REPORT NUMBER: NCAP-MGA-2004-007

NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST

Ford Motor Company
2004 Ford F-150 Supercab
NHTSA NUMBER: M40203

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

Test Date: January 20, 2004

Report Date: February 20, 2004

FINAL REPORT

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

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FINAL REPORT ACCEPTED BY:

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_____
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COTR, NCAP Frontal Impact Program

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Date of Acceptance

Technical Report Documentation Page

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16. Abstract

A 35.1 mph (56.5 km/h) frontal barrier impact was conducted on a 2004 Ford F-150 Supercab at MGA Research Corporation on January 20, 2004. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and foot well intrusion performance. The impact velocity was 56.5 km/h. The ambient temperature at the barrier face at the time of impact was 21 degrees Celsius. The vehicle's maximum post test static crush is 602 mm located at 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:

Measurement Description	Units	Threshold	Driver ATD	Pass. ATD
Head Injury Criteria (HIC)	N/A	1000	493	617
Max. Thorax Accel. (3msec Clip)	G's	60	38	34
Left Femur Force	Newton	10009	-4735	-2743
Right Femur Force	Newton	10009	-4167	-4089

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SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

This 56.5 km/h 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 2004 Ford F-150 Supercab at a velocity of 56.5 kph. The test was performed at MGA Research Corporation on January 20, 2004. Pre-and post-test photographs of the vehicle and dummies can be found in Appendix A.

One real-time camera and sixteen 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 head, chest and pelvis tri-axial accelerometers, chest displacement potentiometer, upper neck transducers, right/left femur load cells, and lower leg instrumentation. 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 161 channels of data were recorded on an on-board data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces.

There was 100 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 602 mm and both the driver and passenger side doors remained closed and latched during the impact event and were operable after the impact.

The driver’s head and chest contacted the airbag. The driver’s head also contacted the headrest. The driver’s knees contacted the bolster. The driver’s abdomen contacted the airbag. The passenger’s head, chest and abdomen contacted the airbag. The passenger's 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 Spool (mm)
Driver	493	38	-27	-4735	-4167	**
Passenger	617	34	-22	-2743*	-4089	**

* See test notes below
** Not recorded

TEST NOTES

There was no valid data collected for the following channels:

Driver Left Ankle X

Passenger Left Femur Force after 150 msec.

Lower Engine X after 35 msec.

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 2004 Ford F-150 Supercab
Test Program: 35mph Frontal Impact

NHTSA No.: M40203
Test Date: 01/20/04

CONVERSION FACTORS USED IN THIS REPORT*

Quantity	Typical Application	English Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	mile/h	km/h	1.609
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.573
Pressure	Tire Pressure	lbf/in^2	kPa	7.0
Volume	Liquid	gal	liter	3.785
Temperature	General Use	°F	°C	=(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: 2004 Ford F-150 Supercab NHTSA No.: M40203
Test Program: 35mph Frontal Impact Test Date: 01/20/04

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/hr	56.5
Test Weight	kg	2626.3
Average Rebound	mm	535
Maximum Static Crush	mm	602
Impact Angle	degrees	0

DOOR OPENING AND SEAT TRACK INFORMATION

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

TEST DUMMY INFORMATION

Description	Driver	Passenger
Dummy Type / Serial No.	HIII 50th/ 065	HIII 50th/ 066
Head Contact	Airbag, Head Rest	Airbag, Head Rest
Chest Contact	Airbag	Airbag
Abdomen Contact	Airbag	Airbag
Left Knee Contact	Knee Bolster	Glovebox
Right Knee Contact	Knee Bolster	Glovebox

16mm MOVIE COVERAGE

High Speed	16
Real Time	1
Total	17

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: 2004 Ford F-150 Supercab
Test Program: 35mph Frontal Impact

NHTSA No.: M40203
Test Date: 01/20/04

TEST VEHICLE INFORMATION

Manufacturer	Ford
Model	F-150 Supercab
Body Style	Truck
NHTSA No.	M40203
VIN	1FTRX12W64NA12043
Color	Blue
Delivery Date	11/19/03
Odometer Reading (mile)	34.9
Dealer	Ricart Ford Inc.
Transmission	Automatic
Final Drive	Rear
Number of Cylinders	8
Engine Displacement (L)	4.6
Engine Placement	Longitudinal
Automatic Door Lock (ADL)	No
Owner's Manual Details Instructions on Disabling ADLs	Not Applicable

TEST VEHICLE OPTIONS

Driver Airbag	Yes
Passenger Airbag	Yes
Force Limiter	Yes
Pretensioner	Yes
Power Windows	No
Power Steering	Yes
Power Door Locks	No
Tilt Wheel	Yes
Air Conditioning	Yes
Power Brakes	Yes
Disc Brakes, Front	Yes
Disc Brakes, Rear	Yes
Anti-lock Brakes	Yes
AM/FM/Cassette	Yes
Anti-theft System	No
Cruise Control	No

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company
Date of Manufacture	07/03

GVWR (kg)	3039
GAWR Front (kg)	1564
GAWR Rear (kg)	1723

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	260	260
Cold Pressure (kPa)	260	260
Recommended Tire Size	P235/70R17	P235/70R17
Tire Size on Vehicle	P235/70R17	P235/70R17
Tire Manufacturer	Hankook	Hankook

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	NA	
Number Of Occupants	3	3	0	6
Capacity Wt. (VCW) (kg)				289
Cargo Wt. (RCLW) (kg)				136.1

DATA SHEET NO. 2... (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2004 Ford F-150 Supercab NHTSA No.: M40203
Test Program: 35mph Frontal Impact Test Date: 01/20/04

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	628.2	512.1		709.9	616.4	
Right	kg	694.5	507.6		721.2	578.8	
Ratio	%	56.5	43.5		54.5	45.5	
Totals	kg	1322.7	1019.7	2342.4	1431.1	1195.2	2626.3

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2342.4
Weight of 2 P572E ATDs	kg	156.0
Rated Cargo/Luggage Weight (RCLW)	kg	136.1
Calculated Vehicle Target Weight (TVTW)	kg	2634.5

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG(aft of front axle)
As Delivered	mm	872	880	947	945	1602
As Tested	mm	866	866	913	936	1674
Post Test	mm	894	780	985	871	

Vehicle Wheelbase (mm): 3679

Weight of Ballast secured in cargo area (kg): 11

Vehicle Components Removed: Rear windows and gaskets

Ballast weight does not include cameras, instrumentation, and data acquisition system.

FUEL SYSTEM DATA

Fuel System Capacity From Owner's Manual (L): 102.2

Usable Capacity Figure Furnished by COTR (L): 102.2

Actual Test Volume (L): 96.1

Test Fluid Type: Stoddard Solvent; Specific Gravity: 0.77

Is Vehicle Fuel Pump Electric or Mechanical? Electric

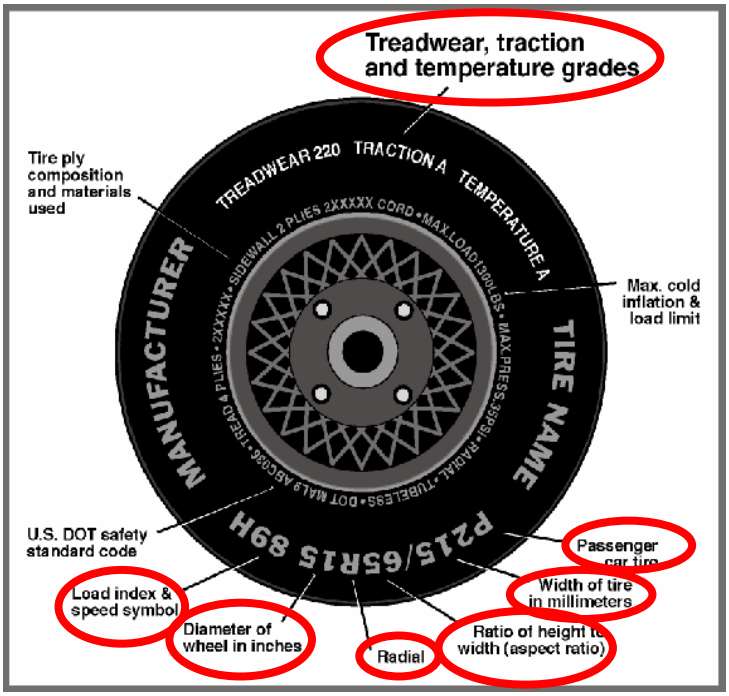
If electric, does pump operate with ignition switch "ON" & engine "OFF"? Yes

DATA SHEET NO. 3

TEST VEHICLE TIRE INFORMATION

Test Vehicle: 2004 Ford F-150 Supercab NHTSA No.: M40203
Test Program: 35mph Frontal Impact Test Date: 01/20/04

Vehicle Year	2004	Vehicle Make	Ford
VIN	1FTRX12W64NA12043	Vehicle Model	F-150 Supercab



	Front	Rear
Tire Manufacturer	Hankook	Hankook
Tire Name	Dyno Pro AS	Dyno Pro AS
Tire Type	Truck Radial	Truck Radial
Tire Width (mm)	235	235
Ratio of Height to Width (aspect ratio)	70	70
Radial	R	R
Wheel Diameter	17	17
Load Index & Speed Symbol	108S	108S
Treadwear	440	440
Traction Grade	B	B
Temperature Grade	A	A

DATA SHEET NO. 4

POST IMPACT DATA

Test Vehicle: 2004 Ford F-150 Supercab
Test Program: 35mph Frontal Impact
NHTSA No.: M40203
Test Date: 01/20/04

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	55.5 – 57.1	56.5
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	56.5
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	5705	5237	468
Center	mm	5852	5250	602
Right Side	mm	5702	5241	461

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	493
Center	mm	542
Right Side	mm	571
Average	mm	535

DATA SHEET NO. 5

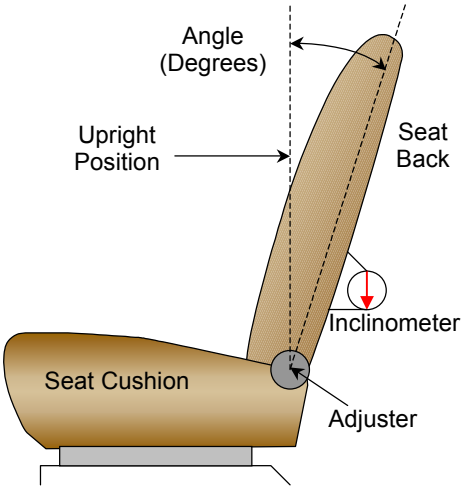
TEST VEHICLE INFORMATION

Test Vehicle: 2004 Ford F-150 Supercab NHTSA No.: M40203
Test Program: 35mph Frontal Impact Test Date: 01/20/04

NORMAL DESIGN RIDING POSITION

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

The seat back angle is measured relative to the rocker sill. Remove the seat back panel and position inclinometer 13 inches above the back pivot point on the rear outboard seat frame. Avoid taking measurement on reinforcement plates. The designated driver and passenger seat back angle is 18.5°.



FRONT SEAT ASSEMBLY

Driver seat back angle: 19.4°
Passenger seat back angle: 18.9°

SEAT FORE/AFT POSITIONS

Position the seat in the mechanical mid-position. Reference points are scribed on the seat and the seat track. The total seat travel is measured and the seat is then positioned in the center of the seat travel. On manual seats, position at the mid-point track location (if available) or the next closest position to the rear of the mid-point travel location.

Driver seat fore/aft total travel: 23 notches
Passenger seat fore/aft total travel: 23 notches
Driver seat fore/aft position: 12 of 23
Passenger seat fore/aft position: 12 of 23

SEAT BELT UPPER ANCHORAGE

This vehicle doesn't have D-Ring adjustment.

DATA SHEET NO. 5... (continued)

TEST VEHICLE INFORMATION

Test Vehicle: 2004 Ford F-150 Supercab NHTSA No.: M40203
Test Program: 35mph Frontal Impact Test Date: 01/20/04

FUEL TANK CAPACITY DATA

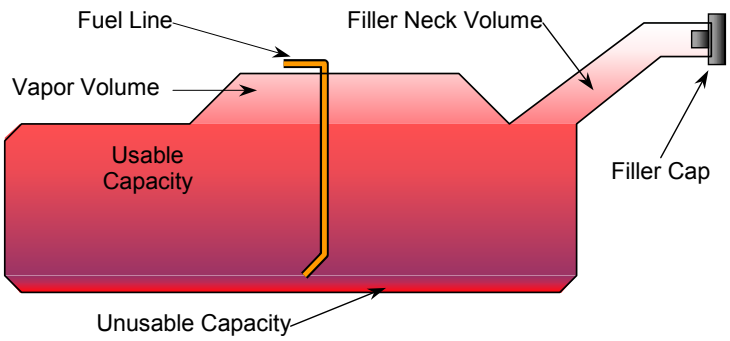
The "Usable Capacity" of the standard equipment fuel tank is: 102.2 liters

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

The "Usable Capacity" used for certification to FMVSS 301 requirements: 102.2 liters

Actual amount of Stoddard solvent added to vehicle for certification test: 96.1 liters

The electric fuel pump operates for 2 seconds to pressurize the fuel system following the actuation of the ignition. If no attempt has been made to start the engine within 2 seconds following ignition actuation the fuel pump will shut off. If the engine stalls the fuel pump is deactivated. Also, a fuel pump shut-off switch is provided, designed to stop fuel flow to the engine if the vehicle sustains an impact above a certain magnitude.



VEHICLE FUEL TANK ASSEMBLY

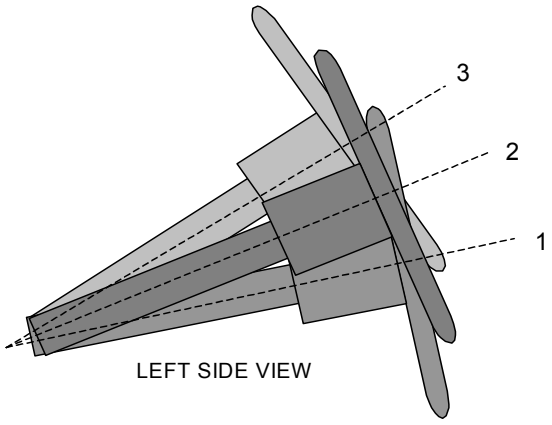
STEERING COLUMN ADJUSTMENT

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

Lowermost, position 1: 18.6°

Geometric center, position 2: 21.9°

Uppermost. Position 3: 25.2°



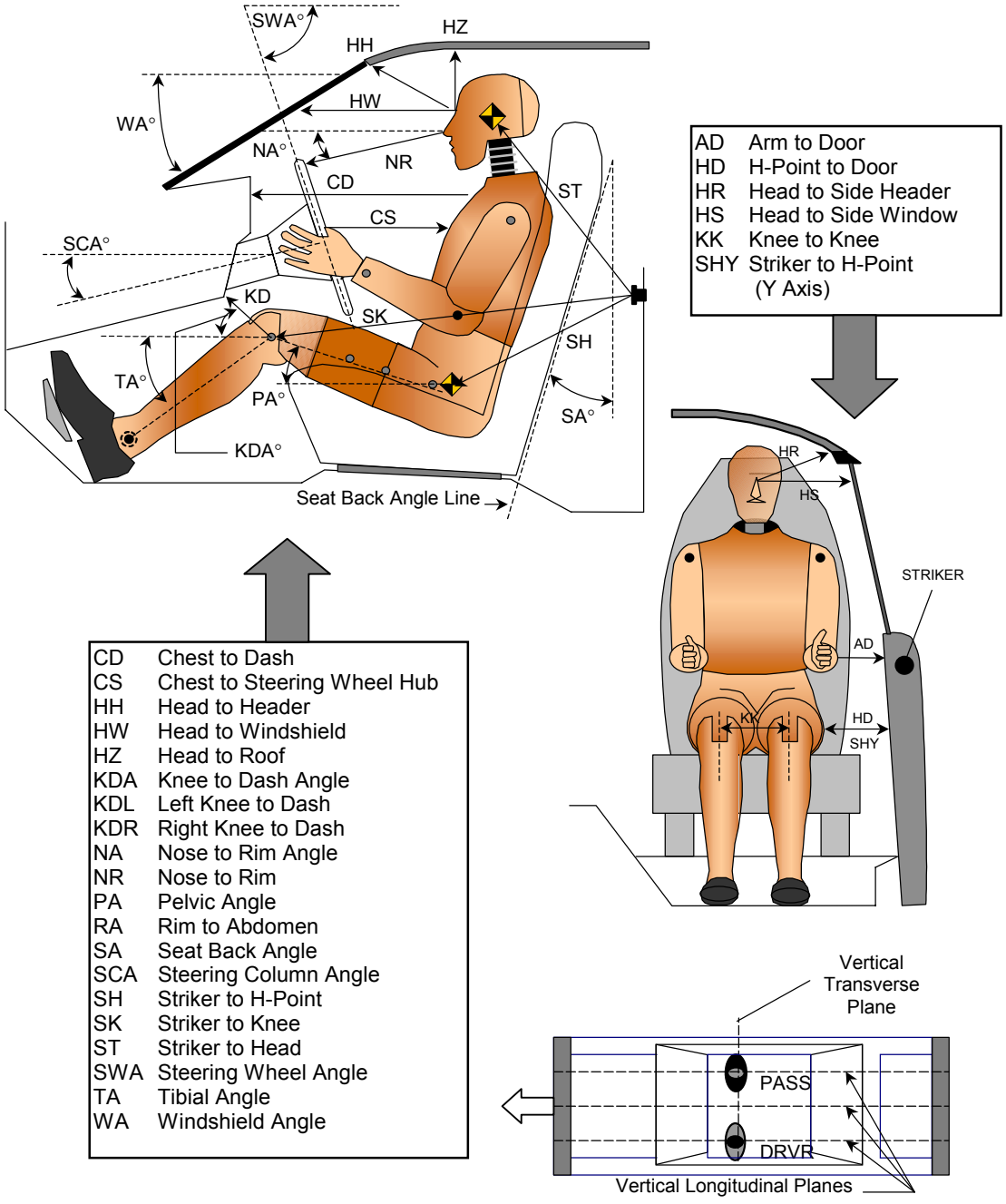
STEERING COLUMN ASSEMBLY

DATA SHEET NO. 6

DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2004 Ford F-150 Supercab
Test Program: 35mph Frontal Impact
NHTSA No.: M40203
Test Date: 01/20/04

DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS



DATA SHEET NO. 6... (continued)

DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2004 Ford F-150 Supercab NHTSA No.: M40203
Test Program: 35mph Frontal Impact Test Date: 01/20/04

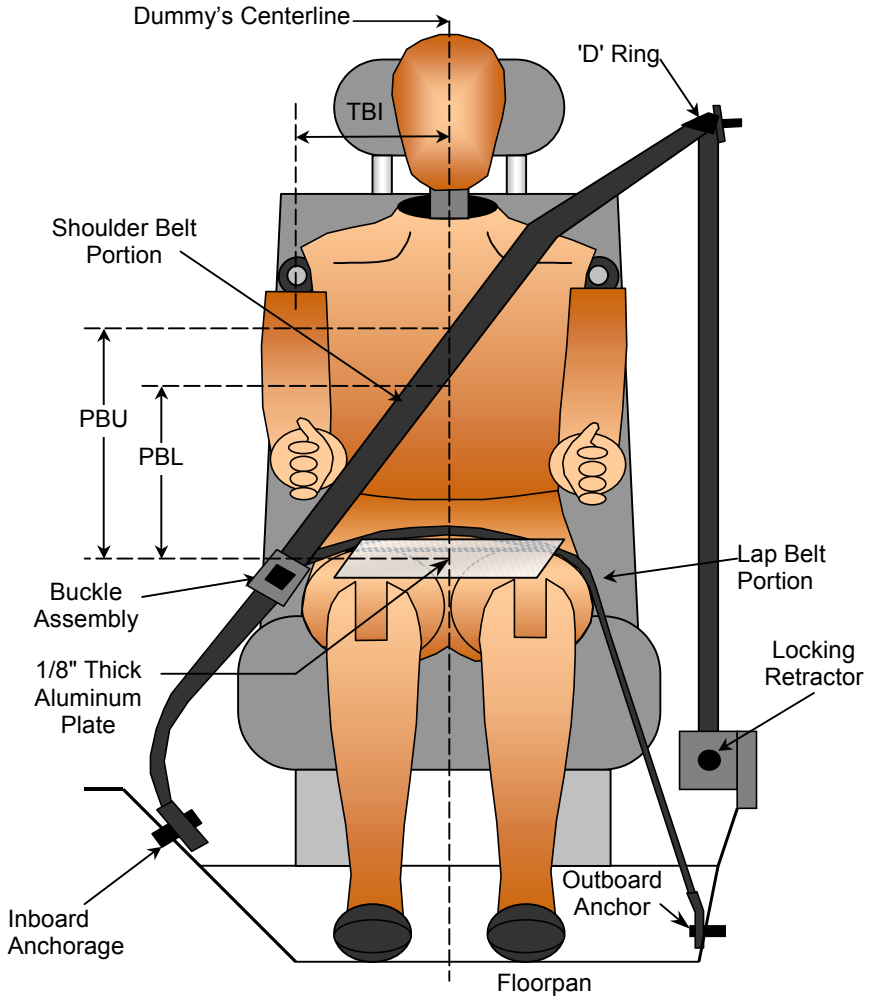
TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield Angle		35.1		
SWA	Steering Wheel Angle		68.9		
SCA	Steering Column Angle		21.2		
SA	Seat Back Angle		19.4		18.9
HZ	Head to Roof (Z)	222	90.0	232	90.0
HH	Head to Header	466	15.4	449	18.9
HW	Head to Windshield	689	0.0	683	0.0
HR	Head to Side Header (Y)	206		215	
NR	Nose to Rim	431	11.4		
CD	Chest to Dash	627		592	
CS	Chest to Steering Hub	359	14.8		
RA	Rim to Abdomen	204	0.0		
KDL	Left Knee to Dash	183	22.6	156	
KDR	Right Knee to Dash	186		162	26.9
PA	Pelvic Angle		24.1		23.2
TA	Tibia Angle		43.4		46.5
KK	Knee to Knee (Y)	306		249	
SK	Striker to Knee	773	91.8	774	91.6
ST	Striker to Head	664	21.0	696	23.1
SH	Striker to H-Point	372	98.6	374	93.3
SHY	Striker to H-Point (Y)	294		286	
HS	Head to Side Window	346		357	
HD	H-Point to Door (Y)	219		223	
AD	Arm to Door (Y)	151		166	
AA	Ankle to Ankle	291		204	

DATA SHEET NO. 7

SEAT BELT POSITIONING DATA

Test Vehicle: 2004 Ford F-150 Supercab
Test Program: 35mph Frontal Impact
NHTSA No.: M40203
Test Date: 01/20/04



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
TBI - Dummy centerline to shoulder bolt	mm	170	170
PBU - Top surface of reference to belt upper edge	mm	369	363
PBL - To surface of reference to belt lower edge	mm	287	277

DATA SHEET NO. 8

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2004 Ford F-150 Supercab
Test Program: 35mph Frontal Impact

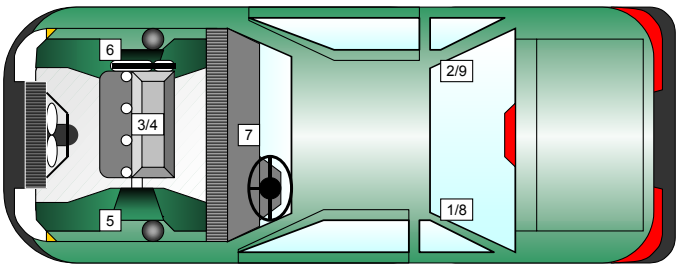
NHTSA No.: M40203
Test Date: 01/20/04

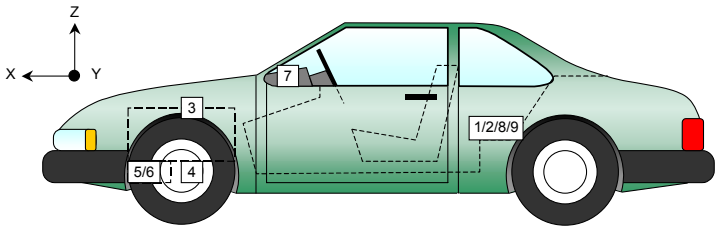
VEHICLE ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)			Peak Values				
		X	Y	Z	Units	Max	Time	Min	Time
1	Left Rear X-Member X	2770	-665	570	G's	3.2	145	-31.6	38
2	Right Rear X-Member X	2772	720	570	G's	12.1	106	-34.4	40
3	Engine Top X	4879	40	1060	G's	7.3	97	-59.8	47
4	Engine Bottom X	4942	0	385	G's	*	*	*	*
5	Left Brake Caliper X	4760	-720	260	G's	77.3	65	-111.5	45
6	Right Brake Caliper X	4762	715	262	G's	32.1	75	-108.3	45
7	Instrument Panel X	4095	0	1340	G's	17.2	104	-56.5	43
8	Left Rear X-Member Z	2770	-665	570	G's	20.3	61	-12.4	56
9	Right Rear X-Member Z	2772	720	570	G's	19.8	53	-13.9	44

* No valid data collected after 35 msec.

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





DATA SHEET NO. 9

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2004 Ford F-150 Supercab
Test Program: 35mph Frontal Impact
NHTSA No.: M40203
Test Date: 01/20/04

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	30.5	198	-47.2	95	6.9	32	-49.0	89
Head CG	Y	G's	12.0	105	-7.9	23	3.5	39	-17.6	107
Head CG	Z	G's	26.7	69	-3.5	25	45.4	86	-5.6	142
Head CG Resultant	N/A	G's	50.6	95			65.2	86		

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	4.4	200	-40.8	58	2.0	199	-33.2	77
Chest CG	Y	G's	15.0	98	-2.1	51	5.5	85	-7.0	100
Chest CG	Z	G's	8.2	47	-6.7	125	20.0	85	-9.9	141
Chest CG Resultant	N/A	G's	41.1	58			35.1	71		

FEMUR PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	308	28	-4735	52	413	39	-2743	54
Right Femur	Z	Newtons	637	42	-4167	54	587	38	-4089	55

Note: Passenger Left Femur Force – No valid data after 150 msec.

SEAT BELT SENSOR PEAK VALUES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Lap Belt Force	N/A	Newtons	6521	56			6065	56		
Shoulder Belt Force	N/A	Newtons	3993	58			4058	70		

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	493.4	45.2	69.1	105.1	616.9	49.4	77.2	113.2

CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T^1	T^2	CLIP	T^1	T^2
Chest CG Primary	38.1	64.9	67.9	33.8	73.0	77.5

DATA SHEET NO. 9... (continued)

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2004 Ford F-150 Supercab
Test Program: 35mph Frontal Impact

NHTSA No.: M40203
Test Date: 01/20/04

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	4.7	122	-71.6	52	5.2	139	-69.6	55
Pelvis	Y	G's	7.5	87	-5.7	54	7.9	49	-6.5	90
Pelvis	Z	G's	2.3	25	-14.7	63	2.0	23	-13.7	58

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	411	67	-447	141	165	95	-537	158
Neck Force	Y	Newtons	352	133	-39	90	189	88	-185	112
Neck Force	Z	Newtons	1883	69	-170	142	1893	83	-143	140
Neck Moment	X	N•m	21.9	137	-4.7	107	14.0	112	-10.1	159
Neck Moment	Y	N•m	33.9	149	-14.5	52	36.9	170	-23.1	64
Neck Moment	Z	N•m	10.1	159	-15.8	117	13.7	99	-8.8	166

FOOT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Foot Aft	X	G's	*	*	*	*	27.6	50	-109.3	36
Left Foot Aft	Z	G's	4.8	182	-43.3	62	22.3	35	-41.9	61
Left Foot Fore	Z	G's	65.0	50	-81.4	58	71.6	35	-92.5	61
Right Foot Aft	X	G's	23.7	63	-112.0	51	17.3	85	-84.3	59
Right Foot Aft	Z	G's	2.7	83	-92.2	55	4.0	85	-43.6	64
Right Foot Fore	Z	G's	38.6	65	-177.9	54	25.5	59	-111.1	64

* No valid data collected

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	29.0	95	-13.0	67	9.3	50	-26.7	92
Left Lower Moment	Y	N•m	56.7	55	-47.0	65	67.9	37	-17.7	85
Left Lower Force	Z	Newtons	151	200	-3982	63	162	19	-1609	40
Left Upper Moment	X	N•m	27.2	49	-48.6	67	9.4	86	-23.4	55
Left Upper Moment	Y	N•m	65.3	47	-113.3	54	23.1	141	-115.0	60
Left Upper Force	Z	Newtons	127	200	-4223	65	192	19	-1175	50
Right Lower Moment	X	N•m	86.6	61	-25.3	58	14.0	76	-9.8	58
Right Lower Moment	Y	N•m	51.7	51	-104.4	67	3.5	38	-107.6	58
Right Lower Force	Z	Newtons	122	144	-2979	61	104	149	-1645	69
Right Upper Moment	X	N•m	98.2	59	-10.5	67	10.2	200	-48.4	96
Right Upper Moment	Y	N•m	28.7	47	-64.0	60	198.8	55	-8.1	187
Right Upper Force	Z	Newtons	150	139	-2468	61	152	149	-2752	67

DATA SHEET NO. 9... (continued)

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2004 Ford F-150 Supercab
Test Program: 35mph Frontal Impact

NHTSA No.: M40203
Test Date: 01/20/04

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest	X	mm			-26.6	62			-21.8	81

HEAD REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	31.7	198	-48.7	96	6.2	32	-44.9	107
Head CG	Y	G's	11.3	96	-7.6	23	3.8	60	-18.1	107
Head CG	Z	G's	27.1	72	-4.0	143	46.4	83	-3.5	28
Head CG Resultant	N/A	G's	53.2	96			63.8	86		

CHEST REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	4.3	200	-40.6	58	2.0	200	-32.8	77
Chest CG	Y	G's	15.1	98	-1.9	150	5.8	85	-6.8	100
Chest CG	Z	G's	9.0	46	-6.7	126	19.7	85	-10.1	133
Chest CG Resultant	N/A	G's	40.9	58			34.3	77		

REDUNDANT HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	Avg.	T^1	T^2	HIC	Avg.	T^1	T^2
Head CG Primary Redundant	476.5	44.5	69.0	105.0	607.1	49.1	77.3	113.3

REDUNDANT CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T^1	T^2	CLIP	T^1	T^2
Chest CG Primary Redundant	38.0	51.5	54.5	33.7	73.3	77.5

DATA SHEET NO. 10

SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

Test Vehicle: 2004 Ford F-150 Supercab
Test Program: 35mph Frontal Impact

NHTSA No.: M40203
Test Date: 01/20/04

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	369	363
PBL - Top surface of reference to belt lower edge	mm	287	277

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Retractor reel to "D" ring	mm	0	0
Shoulder belt length as measured on ATD	mm	822	851
Lap belt length as measured on ATD	mm	634	633
Remainder of belt on reel	mm	970	940
Total belt length for continuous webbing systems	mm	2426	2424

SHOULDER BELT SPOOL-OUT DATA

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	Not recorded	
As determined electronically	mm	Not recorded	

DATA SHEET NO. 11

SUMMARY OF FMVSS 212 DATA

Test Vehicle: 2004 Ford F-150 Supercab
Test Program: 35mph Frontal Impact

NHTSA No.: M40203
Test Date: 01/20/04

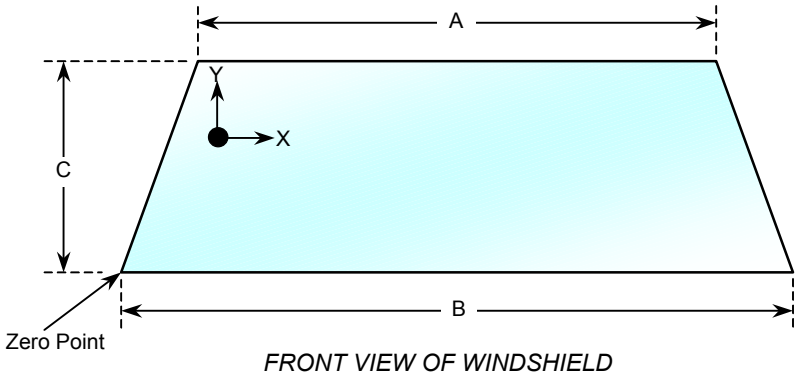
Windshield Mounting Details:
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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

Temperature of windshield molding during test: 21 °C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% of Retention
Left Side	2387	2387	100
Right Side	2387	2387	100
Total	4774	4774	100



FRONT VIEW OF WINDSHIELD

WINDSHIELD DIMENSIONS

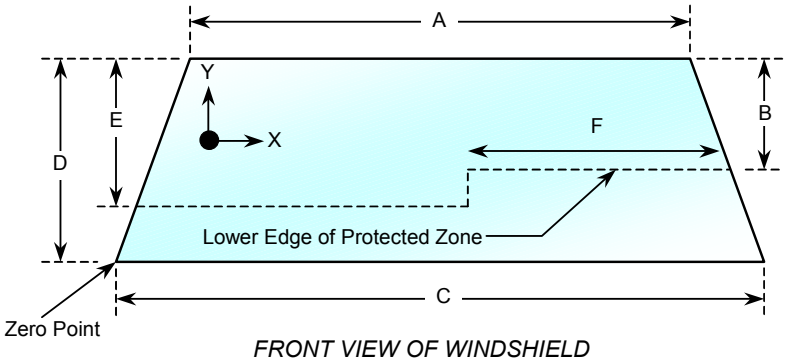
Item	Units	Segment Length	Molding Width
A	mm	1429	6
B	mm	1804	0
C	mm	770	27

DATA SHEET NO. 12

WINDSHIELD ZONE INTRUSION FMVSS 219 (Partial) DATA

Test Vehicle: 2004 Ford F-150 Supercab
Test Program: 35mph Frontal Impact

NHTSA No.: M40203
Test Date: 01/20/04



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1429
B	mm	507
C	mm	1804
D	mm	770
E	mm	503
F	mm	590

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. 13

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Vehicle: 2004 Ford F-150 Supercab NHTSA No.: M40203
Test Program: 35mph Frontal Impact Test Date: 01/20/04

Temperature at Time of Impact: 21° C Test Time: 12:42 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)

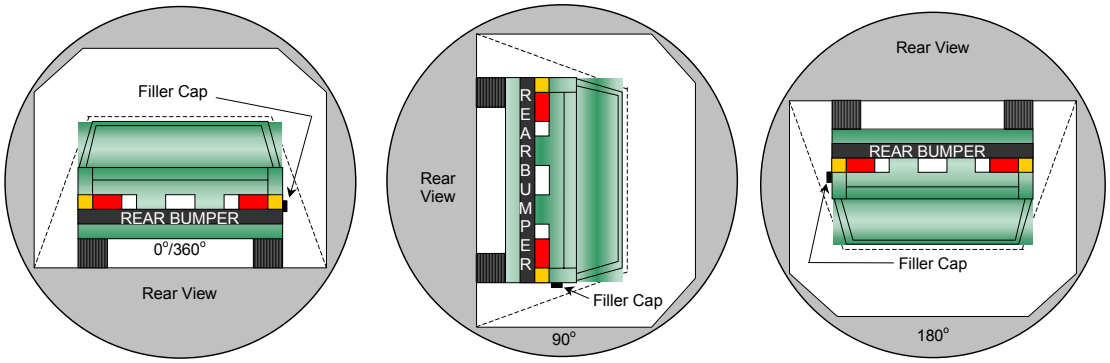
D. Spillage: None

DATA SHEET NO. 14

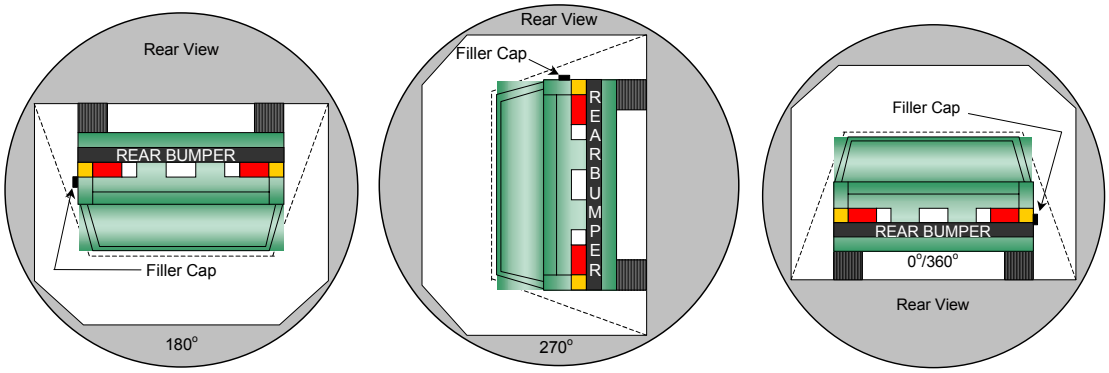
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2004 Ford F-150 Supercab NHTSA No.: M40203
Test Program: 35mph Frontal Impact Test Date: 01/20/04

Test Time: 12:42 pm



0° to 90° 90° to 180°



180° to 270° 270° to 360°

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

Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
0° to 90°	159	300	0
90° to 180°	153	300	0
180° to 270°	135	300	0
270° to 360°	157	300	0

DATA SHEET NO. 15

VEHICLE MEASUREMENTS

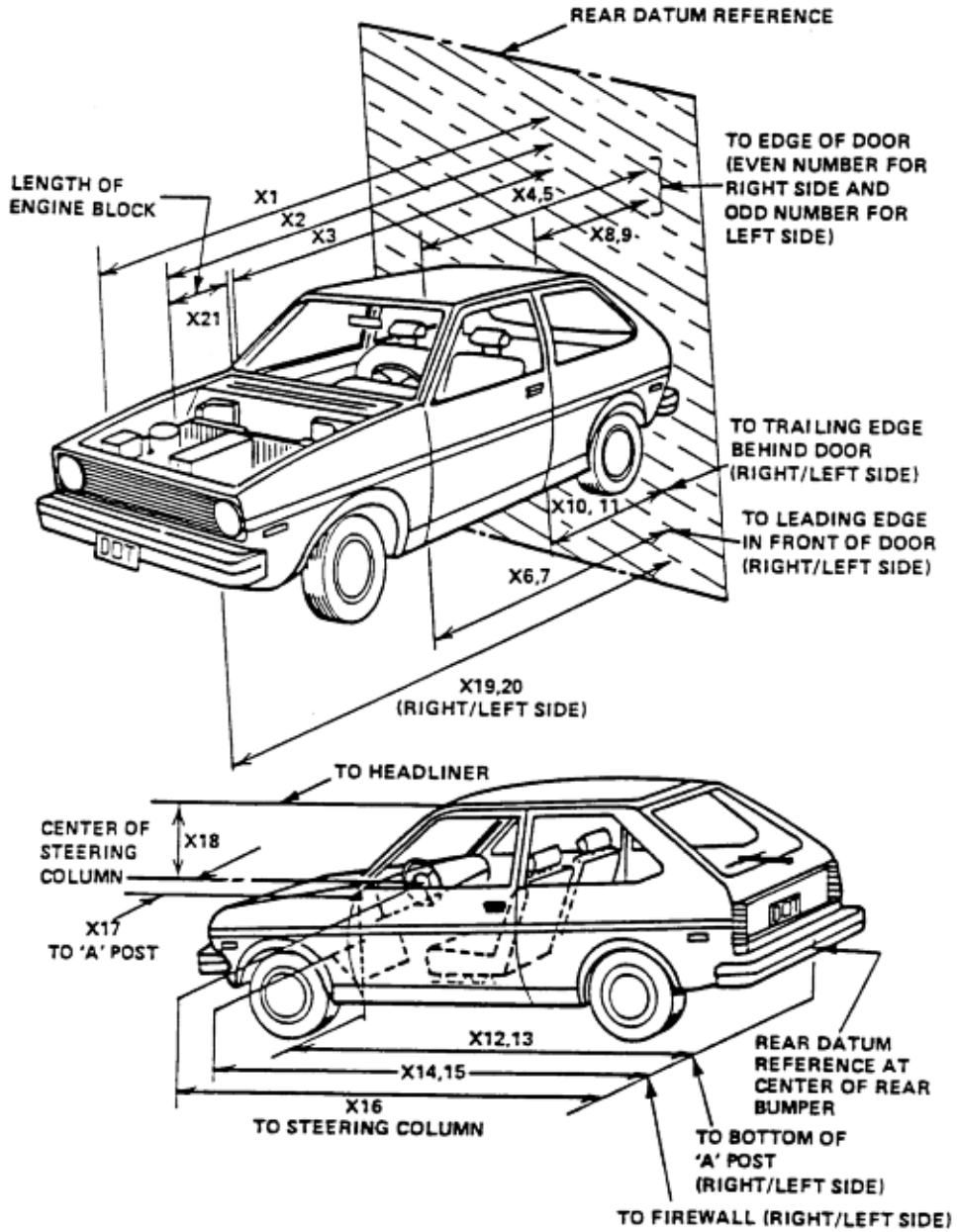
Test Vehicle: 2004 Ford F-150 Supercab NHTSA No.: M40203
Test Program: 35mph Frontal Impact Test Date: 01/20/04

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total length of vehicle at centerline	mm	5852	5250	602
2	RSOV to front of engine	mm	5060	5020	40
3	RSOV to firewall centerline	mm	4711	4706	5
4	RSOV to leading edge of right door	mm	4295	4284	11
5	RSOV to leading edge of left door	mm	4300	4273	27
6	RSOV to lower leading edge of right door	mm	4252	4242	10
7	RSOV to lower leading edge of left door	mm	4259	4248	11
8	RSOV to upper leading edge of right door	mm	3031	3038	-7
9	RSOV to upper leading edge of left door	mm	3037	3043	-6
10	RSOV to lower trailing edge of right door	mm	3010	3002	8
11	RSOV to lower trailing edge of left door	mm	3016	3005	11
12	RSOV to bottom of right 'A' pillar	mm	4196	4196	0
13	RSOV to bottom of left 'A' pillar	mm	4200	4200	0
14	RSOV to firewall on right side	mm	4630	4500	130
15	RSOV to firewall on left side	mm	4621	4539	82
16	RSOV to steering column	mm	3833	3845	-12
17	Center of steering column to left 'A' pillar	mm	445	445	0
18	Center of steering column to headlining	mm	477	485	-8
19	RSOV to right side of front bumper	mm	5702	5241	461
20	RSOV to left side of front bumper	mm	5705	5237	468
21	Length of engine block	mm	560	560	0
RD	RSOV to right side of dash panel	mm	4089	4098	-9
CD	RSOV to center of dash panel	mm	4086	4100	-14
LD	RSOV to left side of dash panel	mm	4076	4063	13

DATA SHEET NO. 15... (continued)

VEHICLE MEASUREMENTS

Test Vehicle: 2004 Ford F-150 Supercab NHTSA No.: M40203
Test Program: 35mph Frontal Impact Test Date: 01/20/04



DATA SHEET NO. 15... (continued)

VEHICLE MEASUREMENTS

Test Vehicle: 2004 Ford F-150 Supercab NHTSA No.: M40203
Test Program: 35mph Frontal Impact Test Date: 01/20/04

Target Vehicle Structural Measurement

	Elements	Pre-Test (mm)
1	Total Length	5852
2	Total Width	1916
3	Bumper Top Height	710
4	Bumper Bottom Height	380
5	Longitudinal Member Top Height	550
6	Distance between Longitudinal Members	765
7	Longitudinal Member Width	95
8	Engine Top Height	1120
9	Engine Bottom Height	270
10	Engine and gearbox width	720
11	Front bumper-engine distance	832
12	Front shock absorber fixing height	825
13	Bonnet leading edge height	740
14	Front shock absorber fixing width	915
15	Front bumper – front axle distance	900
16	Front axle – a pillar distance	645
17	A-pillar – B-pillar distance	1244
18	B-Pillar – rear axle distance	1778
19	B-pillar – C-pillar distance	605
20	Roof sill bottom height	1705
21	Roof sill top height	1775
22	Floor sill bottom height	407
23	Floor sill top height	465

DATA SHEET NO. 16

CAMERA LOCATIONS

Test Vehicle: 2004 Ford F-150 Supercab
Test Program: 35mph Frontal Impact
NHTSA No.: M40203
Test Date: 01/20/04

No.	Camera View	Location (mm) *			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Side View				13	24
2	Left Front View	959	-8605	1415	25	1020
3	Steering Column Top	2070	-8700	1565	25	1005
4	Steering Column Bottom	2050	-8700	1030	25	1026
5	Driver Close-up	1609	-9511	1480	50	1005
6	Driver Angle	4697	-5000	2005	50	1190
7	Left Rear				13	526
8	Right Rear				13	513
9	Right Overall	2580	8016	1735	13	617
10	Right Passenger Half	936	8252	1661	25	1020
11	Right Close-up	1571	10156	1663	50	1156
12	Right Angle	4884	5047	2100	50	1053
13	Windshield	460	0	2960	13	939
14	Top Driver	-120	-500	2280	13	1015
15	Top Passenger	-120	530	2280	13	1015
16	Pit Front	1020	0	-3020	13	1010
17	Pit Rear	2970	0	-3010	13	1010

*COORDINATES:

+X = film plane rearward of barrier

+Y = film plane to right of monorail centerline

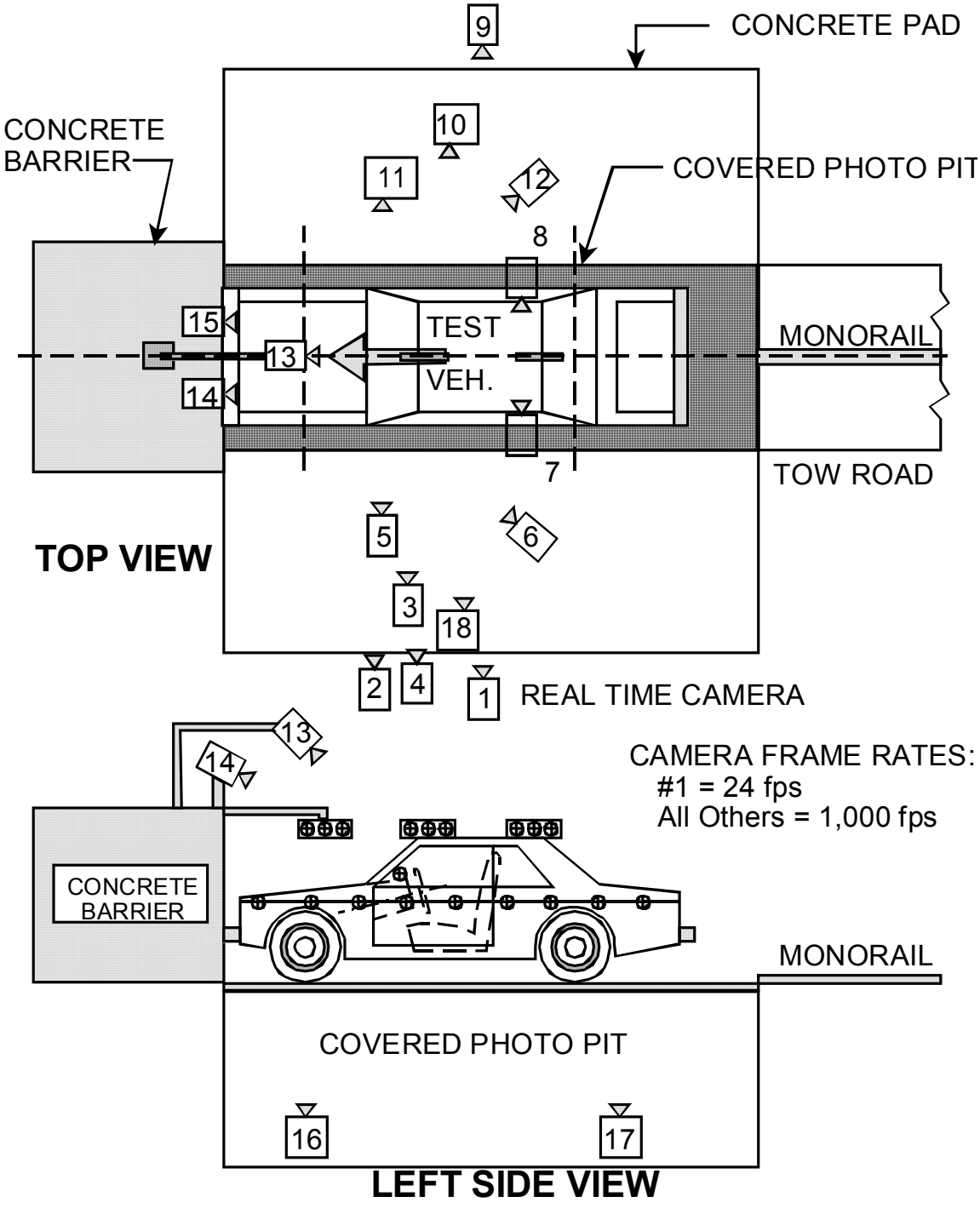
+Z = film plane above ground level

DATA SHEET NO. 16... (continued)

CAMERA LOCATIONS

Test Vehicle: 2004 Ford F-150 Supercab NHTSA No.: M40203
Test Program: 35mph Frontal Impact Test Date: 01/20/04

CAMERA POSITIONS FOR FRONTAL IMPACTS



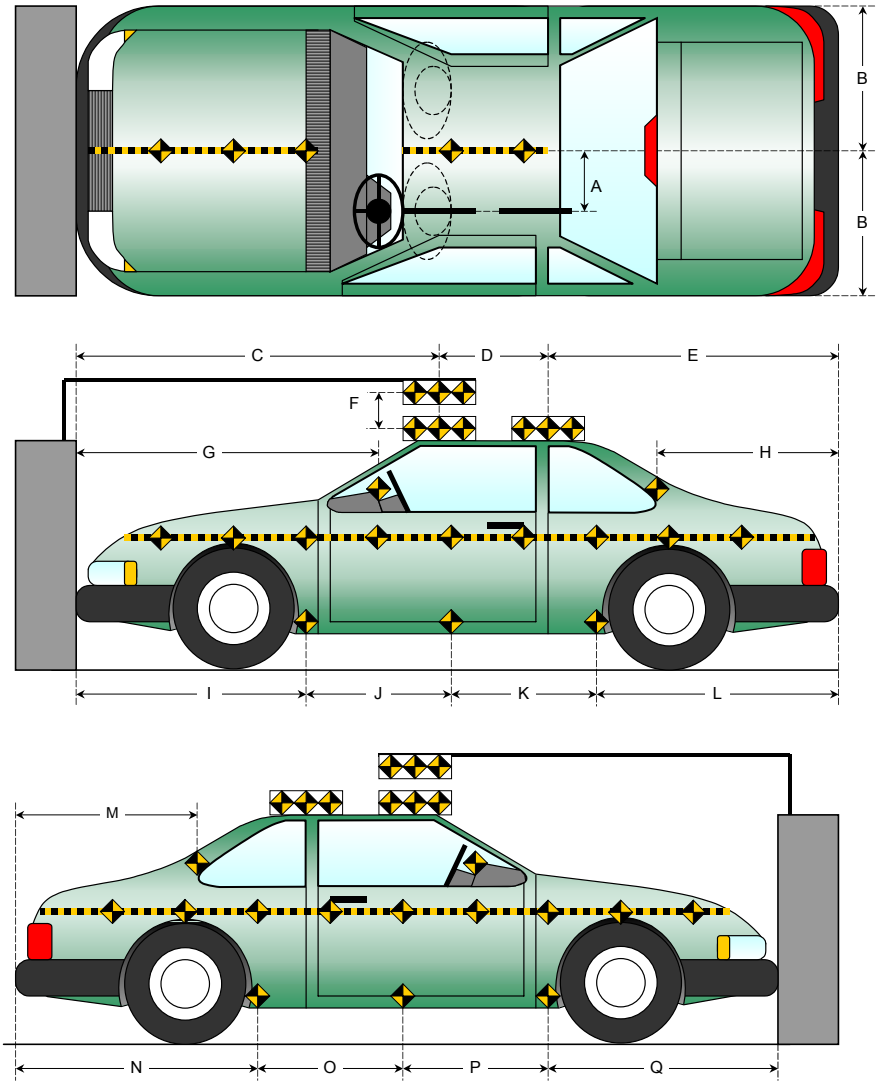
DATA SHEET NO. 17

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2004 Ford F-150 Supercab
Test Program: 35mph Frontal Impact

NHTSA No.: M40203
Test Date: 01/20/04

Item	Value
A	440
B	958
C	2511
D	609
E	2732
F	1834
G	
H	2316
I	1445
J	978
K	970
L	2459
M	2297
N	2408
O	977
P	976
Q	1491



DATA SHEET NO. 18

VEHICLE INTRUSION MEASUREMENTS

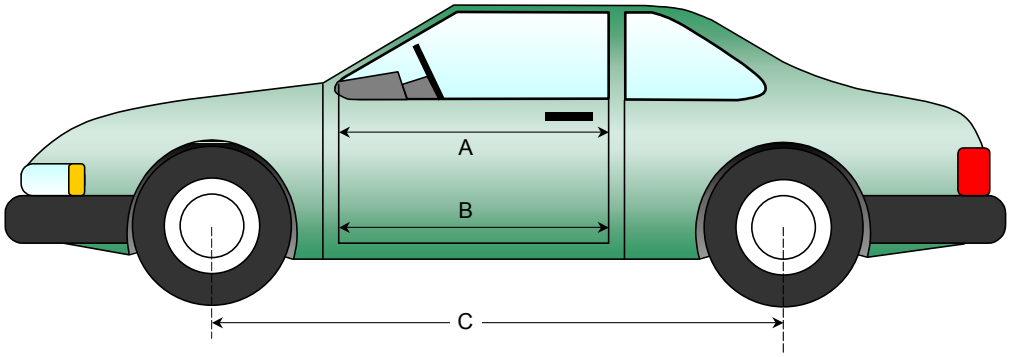
Test Vehicle: 2004 Ford F-150 Supercab
Test Program: 35mph Frontal Impact
NHTSA No.: M40203
Test Date: 01/20/04

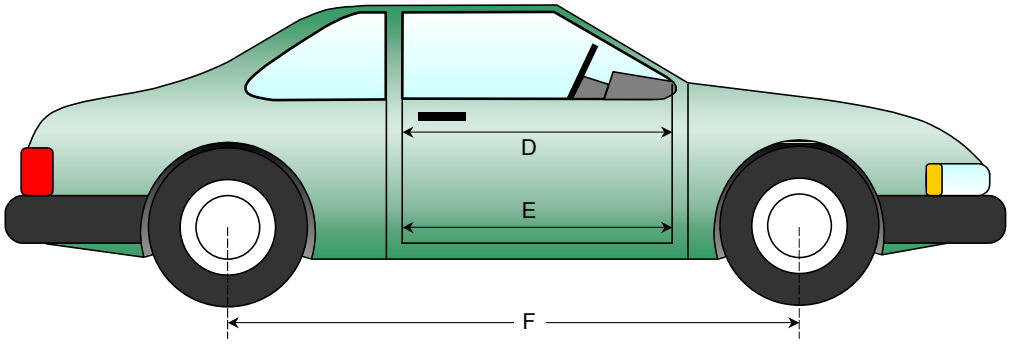
DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1267	1106	161
B	Left Side Lower	mm	1242	1076	166
D	Right Side Upper	mm	1267	1111	156
E	Right Side Lower	mm	1242	1084	158

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3672	3424	248
F	Right Side Wheelbase	mm	3682	3435	247





DATA SHEET NO. 18... (continued)

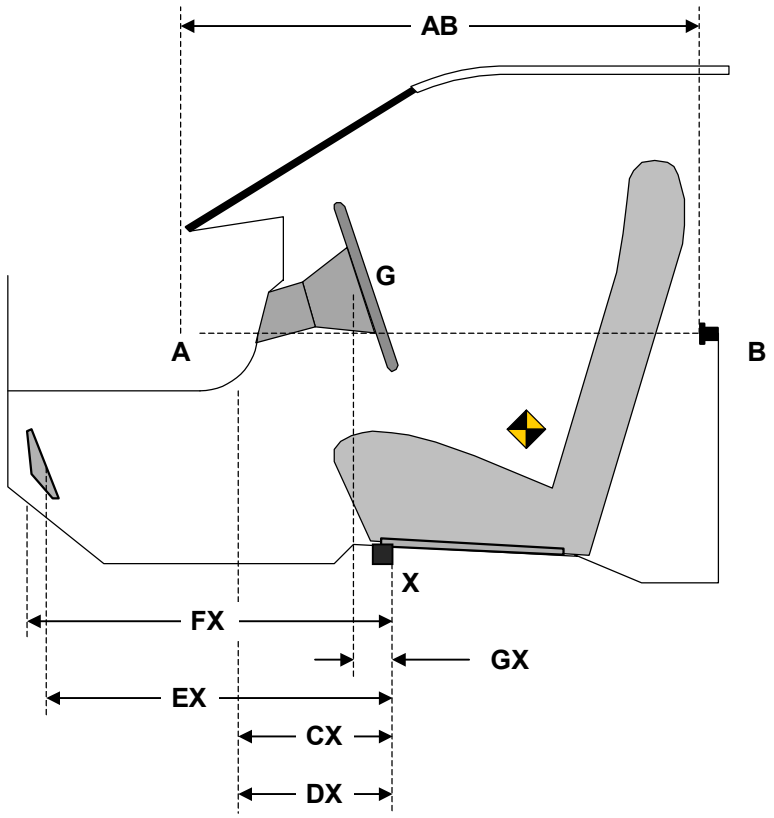
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2004 Ford F-150 Supercab NHTSA No.: M40203
Test Program: 35mph Frontal Impact Test Date: 01/20/04

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	1170	1150	20
CX	Left Knee Bolster to X	mm	285	290	-5
DX	Right Knee Bolster to X	mm	286	260	26
EX	Brake Pedal to X	mm	582	527	55
FX	Foot Rest to X	mm	598	592	6
GX	Center of Steering Column Wheel Hub to X	mm	22	120	-98

X = Front of Seat Track (stationary)



DRIVER COMPARTMENT

DATA SHEET NO. 18... (continued)

VEHICLE INTRUSION MEASUREMENTS

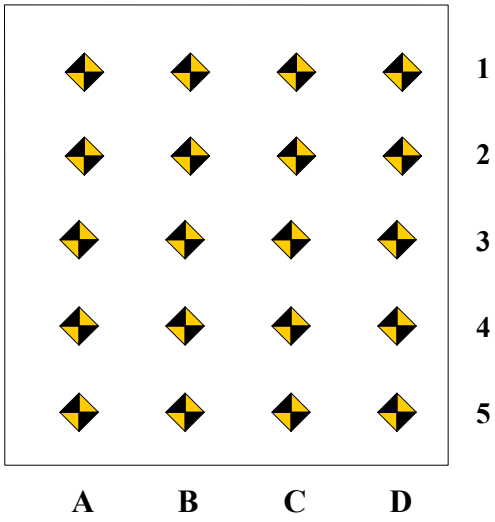
Test Vehicle: 2004 Ford F-150 Supercab
Test Program: 35mph Frontal Impact
NHTSA No.: M40203
Test Date: 01/20/04

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

Columns A through D are evenly spaced.

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

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



DRIVER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	686	690	684	684	670	668	670	657	16	22	14	27
2	594	598	590	590	573	583	572	578	21	15	18	12
3	501	500	500	501	483	482	481	482	18	18	19	19
4	403	400	396	402	383	378	378	380	20	22	18	22
5	299	301	297	297	283	288	280	277	16	13	17	20

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-71	-74	-73	-73	-50	-48	-50	-45	-21	-26	-23	-28
2	-114	-121	-110	-109	-88	-36	-69	-82	-26	-85	-41	-27
3	-149	-148	-142	-146	-117	-137	-121	-142	-32	-11	-21	-4
4	-147	-146	-140	-149	-135	-144	-132	-164	-12	-2	-8	15
5	-149	-144	-136	-147	-142	-142	-138	-158	-7	-2	2	11

DATA SHEET NO. 18... (continued)

VEHICLE INTRUSION MEASUREMENTS

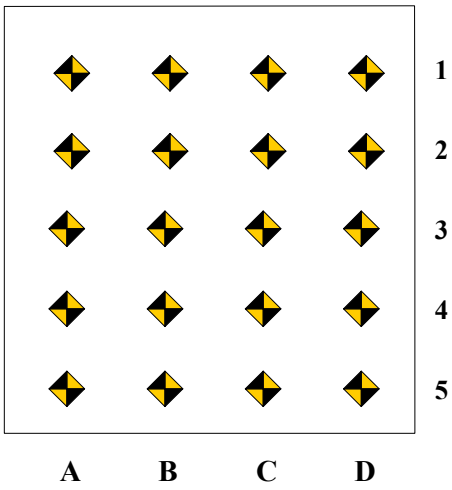
Test Vehicle: 2004 Ford F-150 Supercab
Test Program: 35mph Frontal Impact
NHTSA No.: M40203
Test Date: 01/20/04

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

Columns A through D are evenly spaced.

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

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



PASSENGER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	685	695	700	697	638	643	662	668	47	52	38	29
2	619	615	618	620	583	590	605	604	36	25	13	16
3	518	520	523	525	500	490	507	502	18	30	16	23
4	424	420	419	422	403	395	400	405	21	25	19	17
5	319	312	319	320	298	293	300	305	21	19	19	15

PASSENGER FLOOR PAN Z-AXIS

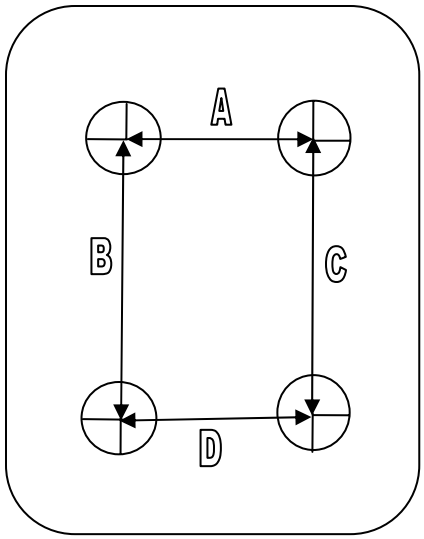
	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-17	-39	-28	-30	-2	-24	-30	-23	-15	-15	2	-7
2	-100	-99	-112	-120	-72	-88	-98	-105	-28	-11	-14	-15
3	-131	-119	-142	-145	-122	-158	-142	-122	-9	39	0	-23
4	-138	-135	-126	-130	-152	-147	-139	-143	14	12	13	13
5	-139	-136	-138	-138	-155	-130	-140	-140	16	-6	2	2

DATA SHEET NO. 18... (continued)

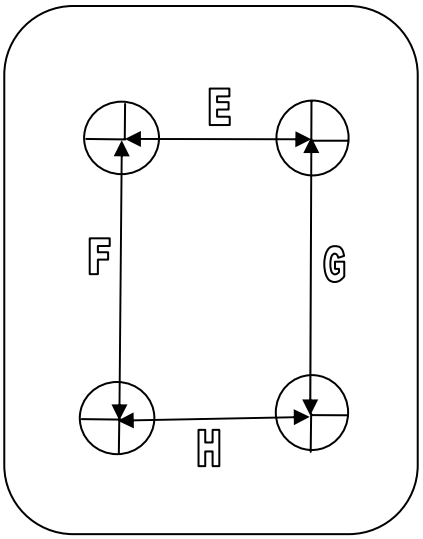
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2004 Ford F-150 Supercab
Test Program: 35mph Frontal Impact

NHTSA No.: M40203
Test Date: 01/20/04



Driver



Passenger

UNDERBODY FLOORBOARD DEFORMATION

Measurement	Pre-Test	Post-Test	Difference
A	442	445	-3
B	289	289	0
C	267	267	0
D	412	430	-18
E	431	432	-1
F	246	244	2
G	306	305	1
H	427	435	-8

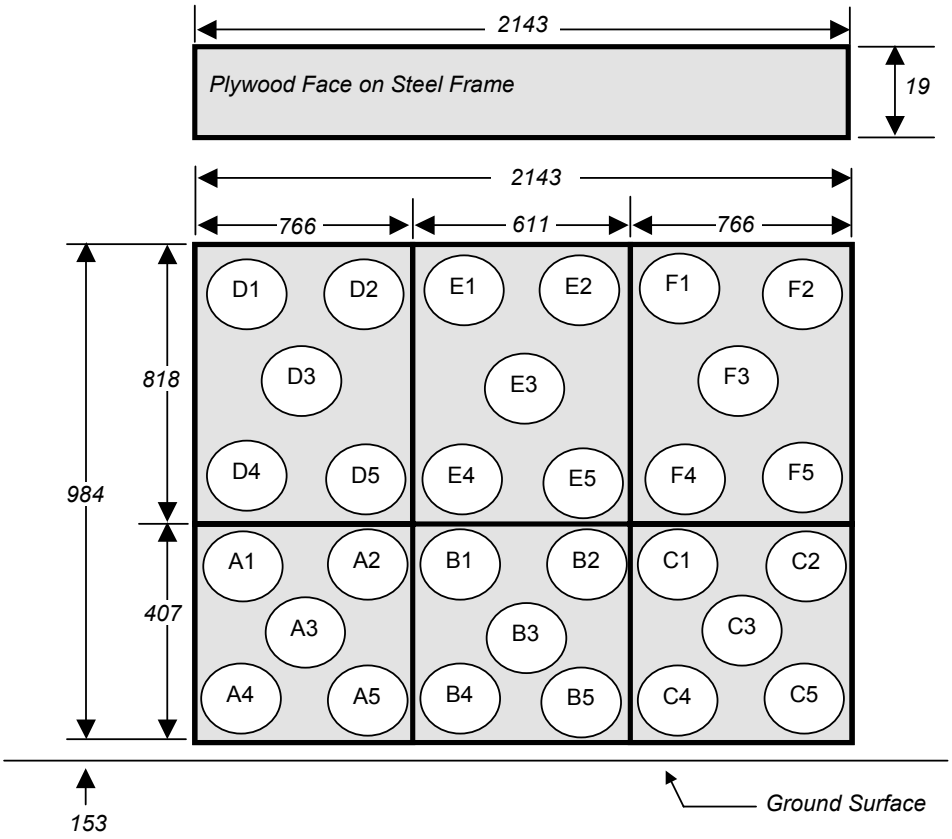
DATA SHEET NO. 19

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2004 Ford F-150 Supercab NHTSA No.: M40203
Test Program: 35mph Frontal Impact Test Date: 01/20/04

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 cross member displacement.

DATA SHEET NO. 20

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2004 Ford F-150 Supercab NHTSA No.: M40203
Test Program: 35mph Frontal Impact Test Date: 01/20/04

VEHICLE INFORMATION

VIN: 1FTRX12W64NA12043 Wheelbase (mm) : 3679
Vehicle Size Category: Truck Test Weight (kg) : 2626.3

ACCELEROMETER DATA

Accelerometer Locations: As per measurements on Page 14
Cal. Procedure/Interval: MGA procedure / 6 month
Integration Algorithm: Trapezoidal Linearity: > 99%
Impact Velocity (km/h): 56.5
Velocity Change (km/h): 63.4 Time of Separation (msec): 134

CRUSH PROFILE

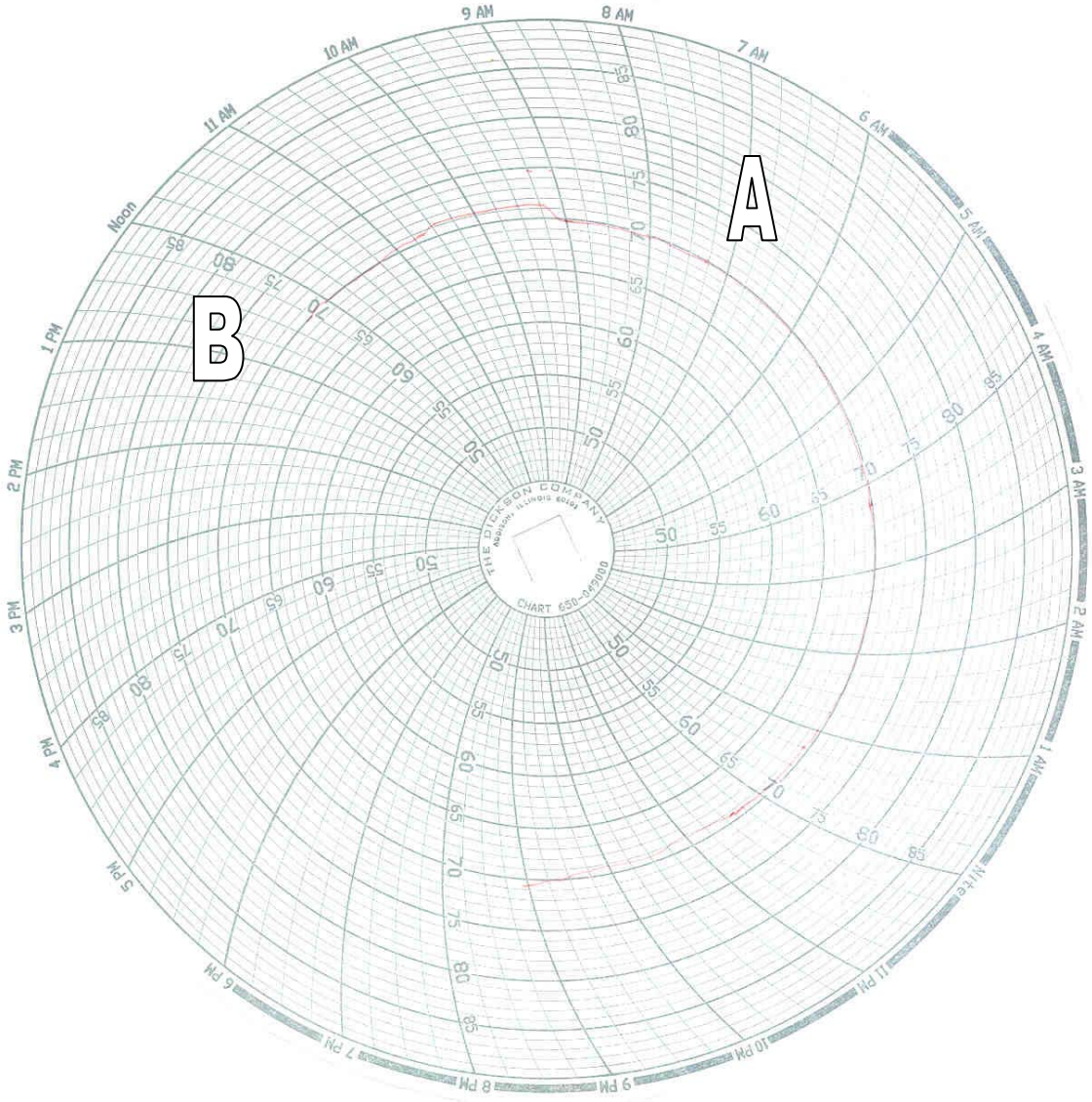
Collision Deformation Classification: Frontal Midpoint of Damage: Centerline
Damage Region Length (mm): 1524 Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	5705	5277	428
C2	Crush zone 2 at left side	mm	5805	5237	568
C3	Crush zone 3 at left side	mm	5832	5252	580
C4	Crush zone 4 at right side	mm	5831	5236	595
C5	Crush zone 5 at right side	mm	5803	5229	574
C6	Crush zone 6 at right side	mm	5702	5241	461
L	C1 TO C6	mm	1524	1512	12

DATA SHEET NO. 21

DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2004 Ford F-150 Supercab NHTSA No.: M40203
Test Program: 35mph Frontal Impact Test Date: 01/20/04



A = Dummies installed in vehicle at 7:00 am

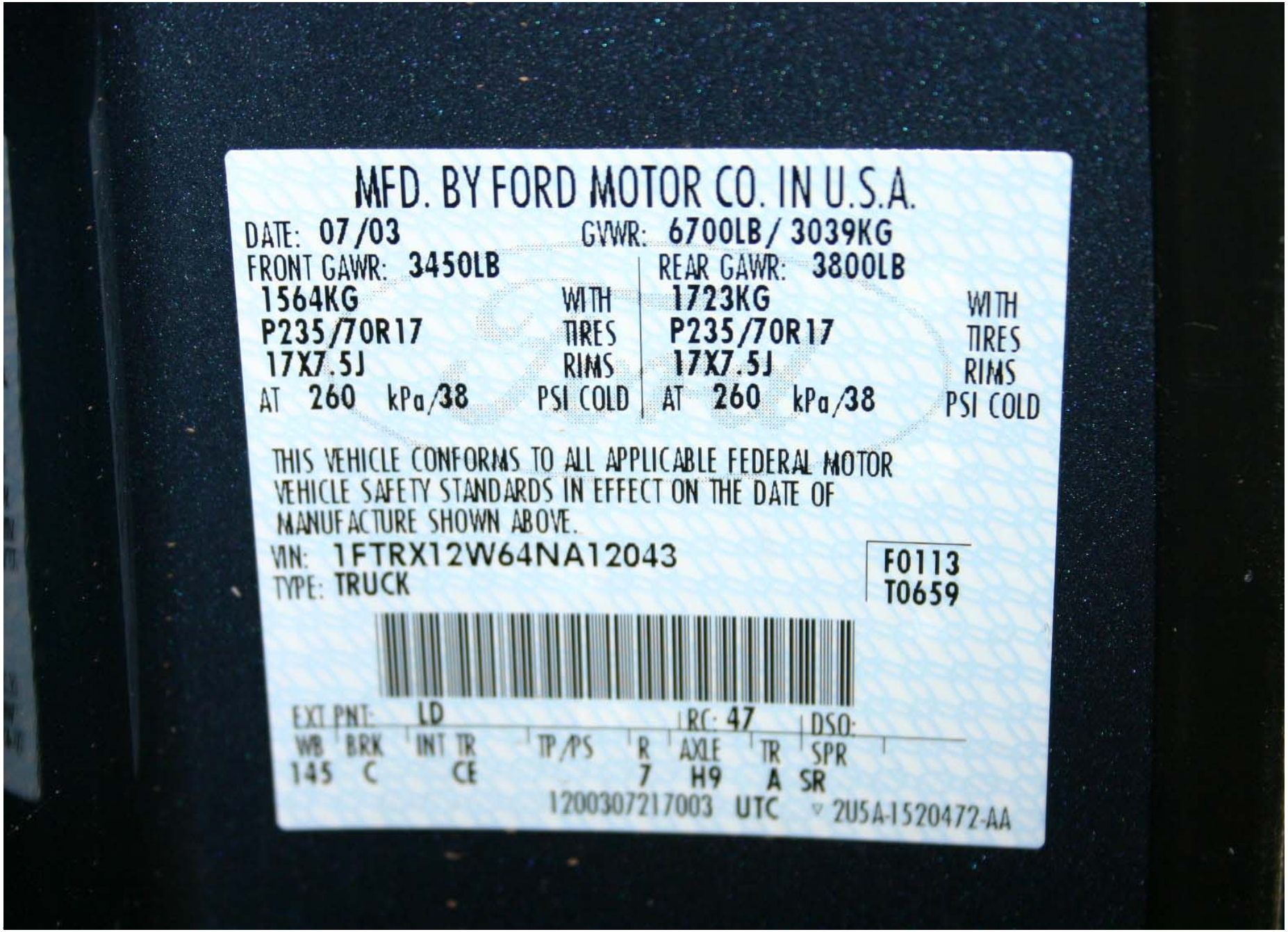
B = Test conducted at 12:42 pm

APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

Load Cell Location



Vehicle Certification Label/Tire Placard

Right Front View of Test Vehicle, as received

Left Rear View of Test Vehicle, as received

Pre-Test Front View of Test Vehicle

Post-Test Front View of Test Vehicle

Pre-Test Left Side View of Test Vehicle

Post-Test Left Side View of Test Vehicle

Pre-Test Right Side View of Test Vehicle

Post-Test Right Side View of Test Vehicle

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

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

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

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

Pre-Test Right Rear Three-Quarter View of Doors Before Impact

Post-Test Right Rear Three-Quarter View of Doors After Impact

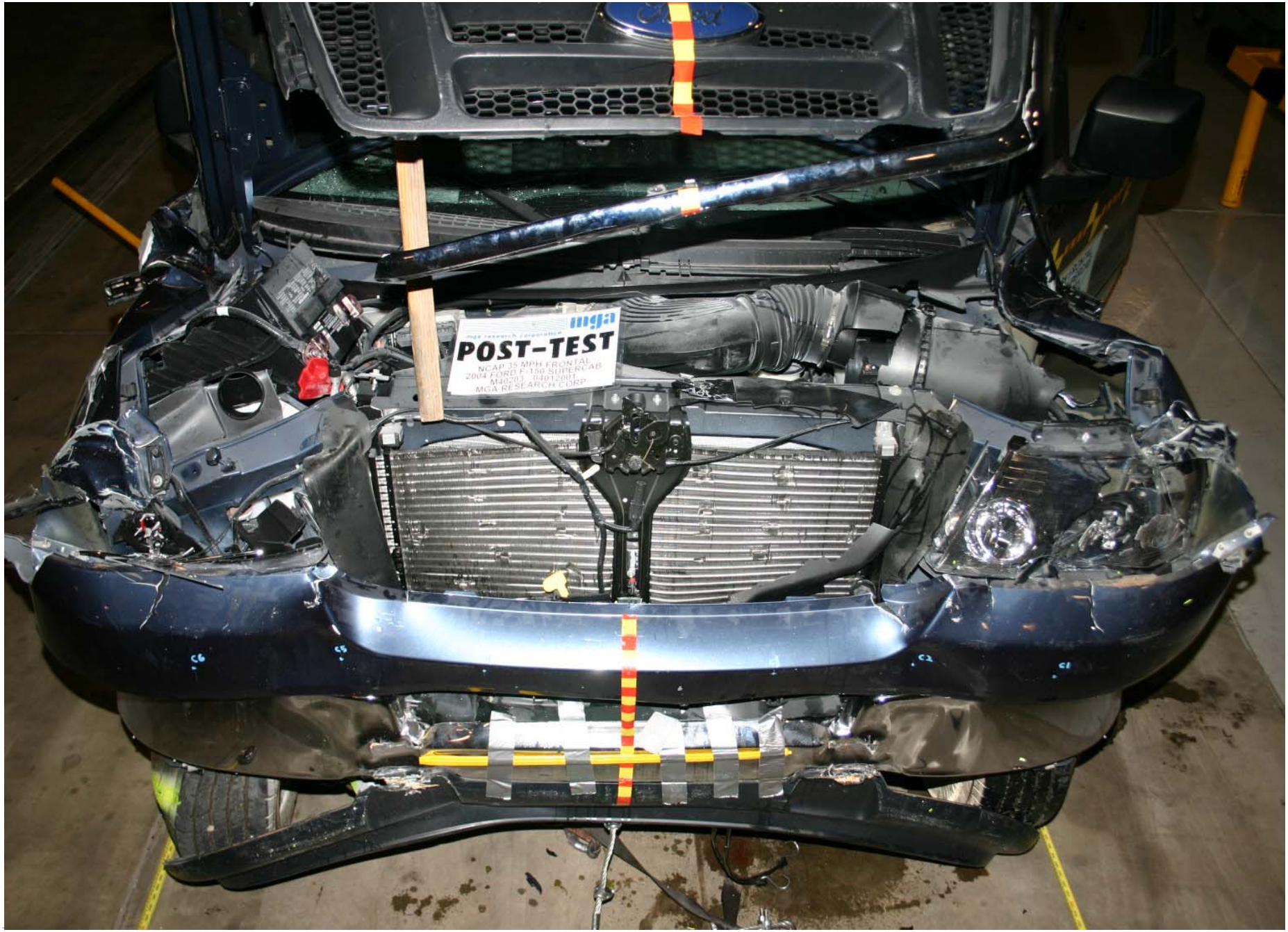
Pre-Test Left Rear Three-Quarter View of Doors Before Impact

Post-Test Left Rear Three-Quarter View of Doors After Impact

Pre-Test Windshield View

Post-Test Windshield View

Pre-Test Engine Compartment View



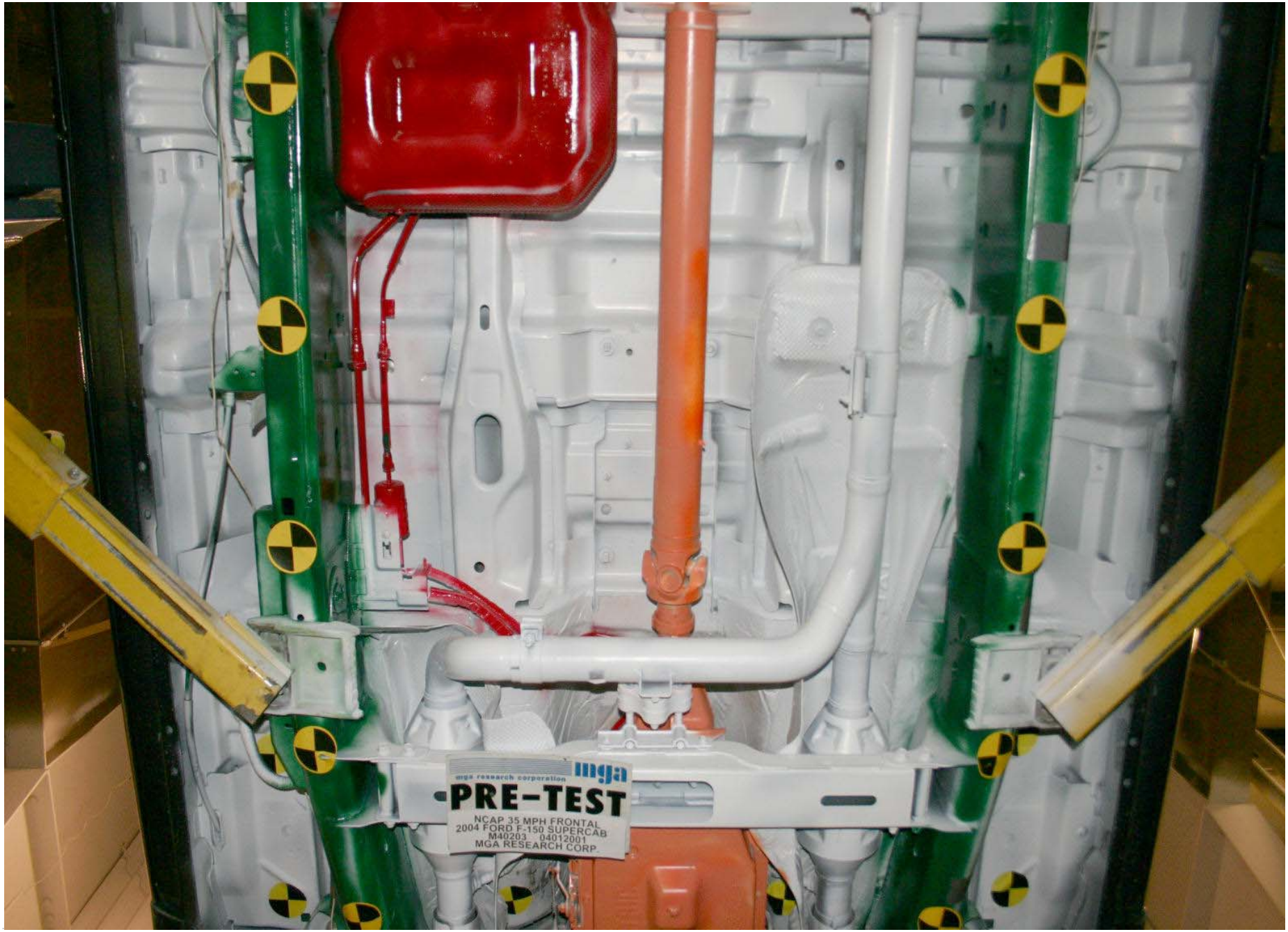
Post-Test Engine Compartment View

Pre-Test Fuel Filler Cap View

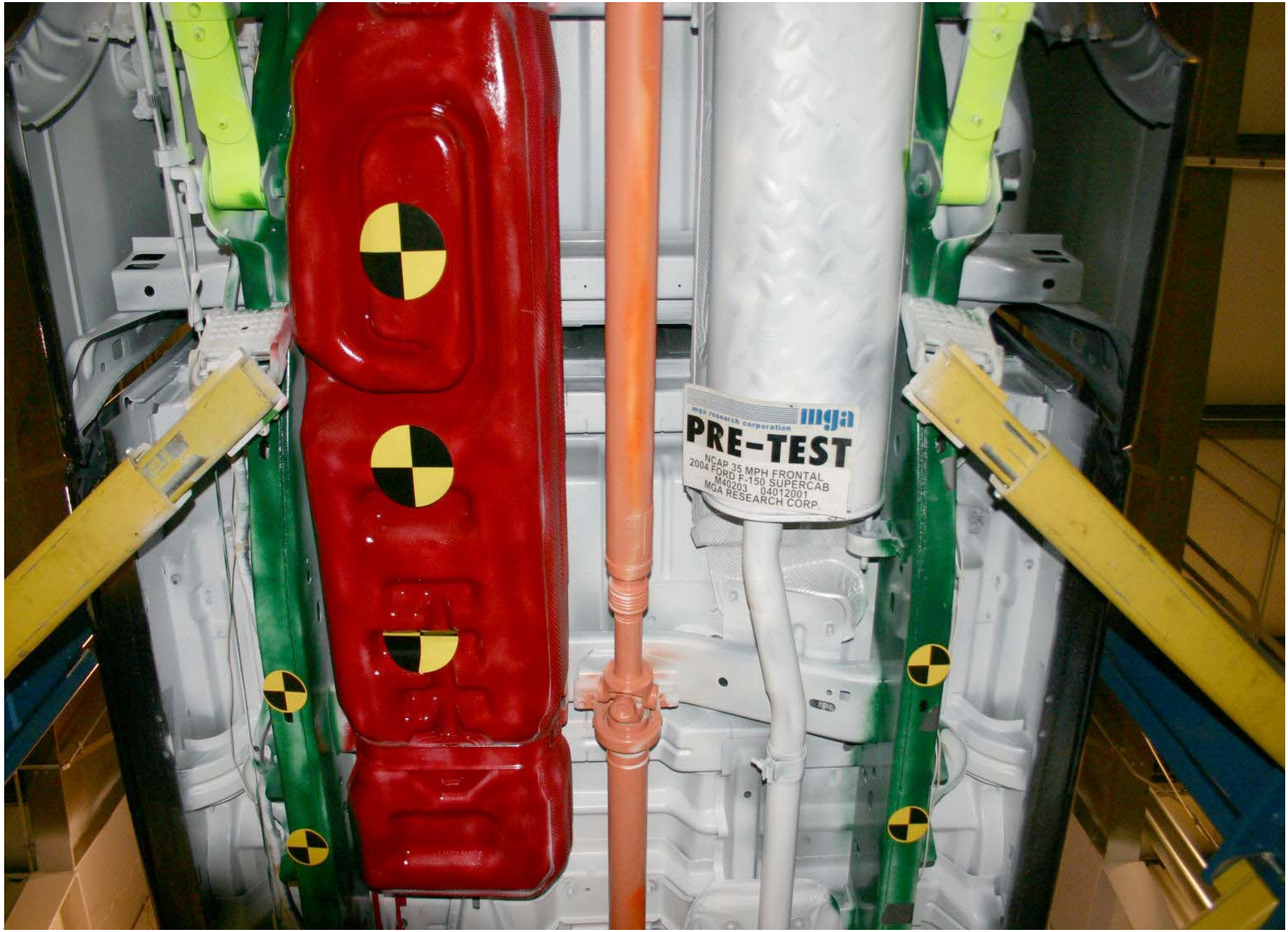
Post-Test Fuel Filler Cap View

Pre-Test Front Underbody View

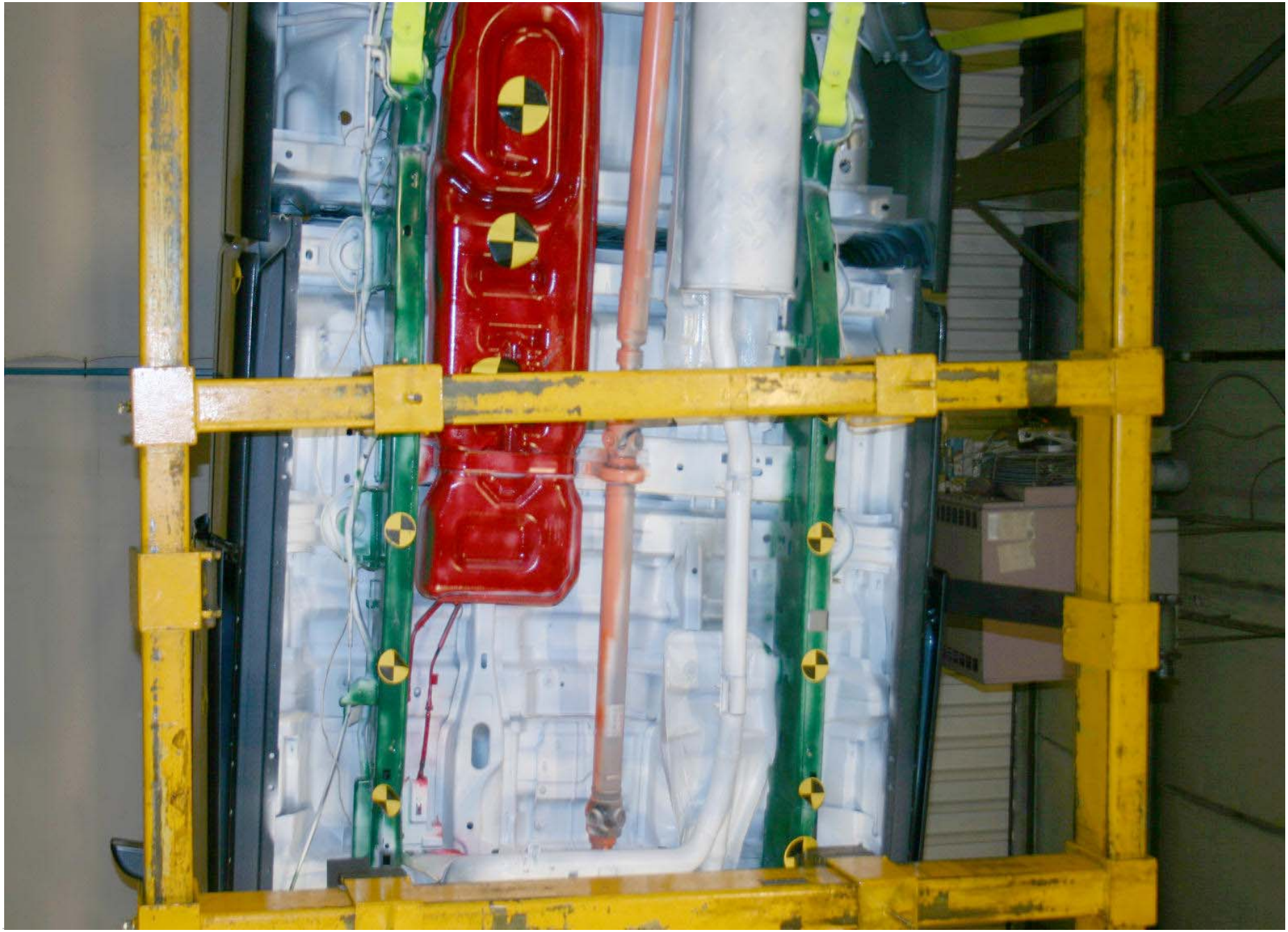
Post-Test Front Underbody View



Pre-Test Mid Underbody



Pre-Test Mid Underbody



Post-Test Mid Underbody

Pre-Test Rear Underbody View

Post-Test Rear Underbody View

Pre-Test Driver Dummy Front View (head position)

Post-Test Driver Dummy Front View (head position)

Pre-Test Driver Dummy Position Left Side View

Post-Test Driver Dummy Position Left Side View

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

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

Pre-Test Driver Dummy Feet Position

Post-Test Driver Dummy Feet Position

Pre-Test Driver Side Knee Bolster View

Post-Test Driver Side Knee Bolster View

Post-Test Driver Side Floor Pan View

Post-Test Driver Dummy Head Contact

Post-Test Driver Dummy Knee Contact

Post-Test Driver Dummy Airbag Contact

Pre-Test Passenger Dummy Front View (head position)

Post-Test Passenger Dummy Front View (head position)

Pre-Test Passenger Dummy Position Right Side View

Post-Test Passenger Dummy Position Right Side View

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

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

Pre-Test Passenger Dummy Feet Position

Post-Test Passenger Dummy Feet Position

Pre-Test Passenger Side Knee Bolster View

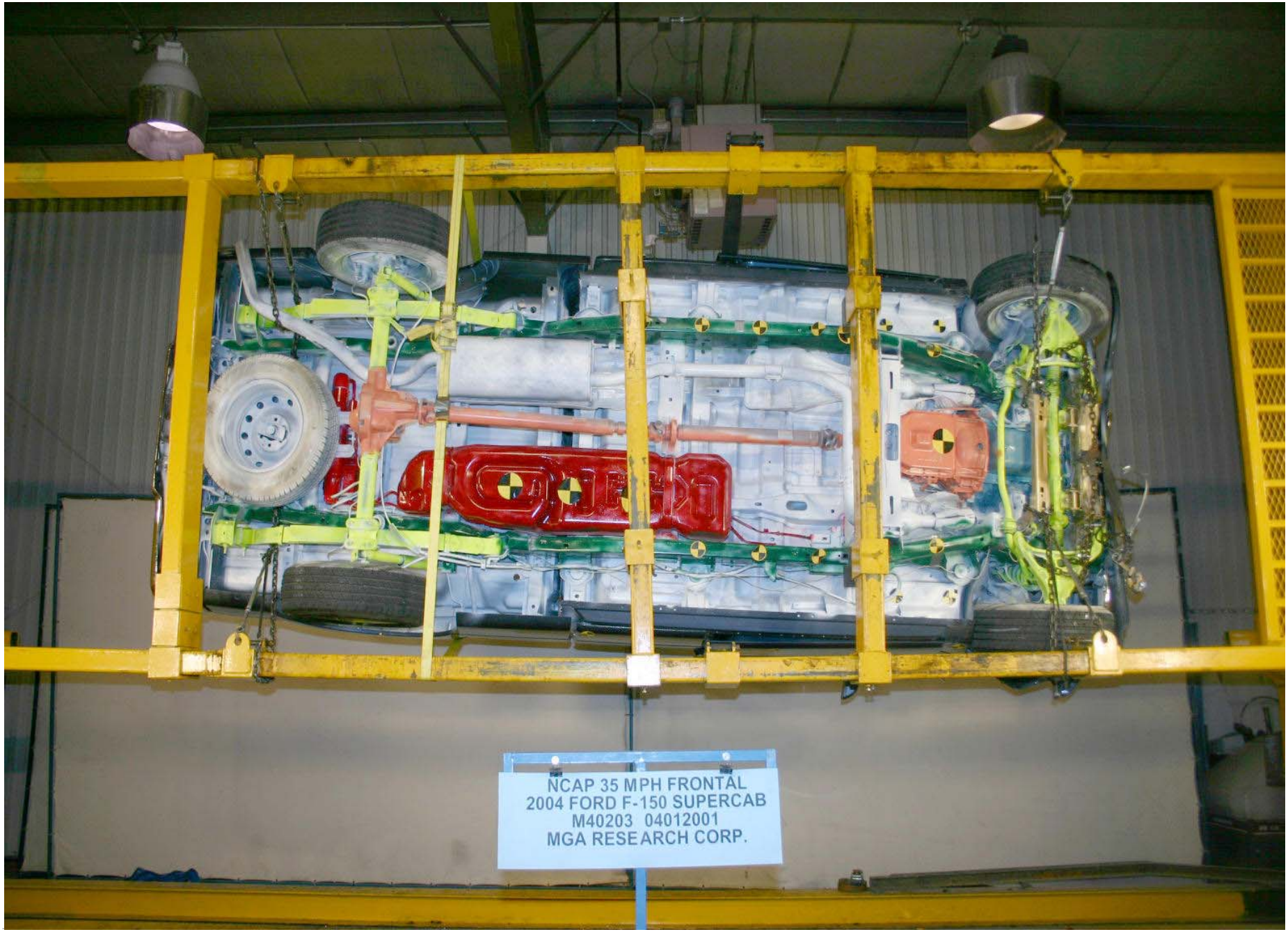
Post-Test Passenger Side Knee Bolster View

Post-Test Passenger Side Floor Pan View

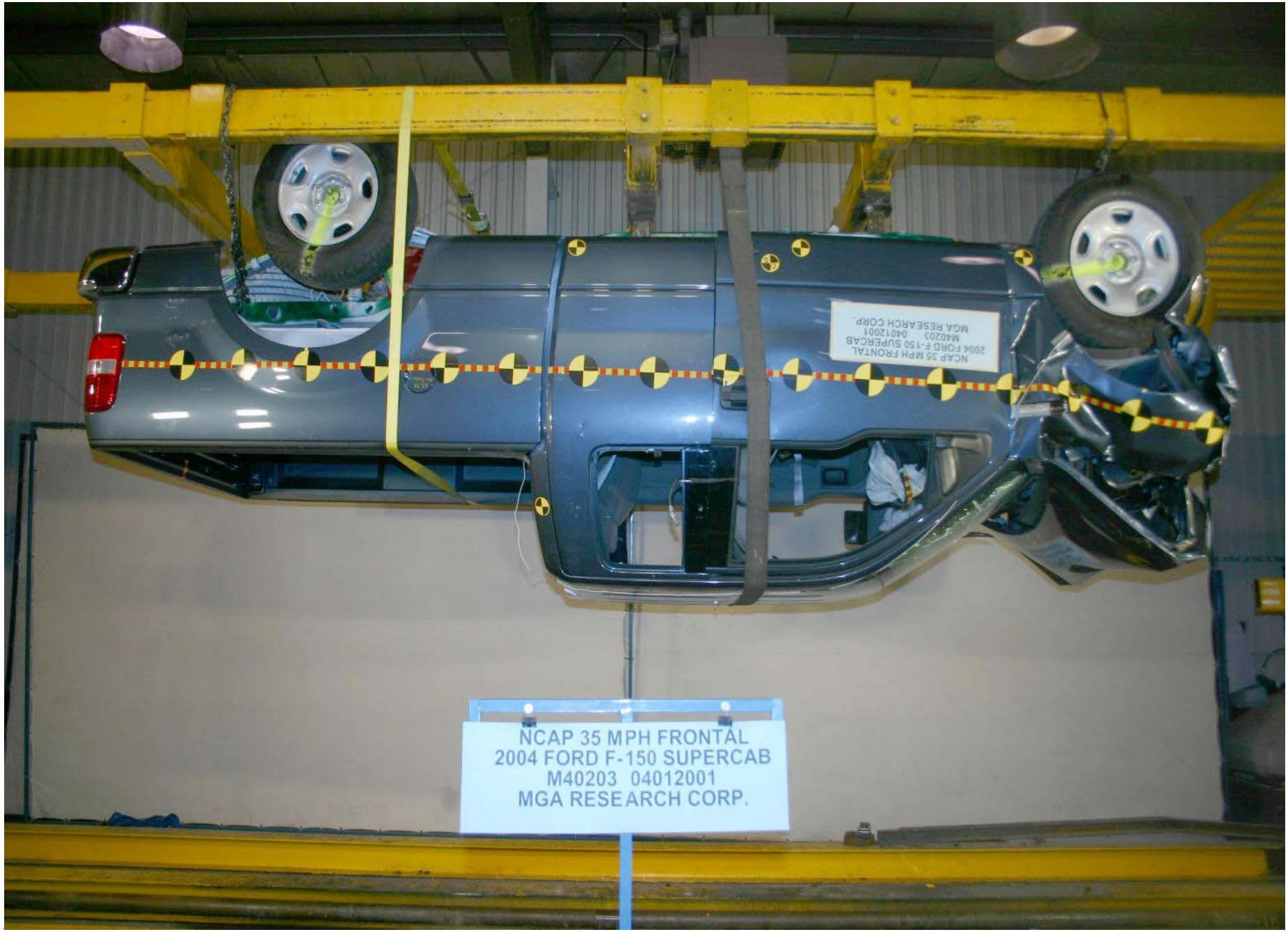
Post-Test Passenger Dummy Head Contact

Post-Test Passenger Dummy Knee Contact

Post-Test Passenger Dummy Airbag Contact



Rollover 90 Degrees



Rollover 180 Degrees

Rollover 270 Degrees

Rollover 360 Degrees

Vehicle Impact

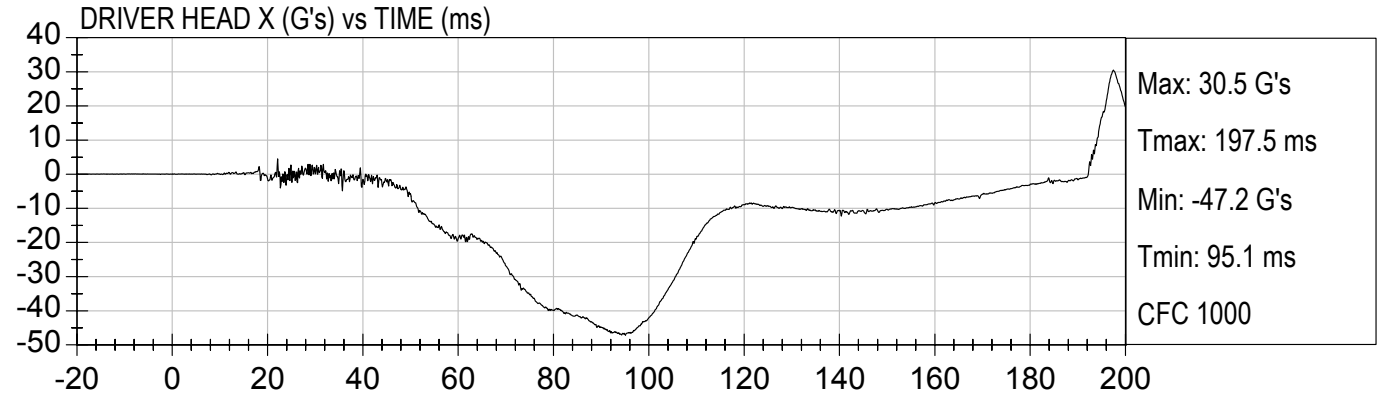
APPENDIX B

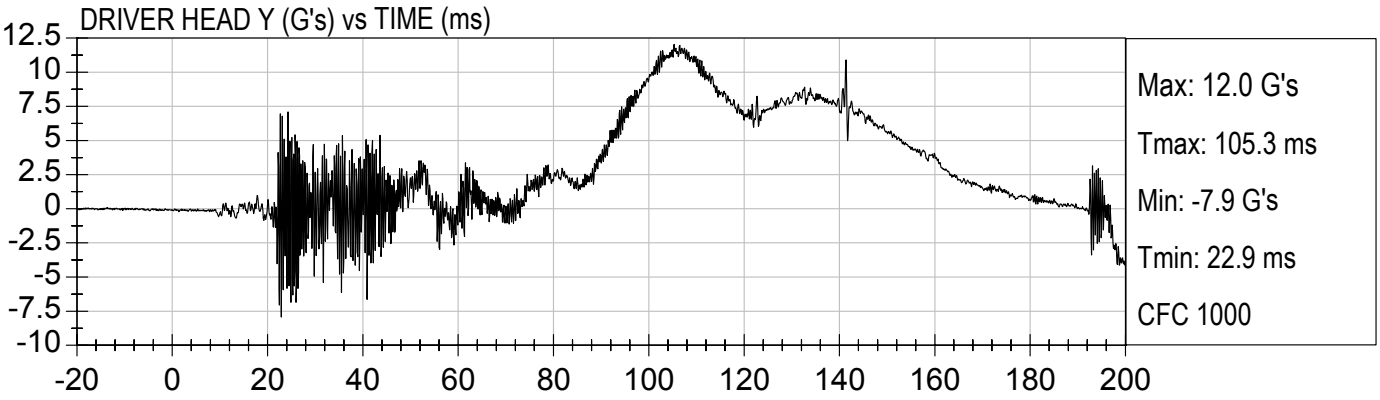
DUMMY AND VEHICLE RESPONSE DATA TRACES

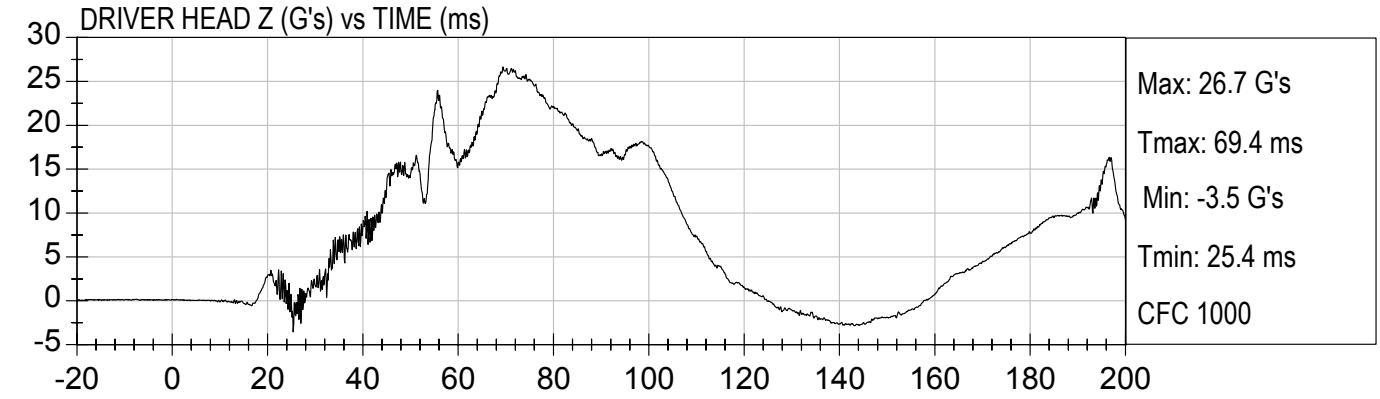
TABLE OF DATA PLOTS

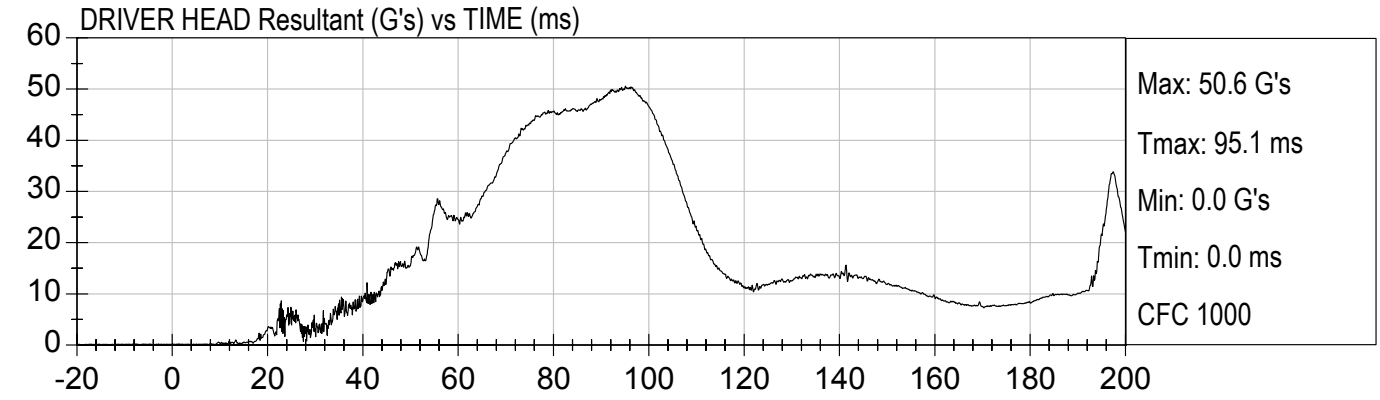
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

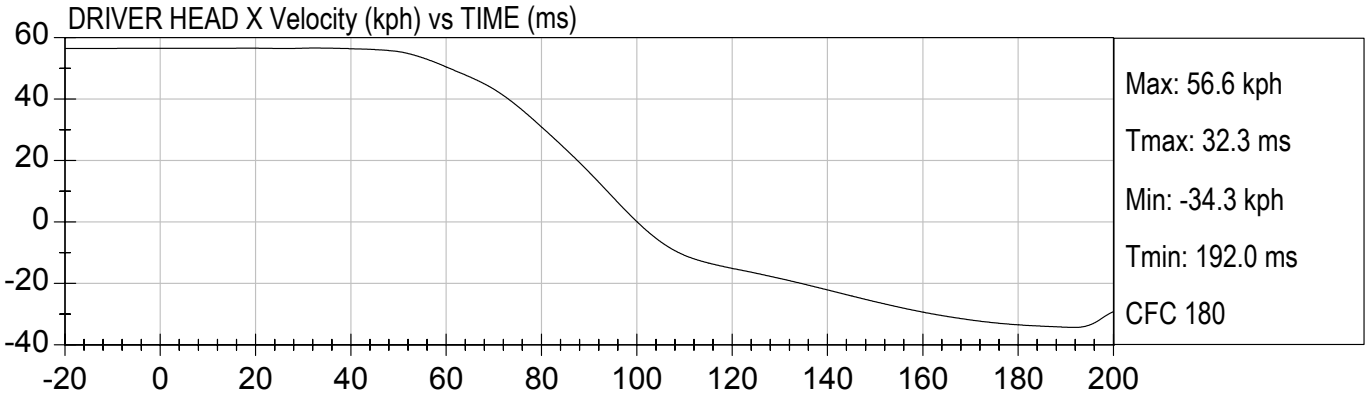
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

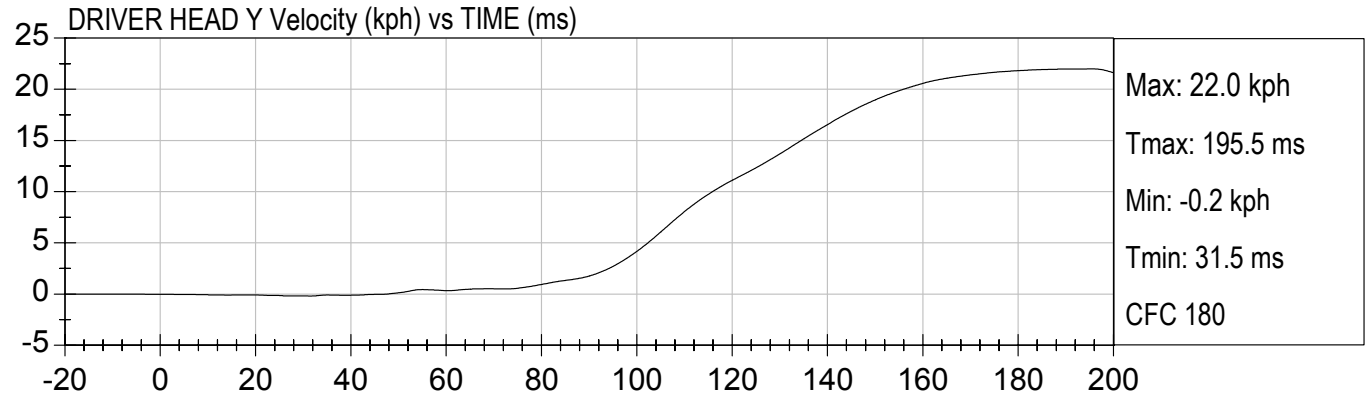


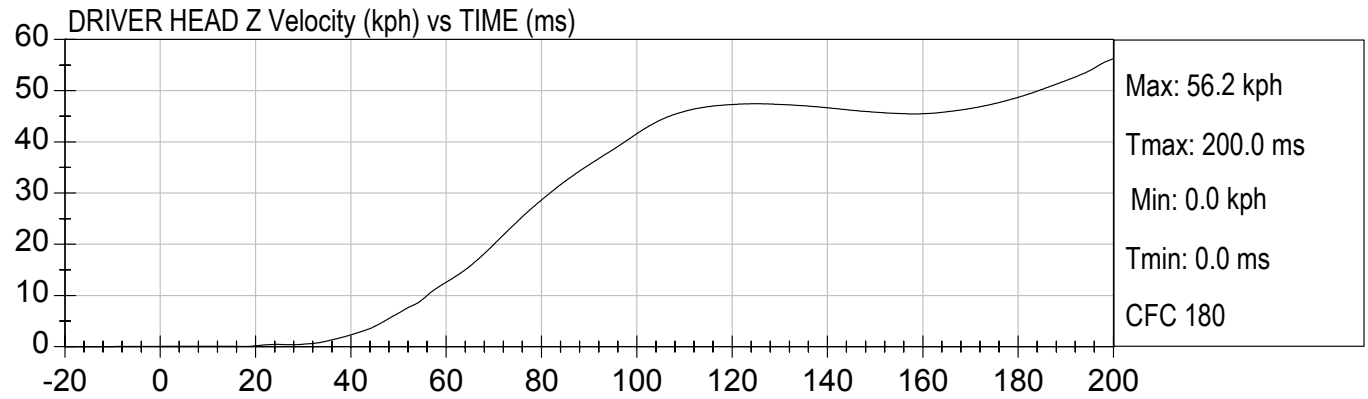






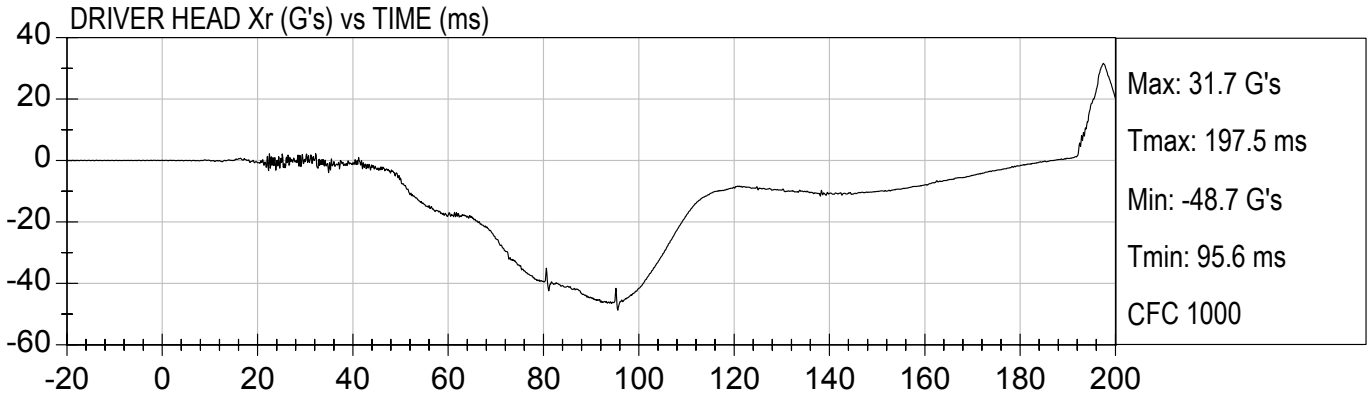

DRIVER HEAD X Velocity (kph) vs TIME (ms)
60
40
20
0
-20
-40
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.6 kph
Tmax: 32.3 ms
Min: -34.3 kph
Tmin: 192.0 ms
CFC 180

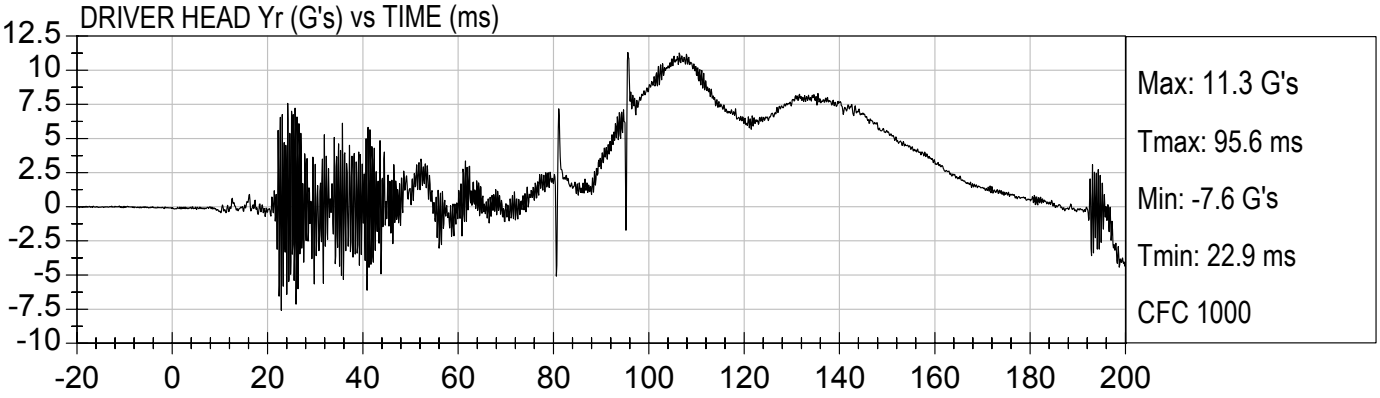

DRIVER HEAD Y Velocity (kph) vs TIME (ms)
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 22.0 kph
Tmax: 195.5 ms
Min: -0.2 kph
Tmin: 31.5 ms
CFC 180

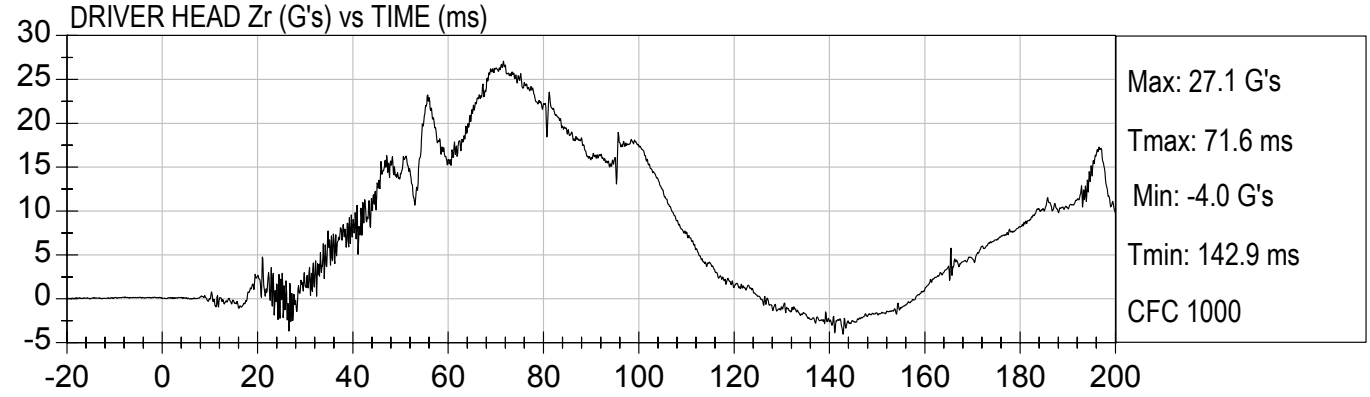

DRIVER HEAD Z Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.2 kph
Tmax: 200.0 ms
Min: 0.0 kph
Tmin: 0.0 ms
CFC 180

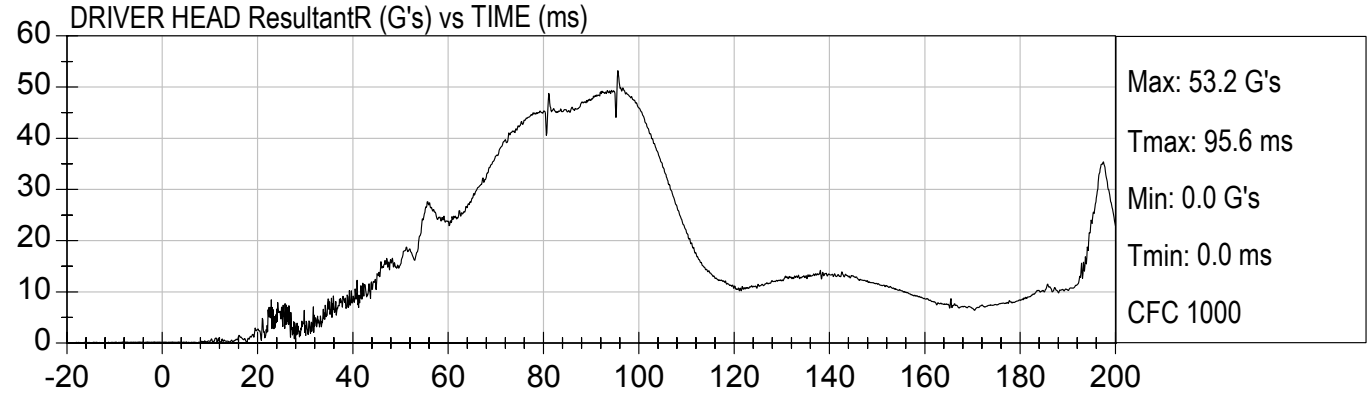
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

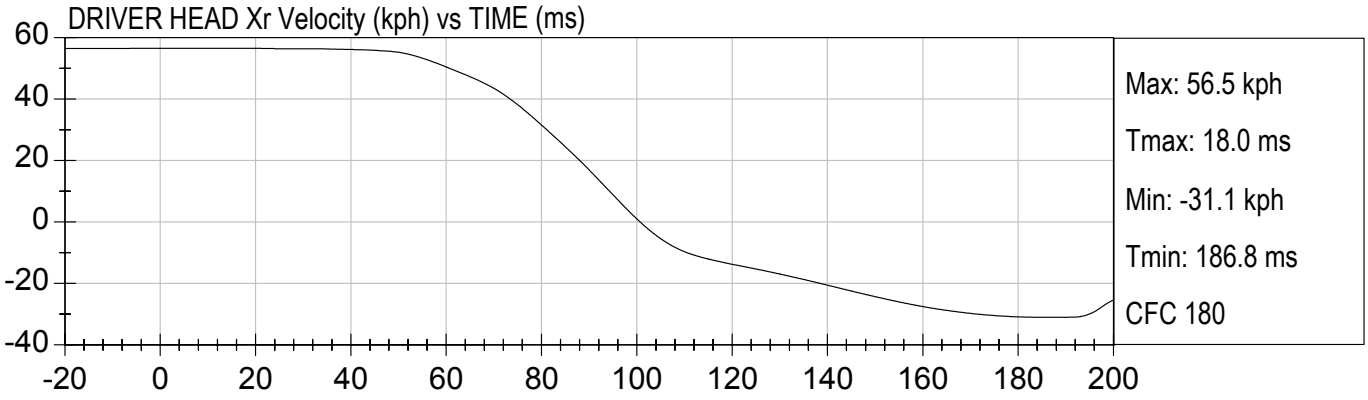
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

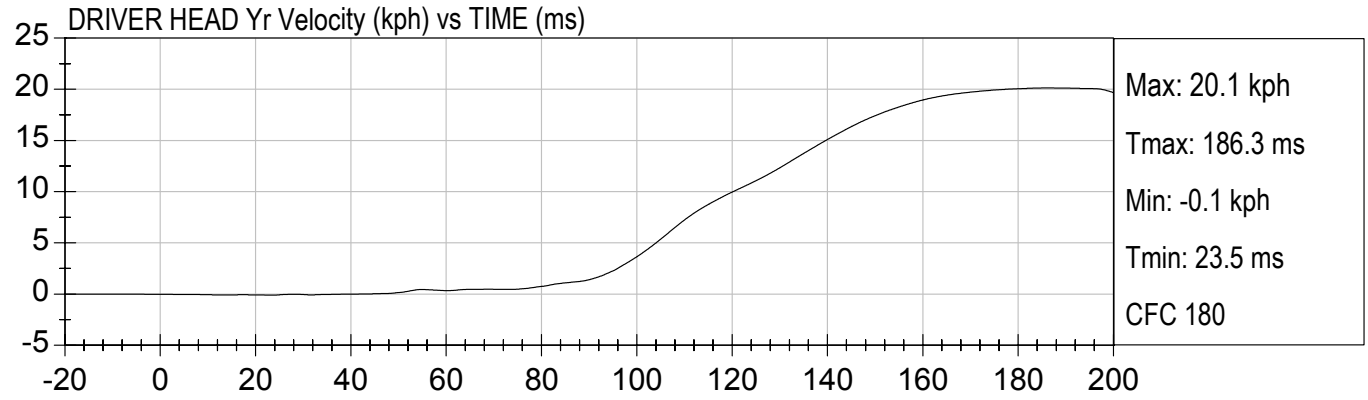


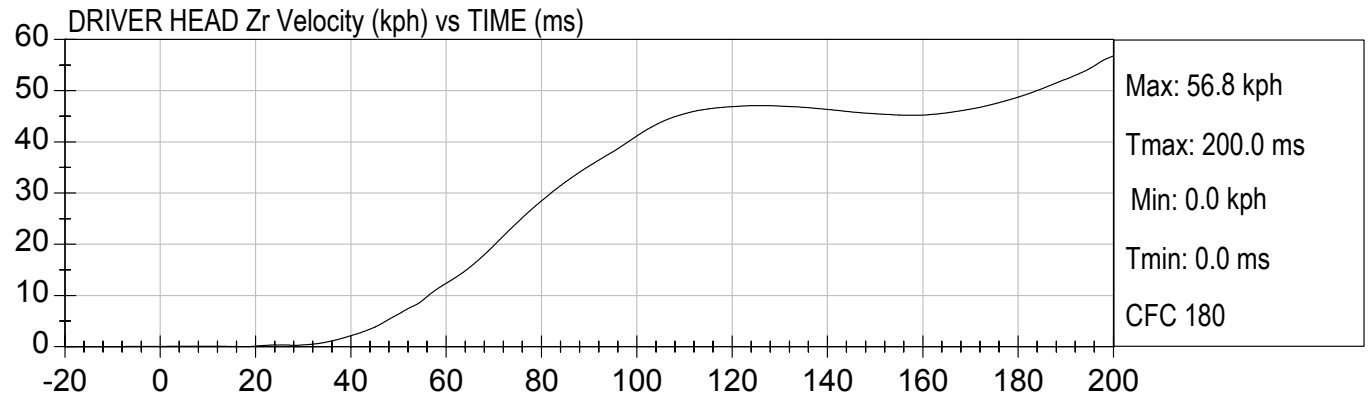






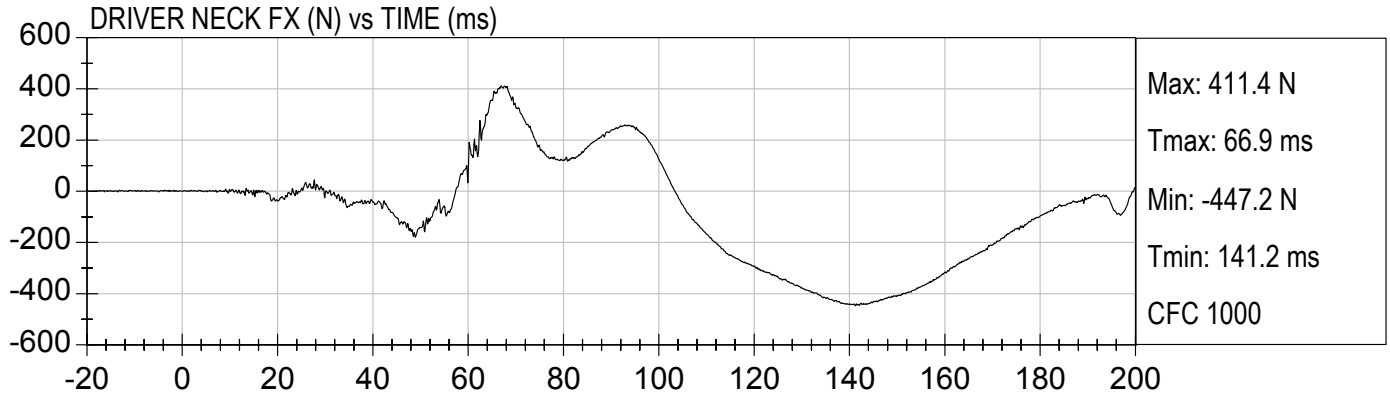

DRIVER HEAD Xr Velocity (kph) vs TIME (ms)
60
40
20
0
-20
-40
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.5 kph
Tmax: 18.0 ms
Min: -31.1 kph
Tmin: 186.8 ms
CFC 180

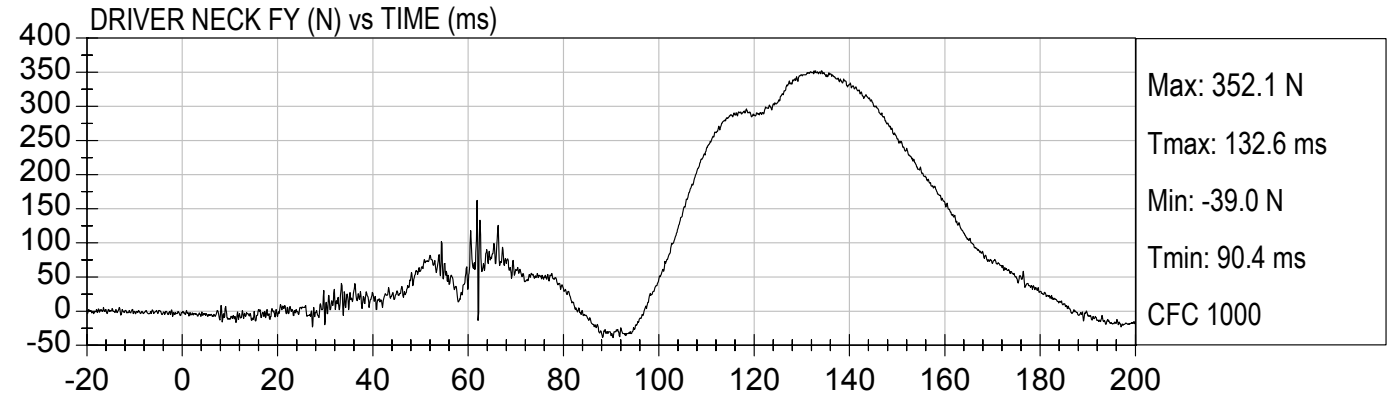

DRIVER HEAD Yr Velocity (kph) vs TIME (ms)
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 20.1 kph
Tmax: 186.3 ms
Min: -0.1 kph
Tmin: 23.5 ms
CFC 180

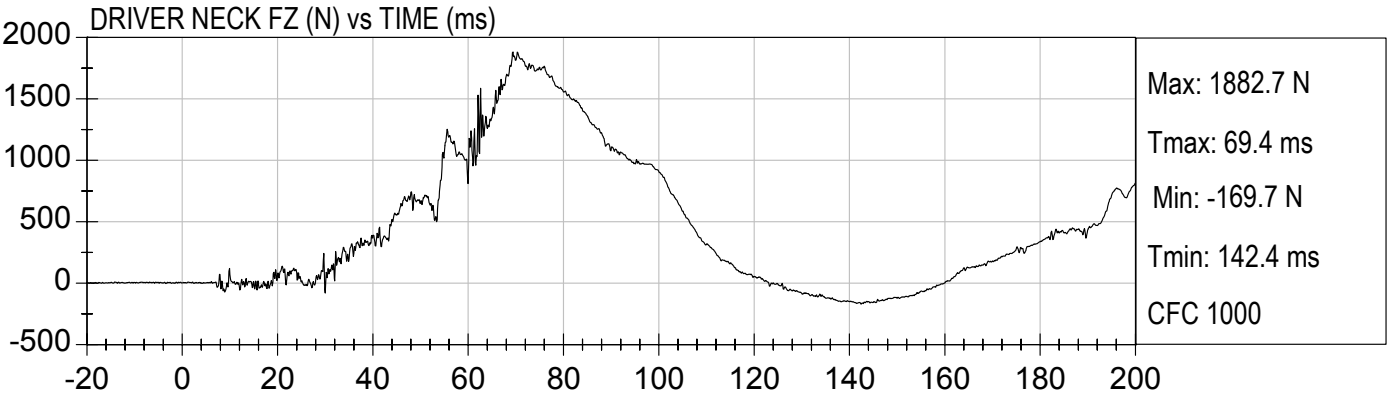

DRIVER HEAD Zr Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.8 kph
Tmax: 200.0 ms
Min: 0.0 kph
Tmin: 0.0 ms
CFC 180

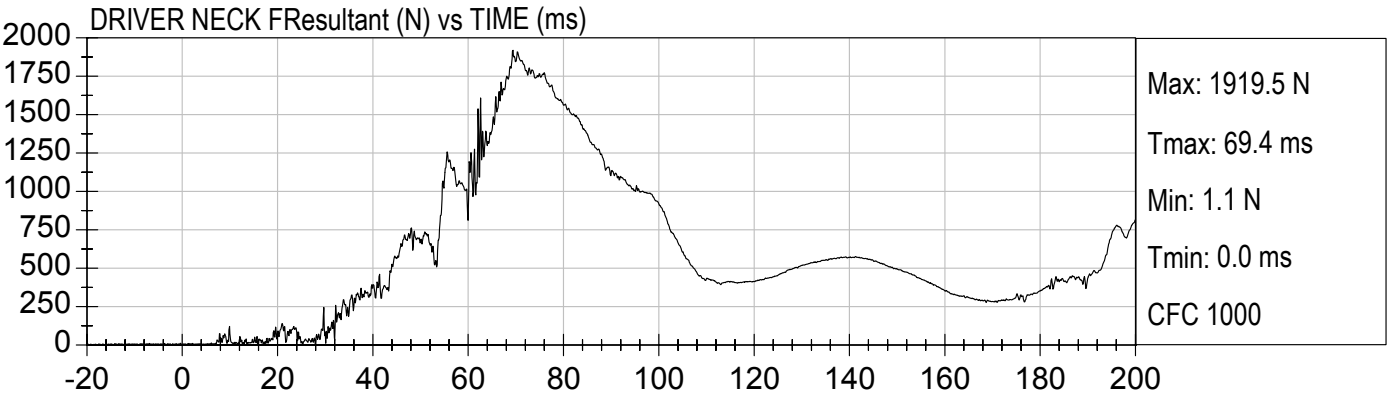
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)



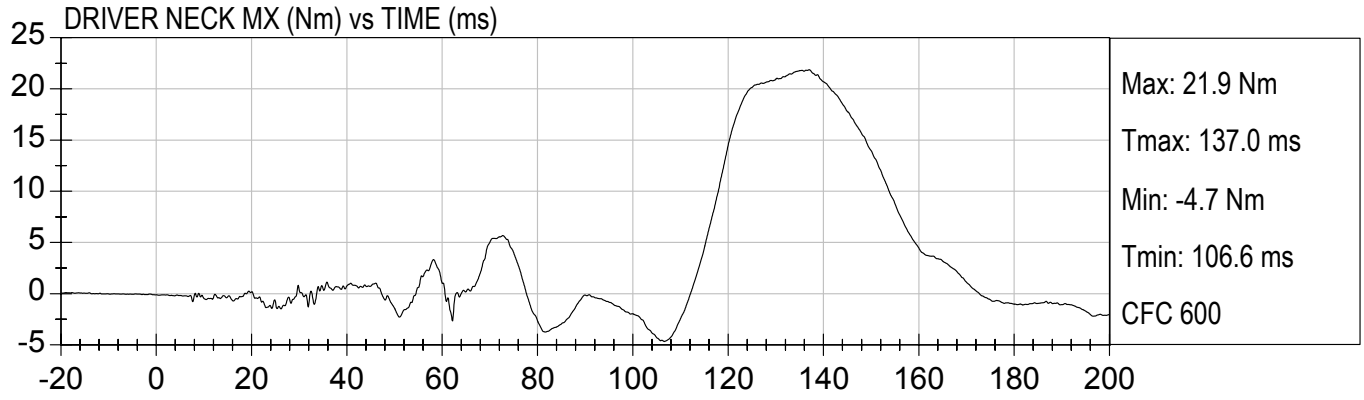


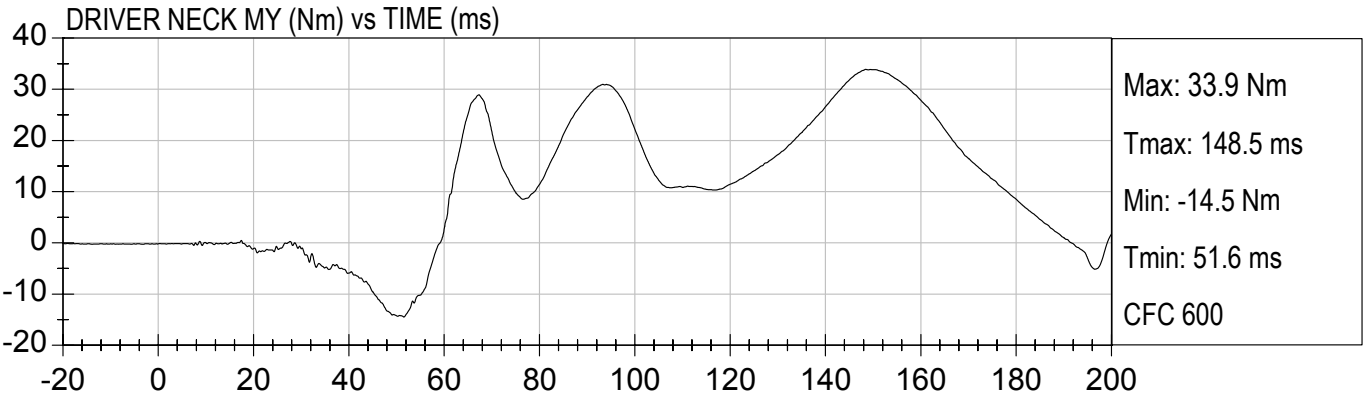


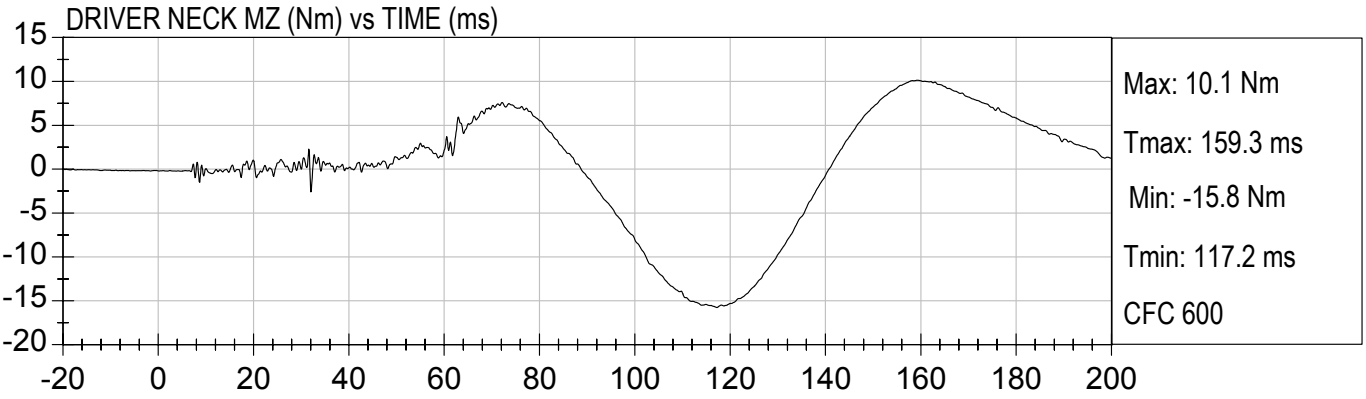


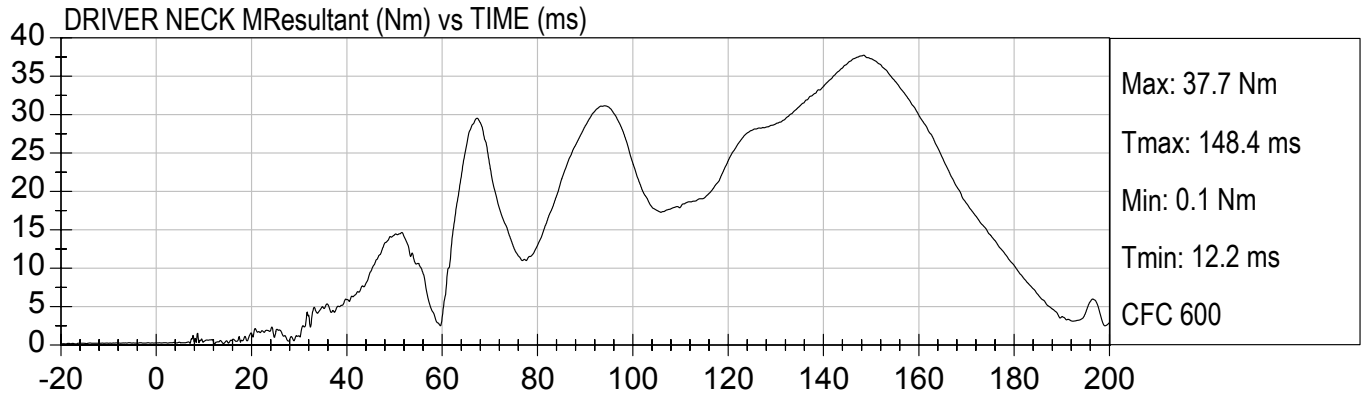
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)



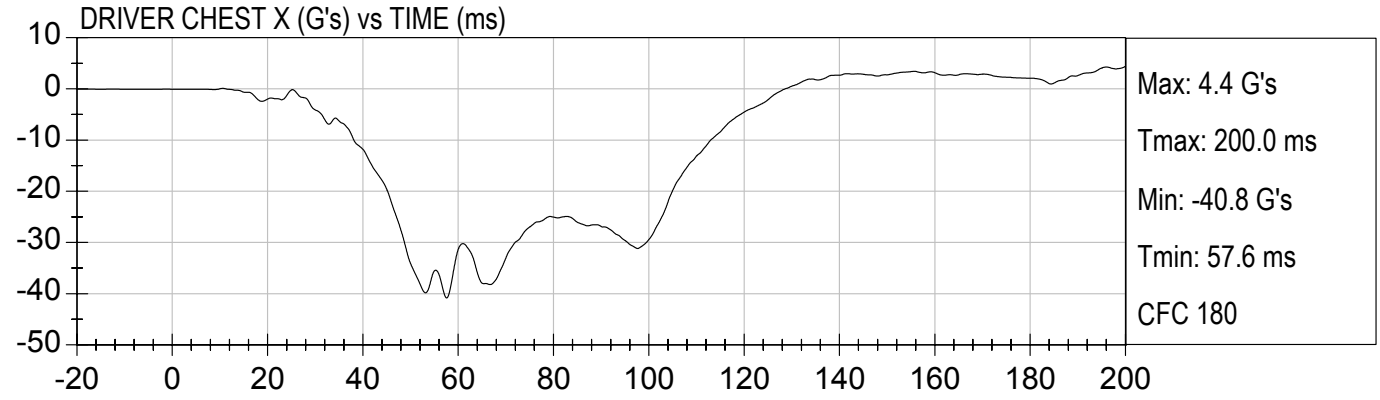


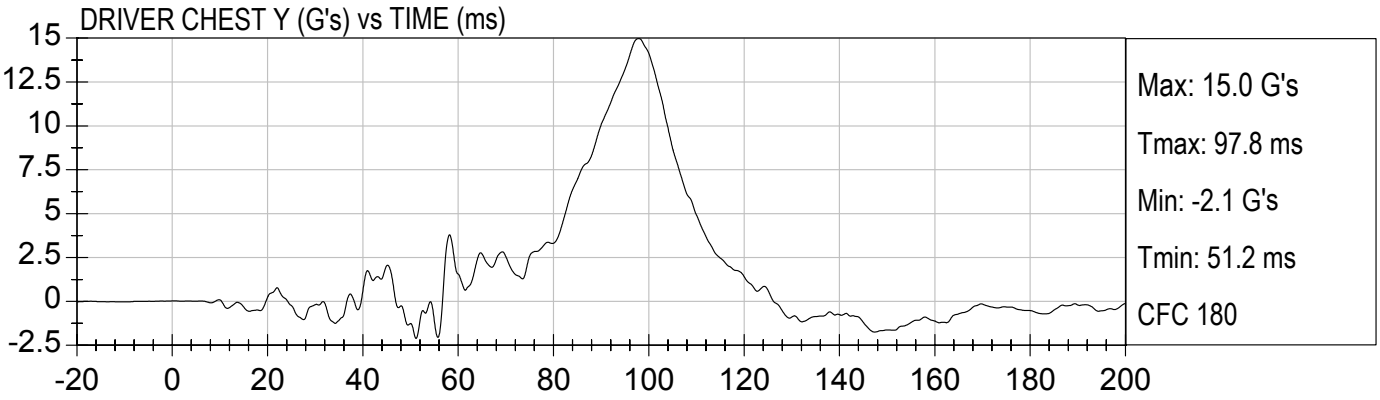


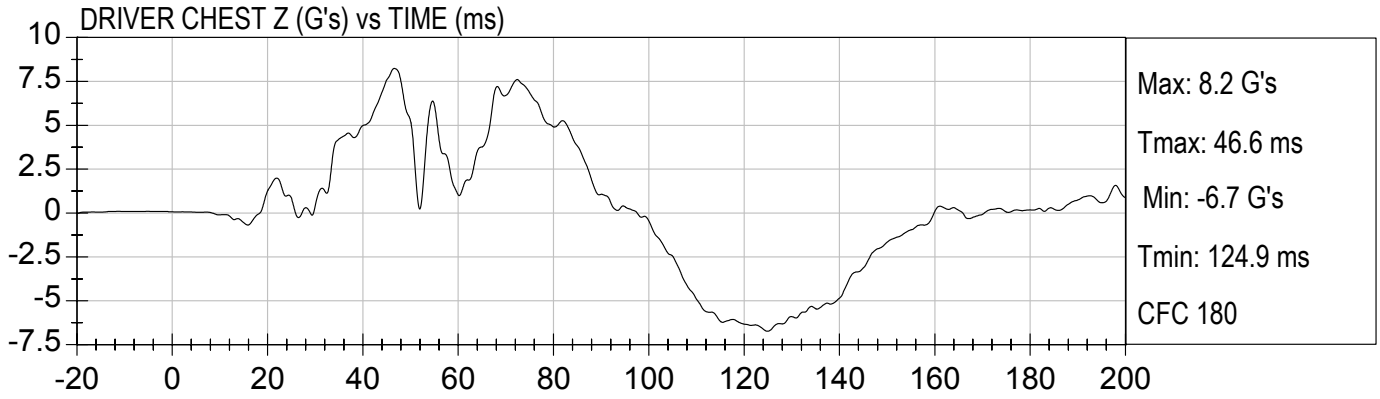


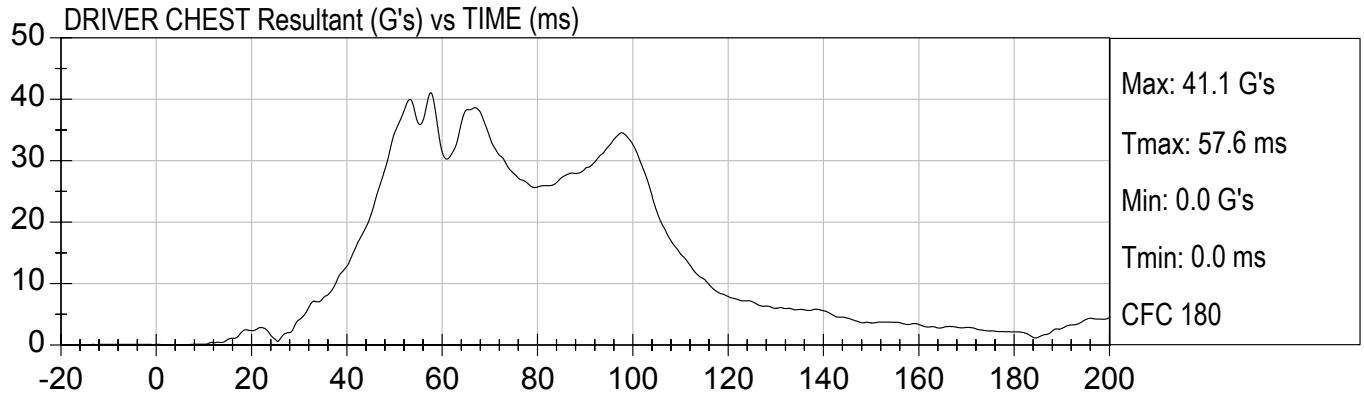
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

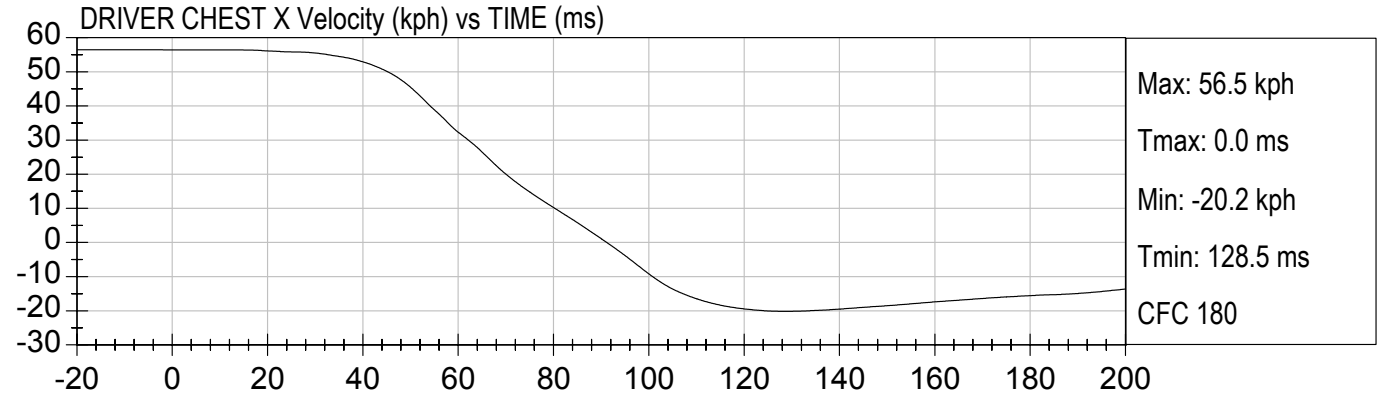
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

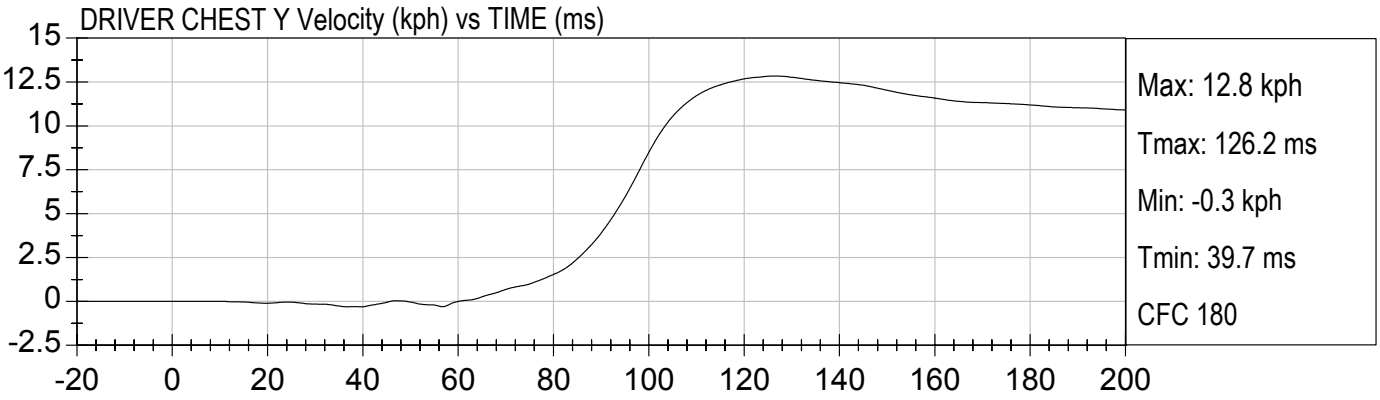


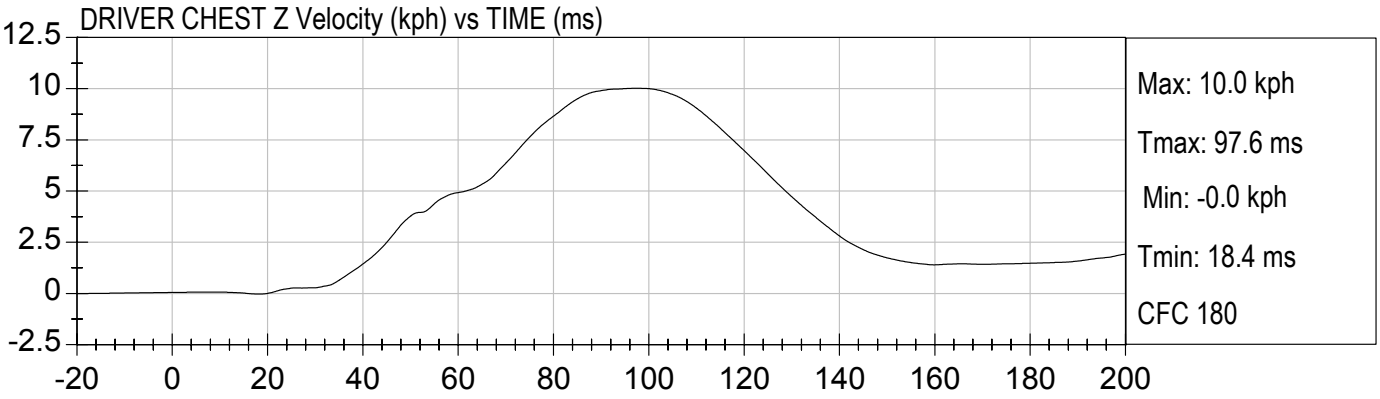


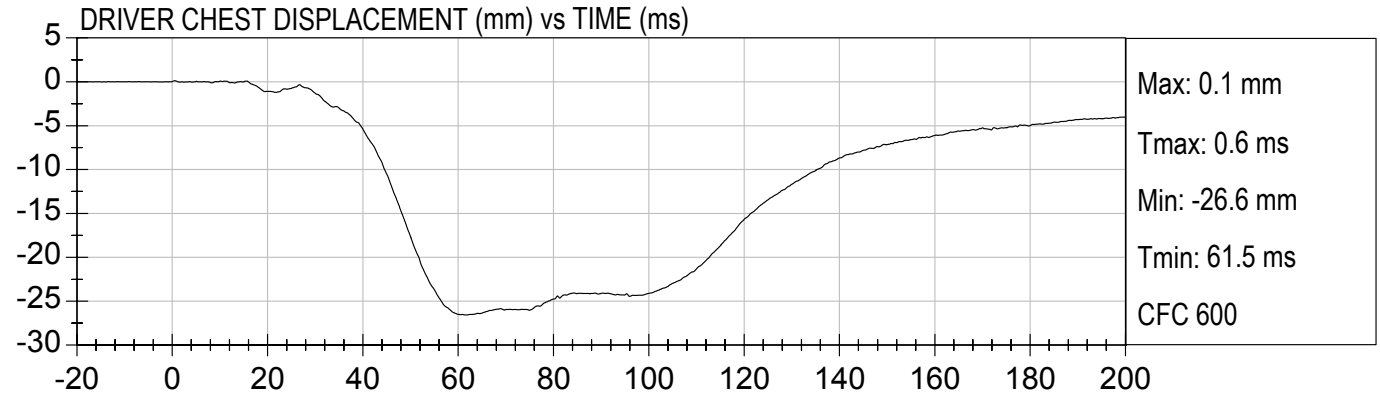





DRIVER CHEST X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
-30
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.5 kph
Tmax: 0.0 ms
Min: -20.2 kph
Tmin: 128.5 ms
CFC 180

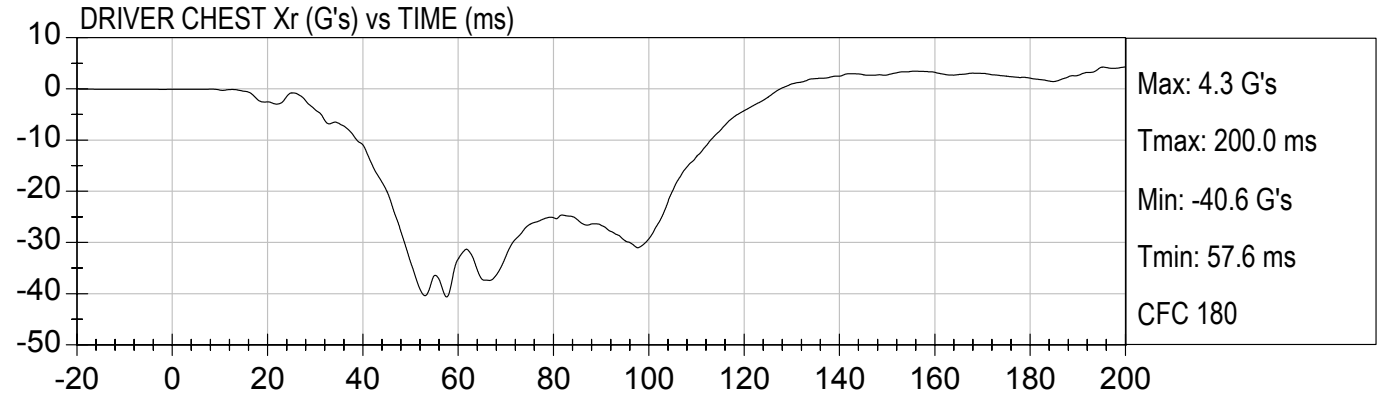

DRIVER CHEST Y Velocity (kph) vs TIME (ms)
15
12.5
10
7.5
5
2.5
0
-2.5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 12.8 kph
Tmax: 126.2 ms
Min: -0.3 kph
Tmin: 39.7 ms
CFC 180

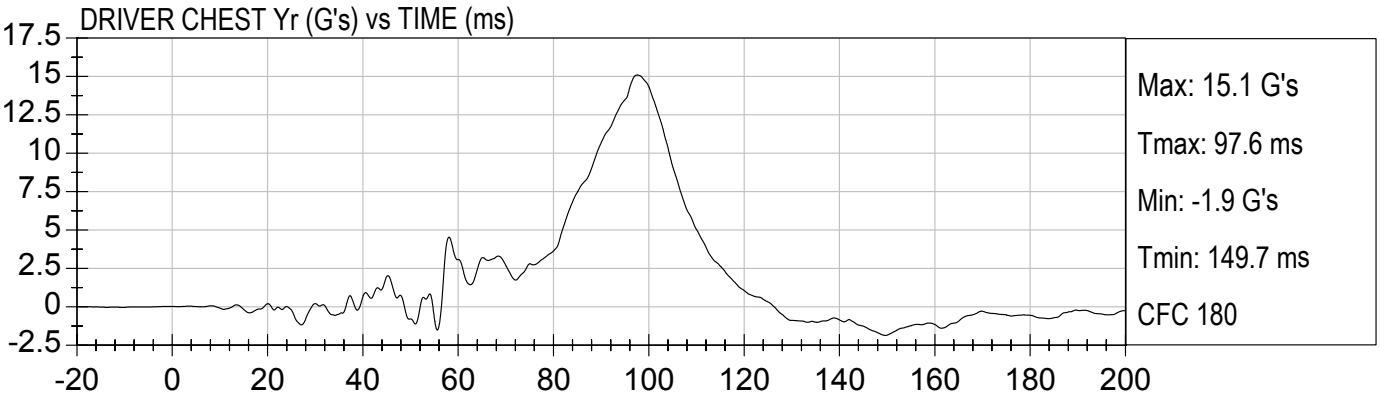

DRIVER CHEST Z Velocity (kph) vs TIME (ms)
12.5
10
7.5
5
2.5
0
-2.5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 10.0 kph
Tmax: 97.6 ms
Min: -0.0 kph
Tmin: 18.4 ms
CFC 180

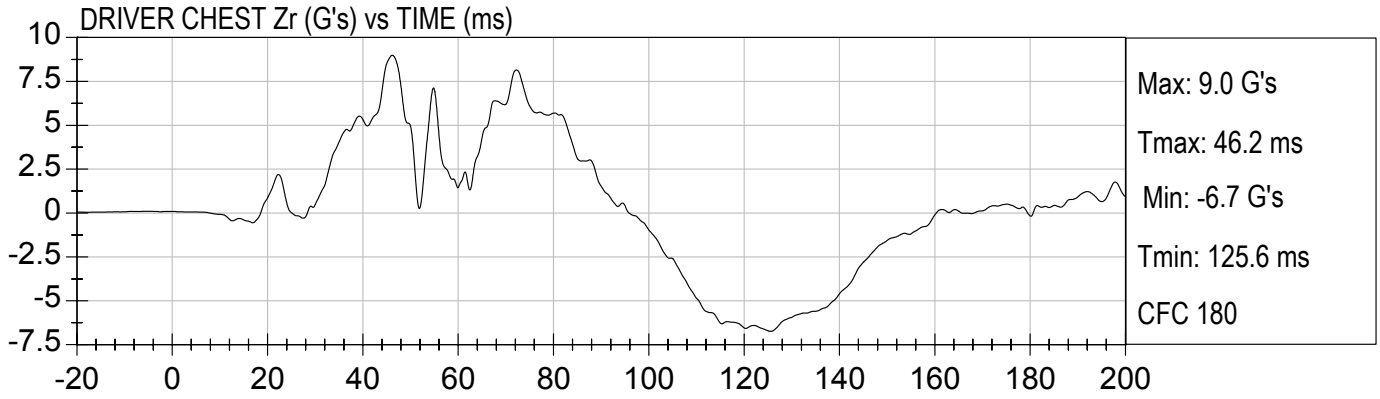

DRIVER CHEST DISPLACEMENT (mm) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 0.1 mm
Tmax: 0.6 ms
Min: -26.6 mm
Tmin: 61.5 ms
CFC 600

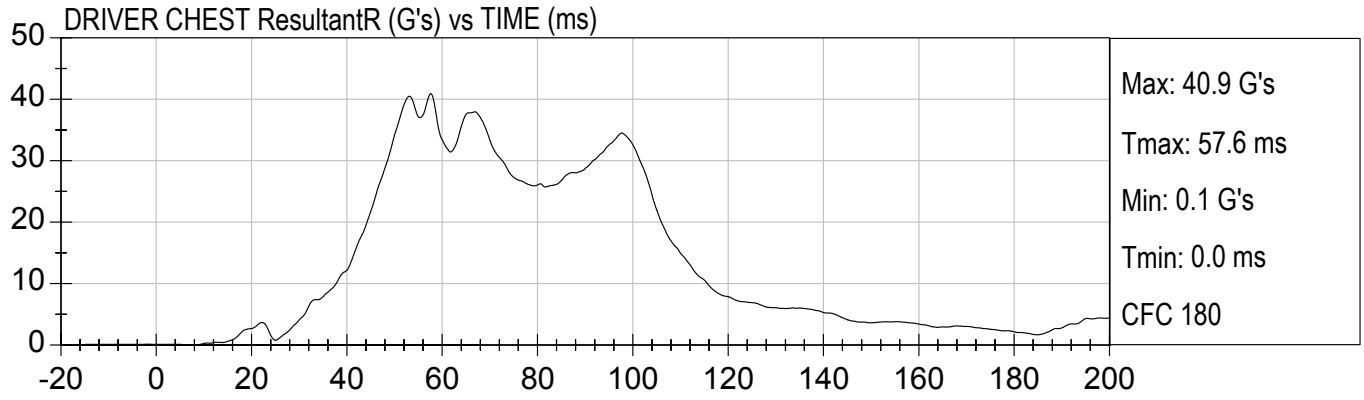
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

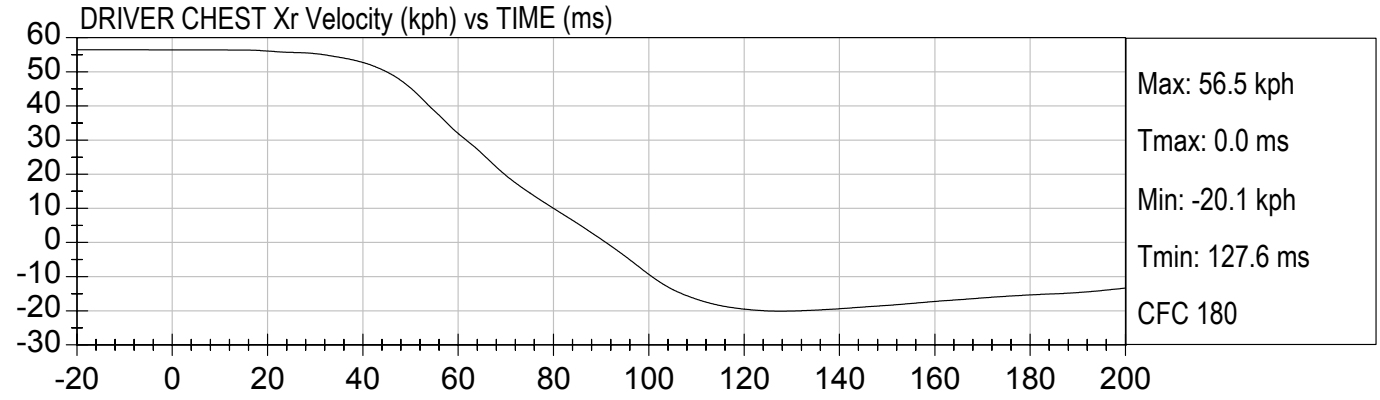
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

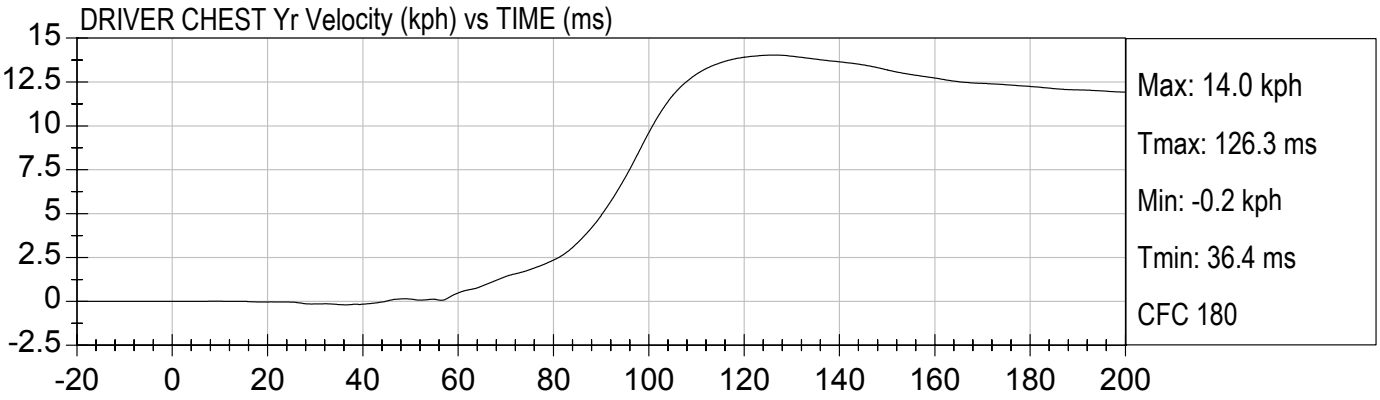


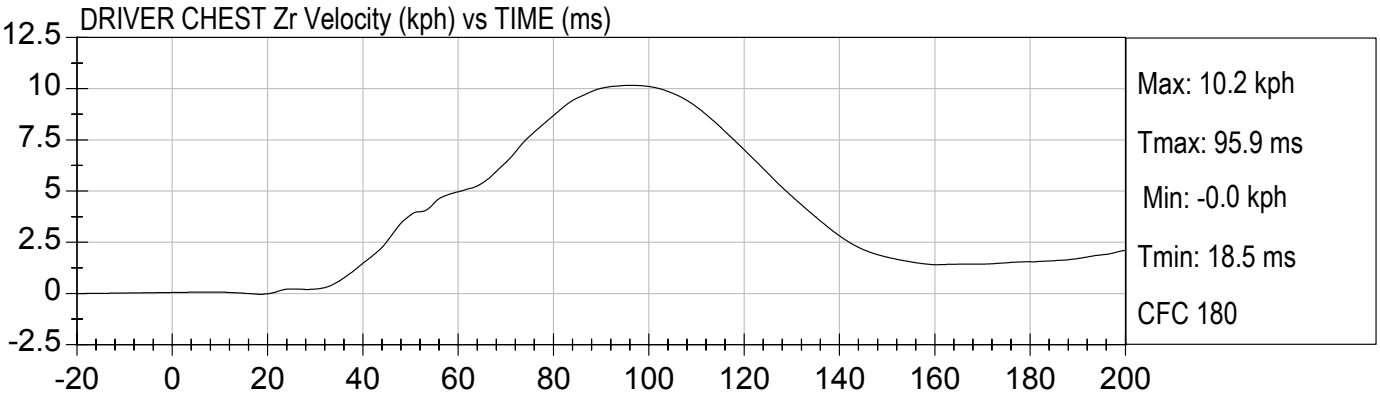






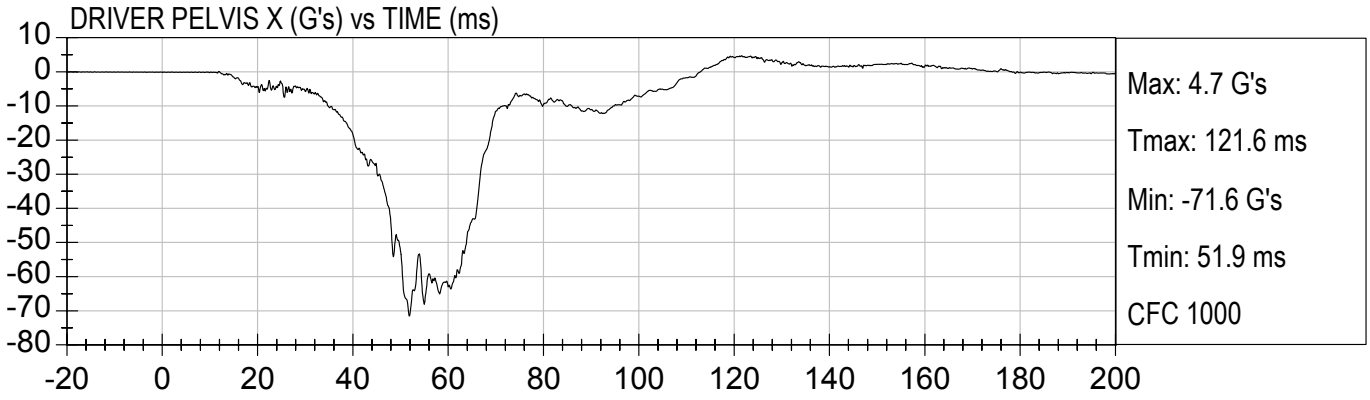

DRIVER CHEST Xr Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
-30
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 56.5 kph
Tmax: 0.0 ms
Min: -20.1 kph
Tmin: 127.6 ms
CFC 180

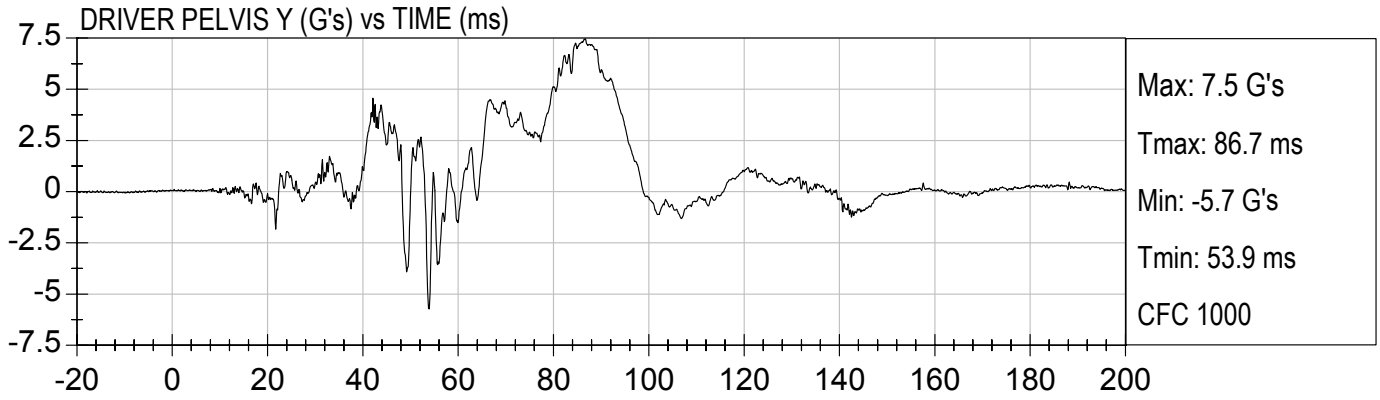

DRIVER CHEST Yr Velocity (kph) vs TIME (ms)
15
12.5
10
7.5
5
2.5
0
-2.5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 14.0 kph
Tmax: 126.3 ms
Min: -0.2 kph
Tmin: 36.4 ms
CFC 180

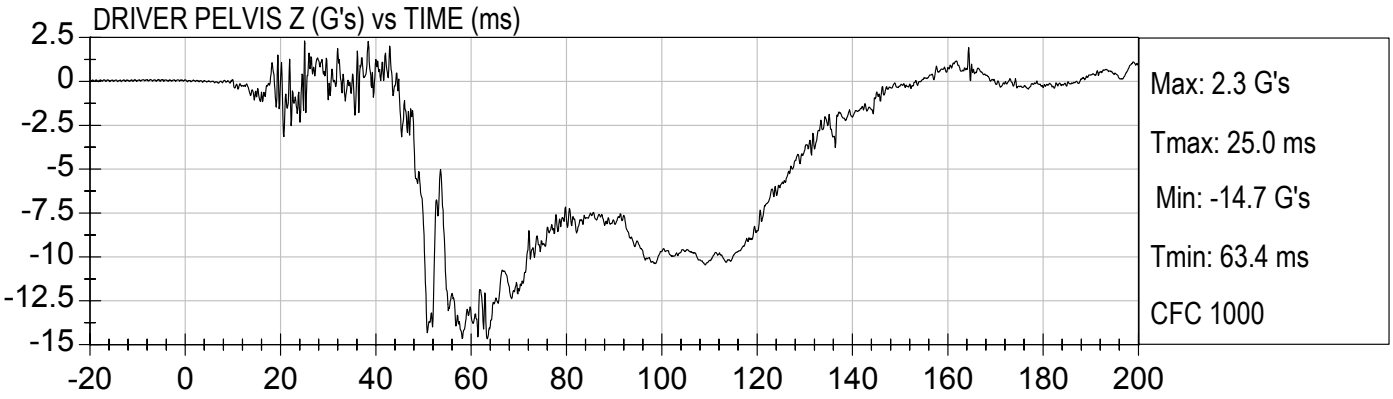

DRIVER CHEST Zr Velocity (kph) vs TIME (ms)
12.5
10
7.5
5
2.5
0
-2.5
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 10.2 kph
Tmax: 95.9 ms
Min: -0.0 kph
Tmin: 18.5 ms
CFC 180

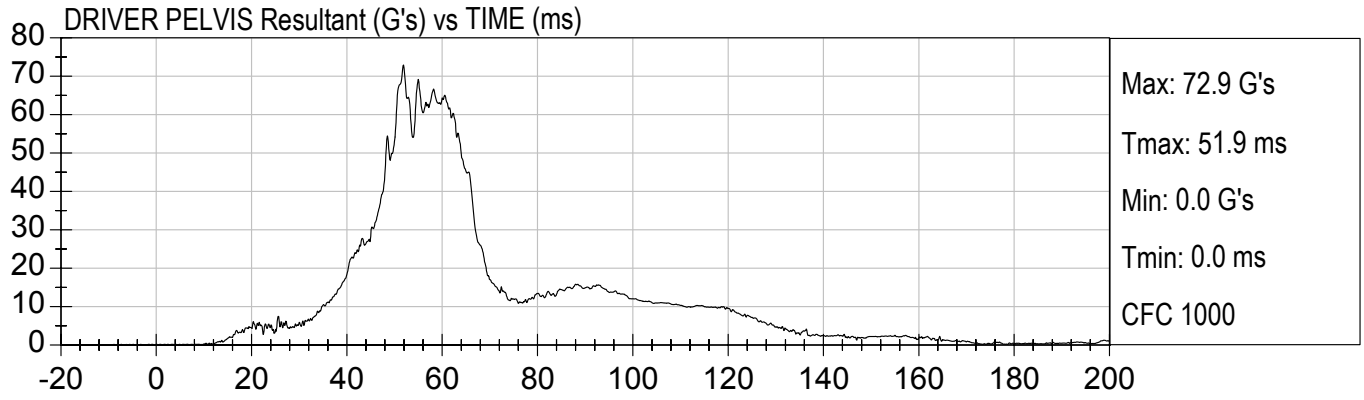
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

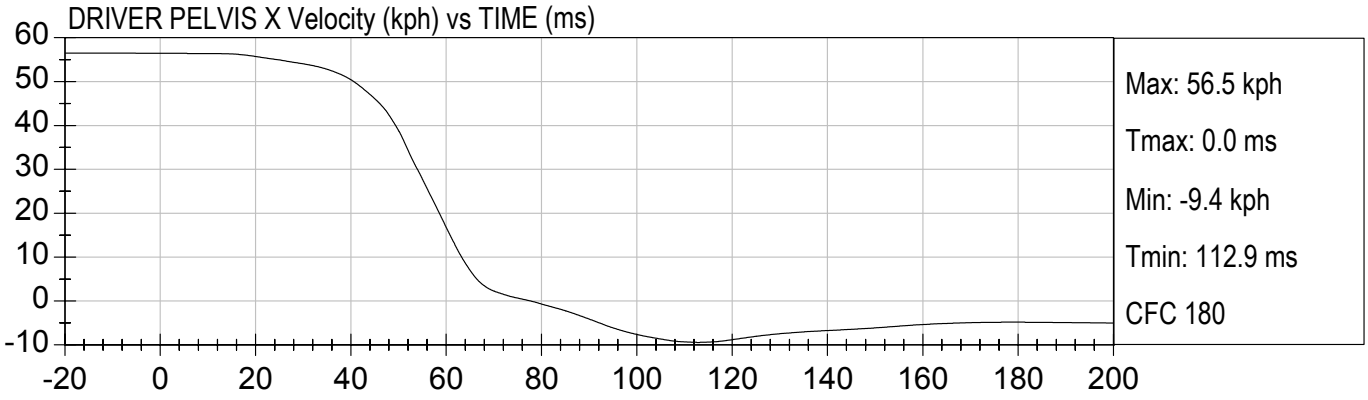
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

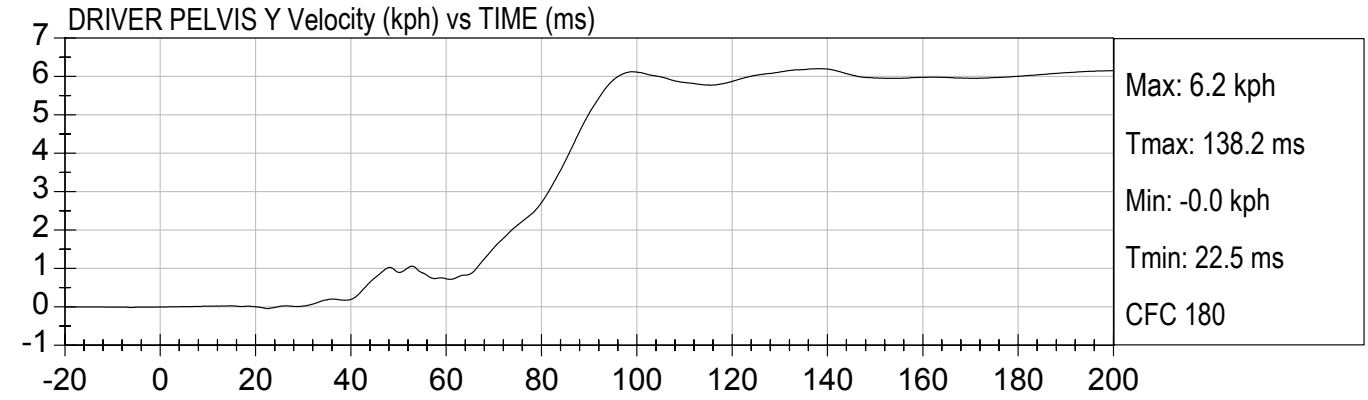


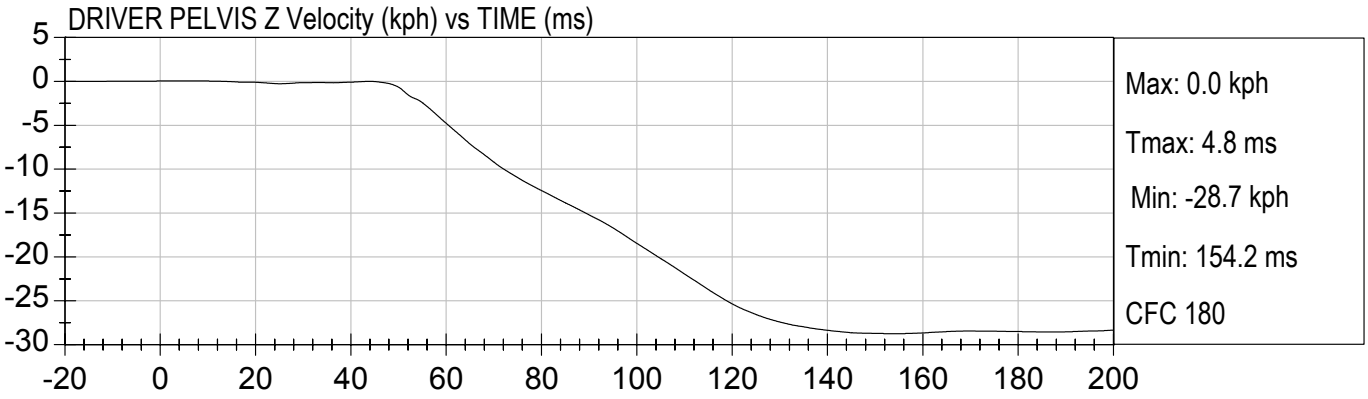






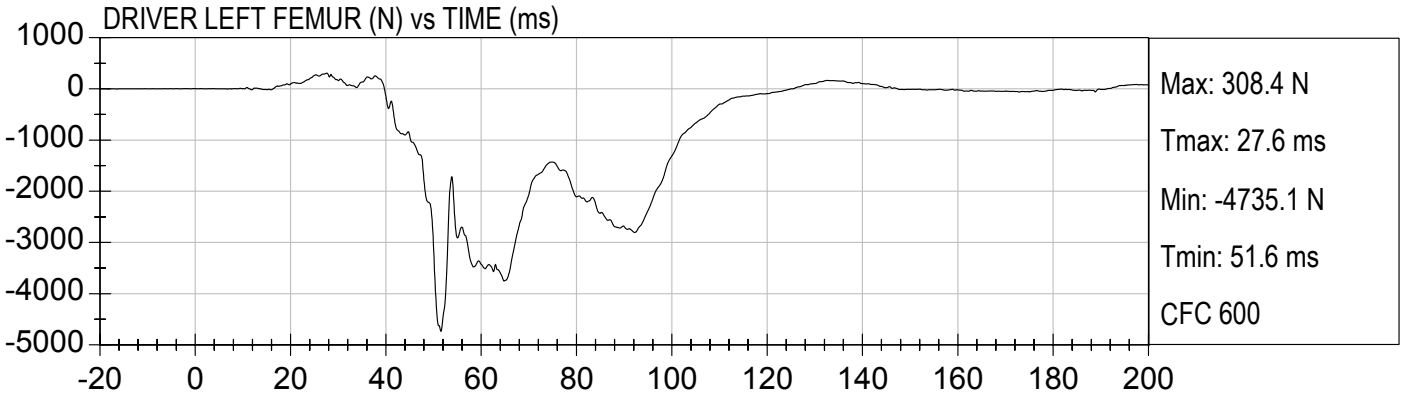

DRIVER PELVIS X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.5 kph
Tmax: 0.0 ms
Min: -9.4 kph
Tmin: 112.9 ms
CFC 180

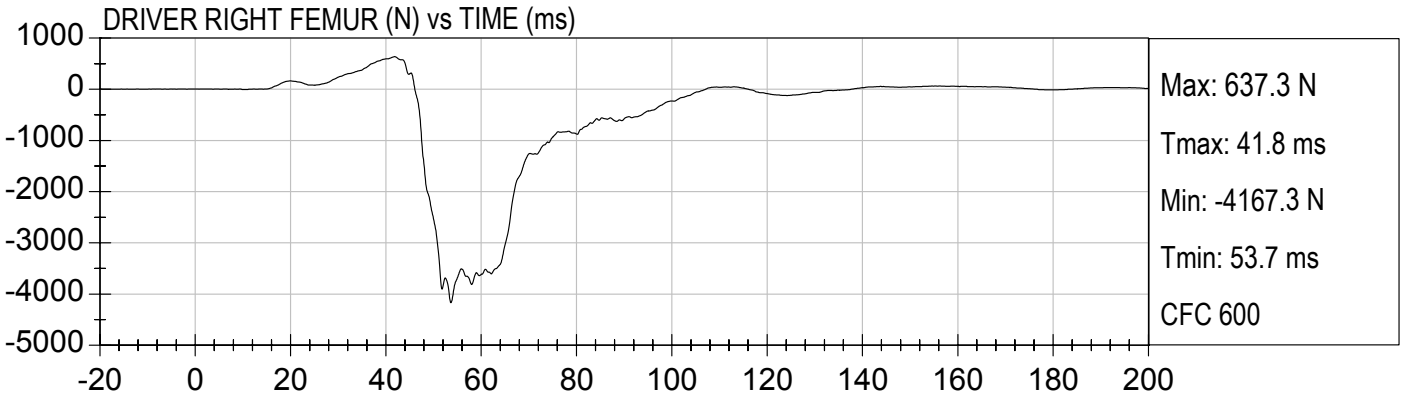

DRIVER PELVIS Y Velocity (kph) vs TIME (ms)
7
6
5
4
3
2
1
0
-1
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 6.2 kph
Tmax: 138.2 ms
Min: -0.0 kph
Tmin: 22.5 ms
CFC 180

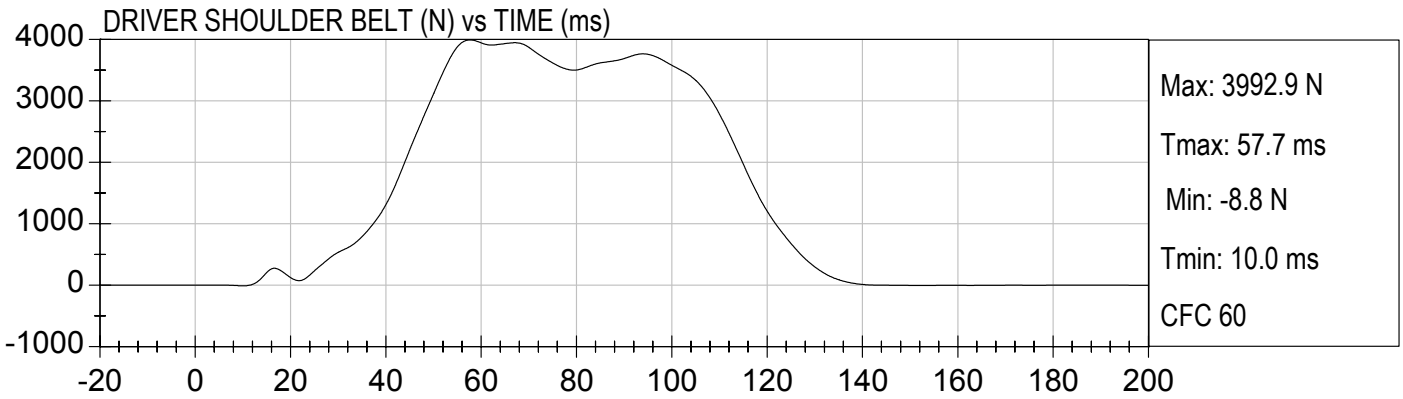

DRIVER PELVIS Z Velocity (kph) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 0.0 kph
Tmax: 4.8 ms
Min: -28.7 kph
Tmin: 154.2 ms
CFC 180

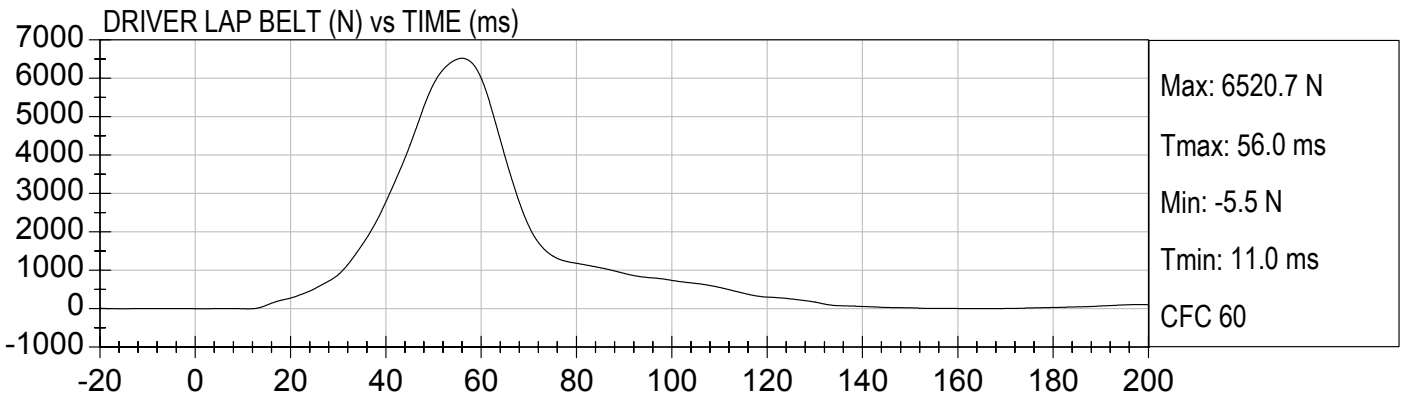
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

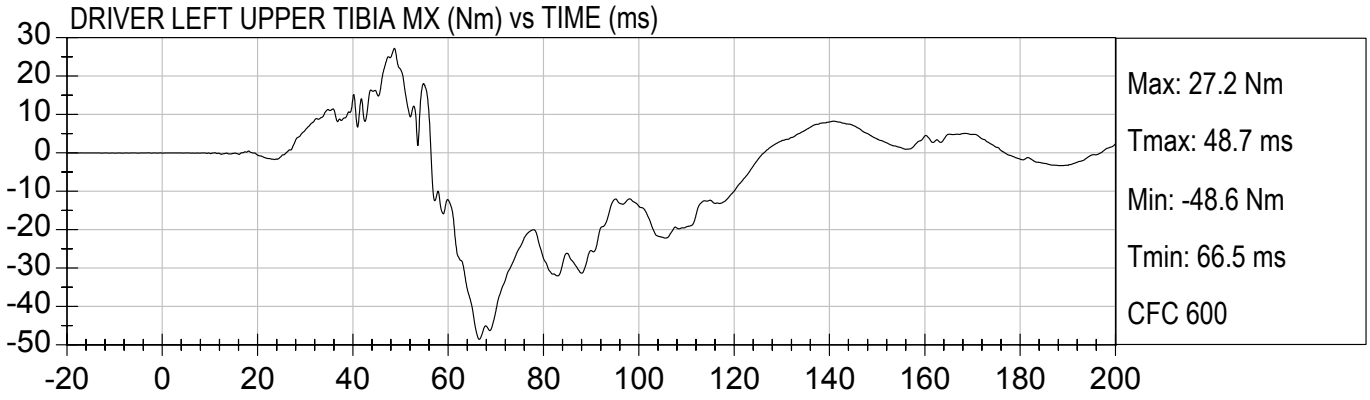
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

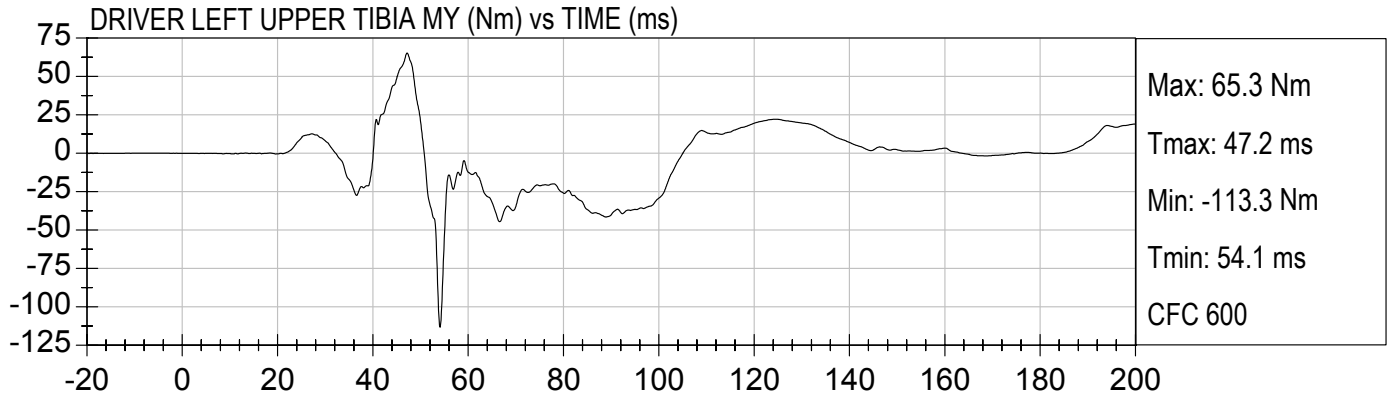


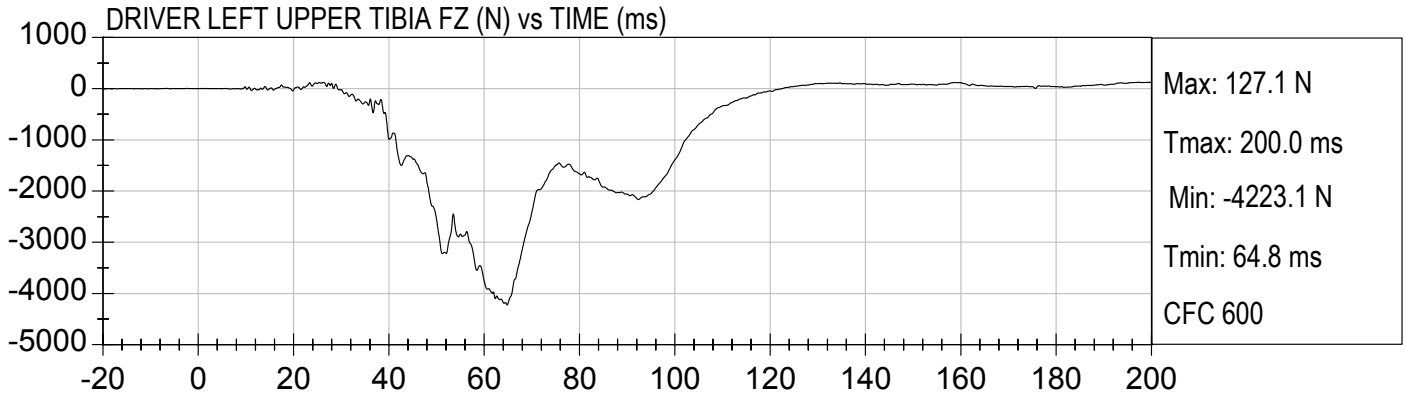


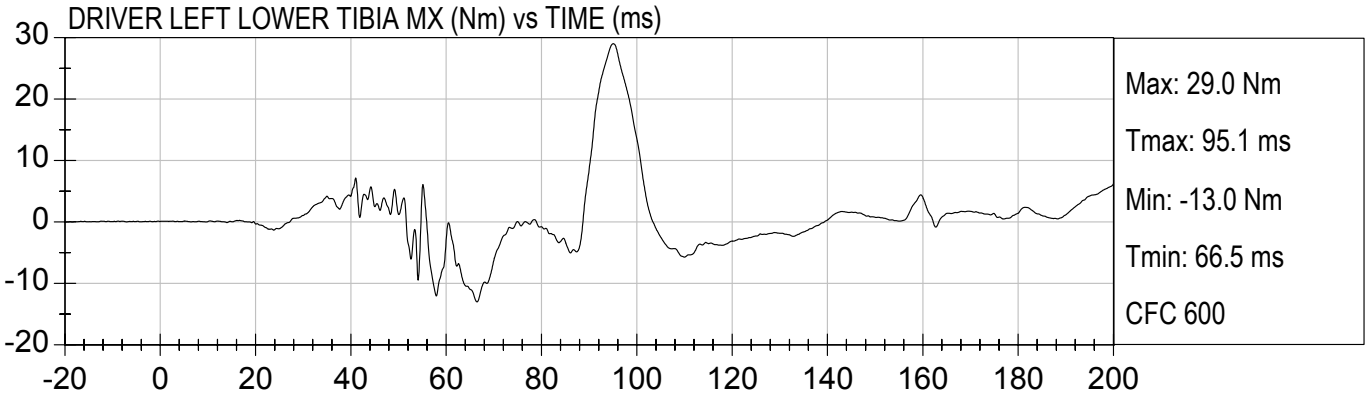


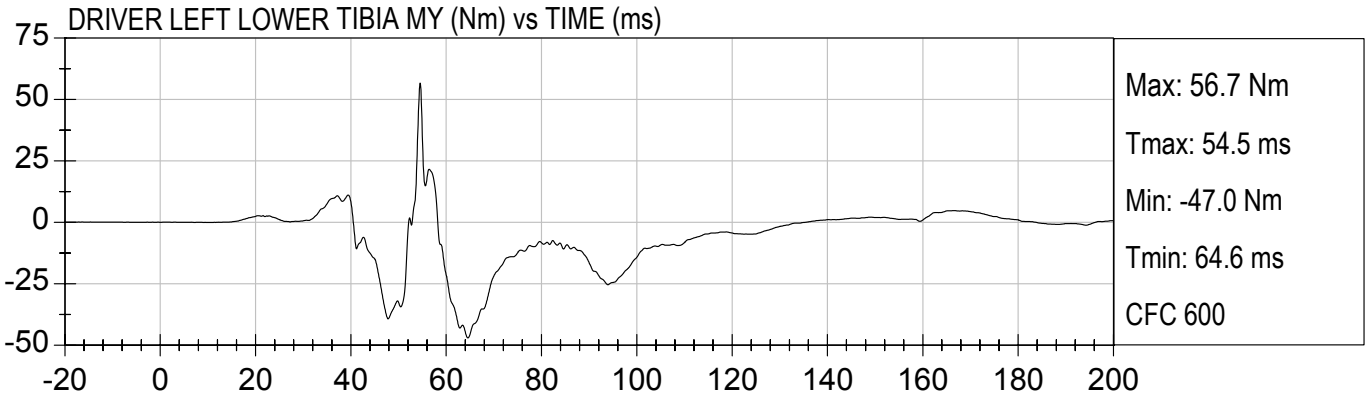


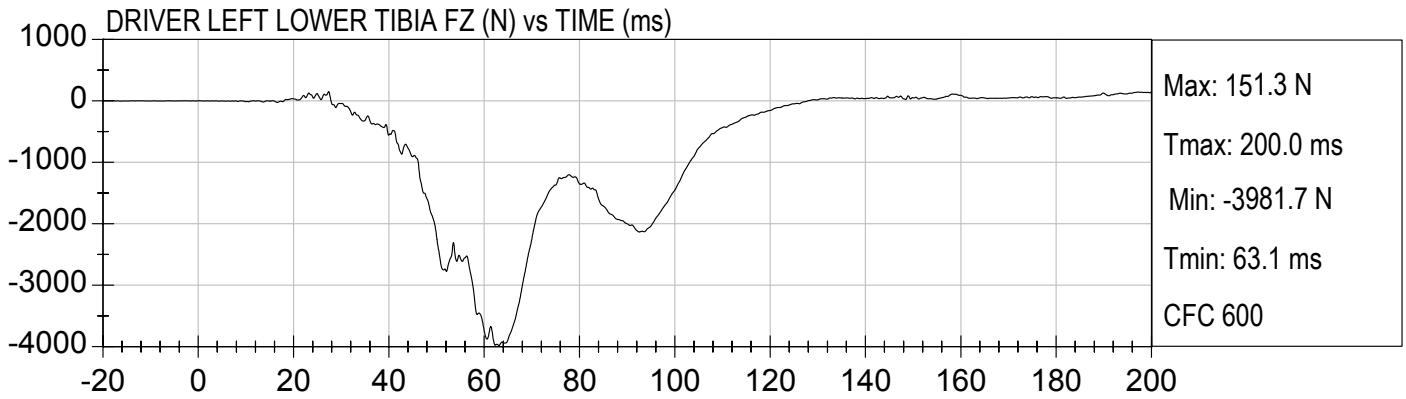

DRIVER LEFT UPPER TIBIA MX (Nm) vs TIME (ms)
30
20
10
0
-10
-20
-30
-40
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 27.2 Nm
Tmax: 48.7 ms
Min: -48.6 Nm
Tmin: 66.5 ms
CFC 600

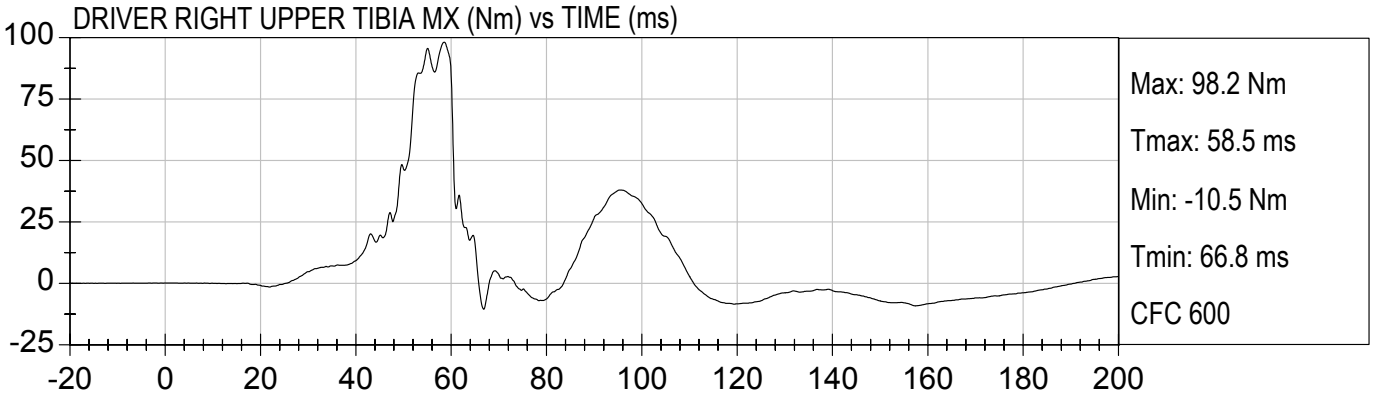

DRIVER LEFT UPPER TIBIA MY (Nm) vs TIME (ms)
75
50
25
0
-25
-50
-75
-100
-125
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 65.3 Nm
Tmax: 47.2 ms
Min: -113.3 Nm
Tmin: 54.1 ms
CFC 600

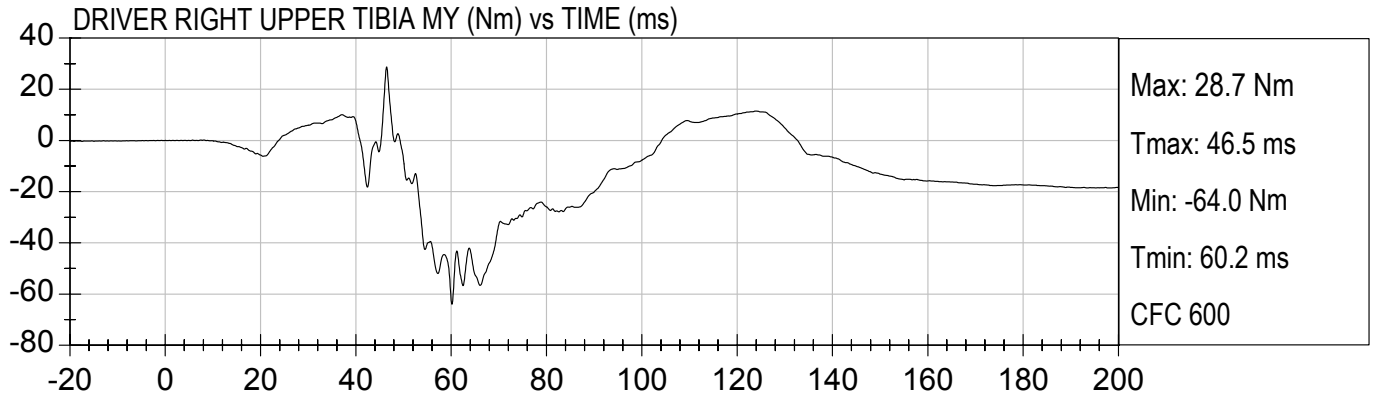

DRIVER LEFT UPPER TIBIA FZ (N) vs TIME (ms)
1000
0
-1000
-2000
-3000
-4000
-5000
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 127.1 N
Tmax: 200.0 ms
Min: -4223.1 N
Tmin: 64.8 ms
CFC 600

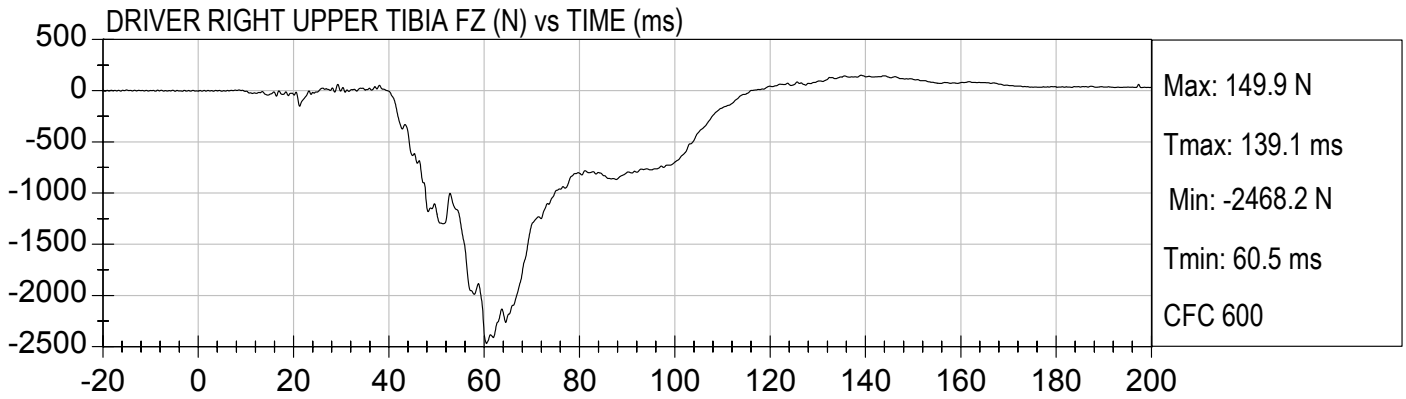

DRIVER LEFT LOWER TIBIA MX (Nm) vs TIME (ms)
30
20
10
0
-10
-20
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 29.0 Nm
Tmax: 95.1 ms
Min: -13.0 Nm
Tmin: 66.5 ms
CFC 600

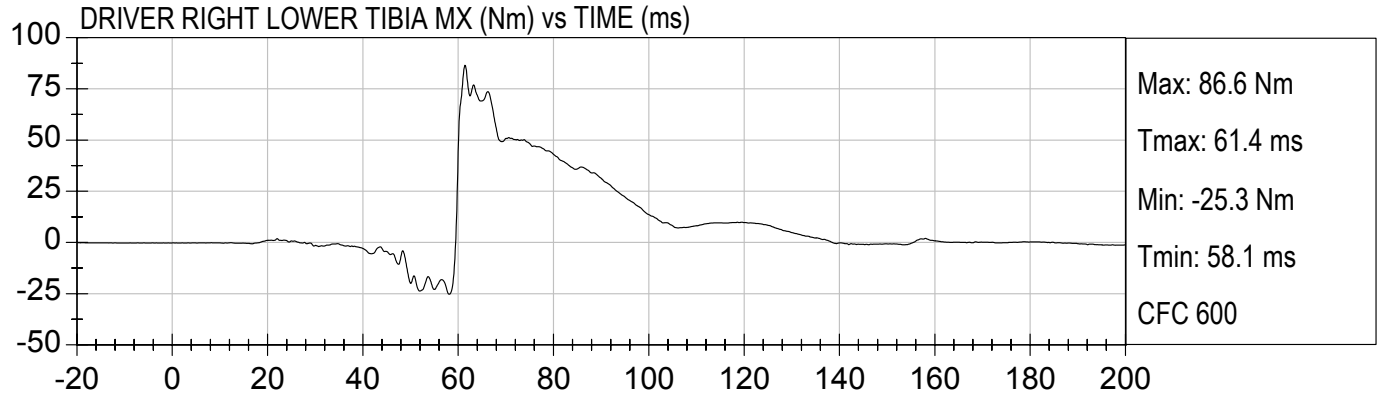

DRIVER LEFT LOWER TIBIA MY (Nm) vs TIME (ms)
75
50
25
0
-25
-50
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.7 Nm
Tmax: 54.5 ms
Min: -47.0 Nm
Tmin: 64.6 ms
CFC 600

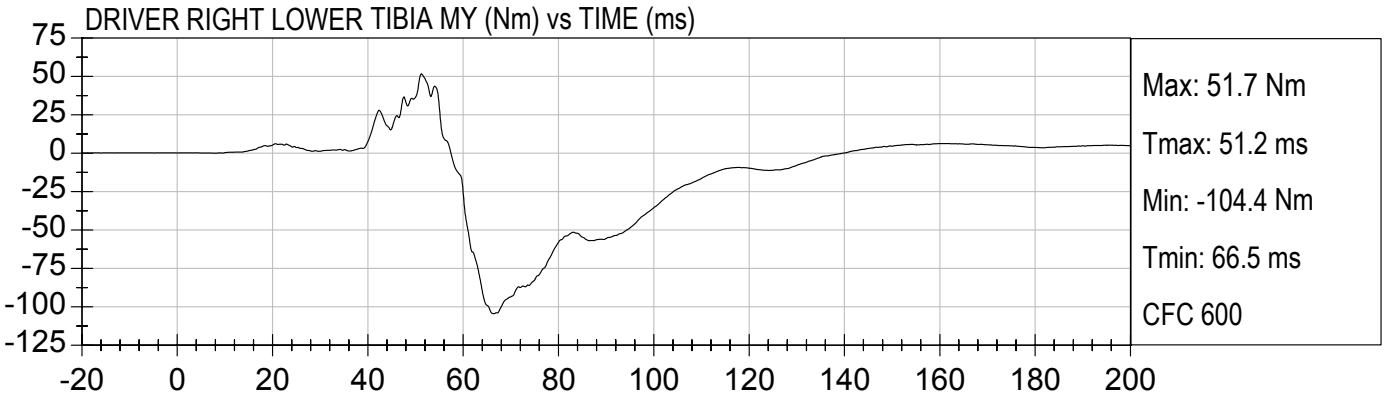

DRIVER LEFT LOWER TIBIA FZ (N) vs TIME (ms)
1000
0
-1000
-2000
-3000
-4000
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 151.3 N
Tmax: 200.0 ms
Min: -3981.7 N
Tmin: 63.1 ms
CFC 600

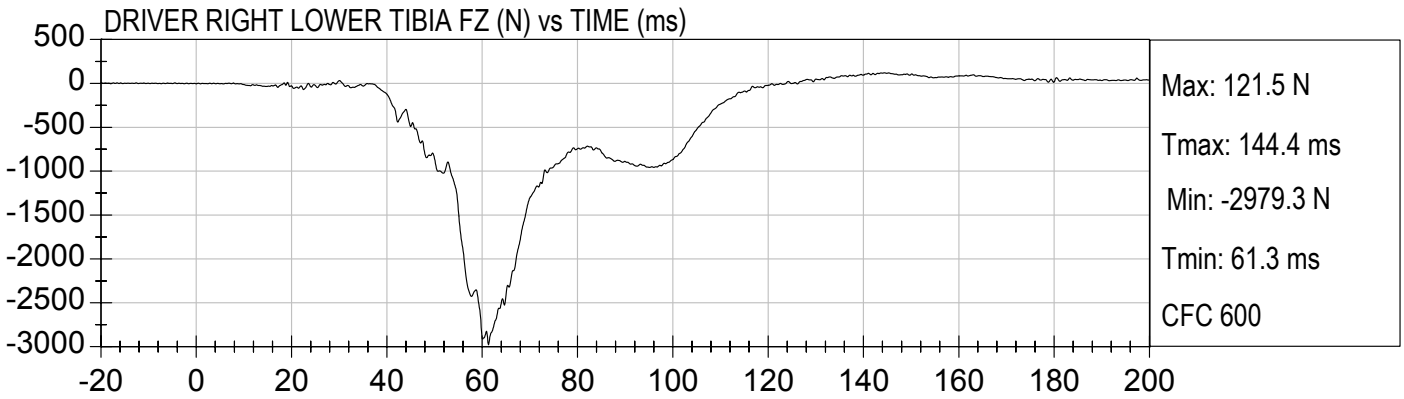

DRIVER RIGHT UPPER TIBIA MX (Nm) vs TIME (ms)
100
75
50
25
0
-25
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 98.2 Nm
Tmax: 58.5 ms
Min: -10.5 Nm
Tmin: 66.8 ms
CFC 600


DRIVER RIGHT UPPER TIBIA MY (Nm) vs TIME (ms)
40
20
0
-20
-40
-60
-80
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 28.7 Nm
Tmax: 46.5 ms
Min: -64.0 Nm
Tmin: 60.2 ms
CFC 600


DRIVER RIGHT UPPER TIBIA FZ (N) vs TIME (ms)
500
0
-500
-1000
-1500
-2000
-2500
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 149.9 N
Tmax: 139.1 ms
Min: -2468.2 N
Tmin: 60.5 ms
CFC 600

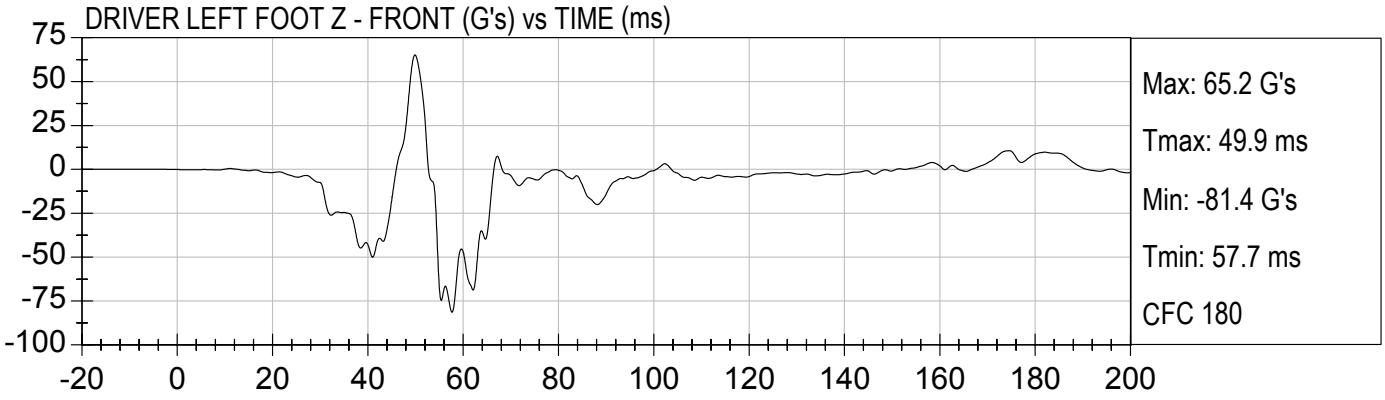

DRIVER RIGHT LOWER TIBIA MX (Nm) vs TIME (ms)
100
75
50
25
0
-25
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 86.6 Nm
Tmax: 61.4 ms
Min: -25.3 Nm
Tmin: 58.1 ms
CFC 600

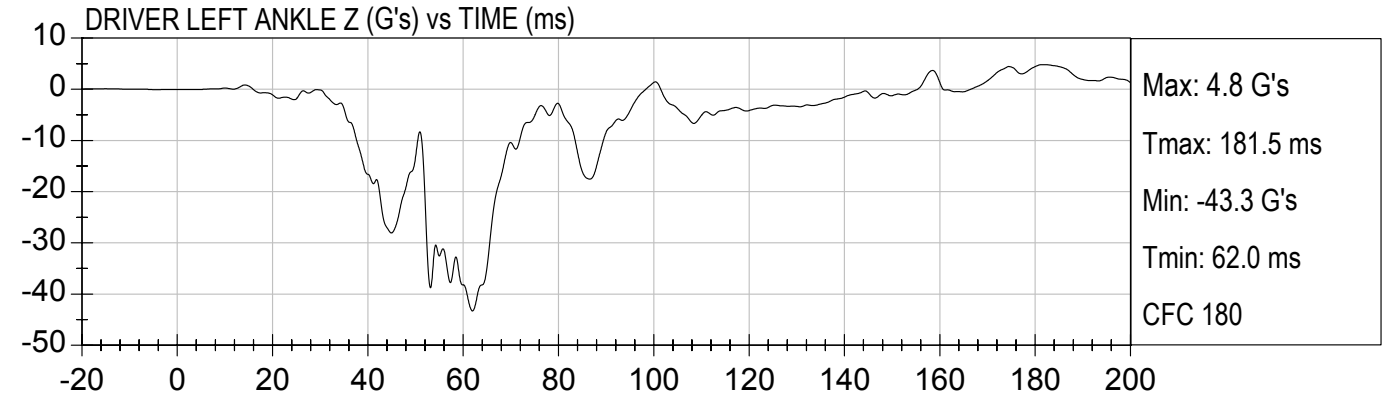

DRIVER RIGHT LOWER TIBIA MY (Nm) vs TIME (ms)
75
50
25
0
-25
-50
-75
-100
-125
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 51.7 Nm
Tmax: 51.2 ms
Min: -104.4 Nm
Tmin: 66.5 ms
CFC 600


DRIVER RIGHT LOWER TIBIA FZ (N) vs TIME (ms)
500
0
-500
-1000
-1500
-2000
-2500
-3000
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 121.5 N
Tmax: 144.4 ms
Min: -2979.3 N
Tmin: 61.3 ms
CFC 600

35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

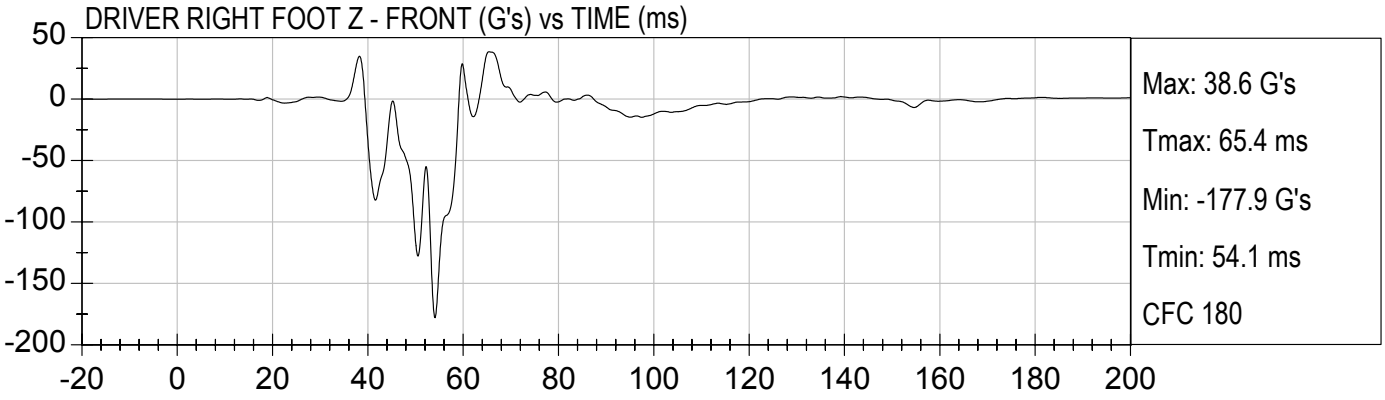
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

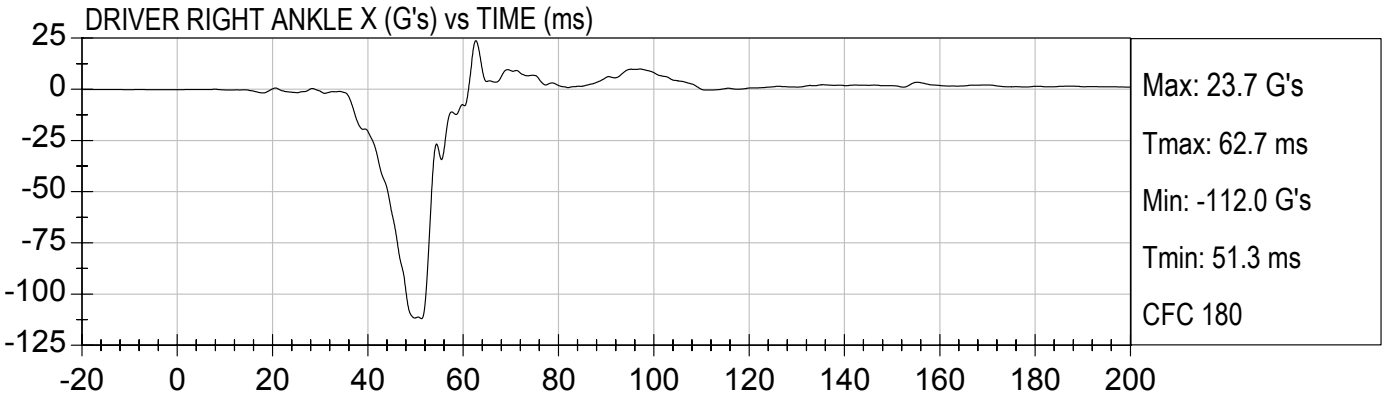


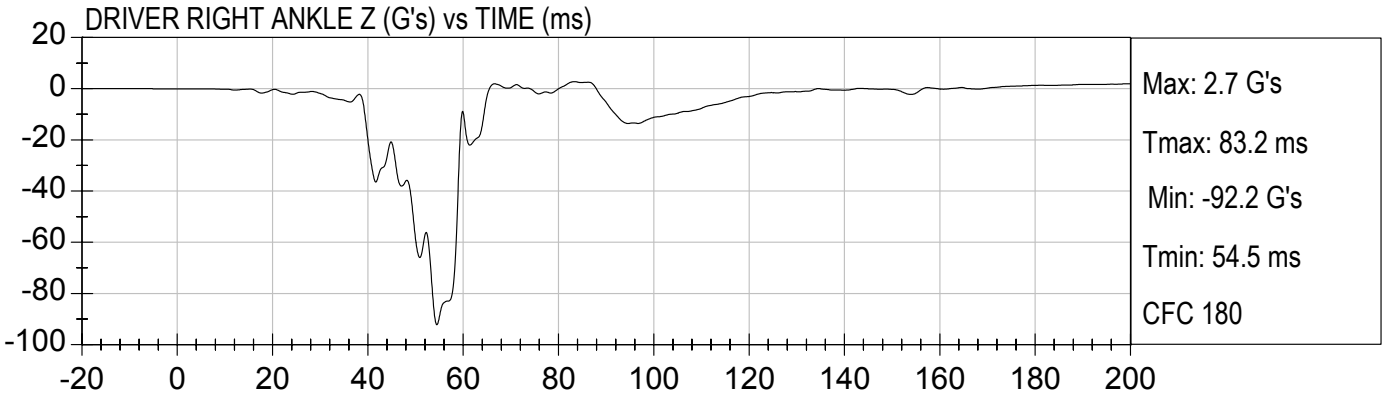


35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

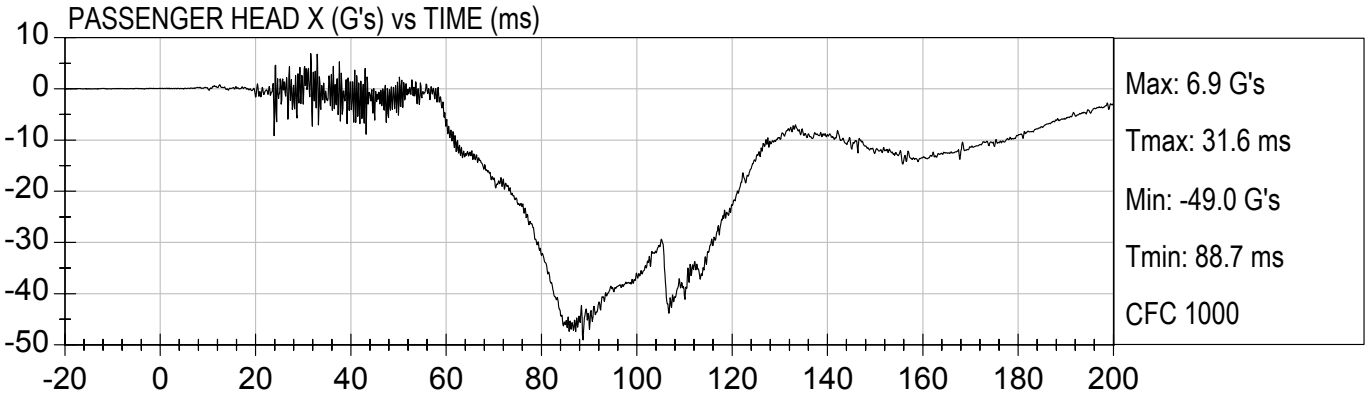


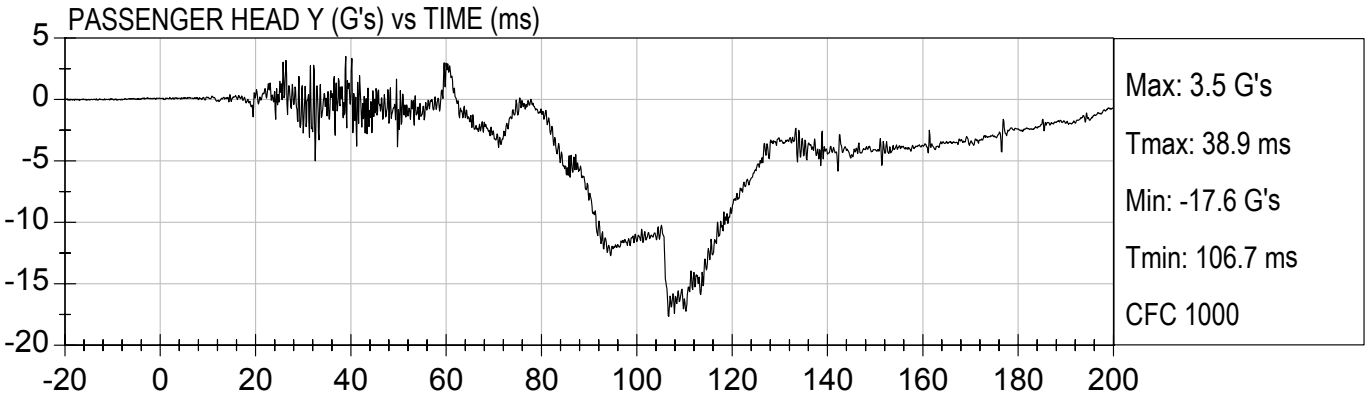


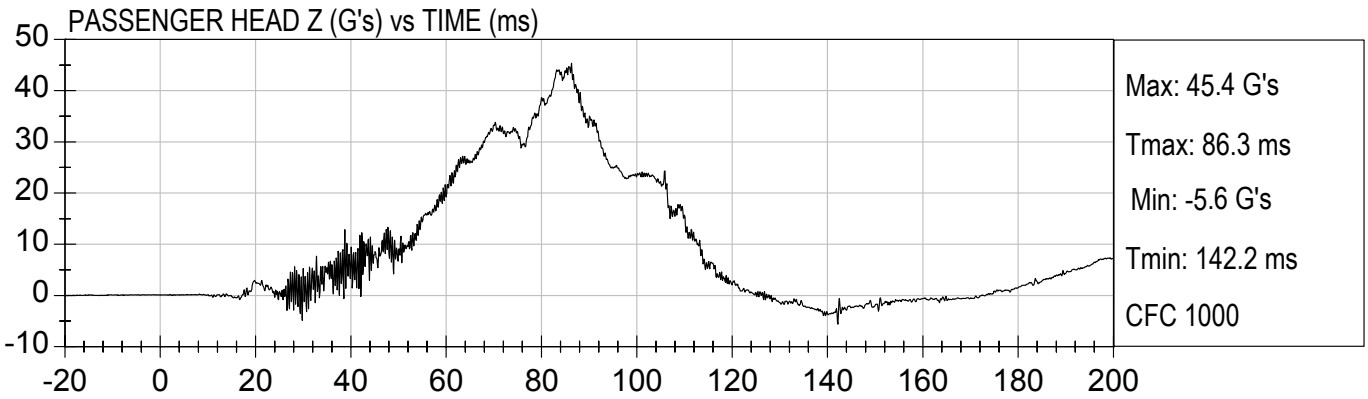


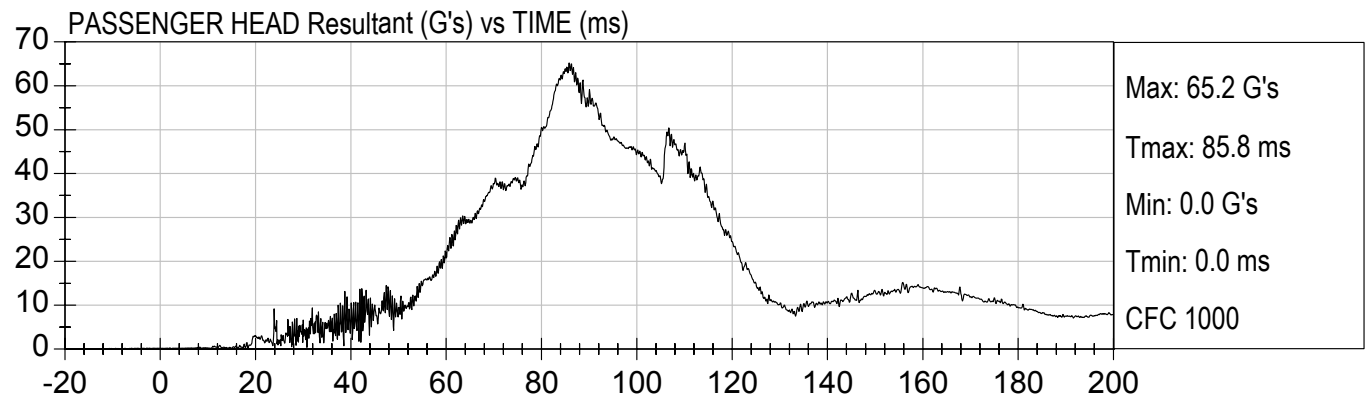
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

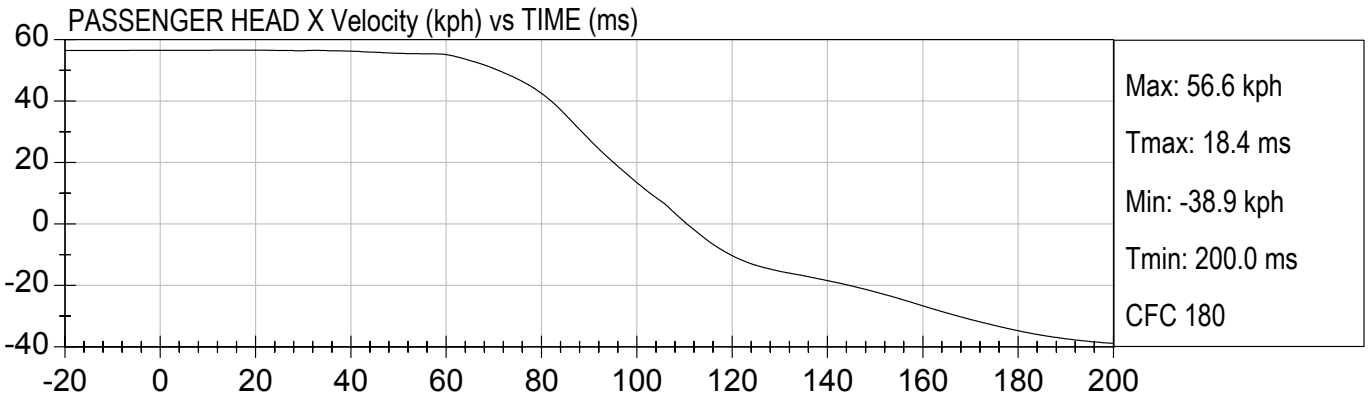
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

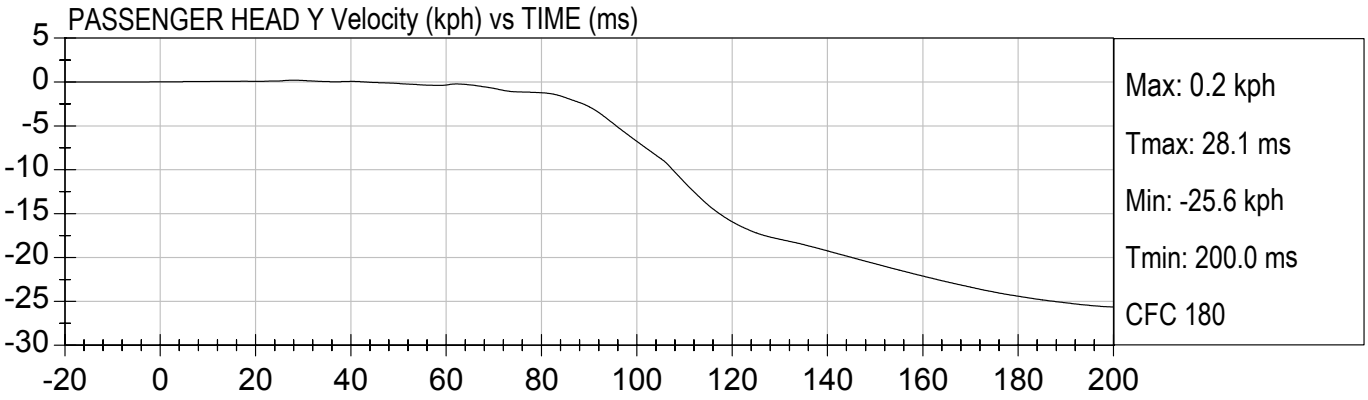


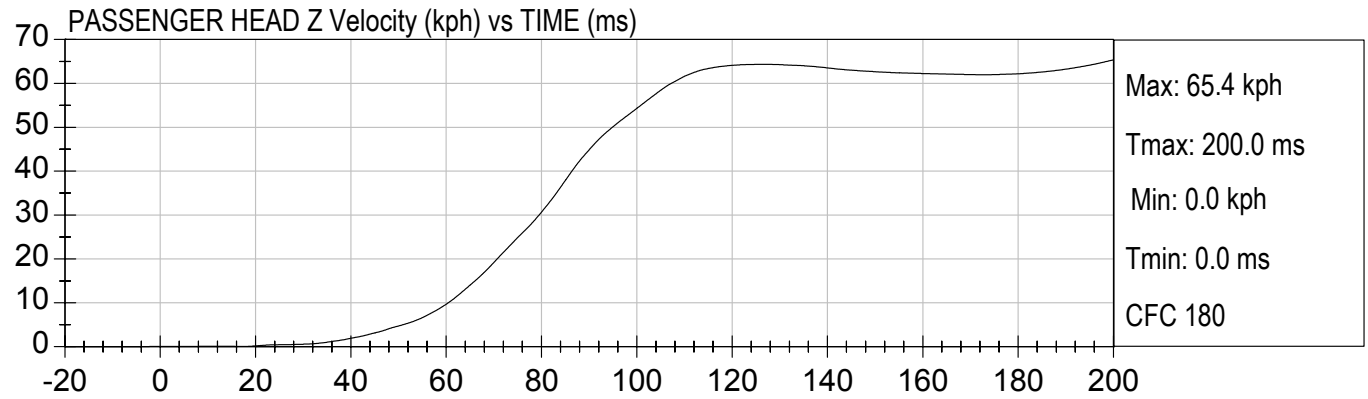






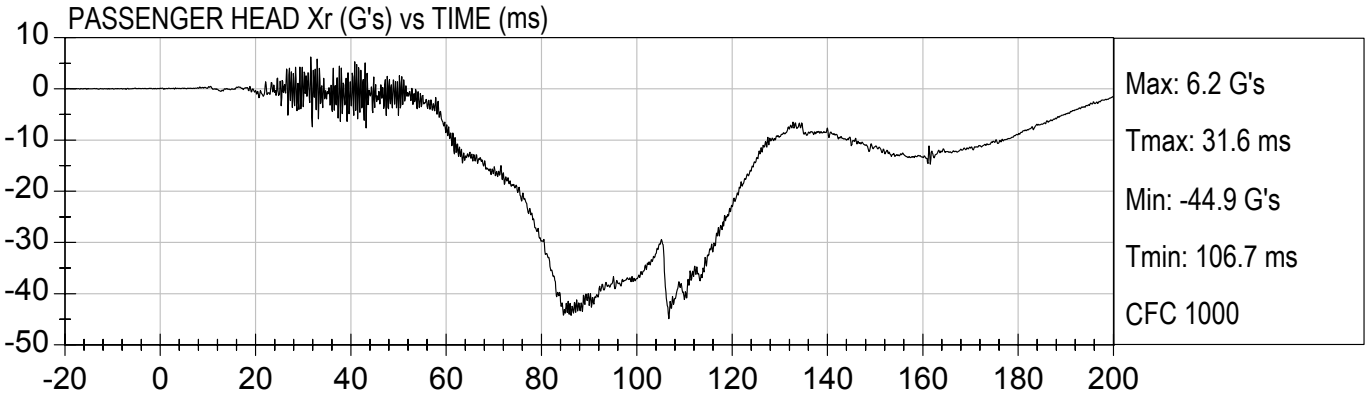

PASSENGER HEAD X Velocity (kph) vs TIME (ms)
60
40
20
0
-20
-40
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.6 kph
Tmax: 18.4 ms
Min: -38.9 kph
Tmin: 200.0 ms
CFC 180

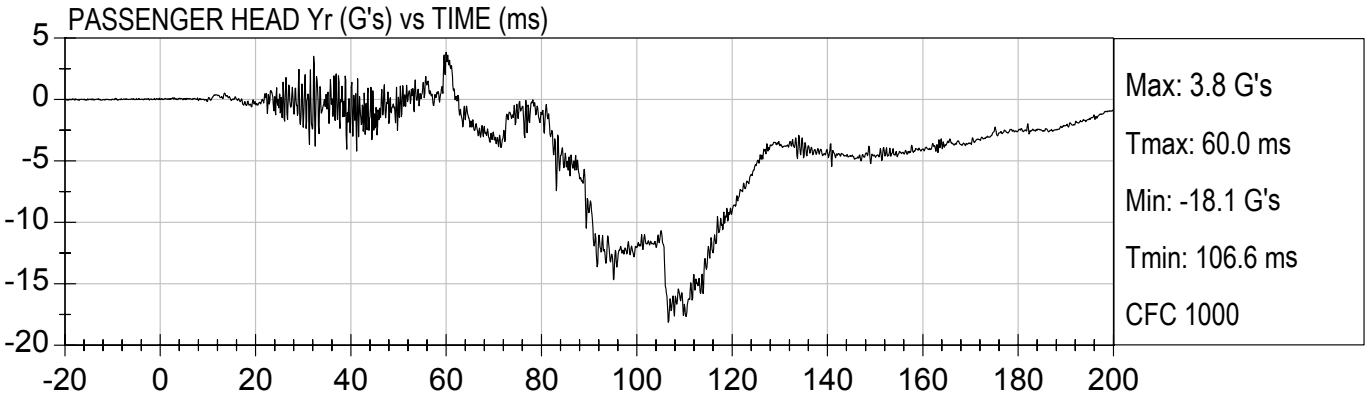

PASSENGER HEAD Y Velocity (kph) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 0.2 kph
Tmax: 28.1 ms
Min: -25.6 kph
Tmin: 200.0 ms
CFC 180

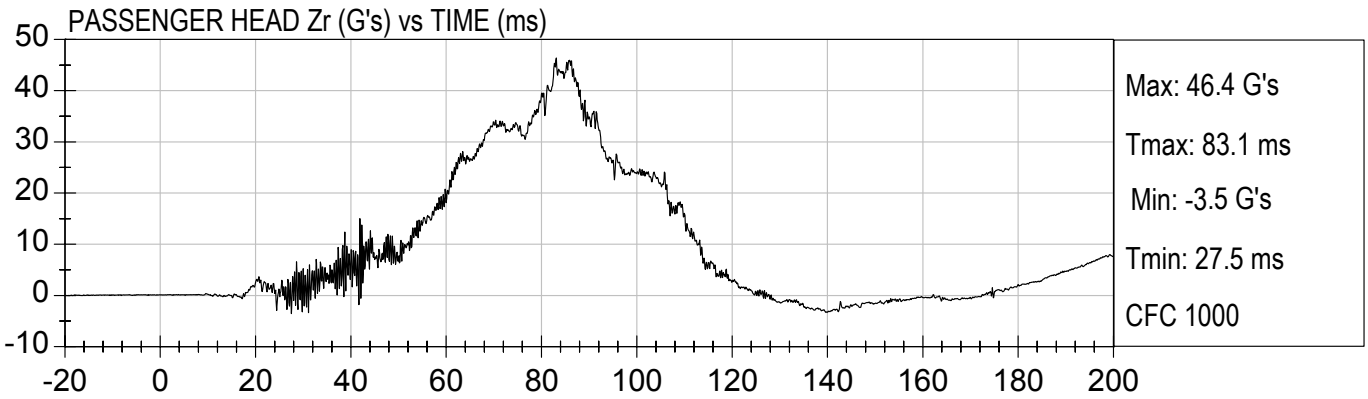

PASSENGER HEAD Z Velocity (kph) vs TIME (ms)
70
60
50
40
30
20
10
0
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 65.4 kph
Tmax: 200.0 ms
Min: 0.0 kph
Tmin: 0.0 ms
CFC 180

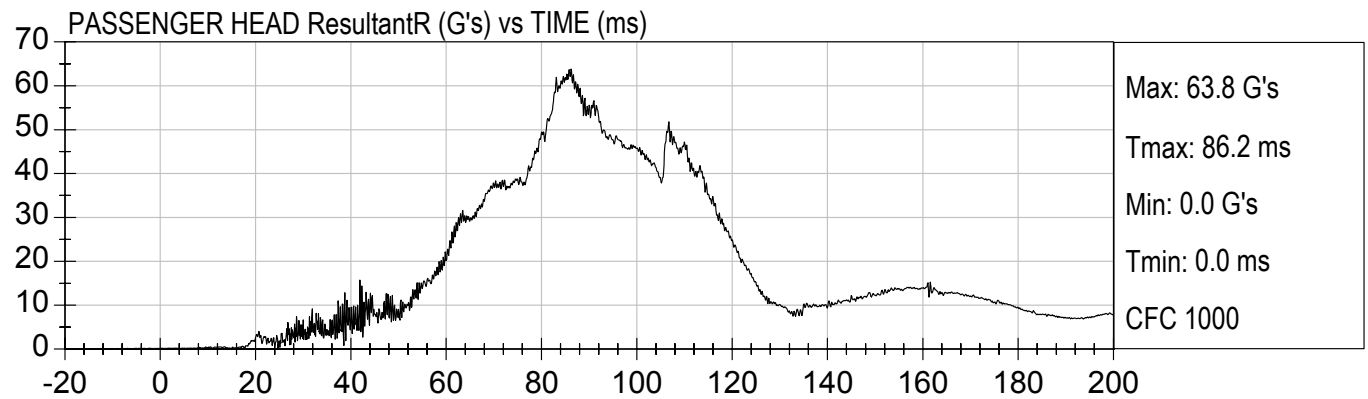
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

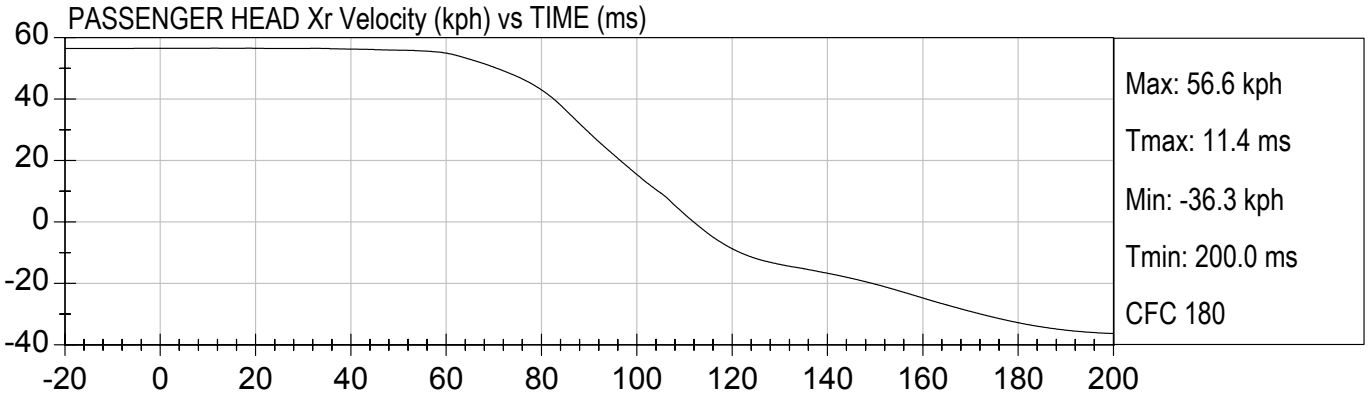
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

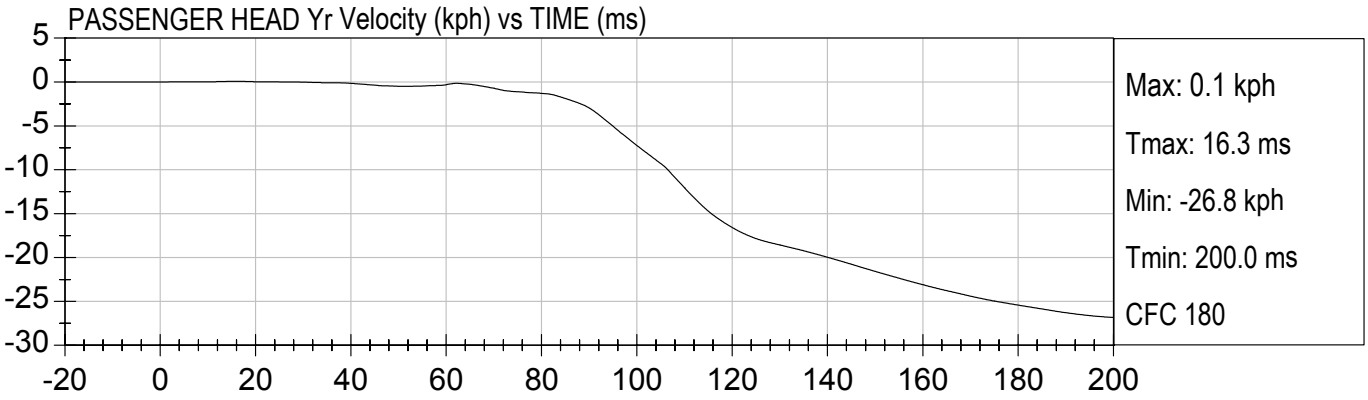


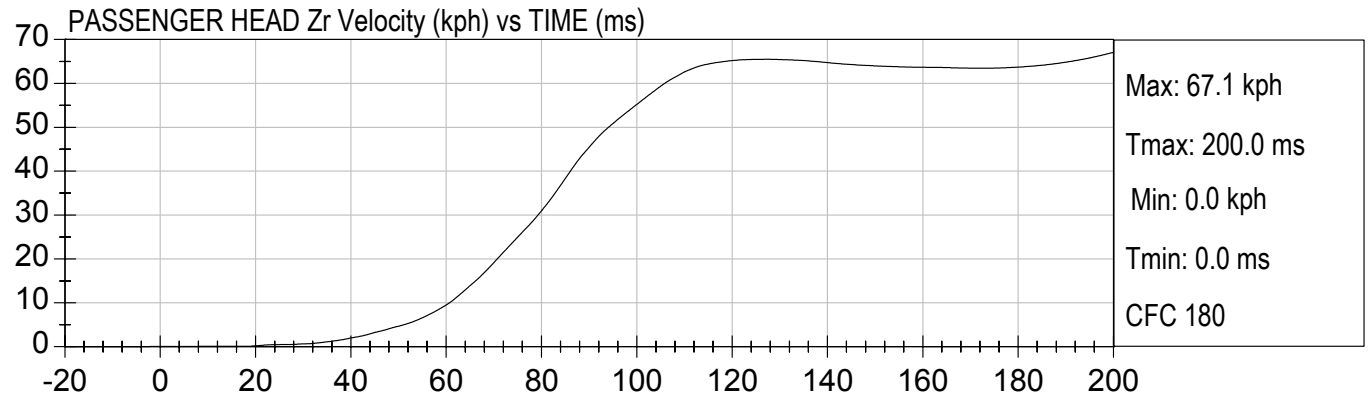






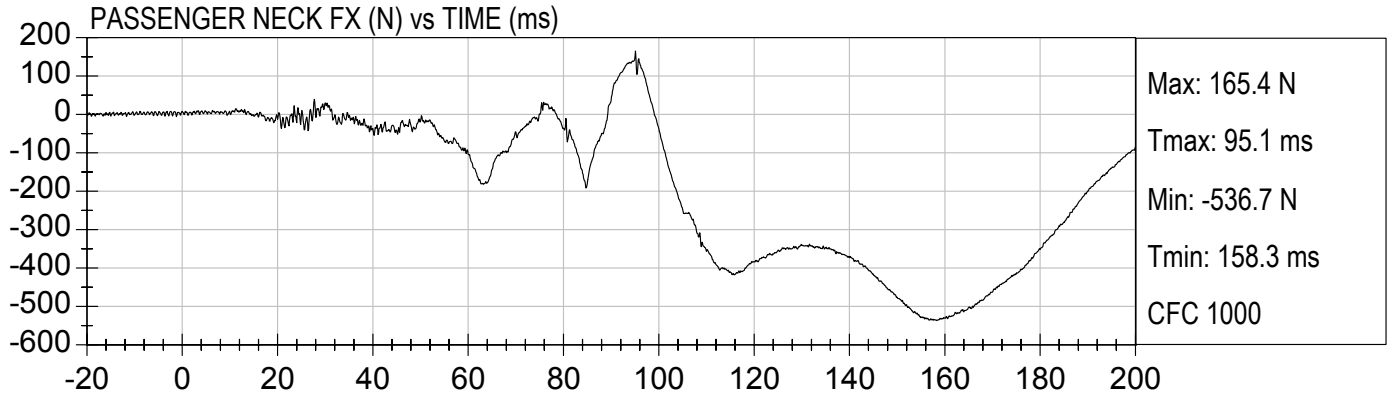

PASSENGER HEAD Xr Velocity (kph) vs TIME (ms)
60
40
20
0
-20
-40
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.6 kph
Tmax: 11.4 ms
Min: -36.3 kph
Tmin: 200.0 ms
CFC 180

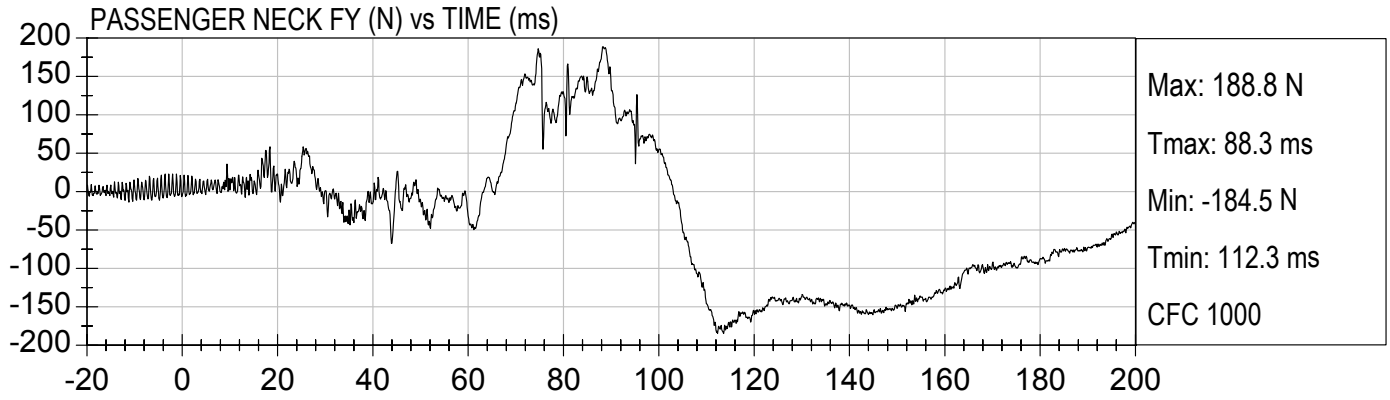

PASSENGER HEAD Yr Velocity (kph) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 0.1 kph
Tmax: 16.3 ms
Min: -26.8 kph
Tmin: 200.0 ms
CFC 180

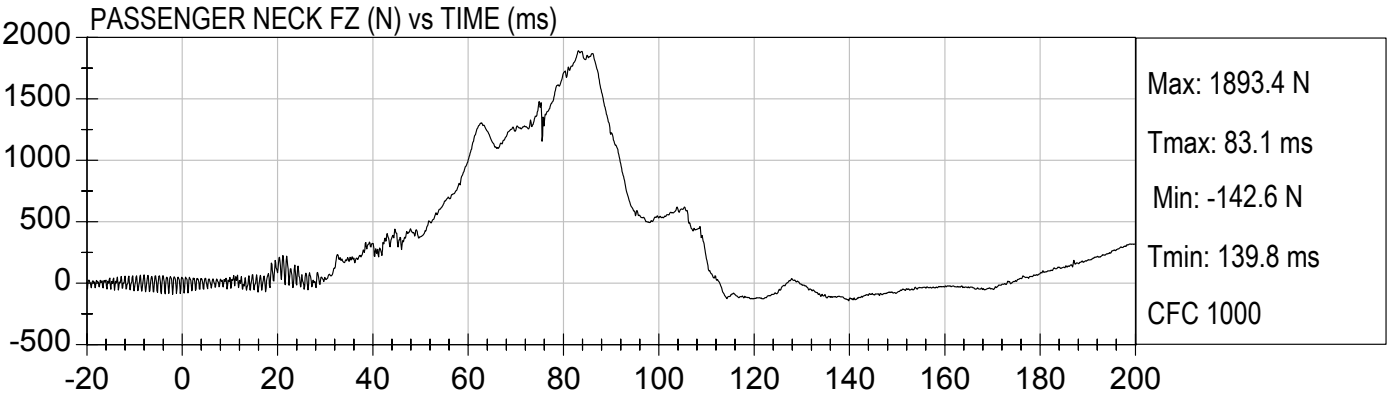

PASSENGER HEAD Zr Velocity (kph) vs TIME (ms)
70
60
50
40
30
20
10
0
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 67.1 kph
Tmax: 200.0 ms
Min: 0.0 kph
Tmin: 0.0 ms
CFC 180

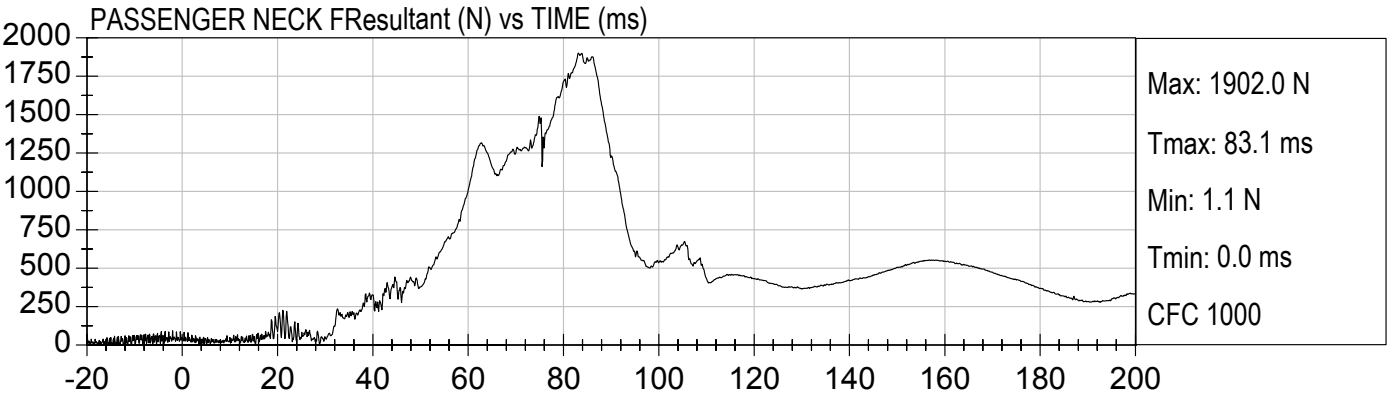
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)



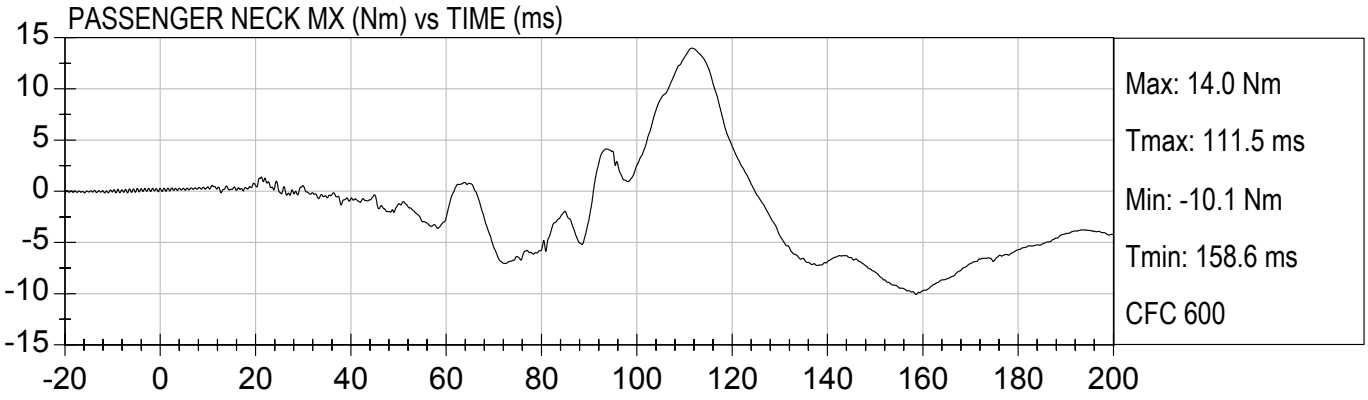


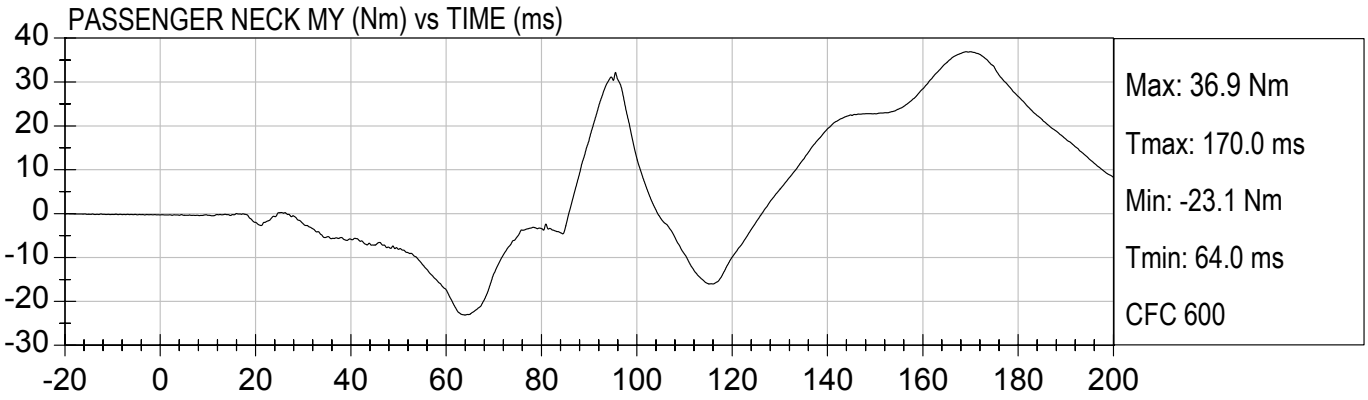


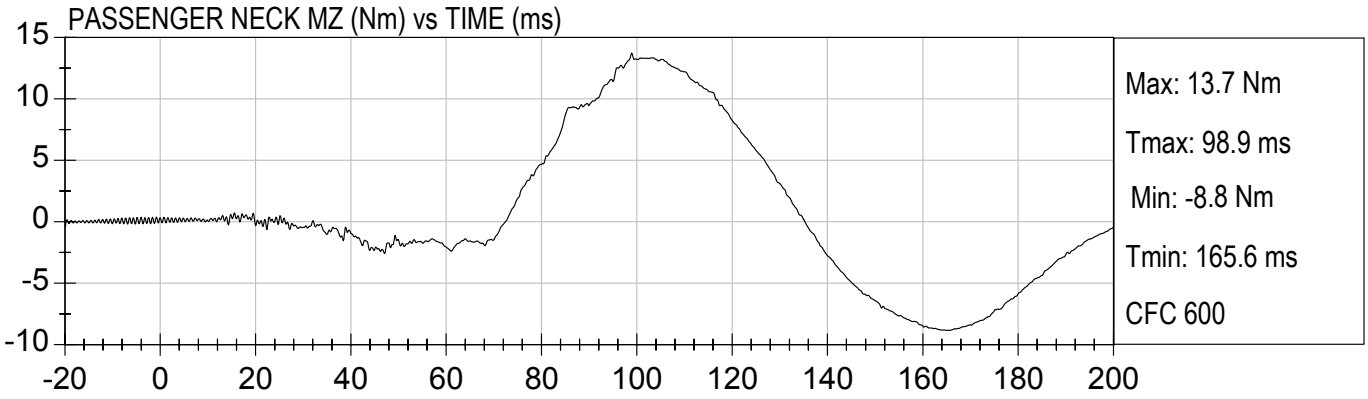


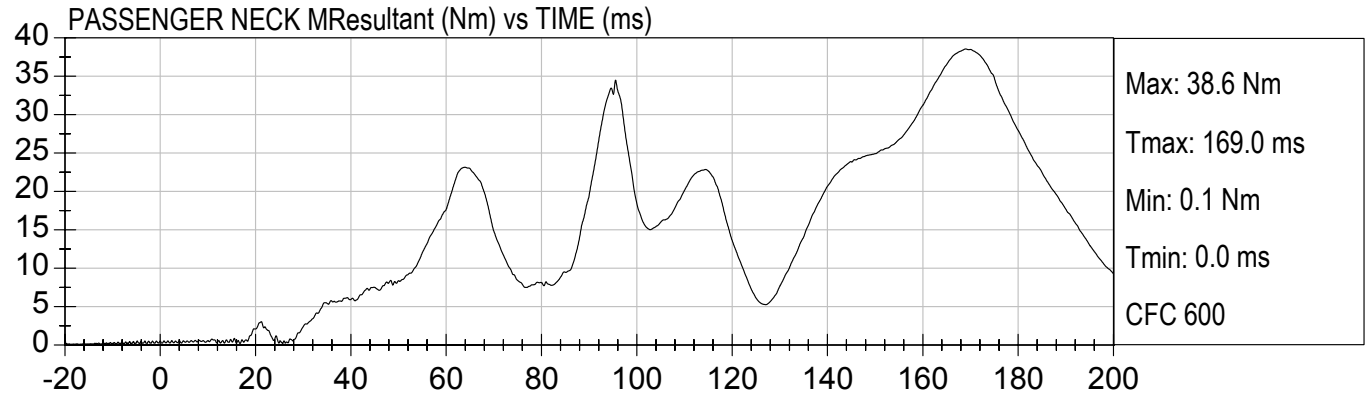
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)



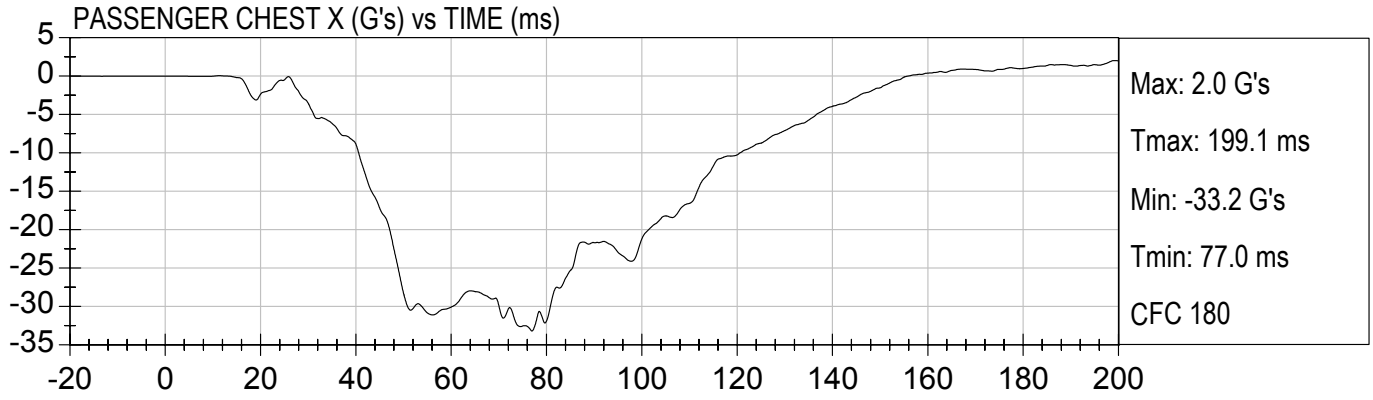


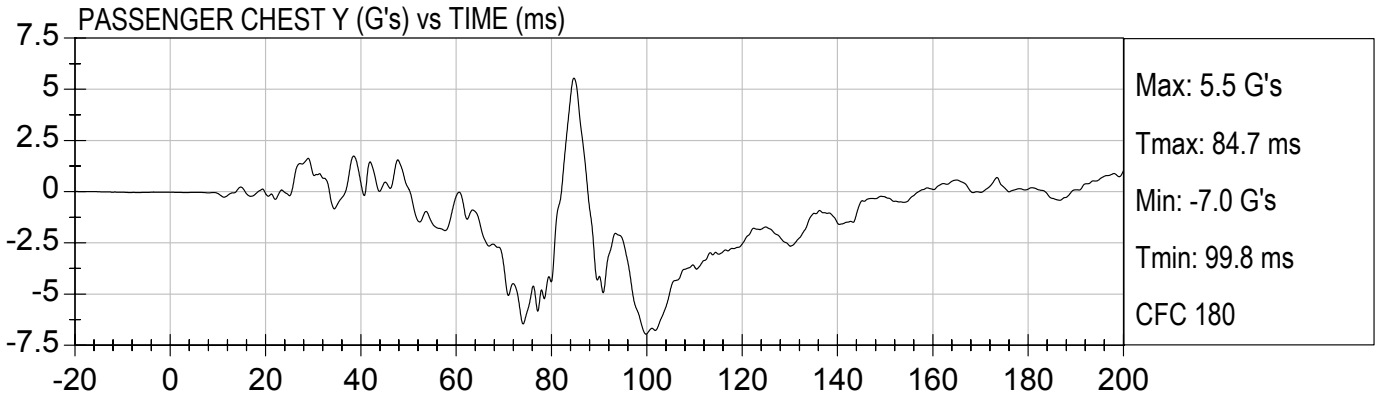


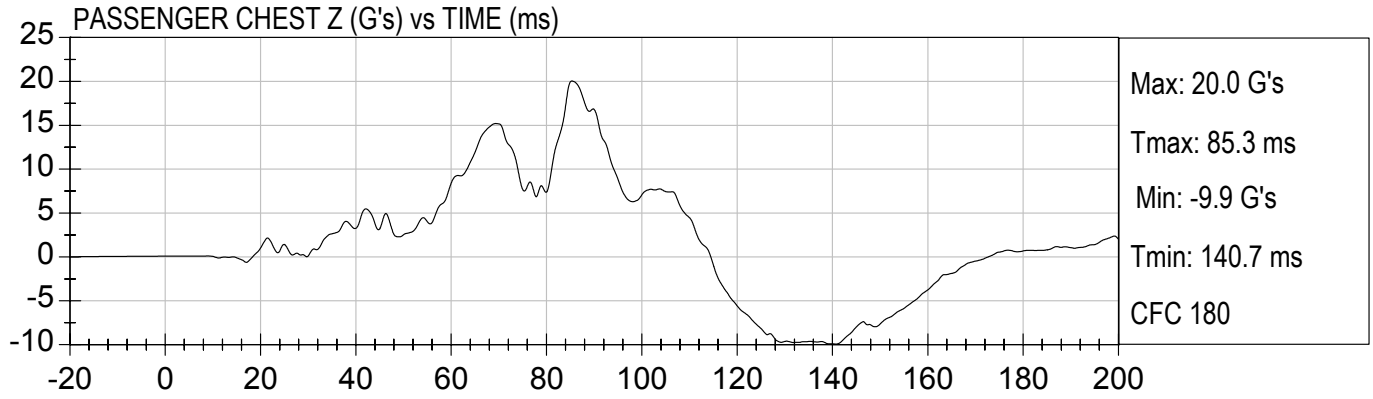


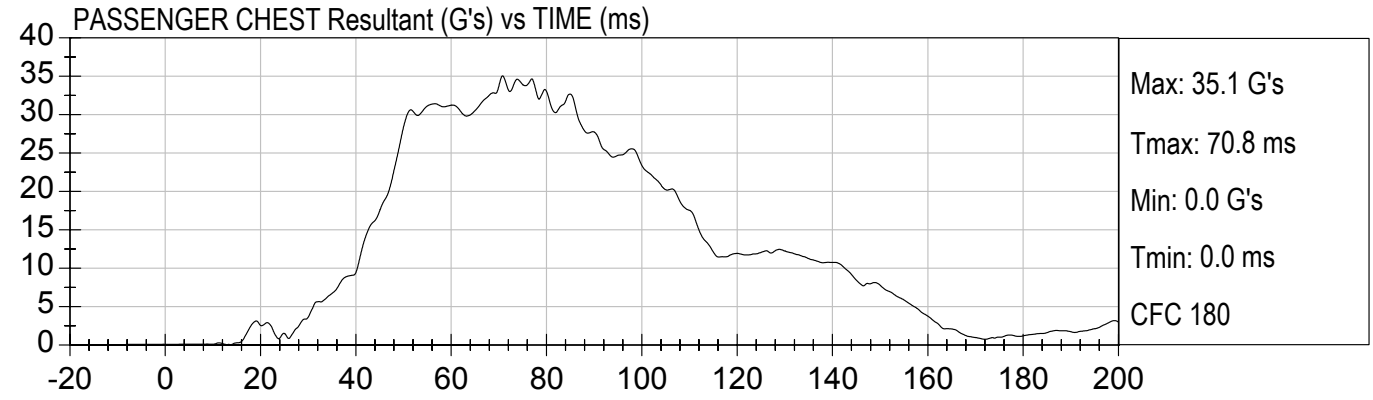
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

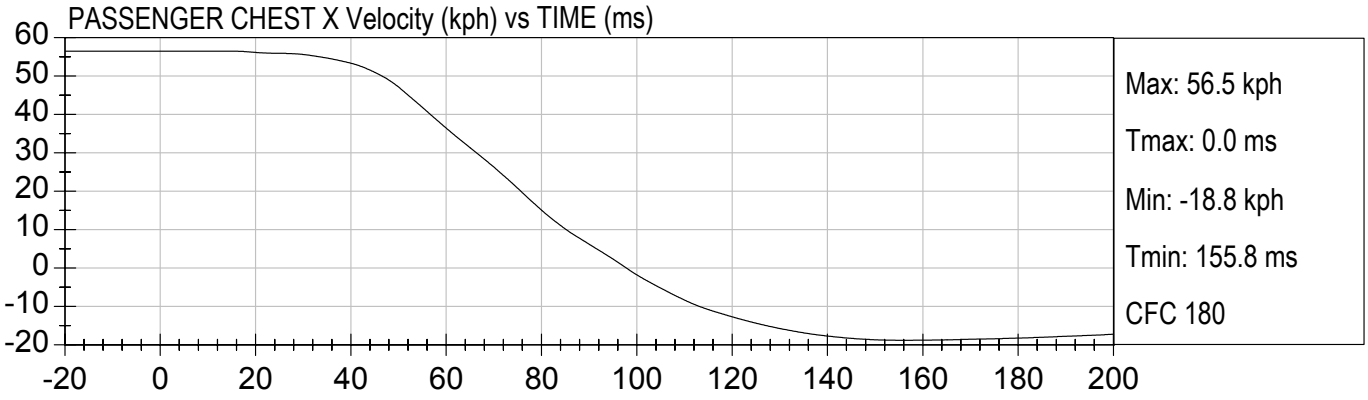
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

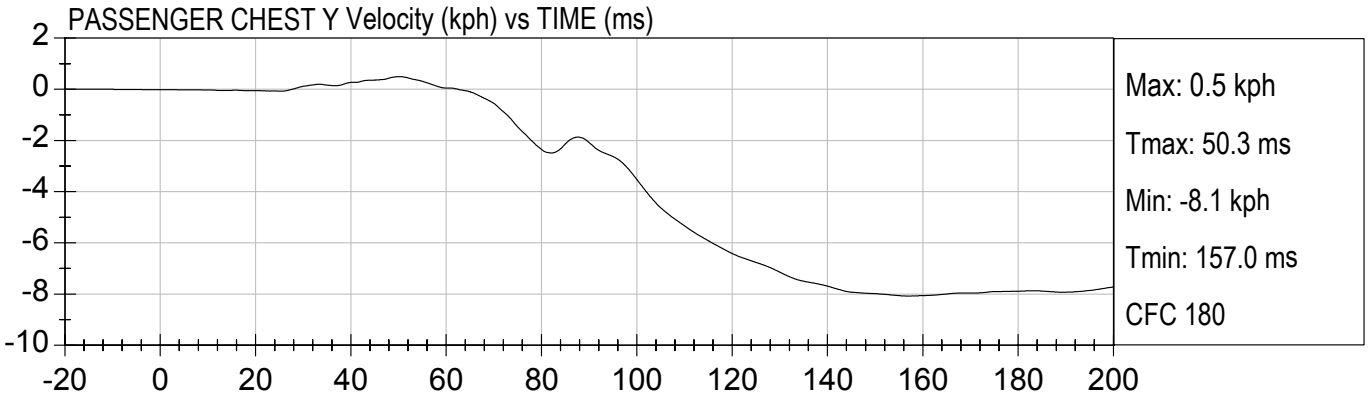


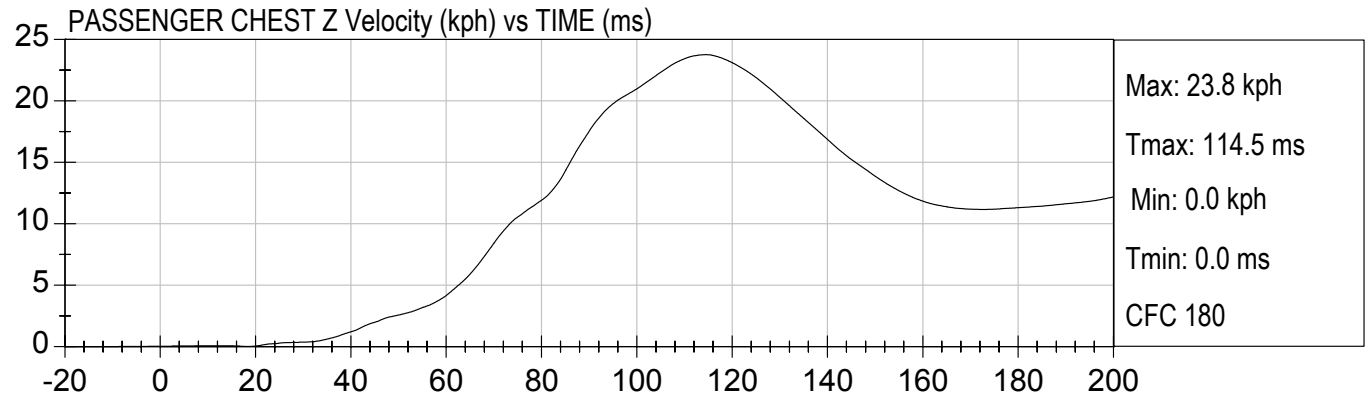


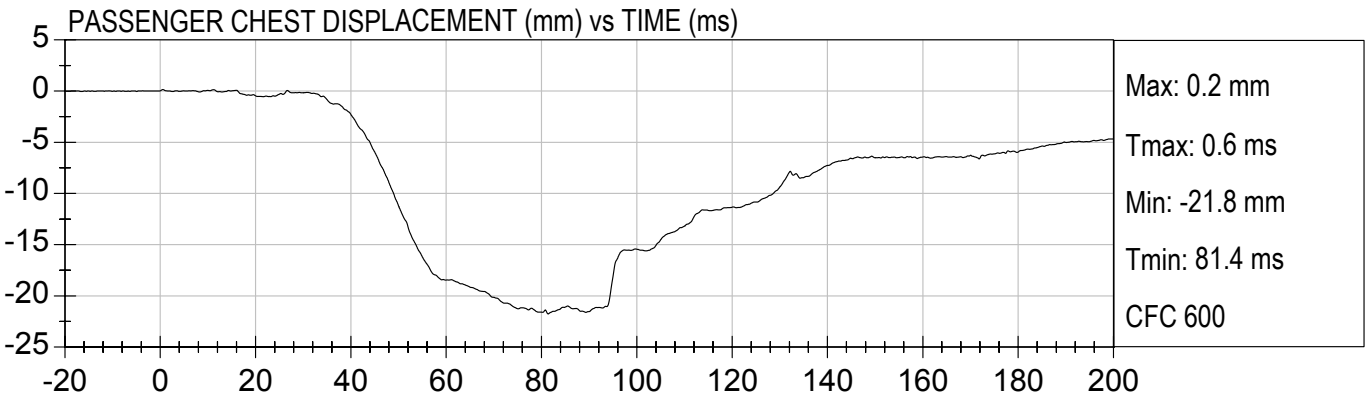





PASSENGER CHEST X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.5 kph
Tmax: 0.0 ms
Min: -18.8 kph
Tmin: 155.8 ms
CFC 180

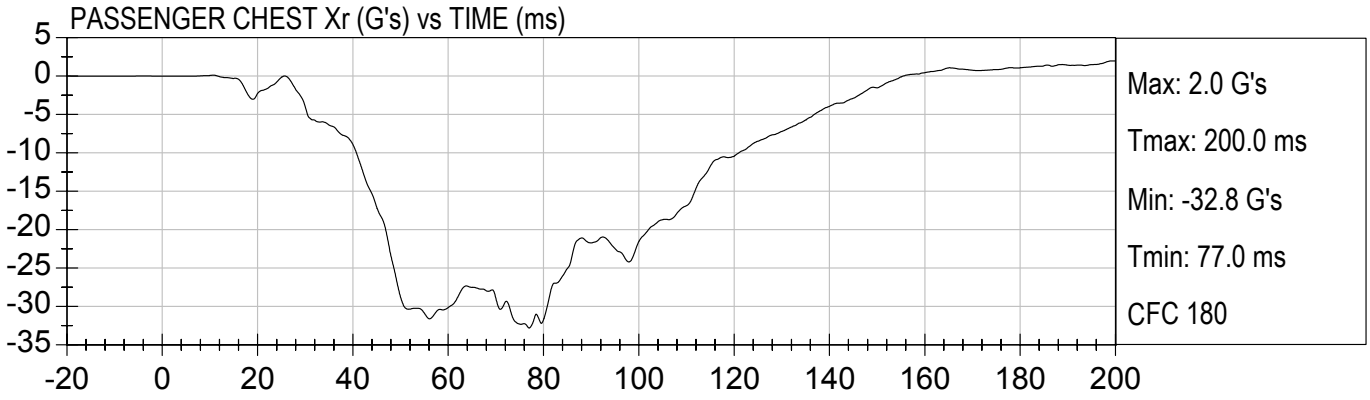

PASSENGER CHEST Y Velocity (kph) vs TIME (ms)
2
0
-2
-4
-6
-8
-10
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 0.5 kph
Tmax: 50.3 ms
Min: -8.1 kph
Tmin: 157.0 ms
CFC 180

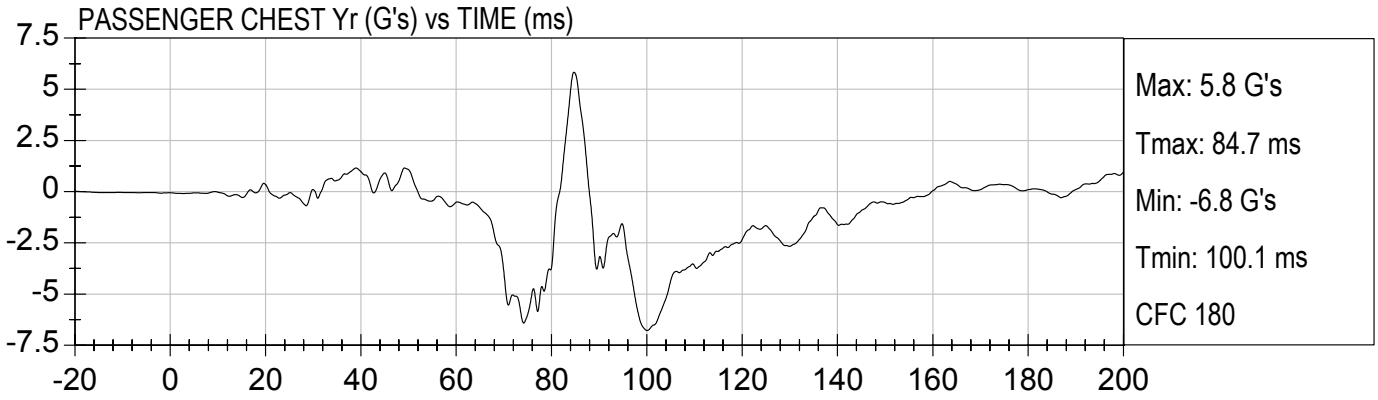

PASSENGER CHEST Z Velocity (kph) vs TIME (ms)
25
20
15
10
5
0
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 23.8 kph
Tmax: 114.5 ms
Min: 0.0 kph
Tmin: 0.0 ms
CFC 180

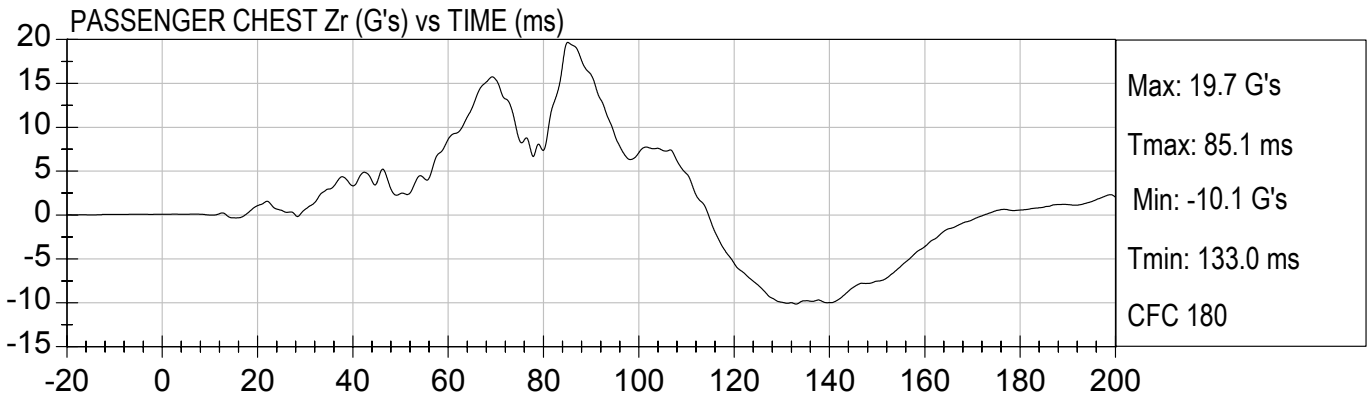

PASSENGER CHEST DISPLACEMENT (mm) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 0.2 mm
Tmax: 0.6 ms
Min: -21.8 mm
Tmin: 81.4 ms
CFC 600

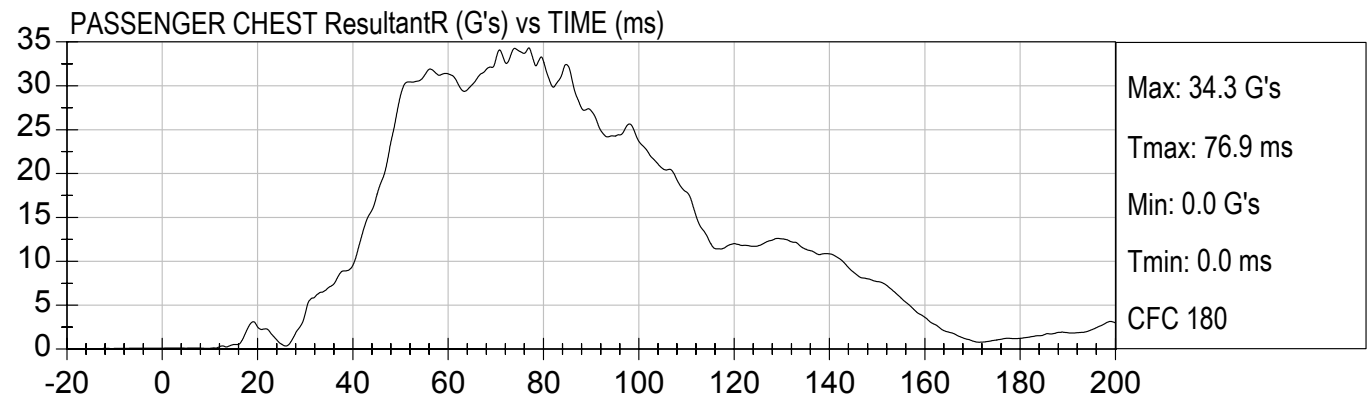
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

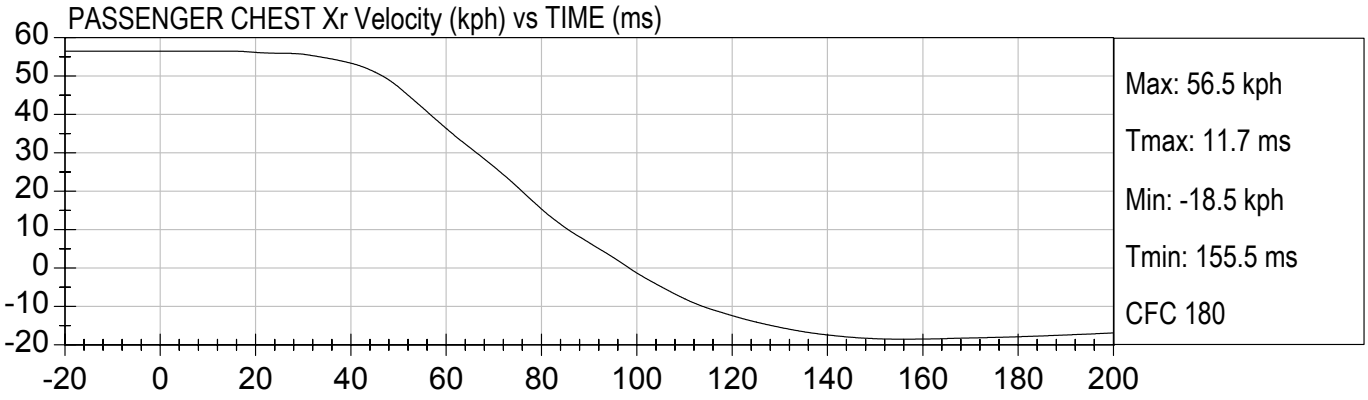
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

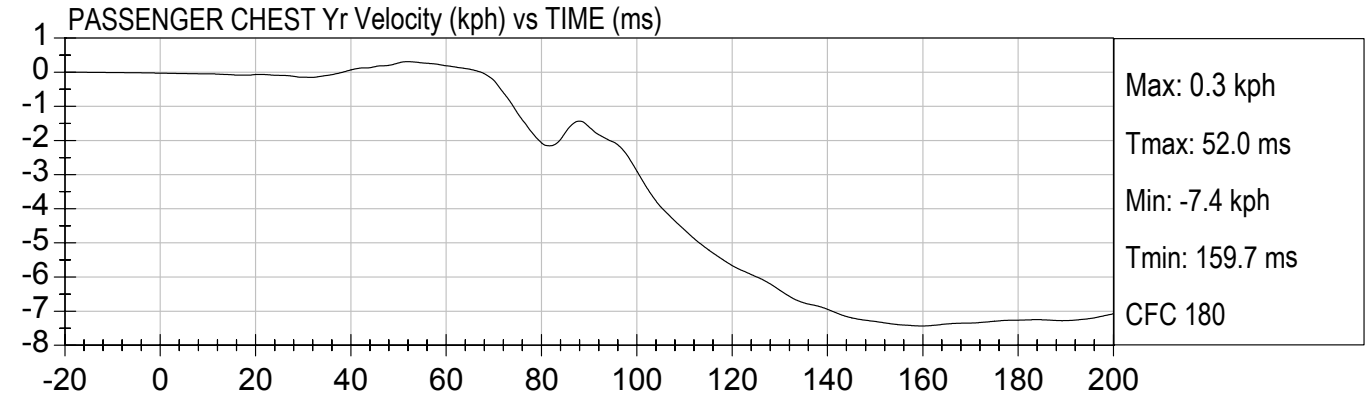


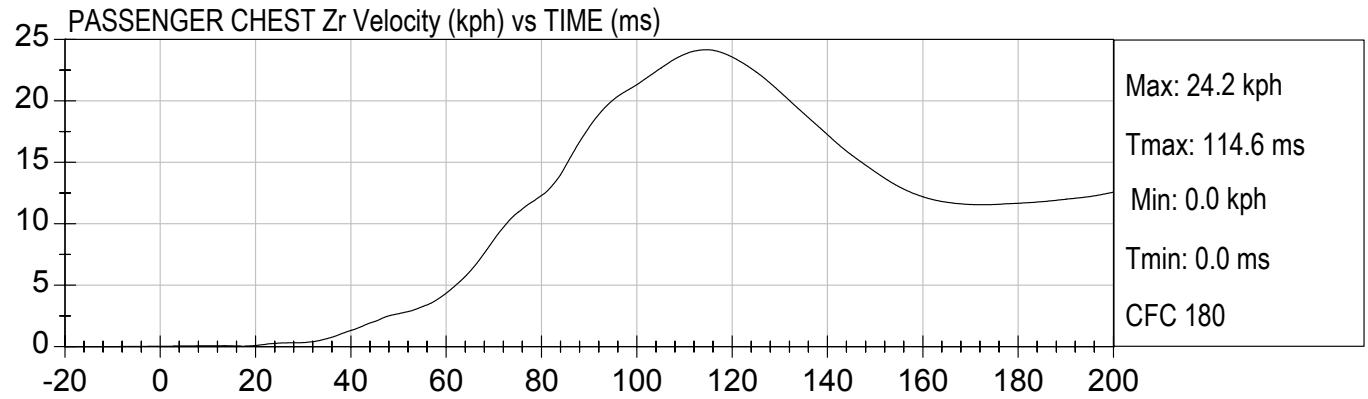






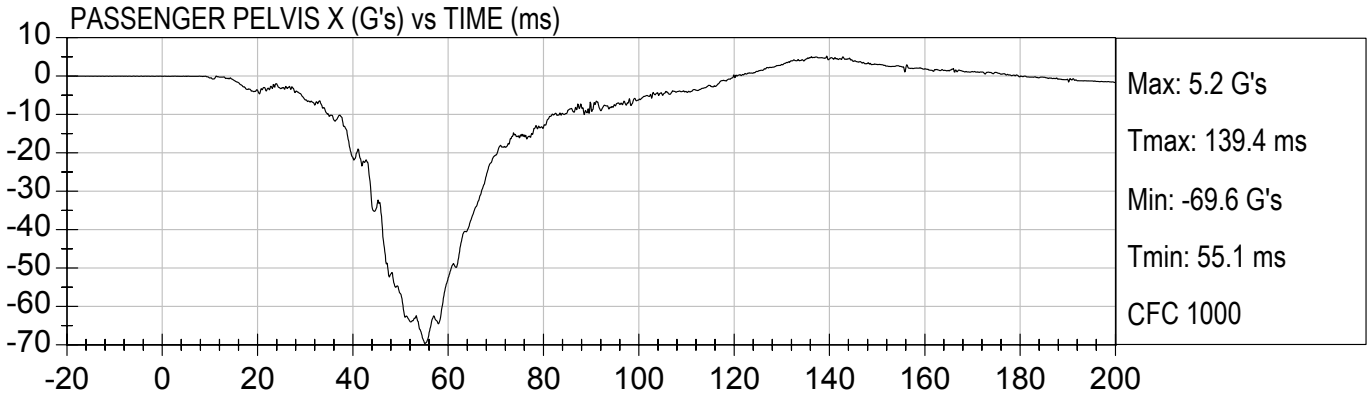

PASSENGER CHEST Xr Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.5 kph
Tmax: 11.7 ms
Min: -18.5 kph
Tmin: 155.5 ms
CFC 180

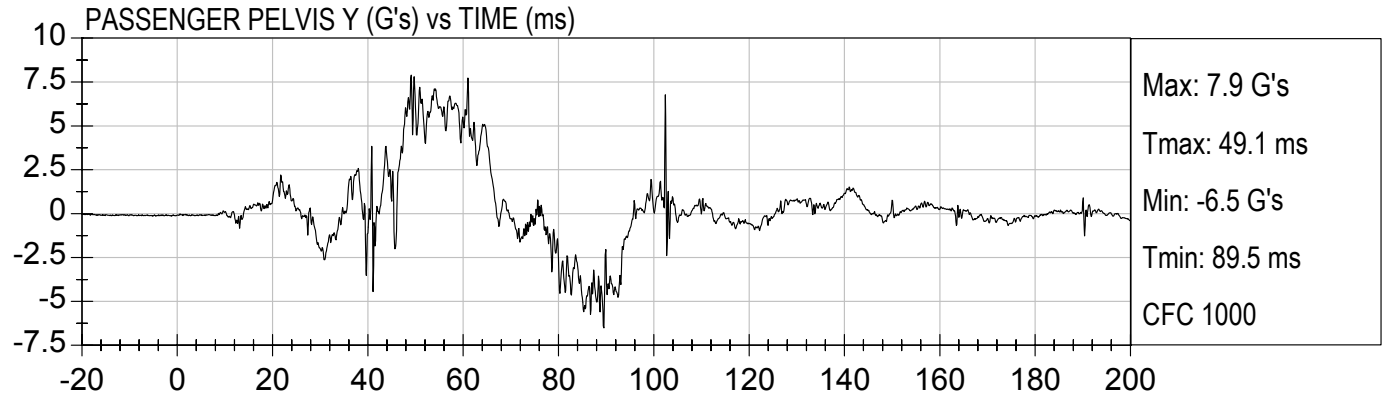

PASSENGER CHEST Yr Velocity (kph) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 0.3 kph
Tmax: 52.0 ms
Min: -7.4 kph
Tmin: 159.7 ms
CFC 180

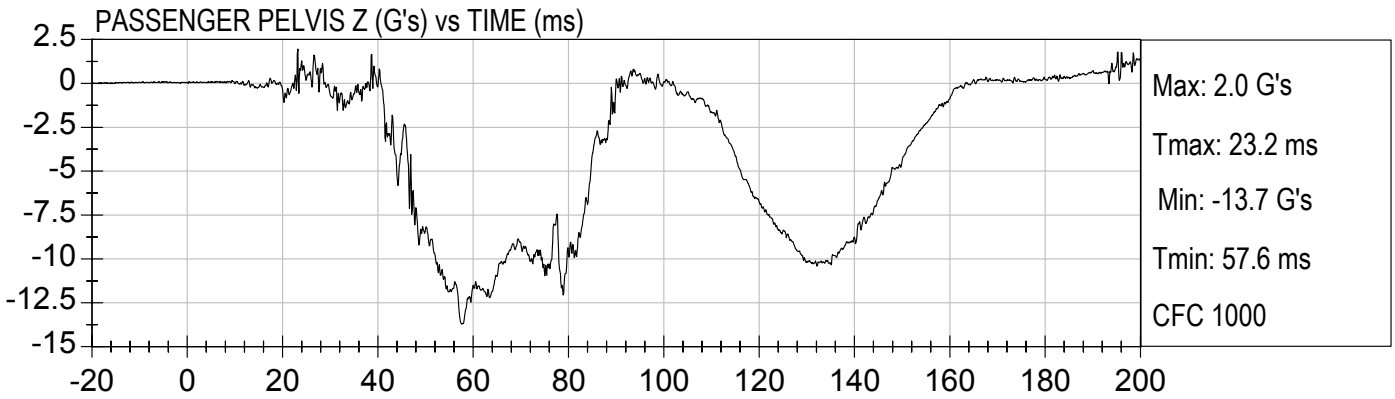

PASSENGER CHEST Zr Velocity (kph) vs TIME (ms)
25
20
15
10
5
0
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 24.2 kph
Tmax: 114.6 ms
Min: 0.0 kph
Tmin: 0.0 ms
CFC 180

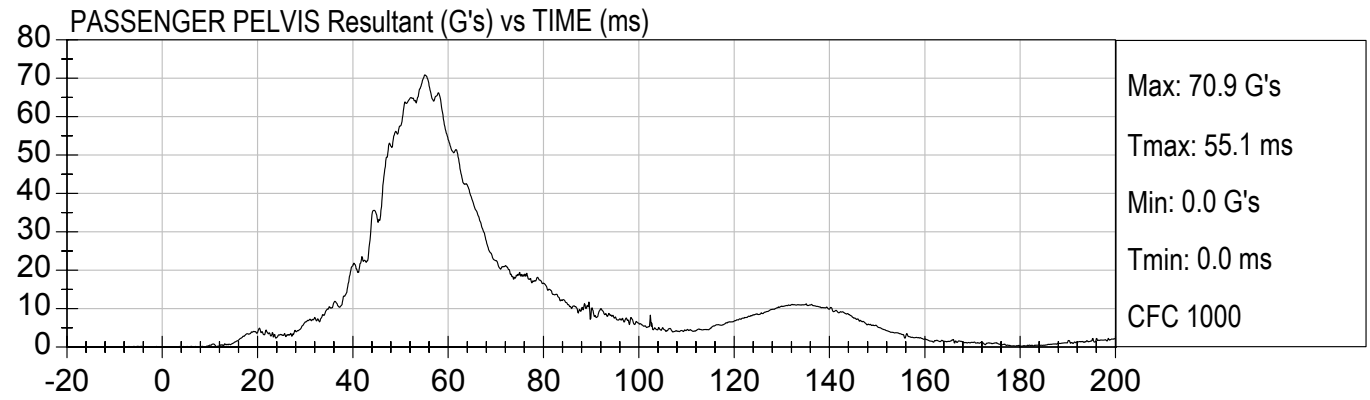
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

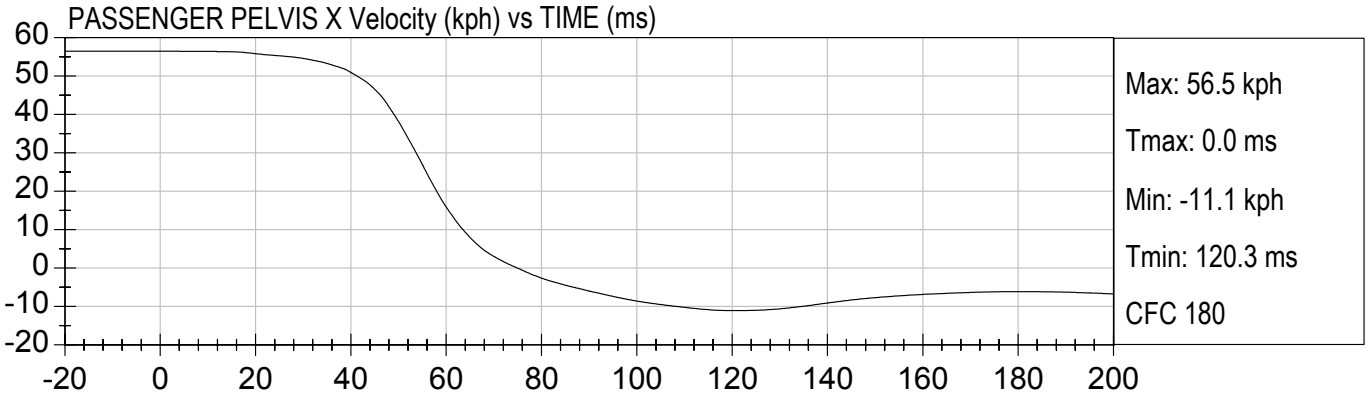
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

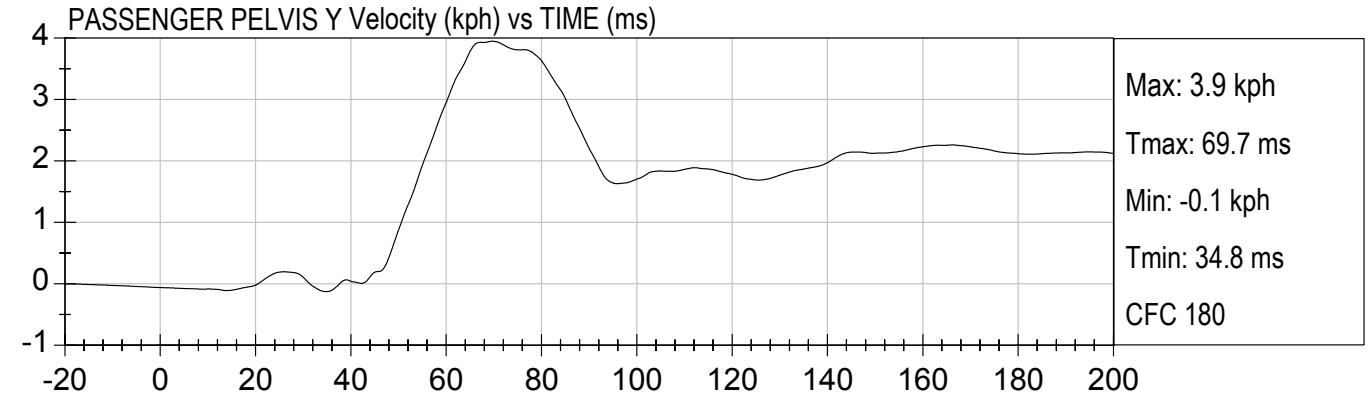


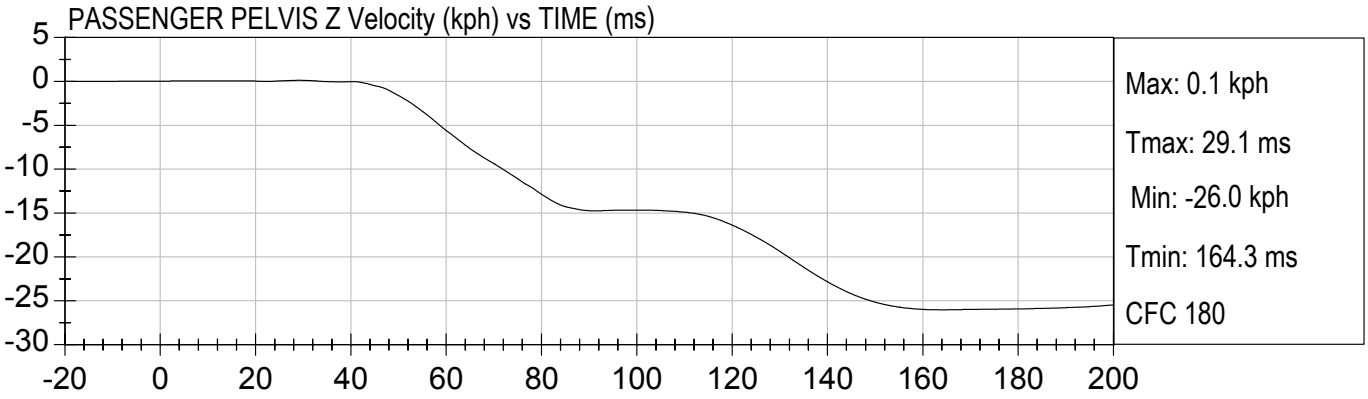






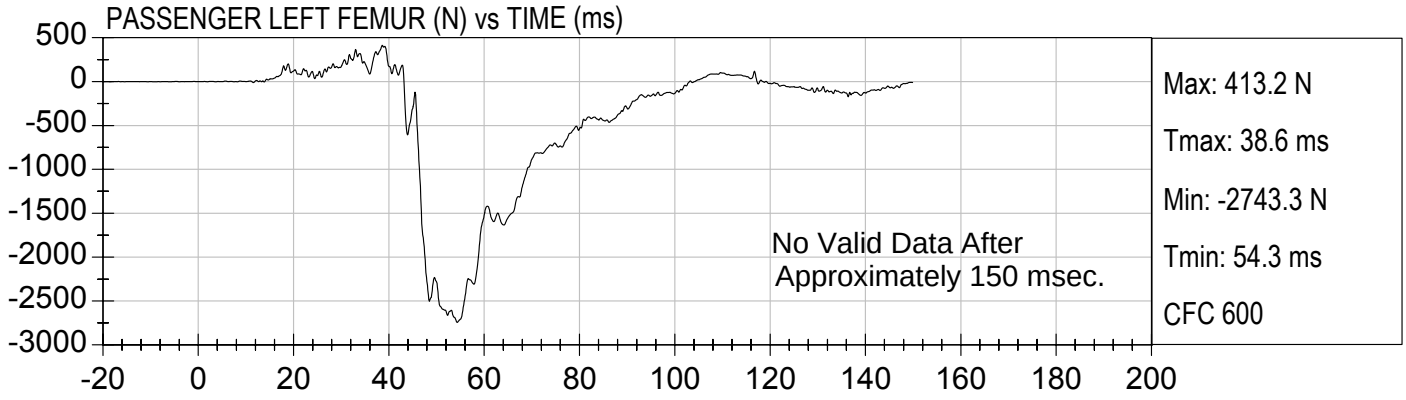

PASSENGER PELVIS X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.5 kph
Tmax: 0.0 ms
Min: -11.1 kph
Tmin: 120.3 ms
CFC 180

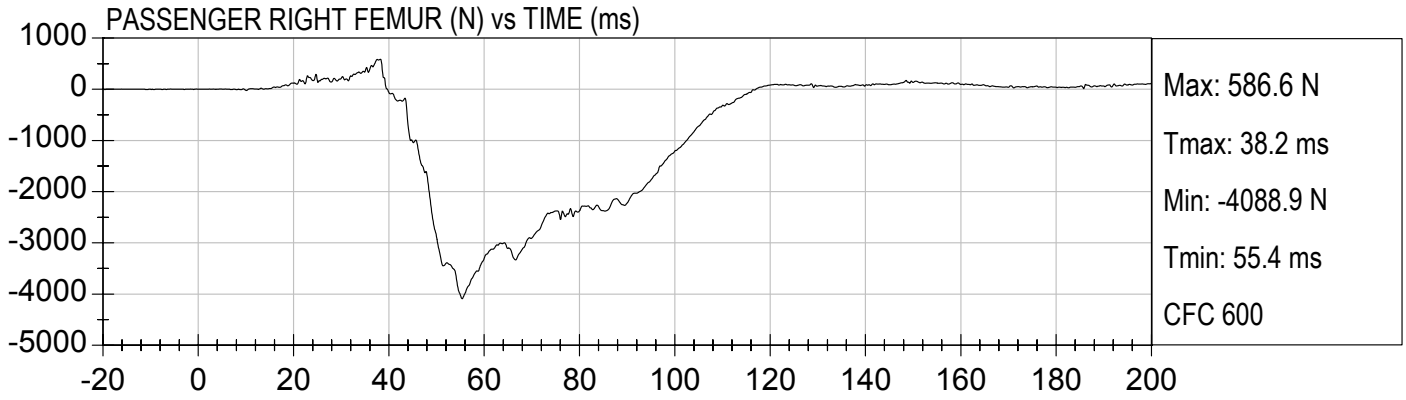

PASSENGER PELVIS Y Velocity (kph) vs TIME (ms)
4
3
2
1
0
-1
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 3.9 kph
Tmax: 69.7 ms
Min: -0.1 kph
Tmin: 34.8 ms
CFC 180

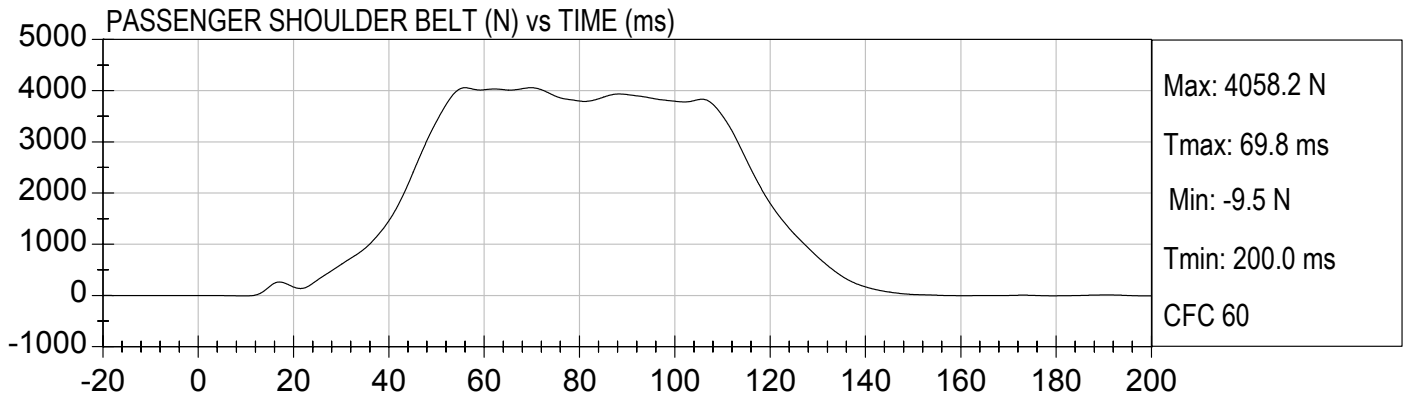

PASSENGER PELVIS Z Velocity (kph) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 0.1 kph
Tmax: 29.1 ms
Min: -26.0 kph
Tmin: 164.3 ms
CFC 180

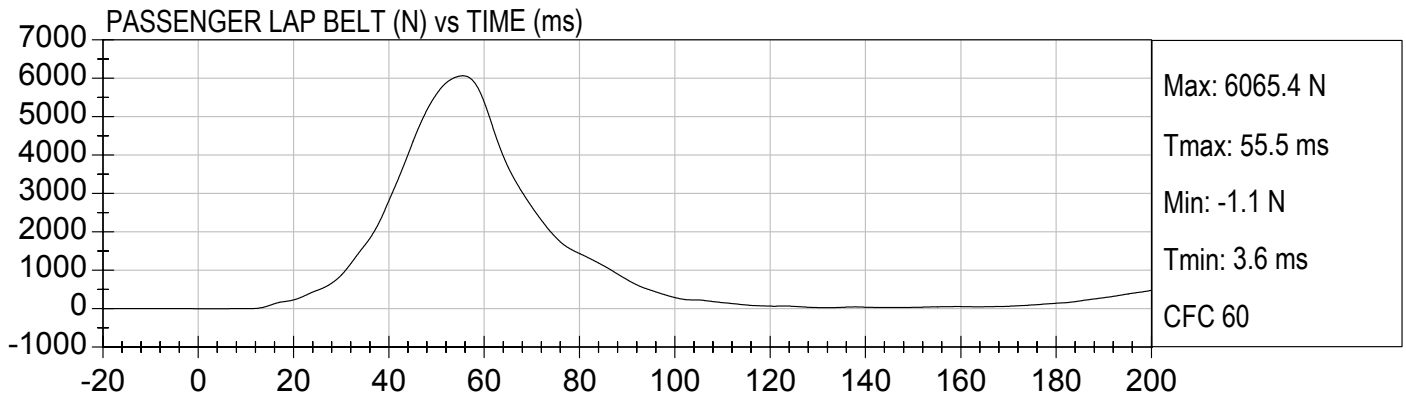
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

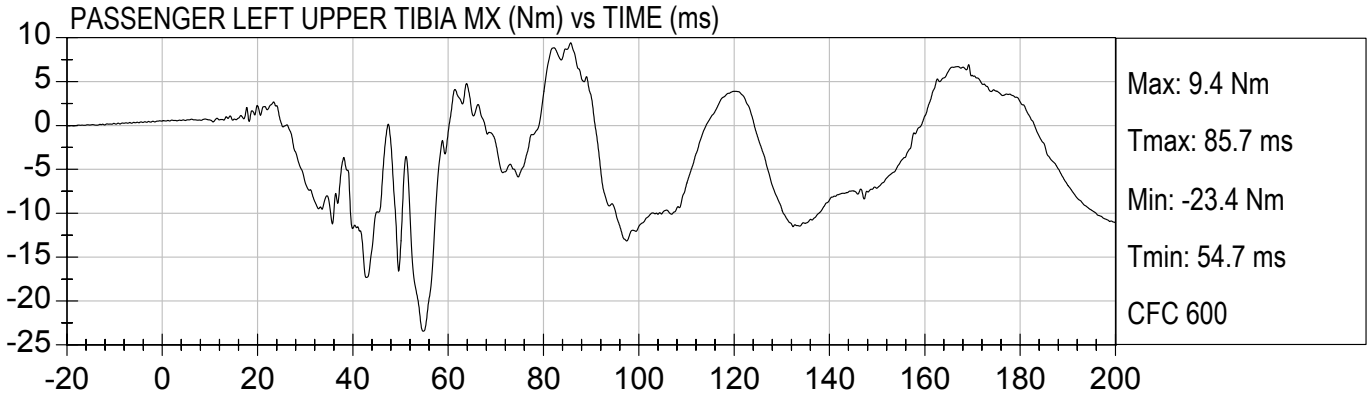
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

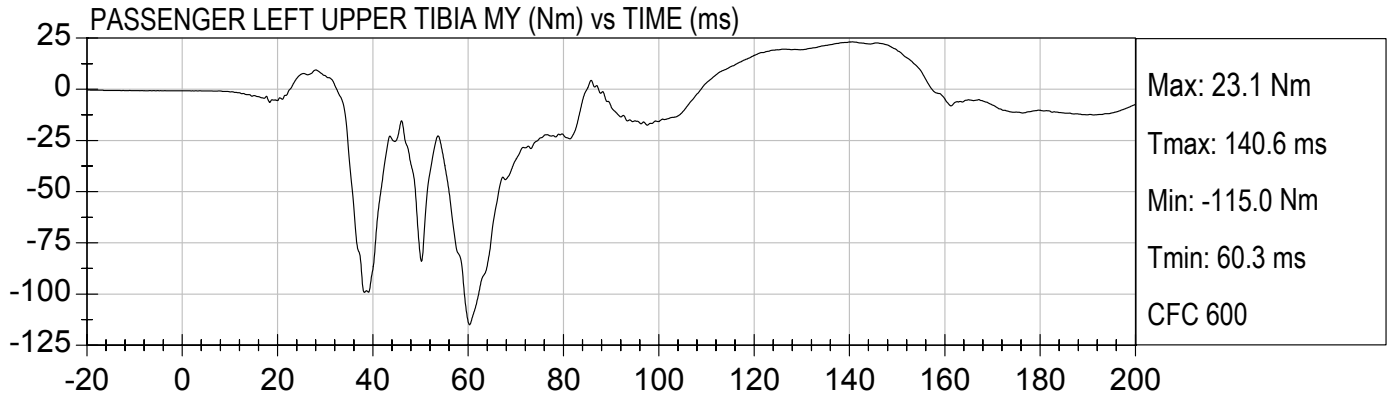


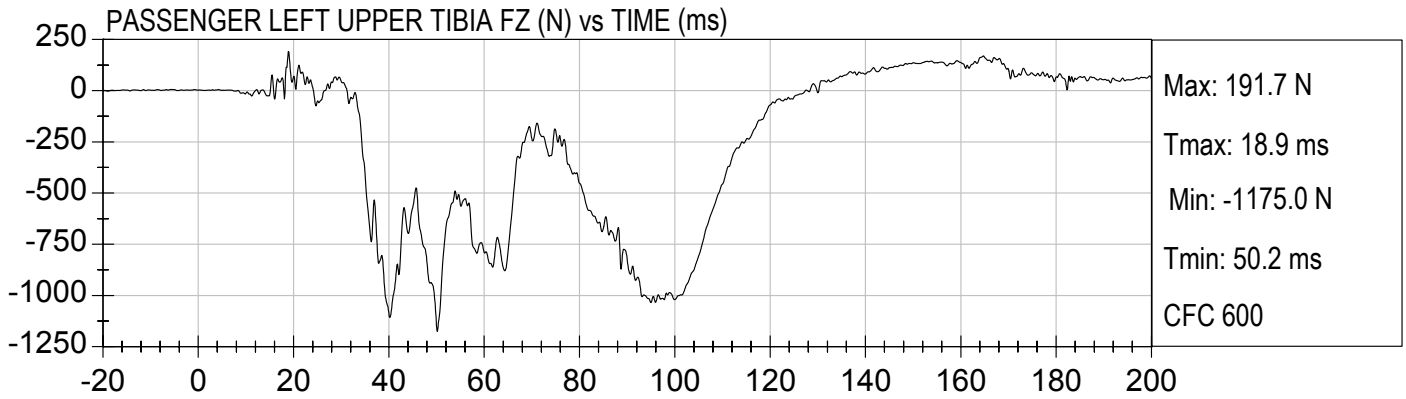


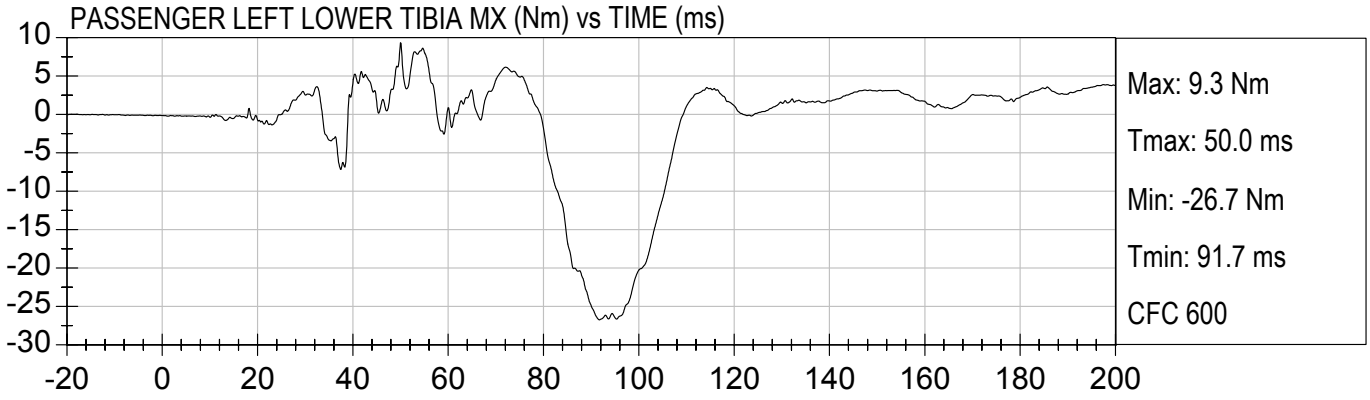


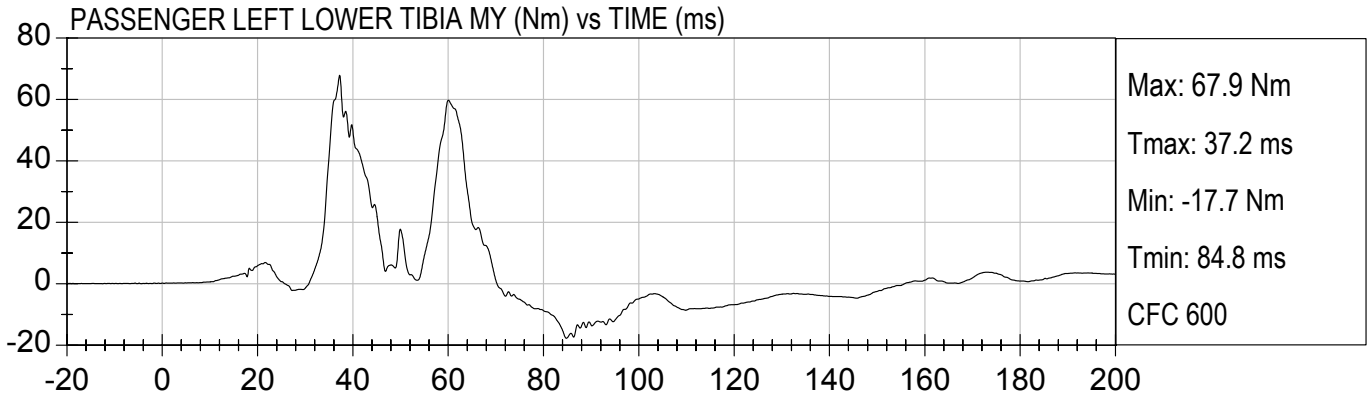


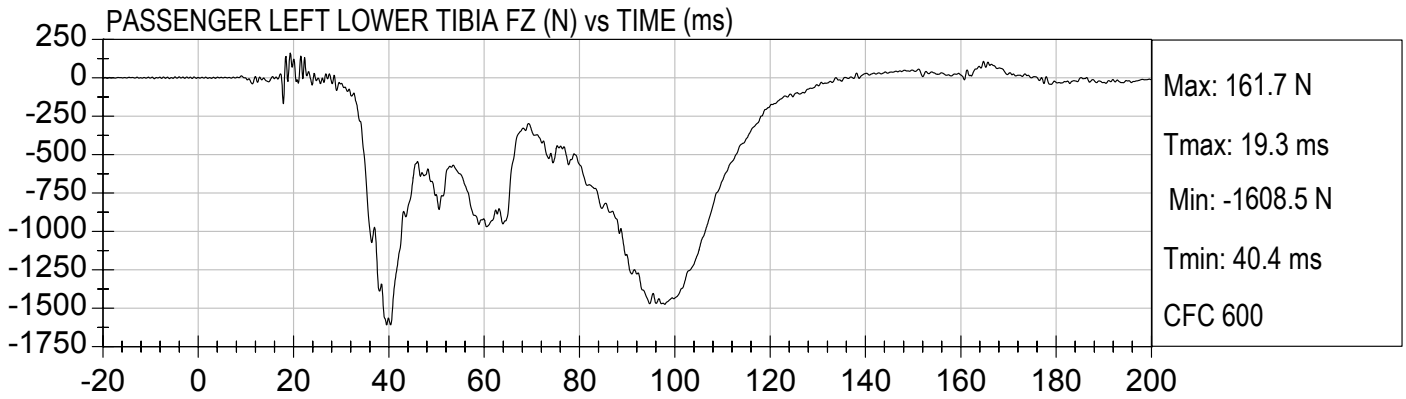

PASSENGER LEFT UPPER TIBIA MX (Nm) vs TIME (ms)
10
5
0
-5
-10
-15
-20
-25
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 9.4 Nm
Tmax: 85.7 ms
Min: -23.4 Nm
Tmin: 54.7 ms
CFC 600

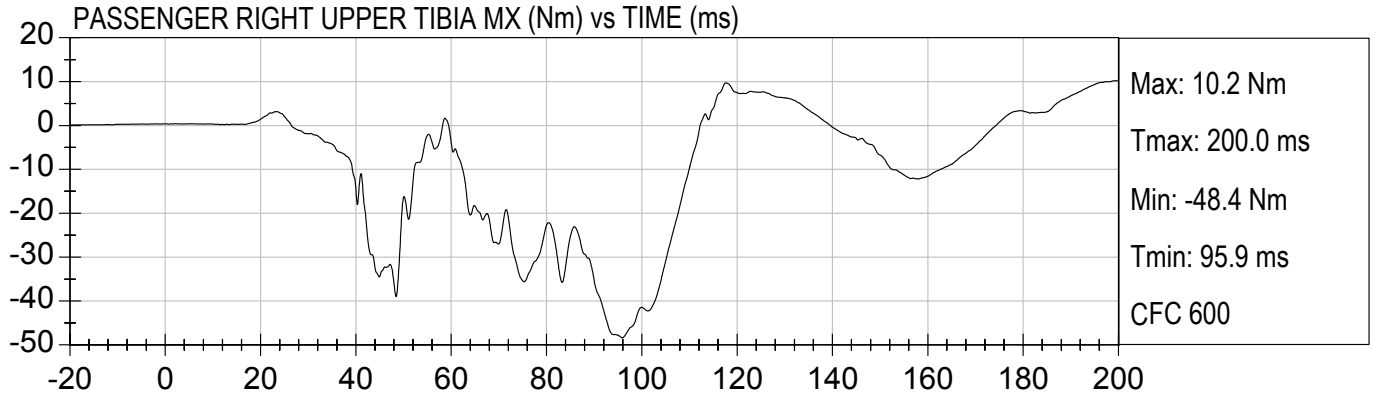

PASSENGER LEFT UPPER TIBIA MY (Nm) vs TIME (ms)
25
0
-25
-50
-75
-100
-125
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 23.1 Nm
Tmax: 140.6 ms
Min: -115.0 Nm
Tmin: 60.3 ms
CFC 600

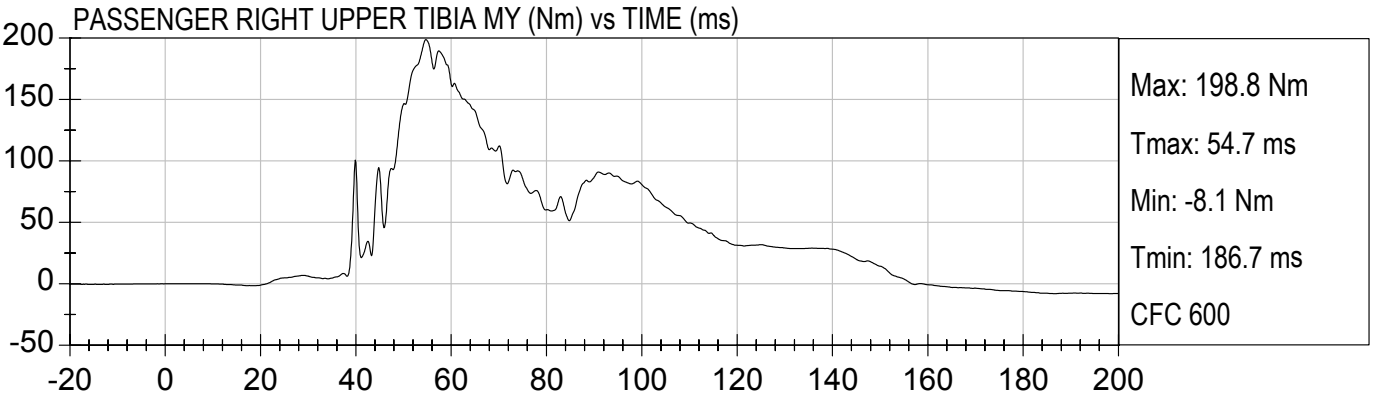

PASSENGER LEFT UPPER TIBIA FZ (N) vs TIME (ms)
250
0
-250
-500
-750
-1000
-1250
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 191.7 N
Tmax: 18.9 ms
Min: -1175.0 N
Tmin: 50.2 ms
CFC 600

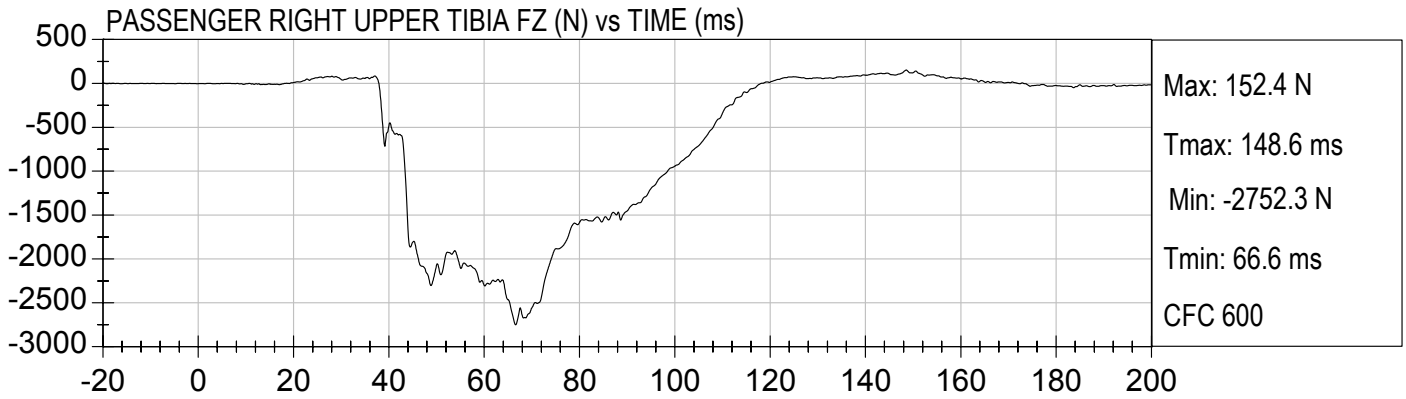

PASSENGER LEFT LOWER TIBIA MX (Nm) vs TIME (ms)
10
5
0
-5
-10
-15
-20
-25
-30
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 9.3 Nm
Tmax: 50.0 ms
Min: -26.7 Nm
Tmin: 91.7 ms
CFC 600

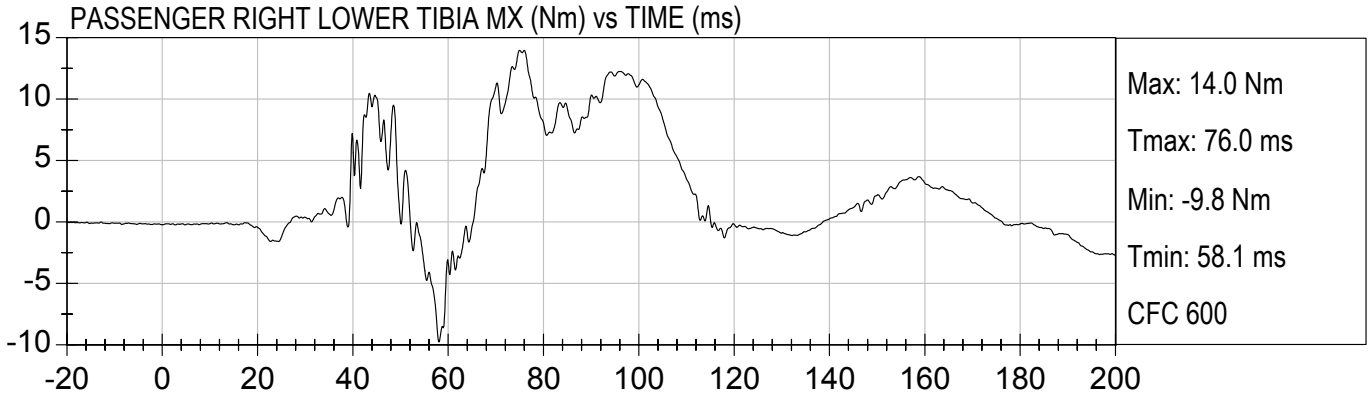

PASSENGER LEFT LOWER TIBIA MY (Nm) vs TIME (ms)
80
60
40
20
0
-20
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 67.9 Nm
Tmax: 37.2 ms
Min: -17.7 Nm
Tmin: 84.8 ms
CFC 600

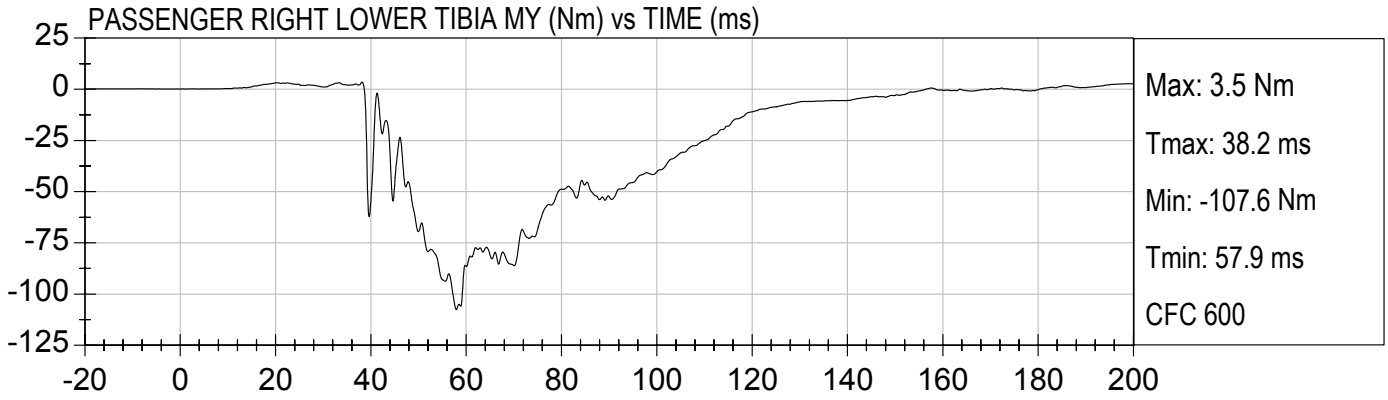

PASSENGER LEFT LOWER TIBIA FZ (N) vs TIME (ms)
250
0
-250
-500
-750
-1000
-1250
-1500
-1750
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 161.7 N
Tmax: 19.3 ms
Min: -1608.5 N
Tmin: 40.4 ms
CFC 600

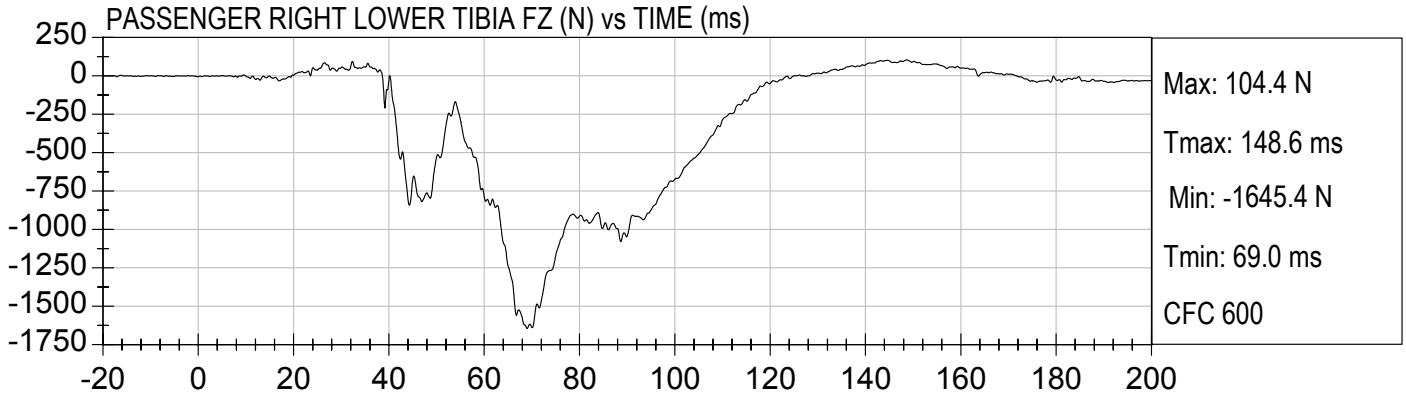

PASSENGER RIGHT UPPER TIBIA MX (Nm) vs TIME (ms)
20
10
0
-10
-20
-30
-40
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 10.2 Nm
Tmax: 200.0 ms
Min: -48.4 Nm
Tmin: 95.9 ms
CFC 600

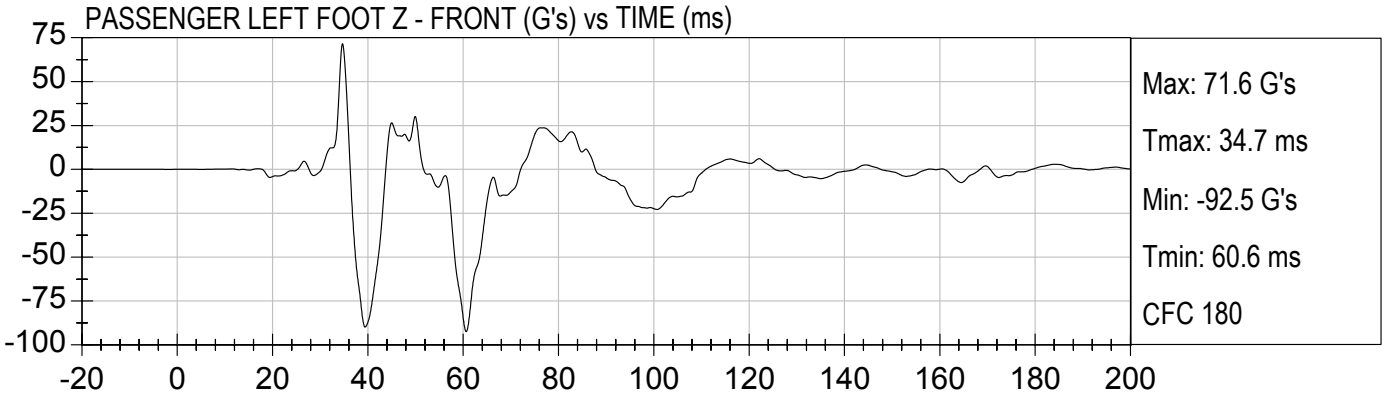

PASSENGER RIGHT UPPER TIBIA MY (Nm) vs TIME (ms)
200
150
100
50
0
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 198.8 Nm
Tmax: 54.7 ms
Min: -8.1 Nm
Tmin: 186.7 ms
CFC 600

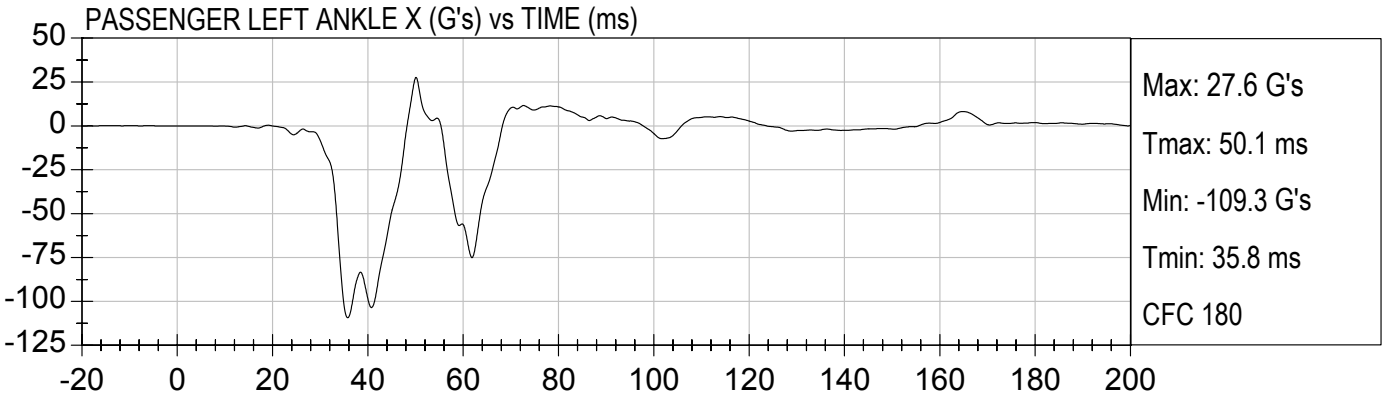

PASSENGER RIGHT UPPER TIBIA FZ (N) vs TIME (ms)
500
0
-500
-1000
-1500
-2000
-2500
-3000
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 152.4 N
Tmax: 148.6 ms
Min: -2752.3 N
Tmin: 66.6 ms
CFC 600

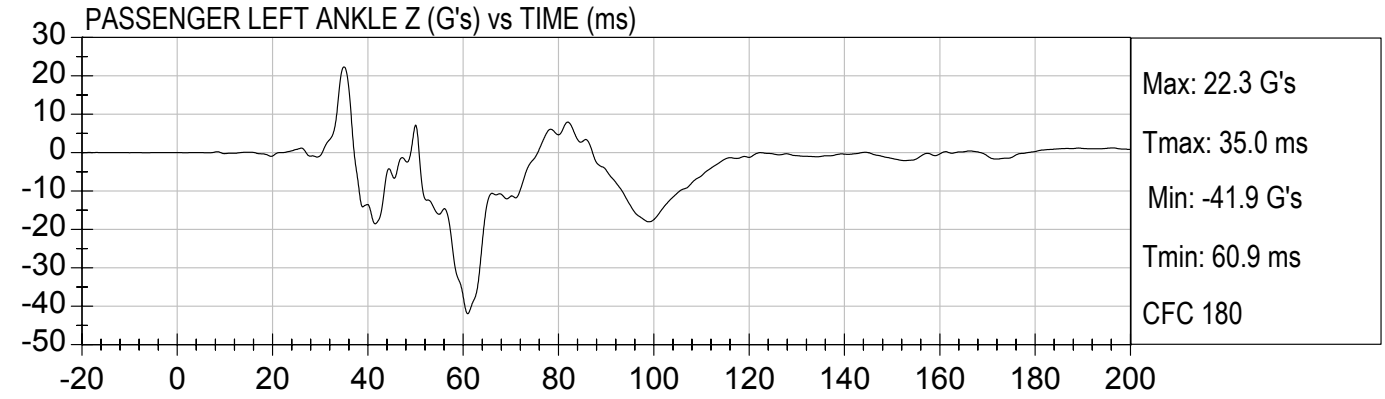

PASSENGER RIGHT LOWER TIBIA MX (Nm) vs TIME (ms)
15
10
5
0
-5
-10
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 14.0 Nm
Tmax: 76.0 ms
Min: -9.8 Nm
Tmin: 58.1 ms
CFC 600

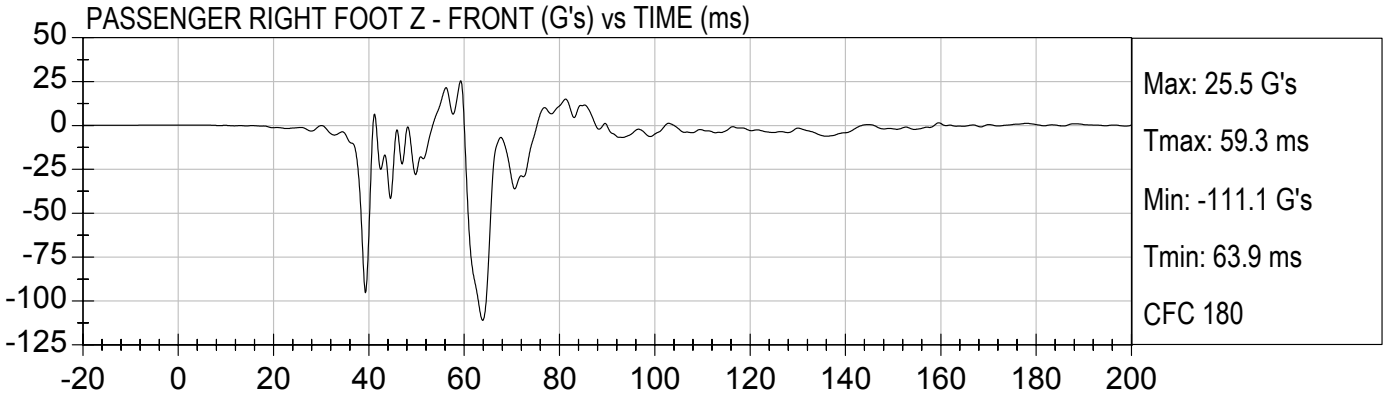

PASSENGER RIGHT LOWER TIBIA MY (Nm) vs TIME (ms)
25
0
-25
-50
-75
-100
-125
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 3.5 Nm
Tmax: 38.2 ms
Min: -107.6 Nm
Tmin: 57.9 ms
CFC 600

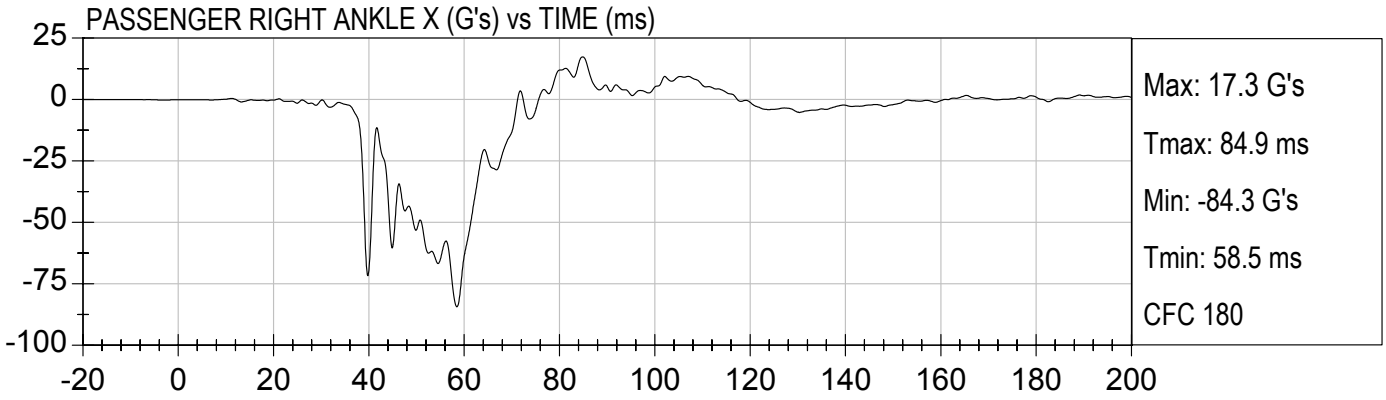

PASSENGER RIGHT LOWER TIBIA FZ (N) vs TIME (ms)
250
0
-250
-500
-750
-1000
-1250
-1500
-1750
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 104.4 N
Tmax: 148.6 ms
Min: -1645.4 N
Tmin: 69.0 ms
CFC 600

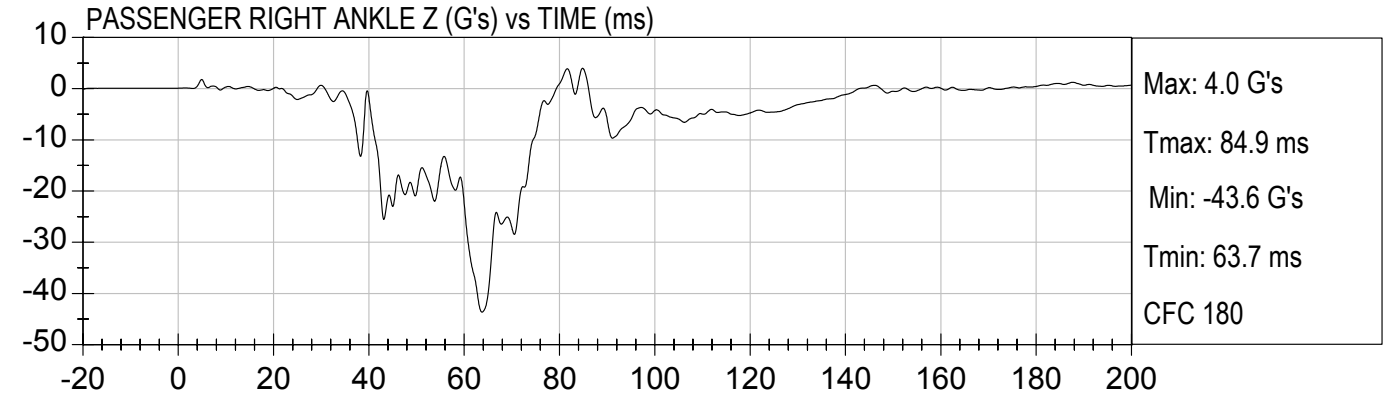

PASSENGER LEFT FOOT Z - FRONT (G's) vs TIME (ms)
75
50
25
0
-25
-50
-75
-100
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 71.6 G's
Tmax: 34.7 ms
Min: -92.5 G's
Tmin: 60.6 ms
CFC 180

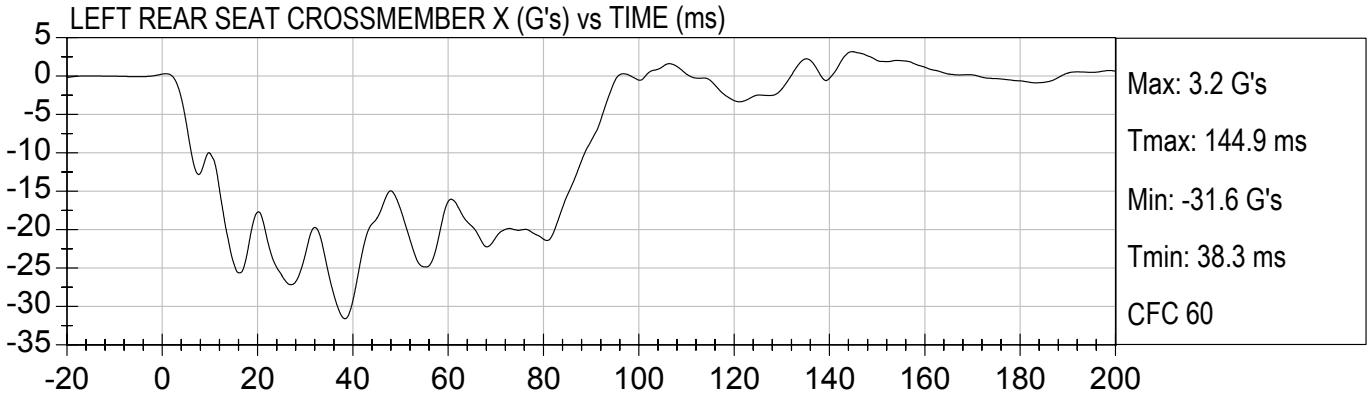

PASSENGER LEFT ANKLE X (G's) vs TIME (ms)
50
25
0
-25
-50
-75
-100
-125
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 27.6 G's
Tmax: 50.1 ms
Min: -109.3 G's
Tmin: 35.8 ms
CFC 180

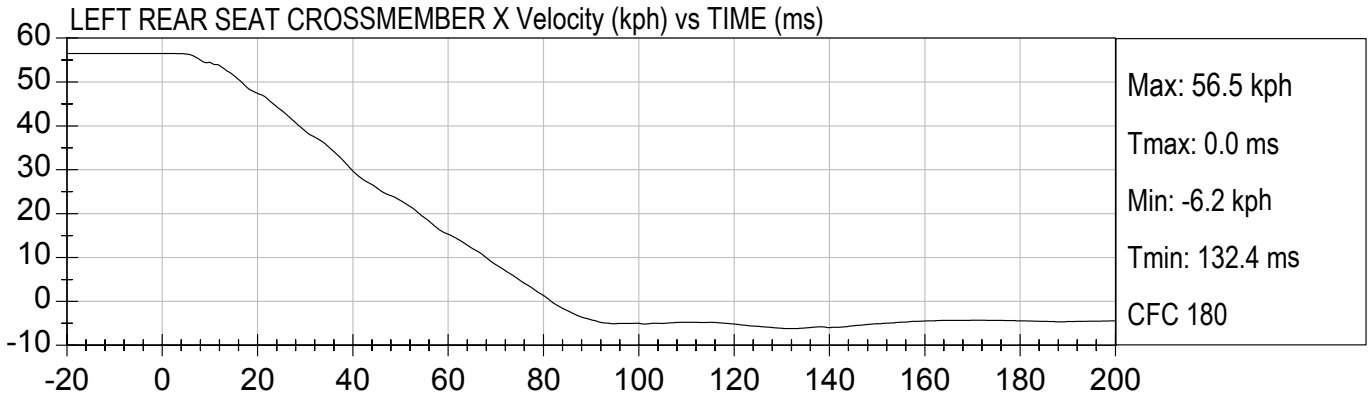

PASSENGER LEFT ANKLE Z (G's) vs TIME (ms)
30
20
10
0
-10
-20
-30
-40
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 22.3 G's
Tmax: 35.0 ms
Min: -41.9 G's
Tmin: 60.9 ms
CFC 180

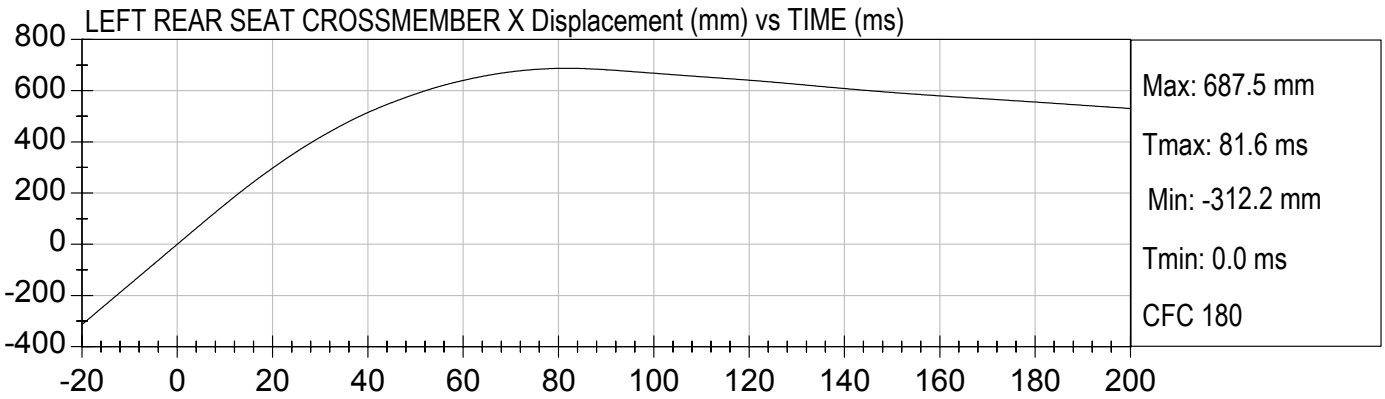

PASSENGER RIGHT FOOT Z - FRONT (G's) vs TIME (ms)
50
25
0
-25
-50
-75
-100
-125
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 25.5 G's
Tmax: 59.3 ms
Min: -111.1 G's
Tmin: 63.9 ms
CFC 180

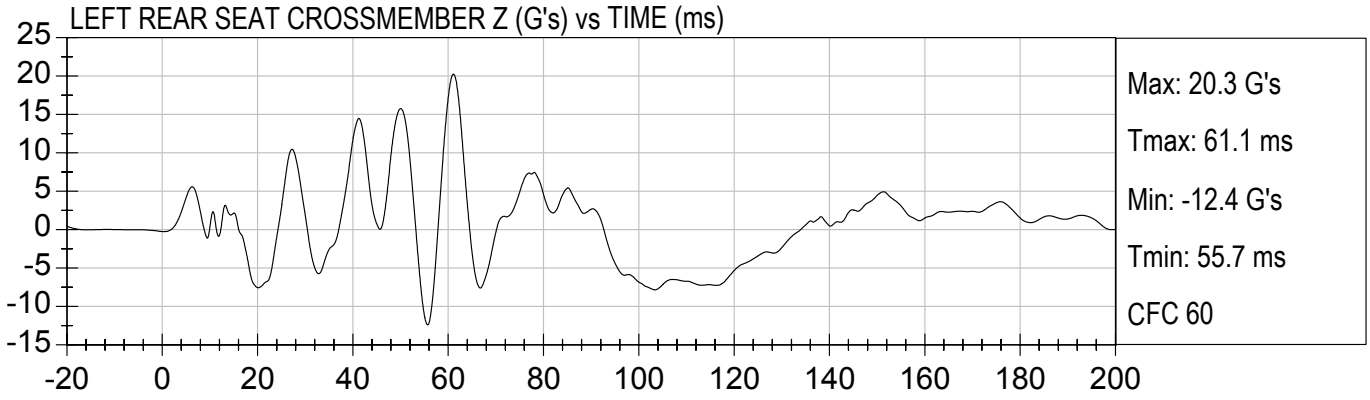

PASSENGER RIGHT ANKLE X (G's) vs TIME (ms)
25
0
-25
-50
-75
-100
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 17.3 G's
Tmax: 84.9 ms
Min: -84.3 G's
Tmin: 58.5 ms
CFC 180

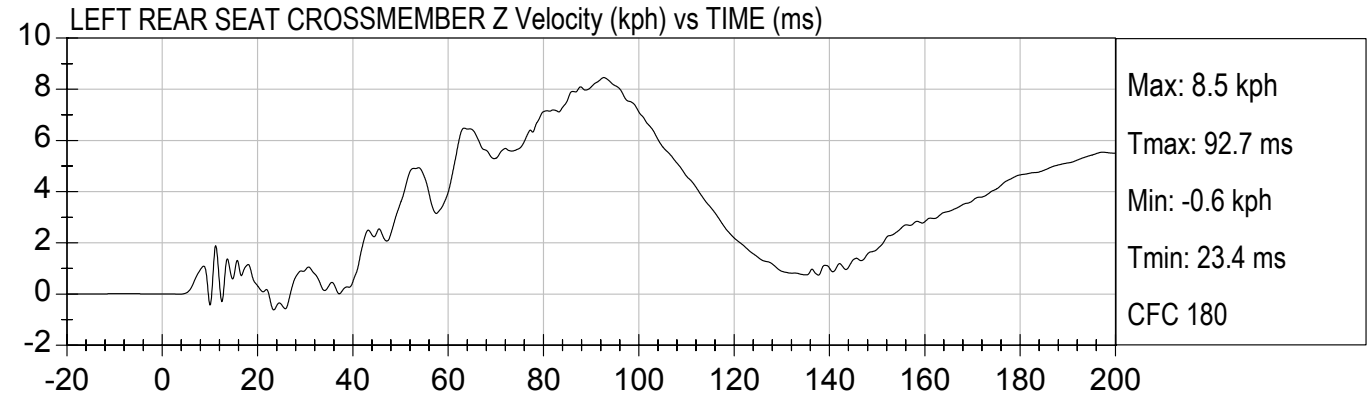

PASSENGER RIGHT ANKLE Z (G's) vs TIME (ms)
10
0
-10
-20
-30
-40
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 4.0 G's
Tmax: 84.9 ms
Min: -43.6 G's
Tmin: 63.7 ms
CFC 180

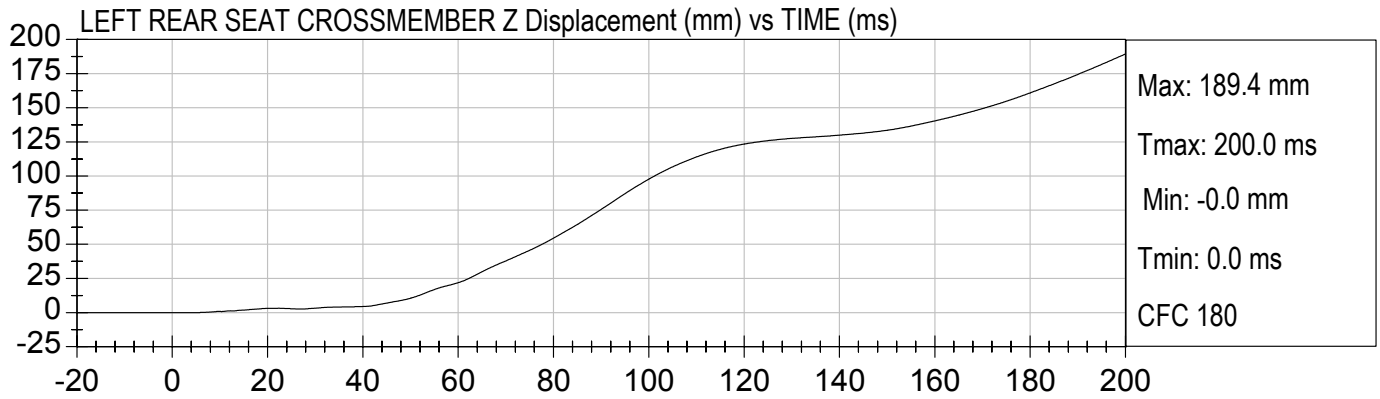

LEFT REAR SEAT CROSSMEMBER X (G's) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-35
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 3.2 G's
Tmax: 144.9 ms
Min: -31.6 G's
Tmin: 38.3 ms
CFC 60

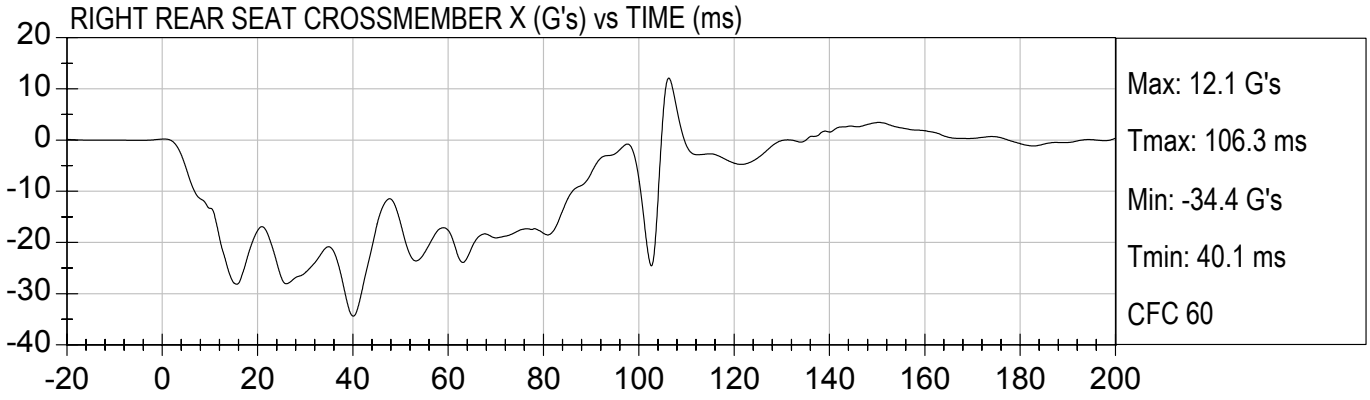

LEFT REAR SEAT CROSSMEMBER X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 56.5 kph
Tmax: 0.0 ms
Min: -6.2 kph
Tmin: 132.4 ms
CFC 180

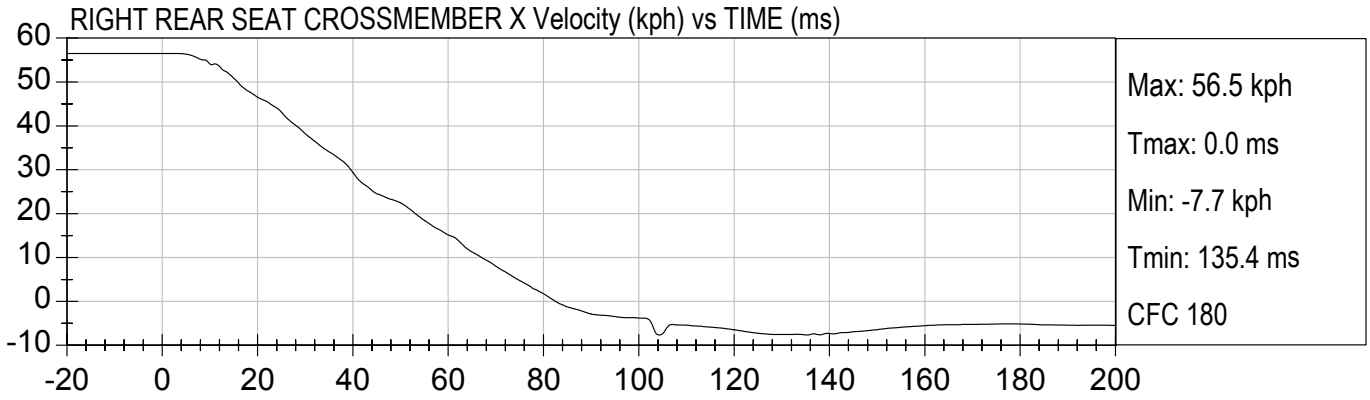

LEFT REAR SEAT CROSSMEMBER X Displacement (mm) vs TIME (ms)
800
600
400
200
0
-200
-400
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 687.5 mm
Tmax: 81.6 ms
Min: -312.2 mm
Tmin: 0.0 ms
CFC 180

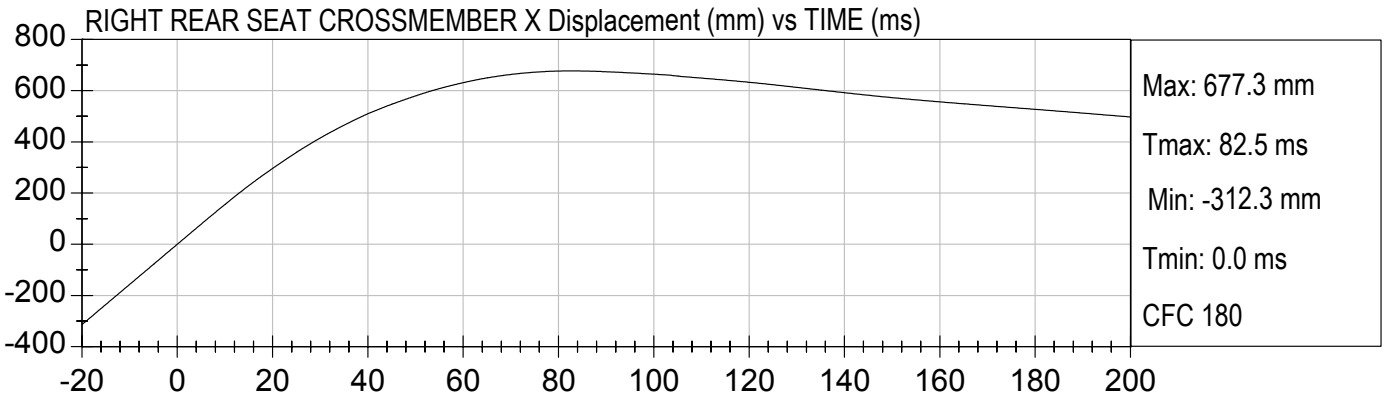

LEFT REAR SEAT CROSSMEMBER Z (G's) vs TIME (ms)
25
20
15
10
5
0
-5
-10
-15
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 20.3 G's
Tmax: 61.1 ms
Min: -12.4 G's
Tmin: 55.7 ms
CFC 60

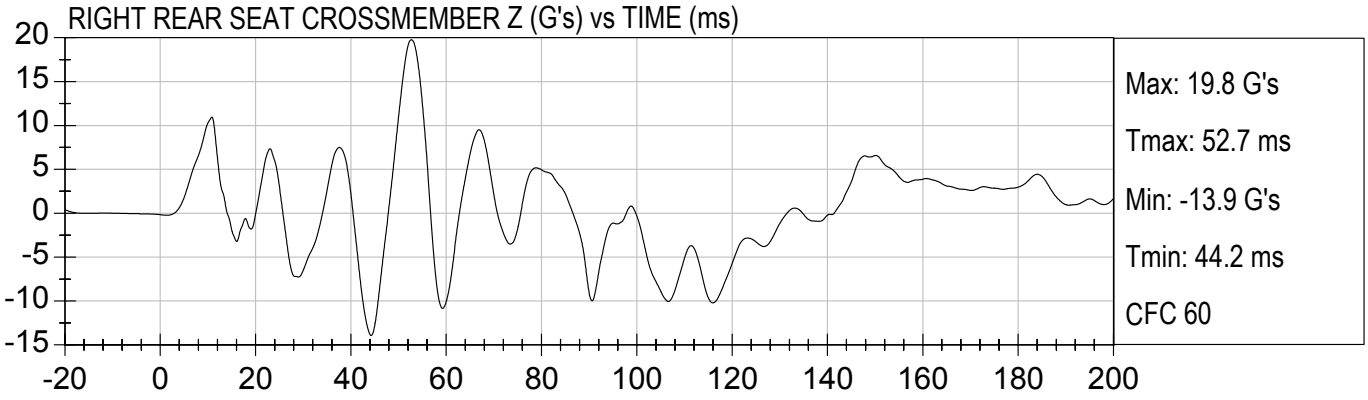

LEFT REAR SEAT CROSSMEMBER Z Velocity (kph) vs TIME (ms)
10
8
6
4
2
0
-2
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 8.5 kph
Tmax: 92.7 ms
Min: -0.6 kph
Tmin: 23.4 ms
CFC 180

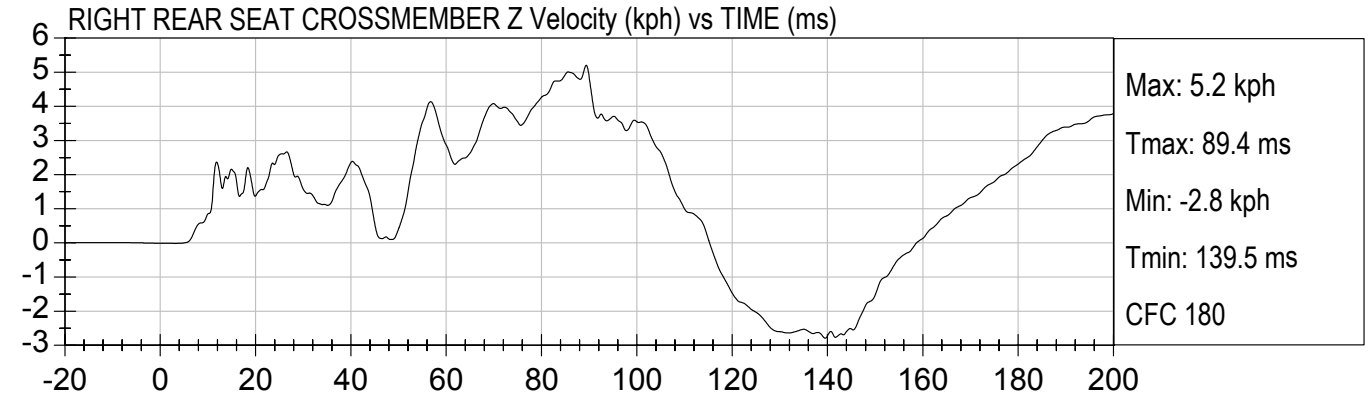

LEFT REAR SEAT CROSSMEMBER Z Displacement (mm) vs TIME (ms)
200
175
150
125
100
75
50
25
0
-25
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 189.4 mm
Tmax: 200.0 ms
Min: -0.0 mm
Tmin: 0.0 ms
CFC 180

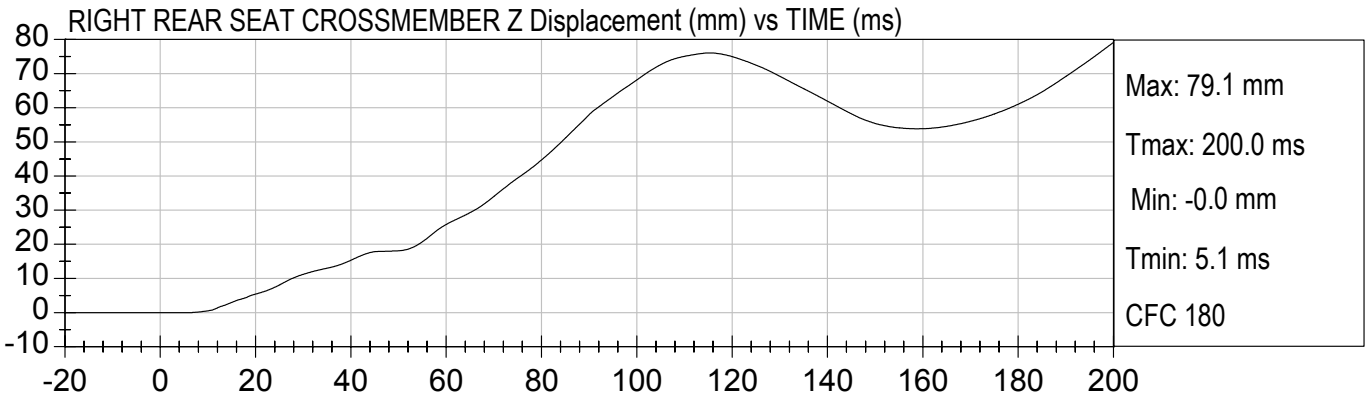

RIGHT REAR SEAT CROSSMEMBER X (G's) vs TIME (ms)
20
10
0
-10
-20
-30
-40
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 12.1 G's
Tmax: 106.3 ms
Min: -34.4 G's
Tmin: 40.1 ms
CFC 60

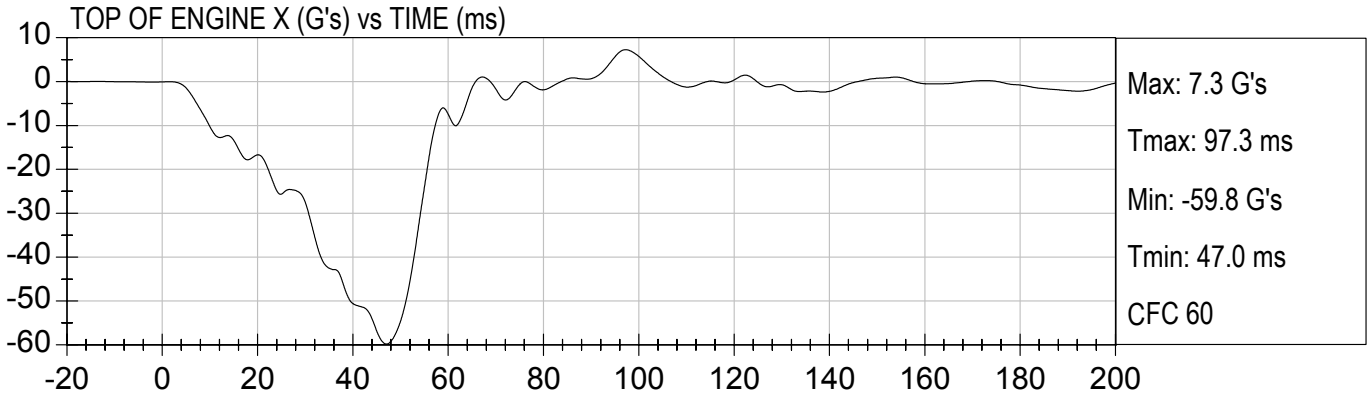

RIGHT REAR SEAT CROSSMEMBER X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 56.5 kph
Tmax: 0.0 ms
Min: -7.7 kph
Tmin: 135.4 ms
CFC 180

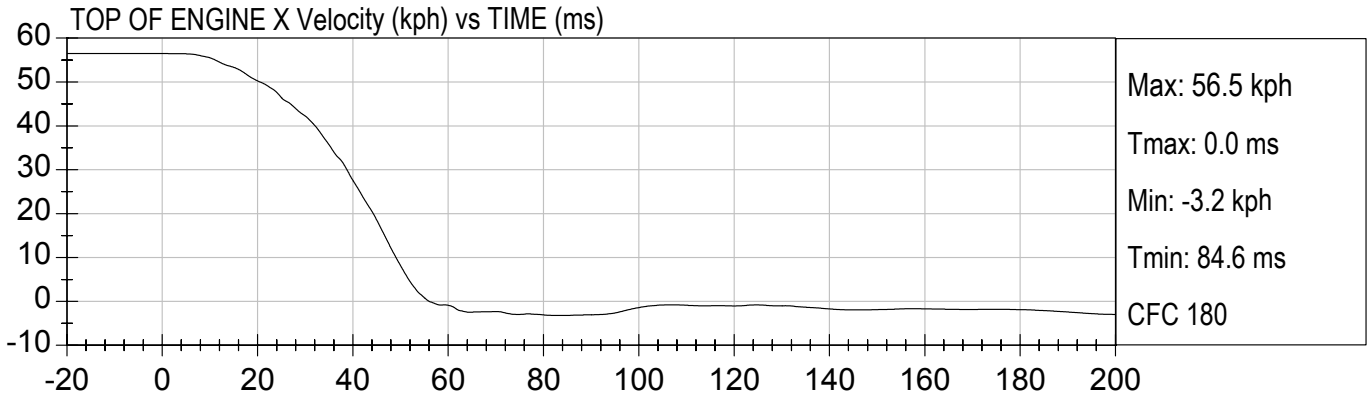

RIGHT REAR SEAT CROSSMEMBER X Displacement (mm) vs TIME (ms)
800
600
400
200
0
-200
-400
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 677.3 mm
Tmax: 82.5 ms
Min: -312.3 mm
Tmin: 0.0 ms
CFC 180

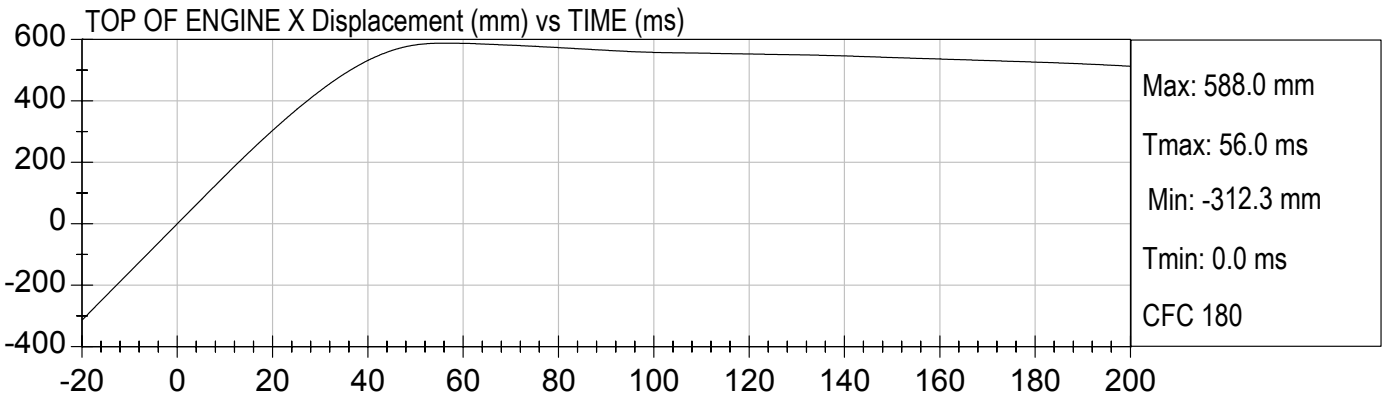

RIGHT REAR SEAT CROSSMEMBER Z (G's) vs TIME (ms)
20
15
10
5
0
-5
-10
-15
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 19.8 G's
Tmax: 52.7 ms
Min: -13.9 G's
Tmin: 44.2 ms
CFC 60

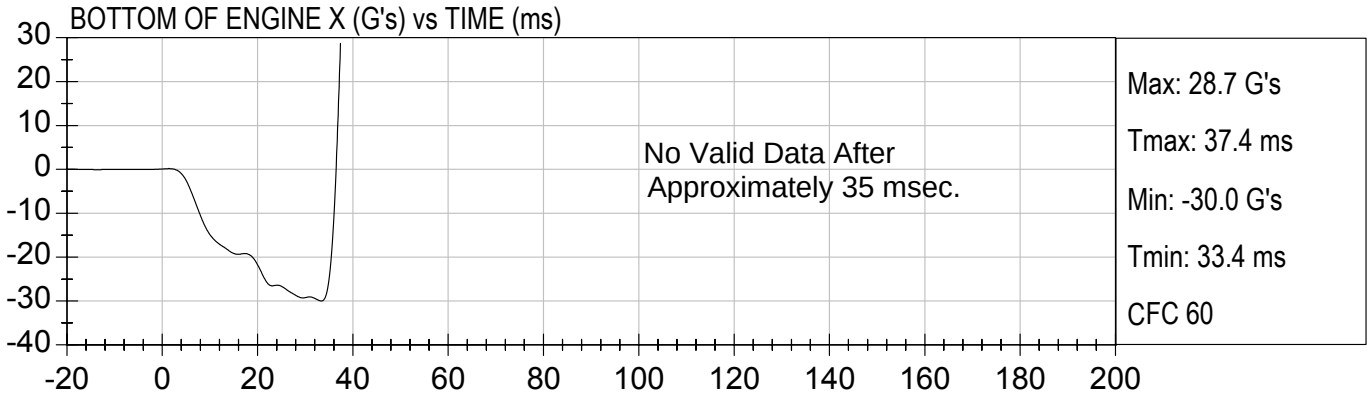

RIGHT REAR SEAT CROSSMEMBER Z Velocity (kph) vs TIME (ms)
6
5
4
3
2
1
0
-1
-2
-3
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 5.2 kph
Tmax: 89.4 ms
Min: -2.8 kph
Tmin: 139.5 ms
CFC 180

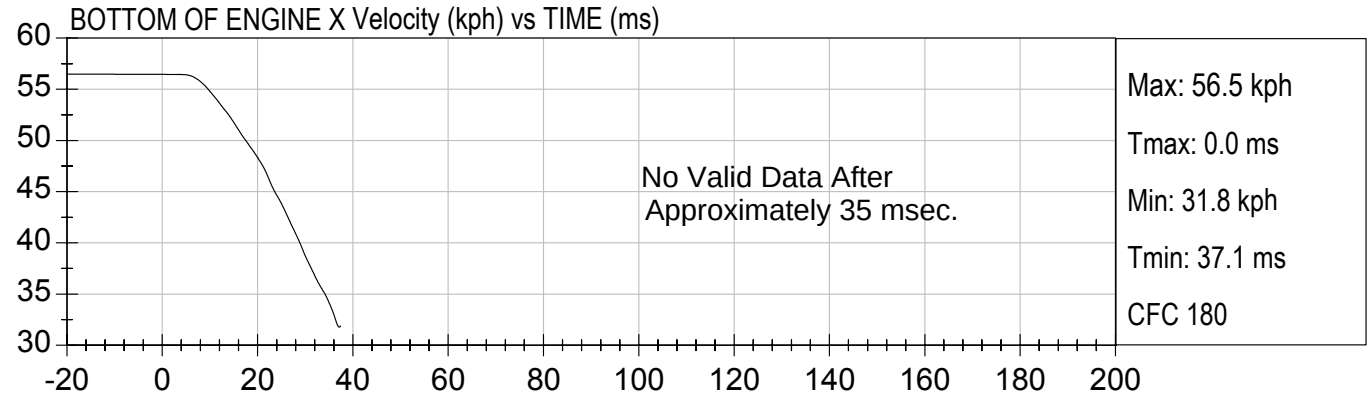

RIGHT REAR SEAT CROSSMEMBER Z Displacement (mm) vs TIME (ms)
80
70
60
50
40
30
20
10
0
-10
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 79.1 mm
Tmax: 200.0 ms
Min: -0.0 mm
Tmin: 5.1 ms
CFC 180

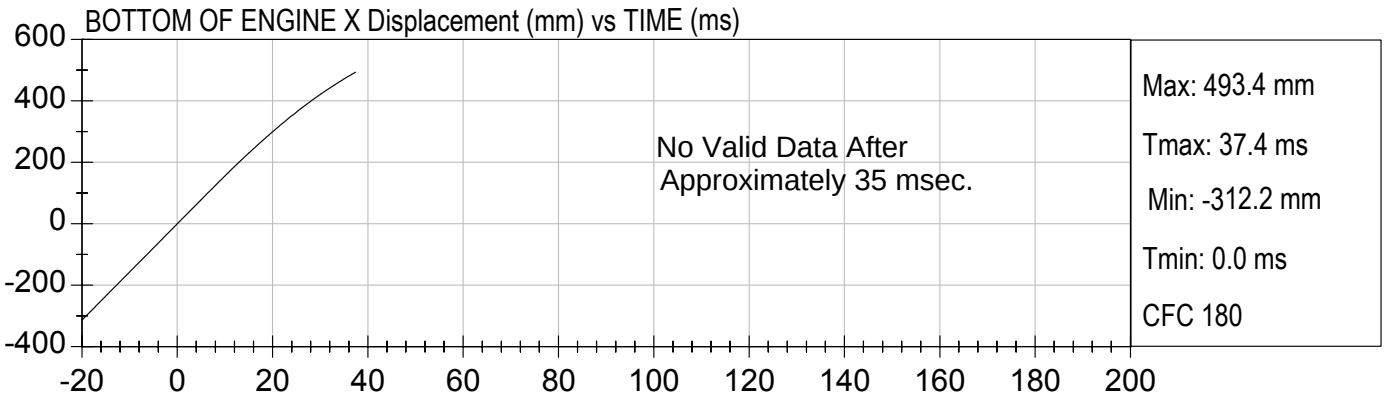

TOP OF ENGINE X (G's) vs TIME (ms)
10
0
-10
-20
-30
-40
-50
-60
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 7.3 G's
Tmax: 97.3 ms
Min: -59.8 G's
Tmin: 47.0 ms
CFC 60


TOP OF ENGINE X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 56.5 kph
Tmax: 0.0 ms
Min: -3.2 kph
Tmin: 84.6 ms
CFC 180


TOP OF ENGINE X Displacement (mm) vs TIME (ms)
600
400
200
0
-200
-400
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 588.0 mm
Tmax: 56.0 ms
Min: -312.3 mm
Tmin: 0.0 ms
CFC 180

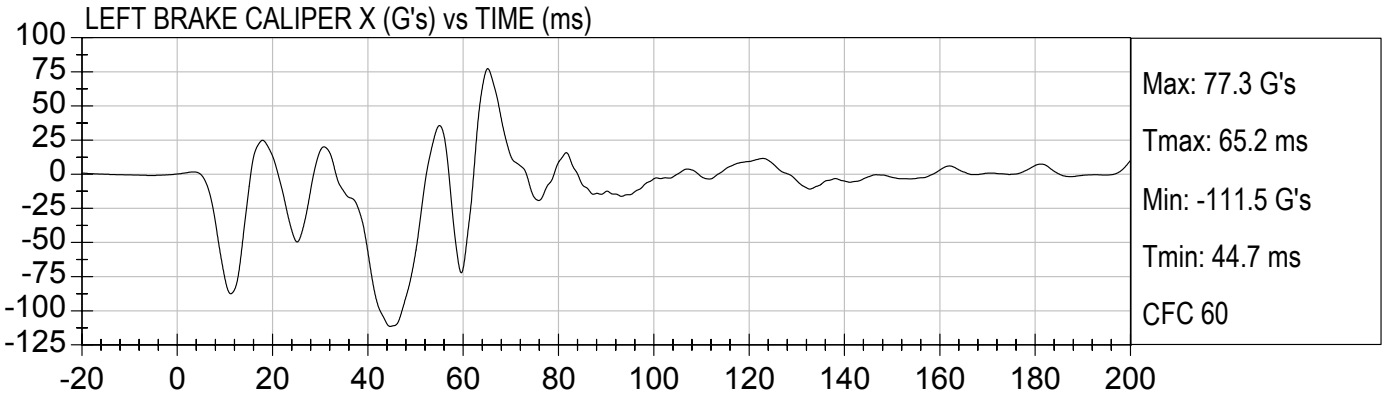

BOTTOM OF ENGINE X (G's) vs TIME (ms)
30
20
10
0
-10
-20
-30
-40
-20
0
20
40
60
80
100
120
140
160
180
200
No Valid Data After
Approximately 35 msec.
Max: 28.7 G's
Tmax: 37.4 ms
Min: -30.0 G's
Tmin: 33.4 ms
CFC 60

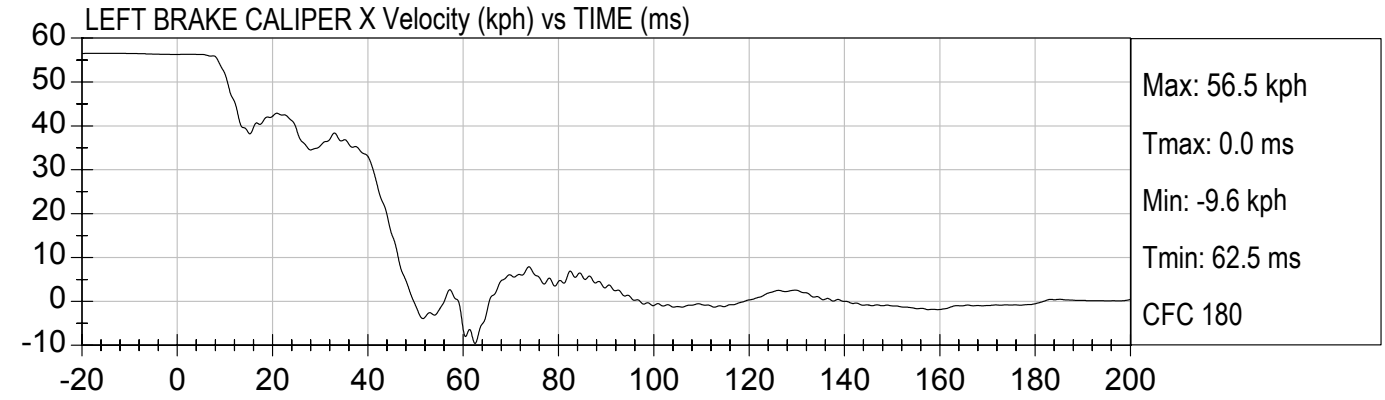

BOTTOM OF ENGINE X Velocity (kph) vs TIME (ms)
60
55
50
45
40
35
30
-20
0
20
40
60
80
100
120
140
160
180
200
No Valid Data After
Approximately 35 msec.
Max: 56.5 kph
Tmax: 0.0 ms
Min: 31.8 kph
Tmin: 37.1 ms
CFC 180

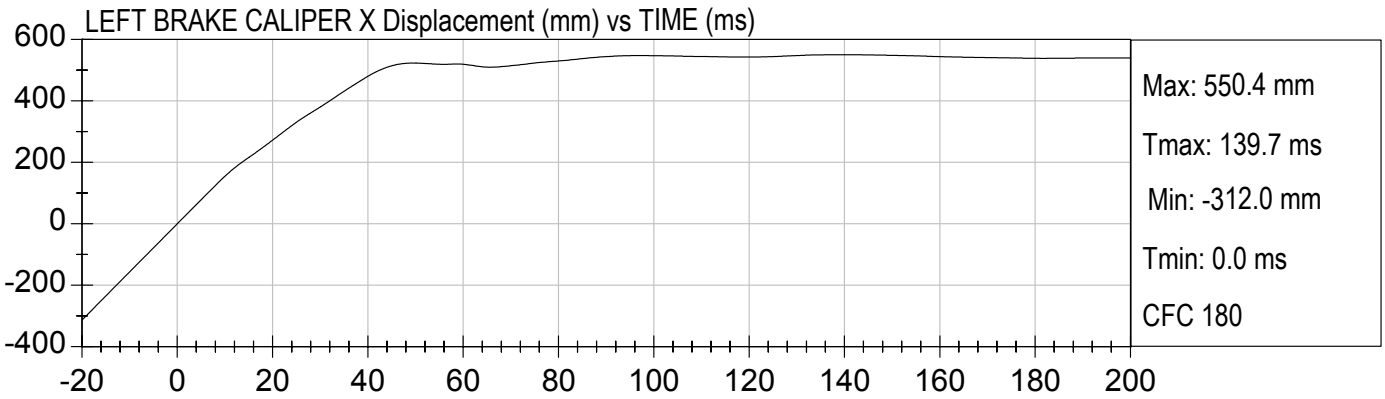

BOTTOM OF ENGINE X Displacement (mm) vs TIME (ms)
600
400
200
0
-200
-400
-20
0
20
40
60
80
100
120
140
160
180
200
No Valid Data After
Approximately 35 msec.
Max: 493.4 mm
Tmax: 37.4 ms
Min: -312.2 mm
Tmin: 0.0 ms
CFC 180

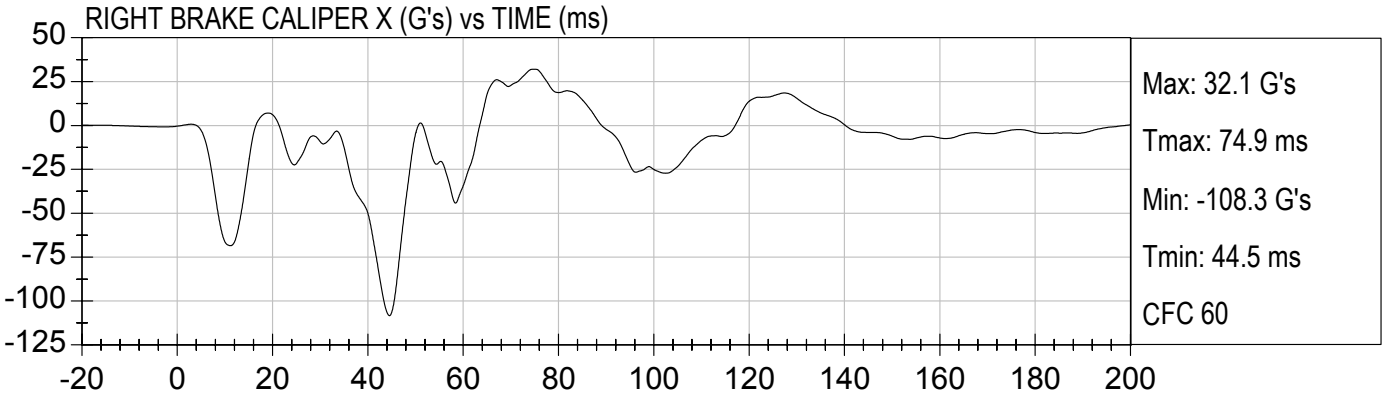
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

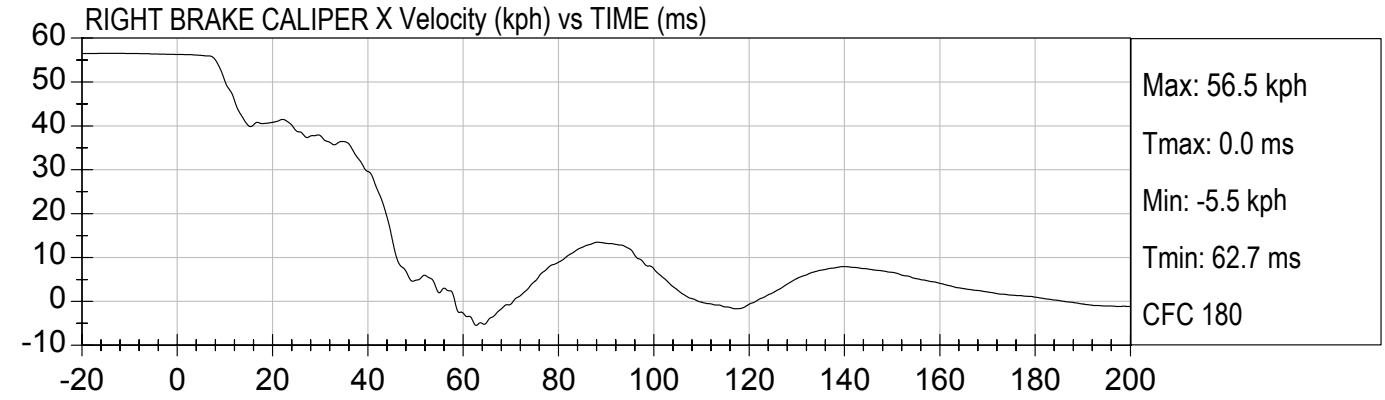
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

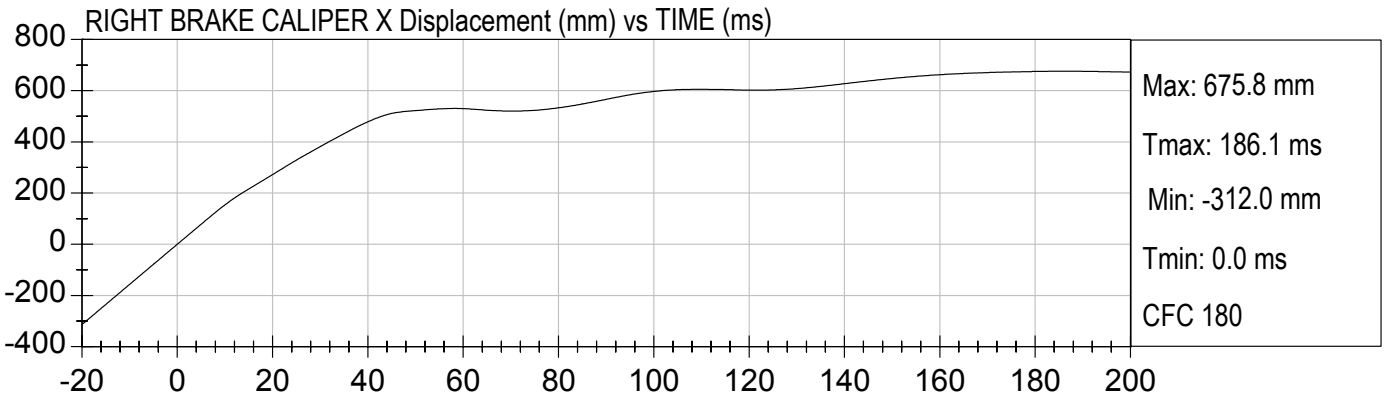






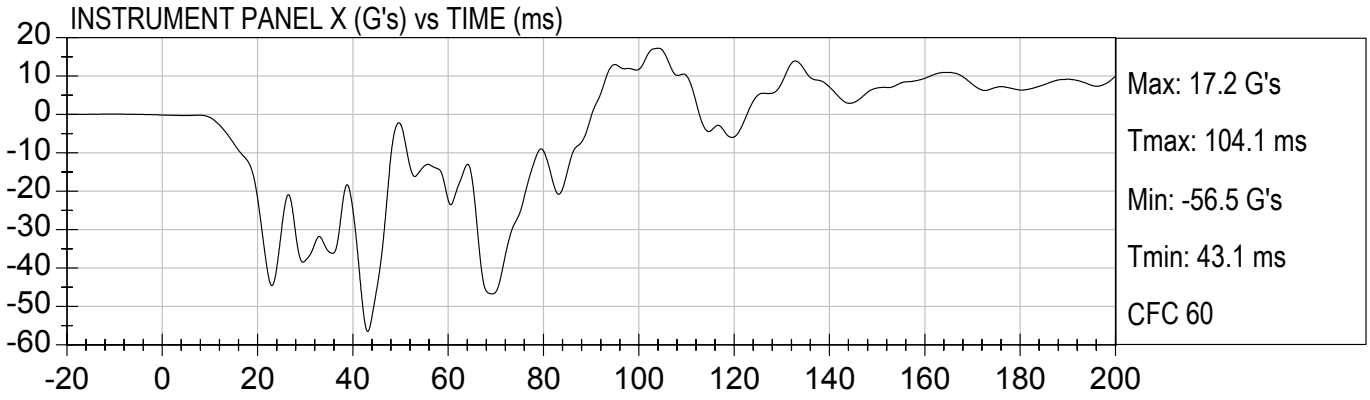

RIGHT BRAKE CALIPER X (G's) vs TIME (ms)
50
25
0
-25
-50
-75
-100
-125
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 32.1 G's
Tmax: 74.9 ms
Min: -108.3 G's
Tmin: 44.5 ms
CFC 60

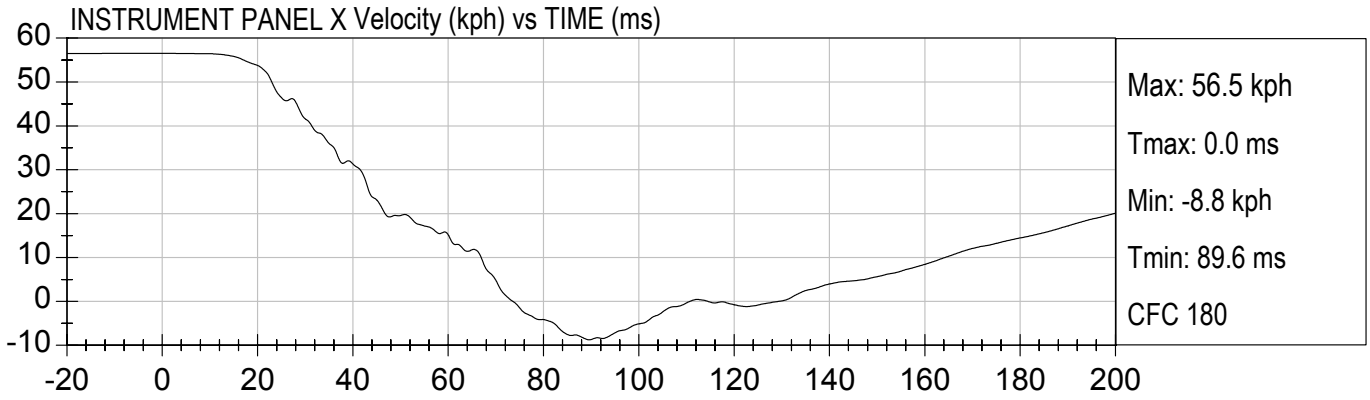

RIGHT BRAKE CALIPER X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 56.5 kph
Tmax: 0.0 ms
Min: -5.5 kph
Tmin: 62.7 ms
CFC 180

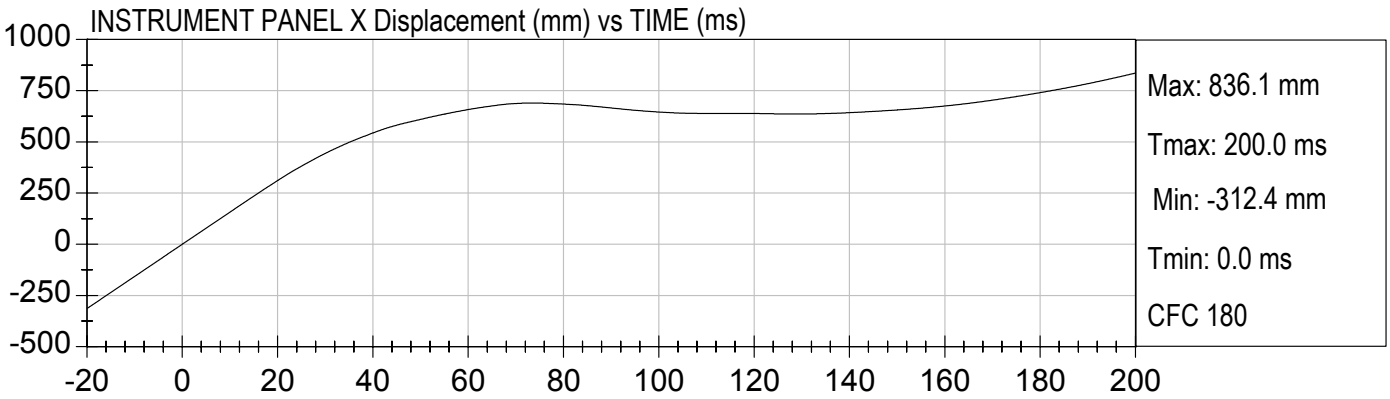

RIGHT BRAKE CALIPER X Displacement (mm) vs TIME (ms)
800
600
400
200
0
-200
-400
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 675.8 mm
Tmax: 186.1 ms
Min: -312.0 mm
Tmin: 0.0 ms
CFC 180

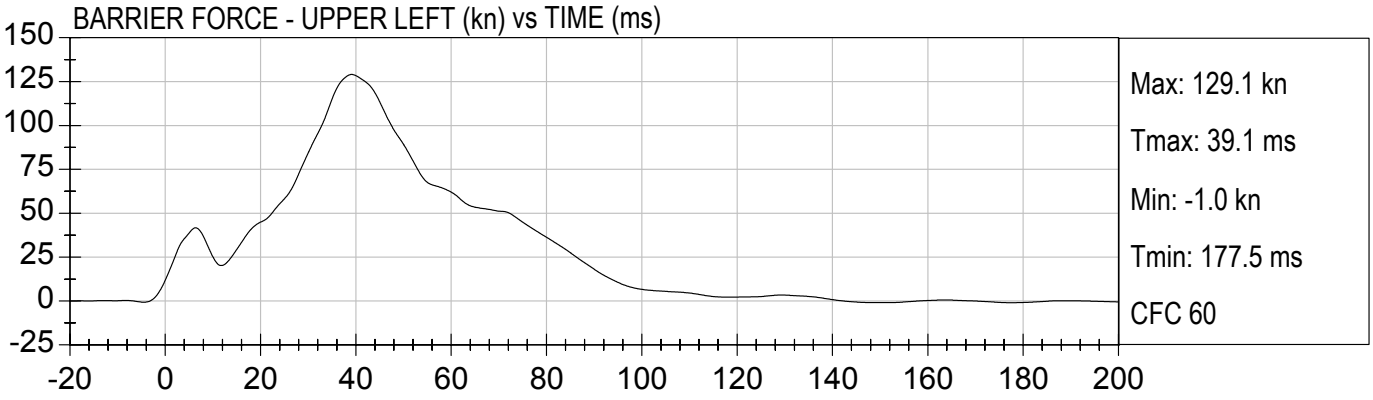
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

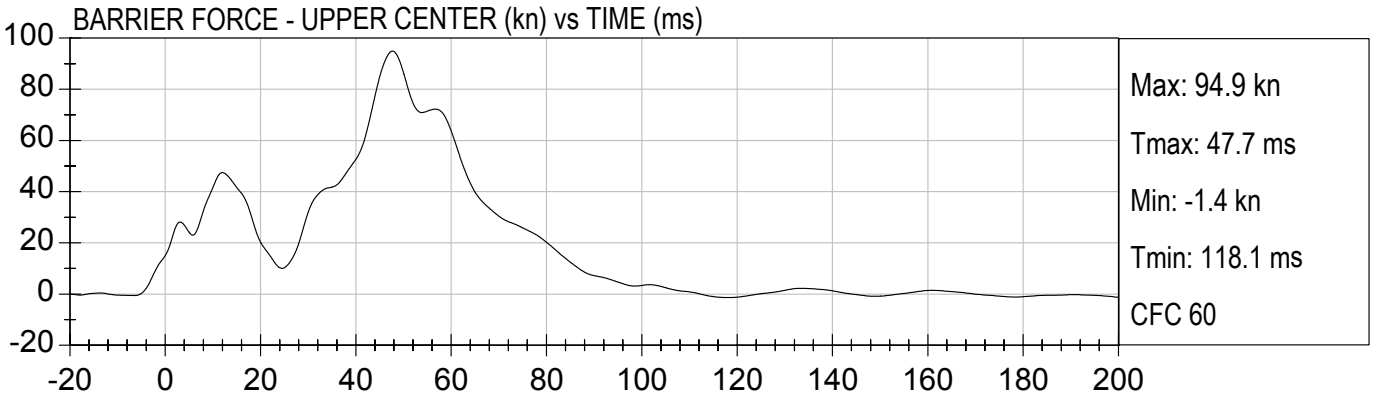
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

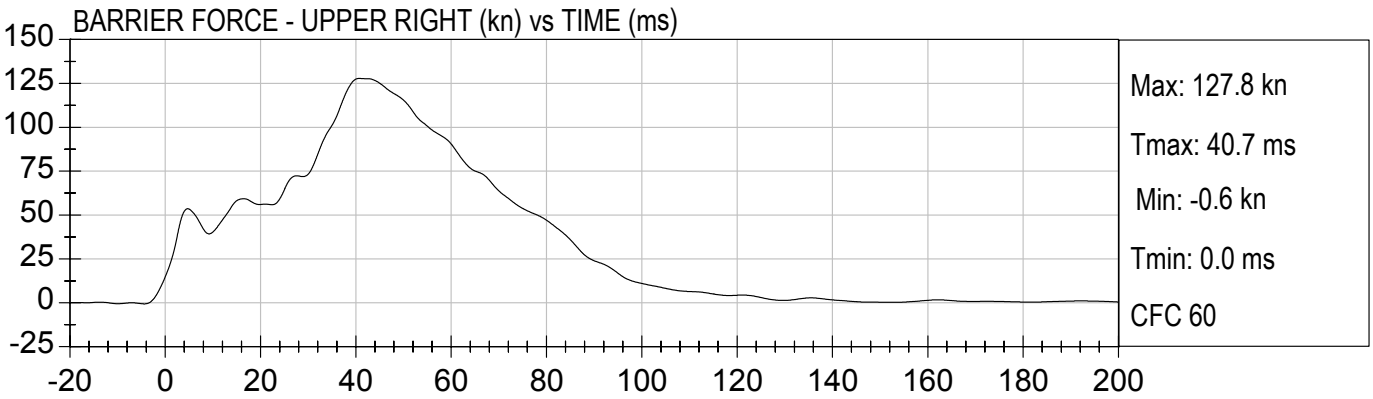


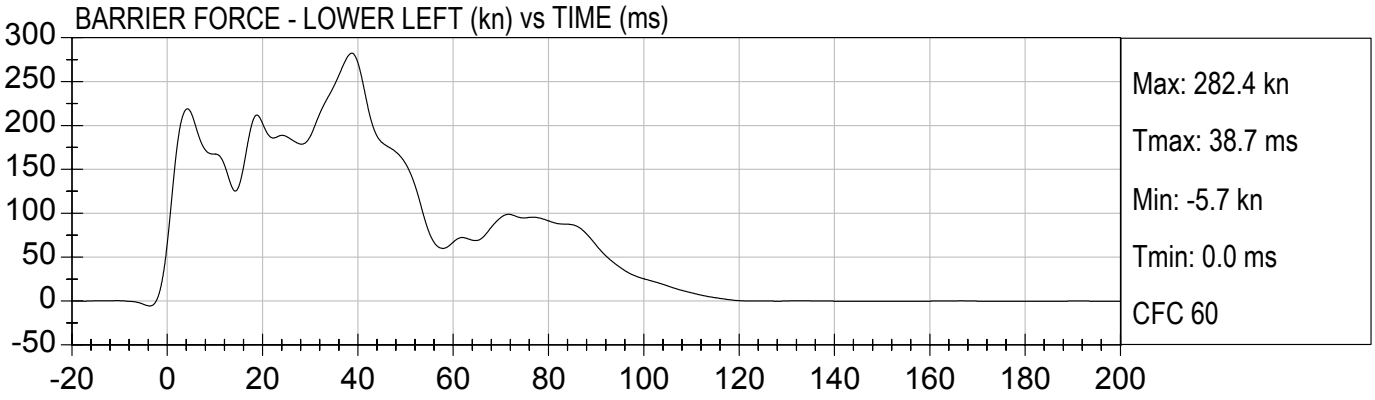


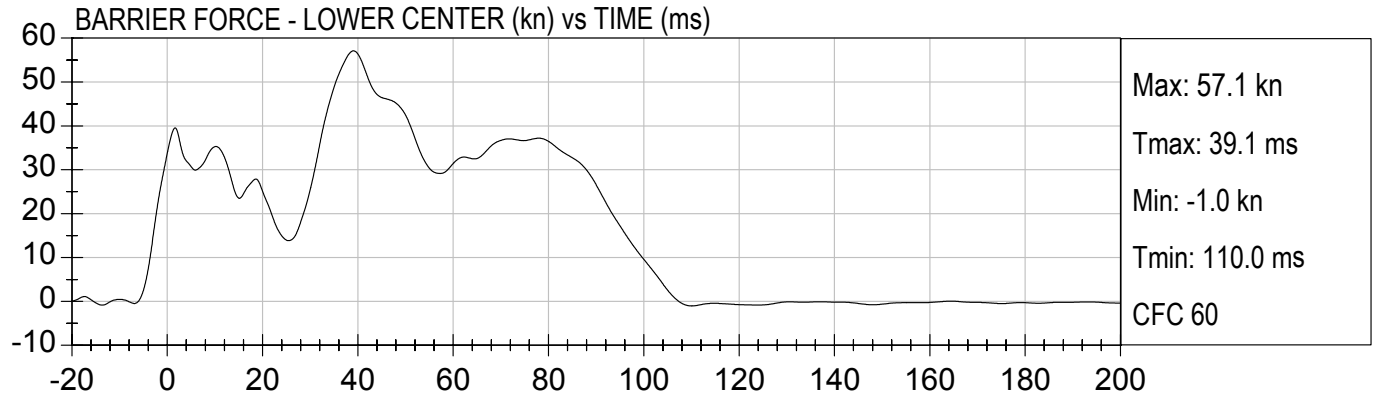


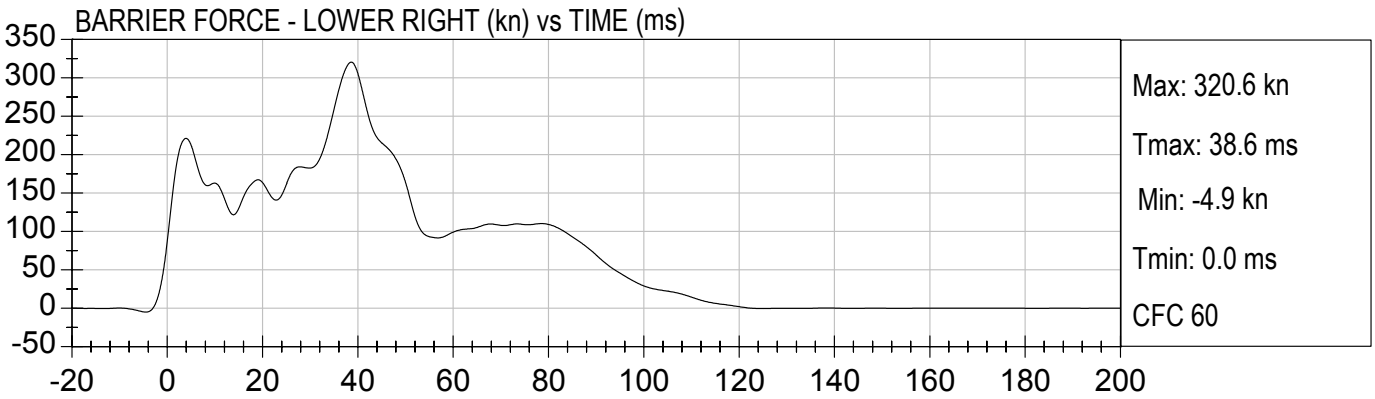

BARRIER FORCE - UPPER LEFT (kn) vs TIME (ms)
150
125
100
75
50
25
0
-25
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 129.1 kn
Tmax: 39.1 ms
Min: -1.0 kn
Tmin: 177.5 ms
CFC 60


BARRIER FORCE - UPPER CENTER (kn) vs TIME (ms)
100
80
60
40
20
0
-20
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 94.9 kn
Tmax: 47.7 ms
Min: -1.4 kn
Tmin: 118.1 ms
CFC 60


BARRIER FORCE - UPPER RIGHT (kn) vs TIME (ms)
150
125
100
75
50
25
0
-25
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 127.8 kn
Tmax: 40.7 ms
Min: -0.6 kn
Tmin: 0.0 ms
CFC 60

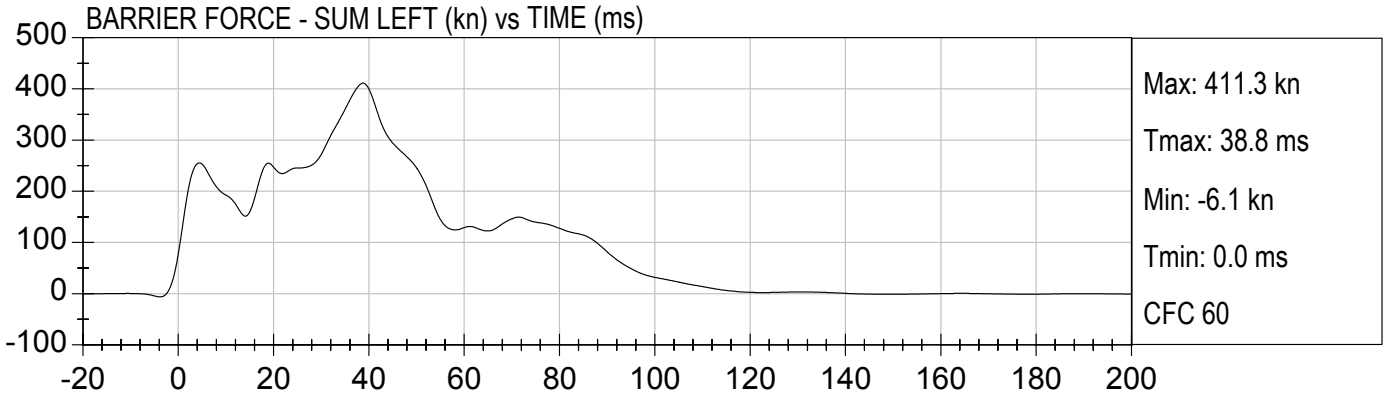

BARRIER FORCE - LOWER LEFT (kn) vs TIME (ms)
300
250
200
150
100
50
0
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 282.4 kn
Tmax: 38.7 ms
Min: -5.7 kn
Tmin: 0.0 ms
CFC 60

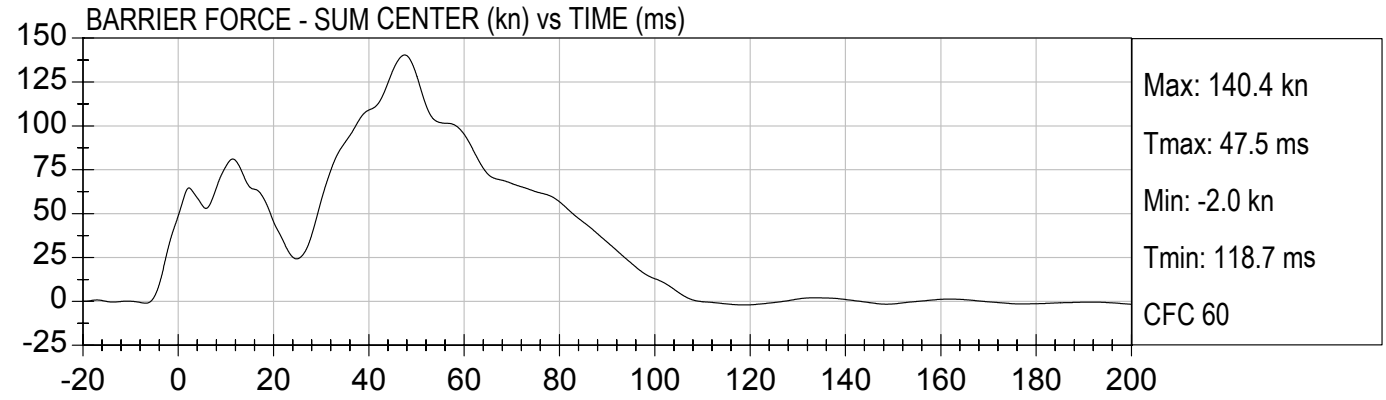

BARRIER FORCE - LOWER CENTER (kn) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 57.1 kn
Tmax: 39.1 ms
Min: -1.0 kn
Tmin: 110.0 ms
CFC 60

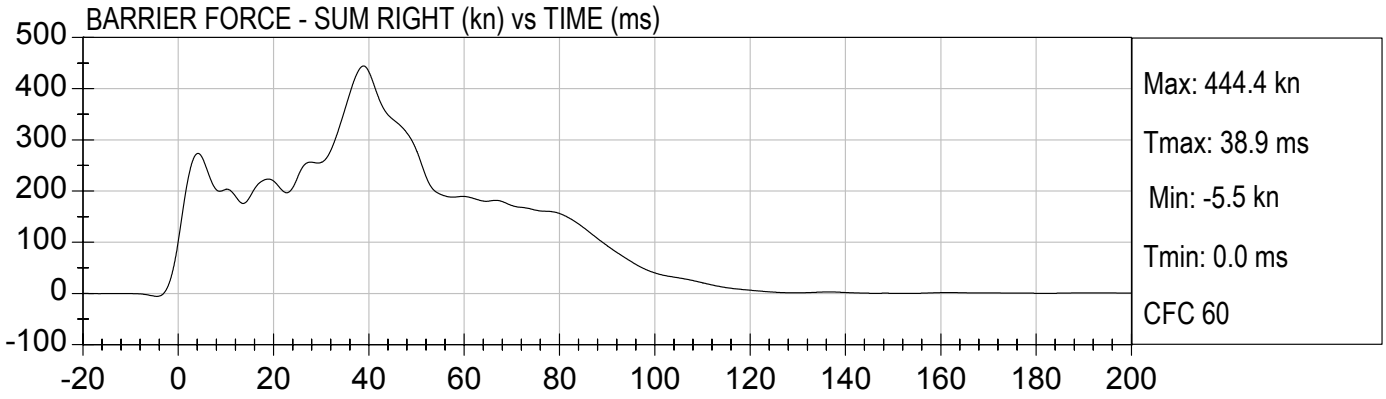

BARRIER FORCE - LOWER RIGHT (kn) vs TIME (ms)
350
300
250
200
150
100
50
0
-50
-20
0
20
40
60
80
100
120
140
160
180
200
Max: 320.6 kn
Tmax: 38.6 ms
Min: -4.9 kn
Tmin: 0.0 ms
CFC 60

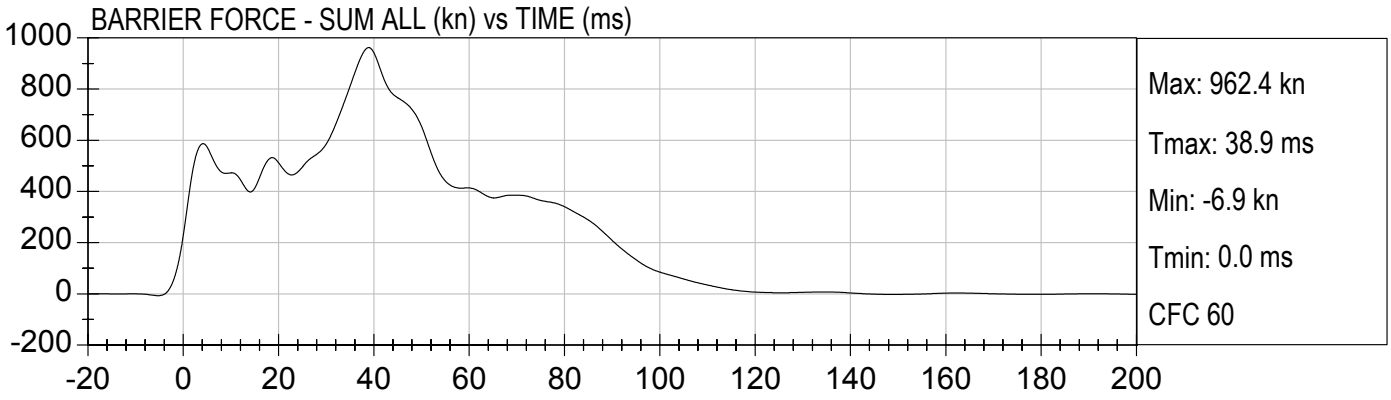
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

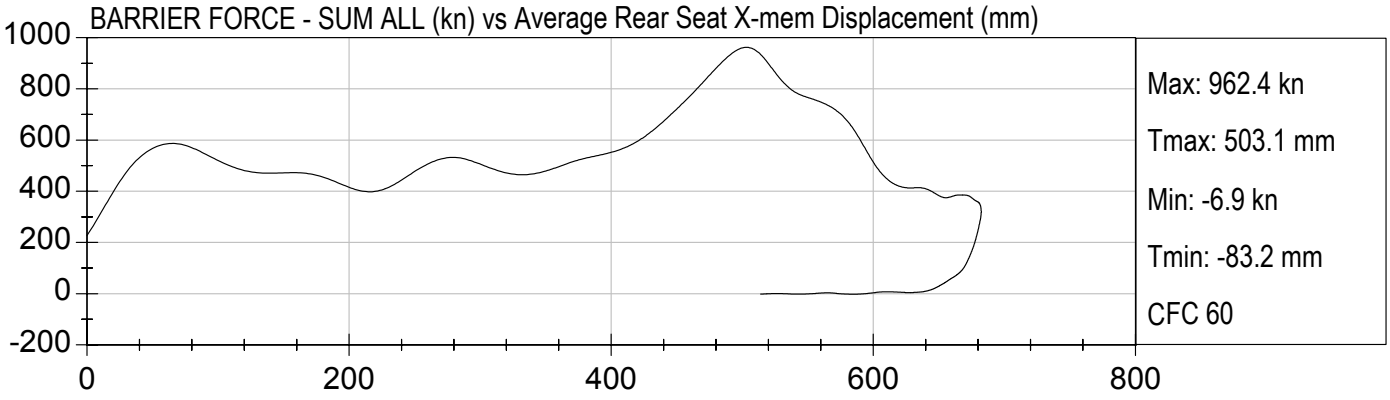
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)










BARRIER FORCE - SUM ALL (kn) vs Average Rear Seat X-mem Displacement (mm)
1000
800
600
400
200
0
-200
0
200
400
600
800
Max: 962.4 kn
Tmax: 503.1 mm
Min: -6.9 kn
Tmin: -83.2 mm
CFC 60

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:** D04051

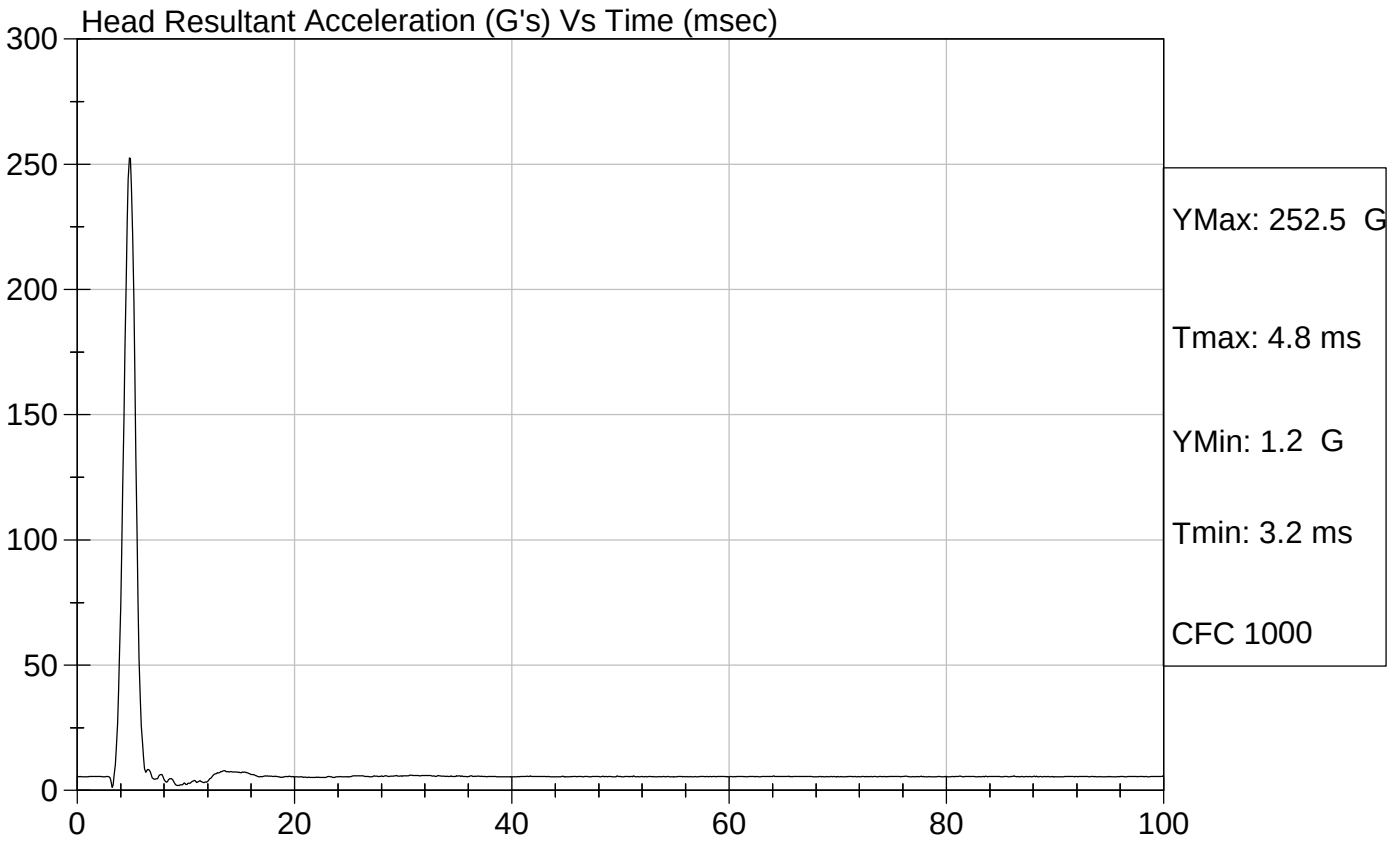
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	252.5	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	6.7	Pass
Is Acceleration Unimodal?	Yes/No	< 10% Peak	Yes	Pass
		Overall Test Results		Pass

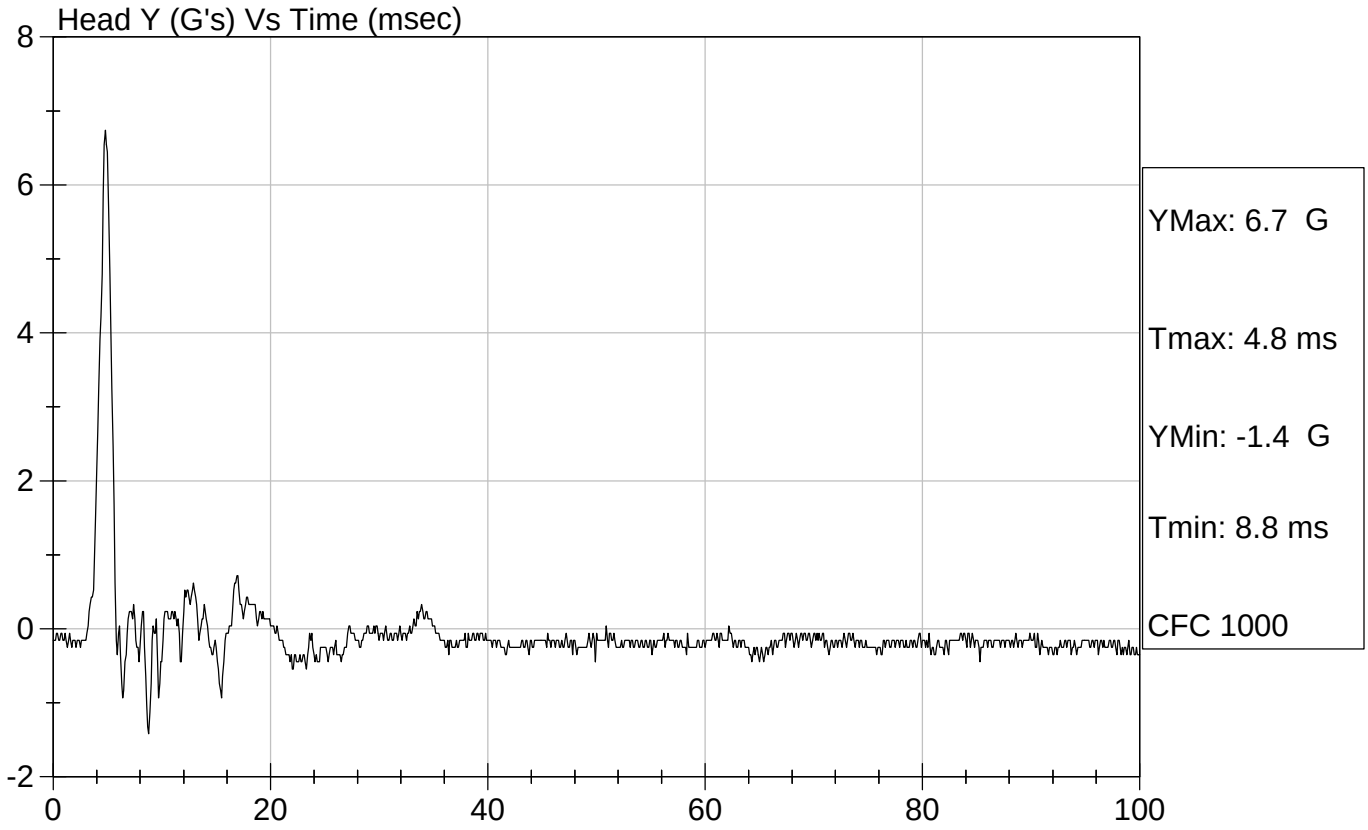
Jessica Hall
Laboratory Technician

01/15/2004
Test Date

Shefalika Jgarwal
Approved By

	Test Description: Head Drop	Test Date: 01/15/2004
	Component: D04051	Speed: 0 ft/s, 0.00 m/s





Hybrid III Calibration Data Sheet

50th Percentile Male

Neck Flexion Test

ATD Serial No: 065 **Test I.D:** D04052

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	23	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.03	Pass
Pendulum Deceleration	10 msec	G's	22.50 to 27.50	22.75	Pass
	20 msec	G's	17.60 to 22.60	19.98	Pass
	30 msec	G's	12.50 to 18.50	14.48	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 29.0	14.48	Pass
Deceleration Decay Time to Cross 5 G's		msec	34.0 to 42.0	39.2	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	72.7	Pass
	Time	msec	57.0 to 64.0	59.2	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	113.0 to 128.0	115.2	Pass
Moment About Occipital Condyle	Maximum	N m	84.1 to 108.5	96.3	Pass
	Time	msec	47.0 to 58.0	51.8	Pass
Positive Moment Decay Time To Zero Crossing		msec	97.0 to 107.0	104.6	Pass
			Overall Test Results		Pass

Jessica Hall
Laboratory Technician

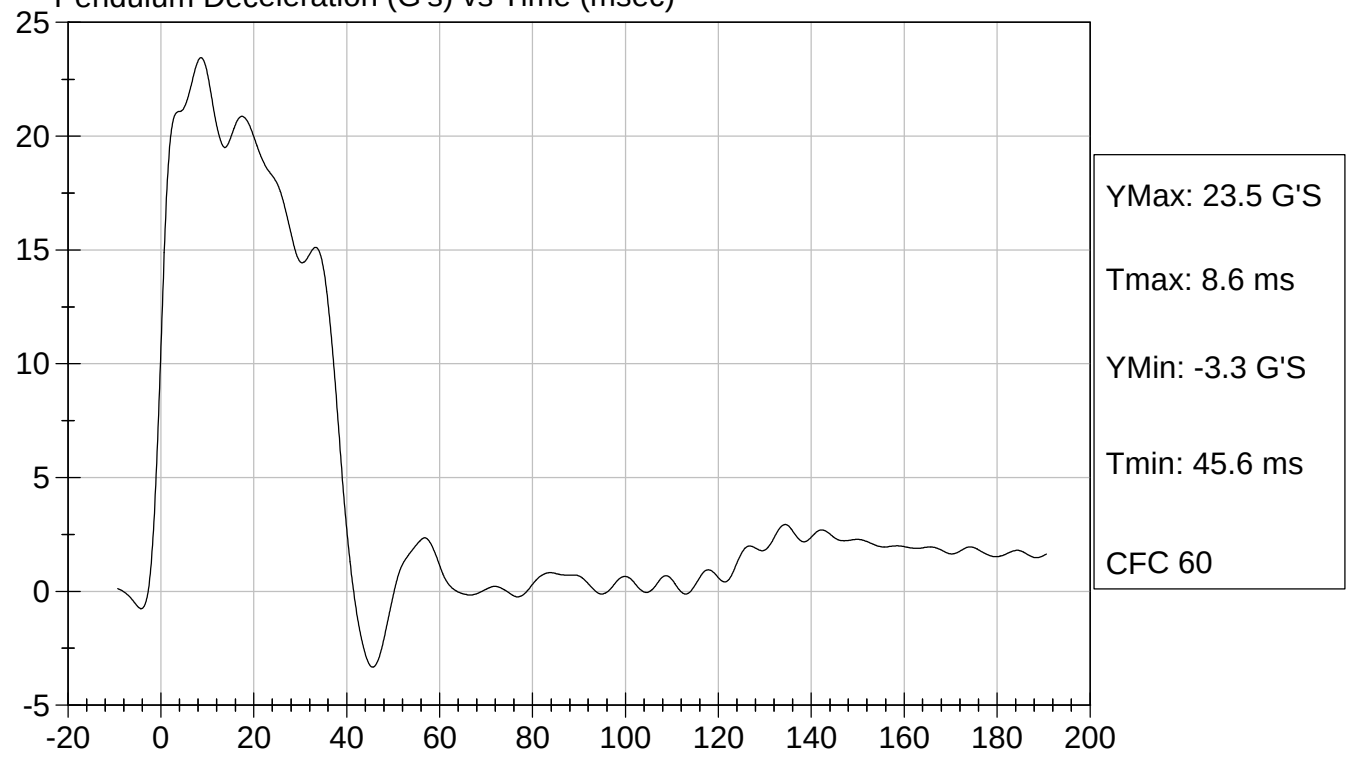
01/16/2004
Test Date

Shefalika Jaiswal
Approved By

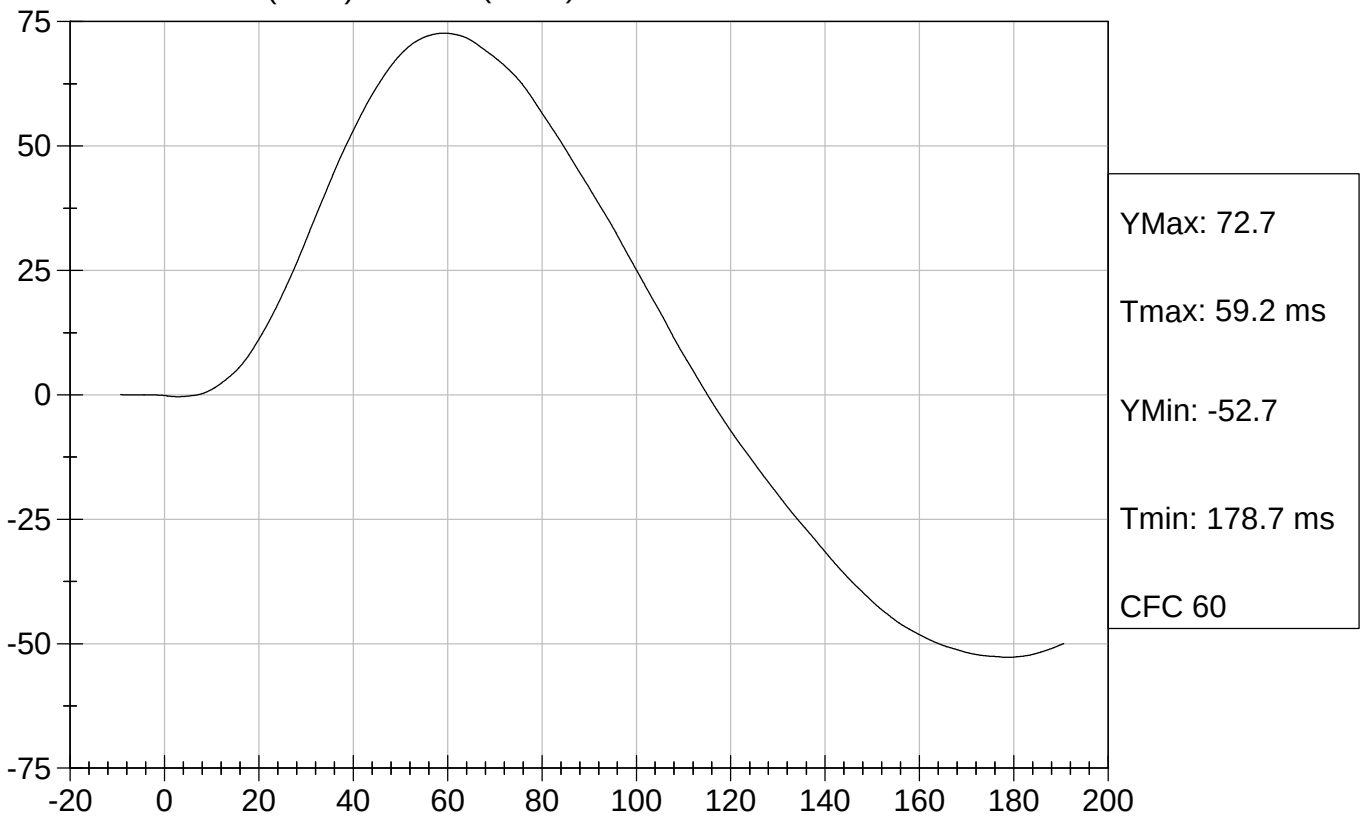
Test Desc: Neck Flexion
Component ID: D04052

Test Date: 01/16/2004
Speed: 23.05 ft/sec, 7.03 m/sec

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

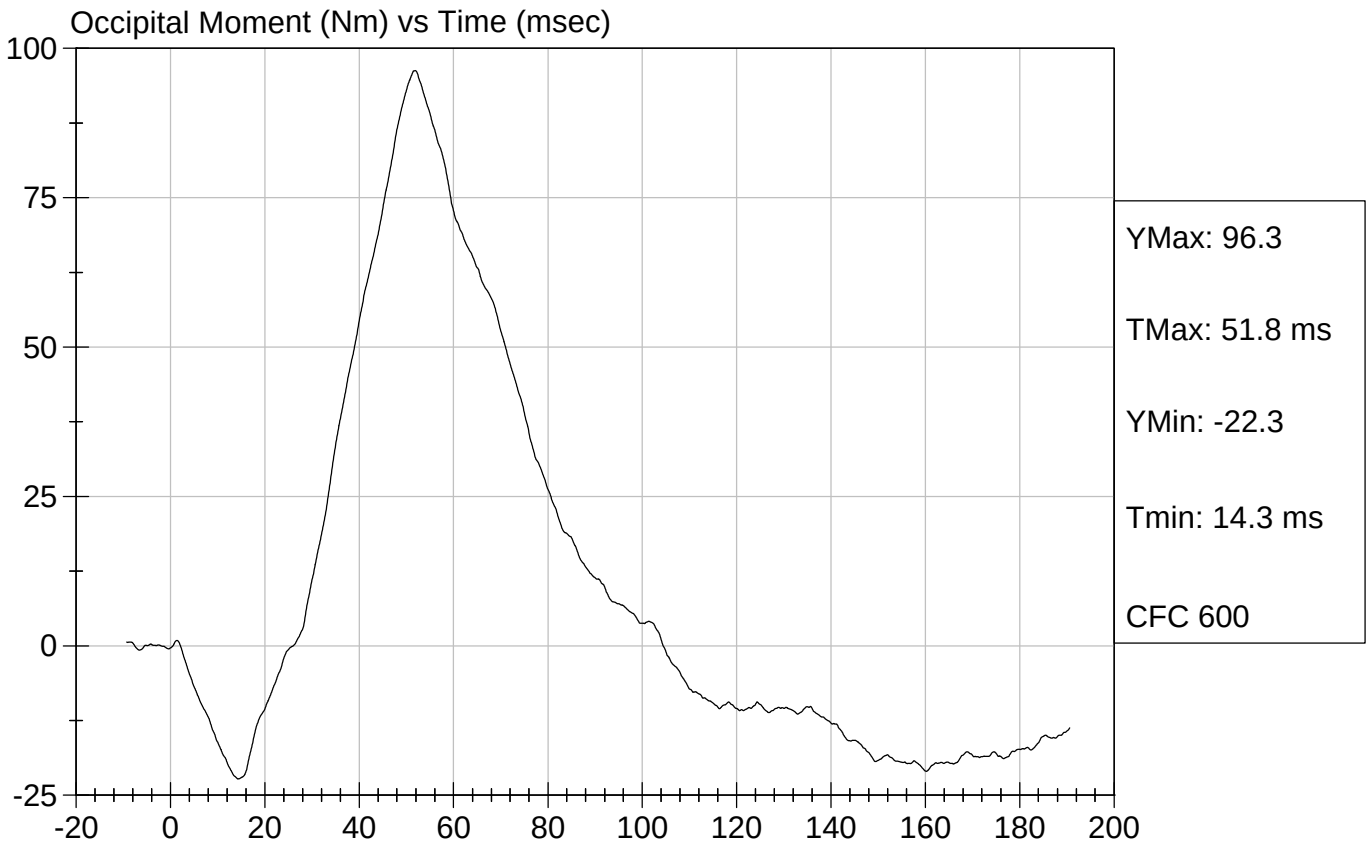


Neck Rotation (DEG) vs Time (msec)



Test Desc: Neck Flexion
Component ID: D04052

Test Date: 01/16/2004
Speed: 23.05 ft/sec, 7.03 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Neck Extension Test

ATD Serial No: 065 **Test I.D:** D04053

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	22	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.18	Pass
Pendulum Deceleration	10 msec	G's	17.20 to 21.20	18.15	Pass
	20 msec	G's	14.00 to 19.00	16.17	Pass
	30 msec	G's	11.00 to 16.00	13.60	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 22.0	14.0	Pass
Deceleration Decay Time to Cross 5 G's		msec	38.0 to 46.0	41.9	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	99.0	Pass
	Time	msec	72.0 to 82.0	77.1	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	147.0 to 174.0	156.7	Pass
Moment About Occipital Condyle	Minimum	N m	-52.9 to -79.9	-68.1	Pass
	Time	msec	65.0 to 79.0	72.7	Pass
Negative Moment Decay Time To Zero Crossing		msec	120.0 to 148.0	145.4	Pass
			Overall Test Results		Pass

Jessica Hall
Laboratory Technician

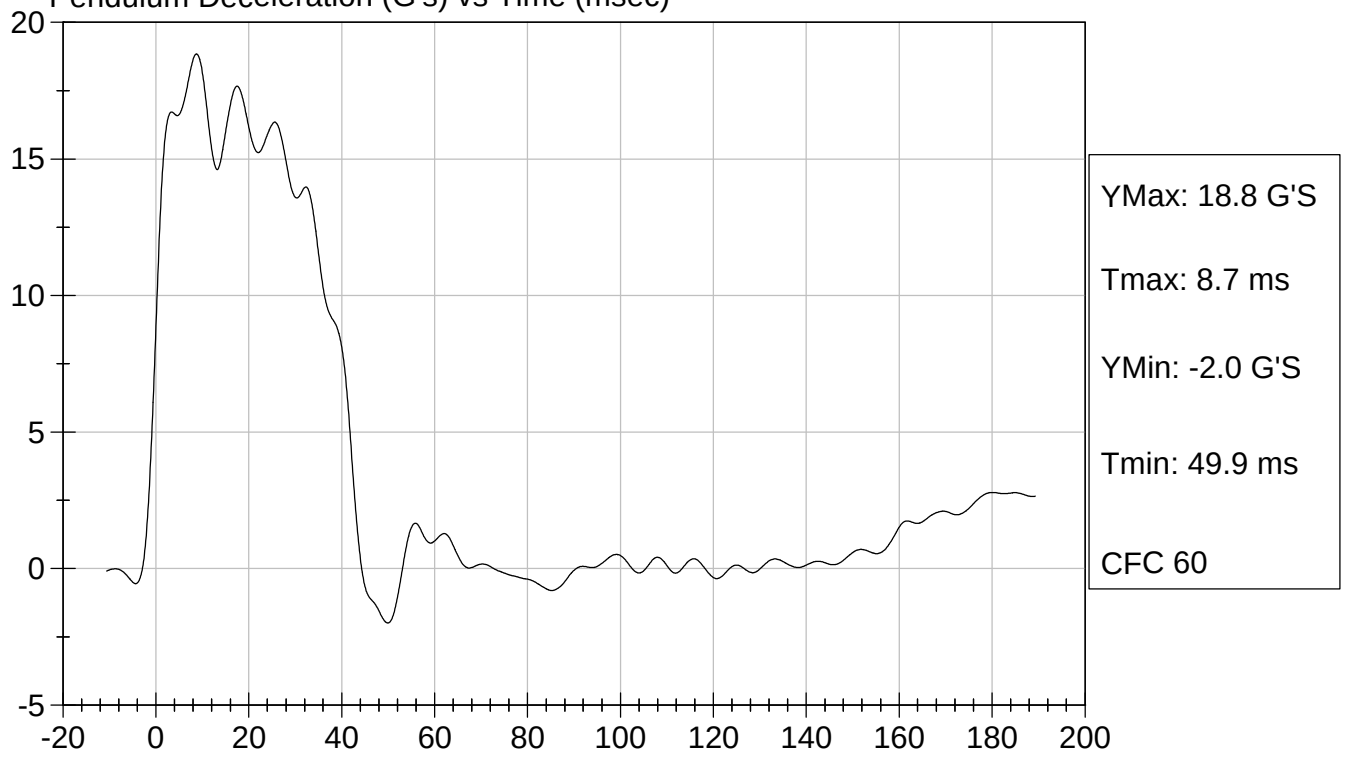
01/16/2004
Test Date

Shefalika Jyaswal
Approved By

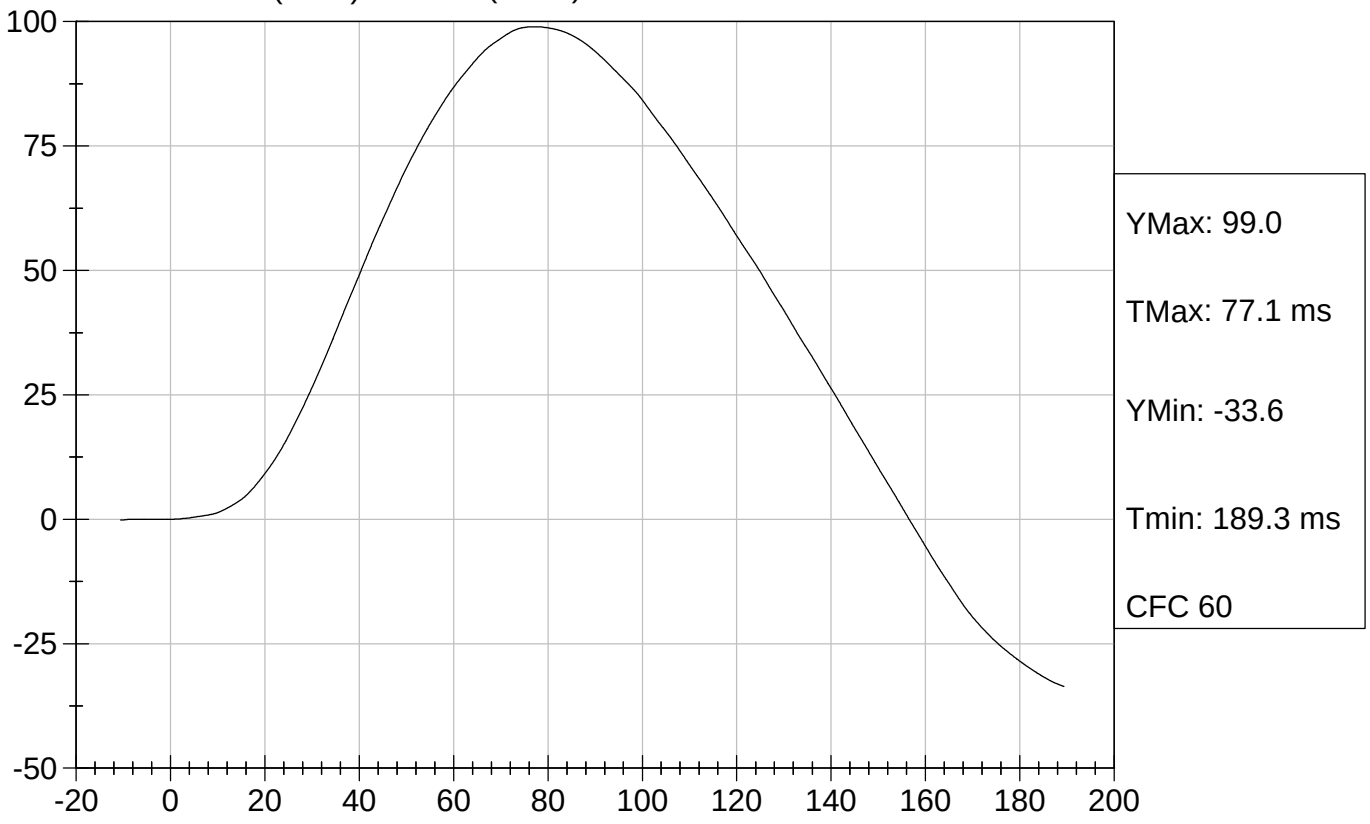
Test Desc: Neck Extension
Component ID: D04053

Test Date: 01/16/2004
Speed: 20.28 ft/sec, 6.18 m/sec

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

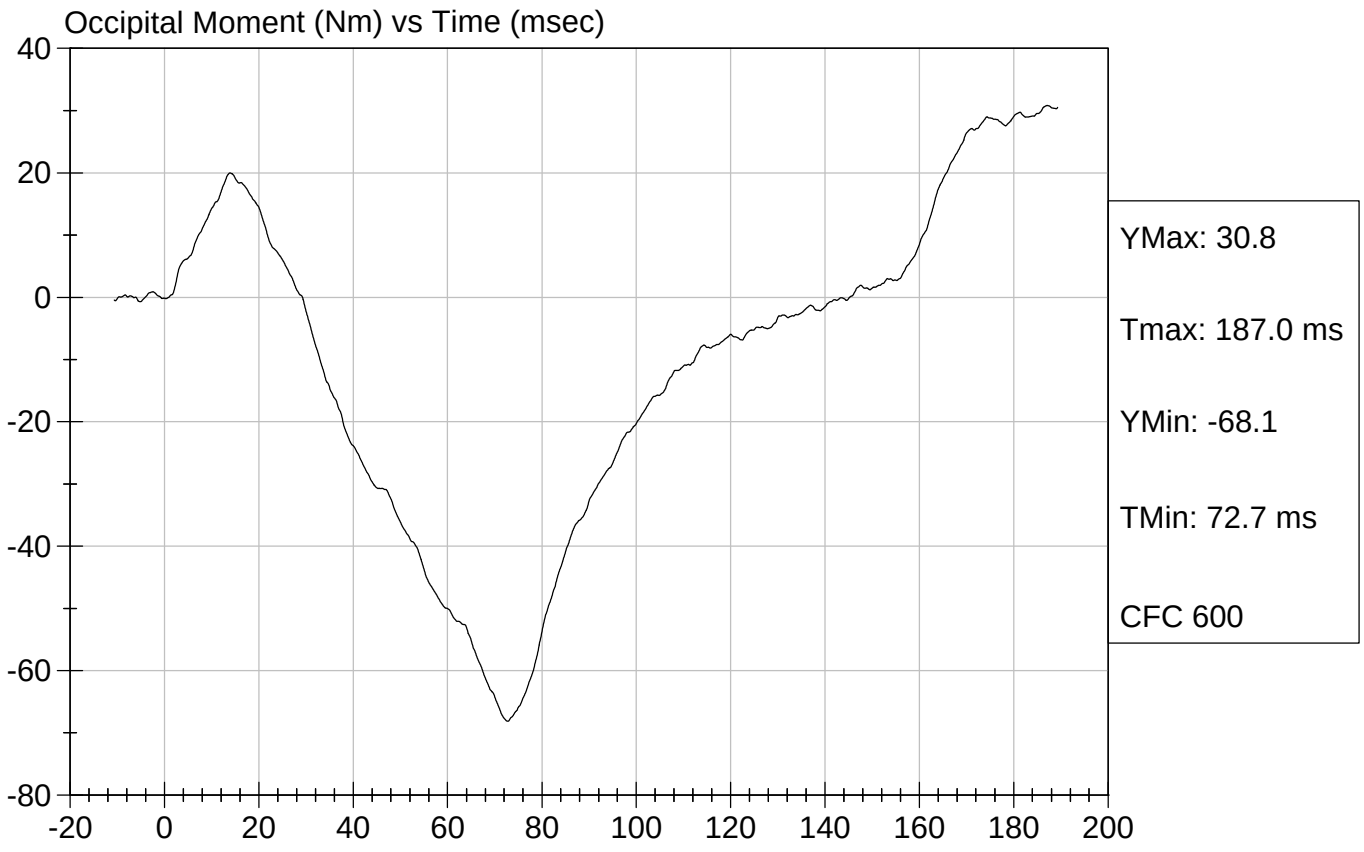


Neck Rotation (DEG) vs Time (msec)



Test Desc: Neck Extension
Component ID: D04053

Test Date: 01/16/2004
Speed: 20.28 ft/sec, 6.18 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Thorax Impact Test

ATD Serial No: 065 **Test I.D:** D04054

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	20.6	Pass
Laboratory Relative Humidity	%	10 to 70	20	Pass
Probe Velocity	m/s	6.58 to 6.82	6.72	Pass
Peak Probe Force	Newtons	5159 to 5893	5,669	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.52	Pass
Internal Hysteresis	%	69 to 85	71	Pass
		Overall Test Results		Pass

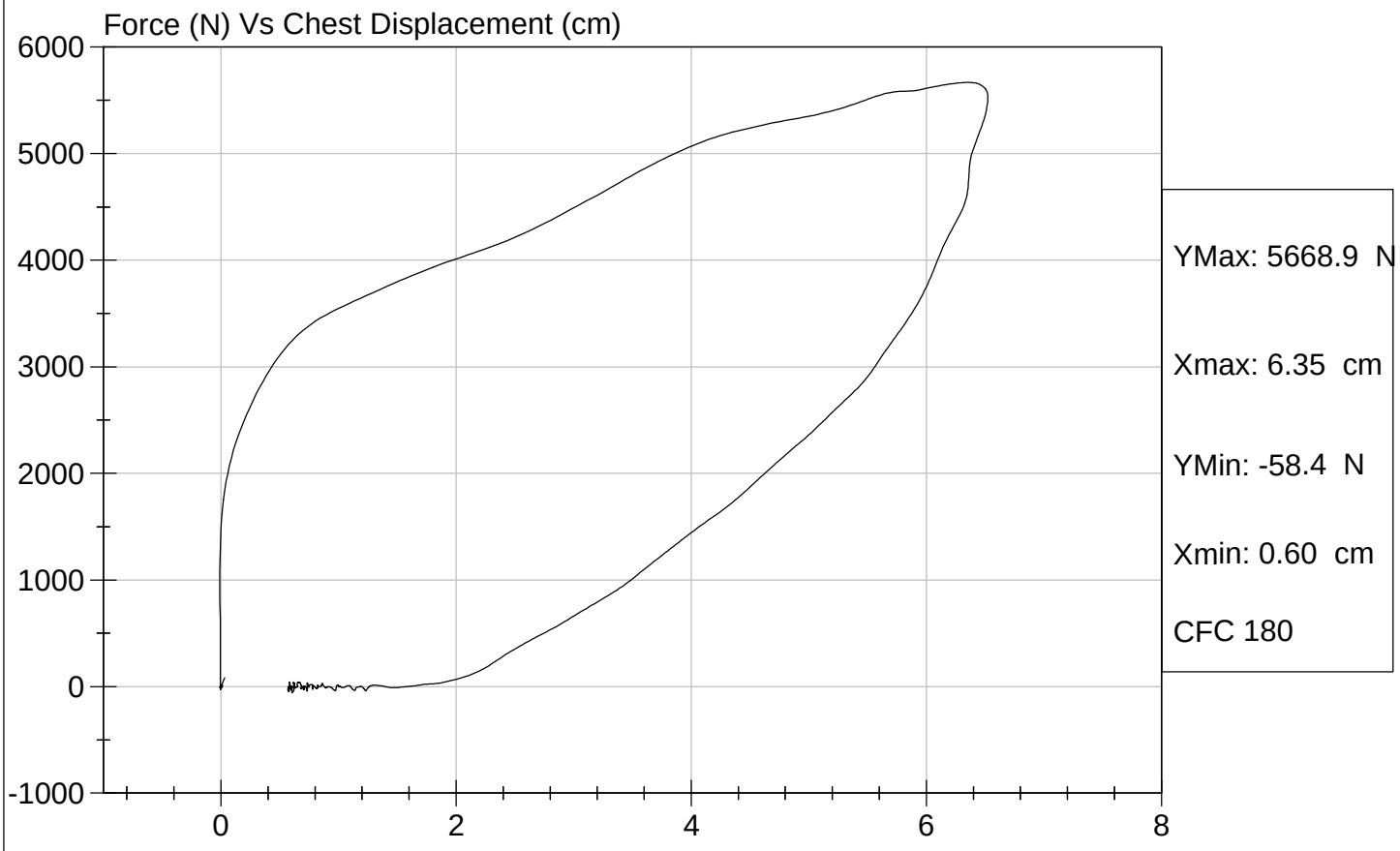
Jessica Hall
Laboratory Technician

01/19/2004
Test Date

Shefalika Jgarwal
Approved By

Test Description: Thorax Impact | Test Date: 01/19/2004

Component: D04054 | Speed: 22.05 ft/sec, 6.72 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Right Knee Impact Test

ATD Serial No: 065 **Test I.D:** D04055

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	5,194	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

01/17/2004
Test Date

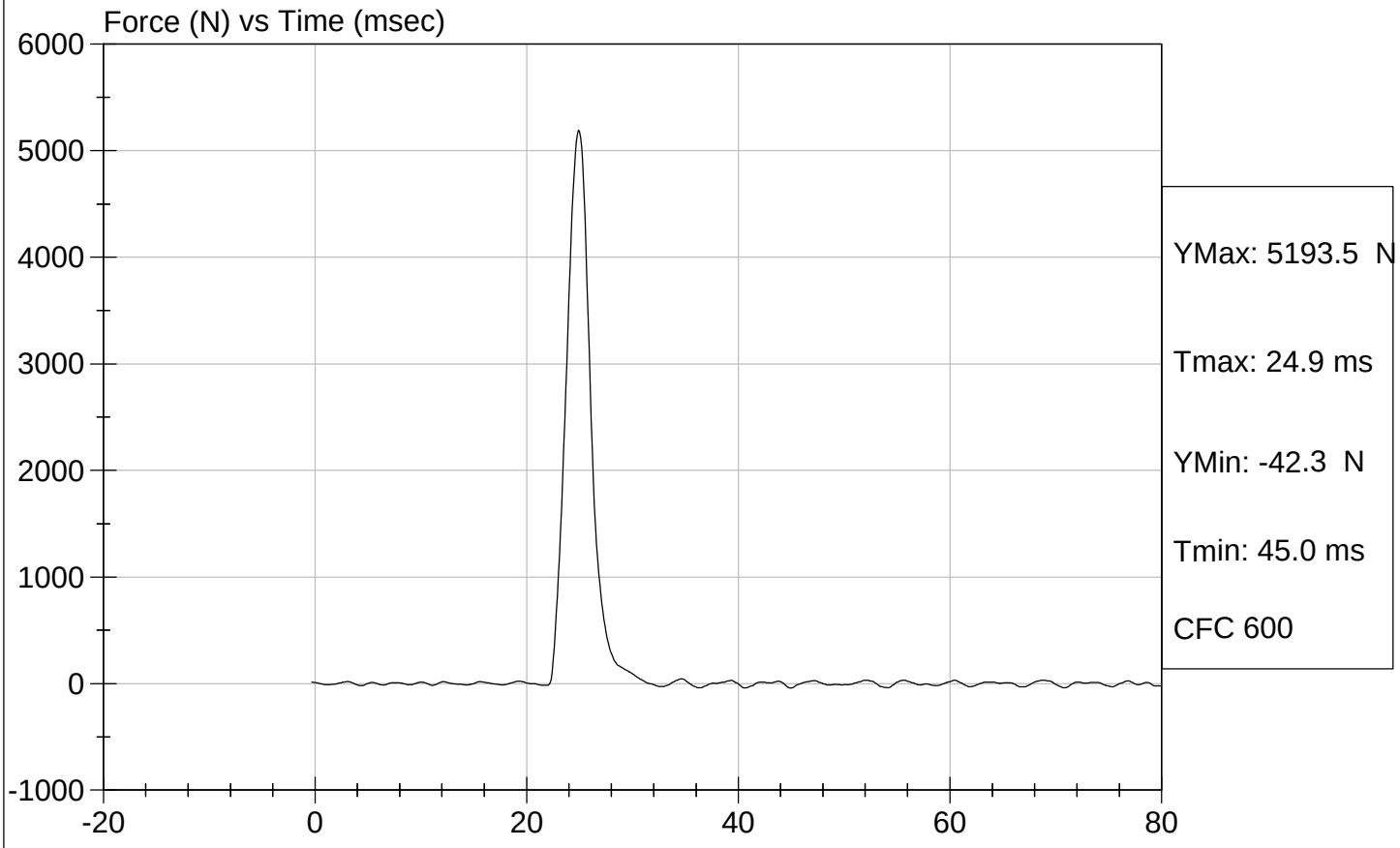
Shefalika Jaiswal
Approved By

Test Description: Right Knee

Test Date: 01/17/2004

Component: D04055

Speed: 6.89 ft/sec, 2.100 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Left Knee Impact Test

ATD Serial No: 065 **Test I.D:** D04056

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Probe Velocity	m/s	2.07 to 2.13	2.07	Pass
Peak Probe Force	Newtons	4715 to 5782	4,925	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

01/16/2004
Test Date

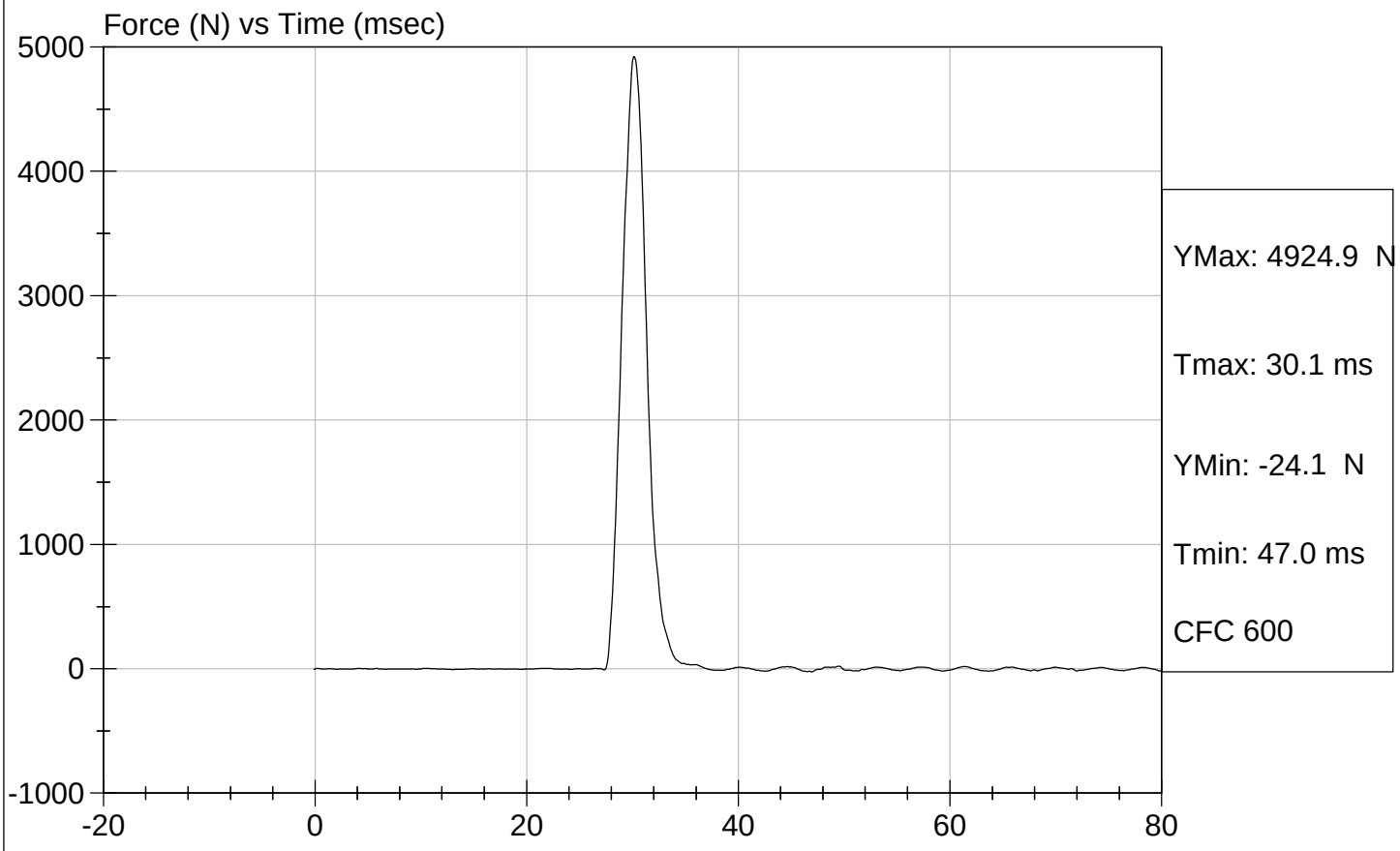
Shefalika Jaiswal
Approved By

Test Description: Left Knee

Test Date: 01/16/2004

Component: D04056

Speed: 6.8 ft/sec, 2.073 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Hip-Femur Flexion Test

ATD Serial No: 065 **Test I.D:** D04050

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	21.5	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	26	26	Pass
Rotation Rate	deg/sec	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	71.4	66.9	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	44	44	Pass
		Overall Test Results			Pass

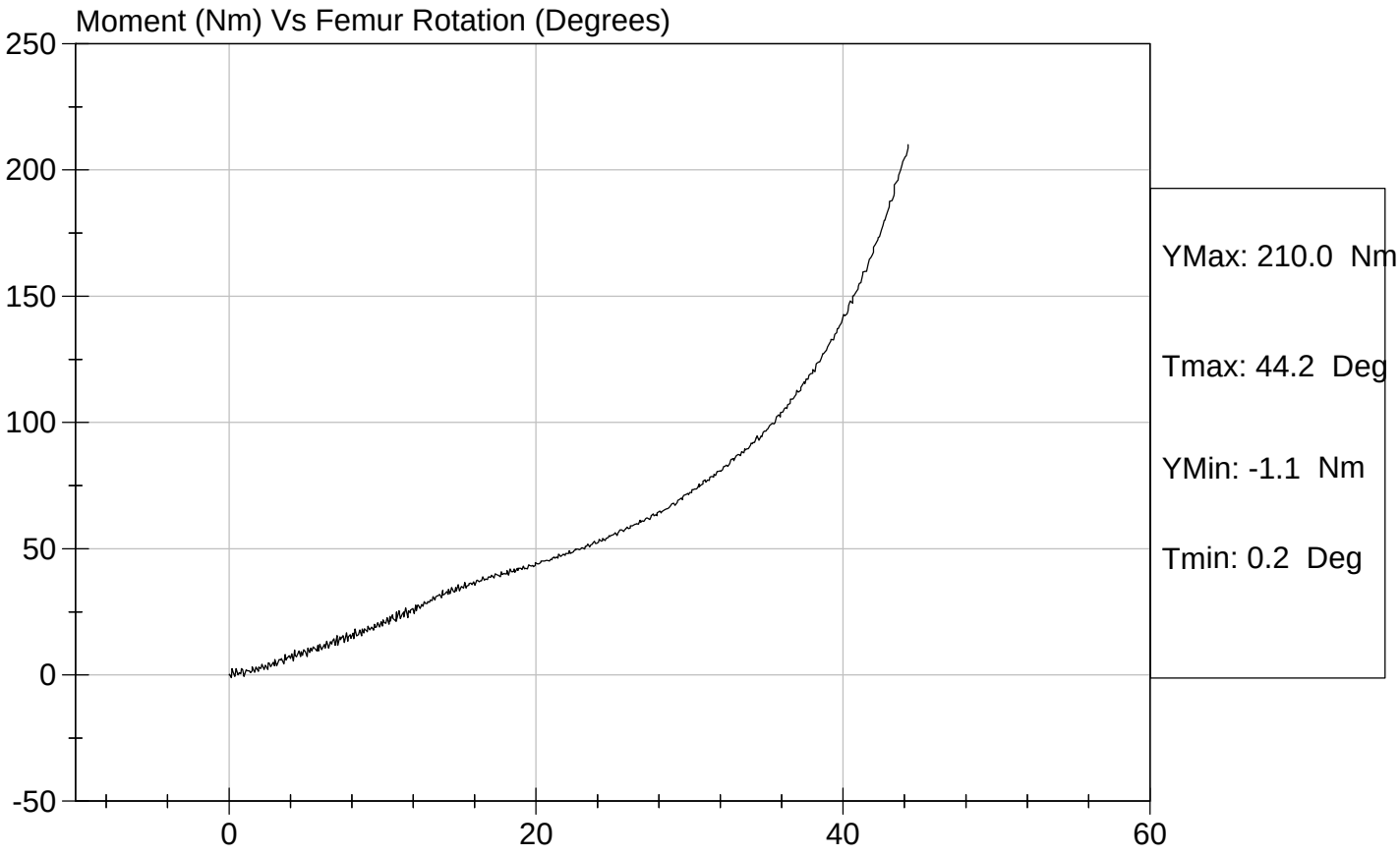
Jessica Hall
Laboratory Technician

01/15/2004
Test Date

Shefalika Jyaswal
Approved By

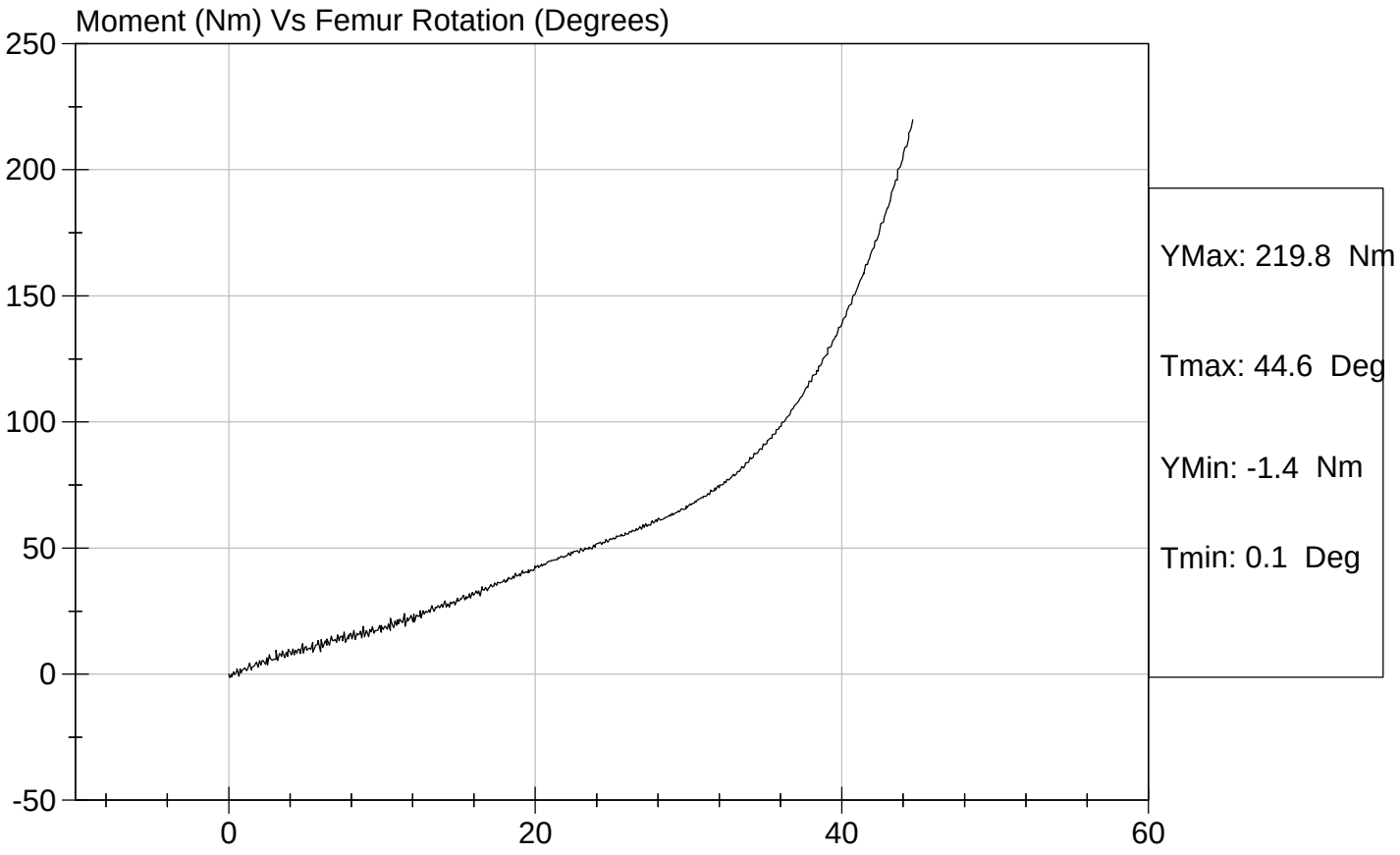
Test Description: Hip Femur Flexion | Test Date: 01/15/2004

Component: D04059 | Speed: 0 ft/sec, 0.00 m/sec



Test Description: Hip Femur Flexion | Test Date: 01/15/2004

Component: D04050 | 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:** D04061

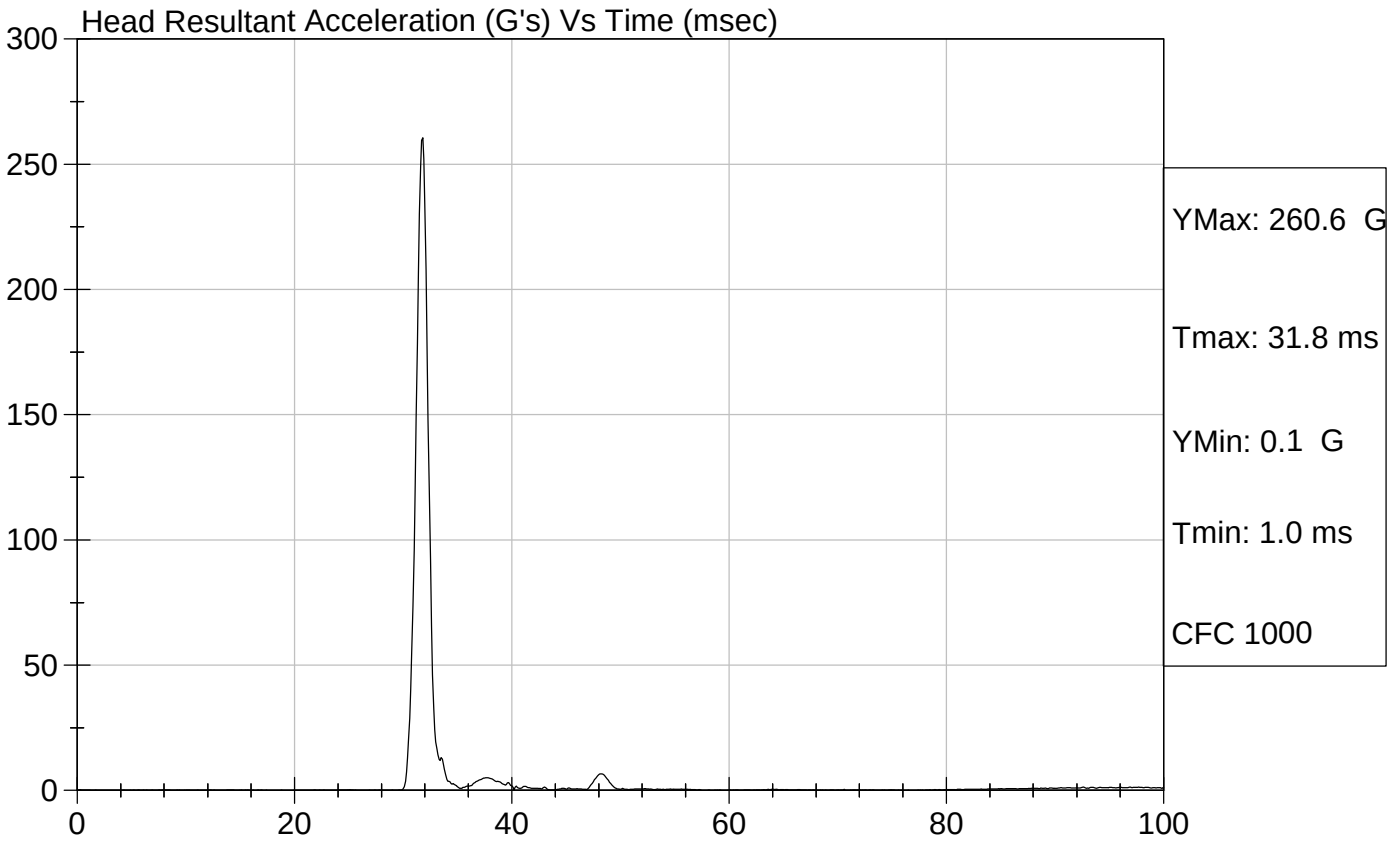
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	27	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	260.6	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	9.1	Pass
Is Acceleration Unimodal?	Yes/No	< 10% Peak	Yes	Pass
		Overall Test Results		Pass

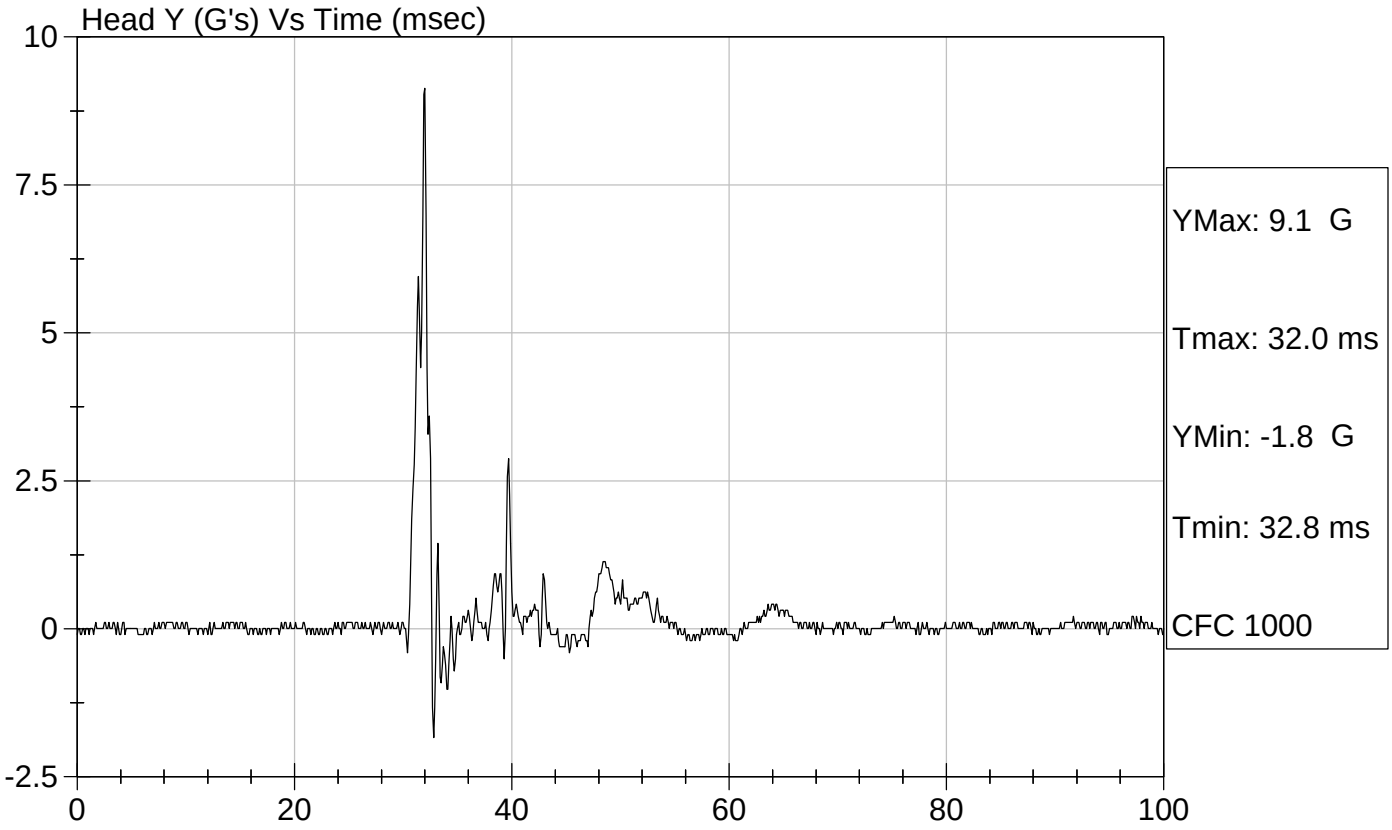
Jessica Hall
Laboratory Technician

01/15/2004
Test Date

Shefalika Jgarwal
Approved By

	Test Description: Head Drop	Test Date: 01/15/2004
	Component: D04061	Speed: 0 ft/s, 0.00 m/s





Hybrid III Calibration Data Sheet

50th Percentile Male

Neck Flexion Test

ATD Serial No: 066 **Test I.D:** D04062

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	22	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.02	Pass
Pendulum Deceleration	10 msec	G's	22.50 to 27.50	23.72	Pass
	20 msec	G's	17.60 to 22.60	20.40	Pass
	30 msec	G's	12.50 to 18.50	16.83	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 29.0	16.83	Pass
Deceleration Decay Time to Cross 5 G's		msec	34.0 to 42.0	36.4	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	71.3	Pass
	Time	msec	57.0 to 64.0	57.5	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	113.0 to 128.0	114.2	Pass
Moment About Occipital Condyle	Maximum	N m	84.1 to 108.5	95.6	Pass
	Time	msec	47.0 to 58.0	48.9	Pass
Positive Moment Decay Time To Zero Crossing		msec	97.0 to 107.0	101.7	Pass
			Overall Test Results		Pass

Jessica Hall
Laboratory Technician

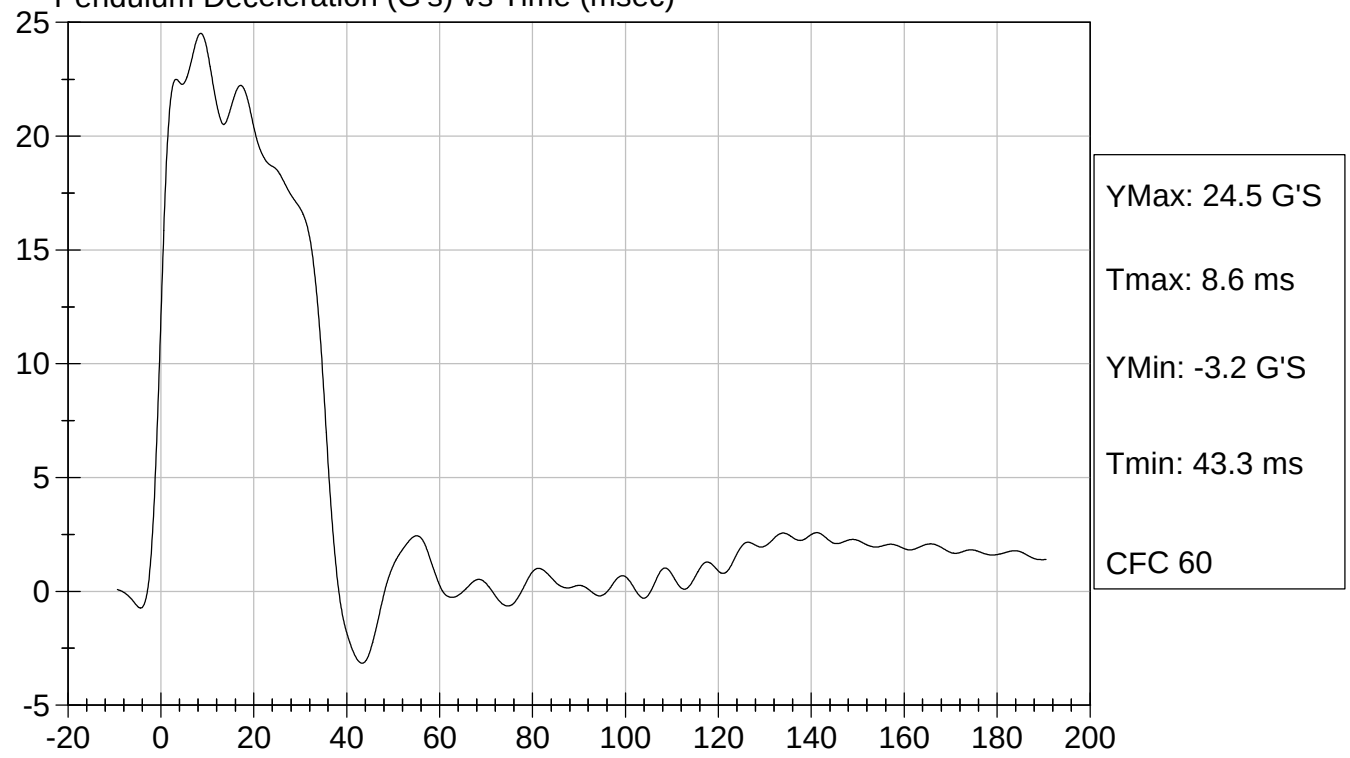
01/16/2004
Test Date

Shefalika Jgarwal
Approved By

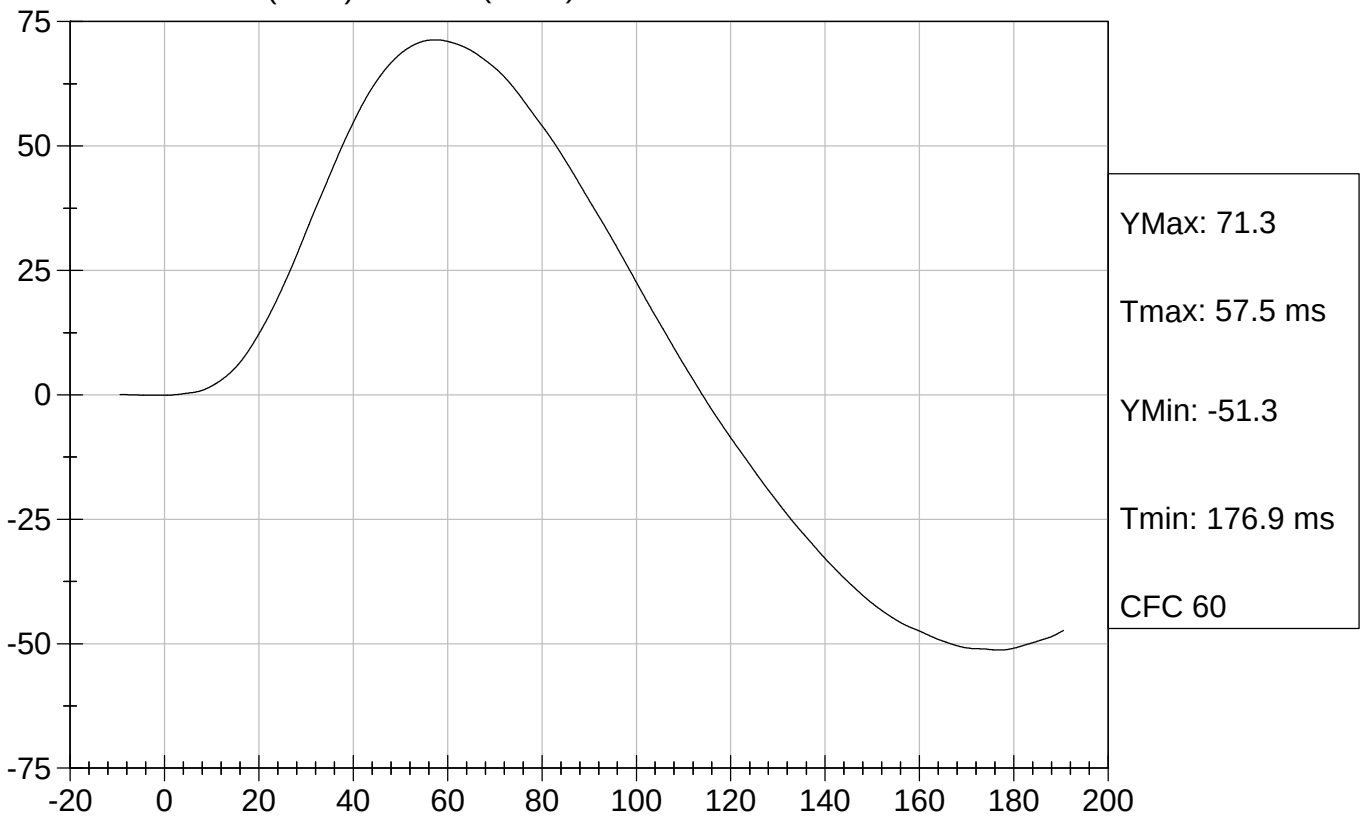
Test Desc: Neck Flexion
Component ID: D04062

Test Date: 01/16/2004
Speed: 23.03 ft/sec, 7.02 m/sec

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

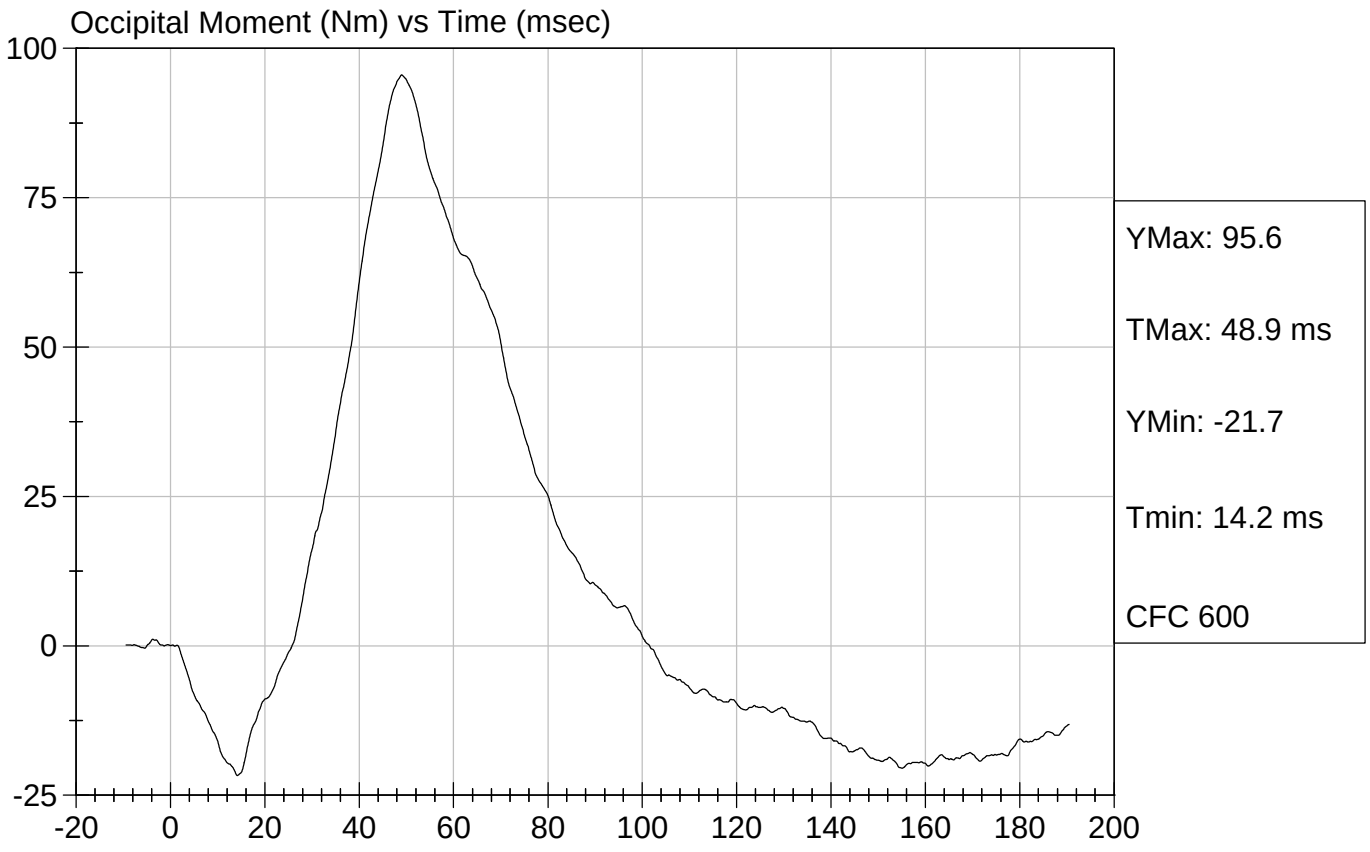


Neck Rotation (DEG) vs Time (msec)



Test Desc: Neck Flexion
Component ID: D04062

Test Date: 01/16/2004
Speed: 23.03 ft/sec, 7.02 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Neck Extension Test

ATD Serial No: 066 **Test I.D:** D04063

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	21.4	Pass
Laboratory Relative Humidity		%	10 to 70	22	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.18	Pass
Pendulum Deceleration	10 msec	G's	17.20 to 21.20	18.88	Pass
	20 msec	G's	14.00 to 19.00	16.55	Pass
	30 msec	G's	11.00 to 16.00	13.10	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 22.0	13.1	Pass
Deceleration Decay Time to Cross 5 G's		msec	38.0 to 46.0	43.7	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	98.1	Pass
	Time	msec	72.0 to 82.0	77.4	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	147.0 to 174.0	155.8	Pass
Moment About Occipital Condyle	Minimum	N m	-52.9 to -79.9	-62.2	Pass
	Time	msec	65.0 to 79.0	73.6	Pass
Negative Moment Decay Time To Zero Crossing		msec	120.0 to 148.0	142.8	Pass
			Overall Test Results		Pass

Jessica Hall
Laboratory Technician

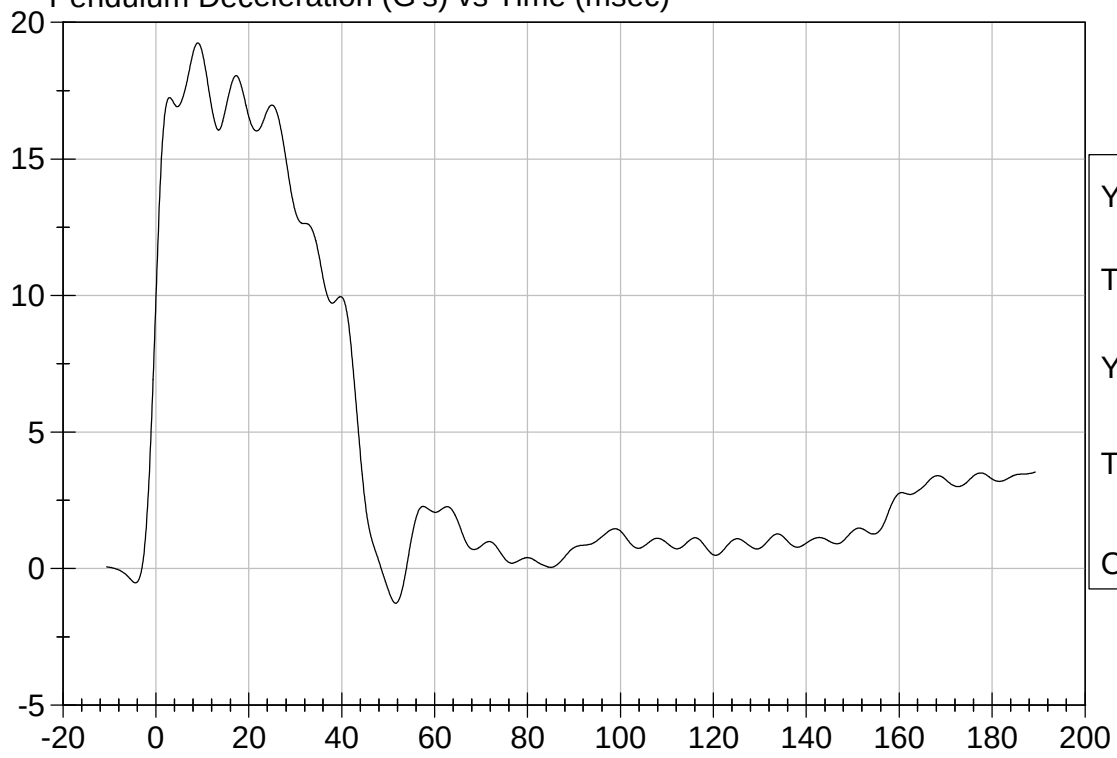
01/16/2004
Test Date

Shefalika Jgarwal
Approved By

Test Desc: Neck Extension
Component ID: D04063

Test Date: 01/16/2004
Speed: 20.28 ft/sec, 6.18 m/sec

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



YMax: 19.2 G'S

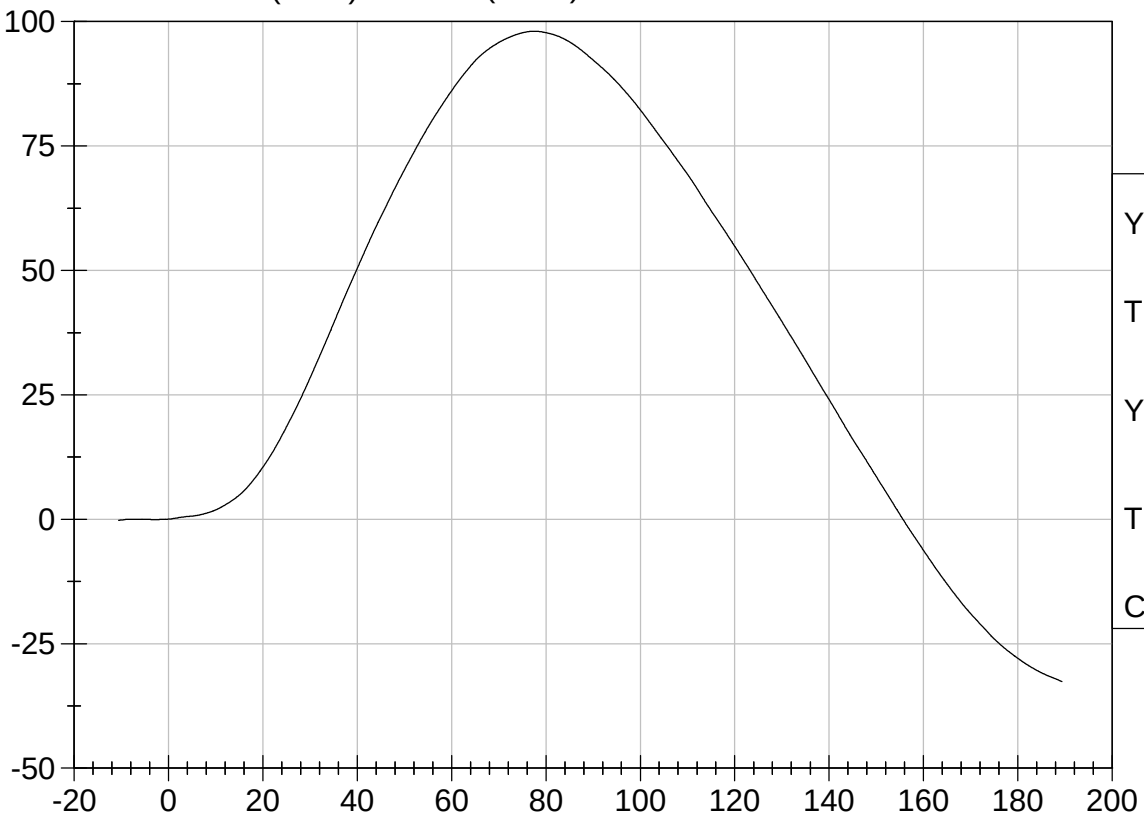
Tmax: 9.0 ms

YMin: -1.3 G'S

Tmin: 51.6 ms

CFC 60

Neck Rotation (DEG) vs Time (msec)



YMax: 98.1

TMax: 77.4 ms

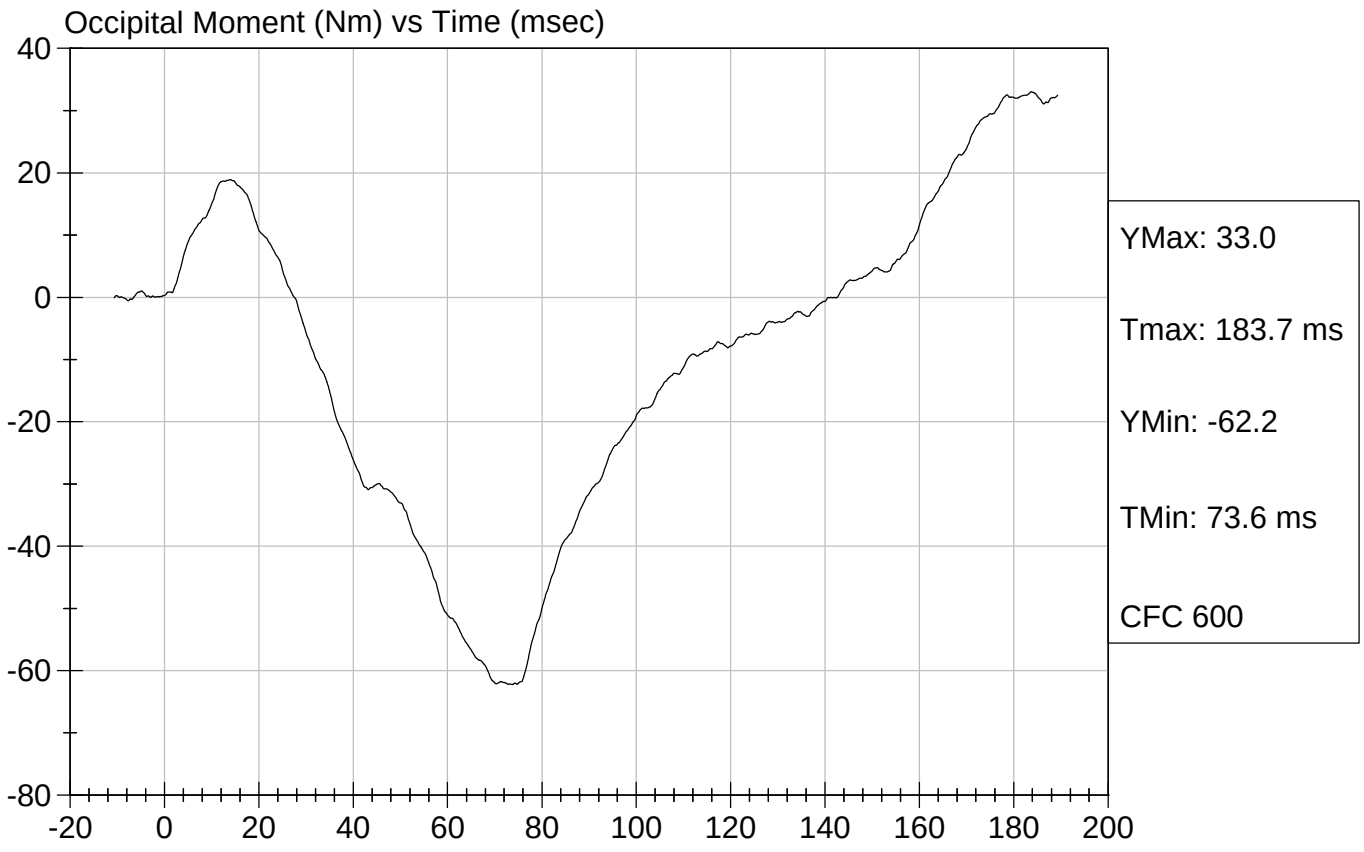
YMin: -32.6

Tmin: 189.3 ms

CFC 60

Test Desc: Neck Extension
Component ID: D04063

Test Date: 01/16/2004
Speed: 20.28 ft/sec, 6.18 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Thorax Impact Test

ATD Serial No: 066 **Test I.D:** D04064

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	14	Pass
Probe Velocity	m/s	6.58 to 6.82	6.69	Pass
Peak Probe Force	Newtons	5159 to 5893	5,802	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.42	Pass
Internal Hysteresis	%	69 to 85	70	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

01/19/2004
Test Date

Shefalika Jaiswal
Approved By

Test Description: Thorax Impact | Test Date: 01/19/2004

Component: D04064 | Speed: 21.96 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:** D04065

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Probe Velocity	m/s	2.07 to 2.13	2.13	Pass
Peak Probe Force	Newtons	4715 to 5782	5,053	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

01/16/2004
Test Date

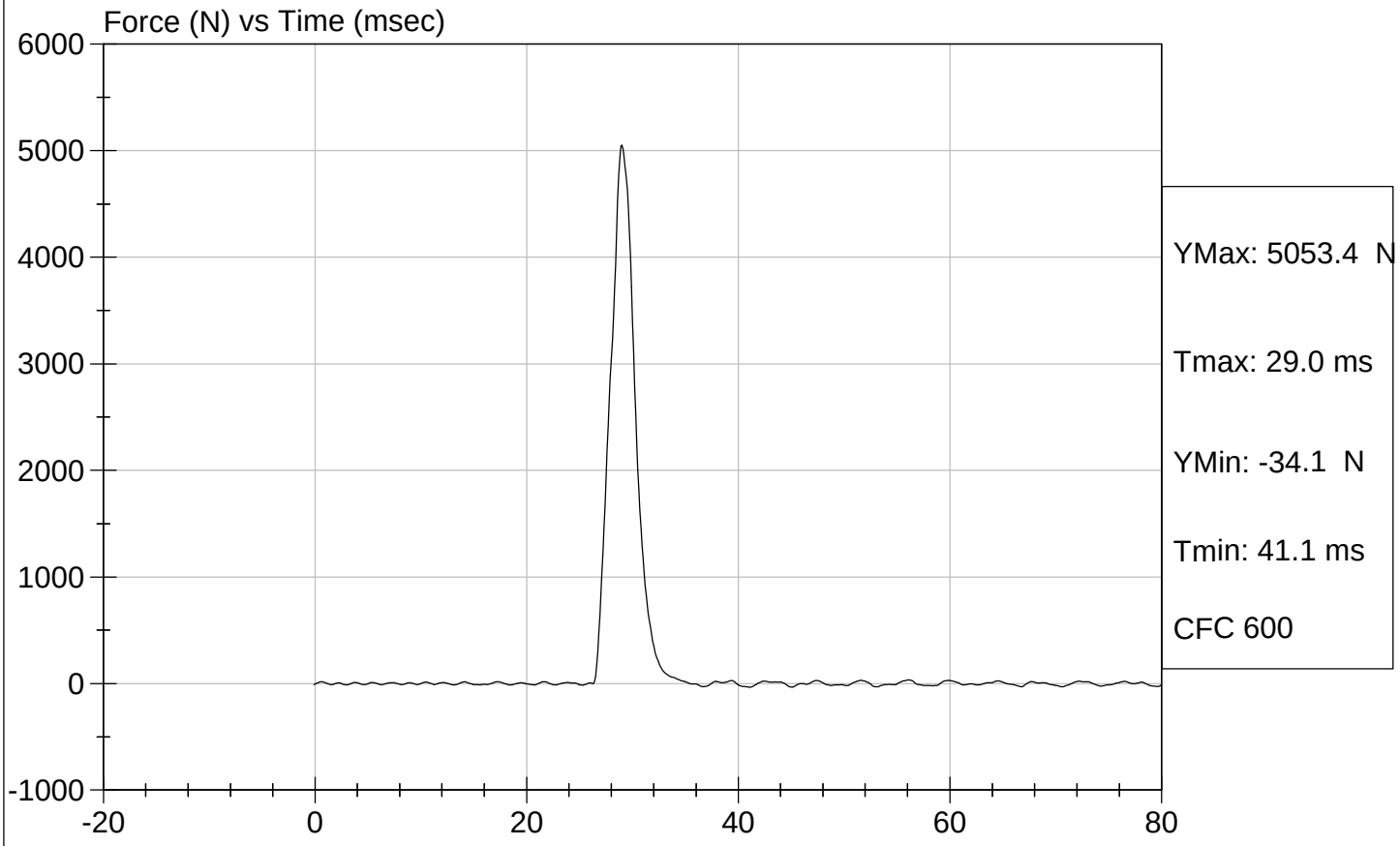
Shefalika Jaiswal
Approved By

Test Description: Right Knee

Test Date: 01/16/2004

Component: D04065

Speed: 6.98 ft/sec, 2.128 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Left Knee Impact Test

ATD Serial No: 066 **Test I.D:** D04066

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	21.4	Pass
Laboratory Relative Humidity	%	10 to 70	22	Pass
Probe Velocity	m/s	2.07 to 2.13	2.10	Pass
Peak Probe Force	Newtons	4715 to 5782	4,928	Pass
		Overall Test Results		Pass

Jessica Hall
Laboratory Technician

01/16/2004
Test Date

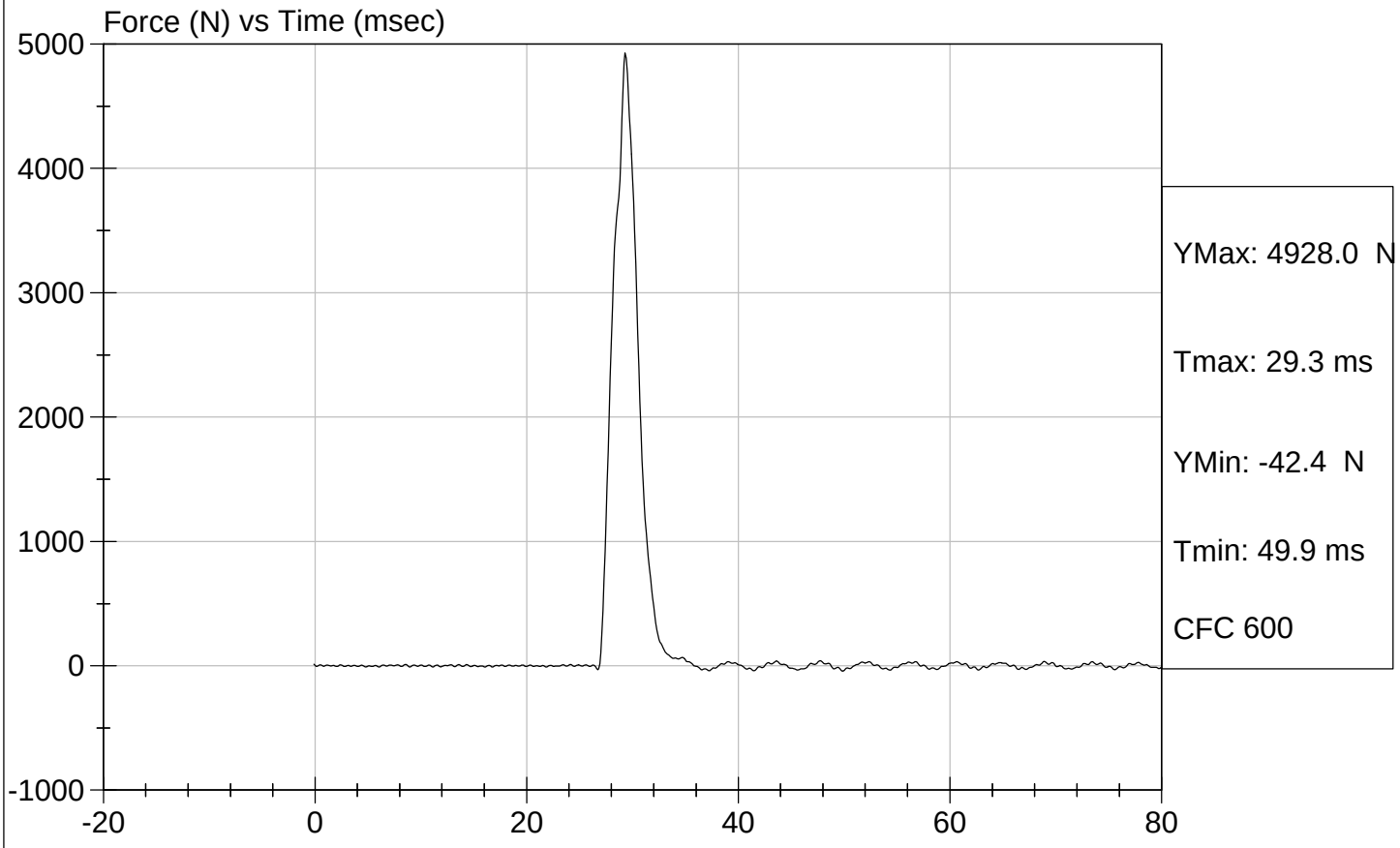
Shefalika Jaiswal
Approved By

Test Description: Left Knee

Test Date: 01/16/2004

Component: D04066

Speed: 6.9 ft/sec, 2.103 m/sec



Hybrid III Calibration Data Sheet

50th Percentile Male

Hip-Femur Flexion Test

ATD Serial No: 066 **Test I.D:** D04060

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	22.0	22.0	Pass
Laboratory Relative Humidity	%	10 to 70	27	27	Pass
Rotation Rate	deg/sec	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	80.7	88.5	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	43	40	Pass
		Overall Test Results			Pass

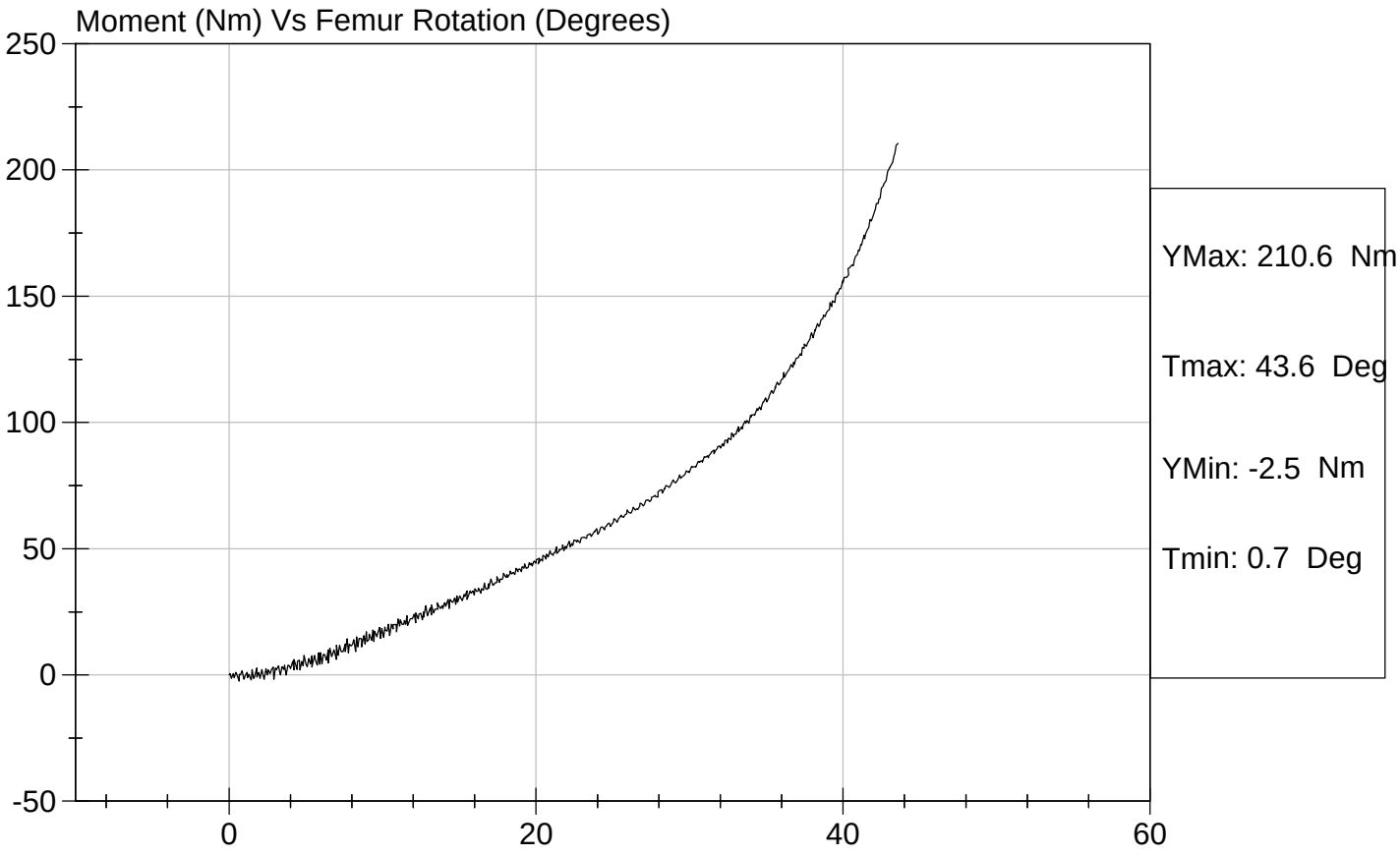
Jessica Hall
Laboratory Technician

01/19/2004
Test Date

Shefalika Jaiswal
Approved By

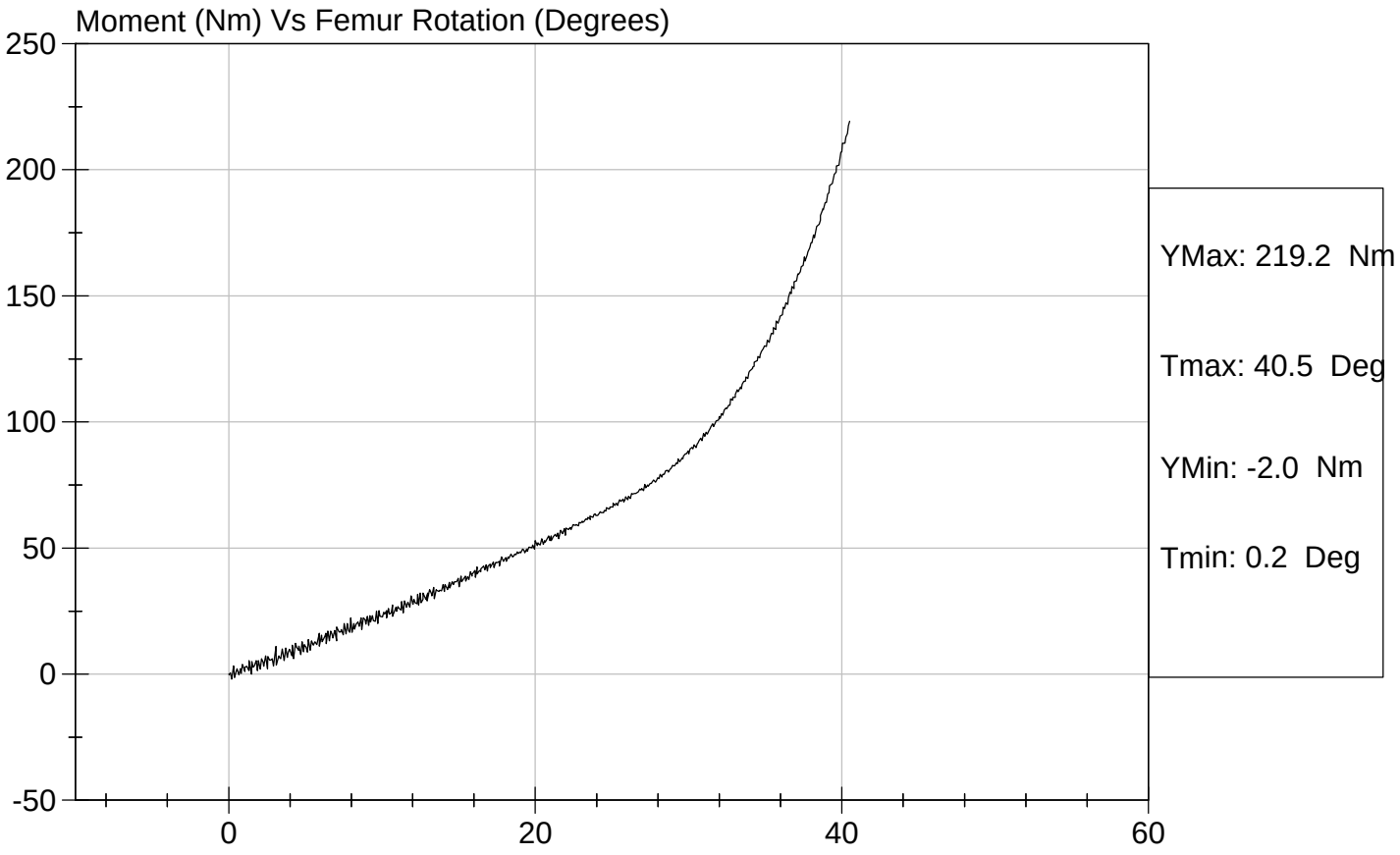
Test Description: Hip Femur Flexion | Test Date: 01/16/2004

Component: D04069 | Speed: 0 ft/sec, 0.00 m/sec



Test Description: Hip Femur Flexion | Test Date: 01/19/2004

Component: D04060 | Speed: 0 ft/sec, 0.00 m/sec



APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

INSTRUMENTS FOR DRIVER DUMMY NO. 065

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	J13941	Endevco	10/06/03
Head Y	ACCY6	Endevco	10/03/03
Head Z	AAMW5	Endevco	10/03/03
Head X Redundant	J18724	Endevco	10/06/03
Head Y Redundant	J14235	Endevco	10/08/03
Head Z Redundant	AJ5R0	Endevco	10/03/03
Head Y – Front	ALBA7	Endevco	11/10/03
Head Z – Front	AMP82	Endevco	11/10/03
Head X – Left	AKAA6	Endevco	11/10/03
Head Z – Left	AP2C4	Endevco	11/10/03
Head X – Upper	J18953	Endevco	11/10/03
Head Y – Upper	J18843	Endevco	11/10/03
Neck Load Cell	442	Denton	8/20/03
Chest X	ACC78	Endevco	10/03/03
Chest Y	ACCE6	Endevco	10/03/03
Chest Z	ACCY3	Endevco	10/03/03
Chest Displacement	065	Servo	9/30/03
Chest X Redundant	J19927	Endevco	10/03/03
Chest Y Redundant	J20580	Endevco	10/03/03
Chest Z Redundant	J23914	Endevco	10/03/03
Pelvis X	AHTN3	Endevco	10/03/03
Pelvis Y	AH0C3	Endevco	10/03/03
Pelvis Z	AHT12	Endevco	10/03/03
Left Femur Load Cell	259	Denton	8/20/03
Right Femur Load Cell	256	Denton	8/20/03
Left Upper Tibia Load Cell	105	Denton	8/20/03
Left Lower Tibia Load Cell	133	Denton	8/19/03
Right Upper Tibia Load Cell	103	Denton	8/19/03
Right Lower Tibia Load Cell	134	Denton	8/20/03
Left Foot Z – Front	J14120	Endevco	10/08/03
Left Ankle X	J23774	Endevco	10/06/03
Left Ankle Z	APYY3	Endevco	10/08/03
Right Foot Z – Front	J18736	Endevco	10/06/03
Right Ankle X	J23946	Endevco	10/06/03
Right Ankle Z	J27513	Endevco	10/06/03
Shoulder Belt Load Cell	161	Denton	9/18/03
Lap Belt Load Cell	198	Denton	12/9/03

INSTRUMENTS FOR PASSENGER DUMMY NO. 066

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	ACC61	Endevco	10/03/03
Head Y	AAMN8	Endevco	10/03/03
Head Z	ACCW9	Endevco	10/03/03
Head X Redundant	J21988	Endevco	10/03/03
Head Y Redundant	J19884	Endevco	10/03/03
Head Z Redundant	J28986	Endevco	10/03/03
Head Y – Front	AH0D1	Endevco	12/05/03
Head Z – Front	AH0M0	Endevco	12/05/03
Head X – Left	J22034	Endevco	12/05/03
Head Z – Left	AHRP6	Endevco	12/05/03
Head X – Upper	AP170	Endevco	12/05/03
Head Y – Upper	AP2G9	Endevco	12/05/03
Neck Load Cell	443	Denton	8/20/03
Chest X	ACCY1	Endevco	10/06/03
Chest Y	ACCC8	Endevco	10/06/03
Chest Z	ACCT7	Endevco	10/06/03
Chest Displacement	066	Servo	9/30/03
Chest X Redundant	J13541	Endevco	10/06/03
Chest Y Redundant	J20093	Endevco	10/06/03
Chest Z Redundant	J19440	Endevco	10/06/03
Pelvis X	J22033	Endevco	10/03/03
Pelvis Y	J21691	Endevco	10/03/03
Pelvis Z	J21970	Endevco	10/03/03
Left Femur Load Cell	262	Denton	8/20/03
Right Femur Load Cell	261	Denton	8/20/03
Left Upper Tibia Load Cell	109	Denton	8/19/03
Left Lower Tibia Load Cell	138	Denton	8/19/03
Right Upper Tibia Load Cell	106	Denton	8/20/03
Right Lower Tibia Load Cell	135	Denton	8/20/03
Left Foot Z – Front	J28988	Endevco	10/03/03
Left Ankle X	J22036	Endevco	10/03/03
Left Ankle Z	J20569	Endevco	10/03/03
Right Foot Z – Front	J20382	Endevco	8/07/03
Right Ankle X	J20165	Endevco	8/07/03
Right Ankle Z	J28708	Endevco	8/07/03
Shoulder Belt Load Cell	172	Denton	10/11/03
Lap Belt Load Cell	199	Denton	12/09/03

INSTRUMENTS FOR VEHICLE AND LABORATORY

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Rear Seat Crossmember X	K07-R25	Entran	12/15/03
Left Rear Seat Crossmember Z	K18-D18	Entran	12/15/03
Right Rear Seat Crossmember X	G13-F15	Entran	8/13/03
Right Rear Seat Crossmember Z	K20-J05	Entran	12/15/03
Top of Engine X	G03-N12	Entran	10/08/03
Bottom of Engine X	K20-J03	Entran	12/15/03
Left Brake Caliper X	K21-N15	Entran	8/15/03
Right Brake Caliper X	E10-F20	Entran	8/13/03
Instrument Panel X	E13-D06	Entran	10/08/03

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

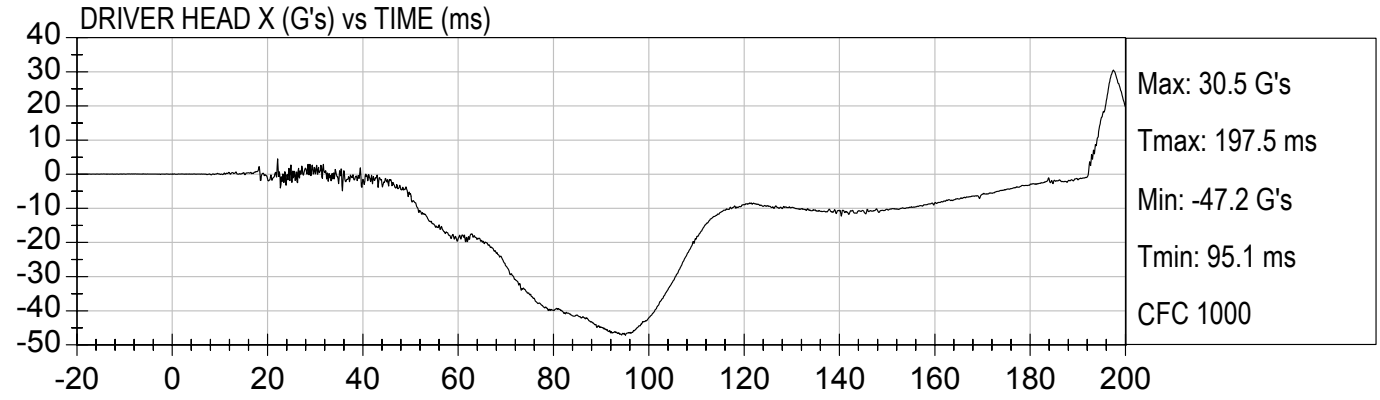
APPENDIX E

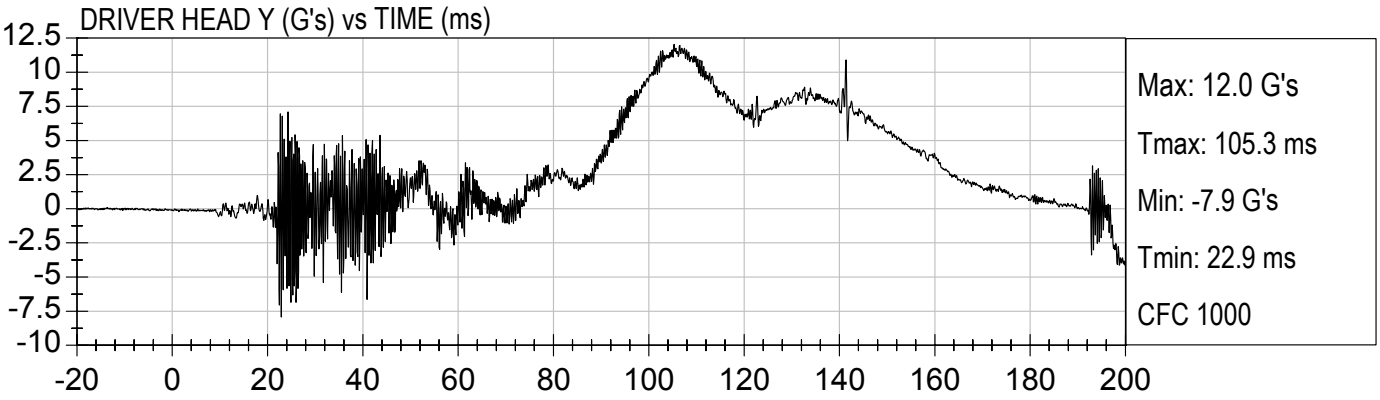
DUMMY HEAD RESPONSE DATA TRACES

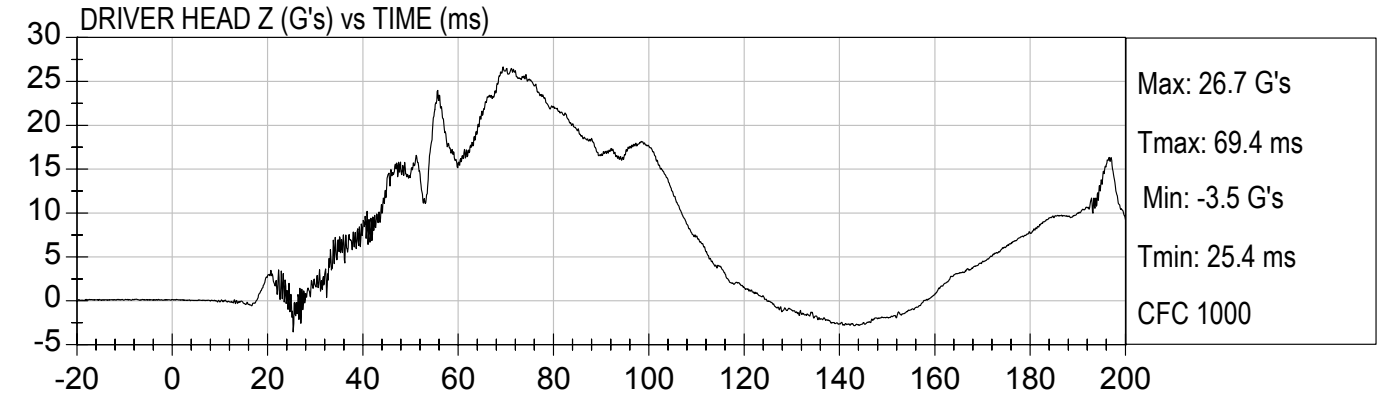
TABLE OF DATA PLOTS

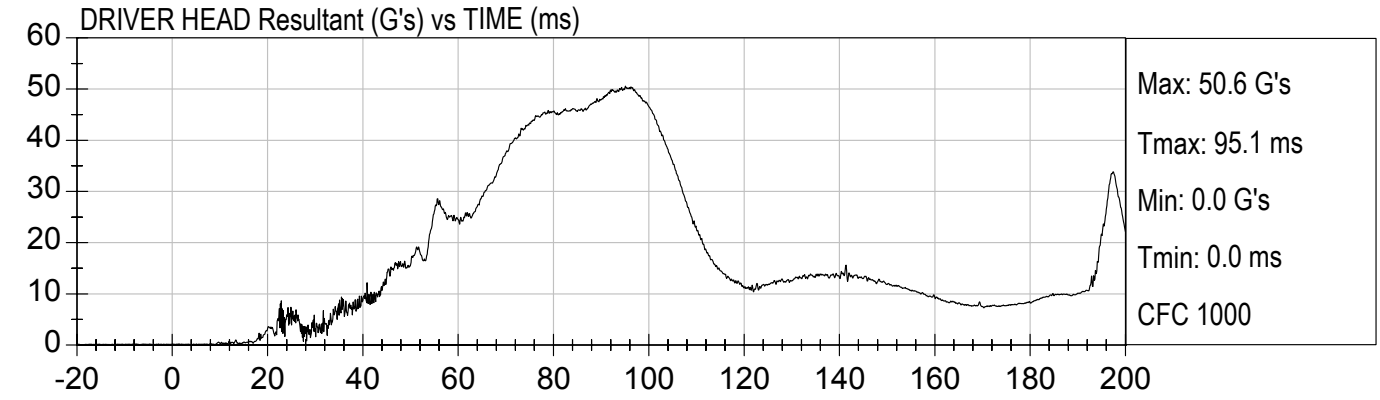
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

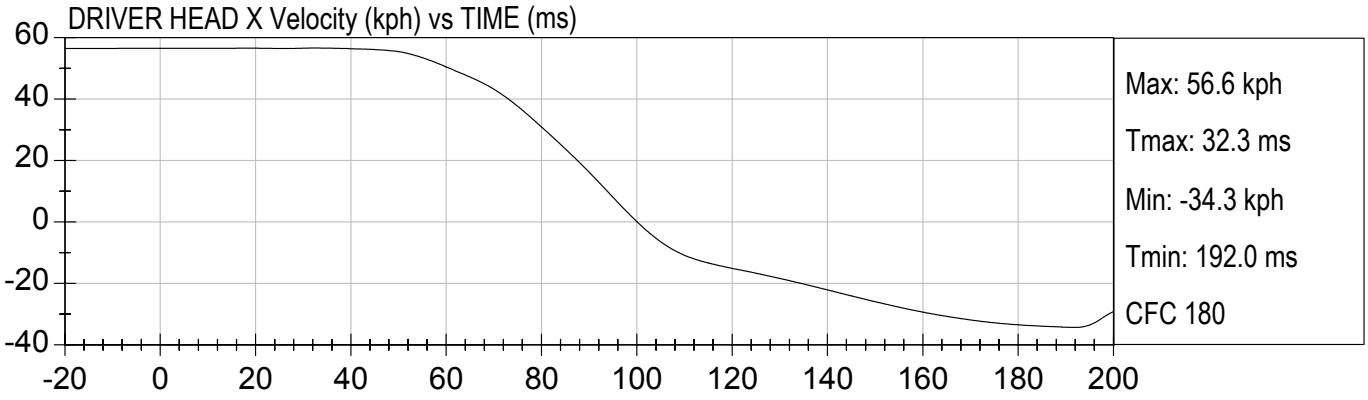
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

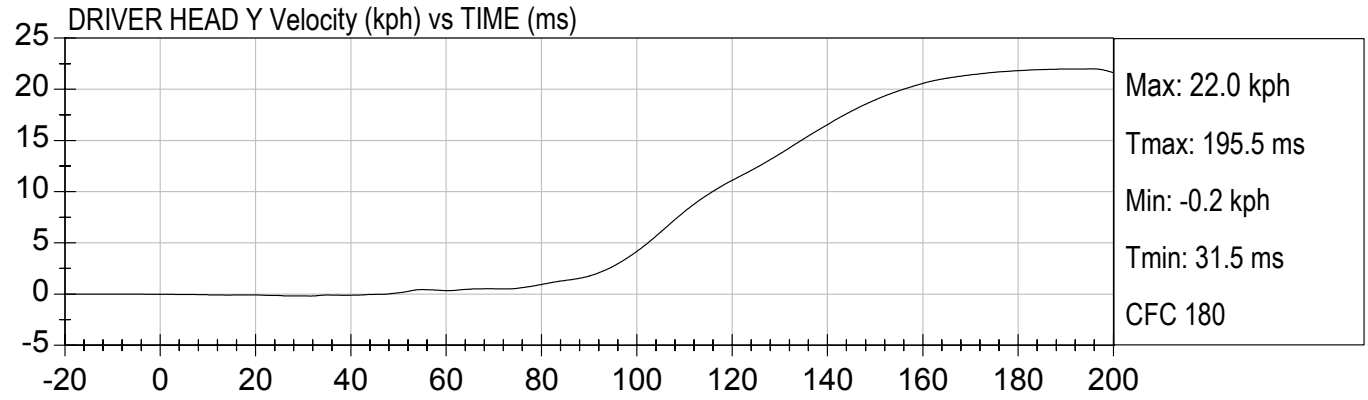


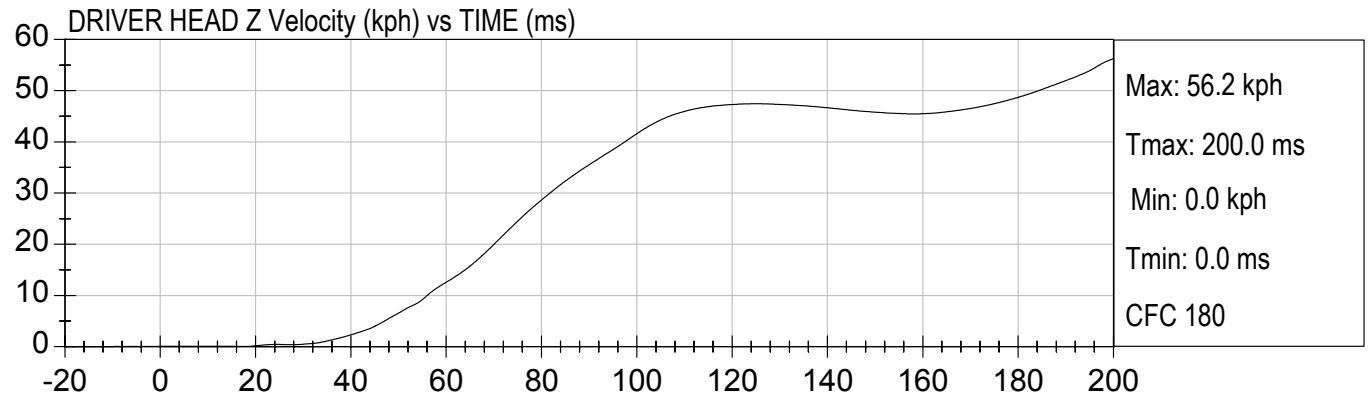






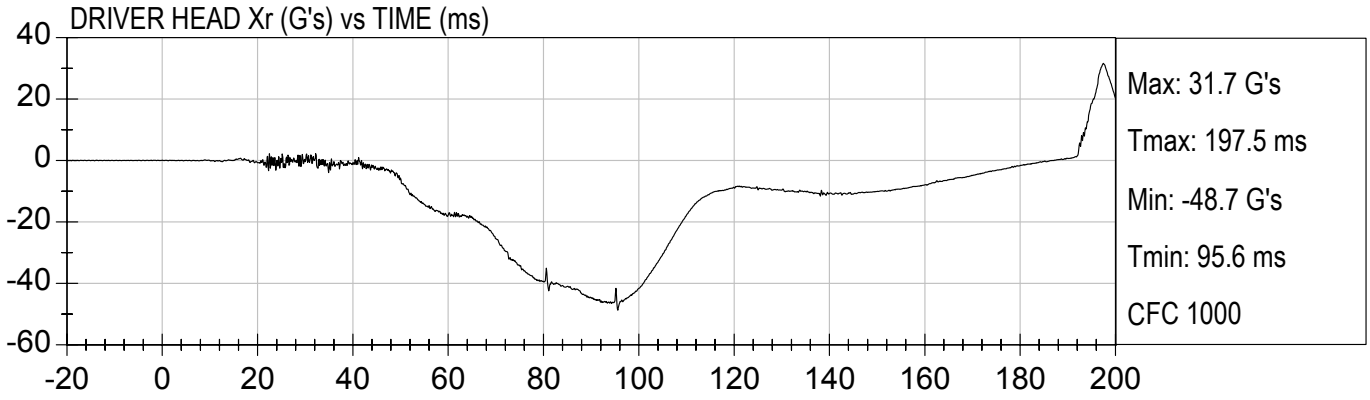

DRIVER HEAD X Velocity (kph) vs TIME (ms)
60
40
20
0
-20
-40
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.6 kph
Tmax: 32.3 ms
Min: -34.3 kph
Tmin: 192.0 ms
CFC 180

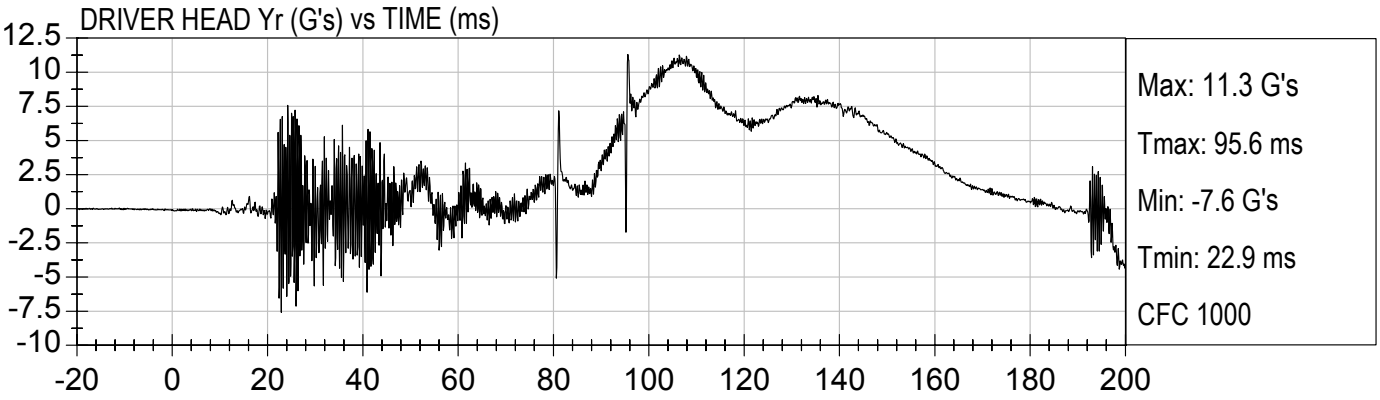

DRIVER HEAD Y Velocity (kph) vs TIME (ms)
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 22.0 kph
Tmax: 195.5 ms
Min: -0.2 kph
Tmin: 31.5 ms
CFC 180

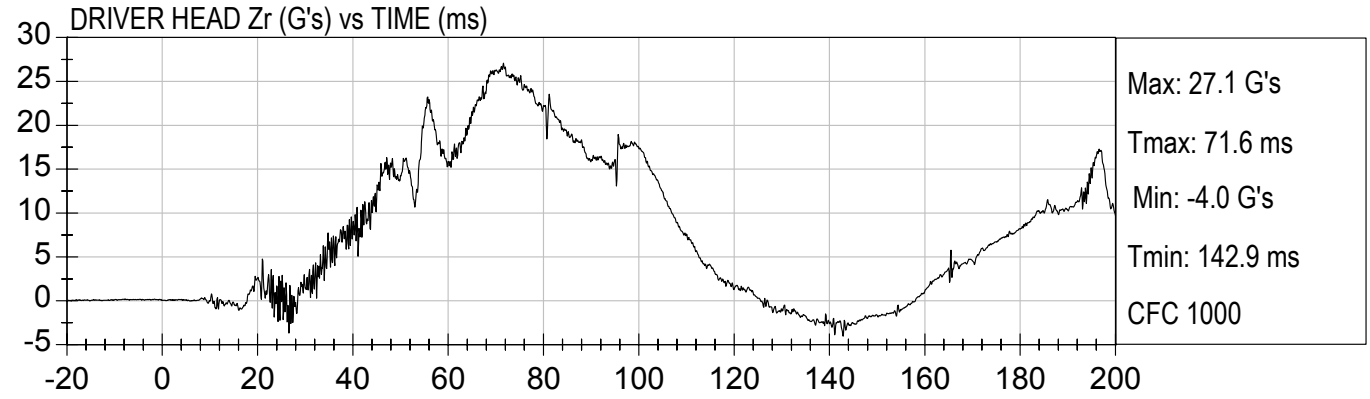

DRIVER HEAD Z Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.2 kph
Tmax: 200.0 ms
Min: 0.0 kph
Tmin: 0.0 ms
CFC 180

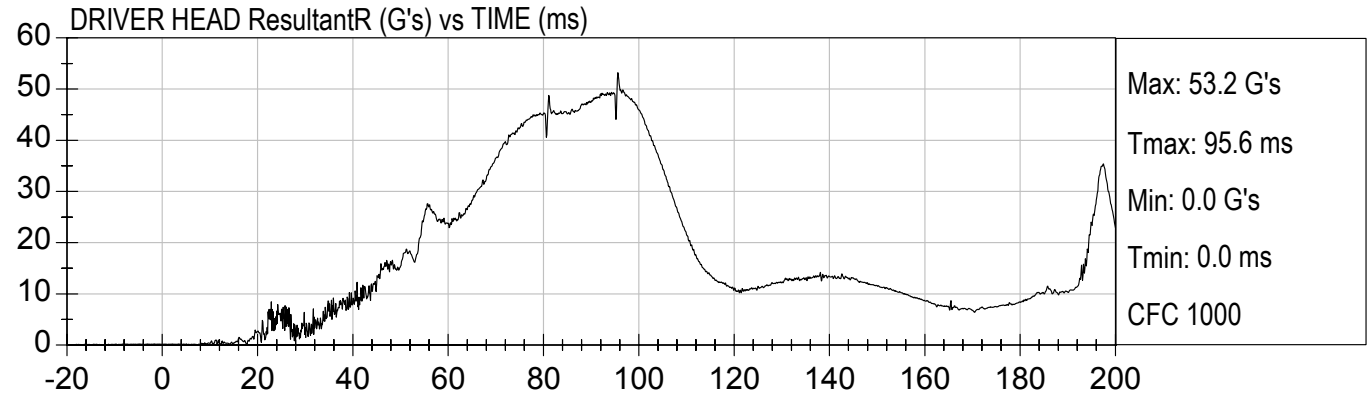
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

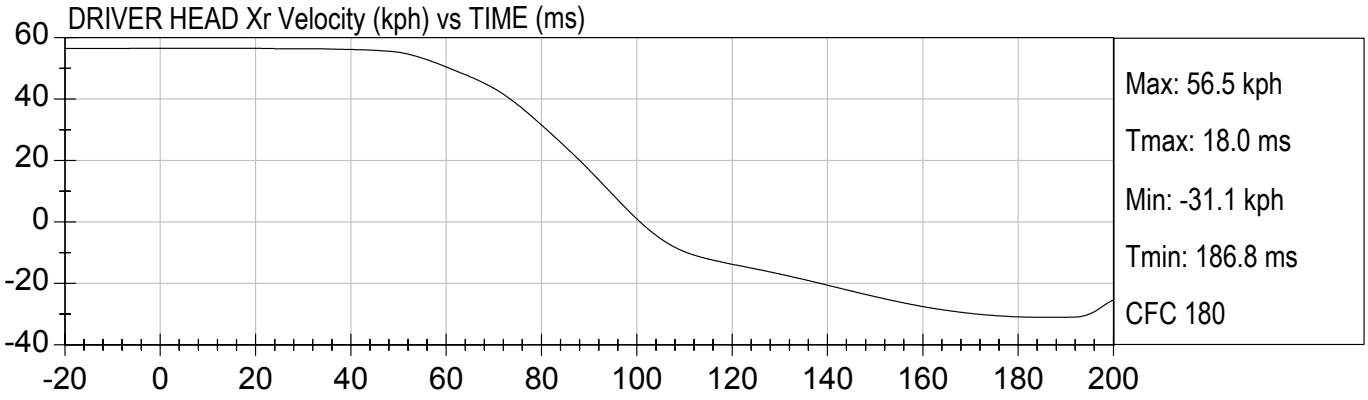
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

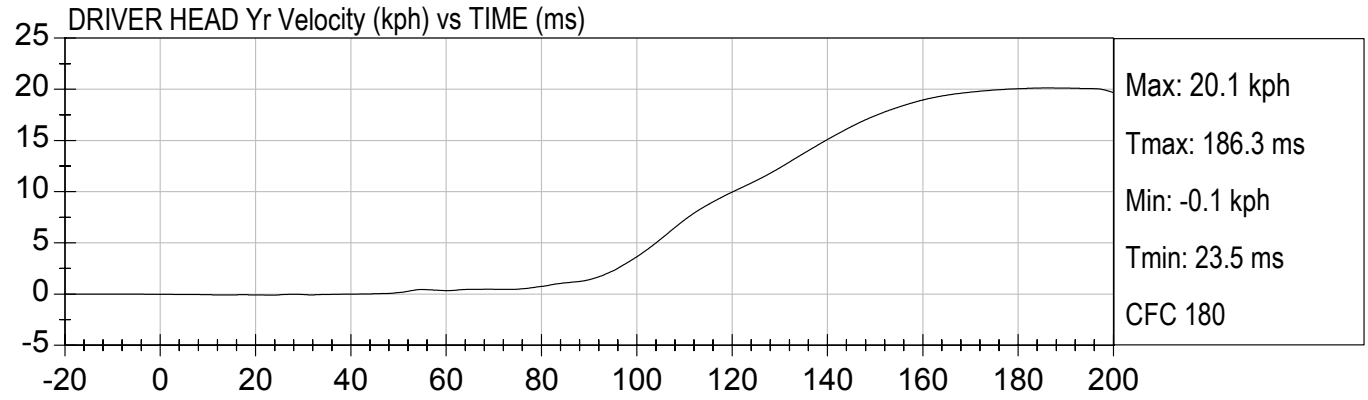


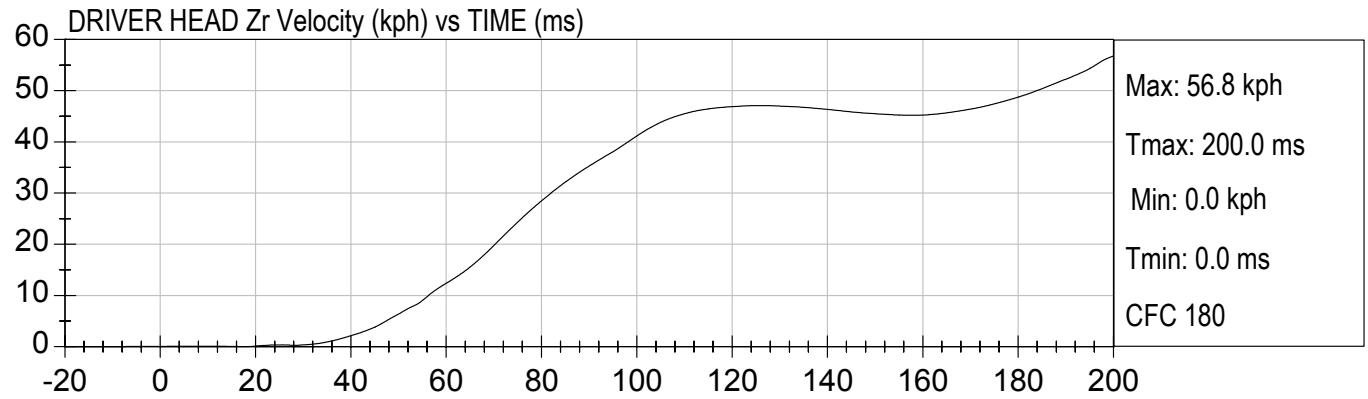






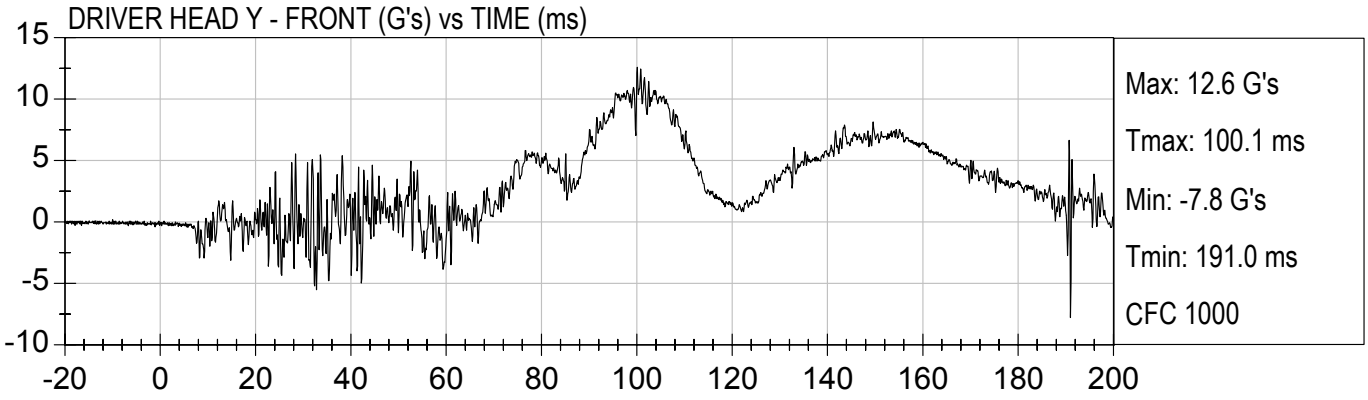

DRIVER HEAD Xr Velocity (kph) vs TIME (ms)
60
40
20
0
-20
-40
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.5 kph
Tmax: 18.0 ms
Min: -31.1 kph
Tmin: 186.8 ms
CFC 180

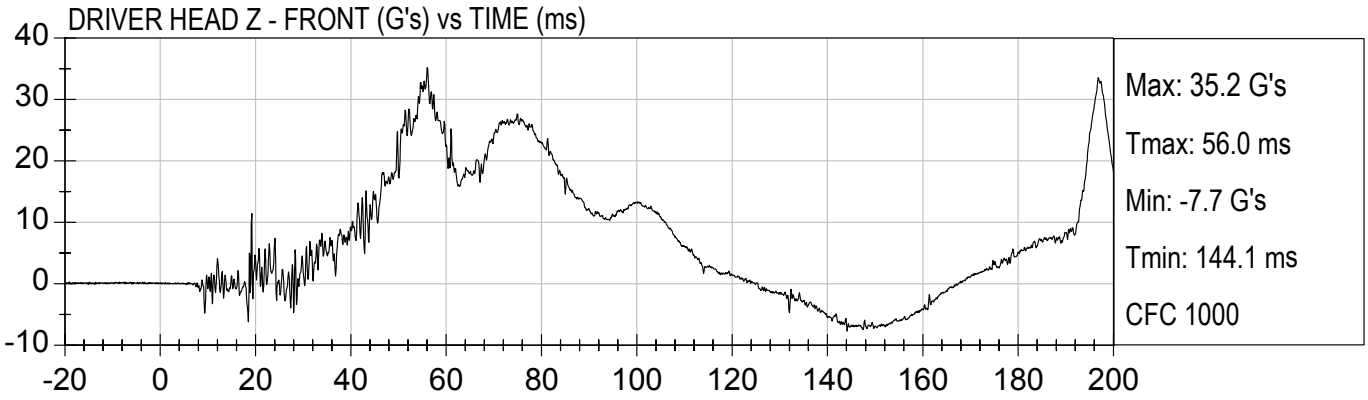

DRIVER HEAD Yr Velocity (kph) vs TIME (ms)
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 20.1 kph
Tmax: 186.3 ms
Min: -0.1 kph
Tmin: 23.5 ms
CFC 180

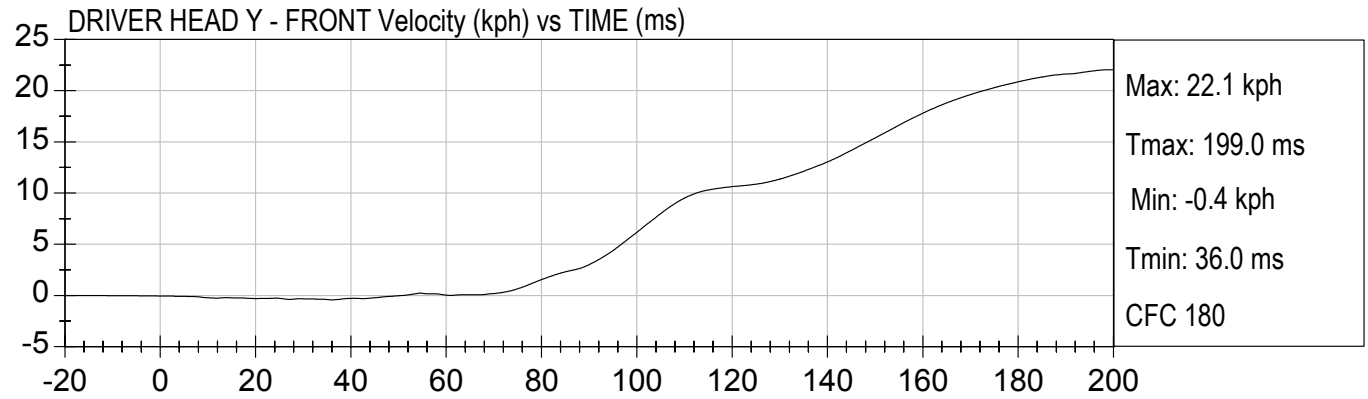

DRIVER HEAD Zr Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.8 kph
Tmax: 200.0 ms
Min: 0.0 kph
Tmin: 0.0 ms
CFC 180

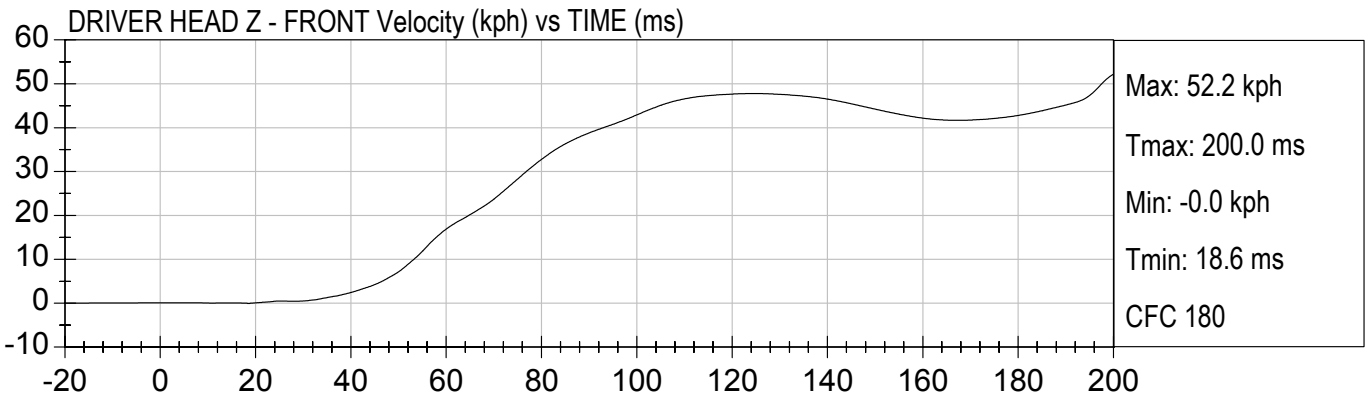
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)



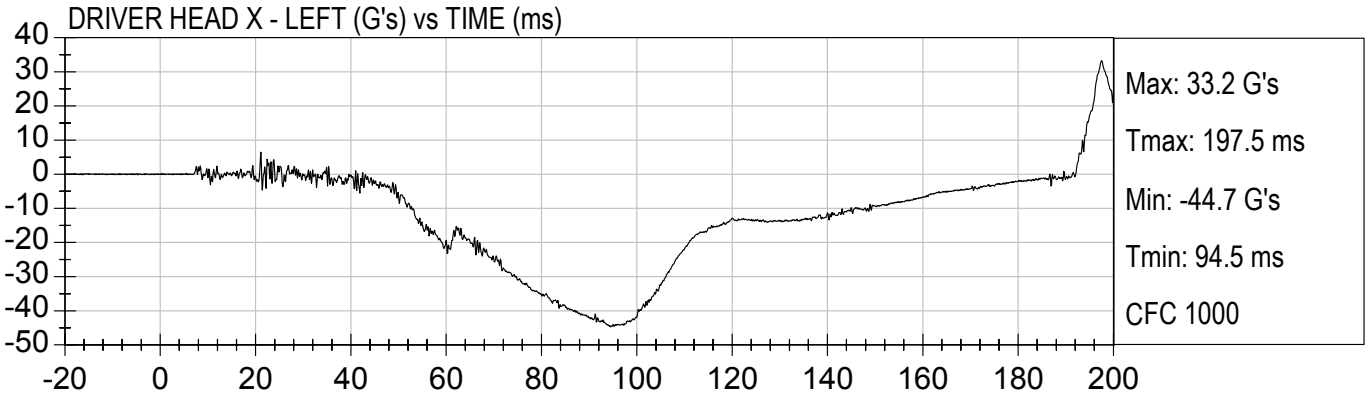


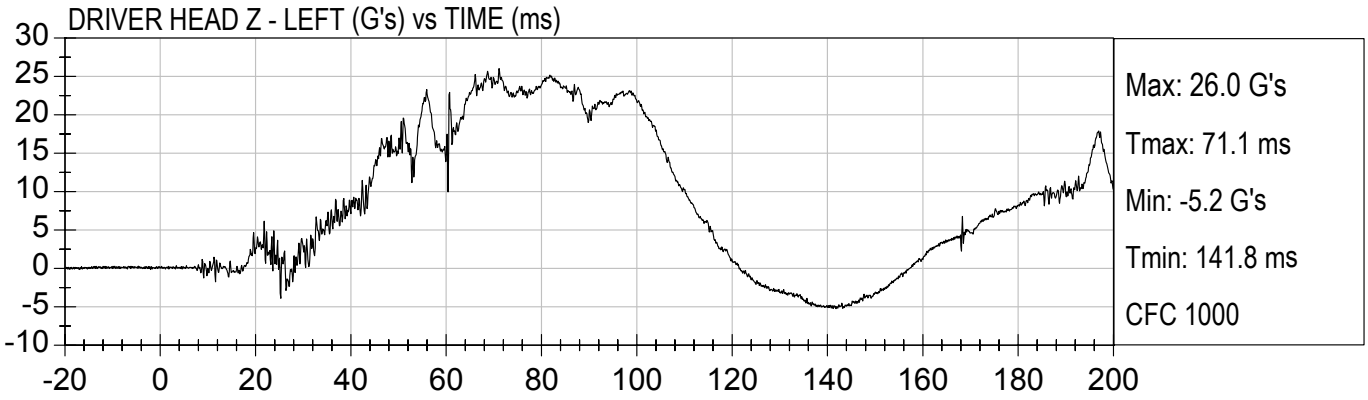


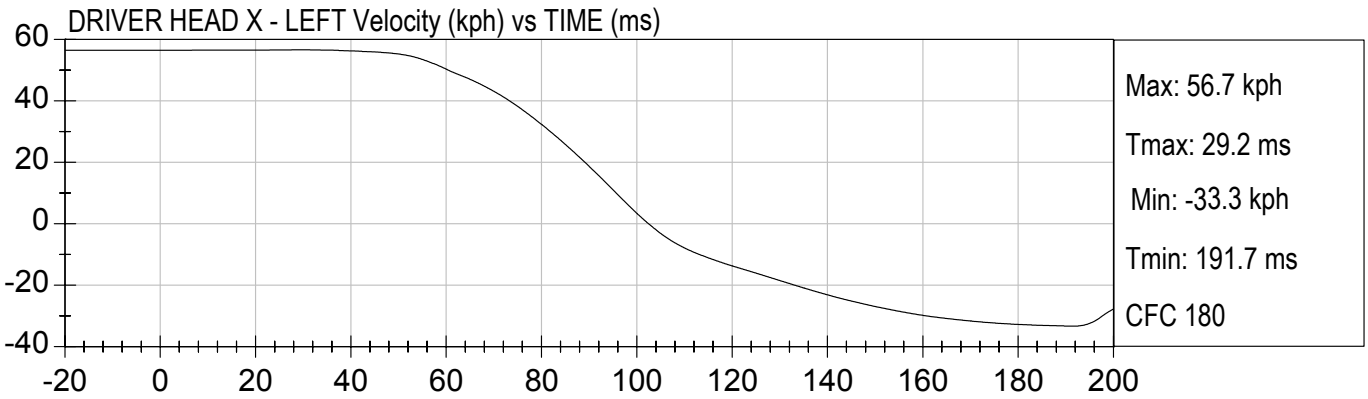


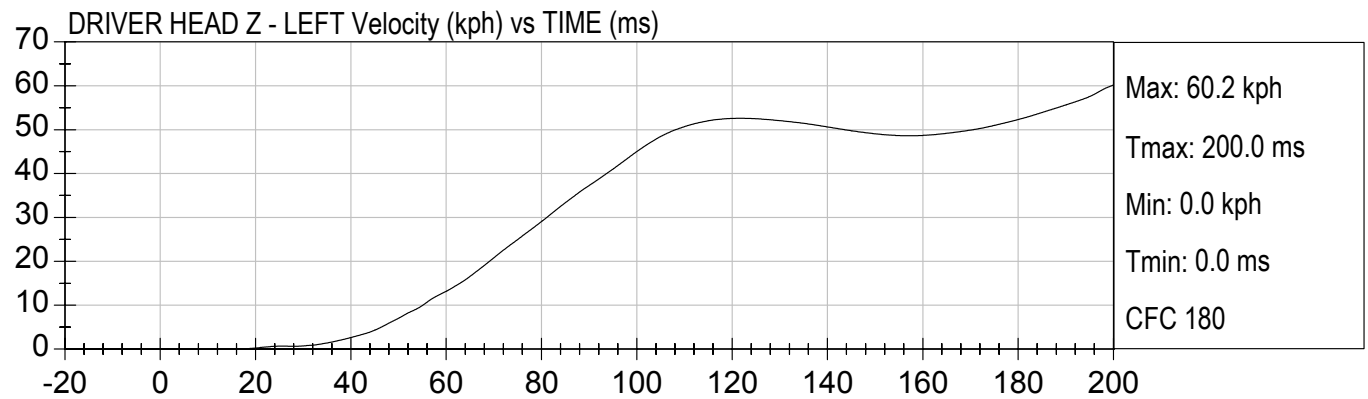
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)



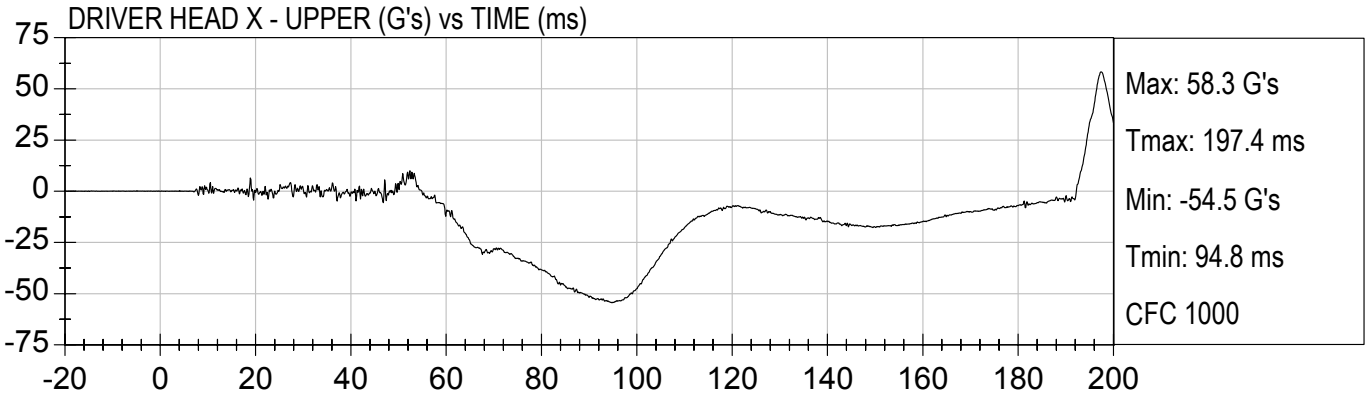


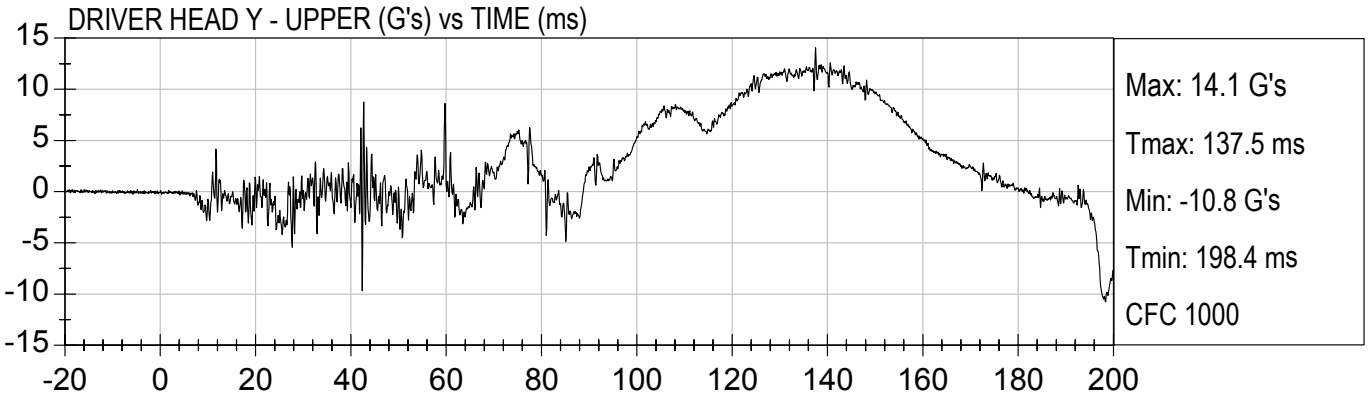


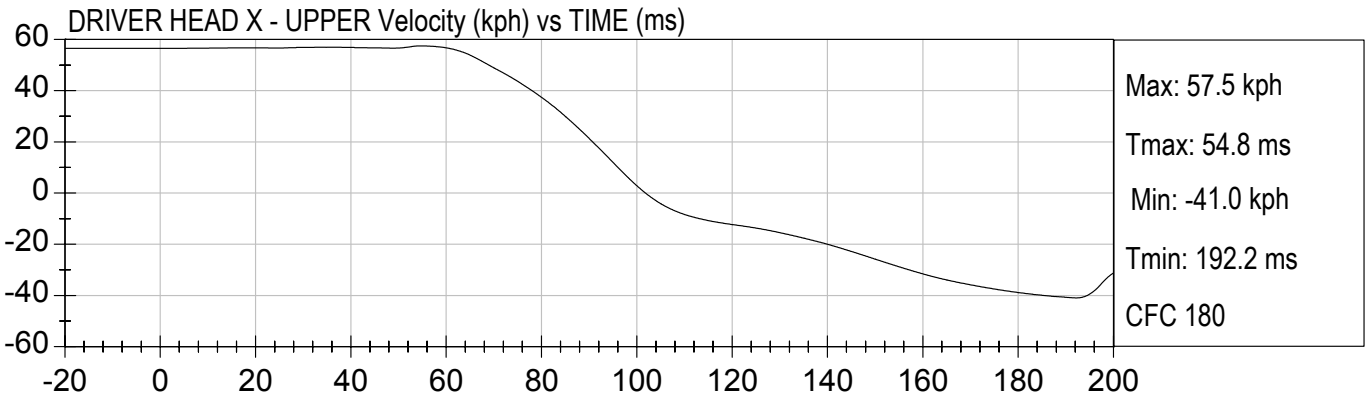


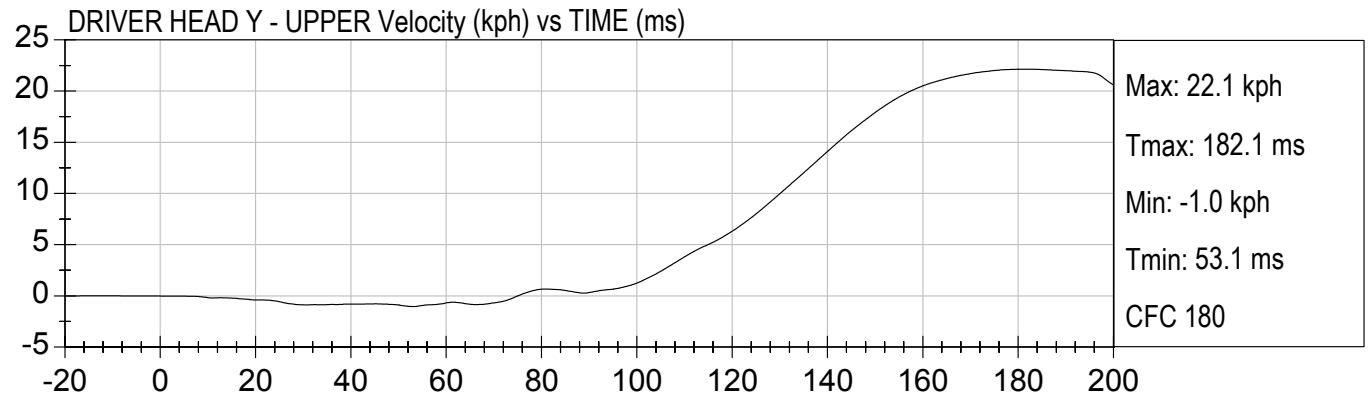
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)



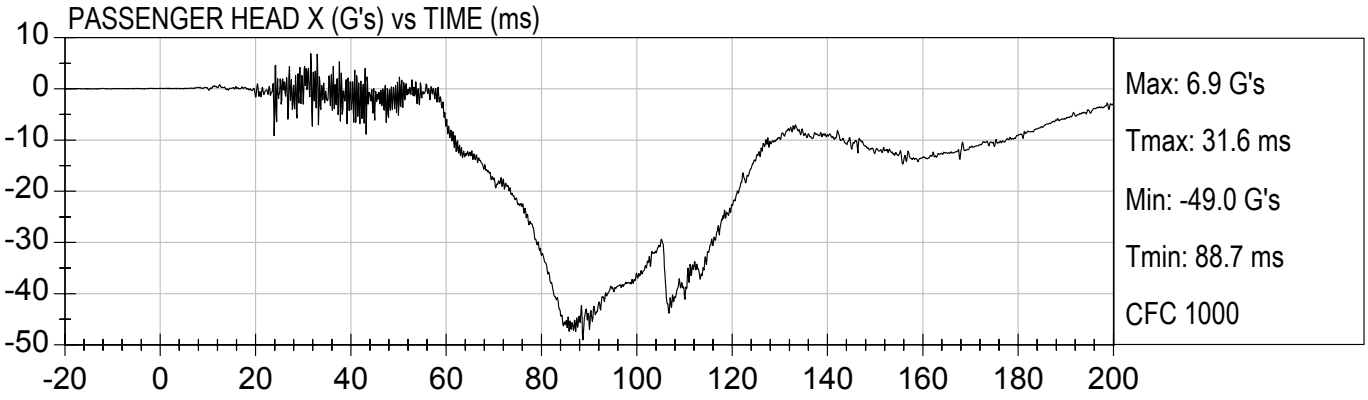


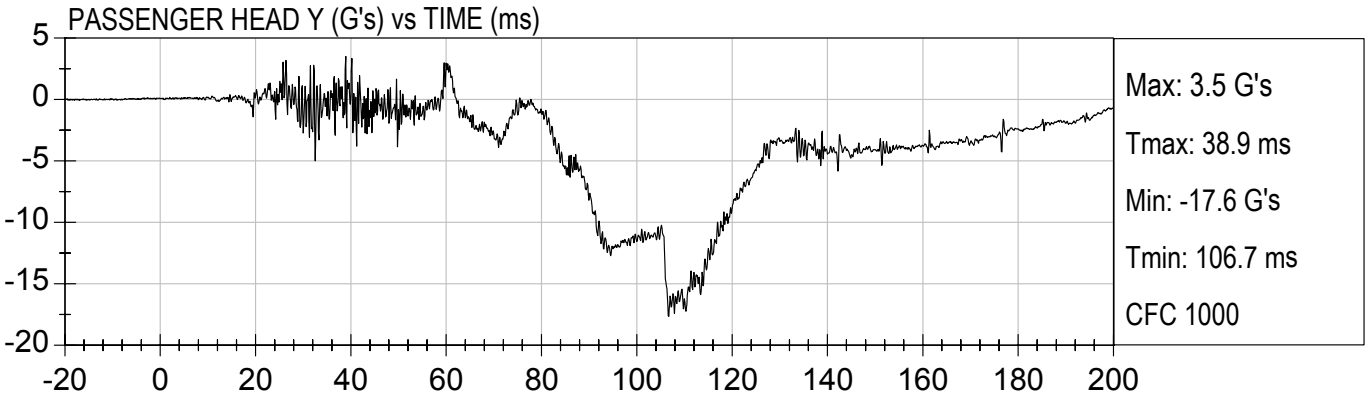


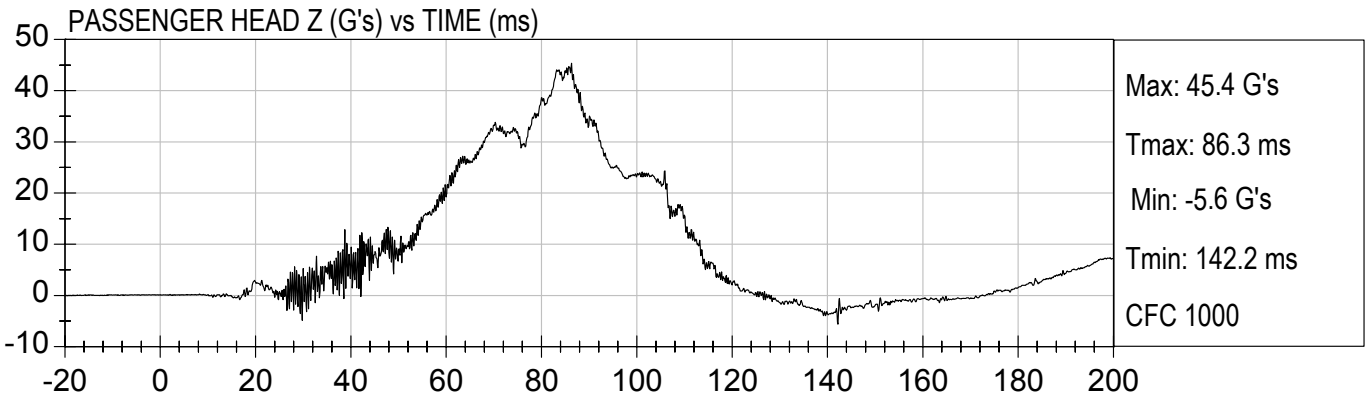


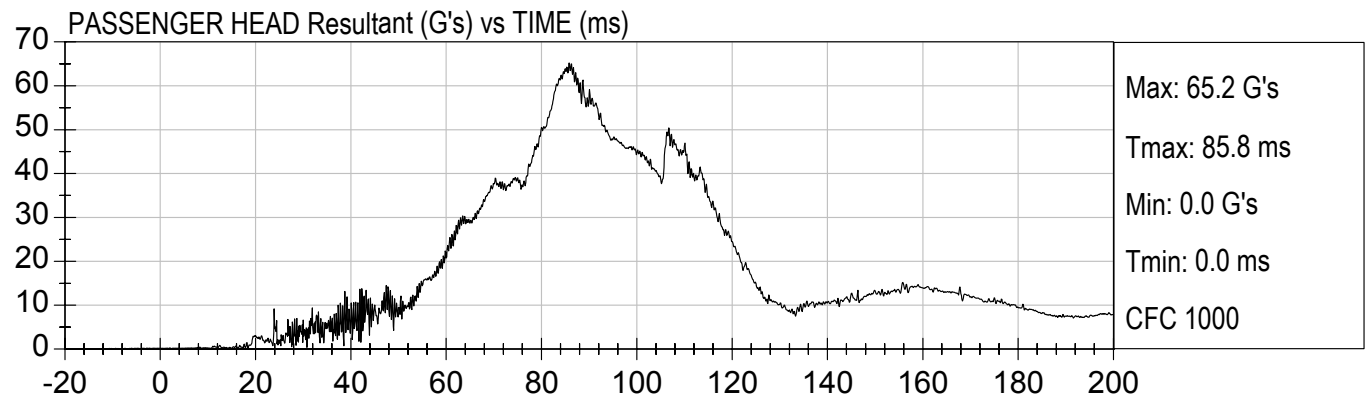
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

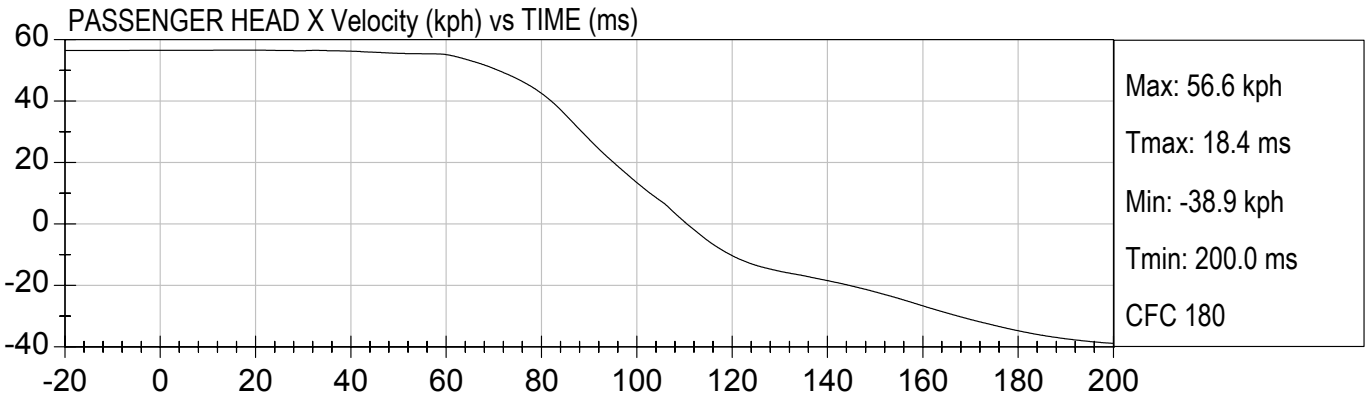
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

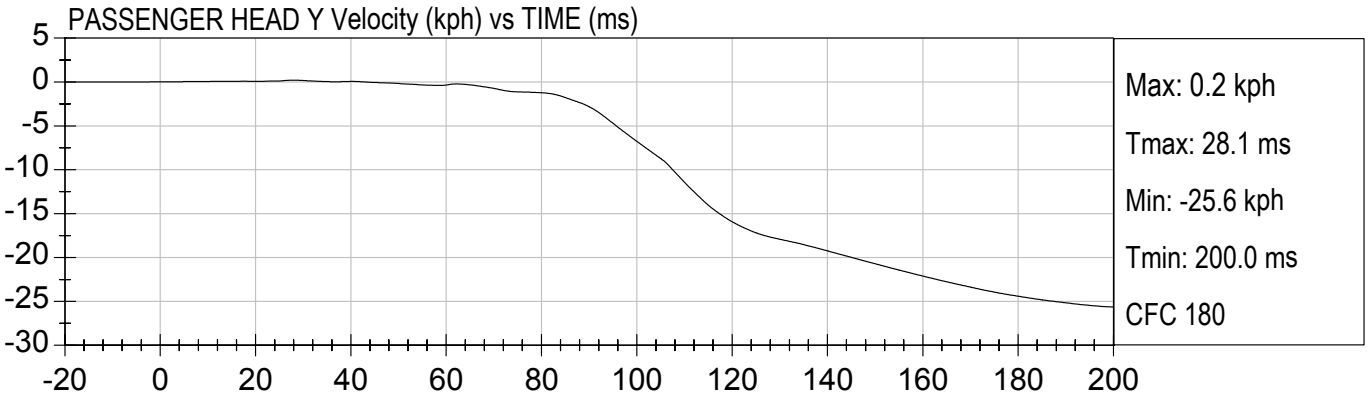


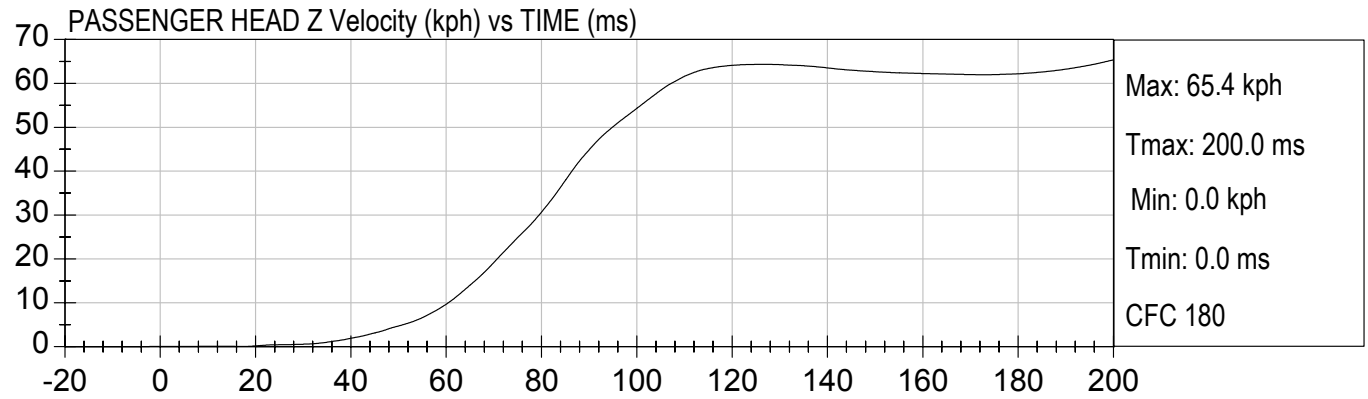






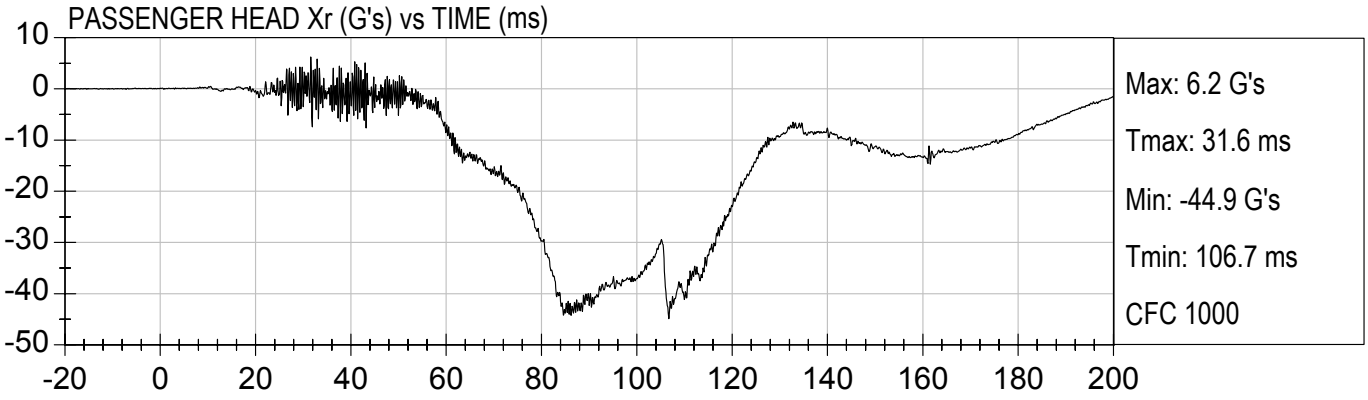

PASSENGER HEAD X Velocity (kph) vs TIME (ms)
60
40
20
0
-20
-40
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.6 kph
Tmax: 18.4 ms
Min: -38.9 kph
Tmin: 200.0 ms
CFC 180

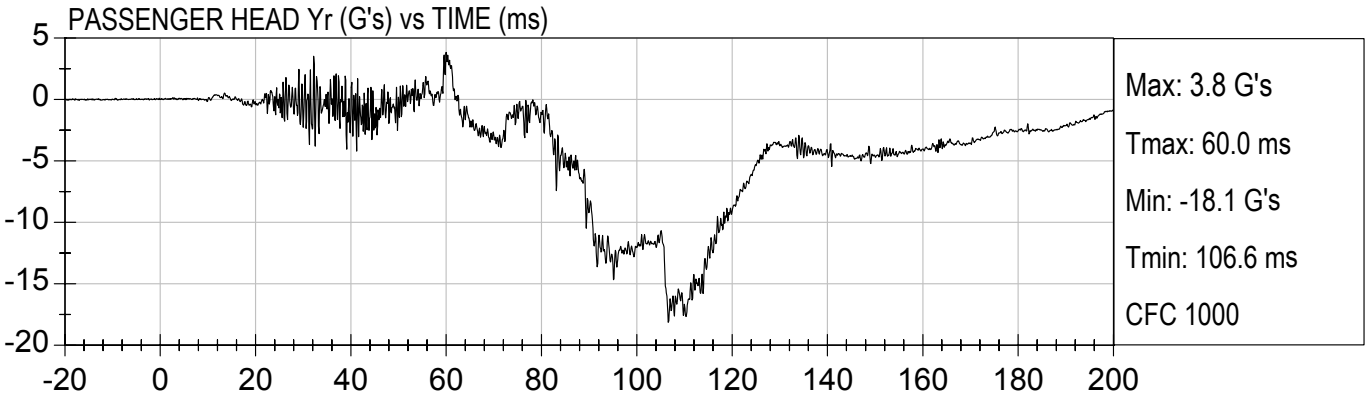

PASSENGER HEAD Y Velocity (kph) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 0.2 kph
Tmax: 28.1 ms
Min: -25.6 kph
Tmin: 200.0 ms
CFC 180

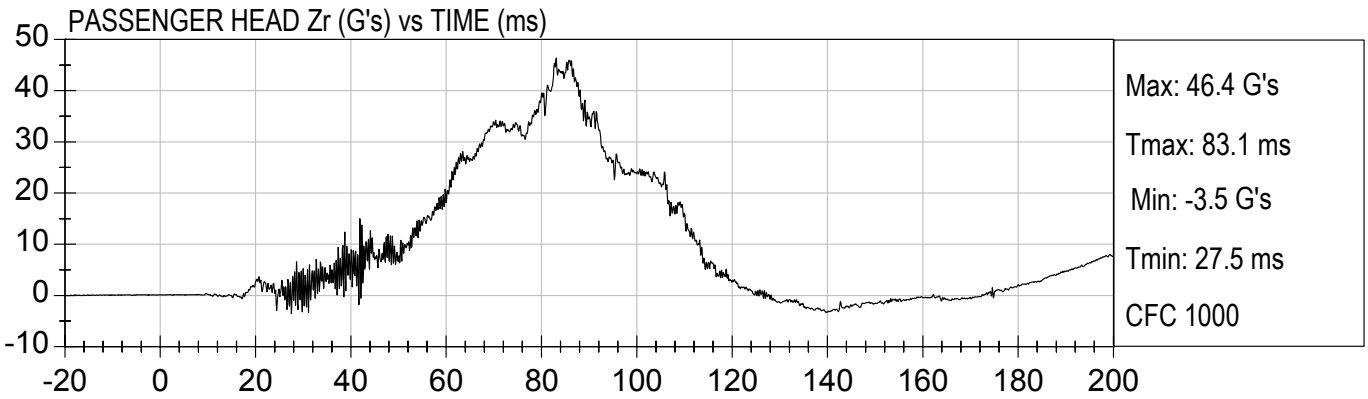

PASSENGER HEAD Z Velocity (kph) vs TIME (ms)
70
60
50
40
30
20
10
0
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 65.4 kph
Tmax: 200.0 ms
Min: 0.0 kph
Tmin: 0.0 ms
CFC 180

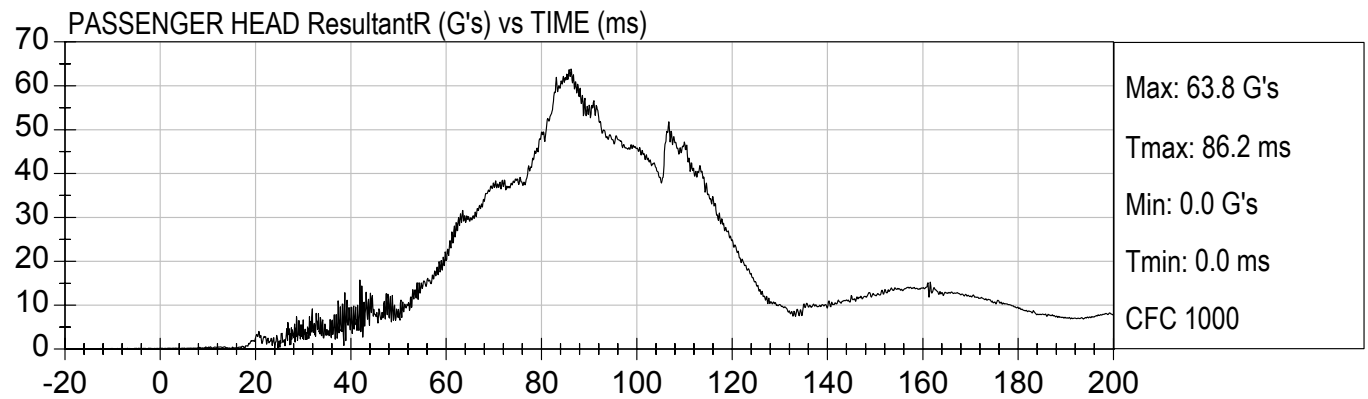
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

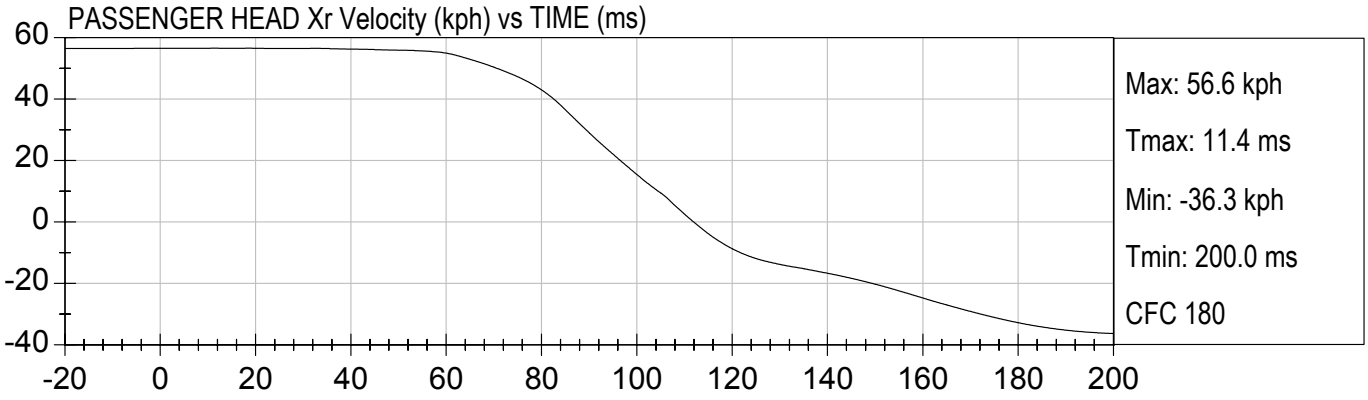
Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)

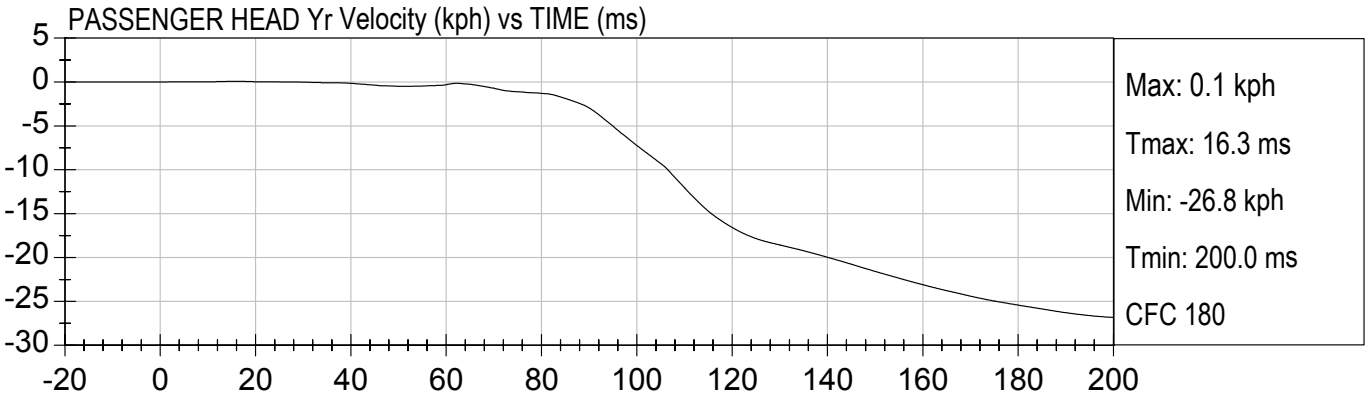


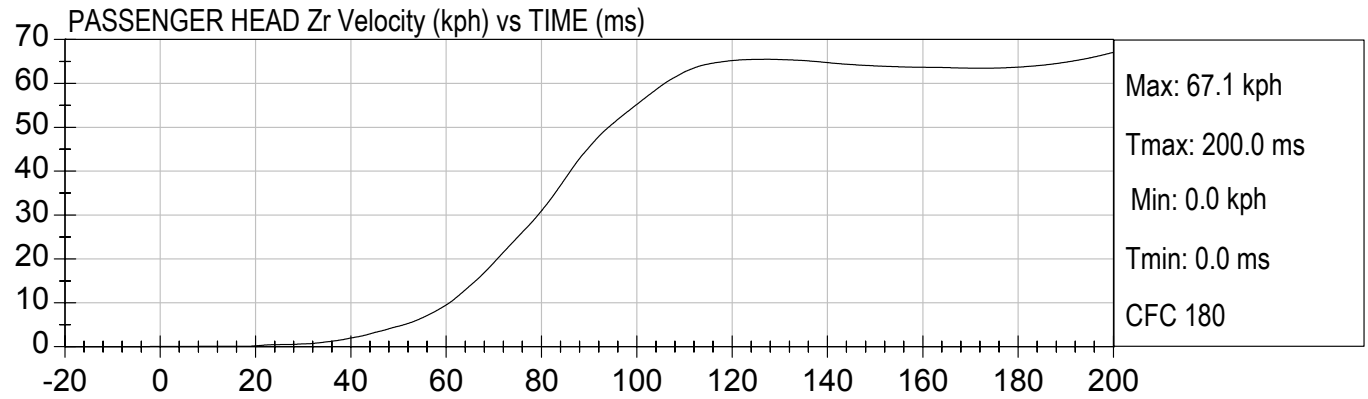






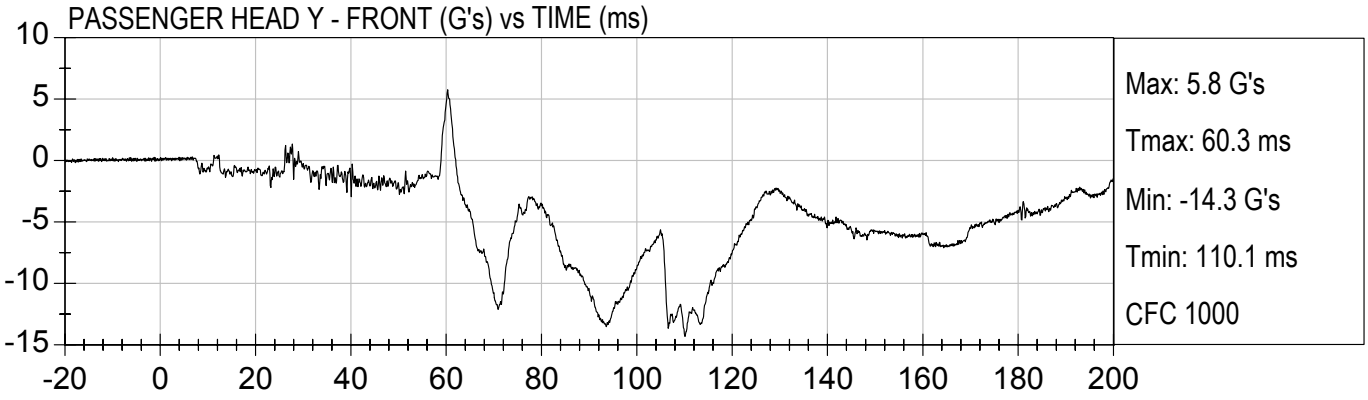

PASSENGER HEAD Xr Velocity (kph) vs TIME (ms)
60
40
20
0
-20
-40
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 56.6 kph
Tmax: 11.4 ms
Min: -36.3 kph
Tmin: 200.0 ms
CFC 180

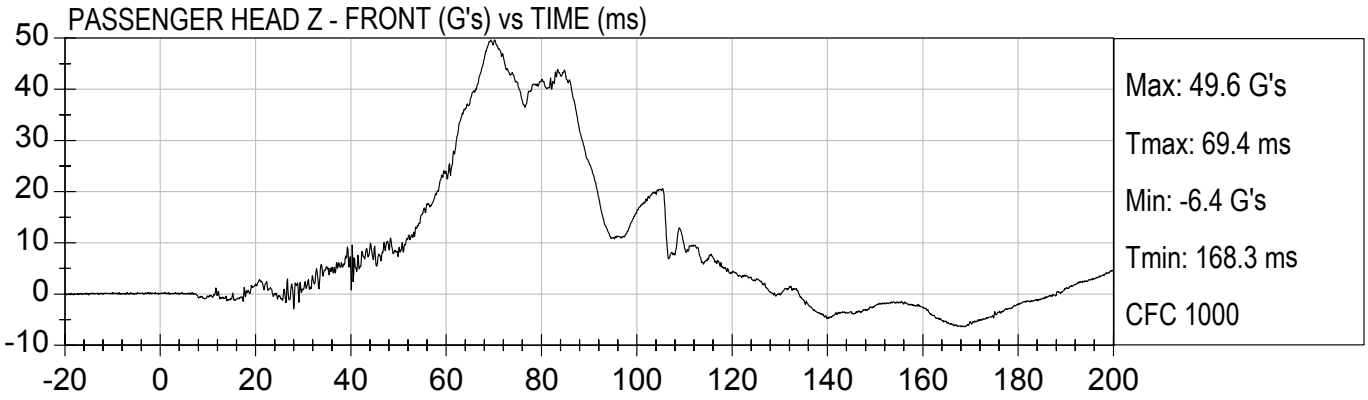

PASSENGER HEAD Yr Velocity (kph) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 0.1 kph
Tmax: 16.3 ms
Min: -26.8 kph
Tmin: 200.0 ms
CFC 180

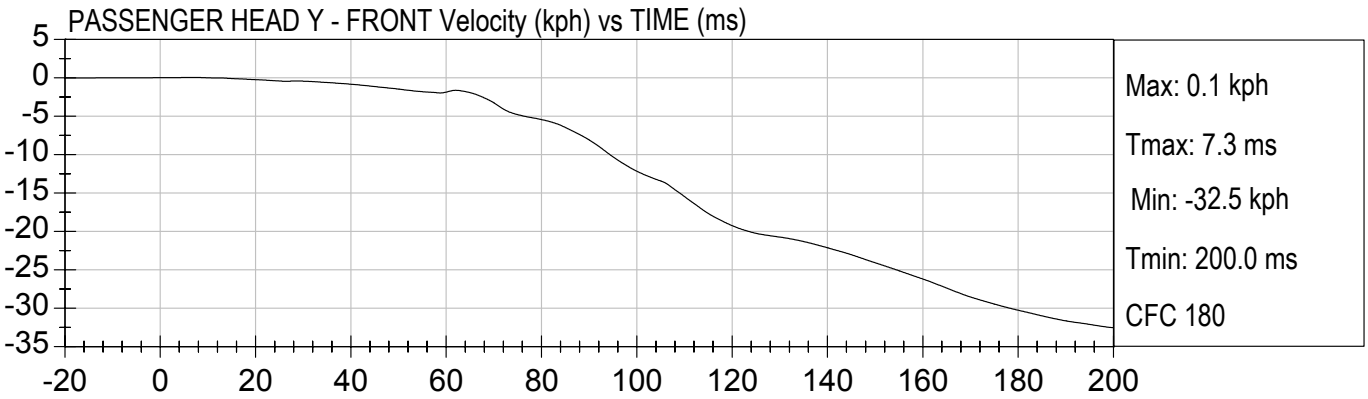

PASSENGER HEAD Zr Velocity (kph) vs TIME (ms)
70
60
50
40
30
20
10
0
-20 0 20 40 60 80 100 120 140 160 180 200
Max: 67.1 kph
Tmax: 200.0 ms
Min: 0.0 kph
Tmin: 0.0 ms
CFC 180

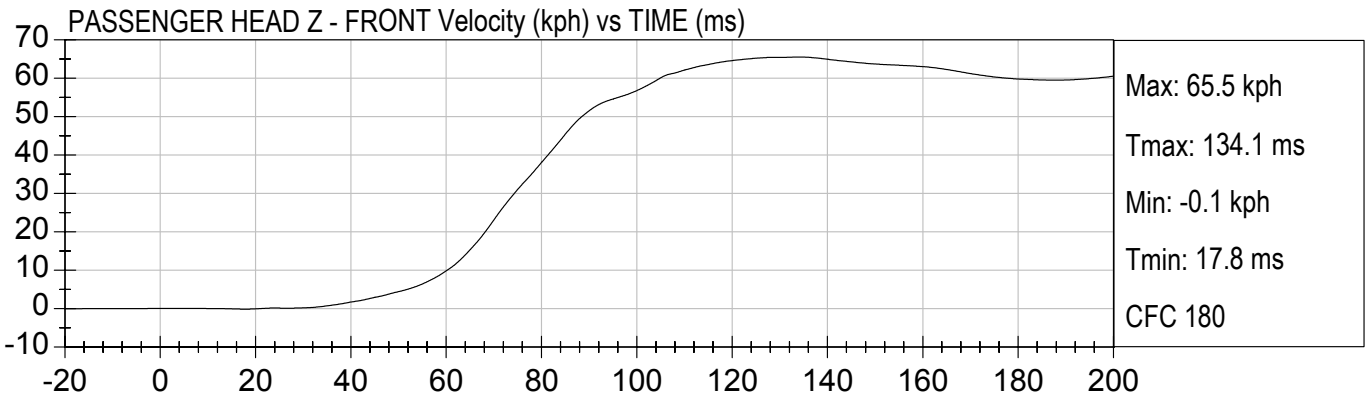
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)



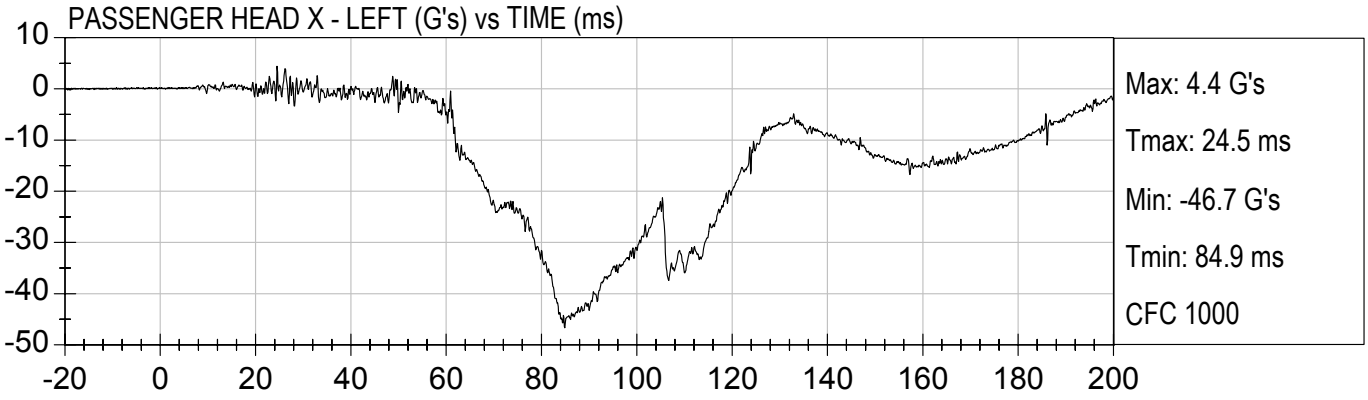


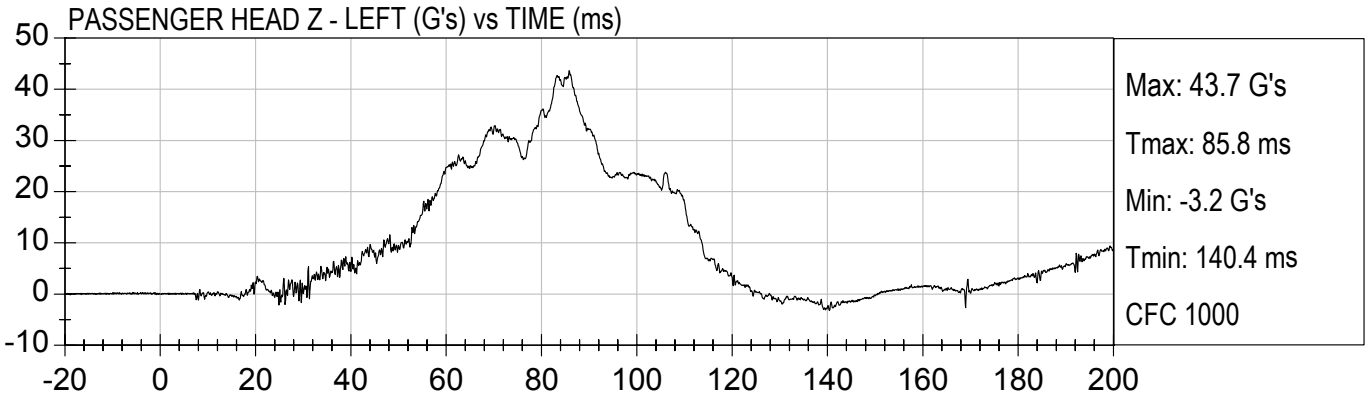


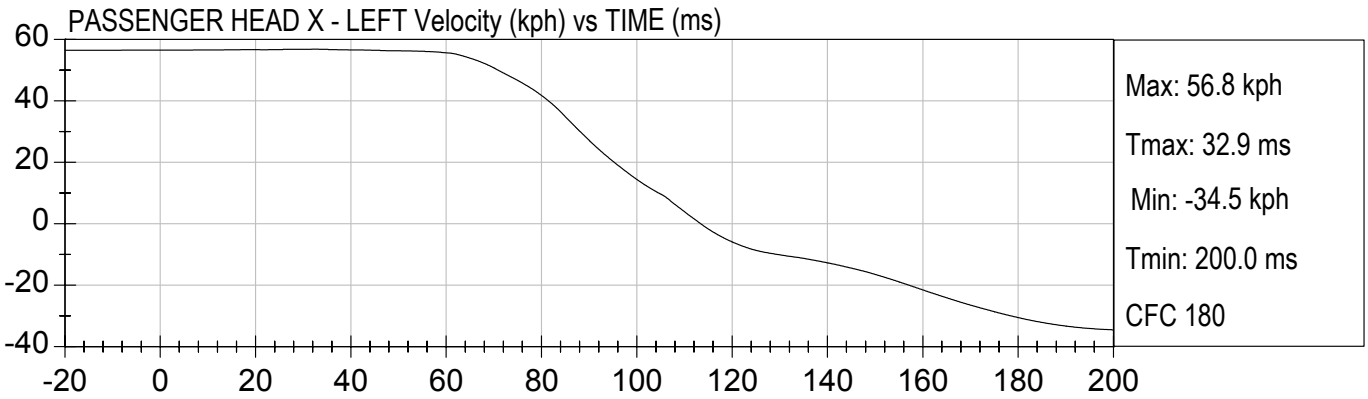


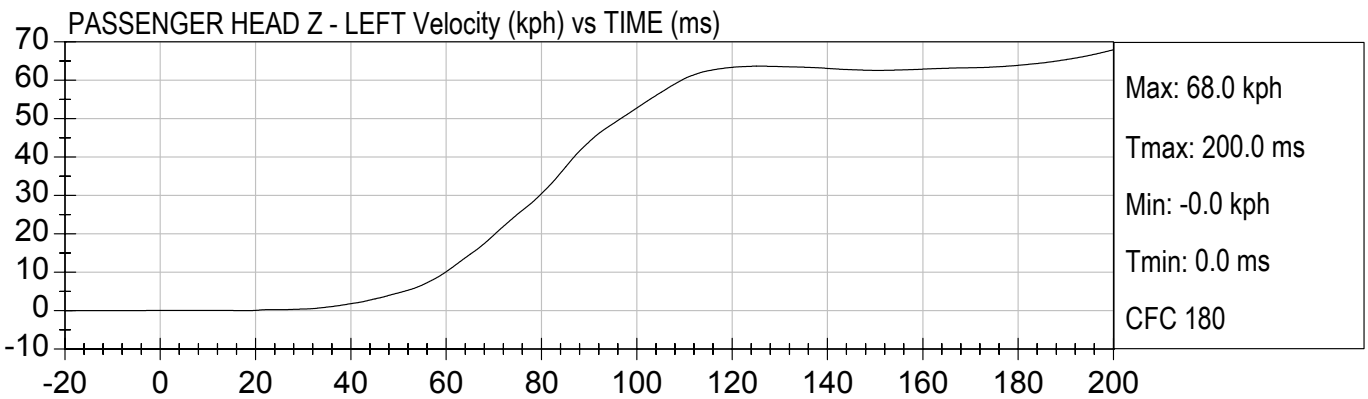
35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)









35MPH FRONTAL IMPACT (M40203)
2004 FORD F-150 SUPERCAB

Test Date: 1/20/2004
Speed: 35.1 mph (56.5 km/h)