REPORT NUMBER: NCAP-MGA-2005-005

NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST

FORD MOTOR COMPANY
2005 Ford Mustang
NHTSA NUMBER: M50206

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

Test Date: December 1, 2004

Final Report Date: January 18, 2005

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
RULEMAKING
OFFICE OF CRASHWORTHINESS STANDARDS
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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 2005 Ford Mustang at MGA Research Corporation on December 1, 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 499 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	325	367
Max. Thorax Accel. (3ms Clip)	G's	60	37	40
Left Femur Force	Newton	10009	-639	-2769
Right Femur Force	Newton	10009	-2059	-1264

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TABLE OF CONTENTS

SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

This 56.3 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 2005 Ford Mustang at a velocity of 56.5 kph. The test was performed at MGA Research Corporation on December 1, 2004. Pre-and post-test photographs of the vehicle and dummies can be found in Appendix A.

One real-time camera and fifteen 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 130 channels of data were recorded on an on-board data acquisition system. Appendix B contains the vehicle 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 499 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, chest, and abdomen contacted the airbag. The driver's head also contacted the headrest. The driver's knees contacted the bolster. 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)
Driver	325.4	36.7	-25.3	-639	-2059
Passenger	366.7	40.3	-26.8	-2769	-1264

TEST NOTES

None

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 2005 Ford Mustang
Test Program: 35mph Frontal Impact

NHTSA No.: M50206
Test Date: 12/01/04

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: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/hr	56.5
Test Weight	kg	1735.0
Average Rebound	mm	1930
Maximum Static Crush	mm	499
Impact Angle	degrees	0.0

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		
Seat Track Shift (mm)	0	0
Seat Back Failure	None	None
Glazing Damage	None	

TEST DUMMY INFORMATION

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

16mm MOVIE COVERAGE

High Speed	15
Real Time	1
Total	16

Driver ATD Sensors	46
Passenger ATD Sensors	42
Belt Assessment Sensors	5
Vehicle Structure Accelerometers	9
Total	102

DATA SHEET NO. 2

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2005 Ford Mustang
Test Program: 35mph Frontal Impact

NHTSA No.: M50206
Test Date: 12/01/04

TEST VEHICLE INFORMATION

Manufacturer	Ford Motor Company
Model	Mustang
Body Style	2 Door Coupe
NHTSA No.	M50206
VIN	1ZVFT80N555124042
Color	Silver
Delivery Date	11/22/04
Odometer Reading (mile)	9.1
Dealer	West Herr Ford
Transmission	Automatic
Final Drive	Rear
Number of Cylinders	6
Engine Displacement (L)	4.0
Engine Placement	Longitudinal
Automatic Door Lock (ADL)	Yes
Owner's Manual Details Instructions on Disabling ADLs	Yes

TEST VEHICLE OPTIONS

Driver Airbag	Yes
Passenger Airbag	Yes
Force Limiter	Yes
Pretensioner	Yes
Power Windows	Yes
Power Steering	Yes
Power Door Locks	Yes
Telescope Wheel	Yes
Air Conditioning	Yes
Power Brakes	Yes
Disc Brakes, Front	Yes
Disc Brakes, Rear	Yes
Anti-lock Brakes	Yes
AM/FM/CD	Yes
Anti-theft System	Yes
Cruise Control	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company
Date of Manufacture	11/04

GVWR (kg)	2004
GAWR Front (kg)	954
GAWR Rear (kg)	1054

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	P215/65R16	P215/65R16
Tire Size on Vehicle	P215/65R16	P215/65R16
Tire Manufacturer	BF Goodrich	BF Goodrich

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench		
Number Of Occupants	2	2		4
Capacity Wt. (VCW) (kg)				327
Cargo Wt. (RCLW) (kg)				54.4

DATA SHEET NO. 2... (continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	413.7	347.5		453.1	418.2	
Right	kg	421.8	348.4		440.0	423.7	
Ratio	%	54.6	45.4		51.5	48.5	
Totals	kg	835.5	695.9	1531.4	893.1	841.9	1735.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1531.4
Weight of 2 P572E ATDs	kg	156.0
Rated Cargo/Luggage Weight (RCLW)	kg	54.4
Calculated Vehicle Target Weight (TVTW)	kg	1741.8

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG(aft of front axle)
As Delivered	mm	726	724	744	738	1237
As Tested	mm	715	715	717	711	1321
Post Test	mm	736	801	702	726	

Vehicle Wheelbase (mm): 2722

Weight of Ballast secured in cargo area (kg): 0.0

Vehicle Components Removed: Tank lid, exhaust

Ballast weight does not include instrumentation and data acquisition system.

FUEL SYSTEM DATA

Fuel System Capacity From Owner's Manual (L): 61.7

Usable Capacity Figure Furnished by COTR (L): 61.7

Actual Test Volume (L): 18.9

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

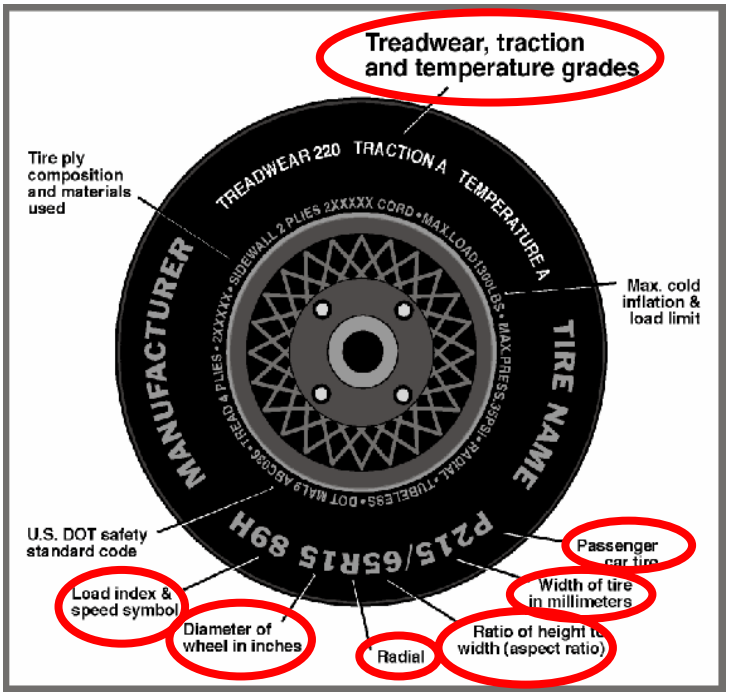
DATA SHEET NO. 3

TEST VEHICLE TIRE INFORMATION

Test Vehicle: 2005 Ford Mustang
Test Program: 35mph Frontal Impact

NHTSA No.: M50206
Test Date: 12/01/04

Vehicle Year	2005	Vehicle Make	Ford
VIN	1ZVFT80N555124042	Vehicle Model	Mustang



	Front	Rear
Tire Manufacturer	BF Goodrich	BF Goodrich
Tire Name	Traction T/A	Traction T/A
Tire Type	Touring/Sport	Touring/Sport
Tire Width (mm)	215	215
Ratio of Height to Width (aspect ratio)	65	65
Radial	R	R
Wheel Diameter	16	16
Load Index & Speed Symbol	96T	96T
Treadwear	620	620
Traction Grade	A	A
Temperature Grade	B	B

DATA SHEET NO. 4

POST IMPACT DATA

Test Vehicle: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04

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	4499	4133	366
Center	mm	4764	4265	499
Right Side	mm	4500	4185	315

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	2031
Center	mm	1851
Right Side	mm	1908
Average	mm	1930

DATA SHEET NO. 5

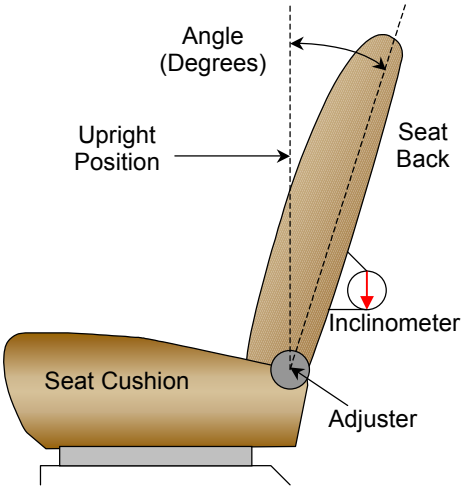
TEST VEHICLE INFORMATION

Test Vehicle: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04

NORMAL DESIGN RIDING POSITION

The driver and passenger seat back is positioned to the manufacturer's designated angle. The procedure is as follows: Adjust seatback at forward-most locking position or forward stop (measured from upright position). The driver and passenger seatback angle (measured from upright position) is 25.9°.

Driver seat back angle: 13.5° on headrest post
Passenger seat back angle: 13.2° on headrest post



FRONT SEAT ASSEMBLY

SEAT FORE/AFT POSITIONS

The driver and the passenger seat were manually operated.

Driver seat fore/aft total travel:	264 mm
Driver seat fore/aft position:	132 of 264 mm
Passenger seat fore/aft total travel:	240 mm
Passenger seat fore/aft position:	120 of 240 mm

DATA SHEET NO. 5... (continued)

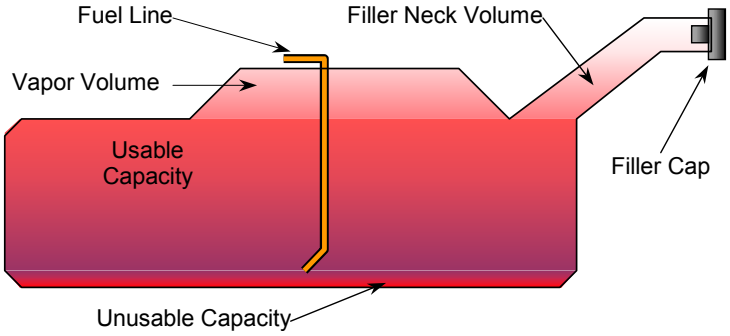
TEST VEHICLE INFORMATION

Test Vehicle: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04

FUEL TANK CAPACITY DATA

The "Usable Capacity" of the standard equipment fuel tank is: 61.7 liters
The "Usable Capacity" of any optional equipment fuel tank is: N/A liters
The "Usable Capacity" used for certification to FMVSS 301 requirements: 61.7 liters
Actual amount of Stoddard solvent added to vehicle for certification test: 18.9 liters

The fuel pump is on the left hand side of the vehicle.

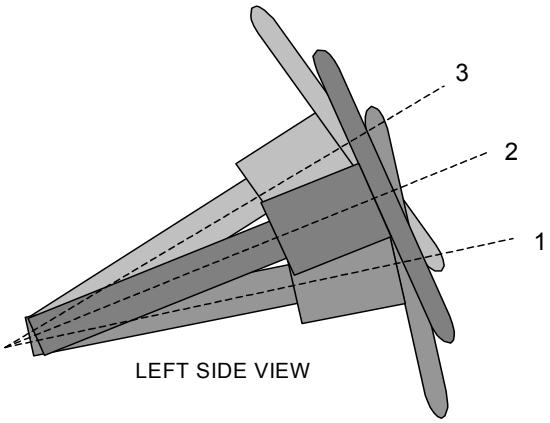


VEHICLE FUEL TANK ASSEMBLY

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: 20.6°
Geometric Center, Position 2: 22.7°
Uppermost, Position 3: 24.8°



STEERING COLUMN ASSEMBLY

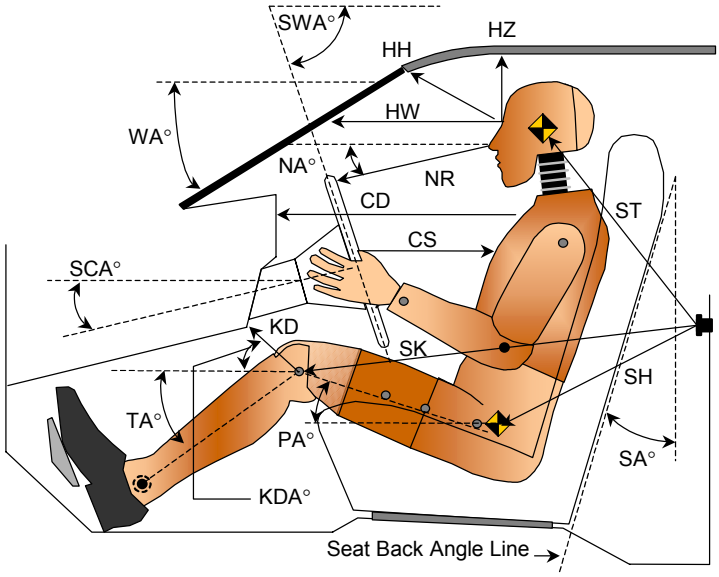
DATA SHEET NO. 6

DUMMY POSITIONING IN VEHICLE

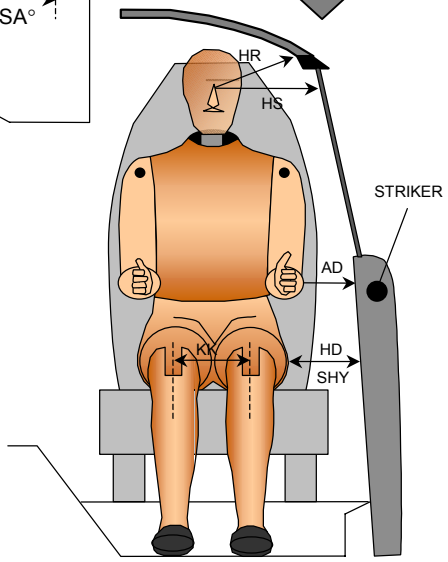
Test Vehicle: 2005 Ford Mustang
Test Program: 35mph Frontal Impact

NHTSA No.: M50206
Test Date: 12/01/04

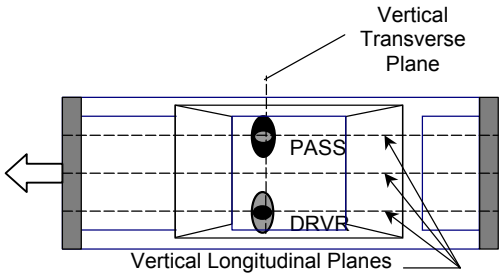
DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS



AD	Arm to Door
HD	H-Point to Door
HR	Head to Side Header
HS	Head to Side Window
KK	Knee to Knee
SHY	Striker to H-Point (Y Axis)



CD	Chest to Dash
CS	Chest to Steering Wheel Hub
HH	Head to Header
HW	Head to Windshield
HZ	Head to Roof
KDA	Knee to Dash Angle
KDL	Left Knee to Dash
KDR	Right Knee to Dash
NA	Nose to Rim Angle
NR	Nose to Rim
PA	Pelvic Angle
RA	Rim to Abdomen
SA	Seat Back Angle
SCA	Steering Column Angle
SH	Striker to H-Point
SK	Striker to Knee
ST	Striker to Head
SWA	Steering Wheel Angle
TA	Tibial Angle
WA	Windshield Angle



DATA SHEET NO. 6... (continued)

DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04

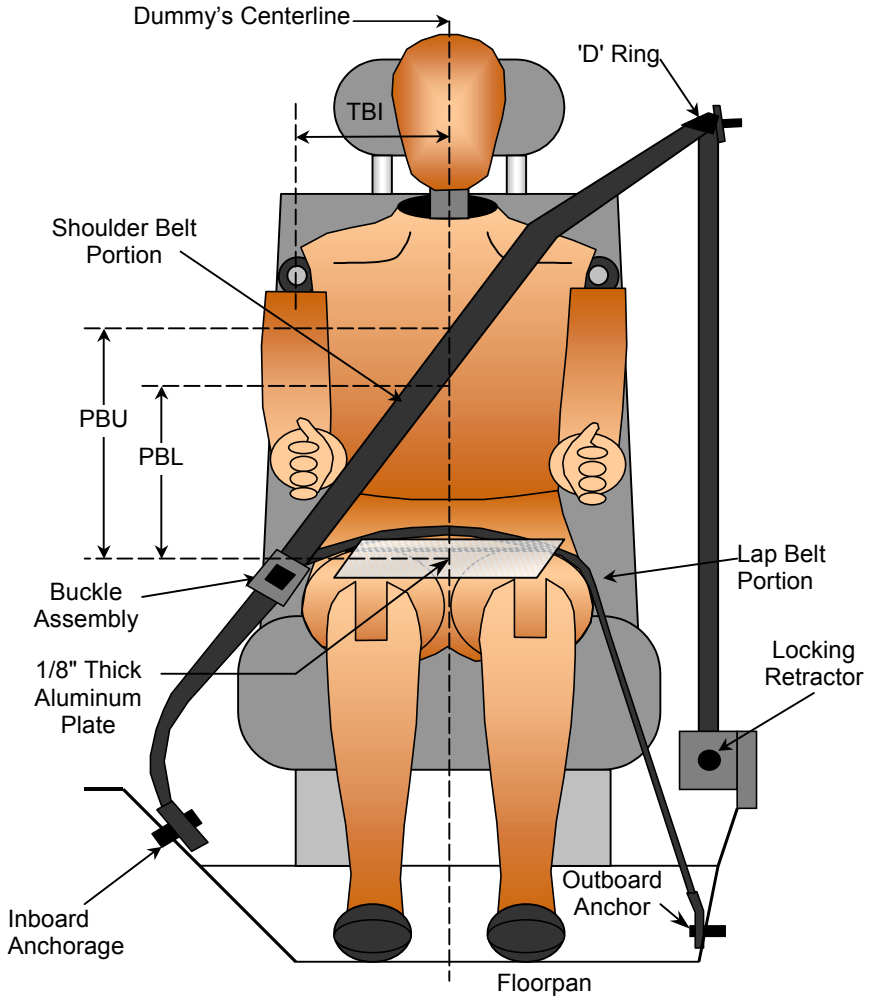
TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield Angle		28.4		
SWA	Steering Wheel Angle		67.3		
SCA	Steering Column Angle		23.7		
SA	Seat Back Angle (headrest post)		13.5		13.2
HZ	Head to Roof (Z)	164	90.0	157	90.0
HH	Head to Header	289	20.4	339	18.5
HW	Head to Windshield	558	0.0	537	0.0
HR	Head to Side Header (Y)	208		197	
NR	Nose to Rim	366	8.9		
CD	Chest to Dash	524		485	
CS	Chest to Steering Hub	315	15.2		
RA	Rim to Abdomen	164	0.0		
KDL	Left Knee to Dash	121	36.0	140	
KDR	Right Knee to Dash	102		139	33.5
PA	Pelvic Angle		22.7		23.2
TA	Tibia Angle		40.9		41.5
KK	Knee to Knee (Y)	260		269	
SK	Striker to Knee	860	96.4	866	94.7
ST	Striker to Head	563	39.1	565	38.4
SH	Striker to H-Point	535	115.9	524	112.3
SHY	Striker to H-Point (Y)	237		242	
HS	Head to Side Window	334		299	
HD	H-Point to Door (Y)	145		115	
AD	Arm to Door (Y)	126		102	
AA	Ankle to Ankle	264		230	

DATA SHEET NO. 7

SEAT BELT POSITIONING DATA

Test Vehicle: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04



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	311	370
PBL - To surface of reference to belt lower edge	mm	236	290

DATA SHEET NO. 8

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

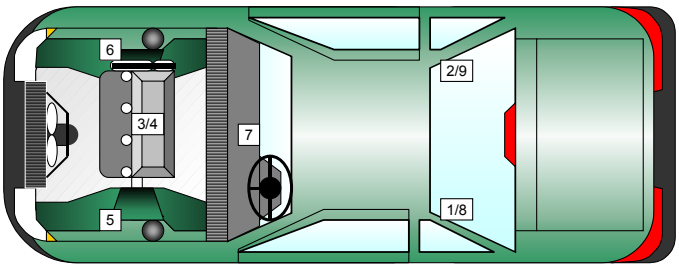
Test Vehicle: 2005 Ford Mustang
Test Program: 35mph Frontal Impact

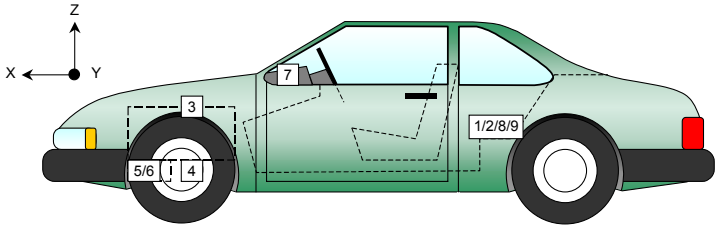
NHTSA No.: M50206
Test Date: 12/01/04

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	1815	-320	446	G's	1.9	126	-32.8	57
2	Right Rear X-Member X	1815	300	426	G's	1.9	126	-34.4	57
3	Engine Top X	3785	-34	980	G's	31.4	59	-95.7	40
4	Engine Bottom X	3635	-5	204	G's	13.8	58	-70.1	47
5	Left Brake Caliper X	3689	-706	234	G's	26.7	70	-68.7	39
6	Right Brake Caliper X	3689	706	234	G's	10.9	27	-74.8	40
7	Instrument Panel X	2970	10	1020	G's	11.6	32	-81.7	24
8	Left Rear X-Member Z	1815	-320	446	G's	8.4	12	-6.4	27
9	Right Rear X-Member Z	1815	300	426	G's	10.5	12	-5.6	21

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: 2005 Ford Mustang
Test Program: 35mph Frontal Impact

NHTSA No.: M50206
Test Date: 12/01/04

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	13.3	221	-47.2	71	22.9	186	-45.0	69
Head CG	Y	G's	1.9	22	-3.4	73	5.7	47	-19.4	85
Head CG	Z	G's	18.5	46	-1.6	17	15.3	39	-1.7	101
Head CG Resultant	N/A	G's	48.1	71			45.9	73		

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	3.7	252	-36.8	73	5.1	212	-39.6	74
Chest CG	Y	G's	0.9	94	-7.2	48	1.1	132	-10.5	81
Chest CG	Z	G's	6.4	44	-9.2	78	6.8	41	-9.7	74
Chest CG Resultant	N/A	G's	37.7	73			41.1	74		

FEMUR PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	325	37	-639	84	589	42	-2769	66
Right Femur	Z	Newtons	383	25	-2059	46	536	34	-1264	52

SEAT BELT SENSOR PEAK VALUES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Lap Belt Force	N/A	Newtons	4691	47			4855	50		
Shoulder Belt Force	N/A	Newtons	3959	67			5698	64		

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	325.4	38.2	53.3	89.3	366.7	40.1	56.1	92.1

CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T^1	T^2	CLIP	T^1	T^2
Chest CG Primary	36.7	71.1	74.1	40.3	72.5	75.5

DATA SHEET NO. 9... (continued)

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2005 Ford Mustang
Test Program: 35mph Frontal Impact

NHTSA No.: M50206
Test Date: 12/01/04

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	2.7	119	-34.4	48	3.2	122	-40.4	59
Pelvis	Y	G's	5.3	85	-6.1	40	3.7	65	-5.7	73
Pelvis	Z	G's	1.8	230	-28.9	72	2.6	28	-26.9	69

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	220	72	-447	103	186	187	-630	57
Neck Force	Y	Newtons	46	132	-76	88	214	74	-255	116
Neck Force	Z	Newtons	1036	62	-204	261	1441	67	-270	211
Neck Moment	X	N•m	4.1	136	-7.0	101	7.0	170	-22.6	120
Neck Moment	Y	N•m	34.9	70	-17.3	98	16.1	142	-35.3	63
Neck Moment	Z	N•m	0.8	50	-4.2	248	26.9	102	-7.2	150

FOOT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Foot Aft	X	G's	5.0	97	-43.3	43	14.6	66	-70.7	48
Left Foot Aft	Z	G's	3.8	53	-30.4	63	13.0	71	-49.0	50
Left Foot Fore	Z	G's	7.4	55	-50.6	36	31.4	37	-112.6	44
Right Foot Aft	X	G's	10.1	98	-106.0	42	3.5	103	-58.7	44
Right Foot Aft	Z	G's	2.4	149	-106.5	39	3.0	234	-41.0	44
Right Foot Fore	Z	G's	21.3	29	-247.5	39	18.3	58	-53.5	46

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	11.8	132	-39.4	34	55.7	66	-7.6	120
Left Lower Moment	Y	N•m	27.6	112	-76.8	68	43.4	45	-57.6	65
Left Lower Force	Z	Newtons	216	267	-3391	65	126	21	-6283	65
Left Upper Moment	X	N•m	70.3	59	-19.4	32	23.3	55	-23.2	79
Left Upper Moment	Y	N•m	21.5	94	-36.7	45	22.5	119	-178.1	66
Left Upper Force	Z	Newtons	186	268	-2496	68	121	121	-5586	66
Right Lower Moment	X	N•m	25.5	72	-6.8	57	38.7	80	-6.2	39
Right Lower Moment	Y	N•m	34.5	96	-55.2	39	10.6	99	-32.0	64
Right Lower Force	Z	Newtons	425	18	-2970	42	103	136	-3255	44
Right Upper Moment	X	N•m	27.3	41	-23.4	69	32.6	68	-12.2	135
Right Upper Moment	Y	N•m	25.3	105	-95.5	42	16.3	118	-124.8	65
Right Upper Force	Z	Newtons	814	18	-2735	64	191	121	-2512	45

DATA SHEET NO. 9... (continued)

HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2005 Ford Mustang
Test Program: 35mph Frontal Impact

NHTSA No.: M50206
Test Date: 12/01/04

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest	X	mm			-25.3	70			-26.8	80

HEAD REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	13.4	223	-47.9	69	22.3	185	-43.7	70
Head CG	Y	G's	2.9	59	-2.9	95	6.3	43	-20.6	87
Head CG	Z	G's	18.7	46	-1.5	16	15.3	39	-1.8	101
Head CG Resultant	N/A	G's	49.7	70			44.5	69		

CHEST REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	3.7	252	-38.5	73	4.9	212	-40.3	75
Chest CG	Y	G's	1.4	97	-6.5	43	1.1	19	-10.1	81
Chest CG	Z	G's	6.5	44	-8.9	78	6.9	41	-9.9	73
Chest CG Resultant	N/A	G's	39.4	73			41.7	75		

REDUNDANT HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	Avg.	T^1	T^2	HIC	Avg.	T^1	T^2
Head CG Primary Redundant	346.7	39.2	53.1	89.1	346.5	39.2	56.1	92.1

REDUNDANT CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T^1	T^2	CLIP	T^1	T^2
Chest CG Primary Redundant	36.6	71.3	74.3	41.2	73.1	76.1

DATA SHEET NO. 10

SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

Test Vehicle: 2005 Ford Mustang
Test Program: 35mph Frontal Impact

NHTSA No.: M50206
Test Date: 12/01/04

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	311	370
PBL - Top surface of reference to belt lower edge	mm	236	290

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	1133	1120
Lap belt length as measured on ATD	mm	906	886
Remainder of belt on reel	mm	811	865
Total belt length for continuous webbing systems	mm	2850	2871

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: 2005 Ford Mustang
Test Program: 35mph Frontal Impact

NHTSA No.: M50206
Test Date: 12/01/04

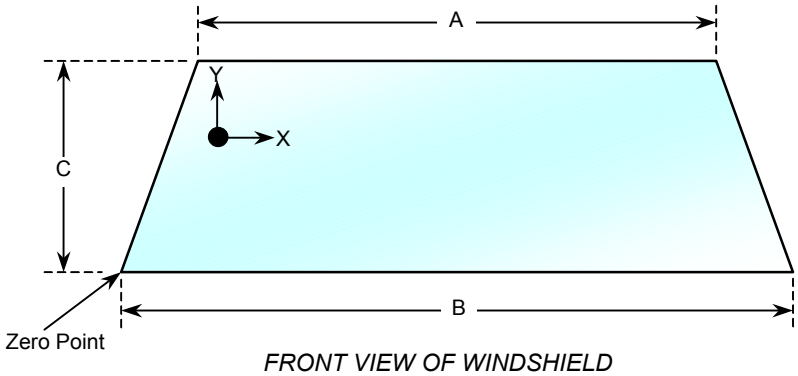
Windshield Mounting Details:
Windshield glass is secured to the vehicle frame with a rubber trim and glue.

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	2105	2105	100
Right Side	2105	2105	100
Total	4210	4210	100



FRONT VIEW OF WINDSHIELD

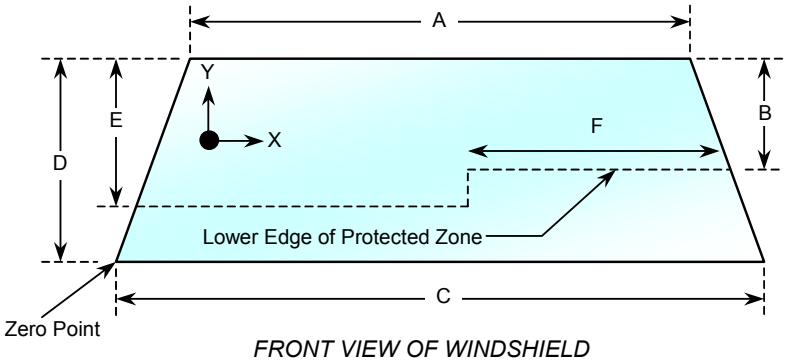
WINDSHIELD DIMENSIONS

Item	Units	Segment Length	Molding Width
A	mm	1234	9
B	mm	1544	17
C	mm	716	9

DATA SHEET NO. 12

WINDSHIELD ZONE INTRUSION FMVSS 219 (Partial) DATA

Test Vehicle: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04



FRONT VIEW OF WINDSHIELD

Item	Units	Value
A	mm	1234
B	mm	353
C	mm	1544
D	mm	716
E	mm	378
F	mm	597

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: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04

Temperature at Time of Impact: 21° C Test Time: 12:20 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)

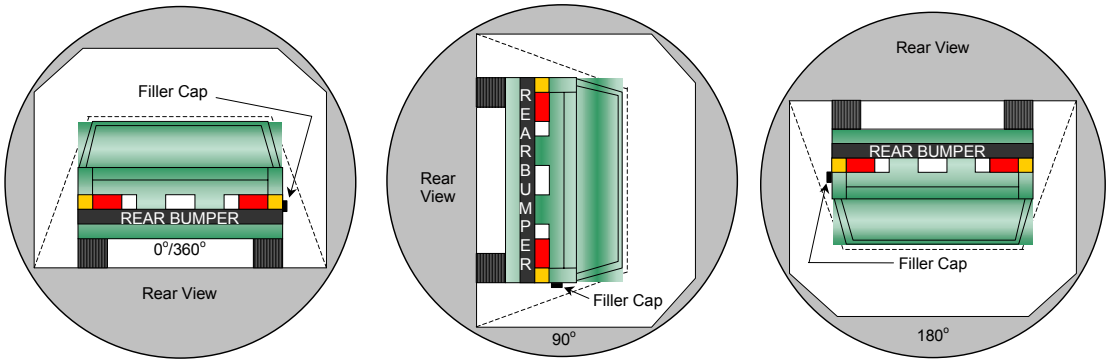
D. Spillage: None

DATA SHEET NO. 14

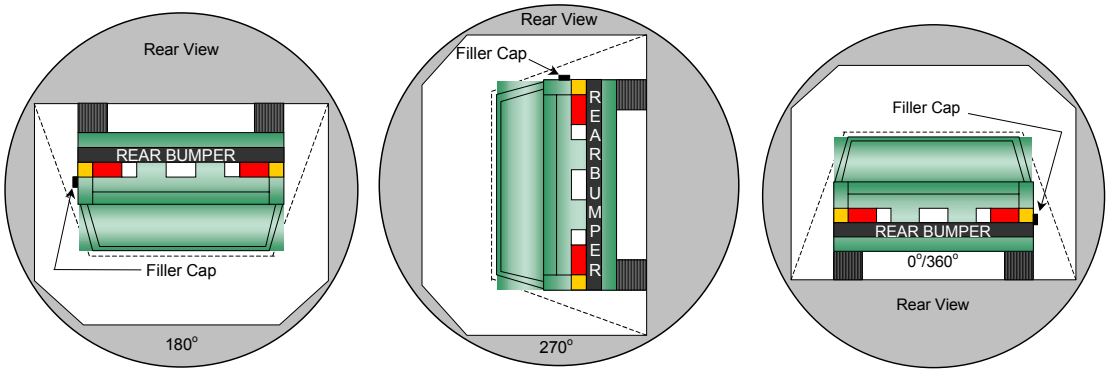
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04

Test Time: 12:20 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°	166	300	0
90° to 180°	149	300	0
180° to 270°	132	300	0
270° to 360°	167	300	0

DATA SHEET NO. 15

VEHICLE MEASUREMENTS

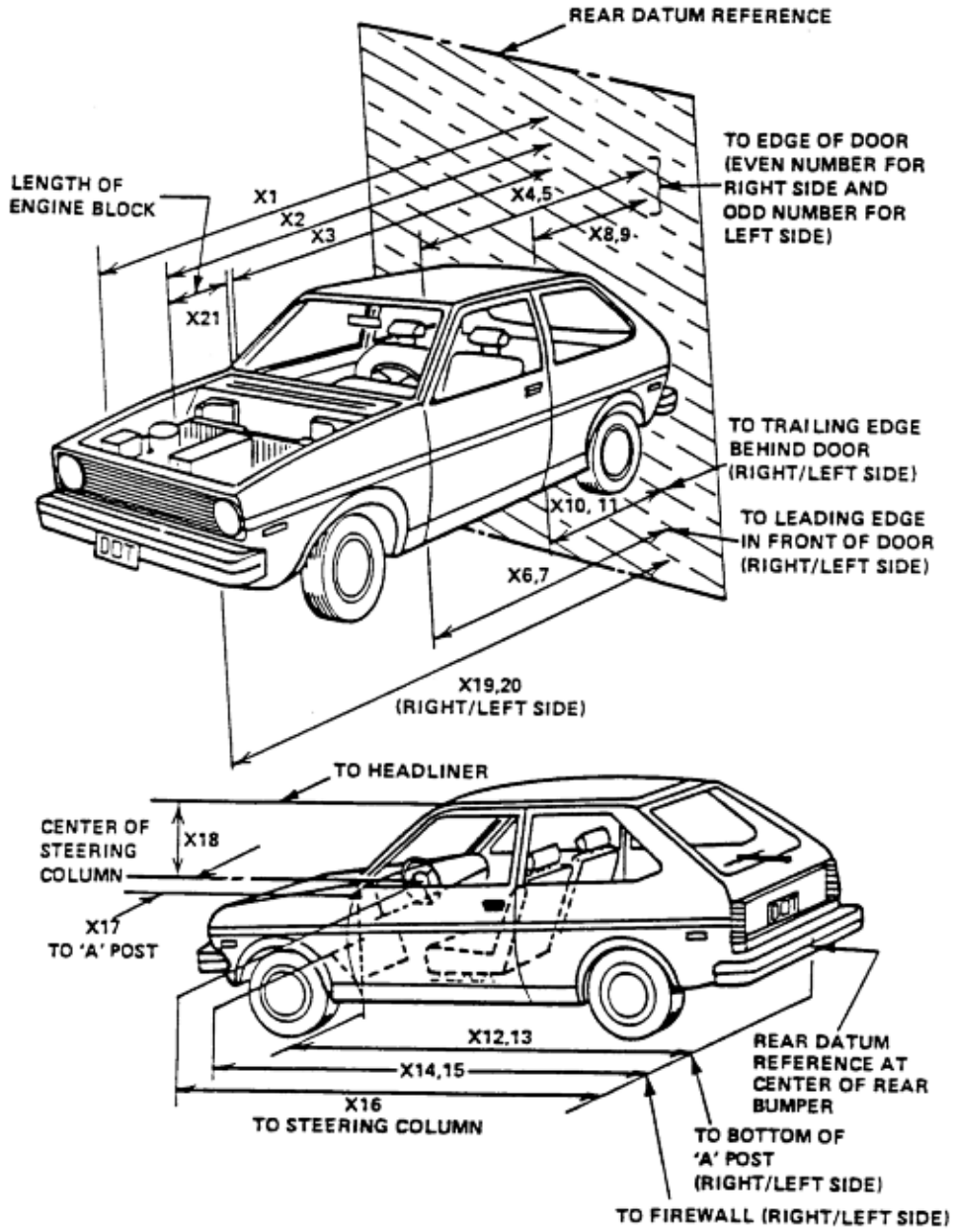
Test Vehicle: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total length of vehicle at centerline	mm	4764	4265	499
2	RSOV to front of engine	mm	3959	3801	158
3	RSOV to firewall centerline	mm	3423	3306	117
4	RSOV to leading edge of right door	mm	3023	3023	0
5	RSOV to leading edge of left door	mm	3023	3032	-9
6	RSOV to lower leading edge of right door	mm	2993	3002	-9
7	RSOV to lower leading edge of left door	mm	2994	3005	-11
8	RSOV to upper leading edge of right door	mm	1732	1734	-2
9	RSOV to upper leading edge of left door	mm	1734	1737	-3
10	RSOV to lower trailing edge of right door	mm	1888	1870	18
11	RSOV to lower trailing edge of left door	mm	1885	1875	10
12	RSOV to bottom of right 'A' pillar	mm	3002	3003	-1
13	RSOV to bottom of left 'A' pillar	mm	3000	3019	-19
14	RSOV to firewall on right side	mm	3347	3330	17
15	RSOV to firewall on left side	mm	3363	3378	-15
16	RSOV to steering column	mm	2595	2597	-2
17	Center of steering column to left 'A' pillar	mm	398	397	1
18	Center of steering column to headlining	mm	404	395	9
19	RSOV to right side of front bumper	mm	4500	4185	315
20	RSOV to left side of front bumper	mm	4499	4133	366
21	Length of engine block	mm	464	464	0
RD	RSOV to right side of dash panel	mm	2828	2836	-8
CD	RSOV to center of dash panel	mm	2902	2908	-6
LD	RSOV to left side of dash panel	mm	2830	2846	-16

DATA SHEET NO. 15... (continued)

VEHICLE MEASUREMENTS

Test Vehicle: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04



DATA SHEET NO. 15... (continued)

VEHICLE MEASUREMENTS

Test Vehicle: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04

Target Vehicle Structural Measurement

	Elements	Pre-Test (mm)
1	Total Length	4764
2	Total Width	1817
3	Bumper Top Height	555
4	Bumper Bottom Height	415
5	Longitudinal Member Top Height	522
6	Distance between Longitudinal Members	800
7	Longitudinal Member Width	85
8	Engine Top Height	965
9	Engine Bottom Height	235
10	Engine and gearbox width	530
11	Front bumper-engine distance	520
12	Front shock absorber fixing height	930
13	Bonnet leading edge height	785
14	Front shock absorber fixing width	1090
15	Front bumper – front axle distance	630
16	Front axle – a pillar distance	773
17	A-pillar – B-pillar distance	1135
18	B-Pillar – rear axle distance	760
19	B-pillar – C-pillar distance	860
20	Roof sill bottom height	1310
21	Roof sill top height	1345
22	Floor sill bottom height	160
23	Floor sill top height	265

DATA SHEET NO. 16

CAMERA LOCATIONS

Test Vehicle: 2005 Ford Mustang
Test Program: 35mph Frontal Impact

NHTSA No.: M50206
Test Date: 12/01/04

No.	Camera View	Location (mm) *			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Side View				13	24
2	Left Front View	1075	-8405	1395	25	1000
3	Steering Column Top	2530	-5840	1580	19	1000
4	Steering Column Bottom	2500	-5840	1035	19	1000
5	Driver Close-up	1619	-9302	1485	50	1000
6	Driver Angle	6800	-4985	1990	50	1000
7	On board Driver Side				10	1000
8	Right Overall	2235	7195	1450	19	1000
9	Right Passenger Half	1005	8310	1420	25	1000
10	Right Close-up	1610	9740	1515	50	1000
11	Right Angle	6710	5019	2000	50	1000
12	Windshield	275	0	2826	14	1000
13	Top Driver	85	-4560	1795	13	1000
14	Top Passenger	90	470	1760	13	1000
15	Pit Front	970	0	-3150	24	1000
16	Pit Rear	3620	0	-3150	25	1000

*COORDINATES:

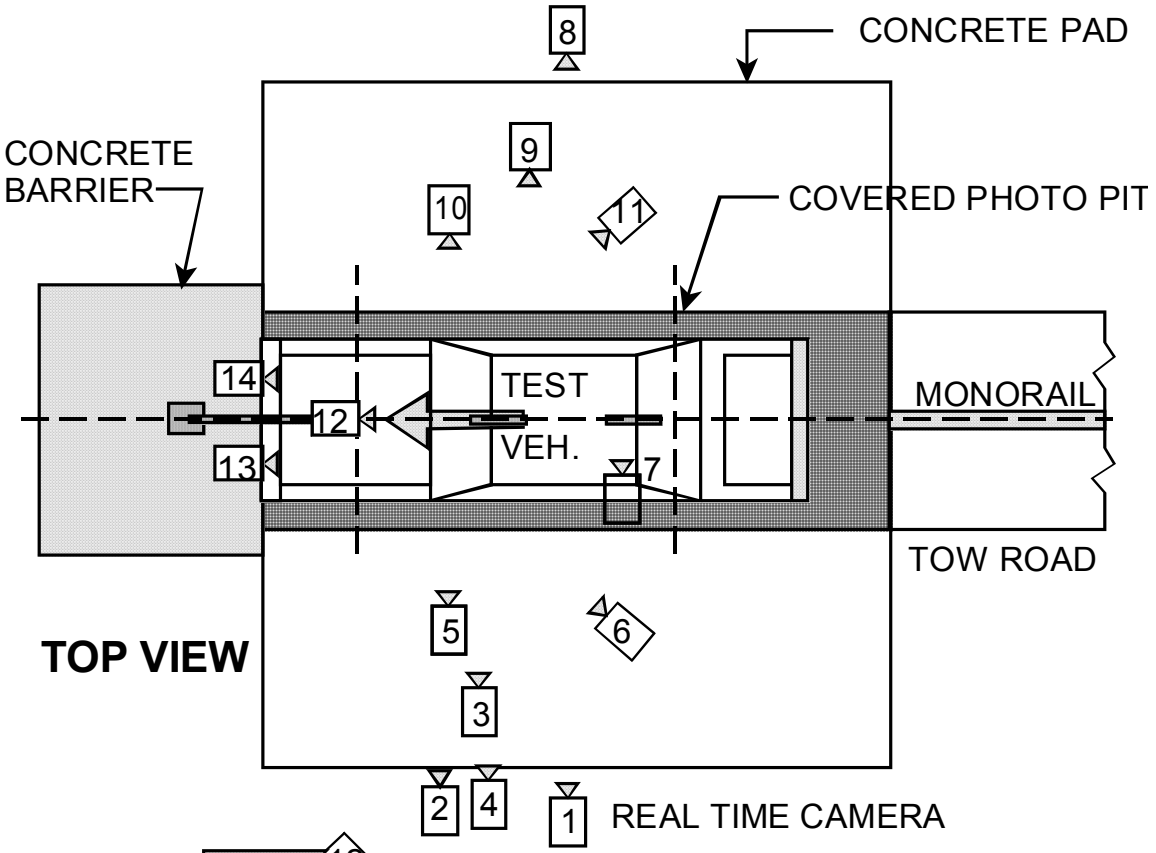
+X = forward of impact plane
+Y = right of monorail centerline
+Z = above ground level

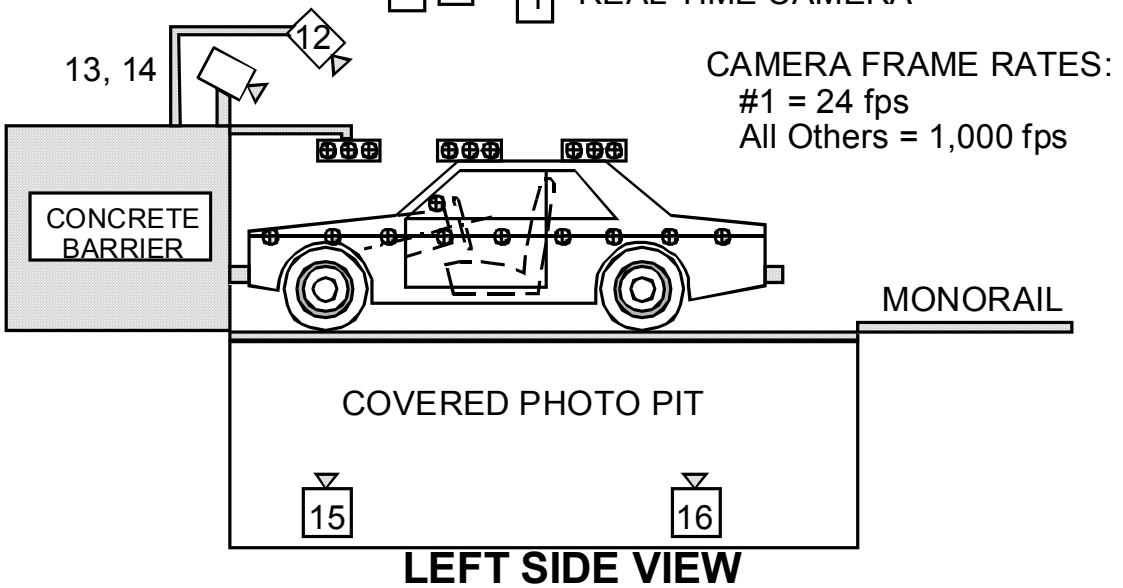
DATA SHEET NO. 16... (continued)

CAMERA LOCATIONS

Test Vehicle: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04

CAMERA POSITIONS FOR FRONTAL IMPACTS





LEFT SIDE VIEW

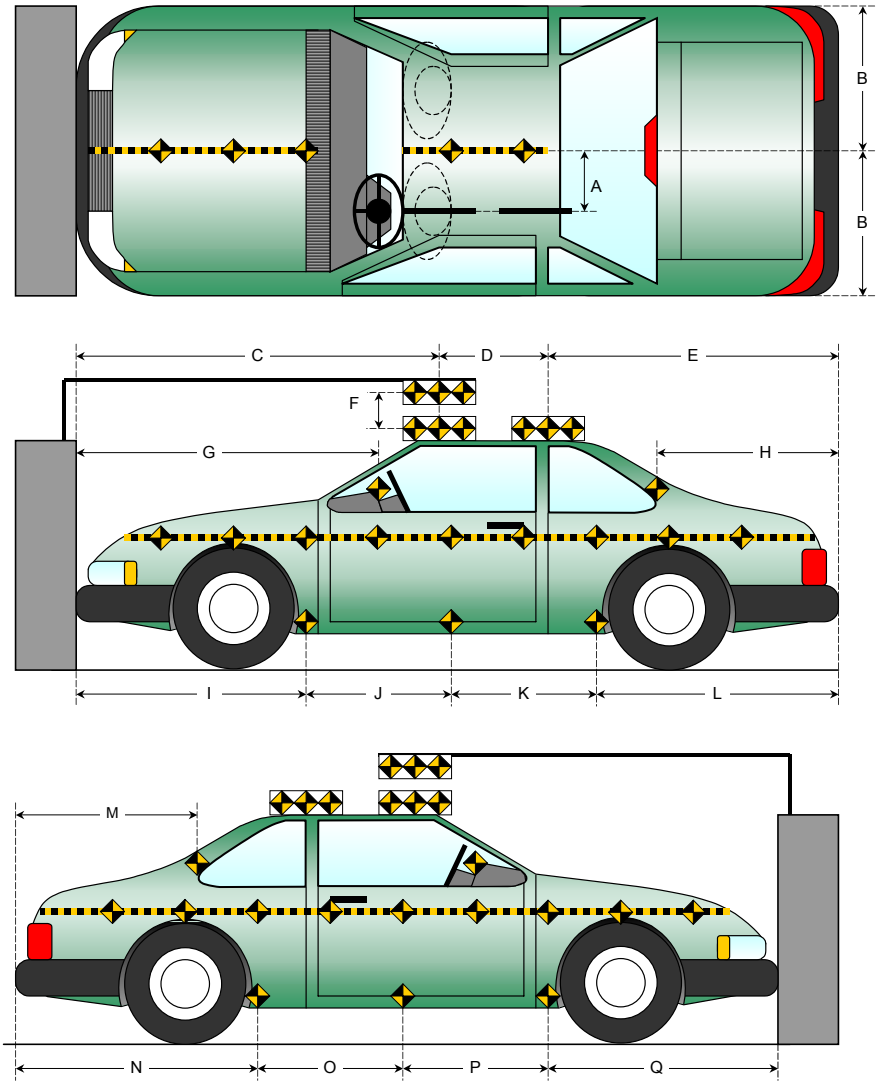
DATA SHEET NO. 17

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2005 Ford Mustang
Test Program: 35mph Frontal Impact

NHTSA No.: M50206
Test Date: 12/01/04

Item	Value
A	369
B	910
C	2399
D	609
E	1756
F	
G	
H	1611
I	1410
J	896
K	896
L	1562
M	1624
N	1570
O	897
P	897
Q	1400



DATA SHEET NO. 18

VEHICLE INTRUSION MEASUREMENTS

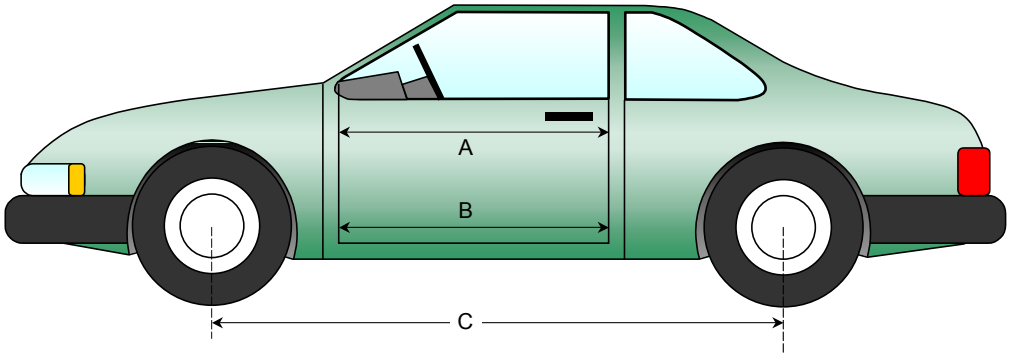
Test Vehicle: 2005 Ford Mustang
Test Program: 35mph Frontal Impact
NHTSA No.: M50206
Test Date: 12/01/04

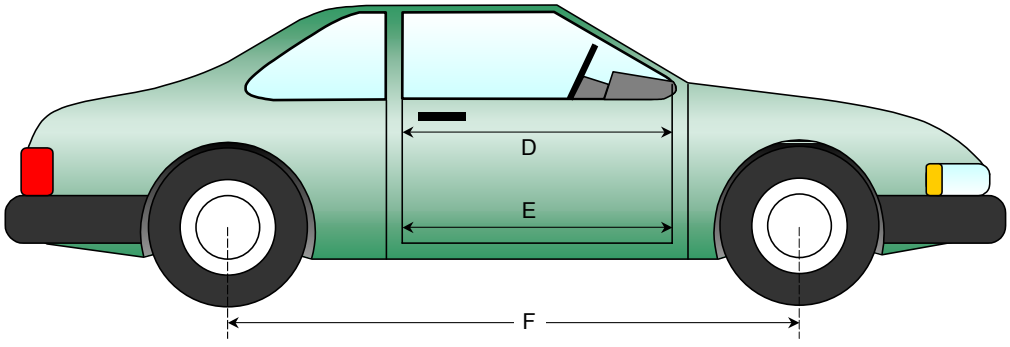
DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1223	1216	7
B	Left Side Lower	mm	1060	1055	5
D	Right Side Upper	mm	1219	1215	4
E	Right Side Lower	mm	1080	1073	7

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2722	2652	70
F	Right Side Wheelbase	mm	2722	2634	88





DATA SHEET NO. 18... (continued)

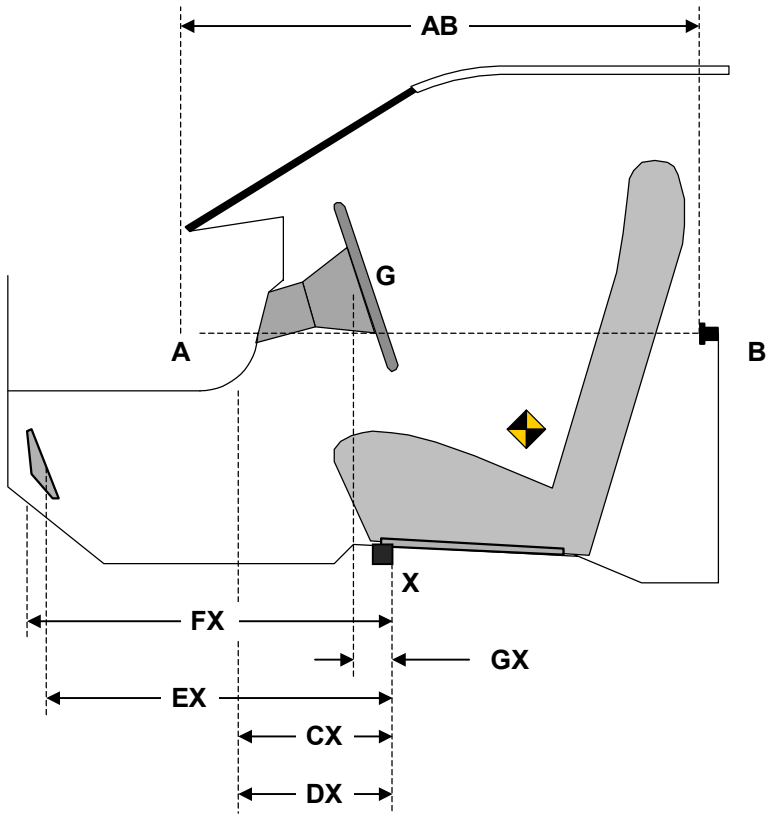
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	1223	1216	7
CX	Left Knee Bolster to X	mm	212	213	-1
DX	Right Knee Bolster to X	mm	228	231	-3
EX	Brake Pedal to X	mm	583	560	23
FX	Foot Rest to X	mm	639	605	34
GX	Center of Steering Column Wheel Hub to X	mm	49	57	-8

X = Front of Seat Track (stationary)



DRIVER COMPARTMENT

DATA SHEET NO. 18... (continued)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2005 Ford Mustang
Test Program: 35mph Frontal Impact

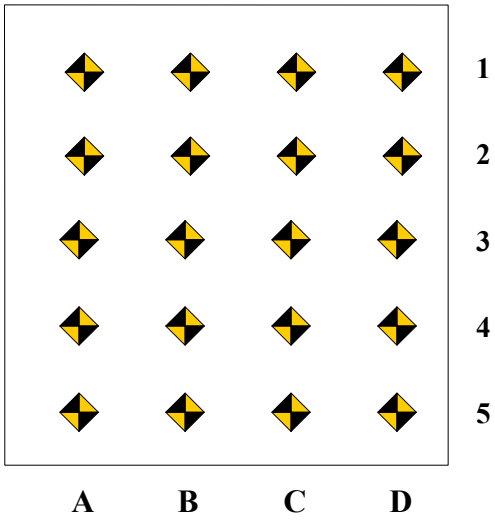
NHTSA No.: M50206
Test Date: 12/01/04

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	740	740	749	749	701	673	674	672	39	67	75	77
2	657	659	671	669	651	614	607	643	6	45	64	26
3	574	578	579	578	570	562	570	576	4	16	9	2
4	427	431	432	431	426	429	430	430	1	2	2	1
5	276	277	272	271	274	275	269	270	2	2	3	1

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	19	18	24	24	29	24	31	30	-10	-6	-7	-6
2	-40	-43	-36	-34	-34	-55	-34	-33	-6	12	-2	-1
3	-93	-91	-91	-82	-91	-98	-128	-98	-2	7	37	16
4	-101	-105	-108	-89	-106	-140	-143	-113	5	35	35	24
5	-105	-109	-109	-78	-112	-146	-148	-109	7	37	39	31

DATA SHEET NO. 18... (continued)

VEHICLE INTRUSION MEASUREMENTS

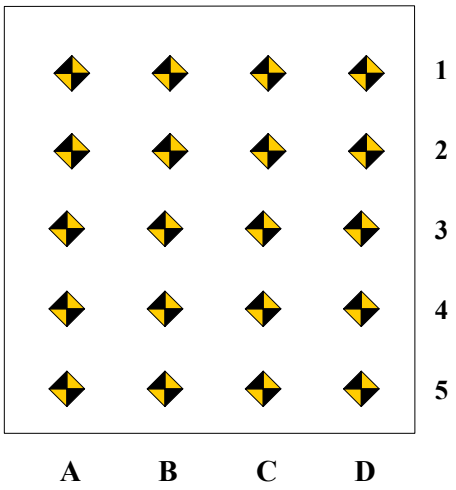
Test Vehicle: 2005 Ford Mustang
Test Program: 35mph Frontal Impact
NHTSA No.: M50206
Test Date: 12/01/04

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	746	748	744	748	699	702	704	713	47	46	40	35
2	666	675	665	675	628	645	633	645	38	30	32	30
3	583	597	590	587	556	569	567	572	27	28	23	15
4	426	447	438	438	418	437	430	431	8	10	8	7
5	277	294	287	289	274	288	280	282	3	6	7	7

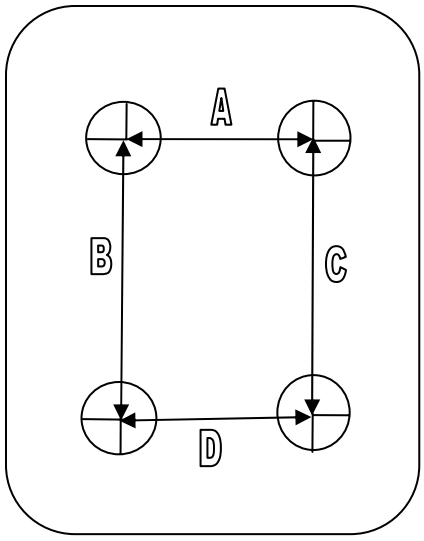
PASSENGER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	19	21	13	21	33	27	15	24	-14	-6	-2	-3
2	-34	-37	-37	-37	-31	-49	-51	-21	-3	12	14	-16
3	-89	-93	-88	-96	-100	-114	-116	-87	11	21	28	-9
4	-92	-103	-104	-99	-104	-132	-135	-112	12	29	31	13
5	-87	-108	-104	-104	-103	-133	-136	-114	16	25	32	10

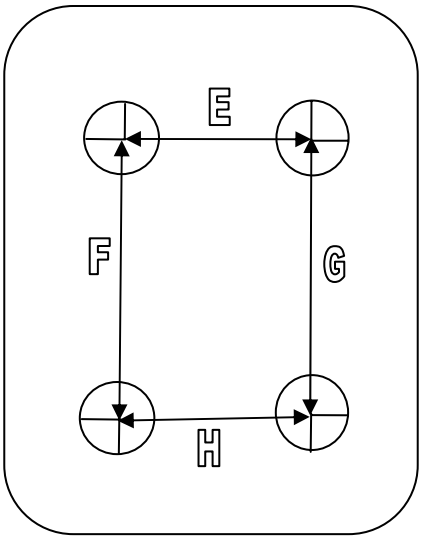
DATA SHEET NO. 18... (continued)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04



Driver



Passenger

UNDERBODY FLOORBOARD DEFORMATION

Measurement	Pre-Test	Post-Test	Difference
A	280	282	-2
B	350	349	1
C	338	337	1
D	286	285	1
E	301	304	-3
F	390	390	0
G	384	383	1
H	290	299	-9

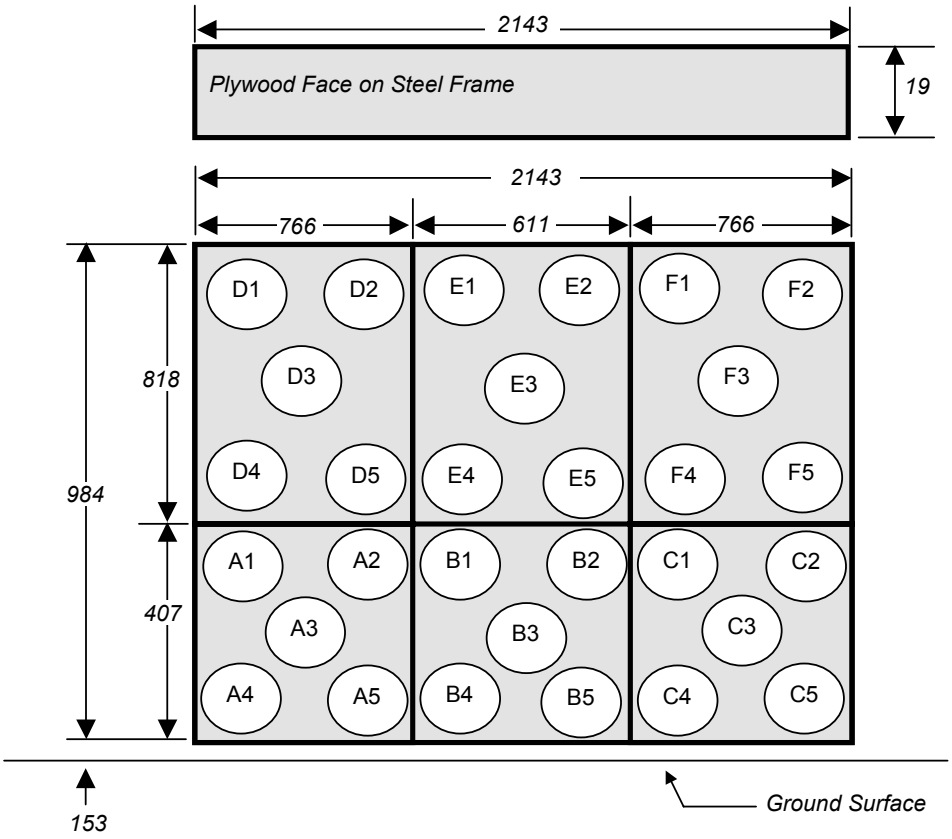
DATA SHEET NO. 19

LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04

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: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04

VEHICLE INFORMATION

VIN: 1ZVFT80N555124042 Wheelbase (mm) : 2722
Vehicle Size Category: Coupe Test Weight (kg) : 1735.0

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): 64.4 Time of Separation (msec): 114

CRUSH PROFILE

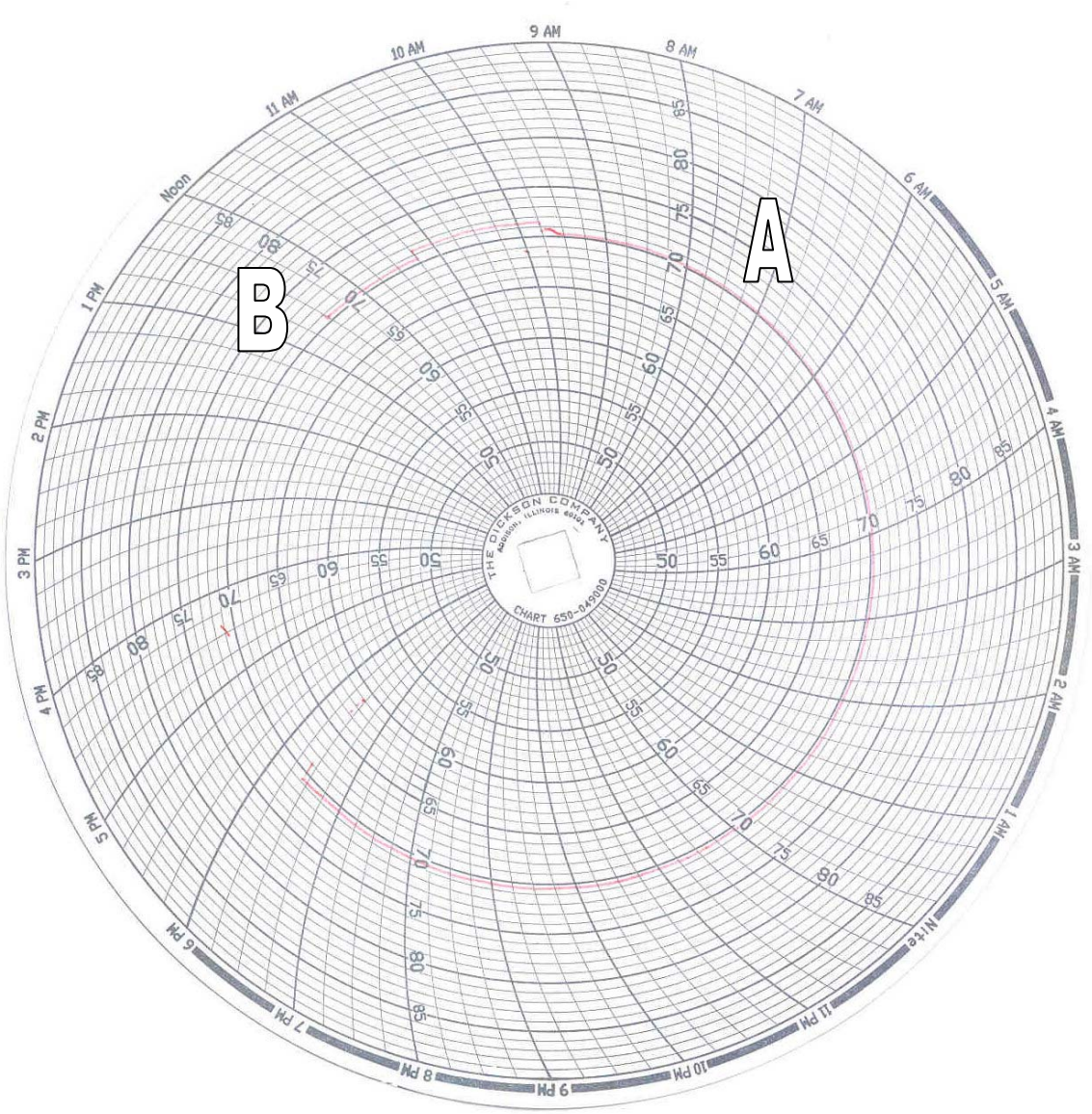
Collision Deformation Classification: Frontal Midpoint of Damage: Centerline
Damage Region Length (mm): 1437 Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4499	4133	366
C2	Crush zone 2 at left side	mm	4635	4155	480
C3	Crush zone 3 at left side	mm	4695	4220	475
C4	Crush zone 4 at right side	mm	4697	4260	437
C5	Crush zone 5 at right side	mm	4638	4234	404
C6	Crush zone 6 at right side	mm	4500	4185	315
L	C1 TO C6	mm	1437	1498	-61

DATA SHEET NO. 21

DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2005 Ford Mustang NHTSA No.: M50206
Test Program: 35mph Frontal Impact Test Date: 12/01/04



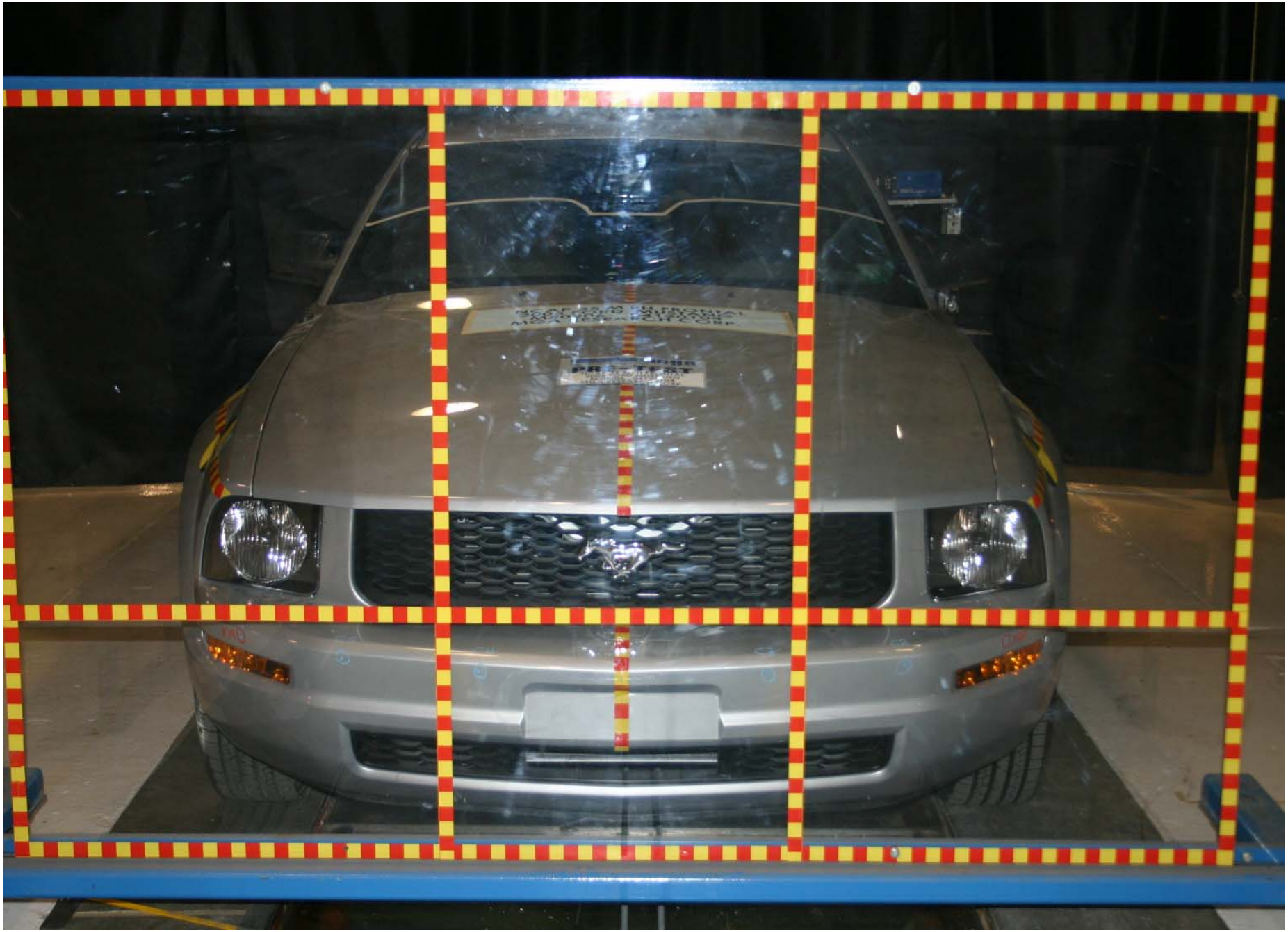
A = Dummies installed in vehicle at 7:00 am

B = Test conducted at 12:20 pm

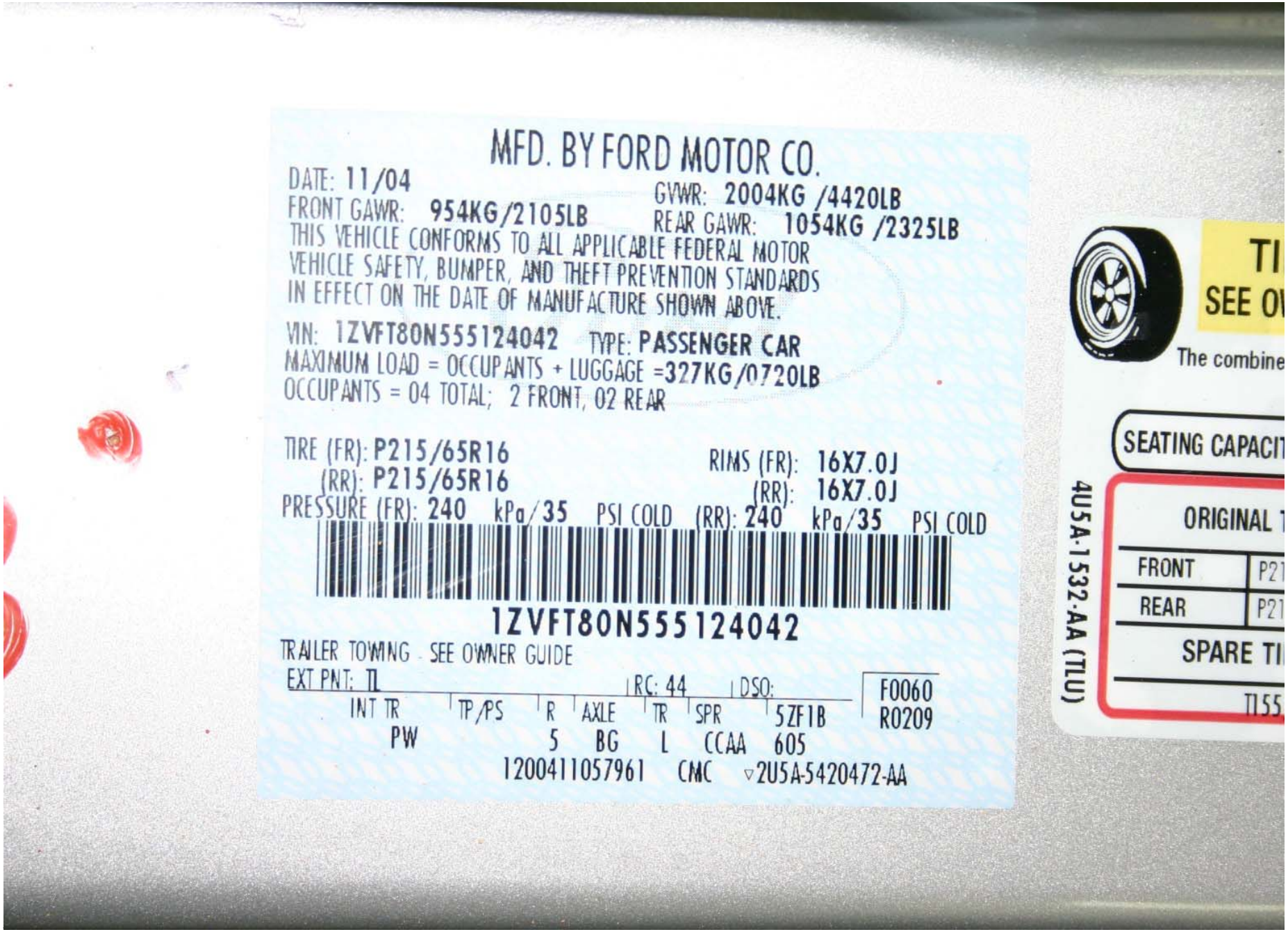
APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS



Load Cell Location



A-2.

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 Front Three-Quarter View of Test Vehicle

Post-Test Right Front 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 Left Rear Three-Quarter View of Door

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

Pre-Test Right Rear Three-Quarter View of Door

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

Pre-Test Windshield View

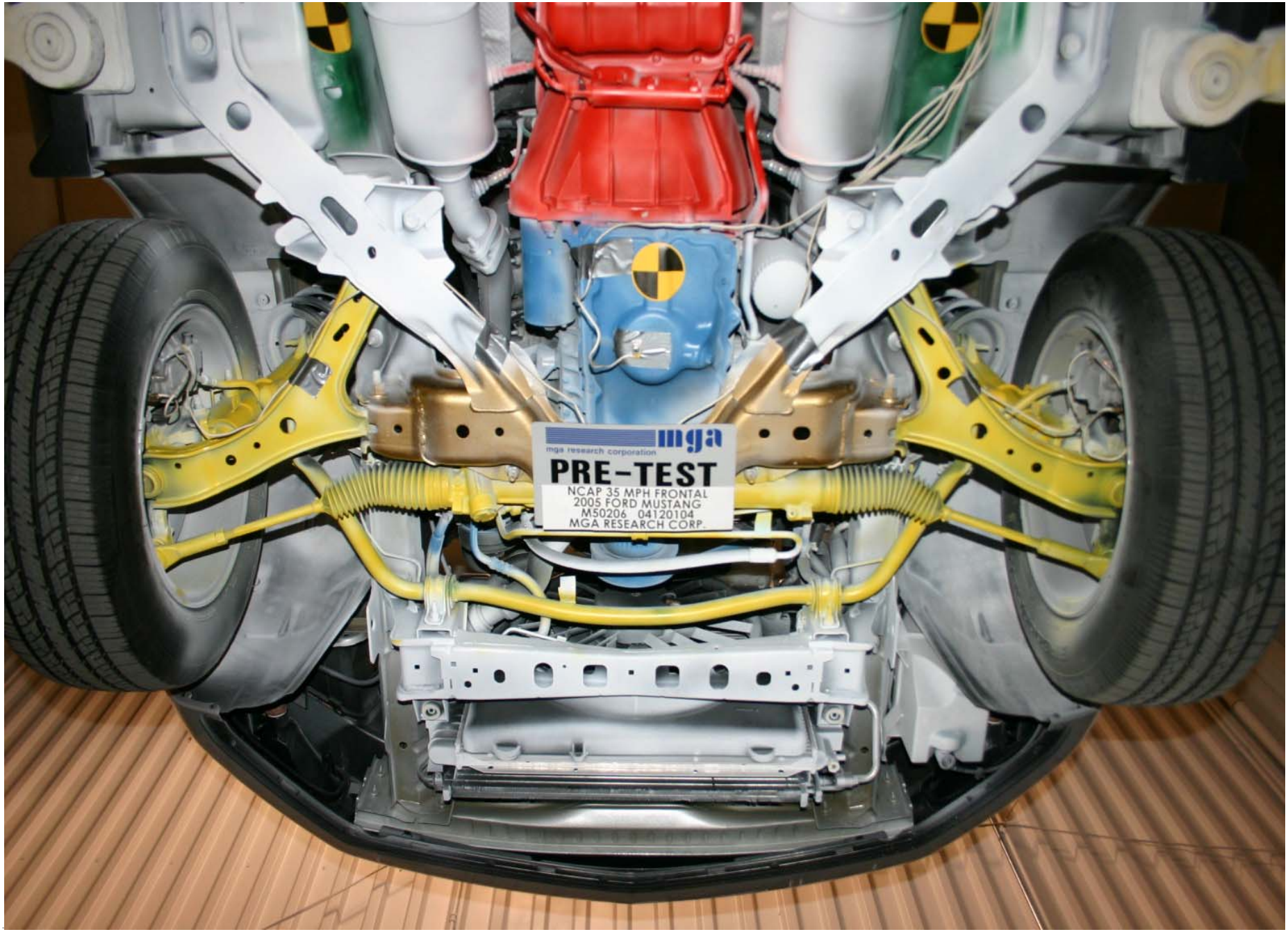
Post-Test Windshield View

Pre-Test Engine Compartment View

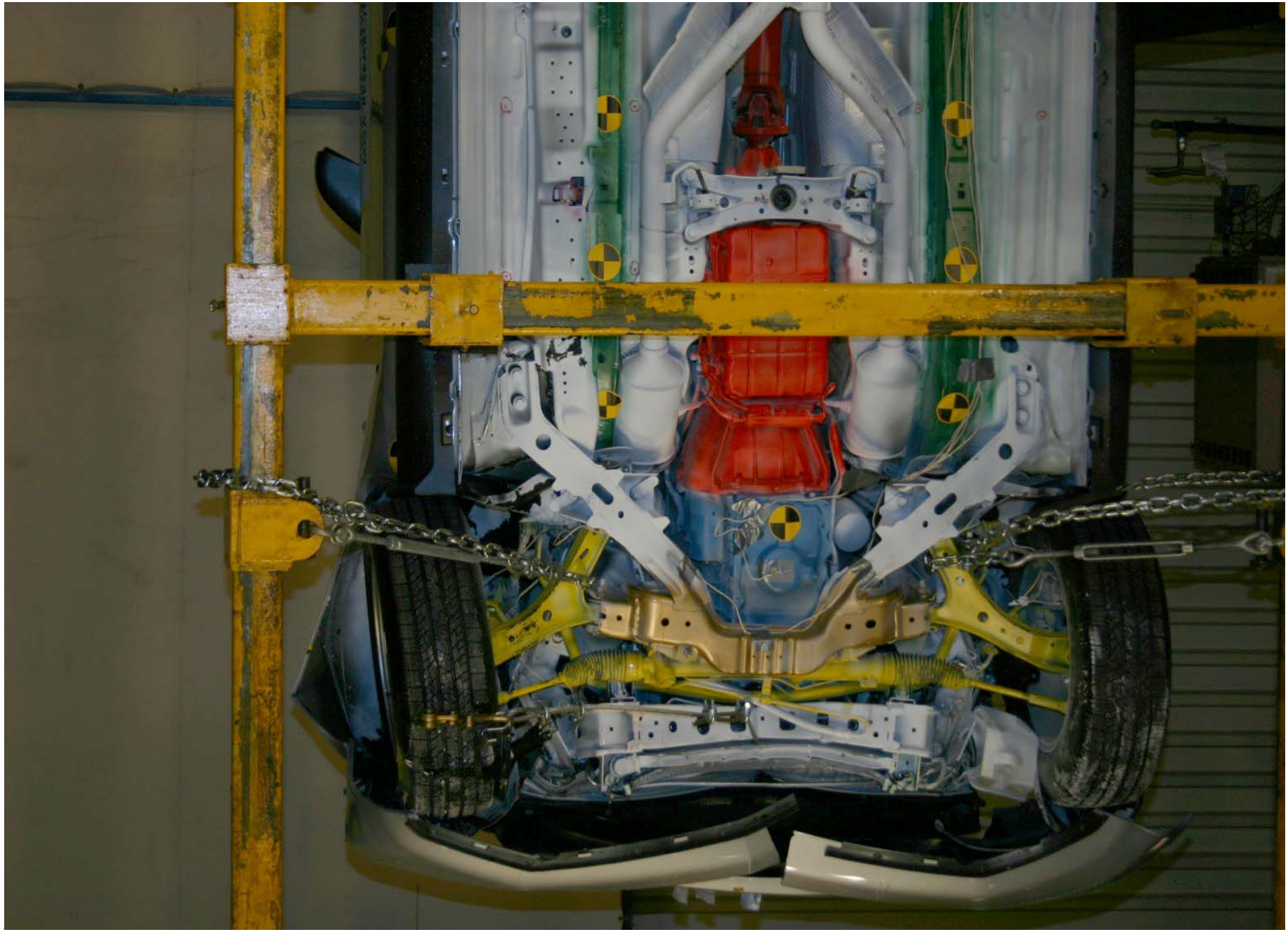
Post-Test Engine Compartment View

Pre-Test Fuel Filler Cap View

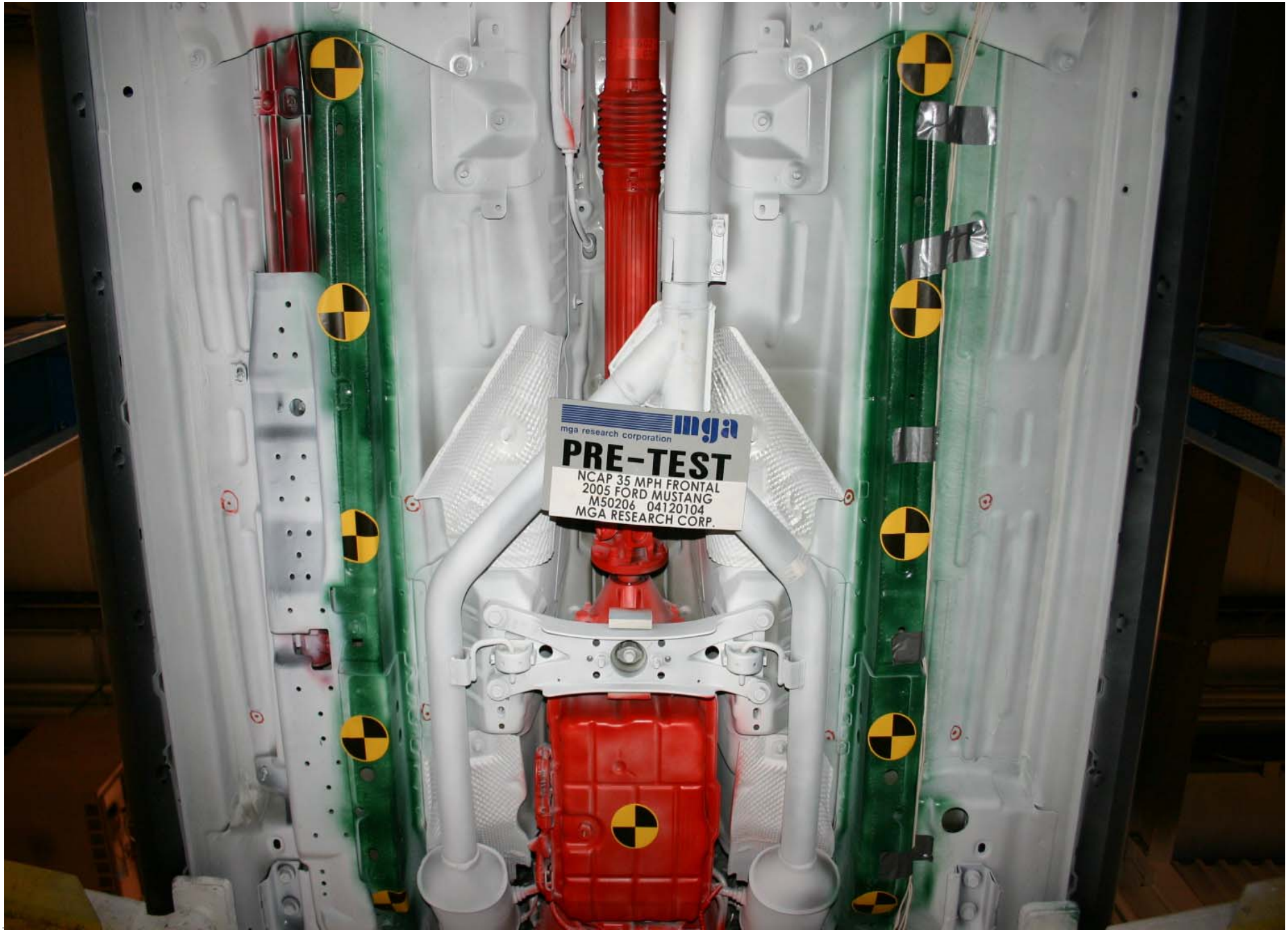
Post-Test Fuel Filler Cap View



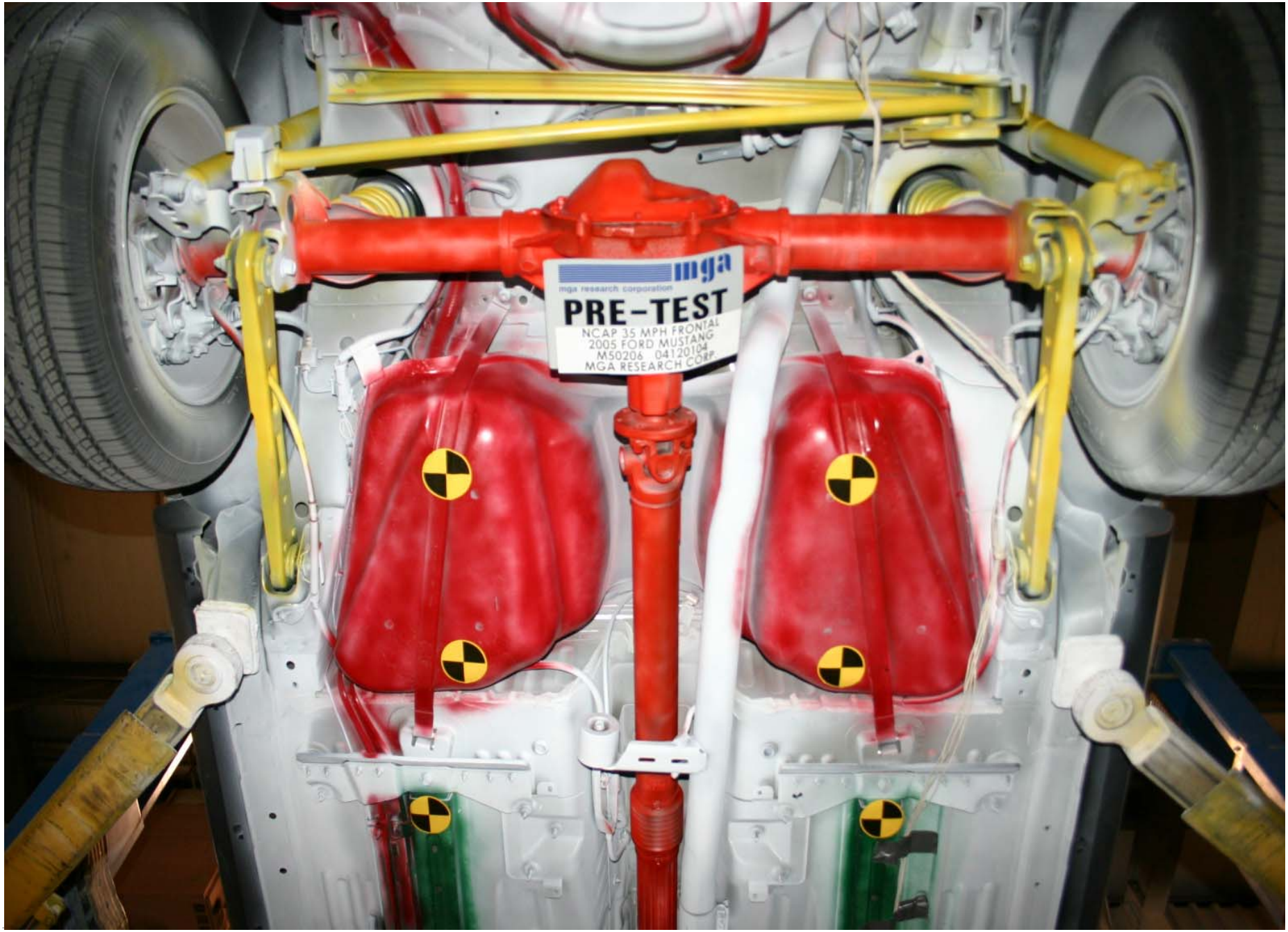
Pre-Test Front Underbody View



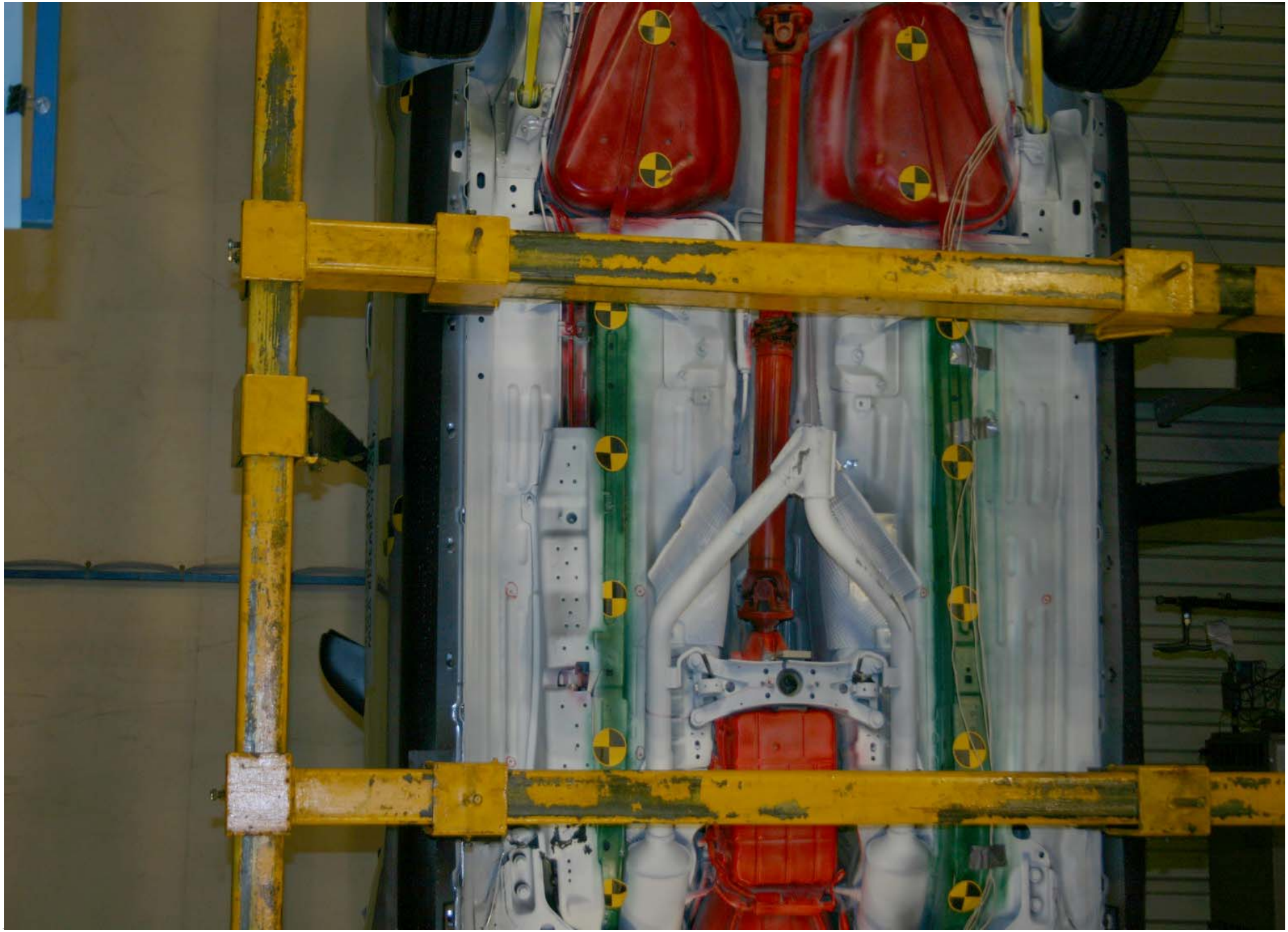
Post-Test Front Underbody View



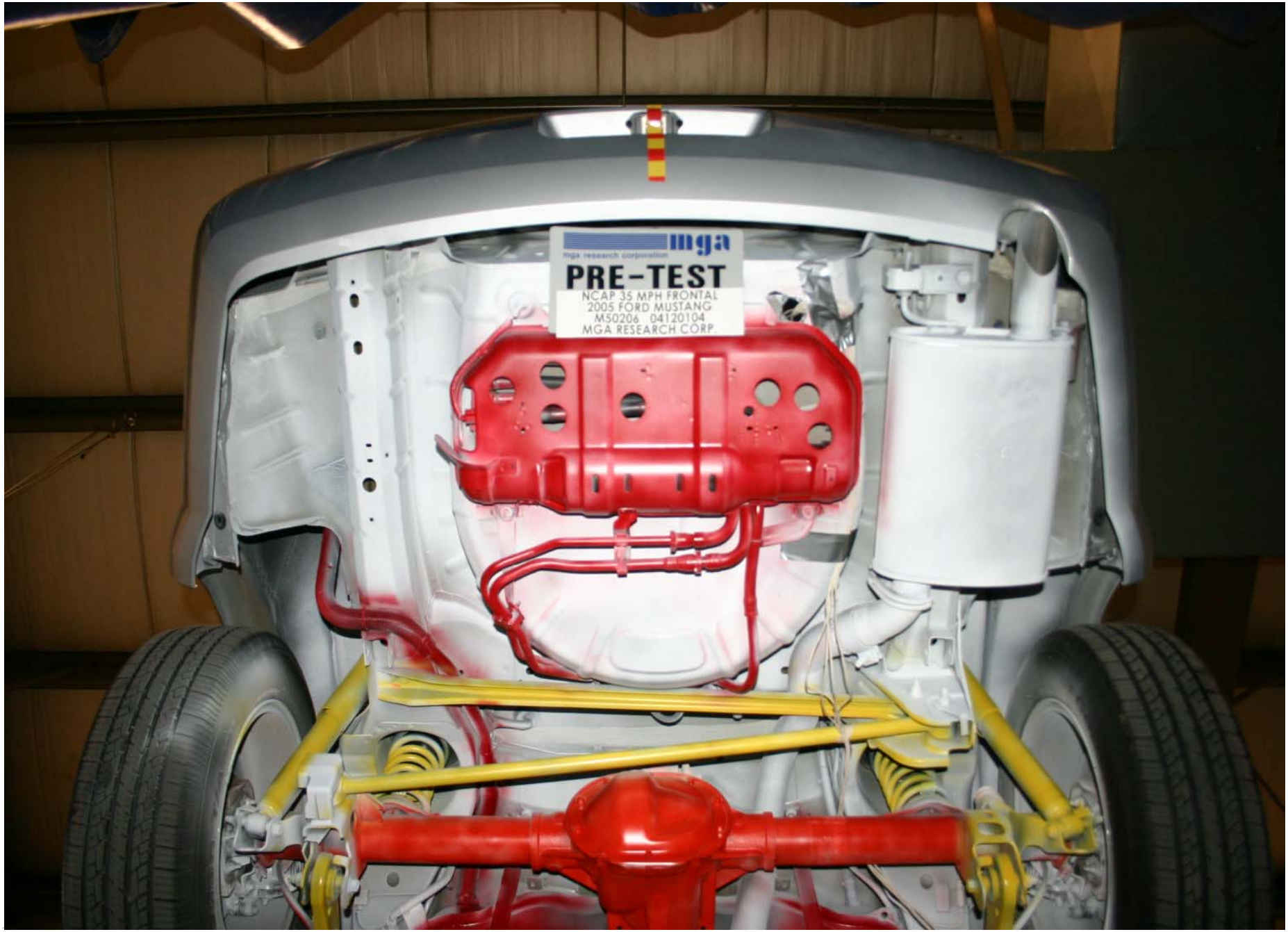
Pre-Test Front Mid Underbody



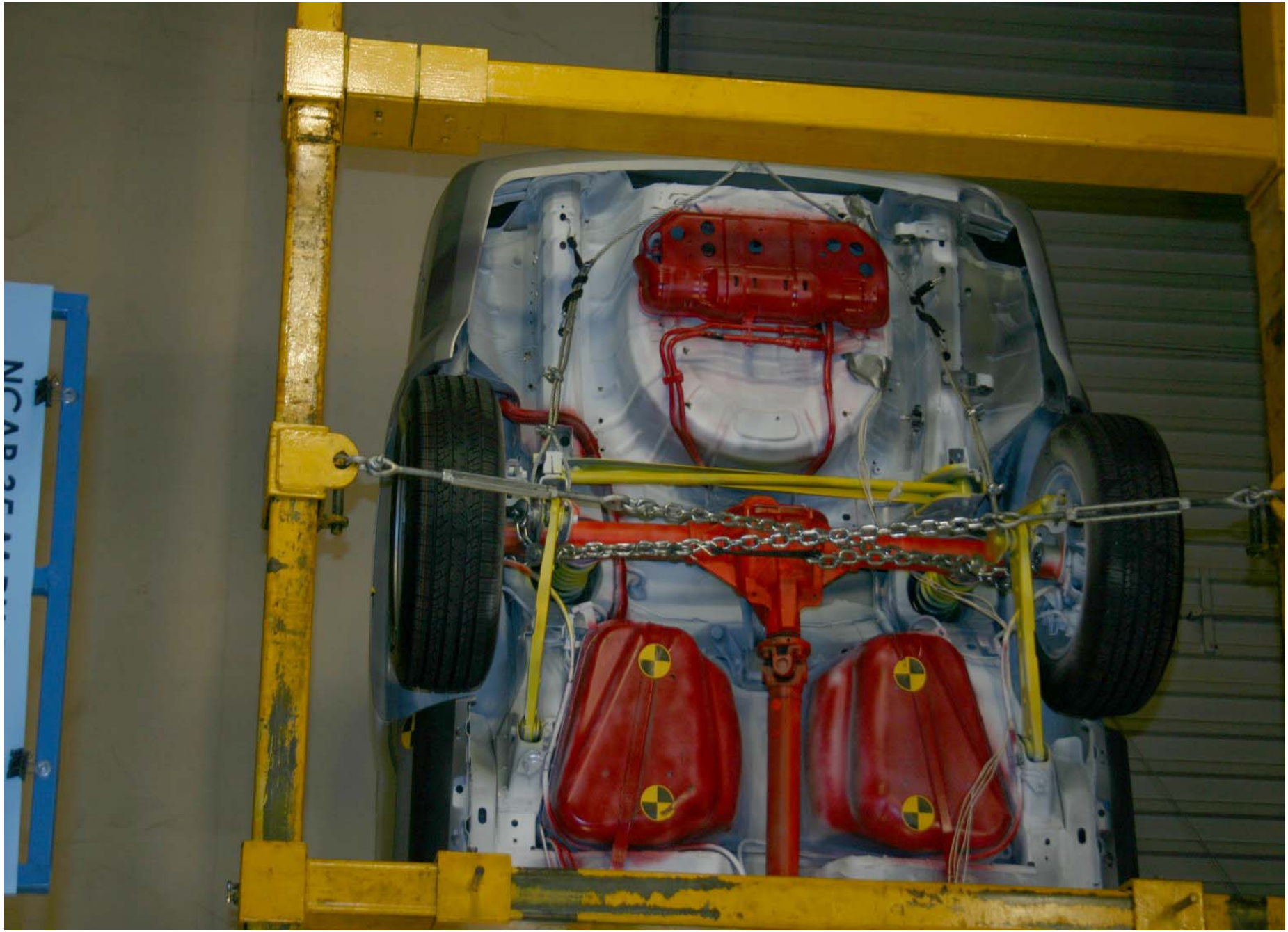
Pre-Test Rear Mid Underbody



Post-Test Mid Underbody

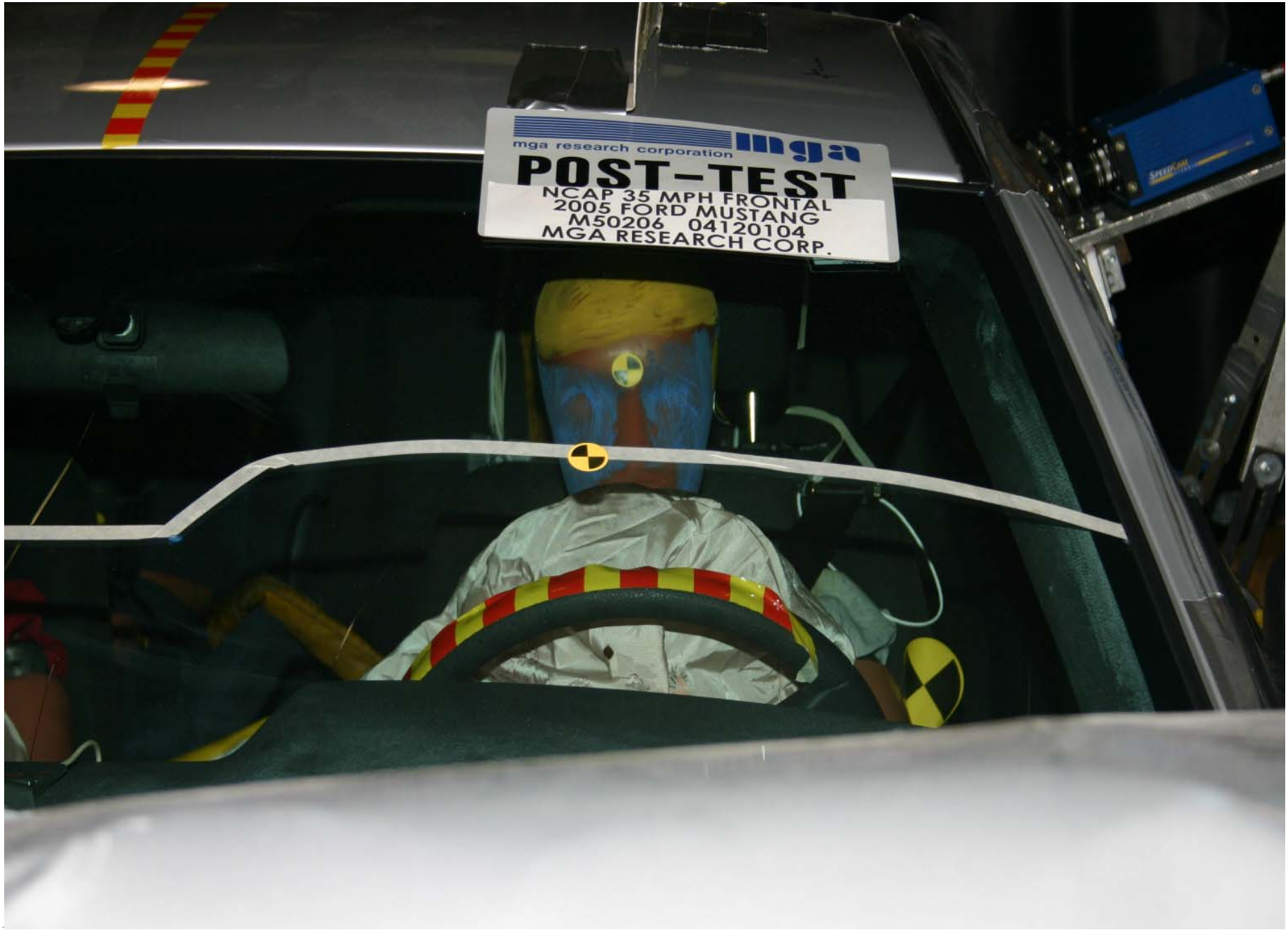


Pre-Test Rear Underbody View



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 Seat Position

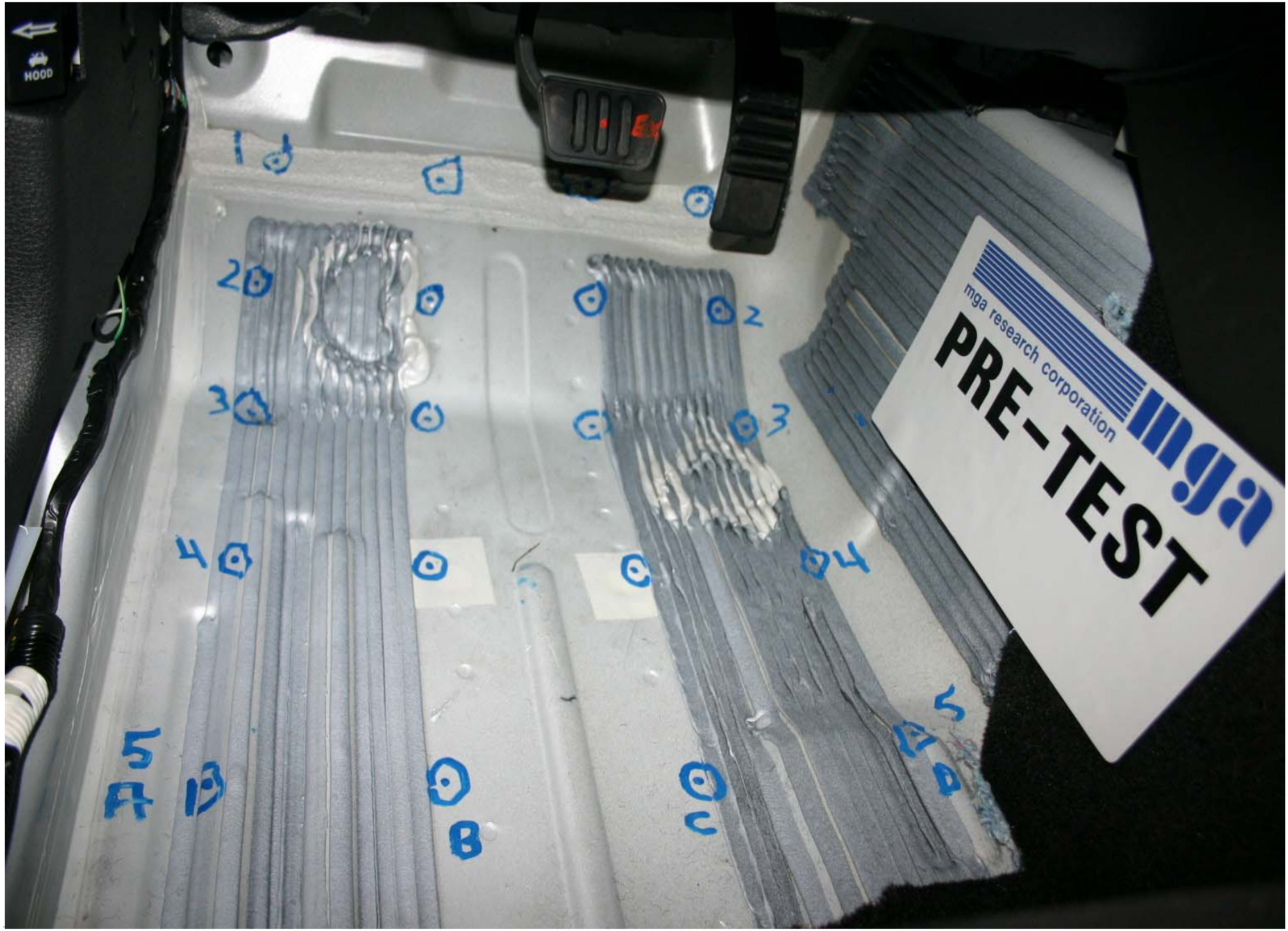
Post-Test Driver Dummy Seat Position

Pre-Test Driver Dummy Feet Position

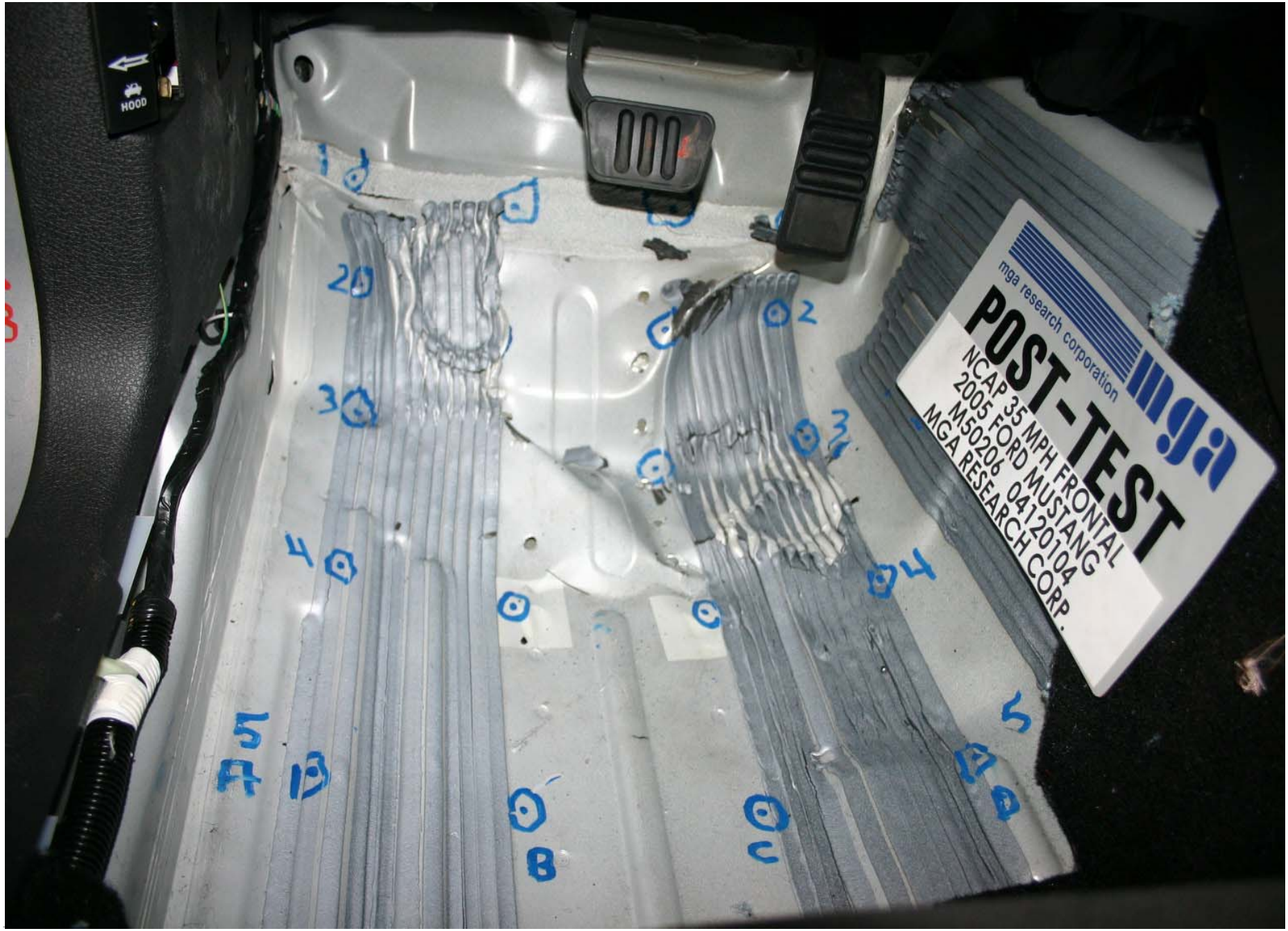
Post-Test Driver Dummy Feet Position

Pre-Test Driver Side Knee Bolster View

Post-Test Driver Side Knee Bolster View



Pre-Test Driver Side Floor Pan 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 Seat Position

Post-Test Passenger Dummy Seat Position

Pre-Test Passenger Dummy Feet Position

Post-Test Passenger Dummy Feet Position

Pre-Test Passenger Side Knee Bolster View

Post-Test Passenger Side Knee Bolster View

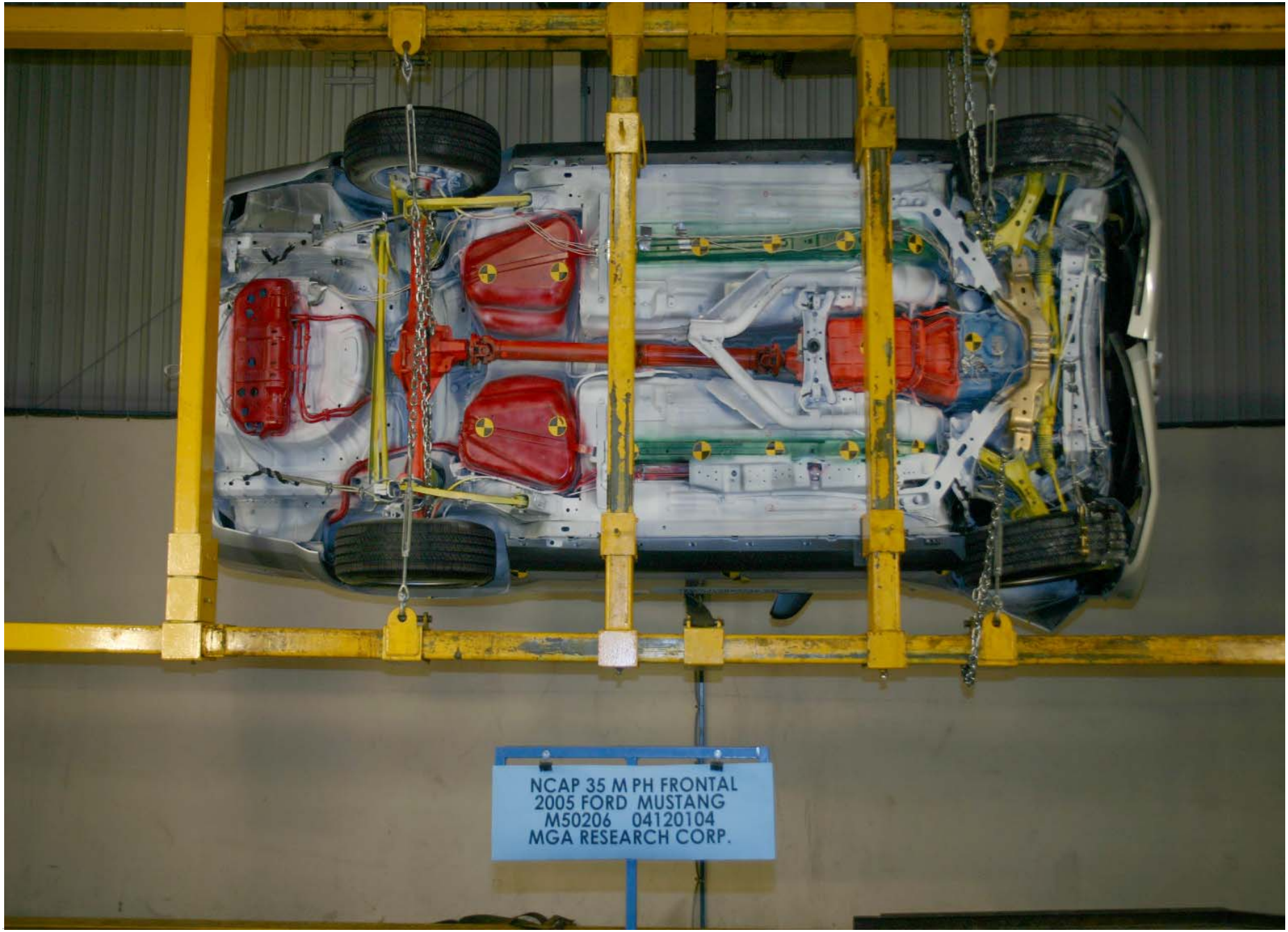
Pre-Test Passenger Side Floor Pan View

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

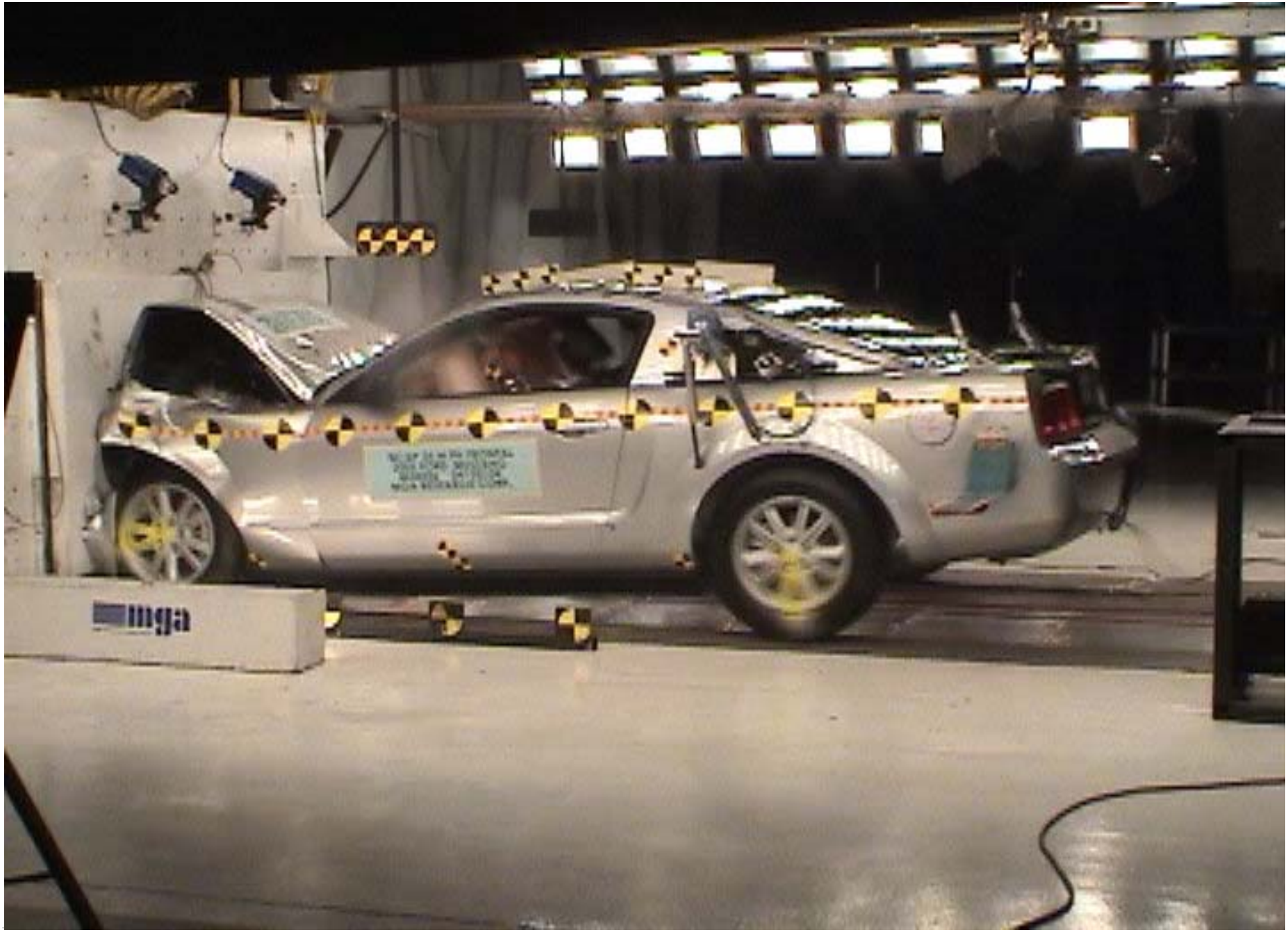


Rollover 90 Degrees

Rollover 180 Degrees

Rollover 270 Degrees

Rollover 360 Degrees



Vehicle Impact

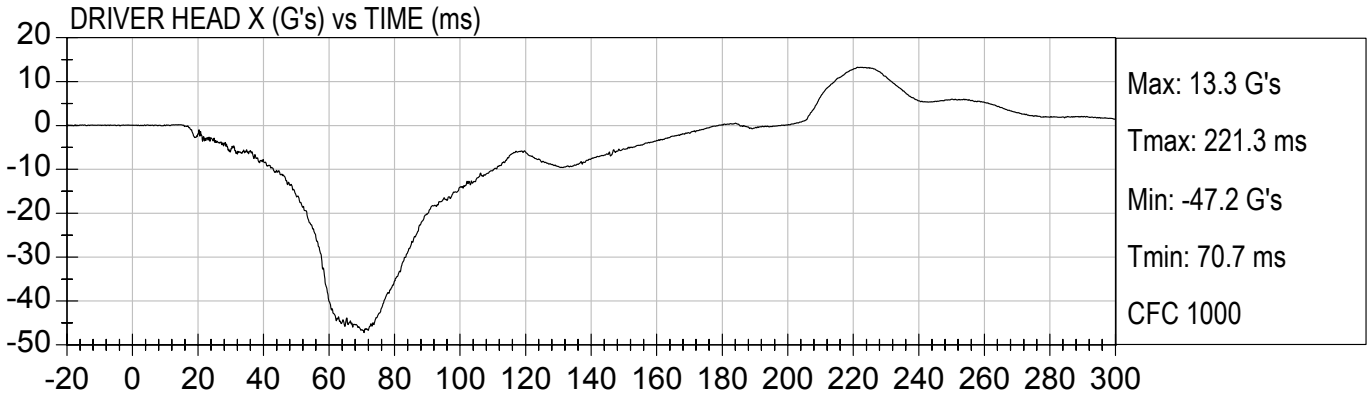
APPENDIX B

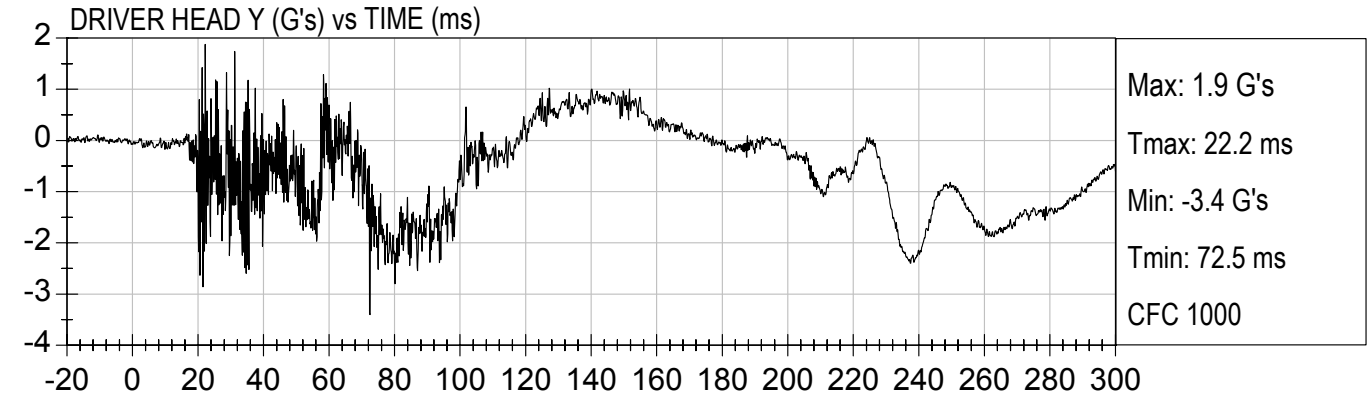
DUMMY AND VEHICLE RESPONSE DATA TRACES

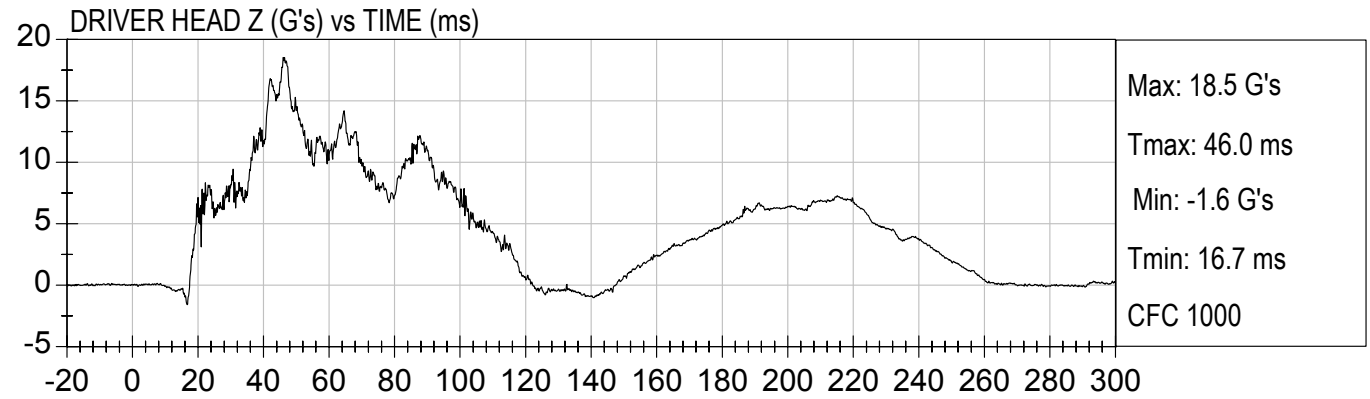
TABLE OF DATA PLOTS

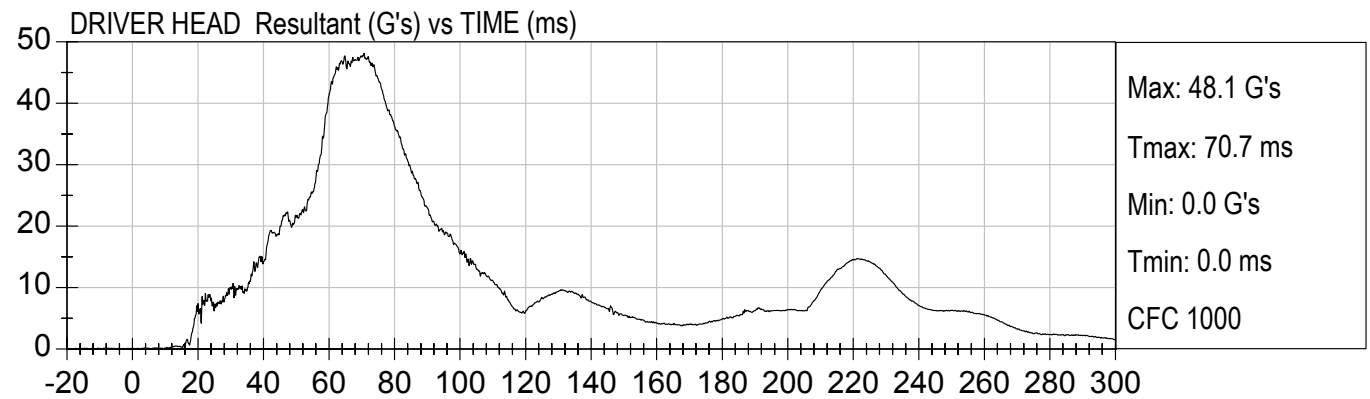
NCAP 35MPH FRONTAL
2005 FORD MUSTANG (M50206)

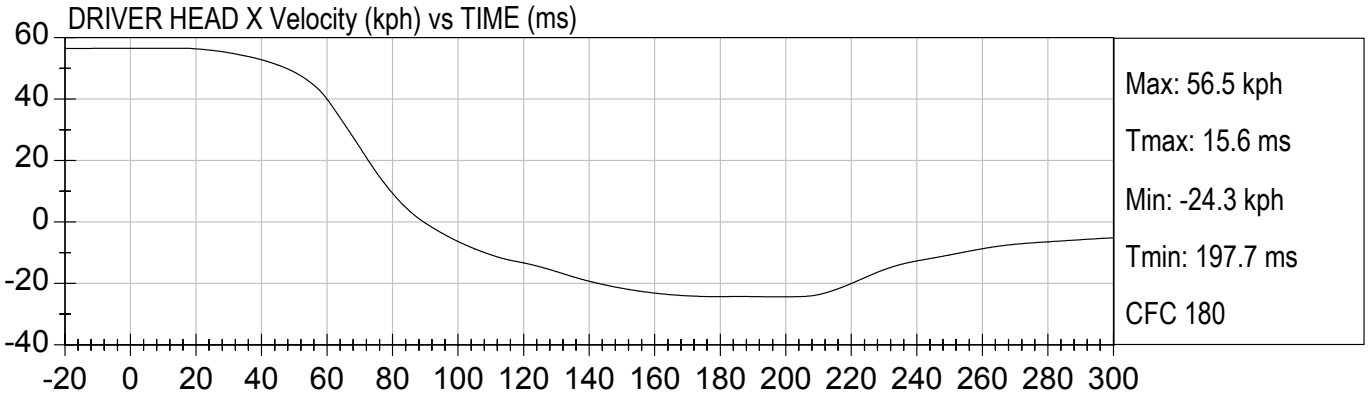
Test Date: 12/01/04
Speed: 35.1 mph (56.5 km/h)

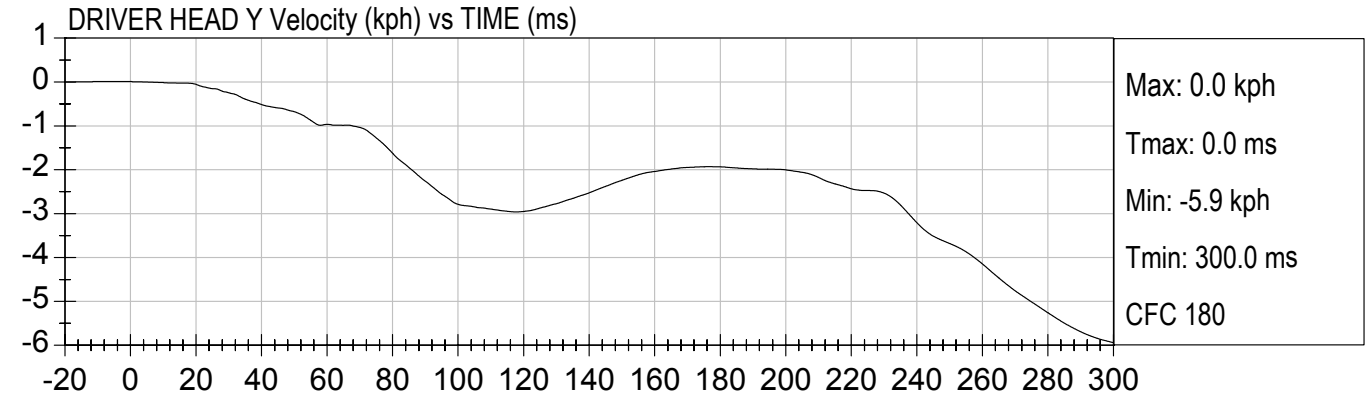


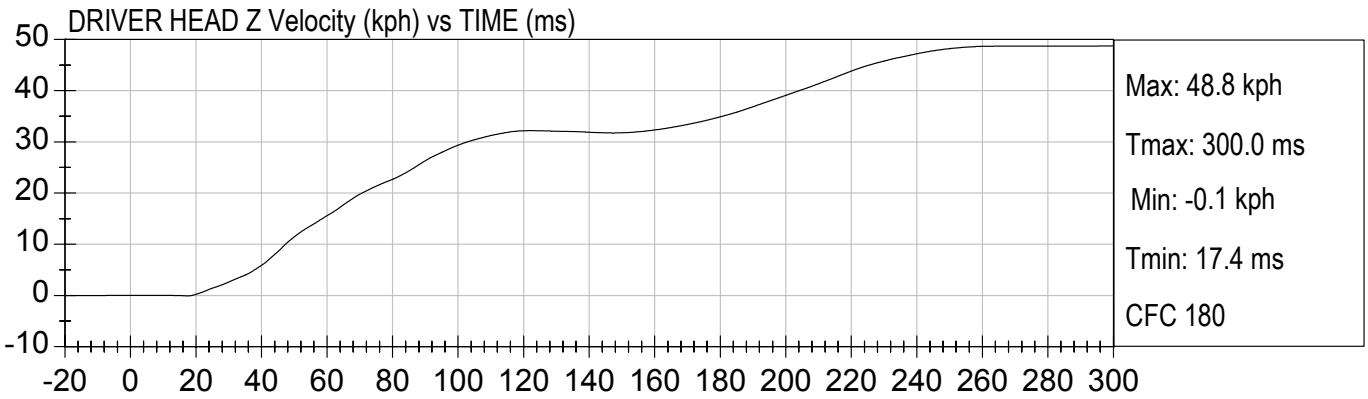






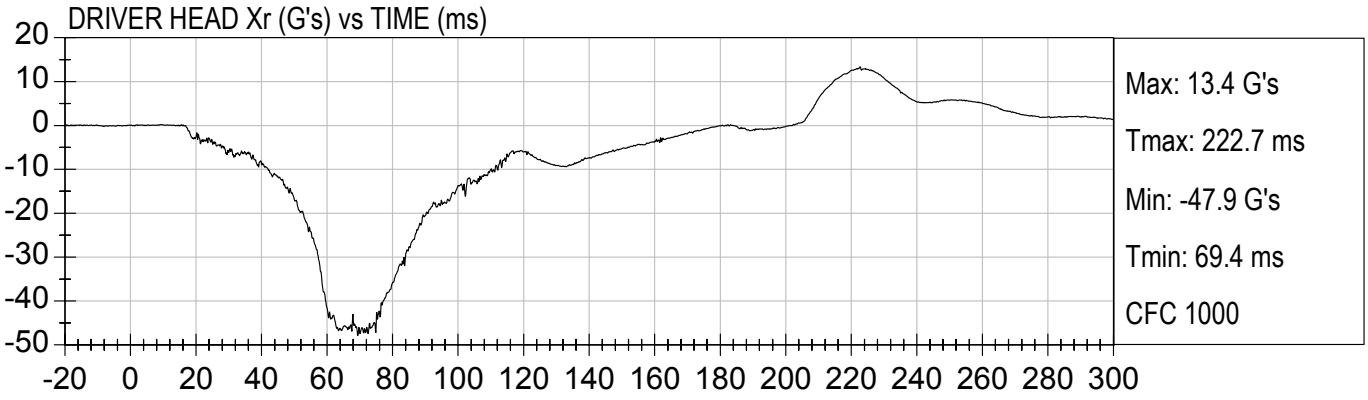

DRIVER HEAD X Velocity (kph) vs TIME (ms)
60
40
20
0
-20
-40
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 56.5 kph
Tmax: 15.6 ms
Min: -24.3 kph
Tmin: 197.7 ms
CFC 180

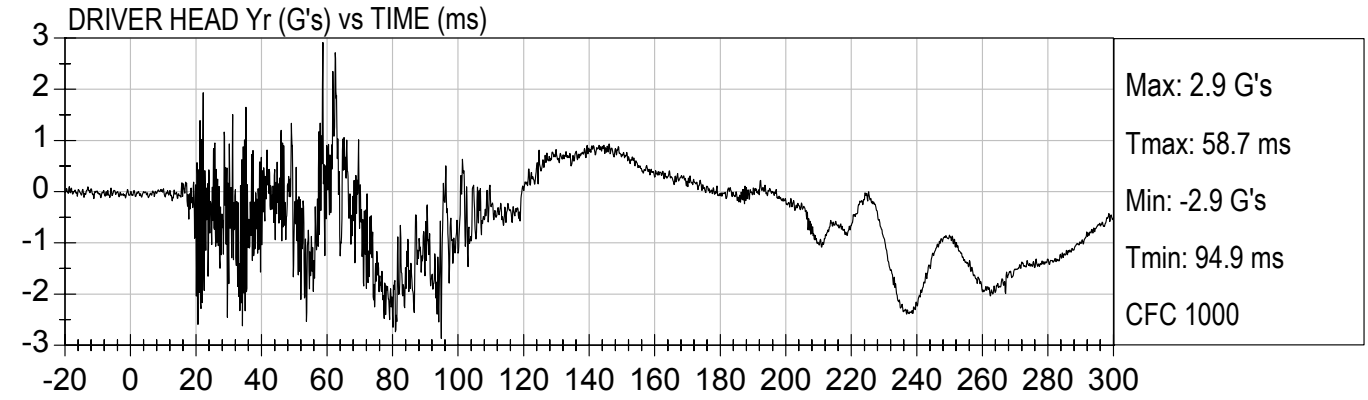

DRIVER HEAD Y Velocity (kph) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-6
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 0.0 ms
Min: -5.9 kph
Tmin: 300.0 ms
CFC 180

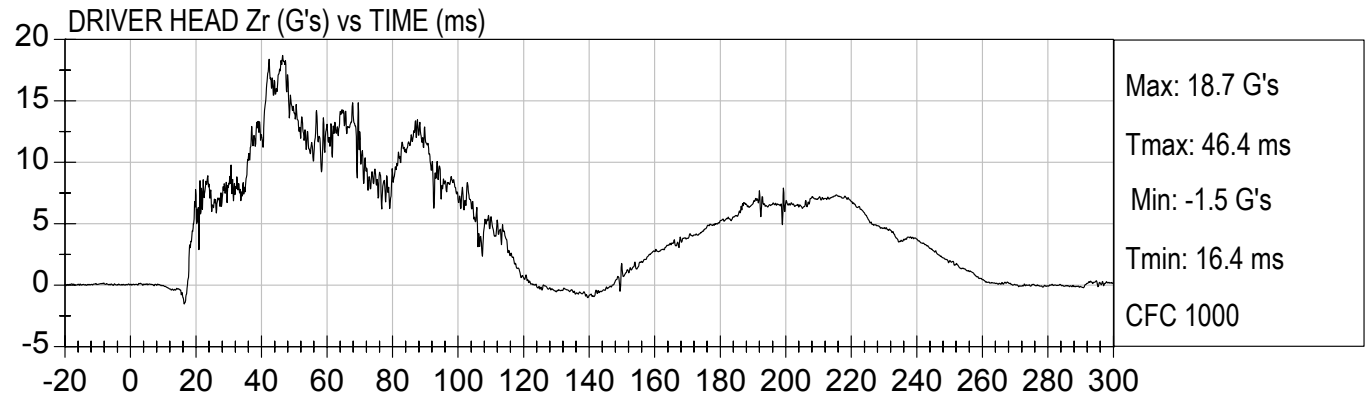

DRIVER HEAD Z Velocity (kph) vs TIME (ms)
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 48.8 kph
Tmax: 300.0 ms
Min: -0.1 kph
Tmin: 17.4 ms
CFC 180

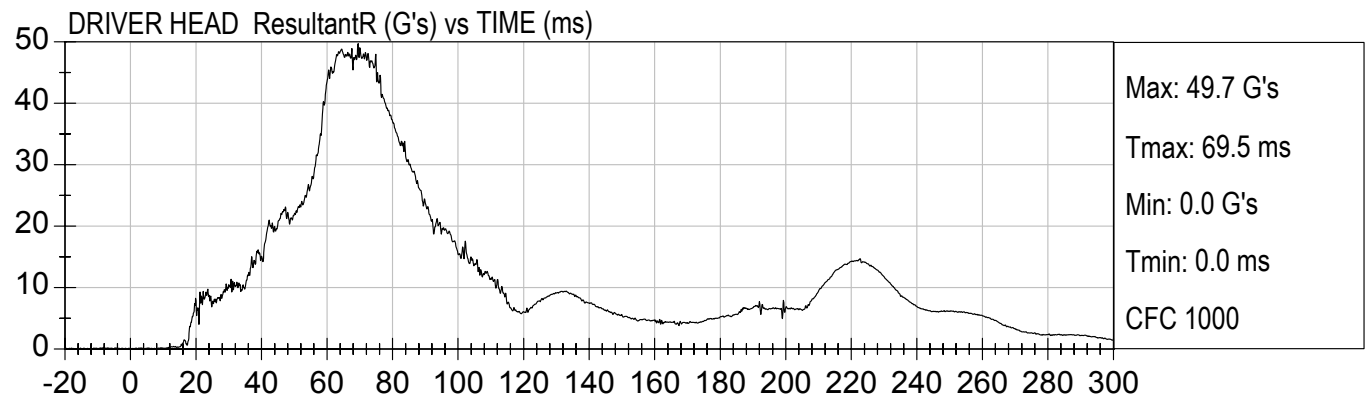
NCAP 35MPH FRONTAL
2005 FORD MUSTANG (M50206)

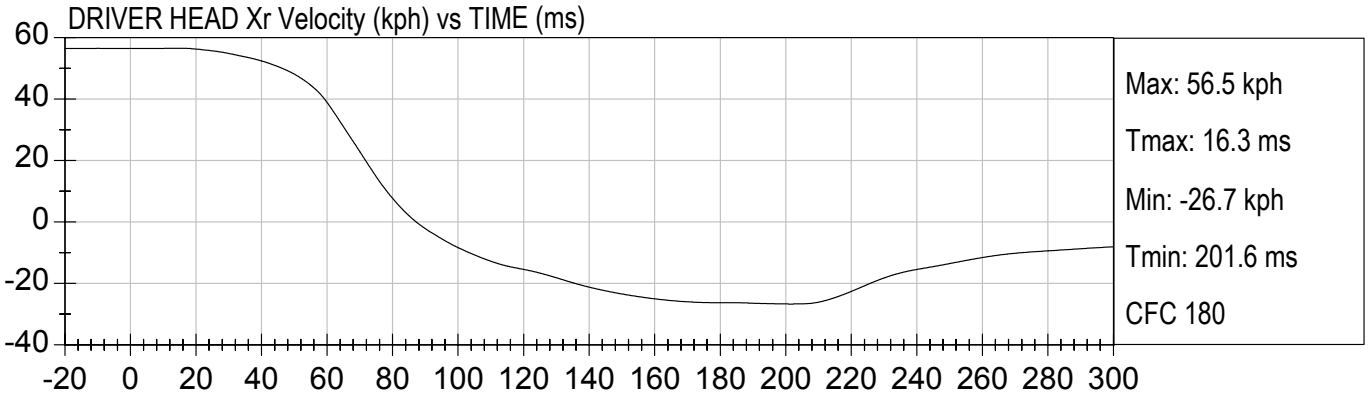
Test Date: 12/01/04
Speed: 35.1 mph (56.5 km/h)

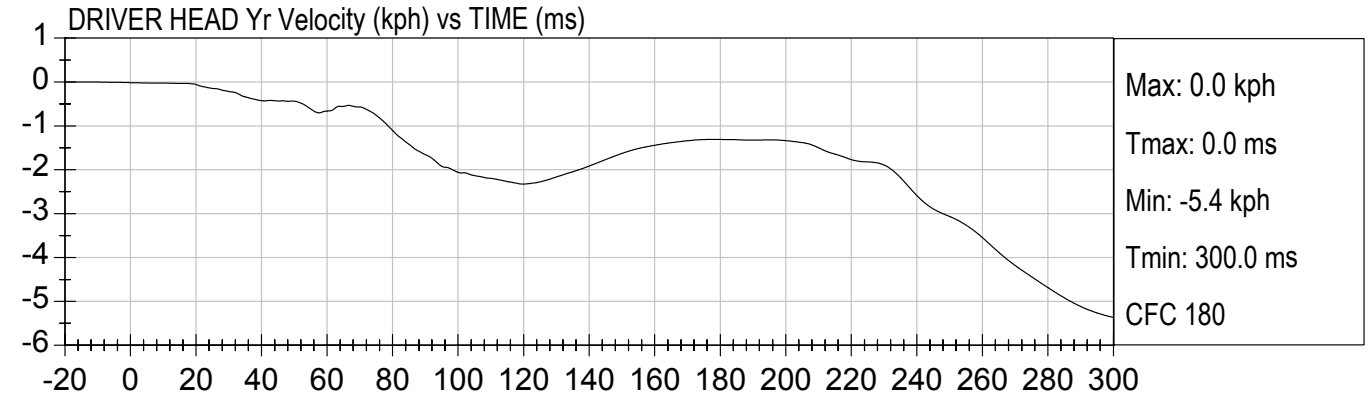


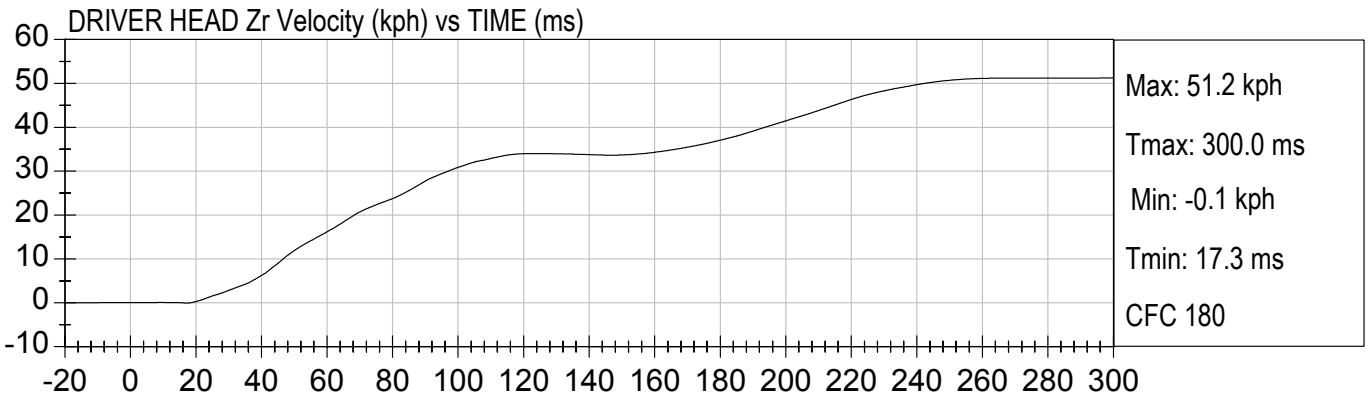






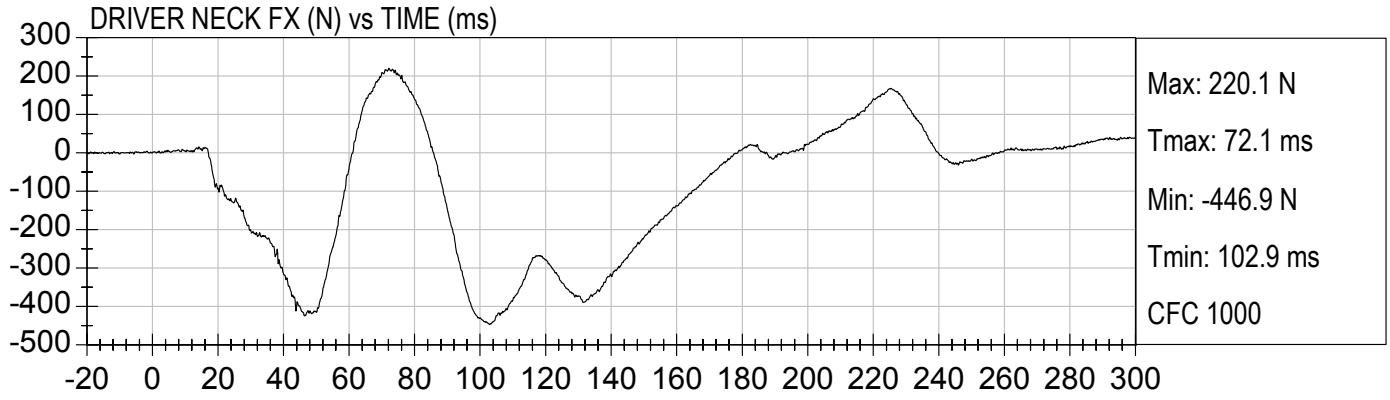

DRIVER HEAD Xr Velocity (kph) vs TIME (ms)
60
40
20
0
-20
-40
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 56.5 kph
Tmax: 16.3 ms
Min: -26.7 kph
Tmin: 201.6 ms
CFC 180

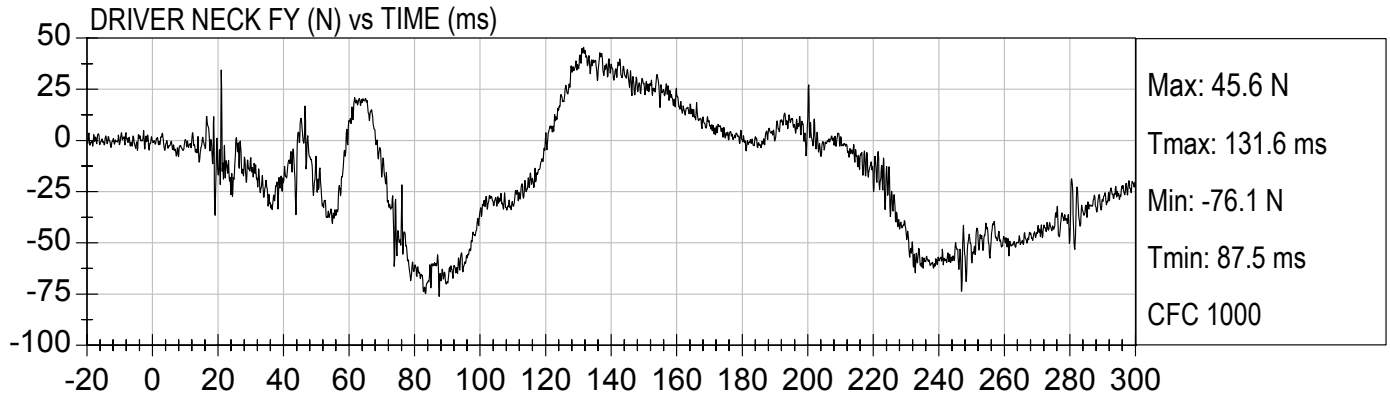

DRIVER HEAD Yr Velocity (kph) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-6
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 0.0 ms
Min: -5.4 kph
Tmin: 300.0 ms
CFC 180

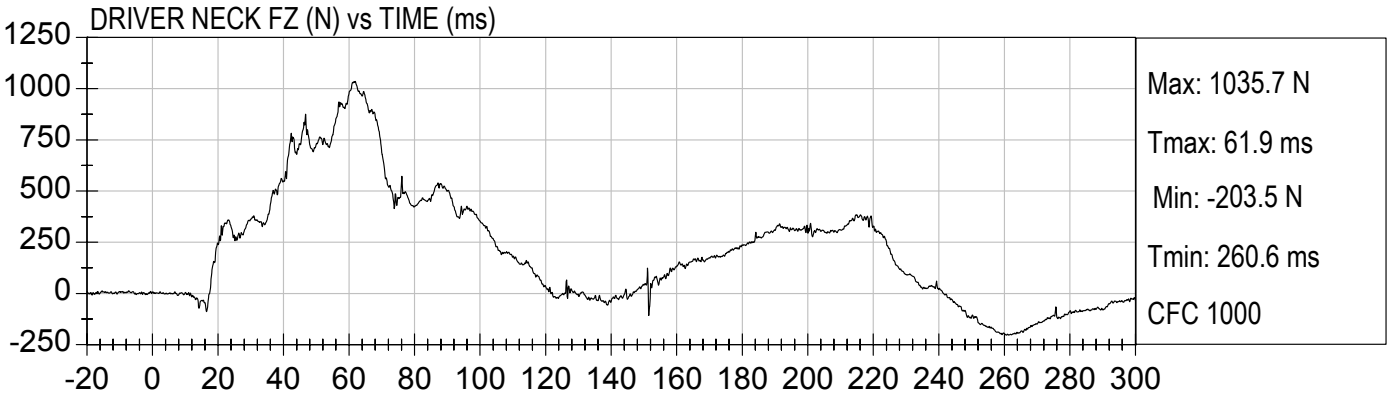

DRIVER HEAD Zr Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 51.2 kph
Tmax: 300.0 ms
Min: -0.1 kph
Tmin: 17.3 ms
CFC 180

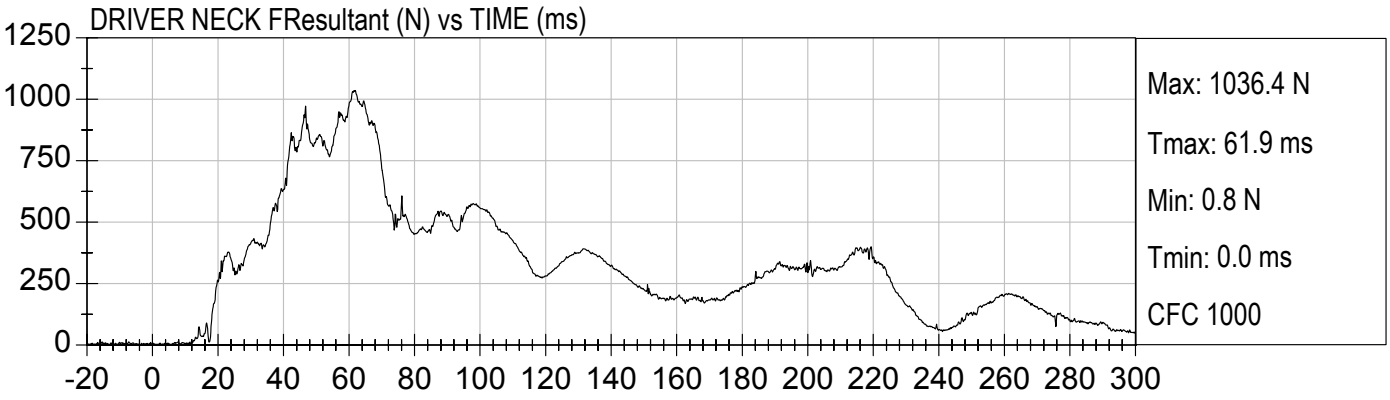
NCAP 35MPH FRONTAL
2005 FORD MUSTANG (M50206)

Test Date: 12/01/04
Speed: 35.1 mph (56.5 km/h)



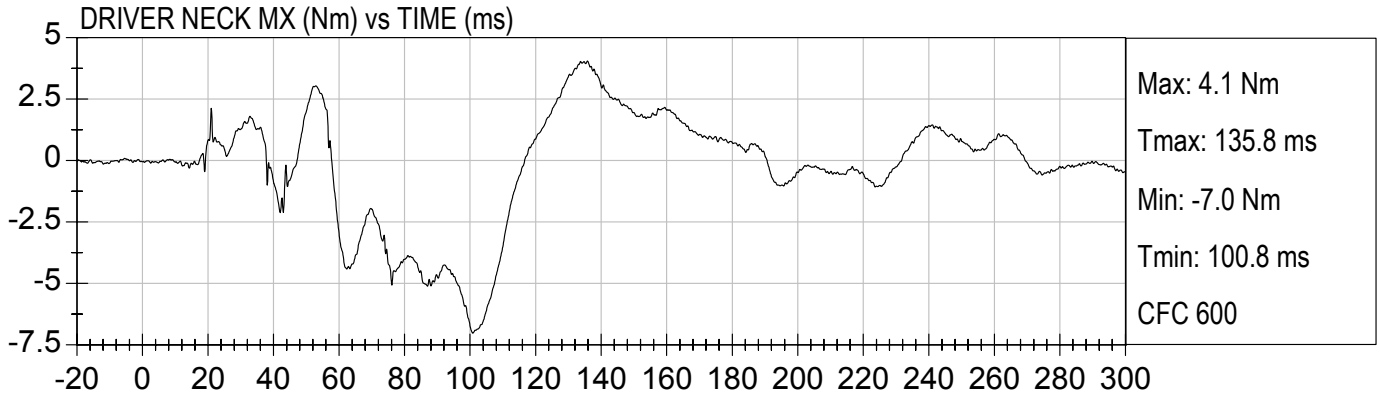


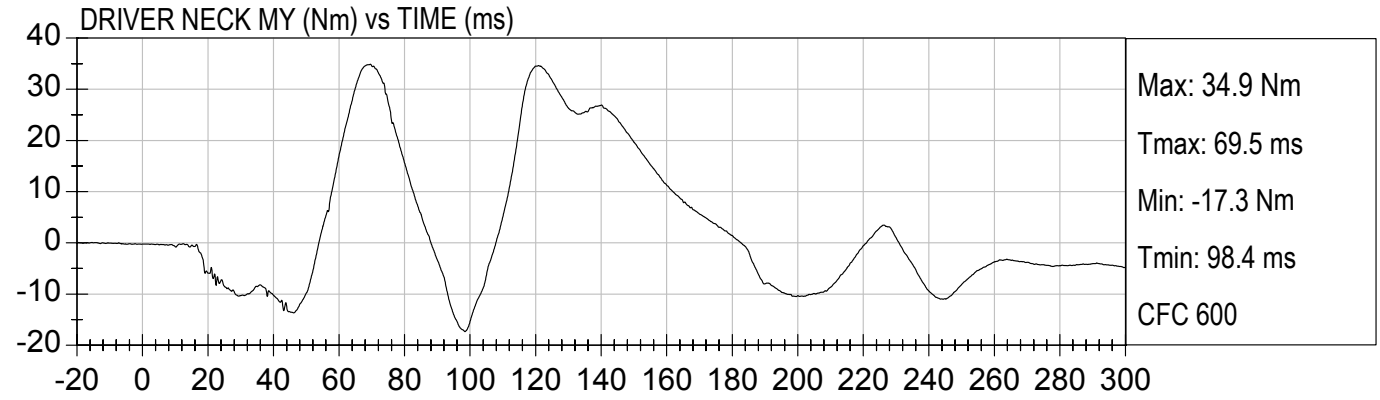


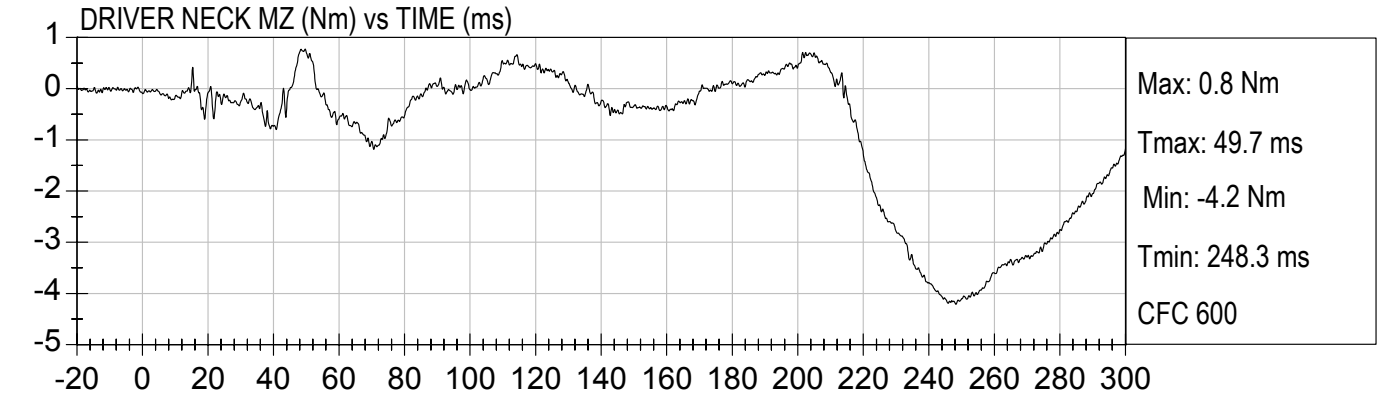


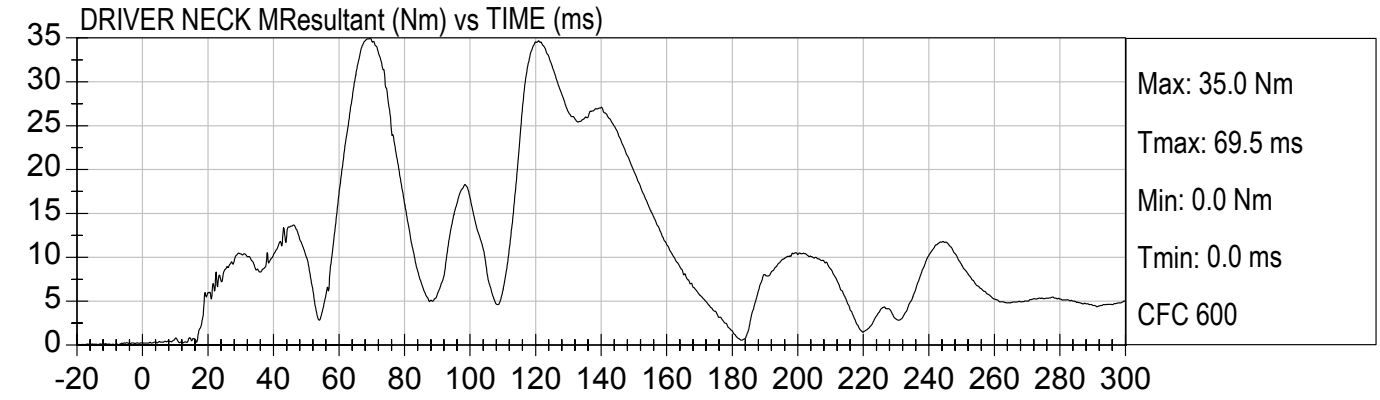
NCAP 35MPH FRONTAL
2005 FORD MUSTANG (M50206)

Test Date: 12/01/04
Speed: 35.1 mph (56.5 km/h)



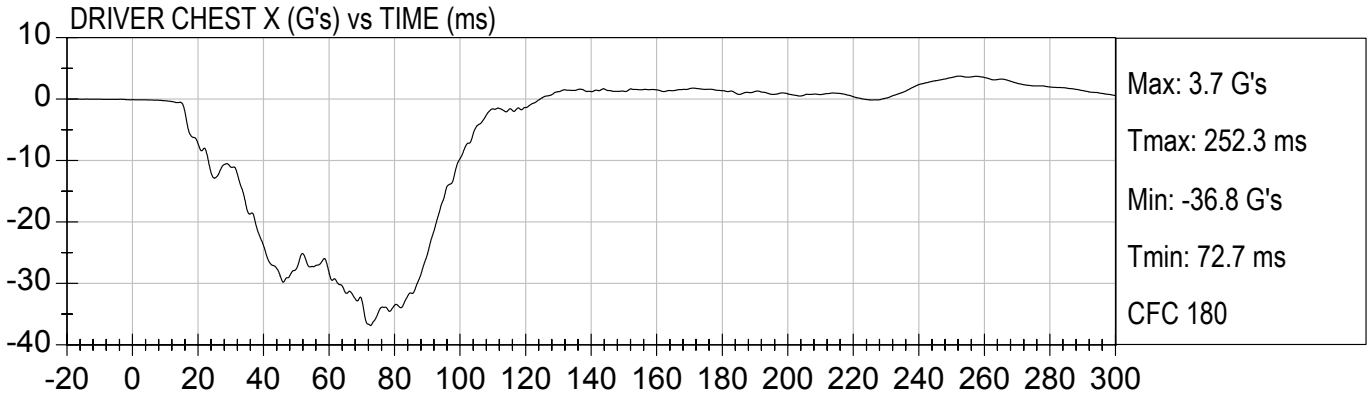


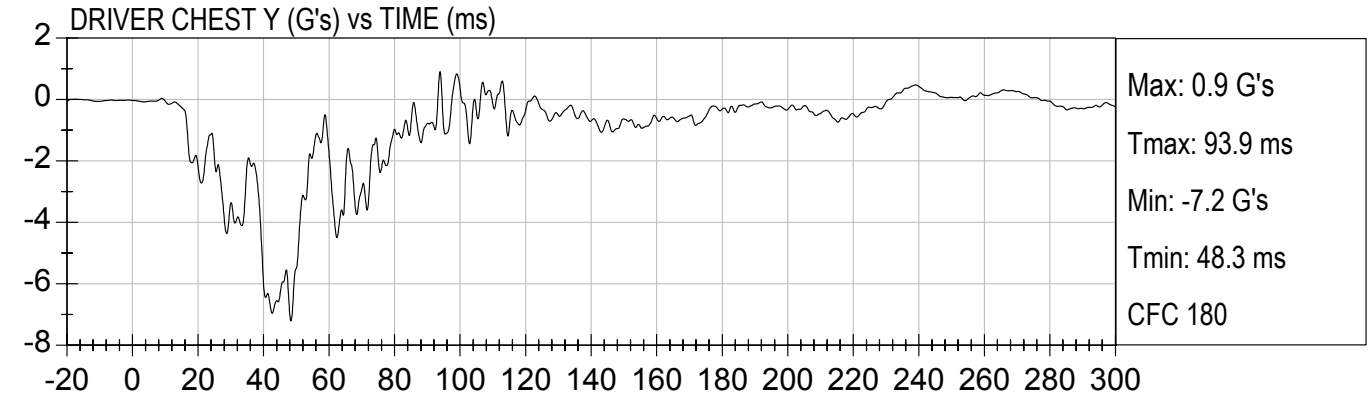


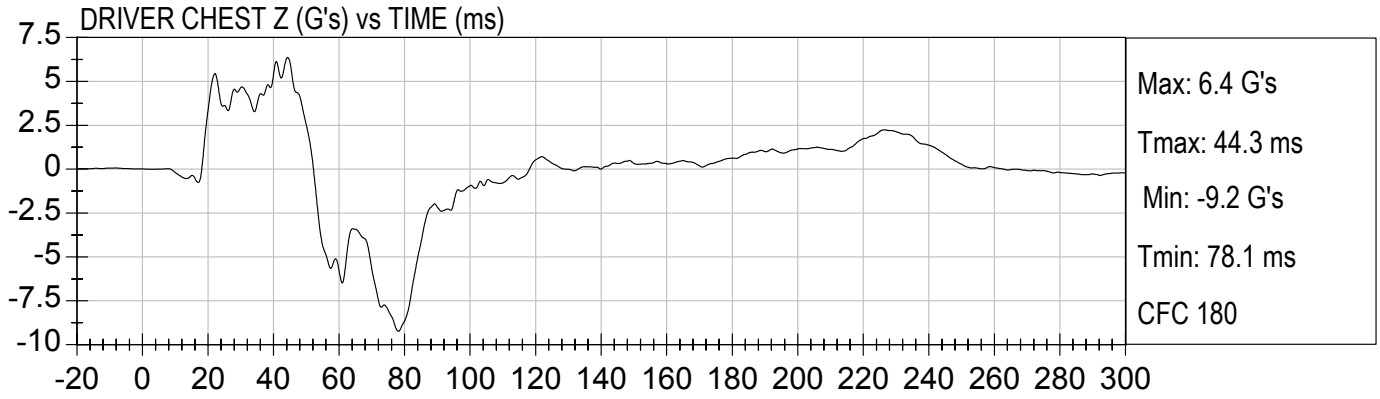


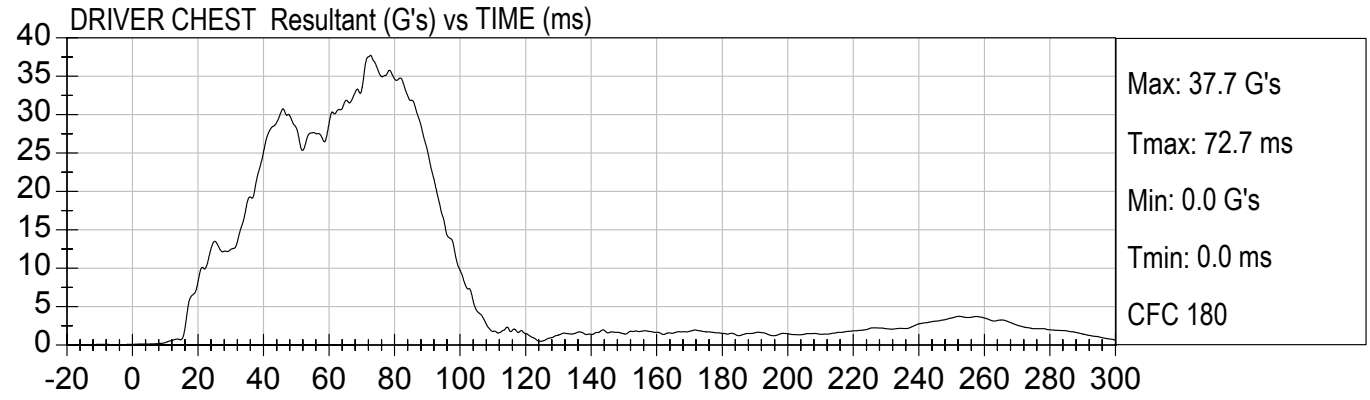
NCAP 35MPH FRONTAL
2005 FORD MUSTANG (M50206)

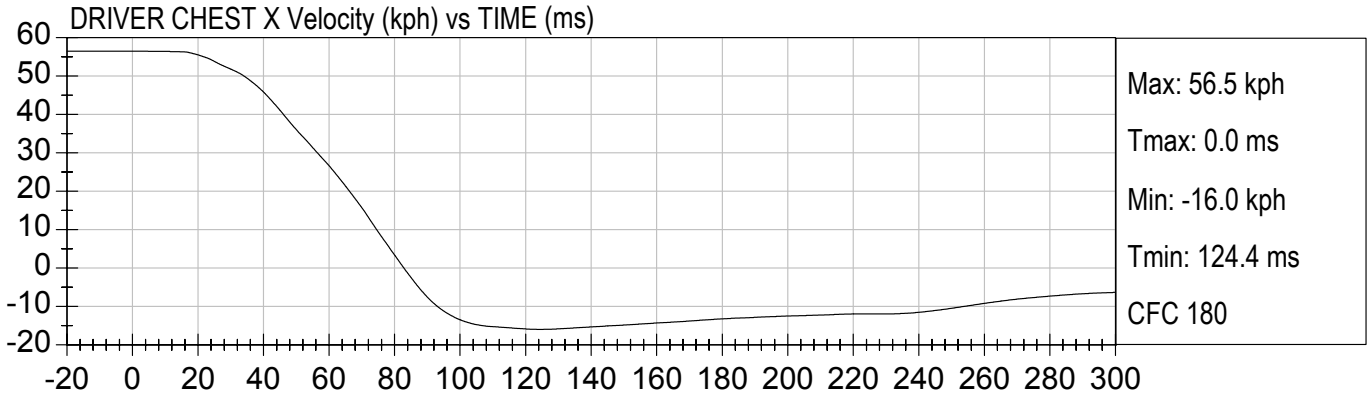
Test Date: 12/01/04
Speed: 35.1 mph (56.5 km/h)

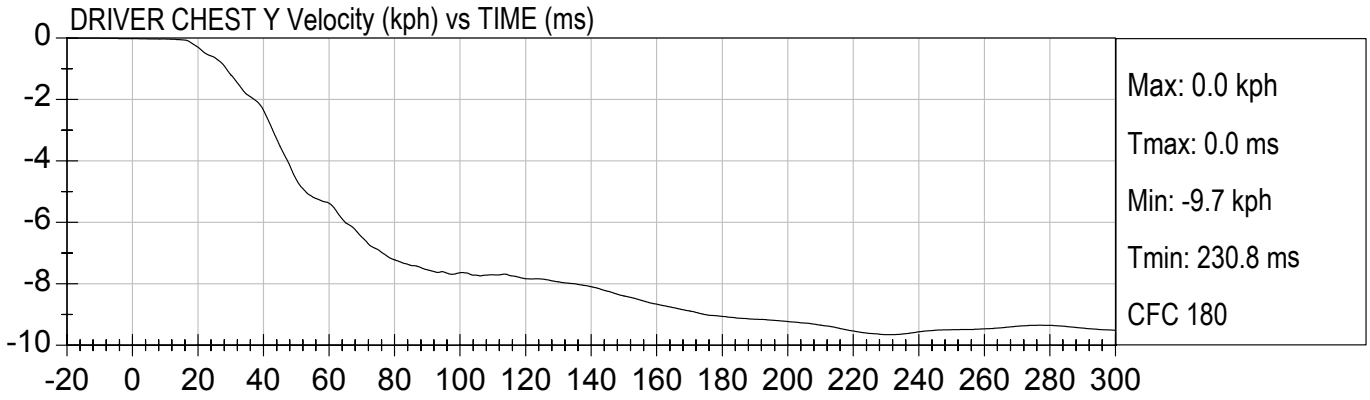


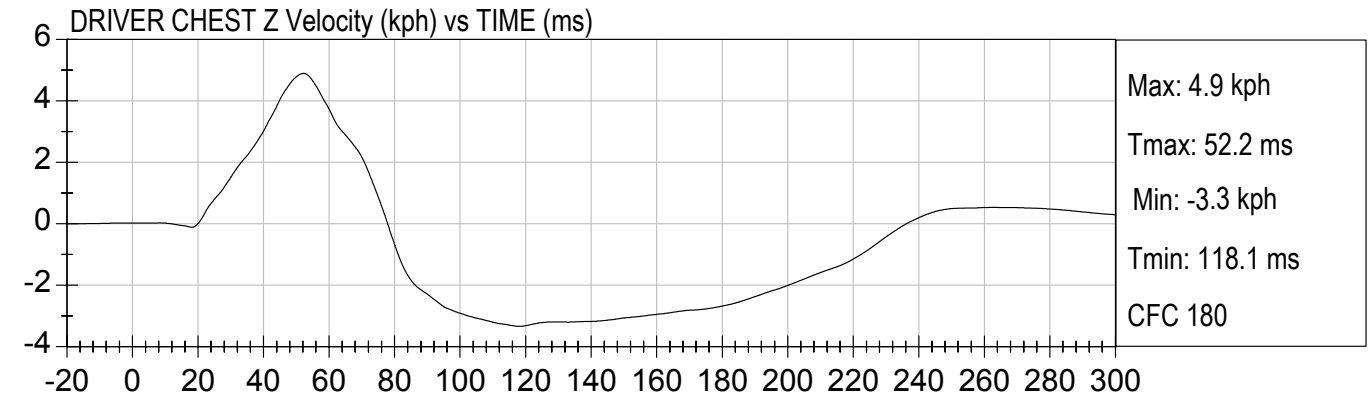


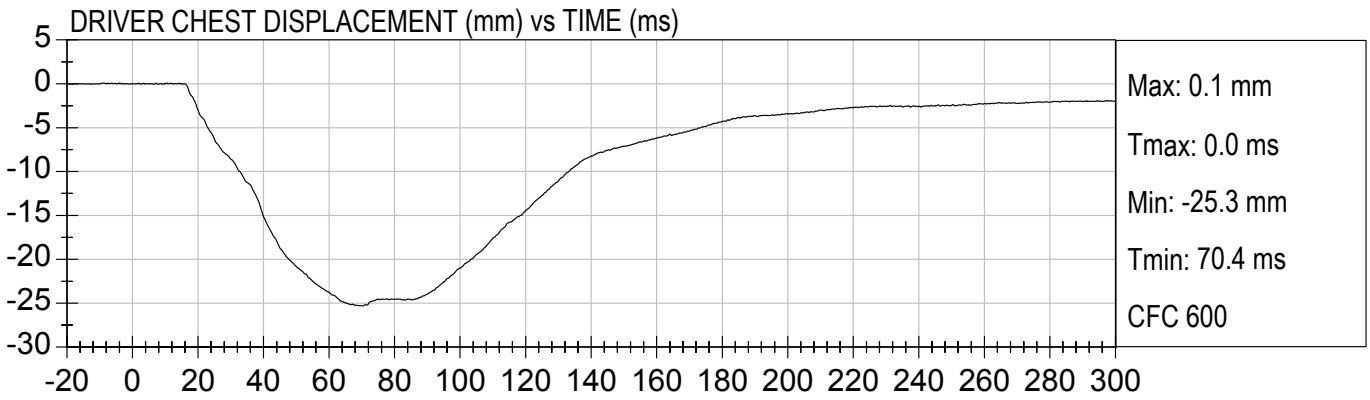





DRIVER CHEST X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 56.5 kph
Tmax: 0.0 ms
Min: -16.0 kph
Tmin: 124.4 ms
CFC 180

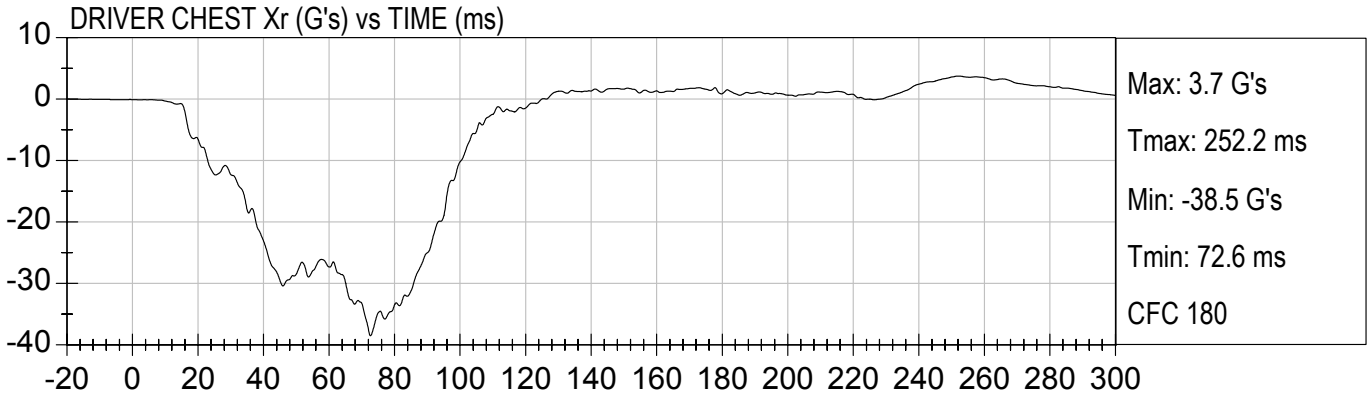

DRIVER CHEST Y Velocity (kph) vs TIME (ms)
0
-2
-4
-6
-8
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 0.0 ms
Min: -9.7 kph
Tmin: 230.8 ms
CFC 180

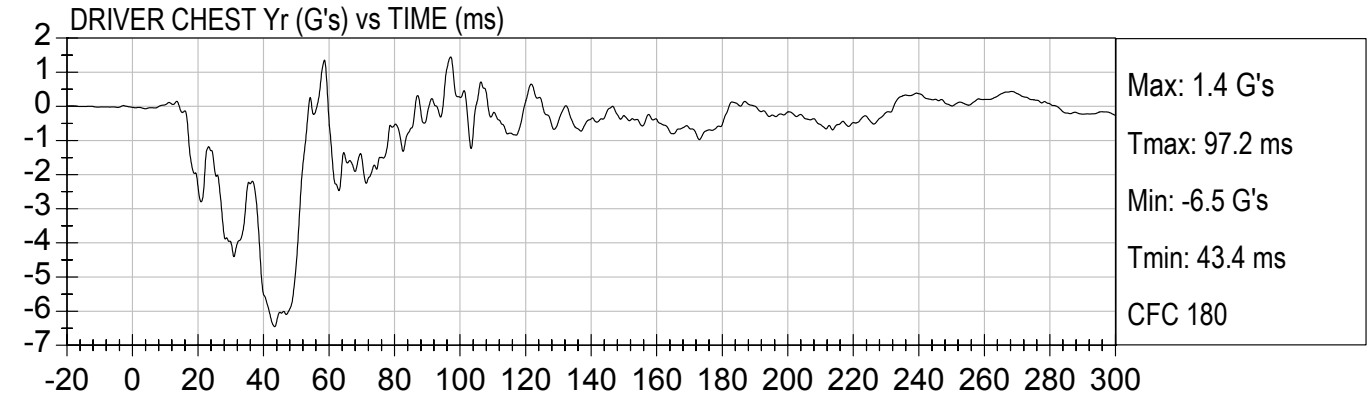

DRIVER CHEST Z Velocity (kph) vs TIME (ms)
6
4
2
0
-2
-4
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 4.9 kph
Tmax: 52.2 ms
Min: -3.3 kph
Tmin: 118.1 ms
CFC 180

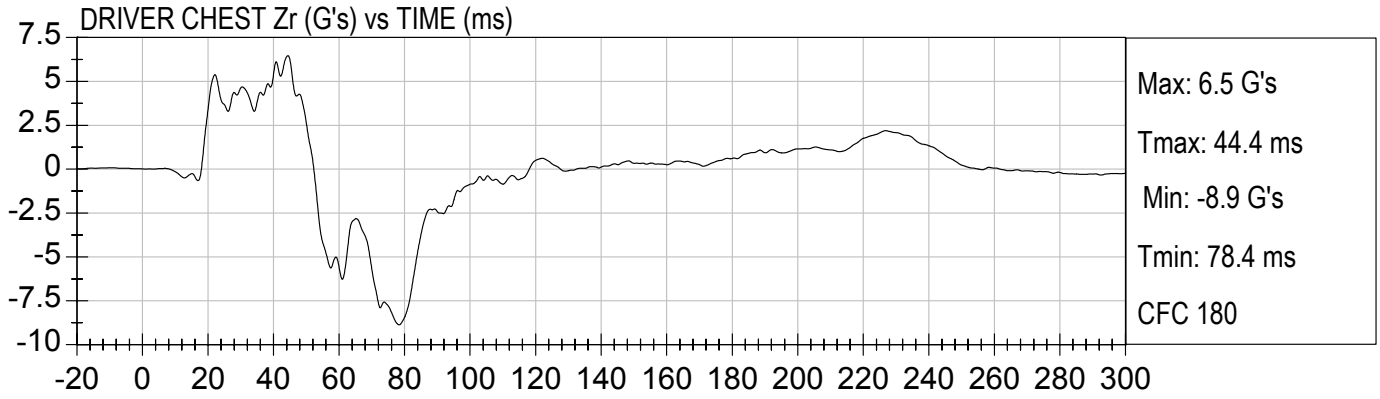

DRIVER CHEST DISPLACEMENT (mm) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.1 mm
Tmax: 0.0 ms
Min: -25.3 mm
Tmin: 70.4 ms
CFC 600

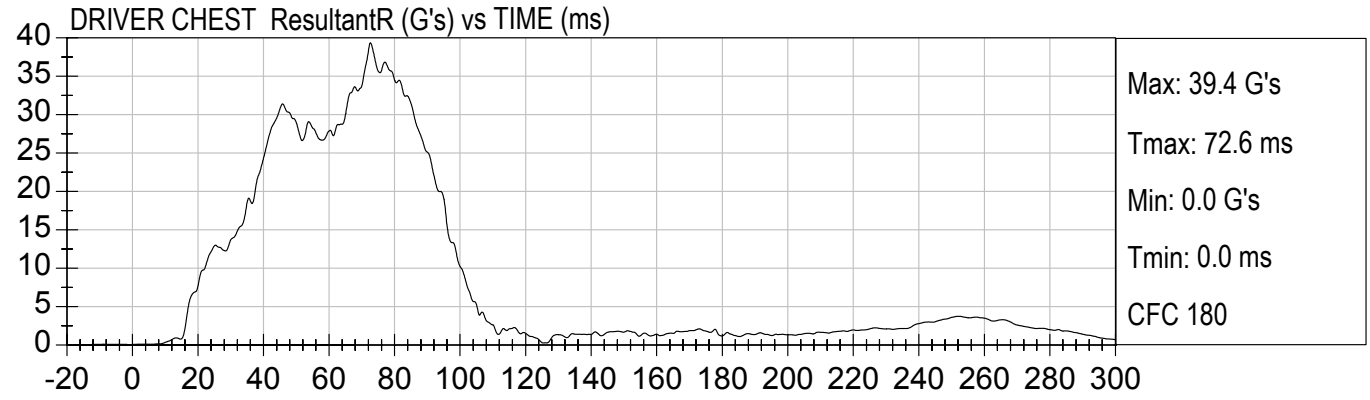
NCAP 35MPH FRONTAL
2005 FORD MUSTANG (M50206)

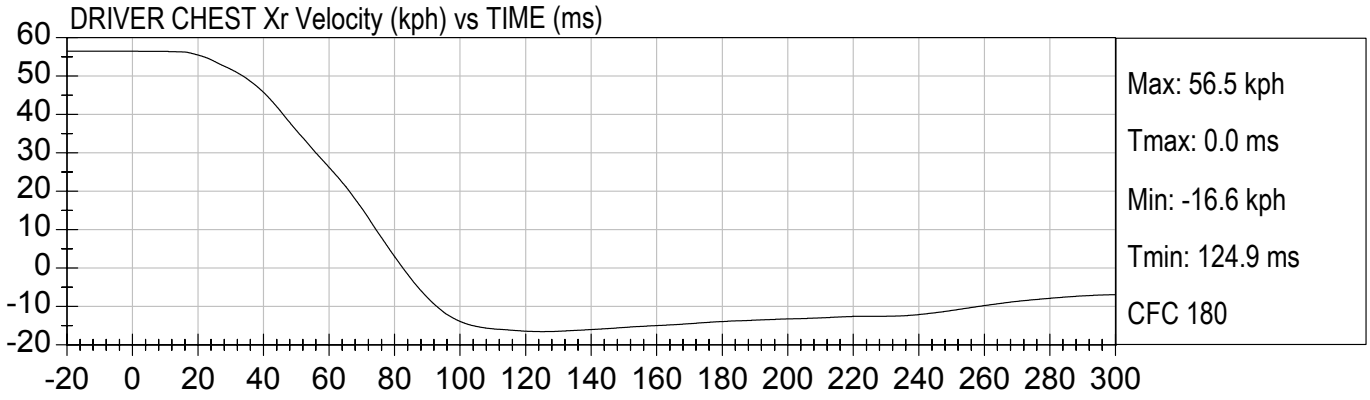
Test Date: 12/01/04
Speed: 35.1 mph (56.5 km/h)

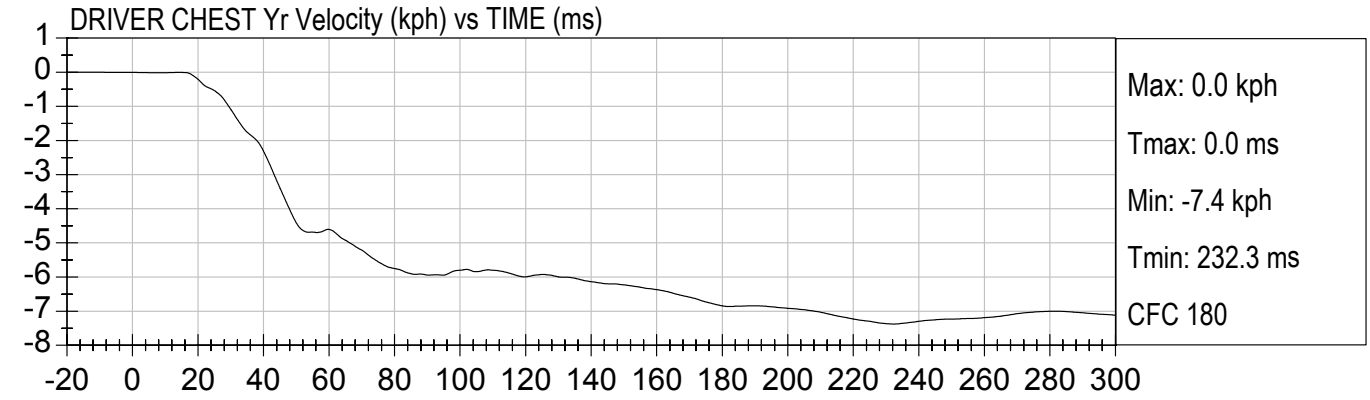


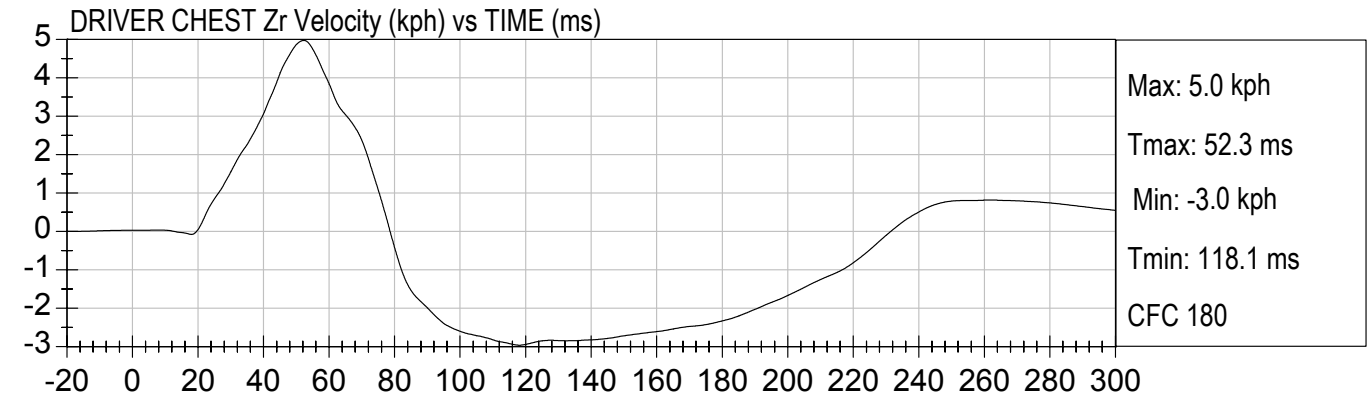






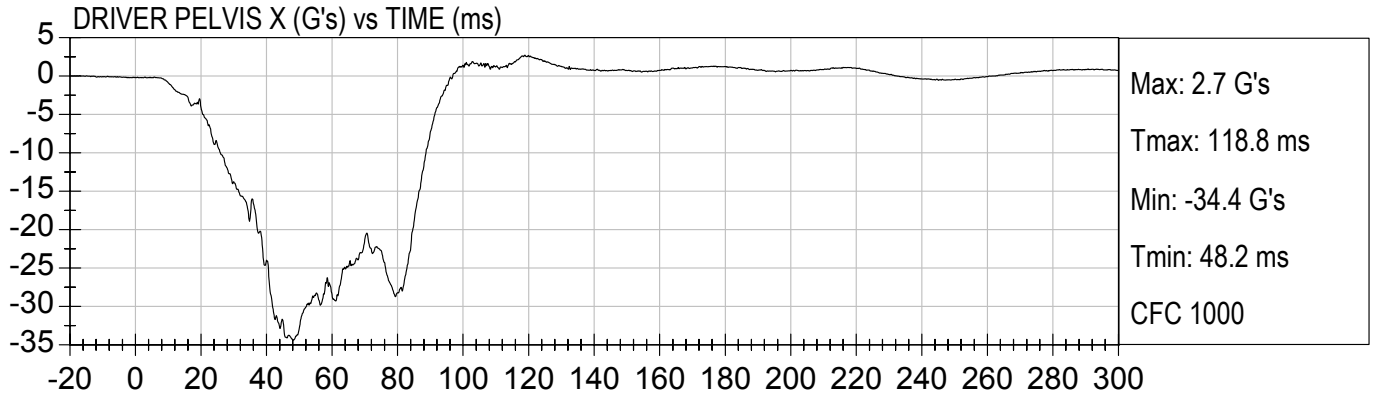

DRIVER CHEST Xr Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 56.5 kph
Tmax: 0.0 ms
Min: -16.6 kph
Tmin: 124.9 ms
CFC 180

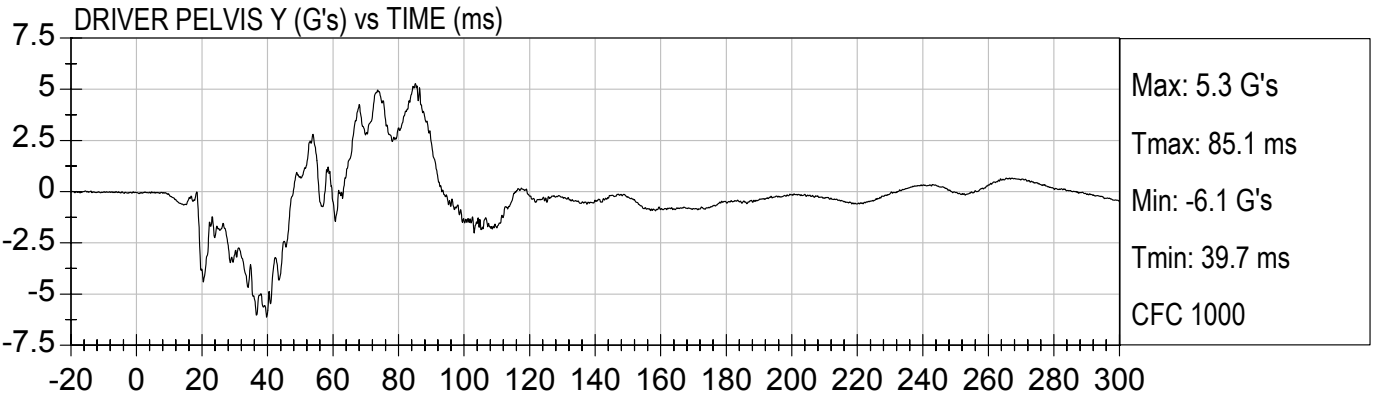

DRIVER CHEST Yr Velocity (kph) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 0.0 ms
Min: -7.4 kph
Tmin: 232.3 ms
CFC 180

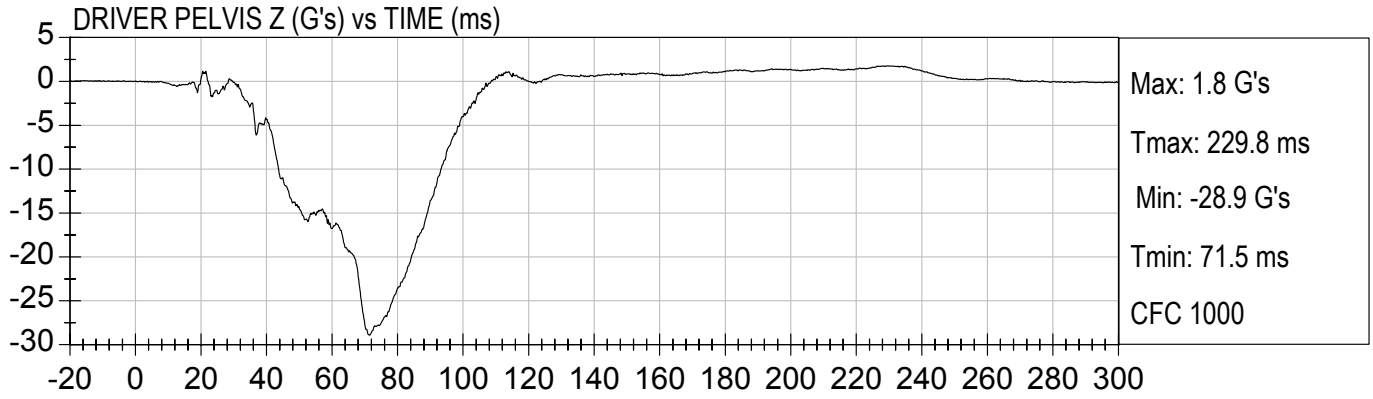

DRIVER CHEST Zr Velocity (kph) vs TIME (ms)
5
4
3
2
1
0
-1
-2
-3
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 5.0 kph
Tmax: 52.3 ms
Min: -3.0 kph
Tmin: 118.1 ms
CFC 180

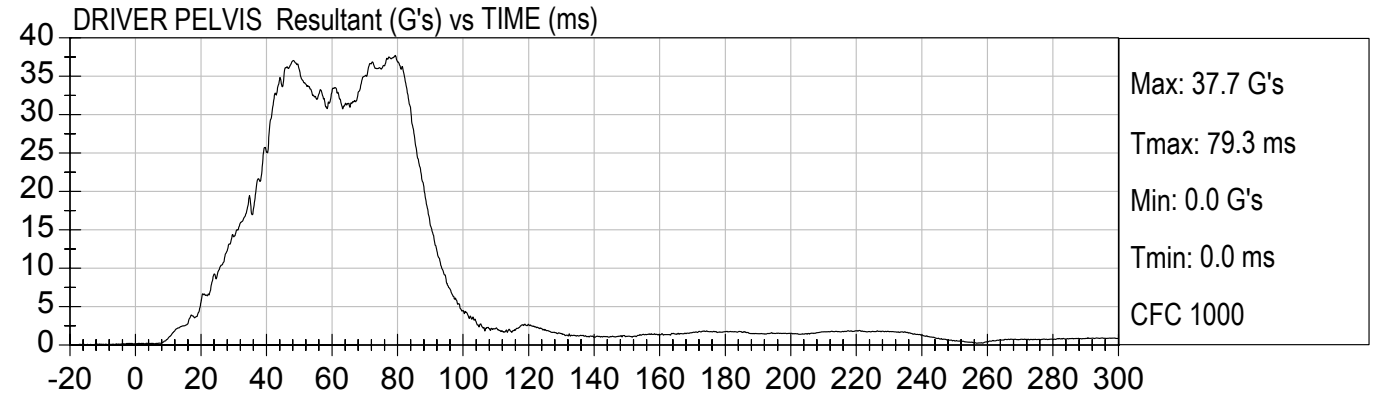
NCAP 35MPH FRONTAL
2005 FORD MUSTANG (M50206)

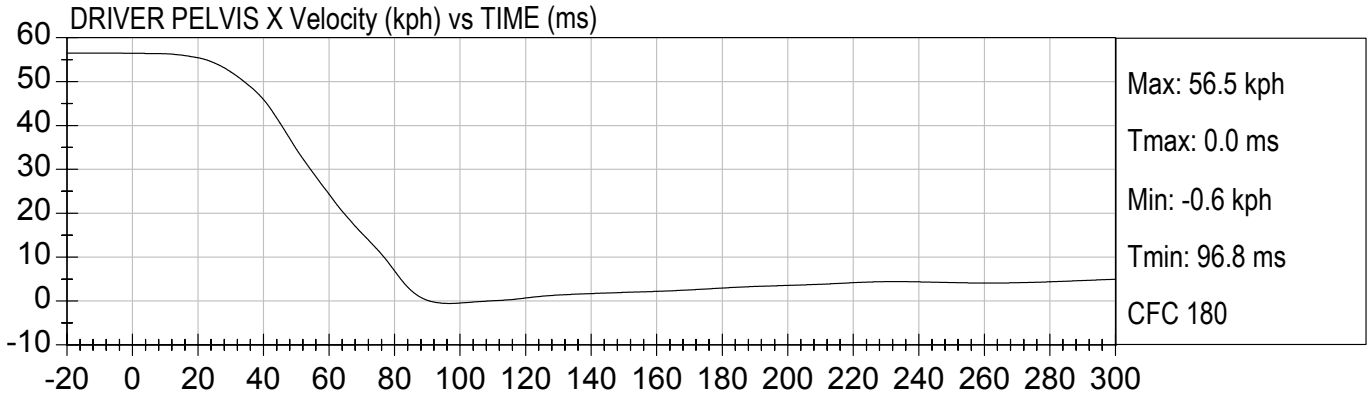
Test Date: 12/01/04
Speed: 35.1 mph (56.5 km/h)

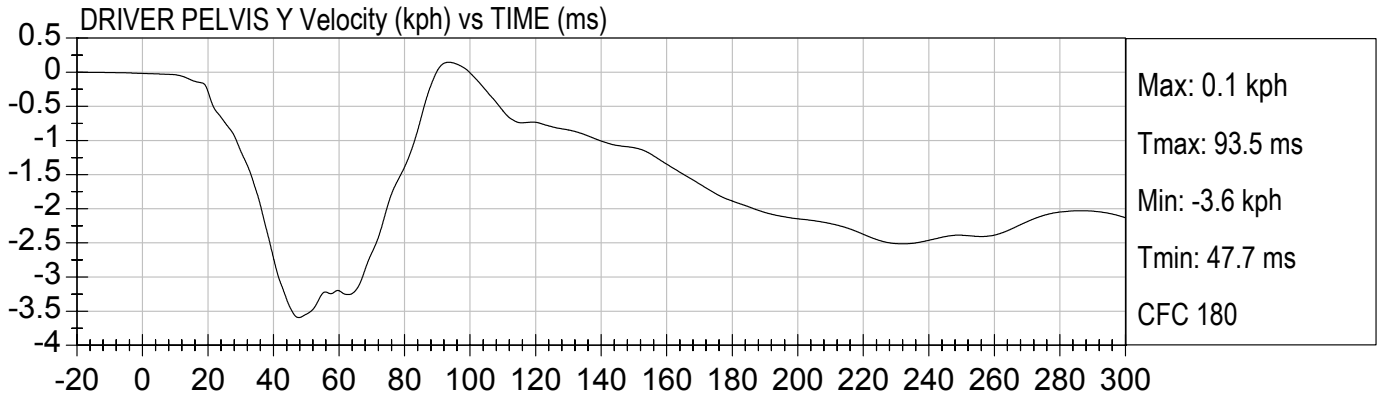


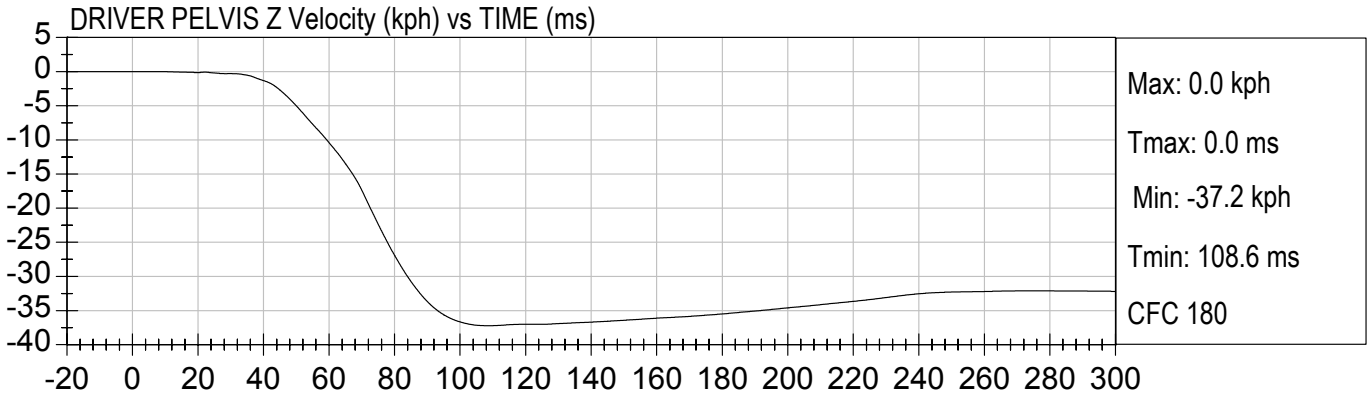






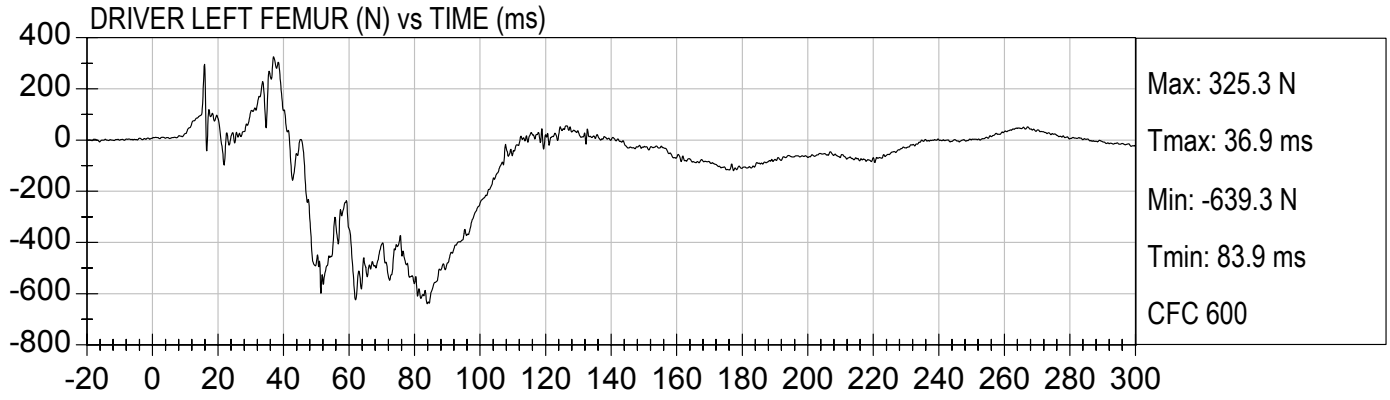

DRIVER PELVIS X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 56.5 kph
Tmax: 0.0 ms
Min: -0.6 kph
Tmin: 96.8 ms
CFC 180

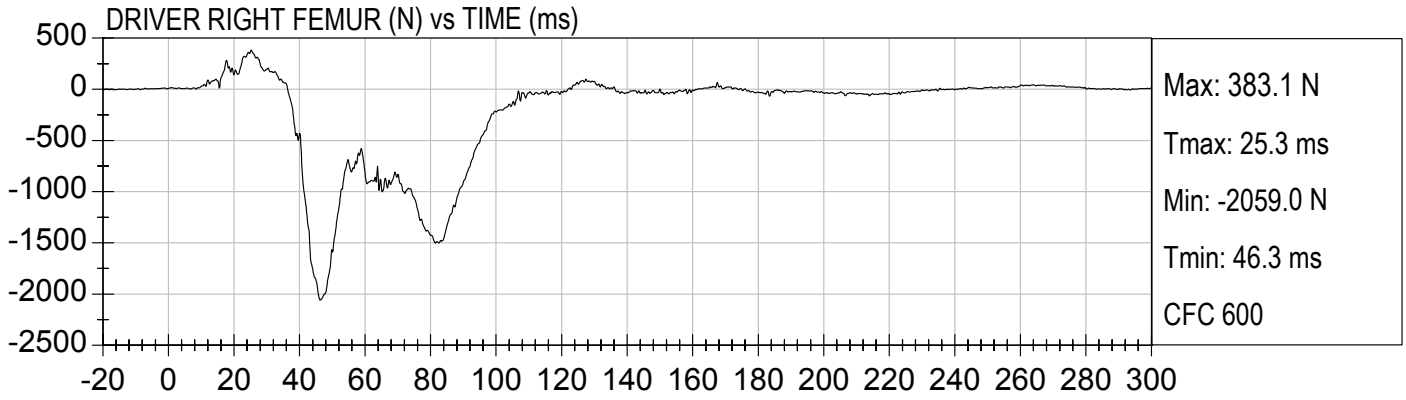

DRIVER PELVIS Y Velocity (kph) vs TIME (ms)
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.1 kph
Tmax: 93.5 ms
Min: -3.6 kph
Tmin: 47.7 ms
CFC 180

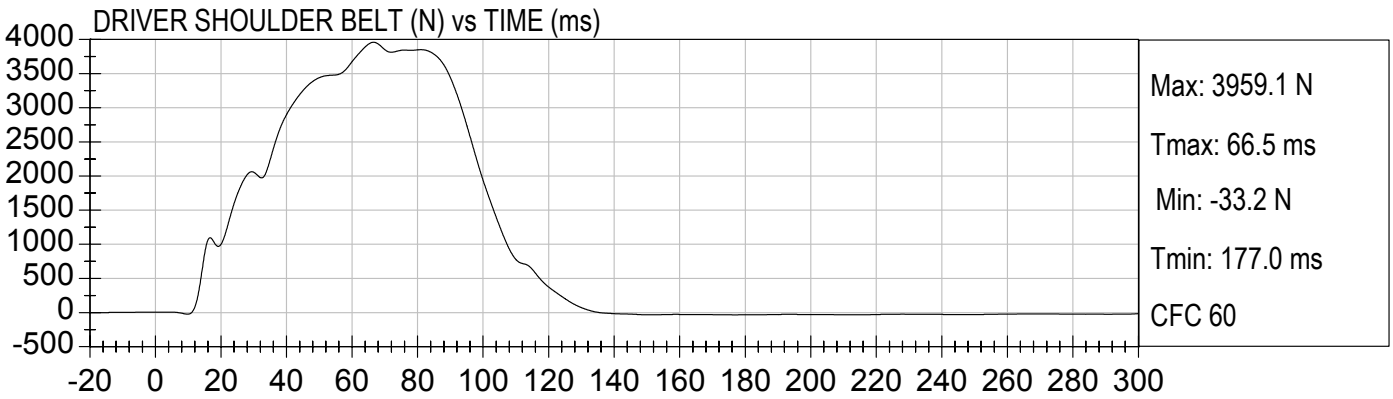

DRIVER PELVIS Z Velocity (kph) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 0.0 ms
Min: -37.2 kph
Tmin: 108.6 ms
CFC 180

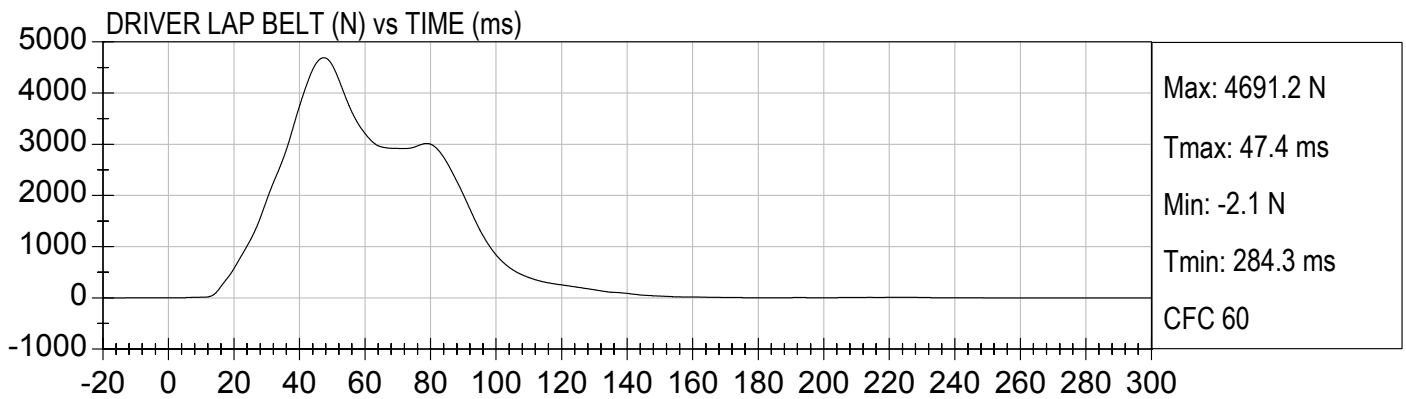
NCAP 35MPH FRONTAL
2005 FORD MUSTANG (M50206)

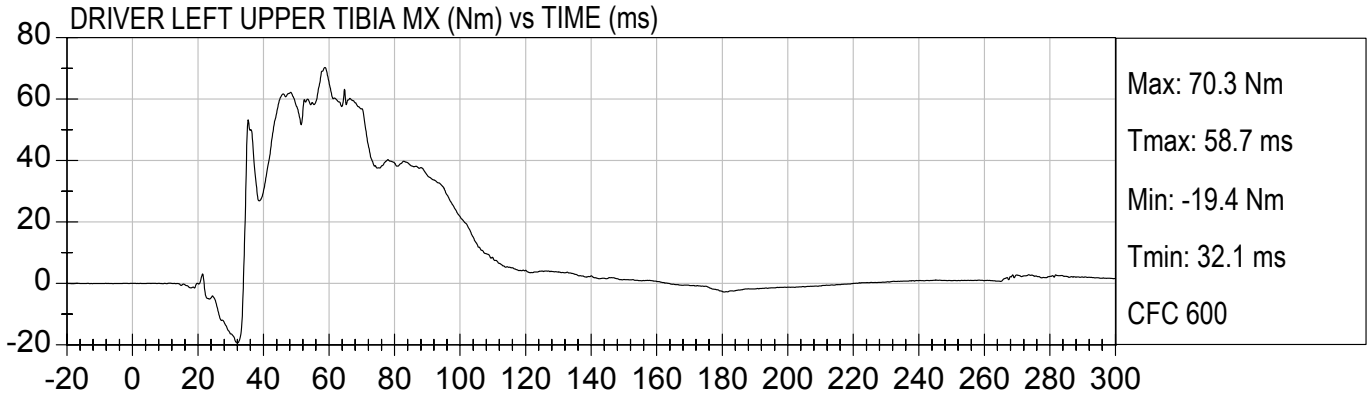
Test Date: 12/01/04
Speed: 35.1 mph (56.5 km/h)

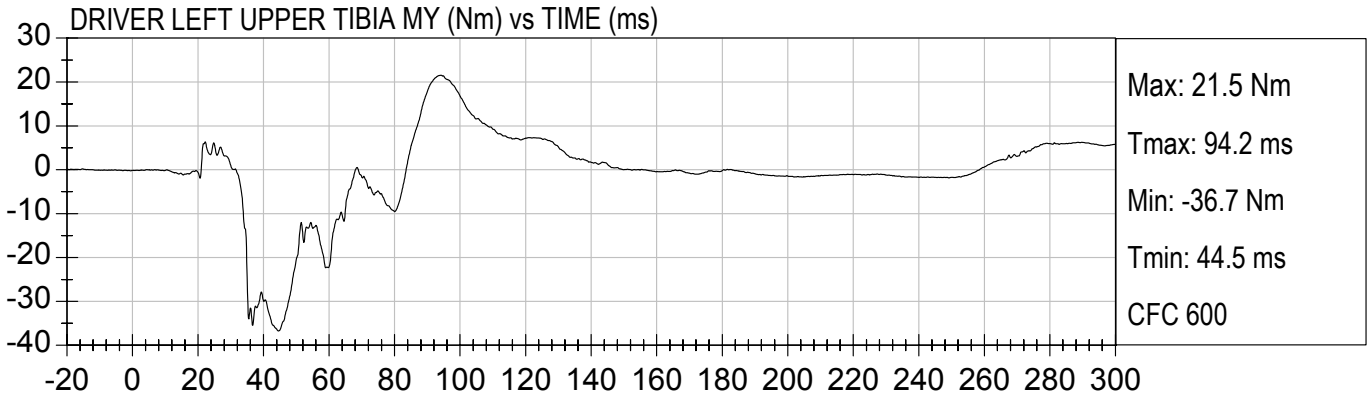


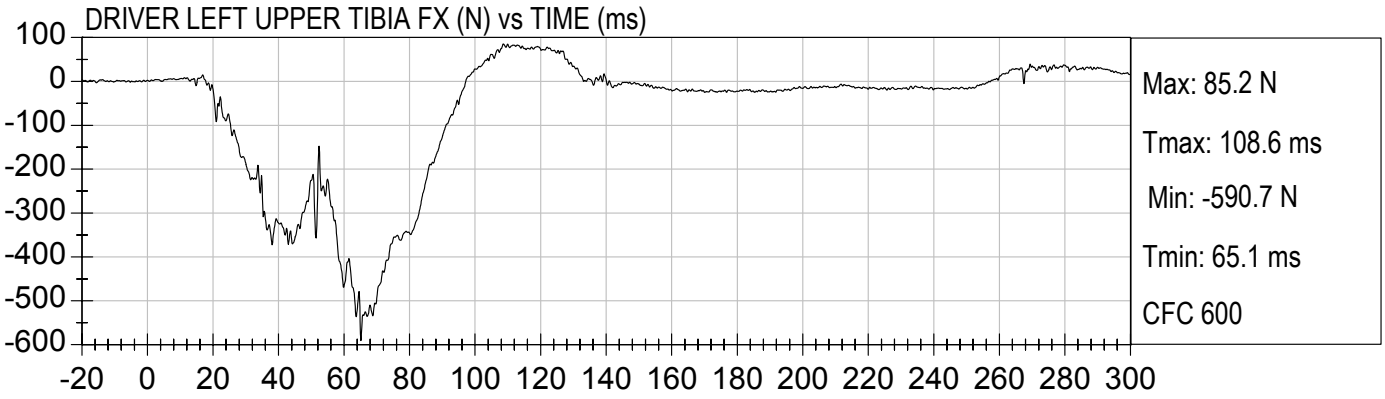


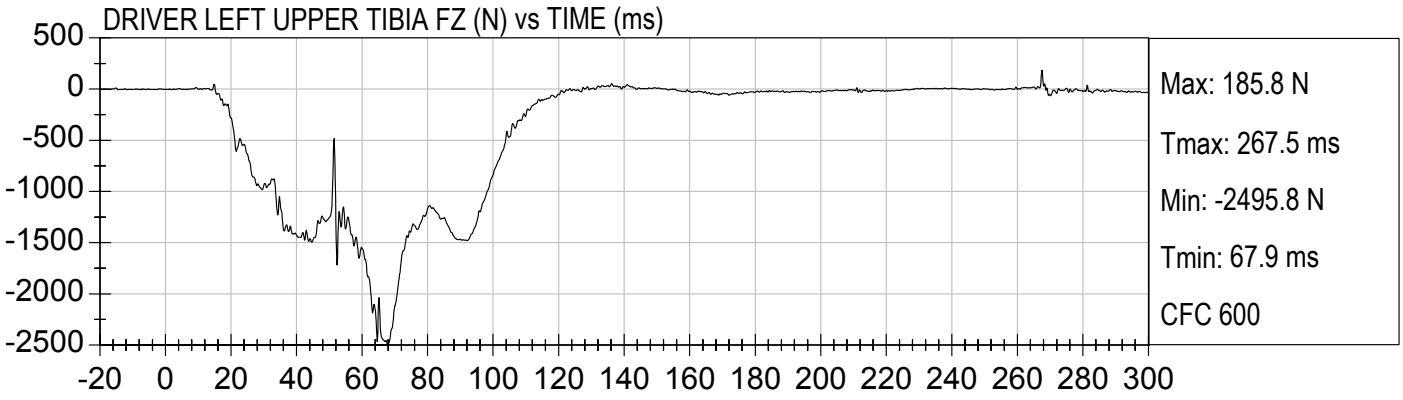


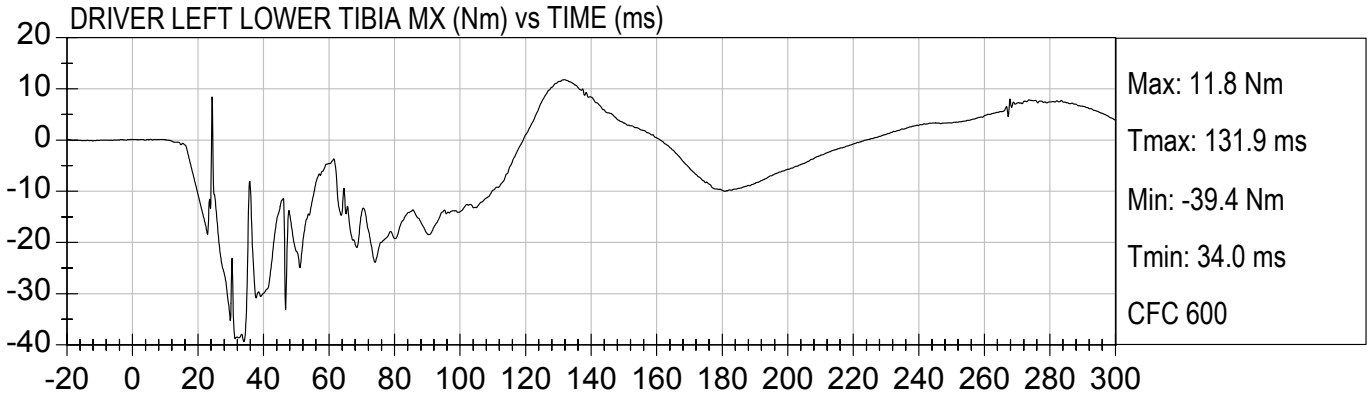


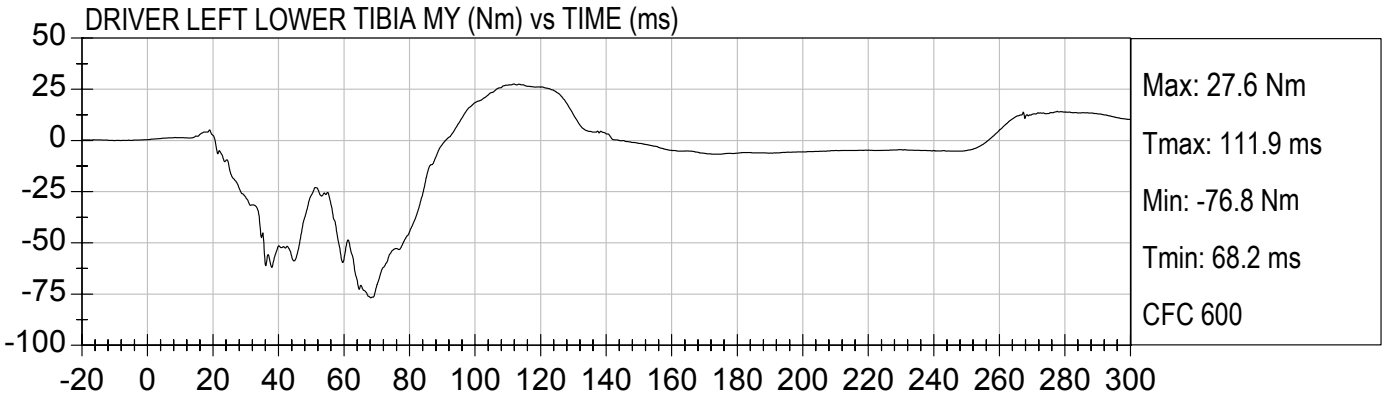

DRIVER LEFT UPPER TIBIA MX (Nm) vs TIME (ms)
Max: 70.3 Nm
Tmax: 58.7 ms
Min: -19.4 Nm
Tmin: 32.1 ms
CFC 600

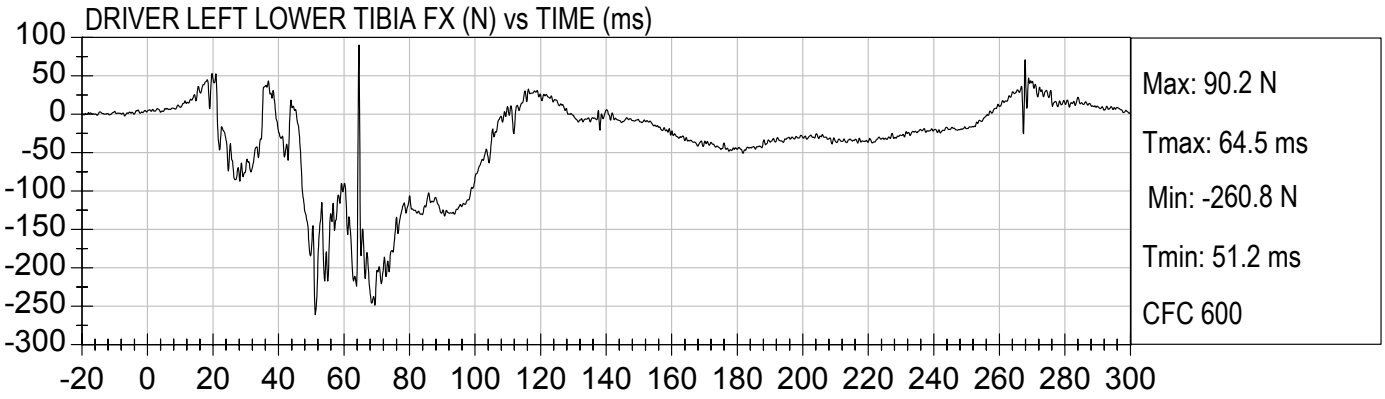

DRIVER LEFT UPPER TIBIA MY (Nm) vs TIME (ms)
Max: 21.5 Nm
Tmax: 94.2 ms
Min: -36.7 Nm
Tmin: 44.5 ms
CFC 600

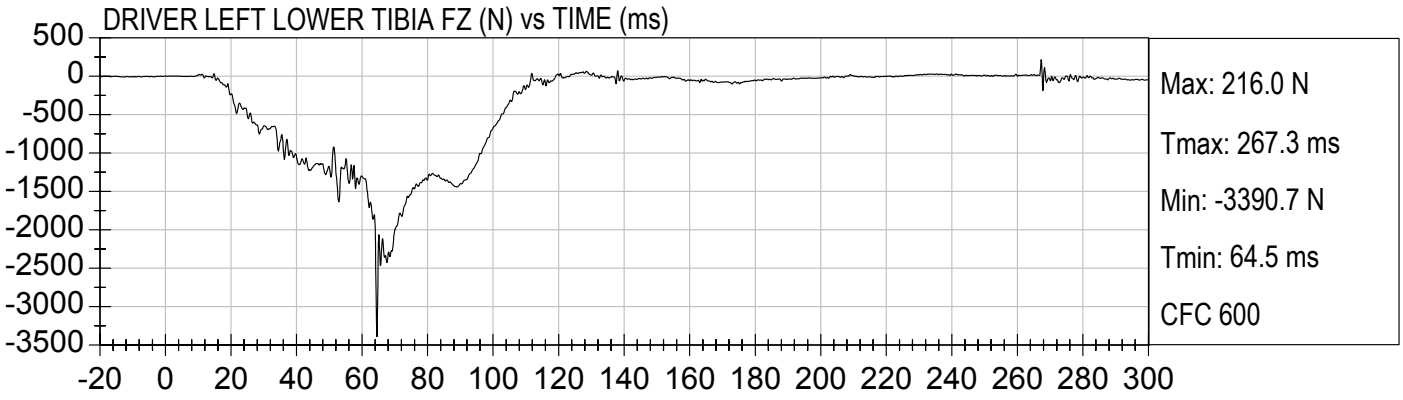

DRIVER LEFT UPPER TIBIA FX (N) vs TIME (ms)
Max: 85.2 N
Tmax: 108.6 ms
Min: -590.7 N
Tmin: 65.1 ms
CFC 600

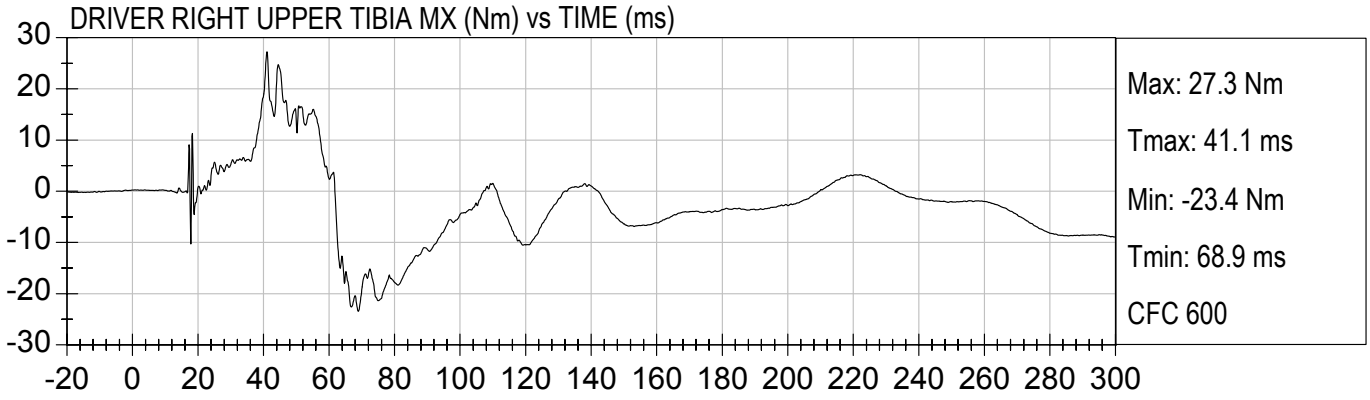

DRIVER LEFT UPPER TIBIA FZ (N) vs TIME (ms)
Max: 185.8 N
Tmax: 267.5 ms
Min: -2495.8 N
Tmin: 67.9 ms
CFC 600

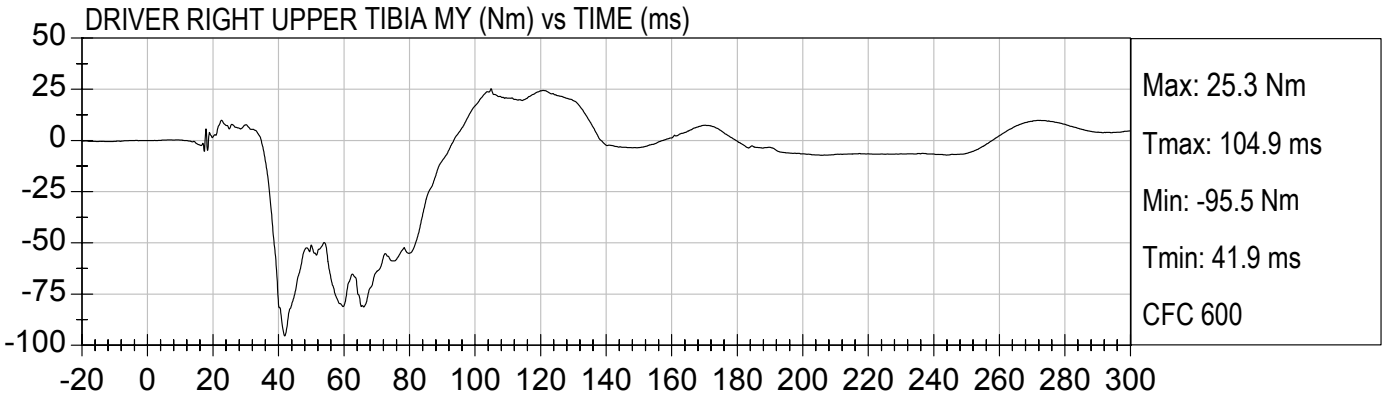

DRIVER LEFT LOWER TIBIA MX (Nm) vs TIME (ms)
Max: 11.8 Nm
Tmax: 131.9 ms
Min: -39.4 Nm
Tmin: 34.0 ms
CFC 600

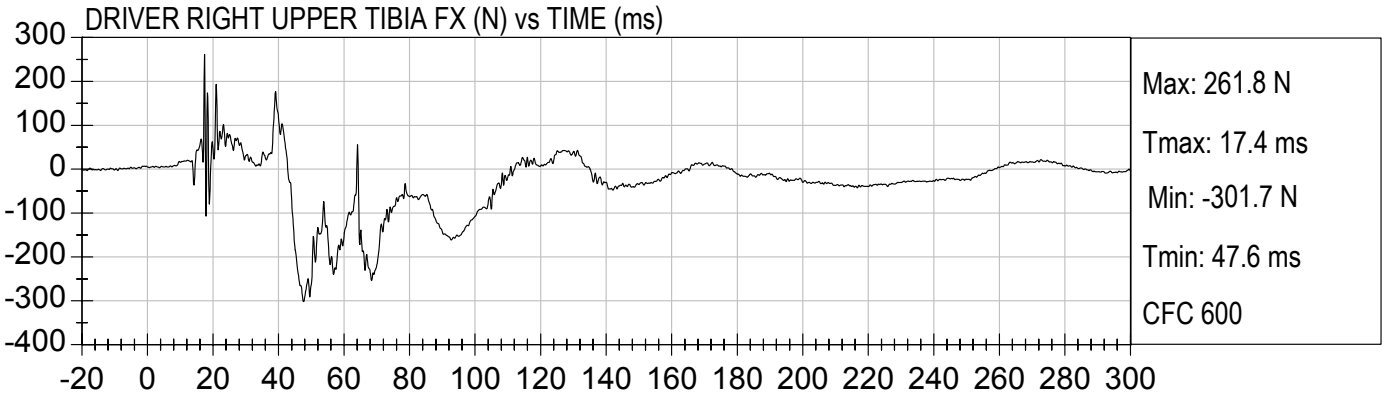

DRIVER LEFT LOWER TIBIA MY (Nm) vs TIME (ms)
Max: 27.6 Nm
Tmax: 111.9 ms
Min: -76.8 Nm
Tmin: 68.2 ms
CFC 600

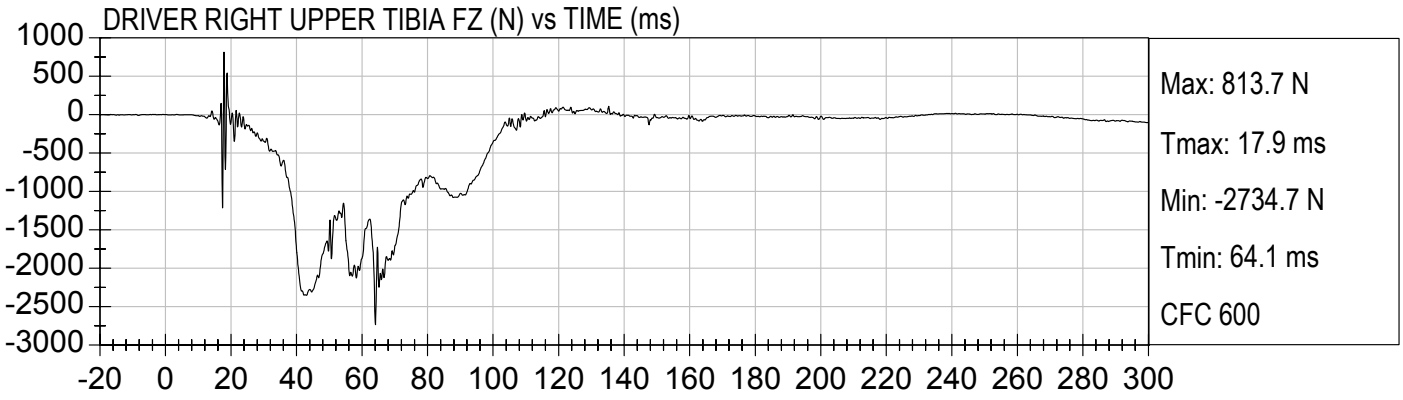

DRIVER LEFT LOWER TIBIA FX (N) vs TIME (ms)
Max: 90.2 N
Tmax: 64.5 ms
Min: -260.8 N
Tmin: 51.2 ms
CFC 600

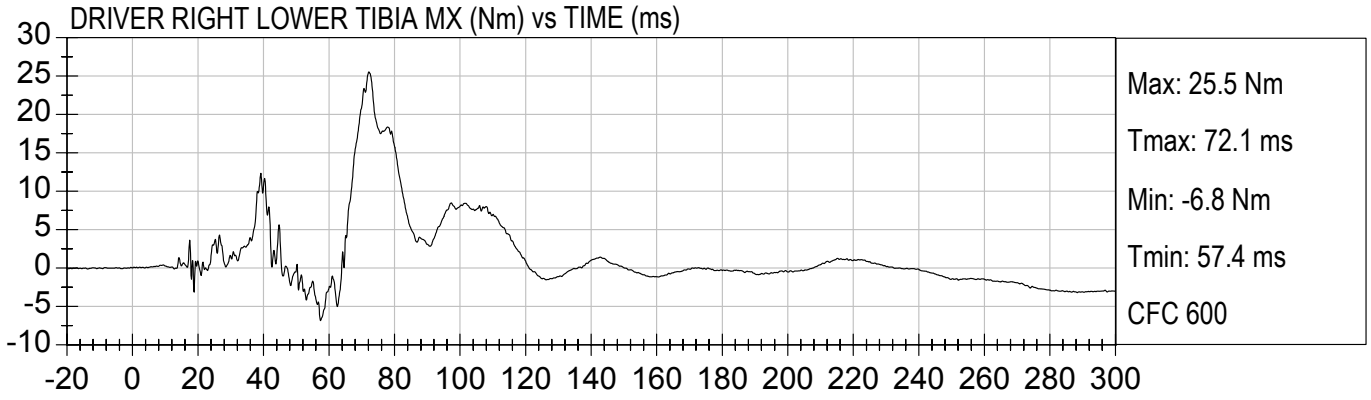

DRIVER LEFT LOWER TIBIA FZ (N) vs TIME (ms)
Max: 216.0 N
Tmax: 267.3 ms
Min: -3390.7 N
Tmin: 64.5 ms
CFC 600

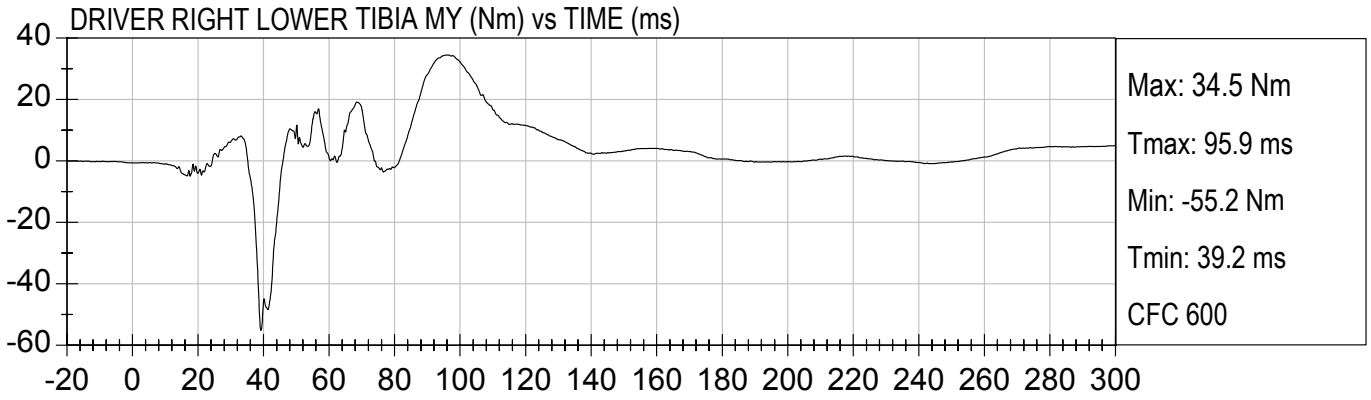

DRIVER RIGHT UPPER TIBIA MX (Nm) vs TIME (ms)
30
20
10
0
-10
-20
-30
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 27.3 Nm
Tmax: 41.1 ms
Min: -23.4 Nm
Tmin: 68.9 ms
CFC 600

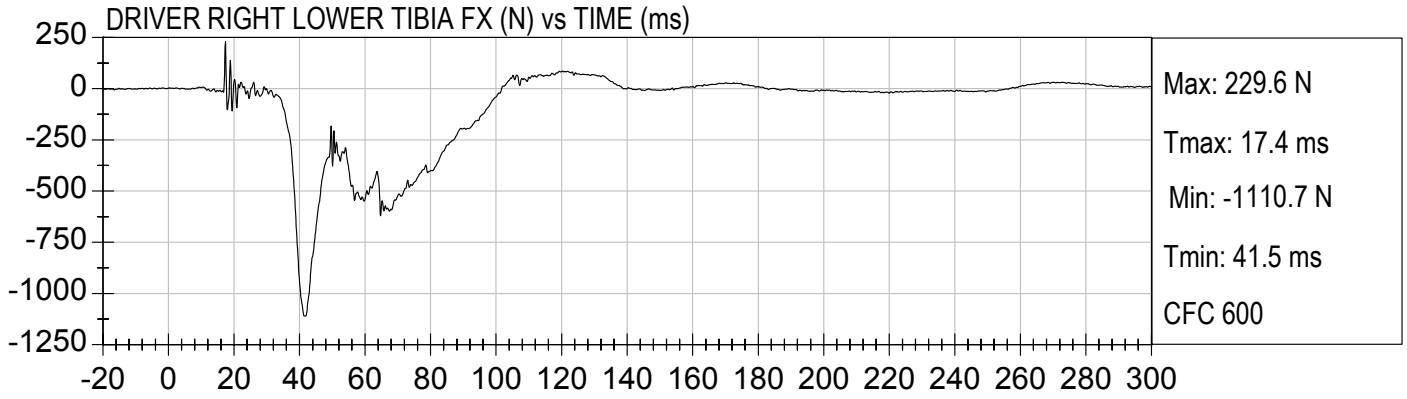

DRIVER RIGHT UPPER TIBIA MY (Nm) vs TIME (ms)
50
25
0
-25
-50
-75
-100
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 25.3 Nm
Tmax: 104.9 ms
Min: -95.5 Nm
Tmin: 41.9 ms
CFC 600

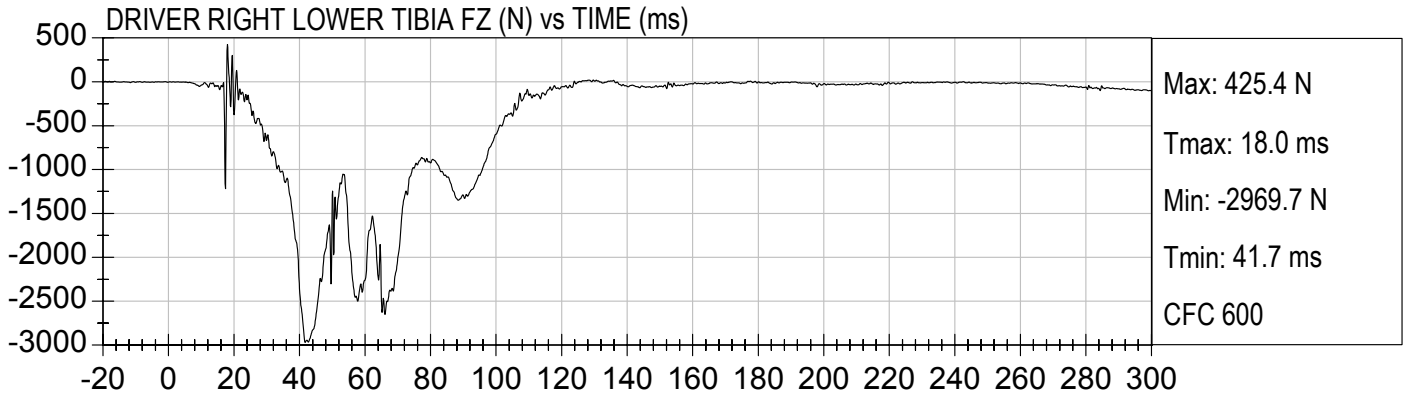

DRIVER RIGHT UPPER TIBIA FX (N) vs TIME (ms)
300
200
100
0
-100
-200
-300
-400
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 261.8 N
Tmax: 17.4 ms
Min: -301.7 N
Tmin: 47.6 ms
CFC 600

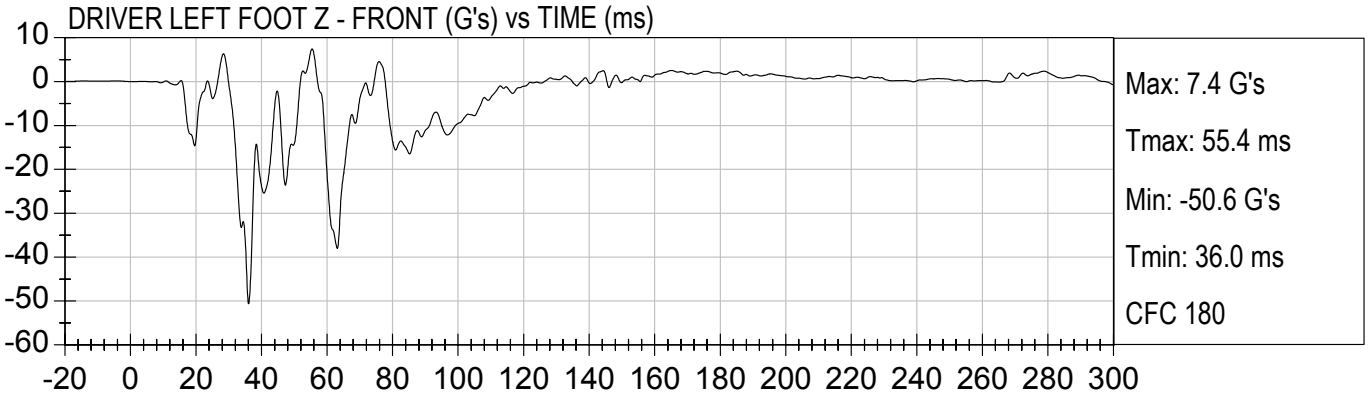

DRIVER RIGHT UPPER TIBIA FZ (N) vs TIME (ms)
1000
500
0
-500
-1000
-1500
-2000
-2500
-3000
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 813.7 N
Tmax: 17.9 ms
Min: -2734.7 N
Tmin: 64.1 ms
CFC 600

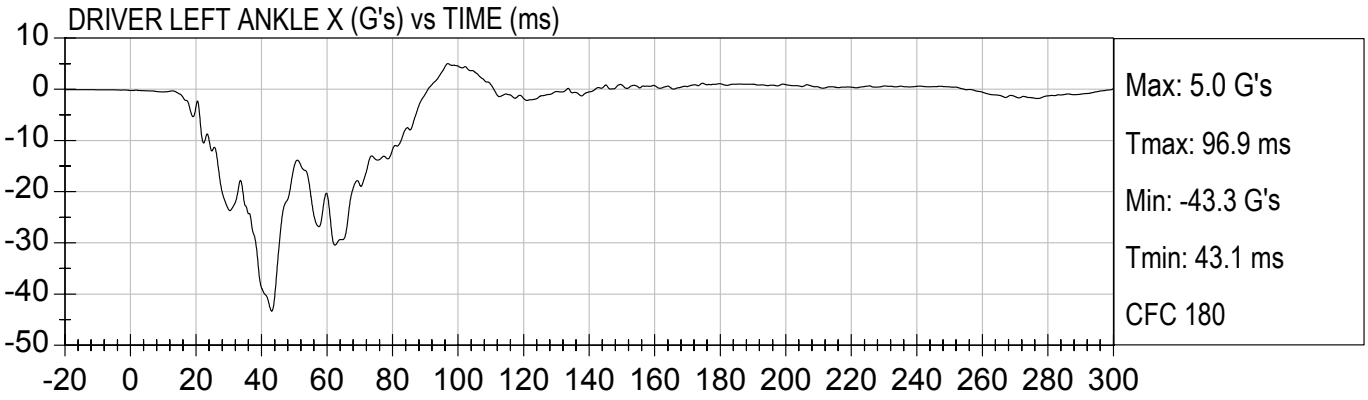

DRIVER RIGHT LOWER TIBIA MX (Nm) vs TIME (ms)
Max: 25.5 Nm
Tmax: 72.1 ms
Min: -6.8 Nm
Tmin: 57.4 ms
CFC 600

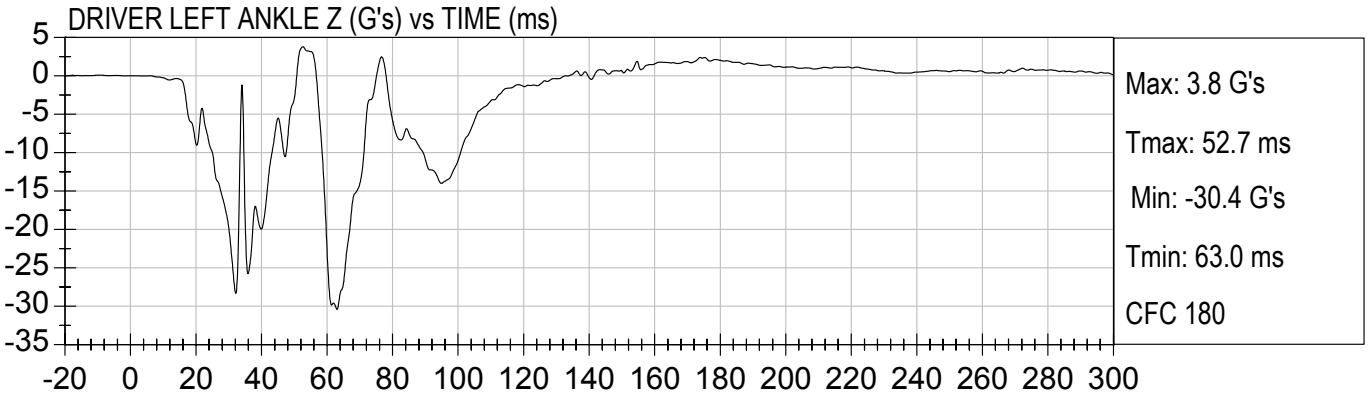

DRIVER RIGHT LOWER TIBIA MY (Nm) vs TIME (ms)
Max: 34.5 Nm
Tmax: 95.9 ms
Min: -55.2 Nm
Tmin: 39.2 ms
CFC 600

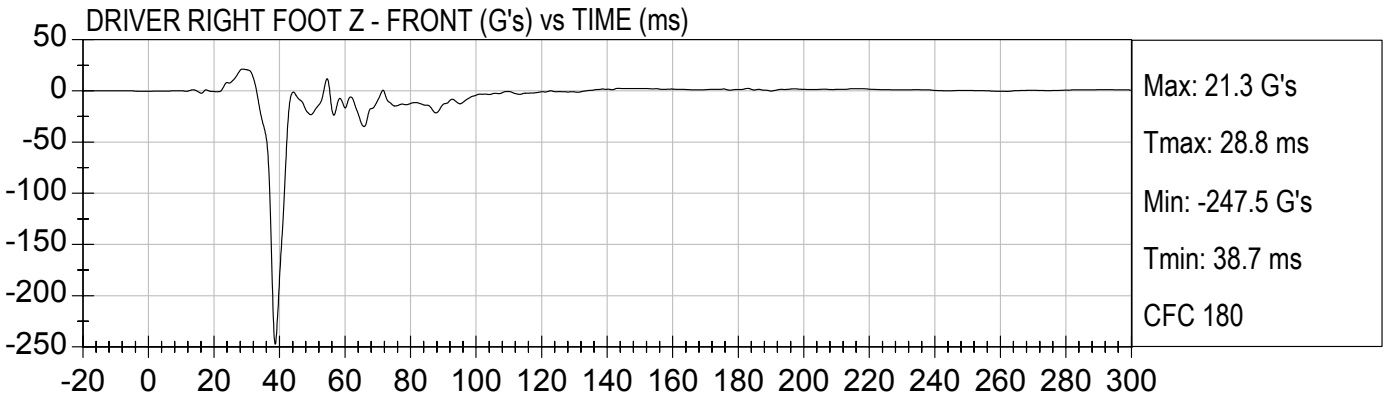

DRIVER RIGHT LOWER TIBIA FX (N) vs TIME (ms)
Max: 229.6 N
Tmax: 17.4 ms
Min: -1110.7 N
Tmin: 41.5 ms
CFC 600

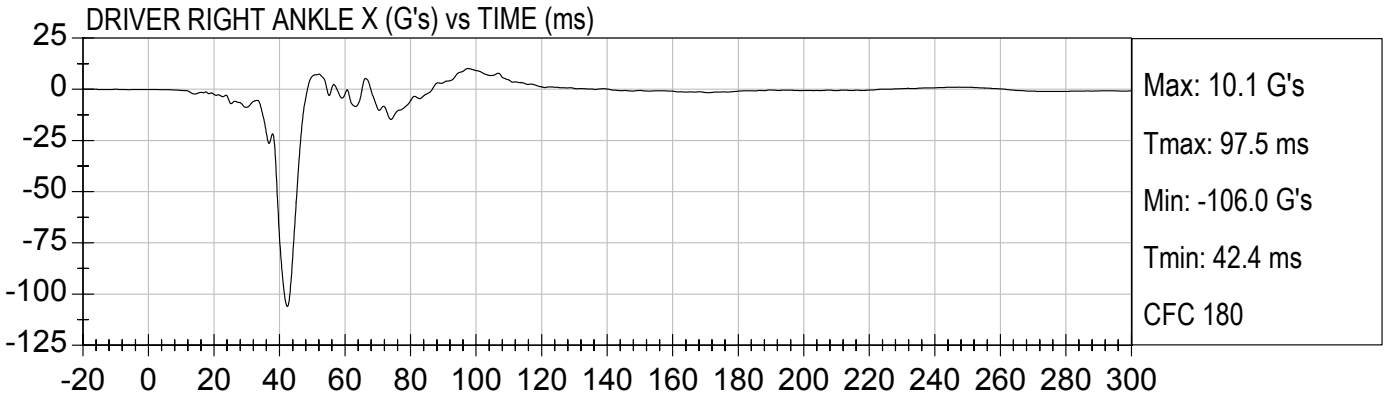

DRIVER RIGHT LOWER TIBIA FZ (N) vs TIME (ms)
Max: 425.4 N
Tmax: 18.0 ms
Min: -2969.7 N
Tmin: 41.7 ms
CFC 600

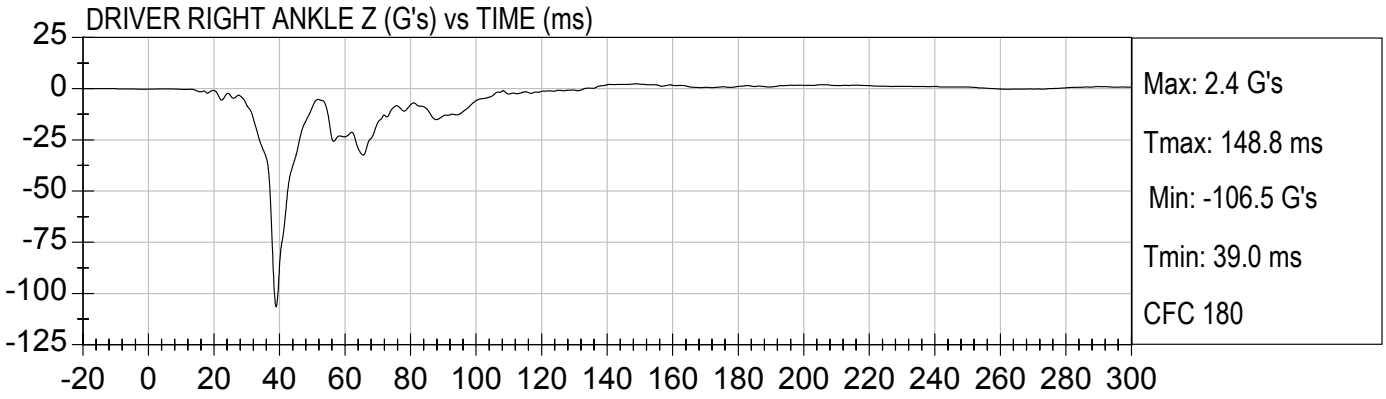

DRIVER LEFT FOOT Z - FRONT (G's) vs TIME (ms)
10
0
-10
-20
-30
-40
-50
-60
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 7.4 G's
Tmax: 55.4 ms
Min: -50.6 G's
Tmin: 36.0 ms
CFC 180


DRIVER LEFT ANKLE X (G's) vs TIME (ms)
10
0
-10
-20
-30
-40
-50
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 5.0 G's
Tmax: 96.9 ms
Min: -43.3 G's
Tmin: 43.1 ms
CFC 180


DRIVER LEFT ANKLE Z (G's) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-35
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 3.8 G's
Tmax: 52.7 ms
Min: -30.4 G's
Tmin: 63.0 ms
CFC 180

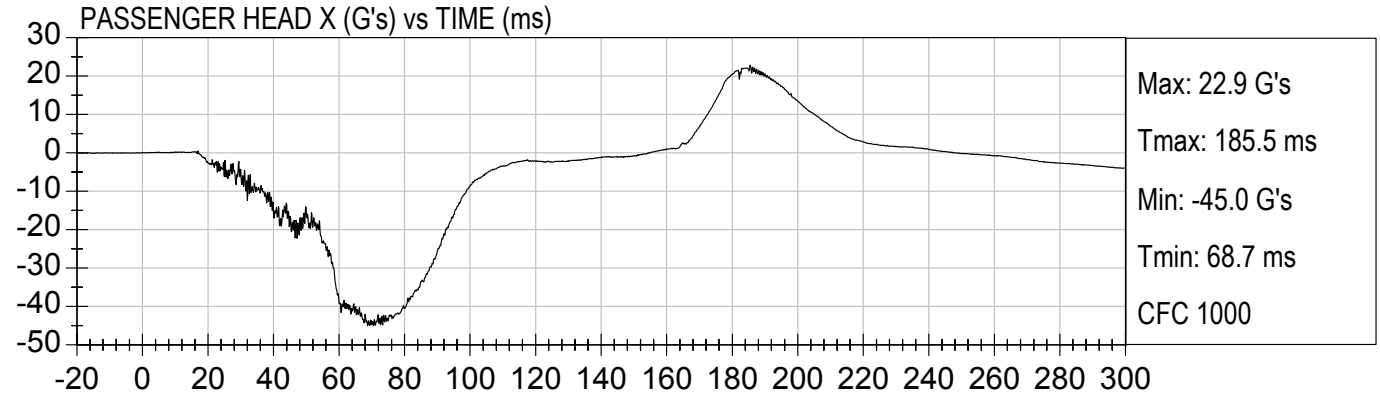

DRIVER RIGHT FOOT Z - FRONT (G's) vs TIME (ms)
50
0
-50
-100
-150
-200
-250
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 21.3 G's
Tmax: 28.8 ms
Min: -247.5 G's
Tmin: 38.7 ms
CFC 180

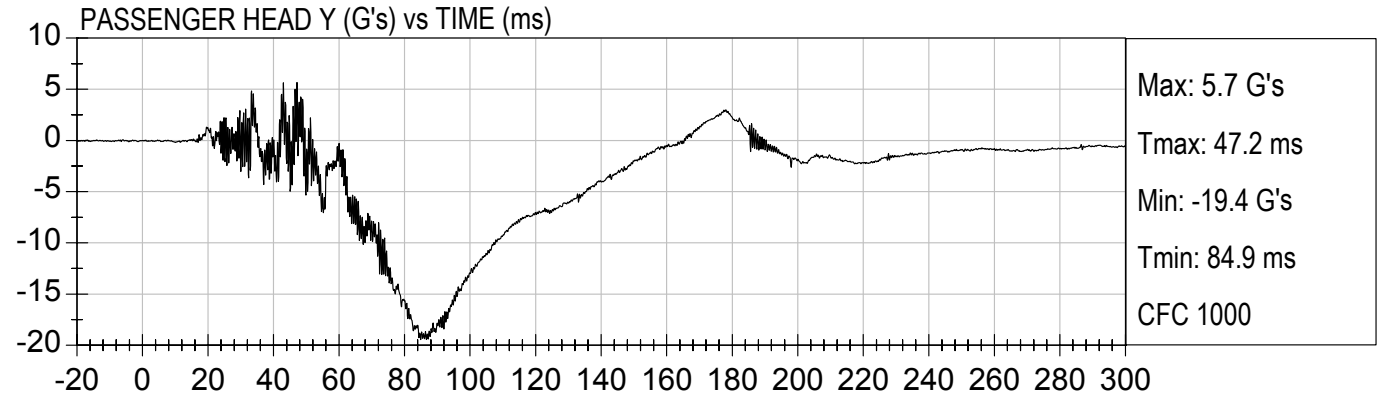

DRIVER RIGHT ANKLE X (G's) vs TIME (ms)
25
0
-25
-50
-75
-100
-125
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 10.1 G's
Tmax: 97.5 ms
Min: -106.0 G's
Tmin: 42.4 ms
CFC 180

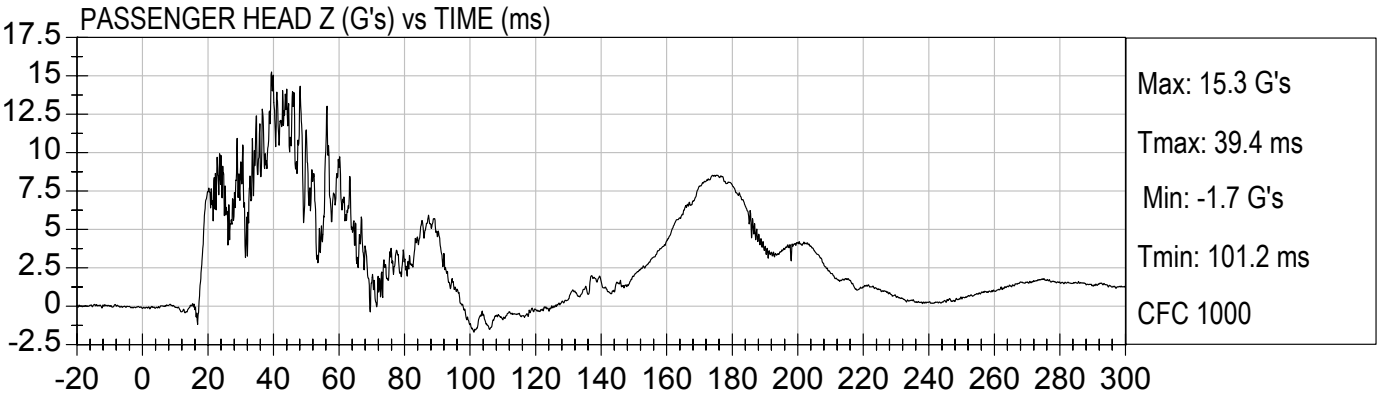

DRIVER RIGHT ANKLE Z (G's) vs TIME (ms)
25
0
-25
-50
-75
-100
-125
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 2.4 G's
Tmax: 148.8 ms
Min: -106.5 G's
Tmin: 39.0 ms
CFC 180

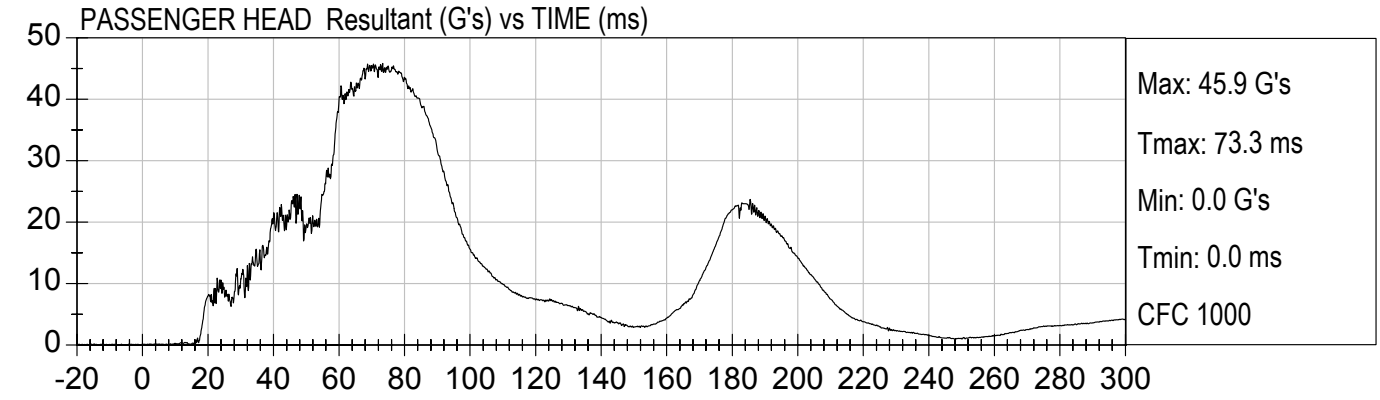
NCAP 35MPH FRONTAL
2005 FORD MUSTANG (M50206)

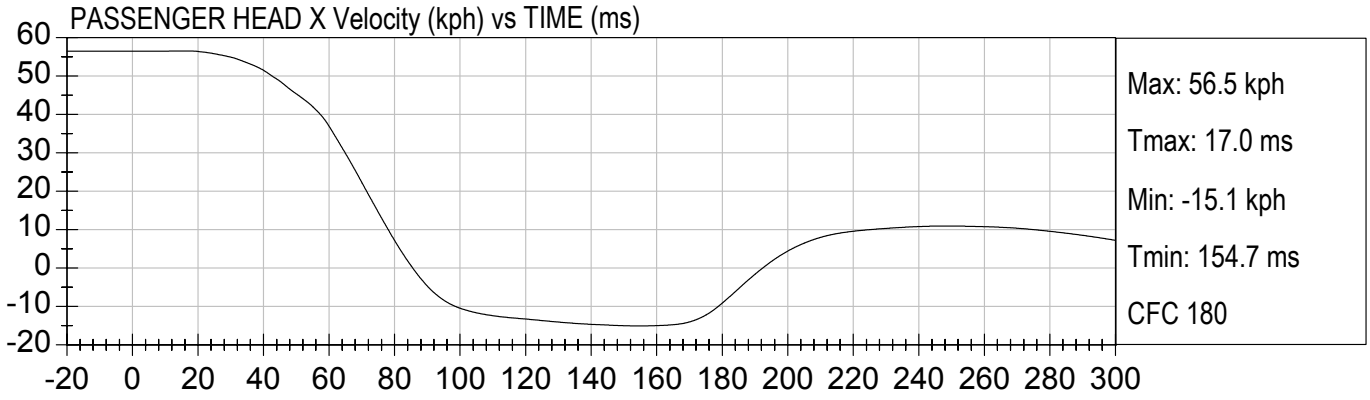
Test Date: 12/01/04
Speed: 35.1 mph (56.5 km/h)

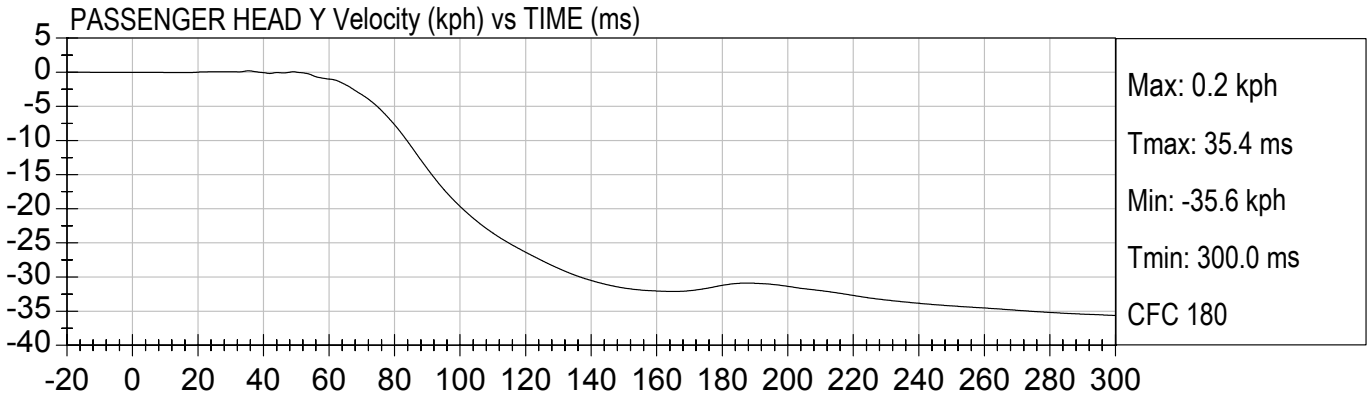


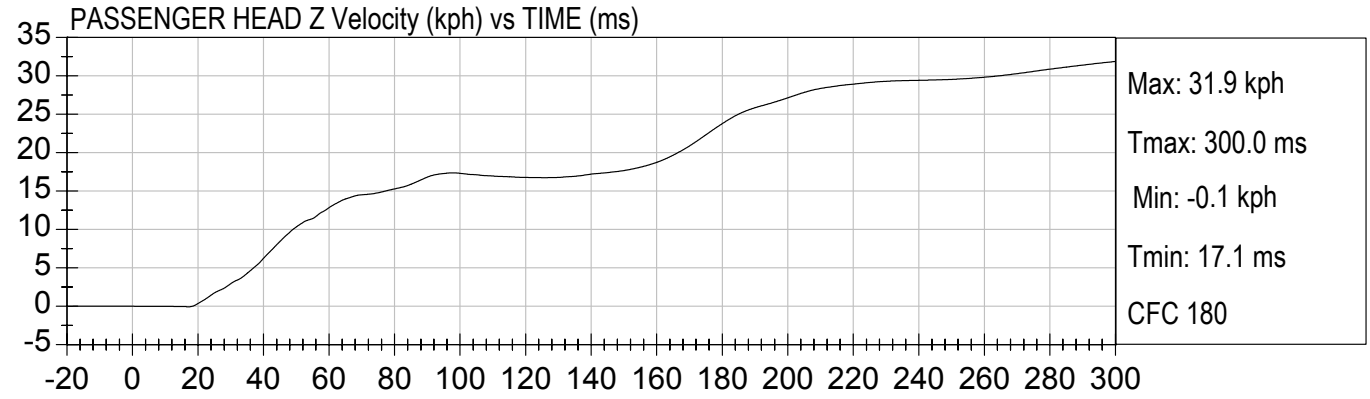






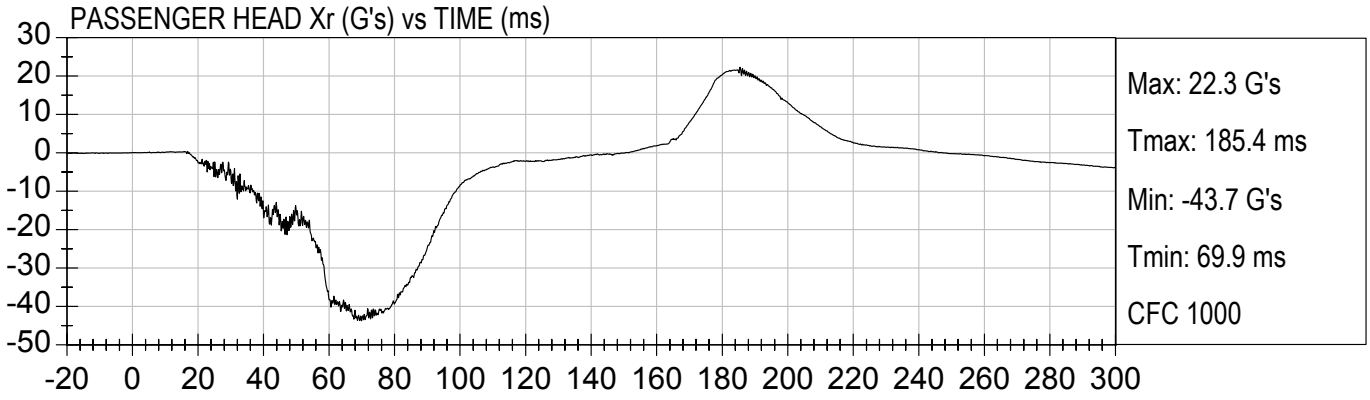

PASSENGER HEAD X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 56.5 kph
Tmax: 17.0 ms
Min: -15.1 kph
Tmin: 154.7 ms
CFC 180

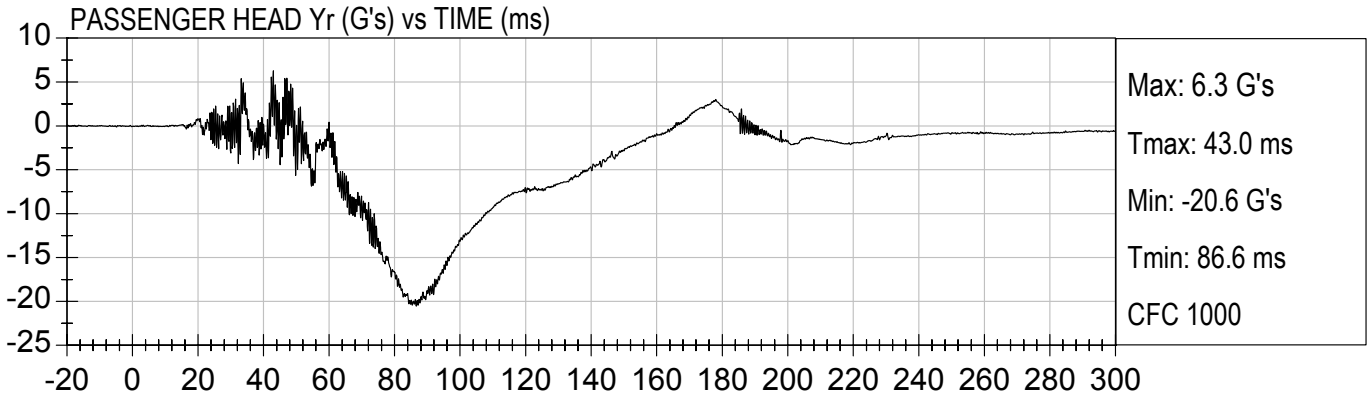

PASSENGER HEAD Y Velocity (kph) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.2 kph
Tmax: 35.4 ms
Min: -35.6 kph
Tmin: 300.0 ms
CFC 180

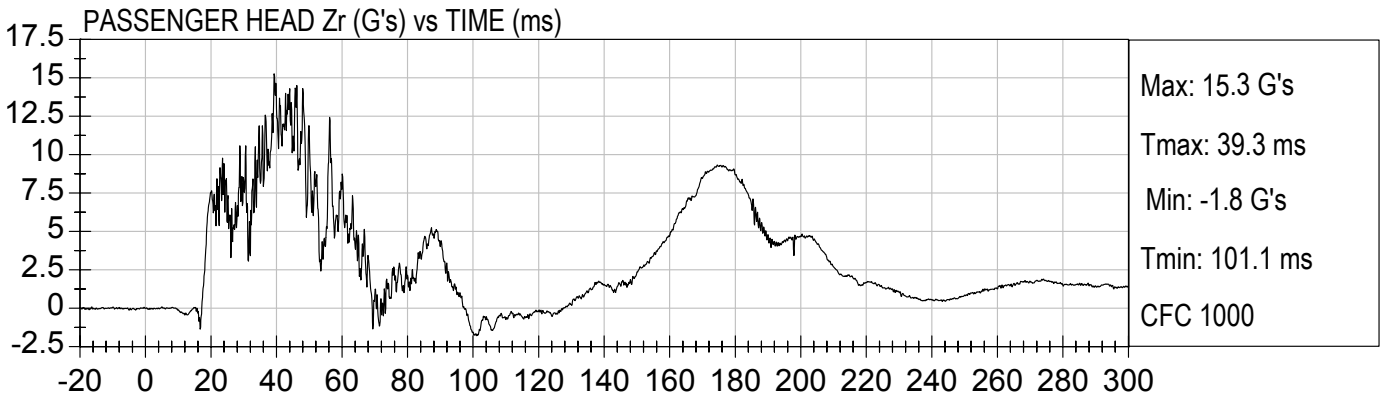

PASSENGER HEAD Z Velocity (kph) vs TIME (ms)
35
30
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 31.9 kph
Tmax: 300.0 ms
Min: -0.1 kph
Tmin: 17.1 ms
CFC 180

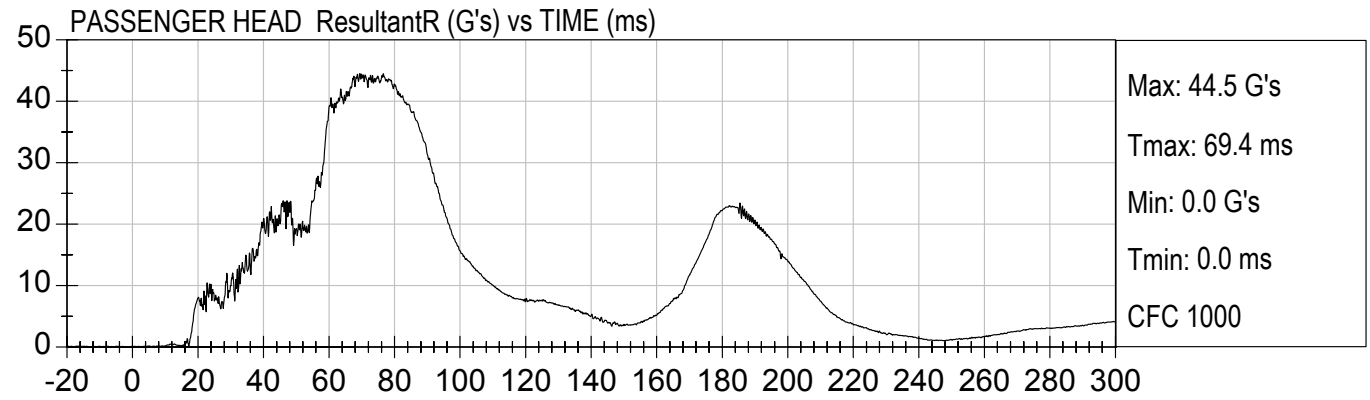
NCAP 35MPH FRONTAL
2005 FORD MUSTANG (M50206)

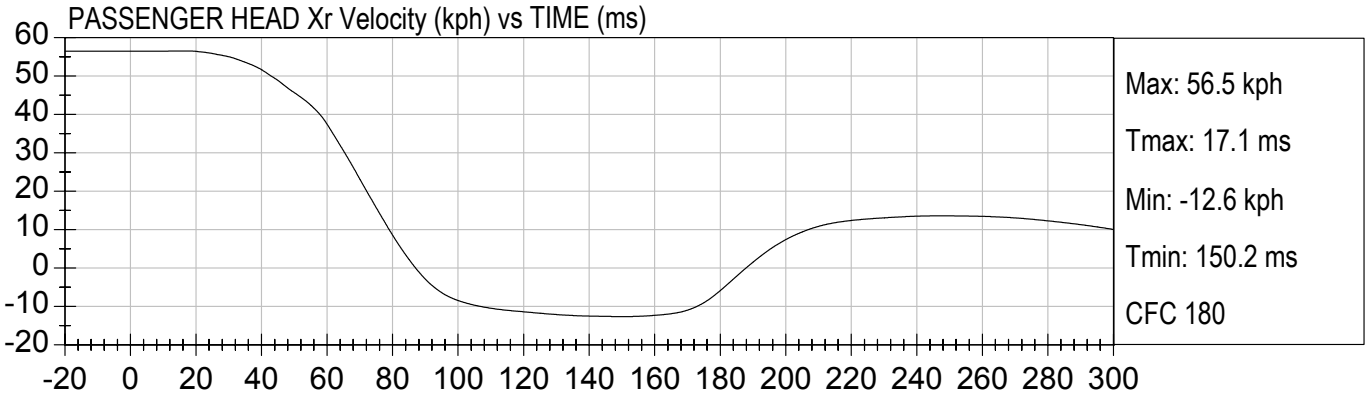
Test Date: 12/01/04
Speed: 35.1 mph (56.5 km/h)

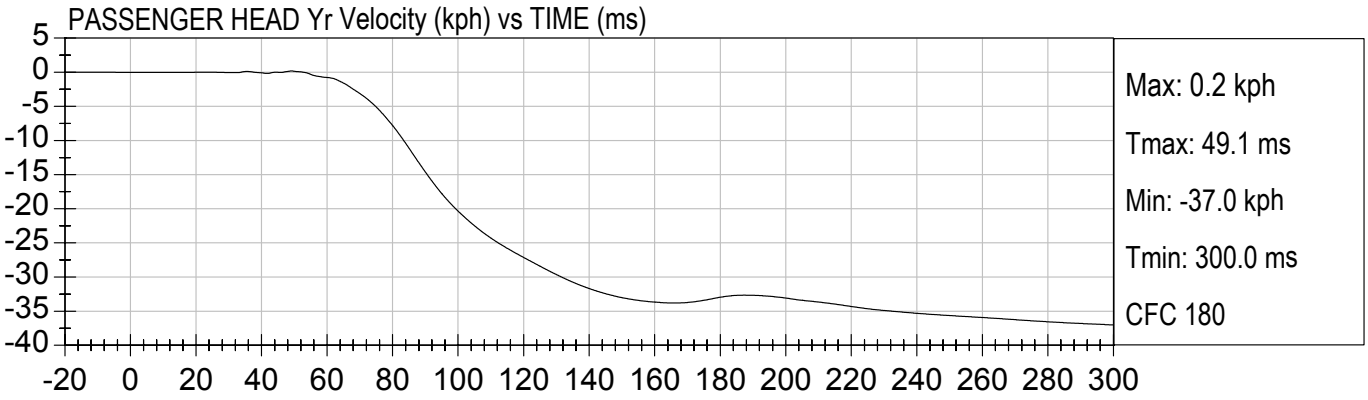


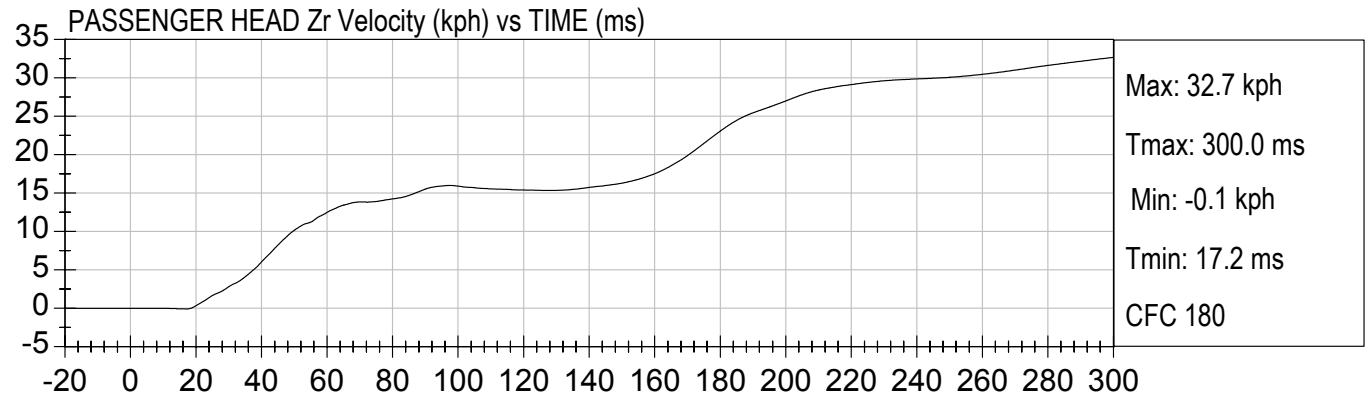






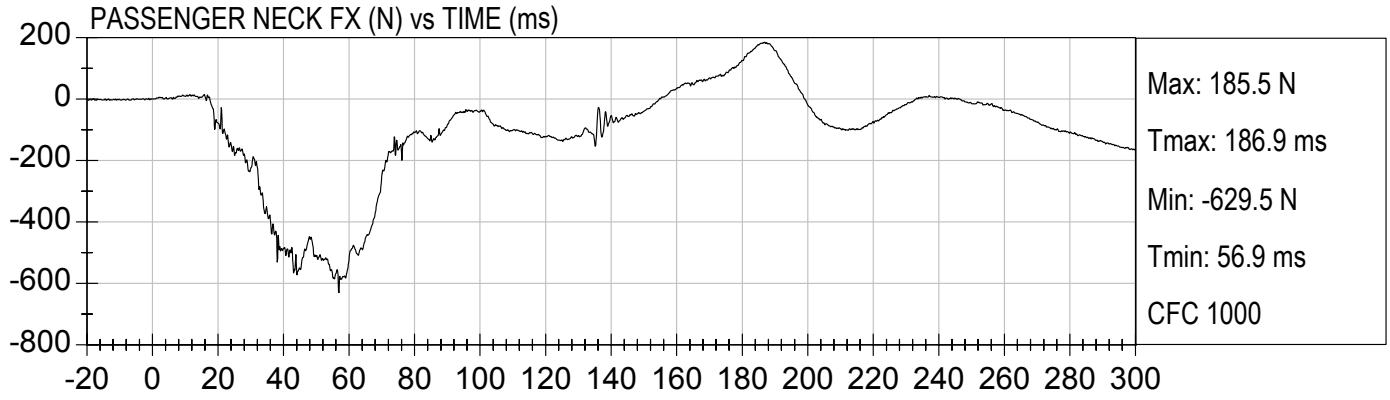

PASSENGER HEAD Xr Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 56.5 kph
Tmax: 17.1 ms
Min: -12.6 kph
Tmin: 150.2 ms
CFC 180

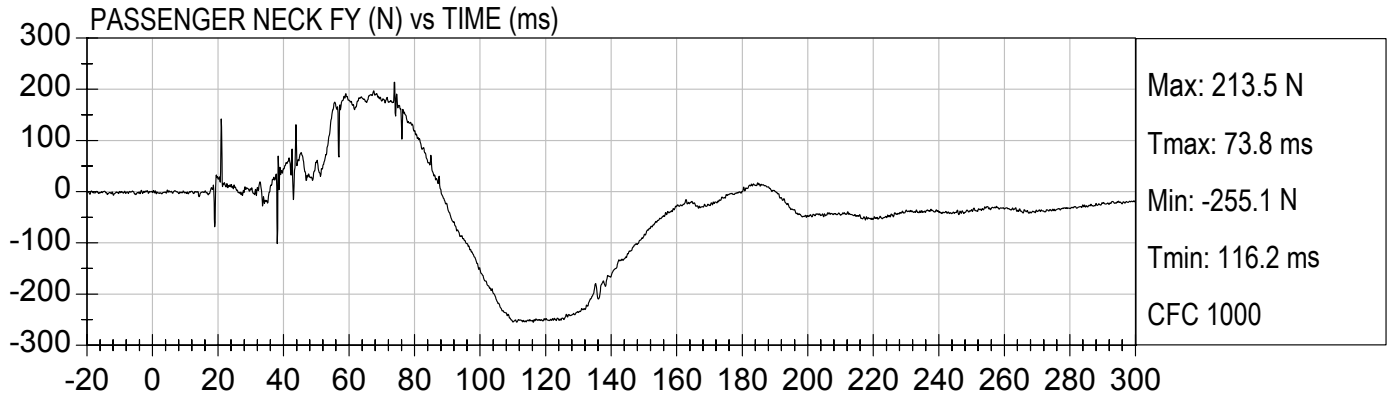

PASSENGER HEAD Yr Velocity (kph) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.2 kph
Tmax: 49.1 ms
Min: -37.0 kph
Tmin: 300.0 ms
CFC 180

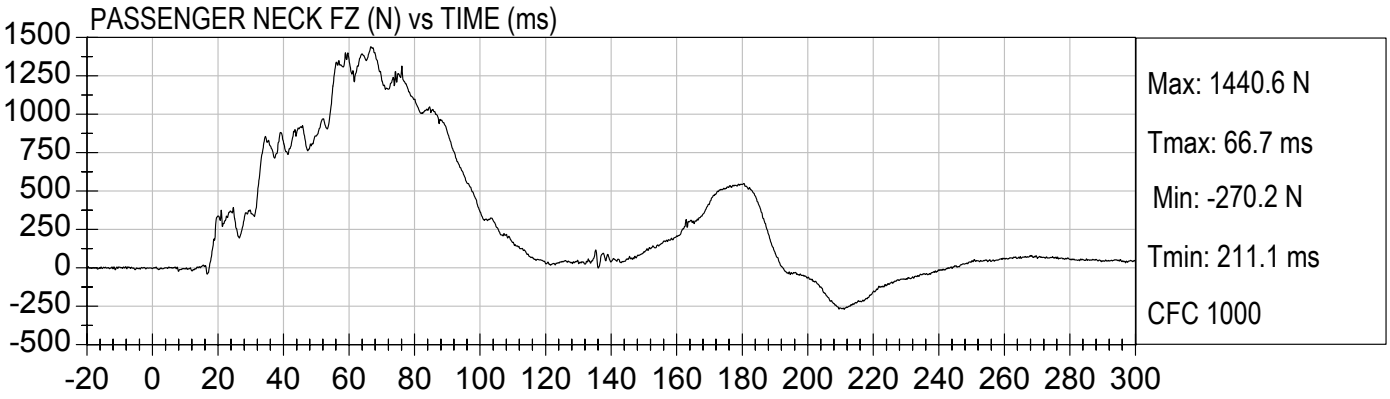

PASSENGER HEAD Zr Velocity (kph) vs TIME (ms)
35
30
25
20
15
10
5
0
-5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 32.7 kph
Tmax: 300.0 ms
Min: -0.1 kph
Tmin: 17.2 ms
CFC 180

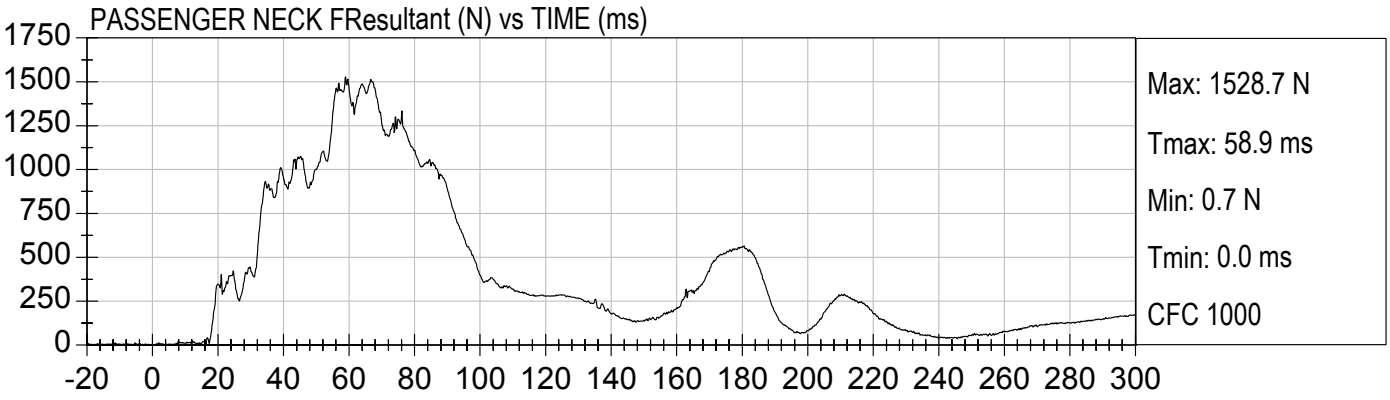
NCAP 35MPH FRONTAL
2005 FORD MUSTANG (M50206)

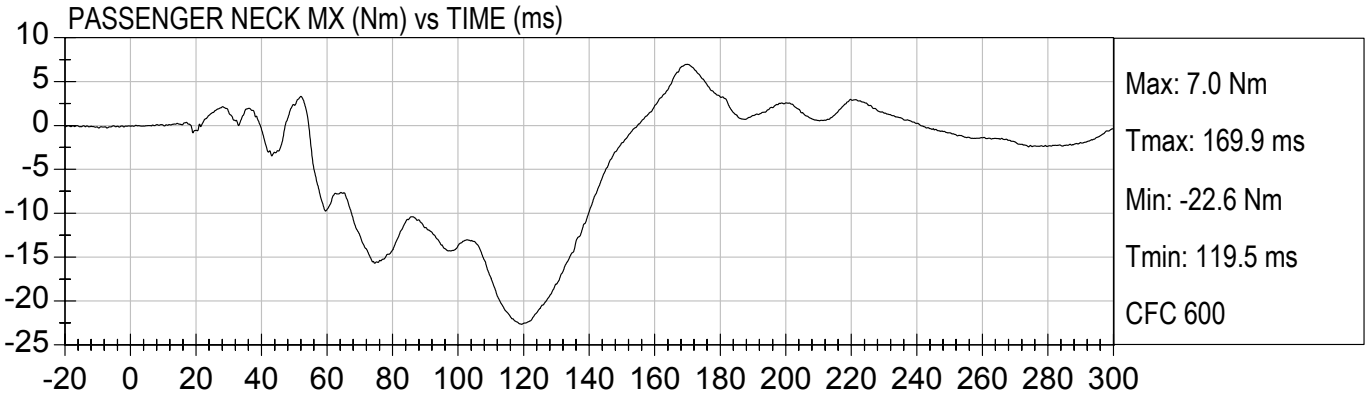
Test Date: 12/01/04
Speed: 35.1 mph (56.5 km/h)

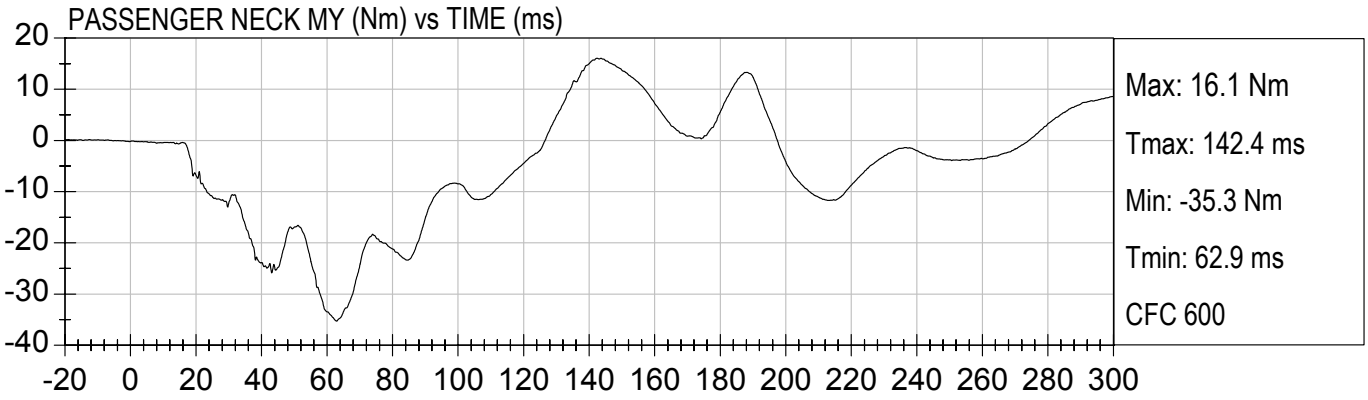


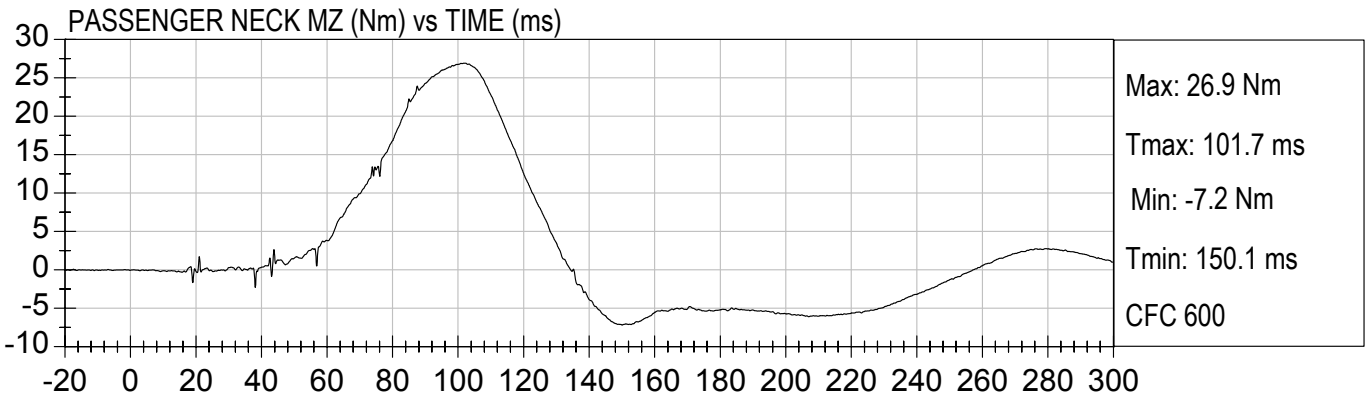


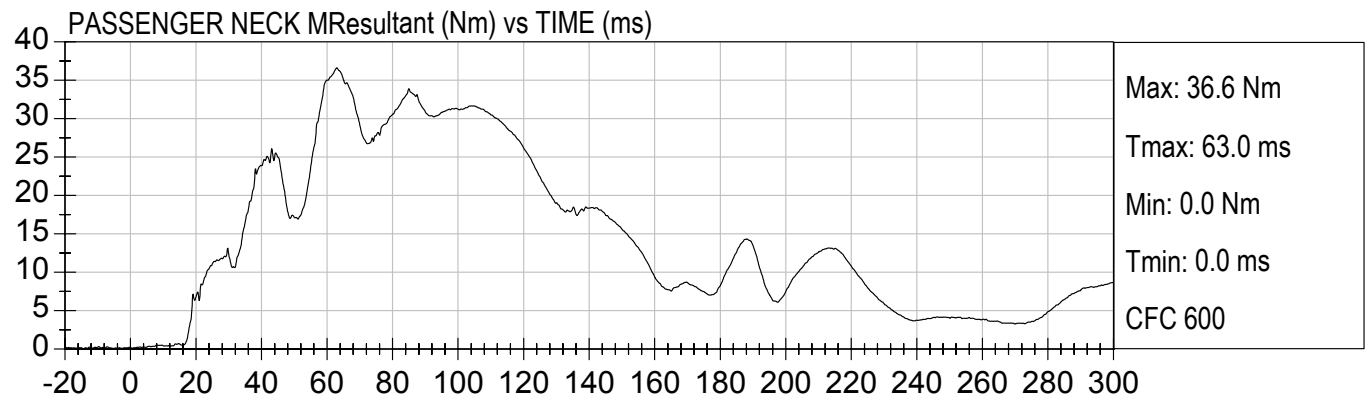


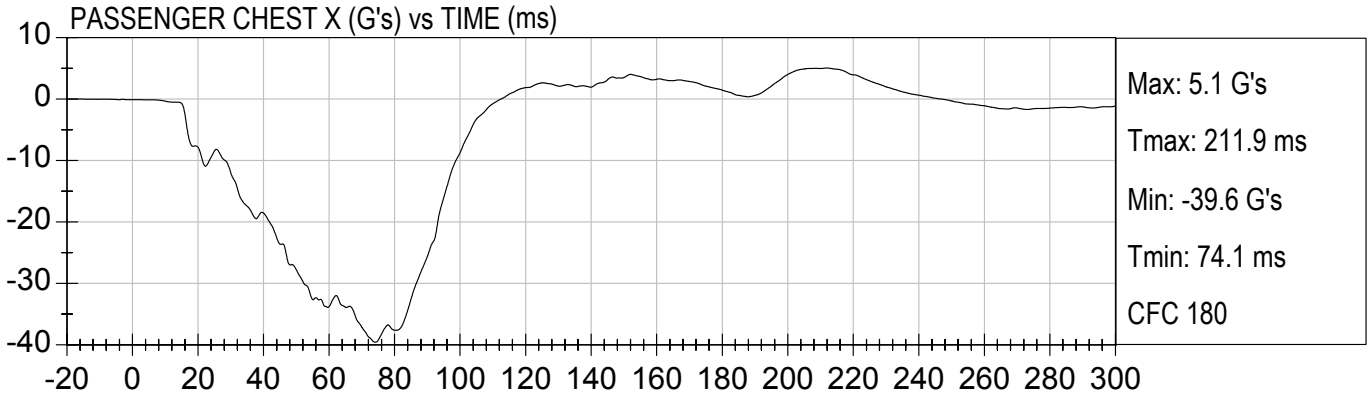


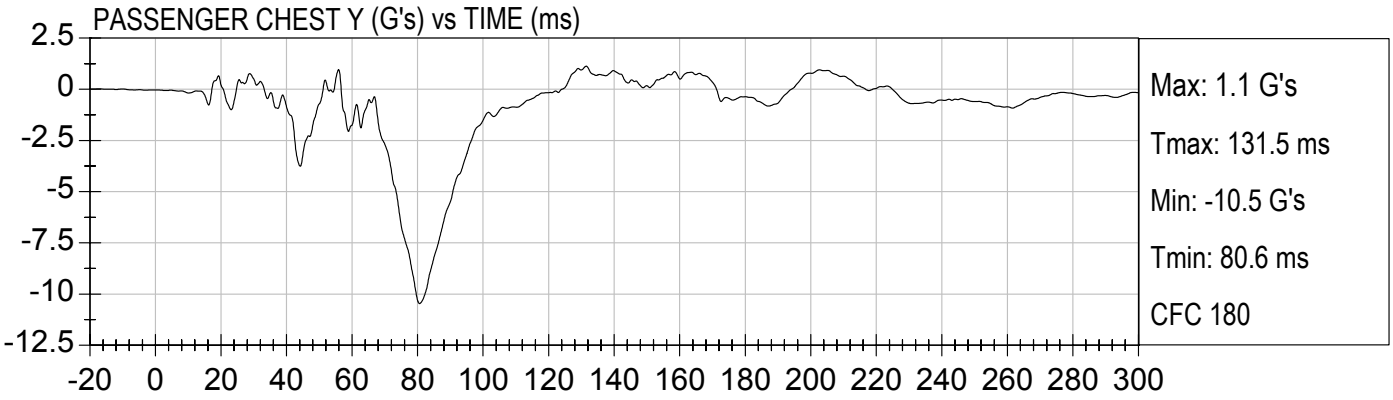

PASSENGER NECK MX (Nm) vs TIME (ms)
Max: 7.0 Nm
Tmax: 169.9 ms
Min: -22.6 Nm
Tmin: 119.5 ms
CFC 600

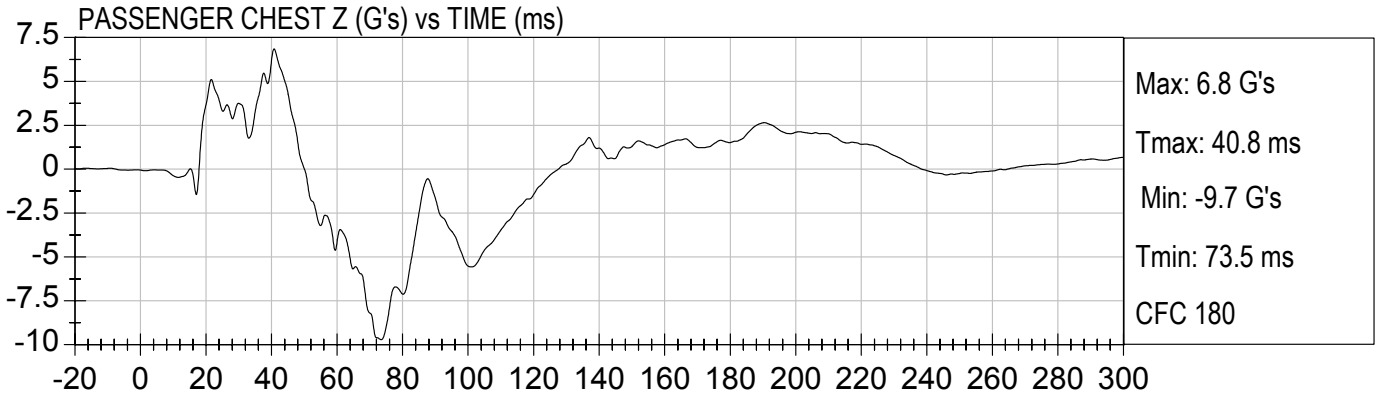

PASSENGER NECK MY (Nm) vs TIME (ms)
Max: 16.1 Nm
Tmax: 142.4 ms
Min: -35.3 Nm
Tmin: 62.9 ms
CFC 600

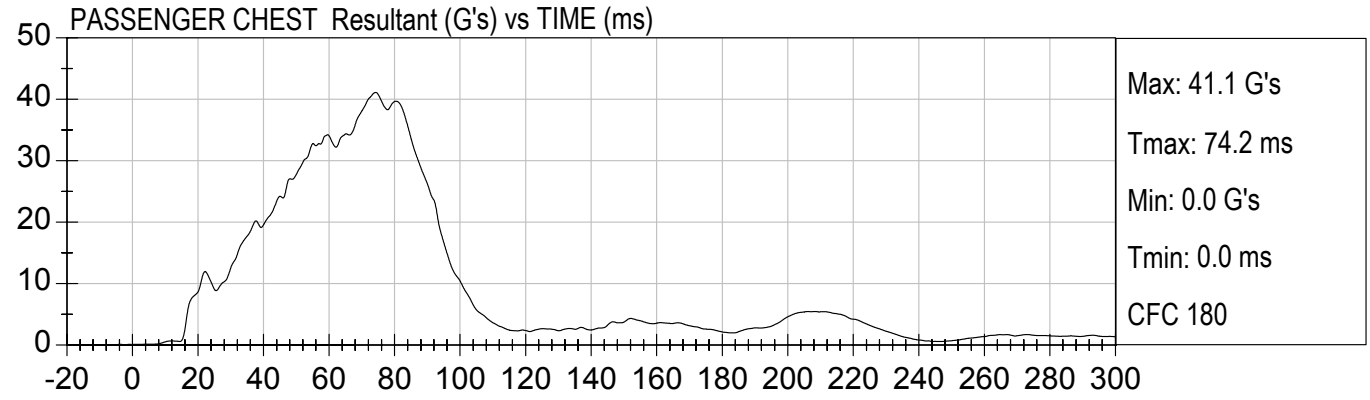

PASSENGER NECK MZ (Nm) vs TIME (ms)
Max: 26.9 Nm
Tmax: 101.7 ms
Min: -7.2 Nm
Tmin: 150.1 ms
CFC 600

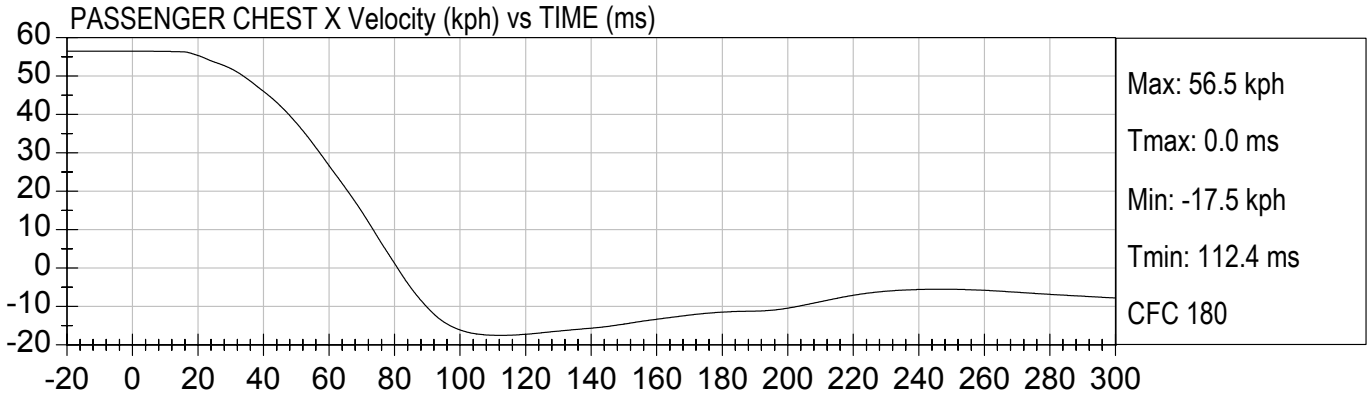

PASSENGER NECK MResultant (Nm) vs TIME (ms)
Max: 36.6 Nm
Tmax: 63.0 ms
Min: 0.0 Nm
Tmin: 0.0 ms
CFC 600

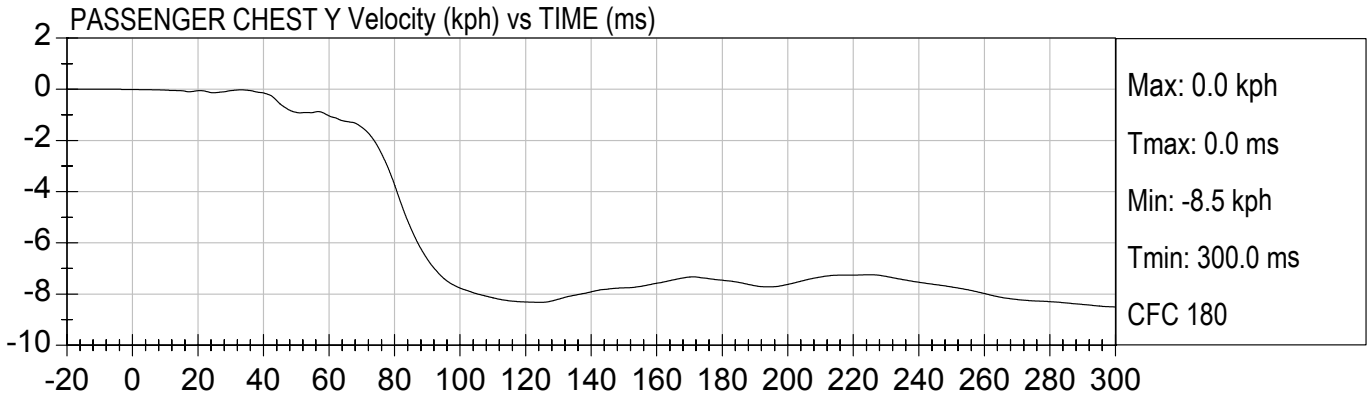

PASSENGER CHEST X (G's) vs TIME (ms)
10
0
-10
-20
-30
-40
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 5.1 G's
Tmax: 211.9 ms
Min: -39.6 G's
Tmin: 74.1 ms
CFC 180

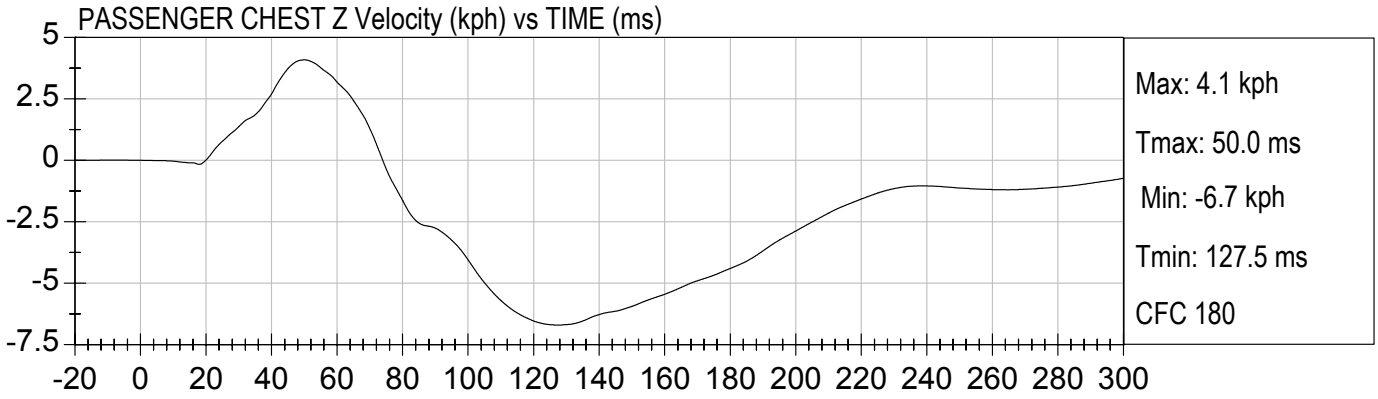

PASSENGER CHEST Y (G's) vs TIME (ms)
2.5
0
-2.5
-5
-7.5
-10
-12.5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 1.1 G's
Tmax: 131.5 ms
Min: -10.5 G's
Tmin: 80.6 ms
CFC 180

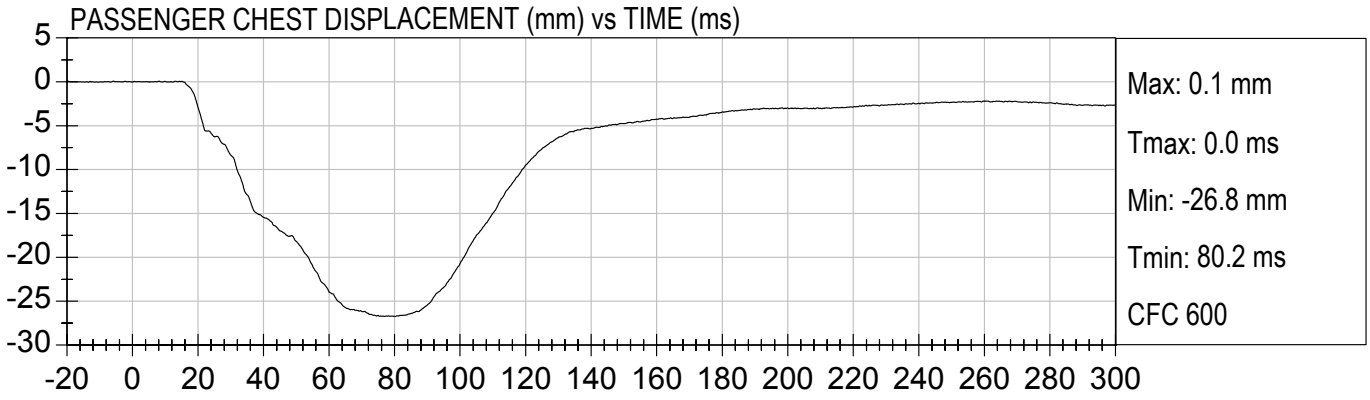

PASSENGER CHEST Z (G's) vs TIME (ms)
7.5
5
2.5
0
-2.5
-5
-7.5
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 6.8 G's
Tmax: 40.8 ms
Min: -9.7 G's
Tmin: 73.5 ms
CFC 180

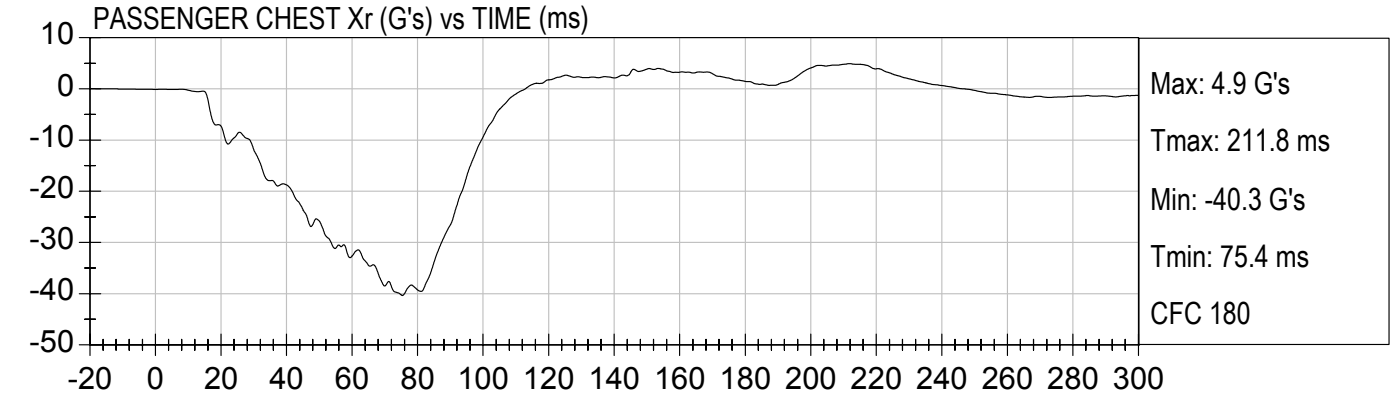

PASSENGER CHEST Resultant (G's) vs TIME (ms)
50
40
30
20
10
0
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 41.1 G's
Tmax: 74.2 ms
Min: 0.0 G's
Tmin: 0.0 ms
CFC 180

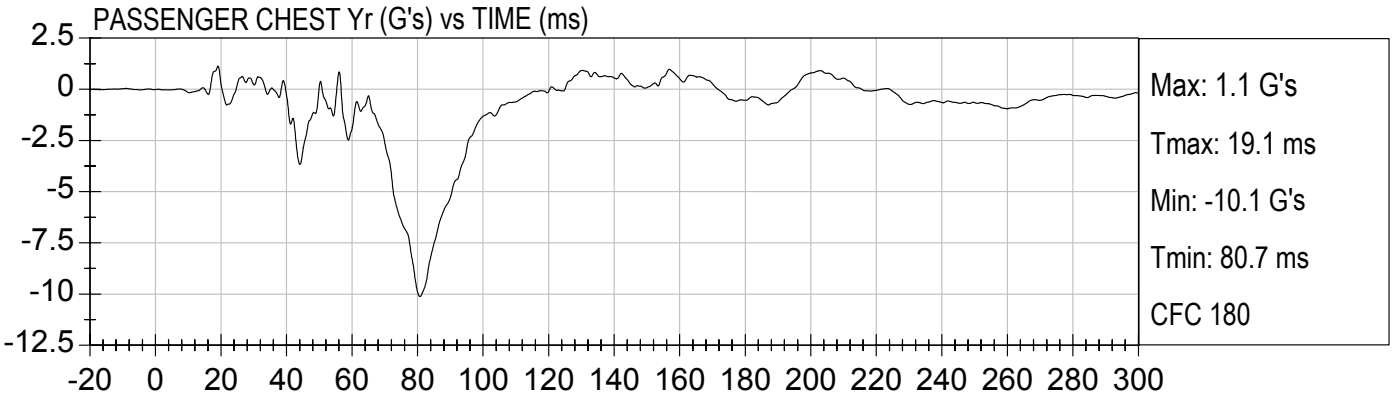

PASSENGER CHEST X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 56.5 kph
Tmax: 0.0 ms
Min: -17.5 kph
Tmin: 112.4 ms
CFC 180

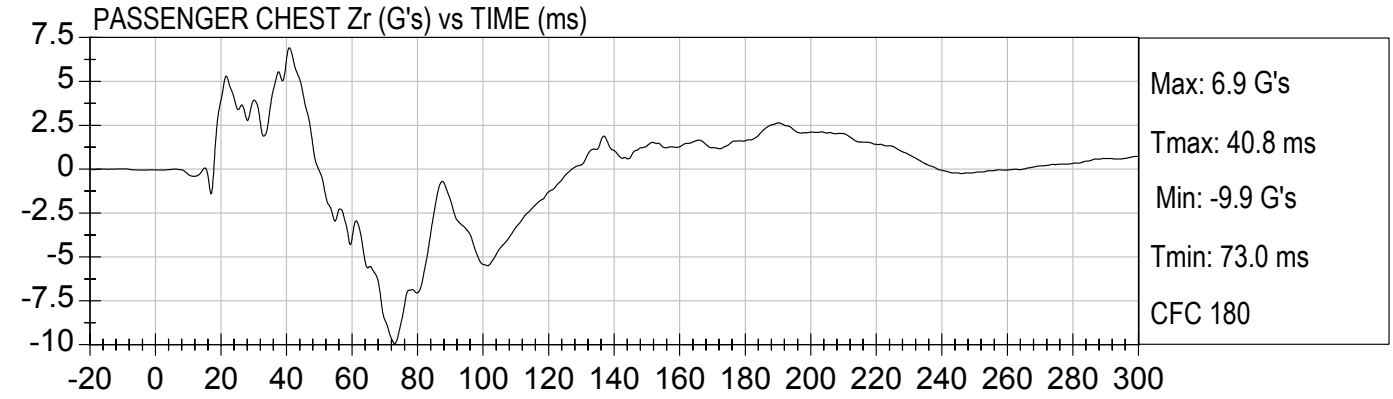

PASSENGER CHEST Y Velocity (kph) vs TIME (ms)
2
0
-2
-4
-6
-8
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.0 kph
Tmax: 0.0 ms
Min: -8.5 kph
Tmin: 300.0 ms
CFC 180

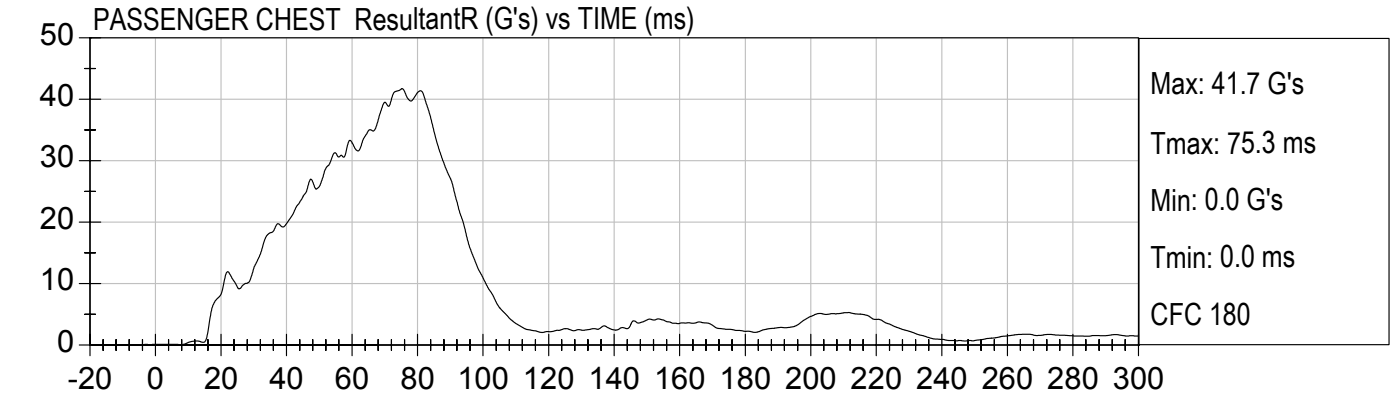

PASSENGER CHEST Z Velocity (kph) vs TIME (ms)
5
2.5
0
-2.5
-5
-7.5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 4.1 kph
Tmax: 50.0 ms
Min: -6.7 kph
Tmin: 127.5 ms
CFC 180

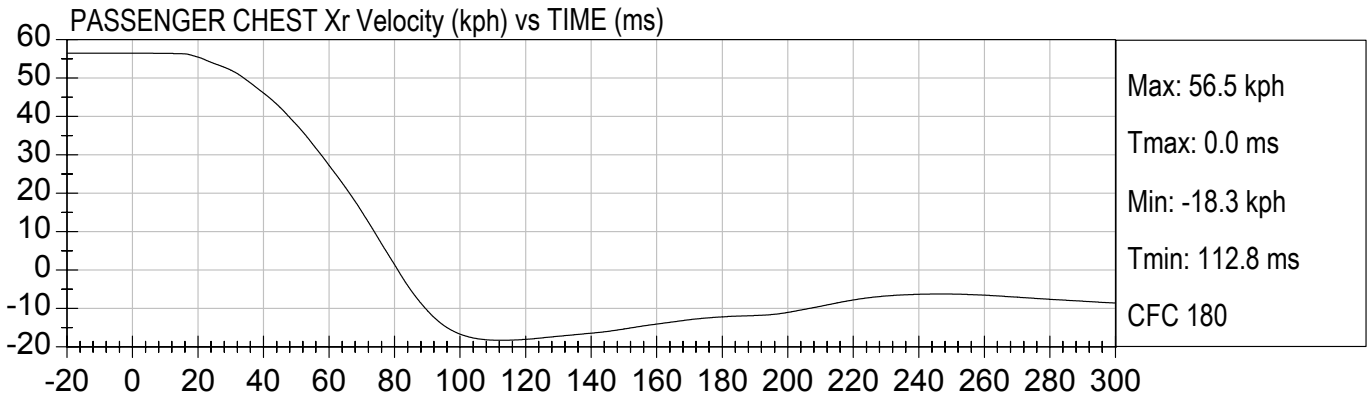

PASSENGER CHEST DISPLACEMENT (mm) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.1 mm
Tmax: 0.0 ms
Min: -26.8 mm
Tmin: 80.2 ms
CFC 600

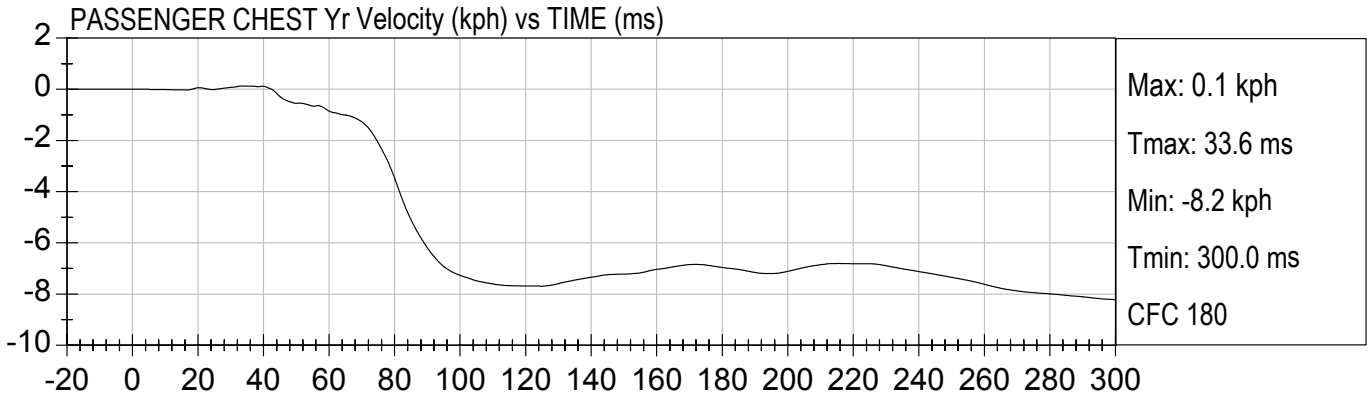

PASSENGER CHEST Xr (G's) vs TIME (ms)
10
0
-10
-20
-30
-40
-50
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 4.9 G's
Tmax: 211.8 ms
Min: -40.3 G's
Tmin: 75.4 ms
CFC 180

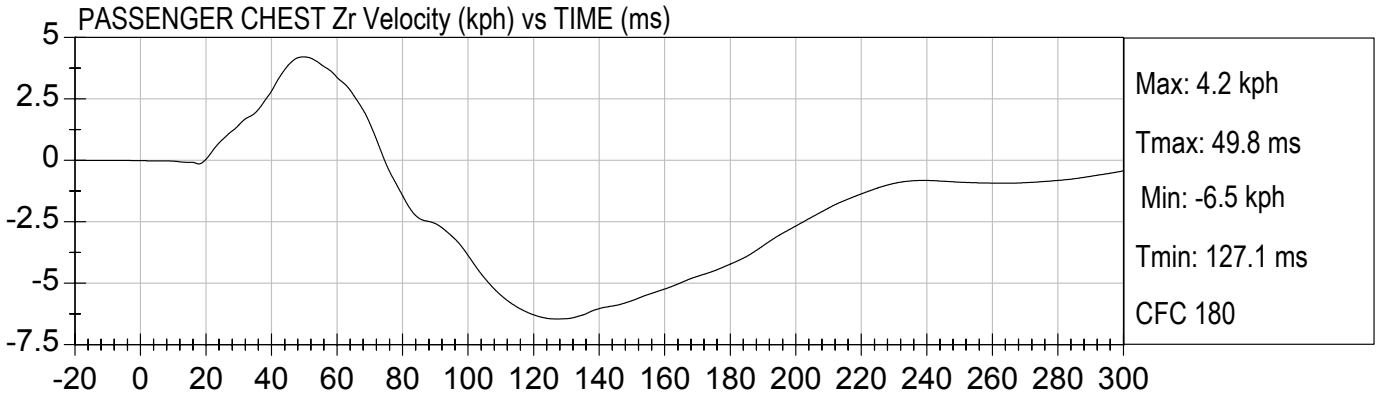

PASSENGER CHEST Yr (G's) vs TIME (ms)
2.5
0
-2.5
-5
-7.5
-10
-12.5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 1.1 G's
Tmax: 19.1 ms
Min: -10.1 G's
Tmin: 80.7 ms
CFC 180

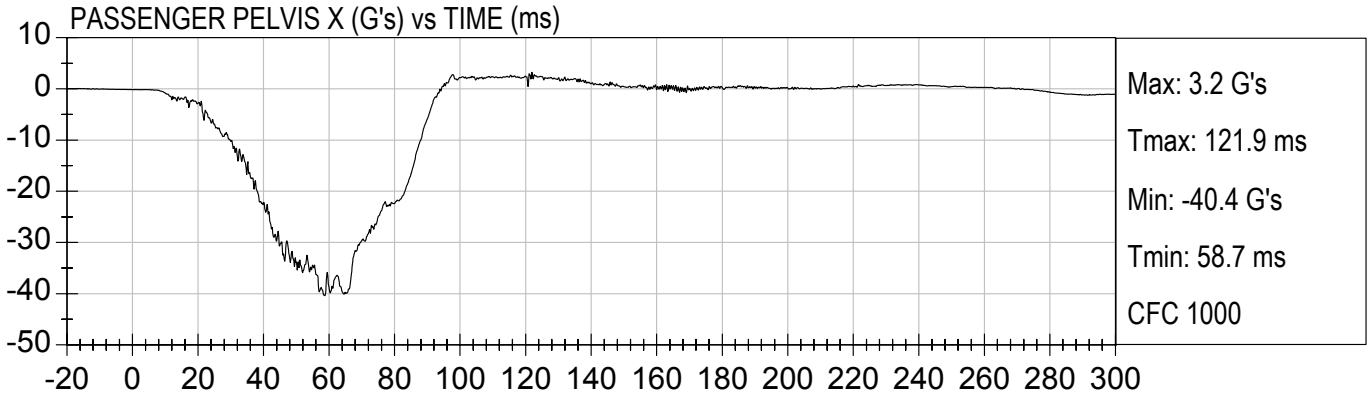

PASSENGER CHEST Zr (G's) vs TIME (ms)
7.5
5
2.5
0
-2.5
-5
-7.5
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 6.9 G's
Tmax: 40.8 ms
Min: -9.9 G's
Tmin: 73.0 ms
CFC 180

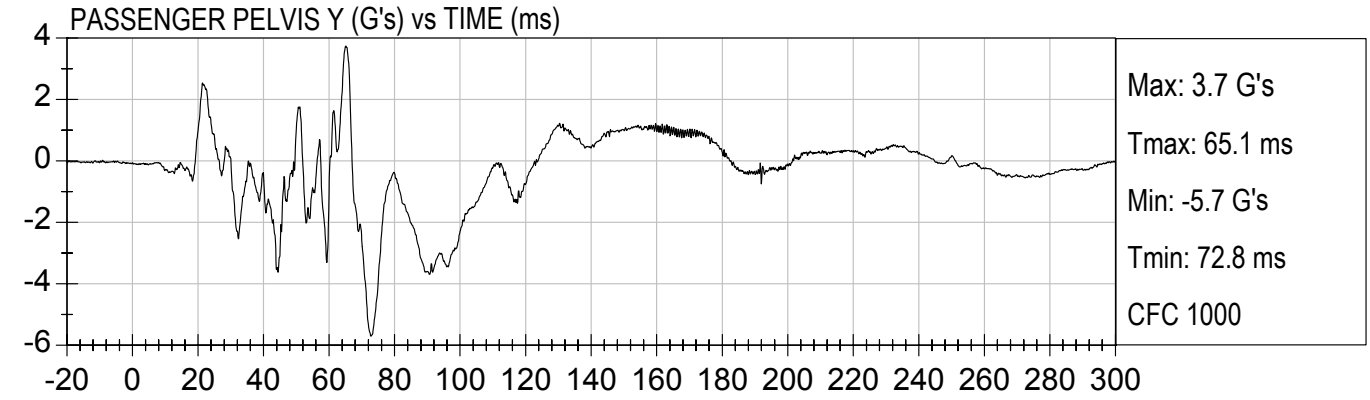

PASSENGER CHEST ResultantR (G's) vs TIME (ms)
50
40
30
20
10
0
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 41.7 G's
Tmax: 75.3 ms
Min: 0.0 G's
Tmin: 0.0 ms
CFC 180

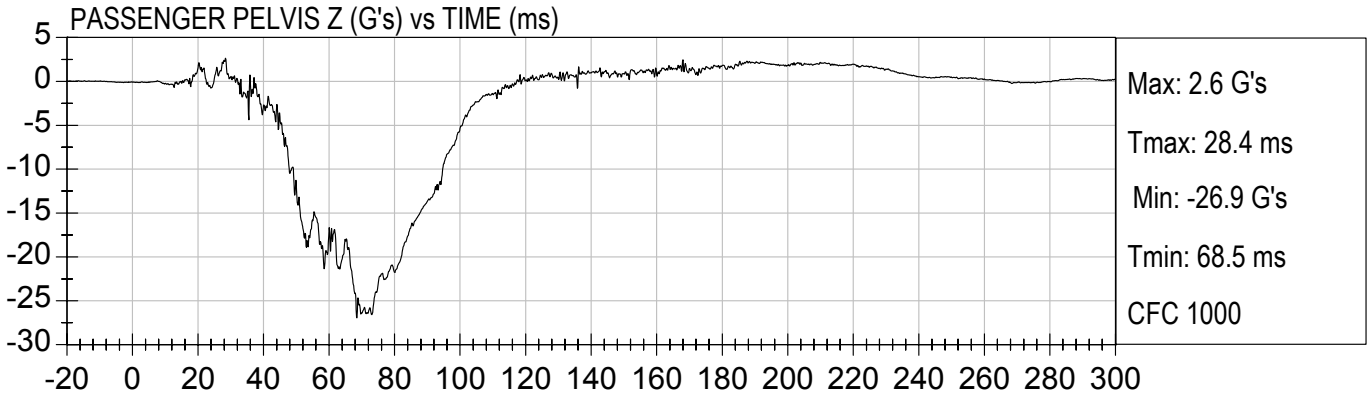

PASSENGER CHEST Xr Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 56.5 kph
Tmax: 0.0 ms
Min: -18.3 kph
Tmin: 112.8 ms
CFC 180

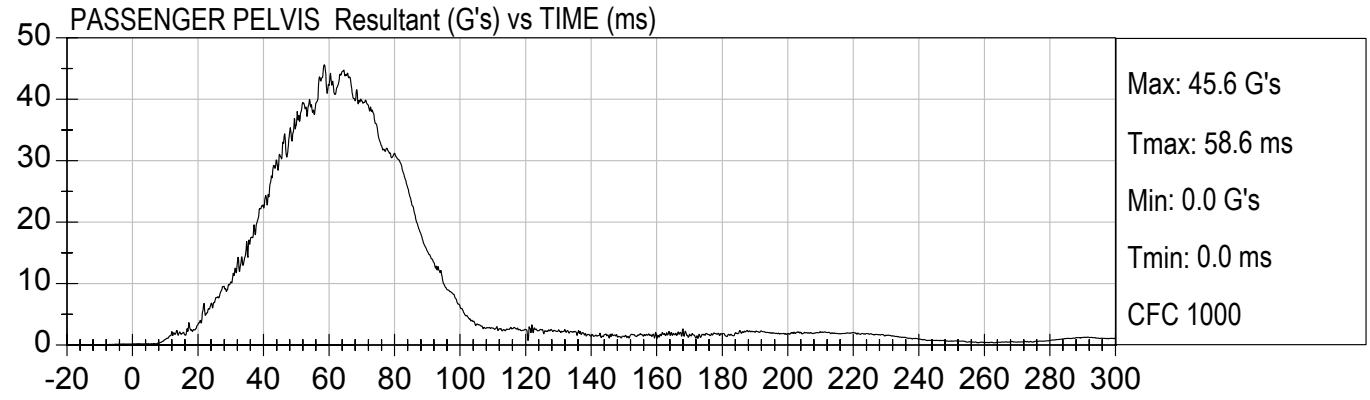

PASSENGER CHEST Yr Velocity (kph) vs TIME (ms)
2
0
-2
-4
-6
-8
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.1 kph
Tmax: 33.6 ms
Min: -8.2 kph
Tmin: 300.0 ms
CFC 180

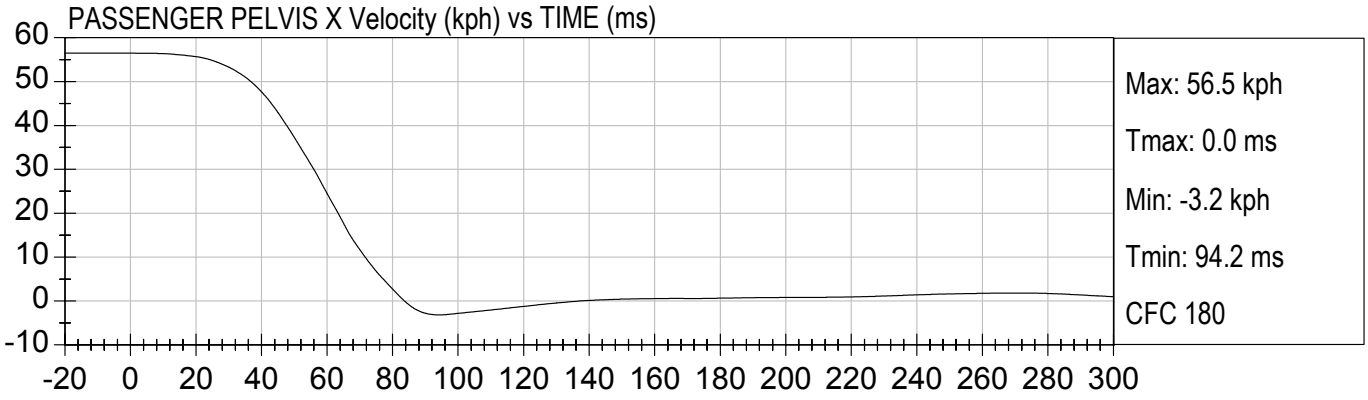

PASSENGER CHEST Zr Velocity (kph) vs TIME (ms)
5
2.5
0
-2.5
-5
-7.5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 4.2 kph
Tmax: 49.8 ms
Min: -6.5 kph
Tmin: 127.1 ms
CFC 180

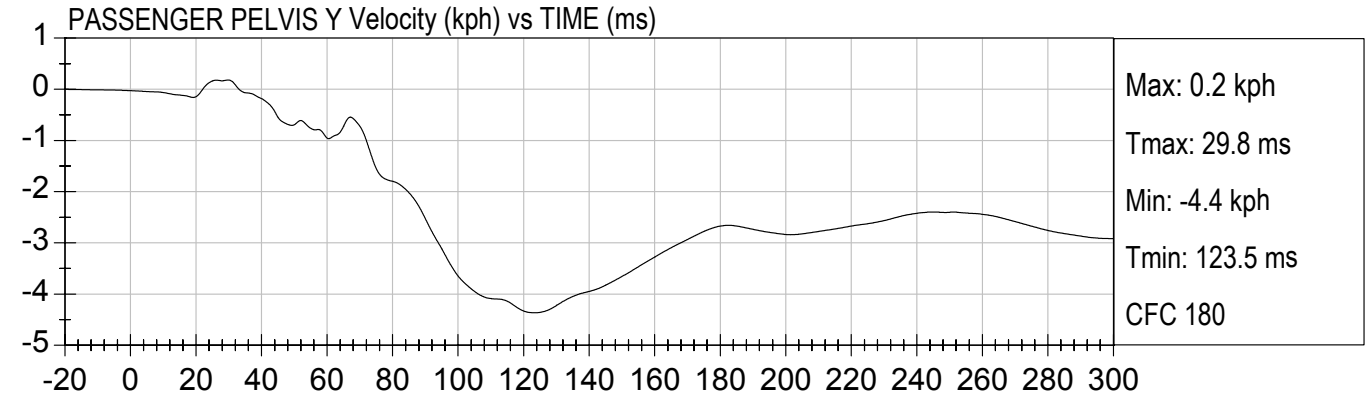

PASSENGER PELVIS X (G's) vs TIME (ms)
Max: 3.2 G's
Tmax: 121.9 ms
Min: -40.4 G's
Tmin: 58.7 ms
CFC 1000

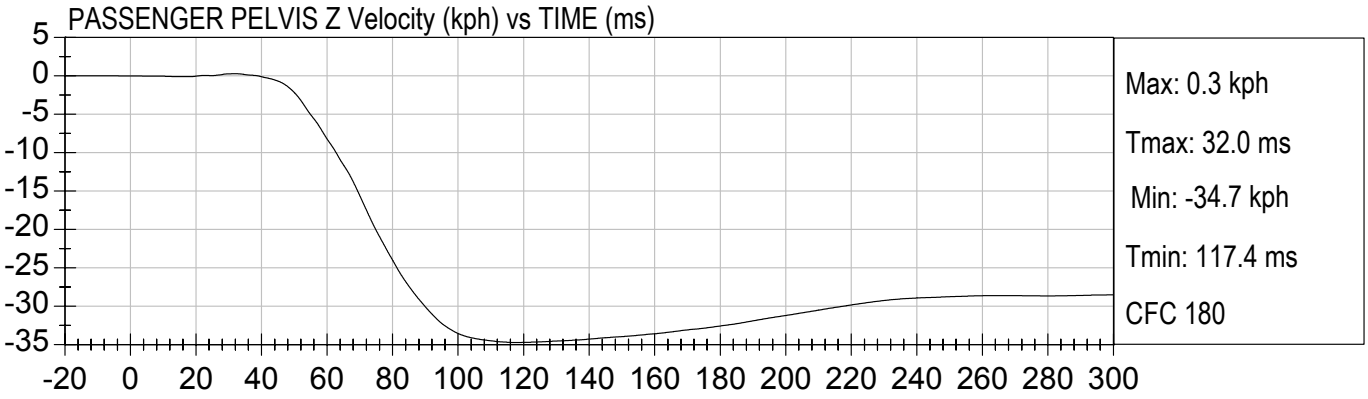

PASSENGER PELVIS Y (G's) vs TIME (ms)
Max: 3.7 G's
Tmax: 65.1 ms
Min: -5.7 G's
Tmin: 72.8 ms
CFC 1000


PASSENGER PELVIS Z (G's) vs TIME (ms)
Max: 2.6 G's
Tmax: 28.4 ms
Min: -26.9 G's
Tmin: 68.5 ms
CFC 1000


PASSENGER PELVIS Resultant (G's) vs TIME (ms)
Max: 45.6 G's
Tmax: 58.6 ms
Min: 0.0 G's
Tmin: 0.0 ms
CFC 1000

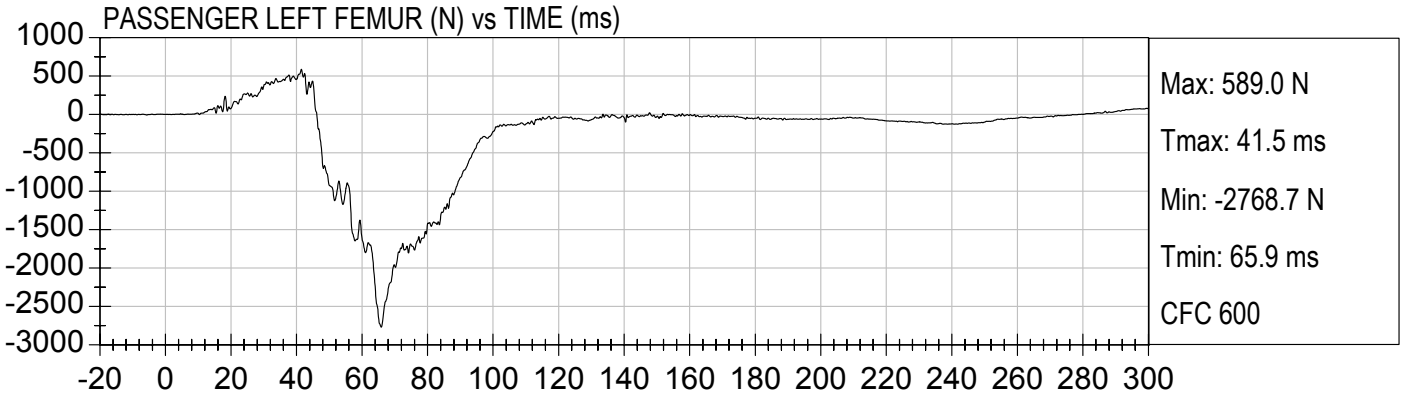

PASSENGER PELVIS X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 56.5 kph
Tmax: 0.0 ms
Min: -3.2 kph
Tmin: 94.2 ms
CFC 180

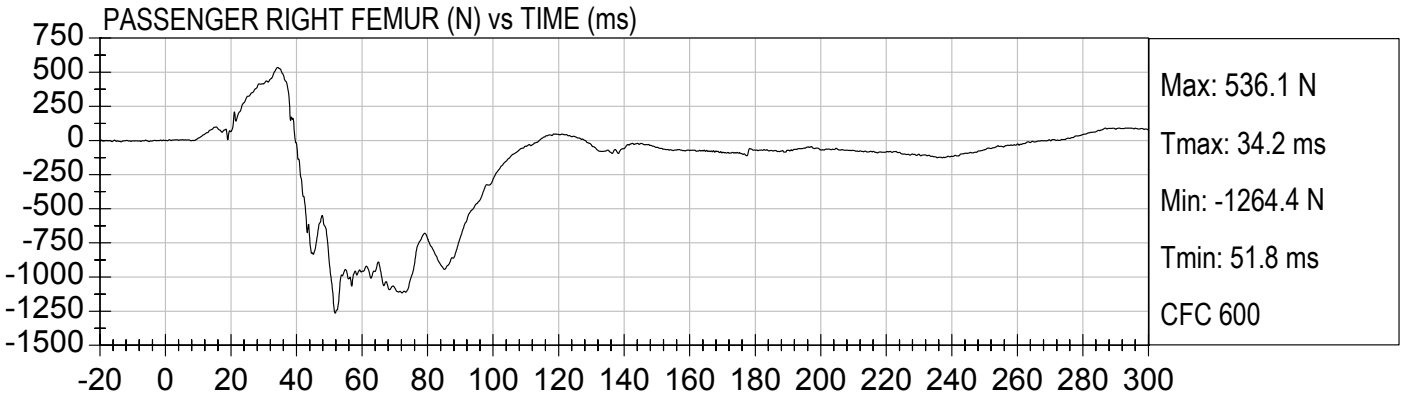

PASSENGER PELVIS Y Velocity (kph) vs TIME (ms)
1
0
-1
-2
-3
-4
-5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.2 kph
Tmax: 29.8 ms
Min: -4.4 kph
Tmin: 123.5 ms
CFC 180

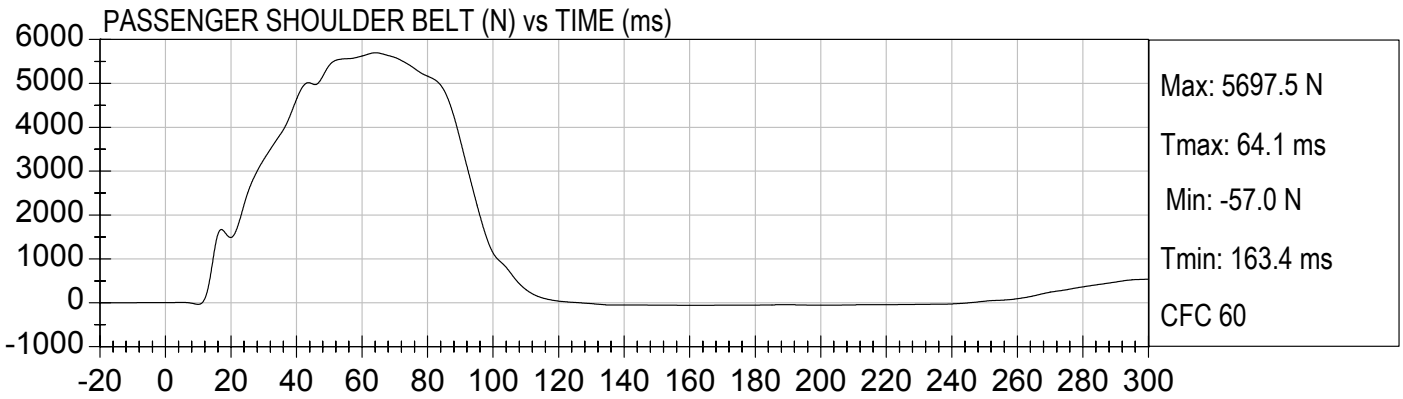

PASSENGER PELVIS Z Velocity (kph) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-35
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 0.3 kph
Tmax: 32.0 ms
Min: -34.7 kph
Tmin: 117.4 ms
CFC 180

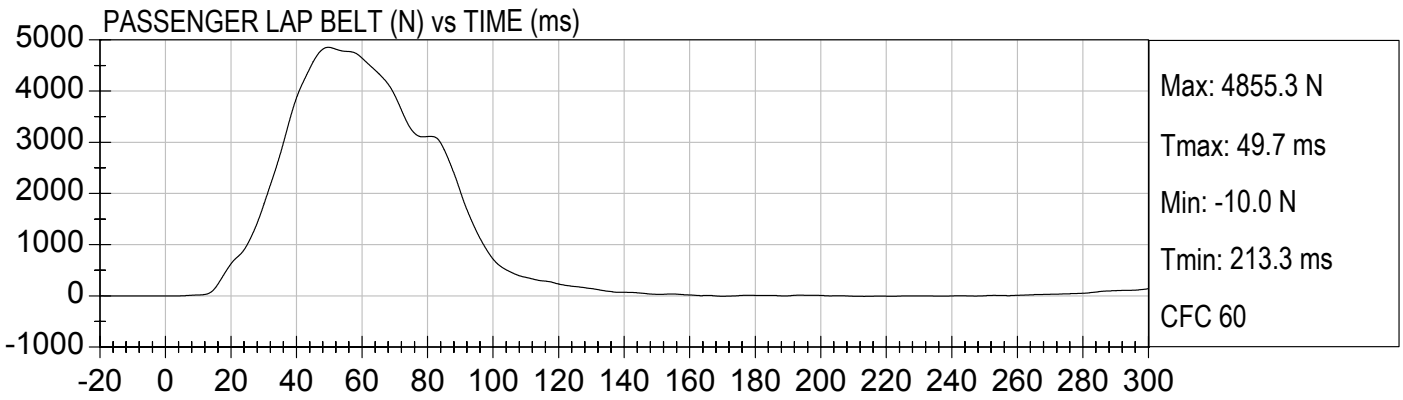
NCAP 35MPH FRONTAL
2005 FORD MUSTANG (M50206)

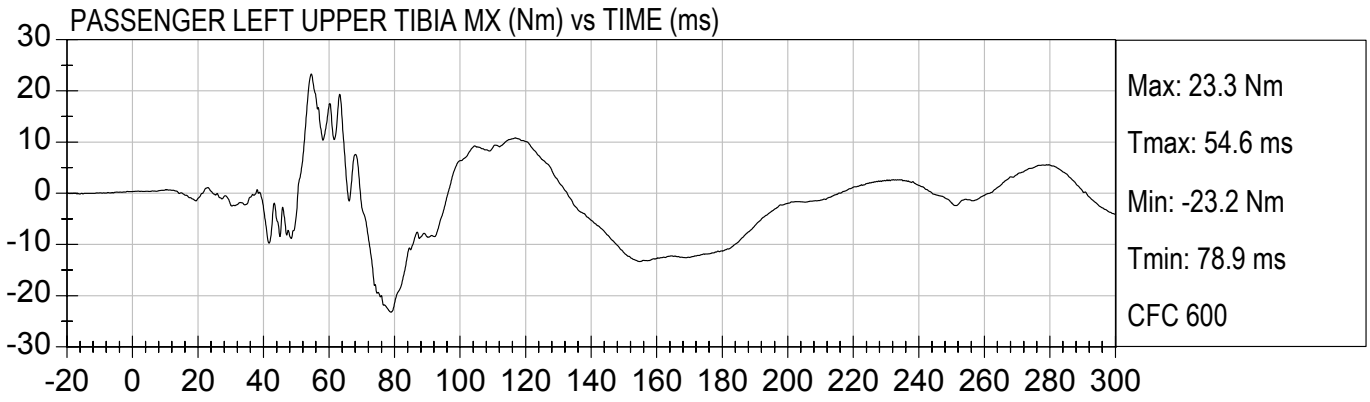
Test Date: 12/01/04
Speed: 35.1 mph (56.5 km/h)

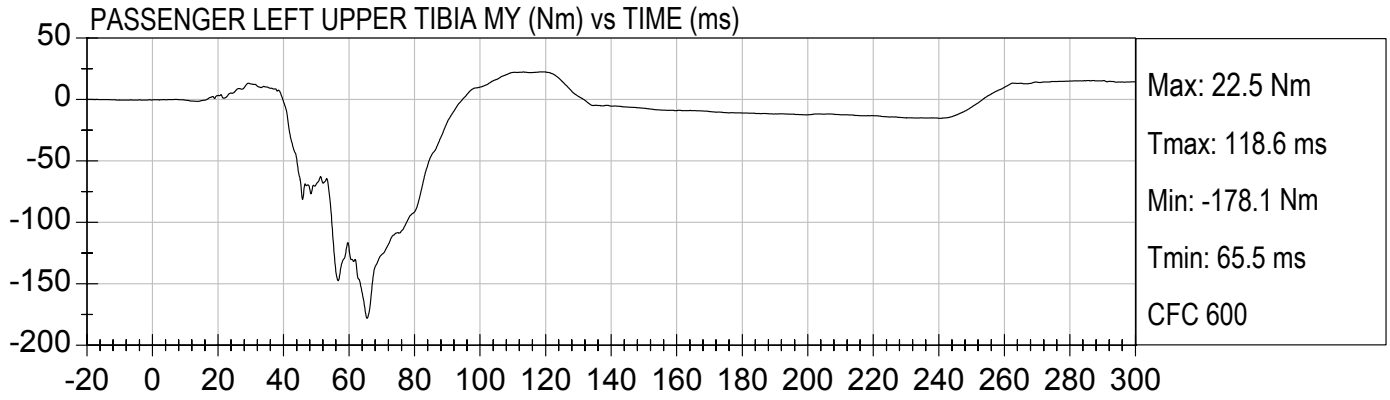


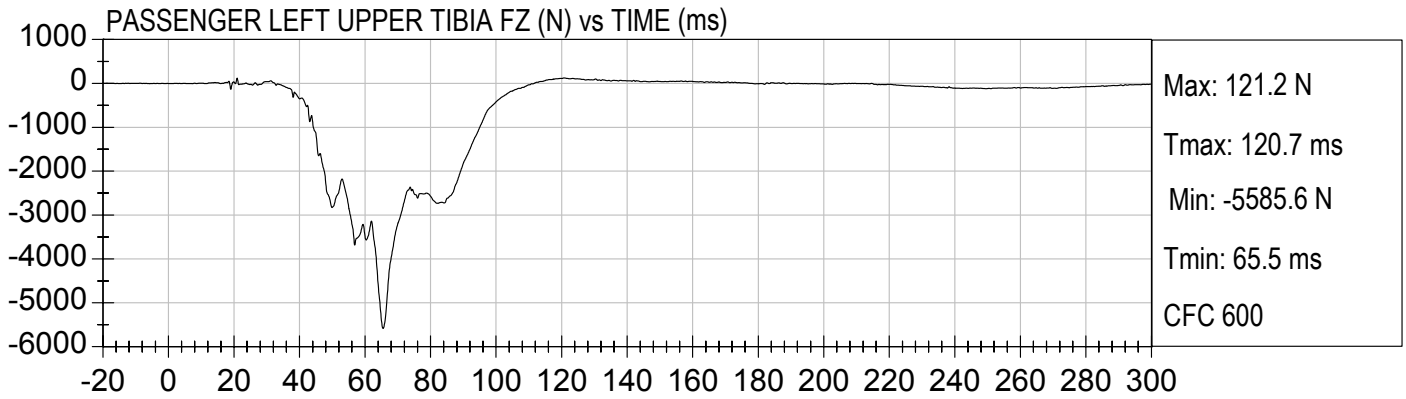


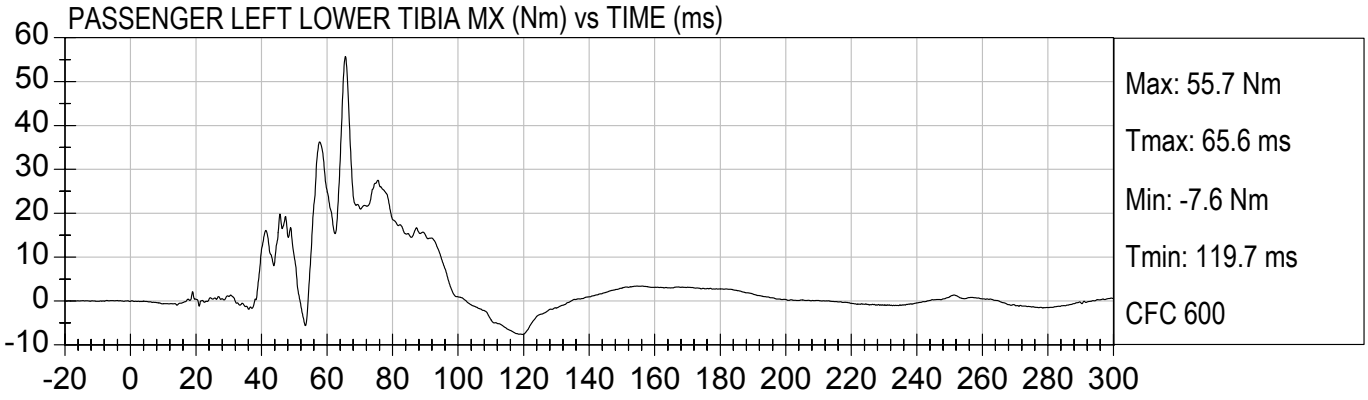


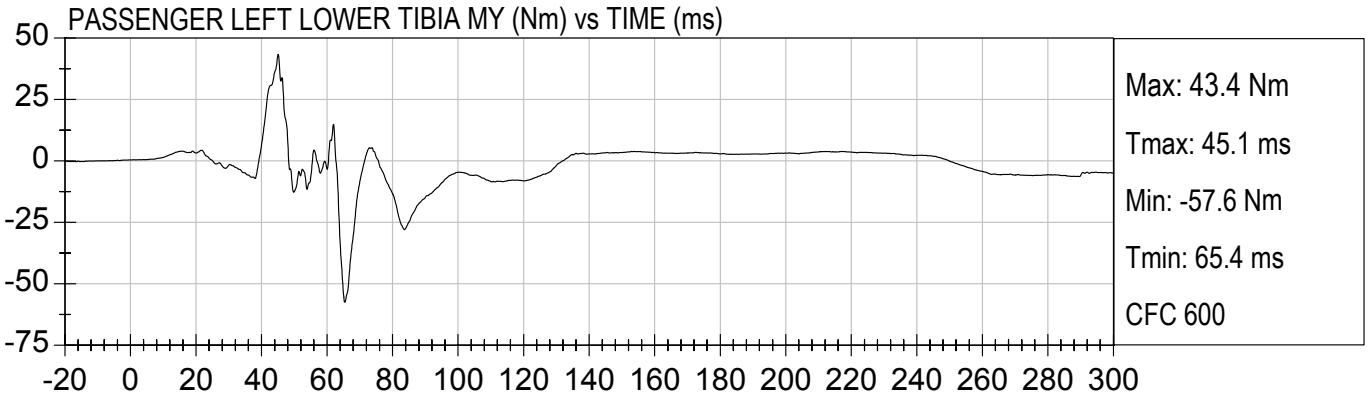


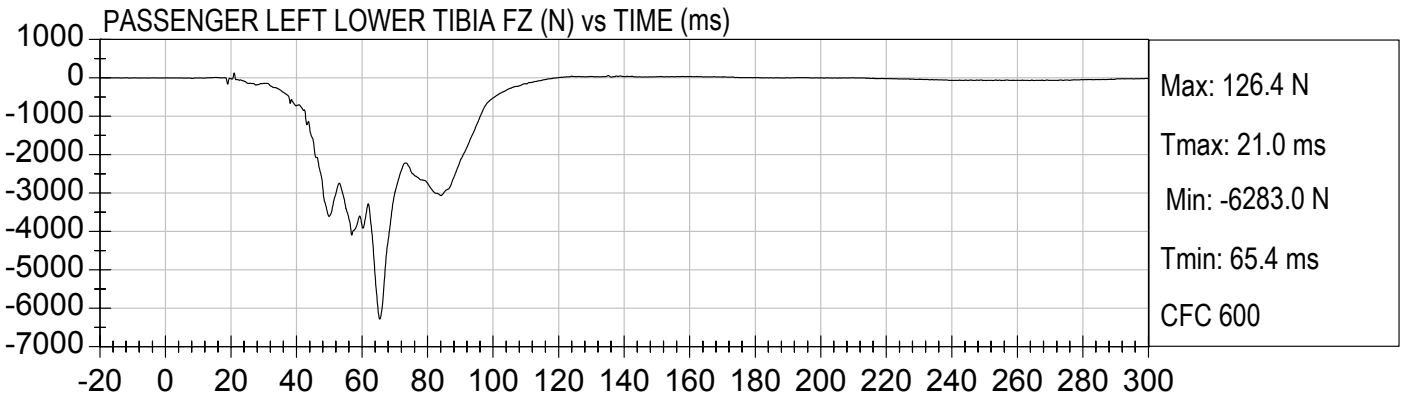

PASSENGER LEFT UPPER TIBIA MX (Nm) vs TIME (ms)
30
20
10
0
-10
-20
-30
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 23.3 Nm
Tmax: 54.6 ms
Min: -23.2 Nm
Tmin: 78.9 ms
CFC 600

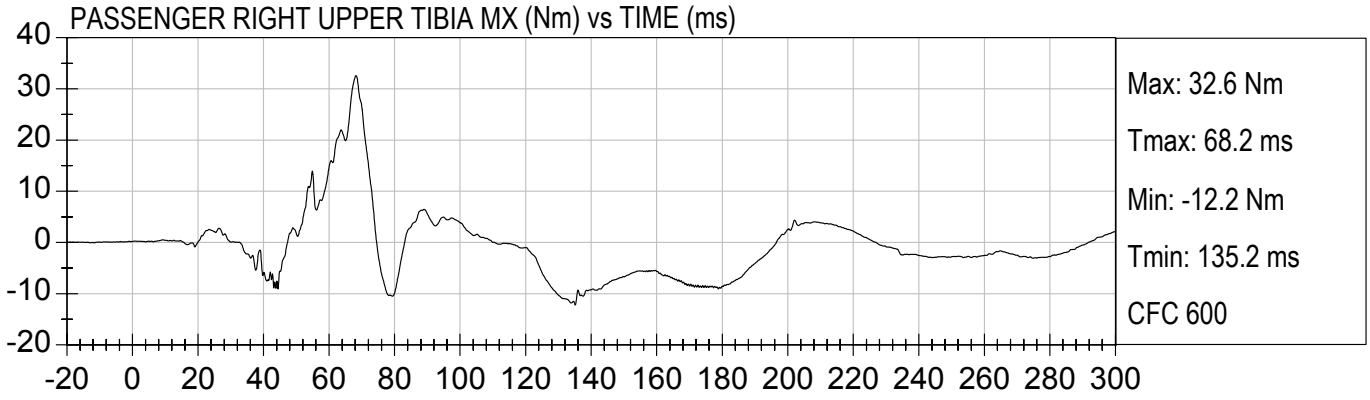

PASSENGER LEFT UPPER TIBIA MY (Nm) vs TIME (ms)
50
0
-50
-100
-150
-200
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 22.5 Nm
Tmax: 118.6 ms
Min: -178.1 Nm
Tmin: 65.5 ms
CFC 600

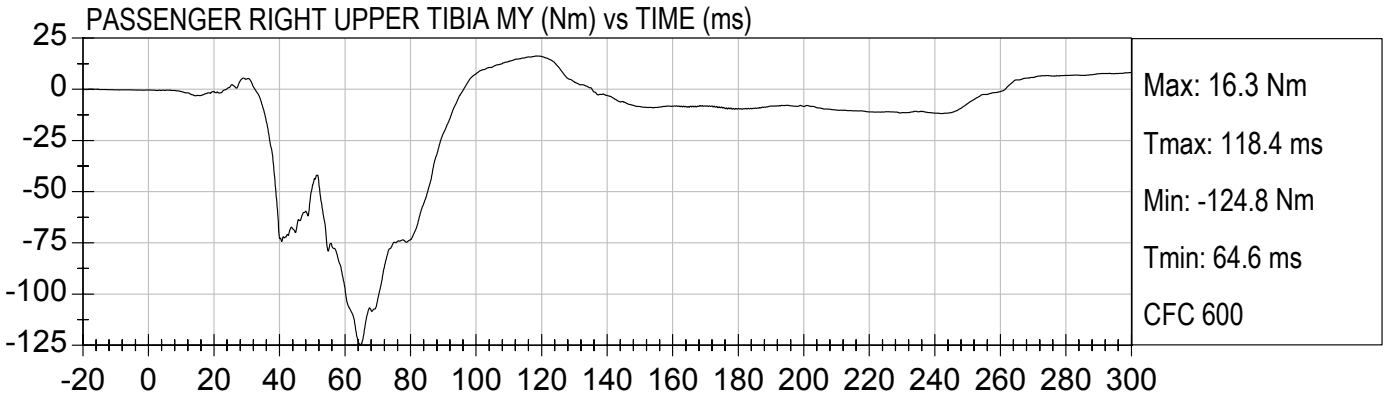

PASSENGER LEFT UPPER TIBIA FZ (N) vs TIME (ms)
1000
0
-1000
-2000
-3000
-4000
-5000
-6000
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 121.2 N
Tmax: 120.7 ms
Min: -5585.6 N
Tmin: 65.5 ms
CFC 600

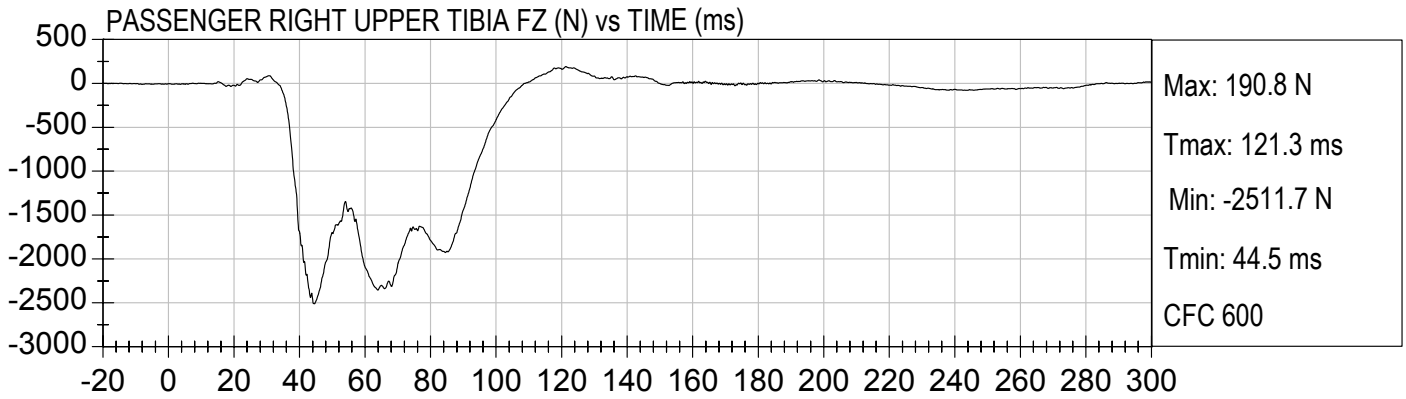

PASSENGER LEFT LOWER TIBIA MX (Nm) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 55.7 Nm
Tmax: 65.6 ms
Min: -7.6 Nm
Tmin: 119.7 ms
CFC 600

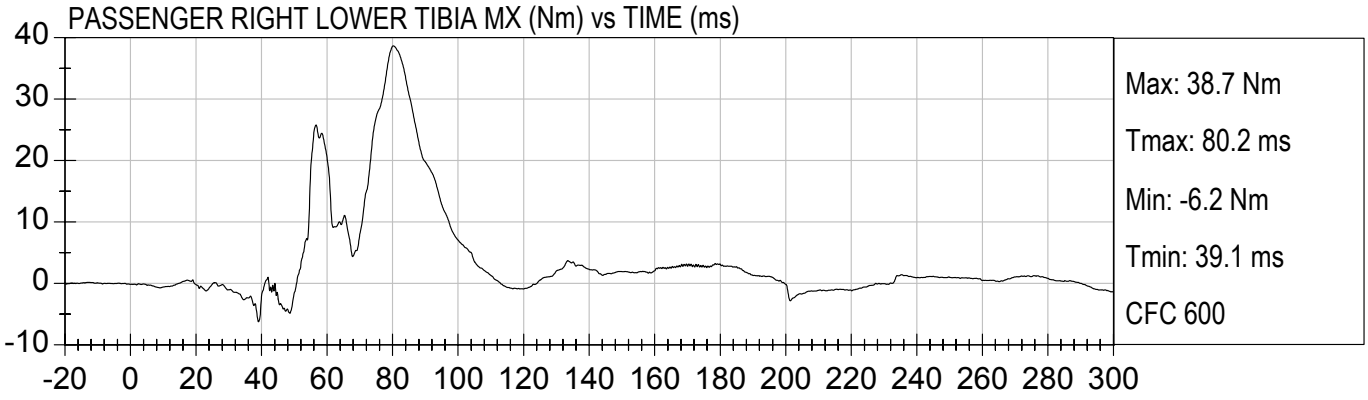

PASSENGER LEFT LOWER TIBIA MY (Nm) vs TIME (ms)
50
25
0
-25
-50
-75
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 43.4 Nm
Tmax: 45.1 ms
Min: -57.6 Nm
Tmin: 65.4 ms
CFC 600

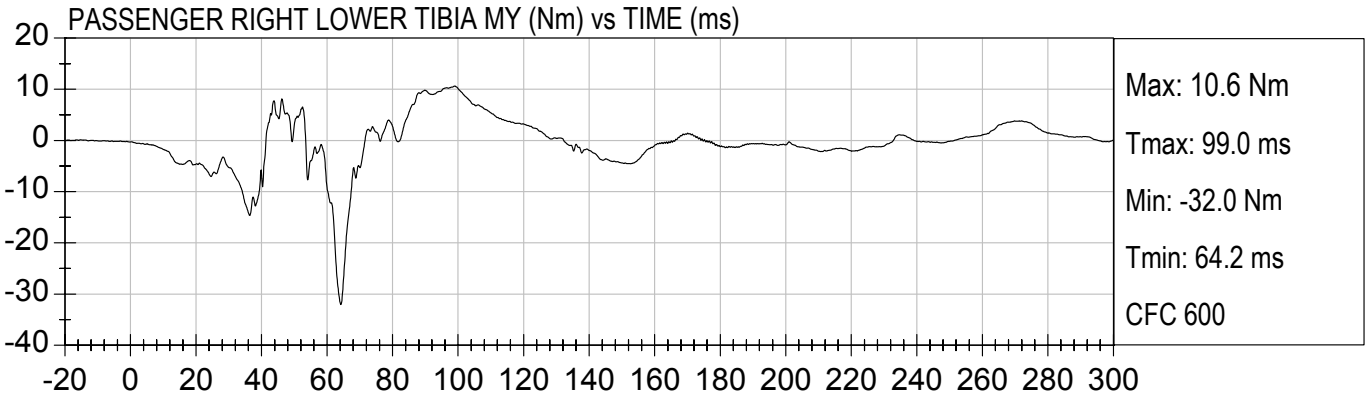

PASSENGER LEFT LOWER TIBIA FZ (N) vs TIME (ms)
1000
0
-1000
-2000
-3000
-4000
-5000
-6000
-7000
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 126.4 N
Tmax: 21.0 ms
Min: -6283.0 N
Tmin: 65.4 ms
CFC 600

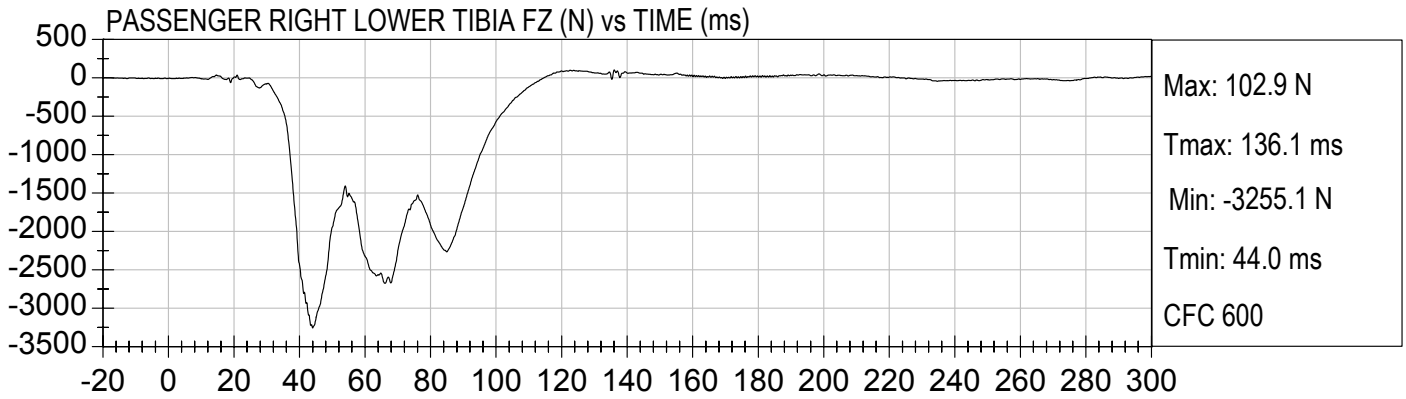

PASSENGER RIGHT UPPER TIBIA MX (Nm) vs TIME (ms)
40
30
20
10
0
-10
-20
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 32.6 Nm
Tmax: 68.2 ms
Min: -12.2 Nm
Tmin: 135.2 ms
CFC 600

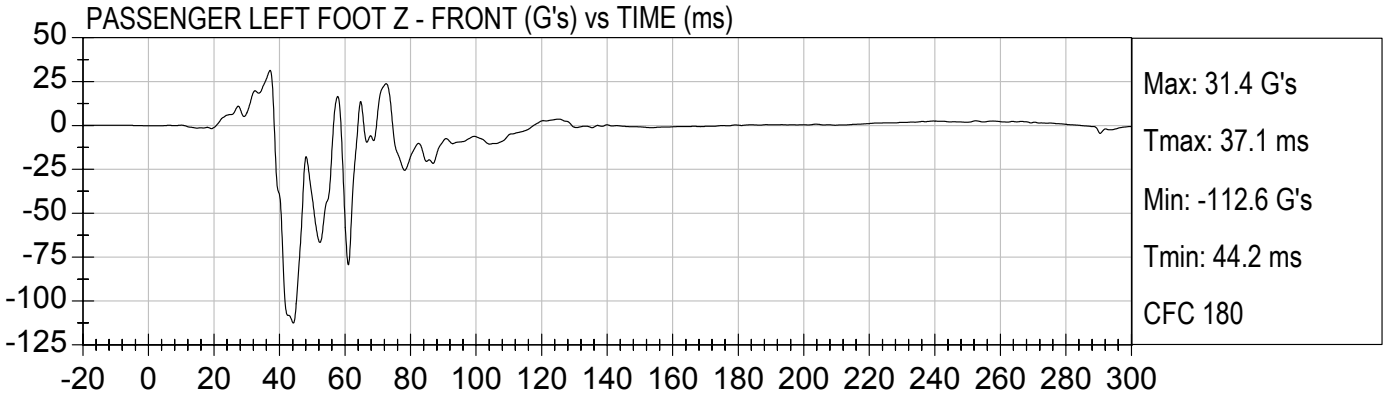

PASSENGER RIGHT UPPER TIBIA MY (Nm) vs TIME (ms)
25
0
-25
-50
-75
-100
-125
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 16.3 Nm
Tmax: 118.4 ms
Min: -124.8 Nm
Tmin: 64.6 ms
CFC 600

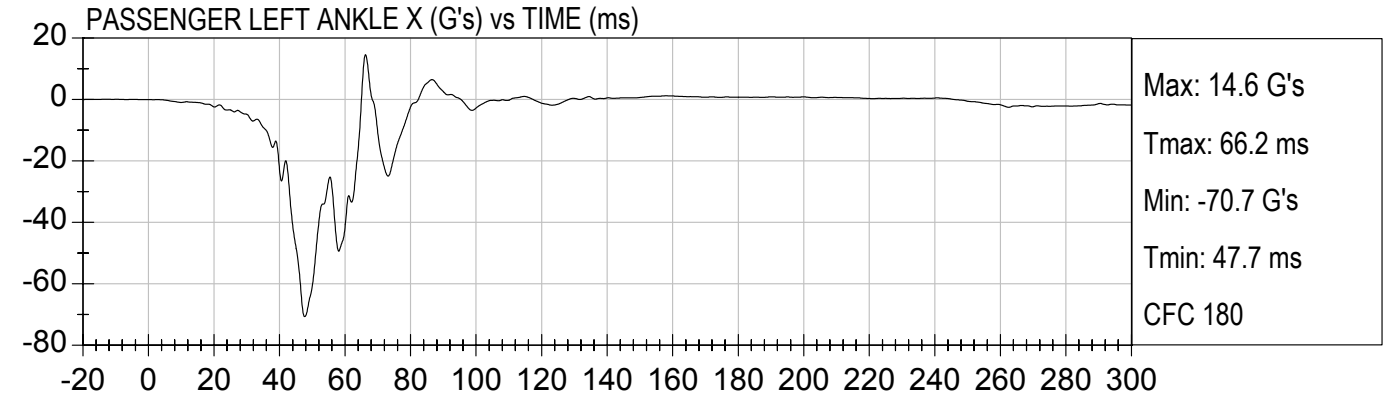

PASSENGER RIGHT UPPER TIBIA FZ (N) vs TIME (ms)
500
0
-500
-1000
-1500
-2000
-2500
-3000
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 190.8 N
Tmax: 121.3 ms
Min: -2511.7 N
Tmin: 44.5 ms
CFC 600

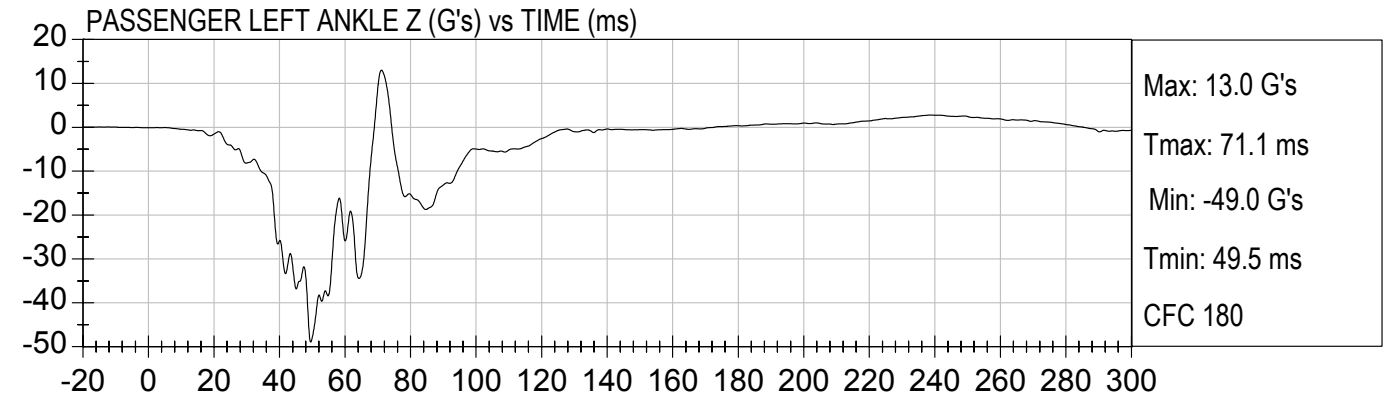

PASSENGER RIGHT LOWER TIBIA MX (Nm) vs TIME (ms)
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 38.7 Nm
Tmax: 80.2 ms
Min: -6.2 Nm
Tmin: 39.1 ms
CFC 600

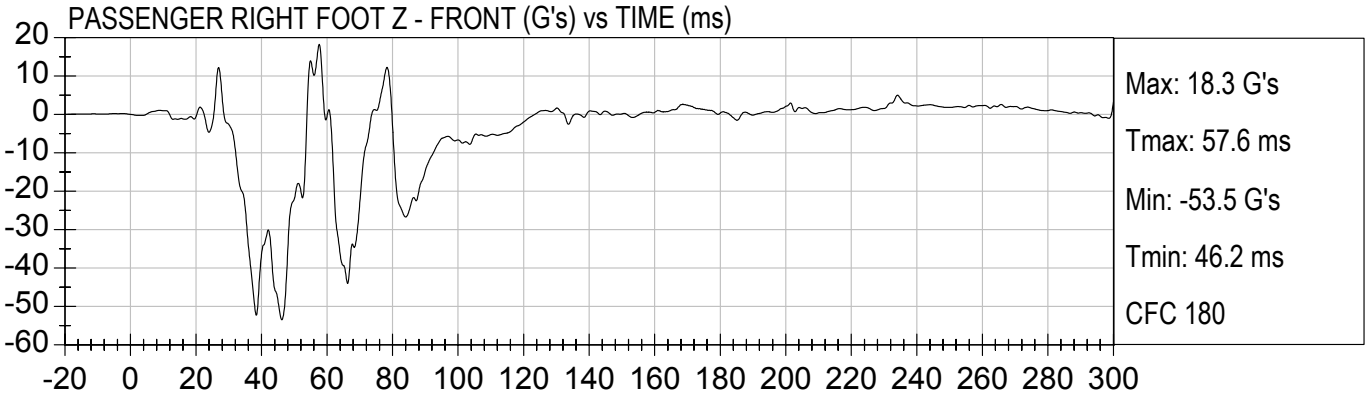

PASSENGER RIGHT LOWER TIBIA MY (Nm) vs TIME (ms)
20
10
0
-10
-20
-30
-40
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 10.6 Nm
Tmax: 99.0 ms
Min: -32.0 Nm
Tmin: 64.2 ms
CFC 600

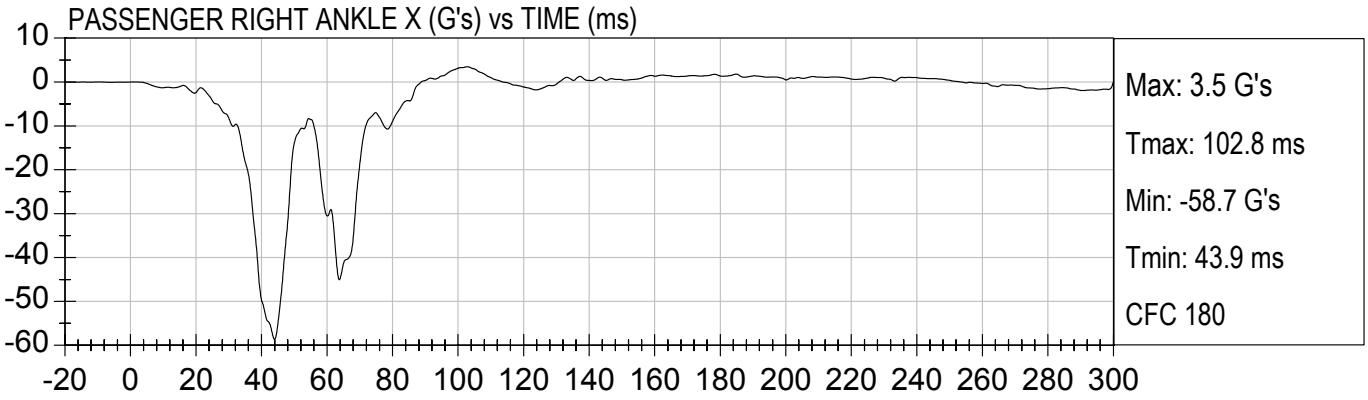

PASSENGER RIGHT LOWER TIBIA FZ (N) vs TIME (ms)
500
0
-500
-1000
-1500
-2000
-2500
-3000
-3500
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 102.9 N
Tmax: 136.1 ms
Min: -3255.1 N
Tmin: 44.0 ms
CFC 600

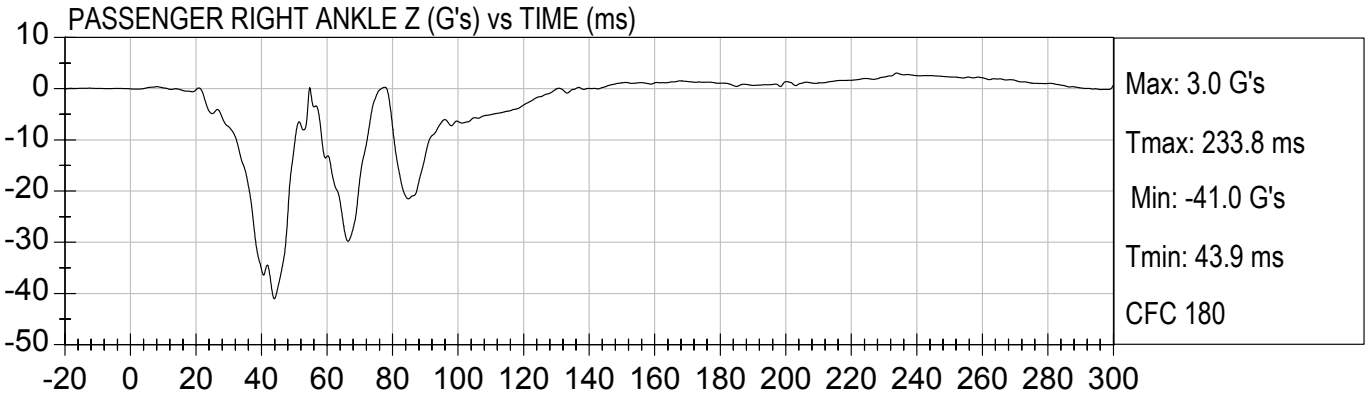

PASSENGER LEFT FOOT Z - FRONT (G's) vs TIME (ms)
50
25
0
-25
-50
-75
-100
-125
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 31.4 G's
Tmax: 37.1 ms
Min: -112.6 G's
Tmin: 44.2 ms
CFC 180

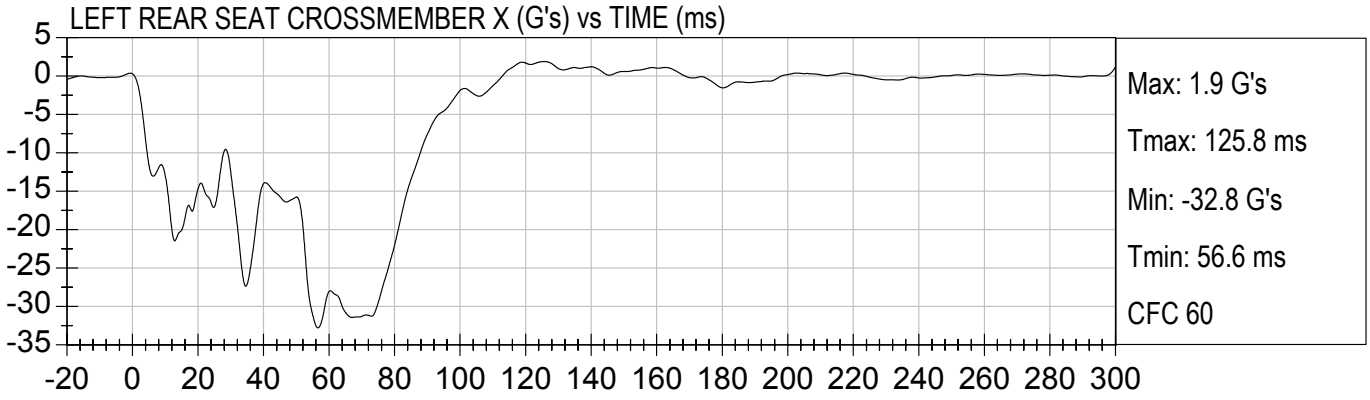

PASSENGER LEFT ANKLE X (G's) vs TIME (ms)
20
0
-20
-40
-60
-80
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 14.6 G's
Tmax: 66.2 ms
Min: -70.7 G's
Tmin: 47.7 ms
CFC 180

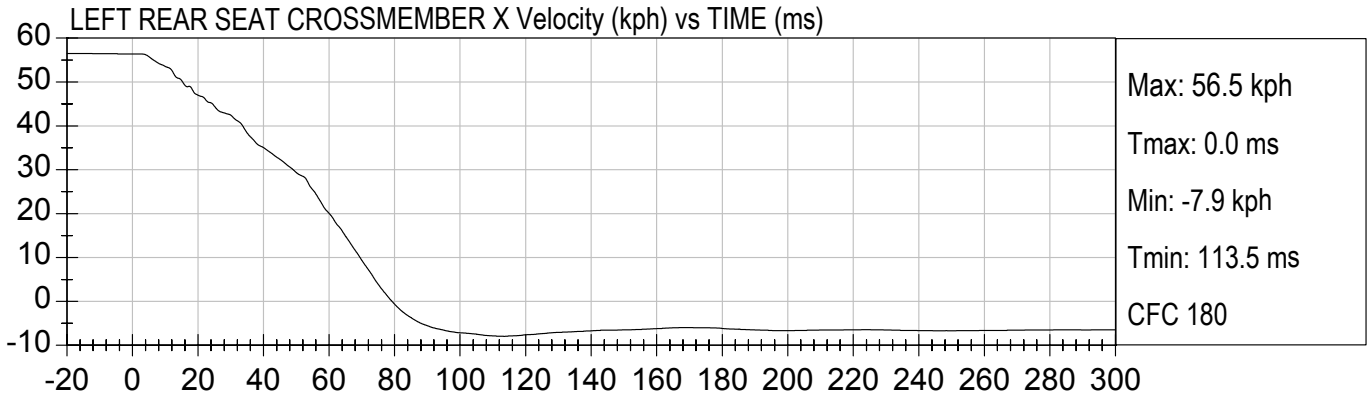

PASSENGER LEFT ANKLE Z (G's) vs TIME (ms)
20
10
0
-10
-20
-30
-40
-50
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 13.0 G's
Tmax: 71.1 ms
Min: -49.0 G's
Tmin: 49.5 ms
CFC 180

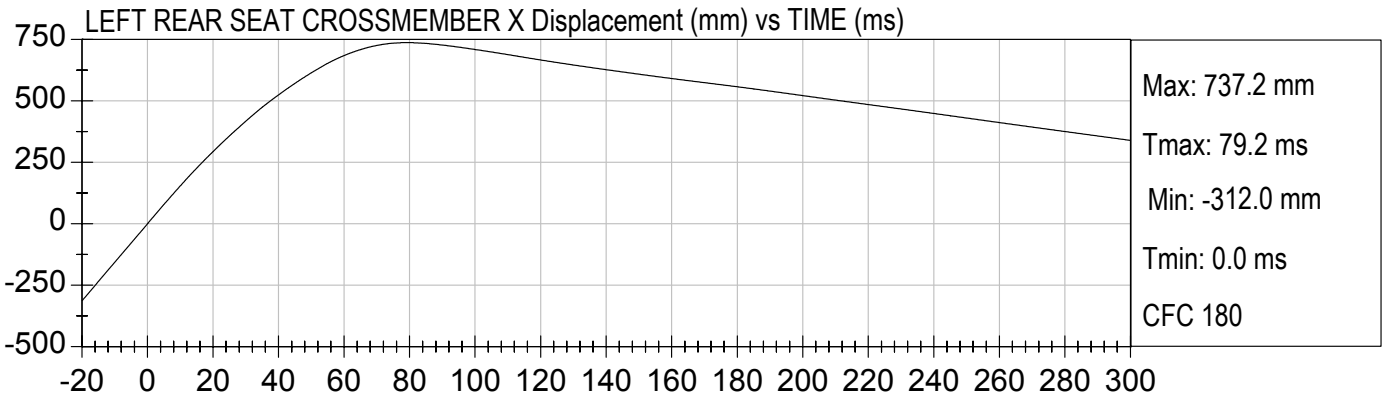

PASSENGER RIGHT FOOT Z - FRONT (G's) vs TIME (ms)
20
10
0
-10
-20
-30
-40
-50
-60
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 18.3 G's
Tmax: 57.6 ms
Min: -53.5 G's
Tmin: 46.2 ms
CFC 180

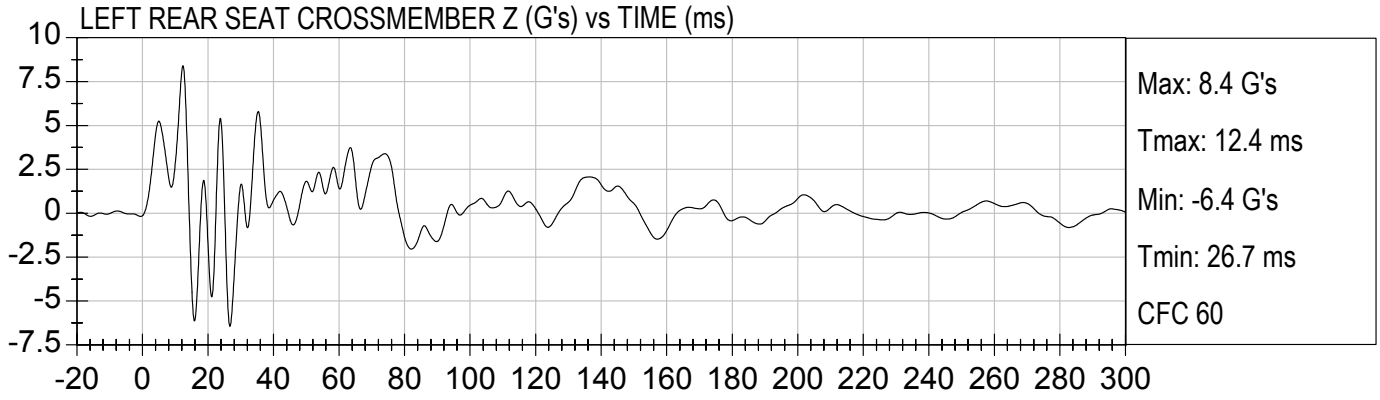

PASSENGER RIGHT ANKLE X (G's) vs TIME (ms)
10
0
-10
-20
-30
-40
-50
-60
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 3.5 G's
Tmax: 102.8 ms
Min: -58.7 G's
Tmin: 43.9 ms
CFC 180

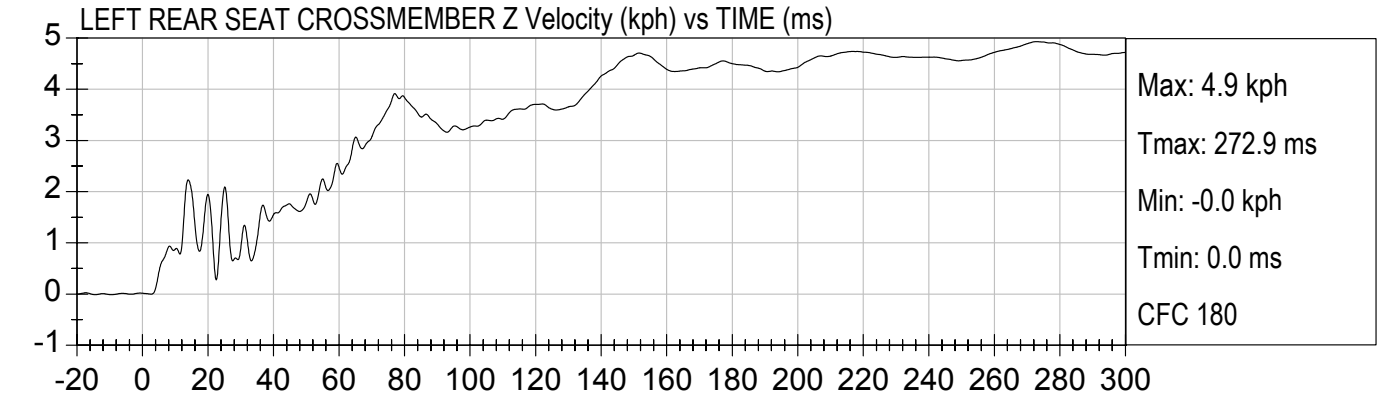

PASSENGER RIGHT ANKLE Z (G's) vs TIME (ms)
10
0
-10
-20
-30
-40
-50
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 3.0 G's
Tmax: 233.8 ms
Min: -41.0 G's
Tmin: 43.9 ms
CFC 180

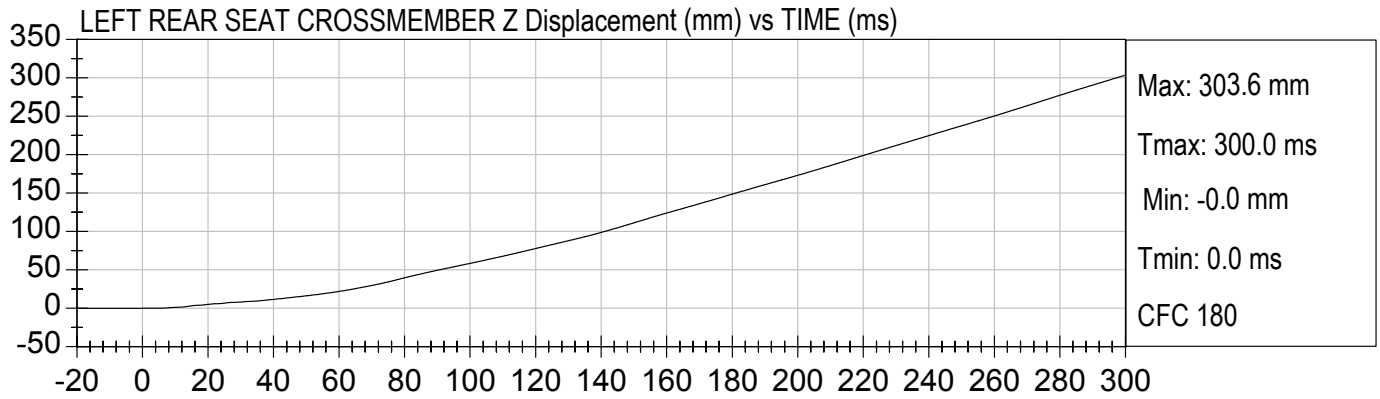

LEFT REAR SEAT CROSSMEMBER X (G's) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-35
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 1.9 G's
Tmax: 125.8 ms
Min: -32.8 G's
Tmin: 56.6 ms
CFC 60

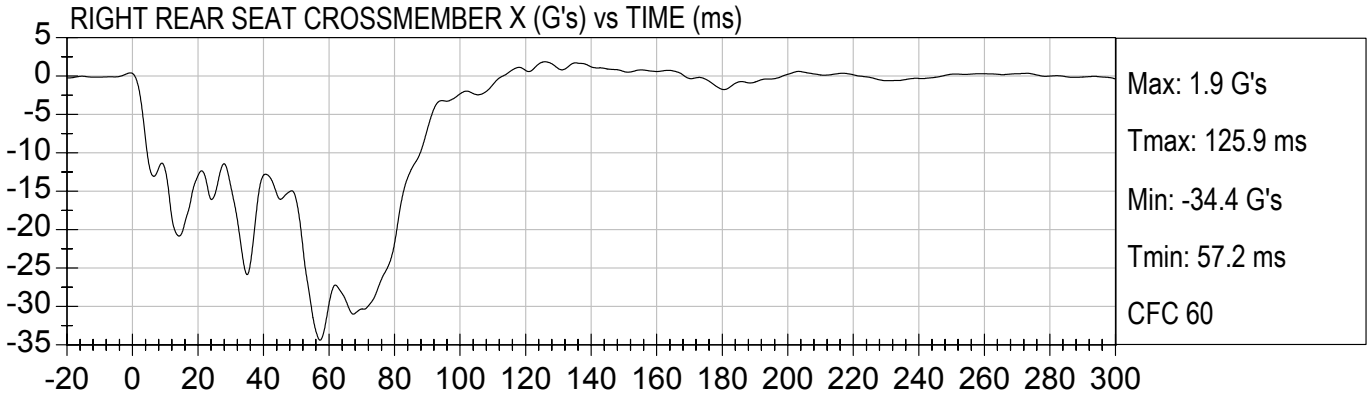

LEFT REAR SEAT CROSSMEMBER X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 56.5 kph
Tmax: 0.0 ms
Min: -7.9 kph
Tmin: 113.5 ms
CFC 180

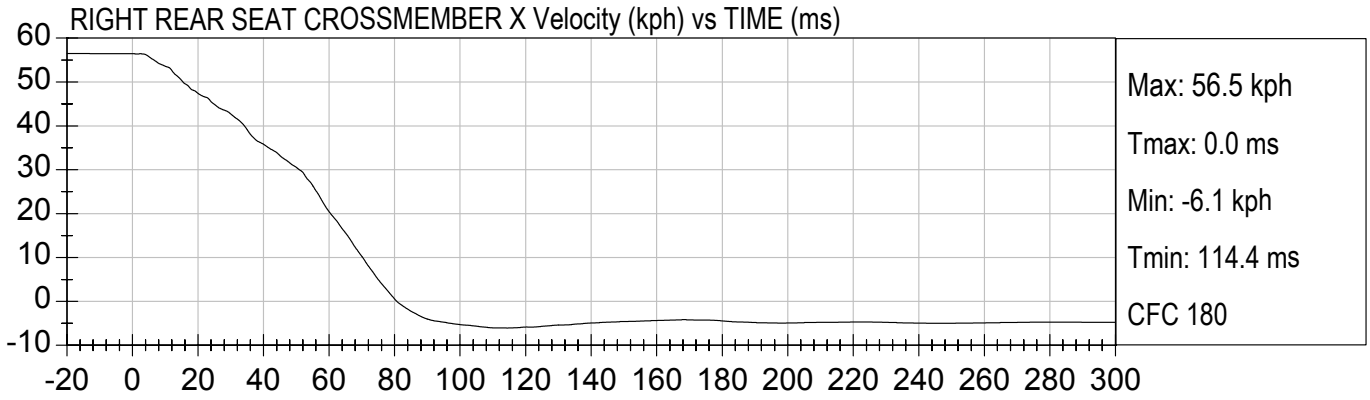

LEFT REAR SEAT CROSSMEMBER X Displacement (mm) vs TIME (ms)
750
500
250
0
-250
-500
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 737.2 mm
Tmax: 79.2 ms
Min: -312.0 mm
Tmin: 0.0 ms
CFC 180

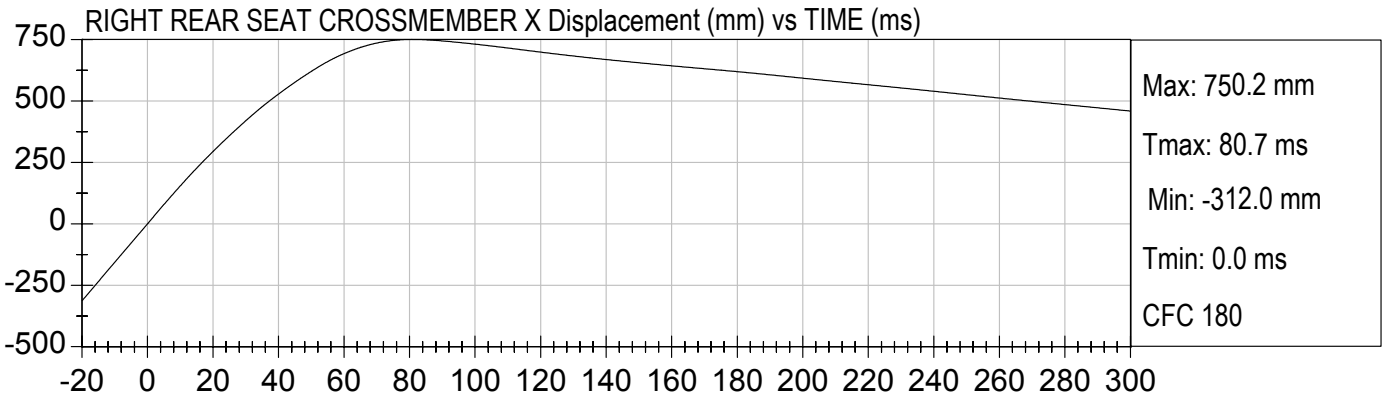

LEFT REAR SEAT CROSSMEMBER Z (G's) vs TIME (ms)
10
7.5
5
2.5
0
-2.5
-5
-7.5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 8.4 G's
Tmax: 12.4 ms
Min: -6.4 G's
Tmin: 26.7 ms
CFC 60

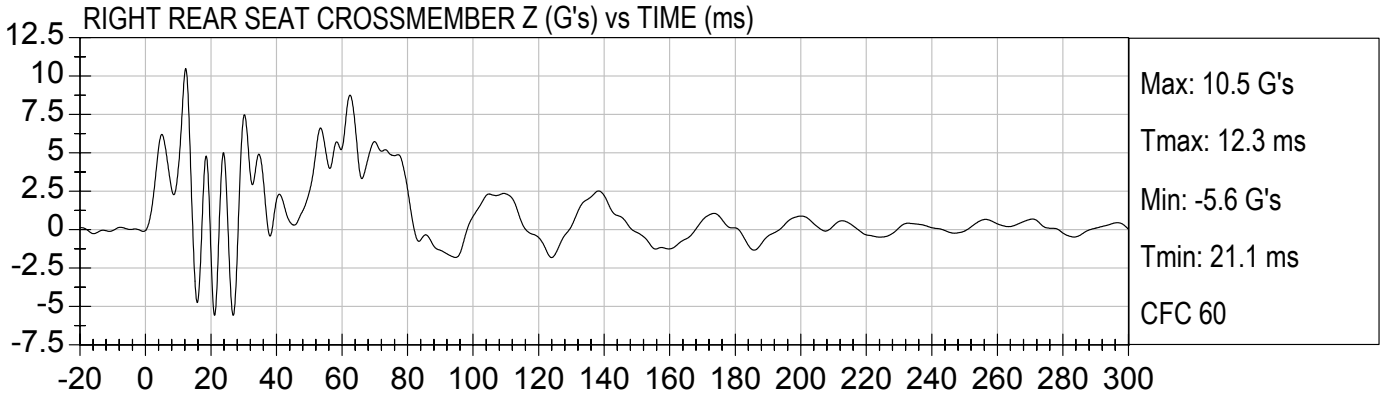

LEFT REAR SEAT CROSSMEMBER Z Velocity (kph) vs TIME (ms)
5
4
3
2
1
0
-1
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 4.9 kph
Tmax: 272.9 ms
Min: -0.0 kph
Tmin: 0.0 ms
CFC 180

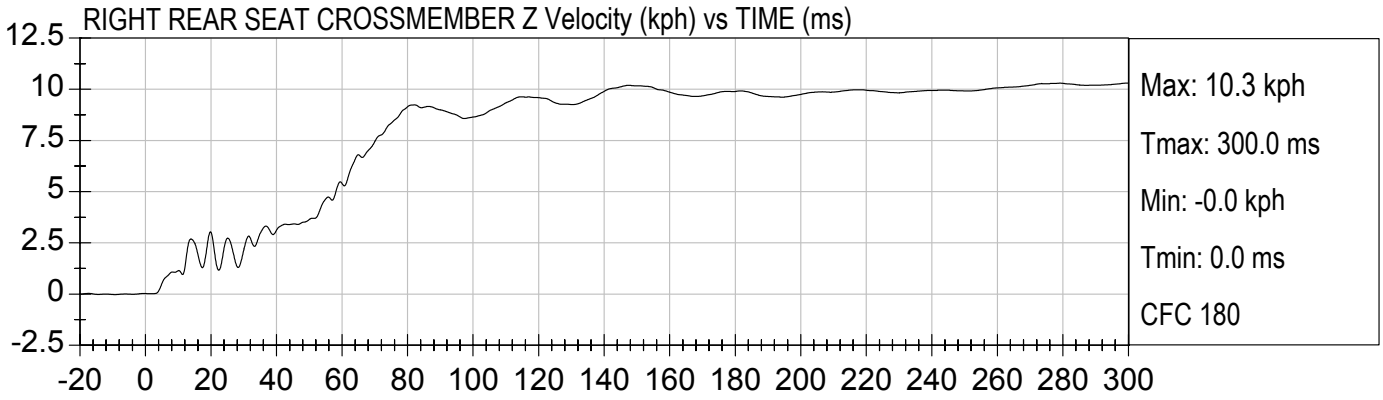

LEFT REAR SEAT CROSSMEMBER Z Displacement (mm) vs TIME (ms)
350
300
250
200
150
100
50
0
-50
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 303.6 mm
Tmax: 300.0 ms
Min: -0.0 mm
Tmin: 0.0 ms
CFC 180

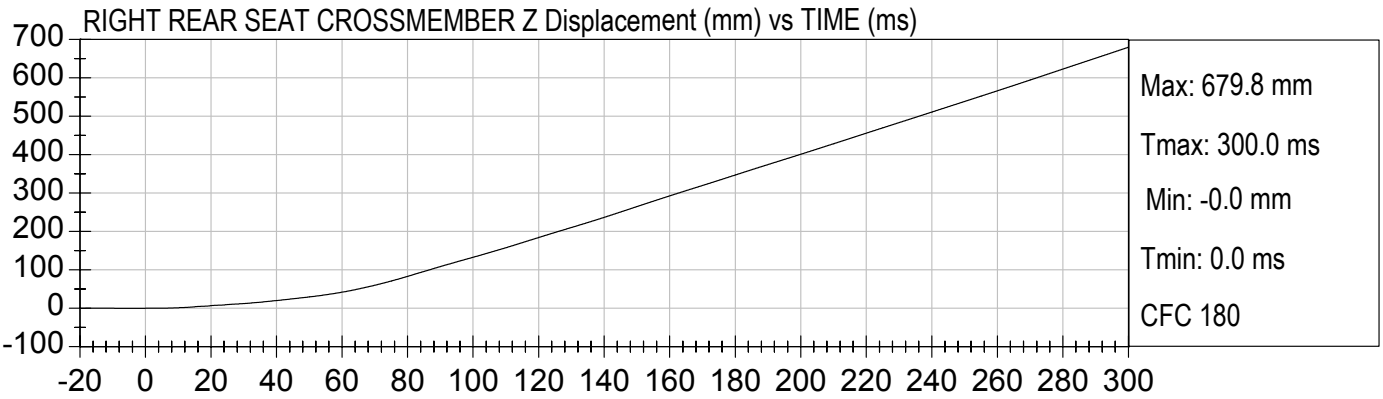

RIGHT REAR SEAT CROSSMEMBER X (G's) vs TIME (ms)
5
0
-5
-10
-15
-20
-25
-30
-35
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 1.9 G's
Tmax: 125.9 ms
Min: -34.4 G's
Tmin: 57.2 ms
CFC 60

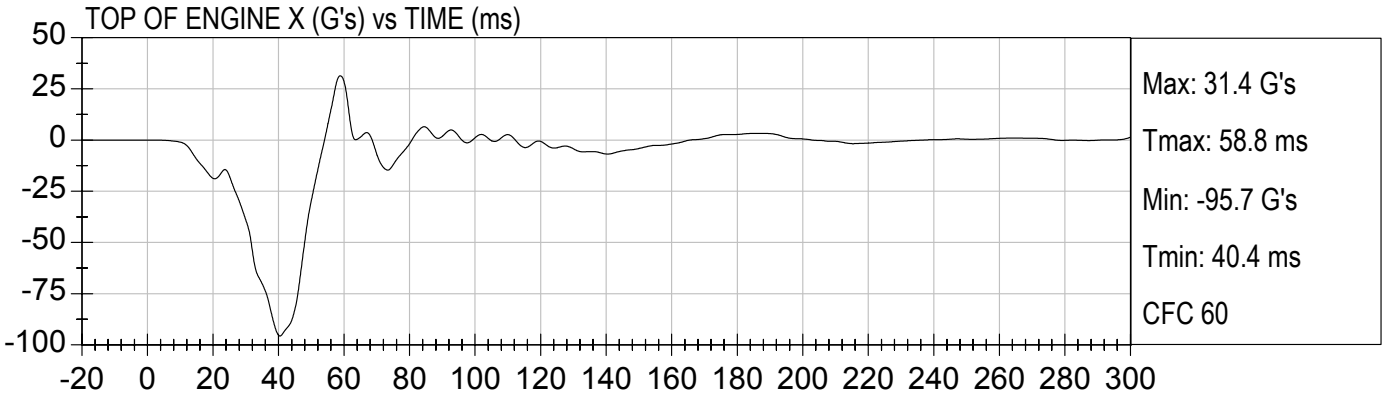

RIGHT REAR SEAT CROSSMEMBER X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 56.5 kph
Tmax: 0.0 ms
Min: -6.1 kph
Tmin: 114.4 ms
CFC 180

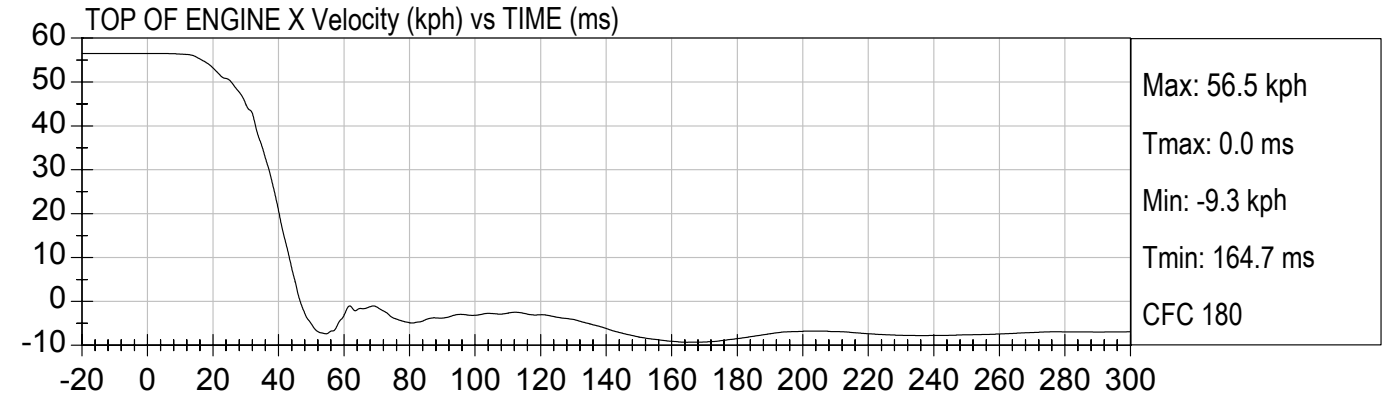

RIGHT REAR SEAT CROSSMEMBER X Displacement (mm) vs TIME (ms)
750
500
250
0
-250
-500
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 750.2 mm
Tmax: 80.7 ms
Min: -312.0 mm
Tmin: 0.0 ms
CFC 180

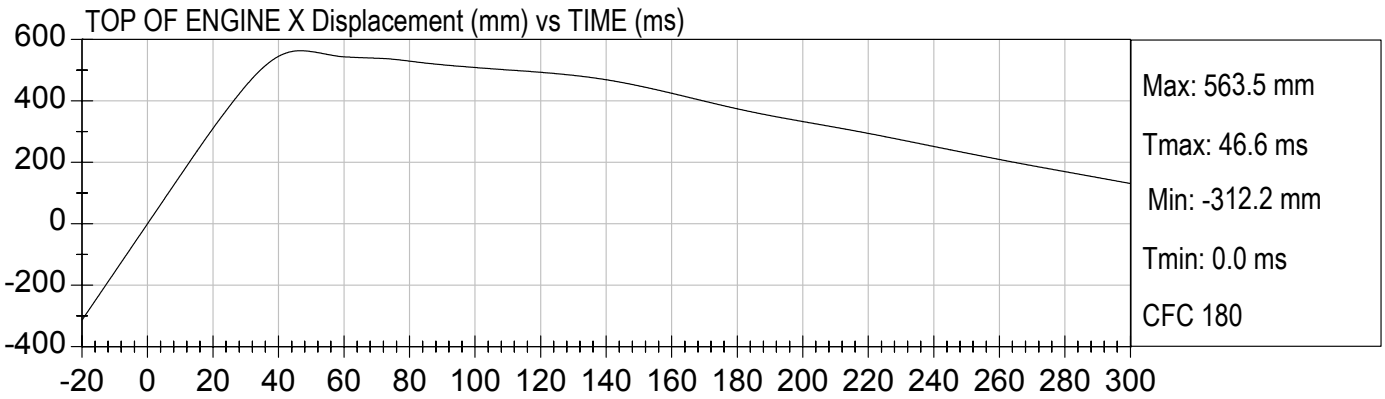

RIGHT REAR SEAT CROSSMEMBER Z (G's) vs TIME (ms)
12.5
10
7.5
5
2.5
0
-2.5
-5
-7.5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 10.5 G's
Tmax: 12.3 ms
Min: -5.6 G's
Tmin: 21.1 ms
CFC 60

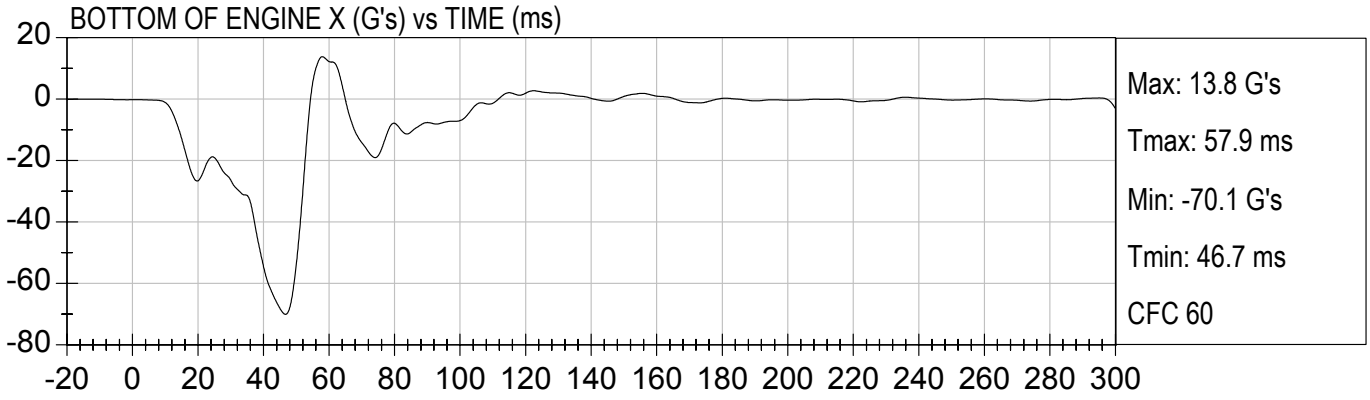

RIGHT REAR SEAT CROSSMEMBER Z Velocity (kph) vs TIME (ms)
12.5
10
7.5
5
2.5
0
-2.5
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 10.3 kph
Tmax: 300.0 ms
Min: -0.0 kph
Tmin: 0.0 ms
CFC 180

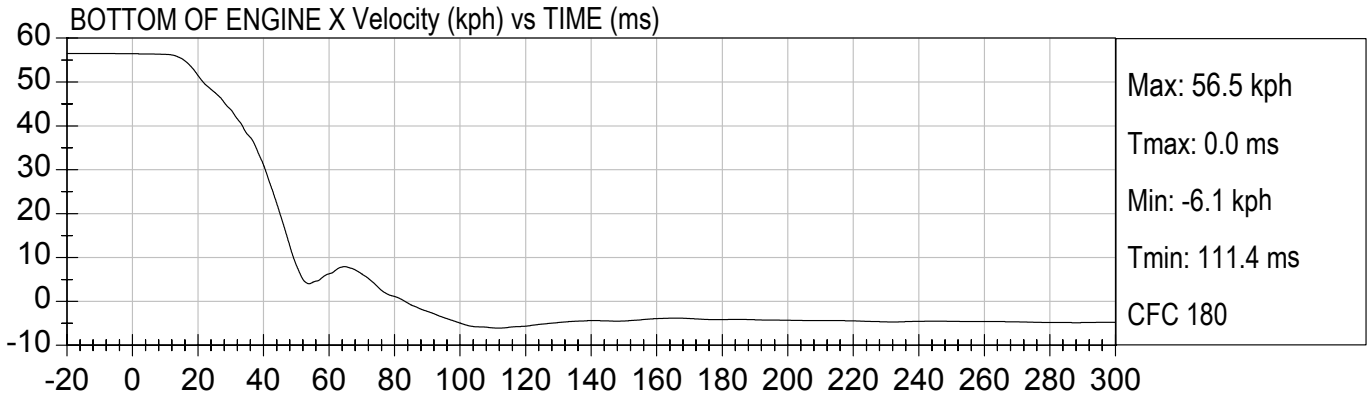

RIGHT REAR SEAT CROSSMEMBER Z Displacement (mm) vs TIME (ms)
700
600
500
400
300
200
100
0
-100
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 679.8 mm
Tmax: 300.0 ms
Min: -0.0 mm
Tmin: 0.0 ms
CFC 180

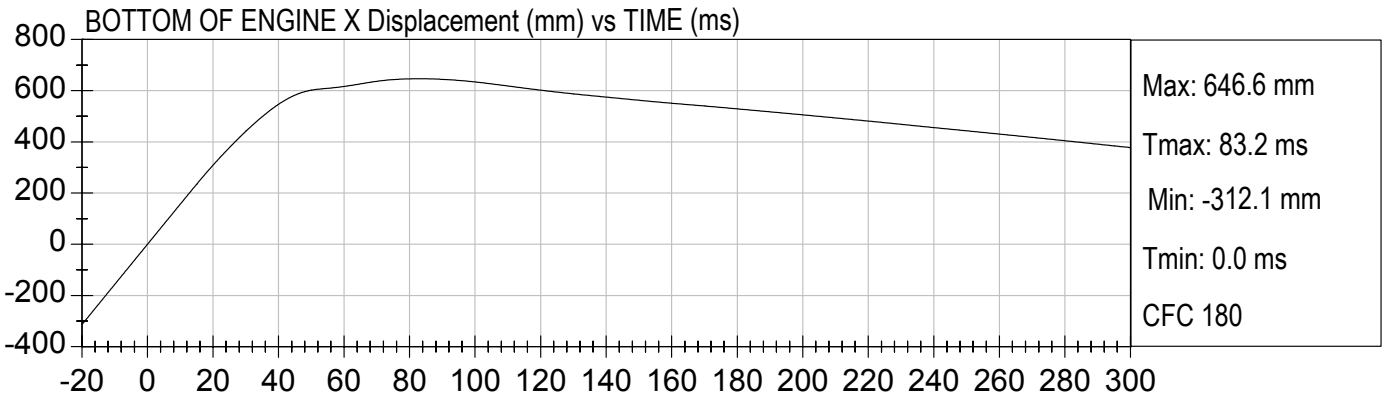

TOP OF ENGINE X (G's) vs TIME (ms)
50
25
0
-25
-50
-75
-100
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 31.4 G's
Tmax: 58.8 ms
Min: -95.7 G's
Tmin: 40.4 ms
CFC 60

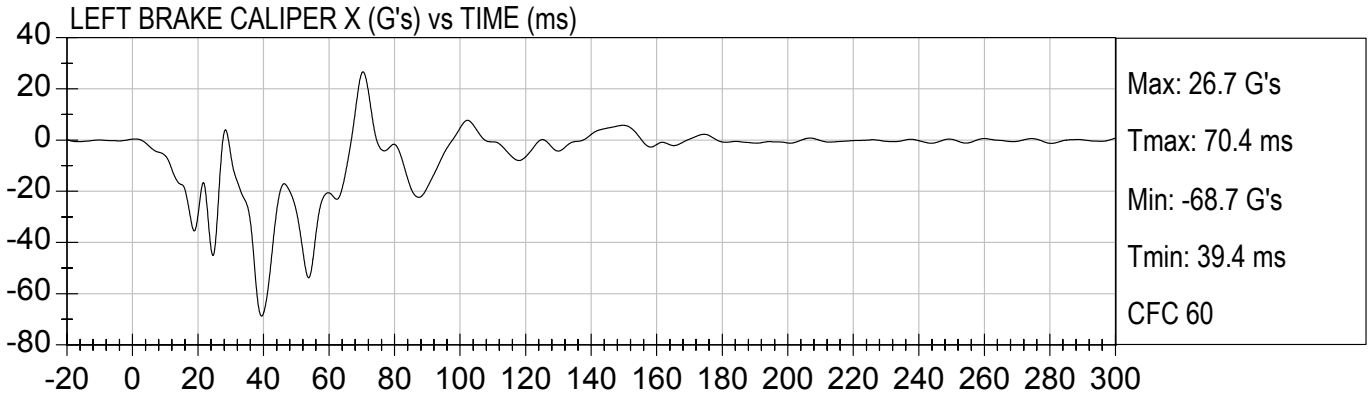

TOP OF ENGINE X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 56.5 kph
Tmax: 0.0 ms
Min: -9.3 kph
Tmin: 164.7 ms
CFC 180

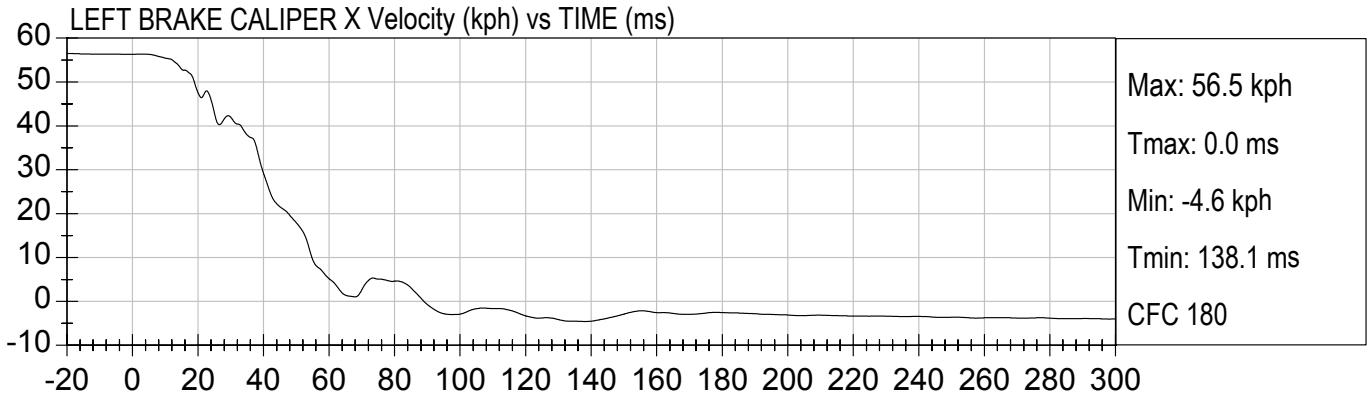

TOP OF ENGINE X Displacement (mm) vs TIME (ms)
600
400
200
0
-200
-400
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 563.5 mm
Tmax: 46.6 ms
Min: -312.2 mm
Tmin: 0.0 ms
CFC 180

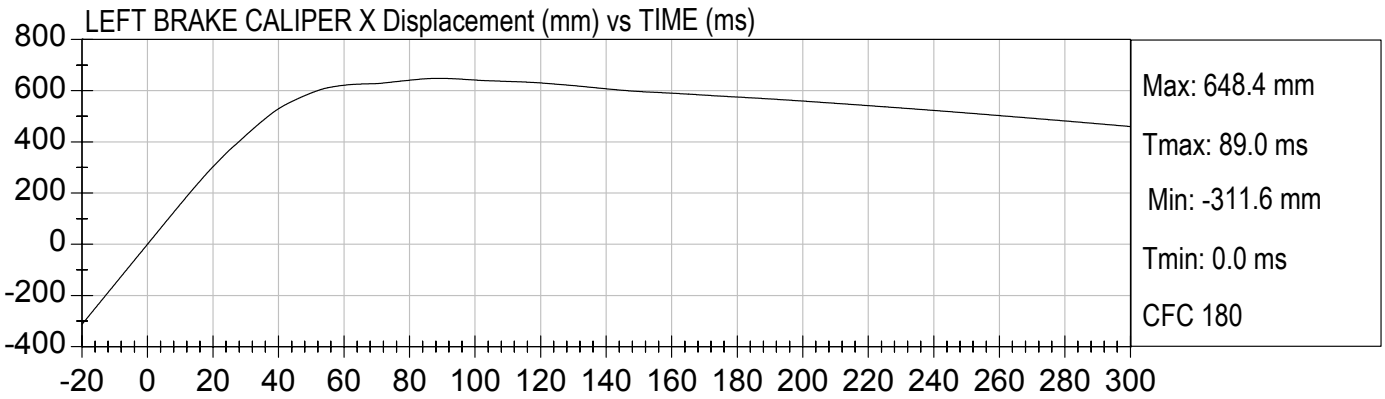

BOTTOM OF ENGINE X (G's) vs TIME (ms)
20
0
-20
-40
-60
-80
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 13.8 G's
Tmax: 57.9 ms
Min: -70.1 G's
Tmin: 46.7 ms
CFC 60

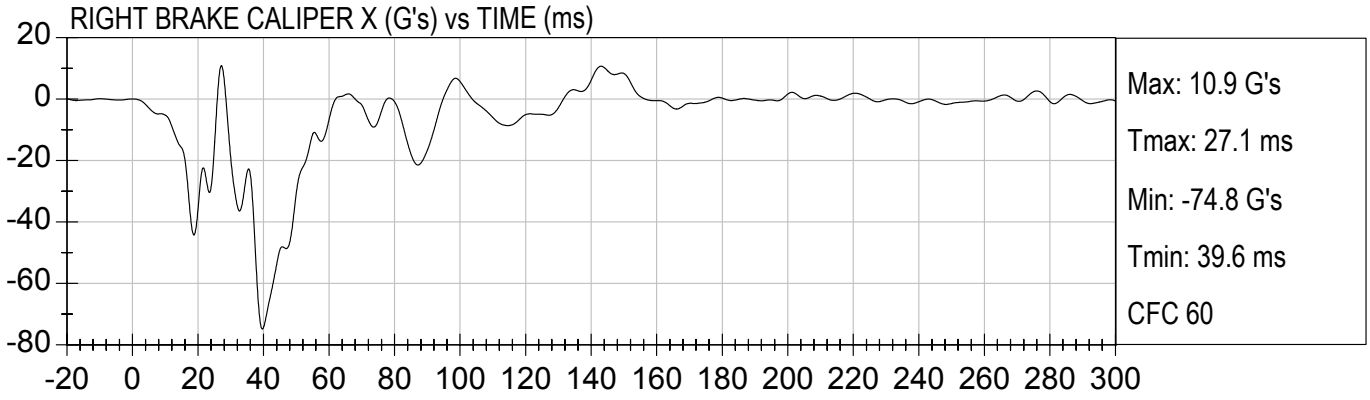

BOTTOM OF ENGINE X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 56.5 kph
Tmax: 0.0 ms
Min: -6.1 kph
Tmin: 111.4 ms
CFC 180

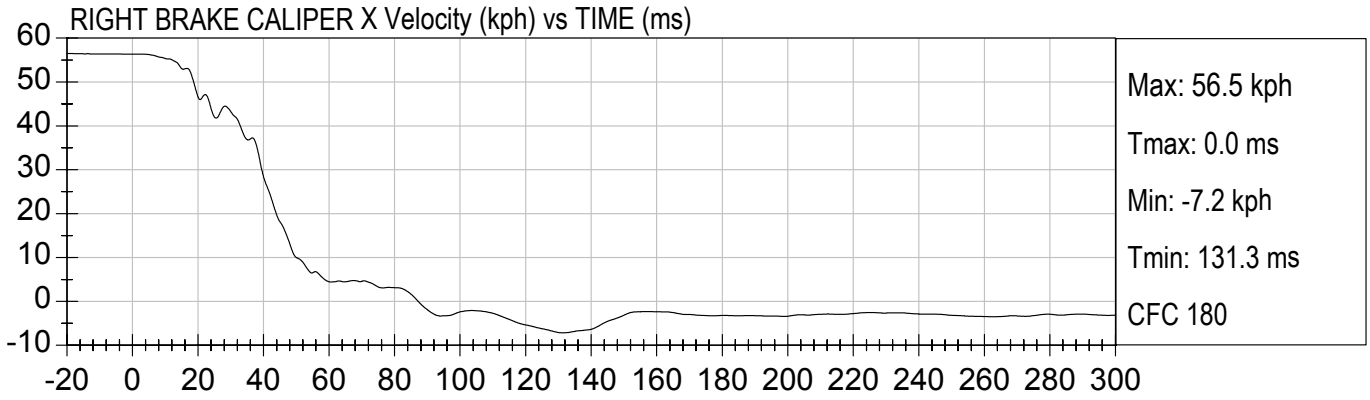

BOTTOM OF ENGINE X Displacement (mm) vs TIME (ms)
800
600
400
200
0
-200
-400
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 646.6 mm
Tmax: 83.2 ms
Min: -312.1 mm
Tmin: 0.0 ms
CFC 180

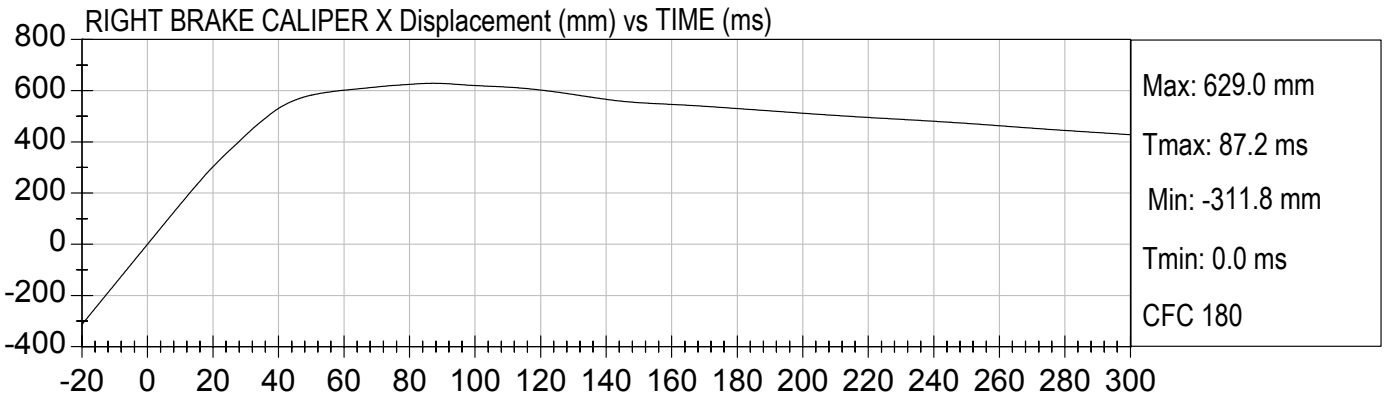

LEFT BRAKE CALIPER X (G's) vs TIME (ms)
40
20
0
-20
-40
-60
-80
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 26.7 G's
Tmax: 70.4 ms
Min: -68.7 G's
Tmin: 39.4 ms
CFC 60

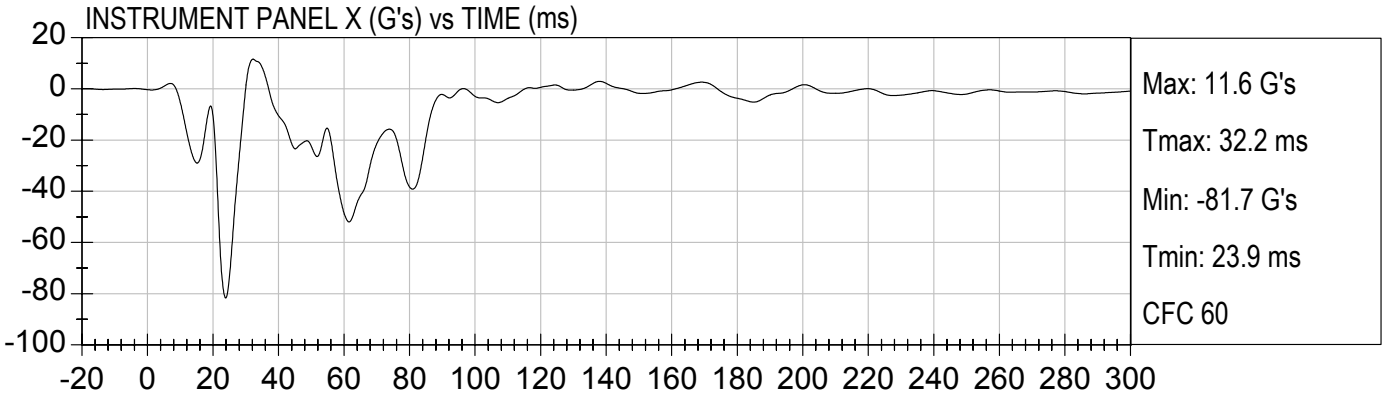

LEFT BRAKE CALIPER X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 56.5 kph
Tmax: 0.0 ms
Min: -4.6 kph
Tmin: 138.1 ms
CFC 180

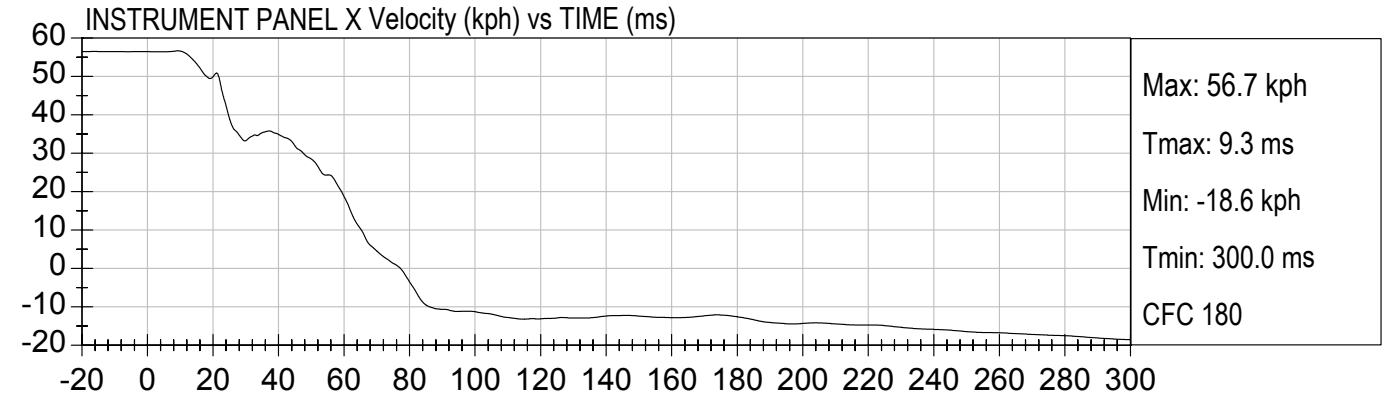

LEFT BRAKE CALIPER X Displacement (mm) vs TIME (ms)
800
600
400
200
0
-200
-400
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 648.4 mm
Tmax: 89.0 ms
Min: -311.6 mm
Tmin: 0.0 ms
CFC 180

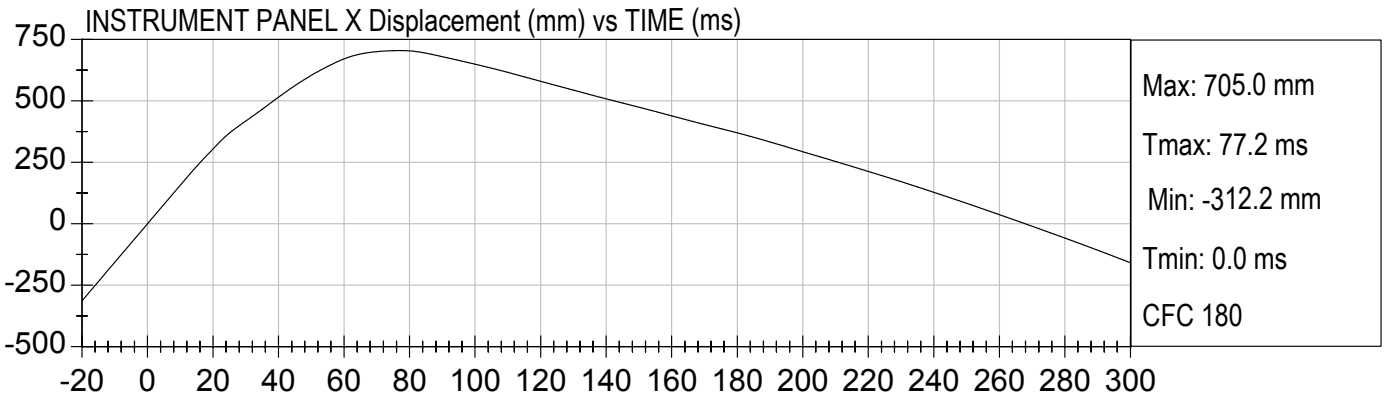

RIGHT BRAKE CALIPER X (G's) vs TIME (ms)
20
0
-20
-40
-60
-80
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 10.9 G's
Tmax: 27.1 ms
Min: -74.8 G's
Tmin: 39.6 ms
CFC 60

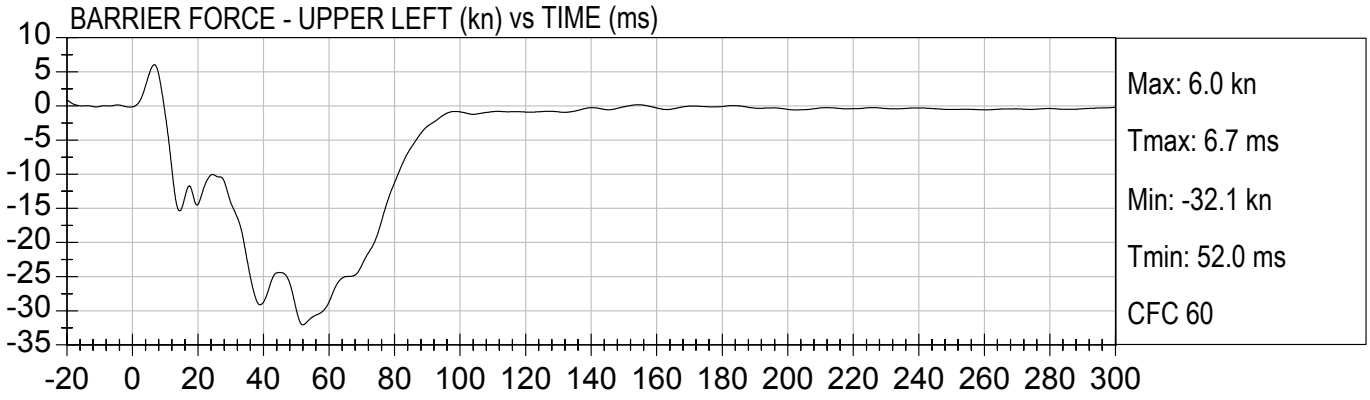

RIGHT BRAKE CALIPER X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 56.5 kph
Tmax: 0.0 ms
Min: -7.2 kph
Tmin: 131.3 ms
CFC 180

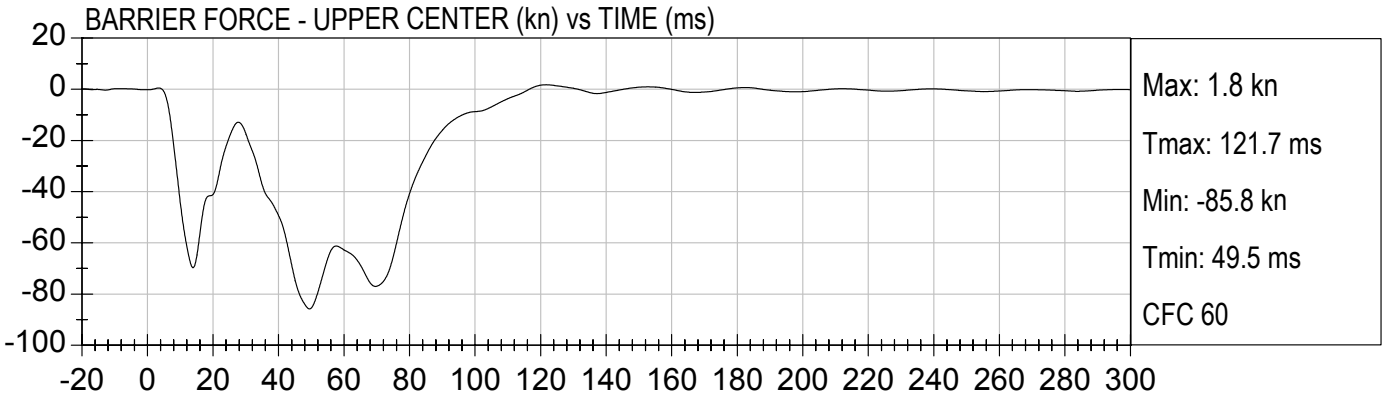

RIGHT BRAKE CALIPER X Displacement (mm) vs TIME (ms)
800
600
400
200
0
-200
-400
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 629.0 mm
Tmax: 87.2 ms
Min: -311.8 mm
Tmin: 0.0 ms
CFC 180

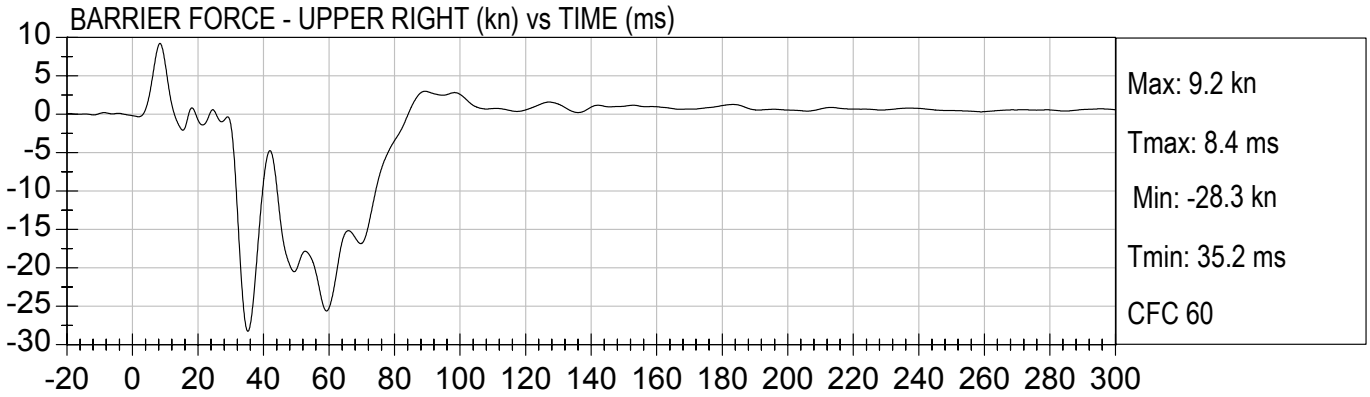

INSTRUMENT PANEL X (G's) vs TIME (ms)
20
0
-20
-40
-60
-80
-100
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 11.6 G's
Tmax: 32.2 ms
Min: -81.7 G's
Tmin: 23.9 ms
CFC 60


INSTRUMENT PANEL X Velocity (kph) vs TIME (ms)
60
50
40
30
20
10
0
-10
-20
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 56.7 kph
Tmax: 9.3 ms
Min: -18.6 kph
Tmin: 300.0 ms
CFC 180


INSTRUMENT PANEL X Displacement (mm) vs TIME (ms)
750
500
250
0
-250
-500
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 705.0 mm
Tmax: 77.2 ms
Min: -312.2 mm
Tmin: 0.0 ms
CFC 180

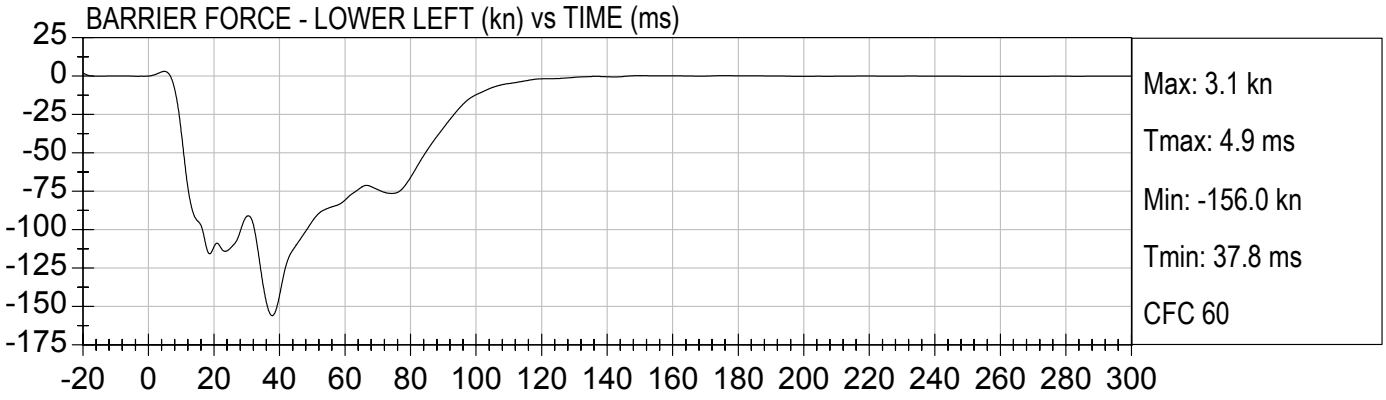

BARRIER FORCE - UPPER LEFT (kn) vs TIME (ms)
10
5
0
-5
-10
-15
-20
-25
-30
-35
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 6.0 kn
Tmax: 6.7 ms
Min: -32.1 kn
Tmin: 52.0 ms
CFC 60

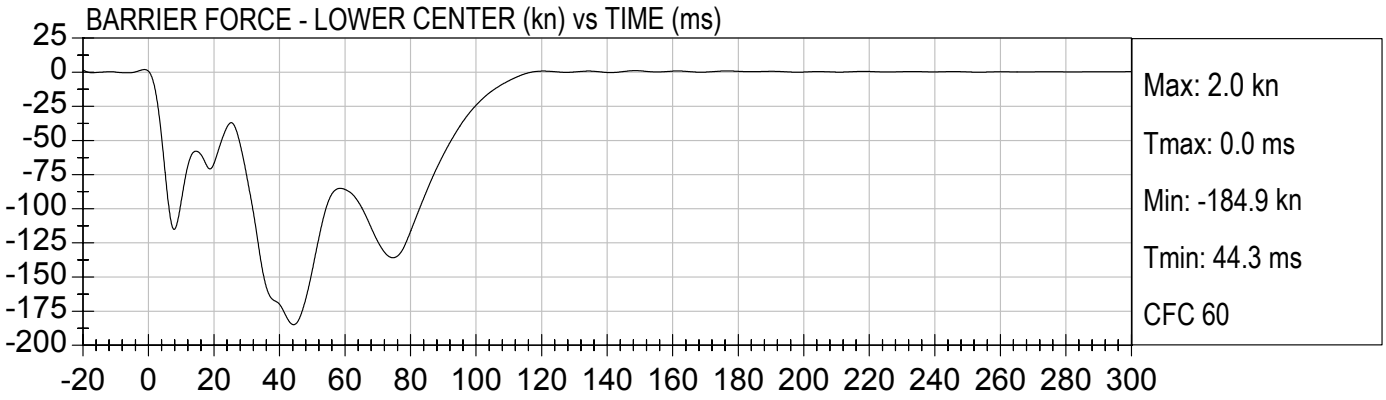

BARRIER FORCE - UPPER CENTER (kn) vs TIME (ms)
20
0
-20
-40
-60
-80
-100
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 1.8 kn
Tmax: 121.7 ms
Min: -85.8 kn
Tmin: 49.5 ms
CFC 60

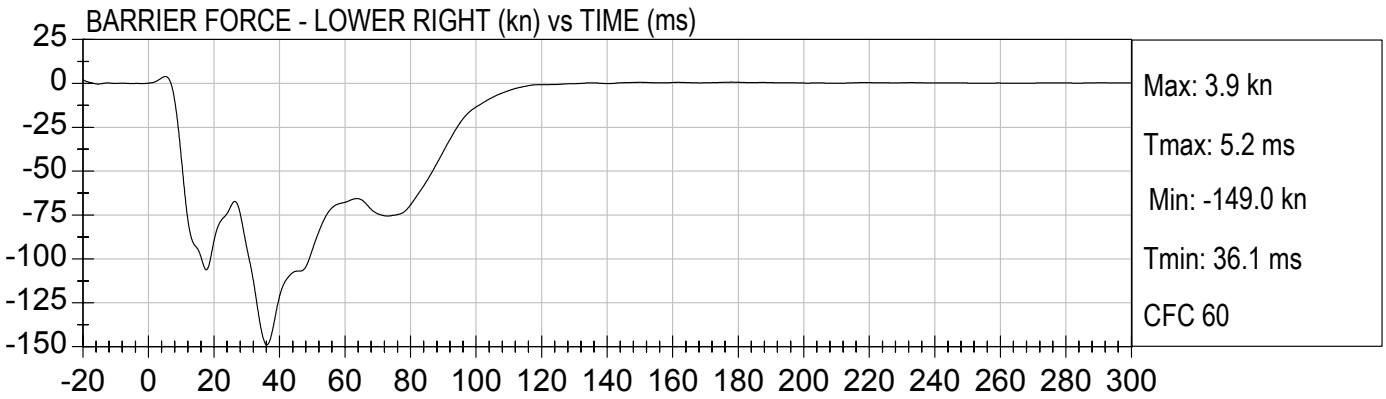

BARRIER FORCE - UPPER RIGHT (kn) vs TIME (ms)
10
5
0
-5
-10
-15
-20
-25
-30
-20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
Max: 9.2 kn
Tmax: 8.4 ms
Min: -28.3 kn
Tmin: 35.2 ms
CFC 60

NCAP 35MPH FRONTAL
2005 FORD MUSTANG (M50206)

Test Date: 12/01/04
Speed: 35.1 mph (56.5 km/h)

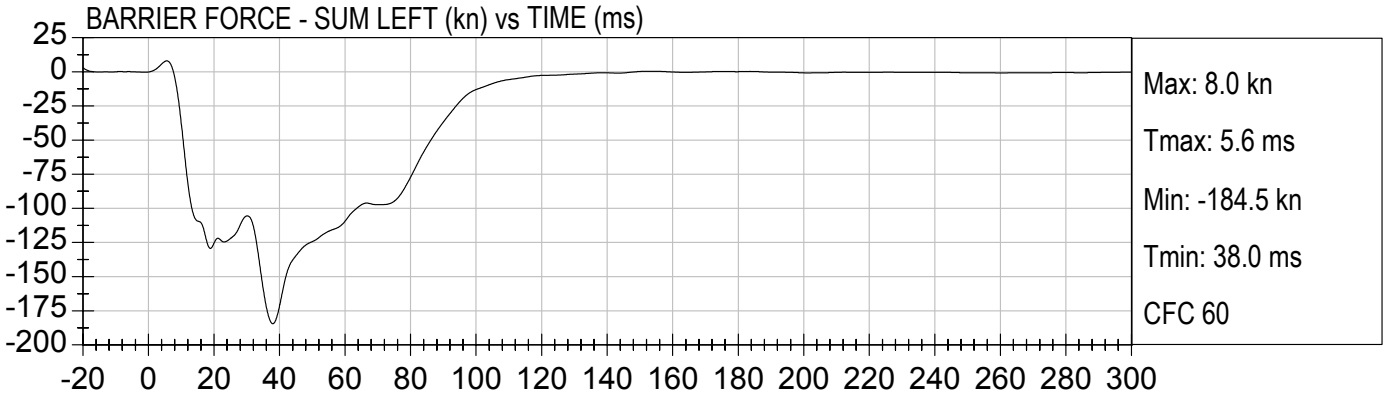


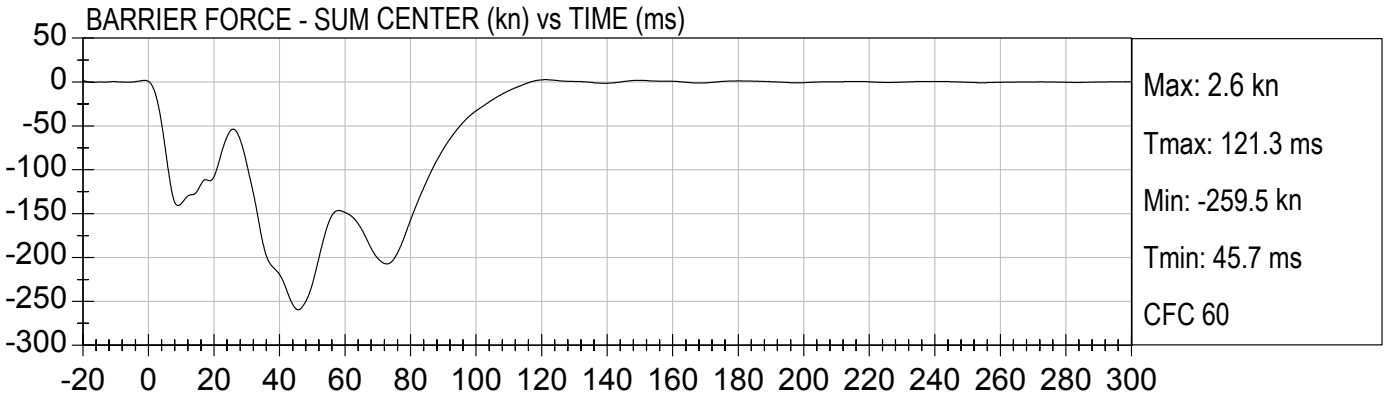


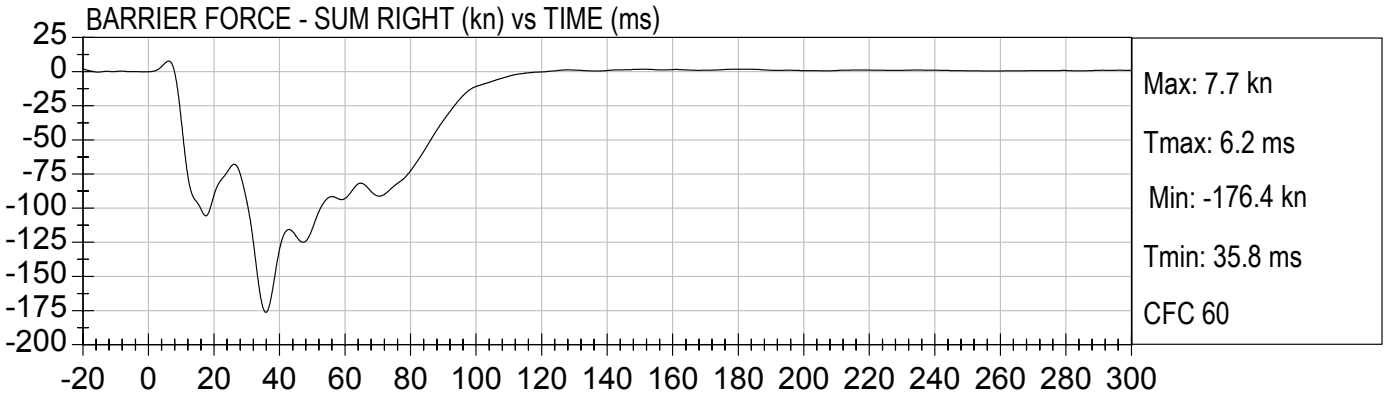


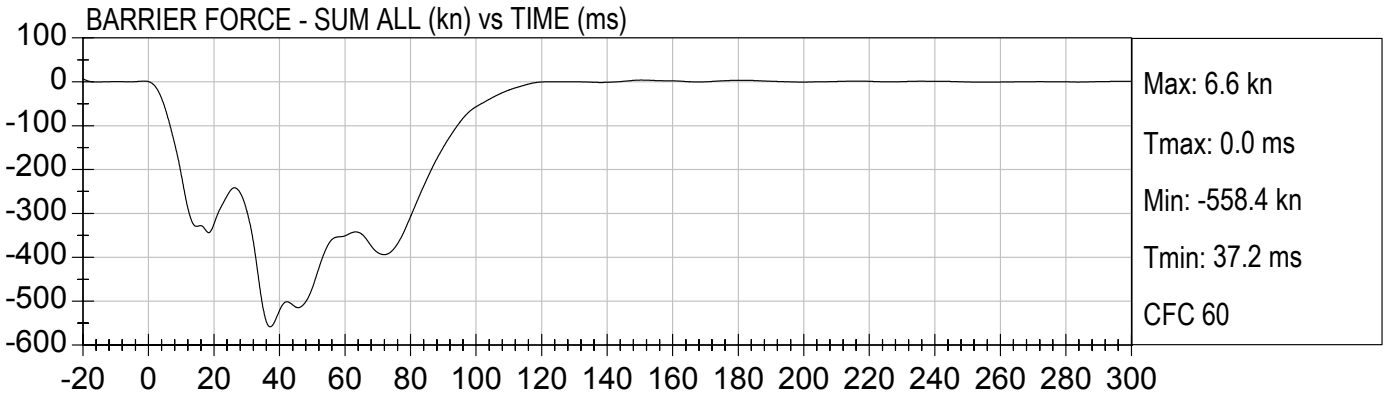
NCAP 35MPH FRONTAL
2005 FORD MUSTANG (M50206)

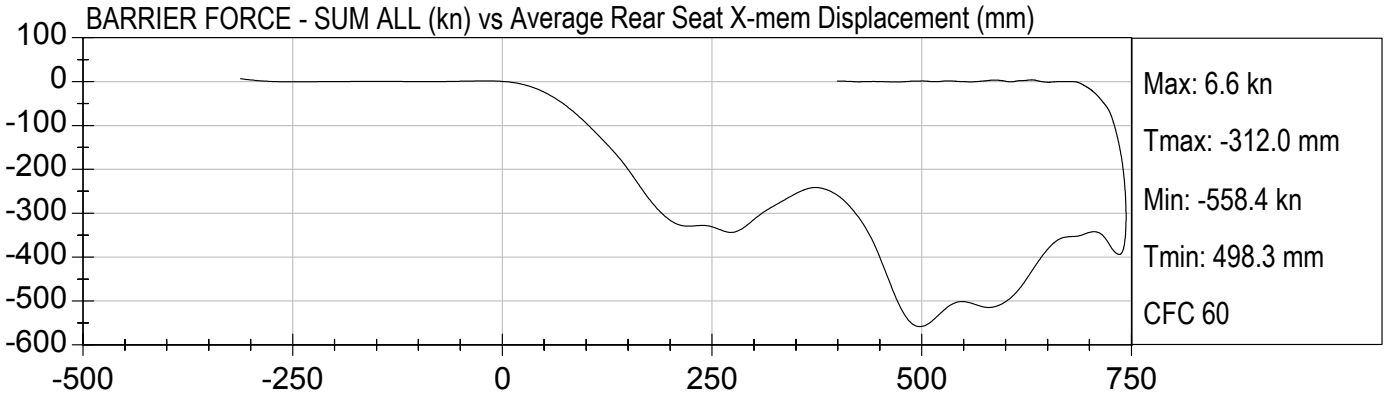
Test Date: 12/01/04
Speed: 35.1 mph (56.5 km/h)










BARRIER FORCE - SUM ALL (kn) vs Average Rear Seat X-mem Displacement (mm)
100
0
-100
-200
-300
-400
-500
-600
-500
-250
0
250
500
750
Max: 6.6 kn
Tmax: -312.0 mm
Min: -558.4 kn
Tmin: 498.3 mm
CFC 60

APPENDIX C

DUMMY CALIBRATION DATA TRACES AND TABLES

MGA RESEARCH CORPORATION

HEAD DROP TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 065 **Test ID:** D042271

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Peak Resultant Acceleration	G's	225 - 275	238	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	7.9	Pass
Unimodal	Yes/No	NA	Yes	Pass
Oscillations	Yes/No	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Jim Carney

Laboratory Technician

09/22/2004

Test Date

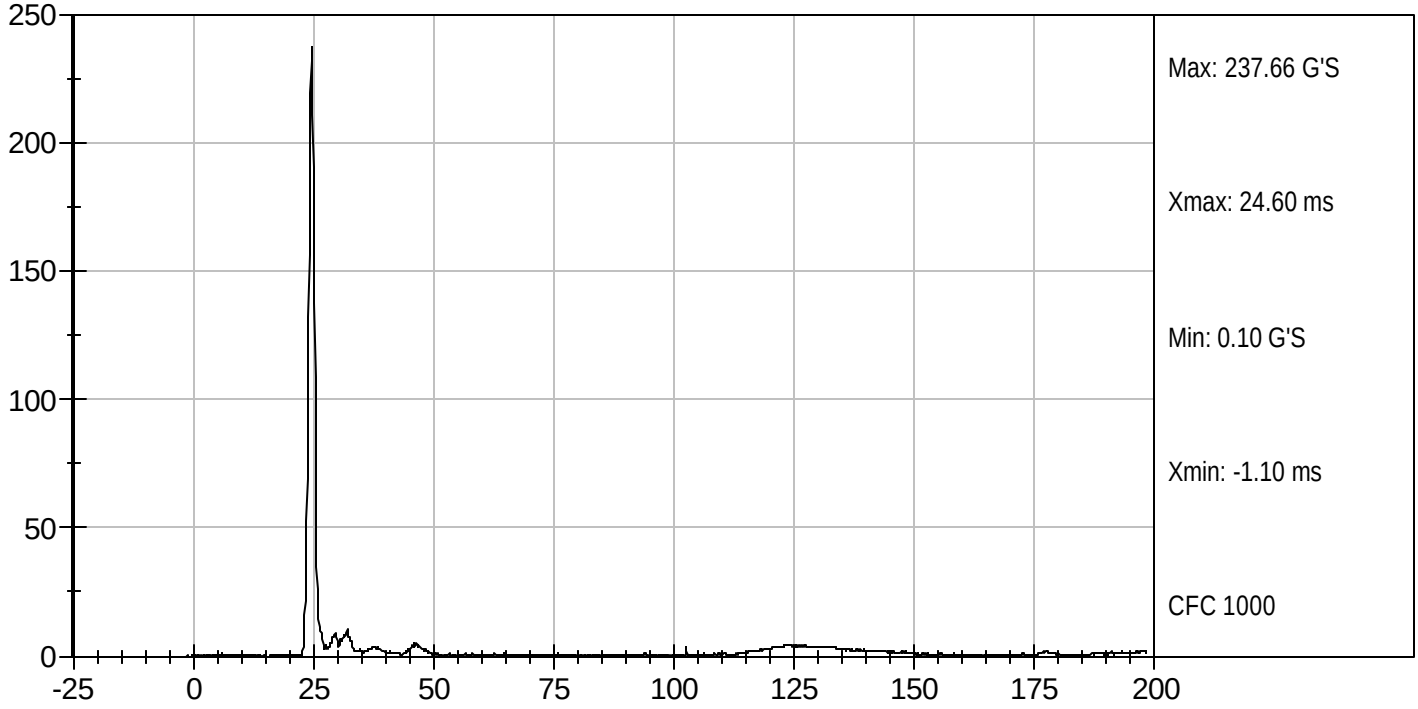
David Winkelbauer

Approved By

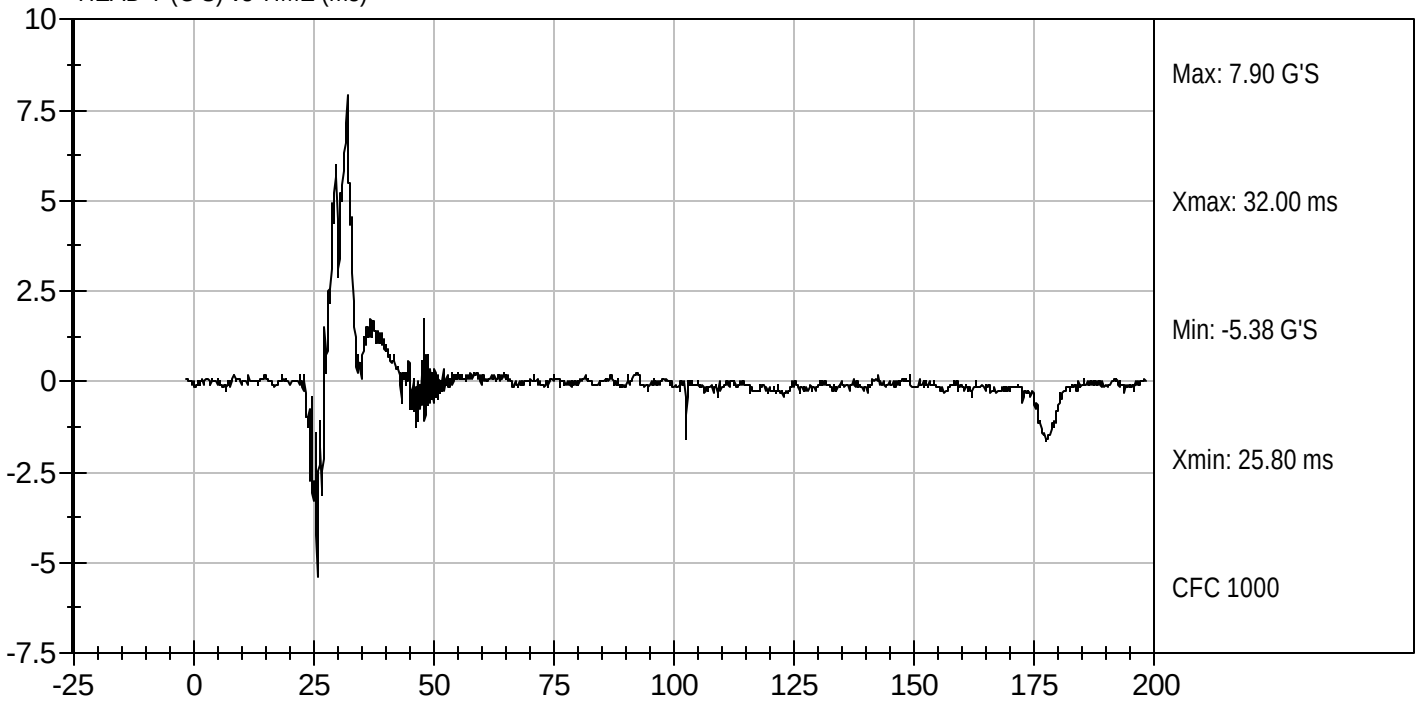
Test Desc: Head Drop
Componet ID: D042271

Test Date: 09/22/2004
Velocity: 0 ft/s, 0.00 m/s

HEAD RESULTANT ACCELERATION (G'S) vs TIME (ms)



HEAD Y (G'S) vs TIME (ms)



MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 065 **Test I.D:** D042272

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	20.8	Pass
Laboratory Relative Humidity		%	10 to 70	40	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.03	Pass
Pendulum Deceleration	10 msec	G's	22.50 to 27.50	22.88	Pass
	20 msec	G's	17.60 to 22.60	20.31	Pass
	30 msec	G's	12.50 to 18.50	14.93	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 29.0	14.87	Pass
Deceleration Decay Time to Cross 5 G's		msec	34.0 to 42.0	39.1	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	72.4	Pass
	Time	msec	57.0 to 64.0	59.4	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	113.0 to 128.0	119.3	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	93.1	Pass
	Time	msec	47.0 to 58.0	51.7	Pass
Positive Moment Decay Time To Zero Crossing		msec	97.0 to 107.0	106.7	Pass
			Overall Test Results		Pass

Jim Carney
Laboratory Technician

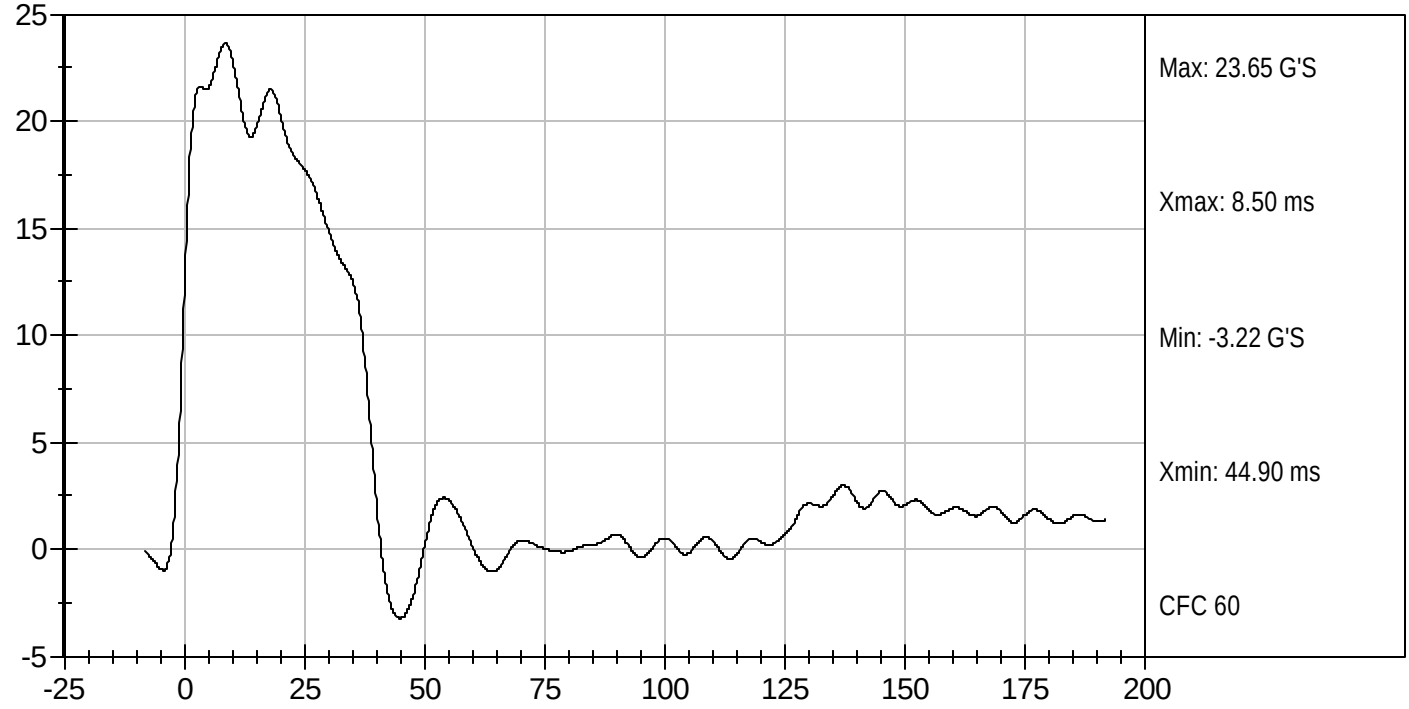
09/21/2004
Test Date

David Winkelbauer
Approved By

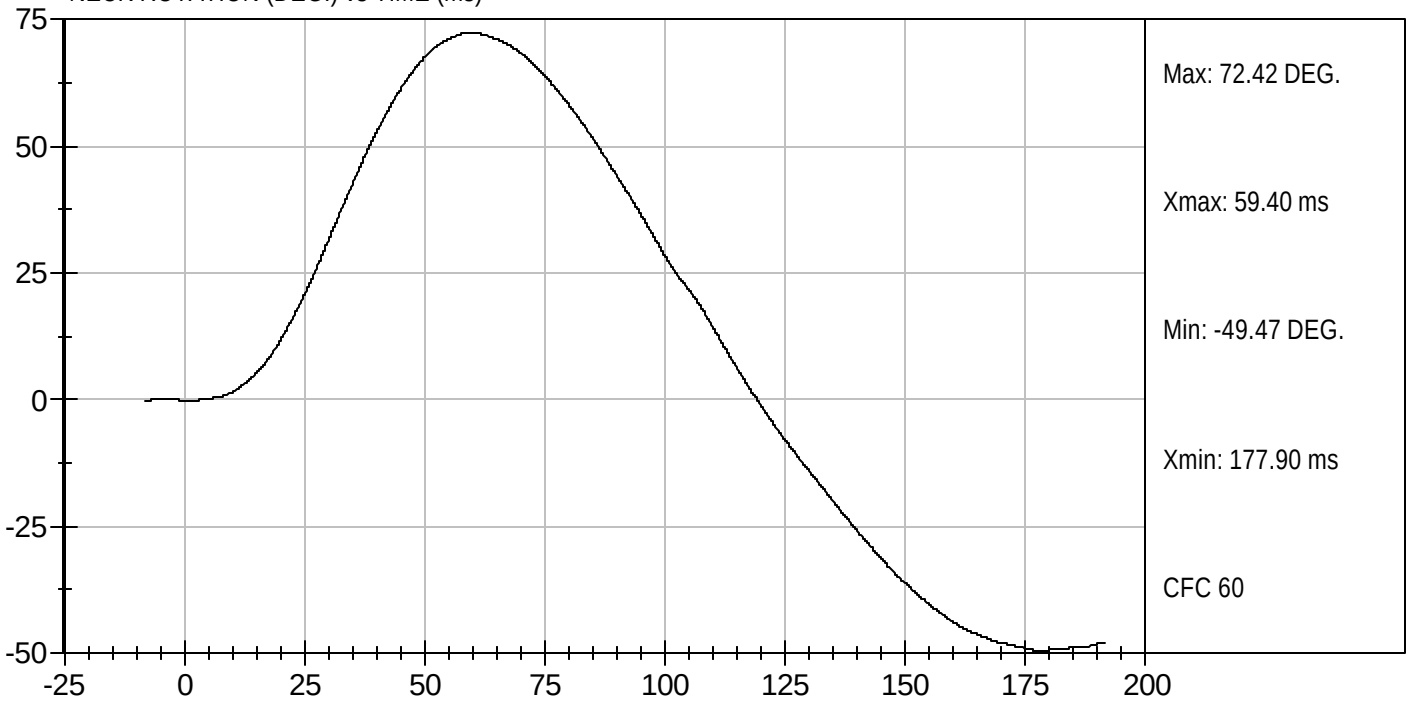
Test Desc: Neck Flexion
Componet ID: D042272

Test Date: 09/21/2004
Velocity: 23.05 ft/s, 7.03 m/s

PENDULUM DECELERATION (G'S) vs TIME (ms)

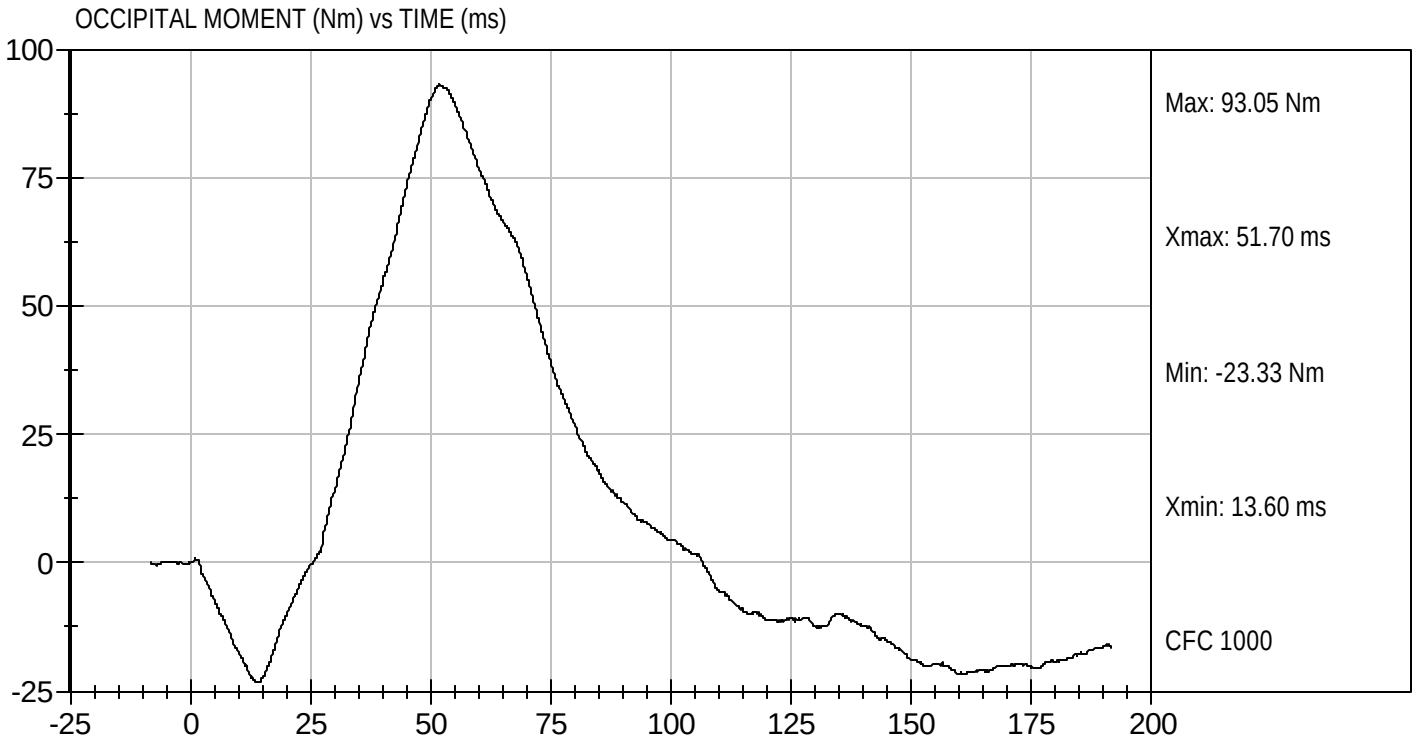


NECK ROTATION (DEG.) vs TIME (ms)



Test Desc: Neck Flexion
Componet ID: D042272

Test Date: 09/21/2004
Velocity: 23.05 ft/s, 7.03 m/s



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 065 **Test I.D:** D042273

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	20.8	Pass
Laboratory Relative Humidity		%	10 to 70	40	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.10	Pass
Pendulum Deceleration	10 msec	G's	17.20 to 21.20	18.44	Pass
	20 msec	G's	14.00 to 19.00	15.92	Pass
	30 msec	G's	11.00 to 16.00	11.28	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 22.0	12.33	Pass
Deceleration Decay Time to Cross 5 G's		msec	38.0 to 46.0	43.5	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	94.7	Pass
	Time	msec	72.0 to 82.0	79.1	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	147.0 to 174.0	159.4	Pass
Moment About Occipital Condyle	Maximum	N m	-52.9 to -79.9	-64.5	Pass
	Time	msec	65.0 to 79.0	74.8	Pass
Negative Moment Decay Time To Zero Crossing		msec	120.0 to 148.0	147.2	Pass
			Overall Test Results		Pass

Jim Carney
Laboratory Technician

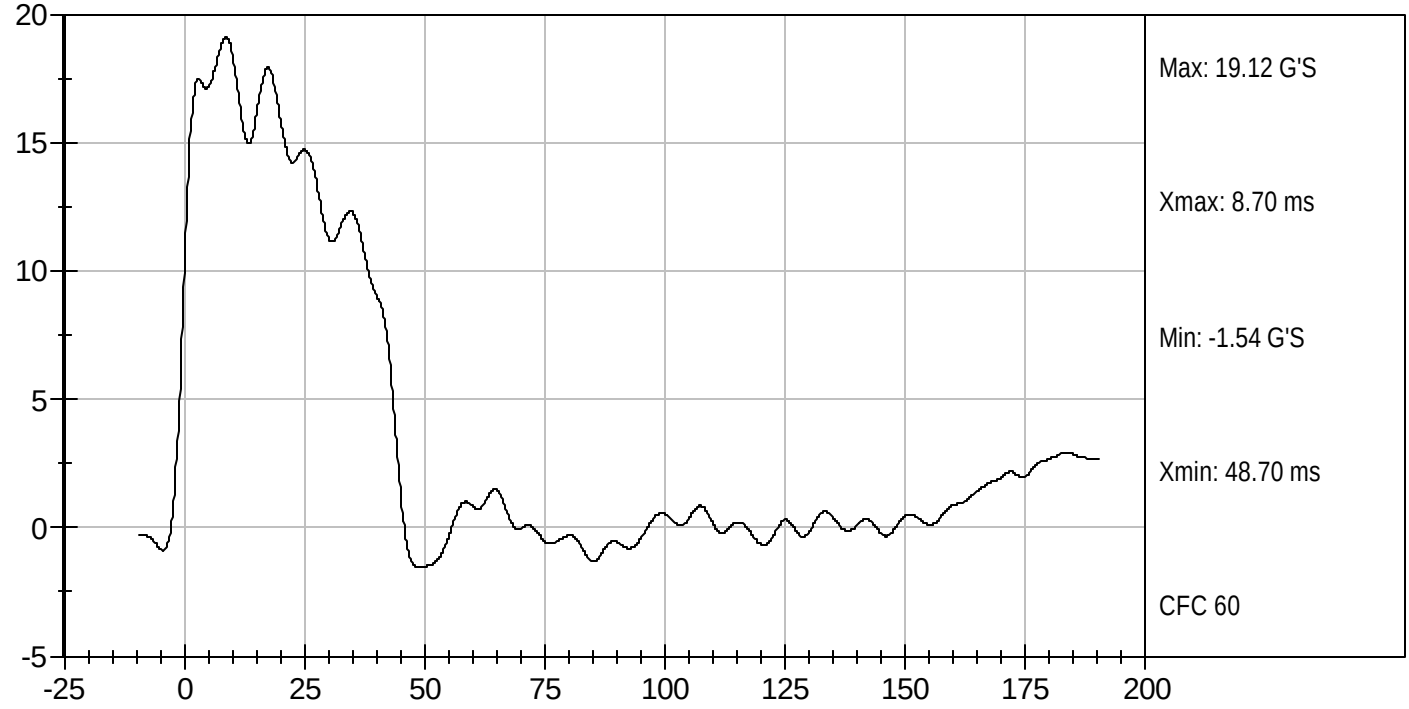
09/22/2004
Test Date

David Winkelbauer
Approved By

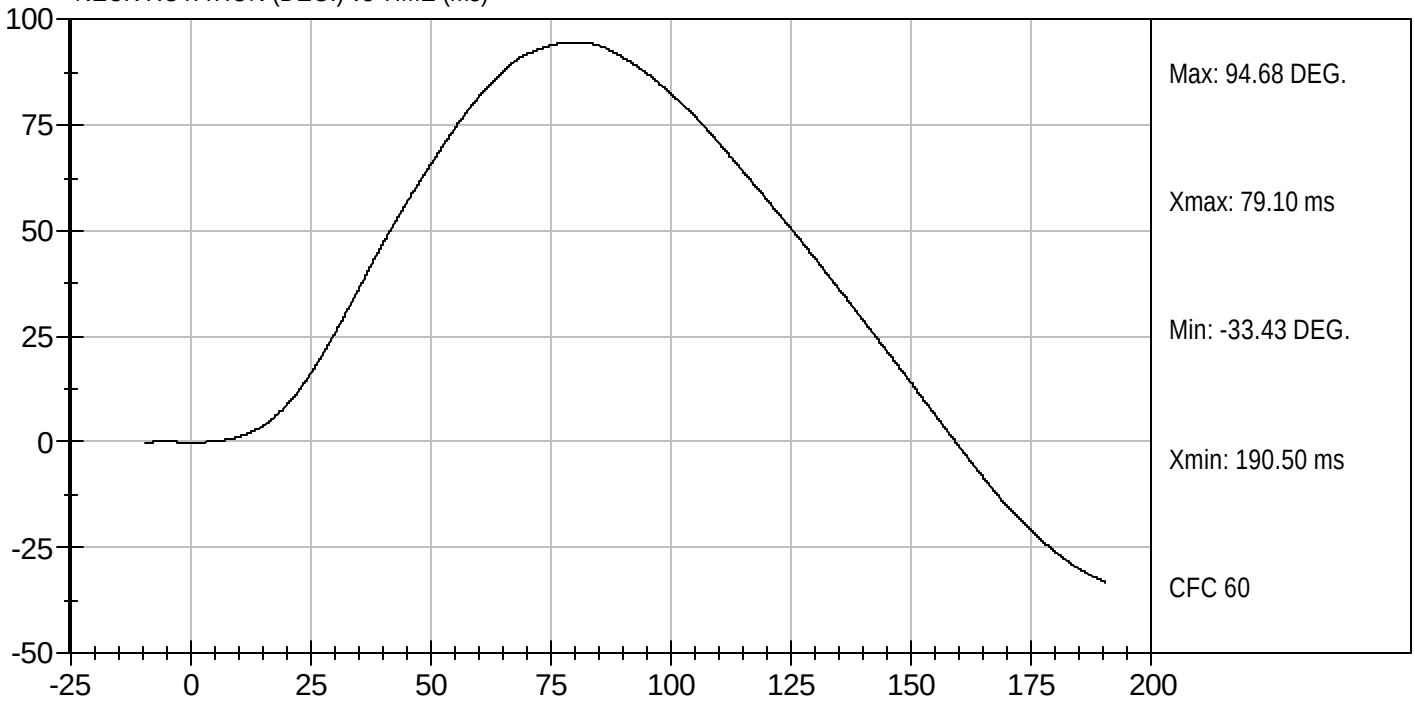
Test Desc: Neck Extension
Componet ID: D042273

Test Date: 09/22/2004
Velocity: 20.02 ft/s, 6.10 m/s

PENDULUM DECELERATION (G'S) vs TIME (ms)

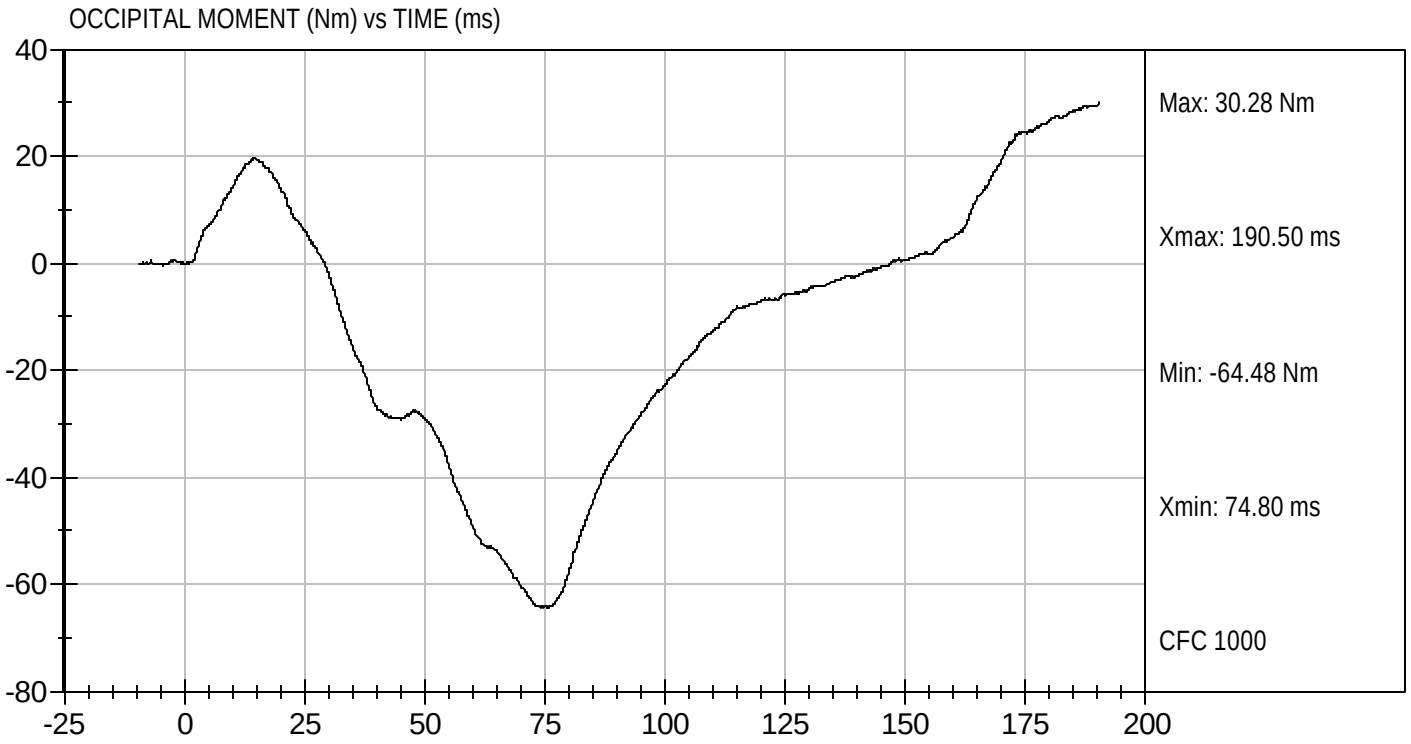


NECK ROTATION (DEG.) vs TIME (ms)



Test Desc: Neck Extension
Componet ID: D042273

Test Date: 09/22/2004
Velocity: 20.02 ft/s, 6.10 m/s



MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 065 **Test I.D:** D042274

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	43	Pass
Probe Velocity	m/s	6.58 to 6.82	6.65	Pass
Peak Probe Force	N	5159 to 5893	5,745	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.35	Pass
Internal Hysteresis	%	69 to 85	72	Pass
		Overall Test Results		Pass

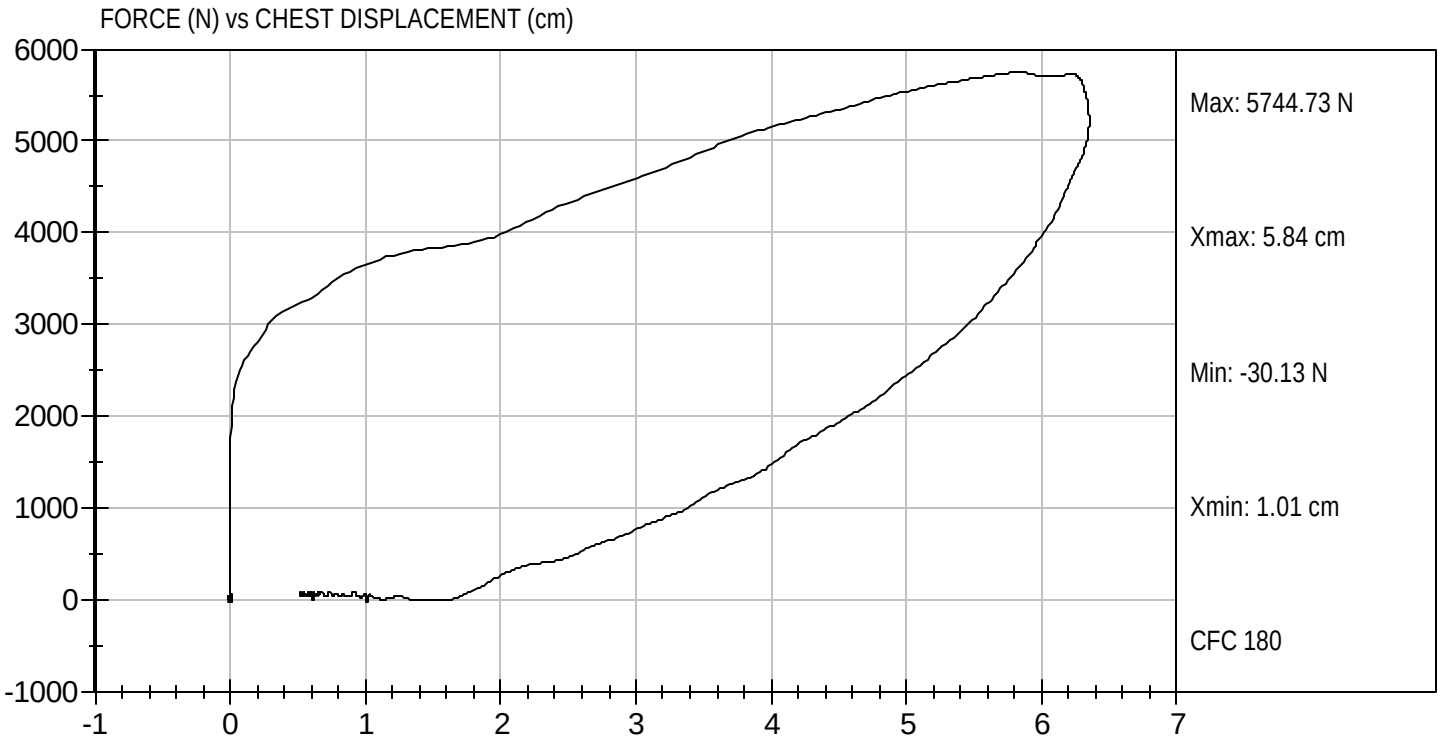
Laboratory Technician

09/22/2004
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Componet ID: D042274

Test Date: 09/22/2004
Velocity: 21.82 ft/s, 6.65 m/s



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 065 **Test I.D:** D042275

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Probe Velocity	m/sec	2.07 to 2.13	2.08	Pass
Peak Probe Force	Newtons	4715 to 5782	5,030	Pass
		Overall Test Results		Pass

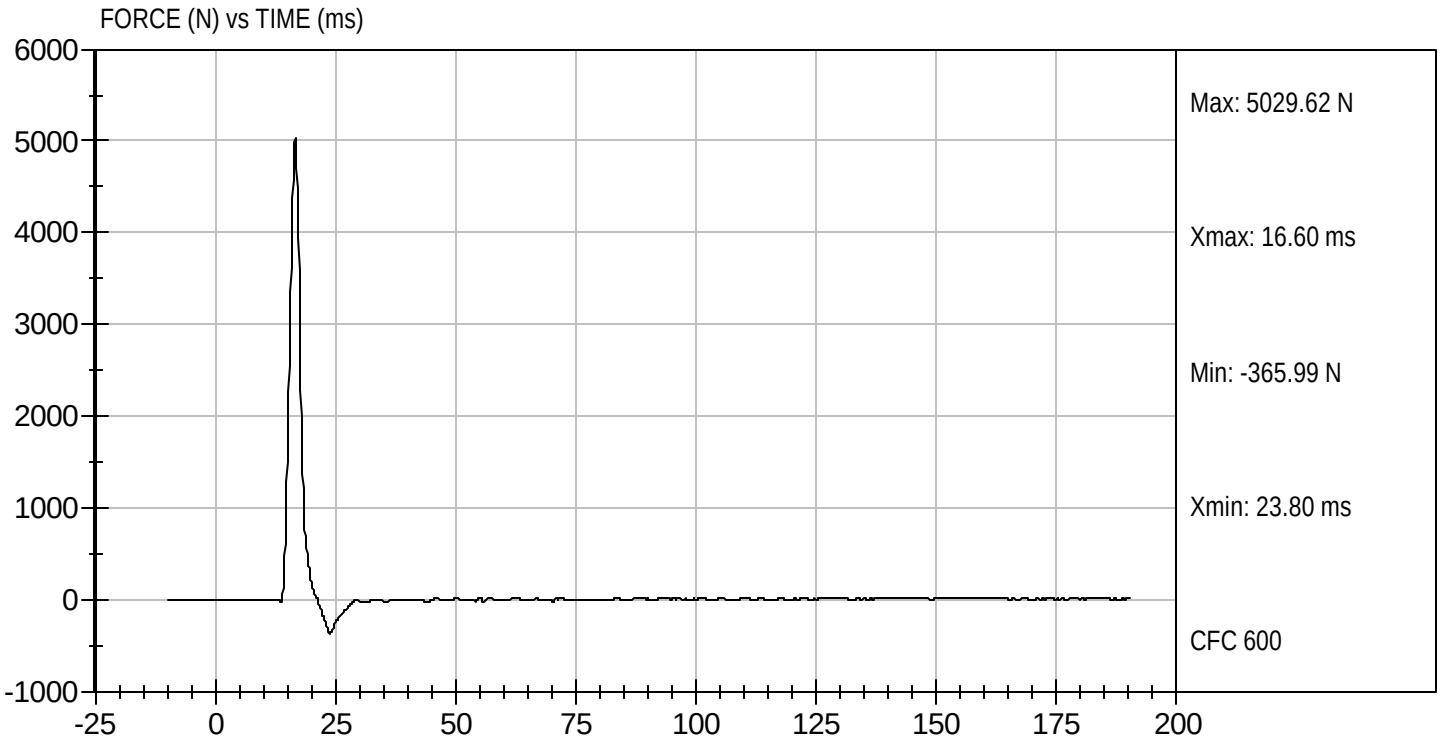
Jim Carney
Laboratory Technician

09/22/2004
Test Date

David Winkelbauer
Approved By

Test Desc: Right Knee
Componet ID: D042275

Test Date: 09/22/2004
Velocity: 6.82 ft/s, 2.08 m/s



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 065 **Test I.D:** D042276

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Probe Velocity	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	5,446	Pass
		Overall Test Results		Pass

Jim Carney

Laboratory Technician

09/22/2004

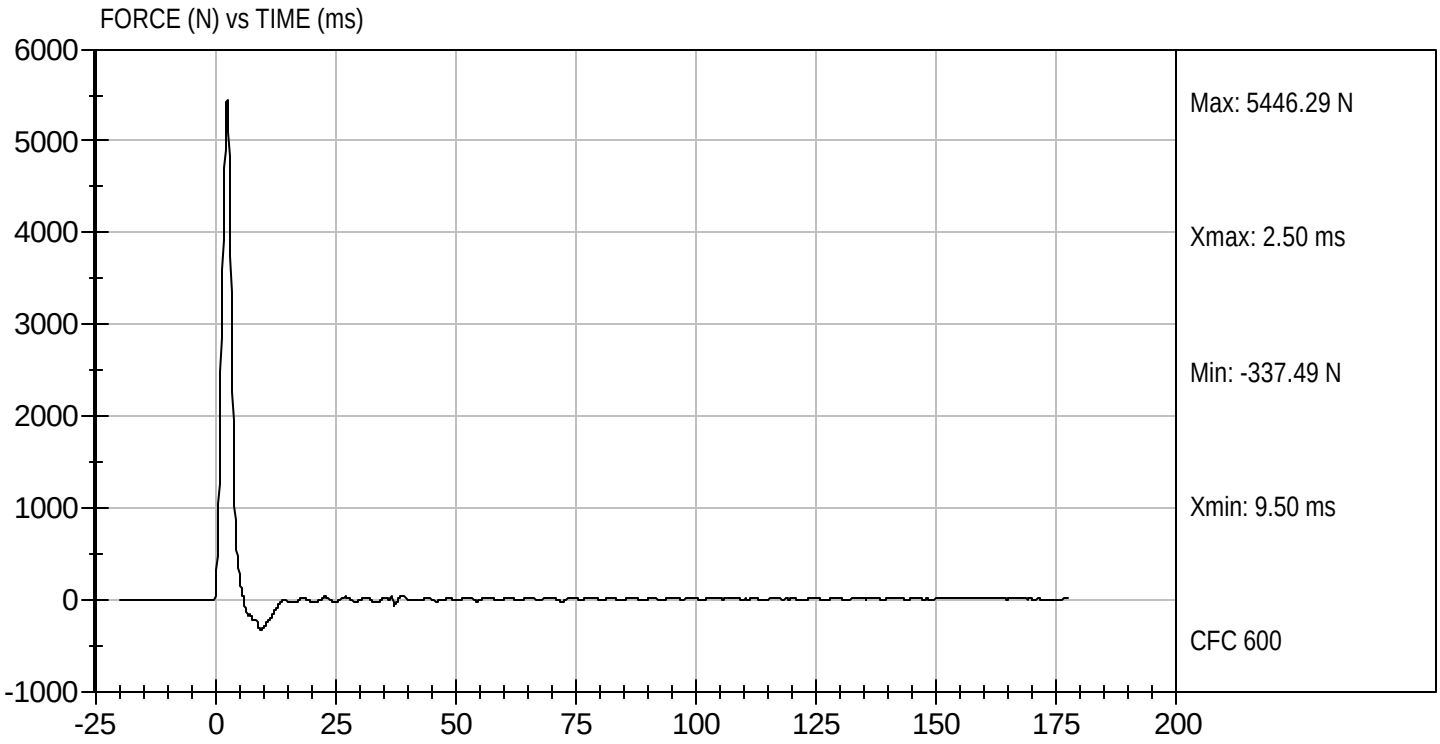
Test Date

David Winkelbauer

Approved By

Test Desc: Left Knee
Componet ID: D042276

Test Date: 09/22/2004
Velocity: 6.85 ft/s, 2.09 m/s



MGA RESEARCH CORPORATION

HIP-FEMUR FLEXION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 065 **Test I.D:** D042270

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	20.8	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	42	42	Pass
Rotation Rate	deg/sec	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	70.2	70.1	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	43	43	Pass
		Overall Test Results			Pass

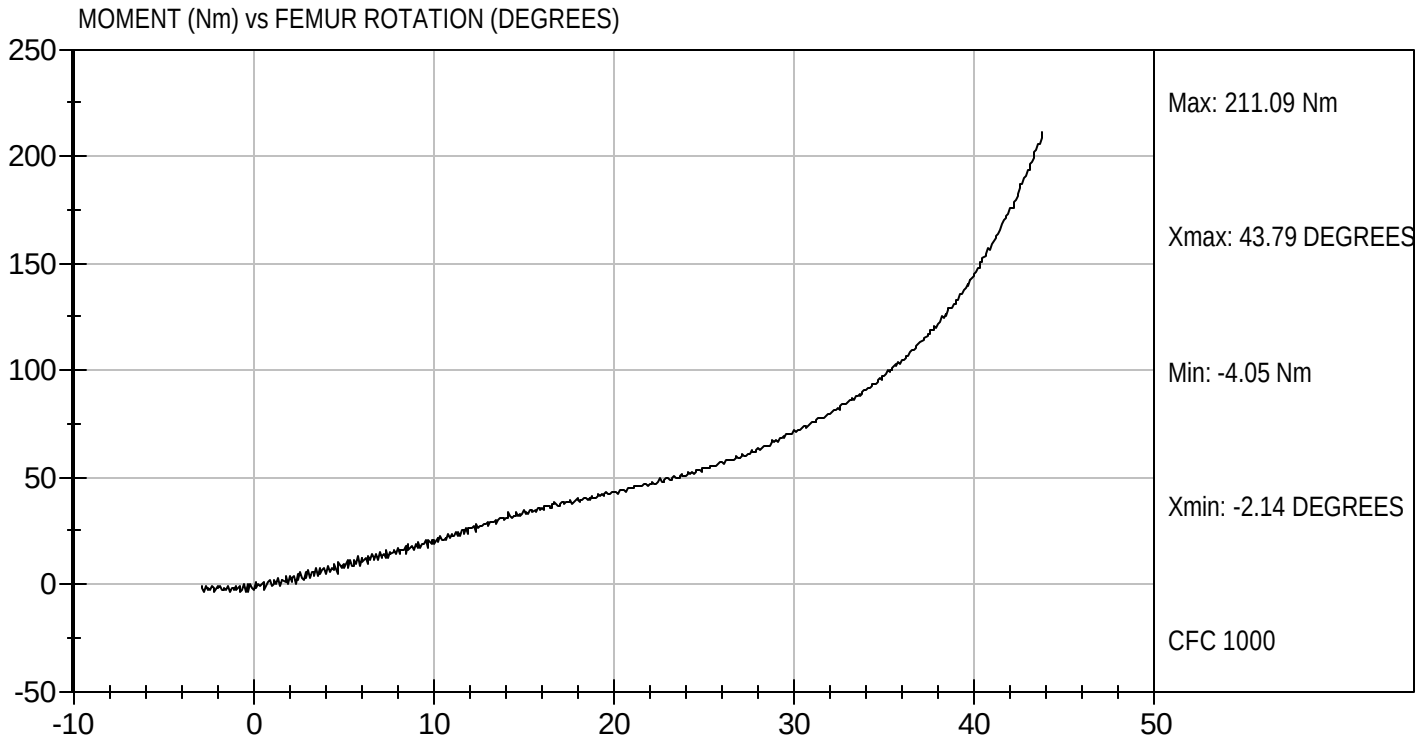
Jim Carney
Laboratory Technician

09/21/2004
Test Date

David Winkelbauer
Approved By

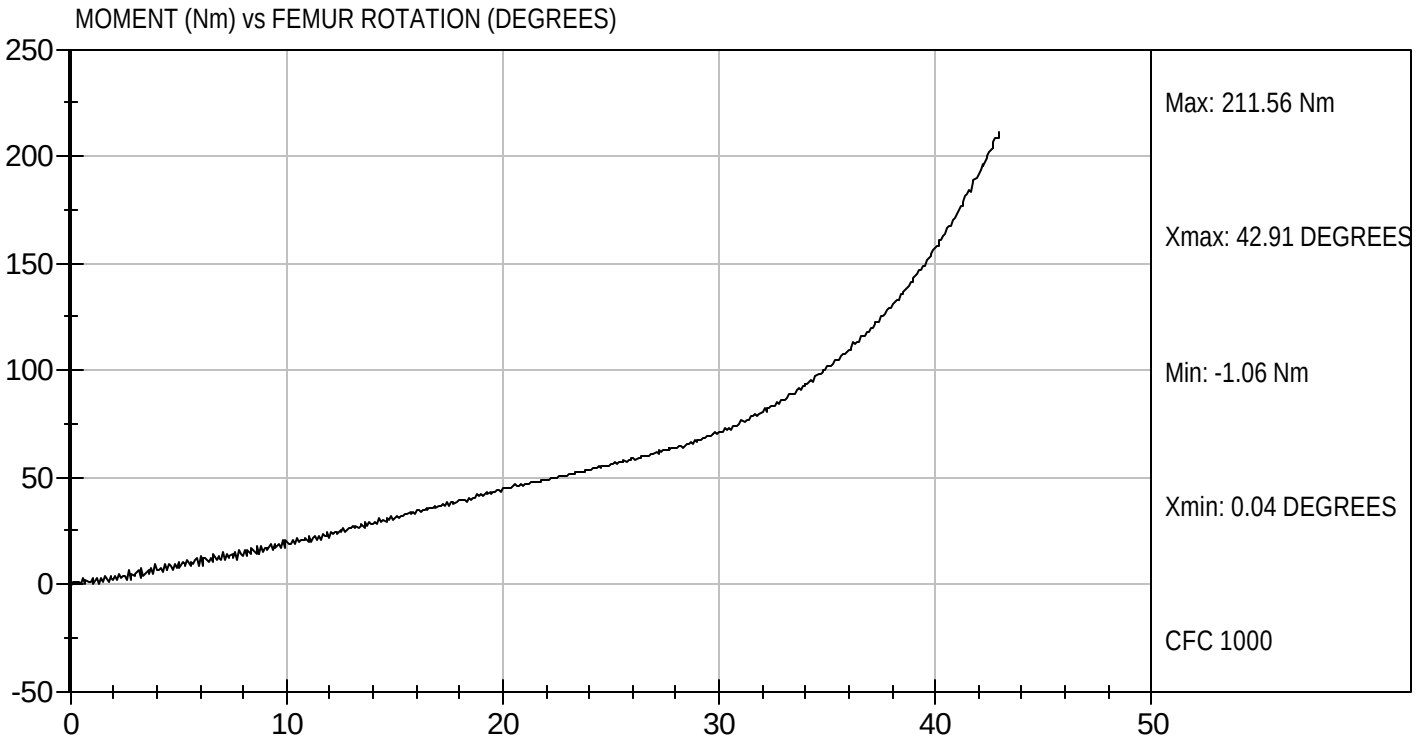
Test Desc: Hip Femur Flexion
Componet ID: D042279

Test Date: 09/21/2004
Velocity: 0 ft/s, 0.00 m/s



Test Desc: Hip Femur Flexion
Componet ID: D042270

Test Date: 09/21/2004
Velocity: 0 ft/s, 0.00 m/s



MGA RESEARCH CORPORATION

HEAD DROP TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 066 **Test ID:** D042281

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 - 25.6	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Peak Resultant Acceleration	G's	225 - 275	261	Pass
Peak Lateral Acceleration	G's	<= +/- 15.0	8.0	Pass
Unimodal	Yes/No	NA	Yes	Pass
Oscillations	Yes/No	within 10% of peak	Yes	Pass
		Overall Test Results		Pass

Jim Carney
Laboratory Technician

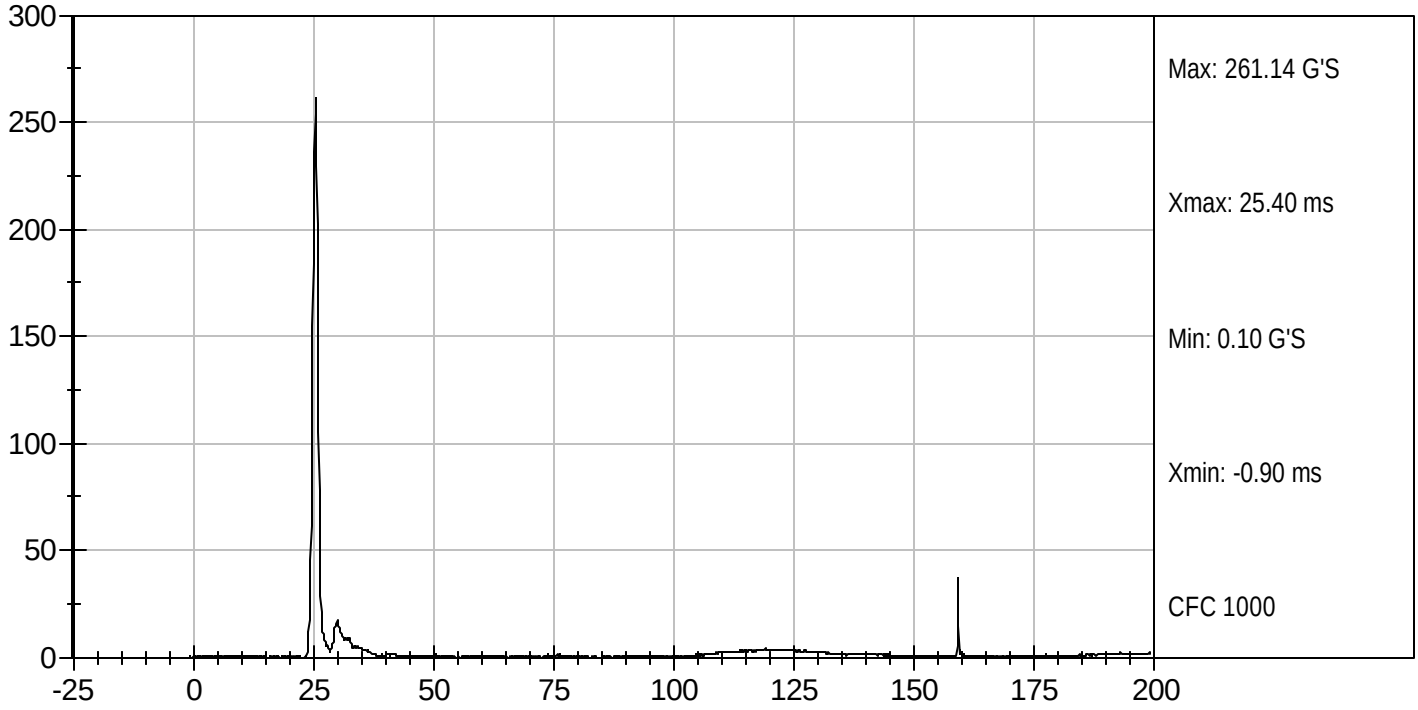
09/22/2004
Test Date

David Winkelbauer
Approved By

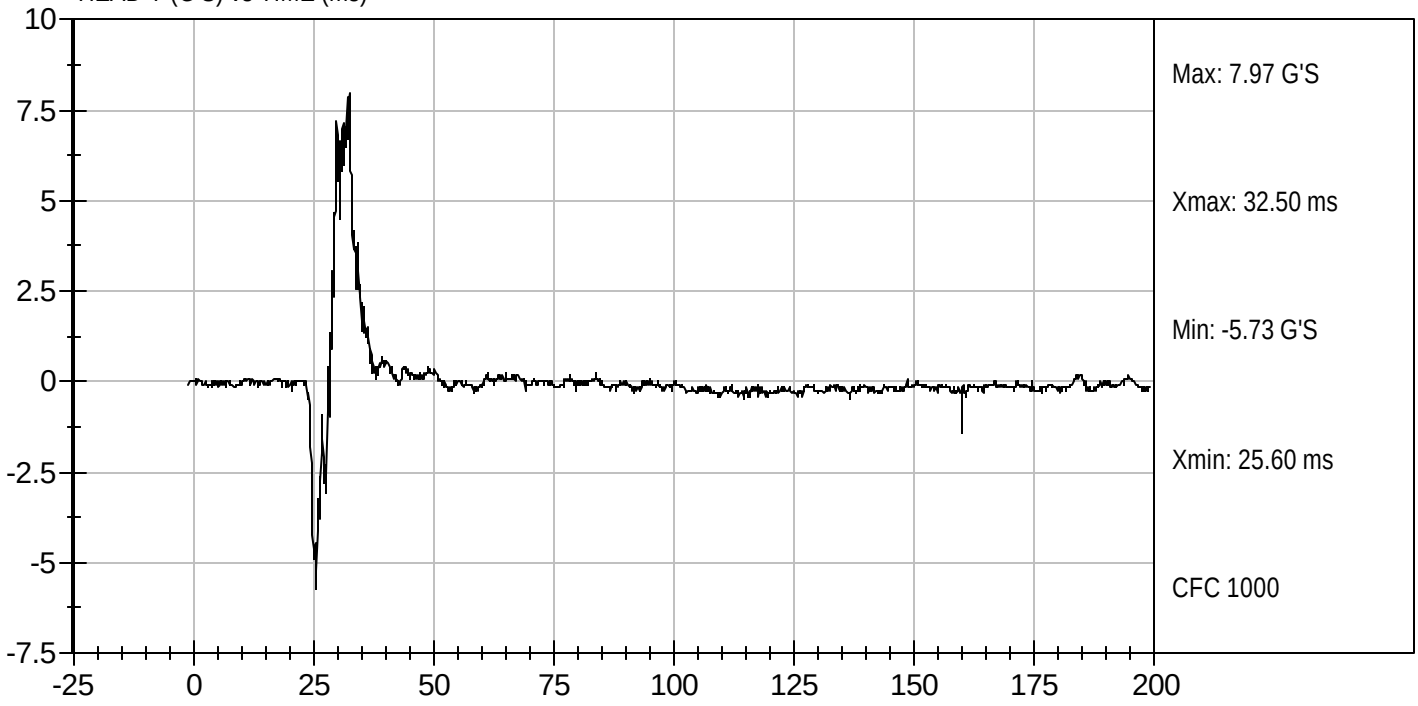
Test Desc: Head Drop
Componet ID: D042281

Test Date: 09/22/2004
Velocity: 0 ft/s, 0.00 m/s

HEAD RESULTANT ACCELERATION (G'S) vs TIME (ms)



HEAD Y (G'S) vs TIME (ms)



MGA RESEARCH CORPORATION

NECK FLEXION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 066 **Test I.D:** D042282

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		deg C	20.6 to 22.2	20.8	Pass
Laboratory Relative Humidity		%	10 to 70	40	Pass
Pendulum Velocity		m/s	6.89 to 7.13	7.02	Pass
Pendulum Deceleration	10 msec	G's	22.50 to 27.50	22.57	Pass
	20 msec	G's	17.60 to 22.60	19.83	Pass
	30 msec	G's	12.50 to 18.50	13.97	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 29.0	13.92	Pass
Deceleration Decay Time to Cross 5 G's		msec	34.0 to 42.0	40.4	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	69.7	Pass
	Time	msec	57.0 to 64.0	58.5	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	113.0 to 128.0	117.0	Pass
Moment About Occipital Condyle	Maximum	N m	88.1 to 108.5	92.7	Pass
	Time	msec	47.0 to 58.0	54.2	Pass
Positive Moment Decay Time To Zero Crossing		msec	97.0 to 107.0	103.5	Pass
			Overall Test Results		Pass

Jim Carney
Laboratory Technician

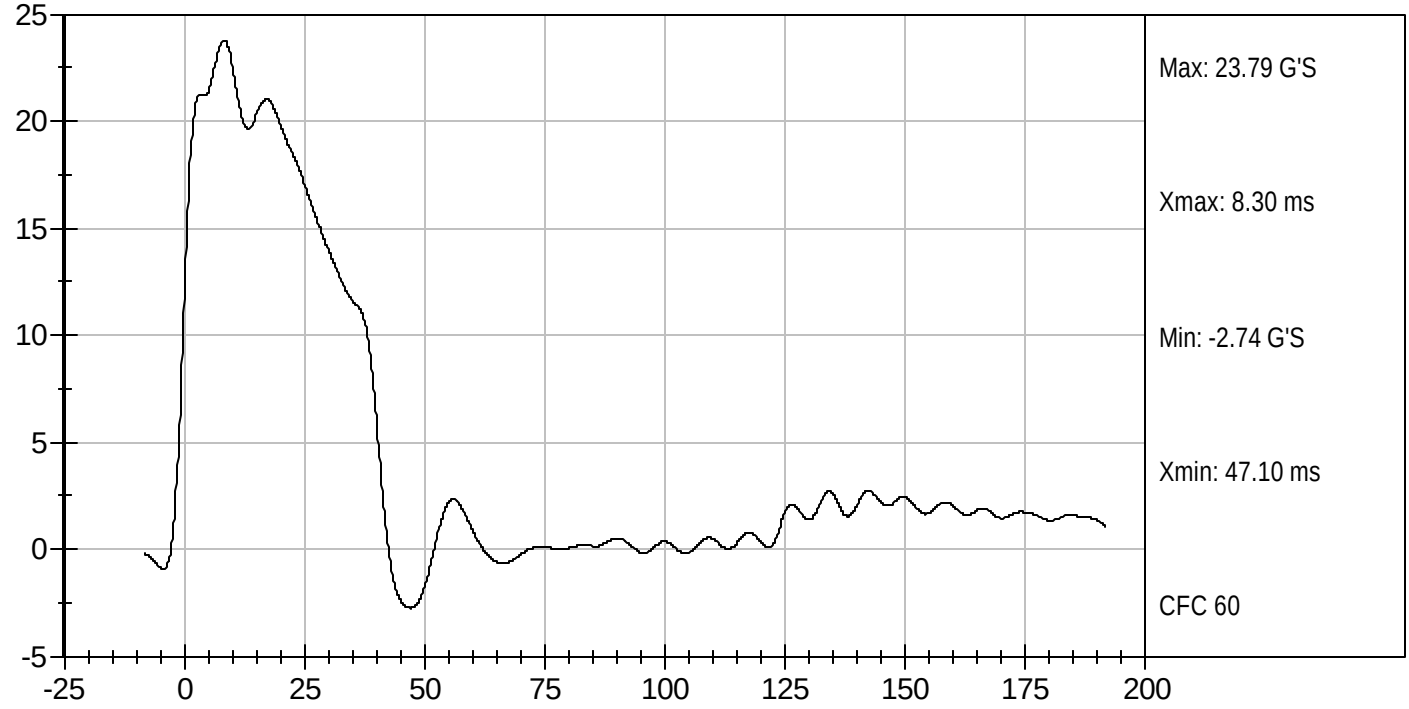
09/22/2004
Test Date

David Winkelbauer
Approved By

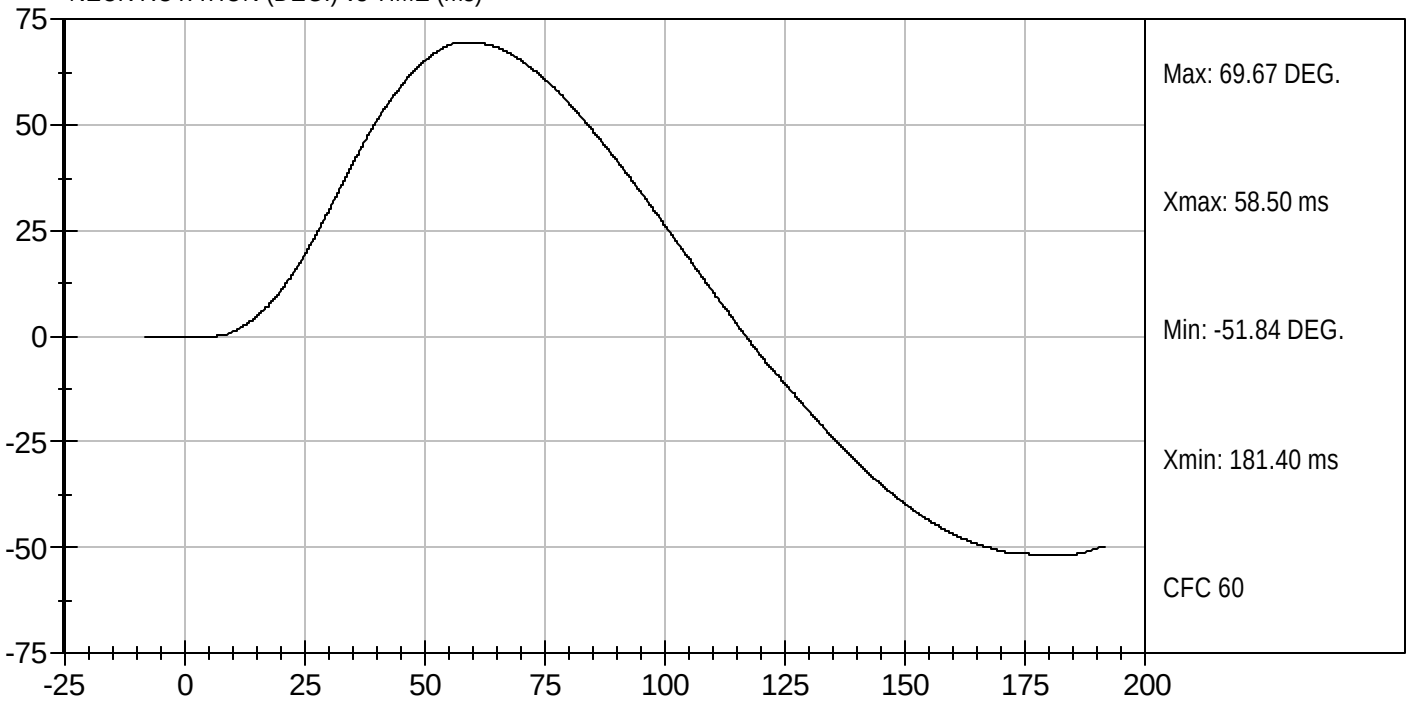
Test Desc: Neck Flexion
Componet ID: D042282

Test Date: 09/22/2004
Velocity: 23.02 ft/s, 7.02 m/s

PENDULUM DECELERATION (G'S) vs TIME (ms)

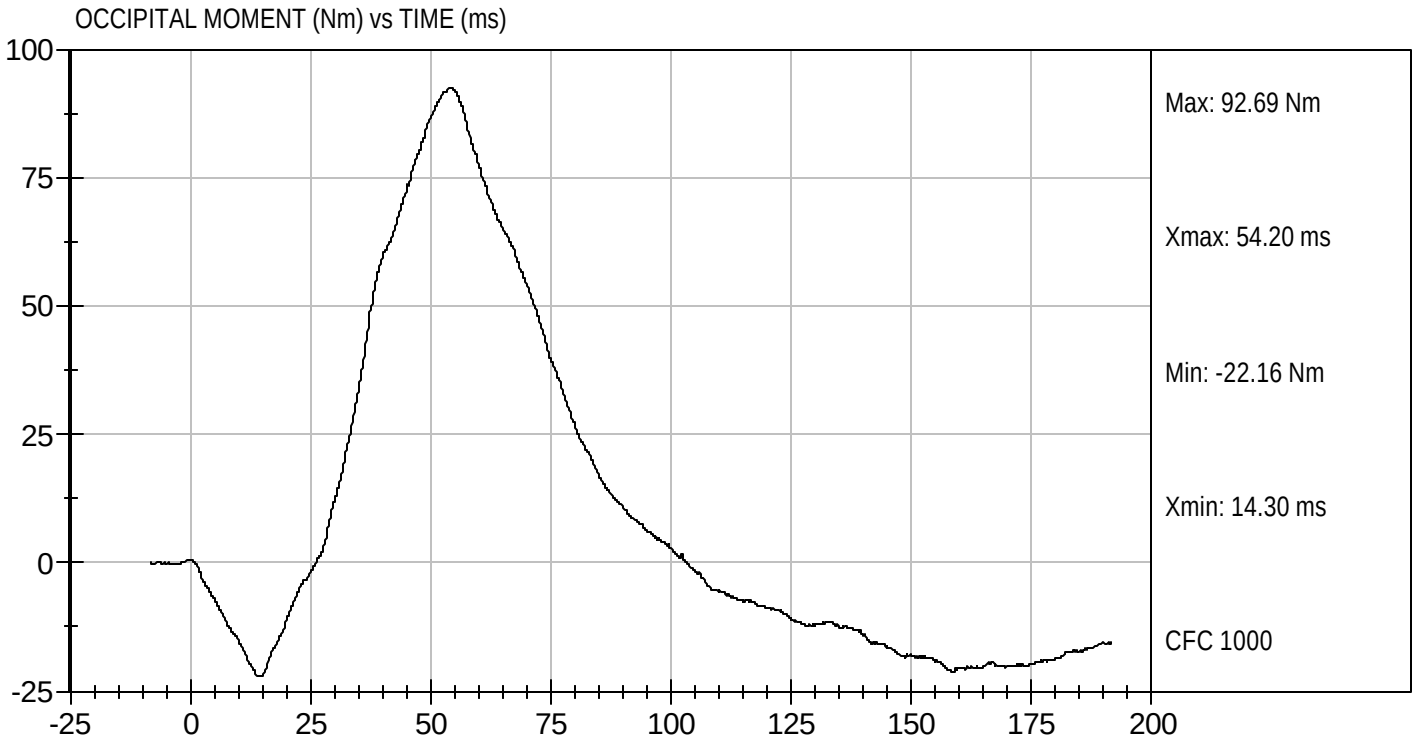


NECK ROTATION (DEG.) vs TIME (ms)



Test Desc: Neck Flexion
Componet ID: D042282

Test Date: 09/22/2004
Velocity: 23.02 ft/s, 7.02 m/s



MGA RESEARCH CORPORATION

NECK EXTENSION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 066 **Test I.D:** D042283

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	41	Pass
Pendulum Velocity		m/s	5.95 to 6.19	6.10	Pass
Pendulum Deceleration	10 msec	G's	17.20 to 21.20	18.05	Pass
	20 msec	G's	14.00 to 19.00	15.88	Pass
	30 msec	G's	11.00 to 16.00	12.15	Pass
Peak Pendulum Deceleration After 30 msec		G's	<= 22.0	12.14	Pass
Deceleration Decay Time to Cross 5 G's		msec	38.0 to 46.0	42.9	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	95.2	Pass
	Time	msec	72.0 to 82.0	78.4	Pass
"D" Plane Rotation Decay Time To Zero Crossing		msec	147.0 to 174.0	158.1	Pass
Moment About Occipital Condyle	Maximum	N m	-52.9 to -79.9	-66.9	Pass
	Time	msec	65.0 to 79.0	74.3	Pass
Negative Moment Decay Time To Zero Crossing		msec	120.0 to 148.0	145.2	Pass
			Overall Test Results		Pass

Jim Carney
Laboratory Technician

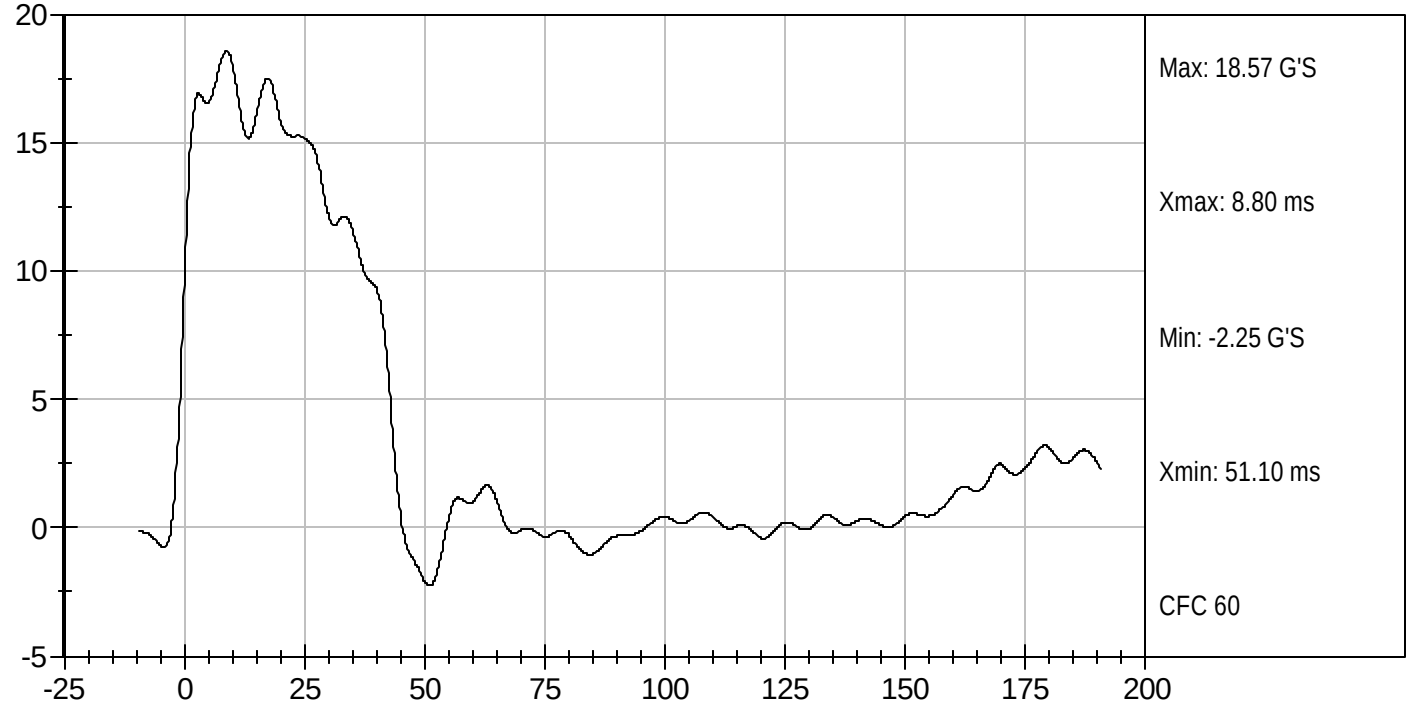
09/22/2004
Test Date

David Winkelbauer
Approved By

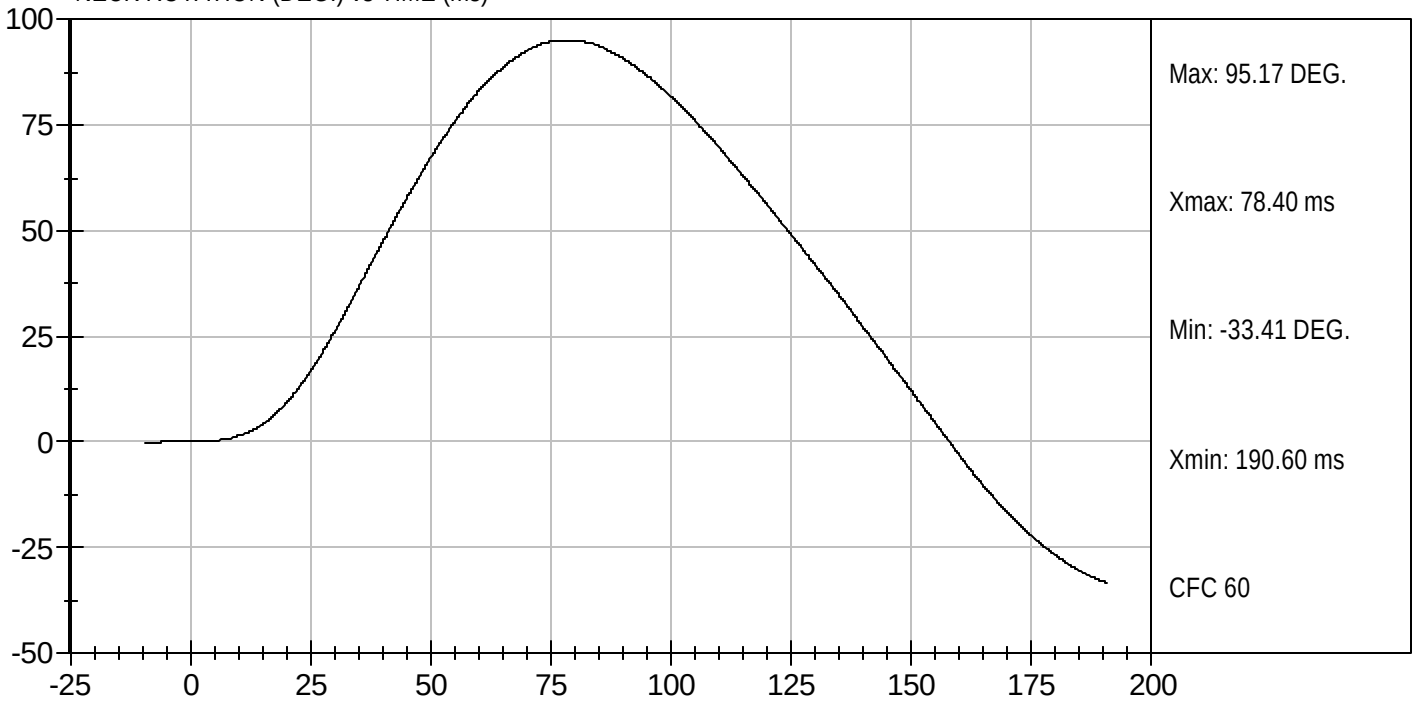
Test Desc: Neck Extension
Componet ID: D042283

Test Date: 09/22/2004
Velocity: 20.01 ft/s, 6.10 m/s

PENDULUM DECELERATION (G'S) vs TIME (ms)

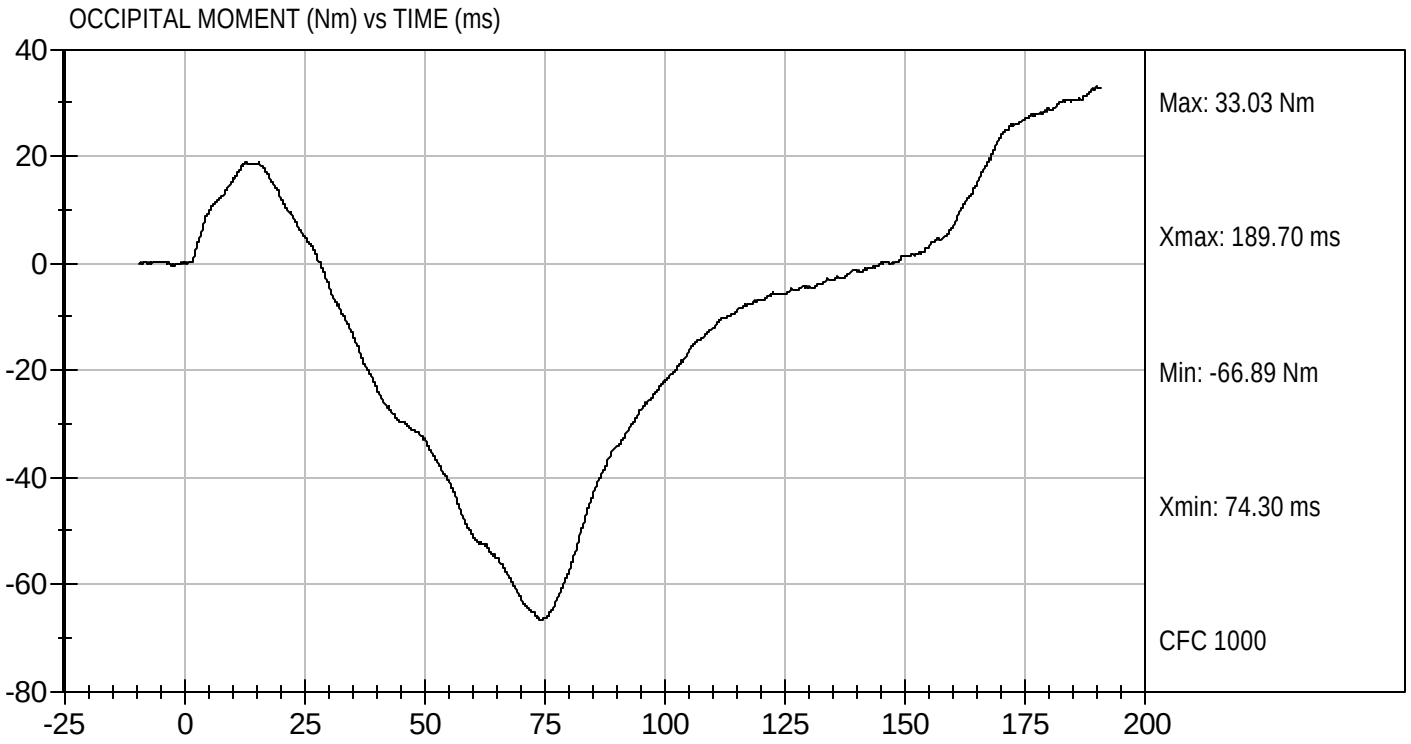


NECK ROTATION (DEG.) vs TIME (ms)



Test Desc: Neck Extension
Componet ID: D042283

Test Date: 09/22/2004
Velocity: 20.01 ft/s, 6.10 m/s



MGA RESEARCH CORPORATION

THORAX IMPACT

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 066 **Test I.D:** D042284

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	20.6 to 22.2	21.5	Pass
Laboratory Relative Humidity	%	10 to 70	43	Pass
Probe Velocity	m/s	6.58 to 6.82	6.71	Pass
Peak Probe Force	N	5159 to 5893	5,835	Pass
Peak Sternum Displacement	cm	6.35 to 7.26	6.55	Pass
Internal Hysteresis	%	69 to 85	69	Pass
		Overall Test Results		Pass

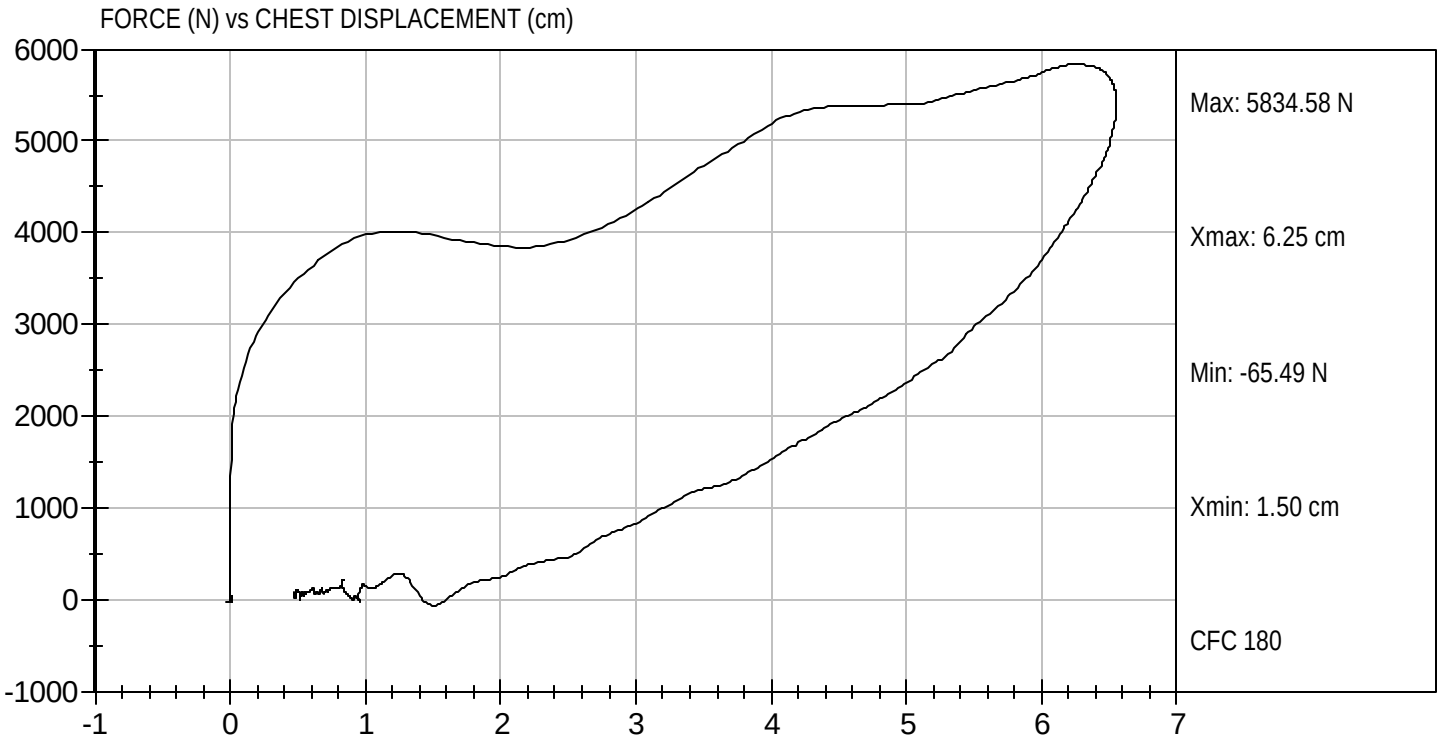
Laboratory Technician

09/22/2004
Test Date

David Winkelbauer
Approved By

Test Desc: Thorax Impact
Componet ID: D042284

Test Date: 09/22/2004
Velocity: 22.01 ft/s, 6.71 m/s



MGA RESEARCH CORPORATION

RIGHT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 066 **Test I.D:** D042285

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Probe Velocity	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	Newtons	4715 to 5782	4,943	Pass
		Overall Test Results		Pass

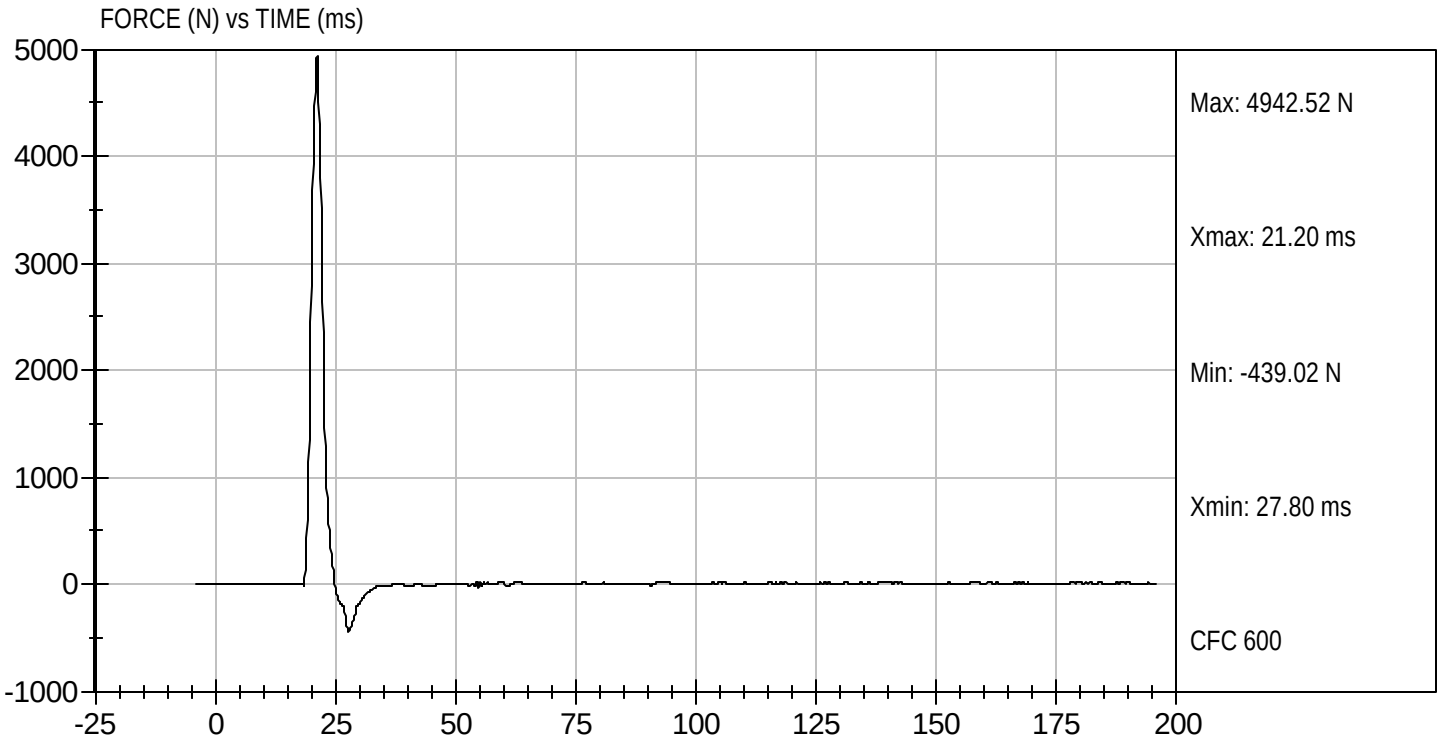
Jim Carney
Laboratory Technician

09/22/2004
Test Date

David Winkelbauer
Approved By

Test Desc: Right Knee
Componet ID: D042285

Test Date: 09/22/2004
Velocity: 6.86 ft/s, 2.09 m/s



MGA RESEARCH CORPORATION

LEFT KNEE IMPACT TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 066 **Test I.D:** D042286

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	deg C	18.9 to 25.5	20.9	Pass
Laboratory Relative Humidity	%	10 to 70	41	Pass
Probe Velocity	m/sec	2.07 to 2.13	2.08	Pass
Peak Probe Force	Newtons	4715 to 5782	5,190	Pass
		Overall Test Results		Pass

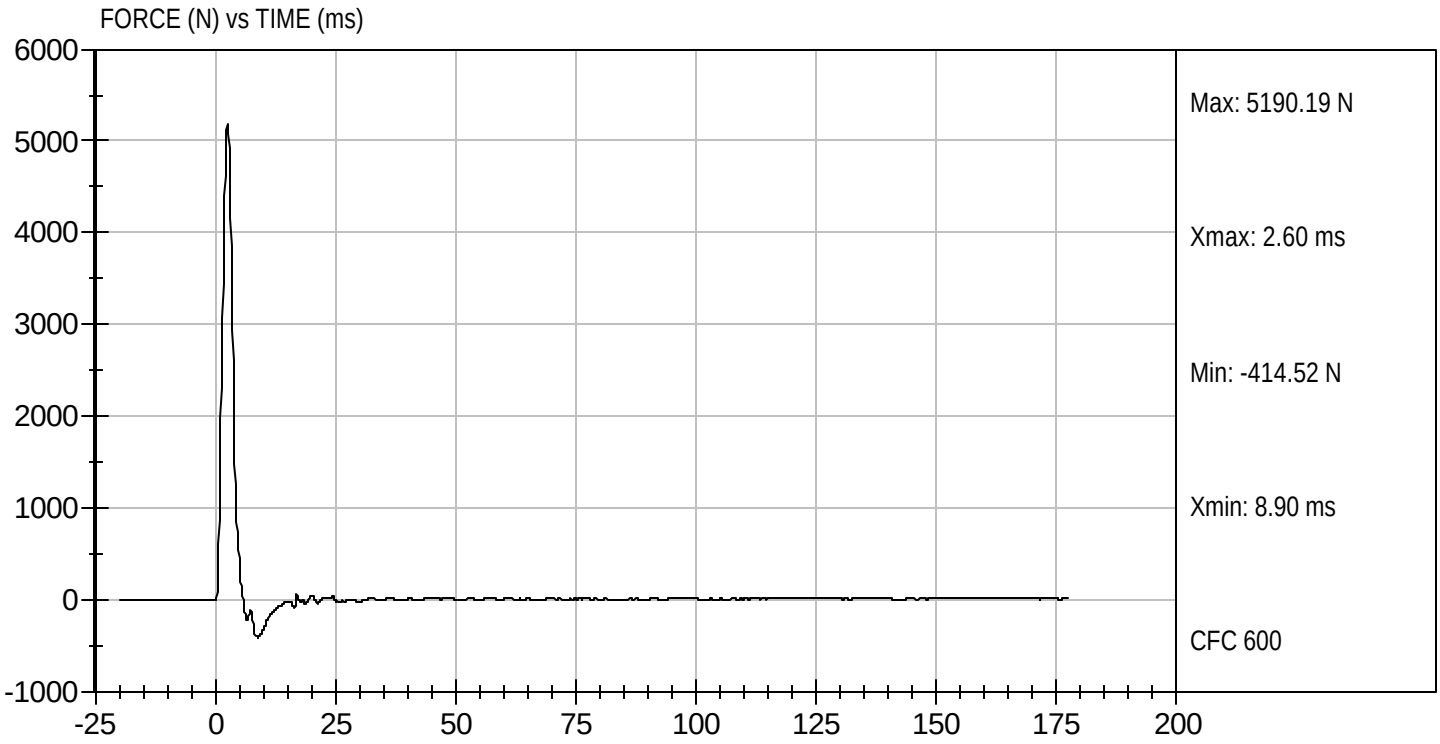
Jim Carney
Laboratory Technician

09/22/2004
Test Date

David Winkelbauer
Approved By

Test Desc: Left Knee
Componet ID: D042286

Test Date: 09/22/2004
Velocity: 6.81 ft/s, 2.08 m/s



MGA RESEARCH CORPORATION

HIP-FEMUR FLEXION TEST

HYBRID III 50TH PERCENTILE MALE

ATD Serial No: 066 **Test I.D:** D042280

Tested Parameter	Units	Specification	Result		Pass/Fail
			Right	Left	
Laboratory Temperature	deg C	18.9 to 25.6	20.8	20.8	Pass
Laboratory Relative Humidity	%	10 to 70	40	40	Pass
Rotation Rate	deg/sec	5 -10	8	8	Pass
30 Degrees	Nm	94.9 Nm Max	86.9	70.2	Pass
150 ft-lbf / 203.4 Nm	Deg	40- 50 Degree Max Rotation	42	41	Pass
		Overall Test Results			Pass

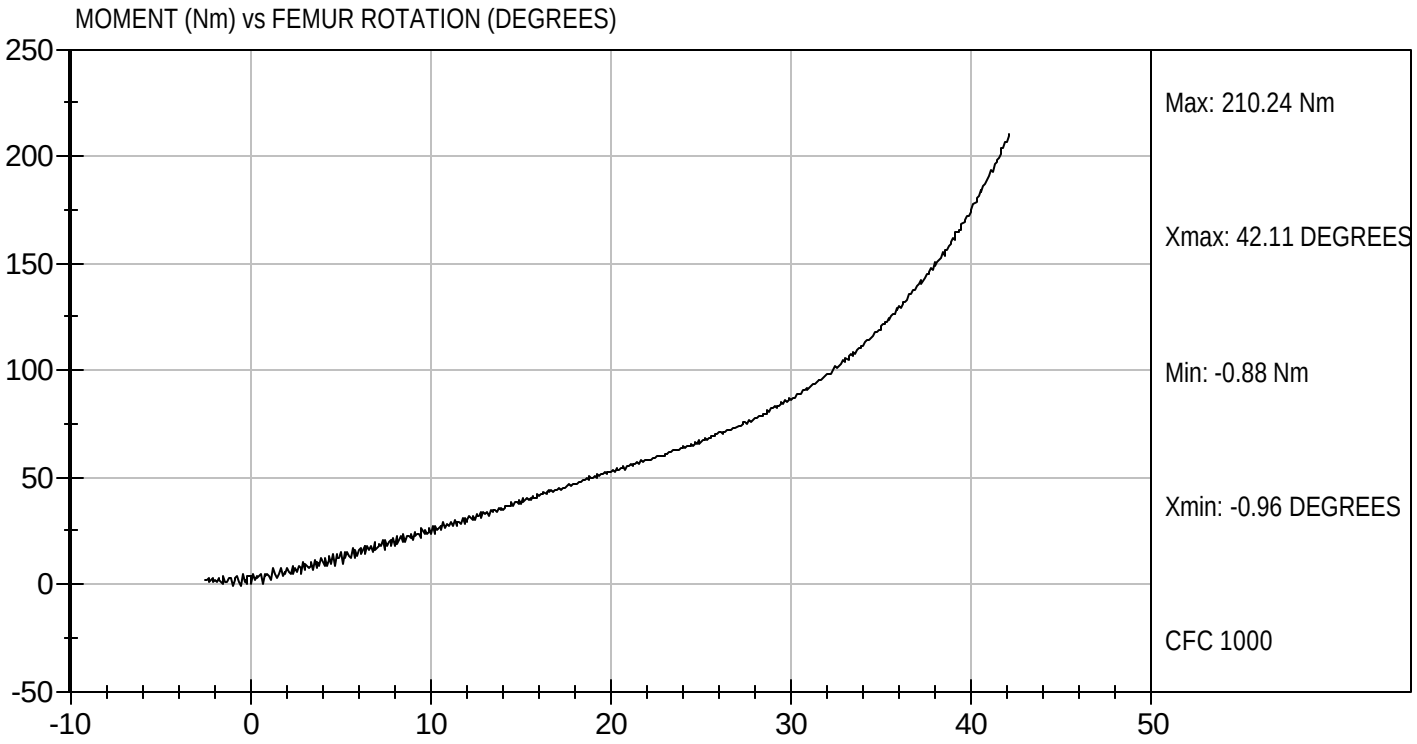
Jim Cooney
Laboratory Technician

09/21/2004
Test Date

David Winkelbauer
Approved By

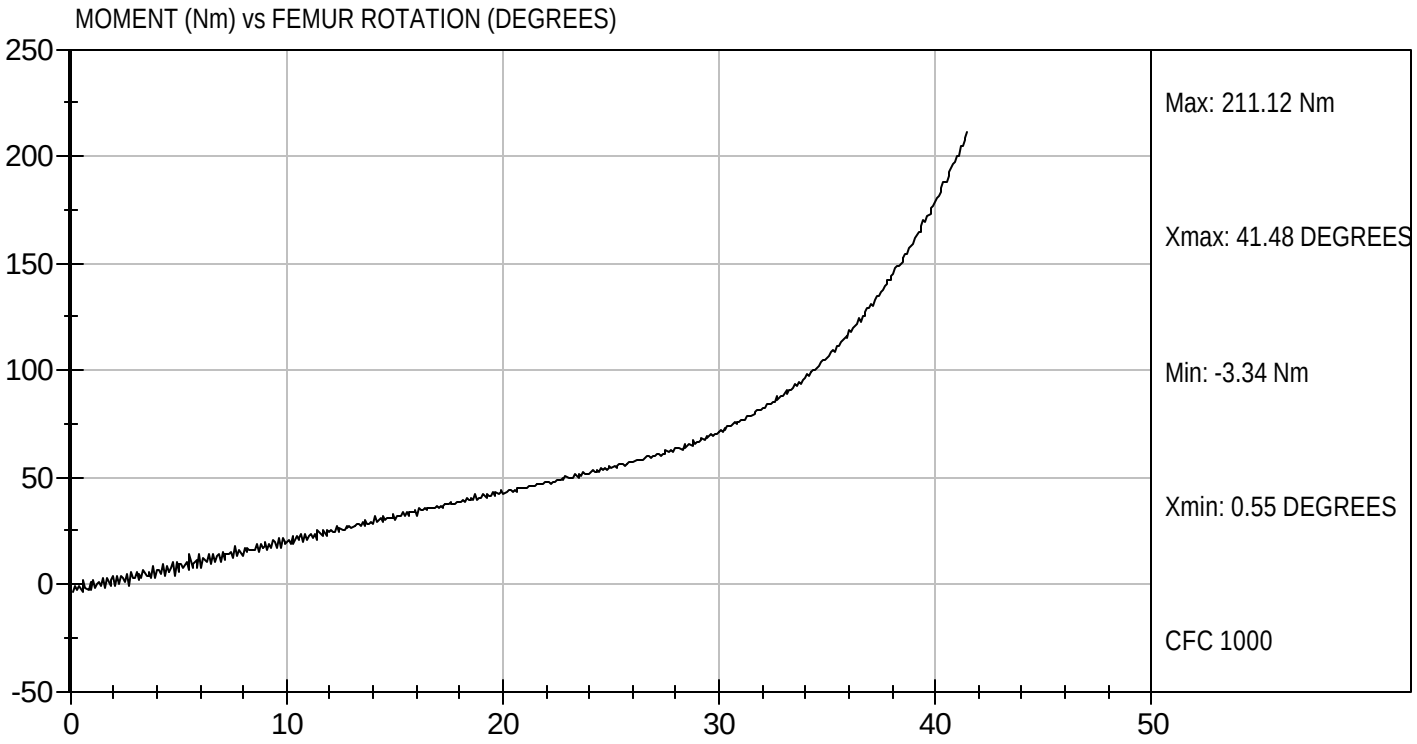
Test Desc: Hip Femur Flexion
Componet ID: D042289

Test Date: 09/21/2004
Velocity: 0 ft/s, 0.00 m/s



Test Desc: Hip Femur Flexion
Componet ID: D042280

Test Date: 09/21/2004
Velocity: 0 ft/s, 0.00 m/s



APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

INSTRUMENTS FOR DRIVER DUMMY NO. 065

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	P27020	Endevco	8/04/04
Head Y	P27025	Endevco	8/04/04
Head Z	P22692	Endevco	8/04/04
Head X Redundant	J10431	Endevco	8/04/04
Head Y Redundant	P26986	Endevco	8/04/04
Head Z Redundant	AN9E3	Endevco	8/04/04
Neck Load Cell	443	Denton	7/20/04
Chest X	AMT78	Endevco	8/04/04
Chest Y	AP1Y8	Endevco	8/04/04
Chest Z	J11361	Endevco	8/04/04
Chest Deflection Gauge	065	Servo	8/03/04
Chest X Redundant	ALFP5	Endevco	8/04/04
Chest Y Redundant	AP138	Endevco	8/04/04
Chest Z Redundant	AJ9Y3	Endevco	8/04/04
Pelvis X	C29-N11	Entran	7/01/04
Pelvis Y	C23-M12	Entran	7/01/04
Pelvis Z	C12-R01	Entran	7/01/04
Left Femur Load Cell	262	Denton	7/20/04
Right Femur Load Cell	261	Denton	7/20/04
Left Upper Tibia Load Cell	266	Denton	7/22/04
Left Lower Tibia Load Cell	179	Denton	7/22/04
Right Upper Tibia Load Cell	263	Denton	7/22/04
Right Lower Tibia Load Cell	174	Denton	7/22/04
Left Foot Z – Front	AMTL6	Endevco	9/17/04
Left Ankle X	AMTG3	Endevco	9/17/04
Left Ankle Z	ALC37	Endevco	9/17/04
Right Foot Z – Front	J21970	Endevco	9/17/04
Right Ankle X	J22033	Endevco	9/17/04
Right Ankle Z	J21691	Endevco	9/17/04
Shoulder Belt Load Cell	158	Denton	6/08/04
Lap Belt Load Cell	166	Denton	6/08/04

INSTRUMENTS FOR PASSENGER DUMMY NO. 066

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	A28-H01	Entran	9/17/04
Head Y	J13535	Endevco	10/25/04
Head Z	A28-H02	Entran	9/17/04
Head X Redundant	A27-Z12	Entran	9/17/04
Head Y Redundant	AH097	Endevco	10/25/04
Head Z Redundant	L17-Z14	Entran	9/17/04
Neck Load Cell	442	Denton	7/20/04
Chest X	P22086	Endevco	8/04/04
Chest Y	AJ9D2	Endevco	8/04/04
Chest Z	P24265	Endevco	8/04/04
Chest Deflection Gauge	066	Servo	8/03/04
Chest X Redundant	P22652	Endevco	8/04/04
Chest Y Redundant	AJ417	Endevco	8/04/04
Chest Z Redundant	P22150	Endevco	8/04/04
Pelvis X	J13851	Endevco	8/02/04
Pelvis Y	AJ808	Endevco	8/02/04
Pelvis Z	AH0F0	Endevco	8/02/04
Left Femur Load Cell	259	Denton	7/20/04
Right Femur Load Cell	256	Denton	7/20/04
Left Upper Tibia Load Cell	107	Denton	7/22/04
Left Lower Tibia Load Cell	136	Denton	7/22/04
Right Upper Tibia Load Cell	103	Denton	7/22/04
Right Lower Tibia Load Cell	133	Denton	7/22/04
Left Foot Z – Front	A05-A20	Entran	8/04/04
Left Ankle X	A05-A21	Entran	8/04/04
Left Ankle Z	A07-J01	Entran	8/04/04
Right Foot Z – Front	ANBP7	Endevco	7/23/04
Right Ankle X	L30-Z18	Entran	8/04/04
Right Ankle Z	A12-Z11	Entran	8/04/04
Shoulder Belt Load Cell	157	Denton	8/18/04
Lap Belt Load Cell	194	Denton	6/08/04

INSTRUMENTS FOR VEHICLE

	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Rear Seat Crossmember X	E01-F03	Entran	8/24/04
Left Rear Seat Crossmember Z	L20-B16	Entran	9/13/04
Right Rear Seat Crossmember X	K07-R13	Entran	8/25/04
Right Rear Seat Crossmember Z	D07-N02	Entran	9/13/04
Top of Engine X	K07-R04	Entran	7/26/04
Bottom of Engine X	A29-F06	Entran	11/02/04
Left Brake Caliper X	K07-R08	Entran	7/02/04
Right Brake Caliper X	A29-B06	Entran	9/13/04
Instrument Panel X	I12-F01	Entran	7/02/04