

REPORT NUMBER: 214D-MGA-2002-002

**SAFETY COMPLIANCE TESTING FOR FMVSS 214
SIDE IMPACT PROTECTION
INDICANT**

**Mitsubishi Motors Corporation
2002 Mitsubishi Lancer 4 Door
NHTSA NUMBER: C25600**

**PREPARED BY:
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January 16, 2002

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF VEHICLE SAFETY COMPLIANCE
400 SEVENTH STREET, SW, ROOM 6111 (NSA-30)
WASHINGTON, D.C. 20590**

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, in response to Contract Number DTNH22-97-C-11033.

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COTR, Side Impact

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16. Abstract A 55/28 km/h 90° Moving Deformable Barrier INDICANT Compliance Test was conducted on the 2002 Mitsubishi Lancer 4 Door in accordance with the specifications of the Office of Vehicle Safety Compliance Laboratory Test Procedure No. TP-214D-06 Side Impact Protection (except the test was conducted 8 km/h (5 mph) faster than the standard specifies) for determination of FMVSS No. 214 Side Impact Protection. The test was conducted at MGA Research Corporation, in Burlington, Wisconsin on January 16, 2002. The impact velocity of the Moving Deformable Barrier (MDB) was 61.8 km/h, and the ambient temperature at the struck side (driver's) of the vehicle was 20°C. The target vehicle's maximum post test static crush was 349 mm at level 2. The test vehicle's occupant performance is as follows: <table style="margin-left: auto; margin-right: auto; border: none;"> <thead> <tr> <th style="text-align: left;"></th> <th style="text-align: center;"><u>DRIVER</u></th> <th style="text-align: center;"><u>PASS.</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Left Upper Rib (LUR) Accel., g</td> <td style="text-align: center;">72</td> <td style="text-align: center;">66</td> </tr> <tr> <td style="text-align: left;">Left Lower Rib (LLR) Accel., g</td> <td style="text-align: center;">91</td> <td style="text-align: center;">61</td> </tr> <tr> <td style="text-align: left;">Lower Spine (T₁₂) Accel., g</td> <td style="text-align: center;">95</td> <td style="text-align: center;">72</td> </tr> <tr> <td style="text-align: left;">Thoracic Trauma Index (TTI)</td> <td style="text-align: center;">93</td> <td style="text-align: center;">69</td> </tr> <tr> <td style="text-align: left;">Pelvis (PEV) Accel., g</td> <td style="text-align: center;">85</td> <td style="text-align: center;">70</td> </tr> <tr> <td style="text-align: left;">HIC</td> <td style="text-align: center;">521</td> <td style="text-align: center;">942</td> </tr> </tbody> </table> The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.					<u>DRIVER</u>	<u>PASS.</u>	Left Upper Rib (LUR) Accel., g	72	66	Left Lower Rib (LLR) Accel., g	91	61	Lower Spine (T ₁₂) Accel., g	95	72	Thoracic Trauma Index (TTI)	93	69	Pelvis (PEV) Accel., g	85	70	HIC	521	942
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17. Key Words Compliance Testing FMVSS 214D Side Impact Protection Side Impact Dummy (SID) New Car Assessment Program (NCAP)		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Adm. Technical Ref. Division, Room 5108 (NAD-52) 400 Seventh Street, S.W. Washington, D.C. 20590																						
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SECTION 1

PURPOSE AND TEST PROCEDURE

1.1 PURPOSE

This side impact test is conducted as part of the FY 2002 test program sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-97-C-11033. The purpose of this test was to evaluate side impact protection in a 2002 Mitsubishi Lancer 4 Door manufactured by Mitsubishi Motors Corporation.

1.2 TEST PROCEDURE

The side impact test was conducted in accordance with the current National Highway Traffic Safety Administration (NHTSA), Office of Vehicle Safety Compliance (OVSC), Laboratory Test Procedure TP-214D-06, dated July 26, 2001 and the corresponding MGA Research Corporation Test Procedure MGA-NHTSA2 with the exception of the test speed, which was at the NCAP High Speed Lateral Impact level (61.2 km/h, approximately 8 km/h faster than compliance speed). 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 SIDE IMPACT TEST

2.1 SUMMARY OF SIDE IMPACT TEST

A model year 2002 Mitsubishi Lancer 4 Door was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.8 km/h. The specified impact velocity range is from 61.2 to 62.8 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 1392.5 kg and the test weight of the MDB was 1362.0 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on January 16, 2002.

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 (SIDs) can be found in Appendix A. Two 50th percentile adult male SID's were placed in the driver and left rear passenger designated seating positions according to instructions specified in the OVSC Laboratory Test Procedure dated July 26, 2001. Each SID was instrumented with fourteen (14) accelerometers 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).

The test vehicle was instrumented with twenty (20) structural accelerometers and the MDB was instrumented with five (5) accelerometers and two (2) contact switches on the bumper to compare left side to right side bumper impact timing. All data channels were recorded with a fully self contained on-board EME Data Acquisition System. The data was digitally sampled at 10,000 samples per second and processed per Appendix V of the Test Procedure.

2.2 GENERAL COMMENTS

The test vehicle sustained a maximum static crush of 349 mm at level 2, 1200 mm rearward of the left vertical impact point. The driver and passenger SID's, Serial Nos. 48 and 49 respectively, were calibrated just prior to this test. The SID's injury criteria is summarized as follows:

Measurements	Units	Driver	Passenger
Thoracic Trauma Index (TTI)	G's	93	69
Peak Pelvic G's (PEV)	G's	85	70
Head Injury Criteria (HIC)	none	521	942

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's, vehicle, and MDB response data traces. Appendix C contains the SID's configuration and performance verification data. Appendix D contains the test equipment information.

TEST NOTES

The following accelerometers were not used for this test:

Left Front Door on Centerline
Mid Rear of Left Front Door
Left Front Door Upper Centerline
Mid Rear of Left Rear door
Left Rear Door Upper Centerline
Rear Seat Track

SECTION 3

SIDE IMPACT DUMMY (SID) AND VEHICLE TEST DATA

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
Test Program: 214 Indicant Side Impact

NHTSA No. C25600
Test Date: 1/16/02

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: 2002 Mitsubishi Lancer 4 Door
 Test Program: 214 Indicant Side Impact

NHTSA No. C25600
 Test Date: 1/16/02

TEST VEHICLE INFORMATION

Make	Mitsubishi
Model	Lancer
Body Style	4 door
NHTSA No.	C25600
VIN	JA3AJ26E42U016163
Color	Coronado Sand
Delivery Date	January 8, 2002
Odometer Reading (mile)	471
Dealer	Porcaro Mitsubishi
Transmission	Manual
Final Drive	Front
Number of Cylinders	4
Engine Displacement (L)	2.0
Engine Placement	lateral

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	No
Cruise Control	No

DATA FROM CERTIFICATION LABEL

Manufactured By	Mitsubishi Motors Corporation
Date of Manufacture	8/01

GVWR (kg)	1650
GAWR Front (kg)	920
GAWR Rear (kg)	780

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	200	180
Cold Pressure (kPa)	200	180
Recommended Tire Size	P185/65R14	P185/65R14
Tire Size on Vehicle	P185/65R14	P185/65R14
Tire Manufacturer	Dunlop	Dunlop

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Contoured		
Number Of Occupants x 68.04	2	3		340.2
Capacity Wt. (VCW) (kg)				375.0
Cargo Wt. (RCLW) (kg)				34.8

DATA SHEET NO. 1...(continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2002 Mitsubishi Lancer 4 Door NHTSA No. C25600
 Test Program: 214 Indicant Side Impact Test Date: 1/16/02

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	377.8	232.2		424.1	310.7	
Right	kg	364.2	227.7		377.4	280.3	
Ratio	%	61.7	38.3		57.6	42.4	
Totals	kg	742.0	459.9	1201.9	801.5	591.0	1392.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1201.9
Weight of 2 P572E ATDs	kg	161.5
Rated Cargo/Luggage Weight (RCLW)	kg	34.8
Calculated Vehicle Target Weight (TVTW)	kg	1398.4

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

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG(aft of front axle)
As Delivered	mm	644	653	635	632	991
As Tested	mm	628	644	600	611	1101
Fully Loaded	mm	625	650	594	607	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2596
Total Vehicle Length at Left Side	mm	3604
Total Vehicle Length at Centerline	mm	4473
Total Vehicle Length at Right Side	mm	3607
Total Vehicle Width	mm	1697
Weight of Ballast in Cargo Area	kg	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 at Front Axle	Mm	383

DATA SHEET NO. 1...(continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
Test Program: 214 Indicant Side Impact

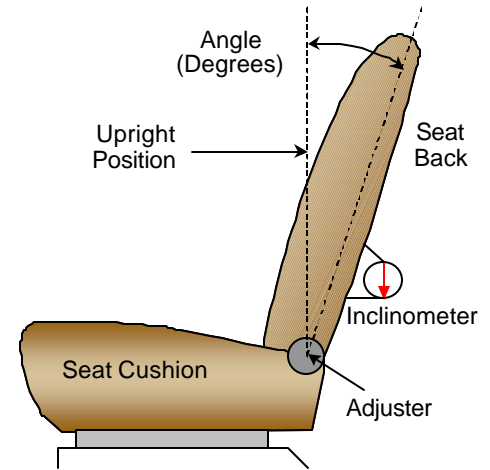
NHTSA No. C25600
Test Date: 1/16/02

NORMAL DESIGN RIDING POSITION

The driver seat is positioned to the manufacturer's designated angle. 17 degrees (reference)
3 step positions from upright position. The first step is numbered "0".

Driver seat back angle: 3rd step , 1st as 0

Passenger seat back angle: non-adjustable



FRONT SEAT ASSEMBLY

SEAT FORE/AFT POSITIONS

The driver's seat is manually operated and the rear passenger seat has no adjustments. The fore/aft is set to the middle position for the driver's seat. The first detent is numbered "1".

Driver seat fore/aft total travel: 26 detents

Passenger seat fore/aft total travel: non-adjustable

Driver seat fore/aft position: 14th detent, 1st as 1

Passenger seat fore/aft position: non-adjustable

SEAT BELT UPPER ANCHORAGE

The test vehicle is equipped with adjustable "D" ring anchorage for the driver's seat position. There are 5 positions or detents, with the uppermost position numbered "1". The driver's "D" ring anchorage is placed in position 3 or middle position.

DATA SHEET NO. 1...(continued)

TEST VEHICLE INFORMATION

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
Test Program: 214 Indicant Side Impact

NHTSA No. C25600
Test Date: 1/16/02

FUEL TANK CAPACITY DATA

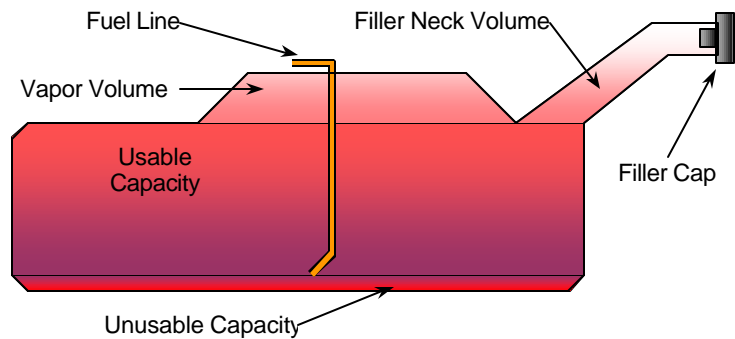
The "Usable Capacity" of the standard equipment fuel tank is: 50.0 liters

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

92-94% of "Usable Capacity" for certification to FMVSS 301 requirements: 46.0 to 47.0 liters

Actual amount of Stoddard solvent added to vehicle for certification test: 46.0 liters

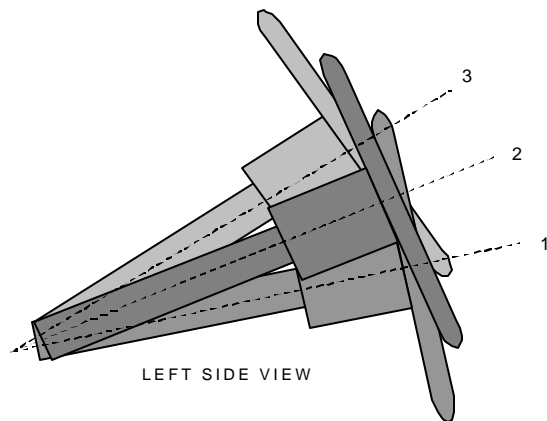
The test vehicle is equipped with an electric fuel pump. The fuel filler door is located on the left rear fender.



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 motion. A aluminum plate is placed across the rim of the steering wheel, and inclinometer is placed onto the plate and the angle is measured.



STEERING COLUMN ASSEMBLY

Lowermost, position 1: 18.1°

Geometric center, position 2: 21.2°

Uppermost, position 3: 24.6°

DATA SHEET NO. 2

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
 Test Program: 214 Indicant Side Impact

NHTSA No. C25600
 Test Date: 1/16/02

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	377.8	232.2		424.1	310.7	
Right	kg	364.2	227.7		377.4	280.3	
Weight Ratio	%	61.7	38.3		57.6	42.4	
Totals	kg	742	459.9	1201.9	801.5	591	1392.5

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
Level 1	Sill Top Height	mm	148	269
Level 2	Occupant H-Point	mm	349	507
Level 3	Mid Door	mm	319	579
Level 4	Window Sill	mm	238	870
Level 5	Window Top	mm	107	1334
Level 2	Maximum Penetration	mm	349	507

INSTRUMENTATION

Driver SID Accelerometers	11
Passenger SID Accelerometers	11
Vehicle Structure Accelerometers	20
MDB Accelerometers	5
Total	47

DATA SHEET NO. 3

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
 Test Program: 214 Indicant Side Impact

NHTSA No. C25600
 Test Date: 1/16/02

MDB SPECIFICATIONS

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

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	395.1	293.8	
Right	kg	385.7	287.4	
Ratio	%	57.3	42.7	
Totals	kg	780.8	581.2	1362.0

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.2 to 62.8	61.8
Trap No. 2 Velocity (Redundant)	km/h	61.2 to 62.8	61.6
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.7

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

Vertical Location			From Centerline		Max. Crush
Level	Description	Height	Distance	Direction	
1	Center of Bumper (mm)	432	800	Right	164
2	Top of Bumper (mm)	533	800	Right	98
3	Mid Level (mm)	686	800	Left	92
4	Top of Stack (mm)	813	800	Left	139

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	2
High Speed Cameras	2

DATA SHEET NO. 4

POST TEST OBSERVATIONS

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
 Test Program: 214 Indicant Side Impact

NHTSA No. C25600
 Test Date: 1/16/02

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat SID	Rear Seat SID
Dummy Type / Serial No.	SID / 48	SID / 49
Head Contact	header, headrest, shoulder	rear window, c-pillar
Upper Torso Contact	door rear above armrest	rear of door above armrest
Lower Torso Contact	armrest	armrest
Left Knee Contact	lower door	lower door
Right Knee Contact	left knee	left knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Door Opening	remained closed	remained closed
Right Side Door Opening	remained closed	remained closed
Seat Movement	none	none
Seat Back Failure	none	none

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	none
Sill Separation	none
Windshield Damage	cracked, left side
Window Damage	left and right side glass
Other Notable Effects	gas fill door opened

AIRBAG DEPLOYMENT

	Driver	Front Passenger	Rear Passenger
Front	no	no	none
Side	none	none	none

MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	25 rearward
Vertical Offset	mm	+/-20	4 up

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 5

SID INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
 Test Program: 214 Indicant Side Impact

NHTSA No. C25600
 Test Date: 1/16/02

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	72.0	36	23.5	71	65.5	52	16.3	58
Upper Rib (LUR)(R)	Y	G's	72.3	36	22.4	71	61.5	52	17.9	58
Lower Rib (LLR)	Y	G's	90.7	26	21.9	70	61.3	36	30.4	59
Lower Rib (LLR) (R)	Y	G's	89.4	26	21.3	69	63.9	36	31.1	59
Lower Spine (T ₁₂)	Y	G's	94.8	33	31.3	63	72.3	48	24.5	63
Lower Spine (T ₁₂) (R)	Y	G's	92.8	33	31.9	63	70.4	48	25.4	63
Pelvis (PEV)	Y	G's	84.5	31	16.4	52	70.1	36	6.4	81
Pelvis (PEV) (R)	Y	G's	87.3	31	16.4	61	70.2	37	6.7	81

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

Location	Driver				Passenger			
	LLR	T ₁₂	TTI(g)	PEV(g)	LUR	T ₁₂	TTI(g)	PEV(g)
Rib, Spine, and Pelvis	90.7	94.8	93	84.5	65.5	72.3	69	70.1
Rib, Spine, and Pelvis (R)	89.4	92.8	91	87.3	61.5	70.4	66	70.2

HEAD CG PEAK ACCELERATIONS (SAE CLASS 1000 Filtered)

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	9.8	172	37.0	80	14.9	171	19.4	49
Head CG	Y	G's	54.2	48	10.6	159	121.4	48	17.8	66
Head CG	Z	G's	51.2	58	1.7	23	32.3	46	54.0	56
Head CG Resultant		G's	56.5	48			124.5	48		

HEAD INJURY CRITERIA (SAE CLASS 1000 Filtered)

Location	Driver				Passenger			
	HIC	T ¹	T ²	Avg G's	HIC	T ¹	T ²	Avg
Head CG	521	45.9	81.9	46.2	942	44.7	57.1	88.9

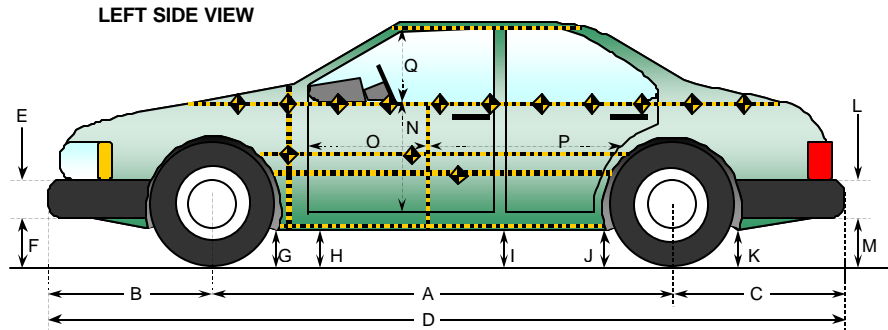
Positive Acceleration Polarities: Longitudinal (X) = Forward
 (Conforms to SAE J211) Lateral (Y) = Right
 Vertical (Z) = Down

DATA SHEET NO. 6

VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
 Test Program: 214 Indicant Side Impact

NHTSA No. C25600
 Test Date: 1/16/02



All Measurements in mm

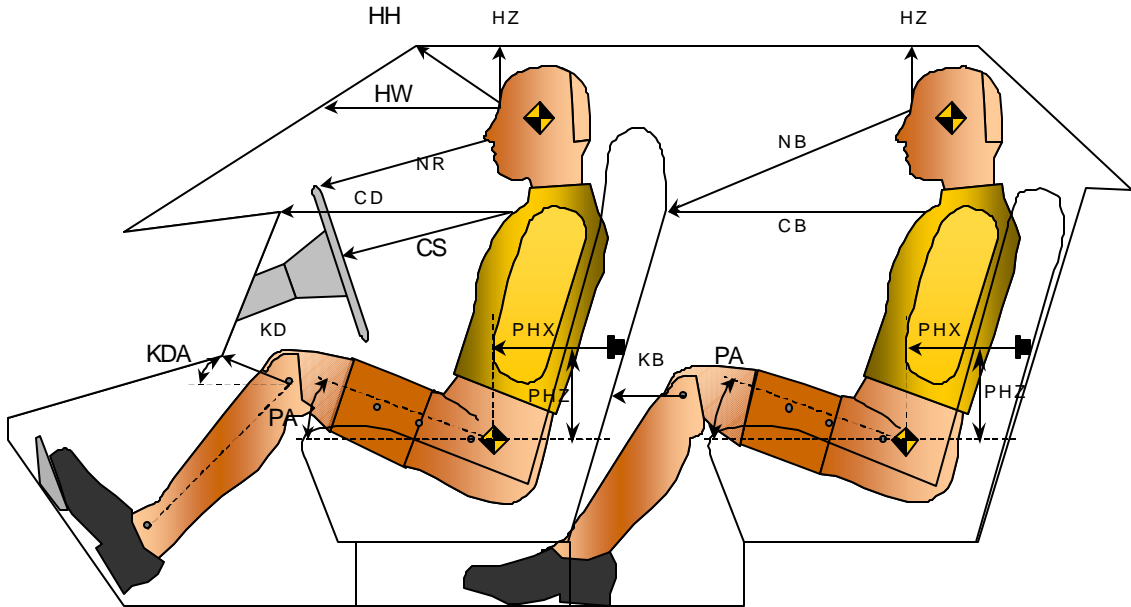
Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2596	2589	-7
B	Front Axle to FSOV	871	865	-6
C	Rear Axle to RSOV	1006	1042	36
D	Total Length at Centerline	4473	4496	23
E	Front Bumper Thickness	81	81	0
F	Front Bumper Bottom to Ground	432	434	2
G	Sill Height at Front Wheel Well	189	190	1
H	Sill Height at Front Door Leading Edge	188	186	-2
I	Sill Height at "B" Pillar	180	160	-20
J1	Sill Height at Rear Wheel Well	176	170	-6
J2	Pinch Weld Height at Rear Wheel Well	175	165	10
K	Sill Height Aft of Rear Wheel Well	230	241	11
L	Rear Bumper Thickness	272	272	0
M	Rear Bumper Bottom to Ground	292	325	33
N	Sill Height to Window Bottom Sill	637	540	-97
O	Front Door Leading Edge to Impact CL	744	647	-97
P	Rear Door Trailing Edge to Impact CL	1187	1141	-46
Q	Front Window Opening	456	441	-15
R	Right Side Length	3607	3610	3
S	Left Side Length	3604	3570	-34
T	Vehicle Width at "B" Post	1697	1374	-323

DATA SHEET NO. 7

SID LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
 Test Program: 214 Indicant Side Impact

NHTSA No. C25600
 Test Date: 1/16/02



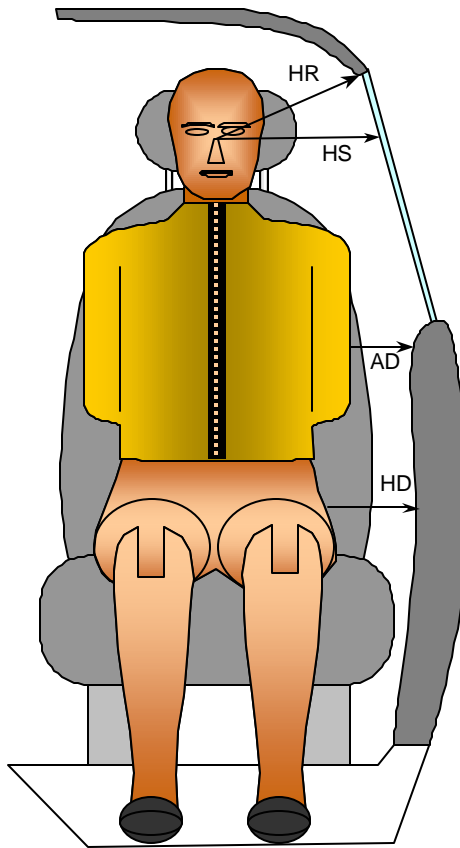
Driver Code	Pass. Code	Measurement Description	Driver 48		Passenger 49	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	348			
HW		Head to Windshield	539			
HZ	HZ	Head to Roof	134		135	
NR	NB	Nose to Rim/Nose to Seatback	397		618	
CD	CB	Chest to Dash or Seatback	504		551	
CS		Chest to Steering Wheel	304			
KDL	KBL	Left Knee to Dash or Seatback	178	0	234	0
KDR	KBR	Right Knee to Dash or Seatback	144	0	235	0
PA	PA	Pelvic Angle		23.3		24.5
PHX	PHX	H-Point to Striker (X-Axis)	182		193	
PHZ	PHZ	H-Point to Striker (Z-Axis)	109		257	

DATA SHEET NO. 8

SID LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
 Test Program: 214 Indicant Side Impact

NHTSA No. C25600
 Test Date: 1/16/02



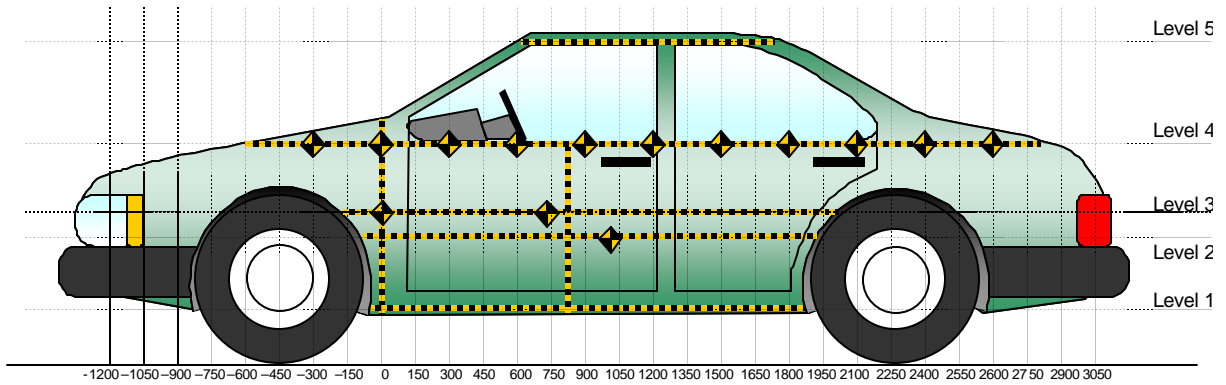
FRONT VIEW OF DUMMY

Code	Measurement Description	Units	Driver 48	Passenger 49
HR	Head to Side Header	mm	192	169
HS	Head to Side Window	mm	281	287
AD	Arm to Door	mm	98	86
HD	H-Point to Door	mm	141	181

DATA SHEET NO. 9
VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
 Test Program: 214 Indicant Side Impact

NHTSA No. C25600
 Test Date: 1/16/02



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	1334
4	Window Sill	870
3	Mid Door	579
2	Occupant H-Point	507
1	Sill Top	269

DATA SHEET NO. 10

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
 Test Program: 214 Indicant Side Impact

NHTSA No. C25600
 Test Date: 1/16/02

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750				378					382					4	
-600				358					364					6	
-450				341					350					9	
-300				329					343					14	
-150				320					338					18	
0		259	260	315			300	315	349			41	55	34	
150	287	257	260	313		351	500	484	395		64	243	224	82	
300	286	254	258	316		369	583	556	482		83	329	298	166	
450	284	252	257	315		382	588	565	540		98	336	308	225	
600	284	252	256	314		395	593	566	555		111	341	310	241	
750	284	252	256	314	521	412	593	560	552	544	128	341	304	238	23
900	284	251	256	316	520	418	592	552	547	562	134	341	296	231	42
1050	283	251	256	317	523	429	586	548	547	587	146	335	292	230	64
1200	283	252	256	318	523	424	601	575	556	614	141	349	319	238	91
1350	284	253	257	319	529	432	592	554	542	636	148	339	297	223	107
1500	285	254	258	320	533	404	572	531	530	614	119	318	273	210	81
1650	286	256	259	323	537	387	548	512	519	594	101	292	253	196	57
1800	288	257	260	325	543	372	519	467	497	582	84	262	207	172	39
1950		258	260	328	546		411	419	400	573		153	159	72	27
2100			252	332				320	355				68	23	
2250			252	336				283	383				31	47	
2400			254	344				262	355				8	11	
2550			275	350				279	358				4	8	
2700				369					372					3	
2850				390					392					2	
3000				410					410					0	

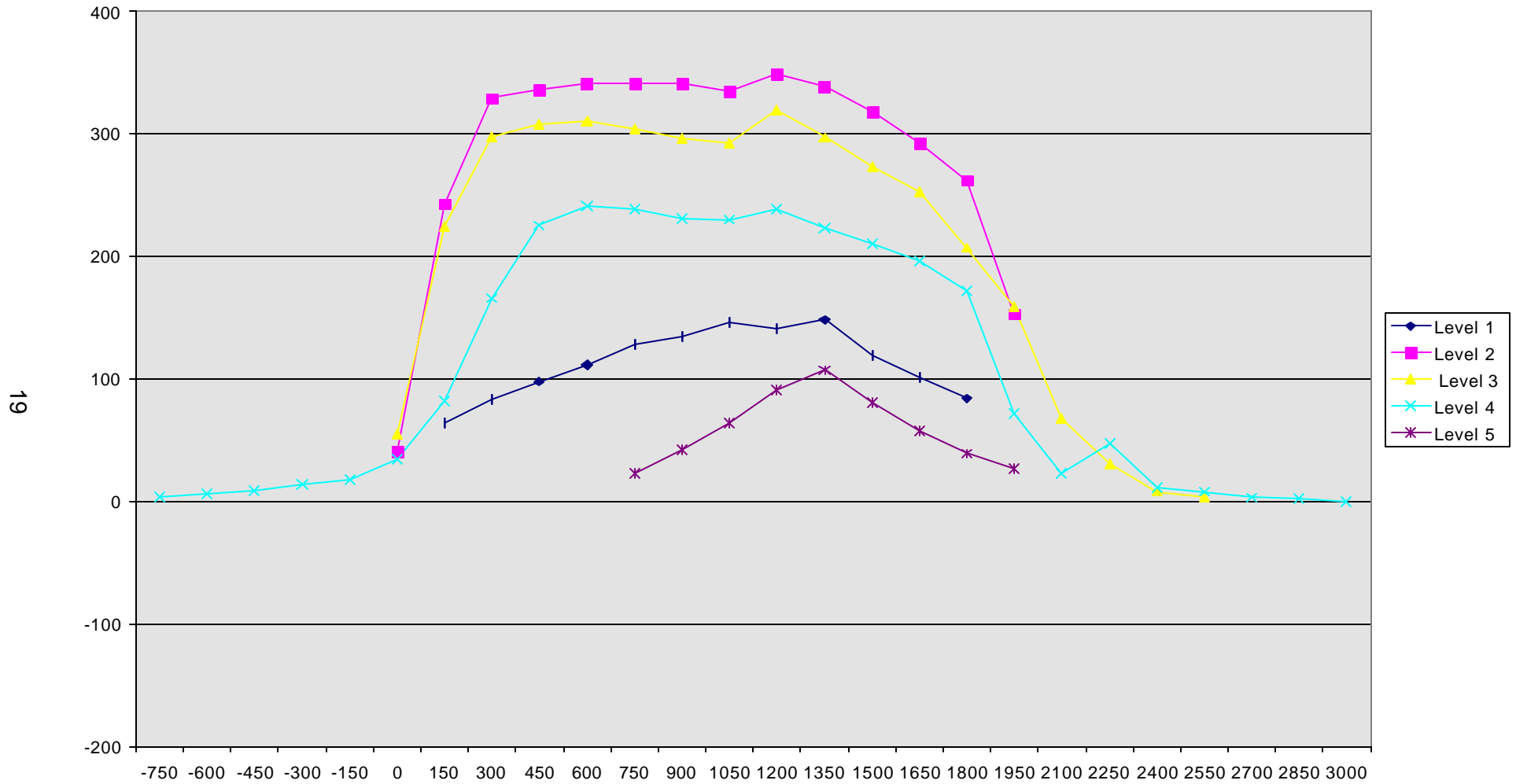
Reference plane is parallel to test vehicle longitudinal centerline.

Given dimensions=Reference plane to car body.

DATA SHEET NO. 10...(continued)
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
Test Program: 214 Indicant Side Impact

NHTSA No. C25600
Test Date: 1/16/02

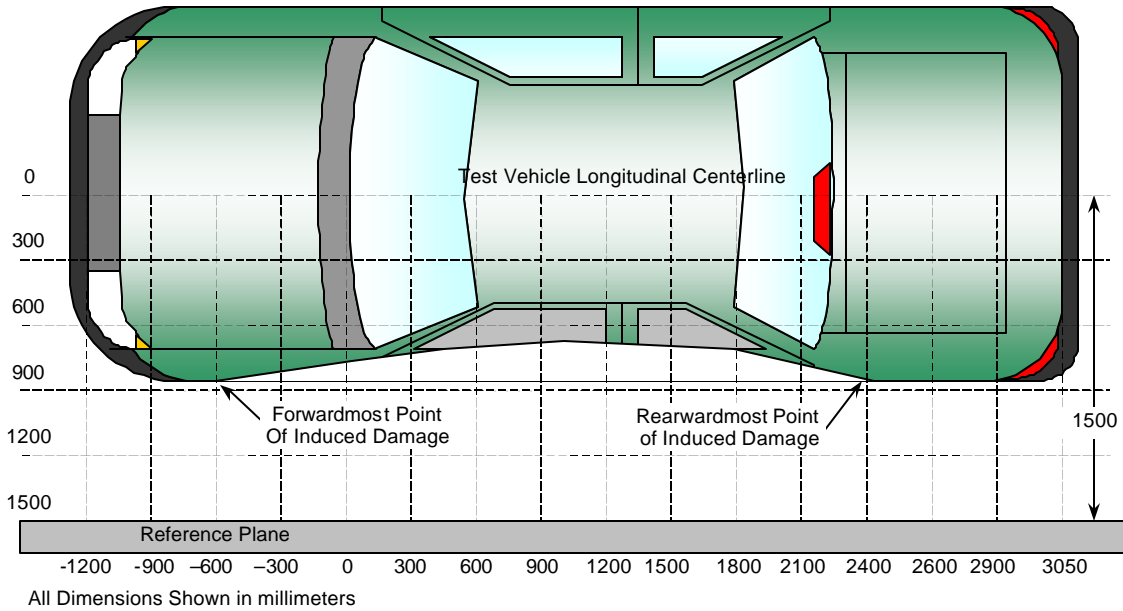


DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
 Test Program: 214 Indicant Side Impact

NHTSA No. C25600
 Test Date: 1/16/02



TOP VIEW

Damage Profile Distances

DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	3000 mm	4	410	410	0
2	2250 mm	4	336	383	47
3	1450 mm	2	254	579	325
4	703 mm	2	252	594	342
5	0 mm	3	260	315	55
6	-750 mm	4	378	382	4

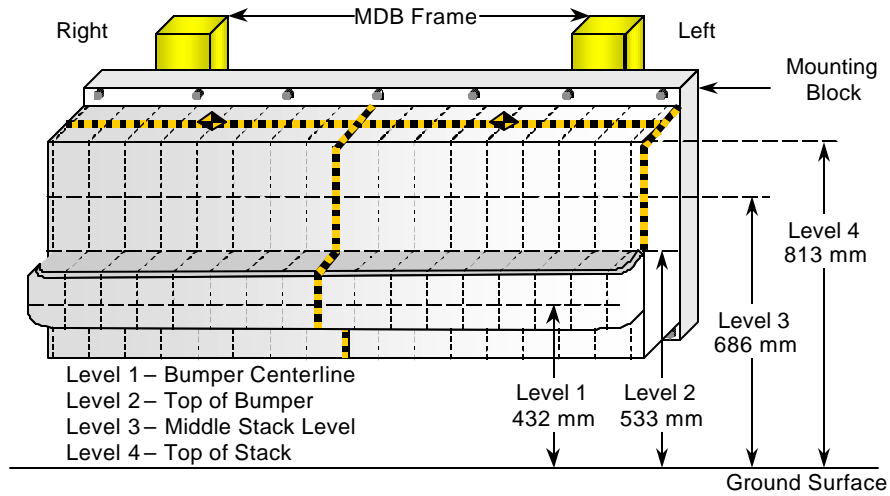
Reference plane is parallel to test vehicle longitudinal centerline.
 Given dimensions = Reference plane to car body.

DATA SHEET NO. 12

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
 Test Program: 214 Indicant Side Impact

NHTSA No. C25600
 Test Date: 1/16/02



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	164	147	131	118	108	106	101	95	97	90	86	87	85	84	86	95	103
2	98	70	54	37	32	29	25	23	23	20	20	20	20	20	25	38	66
3	61	25	7	1	0	2	9	15	11	8	6	4	7	10	22	42	92
4	97	12	1	5	6	4	0	7	5	7	6	4	7	14	36	84	139

All Dimensions in mm

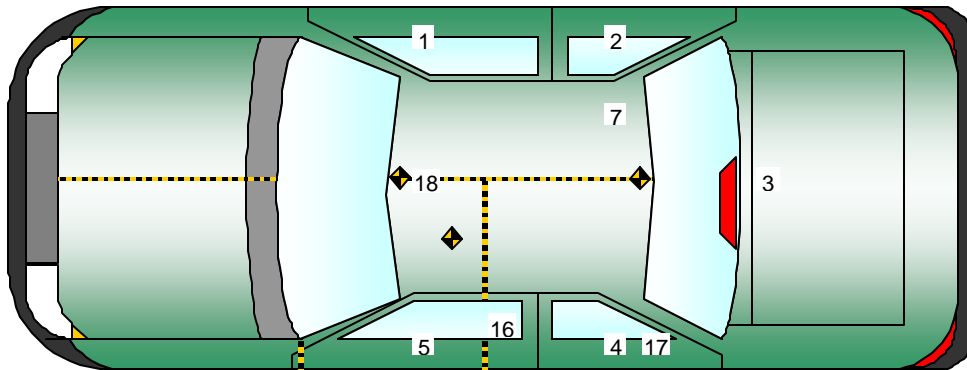
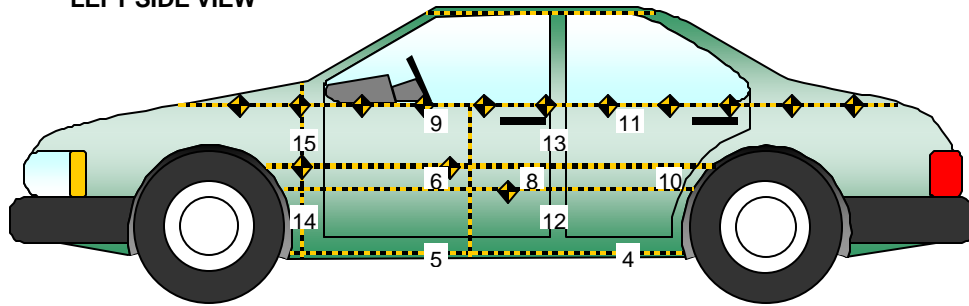
DATA SHEET NO. 13

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
 Test Program: 214 Indicant Side Impact

NHTSA No. C25600
 Test Date: 1/16/02

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. 13... (continued)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
 Test Program: 214 Indicant Side Impact

NHTSA No. C25600
 Test Date: 1/16/02

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	2552	654	-235	X	6.8	61	4.7	11
					Y	25.4	14	3.3	137
					Z	4.4	39	5.8	11
					RES	25.4	14		
2	Right Sill at Rear Seat	1638	654	-229	X	7.2	61	5.5	11
					Y	20.8	9	3.6	109
					Z	7.1	33	6.8	21
					RES	21.1	9		
3	Rear Floorpan Above Axle *	1029	0	-490	X	6.4	60	11.2	46
					Y	22.3	30	2.9	109
					Z	17.3	23	4.7	58
					RES	27.1	23		
4	Left Sill at Rear Door **	1630	-662	-237	Y	44.0	55	12.2	86
5	Left Sill at Front Door	2559	-662	-225	Y	41.2	14	15.6	25
7	Rear Occupant Compartment	1755	326	-314	Y	20.0	8	3.1	109
12	B-Post Lower ***	2023	-663	-335	Y	172.2	10	103.0	27
13	B-Post Middle	2046	-696	-854	Y	192.5	7	63.9	17
14	A-Post Lower	3118	-682	-383	Y	91.3	4	47.6	17
15	A-Post Middle ****	3101	-697	-959	Y	32.0	14	7.2	2
16	Front Seat Track	2278	-536	-904	Y	63.7	14	21.1	21
18	Vehicle CG	2484	0	-316	X	4.4	61	7.2	32
					Y	28.8	14	2.9	23
					Z	9.3	57	7.7	43
					RES	28.9	14		

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

* Questionable data after 58 msec
 ** Questionable data after 108 msec

*** Questionable data after 30 msec
 **** Questionable data after 44 msec

DATA SHEET NO. 14

MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY

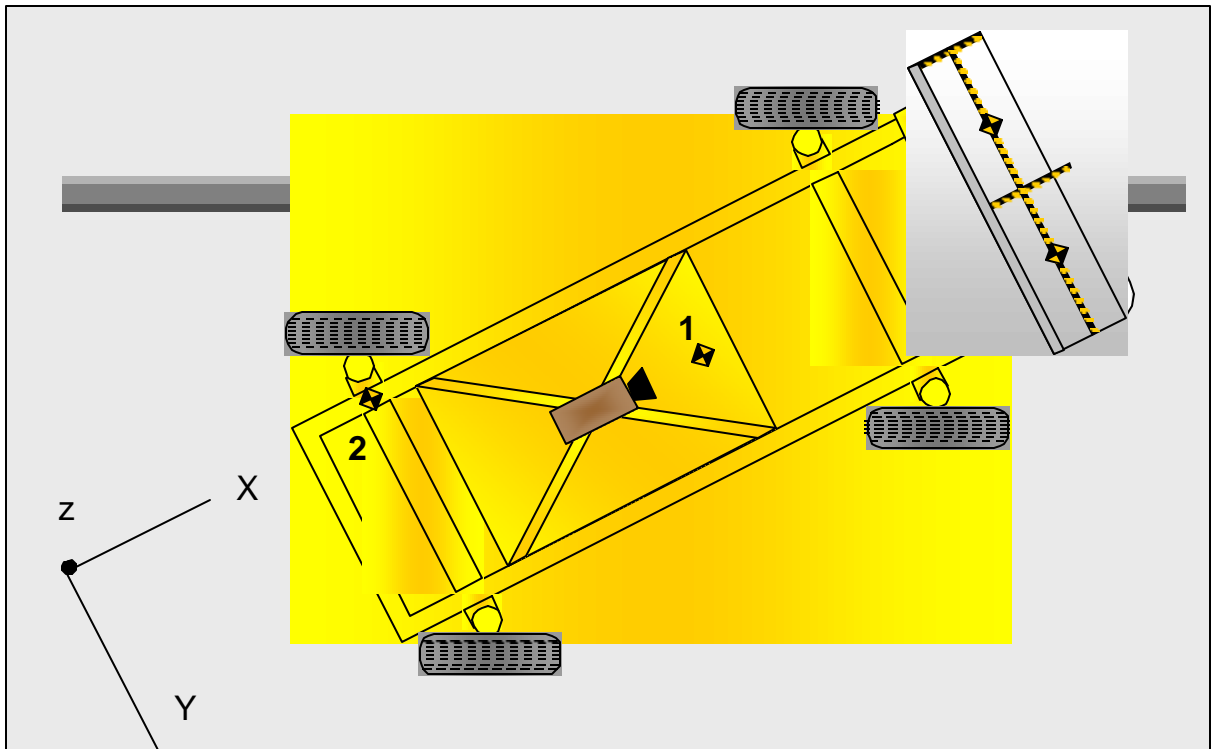
Test Vehicle: 2002 Mitsubishi Lancer 4 Door
 Test Program: 214 Indicant Side Impact

NHTSA No. C25600
 Test Date: 1/16/02

MDB ACCELEROMETER PEAK DATA AND LOCATIONS

Loc. No.	Accelerometer Location	Measurement (mm)			Peak Values (G's)				
		X	Y	Z	Axis	Max	Time	Min	Time
1	MDB CG	-1092	0	-483	X	2.2	125	18.0	41
					Y	4.2	64	8.0	41
					Z	16.8	36	21.2	41
					RES	28.9	41		
2	MDB Rear	-2591	-625	-622	X	2.5	117	20.7	42
					Y	4.9	37	1.2	139

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

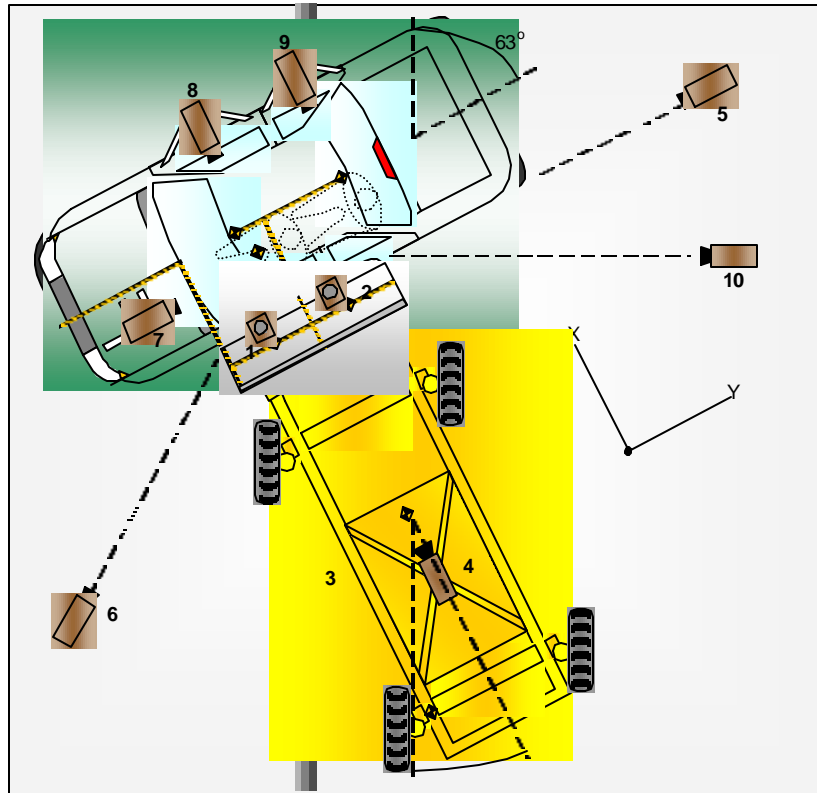


DATA SHEET NO. 15

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
 Test Program: 214 Indicant Side Impact

NHTSA No. C25600
 Test Date: 1/16/02



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Overall	-220	1150	5000	8	1070
2	Overhead Close-up	-690	-350	5000	13	1000
3	MDB Onboard, Impact Point Close-up				13	1010
4	MDB Onboard, Centerline of Impact				13	1010
5	Right Side, Ground Level, Overall	-700	10560	1800	25	766
6	Left Side, Ground Level, Overall	-710	-1930	1660	13	1026
7	Vehicle Onboard Front SID, Front				13	513
8	Vehicle Onboard Front SID, Side				7.5	528
9	Vehicle Onboard Rear SID, Side				13	513
10	Real Time Coverage					

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

DATA SHEET NO. 16

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
Test Program: 214 Indicant Side Impact

NHTSA No. C25600
Test Date: 1/16/02

Test Time: 1:25PM

Temperature at Time of Impact: 20°C

Stoddard Solvent Spillage Measurements

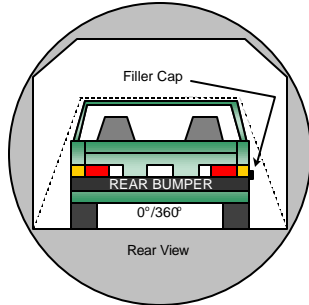
- A. From impact until vehicle motion ceases: 0 oz.
(Maximum Allowable = 1 ounce)
- B. For the 5 minute period after motion ceases: 0 oz.
(Maximum allowable = 5 ounces)
- C. For the following 25 minutes: 0 oz.
(Maximum allowable = 1 oz./minute)
- D. Spillage Details: none

DATA SHEET NO. 17

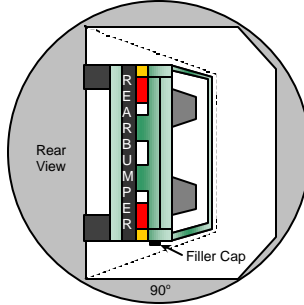
FMVSS 301 STATIC ROLLOVER DATA SHEET

Test Vehicle: 2002 Mitsubishi Lancer 4 Door
 Test Program: 214 Indicant Side Impact

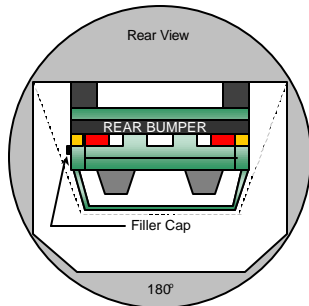
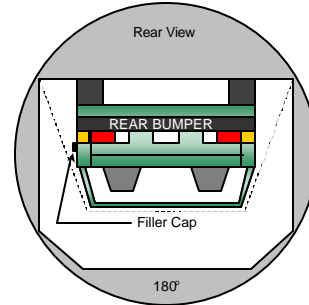
NHTSA No. C25600
 Test Date: 1/16/02



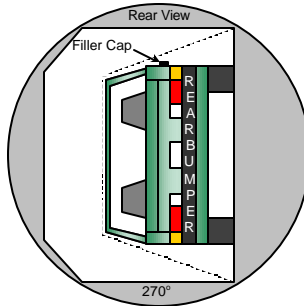
0° to 90°



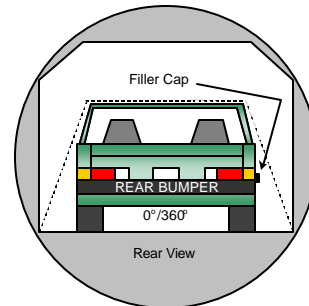
90° to 180°



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:

Rollover Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
0° to 90°	173	300	0
90° to 180°	153	300	0
180° to 270°	139	300	0
270° to 360°	163	300	0

APPENDIX A
PHOTOGRAPHS

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A-1.



Pre-Test Front View of Test Vehicle



Post-Test Front View of Test Vehicle

A-3.



Pre-Test Rear View of Test Vehicle

A-4.



Post-Test Rear View of Test Vehicle

A-5.



Pre-Test Left Side View of Test Vehicle

A-6.



Post-Test Left Side View of Test Vehicle



Pre-Test MDB Positioned Against Vehicle (left side)



Pre-Test MDB Positioned Against Vehicle (right side)



Pre-Test MDB Positioned Against Vehicle Overhead View



Post-Test MDB and Vehicle (left side)

A-11.



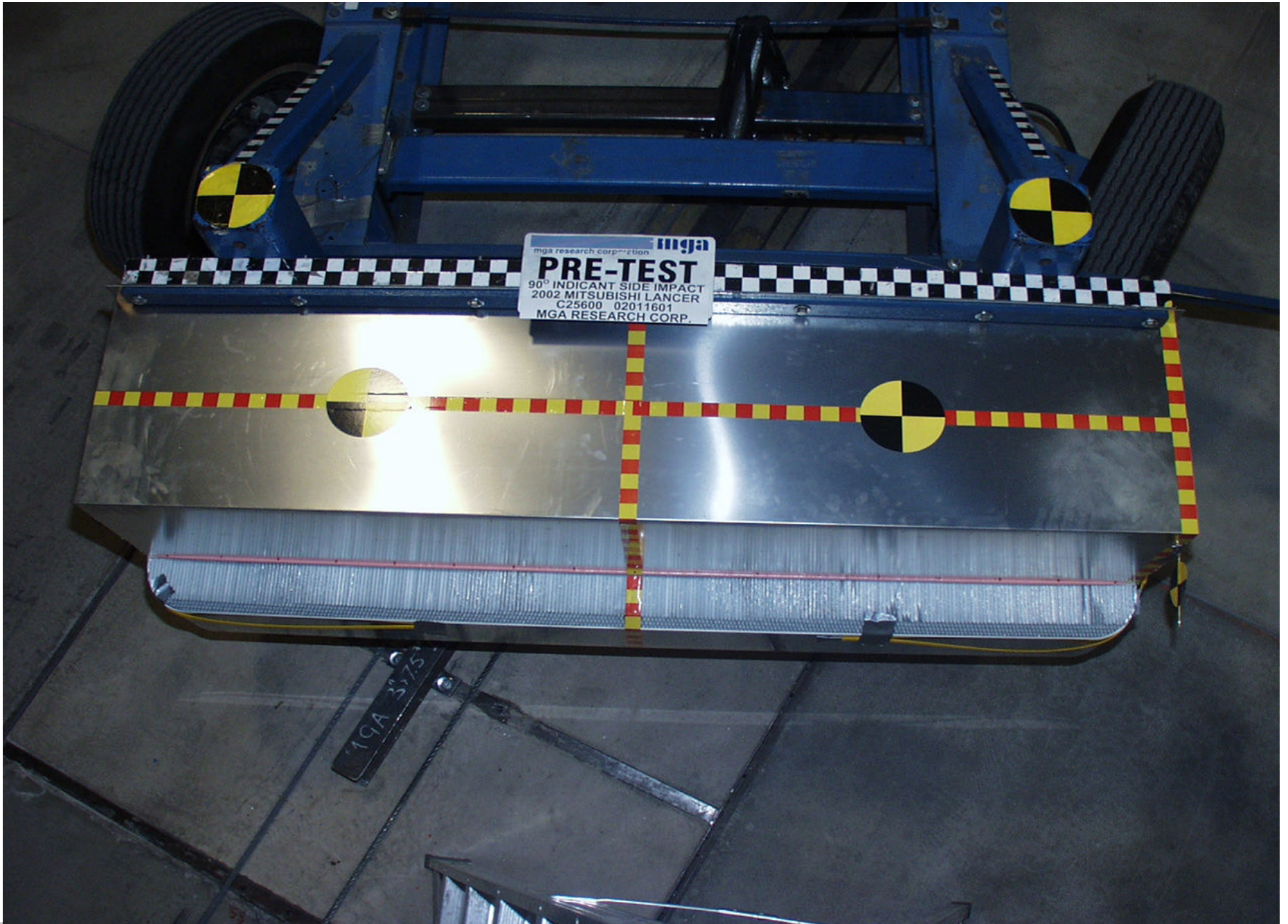
Post-Test MDB and Vehicle (right side)

A-12.



Post-Test MDB and Vehicle Overhead View

A-13.



Pre-Test MDB Top View

A-14.



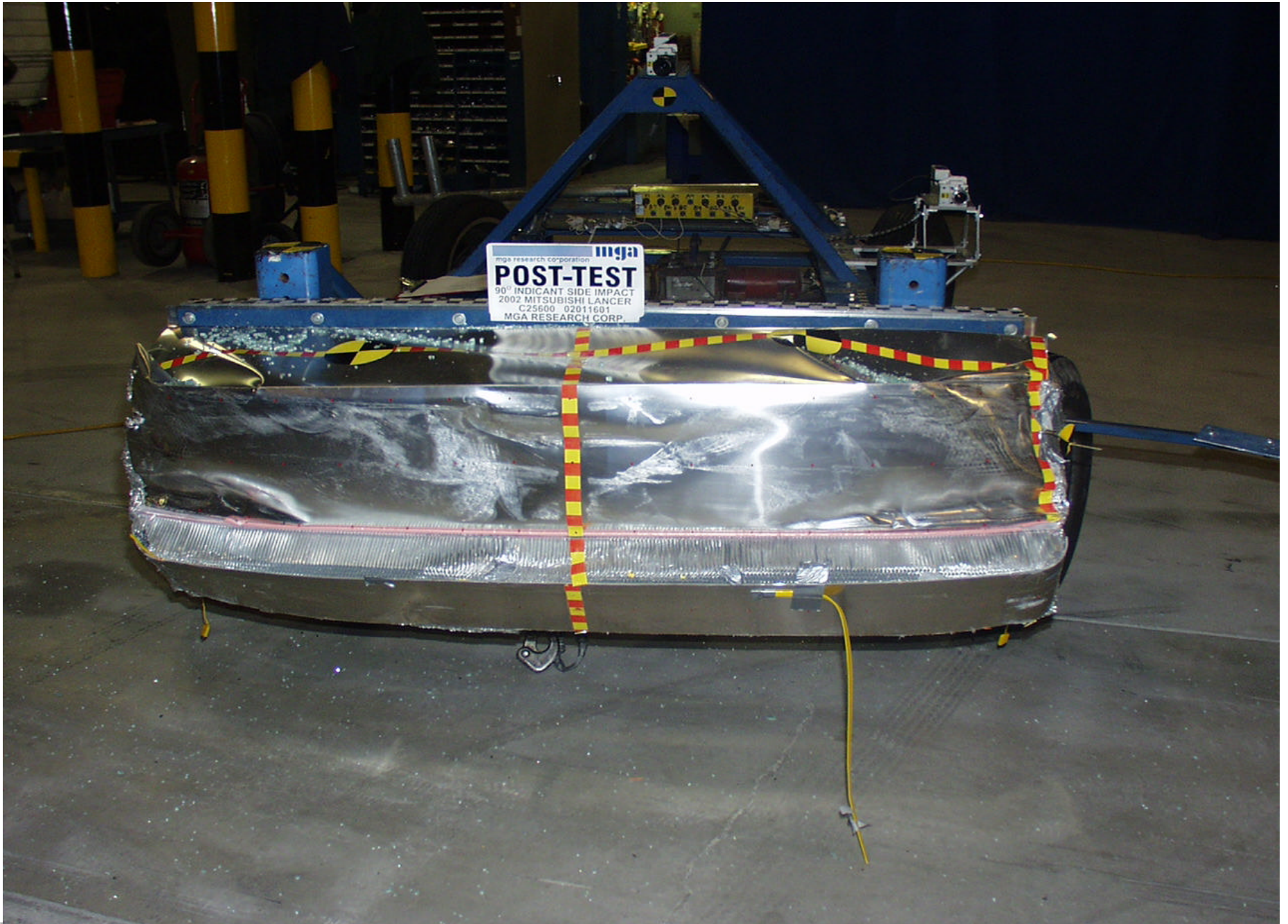
Post-Test MDB Top View

A-15.



Pre-Test MDB Front View

A-16.



Post-Test MDB Front View

A-17.



Pre-Test MDB Right Side View

A-18.



Post-Test MDB Right Side View



Pre-Test MDB Left Side View



Post-Test MDB Left Side View



Pre-Test Driver Dummy Right Side View



Post-Test Driver Dummy Right Side View

A-23.



Pre-Test Driver Dummy Left Side View



Post-Test Driver Dummy Left Side View



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



Pre-Test Driver Dummy Shoulder and Door Top View



Post-Test Driver Dummy Shoulder and Door Top View

A-28.



Post-Test Driver Dummy Contact



Post-Test Driver Dummy Head Contact

A-30.



Pre-Test Passenger Dummy Right Side View



Post-Test Passenger Dummy Right Side View



Pre-Test Passenger Dummy Left Side View

A-33.



Post-Test Passenger Dummy Left Side View

A-34.



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



Pre-Test Passenger Dummy Shoulder and Door Top View



Post-Test Passenger Dummy Shoulder and Door Top View



Post-Test Passenger Dummy Contact



Post-Test Passenger Dummy Head Contact



Pre-Test Left Front Impact Point on Vehicle



Post-Test Left Front Impact Point on Vehicle

A-41.



Impact



Vehicle Certification Label

TIRE INFLATION PRESSURE (CHECK WITH TIRE COOL)		
STANDARD INFLATION PRESSURE FOR ALL LOAD.		
1ST SEAT : 2 PASSENGERS		
2ND SEAT : 3 PASSENGERS		
TOTAL : 5 PASSENGERS		
LUGGAGE : 35kg (77lbs)		
TOTAL WEIGHT : 375kg (827lbs)		
TIRE SIZE	FRONT	REAR
P185/65R14	29PSI (200kPa)	26PSI (180kPa)
TEMPORARY TIRE SIZE		
T125/70D15		
60PSI (420kPa)		
MR130494 B		

A-43.

Tire Placard

A-44.



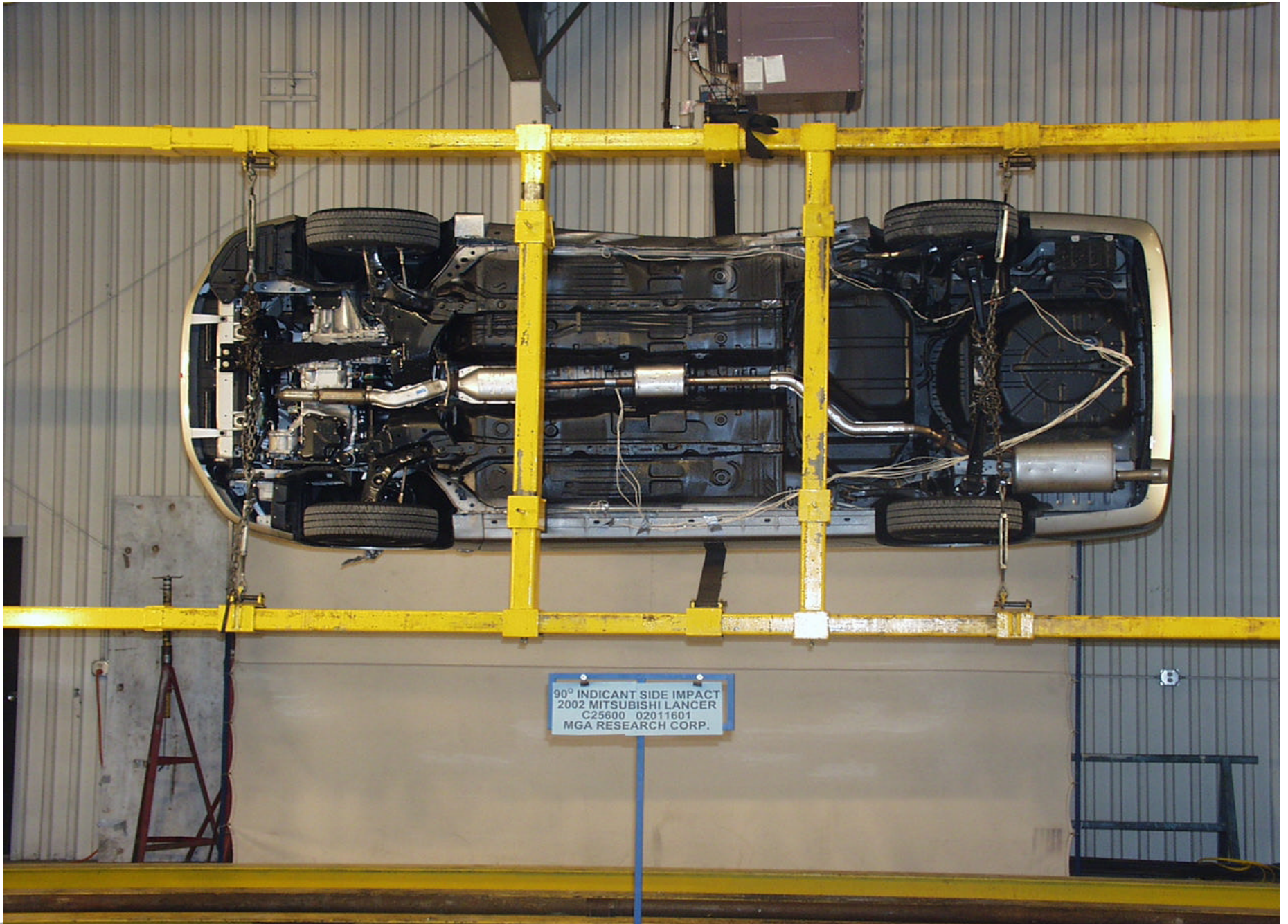
Rollover 90

A-45.



Rollover 180

A-46.



Rollover 270

A-47.



Rollover 360

A-48.



Left Front Attitude Point

A-49.



Right Front Attitude Point

A-50.



Left Rear Attitude Point

A-51.



Right Rear Attitude Point

APPENDIX B

SID, VEHICLE, AND MDB RESPONSE DATA

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*Questionable data after approximately 108 msec.

** Questionable data after approximately 58 msec.

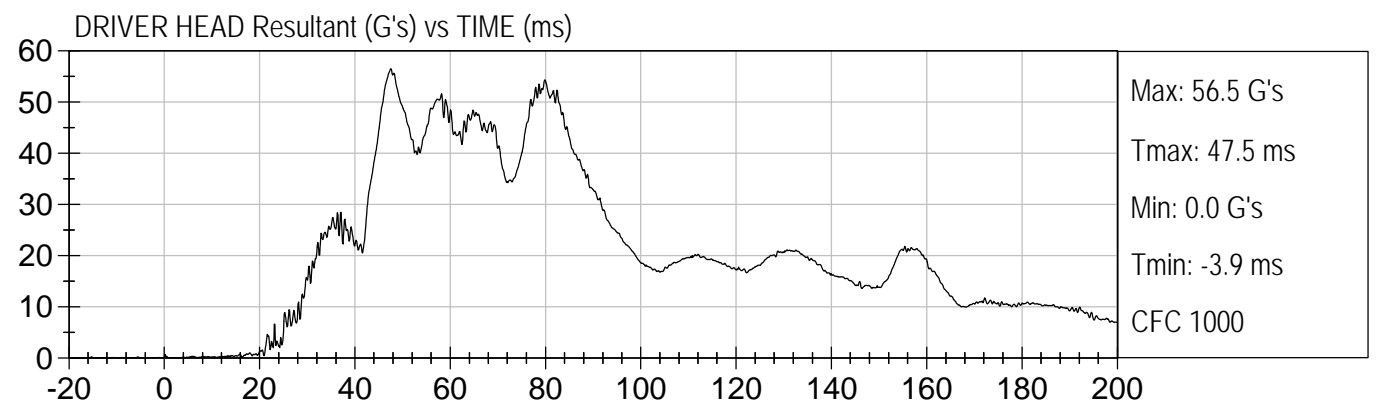
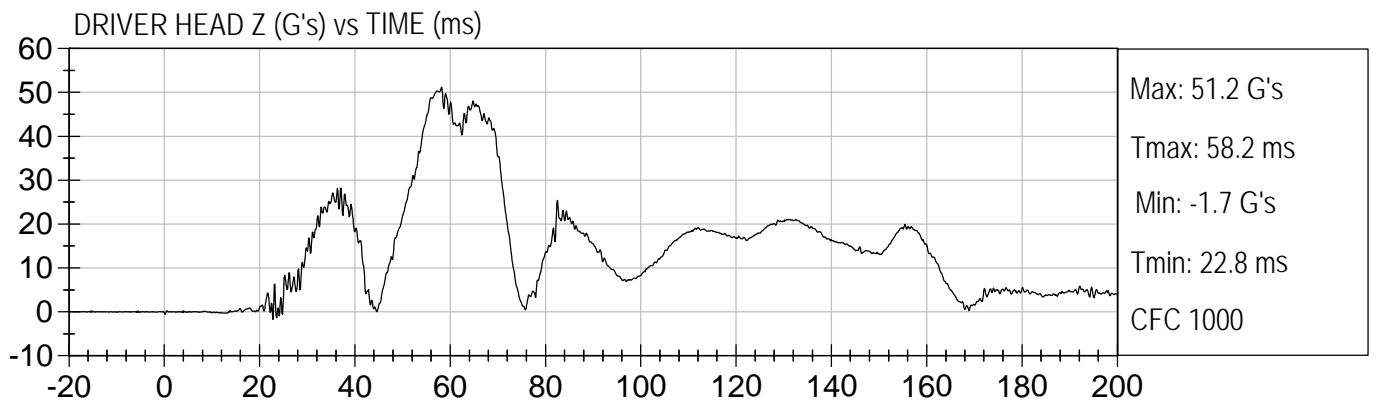
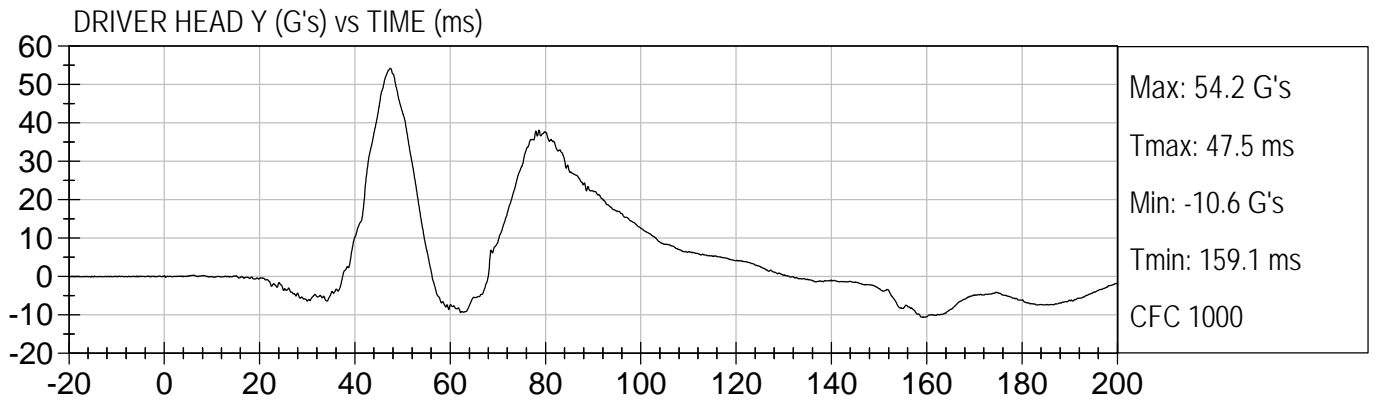
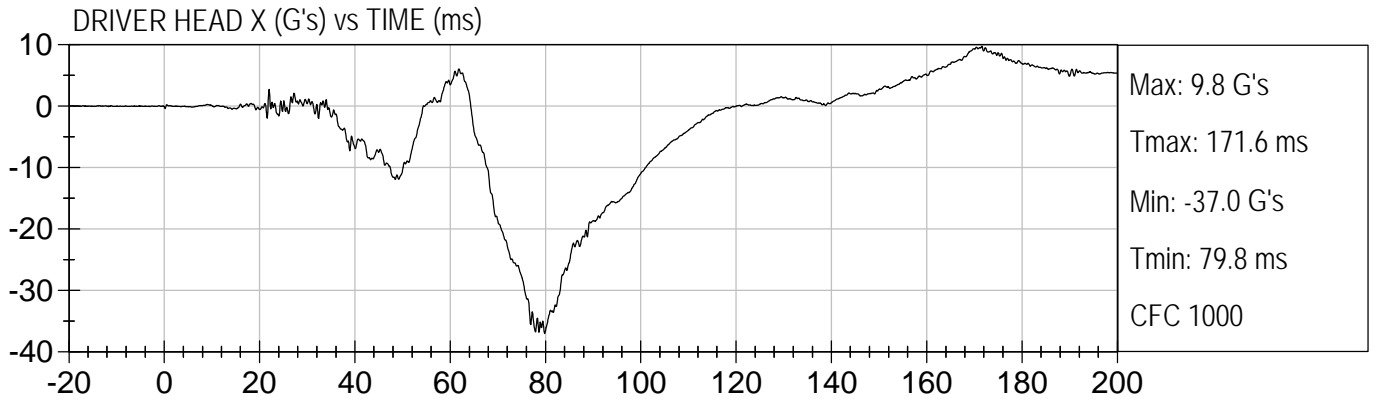
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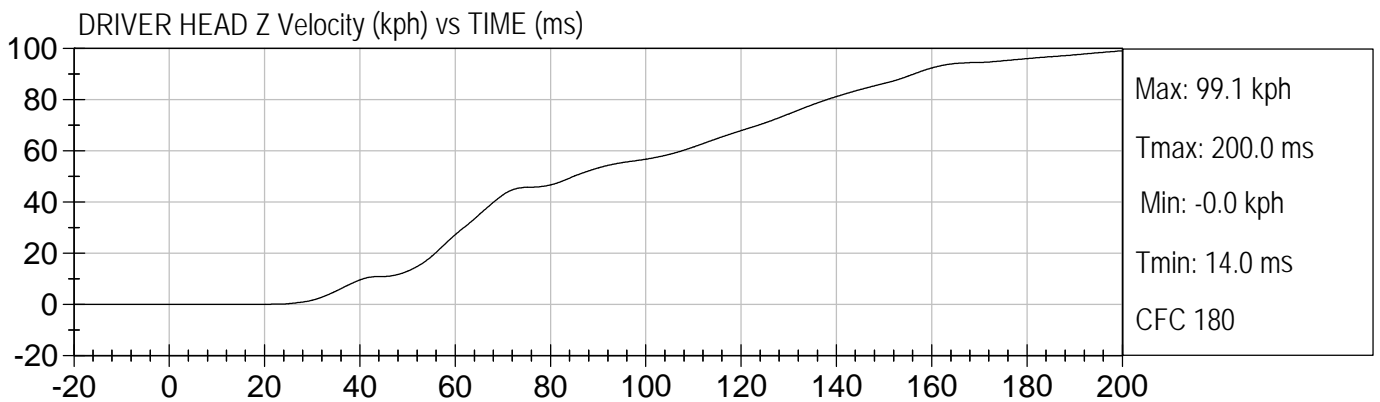
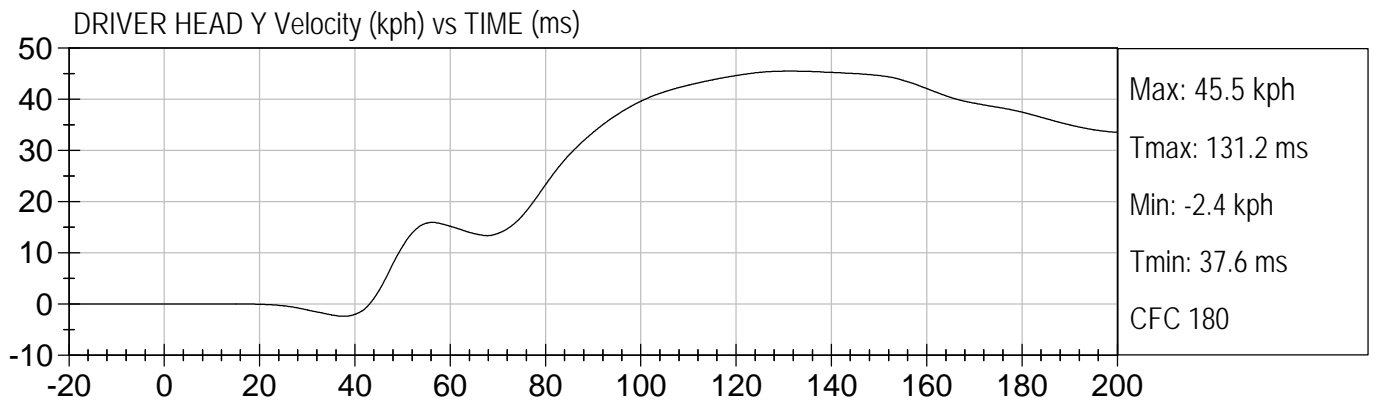
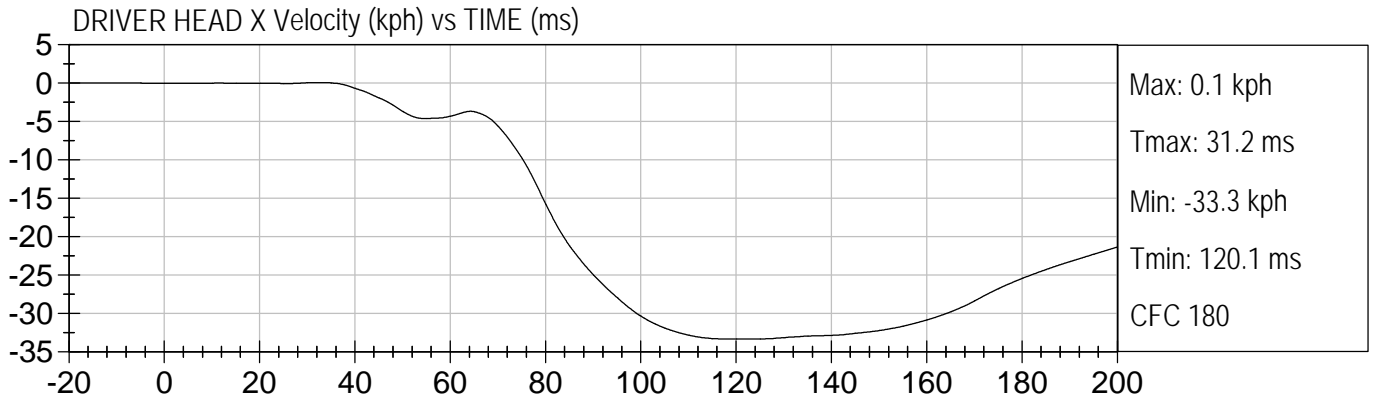
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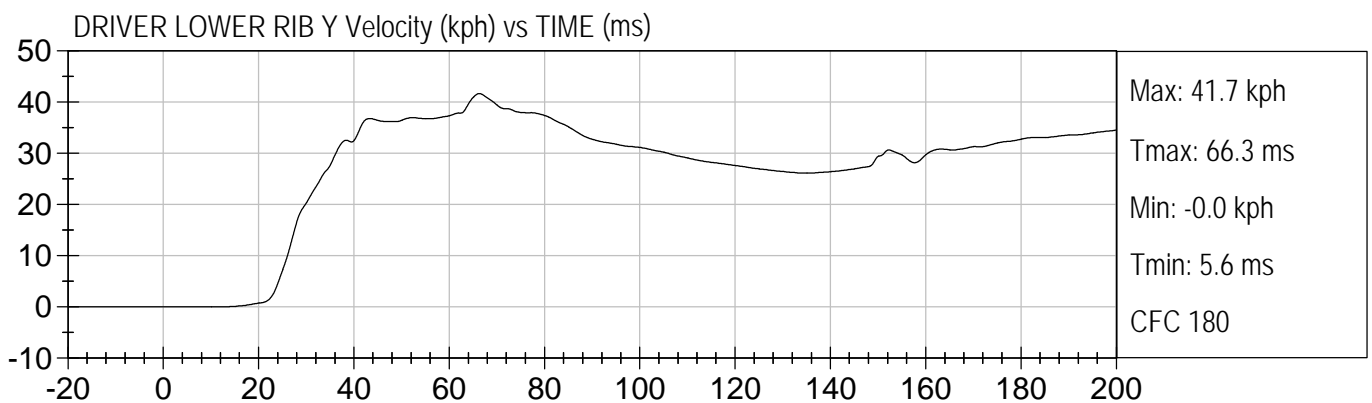
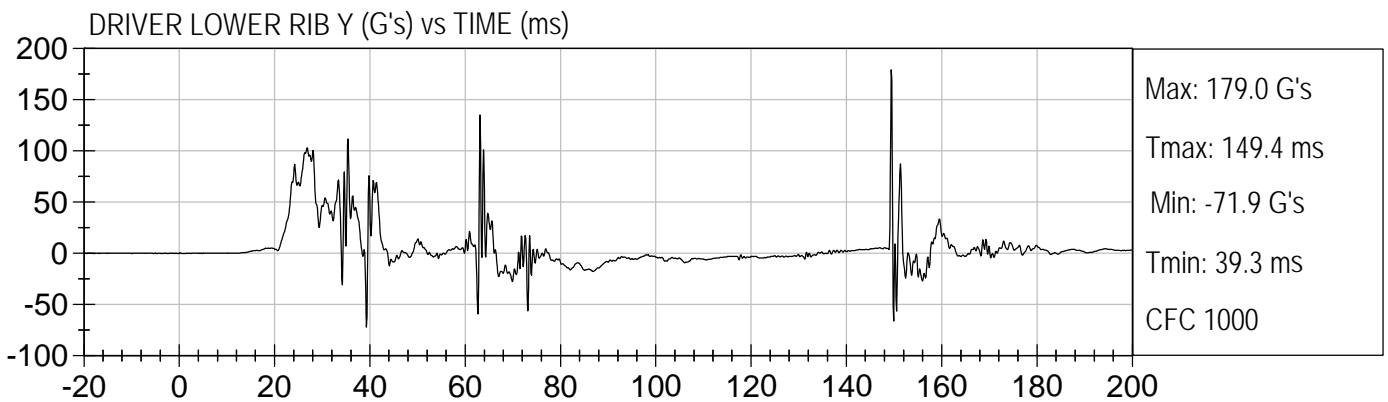
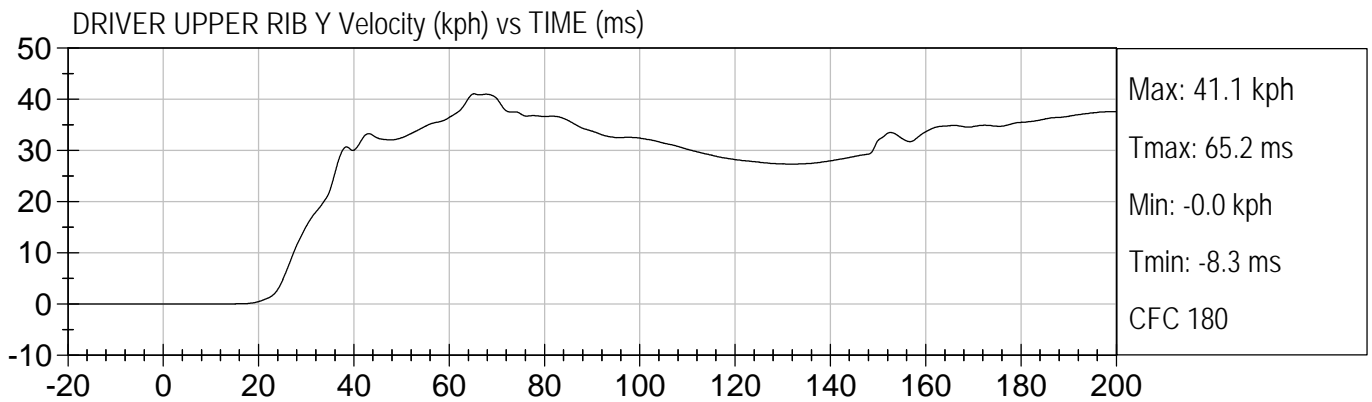
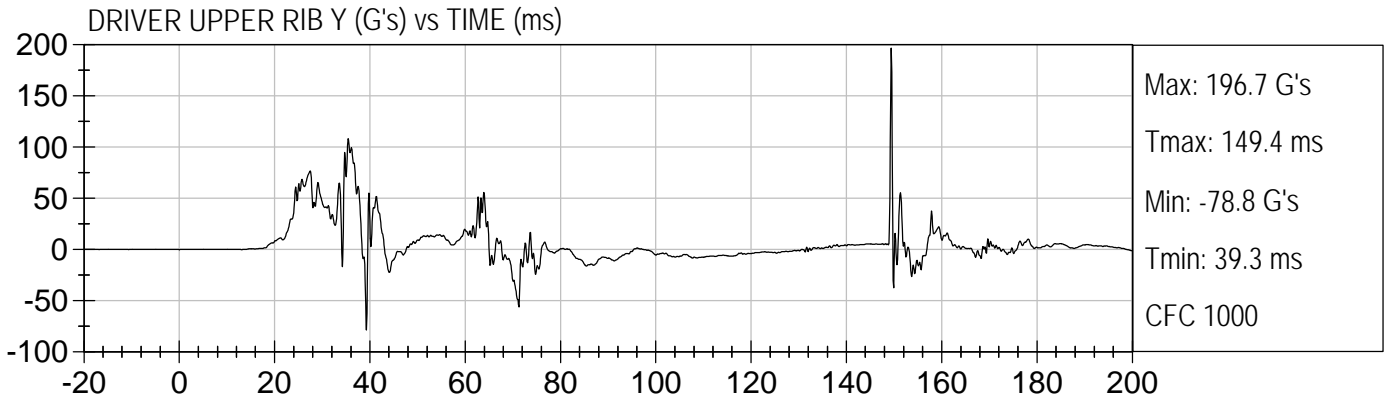
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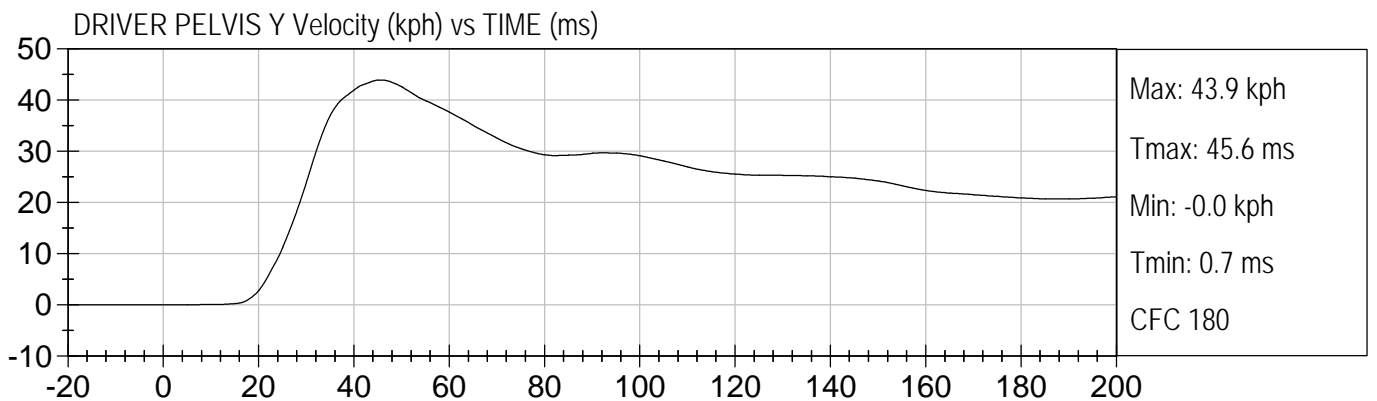
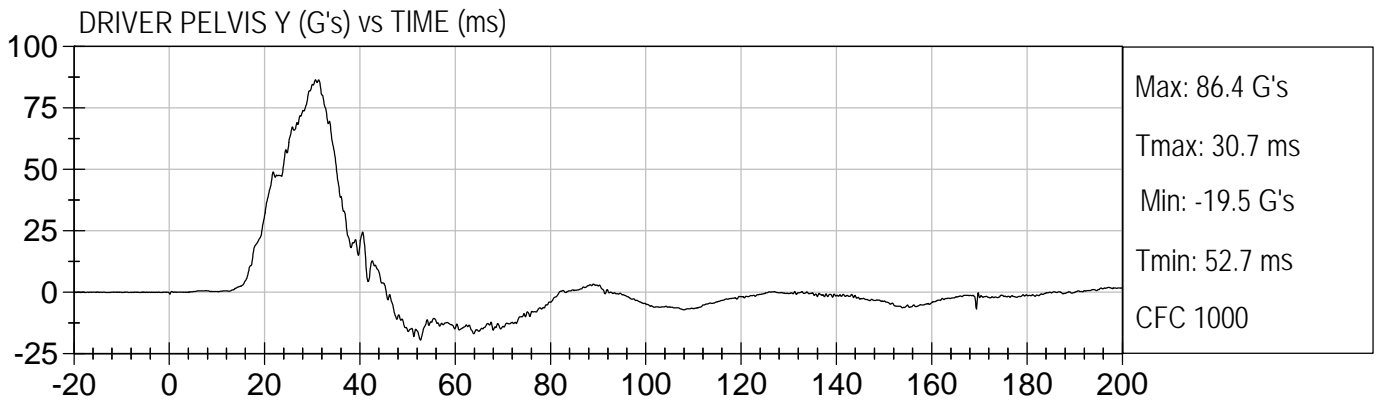
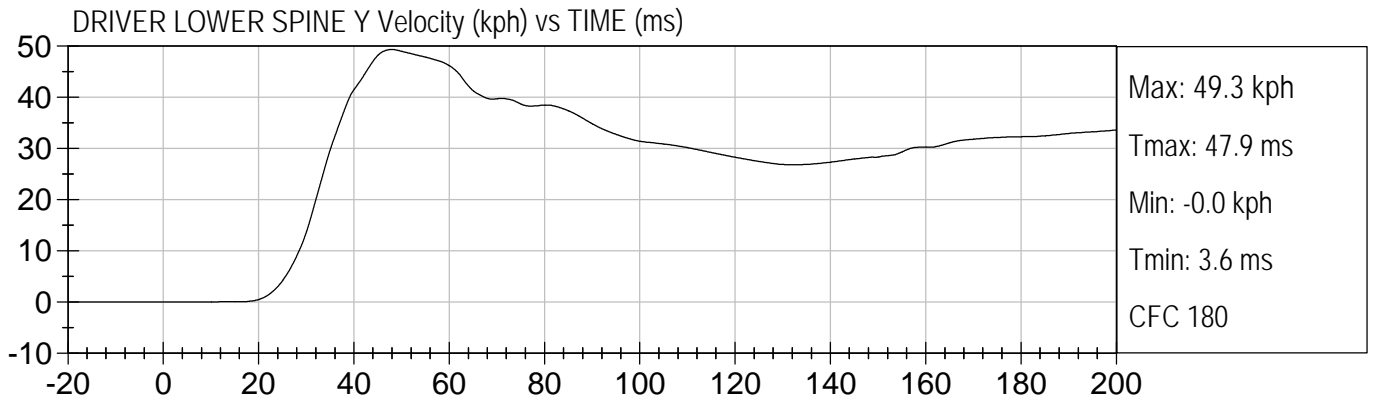
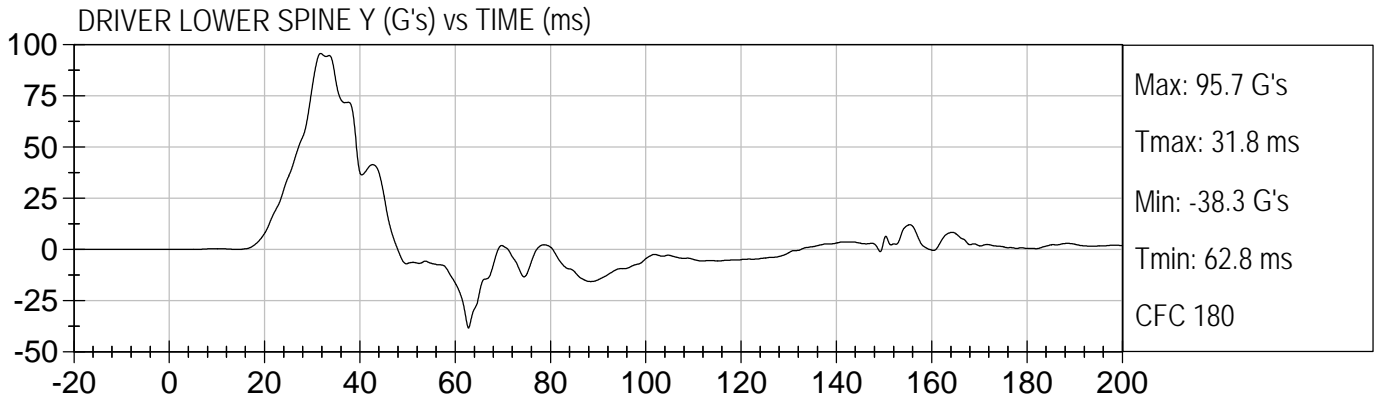
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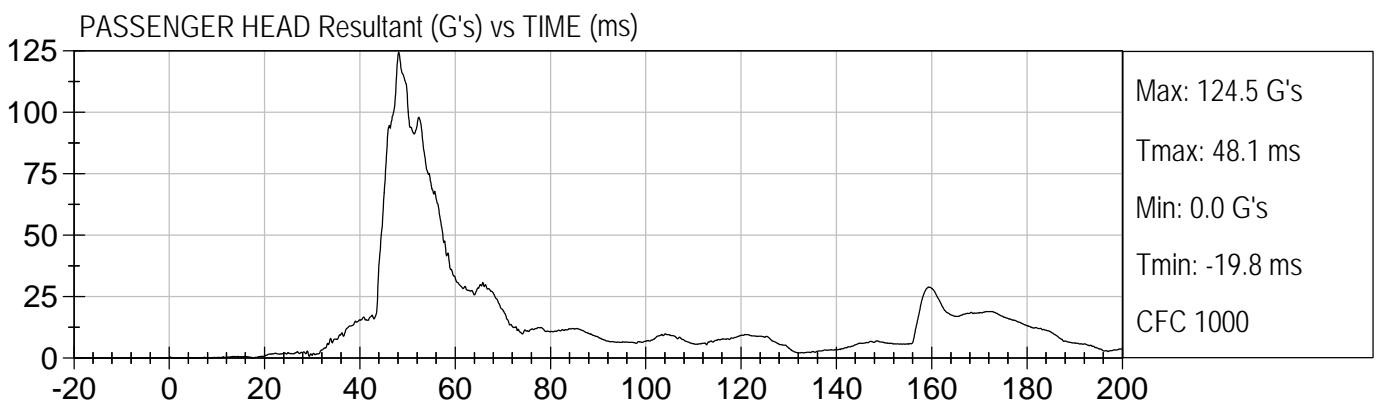
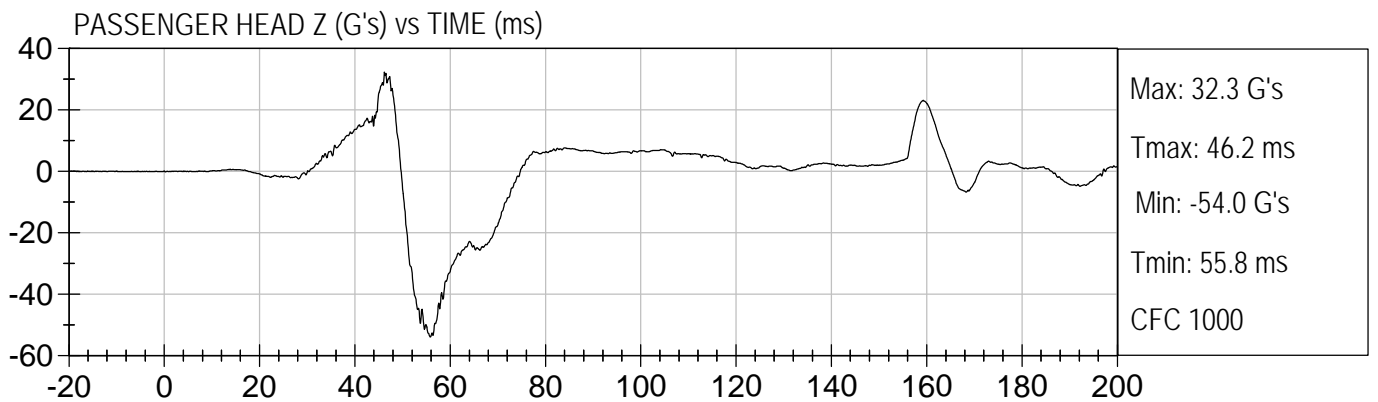
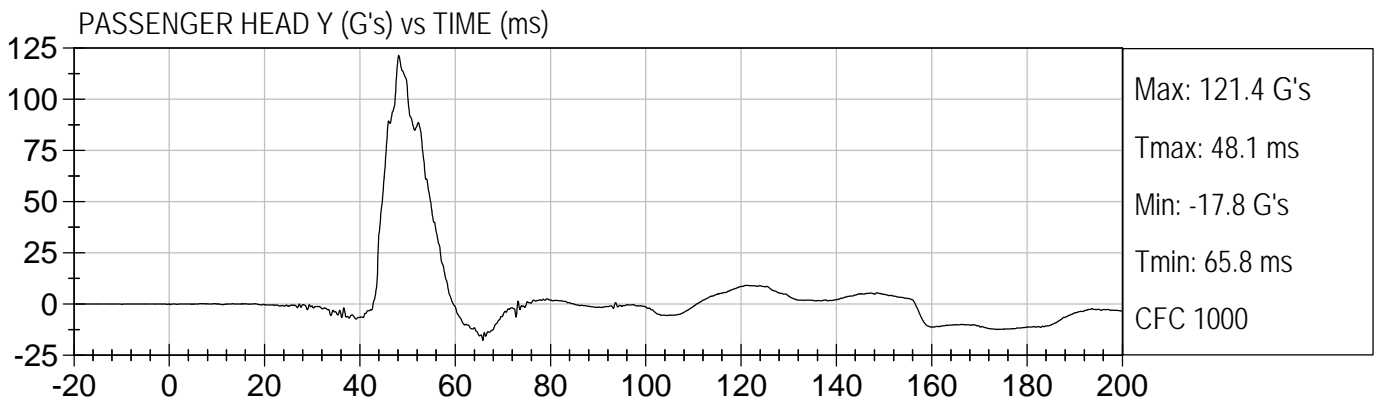
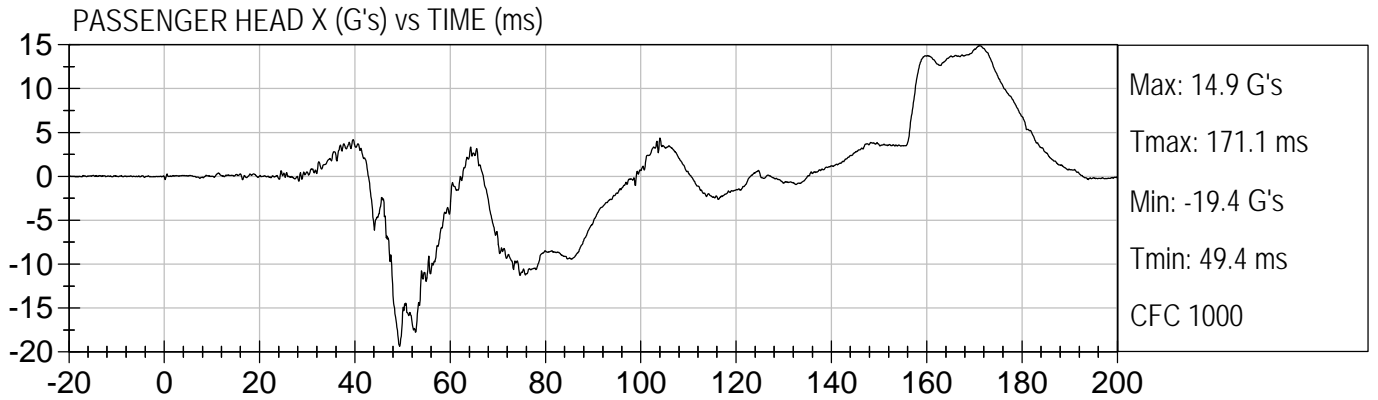
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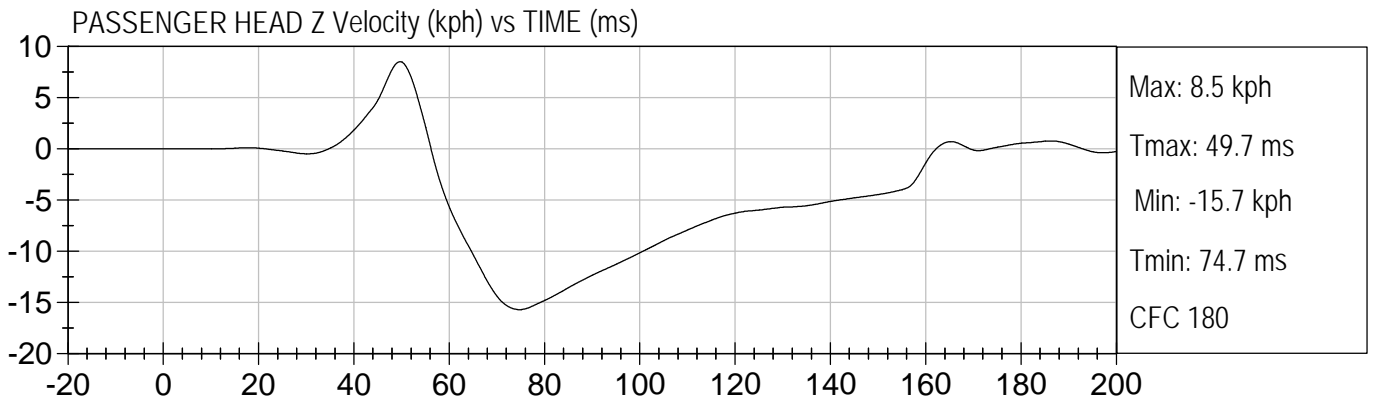
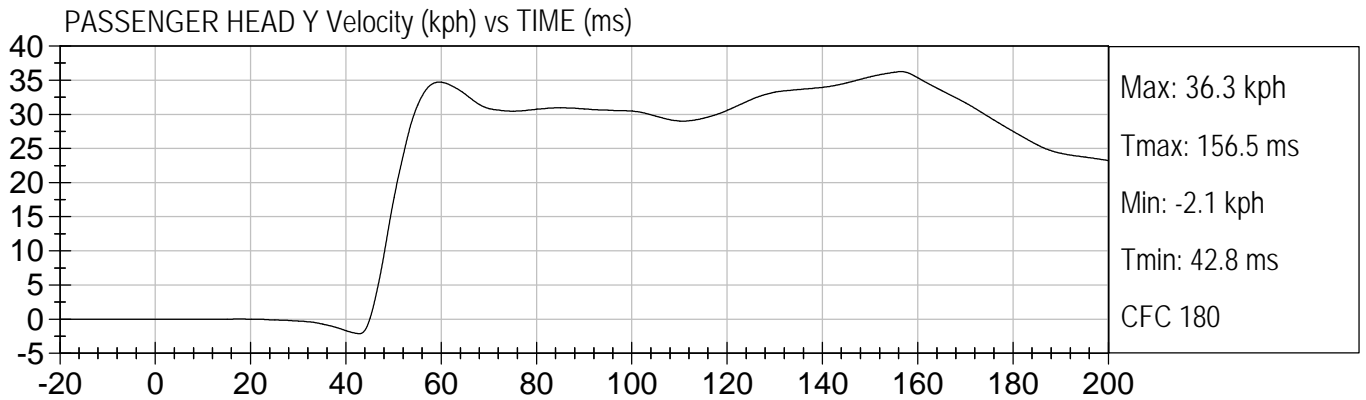
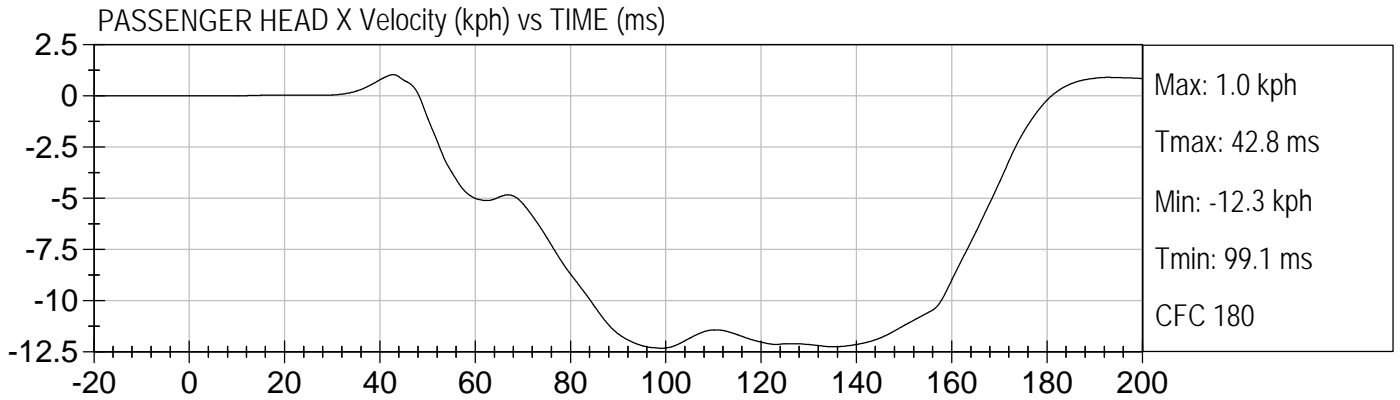


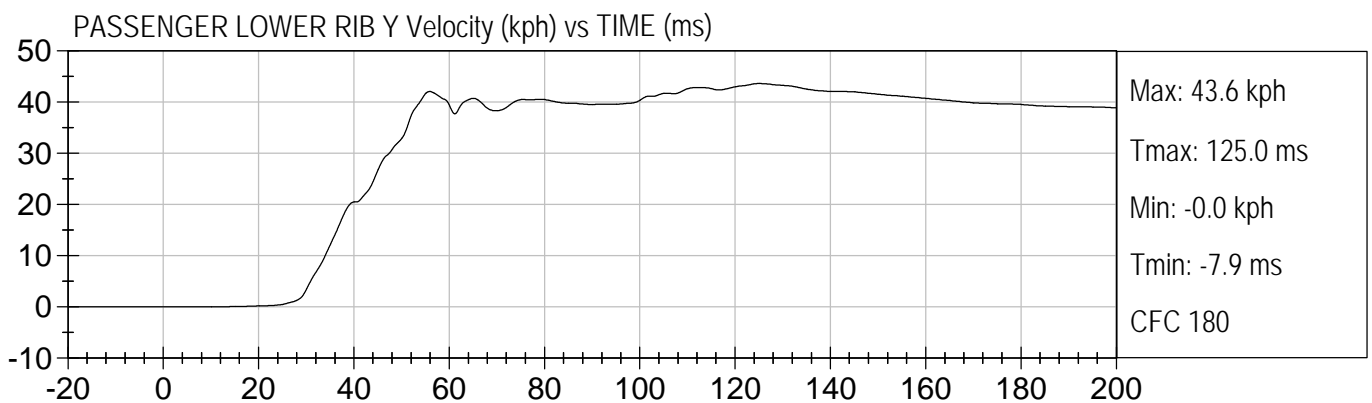
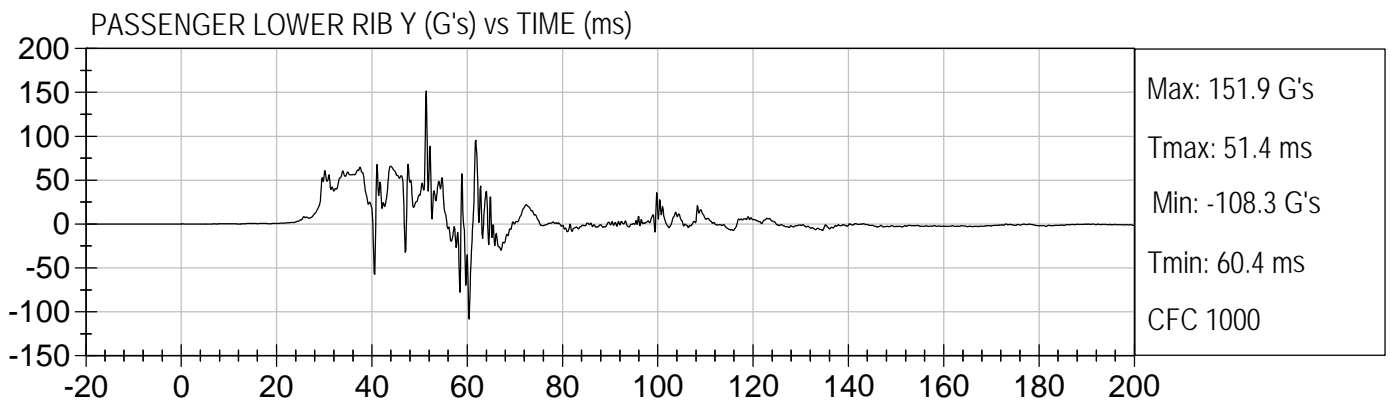
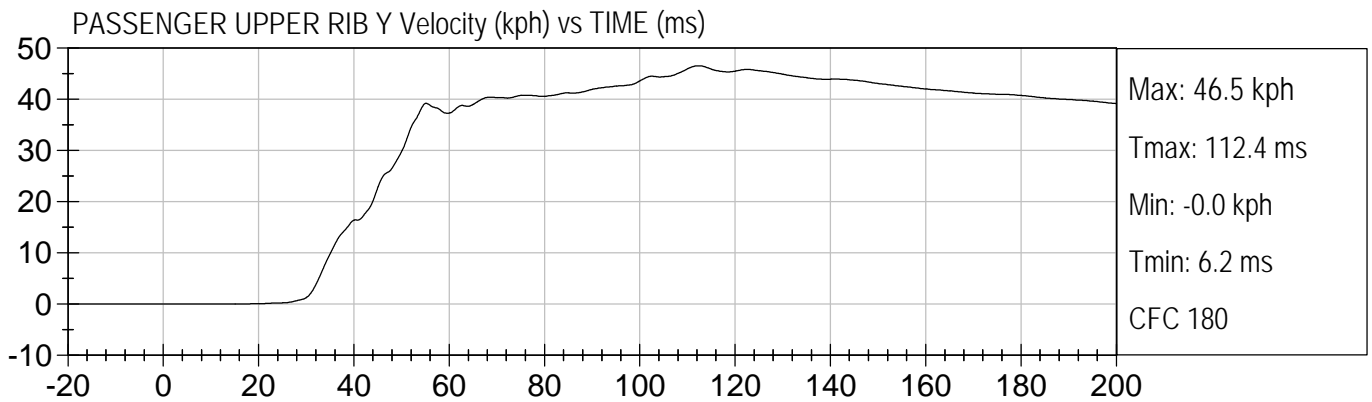
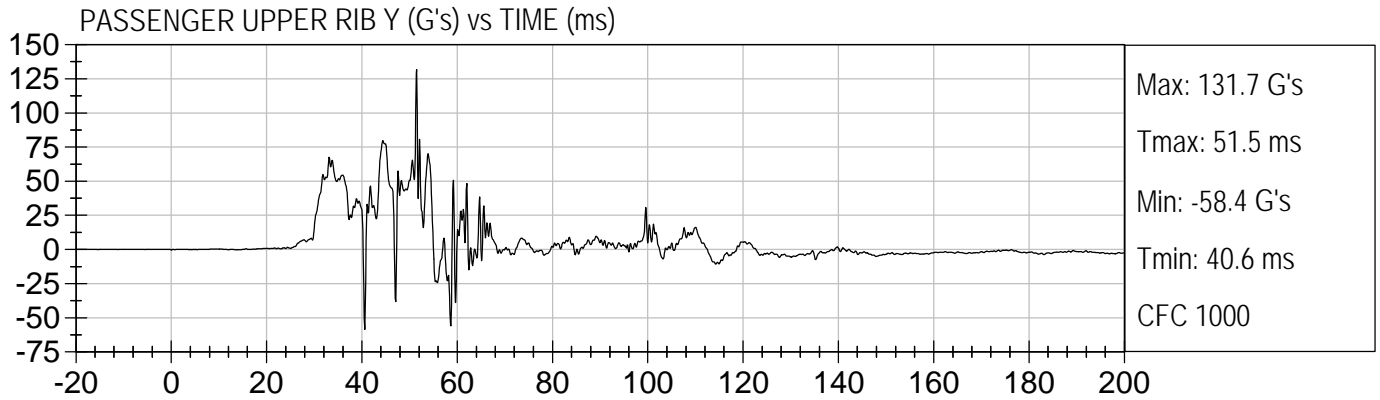


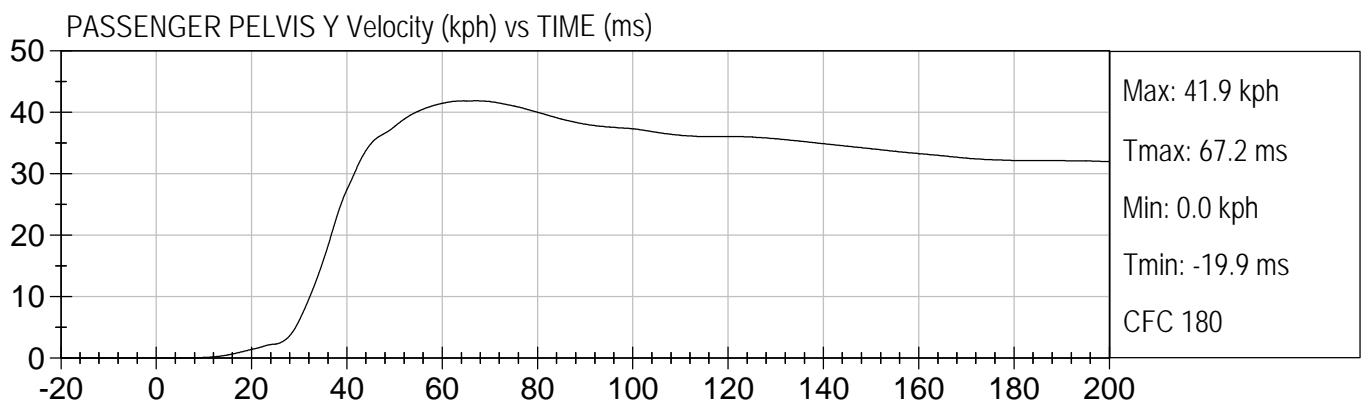
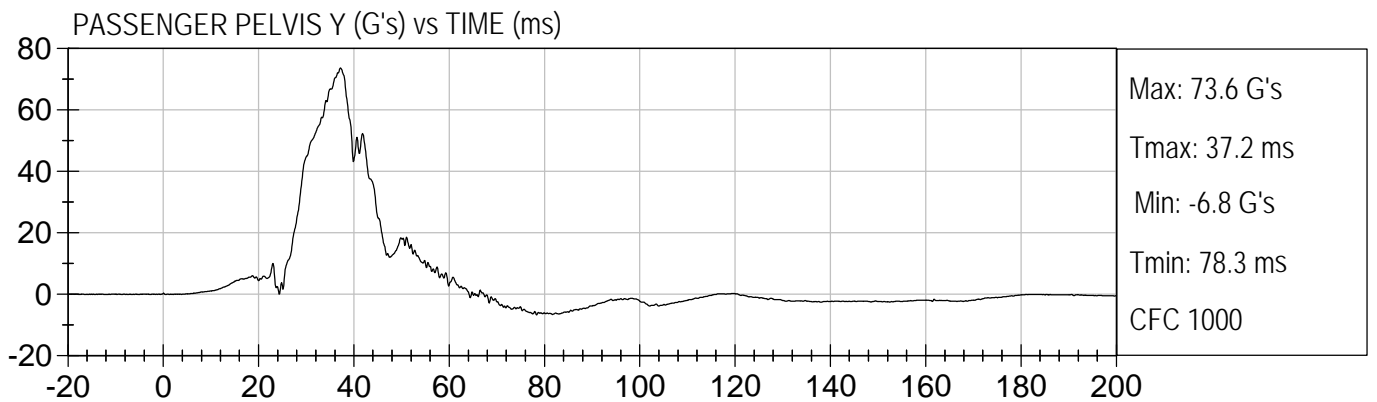
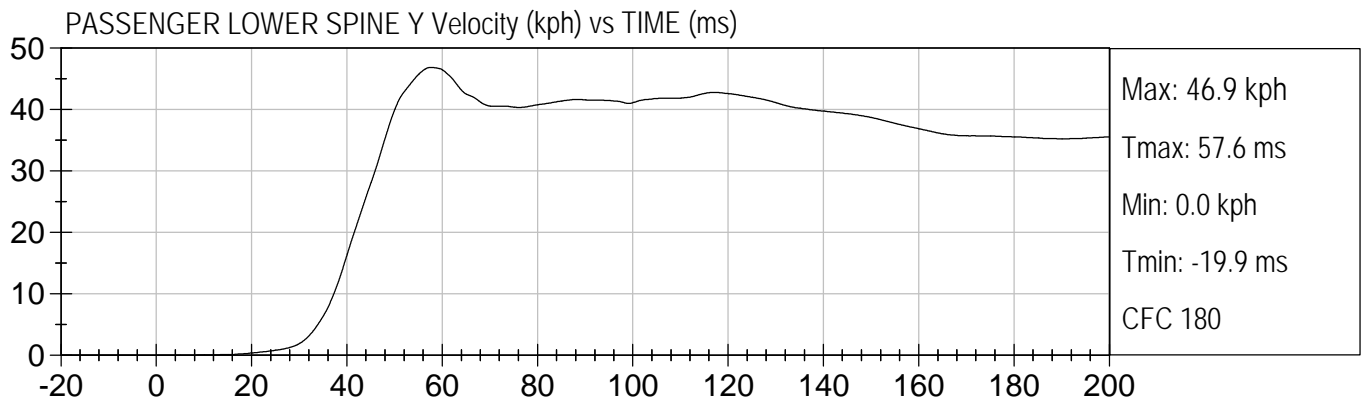
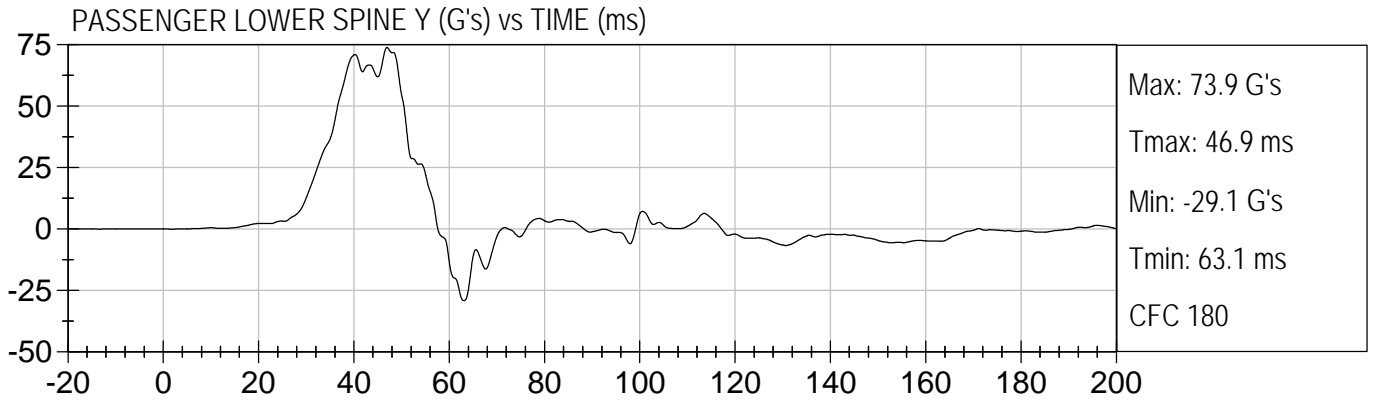


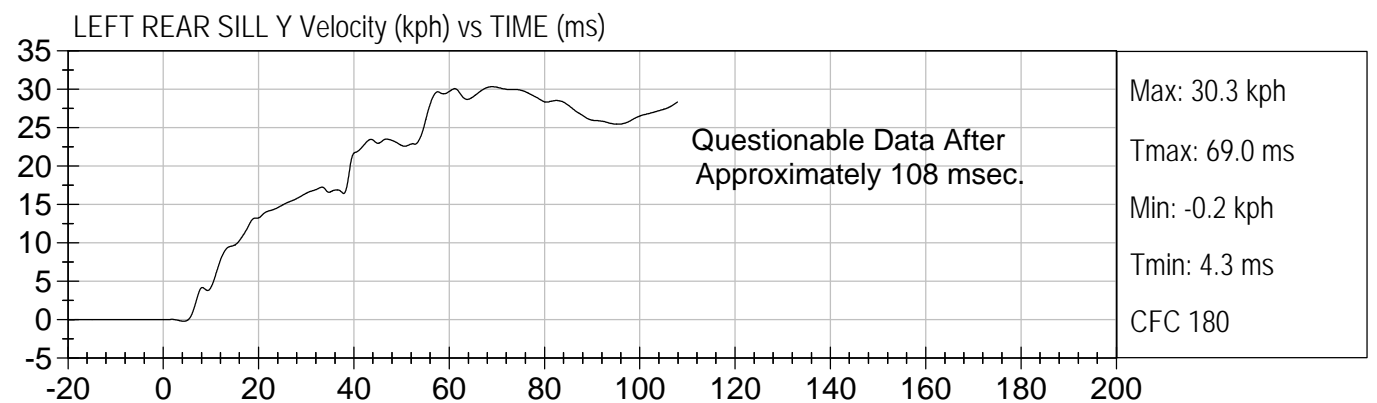
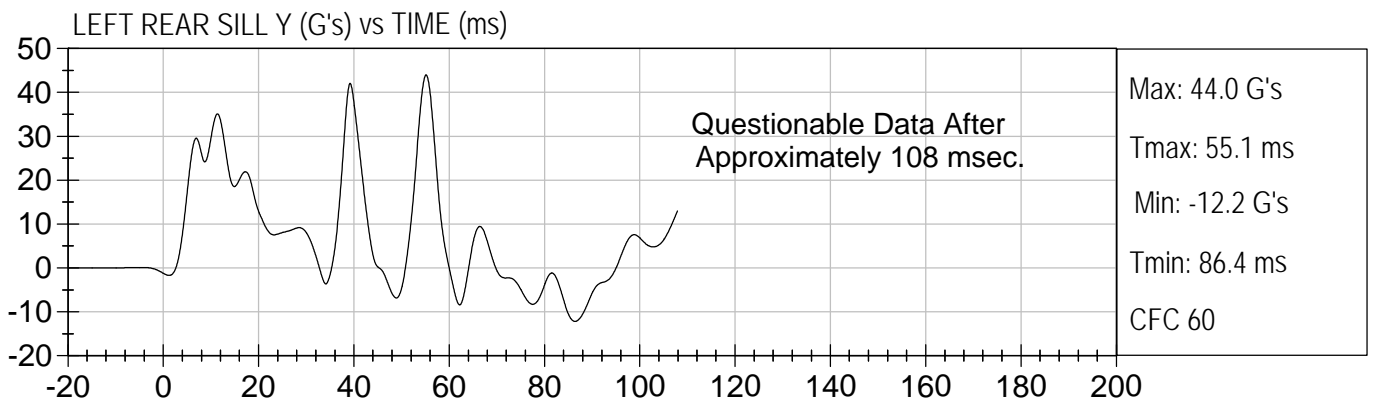
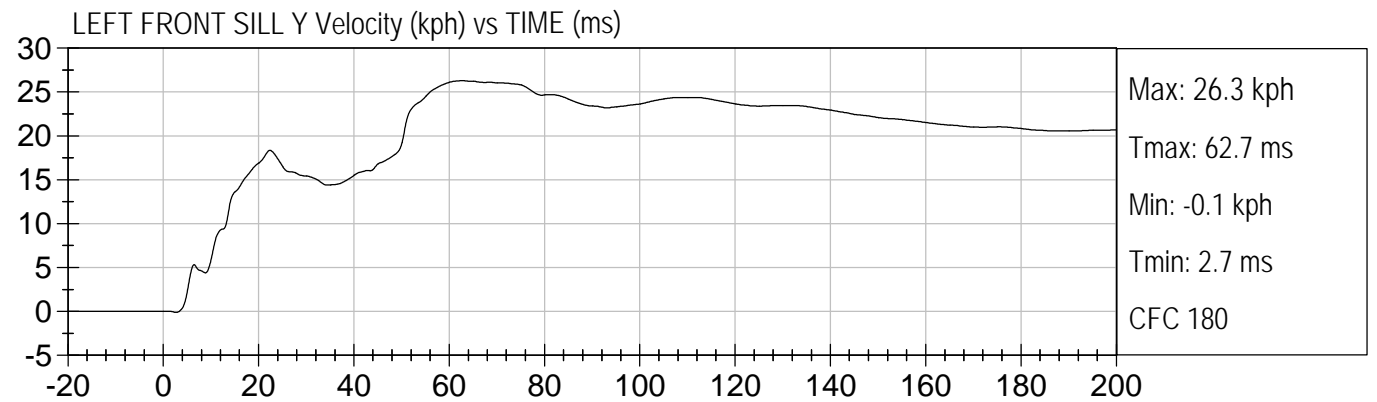
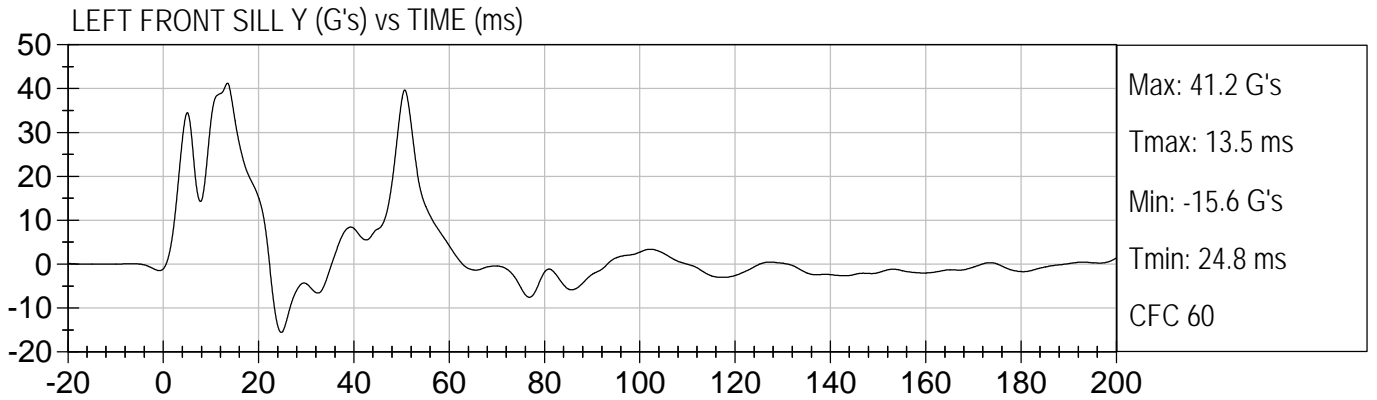


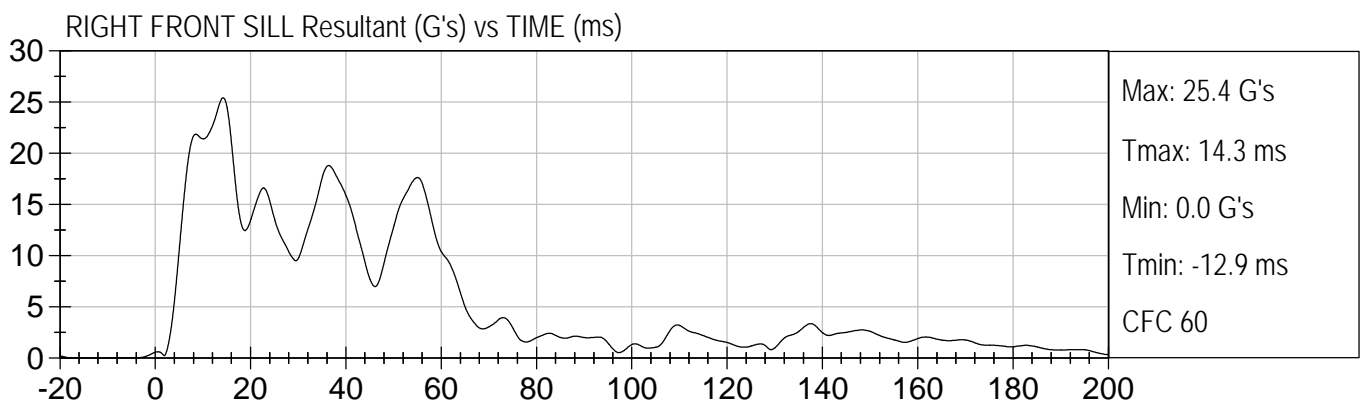
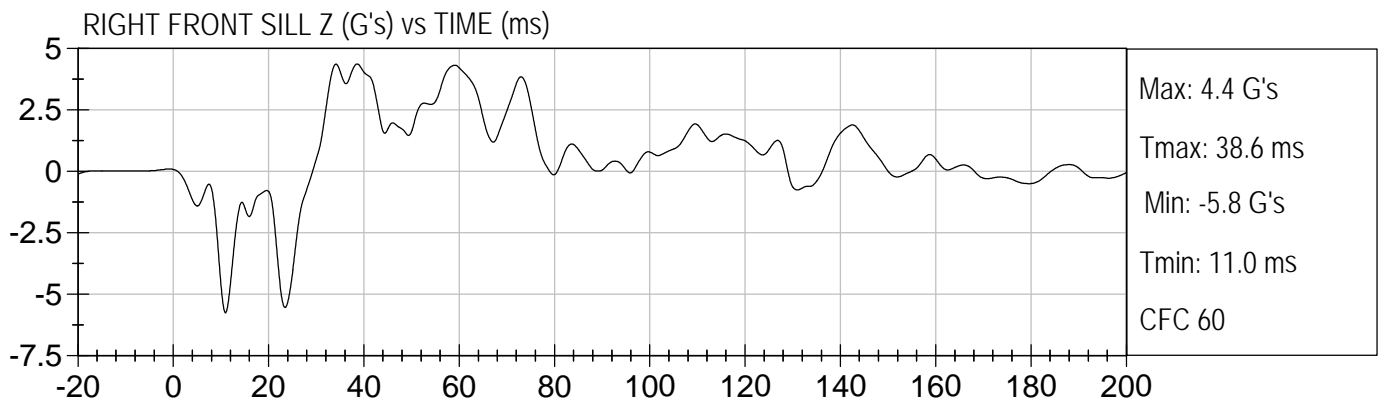
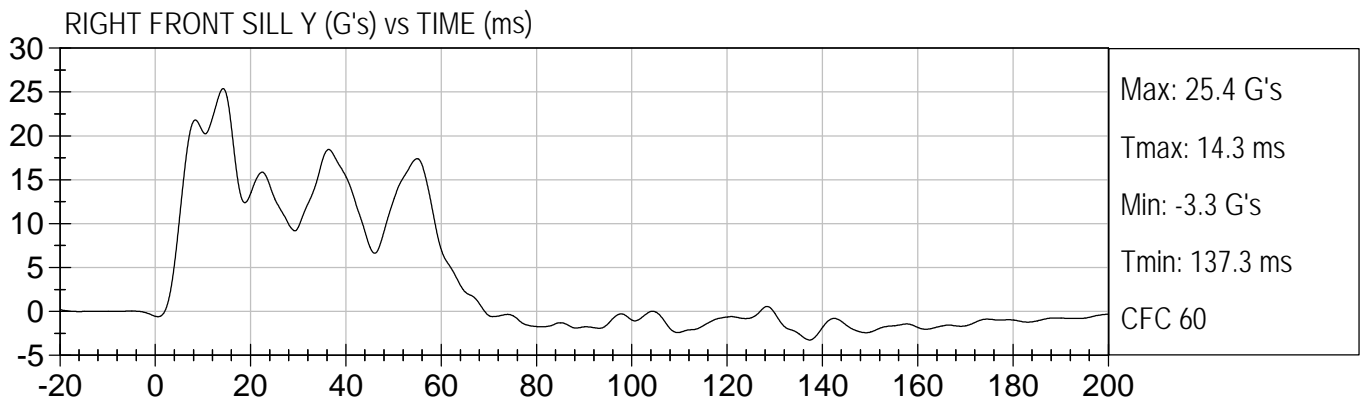
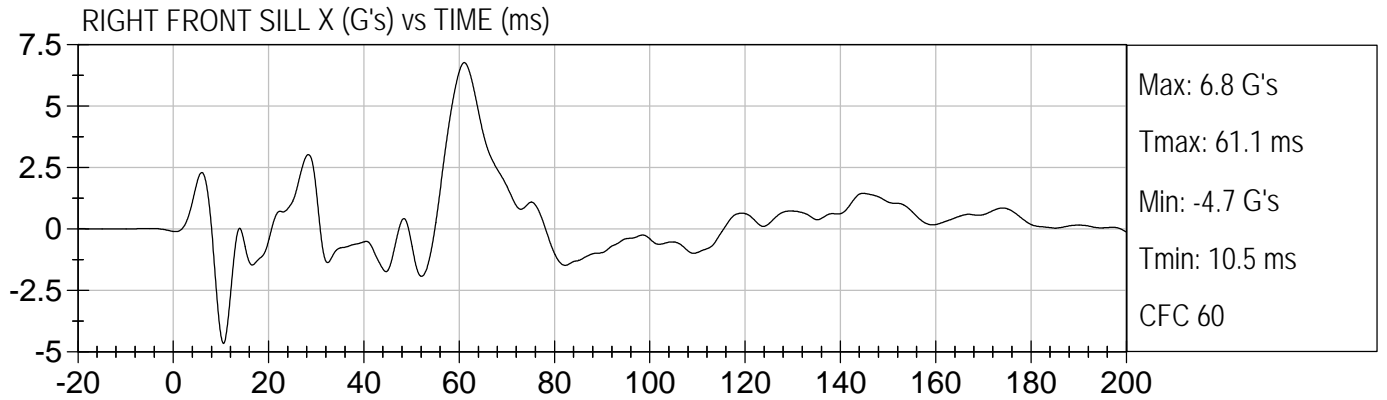


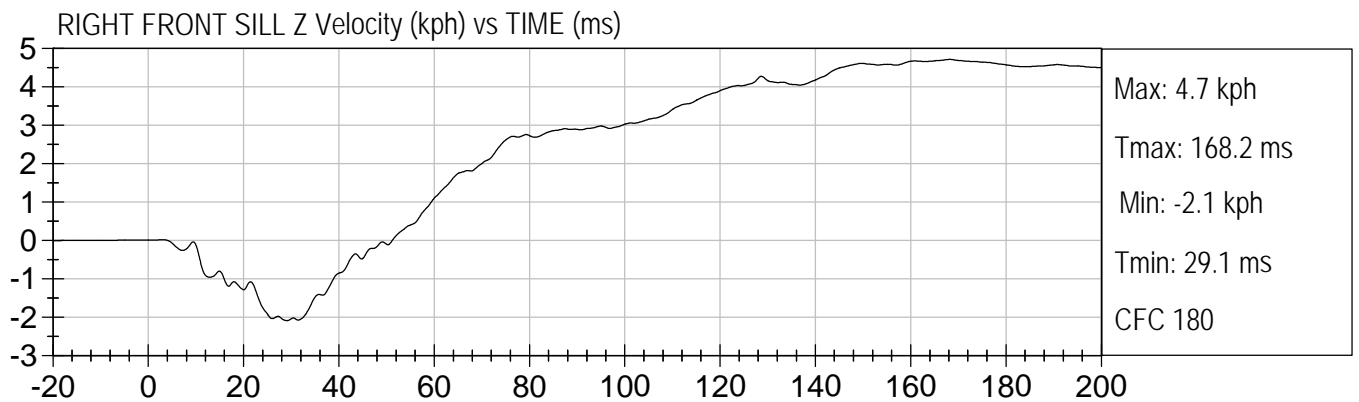
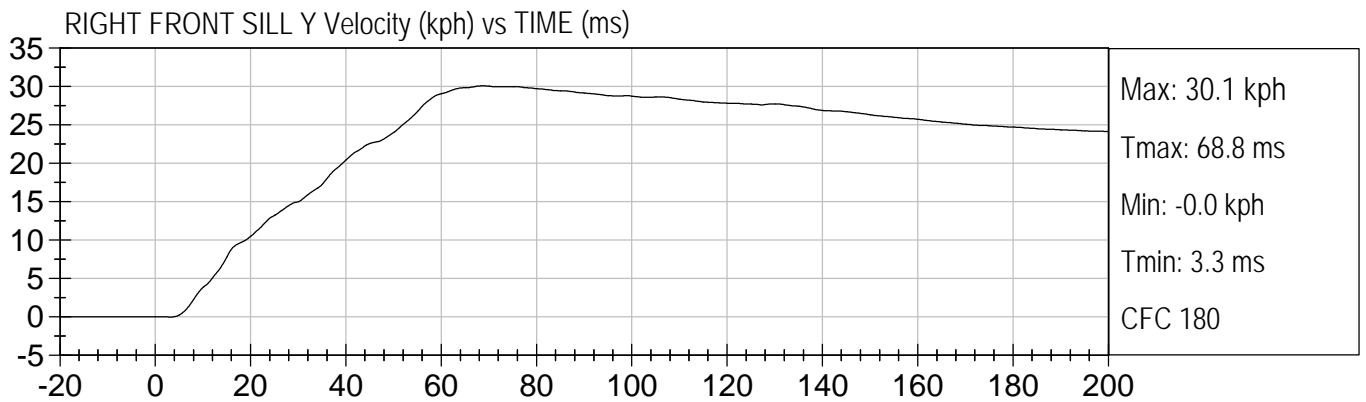
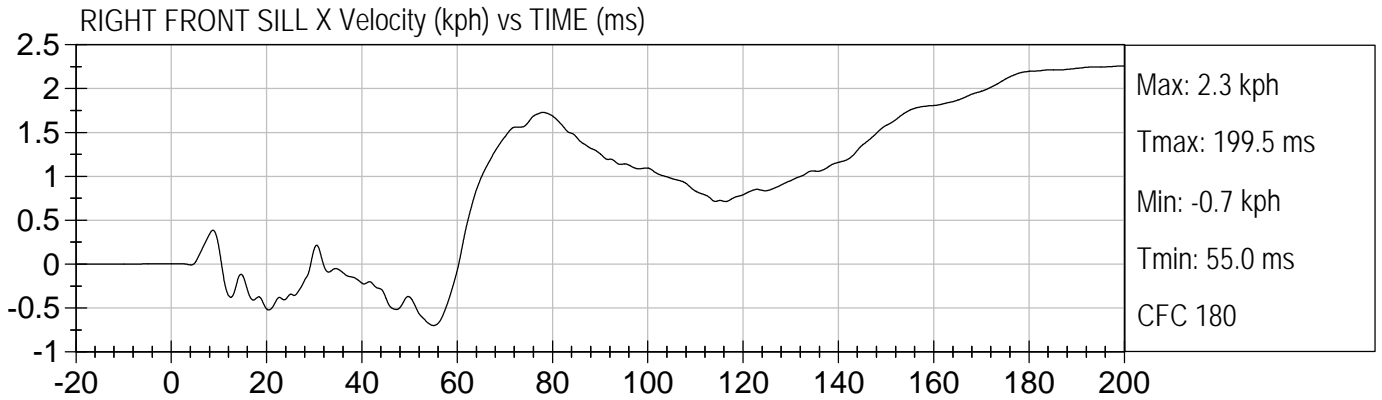


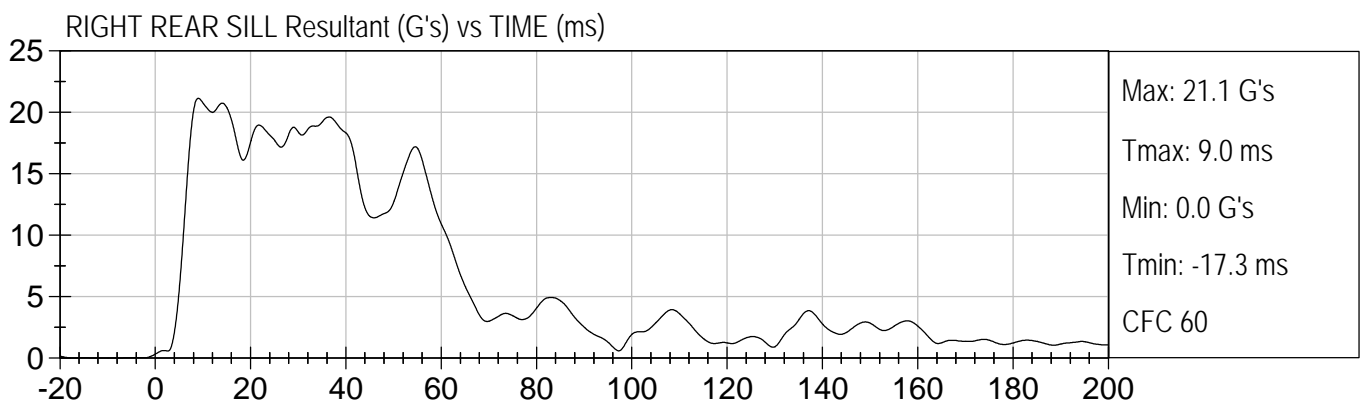
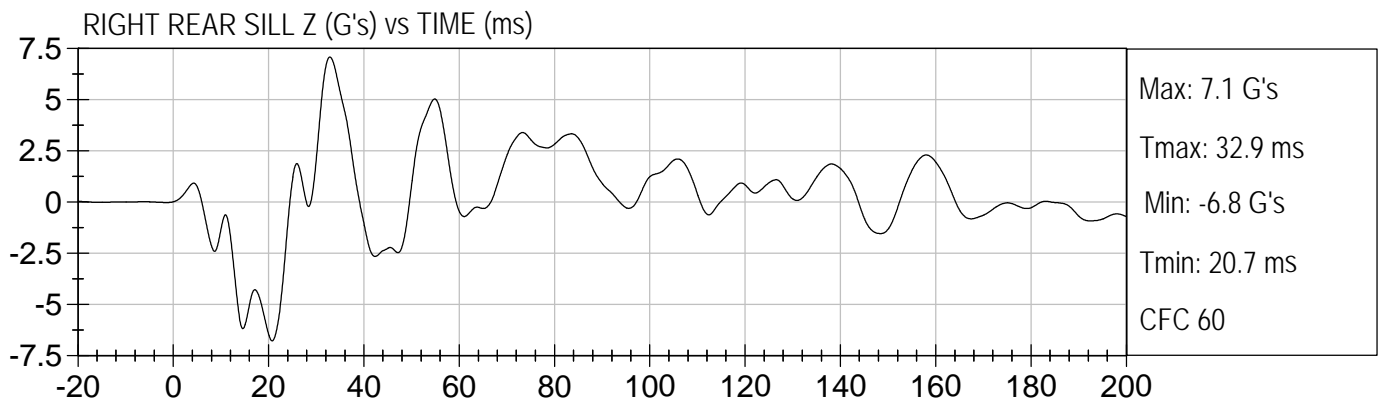
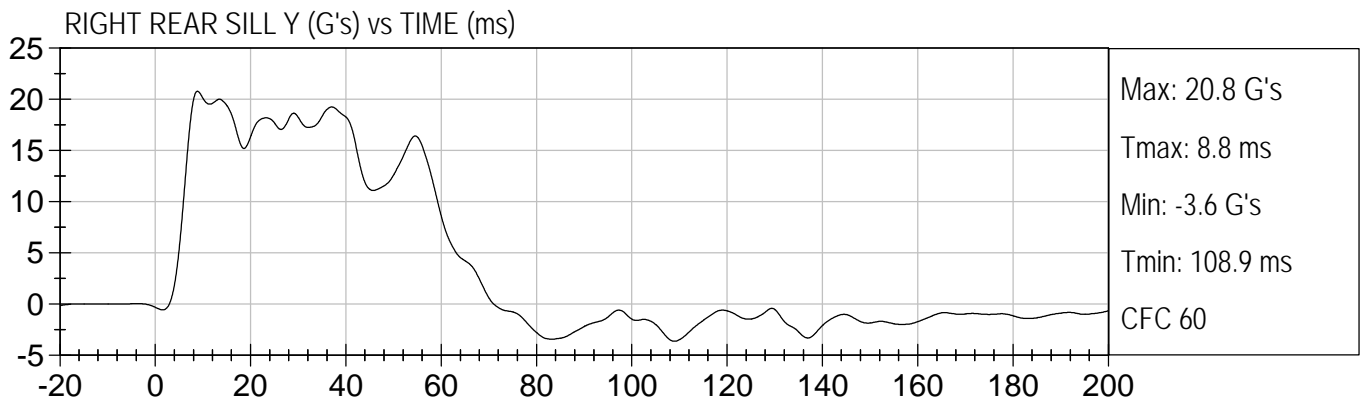
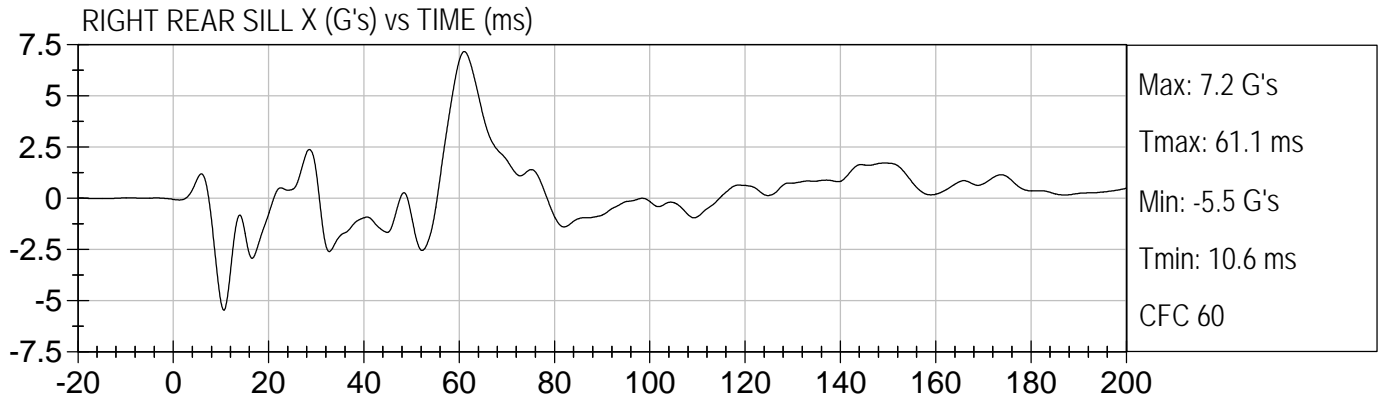


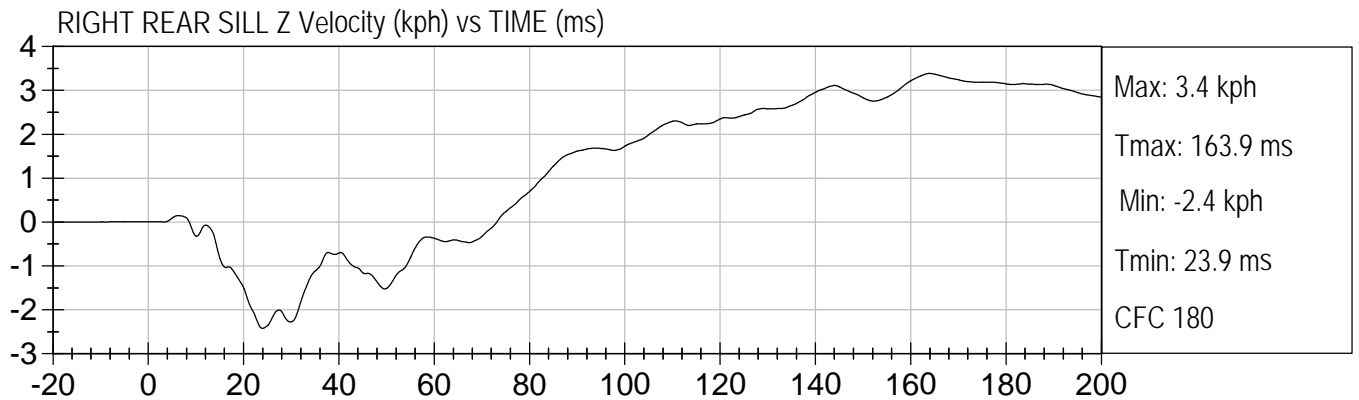
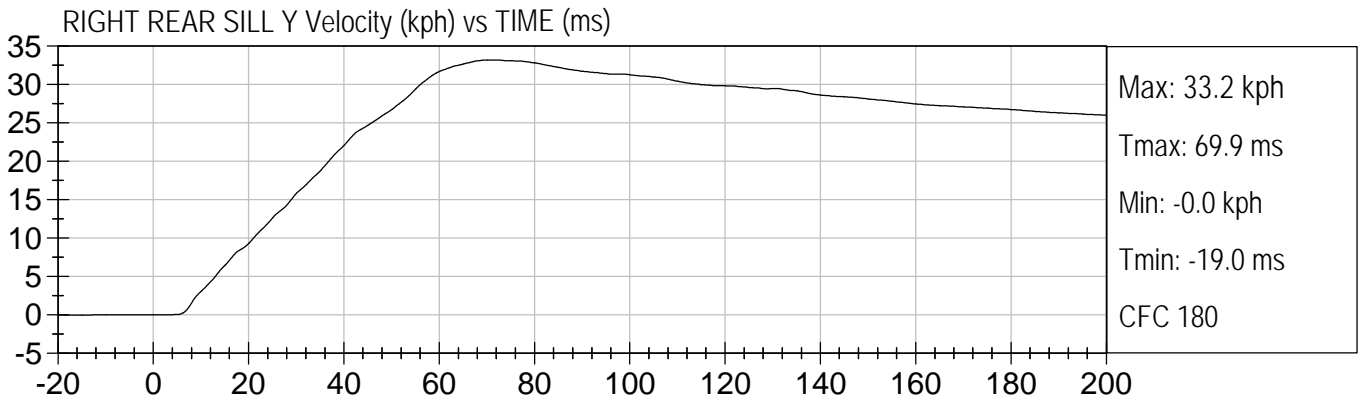
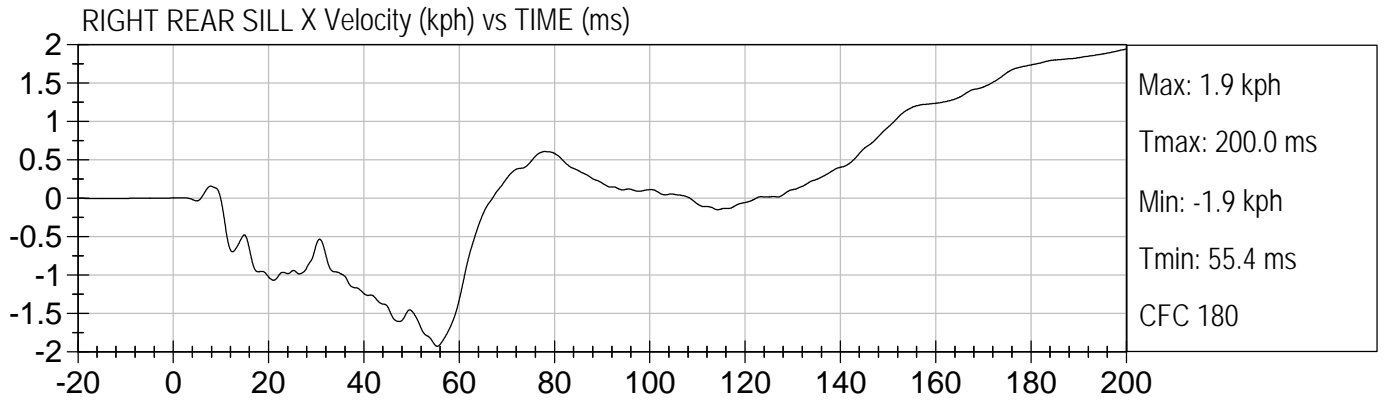


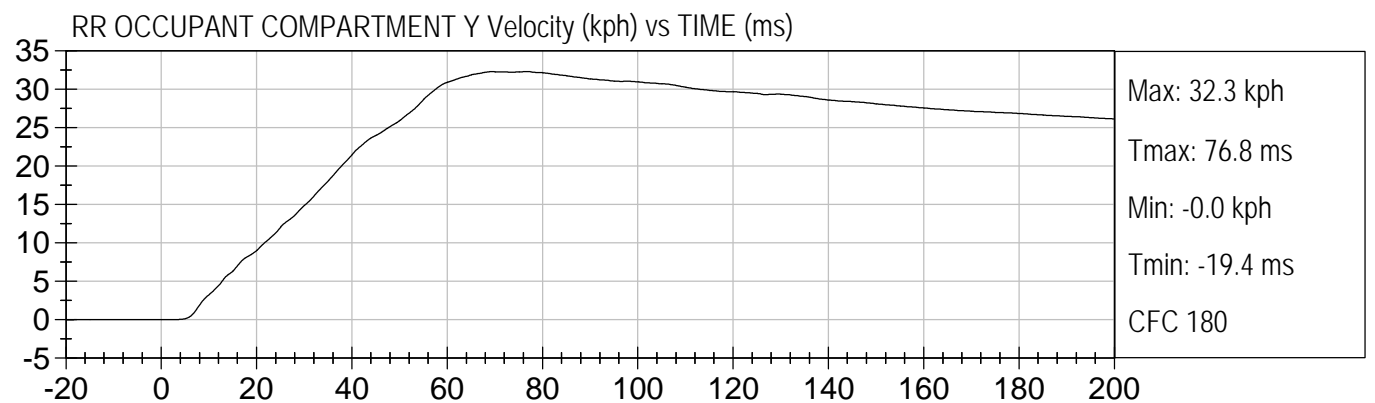
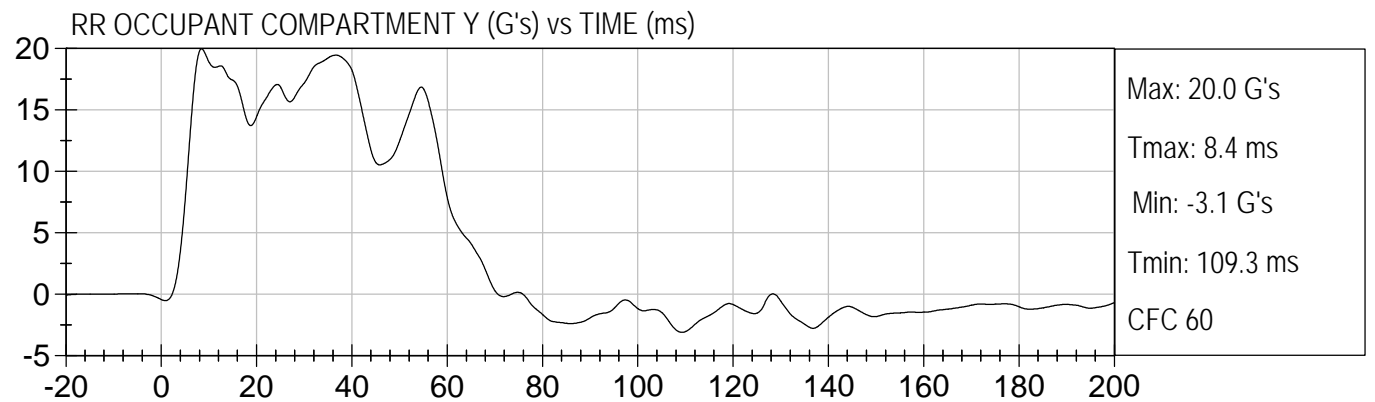
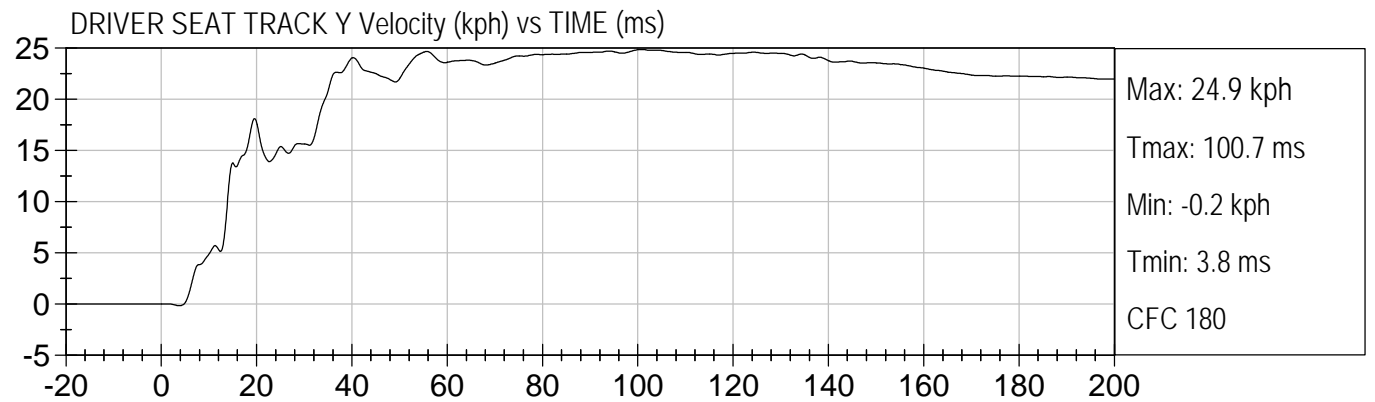
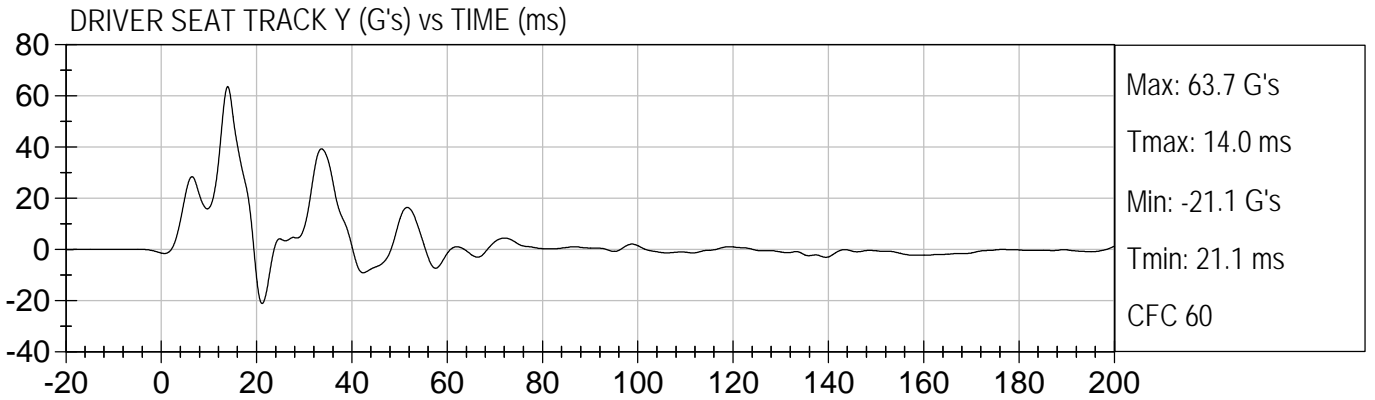


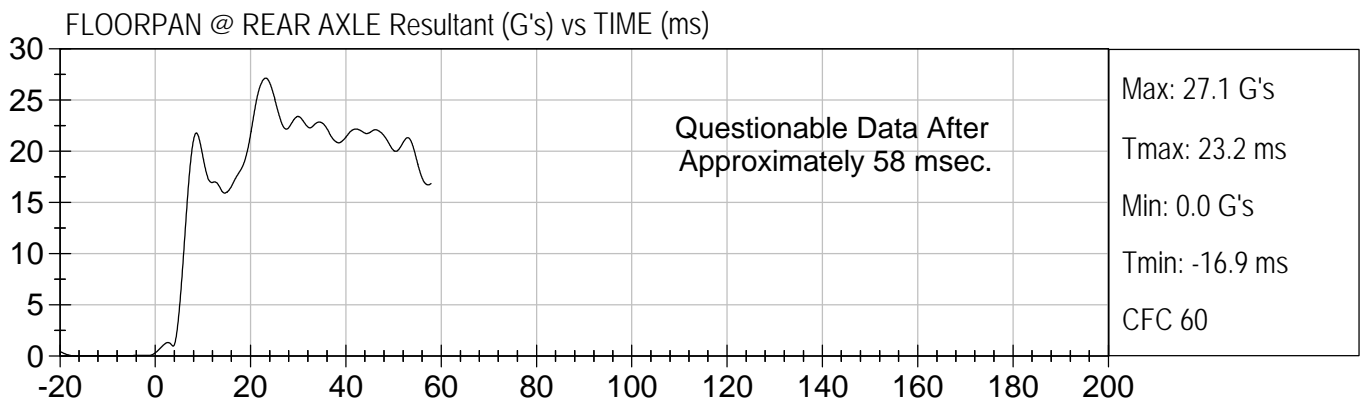
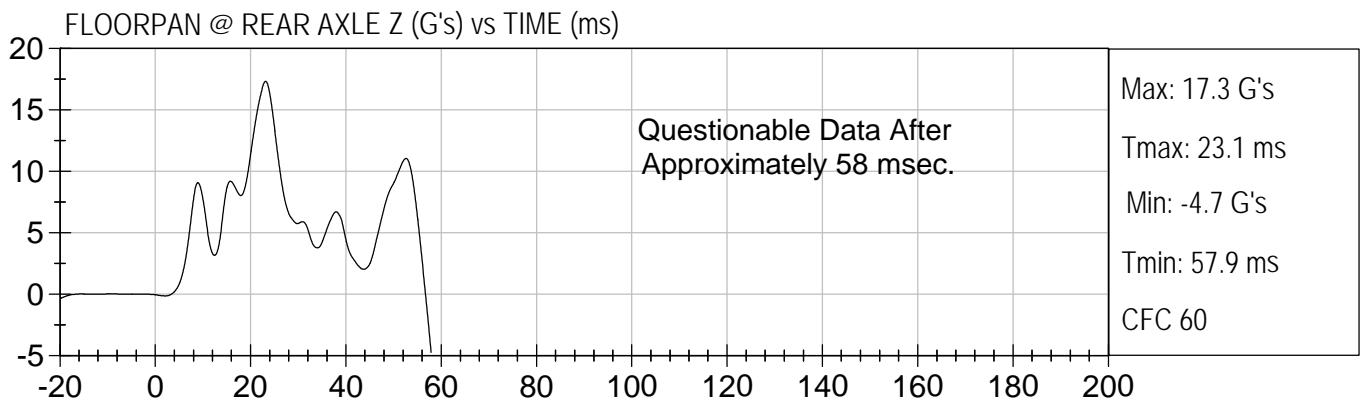
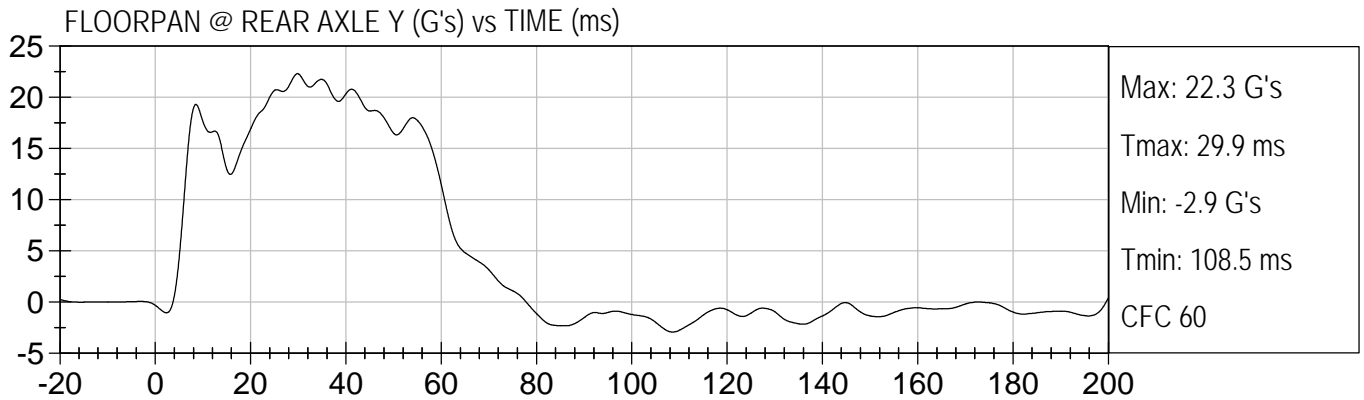
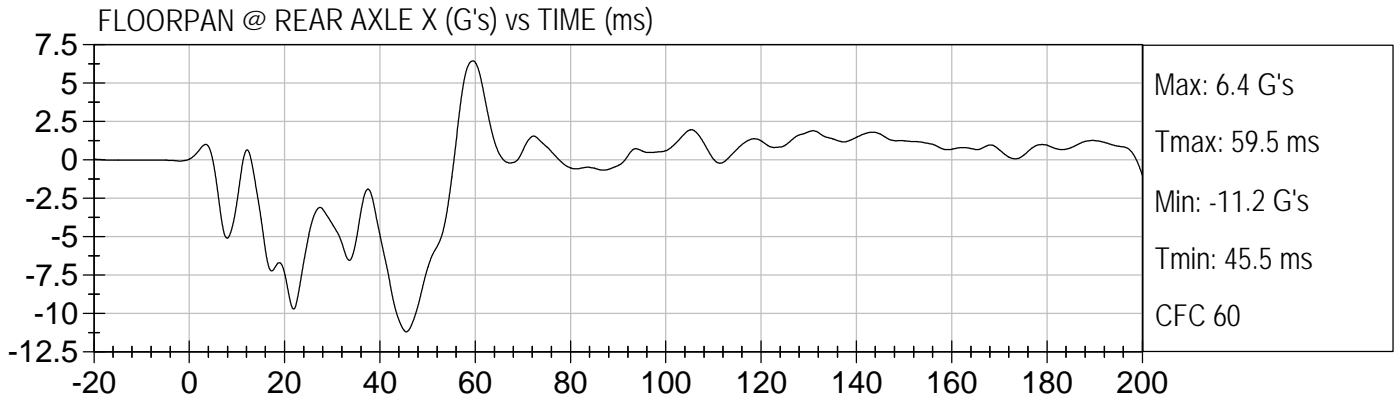


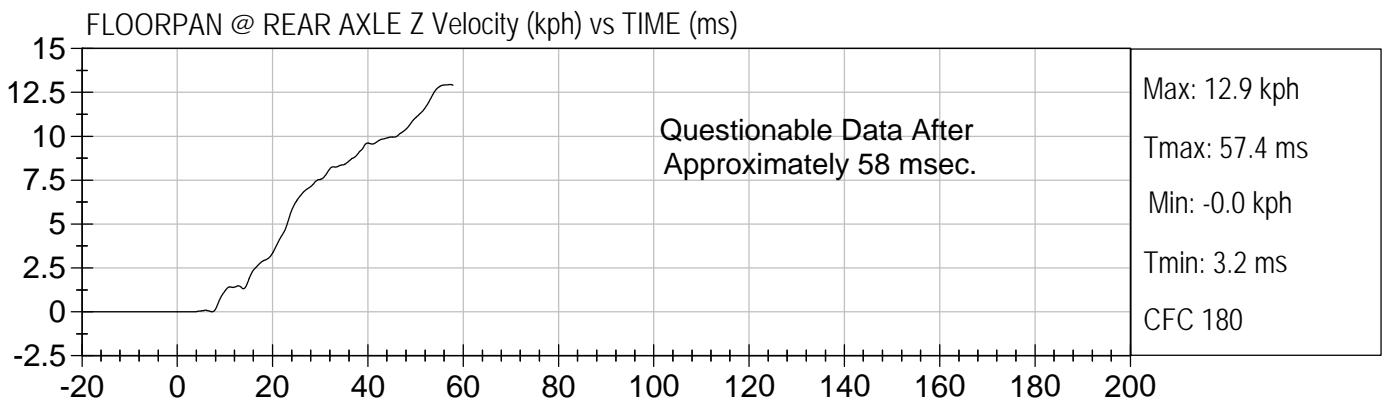
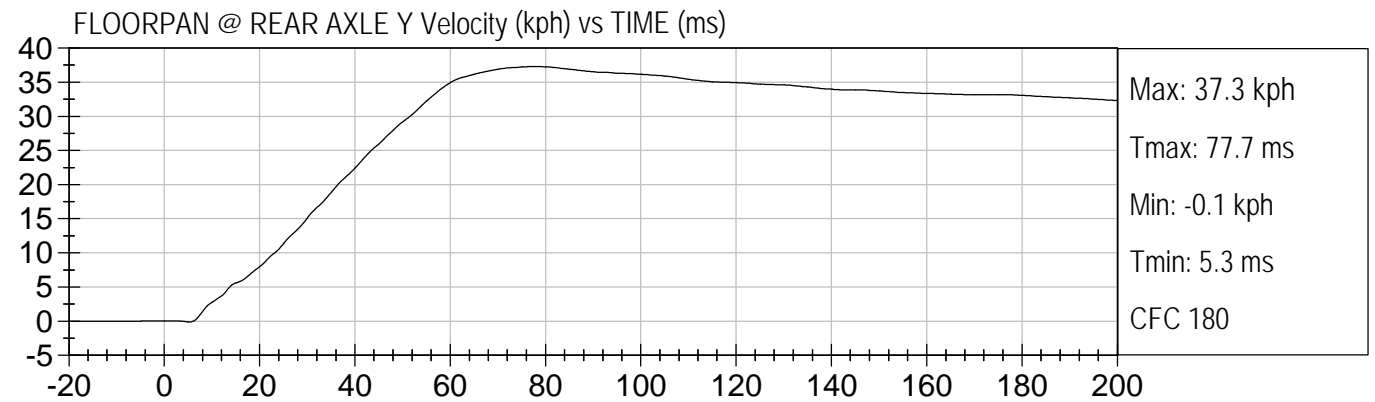
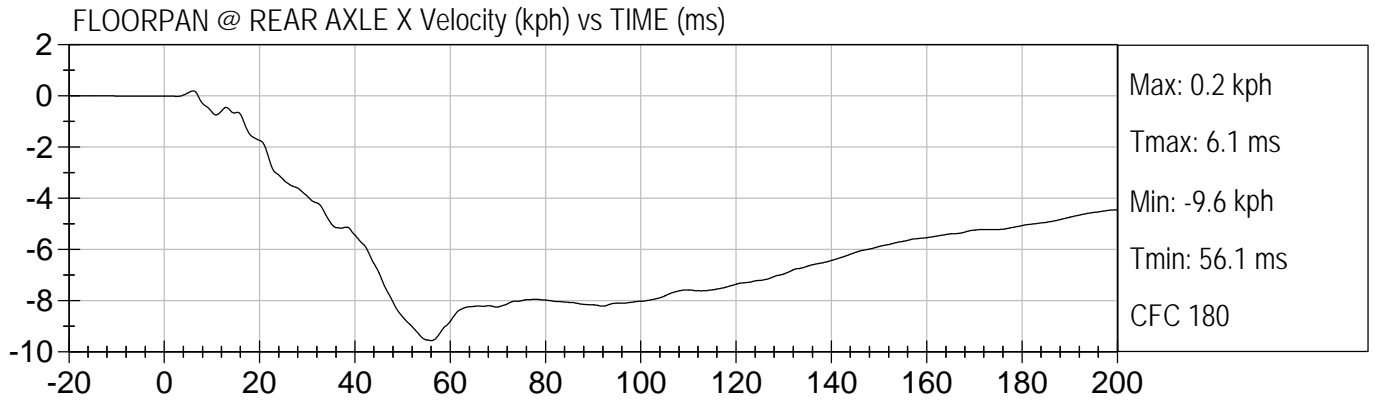


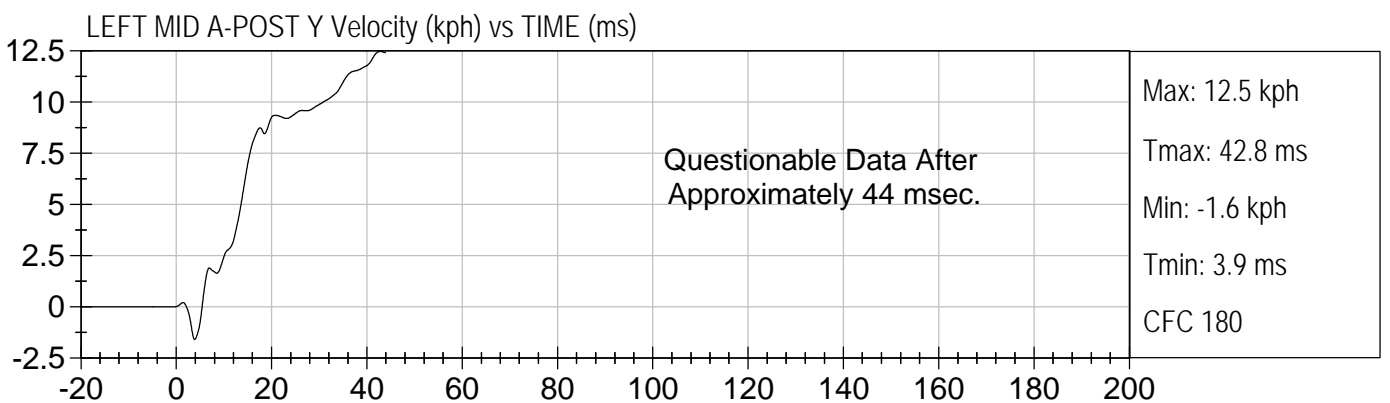
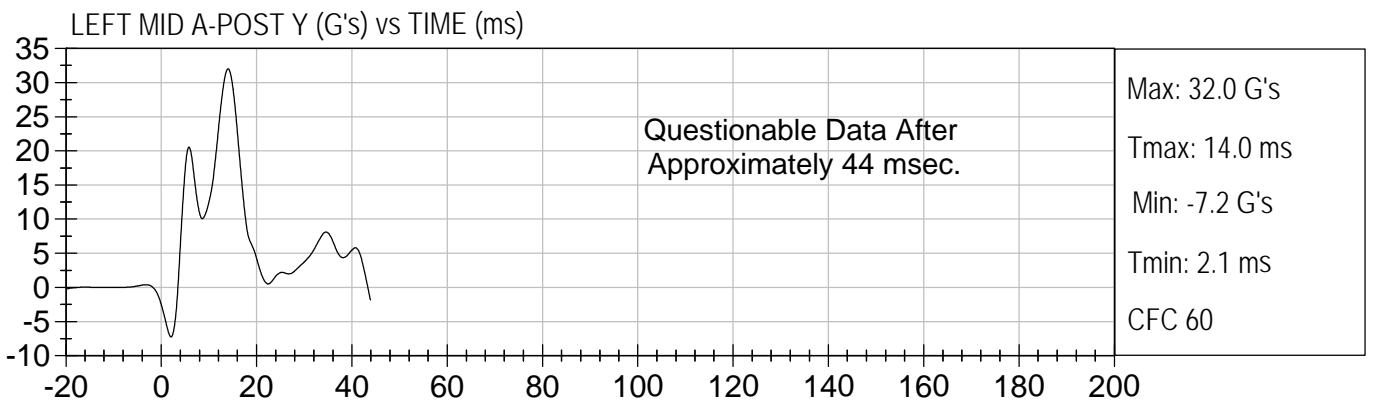
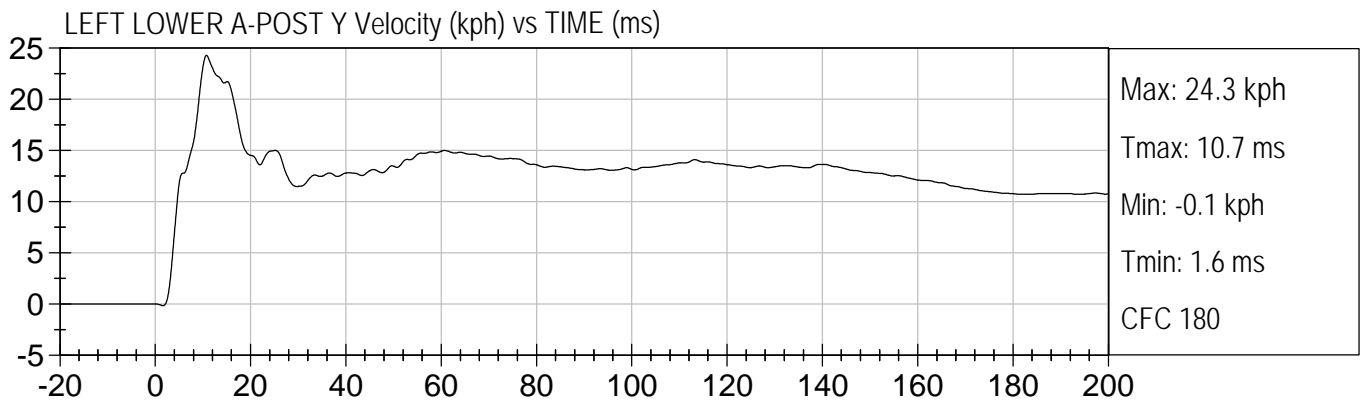
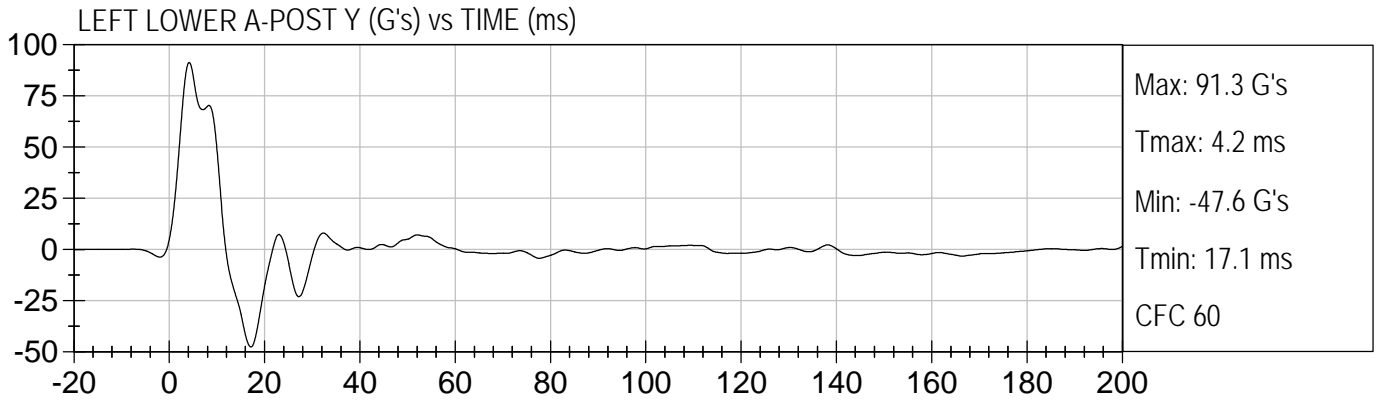


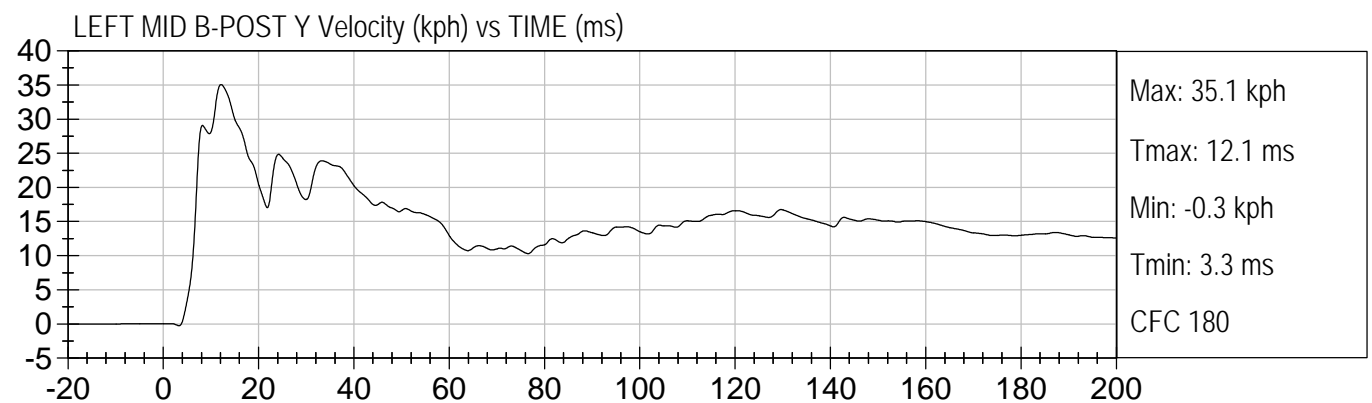
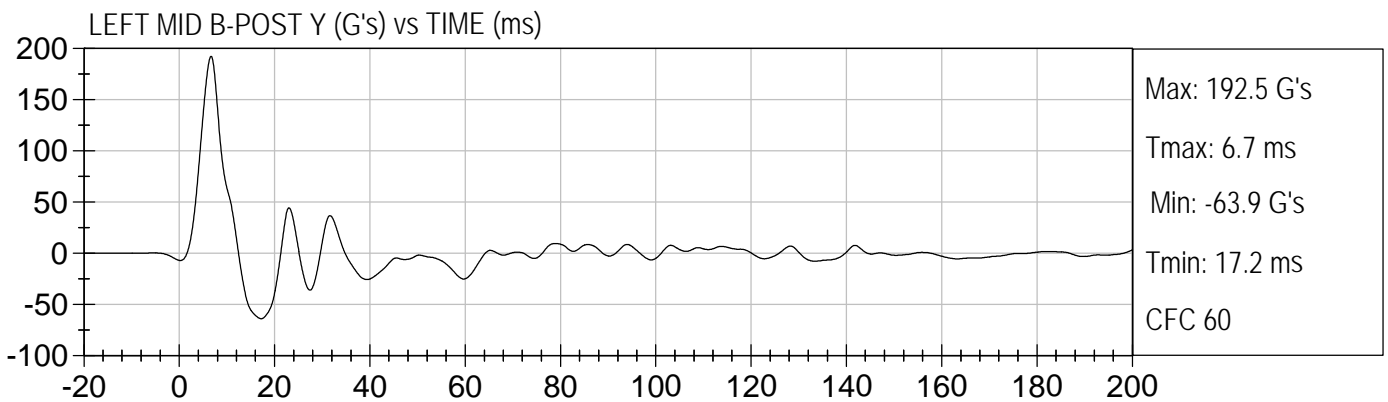
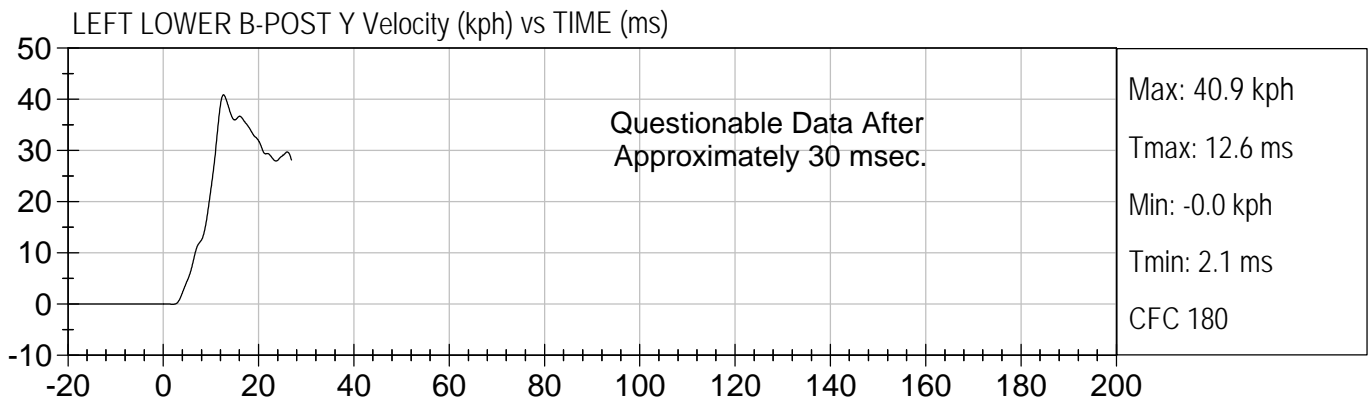
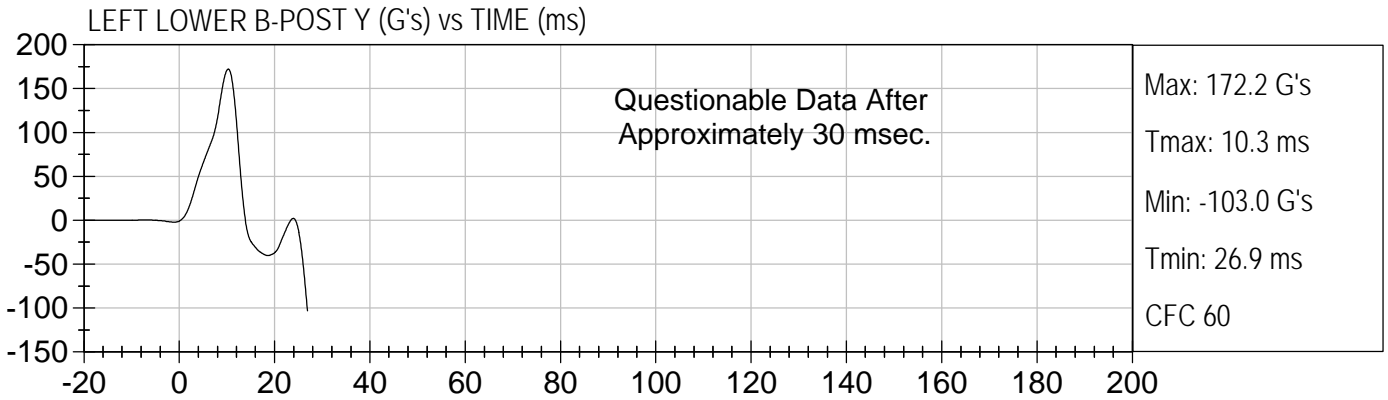


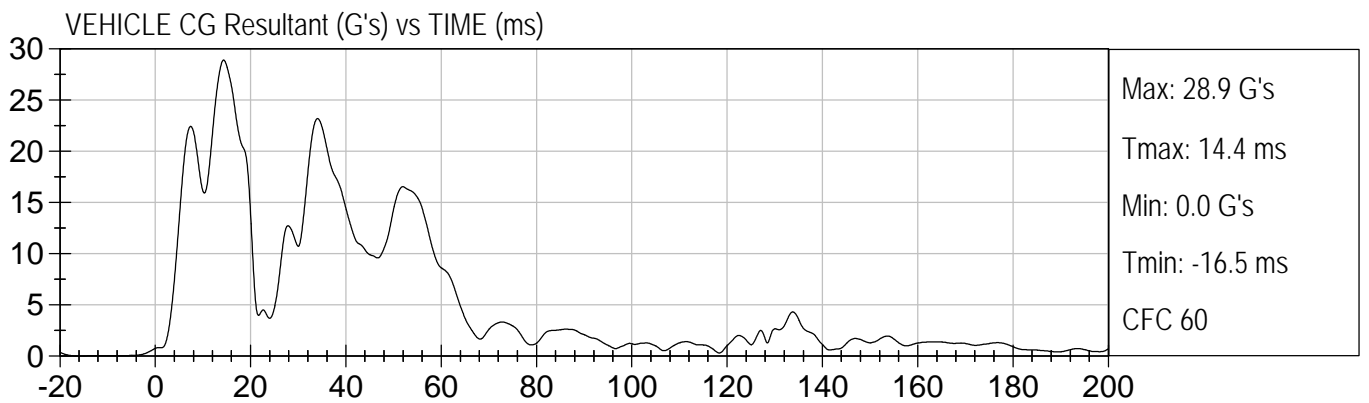
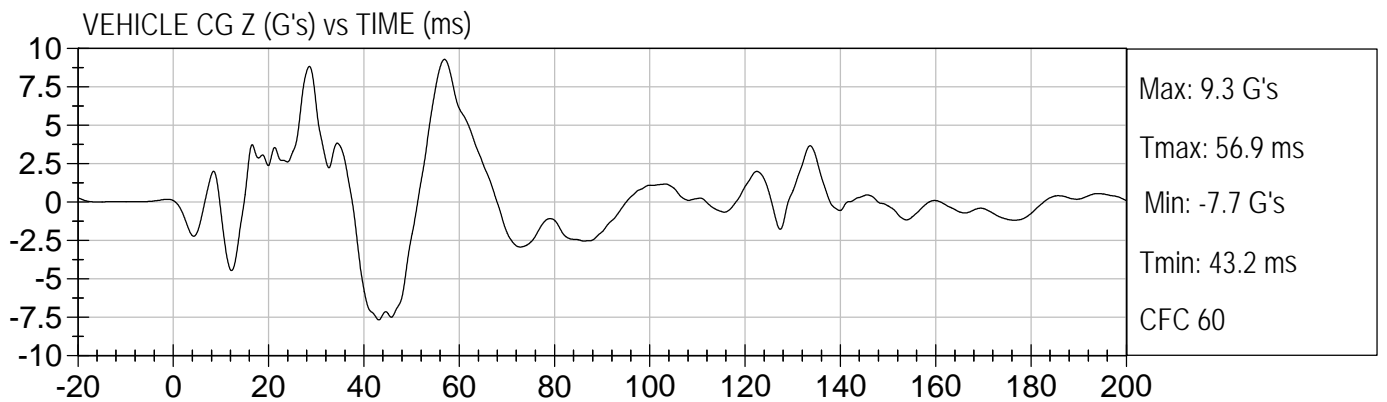
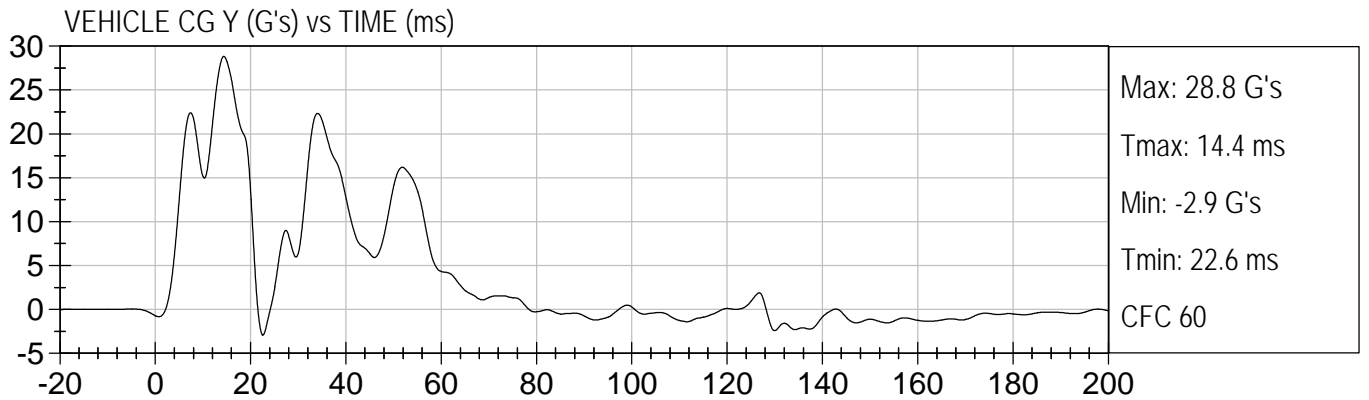
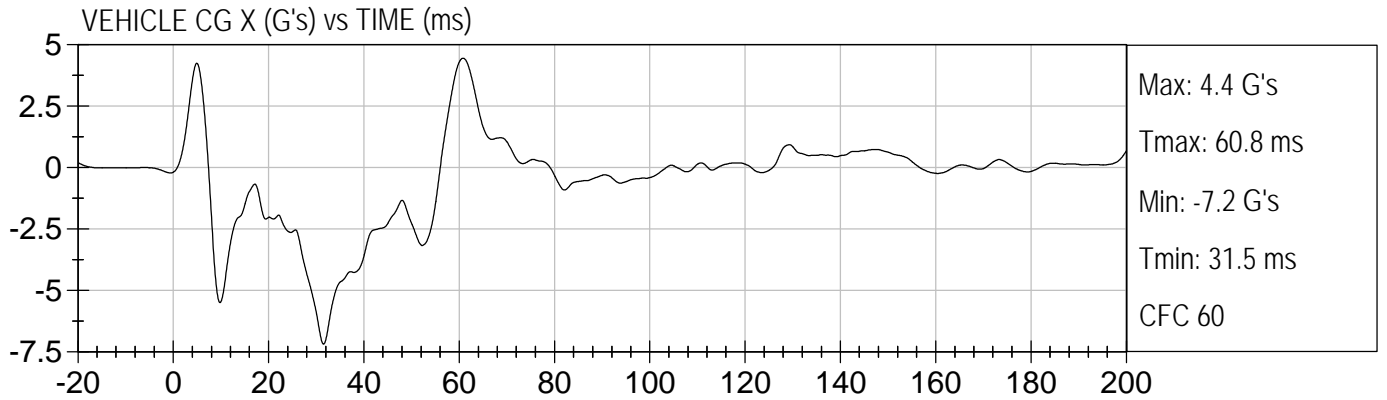






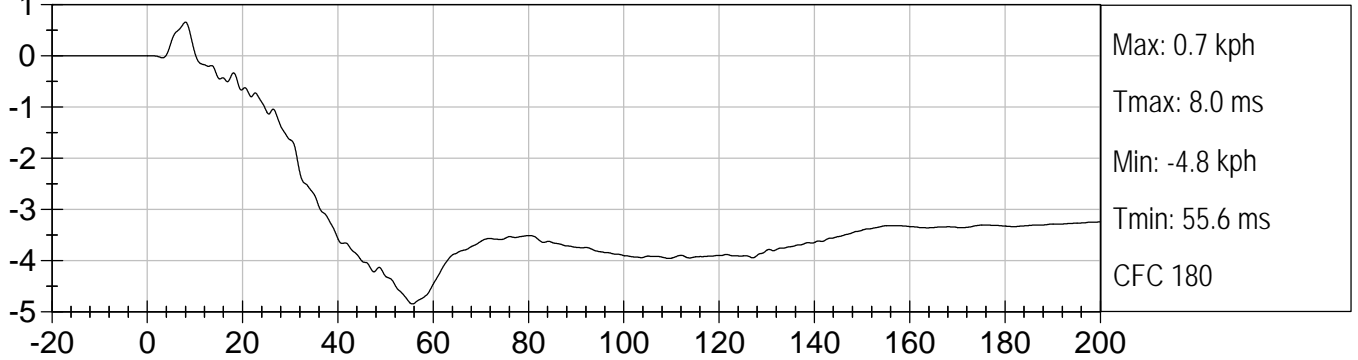




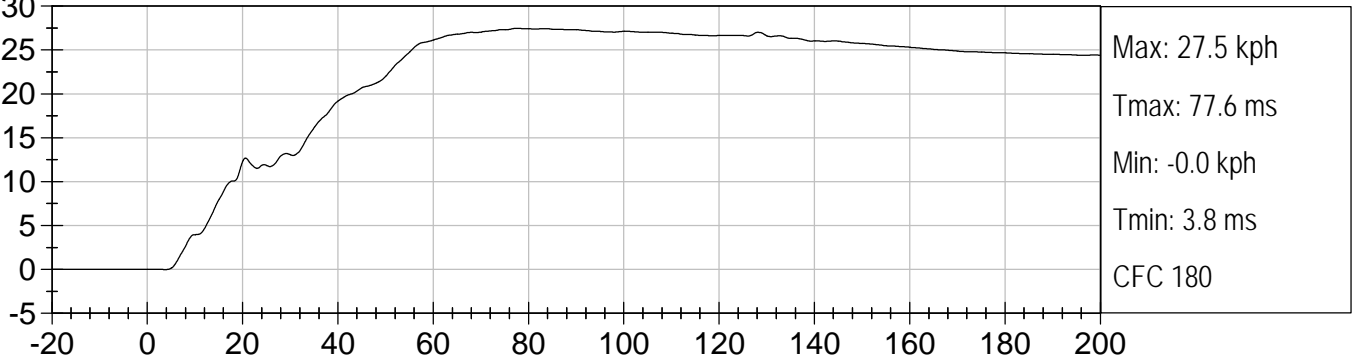




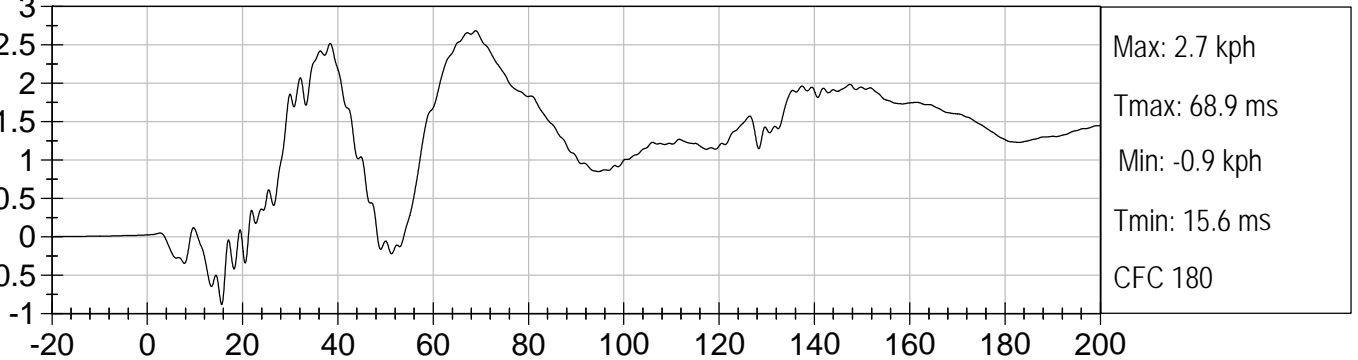
VEHICLE CG X Velocity (kph) vs TIME (ms)

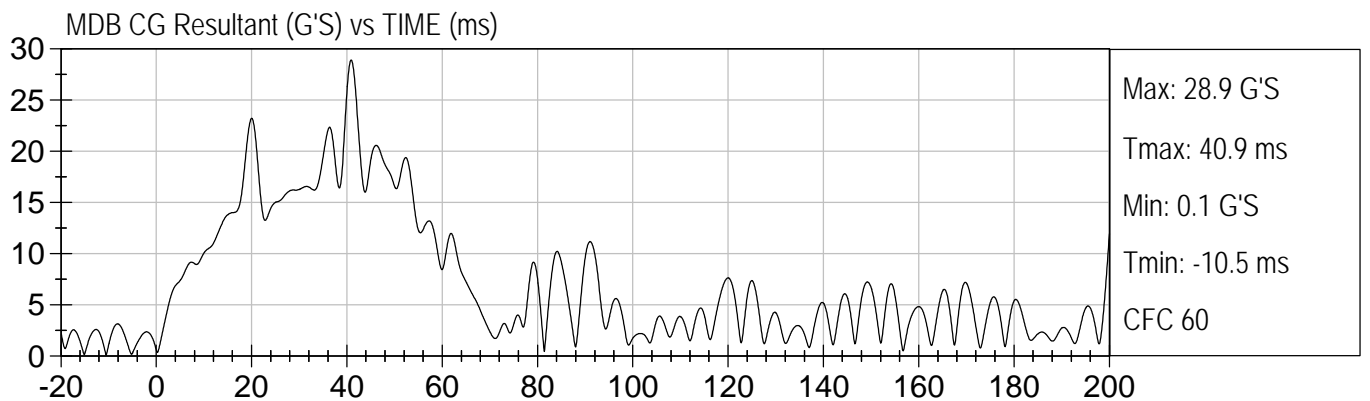
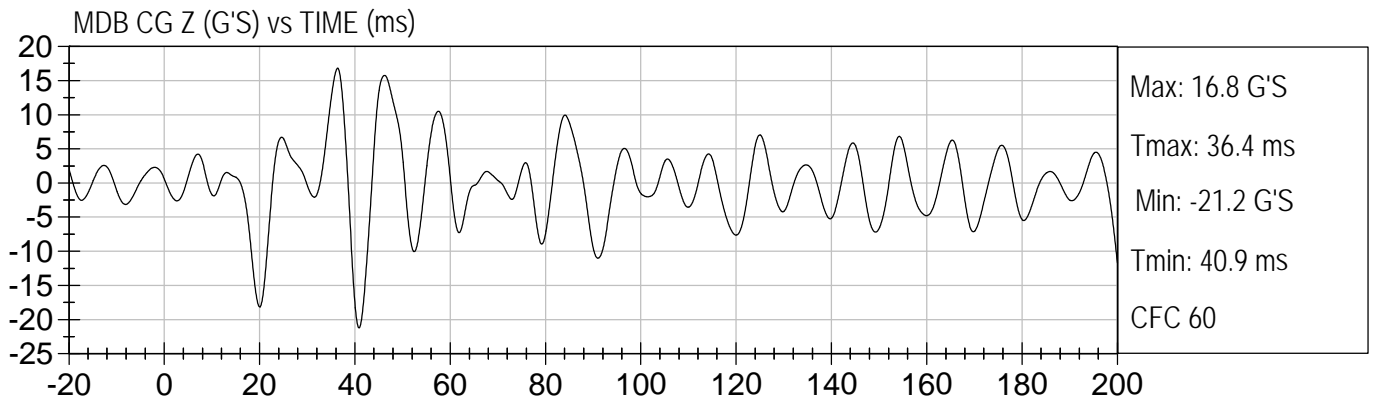
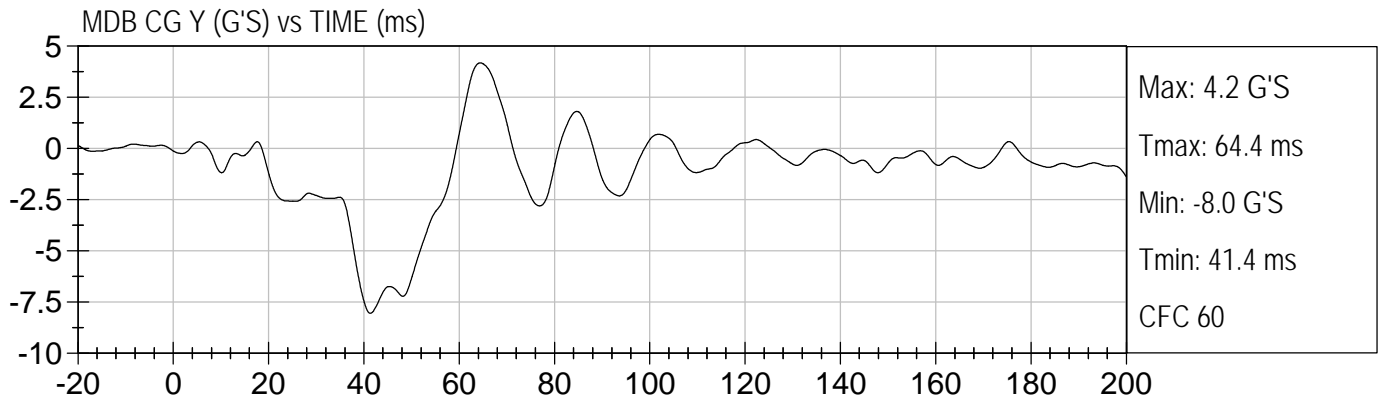
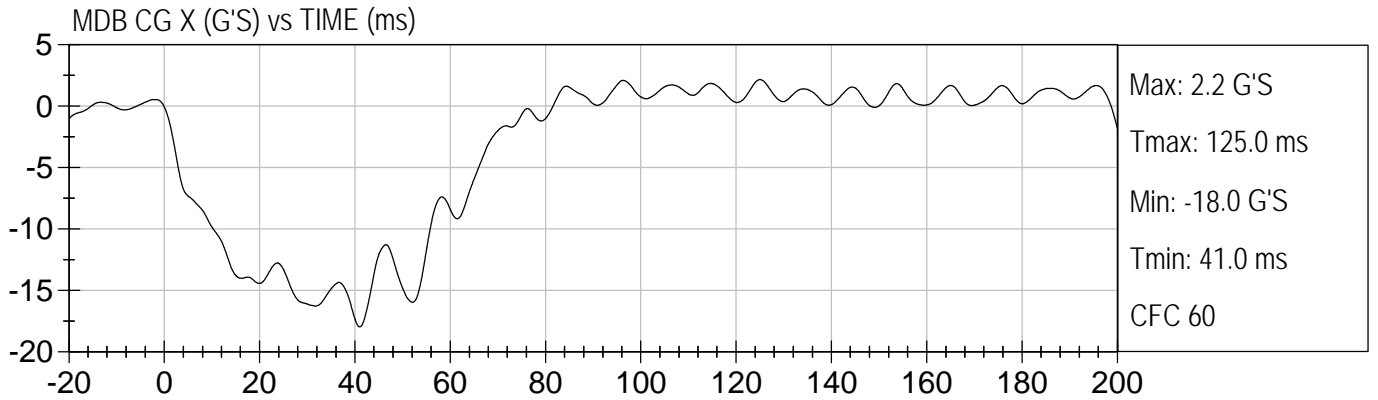


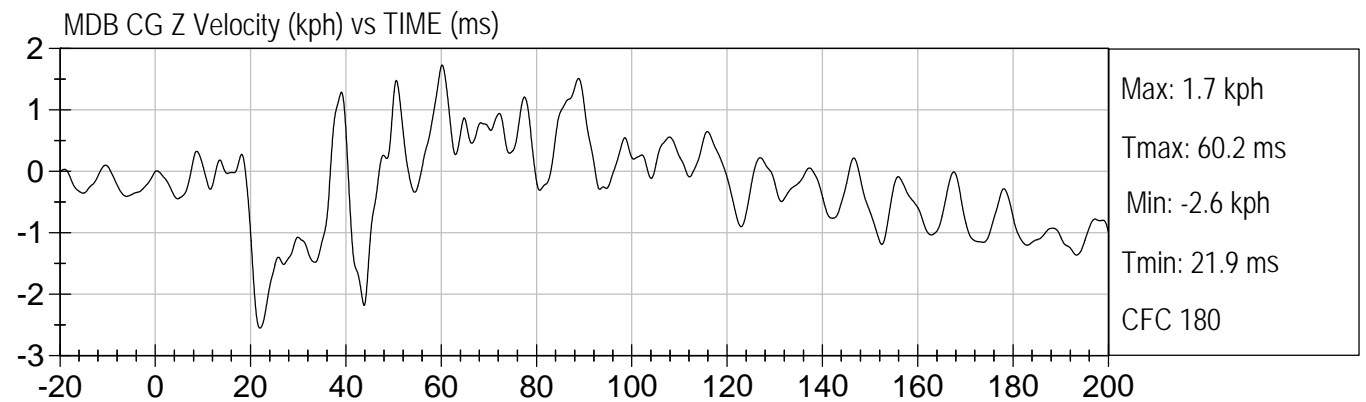
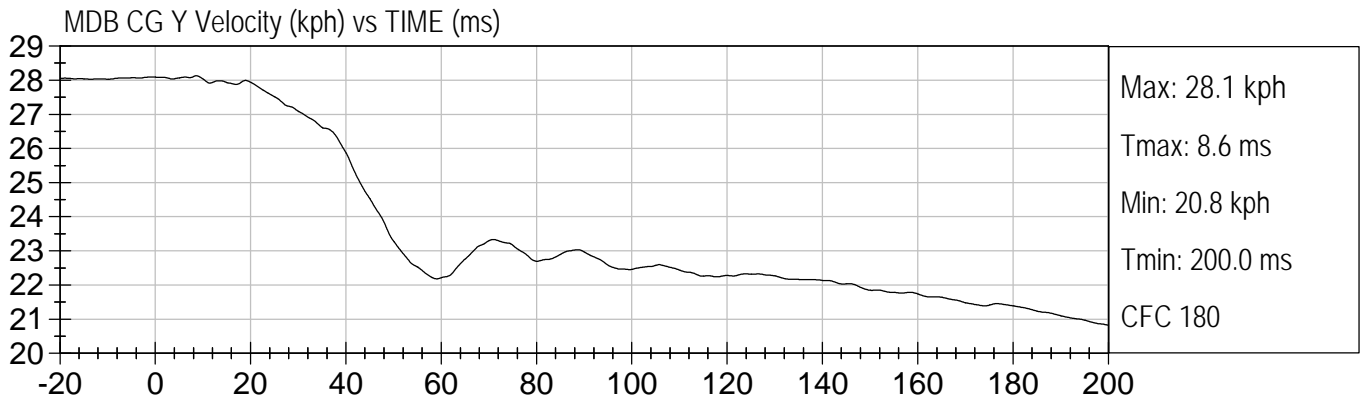
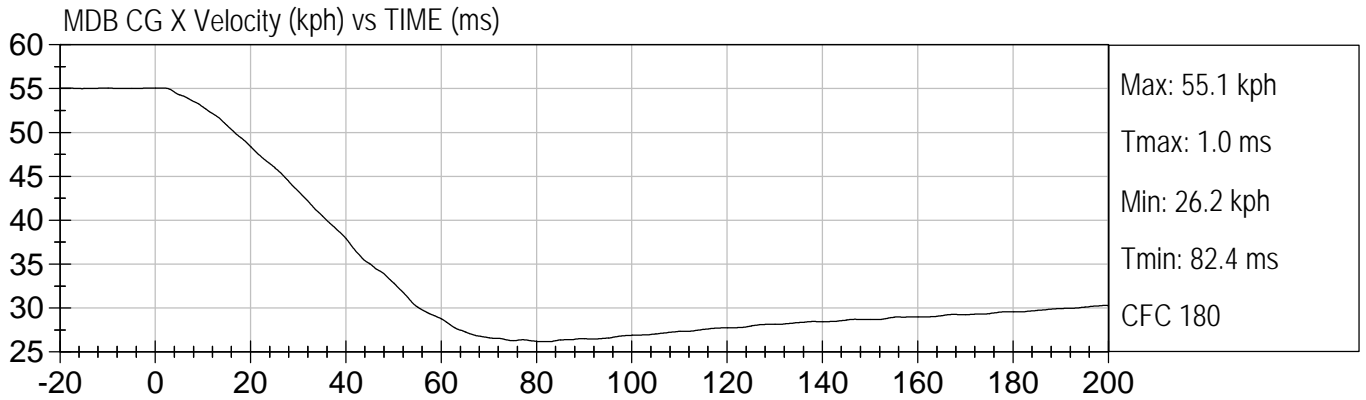
VEHICLE CG Y Velocity (kph) vs TIME (ms)

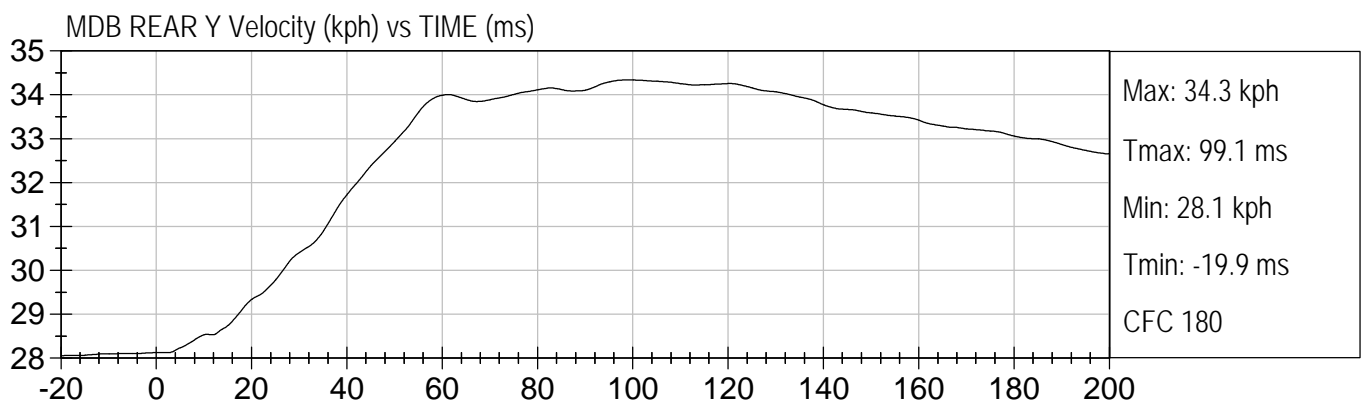
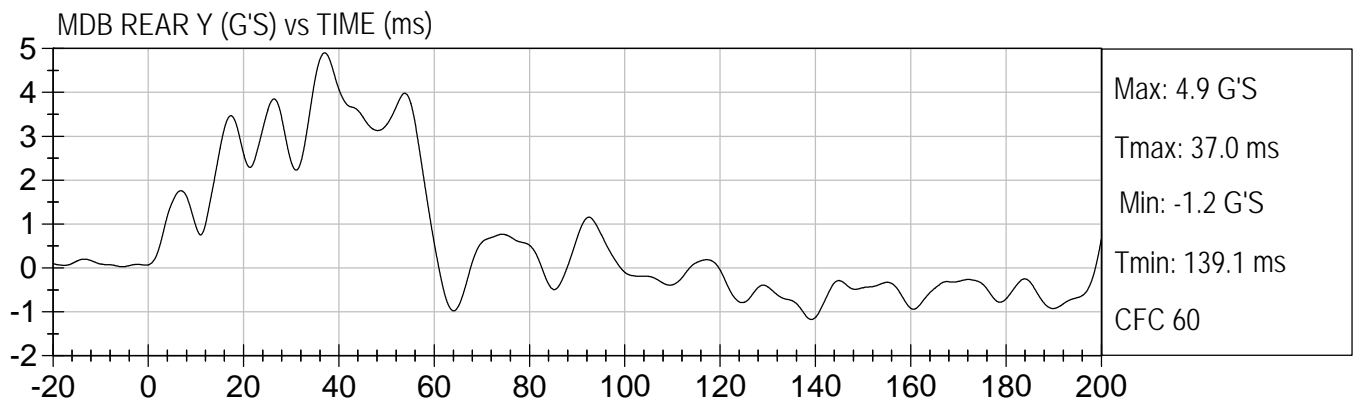
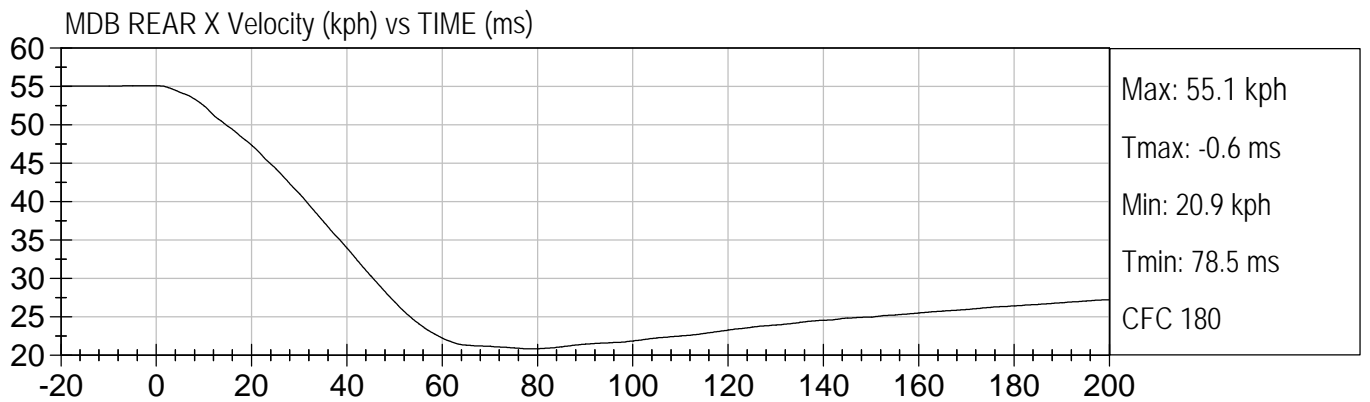
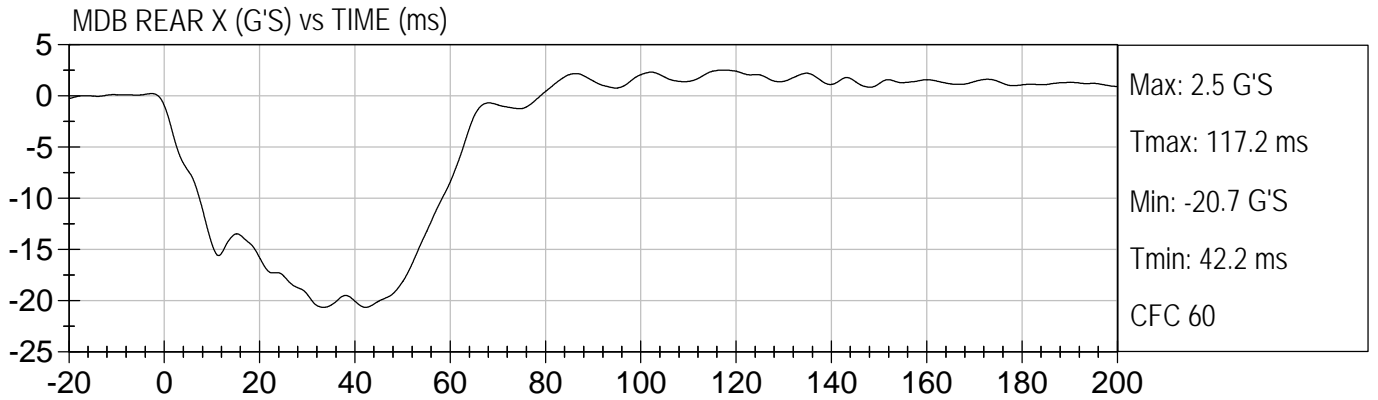


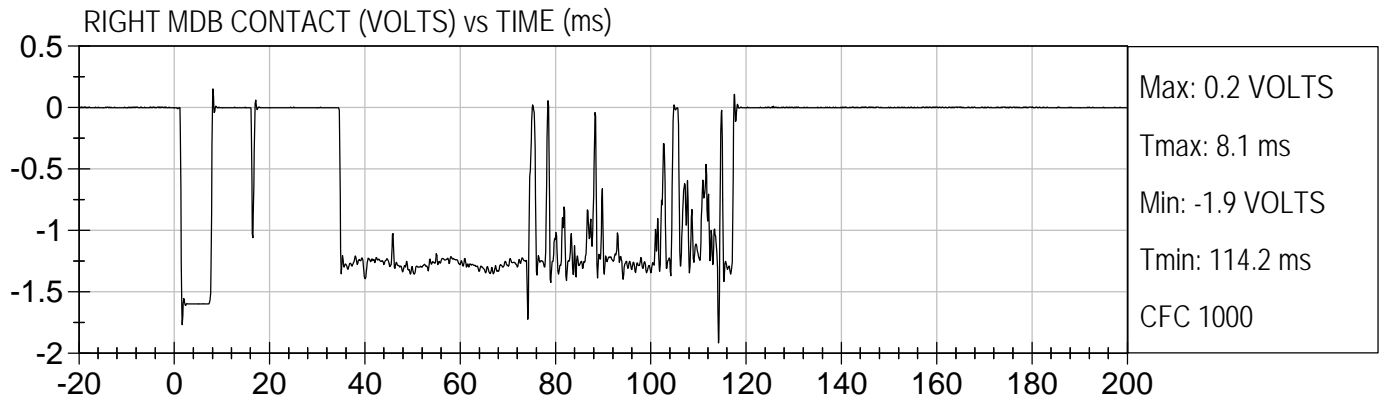
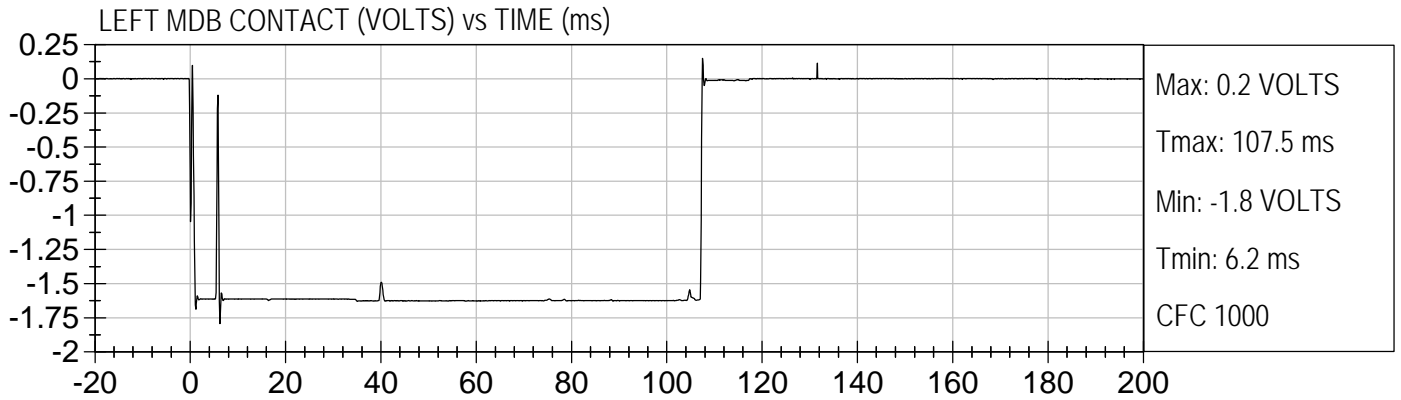
VEHICLE CG Z Velocity (kph) vs TIME (ms)

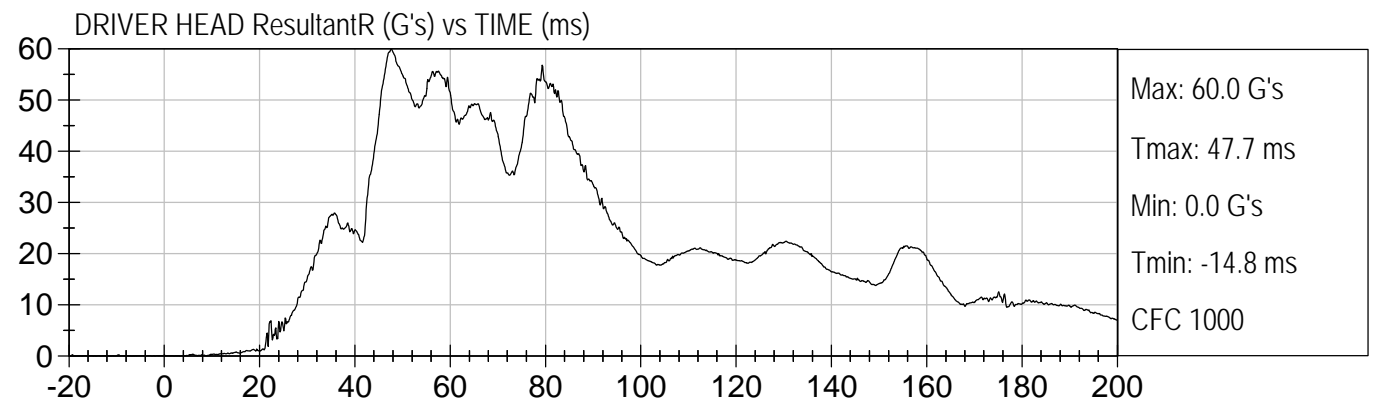
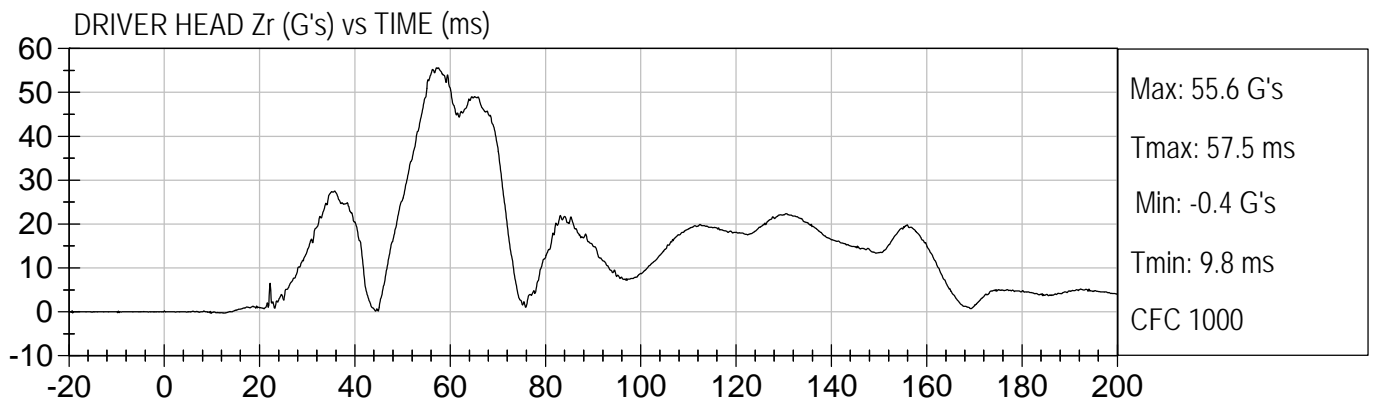
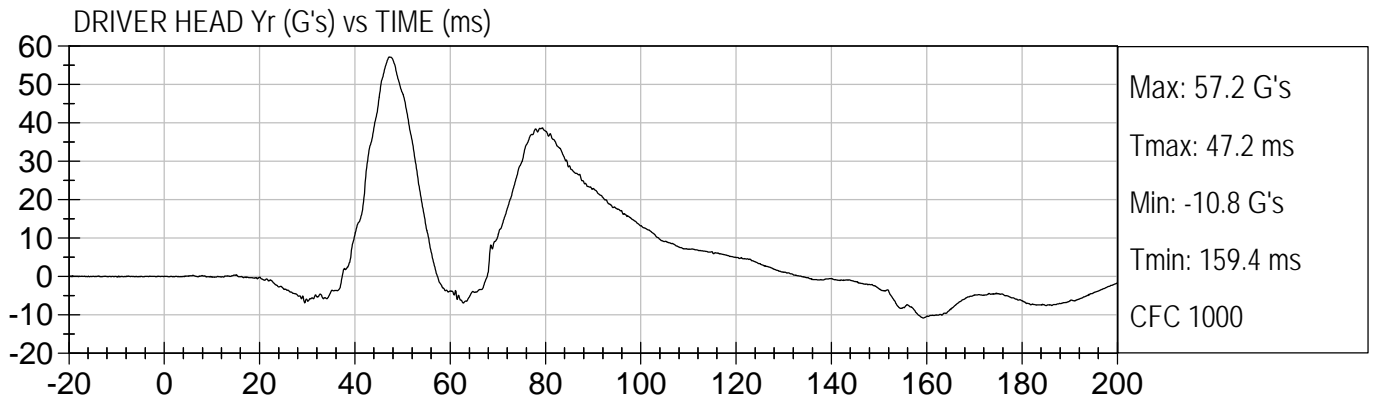
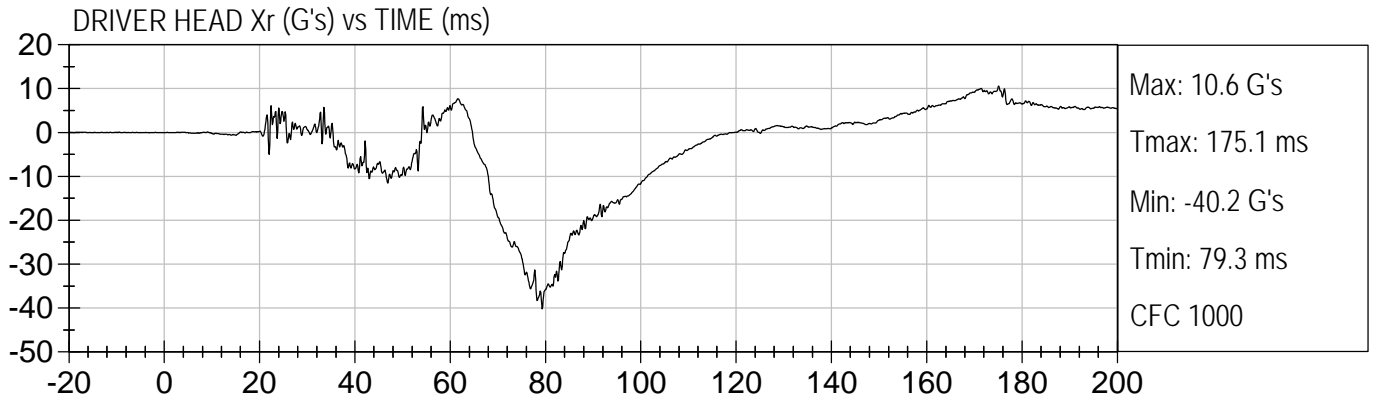


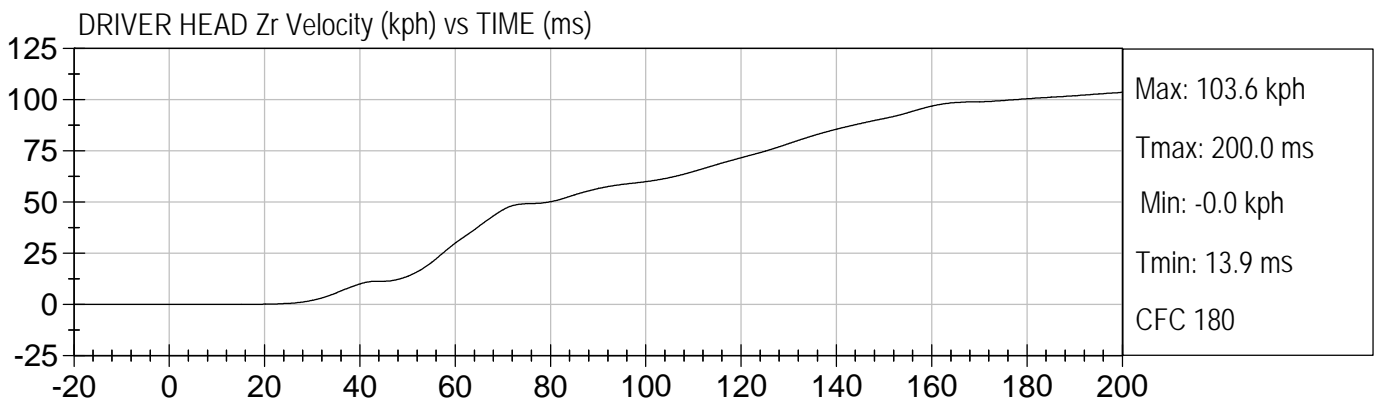
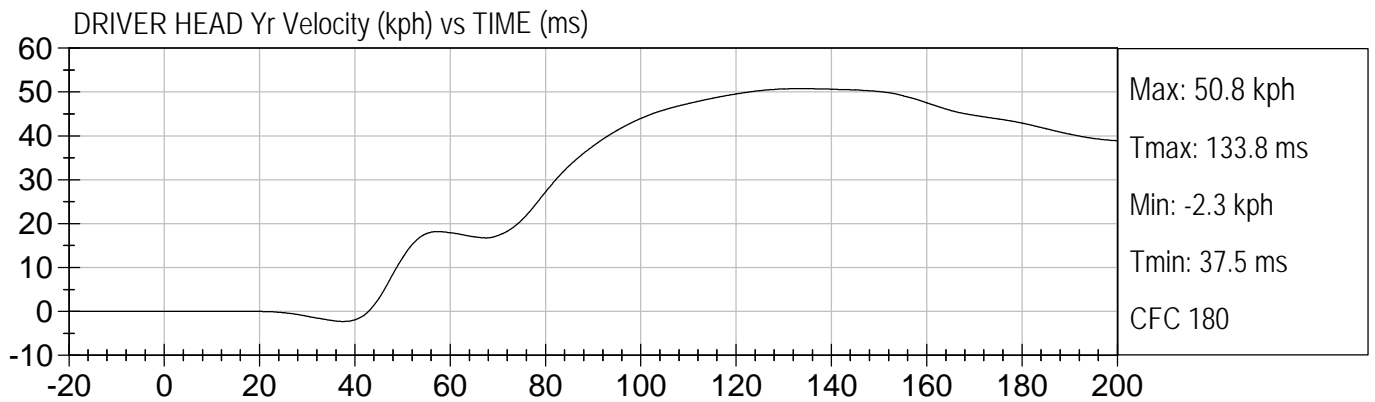
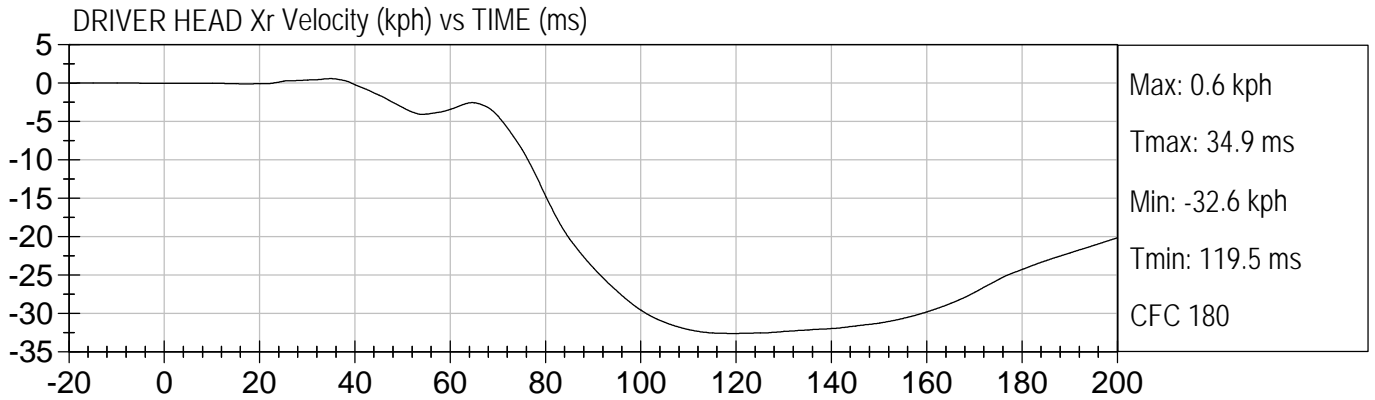


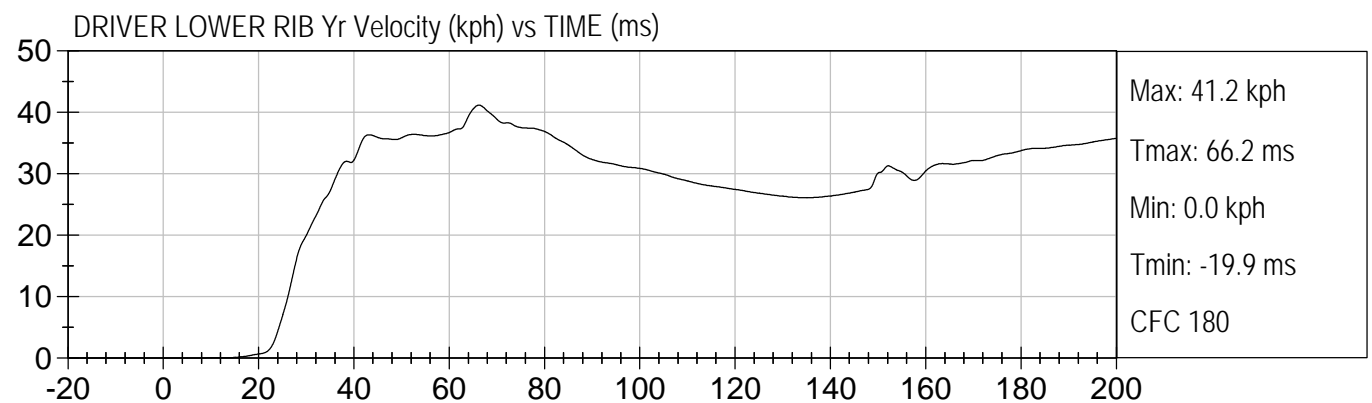
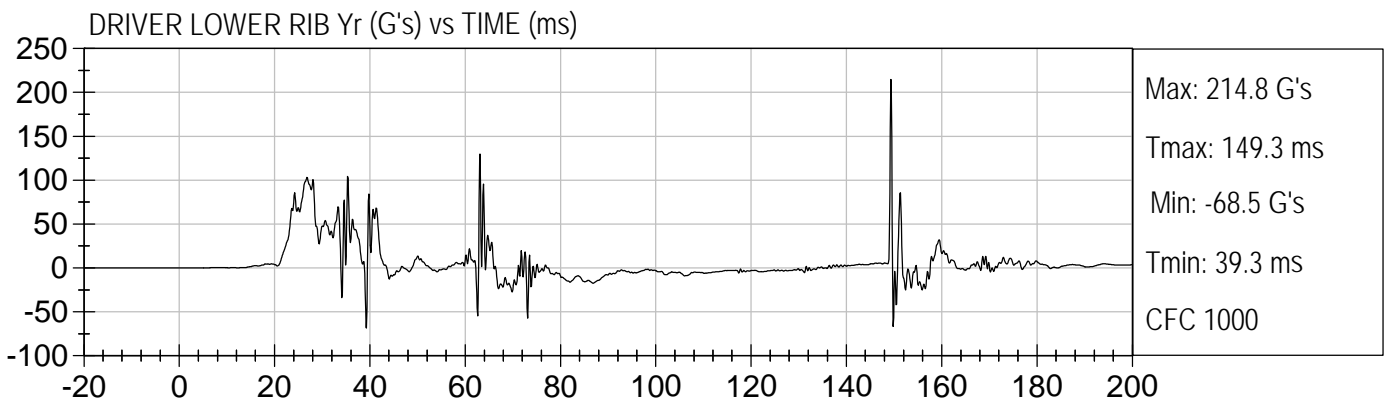
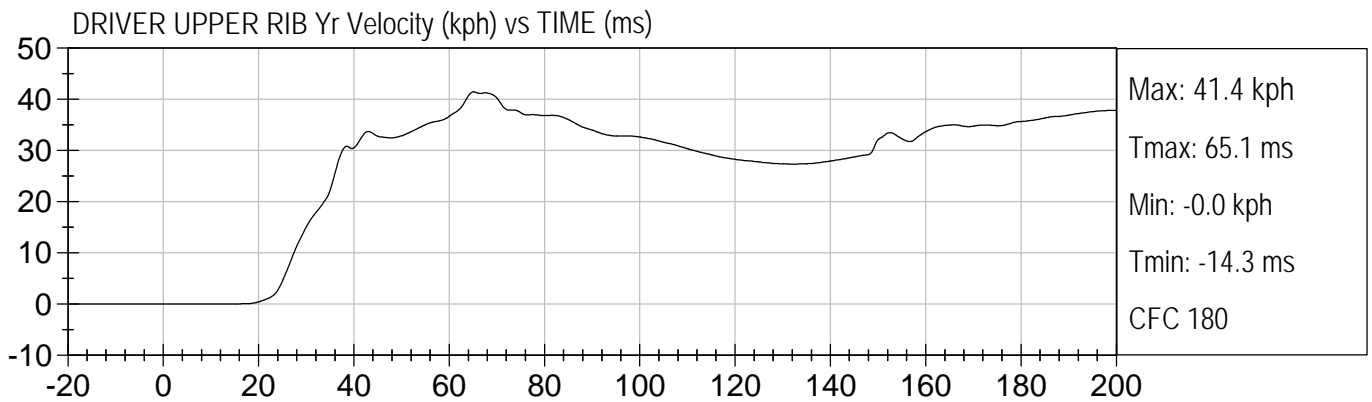
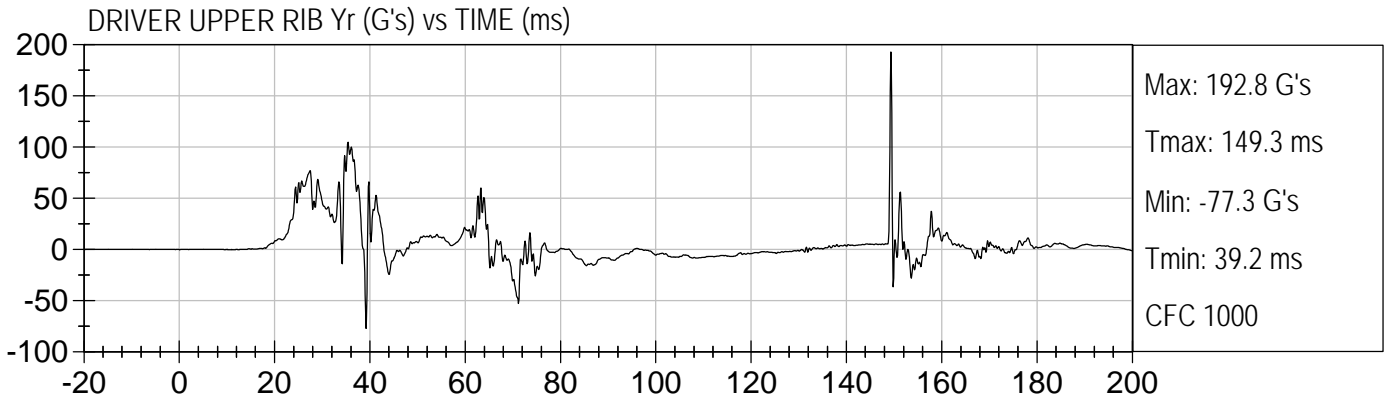


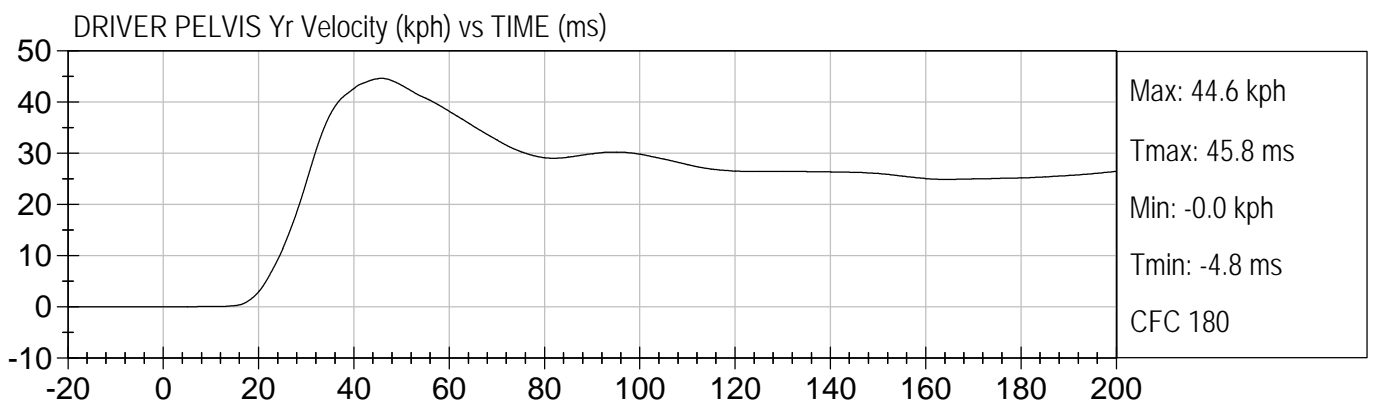
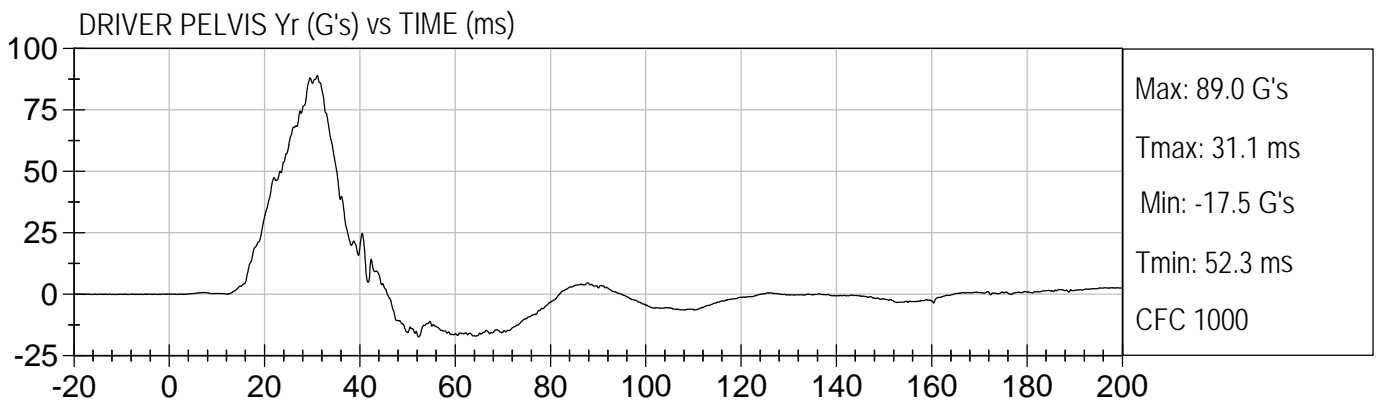
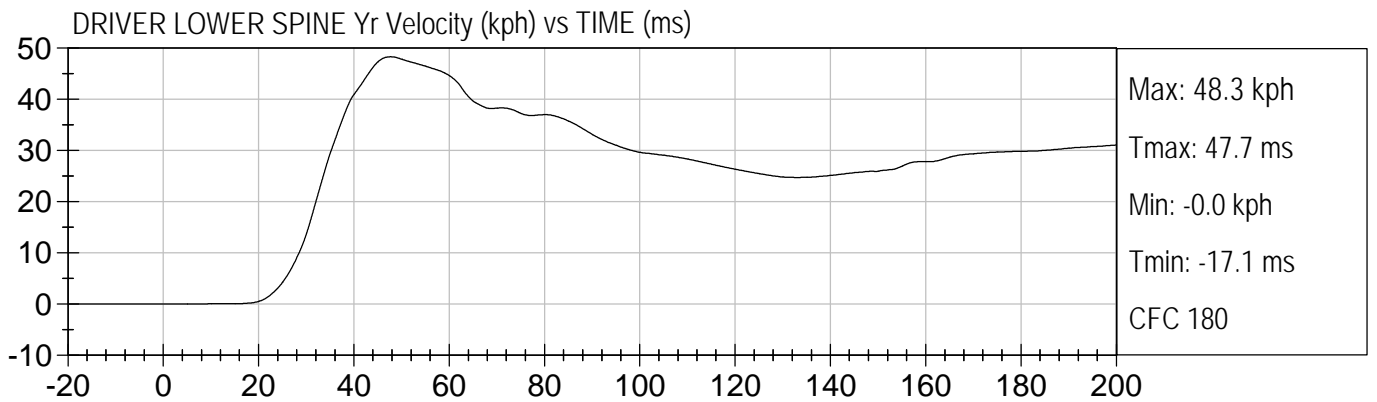
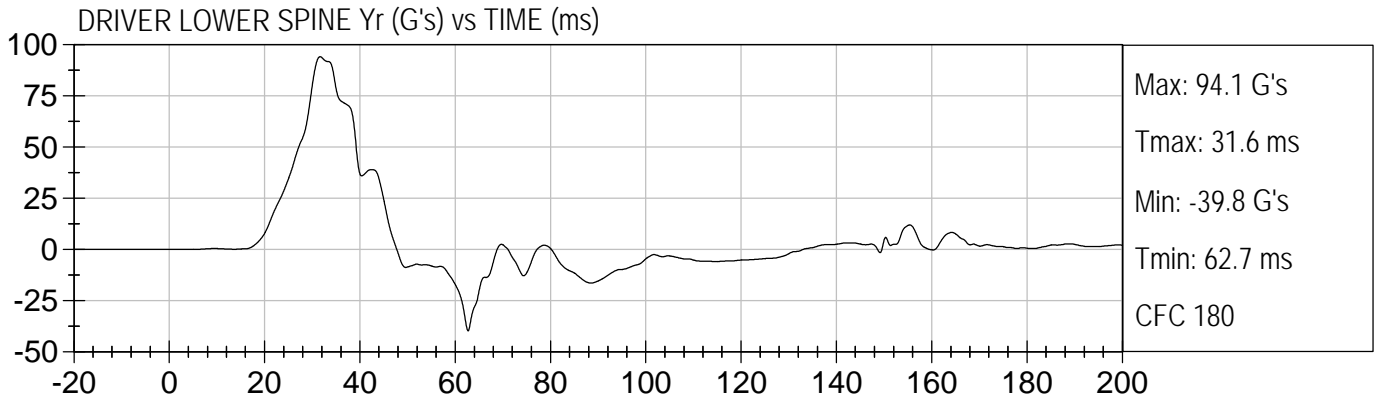


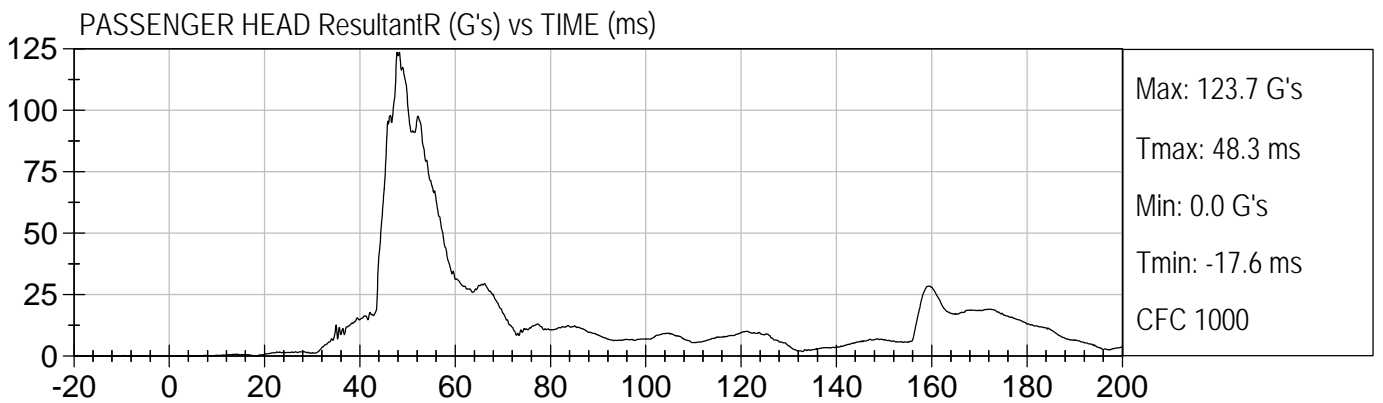
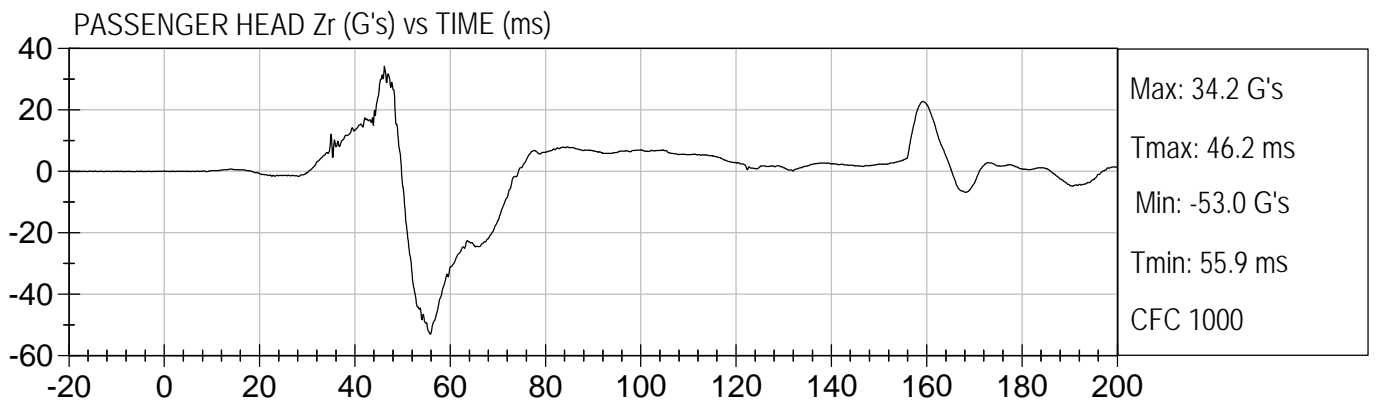
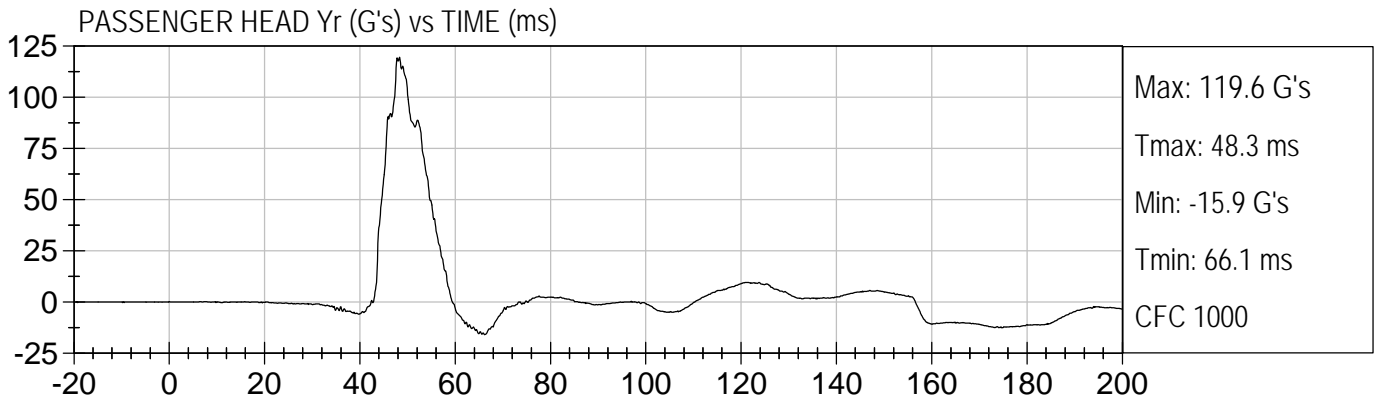
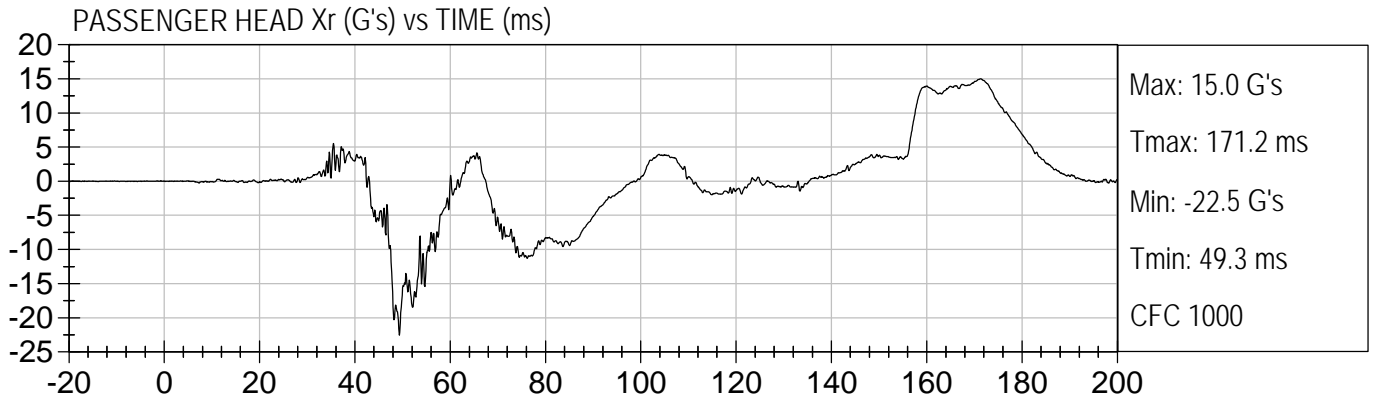


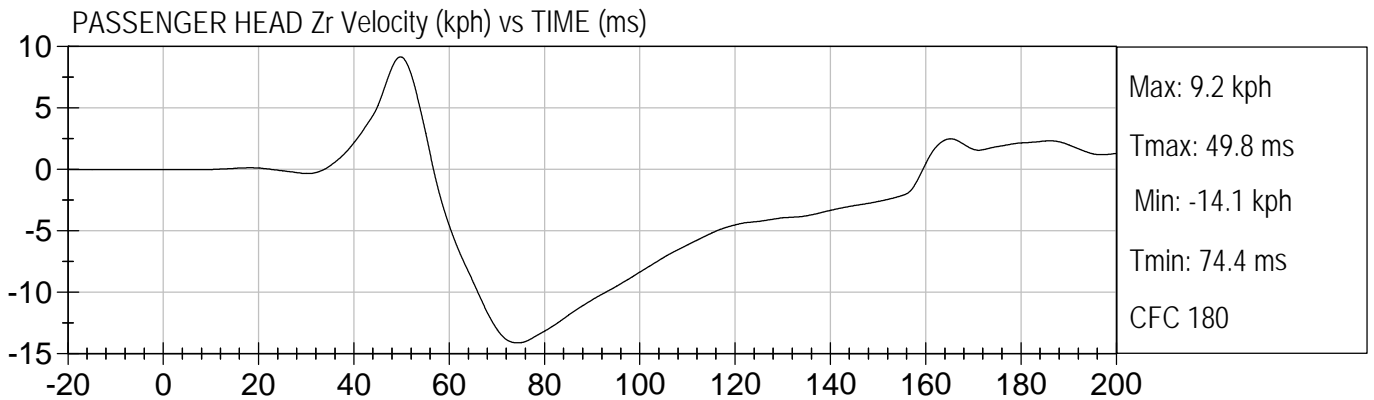
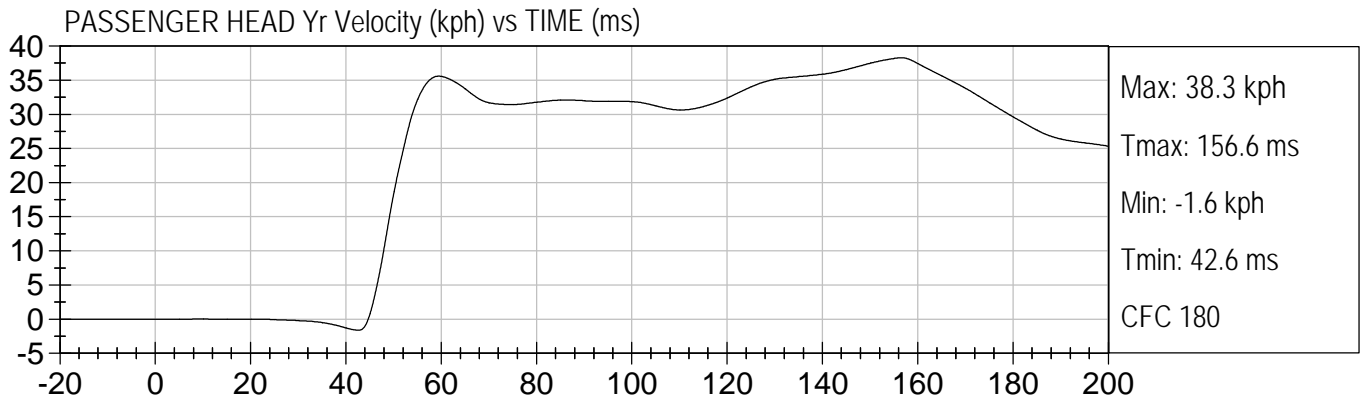
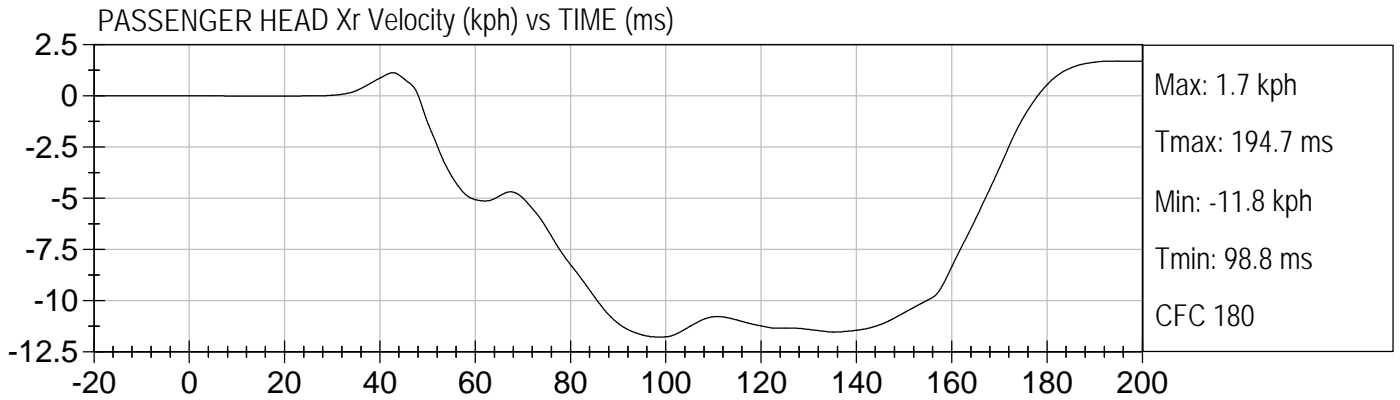


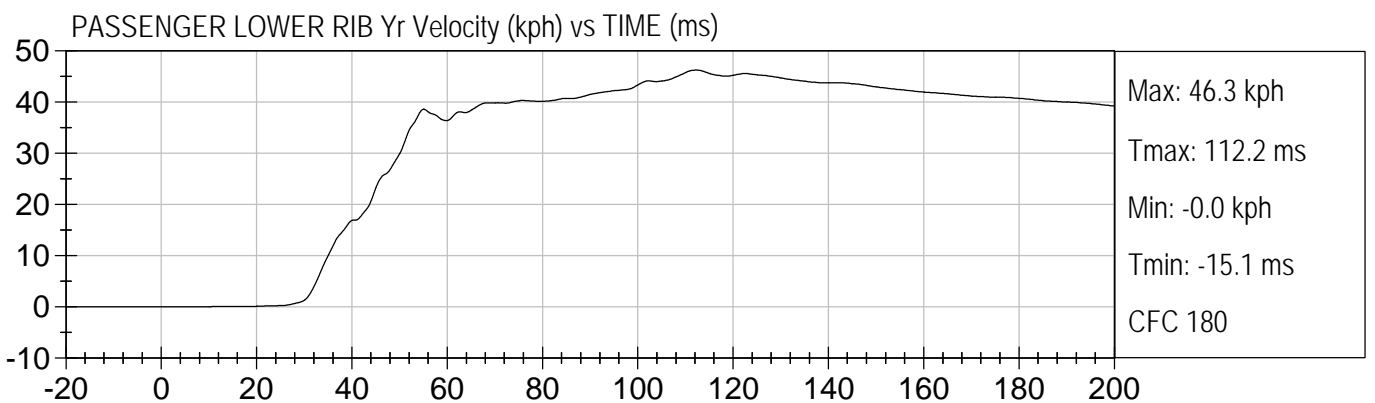
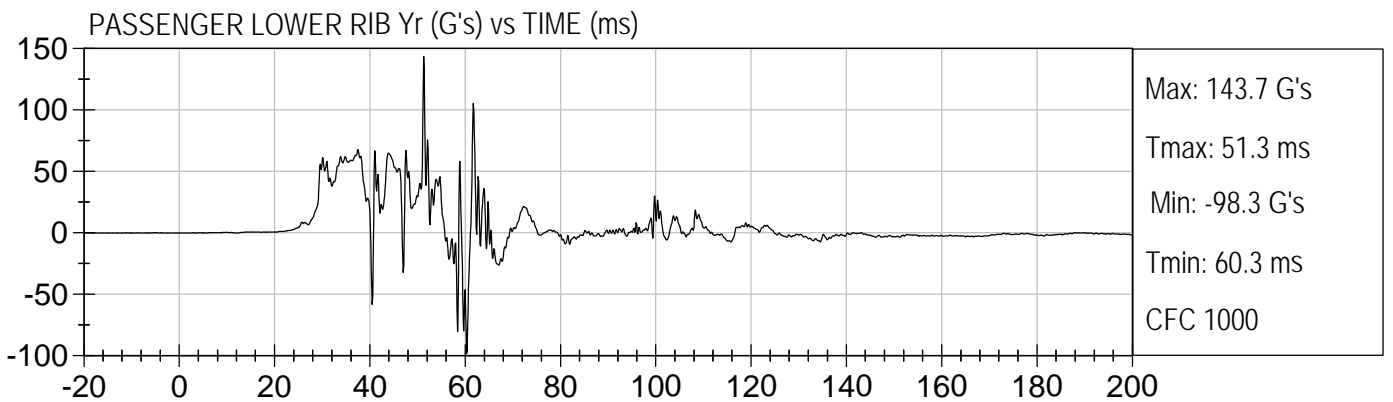
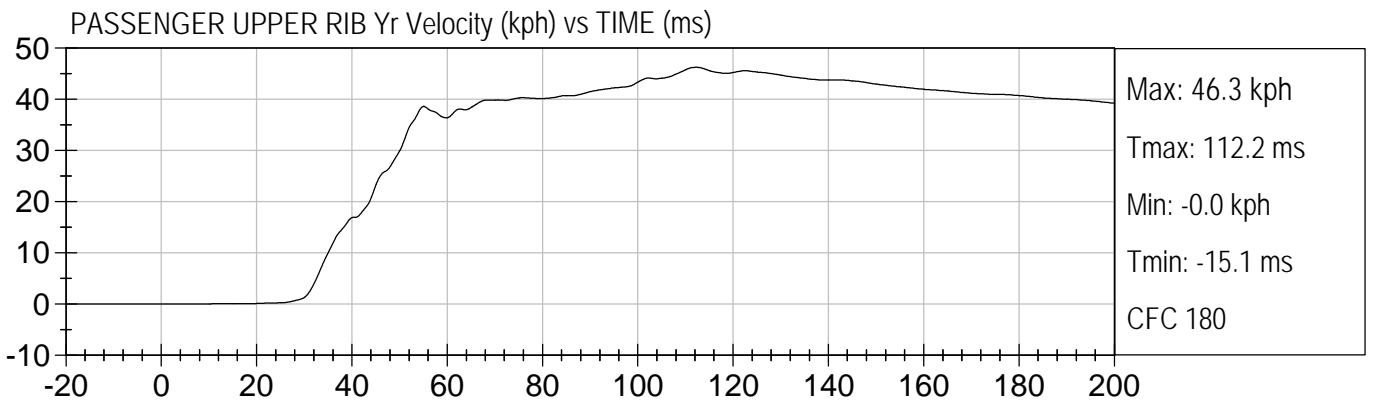
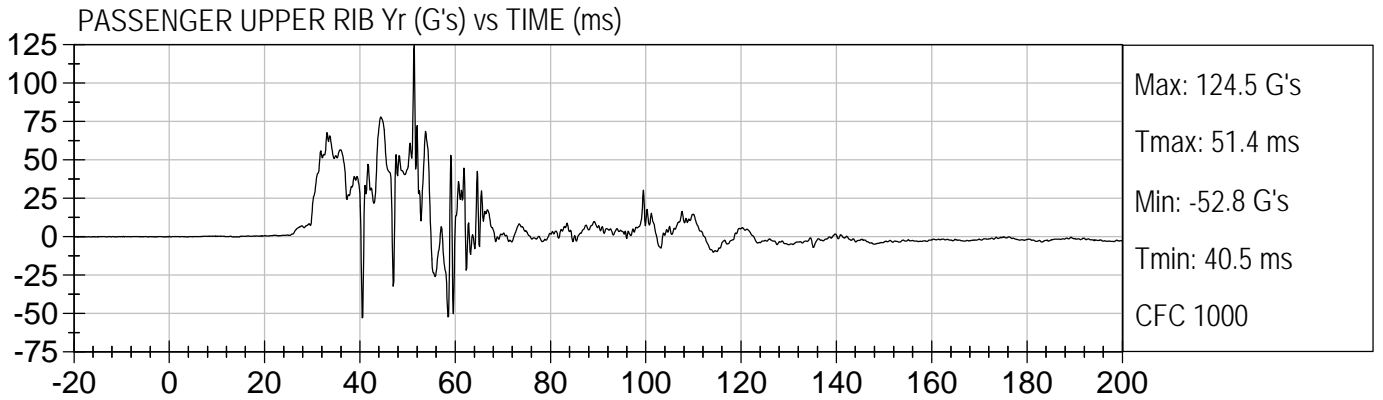


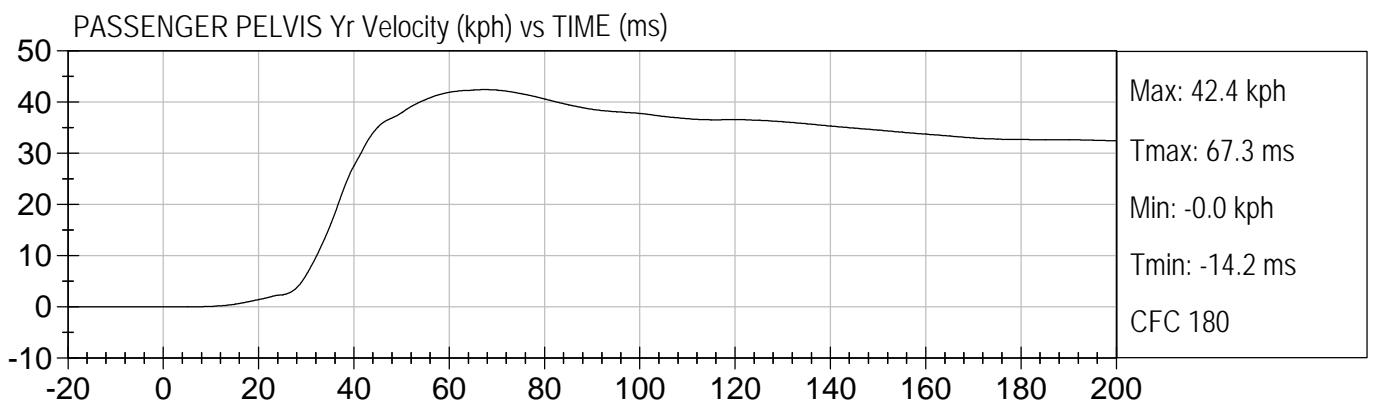
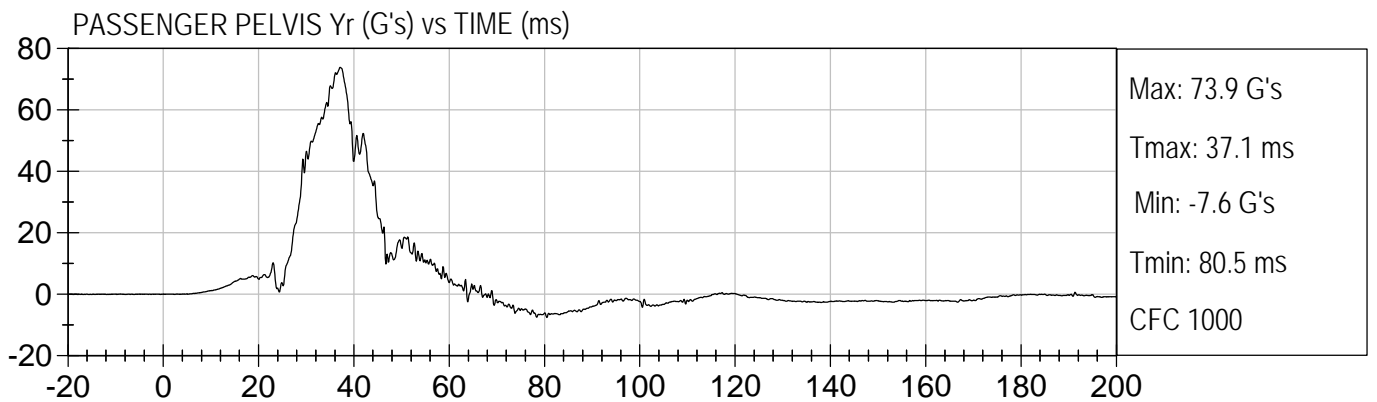
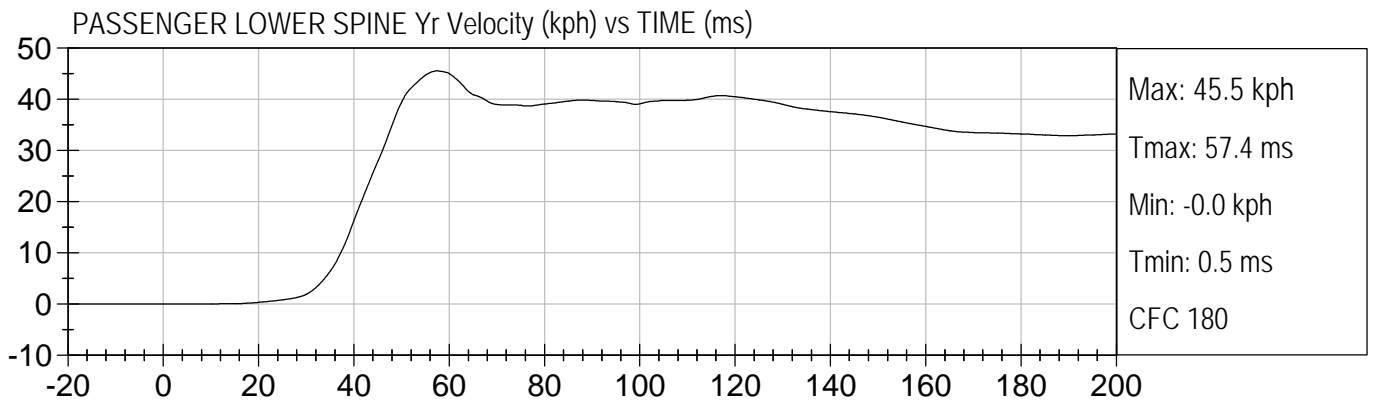
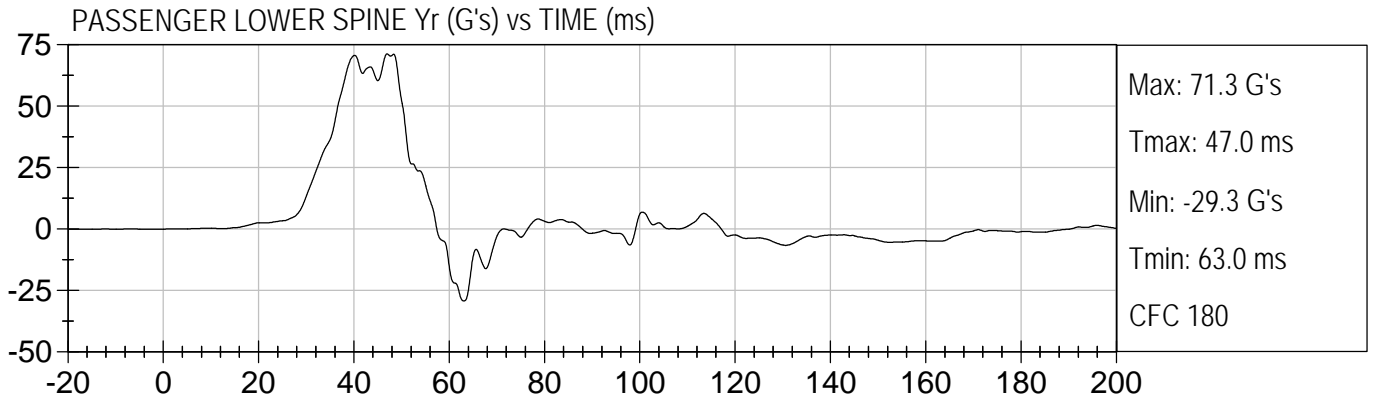


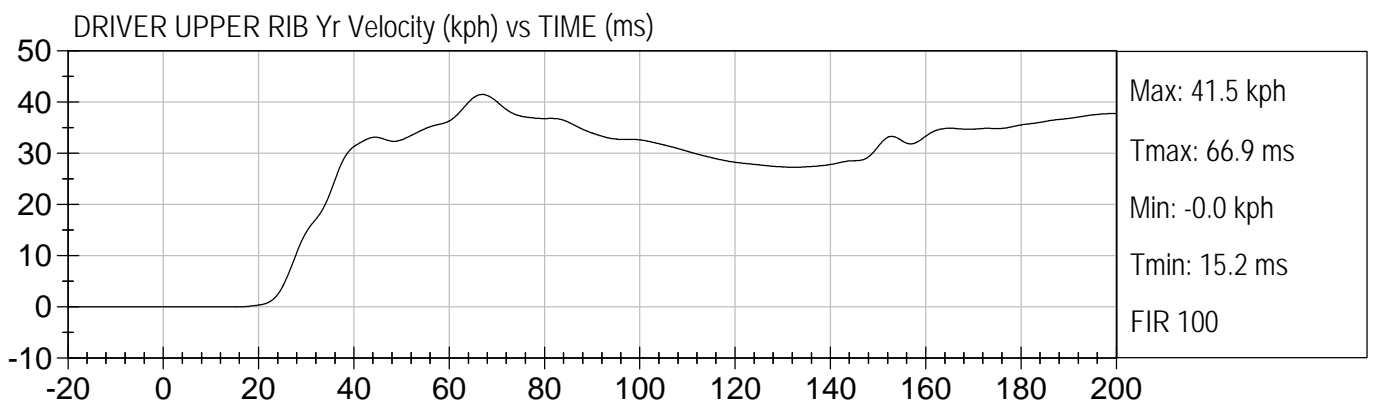
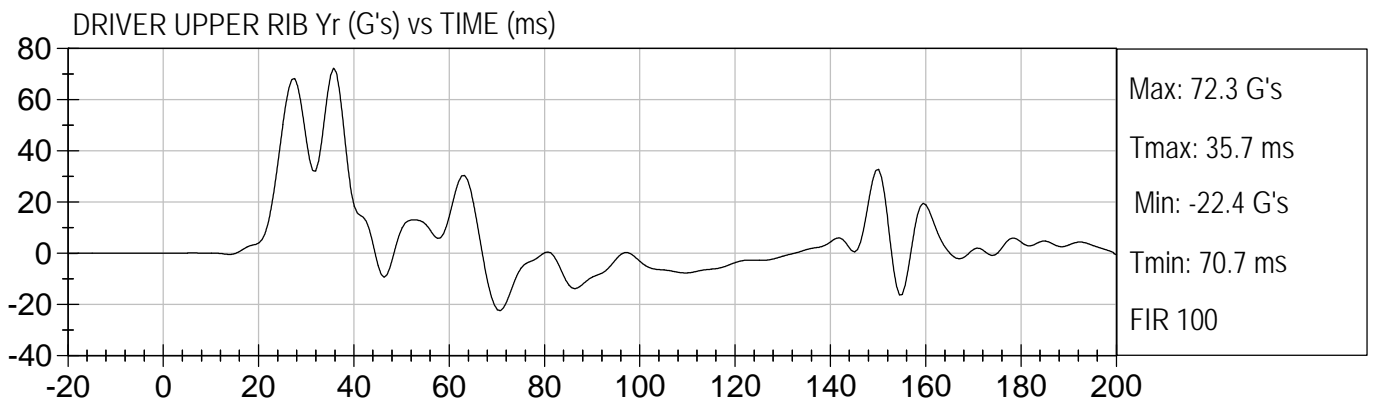
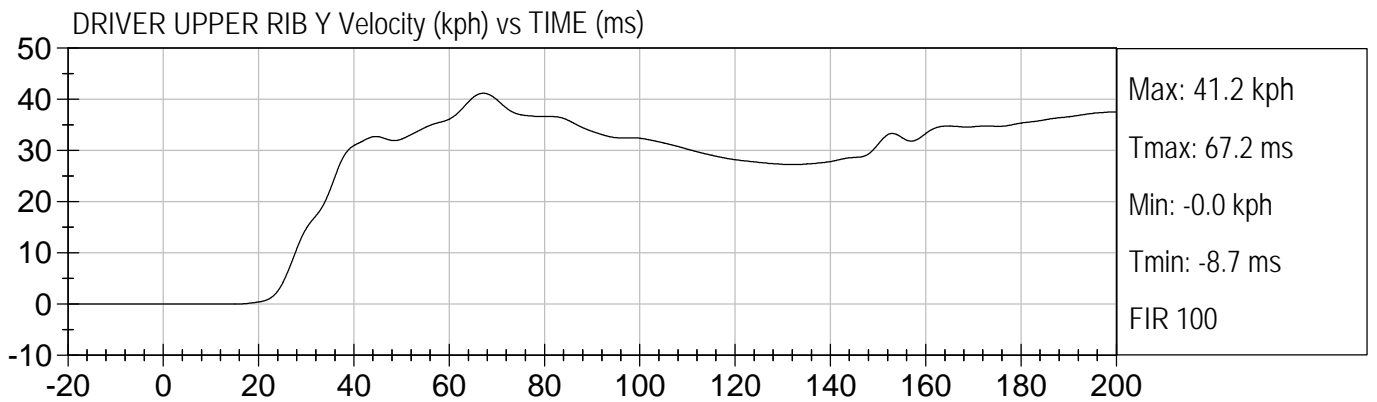
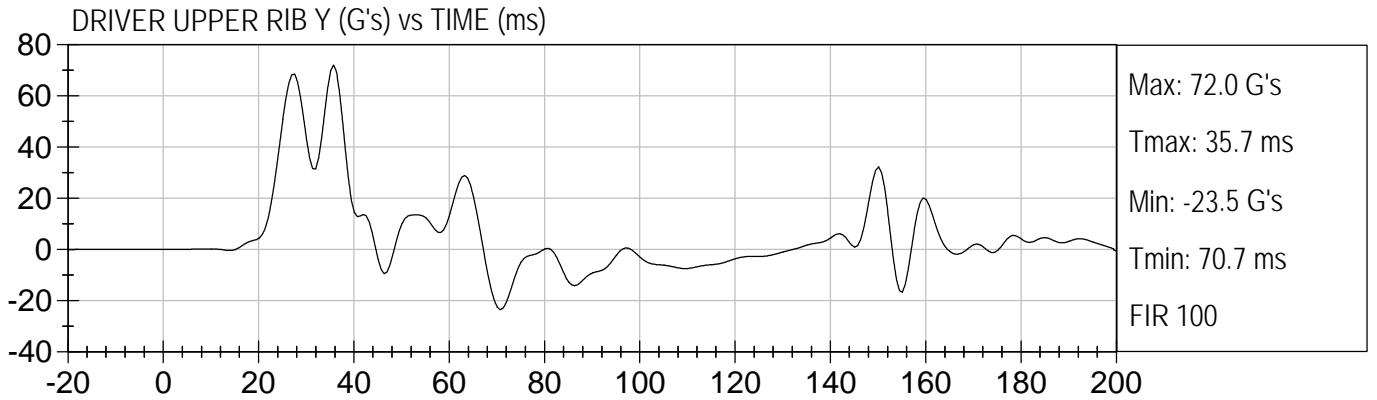


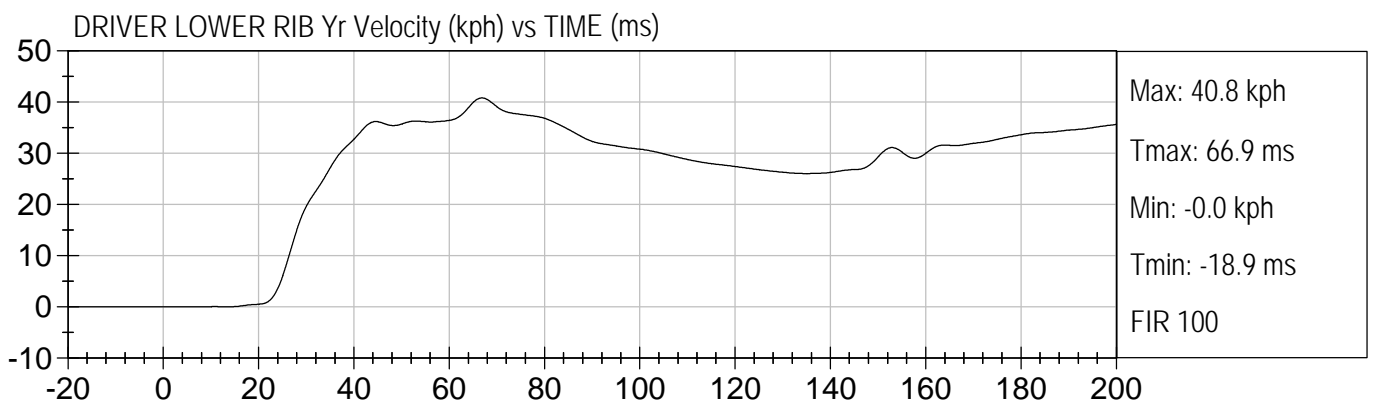
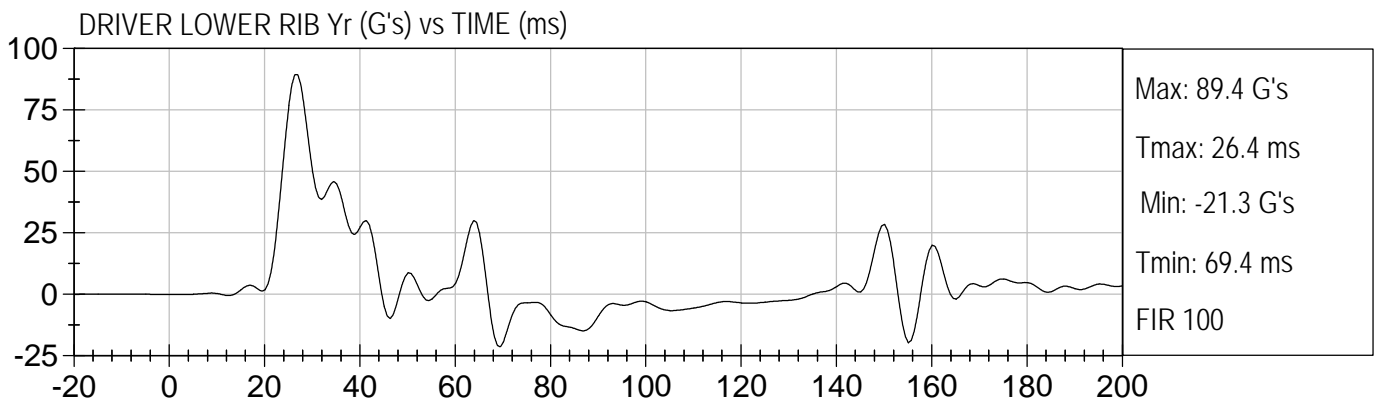
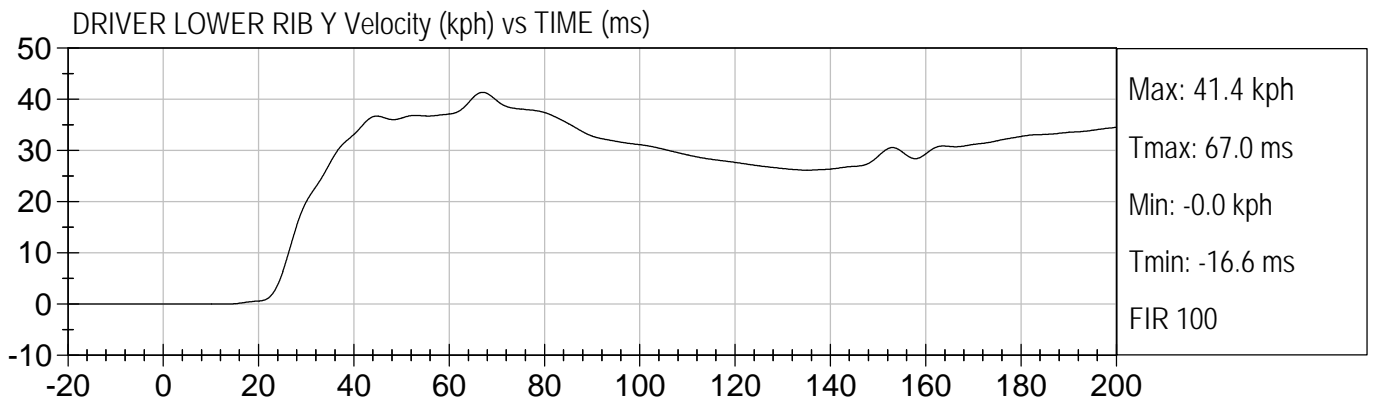
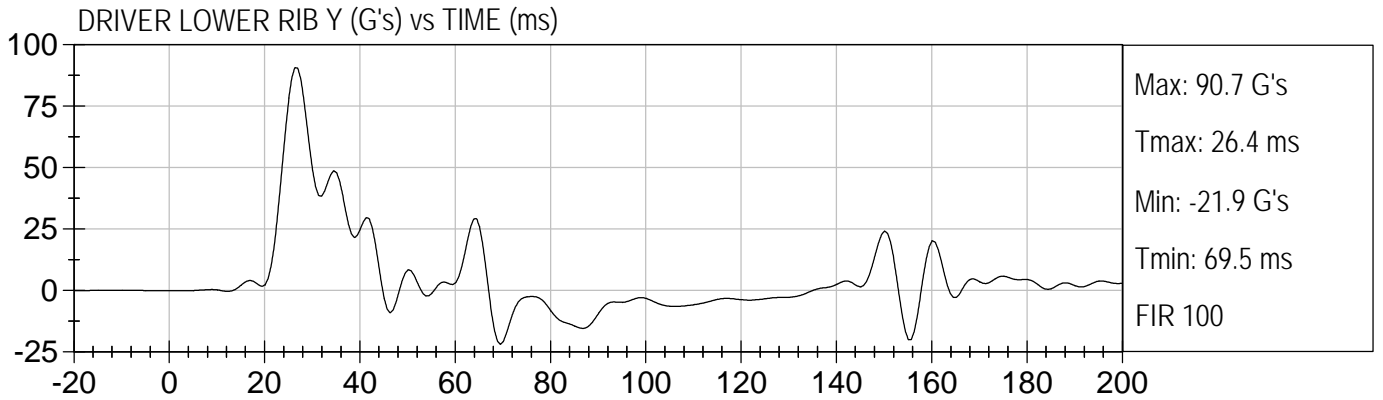


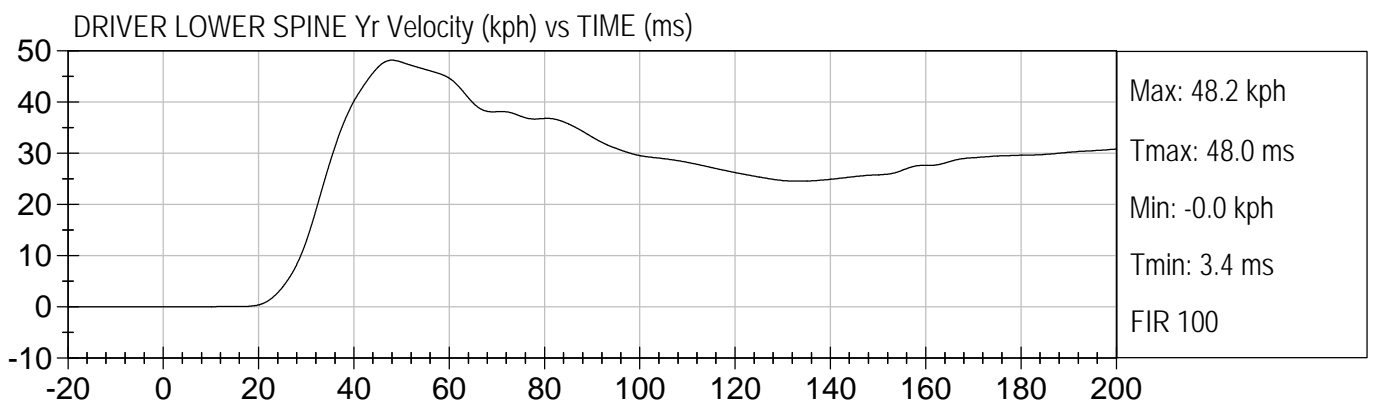
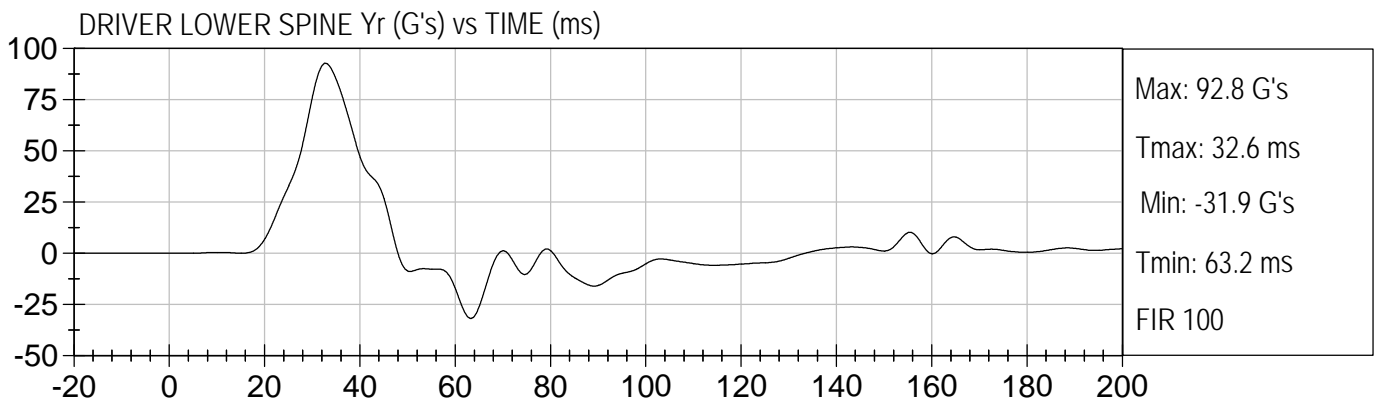
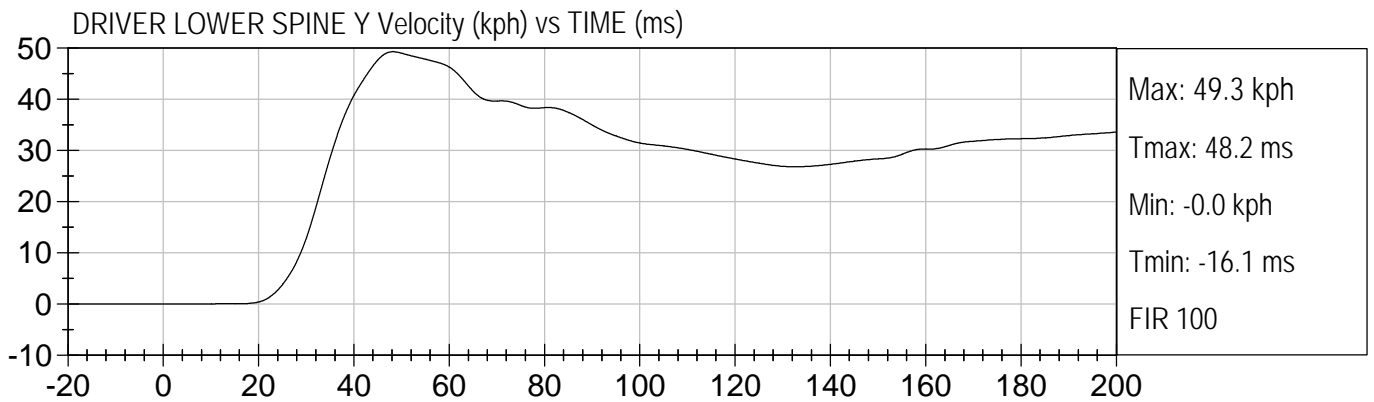
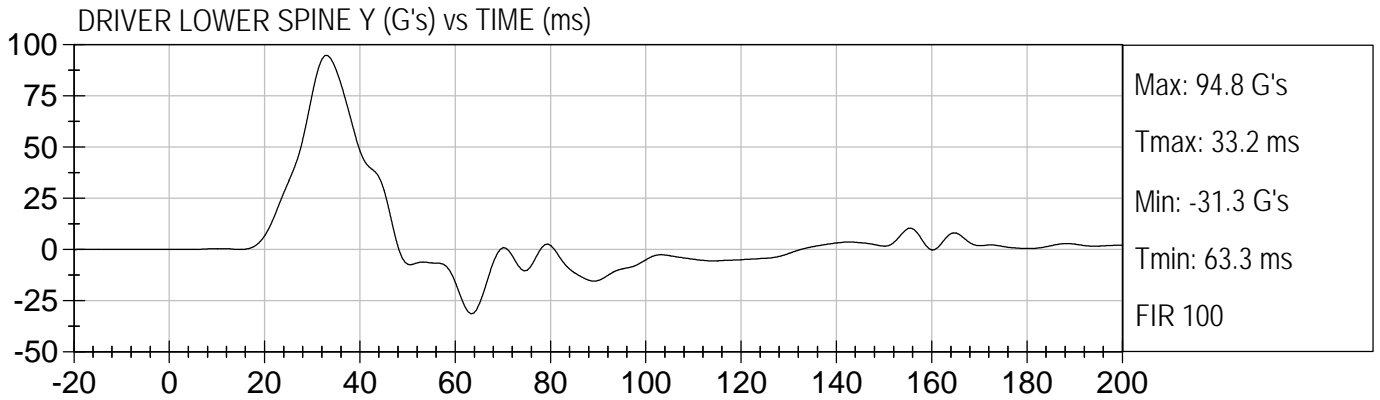


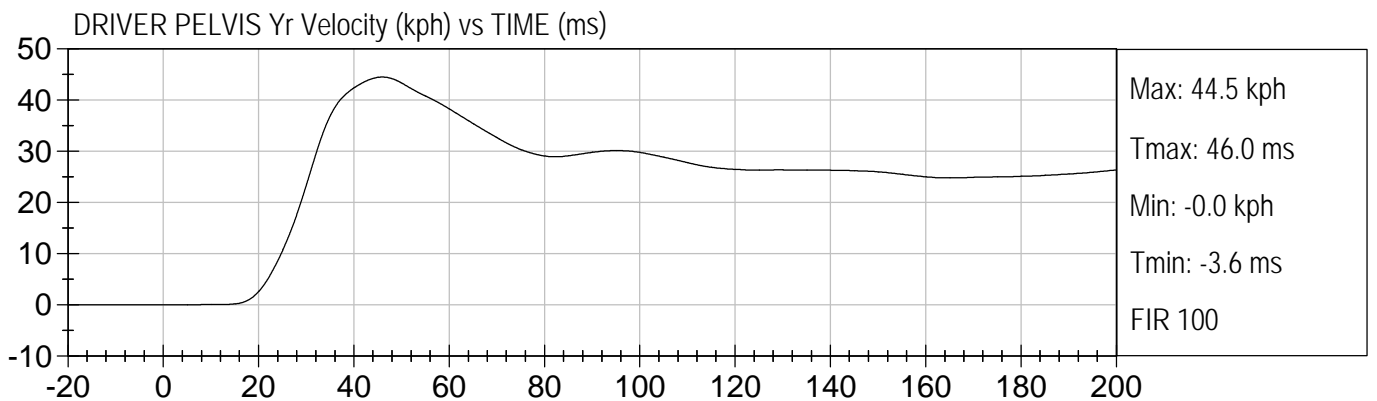
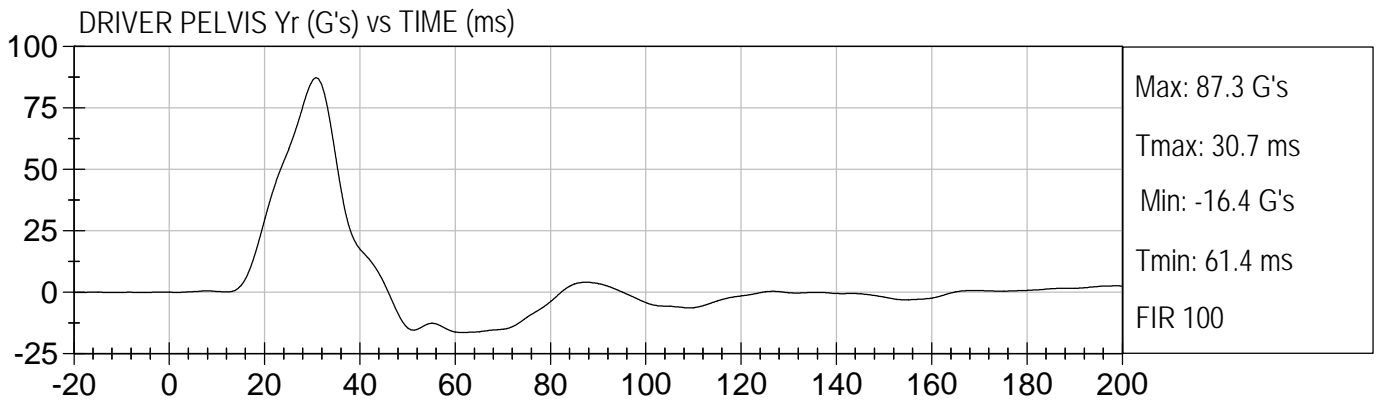
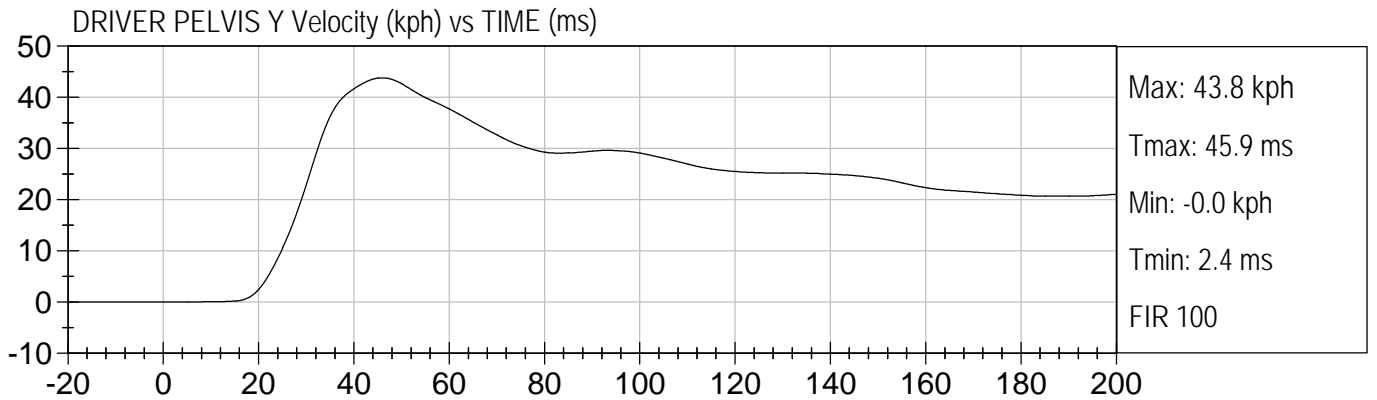
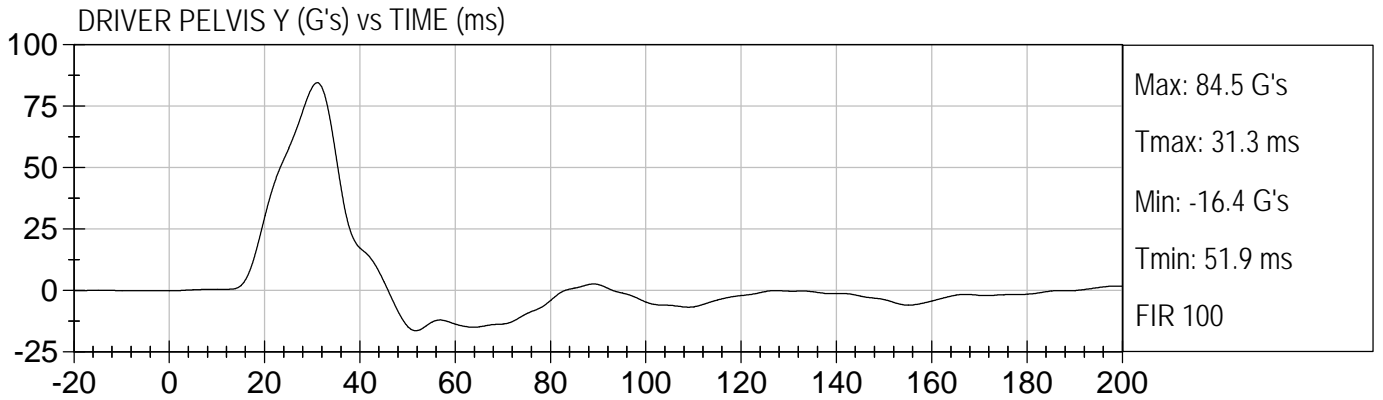


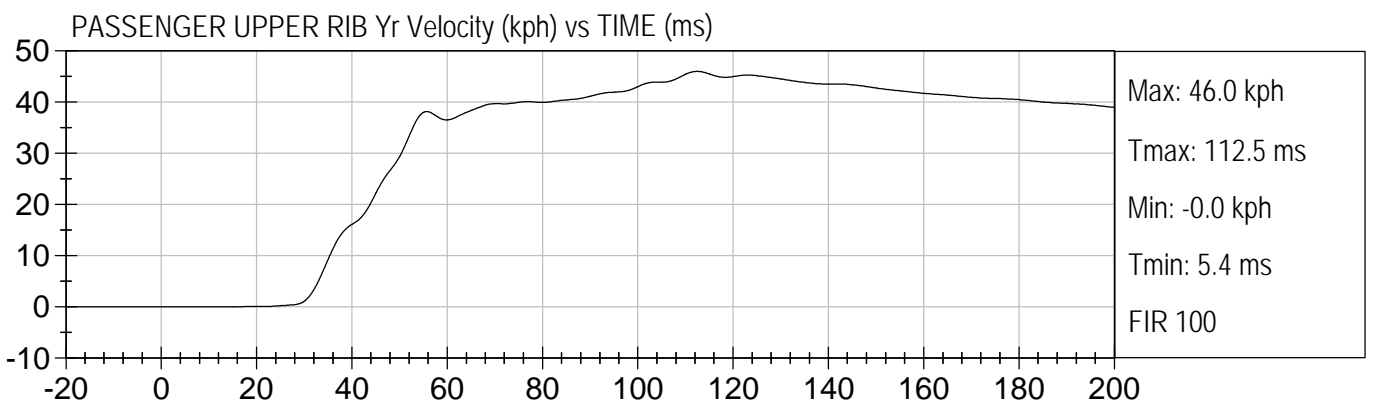
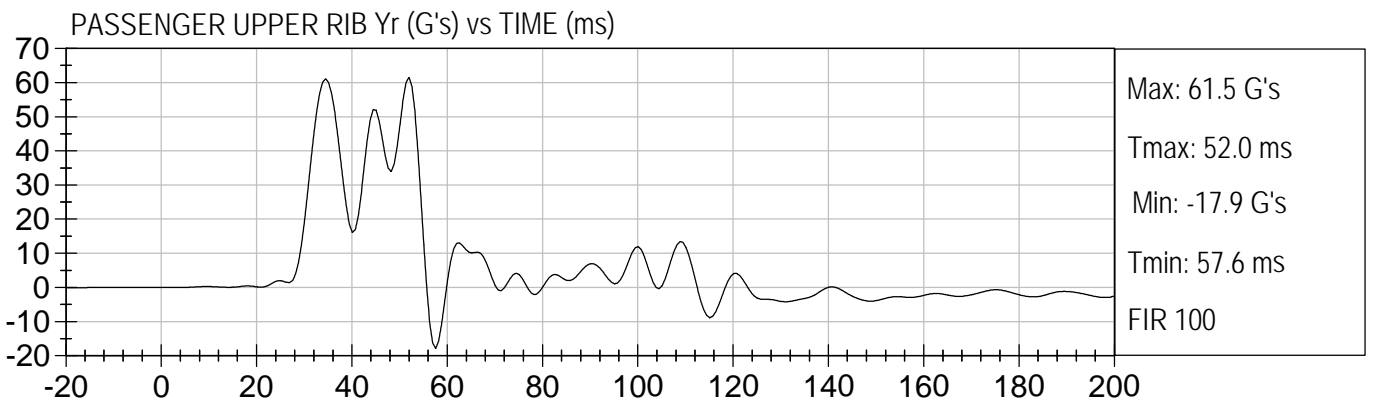
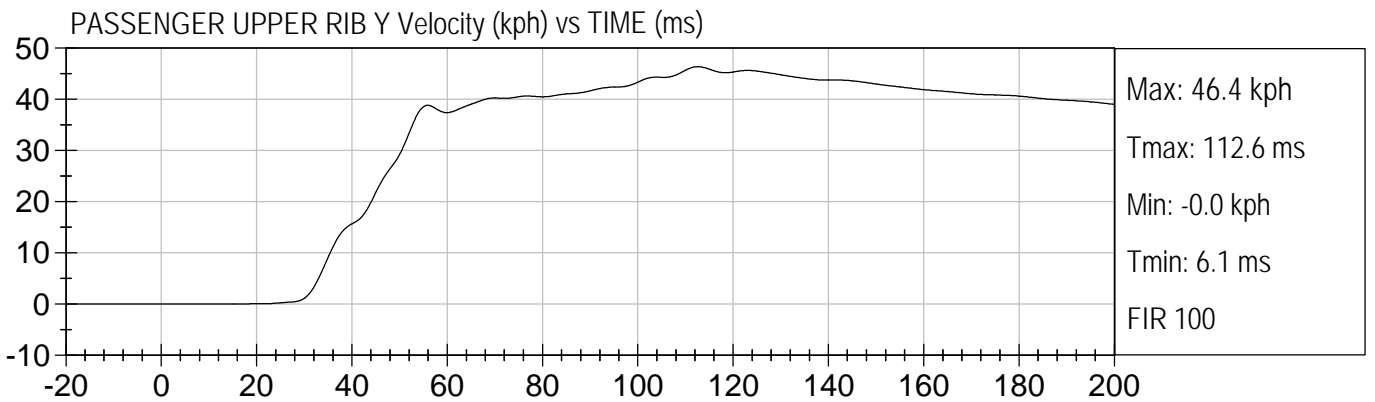
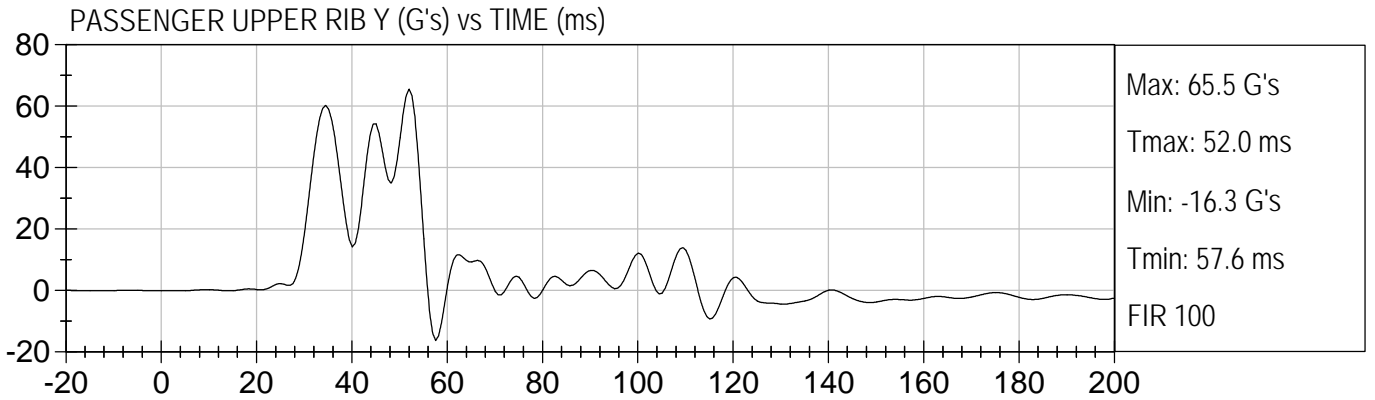


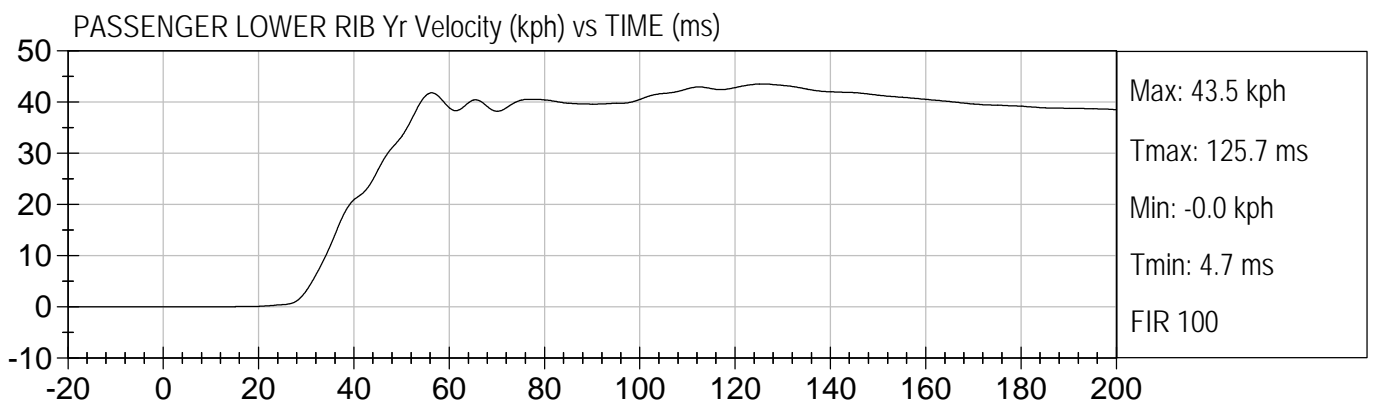
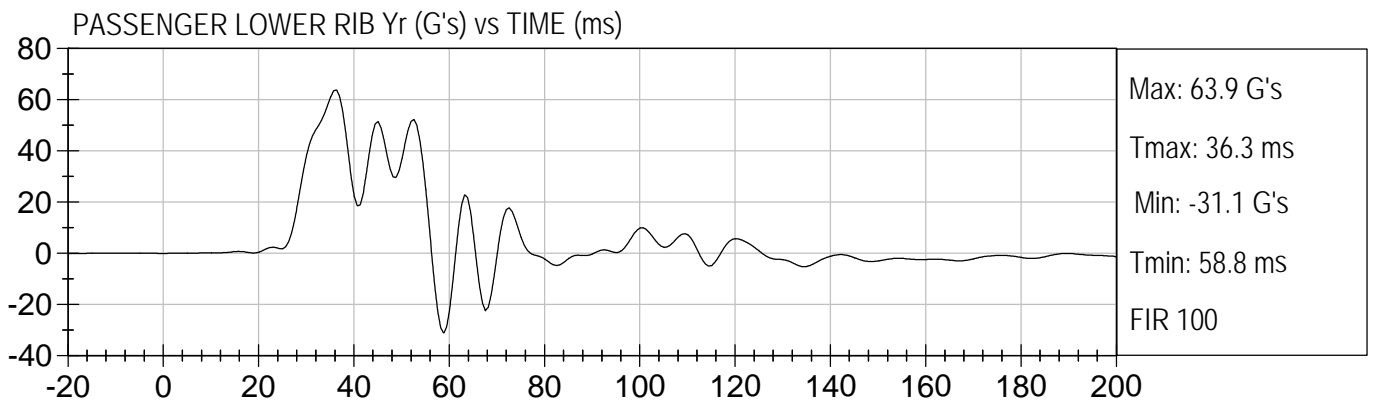
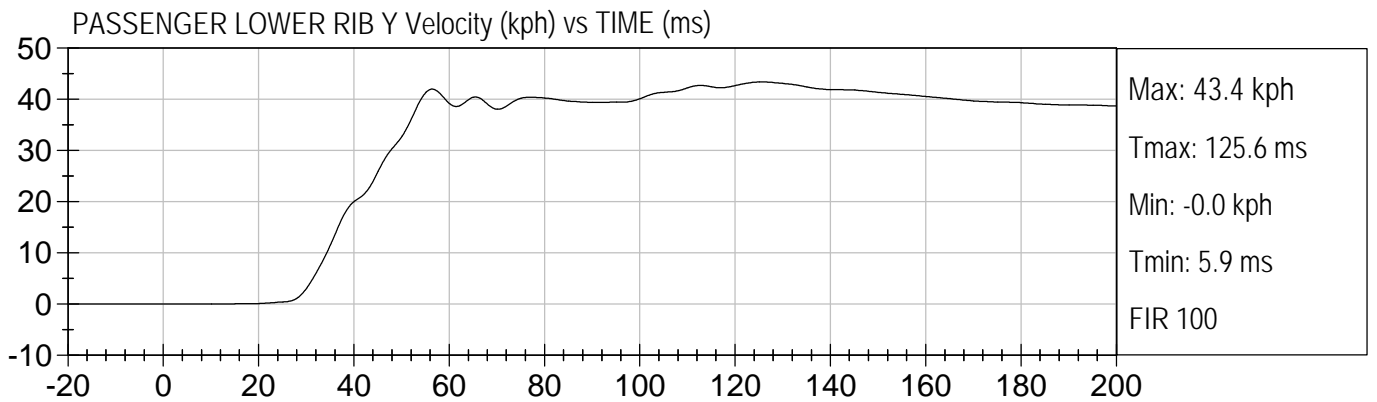
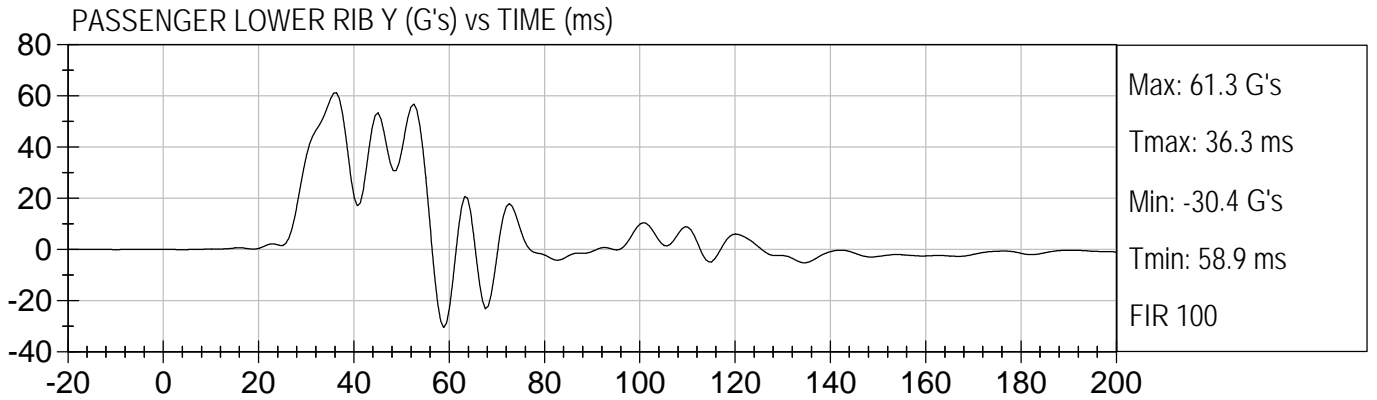


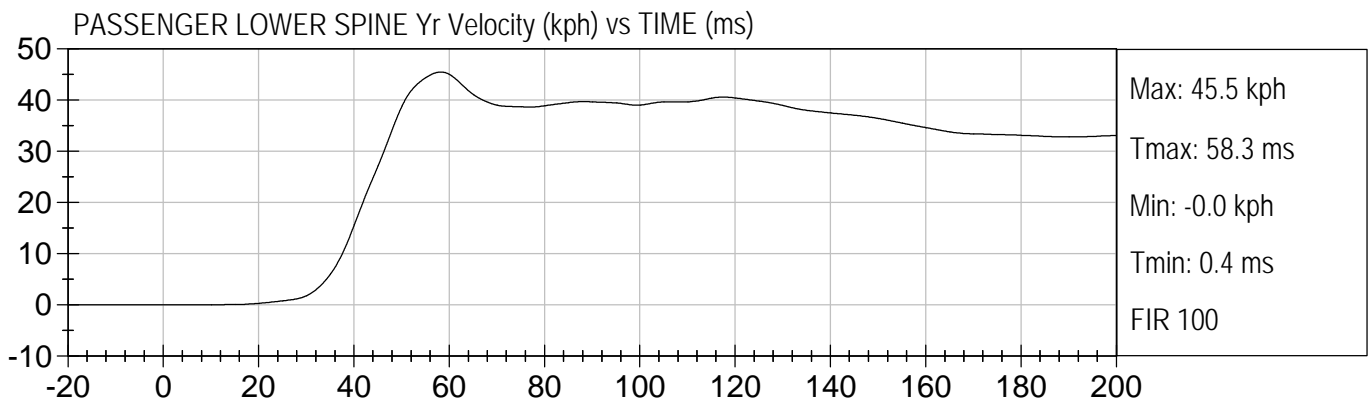
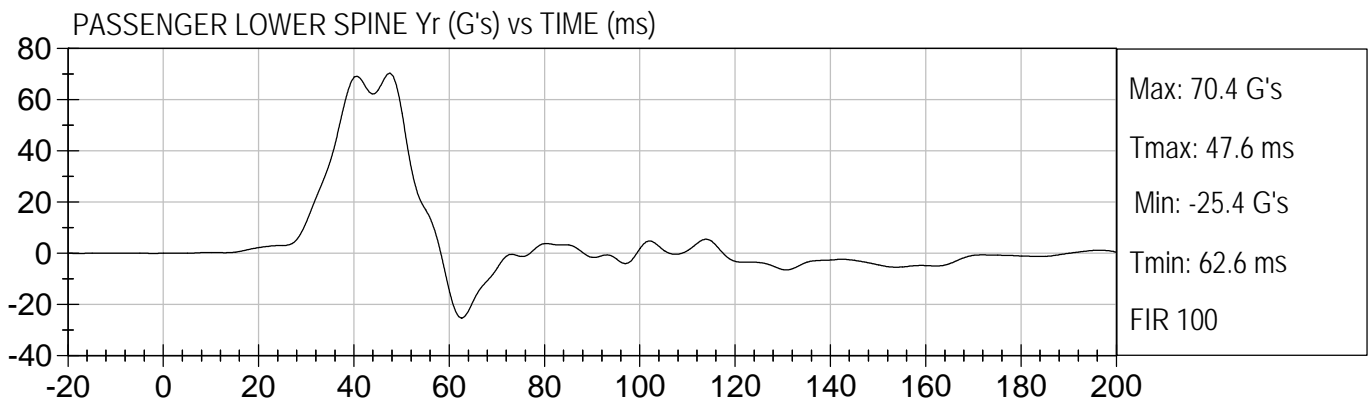
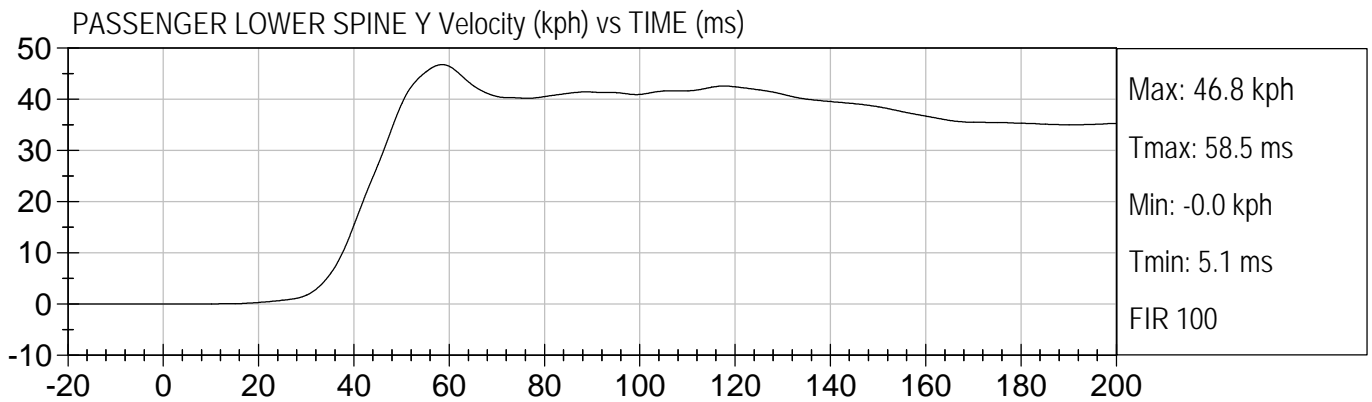
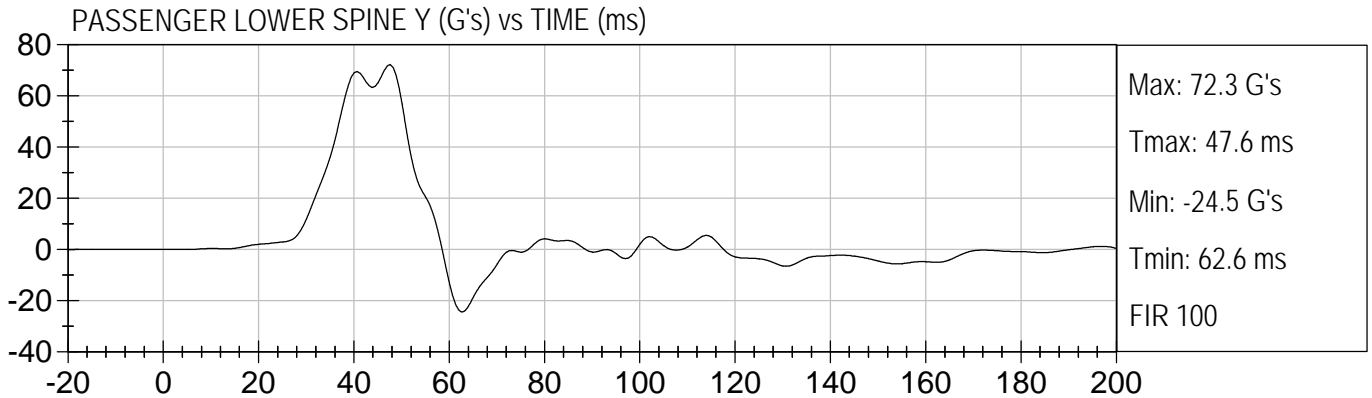


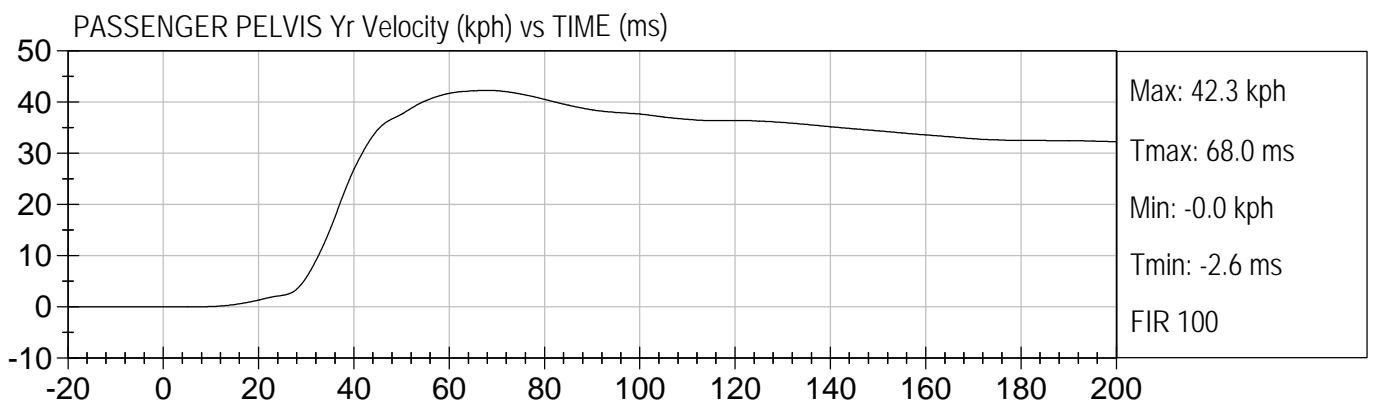
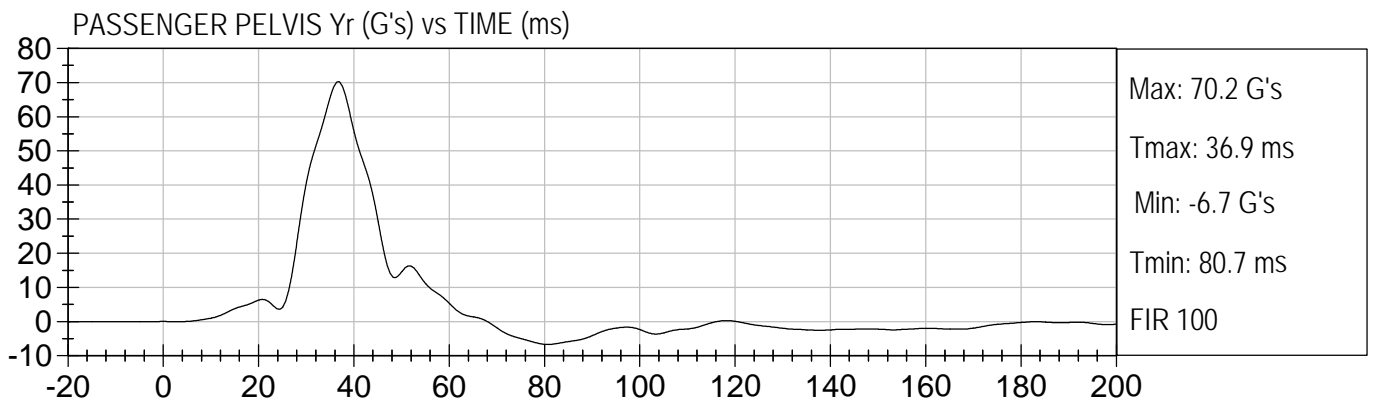
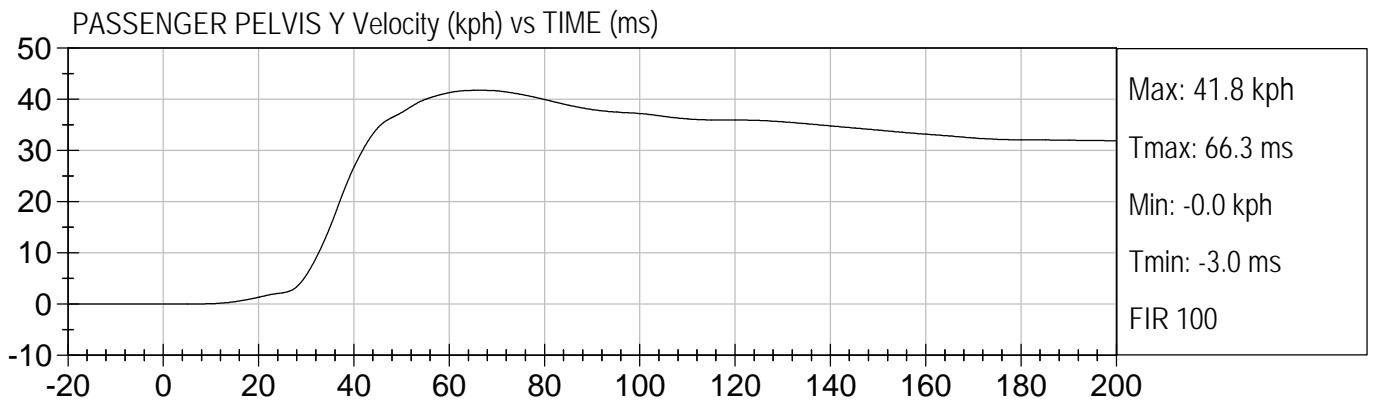
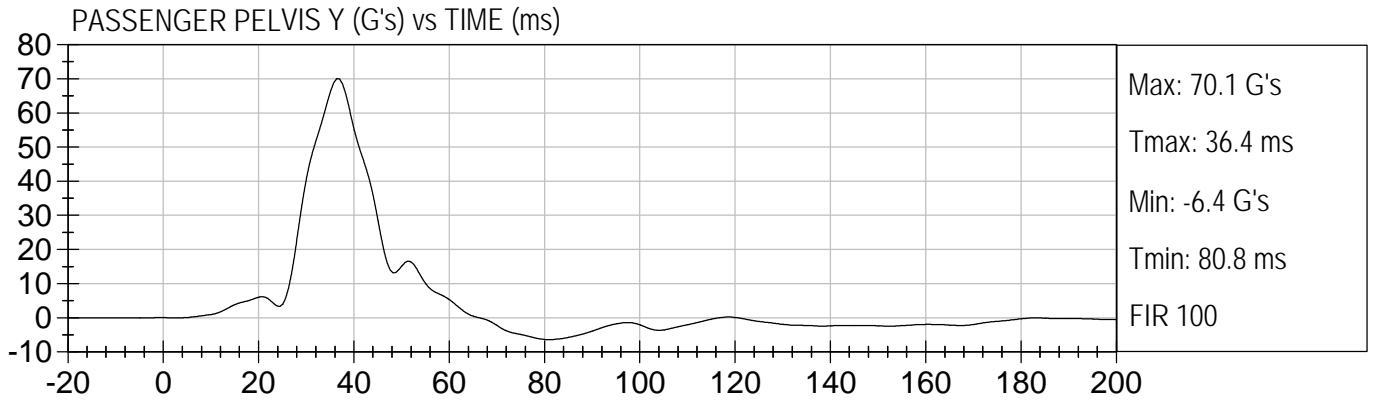












APPENDIX C

SID CONFIGURATION AND PERFORMANCE VERIFICATION DATA

SID Calibration Data Sheet
Side Impact Dummy
Configured to Left Side Impact

Technician: Tim Michnay

Tested Parameter	Units	Specification	Dummy Serial Number:048		Dummy Serial Number:049	
			Pre-Test	Post-Test	Pre-Test	Post-Test
SH – Seated Height	mm	889 - 909	902	902	898	898
RH – Rib Height	mm	501 – 521	507	507	517	517
HP – Hip Pivot Height	mm	99 ref.	99	99	99	99
RD-Rib from Back Line	mm	229 – 241	236	236	232	232
KV – Knee Pivot from Back Line	mm	511 – 526	519	519	522	522
SW – Knee Pivot to Floor	mm	490 – 505	492	492	492	492
HW – Hip Width	mm	356 – 391	364	364	367	367
Thorax Impact						
Laboratory Temperature	°C	18.9 to 25.5	22.9	20.7	23.0	*
Laboratory Relative Humidity	%	10 to 70	30	21	29	*
Probe Velocity	m/s	4.27 – 4.33	4.29	4.30	4.28	*
Upper Rib	G's	37 – 46	39	38	39	*
Lower Rib	G's	37 – 46	39	38	39	*
Lower Spine	G's	15 – 22	18	17	18	*
Pelvis Impact						
Laboratory Temperature	°C	18.9 to 25.5	23.0	20.7	23.0	21.3
Laboratory Relative Humidity	%	10 to 70	30	21	29	35
Probe Velocity	m/s	4.27 – 4.33	4.27	4.30	4.27	4.30
Pelvis	G's	40 - 60	47	47	44	55

*Test not performed due to dampener damage.

CERTIFICATION DATA

Dummy Serial Number: 048

Calibration Test Results Summary

Dummy Serial Number: 48

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.: 048

Test Number: D0202

Tested Parameter	Units	Specification	Result	Pass/Fail
SH – Seated Height	mm	889 - 909	902	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	236	Pass
KV – Knee Pivot from Back Line	mm	511 – 526	519	Pass
SW – Knee Pivot to Floor	mm	490 – 505	492	Pass
HW – Hip Width	mm	356 – 391	364	Pass
Overall Test Results				Pass

Laboratory Technician

01/10/02
Test Date

Approved By

SID Calibration Data Sheet
Side Impact Dummy
Head Drop Calibration

ATD Serial No.: 048

Test I.D.: D02021

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Peak Resultant Acceleration	G's	210 to 260	236	Pass
Peak Lateral Acceleration	G's	< 10	-10	Pass
Time Above 100 G	msec	0.9 – 1.5	1.1	Pass
Overall Test Results				Pass

Laboratory Technician

01/04/02
Test Date

Approved By

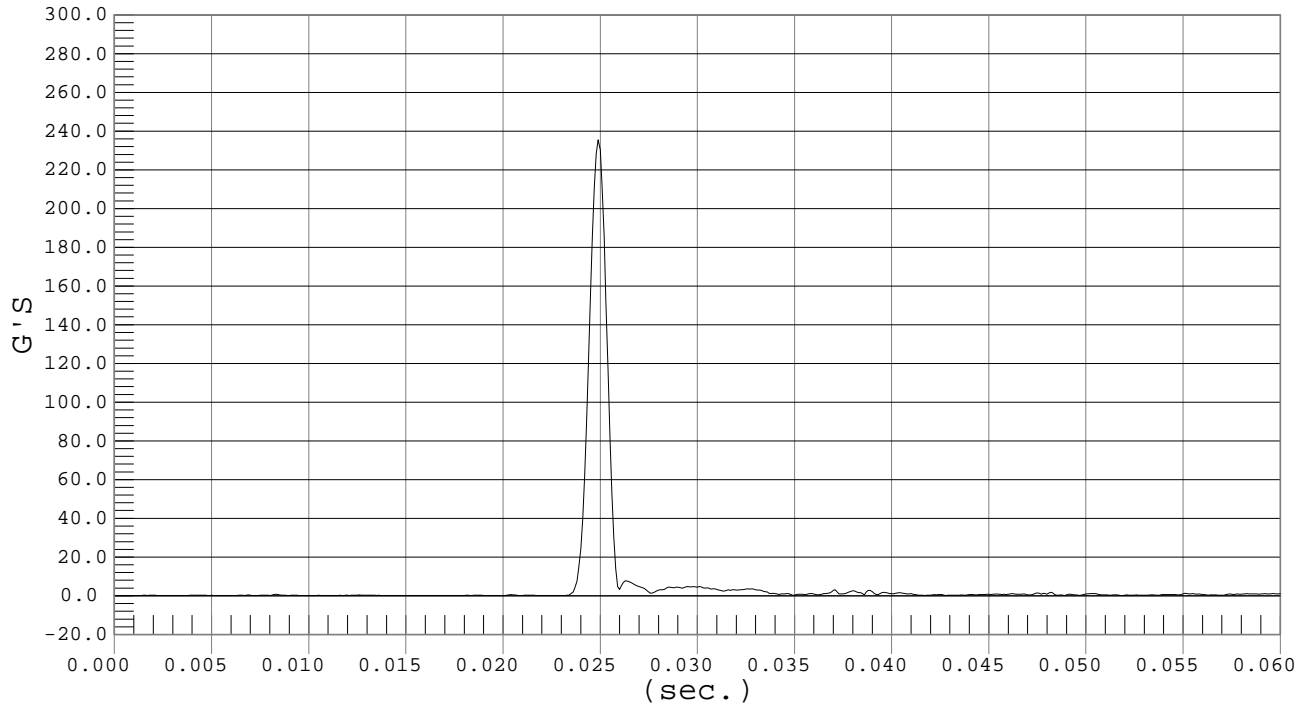


PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #048

Test Date: 01-04-02
Speed: 0.0 fps, 0.00 M/s

Ymin = .06 G'S @ 0.0000 sec., Ymax = 235.57 G'S @ 0.0248 sec.

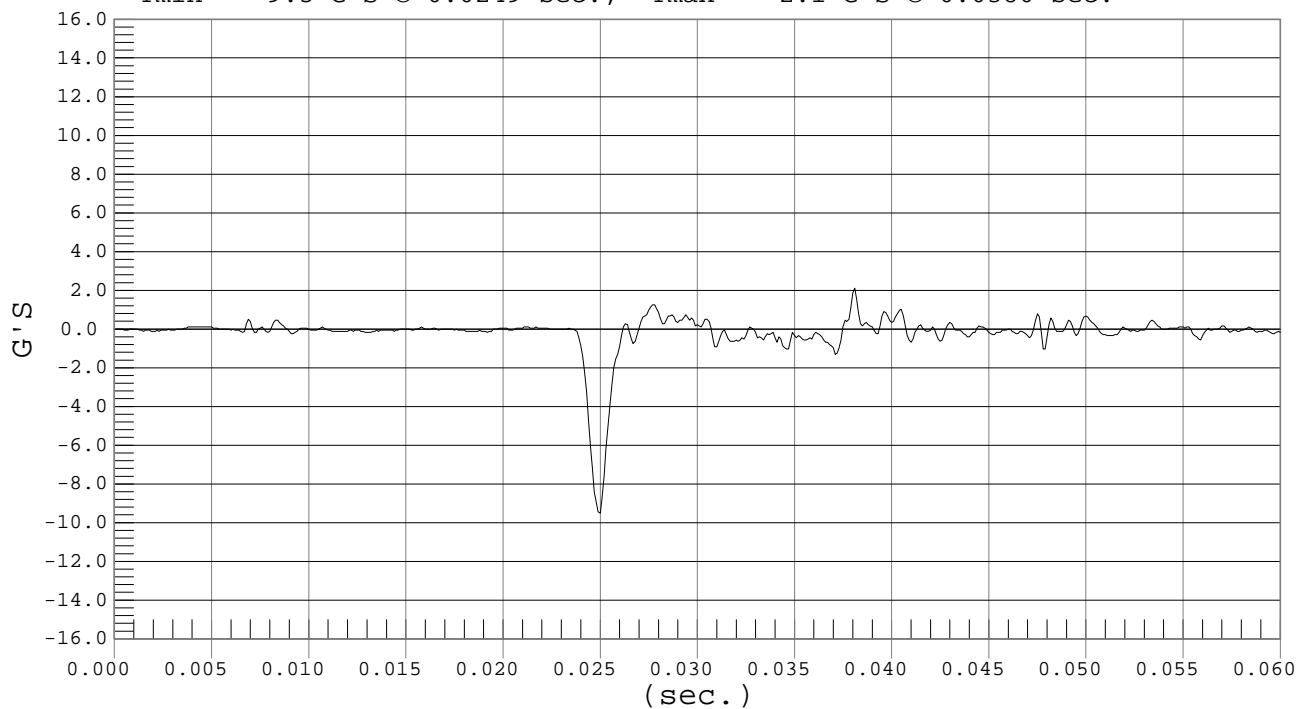


PEAK LATERAL ACCELARATION

Test Desc.: Head Drop
Component: Dummy #048

Test Date: 01-04-02
Speed: 0.0 fps, 0.00 M/s

Ymin = -9.5 G'S @ 0.0249 sec., Ymax = 2.1 G'S @ 0.0380 sec.



SID Calibration Data Sheet
Side Impact Dummy
Thoracic Shock Absorber Calibration

ATD Serial No.: 048

Test I.D.: D02026/7/8

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	19	Pass
Velocity 3.05 m/s	Force	N	836 – 1125	970	Pass
	Displacement	mm	30 – 35	30	Pass
Velocity 4.27 m/s	Force	N	1730 – 2099	1796	Pass
	Displacement	mm	32 – 37	34	Pass
Velocity 6.1 m/s	Force	N	3741 – 4448	4425	Pass
	Displacement	mm	33 - 40	38	Pass
Overall Test Results					Pass

Laboratory Technician

01/07/02
Test Date

Approved By

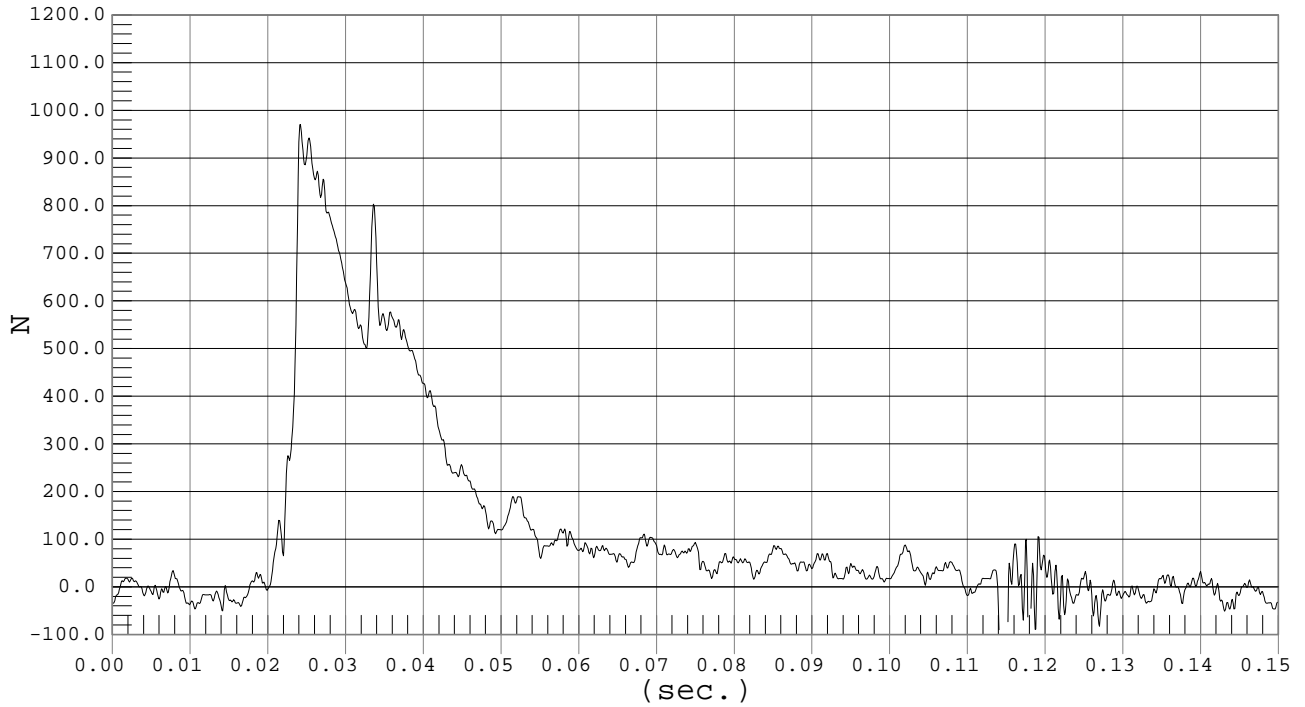


Test Desc.: Dampener Impact
Component: Dummy #048

PEAK FORCE

Test Date: 01-07-02
Speed: 10.0 fps, 3.05 M/s

Ymin = -1058.84 N @ 0.1146 sec., Ymax = 970.4 N @ 0.0241 sec.

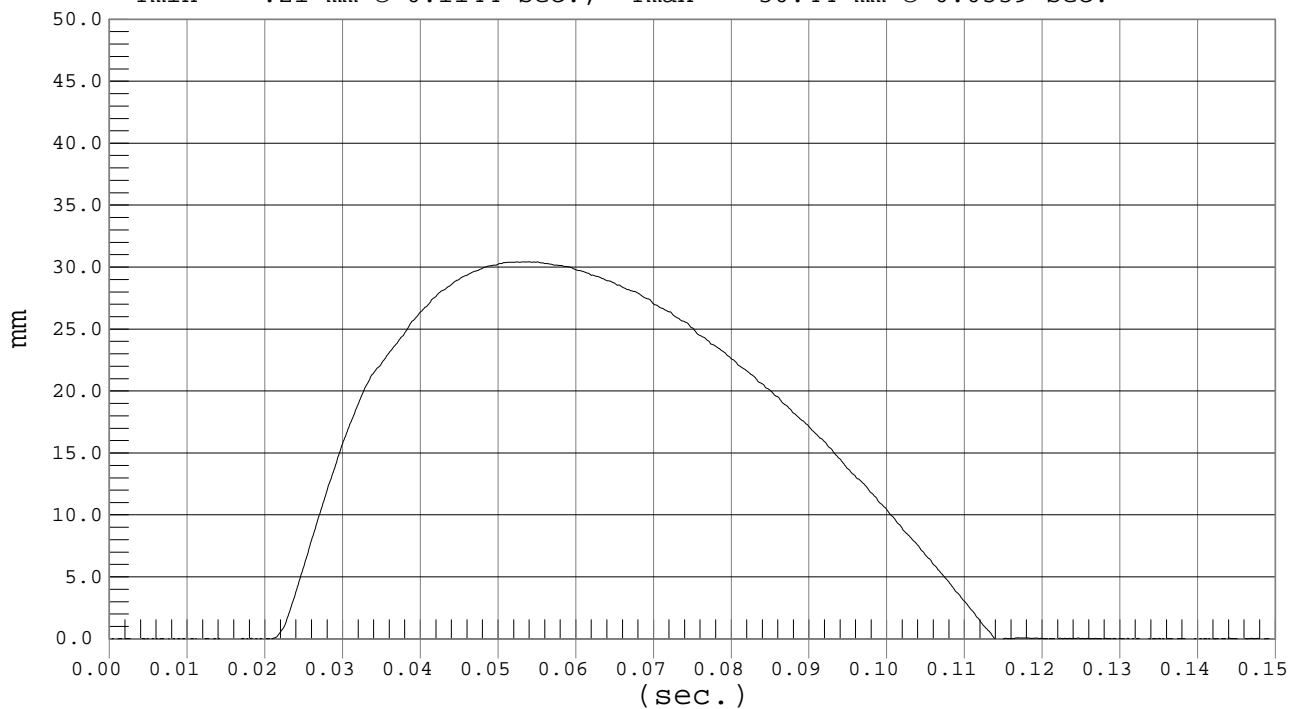


Test Desc.: Dampener Impact
Component: Dummy #048

PEAK DISPLACEMENT

Test Date: 01-07-02
Speed: 10.0 fps, 3.05 M/s

Ymin = -.21 mm @ 0.1144 sec., Ymax = 30.44 mm @ 0.0539 sec.



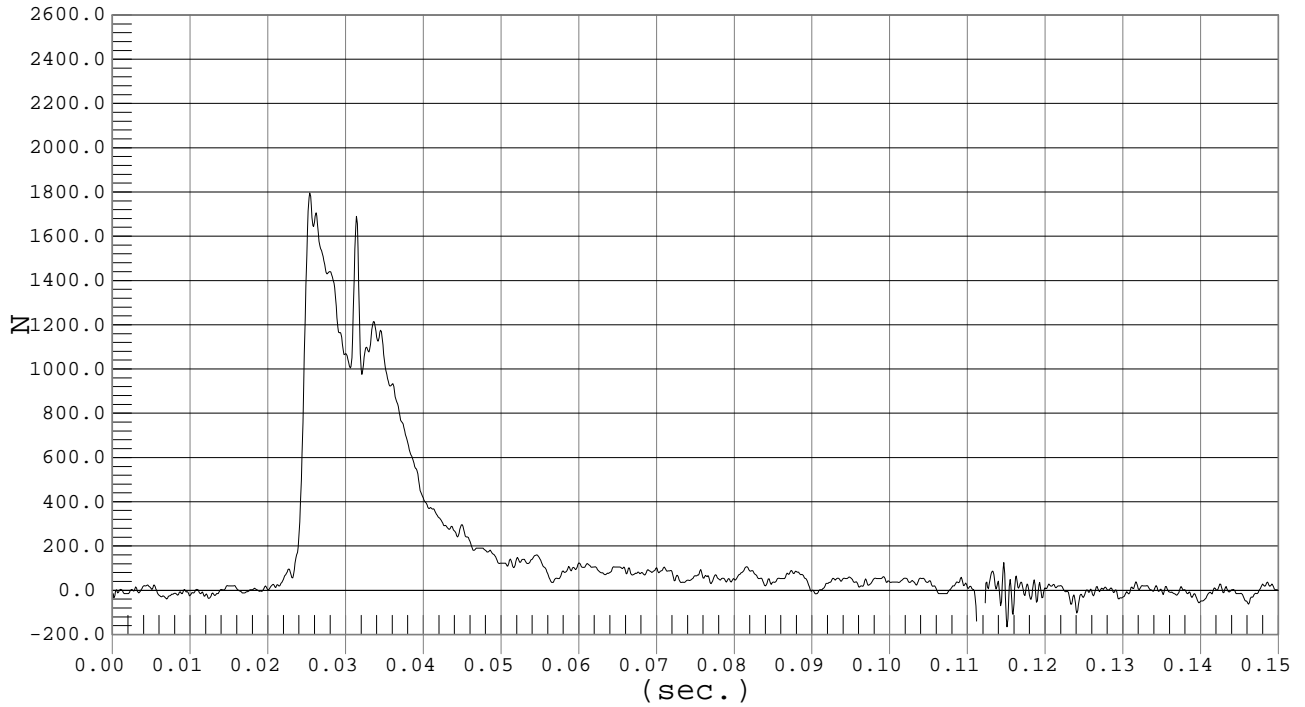


Test Desc.: Dampener Impact
Component: Dummy #048

PEAK FORCE

Test Date: 01-07-02
Speed: 0.0 fps, 0.00 M/s

Ymin = -1103.06 N @ 0.1117 sec., Ymax = 1796.35 N @ 0.0253 sec.

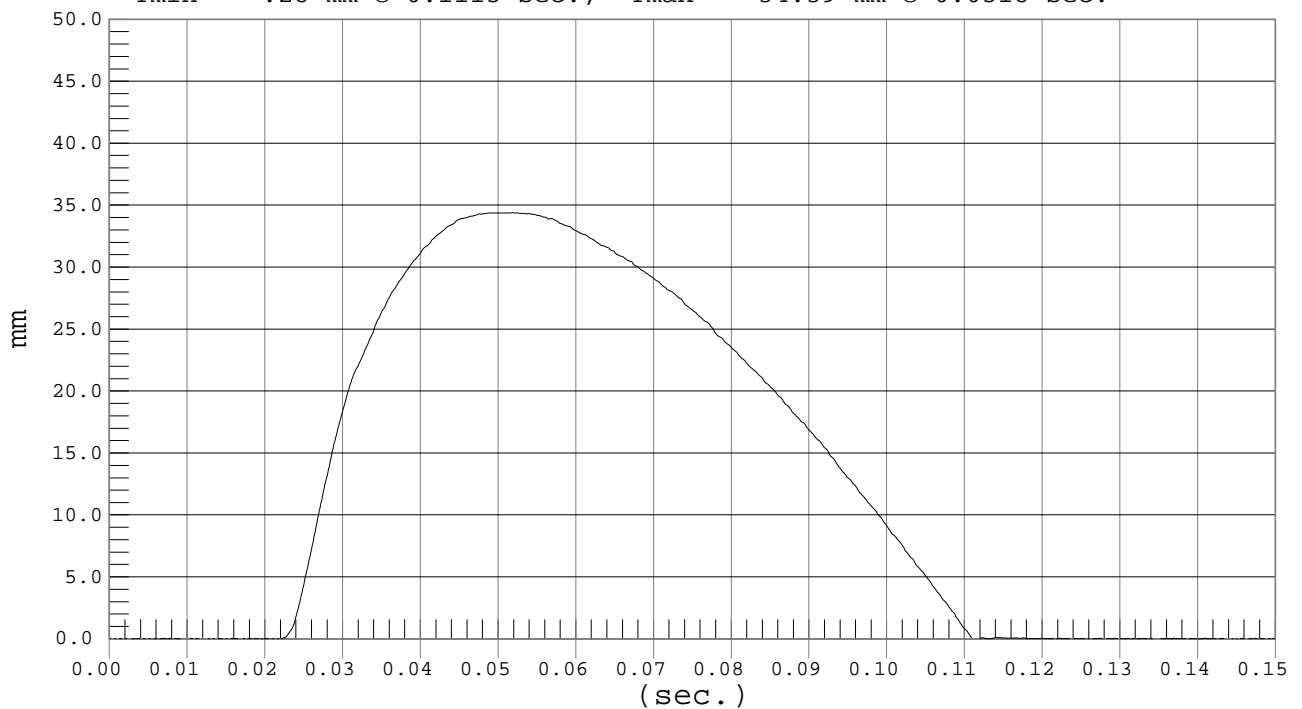


Test Desc.: Dampener Impact
Component: Dummy #048

PEAK DISPLACEMENT

Test Date: 01-07-02
Speed: 0.0 fps, 0.00 M/s

Ymin = -.28 mm @ 0.1115 sec., Ymax = 34.39 mm @ 0.0518 sec.



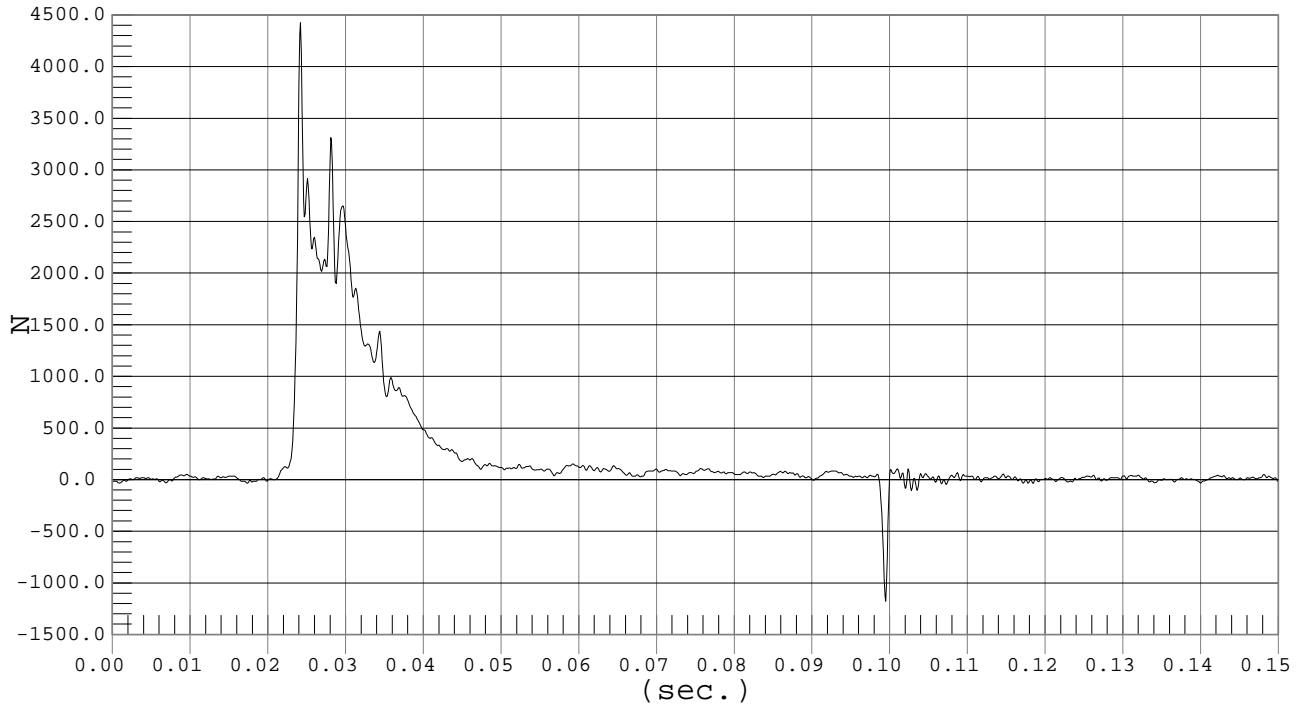


Test Desc.: Dampener Impact
Component: Dummy #048

PEAK FORCE

Test Date: 01-07-02
Speed: 20.0 fps, 6.10 M/s

Ymin = -1177.12 N @ 0.0994 sec., Ymax = 4425.44 N @ 0.0241 sec.

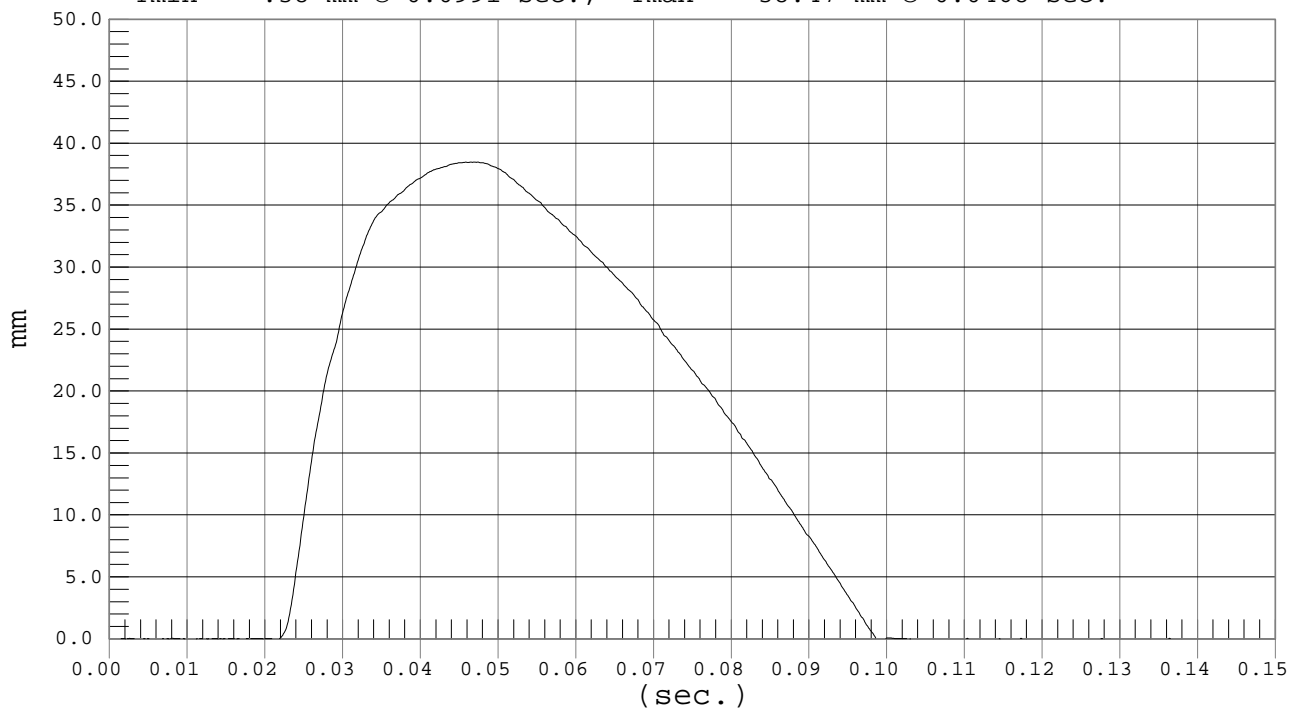


Test Desc.: Dampener Impact
Component: Dummy #048

PEAK DISPLACEMENT

Test Date: 01-07-02
Speed: 20.0 fps, 6.10 M/s

Ymin = -.38 mm @ 0.0991 sec., Ymax = 38.47 mm @ 0.0468 sec.



SID Calibration Data Sheet
Side Impact Dummy
Thorax Impact Calibration

ATD Serial No.: 048

Test I.D.: D02022

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 – 25.5	22.9	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.27 – 4.33	4.29	Pass
Upper Rib	G's	37 – 46	39	Pass
Lower Rib	G's	37 – 46	39	Pass
Lower Spine	G's	15 - 22	18	Pass
Overall Test Results				Pass

 Laboratory Technician

01/09/02
 Test Date

 Approved By

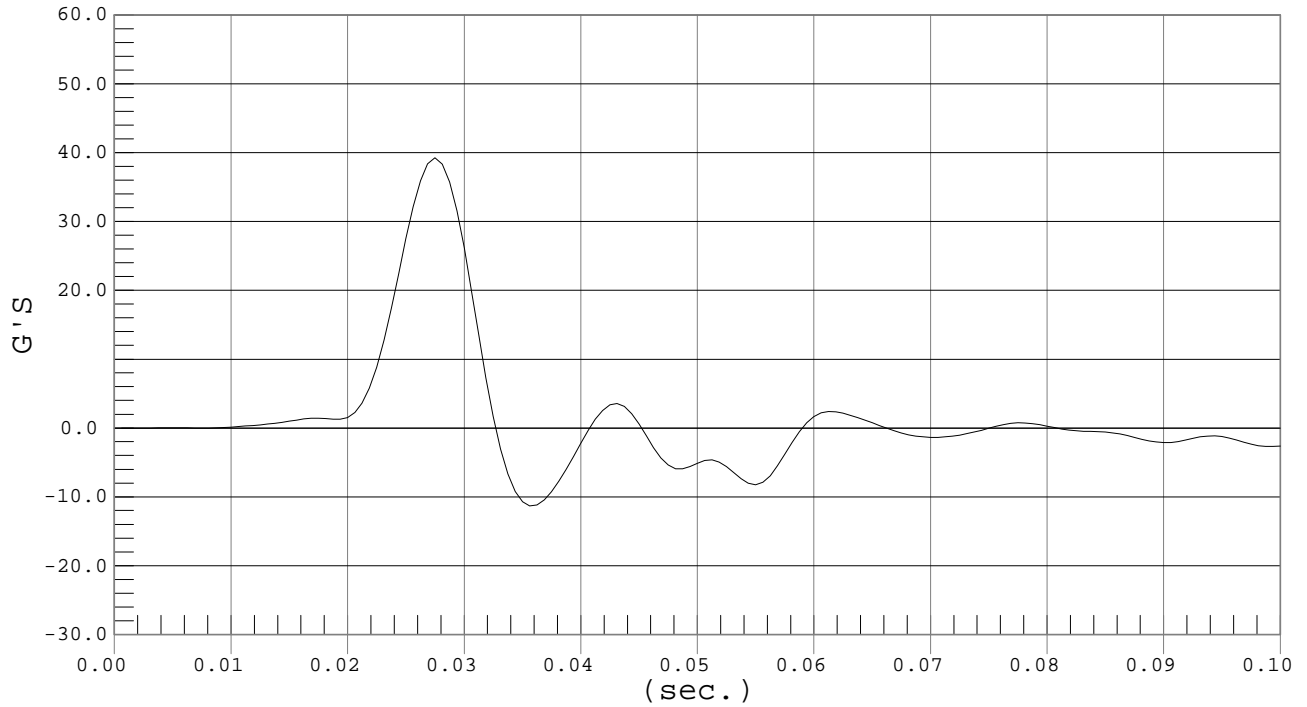


UPPER RIB ACCELERATION

Test Desc.: Thorax Impact
Component: Dummy #048

Test Date: 01-09-02
Speed: 14.1 fps, 4.29 M/s

Ymin = -11.33 G'S @ 0.0355 sec., Ymax = 39.25 G'S @ 0.0274 sec.

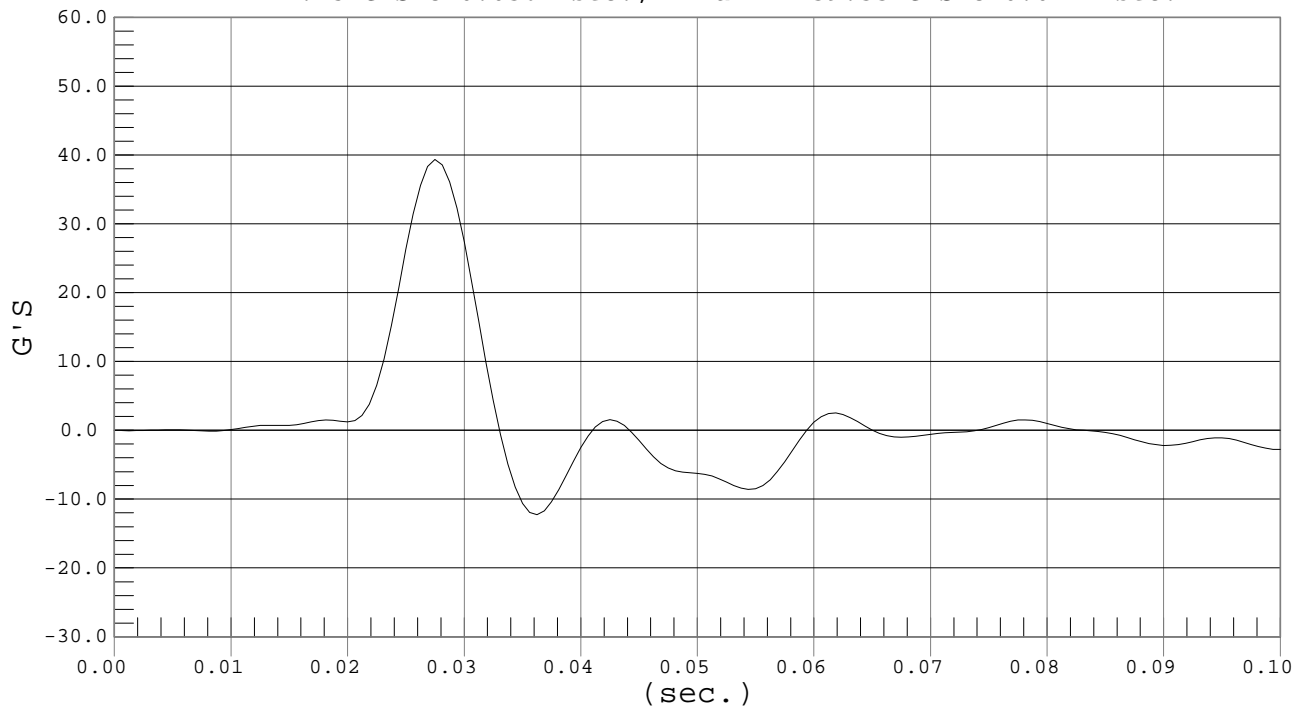


LOWER RIB ACCELERATION

Test Desc.: Thorax Impact
Component: Dummy #048

Test Date: 01-09-02
Speed: 14.1 fps, 4.29 M/s

Ymin = -12.25 G'S @ 0.0361 sec., Ymax = 39.33 G'S @ 0.0274 sec.



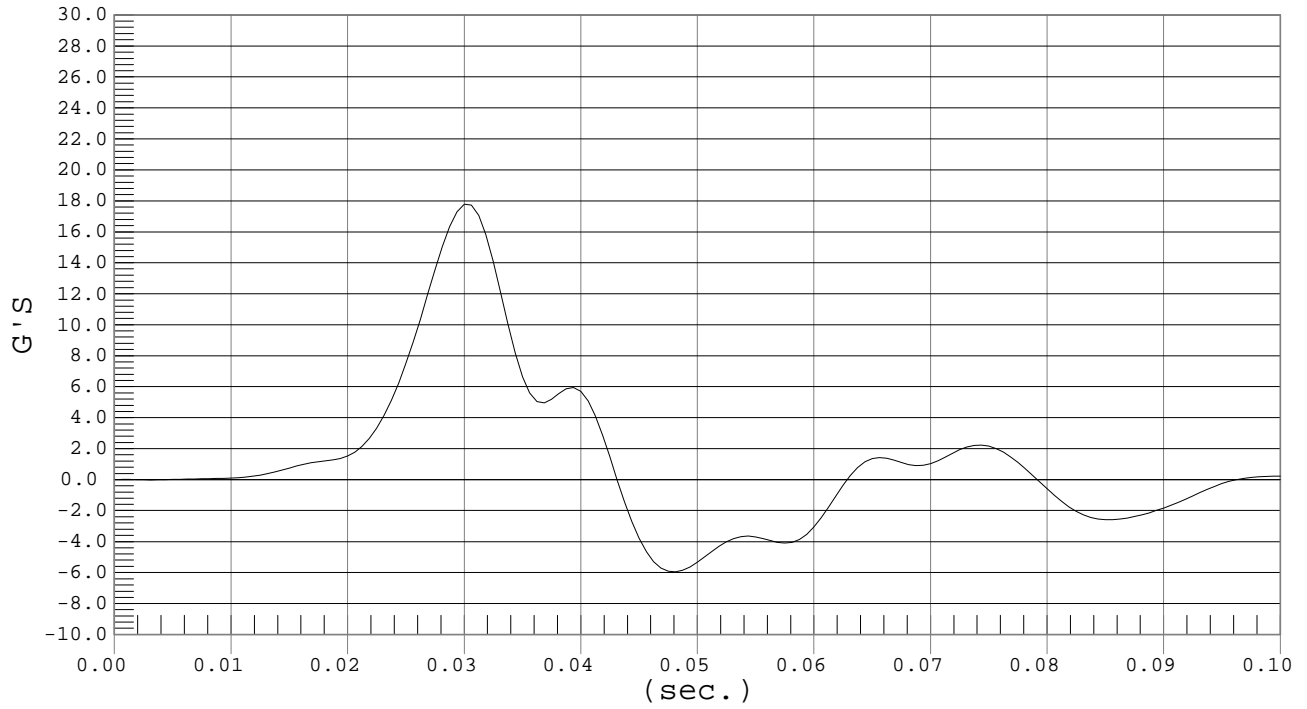


LOWER SPINE ACCELERATION

Test Desc.: Thorax Impact
Component: Dummy #048

Test Date: 01-09-02
Speed: 14.0 fps, 4.28 M/s

Ymin = -5.96 G'S @ 0.0480 sec., Ymax = 17.79 G'S @ 0.0299 sec.



SID Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Calibration

ATD Serial No.: 048

Test I.D.: D02023

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 – 25.5	23.0	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Speed	m/s	4.27 – 4.33	4.27	Pass
Pelvis Acceleration	G's	40 - 60	47	Pass
Overall Test Results				Pass

Laboratory Technician

01/10/02

Test Date

Approved By

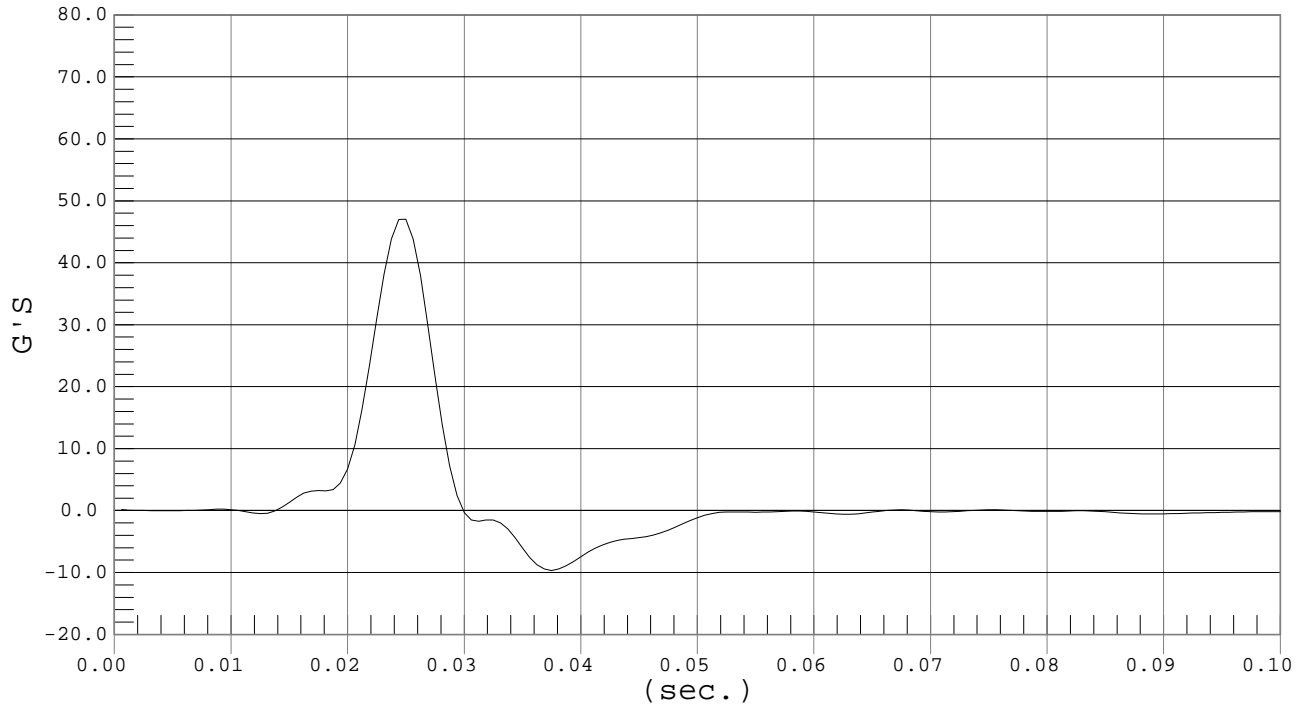


PELVIS ACCELERATION

Test Desc.: Pelvis Impact
Component: Dummy #048

Test Date: 01-09-02
Speed: 14.0 fps, 4.27 M/s

Ymin = -9.65 G'S @ 0.0374 sec., Ymax = 47.03 G'S @ 0.0249 sec.



SID Calibration Data Sheet
Side Impact Dummy
Abdominal Compression Calibration (Preload = 10 lbs)

ATD Serial No.: 048

Test I.D.: D02024

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 – 25.5	21.2	Pass
Laboratory Relative Humidity	%	10 to 70	15	Pass
Force @ 12.7	mm	104 – 162	137	Pass
Force @ 19	mm	163 – 222	193	Pass
Force @ 25.4	mm	222 – 280	261	Pass
Force @ 33	mm	325 - 391	371	Pass
Overall Test Results				Pass

 Laboratory Technician

01/07/02
 Test Date

 Approved By

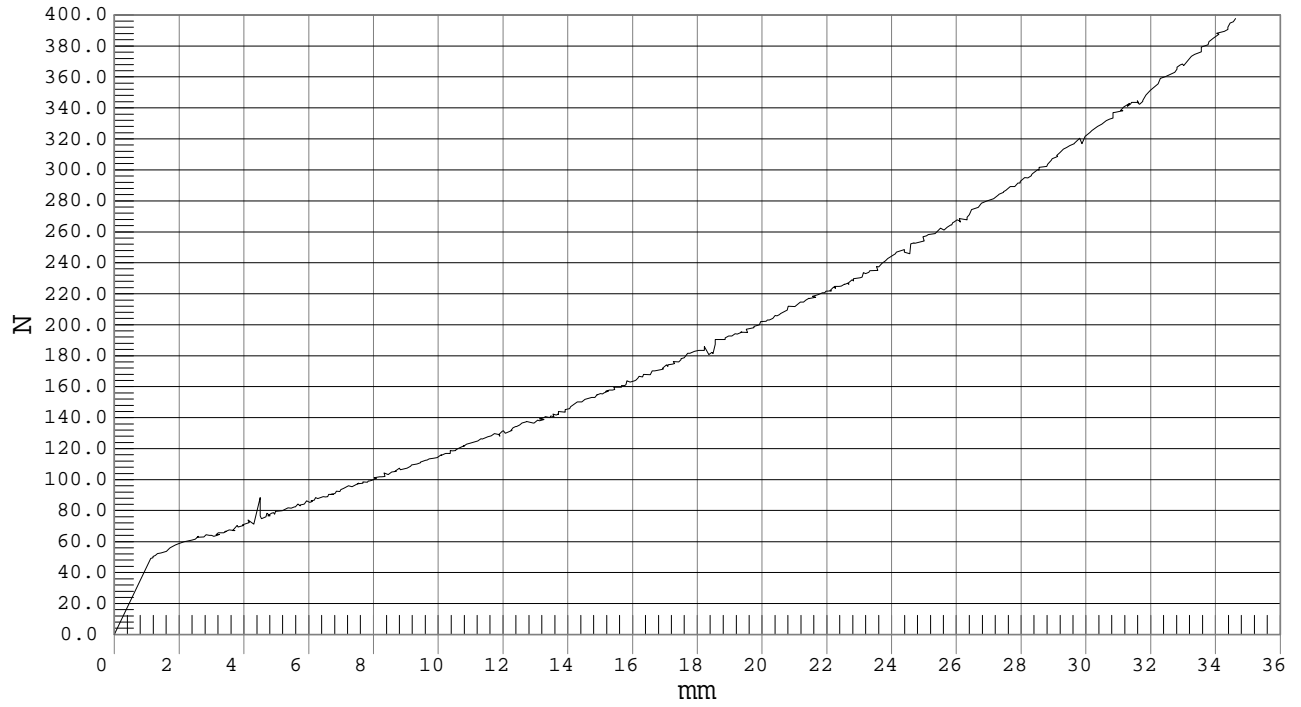


ABDOMEN COMPRESSION

Test Desc.: ABDOMEN COMPRESSION
Component: DUMMY # 048

Test Date: 01-07-02
Speed: 0.0 fps, 0.00 M/s

Ymin = 0 N @ -0.0001 mm, Ymax = 473.47 N @ 39.3269 mm



SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No.: 048

Test I.D.: D02025

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 – 25.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	17	Pass
Force @ 0	mm	0 – 26.7	0.0	Pass
Force @ 20	mm	97.9 – 151.2	98.1	Pass
Force @ 30	mm	151.2 – 204.6	155.4	Pass
Force @ 40	mm	204.6 – 258.0	212.6	Pass
Return Angle	Degrees	12 Maximum	1	Pass
Overall Test Results				Pass

Laboratory Technician

01/07/02
Test Date

Approved By

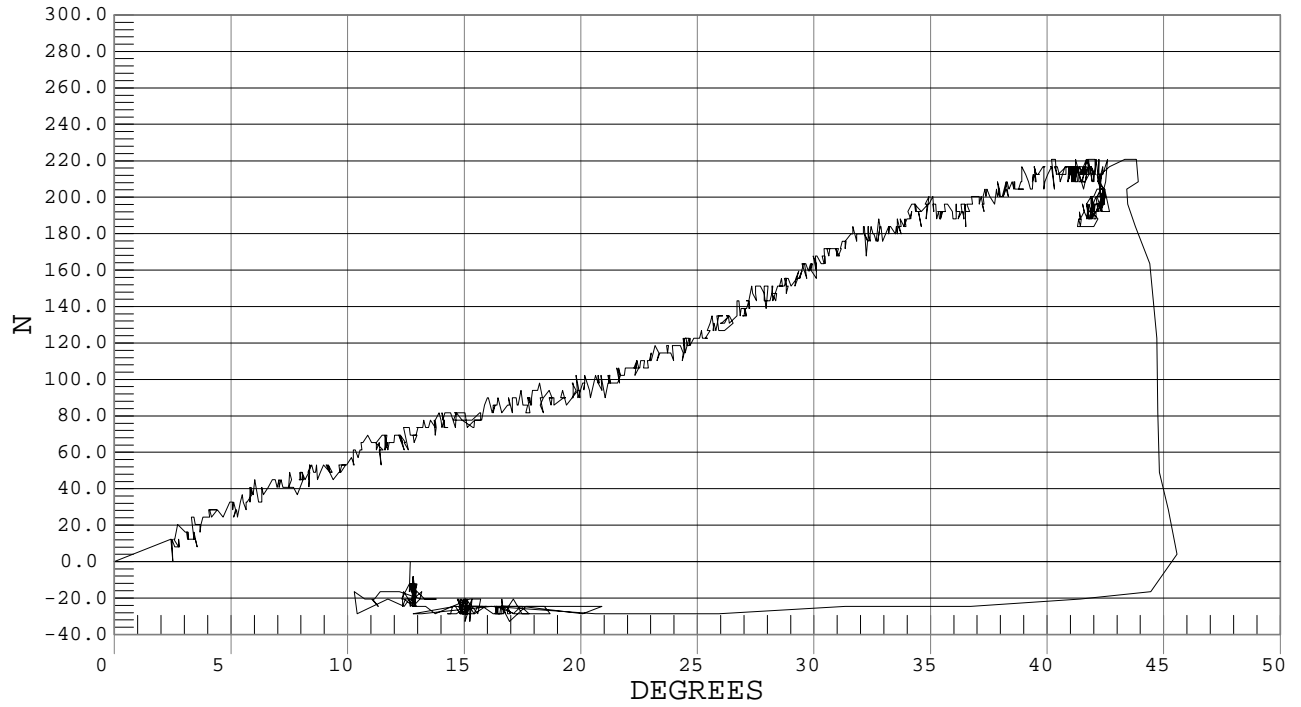


LUMBAR FLEXION

Test Desc.: LUMBAR FLEXION
Component: DUMMY # 048

Test Date: 01-04-02
Speed: 0.0 fps, 0.00 M/s

Ymin = -32.8 N @ 16.9461 DEGREES, Ymax = 220.79 N @ 40.1931 DEGREES



SID Calibration Data Sheet
Side Impact Dummy
Inspection Checklist

ATD Serial No.: 048

Test Part	Items Checked	Result
Skin	Visual inspection	Pass
Head	Visual, ballast, accelerometer mount	Pass
Neck	Visual	Pass
Spine Box	Visual, ballast, weldment, 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		

Notes (include component/problem/section/reason):

Laboratory Technician

01/10/02
Test Date

Approved By

CERTIFICATION DATA

Dummy Serial Number: 049

Calibration Test Results Summary

Dummy Serial Number: 49

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.

Approved By SID Calibration Data Sheet
Side Impact Dummy
External Measurements

ATD Serial No.: 049

Test Number: D0203

Tested Parameter	Units	Specification	Result	Pass/Fail
SH – Seated Height	mm	889 - 909	898	Pass
RH – Rib Height	mm	501 – 521	517	Pass
HP – Hip Pivot Height	mm	99 ref.	99	Pass
RD-Rib from Back Line	mm	229 – 241	232	Pass
KV – Knee Pivot from Back Line	mm	511 – 526	522	Pass
SW – Knee Pivot to Floor	mm	490 – 505	492	Pass
HW – Hip Width	mm	356 – 391	367	Pass
Overall Test Results				Pass

Laboratory Technician

01/09/02
Test Date

Approved By

SID Calibration Data Sheet
Side Impact Dummy
Head Drop Calibration

ATD Serial No.: 049

Test I.D.: D02031

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Peak Resultant Acceleration	G's	210 to 260	214	Pass
Peak Lateral Acceleration	G's	< 10	-4	Pass
Time Above 100 G	msec	0.9 – 1.5	1.1	Pass
Overall Test Results				Pass

 Laboratory Technician

01/04/02
 Test Date

 Approved By

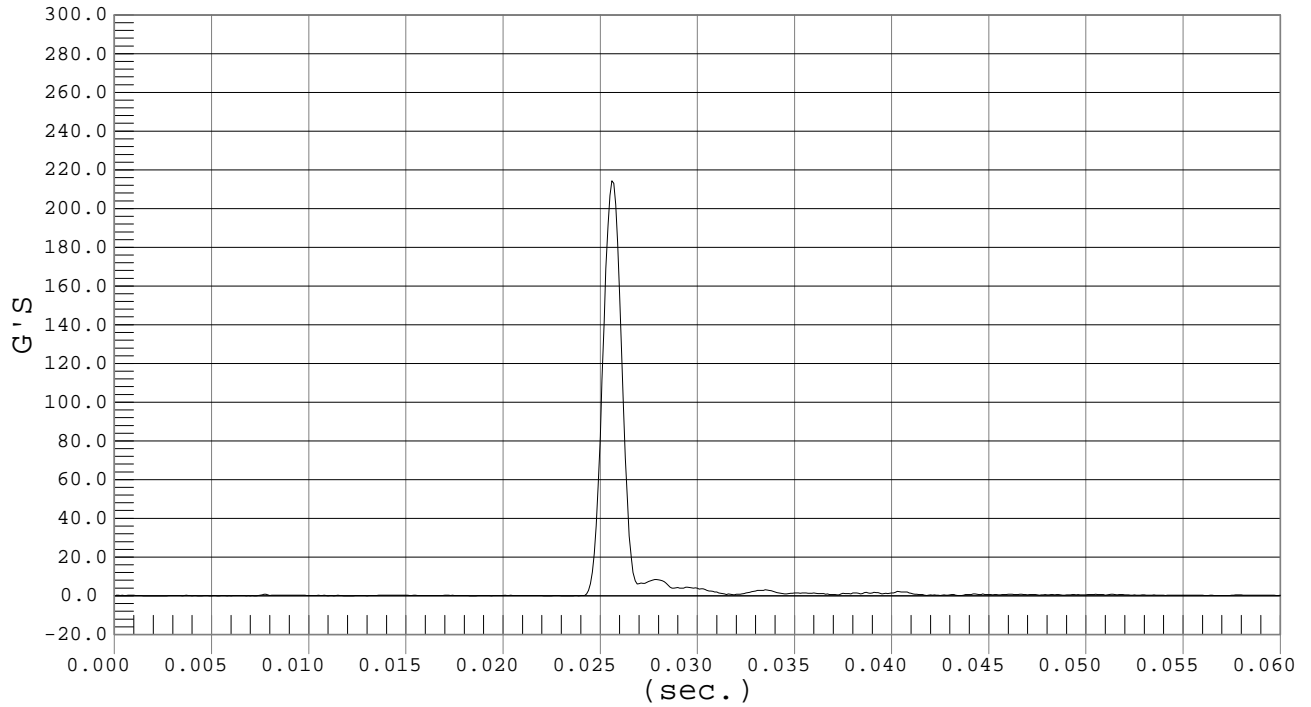


PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #049

Test Date: 01-04-02
Speed: 0.0 fps, 0.00 M/s

Ymin = .04 G'S @ 0.0018 sec., Ymax = 214.4 G'S @ 0.0255 sec.

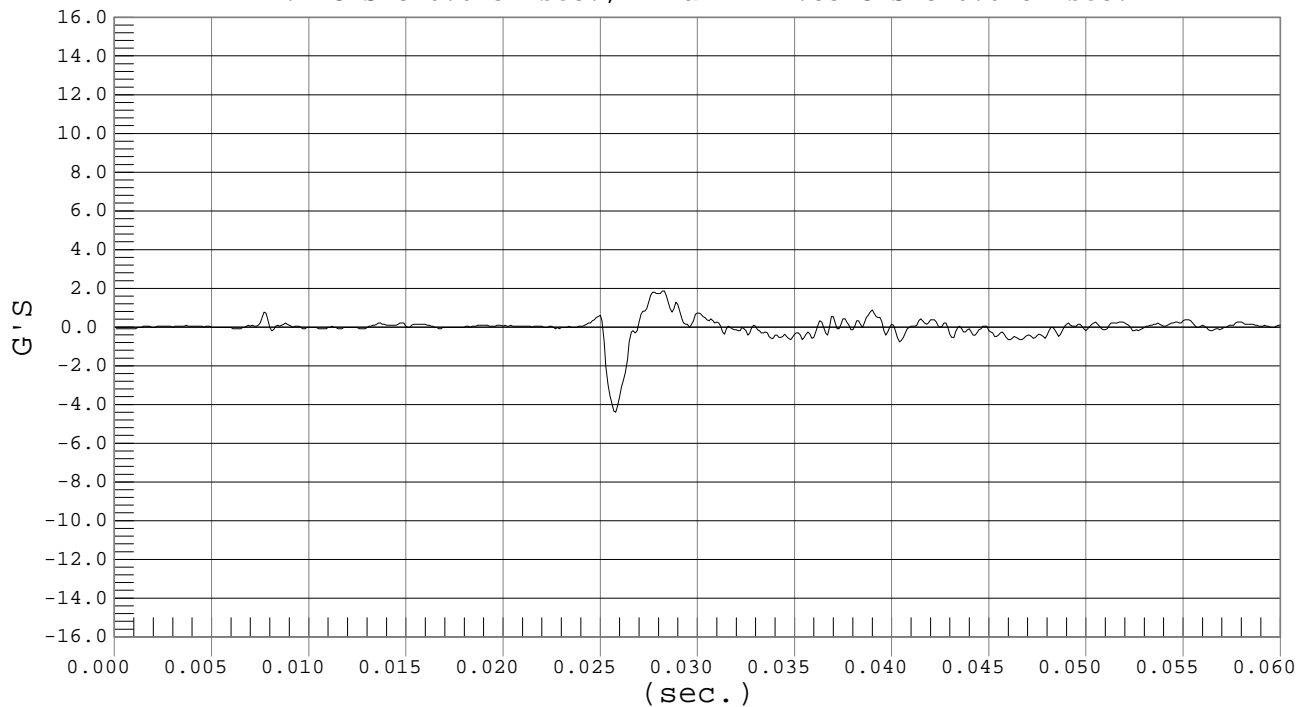


PEAK LATERAL ACCELARATION

Test Desc.: Head Drop
Component: Dummy #049

Test Date: 01-04-02
Speed: 0.0 fps, 0.00 M/s

Ymin = -4.4 G'S @ 0.0257 sec., Ymax = 1.85 G'S @ 0.0281 sec.



SID Calibration Data Sheet
Side Impact Dummy
Thoracic Shock Absorber Calibration

ATD Serial No.: 049

Test I.D.: D02036/7/8

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	20	Pass
Velocity 3.05 m/s	Force	N	836 – 1125	978	Pass
	Displacement	mm	30 – 35	31	Pass
Velocity 4.27 m/s	Force	N	1730 – 2099	1891	Pass
	Displacement	mm	32 – 37	33	Pass
Velocity 6.1 m/s	Force	N	3741 – 4448	4379	Pass
	Displacement	mm	33 - 40	34	Pass
Overall Test Results					Pass

Laboratory Technician

01/07/02

Test Date

Approved By

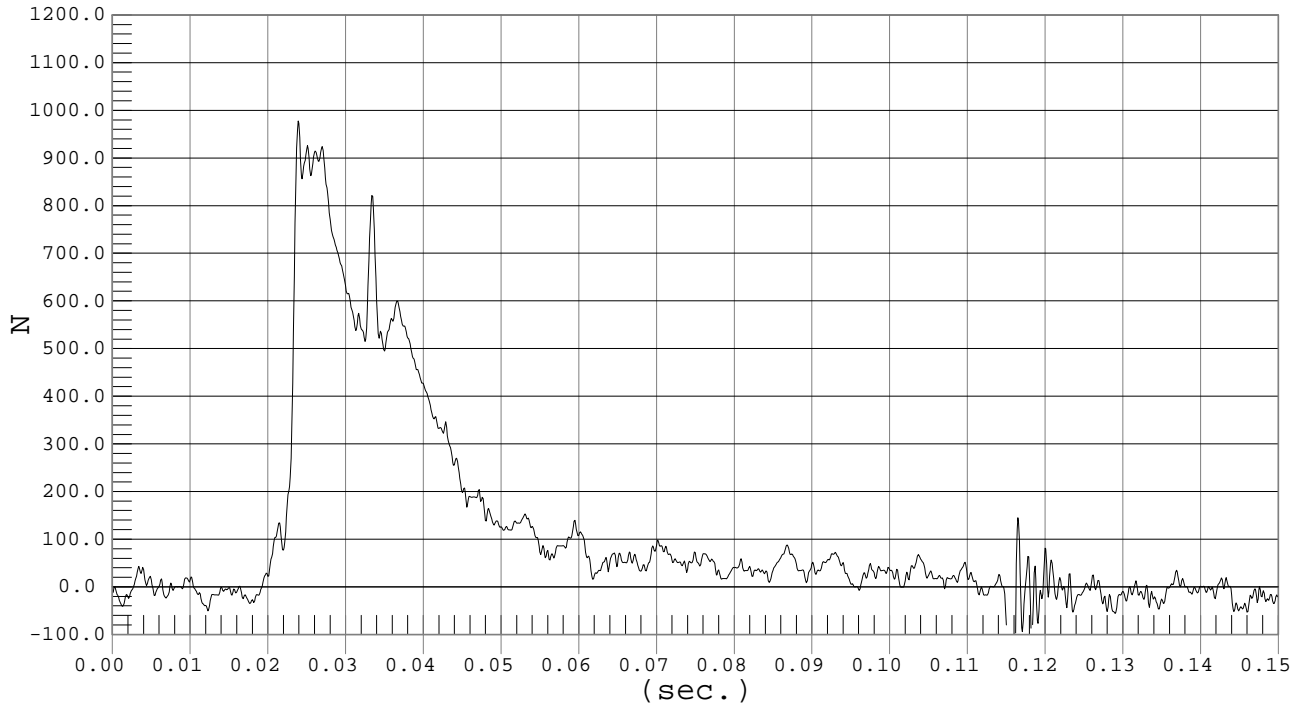


Test Desc.: Dampener Impact
Component: Dummy #049

PEAK FORCE

Test Date: 01-07-02
Speed: 10.0 fps, 3.05 M/s

Ymin = -949.06 N @ 0.1156 sec., Ymax = 977.52 N @ 0.0238 sec.

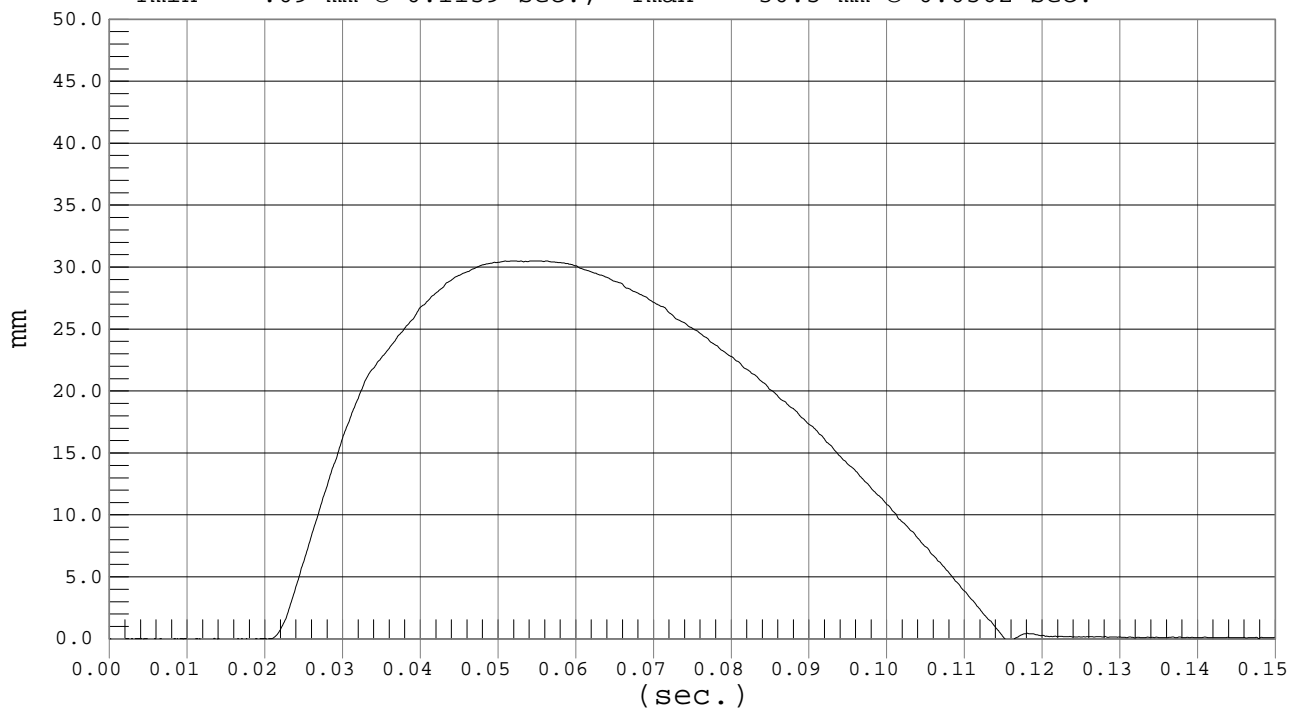


Test Desc.: Dampener Impact
Component: Dummy #049

PEAK DISPLACEMENT

Test Date: 01-07-02
Speed: 10.0 fps, 3.05 M/s

Ymin = -.09 mm @ 0.1159 sec., Ymax = 30.5 mm @ 0.0562 sec.



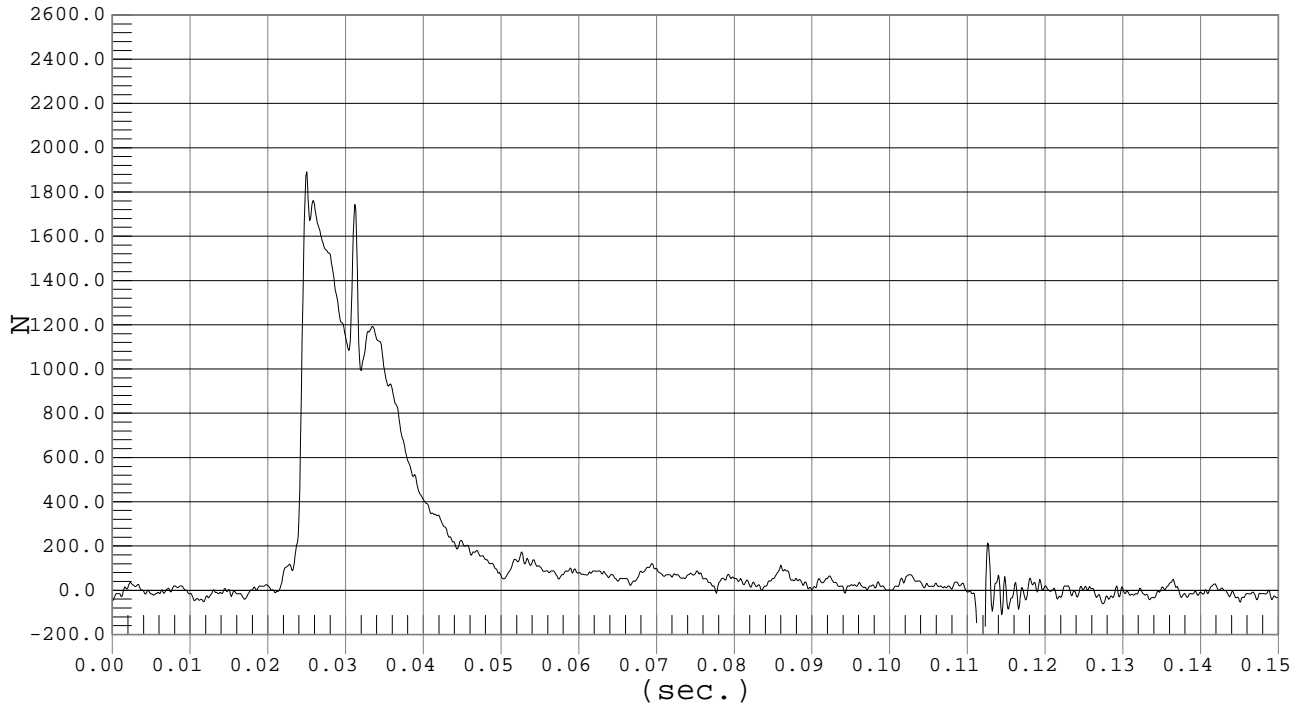


Test Desc.: Dampener Impact
Component: Dummy #049

PEAK FORCE

Test Date: 01-07-02
Speed: 14.0 fps, 4.27 M/s

Ymin = -953.46 N @ 0.1118 sec., Ymax = 1890.72 N @ 0.0249 sec.

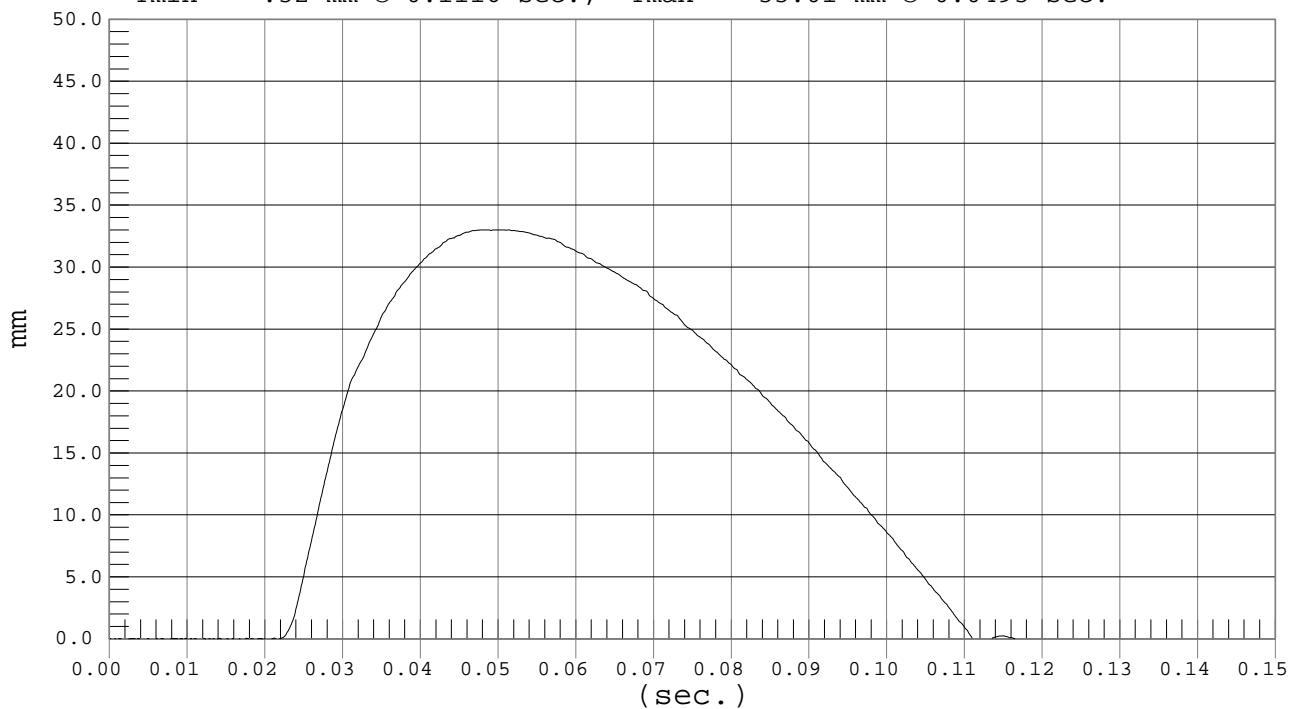


Test Desc.: Dampener Impact
Component: Dummy #049

PEAK DISPLACEMENT

Test Date: 01-07-02
Speed: 14.0 fps, 4.27 M/s

Ymin = -.32 mm @ 0.1116 sec., Ymax = 33.01 mm @ 0.0493 sec.



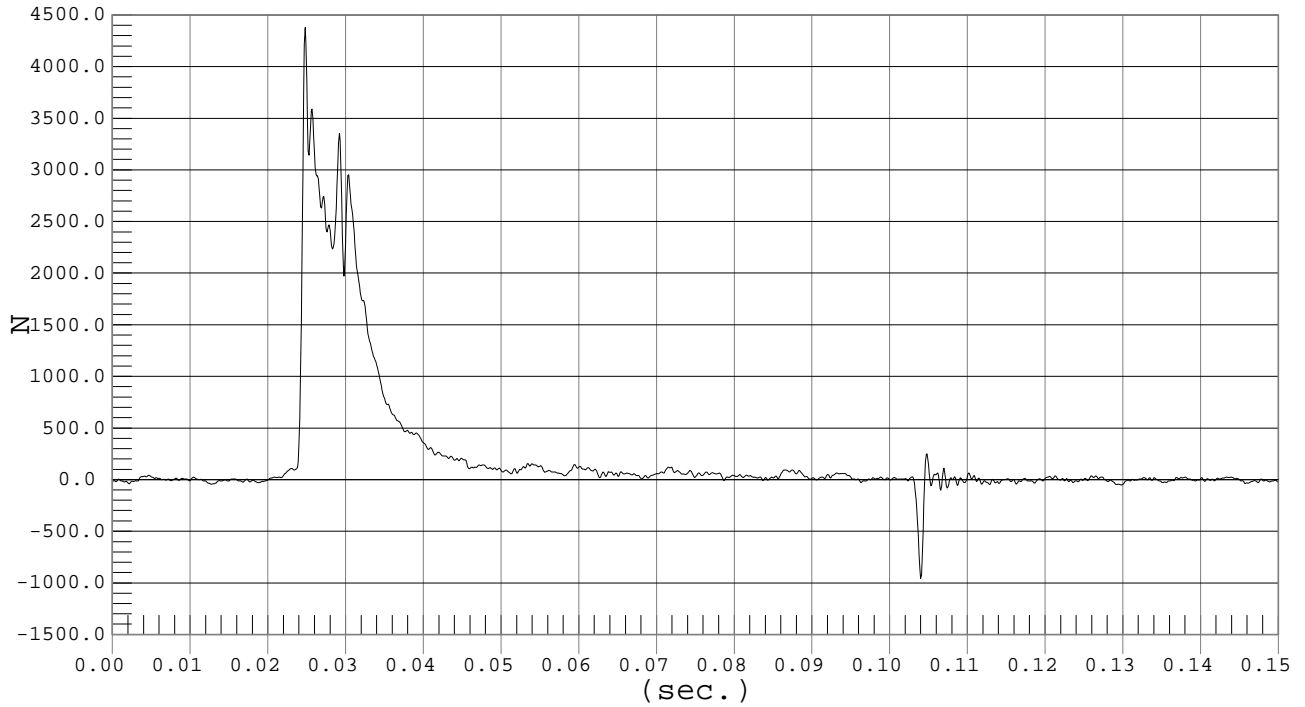


Test Desc.: Dampener Impact
Component: Dummy #049

PEAK FORCE

Test Date: 01-07-02
Speed: 20.0 fps, 6.10 M/s

Ymin = -957.59 N @ 0.1039 sec., Ymax = 4379.36 N @ 0.0247 sec.

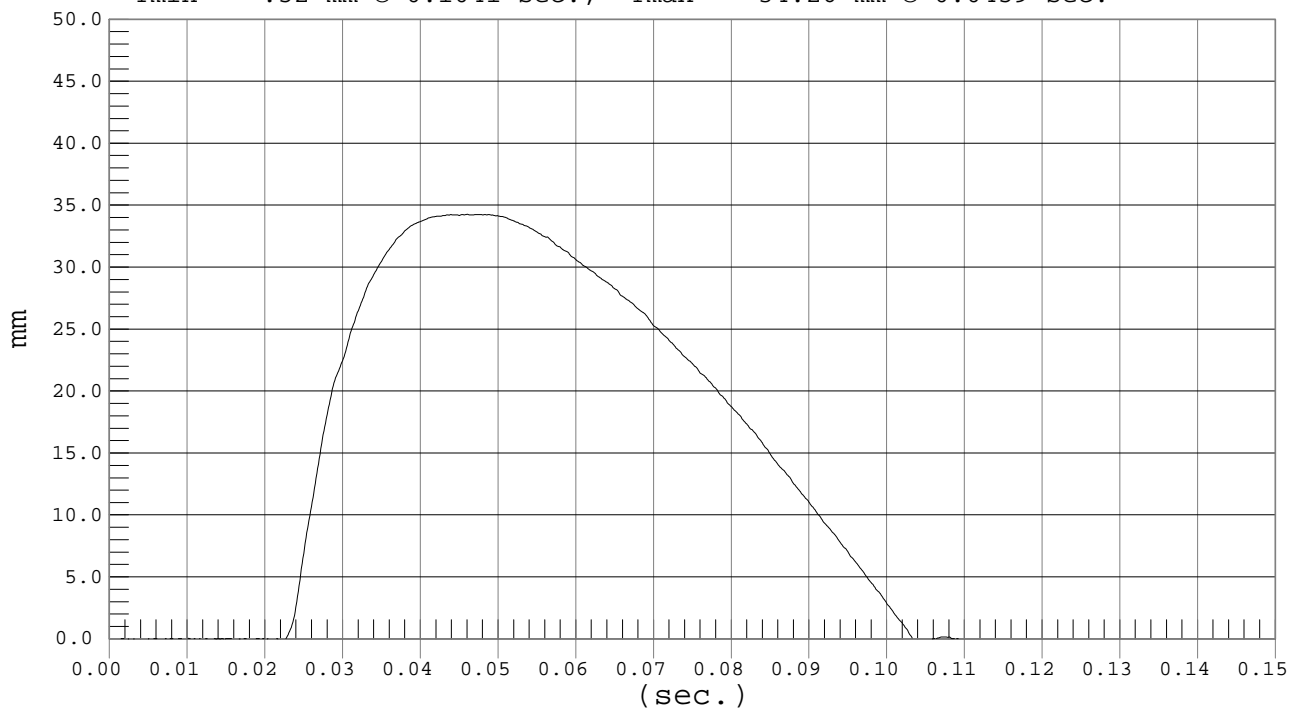


Test Desc.: Dampener Impact
Component: Dummy #049

PEAK DISPLACEMENT

Test Date: 01-07-02
Speed: 20.0 fps, 6.10 M/s

Ymin = -.52 mm @ 0.1041 sec., Ymax = 34.26 mm @ 0.0459 sec.



SID Calibration Data Sheet
Side Impact Dummy
Thorax Impact Calibration

ATD Serial No.: 049

Test I.D.: D02032

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 – 25.5	23.0	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Probe Velocity	m/s	4.27 – 4.33	4.28	Pass
Upper Rib	G's	37 – 46	39	Pass
Lower Rib	G's	37 – 46	39	Pass
Lower Spine	G's	15 - 22	18	Pass
Overall Test Results				Pass

 Laboratory Technician

01/09/02
 Test Date

 Approved By

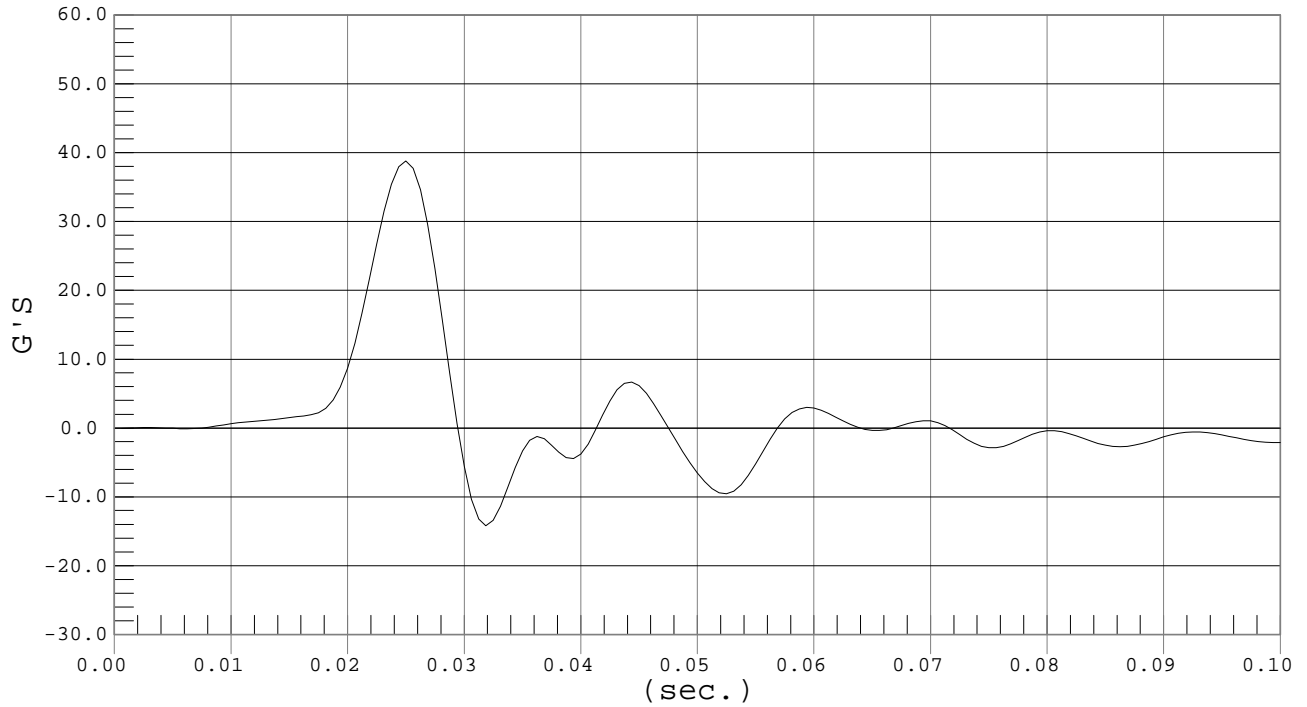


UPPER RIB ACCELERATION

Test Desc.: Thorax Impact
Component: Dummy #049

Test Date: 01-09-02
Speed: 14.0 fps, 4.28 M/s

Ymin = -14.19 G'S @ 0.0318 sec., Ymax = 38.82 G'S @ 0.0249 sec.

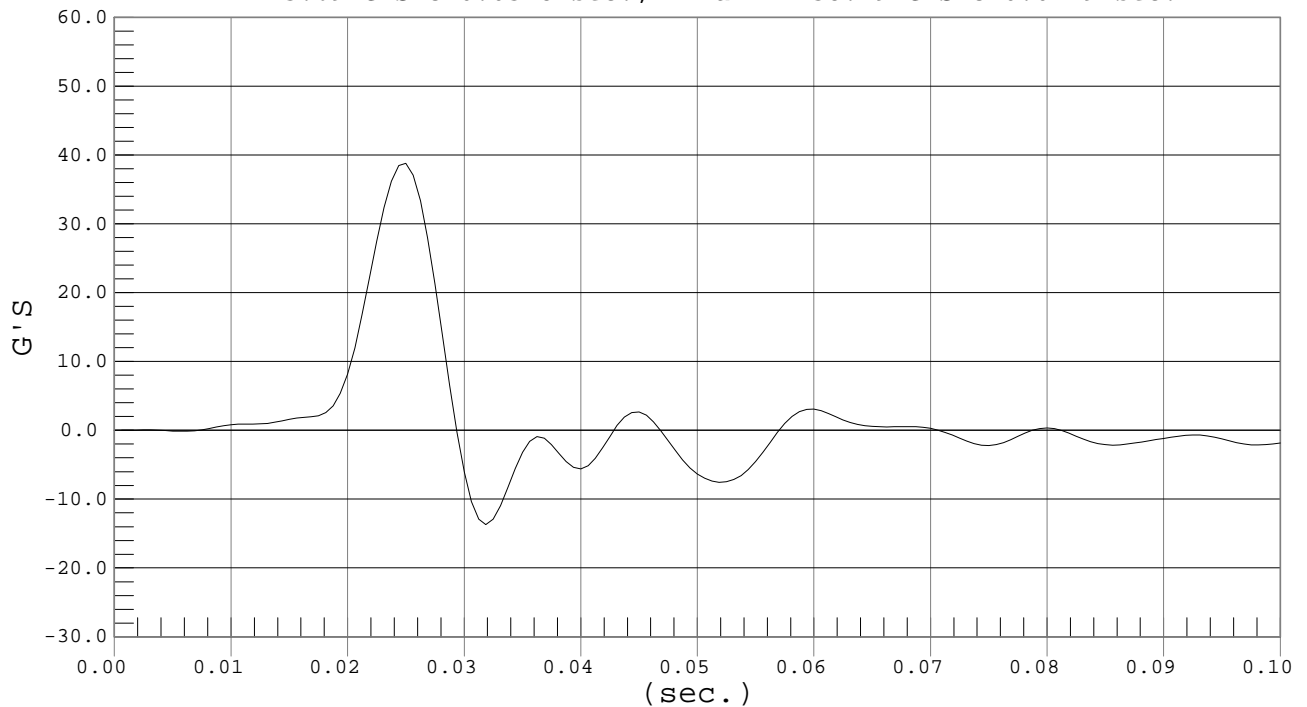


LOWER RIB ACCELERATION

Test Desc.: Thorax Impact
Component: Dummy #049

Test Date: 01-09-02
Speed: 14.0 fps, 4.28 M/s

Ymin = -13.69 G'S @ 0.0318 sec., Ymax = 38.79 G'S @ 0.0249 sec.



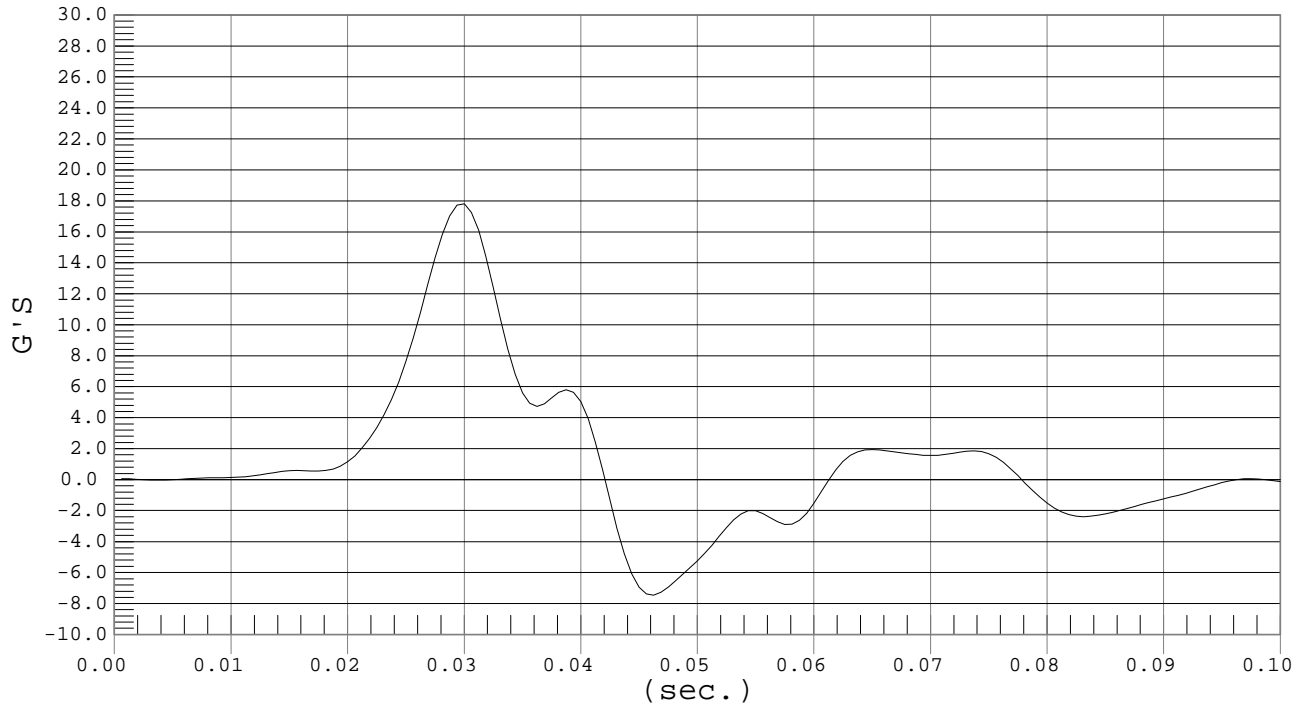


LOWER SPINE ACCELERATION

Test Desc.: Thorax Impact
Component: Dummy #049

Test Date: 01-09-02
Speed: 14.0 fps, 4.28 M/s

Ymin = -7.46 G'S @ 0.0462 sec., Ymax = 17.82 G'S @ 0.0299 sec.



SID Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Calibration

ATD Serial No.: 049

Test I.D.: D02033

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 – 25.5	23.0	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Probe Speed	m/s	4.27 – 4.33	4.27	Pass
Pelvis Acceleration	G's	40 - 60	44	Pass
Overall Test Results				Pass

 Laboratory Technician

01/09/02

Test Date

 Approved By

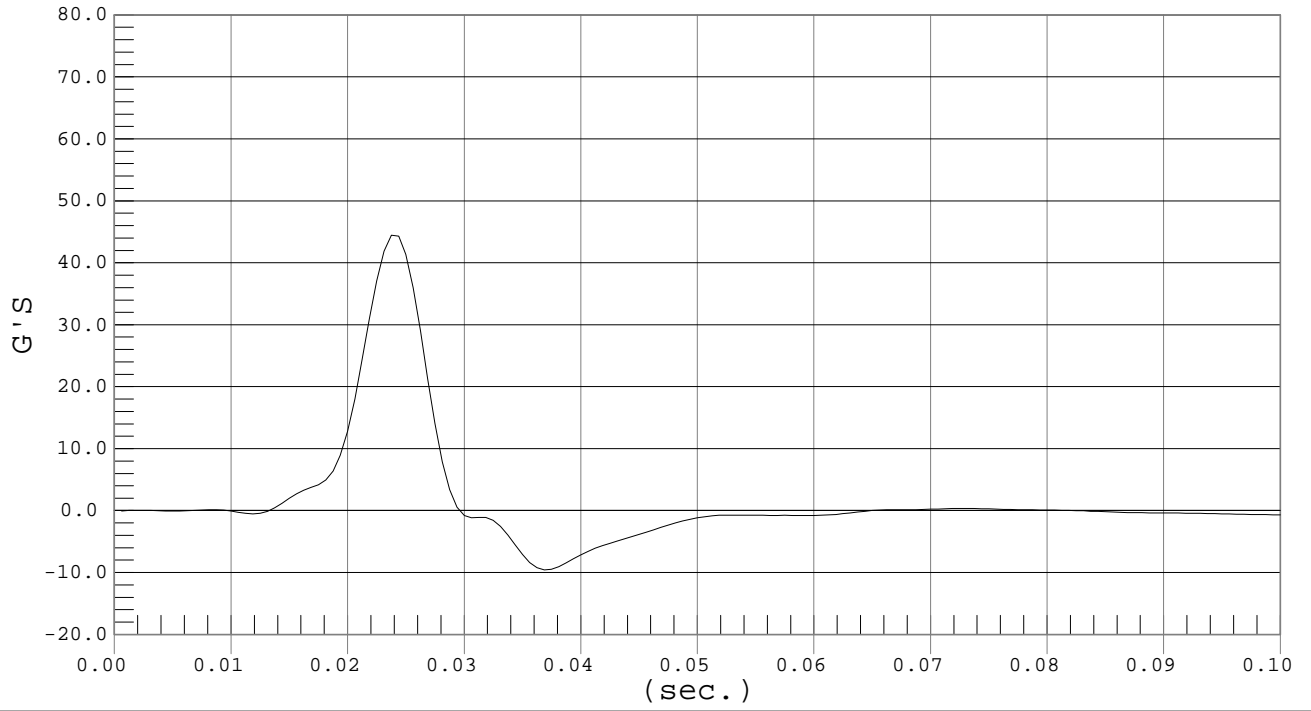


PELVIS ACCELERATION

Test Desc.: Pelvis Impact
Component: Dummy #049

Test Date: 01-09-02
Speed: 14.0 fps, 4.27 M/s

Ymin = -9.56 G'S @ 0.0368 sec., Ymax = 44.43 G'S @ 0.0237 sec.



SID Calibration Data Sheet
Side Impact Dummy
Abdominal Compression Calibration (Preload = 10 lbs)

ATD Serial No.: 049

Test I.D.: D02034

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 – 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	15	Pass
Force @ 12.7	mm	104 – 162	143	Pass
Force @ 19	mm	163 – 222	204	Pass
Force @ 25.4	mm	222 – 280	272	Pass
Force @ 33	mm	325 - 391	376	Pass
Overall Test Results				Pass

Laboratory Technician

01/07/02
Test Date

Approved By

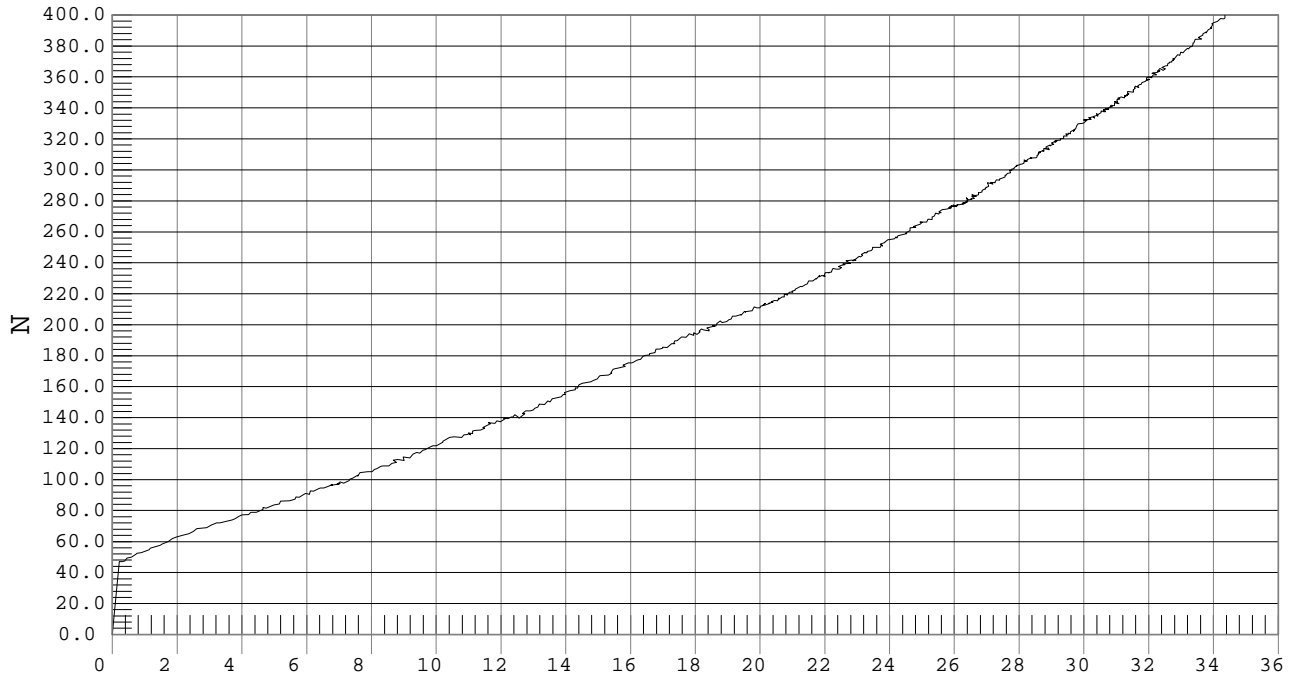


ABDOMEN COMPRESSION

Test Desc.: ABDOMEN COMPRESSION
Component: DUMMY # 049

Test Date: 01-07-02
Speed: 0.0 fps, 0.00 M/s

Ymin = 0 N @ -0.0001 mm, Ymax = 507.43 N @ 40.1517 mm



SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No.: 049

Test I.D.: D02035

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 – 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	20.2	Pass
Force @ 0	mm	0 – 26.7	0.0	Pass
Force @ 20	mm	97.9 – 151.2	115.1	Pass
Force @ 30	mm	151.2 – 204.6	180.6	Pass
Force @ 40	mm	204.6 – 258.0	237.9	Pass
Return Angle	Degrees	12 Maximum	2	Pass
Overall Test Results				Pass

Laboratory Technician

01/04/02
Test Date

Approved By

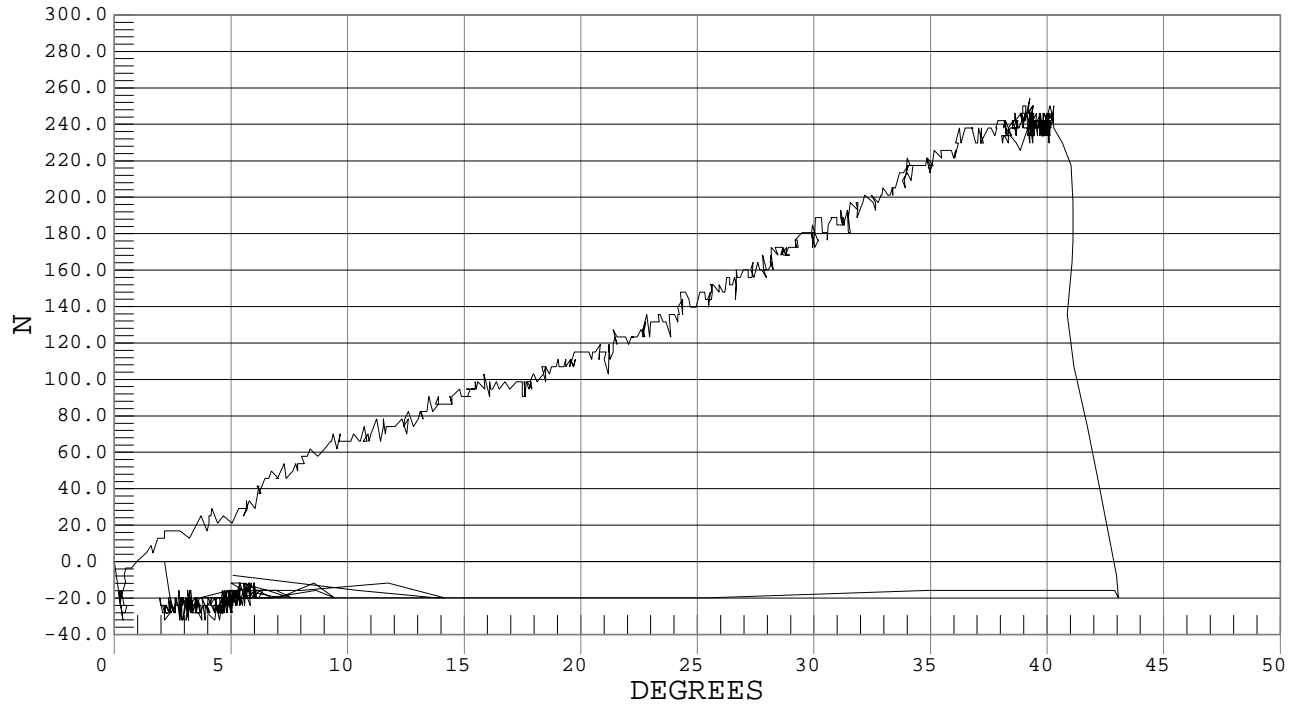


LUMBAR FLEXION

Test Desc.: LUMBAR FLEXION
Component: DUMMY # 049

Test Date: 01-04-02
Speed: 0.0 fps, 0.00 M/s

Ymin = -32.15 N @ 0.3713 DEGREES, Ymax = 254.23 N @ 39.2541 DEGREES



SID Calibration Data Sheet
Side Impact Dummy
Inspection Checklist

ATD Serial No.: 049

Test Part	Items Checked	Result
Skin	Visual inspection	Pass
Head	Visual, ballast, accelerometer mount	Pass
Neck	Visual	Pass
Spine Box	Visual, ballast, weldment, 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		

Notes (include component/problem/section/reason):

Laboratory Technician

01/09/02
Test Date

Approved By

CERTIFICATION DATA

Dummy Serial Number: 048

Calibration Test Results Summary

Dummy Serial Number: 48

Post-Test Calibration

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

SID Calibration Data Sheet
Side Impact Dummy
External Measurements

ATD Serial No.: 048

Test Number: D0210

Tested Parameter	Units	Specification	Result	Pass/Fail
SH – Seated Height	mm	889 - 909	902	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	236	Pass
KV – Knee Pivot from Back Line	mm	511 – 526	519	Pass
SW – Knee Pivot to Floor	mm	490 – 505	492	Pass
HW – Hip Width	mm	356 – 391	364	Pass
Overall Test Results				Pass

Laboratory Technician

01/18/02
Test Date

Approved By

SID Calibration Data Sheet
Side Impact Dummy
Head Drop Calibration

ATD Serial No.: 048

Test I.D.: D02101

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	20.5	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Peak Resultant Acceleration	G's	210 to 260	243	Pass
Peak Lateral Acceleration	G's	< 10	-10	Pass
Time Above 100 G	msec	0.9 – 1.5	1.1	Pass
Overall Test Results				Pass

 Laboratory Technician

01/18/02
 Test Date

 Approved By

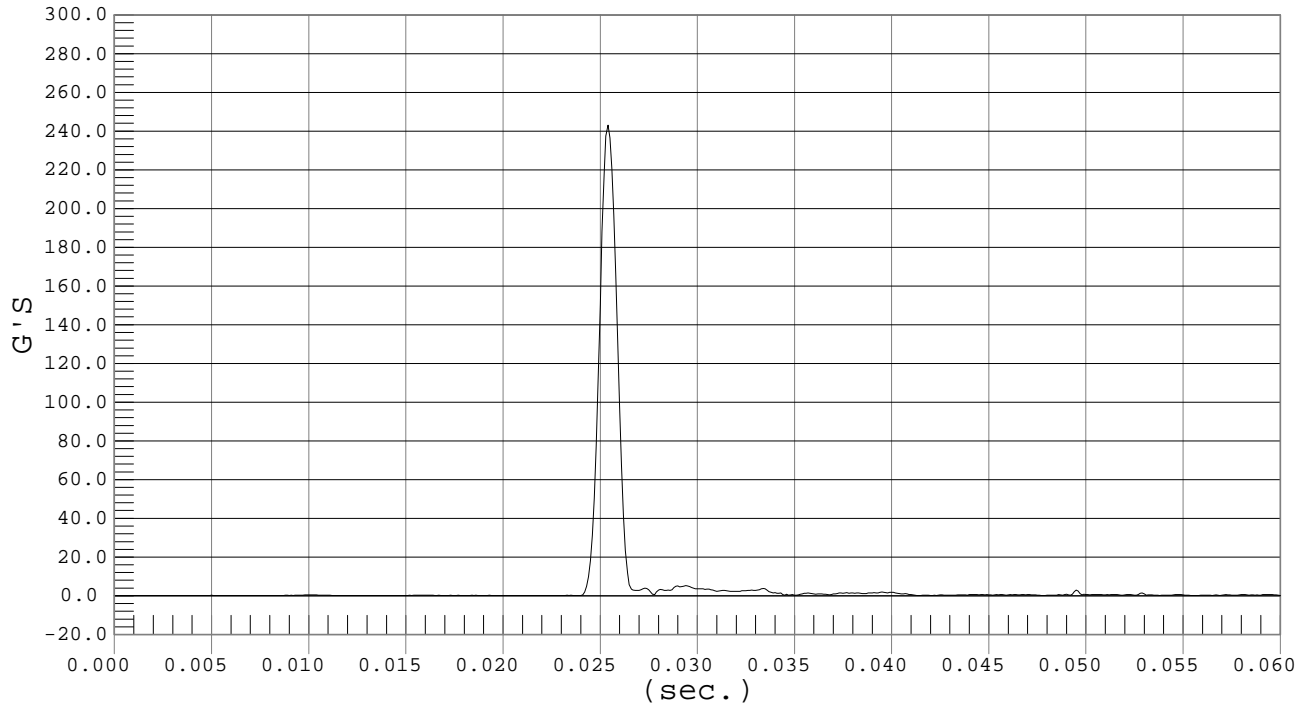


PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #048

Test Date: 01-18-02
Speed: 0.0 fps, 0.00 M/s

Ymin = .07 G'S @ 0.0001 sec., Ymax = 243.13 G'S @ 0.0253 sec.

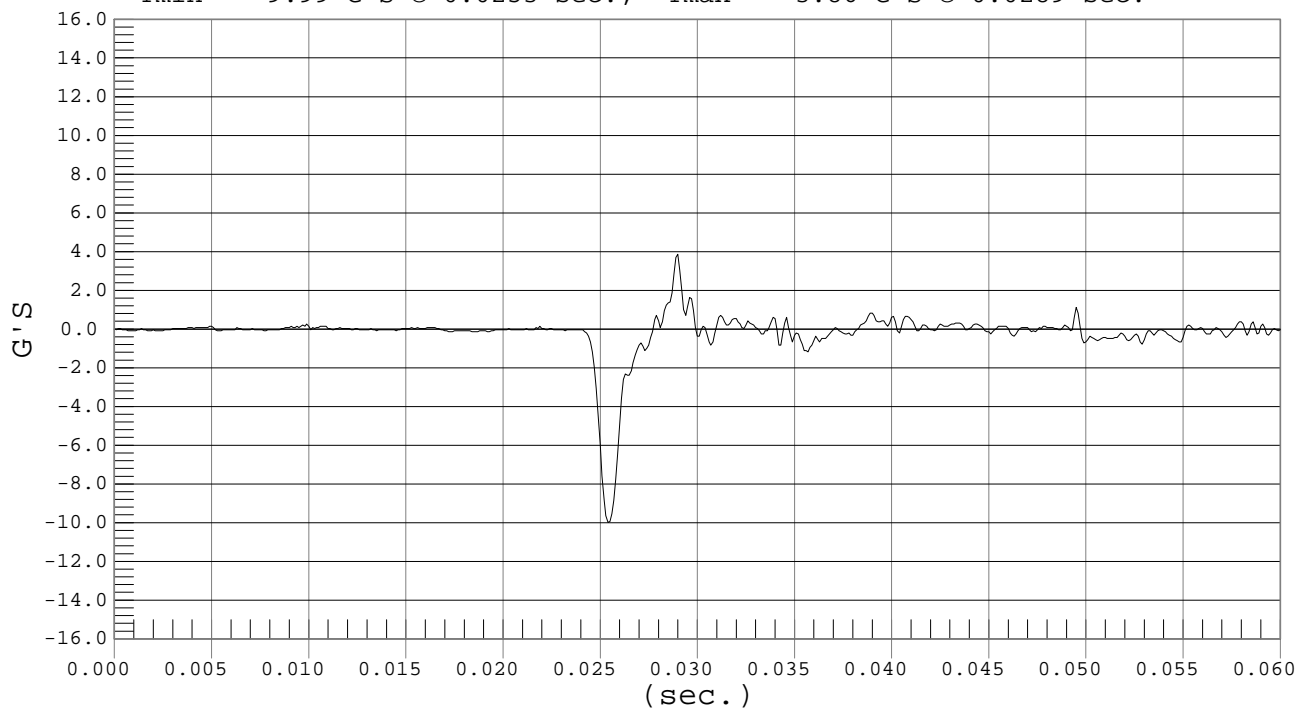


PEAK LATERAL ACCELERATION

Test Desc.: Head Drop
Component: Dummy #048

Test Date: 01-18-02
Speed: 0.0 fps, 0.00 M/s

Ymin = -9.99 G'S @ 0.0253 sec., Ymax = 3.86 G'S @ 0.0289 sec.



SID Calibration Data Sheet
Side Impact Dummy
Thorax Impact Calibration

ATD Serial No.: 048

Test I.D.: D02102

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 – 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	21	Pass
Probe Velocity	m/s	4.27 – 4.33	4.30	Pass
Upper Rib	G's	37 – 46	38	Pass
Lower Rib	G's	37 – 46	38	Pass
Lower Spine	G's	15 - 22	17	Pass
Overall Test Results				Pass

 Laboratory Technician

01/18/02
 Test Date

 Approved By

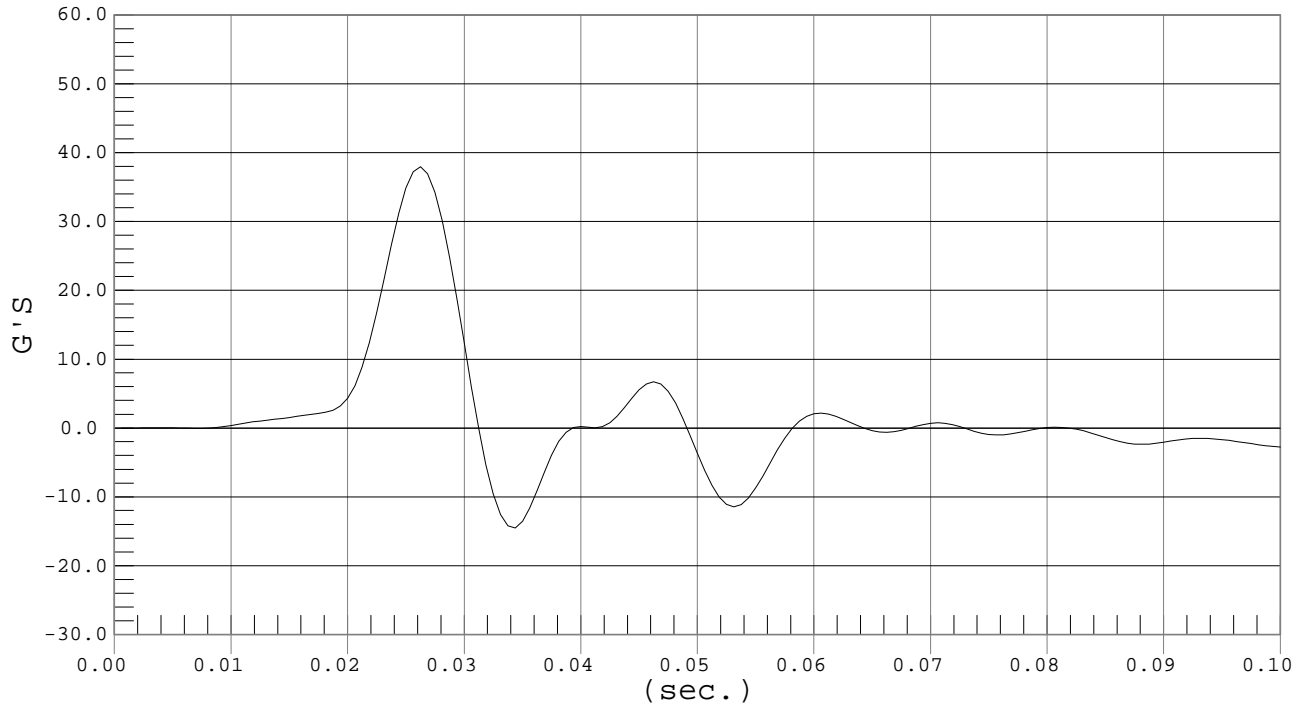


UPPER RIB ACCELERATION

Test Desc.: Thorax Impact
Component: Dummy #048

Test Date: 01-18-02
Speed: 14.1 fps, 4.30 M/s

Ymin = -14.5 G'S @ 0.0343 sec., Ymax = 37.94 G'S @ 0.0262 sec.

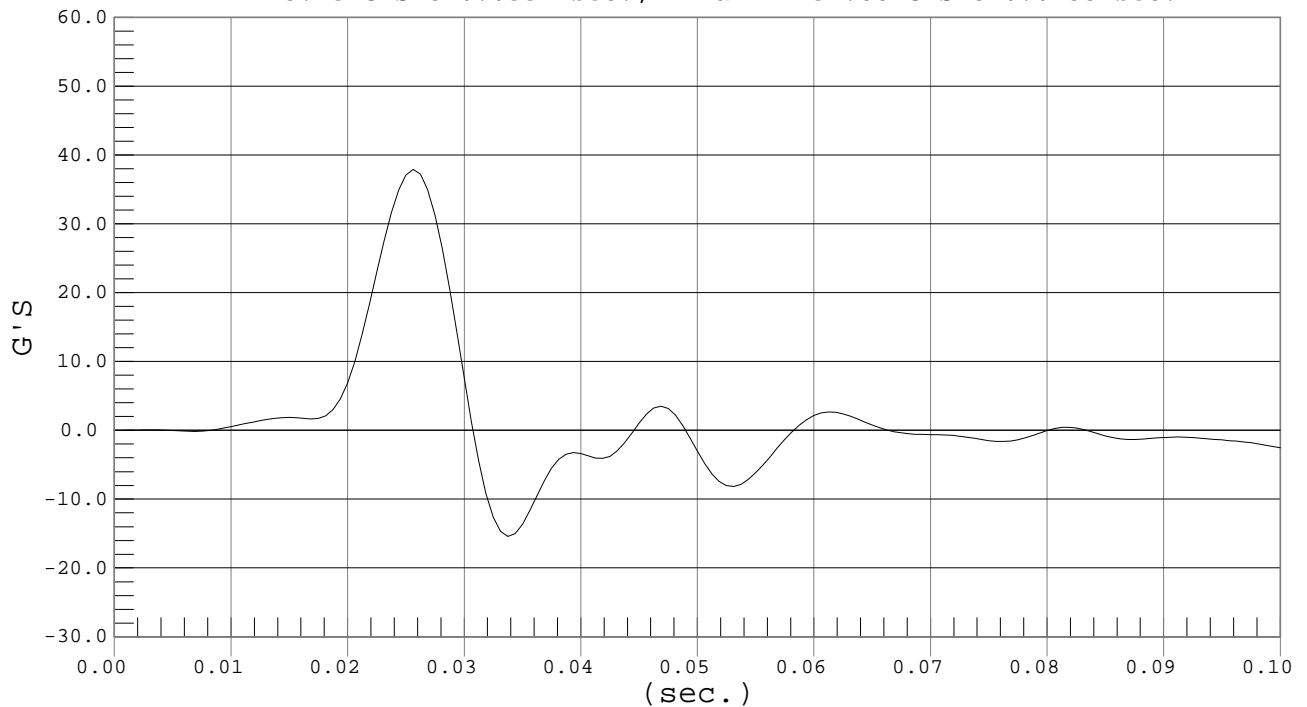


LOWER RIB ACCELERATION

Test Desc.: Thorax Impact
Component: Dummy #048

Test Date: 01-18-02
Speed: 14.1 fps, 4.30 M/s

Ymin = -15.43 G'S @ 0.0337 sec., Ymax = 37.88 G'S @ 0.0255 sec.



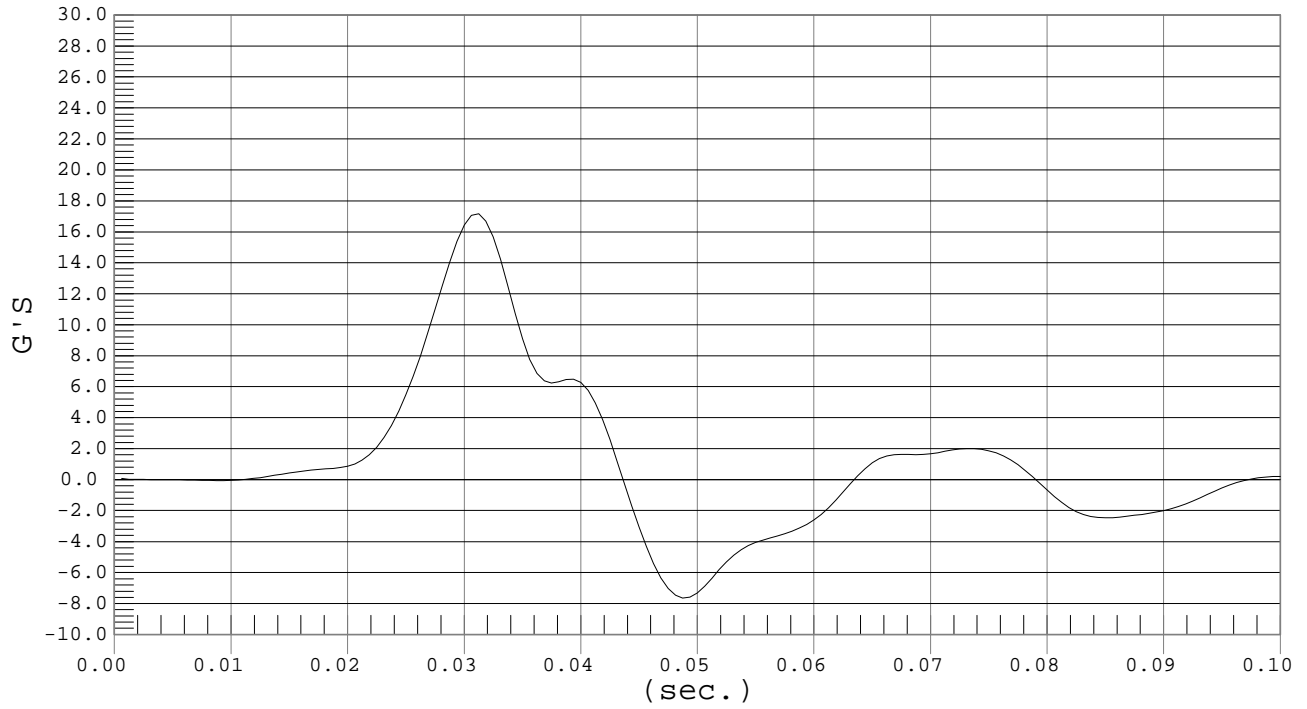


LOWER SPINE ACCELERATION

Test Desc.: Thorax Impact
Component: Dummy #048

Test Date: 01-18-02
Speed: 14.1 fps, 4.30 M/s

Ymin = -7.65 G'S @ 0.0487 sec., Ymax = 17.16 G'S @ 0.0312 sec.



SID Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Calibration

ATD Serial No.: 048

Test I.D.: D02103

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 – 25.5	20.7	Pass
Laboratory Relative Humidity	%	10 to 70	21	Pass
Probe Speed	m/s	4.27 – 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	47	Pass
Overall Test Results				Pass

Laboratory Technician

01/18/02

Test Date

Approved By

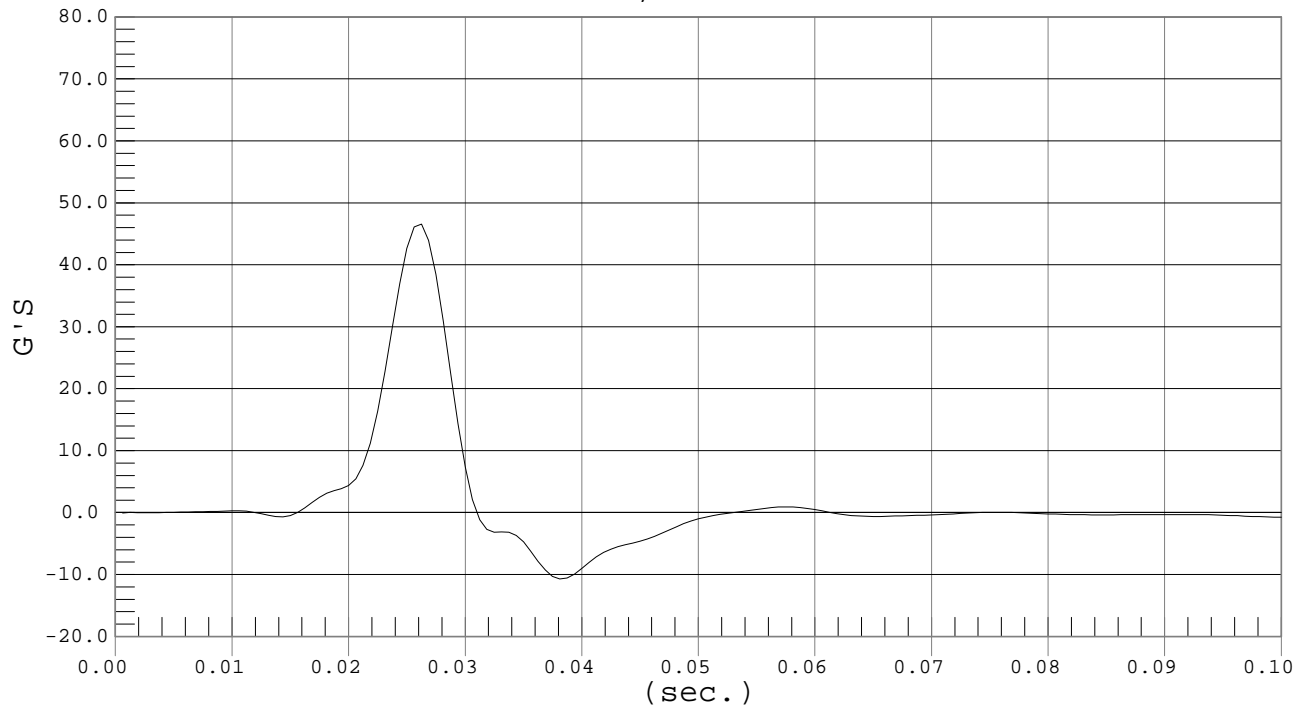


PELVIS ACCELERATION

Test Desc.: Pelvis Impact
Component: Dummy #048

Test Date: 01-18-02
Speed: 14.1 fps, 4.30 M/s

Ymin = -10.71 G'S @ 0.0380 sec., Ymax = 46.59 G'S @ 0.0262 sec.



SID Calibration Data Sheet
Side Impact Dummy
Abdominal Compression Calibration (Preload = 10 lbs)

ATD Serial No.: 048

Test I.D.: D02104

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 – 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Force @ 12.7	mm	104 – 162	129	Pass
Force @ 19	mm	163 – 222	180	Pass
Force @ 25.4	mm	222 – 280	241	Pass
Force @ 33	mm	325 - 391	346	Pass
Overall Test Results				Pass

 Laboratory Technician

01/17/02
 Test Date

 Approved By

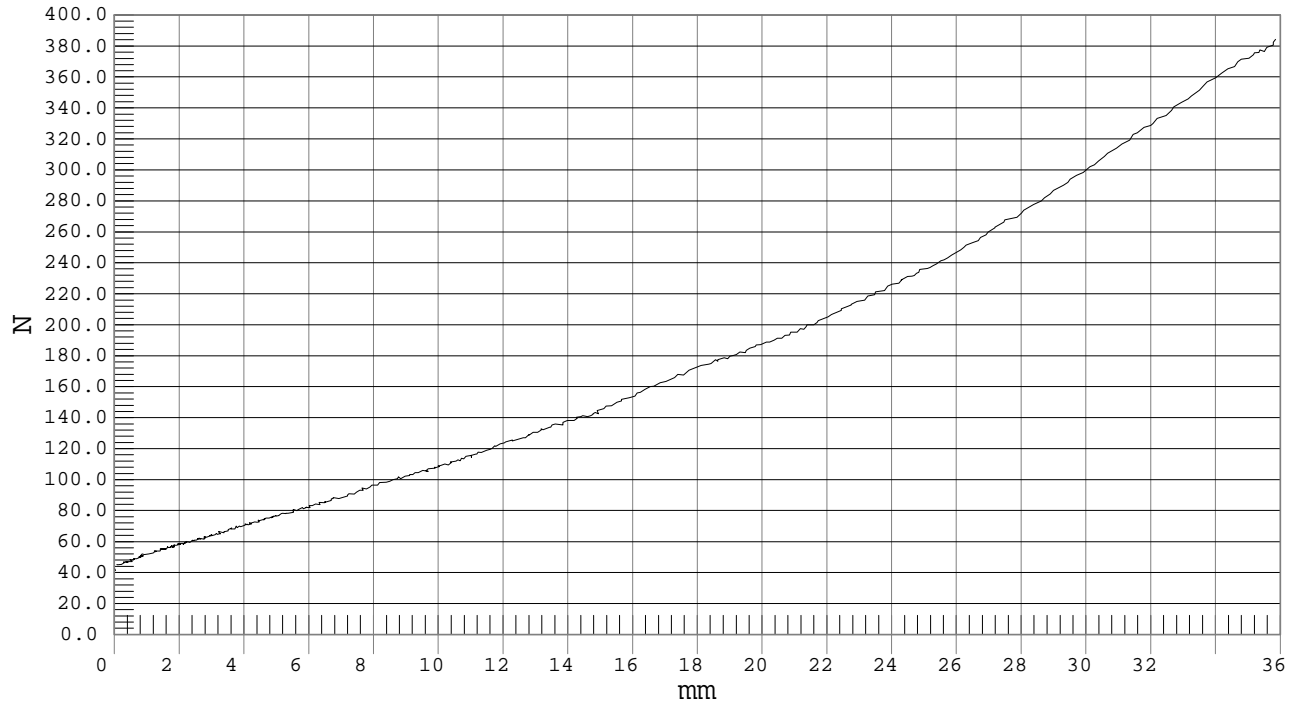


ABDOMEN COMPRESSION

Test Desc.: ABDOMEN COMPRESSION
Component: DUMMY # 048

Test Date: 01-17-02
Speed: 0.0 fps, 0.00 M/s

Ymin = 0 N @ -0.0001 mm, Ymax = 432.04 N @ 38.8543 mm



SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No.: 048

Test I.D.: D02105

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 – 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Force @ 0	mm	0 – 26.7	0.0	Pass
Force @ 20	mm	97.9 – 151.2	110.9	Pass
Force @ 30	mm	151.2 – 204.6	162.7	Pass
Force @ 40	mm	204.6 – 258.0	218.5	Pass
Return Angle	Degrees	12 Maximum	5	Pass
Overall Test Results				Pass

 Laboratory Technician

01/17/02
 Test Date

 Approved By

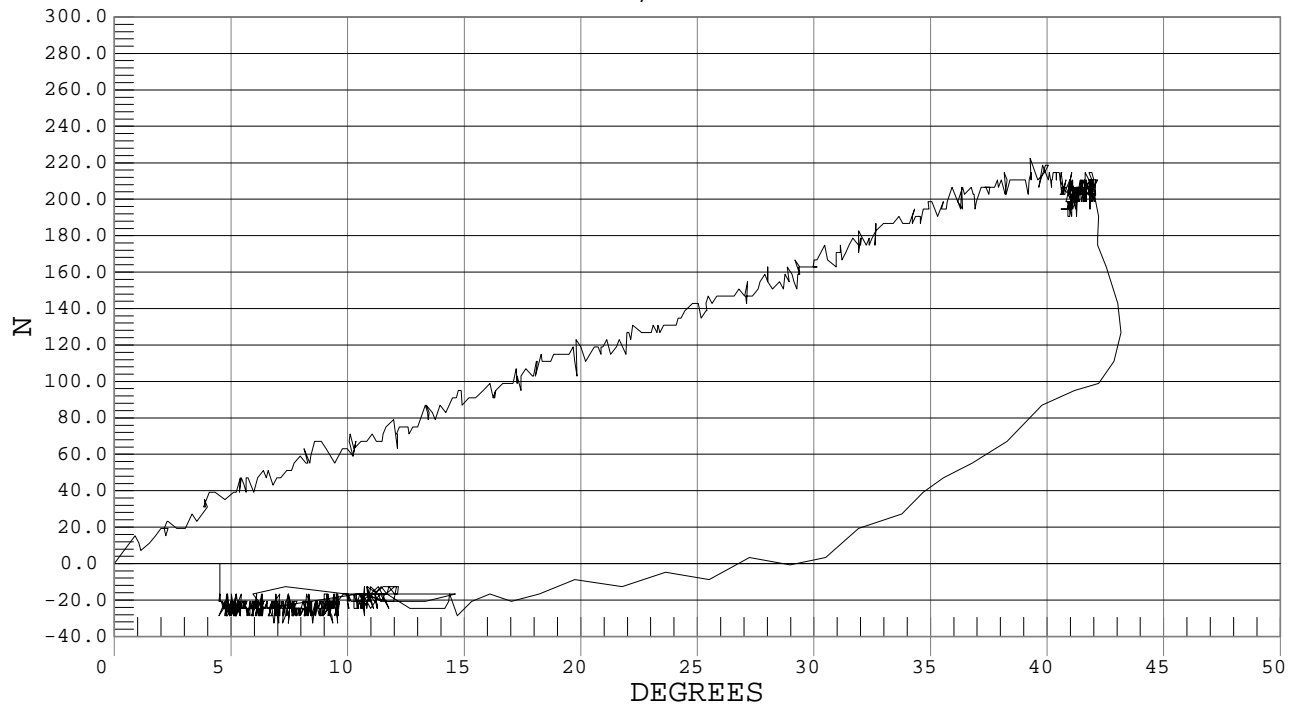


LUMBAR FLEXION

Test Desc.: LUMBAR FLEXION
Component: DUMMY # 048

Test Date: 01-17-02
Speed: 0.0 fps, 0.00 M/s

Ymin = -32.6 N @ 9.5755 DEGREES, Ymax = 222.53 N @ 39.2754 DEGREES



SID Calibration Data Sheet
Side Impact Dummy
Inspection Checklist

ATD Serial No.: 048

Test Part	Items Checked	Result
Skin	Visual inspection	Pass
Head	Visual, ballast, accelerometer mount	Pass
Neck	Visual	Pass
Spine Box	Visual, ballast, weldment, 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		

Notes (include component/problem/section/reason):

Laboratory Technician

01/18/02
Test Date

Approved By

CERTIFICATION DATA

Dummy Serial Number: 049

Calibration Test Results Summary

Dummy Serial Number: 49

Post-Test Calibration

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

SID Calibration Data Sheet
Side Impact Dummy
External Measurements

ATD Serial No.: 049

Test Number: D0211

Tested Parameter	Units	Specification	Result	Pass/Fail
SH – Seated Height	mm	889 - 909	898	Pass
RH – Rib Height	mm	501 – 521	517	Pass
HP – Hip Pivot Height	mm	99 ref.	99	Pass
RD-Rib from Back Line	mm	229 – 241	232	Pass
KV – Knee Pivot from Back Line	mm	511 – 526	522	Pass
SW – Knee Pivot to Floor	mm	490 – 505	492	Pass
HW – Hip Width	mm	356 – 391	367	Pass
Overall Test Results				Pass

Laboratory Technician

01/18/02
Test Date

Approved By

SID Calibration Data Sheet
Side Impact Dummy
Head Drop Calibration

ATD Serial No.: 049

Test I.D.: D02111

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	20.5	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Peak Resultant Acceleration	G's	210 to 260	227	Pass
Peak Lateral Acceleration	G's	< 10	-4	Pass
Time Above 100 G	msec	0.9 – 1.5	1.2	Pass
Overall Test Results				Pass

 Laboratory Technician

01/18/02
 Test Date

 Approved By

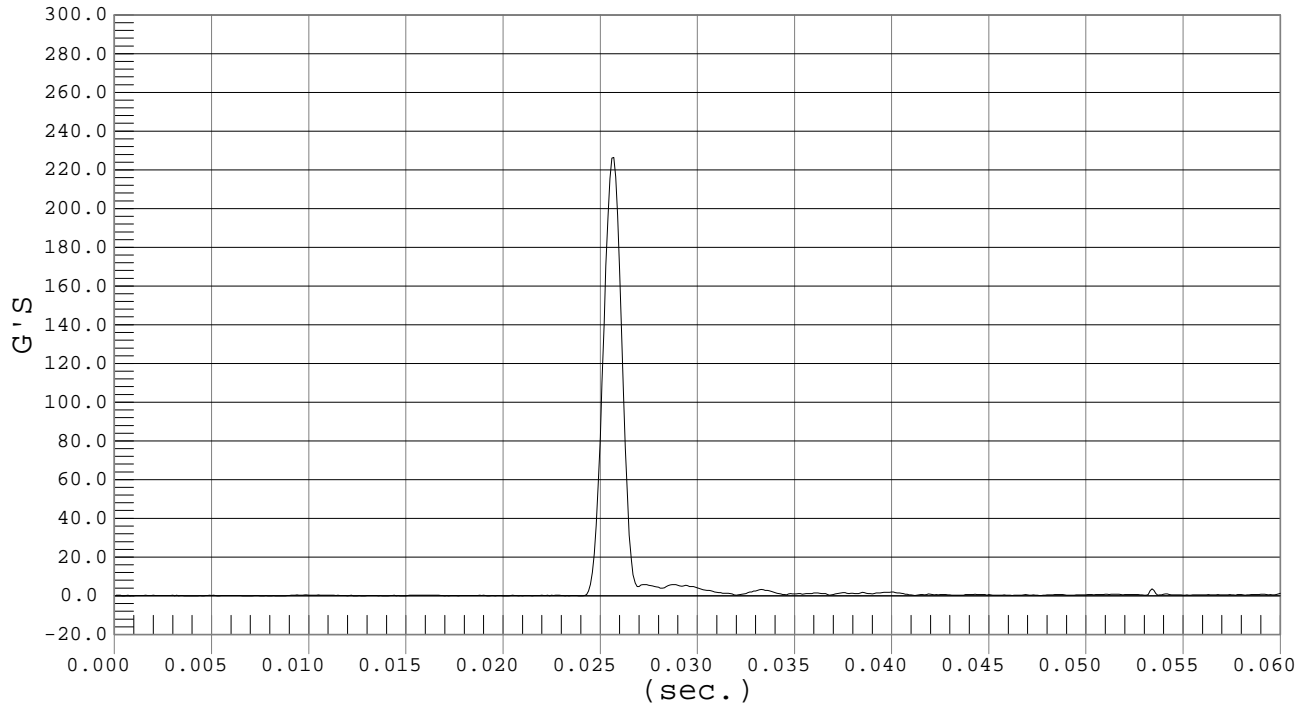


PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #049

Test Date: 01-18-02
Speed: 0.0 fps, 0.00 M/s

Ymin = .06 G'S @ 0.0007 sec., Ymax = 226.5 G'S @ 0.0256 sec.

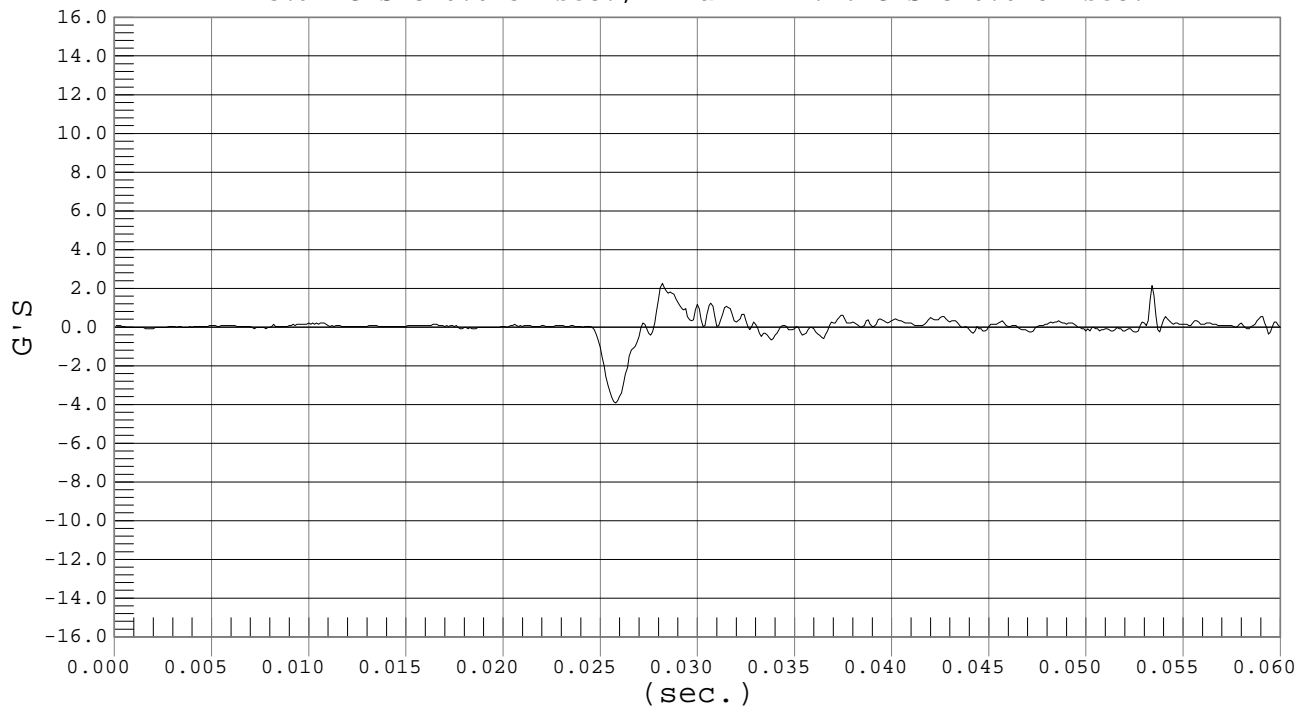


PEAK LATERAL ACCELERATION

Test Desc.: Head Drop
Component: Dummy #049

Test Date: 01-18-02
Speed: 0.0 fps, 0.00 M/s

Ymin = -3.92 G'S @ 0.0257 sec., Ymax = 2.26 G'S @ 0.0281 sec.



SID Calibration Data Sheet
Side Impact Dummy
Thorax Impact Calibration

ATD Serial No.: 049

Test I.D.: D02112

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

*Test not performed due to dampener damage.

 Laboratory Technician

01/17/02
 Test Date

 Approved By

SID Calibration Data Sheet
Side Impact Dummy
Pelvis Impact Calibration

ATD Serial No.: 049

Test I.D.: D02113

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 – 25.5	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	35	Pass
Probe Speed	m/s	4.27 – 4.33	4.30	Pass
Pelvis Acceleration	G's	40 - 60	55	Pass
Overall Test Results				Pass

Laboratory Technician

01/23/02

Test Date

Approved By

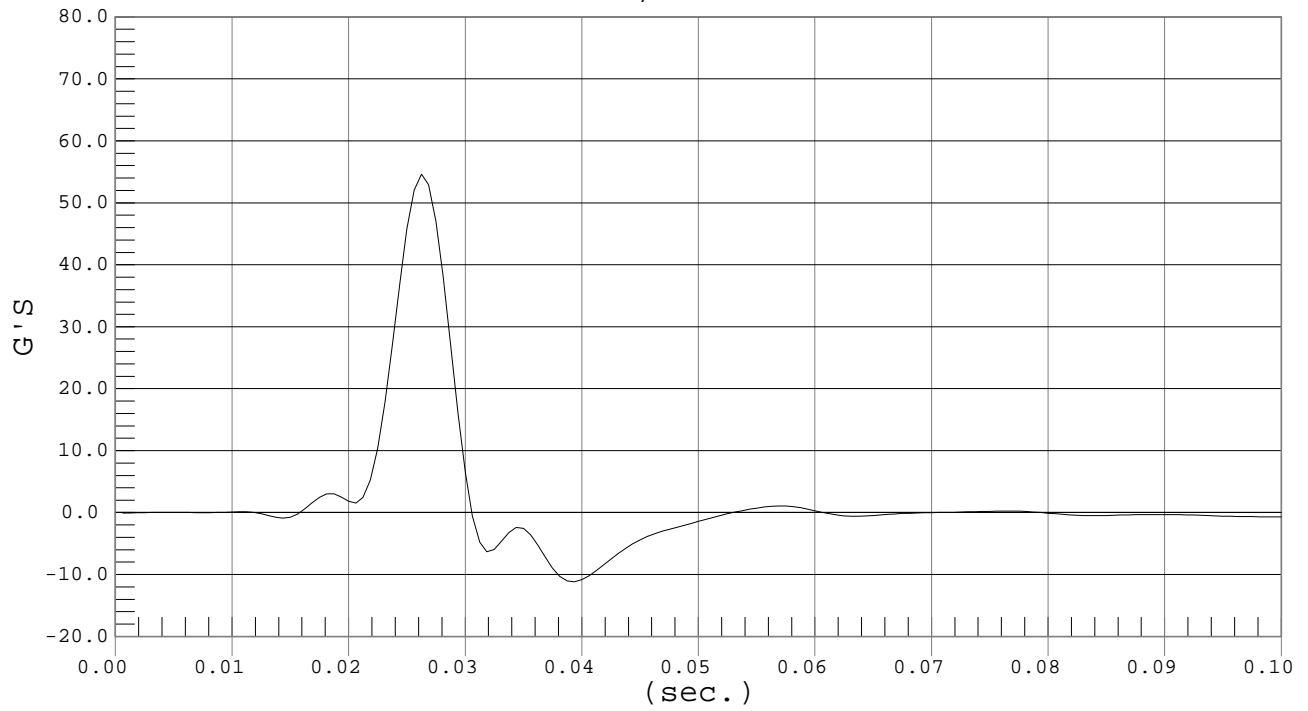


PELVIS ACCELERATION

Test Desc.: Thorax Impact
Component: Dummy #049

Test Date: 01-23-02
Speed: 14.1 fps, 4.30 M/s

Ymin = -11.16 G'S @ 0.0393 sec., Ymax = 54.66 G'S @ 0.0262 sec.



SID Calibration Data Sheet
Side Impact Dummy
Abdominal Compression Calibration (Preload = 10 lbs)

ATD Serial No.: 049

Test I.D.: D02114

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 – 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Force @ 12.7	mm	104 – 162	136	Pass
Force @ 19	mm	163 – 222	190	Pass
Force @ 25.4	mm	222 – 280	254	Pass
Force @ 33	mm	325 - 391	356	Pass
Overall Test Results				Pass

 Laboratory Technician

01/17/02
 Test Date

 Approved By

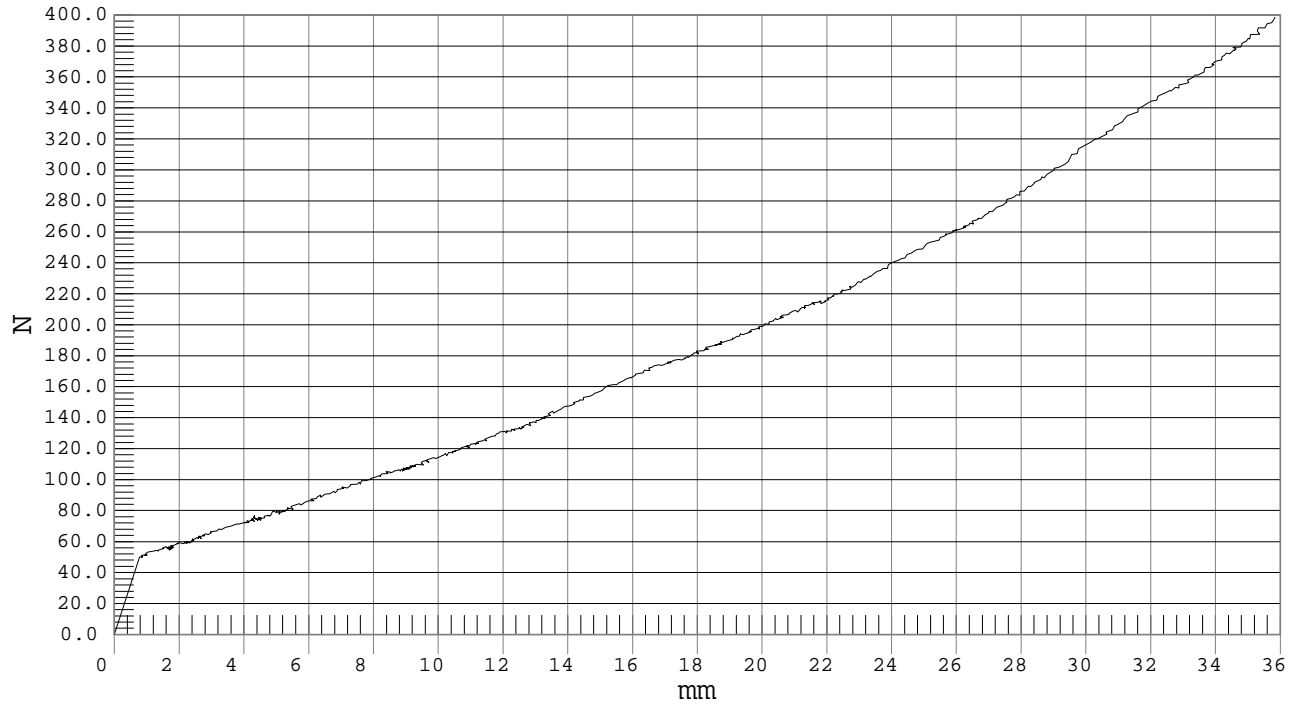


ABDOMEN COMPRESSION

Test Desc.: ABDOMEN COMPRESSION
Component: DUMMY # 049

Test Date: 01-17-02
Speed: 0.0 fps, 0.00 M/s

Ymin = 0 N @ -0.0001 mm, Ymax = 430.87 N @ 38.1903 mm



SID Calibration Data Sheet
Side Impact Dummy
Lumbar Flexion Calibration

ATD Serial No.: 049

Test I.D.: D02115

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 – 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	25	Pass
Force @ 0	mm	0 – 26.7	0.0	Pass
Force @ 20	mm	97.9 – 151.2	132.0	Pass
Force @ 30	mm	151.2 – 204.6	191.8	Pass
Force @ 40	mm	204.6 – 258.0	243.6	Pass
Return Angle	Degrees	12 Maximum	2	Pass
Overall Test Results				Pass

Laboratory Technician

01/17/02

Test Date

Approved By

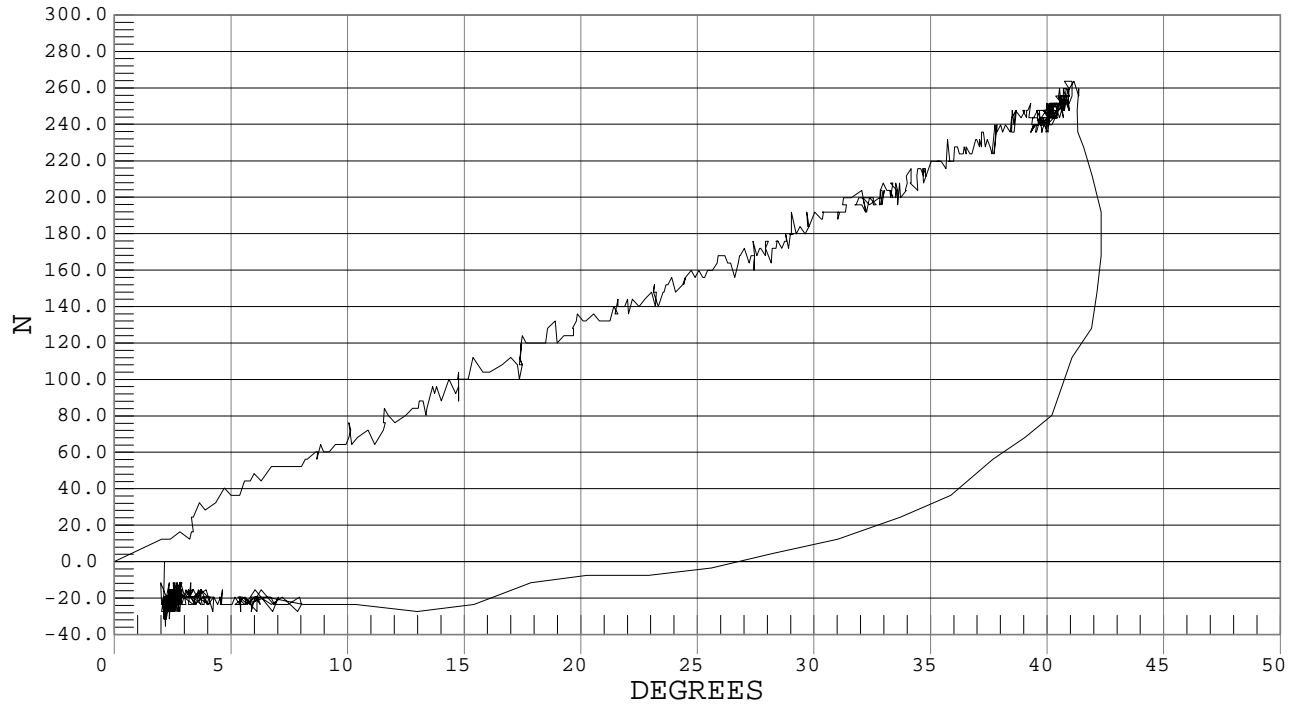


LUMBAR FLEXION

Test Desc.: LUMBAR FLEXION
Component: DUMMY # 049

Test Date: 01-17-02
Speed: 0.0 fps, 0.00 M/s

Ymin = -35.44 N @ 2.1918 DEGREES, Ymax = 263.55 N @ 41.0746 DEGREES



SID Calibration Data Sheet
Side Impact Dummy
Inspection Checklist

ATD Serial No.: 049

Test Part	Items Checked	Result
Skin	Visual inspection	Pass
Head	Visual, ballast, accelerometer mount	Pass
Neck	Visual	Pass
Spine Box	Visual, ballast, weldment, 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	Dampener, visual	Fail

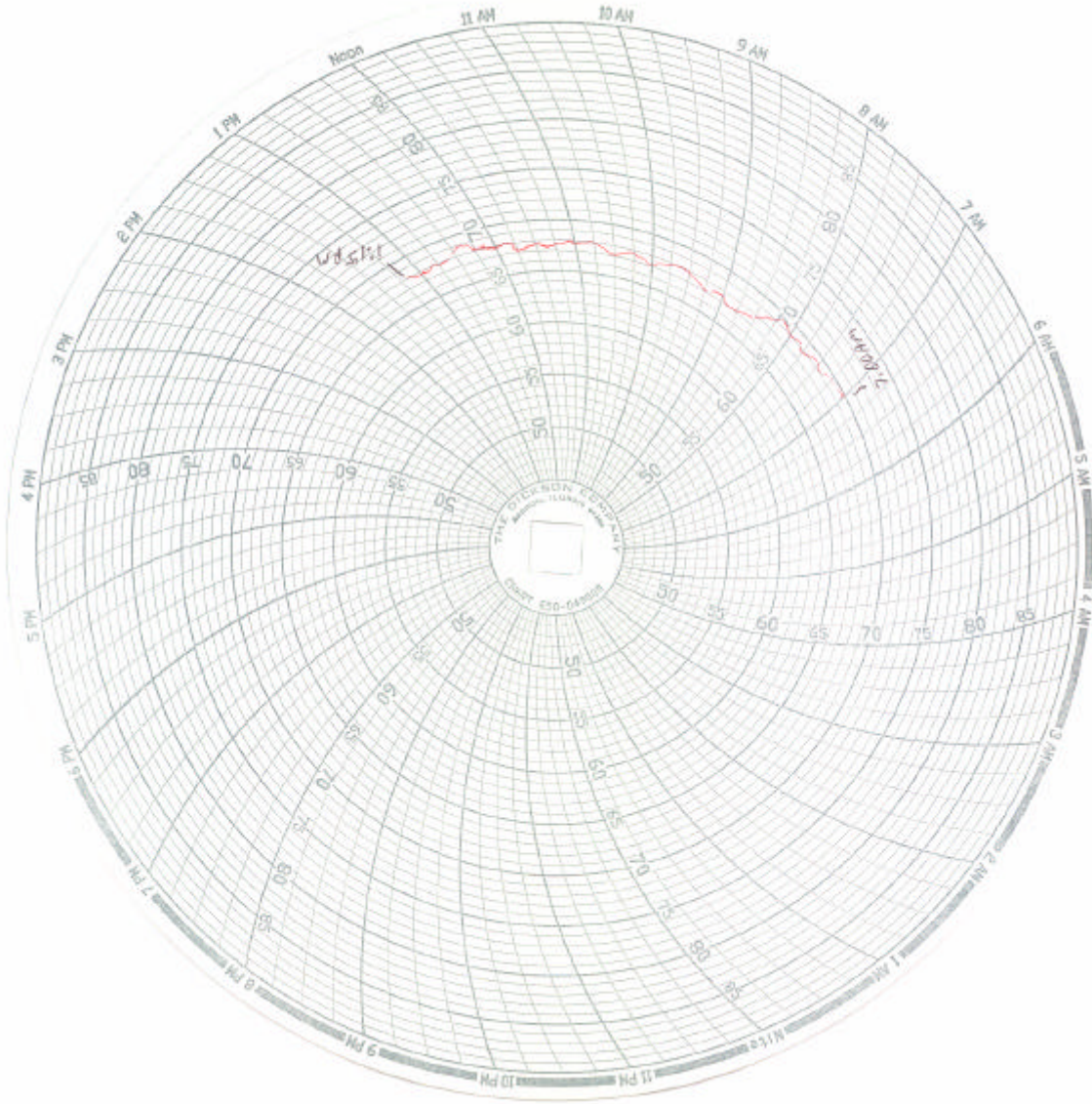
Notes (include component/problem/section/reason): Shaft damaged; dampener replaced.

Laboratory Technician

01/23/02
Test Date

Approved By

Vehicle and Dummy Temperature



APPENDIX D

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

DUMMY AND VEHICLE CALIBRATION DATA

	INSTRUMENTS FOR DRIVER DUMMY NO. 48		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	J23808	Endevco	1/7/02
Lower Rib Y	AHWP2	Endevco	1/8/02
Lower Spine Y	AN8D2	Endevco	1/8/02
Pelvis Y	ALFP5	Endevco	1/7/02
Upper Rib Redundant Y	AKAF3	Endevco	1/7/02
Lower Rib Redundant Y	AHY98	Endevco	1/8/02
Lower Spine Redundant Y	J13709	Endevco	1/8/02
Pelvis Redundant Y	AK956	Endevco	1/7/02
Head Center of Gravity X	J11630	Endevco	1/8/02
Head Center of Gravity Y	J12423	Endevco	1/7/02
Head Center of Gravity Z	J11046	Endevco	1/8/02

	INSTRUMENTS FOR PASSENGER DUMMY NO. 49		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AGTM8	Endevco	1/8/02
Lower Rib Y	AN8D5	Endevco	1/8/02
Lower Spine Y	AK972	Endevco	1/7/02
Pelvis Y	AGRW3	Endevco	1/8/02
Upper Rib Redundant Y	AJ411	Endevco	1/8/02
Lower Rib Redundant Y	AGP28	Endevco	1/8/02
Lower Spine Redundant Y	AHY71	Endevco	1/8/02
Pelvis Redundant Y	AMPY0	Endevco	1/8/02
Head Center of Gravity X	AHRP6	Endevco	1/8/02
Head Center of Gravity Y	AP170	Endevco	1/8/02
Head Center of Gravity Z	AP2G9	Endevco	1/8/02

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Moving Barrier CG X	H14-N05	Entran	9/12/01
Moving Barrier CG Y	A08-A08	Entran	11/2/01
Moving Barrier CG Z	K16-X08	Entran	10/1/01
Moving Barrier Rear Axle X	A08-A05	Entran	8/21/01
Moving Barrier Rear Axle Y	D11-F16	Entran	11/2/01
Left Mid A-Post Y	C25-A25	Entran	8/21/01
Left Lower A-Post Y	F12-G03	Entran	11/2/01
Left Mid B-Post Y	E10-F20	Entran	11/2/01
Left Lower B-Post Y	I18-E14	Entran	11/2/01
Rear Floorpan Above Axle X	J10-E18	Entran	8/29/01
Rear Floorpan Above Axle Y	H14-N06	Entran	9/12/01
Rear Floorpan Above Axle Z	G03-N08	Entran	9/27/01
Driver Seat Track Y	A08-A11	Entran	8/29/01
Right Side Sill at Front Seat X	G03-N14	Entran	7/30/01
Right Side Sill at Front Seat Y	G03-N12	Entran	7/30/01
Right Side Sill at Front Seat Z	H14-N09	Entran	9/12/01
Right Side Sill at Rear Seat X	H02-J14	Entran	8/29/01
Right Side Sill at Rear Seat Y	F07-A20	Entran	8/29/01
Right Side Sill at Rear Seat Z	F20-G10	Entran	8/29/01
Left Side Sill at Front Seat Y	I12-F05	Entran	10/10/01
Left Side Sill at Rear Seat Y	E13-D06	Entran	8/8/01
Right Rear Occupant Compartment Y	K11-J08	Entran	8/8/01
Vehicle CG X	H14-N01	Entran	9/12/01
Vehicle CG Y	H14-N03	Entran	9/12/01
Vehicle CG Z	H14-N14	Entran	9/12/01

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