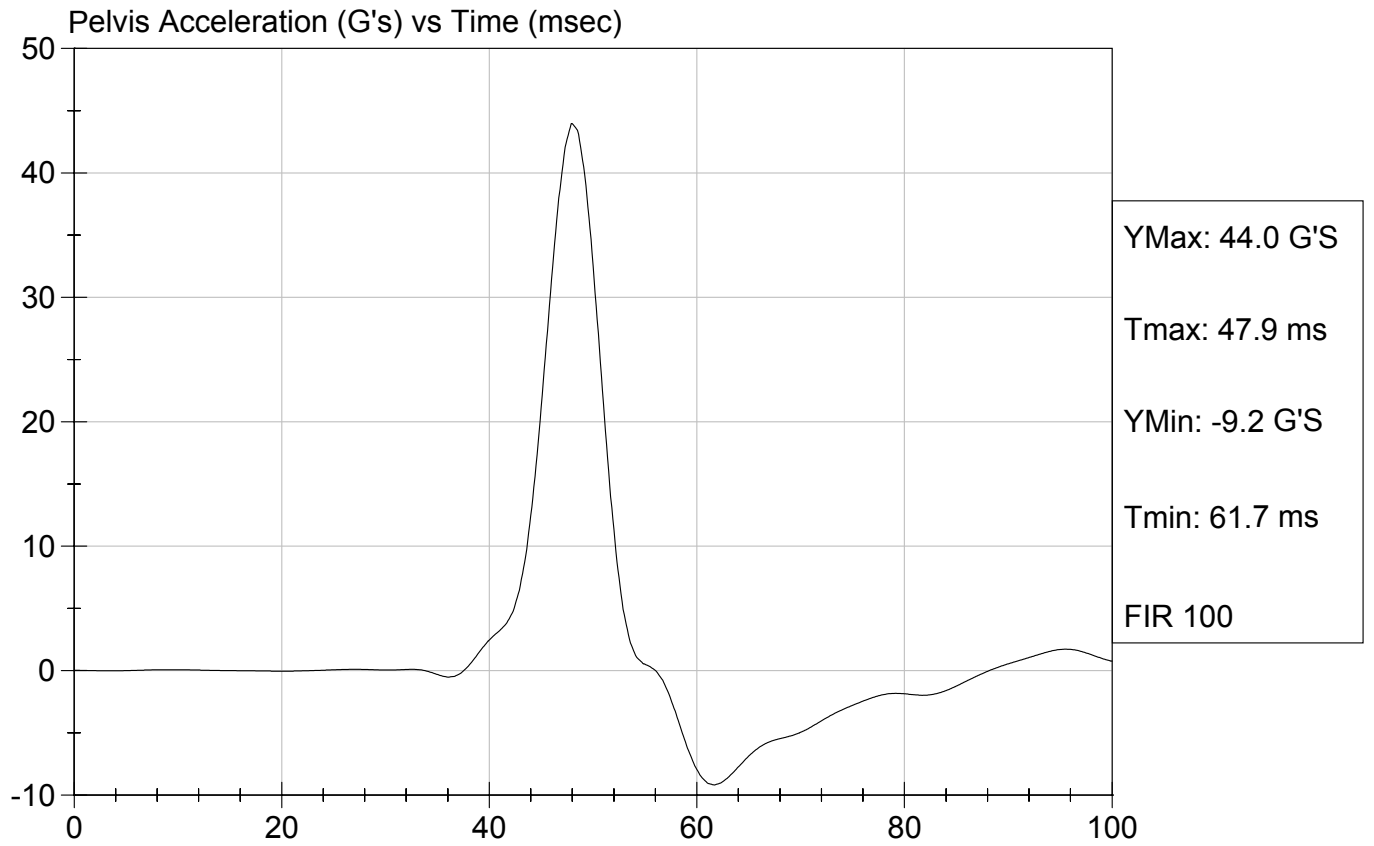
Test I.D: D042013

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	52	Pass
Probe Velocity	m/s	4.27 - 4.33	4.27	Pass
Pelvis Acceleration	G's	40 - 60	44	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

08/25/2004
Test Date

David Winkelbauer
Approved By



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

ATD Serial No: 271

Test I.D.: D042014

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Force At 12.7 mm	N	104 - 162	139	Pass
Force At 19 mm	N	163 - 222	198	Pass
Force At 25.4 mm	N	222 - 280	261	Pass
Force At 33 mm	N	325 - 391	359	Pass
Overall Test Results				Pass

Jessica Hall
 Laboratory Technician

08/24/2004
 Test Date

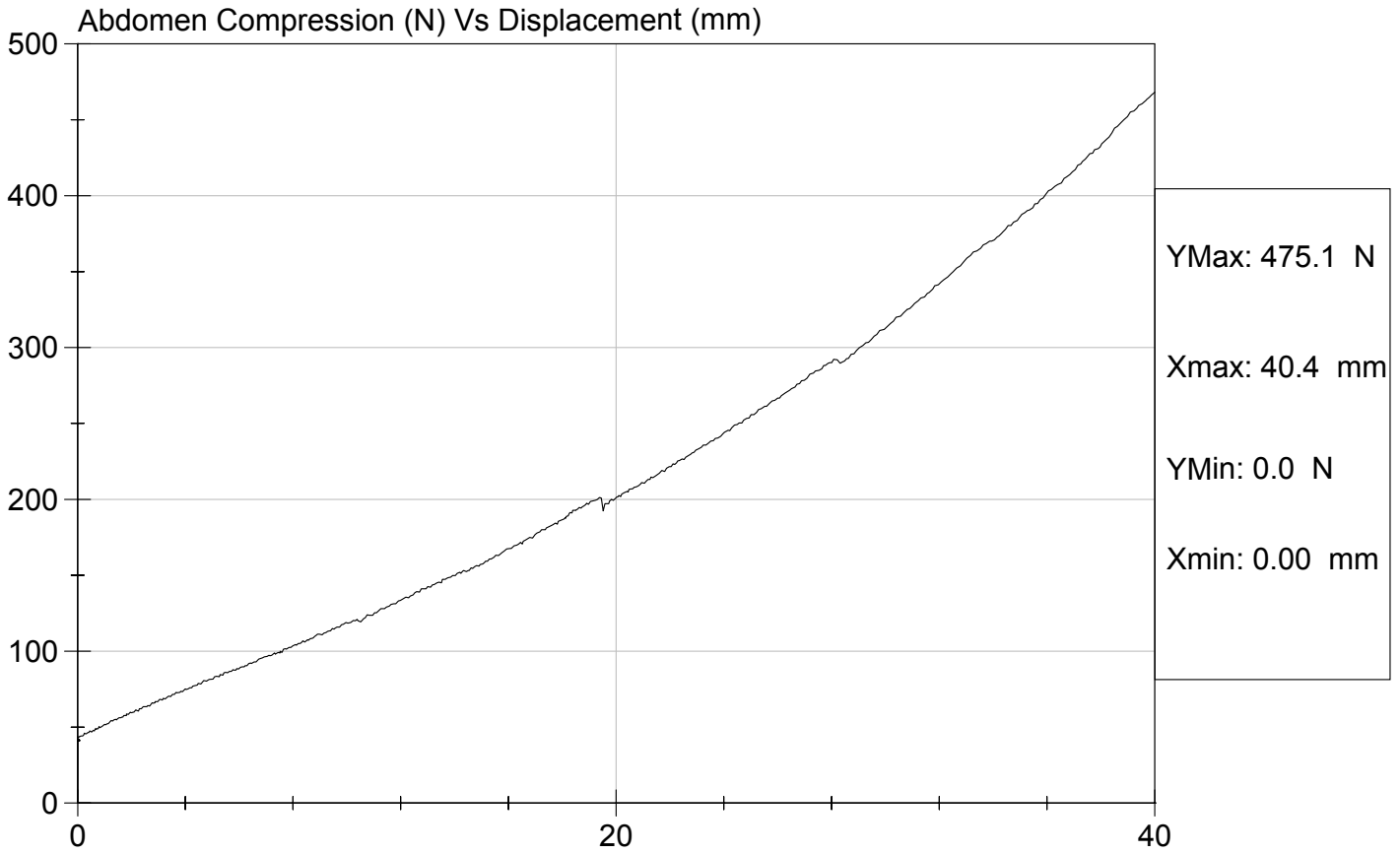
David Winkelbauer
 Approved By



Test Description: Abdomen Compression Test Date: 08/24/2004

Component: D042014

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 271

Test I.D.: D042015

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.9	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	139.3	Pass
Force At 30 deg	N	151.2 - 204.6	181.6	Pass
Force At 40 deg	N	204.6 - 258.0	228.6	Pass
Return Angle	Deg	12 Maximum	5	Pass
Overall Test Results				Pass

Jessica Hall
 Laboratory Technician

08/24/2004
 Test Date

David Winkelbauer
 Approved By

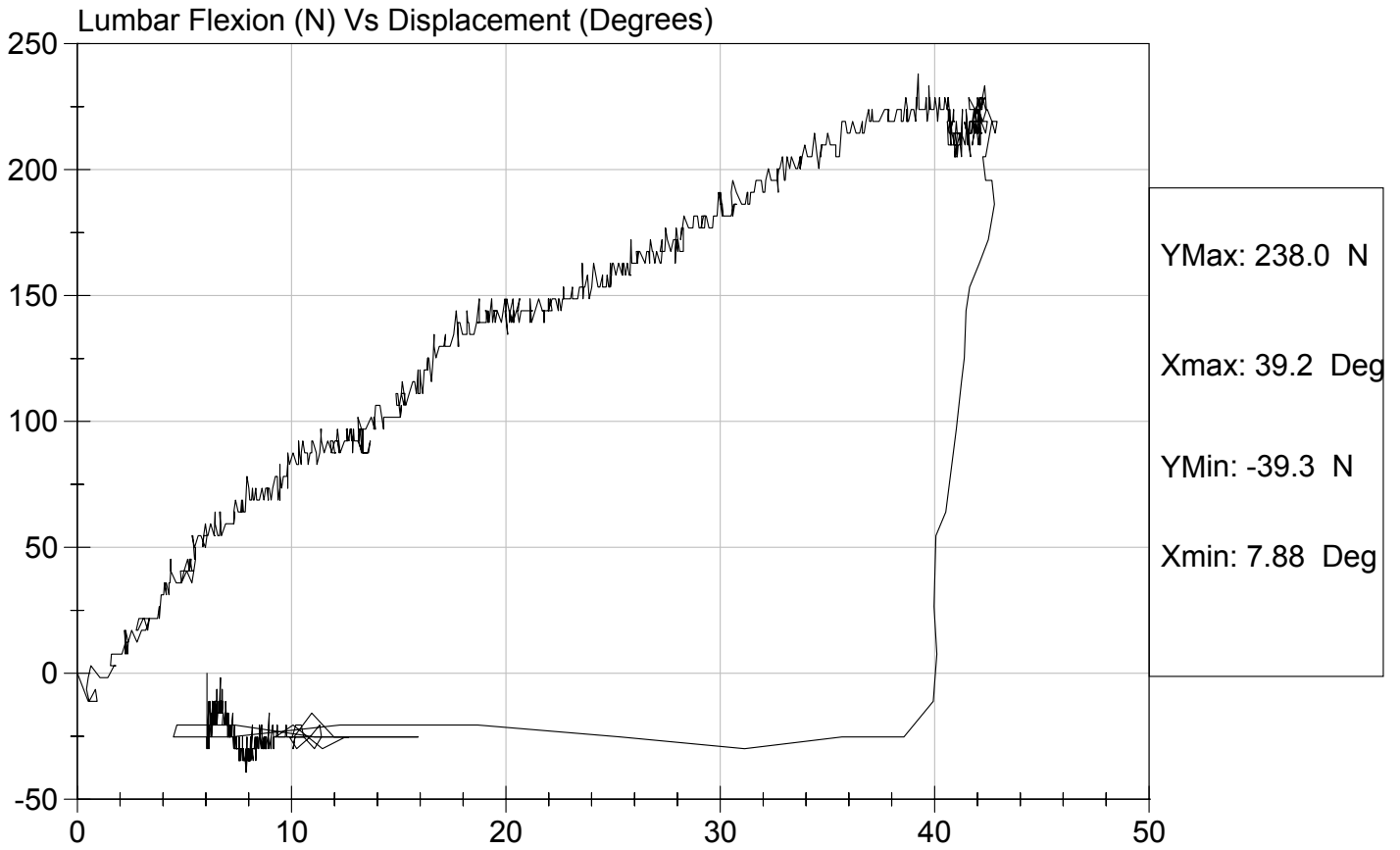


Test Description: Lumbar Flexion

Test Date: 08/24/2004

Component: D042015

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

Jessica Hall
 Laboratory Technician

08/26/2004

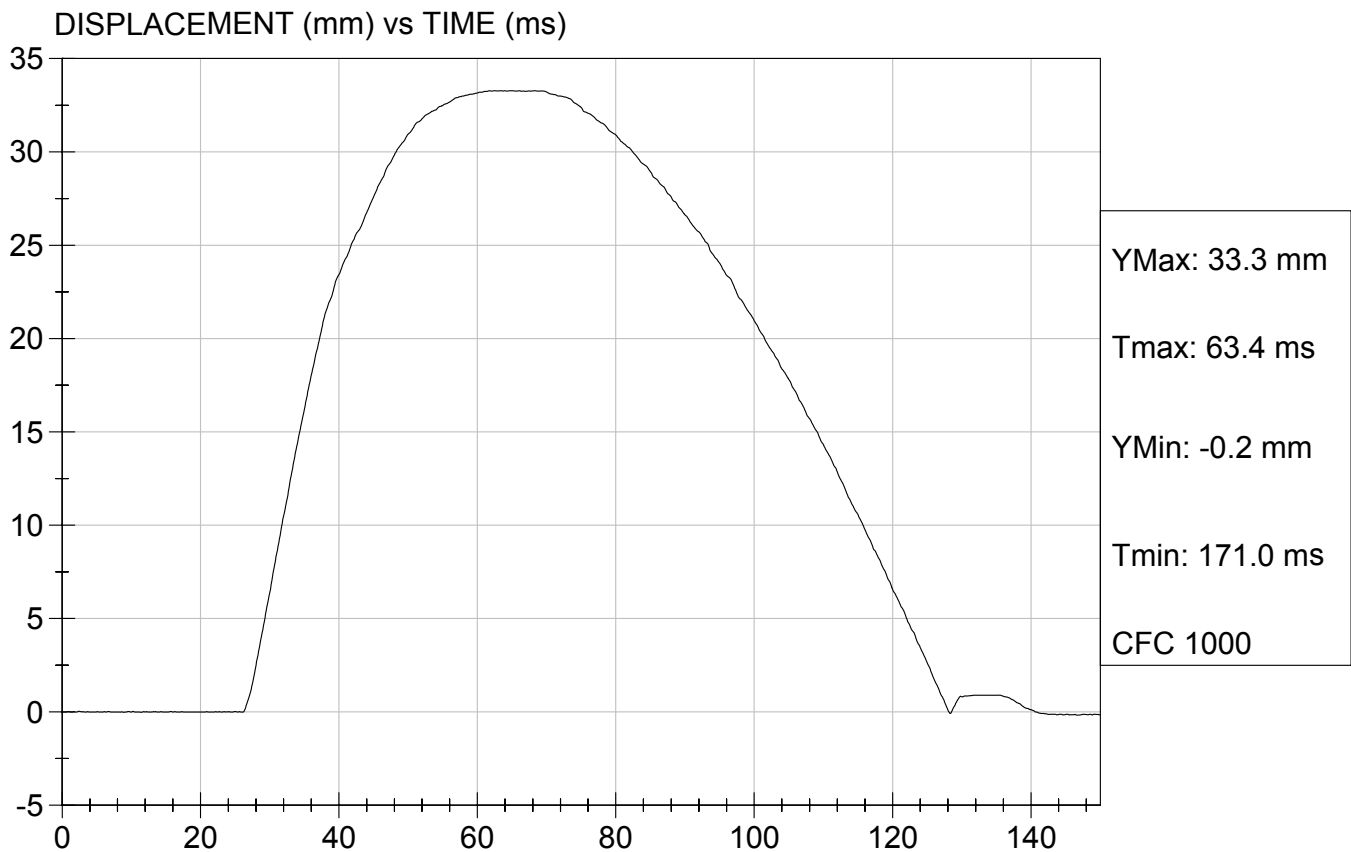
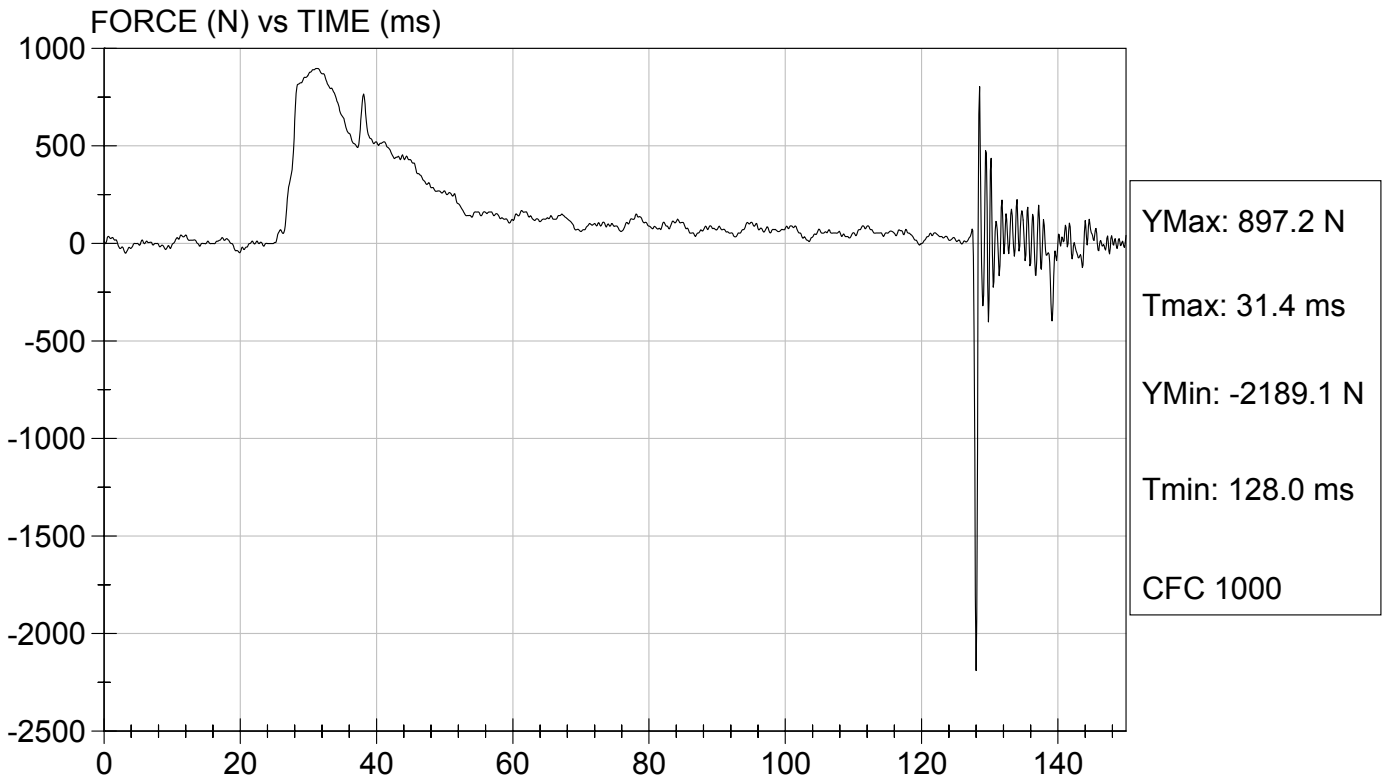
Test Date

David Winkelbauer
 Approved By



Test Desc: Dampener Impact
Component ID: D042016

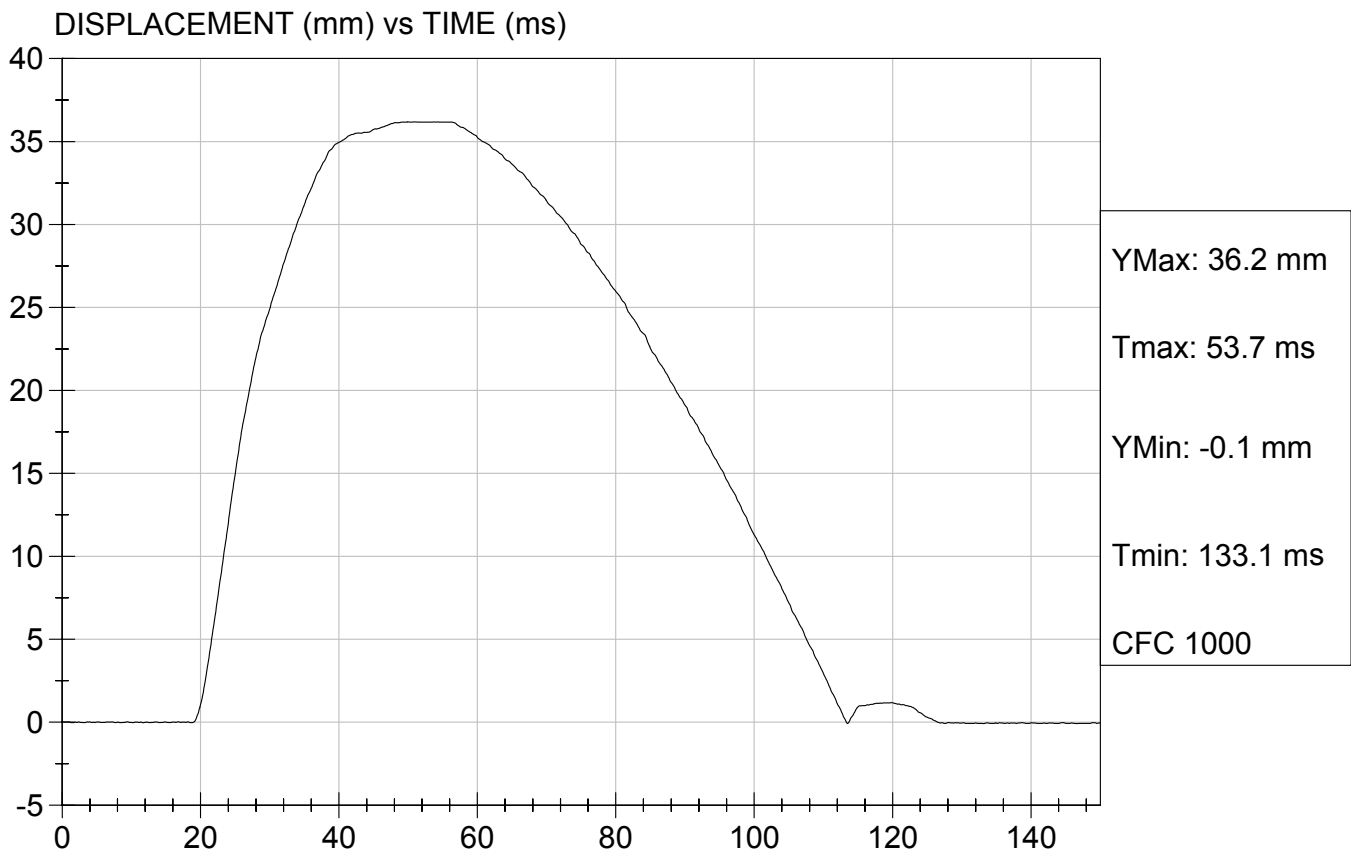
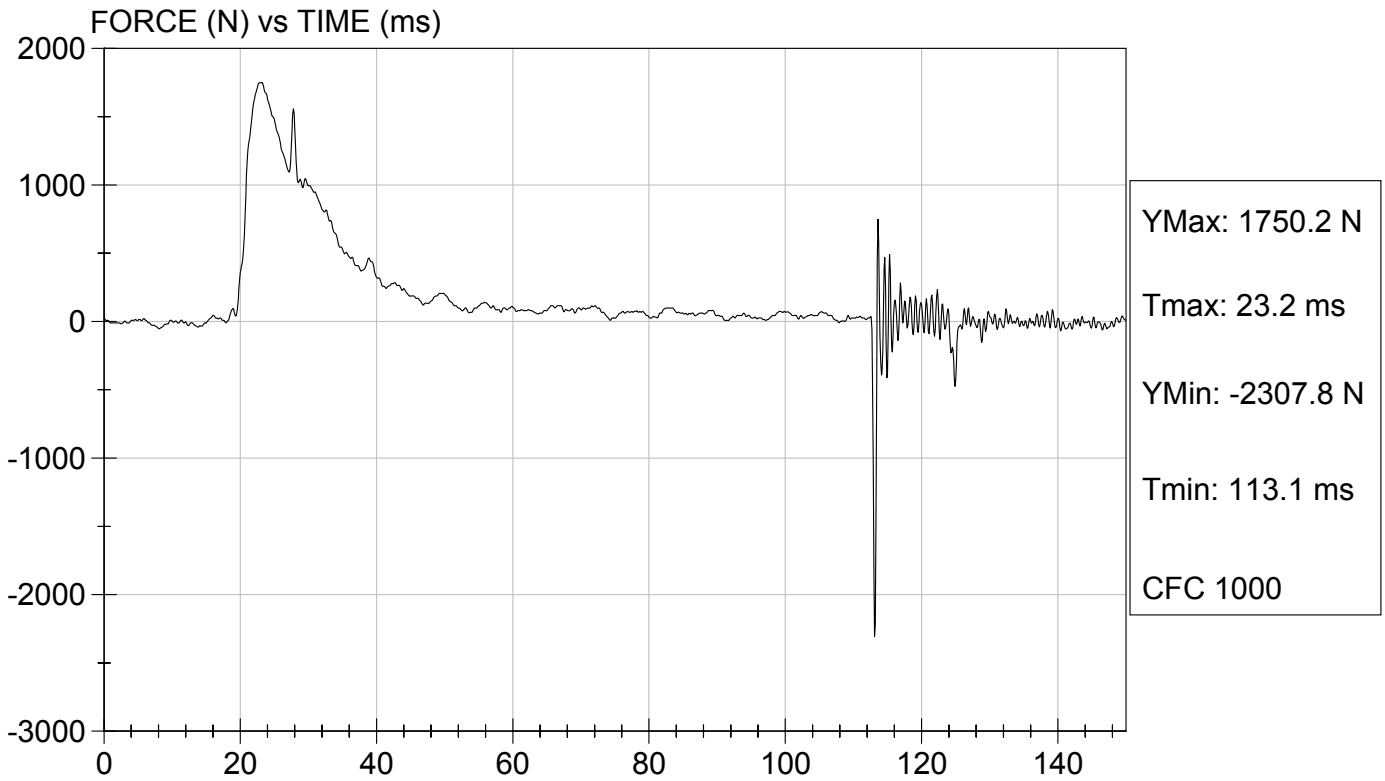
Test Date: 08/26/2004
Speed: 10 ft/sec, 3.05 m/sec





Test Desc: Dampener Impact
Component ID: D042017

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

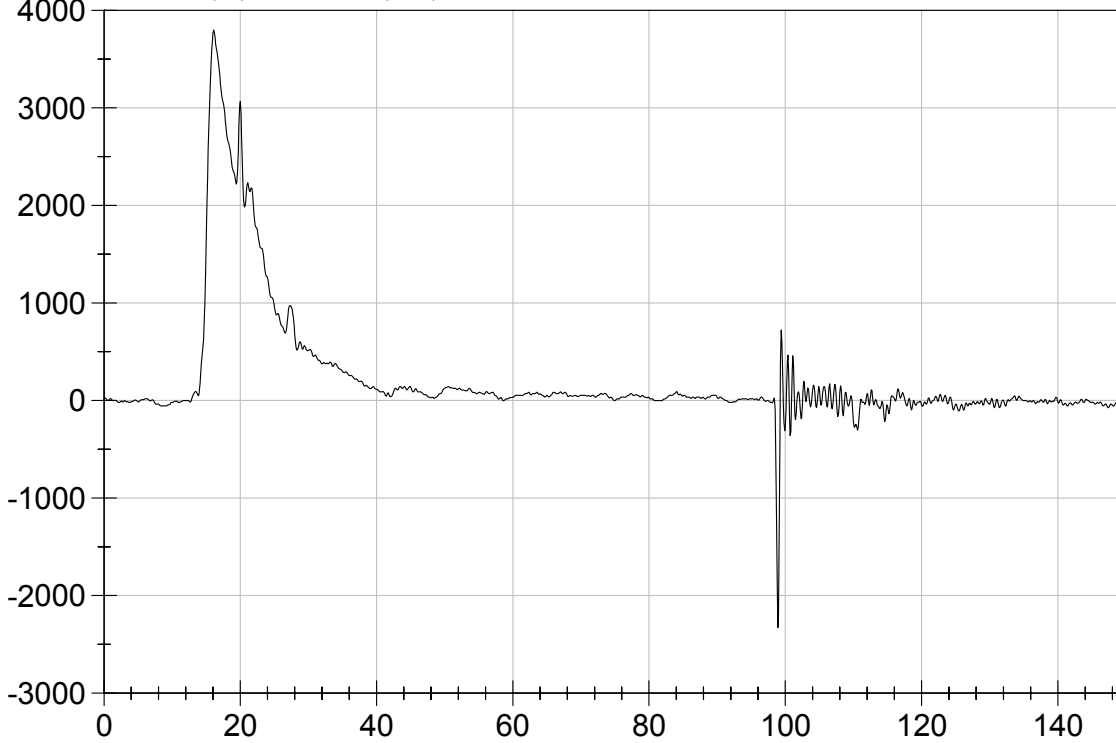




Test Desc: Dampener Impact
Component ID: D042018

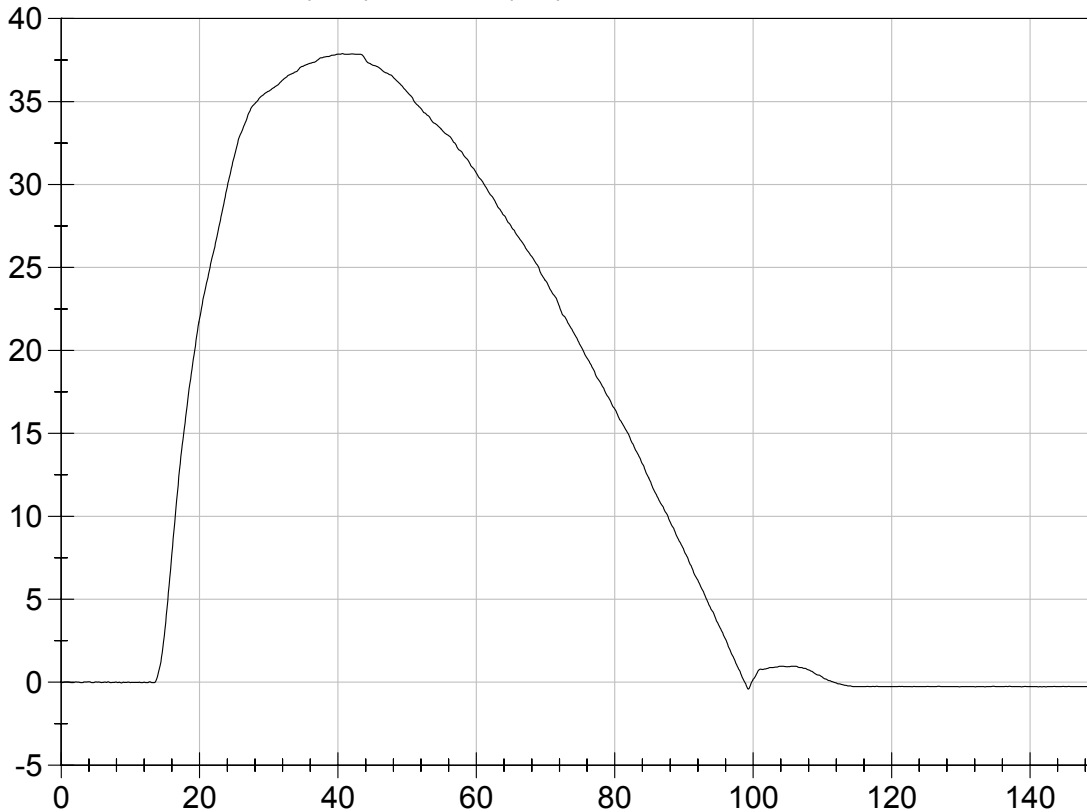
Test Date: 08/26/2004
Speed: 20 ft/sec, 6.1 m/sec

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: D042019

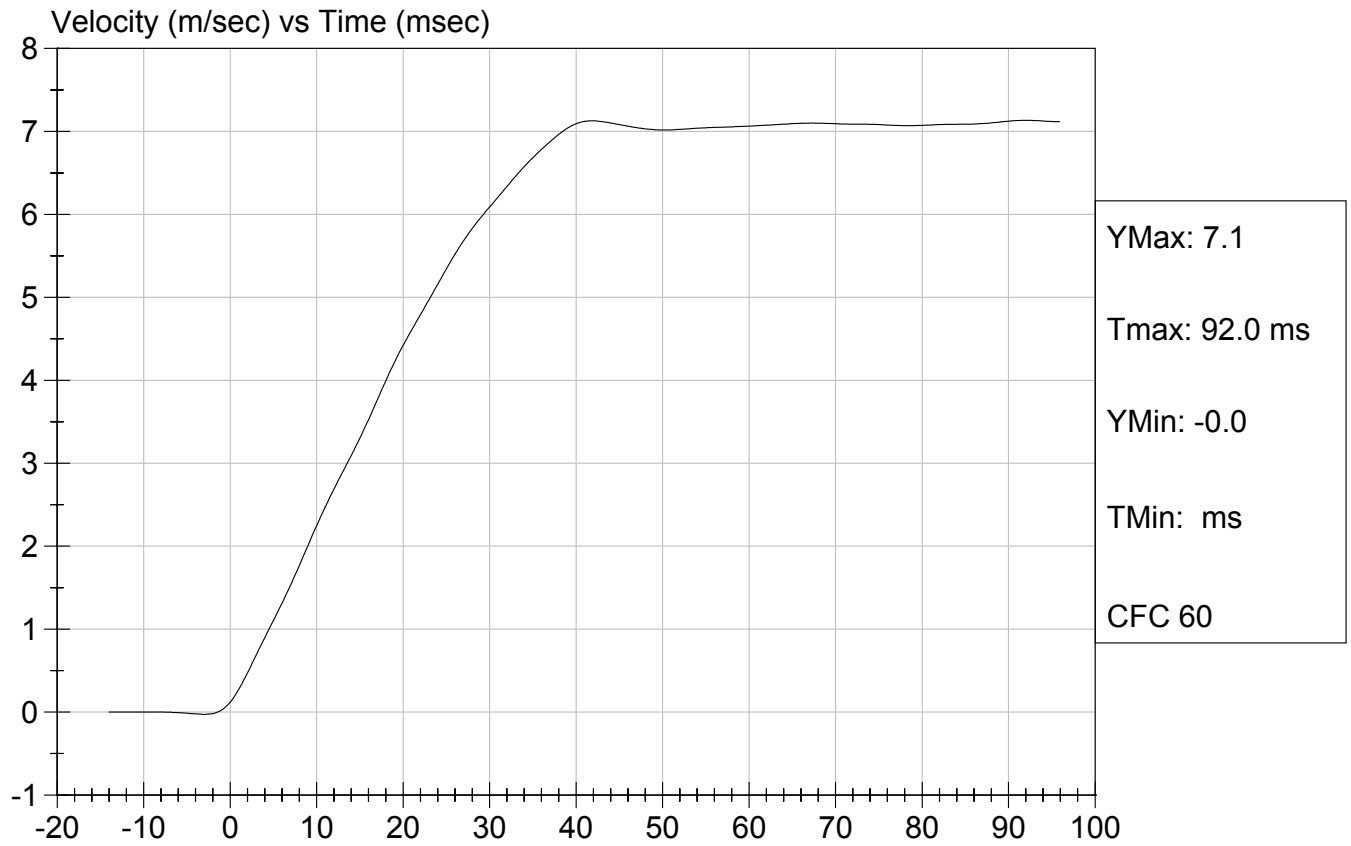
Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	53	Pass
Impact Velocity		m/s	6.89 to 7.13	7.04	Pass
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.25	Pass
	20 msec	m/s	4.12 to 5.10	4.42	Pass
	30 msec	m/s	5.73 to 7.01	6.09	Pass
	40 to 70 msec	m/s	6.27 to 7.64	7.13	Pass
Midsaggital Plane Max Rotation		deg	66 to 82	71	Pass
Head Rotation Peak to Zero - Decay Time		msec	58 to 67	60	Pass
Max. Mx at Occipital Condyles		Nm	73 to 88	75	Pass
Mx Peak To Zero - Decay Time		msec	49 to 64	57	Pass
Mx Peak to Max. Head Rotation		msec	2 to 16	13	Pass


 Laboratory Technician

08/24/2004

Test Date

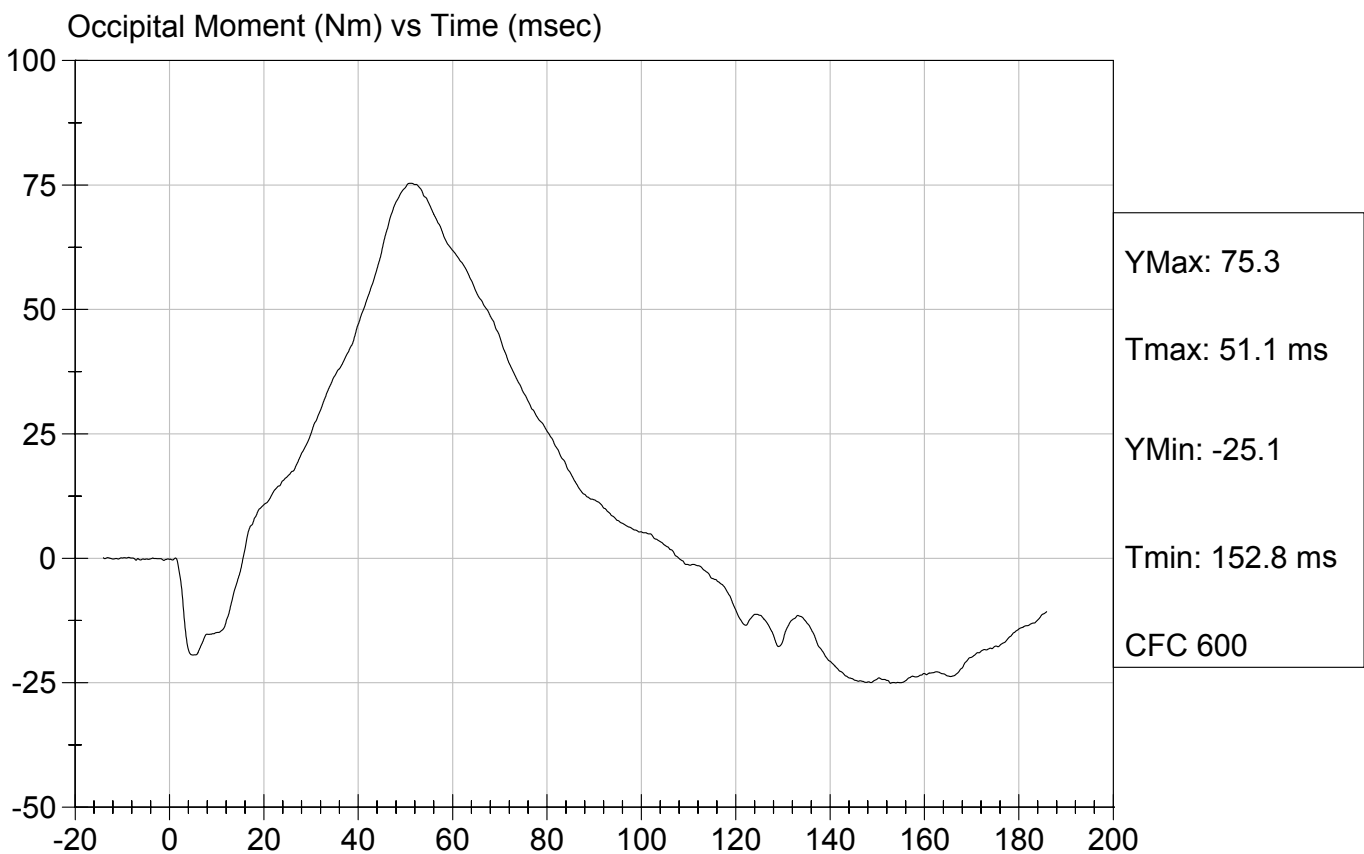
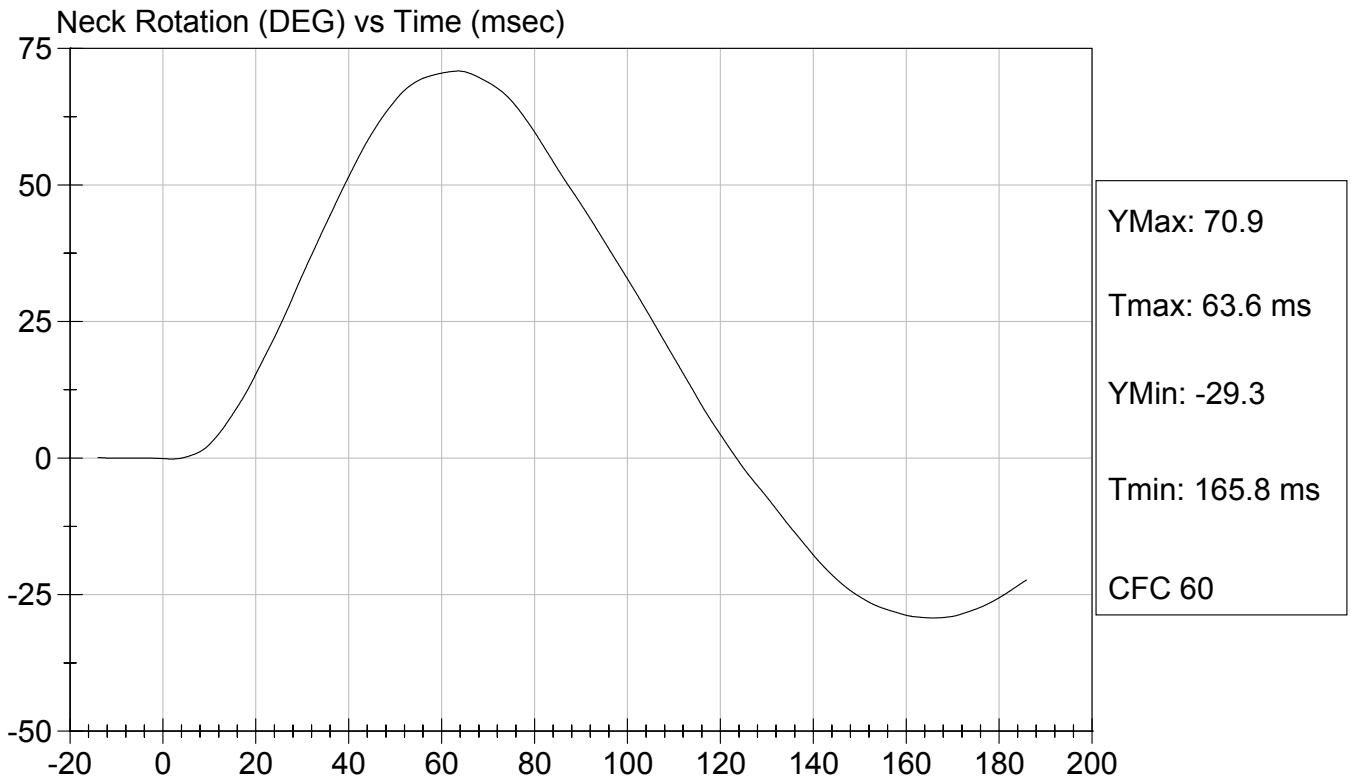

 Approved By





Test Desc: Neck Bending
Component ID: D042019

Test Date: 08/24/2004
Speed: 23.11 ft/sec, 7.04 m/sec



Calibration Test Results Summary

Dummy Serial Number: 271

Post-Test Calibration

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

SID Calibration Data Sheet
Side Impact Dummy
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

Jessica Hall
 Laboratory Technician

09/15/2004
 Test Date

David Winkelbauer
 Approved By



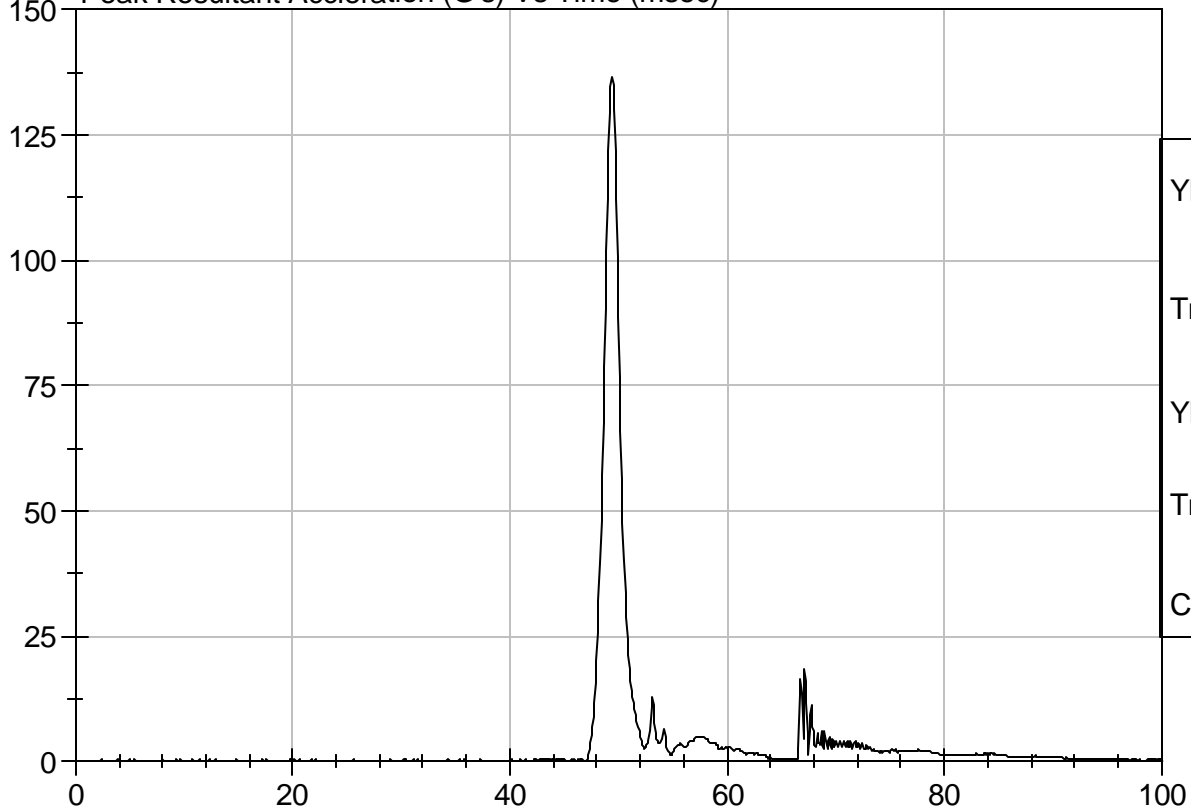
Test Description: Head Drop

Test Date: 09/15/2004

Component: D042231

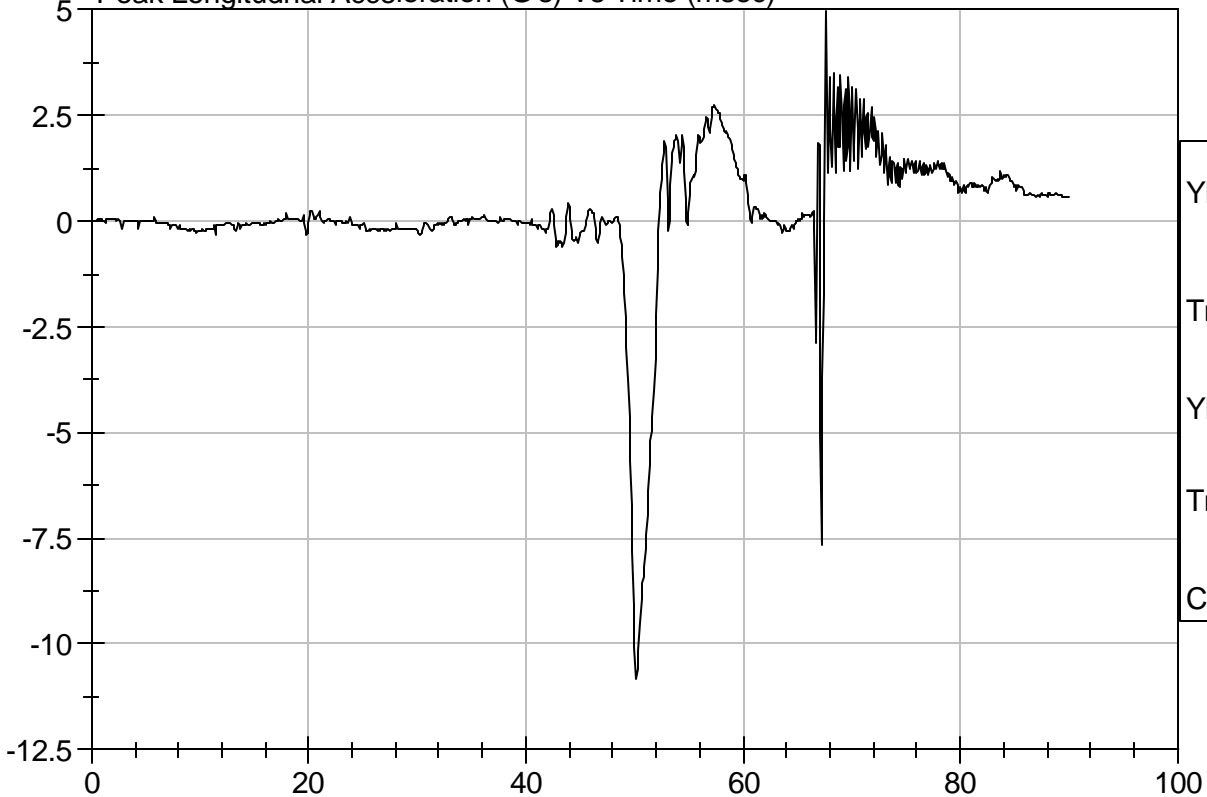
Speed: 0 ft/s, 0.00 m/s

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



YMax: 136.7 G
Tmax: 49.4 ms
YMin: 0.0 G
Tmin: -0.1 ms
CFC 1000

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



YMax: 5.0 G
Tmax: 67.6 ms
YMin: -10.8 G
Tmin: 50.1 ms
CFC 1000

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

Jessica Hall
 Laboratory Technician

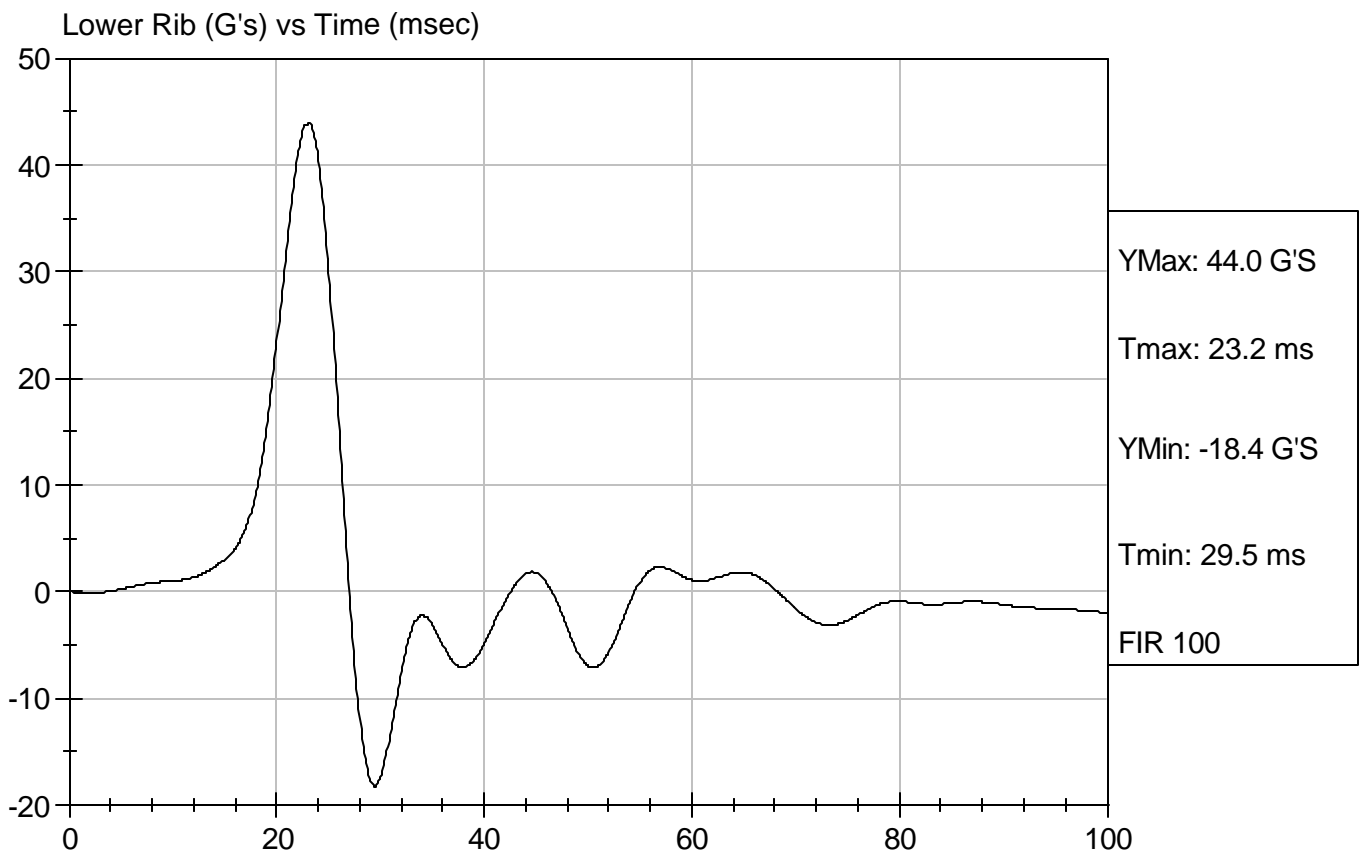
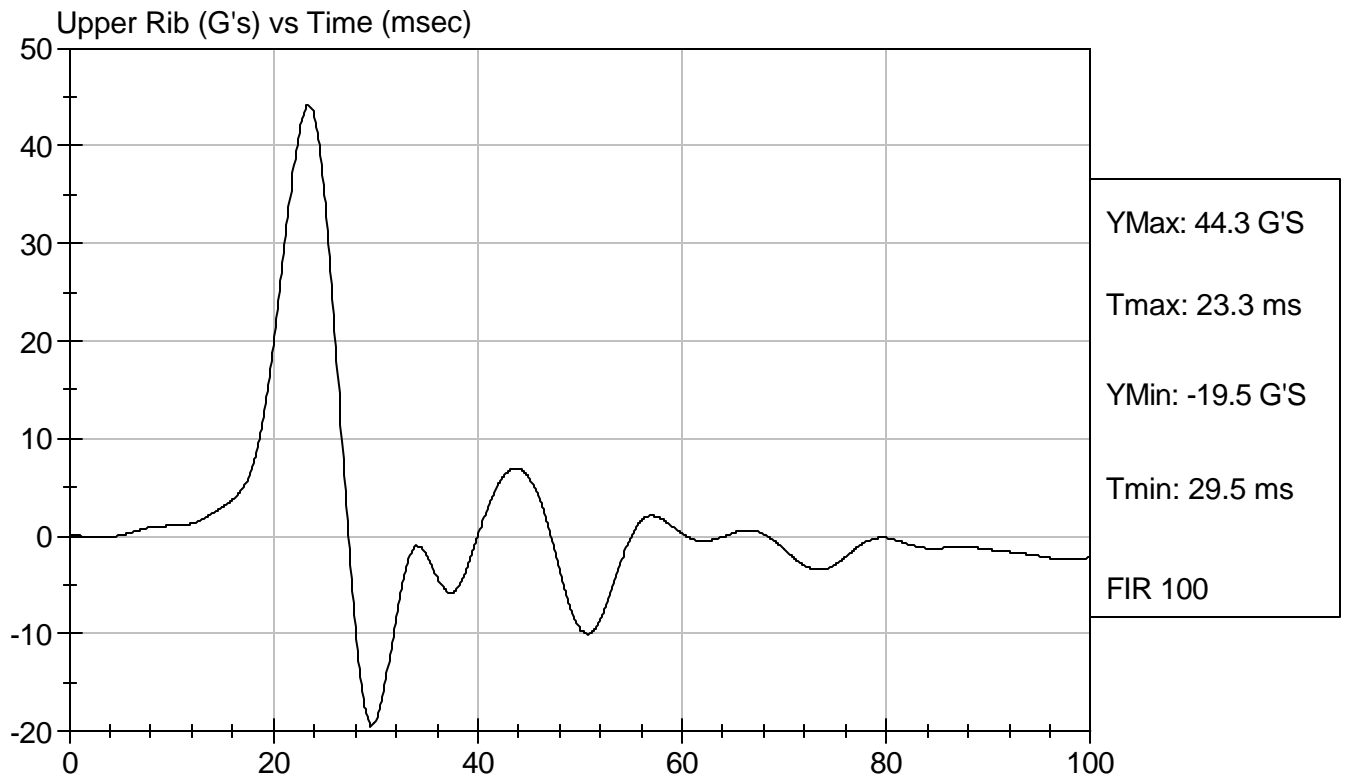
09/15/2004
 Test Date

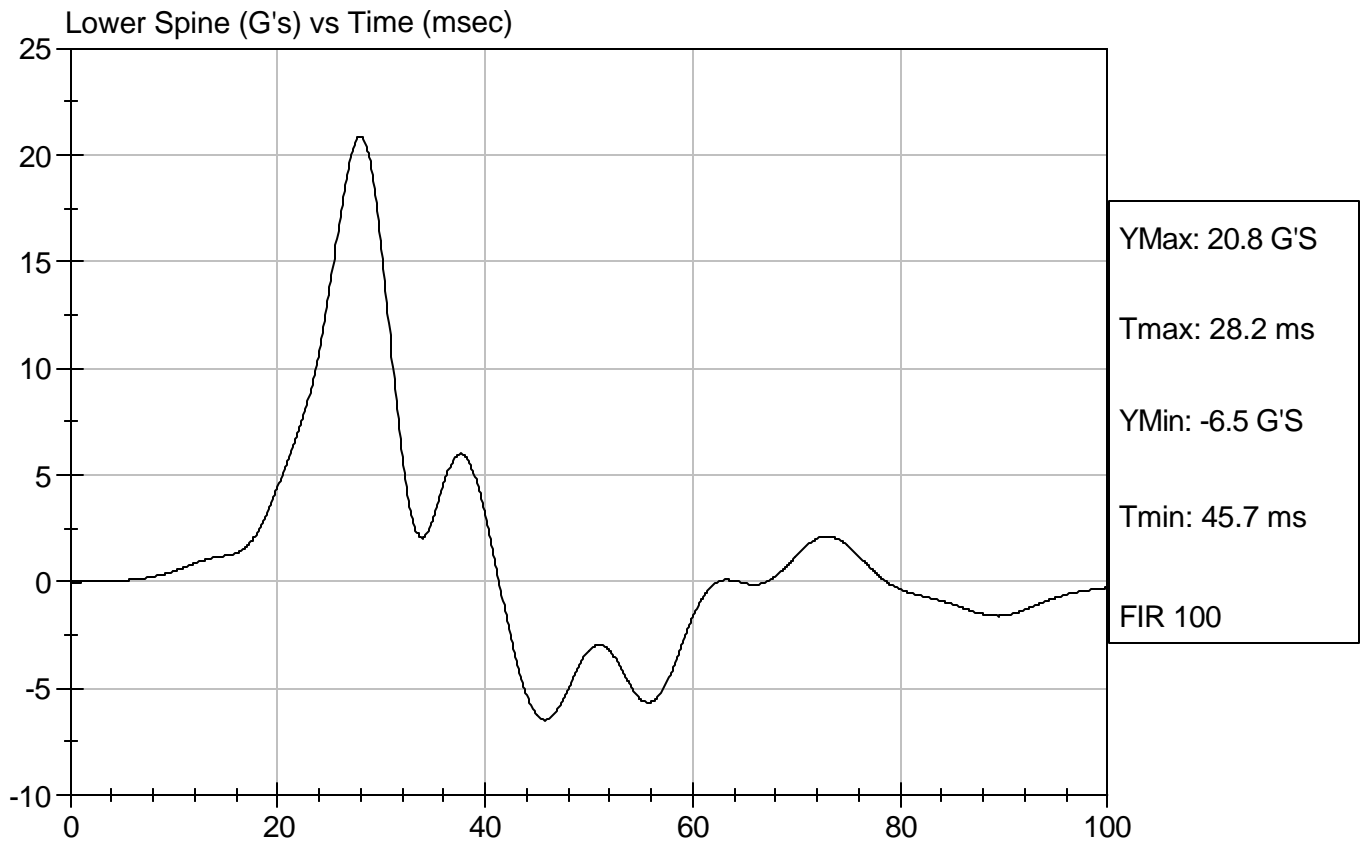
David Winkelbauer
 Approved By



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

Jessica Hall
 Laboratory Technician

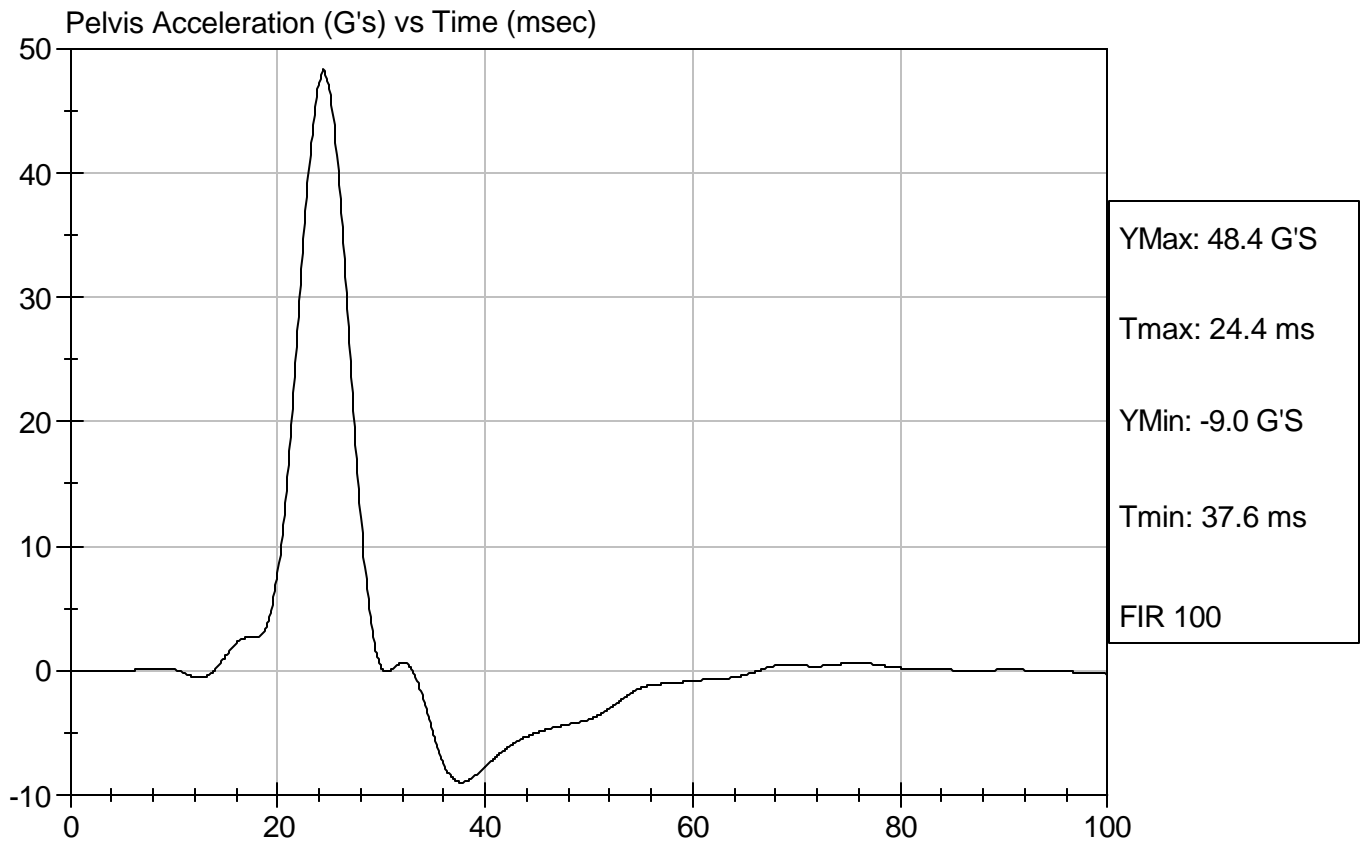
09/15/2004
 Test Date

David Winkelbauer
 Approved By



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

Jessica Hall
 Laboratory Technician

09/15/2004
 Test Date

David Winkelbauer
 Approved By

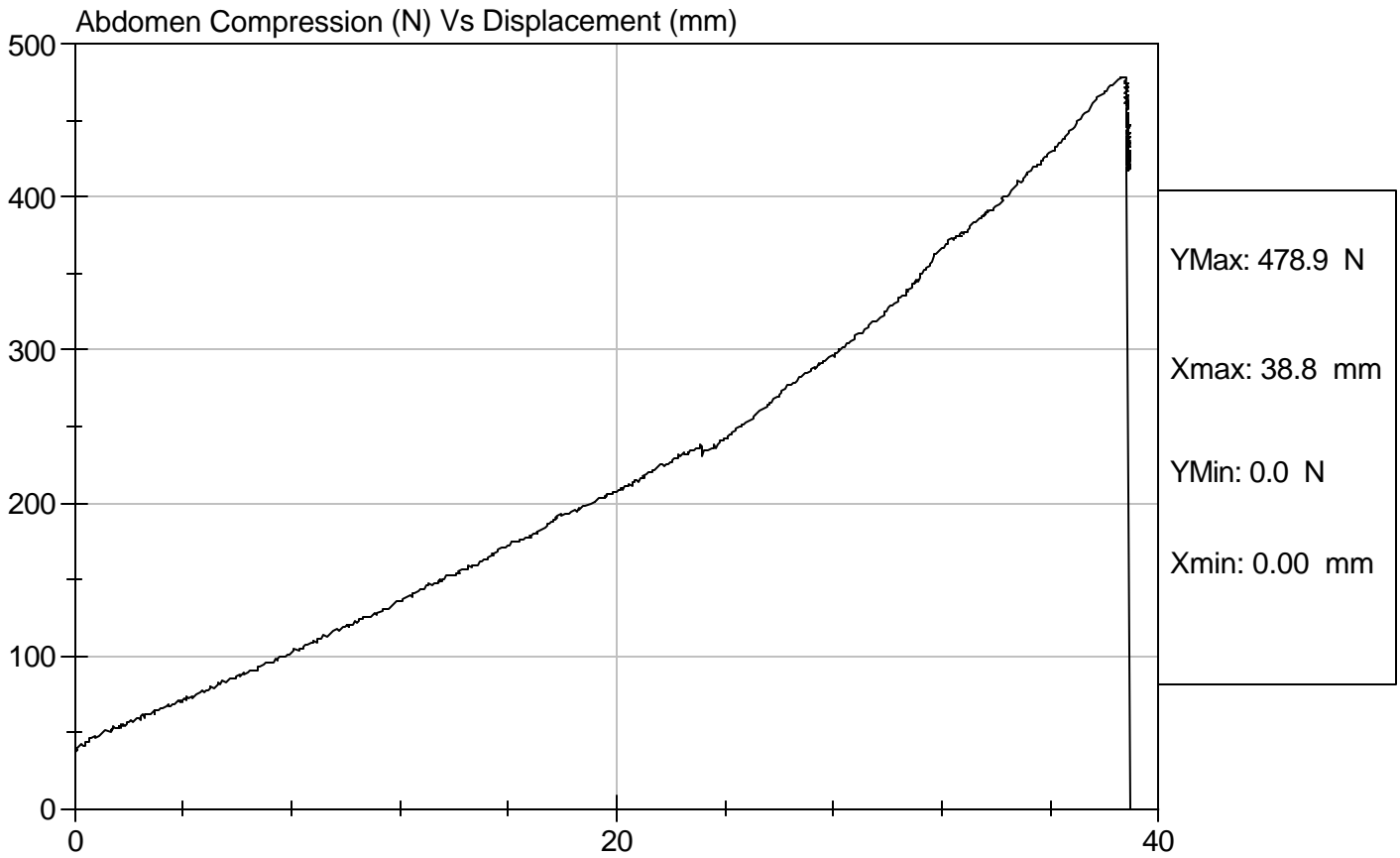


Test Description: Abdomen Compression

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

Jessica Hall
 Laboratory Technician

09/16/2004
 Test Date

David Winkelbauer
 Approved By

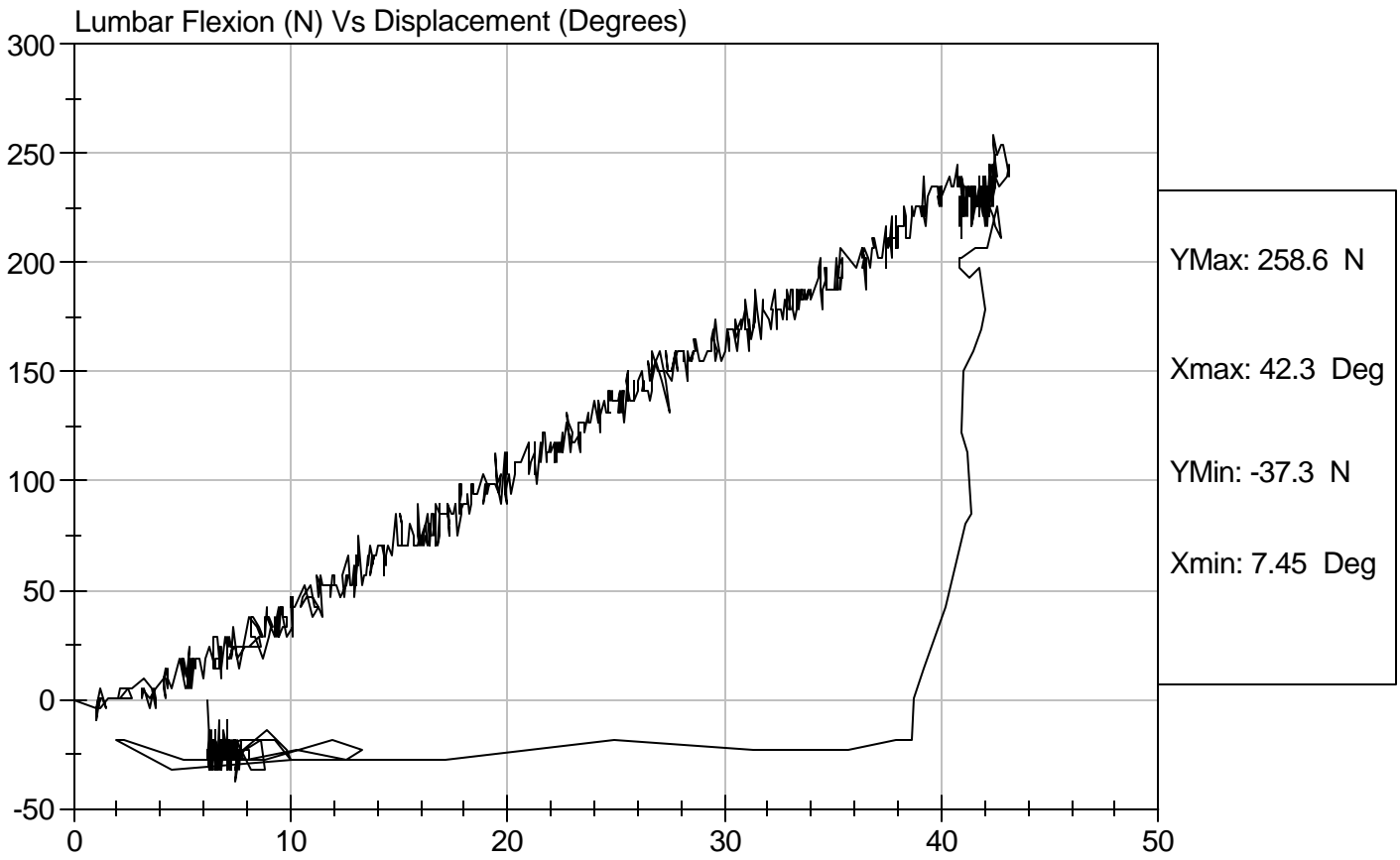


Test Description: Lumbar Flexion

Test Date: 09/16/2004

Component: D042235

Speed: 0 ft/sec, 0 m/sec



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


ATD Serial No: 271

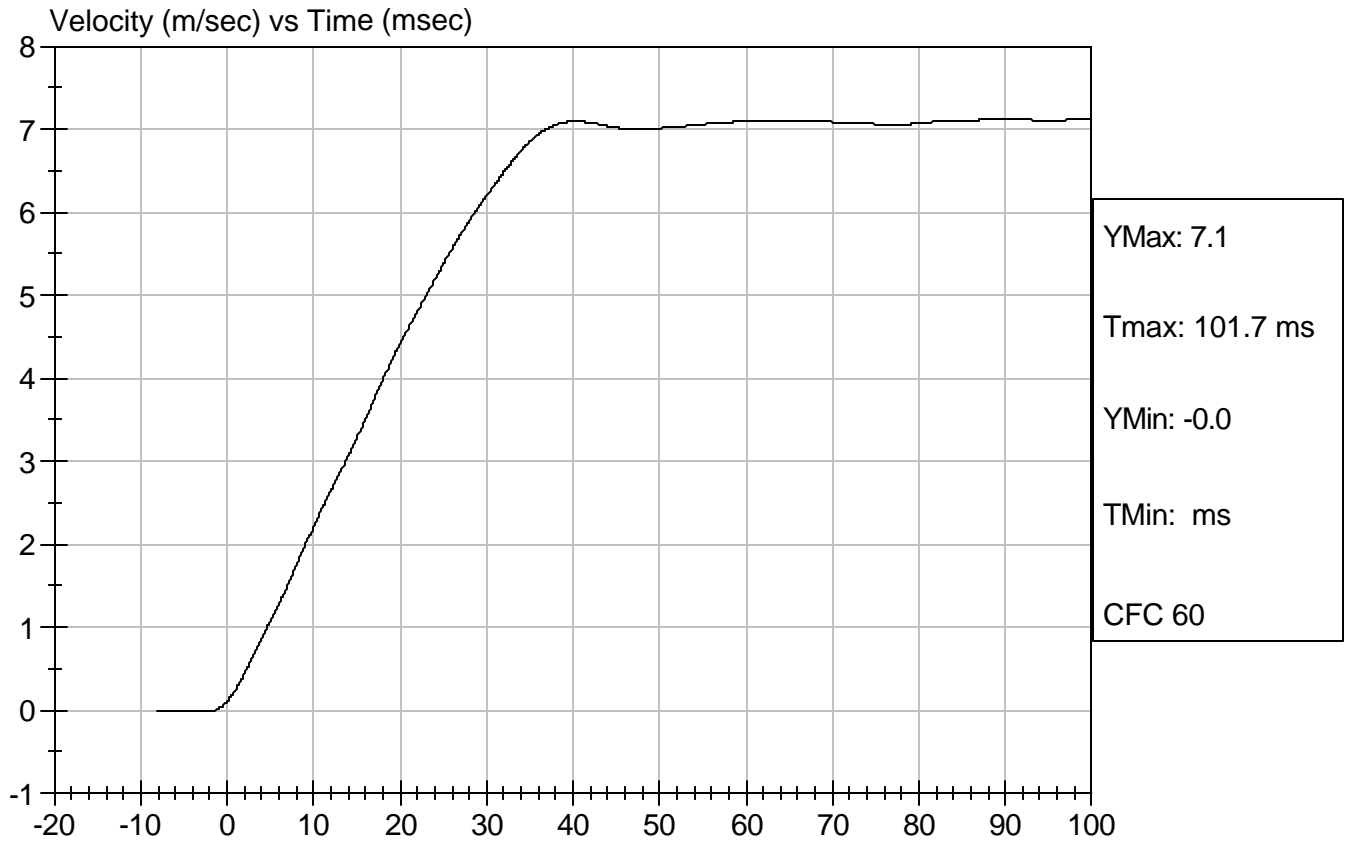
Test I.D: D042239

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

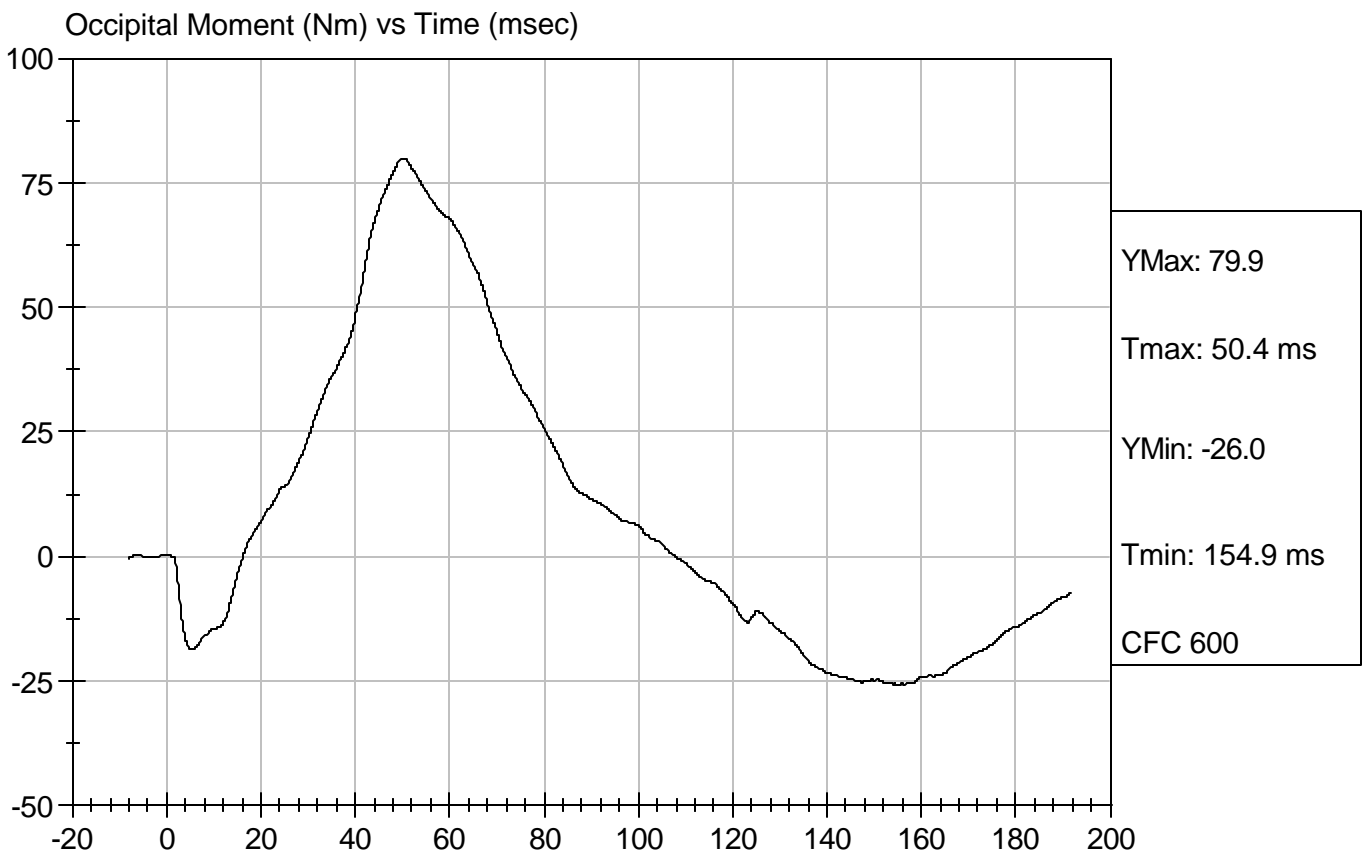
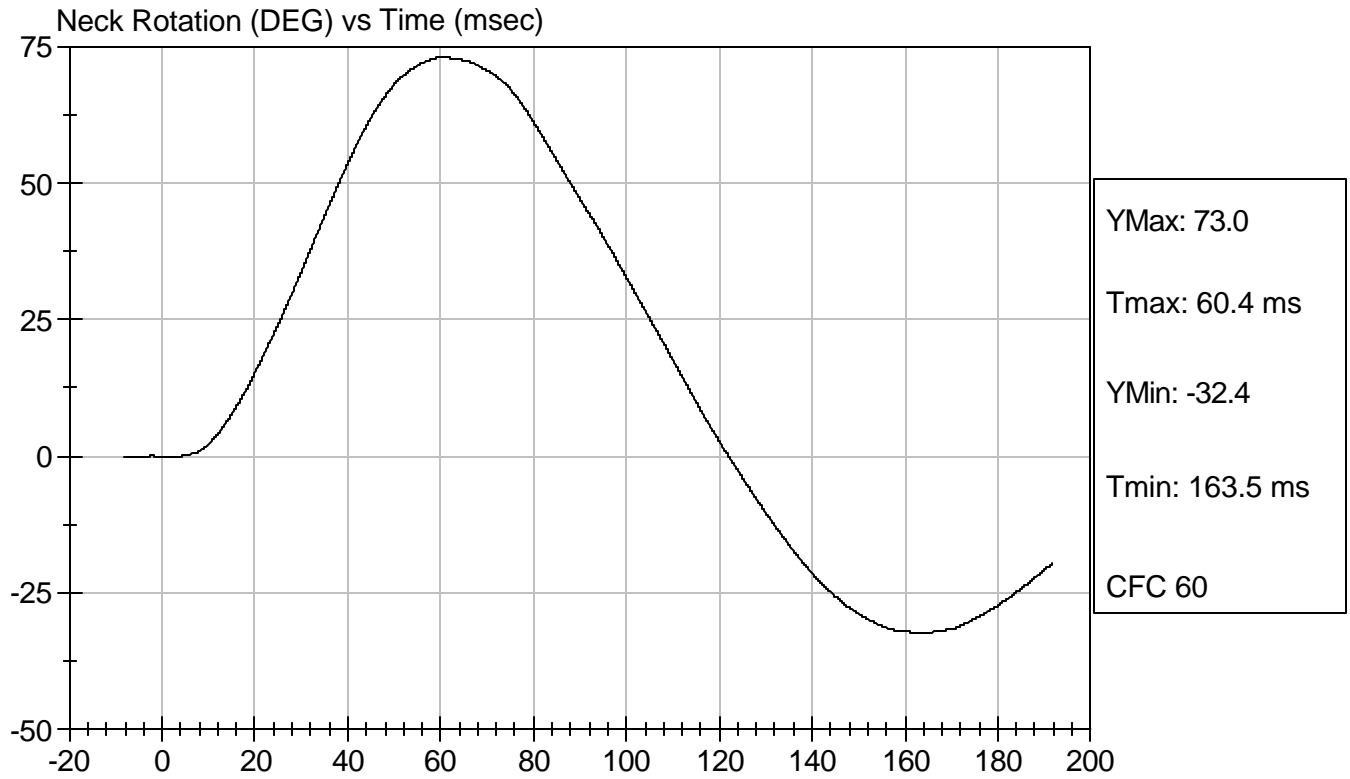

 Approved By





Test Desc: Neck Bending
Component ID: D042239

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



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

09/16/2004
 Test Date

CERTIFICATION DATA

Dummy Serial Number: 904

Calibration Test Results Summary

Dummy Serial Number: 904

Pre-Test Calibration

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

SID Calibration Data Sheet
Side Impact Dummy
External Measurements

ATD Serial No: 904

Test I.D.: 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 Gall
 Laboratory Technician

08/27/04
 Test Date

David Winkelbauer
 Approved By

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

ATD Serial No: 904

Test I.D: D042021

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	51	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	11	Pass
Overall Test Results				Pass

Jessica Gall
 Laboratory Technician

08/24/2004
 Test Date

David Winkelbauer
 Approved By

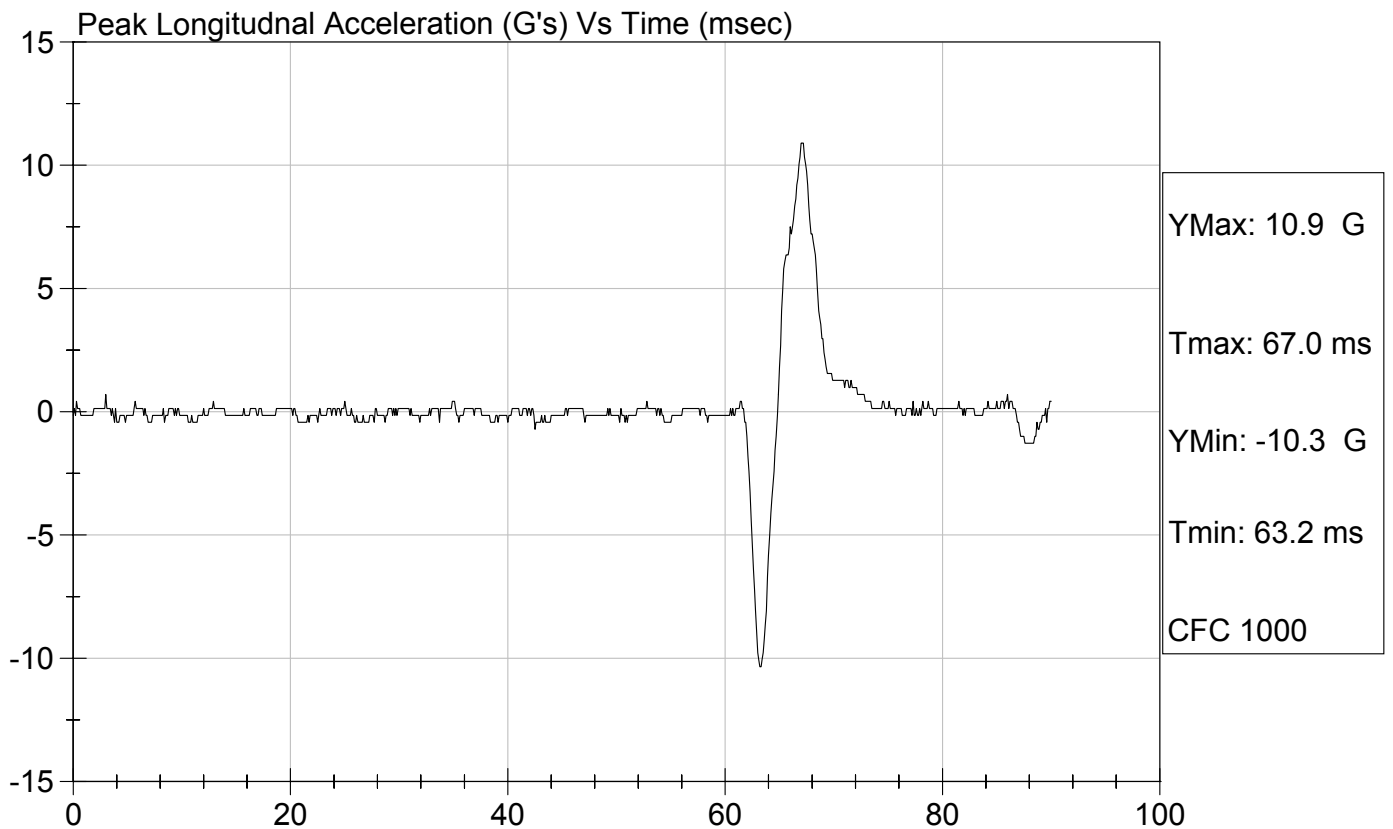
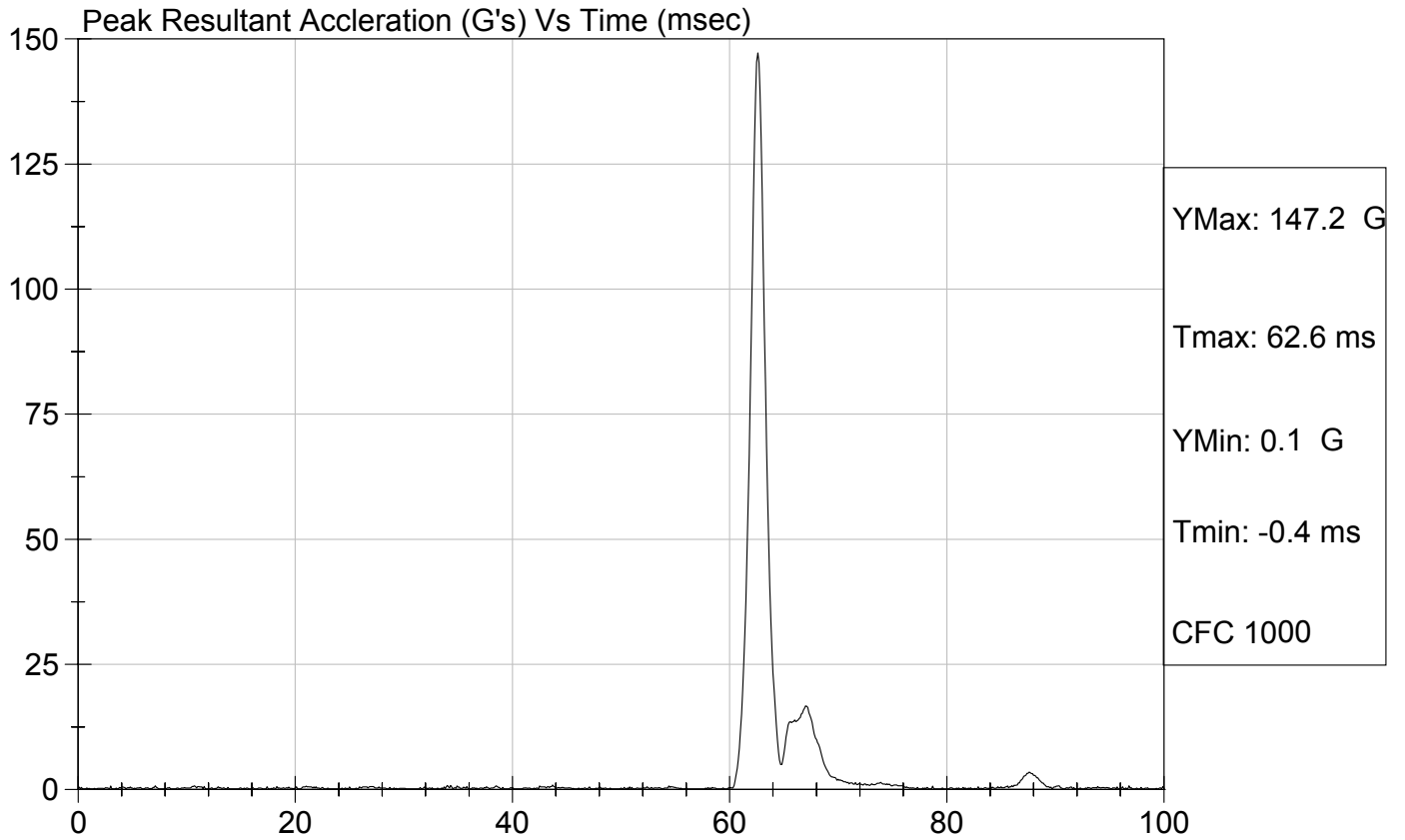


Test Description: Head Drop

Test Date: 08/24/2004

Component: D042021

Speed: 0 ft/s, 0.00 m/s



SID Calibration Data Sheet
Side Impact Dummy
Thorax Impact Test

ATD Serial No: 904

Test I.D.: D042022

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	55	Pass
Probe Velocity	m/s	4.27 - 4.33	4.31	Pass
Upper Rib	G's	37 - 46	41	Pass
Lower Rib	G's	37 - 46	40	Pass
Lower Spine	G's	15 - 22	19	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

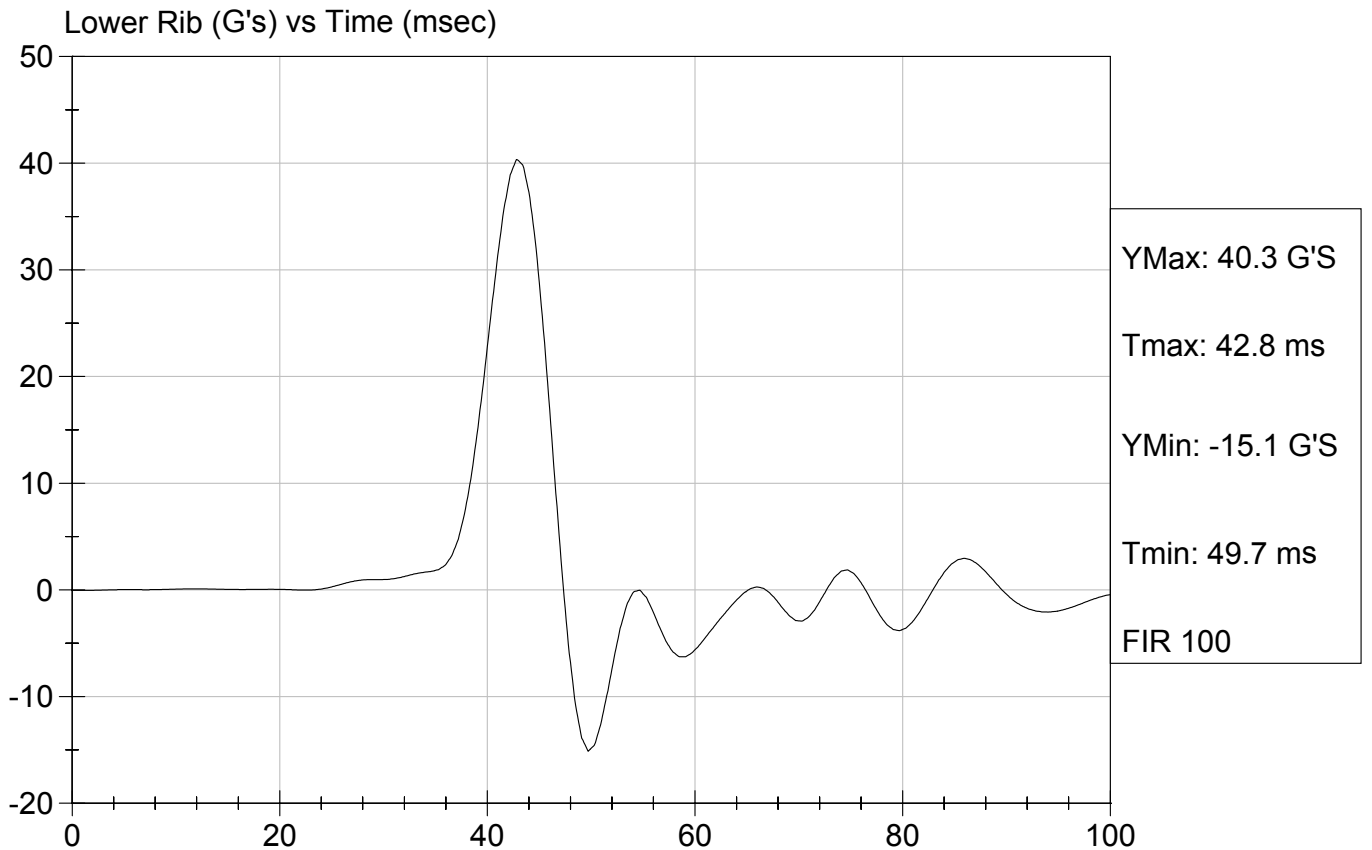
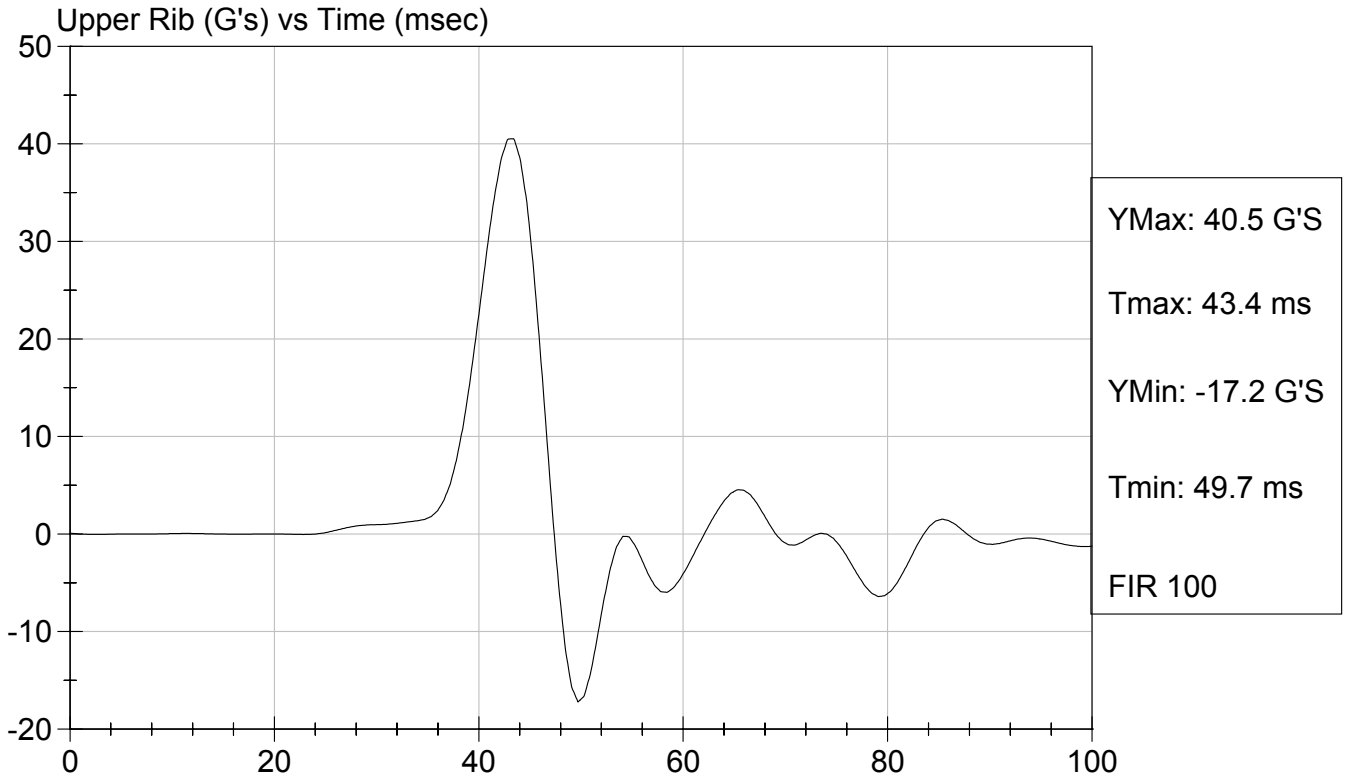
08/26/2004
Test Date

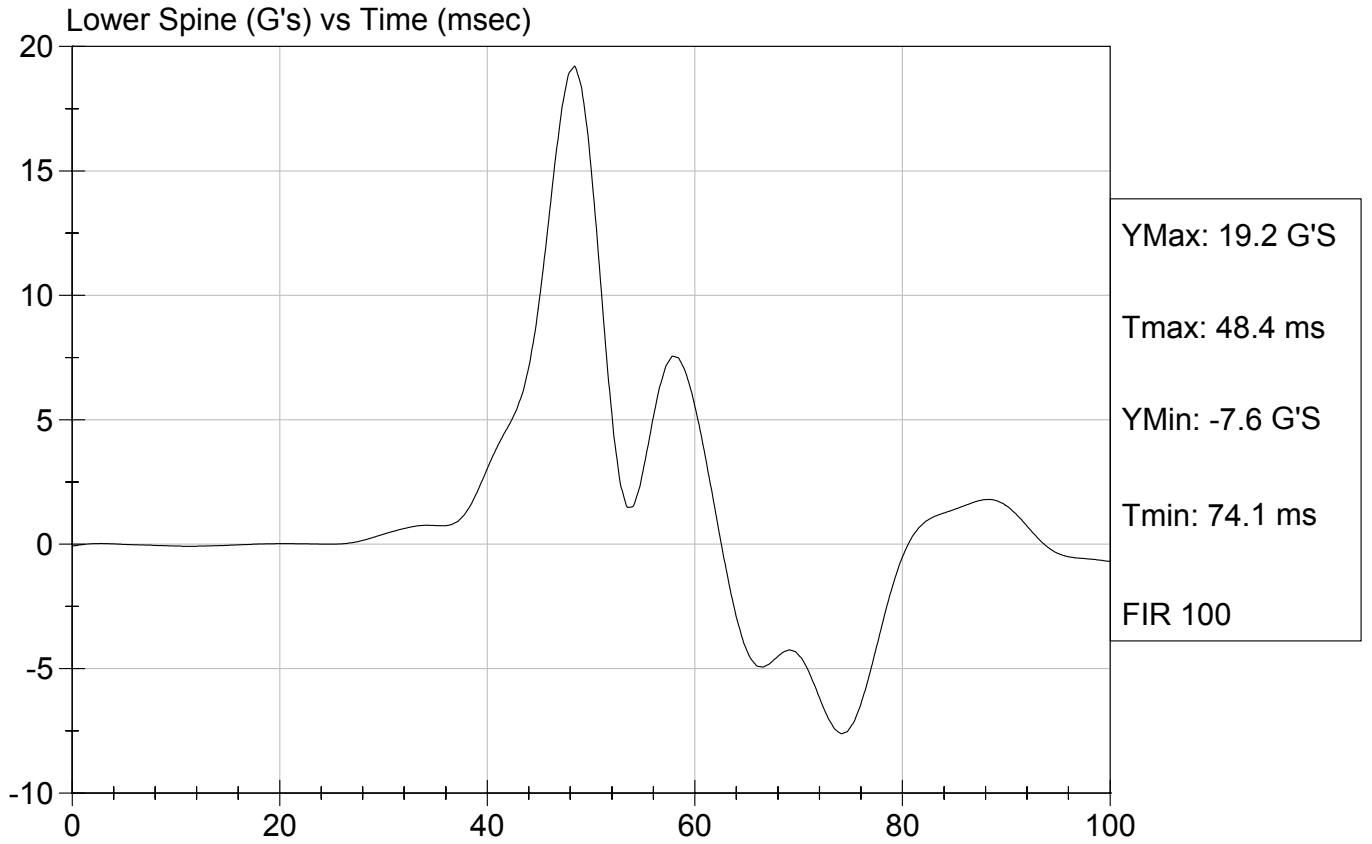
David Winkelbauer
Approved By



Test Desc: Thorax Impact
Component ID: D042022

Test Date: 08/26/2004
Speed: 14.13 ft/sec, 4.31 m/sec





SID Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Test

ATD Serial No: 904

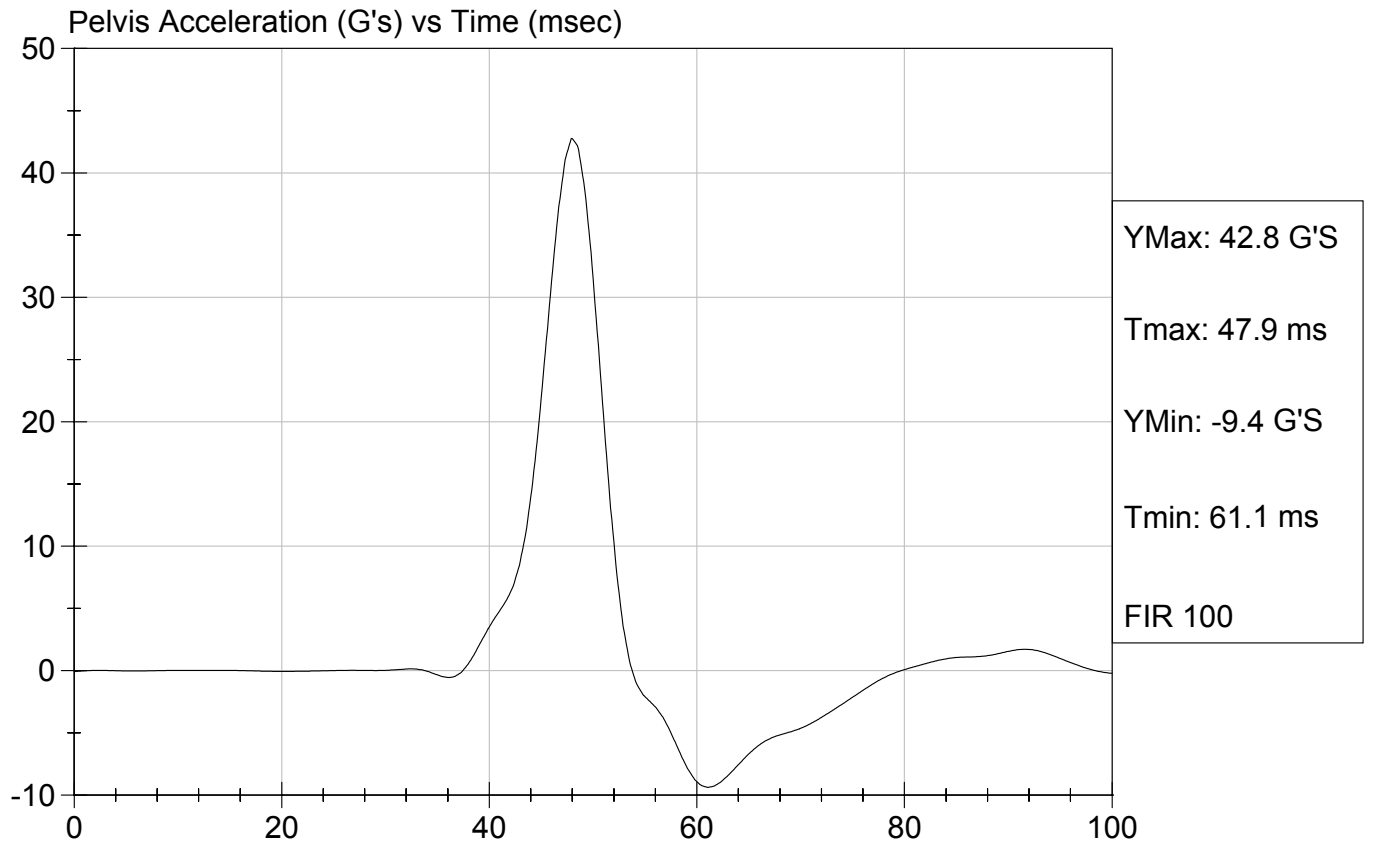
Test I.D: D042023

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	51	Pass
Probe Velocity	m/s	4.27 - 4.33	4.31	Pass
Pelvis Acceleration	G's	40 - 60	43	Pass
Overall Test Results				Pass

Jessica Gall
Laboratory Technician

08/25/2004
Test Date

David Winkelbauer
Approved By



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

ATD Serial No: 904

Test I.D: D042024

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	48	Pass
Force At 12.7 mm	N	104 - 162	139	Pass
Force At 19 mm	N	163 - 222	193	Pass
Force At 25.4 mm	N	222 - 280	256	Pass
Force At 33 mm	N	325 - 391	345	Pass
Overall Test Results				Pass

Jessica Gall
 Laboratory Technician

08/24/2004
 Test Date

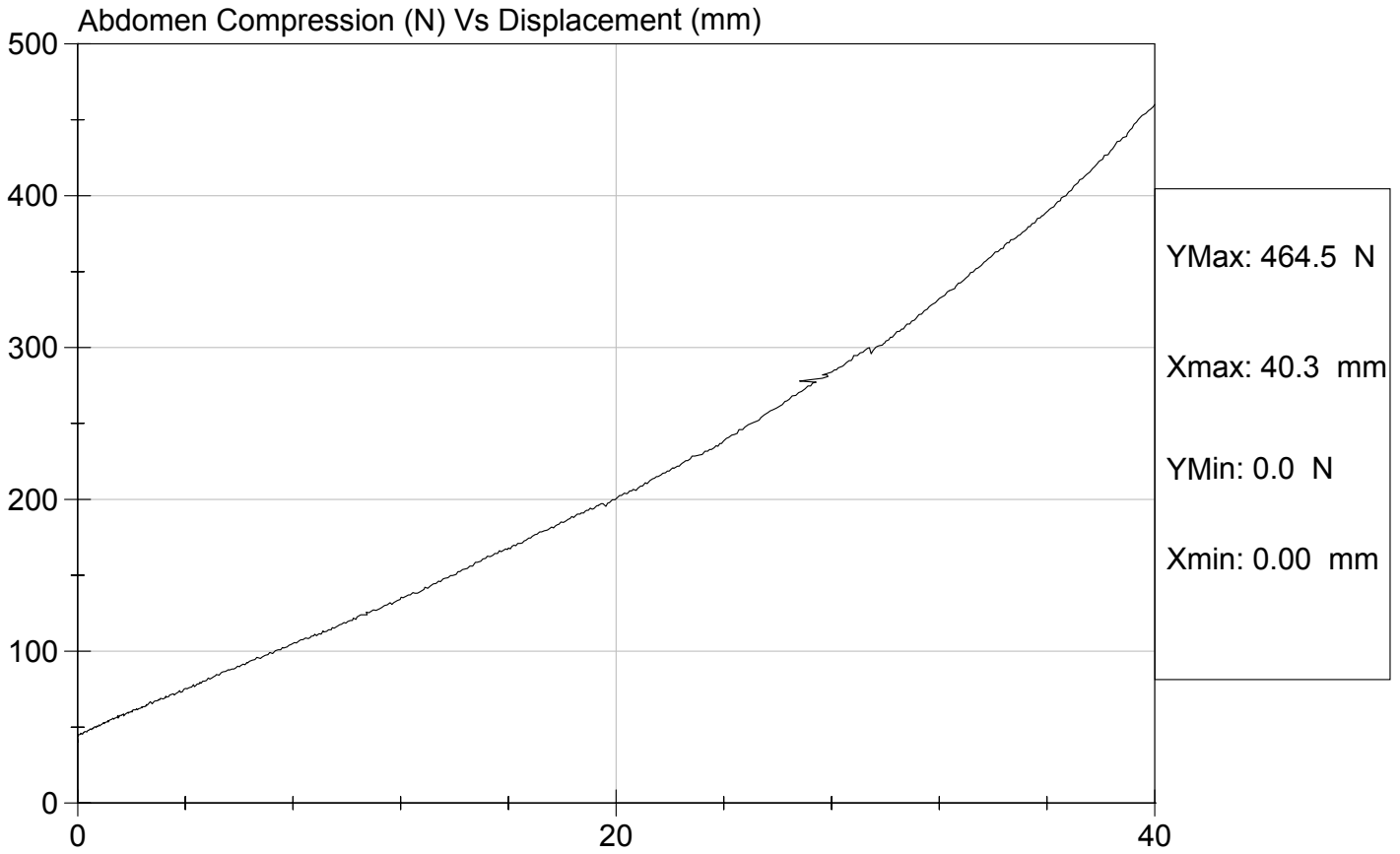
David Winkelbauer
 Approved By



Test Description: Abdomen Compression Test Date: 08/24/2004

Component: D042024

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No: 904

Test I.D: D042025

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.5	20.9	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	107.6	Pass
Force At 30 deg	N	151.2 - 204.6	173.4	Pass
Force At 40 deg	N	204.6 - 258.0	248.6	Pass
Return Angle	Deg	12 Maximum	6	Pass
			Overall Test Results	Pass

Jessica Gall
 Laboratory Technician

08/24/2004
 Test Date

David Winkelbauer
 Approved By

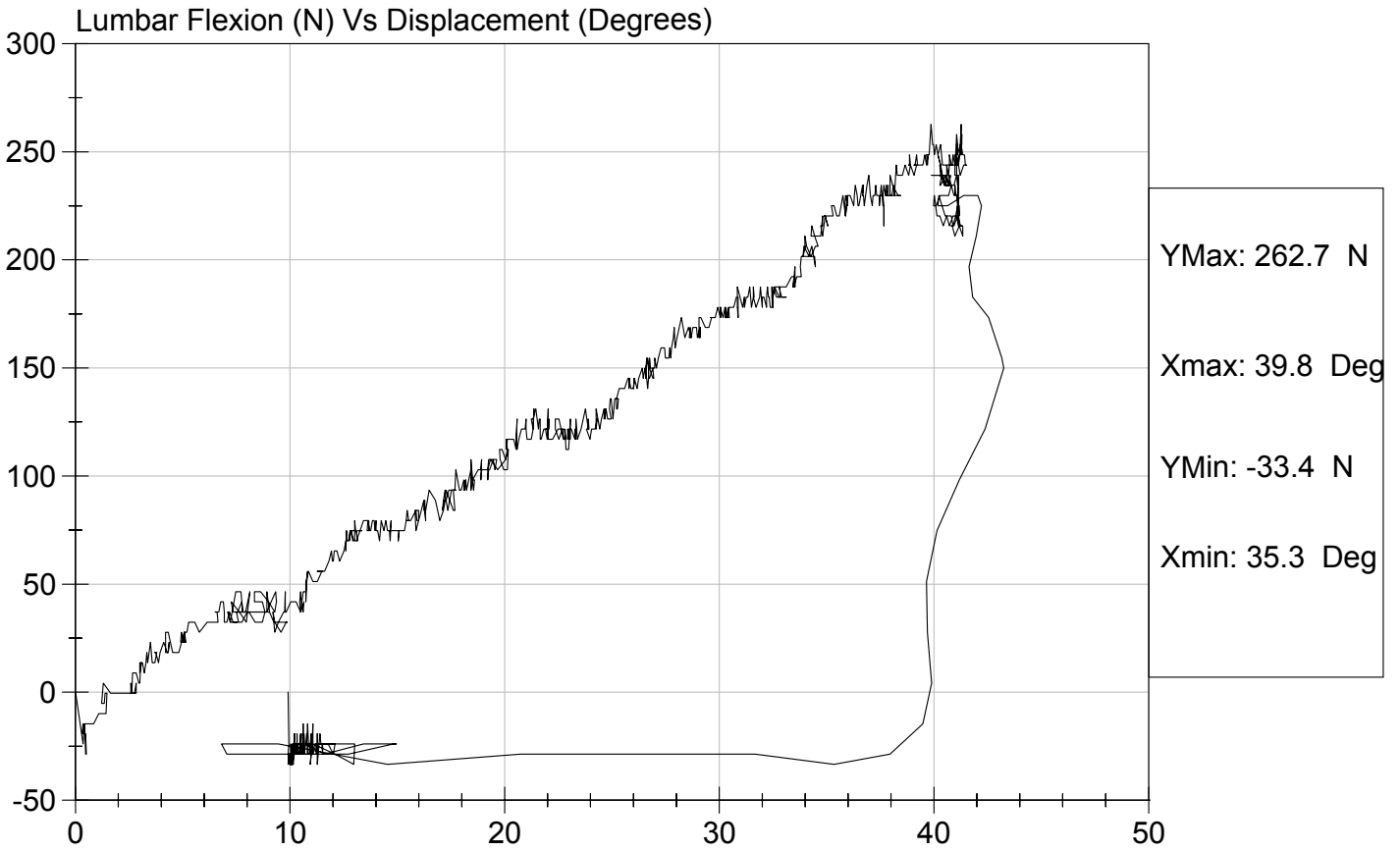


Test Description: Lumbar Flexion

Test Date: 08/24/2004

Component: D042025

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

Jessica Gall
 Laboratory Technician

08/26/2004

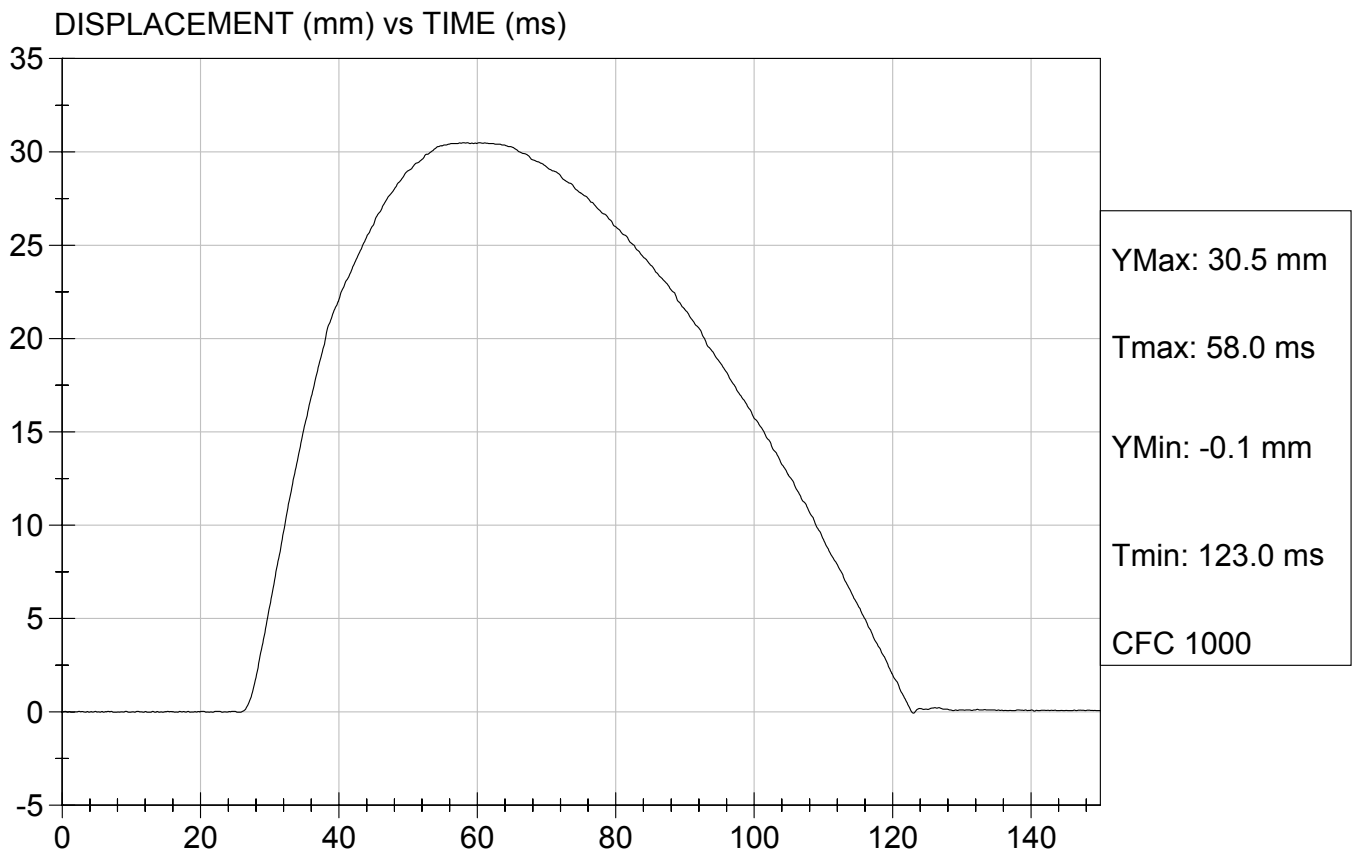
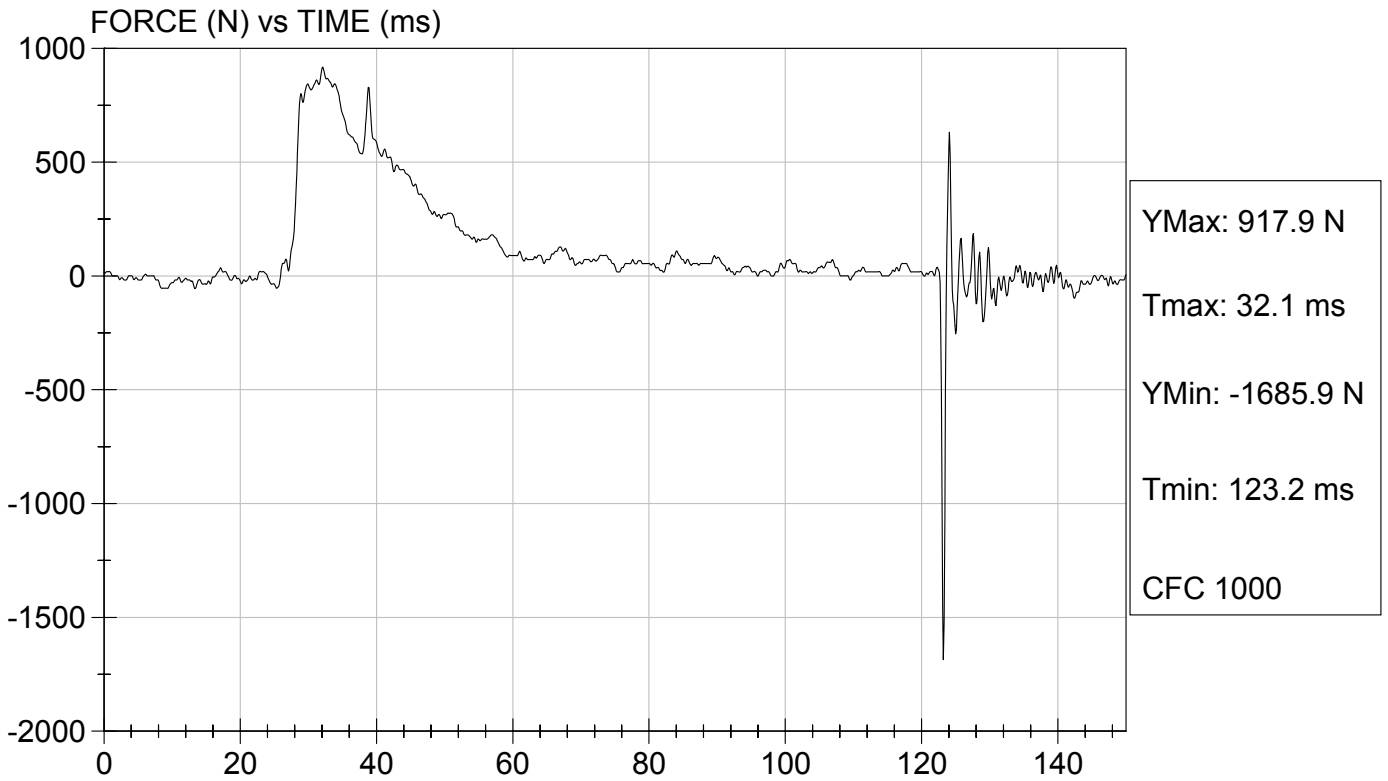
Test Date

David Winkelbauer
 Approved By



Test Desc: Dampener Impact
Component ID: D042026

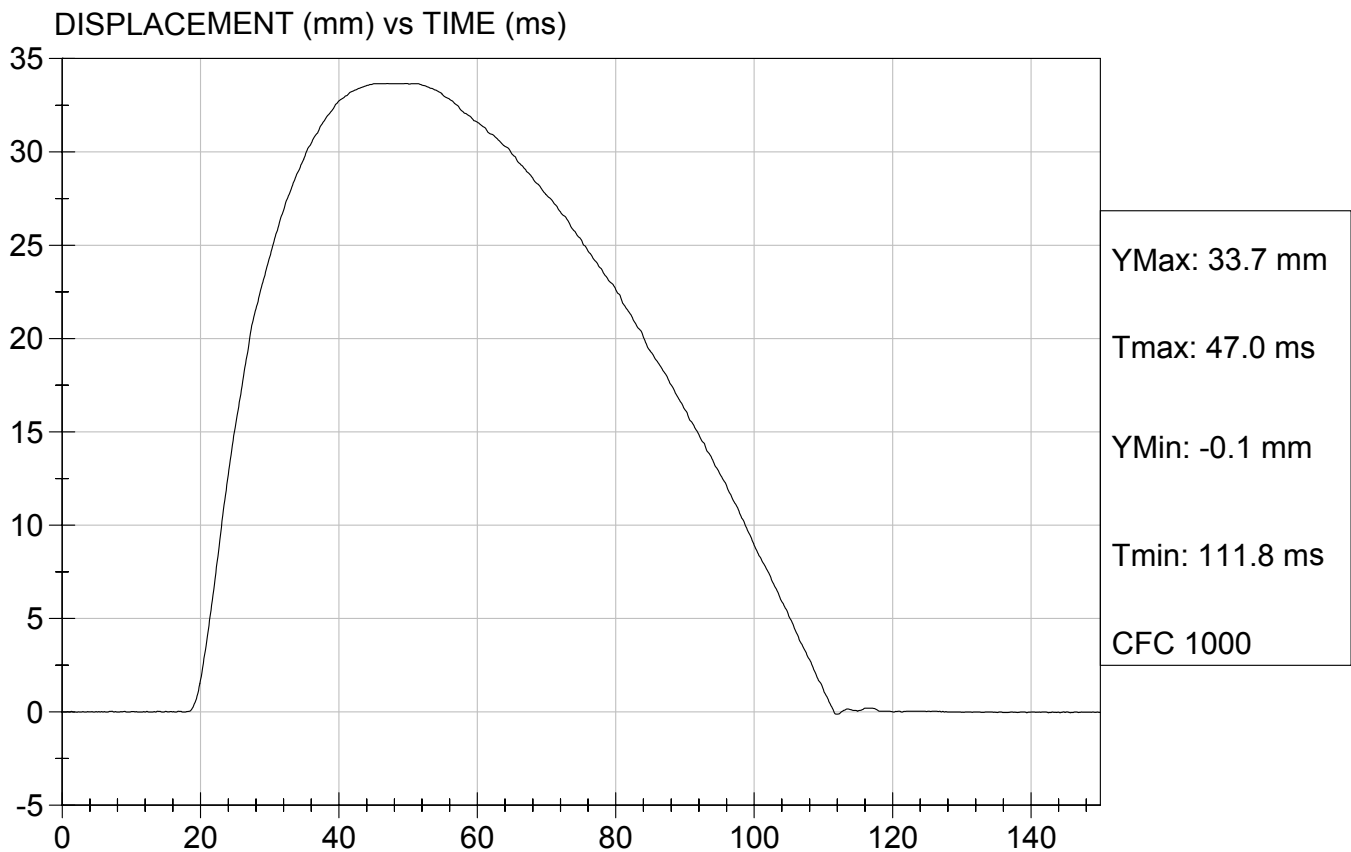
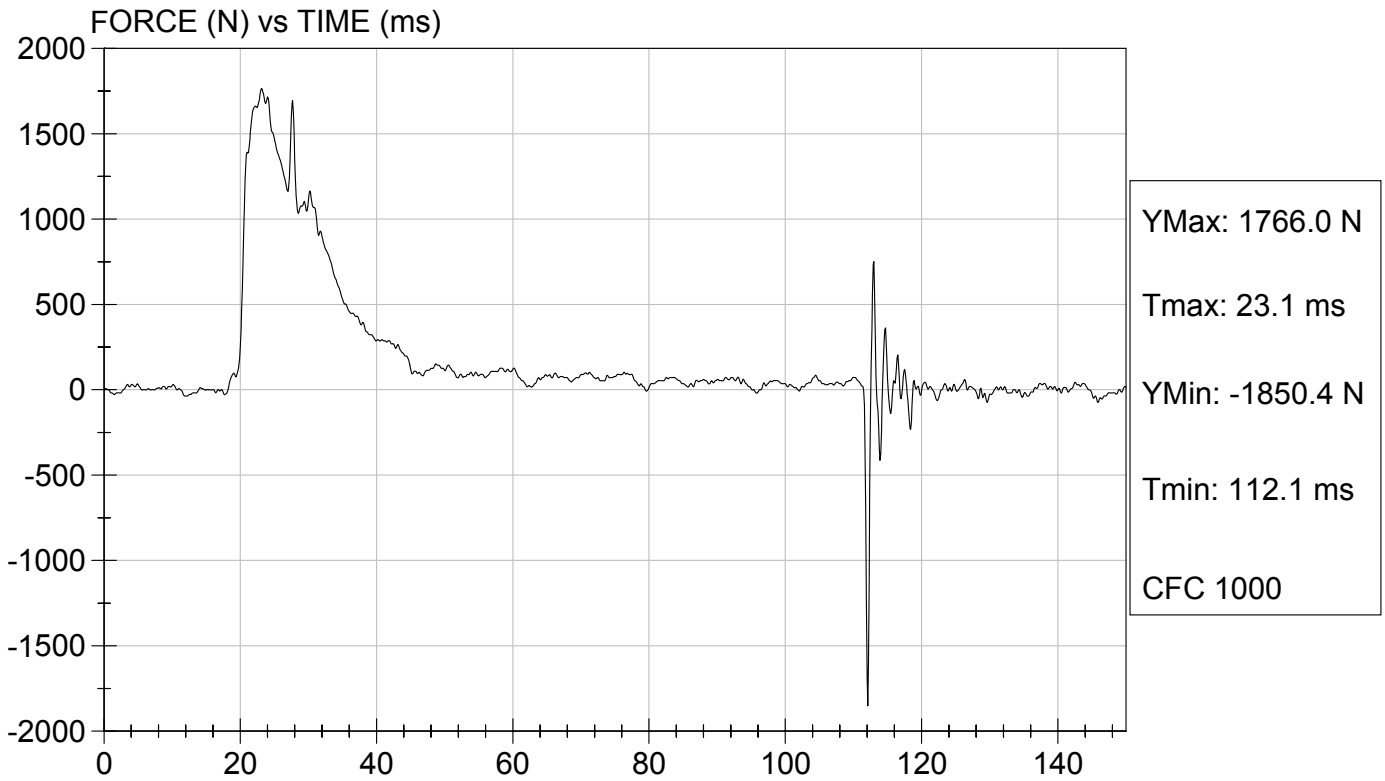
Test Date: 08/26/2004
Speed: 10 ft/sec, 3.05 m/sec





Test Desc: Dampener Impact
Component ID: D042027

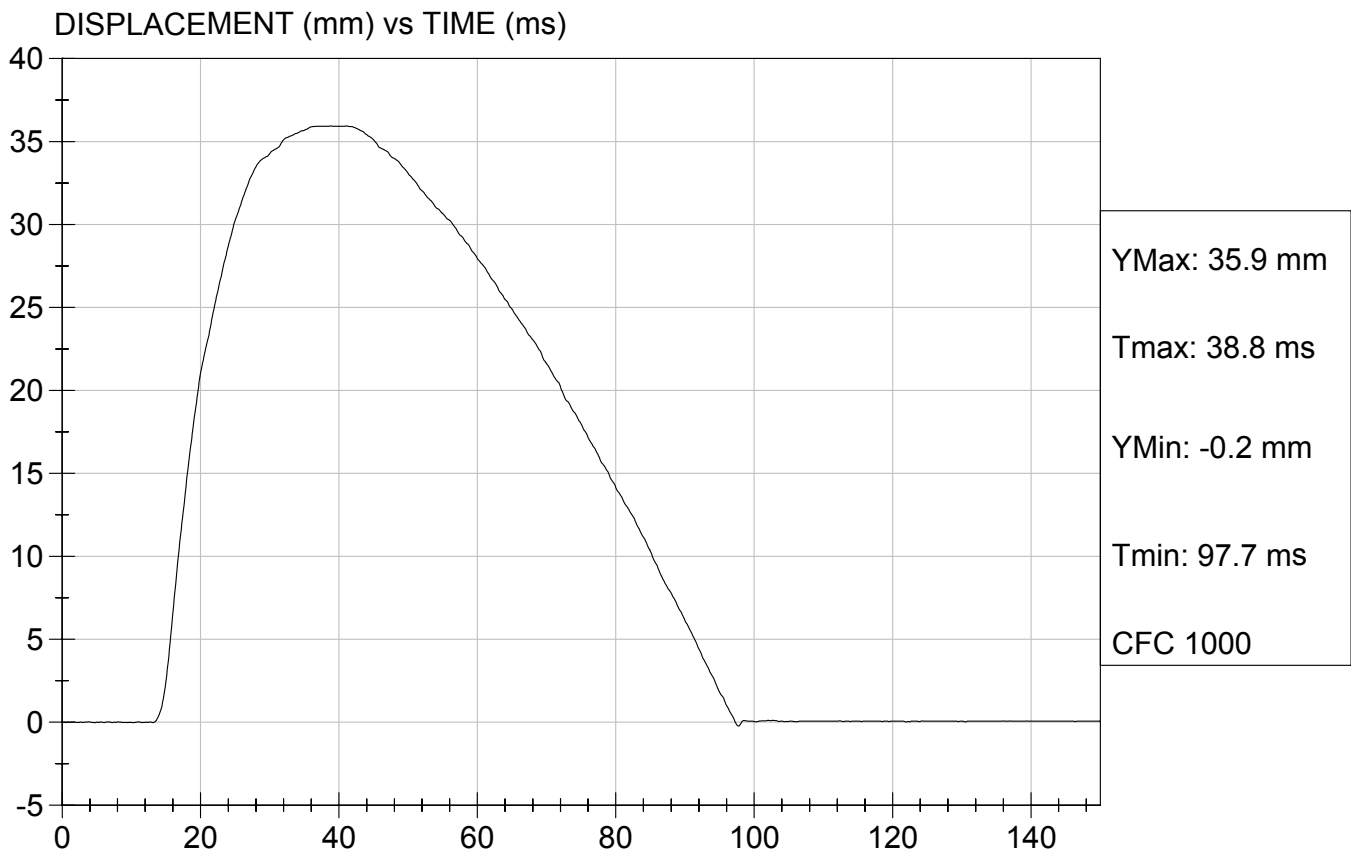
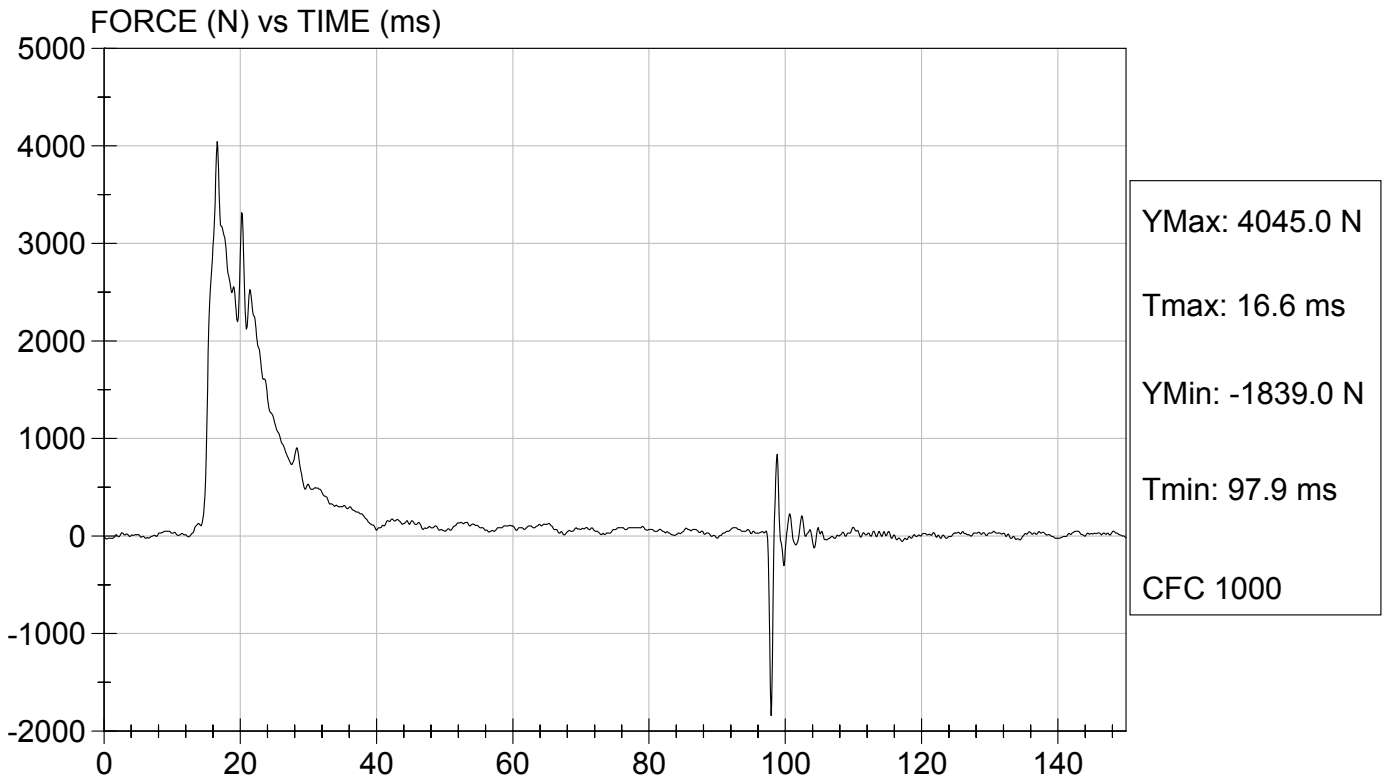
Test Date: 08/26/2004
Speed: 14.01 ft/sec, 4.27 m/sec





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: D042029

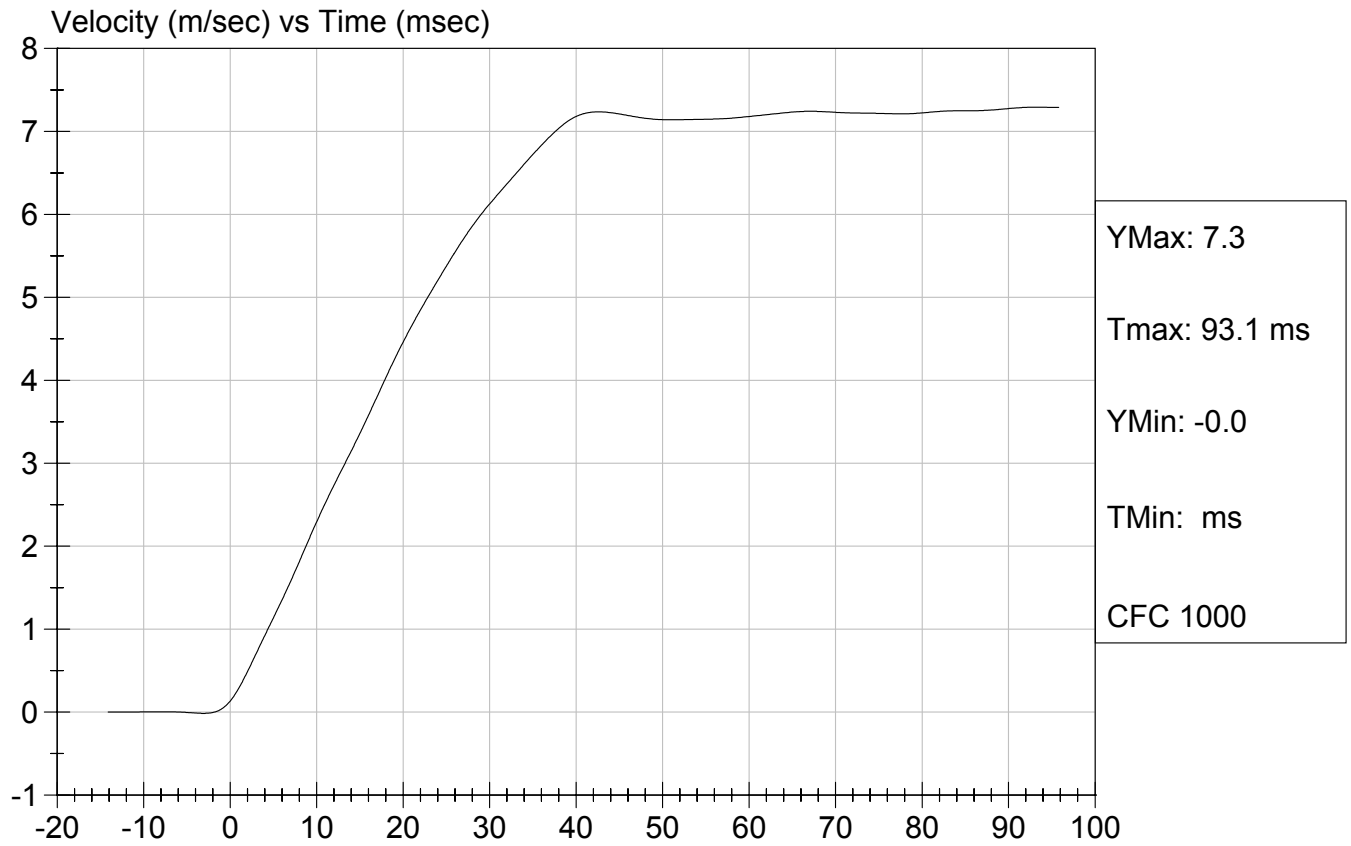
Tested Parameter	Units	Specification	Result	Pass/Fail	
Laboratory Temperature	deg C	20.6 to 22.2	21.2	Pass	
Laboratory Relative Humidity	%	10 to 70	53	Pass	
Impact Velocity	m/s	6.89 to 7.13	6.91	Pass	
Pendulum Deceleration	10 msec	m/s	1.96 to 2.55	2.29	Pass
	20 msec	m/s	4.12 to 5.10	4.46	Pass
	30 msec	m/s	5.73 to 7.01	6.13	Pass
	40 to 70 msec	m/s	6.27 to 7.64	7.24	Pass
Midsagittal Plane Max Rotation	deg	66 to 82	70	Pass	
Head Rotation Peak to Zero - Decay Time	msec	58 to 67	59	Pass	
Max. Mx at Occipital Condyles	Nm	73 to 88	82	Pass	
Mx Peak To Zero - Decay Time	msec	49 to 64	53	Pass	
Mx Peak to Max. Head Rotation	msec	2 to 16	9	Pass	


 Laboratory Technician

08/24/2004

Test Date

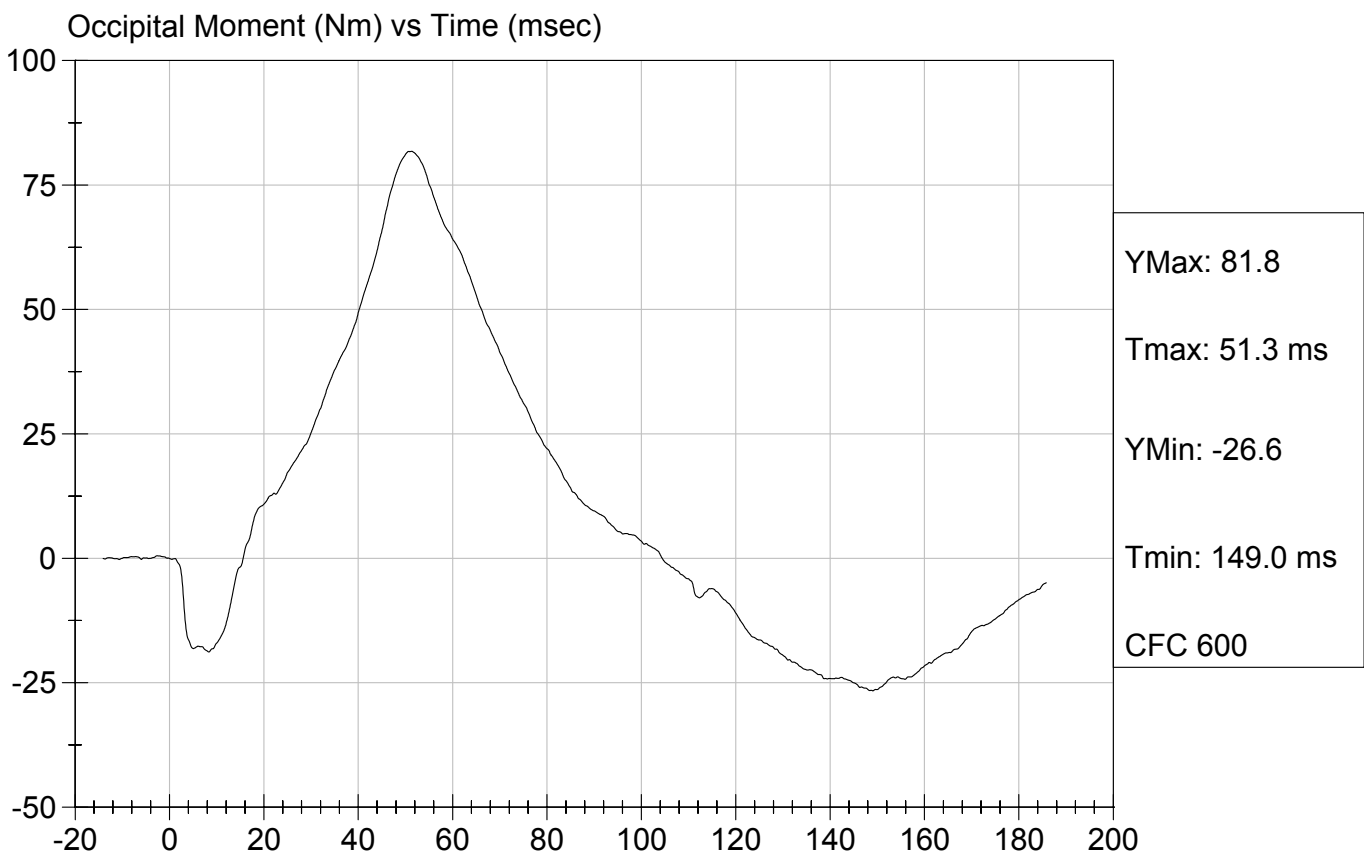
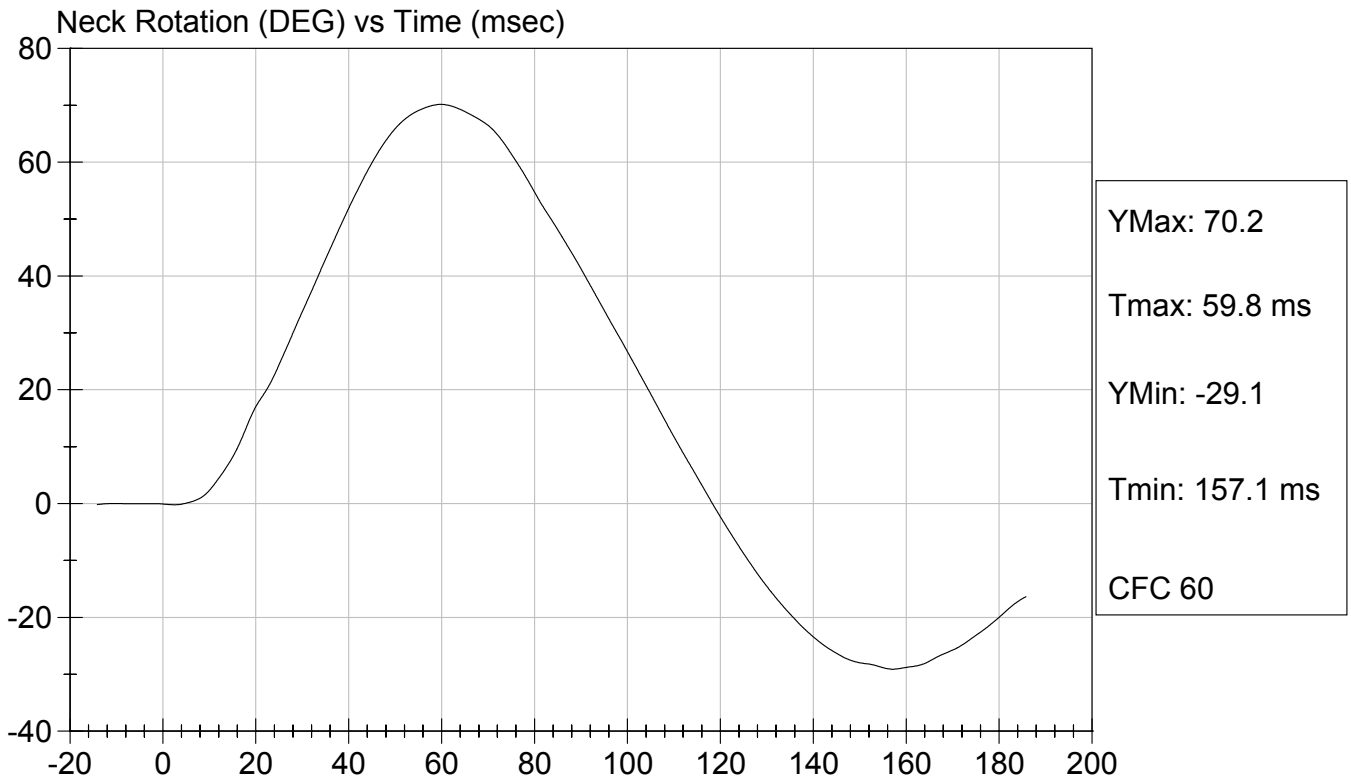

 Approved By





Test Desc: Neck Bending
Component ID: D042029

Test Date: 08/24/2004
Speed: 22.66 ft/sec, 6.91 m/sec



Calibration Test Results Summary

Dummy Serial Number: 904

Post-Test Calibration

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

SID Calibration Data Sheet
Side Impact Dummy
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

Jessica Gall
 Laboratory Technician

09/15/2004
 Test Date

David Winkelbauer
 Approved By

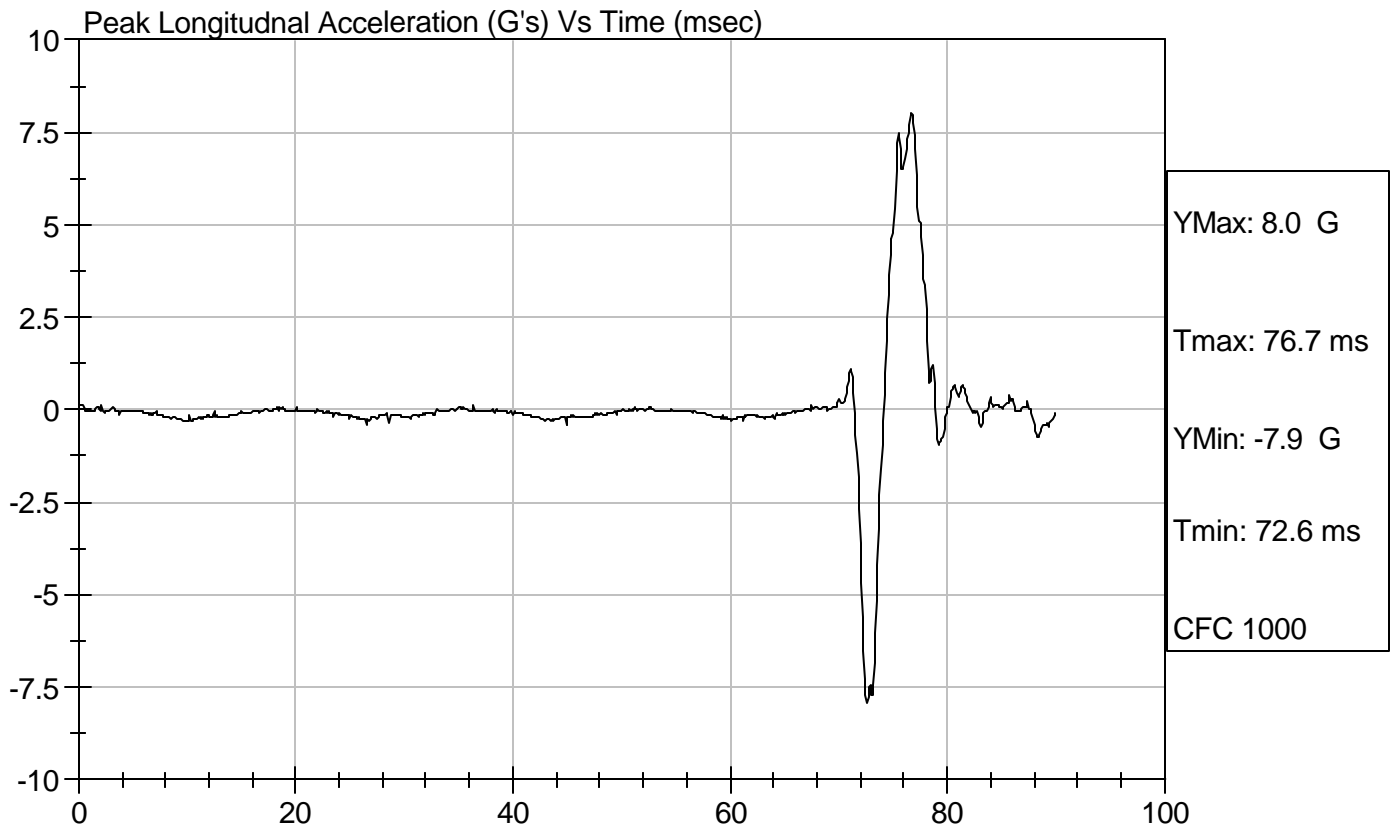
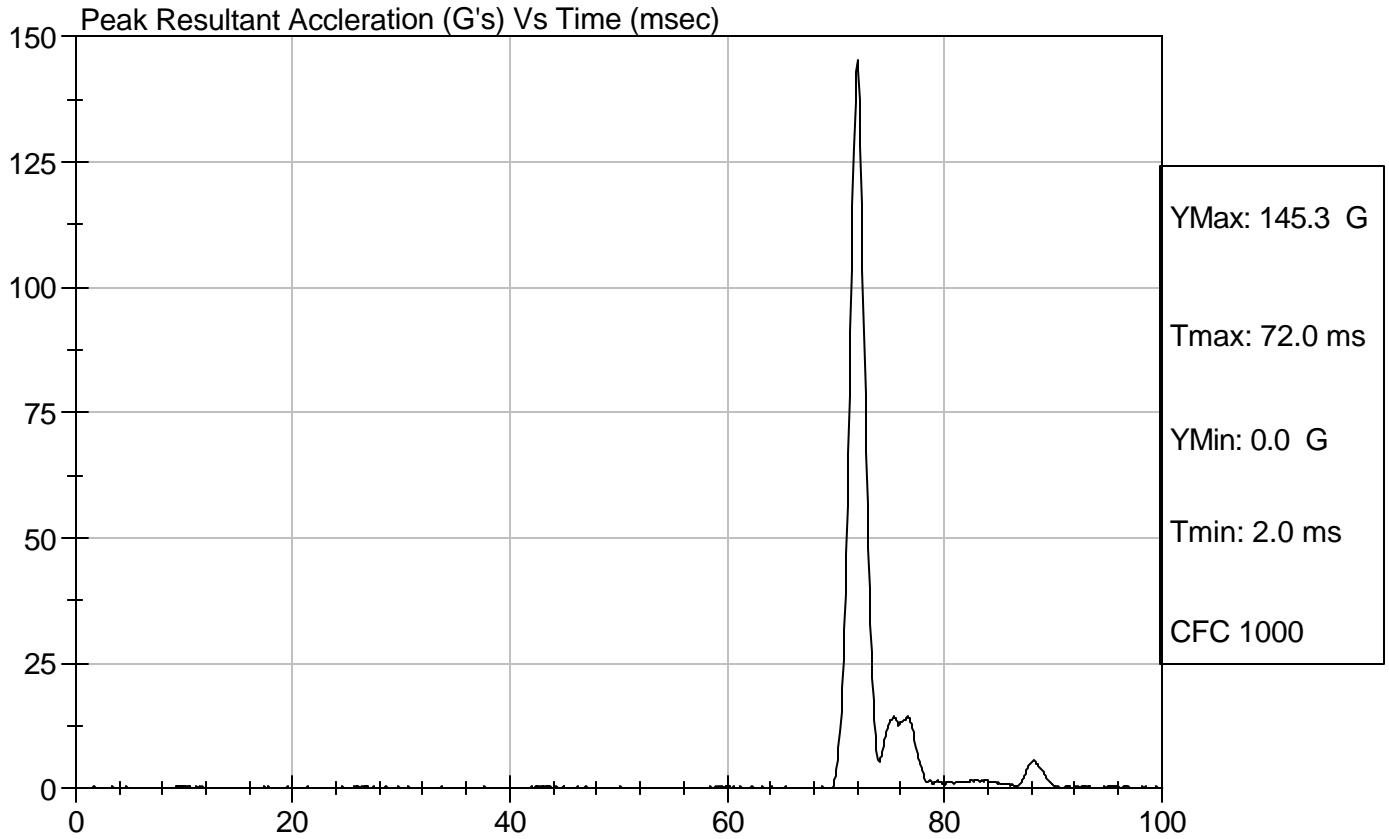


Test Description: Head Drop

Test Date: 09/15/2004

Component: D042241

Speed: 0 ft/s, 0.00 m/s



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

Jessica Gall
 Laboratory Technician

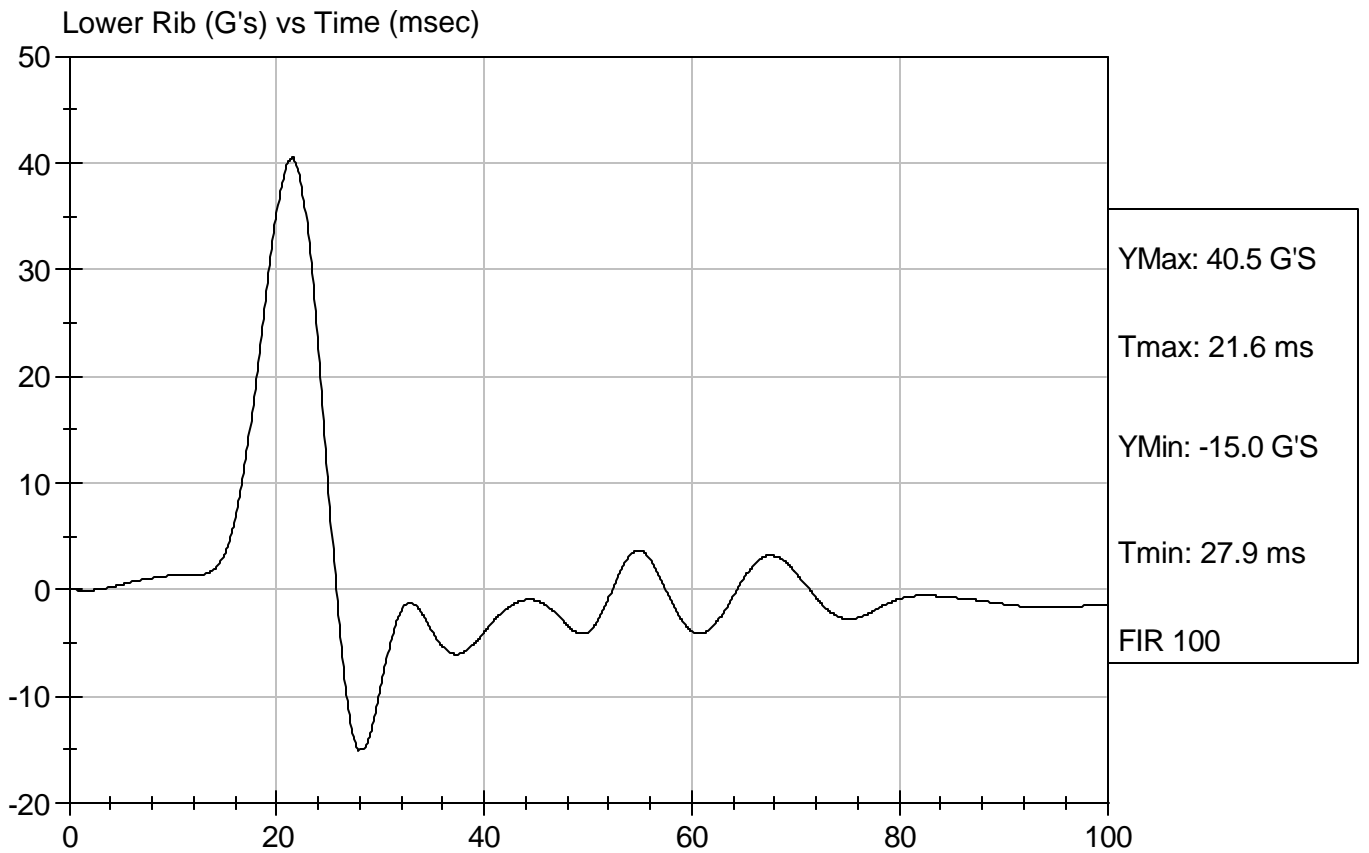
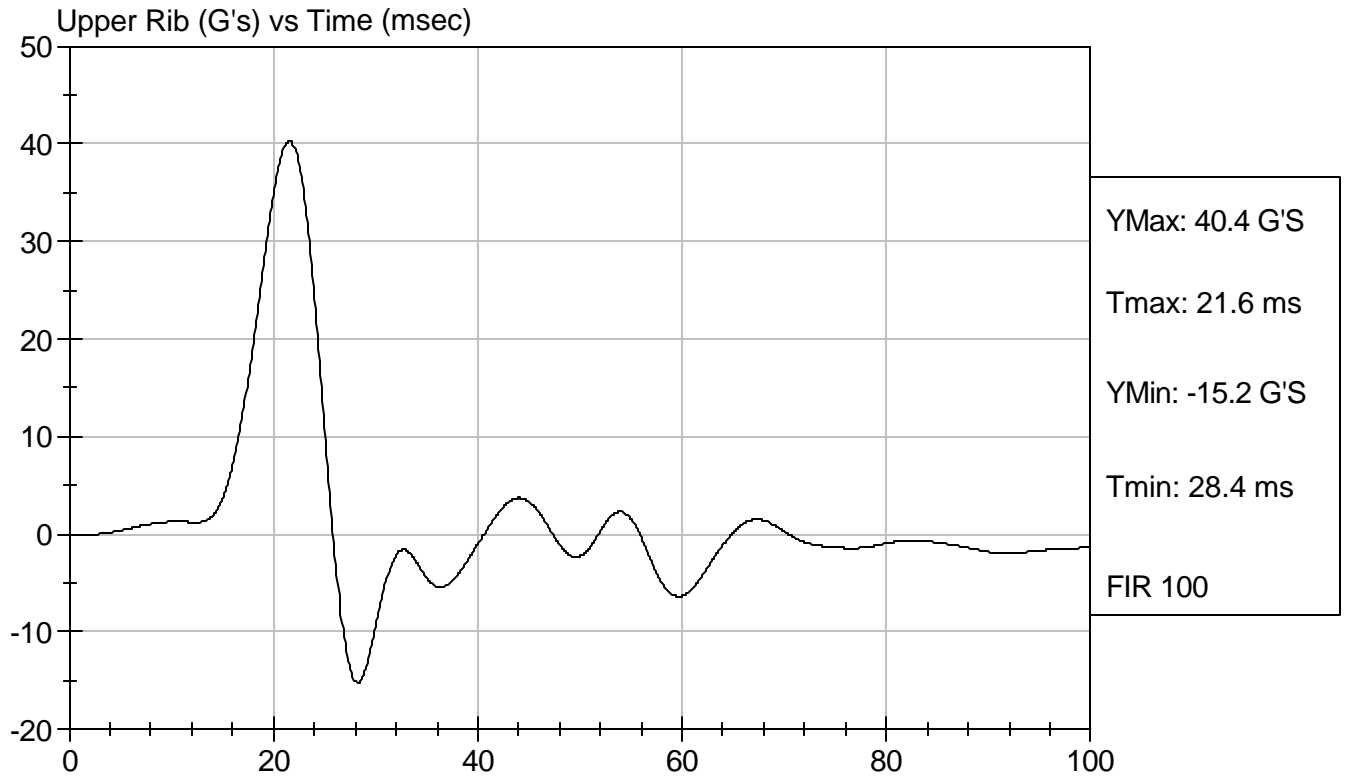
09/15/2004
 Test Date

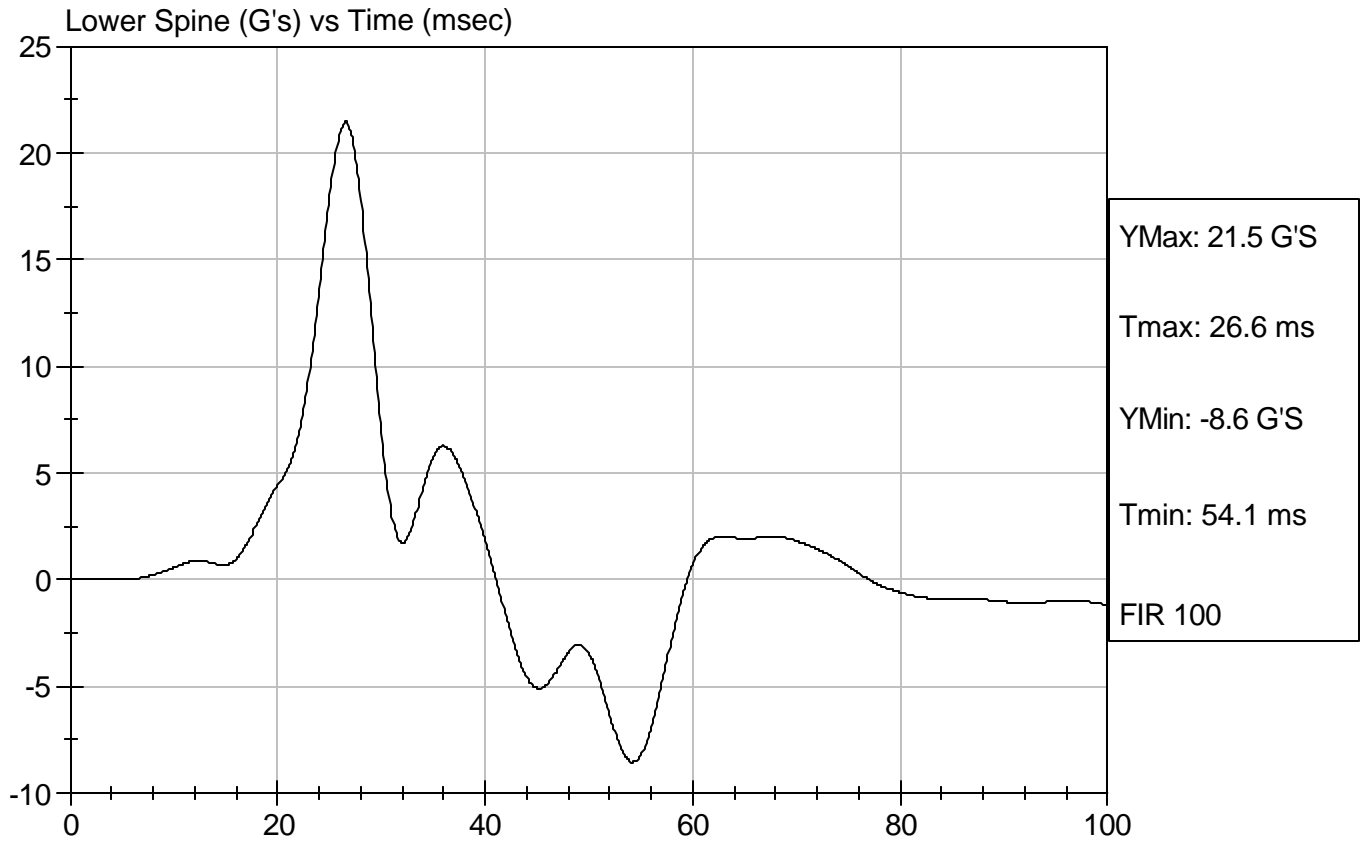
David Winkelbauer
 Approved By



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

Jessica Gall
Laboratory Technician

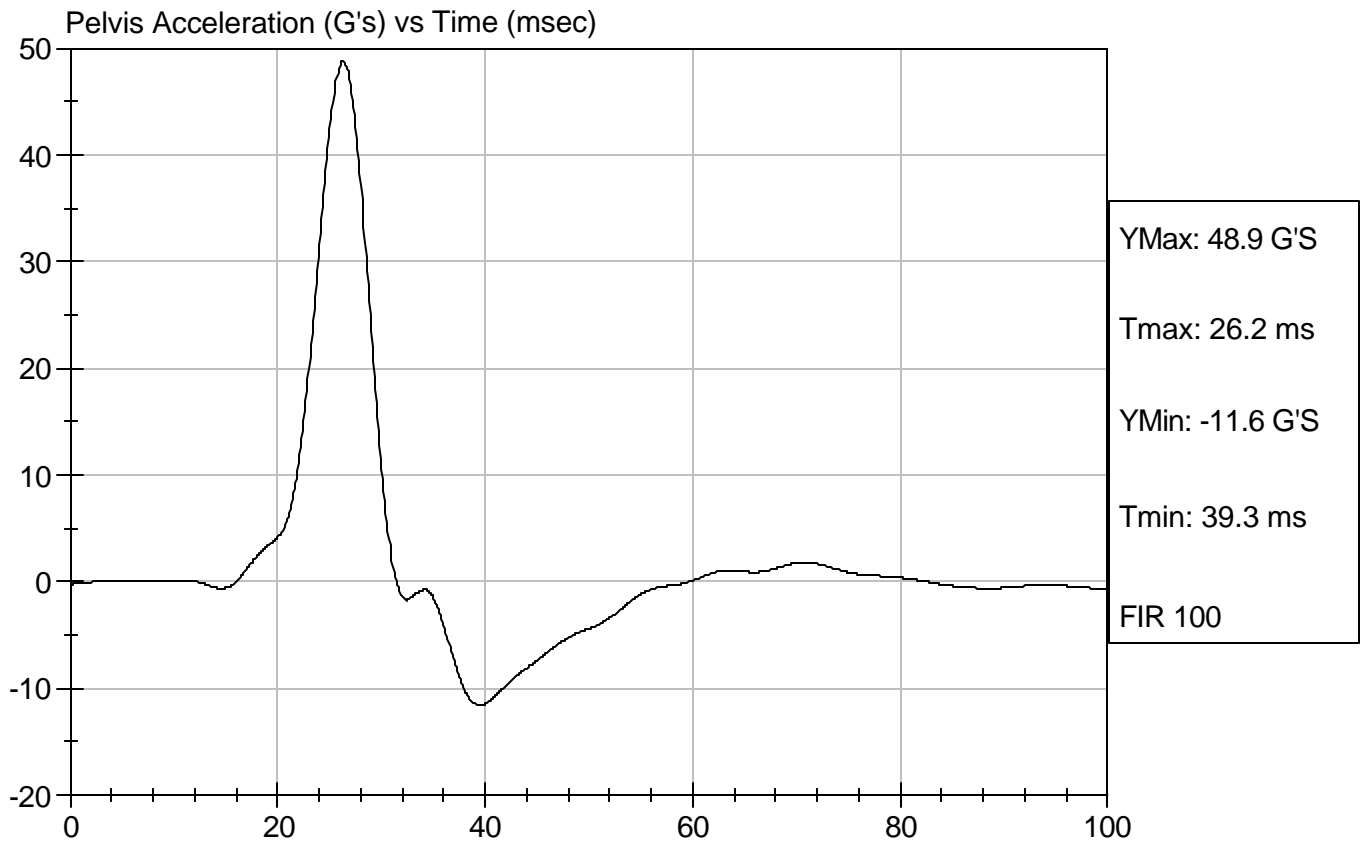
09/15/2004
Test Date

David Winkelbauer
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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

Jessica Gall
 Laboratory Technician

09/16/2004
 Test Date

David Winkelbauer
 Approved By

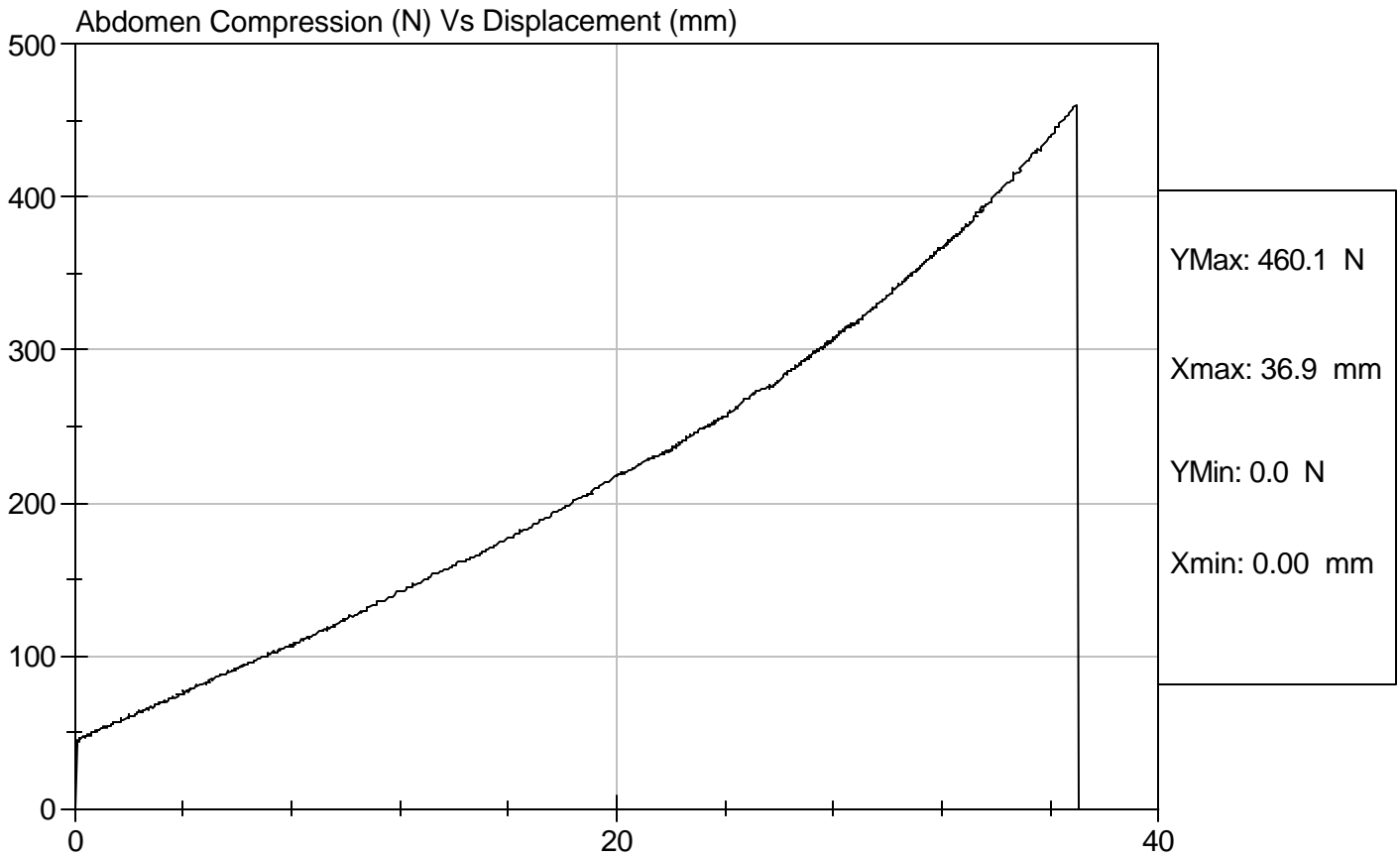


Test Description: Abdomen Compression

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

Jessica Gall
 Laboratory Technician

09/16/2004
 Test Date

David Winkelbauer
 Approved By

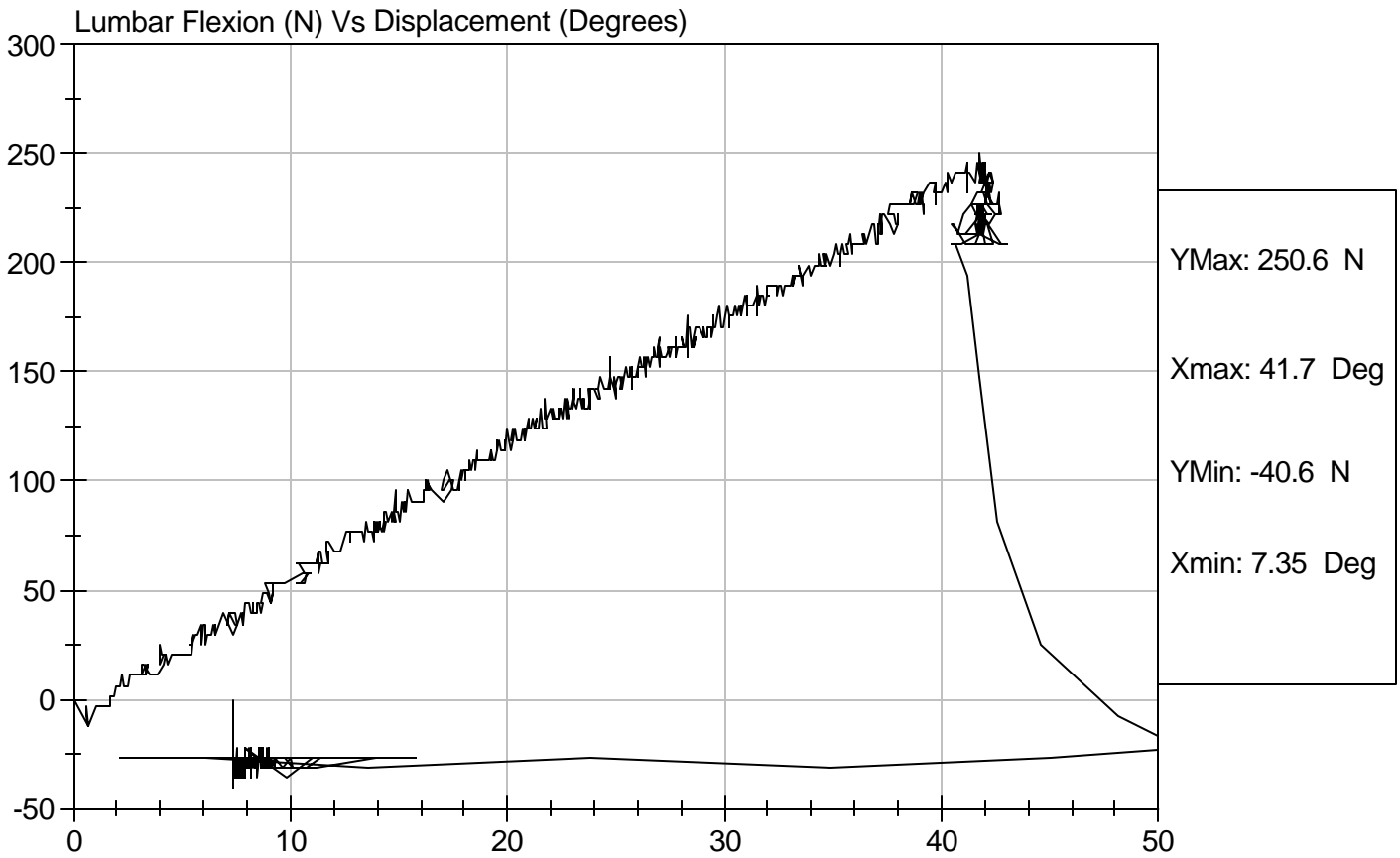


Test Description: Lumbar Flexion

Test Date: 09/16/2004

Component: D042245

Speed: 0 ft/sec, 0 m/sec



SID Calibration Data Sheet
Side Impact Dummy (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
Midsaggital 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

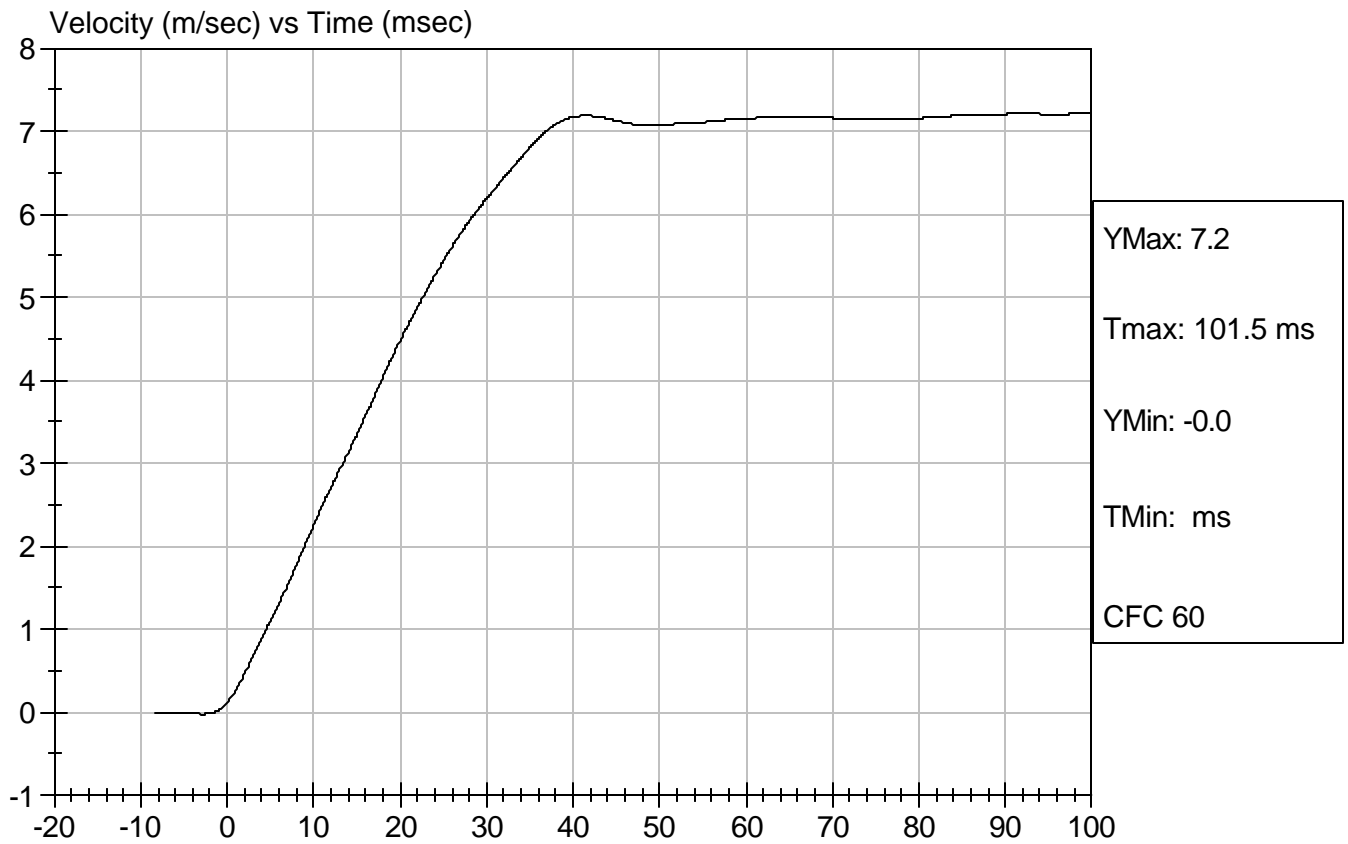
Test Date


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Test Desc: Neck Bending
Component ID: D042249

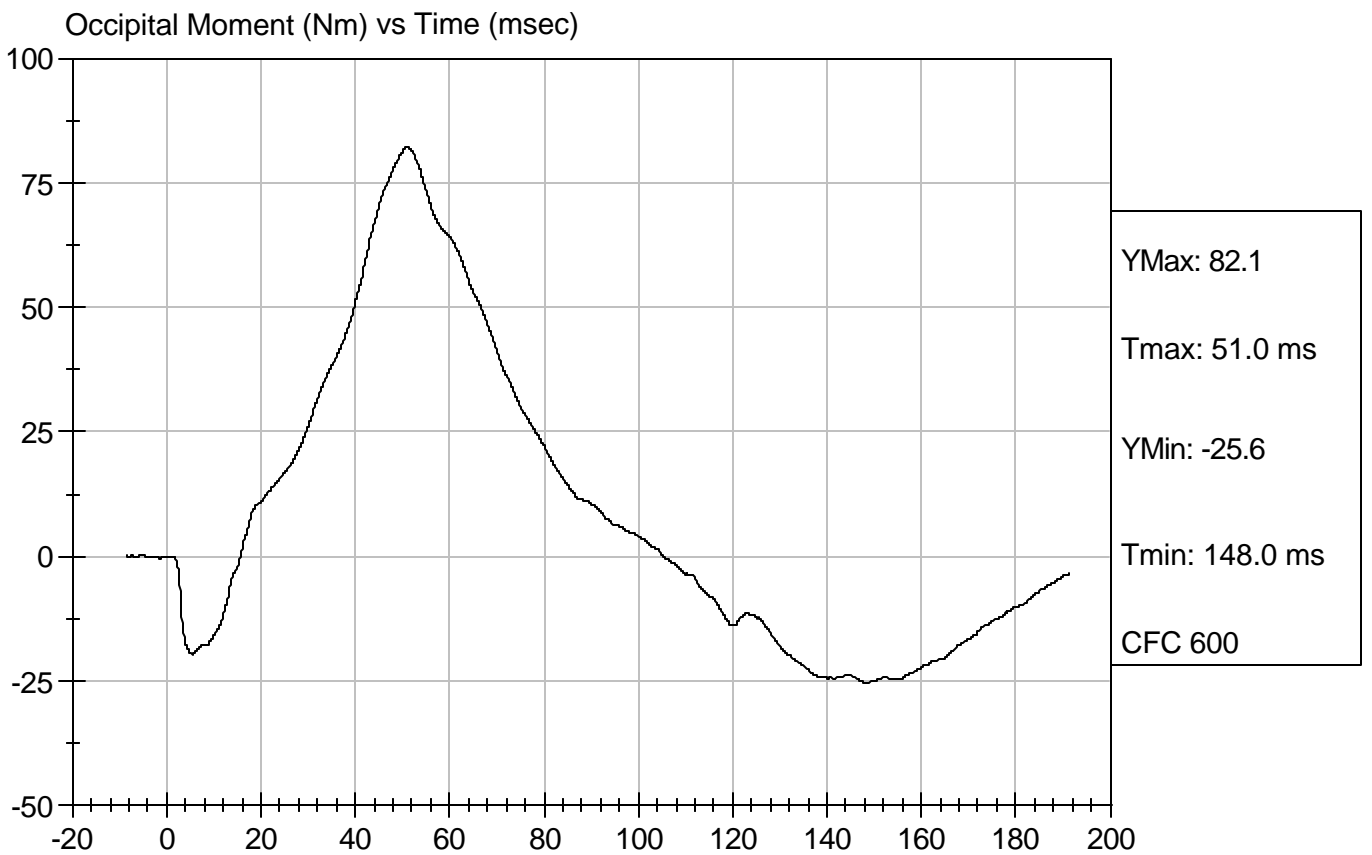
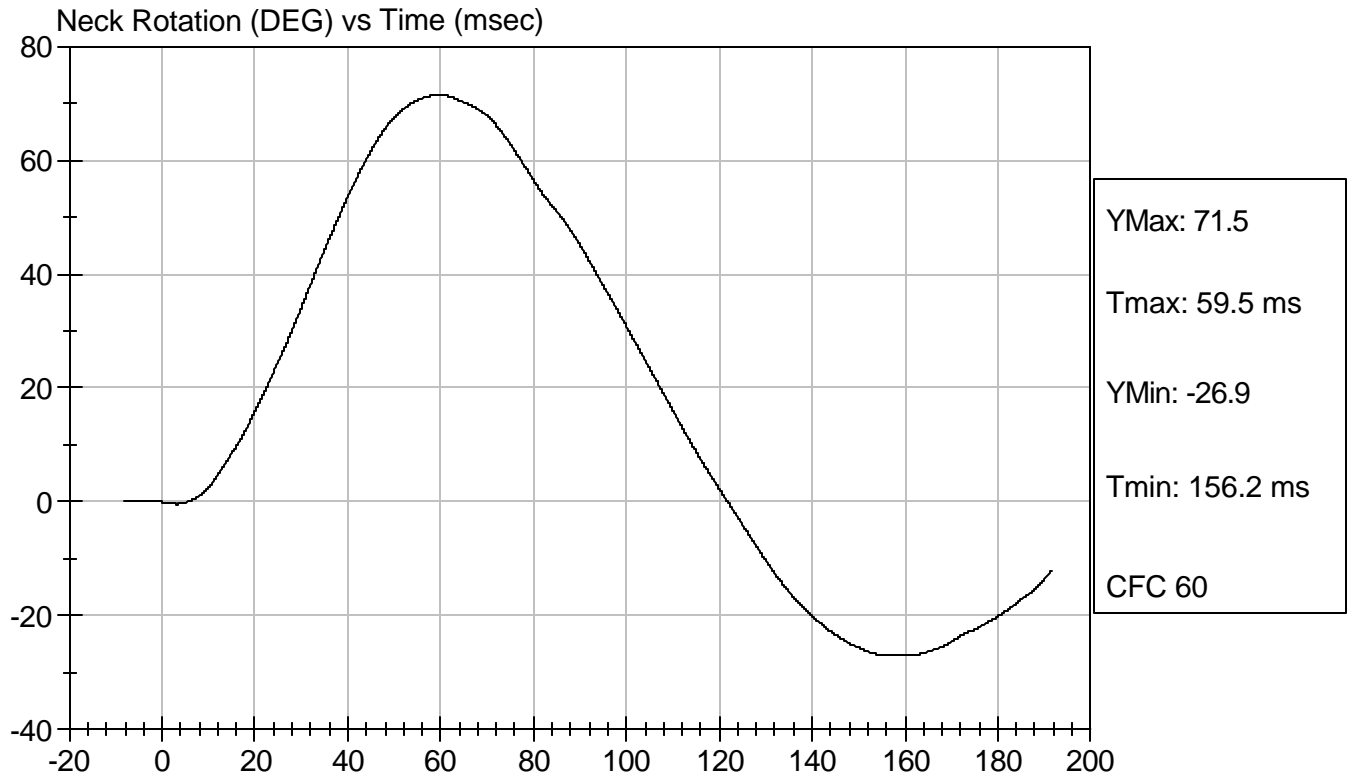
Test Date: 09/16/2004
Speed: 23.15 ft/sec, 7.06 m/sec





Test Desc: Neck Bending
Component ID: D042249

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



**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

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

09/16/2004
Test Date

APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

DUMMY AND VEHICLE CALIBRATION DATA

	INSTRUMENTS FOR DRIVER 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	253	Endevco	4/27/04
Head Redundant Y	F11-H07	Entran	9/10/04
Head Redundant Z	F11-H19	Entran	9/10/04
Neck Load Cell	F28-N04	Entran	9/10/04

	INSTRUMENTS FOR PASSENGER 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	P10149	Endevco	8/23/04
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	Denton	6/22/04

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Front Door Centerline Y	L17-D22	Entran	8/24/04
Midrear of Left Front Door Y	L13-R28	Entran	9/13/04
Left Front Door Upper Centerline Y	L18-N13	Entran	9/13/04
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	L17-D05	Entran	9/13/04
Left Lower A-Post Y	G13-F15	Entran	4/19/04
Left Mid B-Post Y	K18-J06	Entran	7/26/04
Left Lower B-Post Y	K07-R10	Entran	7/02/04
Floorpan @ Rear Axle X	K11-Z14	Entran	7/02/04
Floorpan @ Rear Axle Y	K18-D15	Entran	7/02/04
Floorpan @ Rear Axle Z	C12-M13	Entran	7/02/04
Driver Seat Track Y	A27-R06	Entran	9/13/04
Right Front Sill X	K20-J06	Entran	7/26/04
Right Front Sill Y	K18-D13	Entran	7/26/04
Right Front Sill Z	K07-R24	Entran	7/26/04
Right Rear Sill X	L18-N14	Entran	8/24/04
Right Rear Sill Y	L17-Z19	Entran	8/24/04
Right Rear Sill Z	E01-F03	Entran	8/24/04
Left Front Sill Y	G03-N06	Entran	4/19/04
Left Rear Sill Y	L17-D21	Entran	7/26/04
Right Rear Occupant Compartment Y	H21-J03	Entran	6/04/04
Vehicle CG X	C24-B02	Entran	4/23/04
Vehicle CG Y	A08-M05	Entran	4/16/04
Vehicle CG Z	C12-R14	Entran	4/23/04