

REPORT NUMBER: NCAP-MGA-2002-007

**NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST**

**2002 FORD THUNDERBIRD ROADSTER
NHTSA NUMBER: M20206**

**PREPARED BY:
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BURLINGTON, WI 53105**



Test Date: March 26, 2002

Report Date: April 8, 2002

FINAL REPORT

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

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Date of Acceptance

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Date of Acceptance

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16. Abstract A 35 mph (56.3 km/h) frontal barrier impact was conducted on a 2002 Ford Thunderbird Roadster at MGA Research Corporation on March 26, 2002. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and foot well intrusion performance. The impact velocity was 56.2 km/h. The ambient temperature at the barrier face at the time of impact was 20.5° degrees Celsius. The vehicle's maximum post test static crush is 526 mm located 348 mm left of the vehicle centerline. The test vehicle is equipped with a 3-point continuous belt system and an airbag in both front outboard seating positions. With respect to FMVSS 208 "Occupant Crash Protection", the occupant injury criteria summary is as follows: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Measurement Description</u></th> <th style="text-align: left;"><u>Units</u></th> <th style="text-align: left;"><u>Threshold</u></th> <th style="text-align: left;"><u>Driver ATD</u></th> <th style="text-align: left;"><u>Pass. ATD</u></th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC)</td> <td>N/A</td> <td>1000</td> <td>516</td> <td>340</td> </tr> <tr> <td>Max. Thorax Accel. (3msec Clip)</td> <td>G's</td> <td>60</td> <td>46</td> <td>41</td> </tr> <tr> <td>Left Femur force</td> <td>Newtons</td> <td>10009</td> <td>2217</td> <td>2601</td> </tr> <tr> <td>Right Femur force</td> <td>Newtons</td> <td>10009</td> <td>2414</td> <td>4460</td> </tr> </tbody> </table>				<u>Measurement Description</u>	<u>Units</u>	<u>Threshold</u>	<u>Driver ATD</u>	<u>Pass. ATD</u>	Head Injury Criteria (HIC)	N/A	1000	516	340	Max. Thorax Accel. (3msec Clip)	G's	60	46	41	Left Femur force	Newtons	10009	2217	2601	Right Femur force	Newtons	10009	2414	4460
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17. Key Words 56.3 km/h NCAP Frontal Barrier Impact Test New Car Assessment Program (NCAP) 2002/Ford/Thunderbird/Roadster NHTSA No: M20206		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Admin., Technical Ref. Division, Room 5108 (NAD-52) 400 Seventh Street, S.W. Washington, D.C. 20590																										
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TABLE OF CONTENTS

<u>Section</u>		<u>Page No</u>
1	Purpose and Summary of the Test	1
2	Occupant and Vehicle Information / Data Sheets	3

<u>Data Sheet No.</u>		<u>Page No.</u>
1	Crash Test Summary	4
2	General Test and Vehicle Parameter Data	5
3	Post Impact Data	7
4	Test Vehicle Information	8
5	Dummy Positioning in Vehicle	10
6	Seat Belt Positioning Data	12
7	Vehicle Accelerometer Location and Data Summary	13
8	Hybrid III ATD Injury Criteria and Sensor Data	14
9	Seat Belt Performance Assessment Test Data	17
10	Summary of FMVSS 212 Data	18
11	Windshield Zone Intrusion FMVSS 212 Data	19
12	FMVSS 301 Fuel System Integrity Post Impact Data	20
13	FMVSS 301 Static Rollover Data	21
14	Vehicle Measurements	22
15	Camera Locations	24
16	Photographic Reference Target Locations	26
17	Vehicle Intrusion Measurements	27
18	Load Cell Locations on Fixed Barrier	32
19	Accident Investigation Division Data	33
20	Dummy/Vehicle Temperature Stabilization Chart	34

<u>Appendix</u>		
A	Photographs	A
B	Dummy and Vehicle Response Data Traces	B
C	Dummy Calibration Data Traces and Tables	C
D	Test Equipment and Instrumentation Calibration	D
E	Vehicle Owner's Manual Occupant Restraint Instructions	E

SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

This 56.6 kph frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number DTNH22-01-D-12005. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact in excess of the current 48.3 kph requirements.

SUMMARY

A load cell barrier consisting of 30 load cells was impacted by a 2002 Ford Thunderbird Roadster at a velocity of 56.2 kph. The test was performed at MGA Research Corporation on March 26, 2002. Pre-and post-test photographs of the vehicle and dummies can be found in Appendix A.

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

Two Part 572E, 50th percentile male anthropomorphic test devices (ATDs), were placed in the driver and right-front passenger seating positions according to dummy placement instructions specified in the Laboratory Indicant Test Procedure.

Both ATDs were fully instrumented with nine accelerometer array head, chest and pelvis triaxial accelerometers, chest displacement potentiometer, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 065) and right-front passenger (position 2) ATD (Serial No. 066) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 109 channels of data were recorded on an on-board data acquisition system. Appendix B contains the vehicle and dummy response data traces. The load cell barrier had no valid data collected.

There was 97 percent windshield retention and no intrusion into the protected zone of the windshield during the event. There was no Stoddard Solvent leakage after the event or during any phase of the static rollover.

The maximum static crush of the vehicle was 526 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

The top of the head of both the driver and passenger contacted the visors. The driver's face, chest, and abdomen contacted the airbag. The driver's back of head contacted the headrest. The driver's left knee contacted the knee bolster the right knee contacted the knee bolster and column. The passenger's face, chest and abdomen contacted the airbag. The passenger's back of head contacted the headrest. The passenger's knees contacted the glove box.

The occupant data is summarized below:

ATD position	HIC	Clip(g)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)	Belt Spoolout (mm)	Belt Stretch (mm/m)
Driver	516	46	25	2217	2414	n/a	n/a
Passenger	340	41	20	2601	4460	n/a	n/a

SECTION 2
OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02

CONVERSION FACTORS USED IN THIS REPORT*

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

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

DATA SHEET NO. 1
CRASH TEST SUMMARY

Test Vehicle: 2002/Ford/Thunderbird/Roadster
Test Program: NCAP

NHTSA No.: M20206
Test Date: 3/26/02

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/hr	56.2
Test Weight	kg	1983.1
Average Rebound	mm	437
Maximum Static Crush	mm	526
Impact Angle	degrees	90

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Front Door Opening	Door remained closed and latched; Door opened without tools	Door remained closed and latched; Door opened without tools
Rear Door Opening		
Seat Track Shift (mm)	14 forward	4 forward
Seat Back Failure	none	None

TEST DUMMY INFORMATION

Description	Driver	Passenger
Dummy Type / Serial No.	HIII / 065	HIII / 066
Head Contact	visor, airbag, headrest	visor, airbag, headrest
Chest Contact	airbag	Airbag
Abdomen Contact	airbag	Airbag
Left Knee Contact	knee bolster	glove box
Right Knee Contact	knee bolster, column	glove box

16mm MOVIE COVERAGE

High Speed	14
Real Time	1
Total	15

Driver ATD Sensors	48
Passenger ATD Sensors	48
Belt Assessment Sensors	4
Vehicle Structure Accelerometers	9
Rigid Barrier Load Cells	6
Total	115

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02

TEST VEHICLE INFORMATION

Manufacturer	Ford Motor Company
Model	Thunderbird
Body Style	Roadster
NHTSA No.	M20206
VIN	1FHP60A62Y108515
Color	Black
Delivery Date	3/6/02
Odometer Reading (mile)	5.6
Dealer	Ricart Ford Inc.
Transmission	Automatic
Final Drive	Rear
Number of Cylinders	8
Engine Displacement (L)	3.9
Engine Placement	Longitudinal

TEST VEHICLE OPTIONS

Driver Airbag	front, seat side
Passenger Airbag	front, seat side
Force Limiter	yes
Pretensioner	yes
Power Windows	yes
Power Steering	yes
Power Door Locks	yes
Tilt Wheel	yes, power
Air Conditioning	yes
Power Brakes	yes
Disc Brakes, Front	yes
Disc Brakes, Rear	yes
Anti-lock Brakes	yes
AM/FM/CD	yes
Anti-theft System	yes
Cruise Control	yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company	GVWR (kg)	1995
Date of Manufacture	12/01	GAWR Front (kg)	1002
		GAWR Rear (kg)	997

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	207	207
Cold Pressure (kPa)	207	207
Recommended Tire Size	P235/50R17	P235/50R17
Tire Size on Vehicle	P235/50R17	P235/50R17
Tire Manufacturer	Michellin	Michellin

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	n/a	n/a	
Number Of Occupants	2	0	0	2
Capacity Wt. (VCW) (kg)				205.4
Cargo Wt. (RCLW) (kg)				69.4

DATA SHEET NO. 2...(continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	450.9	427.7		478.5	507.6	
Right	kg	461.3	425.5		497.1	499.9	
Ratio	%	51.7	48.3		49.2	50.8	
Totals	kg	912.2	853.2	1765.4	975.6	1007.5	1983.1

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1765.4
Weight of 2 P572E ATDs	kg	156.0
Rated Cargo/Luggage Weight (RCLW)	kg	69.4
Calculated Vehicle Target Weight (TVTW)	kg	1990.8

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG(aft of front axle)
As Delivered	mm	732	715	687	704	1315
As Tested	mm	721	714	670	664	1382
Post Test	mm	737	649	683	656	

Vehicle Wheelbase (mm): 2720

Weight of Ballast secured in cargo area (kg): 45.3

Vehicle Components Removed: rear windows, jack, tools, trunk lining, wheel covers, and engine cover

Ballast weight does not include cameras, instrumentation, and brake abort system.

FUEL SYSTEM DATA

Fuel System Capacity From Owner's Manual (L): 68.1

Usable Capacity Figure Furnished by COTR (L): 68.1

Actual Test Volume (L): 64.0

Test Fluid Type: Stoddard Solvent ; Specific Gravity: 0.77

Is Vehicle Fuel Pump Electric or Mechanical? electric

If electric, does pump operate with ignition switch "ON" & engine "OFF"? no

DATA SHEET NO. 3
POST IMPACT DATA

Test Vehicle: 2002/Ford/Thunderbird/Roadster
Test Program: NCAP

NHTSA No.: M20206
Test Date: 3/26/02

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	55.5 – 57.1	56.2
Trap No. 1 Entry Distance	mm	<1524	1300
Trap No. 1 Exit Distance	mm	<1524	300
Trap No. 2 Velocity (Redundant)	km/h	55.5 – 57.1	56.2
Trap No. 2 Entry Distance	mm	<1524	1425
Trap No. 2 Exit Distance	mm	<1524	425

VEHICLE STATIC CRUSH

Measured Parameter	Units	Pre-Test	Post-Test	Difference
Left Side	mm	4605	4114	491
Center	mm	4692	4204	488
Right Side	mm	4606	4204	402

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	396
Center	mm	404
Right Side	mm	511
Average	mm	437

DATA SHEET NO. 4
TEST VEHICLE INFORMATION

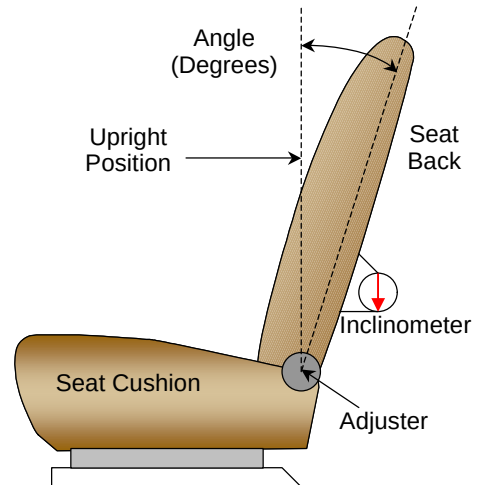
Test Vehicle: 2002/Ford/Thunderbird/Roadster
Test Program: NCAP

NHTSA No.: M20206
Test Date: 3/26/02

NORMAL DESIGN RIDING POSITION

The driver and passenger seat back is positioned to the manufacturer's designated angle. The procedure is as follows: Use headrest post to set the proper seat back angle. A measurement of 18.0° for headrest post = 26.0° seatback angle

Driver seat back angle: 18.0° Headrest post
Passenger seat back angle: 18.0° Headrest post



FRONT SEAT ASSEMBLY

SEAT FORE/AFT POSITIONS

The driver and passenger seats are power operated. The total travel on the driver and passenger seats is 220 mm. The fore/aft position is set at the middle position for both driver and passenger.

Driver seat fore/aft total travel: 220 mm
Passenger seat fore/aft total travel: 220 mm
Driver seat fore/aft position: 110 mm
Passenger seat fore/aft position: 110 mm

SEAT BELT UPPER ANCHORAGE

The test vehicle has rear deck mounted anchorages with belt guides mounted on the top of the seat, they are non-adjustable.

DATA SHEET NO. 4...(continued)

TEST VEHICLE INFORMATION

Test Vehicle: 2002/Ford/Thunderbird/Roadster
Test Program: NCAP

NHTSA No.: M20206
Test Date: 3/26/02

FUEL TANK CAPACITY DATA

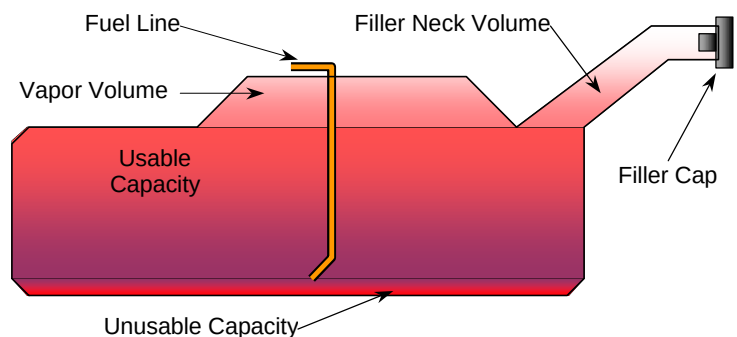
The "Usable Capacity" of the standard equipment fuel tank is: 68.1 liters

The "Usable Capacity" of any optional equipment fuel tank is: n/a liters

The "Usable Capacity" used for certification to FMVSS 301 requirements: 68.1 liters

Actual amount of Stoddard solvent added to vehicle for certification test: 64.0 liters

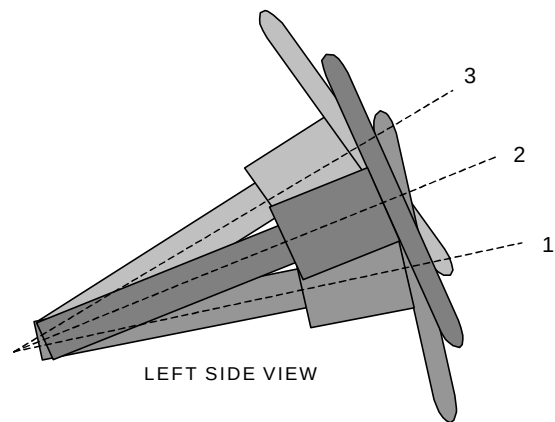
The test vehicle is equipped with an electric fuel pump. The fuel filler door is located on the right rear fender.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

The steering column is power tilt and telescopes. It was placed in mid position for both adjustments. To measure column angle, place a level or straight edge up/down across the center of the driver air bag module resting it on the upper and lower steering wheel rims. Place an inclinometer on the level or straight edge to measure the steering column angle.



STEERING COLUMN ASSEMBLY

Lowermost, position 1: 12.0°

Geometric center, position 2: 19.1°

Uppermost, position 3: 26.0°

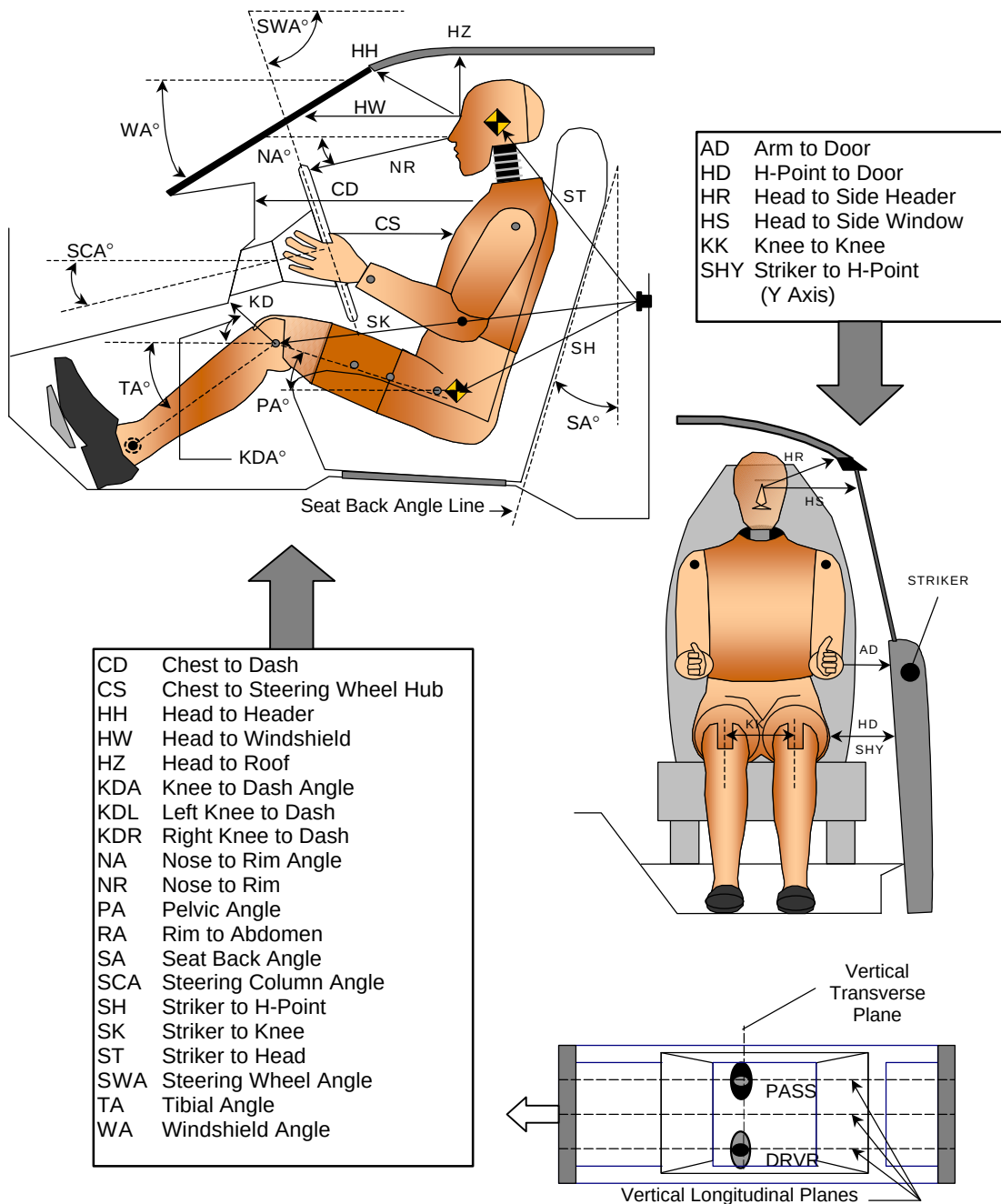
Telescope, mid position 21mm of 42mm total

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

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02

DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS



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

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02

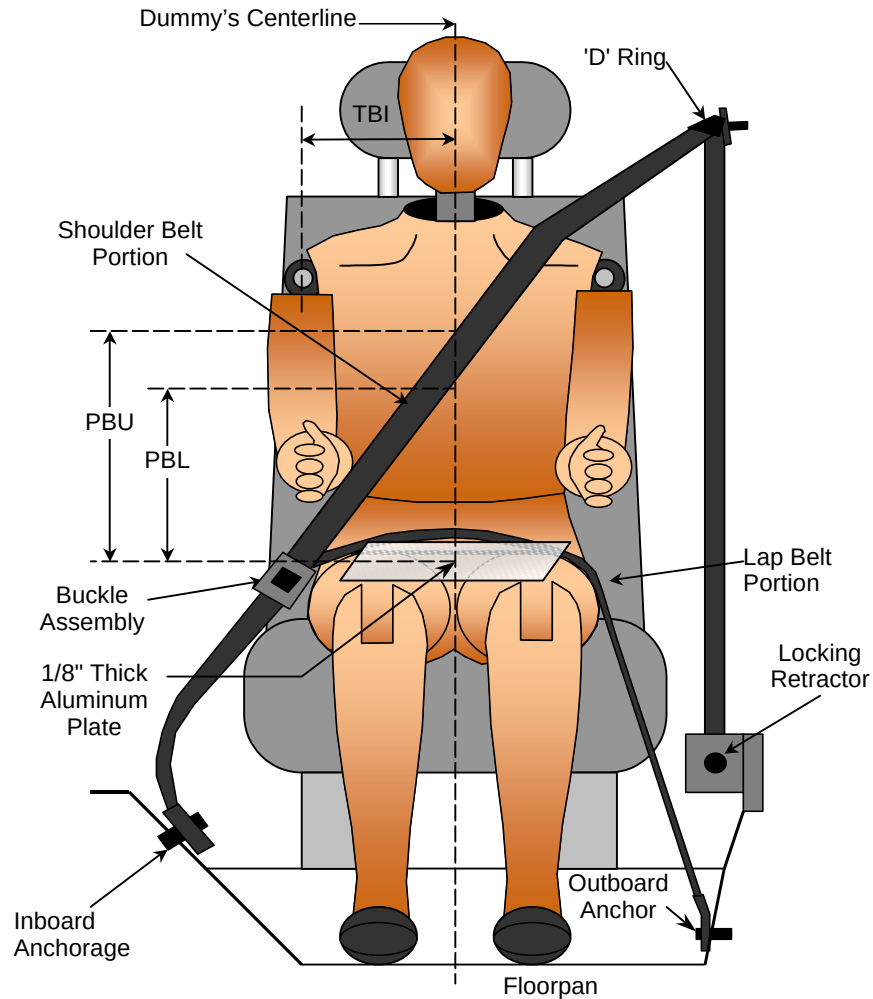
TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield Angle		22.9		
SWA	Steering Wheel Angle		70.1		
SCA	Steering Column Angle		19.8		
SA	Seat Back Angle (headrest post)		18.0		18.0
HZ	Head to Roof (Z)	125	90.0	116	90.0
HH	Head to Header	319	13.6	300	15.3
HW	Head to Windshield	556	0.0	534	0.0
HR	Head to Side Header (Y)	154		163	
NR	Nose to Rim	348	8.0		
CD	Chest to Dash	534		487	
CS	Chest to Steering Hub	289	0.4		
RA	Rim to Abdomen	187	0.0		
KDL	Left Knee to Dash	168	0.0	152	
KDR	Right Knee to Dash	166		170	0.0
PA	Pelvic Angle		24.0		24.7
TA	Tibia Angle		40.7		40.4
KK	Knee to Knee (Y)	271		295	
SK	Striker to Knee	848	1.3	872	4.4
ST	Striker to Head	620	49.6	663	47.5
SH	Striker to H-Point	498	106.1	513	99.5
SHY	Striker to H-Point (Y)	256		273	
HS	Head to Side Window	288		279	
HD	H-Point to Door (Y)	181		191	
AD	Arm to Door (Y)	101		116	
AA	Ankle to Ankle	259		259	

DATA SHEET NO. 6
SEAT BELT POSITIONING DATA

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02



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	354	334
PBL - To surface of reference to belt lower edge	mm	275	255

DATA SHEET NO. 7

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02

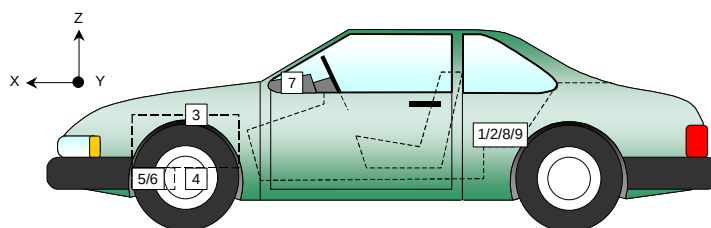
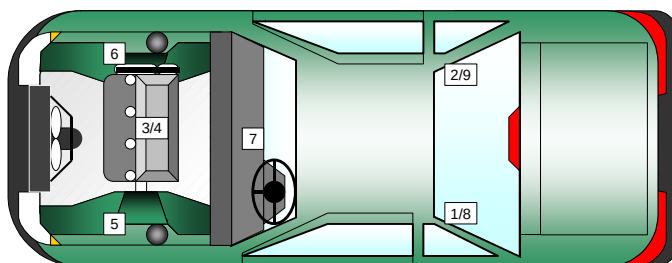
VEHICLE ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)			Peak Values				
		X	Y	Z	Units	Max	Time	Min	Time
1	Left Rear X-Member X	1815	-360	620	G's	2.6	118	40.5	57
2	Right Rear X-Member X	1815	360	623	G's	2.3	135	40.0	57
3	Engine Top X	3730	-130	850	G's	34.4	47	115.3	41
4	Engine Bottom X	3564	0	268	G's	34.1	46	109.3	39
5	Left Brake Caliper X	3605	-708	308	G's	37.0	62	86.4	49
6	Right Brake Caliper X	3605	708	310	G's	60.5	58	106.8	48
7	Instrument Panel X	2870	20	1010	G's	14.9	83	73.5	62
8	Left Rear X-Member Z				G's	15.7	24	13.4	29
9	Right Rear X-Member Z				G's	25.2	51	14.5	28

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: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	35.3	190	59.2	74	7.6	200	46.0	74
Head CG	Y	G's	9.9	70	6.1	34	7.6	31	11.4	119
Head CG	Z	G's	27.9	55	9.9	96	25.4	49	5.2	100
Head CG Resultant	N/A	G's	60.4	74			46.5	74		

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	2.5	192	45.7	78	1.6	148	43.3	66
Chest CG	Y	G's	2.5	88	5.1	75	2.1	24	10.0	75
Chest CG	Z	G's	14.9	54	17.1	95	13.7	44	14.3	99
Chest CG Resultant	N/A	G's	46.2	77			43.3	66		

FEMUR PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	173	138	2217	58	279	34	2601	50
Right Femur	Z	Newtons	359	38	2414	48	318	35	4460	55

SEAT BELT SENSOR PEAK VALUES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Lap Belt Force	N/A	Newtons	6747	56			6609	51		
Shoulder Belt Force	N/A	Newtons	6114	56			5713	57		

HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	Avg G's	T ¹	T ²	HIC	Avg G's	T ¹	T ²
Head CG Primary	516	46.0	55.0	91.0	340	38.9	52.7	88.7

CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Primary	46	76.4	79.4	41	65.7	68.7

DATA SHEET NO. 8...(continued)

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	7.7	90	51.8	59	5.8	106	65.2	50
Pelvis	Y	G's	9.2	73	8.0	61	7.6	50	8.8	65
Pelvis	Z	G's	3.4	198	31.2	76	3.7	34	33.8	78

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	706	77	373	51	40	196	670	60
Neck Force	Y	Newtons	115	72	91	48	128	70	259	118
Neck Force	Z	Newtons	1480	59	321	93	1948	57	158	155
Neck Moment	X	N•m	7.4	155	16.6	91	7.3	58	16.2	128
Neck Moment	Y	N•m	44.3	76	19.2	44	34.0	138	40.7	60
Neck Moment	Z	N•m	4.3	138	10.0	72	13.0	99	7.3	148

FOOT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Foot Aft	X	G's	20.0	73	109.6	50	50.6	54	120.2	48
Left Foot Aft	Z	G's	4.2	200	40.7	50	21.7	59	88.5	50
Left Foot Fore	Z	G's	13.5	19	60.1	52	56.2	59	120.2	46
Right Foot Aft	X	G's	12.1	86	98.3	49	21.3	59	124.9	47
Right Foot Aft	Z	G's	13.7	59	89.6	50	1.7	138	48.3	43
Right Foot Fore	Z	G's	33.8	59	137.7	47	29.3	32	151.6	41

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	97.9	51	18.4	39	49.2	50	117.2	57
Left Lower Moment	Y	N•m	33.4	65	22.3	46	40.3	60	33.4	48
Left Lower Force	Z	Newtons	252	138	3079	51	139	155	6792	50
Left Upper Moment	X	N•m	14.3	133	68.0	40	88.6	51	19.3	62
Left Upper Moment	Y	N•m	45.5	62	38.9	33	166.9	50	10.8	102
Left Upper Force	Z	Newtons	701	138	3030	51	185	141	5365	50
Right Lower Moment	X	N•m	28.8	58	21.0	54	63.1	51	3.1	119
Right Lower Moment	Y	N•m	33.2	61	19.3	37	37.4	69	23.0	44
Right Lower Force	Z	Newtons	215	138	4189	51	213	138	4056	48
Right Upper Moment	X	N•m	22.9	64	39.1	53	24.1	155	21.9	43
Right Upper Moment	Y	N•m	7.7	155	141.1	54	30.3	107	106.2	68
Right Upper Force	Z	Newtons	361	155	3612	51	340	138	3677	48

DATA SHEET NO. 8...(continued)

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	mm			25.1	78			19.7	70

HEAD REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	36.6	190	58.8	75	9.0	200	45.8	76
Head CG	Y	G's	9.3	91	6.1	34	9.7	31	9.6	102
Head CG	Z	G's	28.5	55	9.7	96	24.5	51	5.2	99
Head CG	N/A	G's	59.7	74			46.6	76		

CHEST REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	2.6	192	45.0	77	1.4	149	42.0	66
Chest CG	Y	G's	2.4	97	4.7	75	2.3	24	9.5	75
Chest CG	Z	G's	14.3	54	16.9	95	14.0	47	14.3	98
Chest CG	N/A	G's	45.5	77			42.0	66		

REDUNDANT HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	Avg	T ¹	T ²	HIC	Avg G's	T ¹	T ²
Head CG Redundant	509	45.7	54.8	90.8	334	38.6	52.1	88.1

REDUNDANT CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Redundant	45	76.1	80.1	40	64.6	67.6

DATA SHEET NO. 9
SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02

SEAT BELT PLACEMENT 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	354	334
PBL - Top surface of reference to belt lower edge	mm	275	255

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Retractor reel to "D" ring	mm	N/A	N/A
Shoulder belt length as measured on ATD	mm	1119	1134
Lap belt length as measured on ATD	mm	851	892
Remainder of belt on reel	mm	759	674
Total belt length for continuous webbing systems	mm	2729	2700

SHOULDER BELT SPOOL-OUT DATA

Measurement Description	Units	Driver	Passenger
As determined by film analysis	mm	N/A	N/A

BELT STRETCH DATA

Measurement Description	Units	Driver	Passenger
As determined electronically	mm/m	N/A	N/A

DATA SHEET NO. 10
SUMMARY OF FMVSS 212 DATA

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02

Windshield Mounting Details:

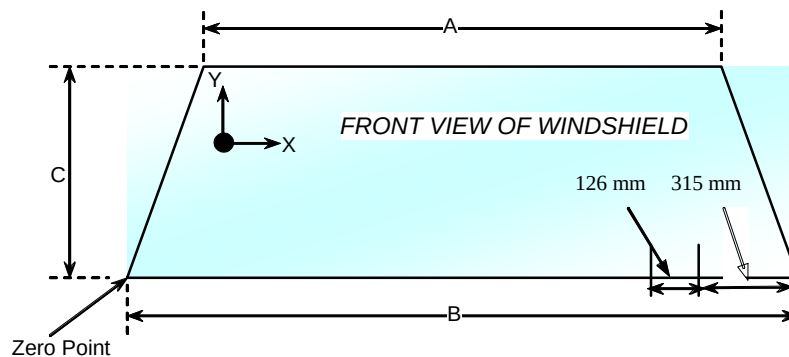
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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.

Temperature of windshield molding during test: 22 °C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2116	1990	94
Right Side	2131	2131	100
Total	4247	4136	97



WINDSHIELD DIMENSIONS

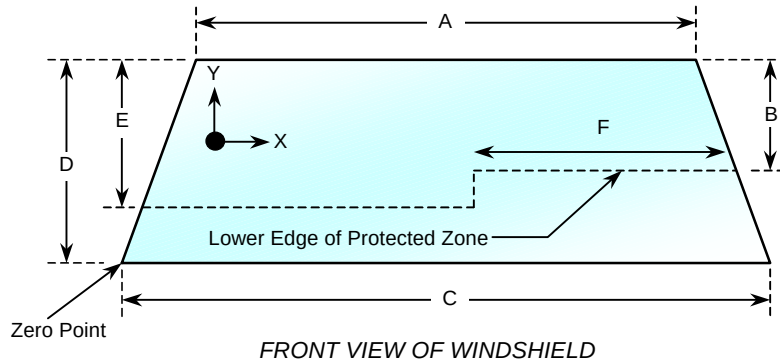
Item	Units	Segment Length	Molding Width
A	mm	1181	20
B	mm	1496	18
C	mm	784	25

DATA SHEET NO. 11

WINDSHIELD ZONE INTRUSION FMVSS 219 (Partial) DATA

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02



Item	Units	Value
A	mm	1181
B	mm	422
C	mm	1496
D	mm	784
E	mm	377
F	mm	531

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

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Vehicle: 2002/Ford/Thunderbird/Roadster
Test Program: NCAP

NHTSA No.: M20206
Test Date: 3/26/02

Temperature at Time of Impact: 20.8° C

Test Time: 12:27 pm

Stoddard Solvent Spillage Measurements

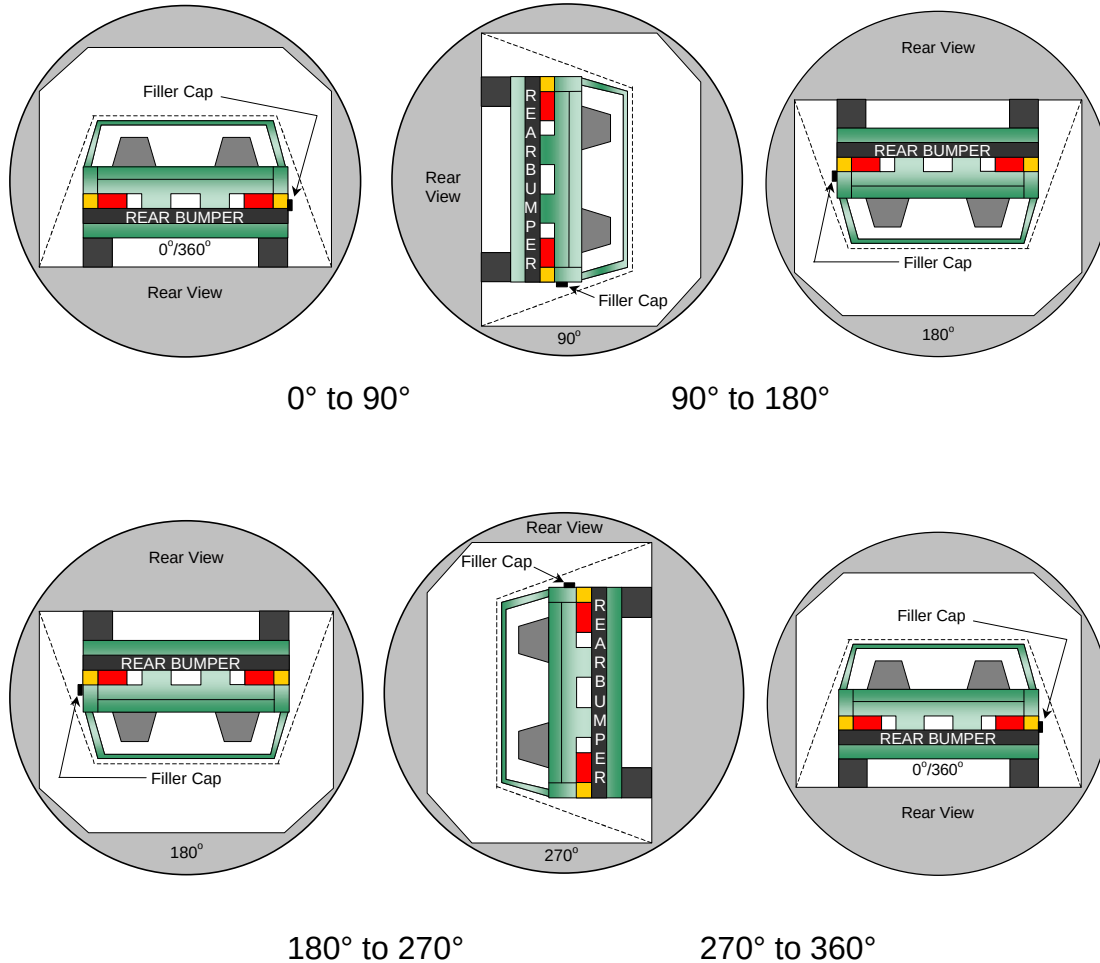
- A. From impact until vehicle motion ceases: 0 oz.
(Maximum Allowable = 1 ounce)
- B. For the 5 minute period after motion ceases: 0 oz.
(Maximum Allowable = 5 ounces)
- C. For the following 25 minutes: 0 oz.
(Maximum Allowable = 1 oz./minute)
- D. Spillage : none

DATA SHEET NO. 13
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02

Test Time: 12:27 p.m.



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

Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
0° to 90°	163	300	0
90° to 180°	155	300	0
180° to 270°	141	300	0
270° to 360°	163	300	0

DATA SHEET NO. 14
VEHICLE MEASUREMENTS

Test Vehicle: 2002/Ford/Thunderbird/Roadster
Test Program: NCAP

NHTSA No.: M20206
Test Date: 3/26/02

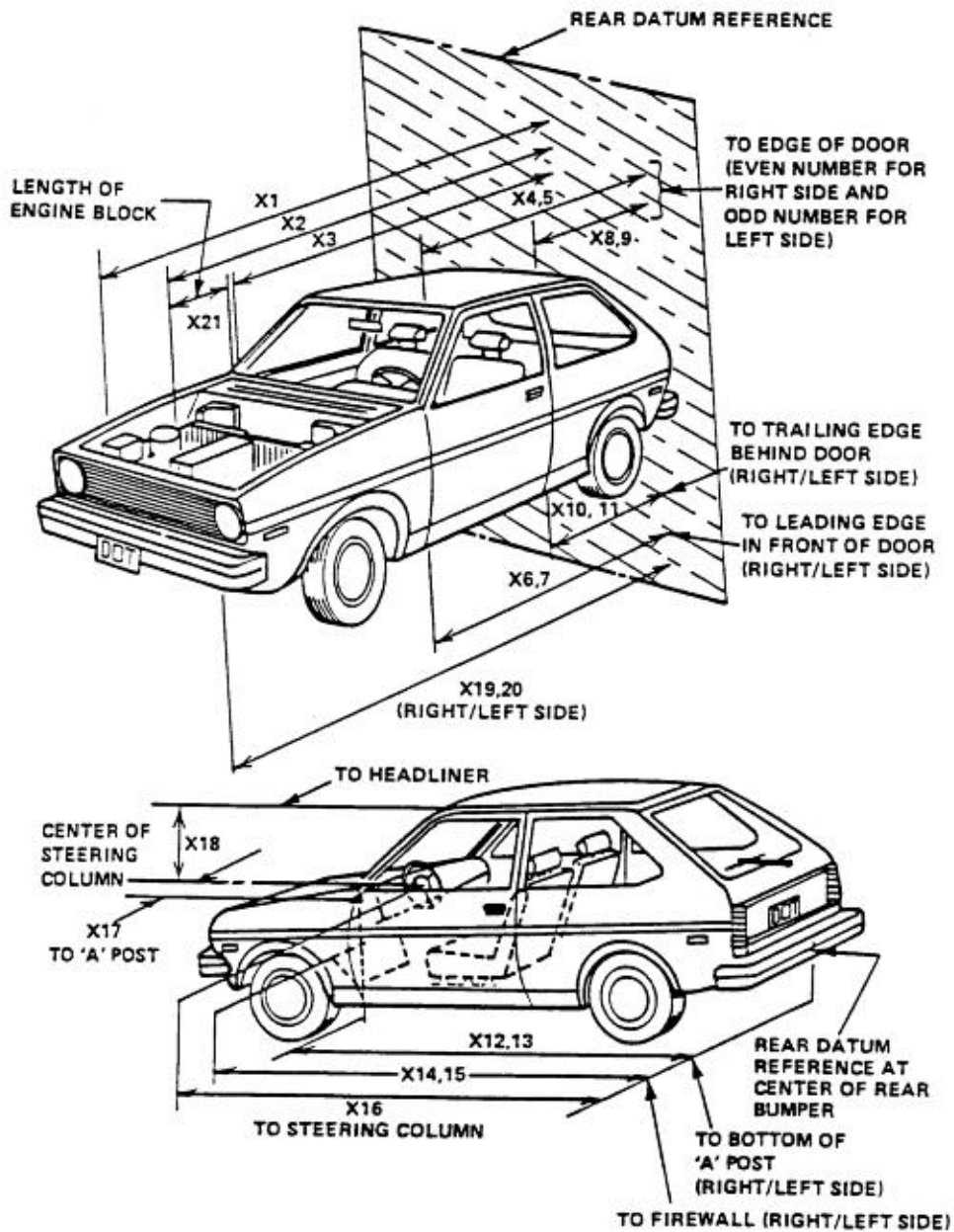
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total length of vehicle at centerline	mm	4692	4204	488
2	RSOV to front of engine	mm	3907	3746	161
3	RSOV to firewall centerline	mm	3572	3476	96
4	RSOV to leading edge of right door	mm	3068	3062	6
5	RSOV to leading edge of left door	mm	3067	3061	6
6	RSOV to lower leading edge of right door	mm	3057	3041	16
7	RSOV to lower leading edge of left door	mm	3053	3041	12
8	RSOV to upper leading edge of right door	mm	1775	1768	7
9	RSOV to upper leading edge of left door	mm	1767	1764	3
10	RSOV to lower trailing edge of right door	mm	1844	1826	18
11	RSOV to lower trailing edge of left door	mm	1846	1832	14
12	RSOV to bottom of right 'A' pillar	mm	3008	2980	28
13	RSOV to bottom of left 'A' pillar	mm	2999	2988	11
14	RSOV to firewall on right side	mm	3630	3472	158
15	RSOV to firewall on left side	mm	3626	3532	94
16	RSOV to steering column	mm	2626	2676	-50
17	Center of steering column to left 'A' pillar	mm	309	326	-17
18	Center of steering column to headlining	mm	333	336	-3
19	RSOV to right side of front bumper	mm	4606	4204	402
20	RSOV to left side of front bumper	mm	4605	4114	491
21	Length of engine block	mm	550	550	0
RD	RSOV to right side of dash panel	mm	2779	2771	8
CD	RSOV to center of dash panel	mm	2859	2782	77
LD	RSOV to left side of dash panel	mm	2777	2775	2

DATA SHEET NO. 14...(continued)

VEHICLE MEASUREMENTS

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02



DATA SHEET NO. 15
CAMERA LOCATIONS

Test Vehicle: 2002/Ford/Thunderbird/Roadster
Test Program: NCAP

NHTSA No.: M20206
Test Date: 3/26/02

No.	Camera View	Location (mm) *			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Side View				18	32
2	Left Front View	1000	-8000	1430	25	1020
3	Steering Column Top	2000	-8170	1560	25	1015
4	Steering Column Bottom	2000	-8170	1030	25	1015
5	Driver Close-up	1500	-8570	1320	50	1020
6	Driver Angle	4680	-5070	2030	50	1000
7	Onboard Driver				13	
8	Onboard Passenger				13	
9	Right Overall	1997	6191	1340	13	905
10	Right Passenger Half	1032	8615	1330	25	957
11	Right Close-up	1315	10294	2103	25	**
12	Right Angle	4822	5073	1163	50	909
13	Windshield	-700	0	2650	13	1005
14	Top Driver	-90	-430	1745	13	1064
15	Top Passenger	-90	460	1745	13	1020
16	Pit Front	900	0	-3220	13	1010
17	Pit Rear	2700	0	-3220	13	1015

*COORDINATES:

** camera did not run

+X = film plane rearward of barrier

+Y = film plane to right of monorail centerline

+Z = film plane above ground level

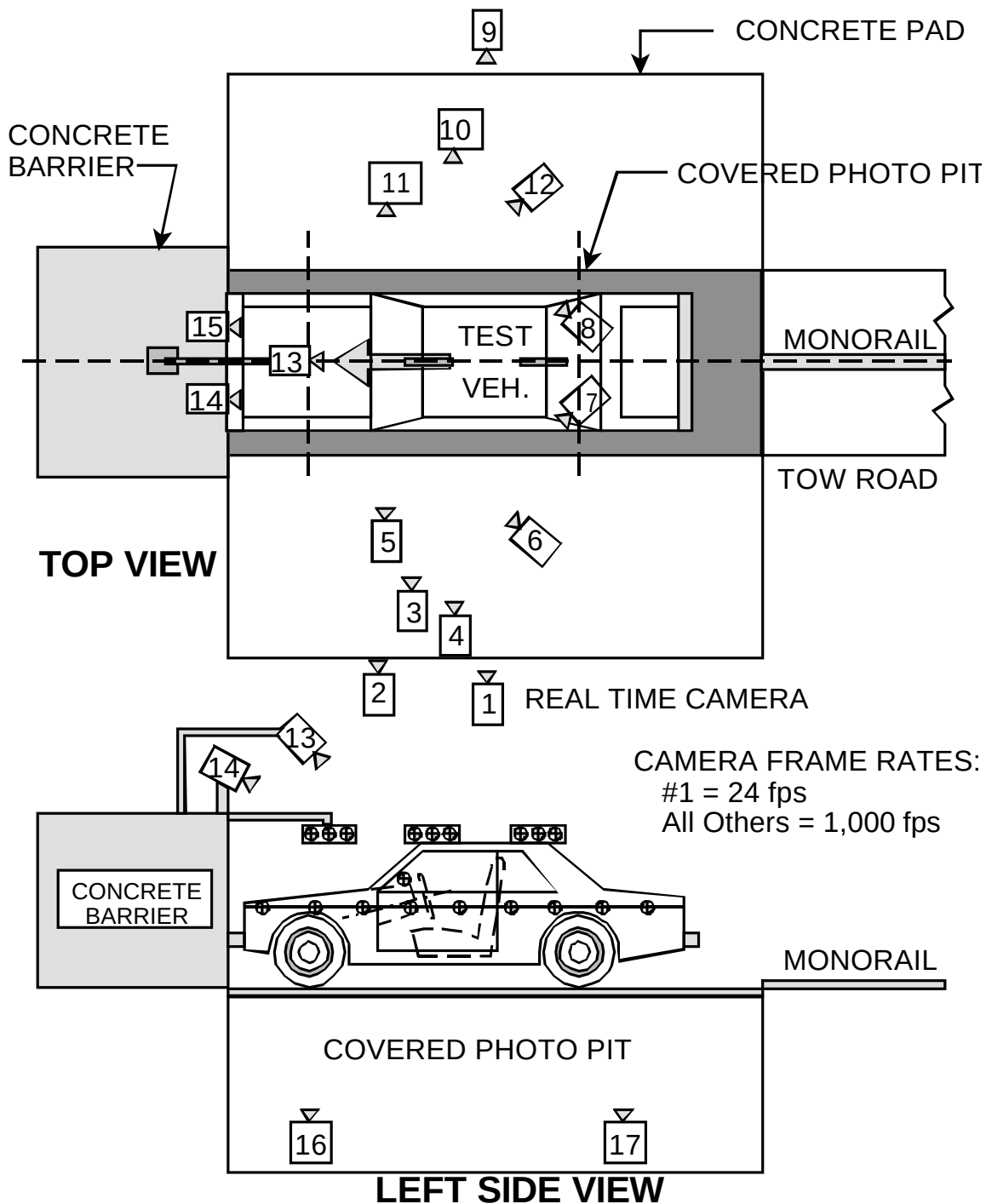
DATA SHEET NO. 15...(continued)

CAMERA LOCATIONS

Test Vehicle: 2002/Ford/Thunderbird/Roadster
Test Program: NCAP

NHTSA No.: M20206
Test Date: 3/26/02

CAMERA POSITIONS FOR FRONTAL IMPACTS

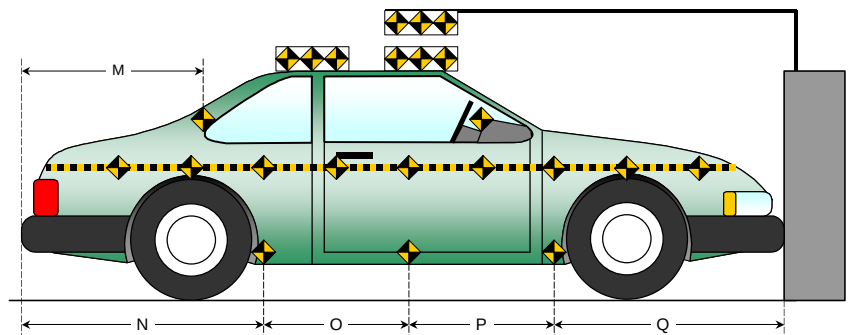
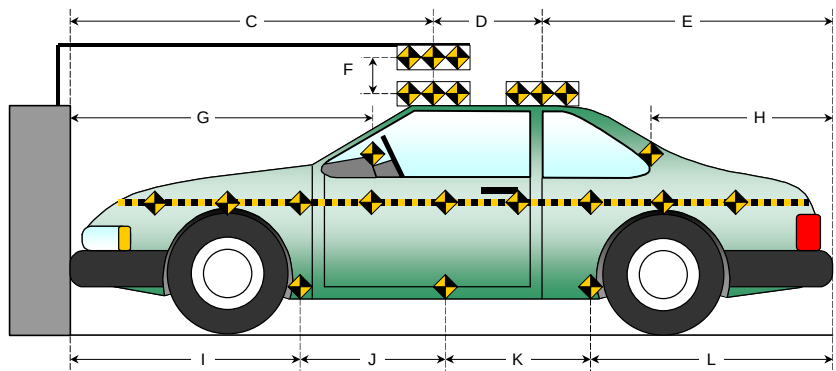
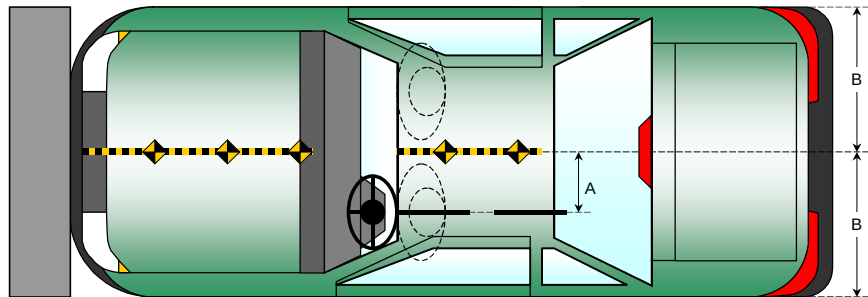


DATA SHEET NO. 16
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02

Item	Value
A	376
B	909
C	2380
D	610
E	1702
F	180
G	1875
H	1320
I	1319
J	905
K	910
L	1512
M	1315
N	1512
O	910
P	905
Q	1319



DATA SHEET NO. 17
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

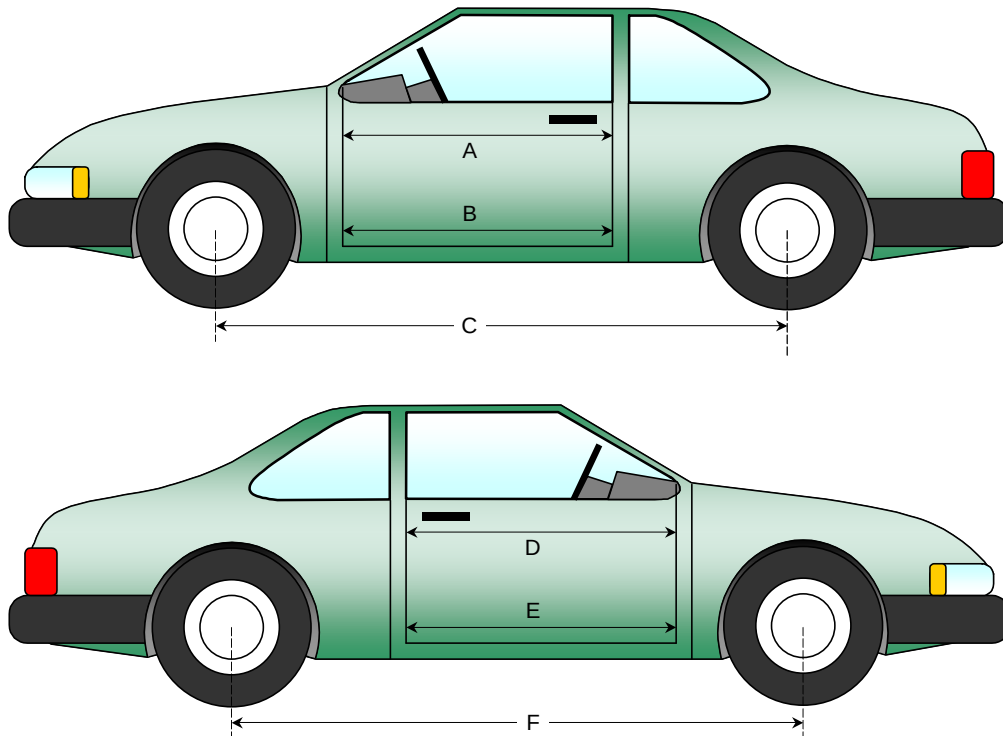
NHTSA No.: M20206
 Test Date: 3/26/02

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1266	1238	28
B	Left Side Lower	mm	1201	1192	9
D	Right Side Upper	mm	1266	1240	26
E	Right Side Lower	mm	1200	1193	7

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2720	2636	84
F	Right Side Wheelbase	mm	2720	2597	123



DATA SHEET NO. 17...(continued)
VEHICLE INTRUSION MEASUREMENTS

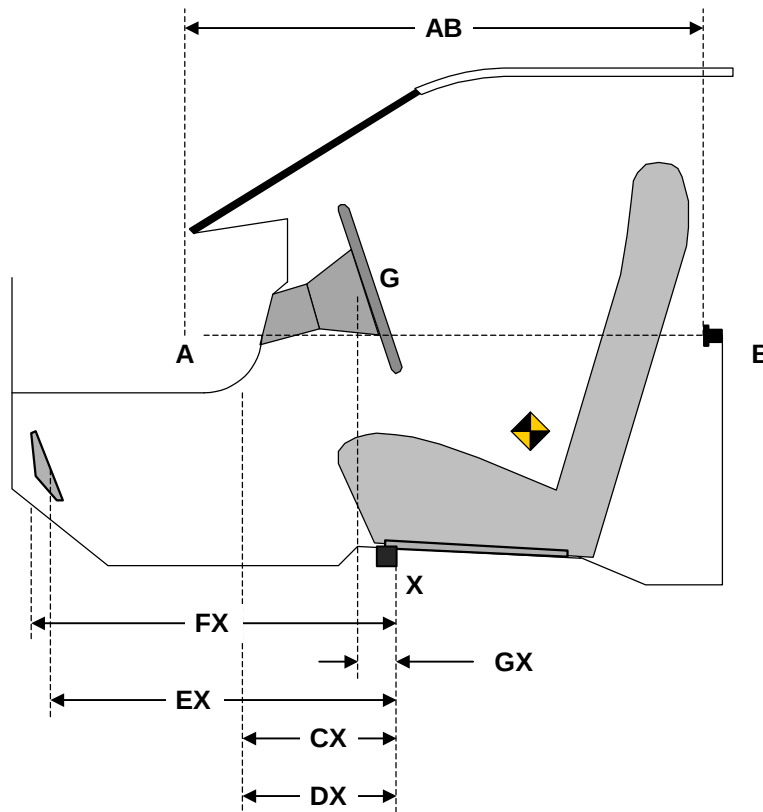
Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	1143	1143	0
CX	Left Knee Bolster to X	mm	289	285	4
DX	Right Knee Bolster to X	mm	290	310	-20
EX	Brake Pedal to X	mm	650	532	118
FX	Foot Rest to X	mm	655	646	9
GX	Center of Steering Column Wheel Hub to X	mm	135	145	-10

X = Left Front Seat Front Outboard Anchor Bolt Head



DRIVER COMPARTMENT

DATA SHEET NO. 17...(continued)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

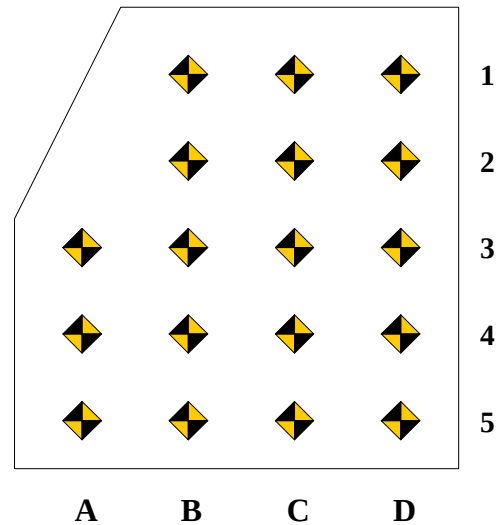
NHTSA No.: M20206
 Test Date: 3/26/02

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		563	562	559		532	522	517		31	40	42
2		472	471	473		455	451	452		17	20	21
3	388	389	385	386	380	372	365	362	8	17	20	24
4	280	280	285	280	275	270	272	256	5	10	13	24
5	158	162	162	160	155	152	148	139	3	10	14	21

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		30	27	20		48	60	62		-18	-33	-42
2		-37	-32	-35		-10	-32	-23		-22	0	-12
3	-40	-35	-35	-35	-31	-38	-38	-23	0	3	3	-12
4	-36	-36	-36	-20	-17	-49	-38	-10	0	13	2	-10
5	-32	-28	-28	-15	-15	-50	-40	-8	-9	22	12	-7

DATA SHEET NO. 17...(continued)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

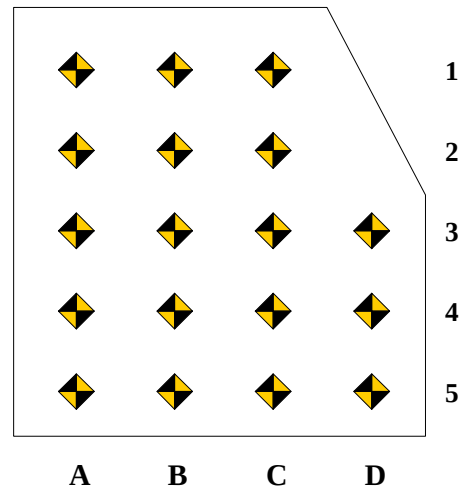
NHTSA No.: M20206
 Test Date: 3/26/02

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	597	600	595	592	545	537	534	563	52	63	61	29
2	490	492	494	491	471	466	470	488	19	26	24	3
3	394	392	386	381	384	381	377	374	10	11	9	7
4	269	271	268	266	260	259	258	258	9	12	10	8
5	145	153	149	146	135	143	144	144	5	10	5	2

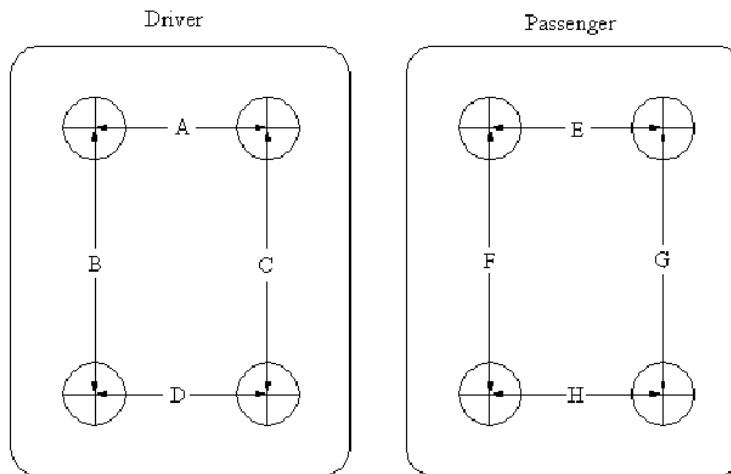
PASSENGER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	53	49	46	45	94	80	66	40	-41	-31	-20	5
2	-35	-30	-30	-31	-32	-45	-34	-35	-3	15	4	4
3	-36	-37	-36	-35	-41	-53	-55	-38	5	16	19	3
4	-20	-34	-34	-35	-25	-47	-52	-45	5	13	18	10
5	-15	-28	-28	-33	-23	-42	-47	-19	8	14	19	-14

DATA SHEET NO. 17...(continued)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02



UNDERBODY FLOORBOARD DEFORMATION

Measurement	Pre-Test	Post-Test	Difference
A	240	237	3
B	272	270	2
C	250	246	4
D	233	216	17
E	296	288	8
F	311	300	11
G	302	296	6
H	285	265	20

DATA SHEET NO. 18

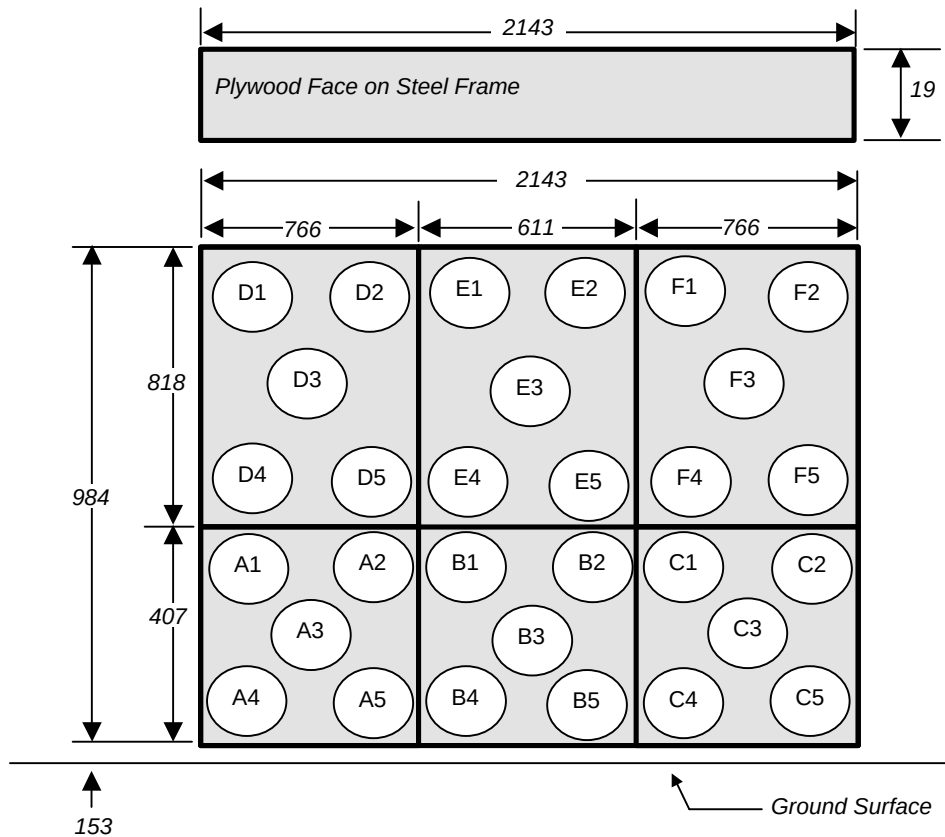
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2002/Ford/Thunderbird/Roadster
 Test Program: NCAP

NHTSA No.: M20206
 Test Date: 3/26/02

30 Load Cell Rigid Barrier

Load Cell Locations on Fixed Barrier



Group 4 D1-D5	Group 5 E1-E5	Group 6 F1-F5
Group 1 A1-A5	Group 2 B1-B5	Group 3 C1-C5

6 Groups of 5 Load Cells Each

The Data is presented in Appendix B with the following requirements:

1. Sum data from 6 groupings shown above (5 cells/group)
2. Sum of left 2 groupings, center 2 groupings and right 2 groupings.
3. Total or sum of all 30 individual load cells.
4. Total versus average rear seat crossmember displacement.

DATA SHEET NO. 19**ACCIDENT INVESTIGATION DIVISION DATA**

Test Vehicle: 2002/Ford/Thunderbird/Roadster
Test Program: NCAP

NHTSA No.: M20206
Test Date: 3/26/02

VEHICLE INFORMATION

VIN: 1FAHP60A62Y108515 Wheelbase (mm) : 2720
Vehicle Size Category: 2C / CV Test Weight (kg) : 1983.1

ACCELEROMETER DATA

Accelerometer Locations: As per measurements on Page 13
Cal. Procedure/Interval: MGA procedure / 6 month
Integration Algorithm: Trapezoidal Linearity: > 99%
Impact Velocity (km/h): 56.2
Velocity Change (km/h): 63.7 Time of Separation (msec): 186

CRUSH PROFILE

Collision Deformation Classification: frontal Midpoint of Damage: CL
Damage Region Length (mm): 1160 Impact Mode: frontal

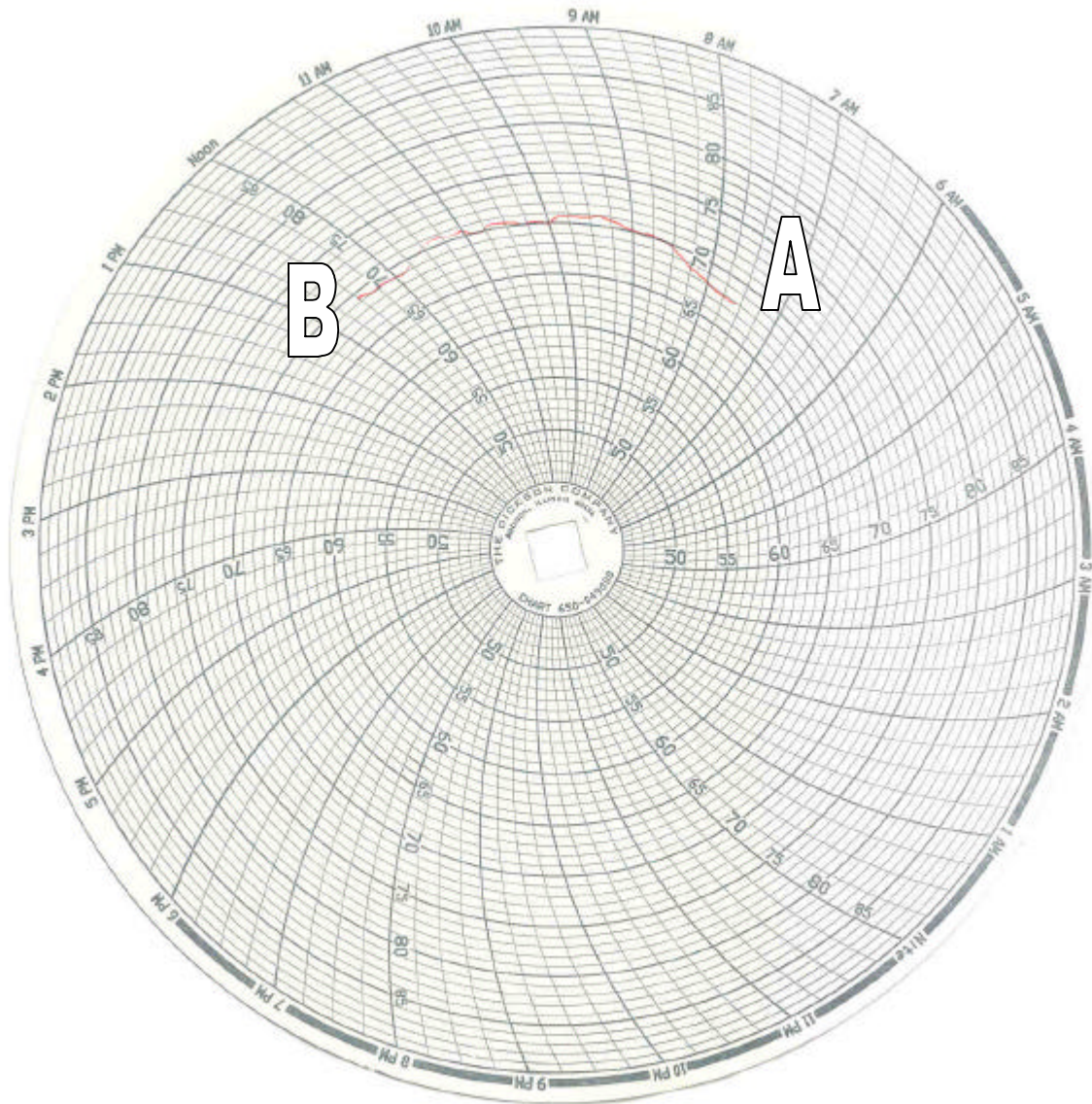
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4605	4114	491
C2	Crush zone 2 at left side	mm	4638	4112	526
C3	Crush zone 3 at left side	mm	4668	4166	502
C4	Crush zone 4 at right side	mm	4670	4205	465
C5	Crush zone 5 at right side	mm	4640	4209	431
C6	Crush zone 6 at right side	mm	4606	4204	402

DATA SHEET NO. 20

DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2002/Ford/Thunderbird/Roadster
Test Program: NCAP

NHTSA No.: M20206
Test Date: 3/26/02



A = Dummies installed in vehicle at 7:30 a.m.

B = Test conducted at 12:27 p.m.

APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

Photo No. A-1	Pre-Test Front View of Test Vehicle	A-1
Photo No. A-2	Post-Test Front View of Test Vehicle	A-2
Photo No. A-3	Pre-Test Rear View of Test Vehicle	A-3
Photo No. A-4	Post-Test Rear View of Test Vehicle	A-4
Photo No. A-5	Pre-Test Left Side View of Test Vehicle	A-5
Photo No. A-6	Post-Test Left Side View of Test Vehicle	A-6
Photo No. A-7	Pre-Test Left Rear Three-Quarter View of Test Vehicle	A-7
Photo No. A-8	Post-Test Left Rear Three-Quarter View of Test Vehicle	A-8
Photo No. A-9	Pre-Test Right Side View of Test Vehicle	A-9
Photo No. A-10	Post-Test Right Side View of Test Vehicle	A-10
Photo No. A-11	Pre-Test Right Front Three-Quarter View of Test Vehicle	A-11
Photo No. A-12	Post-Test Right Front Three-Quarter View of Test Vehicle	A-12
Photo No. A-13	Pre-Test Fuel Filler Cap View	A-13
Photo No. A-14	Pre-Test Engine Compartment View	A-14
Photo No. A-15	Post-Test Engine Compartment View	A-15
Photo No. A-16	Pre-Test Front Underbody View	A-16
Photo No. A-17	Post-Test Front Underbody View	A-17
Photo No. A-18	Pre-Test Mid Underbody	A-18
Photo No. A-19	Post-Test Mid Underbody	A-19
Photo No. A-20	Pre-Test Rear Underbody View	A-20
Photo No. A-21	Post-Test Rear Underbody View	A-21
Photo No. A-22	Pre-Test Windshield View	A-22
Photo No. A-23	Post-Test Windshield View	A-23
Photo No. A-24	Pre-Test Driver Dummy Position Left Side View	A-24
Photo No. A-25	Post-Test Driver Dummy Position Left Side View	A-25
Photo No. A-26	Pre-Test Driver Dummy Position Left Side View (Door Open)	A-26
Photo No. A-27	Post-Test Driver Dummy Position Left Side View (Door Open)	A-27
Photo No. A-28	Pre-Test Driver Seat Position View	A-28

Photo No. A-29	Post-Test Driver Seat Position View	A-29
Photo No. A-30	Pre-Test Driver Dummy Knee Position	A-30
Photo No. A-31	Post-Test Driver Dummy Knee Position	A-31
Photo No. A-32	Post-Test Driver Airbag Contact	A-32
Photo No. A-33	Post-Test Driver Knee Contact View	A-33
Photo No. A-34	Post-Test Driver Head Contact (visor)	A-34
Photo No. A-35	Post-Test Driver Head Contact (headrest)	A-35
Photo No. A-36	Post-Test Driver Seat Belt View #1	A-36
Photo No. A-37	Post-Test Driver Seat Belt View #2	A-37
Photo No. A-38	Post-Test Driver Seat Belt View #3	A-38
Photo No. A-39	Post-Test Driver Seat Belt View #4	A-39
Photo No. A-40	Pre-Test Driver Windshield View	A-40
Photo No. A-41	Post-Test Driver Windshield View	A-41
Photo No. A-42	Pre-Test Passenger Dummy Position Right Side View	A-42
Photo No. A-43	Post-Test Passenger Dummy Position Right Side View	A-43
Photo No. A-44	Pre-Test Passenger Dummy Position Right Side View (Door Open)	A-44
Photo No. A-45	Post-Test Passenger Dummy Position Right Side View (Door Open)	A-45
Photo No. A-46	Pre-Test Passenger Seat Position View	A-46
Photo No. A-47	Post-Test Passenger Seat Position View	A-47
Photo No. A-48	Pre-Test Passenger Dummy Knee Position	A-48
Photo No. A-49	Post-Test Passenger Dummy Knee Position	A-49
Photo No. A-50	Post-Test Passenger Airbag Contact	A-50
Photo No. A-51	Post-Test Passenger Knee Contact View	A-51
Photo No. A-52	Post-Test Passenger Head Contact (visor)	A-52
Photo No. A-53	Post-Test Passenger Head Contact (headrest)	A-53
Photo No. A-54	Pre-Test Passenger Windshield View	A-54
Photo No. A-55	Post-Test Passenger Windshield View	A-55
Photo No. A-56	Vehicle Certification Label	A-56
Photo No. A-57	Tire Placard	A-57

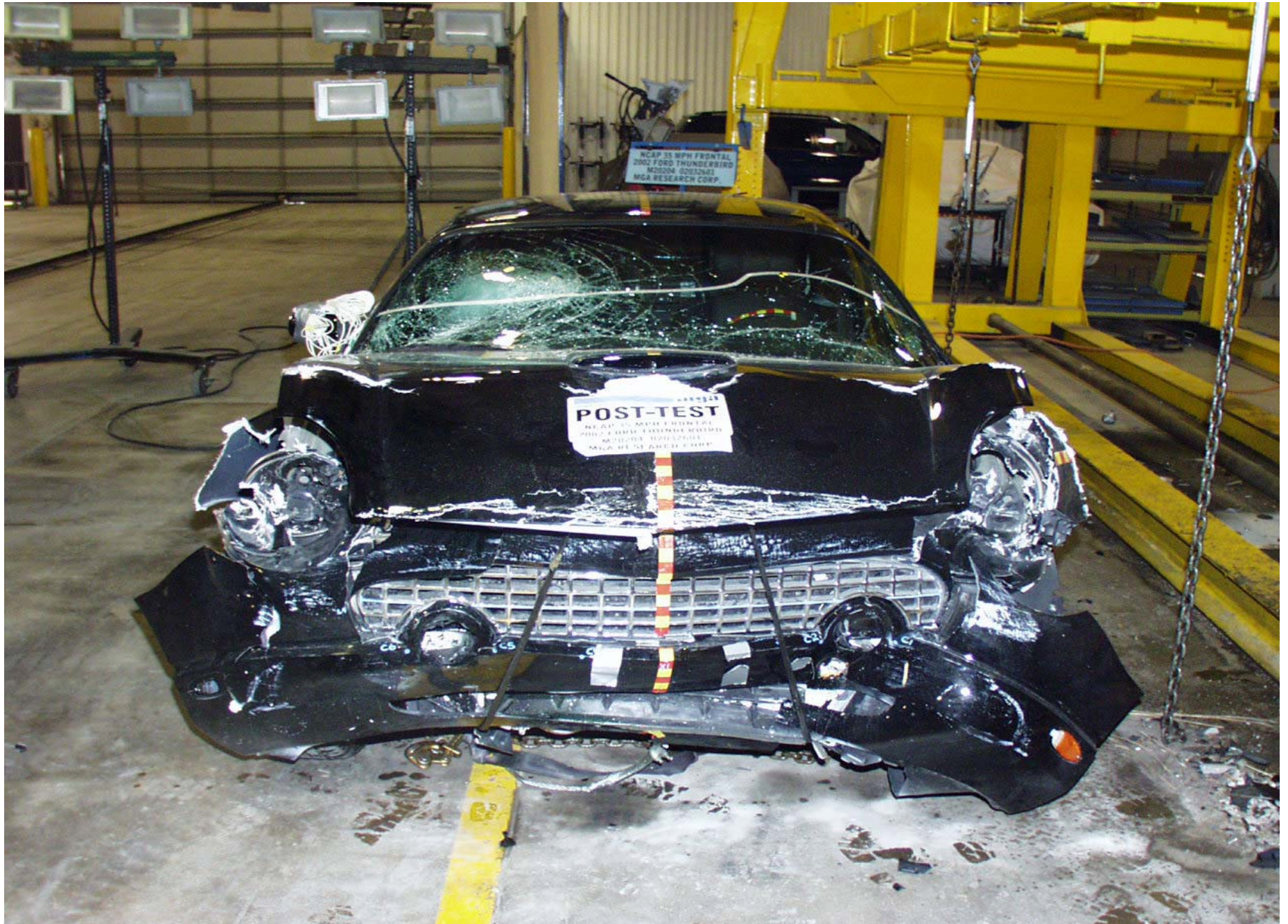
Photo No. A-58	Vehicle Impact	A-58
Photo No. A-59	Rollover 90 Degrees	A-59
Photo No. A-60	Rollover 180 Degrees	A-60
Photo No. A-61	Rollover 270 Degrees	A-61
Photo No. A-62	Rollover 360 Degrees	A-62

A-1.

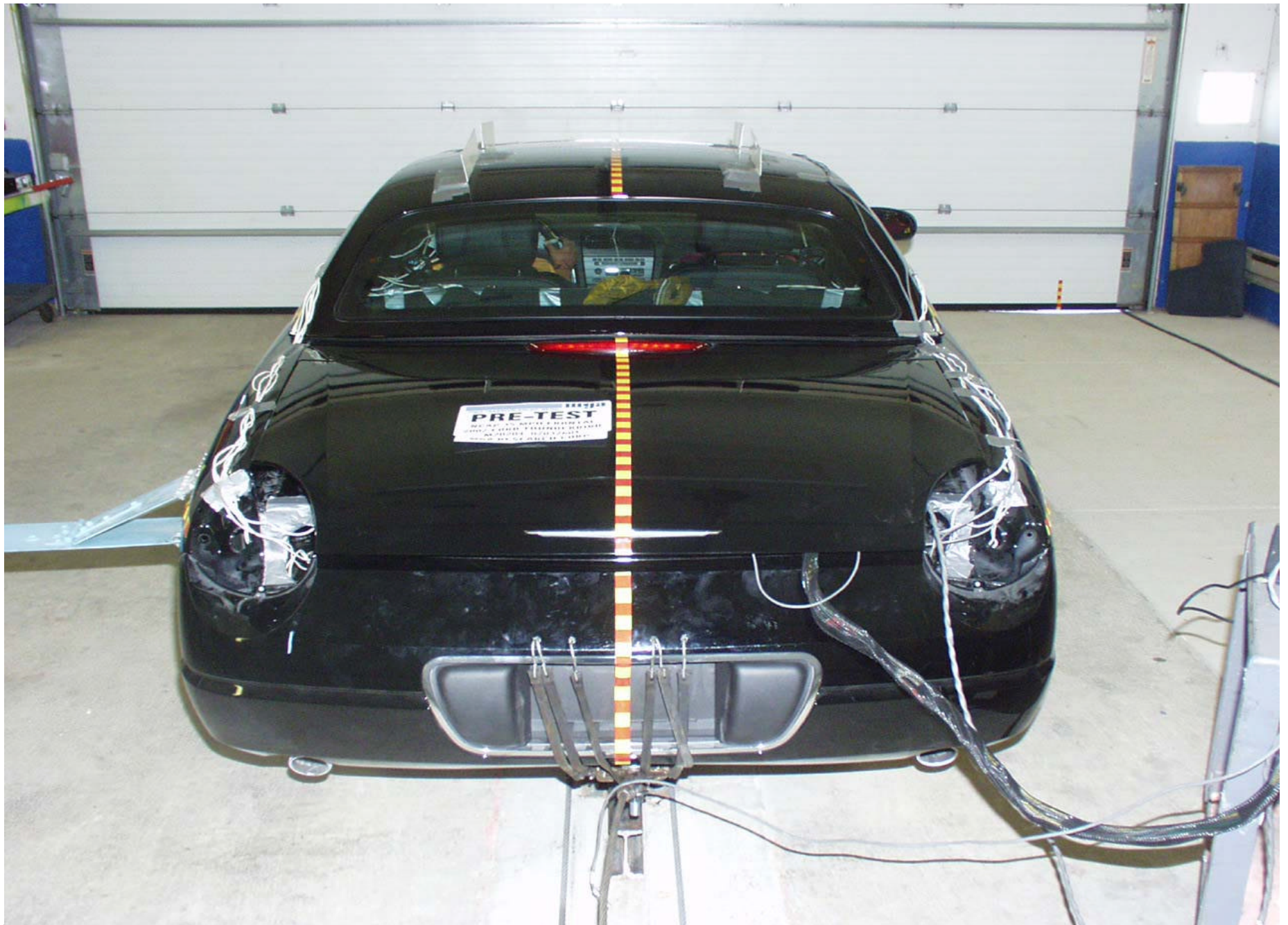


Pre-Test Front View of Test Vehicle

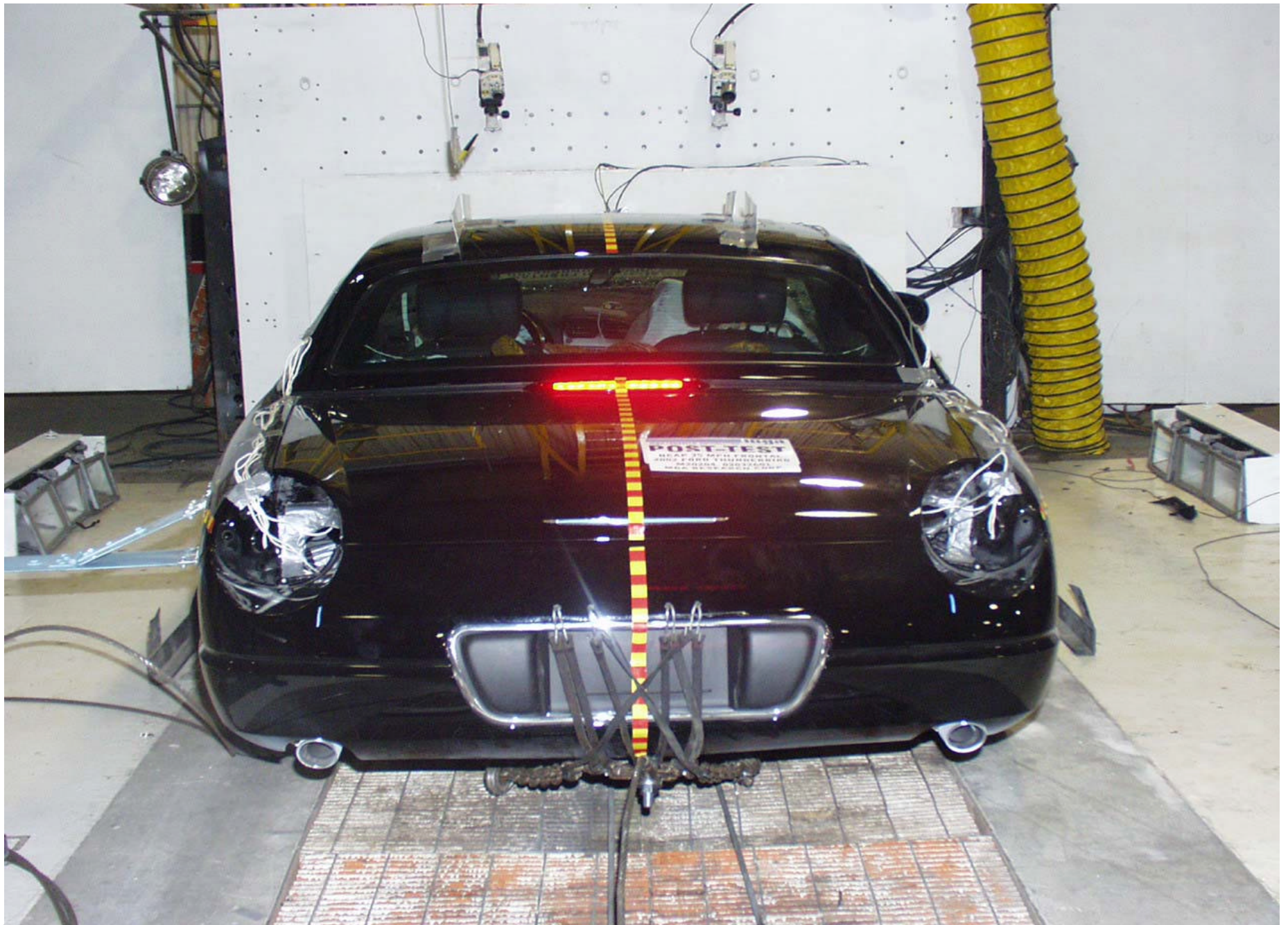
A-2.



Post-Test Front View of Test Vehicle



Pre-Test Rear View of Test Vehicle



Post-Test Rear View of Test Vehicle



Pre-Test Left Side View of Test Vehicle



Post-Test Left Side View of Test Vehicle



Pre-Test Left Rear Three-Quarter View of Test Vehicle

A-8.



Post-Test Left Rear Three-Quarter View of Test Vehicle



Pre-Test Right Side View of Test Vehicle



Post-Test Right Side View of Test Vehicle



Pre-Test Right Front Three-Quarter View of Test Vehicle



Post-Test Right Front Three-Quarter View of Test Vehicle



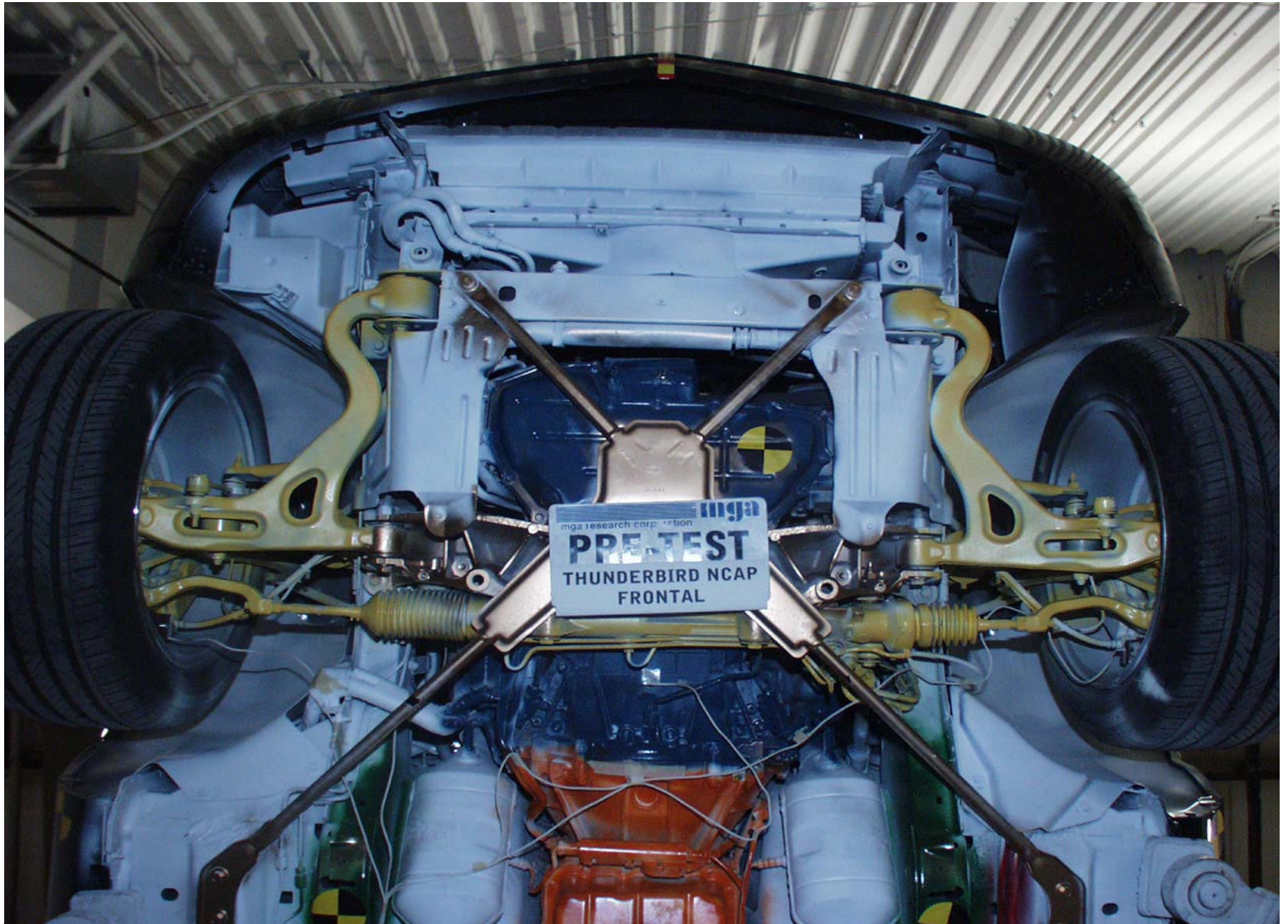
Pre-Test Fuel Filler Cap View



Pre-Test Engine Compartment View



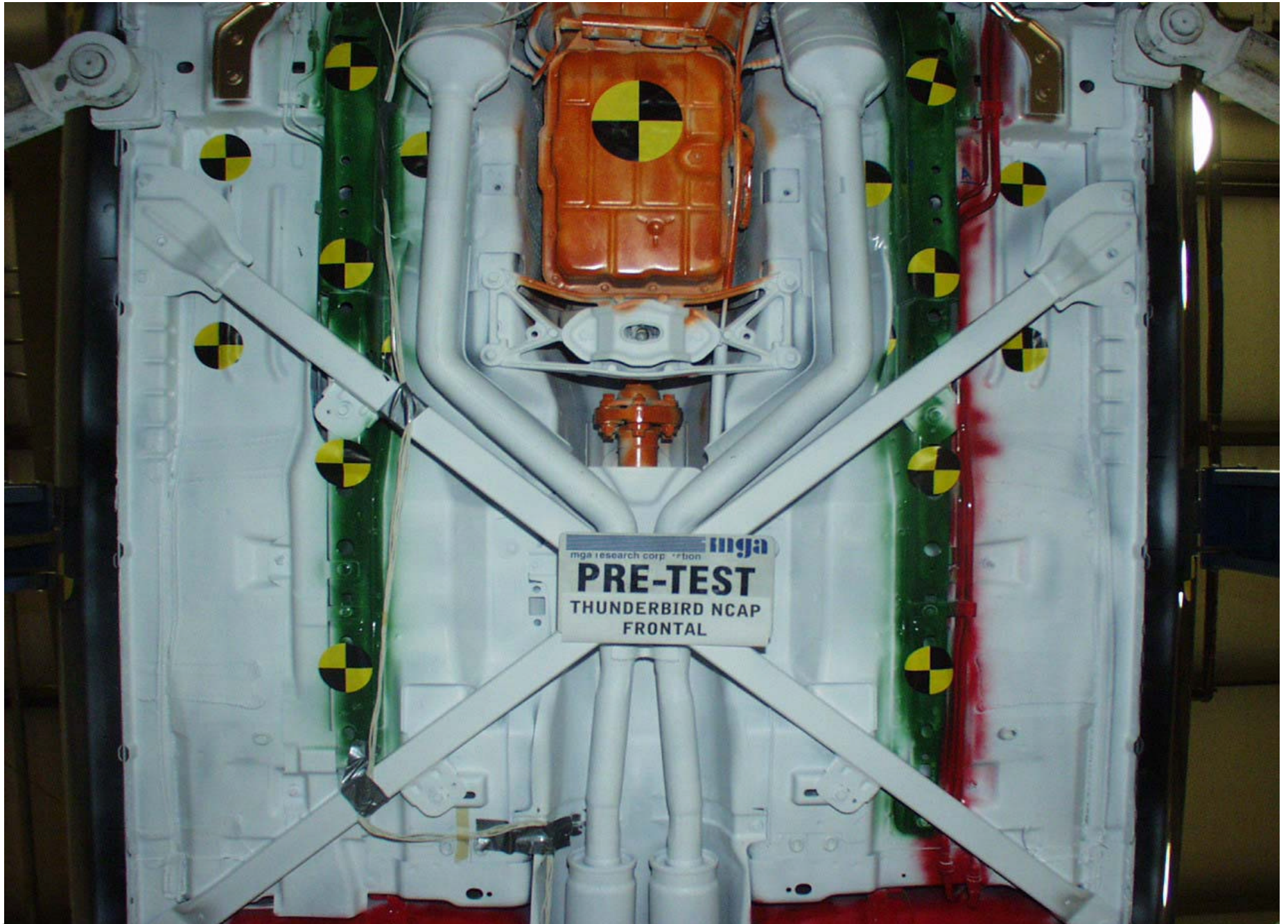
Post-Test Engine Compartment View



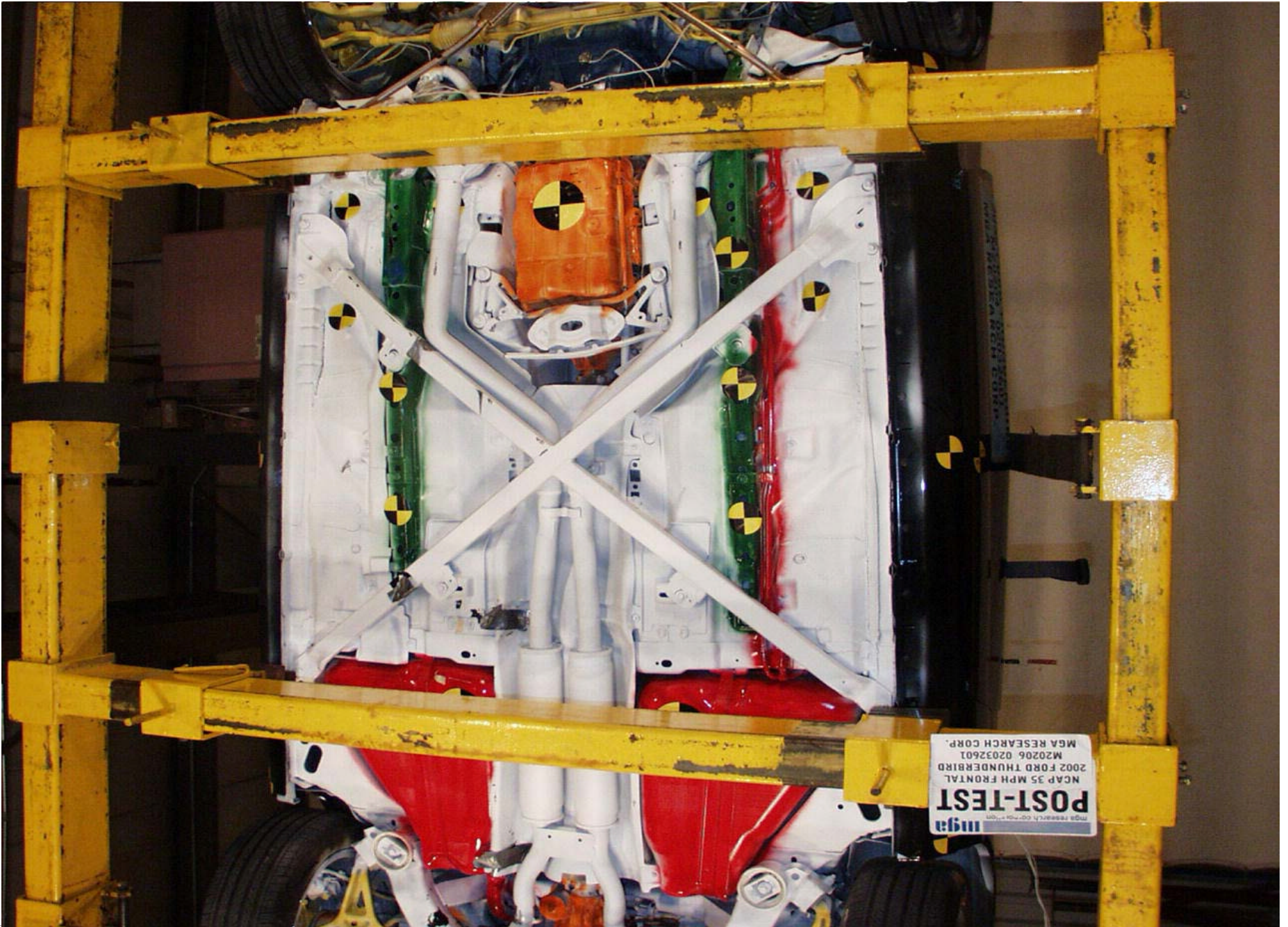
Pre-Test Front Underbody View



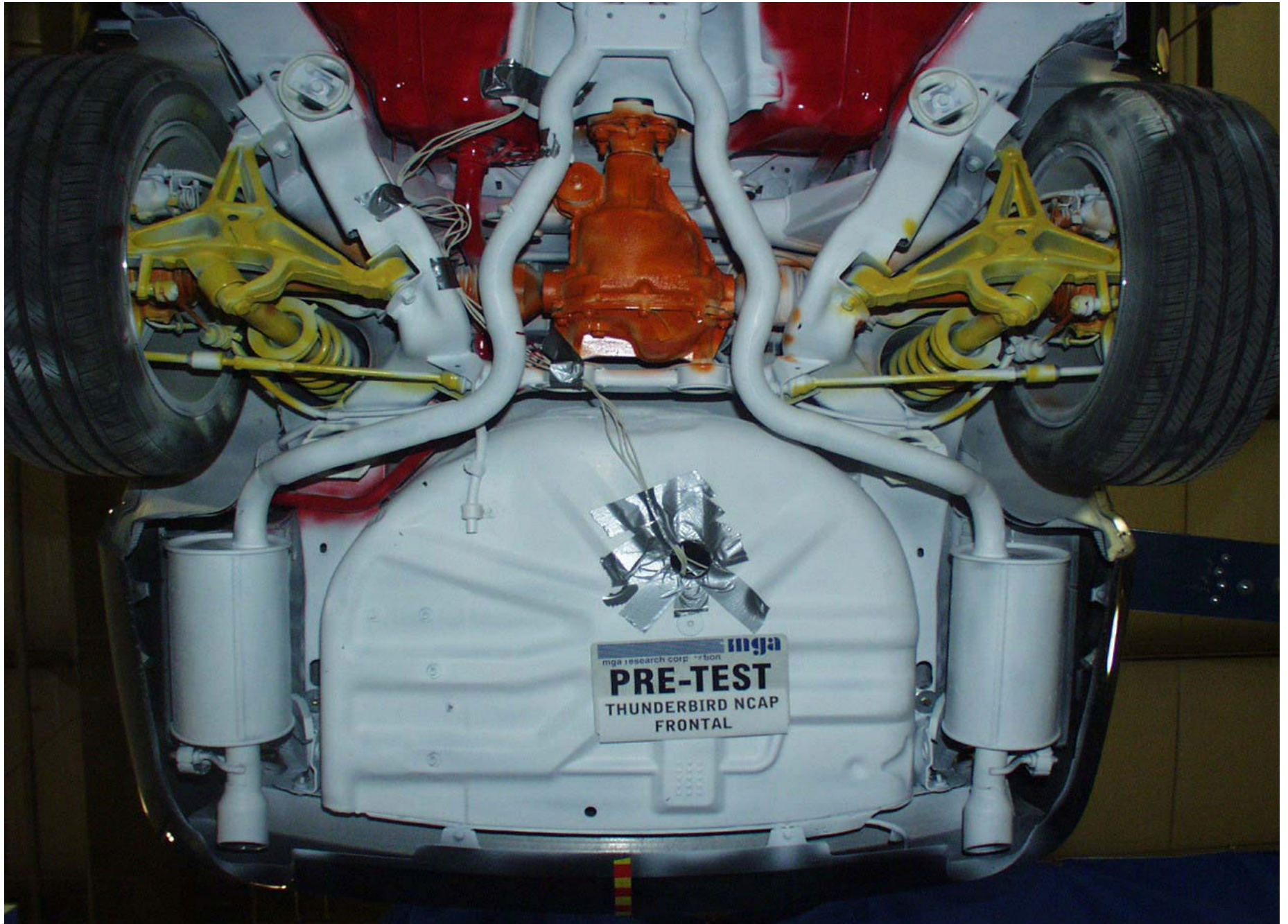
Post-Test Front Underbody View



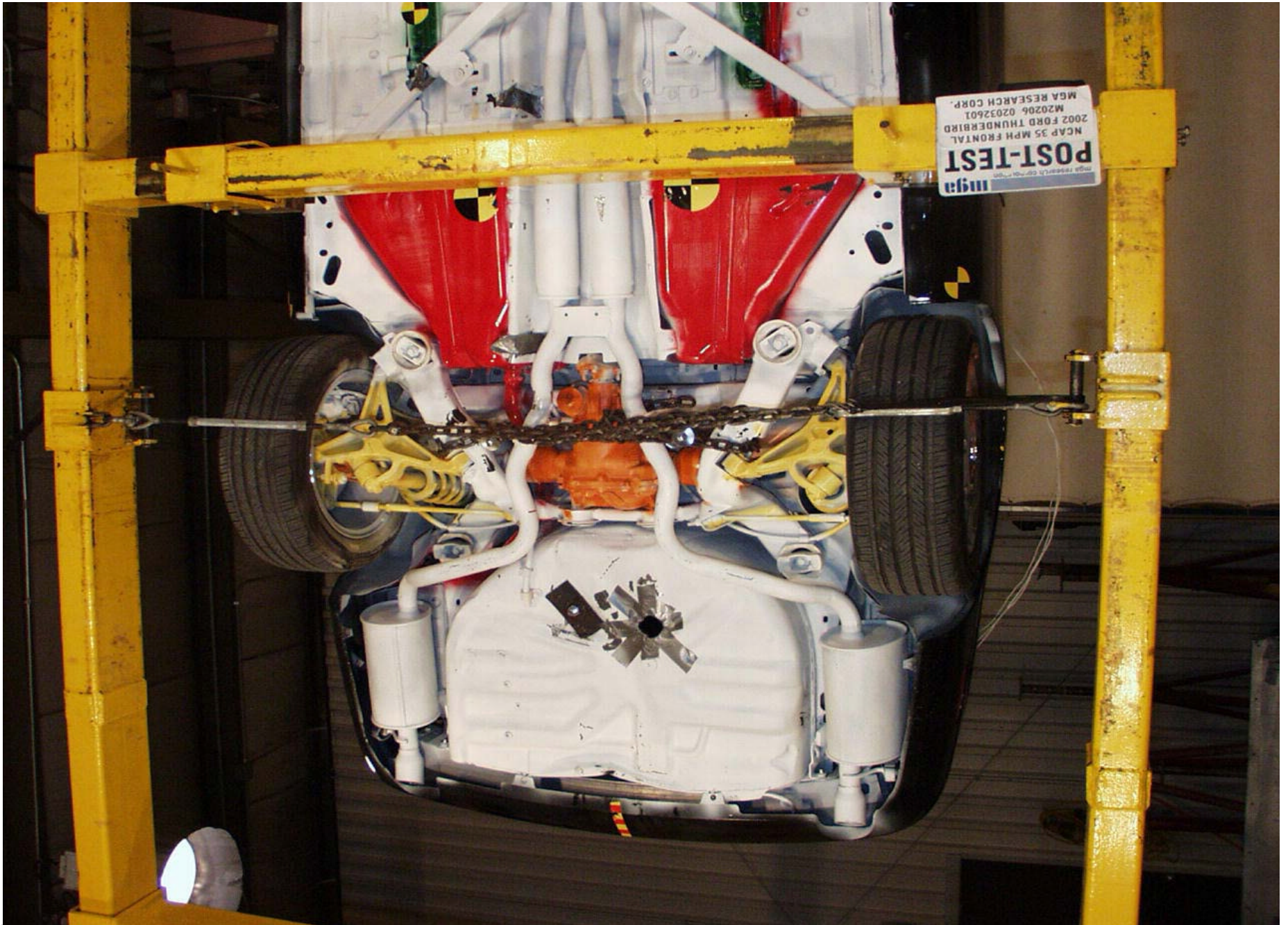
Pre-Test Mid Underbody



Post-Test Mid Underbody



Pre-Test Rear Underbody View



Post-Test Rear Underbody View



Pre-Test Windshield View



Post-Test Windshield View



Pre-Test Driver Dummy Position Left Side View



Post-Test Driver Dummy Position Left Side View



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



Post-Test Driver Dummy Position Left Side View (Door Open)



Pre-Test Driver Seat Position View



Post-Test Driver Seat Position View



Pre-Test Driver Dummy Knee Position



Post-Test Driver Dummy Knee Position



Post-Test Driver Airbag Contact

A-33.



Post-Test Driver Knee Contact View



Post-Test Driver Head Contact (visor)



Post-Test Driver Head Contact (headrest)



Post-Test Driver Seat Belt View #1

A-37.



Post-Test Driver Seat Belt View #2



Post-Test Driver Seat Belt View #3

A-39.



Post-Test Driver Seat Belt View #4

A-40.



Pre-Test Driver Windshield View



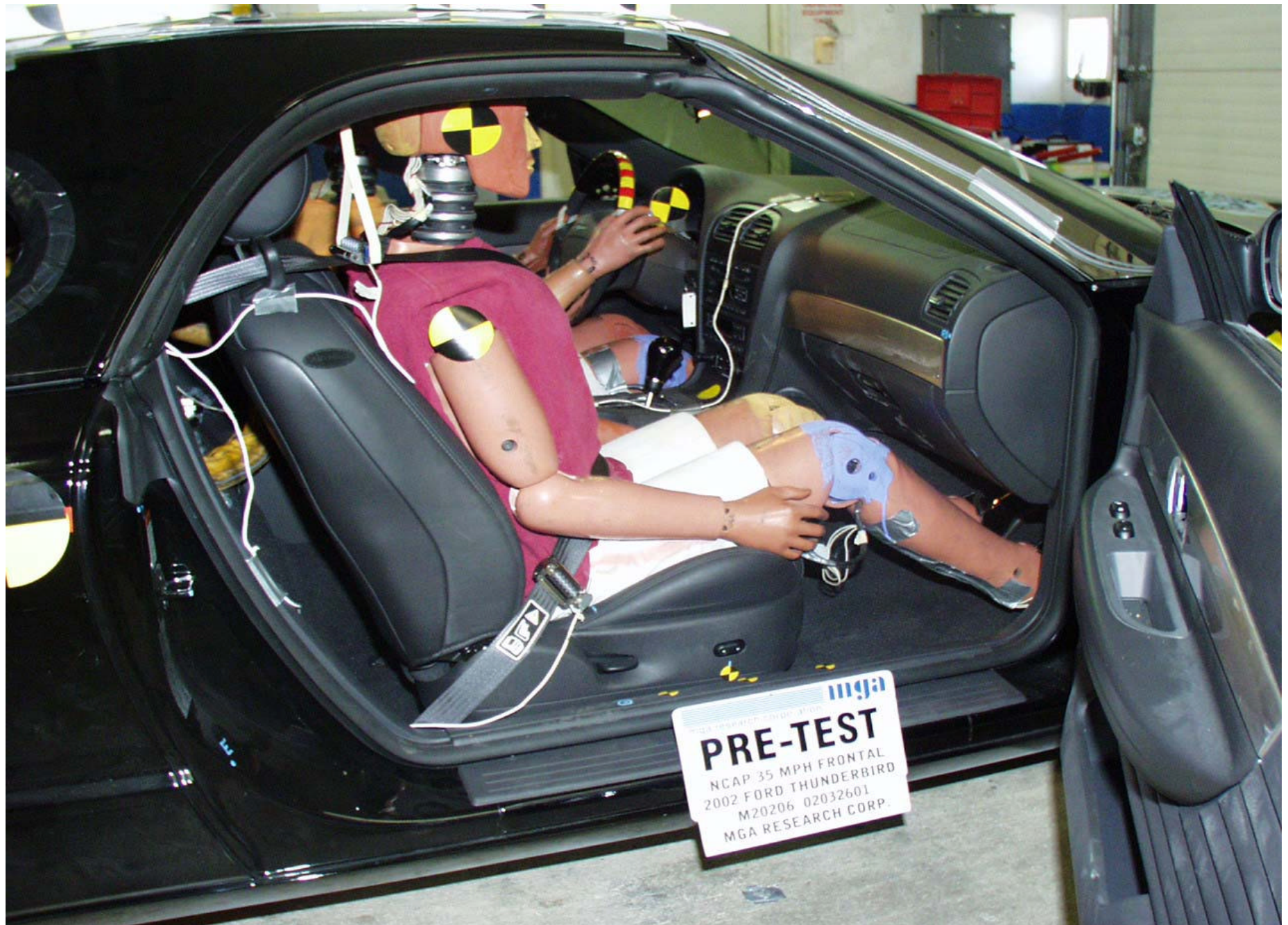
Post-Test Driver Windshield View



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 Seat Position View



Post-Test Passenger Seat Position View



Pre-Test Passenger Dummy Knee Position



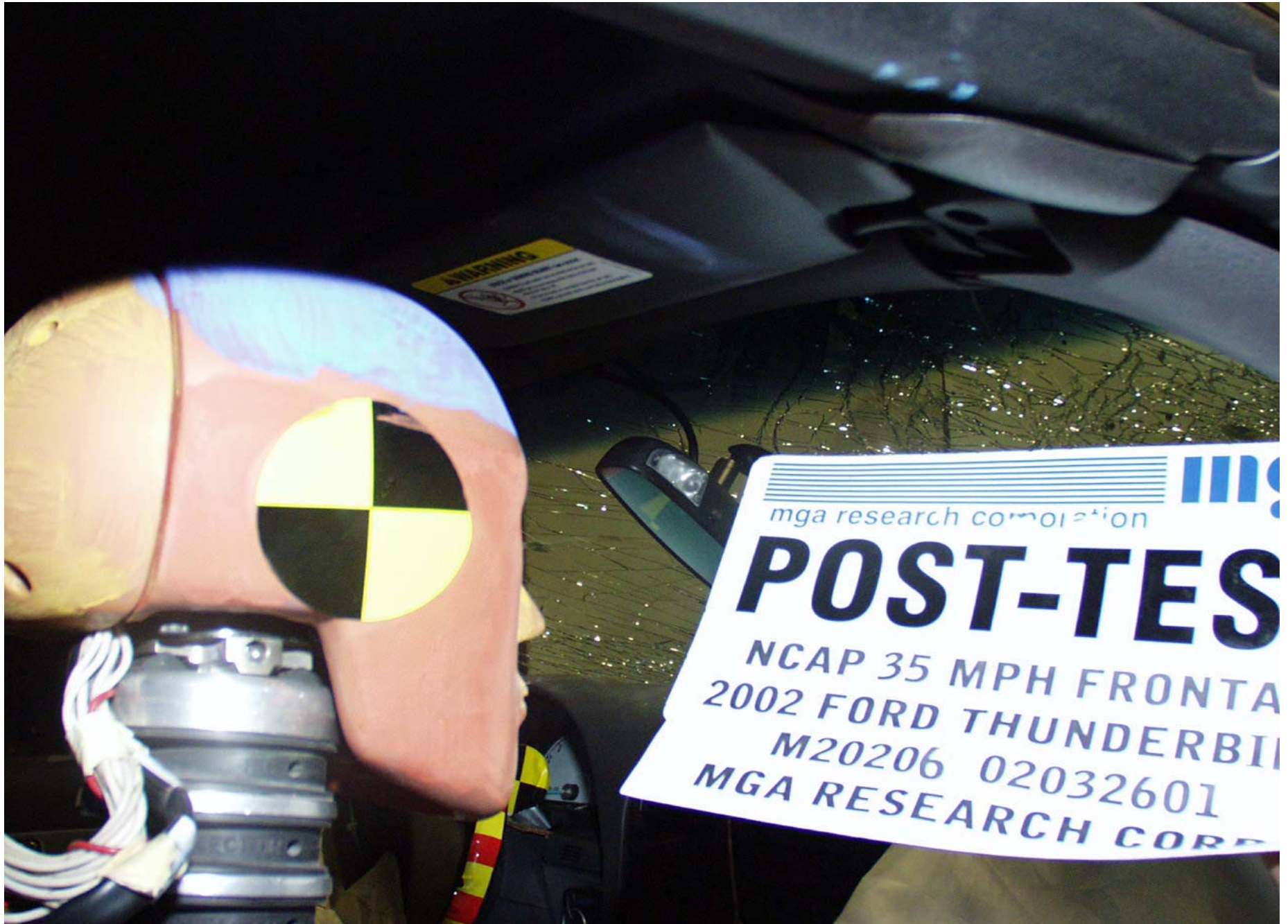
Post-Test Passenger Dummy Knee Position



Post-Test Passenger Airbag Contact



Post-Test Passenger Knee Contact View



Post-Test Passenger Head Contact (visor)



Post-Test Passenger Head Contact (headrest)



Pre-Test Passenger Windshield View



Post-Test Passenger Windshield View

MFD. BY FORD MOTOR CO. IN U.S.A.

DATE: 12/01

GVWR: 1995KG/4400LB

FRONT GAWR: 1002KG/2210LB

REAR GAWR: 997KG/2200LB

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

VIN: 1FAHP60A62Y108515 TYPE: PASSENGER

MAXIMUM LOAD = OCCUPANTS + LUGGAGE = 205KG/0453LB

OCCUPANTS = 2 TOTAL;

OCCUPANTS LUGGAGE
045KG/0100LB

2 FRONT

TIRE: P235/50R17

PRESSURE(FR): 207 kPa/30 PSI COLD

PRESSURE(RR): 207 kPa/30 PSI COLD



1FAHP60A62Y108515

TRAILER TOWING - SEE OWNER GUIDE

EXT PNT: IJA

BRK

4

INT TR

AW

TP/PS

R

X

AXLE

53

TR

A

SPR

2SR12

M05

UBC

▽ 2U5A-5420472-AA

F0071

R0064

Thunderbird

RECOMMENDED TIRE SIZE and INFLATION PRESSURE (COLD) DIMENSIONS DES PNEUS et PRESSIONS DE GONFLAGE (À FROID) RECOMMANDÉES

TIRE SIZE DIMENSIONS DES PNEUS	LOAD RANGE CHARGE NOMINALE	TIRE PRESSURE PRESSION DES PNEUS	
		FRONT / AVANT	REAR / ARRIÈRE
P235/50R17 (95V) *	ALL	207 kPa (30 PSI)/lb/po ²	207 kPa (30 PSI)/lb/po ²
T185/60 R17 * Temporary Spare Tire/Pneu provisoire	ALL	420 kPa (60 PSI)/lb/po ²	420 kPa (60 PSI)/lb/po ²

* MUST BE REPLACED WITH AN EQUIVALENT TYPE SPEED RATED TIRE.

* NE REMPLACER QUE PAR UN PNEU DONT L'INDICE DE VITESSE EST LE MÊME.

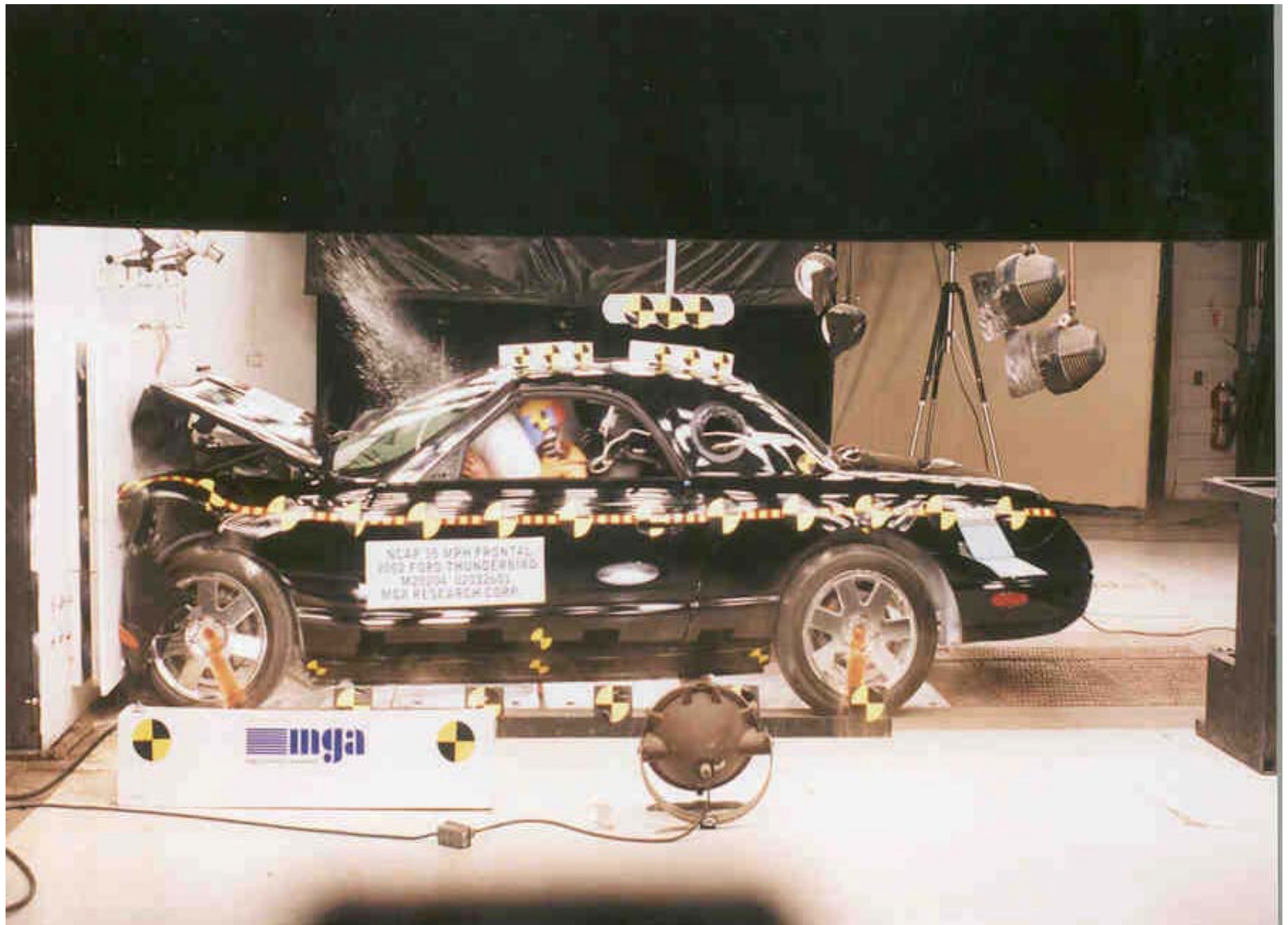
TOTAL LOAD = OCCUPANTS PLUS LUGGAGE CHARGE TOTALE = OCCUPANTS PLUS BAGAGES

MAXIMUM LOAD CHARGE MAXIMALE	OCCUPANTS OCCUPANTS	DISTRIBUTION RÉPARTITION		LUGGAGE BAGAGES
		FRONT AVANT	REAR ARRIÈRE	
205.4 kg / 453 lb	2	2	0	45.4 kg / 100 lb

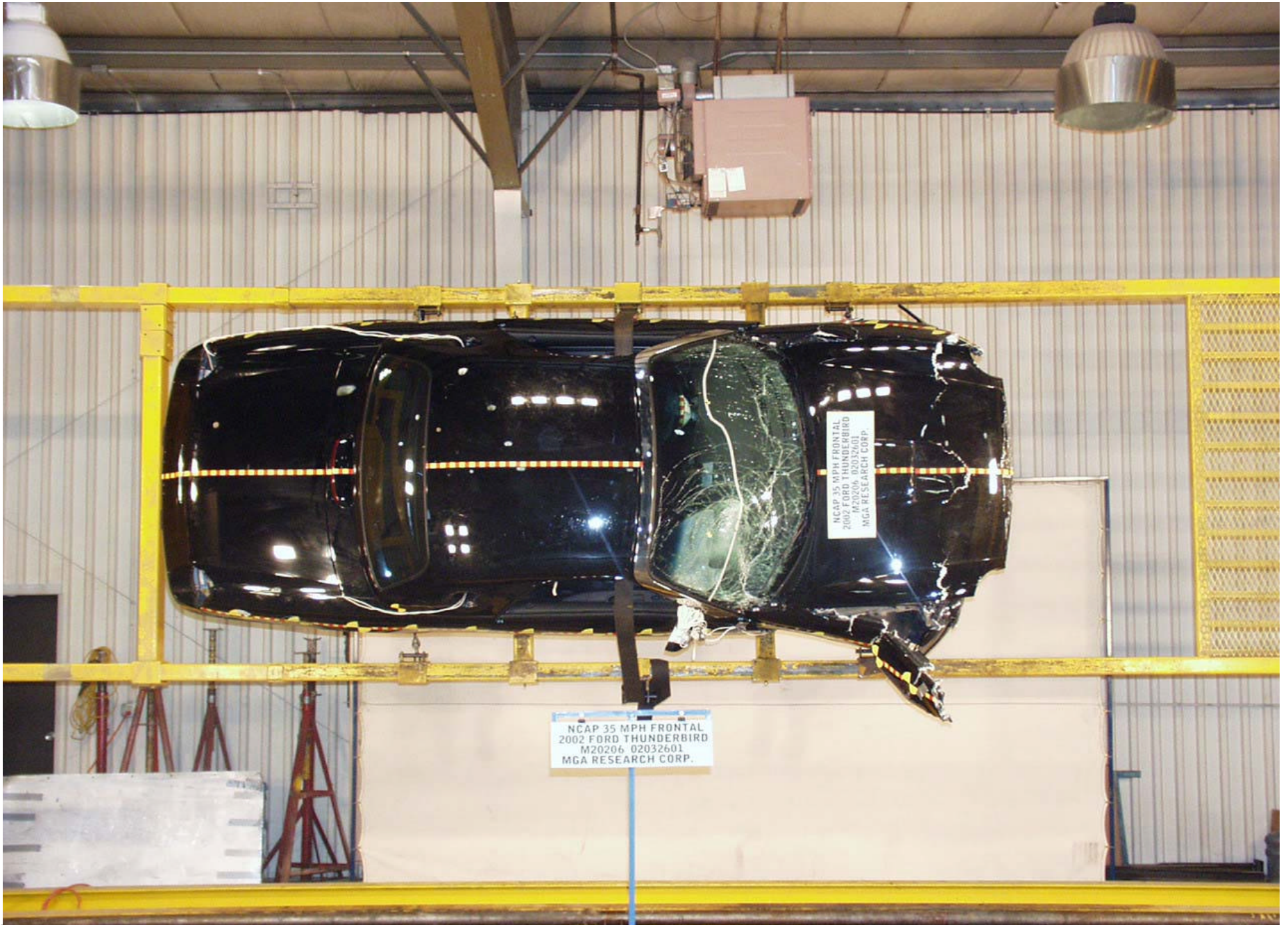
FOR SUSTAINED HIGH SPEED, TRAILER TOWING, RECREATIONAL ACCESSORIES AND SPARE TIRE USAGE –
SEE OWNER GUIDE.

HAUTES VITESSES SOUTENUES, REMORQUES, ACCESSOIRES DE LOISIRS ET PNEU DE SECOURS :
CONSULTER LE GUIDE DU PROPRIÉTAIRE.

2U5A-1532-AE



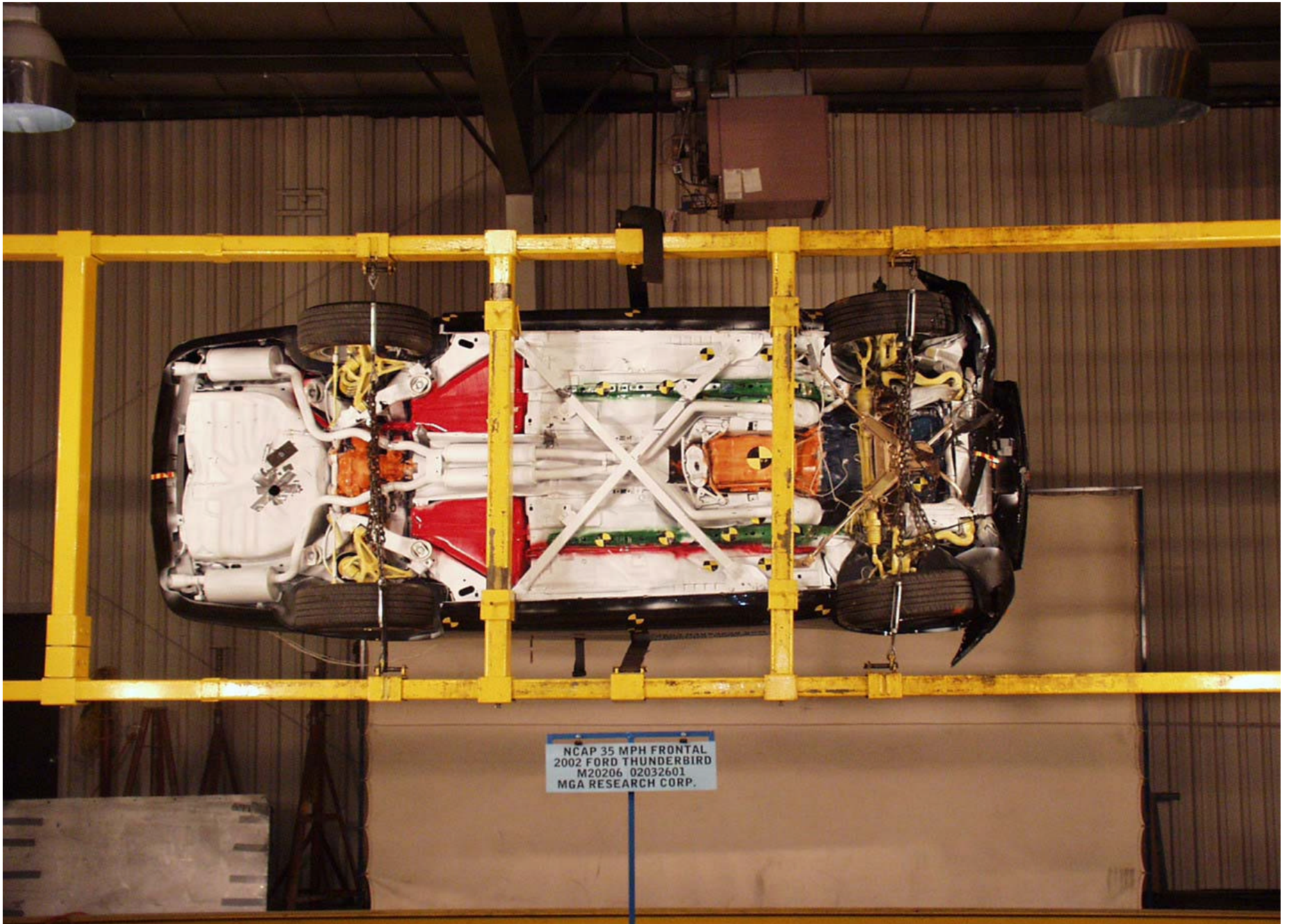
Vehicle Impact



Rollover 90 Degrees



Rollover 180 Degrees



A-61.

Rollover 270 Degrees



Rollover 360 Degrees

APPENDIX B

DUMMY AND VEHICLE RESPONSE DATA TRACES

TABLE OF DATA PLOTS

Figure No. 1	Driver Head X Acceleration vs. Time	B-1
Figure No. 2	Driver Head Y Acceleration vs. Time	B-1
Figure No. 3	Driver Head Z Acceleration vs. Time	B-1
Figure No. 4	Driver Head Resultant Acceleration vs. Time	B-1
Figure No. 5	Driver Head X Velocity vs. Time	B-2
Figure No. 6	Driver Head Y Velocity vs. Time	B-2
Figure No. 7	Driver Head Z Velocity vs. Time	B-2
Figure No. 8	Driver Head Y – Front Acceleration vs. Time	B-3
Figure No. 9	Driver Head Z – Front Acceleration vs. Time	B-3
Figure No. 10	Driver Head X – Left Acceleration vs. Time	B-4
Figure No. 11	Driver Head Z – Left Acceleration vs. Time	B-4
Figure No. 12	Driver Head X – Upper Acceleration vs. Time	B-5
Figure No. 13	Driver Head Y – Upper Acceleration vs. Time	B-5
Figure No. 14	Driver Head X Redundant Acceleration vs. Time	B-6
Figure No. 15	Driver Head Y Redundant Acceleration vs. Time	B-6
Figure No. 16	Driver Head Z Redundant Acceleration vs. Time	B-6
Figure No. 17	Driver Head Resultant Redundant Acceleration vs. Time	B-6
Figure No. 18	Driver Head X Redundant Velocity vs. Time	B-7
Figure No. 19	Driver Head Y Redundant Velocity vs. Time	B-7
Figure No. 20	Driver Head Z Redundant Velocity vs. Time	B-7
Figure No. 21	Driver Neck Force X vs. Time	B-8
Figure No. 22	Driver Neck Force Y vs. Time	B-8
Figure No. 23	Driver Neck Force Z vs. Time	B-8
Figure No. 24	Driver Neck Force Resultant vs. Time	B-8
Figure No. 25	Driver Neck Moment X vs. Time	B-9
Figure No. 26	Driver Neck Moment Y vs. Time	B-9
Figure No. 27	Driver Neck Moment Z vs. Time	B-9
Figure No. 28	Driver Neck Moment Resultant vs. Time	B-9
Figure No. 29	Driver Chest X Acceleration vs. Time	B-10
Figure No. 30	Driver Chest Y Acceleration vs. Time	B-10

Figure No. 31	Driver Chest Z Acceleration vs. Time	B-10
Figure No. 32	Driver Chest Resultant Acceleration vs. Time	B-10
Figure No. 33	Driver Chest X Velocity vs. Time	B-11
Figure No. 34	Driver Chest Y Velocity vs. Time	B-11
Figure No. 35	Driver Chest Z Velocity vs. Time	B-11
Figure No. 36	Driver Chest Displacement vs. Time	B-11
Figure No. 37	Driver Chest X Redundant Acceleration vs. Time	B-12
Figure No. 38	Driver Chest Y Redundant Acceleration vs. Time	B-12
Figure No. 39	Driver Chest Z Redundant Acceleration vs. Time	B-12
Figure No. 40	Driver Chest Resultant Redundant Acceleration vs. Time	B-12
Figure No. 41	Driver Chest X Redundant Velocity vs. Time	B-13
Figure No. 42	Driver Chest Y Redundant Velocity vs. Time	B-13
Figure No. 43	Driver Chest Z Redundant Velocity vs. Time	B-13
Figure No. 44	Driver Pelvis X Acceleration vs. Time	B-14
Figure No. 45	Driver Pelvis Y Acceleration vs. Time	B-14
Figure No. 46	Driver Pelvis Z Acceleration vs. Time	B-14
Figure No. 47	Driver Pelvis Resultant Acceleration vs. Time	B-14
Figure No. 48	Driver Pelvis X Velocity vs. Time	B-15
Figure No. 49	Driver Pelvis Y Velocity vs. Time	B-15
Figure No. 50	Driver Pelvis Z Velocity vs. Time	B-15
Figure No. 51	Driver Left Femur Force vs. Time	B-16
Figure No. 52	Driver Right Femur Force vs. Time	B-16
Figure No. 53	Driver Left Upper Tibia Moment X vs. Time	B-17
Figure No. 54	Driver Left Upper Tibia Moment Y vs. Time	B-17
Figure No. 55	Driver Left Upper Tibia Force Z vs. Time	B-17
Figure No. 56	Driver Left Lower Tibia Moment X vs. Time	B-18
Figure No. 57	Driver Left Lower Tibia Moment Y vs. Time	B-18
Figure No. 58	Driver Left Lower Tibia Force Z vs. Time	B-18
Figure No. 59	Driver Right Upper Tibia Moment X vs. Time	B-19
Figure No. 60	Driver Right Upper Tibia Moment Y vs. Time	B-19
Figure No. 61	Driver Right Upper Tibia Force Z vs. Time	B-19

Figure No. 62	Driver Right Lower Tibia Moment X vs. Time	B-20
Figure No. 63	Driver Right Lower Tibia Moment Y vs. Time	B-20
Figure No. 64	Driver Right Lower Tibia Force Z vs. Time	B-20
Figure No. 65	Driver Left Foot Z – Front Acceleration vs. Time	B-21
Figure No. 66	Driver Left Ankle X Acceleration vs. Time	B-21
Figure No. 67	Driver Left Ankle Z Acceleration vs. Time	B-21
Figure No. 68	Driver Right Foot Z – Front Acceleration vs. Time	B-22
Figure No. 69	Driver Right Ankle X Acceleration vs. Time	B-22
Figure No. 70	Driver Right Ankle Z Acceleration vs. Time	B-22
Figure No. 71	Driver Shoulder Belt Force vs. Time	B-23
Figure No. 72	Driver Lap Belt Force vs. Time	B-23
Figure No. 73	Passenger Head X Acceleration vs. Time	B-24
Figure No. 74	Passenger Head Y Acceleration vs. Time	B-24
Figure No. 75	Passenger Head Z Acceleration vs. Time	B-24
Figure No. 76	Passenger Head Resultant Acceleration vs. Time	B-24
Figure No. 77	Passenger Head X Velocity vs. Time	B-25
Figure No. 78	Passenger Head Y Velocity vs. Time	B-25
Figure No. 79	Passenger Head Z Velocity vs. Time	B-25
Figure No. 80	Passenger Head Y – Front Acceleration vs. Time	B-26
Figure No. 81	Passenger Head Z – Front Acceleration vs. Time	B-26
Figure No. 82	Passenger Head X – Left Acceleration vs. Time	B-27
Figure No. 83	Passenger Head Z – Left Acceleration vs. Time	B-27
Figure No. 84	Passenger Head X – Upper Acceleration vs. Time	B-28
Figure No. 85	Passenger Head Y – Upper Acceleration vs. Time	B-28
Figure No. 86	Passenger Head X Redundant Acceleration vs. Time	B-29
Figure No. 87	Passenger Head Y Redundant Acceleration vs. Time	B-29
Figure No. 88	Passenger Head Z Redundant Acceleration vs. Time	B-29
Figure No. 89	Passenger Head Resultant Redundant Acceleration vs. Time	B-29
Figure No. 90	Passenger Head X Redundant Velocity vs. Time	B-30
Figure No. 91	Passenger Head Y Redundant Velocity vs. Time	B-30
Figure No. 92	Passenger Head Z Redundant Velocity vs. Time	B-30

Figure No. 93	Passenger Neck Force X vs. Time	B-31
Figure No. 94	Passenger Neck Force Y vs. Time	B-31
Figure No. 95	Passenger Neck Force Z vs. Time	B-31
Figure No. 96	Passenger Neck Force Resultant vs. Time	B-31
Figure No. 97	Passenger Neck Moment X vs. Time	B-32
Figure No. 98	Passenger Neck Moment Y vs. Time	B-32
Figure No. 99	Passenger Neck Moment Z vs. Time	B-32
Figure No. 100	Passenger Neck Moment Resultant vs. Time	B-32
Figure No. 101	Passenger Chest X Acceleration vs. Time	B-33
Figure No. 102	Passenger Chest Y Acceleration vs. Time	B-33
Figure No. 103	Passenger Chest Z Acceleration vs. Time	B-33
Figure No. 104	Passenger Chest Resultant Acceleration vs. Time	B-33
Figure No. 105	Passenger Chest X Velocity vs. Time	B-34
Figure No. 106	Passenger Chest Y Velocity vs. Time	B-34
Figure No. 107	Passenger Chest Z Velocity vs. Time	B-34
Figure No. 108	Passenger Chest Displacement vs. Time	B-34
Figure No. 109	Passenger Chest X Redundant Acceleration vs. Time	B-35
Figure No. 110	Passenger Chest Y Redundant Acceleration vs. Time	B-35
Figure No. 111	Passenger Chest Z Redundant Acceleration vs. Time	B-35
Figure No. 112	Passenger Chest Resultant Redundant Acceleration vs. Time	B-35
Figure No. 113	Passenger Chest X Redundant Velocity vs. Time	B-36
Figure No. 114	Passenger Chest Y Redundant Velocity vs. Time	B-36
Figure No. 115	Passenger Chest Z Redundant Velocity vs. Time	B-36
Figure No. 116	Passenger Pelvis X Acceleration vs. Time	B-37
Figure No. 117	Passenger Pelvis Y Acceleration vs. Time	B-37
Figure No. 118	Passenger Pelvis Z Acceleration vs. Time	B-37
Figure No. 119	Passenger Pelvis Resultant Acceleration vs. Time	B-37
Figure No. 120	Passenger Pelvis X Velocity vs. Time	B-38
Figure No. 121	Passenger Pelvis Y Velocity vs. Time	B-38
Figure No. 122	Passenger Pelvis Z Velocity vs. Time	B-38
Figure No. 123	Passenger Left Femur Force vs. Time	B-39

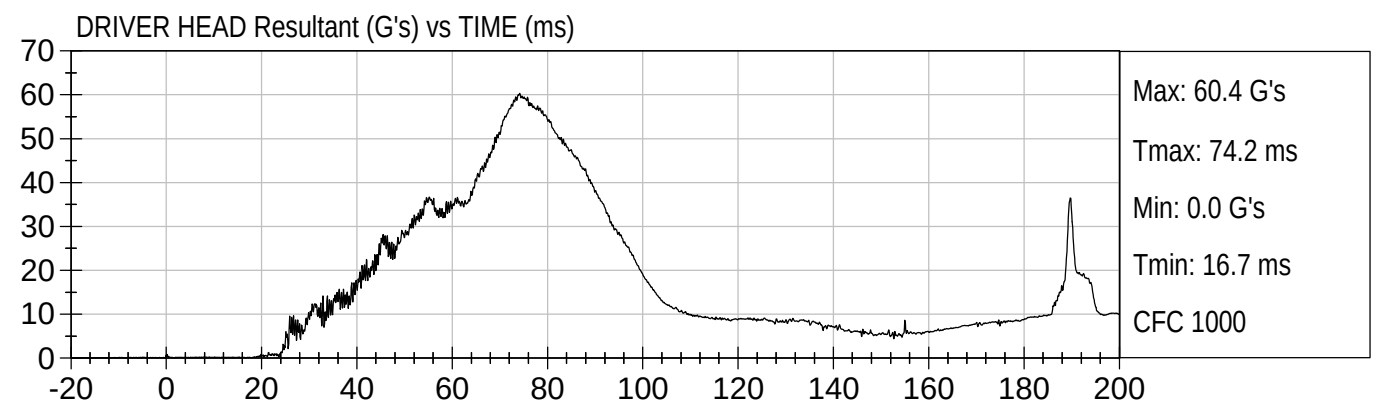
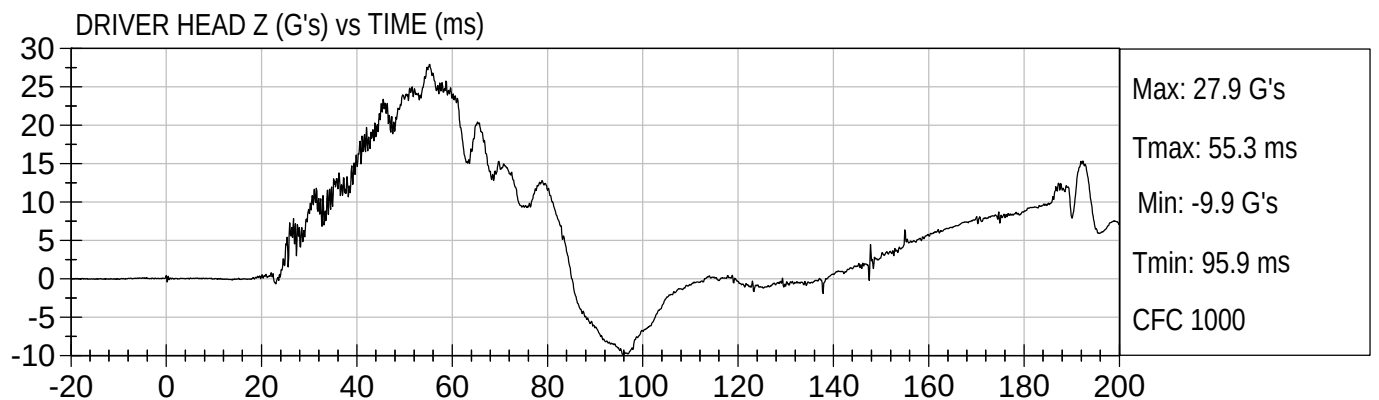
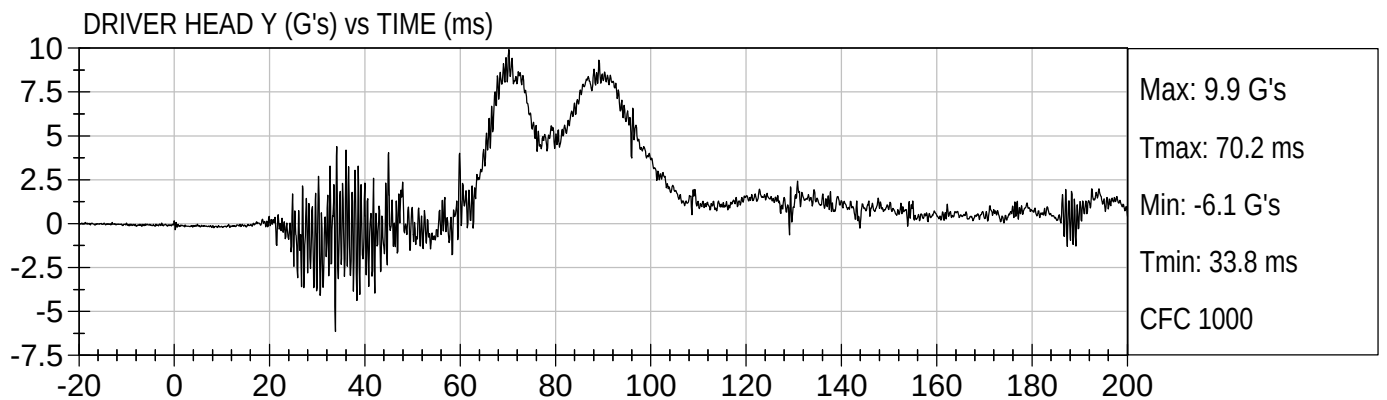
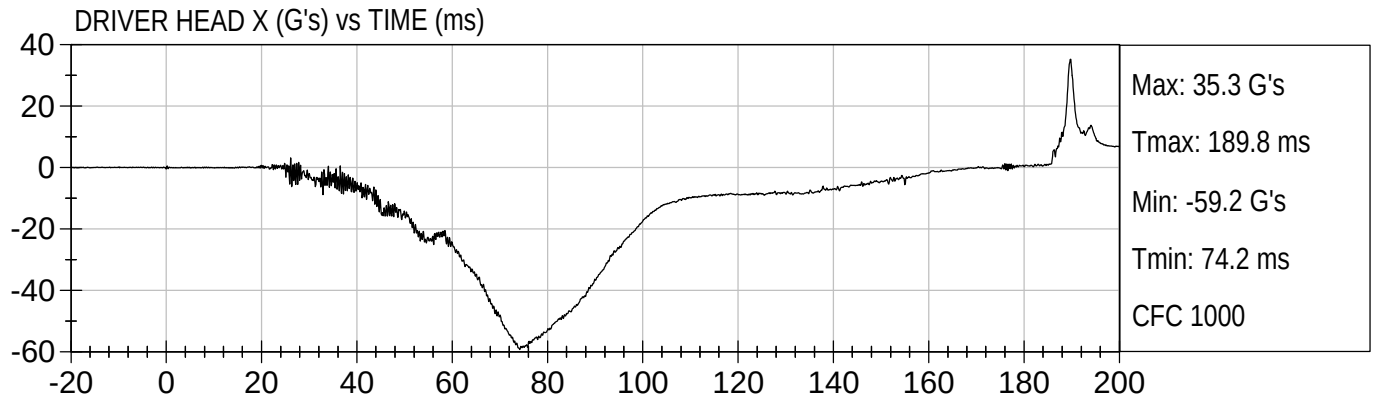
Figure No. 124	Passenger Right Femur Force vs. Time	B-39
Figure No. 125	Passenger Left Upper Tibia Moment X vs. Time	B-40
Figure No. 126	Passenger Left Upper Tibia Moment Y vs. Time	B-40
Figure No. 127	Passenger Left Upper Tibia Force Z vs. Time	B-40
Figure No. 128	Passenger Left Lower Tibia Moment X vs. Time	B-41
Figure No. 129	Passenger Left Lower Tibia Moment Y vs. Time	B-41
Figure No. 130	Passenger Left Lower Tibia Force Z vs. Time	B-41
Figure No. 131	Passenger Right Upper Tibia Moment X vs. Time	B-42
Figure No. 132	Passenger Right Upper Tibia Moment Y vs. Time	B-42
Figure No. 133	Passenger Right Upper Tibia Force Z vs. Time	B-42
Figure No. 134	Passenger Right Lower Tibia Moment X vs. Time	B-43
Figure No. 135	Passenger Right Lower Tibia Moment Y vs. Time	B-43
Figure No. 136	Passenger Right Lower Tibia Force Z vs. Time	B-43
Figure No. 137	Passenger Left Foot Z – Front Acceleration vs. Time	B-44
Figure No. 138	Passenger Left Ankle X Acceleration vs. Time	B-44
Figure No. 139	Passenger Left Ankle Z Acceleration vs. Time	B-44
Figure No. 140	Passenger Right Foot Z – Front Acceleration vs. Time	B-45
Figure No. 141	Passenger Right Ankle X Acceleration vs. Time	B-45
Figure No. 142	Passenger Right Ankle Z Acceleration vs. Time	B-45
Figure No. 143	Passenger Shoulder Belt Force vs. Time	B-46
Figure No. 144	Passenger Lap Belt Force vs. Time	B-46
Figure No. 145	Left Rear Seat Crossmember X Acceleration vs. Time	B-47
Figure No. 146	Left Rear Seat Crossmember X Velocity vs. Time	B-47
Figure No. 147	Left Rear Seat Crossmember X Displacement vs. Time	B-47
Figure No. 148	Left Rear Seat Crossmember Z Acceleration vs. Time	B-48
Figure No. 149	Left Rear Seat Crossmember Z Velocity vs. Time	B-48
Figure No. 150	Left Rear Seat Crossmember Z Displacement vs. Time	B-48
Figure No. 151	Right Rear Seat Crossmember X Acceleration vs. Time	B-49
Figure No. 152	Right Rear Seat Crossmember X Velocity vs. Time	B-49
Figure No. 153	Right Rear Seat Crossmember X Displacement vs. Time	B-49
Figure No. 154	Right Rear Seat Crossmember Z Acceleration vs. Time	B-50

Figure No. 155	Right Rear Seat Crossmember Z Velocity vs. Time	B-50
Figure No. 156	Right Rear Seat Crossmember Z Displacement vs. Time	B-50
Figure No. 157	Top of Engine X Acceleration vs. Time	B-51
Figure No. 158	Top of Engine X Velocity vs. Time	B-51
Figure No. 159	Top of Engine X Displacement vs. Time	B-51
Figure No. 160	Bottom of Engine X Acceleration vs. Time	B-52
Figure No. 161	Bottom of Engine X Velocity vs. Time	B-52
Figure No. 162	Bottom of Engine X Displacement vs. Time	B-52
Figure No. 163	Left Brake Caliper X Acceleration vs. Time	B-53
Figure No. 164	Left Brake Caliper X Velocity vs. Time	B-53
Figure No. 165	Left Brake Caliper X Displacement vs. Time	B-53
Figure No. 166	Right Brake Caliper X Acceleration vs. Time	B-54
Figure No. 167	Right Brake Caliper X Velocity vs. Time	B-54
Figure No. 168	Right Brake Caliper X Displacement vs. Time	B-54
Figure No. 169	Instrument Panel X Acceleration vs. Time	B-55
Figure No. 170	Instrument Panel X Velocity vs. Time	B-55
Figure No. 171	Instrument Panel X Displacement vs. Time	B-55



35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

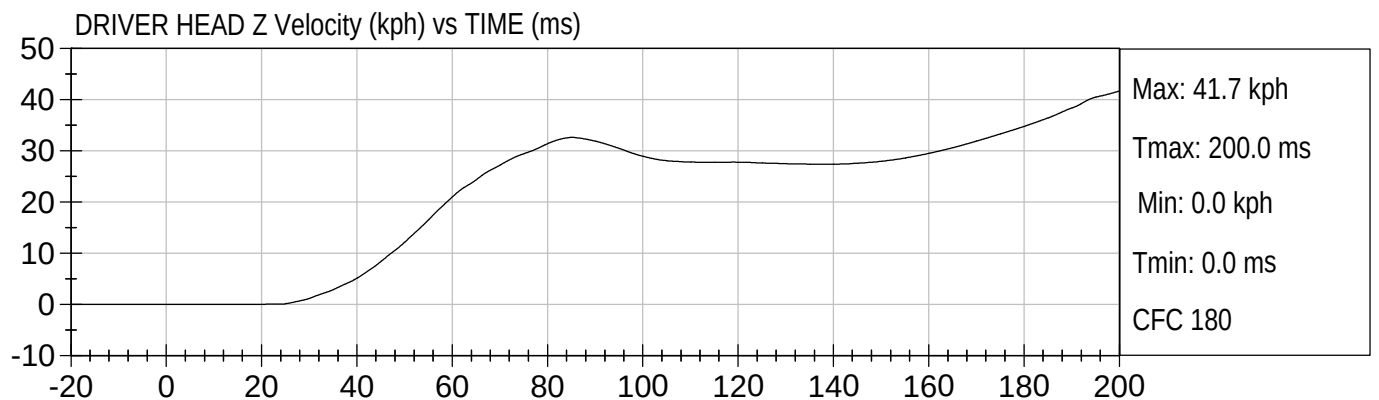
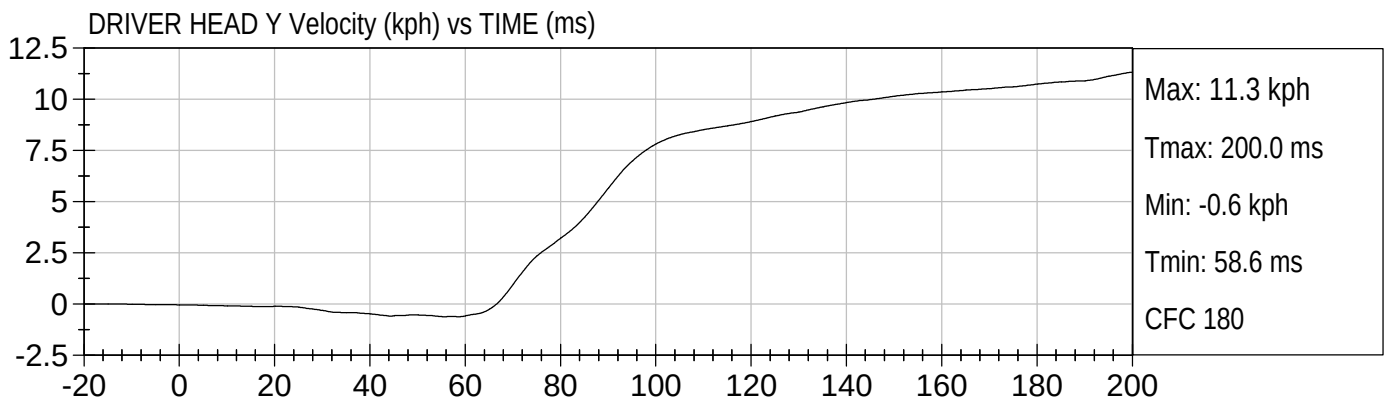
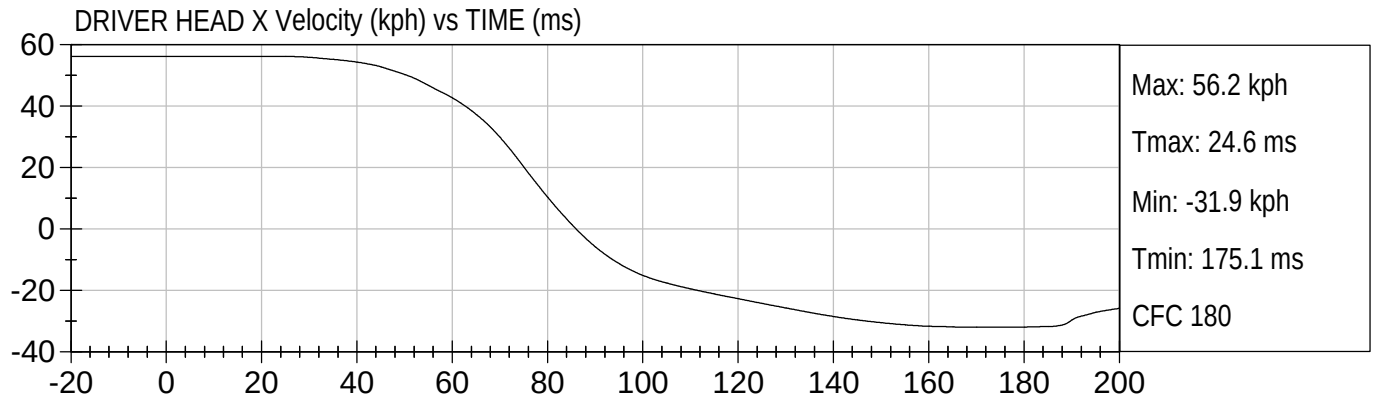
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)





35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

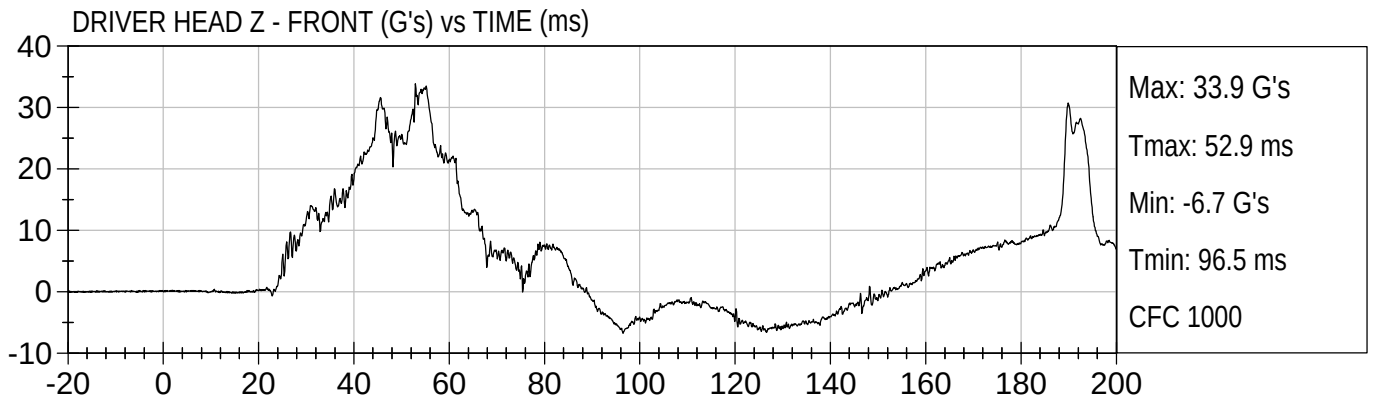
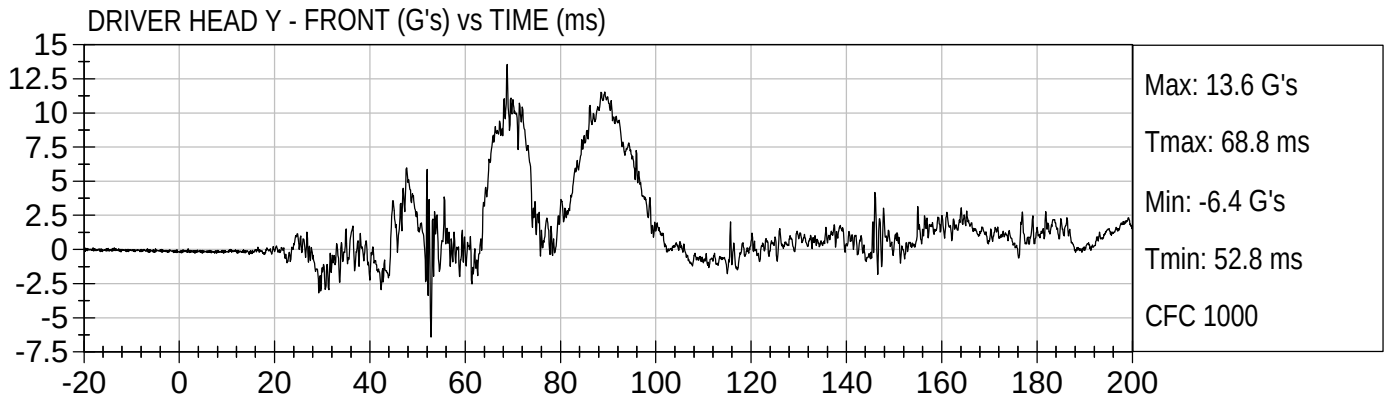
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)





35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

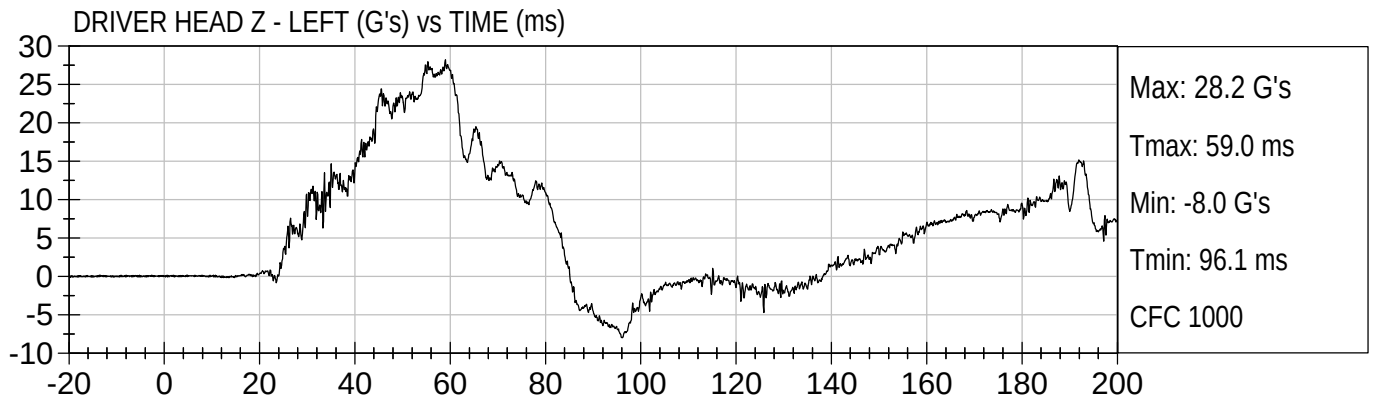
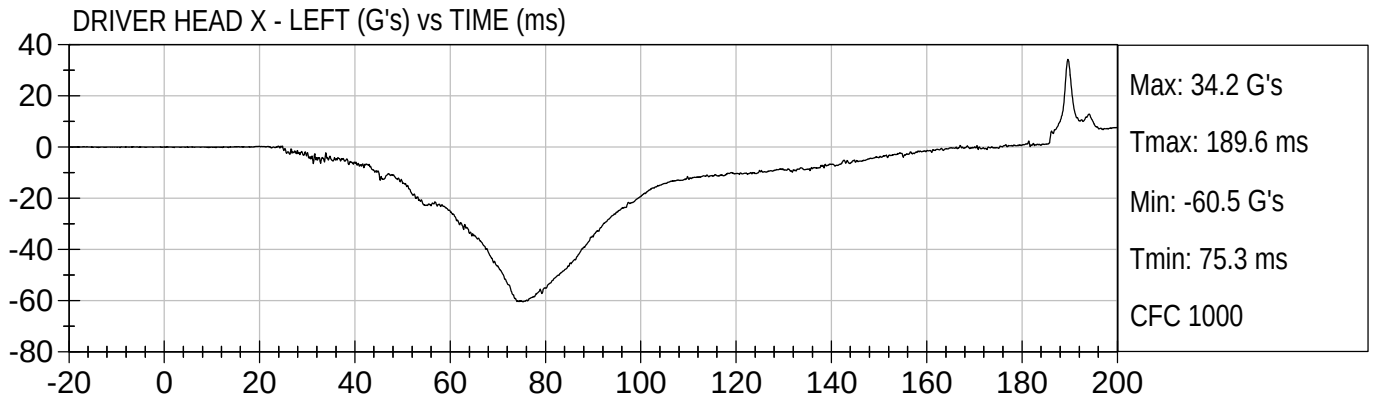
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)





35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

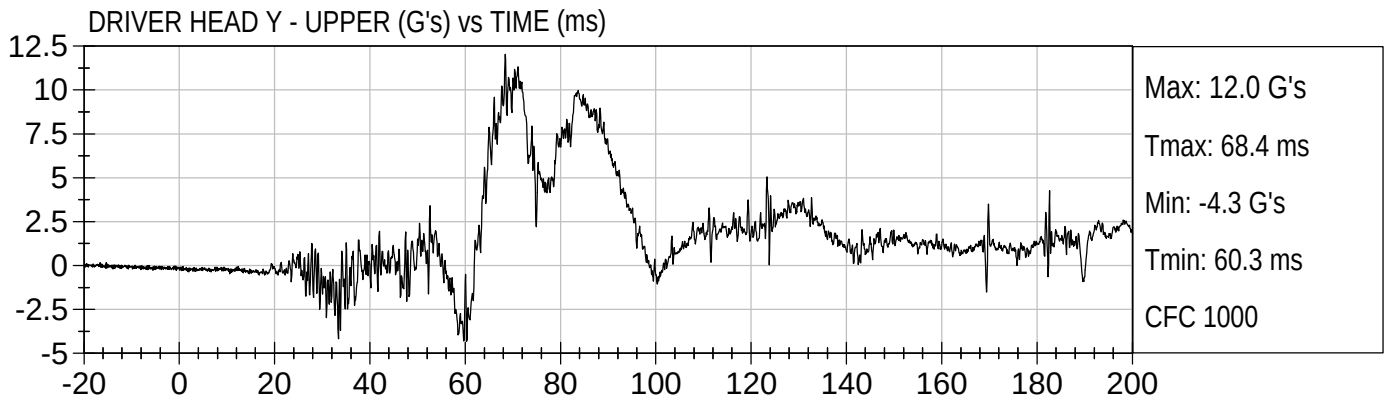
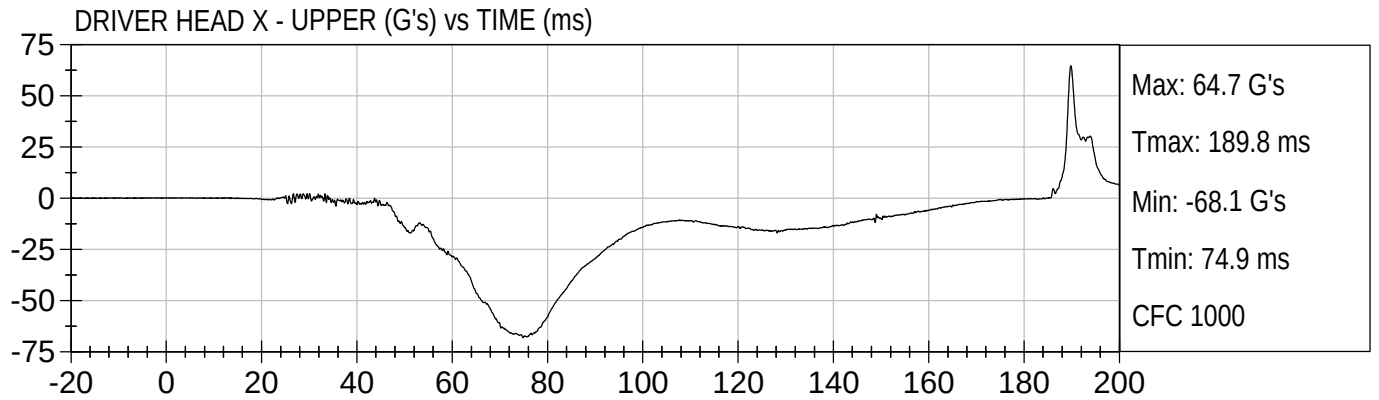
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)

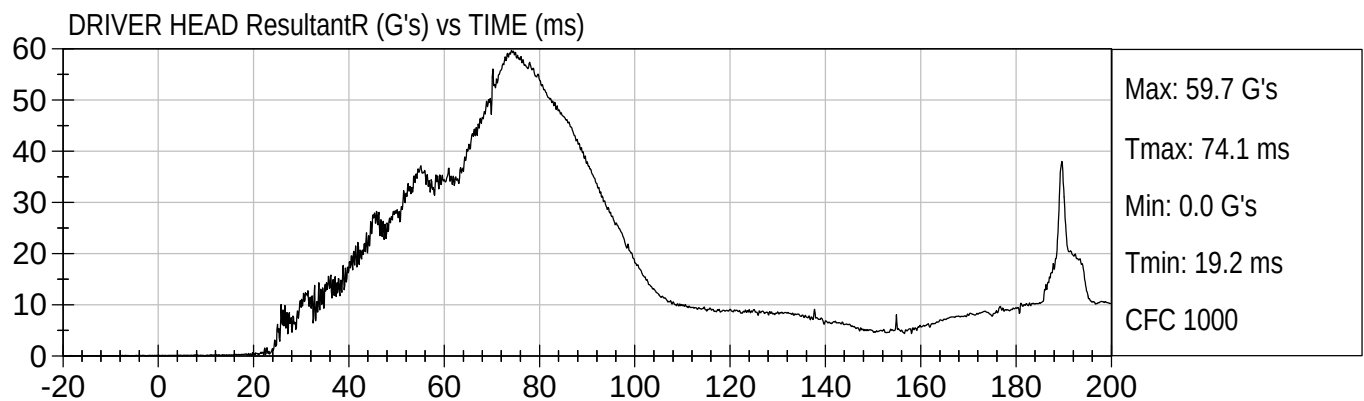
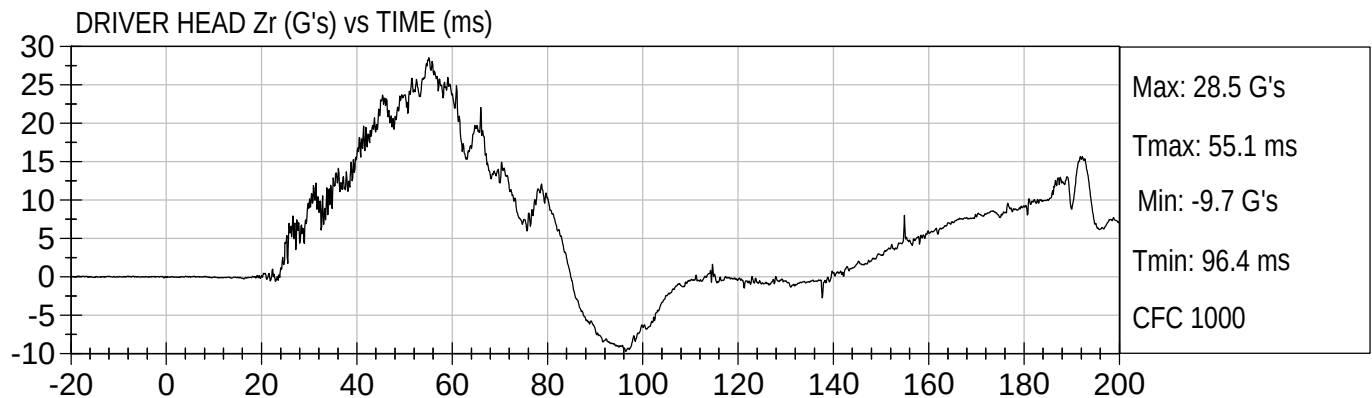
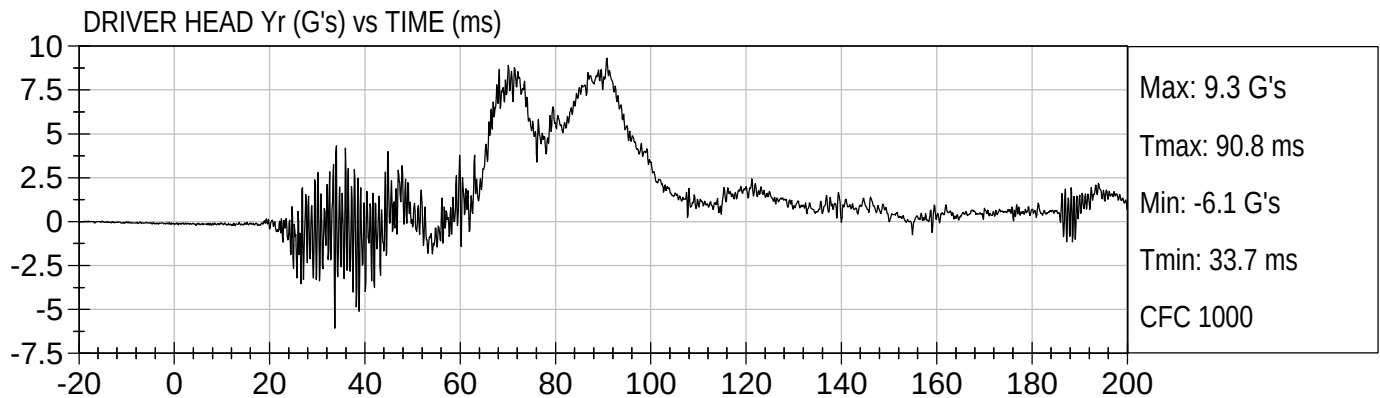
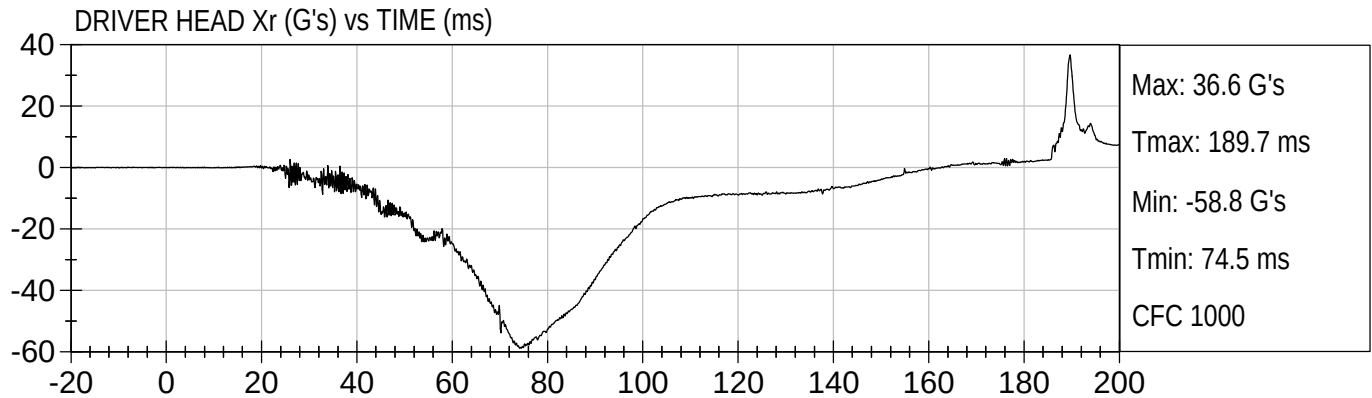




35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)

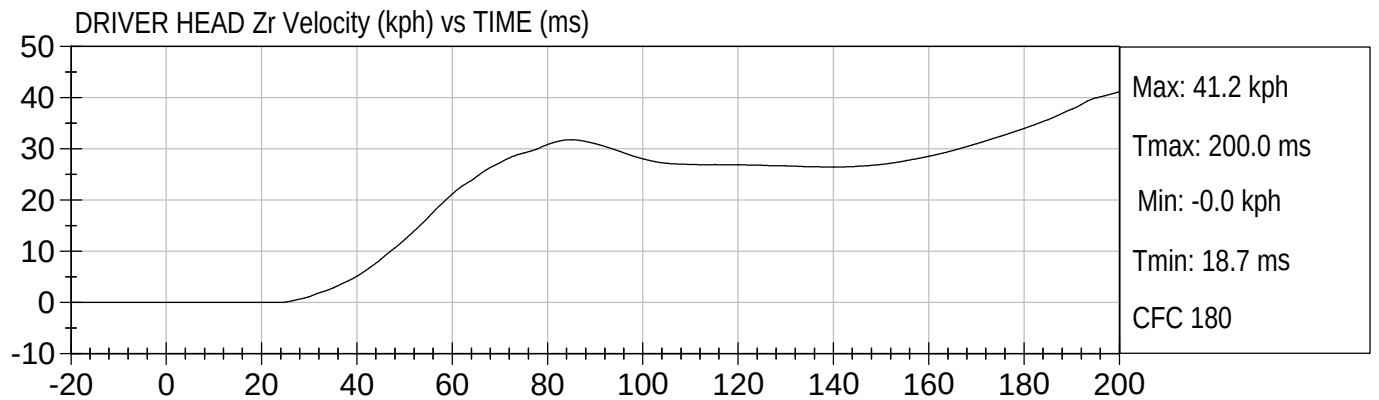
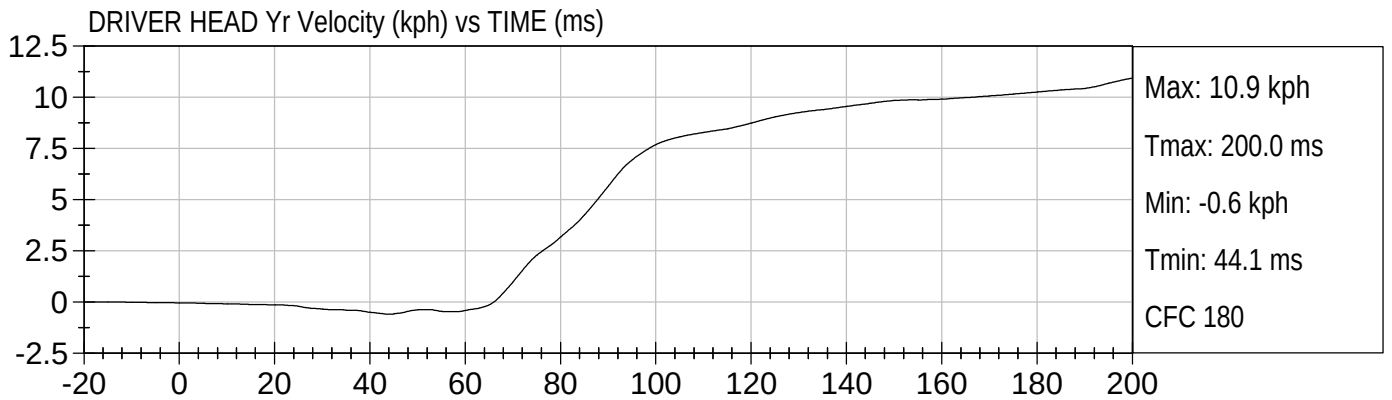
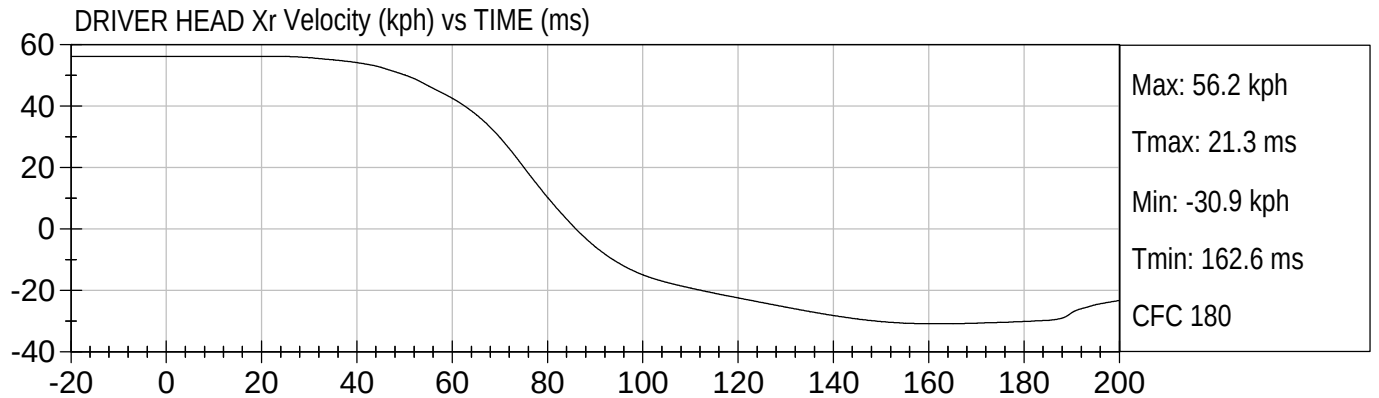






35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

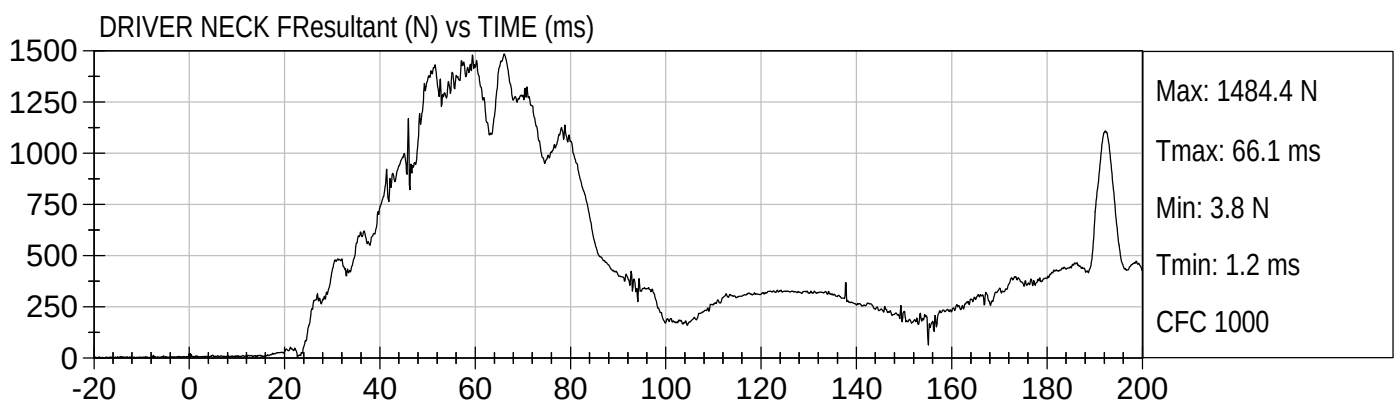
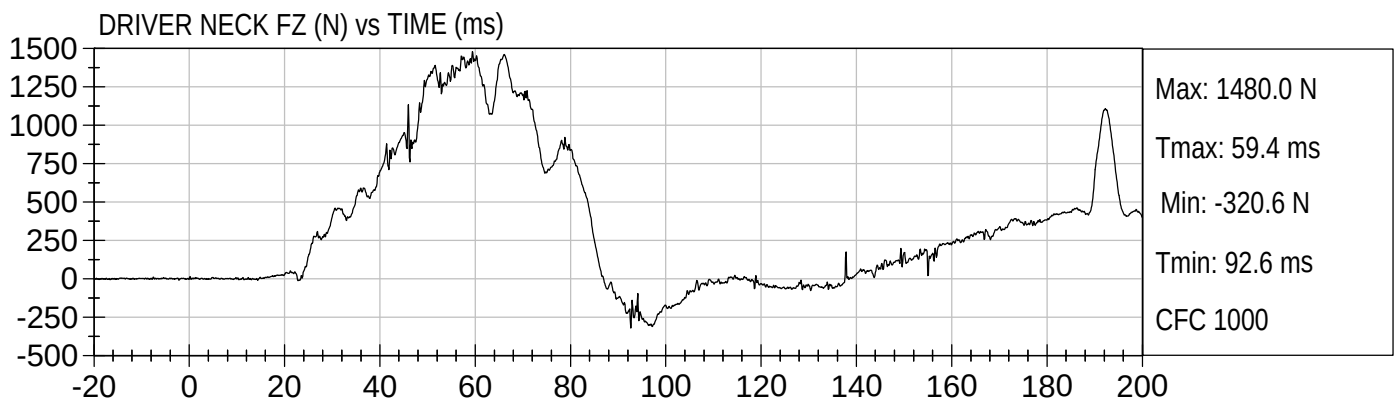
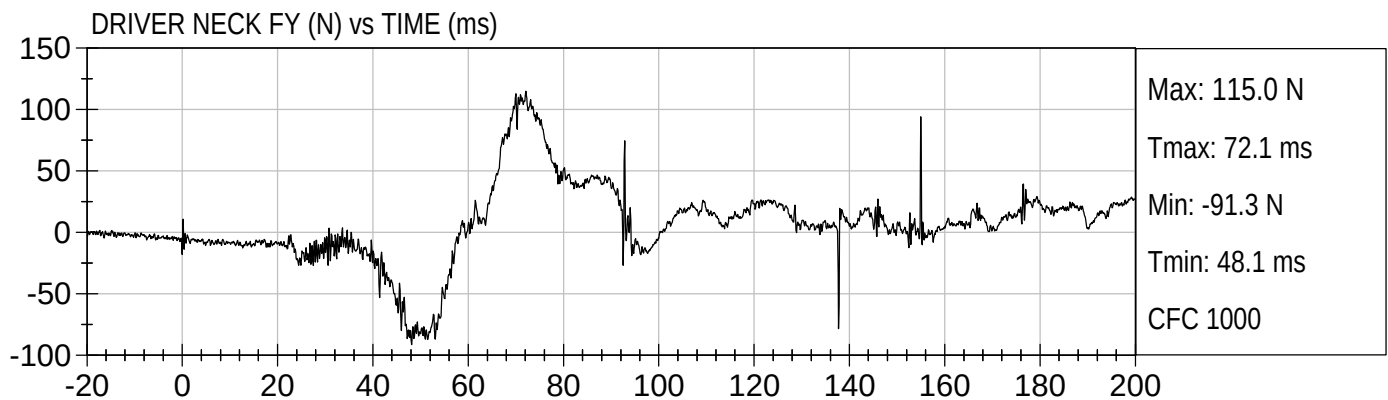
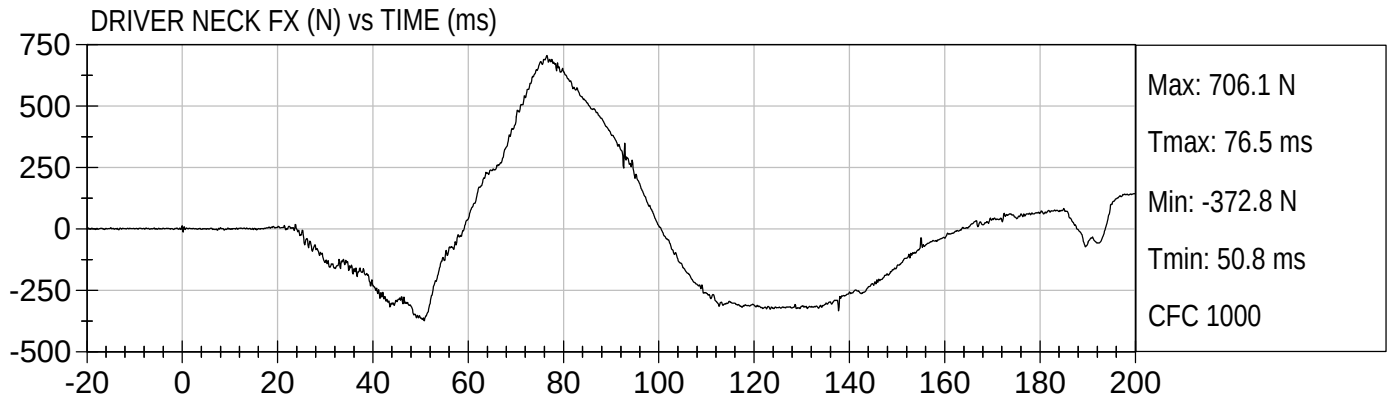
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)





35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

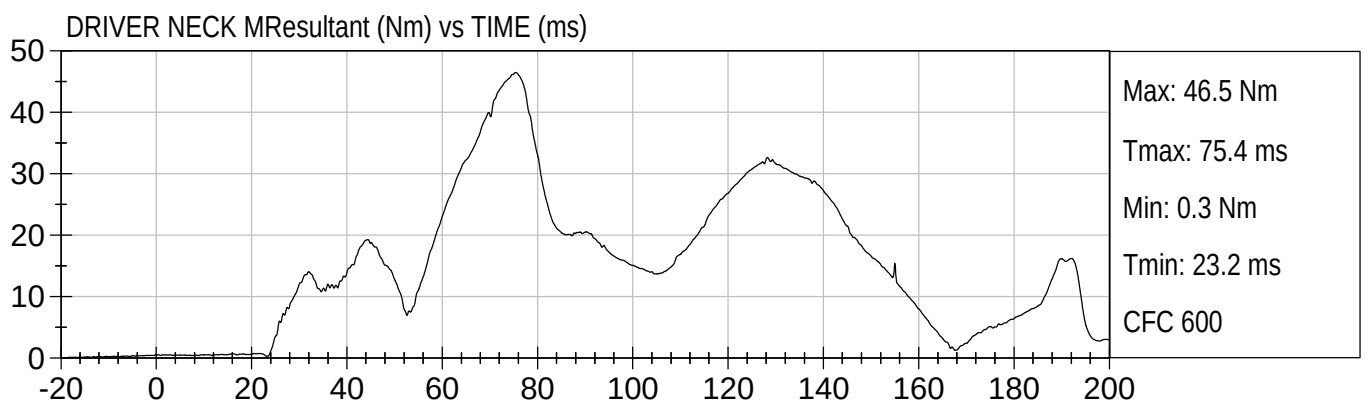
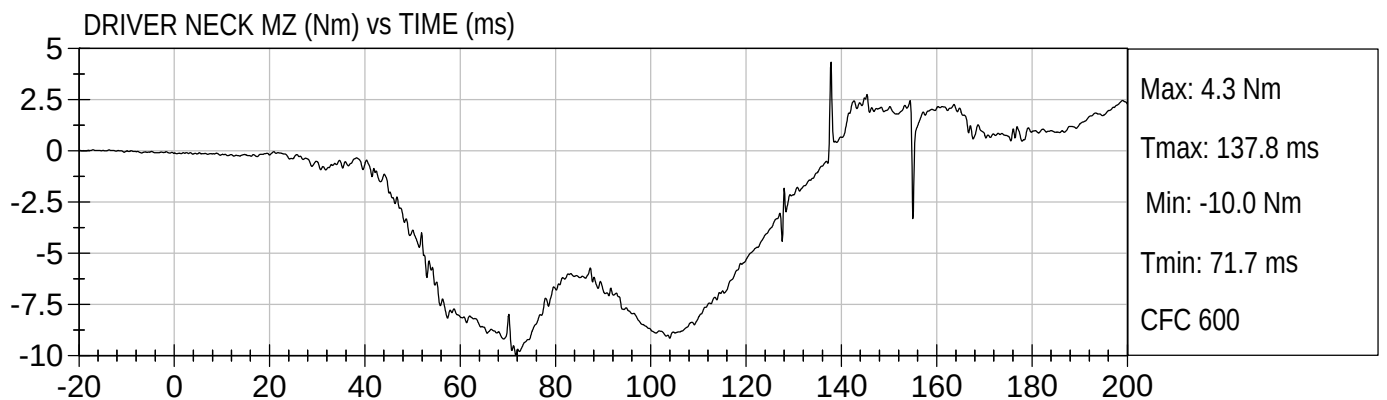
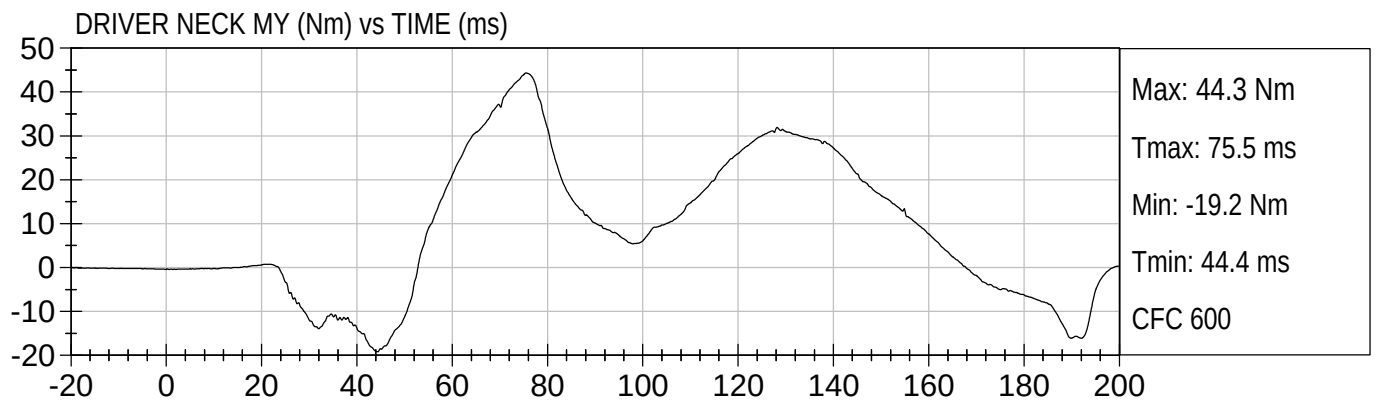
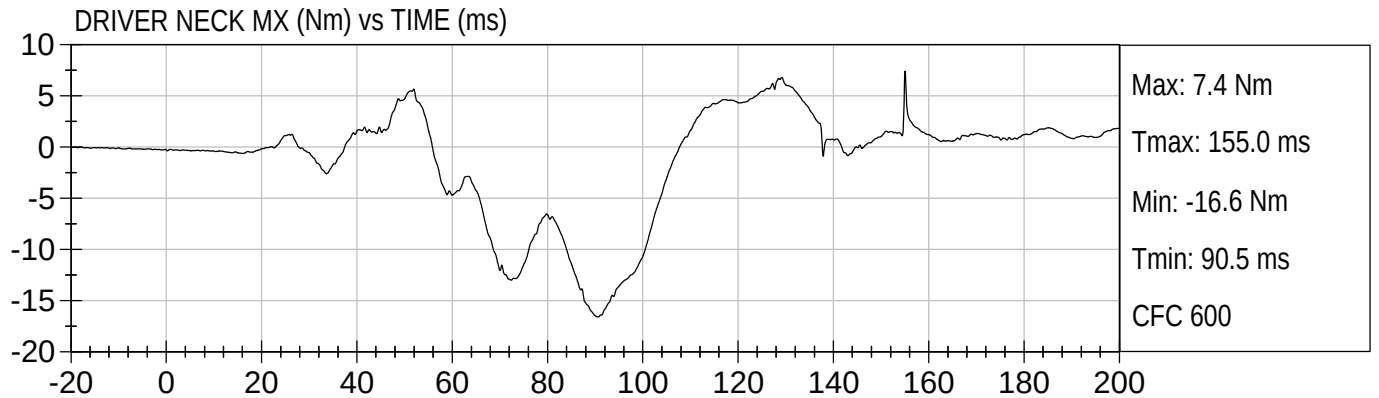
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Speed: 34.9 mph (56.2 km/h)

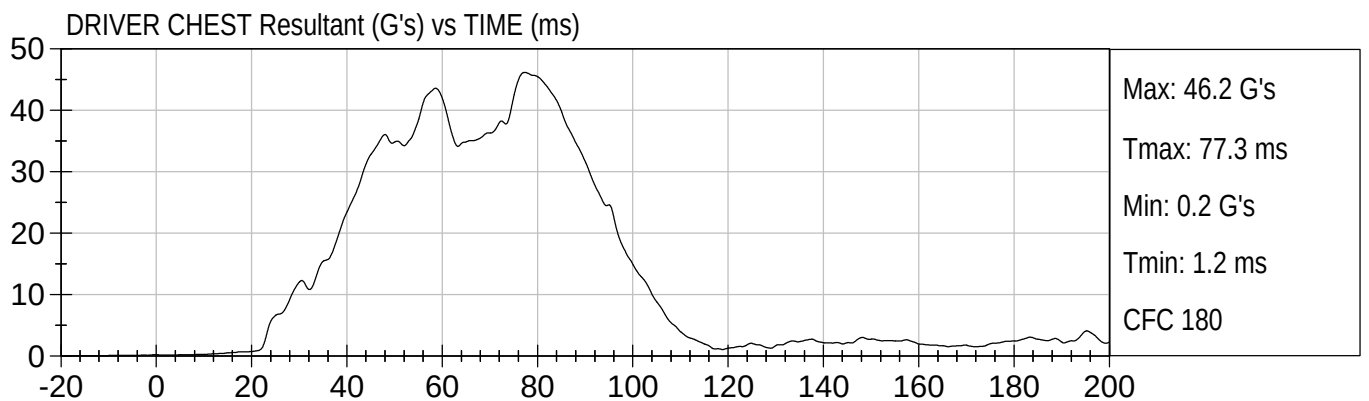
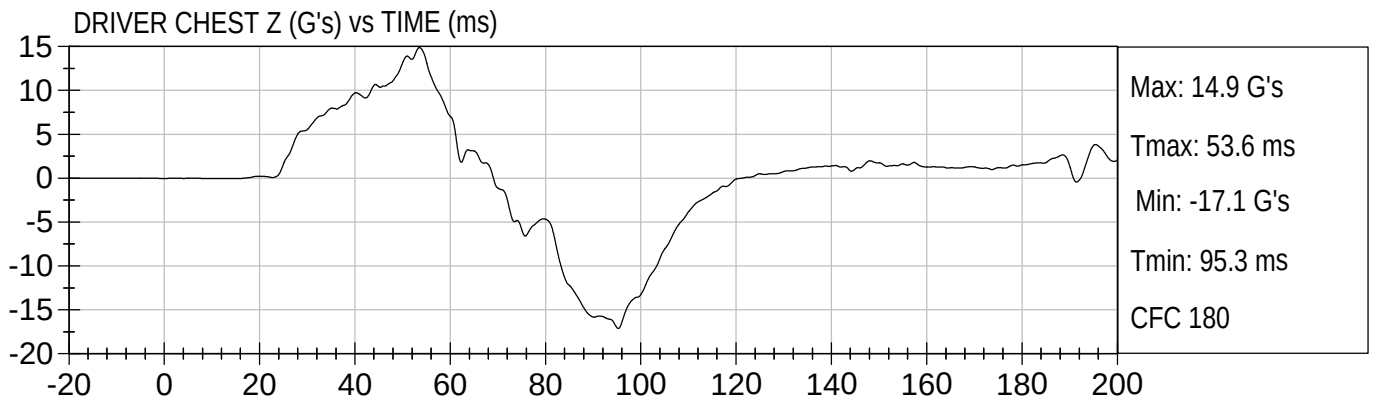
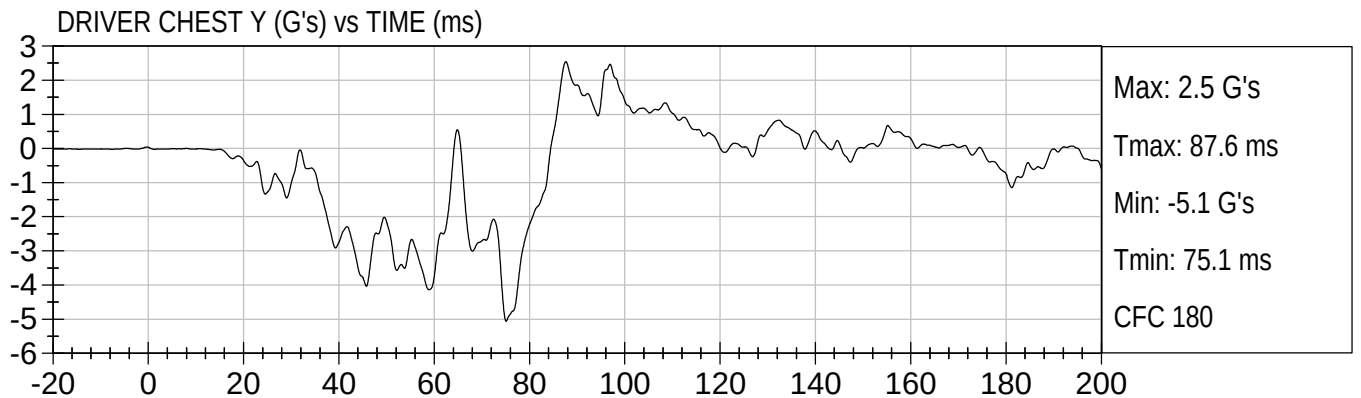
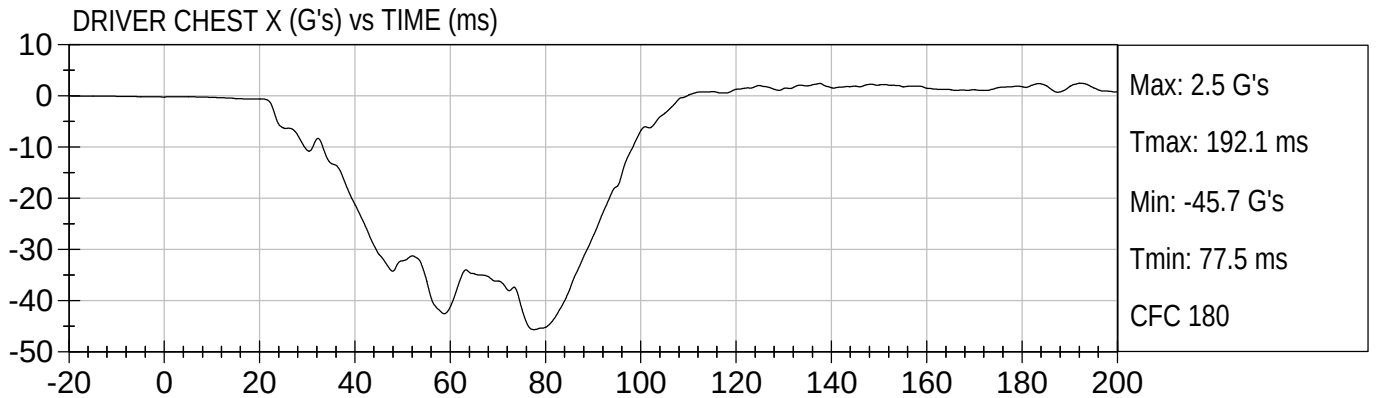


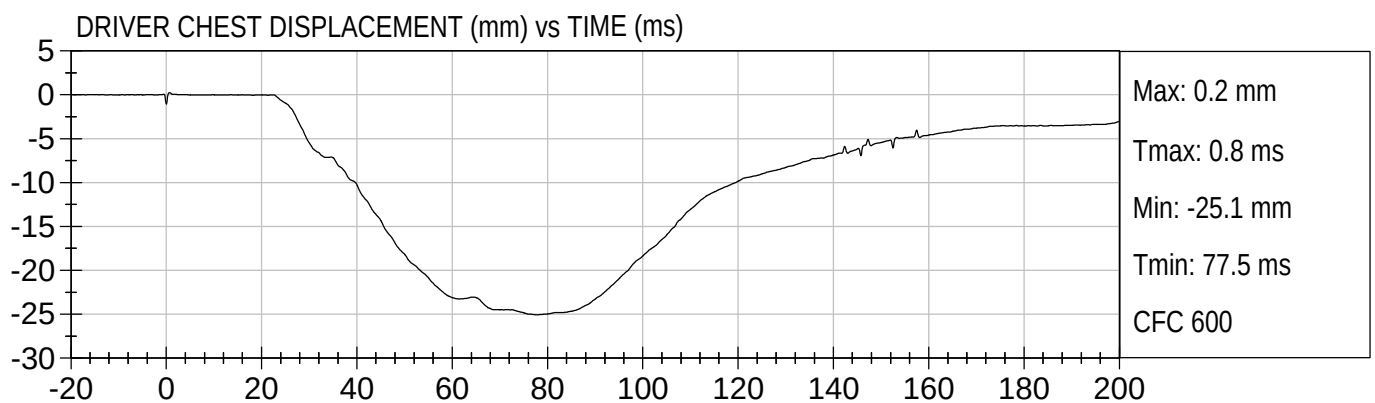
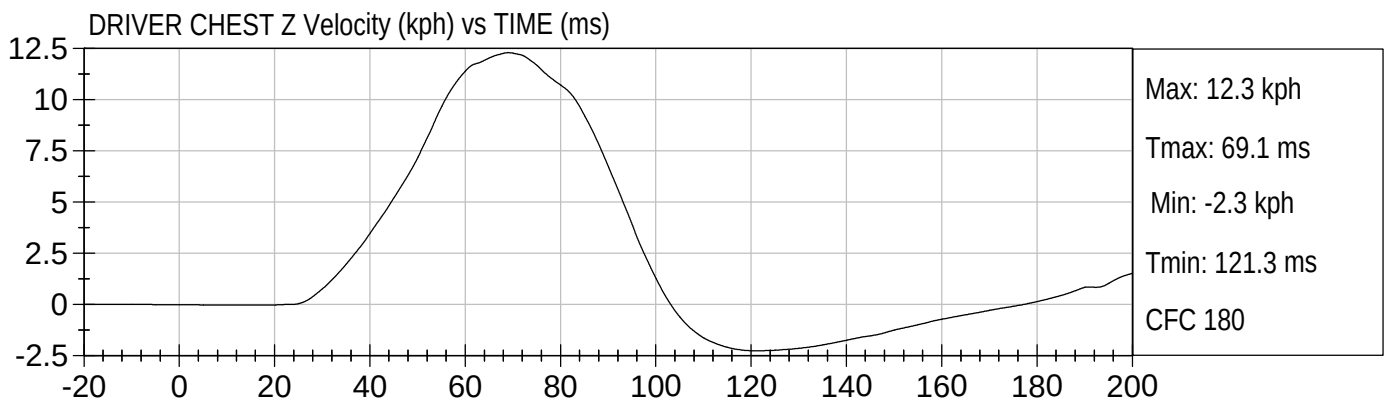
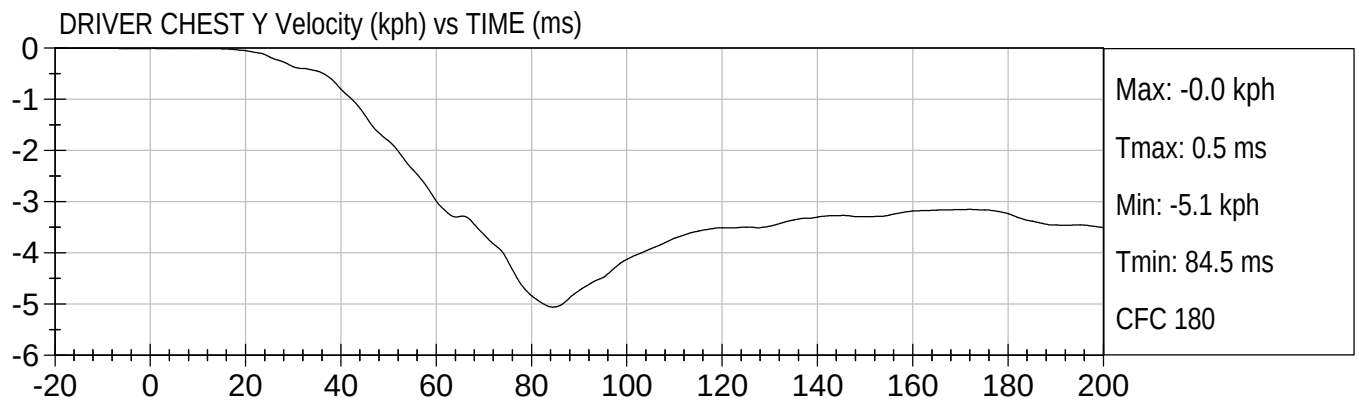
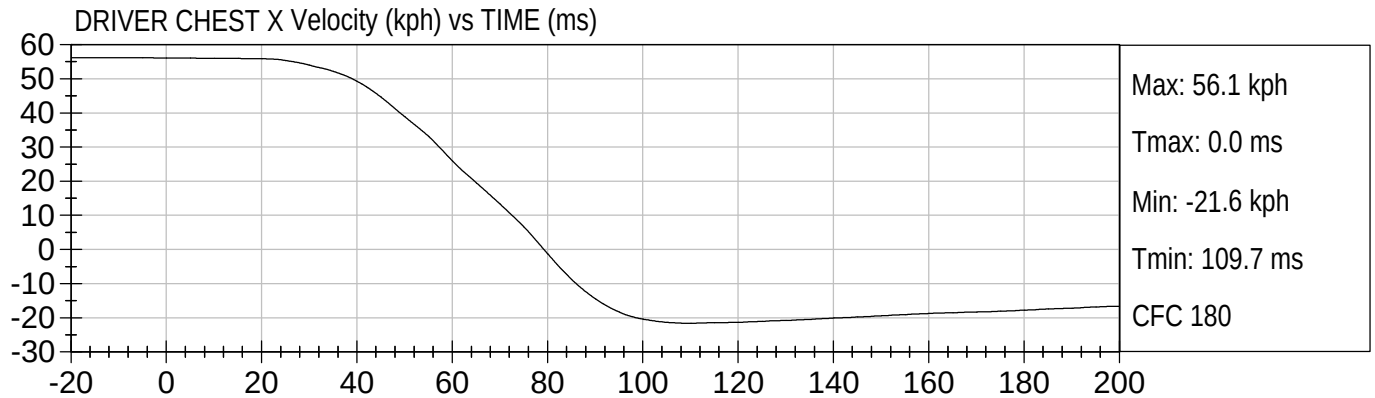


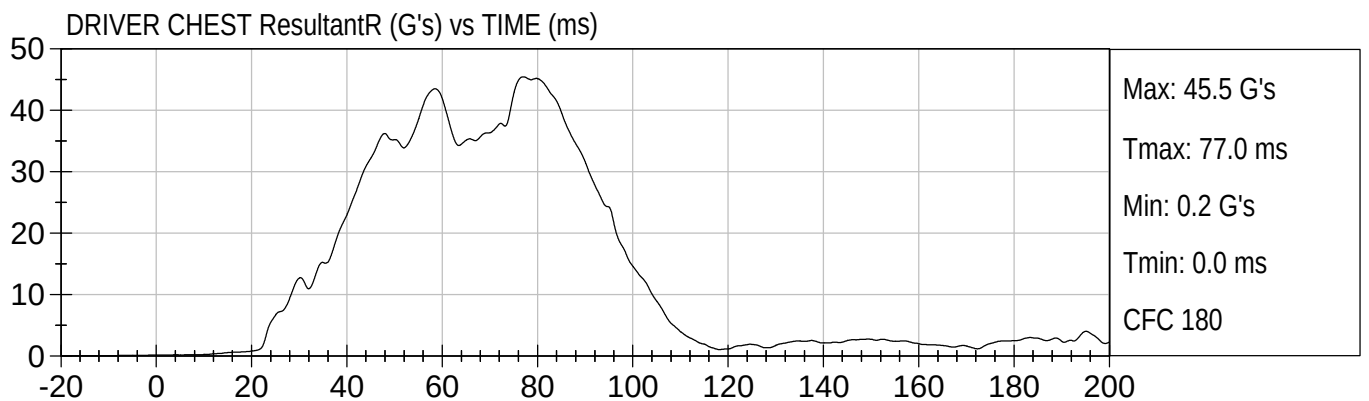
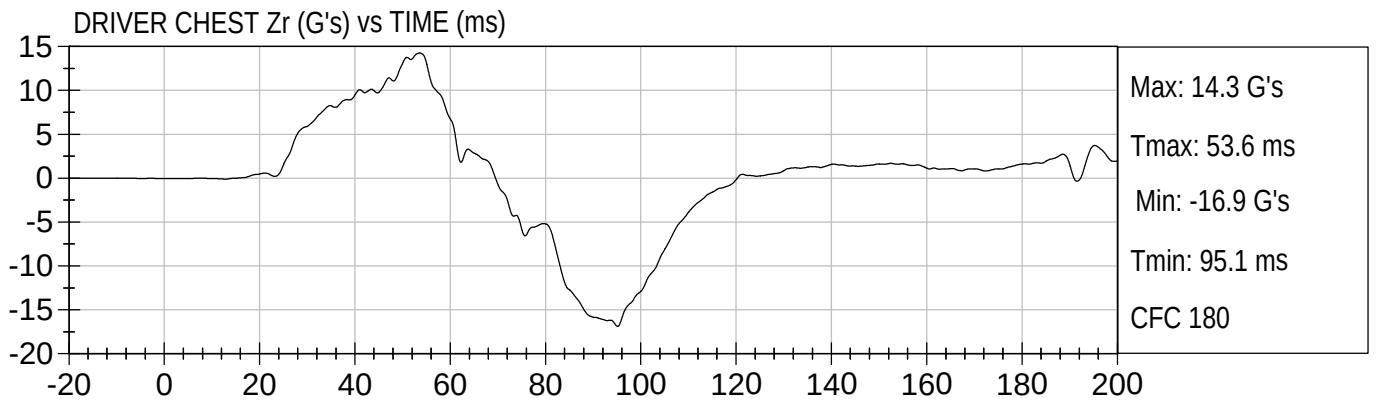
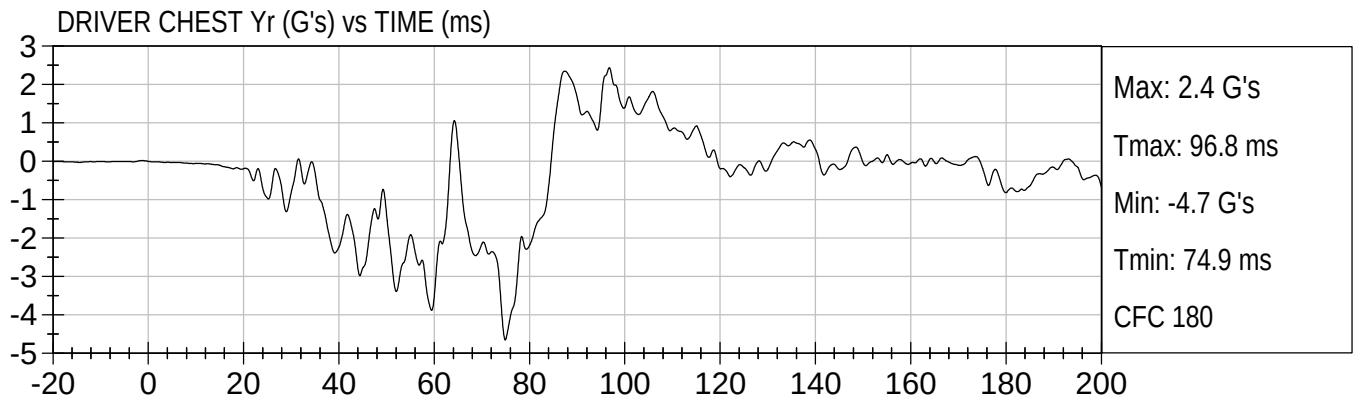
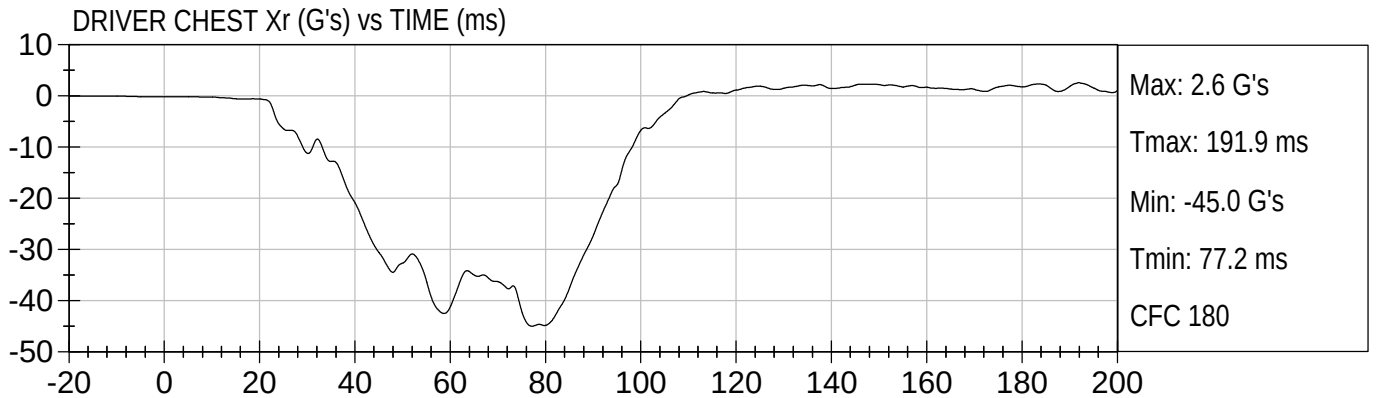
35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

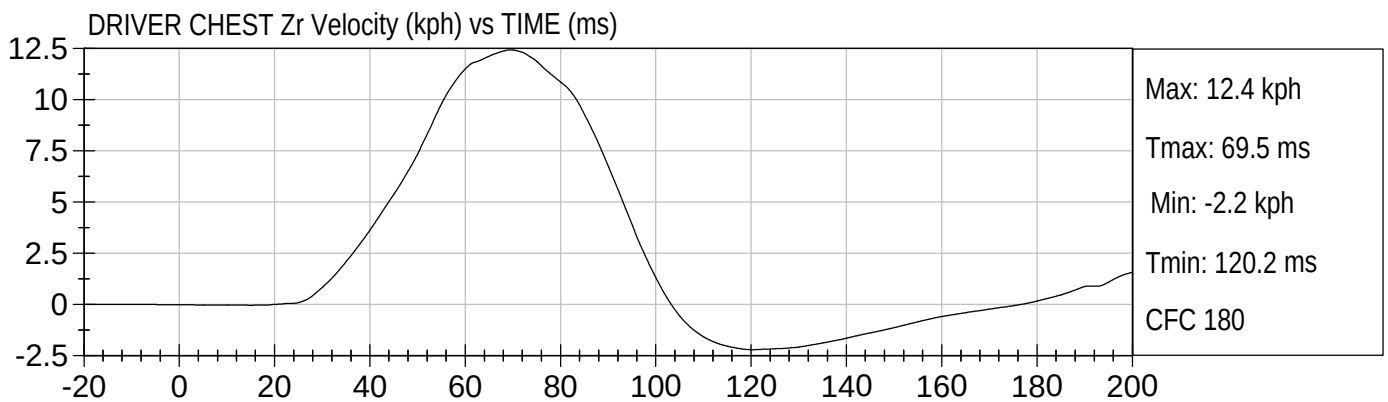
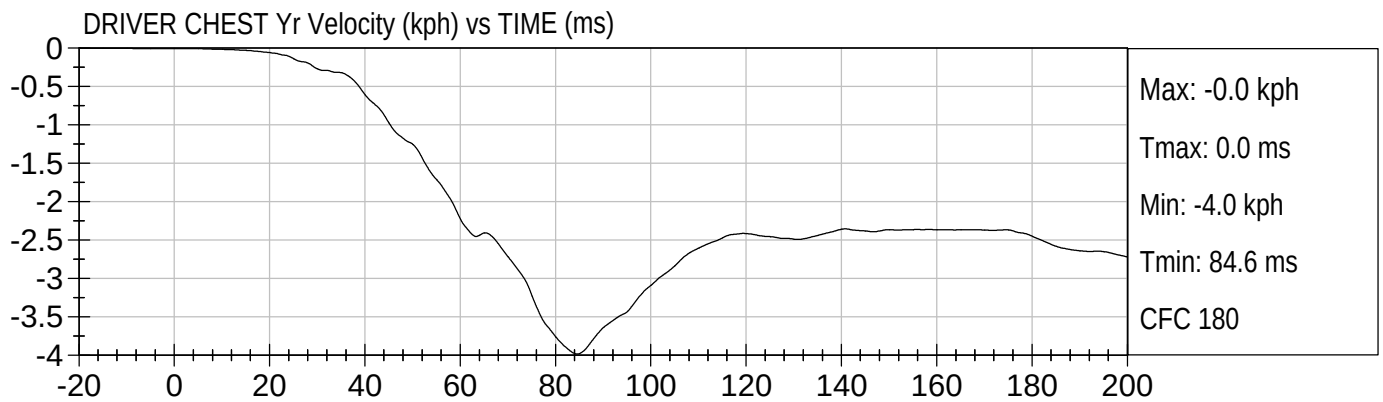
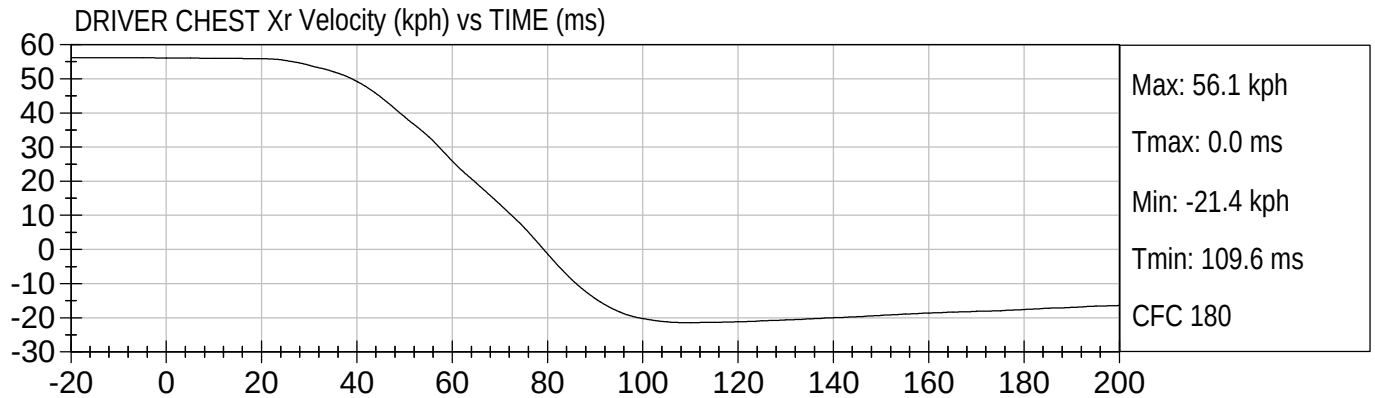
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)

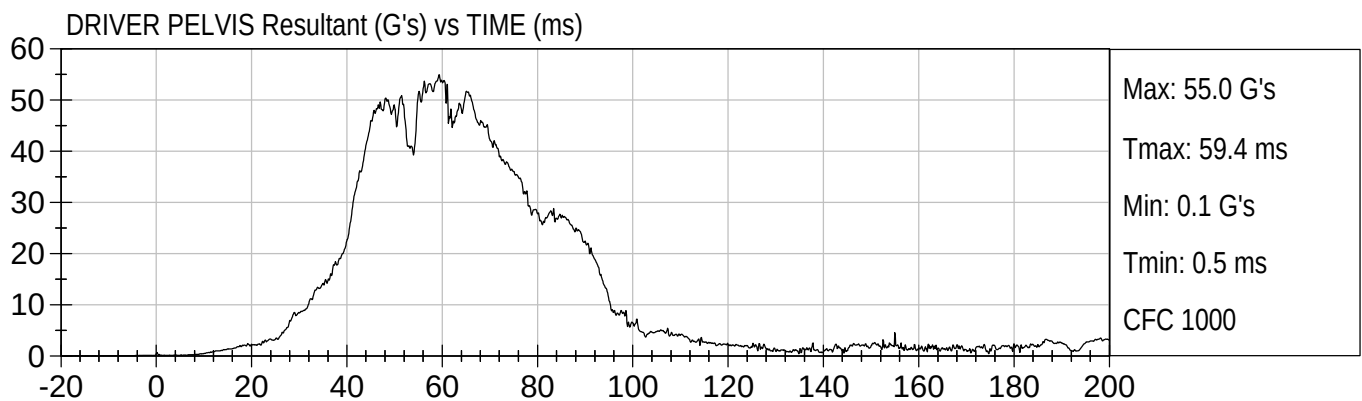
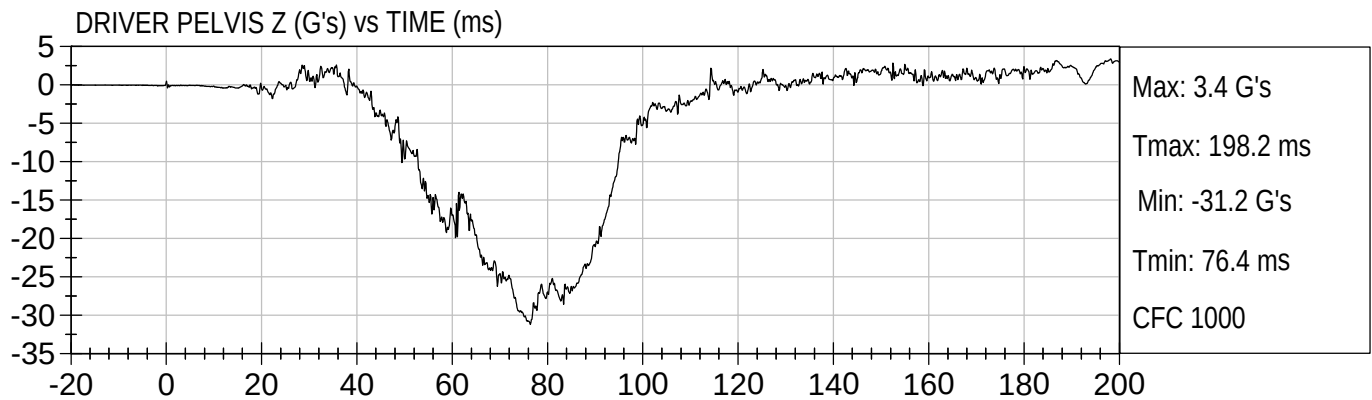
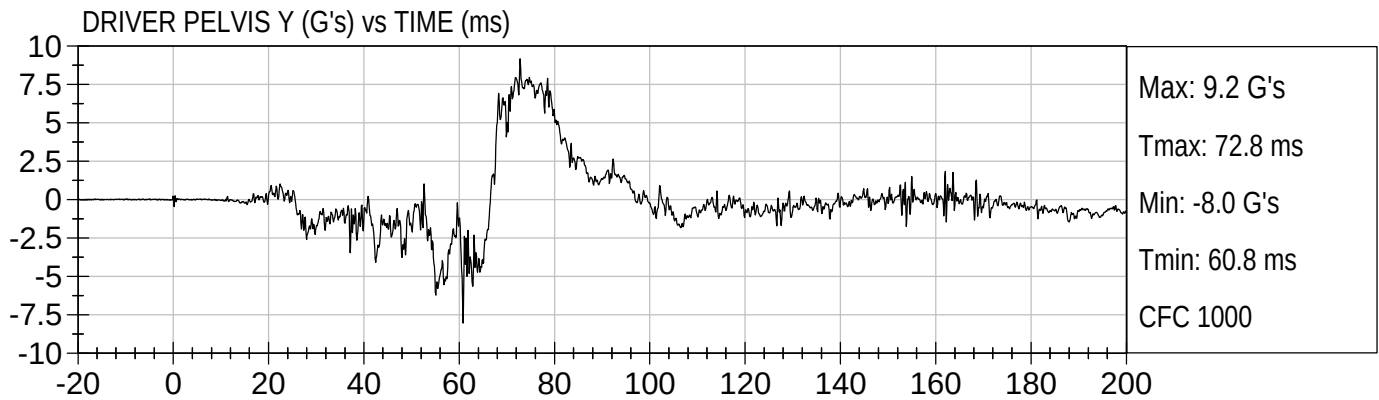
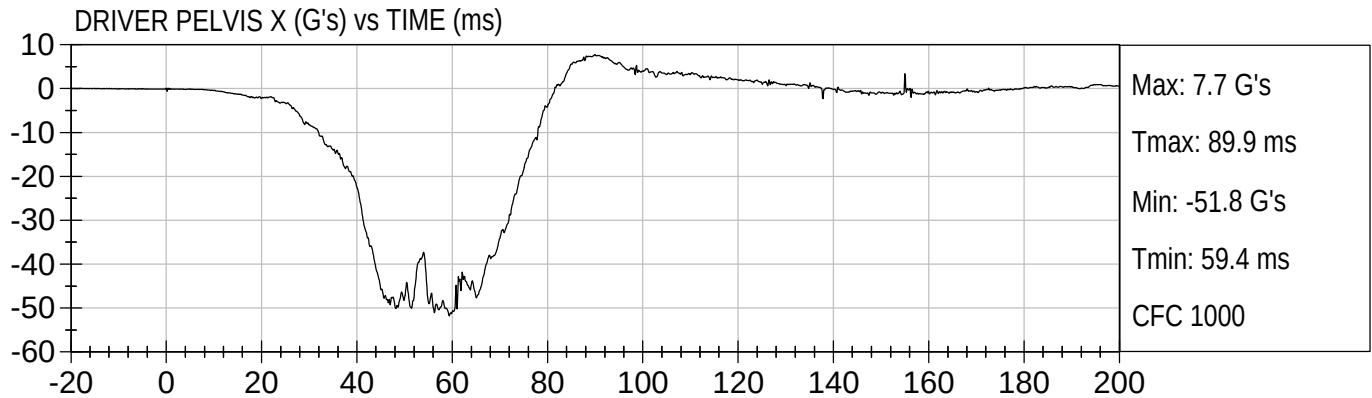


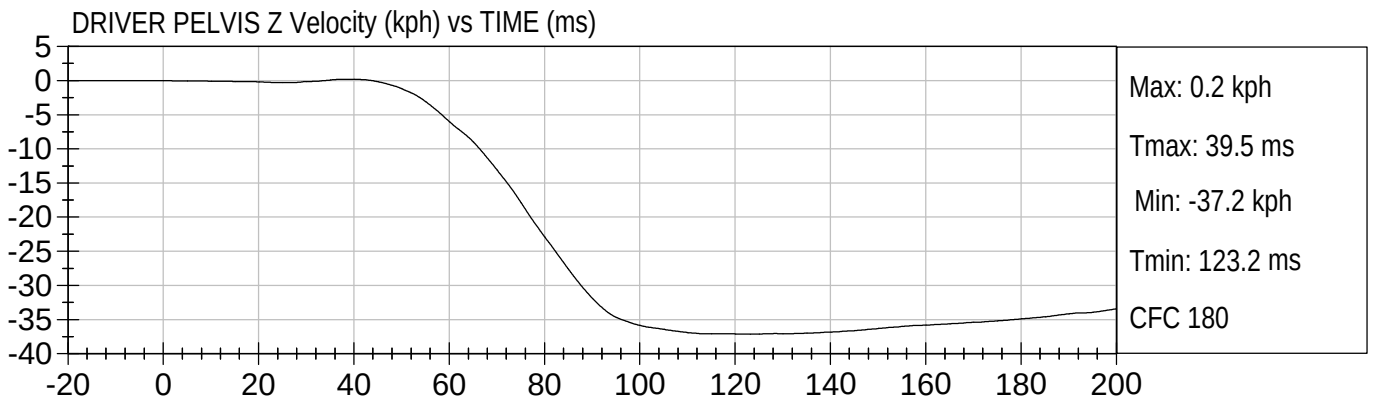
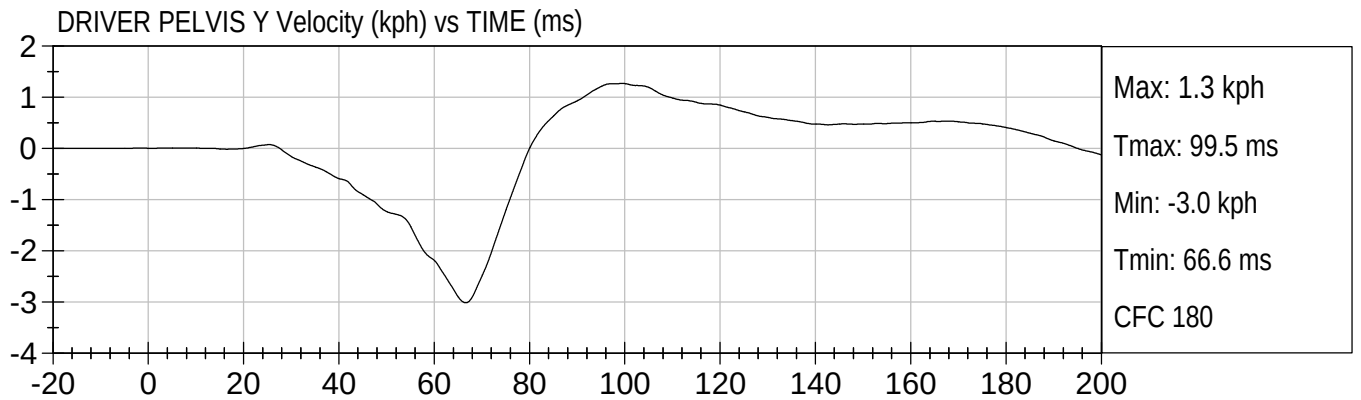
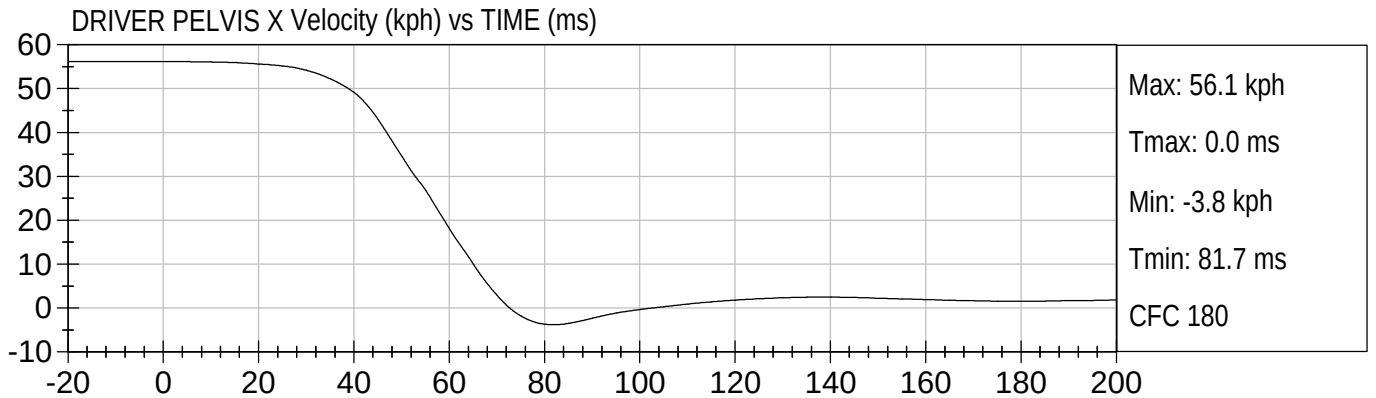








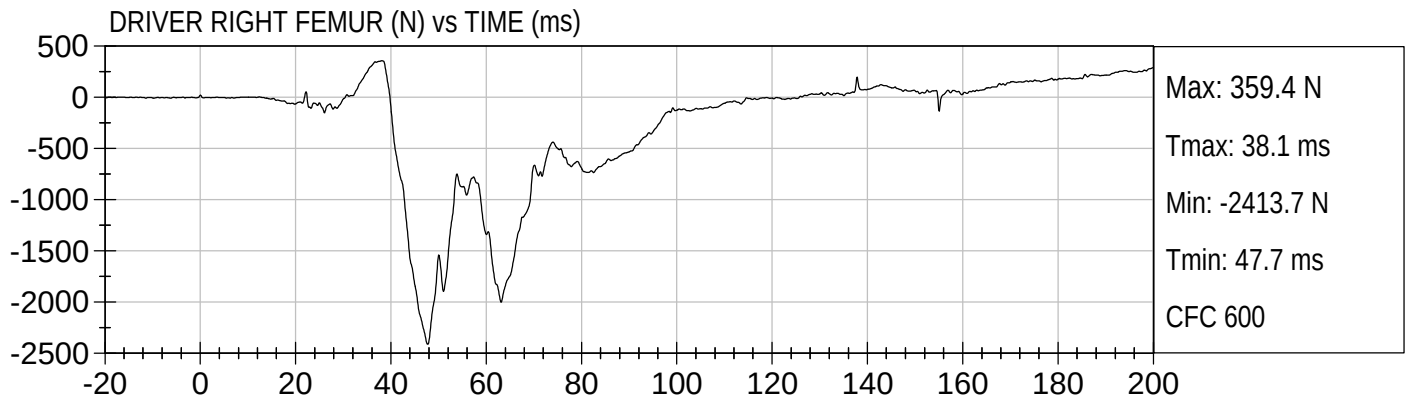
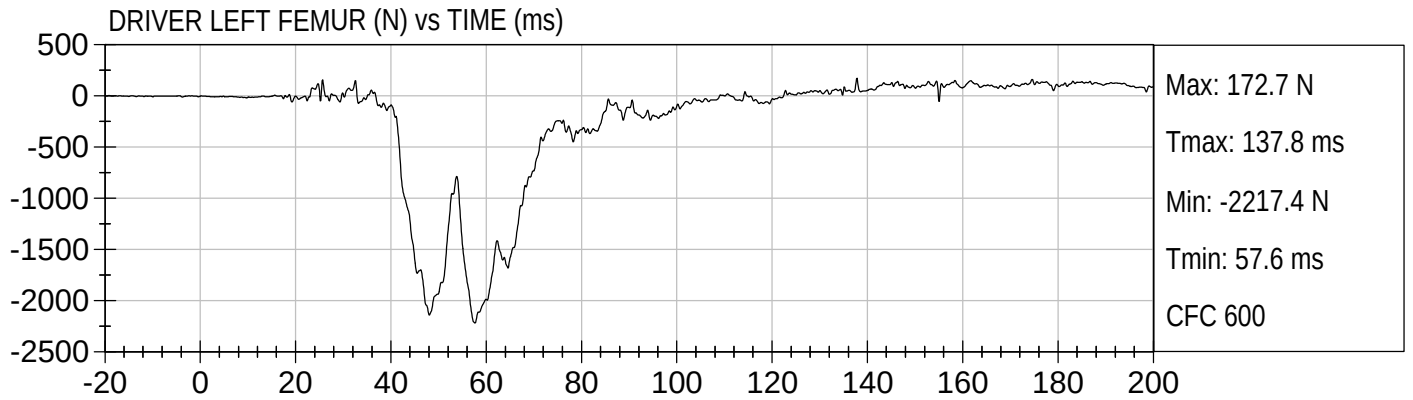






35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

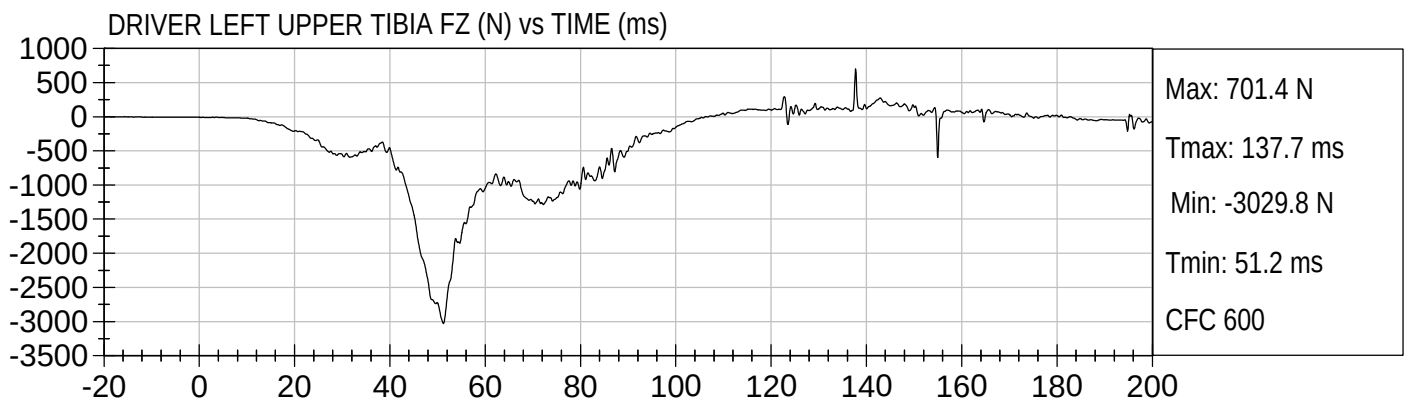
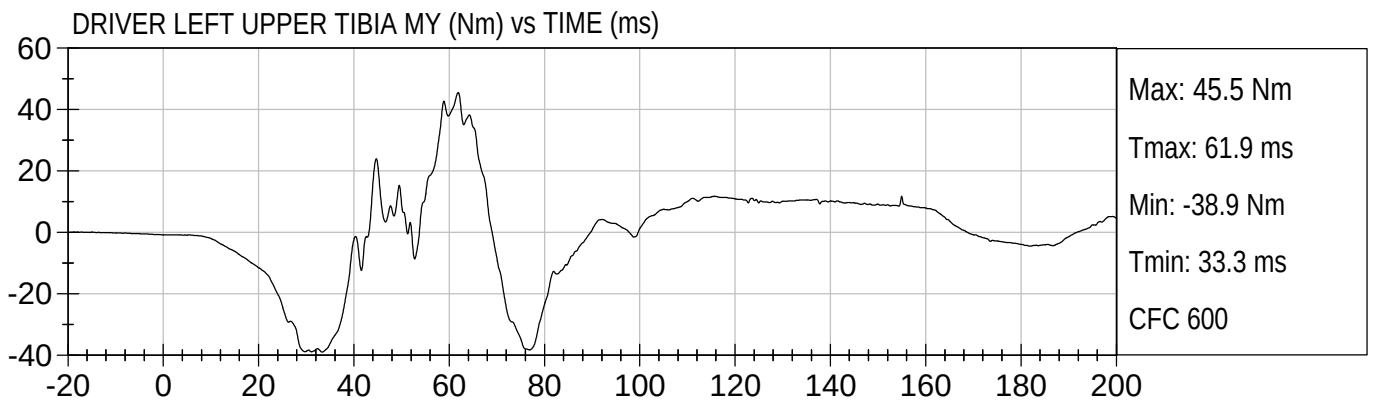
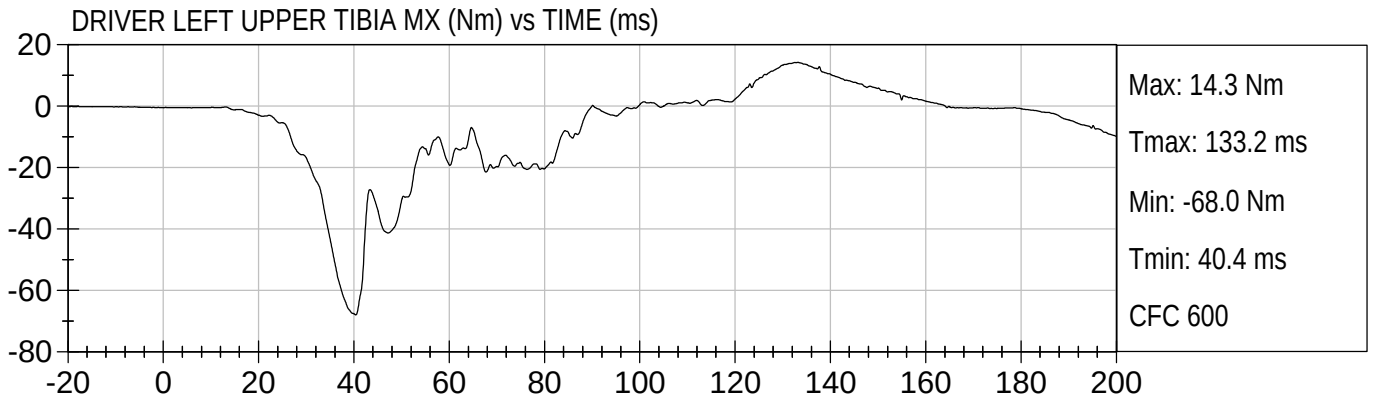
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)





35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)

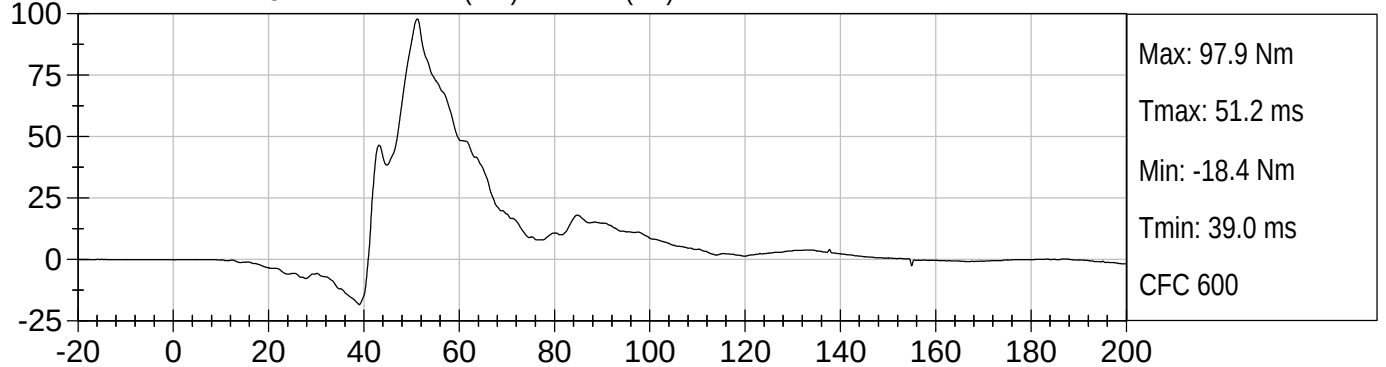




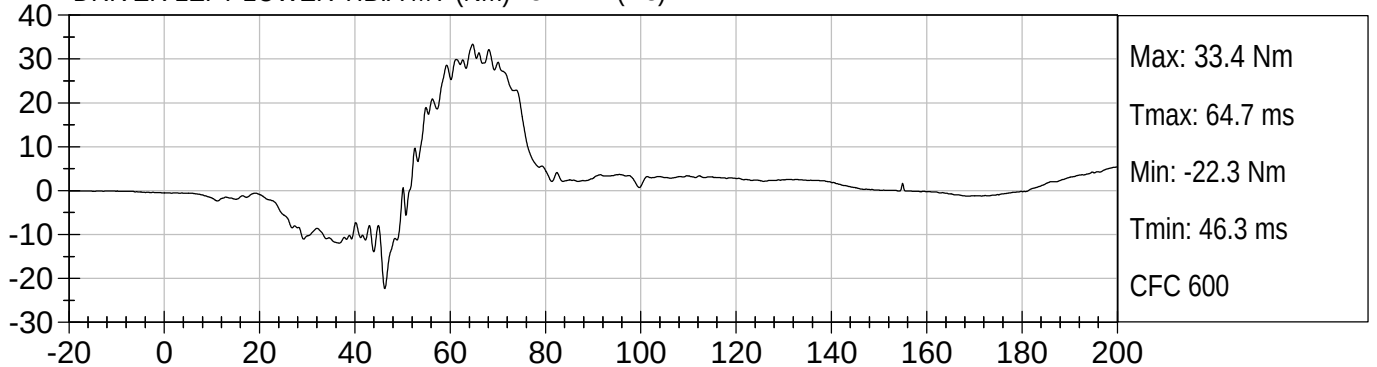
35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)

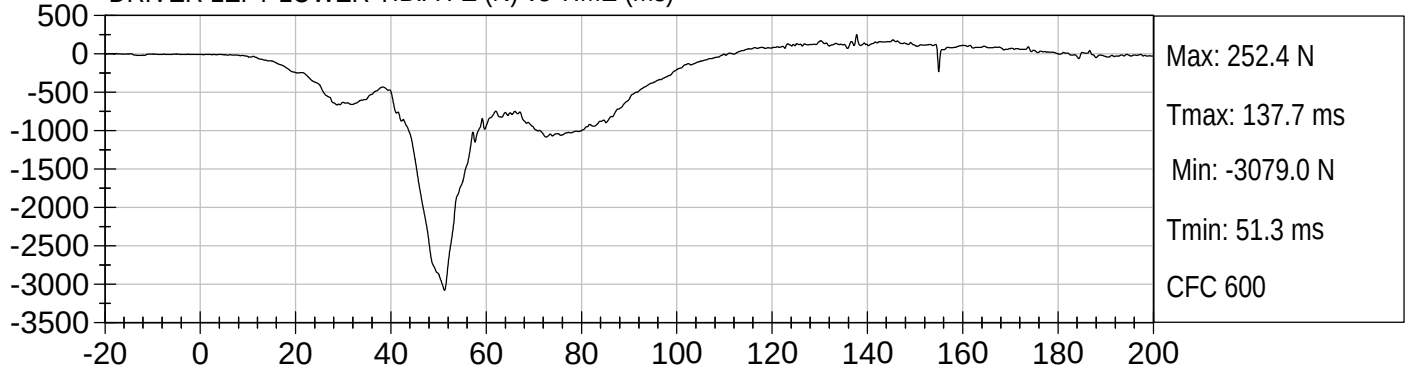
DRIVER LEFT LOWER TIBIA MX (Nm) vs TIME (ms)



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



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

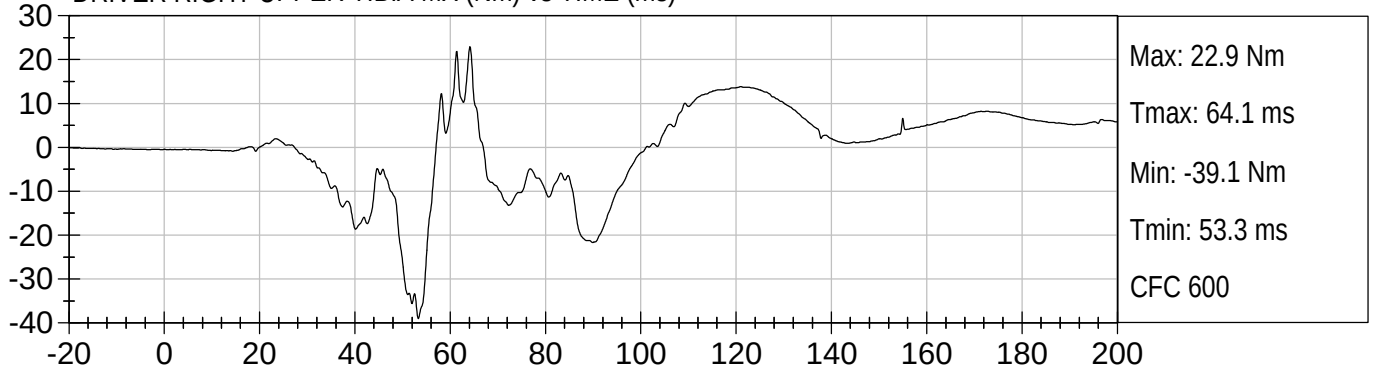




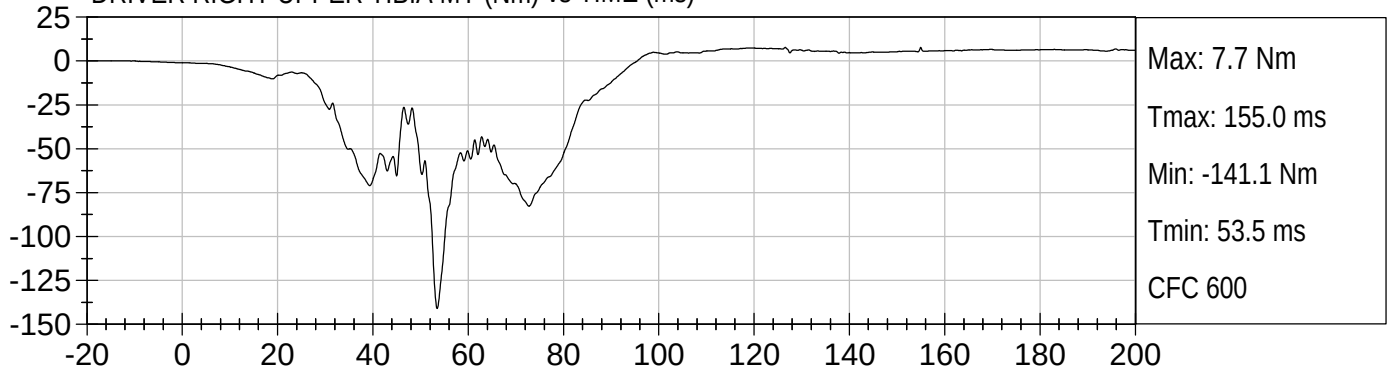
35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)

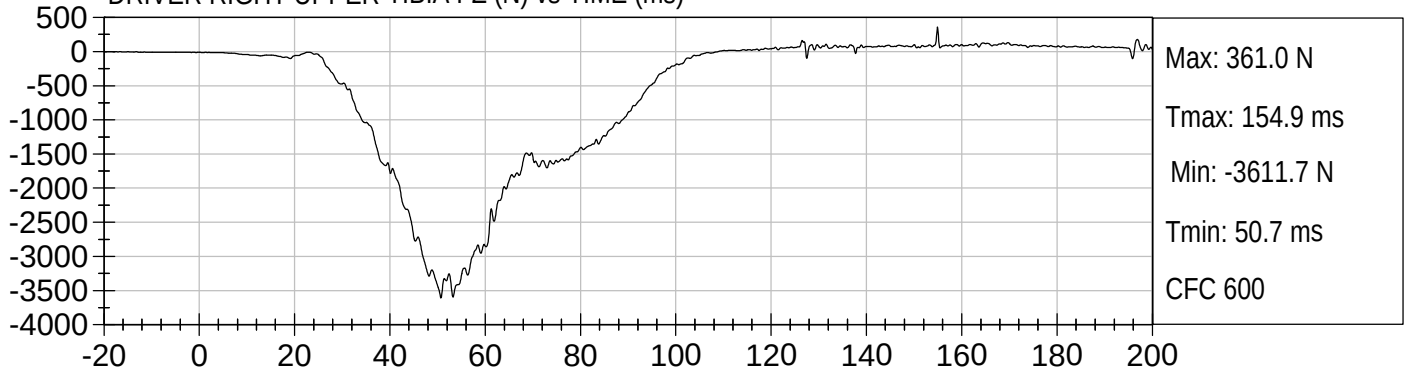
DRIVER RIGHT UPPER TIBIA MX (Nm) vs TIME (ms)



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



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

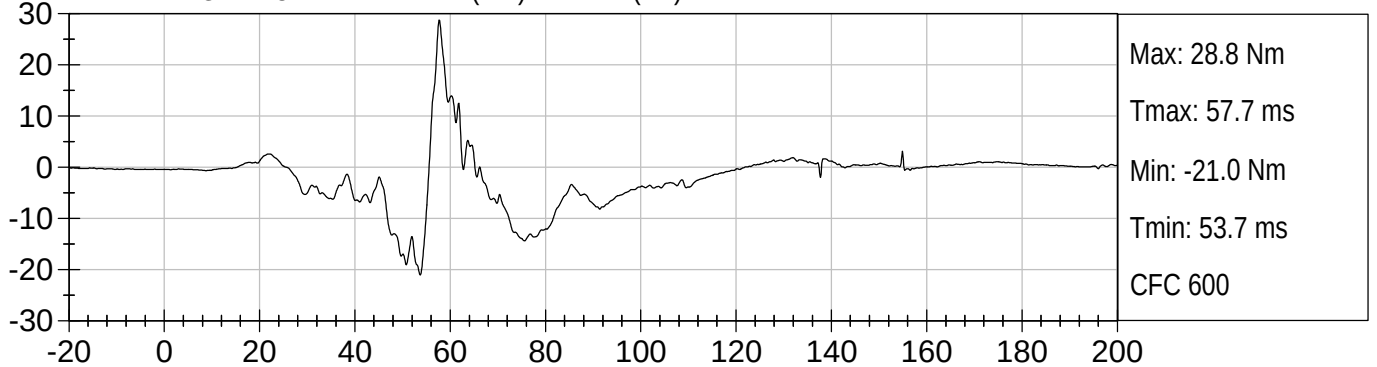




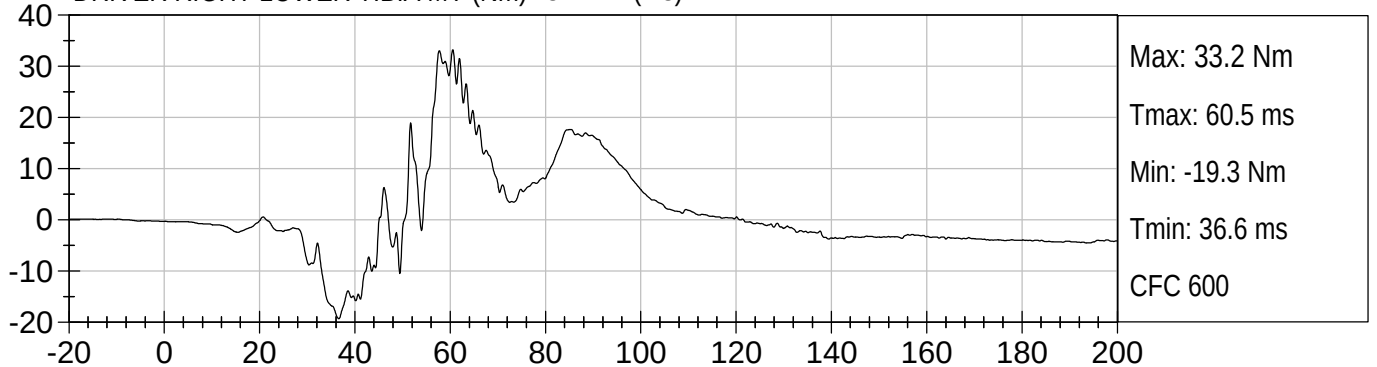
35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)

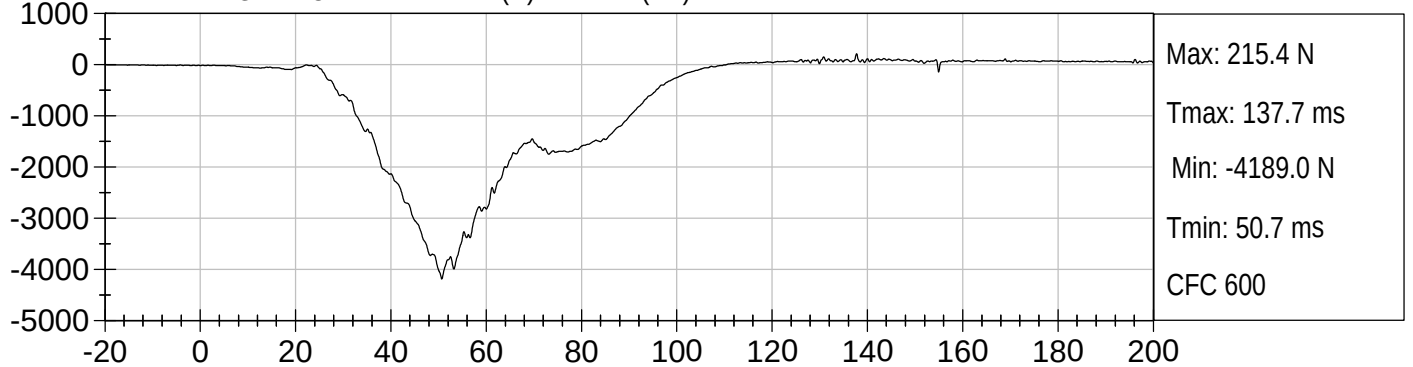
DRIVER RIGHT LOWER TIBIA MX (Nm) vs TIME (ms)



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



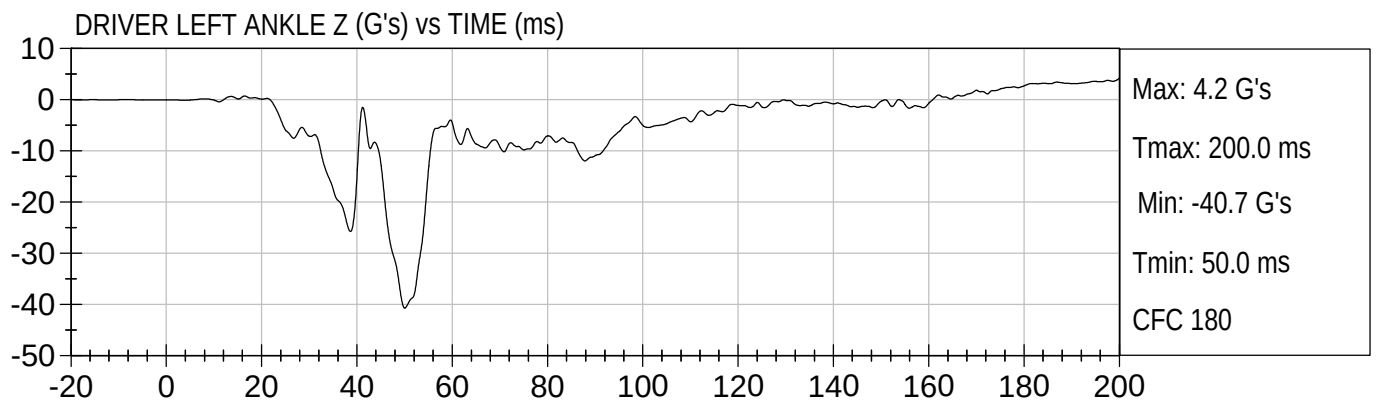
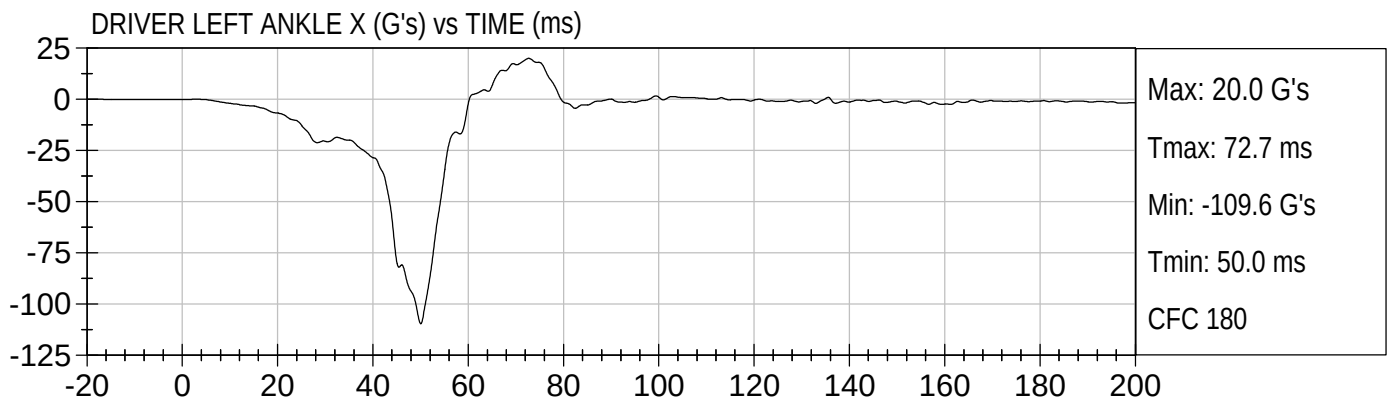
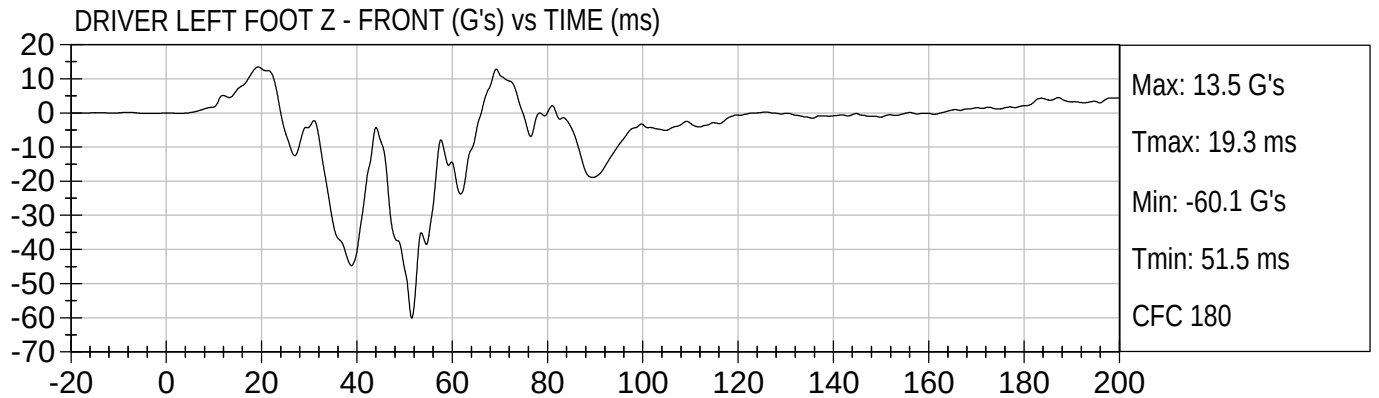
DRIVER RIGHT LOWER TIBIA FZ (N) vs TIME (ms)





35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

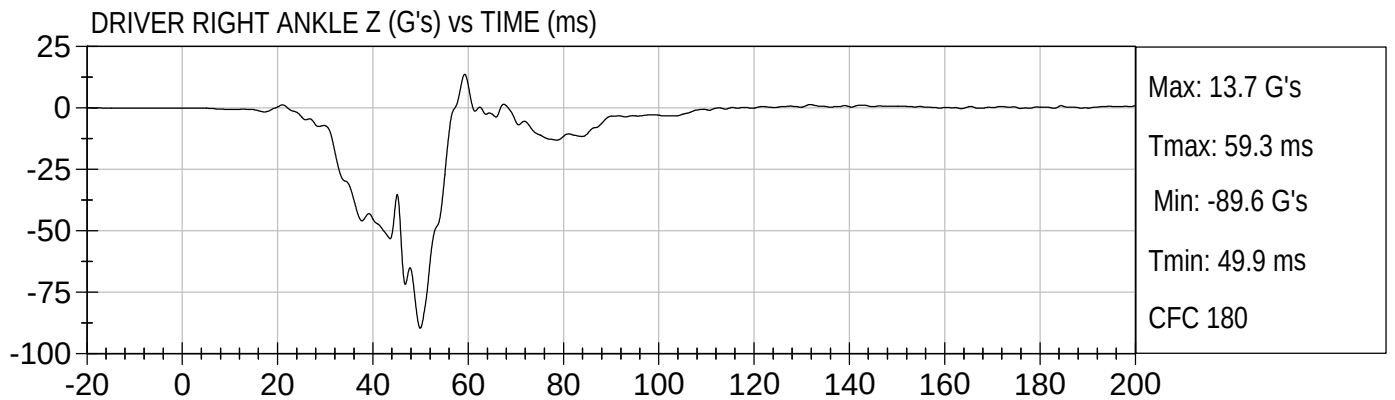
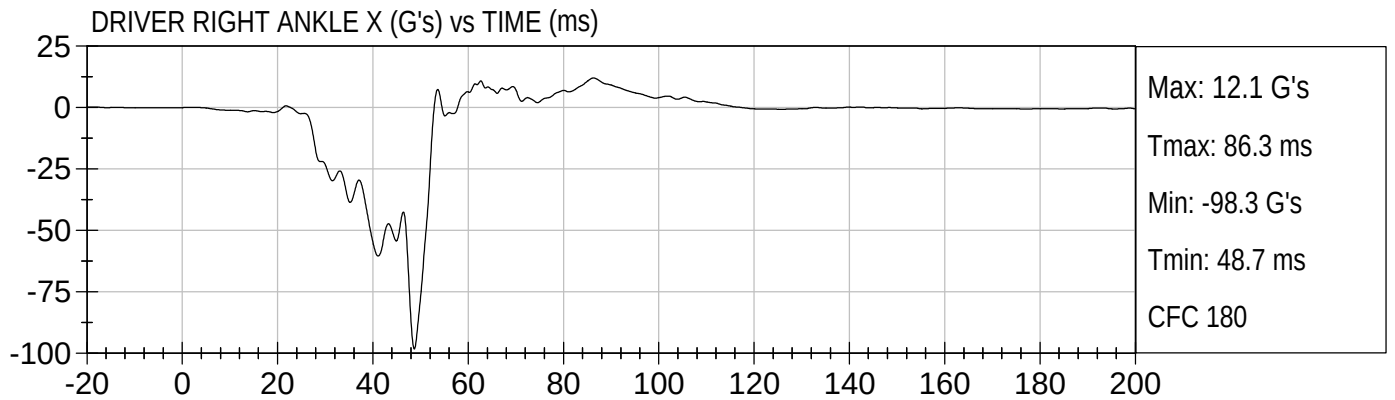
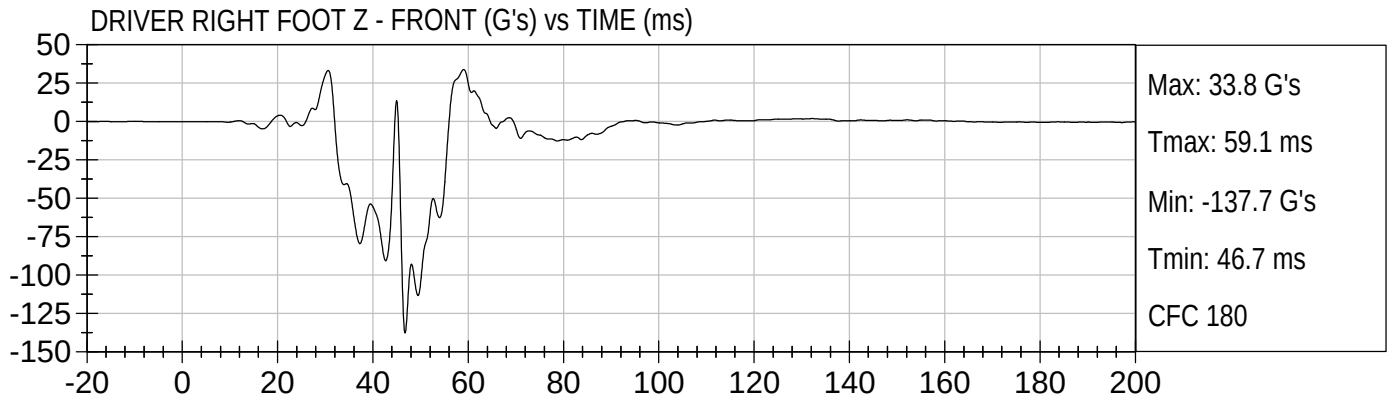
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)





35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

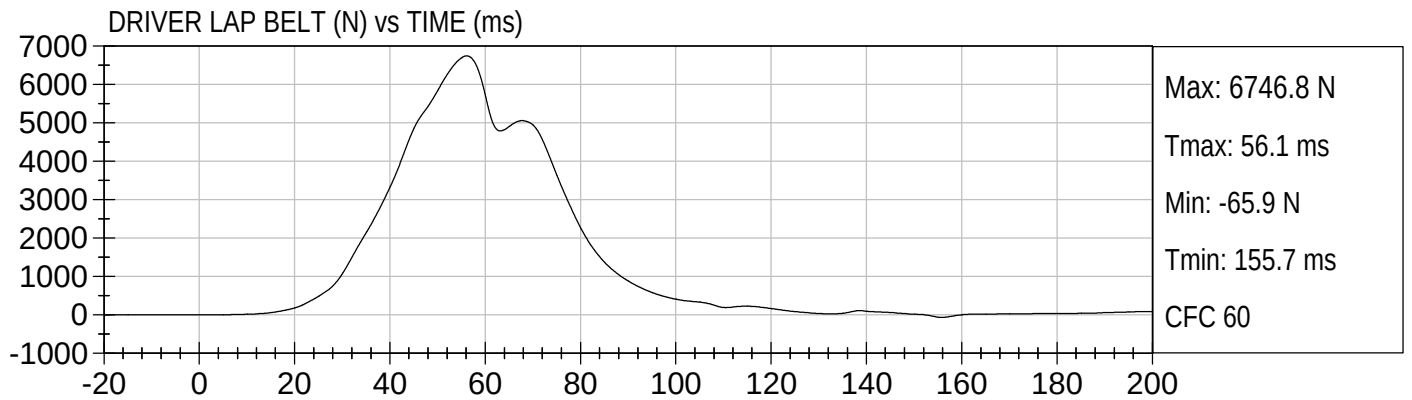
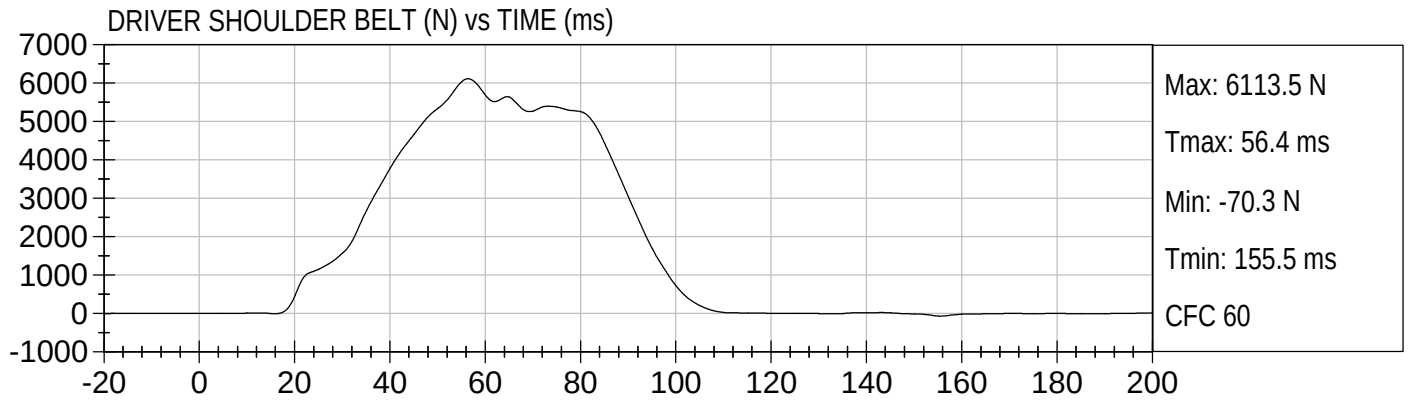
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)

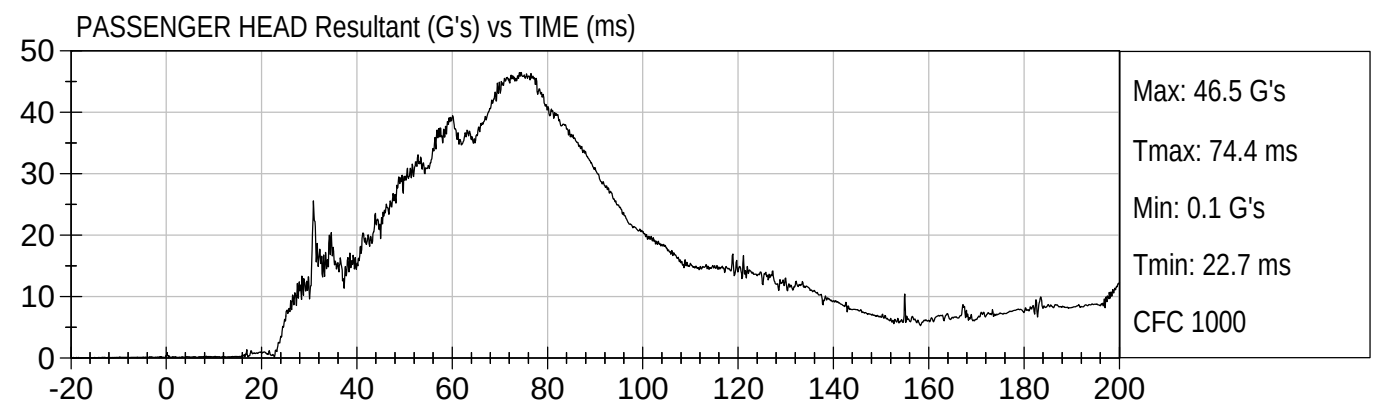
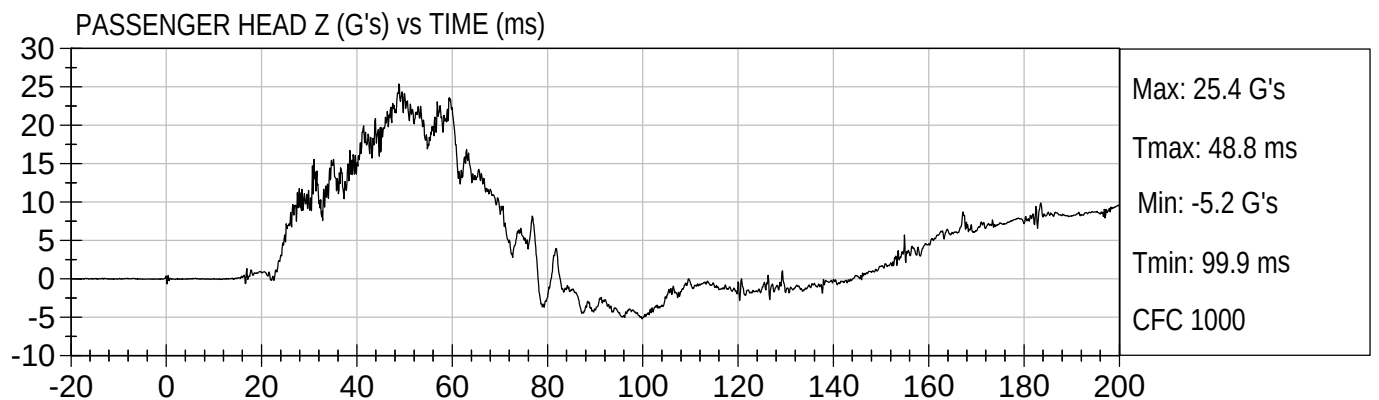
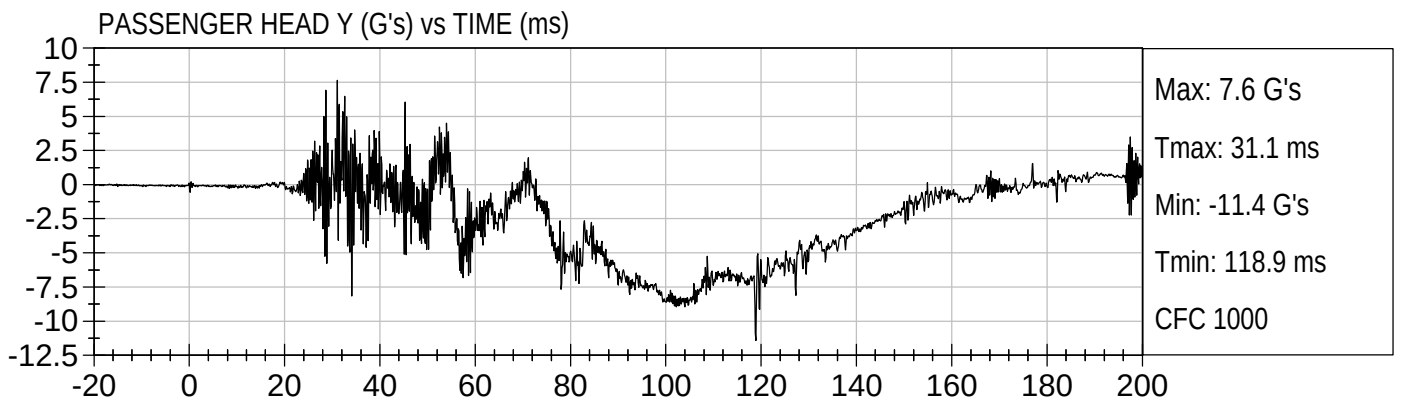
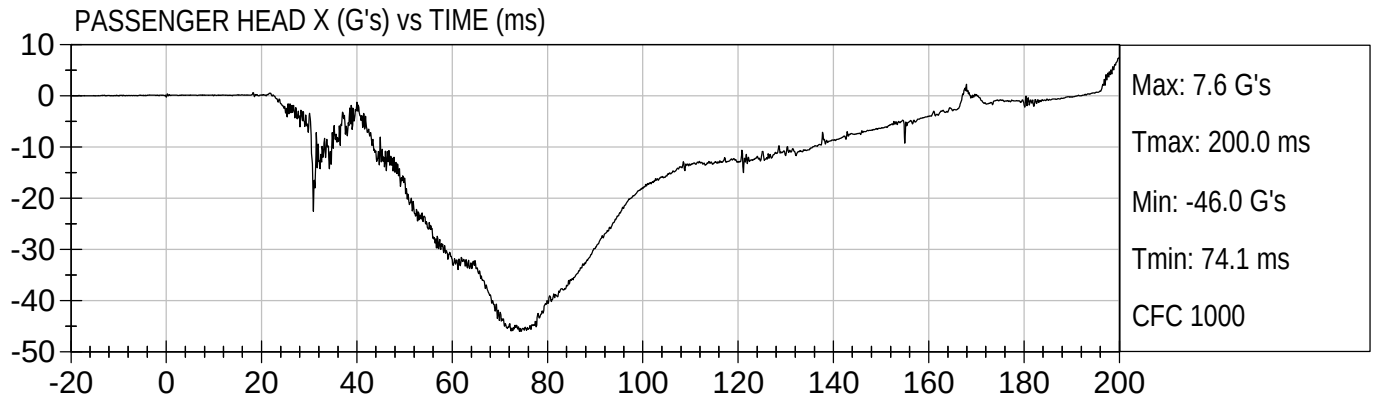




35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)



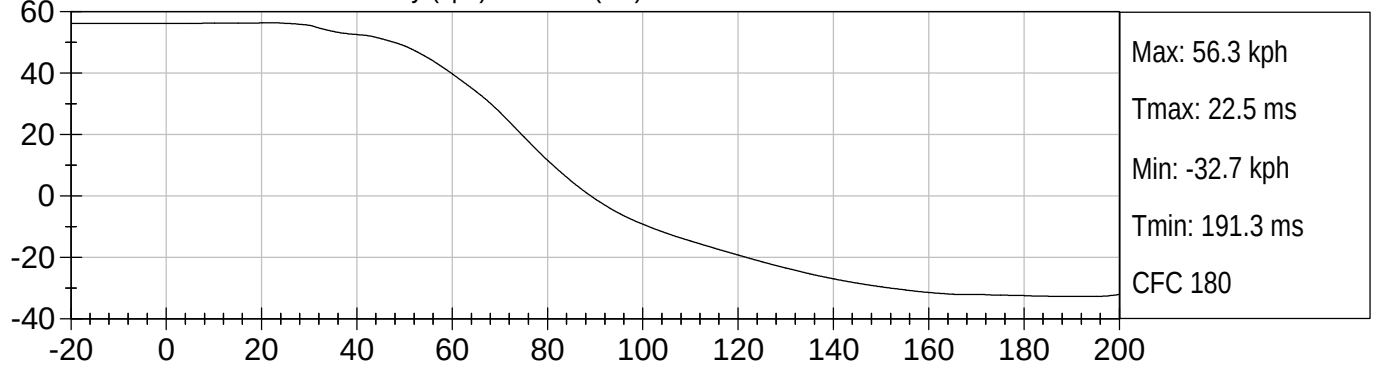




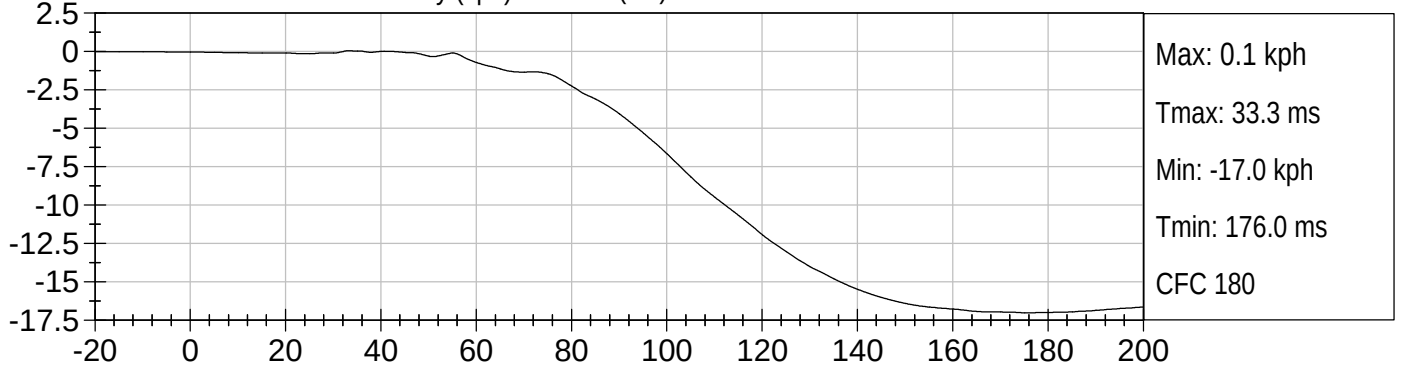
35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

Test Date: March 26, 2002e:
Speed: 34.9 mph (56.2 km/h)

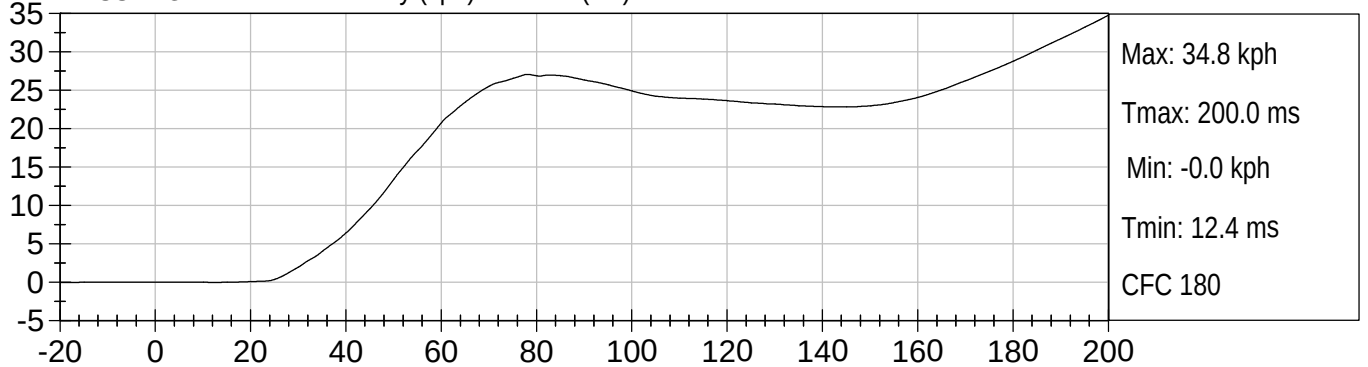
PASSENGER HEAD X Velocity (kph) vs TIME (ms)



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



PASSENGER HEAD Z Velocity (kph) vs TIME (ms)

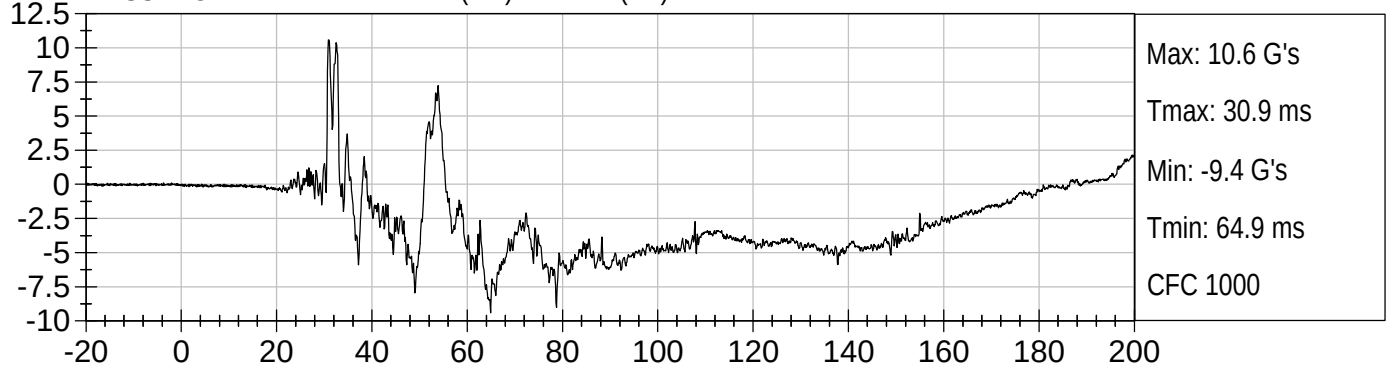




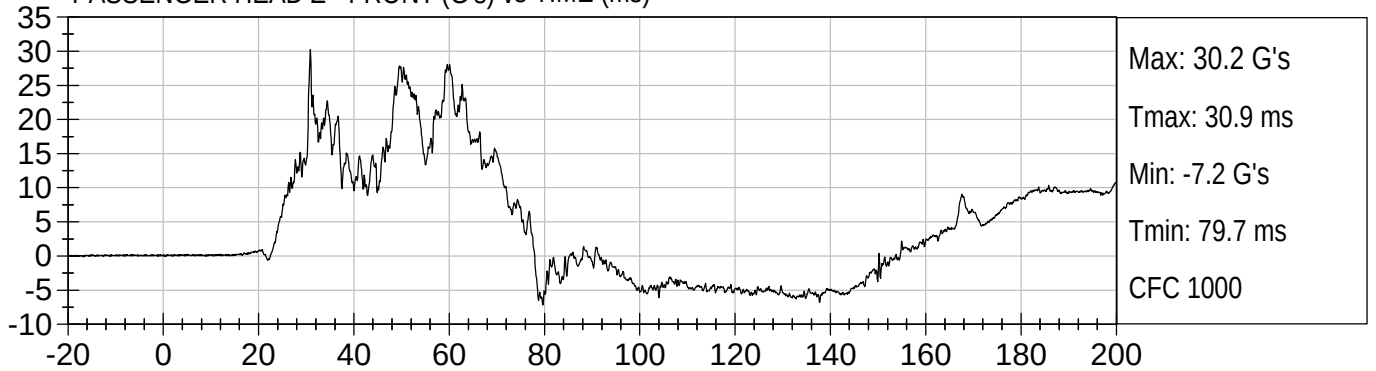
35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)

PASSENGER HEAD Y - FRONT (G's) vs TIME (ms)



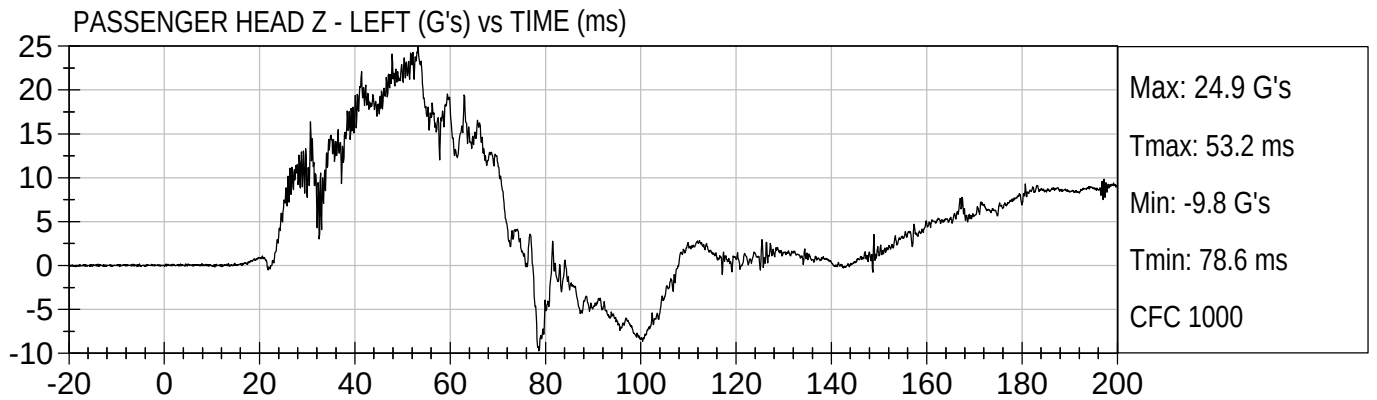
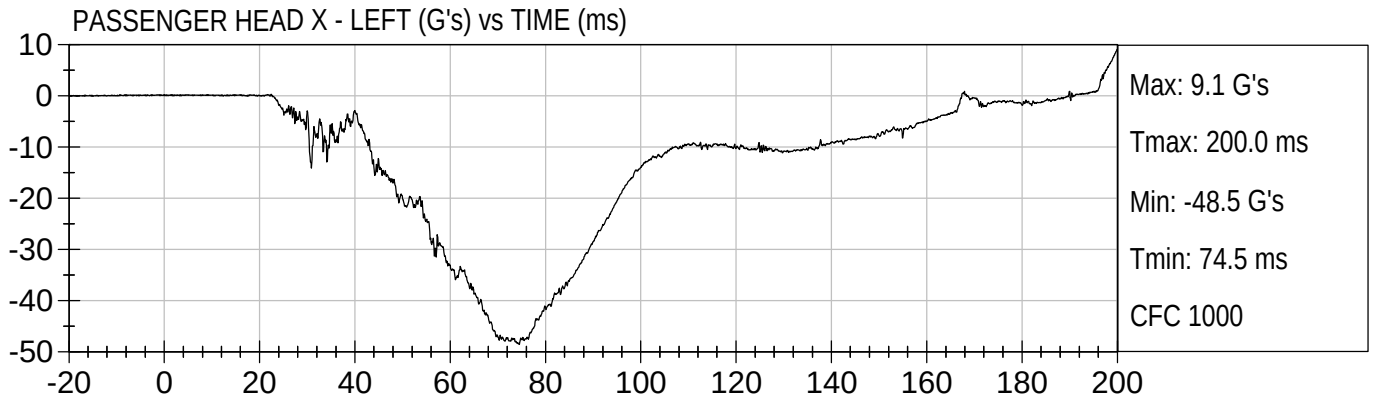
PASSENGER HEAD Z - FRONT (G's) vs TIME (ms)





35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

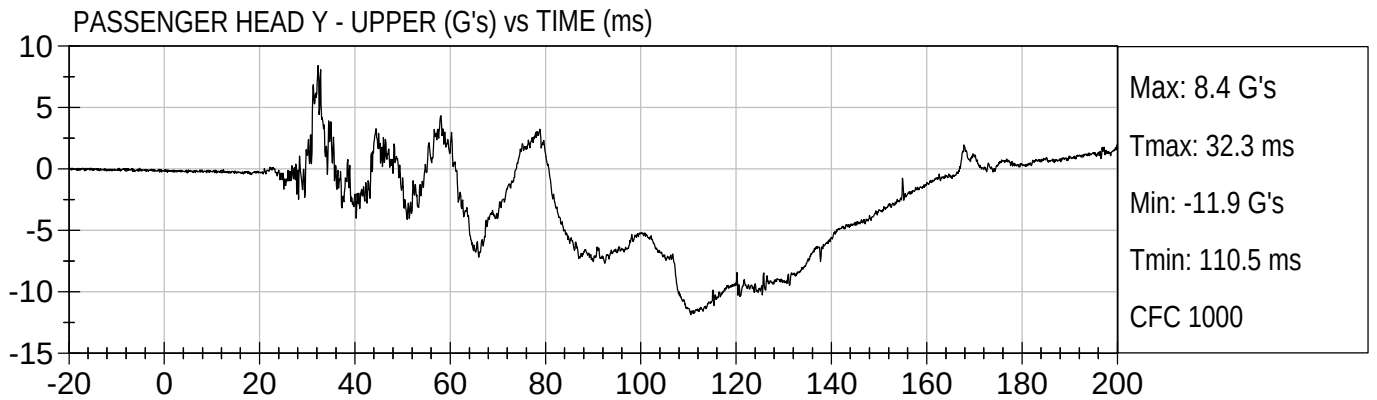
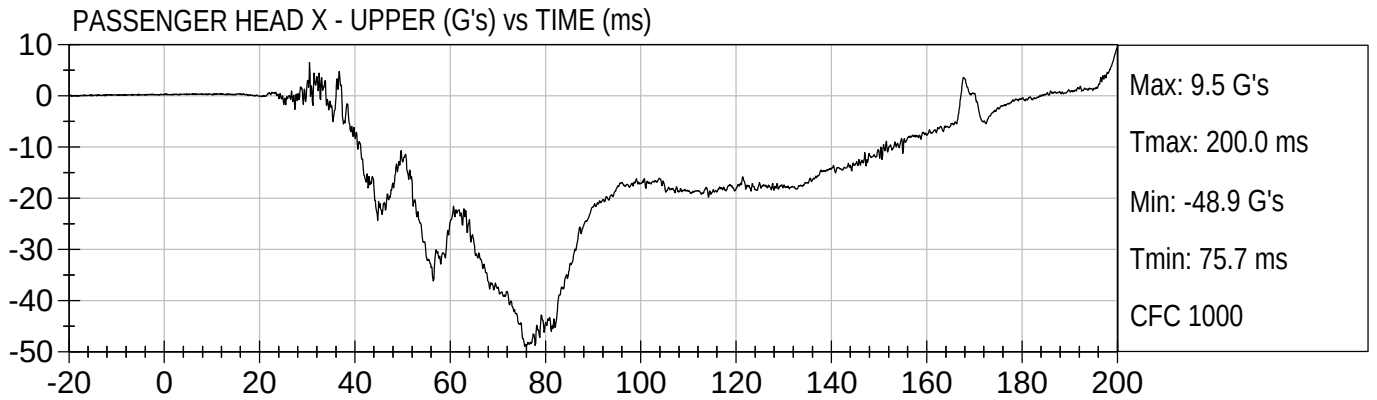
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)





35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

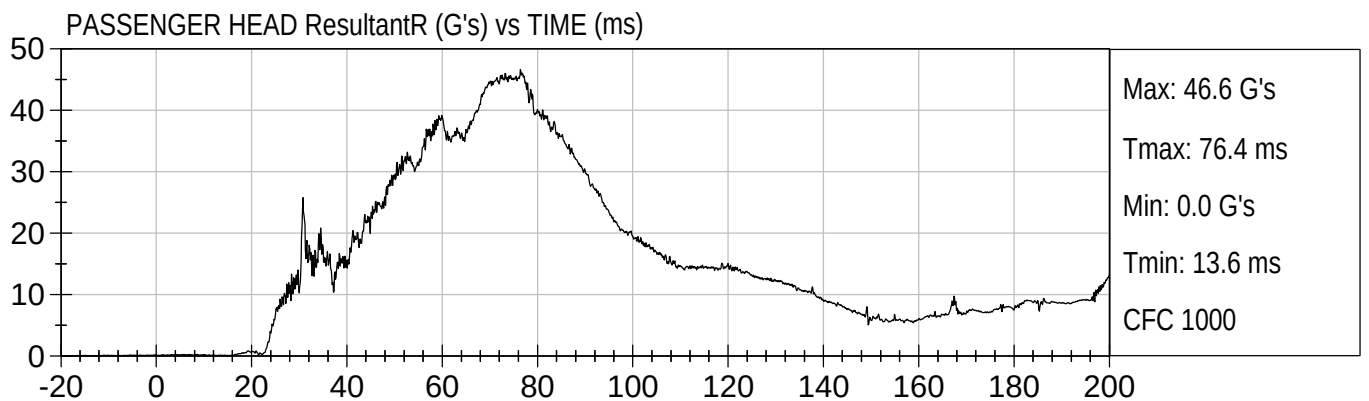
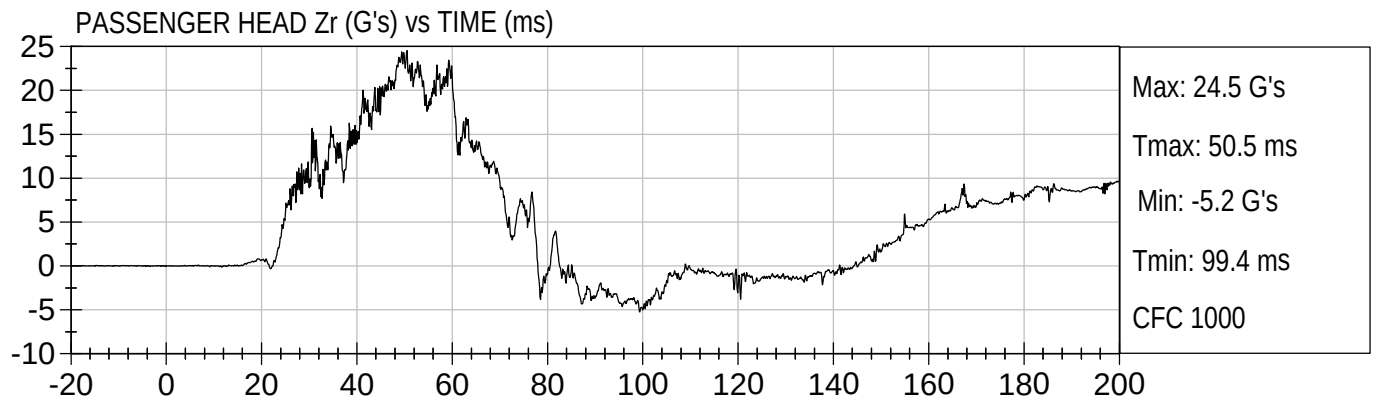
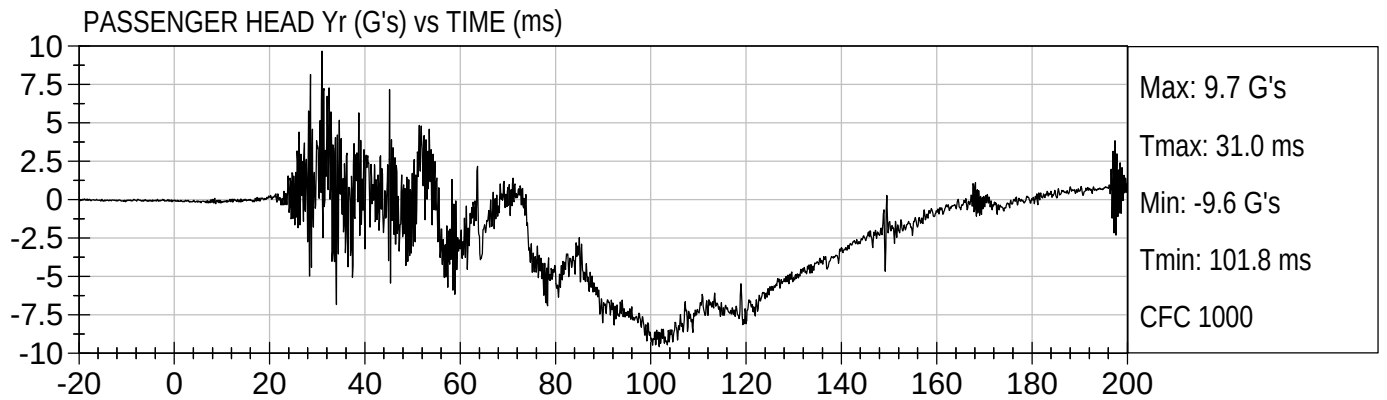
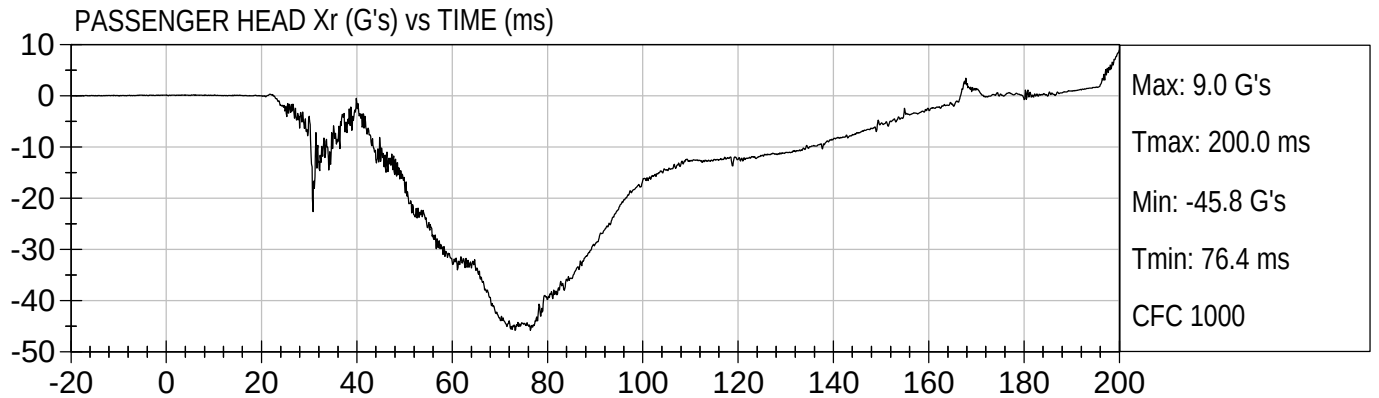
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)





35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

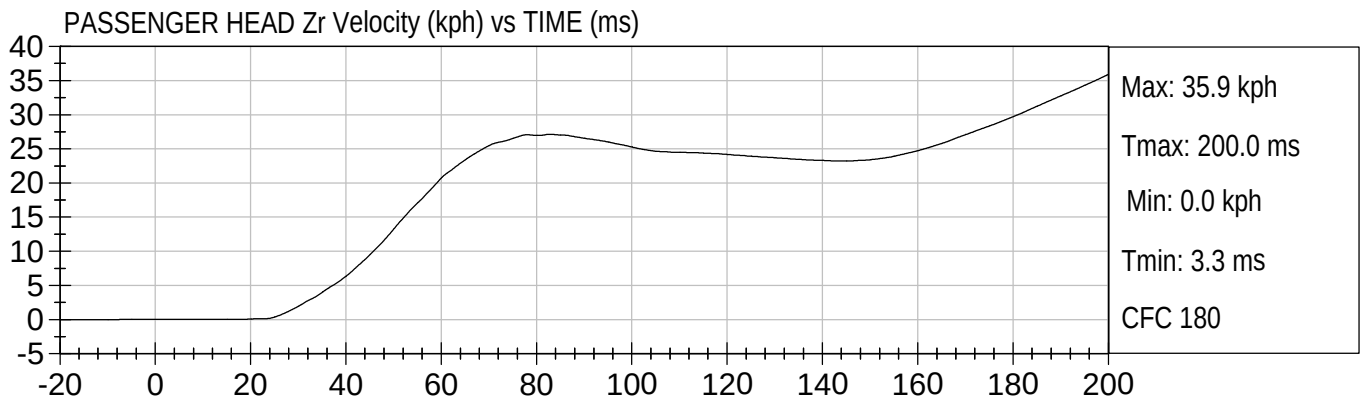
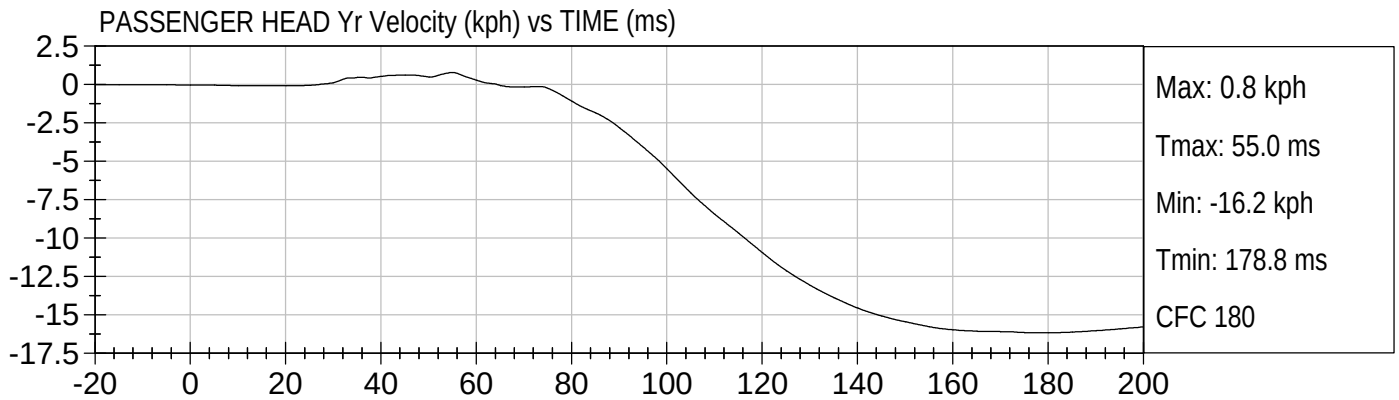
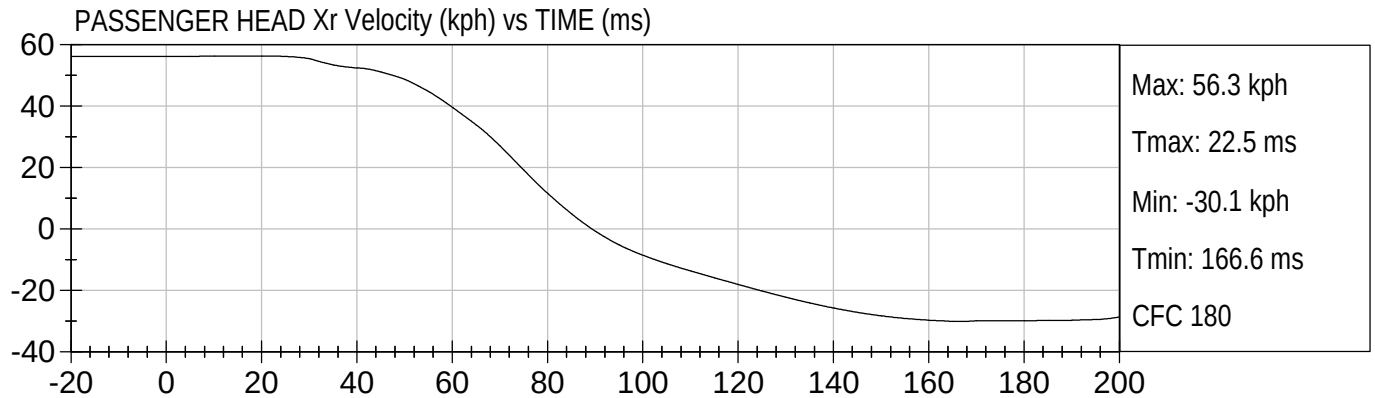
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)





35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

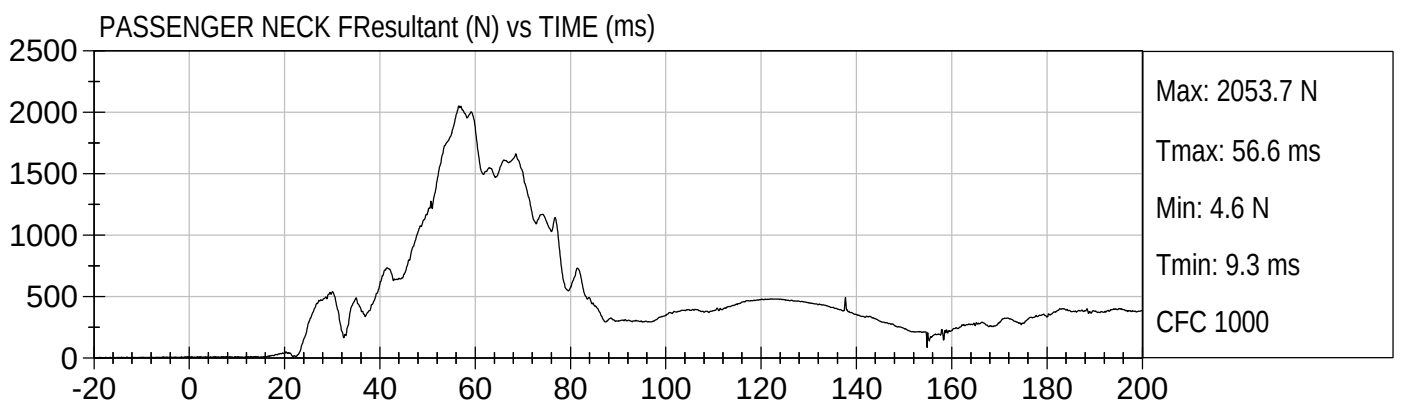
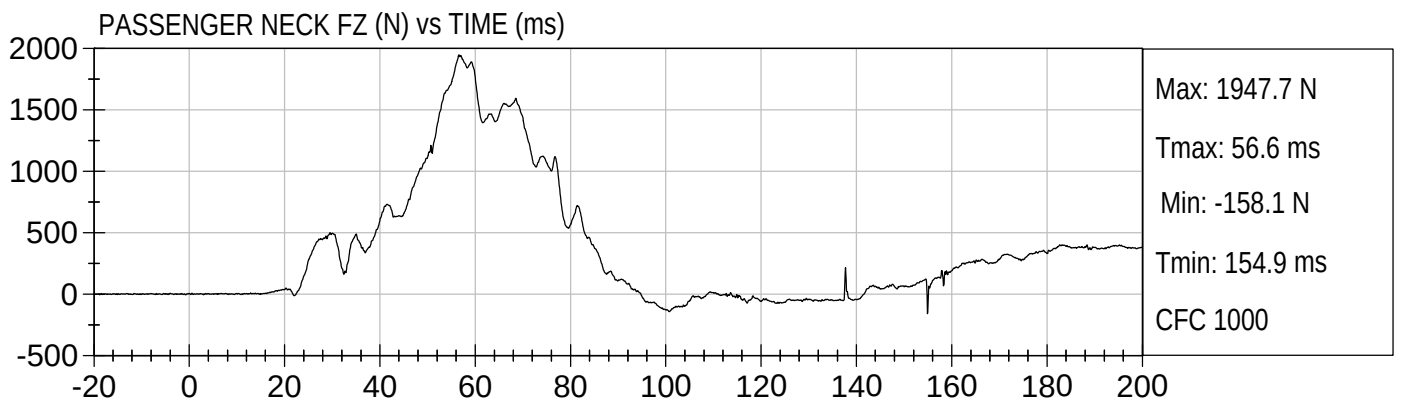
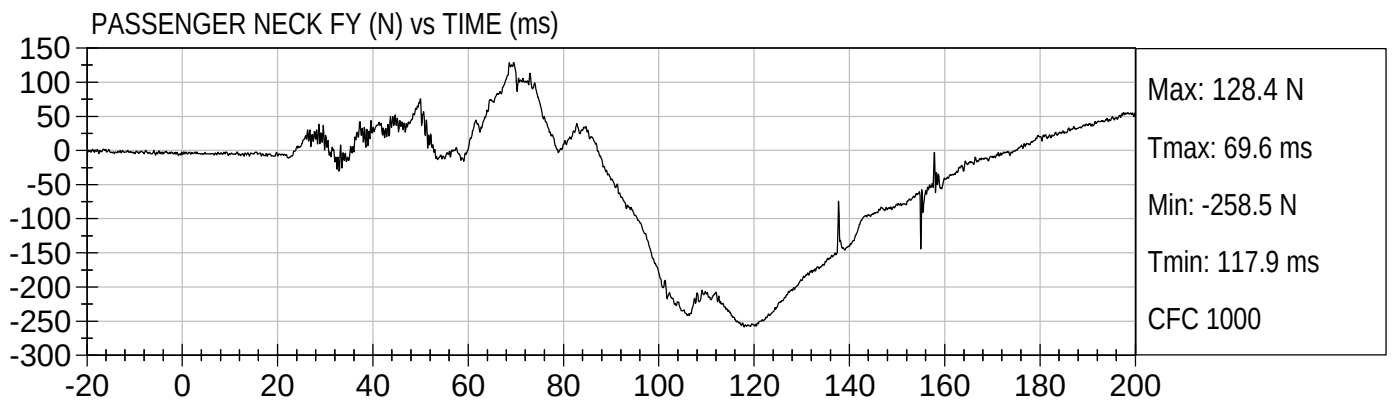
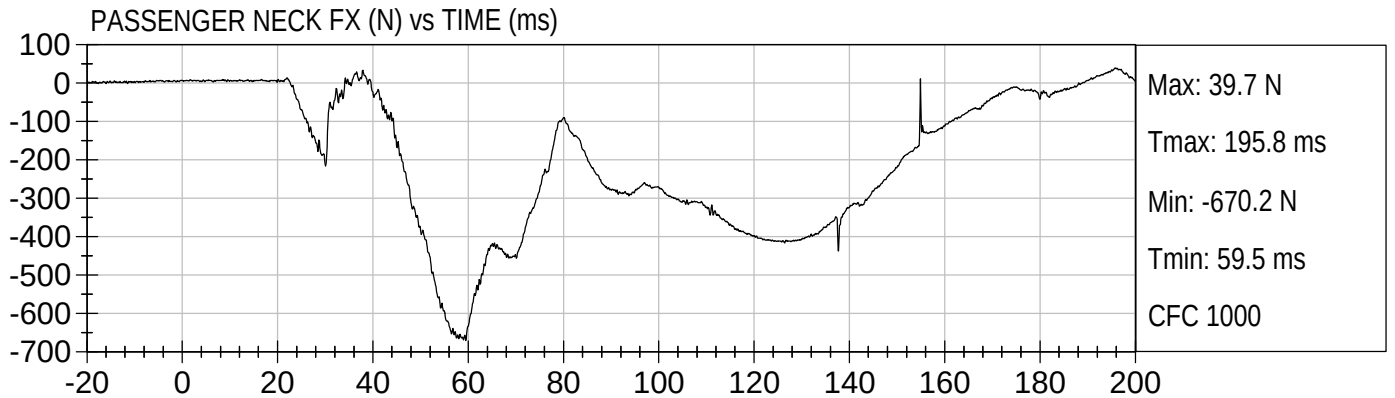
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)





35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

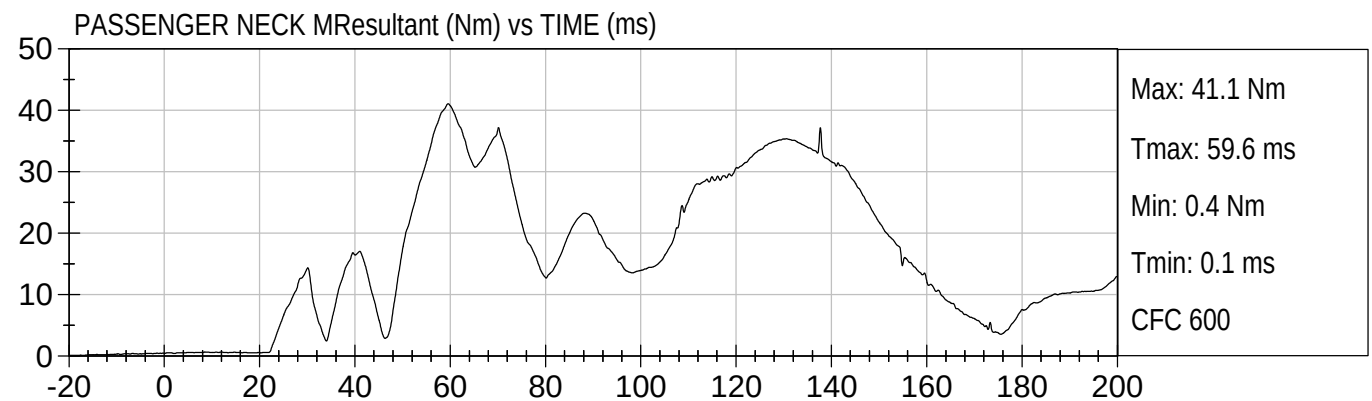
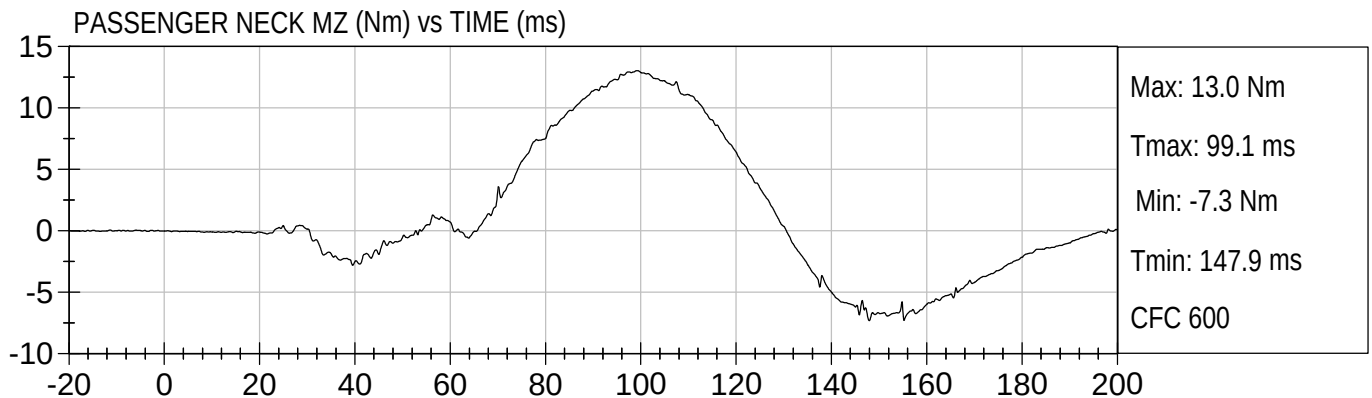
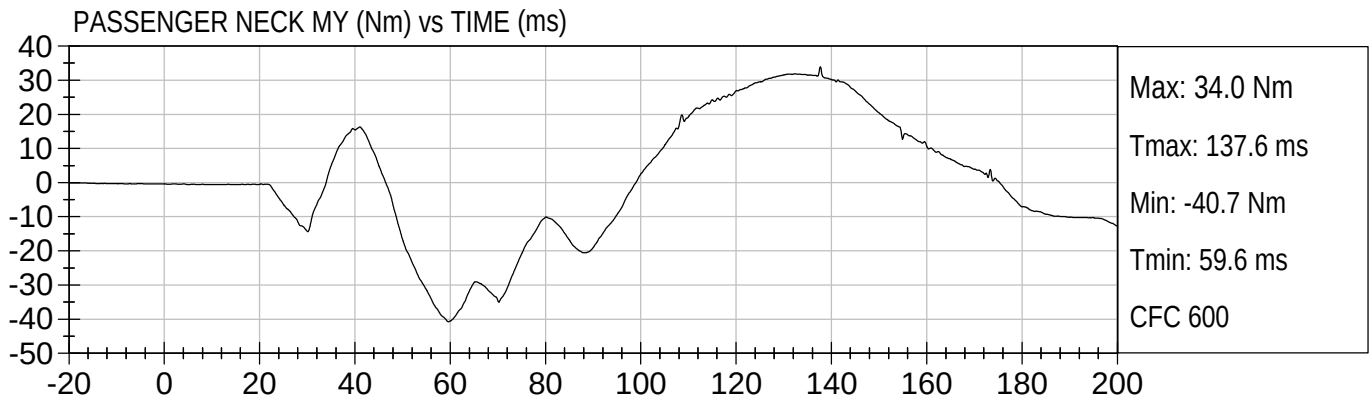
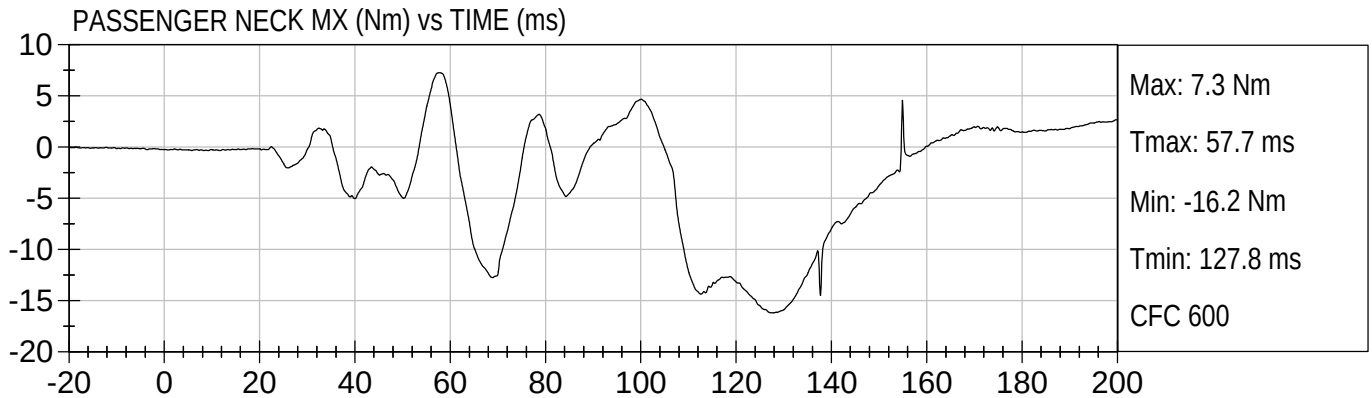
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)





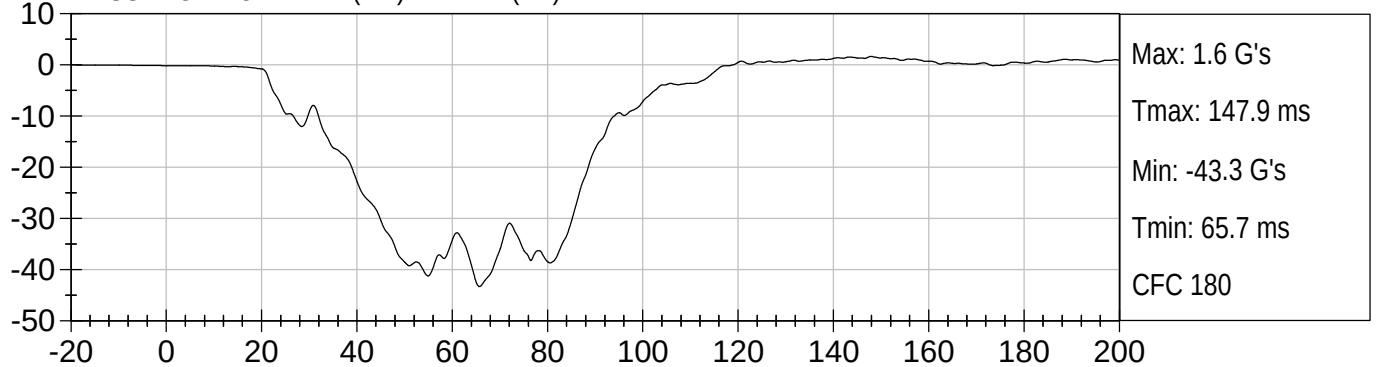
35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)

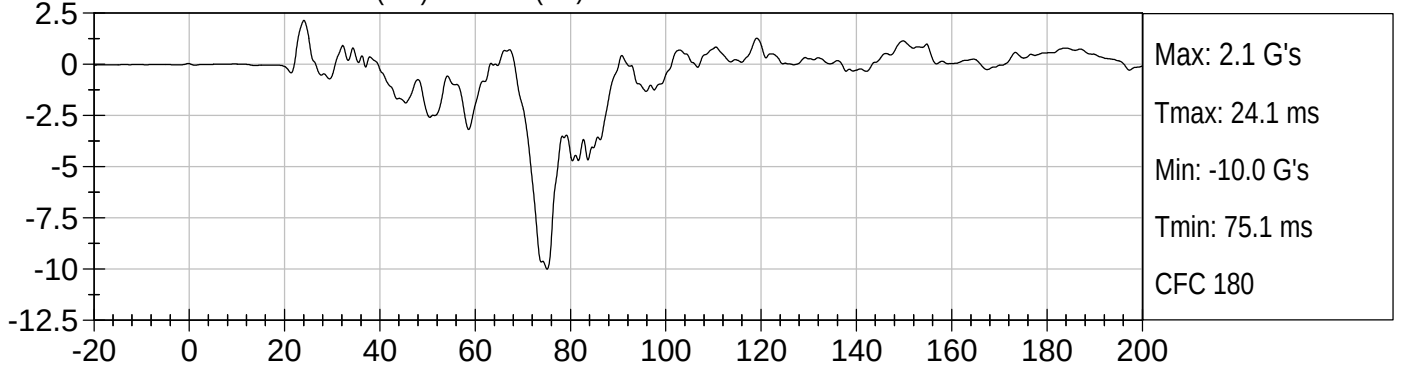




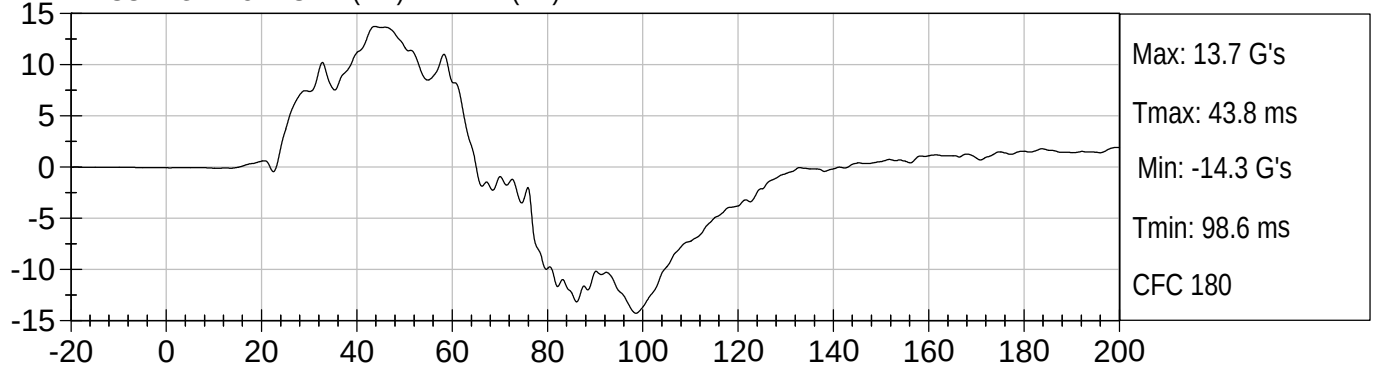
PASSENGER CHEST X (G's) vs TIME (ms)



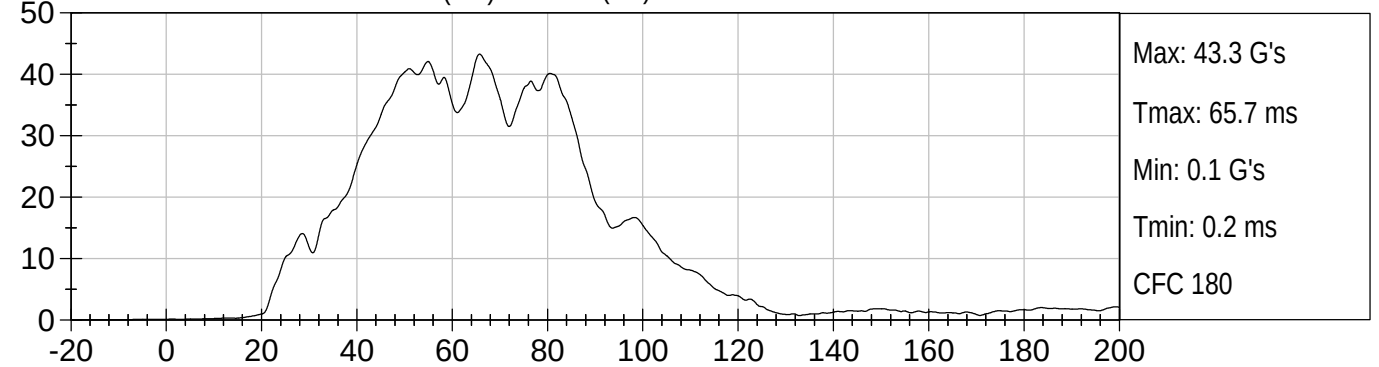
PASSENGER CHEST Y (G's) vs TIME (ms)

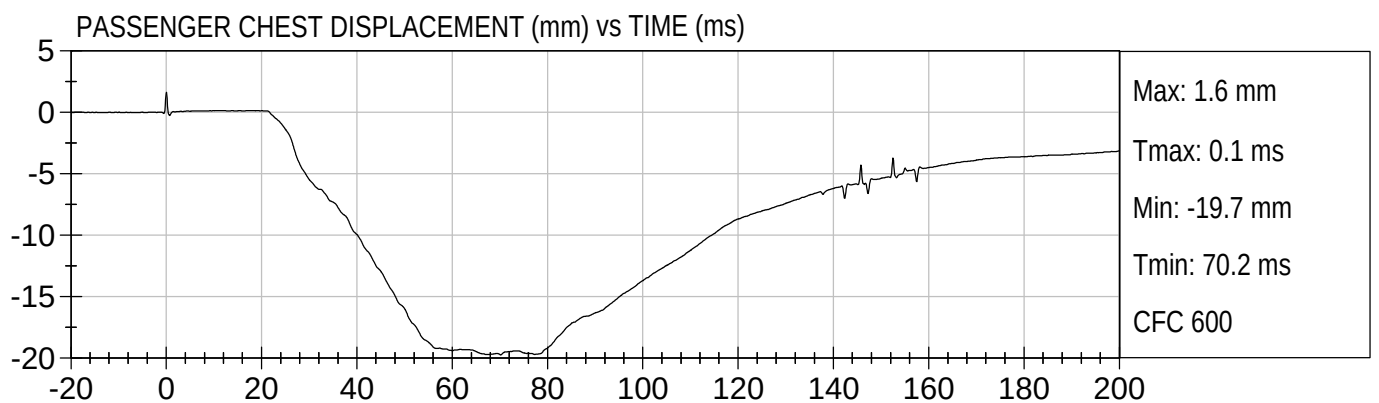
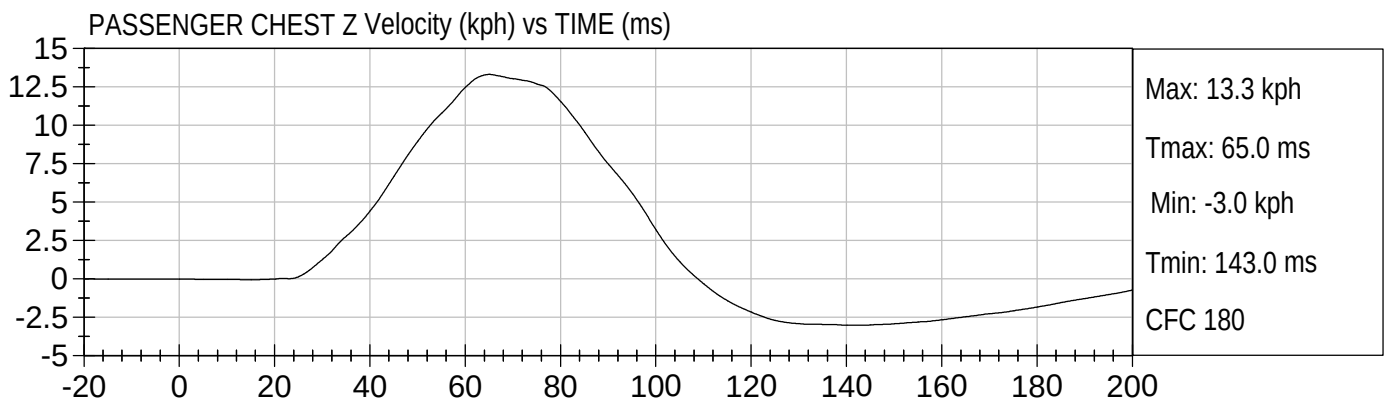
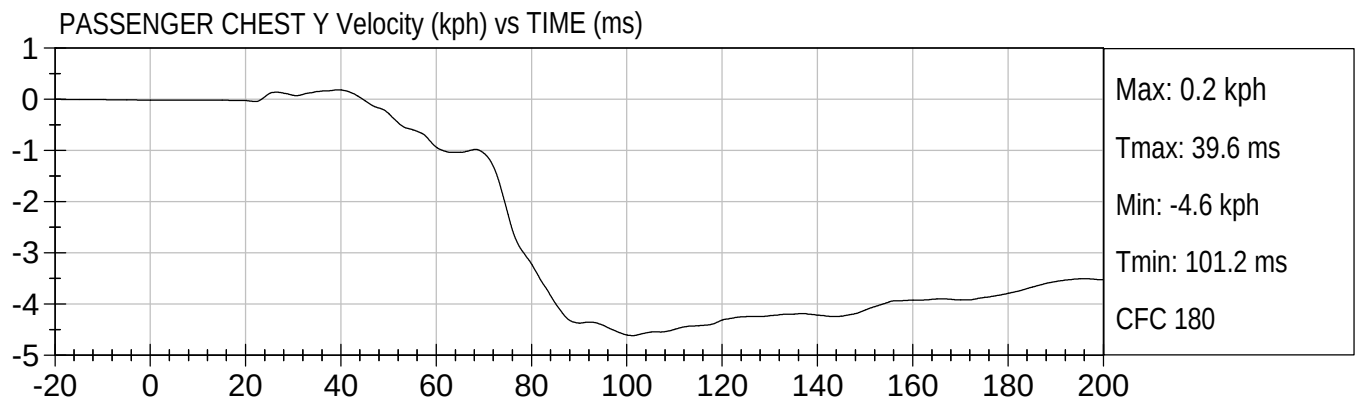
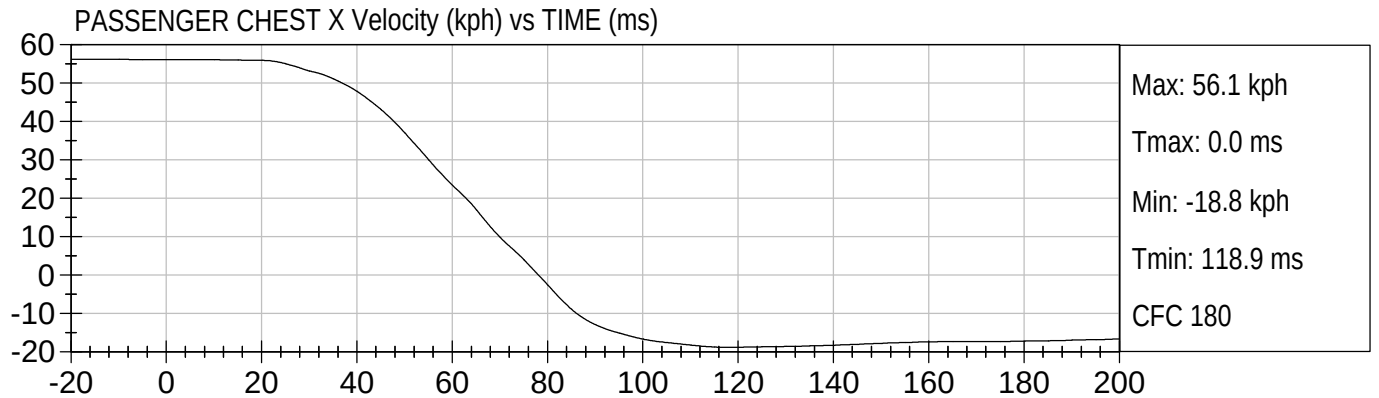


PASSENGER CHEST Z (G's) vs TIME (ms)



PASSENGER CHEST Resultant (G's) vs TIME (ms)

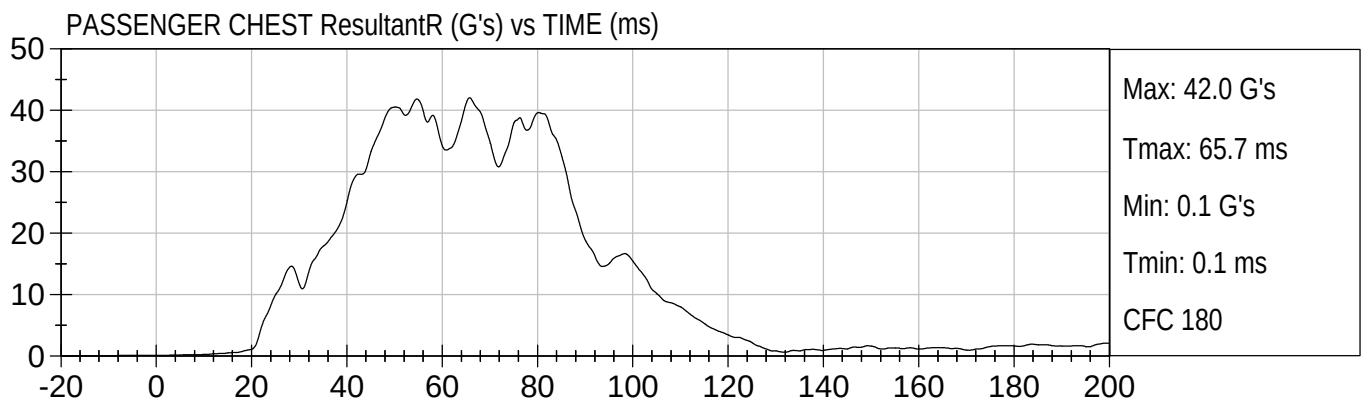
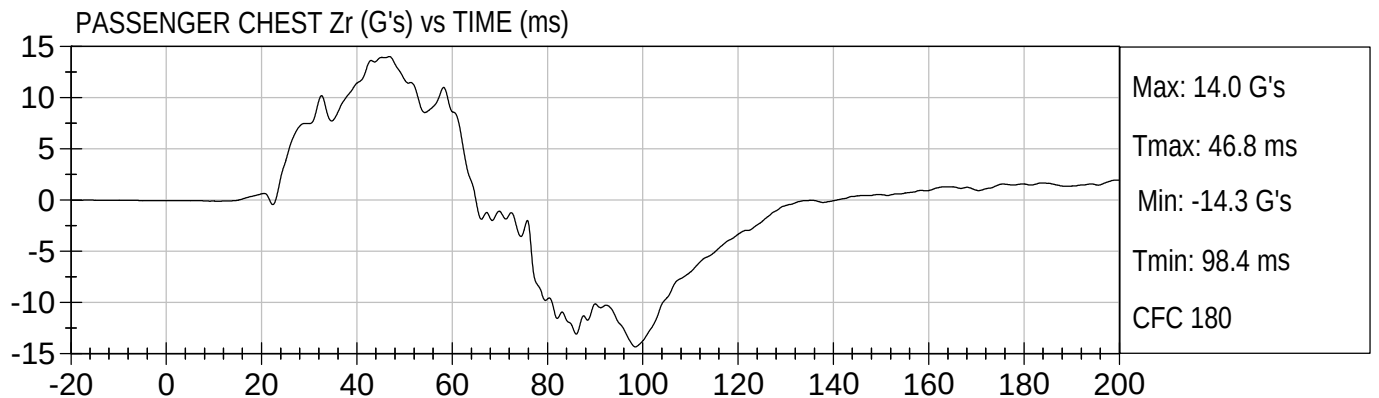
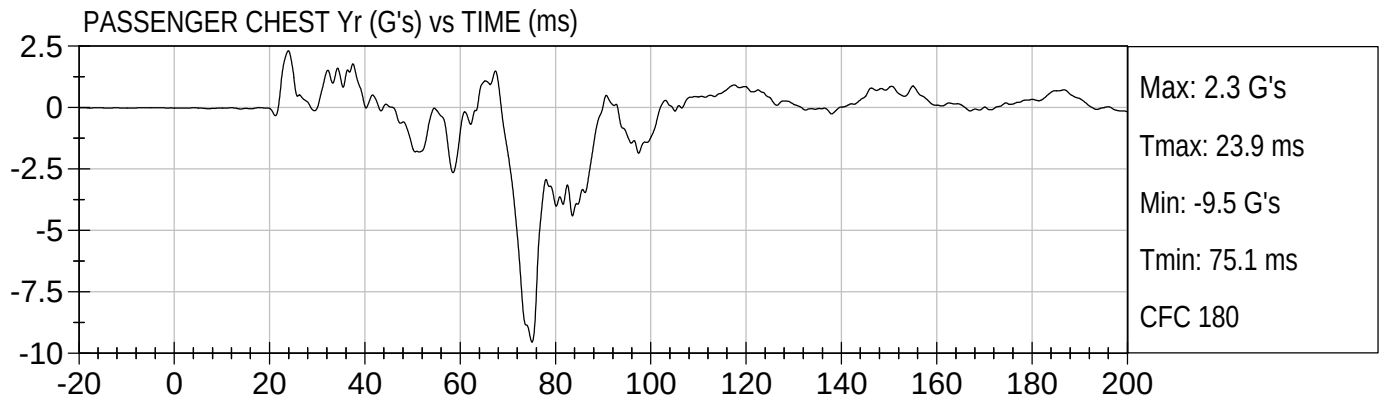
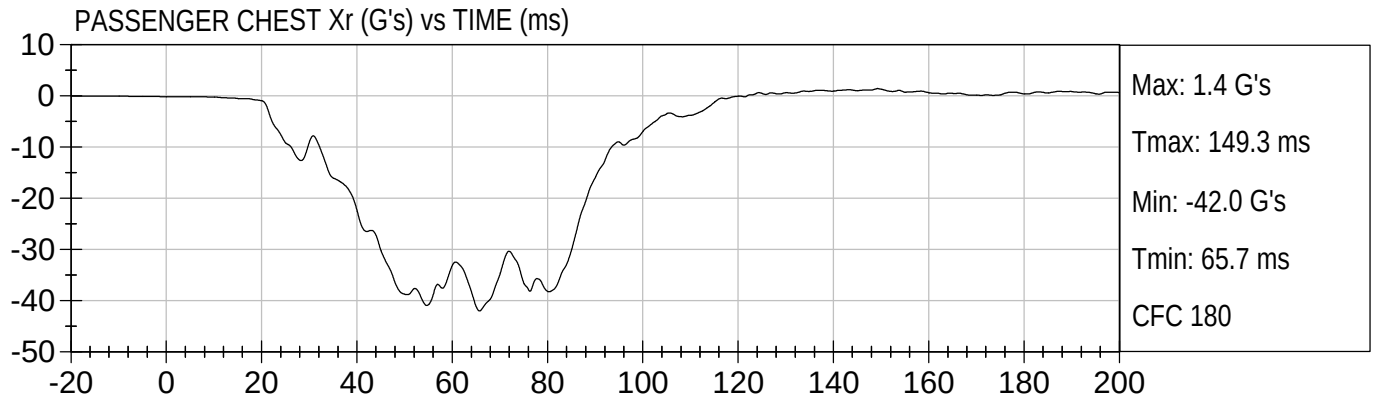






35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

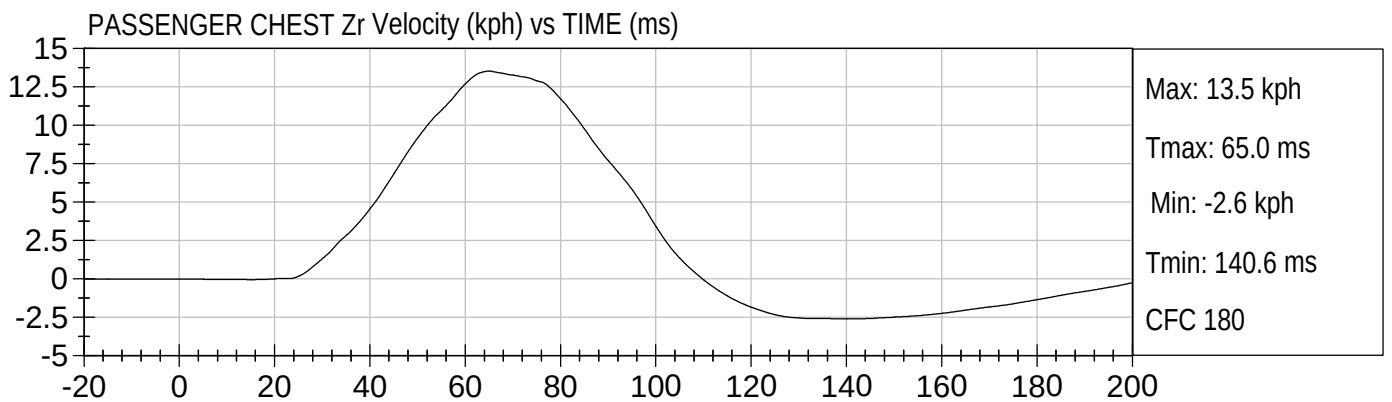
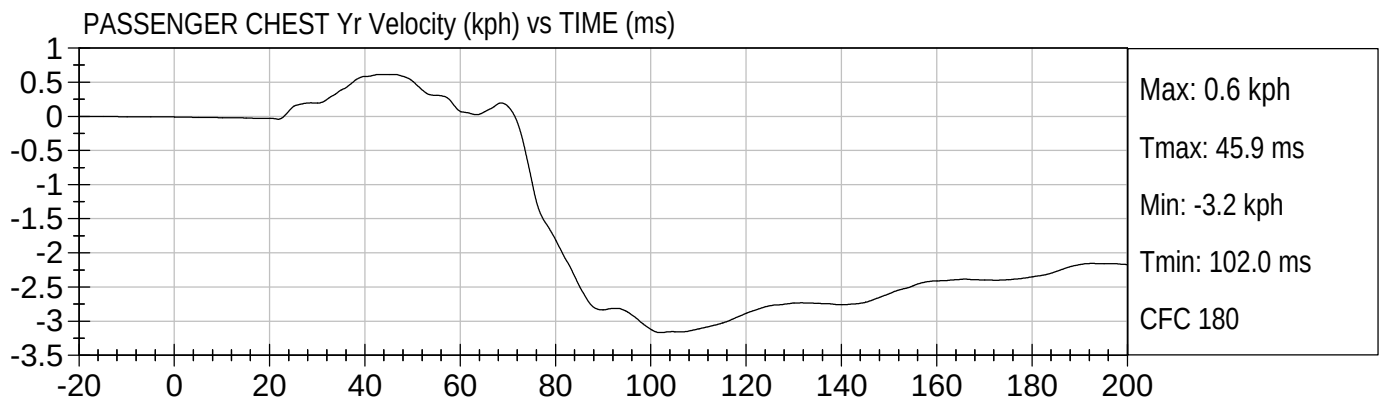
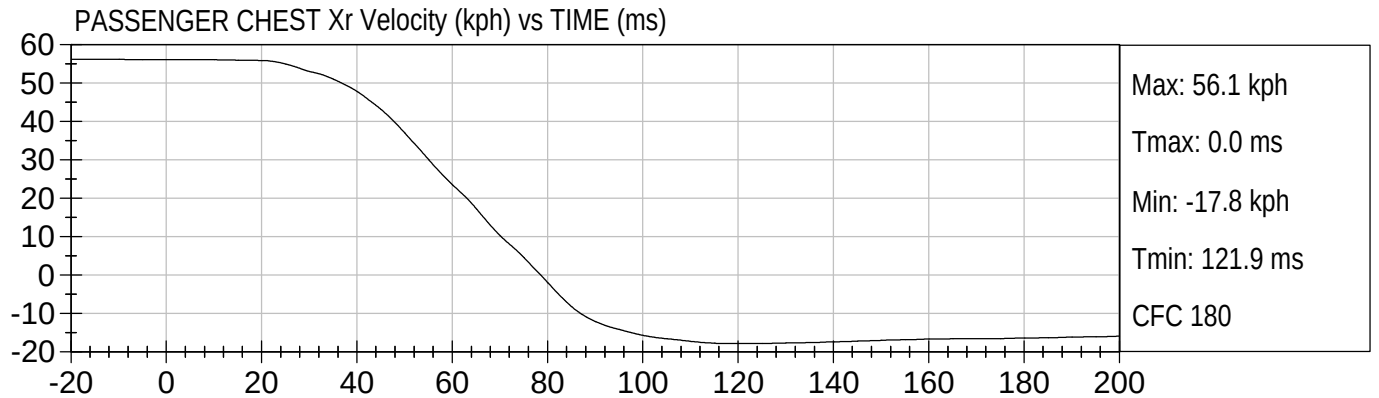
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)





35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

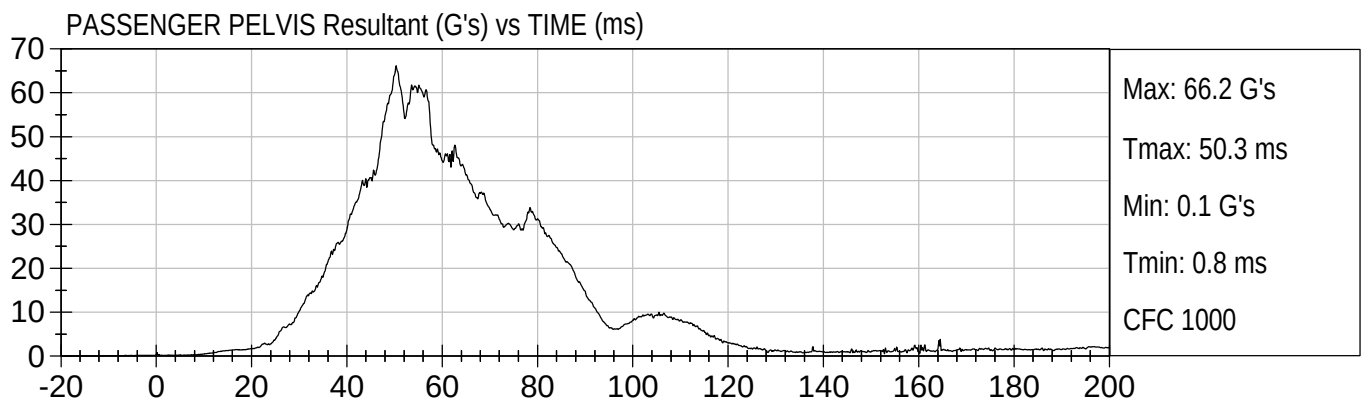
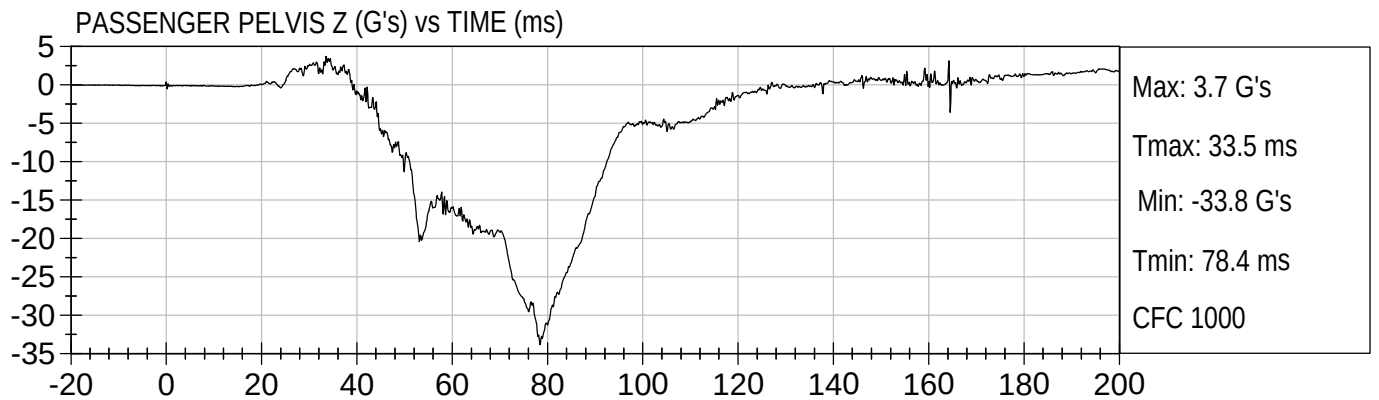
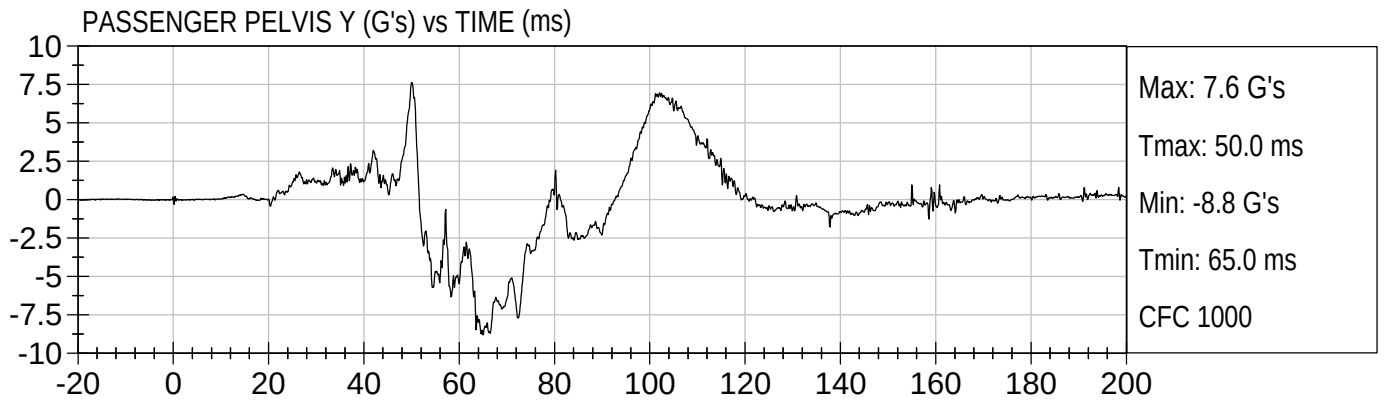
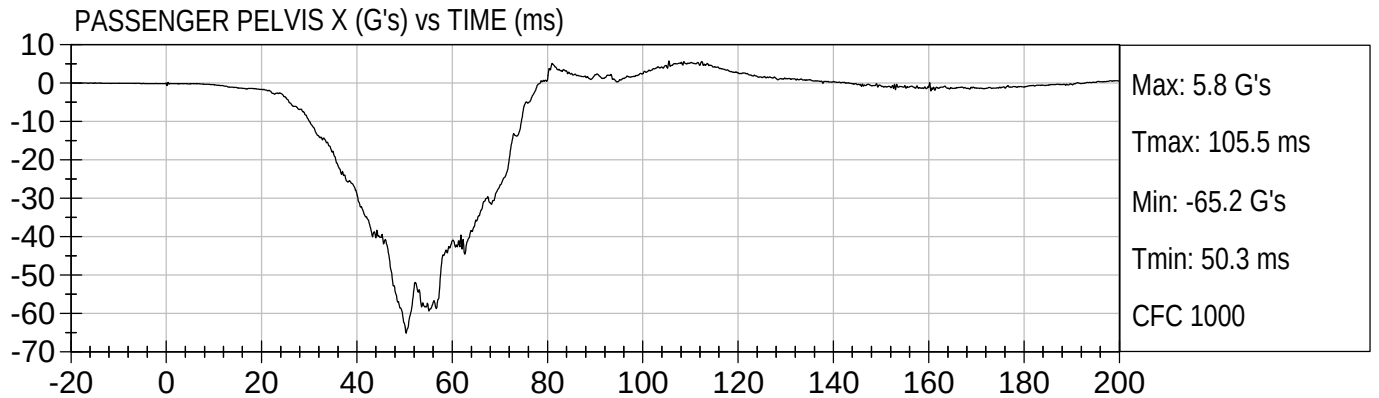
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Speed: 34.9 mph (56.2 km/h)

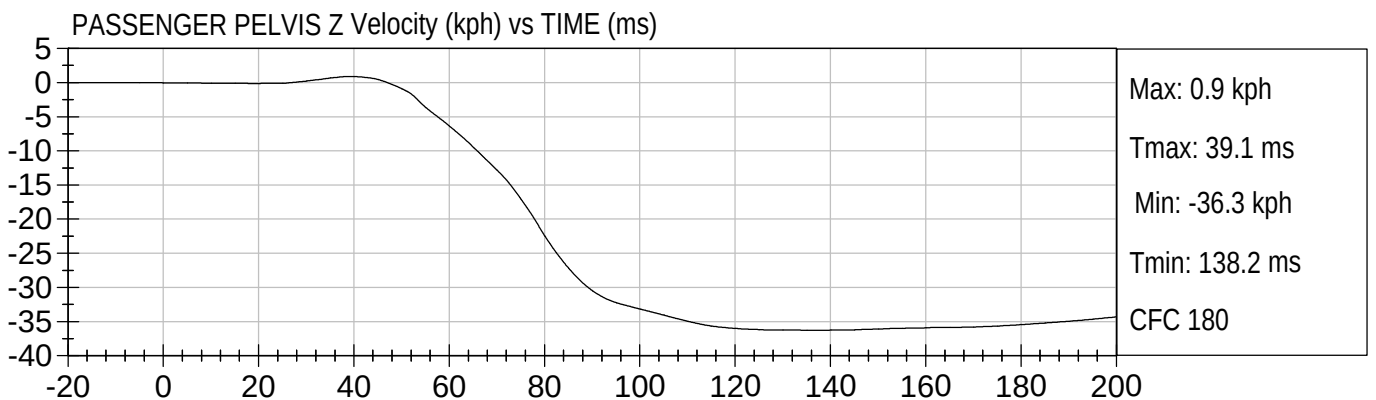
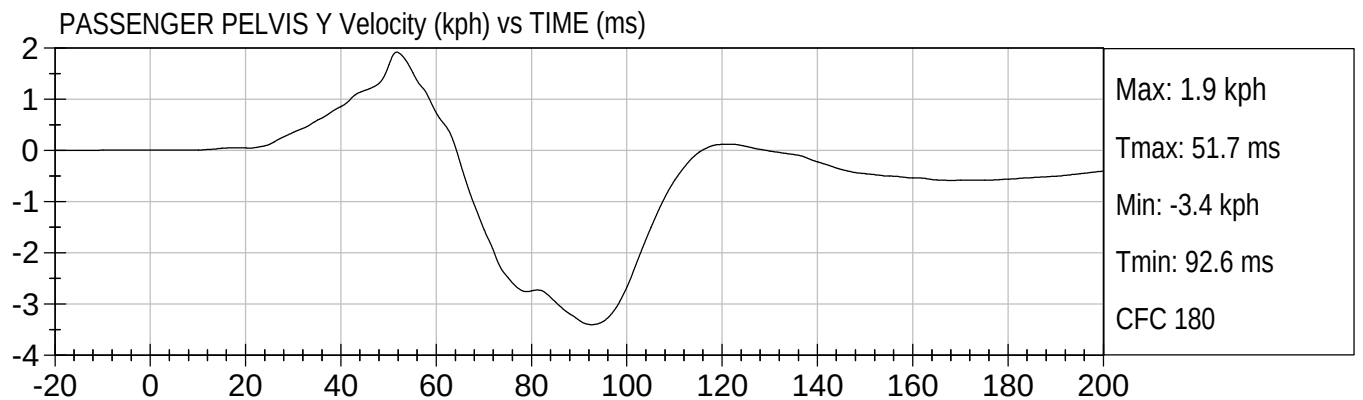
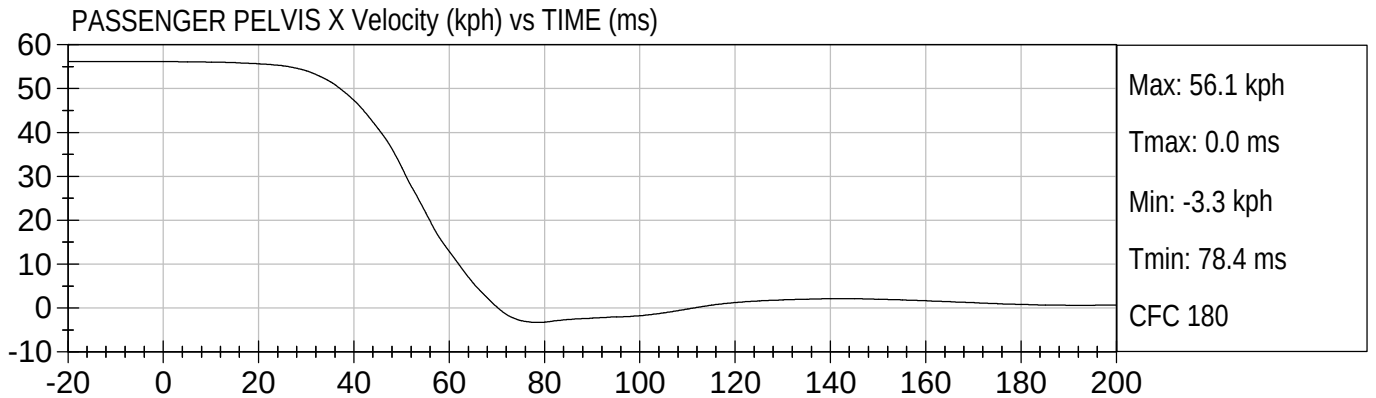




35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)

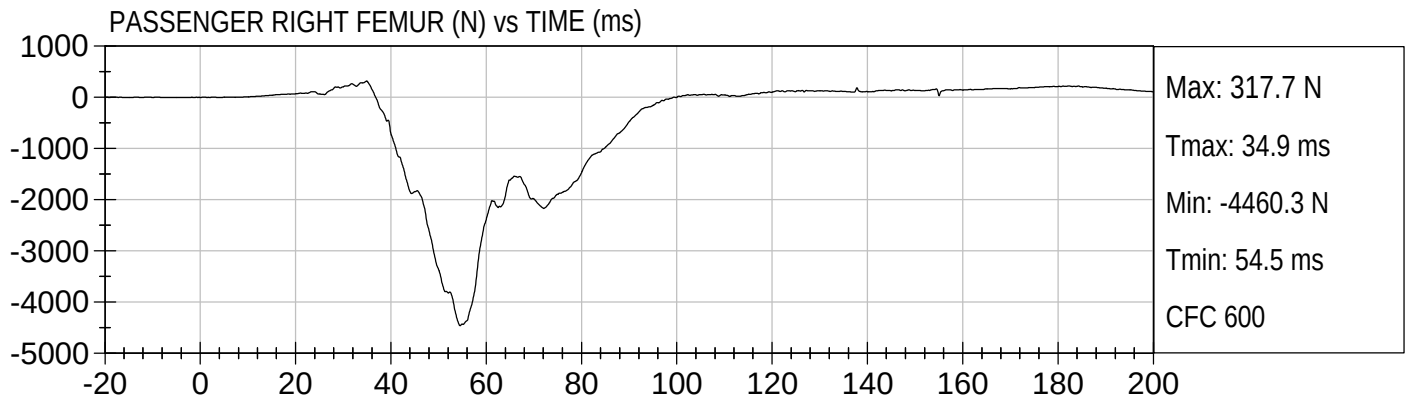
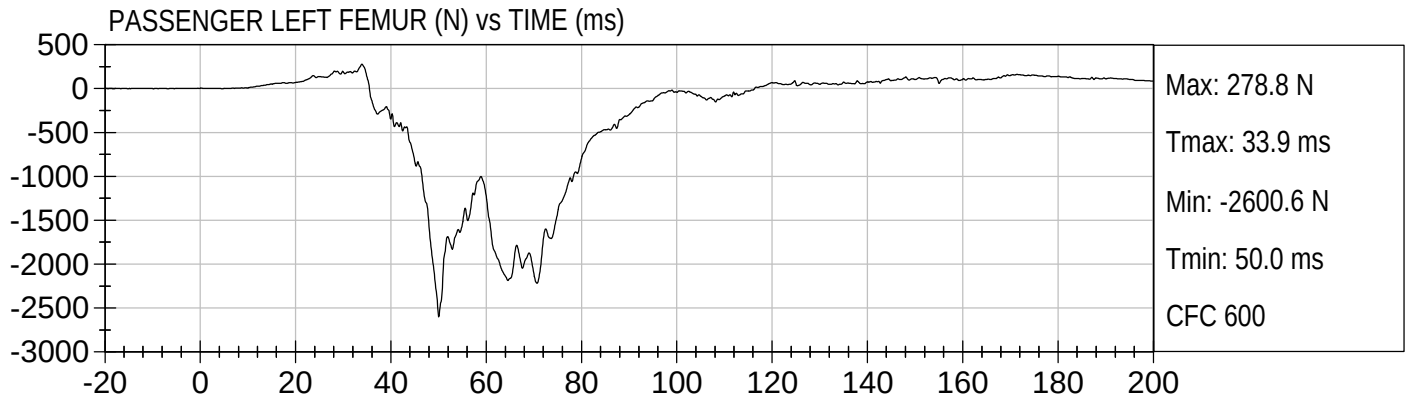






35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)

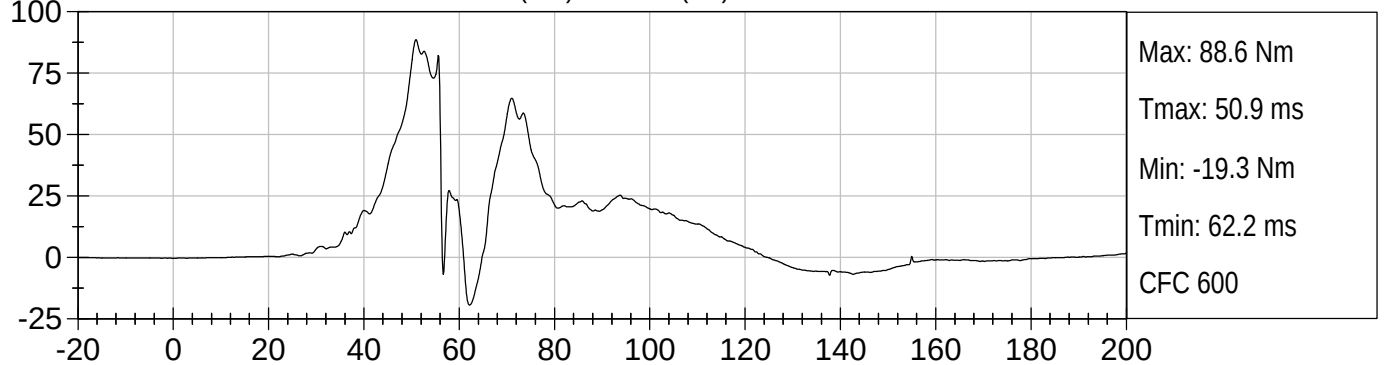




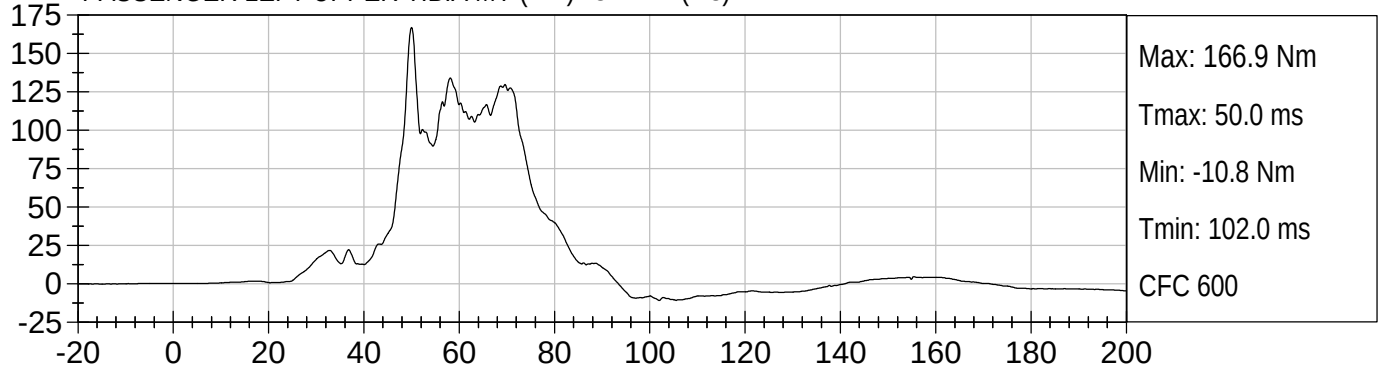
35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)

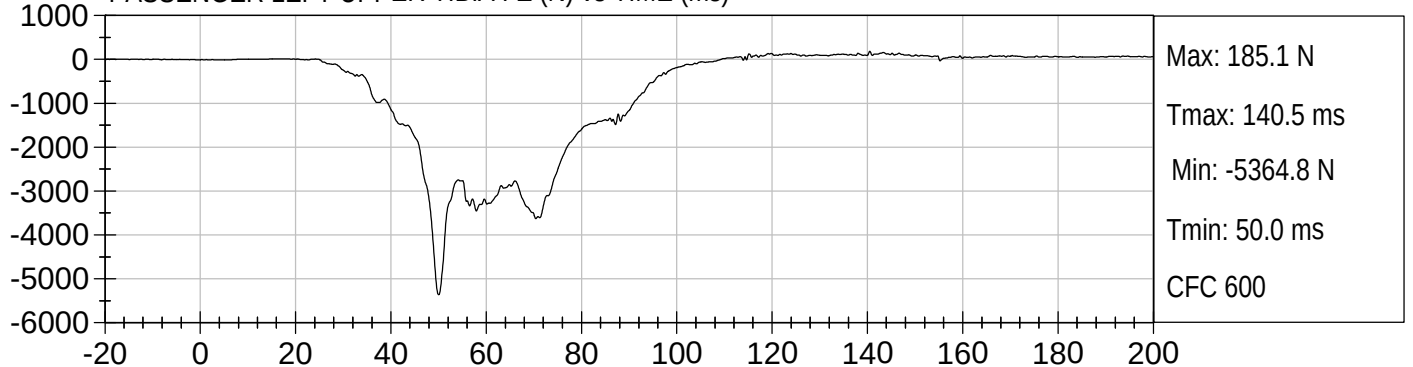
PASSENGER LEFT UPPER TIBIA MX (Nm) vs TIME (ms)



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



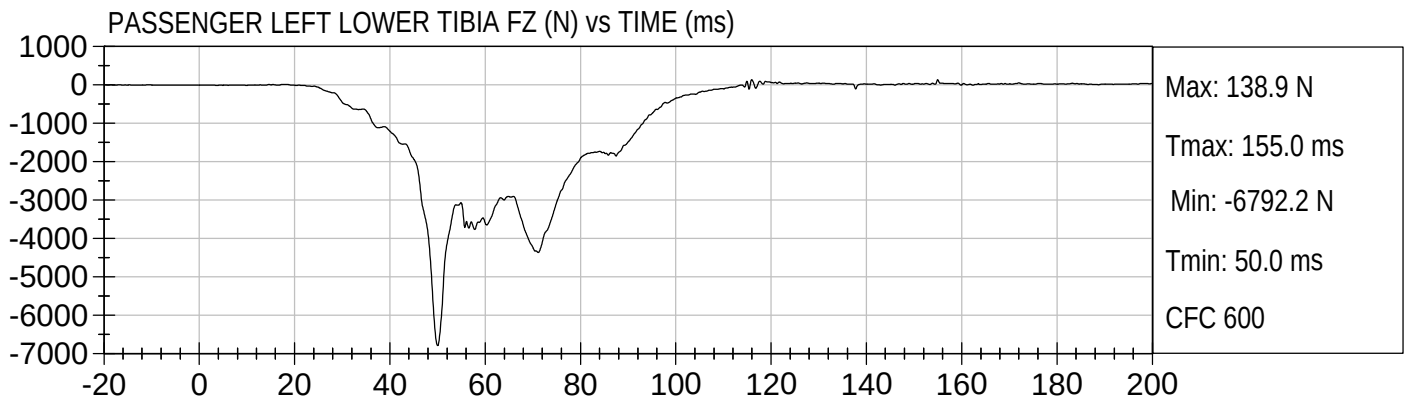
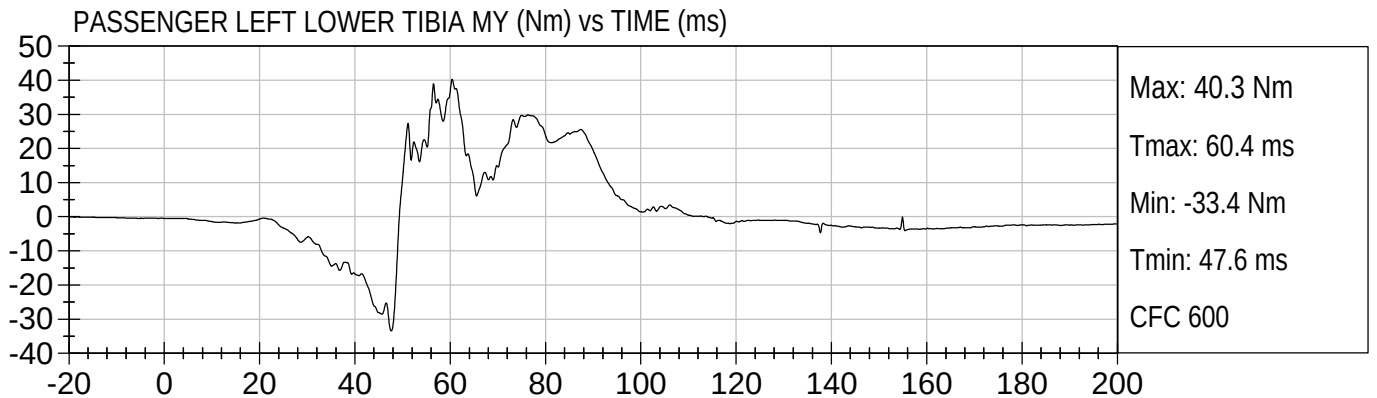
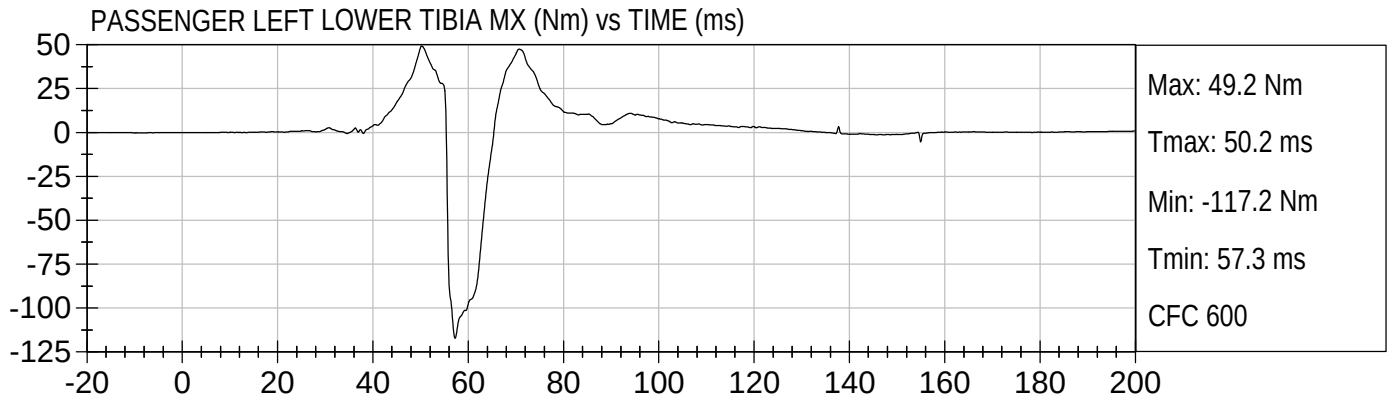
PASSENGER LEFT UPPER TIBIA FZ (N) vs TIME (ms)





35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)

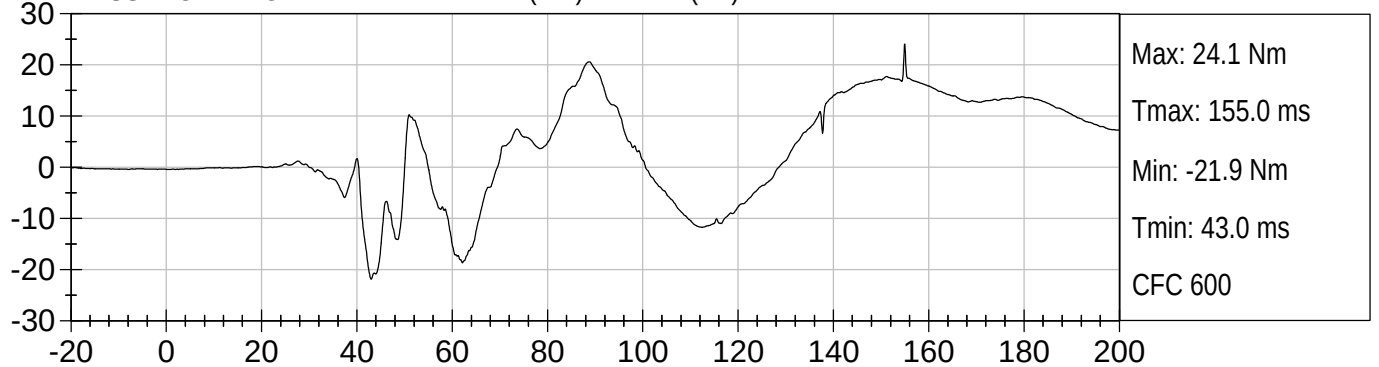




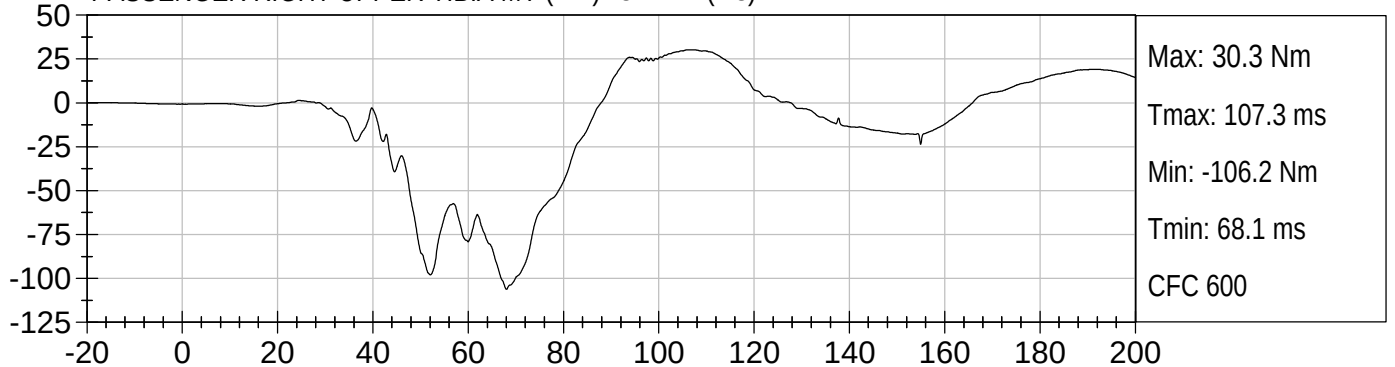
35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)

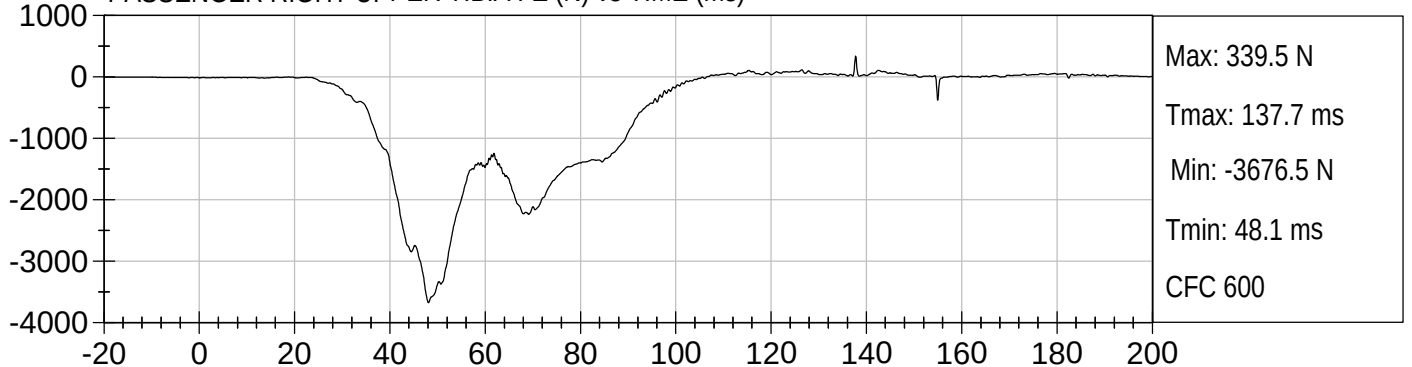
PASSENGER RIGHT UPPER TIBIA MX (Nm) vs TIME (ms)



PASSENGER RIGHT UPPER TIBIA MY (Nm) vs TIME (ms)



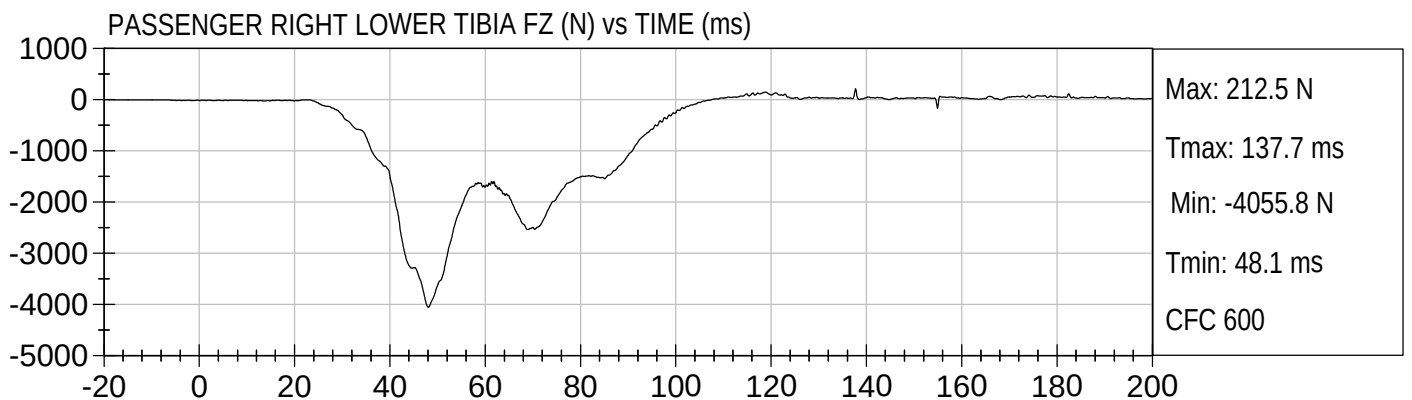
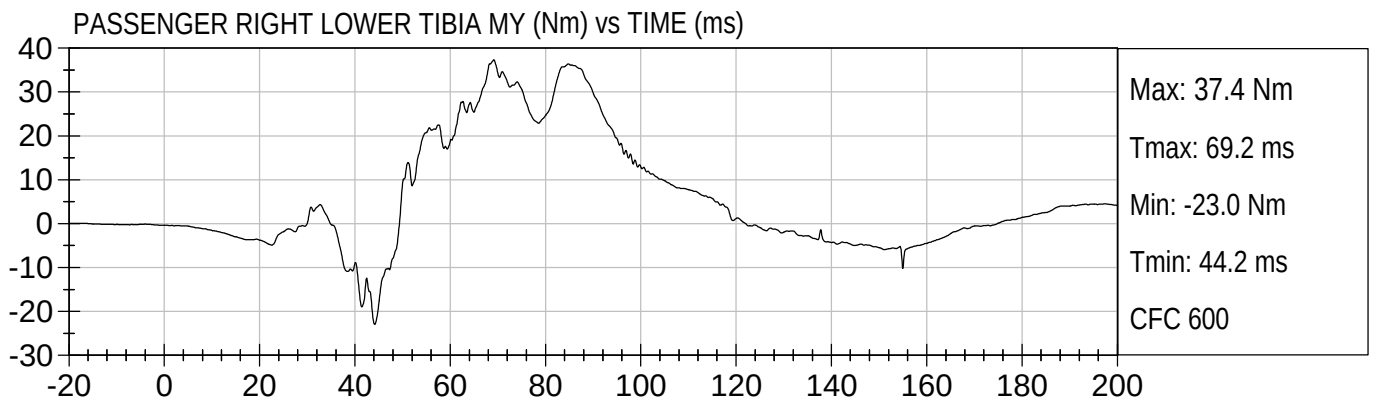
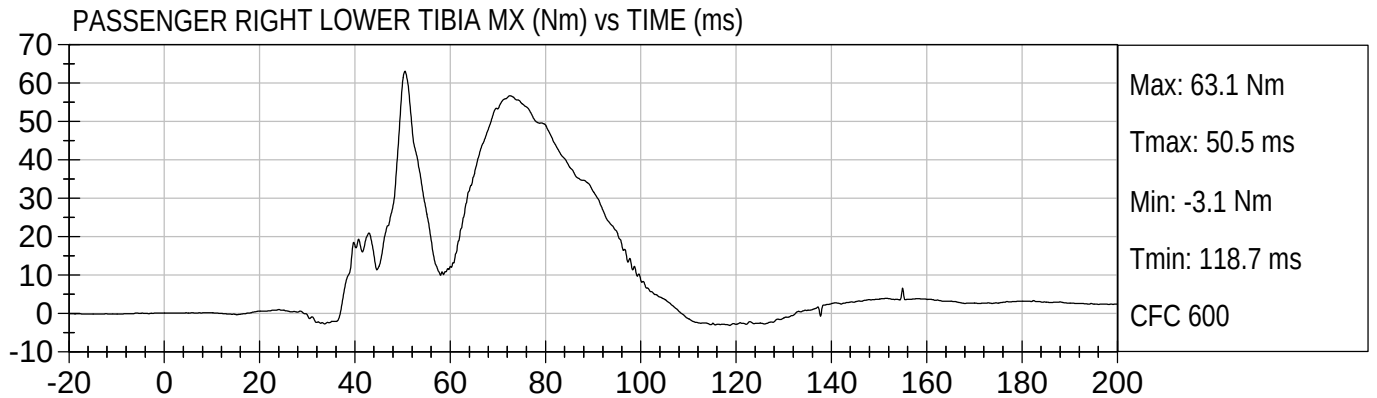
PASSENGER RIGHT UPPER TIBIA FZ (N) vs TIME (ms)





35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

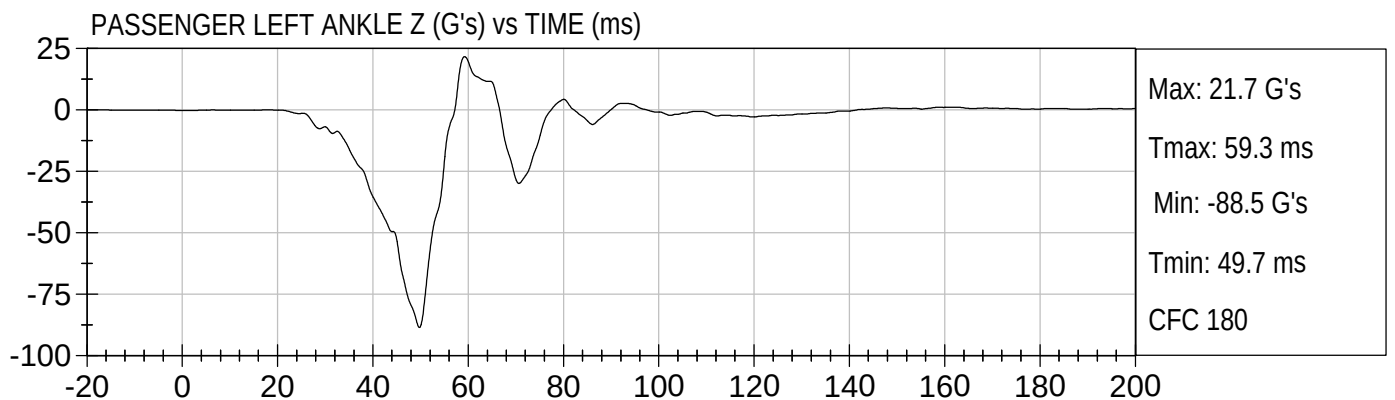
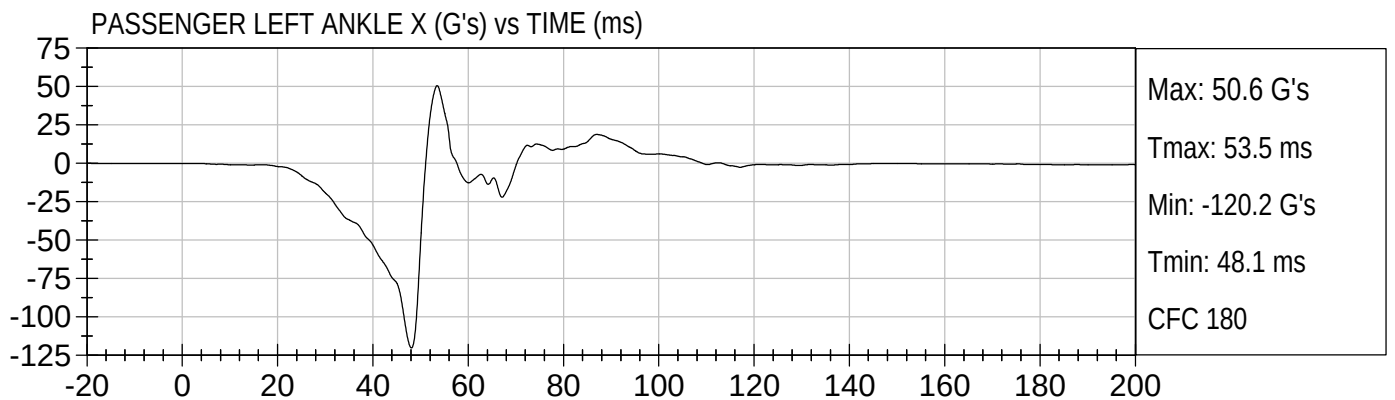
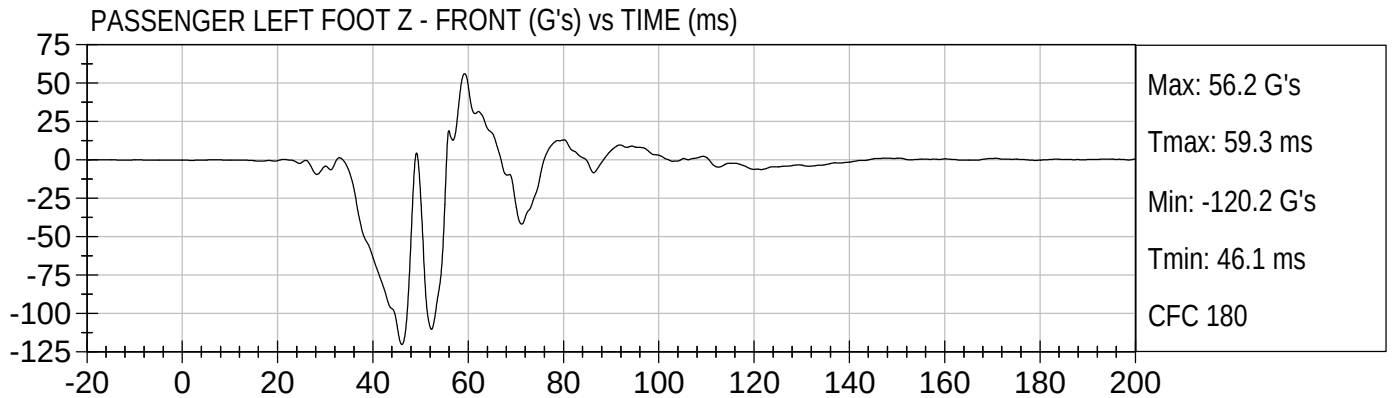
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)





35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

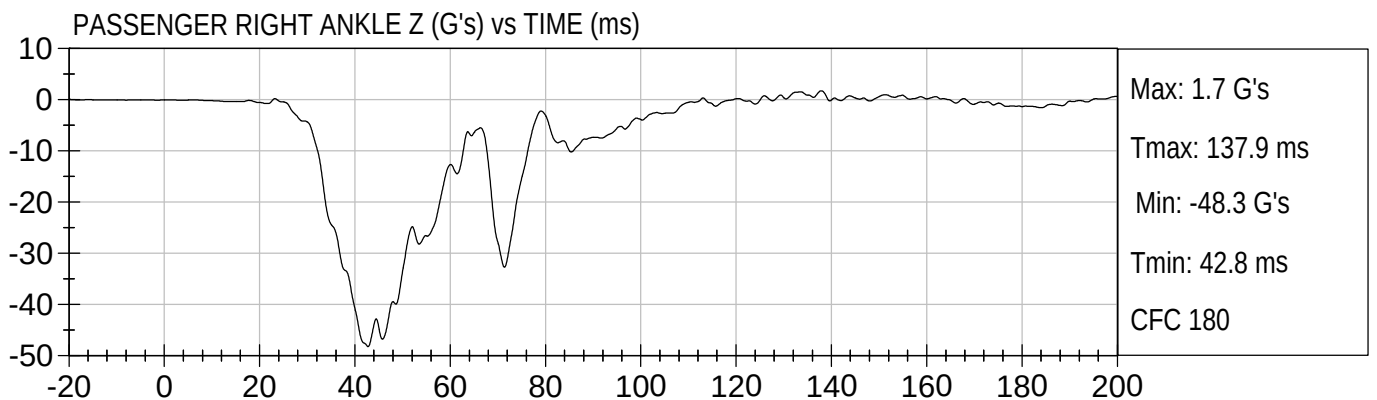
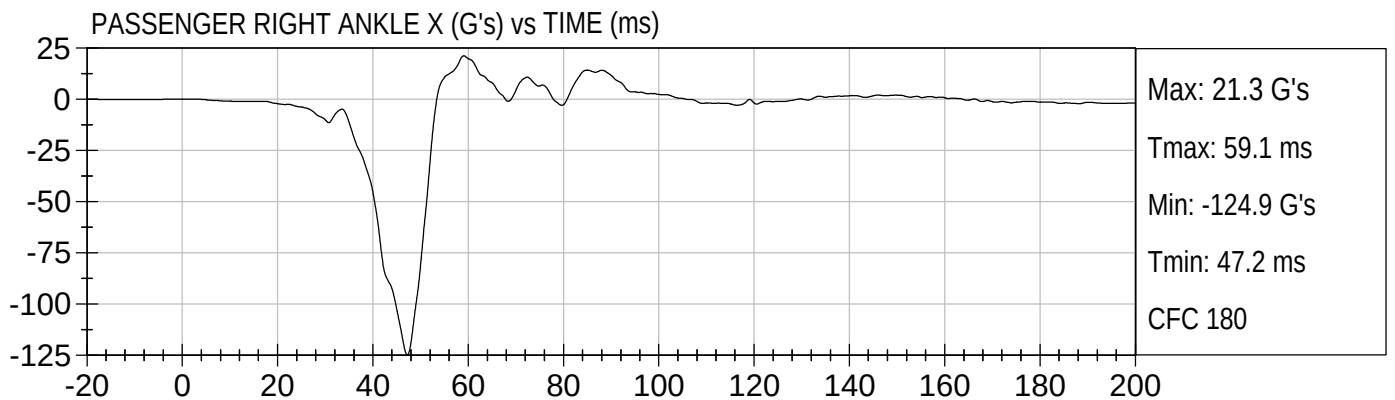
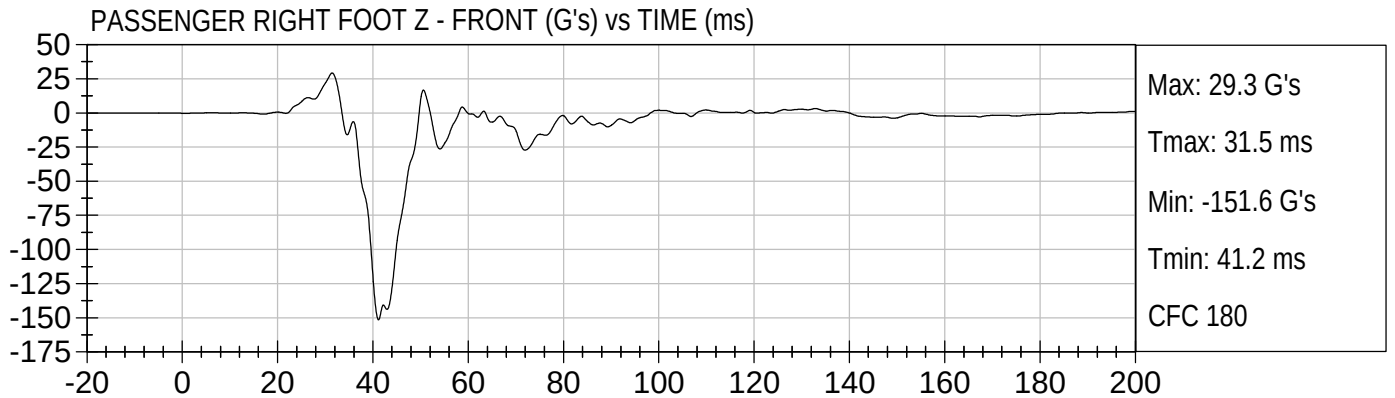
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)





35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

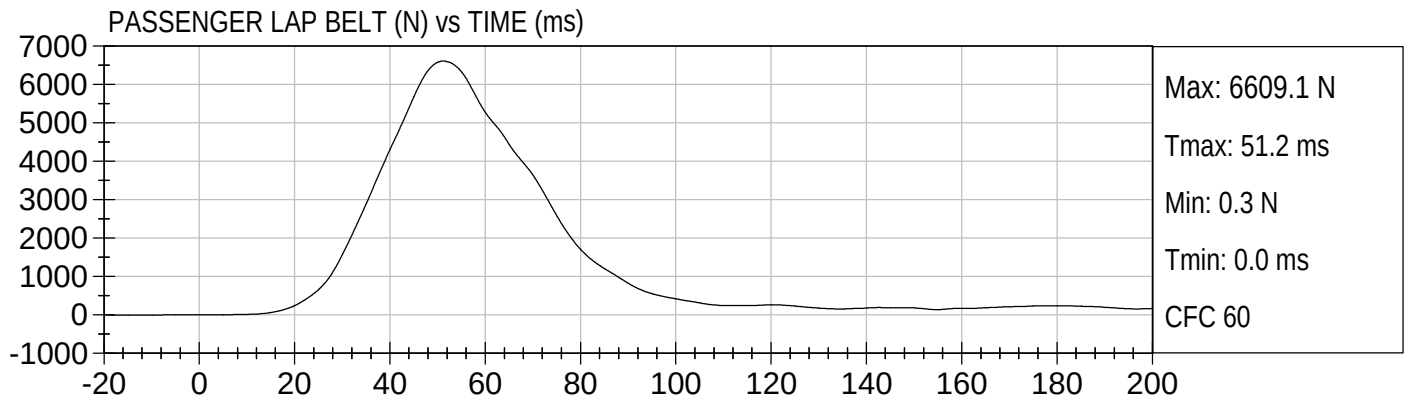
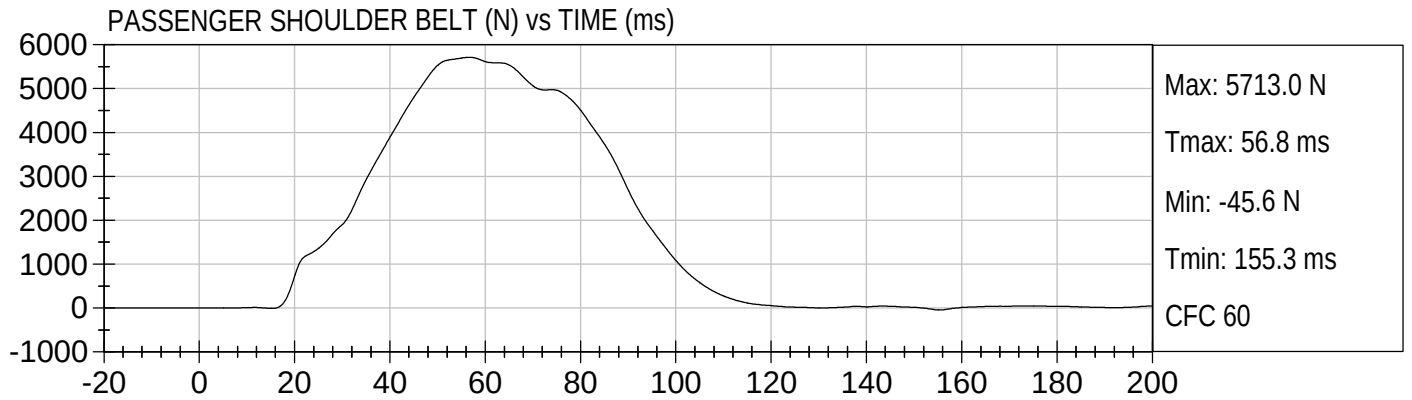
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)





35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

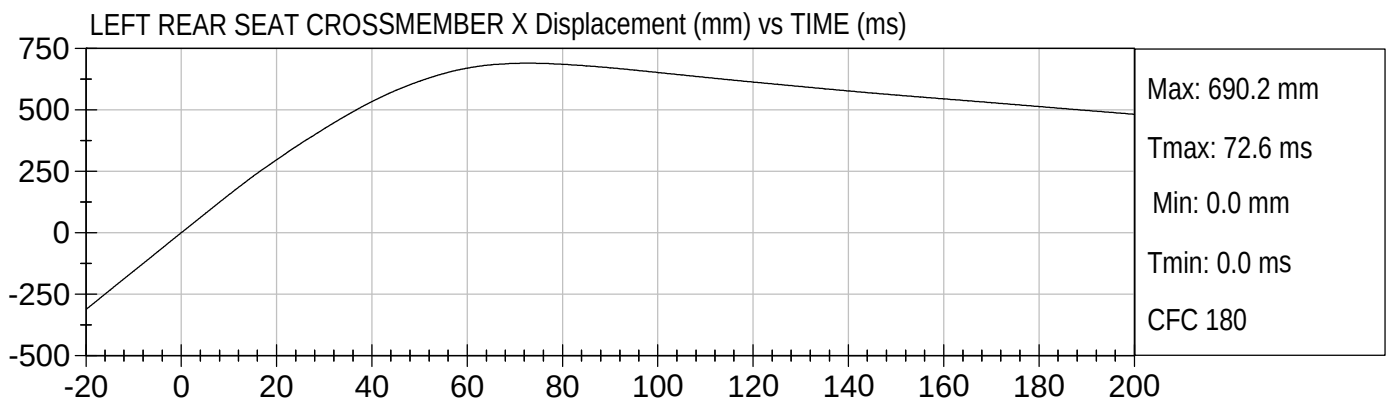
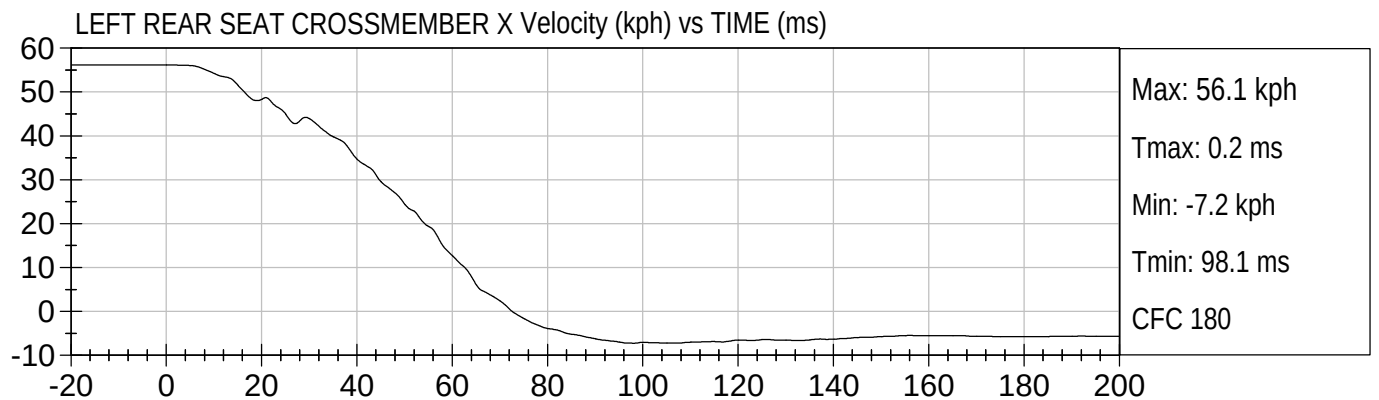
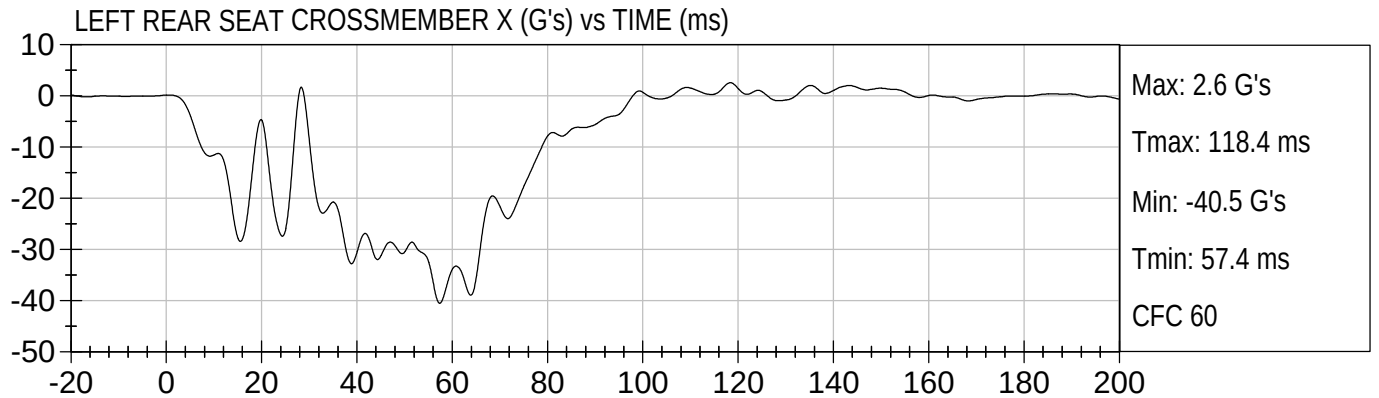
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)

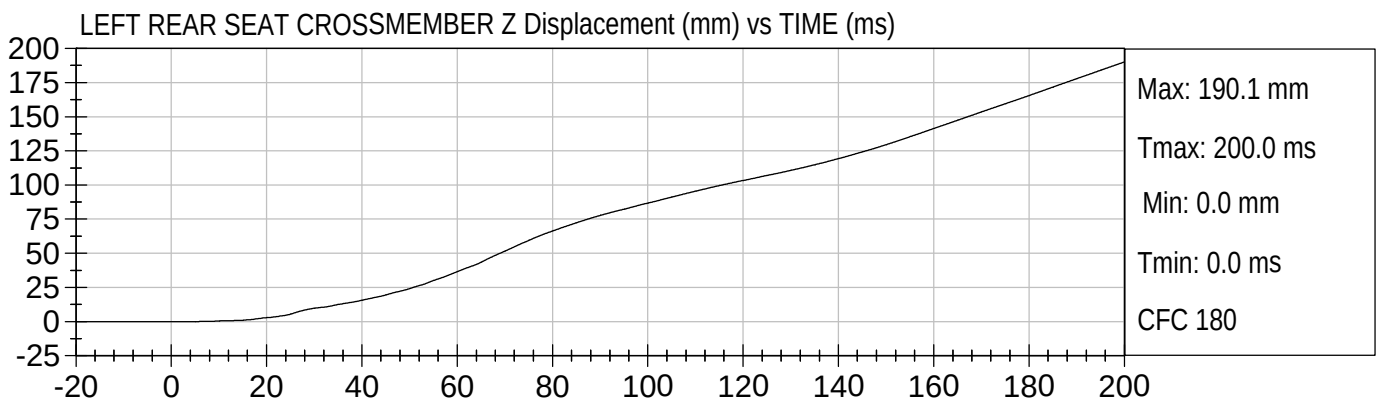
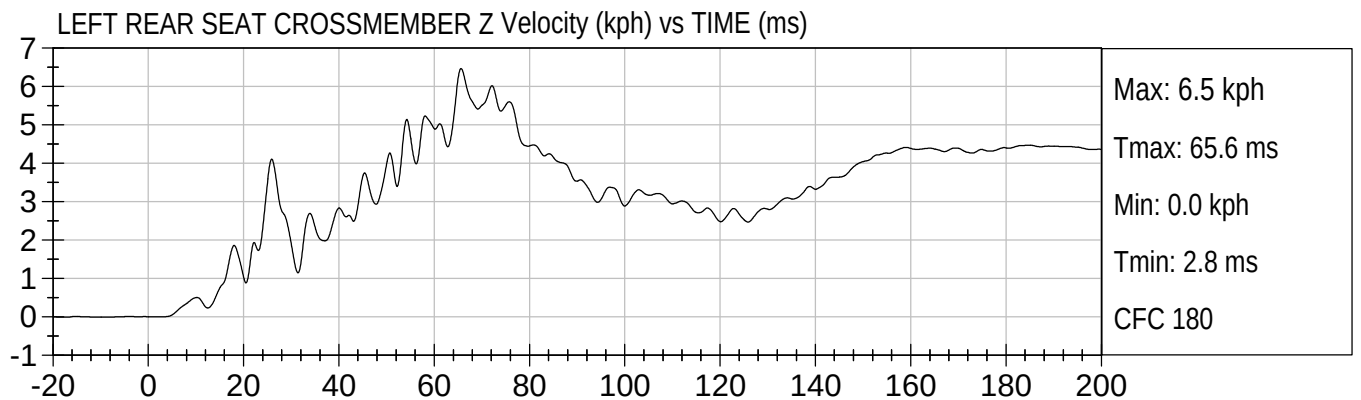
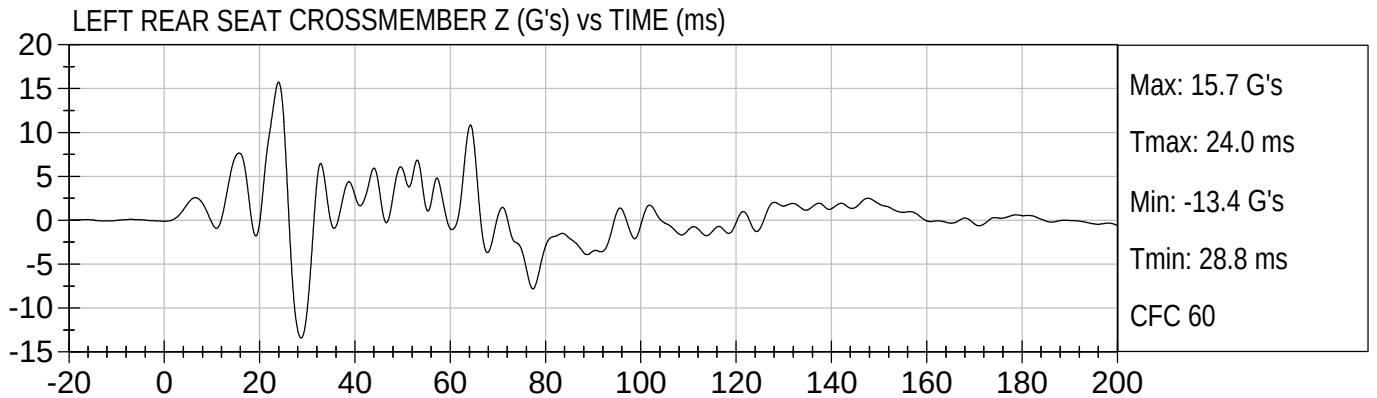


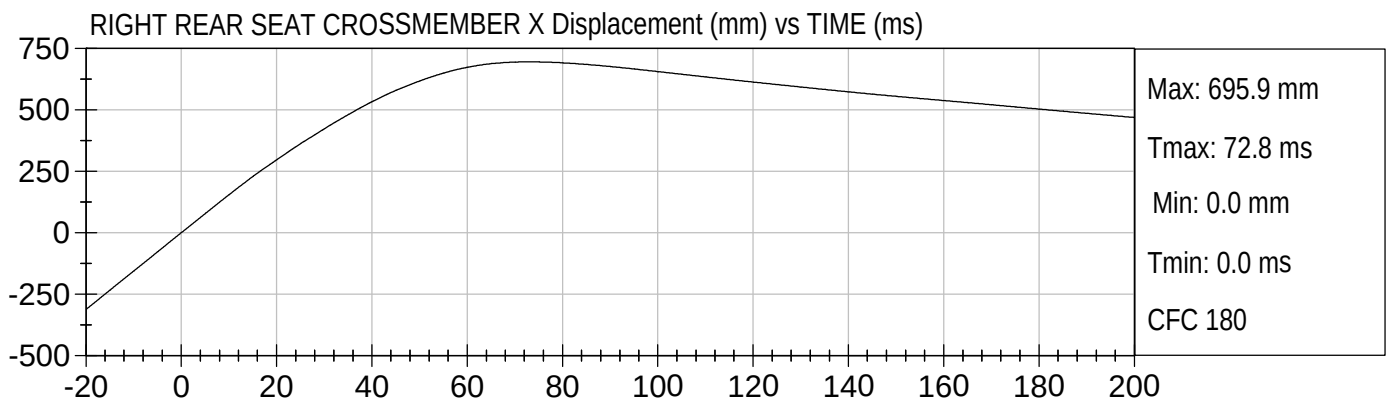
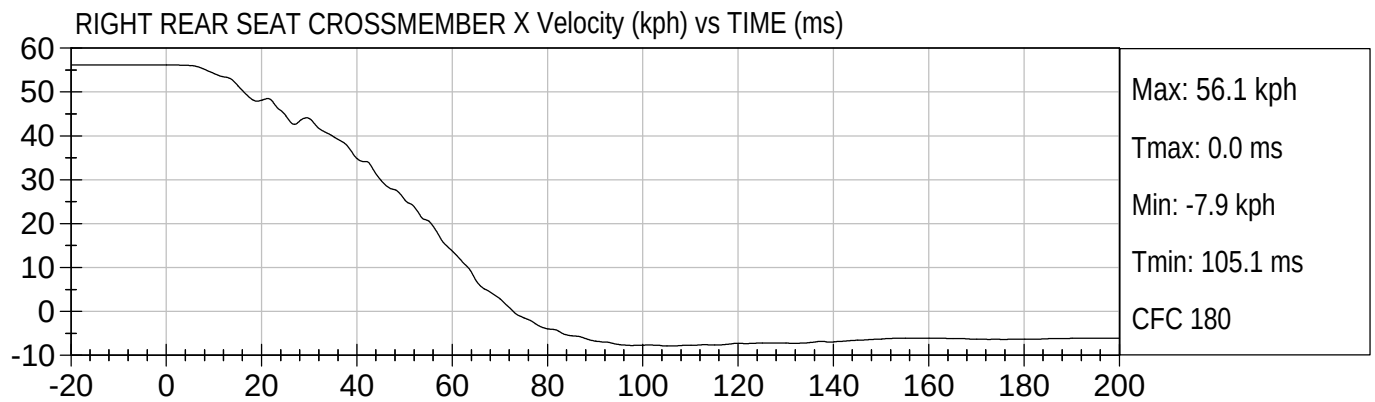
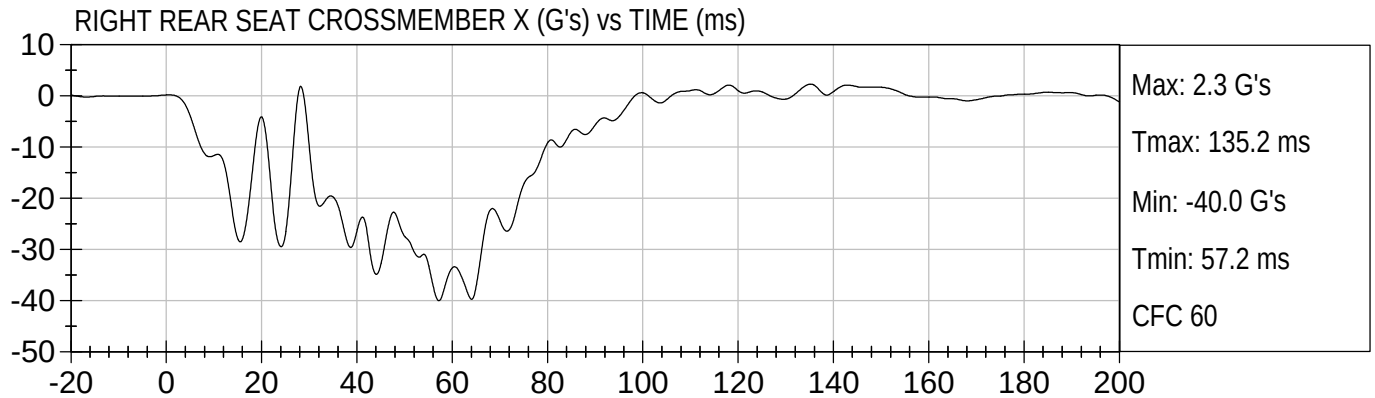


35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

Test Date: March 26, 2002
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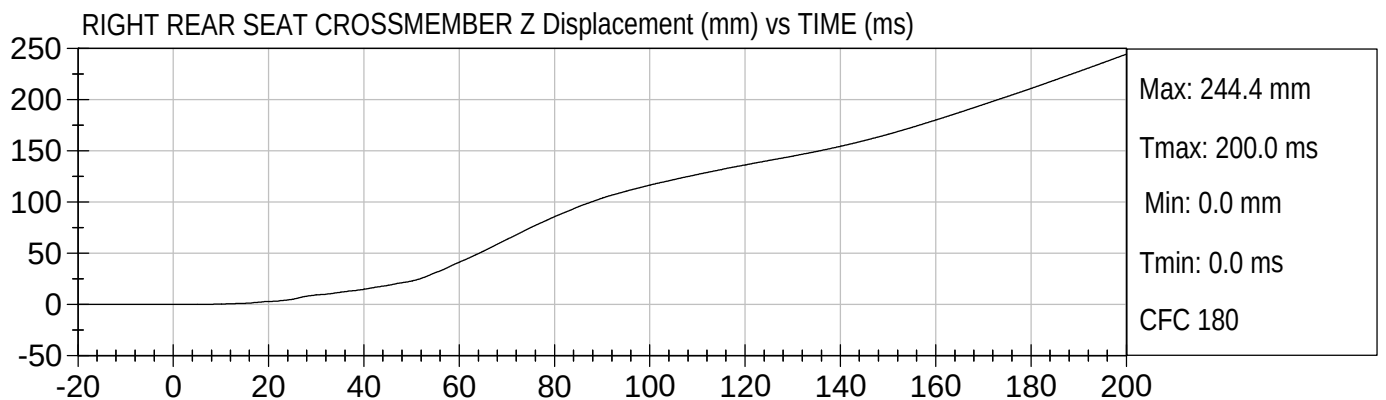
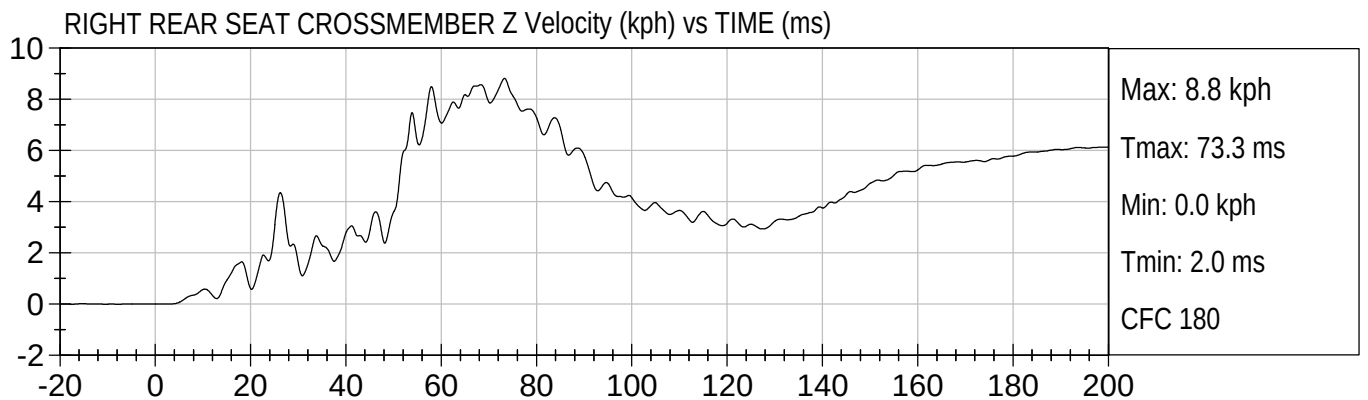
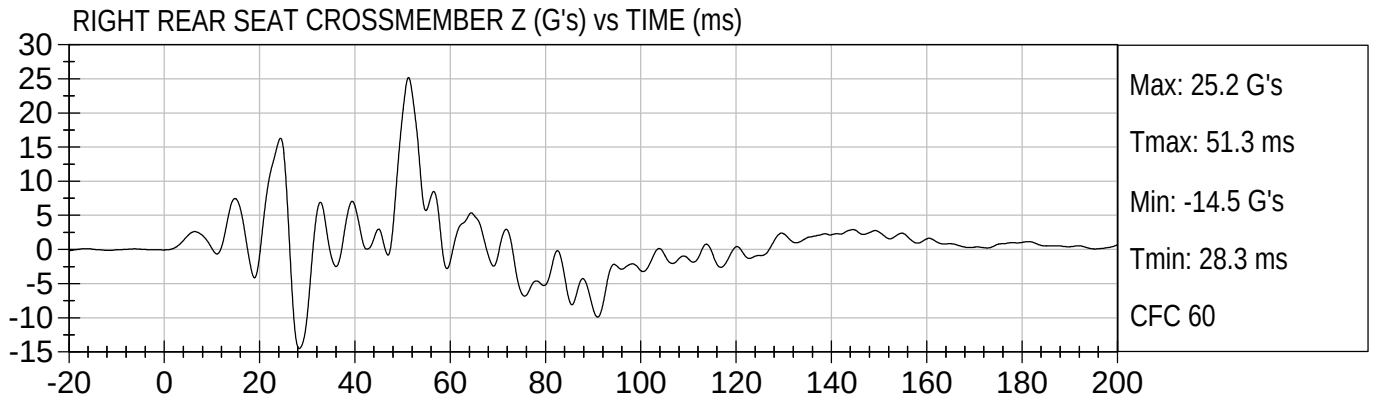


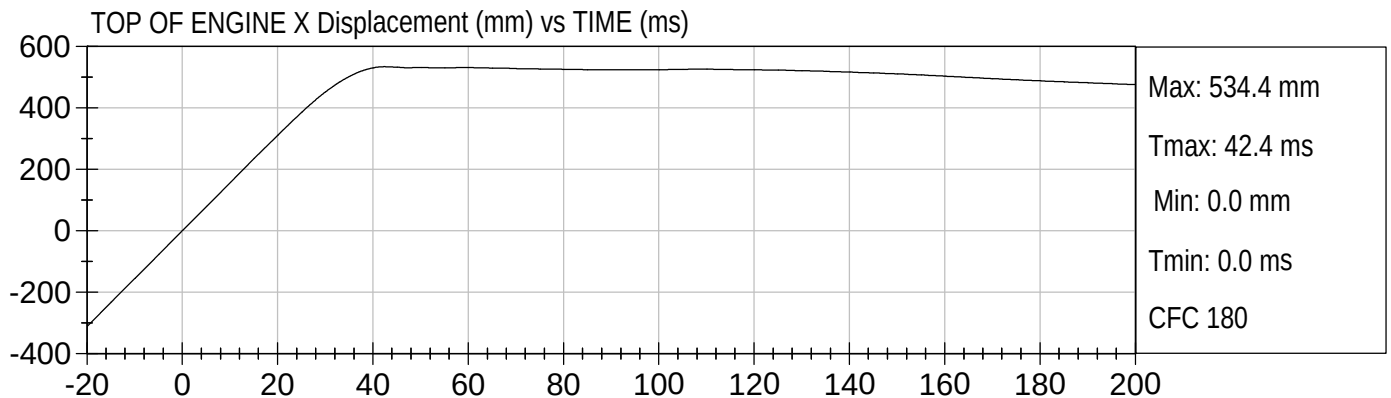
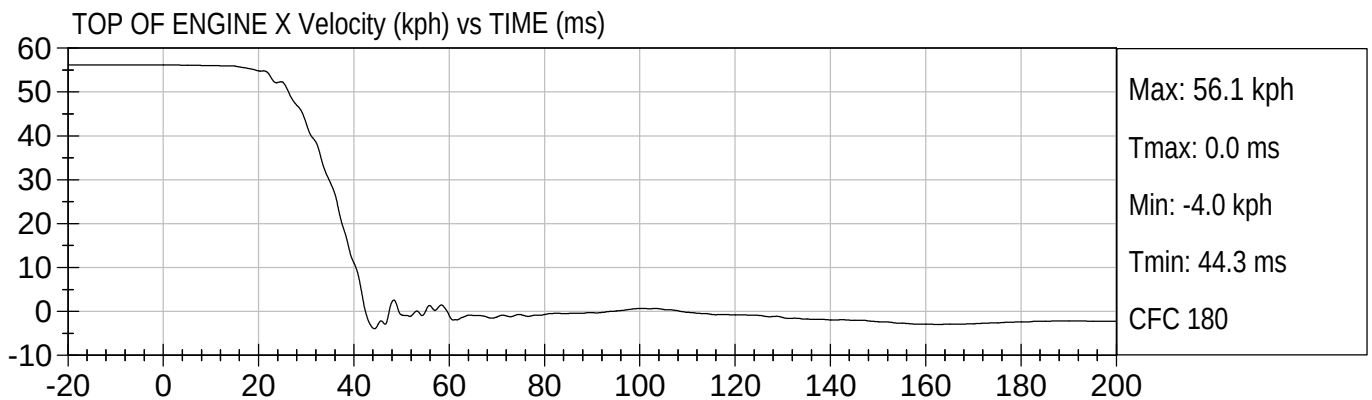
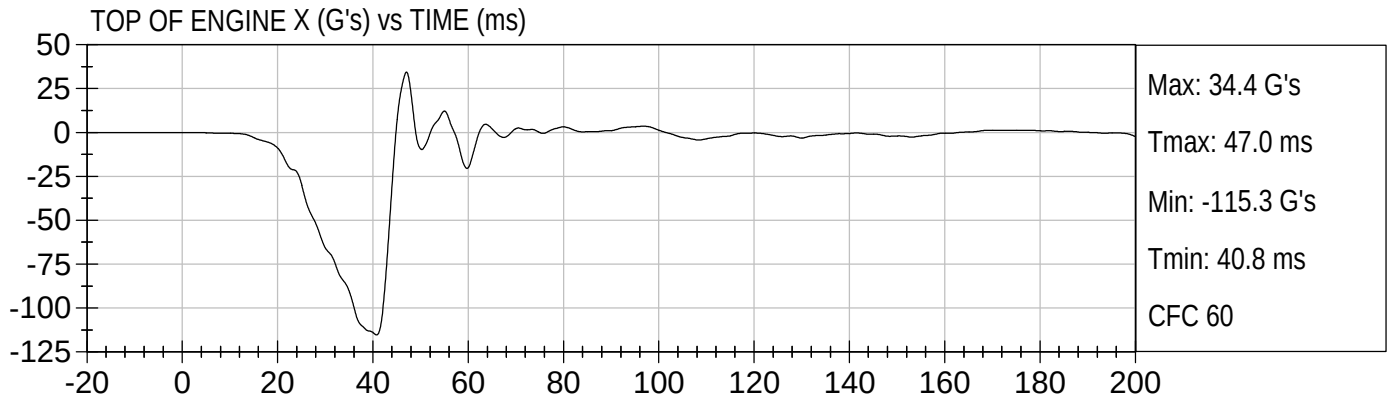




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2002 FORD THUNDERBIRD ROADSTER (M20206)

Test Date: March 26, 2002
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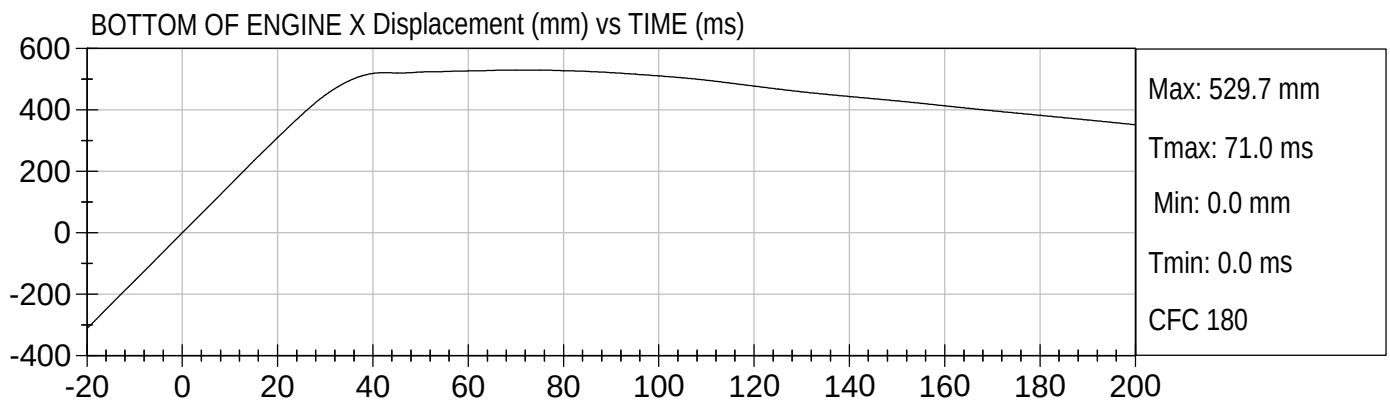
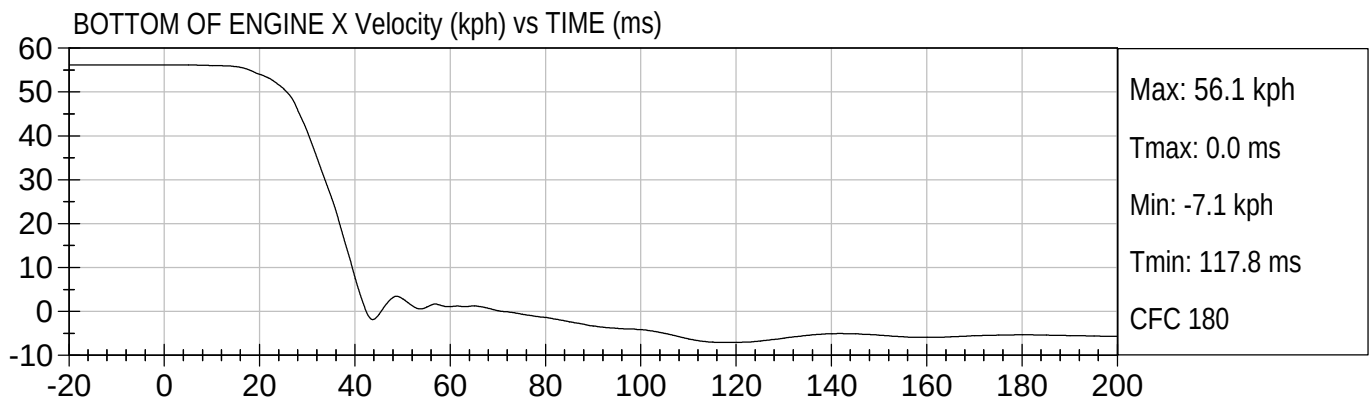
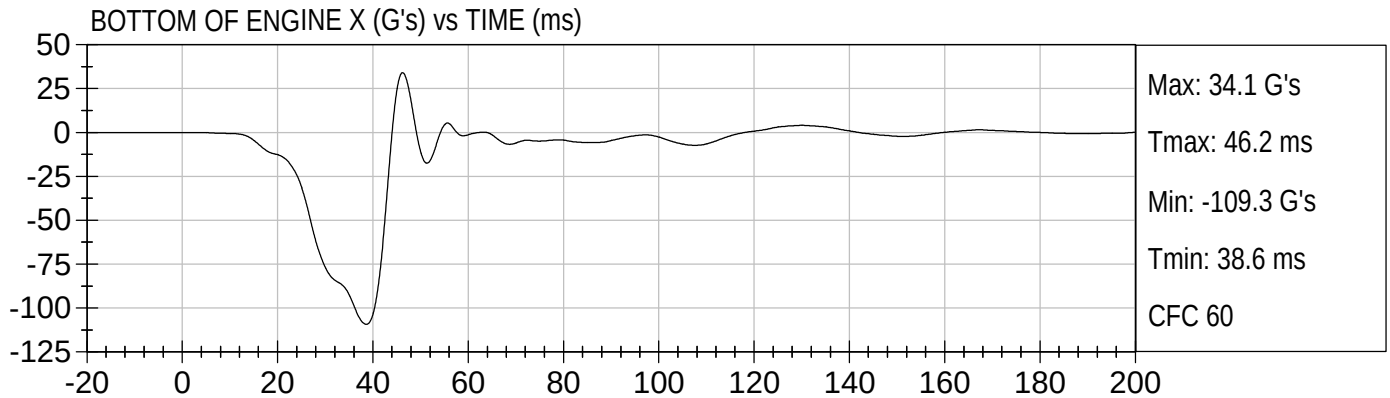






35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

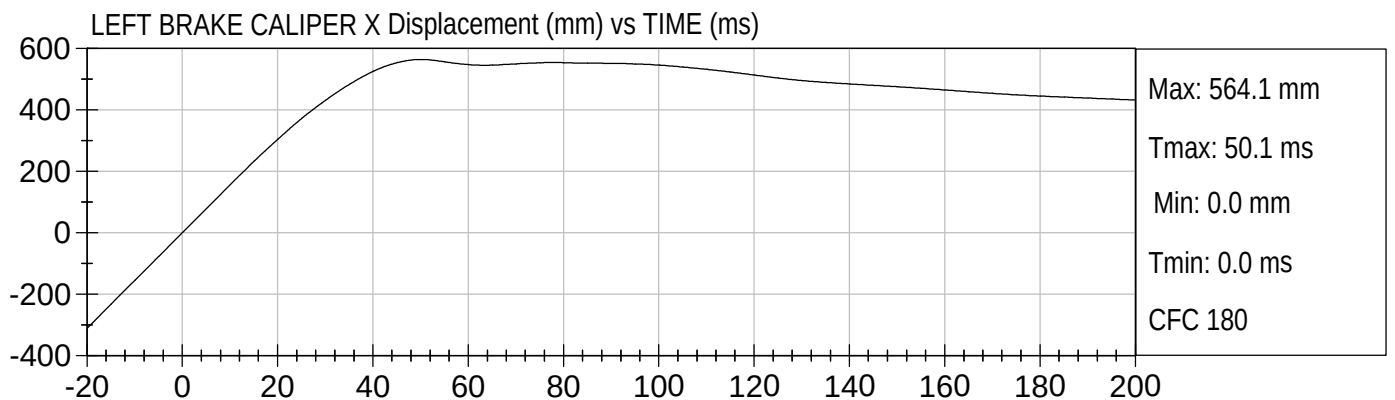
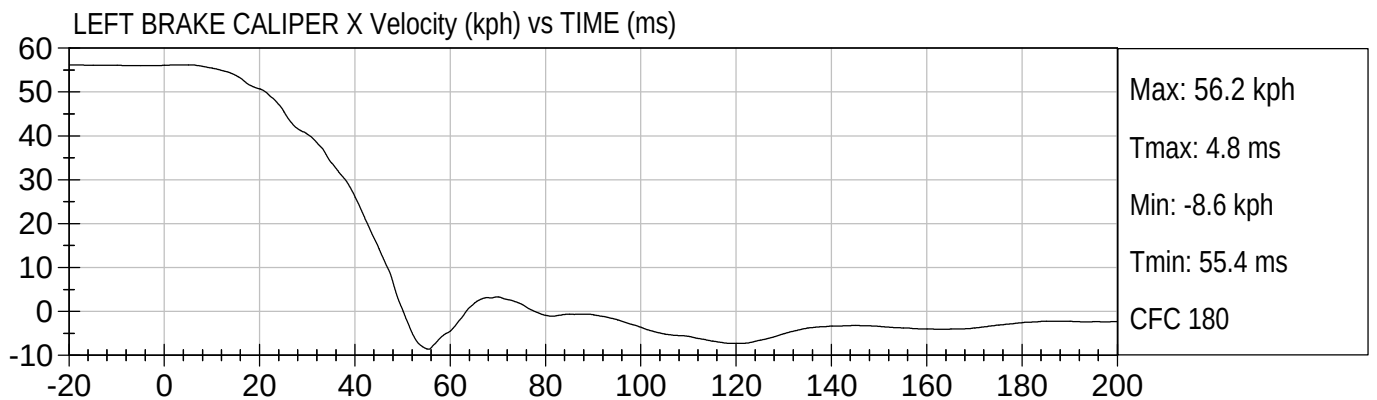
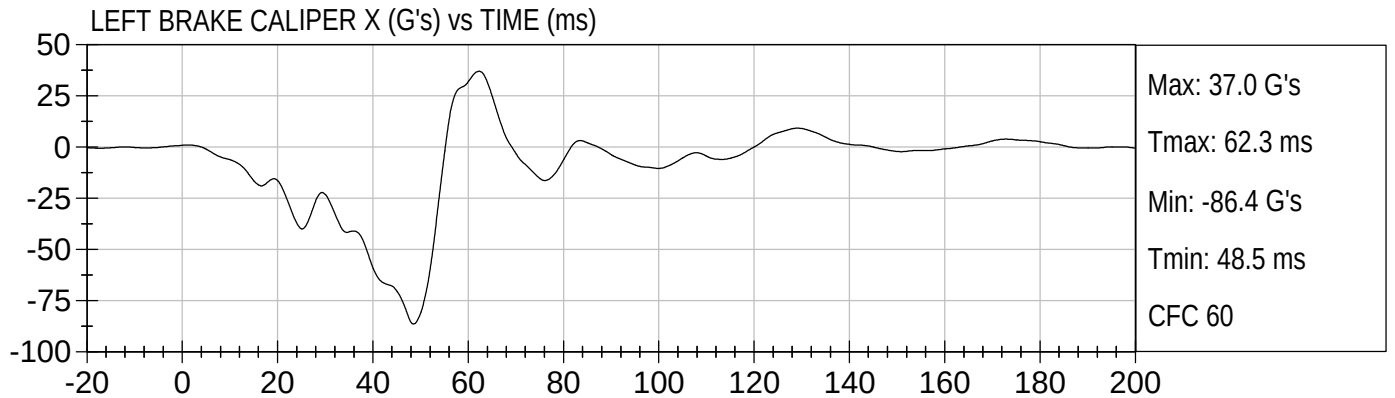
Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)

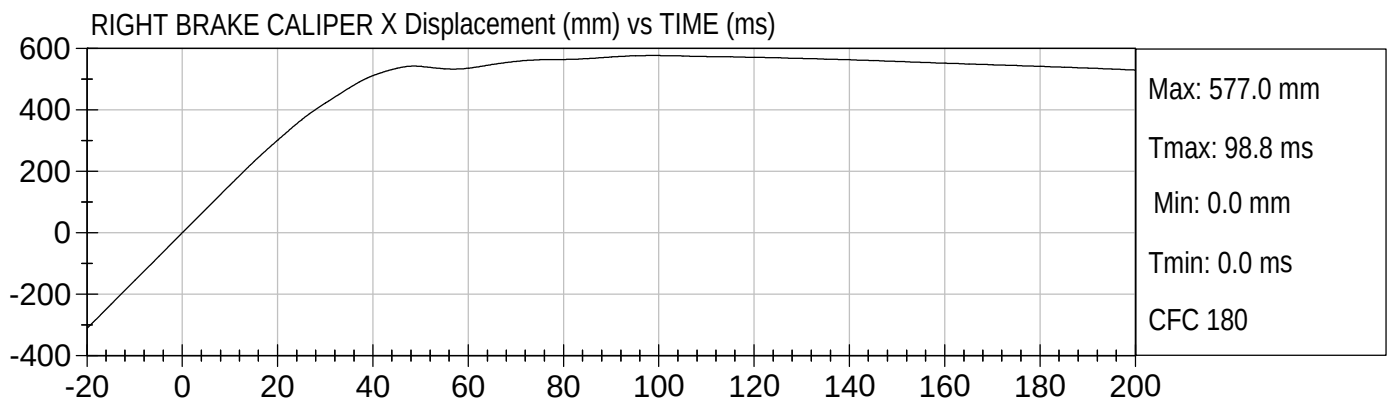
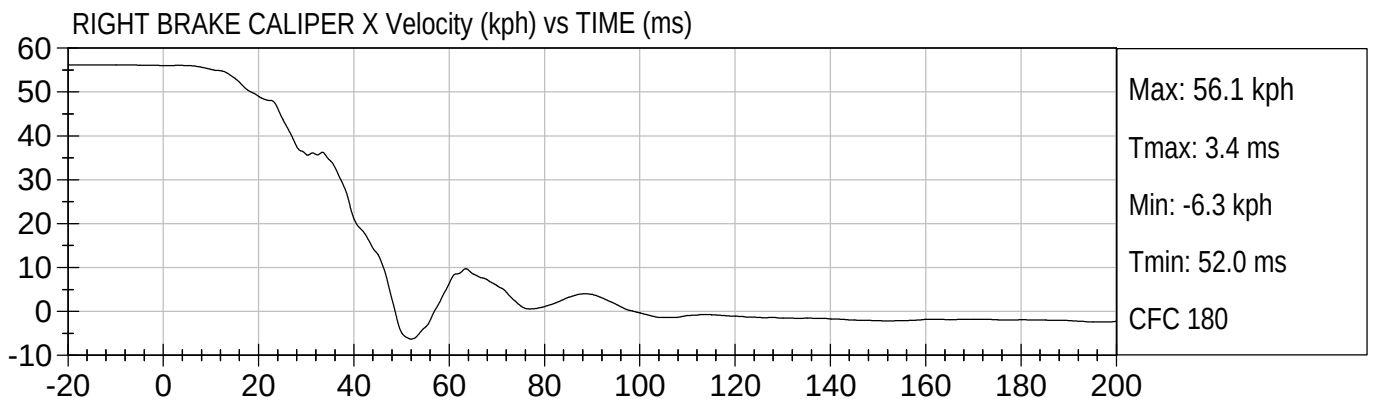
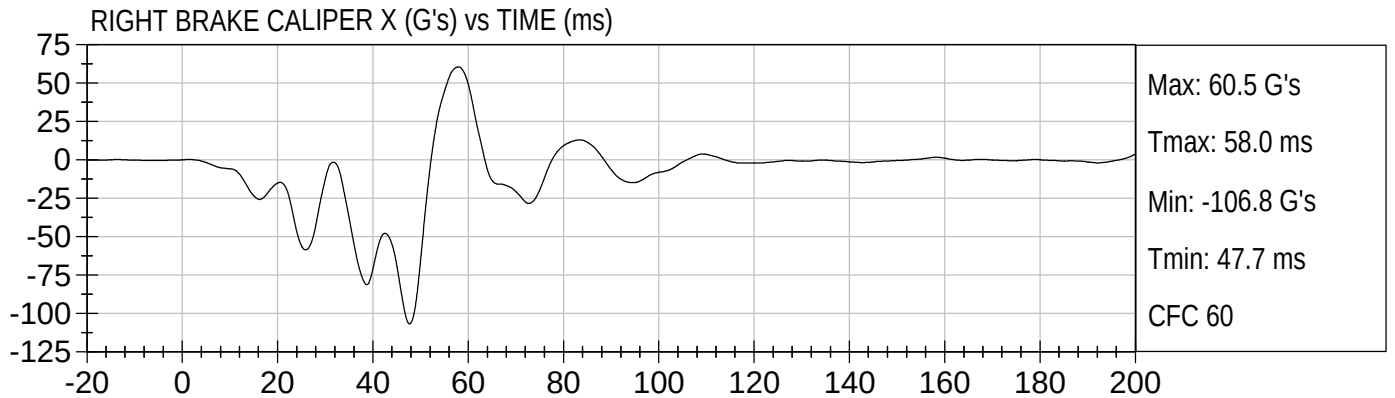




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Speed: 34.9 mph (56.2 km/h)

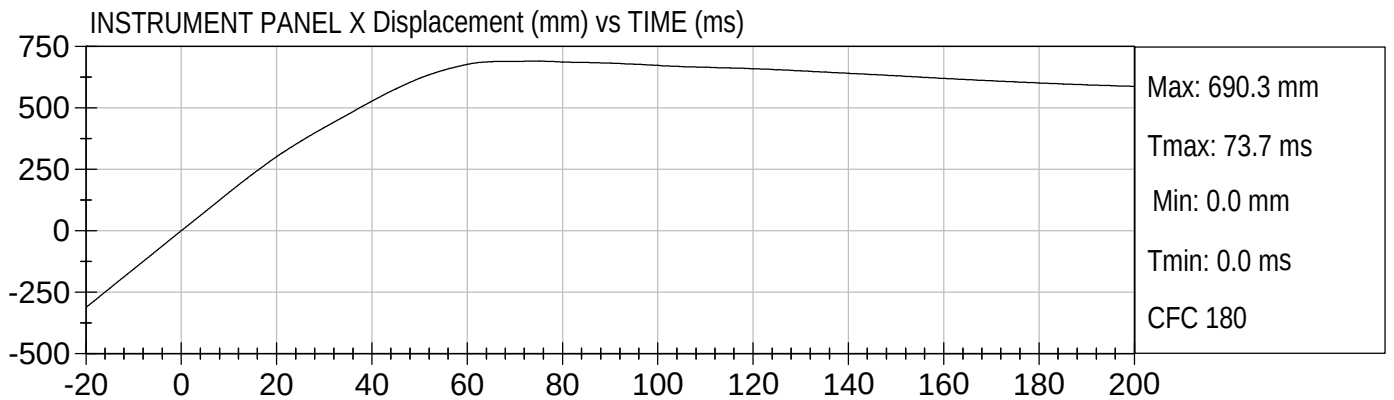
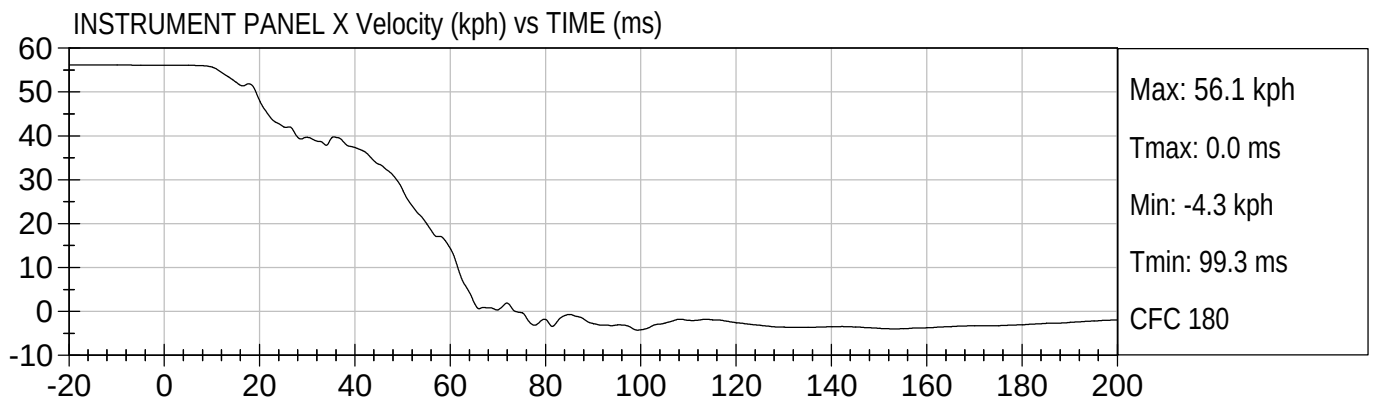
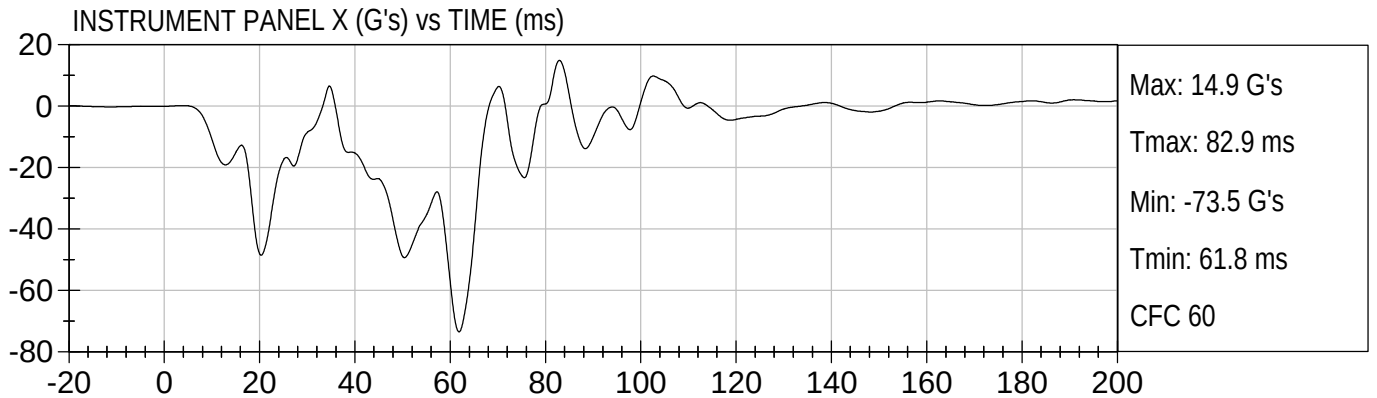






35 MPH FRONTAL IMPACT
2002 FORD THUNDERBIRD ROADSTER (M20206)

Test Date: March 26, 2002
Speed: 34.9 mph (56.2 km/h)



APPENDIX C

DUMMY CALIBRATION DATA TRACES AND TABLES

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

ATD Serial No: 065

Test I.D: D02461

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	257.2	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-3.6	Pass
Is Acceleration Unimodal?	Yes/No	< 10% Peak	Yes	Pass
			Overall Test Results	Pass

Laboratory Technician

3/21/02
Test Date

Approved By



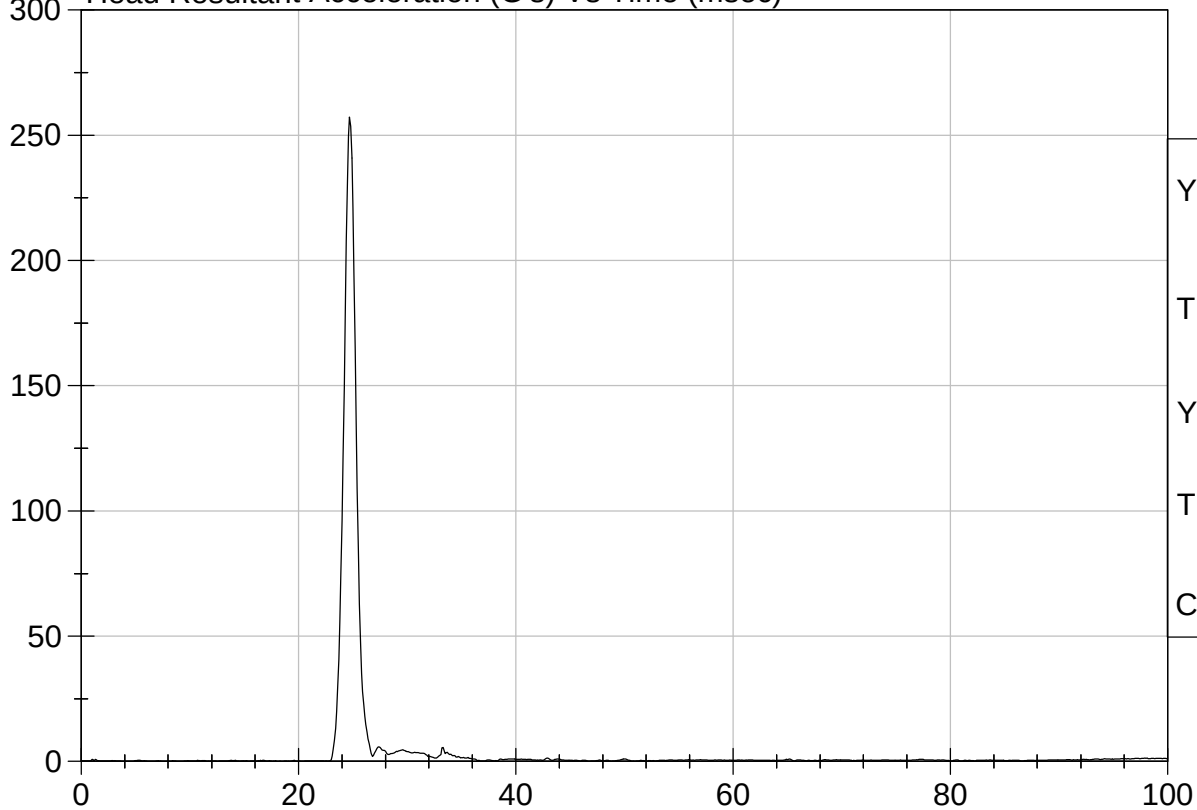
Test Description: Head Drop

Test Date: 3/21/02

Component: D02461

Speed: 0 ft/s, 0.00 m/s

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



YMax: 257.2 G

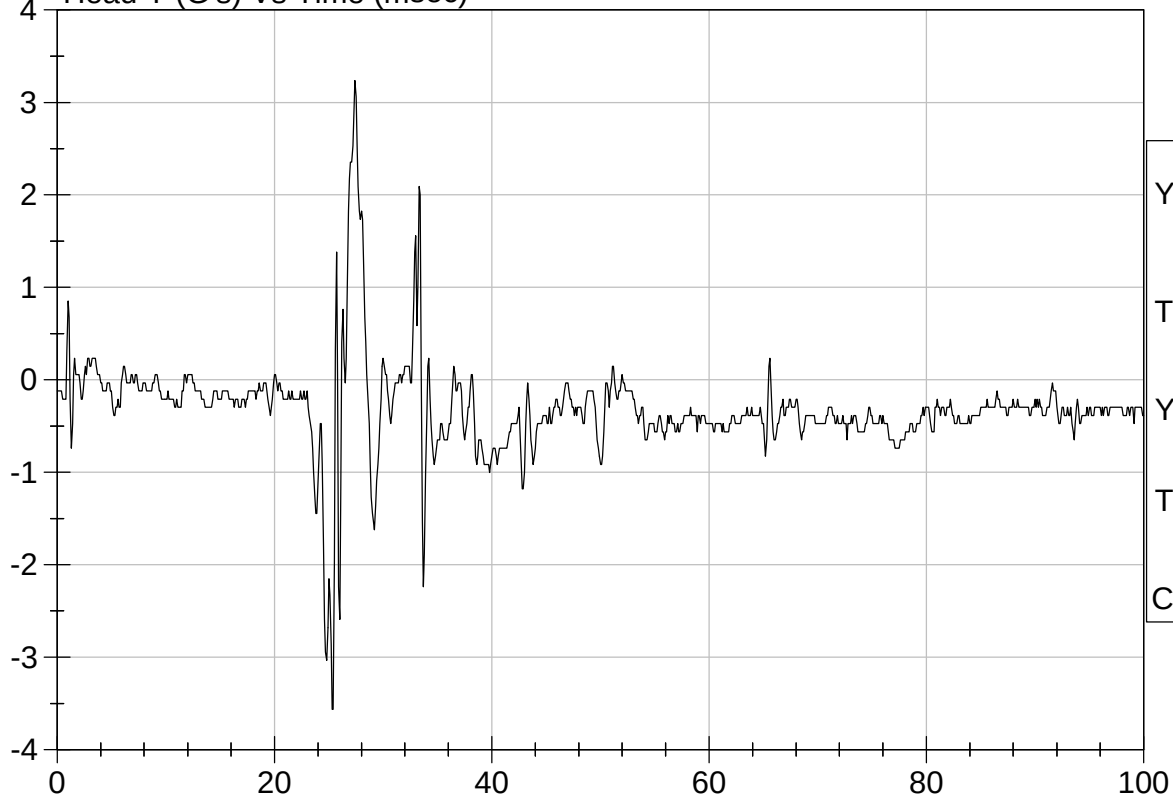
Tmax: 24.7 ms

YMin: 0.0 G

Tmin: 4.0 ms

CFC 1000

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



YMax: 3.2 G

Tmax: 27.4 ms

YMin: -3.6 G

Tmin: 25.3 ms

CFC 1000

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

ATD Serial No: 065

Test I.D: D02462

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	20	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.00	Pass
Pendulum Deceleration	10 msec	G's	22.50 to 27.50	23.73	Pass
	20 msec	G's	17.60 to 22.60	20.10	Pass
	30 msec	G's	12.50 to 18.50	15.19	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 29.0	15.2	Pass
Deceleration Decay Time to Cross 5 G's		msec	34.0 to 42.0	37	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	71.3	Pass
	Time	msec	57.0 to 64.0	58.2	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	113.0 to 128.0	113.9	Pass
Moment About Occipital Condyle	Maximum	N m	84.1 to 108.5	91.2	Pass
	Time	msec	47.0 to 58.0	50.5	Pass
Positive Moment Decay Time To Zero Crossing		msec	97.0 to 107.0	103.1	Pass
Overall Test Results					Pass

Laboratory Technician

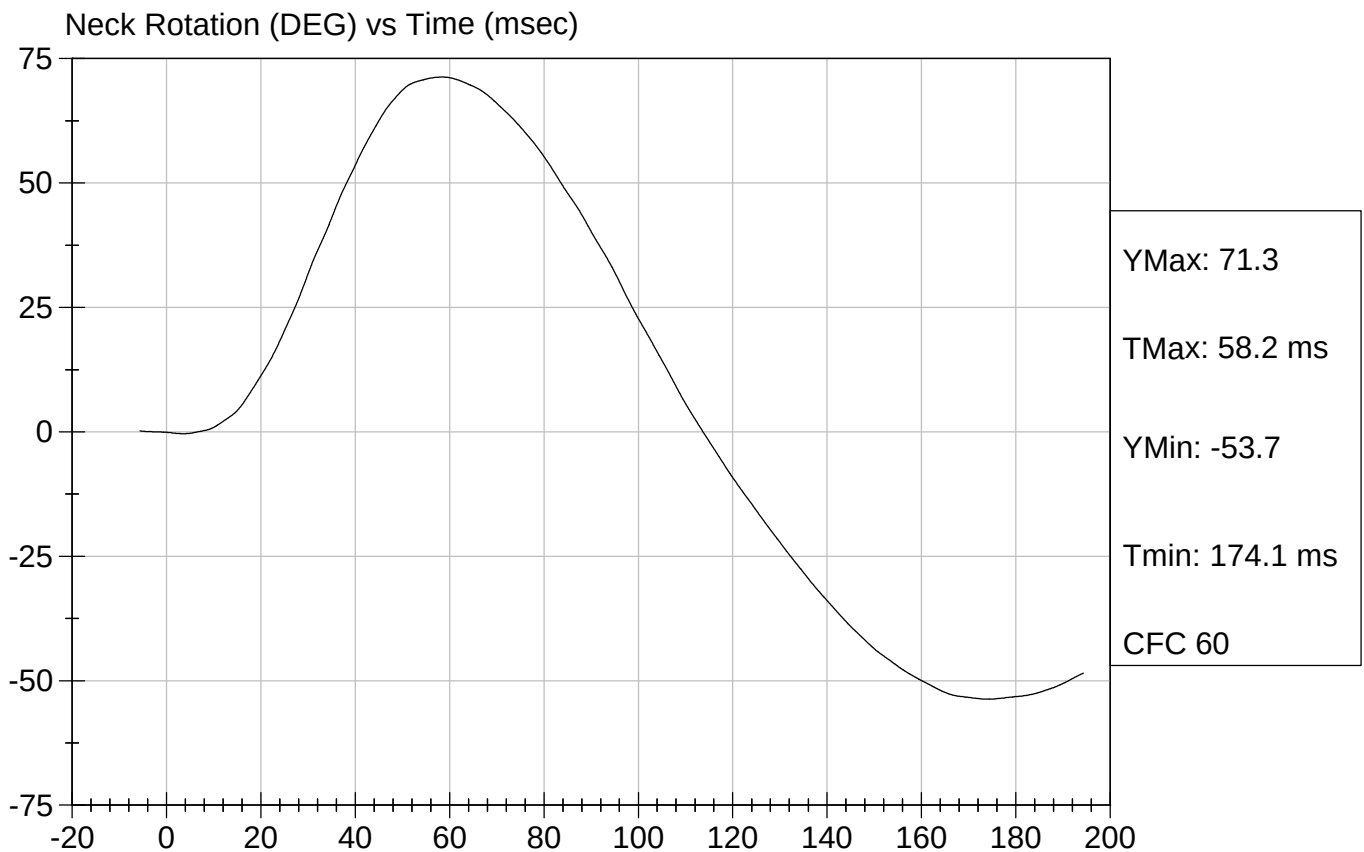
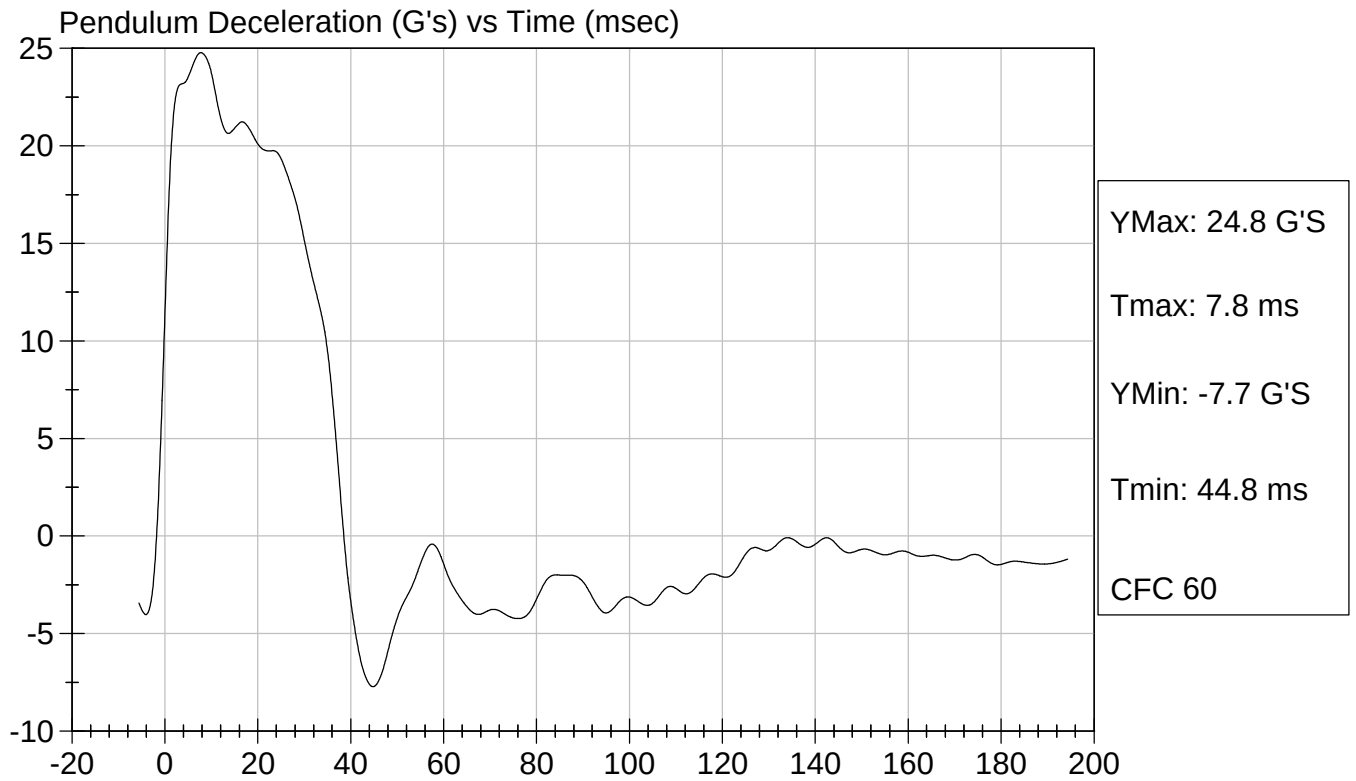
3/21/02
Test Date

Approved By



Test Desc: Neck Flexion
Component ID: D02462

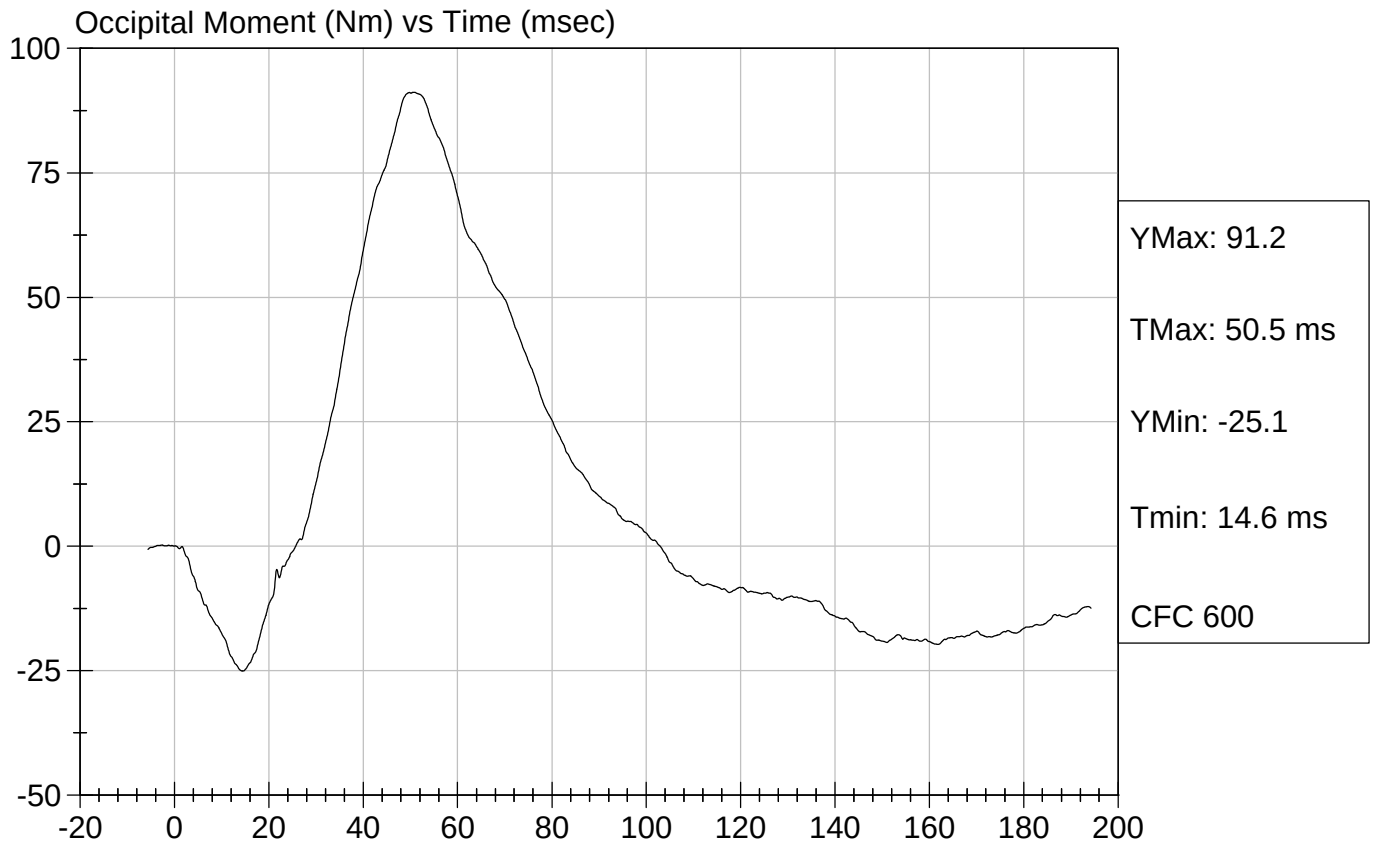
Test Date: 3/21/02
Speed: 22.98 ft/sec, 7.00 m/sec





Test Desc: Neck Flexion
Component ID: D02462

Test Date: 3/21/02
Speed: 22.98 ft/sec, 7.00 m/sec



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

ATD Serial No: 065

Test I.D: D02463

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	20	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.10	Pass
Pendulum Deceleration	10 msec	G's	17.20 to 21.20	18.19	Pass
	20 msec	G's	14.00 to 19.00	16.28	Pass
	30 msec	G's	11.00 to 16.00	12.22	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 22.0	12.3	Pass
Deceleration Decay Time to Cross 5 G's		msec	38.0 to 46.0	42.8	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	98.6	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	158.7	Pass
Moment About Occipital Condyle	Minimum	N m	-52.9 to -79.9	-57.7	Pass
	Time	msec	65.0 to 79.0	73.9	Pass
Negative Moment Decay Time To Zero Crossing		msec	120.0 to 148.0	144.6	Pass
Overall Test Results					Pass

Laboratory Technician

3/21/02

Test Date

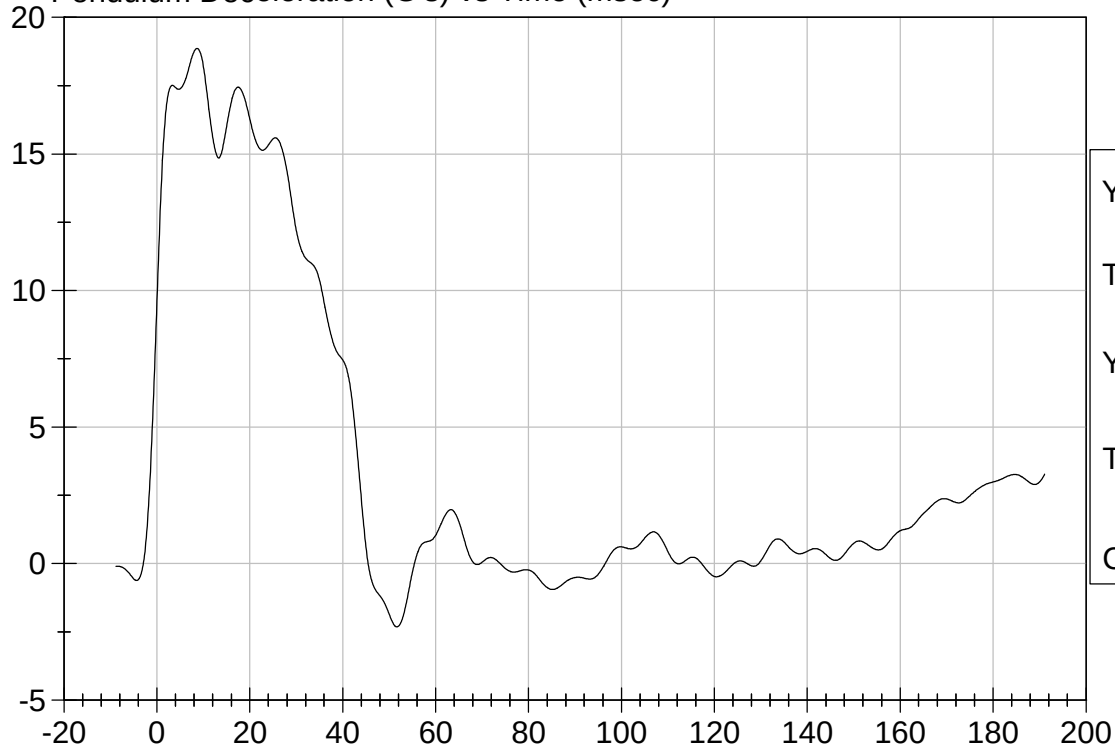
Approved By



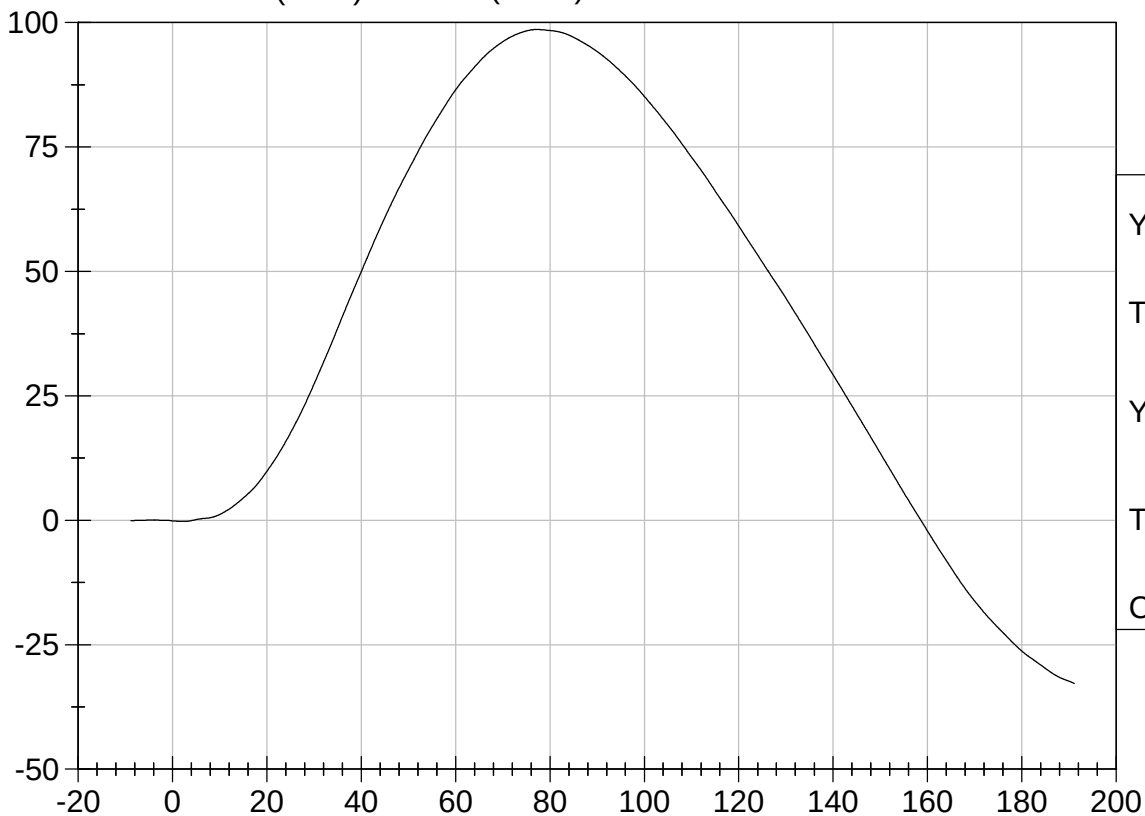
Test Desc: Neck Extension
Component ID: D02463

Test Date: 3/21/02
Speed: 20.01 ft/sec, 6.10 m/sec

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



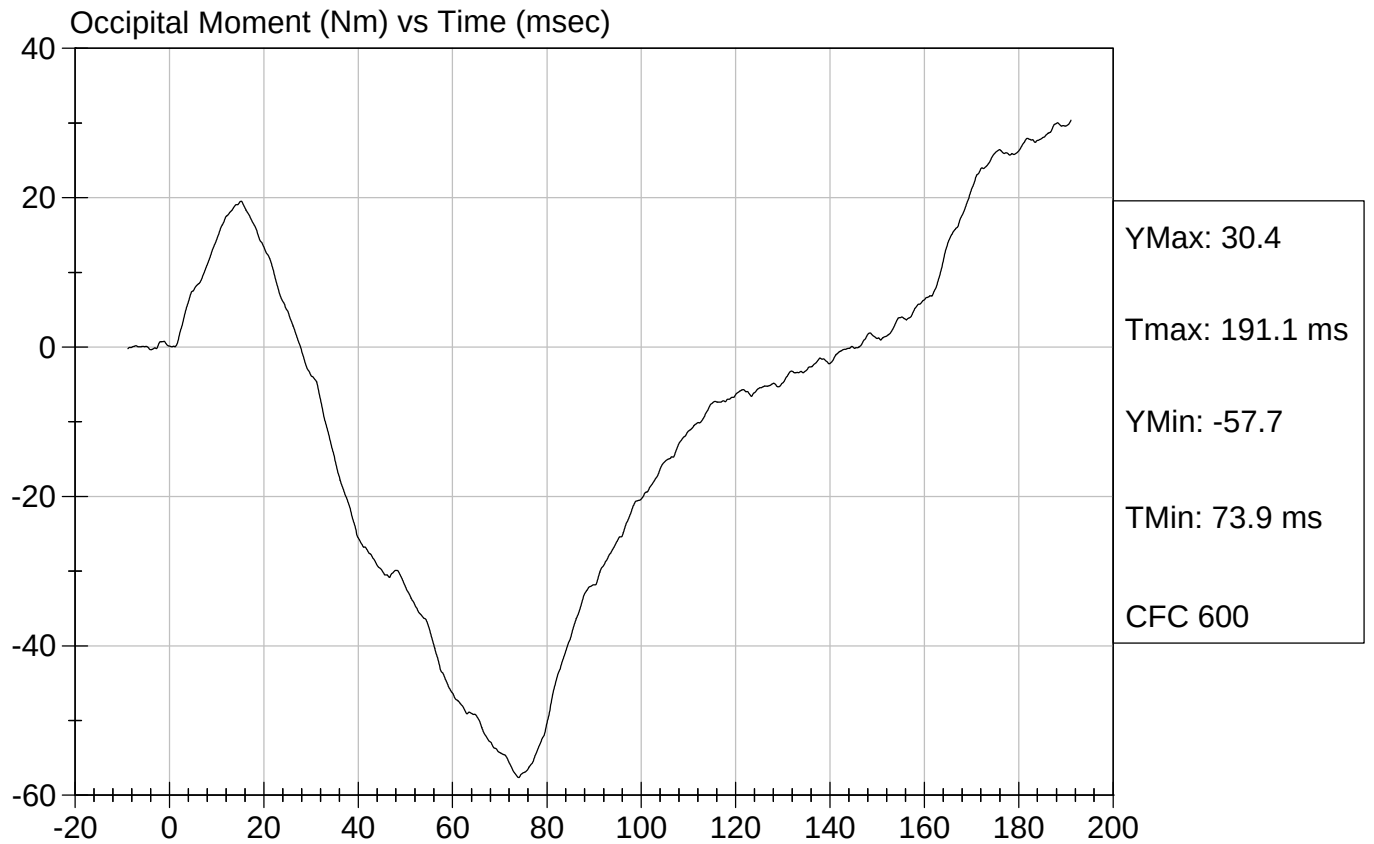
Neck Rotation (DEG) vs Time (msec)





Test Desc: Neck Extension
Component ID: D02463

Test Date: 3/21/02
Speed: 20.01 ft/sec, 6.10 m/sec



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

ATD Serial No: 065

Test I.D: D02464

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Probe Velocity	m/s	6.58 to 6.82	6.68	Pass
Peak Probe Force	Newtons	5159 to 5893	5,706	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.84	Pass
Internal Hysteresis	%	69 to 85	70	Pass
			Overall Test Results	Pass

Laboratory Technician

3/20/02
Test Date

Approved By

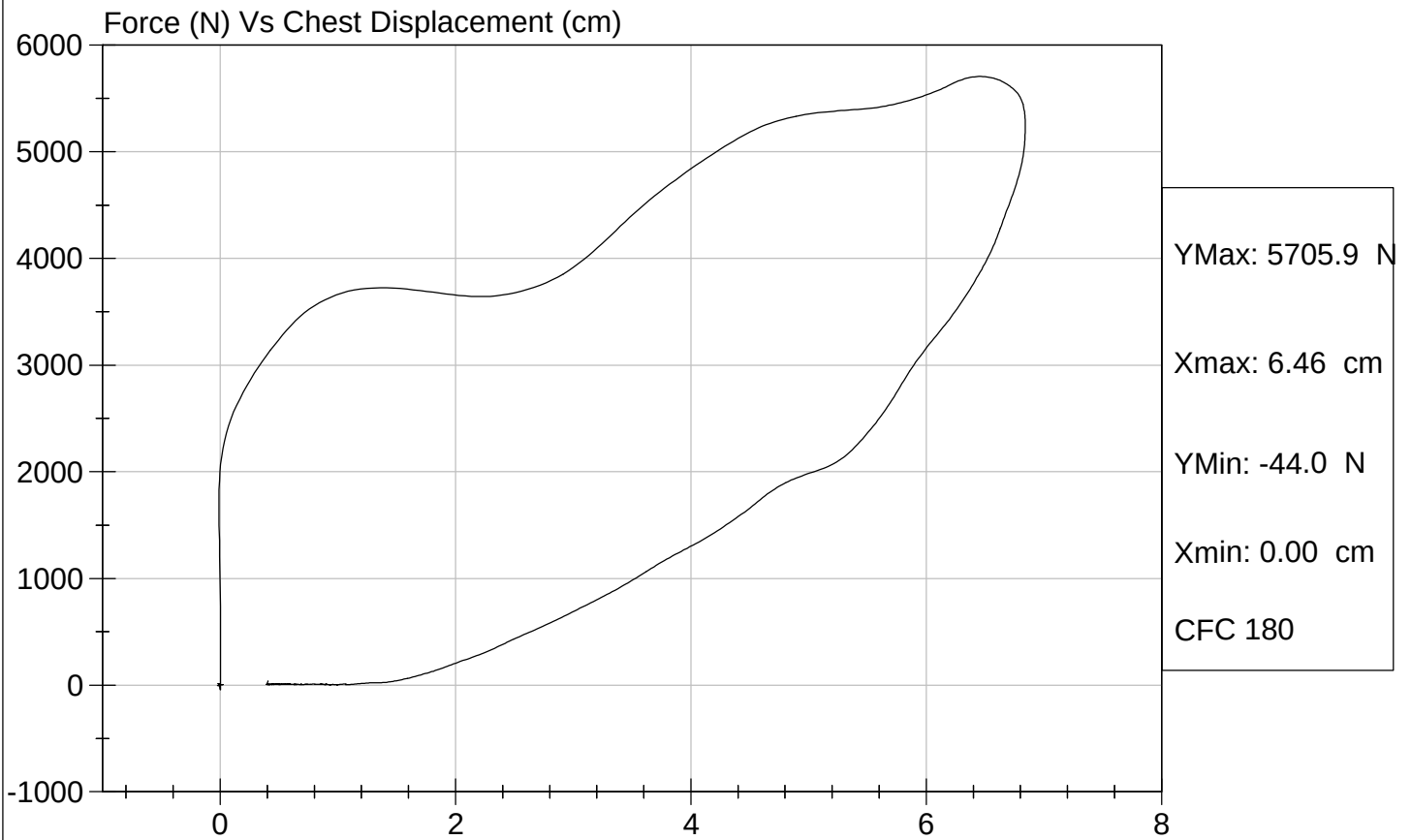


Test Description: Thorax Impact

Test Date: 3/20/02

Component: D02464

Speed: 21.91 ft/sec, 6.68 m/sec



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

ATD Serial No: 065

Test I.D: D02465

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	19	Pass
Probe Velocity	m/s	2.07 to 2.13	2.11	Pass
Peak Probe Force	Newtons	4715 to 5782	5,402	Pass
Overall Test Results				Pass

Laboratory Technician

3/21/02
Test Date

Approved By

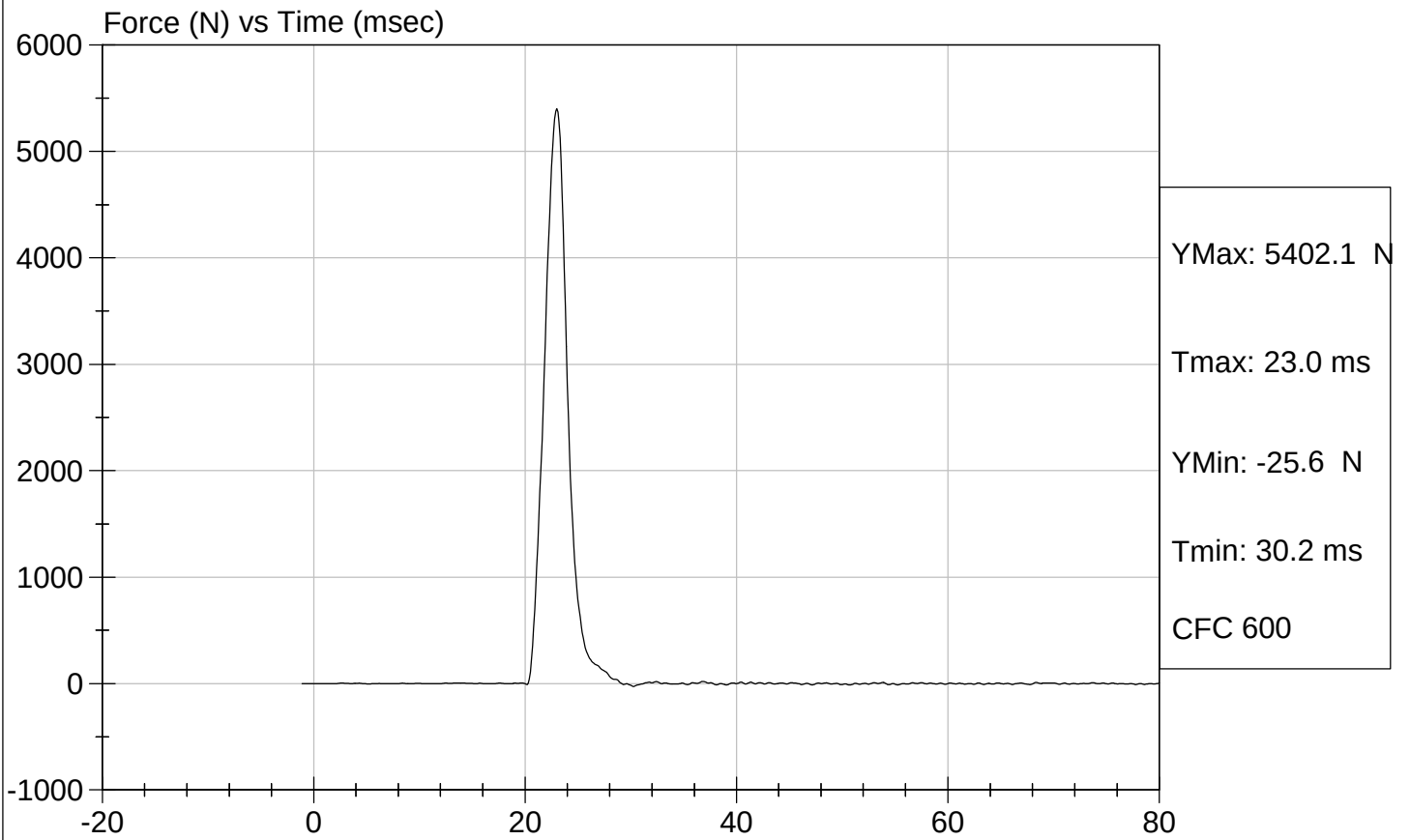


Test Description: Right Knee

Test Date: 3/21/02

Component: D02465

Speed: 6.91 ft/sec, 2.11 m/sec



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

ATD Serial No: 065

Test I.D: D02466

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	19	Pass
Probe Velocity	m/s	2.07 to 2.13	2.11	Pass
Peak Probe Force	Newtons	4715 to 5782	5,507	Pass
Overall Test Results				Pass

Laboratory Technician

3/21/02
Test Date

Approved By

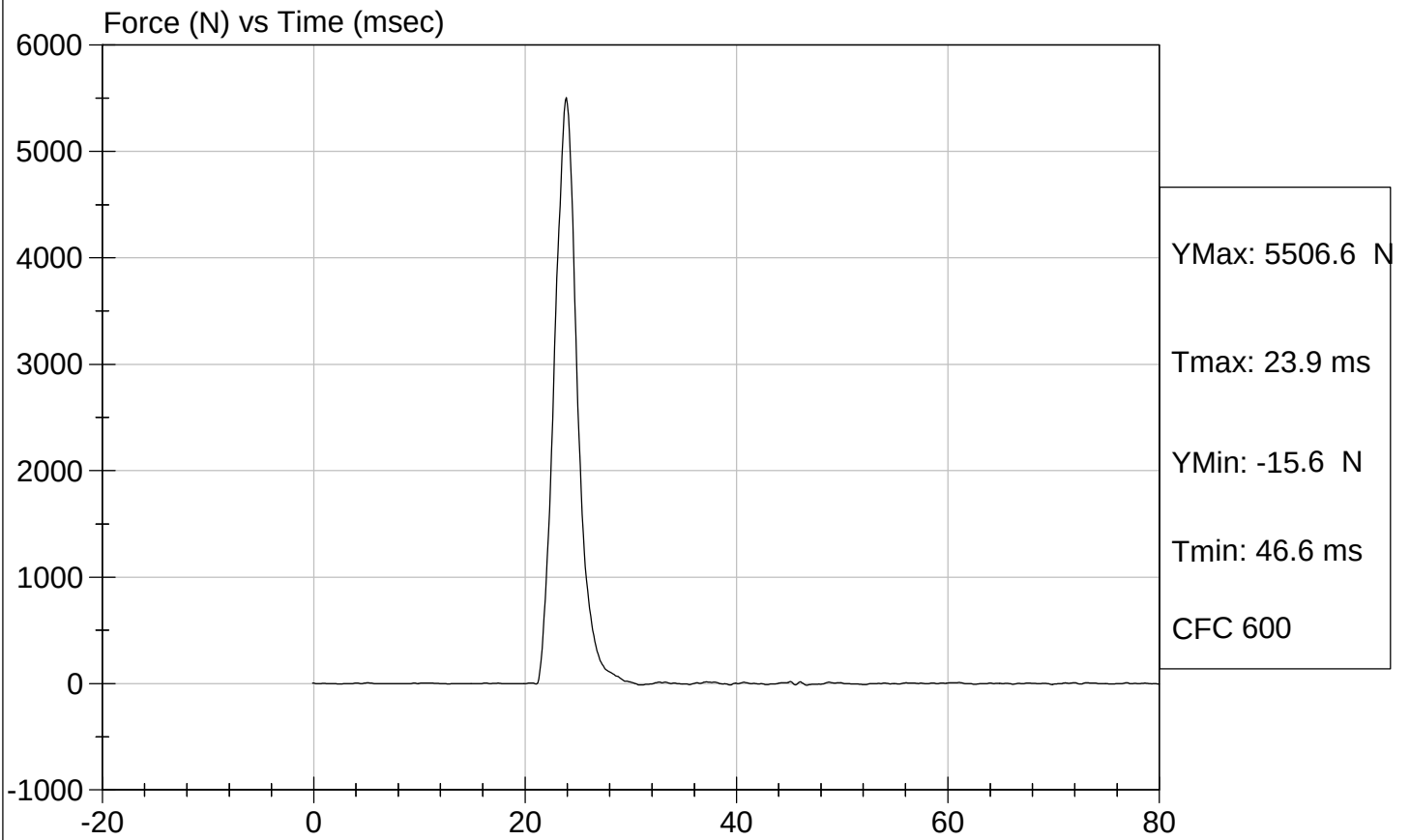


Test Description: Left Knee

Test Date: 3/21/02

Component: D02466

Speed: 6.92 ft/sec, 2.11 m/sec



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

ATD Serial No: 065

Test I.D: D02469/0

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.7	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	19	19	Pass
Rotation Rate	deg/sec	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	79.9	74.1	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	45	44	Pass
Overall Test Results					Pass

Laboratory Technician

3/21/02
Test Date

Approved By

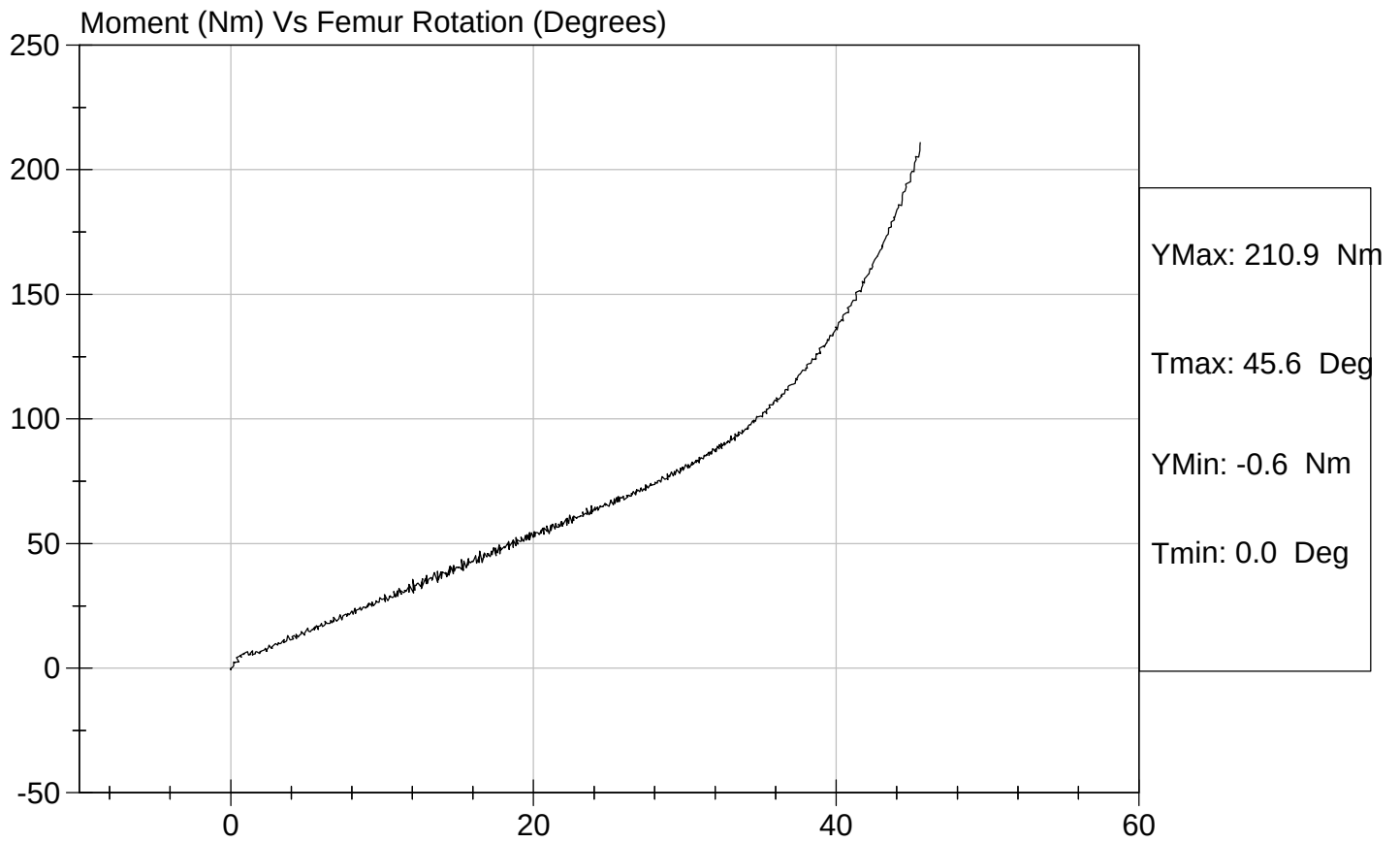


Test Description: Hip Femur Flexion

Test Date: 3/21/02

Component: D02469

Speed: 0 ft/sec, 0.00 m/sec



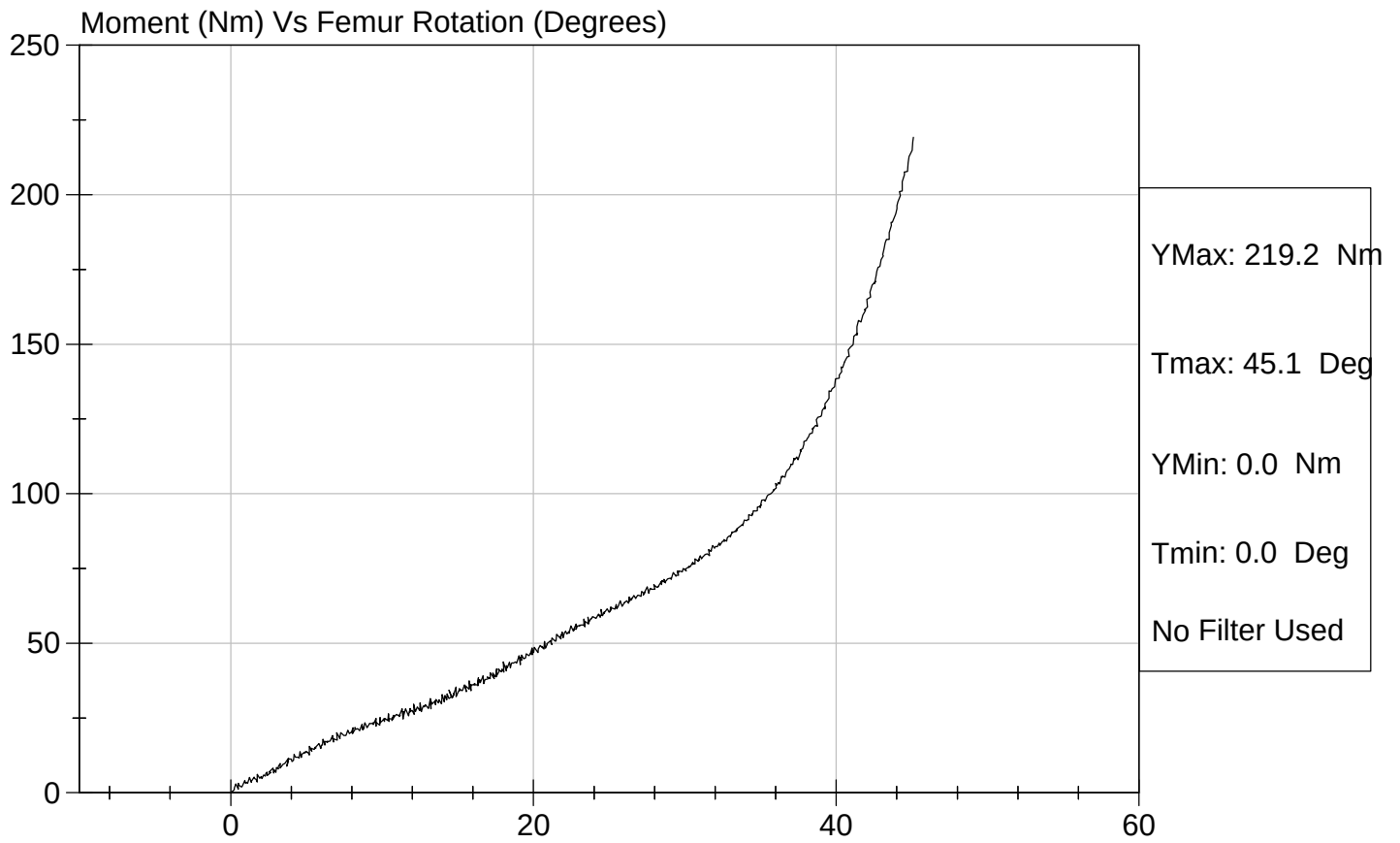


Test Description: Hip Femur Flexion

Test Date: 3/21/02

Component: D02460

Speed: 0 ft/sec, 0.00 m/sec



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

ATD Serial No: 066

Test I.D: D02471

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	259.4	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	-13.3	Pass
Is Acceleration Unimodal?	Yes/No	< 10% Peak	Yes	Pass
			Overall Test Results	Pass

Laboratory Technician

3/21/02
Test Date

Approved By



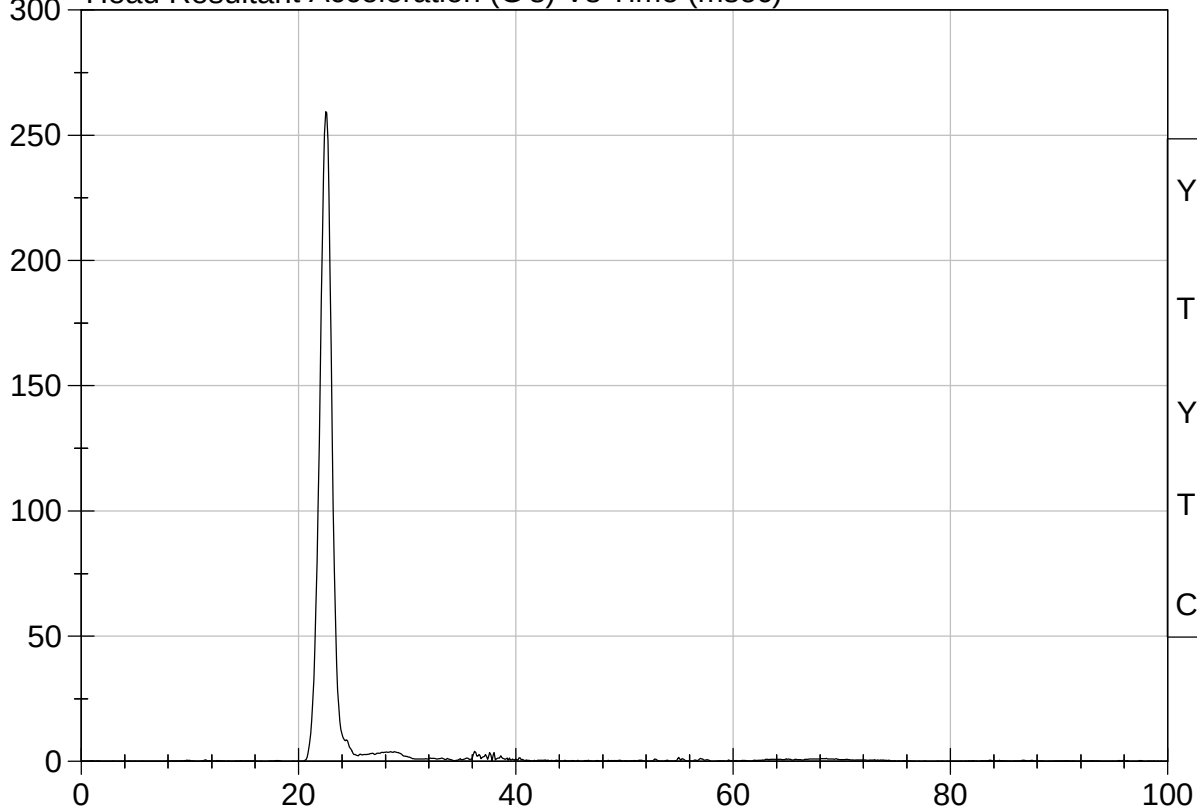
Test Description: Head Drop

Test Date: 3/21/02

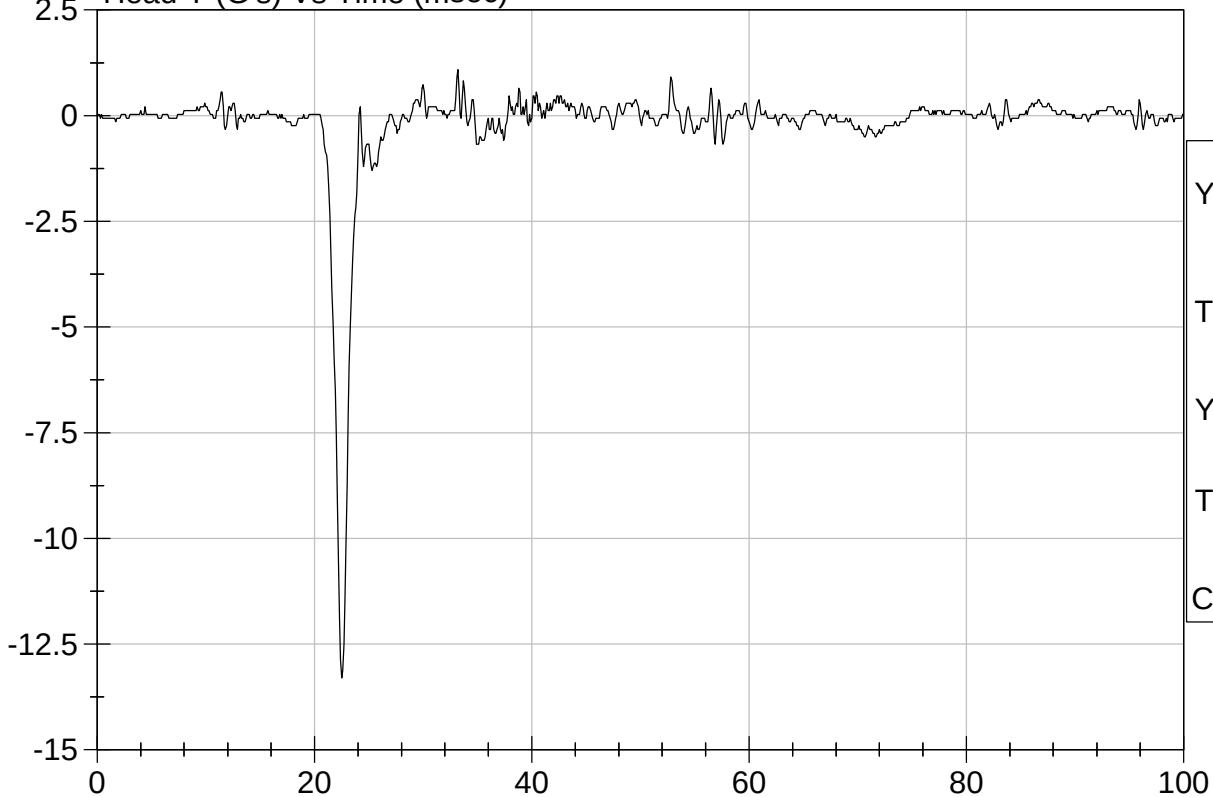
Component: D02471

Speed: 0 ft/s, 0.00 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: 066

Test I.D: D02472

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	20	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.00	Pass
Pendulum Deceleration	10 msec	G's	22.50 to 27.50	23.15	Pass
	20 msec	G's	17.60 to 22.60	20.18	Pass
	30 msec	G's	12.50 to 18.50	15.38	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 29.0	15.4	Pass
Deceleration Decay Time to Cross 5 G's		msec	34.0 to 42.0	36.6	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	73.5	Pass
	Time	msec	57.0 to 64.0	57.2	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	113.0 to 128.0	114.5	Pass
Moment About Occipital Condyle	Maximum	N m	84.1 to 108.5	98.0	Pass
	Time	msec	47.0 to 58.0	50.5	Pass
Positive Moment Decay Time To Zero Crossing		msec	97.0 to 107.0	99.3	Pass
Overall Test Results					Pass

Laboratory Technician

3/21/02

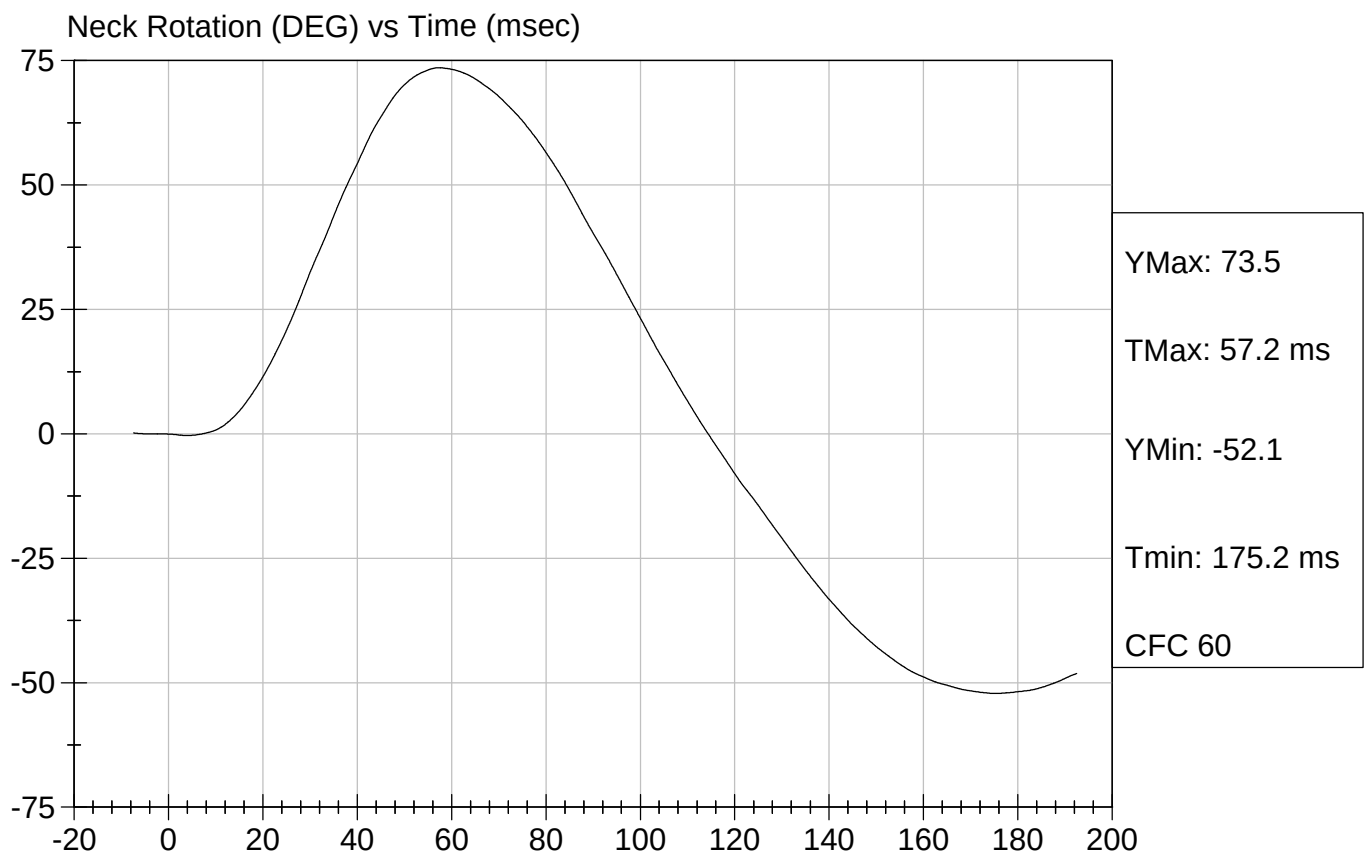
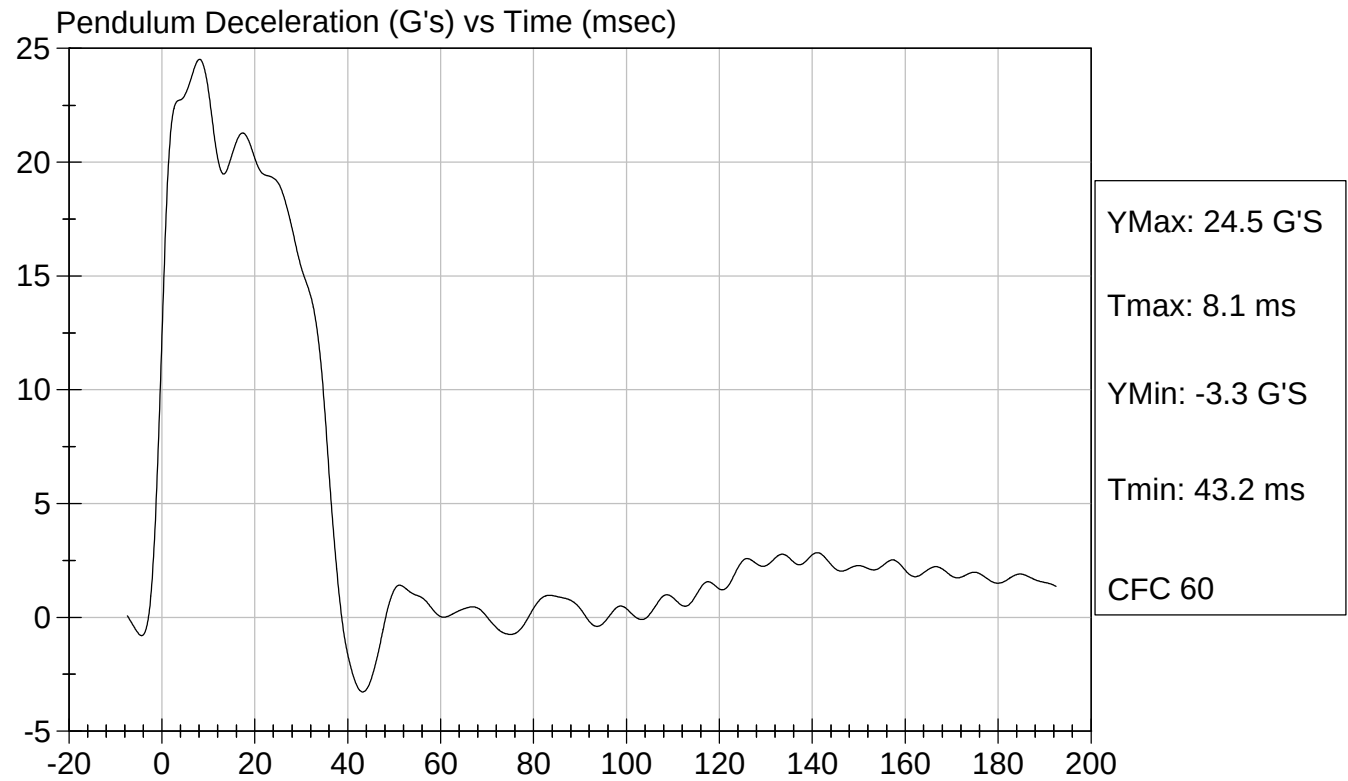
Test Date

Approved By



Test Desc: Neck Flexion
Component ID: D02472

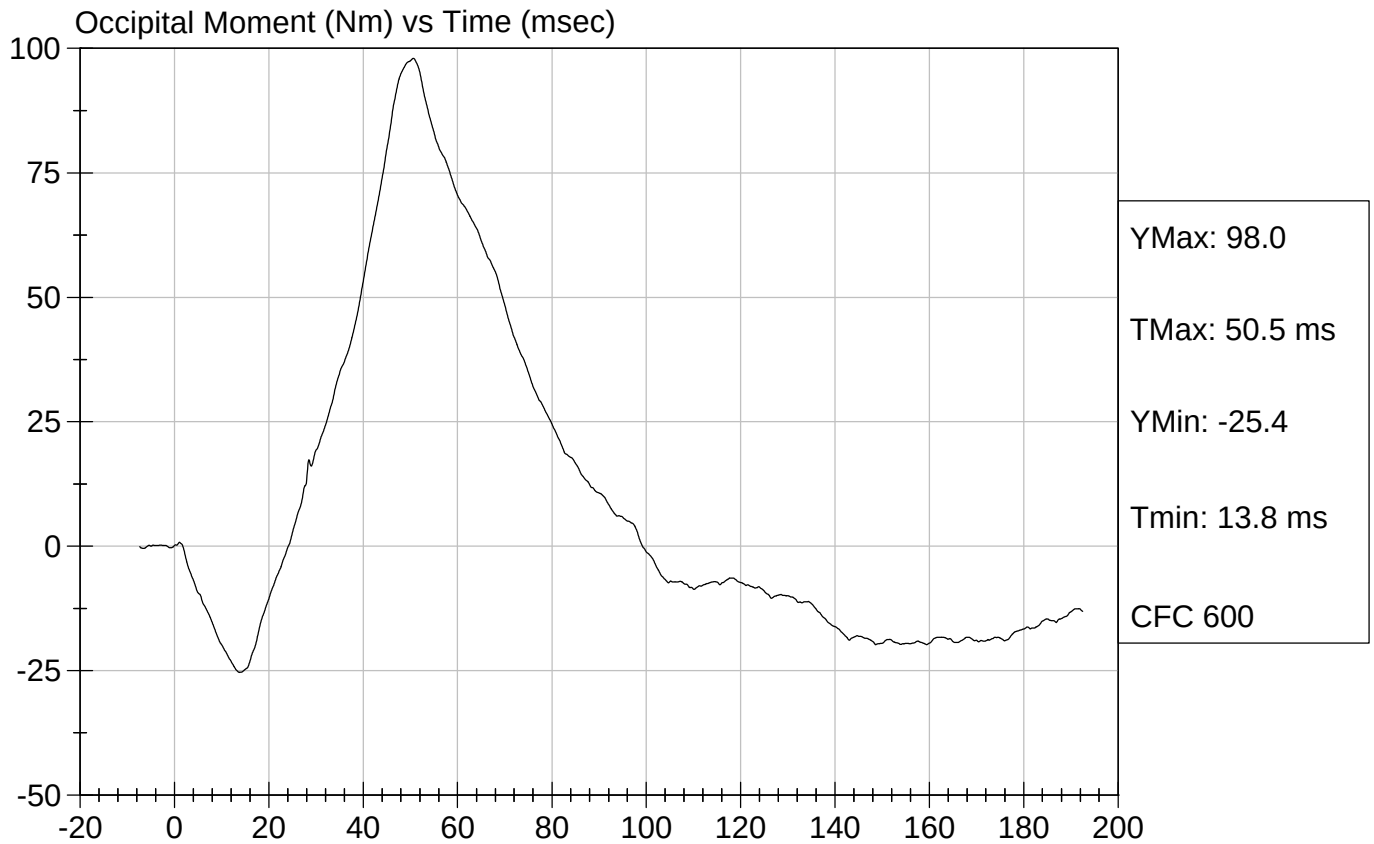
Test Date: 3/21/02
Speed: 22.96 ft/sec, 7.00 m/sec





Test Desc: Neck Flexion
Component ID: D02472

Test Date: 3/21/02
Speed: 22.96 ft/sec, 7.00 m/sec



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

ATD Serial No: 066

Test I.D: D02473

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.7	Pass
Laboratory Relative Humidity		%	10 to 70	20	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.06	Pass
Pendulum Deceleration	10 msec	G's	17.20 to 21.20	19.27	Pass
	20 msec	G's	14.00 to 19.00	16.01	Pass
	30 msec	G's	11.00 to 16.00	13.06	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	38.6	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	96.6	Pass
	Time	msec	72.0 to 82.0	76.5	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	147.0 to 174.0	154.2	Pass
Moment About Occipital Condyle	Minimum	N m	-52.9 to -79.9	-64.5	Pass
	Time	msec	65.0 to 79.0	70.2	Pass
Negative Moment Decay Time To Zero Crossing		msec	120.0 to 148.0	141.8	Pass
Overall Test Results					Pass

Laboratory Technician

3/21/02

Test Date

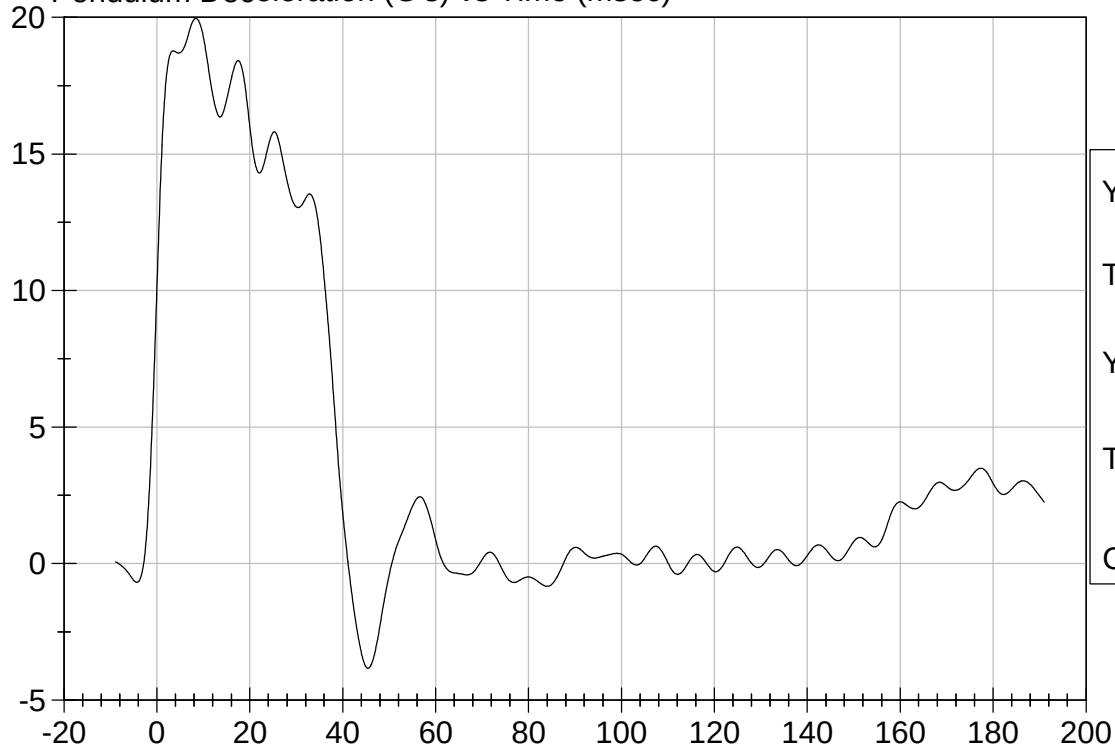
Approved By



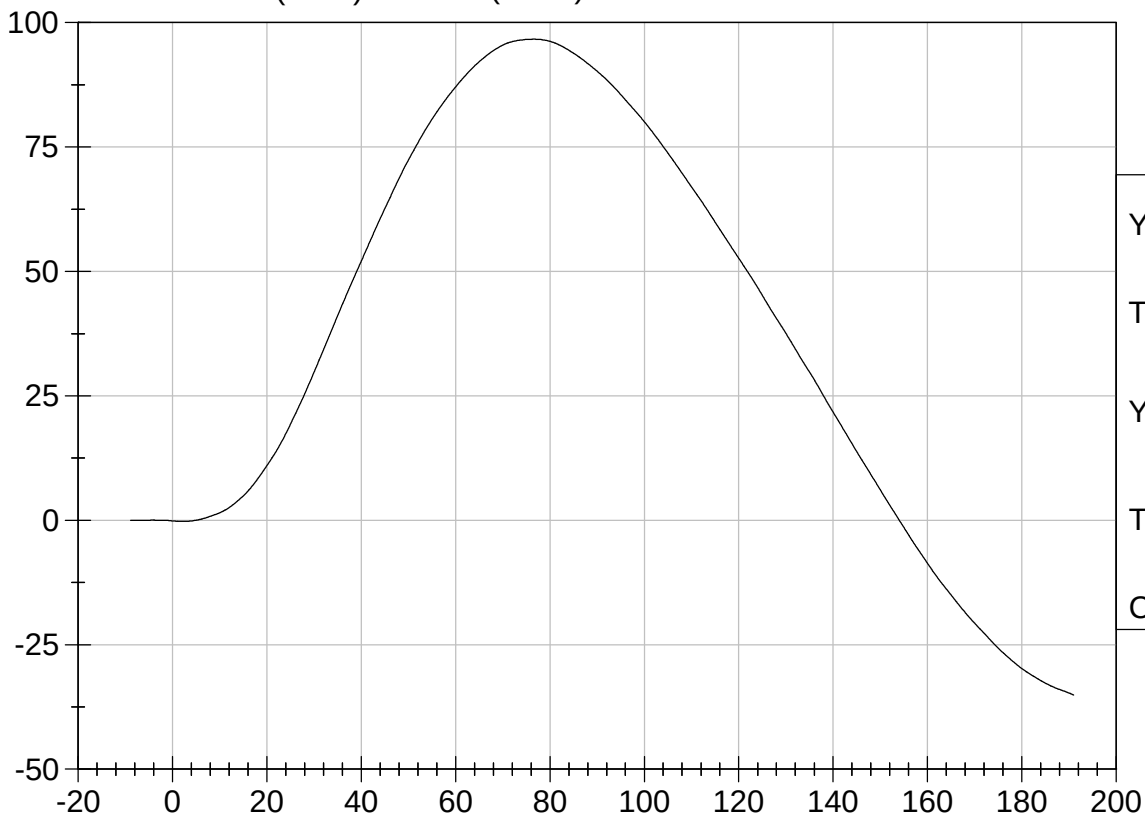
Test Desc: Neck Extension
Component ID: D02473

Test Date: 3/21/02
Speed: 19.88 ft/sec, 6.06 m/sec

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



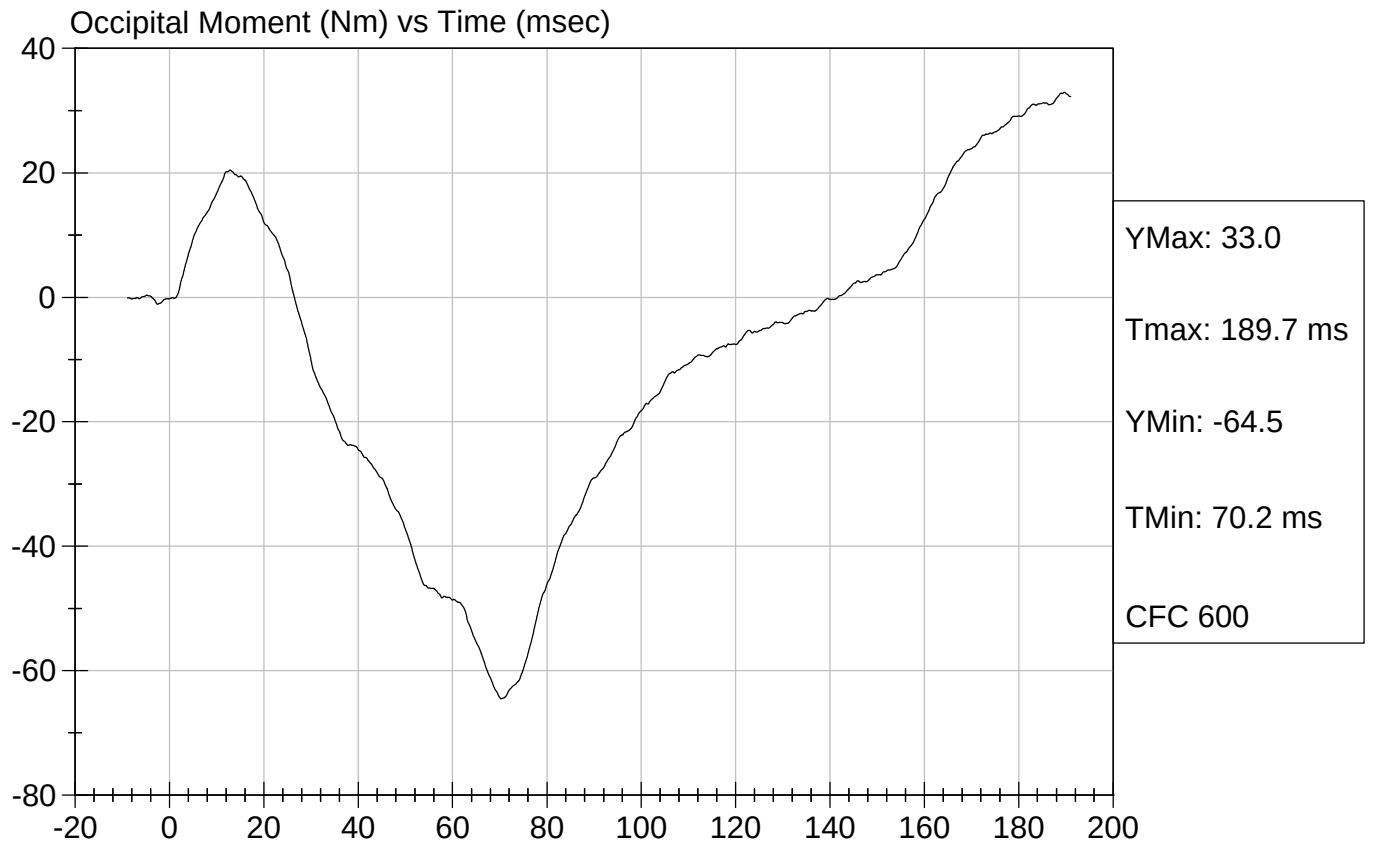
Neck Rotation (DEG) vs Time (msec)





Test Desc: Neck Extension
Component ID: D02473

Test Date: 3/21/02
Speed: 19.88 ft/sec, 6.06 m/sec



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

ATD Serial No: 066

Test I.D: D02484

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	29	Pass
Probe Velocity	m/s	6.58 to 6.82	6.69	Pass
Peak Probe Force	Newtons	5159 to 5893	5,715	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.64	Pass
Internal Hysteresis	%	69 to 85	73	Pass
Overall Test Results				Pass

Laboratory Technician

3/20/02
Test Date

Approved By

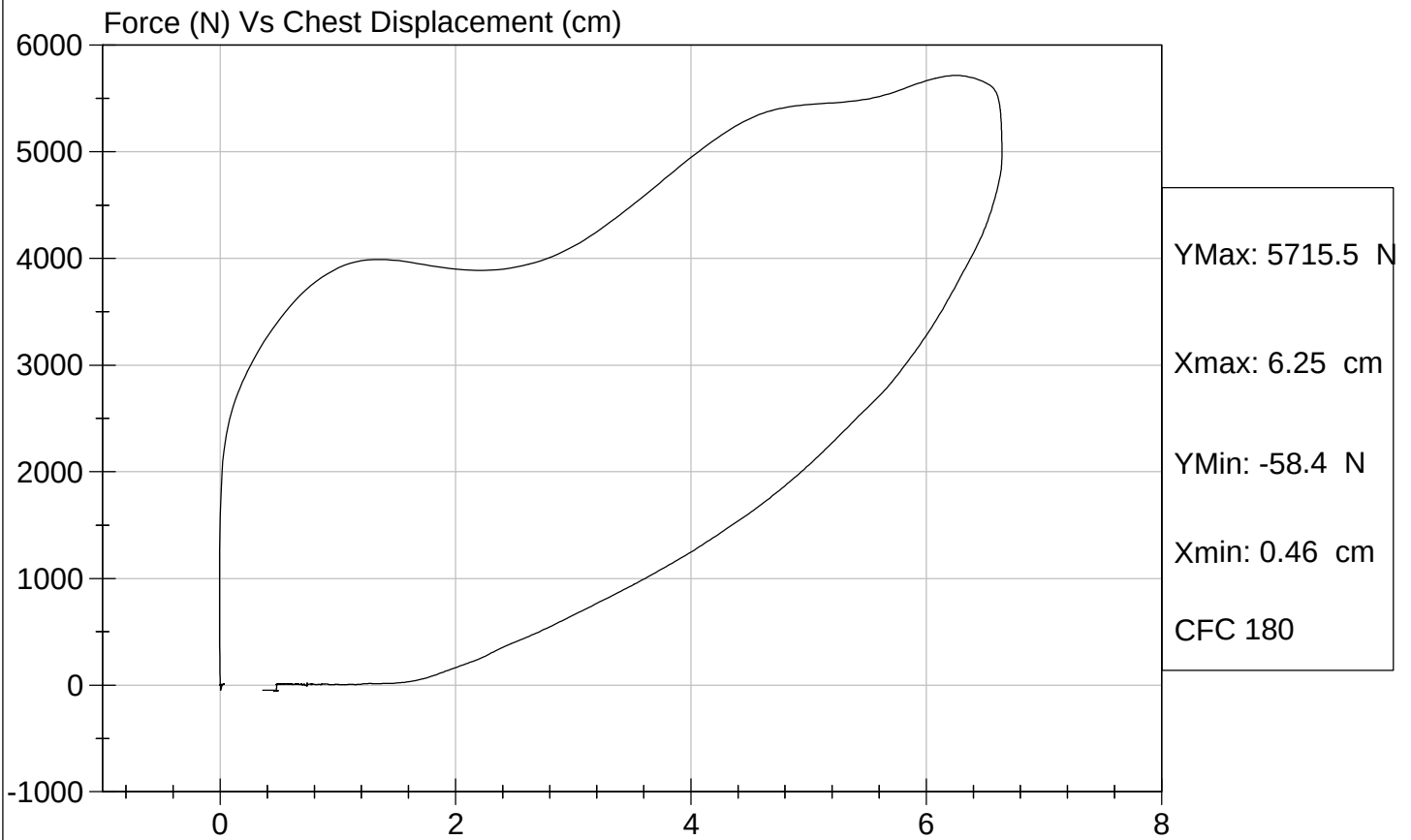


Test Description: Thorax Impact

Test Date: 3/20/02

Component: D02484

Speed: 21.95 ft/sec, 6.69 m/sec



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

ATD Serial No: 066

Test I.D: D02475

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	19	Pass
Probe Velocity	m/s	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5,192	Pass
Overall Test Results				Pass

Laboratory Technician

3/21/02
Test Date

Approved By

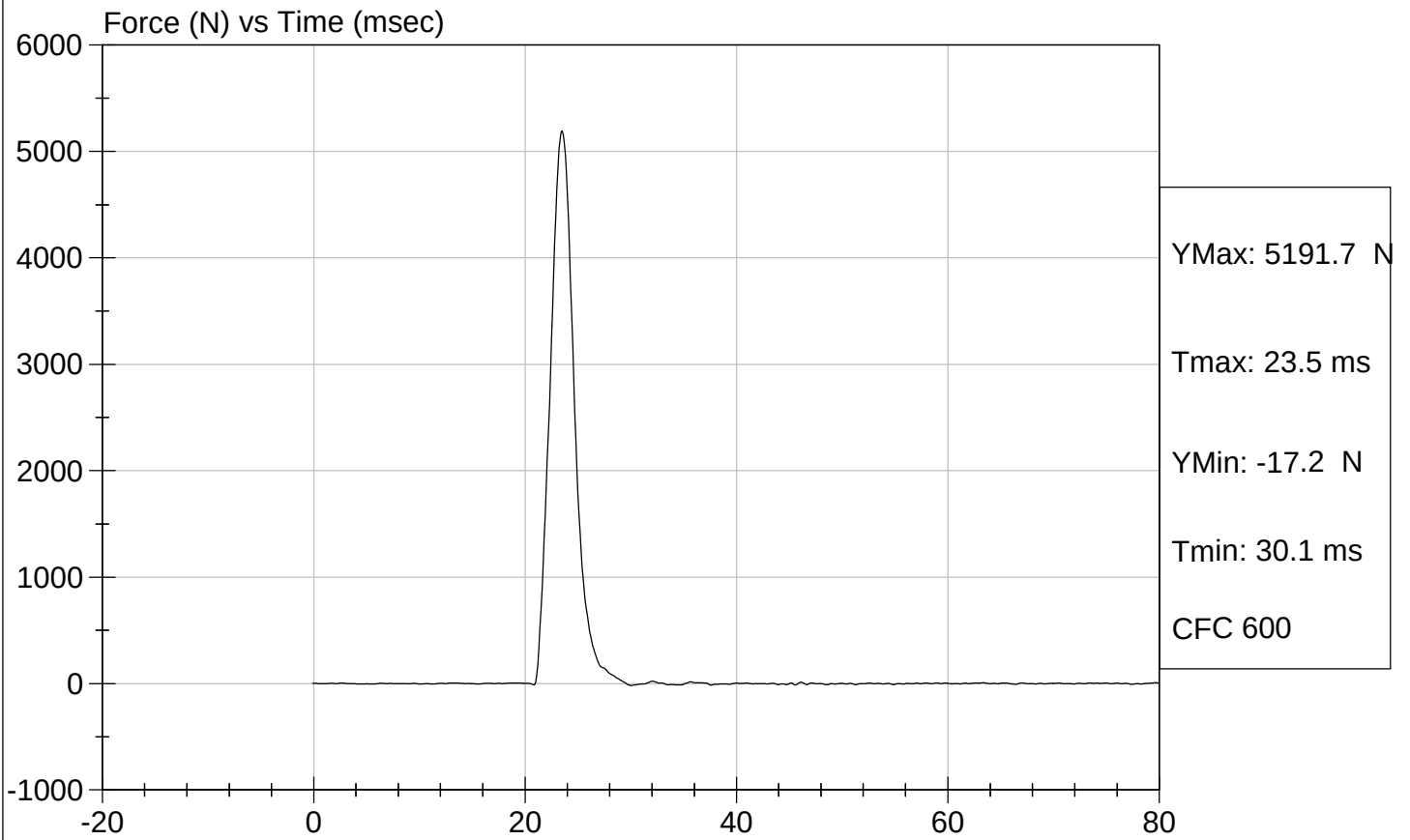


Test Description: Right Knee

Test Date: 3/21/02

Component: D02475

Speed: 6.87 ft/sec, 2.09 m/sec



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

ATD Serial No: 066

Test I.D: D02476

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	19	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	4,851	Pass
Overall Test Results				Pass

Laboratory Technician

3/21/02
Test Date

Approved By

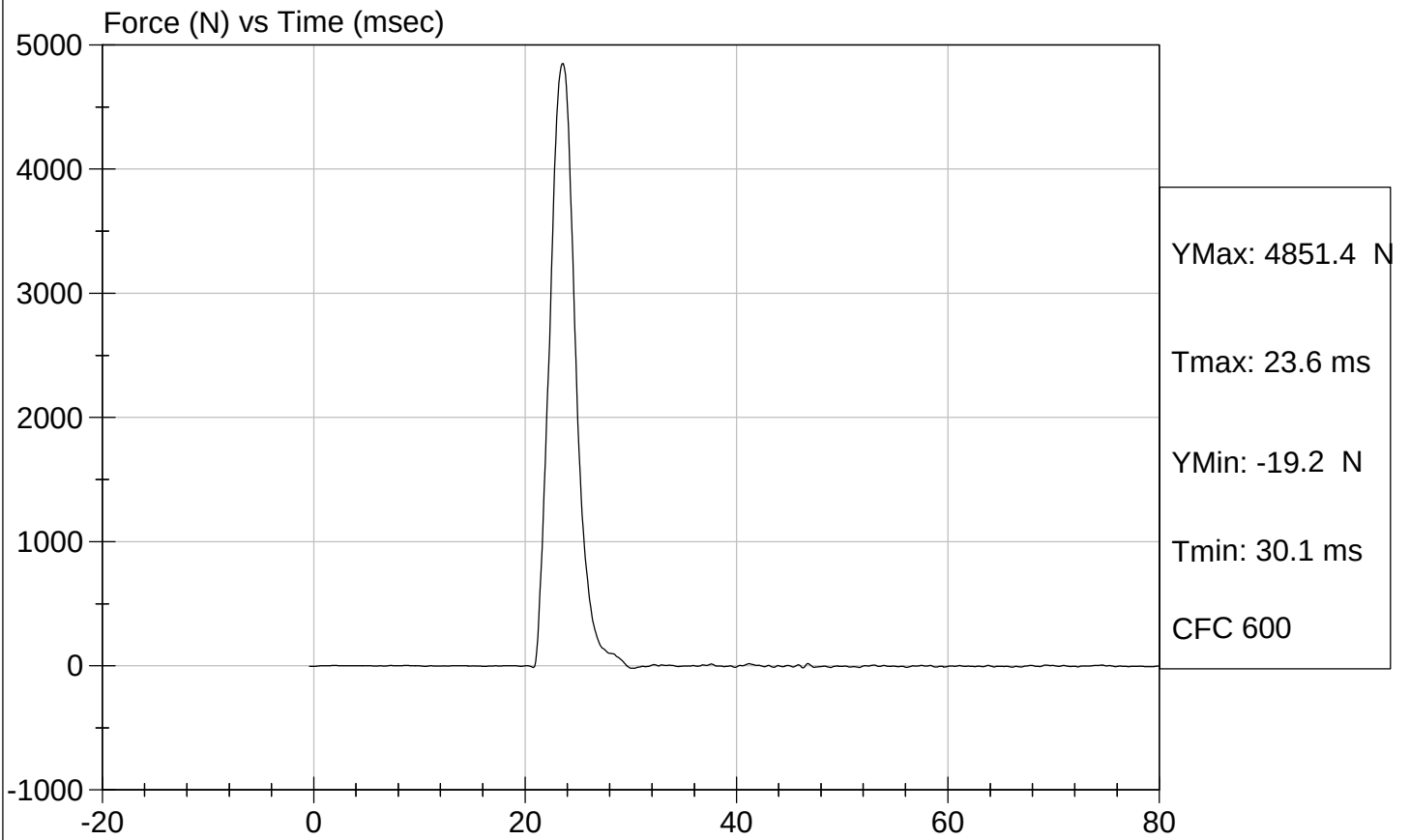


Test Description: Left Knee

Test Date: 3/21/02

Component: D02476

Speed: 6.89 ft/sec, 2.10 m/sec



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

ATD Serial No: 066

Test I.D: D02479/0

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.7	21.7	Pass
Laboratory Relative Humidity	%	10 to 70	19	19	Pass
Rotation Rate	deg/sec	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	79.9	71.8	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	45	44	Pass
Overall Test Results					Pass

Laboratory Technician

3/21/02
Test Date

Approved By

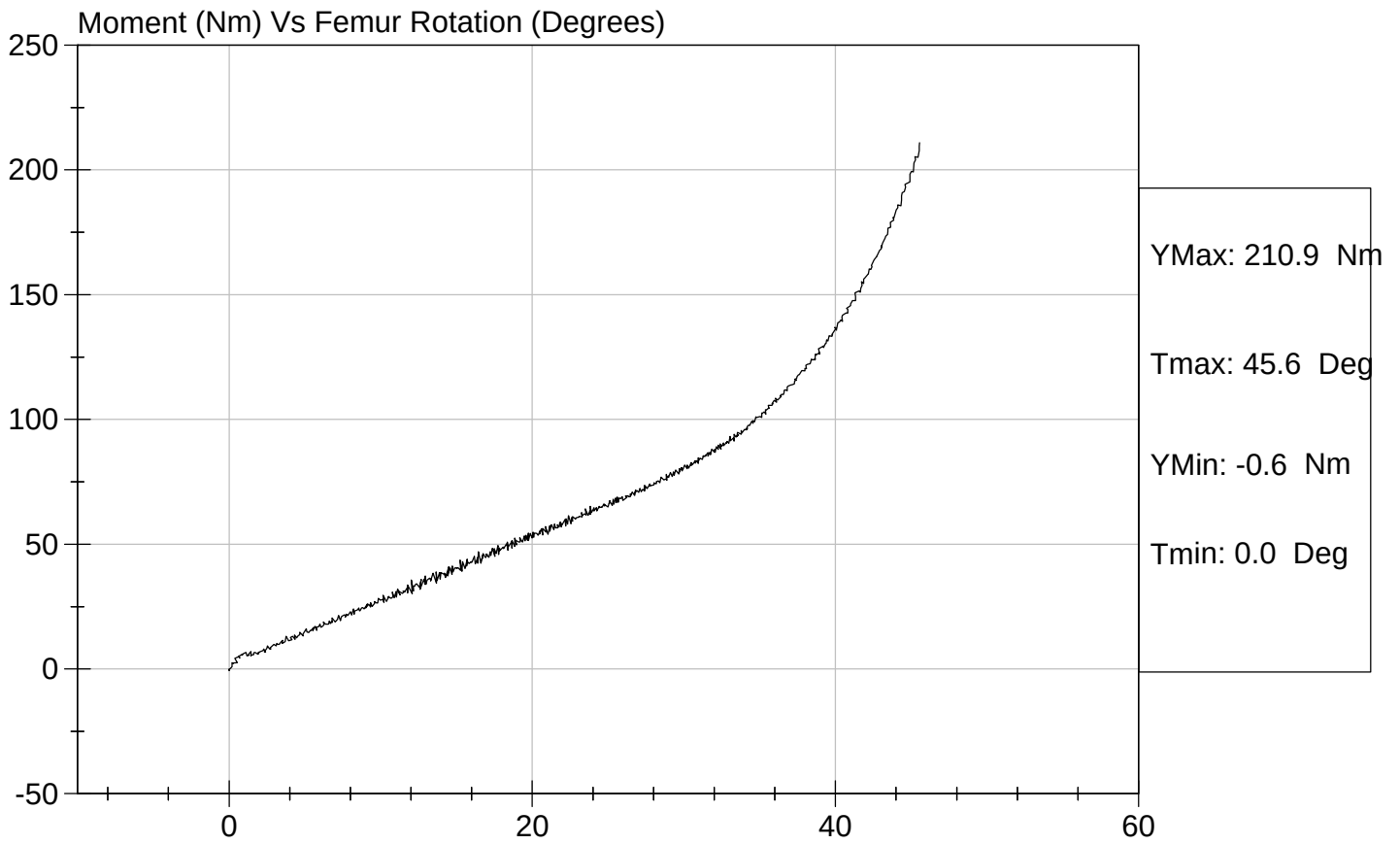


Test Description: Hip Femur Flexion

Test Date: 3/21/02

Component: D02479

Speed: 0.0 ft/sec, 0.0 m/sec



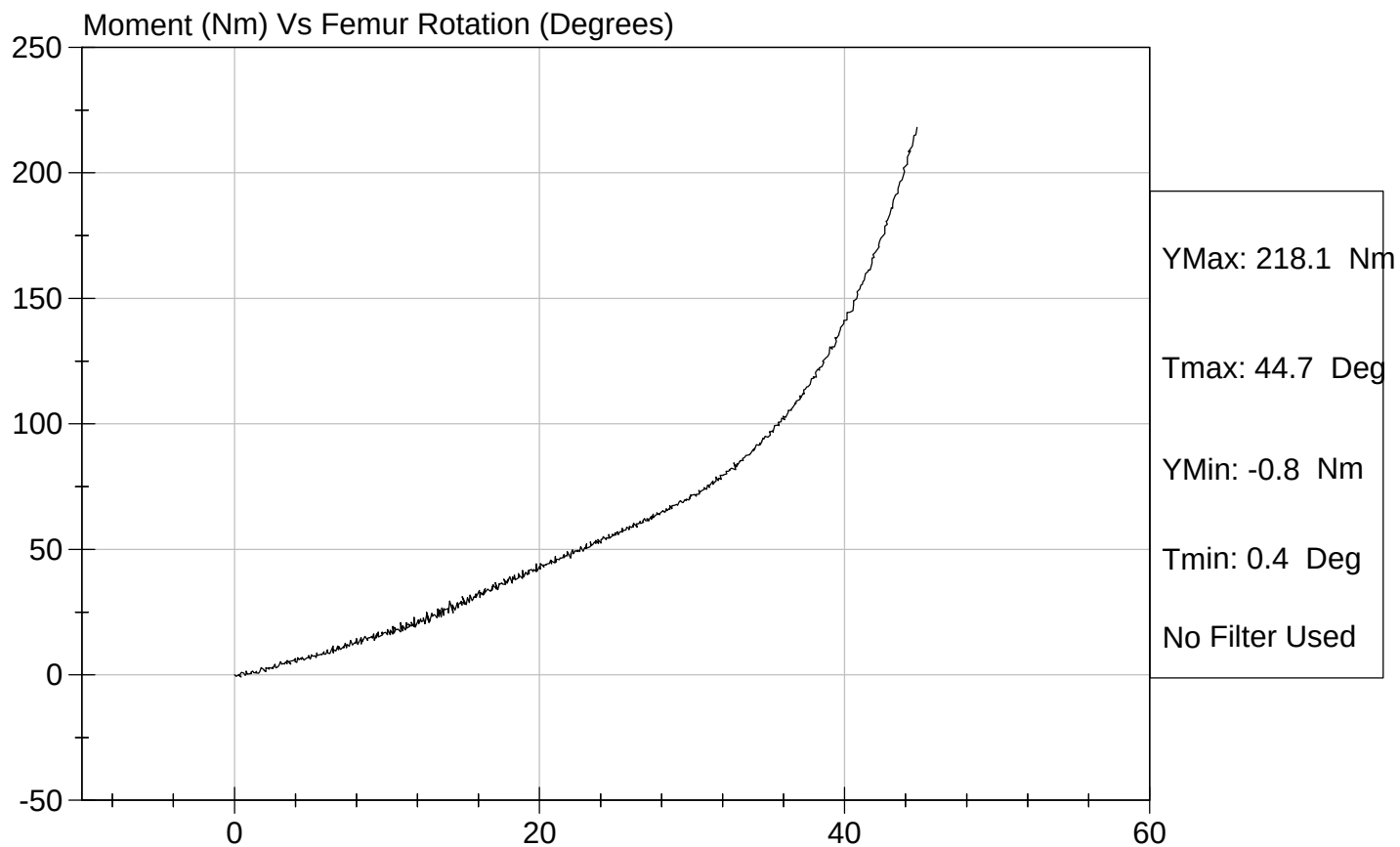


Test Description: Hip Femur Flexion

Test Date: 3/21/02

Component: D02470

Speed: 0 ft/sec, 0.00 m/sec



APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

INSTRUMENTS FOR DRIVER DUMMY NO. 65

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	ACCY6	Endevco	11/14/01
Head Y	J13941	Endevco	10/2/01
Head Z	AAMW5	Endevco	11/14/01
Head Y – Front	J20165	Endevco	11/15/01
Head Z – Front	J28708	Endevco	11/15/01
Head X – Left	J27513	Endevco	11/15/01
Head Z – Left	J23946	Endevco	11/15/01
Head X – Upper	J20580	Endevco	11/15/01
Head Y - Upper	J23914	Endevco	11/15/01
Head X Redundant	J18724	Endevco	11/15/01
Head Y Redundant	J14235	Endevco	11/15/01
Head Z Redundant	AJ5R0	Endevco	11/15/01
Neck Load Cell	442	Denton	3/15/02
Chest X	ACC78	Endevco	11/14/01
Chest Y	ACCE6	Endevco	11/14/01
Chest Z	ACCY3	Endevco	11/14/01
Chest Deflection Gauge	65	Servo	11/28/01
Chest X Redundant	J19927	Endevco	11/15/01
Chest Y Redundant	J14674	Endevco	11/15/01
Chest Z Redundant	J18736	Endevco	11/15/01
Pelvis X	J33416	Endevco	2/12/02
Pelvis Y	J13927	Endevco	10/2/01
Pelvis Z	AHTB2	Endevco	2/12/02
Left Femur Load Cell	945	Denton	1/17/02
Right Femur Load Cell	946	Denton	1/17/02
Left Upper Tibia Load Cell	105	Denton	11/19/01
Left Lower Tibia Load Cell	133	Denton	11/16/01
Right Upper Tibia Load Cell	103	Denton	11/19/01

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Right Lower Tibia Load Cell	134	Denton	11/19/01
Left Foot Z – Front	J13630	Endevco	2/12/02
Left Ankle X	J13938	Endevco	2/12/02
Left Ankle Z	ANAT6	Endevco	2/12/02
Right Foot Z – Front	AJ9J7	Endevco	11/16/01
Right Ankle X	AJ819	Endevco	11/16/01
Right Ankle Z	AJ7A2	Endevco	11/16/01
Shoulder Belt Load Cell	197	Denton	11/7/01
Lap Belt Load Cell	198	Denton	11/19/01

INSTRUMENTS FOR PASSENGER DUMMY NO. 66

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	AAMN8	Endevco	11/14/01
Head Y	ACC61	Endevco	11/14/01
Head Z	ACCW9	Endevco	11/14/01
Head Y – Front	APYY3	Endevco	10/2/01
Head Z – Front	J23774	Endevco	11/15/01
Head X – Left	J20382	Endevco	11/15/01
Head Z – Left	J28988	Endevco	11/15/01
Head X – Upper	J22036	Endevco	11/15/01
Head Y - Upper	J20569	Endevco	11/15/01
Head X Redundant	J19884	Endevco	11/15/01
Head Y Redundant	J21988	Endevco	11/15/01
Head Z Redundant	J28986	Endevco	11/15/01
Neck Load Cell	443	Denton	1/24/02
Chest X	ACCY1	Endevco	11/14/01
Chest Y	ACCC8	Endevco	11/14/01
Chest Z	ACCT7	Endevco	11/14/01
Chest Deflection Gauge	66	Servo	11/28/01
Chest X Redundant	J19927	Endevco	11/15/01
Chest Y Redundant	J14674	Endevco	11/15/01
Chest Z Redundant	J18736	Endevco	11/15/01
Pelvis X	J13530	Endevco	2/11/02
Pelvis Y	J13535	Endevco	2/11/02
Pelvis Z	AP2E1	Endevco	2/12/02
Left Femur Load Cell	261	Denton	11/30/01
Right Femur Load Cell	262	Denton	11/30/01
Left Upper Tibia Load Cell	109	Denton	11/19/01
Left Lower Tibia Load Cell	138	Denton	11/16/01
Right Upper Tibia Load Cell	106	Denton	11/19/01

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Right Lower Tibia Load Cell	135	Denton	11/16/01
Left Foot Z – Front	AHWK8	Endevco	11/16/01
Left Ankle X	AH0D1	Endevco	11/16/01
Left Ankle Z	AH0M0	Endevco	11/16/01
Right Foot Z – Front	J21612	Endevco	11/16/01
Right Ankle X	J22034	Endevco	11/16/01
Right Ankle Z	J21724	Endevco	11/16/01
Shoulder Belt Load Cell	192	Denton	11/7/01
Lap Belt Load Cell	191	Denton	11/7/01

INSTRUMENTS FOR VEHICLE AND LABORATORY

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Rear Seat Crossmember X	G13-F15	Entran	3/6/02
Left Rear Seat Crossmember Z	K21-N18	Entran	1/17/02
Right Rear Seat Crossmember X	K21-N15	Entran	3/1/02
Right Rear Seat Crossmember Z	G13-F02	Entran	3/1/02
Top of Engine X	I12-F16	Entran	10/29/01
Bottom of Engine X	K21-N22	Entran	1/17/02
Left Brake Caliper X	K21-N01	Entran	12/11/01
Right Brake Caliper X	K21-N20	Entran	1/17/02
Instrument Panel X	G13-B07	Entran	1/16/02

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

APPENDIX E

VEHICLE OWNER'S MANUAL OCCUPANT RESTRAINT INSTRUCTIONS

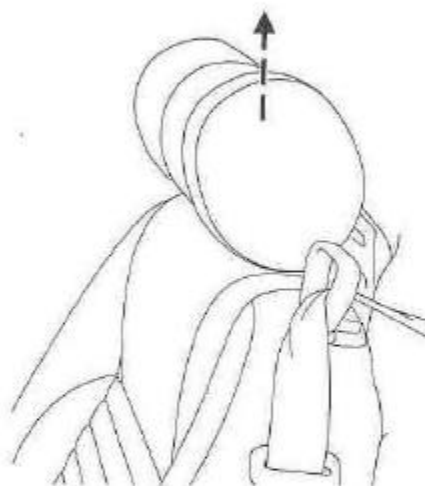
Seating and Safety Restraints

SEATING

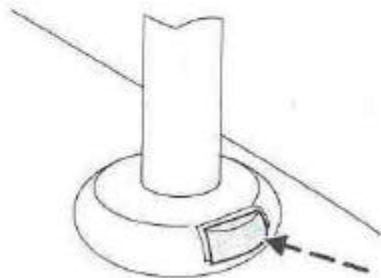
Adjustable head restraints (if equipped)

Your vehicle's seats may be equipped with head restraints which are vertically adjustable. The purpose of these head restraints is to help limit head motion in the event of a rear collision. To properly adjust your head restraints, lift the head restraint so that it is located directly behind your head or as close to that position as possible. Refer to the following to raise and lower the head restraints.

The head restraints can be moved up and down.



Push control to lower head restraint.

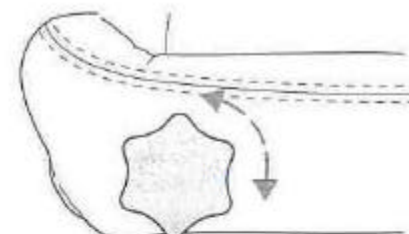


Seating and Safety Restraints

Using the manual lumbar support

The lumbar control is located on the front of the driver's seat cushion.

Turn to adjust lumbar support.



Using the manual recline function (if equipped)



Never adjust the driver's seat or seatback when the vehicle is moving.



Do not pile cargo higher than the seatbacks to avoid injuring people in a collision or sudden stop.



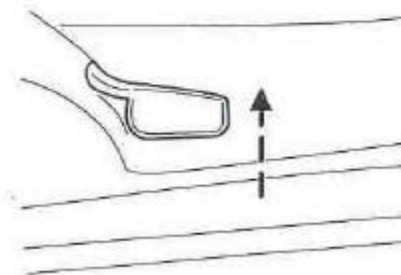
The driver and passenger seat must be in the upright position and the lap belt must be snug and low across the hips while the vehicle is moving.



Reclining the seatback can reduce the effectiveness of the seat's safety belt in the event of a collision.

To adjust the front seatback using the manual recliner:

- Lift and hold the handle located on the side of the seat.
- Lean against the seatback to adjust it to your desired position. You can recline the seat back or bring it forward.
- Release the handle when the desired position has been reached.



Seating and Safety Restraints

Adjusting the driver's power seat

⚠ Never adjust the driver's seat or seatback when the vehicle is moving.

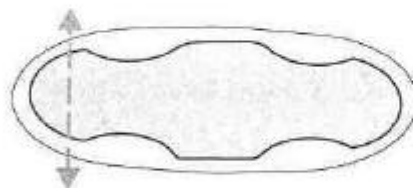
⚠ Do not pile cargo higher than the seatbacks to avoid injuring people in a collision or sudden stop.

⚠ The driver and passenger seat must be in the upright position and the lap belt must be snug and low across the hips while the vehicle is moving.

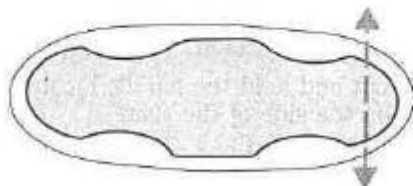
⚠ Reclining the seatback can reduce the effectiveness of the seat's safety belt in the event of a collision.

The seat position control is located on the outboard side of the seat cushion.

Press front to raise or lower the front portion of the seat cushion.

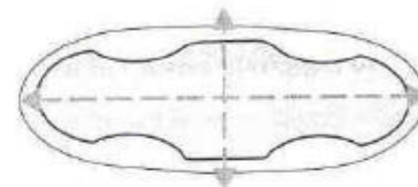


Press rear to raise or lower the rear portion of the seat cushion.



Seating and Safety Restraints

Press the control to move the seat forward, backward, up or down.



Adjusting the passenger's power seat

⚠ Do not pile cargo higher than the seatbacks to avoid injuring people in a collision or sudden stop.

⚠ The driver and passenger seat must be in the upright position and the lap belt must be snug and low across the hips while the vehicle is moving.

⚠ Reclining the seatback can reduce the effectiveness of the seat's safety belt in the event of a collision.

The control is located on the outboard side of the seat cushion.
Press the control to move the seat forward or backward.



Seating and Safety Restraints

SAFETY RESTRAINTS

Safety restraints precautions

-  The driver and passenger seat must be in the upright position and the lap belt must be snug and low across the hips while the vehicle is moving.
-  To reduce the risk of injury, make sure children sit where they can be properly restrained.
-  Never let a passenger hold a child on his or her lap while the vehicle is moving. The passenger cannot protect the child from injury in a collision.
-  All occupants of the vehicle, including the driver, should always properly wear their safety belts, even when an air bag (SRS) is provided.
-  It is extremely dangerous to ride in a cargo area, inside or outside of a vehicle. In a collision, people riding in these areas are more likely to be seriously injured or killed. Do not allow people to ride in any area of your vehicle that is not equipped with seats and safety belts. Be sure everyone in your vehicle is in a seat and using a safety belt properly.
-  In a rollover crash, an unbelted person is significantly more likely to die than a person wearing a safety belt.
-  Each seating position in your vehicle has a specific safety belt assembly which is made up of one buckle and one tongue that are designed to be used as a pair. 1) Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. 2) Never swing the safety belt around your neck over the inside shoulder. 3) Never use a single belt for more than one person.

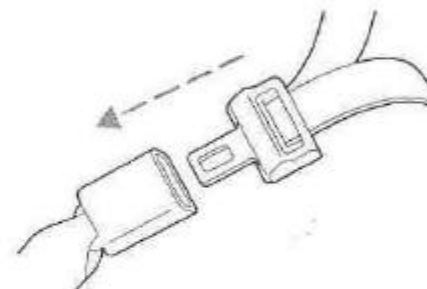
Seating and Safety Restraints

Combination lap and shoulder belts

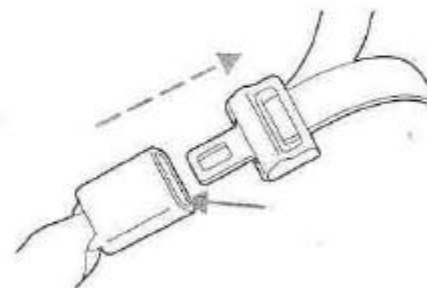
Before fastening the safety belt, make sure the shoulder belt passes through the belt holder on the top of the seatback.



1. Insert the belt tongue into the proper buckle (the buckle closest to the direction the tongue is coming from) until you hear a snap and feel it latch. Make sure the tongue is securely fastened in the buckle.



2. To unfasten, push the release button and remove the tongue from the buckle.



Seating and Safety Restraints

Energy Management Feature

The safety belts in the vehicle are combination lap and shoulder belts.

- This vehicle has a seat belt system with an energy management feature at the front outboard seating positions to help further reduce the risk of injury in the event of a head-on collision.
- This seat belt system has a retractor assembly that is designed to pay out webbing in a controlled manner. This feature is designed to help reduce the belt force acting on the occupant's chest.

! After any vehicle collision, the seat belt system at all passenger seating positions must be checked by a qualified technician to verify that the "automatic locking retractor" feature for child seats is still functioning properly. In addition, all seat belts should be checked for proper function.

! BELT AND RETRACTOR ASSEMBLY MUST BE REPLACED if the seat belt assembly "automatic locking retractor" feature or any other seat belt function is not operating properly when checked according to the procedures in Workshop Manual.

! Failure to replace the Belt and Retractor assembly could increase the risk of injury in collisions.

Vehicle sensitive mode

The safety restraints in the vehicle are combination lap and shoulder belts. The safety belts have two types of locking modes described below.

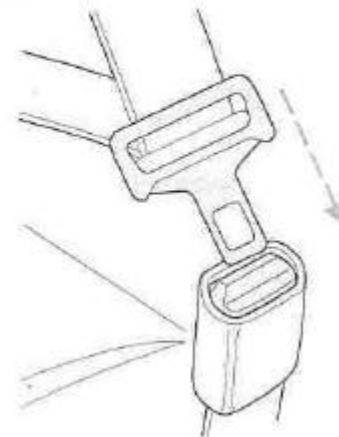
The vehicle sensitive mode is the normal retractor mode, allowing free shoulder belt length adjustment to your movements and locking in response to vehicle movement. For example, if the driver brakes suddenly or turns a corner sharply, or the vehicle receives an impact of approximately 8 km/h (5 mph) or more, the combination safety belts will lock to help reduce forward movement of the driver and passengers.

Seating and Safety Restraints

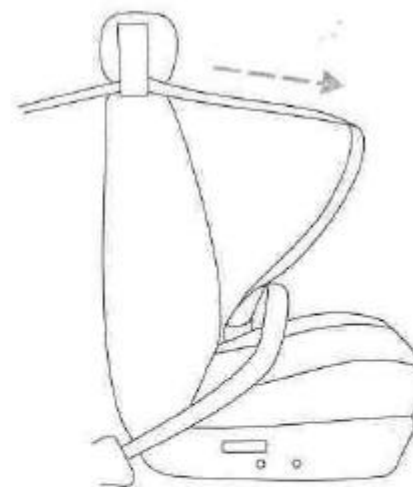
Automatic locking mode

How to use the automatic locking mode

- Buckle the combination lap and shoulder belt.



- Grasp the shoulder portion and pull downward until the entire belt is extracted.



- Allow the belt to retract. As the belt retracts, you will hear a clicking sound. This indicates the safety belt is now in the automatic locking mode.

Seating and Safety Restraints

In this mode, the shoulder belt is automatically pre-locked. The belt will still retract to remove any slack in the shoulder belt.

The automatic locking mode is not available on the driver safety belt.

When to use the automatic locking mode

- **Anytime** a child safety seat is installed in the vehicle. Refer to *Safety Restraints for Children* or *Safety Seats for Children* later in this chapter.

How to disengage the automatic locking mode

Disconnect the combination lap/shoulder belt and allow it to retract completely to disengage the automatic locking mode and activate the vehicle sensitive (emergency) locking mode.

 After any vehicle collision, the seat belt system at all passenger seating positions must be checked by a qualified technician to verify that the "automatic locking retractor" feature for child seats is still functioning properly, in addition to other checks for proper seat belt system function.

 **BELT AND RETRACTOR ASSEMBLY MUST BE REPLACED** if the seat belt assembly "automatic locking retractor" feature or any other seat belt function is not operating properly. In addition, all seat belts should be checked for proper function.

 Failure to replace the belt and retractor assembly could increase the risk of injury in collisions.

Safety belt pretensioner

Your vehicle is equipped with safety belt pretensioners at the driver and front passenger seating positions.

The safety belt pretensioner is a device which removes excess webbing from the safety belt system. The safety belt pretensioner uses the same crash sensor system as the front air bag supplemental restraint system (SRS). When the safety belt pretensioner deploys, webbing from the lap and shoulder belt is tightened. The driver and front passenger seat belt system (including retractors, buckles and height adjusters) must be replaced if the vehicle is involved in a collision that results in

Seating and Safety Restraints

deployment of front air bags and safety belt pretensioners. Refer to the *Safety belt maintenance* section in this chapter.

 Failure to replace the safety belt assembly under the above conditions could result in severe personal injuries in the event of a collision.

Safety belt warning light and indicator chime

The seat belt warning light illuminates in the instrument cluster and a chime sounds to remind the occupants to fasten their safety belts.

Conditions of operation

If...	Then...
The driver's safety belt is not buckled before the ignition switch is turned to the RUN position...	The safety belt warning light illuminates 1-2 minutes and the warning chime sounds 4-8 seconds.
The driver's safety belt is buckled while the indicator light is illuminated and the warning chime is sounding...	The safety belt warning light and warning chime turn off.
The driver's safety belt is buckled before the ignition switch is turned to the RUN position...	The safety belt warning light and indicator chime remain off.

BeltMinder

The BeltMinder feature is a supplemental warning to the safety belt warning function. This feature provides additional reminders to the driver that the driver's safety belt is unbuckled by intermittently sounding a chime and illuminating the safety belt warning lamp in the instrument cluster.

Seating and Safety Restraints

If...	Then...
The driver's safety belt is not buckled before the vehicle has reached at least 5 km/h (3 mph) and 1-2 minutes have elapsed since the ignition switch has been turned to ON...	The BeltMinder feature is activated - the safety belt warning light illuminates and the warning chime sounds for 6 seconds every 30 seconds, repeating for approximately 5 minutes or until safety belt is buckled.
The driver's safety belt is buckled while the safety belt indicator light is illuminated and the safety belt warning chime is sounding...	The BeltMinder feature will not activate.
The driver's safety belt is buckled before the ignition switch is turned to the ON position...	The BeltMinder feature will not activate.

The purpose of the BeltMinder is to remind occasional wearers to wear safety belts all of the time.

The following are reasons most often given for not wearing safety belts: (All statistics based on U.S. data)

Reasons given...	Consider...
"Crashes are rare events"	36 700 crashes occur every day. The more we drive, the more we are exposed to "rare" events, even for good drivers. <i>1 in 4 of us will be seriously injured in a crash during our lifetime.</i>
"I'm not going far"	3 of 4 fatal crashes occur within 25 miles of home.
"Belts are uncomfortable"	We design our safety belts to enhance comfort. If you are uncomfortable - try different positions for the safety belt upper anchorage and seatback which should be as upright as possible; this can improve comfort.

Seating and Safety Restraints

Reasons given...	Consider...
"I was in a hurry"	Prime time for an accident. BeltMinder reminds us to take a few seconds to buckle up.
"Seat belts don't work"	Safety belts, when used properly, reduce risk of death to front seat occupants by 45% in cars , and by 60% in light trucks .
"Traffic is light"	Nearly 1 of 2 deaths occur in single-vehicle crashes , many when no other vehicles are around.
"Belts wrinkle my clothes"	Possibly, but a serious crash can do much more than wrinkle your clothes, particularly if you are unbelted.
"The people I'm with don't wear belts"	Set the example, teen deaths occur 4 times more often in vehicles with TWO or MORE people. Children and younger brothers/sisters imitate behavior they see.
"I have an air bag"	Air bags offer greater protection when used with safety belts. Frontal airbags are not designed to inflate in rear and side crashes or rollovers.
"I'd rather be thrown clear"	Not a good idea. People who are ejected are 40 times more likely to DIE. Safety belts help prevent ejection, WE CAN'T "PICK OUR CRASH".



Do not sit on top of a buckled safety belt to avoid the Belt Minder chime. Sitting on the safety belt will increase the risk of injury in an accident. To disable (one-time) or deactivate the Belt Minder feature please follow the directions stated below.

One time disable

Any time the safety belt is buckled and then unbuckled during an ignition ON cycle, BeltMinder will be disabled for that ignition cycle only.

Seating and Safety Restraints

Deactivating/activating the BeltMinder feature

Read steps 1 - 9 thoroughly before proceeding with the deactivation/activation programming procedure.

The BeltMinder feature can be deactivated/activated by performing the following procedure:

Before following the procedure, make sure that:

- The parking brake is set.
- The gearshift is in P (Park) (automatic transmission) or the neutral position (manual transmission).
- The ignition switch is in the OFF position.
- All vehicle doors are closed.
- The driver's safety belt is unbuckled.
- The parklamps are in OFF position.



To reduce the risk of injury, do not deactivate/activate the BeltMinder feature while driving the vehicle.

1. Turn the ignition switch to the RUN (or ON) position. (DO NOT START THE ENGINE.)
2. Wait until the safety belt warning light turns off. (Approximately 1-2 minutes.)
 - Steps 3-5 must be completed within 60 seconds or the procedure will have to be repeated.
3. Buckle then unbuckle the safety belt three times, ending with the safety belt unbuckled. This can be done before or during BeltMinder warning activation.
4. Turn on the parklamps, turn off the parklamps.
5. Buckle then unbuckle the safety belt three times, ending with the safety belt unbuckled.
 - After step 5 the safety belt warning light will be turned on for three seconds.
6. Within seven seconds of the safety belt warning light turning off, buckle then unbuckle the safety belt.
 - This will disable BeltMinder if it is currently enabled, or enable BeltMinder if it is currently disabled.

Seating and Safety Restraints

7. Confirmation of disabling BeltMinder is provided by the safety belt warning light flashing four times per second for three seconds.

8. Confirmation of enabling BeltMinder is provided by:

- The safety belt warning light flashing four times per second for three seconds.
- Followed by three seconds with the safety belt warning light off.
- Once again, the safety belt warning light will flash four times per second for three seconds.

9. After receiving confirmation, the deactivation/activation procedure is complete.

Safety belt extension assembly

If the safety belt is too short when fully extended, there is a 20 cm (8 inch) safety belt extension assembly that can be added (part number 611C22). This assembly can be obtained from your dealer at no cost.

Use only extensions manufactured by the same supplier as the safety belt. Manufacturer identification is located at the end of the webbing on the label. Also, use the safety belt extension only if the safety belt is too short for you when fully extended. Do not use extensions to change the fit of the shoulder belt across the torso.

Safety belt maintenance

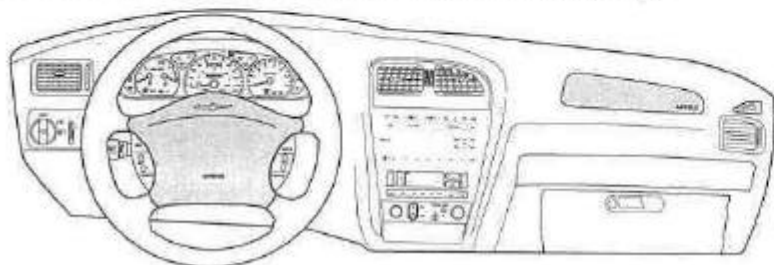
Inspect the safety belt systems periodically to make sure they work properly and are not damaged. Inspect the safety belts to make sure there are no nicks, tears or cuts. Replace if necessary. All safety belt assemblies, including retractors, buckles, front seat belt buckle assemblies, buckle support assemblies (slide bar-if equipped), shoulder belt height adjusters (if equipped), shoulder belt guide on seatback (if equipped), child safety seat tether bracket assemblies (if equipped), LATCH child seat tether anchors and lower anchors (if equipped), and attaching hardware, should be inspected after a collision. Ford recommends that all safety belt assemblies used in vehicles involved in a collision be replaced. However, if the collision was minor and a qualified technician finds that the belts do not show damage and continue to operate properly, they do not need to be replaced. Safety belt assemblies not in use during a collision should also be inspected and replaced if either damage or improper operation is noted.

Seating and Safety Restraints

 Failure to inspect and if necessary replace the safety belt assembly under the above conditions could result in severe personal injuries in the event of a collision.

Refer to *Cleaning and maintaining safety belts* in the *Cleaning* chapter.

AIR BAG SUPPLEMENTAL RESTRAINT SYSTEM (SRS)



Your vehicle is equipped with a crash sensing and diagnostic module which records information about the air bag and sensor systems. In the event of a collision this module may save information related to the collision including information about the air bag system and impact severity. This information will assist Ford Motor Company in the servicing vehicle and helping to better understand real world collisions and further improve the safety of future vehicles.

 The front passenger air bag is not designed to offer protection to occupants in the center front seating position.

Seating and Safety Restraints

Important supplemental restraint system (SRS) precautions

The supplemental restraint system is designed to work with the safety belt to help protect the driver and right front passenger from certain upper body injuries.

Air bags DO NOT inflate slowly or gently and the risk of injury from a deploying air bag is greatest close to the trim covering the air bag module.



 All occupants of the vehicle, including the driver, should always properly wear their safety belts, even when an air bag (SRS) is provided.

 National Highway Traffic Safety Administration (NHTSA) recommends a minimum distance of at least 25 cm (10 inches) between an occupant's chest and the driver air bag module.

 Never place your arm over the air bag module as a deploying air bag can result in serious arm fractures or other injuries.

Steps you can take to properly position yourself away from the air bag:

- Move your seat to the rear as far as you can while still reaching the pedals comfortably.
- Recline the seat slightly (one or two degrees) from the upright position.

 Do not put anything on or over the air bag module. Placing objects on or over the air bag inflation area may cause those objects to be propelled by the air bag into your face and torso causing serious injury.

 Do not attempt to service, repair, or modify the Air Bag Supplemental Restraint System or its fuses. See your Ford or Lincoln Mercury dealer.

Seating and Safety Restraints

! Modifications to the front end of the vehicle, including frame, bumper, front end body structure and tow hooks may affect the performance of the air bag sensors increasing the risk of injury. Do not modify the front end of the vehicle.

Children and air bags

For additional important safety information, read all information on safety restraints in this guide.

Children must always be properly restrained. Failure to follow these instructions may increase the risk of injury in a collision.



! Air bags can kill or injure a child in a child seat. **NEVER** place a rear-facing child seat in front of an active air bag. If you must use a forward-facing child seat in the front seat, move the seat all the way back and turn the passenger air bag off. Refer to *Passenger air bag ON/OFF switch* in this chapter of the owner's guide.

Seating and Safety Restraints

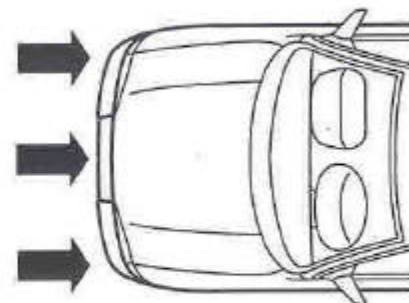
How does the safety belt pretensioner and air bag supplemental restraint system work?

The safety belt pretensioner and air bag SRS are designed to activate when the vehicle sustains longitudinal deceleration sufficient to cause the sensors to close an electrical circuit that initiates pretensioner activation and air bag inflation.

The fact that the pretensioners and air bags did not activate in a collision does not mean that something is wrong with the system. Rather, it means the forces were not of the type sufficient to cause activation. Front air bags and pretensioners are designed to activate in frontal and near-frontal collisions, not rollover, side-impact, or rear-impacts unless the collision causes sufficient longitudinal deceleration.

The air bags inflate and deflate rapidly upon activation. After air bag deployment, it is normal to notice a smoke-like, powdery residue or smell the burnt propellant. This may consist of cornstarch, talcum powder (to lubricate the bag) or sodium compounds (e.g., baking soda) that result from the combustion process that inflates the air bag. Small amounts of sodium hydroxide may be present which may irritate the skin and eyes, but none of the residue is toxic.

While the system is designed to help reduce serious injuries, contact with a deploying air bag may also cause abrasions, swelling or temporary hearing loss. Because air bags must inflate rapidly and with considerable force, there is the risk of death or serious injuries such as fractures, facial and eye injuries or internal injuries, particularly to occupants who are not properly restrained or are otherwise out of position at the time of air bag deployment. Thus, it is extremely important that occupants be properly restrained as far away from the air bag module as possible while maintaining vehicle control.



Seating and Safety Restraints



Several air bag system components get hot after inflation. Do not touch them after inflation.



If the air bag has deployed, **the air bag will not function again and must be replaced immediately.** If the air bag is not replaced, the unrepaired area will increase the risk of injury in a collision.

The SRS consists of:

- driver and passenger air bag modules (which include the inflators and air bags)
- side air bags (if equipped). Refer to *Side air bag system* later in this chapter
- safety belt pretensioners
- one or more impact and safing sensors
- a readiness light and tone
- and the electrical wiring which connects the components

The diagnostic module monitors its own internal circuits and the supplemental air bag electrical system warning (including the impact sensors), the system wiring, the air bag system readiness light, the air bag back up power, the air bag ignitors and safety belt pretensioners.

Determining if the system is operational

The SRS uses a readiness light in the instrument cluster or a tone to indicate the condition of the system. Refer to the *Air bag readiness* section in the *Instrument cluster* chapter. Routine maintenance of the air bag is not required.

Any difficulty with the system is indicated by one or more of the following:

- The readiness light will either flash or stay lit
- The readiness light will not illuminate immediately after ignition is turned to the RUN position



Seating and Safety Restraints

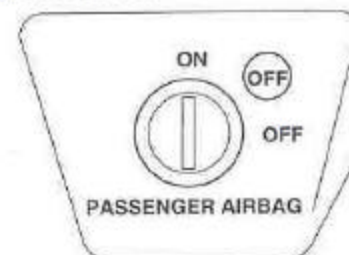
- A series of five beeps will be heard. The tone pattern will repeat periodically until the problem and/or light are repaired.

If any of these things happen, even intermittently, have the SRS serviced at your dealership or by a qualified technician immediately. Unless serviced, the system may not function properly in the event of a collision.

Passenger front and side air bag ON/OFF switch



An air bag ON/OFF switch has been installed in this vehicle. Before driving, *always* look at the face of the switch to be sure the switch is in the proper position in accordance with these instructions and warnings. Failure to put the switch in a proper position can increase the risk of serious injury or death in a collision.



Turning the passenger front and side air bags off

1. Insert the ignition key, turn the switch to OFF position and hold in OFF position while removing the key.
2. When the ignition is turned to the ON position the OFF light illuminates briefly, momentarily shuts off and then turns back on. This indicates that the passenger front and side air bags are deactivated.



If the light fails to illuminate when the front and side passenger air bag switch is in the OFF position and the ignition switch is in ON, have the front and side passenger air bag switch serviced at your Ford or Lincoln-Mercury dealer.

Seating and Safety Restraints

! In order to avoid inadvertent activation of the switch, always remove the ignition key from the front and side passenger air bag ON/OFF switch.

Turning the front and side passenger air bags back on

The front and side passenger air bags remain OFF until you turn them back ON.

1. Insert the ignition key and turn the switch to ON.
2. The OFF light will briefly illuminate when the ignition is turned to ON. This indicates that the passenger front and side air bags are operational.



! If the light is illuminated when the front and side passenger air bag ON/OFF switch is in the ON position and the ignition switch is in ON, have the front and side passenger air bag ON/OFF switch serviced at your Ford or Lincoln-Mercury dealer immediately.

The front passenger air bag and the passenger side air bag should always be ON (the air bag OFF light should *not* be illuminated) unless the passenger is a person who meets the requirements stated either in Category 1, 2 or 3 of the NHTSA/Transport Canada deactivation criteria which follows.

! The safety belts for the driver and right front passenger seating positions have been specifically designed to function together with the air bags in certain types of crashes. When you turn OFF your air bag, you not only lose the protection of the air bag, you also may reduce the effectiveness of your safety belt system, which was designed to work with the air bag. If you are not a person who meets the requirements stated in the NHTSA/Transport Canada deactivation criteria turning OFF the air bag can increase the risk of serious injury or death in a collision.

Seating and Safety Restraints

! Always use safety belts and child restraints properly. If a child in a rear facing infant seat must be transported in front, the passenger air bag *must* be turned OFF. This is because the back of the infant seat is too close to the inflating air bag and the risk of a fatal injury to the infant when the air bag inflates is substantial.

The vast majority of drivers and passengers are much safer with an air bag than without. To do their job and reduce the risk of life threatening injuries, air bags must open with great force, and this force can pose a potentially deadly risk in some situations, particularly when a front seat occupant is not properly buckled up. The most effective way to reduce the risk of unnecessary air bag injuries, without reducing the overall safety of the vehicle, is to make sure all occupants are properly restrained in the vehicle, especially in the front seat. This provides the protection of safety belts and permits the air bags to provide the additional protection they were designed to provide. If you choose to deactivate your air bag, you are losing the very significant risk reducing benefits of the air bag and you are also reducing the effectiveness of the safety belts, because safety belts in modern vehicles are designed to work as a safety system with the air bags.

Read all air bag Warning labels in the vehicle as well as the other important air bag instructions and Warnings in this Owner's Guide.

NHTSA deactivation criteria (excluding Canada)

1. **Infant.** An infant (less than 1 year old) must ride in the front seat because:
 - the vehicle has no rear seat, or
 - the vehicle has a rear seat too small to accommodate a rear-facing infant seat, or
 - the infant has a medical condition which, according to the infant's physician, makes it necessary for the infant to ride in the front so that the driver can constantly monitor the child's condition.
2. **Child age 1 to 12.** A child age 1 to 12 must ride in the front seat because:
 - the vehicle has no rear seat, or
 - although children ages 1 to 12 ride in the rear seat(s) whenever possible, children ages 1 to 12 sometimes must ride in the front because no space is available in the rear seat(s) of the vehicle, or

Seating and Safety Restraints

- the child has a medical condition which, according to the child's physician, makes it necessary for the child to ride in the front seat so that the driver can constantly monitor the child's condition.

3. Medical condition. A passenger has a medical condition which, according to his or her physician:

- causes the passenger air bag to pose a special risk for the passenger and
- makes the potential harm from the passenger air bag in a crash greater than the potential harm from turning OFF the air bag and allowing the passenger, even if belted, to hit the dashboard or windshield in a crash.

 This vehicle has special energy management safety belts for the driver and/or right front passenger. These particular belts are specifically designed to work with air bags to help reduce the risk of injury in a collision. The energy management safety belt is designed to give or release additional belt webbing in some accidents to reduce concentration of force on an occupant's chest and reduce the risk of certain bone fractures and injuries to underlying organs. In a crash, if the air bag is turned OFF, this energy management safety belt might permit the person wearing the belt to move forward enough to incur a serious or fatal injury. The more severe the crash, and the heavier the occupant, the greater the risk is. Be sure the air bag is turned ON for any person who does not qualify under the NHTSA deactivation criteria.

Transport Canada deactivation criteria (Canada Only)

- Infant:** An infant (less than 1 year old) must ride in the front seat because:
 - my vehicle has no rear seat, or
 - the rear seat in my vehicle cannot accommodate a rear-facing infant seat, or
 - the infant has a medical condition which, according to the infant's physician, makes it necessary for the infant to ride in the front seat so that the driver can monitor the infant's condition.
- Child age 12 or under:** A child age 12 or under must ride in the front seat because:
 - my vehicle has no rear seat, or

Seating and Safety Restraints

- although children age 12 and under ride in the rear seat whenever possible, children age 12 and under have no option but to sometimes ride in the front seat because rear seat space is insufficient, or
- the child has a medical condition that, according to the child's physician, makes it necessary for the child to ride in the front seat so that the driver can monitor the child's condition.

3. Medical condition: A passenger has a medical condition that, according to his or her physician:

- poses a special risk for the passenger if the air bag deploys and
- makes the potential harm from the passenger air bag deployment greater than the potential harm from turning OFF the air bag and experiencing a crash without the protection offered by the air bag

 This vehicle has special energy management safety belts for the driver and/or right front passenger. These particular belts are specifically designed to work with air bags to help reduce the risk of injury in a collision. The energy management safety belt is designed to give or release additional belt webbing in some accidents to reduce concentration of force on an occupant's chest and reduce the risk of certain bone fractures and injuries to underlying organs. In a crash, if the air bag is turned OFF, this energy management safety belt might permit the person wearing the belt to move forward enough to incur a serious or fatal injury. The more severe the crash, and the heavier the occupant, the greater the risk is. Be sure the air bag is turned ON for any person who does not qualify under the Transport Canada deactivation criteria.

Side air bag system

 Do not place objects or mount equipment on or near the air bag cover on the side of the seatbacks of the front seats or in front seat areas that may come into contact with a deploying air bag. Failure to follow these instructions may increase the risk of personal injury in the event of a collision.

 Do not use accessory seat covers. The use of accessory seat covers may prevent the deployment of the side air bags and increase the risk of injury in an accident.

Seating and Safety Restraints

 Do not lean your head on the door. The side air bag could injure you as it deploys from the side of the seatback.

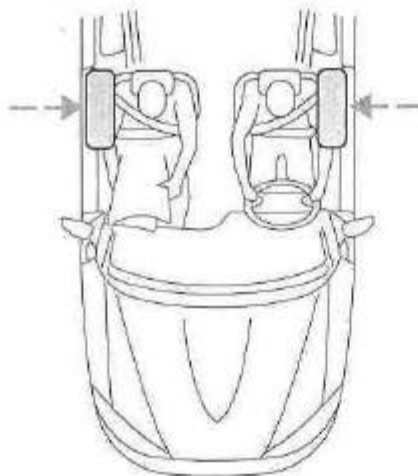
 Do not attempt to service, repair, or modify the air bag supplemental restraint system, its fuses or the seat cover on a seat containing an air bag. See your Ford or Lincoln Mercury dealer.

 All occupants of the vehicle including the driver should always wear their safety belts even when an air bag SRS is provided.

How does the side air bag system work?

The side air bag system consists of the following:

- An inflatable nylon bag (air bag) with a gas generator concealed behind the outboard bolster of the driver and front passenger seatbacks.
- A special seat cover designed to allow air bag deployment.
- The same warning light, electronic control and diagnostic unit as used for the front air bags.
- Two crash sensors located under the outboard side of the front seats, attached near the floor.



Side air bags, in combination with seat belts, can help reduce the risk of severe injuries in the event of a significant side impact collision.

The side air bags are fitted on the outboard side of the seatbacks of the front seats. In certain lateral collisions, the air bag on the side affected by the collision will be inflated, even if the respective seat is not occupied. The air bag was designed to inflate between the door panel and occupant to further enhance the protection provided occupants in side impact collisions.

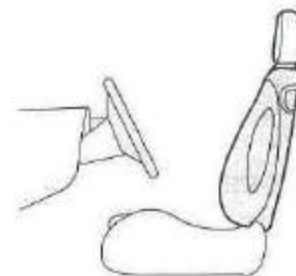
Seating and Safety Restraints

The air bag SRS is designed to activate when the vehicle sustains lateral deceleration sufficient to cause the sensors to close an electrical circuit that initiates air bag inflation.

The fact that the air bags did not inflate in a collision does not mean that something is wrong with the system. Rather, it means the forces were not of the type sufficient to cause activation. Side air bags are designed to inflate in side-impact collisions, not roll-over, rear-impact, frontal or near-frontal collisions, unless the collision causes sufficient lateral deceleration.

 Several air bag system components get hot after inflation. Do not touch them after inflation.

 If the side air bag has deployed, the air bag will not function again. The side air bag system (including the seat) must be inspected and serviced by a qualified technician in accordance with the vehicle service manual. If the air bag is not replaced, the unrepaired area will increase the risk of injury in a collision.



Determining if the system is operational

The SRS uses a readiness light in the instrument cluster or a tone to indicate the condition of the system. Refer to the *Air bag readiness* section in the *Instrument cluster* chapter. Routine maintenance of the air bag is not required.

Any difficulty with the system is indicated by one or more of the following:

- The readiness light (same light as used for front air bag system) will either flash or stay lit.

Seating and Safety Restraints

- The readiness light will not illuminate immediately after ignition is turned to the RUN position.
- A series of five beeps will be heard. The tone pattern will repeat periodically until the problem and light are repaired.

If any of these things happen, even intermittently, have the SRS serviced at your dealership or by a qualified technician immediately. Unless serviced, the system may not function properly in the event of a collision.

Disposal of air bags and air bag equipped vehicles (including pretensioners)

For disposal of air bags or air bag equipped vehicles, see your local dealership or qualified technician. Air bags **MUST BE** disposed of by qualified personnel.

SAFETY RESTRAINTS FOR CHILDREN

See the following sections for directions on how to properly use safety restraints for children. Also see *Air bag supplemental restraint system (SRS)* in this chapter for special instructions about using air bags.

Important child restraint precautions

You are required by law to use safety restraints for children in the U.S. and Canada. If small children ride in your vehicle (generally children who are four years old or younger and who weigh 18 kg [40 lbs] or less), you must put them in safety seats made especially for children. Check your local and state or provincial laws for specific requirements regarding the safety of children in your vehicle.

 Never let a passenger hold a child on his or her lap while the vehicle is moving. The passenger cannot protect the child from injury in a collision.

Always follow the instructions and warnings that come with any infant or child restraint you might use.

Children and safety belts

If the child is the proper size, restrain the child in a safety seat.

Children who are too large for child safety seats (as specified by your child safety seat manufacturer) should always wear safety belts.

Seating and Safety Restraints

Follow all the important safety restraint and air bag precautions that apply to adult passengers in your vehicle.

If the shoulder belt portion of a combination lap and shoulder belt can be positioned so it does not cross or rest in front of the child's face or neck, the child should wear the lap and shoulder belt. Moving the child closer to the center of the vehicle may help provide a good shoulder belt fit.

 Do not leave children, unreliable adults, or pets unattended in your vehicle.

To improve the fit of lap and shoulder belts on children who have outgrown child safety seats, Ford recommends use of a belt-positioning booster seat that is labelled as conforming to all applicable Federal motor vehicle safety standards. Belt-positioning booster seats raise the child and provide a shorter, firmer seating cushion that encourages safer seating posture and better fit of lap and shoulder belts on the child.

A belt-positioning booster seat should be used if the shoulder belt rests in front of the child's face or neck, or if the lap belt does not fit snugly on both thighs, or if the thighs are too short to let the child sit all the way back on the seat cushion when the lower legs hang over the edge of the seat cushion. You may wish to discuss the special needs of your child with your pediatrician.

SAFETY SEATS FOR CHILDREN



Child and infant or child safety seats

Use a safety seat that is recommended for the size and weight of the child. Carefully follow all of the manufacturer's instructions with the safety seat you put in your vehicle. If you do not install and use the safety seat properly, the child may be injured in a sudden stop or collision.