

REPORT NUMBER: OFFSET-MGA-2004-002

**FRONTAL OFFSET-OBLIQUE MOTOR VEHICLE CRASH TESTS
WITH A MOVING DEFORMABLE BARRIER**

**1997 FORD EXPLORER
NHTSA NUMBER: RV1324**

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Test Date: February 11, 2004

Report Date: March 5, 2004

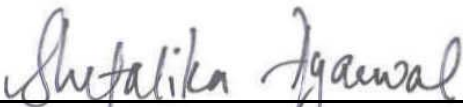
FINAL REPORT

**PREPARED FOR:
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SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

This frontal offset oblique crash test is part of a four test series sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number DTNH22-01-D-12005. The purpose of the testing is to evaluate and compare vehicle and occupant responses during offset-oblique crash events in support of the NHTSA Offset Frontal Program.

SUMMARY

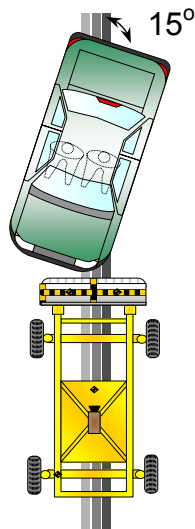
A Moving Deformable Barrier (MDB) with an instrumented load cell face and a special design deformable face with bumper struck a stationary 1997 Ford Explorer at 100 kph. The 1997 Ford Explorer was positioned at 15 degrees to the line of motion so that the center of the deformable barrier face struck the left front virtual corner of the vehicle. (See the figure below) The test was performed at MGA Research Corporation on February 11, 2004. Pre-and post-test photographs of the vehicle and dummies can be found in Appendix A. Appendix B contains the MDB, vehicle, and dummy response data traces.

One real-time camera and twelve high-speed cameras were used to document the impact event. Camera locations and other pertinent camera information can be found in this report.

One Part 572E, 50th percentile male anthropomorphic test device (ATD) was placed in the driver seating position and one Part 572O, 5th percentile female ATD was placed in the right front seating position according to dummy placement instructions specified in the FMVSS 208 TP-12 Laboratory Indicant Test Procedure.

Both ATDs were instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometer, upper neck transducers, right/left femur load cells, right/left knee shear displacements, and THOR-Lx (50th) and THOR FLx (5th) lower leg instrumentation. ATD certification details, along with instrumentation calibration data, are found in Appendices C and D.

The remainder of this report contains data sheets that document the test conditions.



TEST NOTES

During post test observations it was noted that the Driver X, Y, Z accelerometers were not rigidly attached to the dummy.

The Passenger Left Upper Tibia Force Z has questionable data.

The Passenger Right Mid Foot X Acceleration has questionable data.

The Passenger Right Mid Foot Z Acceleration has no valid data after 75 msec.

The Driver Right Knee Shear Displacement had no valid data after 120 msec.

Passenger Left Mid Foot Z Acceleration: anomaly 20-35 msec.

41 load cells were available for the moving barrier face (capable of holding 55).

The following locations were not used for this test: 1-1, 2-1, 3-1, 4-1, 5-1, 5-3, 5-5, 5-6, 5-7, 1-11, 2-11, 3-11, 4-11, 5-11

Moving Deformable Barrier Load Cell 3-3 had no valid data after 30 msec.

Moving Deformable Barrier Load Cell 3-6 had no valid data after 50 msec.

SECTION 2
OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
 Test Date: 2/11/04

CONVERSION FACTORS USED IN THIS REPORT*

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

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

**DATA SHEET NO. 1
CRASH TEST SUMMARY**

Test Vehicle: 1997 Ford Explorer
Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
Test Date: 2/11/04

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked/Unlocked Doors	Doors were unlocked	Doors were unlocked
Front Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
Rear Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
Seat Track Shift (mm)	21 forward	0
Seat Back Failure	None	None

TEST DUMMY INFORMATION

Description	Driver	Passenger
Dummy Type / Serial No.	HIII 50 th / 087	HIII 5 th / 547
Head Contact	Airbag, Head Rest, B Pillar, Roof, Door	Airbag, Head Rest
Chest Contact	Airbag	Airbag
Abdomen Contact	Airbag	Airbag
Left Knee Contact	Knee Bolster	Glovebox
Right Knee Contact	Knee Bolster	Glovebox

Driver ATD Sensors	60
Passenger ATD Sensors	60
Belt Assessment Sensors	4
Vehicle Structure Accelerometers	12
Vehicle Displacement	1
Moving Barrier Load Cells	41
Moving Barrier Accelerometers	6
Timing Channels	5
Total	189

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
 Test Date: 2/11/04

TEST VEHICLE INFORMATION

Manufacturer	Ford
Model	Explorer
Body Style	SUV
NHTSA No.	RV1324
VIN	1FMDU34X1VZA76243
Color	Green
Odometer Reading (mile)	120,118
Transmission	Automatic
Final Drive	4 WD
Number of Cylinders	6
Engine Displacement (L)	4.0
Engine Placement	Longitudinal

TEST VEHICLE OPTIONS

Driver Airbag	Yes
Passenger Airbag	Yes
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	Yes
Anti-lock Brakes	Yes
AM/FM/Cassette	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company	GVWR (kg)	2422
Date of Manufacture	11/96	GAWR Front (kg)	1229
		GAWR Rear (kg)	1338

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Cold Pressure (kPa)	179	179
Recommended Tire Size	P235/75R15	P235/75R15
Tire Size on Vehicle	P235/75R15	P235/75R15
Tire Manufacturer	Michelin	Michelin

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench		
Number Of Occupants	2	3		5

DATA SHEET NO. 2... (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
 Test Date: 2/11/04

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	547.9	479.0		567.9	577.4	
Right	kg	512.6	435.0		512.1	516.2	
Ratio	%	53.7	46.3		49.7	50.3	
Totals	kg	1060.5	914.0	1974.5	1080.0	1093.6	2173.6

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1974.5
Weight of 1 P572E & 1 P572O ATDs	kg	127.0
Rated Cargo/Luggage Weight (RCLW)	kg	79.4
Calculated Vehicle Target Weight (TVTW)	kg	2180.9

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG(aft of front axle)
As Delivered	mm	813	842	807	831	1317
As Tested	mm	820	846	775	807	1431
Post Test	mm	822	734	755	842	

Vehicle Wheelbase (mm): 2845

Weight of Ballast secured in cargo area (kg): 70.3

Vehicle Components Removed: Rear carpet, jack, right rear taillight

Ballast weight does not include instrumentation and data acquisition system.

TEST SPEED

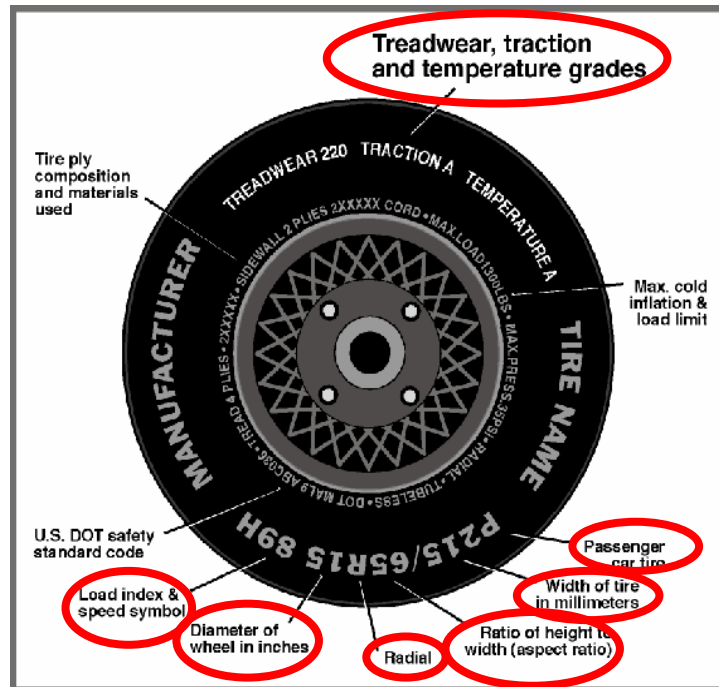
Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	98.5 - 101.5	99.5

DATA SHEET NO. 3
TEST VEHICLE TIRE INFORMATION

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
 Test Date: 2/11/04

Vehicle Year	1997	Vehicle Make	Ford
VIN	1FMDU34X1VZA76243	Vehicle Model	Explorer



	Front	Rear
Tire Manufacturer	Pathfinder	Pathfinder
Tire Name	Trail A/P	Trail A/P
Tire Type	P	P
Tire Width (mm)	235	235
Ratio of Height to Width (aspect ratio)	75	75
Radial	R	R
Wheel Diameter	15	15
Load Index & Speed Symbol	**	**
Treadwear	**	**
Traction Grade	**	**
Temperature Grade	**	**

** Not found on tire

DATA SHEET NO. 4
TEST VEHICLE INFORMATION

Test Vehicle: 1997 Ford Explorer
Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
Test Date: 2/11/04

SEAT BACK POSITION

Driver seat back angle: 22.3° on seat back frame

Passenger seat back angle: 12.9° on seat back frame

SEAT FORE/AFT POSITIONS

The driver and passenger seat were electric operated.

Driver seat fore/aft total travel: 250 mm

Passenger seat fore/aft total travel: 250 mm

Driver seat fore/aft position: 125 mm

Passenger seat fore/aft position: 34 mm rear of full forward

SEAT BELT UPPER ANCHORAGE

This vehicle doesn't have D-Ring adjustment.

FUEL TANK CAPACITY DATA

The fuel tank was filled with 19.5 gallons of water for ballast.

STEERING COLUMN ADJUSTMENT

Adjustable steering controls are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions.

Lowermost, position 1: 11.6°

Geometric center, position 2: 19.7°

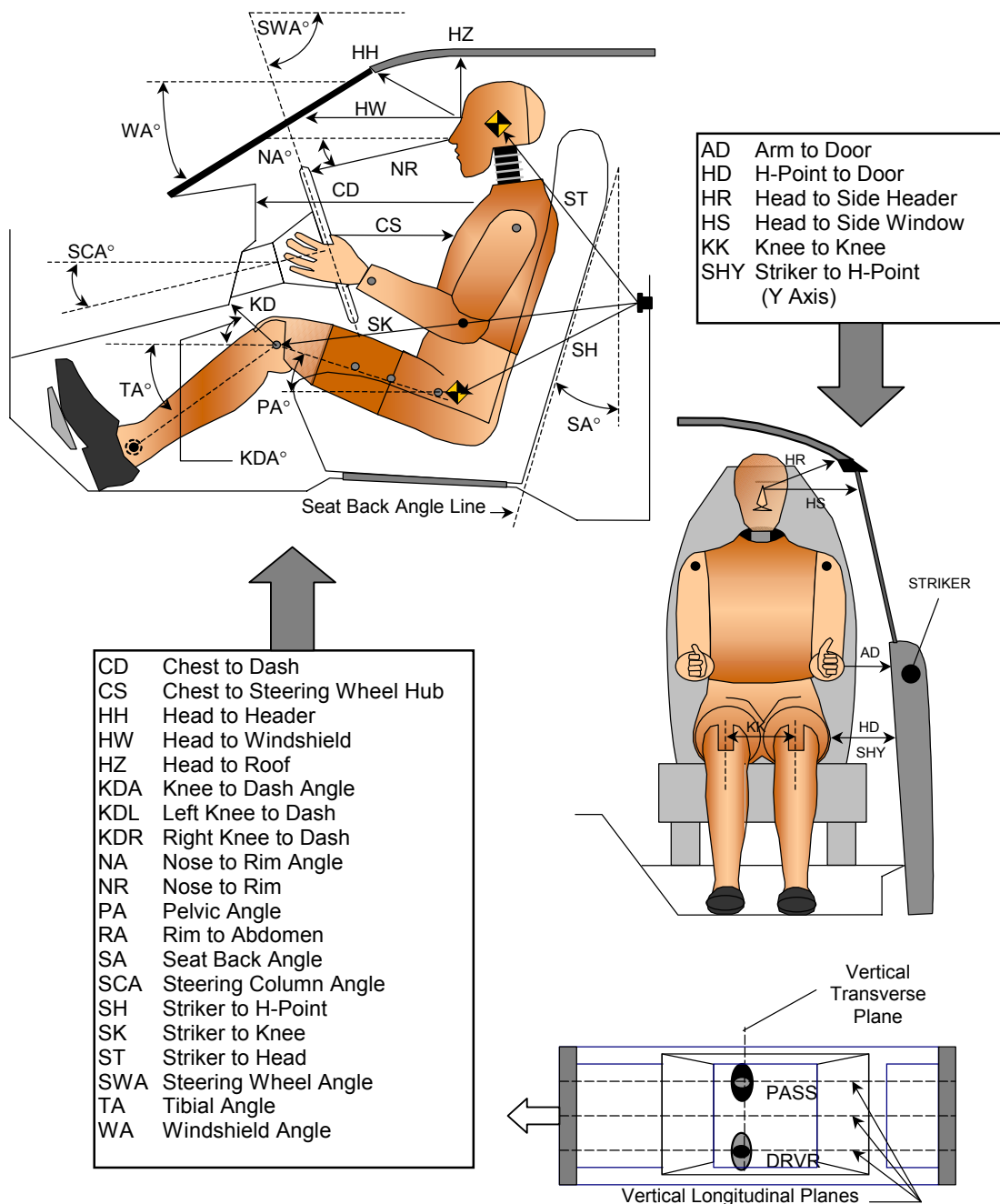
Uppermost position 3: 27.7°

DATA SHEET NO. 5 **DUMMY POSITIONING IN VEHICLE**

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
 Test Date: 2/11/04

DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS



DATA SHEET NO. 5... (continued)
DUMMY POSITIONING IN VEHICLE

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
 Test Date: 2/11/04

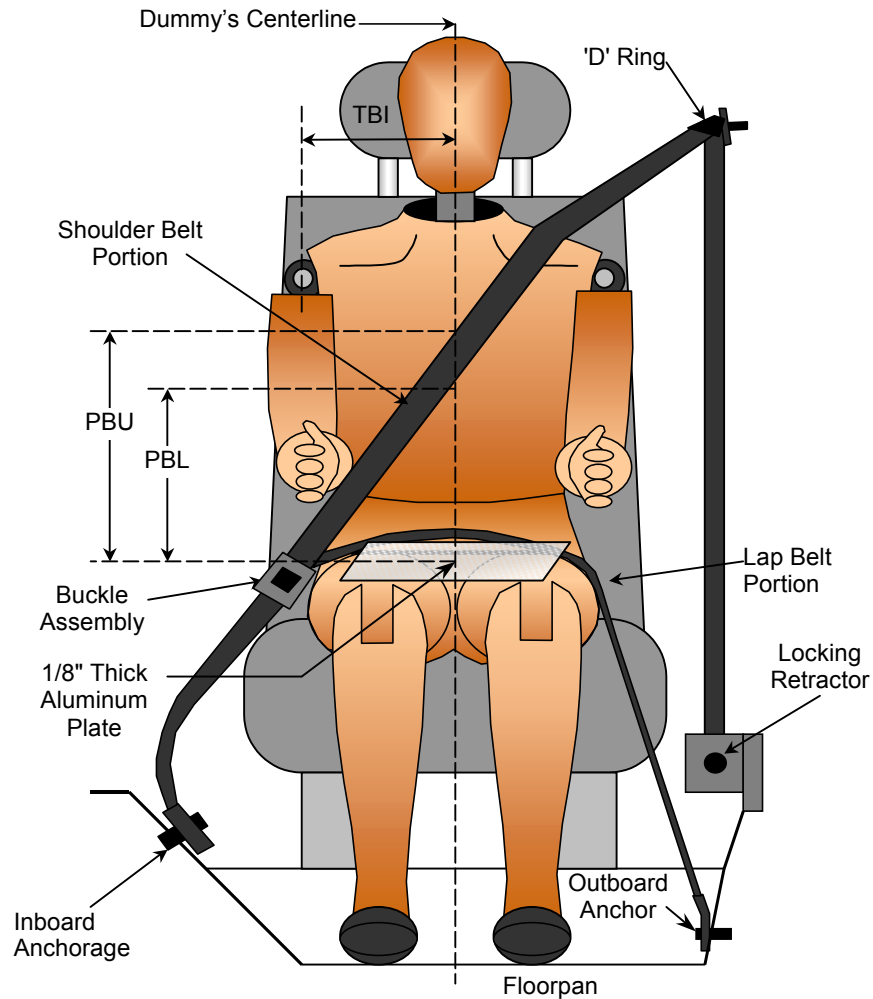
TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield Angle		38		
SWA	Steering Wheel Angle		69		
SCA	Steering Column Angle		21		
SA	Seat Back Angle		22.3		12.9
HZ	Head to Roof (Z)	223	90	268	90
HH	Head to Header	422	21	318	40
HW	Head to Windshield	587	0	522	0
HR	Head to Side Header (Y)	251		283	
NR	Nose to Rim	371	11		
CD	Chest to Dash	526		424	
CS	Chest to Steering Hub	296	4		
RA	Rim to Abdomen	193	0		
KDL	Left Knee to Dash	168	25	58	
KDR	Right Knee to Dash	134		63	20
PA	Pelvic Angle		23.6		24.7
TA	Tibia Angle		37		66
KK	Knee to Knee (Y)	304		212	
SK	Striker to Knee	604	89	712	84
ST	Striker to Head	541	12	520	22
SH	Striker to H-Point	228	113	384	83
SHY	Striker to H-Point (Y)	244		258	
HS	Head to Side Window	332		366	
HD	H-Point to Door (Y)	123		168	
AD	Arm to Door (Y)	98		138	
AA	Ankle to Ankle	232		163	

DATA SHEET NO. 6 **SEAT BELT POSITIONING DATA**

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
 Test Date: 2/11/04



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
TBI - Dummy centerline to shoulder bolt	mm	170	170
PBU - Top surface of reference to belt upper edge	mm	324	254
PBL - To surface of reference to belt lower edge	mm	207	179

DATA SHEET NO. 7

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
 Test Date: 2/11/04

VEHICLE ACCELEROMETER PEAK DATA

Accelerometer Location	Peak Values				
	Units	Max	Time	Min	Time
Left Rear Seat Crossmember X	G's	8.3	200	-43.7	63
Left Rear Seat Crossmember Y	G's	19.5	70	-4.8	64
Right Rear Seat Crossmember X	G's	4.0	106	-43.1	63
Right Rear Seat Crossmember Y	G's	13.8	53	-3.5	59
Vehicle CG X	G's	8.6	164	-49.7	59
Vehicle CG Y	G's	24.7	76	-8.8	168
Vehicle CG Z	G's	14.6	63	-23.1	80
Toe Pan (Accelerator) X	G's	16.7	68	-73.5	48
Toe Pan (Accelerator) Y	G's	93.8	54	-18.6	39
Toe Pan (Footrest) X	G's	17.0	72	-67.0	52
Toe Pan (Footrest) Y	G's	67.2	53	-12.8	64
Rear Deck Z	G's	18.1	106	-18.2	100

Accelerometer Location	Pre Test Measurements (mm)			Post Test Measurements (mm)		
	X	Y	Z	X	Y	Z
Left Rear Seat Crossmember	1865	-583	514	1893	-583	392
Right Rear Seat Crossmember	1864	583	514	1855	583	482
Vehicle CG	2687	0	710	2652	0	583
Toe Pan (Accelerator)	3455	-292	599	3385	-280	446
Toe Pan (Footrest)	3487	-586	642	3410	-510	550
Rear Deck	1006	0	720	988	0	788

Reference Points: X - Rear Surface of Vehicle (+ forward)
 Y - Vehicle Centerline (+ to right)
 Z - Ground Plane (+ up)

DATA SHEET NO. 8

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 1997 Ford Explorer
Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
Test Date: 2/11/04

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	22.3	154	-63.9	82	6.5	126	-44.0	33
Head CG	Y	G's	18.5	112	-70.2	159	15.9	33	-17.4	53
Head CG	Z	G's	24.5	72	-24.3	93	13.6	40	-23.3	97
Head CG Resultant	N/A	G's	72.6	159			44.9	33		

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	7.4	129	-46.1	77	7.4	145	-40.0	84
Chest CG	Y	G's	24.9	97	-6.6	153	21.6	99	-4.0	57
Chest CG	Z	G's	15.9	74	-17.7	111	6.1	76	-15.9	101
Chest CG Resultant	N/A	G's	48.0	77			42.3	85		

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	mm			-24.2	79			-13.6	85

FEMUR PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	997	60	-3388	72	190	193	-3580	63
Right Femur	Z	Newtons	251	89	-7087	59	289	32	-4051	74

HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	Avg. G's	T ¹	T ²	HIC	Avg. G's	T ¹	T ²
HIC 36	555	51.9	68.6	97.2	164	29.1	61.7	97.7
HIC 15	440	61.2	74.0	89.0	85	31.7	68.9	83.9

CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Primary	46.3	75.3	78.3	40.6	82.8	85.8

SEAT BELT SENSOR PEAK VALUES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Lap Belt Force	N/A	Newtons	5527	73			1694	71		
Shoulder Belt Force	N/A	Newtons	5787	81			4133	82		

DATA SHEET NO. 8... (continued)

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 1997 Ford Explorer
Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
Test Date: 2/11/04

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	555	168	-98	200	668	67	-104	113
Neck Force	Y	Newtons	853	159	-37.3	44	265	58	-234	97
Neck Force	Z	Newtons	2083	77	-178	168	844	31	-572	104
Neck Moment	X	N•m	38.6	139	-37.9	163	28.0	153	-27.7	57
Neck Moment	Y	N•m	35.8	69	-35.9	161	40.5	68	-20.2	100
Neck Moment	Z	N•m	17.0	93	-41.3	164	15.2	77	-16.1	113

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	52.9	49	-139.2	56	10.4	113	-47.7	73
Pelvis	Y	G's	120.7	49	-105.5	48	33.3	83	-4.8	200
Pelvis	Z	G's	126.2	48	-122.7	47	3.5	200	-20.3	82

** The driver accelerometers were found to be loose during post test observation

UPPER AND LOWER TIBIA PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Lower Moment	X	N•m	77.7	68	-144.0	60	117.1	61	-15.7	73
Left Lower Moment	Y	N•m	10.9	87	-84.8	57	74.1	61	-56.4	56
Left Lower Force	X	Newtons	800	60	-141	103	734	61	-469	65
Left Lower Force	Y	Newtons	1406	60	-131	182	914	61	-48	141
Left Lower Force	Z	Newtons	341	100	-3607	60	53	195	-2237	60
Left Upper Moment	X	N•m	202.4	61	-34.9	182	18.5	172	-129.5	61
Left Upper Moment	Y	N•m	101.4	61	-21.3	102	28.8	62	-76.3	57
Left Upper Force	X	Newtons	491	58	-231	80	413	56	-510	61
Left Upper Force	Z	Newtons	122	108	-2435	61	4068*	61*	-6139*	72*
Right Lower Moment	X	N•m	153.2	66	-11.8	96	19.8	97	-31.9	69
Right Lower Moment	Y	N•m	34.8	71	-64.0	58	5.7	108	-58.2	69
Right Lower Force	X	Newtons	73	113	-876	60	70.6	117	-631	69
Right Lower Force	Y	Newtons	372	71	-200	91	840	69	-161	194
Right Lower Force	Z	Newtons	67	162	-3792	63	68	130	-916	71
Right Upper Moment	X	N•m	22.3	174	-99.3	67	36.5	194	-64.7	70
Right Upper Moment	Y	N•m	37.2	93	-123.0	59	13.2	105	-68.6	69
Right Upper Force	X	Newtons	410	59	-630	71	344	69	-65	84
Right Upper Force	Z	Newtons	322	125	-1980	63	139	161	-523	82

* Questionable Data

DATA SHEET NO. 8... (continued)

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 1997 Ford Explorer
Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
Test Date: 2/11/04

KNEE SHEAR DISPLACEMENT

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left	X	mm	0.4	200	-2.6	78	0.5	59	-1.8	64
Right	Z	mm	1.2	55	-6.4	73	0.6	72	-0.2	107

** Driver Right had no valid data collected after 120 msec

TIBIA MID SHAFT ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left	X	G's	8.5	86	-68.5	57	76.0	62	-238.4	56
Left	Y	G's	102.5	60	-32.9	67	158.9	60	-41.0	70
Right Mid Foot	X	G's	9.1	93	-70.9	58	10.3	84	-97.7	69
Right Mid Foot	Y	G's	46.6	65	-18.7	94	129.2	69	-20.3	87

FOOT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Mid Foot	X	G's	14.7	67	-85.1	56	131.6*	64*	-240.4*	58*
Left Mid Foot	Y	G's	105.1	56	-43.9	65	205.8	58	-248.6	68
Left Mid Foot	Z	G's	18.0	72	-116.5	59	381	35	-178.8	57
Right Mid Foot	X	G's	60.1	58	-89.0	59	593.1	75	-611.4	71
Right Mid Foot	Y	G's	118.3	63	-45.1	58	212.3	69	-28.3	181
Right Mid Foot	Z	G's	78.5	58	-102.6	60	46.0**	69**	-69.3**	62**

* Questionable Data

** No valid data collected after 80 msec

FOOT ROTATIONS

Location	Units	Driver				Passenger			
		Max	Time	Min	Time	Max	Time	Min	Time
Left Dorsiflexion / Plantar Flexion	Degrees	11.1	78	-19.3	29	37.8	69	-17.5	16
Left Inversion / Eversion	Degrees	39.2	70	0.9	0	9.0	74	-5.5	62
Left Internal / External	Degrees	6.9	167	-3.8	88	8.3	69	-0.4	99
Right Dorsiflexion / Plantar Flexion	Degrees	33.6	75	-12.5	39	21.7	75	-14.9	16
Right Inversion / Eversion	Degrees	3.5	192	-42.7	71	5.7	101	-4.6	65
Right Internal / External	Degrees	8.6	117	-0.9	63	6.8	72	-10.4	195

DATA SHEET NO. 8... (continued)

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
 Test Date: 2/11/04

HEAD REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	21.9	154	-65.0	82	7.8	124	-43.9	33
Head CG	Y	G's	22.4	129	-68.7	159	17.6	35	-18.3	53
Head CG	Z	G's	22.1	73	-23.2	94	12.8	41	-21.6	97
Head CG Resultant	N/A	G's	71.7	159			44.6	33		

CHEST REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	7.9	128	-46.4	77	6.4	131	-39.9	84
Chest CG	Y	G's	26.2	97	-6.8	154	21.2	98	-3.7	57
Chest CG	Z	G's	14.4	71	-18.8	108	5.6	76	-15.2	101
Chest CG Resultant	N/A	G's	47.9	77			42.5	85		

REDUNDANT HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	Avg.	T ¹	T ²	HIC	Avg.	T ¹	T ²
HIC 36	532	51.2	68.3	96.7	148	27.9	60.5	96.5
HIC 15	415	59.8	73.7	88.7	78	30.6	68.0	83.0

REDUNDANT CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Redundant	46.9	75.2	78.2	40.7	82.7	85.8

NECK INJURY CRITERIA

Location	Driver	Passenger
N _{te} (Tension – Extension)	0.4	0.3
N _{tf} (Tension – Flexion)	0.3	0.3
N _{ce} (Compression – Extension)	0.3	0.4
N _{cf} (Compression – Flexion)	0	0.2

DATA SHEET NO. 9
SEAT BELT ASSESSMENT AND POST TEST AIRBAG DATA

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
 Test Date: 2/11/04

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Retractor reel to "D" ring	mm	563	522
Shoulder belt length as measured on ATD	mm	852	928
Lap belt length as measured on ATD	mm	879	903
Remainder of belt on reel	mm	886	787
Total belt length for continuous webbing systems	mm	3180	3140

BELT SPOOL-OUT DATA

Measurement Description	Units	Driver	Passenger
At the Retractor	mm	17	String Broke
At the Shoulder	mm	73	52

POST TEST AIRBAG DATA

Number of Vent Holes			
Driver	2	Passenger	2
Size of Vent Holes (Note whether round or square)			
Driver	Round 16 mm diameter	Passenger	Round 55 mm diameter
Total Vent Area			
Driver	201 mm ²	Passenger	2375 mm ²
Deflated Airbag Length and Width Dimensions or, if Round, Diameter			
Driver	Length:	Width:	Diameter: 626 mm
Passenger	Length: 642 mm	Width: 950 mm	Diameter:
Is the Airbag Tethered?			
Driver	Yes		Length: 330 mm
Passenger		No	Length:

DATA SHEET NO. 10
SUMMARY OF FMVSS 212 DATA

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
 Test Date: 2/11/04

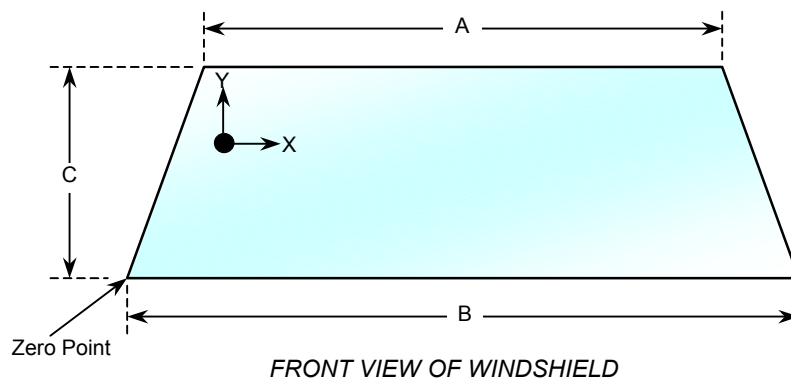
Windshield Mounting Details:

Windshield glass is secured to the vehicle frame with a rubber trim and glue.

The standard requires that the post-test retention measurement be a minimum of 75 percent of the pretest total periphery measurement for vehicles not equipped with occupant passive restraints and 50 percent for each side of the windshield for vehicles, which are equipped with occupant passive restraints.

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2019	2019	100
Right Side	2019	2019	100
Total	4038	4038	100



WINDSHIELD DIMENSIONS

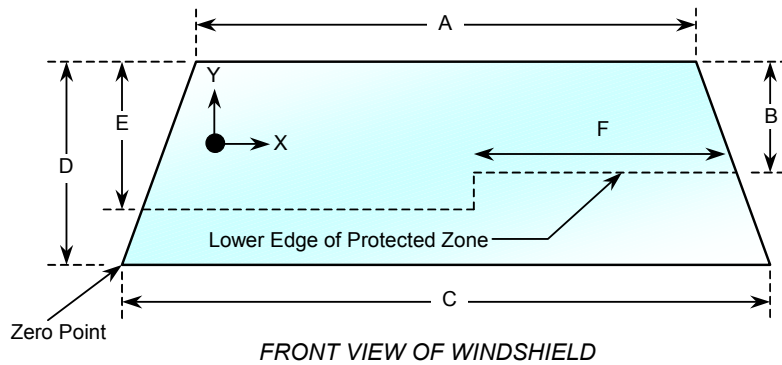
Item	Units	Segment Length	Molding Width
A	mm	1226	20
B	mm	1534	20
C	mm	639	10

DATA SHEET NO. 11

WINDSHIELD ZONE INTRUSION FMVSS 219 (Partial) DATA

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
 Test Date: 2/11/04



Item	Units	Value
A	mm	1226
B	mm	348
C	mm	1534
D	mm	639
E	mm	450
F	mm	594

AREA OF PROTECTED ZONE FAILURES - NONE

- A. Provide coordinates of the area that the protected zone was penetrated more than 0.25 inches by a vehicle component other than one that is normally in contact with the windshield. **None**

X	Y

- B. Provide coordinates of the area beneath the protected zone that the inner surface of the windshield was penetrated by a vehicle component. **None**

X	Y

DATA SHEET NO. 12
VEHICLE MEASUREMENTS

Test Vehicle: 1997 Ford Explorer
Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
Test Date: 2/11/04

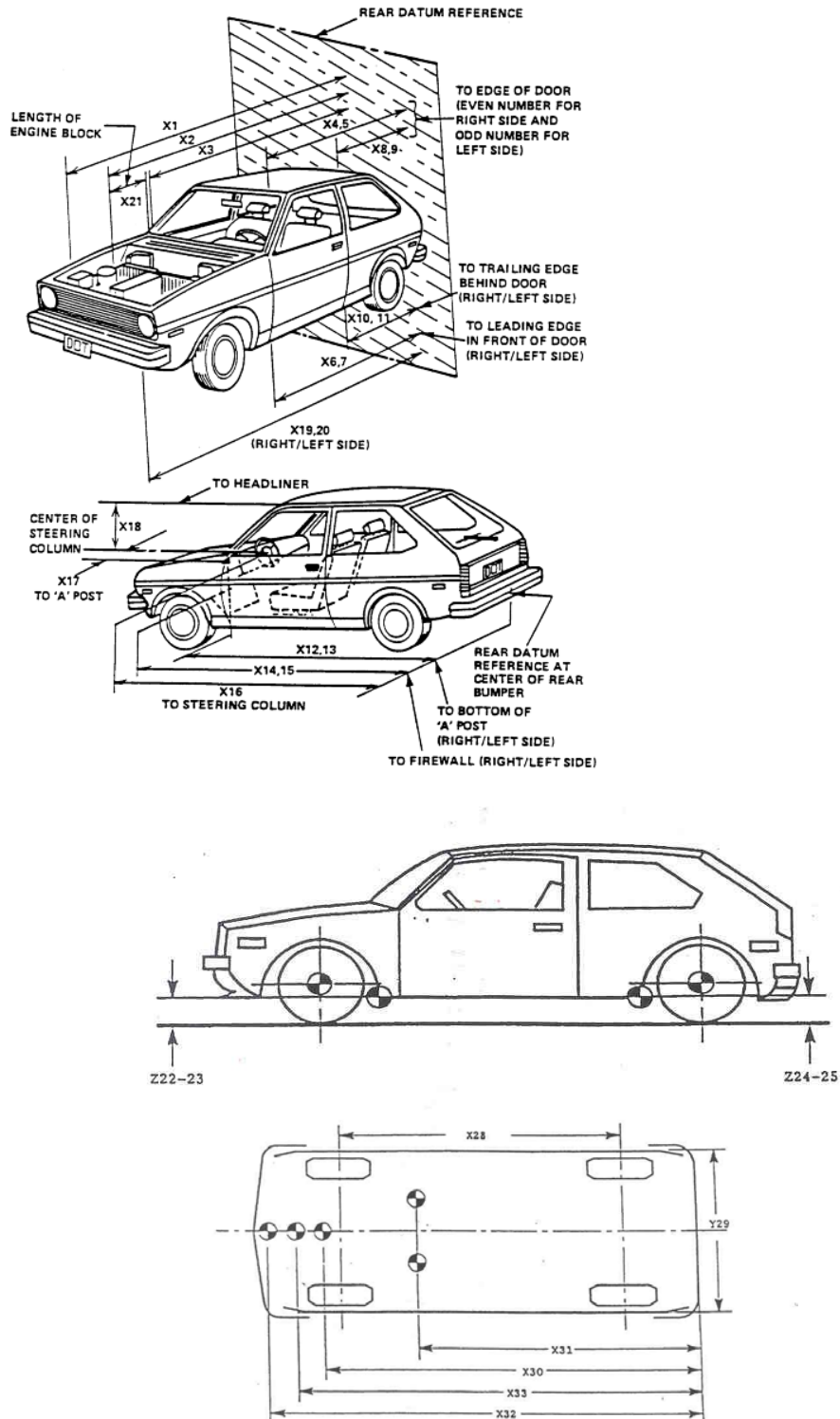
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
X1	Total length of vehicle at centerline	mm	4745	4078	667
X2	RSOV to front of engine	mm	3859	3654	205
X3	RSOV to firewall centerline	mm	3566	3491	75
X4	RSOV to leading edge of right door	mm	3291	3297	-6
X5	RSOV to leading edge of left door	mm	3304	3304	0
X6	RSOV to lower leading edge of right door	mm	3231	3224	7
X7	RSOV to lower leading edge of left door	mm	3246	3239	7
X8	RSOV to upper leading edge of right door	mm	2242	2261	-19
X9	RSOV to upper leading edge of left door	mm	2258	2258	0
X10	RSOV to lower trailing edge of right door	mm	2253	2240	13
X11	RSOV to lower trailing edge of left door	mm	2269	2258	11
X12	RSOV to bottom of right 'A' pillar	mm	3236	3227	9
X13	RSOV to bottom of left 'A' pillar	mm	3253	3259	-6
X14	RSOV to firewall on right side	mm	3528	3528	0
X15	RSOV to firewall on left side	mm	3549	3478	71
X16	RSOV to steering column	mm	2823	2903	-80
X17	Center of steering column to left 'A' pillar	mm	351	346	5
X18	Center of steering column to headlining	mm	534	498	36
X19	RSOV to right side of front bumper	mm	4634	4825	-191
X20	RSOV to left side of front bumper	mm	4634	4040	594
X21	Width of engine block	mm	404	404	0
Z22	Right Front Sill to Ground Plane	mm	457	366	-91
Z23	Left Front Sill to Ground Plane	mm	434	361	-73
Z24	Right Rear Sill to Ground Plane	mm	443	436	-7
Z25	Left Rear Sill to Ground Plane	mm	441	353	-88
X26	Firewall to Engine or Transaxle	mm	311	240	71
Z27	Vertical Dim. From Door Sill to Centerline of St. Col.	mm	604	687	83
X28	Wheelbase of Vehicle (left side)	mm	2845	2509	336
Y29	Width of Vehicle at Maximum Width Point	mm	1753	1815	-62
X30	RSOV to Engine Target	mm	3696	3595	101
X31	RSOV to Compartment Target	mm	2674	2689	-15
X32	RSOV to Bumper Target	mm	4679	4322	357
X33	RSOV to Frame Crossmember	mm	4039	3960	79

DATA SHEET NO. 12... (continued)

VEHICLE MEASUREMENTS

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
 Test Date: 2/11/04



DATA SHEET NO. 13
CAMERA LOCATIONS

Test Vehicle: 1997 Ford Explorer
Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
Test Date: 2/11/04

No.	Camera View	Location (mm) *			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Side View				13	24
2	Driver Side Full	3779	9139	1394	13	490
3	Cart Full	-787	7671	1136	13	498
4	Impact Point	3328	8481	1325	35	503
5	Driver Side	-478	13919	1392	25	**
6	Driver Close-Up	255	7762	1433	50	481
7	Full Passenger	7554	-10193	1563	13	495
8	Cart Full View	-347	-10561	1641	13	500
9	Full View	3824	-13352	1613	25	493
10	Passenger Close	6460	-10443	1587	50	493
11	Cart Left Side	2221	-11296	1581	25	***
12	Overhead Wide	543	0	4122	8	500
13	Overhead Close	265	-255	3869	13	***

*COORDINATES:

+X = film plane forward of barrier

+Y = film plane to right of monorail centerline

+Z = film plane above ground level

**No Timing

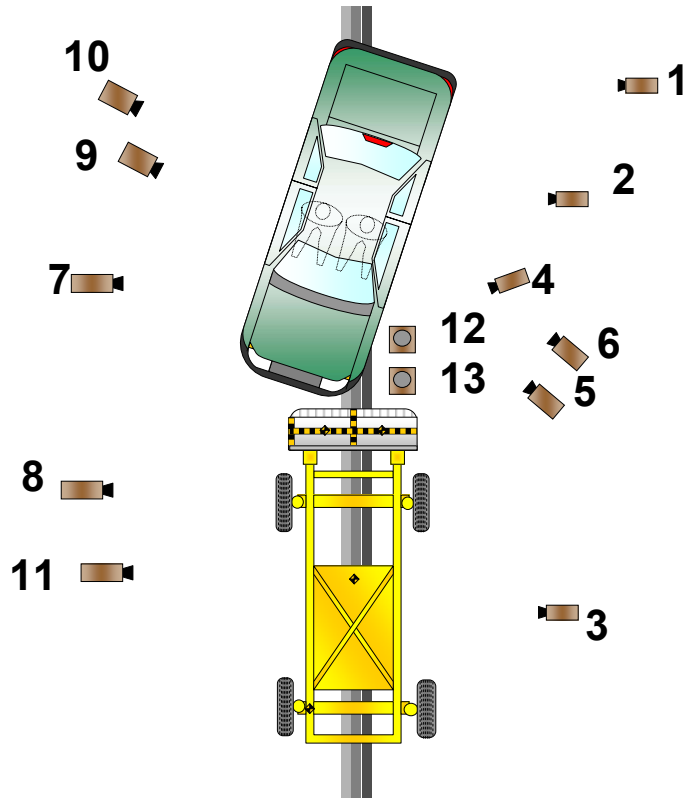
***Camera Did Not Run

DATA SHEET NO. 13... (continued)

CAMERA LOCATIONS

Test Vehicle: 1997 Ford Explorer
Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
Test Date: 2/11/04



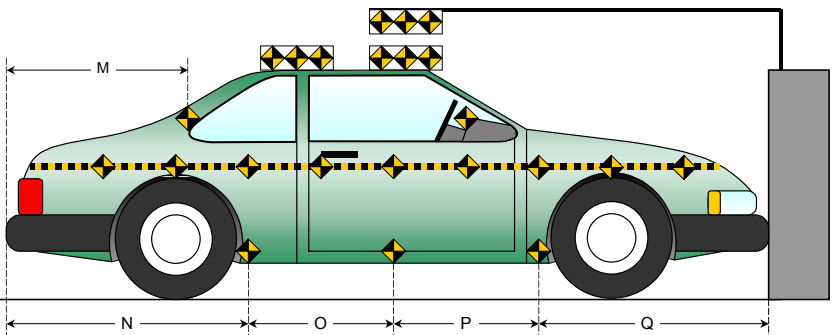
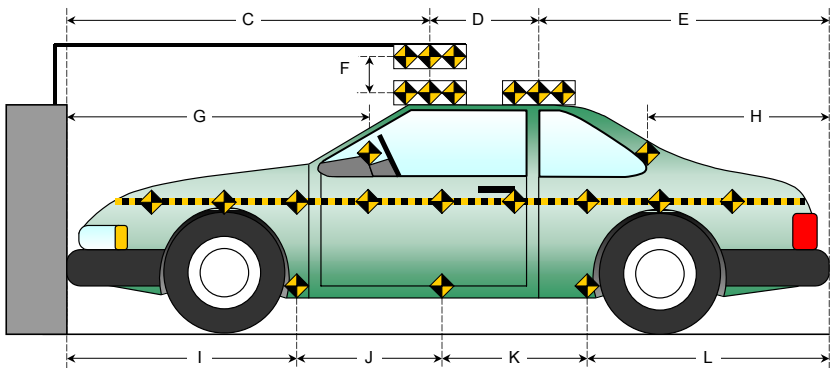
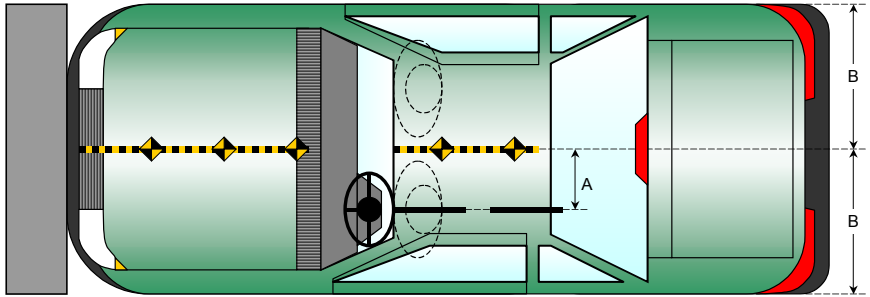
DATA SHEET NO. 14

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
 Test Date: 2/11/04

Item	Value
A	380
B	877
C	2342
D	609
E	1794
F	
G	1699
H	1340
I	1424
J	854
K	846
L	1621
M	1348
N	1627
O	855
P	848
Q	1415



DATA SHEET NO. 15
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

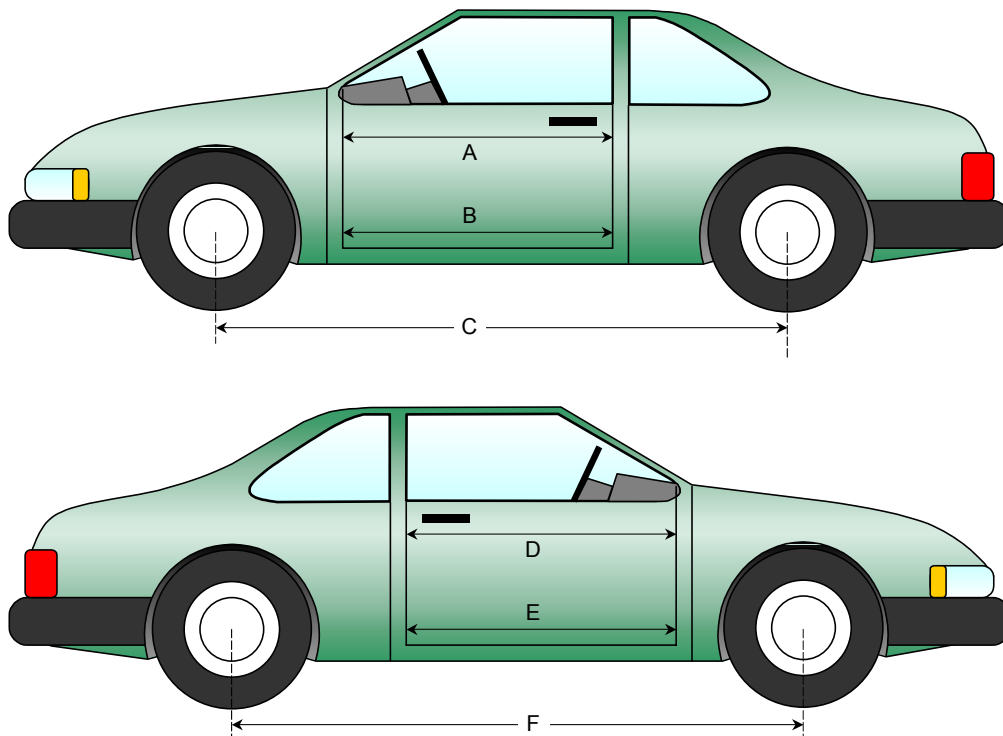
NHTSA No.: RV1324
 Test Date: 2/11/04

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	954	913	41
B	Left Side Lower	mm	755	753	2
D	Right Side Upper	mm	955	950	5
E	Right Side Lower	mm	775	775	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2845	2509	336
F	Right Side Wheelbase	mm	2845	2875	-30



DATA SHEET NO. 15... (continued)
VEHICLE INTRUSION MEASUREMENTS

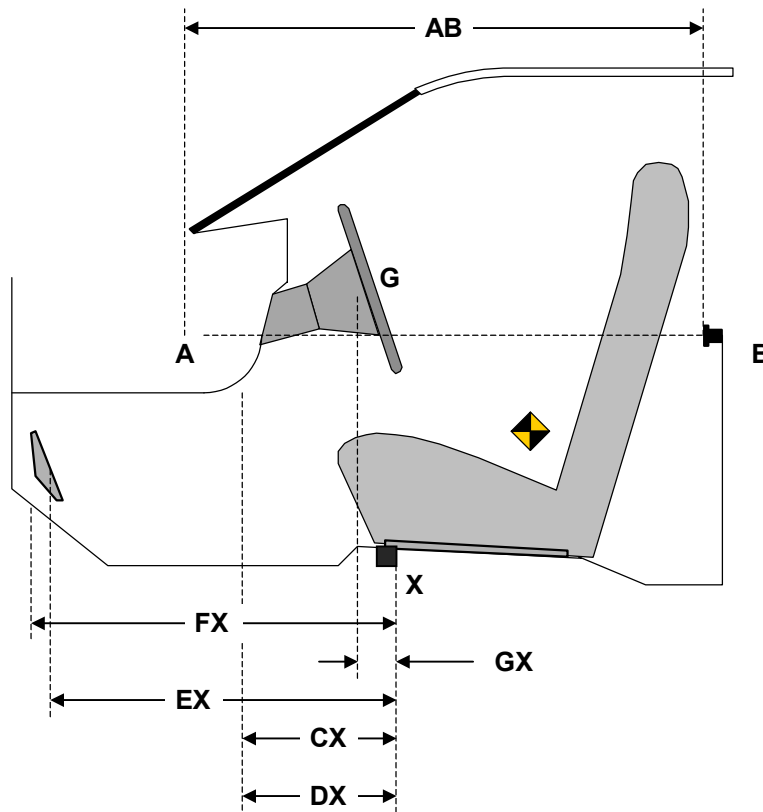
Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
 Test Date: 2/11/04

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	954	913	41
CX	Left Knee Bolster to X	mm	275	226	49
DX	Right Knee Bolster to X	mm	237	196	41
EX	Brake Pedal to X	mm	514	507	7
FX	Foot Rest to X	mm	704	665	39
GX	Center of Steering Column Wheel Hub to X	mm	17	0	17

X = Front of Seat Track (stationary)



DRIVER COMPARTMENT

DATA SHEET NO. 15... (continued)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

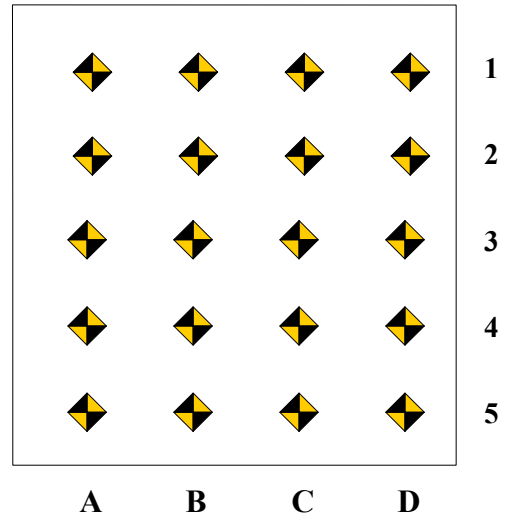
NHTSA No.: RV1324
 Test Date: 2/11/04

Measurement reference point for X and Z axis is the forward outboard seat mounting bolt.

Columns A through D are evenly spaced.

Rows 1 and 2 are on the toe kick portion of the floor pan. Rows 3, 4, and 5 are located on the most level portion of the floor pan.

Row 3 will be at the intersection of the toe kick and the level sections of the floor pan.



DRIVER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	620	631	625	615	570	590	565	558	50	41	60	57
2	575	568	564	558	546	545	535	522	29	23	29	36
3	495	490	488	480	475	480	471	468	20	10	17	12
4	293	285	277	275	282	280	268	263	11	5	9	12
5	89	77	79	72	75	61	62	61	14	16	17	11

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	75	35	27	25	130	115	118	124	-55	-80	-91	-99
2	40	10	7	5	92	62	66	75	-52	-52	-59	-70
3	-19	-20	-25	-35	40	23	17	15	-59	-43	-42	-50
4	-36	-40	-41	-48	-12	-28	-24	-10	-24	-12	-17	-38
5	-44	-41	-44	-46	-50	-38	-33	-34	6	-3	-11	-12

DATA SHEET NO. 15... (continued)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

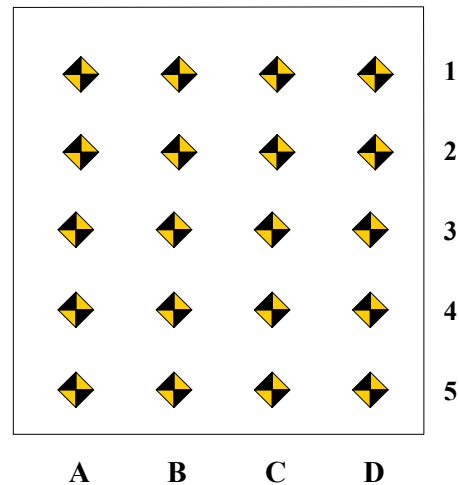
NHTSA No.: RV1324
 Test Date: 2/11/04

Measurement reference point for X and Z axis is the forward outboard seat mounting bolt.

Columns A through D are evenly spaced.

Rows 1 and 2 are on the toe kick portion of the floor pan. Rows 3, 4, and 5 are located on the most level portion of the floor pan.

Row 3 will be at the intersection of the toe kick and the level sections of the floor pan.



PASSENGER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	592	589	589	590	547	565	590	594	45	24	-1	-4
2	552	554	550	549	510	535	554	556	42	19	-4	-7
3	479	482	496	497	470	490	503	506	9	-8	-7	-9
4	300	291	292	300	296	294	304	309	4	-3	-12	-9
5	129	128	125	126	130	135	130	130	-1	-7	-5	-4

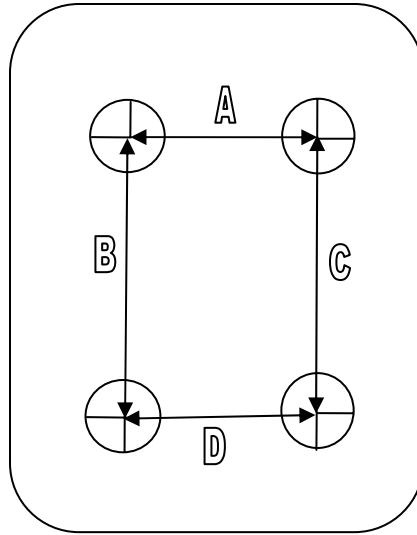
PASSENGER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	62	61	65	69	139	113	88	83	-77	-52	-23	-14
2	19	18	21	23	104	72	54	41	-85	-54	-33	-18
3	-9	-19	-10	-12	25	12	0	-4	-34	-31	-10	-8
4	-41	-42	-49	-33	-52	-50	-43	-38	11	8	-6	5
5	-53	-46	-41	-39	-70	-60	-50	-42	17	14	9	3

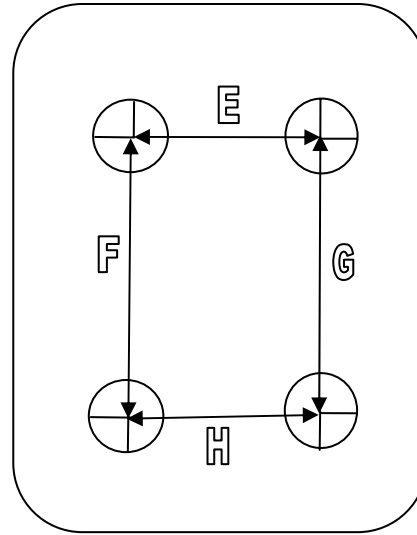
DATA SHEET NO. 15... (continued)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
 Test Date: 2/11/04



Driver



Passenger

UNDERBODY FLOORBOARD DEFORMATION

Measurement	Pre-Test	Post-Test	Difference
A	343	334	9
B	302	300	2
C	331	320	11
D	245	227	18
E	224	218	6
F	407	395	12
G	360	355	5
H	217	209	8

DATA SHEET NO. 16
IIHS VEHICLE MEASUREMENTS

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
 Test Date: 2/11/04

Location		Difference
A Pillar	X	-63
	Y	-20
	Z	89
B Pillar	X	-11
	Y	16
	Z	14
Brake Pedal	X	-29
	Y	-23
	Z	84
Footrest	X	-75
	Y	-56
	Z	19
Knee Bolster Left	X	-53
	Y	-23
	Z	105
Knee Bolster Right	X	-54
	Y	-23
	Z	111
Steering Column	X	-39
	Y	-24
	Z	125
Toepan Left	X	-61
	Y	-55
	Z	113
Toepan Center	X	-97
	Y	-51
	Z	111
Toepan Right	X	-122
	Y	-26
	Z	116
Outboard Front Seat Bolt	X	2
	Y	-20
	Z	-12
Inboard Front Seat Bolt	X	-10
	Y	-17
	Z	20
Inboard Aft Seat Bolt	X	-2
	Y	-5
	Z	24
Outboard Aft Seat Bolt	X	2
	Y	-6
	Z	14

DATA SHEET NO. 16... (continued)
IIHS VEHICLE MEASUREMENTS

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No.: RV1324
 Test Date: 2/11/04

Location		Difference
Bumper 1 (Extreme LH)	X	-613
	Y	-405
	Z	251
Bumper 2	X	-624
	Y	-403
	Z	269
Bumper 3	X	-596
	Y	-393
	Z	284
Bumper 4	X	-590
	Y	-382
	Z	291
Bumper 5	X	-503
	Y	-322
	Z	273
Bumper 6 (Mid)	X	-380
	Y	-233
	Z	267
Bumper 7	X	-259
	Y	-164
	Z	258
Bumper 8	X	-126
	Y	-99
	Z	240
Bumper 9	X	-17
	Y	-59
	Z	211
Bumper 10	X	92
	Y	-25
	Z	177
Bumper 11 (Extreme RH)	X	206
	Y	4
	Z	141

X – Positive forward, Y – Positive to the left, Z – Positive up

DATA SHEET NO. 17

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No. RV1324
 Test Date: 2/11/04

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	604.2	494.4	
Right	kg	642.3	458.6	
Ratio	%	56.7	43.3	
Totals	kg	1246.5	953.0	2199.5

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	6
Contact Switches	2
High Speed Cameras	2

DEFORMABLE BARRIER STATIC CRUSH

Above Ground	Distance Right of Center								C _L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
250	-19	2	22	48	78	138	222	268	289	297	280	218	220	244	218	231	247
475 (bumper C/L)	-39	-19	22	58	97	142	133	178	178	223	322	384	364	309	286	258	253
555	-52	-47	-21	18	62	87	104	130	160	195	285	355	362	347	334	286	269
720	13	25	39	50	69	102	135	147	141	215	300	374	412	412	406	410	409

All Dimensions in mm

DATA SHEET NO. 17... (continued)

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No. RV1324
 Test Date: 2/11/04

MDB ACCELEROMETER PEAK DATA

Loc. No.	Accelerometer Location	Peak Values (G's)				
		Axis	Max	Time	Min	Time
1	MDB CG	X	1.3	160	-34.0	50
		Y	4.7	128	-11.7	56
		Z	30.1	78	-36.5	60
		RES	48.2	59		
2	MDB Rear	X	1.8	111	-42.6	49
		Y	13.9	51	-4.6	93
		Z	15.3	83	-32.6	71
		RES	45.2	49		

Column

	11	10	9	8	7	6	5	4	3	2	1
Row 1	1-11	1-10	1-9	1-8	1-7	1-6	1-5	1-4	1-3	1-2	1-1
Row 2	2-11	2-10	2-9	2-8	2-7	2-6	2-5	2-4	2-3	2-2	2-1
Row 3	3-11	3-10	3-9	3-8	3-7	3-6	3-5	3-4	3-3	3-2	3-1
Row 4	4-11	4-10	4-9	4-8	4-7	4-6	4-5	4-4	4-3	4-2	4-1
Row 5	5-11	5-10	5-9	5-8	5-7	5-6	5-5	5-4	5-3	5-2	5-1

MDB Load Cell Configuration

DATA SHEET NO. 17... (continued)
MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No. RV1324
 Test Date: 2/11/04

MDB LOAD CELL PEAK DATA

Load Cell Location	Units	Max	Time
MDB 1-2	KN	113.0	51
MDB 1-3	KN	62.9	49
MDB 1-4	KN	15.9	48
MDB 1-5	KN	14.1	38
MDB 1-6	KN	7.9	39
MDB 1-7	KN	6.3	34
MDB 1-8	KN	3.3	32
MDB 1-9	KN	-0.8	95
MDB 1-10	KN	-1.1	84
MDB 2-2	KN	116.6	52
MDB 2-3	KN	36.7	28
MDB 2-4	KN	45.3	52
MDB 2-5	KN	8.1	11
MDB 2-6	KN	9.2	70
MDB 2-7	KN	8.7	73
MDB 2-8	KN	7.3	76
MDB 2-9	KN	6.2	76
MDB 2-10	KN	0.6	66

DATA SHEET NO. 17... (continued)
MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Test Vehicle: 1997 Ford Explorer
 Test Program: Frontal Offset Oblique

NHTSA No. RV1324
 Test Date: 2/11/04

MDB LOAD CELL PEAK DATA

Load Cell Location	Units	Max	Time
MDB 3-2	KN	29.6	52
MDB 3-3	KN	*	*
MDB 3-4	KN	36.4	77
MDB 3-5	KN	8.5	10
MDB 3-6	KN	*	*
MDB 3-7	KN	7.0	80
MDB 3-8	KN	7.0	70
MDB 3-9	KN	8.4	26
MDB 3-10	KN	6.4	80
MDB 4-2	KN	13.5	52
MDB 4-3	KN	10.7	50
MDB 4-4	KN	39.4	65
MDB 4-5	KN	8.6	7
MDB 4-6	KN	12.2	79
MDB 4-7	KN	14.4	79
MDB 4-8	KN	7.1	38
MDB 4-9	KN	6.5	80
MDB 4-10	KN	7.6	91
MDB 5-2	KN	5.7	39
MDB 5-4	KN	9.8	30
MDB 5-8	KN	6.6	84
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MDB 5-10	KN	8.8	19

* No valid data collected

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MFD. BY FORD MOTOR CO. IN U.S.A.
 DATE: 11/96
 FRONT GAWR: 2710LB
 1229KG
 P235/75R15SL
 15X7.0J
 AT 179 kPa/ 26 PSI COLD
 GVWR: 5340LB/ 2422KG
 REAR GAWR: 2950LB
 1338KG
 P235/75R15SL
 15X7.0J
 AT 179 kPa/ 26 PSI COLD
 WITH TIRES RIMS

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR
 VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF
 MANUFACTURE SHOWN ABOVE.

VIN: 1FMDU34X1VZA76243
 TYPE: MPV

F0124
 T0107



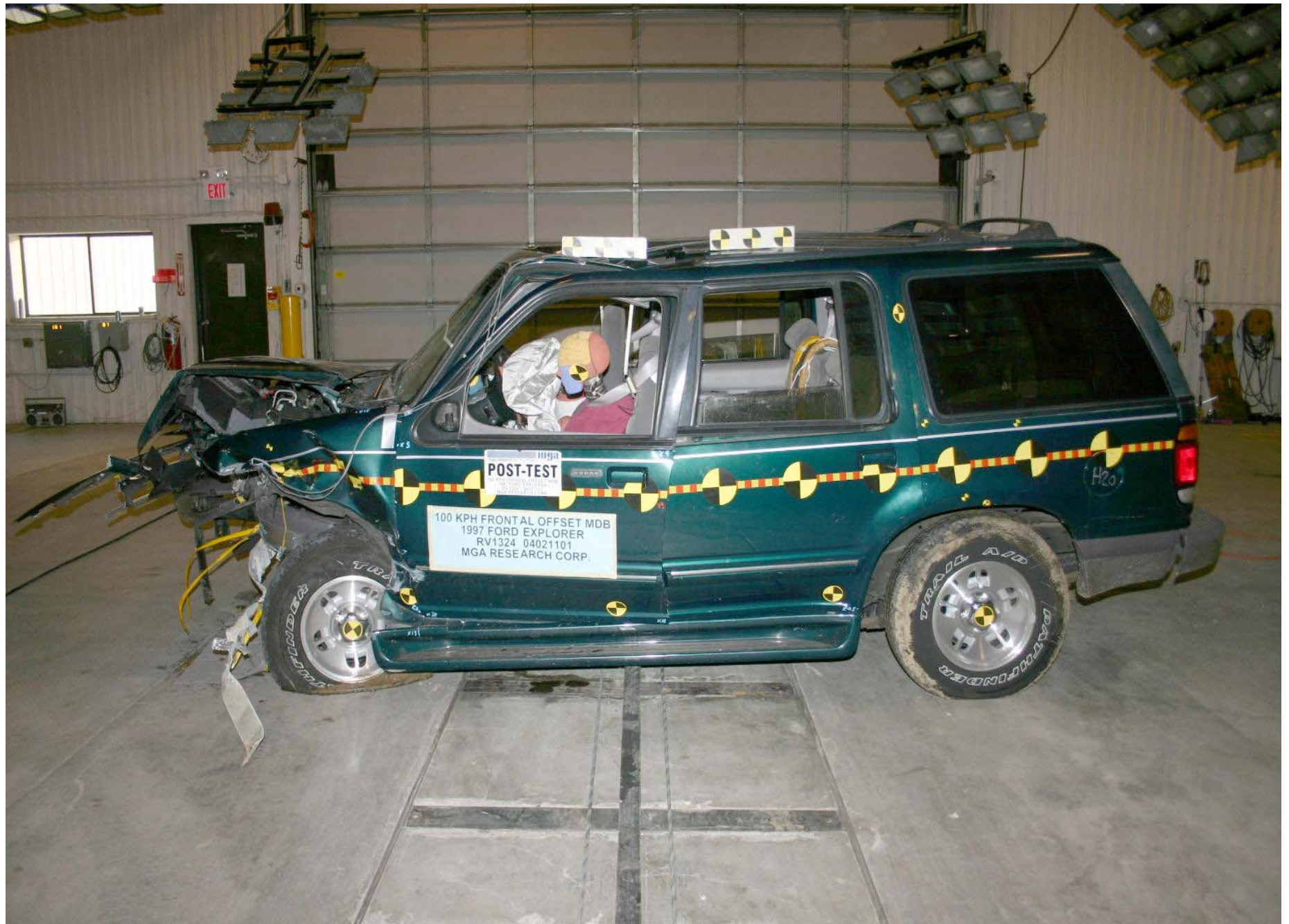
EXT PNT: PA IRC: 13 DSO:

WB | BRK | INT TR | TP/PS | R | AXLE | TR | SPR
 112 4 22 D/ 8 D4 D BF

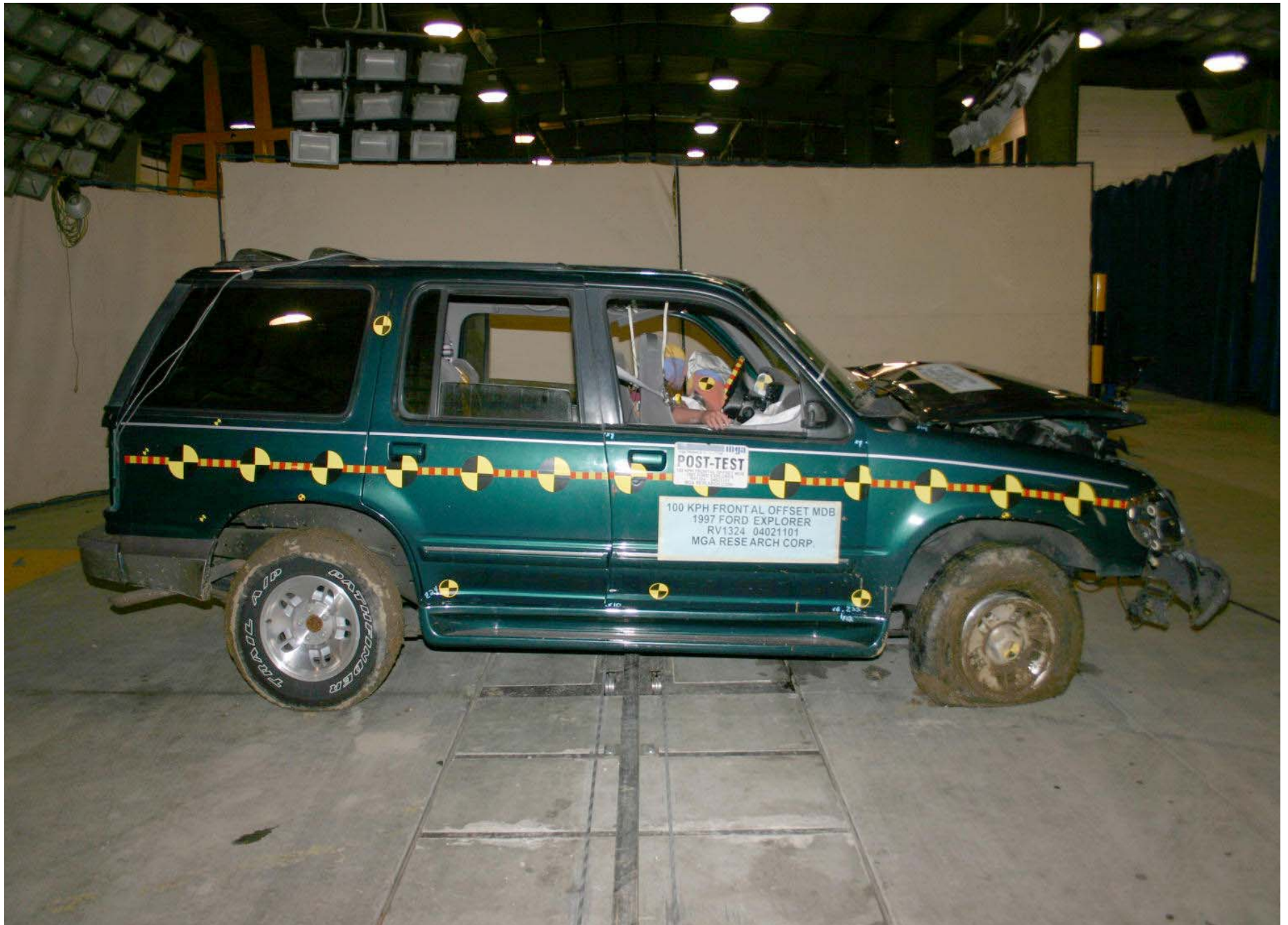
UTC 7 F65B-1520472-AA



Post-Test Front View of Test Vehicle



Post-Test Left Side View of Test Vehicle



Post-Test Right Side View of Test Vehicle

A-5.



Post-Test Rear View of Test Vehicle



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



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



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



Post-Test Right Rear ¾ View of Test Vehicle



Pre-Test Windshield View

A-11.



Post-Test Windshield View

A-12.



Pre-Test Engine Compartment View



Post-Test Engine Compartment View

A-14.



Pre-Test Front Underbody View



Post-Test Front Underbody View



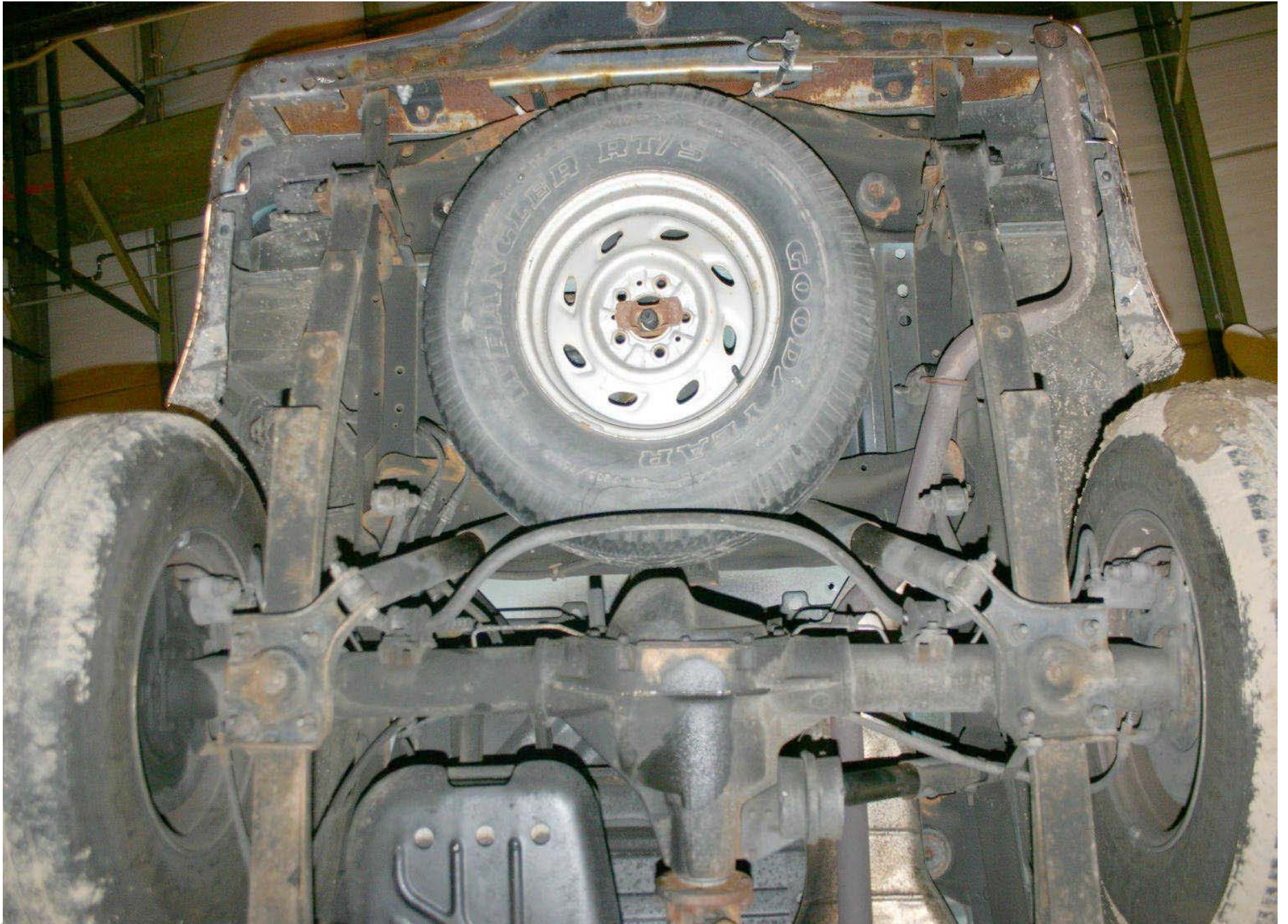
Pre-Test Mid Underbody



Post-Test Mid Underbody



Pre-Test Rear Underbody View



Post-Test Rear Underbody View



Pre-Test Driver Dummy Front View (head position)

A-21.



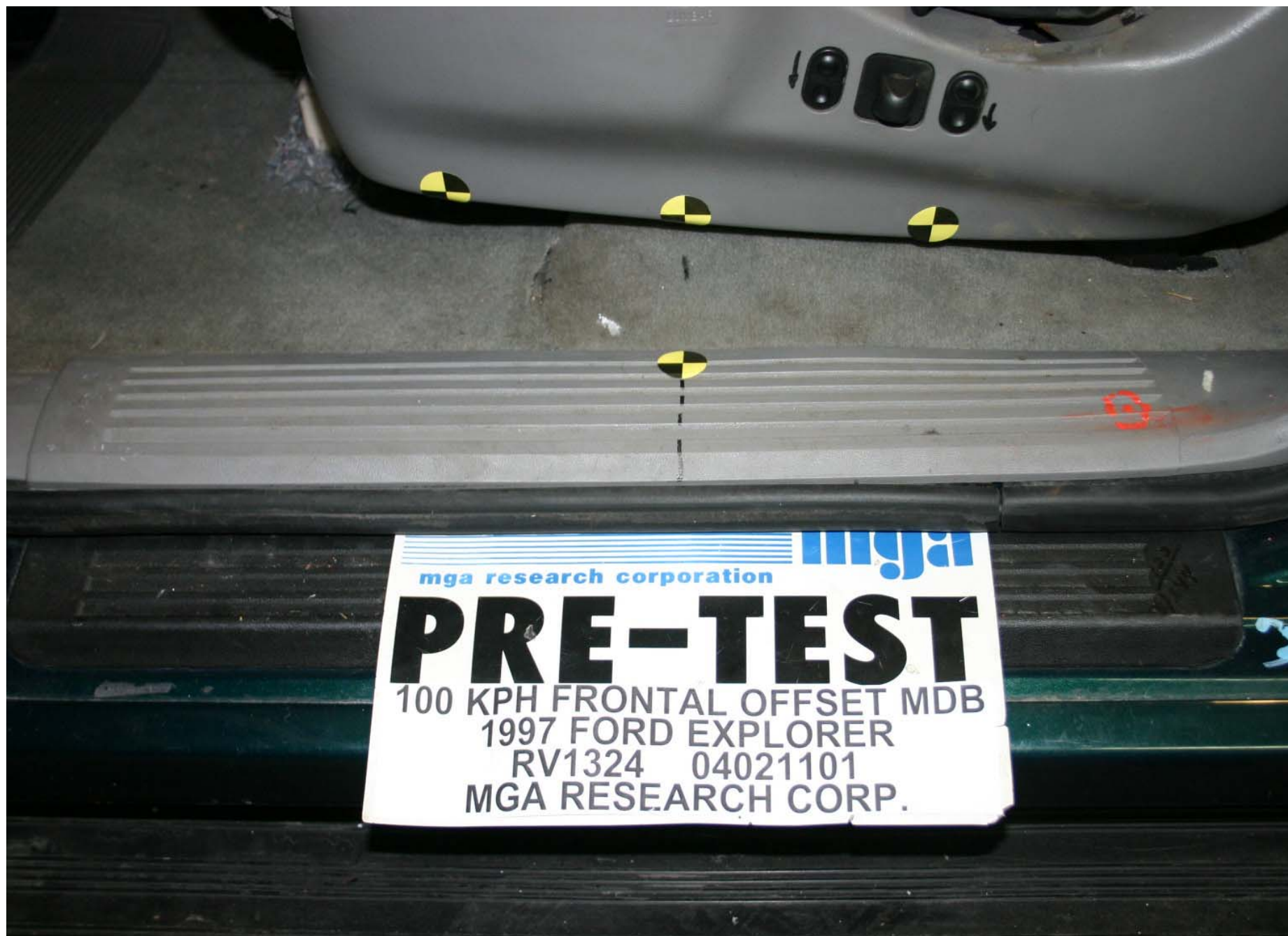
Post-Test Driver Dummy Front View (head position)



Pre-Test Driver Dummy Position Left Side View



Post-Test Driver Dummy Position Left Side View



Pre-Test Driver Dummy Seat Position



Post-Test Driver Dummy Seat Position



Pre-Test Driver Dummy Feet Position



Post-Test Driver Dummy Feet Position



Pre-Test Driver Side Knee Bolster View



Post-Test Driver Side Knee Bolster View



Post-Test Driver Dummy Head Contact



Post-Test Driver Dummy Head Contact



Post-Test Driver Dummy B Pillar Contact



Post-Test Driver Dummy Knee Contact



Post-Test Driver Dummy Airbag Contact



Post-Test Driver Side Floor Pan View



Pre-Test Passenger Dummy Front View (head position)



Post-Test Passenger Dummy Front View (head position)



Pre-Test Passenger Dummy Position Right Side View



Post-Test Passenger Dummy Position Right Side View



Pre-Test Passenger Dummy Position Right Side View (Door Open)



Post-Test Passenger Dummy Position Right Side View (Door Open)



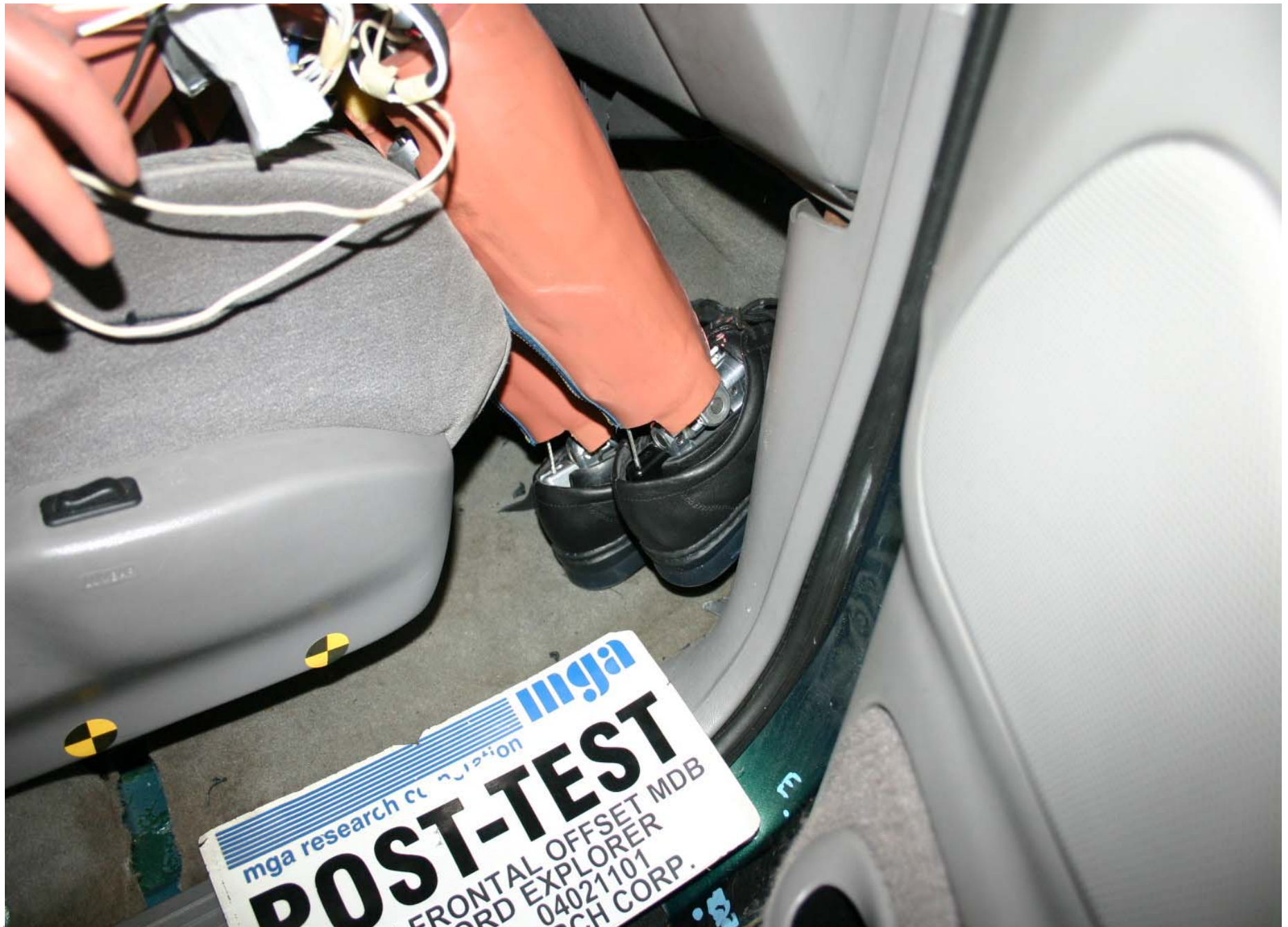
Pre-Test Passenger Dummy Seat Position



Post-Test Passenger Dummy Seat Position



Pre-Test Passenger Dummy Feet Position



Post-Test Passenger Dummy Feet Position



Pre-Test Passenger Side Knee Bolster View



Post-Test Passenger Side Knee Bolster View

A-48.



Post-Test Passenger Dummy Knee Contact



Post-Test Passenger Dummy Airbag Contact



Post-Test Passenger Side Floor Pan View

The image shows a large, white, rectangular test specimen, likely a battery pack, mounted on a blue frame with orange diagonal supports. A yellow and red striped vertical line is visible on the right side of the specimen. A label on the top left corner reads "PRE-TEST" and includes technical specifications.

A-52.



Post-Test MDB Front View



Pre-Test MDB Top View



Post-Test MDB Top View



Pre-Test MDB Right Side View



Post-Test MDB Right Side View

A-57.



Pre-Test MDB Left Side View



Post-Test MDB Left Side View



Pre-Test Left Front Wheel Well



Post-Test Left Front Wheel Well



Pre-Test Right Front Wheel Well



Post-Test Right Front Wheel Well



Post-Test Left Front Close-Up View



Post-Test Roof Buckle View

A-65.



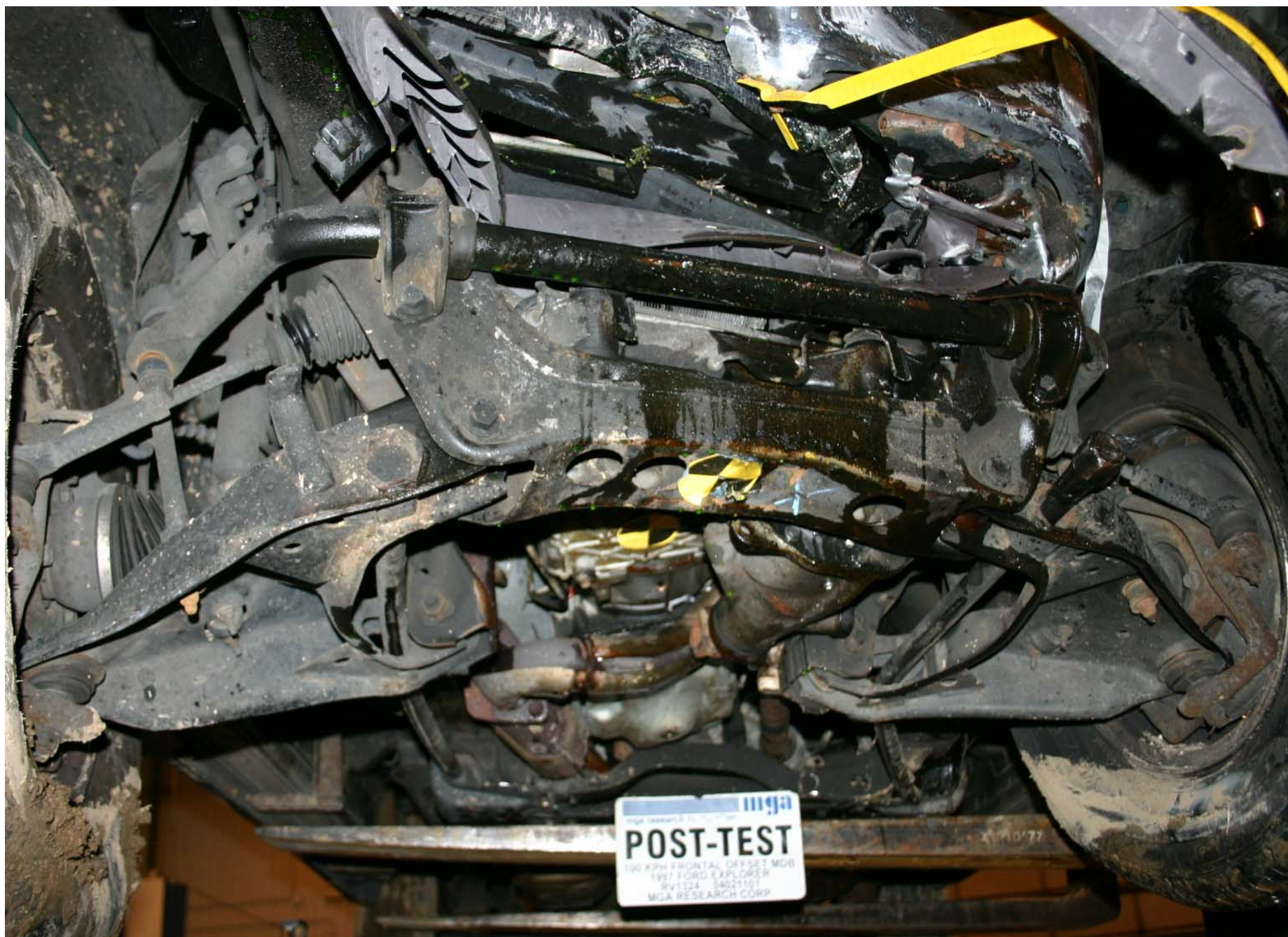
Post-Test Front Sub-Frame View #1

A-66.



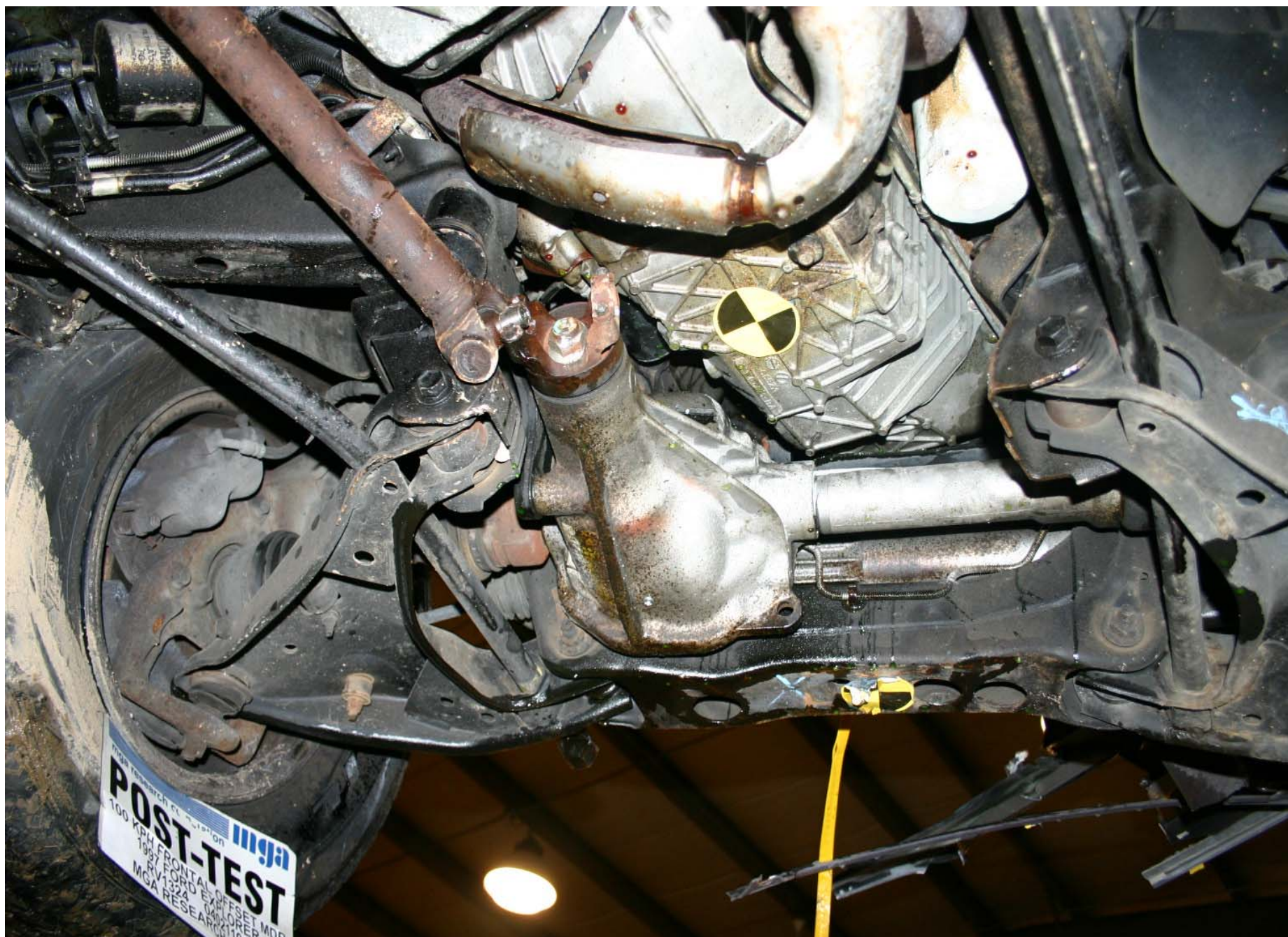
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Post-Test Front Sub-Frame View #3

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Post-Test Front Sub-Frame View #4

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MDB, DUMMY AND VEHICLE RESPONSE DATA TRACES

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B-61

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B-62

Figure No. 212. Rear Y Velocity vs. Time

B-62

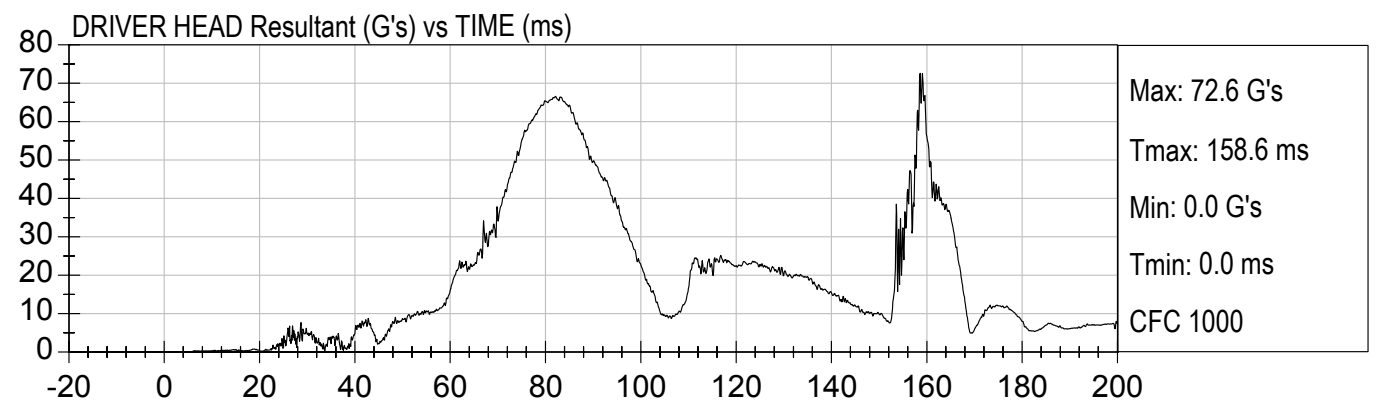
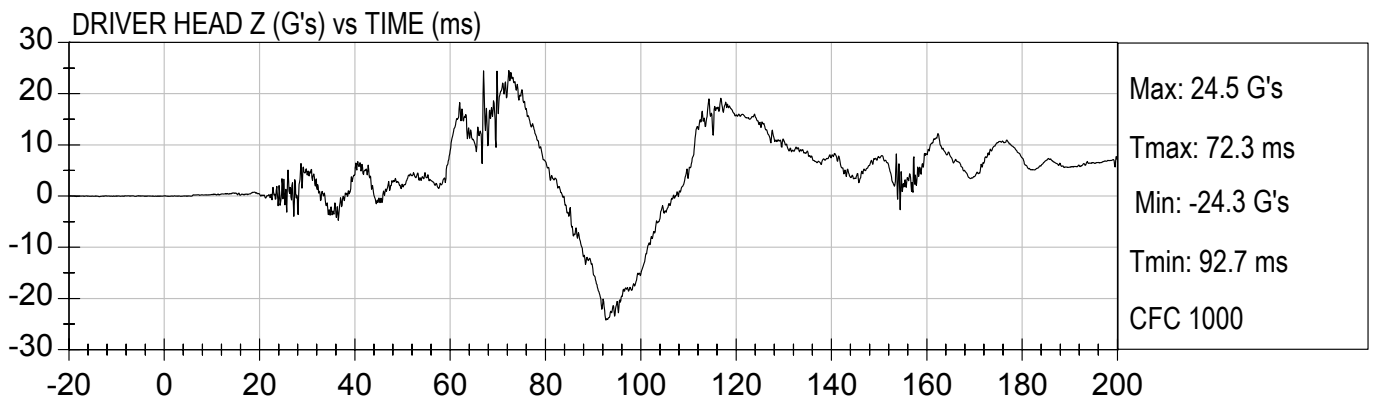
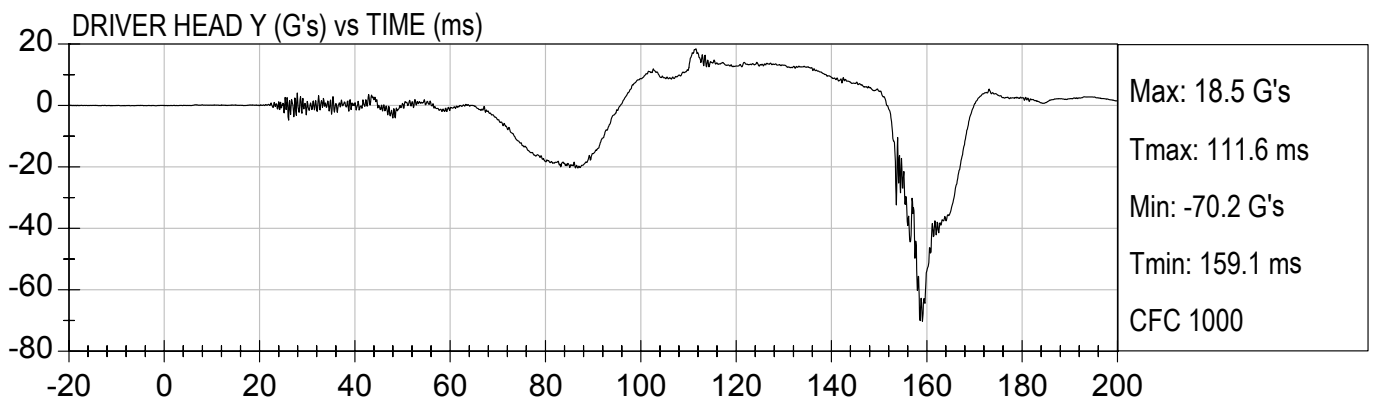
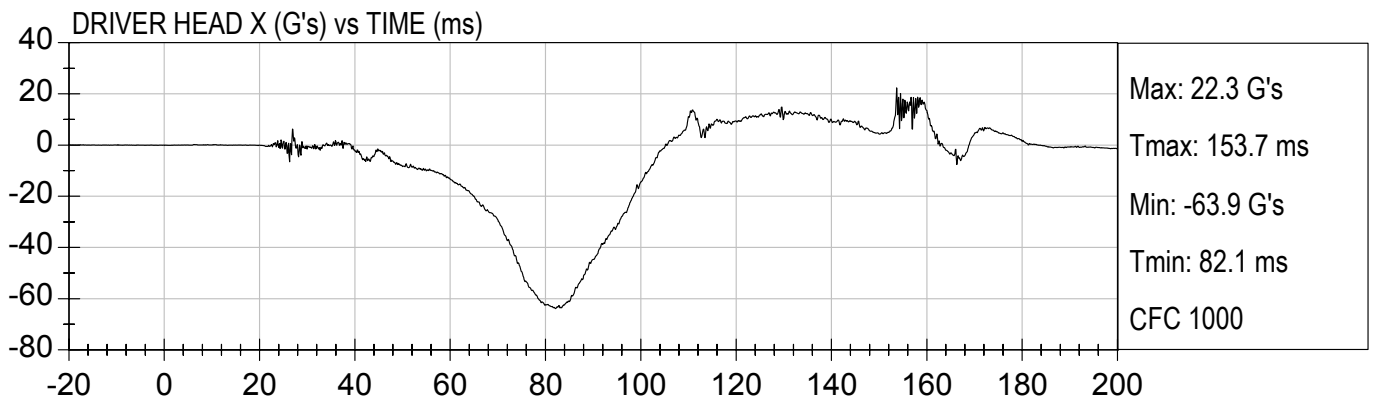
Figure No. 213. Rear Z Velocity vs. Time

B-62



100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

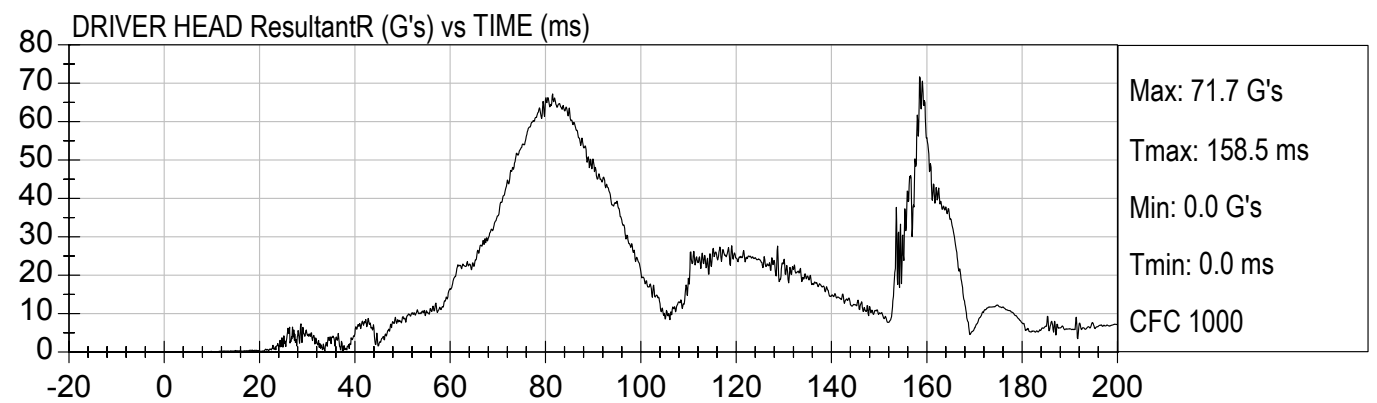
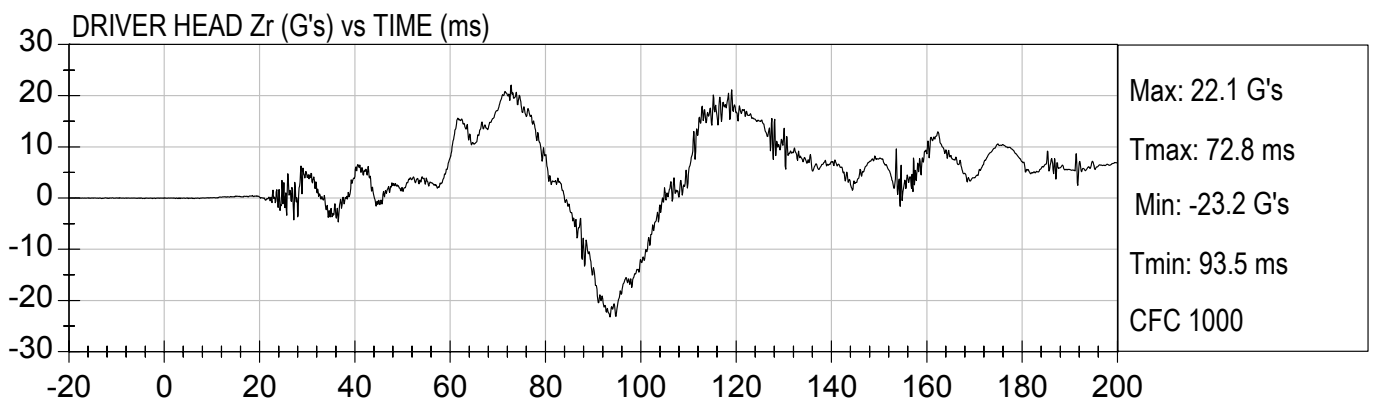
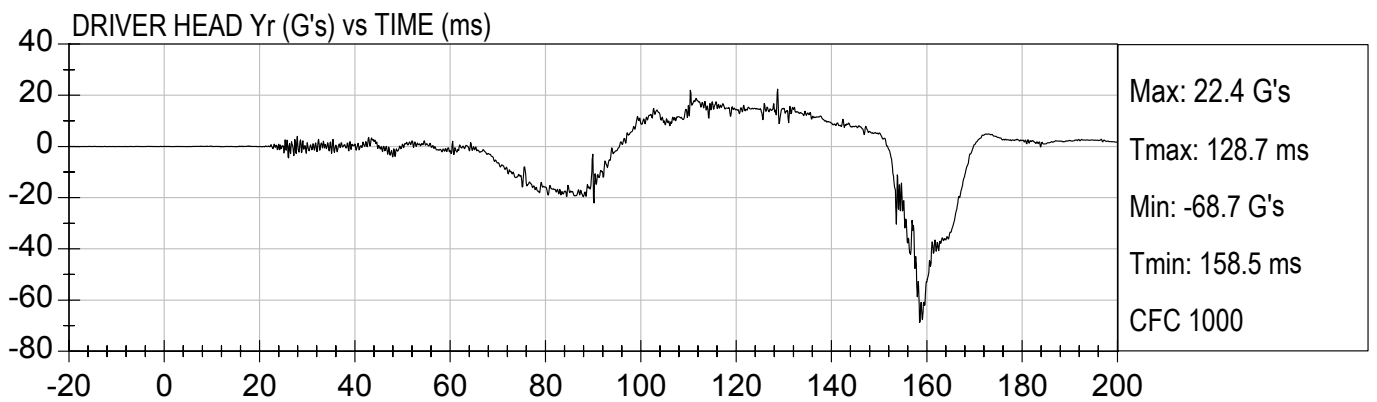
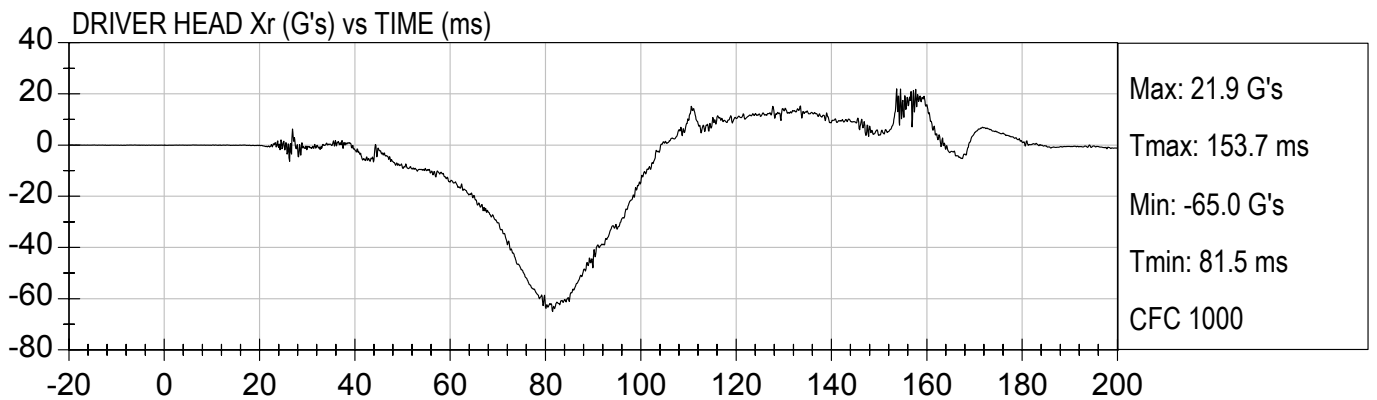
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

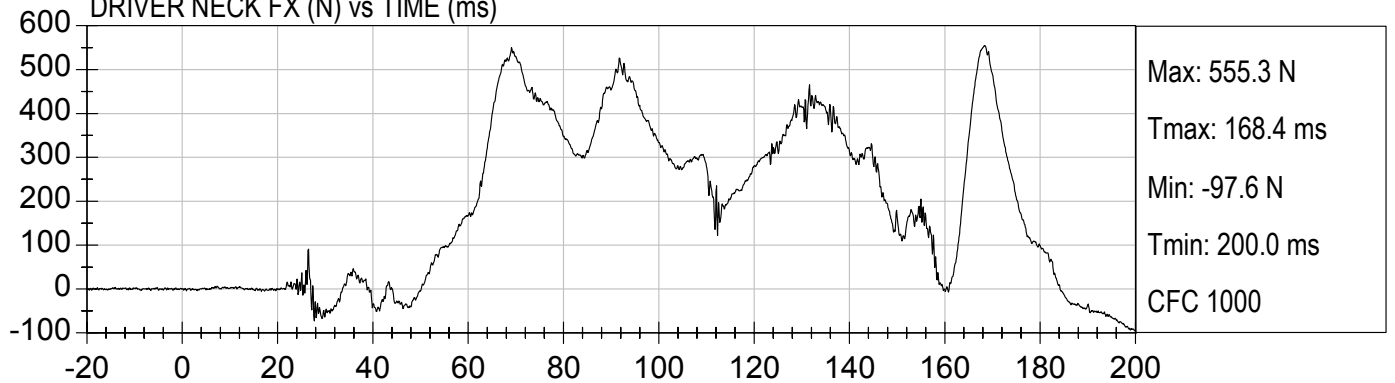




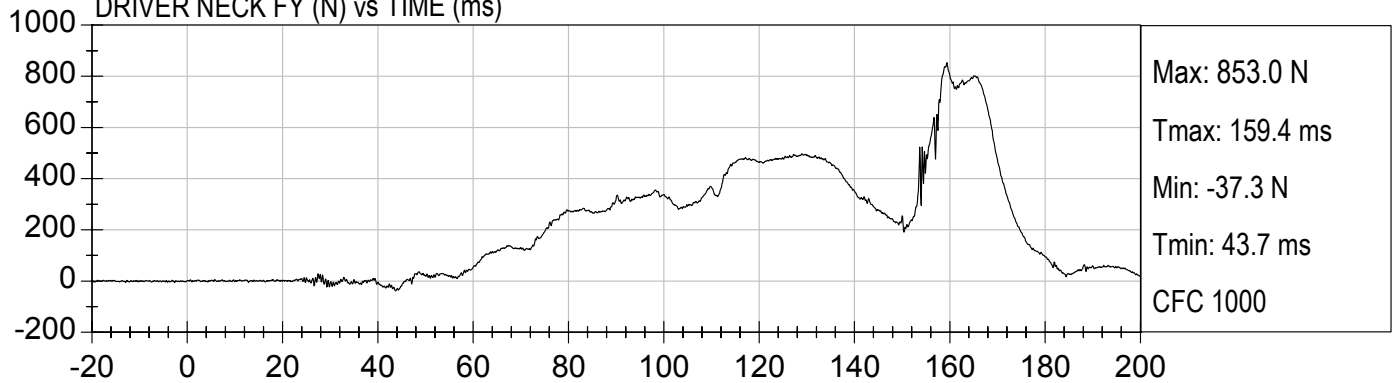
100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

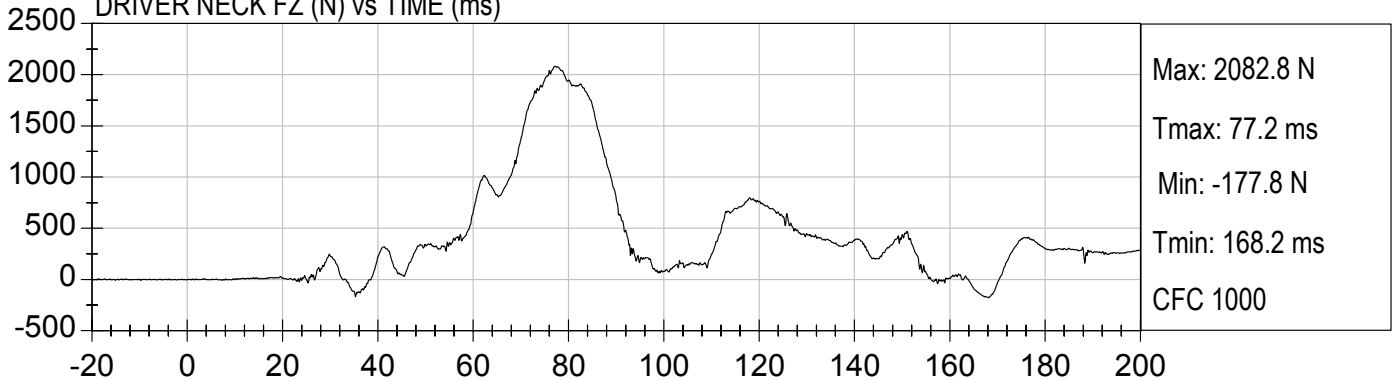
DRIVER NECK FX (N) vs TIME (ms)



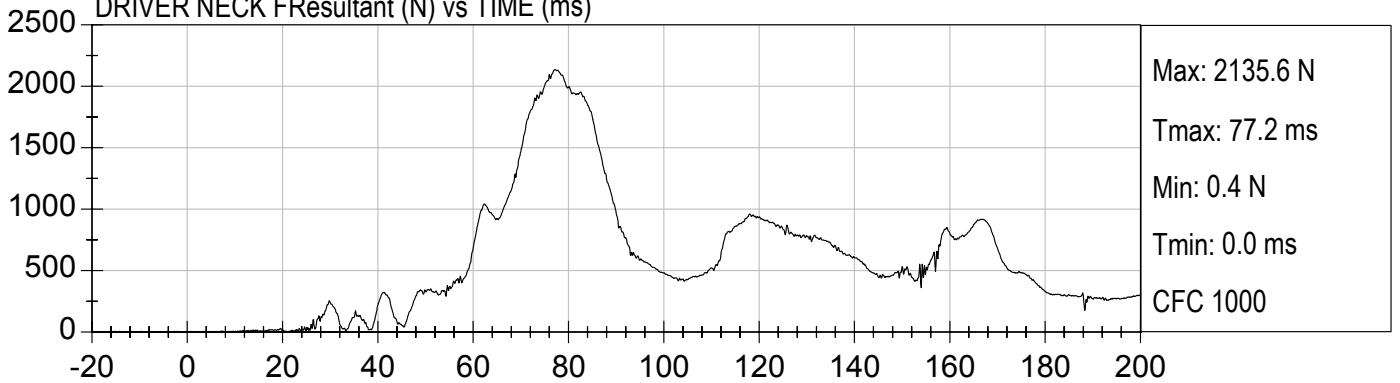
DRIVER NECK FY (N) vs TIME (ms)



DRIVER NECK FZ (N) vs TIME (ms)



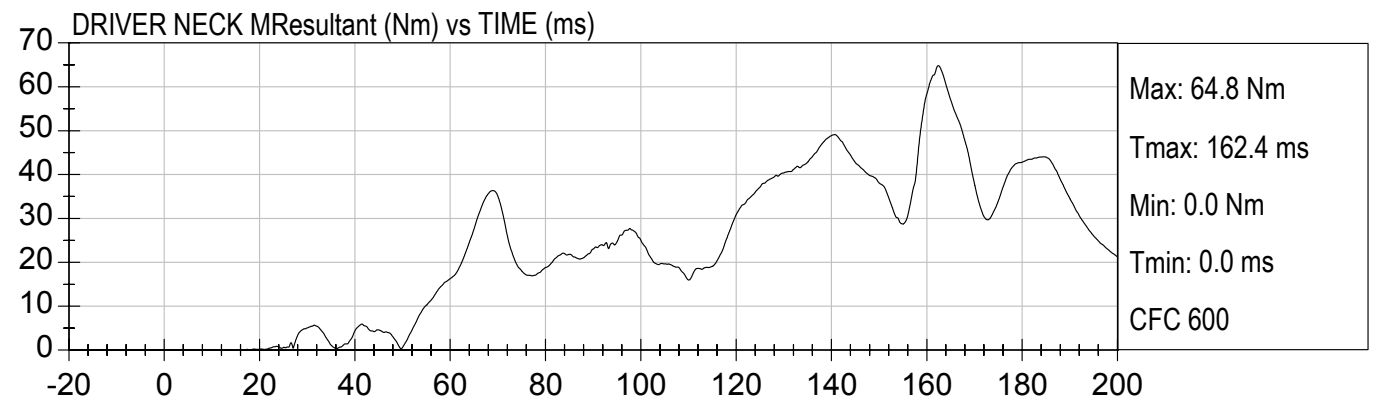
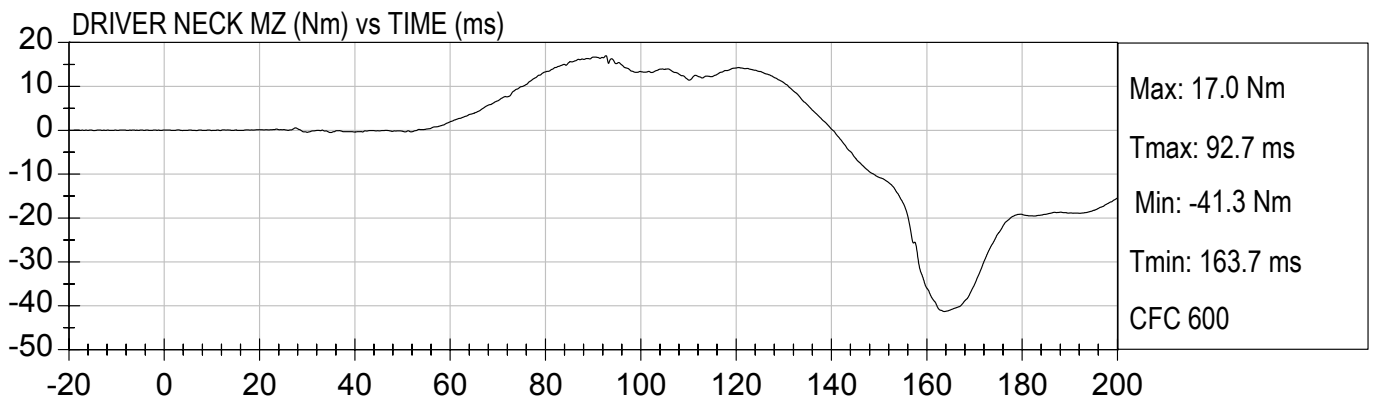
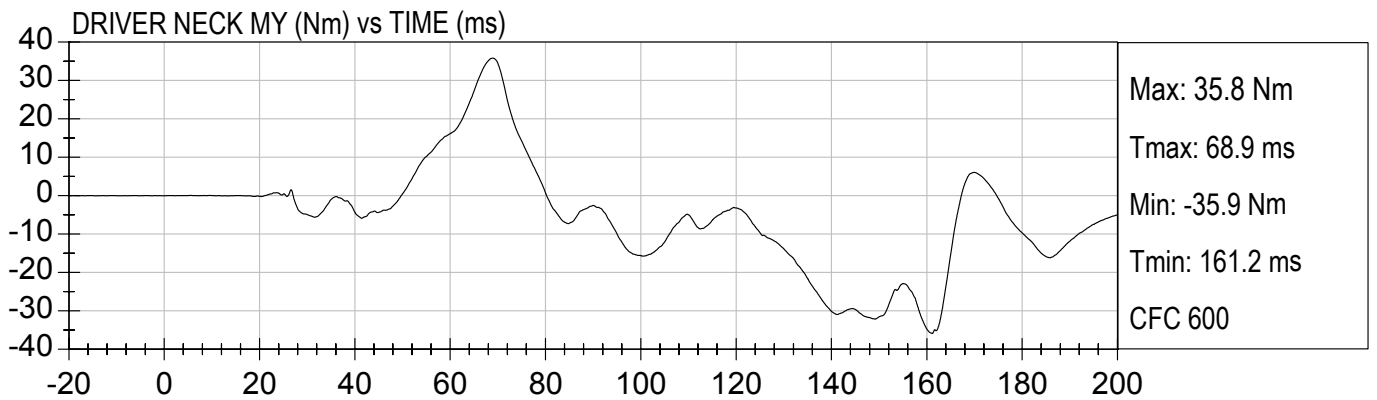
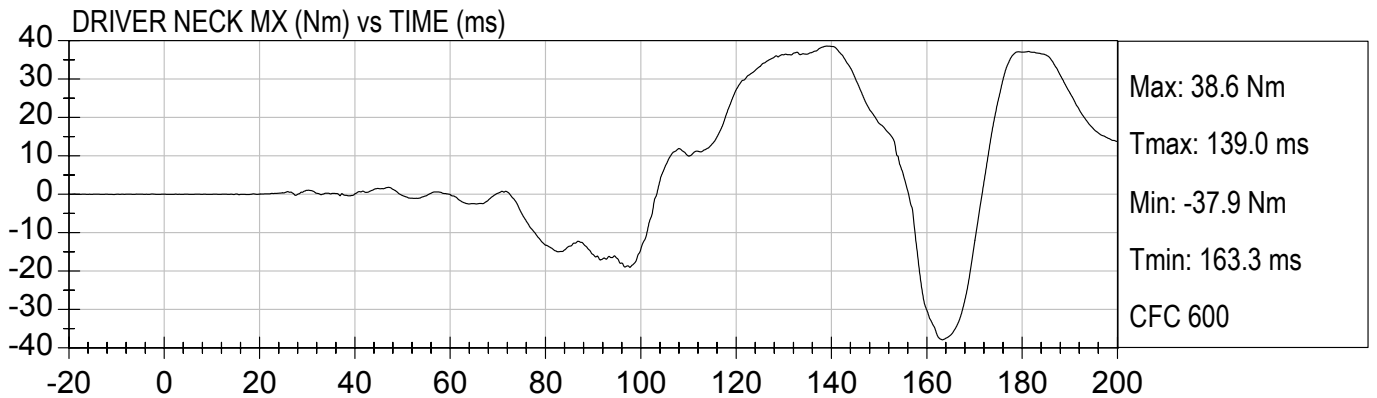
DRIVER NECK FResultant (N) vs TIME (ms)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

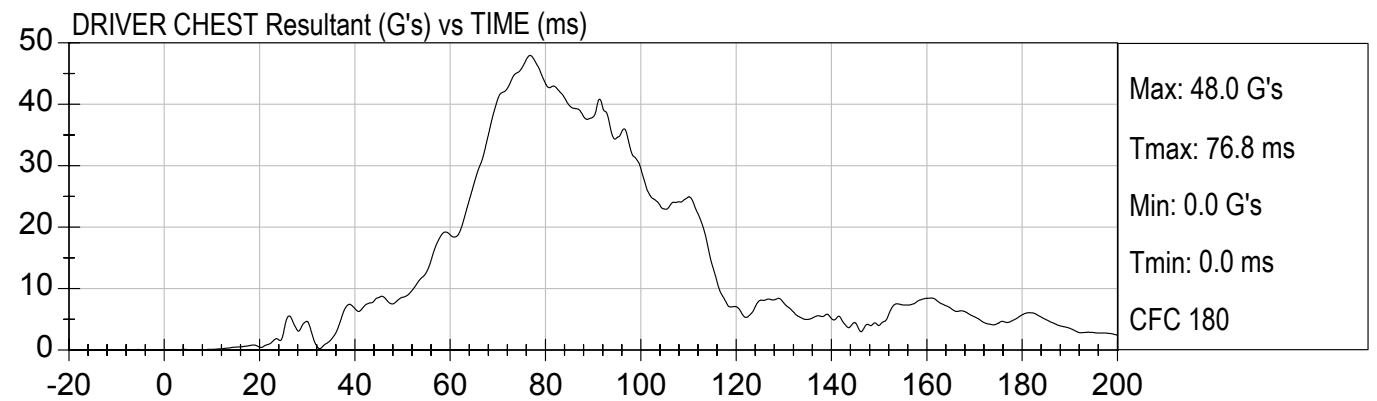
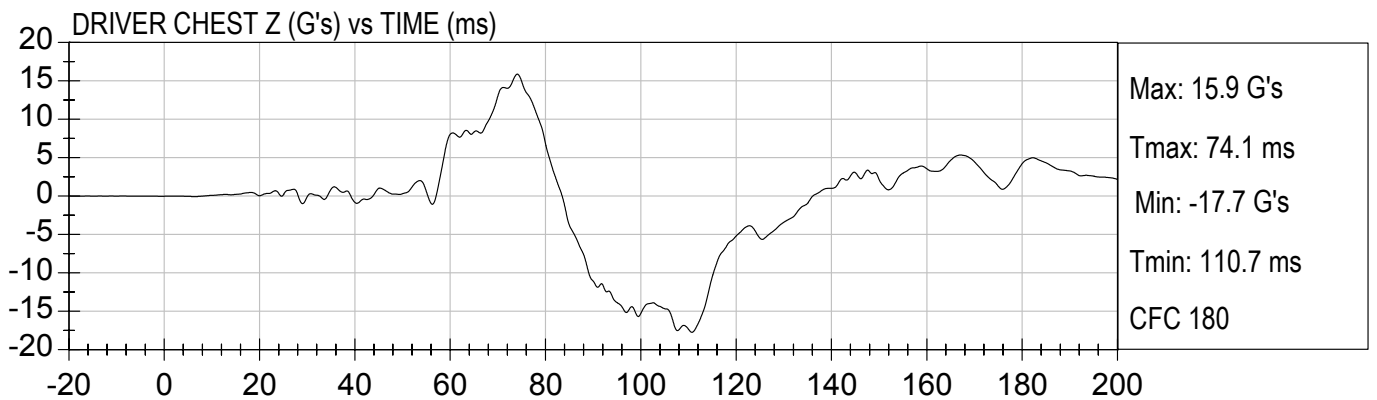
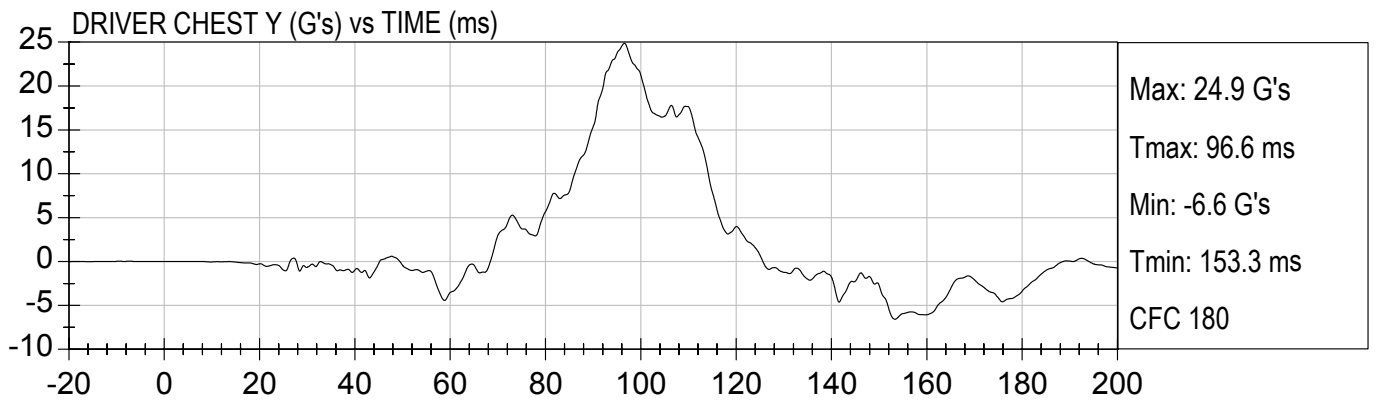
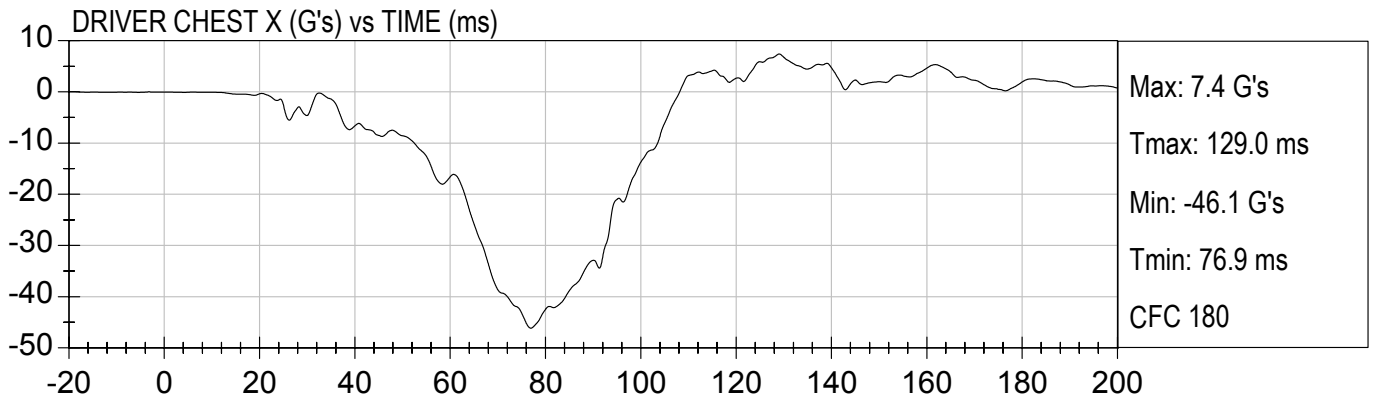
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

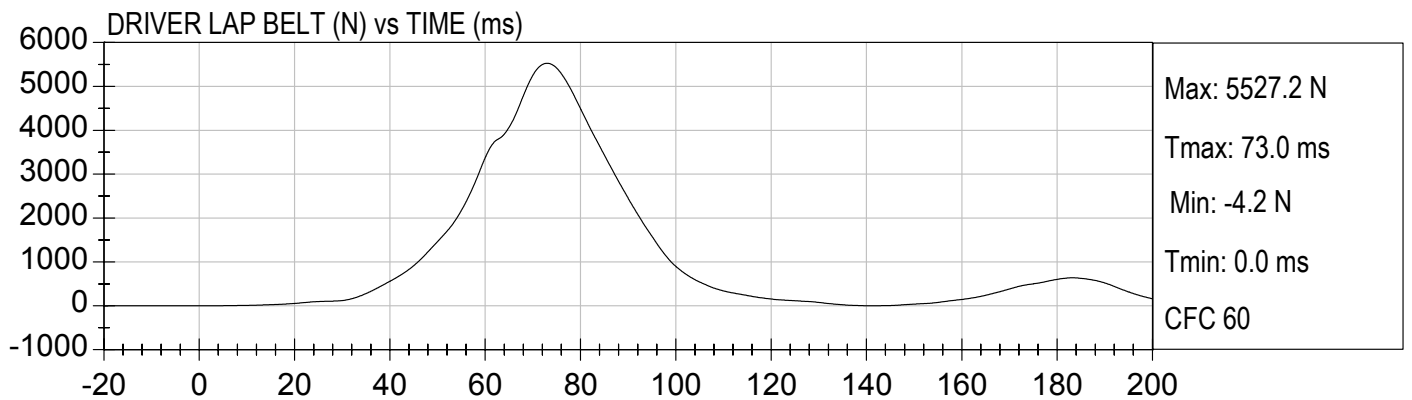
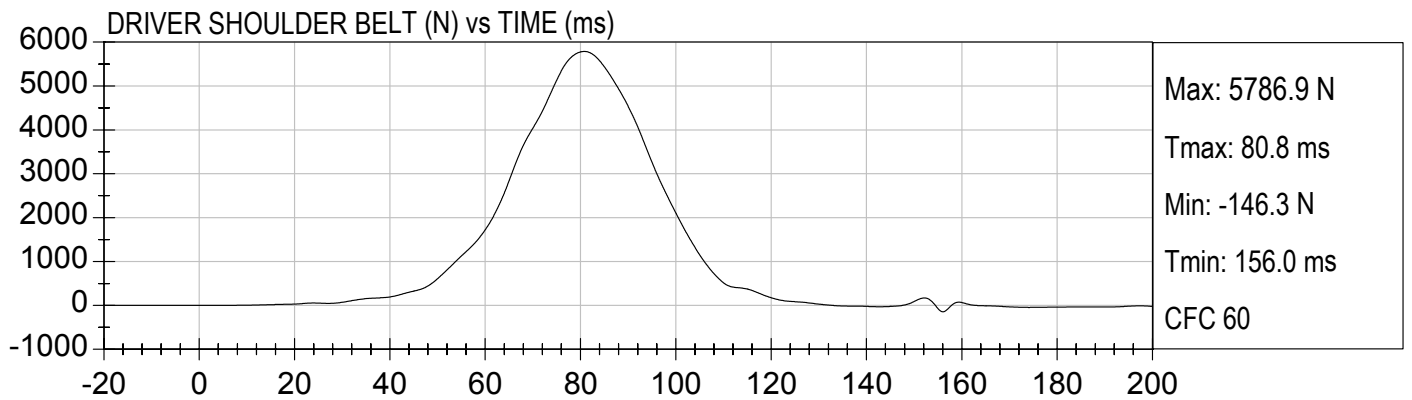
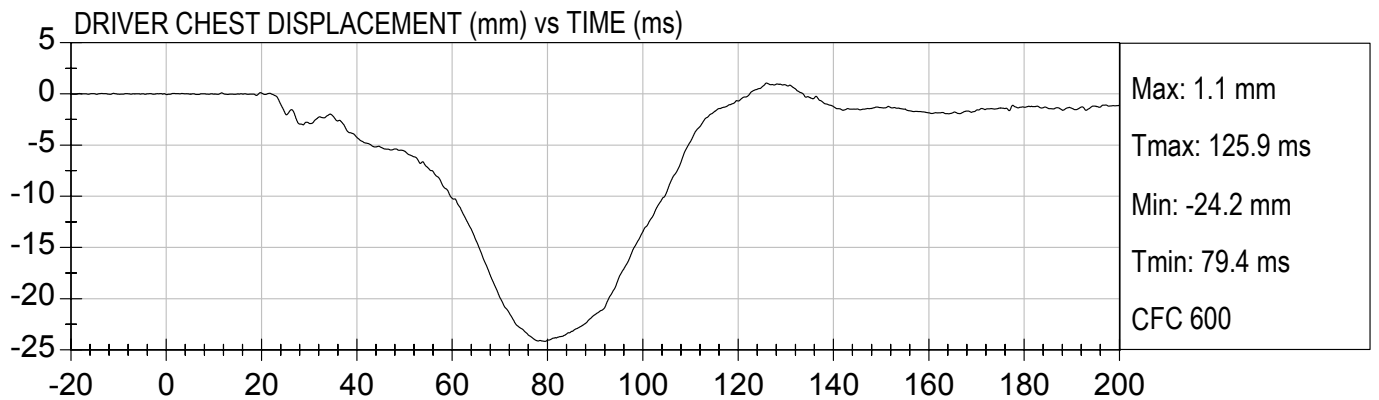
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

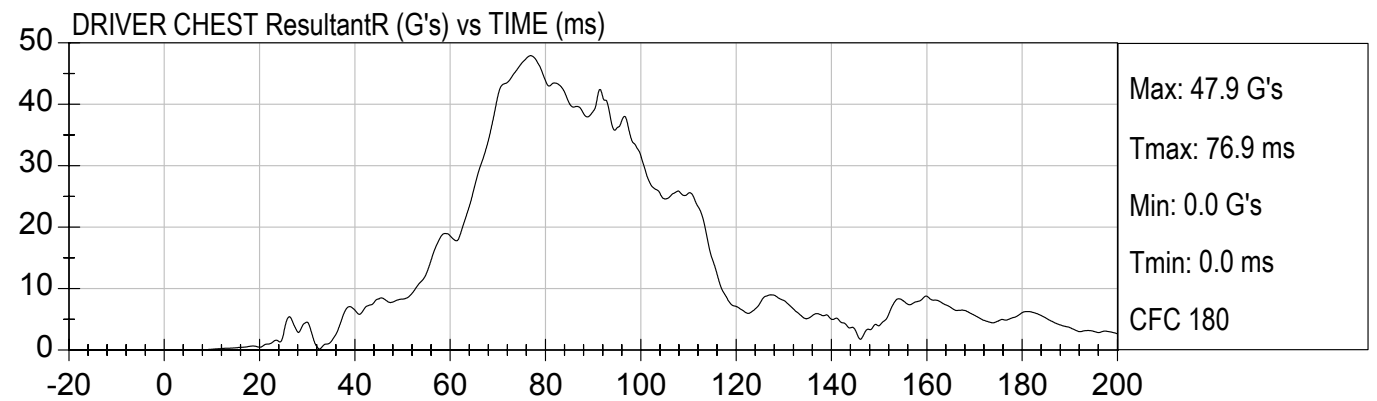
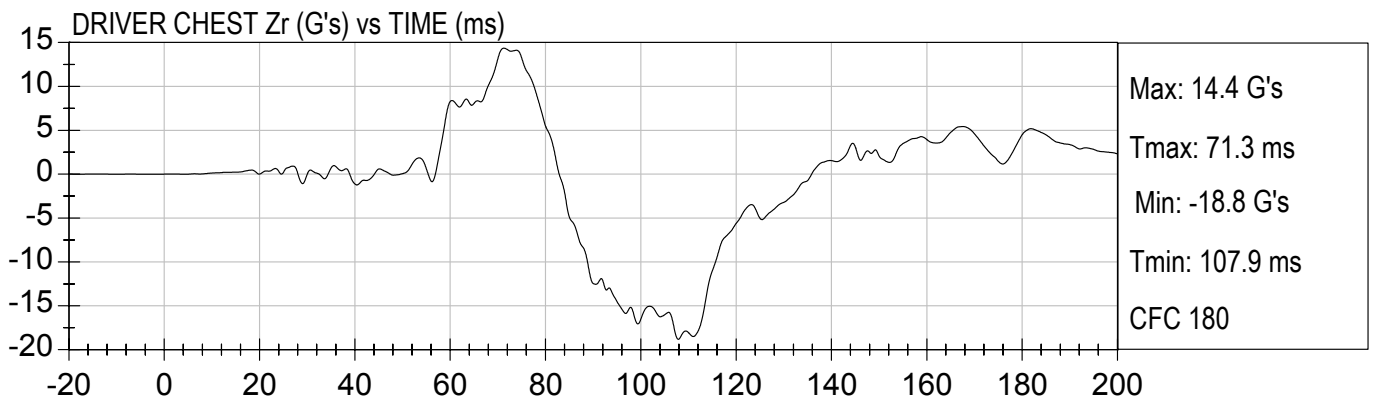
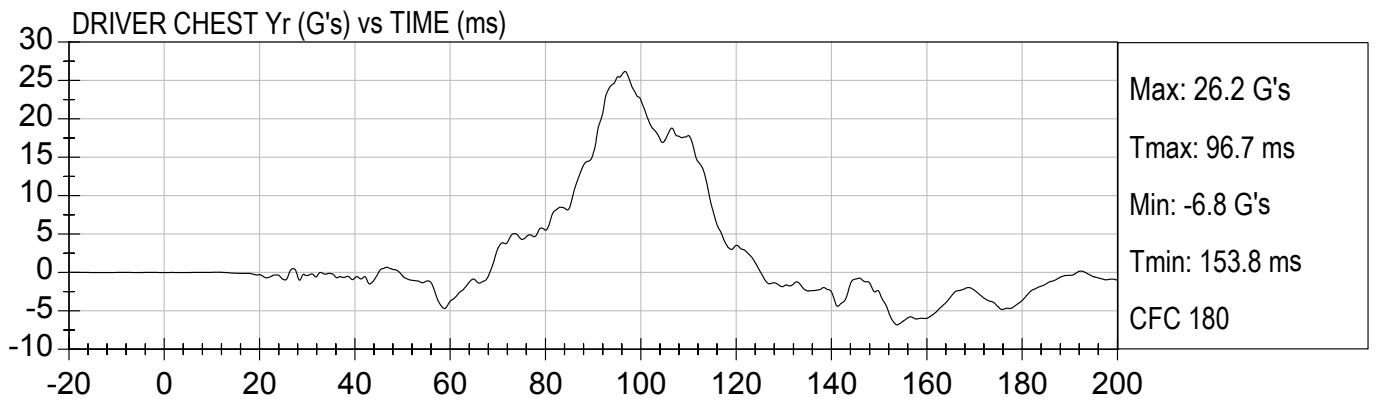
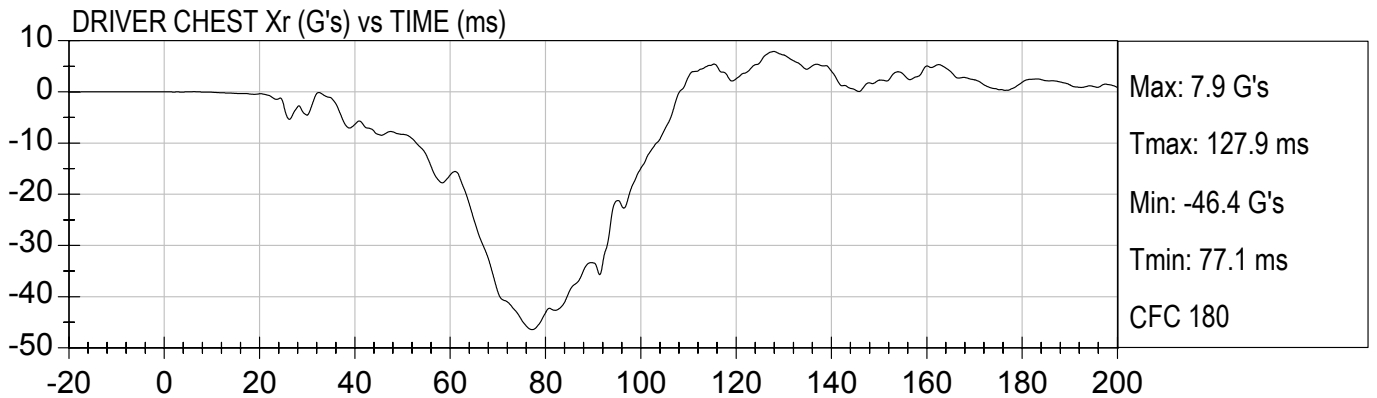
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100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

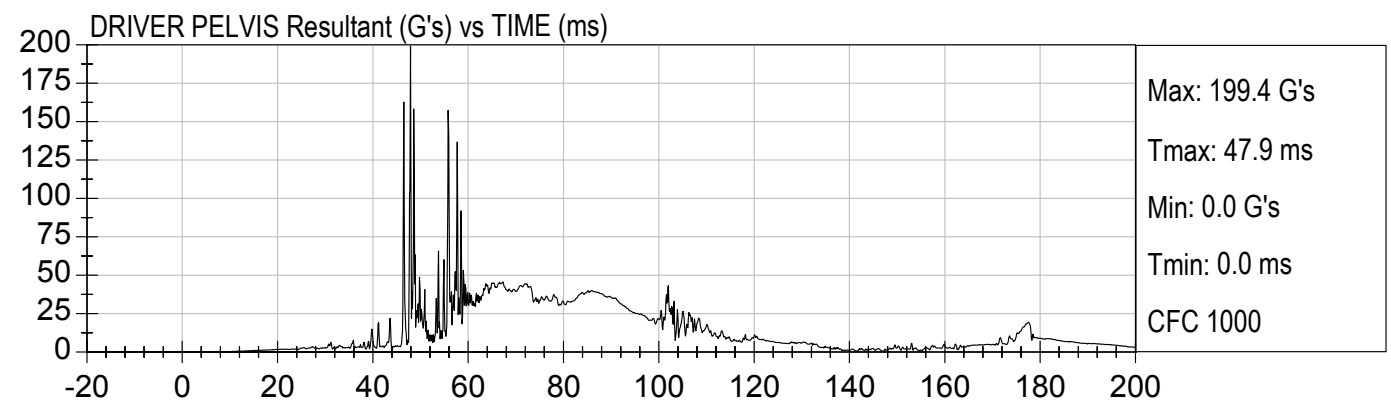
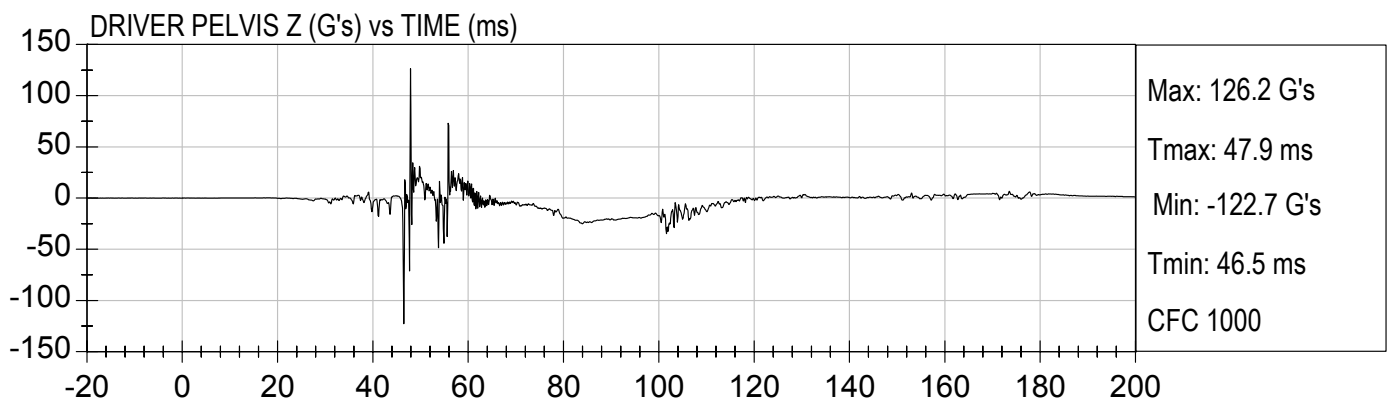
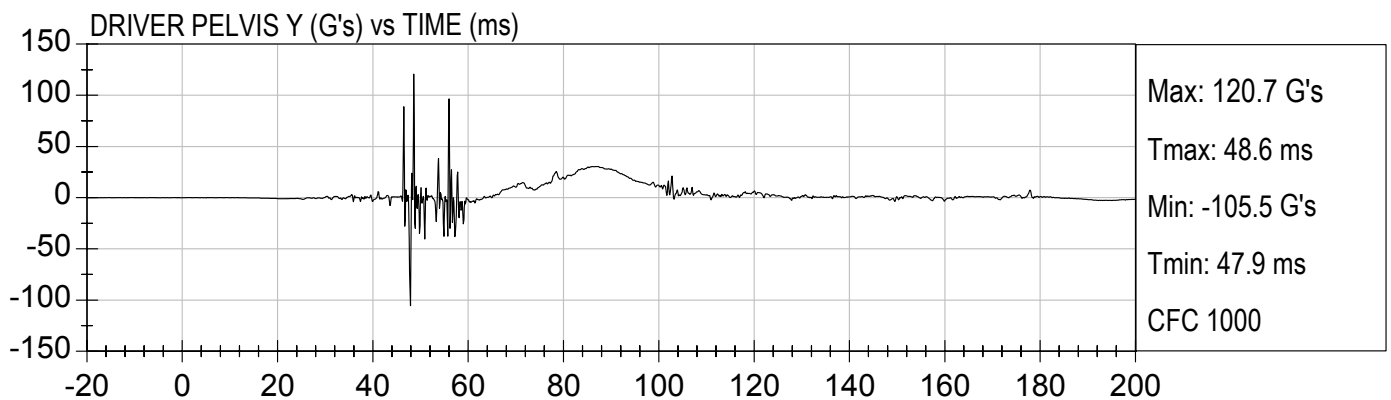
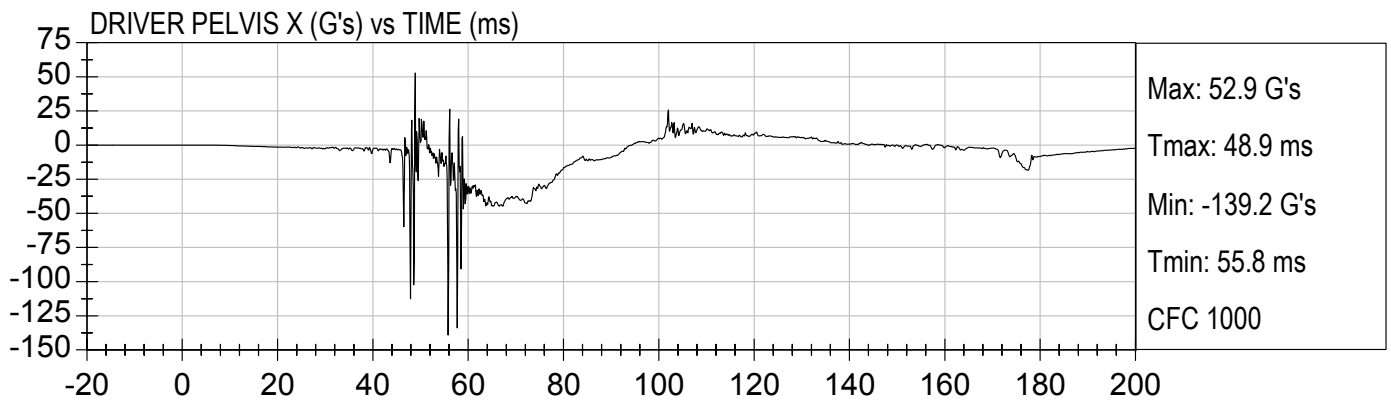
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Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

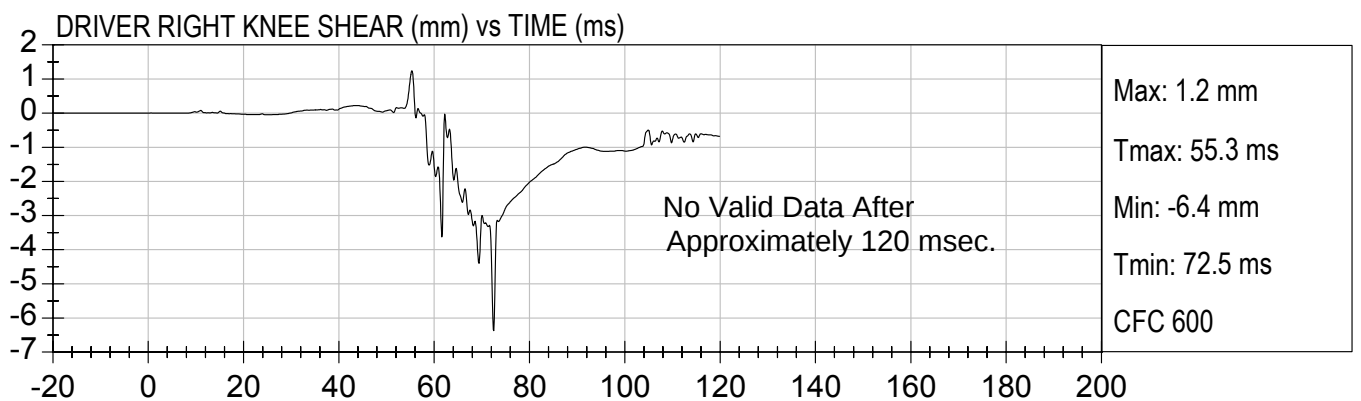
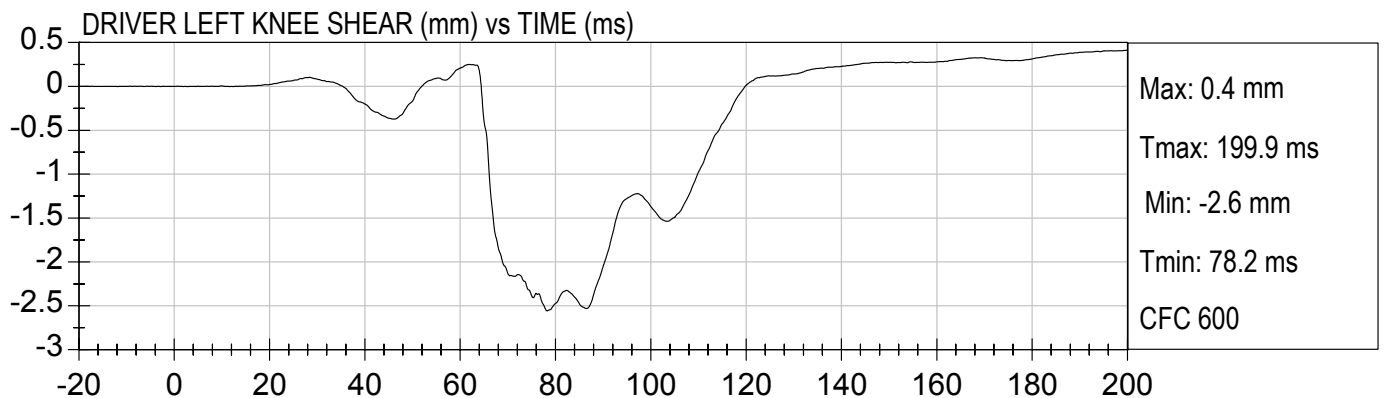
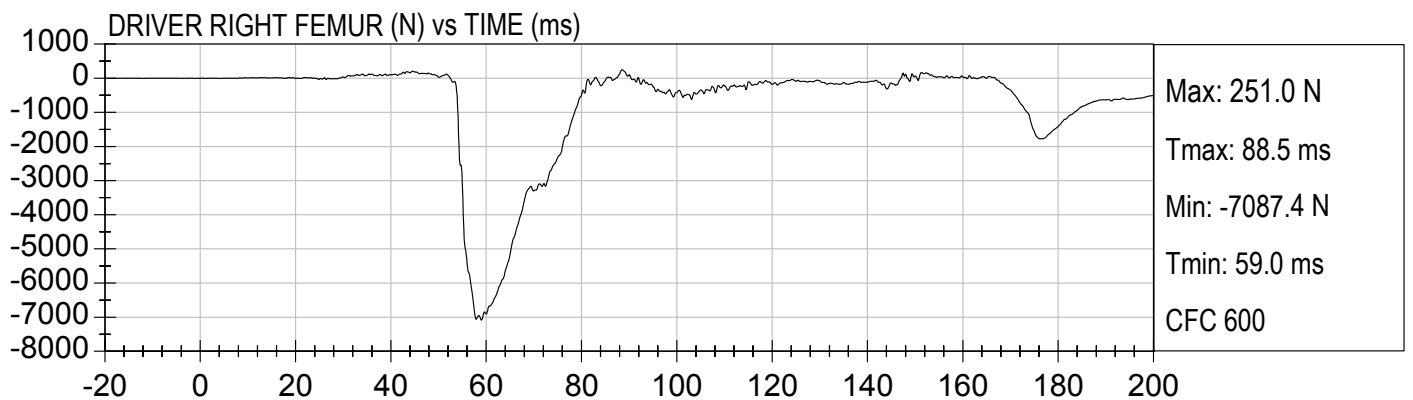
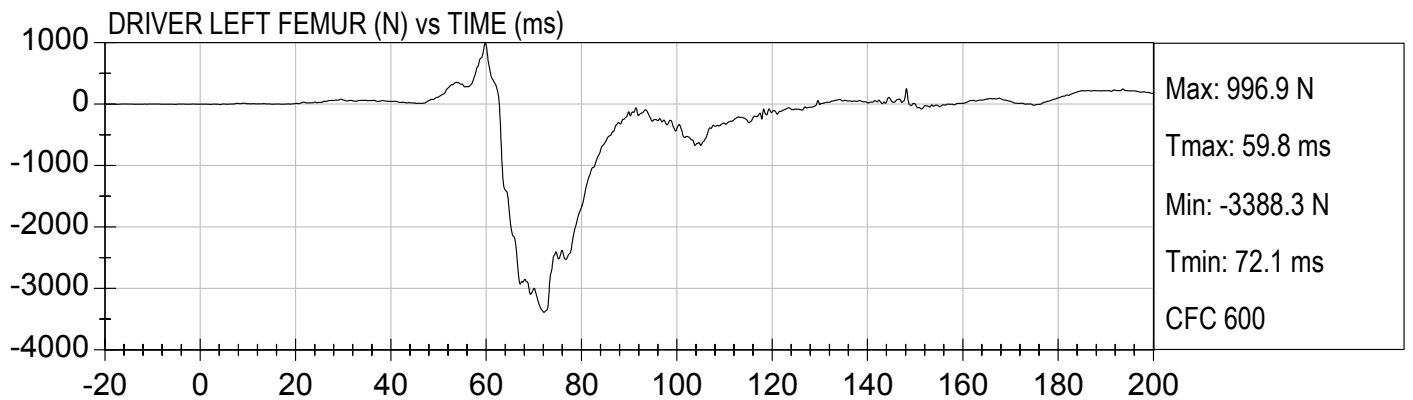
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

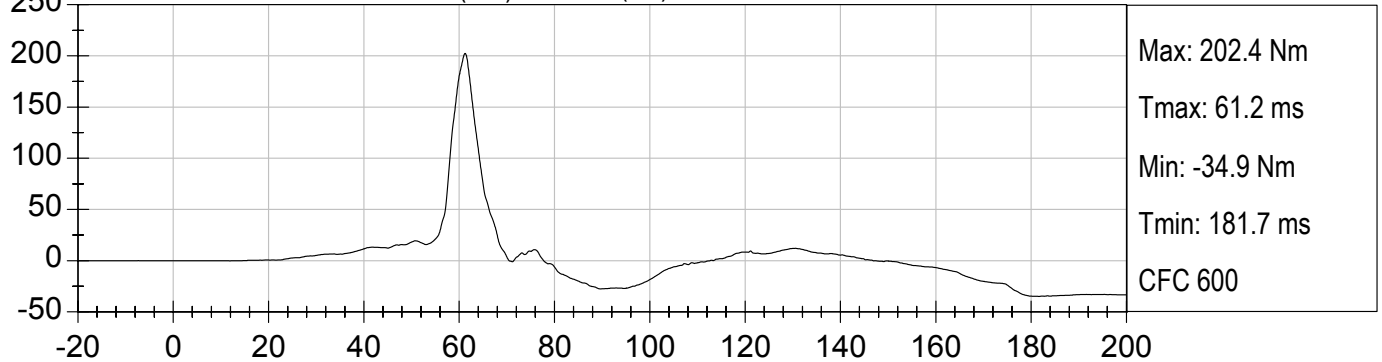




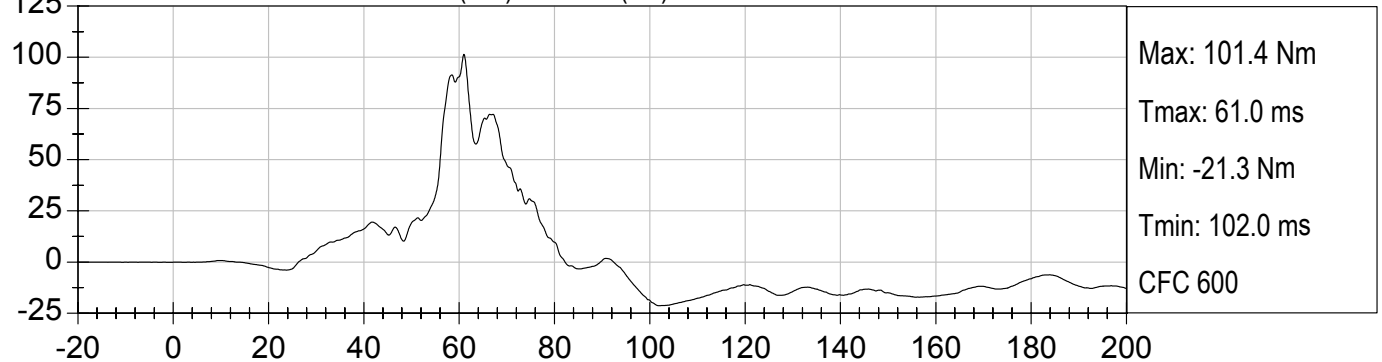
100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

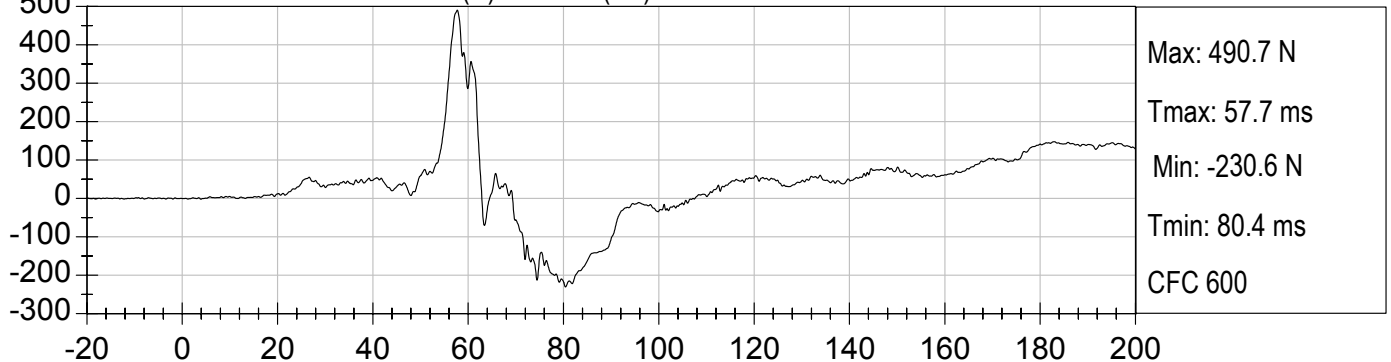
DRIVER LEFT UPPER TIBIA MX (Nm) vs TIME (ms)



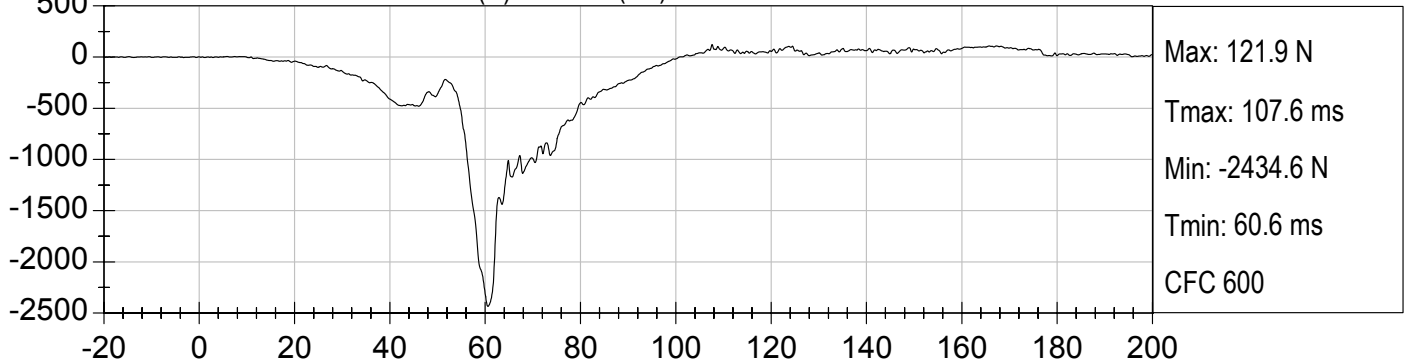
DRIVER LEFT UPPER TIBIA MY (Nm) vs TIME (ms)



DRIVER LEFT UPPER TIBIA FX (N) vs TIME (ms)



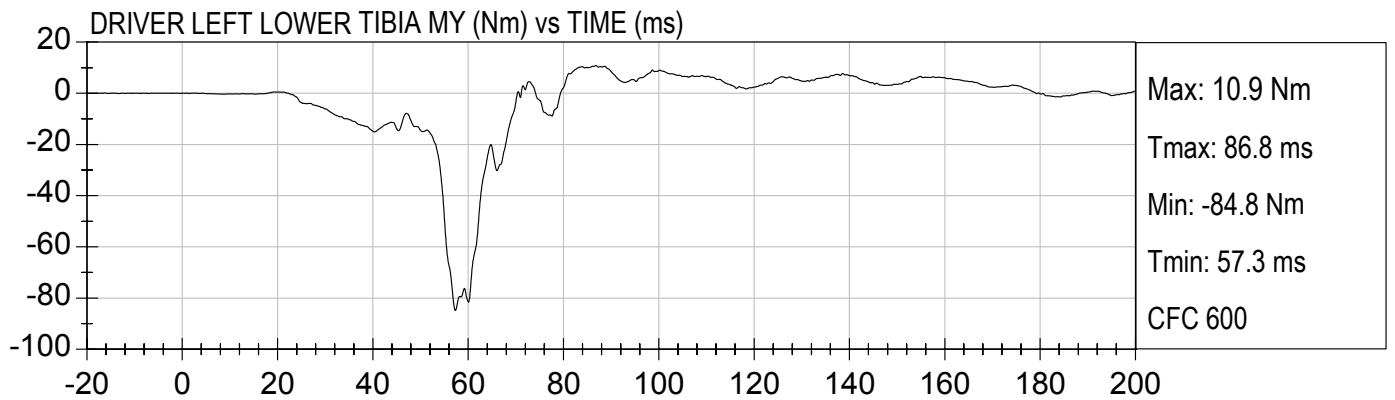
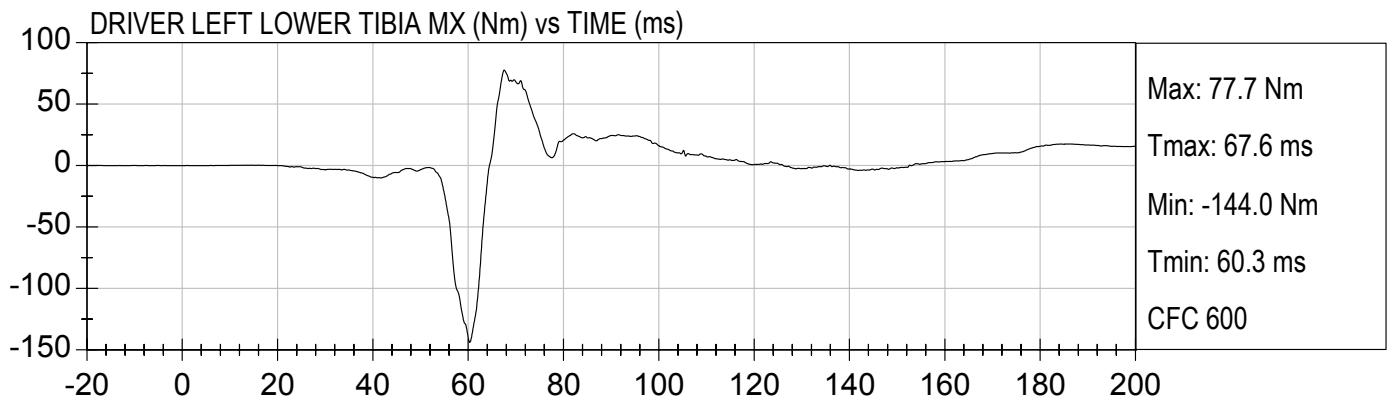
DRIVER LEFT UPPER TIBIA FZ (N) vs TIME (ms)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

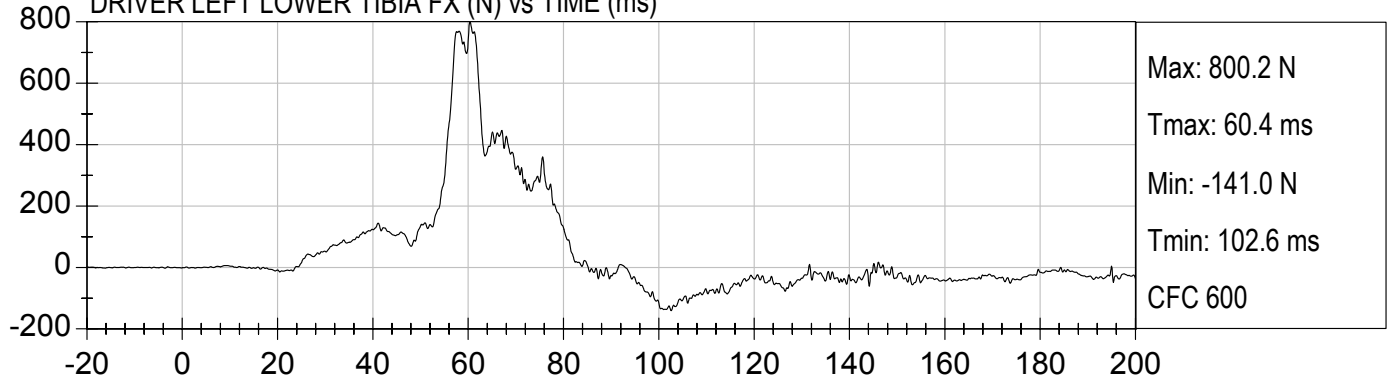




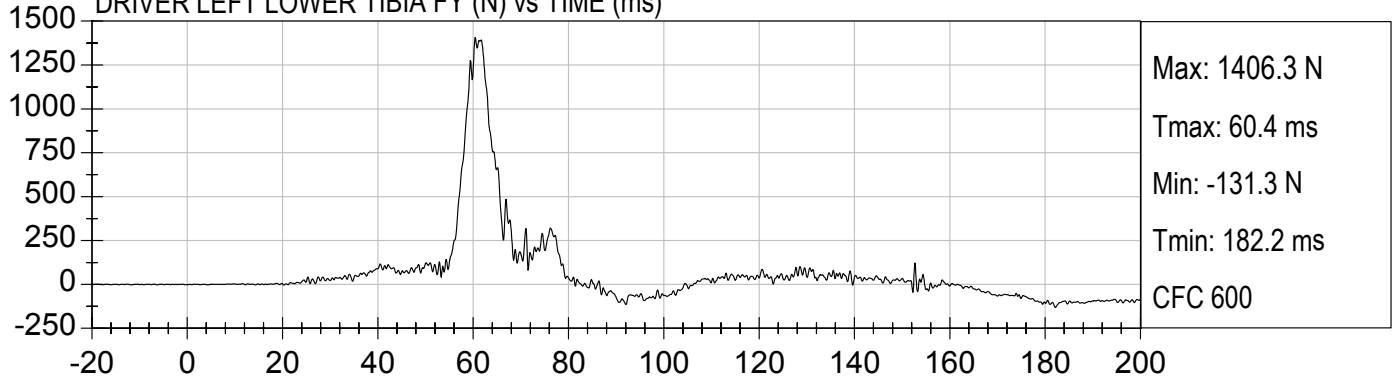
100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

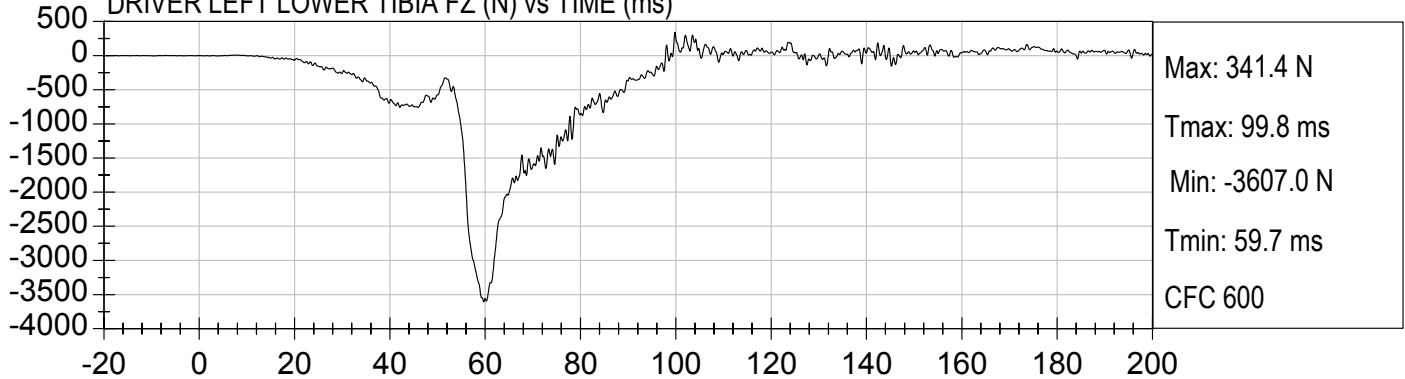
DRIVER LEFT LOWER TIBIA FX (N) vs TIME (ms)



DRIVER LEFT LOWER TIBIA FY (N) vs TIME (ms)



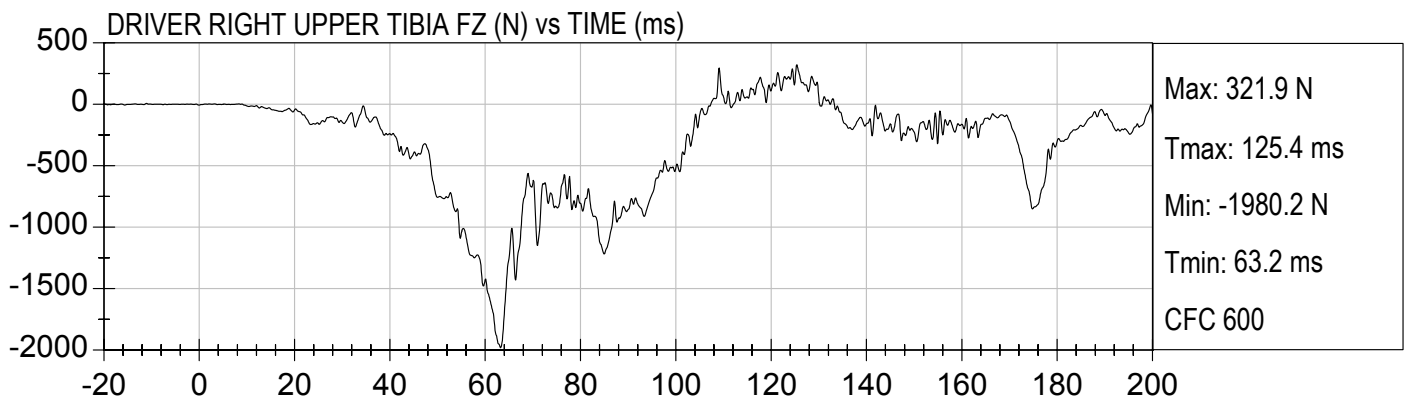
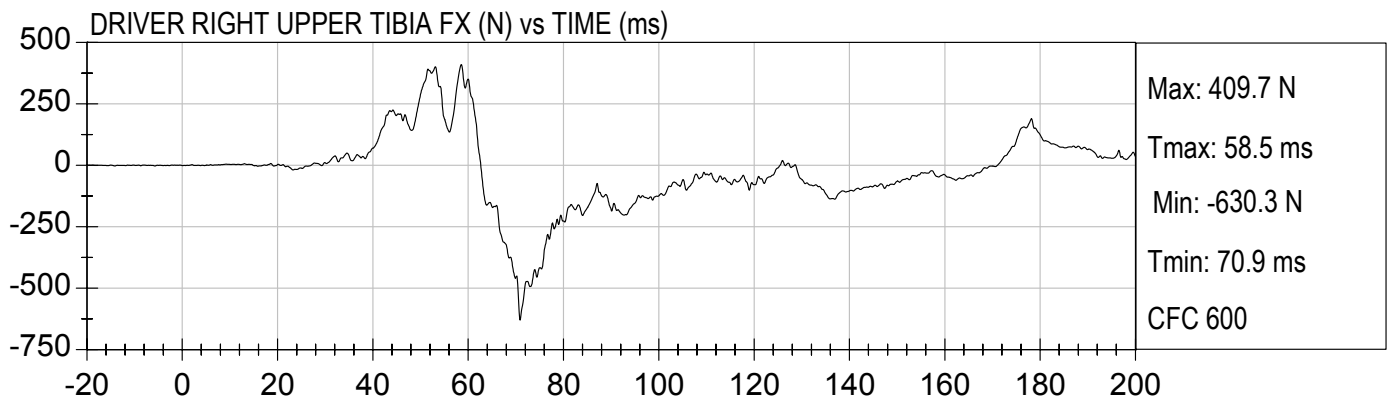
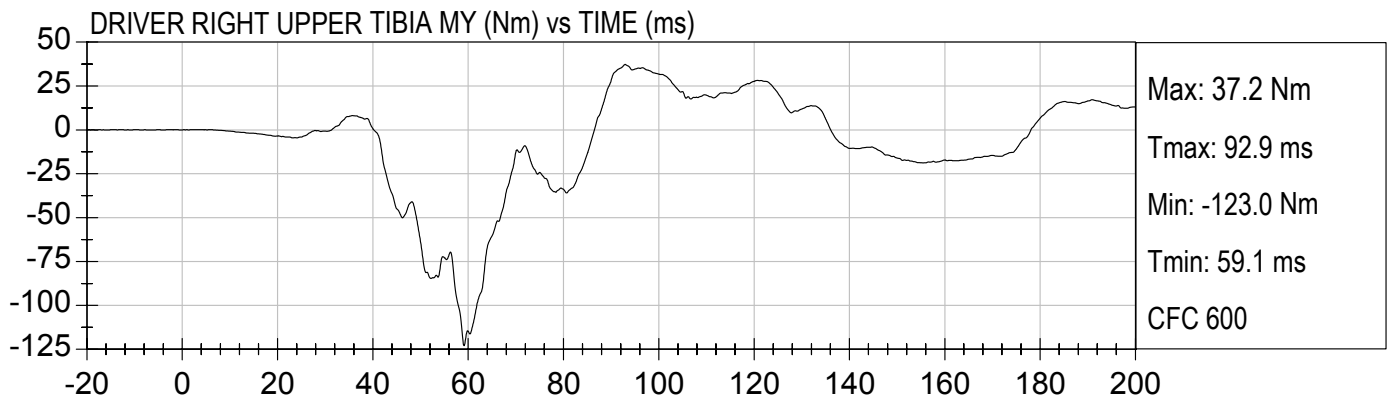
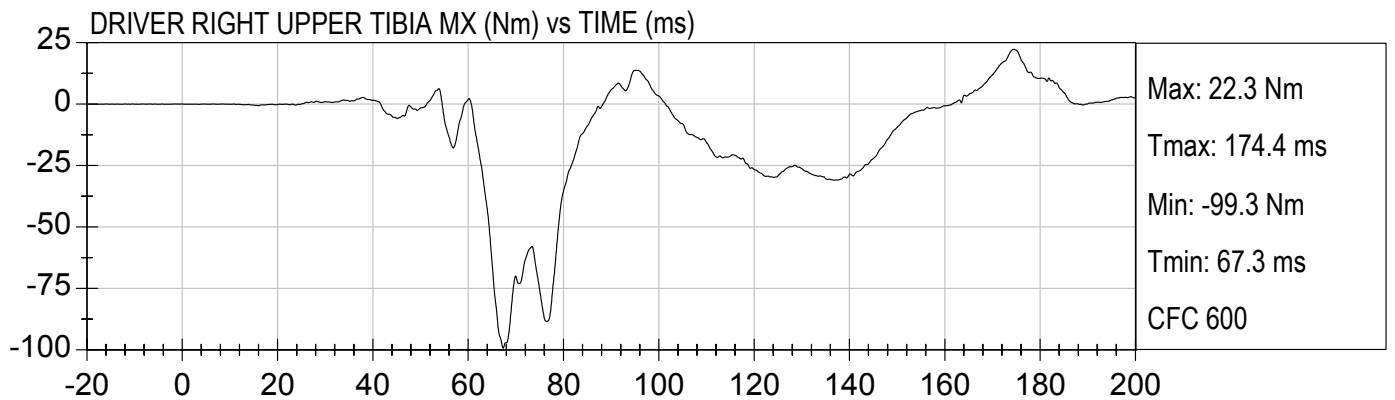
DRIVER LEFT LOWER TIBIA FZ (N) vs TIME (ms)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

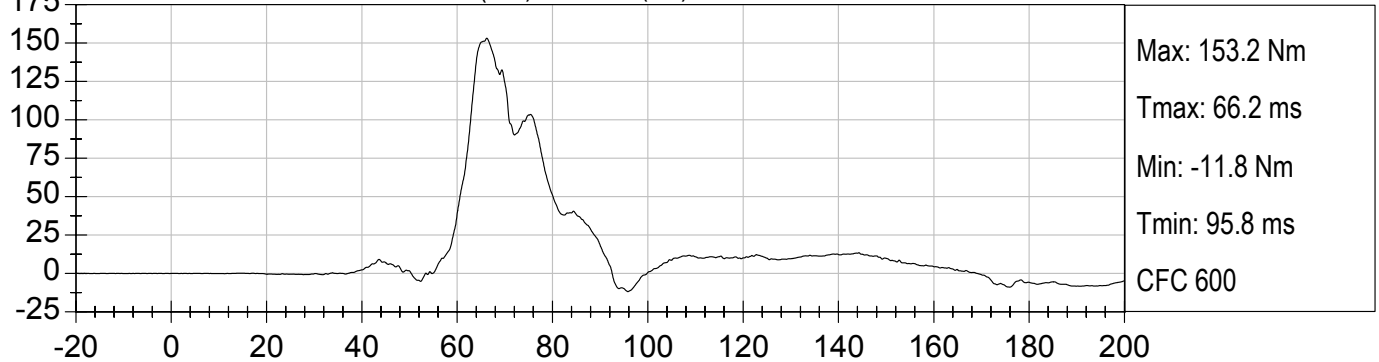




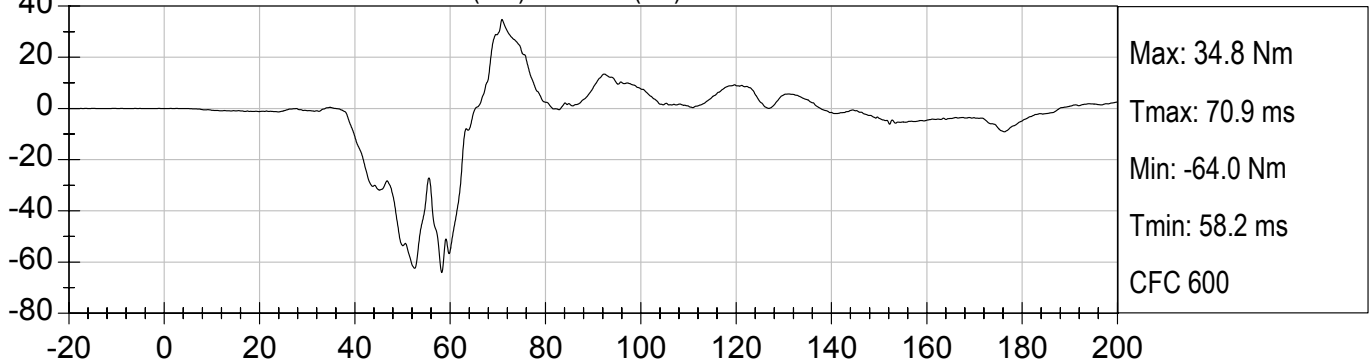
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1997 FORD EXPLORER RV1325

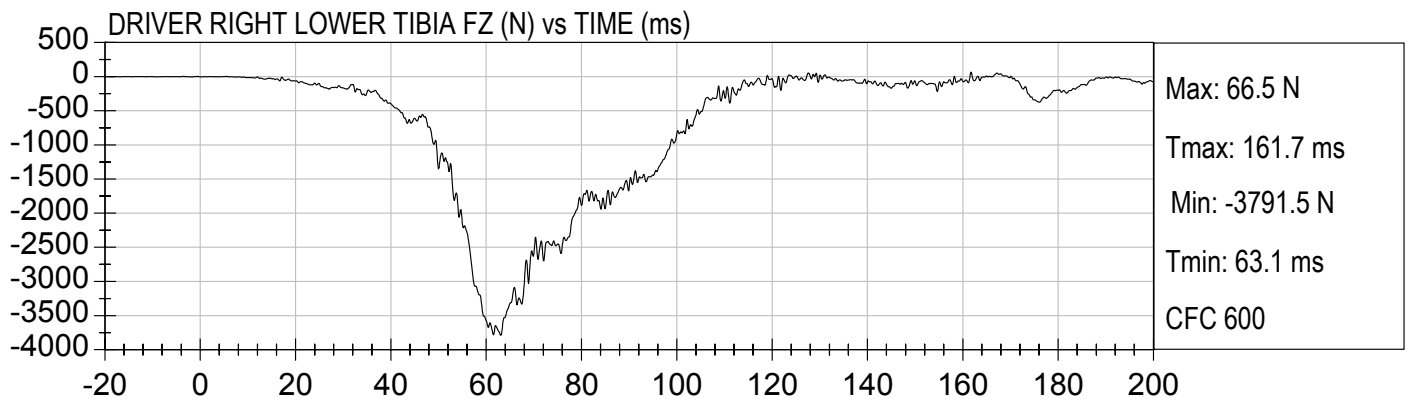
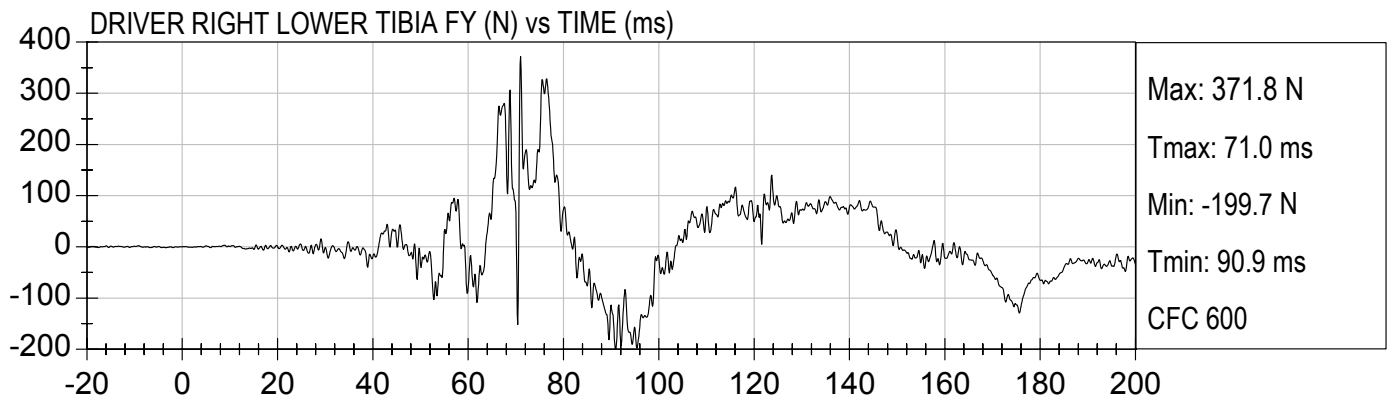
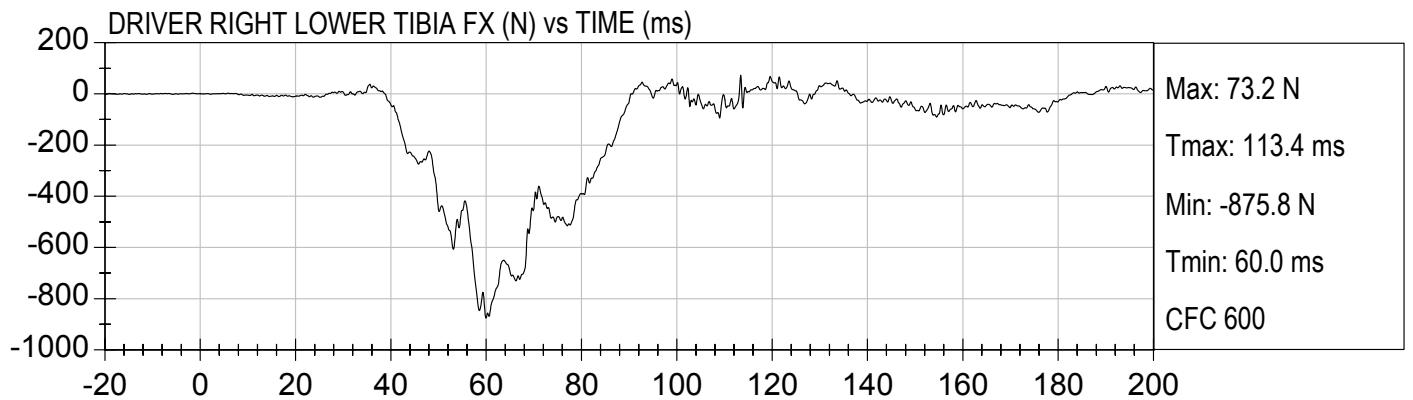
Test Date: 2/11/2004
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DRIVER RIGHT LOWER TIBIA MX (Nm) vs TIME (ms)



DRIVER RIGHT LOWER TIBIA MY (Nm) vs TIME (ms)

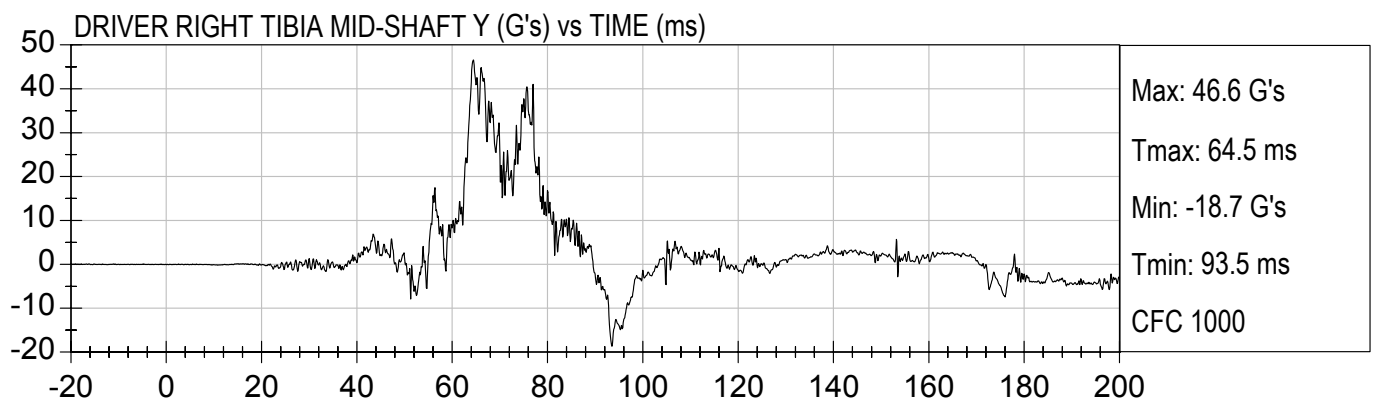
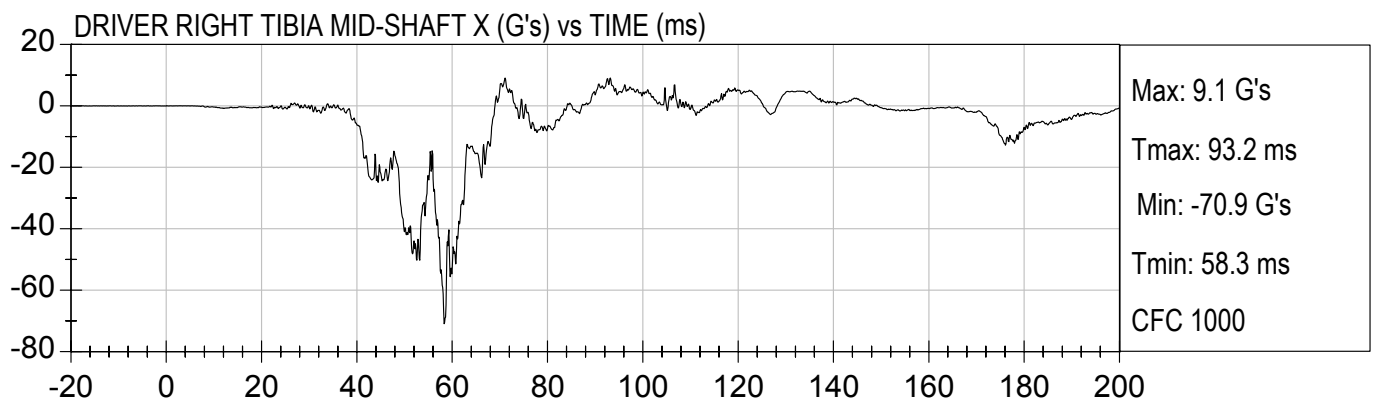
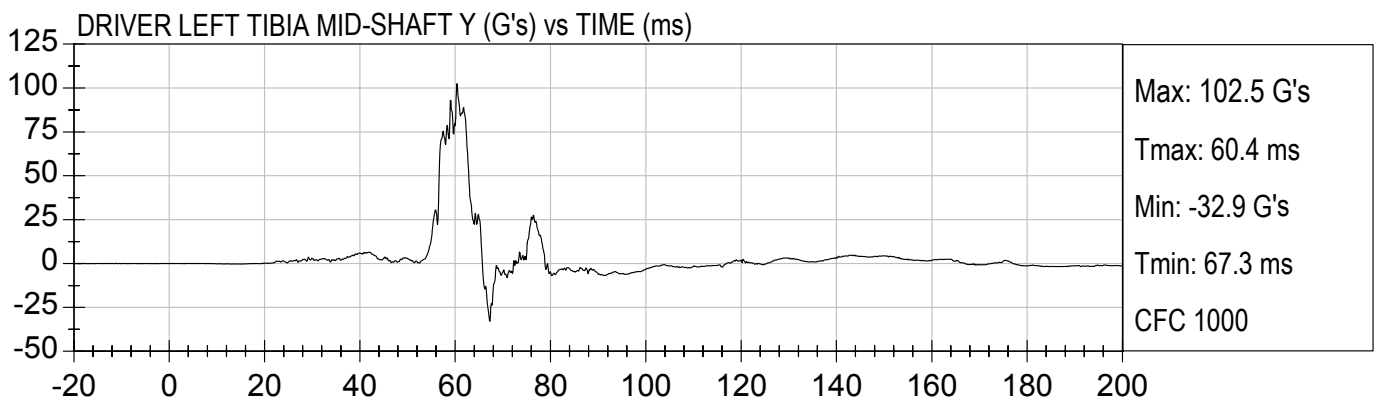
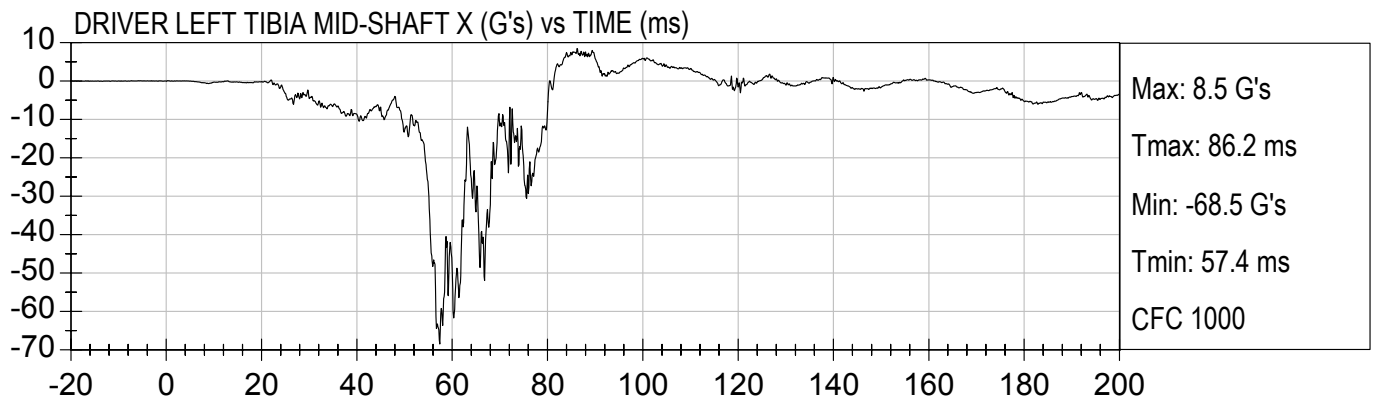






100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

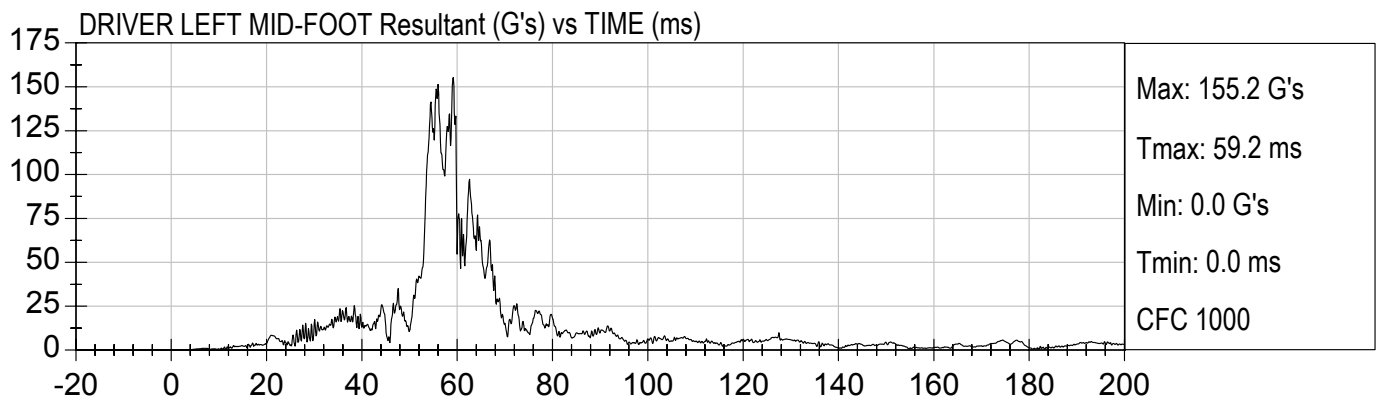
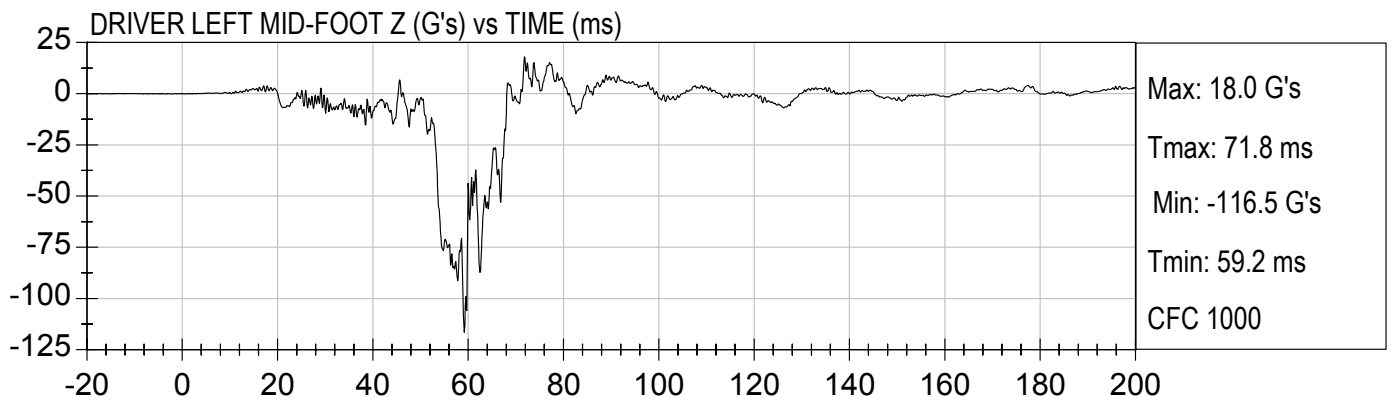
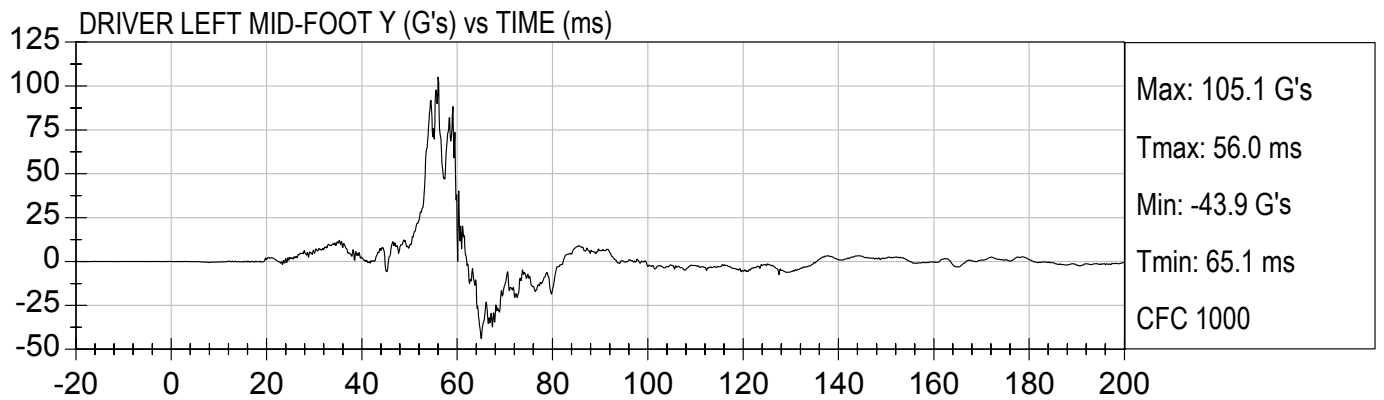
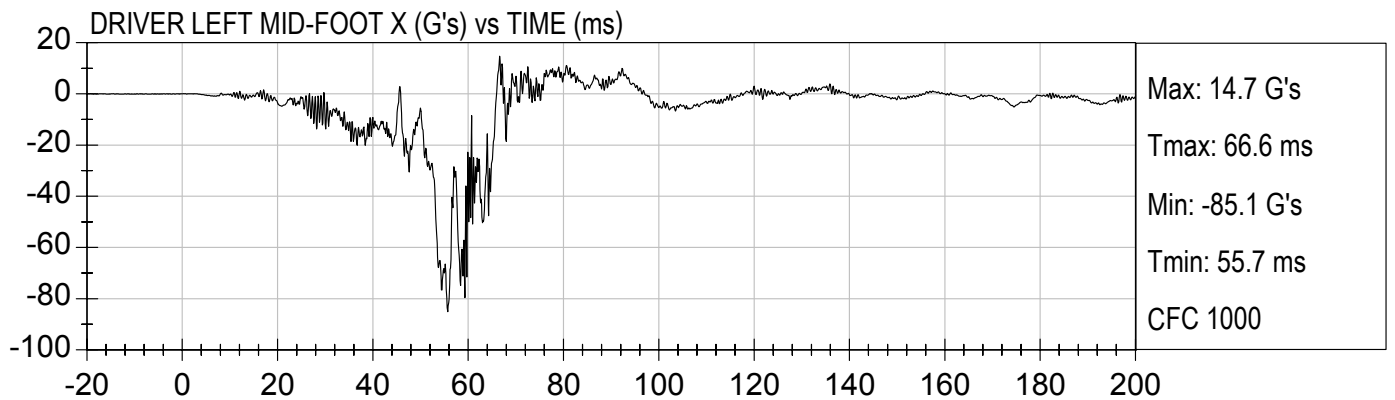
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Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

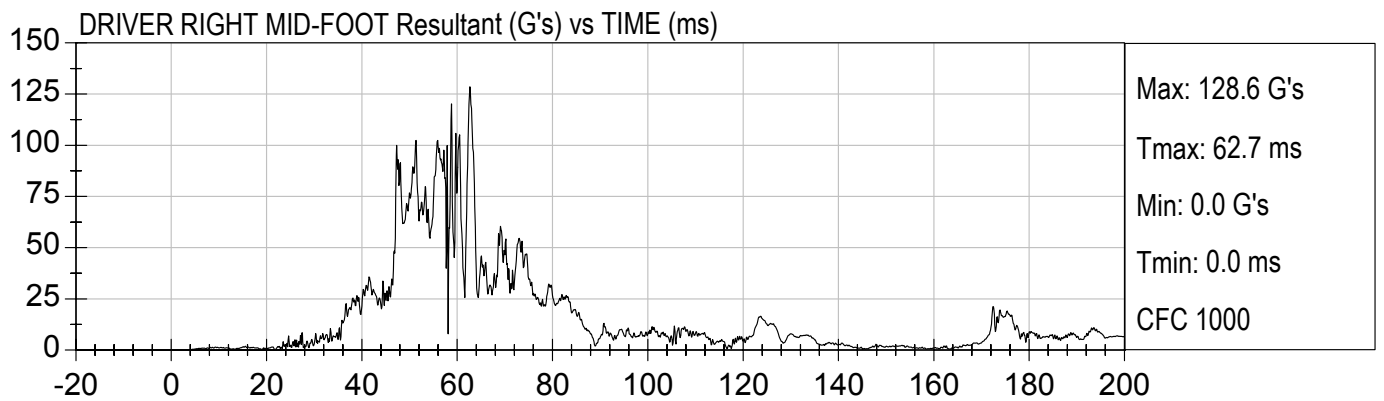
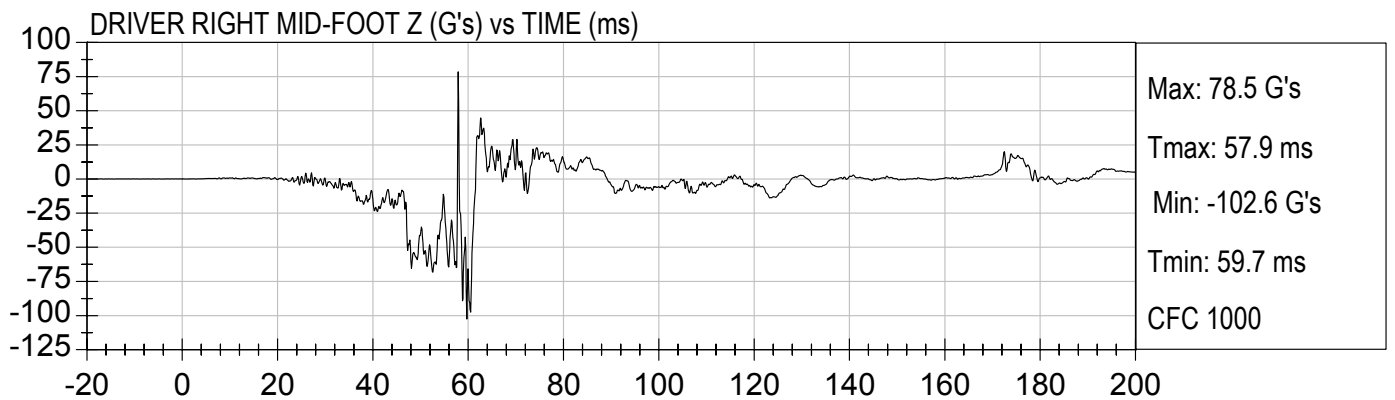
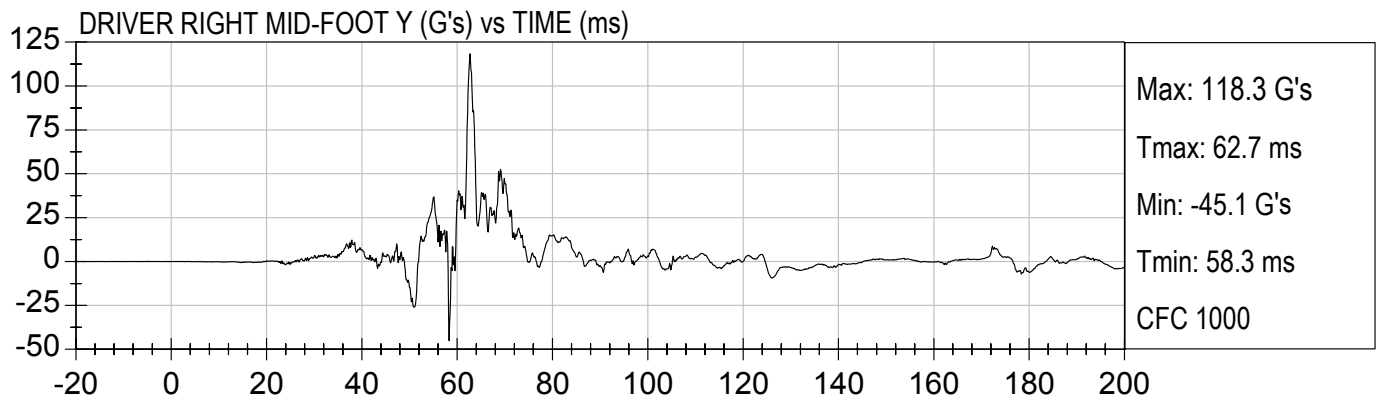
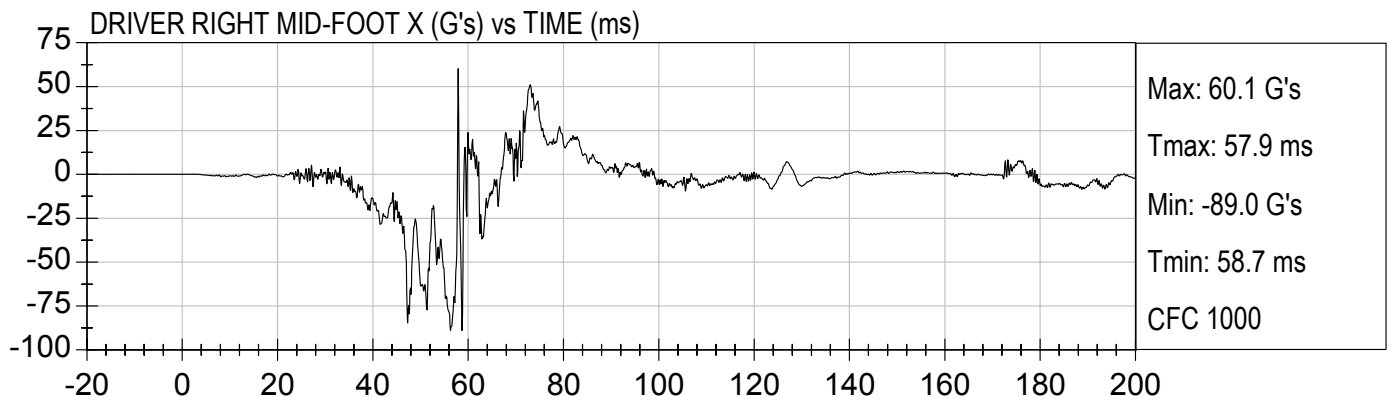
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

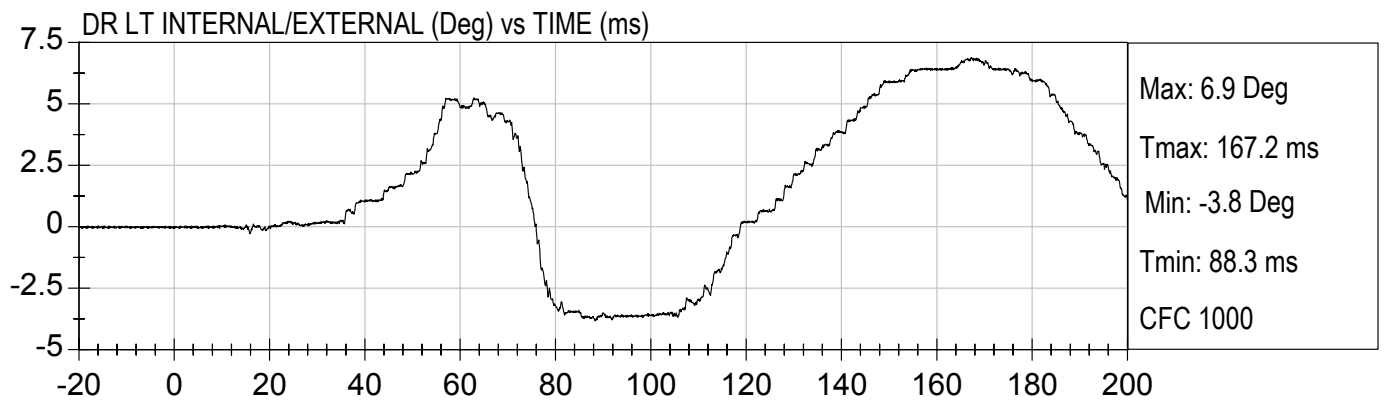
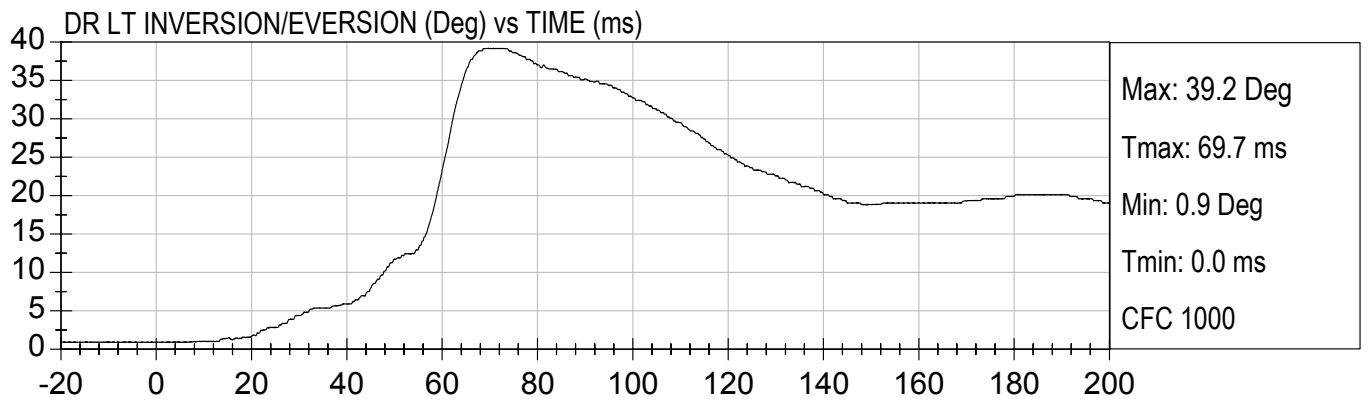
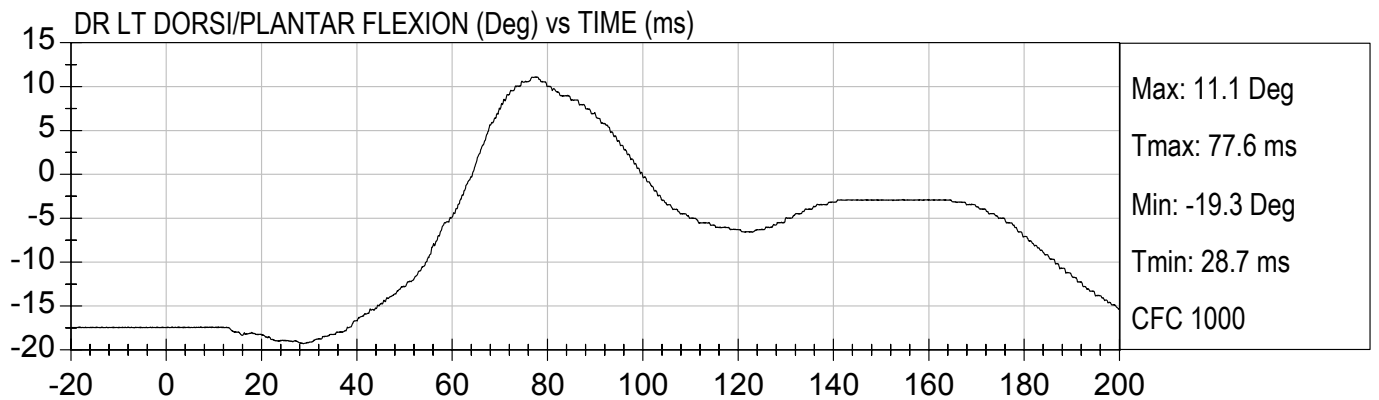
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100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

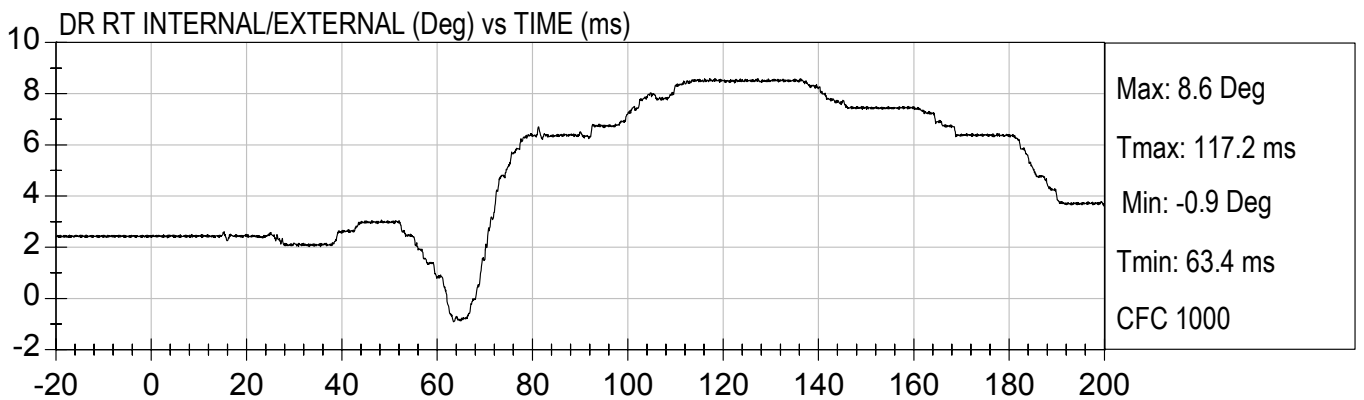
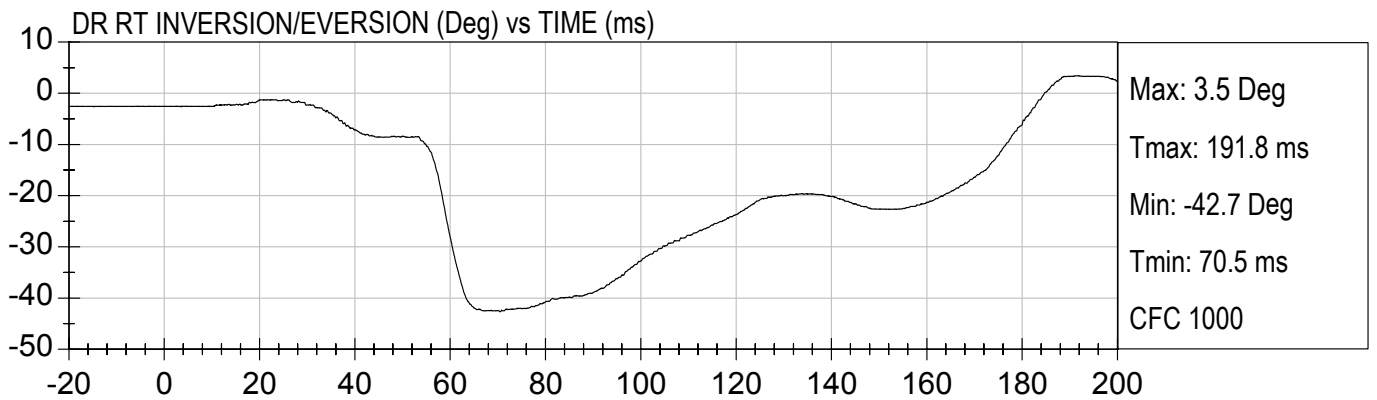
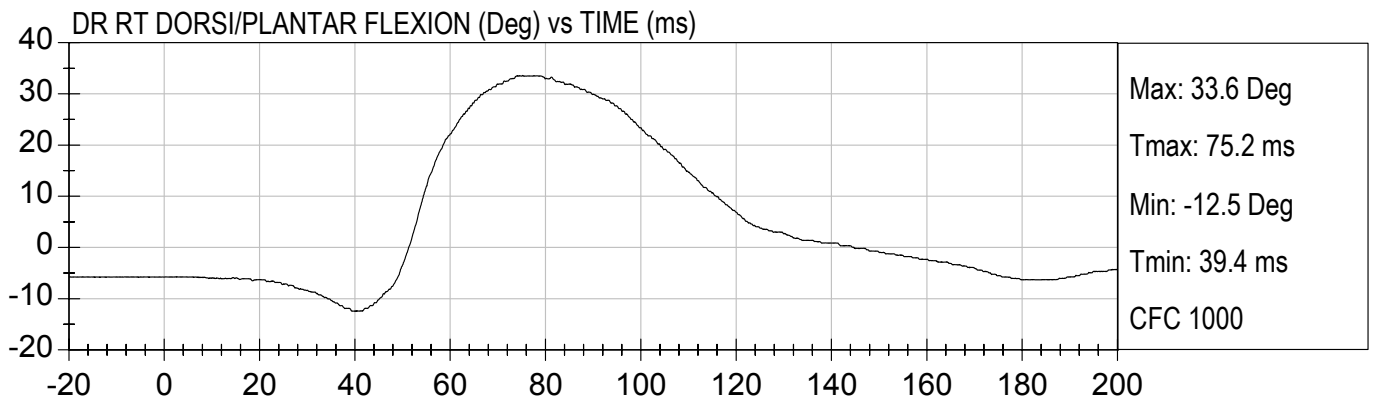
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Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

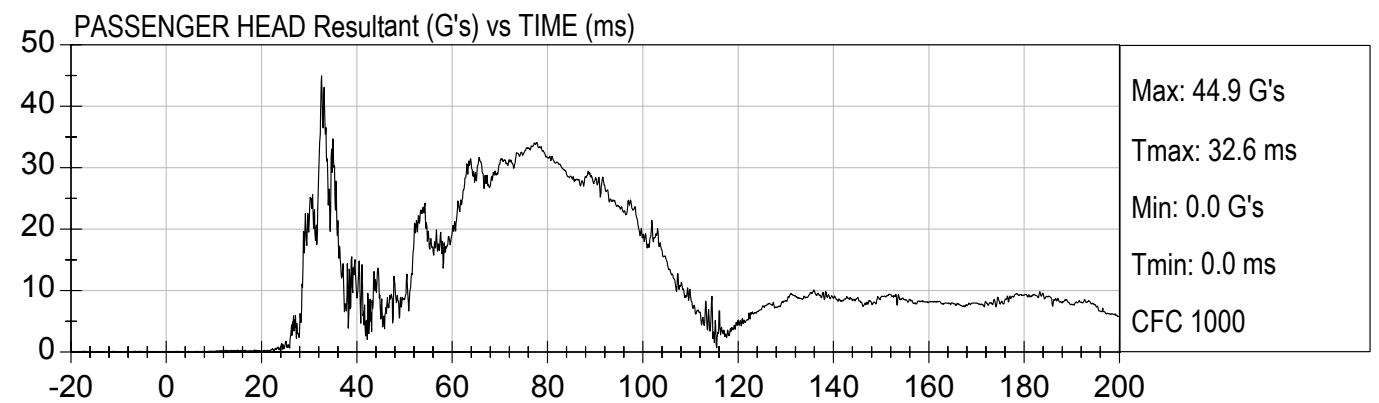
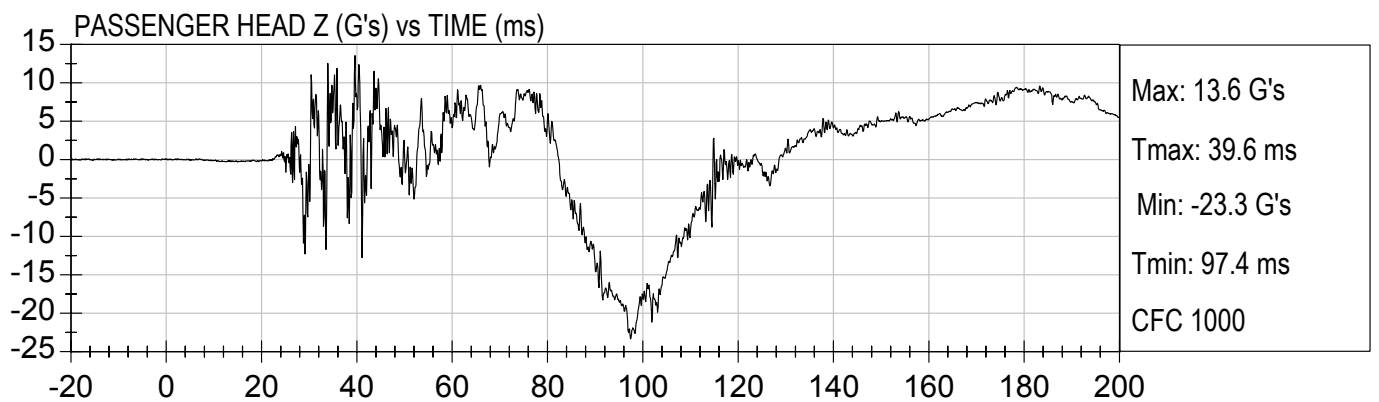
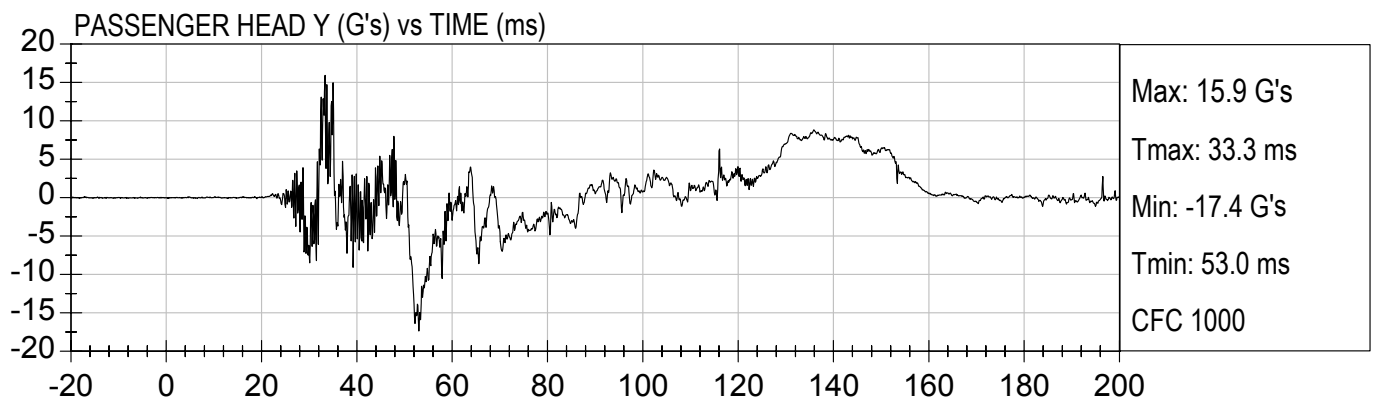
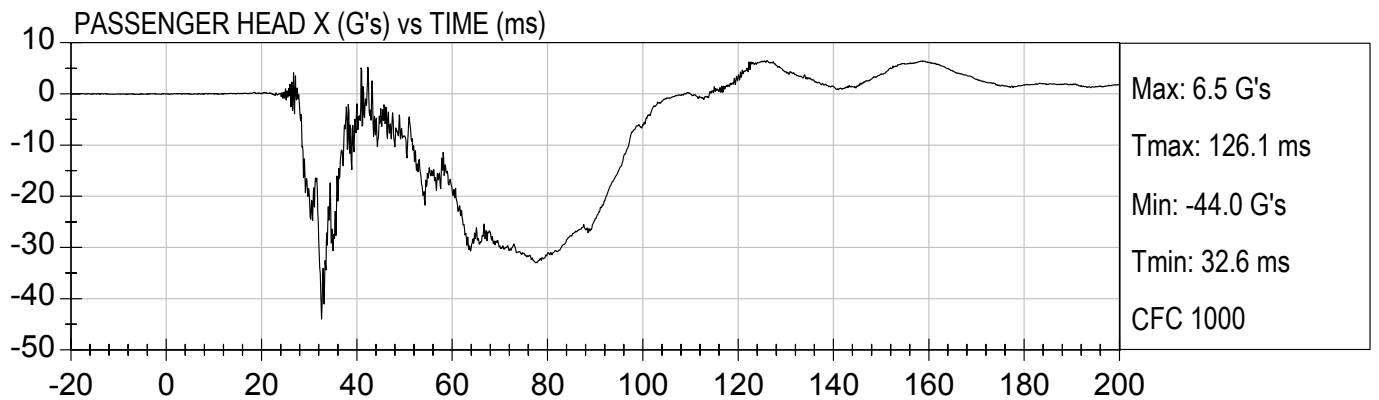
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1997 FORD EXPLORER RV1325

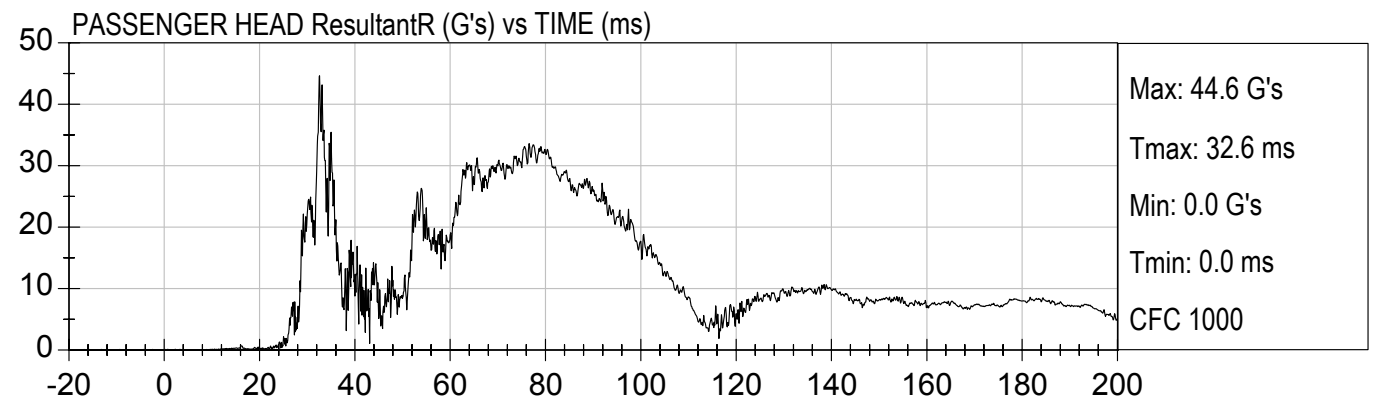
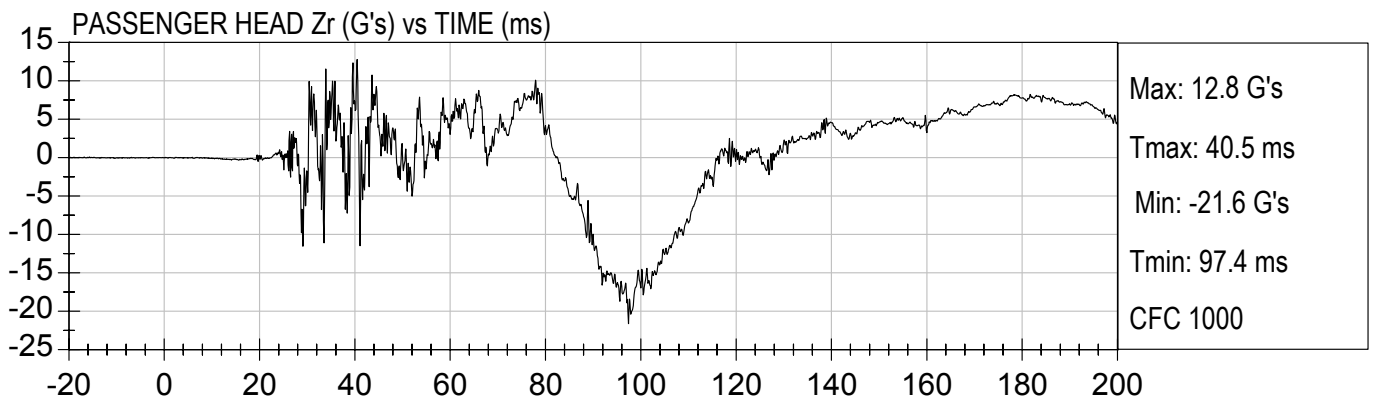
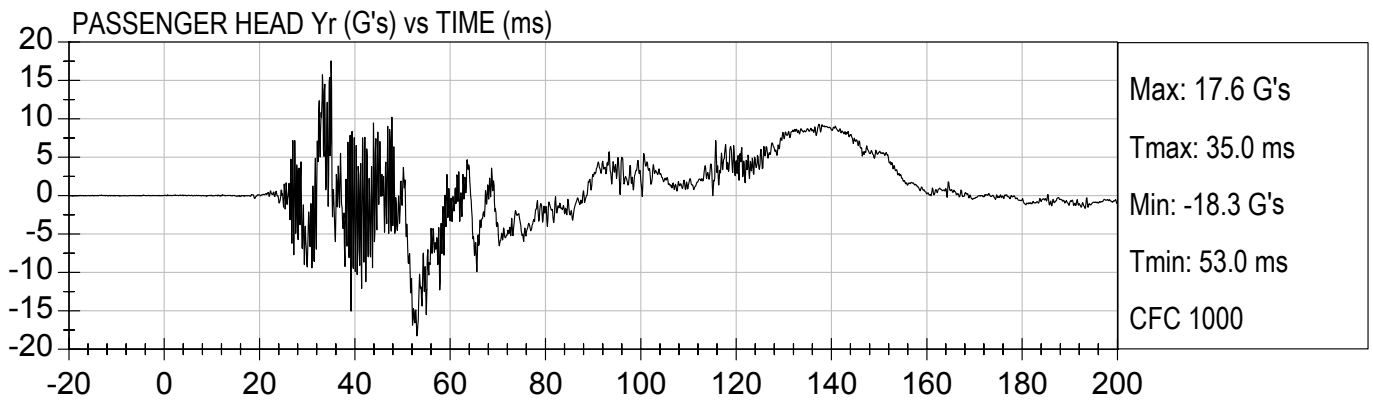
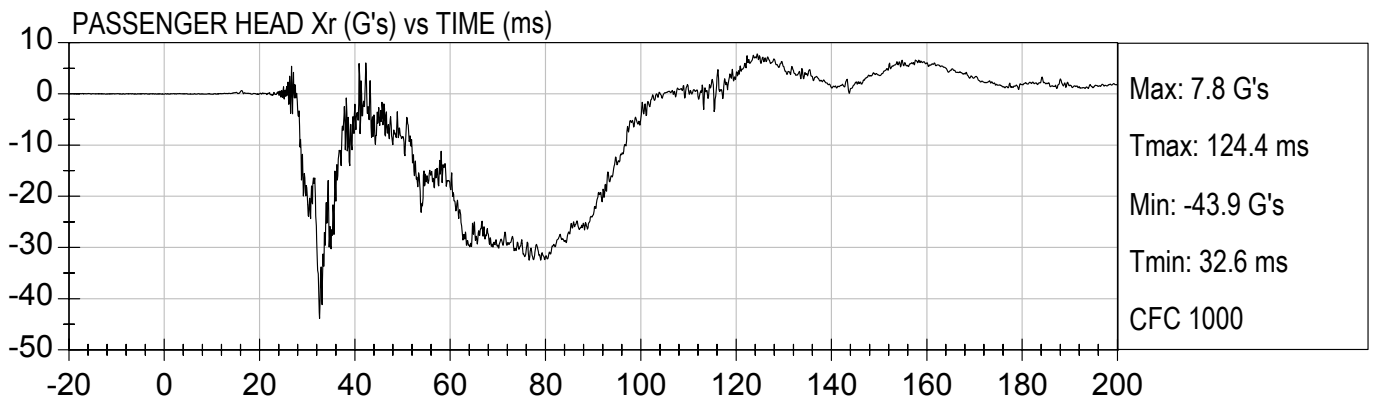
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

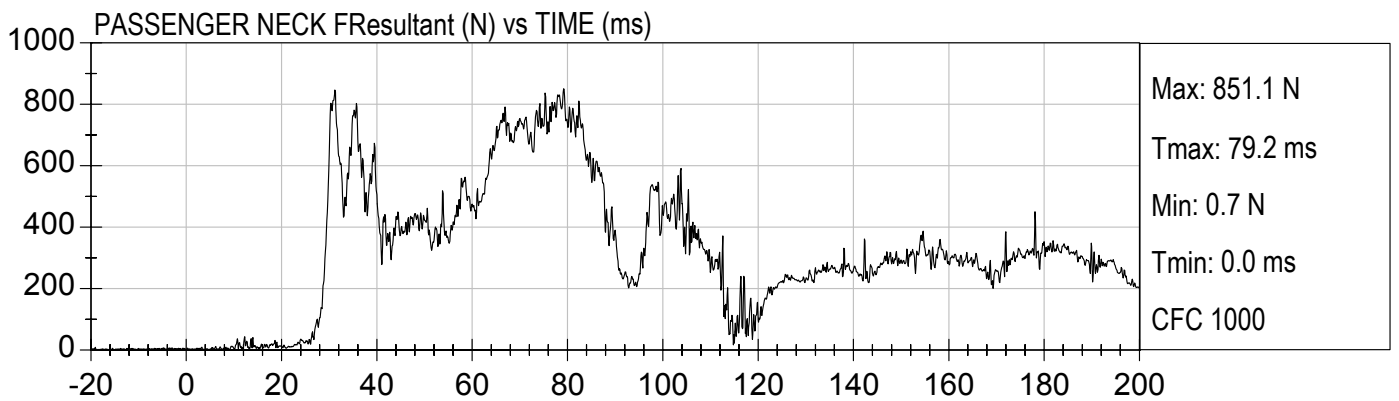
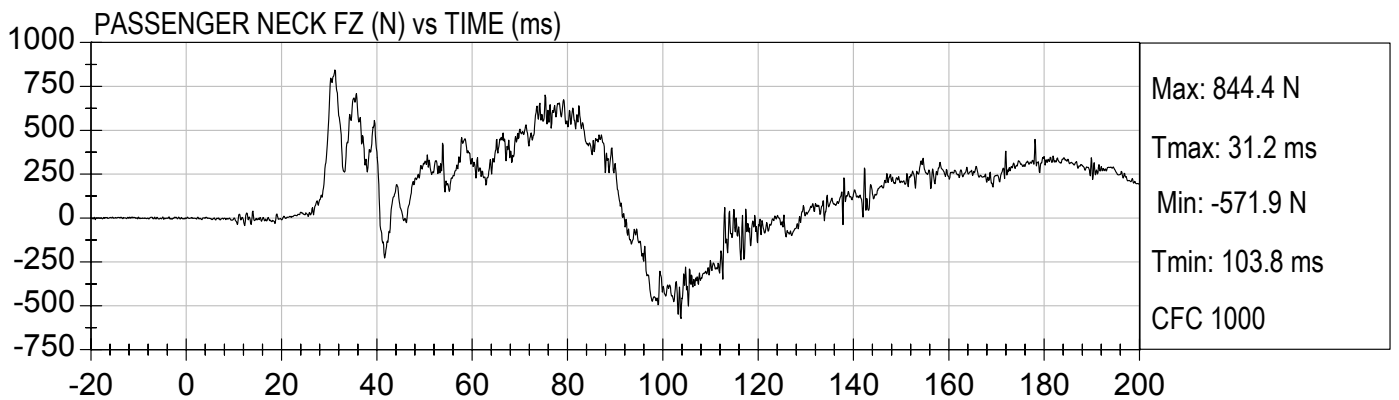
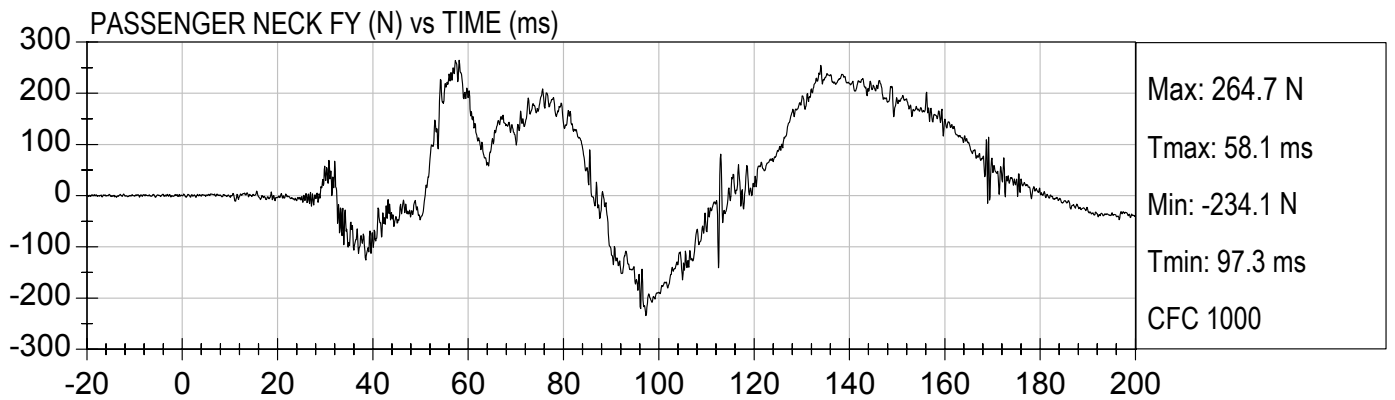
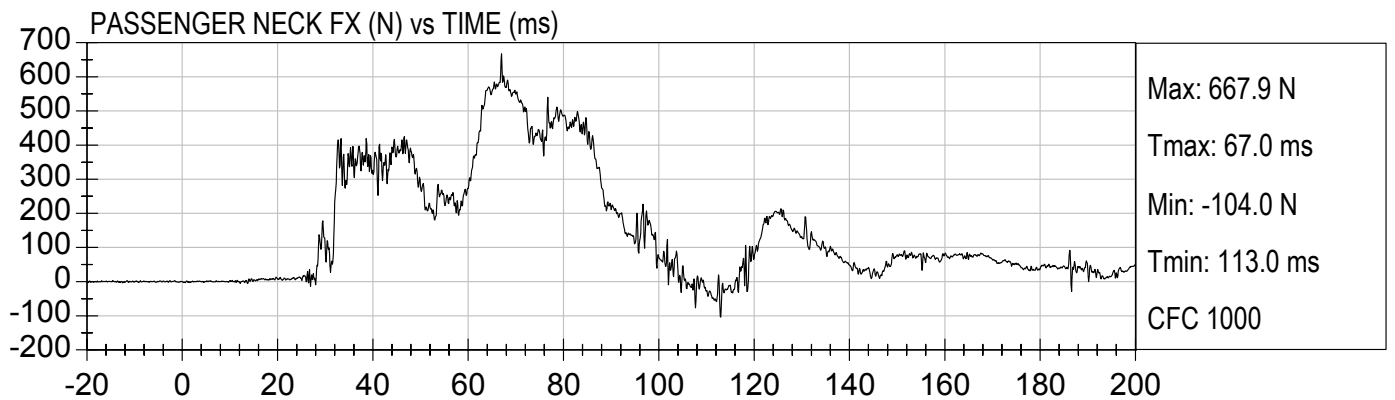
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

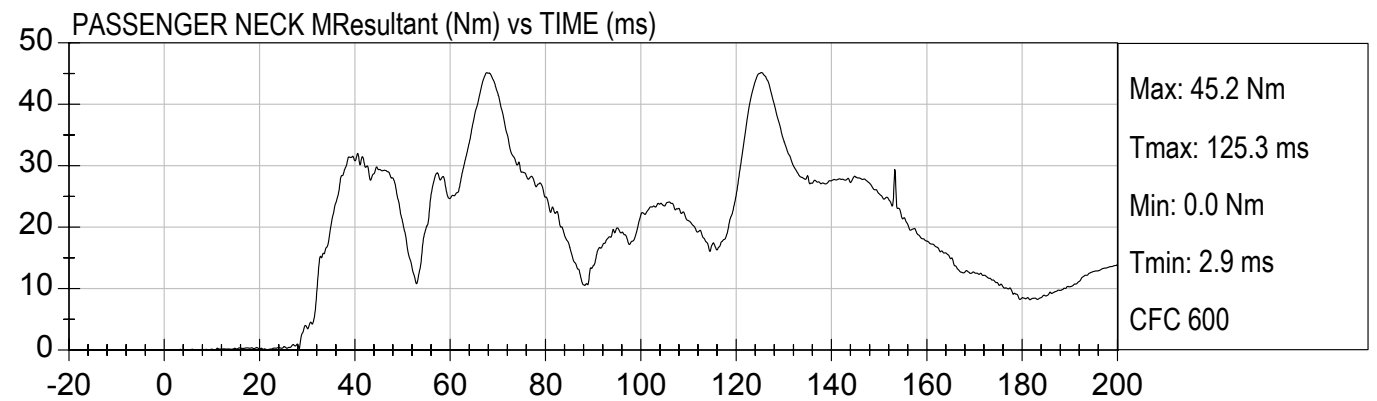
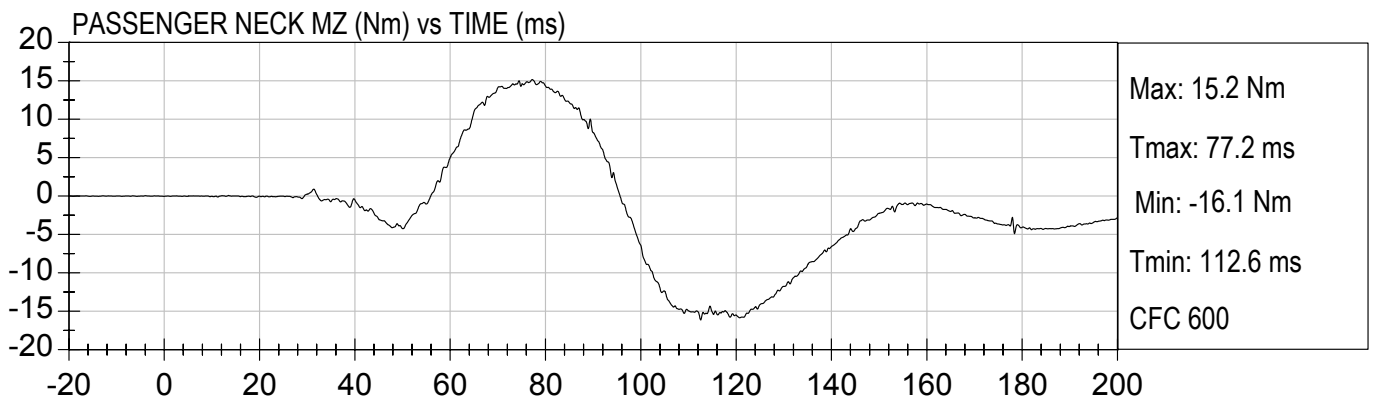
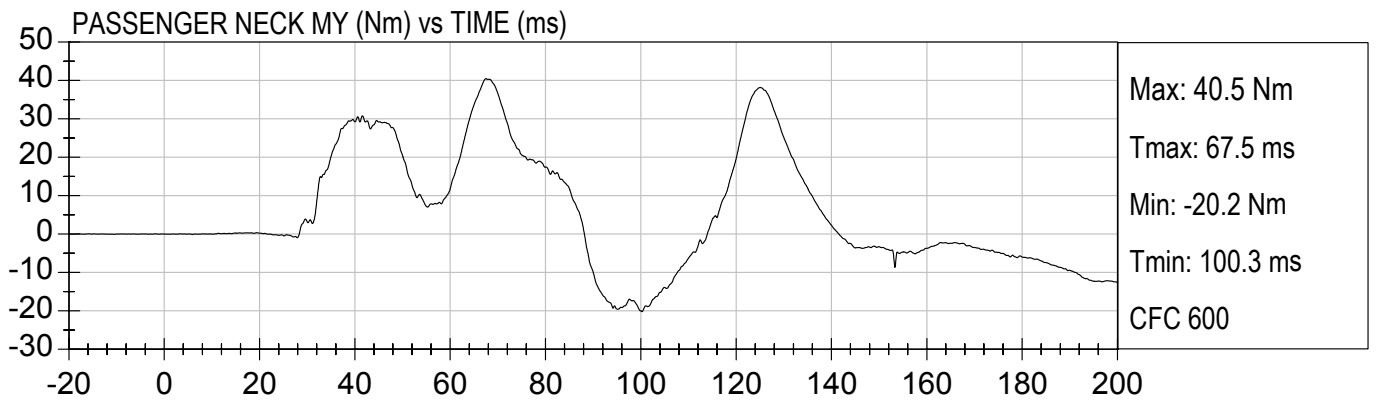
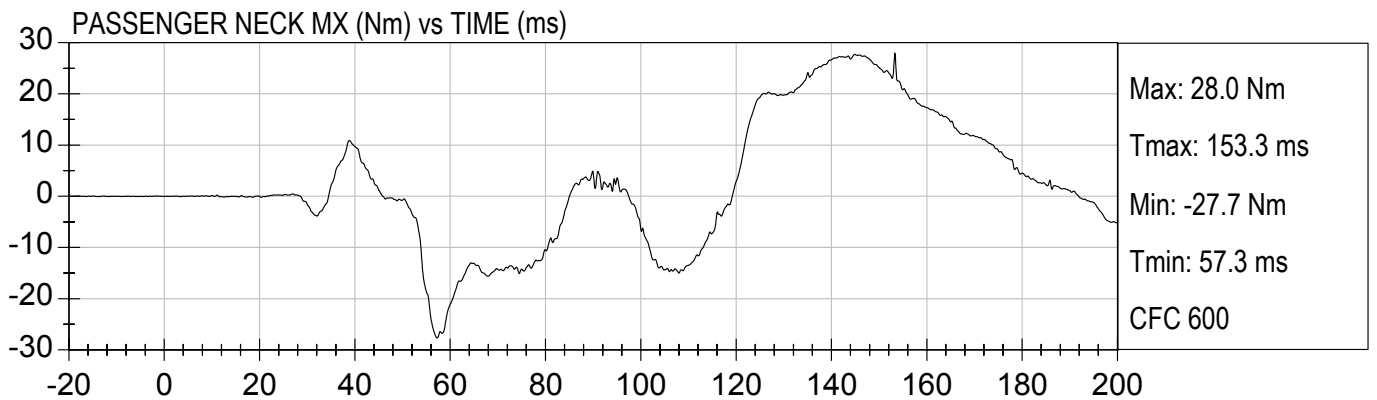
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

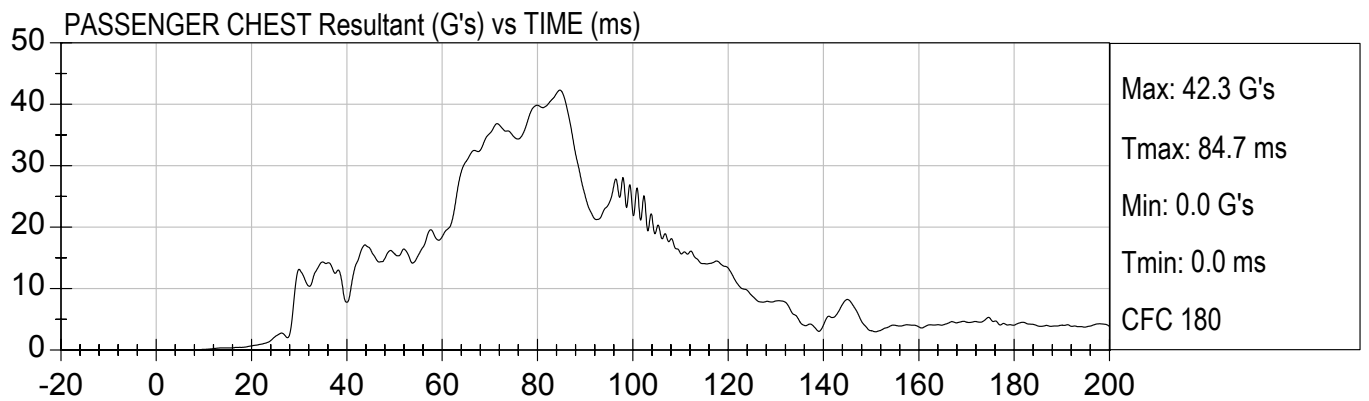
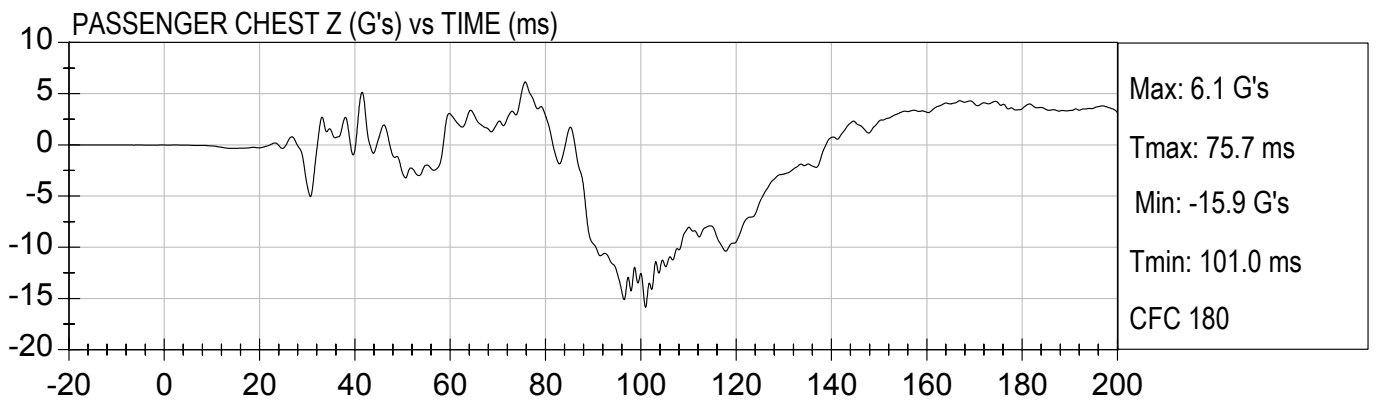
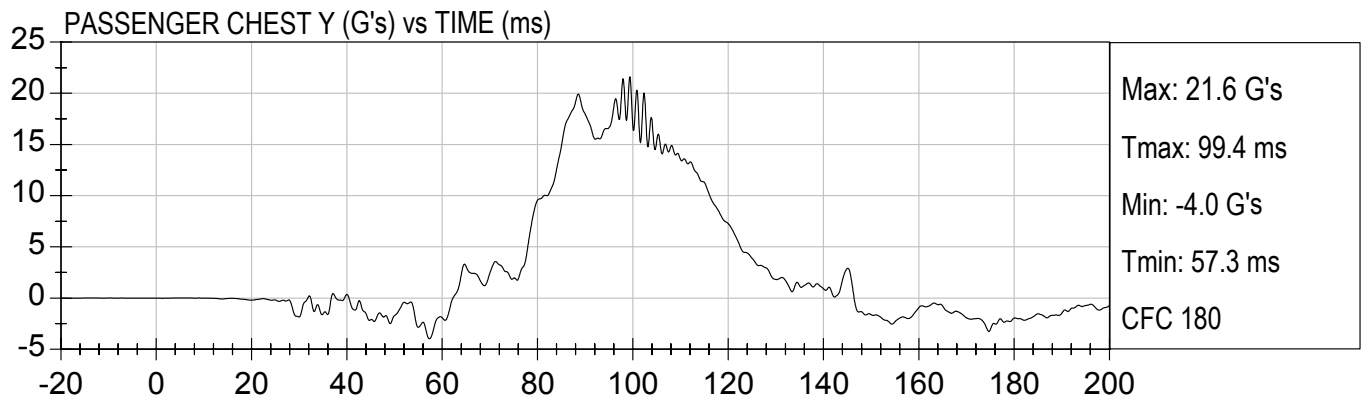
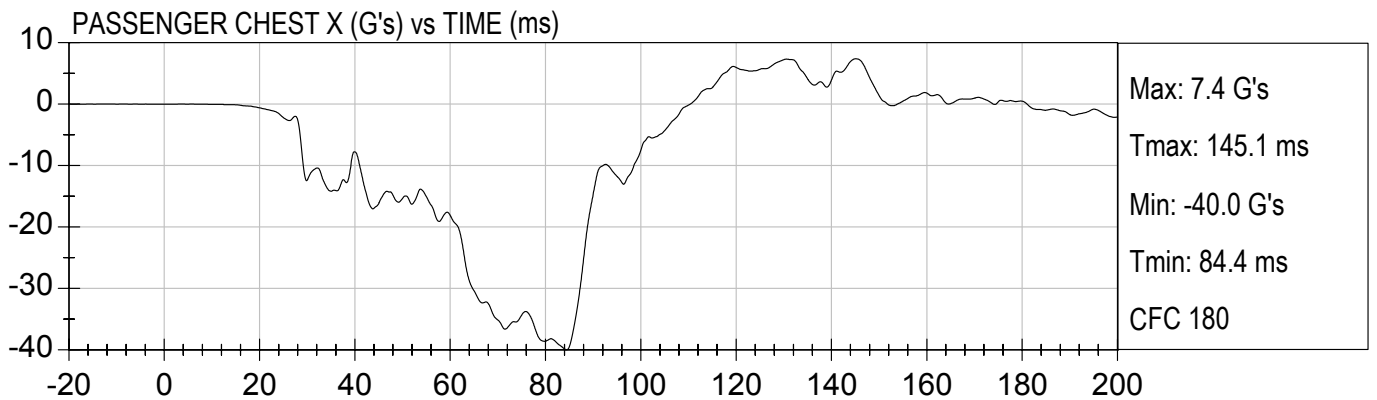
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

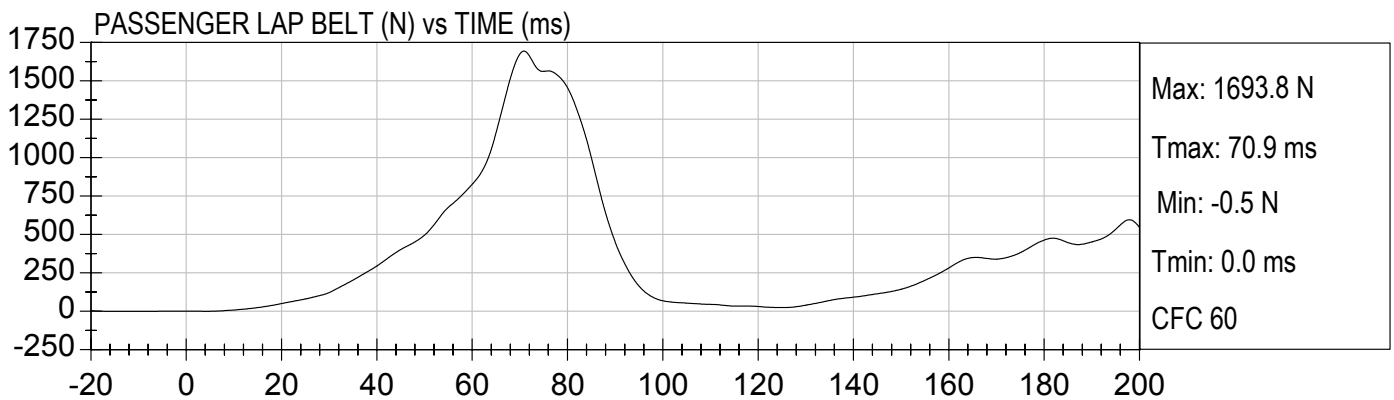
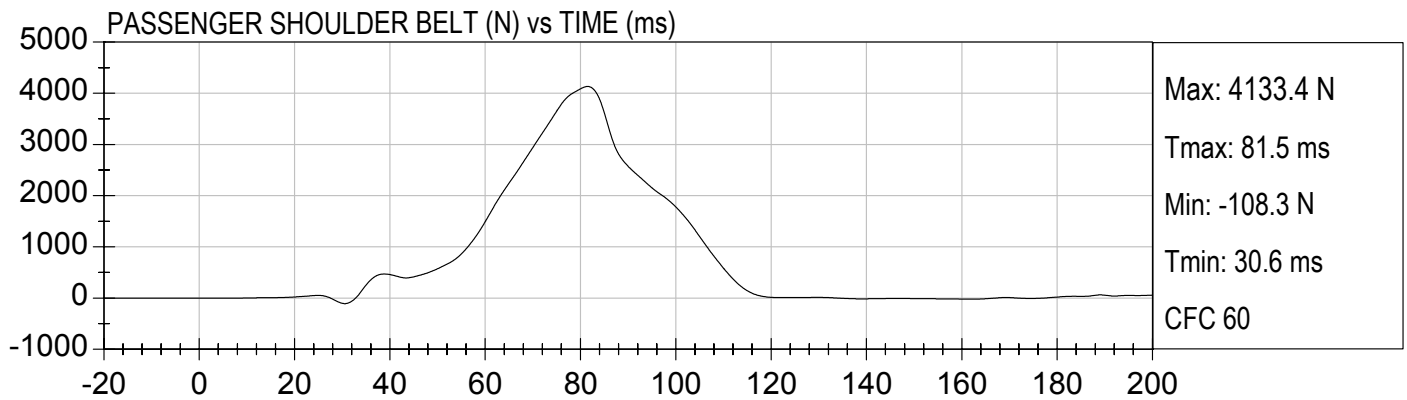
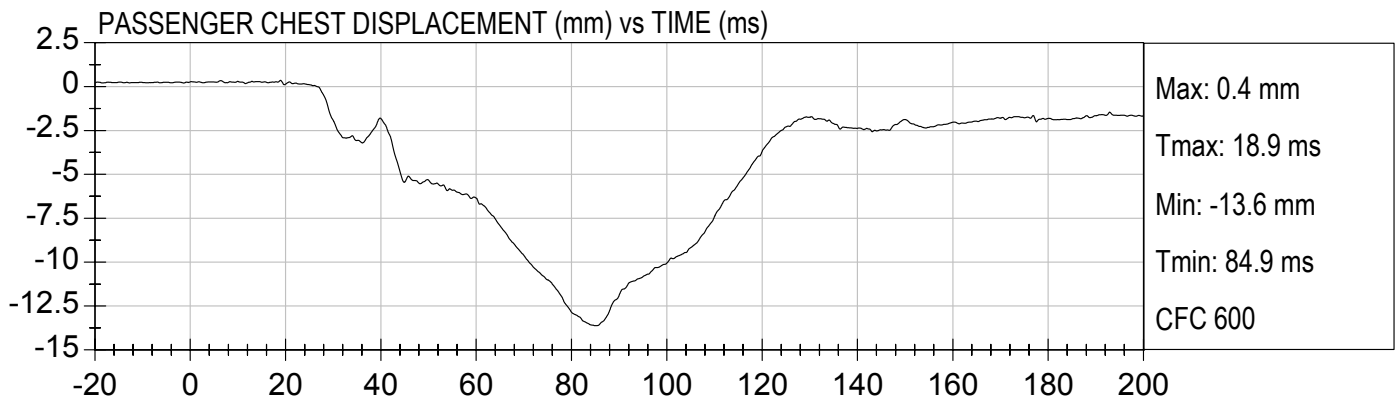
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

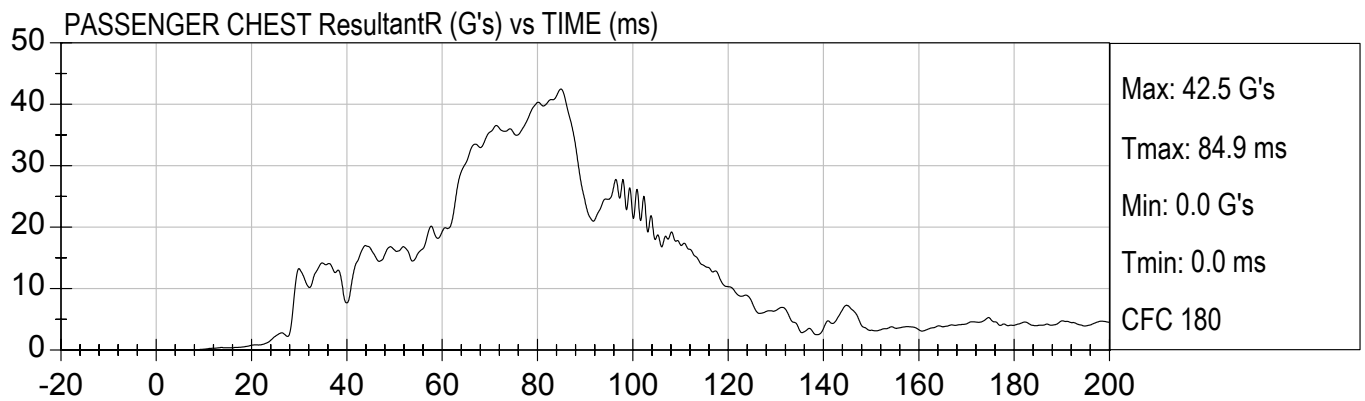
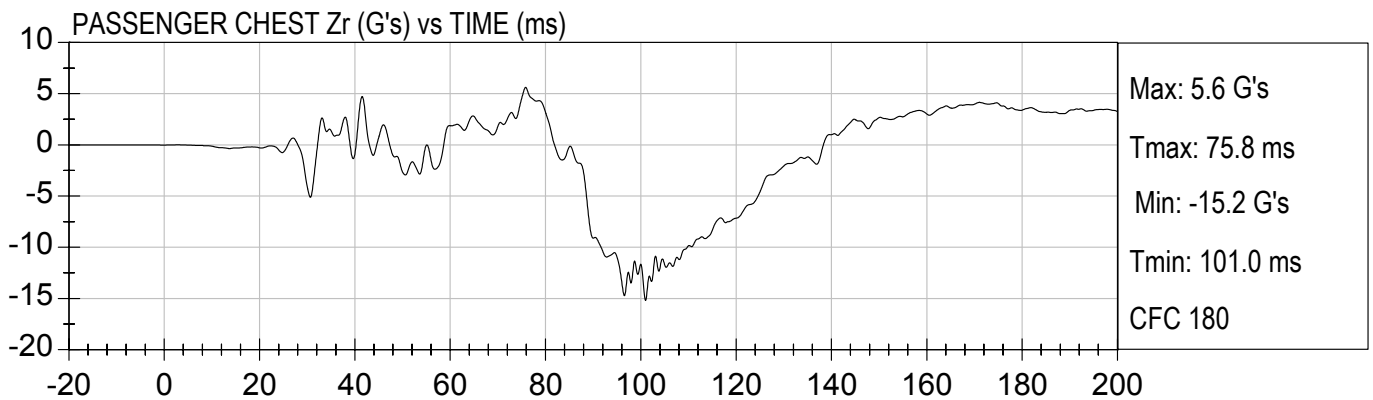
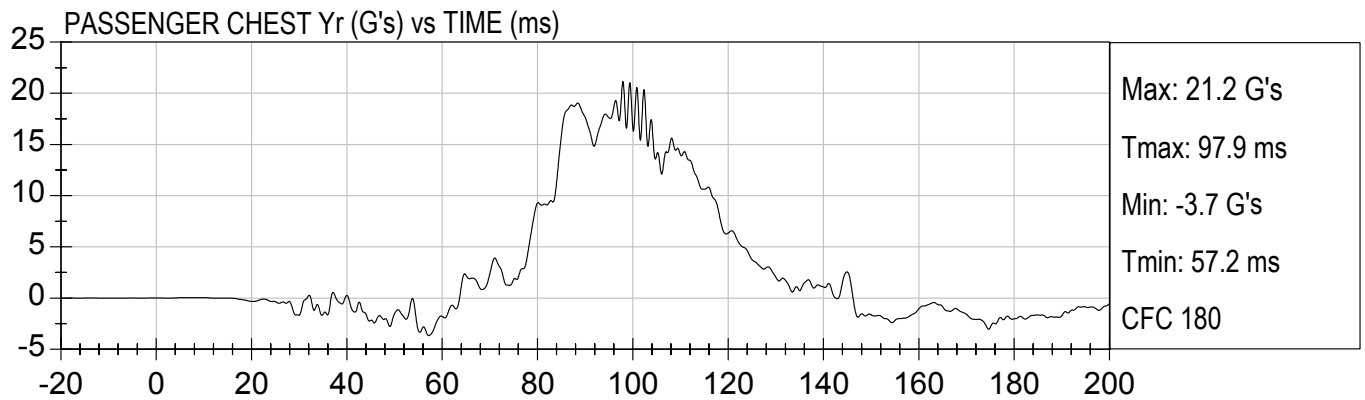
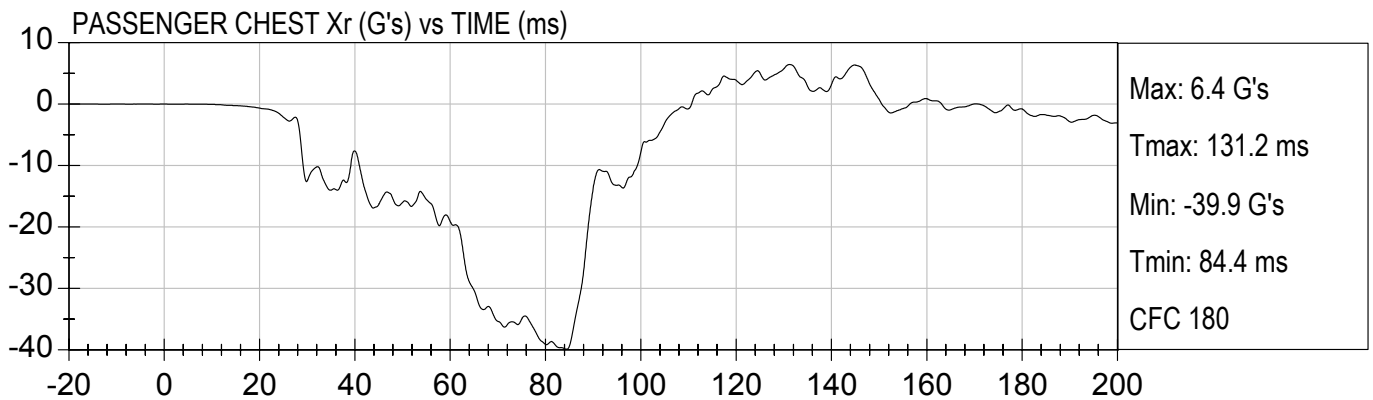
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

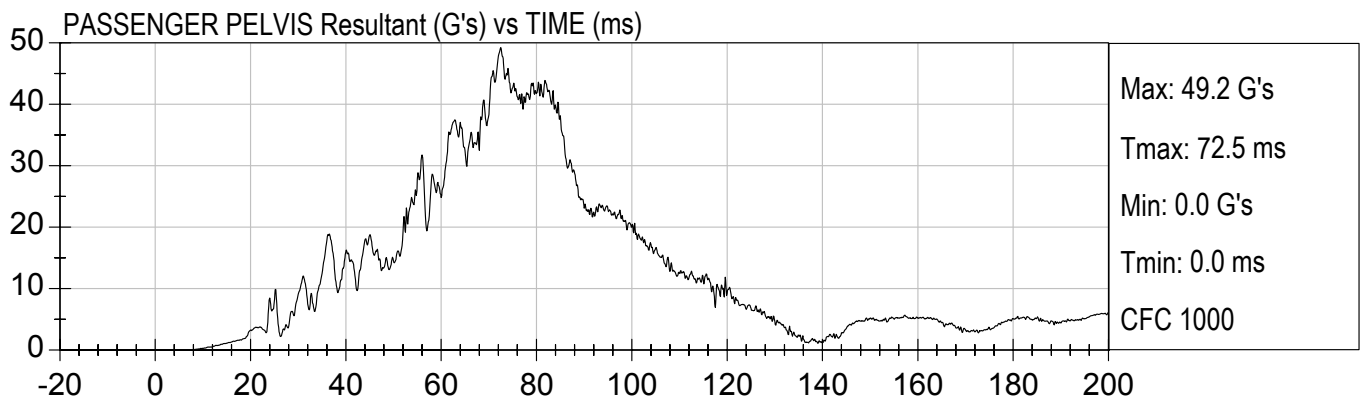
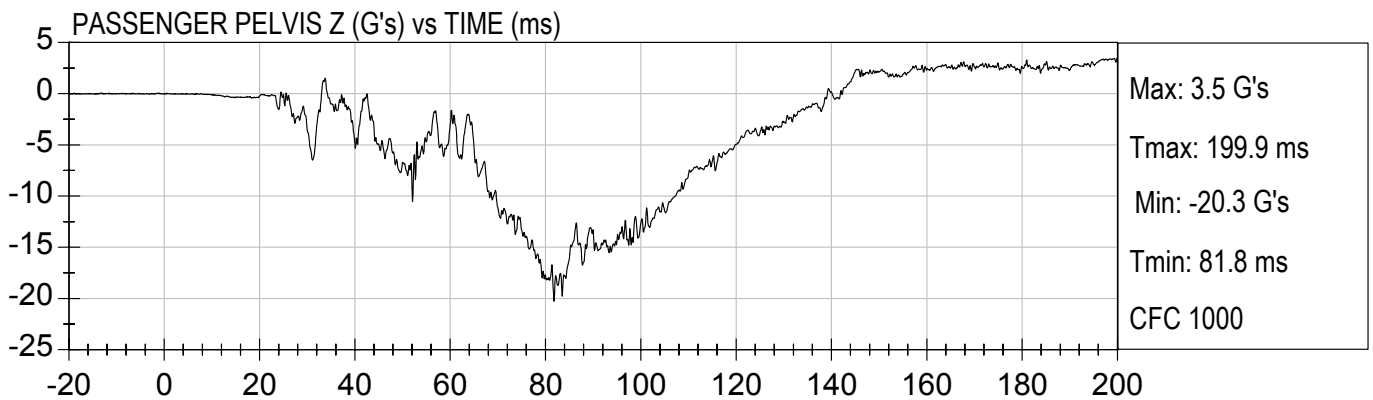
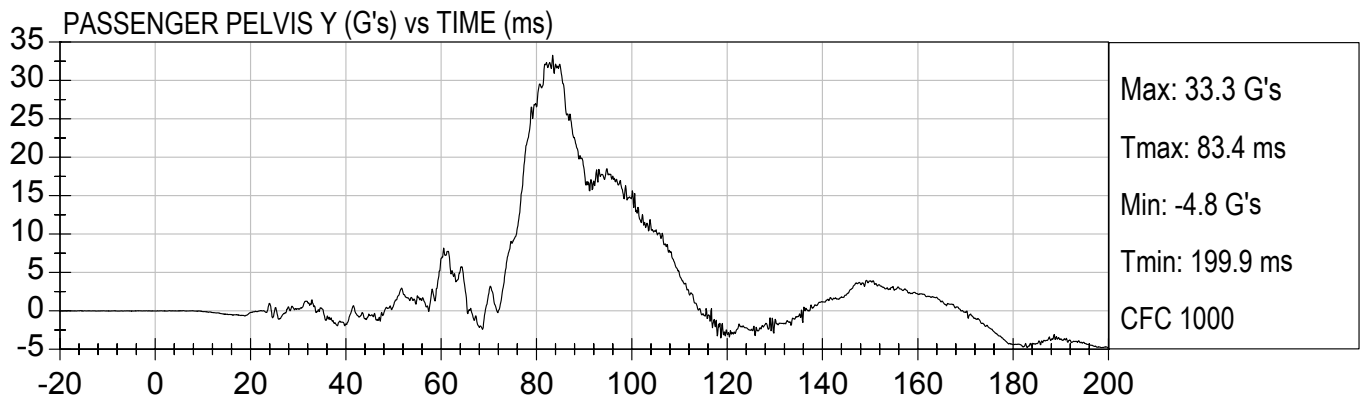
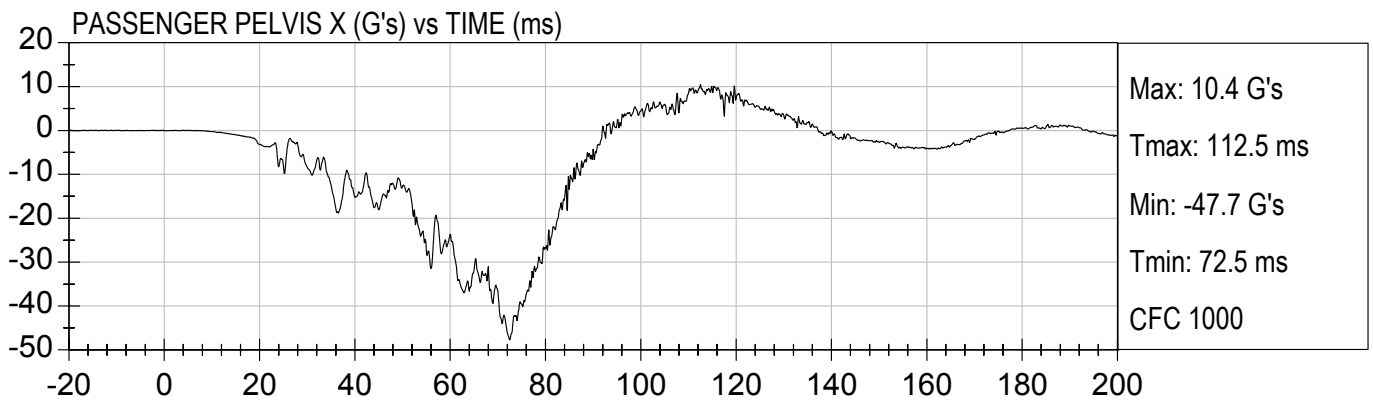
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

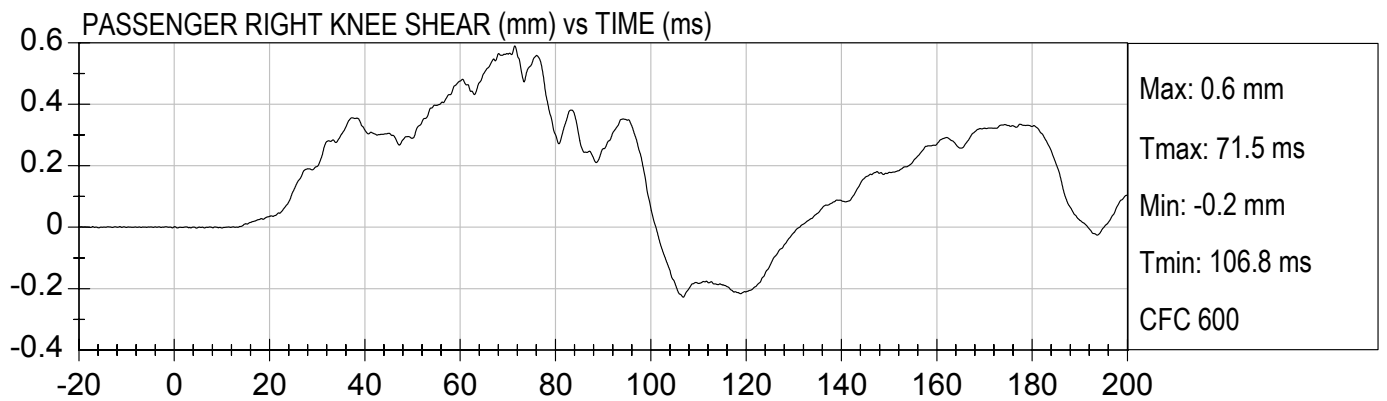
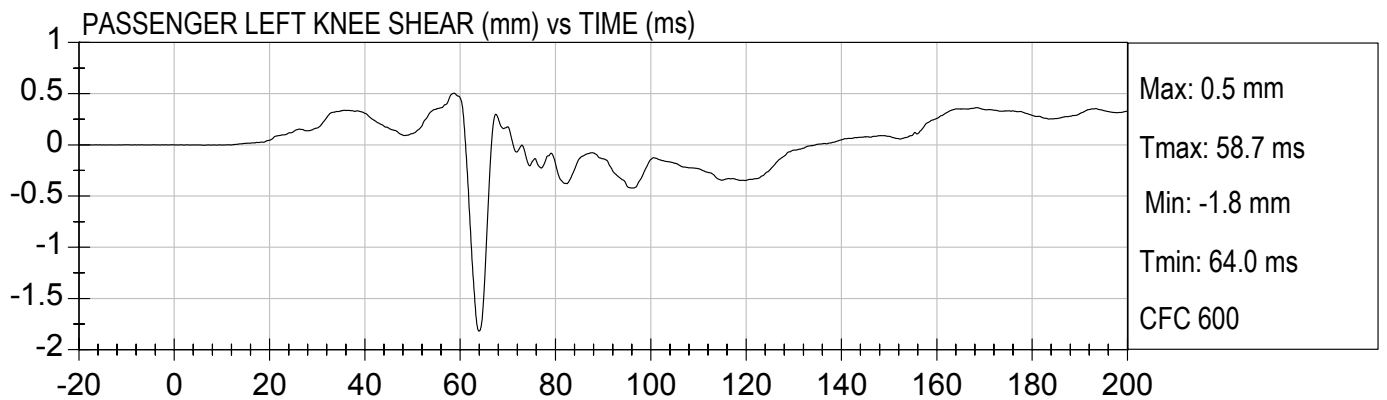
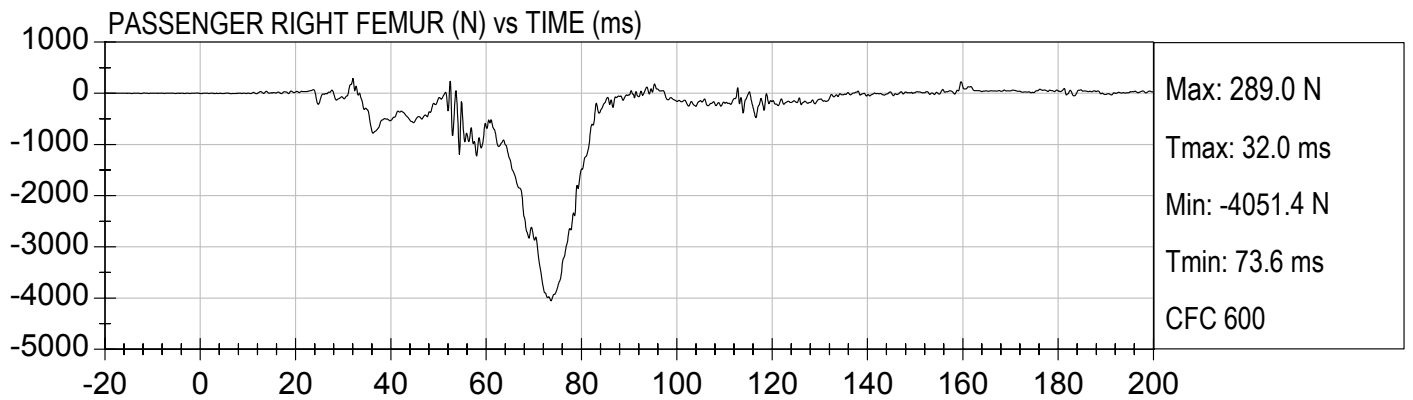
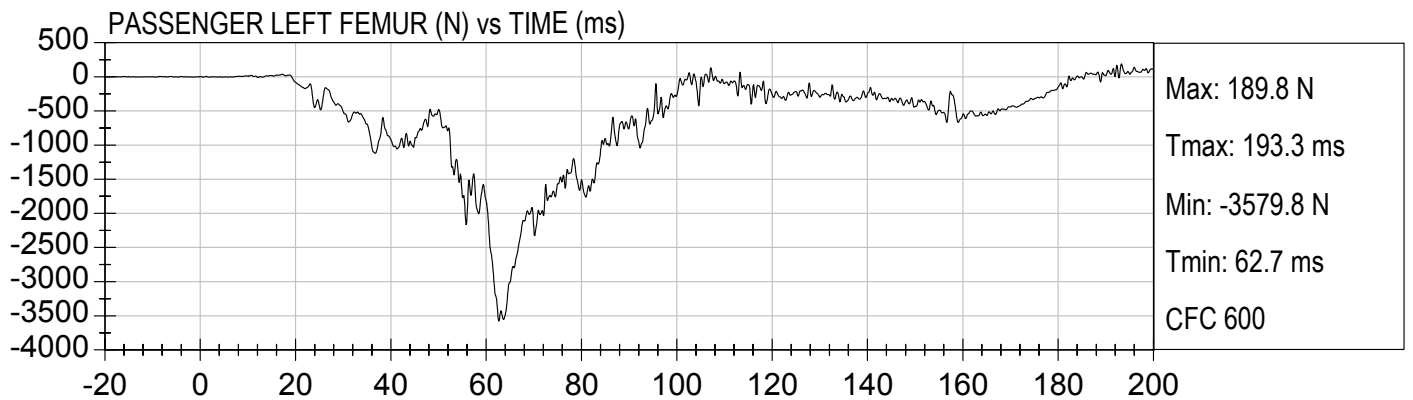
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

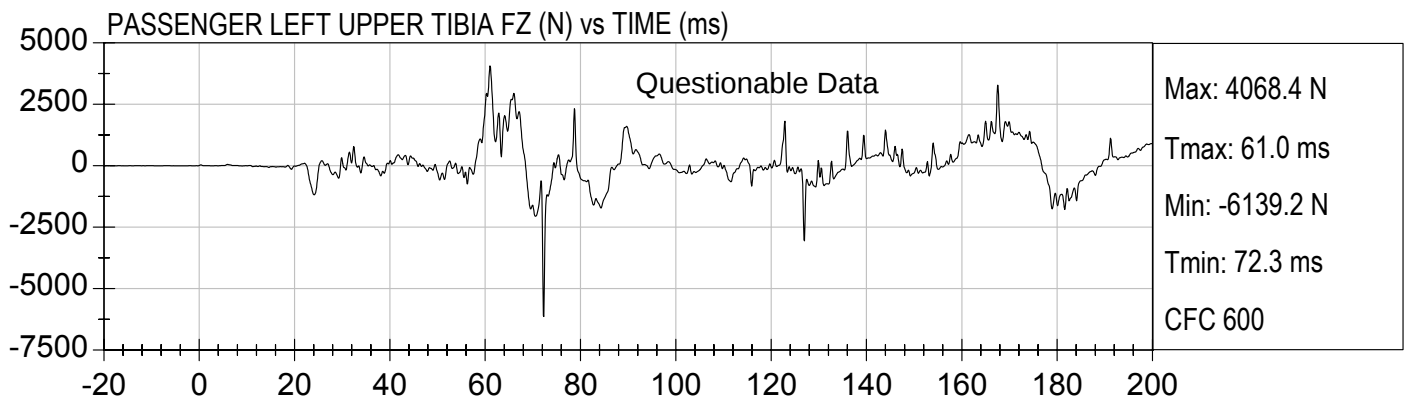
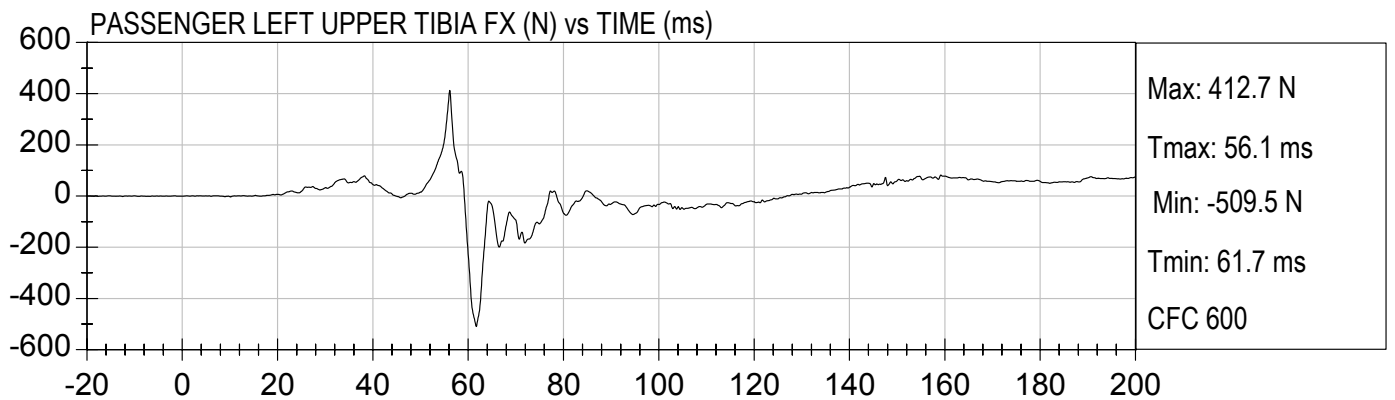
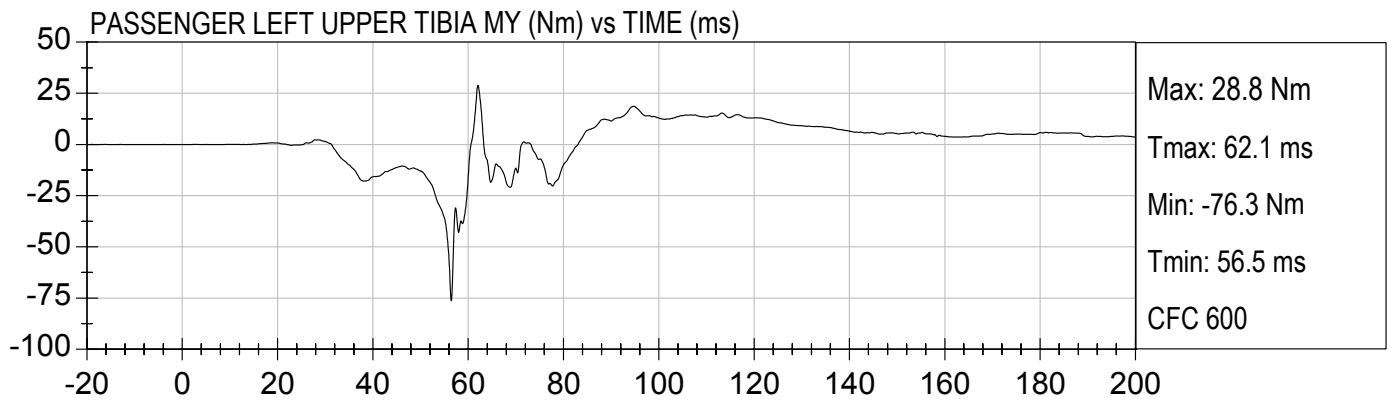
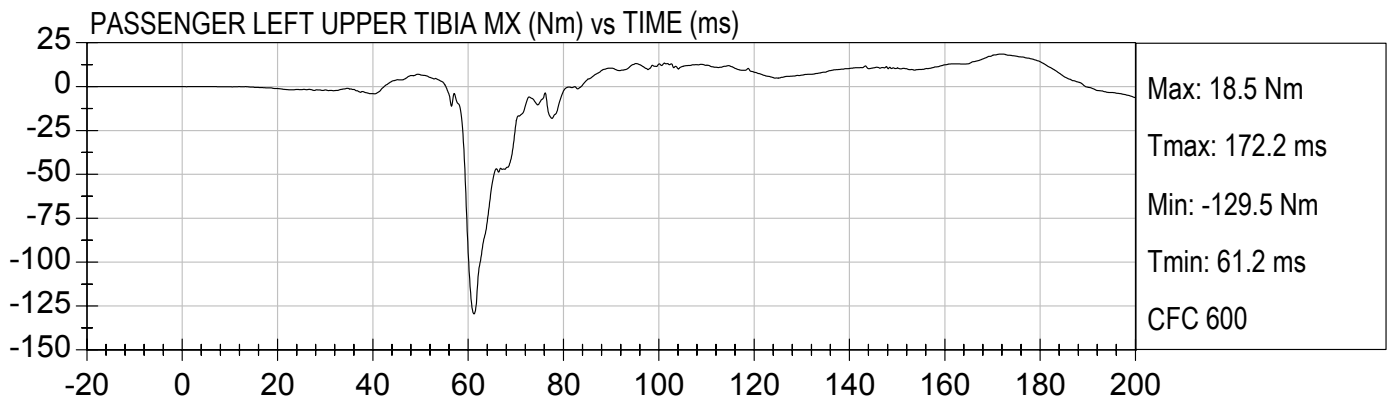
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

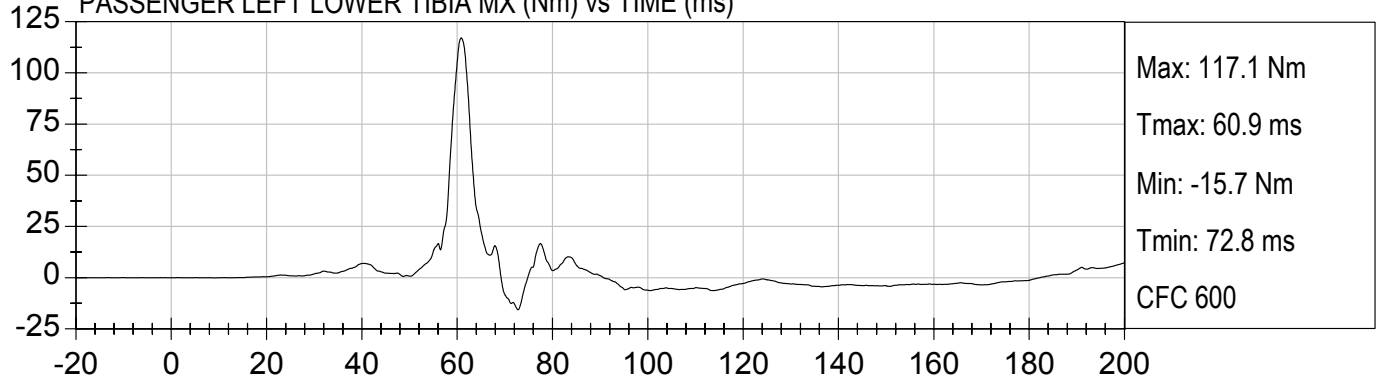




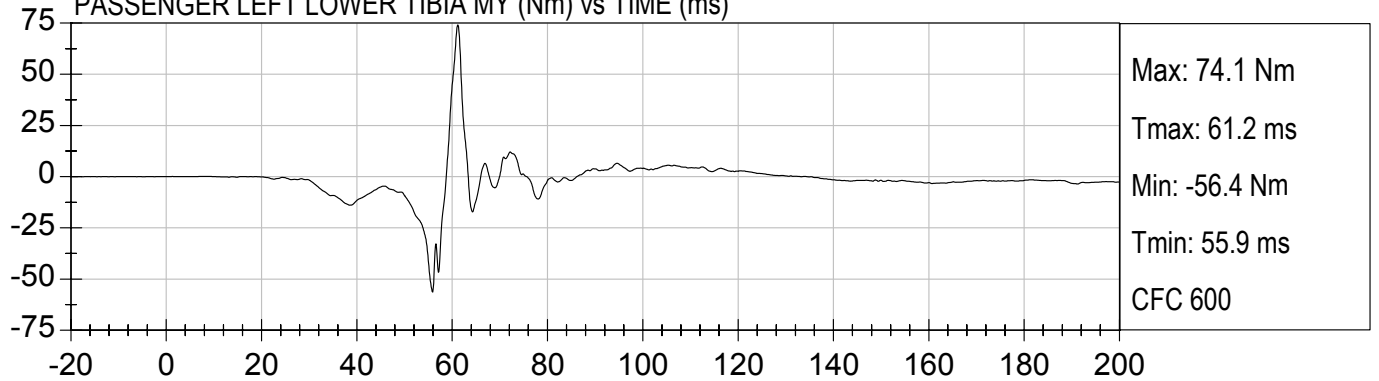
100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

PASSENGER LEFT LOWER TIBIA MX (Nm) vs TIME (ms)



PASSENGER LEFT LOWER TIBIA MY (Nm) vs TIME (ms)

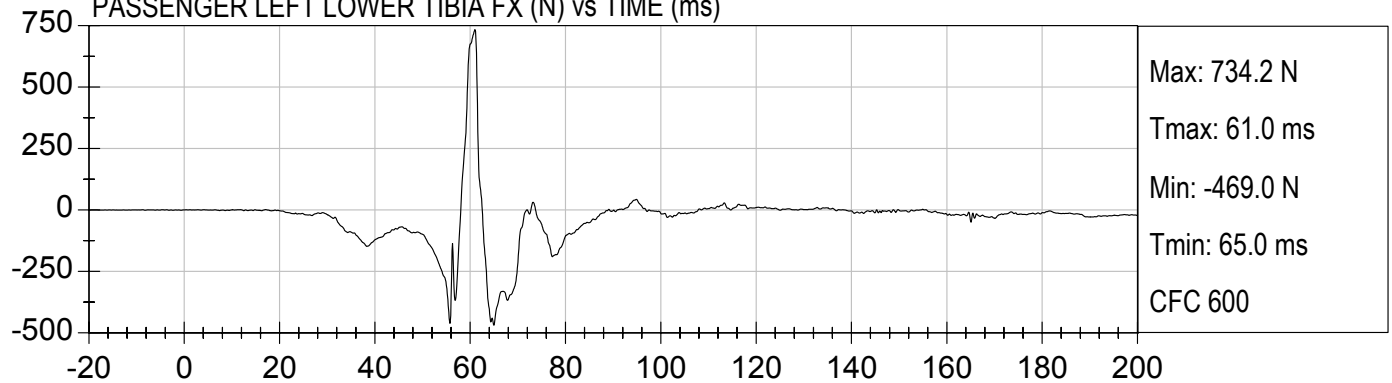




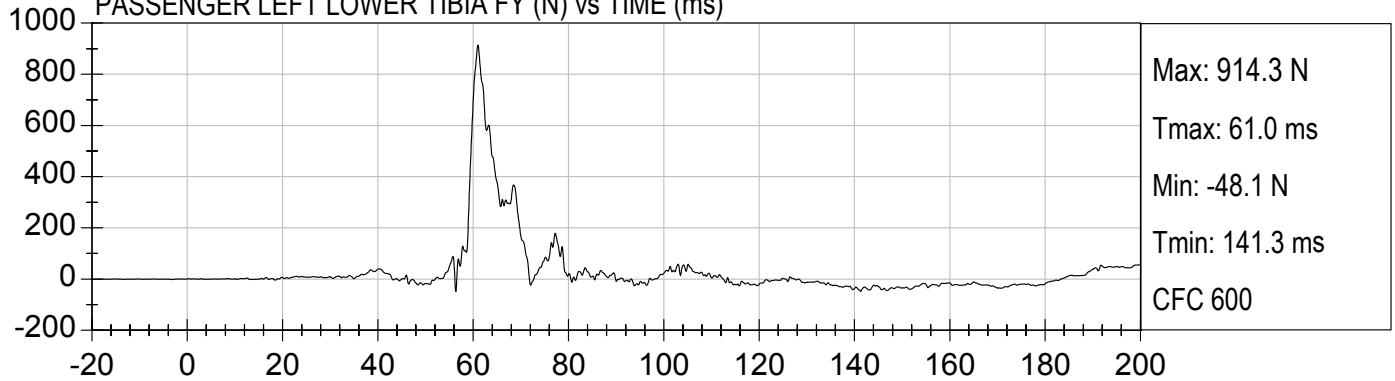
100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

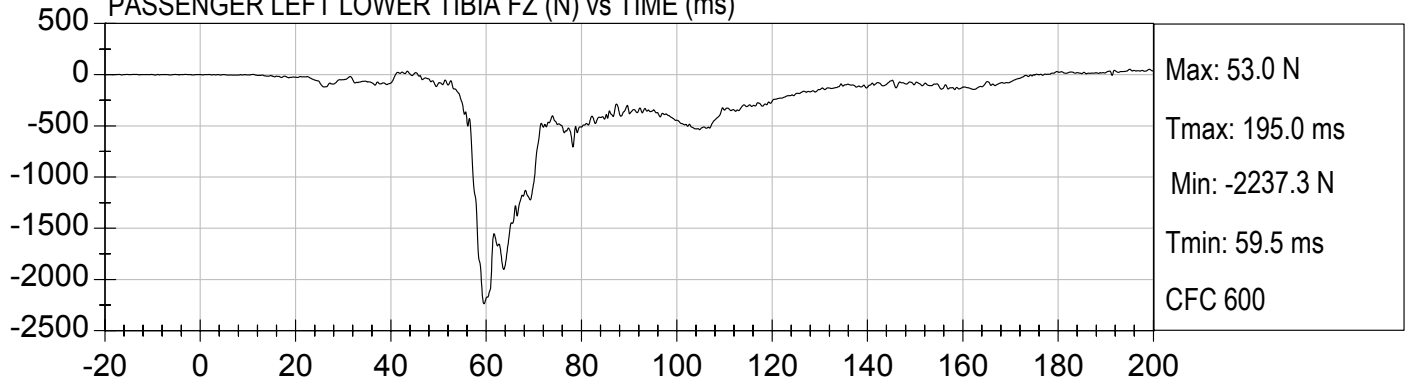
PASSENGER LEFT LOWER TIBIA FX (N) vs TIME (ms)



PASSENGER LEFT LOWER TIBIA FY (N) vs TIME (ms)



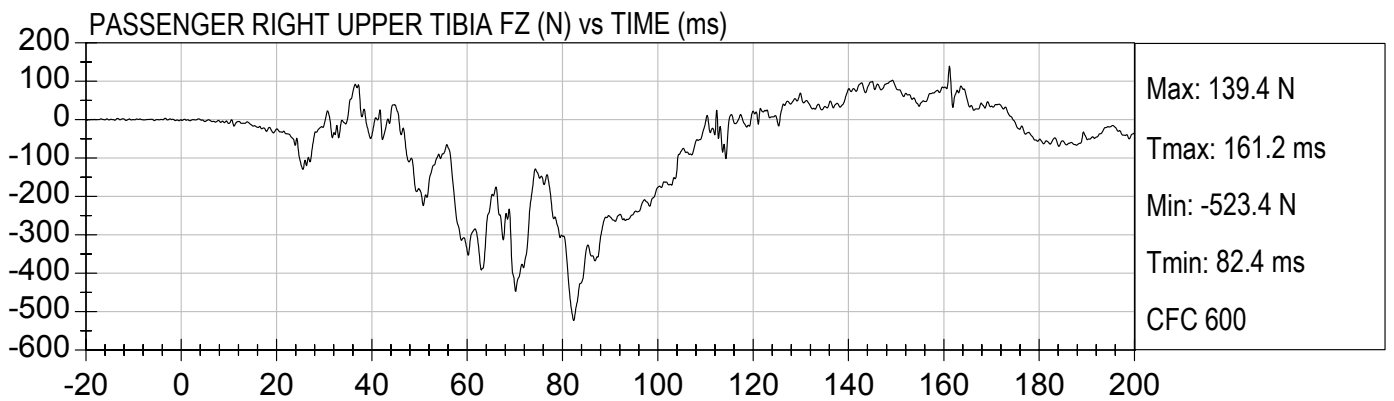
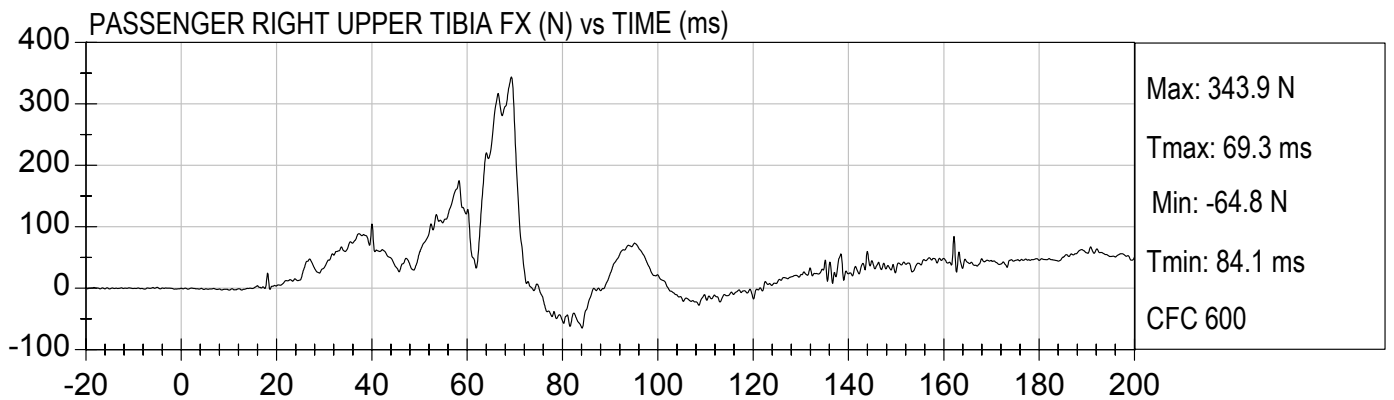
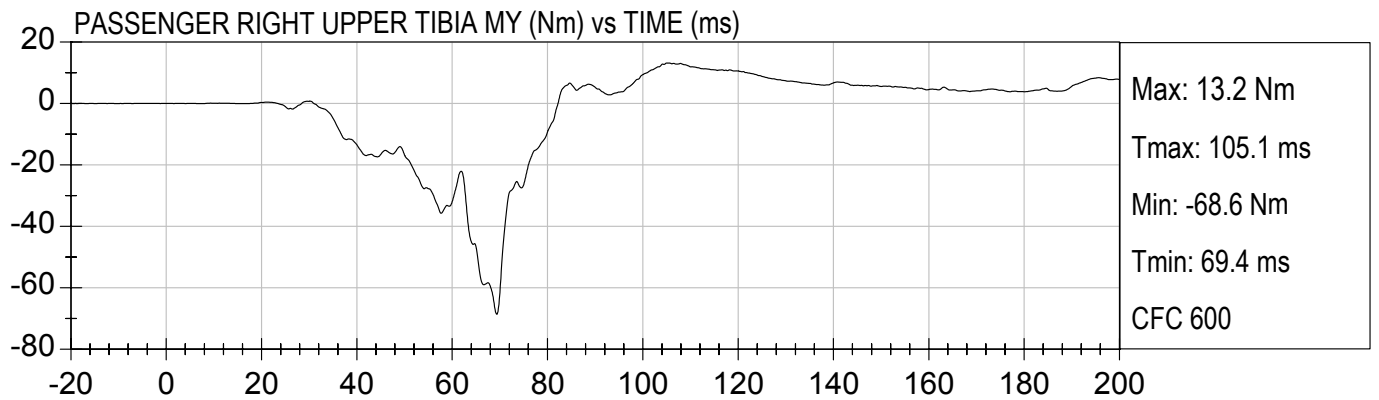
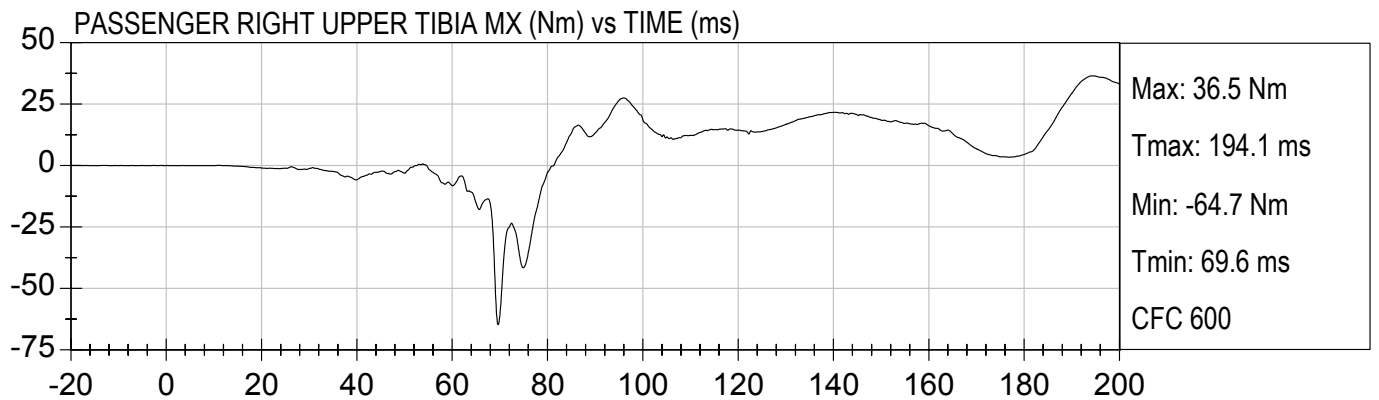
PASSENGER LEFT LOWER TIBIA FZ (N) vs TIME (ms)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

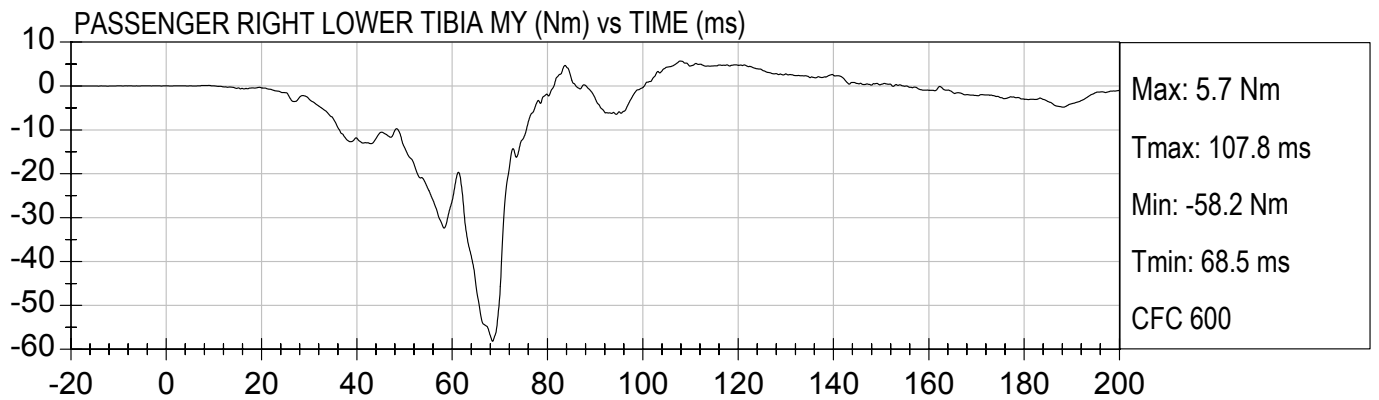
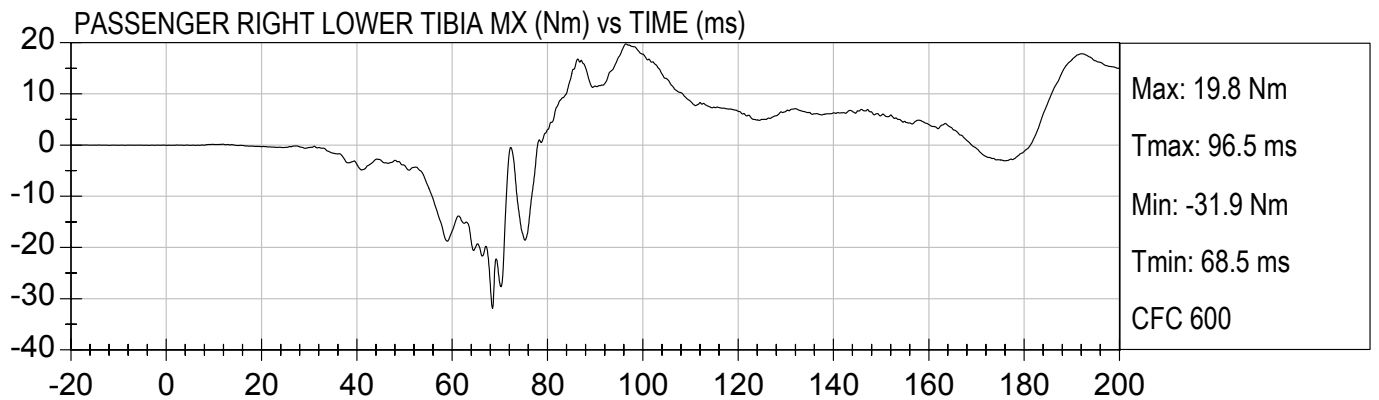
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

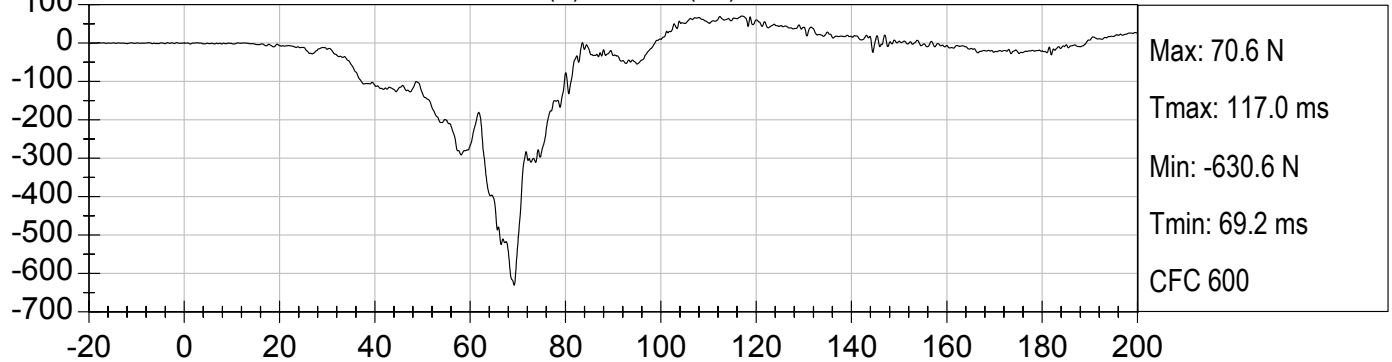




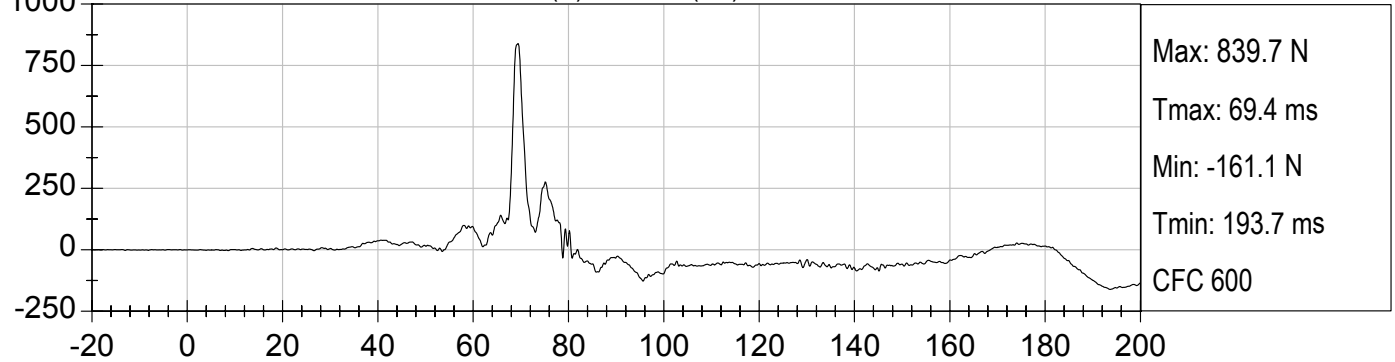
100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

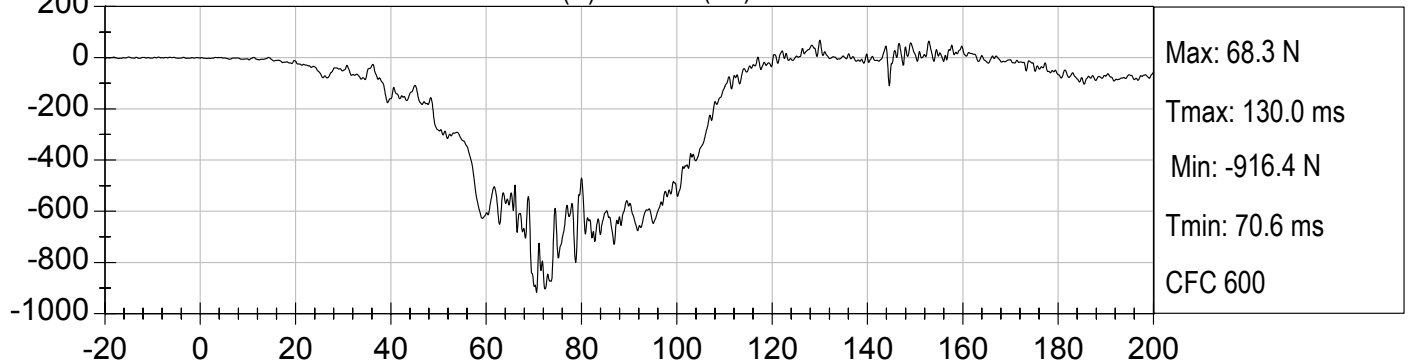
PASSENGER RIGHT LOWER TIBIA FX (N) vs TIME (ms)



PASSENGER RIGHT LOWER TIBIA FY (N) vs TIME (ms)



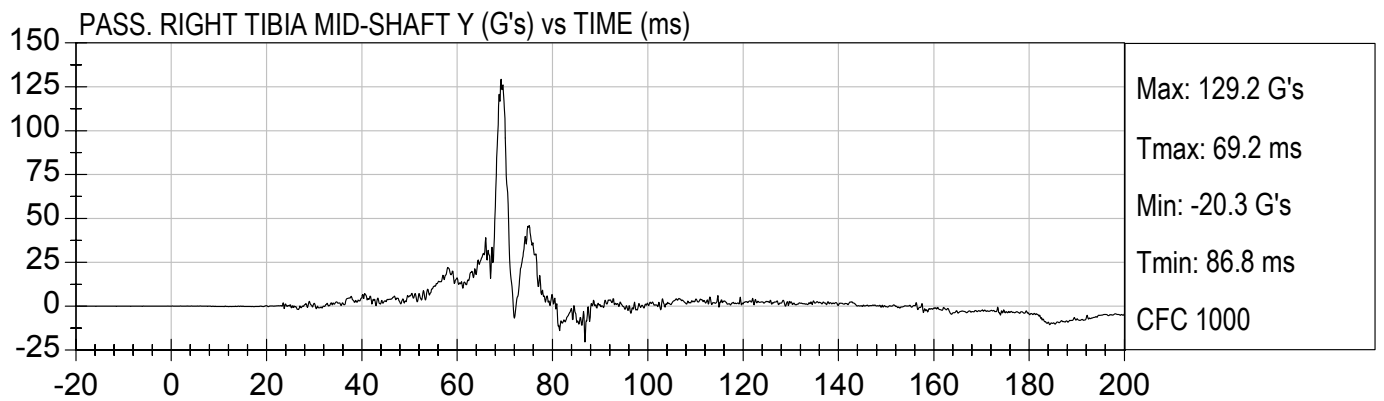
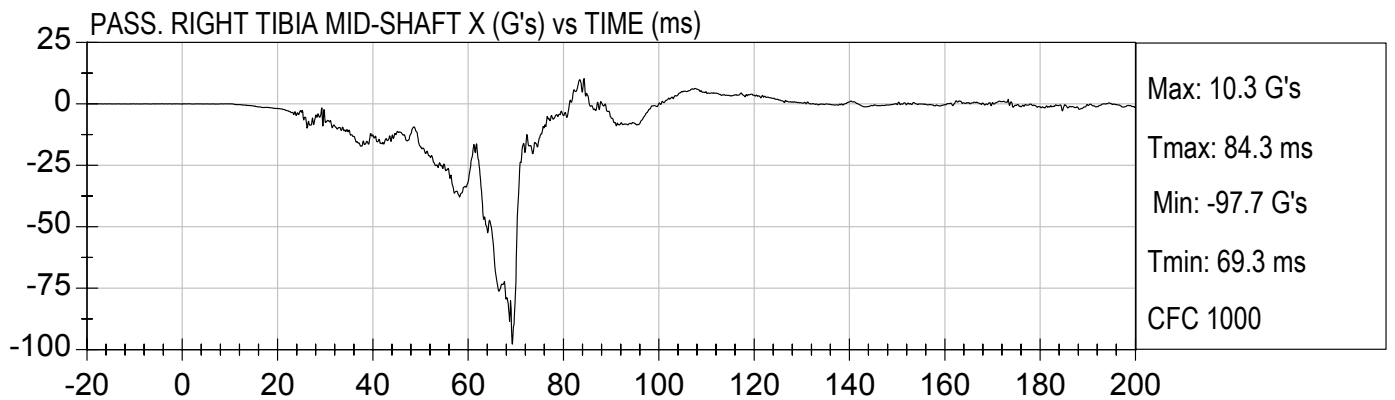
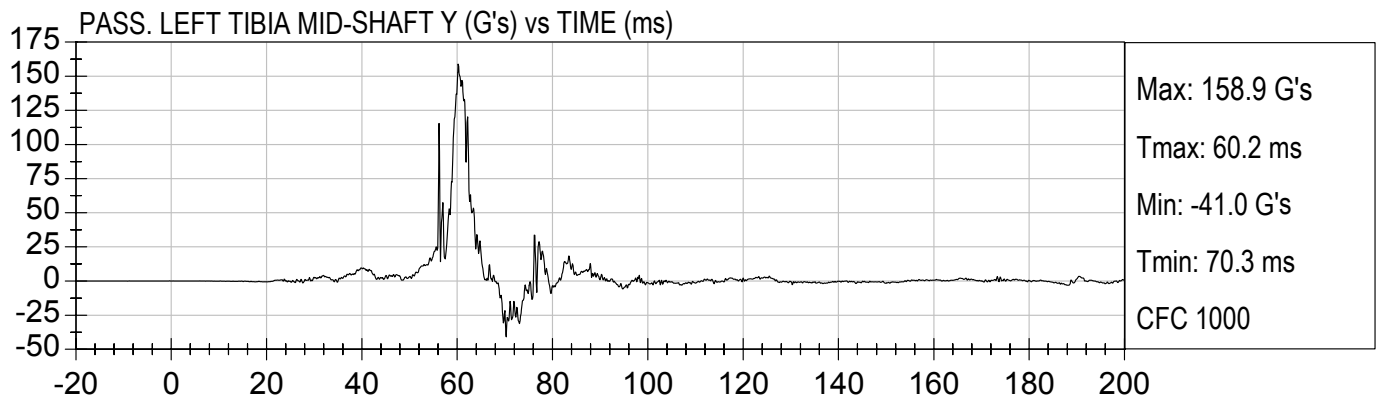
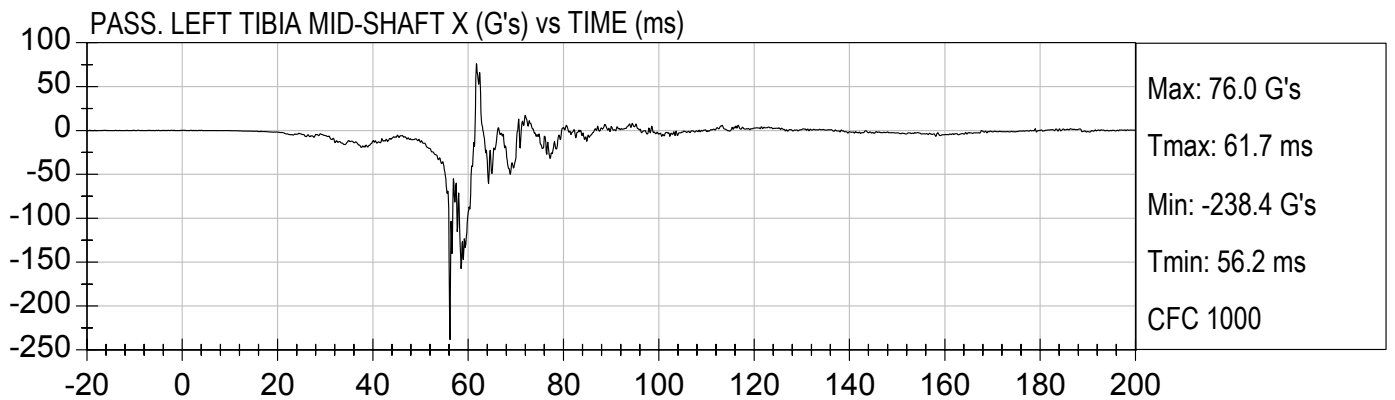
PASSENGER RIGHT LOWER TIBIA FZ (N) vs TIME (ms)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

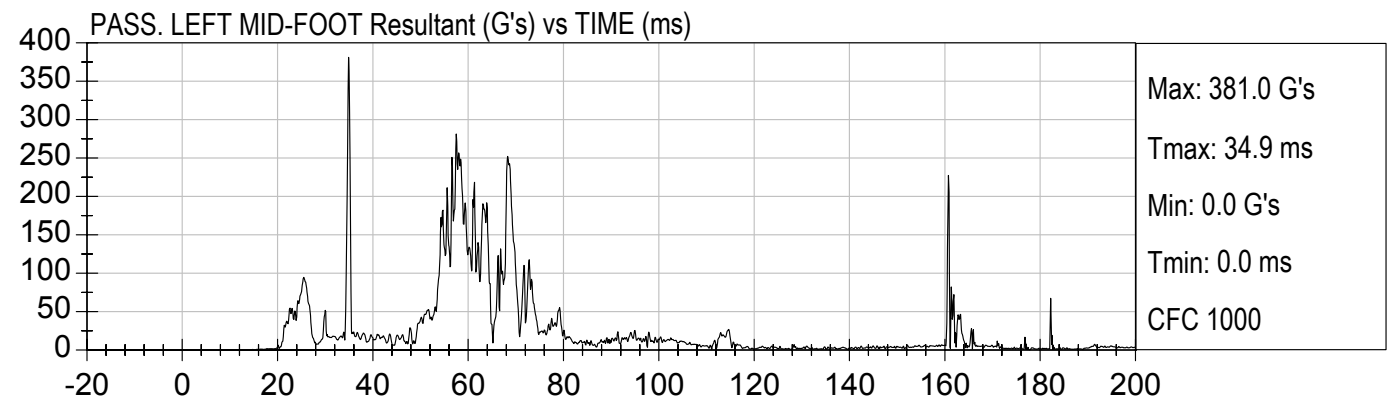
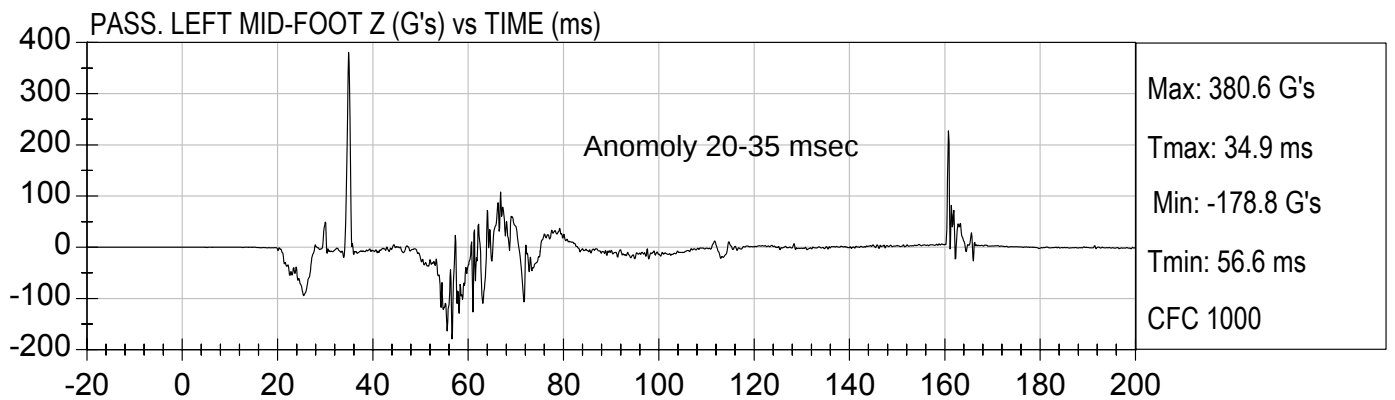
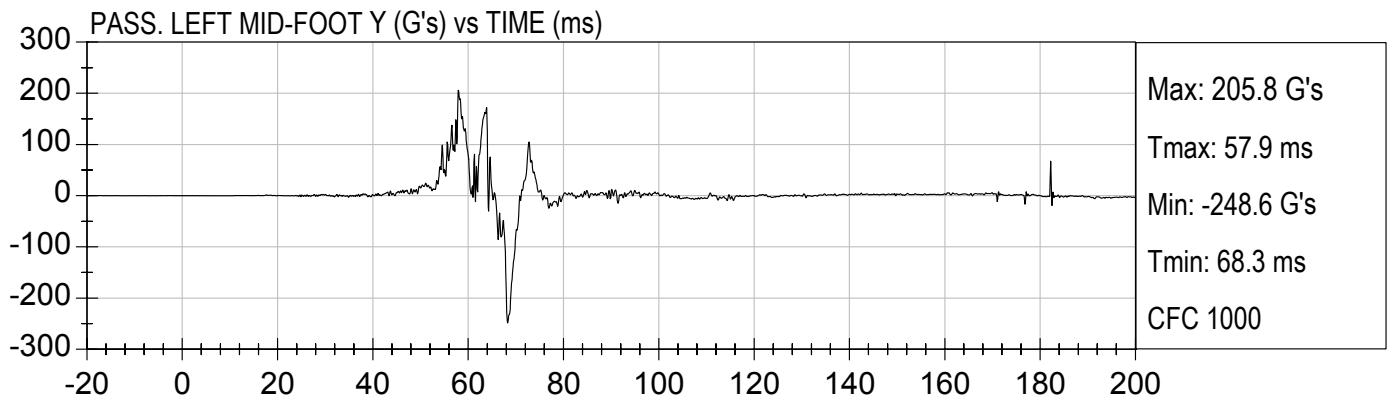
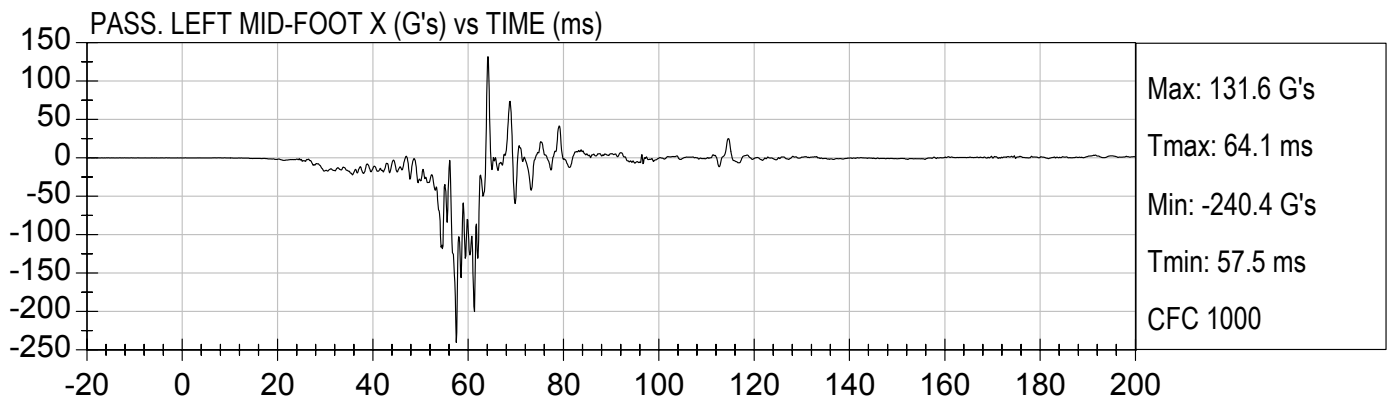
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

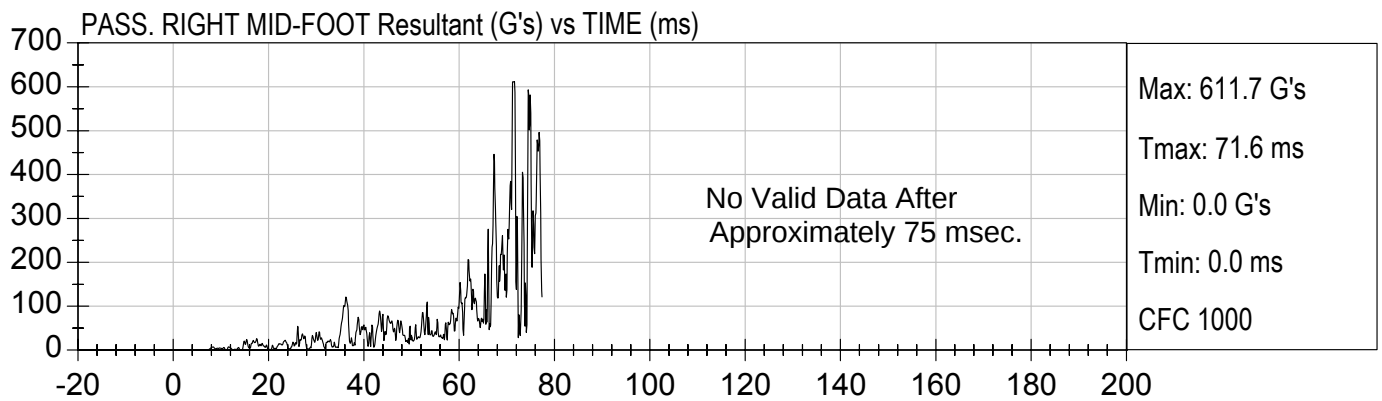
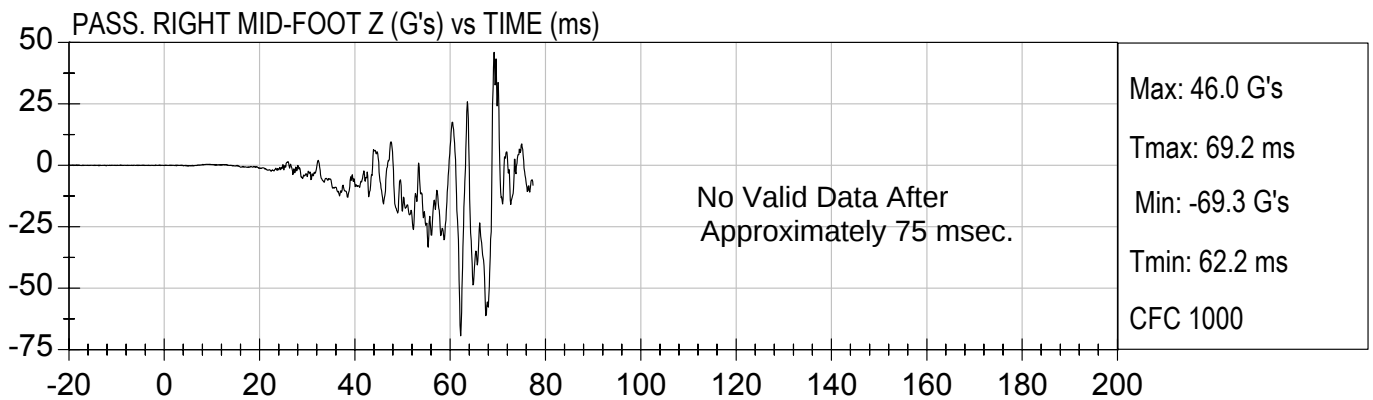
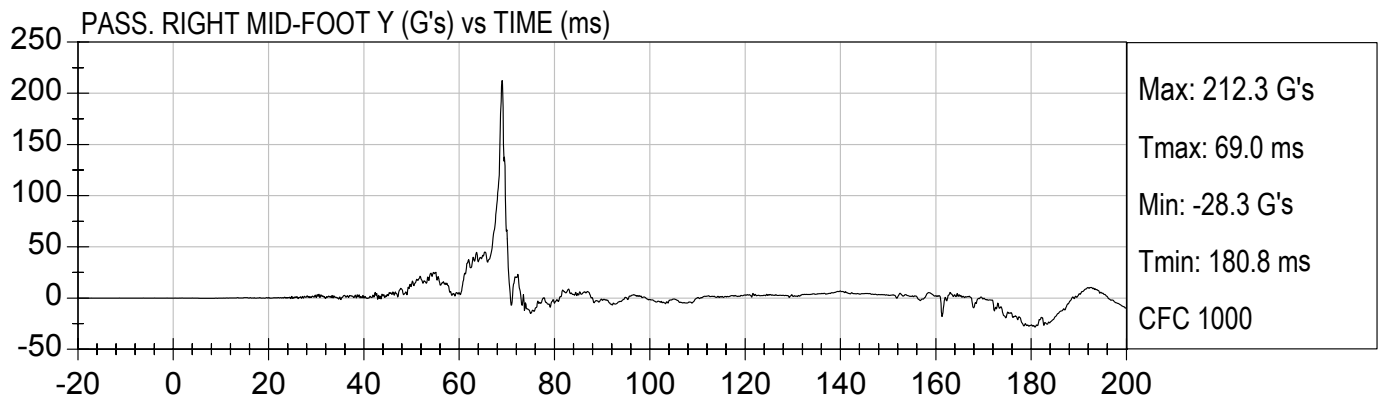
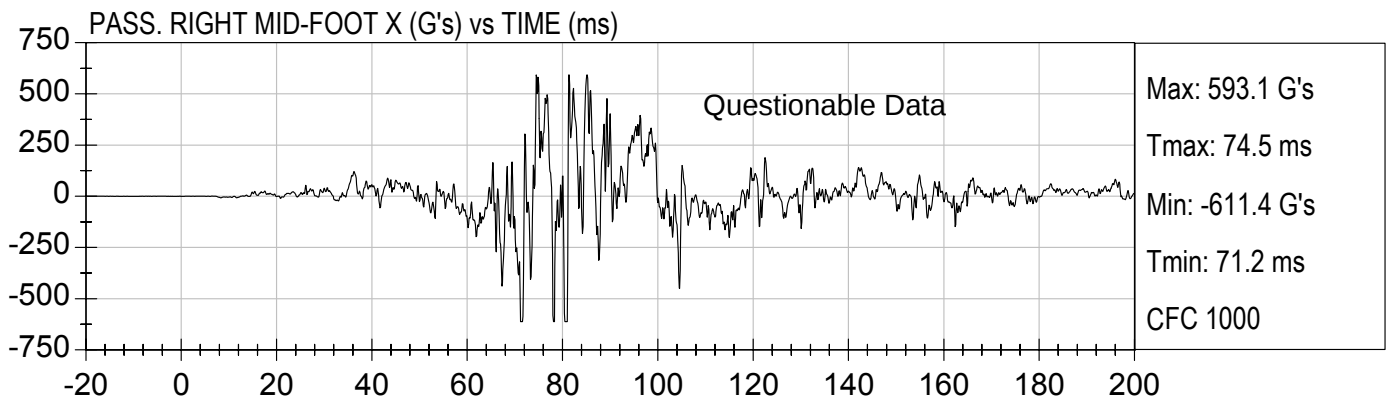
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

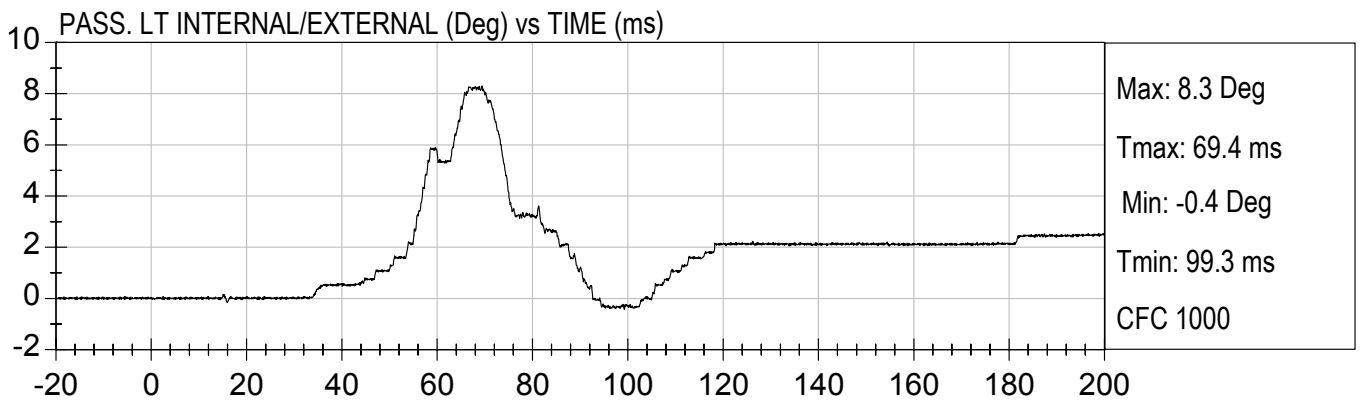
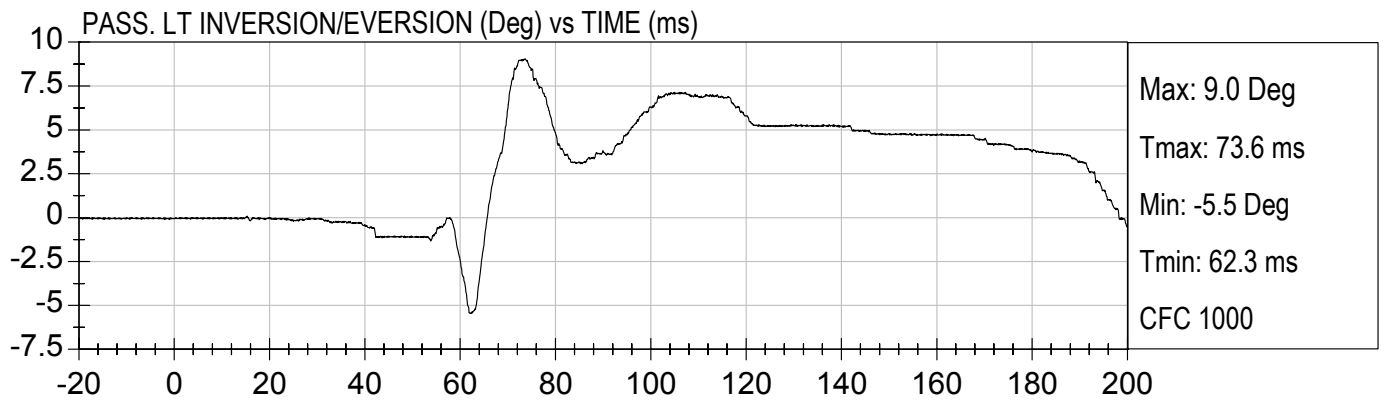
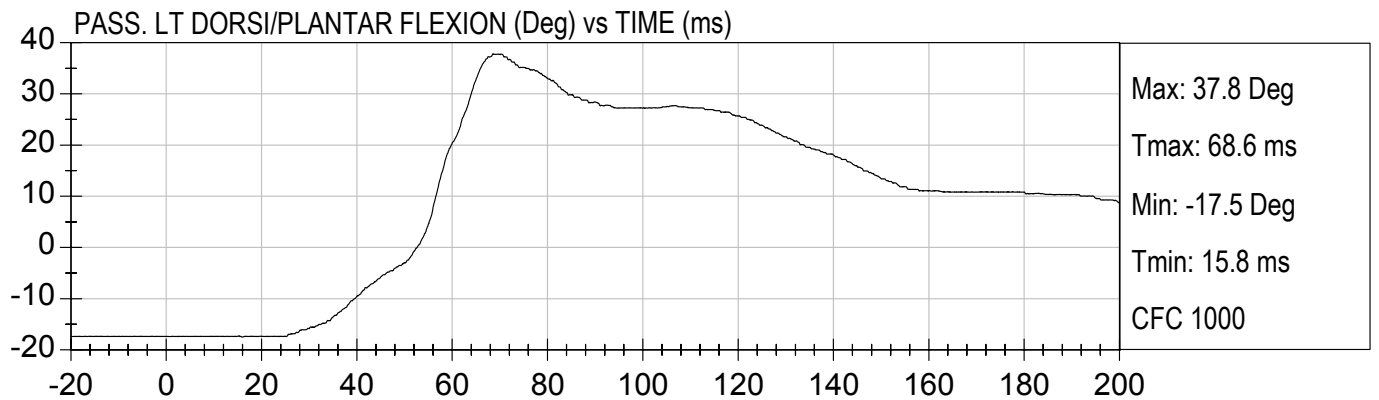
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

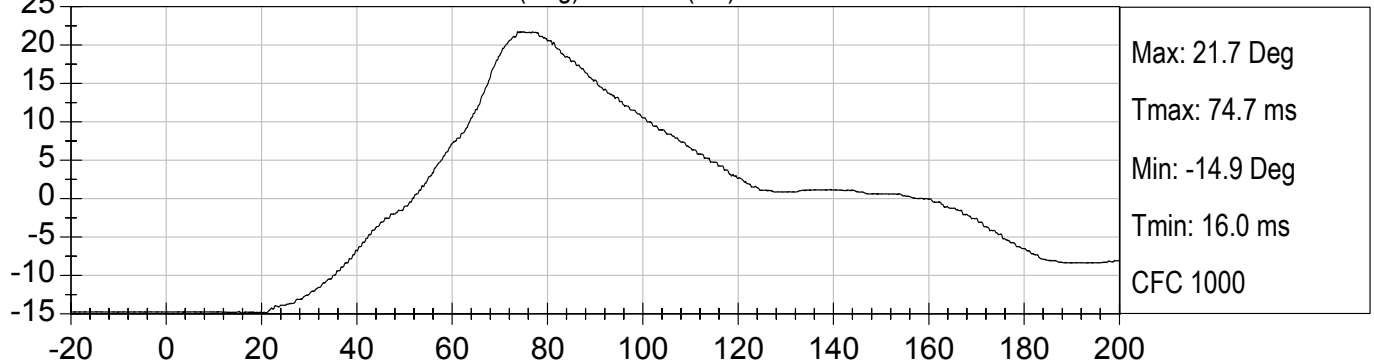




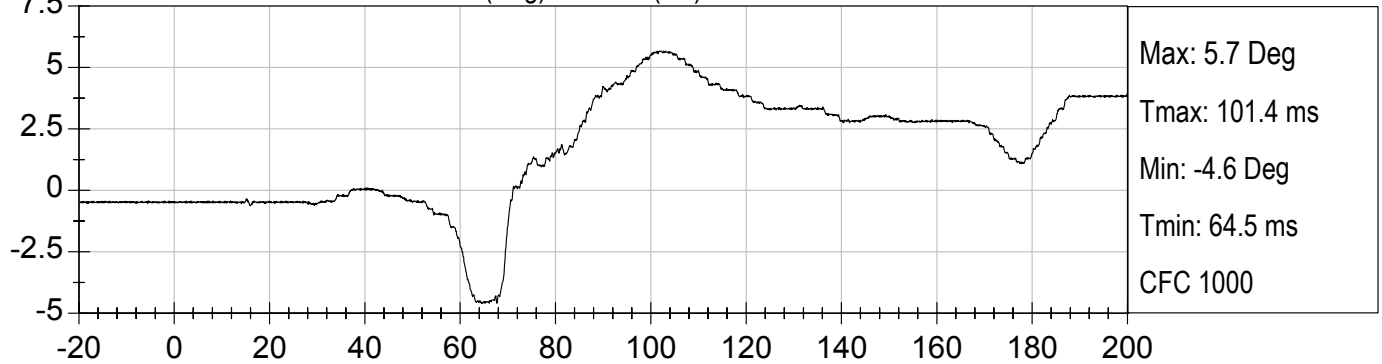
100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

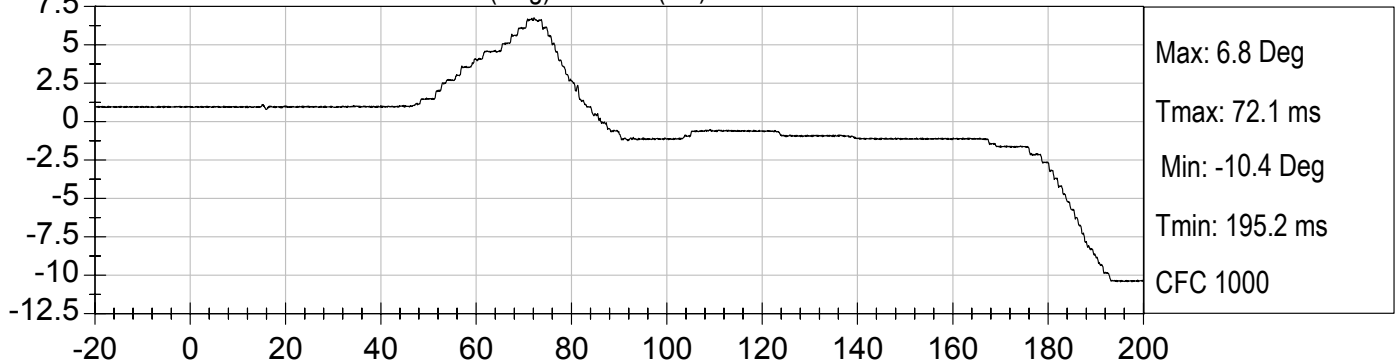
PASS. RT DORSI/PLANTAR FLEXION (Deg) vs TIME (ms)



PASS. RT INVERSION/EVERSION (Deg) vs TIME (ms)



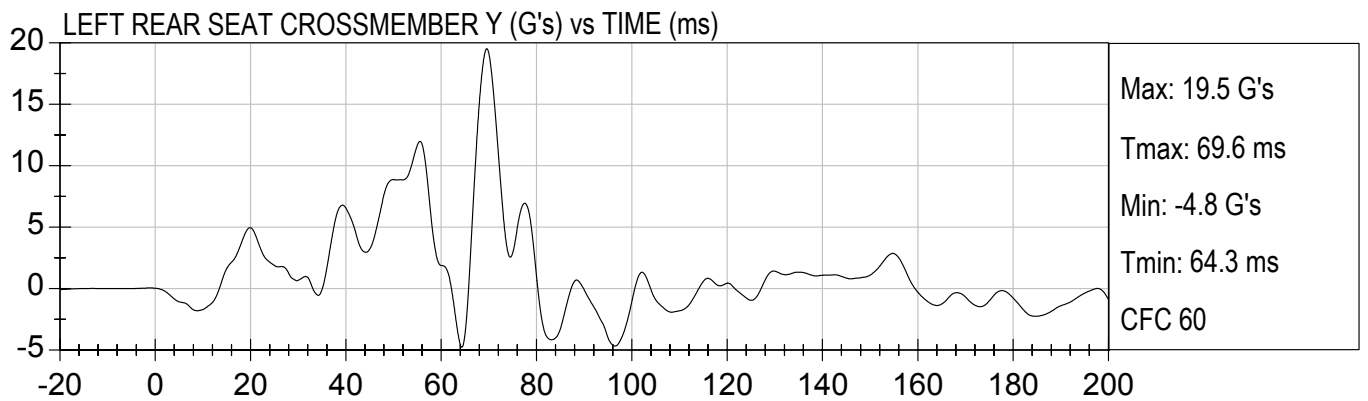
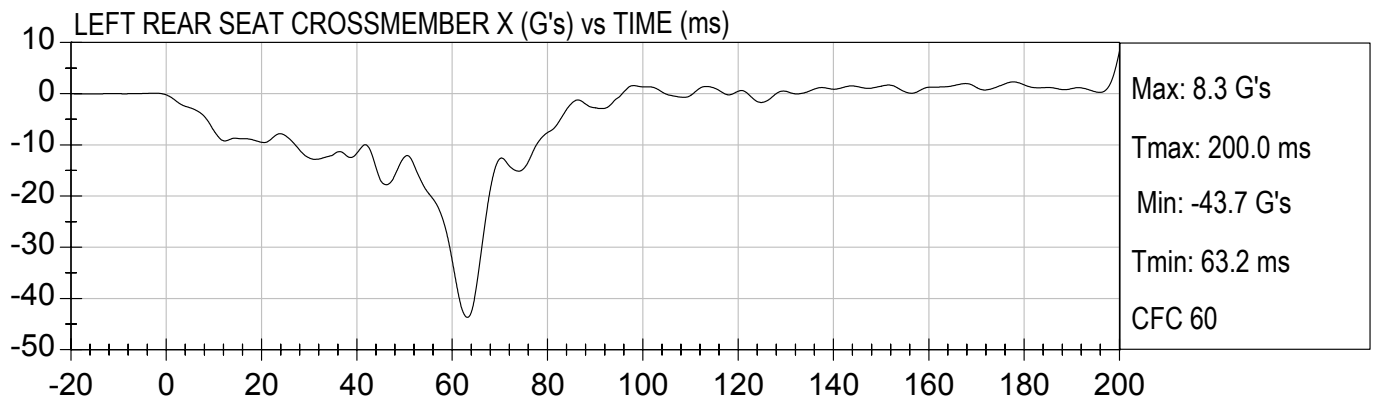
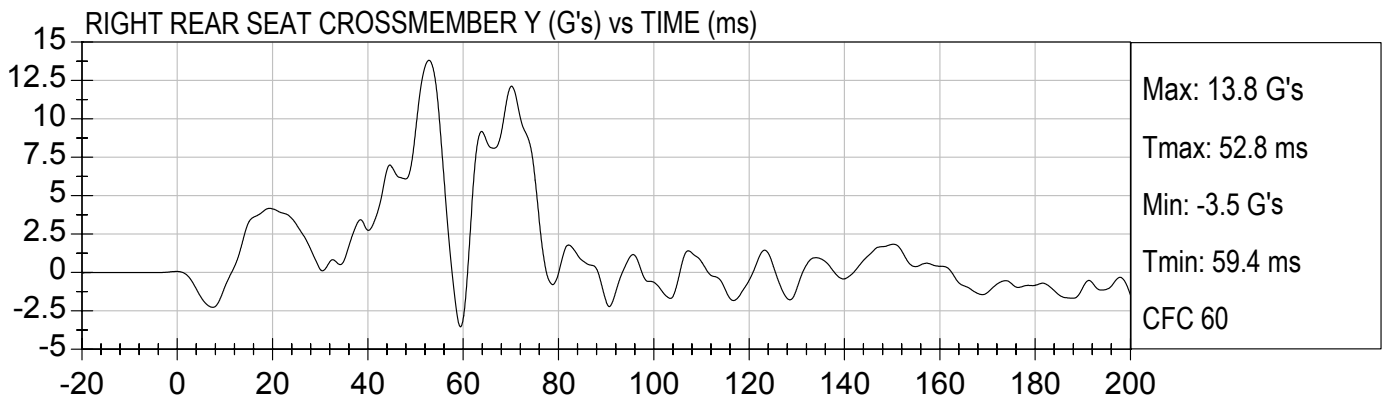
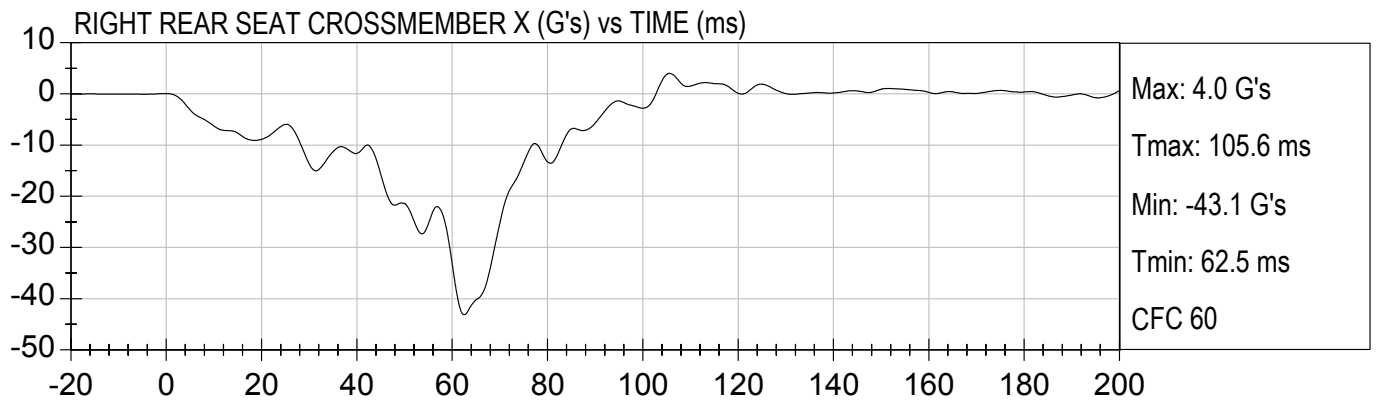
PASS. RT INTERNAL/EXTERNAL (Deg) vs TIME (ms)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

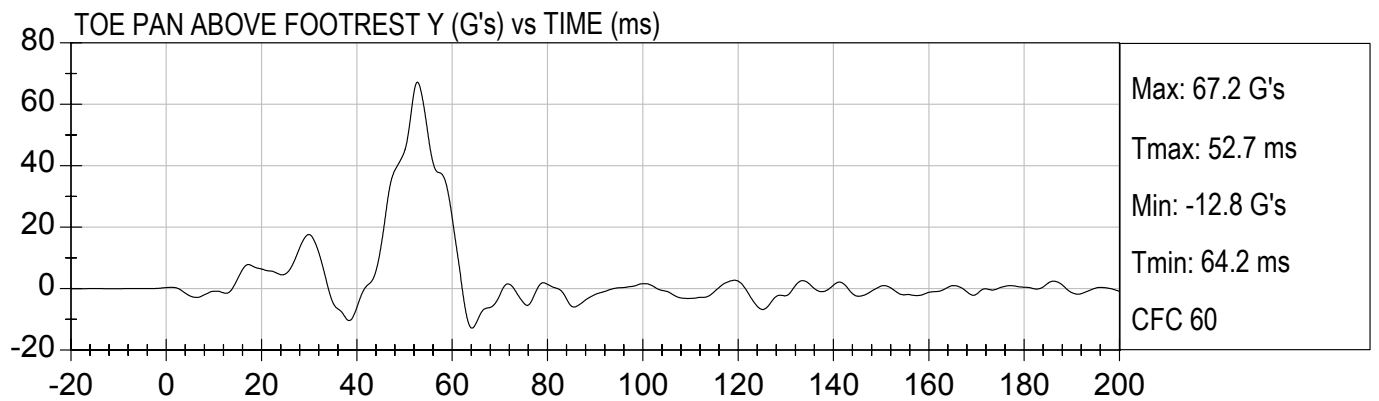
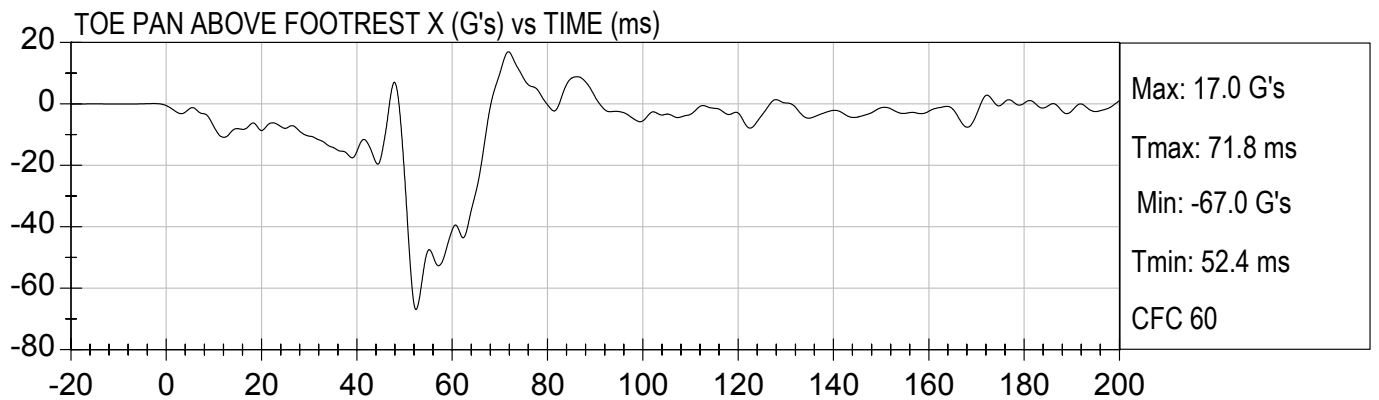
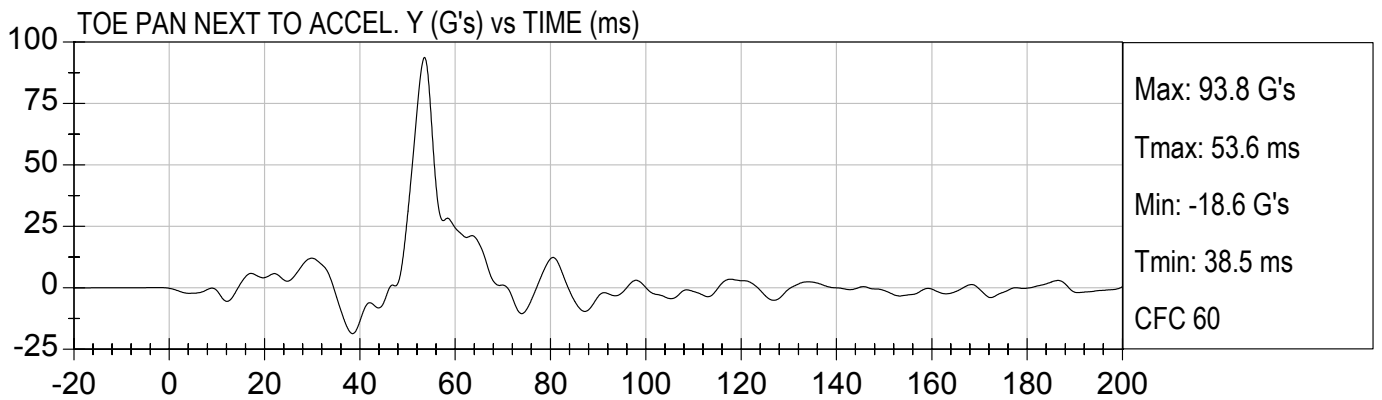
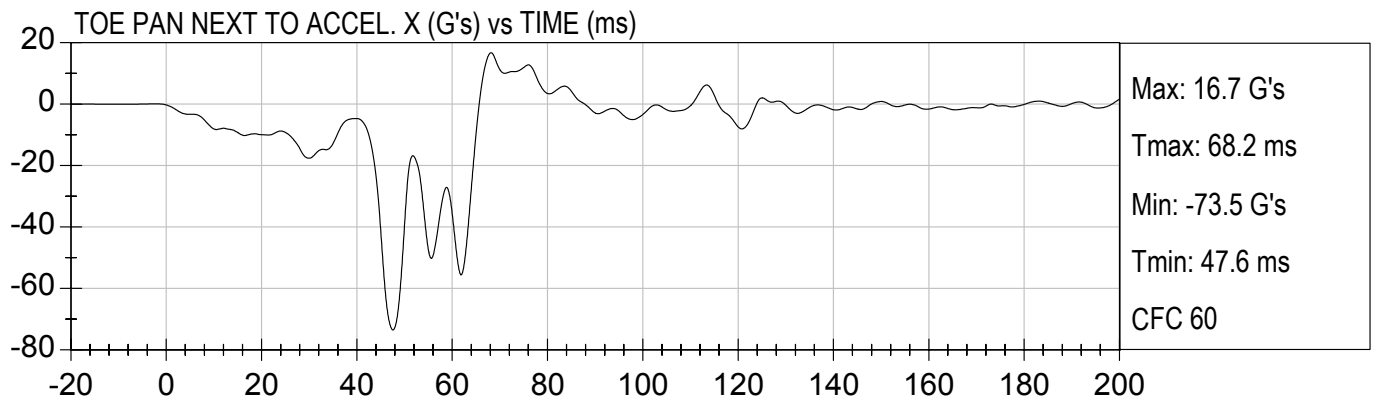
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

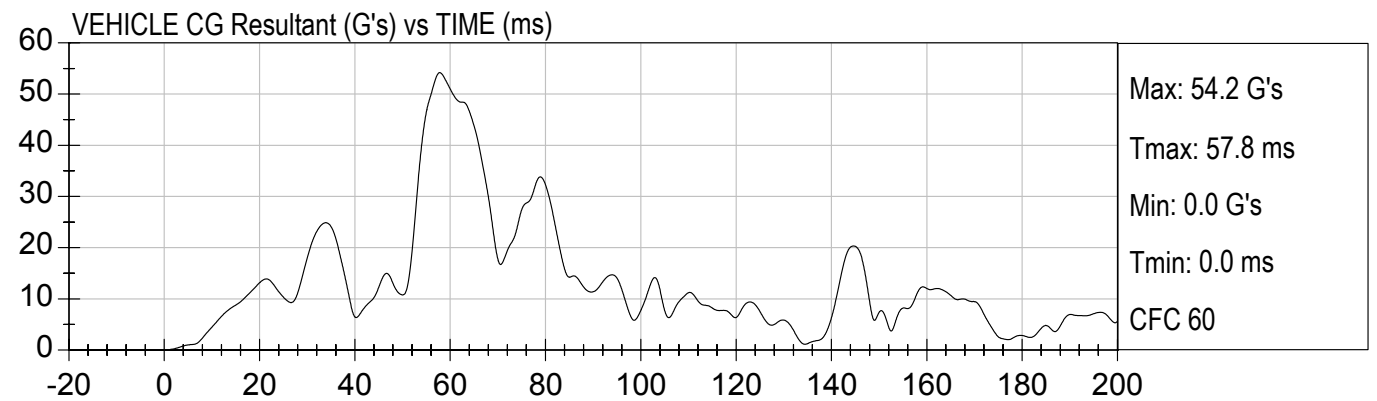
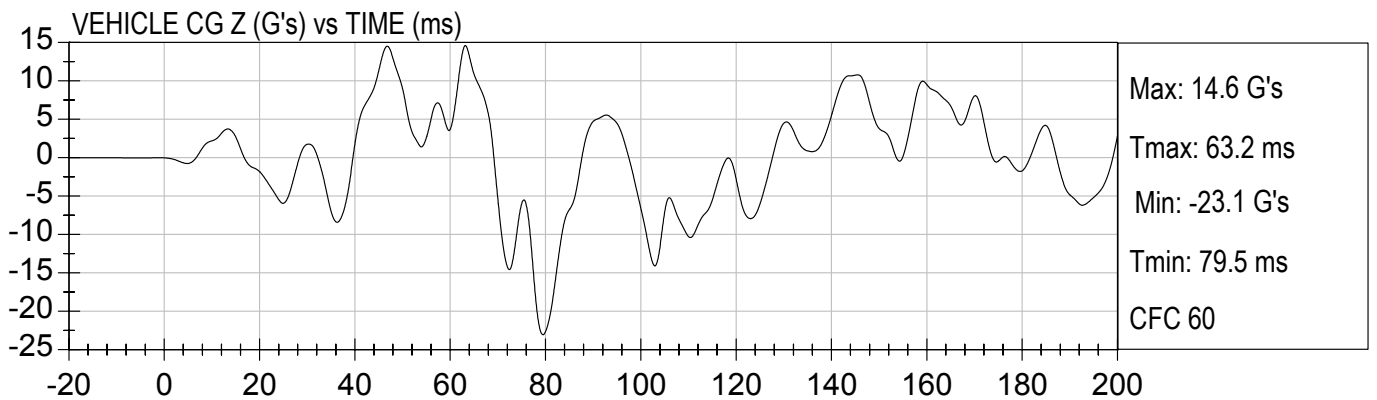
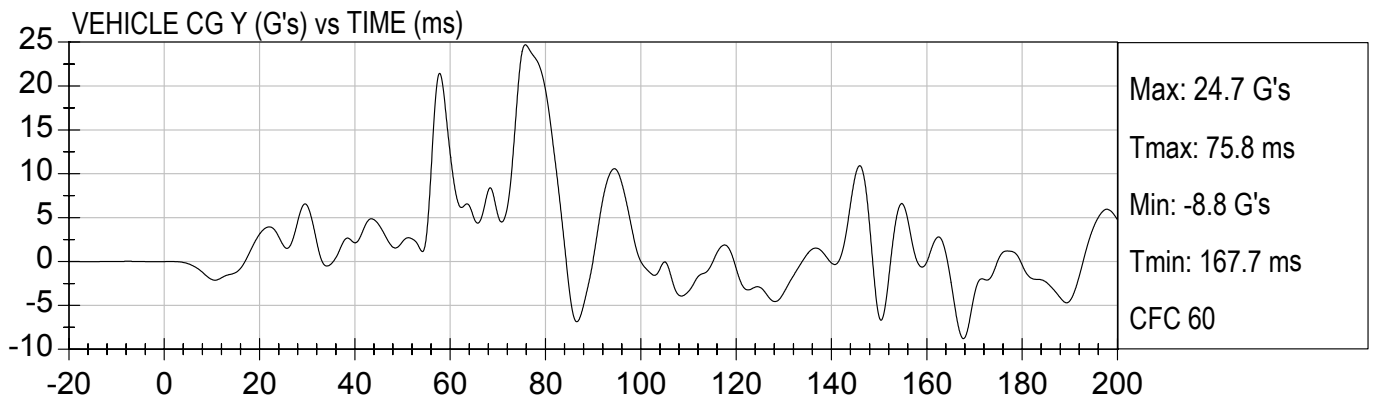
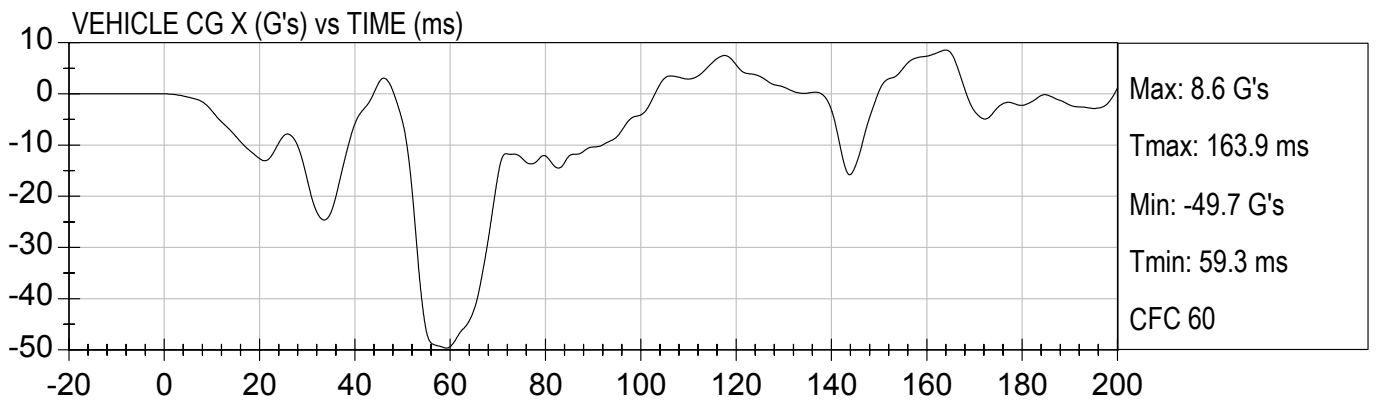
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

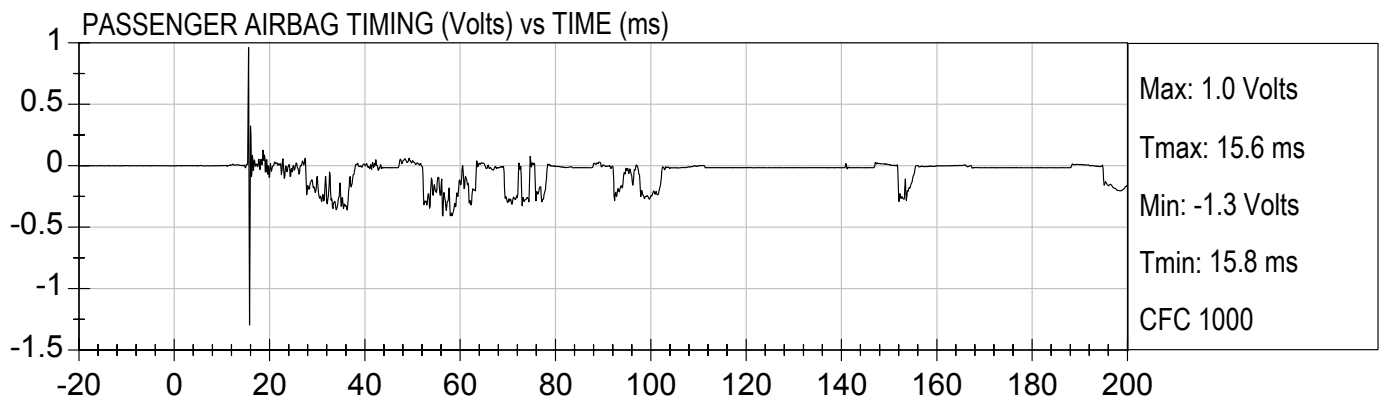
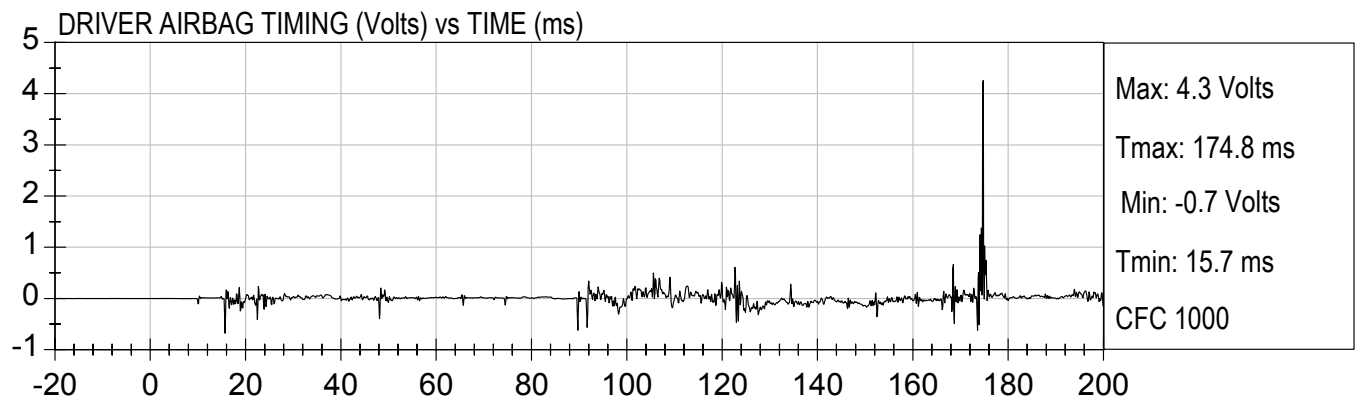
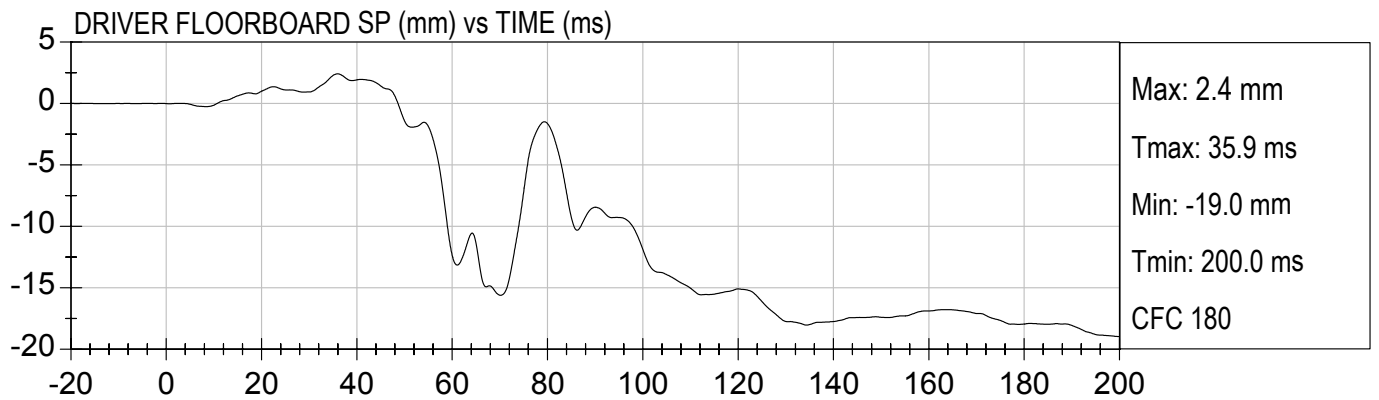
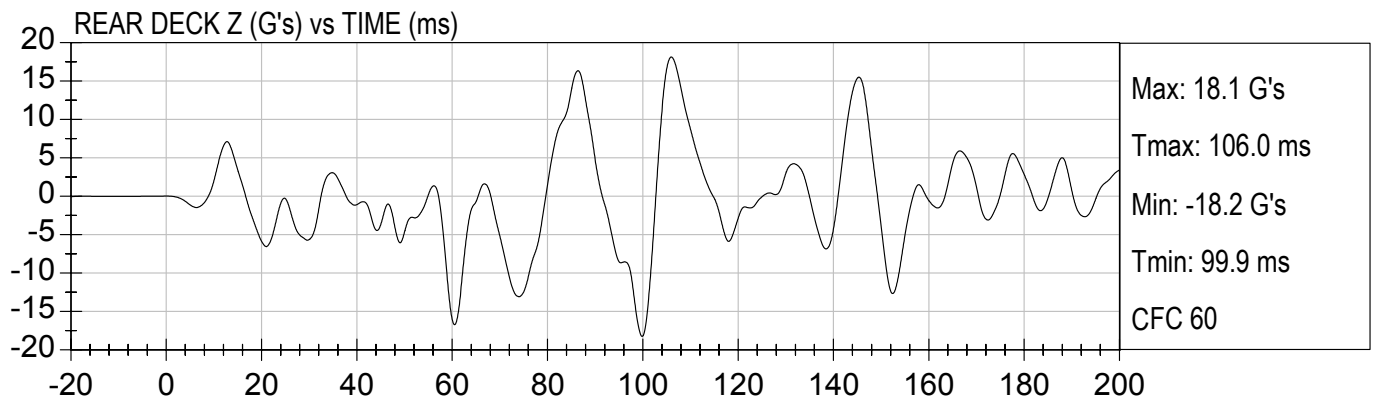
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

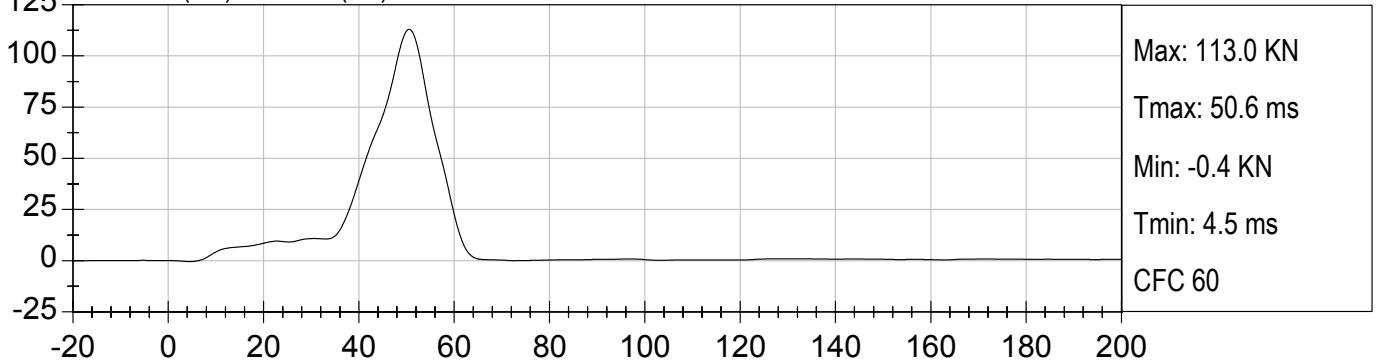




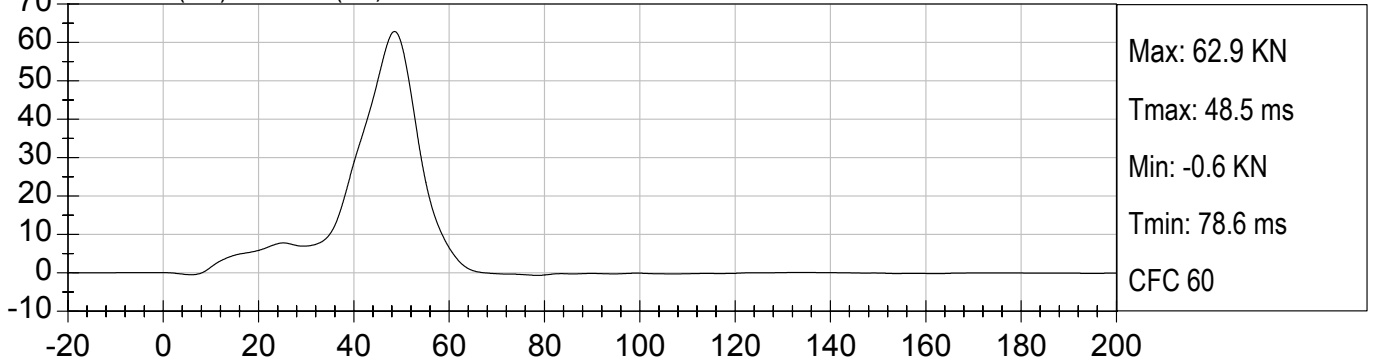
100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

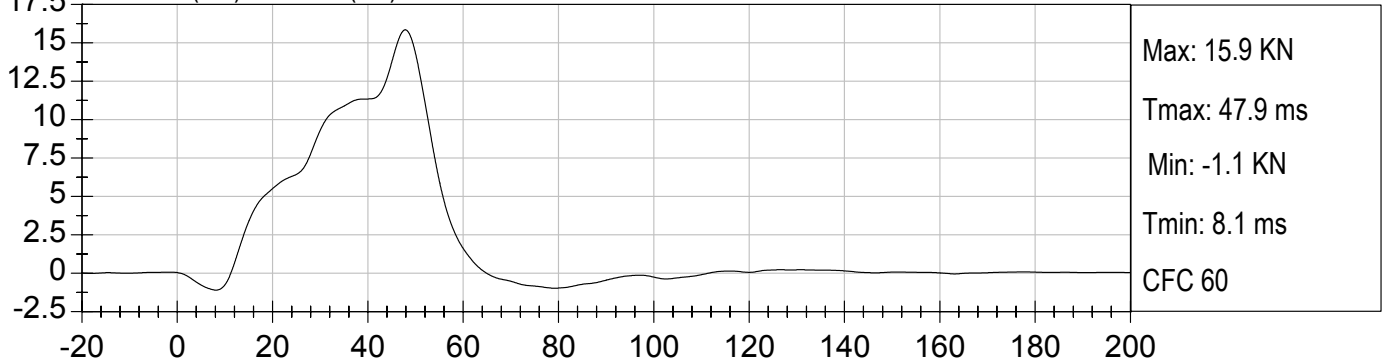
MDB 1-2 (KN) vs TIME (ms)



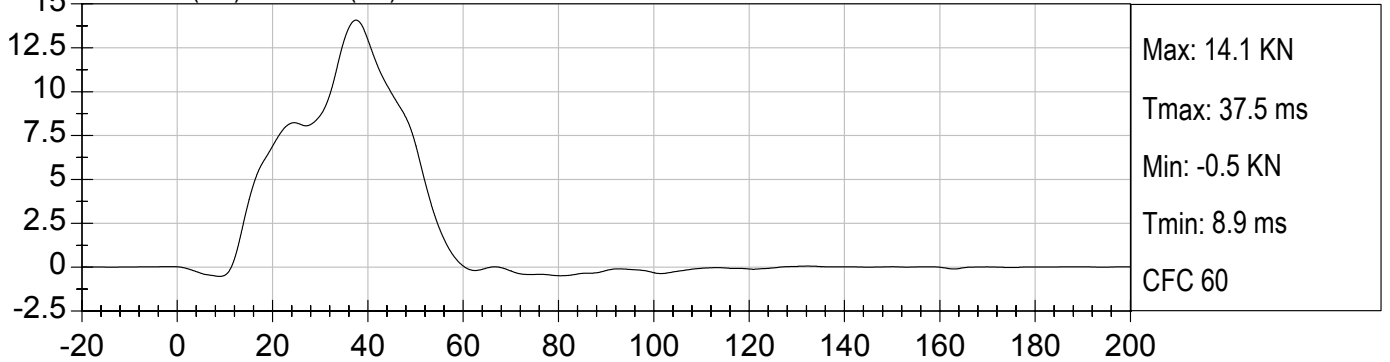
MDB 1-3 (KN) vs TIME (ms)



MDB 1-4 (KN) vs TIME (ms)



MDB 1-5 (KN) vs TIME (ms)

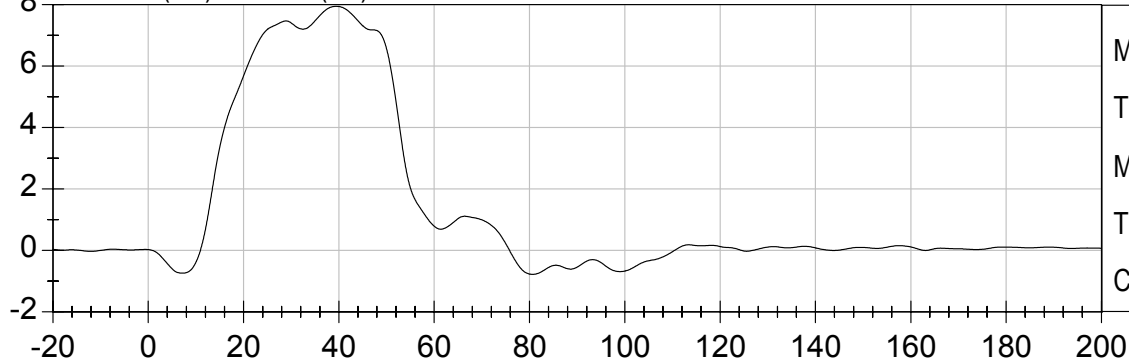




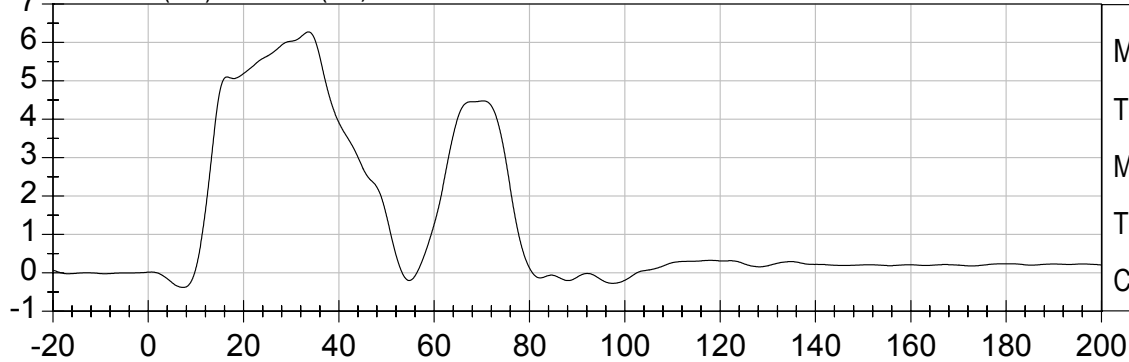
100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

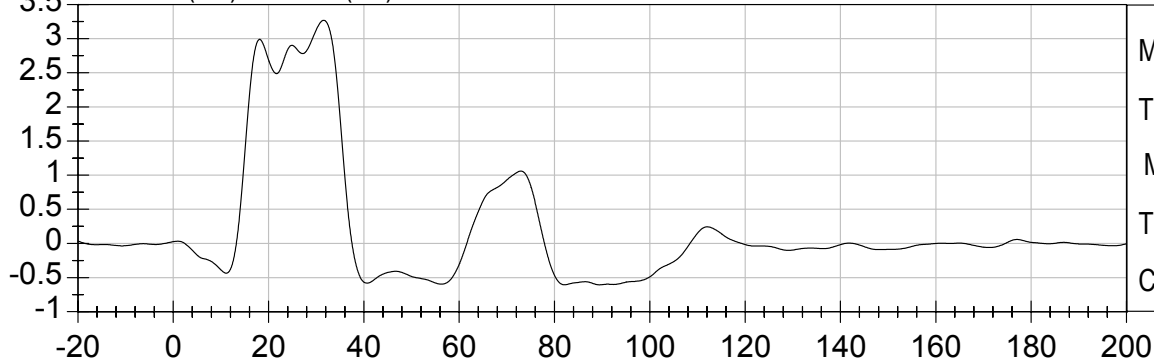
MDB 1-6 (KN) vs TIME (ms)



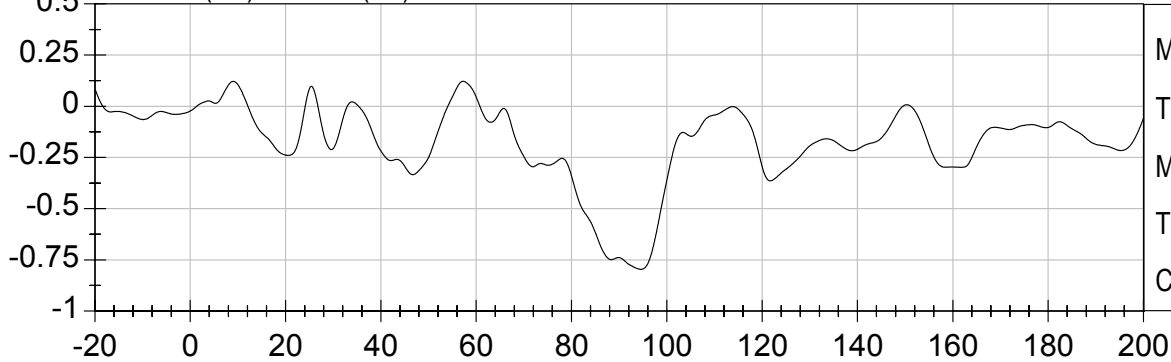
MDB 1-7 (KN) vs TIME (ms)



MDB 1-8 (KN) vs TIME (ms)



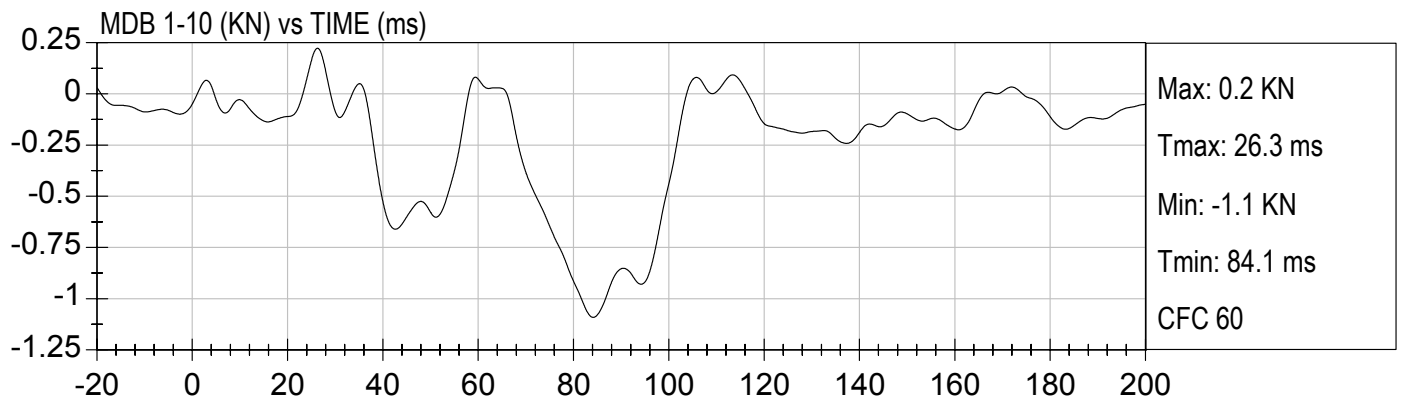
MDB 1-9 (KN) vs TIME (ms)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

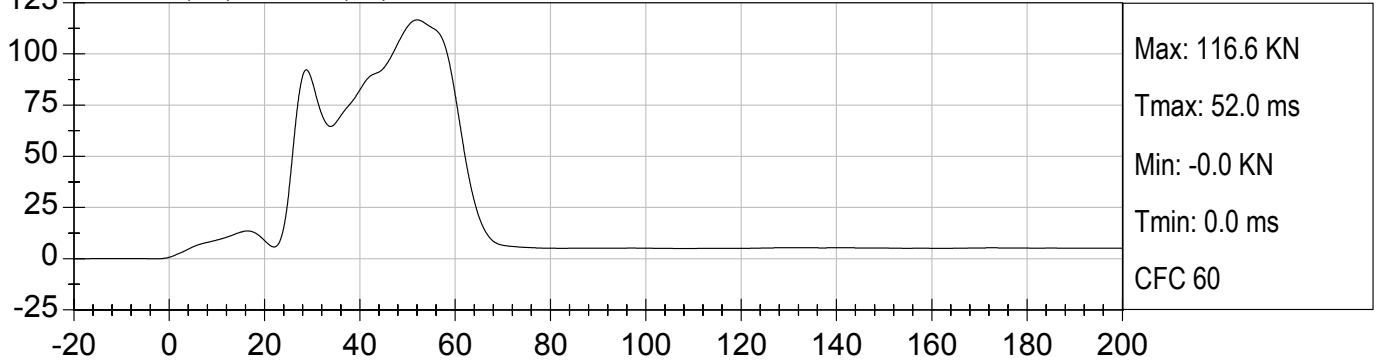




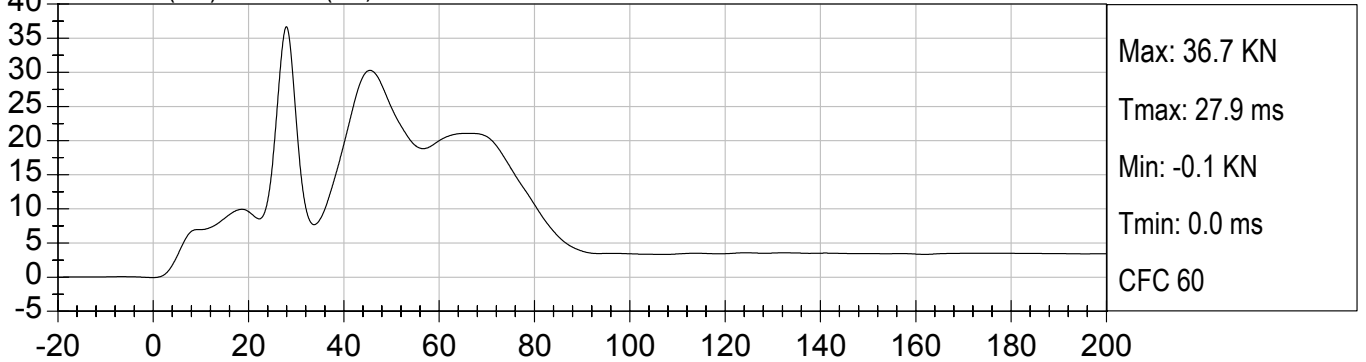
100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

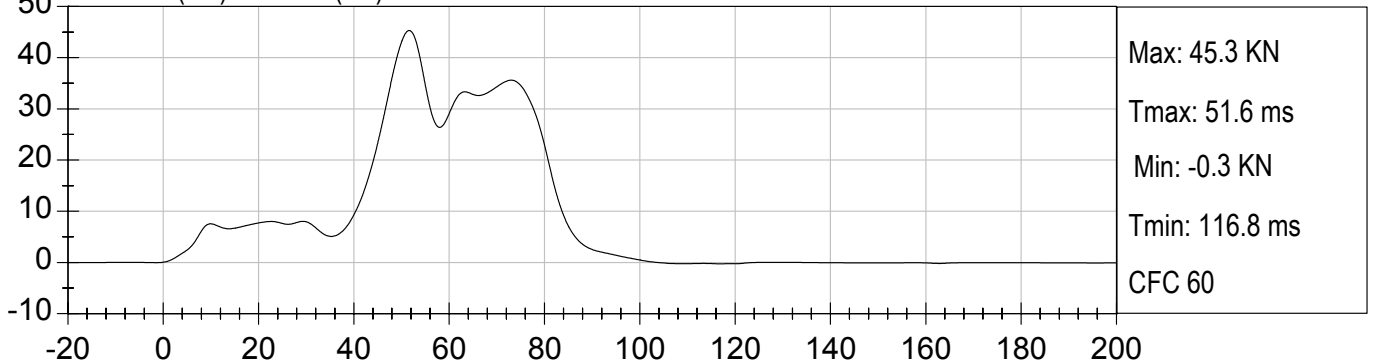
MDB 2-2 (KN) vs TIME (ms)



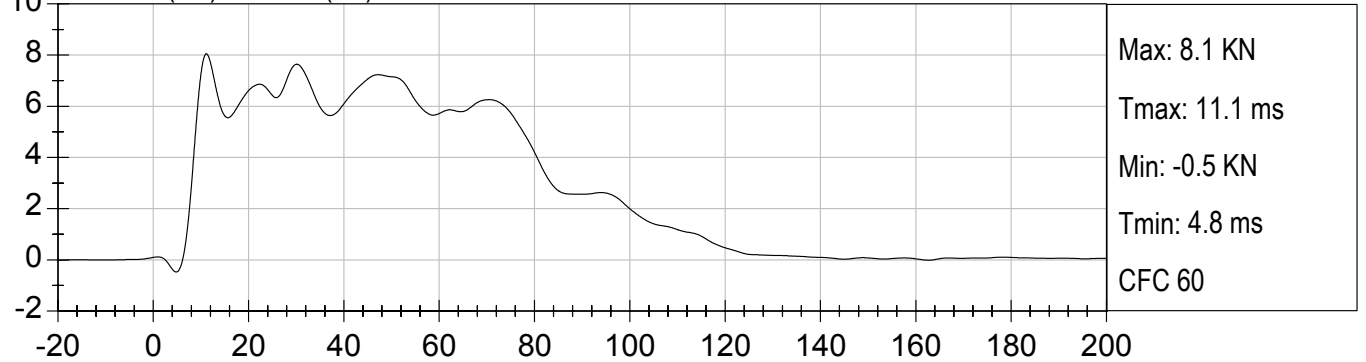
MDB 2-3 (KN) vs TIME (ms)



MDB 2-4 (KN) vs TIME (ms)



MDB 2-5 (KN) vs TIME (ms)

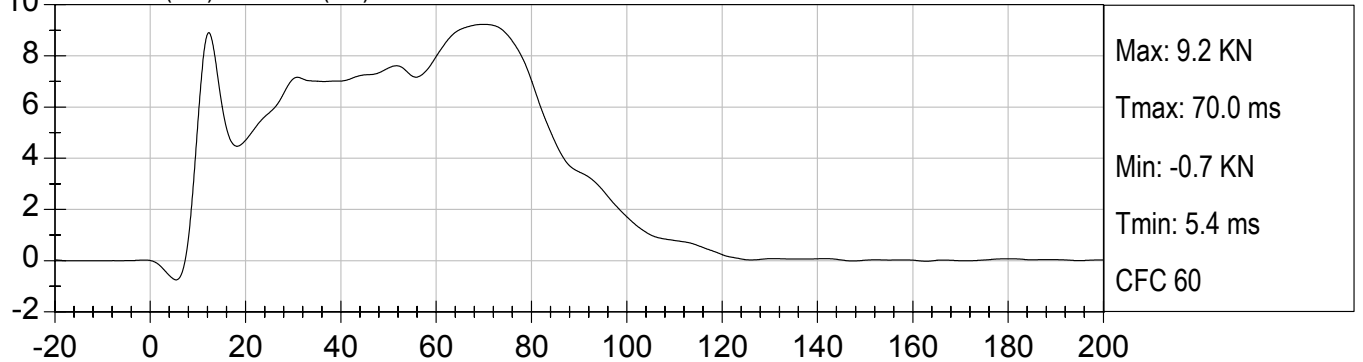




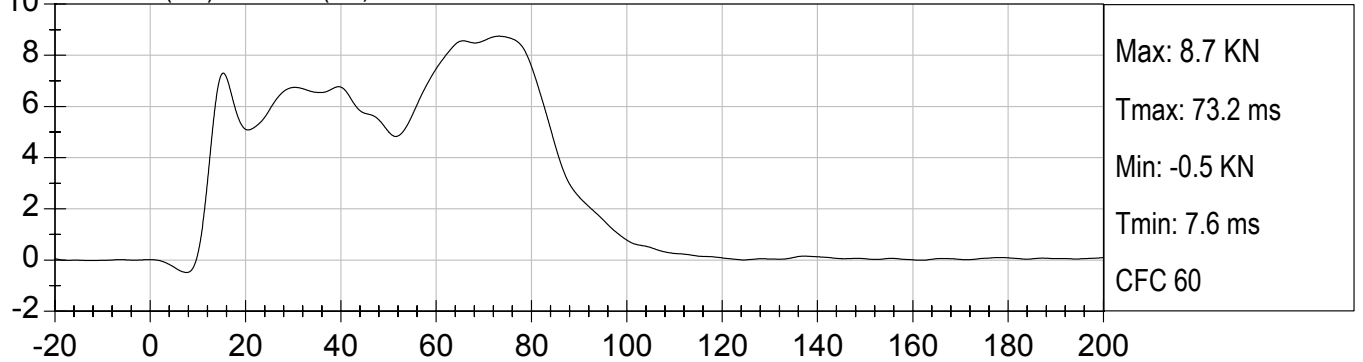
100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

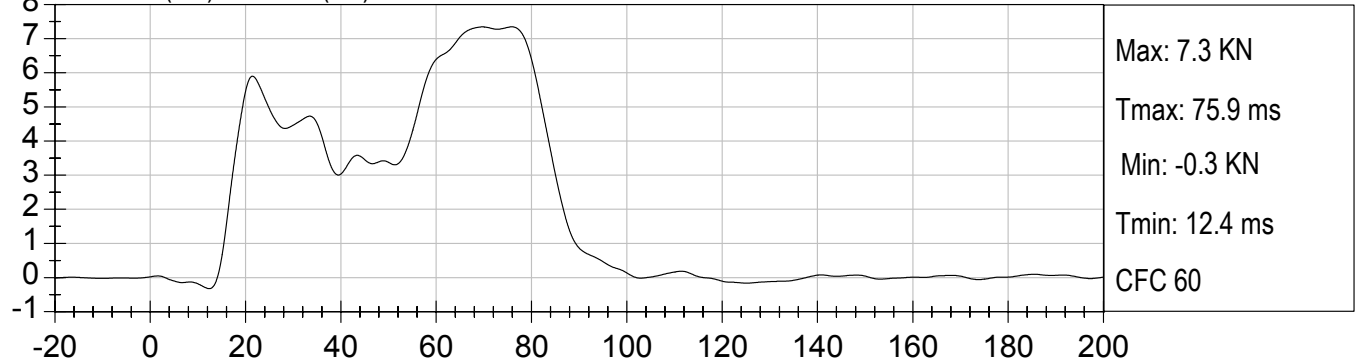
MDB 2-6 (KN) vs TIME (ms)



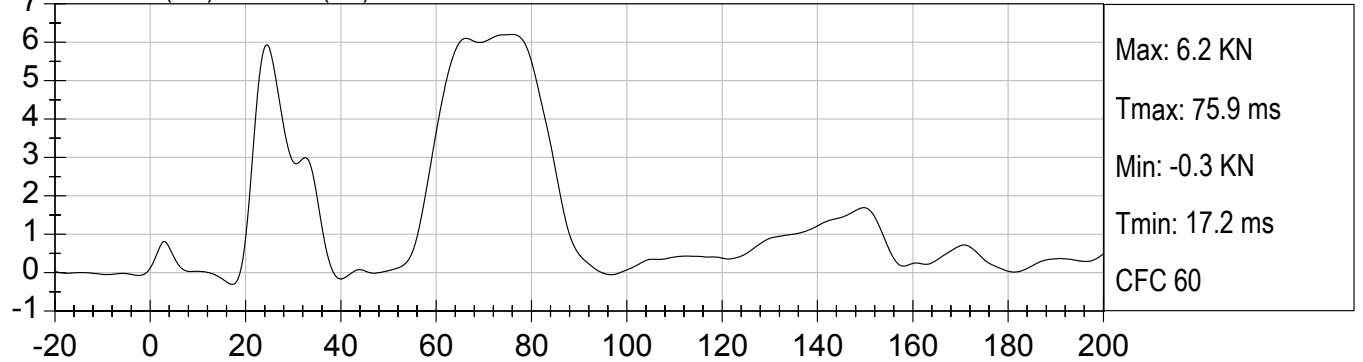
MDB 2-7 (KN) vs TIME (ms)



MDB 2-8 (KN) vs TIME (ms)



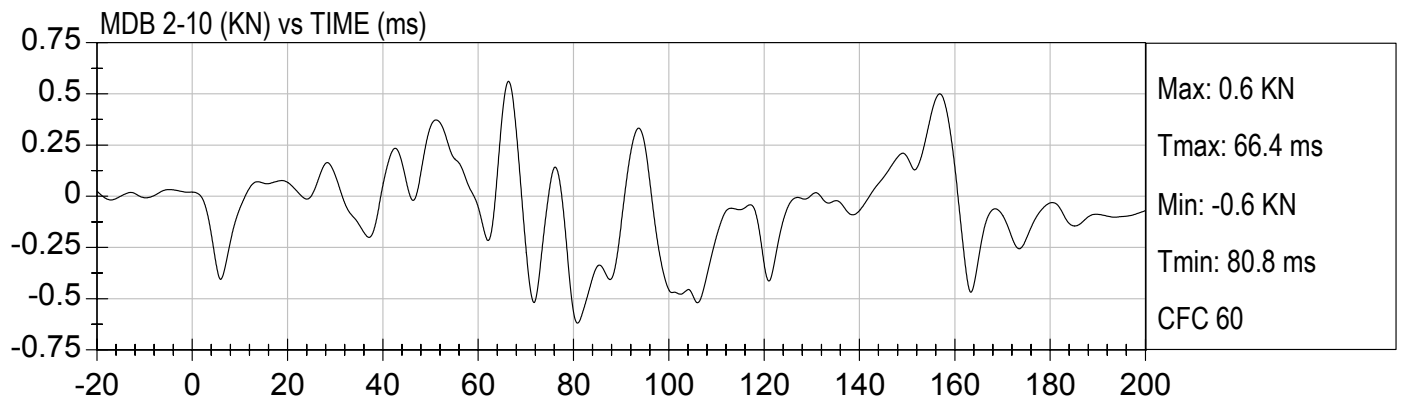
MDB 2-9 (KN) vs TIME (ms)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

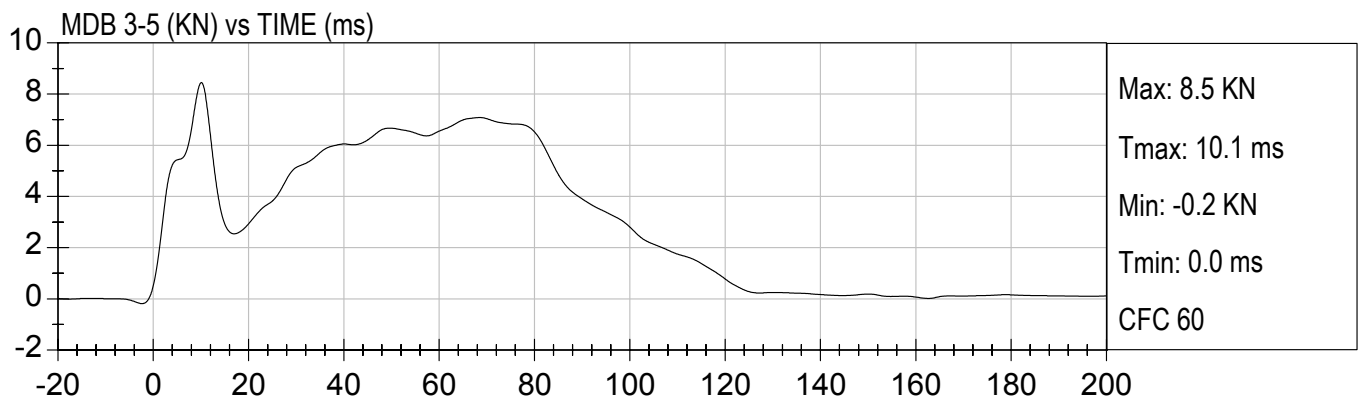
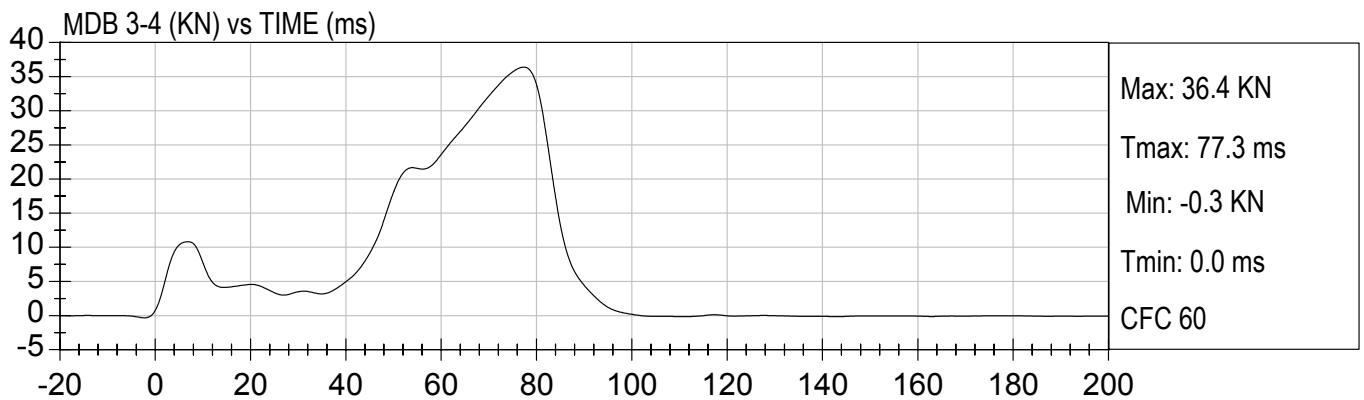
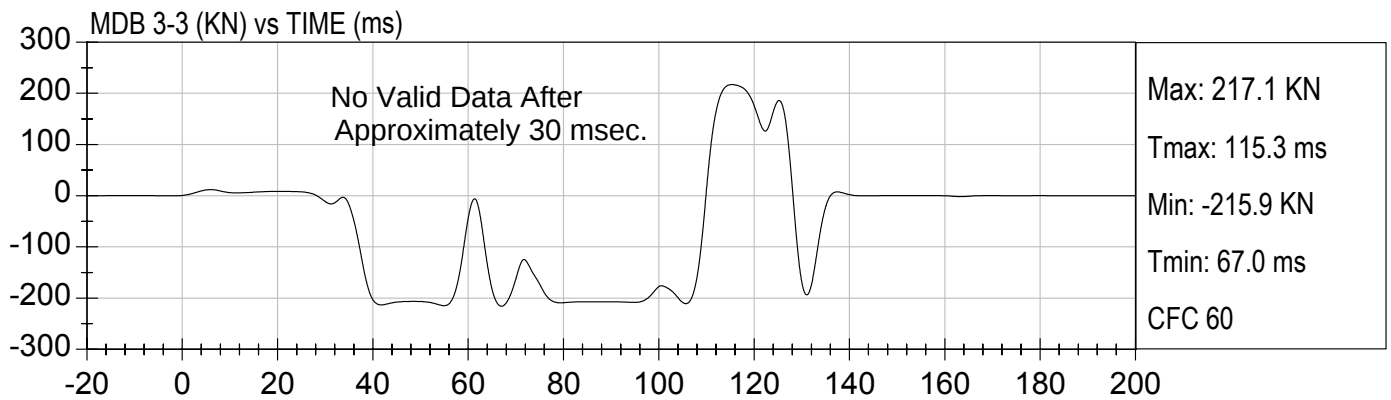
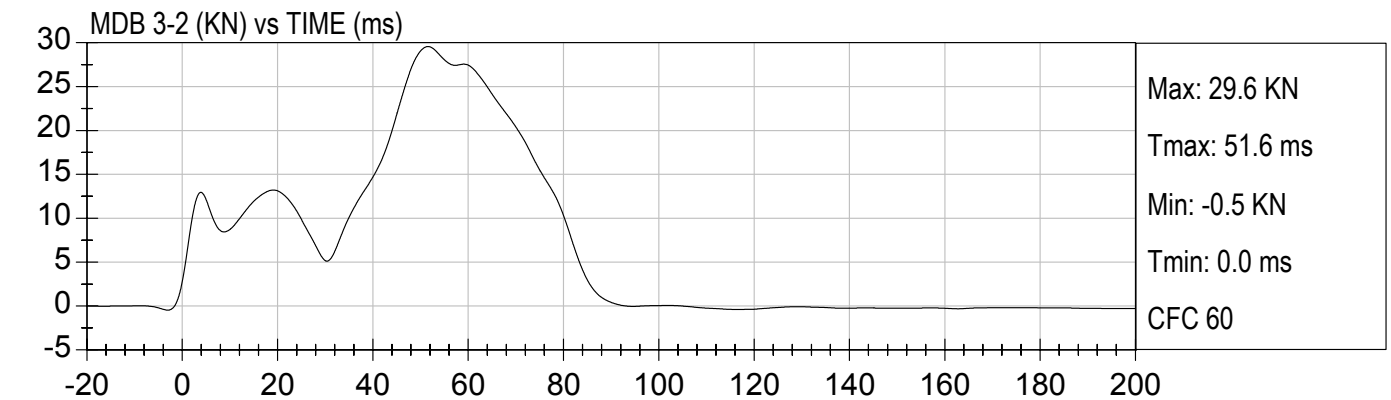
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

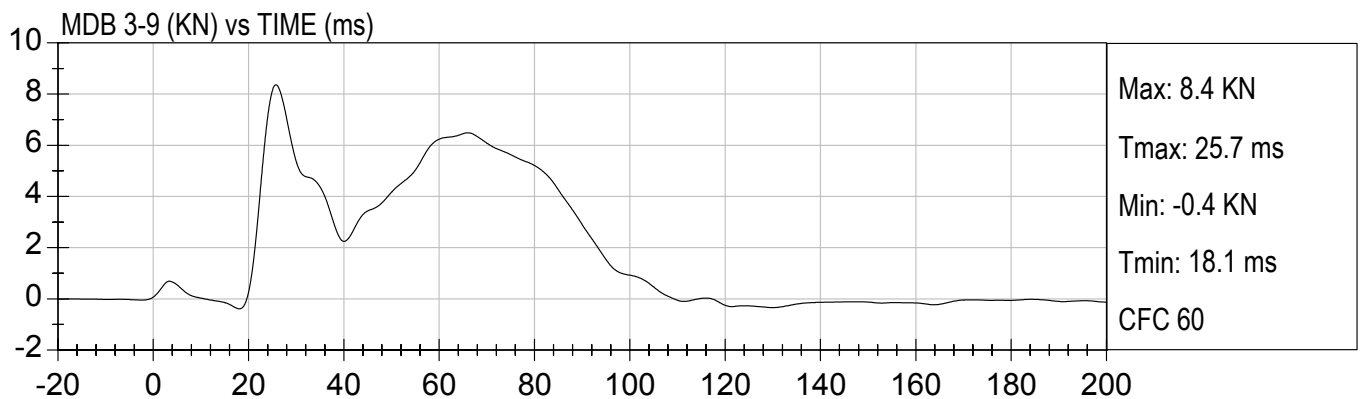
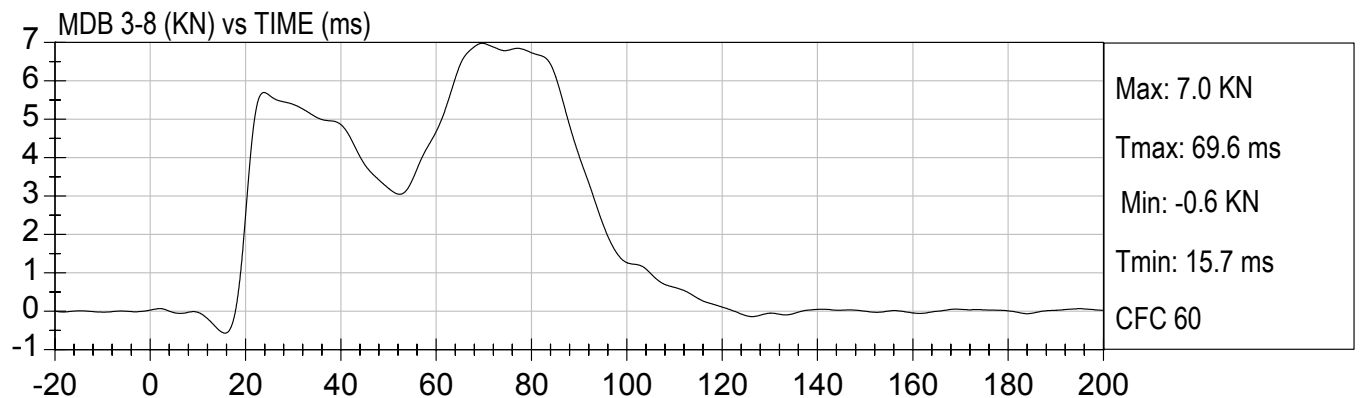
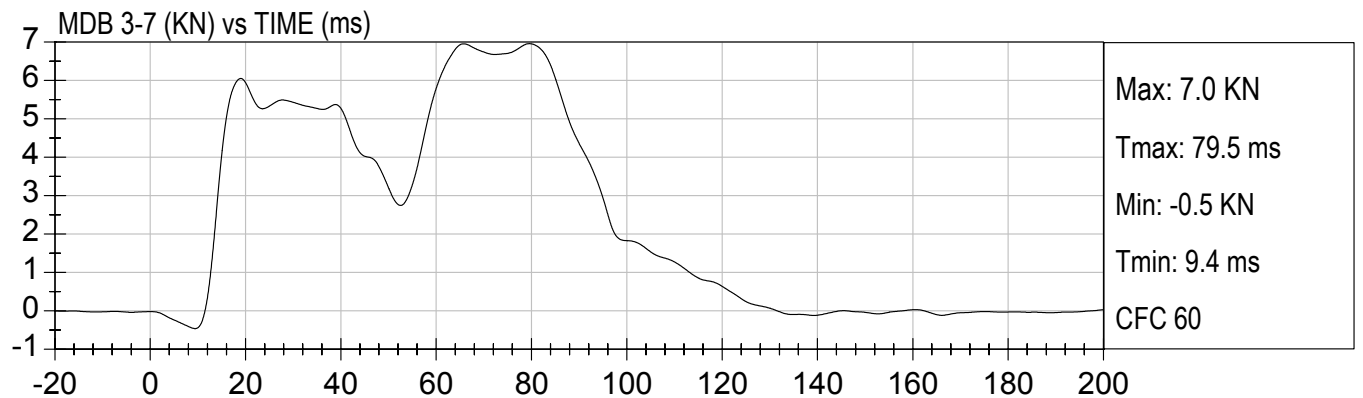
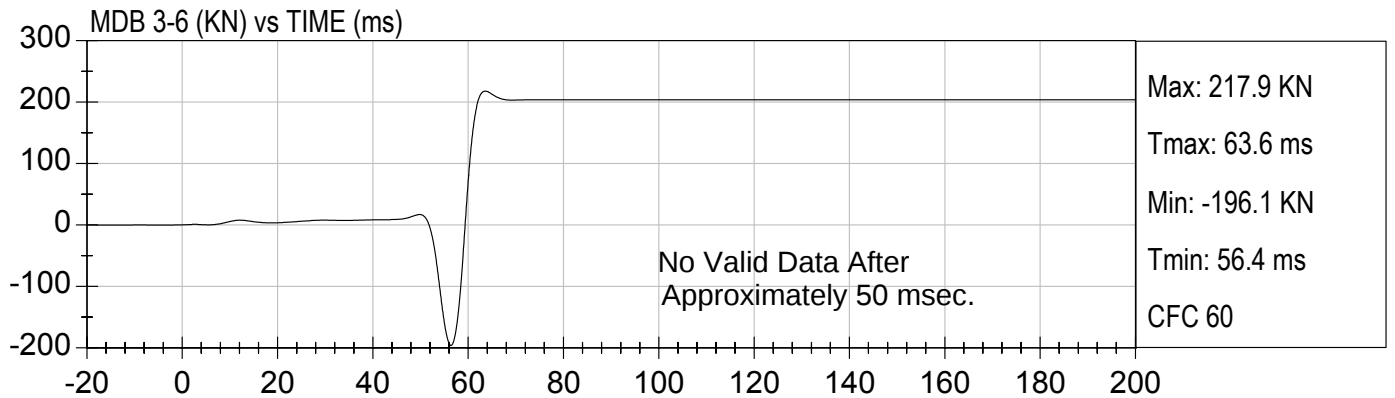
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

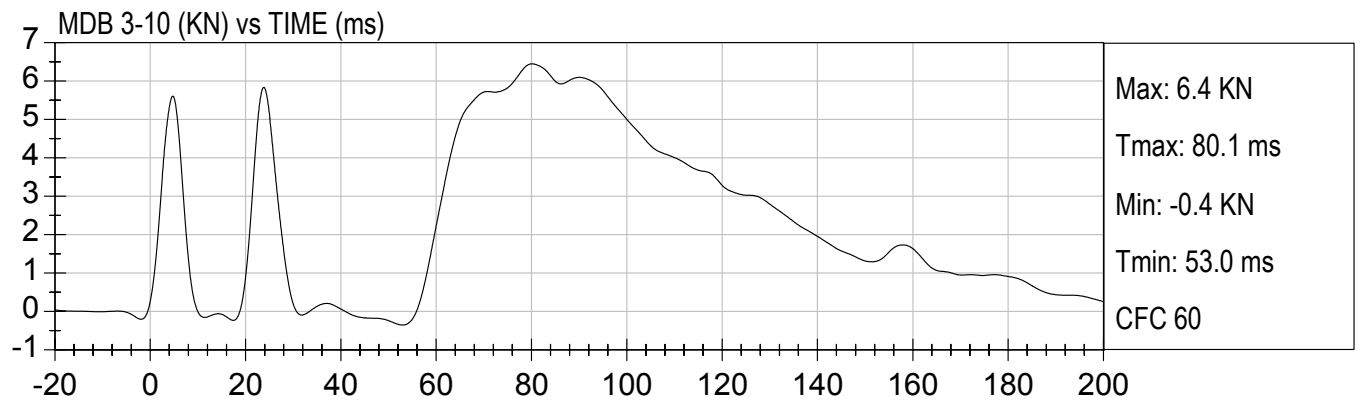
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

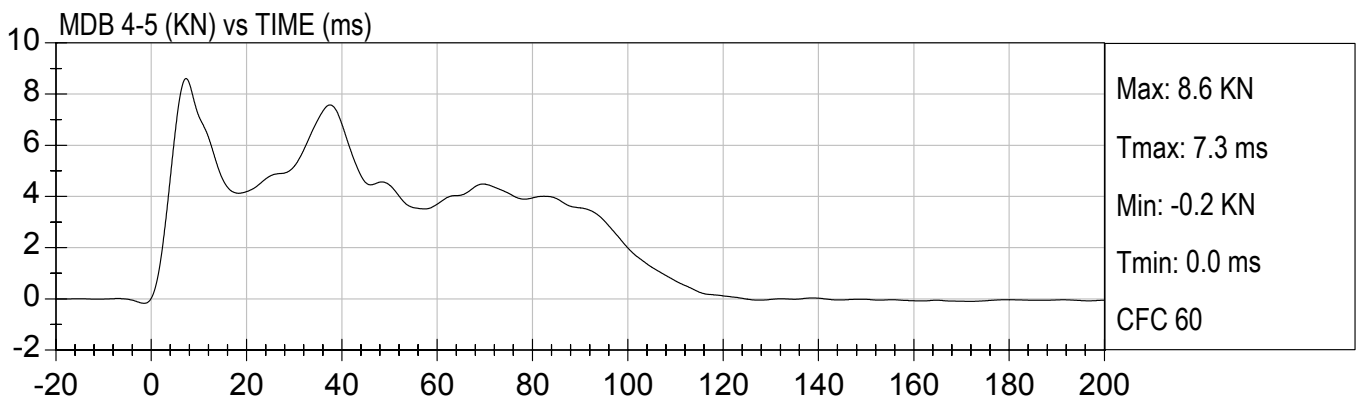
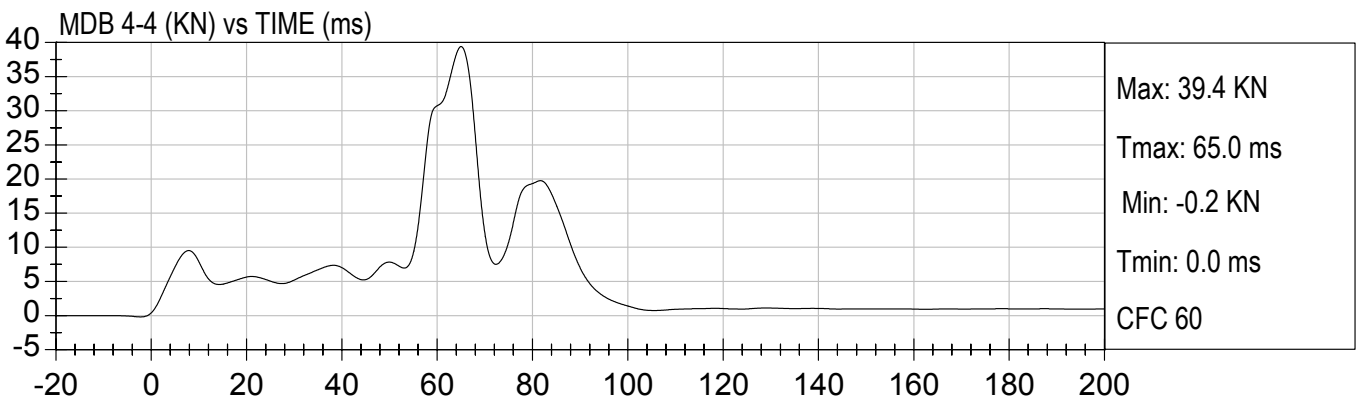
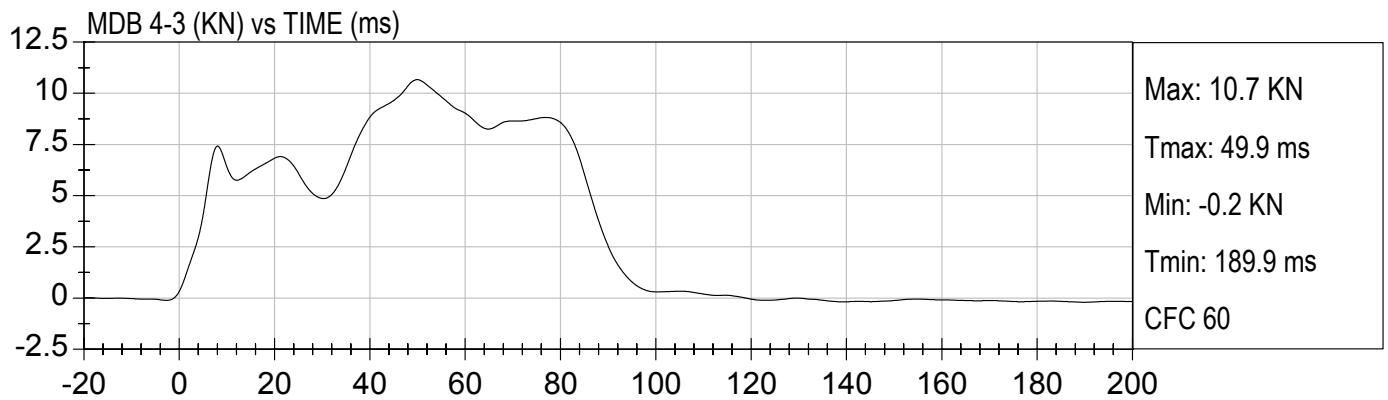
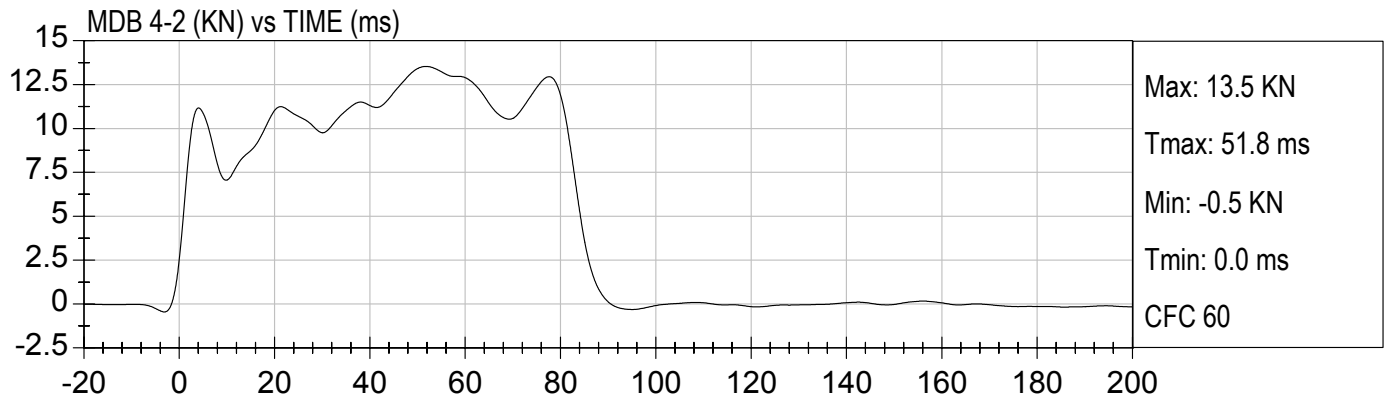
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

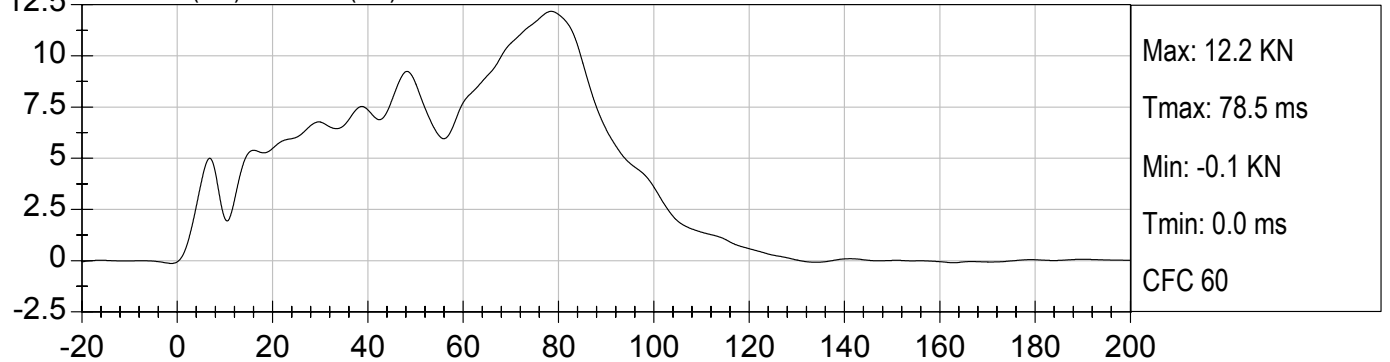




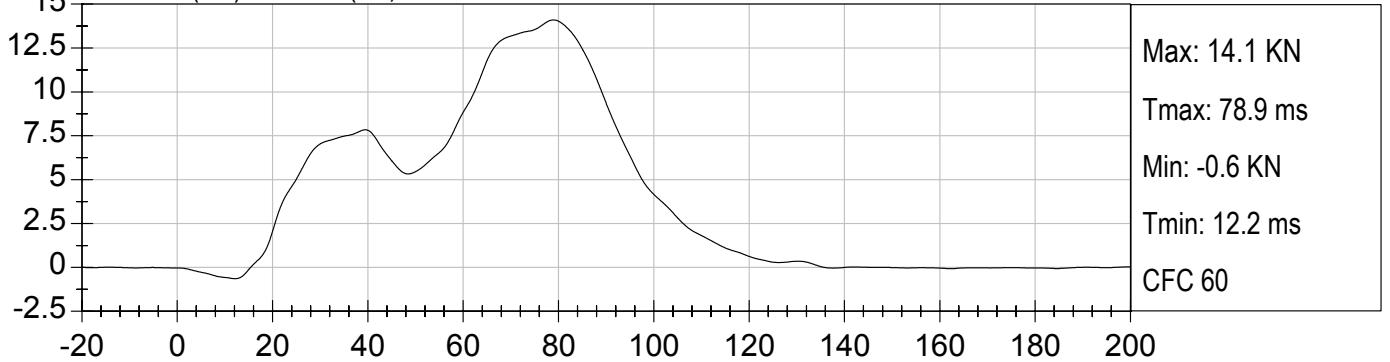
100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

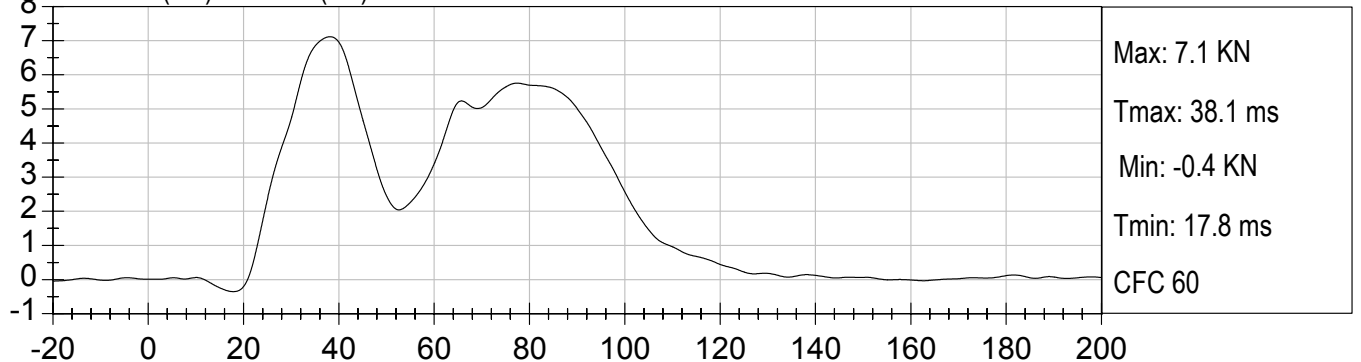
MDB 4-6 (KN) vs TIME (ms)



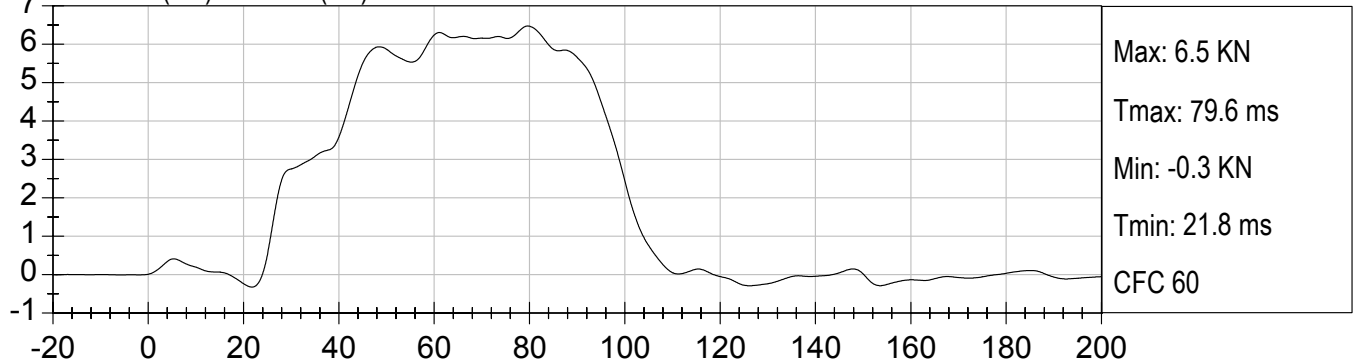
MDB 4-7 (KN) vs TIME (ms)



MDB 4-8 (KN) vs TIME (ms)



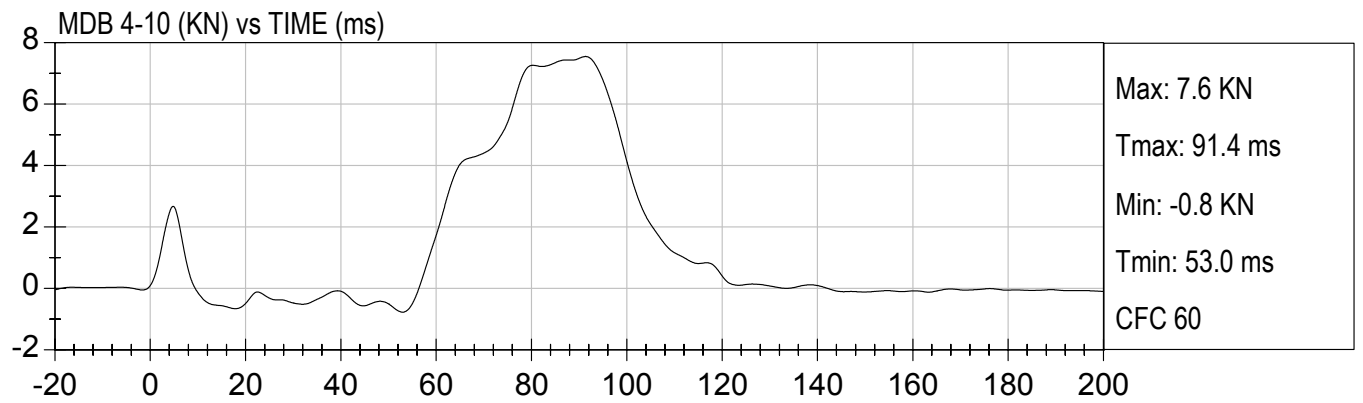
MDB 4-9 (KN) vs TIME (ms)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

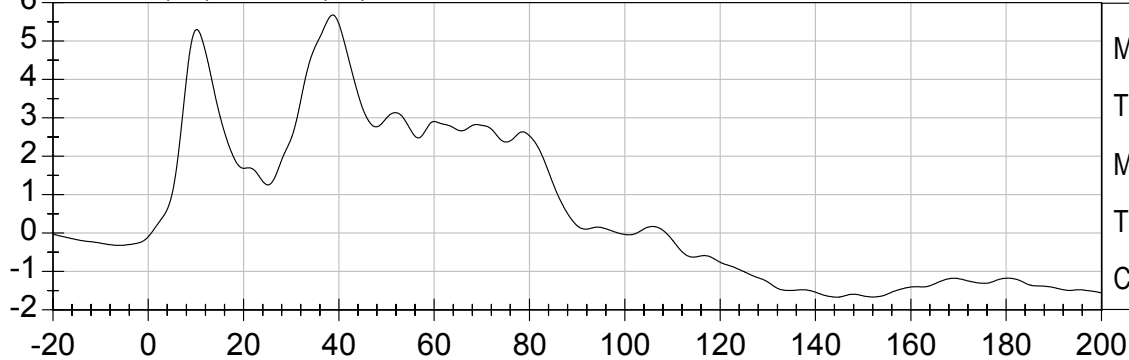




100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

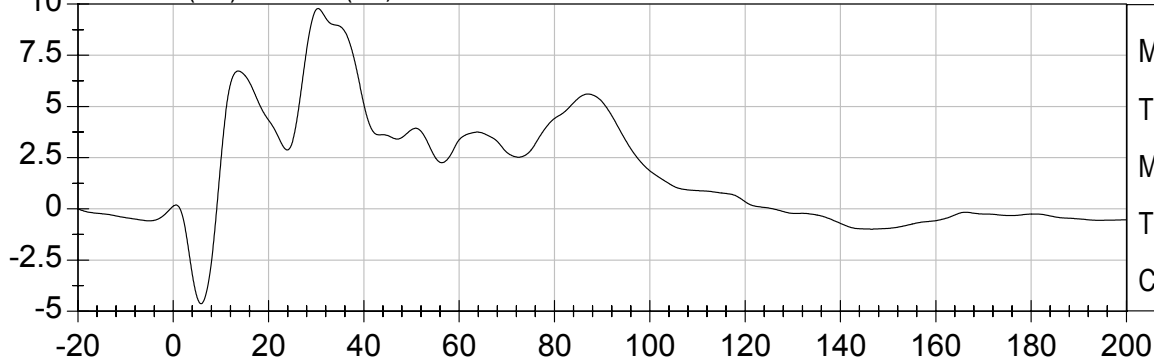
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

MDB 5-2 (KN) vs TIME (ms)



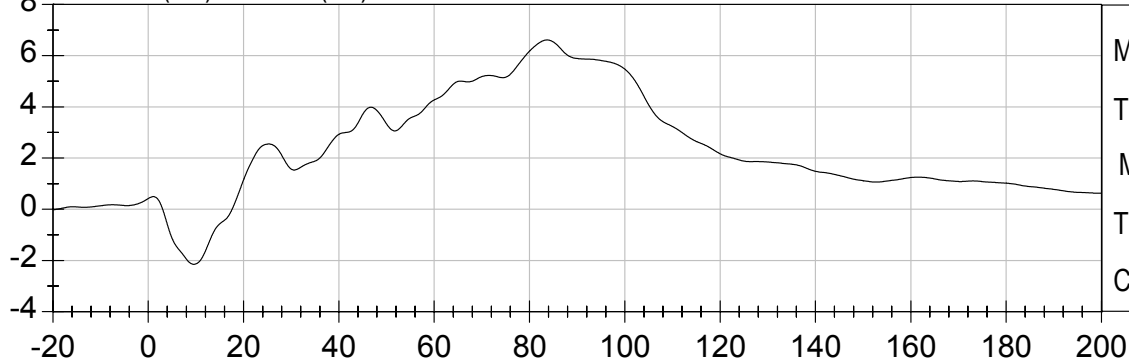
Max: 5.7 KN
Tmax: 38.7 ms
Min: -1.7 KN
Tmin: 144.4 ms
CFC 60

MDB 5-4 (KN) vs TIME (ms)



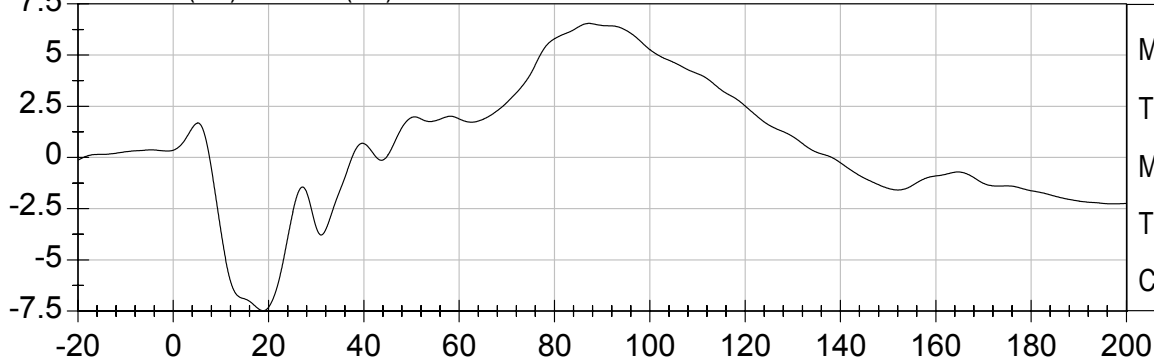
Max: 9.8 KN
Tmax: 30.4 ms
Min: -4.6 KN
Tmin: 5.8 ms
CFC 60

MDB 5-8 (KN) vs TIME (ms)



Max: 6.6 KN
Tmax: 83.7 ms
Min: -2.1 KN
Tmin: 9.6 ms
CFC 60

MDB 5-9 (KN) vs TIME (ms)

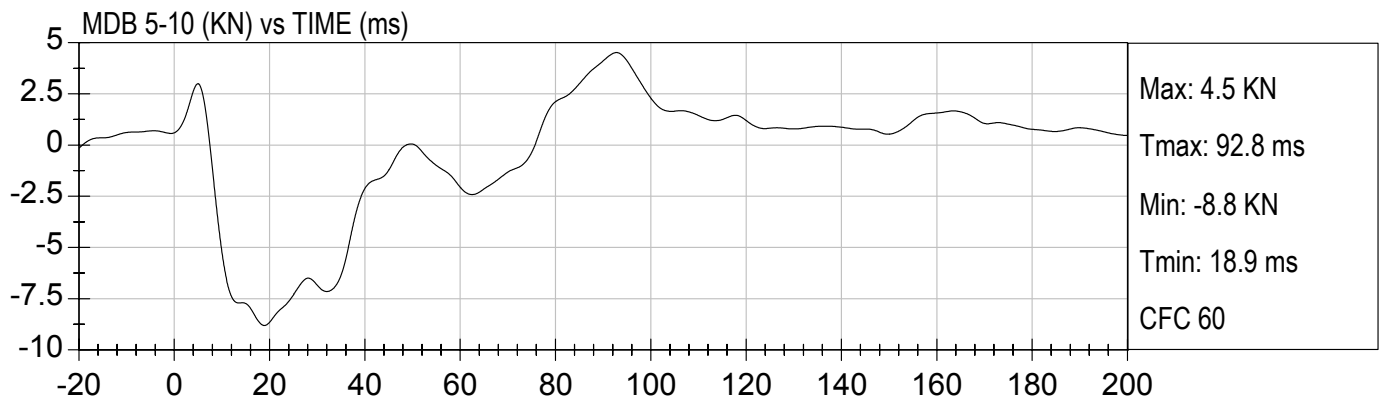


Max: 6.5 KN
Tmax: 87.2 ms
Min: -7.5 KN
Tmin: 18.9 ms
CFC 60



100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

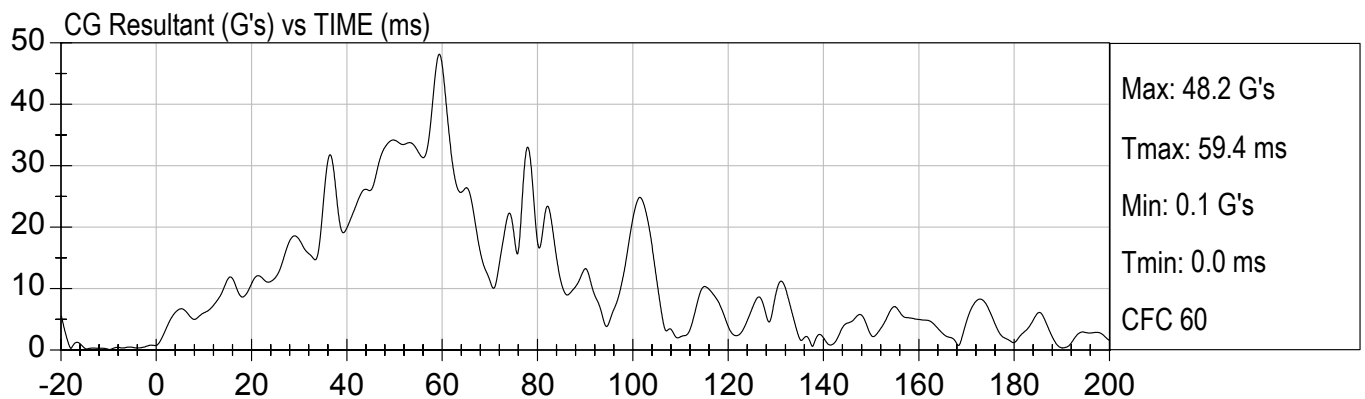
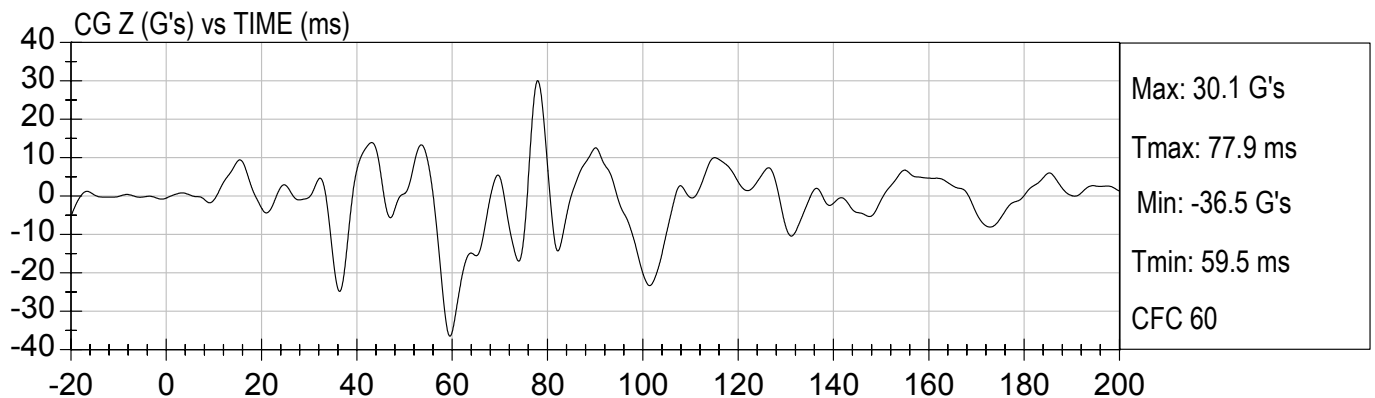
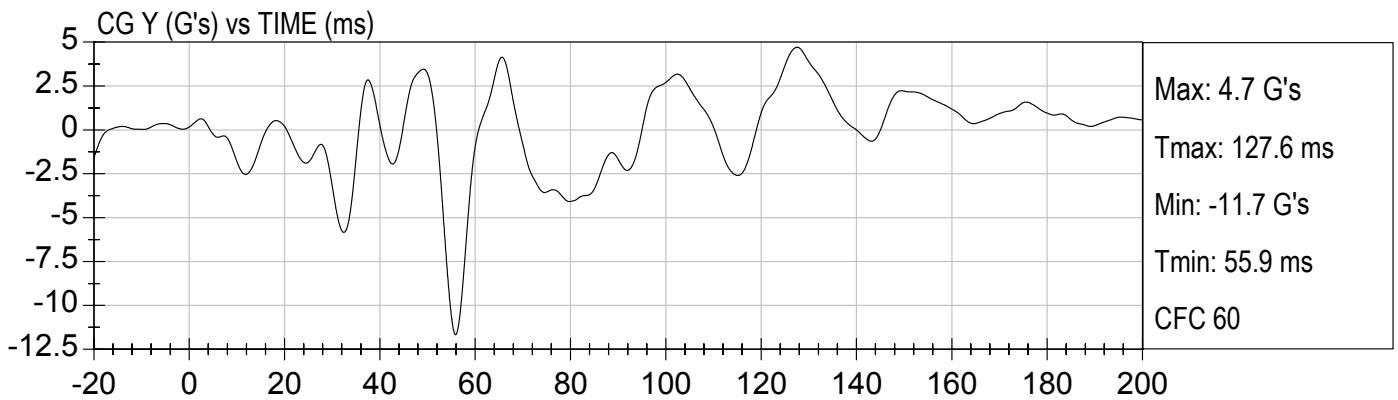
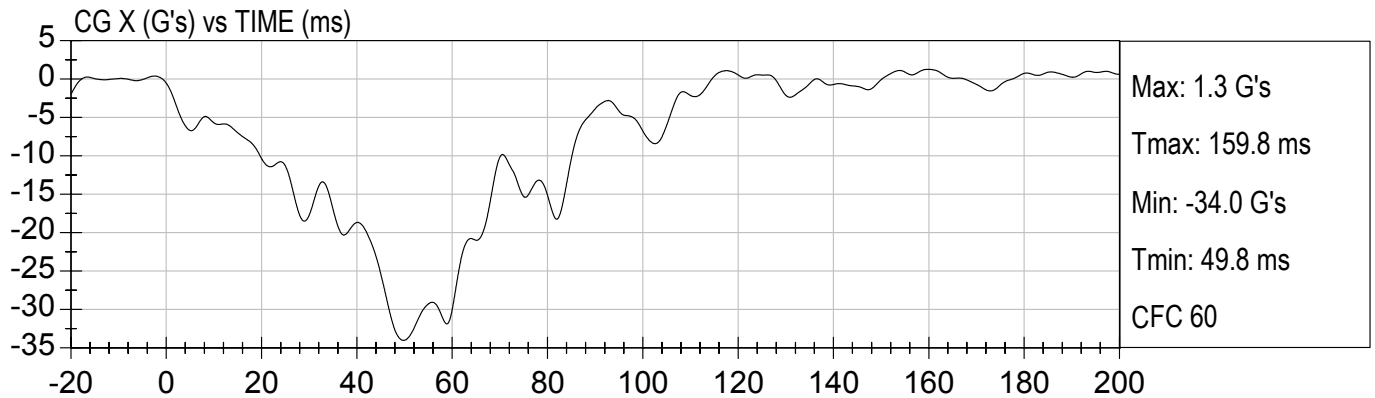
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

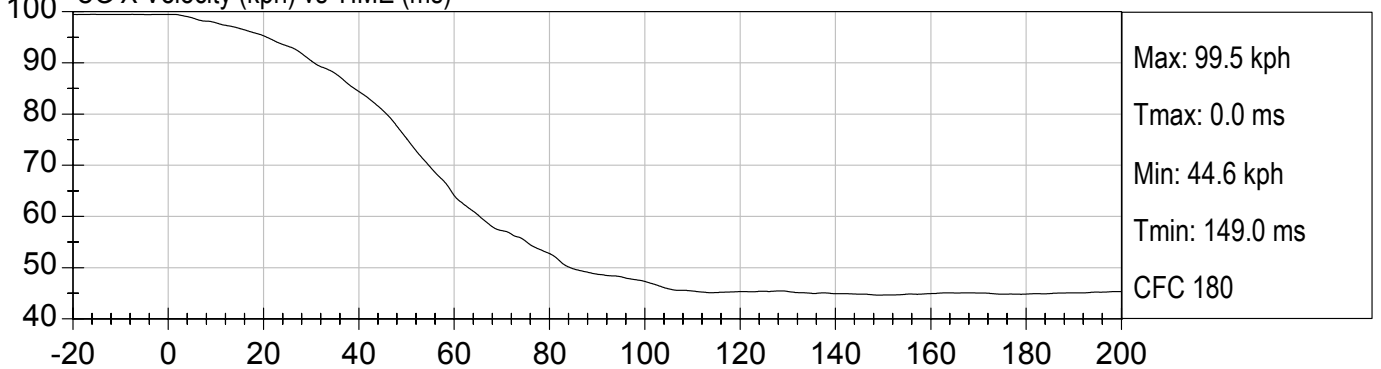




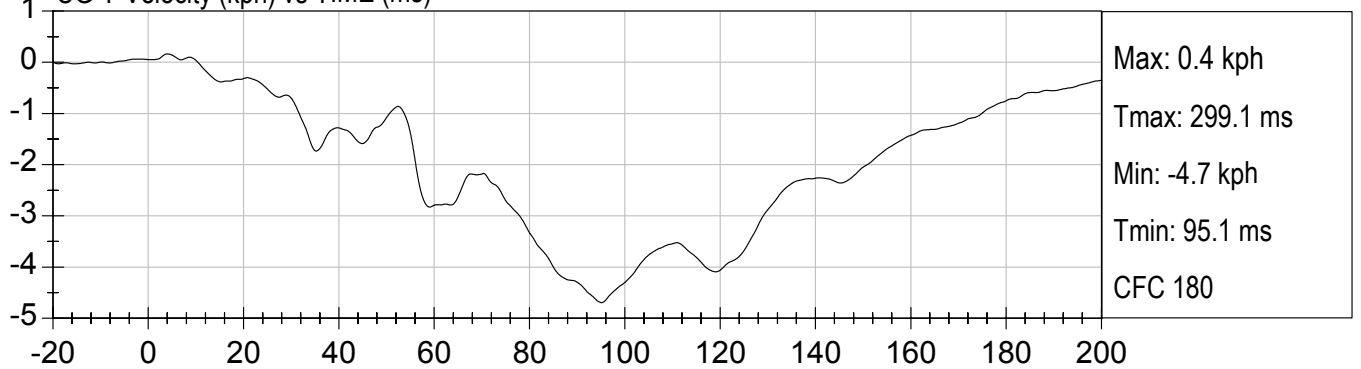
100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)

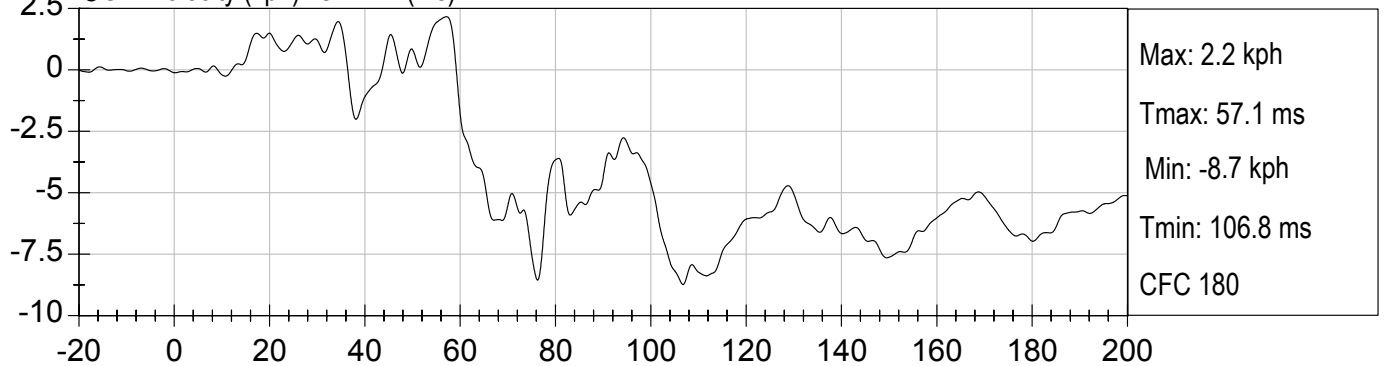
CG X Velocity (kph) vs TIME (ms)



CG Y Velocity (kph) vs TIME (ms)



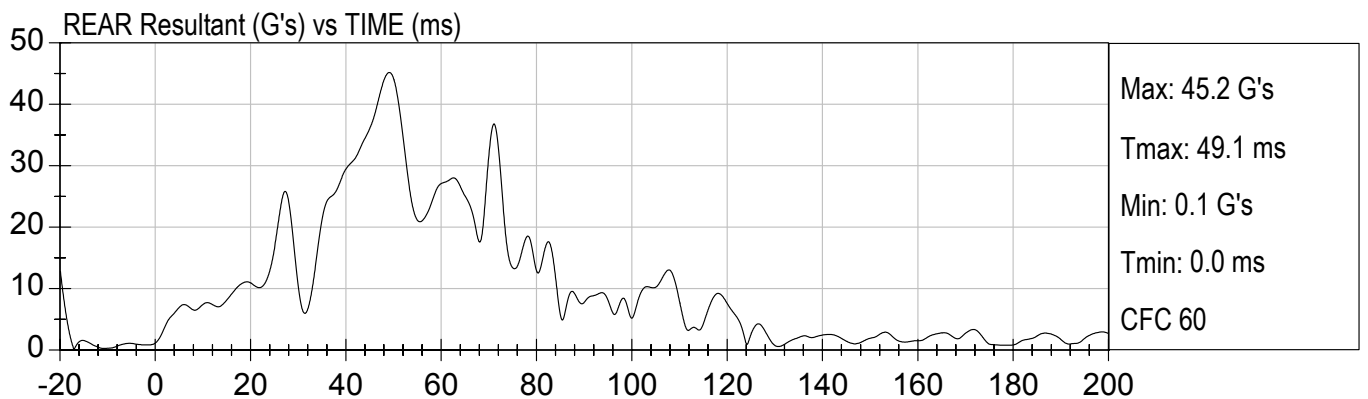
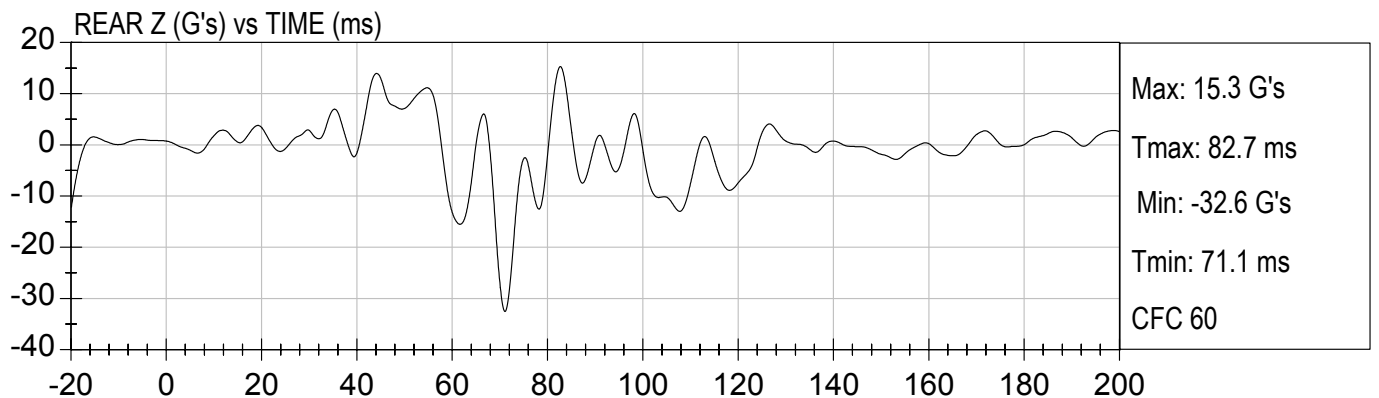
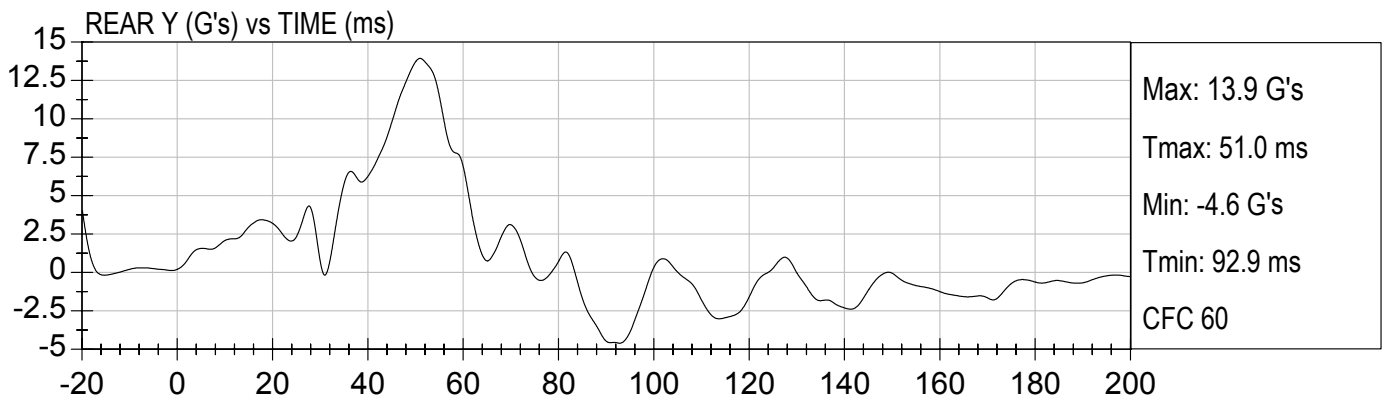
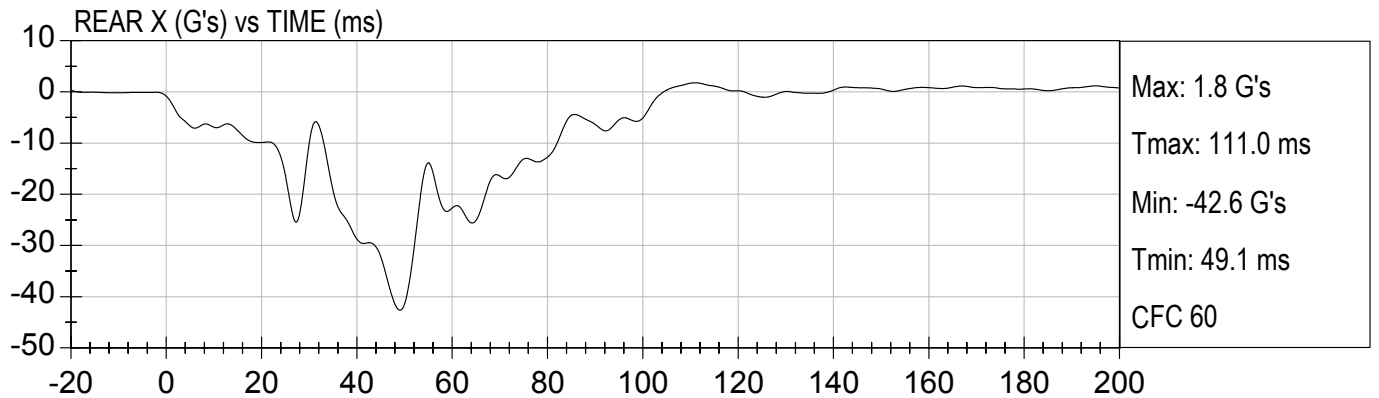
CG Z Velocity (kph) vs TIME (ms)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

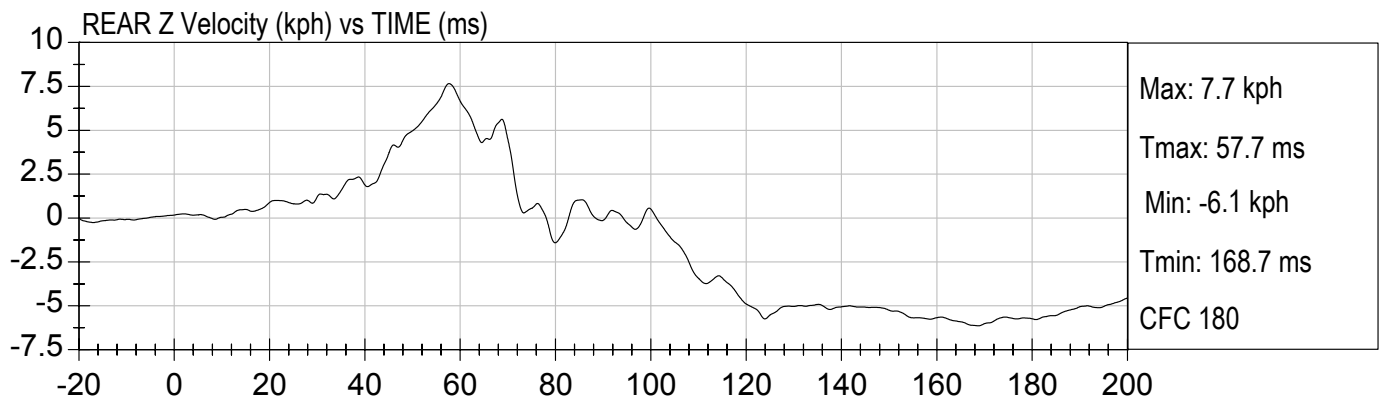
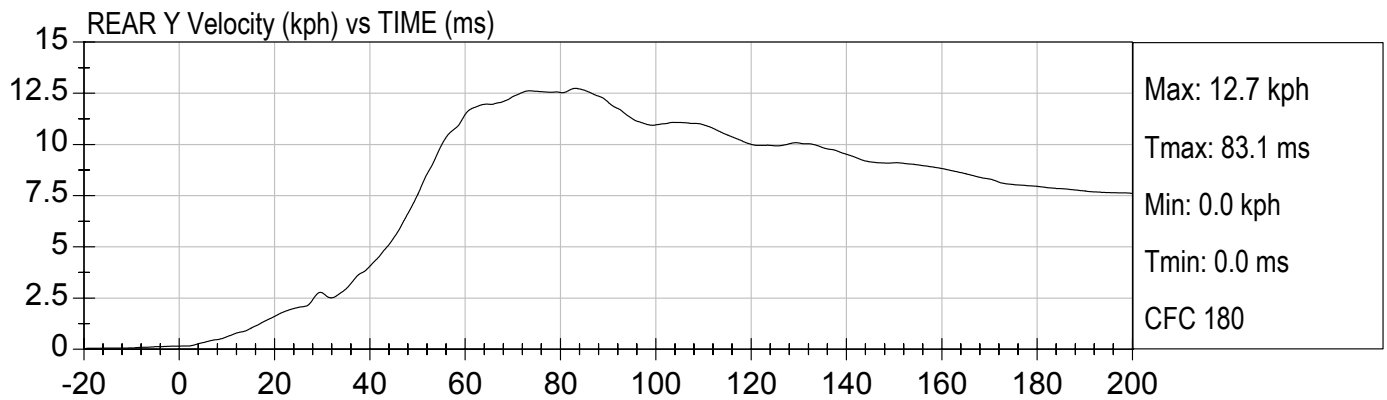
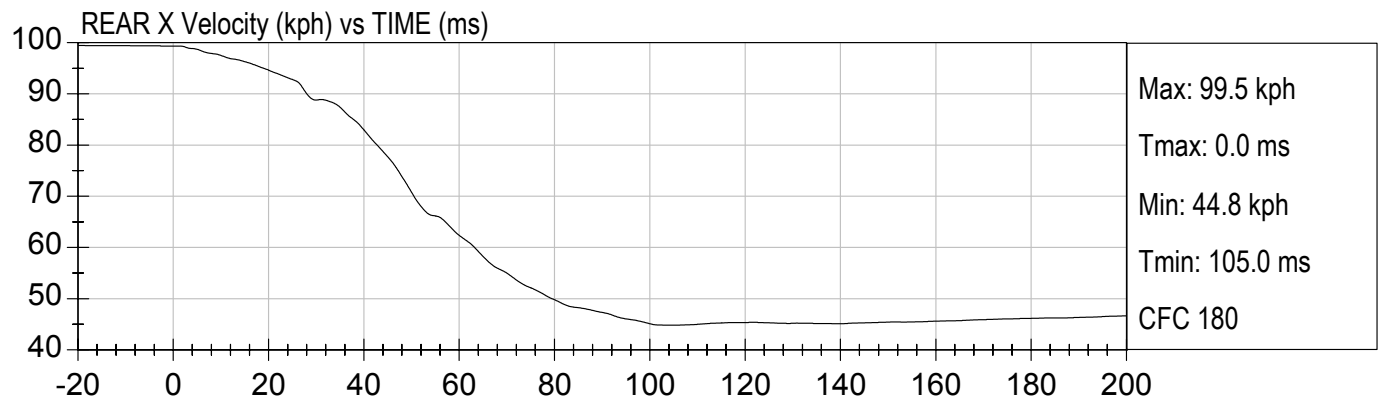
Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)





100 KPH FRONTAL OFFSET MDB
1997 FORD EXPLORER RV1325

Test Date: 2/11/2004
Speed: 61.8 mph (99.5 km/h)



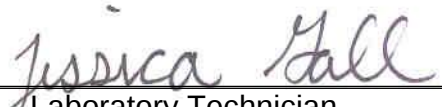
APPENDIX C
DUMMY CALIBRATION DATA TRACES AND TABLES

Hybrid III Calibration Data Sheet
50th Percentile Male
Head Drop Calibration

ATD Serial No: 087

Test I.D: D04071

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	250.8	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	7.3	Pass
Is Acceleration Unimodal?	Yes/No	< 10% Peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

01/19/2004
Test Date



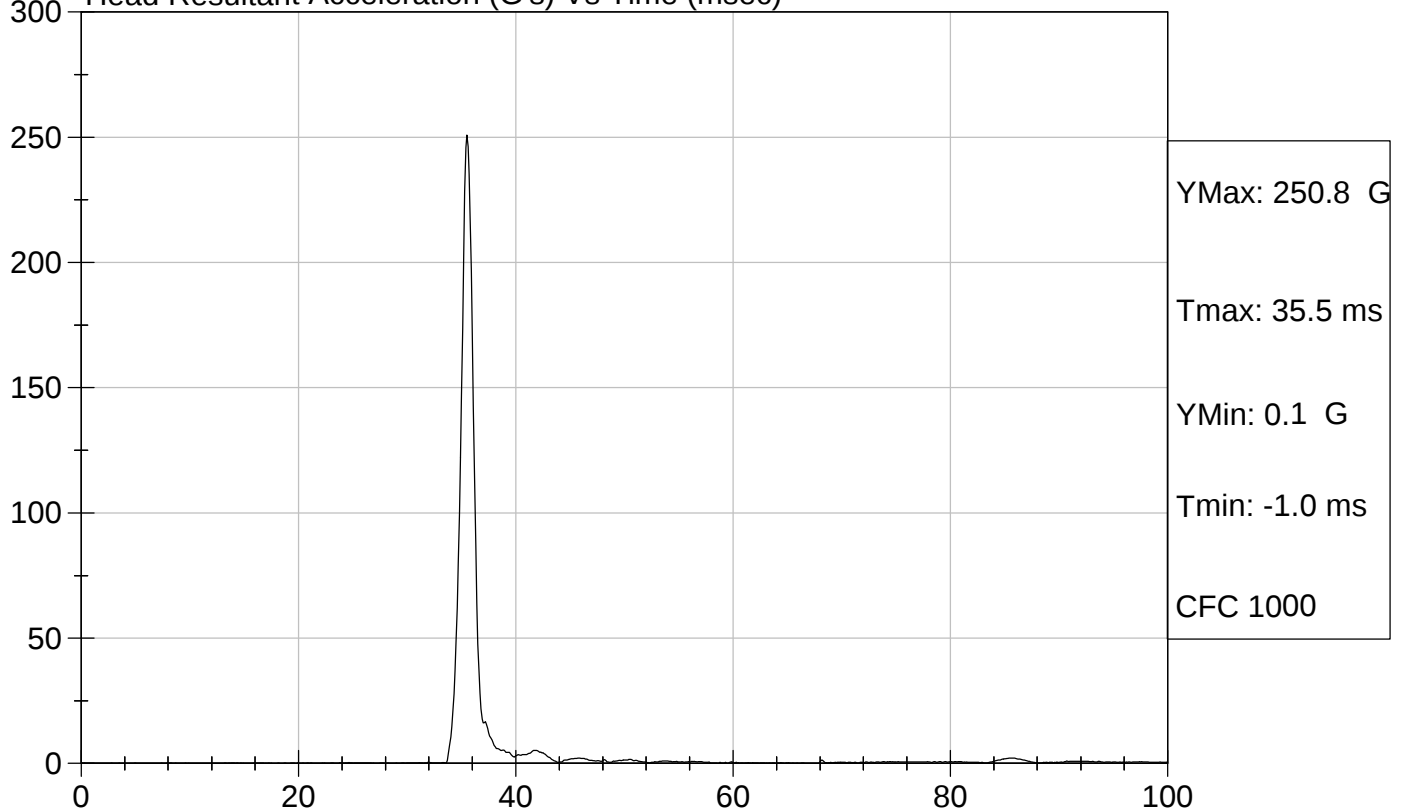
Test Description: Head Drop

Test Date: 01/19/2004

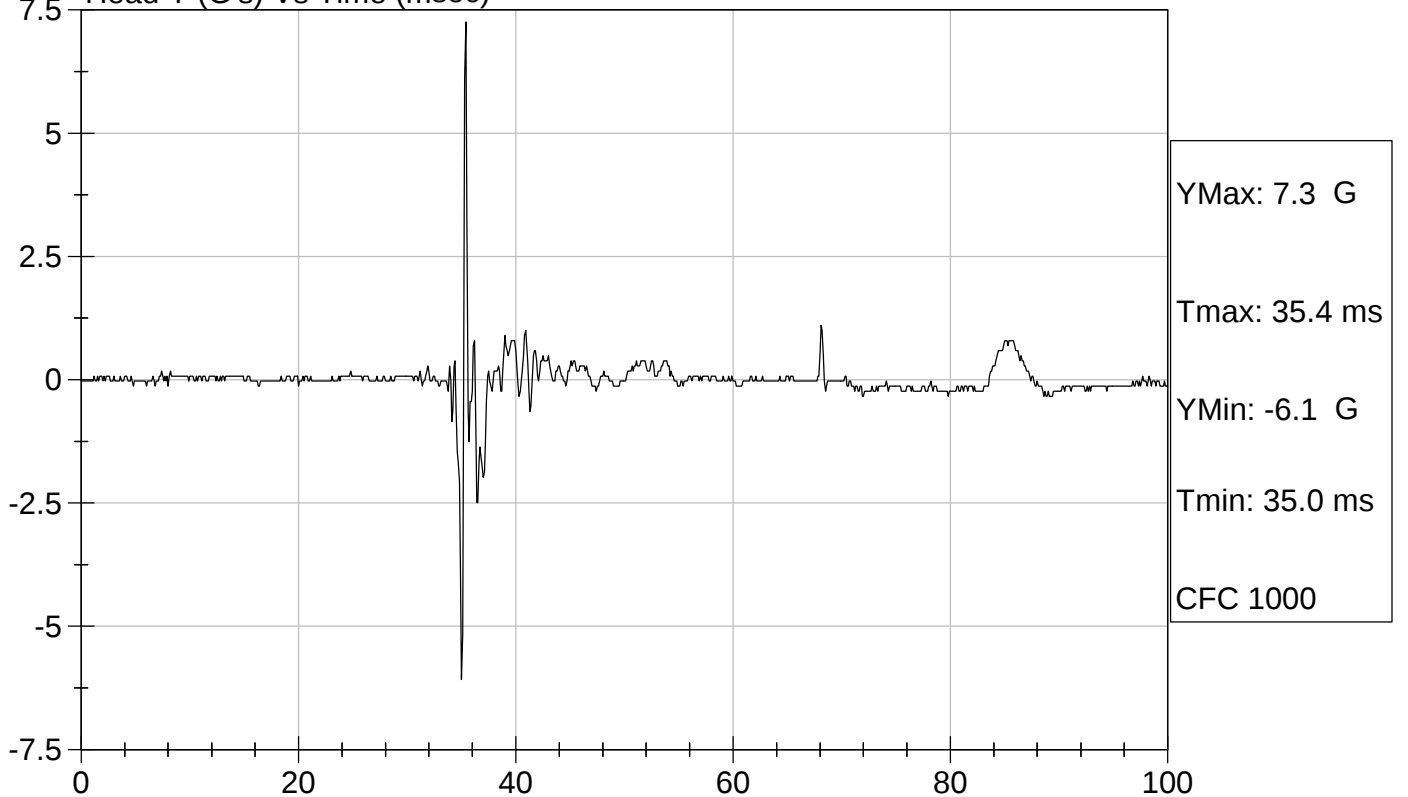
Component: D04071

Speed: 0 ft/s, 0.0 m/s

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



Head Y (G's) Vs Time (msec)



Hybrid III Calibration Data Sheet
50th Percentile Male
Neck Flexion Test

ATD Serial No: 087

Test I.D: D04072

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	21	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.04	Pass
Pendulum Deceleration	10 msec	G's	22.50 to 27.50	23.76	Pass
	20 msec	G's	17.60 to 22.60	20.64	Pass
	30 msec	G's	12.50 to 18.50	16.53	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 29.0	16.53	Pass
Deceleration Decay Time to Cross 5 G's		msec	34.0 to 42.0	35.8	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	77.0	Pass
	Time	msec	57.0 to 64.0	59.0	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	113.0 to 128.0	120.4	Pass
Moment About Occipital Condyle	Maximum	N m	84.1 to 108.5	97.8	Pass
	Time	msec	47.0 to 58.0	49.2	Pass
Positive Moment Decay Time To Zero Crossing		msec	97.0 to 107.0	100.4	Pass
Overall Test Results					Pass


Laboratory Technician

01/20/2004

Test Date

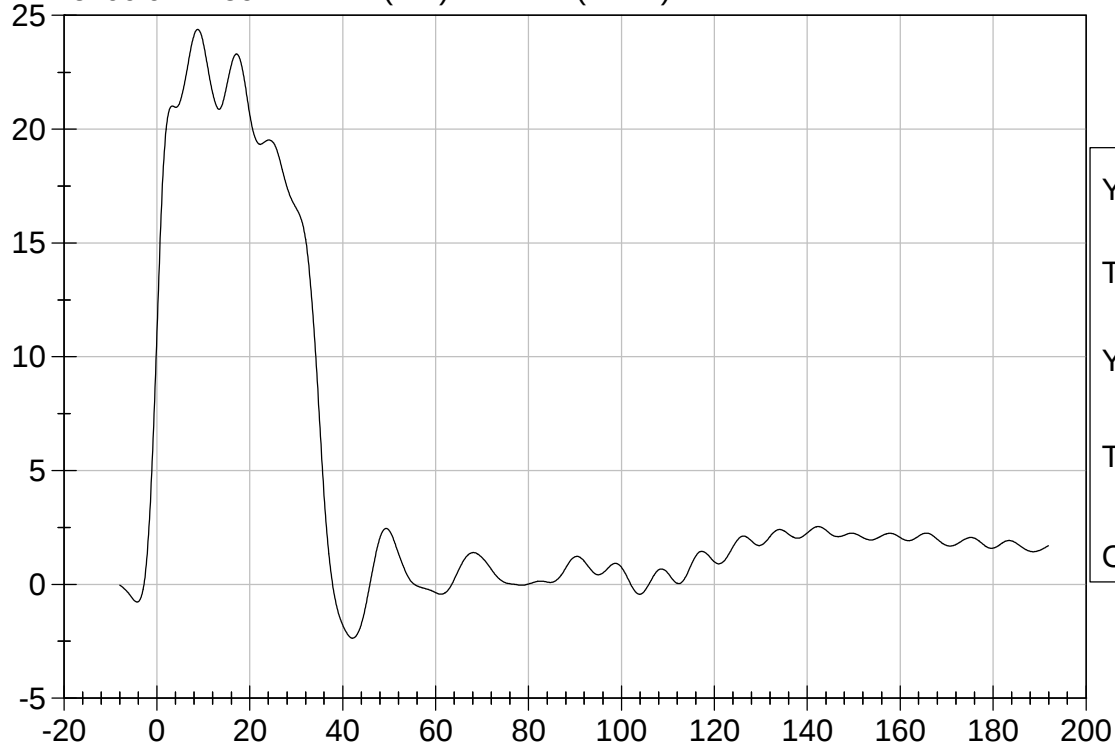

Approved By



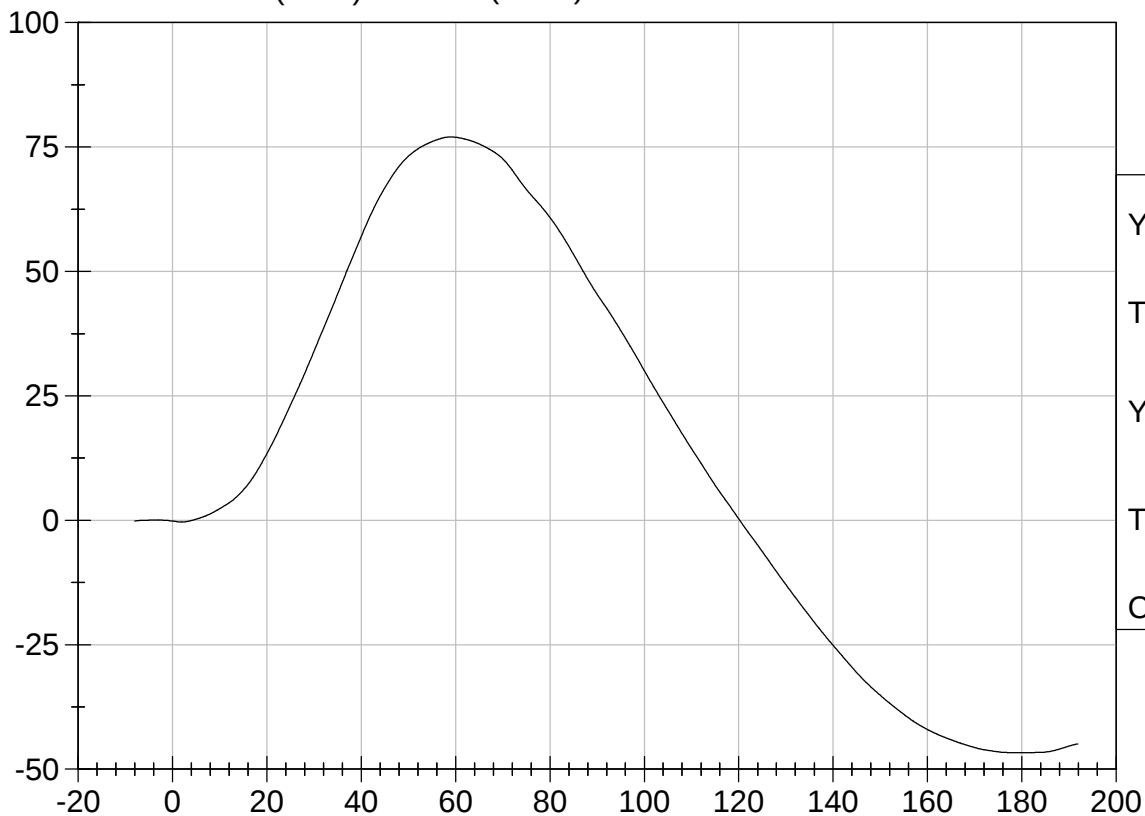
Test Desc: Neck Extension
Component ID: D04072

Test Date: 01/20/2004
Speed: 23.1 ft/sec, 7.04 m/sec

Pendulum Deceleration (G's) vs Time (msec)



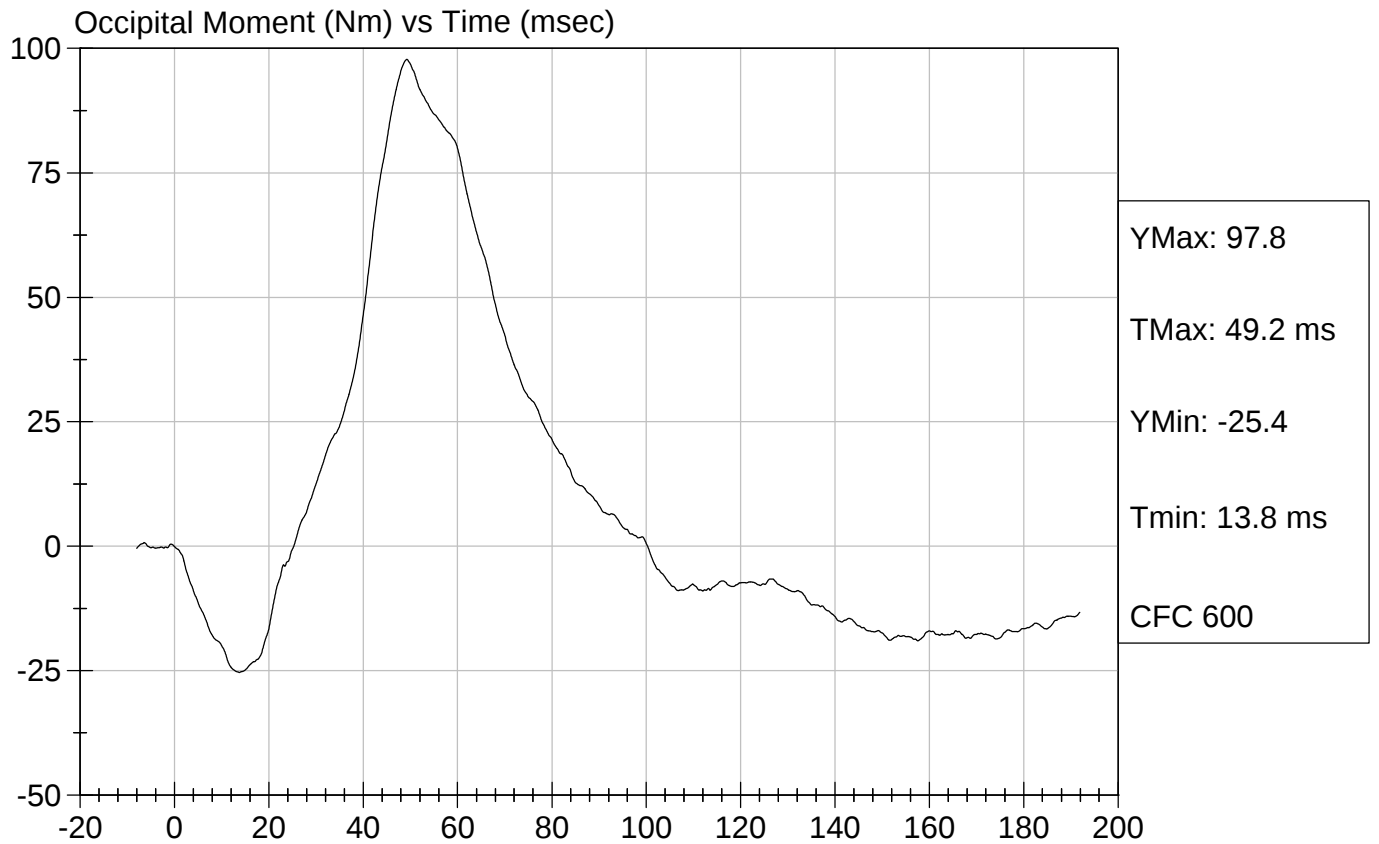
Neck Rotation (DEG) vs Time (msec)





Test Desc: Neck Extension
Component ID: D04072

Test Date: 01/20/2004
Speed: 23.1 ft/sec, 7.04 m/sec



Hybrid III Calibration Data Sheet
50th Percentile Male
Neck Extension Test

ATD Serial No: 087

Test I.D: D04073

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	21	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.18	Pass
Pendulum Deceleration	10 msec	G's	17.20 to 21.20	18.68	Pass
	20 msec	G's	14.00 to 19.00	15.78	Pass
	30 msec	G's	11.00 to 16.00	13.45	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 22.0	13.5	Pass
Deceleration Decay Time to Cross 5 G's		msec	38.0 to 46.0	41.2	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	102.2	Pass
	Time	msec	72.0 to 82.0	77.0	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	147.0 to 174.0	160.5	Pass
Moment About Occipital Condyle	Minimum	N m	-52.9 to -79.9	-68.6	Pass
	Time	msec	65.0 to 79.0	71.4	Pass
Negative Moment Decay Time To Zero Crossing		msec	120.0 to 148.0	139.5	Pass
Overall Test Results					Pass


Laboratory Technician

01/20/2004

Test Date

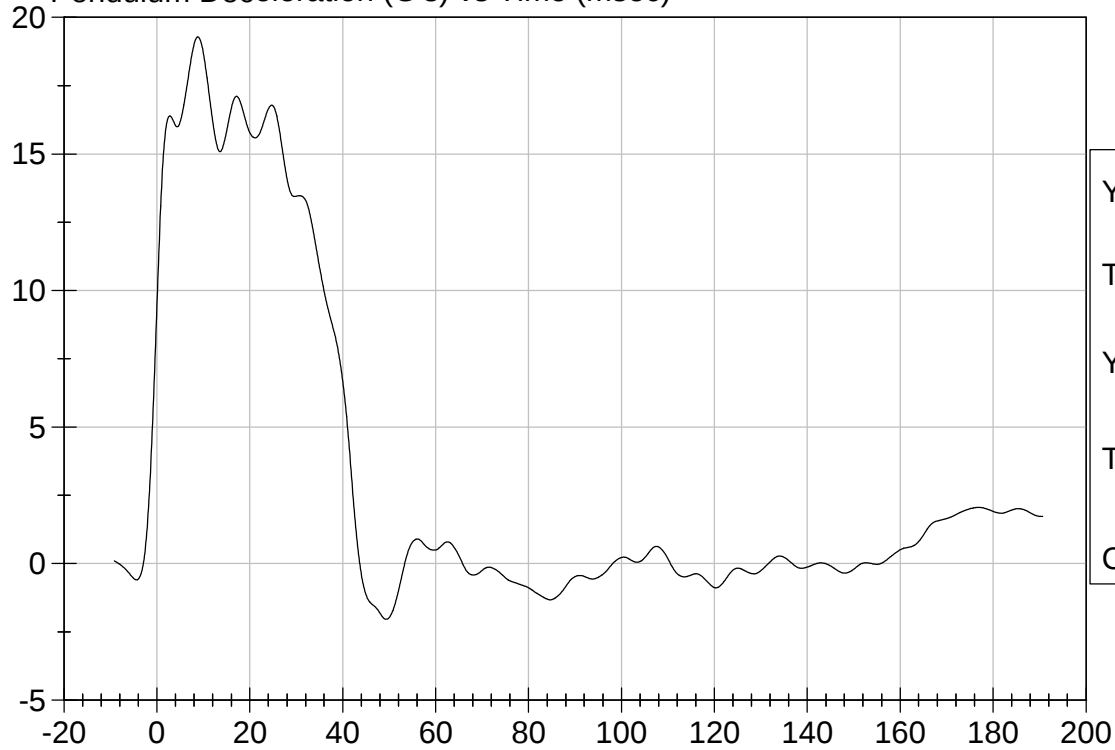

Approved By



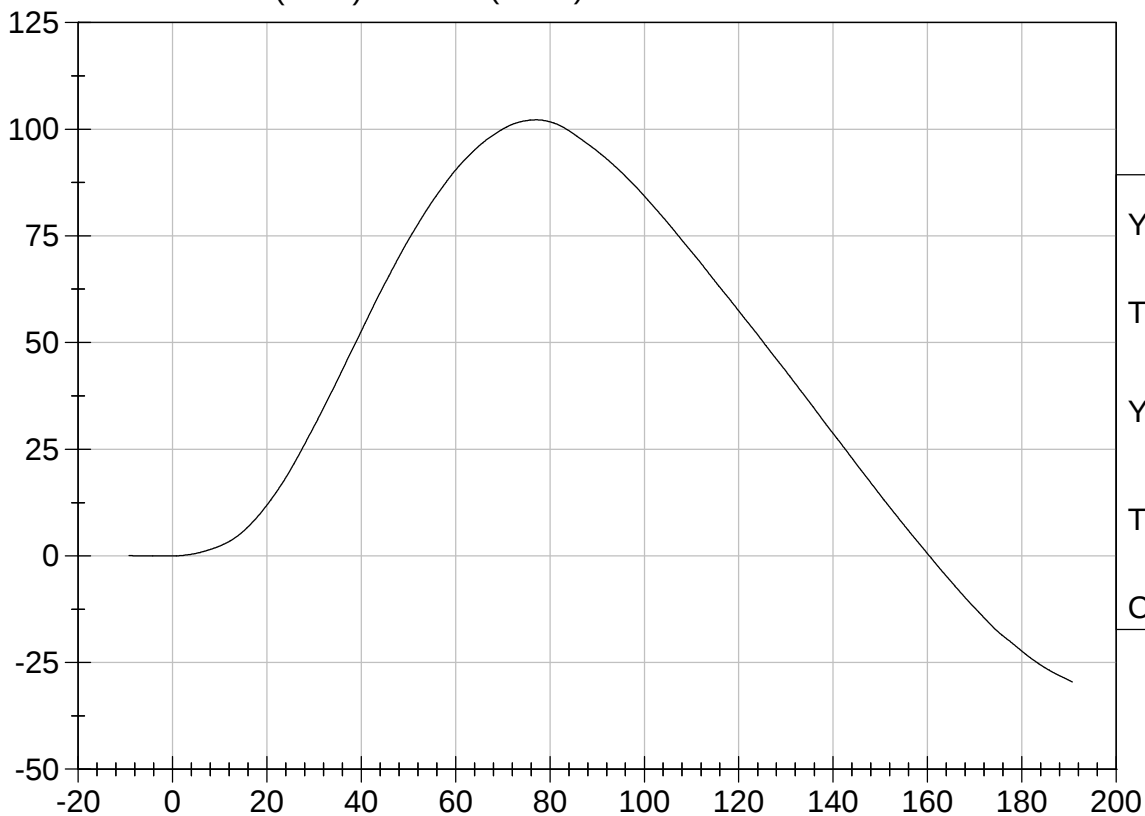
Test Desc: Neck Extension
Component ID: D04073

Test Date: 01/20/2004
Speed: 20.29 ft/sec, 6.18 m/sec

Pendulum Deceleration (G's) vs Time (msec)



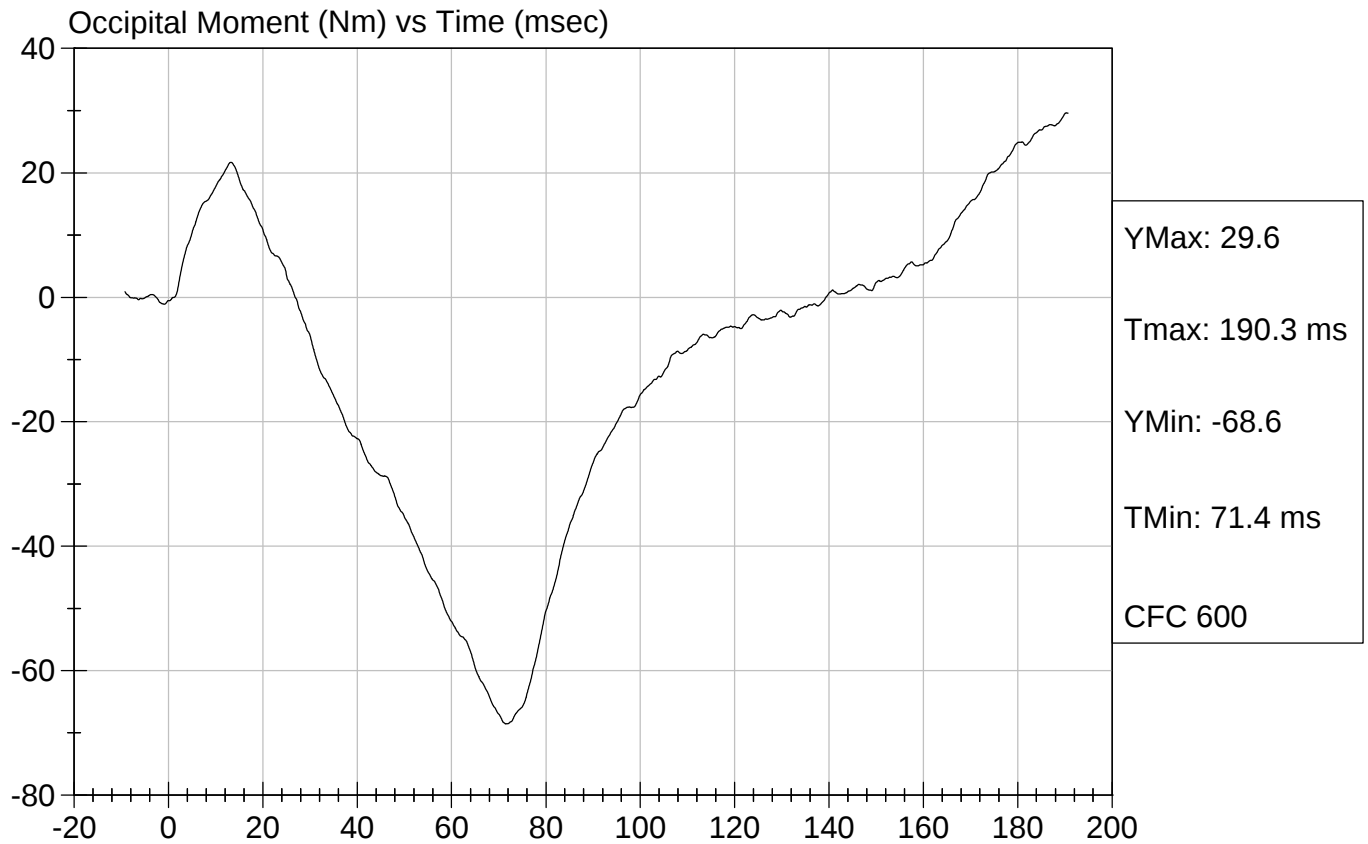
Neck Rotation (DEG) vs Time (msec)





Test Desc: Neck Extension
Component ID: D04073

Test Date: 01/20/2004
Speed: 20.29 ft/sec, 6.18 m/sec



Hybrid III Calibration Data Sheet
50th Percentile Male
Thorax Impact Test

ATD Serial No: 087

Test I.D: D04074

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Probe Velocity	m/s	6.58 to 6.82	6.60	Pass
Peak Probe Force	Newtons	5159 to 5893	5,231	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.72	Pass
Internal Hysteresis	%	69 to 85	71	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

01/20/2004
Test Date

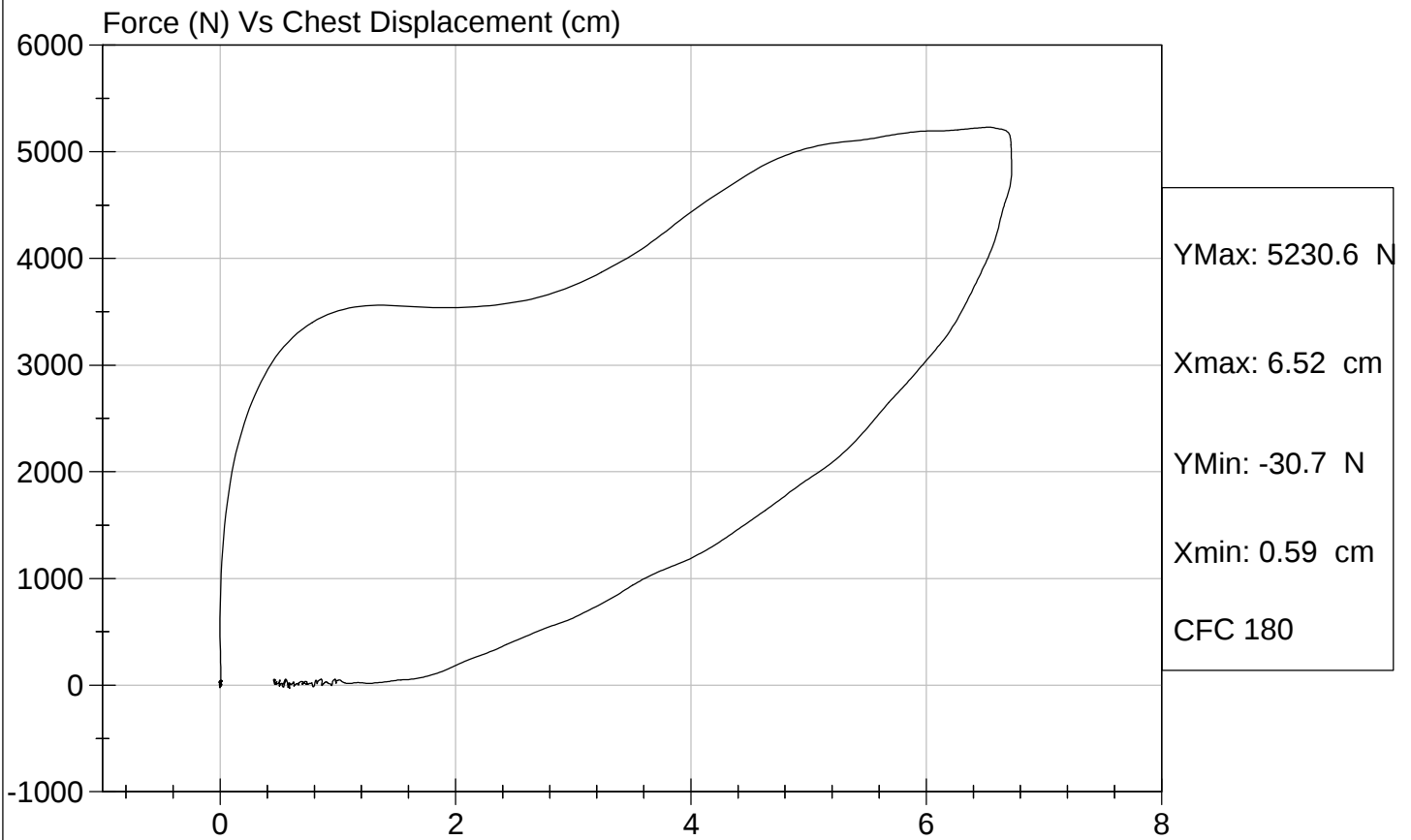


Test Description: Thorax Impact

Test Date: 01/20/2004

Component: D04074

Speed: 21.66 ft/sec, 6.60 m/sec

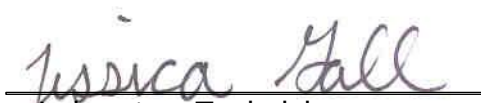


Hybrid III Calibration Data Sheet
50th Percentile Male
Right Knee Impact Test

ATD Serial No: 087

Test I.D: D04075

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Probe Velocity	m/s	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	4,980	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

01/19/2004
Test Date

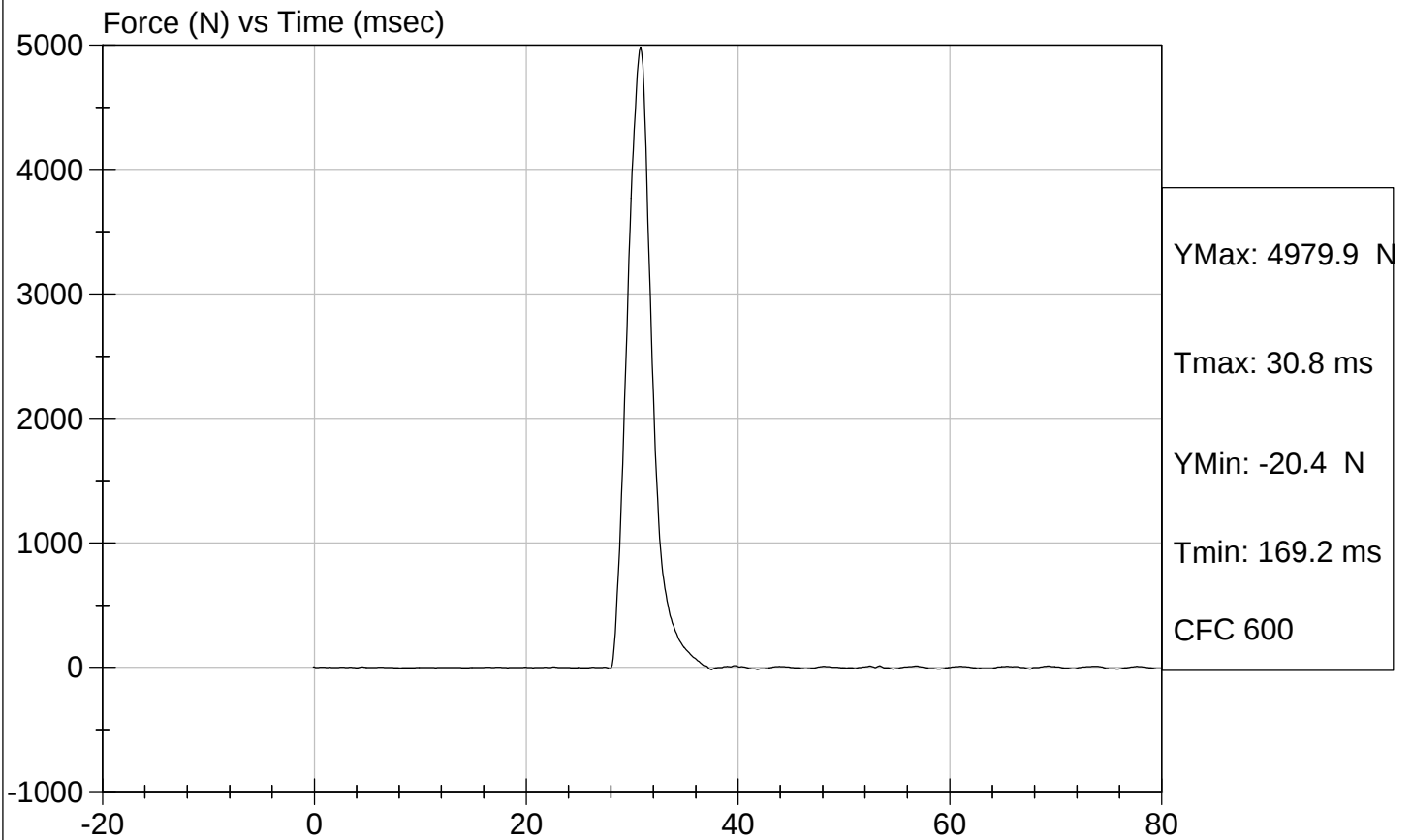


Test Description: Right Knee

Test Date: 01/19/2004

Component: D04075

Speed: 6.84 ft/sec, 2.085 m/sec

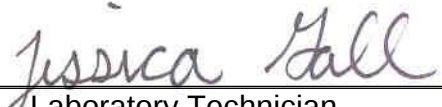


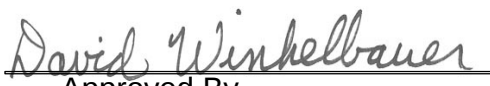
Hybrid III Calibration Data Sheet
50th Percentile Male
Left Knee Impact Test

ATD Serial No: 087

Test I.D: D04076

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.0	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Probe Velocity	m/s	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5,252	Pass
Overall Test Results				Pass


Laboratory Technician


Approved By

01/19/2004
Test Date

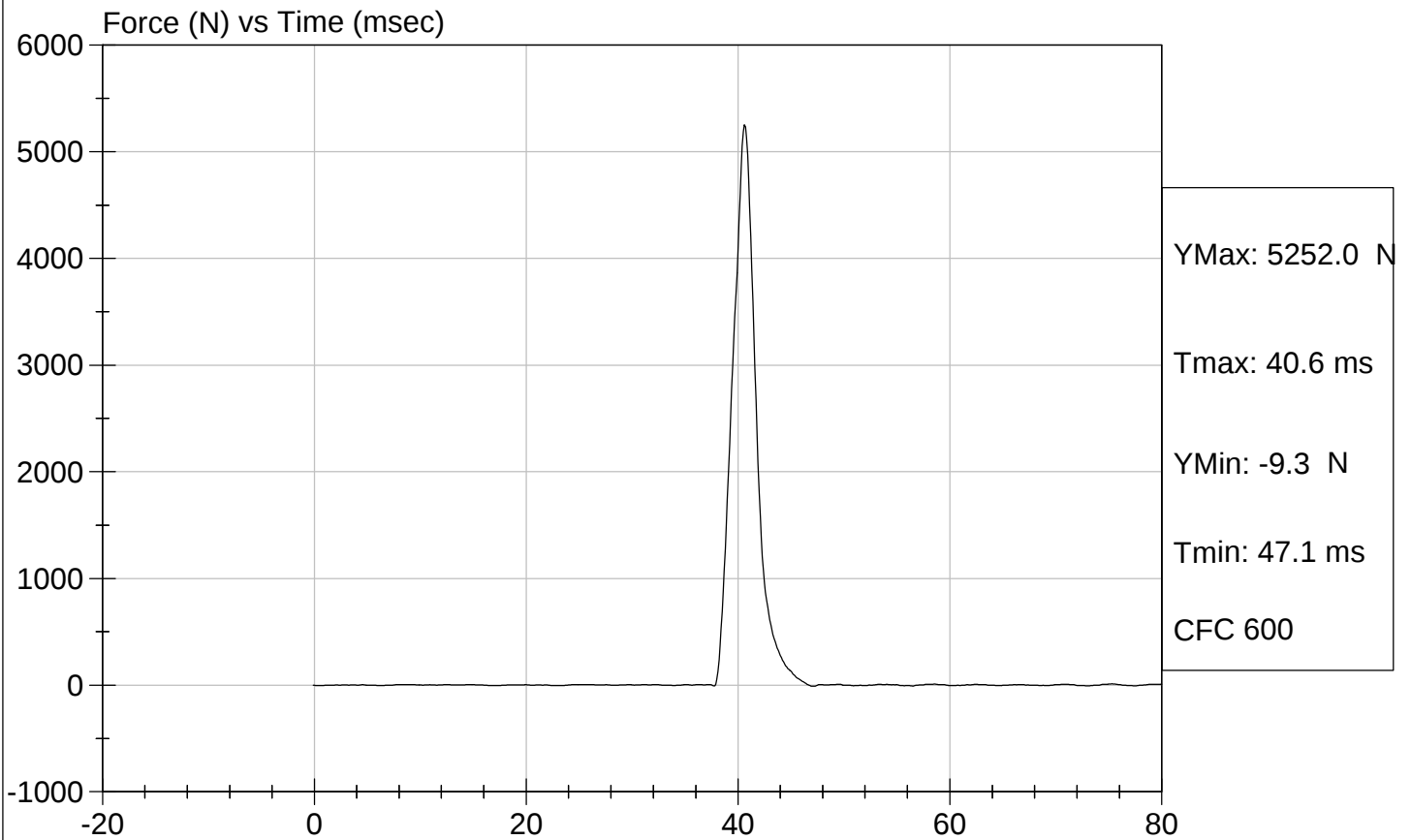


Test Description: Left Knee

Test Date: 01/19/2004

Component: D04076

Speed: 6.86 ft/sec, 2.091 m/sec



Hybrid III Calibration Data Sheet
50th Percentile Male
Hip-Femur Flexion Test

ATD Serial No: 087

Test I.D: D04070

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.1	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	21	21	Pass
Rotation Rate	deg/sec	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	84.0	77.6	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	43	43	Pass
Overall Test Results					Pass

Jessica Hall
Laboratory Technician

David Winkelbauer
Approved By

01/20/2004
Test Date

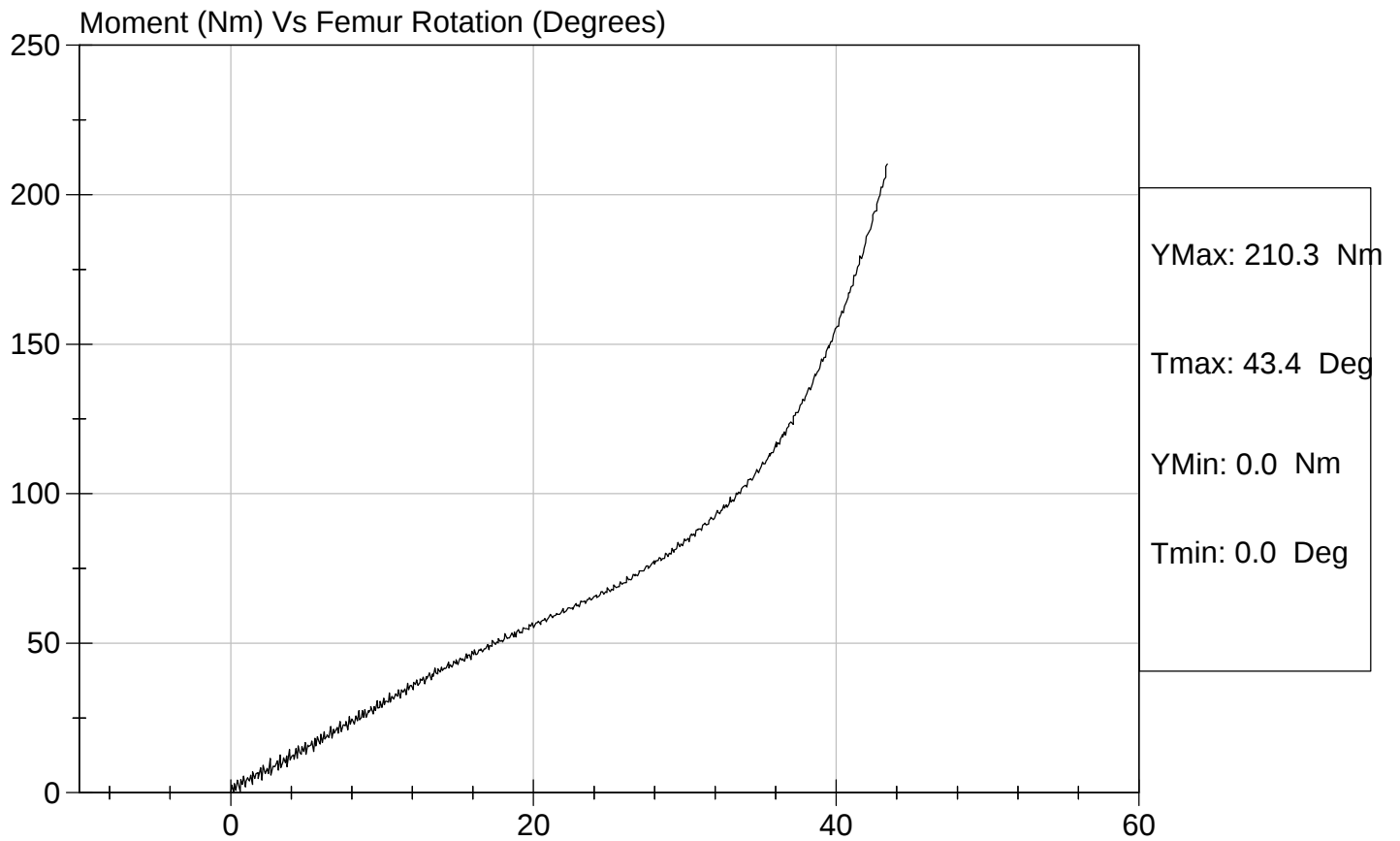


Test Description: Hip Femur Flexion

Test Date: 01/20/2004

Component: D04079

Speed: 0 ft/sec, 0.0 m/sec



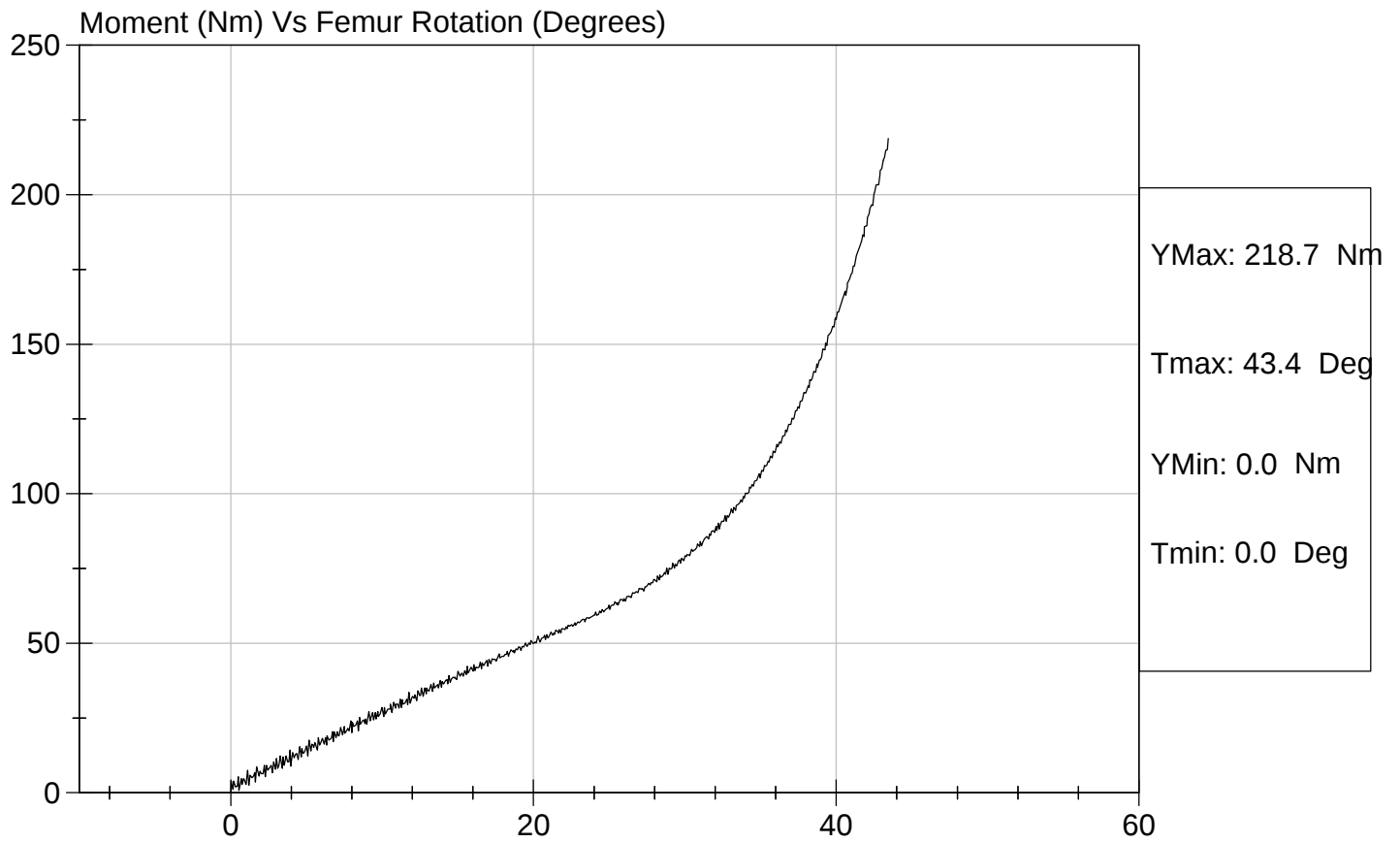


Test Description: Hip Femur Flexion

Test Date: 01/20/2004

Component: D04070

Speed: 0 ft/sec, 0.0 m/sec

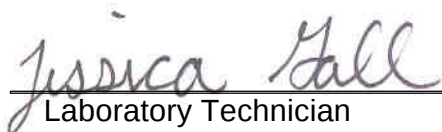


MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 5th PERCENTILE

ATD Serial No: 547

Test I.D: D04251

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.3	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Peak Resultant Acceleration	G's	250 - 300	278	Pass
Peak Lateral Acceleration	G's	+/- 15	11	Pass
Unimodal above 50 G's	Yes/No	within 10% of peak	Yes	Pass
Overall Test Results				Pass


Laboratory Technician

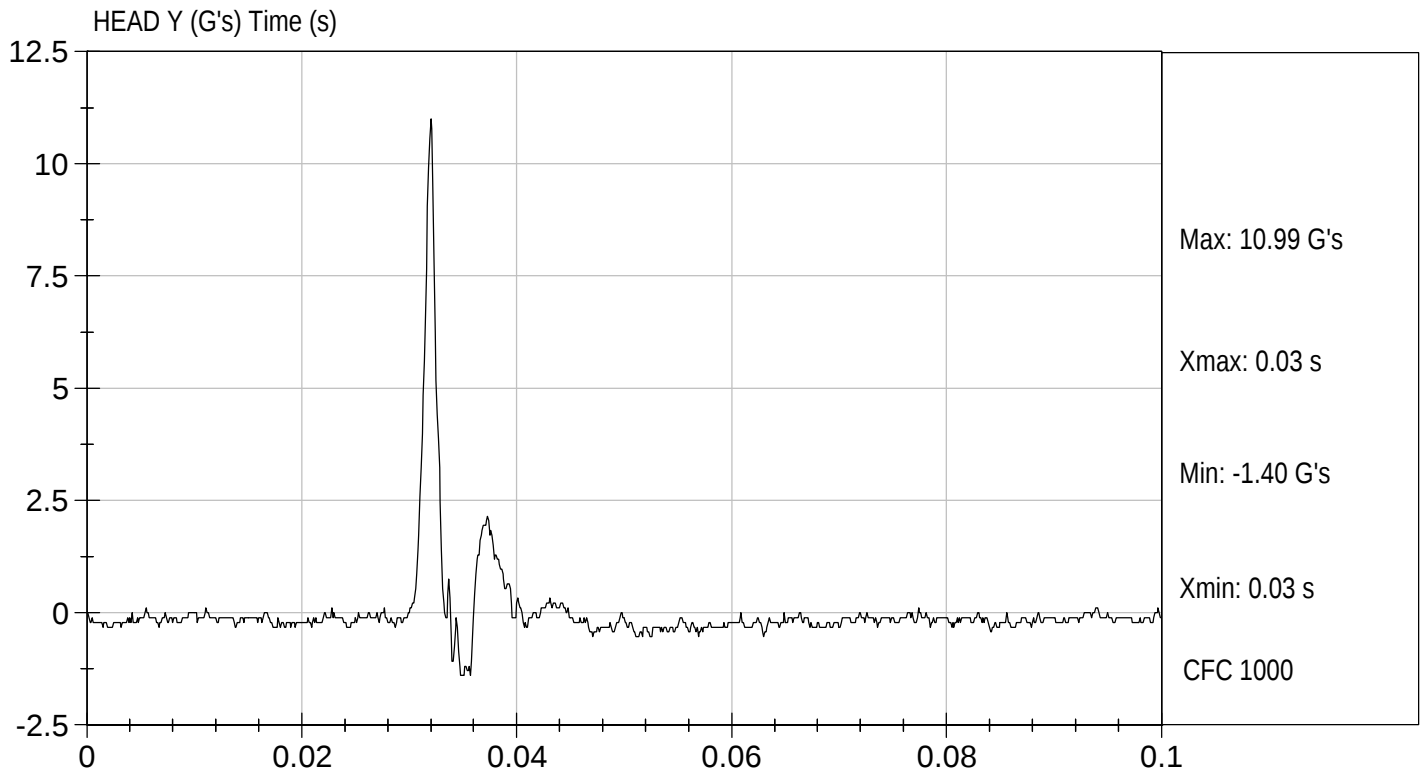
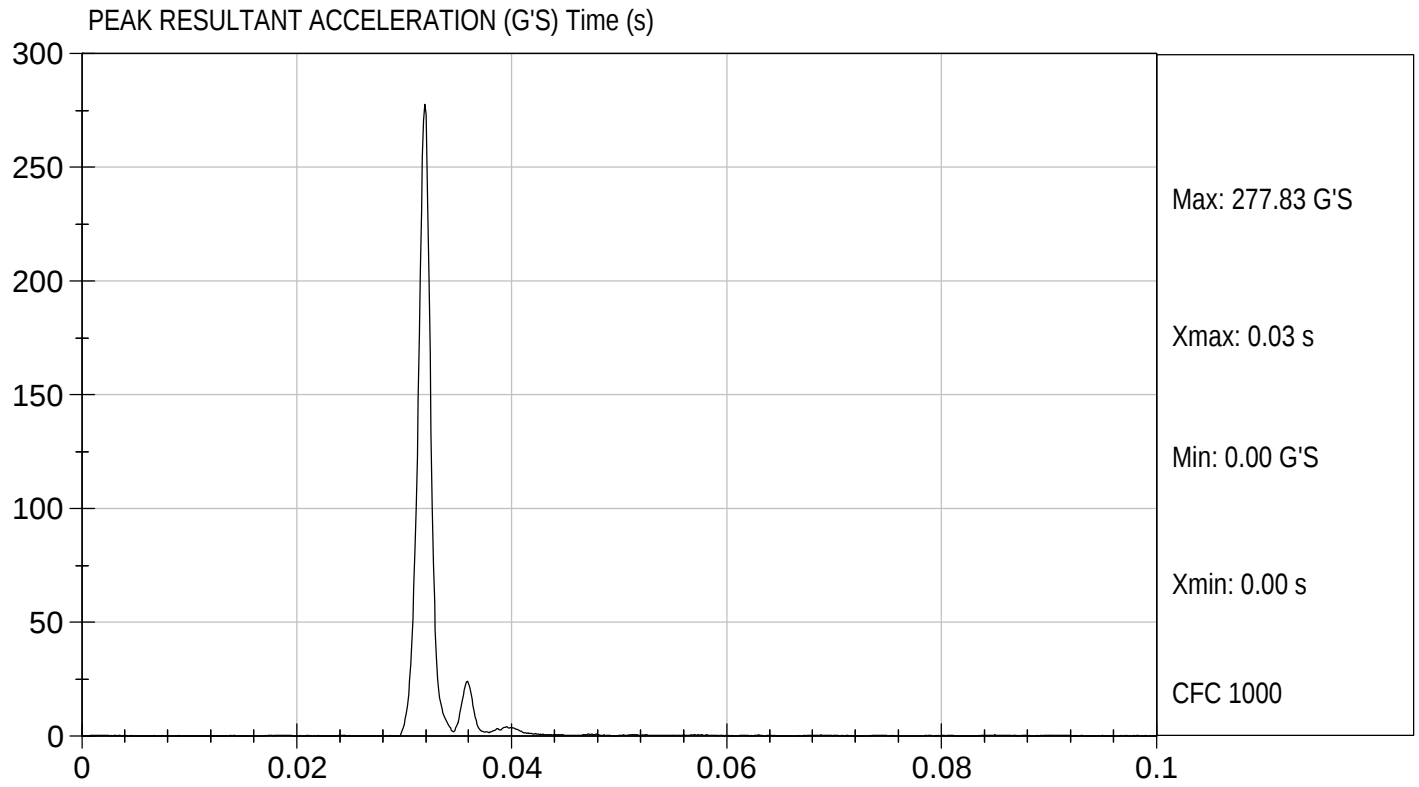
02/04/2004
Test Date


Approved By



Test Desc: Head Drop
Componet ID: D04251

Test Date: 02/04/2004
Velocity: 0 ft/s, 0 m/s

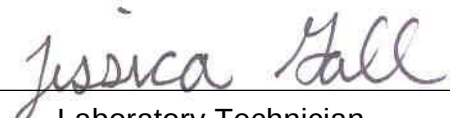


MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 547

Test I.D: D04252

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	23	Pass
Pendulum Speed		m/sec	6.89 to 7.13	7.12	Pass
Pendulum Deceleration	10 msec	msec	2.1 to 2.5	2.4	Pass
	20 msec	msec	4.0 to 5.0	4.6	Pass
	30 msec	msec	5.8 to 7.0	6.6	Pass
D Plane Rotation	Max	deg	77 to 91	86	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	69 to 83	77	Pass
Positive Moment Time Curve Decay to 10 Nm		msec	80 to 100	86	Pass
Overall Results				Pass	


 Laboratory Technician

02/04/2004
 Test Date

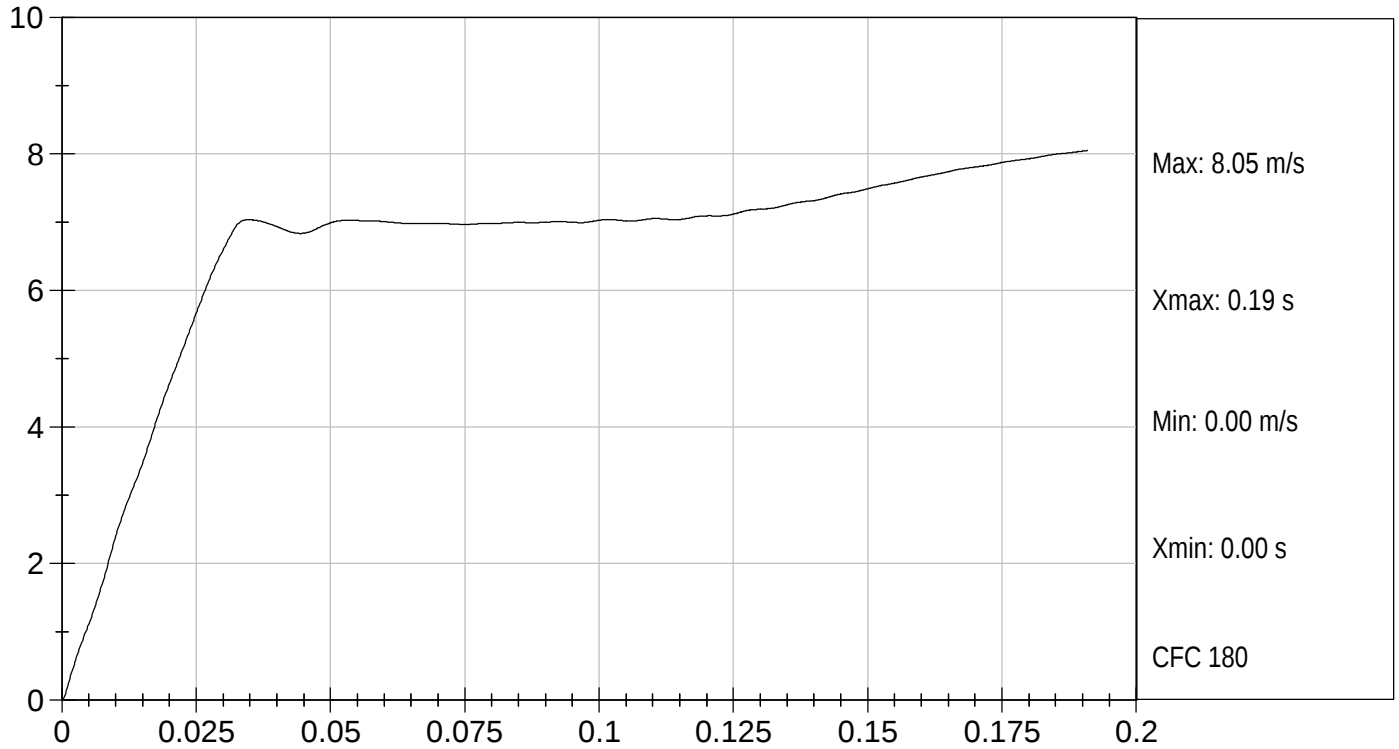

 Approved By



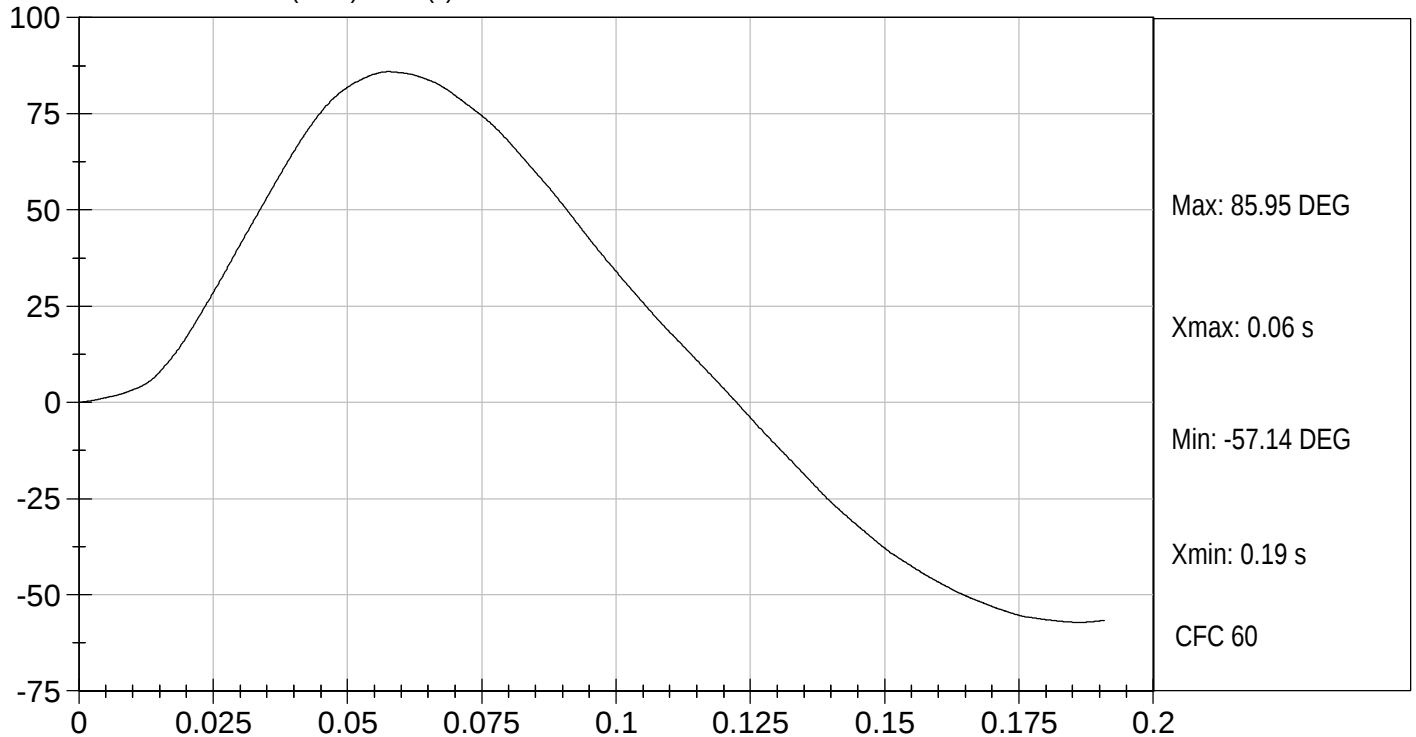
Test Desc: Neck Flexion
Componet ID: D04252

Test Date: 02/04/2004
Velocity: 23.35 ft/s, 7.12 m/s

PENDULUM DECELERATION (m/s) Time (s)



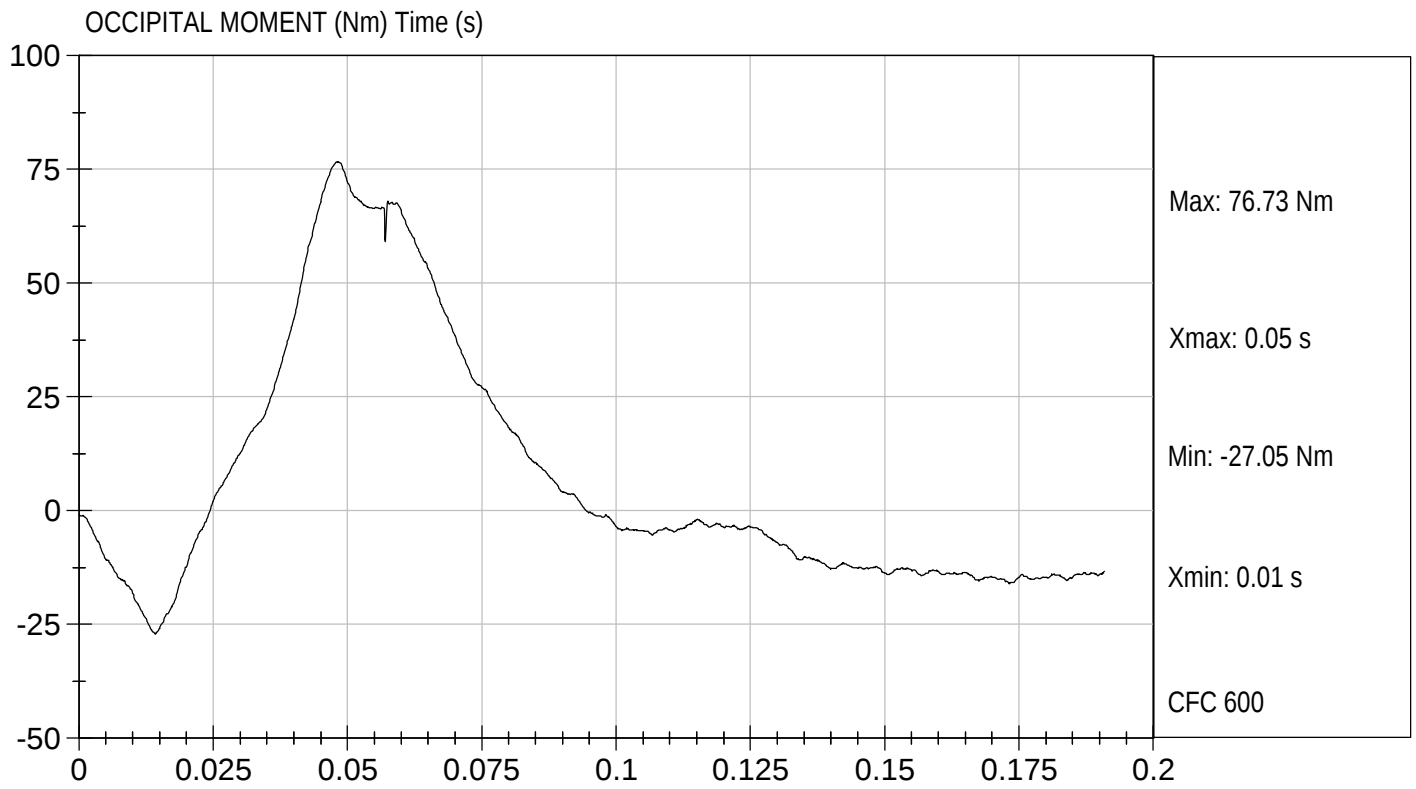
NECK ROTATION (DEG) Time (s)





Test Desc: Neck Flexion
Componet ID: D04252

Test Date: 02/04/2004
Velocity: 23.35 ft/s, 7.12 m/s

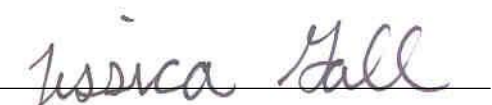


MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 547

Test I.D: D04253

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.6	Pass
Laboratory Relative Humidity		%	10 to 70	23	Pass
Pendulum Speed		m/sec	5.95 to 6.19	6.18	Pass
Pendulum Deceleration	10 msec	msec	1.5 to 1.9	1.8	Pass
	20 msec	msec	3.1 to 3.9	3.4	Pass
	30 msec	msec	4.6 to 5.6	5	Pass
D Plane Rotation	Max	deg	99 to 114	107	Pass
Occipital Condyle Moment within Deflection Corridor		Nm	-65 to -53	-57	Pass
Positive Moment Time Curve Decay to -10 Nm		msec	94 to 114	106	Pass
Overall Results					Pass


Laboratory Technician

02/04/2004

Test Date

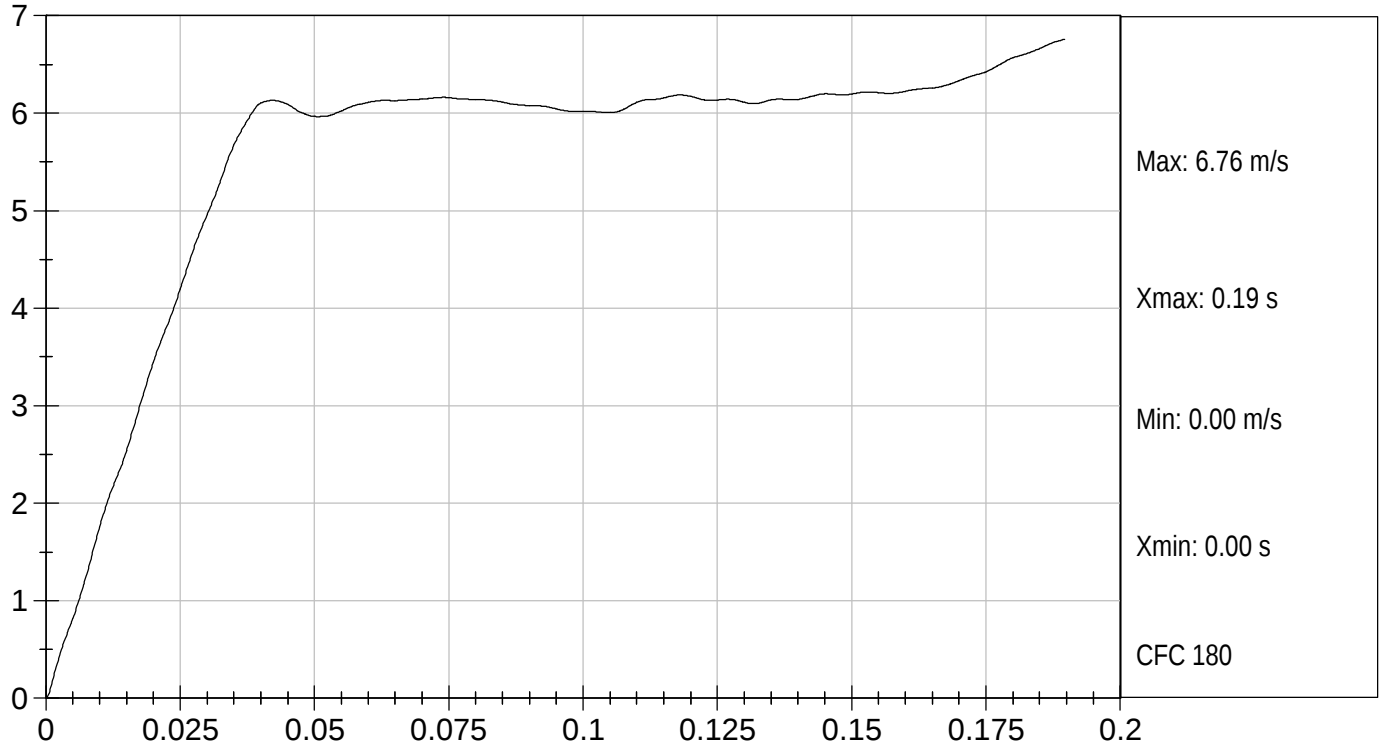

Approved By



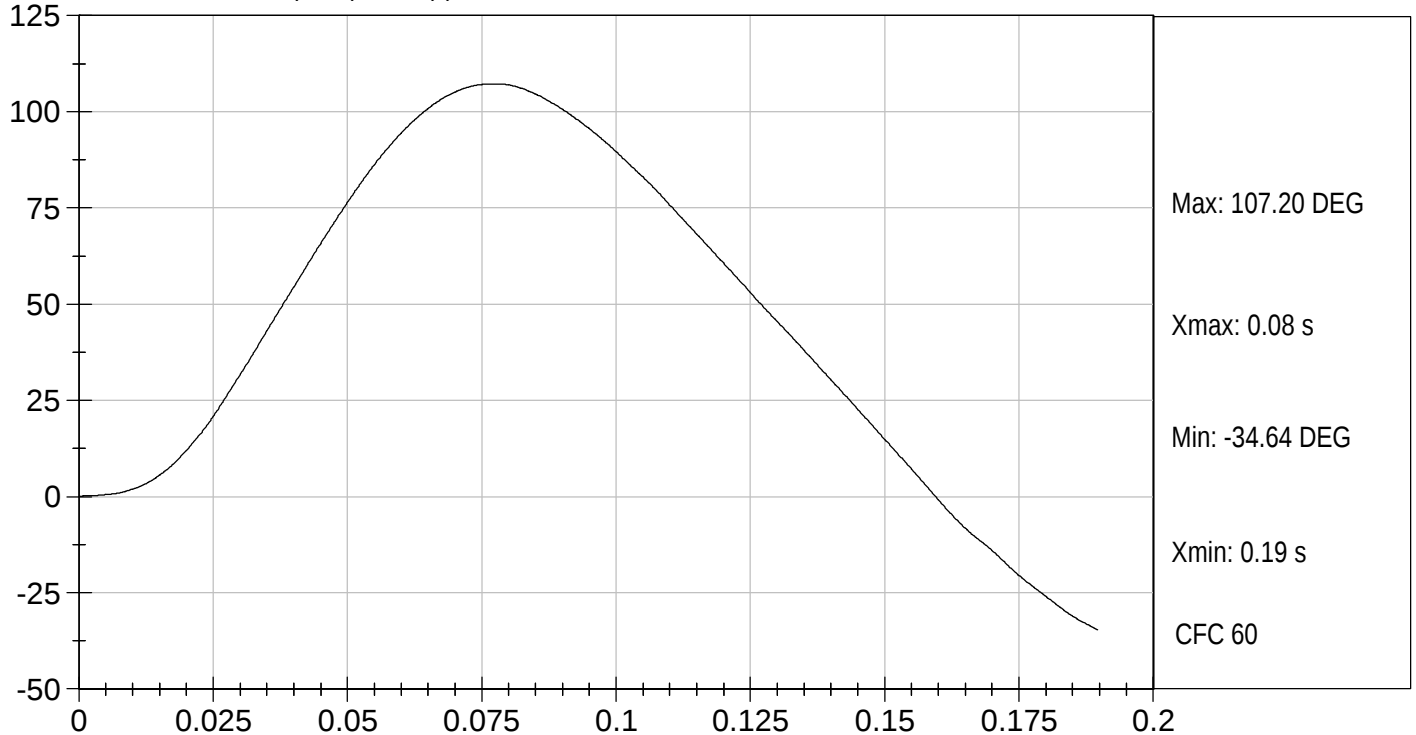
Test Desc: Neck Extension
Componet ID: D04253

Test Date: 02/04/2004
Velocity: 20.28 ft/s, 6.18 m/s

PENDULUM DECELERATION (m/s) Time (s)



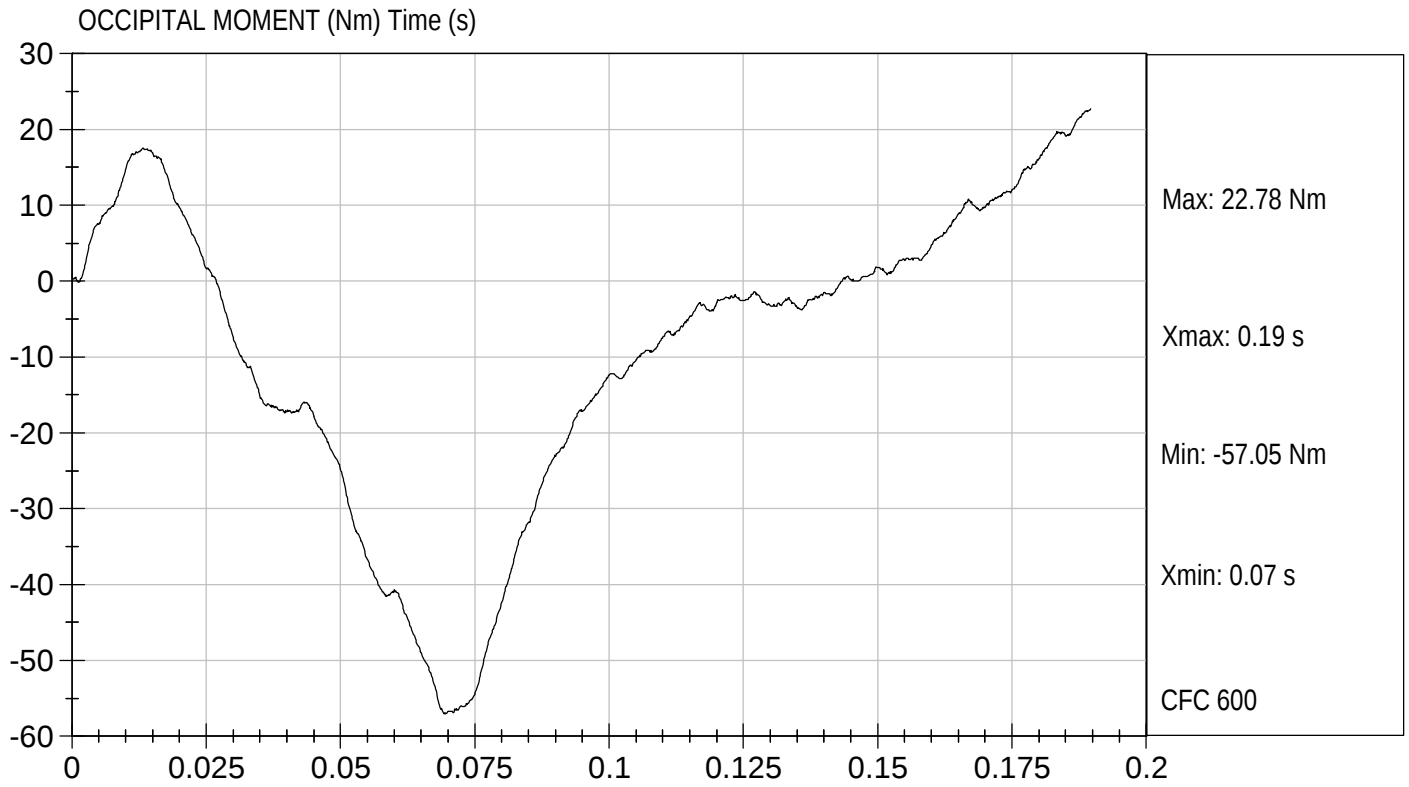
NECK ROTATION (DEG) Time (s)





Test Desc: Neck Extension
Componet ID: D04253

Test Date: 02/04/2004
Velocity: 20.28 ft/s, 6.18 m/s



MGA RESEARCH CORPORATION
THORAX IMPACT
HYBRID III 5TH PERCENTILE

ATD Serial No: 547

Test I.D: D04254

Tested Parameter	Units	Specification	Result	Pass/Fail
Temperature	deg C	20.6 to 22.2	21.4	Pass
Relative Humidity	%	10 to 70	20	Pass
Probe Speed	m/s	6.59 to 6.83	6.81	Pass
Peak Deflection	mm	50 to 58	54	Pass
Peak Resistive Force w/in Deflection Corridor	kN	3.9 to 4.4	4.2	Pass
Internal Hysteresis	%	69 to 85	69	Pass
Peak Force 12.5 mm - 38 mm	Yes/No	< 105% of Peak Force in Deflection Corridor	Yes	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

02/05/2004
Test Date

David Winkelbauer
Approved By

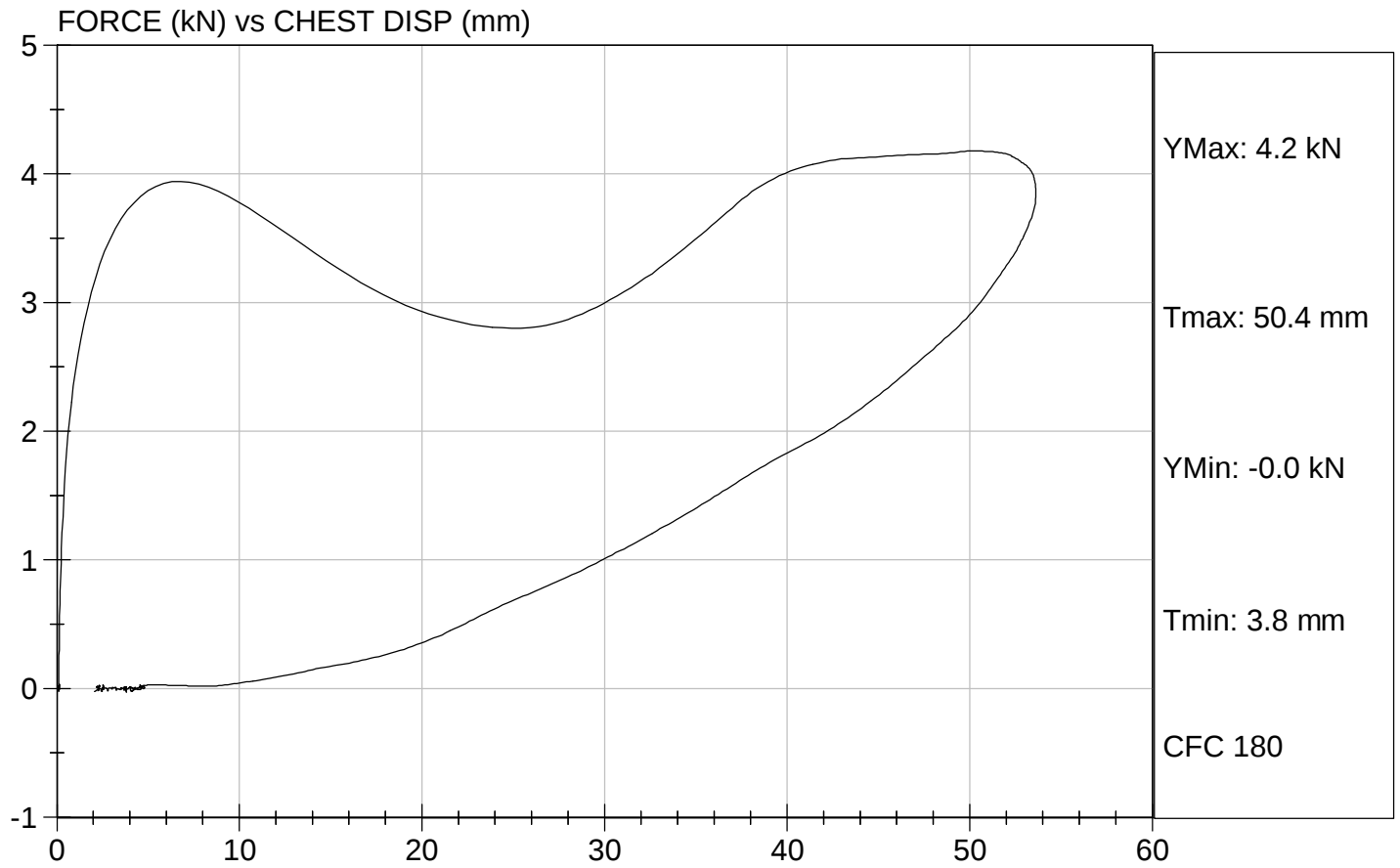


Test Description: Thorax Impact

Test Date: 02/05/2004

Component: D04254

Speed: 22.34 ft/sec, 6.81 m/sec



MGA RESEARCH CORPORATION
RIGHT KNEE IMPACT TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 547

Test I.D: D04255

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	23	Pass
Probe Speed	m/sec	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.56	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

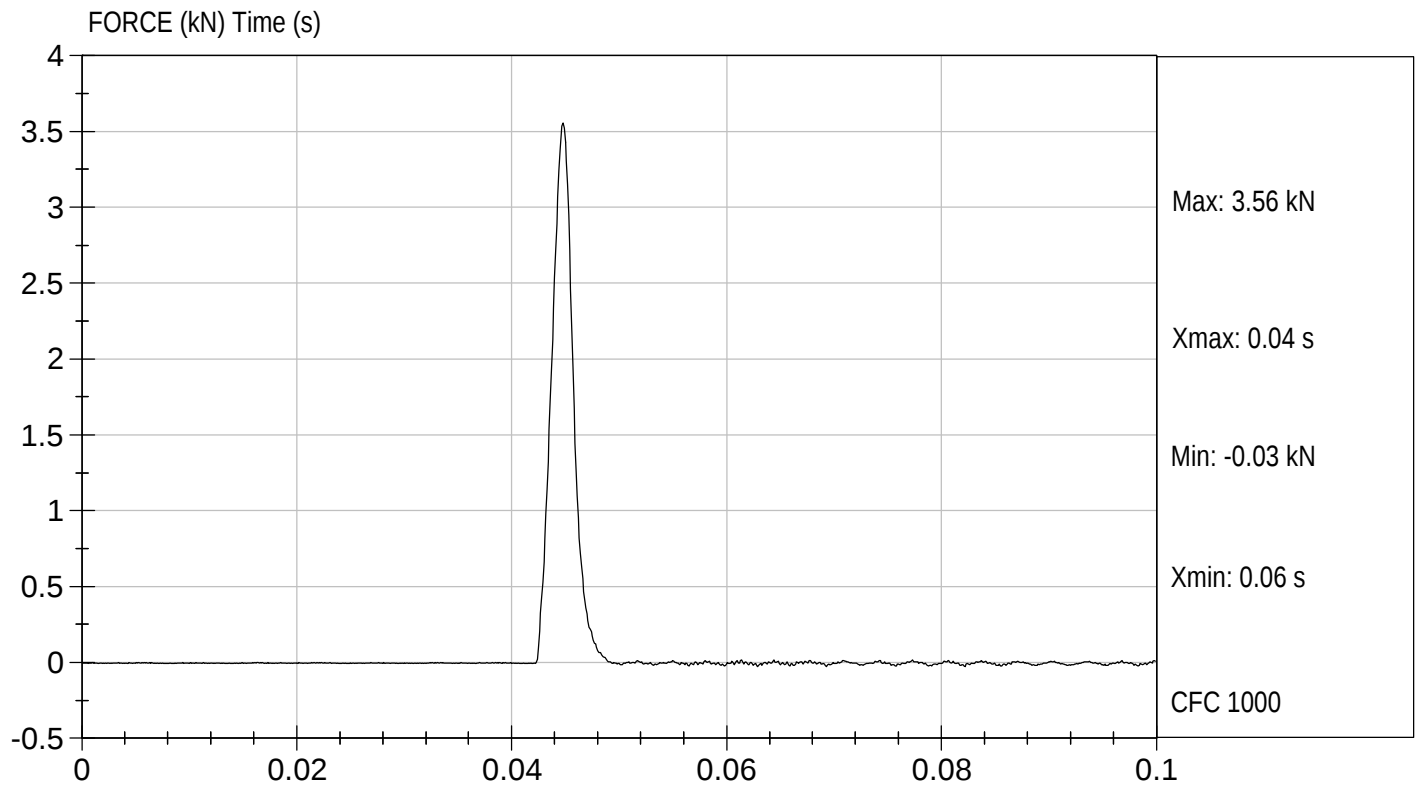
David Winkelbauer
Approved By

02/04/2004
Test Date



Test Desc: Right Knee
Componet ID: D04255

Test Date: 02/04/2004
Velocity: 6.95 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION
LEFT KNEE IMPACT TEST
HYBRID III 5TH PERCENTILE

ATD Serial No: 547

Test I.D: D04256

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.6	Pass
Laboratory Relative Humidity	%	10 to 70	23	Pass
Probe Speed	m/sec	2.07 to 2.13	2.12	Pass
Maximum Force	kN	3.45 to 4.06	3.65	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

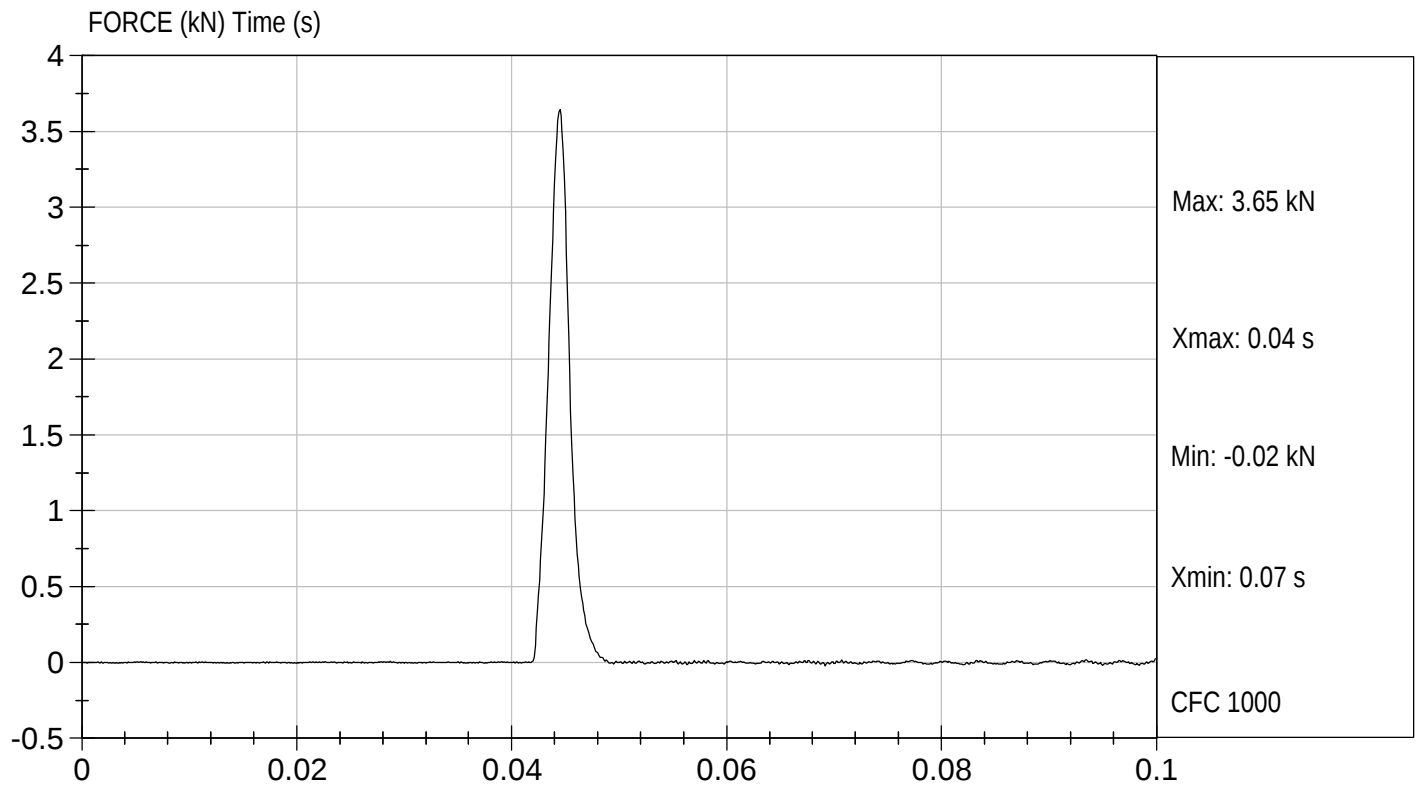
02/04/2004
Test Date

David Winkelbauer
Approved By



Test Desc: Left Knee
Componet ID: D04256

Test Date: 02/04/2004
Velocity: 6.97 ft/s, 2.12 m/s



MGA RESEARCH CORPORATION
TORSO FLEXION TEST
HYBRID III 5th PERCENTILE

ATD Serial No: 547

Test I.D: D04257

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	21.8	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Initial Angle	deg	0 to 20	8	Pass
Return Angle	deg	0 to 8	5	Pass
Force at 45 deg	N	320 to 390	353	Pass
Overall Test Results				Pass

Jessica Hall
Laboratory Technician

02/05/2004
Test Date

David Winkelbauer
Approved By

APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

INSTRUMENTS FOR DRIVER DUMMY NO. 087

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	AGTB5	Endevco	9/12/03
Head Y	AGM47	Endevco	11/12/03
Head Z	AJ9D9	Endevco	11/12/03
Head X Redundant	AGTG8	Endevco	11/9/03
Head Y Redundant	ANAN3	Endevco	11/12/03
Head Z Redundant	ANAN6	Endevco	11/12/03
Neck Load Cell	1561	Denton	1/13/04
Chest X	J10431	Endevco	12/5/03
Chest Y	J14007	Endevco	11/10/03
Chest Z	J13424	Endevco	11/10/03
Chest Displacement	087	Servo	9/17/03
Chest X Redundant	AN9E3	Endevco	12/5/03
Chest Y Redundant	J13650	Endevco	11/10/03
Chest Z Redundant	P22692	Endevco	12/5/03
Pelvis X	P27020	Endevco	12/5/03
Pelvis Y	P26986	Endevco	12/5/03
Pelvis Z	P27025	Endevco	12/5/03
Shoulder Belt Load Cell	172	Denton	10/11/03
Lap Belt Load Cell	199	Denton	12/9/03
Left Femur Load Cell	957	Denton	9/30/03
Right Femur Load Cell	956	Denton	9/30/03
Left Upper Tibia Load Cell	T76	Denton	8/20/03
Left Lower Tibia Load Cell	A77	Denton	8/22/03
Right Upper Tibia Load Cell	T75	Denton	8/20/03
Right Lower Tibia Load Cell	A76	Denton	8/22/03
Left Tibia Mid-Shaft X	P24154	Endevco	12/5/03
Left Tibia Mid-Shaft Y	P23059	Endevco	12/5/03
Right Tibia Mid-Shaft X	J18260	Endevco	2/4/04
Right Tibia Mid-Shaft Y	AKAH1	Endevco	2/4/04
Left Knee Shear	013739	Servco	2/6/04
Right Knee Shear	013723	Servco	2/6/04
Left Mid-Foot X	L17-Z14	Entran	2/4/04
Left Mid-Foot Y	L20-B14	Entran	2/4/04
Left Mid-Foot Z	L20-B17	Entran	2/4/04
Right Mid-Foot X	L17-Z13	Entran	2/4/04

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Right Mid-Foot Y	A12-A14	Entran	2/4/04
Right Mid-Foot Z	L18-N01	Entran	2/4/04
LT Dorsi/Plantar	LX104X	Gesac	9/17/03
LT Inversion/Eversion	LX104Y	Gesac	9/17/03
LT Internal/External	LX104Z	Gesac	9/17/03
RT Dorsi/Plantar	LX103X	Gesac	9/17/03
RT Inversion/Eversion	LX103Y	Gesac	9/17/03
RT Internal/External	LX103Z	Gesac	9/17/03

INSTRUMENTS FOR PASSENGER DUMMY NO. 547

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	AH097	Endevco	10/8/03
Head Y	AJ9P7	Endevco	1/13/04
Head Z	AH0F0	Endevco	10/8/03
Head X Redundant	AJ462	Endevco	1/13/04
Head Y Redundant	J13851	Endevco	10/8/03
Head Z Redundant	AH1F9	Endevco	10/8/03
Neck Load Cell	606	Denton	8/26/03
Chest X	J13535	Endevco	10/6/03
Chest Y	J13658	Endevco	10/8/03
Chest Z	J13927	Endevco	10/6/03
Chest Displacement	547	Servo	2/5/04
Chest X Redundant	ALFL9	Endevco	10/8/03
Chest Y Redundant	AHTB2	Endevco	10/6/03
Chest Z Redundant	J33416	Endevco	10/6/03
Pelvis X	J11046	Endevco	1/13/04
Pelvis Y	J11784	Endevco	1/13/04
Pelvis Z	J14771	Endevco	1/13/04
Shoulder Belt Load Cell	161	Denton	9/18/03
Lap Belt Load Cell	198	Denton	12/9/03
Left Femur Load Cell	9426	Denton	1/23/04
Right Femur Load Cell	9425	Denton	1/23/04
Left Upper Tibia Load Cell	091	Denton	9/5/03
Left Lower Tibia Load Cell	92	Denton	9/5/03
Right Upper Tibia Load Cell	090	Denton	9/4/03
Right Lower Tibia Load Cell	93	Denton	9/5/03
Left Tibia Mid-Shaft X	J13772	Endevco	10/8/03
Left Tibia Mid-Shaft Y	AJ9D6	Endevco	10/8/03
Right Tibia Mid-Shaft X	AJ9D8	Endevco	10/8/03
Right Tibia Mid-Shaft Z	J11014	Endevco	11/10/03
Left Knee Shear	022653	Servo	2/6/04
Right Knee Shear	020590	Servo	2/6/04
Left Mid-Foot X	J12439	Entran	11/12/03
Left Mid-Foot Y	AJ8T5	Entran	11/12/03
Left Mid-Foot Z	J20965	Entran	11/12/03
Right Mid-Foot X	P22687	Entran	2/2/04

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Right Mid-Foot Y	P26991	Entran	2/2/04
Right Mid-Foot Z	P23012	Entran	9/4/03
LT Dorsi/Plantar	FLX102X	Gesac	11/5/03
LT Inversion/Eversion	FLX102Y	Gesac	11/5/03
LT Internal/External	FLX102Z	Gesac	11/5/03
RT Dorsi/Plantar	FLX101X	Gesac	11/5/03
RT Inversion/Eversion	FLX101Y	Gesac	11/5/03
RT Internal/External	FLX101Z	Gesac	11/5/03

INSTRUMENTS FOR VEHICLE AND MDB

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Rear Seat Crossmember X	K20-J05	Entran	12/15/03
Left Rear Seat Crossmember Y	K07-R25	Entran	12/15/03
Right Rear Seat Crossmember X	H20-R10	Entran	10/9/03
Right Rear Seat Crossmember Y	E10-F20	Entran	8/13/03
Vehicle CG X	L17-D31	Entran	1/29/04
Vehicle CG Y	L17-D27	Entran	1/29/04
Vehicle CG Z	L20-B12	Entran	1/29/04
Rear Deck Z	K20-J09	Entran	12/15/03
Toe Pan Next to Accel. X	E10-F07	Entran	2/3/04
Toe Pan Next to Accel. Y	K07-R02	Entran	1/21/04
Toe Pan Above Footrest X	K18-D22	Entran	12/15/03
Toe Pan Above Footrest Y	K07-R22	Entran	12/15/03
MDB 1-10	CLC108FZ	Key	3/3/03
MDB 2-10	CLC145FZ	Key	3/5/03
MDB 3-10	CLC129FZ	Key	3/5/03
MDB 4-10	CLC135FZ	Key	3/5/03
MDB 5-10	CLC142FZ	Key	2/27/03
MDB 1-9	CLC127FZ	Key	3/6/03
MDB 2-9	CLC139FZ	Key	2/28/03
MDB 3-9	CLC122FZ	Key	3/6/03
MDB 4-9	CLC109FZ	Key	3/5/03
MDB 5-9	CLC161FZ	Key	2/27/03
MDB 1/8	CLC116FZ	Key	2/27/03
MDB 2-8	CLC124FZ	Key	3/5/03
MDB 3-8	CLC107FZ	Key	3/5/03
MDB 4-8	CLC166FZ	Key	3/12/03
MDB 5-8	CLC123FZ	Key	3/6/03
MDB 1-7	CLC134FZ	Key	3/3/03
MDB 2-7	CLC106FZ	Key	3/5/03
MDB 3-7	CLC149FZ	Key	3/6/03
MDB 4-7	CLC114FZ	Key	3/4/03
MDB 1-6	CLC118FZ	Key	3/5/03
MDB 2-6	CLC137FZ	Key	3/5/03
MDB 3-6	CLC132FZ	Key	3/4/03
MDB 4-6	CLC128FZ	Key	3/5/03
MDB 1-5	CLC140FZ	Key	2/28/03

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
MDB 2-5	CLC101FZ	Key	2/28/03
MDB 3-5	CLC143FZ	Key	3/3/03
MDB 4-5	CLC113FZ	Key	3/4/03
MDB 1-4	CLC136FZ	Key	2/28/03
MDB 2-4	CLC131FZ	Key	3/3/03
MDB 3-4	CLC144FZ	Key	3/5/03
MDB 4-4	CLC117FZ	Key	2/28/03
MDB 5-4	CLC119FZ	Key	3/6/03
MDB 1-3	CLC148FZ	Key	3/6/03
MDB 2-3	CLC120FZ	Key	3/6/03
MDB 3-3	CLC163FZ	Key	2/27/03
MDB 4-3	CLC165FZ	Key	2/27/03
MDB 1-2	CLC111FZ	Key	3/6/03
MDB 2-2	CLC130FZ	Key	3/3/03
MDB 3-2	CLC147FZ	Key	3/6/03
MDB 4-2	CLC102FZ	Key	3/3/03
MDB 5-2	CLC104FZ	Key	2/27/03
CG X	L17-D39	Entran	1/23/04
CG Y	L19-K06	Entran	1/23/04
CG Z	L17-D04	Entran	1/23/04
Rear X	L17-D23	Entran	1/29/04
Rear Y	L18-J03	Entran	1/29/04
Rear Z	L17-D09	Entran	1/29/04